Electronic copy
of letterhead

STATE OF MISSOURI Jeremiah W. (Jay) Nixon, Governor Mark N. Templeton, Acting Director
DEPARTMENT OF NATURAL RESOURCES
www.dnr.mo.gov

March 11, 2009

Mr. William W. Rice
Acting Regional Administrator
U.S. Environmental Protection Agency, Region VII
901 North Fifth Street
Kansas City, KS 66101

Dear Mr. Rice:

Enclosed please find the State of Missouri's ozone nonattainment area recommendations pursuant to the new ozone standard promulgated by the U.S. Environmental Protection Agency (EPA) in March 2008. The final recommendations have been fully vetted through stakeholder discussions, formal public hearing and comment period, and, finally, the Missouri Air Conservation Commission.

The 1990 Clean Air Act Amendments have provided countless benefits for the health and well-being of our citizens. The state implementation plan process has developed health-based standards and emission controls to improve air quality in nonattainment areas.

However, the major revisions adopted by Congress almost 20 years ago do not appear to address many of the issues which Missouri faces today. The 1990 amendments set the ozone standard at 120 ppb. At this level, ozone was clearly an urban area problem. Accordingly, many of the provisions in the Act are well-suited for large metropolitan areas. In 1997, when EPA strengthened the standard to a level of 84 ppb, ozone became more of a regional problem, but one still addressed by many of the approaches for urban areas.

The new 75 ppb standard has made ozone a rural issue. For the 2005 to 2007 period, eighteen of the 19 monitors in the state recorded violations, of which 5 we would describe as in rural areas. Never before has Missouri had violating monitors in rural areas. We will need to expand our network of monitors to track ozone in smaller communities and rural areas adequately.

We are concerned that a significant percentage of the strategies in the Act mandated for certain levels of nonattainment will not be workable, effective, make economic sense, or protective of public health in rural areas. For example, vehicle emissions testing and reformulated gasoline make sense for large urban areas with a large concentration of mobile sources. However, imposing such strategies on rural communities is likely to produce little air quality benefit despite a substantial cost.

We also want to note that the 1990 amendments did not contemplate climate change or the need to reduce greenhouse gases. Some of the controls that have been used effectively to combat ozone may not have been the best choice when considering the issue of climate change. If efforts to combat ozone and other criteria pollutants are not harmonized with policies aimed at greenhouse gas reduction, we may be working at cross-purposes.

Recognizing that the U.S. EPA must implement the provisions of the Act as they are currently written, I strongly encourage you to consider the implementation issues that are inextricably linked to the designation of nonattainment areas. This consideration is vital in light of the vastly different emission control scenarios currently facing counties across the nation now that the ozone standard is 75 ppb versus 84 ppb. In Missouri, the rural areas in question have begun to undertake serious efforts to closely scrutinize their ozone causing emissions and to develop plans to improve air quality for their citizens. These efforts will allow local communities to develop and to implement the best, most cost-effective options to improve air quality, which will likely be very different than previous urban control efforts. Stepping back, given current discussions regarding energy independence and reduction of greenhouse gases that are occurring on the national level, I believe that the time is right to take a more holistic approach to air quality planning and air pollution regulation.

Your determination regarding the ozone nonattainment areas in Missouri are of critical importance to our citizens and businesses. We are hopeful that after thoughtful consideration of this submittal you will come to the same conclusion as our final recommendation.

Thank you for the opportunity to provide these recommendations. If you have any questions, please contact Jim Kavanaugh at (573) 751-7840.

Sincerely,

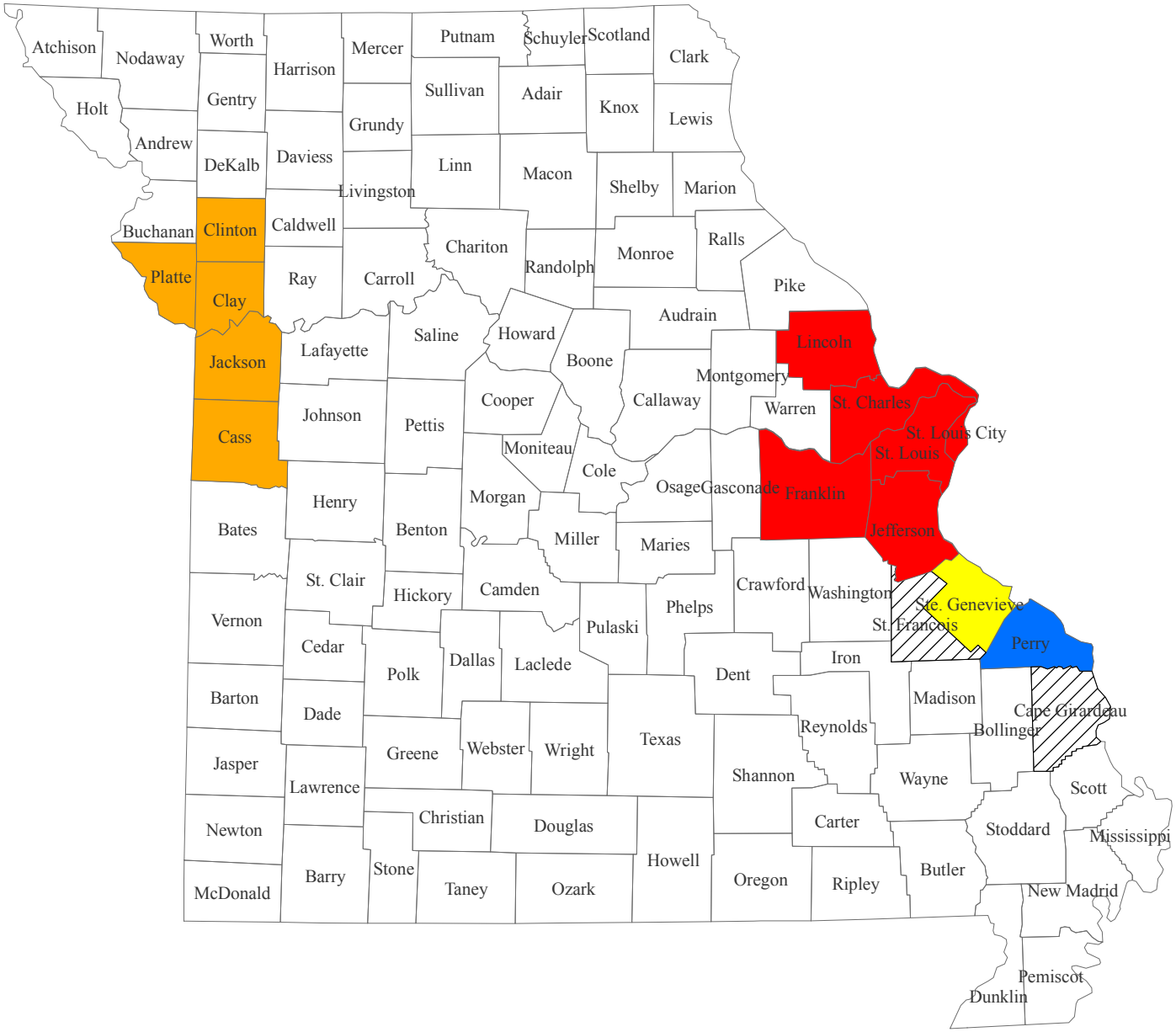
DEPARTMENT OF NATURAL RESOURCES

Mark N. Templeton
Director

MNT:jkb

Enclosures

2008 Ozone Nonattainment Designation Recommendation



Missouri Department of Natural Resources
Division of Environmental Quality
Air Pollution Control Program
Prepared by Bern Johnson 25 JAN 09

- Nonattainment - St. Louis
- Nonattainment - Kansas City
- Nonattainment - Ste. Genevieve
- Nonattainment - Southeast Missouri
- Unclassifiable
- Attainment/Unclassifiable

County	Recommended Classification
ADAIR	Attainment/unclassifiable
ANDREW	Attainment/unclassifiable
ATCHISON	Attainment/unclassifiable
AUDRAIN	Attainment/unclassifiable
BARRY	Attainment/unclassifiable
BARTON	Attainment/unclassifiable
BATES	Attainment/unclassifiable
BENTON	Attainment/unclassifiable
BOLLINGER	Attainment/unclassifiable
BOONE	Attainment/unclassifiable
BUCHANAN	Attainment/unclassifiable
BUTLER	Attainment/unclassifiable
CALDWELL	Attainment/unclassifiable
CALLAWAY	Attainment/unclassifiable
CAMDEN	Attainment/unclassifiable
CAPE GIRARDEAU	Unclassifiable
CARROLL	Attainment/unclassifiable
CARTER	Attainment/unclassifiable
CASS	Nonattainment
CEDAR	Attainment
CHARITON	Attainment/unclassifiable
CHRISTIAN	Attainment/unclassifiable
CLARK	Attainment/unclassifiable
CLAY	Nonattainment
CLINTON	Nonattainment
COLE	Attainment/unclassifiable
COOPER	Attainment/unclassifiable
CRAWFORD	Attainment/unclassifiable
DADE	Attainment/unclassifiable
DALLAS	Attainment/unclassifiable
DAVIESS	Attainment/unclassifiable
DeKALB	Attainment/unclassifiable
DENT	Attainment/unclassifiable
DOUGLAS	Attainment/unclassifiable
DUNKLIN	Attainment/unclassifiable
FRANKLIN	Nonattainment
GASCONADE	Attainment/unclassifiable
GENTRY	Attainment/unclassifiable
GREENE	Attainment/unclassifiable
GRUNDY	Attainment/unclassifiable
HARRISON	Attainment/unclassifiable
HENRY	Attainment/unclassifiable

HICKORY	Attainment/unclassifiable
HOLT	Attainment/unclassifiable
HOWARD	Attainment/unclassifiable
HOWELL	Attainment/unclassifiable
IRON	Attainment/unclassifiable
JACKSON	Nonattainment
JASPER	Attainment/unclassifiable
JEFFERSON	Nonattainment
JOHNSON	Attainment/unclassifiable
KNOX	Attainment/unclassifiable
LACLEDE	Attainment/unclassifiable
LAFAYETTE	Attainment/unclassifiable
LAWRENCE	Attainment/unclassifiable
LEWIS	Attainment/unclassifiable
LINCOLN	Nonattainment
LINN	Attainment/unclassifiable
LIVINGSTON	Attainment/unclassifiable
McDONALD	Attainment/unclassifiable
MACON	Attainment/unclassifiable
MADISON	Attainment/unclassifiable
MARIES	Attainment/unclassifiable
MARION	Attainment/unclassifiable
MERCER	Attainment/unclassifiable
MILLER	Attainment/unclassifiable
MISSISSIPPI	Attainment/unclassifiable
MONITEAU	Attainment/unclassifiable
MONROE	Attainment
MONTGOMERY	Attainment/unclassifiable
MORGAN	Attainment/unclassifiable
NEW MADRID	Attainment/unclassifiable
NEWTON	Attainment/unclassifiable
NODAWAY	Attainment/unclassifiable
OREGON	Attainment/unclassifiable
OSAGE	Attainment/unclassifiable
OZARK	Attainment/unclassifiable
PEMISCOT	Attainment/unclassifiable
PERRY	Nonattainment
PETTIS	Attainment/unclassifiable
PHELPS	Attainment/unclassifiable
PIKE	Attainment/unclassifiable
PLATTE	Nonattainment
POLK	Attainment/unclassifiable
PULASKI	Attainment/unclassifiable
PUTNAM	Attainment/unclassifiable
RALLS	Attainment/unclassifiable

RANDOLPH	Attainment/unclassifiable
RAY	Attainment/unclassifiable
REYNOLDS	Attainment/unclassifiable
RIPLEY	Attainment/unclassifiable
ST. CHARLES	Nonattainment
ST. CLAIR	Attainment/unclassifiable
ST. FRANCOIS	Unclassifiable
STE. GENEVIEVE	Nonattainment
ST. LOUIS	Nonattainment
SALINE	Attainment/unclassifiable
SCHUYLER	Attainment/unclassifiable
SCOTLAND	Attainment/unclassifiable
SCOTT	Attainment/unclassifiable
SHANNON	Attainment/unclassifiable
SHELBY	Attainment/unclassifiable
STODDARD	Attainment/unclassifiable
STONE	Attainment/unclassifiable
SULLIVAN	Attainment/unclassifiable
TANEY	Attainment/unclassifiable
TEXAS	Attainment/unclassifiable
VERNON	Attainment/unclassifiable
WARREN	Attainment/unclassifiable
WASHINGTON	Attainment/unclassifiable
WAYNE	Attainment/unclassifiable
WEBSTER	Attainment/unclassifiable
WORTH	Attainment/unclassifiable
WRIGHT	Attainment/unclassifiable
ST. LOUIS CITY	Nonattainment

2008 8-HOUR OZONE BOUNDARY RECOMMENDATION

And

Technical Support Document for Determination of Nonattainment Boundaries in Missouri for the 2008 8-Hour Ozone National Ambient Air Quality Standard

MISSOURI
DEPARTMENT OF
NATURAL RESOURCES

Adopted by the
Missouri Air Conservation Commission
February 3, 2009

Missouri Department of Natural Resources
Air Pollution Control Program
P.O. Box 176
Jefferson City, MO 65102

Telephone: (573) 751-4817

ORGANIZATION OF DOCUMENT

KANSAS CITY AREA

Kansas City Area Recommendation

SPRINGFIELD/SOUTHWEST MISSOURI AREA

Springfield/Southwest Missouri Area Recommendation

APPENDICES

Appendix A – Meteorology

Meteorology of 8-Hour Ozone Formation in Missouri

Missouri Department of Natural Resources

SUMMARY FOR REVISED MISSOURI RECOMMENDATION
8-hour Ozone Nonattainment Designations
2008 National Ambient Air Quality Standard

INTRODUCTION

This summary describes the process used to formulate the proposed 2008 8-hour ozone nonattainment area boundary recommendation. The U.S. Environmental Protection Agency (EPA) 2008 revision to the 8-hour ozone standard establishes 0.075 parts per million (ppm) as the primary and secondary air quality standard. The previous 8-hour ozone standard was 0.08 ppm with compliance measured at 0.084 ppm due to rounding. The area boundaries are based on the most current ozone monitoring data (2005-07) along with primary guidance from the March 28, 2000, EPA guidance for developing the 2003 8-hour designation recommendations and with secondary guidance from the June 8, 2007, EPA memorandum for 2007 PM designations. After the initial recommendation was published, EPA provided revised guidance for the 2008 designation process. This guidance did not provide new information to address in this recommendation. It is important to note that the 2006-08 monitoring data (current at the time of document creation) was considered during the review process and is included as it provides important evidence to the overall recommendation. As part of the designation effort, the department has conducted a series of three meetings in the four areas potentially impacted by the designation process and has requested local information from stakeholders within those areas. The department developed the "Technical Support Document for Determination of Nonattainment Boundaries in Missouri for the 2008 8-hour Ozone National Ambient Air Quality Standard" to gather information necessary to make this recommendation and address the EPA criteria in detail.

SUMMARY OF RECOMMENDATION

Based on the 2005-07 monitoring data, six distinct areas in Missouri violate the 2008 8-hour ozone National Ambient Air Quality Standard (NAAQS): Kansas City (Missouri/Kansas), St. Louis (Missouri/Illinois), Ste. Genevieve, Southeast Missouri, Springfield, and El Dorado Springs. The proposed boundaries for 8-hour ozone nonattainment areas in Missouri include the following counties:

Kansas City:	Cass, Clay, Clinton, Jackson, Platte
St. Louis:	Franklin, Jefferson, Lincoln, St. Charles, St. Louis, City of St. Louis
Ste. Genevieve:	Ste. Genevieve

Southeast Missouri:	Perry
**Springfield:	Christian, Greene, Stone, Taney
**El Dorado Springs:	Cedar (rural transport)

St. Francois County and Cape Girardeau County are recommended for designation as unclassifiable. The remaining counties in the state of Missouri are recommended for designation as attainment/unclassifiable.

The above counties were designated nonattainment based on affirmative answers to one or both of the two basic designation questions: (1) Does the representative ozone monitoring data for each county indicate a violation of the ozone standard? and (2) Do the emissions within this county contribute to a downwind monitored violation?

This recommendation has been developed through in-depth technical evaluations of the available information related to the EPA guidance along with a series of stakeholder meetings and input. The information presented as part of the recommendation has been collected from many different sources including data from individual industrial facilities within Missouri. All the data and the rationale for answering the two questions is presented in the Technical Support Document (TSD) for this recommendation. To be clear, the input provided by stakeholders from all the different areas was considered during the development of the recommendation. The department believes this document is a fair and accurate assessment of the information and incorporates many stakeholder comments and contributions. However, this document does not reflect a consensus reached by all stakeholders that participated in the formal meetings for each area.

**It is important to note that based on the current 2006-08 monitoring data, the counties within the El Dorado Springs and Springfield areas would be designated attainment/unclassifiable for the 2008 ozone NAAQS. Therefore, Springfield/Southwest Missouri area has two recommendation scenarios: one based on the 2005-07 monitoring data that demonstrates a violation of the standard as documented above and the other based on the 2006-08 monitoring data that shows attainment of the standard for the entire area. These two distinct scenarios are presented for completeness.

BACKGROUND

On March 12, 2008, EPA promulgated a revision to the ozone NAAQS which obligated the state of Missouri to designate the attainment status of all areas of the state. EPA revised the NAAQS by changing the level of the primary and secondary standards from 0.08 ppm to 0.075 ppm with an 8-hour averaging time. The Clean Air Act (CAA) allows each state to recommend initial designations of the attainment status for all areas of the State. Specifically, Section 107(d)(1) of the CAA allows each state an opportunity to recommend attainment/unclassifiable and nonattainment areas including appropriate

boundaries. EPA can accept the recommendation or make modifications as it deems necessary.

The previous 8-hour ozone NAAQS was promulgated in 1997, but legal delays caused the ozone recommendation process to extend until July 2003. After a series of workgroup meetings in both Kansas City and St. Louis, the department provided a designation recommendation that included counties in both areas. The 2003 recommendation included the following counties in the St. Louis area: Franklin, Jefferson, St. Charles, St. Louis and the City of St. Louis. Ultimately, EPA agreed with this recommendation after requesting additional information regarding Ste. Genevieve County.

The 2003 recommendation included the following counties in the Kansas City area: Clay, Jackson, Platte, and the portion of Cass County inside the Metropolitan Planning Organization boundary (northern portion of the county). However, based on the 2001-03 and 2002-04 ozone monitoring data, the Kansas City area attained the 1997 8-hour ozone standard and EPA revised the recommendation to state that these counties would be in attainment of the NAAQS. Further, since the Kansas City area was a maintenance area for the 1-hour ozone standard, EPA required a maintenance plan for the 1997 8-hour ozone standard in the same area as the previous maintenance plan: Clay, Jackson, and Platte Counties.

The remaining counties in Missouri were designated attainment for the 1997 8-hour ozone standard during the 2003 designation process.

Pursuant to the establishment of any new NAAQS, EPA requests states submit boundary recommendations for nonattainment areas twelve months after promulgation. Therefore, Missouri's recommendation for the 2008 8-hour ozone NAAQS will be submitted to EPA before March 12, 2009.

FEDERAL AREA DESIGNATIONS

Unclassifiable: any area that cannot be classified on the basis of available information as meeting or not meeting the national primary or secondary ambient air quality standard for the pollutant.
Attainment: any area that meets the national primary or secondary ambient air quality standard for the pollutant.
Nonattainment: any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary of secondary ambient air quality standard for the pollutant.

CRITERIA FOR DESIGNATION:

After initial publication of the draft designation recommendations, EPA published revised guidance for the 2008 ozone standard designation. The guidance used to support this designation comes from two previous guidance documents: the primary guidance is

from the 2003 ozone designation process with secondary guidance from the 2007 PM designation process. There are no differences in criteria from the two previous documents and the newly published guidance. Discussion of Core Based Statistical Areas or Combined Statistical Areas is new to this guidance and reflects EPA's finding that ozone violations are occurring outside large metropolitan areas and potentially near and inside smaller, micropolitan statistical areas. These new areas primarily replace the existing guidance for Metropolitan Statistical Areas and Combined Metropolitan Statistical Areas discussed next.

Pursuant to the 2003 ozone designation process, EPA published a guidance document titled "Boundary Guidance on Air Quality Designations of the 8-hour Ozone National Ambient Air Quality Standards" on March 28, 2000. This guidance was written to assist states in recommending areas under the 1997 8-hour ozone standard. In that guidance, the EPA recommends that the Metropolitan Statistical Area (MSA) or Consolidated Metropolitan Statistical Area (CMSA) serve as the presumptive boundary for the 8-hour ozone nonattainment areas. In order to remove counties within the presumptive boundary or include counties outside the presumptive boundary, each state is required to address the following eleven boundary criteria:

- Emissions and air quality in adjacent areas
- Population density and degree of urbanization including commercial development
- Monitoring data representing ozone concentrations in local areas and larger areas
- Location of emission sources
- Traffic and commuting patterns
- Expected growth
- Meteorology
- Geography/topography
- Jurisdictional boundaries
- Level of control of emissions sources
- Regional emission reductions

Pursuant to the 2007 PM designation process, EPA supplied a guidance memorandum on June 8, 2007 from Robert Meyers to the EPA Regional Administrators. In this guidance, EPA specifically addressed the nonattainment designation of areas that are found to contribute to nearby violating monitors as part of the designation process. Also, EPA did not establish a presumptive boundary for the revised PM standard. Further, EPA addressed nine boundary criteria in this guidance:

- Emission data
- Air quality data
- Population density and degree of urbanization including commercial development
- Traffic and commuting patterns
- Growth rates and patterns
- Meteorology (weather/transport patterns)
- Geography/topography

- Jurisdictional boundaries
- Level of control of emissions sources

It is important to note that the 2008 ozone designation guidance contains the same nine criteria as the 2007 PM designation guidance. Since there is considerable overlap between the two previous guidance documents and the new guidance, the department has included an evaluation of all the criteria listed here in a comprehensive fashion to fully address all the necessary criteria.

PROCESS FOR DEVELOPING RECOMMENDATIONS

The department held a series of three meetings in each of the four areas of the state impacted by this revised standard. These meetings were designed to provide information to stakeholders and allow the affected communities to better understand the designation process. Also, the department provided the technical information used in the recommendation development to these stakeholders via the 8-hour ozone designation Web site: (http://www.dnr.mo.gov/env/apcp/ozone/8hourdesignationprocess.htm). In addition, the Web site includes a link that allows stakeholders to submit information or comments regarding the technical data. Based on the attendance at the meetings, the department believes these meetings encouraged participation from many stakeholders. Environmental interests, industry, county commissioners, mayors, county health departments, regional planning organizations, local air quality control agencies, neighboring state air agencies, EPA Region VII, and other air quality management partners attended the meetings.

Similar to the 2003 ozone designation process, the department decided to publish a draft recommendation for public comment and review. The draft document was made available to the public 30 days prior to the department presenting the draft designation recommendation to the Missouri Air Conservation Commission as part of the public hearing on December 4, 2008. After consideration of the comments received, the department is presenting this final statewide recommendation for adoption by the commission. Upon adoption, the Governor or his designee will send the recommendation to EPA Region VII. After this submittal, EPA will consider all states' recommendations and provide an additional opportunity for comment on the final designation status of all areas. The department is, and will remain, committed to keeping stakeholders involved throughout the remaining designation process and subsequent State Implementation Plan development process.

CRITERIA FOR ESTABLISHING BOUNDARIES AND DISCUSSION OF BOUNDARY DEVELOPMENT

Although every nonattainment area is unique, the recommendations for all the areas considered were consistently guided by the following principles:

- Existing 8-hour ozone nonattainment/maintenance areas were recommended for inclusion in the 2008 8-hour ozone boundary recommendation.
- Any county that contains a monitor that violates the 2008 8-hour ozone standard is included in an existing nonattainment area or becomes part of its own area.
- Areas that have a violating monitor using the 2005-07 ozone design values, but do not have violations based on 2006-08 design values will have two different scenarios presented. One will be based on the 2005-07 ozone design values and the other will be based on the 2006-08 ozone design values.
- Using the EPA boundary criteria and the information presented in the technical support document, counties that exhibit a pattern of frequent and significant contribution were considered for inclusion in the applicable nonattainment area. Along with this technical information, the department considered relevant policy considerations as part of the designation process. The review of contributing factors must be conducted for different counties in a consistent manner statewide. Due to the fact each of the counties has unique characteristics, the factors for the designation of each county are compared with the other counties and evaluated in a collective fashion.

Section 107(d)(1)(A) of the Clean Air Act defines a nonattainment area as any area that does not meet or that contributes to nearby areas not meeting the ambient air quality standard. The relevant EPA guidance allows states to consider, at a minimum, the boundary criteria when establishing boundaries. The implementation of control strategies that will eventually be used in the attainment demonstrations for these areas is a distinct and separate process and is not a primary consideration in this boundary evaluation. It is premature to consider control strategies in this process when the strategies have not been finalized or even evaluated.

In order to determine trends within each potential ozone nonattainment area and provide the most comprehensive set of information, the department chose to begin the evaluation process with counties within the metropolitan statistical area (MSA). Based on information gathered in the 2003 ozone designation process for the Kansas City metropolitan complex, the Department also preliminarily identified counties bordering the MSAs with higher VOC and/or NOx emissions or that were part of a contiguous MSA. The 2007 MSA boundary (developed by the United States Office of Management and Budget) for Kansas City has expanded in both Missouri and Kansas since the 2003 designation process. The following Missouri counties were examined in the Kansas City area: Bates, Caldwell, Cass, Clay, Clinton, Jackson, Lafayette, Platte, and Ray in the MSA and Andrew, Buchanon, De Kalb, Henry, and Johnson outside the MSA. It should be noted that the Warrensburg micropolitan statistical area (Johnson County) is part of the 2006 Combined Statistical Area for Kansas City.

The department also began the St. Louis evaluation with the St. Louis MSA and preliminarily identified counties bordering the MSAs with higher VOC and/or NOx emissions. The 2007 MSA boundary (developed by the United States Office of Management and Budget) for St. Louis has expanded in both Missouri and Illinois since the 2003 designation process. The following Missouri counties were examined in the St.

Louis area: Franklin, Jefferson, Lincoln, St. Charles, St. Louis, Washington, and the City of St. Louis in the MSA and Crawford, Gasconade, Montgomery, Perry, Pike, St. Francois, and Ste. Genevieve outside the St. Louis MSA. It should be noted that the Farmington micropolitan statistical area (St. Francois County) is part of the 2006 Combined Statistical Area for St. Louis.

The Southeast Missouri violating monitor (Farrar in Perry County) is in a region that is not in or contiguous with one of the three major metropolitan areas in Missouri (St. Louis, Kansas City, or Springfield). Since this area is very close to the St. Louis area, there is some overlap of counties within the evaluation for both areas. Since Perry County has the monitor with the violation (Farrar), the contiguous micropolitan statistical area (μSA - Cape Girardeau) was the basis for the initial evaluation. Note: the St. Louis MSA is not contiguous with Perry County. Therefore, the following Missouri counties were evaluated as part of the Southeast Missouri area: Bollinger and Cape Girardeau inside the Cape Girardeau μSA and Perry, Scott, St. Francois, and Ste. Genevieve outside the μSA. The Sikeston μSA (Scott County) is considered part of the Combined Statistical Area for Cape Girardeau.

For Springfield/Southwest Missouri, the department chose to begin the boundary designation evaluating counties with representation in the Ozarks Clean Air Alliance. This organization has endeavored to bring local stakeholders together to discuss air quality issues within the Springfield/Southwest Missouri area. These counties are as follows: Christian, Dallas, Greene, Polk, and Webster in the Springfield MSA; Stone and Taney in the Branson MSA; and Barry, Lawrence, and Dade counties outside both MSA boundaries. In addition to the counties in the Clean Air Alliance, the department evaluated several counties due to potential upwind transport contribution to the Springfield and El Dorado Springs monitored violations. These counties included: Cedar with the monitor, and Barton, Jasper, McDonald, and Newton.

The first consideration for nonattainment designations is based on the air quality data to determine if the collective area violates the standard. Based on the 2005-07 monitoring period, the Kansas City, St. Louis, Ste. Genevieve, Springfield/Southwest Missouri, and Southeast Missouri areas violate the 2008 8-hour ozone NAAQS. The counties with monitored violations are as follows:

Kansas City – Cass, Clay, Clinton

St. Louis – Jefferson, Lincoln, St. Charles, St. Louis, City of St. Louis

Ste. Genevieve – Ste. Genevieve

Southeast Missouri – Perry

Springfield – Greene

El Dorado Springs – Cedar

Therefore, these counties are being designated nonattainment under the "does not meet the standard" provision of Section 107(d)(1)(A) of the Clean Air Act. The monitoring data contained in the technical support document Tables KC2, STL2, SE2, and SW2 illustrates the 2005-07 and current 2006-08 ozone design values for each monitor (Ste. Genevieve is contained in Table STL2). If the current 2006-08 data is used, the Springfield and El Dorado Springs violating areas change because the 4th highest concentrations in 2008 are much less than the 4th highest concentrations in 2005 at every Missouri monitor. This difference is very important to the designation process because compliance with the 8-hour ozone standard is based on the most recent three-year average of the 4th highest 8-hour ozone concentration at each monitoring site. Based on the new data, all monitors in southwest Missouri would meet the 2008 ozone standard. Therefore, as documented above, the Southwest Missouri region will have two different scenarios pursuant to this recommendation: all counties in the region attainment (2006-08 monitoring data) and violating/contributing counties in region nonattainment (2005-07 monitoring data). Also, the violating monitor in Cass County meets the ozone standard using the 2006-08 ozone design value. This fact does not change the designation as nonattainment for Cass County due to the department's finding of contribution to the downwind Kansas City monitored violations. The design values for the remainder of Missouri sites in Kansas City and St. Louis along with Perry County illustrate a violation of the standard using both sets of monitoring data.

The second consideration for nonattainment designations is based on contribution to areas not meeting the NAAQS under Section 107(d)(1)(A). This consideration is much more difficult and requires a comprehensive evaluation of the criteria included in the relevant EPA guidance. In determining which areas are contributing, the department gathered information and analyzed it with respect to these criteria. The proposed recommendation considered all the relevant information including: emissions size and location, predominant meteorological conditions that lead to high ozone concentrations, population and urbanization of counties, traffic patterns and transportation corridors, existing jurisdictional boundaries, and population/emission growth. The question is whether the information gathered supports the conclusion that a particular county has a frequent and significant contribution to downwind ozone concentrations that violate the 2008 8-hour ozone standard. A close evaluation of the contribution criteria seems to indicate that if a county does not have a significant amount of precursor emissions (volatile organic compounds [VOC] or oxides of nitrogen [NOx]), it should not be included in the designated area. Also, the idea of long range and regional transport of ozone and its precursors leading to ozone problems throughout the eastern United States is now well established and leads to the conclusion that all ozone precursor sources contribute to ozone formation. Yet, the Clean Air Act limits the designation of contributing areas to "nearby areas". These two facts eliminate a number of counties in Missouri from inclusion in nonattainment boundaries based on the contribution test. The inclusion of counties within an existing 8-hour nonattainment or maintenance area in the new boundary recommendation is straightforward since the evaluation demonstrates a sizable contribution for each of these counties in Missouri. In evaluating significant

contribution, counties have been compared to other counties within the area to determine the level of potential contribution to high ozone levels. Below is a discussion of both monitoring status and an evaluation of the contribution of emissions impacting ozone values for all counties that have monitored a violation of the standard in the last two design value periods by geographic region.

Kansas City

In the Missouri portion of the Kansas City maintenance area, Clay County is the only county with ozone monitoring. Jackson and Platte Counties do not contain ozone monitors. The design value for Rocky Creek was 87 ppb for the 2005-07 monitoring period and 81 ppb for the 2006-08 monitoring period. Cass and Clinton Counties also contain monitoring sites that violated the ozone standard for the 2005-07 time period (Cass – Richards Gebaur South with a design value of 77 ppb and Clinton – Trimble with a design value of 85 ppb). The design value for the Richards Gebaur South site is 72 ppb and the Trimble design value is 79 ppb for the 2006-08 monitoring period. These two counties border the current 8-hour maintenance area and are located inside the Kansas City MSA. Jackson and Platte Counties both contain a portion of the Kansas City contiguous metropolitan complex.

The pattern of population density, emission density, and vehicle miles traveled are considerably higher for Jackson and Platte counties (especially the metropolitan core areas) when compared to the other counties in the MSA (Table KC3 of the TSD). It should be noted that Cass County has the highest VMT and contains a portion of the contiguous metropolitan complex. Jackson and Platte Counties have a substantial amount of precursor emissions (59.4 tons per day VOC and 92.1 tons per day NOx – Jackson; 11.3 tons per day VOC and 43.0 tons per day NOx – Platte). These emissions were projected as part of a 2009 emission inventory analysis and include controls already occurring in the Kansas City area. The corresponding percentages of the total maintenance area for each county are as follows: Jackson – 35.3% VOC and 35.6% NOx; Platte – 6.7% VOC and 16.6% NOx. Further, the Jackson County 2007 population is estimated as 666,890 and the Platte County 2007 population is 84,881. Platte County also has considerable connection to the other counties in the maintenance area based on 2004 Census Bureau commuter data (56.6% of the working population in Platte County worked in Jackson, Clay, Wyandotte (KS), or Johnson (KS) counties). The existing 8-hour maintenance area boundary, meteorology, connection to the metropolitan core area, and total emission in Platte and Jackson Counties lead directly to the conclusion of contribution to violating monitors in the area. Other factors such as level of control of sources and regional emission reductions were less relevant in determining the attainment status of these counties.

Clinton County contains a monitor that violates the 2008 8-hour ozone standard. The emissions, population, and meteorological conditions conducive for elevated ozone formation relative to the Kansas City metropolitan complex do not indicate a Clinton County contribution to other violating monitors. The 2009 emissions are 3.2 tons per day

VOC and 3.2 tons per day NOx (less than 2% for both VOC and NOx of the maintenance area total), the 2007 population is 20,894, and the county is north of the Kansas City metropolitan area (downwind). Nearly all of the monitored exceedances at the Trimble monitor have a strong contribution from the upwind Kansas City metropolitan area. Clinton County does have a connection to the maintenance area counties (48.7% of working residents in Clinton County work in the maintenance area - over 4,000 commuters). Also, Clinton County is part of the metropolitan statistical area for Kansas City. Clinton County was not found to have a significant contribution to other violating monitors. Its inclusion in the Kansas City nonattainment area is primarily due to the downwind receptor relationship with sources from the Kansas City core emission area.

Cass County has a monitor in the extreme northern portion of the county that violated the 2008 8-hour ozone standard using the 2005-07 monitoring data (77 ppb), but does not violate the standard using 2006-08 monitoring data (72 ppb). Therefore, the focus of the determination for this county was based on the contribution to downwind violating monitors. Cass County has the largest population of any county in the region not in the current maintenance area (97,133 in 2007). It has the strongest connection to the maintenance area with 60% of employed residents working in those counties (over 24,000 people). It is upwind of the other counties in the maintenance area under conditions conducive to elevated ozone formation (winds with a strong southerly component). The projected 2009 emissions in Cass County are 8.9 tons per day VOC and 9.4 tons per day NOx (5.3% VOC and 3.6% NOx of the maintenance area total). Further, northern Cass County contains a portion of the contiguous Kansas City metropolitan area and it is part of the Kansas City MSA. Cass County has the largest projected population growth rate of any county in the region (48% from 2000-2020) and the 2020 projected population is 121,000 people. The inclusion of Cass County in the recommended Kansas City 8-hour ozone nonattainment area is based on the strong connection to the metropolitan area, the current population and large growth of the county in the future, the upwind location of the county, and the sizable amount of precursor emissions that contribute to downwind ozone formation.

St. Louis

In the Missouri portion of the 1997 St. Louis 8-hour ozone nonattainment area, every county monitors a violation of the 2008 ozone standard with the exception of Franklin County. The City of St. Louis and Jefferson, St. Charles, and St. Louis Counties all have at least one violating monitor. Franklin County does not contain an ozone monitor. The closest monitor to Franklin County is located in Pacific. Pacific is located very near the border between St. Louis County and Franklin County (shown on Technical Support Document Figure STL1). This monitor has a design value of 83 ppb for the 2005-07 monitoring period and 76 ppb for the 2006-08 monitoring period. Therefore, Franklin County evaluation is based on the contribution to the other violating monitors in St. Louis (discussed below). The Foley monitor in Lincoln County violates the ozone standard with a 2005-07 design value of 87 ppb and a 2006-08 design value of 80 ppb. Therefore, Lincoln County is required to be designated nonattainment due to its violating monitor under Section 107(d).

Overall, in the St. Louis area, the majority of emissions and population are located within the current 8-hour ozone nonattainment area as shown in Table STL3 of the Technical Support Document. Specifically, Franklin County has a sizable amount of 2009 projected VOC (14.6 tons per day) and NOx emissions (44.0 tons per day) that correspond to 5.4% for VOC and 10.7% for NOx of the inventory in the current St. Louis 8-hour ozone nonattainment area. Further, these emissions have been controlled by several VOC and NOx regulations in the St. Louis area under previous state implementation plans. Franklin County has a large commuter connection with the other counties in the St. Louis nonattainment area (39% of working residents work in other Missouri and Illinois nonattainment counties). In addition, the 2007 population for Franklin County is 100,045 people. The projected population growth between 2000 and 2020 for Franklin County is 18 percent (2020 population over 110,000). The connection to the other counties in the nonattainment area, the considerable amount of precursor emissions, and its current inclusion in the ozone nonattainment area lead to the recommendation for inclusion in the 2008 St. Louis ozone nonattainment area.

Lincoln County and its relationship to upwind St. Louis is very similar to Clinton County and its relationship to upwind Kansas City. As noted previously, the Foley monitor violates the 2008 8-hour ozone standard. However, the precursor emissions and meteorological conditions conducive for elevated ozone formation relative to the St. Louis metropolitan complex do not indicate Lincoln County contribution to other violating monitors. The 2009 emissions are 6.1 tons per day VOC and 7.2 tons per day NOx (2% for both VOC and NOx of the maintenance area total), the 2007 population is 51,528, and the county is north of the St. Louis metropolitan area (downwind). The projected population growth of Lincoln County is very high (over 90% between 2000 and 2020). Nonetheless, nearly all of the monitored exceedances at the Foley monitor have a strong contribution from the upwind St. Louis metropolitan area. Lincoln County does have a connection to the nonattainment area counties (53% of working residents in Lincoln County work in the maintenance area - over 9,000 commuters). Also, Lincoln County is part of the metropolitan statistical area for St. Louis. Lincoln County was not found to have a significant contribution to other violating monitors. Its inclusion in the St. Louis nonattainment area is primarily due to the downwind receptor relationship with sources from the St. Louis core emission area.

Ste. Genevieve

The Bonne Terre site also monitors a violation of the 2008 standard with a design value of 83 ppb for the 2005-07 monitoring period and 79 ppb for the 2006-08 monitoring period. This monitor is located in Ste. Genevieve County (near the border with St. Francois County). Upon review of comments from stakeholders in St. Francois County and the Southeast Missouri Regional Planning Commission, the department has conducted some additional analyses to more thoroughly investigate the relationship between the emissions in St. Francois and Ste. Genevieve Counties and ozone impacts in the area. Further, there is no specific guidance on the use of a single monitor as being representative of multiple counties. 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. Therefore, since the Bonne Terre monitoring site in Ste. Genevieve County violates the ozone standard, Ste. Genevieve is required to be designated nonattainment under the "does not meet the air quality standard" provision of Clean Air Act Section 107(d)(1)(A)(i).

In order to determine the appropriate nonattainment area for Ste. Genevieve County, the contribution to elevated ozone concentrations in the St. Louis area from sources in Ste. Genevieve County and from St. Louis emission sources to elevated ozone concentrations at the Bonne Terre monitor must also be evaluated. Further, the contributions from St. Francois County on downwind St. Louis must be examined. The population, growth, and emission characteristics of St. Francois and Ste. Genevieve Counties are somewhat different. St. Francois County contains a micropolitan statistical area (Farmington) and has a 2007 population of 62,810. Ste. Genevieve County is much more rural in nature (population density and urbanization) and has a 2007 population of 17,841. The projected population growth for St. Francois County is 25% from 2000 to 2020 (nearly 70,000 people in 2020), while Ste. Genevieve County has no projected population growth between 2000 and 2020. The 2009 projected NOx emissions in Ste. Genevieve County are quite large, 30.2 tons per day, which account for over 7% of the total St. Louis nonattainment area inventory, and will be primarily generated from three large point sources in the county. The VOC emissions in both counties are less than 6 tons per day and are nearly 2% of the St. Louis nonattainment area inventory. Further, the NOx emissions in St. Francois County are less than 2% of the St. Louis nonattainment area inventory (5.1 tons per day). Neither county is in the St. Louis MSA, but both are adjacent to the current 8-hour nonattainment area and are upwind (south) of the area under predominant high ozone conditions. Neither county is strongly connected to the current St. Louis 8-hour nonattainment area through traffic patterns. Comments were received from multiple parties regarding the inclusion or exclusion of Ste. Genevieve County in the recommended St. Louis ozone nonattainment area.

The comments that concurred with our initial recommendation to include Ste. Genevieve County in the St. Louis area noted the large amount of NOx emissions and the upwind nature of the county to St. Louis. There were numerous comments that requested Ste. Genevieve County not be included as part of the St. Louis area. These comments contained a variety of rationale and included the following logic: (1) Ste. Genevieve is a very rural county with no strong connection to the St. Louis area, (2) the current regional governmental structure would need to change significantly if Ste. Genevieve County was part of the St. Louis area, (3) the vast majority of NOx emissions in Ste. Genevieve County are from three distinct point sources, and (4) the present controls required in the St. Louis area would produce little impact if implemented in Ste. Genevieve County. The department concurs with the comment that Ste. Genevieve County is very rural in nature and is not strongly connected to the St. Louis area. It is also important to note that this rural nature translates to a different planning approach than the St. Louis metropolitan complex as denoted by many commenters. 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 NOx emissions from these three large point sources will require a Reasonably Available Control Technology (RACT) evaluation regardless of whether the sources are included in a Ste. Genevieve Ozone Nonattainment Area or the St. Louis Area Ozone Nonattainment Area. 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 NOx 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.

The other consideration for inclusion of Ste. Genevieve County in the St. Louis nonattainment area is the source/receptor relationship between St. Louis sources and the Bonne Terre monitor. Based on comments received, the department conducted additional meteorological analyses to identify surface meteorological conditions associated with ozone exceedances days at the Bonne Terre site. This is in addition to the meteorological analysis conducted previously that evaluated synoptic and regional conditions. The previous analyses illustrated that the synoptic and regional surface flows for elevated ozone at Bonne Terre had southerly, easterly, and northerly (from St. Louis) winds. The additional analyses tried to more specifically identify the number of exceedance days primarily influenced by local Ste. Genevieve sources and sources in the St. Louis area. There were 33 days during 2004-2008 that exceeded the 2008 8-hour ozone standard at the Bonne Terre monitor. The analysis indicated ten days with ozone contributions from St. Louis (Missouri or Illinois) emission sources. Further, ten additional days were found to have specific contributions with light easterly winds (likely contribution from Ste. Genevieve NOx sources). The remaining days illustrated a pattern of high regional ozone and had a strong southerly component.

Two important items were discovered from this additional analysis: (1) St. Francois County emission sources do not have a frequent impact on the Bonne Terre monitor and (2) the same number of days from St. Louis and easterly (Ste. Genevieve) emissions were impacting exceedance concentrations at the Bonne Terre monitor. To put these exceedance day contribution numbers in context, the Foley monitor in Lincoln County had 45 exceedance days between 2005 and 2008. All the exceedance days were found to be impacted by St. Louis emissions. Given this information, the ultimate question is whether the Bonne Terre monitor is impacted more by the St. Louis area or by local (Ste. Genevieve) emission sources that contribute to violations of the standard. This question is important because the 2000 EPA designation guidance says each monitor/County in violation should be placed in the same nonattainment area as the emission sources impacting it. In the case of Ste. Genevieve County, the monitoring information shows multiple emission sources impacting the Bonne Terre monitor. The St. Louis and Ste. Genevieve source regions impact the monitor on the same number of days.

In summary, the department is recommending that Ste. Genevieve County be designated a distinct nonattainment area from St. Louis. This conclusion is based on the following: the strong desire of the Ste. Genevieve County government for independent air quality planning separate from the St. Louis area, the fact that the NOx emissions are primarily from a set of large industrial facilities and not a variety of different sources, the likelihood of consistent control outcomes from a nonattainment designation as a stand-alone area when compared to inclusion in the St. Louis area, similar impact from multiple source regions including local sources from Ste. Genevieve, the very rural nature of the county, the fact that Ste. Genevieve is not inside the current St. Louis MSA, the lack of strong commuter connection to the current St. Louis nonattainment area, and notwithstanding, the generally upwind nature of the county and the large amount of NOx emissions generated in Ste. Genevieve.

Southeast

In Southeast Missouri, the Farrar monitor (Perry County) also violates the standard with a 2005-07 design value of 80 ppb and a 2006-08 design value of 76 ppb. Based on the meteorological analysis, this monitored violation is not due to contributions from emissions in the St. Louis or Ste. Genevieve nonattainment areas. Perry County is rural in nature and does not contain a sizable employment center for the region. The 2009 projected emissions from sources in Perry County are 4.6 tons per day of VOC and 6.4 tons per day of NOx. There is limited population (<20,000) and growth (<10% between 2000 and 2020) in Perry County and it does not have a strong connection to either Cape Girardeau or the St. Louis metropolitan complex with respect to commuter traffic. Based on this information, the department found that Perry County does not contribute to other violating monitors in the region. Based on the overall technical analysis, contributions to elevated ozone concentrations at the Farrar site are due to regional transport as well as near-field transport primarily from areas east and south of the monitor.

Springfield/Southwest

In Southwest Missouri, the Hillcrest monitor (Greene County) and the El Dorado Springs monitor (Cedar County) violate the standard for the 2005-07 monitoring period. The design value for the Hillcrest sampler was 77 ppb and the design value for El Dorado Springs was 76 ppb during that time period. The 2006-08 design values both demonstrate attainment of the standard (73 ppb – Hillcrest and 72 ppb – El Dorado Springs). Greene County and Cedar County are not similar in virtually any manner with respect to ozone analysis. Greene County has a substantial amount of precursor emissions (23.3 tons per day VOC and 44.1 tons per day NOx), has a large population (over 250,000 in 2007), is the center of the metropolitan statistical area and economic complex in Southwest Missouri (Springfield), and is very urbanized and densely populated. Cedar County has a low amount of precursor emissions (4.6 tons per day VOC and 2.1 tons per day NOx), has a very small population (less than 15,000), is not strongly connected to any metropolitan area via commuter traffic, and has no sizable areas of urbanization or high population density. The meteorological analysis for the El Dorado Springs monitor does not implicate Springfield area emissions as a contributor to

elevated ozone formation in Cedar County. This analysis shows potential contribution from the Joplin/Tulsa areas and some contribution from extreme northwest Arkansas. Greene County emissions were found to contribute to elevated ozone concentrations at the Hillcrest monitor, but Cedar County emissions were not found to contribute to elevated ozone concentrations at El Dorado Springs. Therefore, Greene County meets both tests (monitored violation in 2005-07 and contribution to the violation) and is included in the Springfield nonattainment area (2005-07 scenario); while Cedar County meets the monitored violation test in 2005-07, but does not meet the contribution test. Therefore, the recommendation for Cedar County is designation (2005-07 scenario) as a rural transport area under Section 182(h) of the Clean Air Act.

Again, the entire Southwest Missouri region will be recommended for attainment using the 2006-08 monitoring data.

After the initial findings with respect to monitored violations, the remaining counties in each area were examined for contribution to these monitored violations. Counties inside each individual MSA, but outside the current maintenance or nonattainment areas, were evaluated due to the 2003 EPA guidance recommending the MSA as the presumptive boundary for each metropolitan area. Some counties were identified quickly as minimally contributing based on low precursor emission levels. For counties designated based on contribution to downwind areas, the EPA guidance factors represent a technique that emphasizes emissions and meteorological factors to elevated ozone formation. In general, when emissions and meteorology clearly support the inclusion of a county in the boundary, less scrutiny is given to the remaining factors. Likewise, if emissions and meteorology clearly do not support the inclusion of a county, then less scrutiny is given to the other factors. The counties that required further examination in each area for the contribution test are as follows:

Kansas City – inside the MSA (Bates, Caldwell, Johnson, Lafayette, Ray); outside the MSA (Buchanon, Henry)

St. Louis – inside the MSA (Warren, Washington); outside the MSA (Pike, St. Francois)

Southeast Missouri – Cape Girardeau, Scott

Springfield – inside the MSA (Christian, Dallas, Polk, Webster); outside the MSA (Taney, Stone, Jasper, Newton)

El Dorado Springs – Jasper, Newton

Kansas City

The counties inside the Kansas City MSA that were evaluated for contribution to the Kansas City violating monitors include two counties that are predominantly "downwind" of the area: Caldwell and Ray. These two counties have less than 25,000 population, have no sizable areas of urbanization or high population density, and have less than 2% of each precursor emission total for the Kansas City maintenance area. Also, both counties have a nearly flat population growth rate. Ray County is more connected to the Kansas City core with over 5,000 commuters into the maintenance area, while Caldwell County has only 1,200 commuters (Caldwell nearly 30% of working people and Ray over 55% of working people employed in the maintenance area). Caldwell and Ray Counties were not determined to contribute to the violating monitors in the Kansas City area even though both counties are part of the MSA (presumptive boundary). Therefore, these counties were not included in the recommended Kansas City 2008 8-hour ozone nonattainment area.

Johnson and Lafayette Counties are also inside the Kansas City MSA and lie east-southeast and east of the Kansas City downtown core. The meteorological analysis is not definitive in excluding these wind directions from potential contribution to some of the violating sites in the Kansas City area. However, there is still very limited support for these counties to be included from a meteorological perspective. Lafayette County has slightly over 30,000 residents, a small amount of urbanization and higher population density along Interstate 70, flat population growth. Further, Lafayette County has precursor emission totals of 6.2 tons per day VOC and 8.4 tons per day NOx which correspond to 3.7% VOC and 3.2% NOx of the Kansas City maintenance area inventory and over 5,000 residents working in the maintenance area. Johnson County has greater than 50,000 population, a 20% population growth by 2020, and an area with higher population density along US Highway 50. The commuter data for Johnson County provides some connection between the county and the remainder of the Kansas City metropolitan area (4,530 residents working in the Kansas City maintenance area). Johnson County sources emit NOx and VOC emissions at a rate of 6 TPD for both (3.4% VOC and 2.4% NOx of the maintenance area). While there is some rationale to suggest a contribution, the department's finding for Johnson and Lafayette Counties is that they do not contribute to downwind Kansas City ozone violations based on a review of all the relevant boundary guidance factors. This leads to their exclusion from the recommendation for the 2008 Kansas City nonattainment area.

Bates County is upwind of the Kansas City area under predominant ozone conducive conditions and is part of the Kansas City MSA. However, the emissions (2% VOC and 1.5% NOx), population (17,000), urbanization (very limited), and connection to the Kansas City metropolitan area (1,232 commuters per day) do not suggest sufficient evidence to include Bates County as a contributor to ozone violations. Therefore, Bates County will be recommended for attainment status of the 2008 ozone standard.

Buchanon County is outside the Kansas City MSA and is the center of the St. Joseph MSA This county has a sizable amount of ozone precursor emissions (10.4 tons per day

VOC and 15.0 tons per day NOx – both nearly 6% of the maintenance area inventory), a population of over 85,000, and urbanization as part of the St. Joseph area. Further, there is a commuter connection between Buchanon County and the Kansas City area (6,100 residents work in the maintenance area). Nonetheless, the meteorological analysis does not provide evidence that Buchanon County emissions impact violating monitors in the Kansas City area. Based on the downwind nature of Buchanon County and notwithstanding its emissions, connection to Kansas City, population, and urbanization, the department has found that emissions in Buchanon County do not contribute to elevated ozone formation at the current Kansas City violating monitors. Therefore, it is excluded from the Kansas City nonattainment area recommendation. It is important to note that ozone monitoring downwind (north) of the St. Joseph area is planned for the 2009 ozone season. This will allow the department to help establish the ozone concentrations downwind of St. Joseph and determine if additional violations of the standard exist in the St. Joseph area. At the current time, there are no ozone monitors in that area.

Henry County is southeast of the downtown Kansas City area, is outside the MSA, is somewhat distant from the core metropolitan area, and does not border the existing maintenance area. This county has a sizable amount of precursor emissions (8.3 tons per day VOC and 24.1 tons per day NOx – 5% VOC and 9% NOx of the Kansas City maintenance area inventory). Henry County is rural in nature, has less than 25,000 residents, and only 1,200 residents commute to the maintenance area for work. The single largest source in Henry County is the Montrose power plant that is included in the statewide utility NOx rule and the upcoming Clean Air Interstate Rule. Further, the meteorological analysis is not conclusive for southeasterly winds being a frequent contributor to downwind Kansas City elevated ozone concentrations (southerly and southwesterly more predominant). Therefore, notwithstanding the potential upwind nature of the county and the large amount of precursor emissions, the department has found that there is not sufficient evidence to include Henry County as part of the Kansas City ozone nonattainment area.

St. Louis

The two counties inside the St. Louis MSA, Warren and Washington, both show little evidence to suggest sufficient downwind contribution to St. Louis violating monitors for inclusion in the 8-hour ozone nonattainment area recommendation. Warren County has less than 2% of the St. Louis nonattainment inventory for both VOC and NOx (4.7 tons per day VOC and 5.1 tons per day NOx) and a population of 30,000 (but a projected population growth rate of over 60%). The commuter connection to the current nonattainment area has over 5,000 people from Warren County working in St. Louis. Further, Warren County is downwind of the St. Louis metropolitan area under predominant wind conditions. Washington County has 1% or less of the St. Louis nonattainment inventory for both VOC and NOx (2.6 tons per day VOC and 1.7 tons per day NOx) and a population of less than 25,000 (flat growth). Also, less than 2,000 people commute from Washington County to the St. Louis nonattainment area. Washington County is south-southwest of the St. Louis urban area and is an upwind

county for the St. Louis monitoring violations. However, the emissions in both of these counties are not sufficient to contribute significantly to elevated ozone concentrations in the St. Louis area. Therefore, even though these counties are part of the St. Louis MSA, the recommendation for these counties is attainment of the 2008 ozone standard.

Pike County is outside the St. Louis MSA and is somewhat distant from the downtown St. Louis area. Pike County has a very large amount of ozone precursor emissions (12.2 tons per day VOC and 37.6 tons per day NOx – VOC nearly 5% and NOx 9% of the St. Louis nonattainment area inventory), a population of under 20,000, and is a very rural county with limited urbanization and areas of high population density. One of the two large non-utility point sources in Pike County (a cement kiln) recently decided to close its current kiln operation in 2009. Further, there is no strong commuter connection between Pike County and the St. Louis area (1,200 residents work in the maintenance area). Also, the meteorological analysis does not provide evidence that Pike County emissions impact violating monitors in the St. Louis area. Based on the downwind nature of Pike County and its rural nature along with the limited population, recent large source closure, and location outside the St. Louis MSA; and notwithstanding its significant amount of ozone precursor emissions, the department has found that emissions in Pike County do not contribute to elevated ozone formation at the monitors currently violating the 2008 ozone standard in the St. Louis area. Therefore, it is being recommended for designation as attainment of the 2008 ozone standard.

St. Francois County was evaluated for potential contribution to the St. Louis area and the Ste. Genevieve area. St. Francois County sources emit a moderate level of both ozone precursors (5.5 TPD – VOC and 5.1 TPD NOx). 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. This county is much more urbanized and connected to the St. Louis area than Ste. Genevieve County. St. Francois County is not part of the St. Louis MSA, but the Farmington micropolitan statistical area is part of the St. Louis/Farmington Combined Statistical Area (CSA). However, the department's initial finding was that St. Francois did not contribute to downwind St. Louis air quality violations based on a lack of precursor emissions.

St. Francois County was originally designated based on the Bonne Terre site monitored violation. 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. Therefore, the department has confirmed 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.

Southeast Missouri

Cape Girardeau County in Southeast Missouri is the center of the Cape Girardeau micropolitan statistical area (μSA). When discussing the impact on the Farrar monitor, it is important to understand the secondary nature of ozone. The distance between the contributing emission sources in this county and the receptor or monitor location is the important concept. Initially, the Farrar monitor in Perry County was sited to collect pre-construction ozone data from a major VOC source being permitted in Cape Girardeau County. The siting for the monitor was designed to provide sufficient distance from the source to the location of the maximum ozone concentration for impacts from that source (15-25 miles north). The data collected at this monitor was very close to the 1997 ozone standard and, therefore, the department placed a permanent monitoring site at Farrar in 2004 to better characterize the ozone concentrations in Southeast Missouri (specifically downwind of Cape Girardeau). The ozone impacts from sources in Cape Girardeau County and southern Illinois on this monitor are linked to the precursor emissions from these areas. The emissions in Cape Girardeau County are nearly 9 tons per day of VOC and 17 tons per day of NOx. Further, the urbanization and population density in Cape Girardeau County are substantially higher than the surrounding area. Also, Cape Girardeau County's population is nearly 75,000 people with a 16% growth rate between 2000 and 2020.

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 previous analysis identified two primary wind directions for the Farrar monitor when ozone concentrations exceed the standard; south and east.

The second analysis included an evaluation of the Farrar and Houston (IL) monitors that are located to the south of St. Louis. All these sites can provide (on different days) an overall regional ozone concentration for the area. 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 location specific. Further, there are some sizable NOx sources to the south of Cape Girardeau in Scott and New Madrid Counties. 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. 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 were developed for St. Louis exceedance days and not southeast Missouri exceedance days. Nonetheless, the model is able to predict the impact from a particular geographic region's man-made emissions 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 NOx 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 NOx 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 lower concentration day) 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.

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 impact the Bonne Terre monitor and sources in Ste. Genevieve or St. Francois Counties do not impact 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 NOx 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.

Scott County is located south of Cape Girardeau County and is not part of the Cape Girardeau μSA, but is part of the Combined Cape Girardeau/Sikeston statistical area. The emissions in Scott County are also sizable – 6.6 tons per day VOC and 14.2 tons per day NOx. These emission totals are slightly less than Cape Girardeau's and the NOx emissions are influenced strongly by one source in far southern portion of the county. This source (Sikeston Power Plant) is part of the NOx SIP call for control of utility NOx emissions and is also included in the Clean Air Interstate Rule. The population density and urbanization of Scott County illustrate Sikeston as the main center for employment and population, again in the southern portion of the county. However, there is a connection between extreme northern Scott County and the Cape Girardeau metropolitan area (south Cape Girardeau County). Further, there are over 4,000 residents of Scott County that work in Cape Girardeau County with very few (100 residents) working in Perry County. The population of Scott County is over 40,000, but the growth rate between 2000 and 2020 is flat. As discussed previously for Cape Girardeau County, the meteorological analysis illustrates that Scott County is upwind of the violating monitor. Notwithstanding its upwind status and the sizable emission totals, the department has found that Scott County emissions do not contribute significantly to the "nearby" Farrar monitor's ozone violations.

Springfield/Southwest Missouri

The Springfield and El Dorado Springs monitors do not violate the ozone standard using the 2006-08 monitoring data and the contribution analyses detailed here are only relevant if the monitors violate the standard in the future. These contribution data were gathered and analyzed due to the 2005-07 monitoring period that showed a violation of the standard for both areas.

The counties inside the Springfield MSA that were evaluated for contribution to the Springfield violating monitor include two counties that are predominantly "downwind" of the area: Dallas and Polk. These two counties have 16,000 (Dallas) and 30,000 (Polk) population, have no sizable areas of urbanization or high population density, and have less than 10% of each precursor emission total for the Springfield MSA (VOC – Polk 3.6

and Dallas 2.4 tons per day and NOx – Polk 3.5 and Dallas 1.8 tons per day). Also, both counties have approximately a 30% population growth rate from 2000-2020. Polk County is more connected to the Springfield core with over 3,000 commuters into Greene County, while Dallas County has only 800 commuters (Polk nearly 30% of working people and Dallas over 13% of working people employed in Greene County). Polk and Dallas Counties were determined to not contribute to the violating monitors in the Kansas City area even though both counties are part of the MSA (presumptive boundary), because they have limited emissions and are downwind of the violating monitor in Springfield. Therefore, these counties were not included in the recommended Springfield 2008 8-hour ozone nonattainment area.

Christian County is located due south of Greene County and is located in the Springfield MSA. Christian County has the largest population of any county in the MSA, not including Greene County (73,066 in 2007). It has the strongest connection to the maintenance area counties with 50% of employed residents working in Greene County (nearly 14,000 people). It is upwind of the violating monitor under conditions conducive to elevated ozone formation (winds with a southerly component). The projected 2009 emissions in Christian County are 5.6 tons per day VOC and 5.1 tons per day NOx (14.2% VOC and 8.4% NOx of the Springfield MSA total). Further, north-central Christian County contains a portion of the contiguous Springfield metropolitan area. Christian County has the largest population growth rate of any county in the state (98% from 2000-2020) and the 2020 projected population is 107,000 people. The inclusion of Christian County as a contributing county to the ozone violations in Springfield is based on the strong connection to the metropolitan area, the current population and large growth of the county in the future, the upwind location of the county, and the sizable amount of precursor emissions that contribute to downwind ozone formation.

Webster County is located east of the Springfield downtown area and is part of the Springfield MSA. The meteorological analysis suggests that there are days with wind directions from Webster County to the violating site in Springfield. However, there is still limited support for Webster County to be included from a meteorological perspective. Webster County has slightly over 35,000 residents, a very small amount of urbanization and a small area of higher population density along Interstate 44, and a 50% population growth between 2000 and 2020. Further, precursor emission totals of 4.7 tons per day VOC and 6.0 tons per day NOx correspond to 11.8% VOC and 10.0% NOx of the Springfield MSA inventory. Also, over 6,000 residents work in the Greene County. While there is some rationale to suggest a contribution, the department's finding for Webster County is that it does not contribute to downwind Springfield ozone violations based on a review of all the relevant boundary guidance factors.

Taney and Stone Counties comprise the Branson μSA and are located south of the Springfield violating monitor. Taney County contains Branson proper and has a 2007 population of 45,721. Stone County is somewhat more rural in nature (population density and urbanization) and has a 2007 population of 28,658. The projected population growth for Taney County is 49% from 2000 to 2020 (nearly 60,000 people in 2020), while Stone County has a projected population growth of 30% between 2000 and 2020

(37,000 people in 2020). The 2009 projected VOC emissions in both counties are quite large (10.8 tons per day – Stone and 15.0 tons per day - Taney), corresponding to 27% and 37% of the total Springfield MSA inventory. The NOx emissions in both counties are less than 6 tons per day and are between 6% and 8% of the Springfield MSA inventory. Further, the connection to the Springfield area from the Branson area is 8,000 commuters per day. The level of VOC emissions from both counties along with the projected growth, commuter connection to the Springfield area, and upwind nature of the counties to Springfield provides sufficient evidence that Stone and Taney Counties contribute to the downwind monitor in Springfield.

Jasper and Newton Counties comprise the Joplin MSA, are not contiguous with either the Springfield MSA or Cedar County, and were evaluated for contribution to both Springfield and El Dorado Springs. The meteorological analysis for Springfield monitored violations did illustrate a few days when contributions could be resulting from Joplin area emissions, but did not highlight the Joplin area as a frequent contributor to ozone in Springfield. However, the analyses for El Dorado Springs did identify the Joplin, Tulsa, and northwest Arkansas areas as potential contributors to ozone violations. Jasper County contains the majority of Joplin's urbanized area and has a sizable amount of ozone precursor emissions (13.4 tons per day VOC and 13.9 tons per day NOx – 34% and VOC – 23% of the Springfield MSA inventory), a population of over 115,000 with a 30% population growth rate between 2000 and 2020, and urbanization as part of the Joplin area. There is a small commuter connection between Jasper County and the Springfield area (2,500 residents work in the Springfield MSA). Newton County has nearly half the emissions of Jasper County (6.4 tons per day VOC and 7.1 tons per day NOx), a population of 56,038 in 2007 and a growth of 18% between 2000 and 2020. There are slightly over 1,000 residents commuting to the Springfield MSA for work. The critical issue for the counties in the Joplin MSA is not amount of emissions which are sizable, but distance and connection to the counties containing violating monitors. The department found that, even though the meteorological analysis provides evidence that Jasper and Newton County emissions contribute to the El Dorado Springs violating monitor, the monitor is not "nearby" and does not believe that there is sufficient evidence to find a frequent and significant contribution. Further, the Springfield area meteorological analysis also does not provide evidence that these counties contribute to the monitored violation in Springfield.

A full discussion of the all designation criteria is provided in the Technical Support Documents for each area.

SUMMARY

Based on the 2006-08 monitoring timeframe, the proposed 2008 8-hour ozone nonattainment boundary recommendations for Missouri contain the following counties in one of four nonattainment areas:

Kansas City:	Cass, Clay, Clinton, Jackson, Platte

St. Louis:	Franklin, Jefferson, Lincoln, St. Charles, St. Louis, City of St. Louis
Ste. Genevieve:	Ste. Genevieve
Southeast Missouri:	Perry

Two additional areas are included due to monitored violations during the 2005-07 monitoring period, but these areas attained the standard for 2006-08. Therefore, these areas will be recommended as attainment with the 2005-07 information provided for completeness. The counties included in these areas are:

Springfield:	Christian, Greene, Stone, Taney
El Dorado Springs:	Cedar (rural transport)

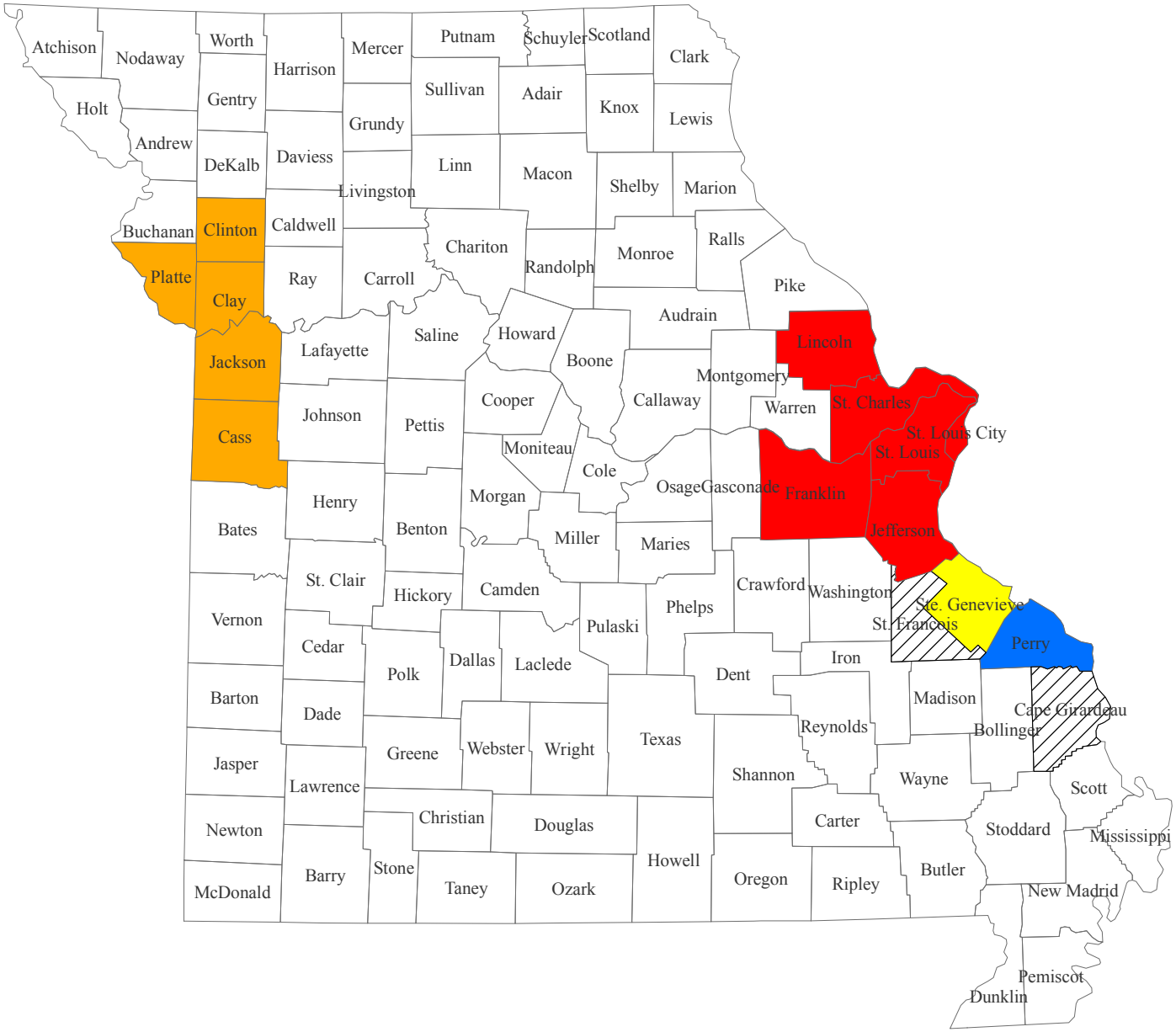
St. Francois County is recommended for unclassifiable status due to the uncertainty regarding the ozone concentration data in St. Francois County. Cape Girardeau County is recommended for unclassifiable status due to concerns over the implementation of the 2008 standard and the corresponding requirements on smaller communities that are influenced by regional ozone transport. The remainder of the state of Missouri is being recommended for attainment/unclassifiable status with respect to the new ozone standard. This includes the only county in Missouri with a monitor that did not exceed the 2008 ozone standard in either 2005-07 or 2006-08 (Randolph County). The design value for the Mark Twain State Park monitor was 75 ppb in 2005-07 and 71 ppb in 2006-08.

This designation process has identified new ozone problem areas that do not meet the "traditional" definition of metropolitan ozone nonattainment areas. These new areas include some that contribute to ozone formation (Cass) or receive ozone impacts from the large metropolitan complexes of St. Louis (Lincoln) and Kansas City (Clinton). Another monitored area has been found to contribute to its own problems and will be designated as a separate nonattainment area (Ste. Genevieve). One other monitored area (Perry) is not impacted directly by a large metropolitan area and was found to have contribution from regional as well as multiple smaller metropolitan area emission sources. Further, there are four additional communities that will begin ozone sampling in 2009 and the results of this monitoring will help the department better understand the ozone problem in Missouri with respect to the 2008 ozone standard. These four communities are Joplin, St. Joseph, Columbia, and Jefferson City.

It is important to understand that emission controls proposed for these new potential nonattainment areas will not necessarily be identical to controls in the existing ozone areas in Missouri. Control strategy development is accomplished through the State Implementation Plan Process for each nonattainment area and will happen through a stakeholder process similar to the process used in the development of this draft

recommendation. The goal of this recommendation development process was to gather the necessary information and to provide a technically sound product for submittal to EPA Region VII.

2008 Ozone Nonattainment Designation Recommendation



Missouri Department of Natural Resources
Division of Environmental Quality
Air Pollution Control Program
Prepared by Bern Johnson 25 JAN 09

- Nonattainment - St. Louis
- Nonattainment - Kansas City
- Nonattainment - Ste. Genevieve
- Nonattainment - Southeast Missouri
- Unclassifiable
- Attainment/Unclassifiable

Missouri Department of Natural Resources

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	4th 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 Avg.	2001-3 Avg.	2002-4 Avg.	2003-5 Avg.	2004-6 Avg.	2005-7 Avg.	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 NOx 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 NOx 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 NOx 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 NOx 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 NOx 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 NOx as seen in Figures SE7 and SE8.

The St. Louis area has been regulated for VOC/NOx control under the previous ozone NAAQS. Therefore, there are many emission controls regulations for VOC and NOx 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 NOx RACT rule for major NOx sources in the St. Louis area (10 CSR 10-5.510). Further, the NOx 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 NOx trading program. Missouri was also included in the Clean Air Interstate Rule (CAIR) for utility control. Also, there is an upwind NOx 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 NOx 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 (μSA). 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 μSA.
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 <u>all</u> 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 NOx (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 NOx sources in Pike County to reduce NOx 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 – NOx). 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 nonatttainment 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 NOx 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 μSA. 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 NOx 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 NOx 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 NOx 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 NOx 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 NOx 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 NOx 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 NOx). 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 NOx – 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 – NOx). 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 – NOx). 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 NOx 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 NOx 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 NOx 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 μSA. 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 – NOx). Further, the meteorological analysis supports potential contribution from Scott County emissions to the Farrar monitor. The power plant NOx emissions are controlled by the NOx 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 NOx (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/NOx control requirements

St. Louis City

1) Second largest emission in St. Louis for VOC (38.2 TPD) and fifth largest for NOx (39.3 TPD)
2) Both monitors within the city monitor a violation of the standard (highest design value – Margaretta 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/NOx control requirements

Madison County (IL)

1) Second largest emission in St. Louis for NOx (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/NOx control requirements

St. Charles County

1) Third (tied) largest emission in St. Louis for NOx (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/NOx control requirements

Jefferson County

1) Third (tied) largest emission in St. Louis for NOx (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/NOx control requirements

St. Clair County (IL)

1) Combined emissions nearly 50 TPD (VOC – 23.5 TPD and NOx - 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/NOx control requirements

Franklin County

1) Combined emissions over 50 TPD (VOC – 14.6 TPD and NOx - 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 NOx -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 (Macopuin 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 NOx – 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 NOx – 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 NOx – 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 NOx – 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/NOx control requirements

Jersey County (IL)

1) Combined emissions under 10 TPD (VOC - 3.2 TPD and NOx – 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/NOx control requirements

Greene, Bond, and Calhoun Counties (IL)

1) Combined emissions less than 10 TPD (all VOC less than 4 TPD and all NOx 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 NOx 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 NOx – 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 μSA
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 μSA

Cape Girardeau County

1) Combined emissions over 25 TPD (VOC - 9.0 TPD and NOx – 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 μSA
8) Regional ozone analysis and APCA modeling provide evidence of ozone impacts at the Farrar monitor

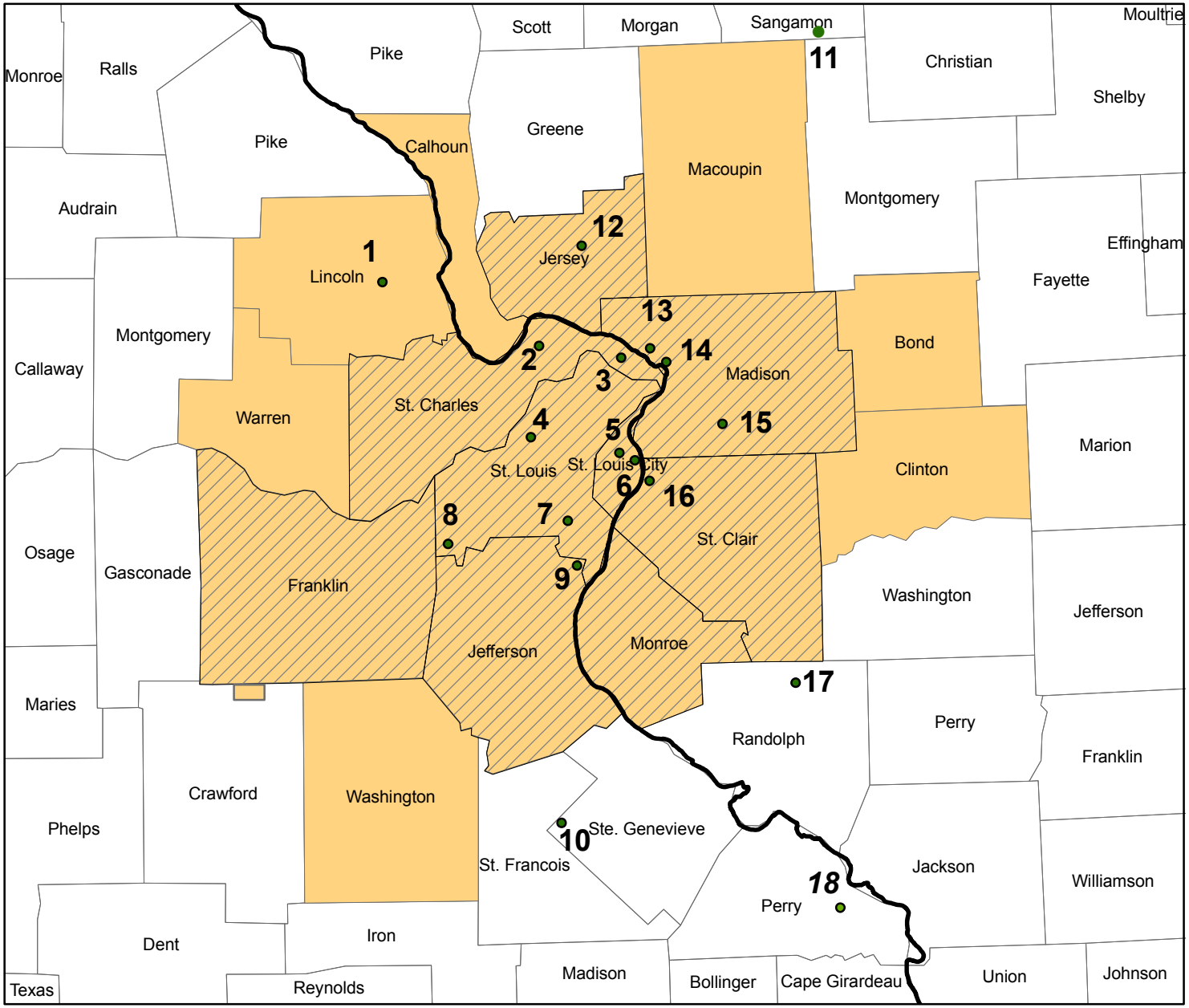
Jackson County (IL)

1) Combined emissions over 15 TPD (VOC – 8.9 TPD and NOx – 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 μSA

Scott County

1) Combined emissions over 20 TPD (VOC – 6.6 TPD and NOx – 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 μSA with some commuter connection to the Cape Girardeau μSA

Figure StL 1a- 2008 Ozone Sites and 06-08 Design Values



Non-Attainment Area

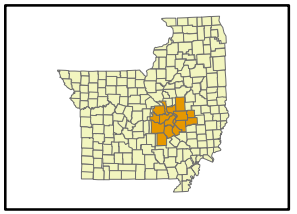
St. Louis MSA

 # - Site Name (ppb)

1 - Foley (80)
2 - Orchard Farm (82)
3 - West Alton (85)
4 - Maryland Hts (82)
5 - Margaretta (81)
6 - Blair Street (78)
7 - Sunset Hills (78)
8 - Pacific (76)
9 - Arnold (78)
10 - Bonne Terre (79)
11 - Nilwood (70)
12 - Jerseyville (73)
13 - Alton (76)
14 - Wood River (76)
15 - Maryville (78)
16 - E. St. Louis (72)
17 - Houston (72)

18 - Farrar (77)

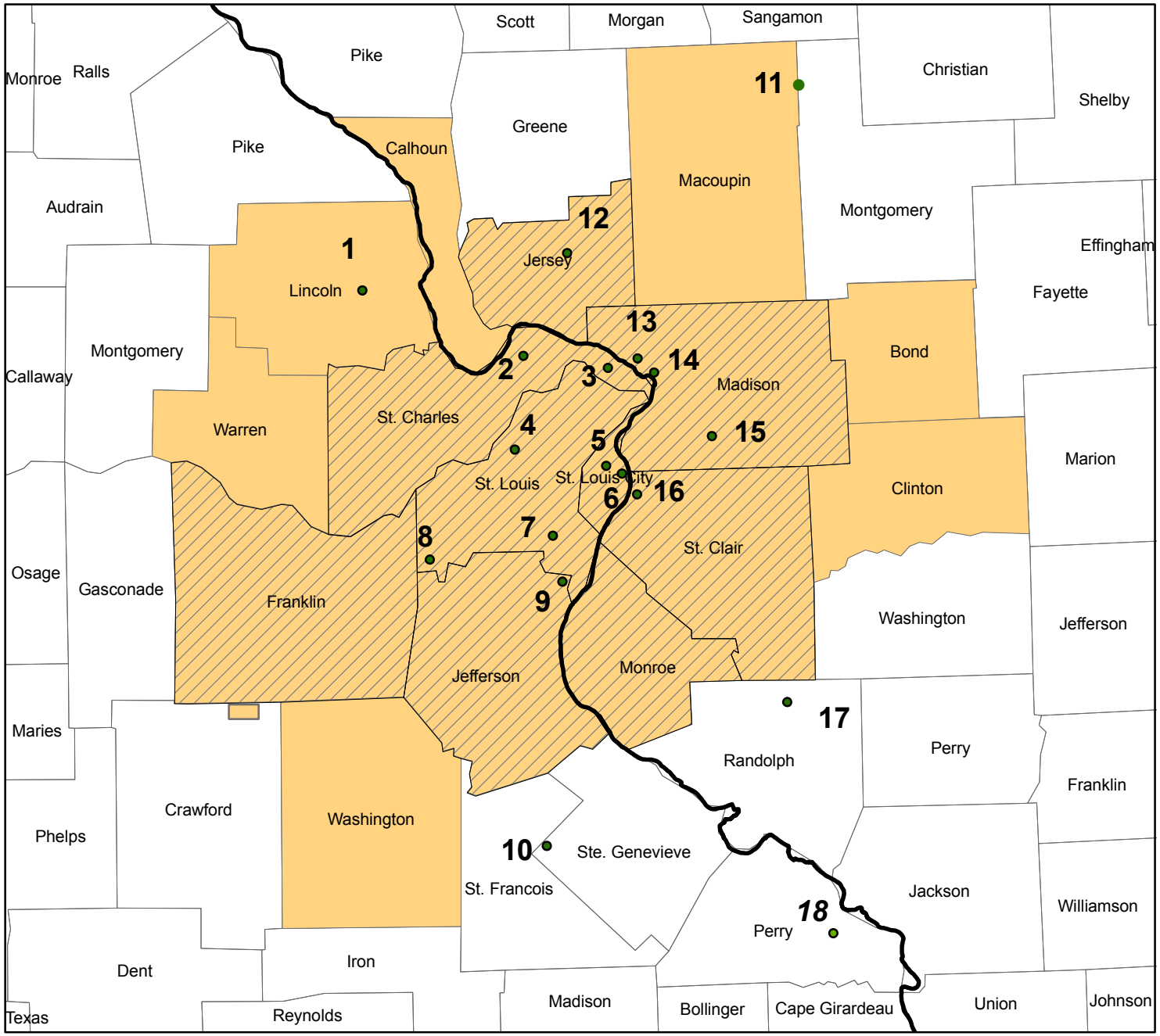
N
W E
S



Department of Natural Resources
Division of Environmental Quality
Air Pollution Control Program
Prepared by Bern Johnson 18 FEB 09

0 15 30 60 Kilometers

Figure StL 1b - 2008 Ozone Sites and 05-07 Design Values



Non-Attainment Area

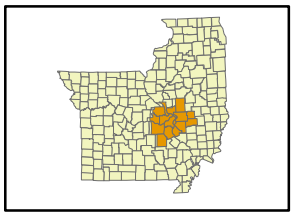
St. Louis MSA

 # - Site Name (ppb)

1 - Foley (87)
2 - Orchard Farm (89)
3 - West Alton (89)
4 - Maryland Hts (88)
5 - Margaretta (86)
6 - Blair Street (84)
7 - Sunset Hills (86)
8 - Pacific (83)
9 - Arnold (86)
10 - Bonne Terre (83)
11 - Nilwood (74)
12 - Jerseyville (77)
13 - Alton (83)
14 - Wood River (83)
15 - Maryville (84)
16 - E. St. Louis (82)
17 - Houston (75)

18 - Farrar (80)

N
W E
S



Department of Natural Resources
Division of Environmental Quality
Air Pollution Control Program
Prepared by Bern Johnson 25 JUN 2008

0 15 30 60 Kilometers

Figure StL2 - Population Density 2000

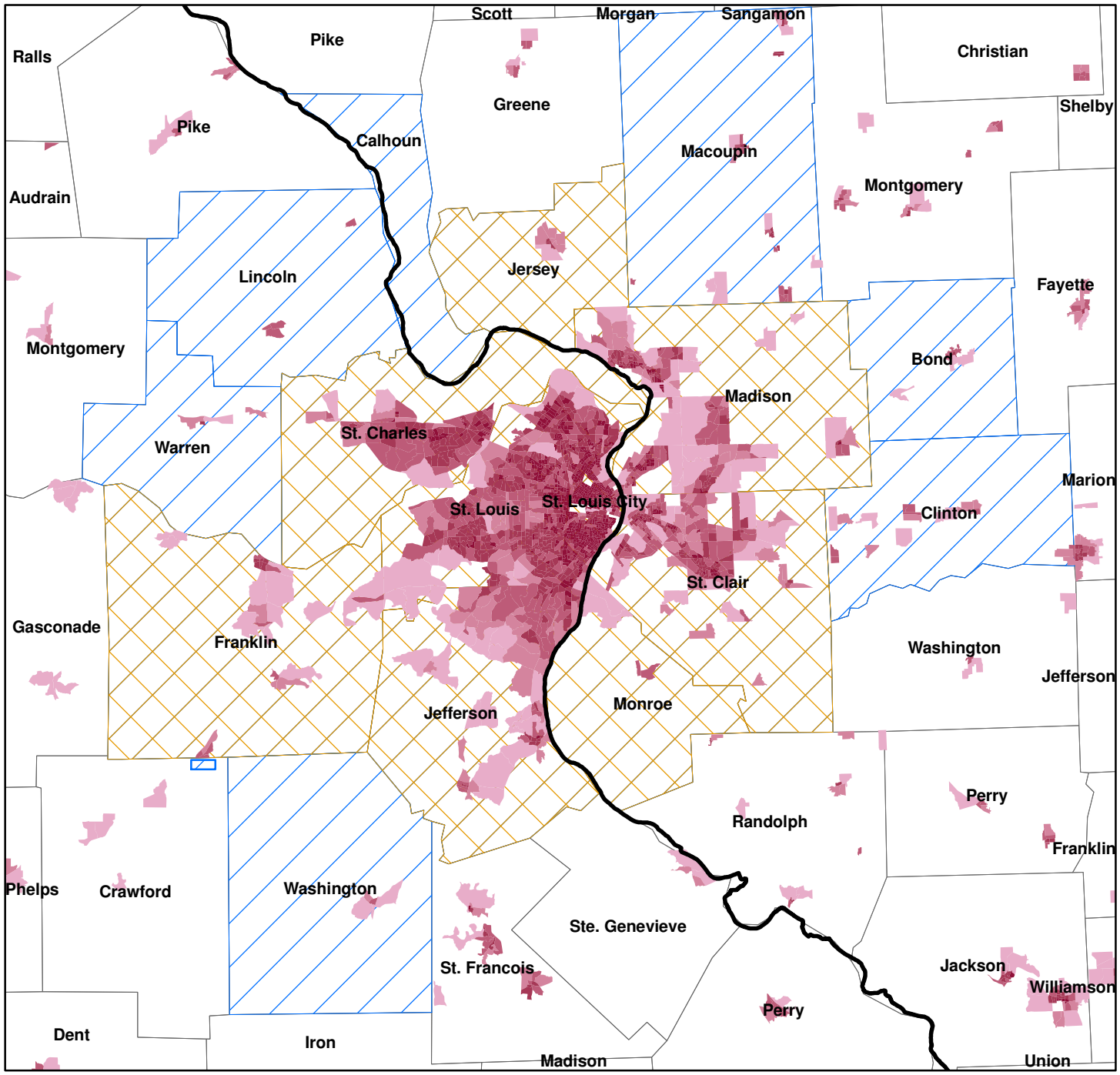
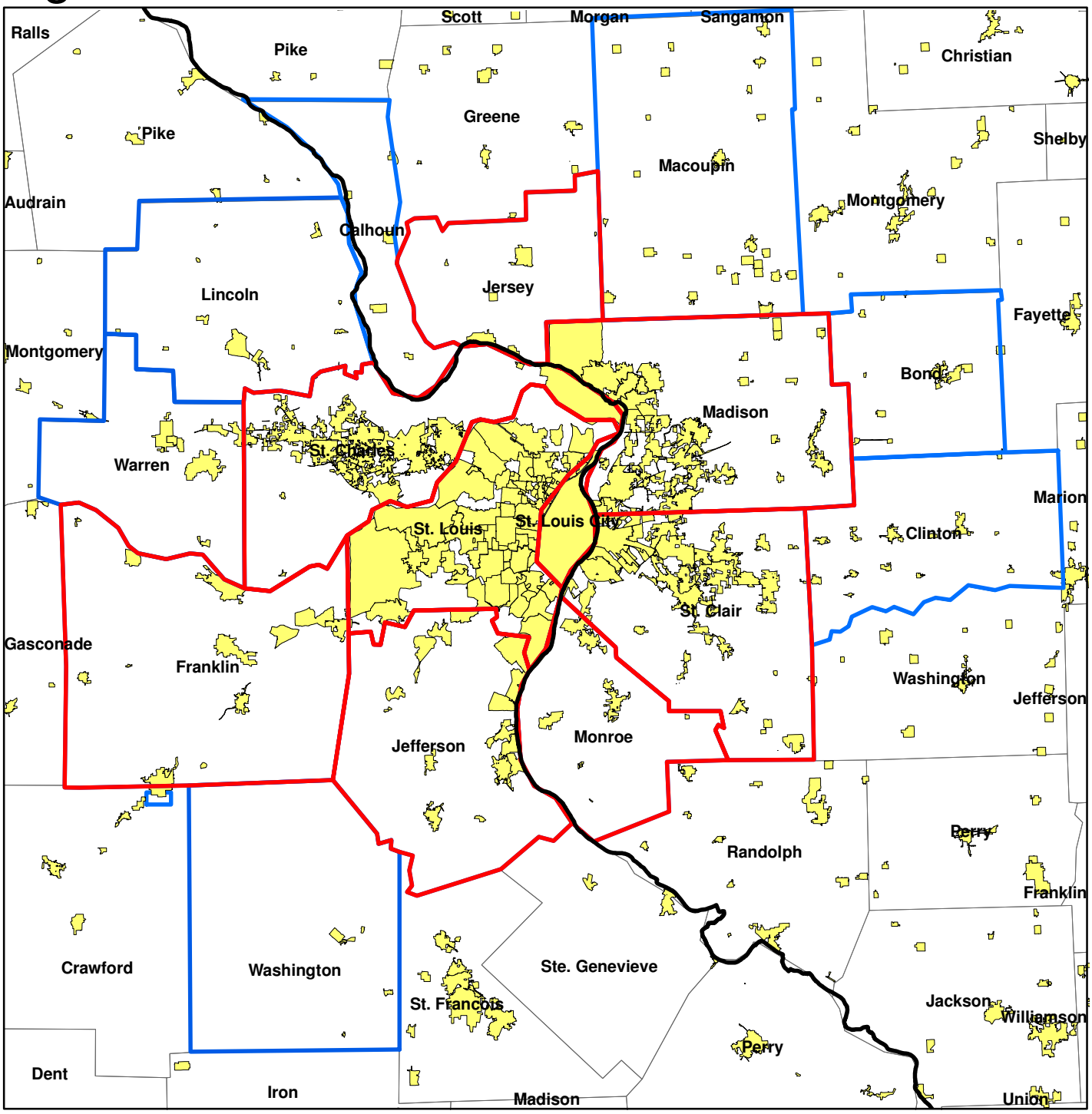


Figure StL3 - Urbanization 2000

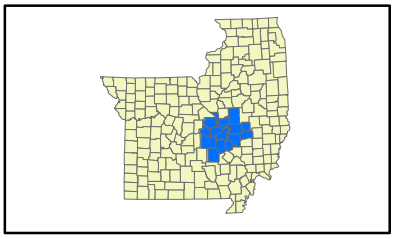


0 12.5 25 50 Kilometers

Non-Attainment Area

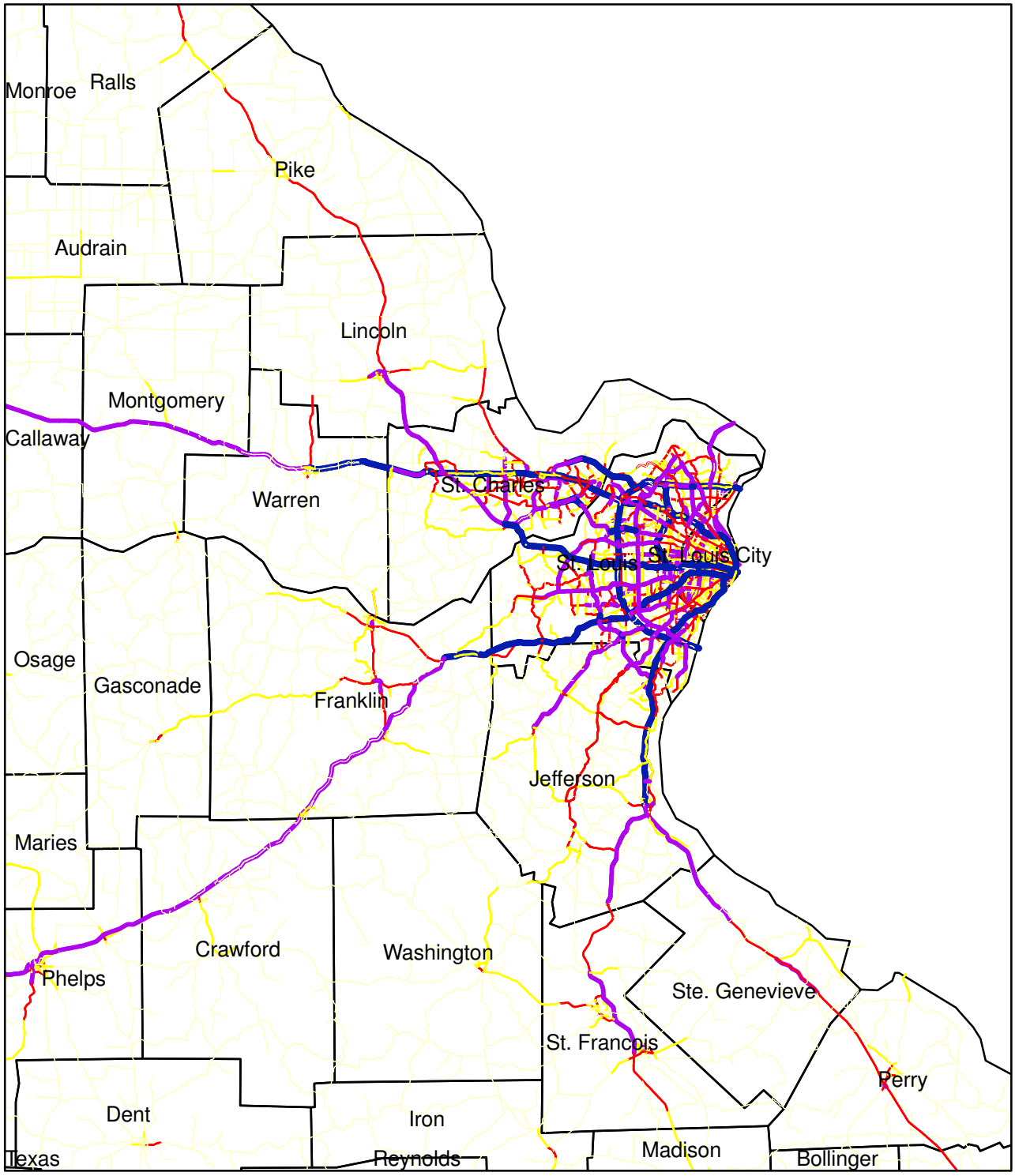
St. Louis MSA

Urban areas



Department of Natural Resources
Division of Environmental Quality
Air Pollution Control Program
Prepared by Bern Johnson 10 JUL 2008

Figure StL4 - Traffic Count 2007

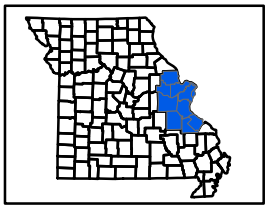


0 15 30 60 Kilometers

Average Annual Daily Traffic

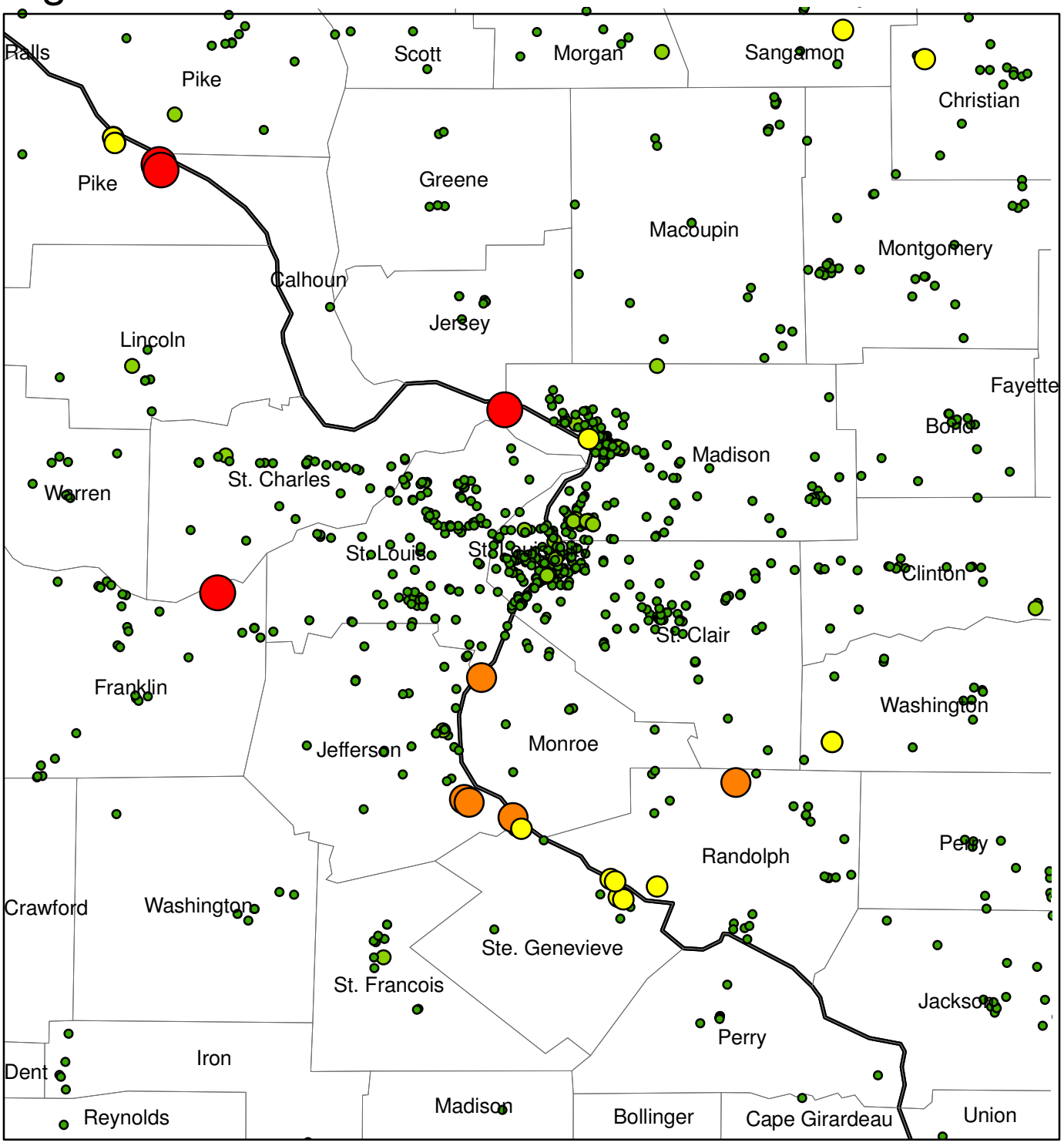
Number of Vehicles

- 1 - 5,000
- 5001 - 10,000
- 10,001 - 20,000
- 20,001 -50,000
- > 50,000



Missouri Department of Natural Resources
Division of Environmental Quality
Air Pollution Control Program
Prepared by Bern Johnson 5 SEP 2008

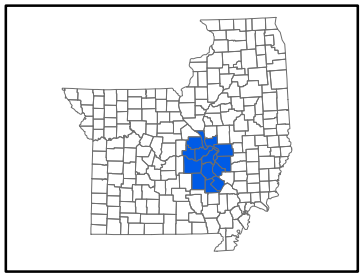
Figure StL5 - NOx Point Sources



0 15 30 60 Kilometers

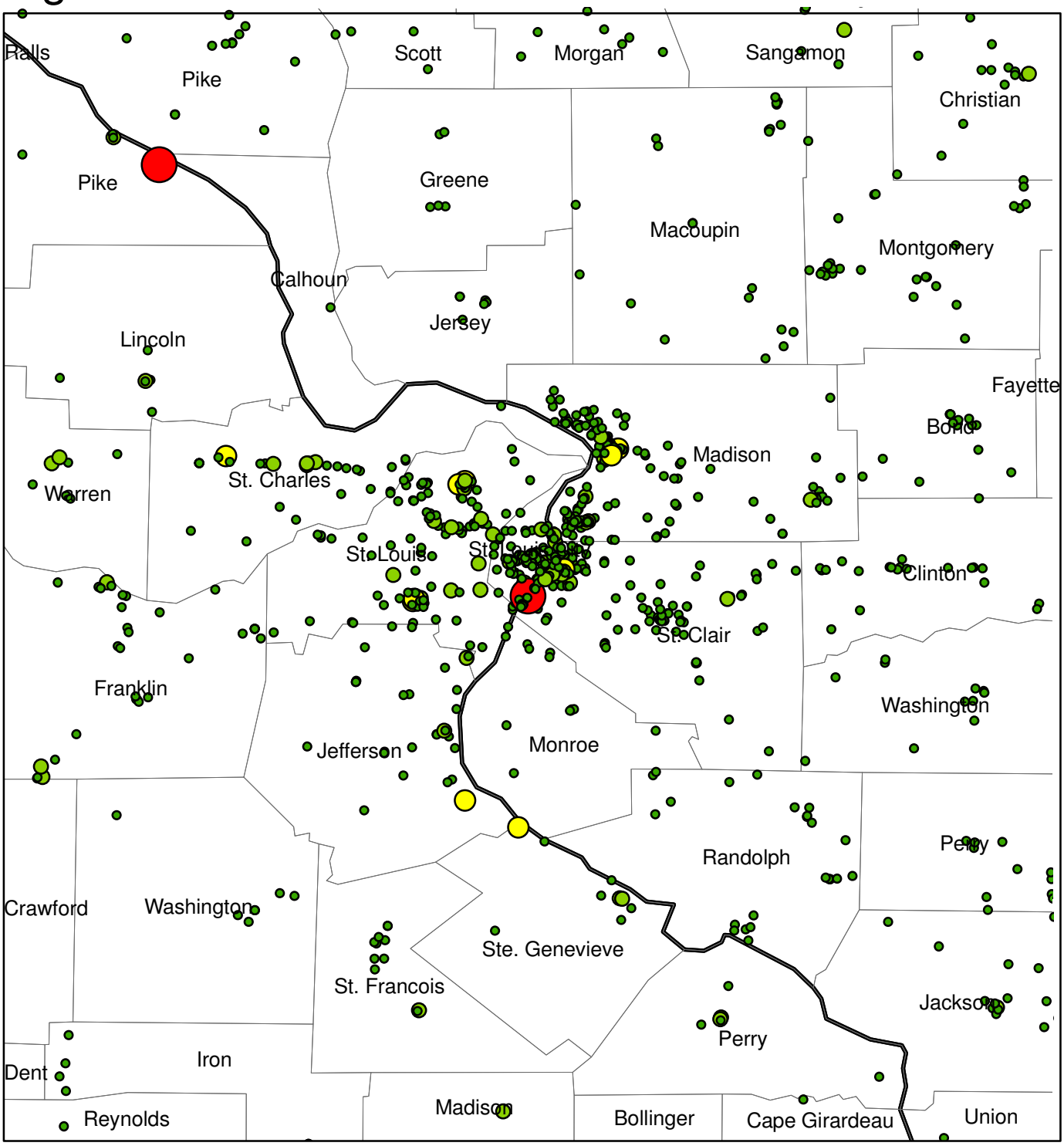
NOx emissions in tons per day

- 0 - 0.3
- 0.4 - 2
- 2.1 - 10
- 10.1 - 20
- 20.1 - 59.5



Missouri Department of Natural Resources
Division of Environmental Quality
Air Pollution Control Program
Prepared by Bern Johnson 10 SEP 08

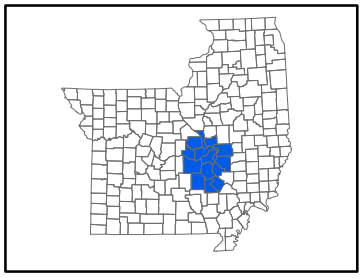
Figure StL6- VOC Point Sources



0 15 30 60 Kilometers

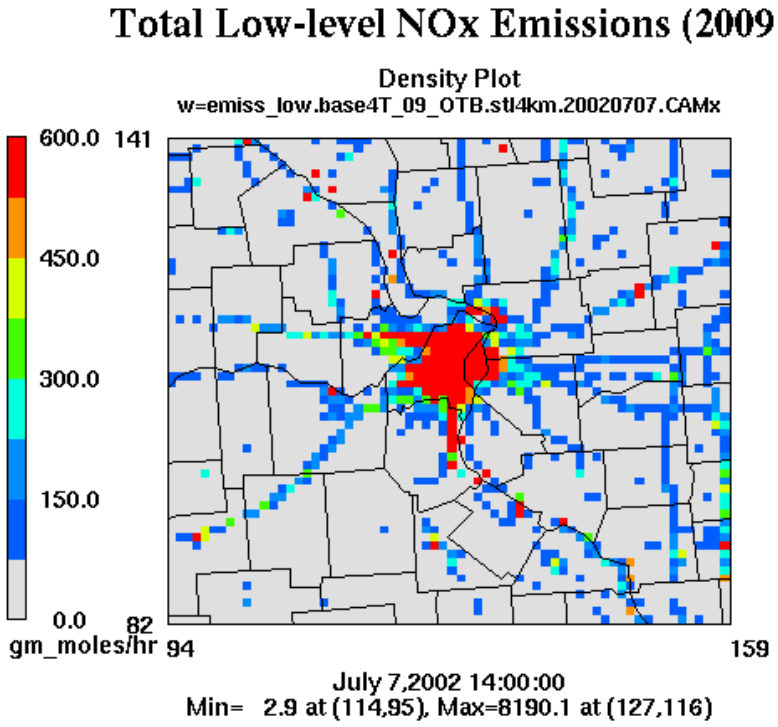
VOC Emissions in tons per day

- 0 - 0.1
- 0.2 - 0.5
- 0.6 - 2
- 2.1 - 6
- > 6

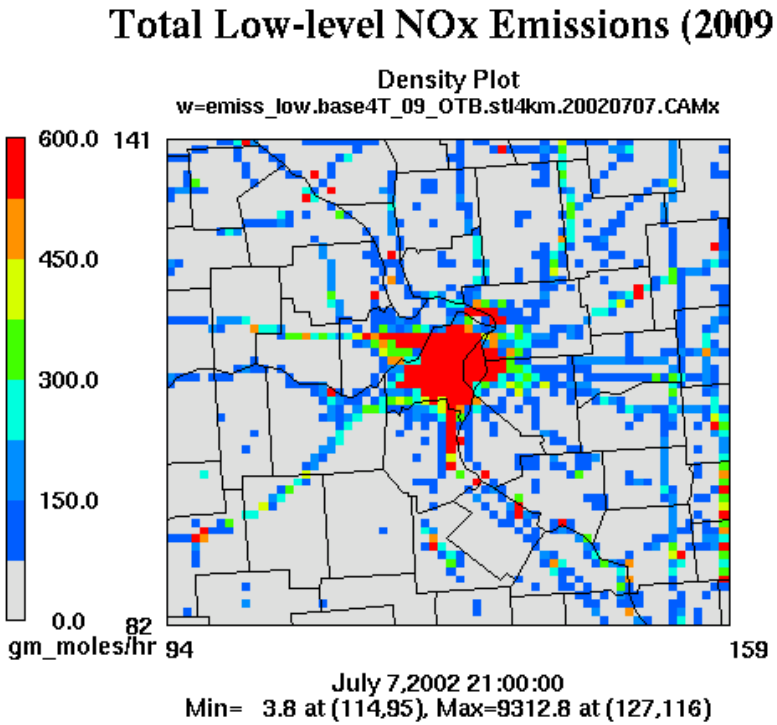


Missouri Department of Natural Resources
Division of Environmental Quality
Air Pollution Control Program
Prepared by Bern Johnson 10 SEP 08

Figure StL7 – NOx Emission Density

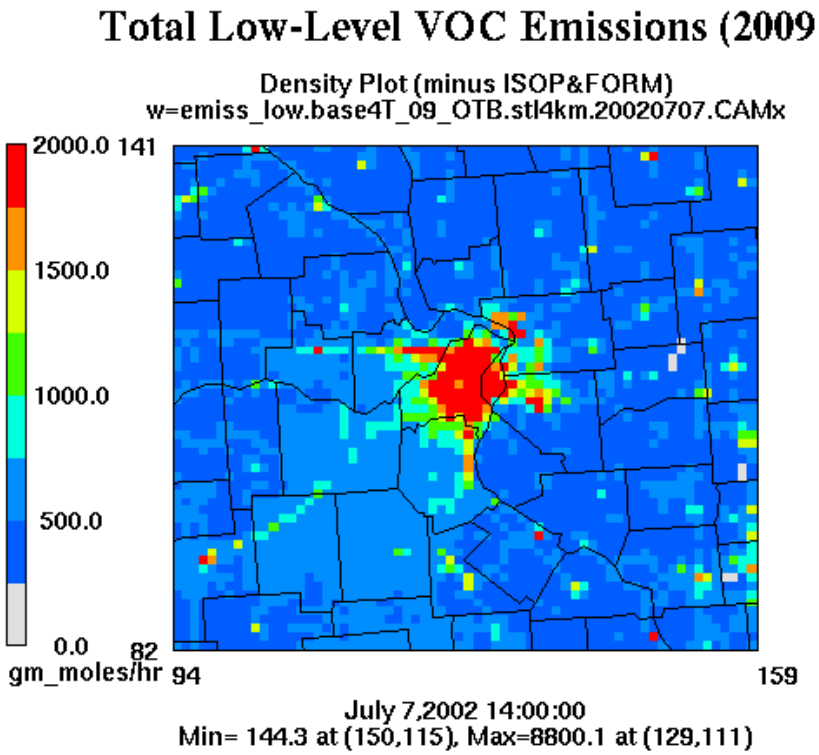


July 7, 2002 – 8 AM

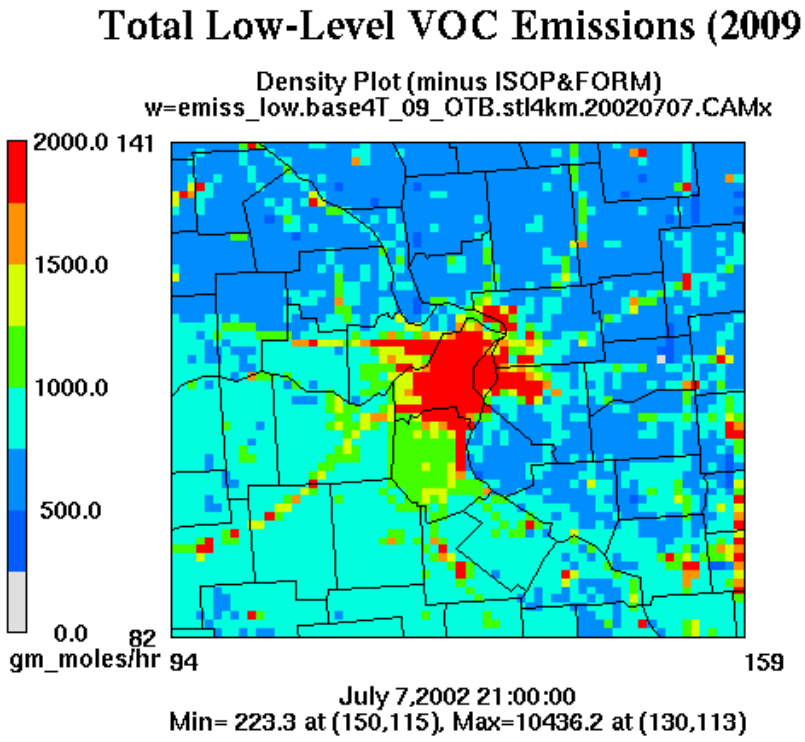


July 7, 2002 – 3 PM

Figure StL8 – VOC Emission Density



July 7, 2002 – 8 AM



July 7, 2002 – 3 PM

TABLE STL3

	2009 Total VOC (TPD)	2009 Total Nox (TPD)	2000 Population	2007 Population	2006 Employment	2009 Million VMT per year	NAA VOC %	NAA NOx %	Pop. Growth 2000-07	Employment % (NAA)
St. Louis	105.22	135.01	1,016,315	995,118	568,298	11,816.1	38.8%	32.8%	-2.1%	46.6%
St. Louis City	38.19	39.33	348,189	350,759	271,016	3,382.8	14.1%	9.6%	0.7%	22.2%
St. Charles	28.43	50.24	283,883	343,952	122,163	2,770.8	10.5%	12.2%	21.2%	10.0%
Jefferson	24.07	50.24	198,099	216,076	41,043	2,036.1	8.9%	12.2%	9.1%	3.4%
Franklin	14.61	44.03	93,807	100,045	35,542	1,575.5	5.4%	10.7%	6.6%	2.9%
Lincoln	6.14	7.16	38,944	51,528	9,334	530.2	2.3%	1.7%	32.3%	0.8%
Warren	4.66	5.05	24,525	30,467	5,927	528.1	1.7%	1.2%	24.2%	0.5%
Washington	2.58	1.74	23,344	24,317	3,099	251.3	1.0%	0.4%	4.2%	0.3%
NAA TOTAL (MO)	210.52	318.85	1,940,293	2,005,950	1,038,062	21,581.3	77.7%	77.5%	3.4%	85.1%
MSA TOTAL (MO)	238.51	376.84	2,027,106	2,112,262	1,056,422	22,890.9	82.7%	80.9%	4.2%	86.7%
Madison (IL)	30.66	59.41	258,941	267,347	86,544	3,184.7	11.3%	14.4%	3.2%	7.1%
St. Clair (IL)	23.47	25.43	256,082	261,316	82,004	3,267.8	8.7%	6.2%	2.0%	6.7%
Jersey (IL)	3.17	3.25	21,668	22,455	4,547	223.5	1.2%	0.8%	3.6%	0.4%
Monroe (IL)	3.03	4.60	27,619	32,372	7,992	554.2	1.1%	1.1%	17.2%	0.7%
Macoupin (IL)	6.28	4.81	49,019	48,235	10,405	514.4	2.3%	1.2%	-1.6%	0.9%
Clinton (IL)	5.42	4.66	35,535	36,450	9,331	420.6	2.0%	1.1%	2.6%	0.8%
Bond (IL)	3.37	3.05	17,633	18,103	4,522	323.6	1.2%	0.7%	2.7%	0.4%
Calhoun (IL)	1.37	2.17	5,084	5,167	590	43.8	0.5%	0.5%	1.6%	0.0%
NAA TOTAL (IL)	60.34	92.69	564,310	583,490	181,087	7,230.2	22.3%	22.5%	3.4%	14.9%
MSA TOTAL (IL)	76.77	107.39	671,581	691,445	205,935	8,532.6	28.3%	26.1%	3.0%	16.9%
NAA TOTAL	270.86	411.54	2,504,603	2,589,440	1,219,149	28,811.5	100.0%	100.0%	3.4%	100.0%
MSA TOTAL	315.28	484.23	2,698,687	2,803,707	1,262,357	31,423.5			3.9%	

	2009 Total VOC (TPD)	2009 Total Nox (TPD)	2000 Population	2007 Population	2006 Employment	2009 Million VMT per year	NAA VOC %	NAA NOx %	Pop. Growth 2000-07	Employment % (NAA)
Ste. Genenvieve	5.79	30.16	17,842	17,841	5,428	412.6	2.1%	7.3%	0.0%	0.4%
St. Francois	5.53	5.11	55,641	62,810	20,411	587.3	2.0%	1.2%	12.9%	1.7%
Pike	12.24	37.61	18,351	18,471	4,715	314.7	4.5%	9.1%	0.7%	0.4%
Crawford*	5.67	4.40	22,804	24,076	5,168	608.4	2.1%	1.1%	5.6%	0.4%
Montgomery	2.87	4.56	12,136	11,920	2,369	504.0	1.1%	1.1%	-1.8%	0.2%
Gasconade	2.91	2.46	15,342	15,399	4,755	175.7	1.1%	0.6%	0.4%	0.4%
Perry	4.56	6.39	18,132	18,794	8,530	365.8	1.7%	1.6%	3.7%	0.7%
Randolph (IL)**	5.75	21.70	33,893	32,760	10,778	300.3	2.1%	5.3%	-3.3%	0.9%
Montgomery (IL)	7.43	11.74	30,652	29,810	8,182	581.4	2.7%	2.9%	-2.7%	0.7%
Washington (IL)	5.46	16.21	15,148	14,769	5,566	395.8	2.0%	3.9%	-2.5%	0.5%
Greene (IL)	3.89	3.80	14,761	13,890	1,953	135.9	1.4%	0.9%	-5.9%	0.2%

* portion of county in MSA

** portion of county in PM2.5 NAA

TABLE STL4

County	2000	2010	2020	2030	00-10 Growth %	00-20 Growth %
ST. LOUIS	1,016,300	987,799	967,196	956,817	-2.80%	-4.83%
ST. LOUIS CITY	348,189	350,800	350,385	349,004	0.75%	0.63%
ST. CHARLES	283,893	364,607	439,068	499,126	28.43%	**54.66%**
JEFFERSON	198,099	222,183	244,003	260,276	12.16%	23.17%
FRANKLIN	93,807	102,419	110,704	117,122	9.18%	18.01%
LINCOLN	38,944	56,010	74,529	91,294	43.82%	**91.37%**
WARREN	24,525	32,377	40,174	46,241	32.02%	**63.81%**
WASHINGTON	23,344	24,789	26,294	27,294	6.19%	12.64%
Crawford	22,804	24,608	26,561	27,895	7.91%	16.48%
St. Francois	55,641	64,538	69,815	73,382	15.99%	25.47%
Pike	18,351	18,589	18,669	18,728	1.30%	1.73%
Ste. Genevieve	17,842	17,899	18,161	18,426	0.32%	1.79%
Gasconade	15,342	15,611	15,890	15,921	1.75%	3.57%
Montgomery	12,136	11,881	11,727	11,513	-2.10%	-3.37%
Perry	18,132	18,948	20,100	21,164	4.5%	10.9%
MADISON	259,391	267,588	285,586	296,342	3.16%	10.10%
ST. CLAIR	256,532	254,235	253,924	243,453	-0.90%	-1.02%
MONROE	27,667	32,920	38,754	43,111	18.99%	**40.07%**
JERSEY	21,706	24,334	28,280	31,071	12.11%	**30.29%**
MACOUPIN	49,103	51,161	55,948	59,442	4.19%	13.94%
CLINTON	35,593	40,058	43,075	44,621	12.54%	21.02%
BOND	17,664	17,804	19,154	20,064	0.79%	8.44%
CALHOUN	5,084	5,018	5,260	5,572	-1.30%	3.46%
Randolph	33,951	34,432	35,743	37,004	1.42%	5.28%
Montgomery	30,704	30,729	31,744	33,124	0.08%	3.39%
Washington	15,178	15,805	16,534	16,793	4.13%	8.93%
Greene	14,791	14,641	14,872	14,958	-1.01%	0.55%

Table STL5 Place of Residence/Employment Matrix (County by County) - 2004

Missouri Residence		Employment (MO)							
		Crawford	Franklin	Gasconade	Jefferson	Lincoln	Montgomery	Perry	Pike
	ST. LOUIS	133	2,499	146	8,146	433	87	143	97
	ST. CHARLES	43	1,040	54	1,348	1,149	76	38	106
	ST. LOUIS CITY	42	484	14	2,042	99	15	33	36
	JEFFERSON	53	1,294	60	26,579	111	27	171	74
	FRANKLIN	813	22,859	763	946	108	33	23	48
	LINCOLN	4	169	8	145	6,122	93	4	195
	WARREN	7	707	31	106	312	205	3	28
	WASHINGTON	58	269	1	444	10	5	26	14
	Crawford	3,672	1,703	122	114	15	9	5	15
	St. Francois	26	232	9	1,591	28	9	209	58
	Ste. Genevieve	3	46	0	838	8	3	569	7
	Pike	4	44	10	23	657	33	0	3,906
	Gasconade	78	1,205	3,211	39	10	164	2	13
	Perry	3	29	9	88	23	1	5,109	3
	Montgomery	0	160	287	16	153	1,984	1	39
	Missouri NAA	1,084	28,176	1,037	39,061	1,900	238	408	361
	Missouri MSA	1,153	29,321	1,077	39,756	8,344	541	441	598
	Total Missouri	4,939	32,740	4,725	42,465	9,238	2,744	6,336	4,639
Illinois Residence									
		Crawford	Franklin	Gasconade	Jefferson	Lincoln	Montgomery	Perry	Pike
	MADISON	9	133	12	373	38	3	4	9
	ST. CLAIR	9	104	2	457	34	5	11	12
	MONROE	0	39	5	179	2	0	21	0
	JERSEY	0	5	1	20	7	0	0	1
	MACOUPIN	1	6	0	16	1	0	0	0
	CLINTON	2	9	0	22	1	1	4	0
	BOND	0	0	1	2	0	0	1	1
	CALHOUN	0	1	0	0	13	0	0	12
	Randolph	1	5	1	25	3	0	641	0
	Montgomery	0	0	0	1	2	3	0	1
	Washington	0	2	7	9	0	0	7	0
	Greene	0	0	0	1	0	0	0	8
	Illinois NAA	18	281	20	1,029	81	8	36	22
	Illinois MSA	21	297	21	1,069	96	9	41	35
	Total Illinois	22	304	29	1,105	101	12	689	44
	Total NAA	1,102	28,457	1,057	40,090	1,981	246	444	383
	Total MSA	1,174	29,618	1,098	40,825	8,440	550	482	633
	Grand Total	4,961	33,044	4,754	43,570	9,339	2,756	7,025	4,683
	Total Employees	6,329	35,853	5,671	46,747	10,575	3,470	9,166	6,485

Missouri Residence		Employment (MO)							Missouri Total	All Residents Working in MO
		St. Charles	St. Francois	Ste. Genevieve	St. Louis	Warren	Washington	St. Louis City		
	ST. LOUIS	23,482	751	68	308,341	336	188	95,330	440,180	467,600
	ST. CHARLES	56,451	247	27	66,771	859	73	12,138	140,420	151,314
	ST. LOUIS CITY	3,864	240	22	60,588	86	27	65,712	133,304	140,147
	JEFFERSON	3,724	763	197	45,423	72	271	13,996	92,815	99,074
	FRANKLIN	1,860	207	13	12,929	415	88	2,382	43,487	46,828
	LINCOLN	4,743	29	3	3,708	476	11	667	16,377	17,860
	WARREN	2,385	24	3	2,204	2,847	3	436	9,301	10,271
	WASHINGTON	116	745	29	715	8	2,085	147	4,672	5,648
	Crawford	154	53	5	863	17	28	195	6,970	8,630
	St. Francois	364	14,215	289	2,838	26	829	1,045	21,768	25,218
	Ste. Genevieve	127	880	4,217	1,034	3	43	417	8,195	8,904
	Pike	415	74	9	556	65	24	145	5,965	7,606
	Gasconade	133	39	4	564	59	11	118	5,650	7,064
	Perry	48	135	339	394	1	12	126	6,320	7,585
	Montgomery	328	9	0	414	353	5	135	3,884	5,083
	Missouri NAA	89,381	2,208	327	494,052	1,768	647	189,558	850,206	904,963
	Missouri MSA	96,625	3,006	362	500,679	5,099	2,746	190,808	880,556	938,742
	Total Missouri	98,194	18,411	5,225	507,342	5,623	3,698	192,989	939,308	1,008,832

Illinois Residence									Missouri Total	All Residents Working in MO
		St. Charles	St. Francois	Ste. Genevieve	St. Louis	Warren	Washington	St. Louis City		
	MADISON	1,449	67	6	15,152	16	3	12,229	29,503	31,919
	ST. CLAIR	907	51	11	12,504	17	8	15,347	29,479	31,587
	MONROE	167	12	10	3,177	2	6	2,129	5,749	6,142
	JERSEY	94	5	0	764	3	0	256	1,156	1,295
	MACOUPIN	64	3	0	741	1	0	472	1,305	1,445
	CLINTON	47	1	0	564	0	0	792	1,443	1,581
	BOND	17	0	0	153	0	0	147	322	353
	CALHOUN	35	0	0	68	0	0	37	166	176
	Randolph	29	14	62	456	0	0	325	1,562	1,715
	Montgomery	21	1	0	113	0	0	82	224	260
	Washington	7	0	0	101	1	0	160	294	336
	Greene	26	0	0	94	0	0	45	174	202
	Illinois NAA	2,617	135	27	31,597	38	17	29,961	65,887	70,943
	Illinois MSA	2,780	139	27	33,123	39	17	31,409	69,123	74,498
	Total Illinois	2,863	154	89	33,887	40	17	32,021	71,377	77,011
	Total NAA	91,998	2,343	354	525,649	1,806	664	219,519	916,093	975,906
	Total MSA	99,405	3,145	389	533,802	5,138	2,763	222,217	949,679	1,013,240
	Grand Total	101,057	18,565	5,314	541,229	5,663	3,715	225,010	1,010,685	1,085,843
	Total Employees	111,392	23,029	5,863	600,620	6,672	4,521	247,481	1,123,874	

Missouri Residence		Employment (IL)							
		Bond	Calhoun	Clinton	Greene	Jersey	Macoupin	Madison	Monroe
	ST. LOUIS	0	0	33	2	33	24	2,495	253
	ST. CHARLES	1	3	7	2	11	5	407	39
	ST. LOUIS CITY	5	0	14	0	3	6	671	44
	JEFFERSON	1	3	1	0	1	6	299	89
	FRANKLIN	0	0	1	0	0	0	41	7
	LINCOLN	2	0	0	0	0	1	23	1
	WARREN	0	0	0	0	1	1	11	0
	WASHINGTON	0	0	1	0	0	0	3	0
	Crawford	0	0	0	0	0	0	1	0
	St. Francois	0	0	1	0	0	0	14	16
	Ste. Genevieve	0	1	0	0	0	0	10	11
	Pike	0	4	0	0	1	1	4	3
	Gasconade	0	0	0	0	0	0	3	0
	Perry	0	0	2	0	0	0	10	5
	Montgomery	0	0	0	0	0	0	5	0
	Missouri NAA	7	6	56	4	48	41	3,913	432
	Missouri MSA	9	6	57	4	49	43	3,950	433
	Total Missouri	9	11	60	4	50	44	3,997	468

Illinois Residence		Employment (IL)							
		Bond	Calhoun	Clinton	Greene	Jersey	Macoupin	Madison	Monroe
	MADISON	326	36	618	47	664	664	60,475	281
	ST. CLAIR	48	10	657	4	109	107	9,515	1,269
	MONROE	5	2	35	2	18	12	465	4,023
	JERSEY	10	108	10	115	2,857	307	2,774	21
	MACOUPIN	24	10	50	95	191	7,738	3,766	10
	CLINTON	226	4	6,665	5	11	53	1,596	51
	BOND	2,743	1	318	0	16	52	1,292	9
	CALHOUN	0	471	0	6	86	7	118	0
	Randolph	5	4	57	5	32	4	282	611
	Montgomery	203	1	60	8	31	688	436	8
	Washington	13	1	307	0	0	16	179	15
	Greene	1	39	6	1,832	403	170	428	2
	Illinois NAA	389	156	1,320	168	3,648	1,090	73,229	5,594
	Illinois MSA	3,382	642	8,353	274	3,952	8,940	80,001	5,664
	Total Illinois	3,604	687	8,783	2,119	4,418	9,818	81,326	6,300
	Total NAA	396	162	1,376	172	3,696	1,131	77,142	6,026
	Total MSA	3,391	648	8,410	278	4,001	8,983	83,951	6,097
	Grand Total	3,613	698	8,843	2,123	4,468	9,862	85,323	6,768
	Total Employees	4409	847	11,788	2,687	5,049	11,559	97,373	7,435

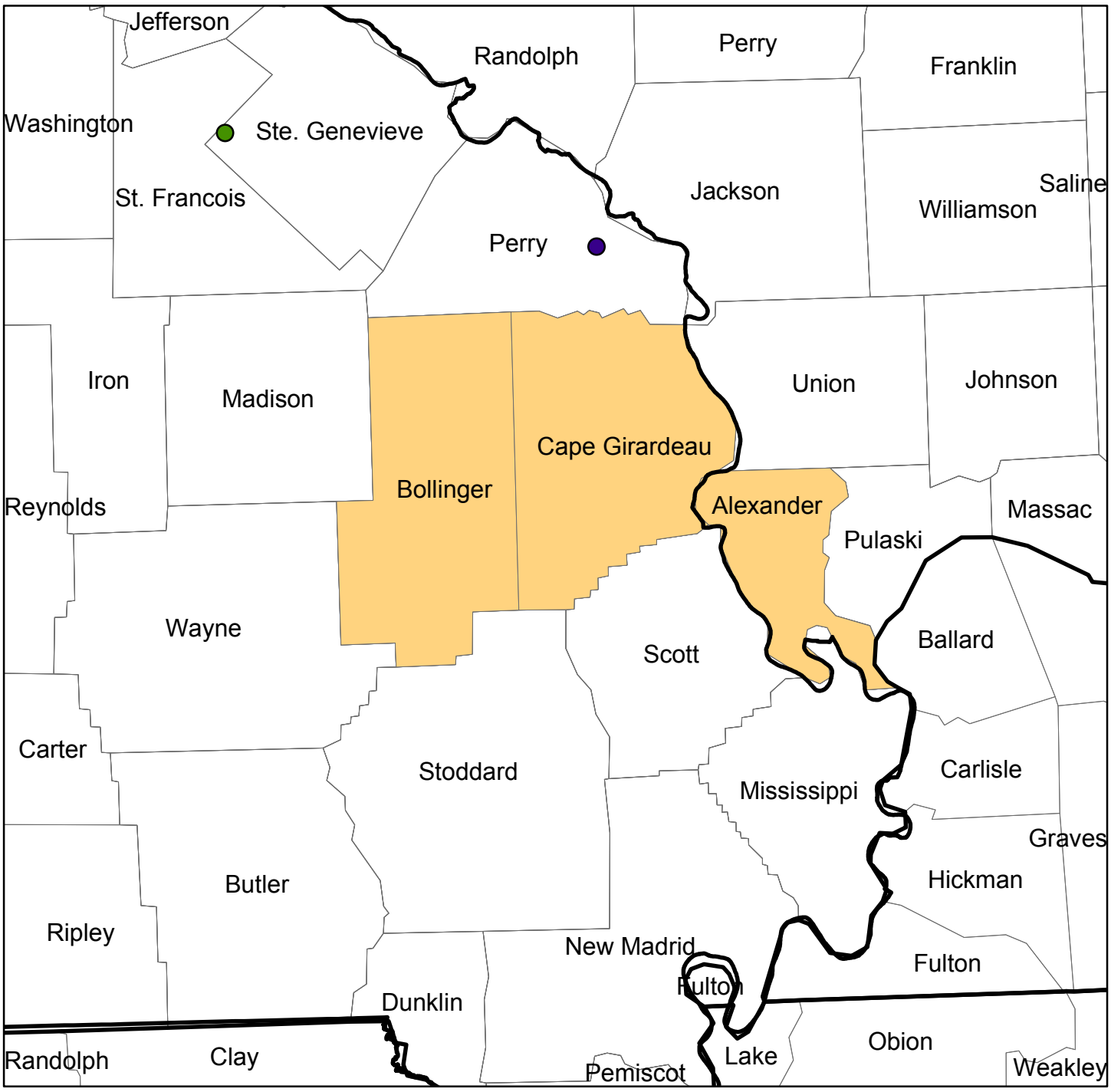
Missouri Residence		Employment (IL)				Illinois Total	All Residents Working in IL
		Montgomery	Randolph	St. Clair	Washington		
	ST. LOUIS	20	27	2,775	10	5,672	8,461
	ST. CHARLES	2	4	281	2	764	1,410
	ST. LOUIS CITY	7	15	1,035	1	1,801	2,645
	JEFFERSON	1	6	514	0	921	1,298
	FRANKLIN	0	3	72	0	124	230
	LINCOLN	0	0	11	0	38	84
	WARREN	0	0	6	0	19	46
	WASHINGTON	0	0	12	0	16	31
	Crawford	0	0	11	0	12	26
	St. Francois	0	1	44	0	76	135
	Ste. Genevieve	0	11	57	0	90	121
	Pike	0	1	10	0	24	121
	Gasconade	0	0	2	0	5	13
	Perry	0	103	12	1	133	200
	Montgomery	0	0	3	1	9	26
	Missouri NAA	30	55	4,677	13	9,282	14,044
	Missouri MSA	30	55	4,706	13	9,355	14,205
	Total Missouri	30	171	4,845	15	9,704	14,847

Illinois Residence		Employment (IL)				Illinois Total	All Residents Working in IL
		Montgomery	Randolph	St. Clair	Washington		
	MADISON	327	193	11,799	81	75,511	90,762
	ST. CLAIR	153	680	53,411	226	66,189	79,947
	MONROE	18	429	1,947	1	6,957	8,212
	JERSEY	33	17	299	4	6,555	7,701
	MACOUPIN	1,421	29	561	8	13,903	19,498
	CLINTON	63	127	2,082	450	11,333	14,886
	BOND	172	19	303	13	4,938	6,230
	CALHOUN	30	1	18	0	737	894
	Randolph	31	7,252	1,507	196	9,986	12,359
	Montgomery	5,486	50	300	1	7,272	11,668
	Washington	13	222	853	3,070	4,689	6,561
	Greene	21	9	89	1	3,001	5,154
	Illinois NAA	531	1,319	67,456	312	155,212	186,622
	Illinois MSA	2,217	1,495	70,420	783	186,123	228,130
	Total Illinois	7,768	9,028	73,169	4,051	211,071	263,872
	Total NAA	561	1,374	72,133	325	164,494	200,666
	Total MSA	2,247	1,550	75,126	796	195,478	242,335
	Grand Total	7,798	9,199	78,014	4,066	220,775	278,719
	Total Employees	10,535	12,938	92,865	5,992	263,477	

Missouri Residence		Area Total	All Residents Work in IL&MO	% Work in NAA	% Work in MSA	% Work in NAA+County	% Work in County		# Working in NAA	# Working in MSA
	ST. LOUIS	445,852	476,061	93.13%	93.34%	93.13%	64.77%		443,354	444,368
	ST. CHARLES	141,184	152,724	90.68%	92.05%	90.68%	36.96%		138,486	140,583
	ST. LOUIS CITY	135,105	142,792	94.15%	94.32%	94.15%	46.02%		134,443	134,680
	JEFFERSON	93,736	100,372	91.58%	92.04%	91.58%	26.48%		91,919	92,384
	FRANKLIN	43,611	47,058	87.33%	88.63%	87.33%	48.58%		41,096	41,708
	LINCOLN	16,415	17,944	52.76%	89.61%	86.88%	34.12%		9,467	16,079
	WARREN	9,320	10,317	56.76%	87.42%	84.36%	27.60%		5,856	9,019
	WASHINGTON	4,688	5,679	30.04%	67.09%	66.75%	36.71%		1,706	3,810
	Crawford	6,982	8,656	35.13%	35.82%	77.55%	42.42%		3,041	3,101
	St. Francois	21,844	25,353	24.23%	27.72%	80.30%	56.07%		6,144	7,028
	Ste. Genevieve	8,285	9,025	28.14%	28.75%	74.87%	46.73%		2,540	2,595
	Pike	5,989	7,727	15.54%	25.26%	66.09%	50.55%		1,201	1,952
	Gasconade	5,655	7,077	29.16%	30.30%	74.54%	45.37%		2,064	2,144
	Perry	6,453	7,785	9.15%	9.63%	74.77%	65.63%		712	750
	Montgomery	3,893	5,109	20.77%	30.77%	59.60%	38.83%		1,061	1,572
	Missouri NAA	859,488	919,007						849,298	853,723
	Missouri MSA	889,911	952,947						866,327	882,631
	Total Missouri	949,012	1,023,679	86.27%	92.62%				883,090	901,773

Illinois Residence		Area Total	All Residents Work in IL&MO	% Work in NAA	% Work in MSA	% Work in NAA+County	% Work in County		# Working in NAA	# Working in MSA
	MADISON	105,014	122,681	83.59%	84.98%	83.59%	49.29%		102,555	104,256
	ST. CLAIR	95,668	111,534	83.94%	84.73%	83.94%	47.89%		93,623	94,504
	MONROE	12,706	14,354	84.60%	85.05%	84.60%	28.03%		12,144	12,208
	JERSEY	7,711	8,996	78.81%	83.76%	78.81%	31.76%		7,090	7,535
	MACOUPIN	15,208	20,943	27.82%	65.18%	64.77%	36.95%		5,827	13,651
	CLINTON	12,776	16,467	31.42%	73.62%	71.90%	40.47%		5,174	12,123
	BOND	5,260	6,583	29.45%	76.76%	71.12%	41.67%		1,939	5,053
	CALHOUN	903	1,070	33.93%	79.81%	77.94%	44.02%		363	854
	Randolph	11,548	14,074	23.25%	23.77%	74.78%	51.53%		3,272	3,345
	Montgomery	7,496	11,928	8.32%	16.31%	54.31%	45.99%		992	1,946
	Washington	4,983	6,897	19.23%	24.13%	63.74%	44.51%		1,326	1,664
	Greene	3,175	5,356	20.31%	24.35%	54.52%	34.20%		1,088	1,304
	Illinois NAA	221,099	257,565						215,412	218,503
	Illinois MSA	255,246	302,628						228,715	250,184
	Total Illinois	282,448	340,883	69.05%	82.67%				235,393	258,443
	Total NAA		1,176,572							
	Total MSA		1,255,575							
	Grand Total		1,364,562	81.97%	90.22%				1,118,483	1,160,216

Figure SE1a - 2008 Ozone Sites and 06-08 Design Values



Farrar

BonneTerre

Cape Girardeau MSA

0 15 30 60 Kilometers

Site Name (ppb)
Farrar (77)
Bonne Terre (79)

Department of Natural Resources
Division of Environmental Quality
Air Pollution Control Program
Prepared by Bern Johnson 18 FEB 09

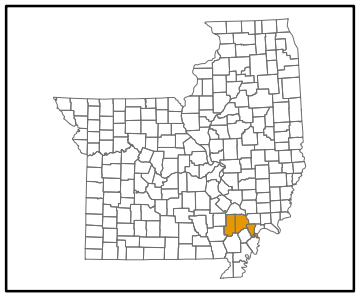
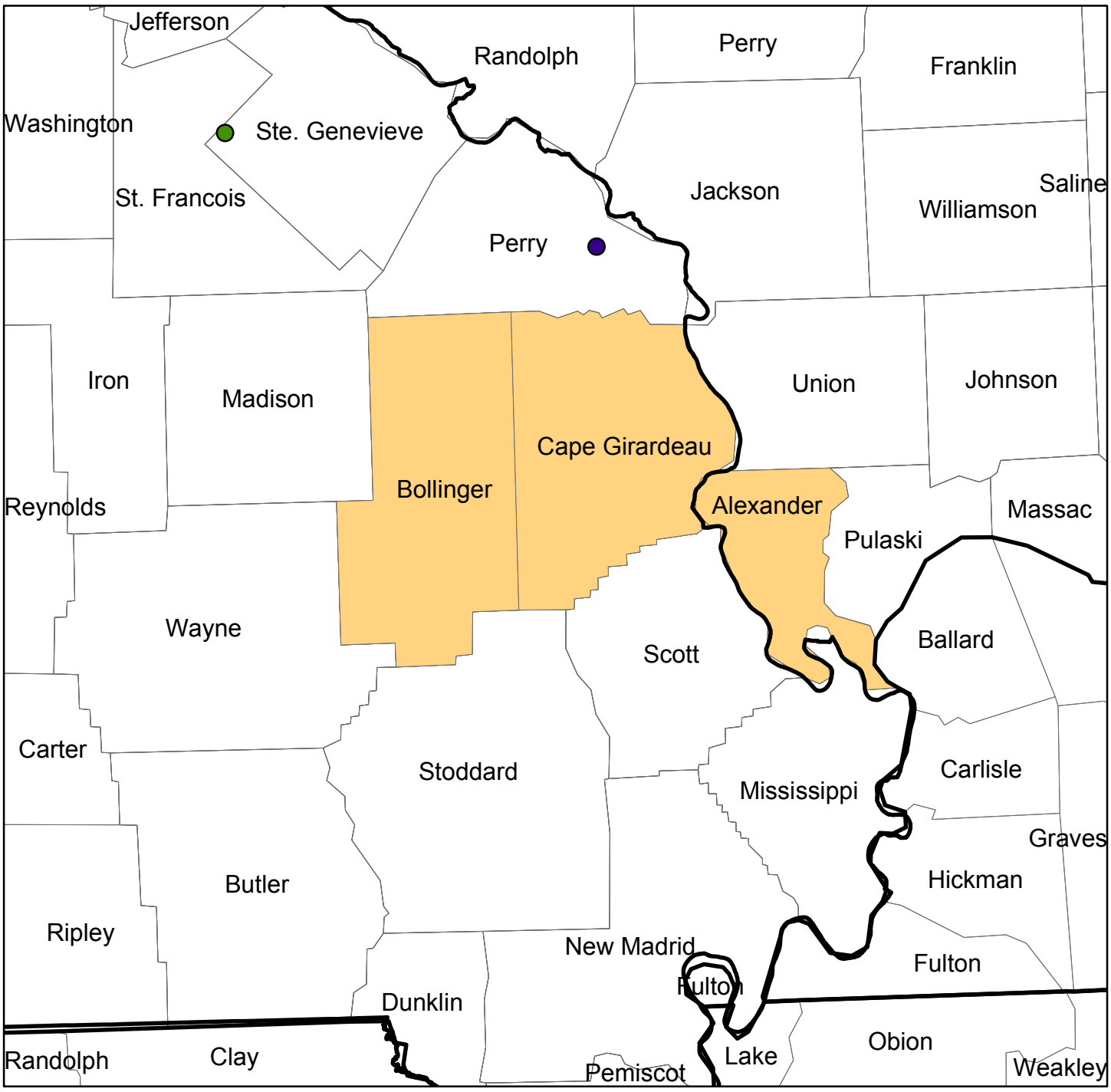
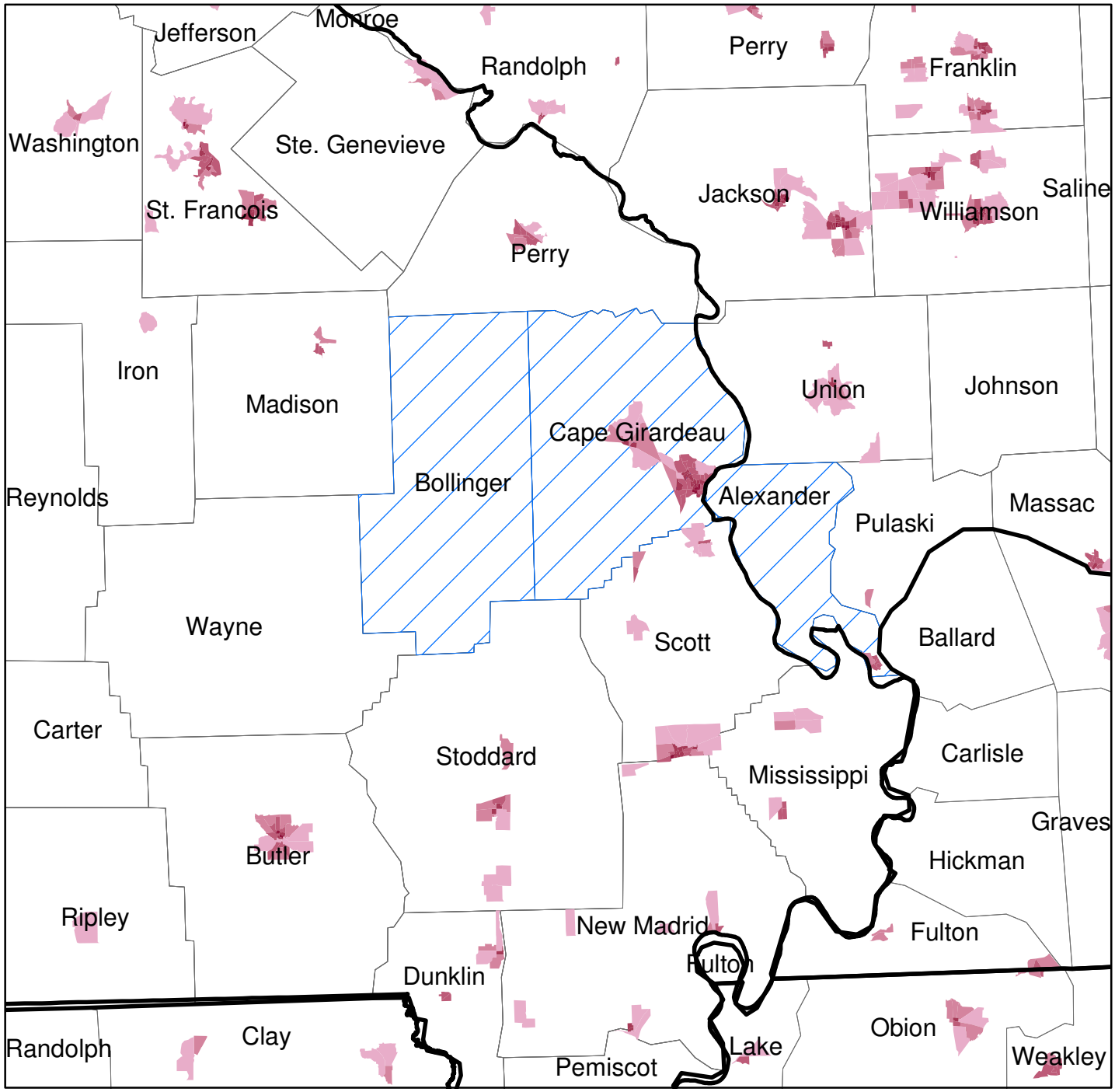


Figure SE1b - 2008 Ozone Sites and 05-07 Design Values



Department of Natural Resources
Division of Environmental Quality
Air Pollution Control Program
Prepared by Bern Johnson 4 AUG 2008

Figure SE2- Population Density 2000



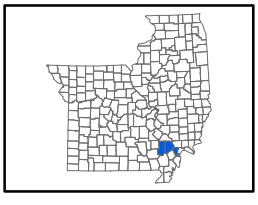
Cape Girardeau MSA

0 10 20 40 Kilometers

Population Density

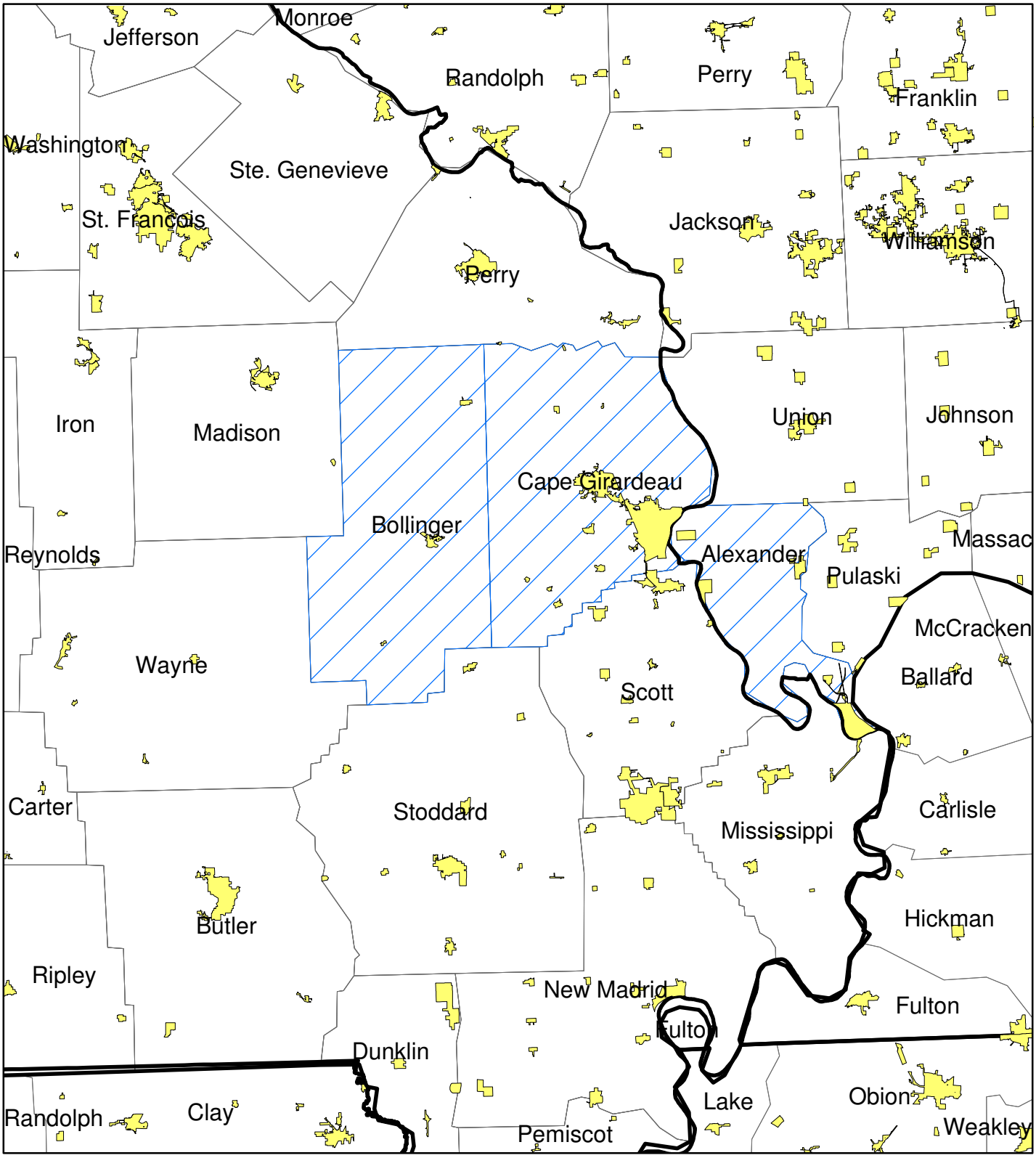
Persons / sq mile

- 0 - 200
- 201 - 500
- 501 - 1000
- 1001 - 2500
- 2501 - 5000
- 5001 +



Department of Natural Resources
Division of Environmental Quality
Air Pollution Control Program
Prepared by Bern Johnson 4 AUG 2008

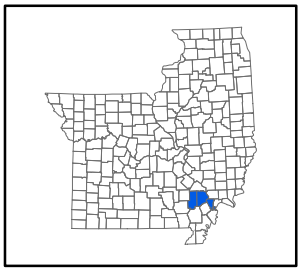
Figure SE3 - Urbanization 2000



Cape Girardeau MSA

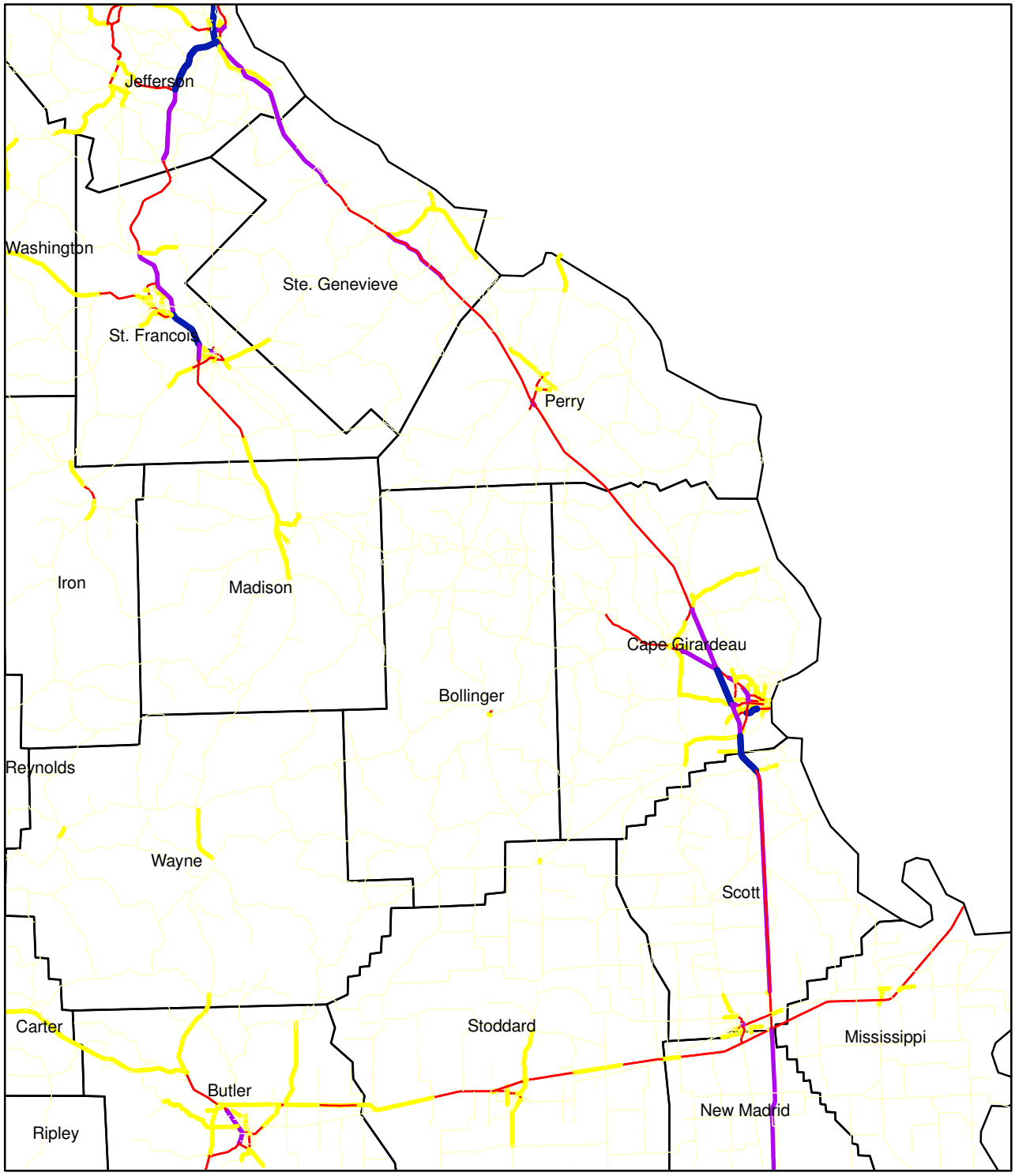
Urban Areas

0 12.5 25 50 Kilometers



Department of Natural Resources
Division of Environmental Quality
Air Pollution Control Program
Prepared by Bern Johnson 4 AUG 2008

Figure SE4 - Traffic Count 2007

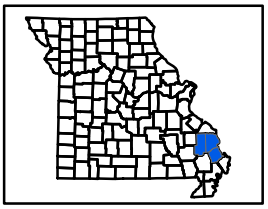


03.57 14 Kilometers

Average Annual Daily Traffic

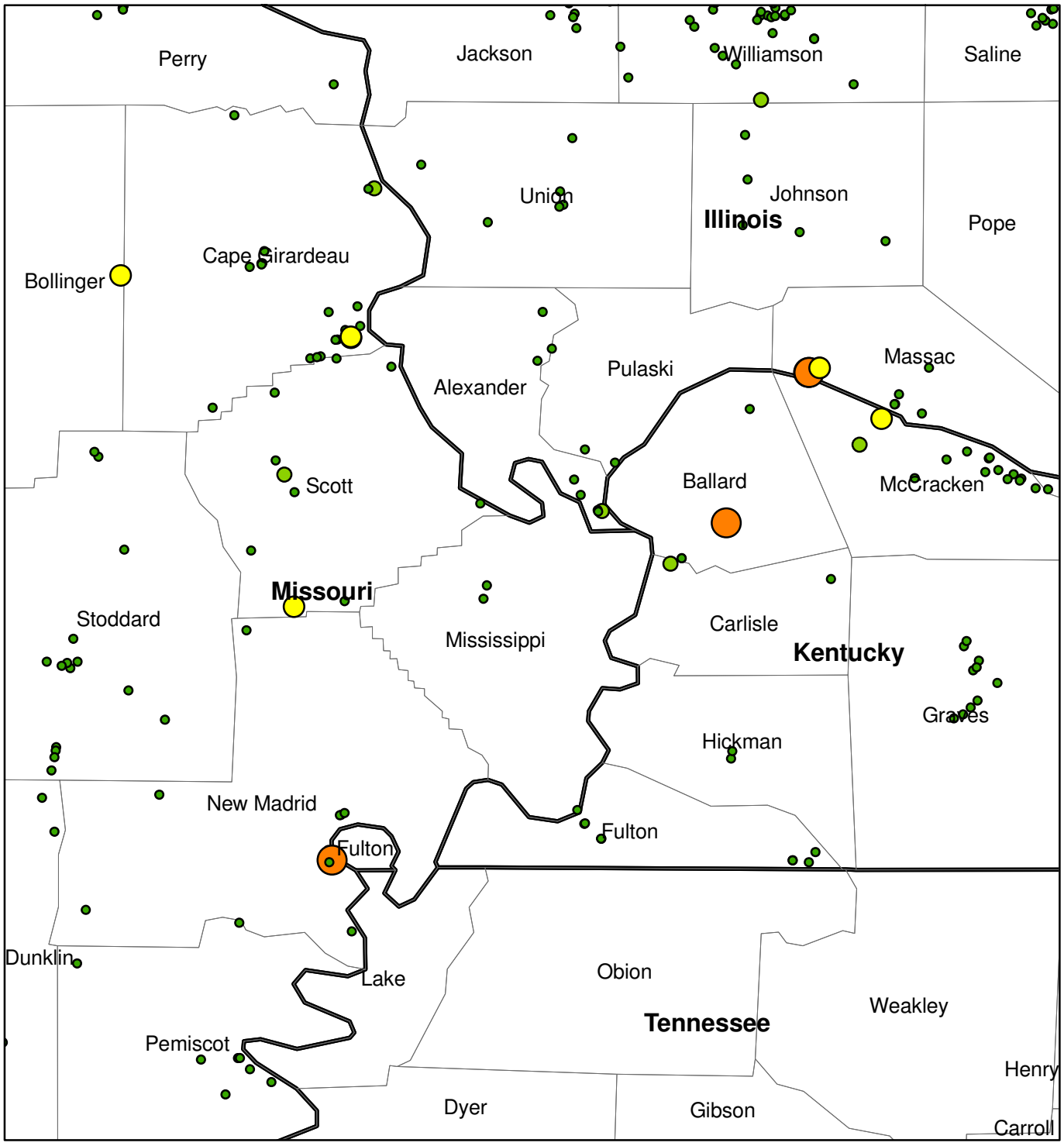
Number of Vehicles

- 1 - 5,000
- 5,001 - 10,000
- 10,001 - 20,000
- 20,001 - 30,000
- > 30,000



Missouri Department of Natural Resources
Division of Environmental Quality
Air Pollution Control Program
Prepared by Bern Johnson 5 SEP 2008

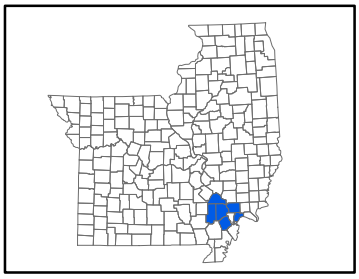
Figure SE5 - NOx Point Sources 2007



0 10 20 40 Kilometers

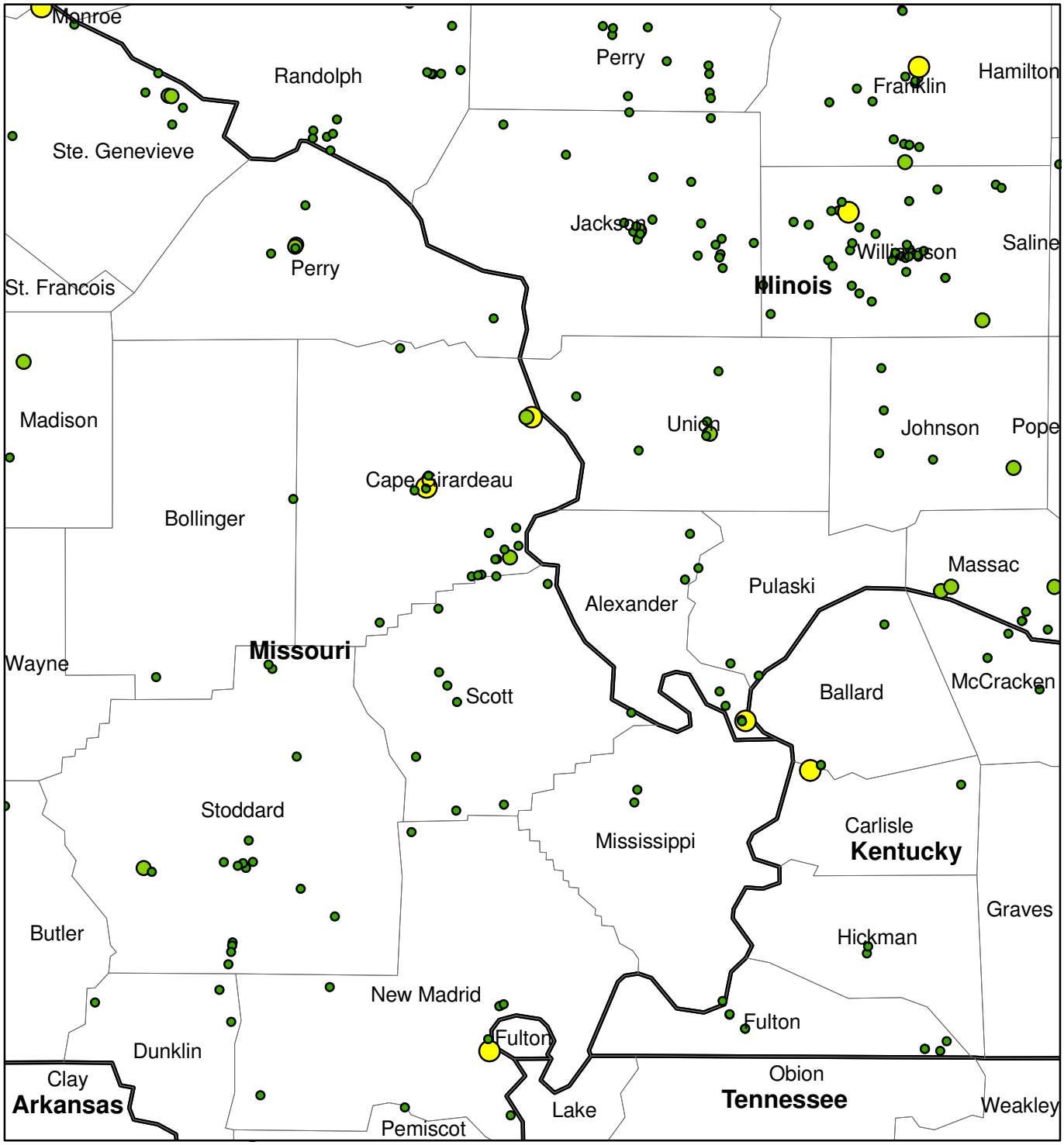
NOx emissions in tons per day

- 0 - 0.3
- 0.4 - 2
- 2.1 - 10
- 10.1 - 20
- > 20



Missouri Department of Natural Resources
Division of Environmental Quality
Air Pollution Control Program
Prepared by Bern Johnson 10 SEP 08

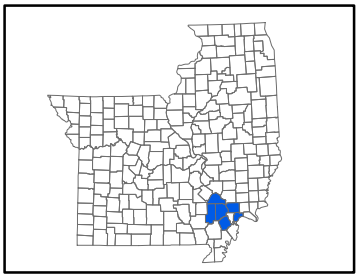
Figure SE6 - VOC Point Sources 2007



0 5 10 20 Kilometers

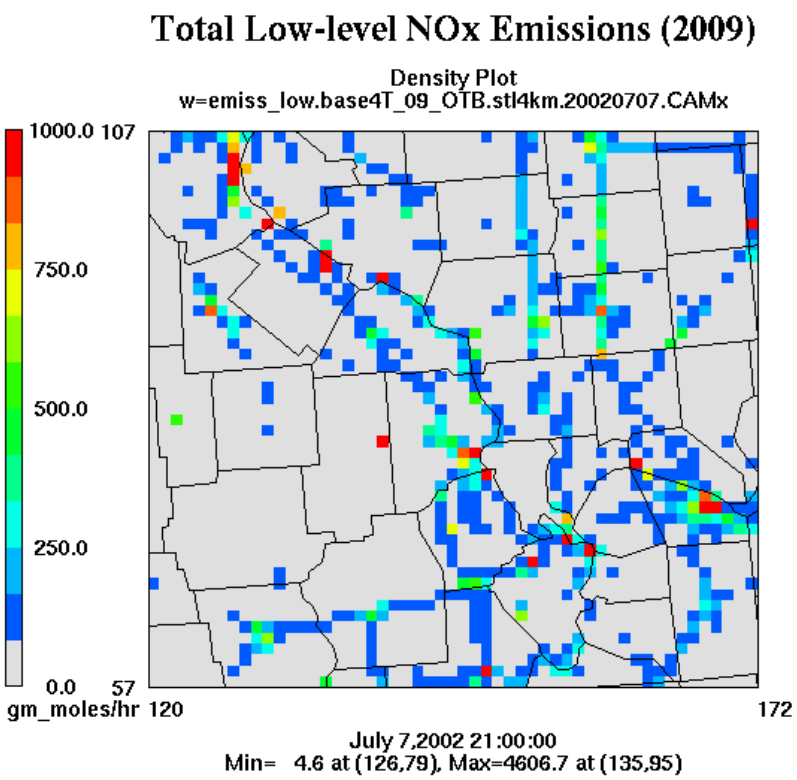
VOC Emissions in tons per day

- 0 - 0.1
- 0.2 - 0.5
- 0.6 - 2
- 2.1 - 6
- > 6

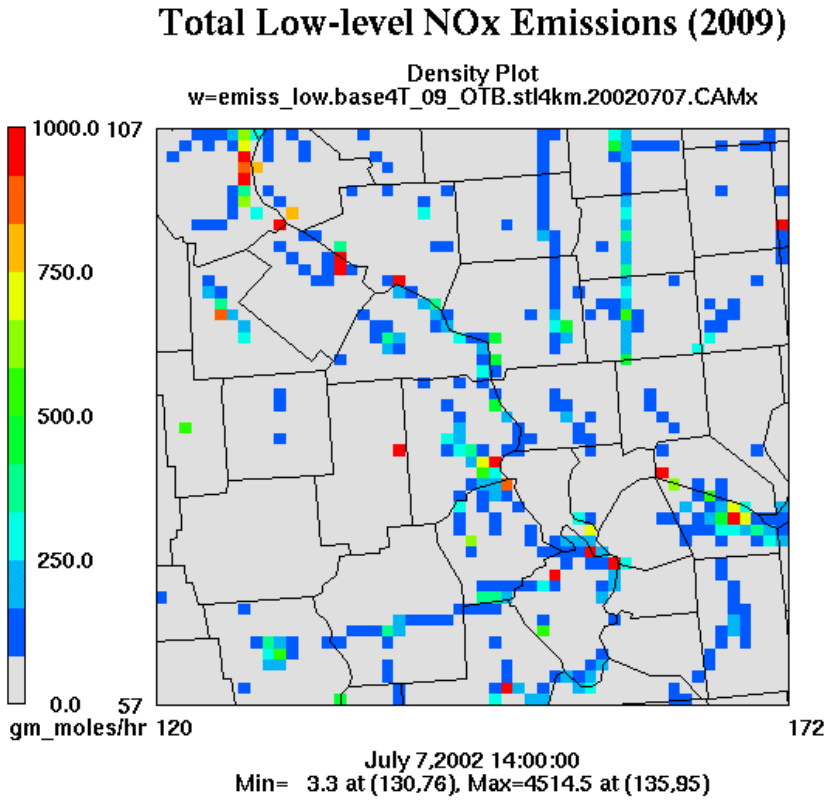


Missouri Department of Natural Resources
Division of Environmental Quality
Air Pollution Control Program
Prepared by Bern Johnson 10 SEP 08

Figure SE7 – NOx Emission Density

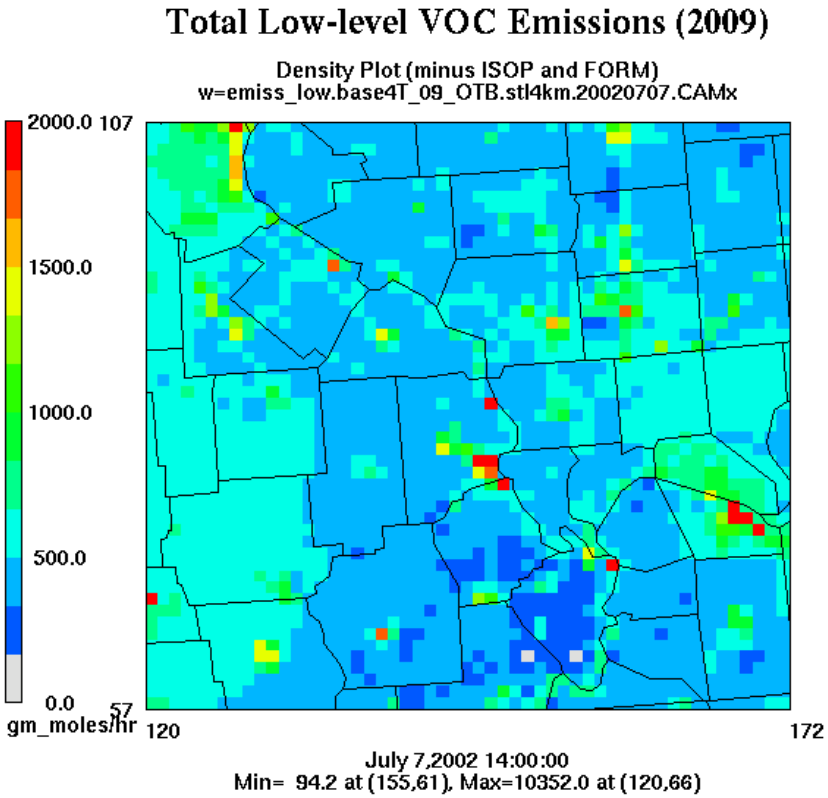


July 7, 2002 – 8 AM

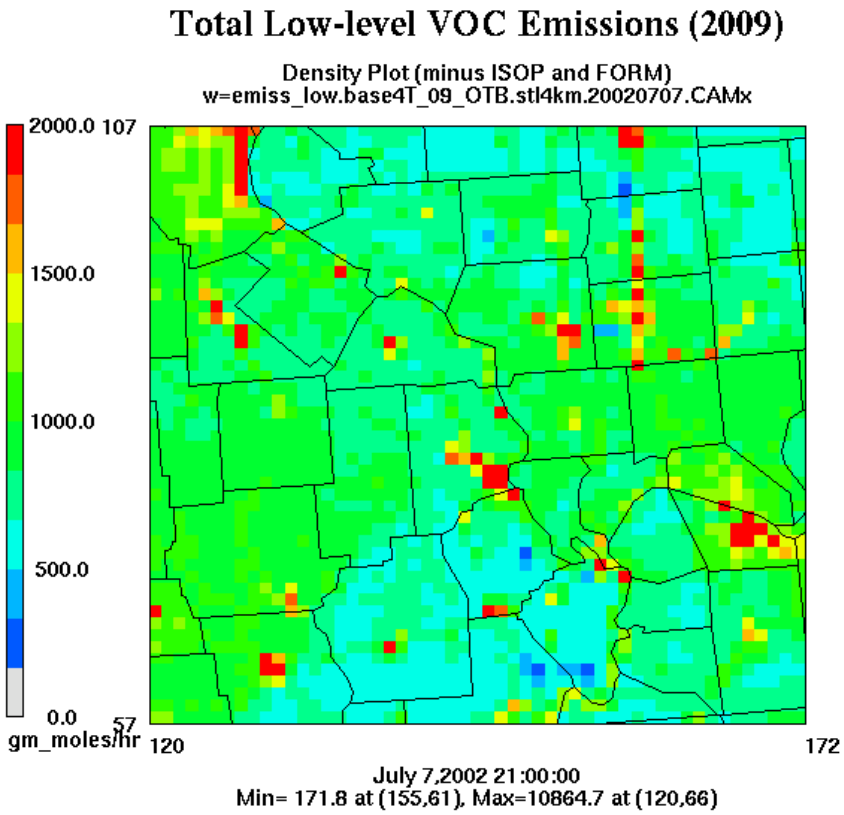


July 7, 2002 – 3 PM

Figure SE8 – VOC Emission Density



July 7, 2002 – 8 AM



July 7, 2002 – 3 PM

TABLE SE3

	2009 Total VOC (TPD)	2009 Total Nox (TPD)	2000 Population	2007 Population	2006 Employment	2009 Million VMT per year	MSA VOC %	MSA NOx %	Pop. Growth 2000-07	Employment % MSA
CAPE GIRARDEAU	8.980	16.830	68,693	72,740	39,476	820.5	58.7%	62.6%	5.9%	93.4%
BOLLINGER	1.804	4.200	12,029	12,118	1,451	141.4	11.8%	15.6%	0.7%	3.4%
ALEXANDER (IL)	4.524	5.857	9,590	8,458	1,357	135.4	29.6%	21.8%	-11.8%	3.2%
MSA TOTAL	15.308	26.888	90,312	93,316	42,284	1097.3	100.0%	100.0%	3.3%	100.0%
Perry	4.557	6.392	18,132	18,794	8,530	365.8	29.8%	23.8%	3.7%	20.2%
Scott	6.614	14.180	40,422	40,735	16,616	574.3	43.2%	52.7%	0.8%	39.3%
Ste. Genevieve	5.791	30.157	17,842	17,841	5,428	412.6	37.8%	112.2%	0.0%	12.8%
St.Francois	5.530	5.113	55,641	62,810	20,411	587.3	36.1%	19.0%	12.9%	48.3%
Randolph (IL)	5.745	21.702	33,893	32,760	10,778	300.3	37.5%	80.7%	-3.3%	25.5%
Jackson (IL)	8.939	6.984	59,612	58,841	17,943	533.6	58.4%	26.0%	-1.3%	42.4%
Union (IL)	2.782	4.374	18,293	18,257	3,725	257.2	18.2%	16.3%	-0.2%	8.8%

TABLE SE4

County	2000	2010	2020	2030	00-10 Growth %	00-20 Growth %
CAPE GIRARDEAU	68,693	74,106	79,916	84,612	7.9%	16.3%
BOLLINGER	12,029	12,260	12,555	12,805	1.9%	4.4%
Perry	18,132	18,948	20,100	21,164	4.5%	10.9%
Scott	40,422	40,646	40,948	41,076	0.6%	1.3%
St. Francois	55,641	64,538	69,815	73,382	16.0%	25.5%
Ste. Genevieve	17,842	17,899	18,161	18,426	0.3%	1.8%
ALEXANDER	9,590	9,501	9,933	10,464	-0.9%	3.6%
Jackson	59,710	61,574	63,719	63,825	3.1%	6.7%
Union	18,326	18,809	20,454	21,617	2.6%	11.6%
Randolph	33,951	34,432	35,743	37,004	1.4%	5.3%

Table SE5 Place of Residence/Employment Matrix (Work

Missouri Residence		Employment (MO)						Missouri Total	All Residents Working in MO
		Bollinger	Cape Giradeau	Perry	Ste. Genevieve	St. Francois	Scott		
	Bollinger	1,150	1,042	304	17	55	90	2,658	3,669
	Cape Giradeau	271	22,354	924	63	334	1,513	25,459	32,745
	Perry	27	742	5,109	339	135	47	6,399	7,585
	Ste. Genevieve	5	142	569	4,217	880	1	5,814	8,904
	St. Francois	23	270	209	289	14,215	53	15,059	25,218
	Scott	26	4,054	113	26	27	7,857	12,103	17,567
	Missouri CG MSA	**1,421**	**23,396**	**1,228**	**80**	**389**	**1,603**	**28,117**	
	Missouri Total	1,502	28,604	7,228	4,951	15,646	9,561	34,516	
Illinois Residence									All Residents Working in MO
	Alexander	3	418	23	2	9	60	515	709
	Jackson	3	56	90	3	8	5	165	297
	Union	0	268	33	2	4	18	325	443
	Randolph	0	50	641	62	14	5	772	1,715
	Illinois CG MSA	**3**	**418**	**23**	**2**	**9**	**60**	**515**	
	Illinois Total	6	792	787	69	35	88	1,777	
	Total CG MSA	1,424	23,814	1,251	82	398	1,663	28,632	
	Grand Total	1,508	29,396	8,015	5,020	15,681	9,649	36,293	
	Connect Total	1,895	37,165	9,166	5,863	23,029	14,532		

Missouri Residence		Employment (IL)				Illinois Total	All Residents Working in IL	Grand Total	All Residents Working in MO&IL
		Alexander	Jackson	Union	Randolph				
	Bollinger	0	0	0	3	3	21	2,661	3,690
	Cape Giradeau	81	26	65	28	200	433	25,659	33,178
	Perry	1	3	3	103	110	200	6,509	7,785
	Ste. Genevieve	1	1	2	11	15	121	5,829	9,025
	St. Francois	0	0	0	1	1	135	15,060	25,353
	Scott	18	2	2	5	27	103	12,130	17,670
	Missouri CG MSA	**81**	**26**	**65**	**31**	**203**		**28,320**	
	Missouri Total	101	32	72	151	356		67,848	
Illinois Residence							All Residents Working in IL		
	Alexander	696	17	162	23	898	1,354	1,413	2,063
	Jackson	89	11,910	505	662	13,166	20,501	13,331	20,798
	Union	185	934	2,963	137	4,219	6,242	4,544	6,685
	Randolph	35	320	53	7,252	7,660	12,359	8,432	14,074
	Illinois CG MSA	**696**	**17**	**162**	**23**	**898**		**1,413**	
	Illinois Total	1,005	13,181	3,683	8,074	25,943		19,288	
	Total CG MSA	777	43	227	54	1,101		29,733	
	Grand Total	1,106	13,213	3,755	8,225	26,299		87,136	140,321
	Connect Total	1,944	24,794	5,720	12,936				

Missouri Residence		% Work in CG MSA	% Work in County	Working in MSA Living in County	Living in MSA Working in County	Working in STL MSA Living in County	Living in STL MSA Working in County
	Bollinger	59.40%	31.17%	2,192	1,424		
	Cape Giradeau	68.44%	67.38%	22,706	23,814		
	Perry	9.89%	65.63%	770	1,251	750	482
	Ste. Genevieve	1.64%	46.73%	148	82	2,595	389
	St. Francois	1.16%	56.07%	293	398	7,028	3,145
	Scott	23.19%	44.47%	4,098			
	Missouri CG MSA						
	Missouri Total						
Illinois Residence							
	Alexander	54.14%	33.74%	1,117	777		
	Jackson	0.71%	57.27%	148	43		
	Union	6.78%	44.32%	453	227		
	Randolph	0.60%	51.53%	85	54	3,345	1,550
	Illinois CG MSA						
	Illinois Total						
	Total CG MSA						
	Grand Total	18.54%					
	Connect Total						

Missouri Department of Natural Resources

KANSAS CITY AREA

CURRENT AIR QUALITY

The current and recent past air quality information for 8-hour ozone in the Kansas City area is shown below in Tables KC1 and KC2. Table KC1 contains the 4th highest concentration and Table KC2 contains the design value for each monitor/year pair. The design value for each monitor is the metric used to determine compliance with the standard. The design value is calculated by averaging the 4th highest 8-hour ozone concentration at each monitor over a three-year period. For example, a monitor has the following 4th highest values in 2005-07: 80 parts per billion (ppb), 81 ppb, and 83 ppb. The average of those three concentrations would be 81.3 ppb. The design value for 2005-07 would be 81 ppb, because the average is truncated. Figure KC1 denotes the locations of the monitors within the Kansas City ozone network.

TABLE KC1

Monitor	2000	2001	2002	2003	2004	2005	2006	2007	2008
Liberty	91	79	87	88	71	88	93	81	66
Watkins Mill	84	73	83	85	67	79	91	73	66
KCI	90	79	85	77	70	86			
RG South	84	72	83	82	61	81	78	72	66
Rocky Creek			91	88	69	87	87	89	69
Trimble					71	87	85	83	70
Wyandotte Co. (KS)	87	76	80	84	63	79	81	73	63
U.S. Penitentiary (KS)				82	67	77	74	80	64
Heritage Park (KS)				81	66	81	76	71	62
Mine Creek (KS)	81	76	72	79	65	75	79	70	63

TABLE KC2

Monitor	00-02 Avg	01-03 Avg.	02-04 Avg	03-05 Avg	04-06 Avg	05-07 Avg	06-08 Avg
Liberty	85	84	82	82	84	87	80
Watkins Mill	80	80	78	77	79	81	76
KCI	84	80	77	77			
RG South	79	79	75	74	73	77	72
Rocky Creek			82	81	81	87	81
Trimble					81	85	79
Wyandotte Co. (KS)	81	80	75	75	74	77	72
U.S. Penitentiary (KS)				75	72	77	72
Heritage Park (KS)				76	74	76	69
Mine Creek (KS)	76	75	72	73	73	74	70

The 2008 fourth high information has not been validated at this time, but these data and the corresponding 2006-08 design value information is provided for completeness. For the Missouri sites, the 2006-08 data potentially changes only the Richards-Gebaur South site's attainment status. The remaining sites continue to monitor violations of the standard. All the Kansas monitoring sites in the Kansas City network are in compliance with the 2008 ozone standard using the 2006-08 monitoring data. The overall recommendation presented here did not change based on the attainment status of this monitor, but it does change the finding with respect to the Cass County's combined rationale for inclusion.

The Springfield/Joplin, Missouri, the Wichita, Kansas, and the Tulsa, Oklahoma, areas are potential upwind metropolitan areas for Kansas City. The Springfield area has the following design values: 77 ppb for the 2005-07 monitoring period and 73 ppb for the 2006-08 monitoring period. No monitoring data exists for Joplin, Missouri at this time, but the 2007 ozone network design for Missouri includes a monitor north of Joplin. The Wichita, Kansas, design value was 76 ppb for 2005-07. For Tulsa, the 2004-06 design value was 79 ppb and the 2005-07 design value was 80 ppb.

As noted previously, the appropriate quality assurance measures are not complete for the 2006-08 dataset at this time. Therefore, the design value may still change and the recommendation could be modified to reflect any change in design values necessary.

KANSAS CITY AREA EMISSION, POPULATION, AND TRAFFIC/COMMUTER INFORMATION

Table KC3 illustrates the precursor emissions and population data for the counties in the Kansas City area. Jackson County has the largest amount of anthropogenic emissions (with over one-third of the emissions) for VOC (35%) and NOx (36%) in the current Kansas City maintenance area. Johnson County (KS) has the second highest emission totals with 29% of the VOC emissions and 22% of the NOx emissions in the maintenance area. The next highest VOC emission totals are from Clay (15%) and Wyandotte – KS (14%) Counties. The next highest NOx emissions totals are Wyandotte – KS (17%), Platte (17%), Linn – KS (16%), and Douglas – KS (12%). All these counties are part of the maintenance area, except Linn and Douglas Counties in Kansas. Linn is part of the Kansas City metropolitan statistical area (MSA), while Douglas is the only county in the Lawrence, Kansas MSA.

The population data for the area illustrates that the core Kansas City metropolitan complex has the vast majority of the population in the area. Jackson County is the most populous county with over 650,000 people followed by Johnson – KS (526,319), Clay (211,952), and Wyandotte – KS (153,956). Population growth rates over 15 percent between 2000 and 2007 were projected for Clay, Platte, Cass, and Johnson (KS). Figure KC2 provides population density for the area. The Kansas City core population center contains nearly all of Jackson and Wyandotte (KS) Counties, Southwestern Clay County, extreme southeastern Platte County, eastern Johnson (KS) County, and northern Cass

County. Several counties outside the core metropolitan complex have some areas of higher population density. These include Douglas – KS (Lawrence MSA), Buchanon (St. Joseph MSA), and Leavenworth (KS) Counties. Figure KC3 provides the urbanized area information for the region. This figure illustrates a very similar outcome as Figure KC2 including St. Joseph and Lawrence, Kansas as more urbanized than the surrounding communities..

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. These data illustrate a consistent pattern of higher VMT in the urbanized areas in Kansas City with substantial traffic on the Interstate highways. The highest annual VMT for the Kansas City area are found in Jackson County with 5.9 billion VMT/year and Johnson (KS) County with 5.2 billion VMT/year. The following counties also have annual VMT over 1 billion/year: Clay (2.3 billion/year) Wyandotte – KS (1.9 billion/year), Platte (1.4 billion/year), and Cass (1.1 billion/year).

Figure KC4 includes traffic count information from the Missouri Department of Transportation (MoDOT) and Kansas Department of Transportation (KDOT) for 2007. This figure illustrates the highest volume of traffic on the Interstates (29, 35, 70, 435, 470) along with considerable traffic on Highway 50 (going east into Jackson County and west into Johnson County on a daily basis.

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 KC5 and KC6 contain point source emission locations for NOx and VOC, respectively. As expected, the largest numbers of point sources are located in the Kansas City core area (Jackson, Clay, Wyandotte). The two largest NOx sources in the region are power plants (one in Linn County (KS) and the other in northern Platte County). The second set presented in Figures KC7 and KC8 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 KC7 presents the NOx information for the area and Figure KC8 presents the VOC information for the area. These two figures also show the highest emission density in the Kansas City metropolitan complex (Johnson – KS and Jackson/Clay/Wyandotte (KS) boundary area) as well as in the St. Joseph and Lawrence metropolitan areas.

The Kansas City 8-hour maintenance area (Platte, Clay, and Jackson Counties in Missouri) has specific fuel requirements for control of VOC emissions. The applicable state regulations require 7.0 Reid Vapor Pressure (RVP) gasoline (10 CSR 10-2.330). There are several other point and area source regulations in place in the Missouri portion of the maintenance area:

1) aerospace manufacturing/rework 10 CSR 10-2.205,
2) solvent metal cleaning 10 CSR 10-2.210,
3) solvent cleanup operations 10 CSR 10-2.215,
4) liquified cutback asphalt 10 CSR 10-2.220,

5) industrial surface coating 10 CSR 10-2.230,
6) petroleum storage/transfer (Stage I) 10 CSR 10-2.260,
7) rotogravure/flexographic printing 10 CSR 10-2.290,
8) manufacturing of paint, laquer, varnish, enamels 10 CSR 10-2.300,
9) application of automotive underbody deadeners 10 CSR 10-2.310,
10) pesticide and herbicide production 10 CSR 10-2.320,
11) lithographic printing 10 CSR 10-2.340,
12) bakery ovens 10 CSR 10-2.360.

Further, the statewide utility NOx rule (10 CSR 10-6.350) requires the large power plants in this area to control NOx emissions to a level of 0.35 pounds per million British thermal units (lb/MMBTU) or 0.68 lb/MMBTU for cyclone units firing tire-derived fuel. Also, the Clean Air Interstate Rule (CAIR) will require a sizable NOx reduction in these utility sources by 2010.

METEOROLOGICAL IMPACTS IN KANSAS CITY

When evaluating all the meteorological information for the Kansas City areas, the trajectory analysis, the regime analysis, and the windroses), the metropolitan Kansas City area demonstrates the strongest likelihood of contribution to the nearly all 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 contributing to ozone exceedances 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 (southerly components to flow direction are predominant). Stagnation conditions are especially evident when ozone exceedances occur in the areas near downtown Kansas City at the Wyandotte County monitoring site. Many of the sites in the southern or western portion of the network exhibit two different transport characteristics; one from the Kansas City area and the other with more southerly contribution. The trajectory analysis for the monitors to the north of the metropolitan complex (Trimble, Rocky Creek, Leavenworth (KS), and Watkins Mill) illustrate that the Kansas City area has the most frequent upwind status for each monitor. It should be noted that when evaluating the trajectory analysis, the Lawrence (KS) monitoring site has the clearest signal of both the southerly and Kansas City wind flows.

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 (using data from KCI Airport) during the months with ozone exceedances (April – September) provide that, by far, 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).

One other analysis was conducted to evaluate the number of 8-hour ozone exceedances within the last 5 years. In the Meteorological Analysis document, Table 12 illustrates the number of exceedances at every monitor. The monitoring network in Kansas City covers much of the downwind (northerly) urban/suburban areas and provides some near-field upwind sites at Richards-Gebaur South and Olathe and far downfield monitors like Trimble. Between 2003 and 2007, the Rocky Creek monitor (due north of the core emission area) has the highest number of 8-hour exceedances in the network (79). The Liberty monitor (north-northwest of the core emission area) has the second largest number of exceedances at 70. No other sites in the network had more than 50 exceedances (but the Trimble monitor has 48 exceedances from 2004-07. The upwind sites had a large number of exceedances as well (Richards Gebaur South – 25 and Olathe – 24). Overall, based on the analysis conducted by the department, the Kansas City area is potentially impacted by source regions to the south (possibly Tulsa or Oklahoma City) along with local impacts from emission sources within the region.

URBANIZATION AND OTHER INFORMATION REQUESTED IN THE EPA GUIDANCE

There are two different MSA boundaries in Missouri that are of interest to the designation process: Kansas City and St. Joseph. In addition, the Kansas City maintenance area boundary is also important for recommendation development. These boundaries are shown with the monitoring site information in Figure KC1. As seen in Table KC4, there is population growth from 2000-2020 above 30% for the following counties in the Kansas City area: Johnson – KS (55% growth), Cass (48% growth), Clay (42% growth), Platte (39% growth), Douglas – KS (38% growth), Miami – KS (33%) and Clinton (31% growth). The particular areas of interest with respect to growth are Johnson County (KS) with over 700,000 projected in 2020, Clay County with over 250,000 projected in 2020, and Cass County with over 120,000 people projected in 2020. It should be noted that Wyandotte (KS) and Lafayette Counties have a flat or decreasing population between 2000 and 2020 based on these projections.

Employment data were also incorporated into Table KC3. This data can provide a better understanding about counties outside the MSA that still have large industrial/commercial activity. This trend can be found in the Lawrence (KS) and St. Joseph areas in the Kansas City region. It should be noted that Jackson and Johnson (KS) Counties has 77% of the employment in the current Kansas City maintenance area.

There are significant geographic or topographic features that impact ozone concentrations in the Kansas City area.

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 Kansas' nearly 1 million individual block group level data points to summarize the

commuter relationships between counties in each region of interest. This data is summarized in Table KC5 and provides a matrix of residence versus employment location. Several important pieces of information can be gained from review of this data.

1) The vast majority of employed people who live in the Kansas City maintenance area work in the area (all counties - 85% or higher).
2) There is some interconnection between the Kansas City maintenance area and the Lawrence and St. Joseph MSAs.
3) Cass, Buchanon, Lafayette, Ray, Leavenworth (KS), Miami (KS), and Douglas (KS) are the most connected to the Kansas City maintenance area for counties outside the area (all over 5,000 residents working in the Kansas City maintenance area).

SUMMARY

Based on the first test for designation (the monitored violation test) using the 2005-07 design values; Clay, Johnson (KS), and Wyandotte (KS) violate the standard in the current nonattainment area and should be designated nonattainment. Further, the Richards Gebaur South monitor in Cass County, the Trimble monitor in Clinton County, and the US Penitentiary monitor in Leavenworth 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. However, the final 2006-08 monitoring data may change the required designation for Kansas. Since the monitored concentrations in 2008 have been less than in previous years, some or all of the monitors in Kansas may attain the standard based on 2006-08 monitored data. In Missouri, using the most current 2008 data, only one site could change from a monitored violation to attainment status (the Richards Gebaur site).

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 KC6

County	Maint. Area/ MSA	2009 VOC Total % (TPD)	2009 NOx Total % (TPD)	2007 Pop. % (1000)	Total Non-Met Summary
Jackson	Yes/Yes	35.3 (59.4)	35.6 (92.1)	40.6 (667)	111.5
Johnson (KS)	Yes/Yes	29.1 (49.0)	21.5 (55.5)	32.0 (526)	82.6
Wyandotte (KS)	Yes/Yes	14.2 (23.9)	17.1 (44.1)	9.4 (154)	40.6
Clay	Yes/Yes	14.7 (24.8)	9.2 (23.6)	12.9 (212)	36.8
Platte	Yes/Yes	6.7 (11.3)	16.6 (43.0)	5.2 (85)	28.5
Douglas (KS)	No/No	6.6 (11.2)	11.7 (30.3)	6.9 (113)	25.3
Linn (KS)	No/Yes	2.1 (3.5)	16.2 (41.9)	0.6 (10)	18.9
Buchanan	No/No	6.2 (10.4)	5.8 (15.0)	5.3 (86)	17.2
Henry	No/No	4.9 (8.3)	9.3 (24.1)	1.4 (22)	15.6
Cass	No/Yes	5.3 (8.9)	3.6 (9.4)	5.9 (97)	14.8

Leavenworth (KS)	No/Yes	3.8 (6.5)	2.6 (6.8)	4.5 (74)	11.0
Miami (KS)	No/Yes	2.7 (4.5)	4.9 (12.7)	1.9 (31)	9.5
Johnson	No/Yes	3.4 (5.8)	2.4 (6.2)	3.2 (52)	9.0
Lafayette	No/Yes	3.7 (6.2)	3.2 (8.4)	2.0 (33)	8.9
Franklin (KS)	No/Yes	2.7 (4.5)	2.7 (7.1)	1.6 (26)	7.0
Ray	No/Yes	1.8 (3.1)	1.7 (4.5)	1.4 (23)	5.0
Bates	No/Yes	2.1 (3.5)	1.5 (4.0)	1.0 (17)	4.7
Jefferson (KS)	No/No	2.0 (3.4)	1.5 (3.8)	1.1 (18)	4.6
Clinton	No/Yes	1.9 (3.2)	1.2 (3.2)	1.3 (21)	4.4
Andrew	No/No	1.8 (3.0)	1.5 (3.8)	1.0 (17)	4.3
Atchison (KS)	No/No	1.4 (2.3)	1.3 (3.3)	1.0 (17)	3.7
Anderson (KS)	No/No	1.2 (2.0)	1.4 (3.6)	0.5 (8)	3.1
De Kalb	No/No	1.2 (2.1)	0.9 (2.3)	0.7 (12)	2.9
Caldwell	No/Yes	0.8 (1.3)	0.9 (2.3)	0.6 (9)	2.2

Percentages in Table KC6 are based on Kansas City maintenance 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 Kansas City Region, the following Missouri counties will receive no additional evaluation due to lack of contribution: Andrew, De Kalb, and Caldwell.

Further, based on the findings of this analysis, Clinton County does not have sufficient ozone precursor emissions to be found to contribute to the ozone problem in Clinton County. Therefore, the recommendation for Clinton County is a nonattainment designation as a monitored violation area and not as a contributory area to monitors in violation of the standard.

The meteorology of ozone formation in the Kansas City Region should be considered into this summary, in at least a qualitative fashion. As discussed previously, the predominant wind components that lead to elevated ozone concentrations in the Kansas City area are strong southerly components for the maximum design value sites.

The three in the Missouri portion of the current maintenance area (Jackson, Clay and Platte) 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 Johnson and Wyandotte in Kansas of the Kansas City area. Therefore, these Missouri counties have all been recommended for inclusion in the Kansas City nonattainment area due to either monitored violations or their contribution to monitored violations in the Kansas City area.

Buchanan County, also, contains a very high level of VOC (10 TPD) and NOx (15 TPD) emissions. The population growth rate for Buchanan County is low compared to the counties in the Kansas City area. However, since Buchanan County is the center of St.

Joseph MSA, the population and employment data are sizable. Buchanan County is somewhat urbanized with the St. Joseph area having a higher population density, or some connection to the Kansas City metropolitan area. Nonetheless, this county is downwind for a large majority of ozone exceedance days around Kansas City. Also, there is one source in Buchanan County that is part of the statewide NOx rule (10-6.350) to control utility NOx and is included in the CAIR control package. Further, there is no ozone monitoring in the St. Joseph area, but the most recent ozone network review has recommended a site downwind of the St. Joseph area to provide a clearer picture of ozone concentrations in the area. This site will begin operation for the 2009 ozone season.

Henry County sources emit a very high level of NOx emissions (24 TPD). The VOC emissions for this county are (8.3 TPD). The population growth rate and population for Henry County are low compared to other counties in the area. Henry County is rural and has only a small component of high population density around the town of Clinton. The traffic patterns/connectivity data exhibit limited connection to the Kansas City area and the traffic count data does not illustrate any large VMT traveling back to Kansas City. The largest NOx source in Henry County is a power plant that is included in the statewide utility NOx regulation and will be included for control in the Clean Air Interstate Rule. Henry County is also somewhat distant from the metropolitan core and not contiguous with the current maintenance area for Kansas City.

Cass County sources emit a sizable amount of NOx and VOC emissions (9 TPD for both). The population growth rate and population for Cass County are substantial and are considerably greater than the more rural counties surrounding it to the west, south, and east. The population density and urbanization figures illustrate a contiguous urbanized area from the core metropolitan complex that extends into northern Cass County. The ozone monitor (Richard Gebaur South) had a design value of 77 parts per billion in 2005-07 and a design value of 72 ppb using current data for 2006-08. The commuter data for Cass County provides a strong connection between the county and the remainder of the Kansas City metropolitan area (largest connection of any “outside” county). Further, this county is south of the Kansas City metropolitan complex and is characterized as upwind for many of the remaining sites in the area.

Johnson County sources emit NOx and VOC emissions at a rate of 6 TPD for both. The population growth rate and population for Johnson are moderately high (50,000 population and 20% growth by 2020). Johnson County is part of the Kansas City MSA, but the population density and urbanization figures illustrate a less urbanized area with some higher population density along US Highway 50. The commuter data for Johnson County provides some connection between the county and the remainder of the Kansas City metropolitan area (4,530 residents working in the Kansas City maintenance area). Further, this county is east-southeast of the Kansas City metropolitan complex and can characterized as upwind on some days with elevated ozone concentrations, but would not be in the predominant wind direction for upwind contribution.

Lafayette County sources emit ozone precursor emissions at a rate of 6 TPD for VOC and 8 TPD for NOx. The population growth rate and population for Lafayette are both

relatively low (30,000 population and flat growth by 2020). Lafayette is part of the Kansas City MSA, but the population density and urbanization figures illustrate a less urbanized area with some higher population density along Interstate 70. The commuter data for Lafayette County provides a demonstrated connection between the county and the remainder of the Kansas City metropolitan area (over 5,000 residents working in the Kansas City maintenance area). Nonetheless, this county is due east of the Kansas City metropolitan complex and can characterized as upwind on few days with elevated ozone concentrations, but would not be in the predominant wind direction for upwind contribution.

Ray and Bates Counties sources emit less than 10 TPD combined ozone precursor emissions. The population and growth projections for these two counties are low compared with other counties in the area. Both are part of the Kansas City MSA, but only Ray County has a sizable connection to the Kansas City maintenance area (greater than 5,000 people from Ray working in the maintenance area). Ray County is downwind of the area under predominant winds, while Bates County is upwind but since Cass County is in between Bates and the metropolitan area there is considerably more distance to the downwind area.

Clinton County sources emit a low level of emissions for both ozone precursors (3.2 TPD – VOC and 3.2 TPD – NOx). The projected population growth rate for Clinton County is 30 percent, but the overall projected population in 2020 is only 25,000 people. Clinton County has 4,000 residents working in the current Kansas City maintenance area. Clinton County is part of the Kansas City MSA and does receive the majority of ozone impacts at the Trimble monitor from the upwind Kansas City area. Lincoln County has been recommended for inclusion in the Kansas City nonattainment area based on the evaluation of all the criteria. Its inclusion is primarily due to the facts that it part of the Kansas City MSA and its monitored violation is being impacted predominantly by the current maintenance area. It is important to note that Clinton County has not been found to contribute significantly to other monitors in the area.

To summarize, the following Missouri counties have been recommended for inclusion in the Kansas City 8-hour ozone nonattainment area: Cass, Clay, Clinton, Jackson, and Platte.

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 Kansas City 8-hour ozone nonattainment area. 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 (geography/topography).

Jackson County

1) Largest emissions for both VOC (59.4 TPD) and NOx (92.1 TPD) in the Kansas City area
2) No ozone monitoring in this county
3) Largest population in the area (666,890)
4) Largest annual VMT in the area (5.9 billion VMT/year)
5) Meteorological analysis is supportive of frequent contribution
6) 5% population growth rate predicted between 2000 and 2020
7) Located in the current 8-hour ozone maintenance area
8) Emission reductions have been realized from previous VOC/NOx control requirements

Johnson County (KS)

1) Second largest emission in Kansas City for VOC (49.0 TPD) and NOx (55.5 TPD)
2) Ozone site within the county monitors a violation of the standard in 2005-07, but is in compliance for 2006-08 (Heritage Park design values - 76 ppb for 2005-07 and 69 ppb for 2006-08)
3) Second largest population in the area (526,319)
4) Second largest VMT in the area (5.2 billion VMT/year)
5) Meteorological analysis is supportive of frequent contribution
6) 55% projected population growth rate between 2000 and 2020
7) Located in the current Kansas City maintenance area
8) Emission reductions have been realized from previous VOC/NOx control requirements

Wyandotte County (KS)

1) Third largest emission in Kansas City for NOx (44.1 TPD) and fourth largest for VOC (23.9 TPD)
2) Ozone site within the county monitors a violation of the standard in 2005-07, but is in compliance for 2006-08 (JFK – Wyandotte design values – 77 ppb for 2005-07 and 72 ppb for 2006-08)
3) Fourth largest population in the area (153,956)
4) Fourth largest VMT in the area (1.9 billion VMT/year)
5) Meteorological analysis is supportive of frequent contribution
6) Projected population reduction between 2000 and 2020 (-4%)
7) Located in the current Kansas City ozone maintenance area
8) Emission reductions have been realized from previous VOC/NOx control requirements

Clay County

1) Third largest emission in Kansas City for VOC (24.8 TPD) and NOx emissions of 23.6 TPD
2) All monitors within the county monitor a violation of the standard (highest design value – Liberty and Rocky Creek 87 ppb for 2005-07 and Rocky Creek 81 ppb for 2006-08)
3) Third largest population (211,952)
4) Third largest VMT in the area (2.3 billion/year)
5) Meteorological analysis is supportive of frequent contribution
6) 42% population growth between 2000 and 2020 (over 250,000 in 2020)
7) Located in the current Kansas City ozone maintenance area
8) Emission reductions have been realized from previous VOC/NOx control requirements

Platte County

1) Fourth largest emission in Kansas City for NOx (43.0 TPD) and VOC emissions of 11.3 TPD
2) No ozone monitoring in the county
3) Population over 75,000 (84,881)
4) Fifth largest VMT in the area (1.4 billion/year)
5) Meteorological analysis is somewhat supportive of frequent contribution
6) 39% population growth between 2000 and 2020 (over 100,000 in 2020)
7) Located in the current Kansas City ozone maintenance area
8) Emission reductions have been realized from previous VOC/NOx control requirements

Douglas County (KS)

1) Combined emissions over 40 TPD (VOC – 11.2 TPD and NOx - 30.3 TPD)
2) No current ozone monitoring within the county
3) Population over 100,000 people (113,488)
4) High VMT (1.0 billion VMT/year)
5) Sizable commuter connection to the Kansas City area (nearly 10,000 residents working in the maintenance area)
6) Meteorological analysis is not supportive of frequent contribution (trajectory analysis demonstrated this county as downwind for impacts from Kansas City on some elevated ozone days)
7) 38% projected population growth between 2000 and 2020 (over 130,000 population in 2020)
8) Douglas is the only county in the Lawrence (KS) MSA

Linn County (KS)

1) Combined emissions over 40 TPD (VOC – 3.5 TPD and NOx - 41.9 TPD)
2) Current ozone monitoring in this county shows attainment of the standard (Mine Creek design values of 74 ppb for 2005-07 and 70 ppb for 2006-08)

3) Low population (9,767)
4) Low VMT (134 million VMT/year)
5) Meteorological analysis is supportive of frequent contribution
6) 11% population growth between 2000 and 2020
7) Located in the Kansas City MSA, but not in the maintenance area
8) Single largest source is a power plant with a sizable emission reduction from previous designation analysis, but still county has over 40 TPD of NOx emissions

Buchanan County

1) Combined emissions of nearly 25 TPD (VOC - 10.4 TPD and NOx - 15.0 TPD)
2) No ozone monitoring in county; monitoring recommended to begin north of St. Joseph in 2009
3) Population of more than 75,000 (86,485)
4) Some connection to the Kansas City metropolitan area (6,100 residents working in the maintenance area)
5) Medium VMT (803 million VMT/year)
6) Meteorological analysis shows very limited contribution to all Kansas City monitors
7) 5% projected population growth between 2000 and 2020
8) Buchanan County is the center of the St. Joseph MSA, located adjacent to the Kansas City maintenance area
9) Largest NOx emission source part of the statewide utility NOx rule and CAIR

Henry County

1) Combined emissions over 30 TPD (VOC – 8.3 TPD and NOx – 24.1 TPD)
2) No ozone monitorinig in this county
3) Population of less than 25,000 (22,398)
4) Limited connection to Kansas City metropolitan area (along US-50)
5) Low VMT (411 million VMT/year)
6) Meteorological analysis is supportive of frequent contribution
7) 7% projected population growth between 2000 and 2020
8) Located adjacent to the Kansas City MSA
9) Largest NOx emission source part of the statewide utility NOx rule and CAIR

Cass County

1) Combined emissions over 15 TPD (VOC - 8.9 TPD and NOx – 9.4 TPD)
2) Richards Gebaur South monitor violates the 8-hour ozone standard using 2005-07 (design value – 77 ppb), but demonstrates attainment of standard (design value – 72 ppb) using current 2006-08 data
3) Population of nearly 100,000 (97,133)
4) Largest connection to the Kansas City maintenance area for a county outside the area (24,025 residents work in KC maintenance area)
5) High VMT (1.1 billion VMT/year)

6) Meteorological analysis is supportive of frequent contribution
7) 48% projected population growth between 2000 and 2020 (over 120,000 people in 2020)
8) Located within the Kansas City MSA, and upwind of the current Kansas City ozone maintenance area

Leavenworth County (KS)

1) Combined emissions less than 15 TPD (VOC – 6.5 TPD and NOx - 6.8 TPD)
2) Ozone site within the county monitors a violation of the standard for 2005-07, but is in compliance for 2006-08 (US Penitentiary design values – 77 ppb for 2005-07 and 72 ppb for 2006-08)
3) Population of nearly 75,000 (73,603)
4) Sizable connection to the Kansas City maintenance area (10,085 residents working in KC)
5) Medium VMT (624 million VMT/year)
6) Meteorological analysis shows limited support for frequent contribution
7) 28% projected population growth between 2000 and 2020 (2020 population of 88,000)
8) Located within the Kansas City MSA and adjacent to current Kansas City ozone maintenance area

Miami County (KS)

1) Combined emissions over 15 TPD (VOC – 4.5 TPD and NOx - 12.7 TPD)
2) No ozone monitoring in this county
3) Population of nearly 30,000 (31,078)
4) Some connection to the Kansas City maintenance area (7,649 residents working in KC)
5) Low/Medium VMT (493 million VMT/year)
6) Meteorological analysis shows support for frequent contribution
7) 33% projected population growth between 2000 and 2020 (2020 population of 38,000)
8) Located within the Kansas City MSA and adjacent to current Kansas City ozone maintenance area

Johnson County

1) Combined emissions under 15 TPD (VOC - 5.8 TPD and NOx – 6.2 TPD)
2) No ozone monitoring in this county
3) Population of more than 50,000 (51,928)
4) 4,530 residents work in current Kansas City maintenance area
5) Medium VMT (612 million VMT/year) – along US Highway 50
6) Meteorological analysis shows limited support for contribution
7) 20% projected population growth between 2000 and 2020
8) Located in the Kansas City MSA

Lafayette County

1) Combined emissions under 15 TPD (VOC - 6.2 TPD and NOx – 8.4 TPD)
2) No ozone monitoring in this county
3) Population of less than 50,000 (32,677)
4) 5,367 residents work in current Kansas City maintenance area
5) Medium VMT (759 million VMT/year) – along Interstate 70
6) Meteorological analysis shows limited support for contribution
7) Flat population growth between 2000 and 2020
8) Located in the Kansas City MSA

Franklin and Anderson Counties (KS)

1) Combined emissions under 12 TPD for both (VOC/NOx Franklin - 4.5/7.1 TPD and Anderson 2.0/3.6 TPD)
2) No ozone monitoring in either county
3) Population of less than 30,000 (Franklin – 26,479 and Anderson 7,908)
4) Limited connection to the current Kansas City maintenance area (3,771 residents in Franklin and 518 in Anderson working in the KC area)
5) Low VMT (417 million for Franklin and 107 million VMT/year for Anderson)
6) Meteorological analysis is supportive of frequent contribution
7) Franklin 18% population growth between 2000 and 2020 (nearly 30,000 in 2020); Anderson flat projected population
8) Franklin located in the Kansas City MSA and Anderson located south of and adjacent to Franklin

Ray and Caldwell Counties

1) Combined emissions less than 10 TPD (Ray/Caldwell VOC – 3.1/1.3 TPD and NOx -4.5/2.3 TPD)
2) No ozone monitoring in either county
3) Population of less than 25,000 (Ray 23,482 and Caldwell 9,284)
4) Some connection to the Kansas City maintenance area for Ray and very limited connection to the maintenance area for Caldwell
5) Low VMT (Ray 216 million and Caldwell 177 million VMT/year)
6) Meteorological analysis suggest downwind of the Kansas City area under predominant winds
7) Both counties are projected to grow less than 15% between 2000 and 2020 (2020 population of less than 25,000 for both)
8) Both located in the Kansas City MSA with Ray adjacent to current Kansas City maintenance area

Bates County

1) Combined emissions less than 10 TPD (VOC – 3.5 TPD and NOx – 4.0 TPD)
2) No ozone monitoring in county

3) Population of less than 20,000 (17,034)
4) Limited connection to the Kansas City area
5) Low VMT (338 million VMT/year)
6) Meteorological analysis is somewhat supportive of frequent contribution
7) 9% projected population growth between 2000 and 2020
8) Included in the Kansas City MSA,

Jefferson and Atchison Counties (KS)

1) Combined emissions under 10 TPD (Jefferson/Atchison VOC – 3.4/2.3 TPD and NOx – 3.8/3.3 TPD)
2) No ozone monitoring in counties
3) Population of less than 20,000 for both
4) Limited connection for both counties to the Kansas City area
5) Low VMT (Jefferson 233 million and Atchison 137 million VMT/year)
6) Meteorological analysis illustrates that these counties are downwind of violating monitors in the area
7) Limited population growth between 2000 and 2020 (both counties less than 25,000 people in 2020)
8) Located adjacent to the Kansas City MSA

Clinton County

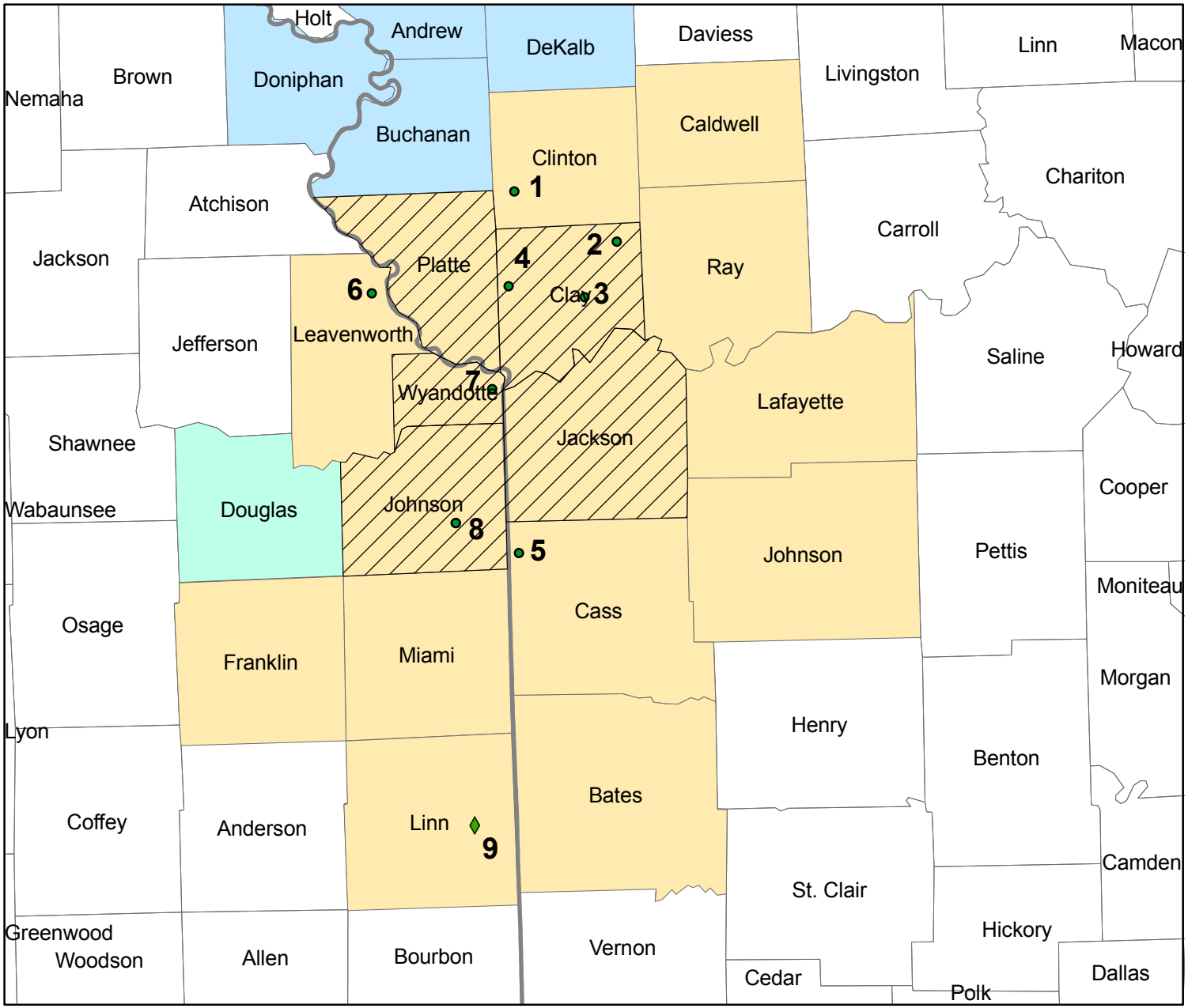
1) Combined emissions under 10 TPD (VOC - 3.2 TPD and NOx – 3.2 TPD)
2) Trimble monitor in violation of the standard (2005-07 design value – 85 ppb; 2006-08 design value – 79 ppb)
3) Population of less than 25,000 (20,894)
4) Moderate connection to the current Kansas City maintenance area (4,156 residents working in KC MA)
5) Low VMT (356 million VMT/year)
6) Meteorological analysis illustrates the Trimble monitor is a recipient of ozone and precursors from the upwind Kansas City area)
7) 31% population growth between 2000 and 2020 (nearly 25,000 in 2020)
8) Located in the Kansas City MSA, adjacent to the Kansas City maintenance area

Andrew and De Kalb Counties

1) Combined emissions less than 10 TPD (both VOC less than 4 TPD and both NOx less than 4 TPD)
2) No ozone monitoring in counties; monitoring recommended to begin north of St. Joseph in 2009
3) Populations of less than 20,000
4) Very limited connection to the Kansas City metropolitan area
5) Low VMT (Both less than 400 million VMT/year)
6) Meteorological analysis suggest downwind of the Kansas City area under predominant winds

7) Both counties are projected to grow less than 12% between 2000 and 2020 (2020 population of less than 20,000 for both)
8) Both counties are located in the St. Joseph MSA and are not adjacent to the Kansas City MSA

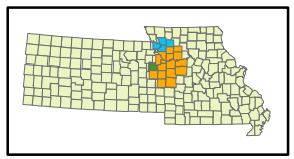
Figure KC1a - 2008 Ozone Sites and 06-08 Design Values



KC Maintenance area
Kansas City MSA
St. Joseph MSA
Lawrence MSA

- Site Name (ppb)
1 - Trimble (79)
2 - Watkins Mill (76)
3 - Liberty (80)
4 - Rocky Creek (79)
5 - RG South (72)
6 - US Penitentiary (72)
7 - JFK Core (72)
8 - Heritage Park (69)
9 - Mine Creek (70)

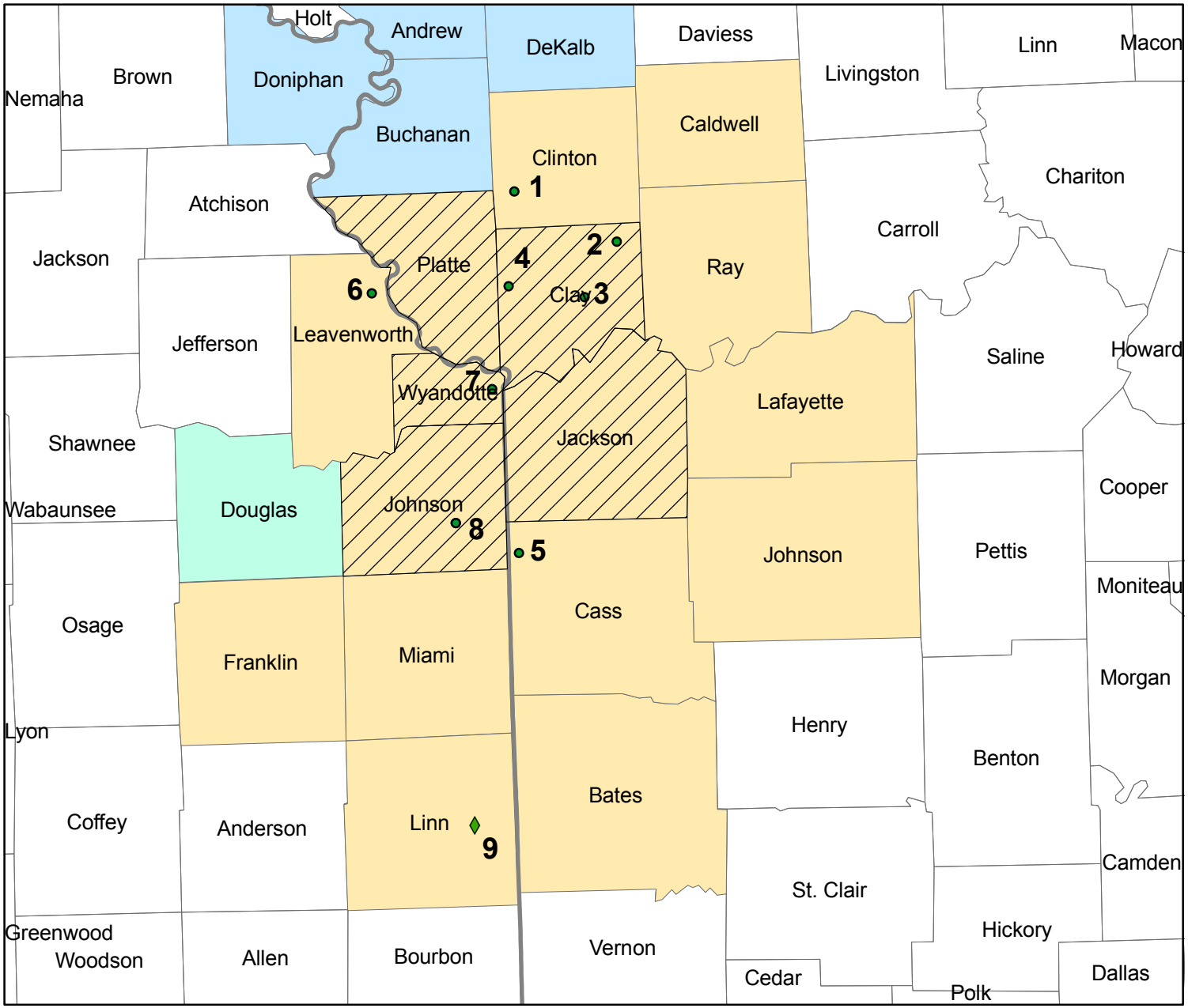
N



Department of Natural Resources
Division of Environmental Quality
Air Pollution Control Program
Prepared by Bern Johnson 18 FEB 09

0 25 50 100 Kilometers

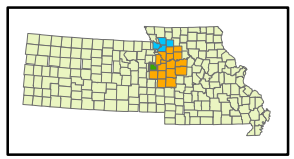
Figure KC1b - 2008 Ozone Sites and 05-07 Design Values



KC Maintenance area
Kansas City MSA
St. Joseph MSA
Lawrence MSA

- Site Name (ppb)
1 - Trimble (85)
2 - Watkins Mill (81)
3 - Liberty (87)
4 - Rocky Creek (87)
5 - RG South (77)
6 - US Penitentiary (77)
7 - JFK Core (77)
8 - Heritage Park (76)
9 - Mine Creek (74)

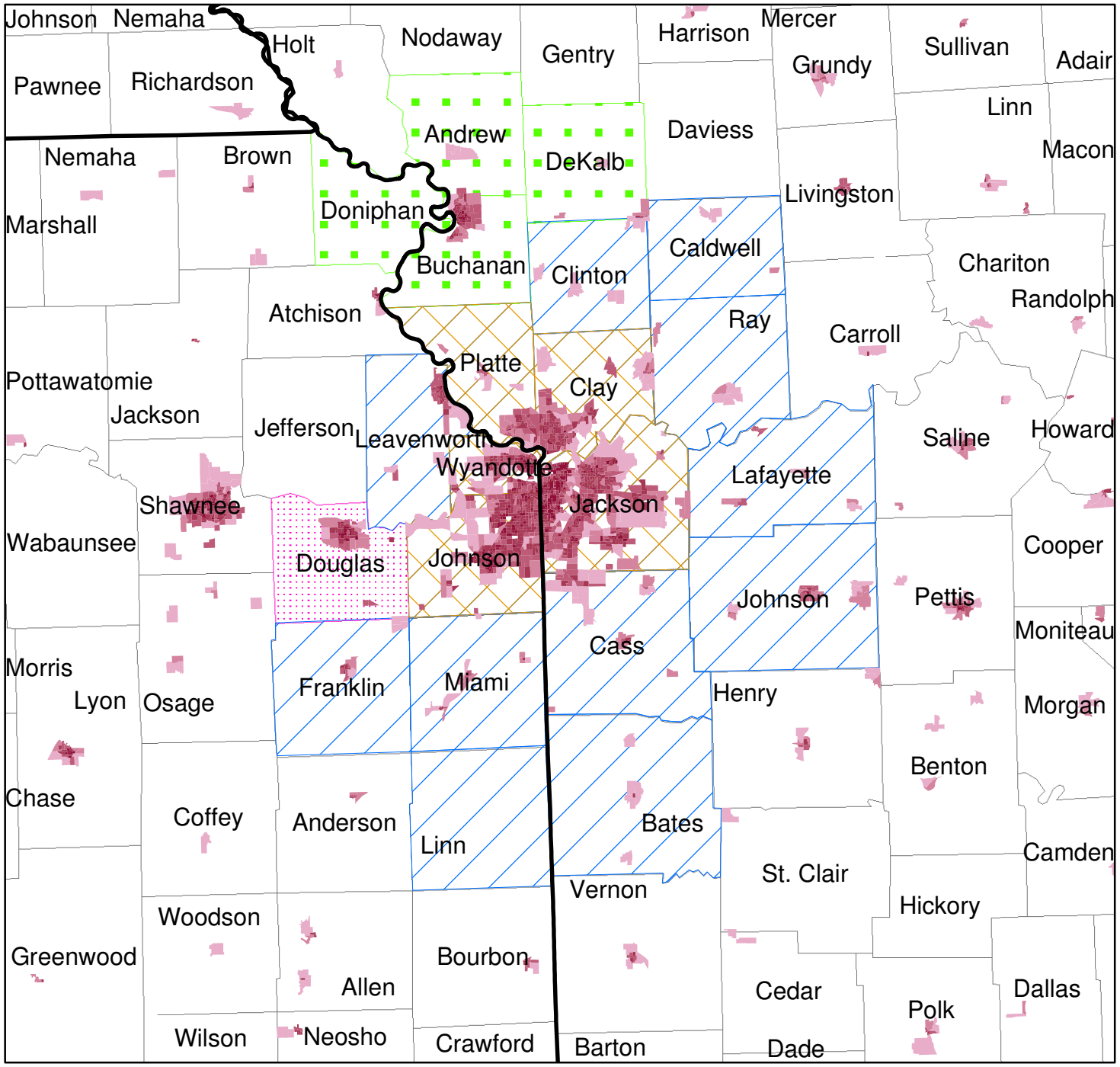
N



Department of Natural Resources
Division of Environmental Quality
Air Pollution Control Program
Prepared by Bern Johnson 18 FEB 09

0 25 50 100 Kilometers

Figure KC2 - Population Density 2000



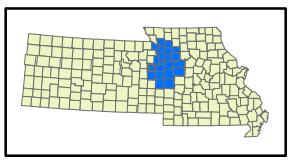
Maintenance area

Kansas City MSA

St. Joseph MSA

Lawrence MSA

0 20 40 80 Kilometers



Population Density

Persons / sq mile

0 - 200

201 - 500

501 - 1000

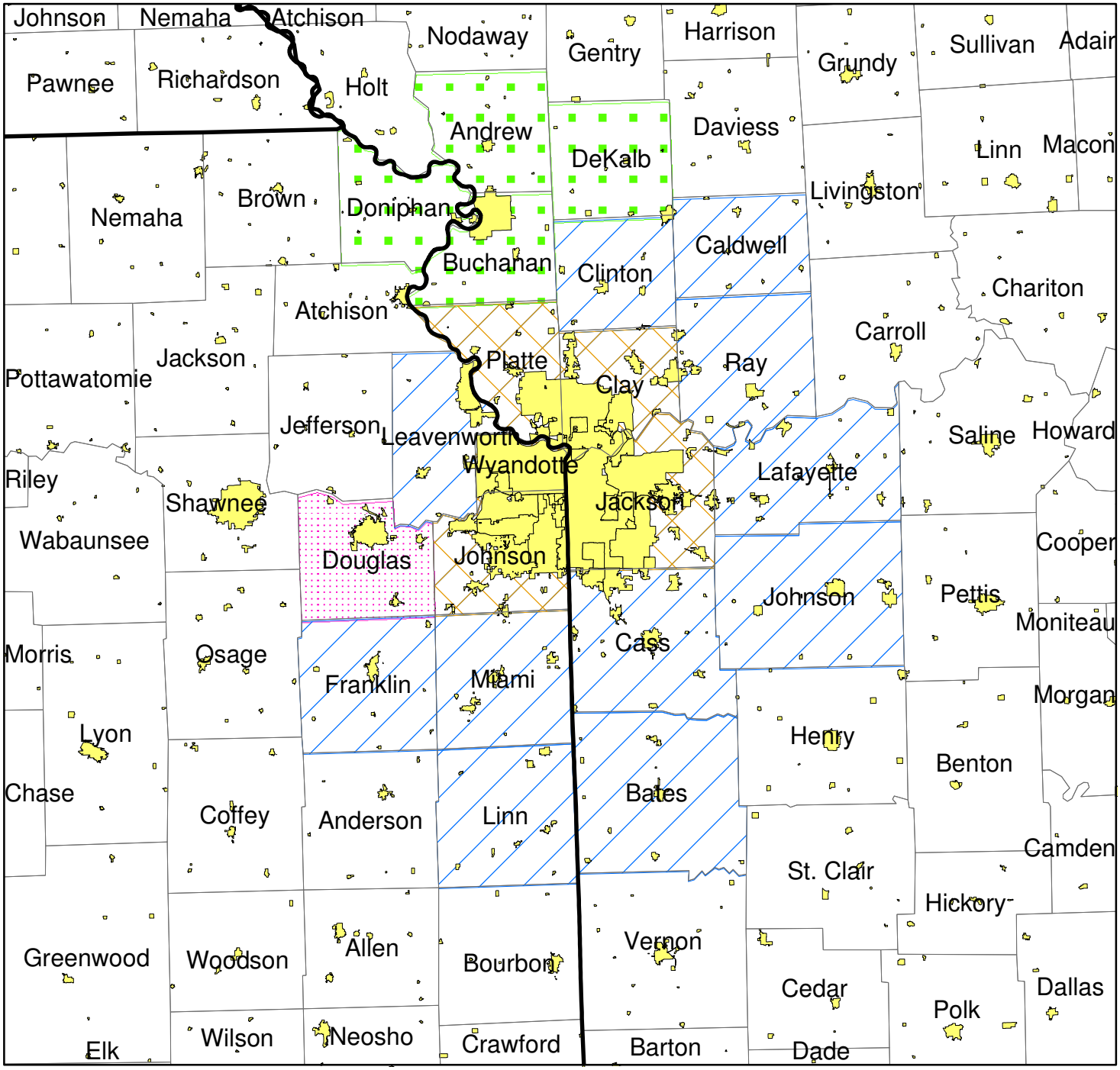
1001 - 2500

2501 - 5000

5001 +

Department of Natural Resources
Division of Environmental Quality
Air Pollution Control Program
Prepared by Bern Johnson 9 JUL 2008

Figure KC3 - Urbanization 2000



0 20 40 80 Kilometers

Urban Areas

Maintenance area

Kansas City MSA

St. Joseph MSA

Lawrence MSA

Department of Natural Resources
Division of Environmental Quality
Air Pollution Control Program
Prepared by Bern Johnson 9 JUL 2008

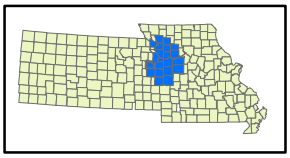
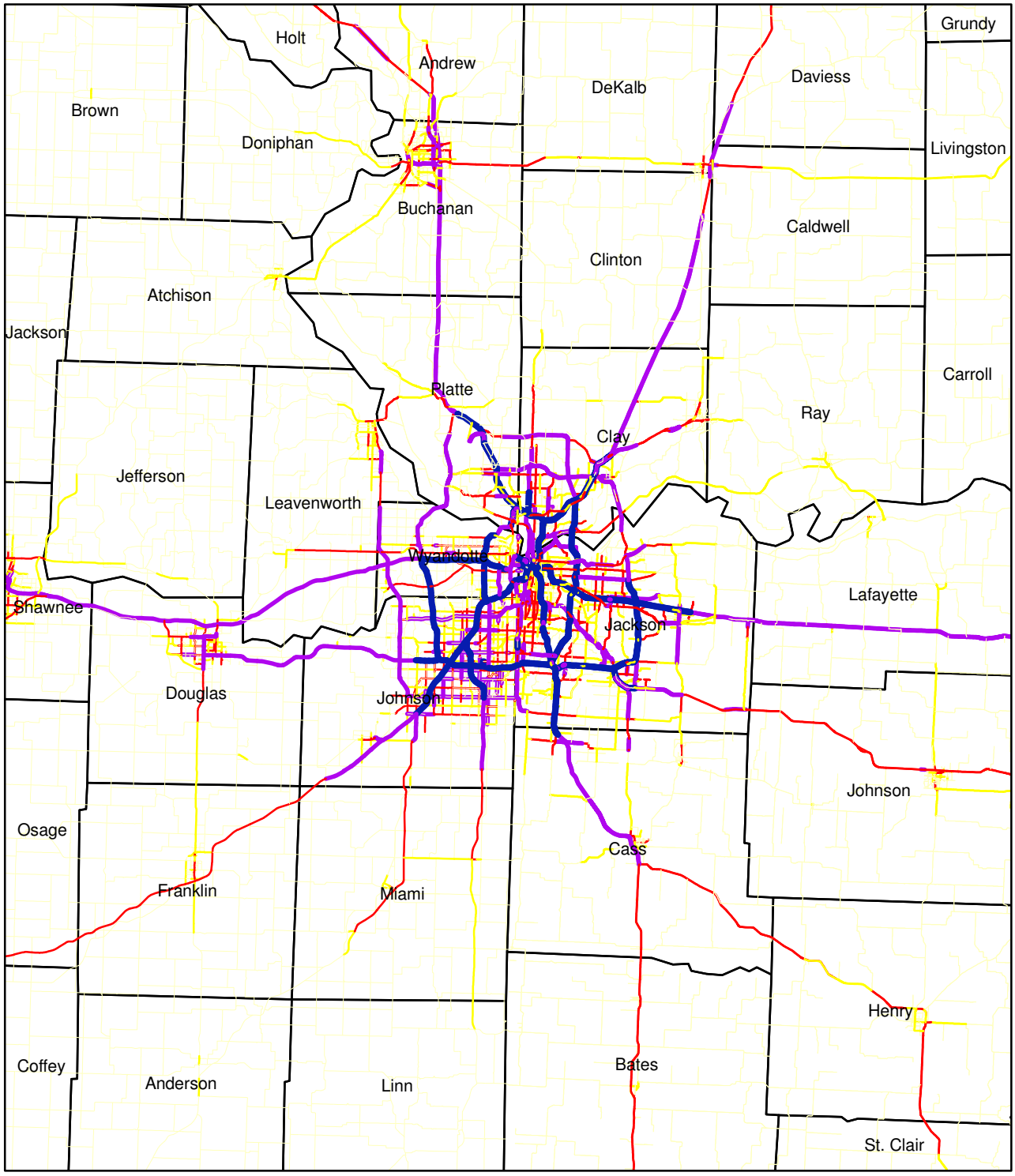


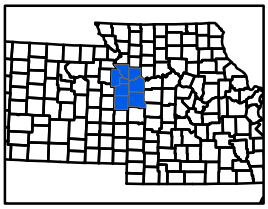
Figure KC4 - Traffic Count 2007



Annual Average Daily Traffic

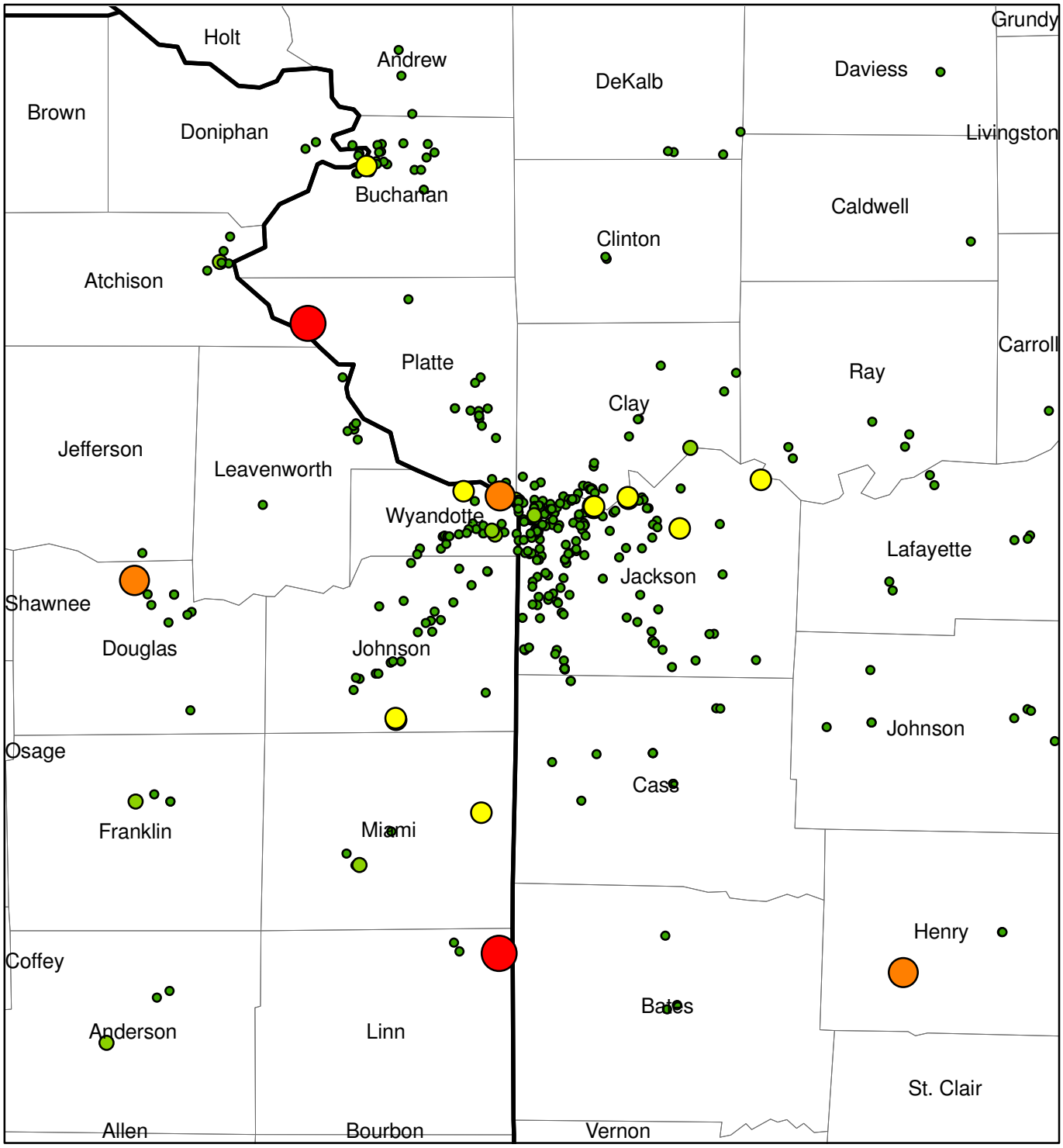
Number of Vehicles

- 0 - 5,000
- 5,001 - 10,000
- 10,001 - 20,000
- 20,001 - 50,000
- > 50,000



Missouri Department of Natural Resources
Division of Environmental Quality
Air Pollution Control Program
Prepared by Bern Johnson 5 SEP 2008

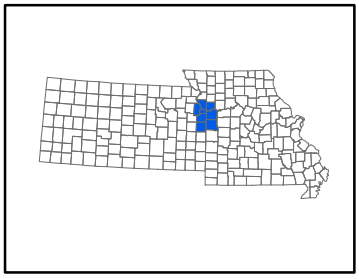
Figure KC5 - NOx Point Sources 2007



0 12.5 25 50 Kilometers

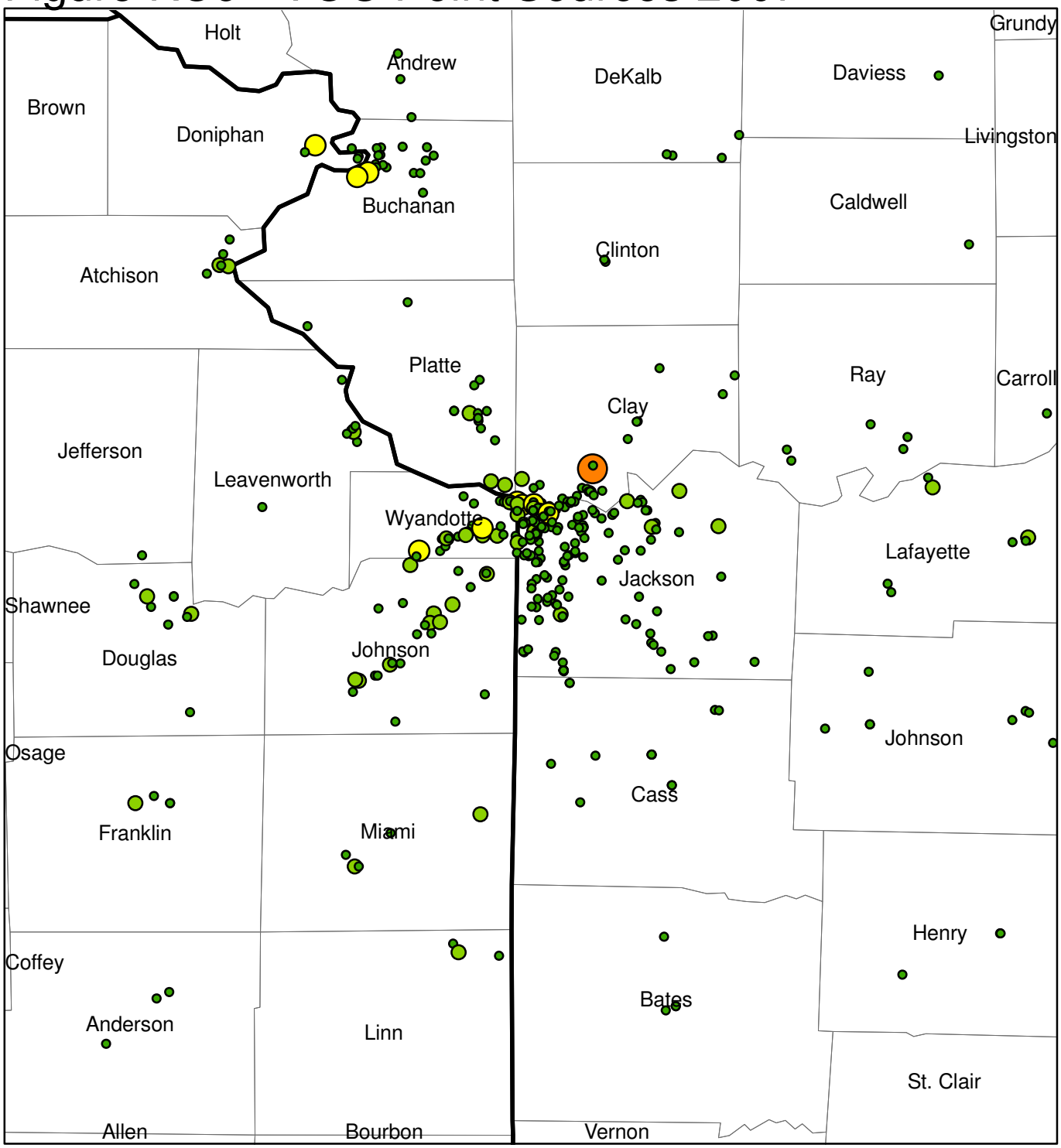
NOx emissions in tons per day

- 0 - 0.3
- 0.4 - 2
- 2.1 - 10
- 10.1 - 20
- > 20



Missouri Department of Natural Resources
Division of Environmental Quality
Air Pollution Control Program
Prepared by Bern Johnson 10 SEP 08

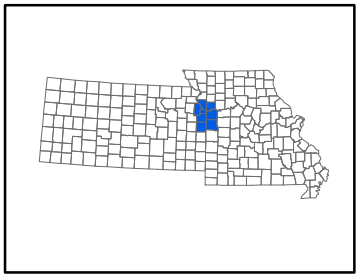
Figure KC6 - VOC Point Sources 2007



0 12.5 25 50 Kilometers

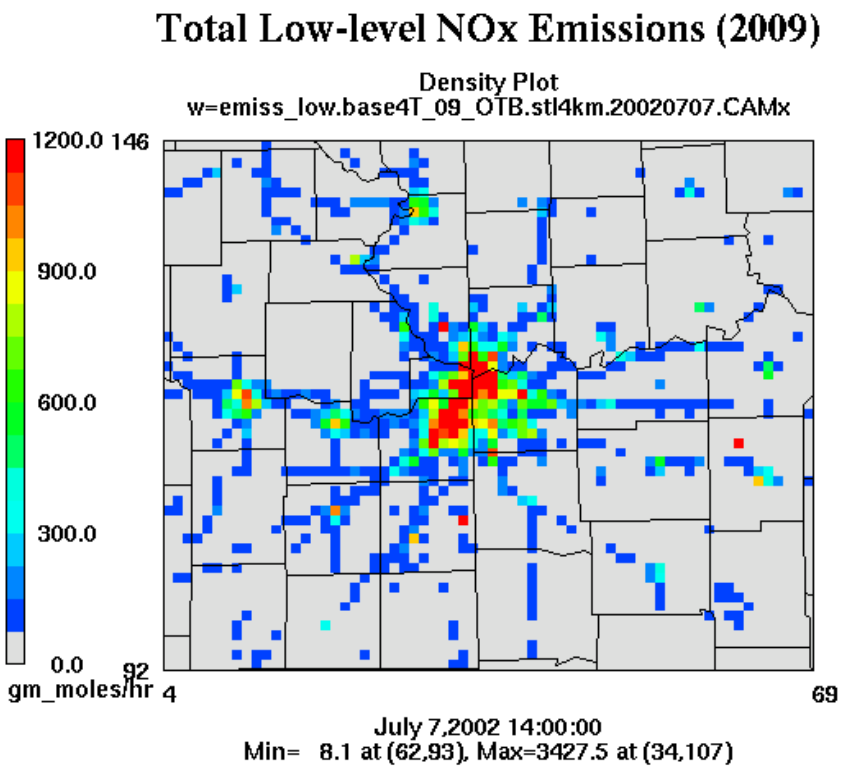
VOC Emissions in tons per day

- 0 - 0.1
- 0.2 - 0.5
- 0.6 - 2
- 2.1 - 6
- > 6

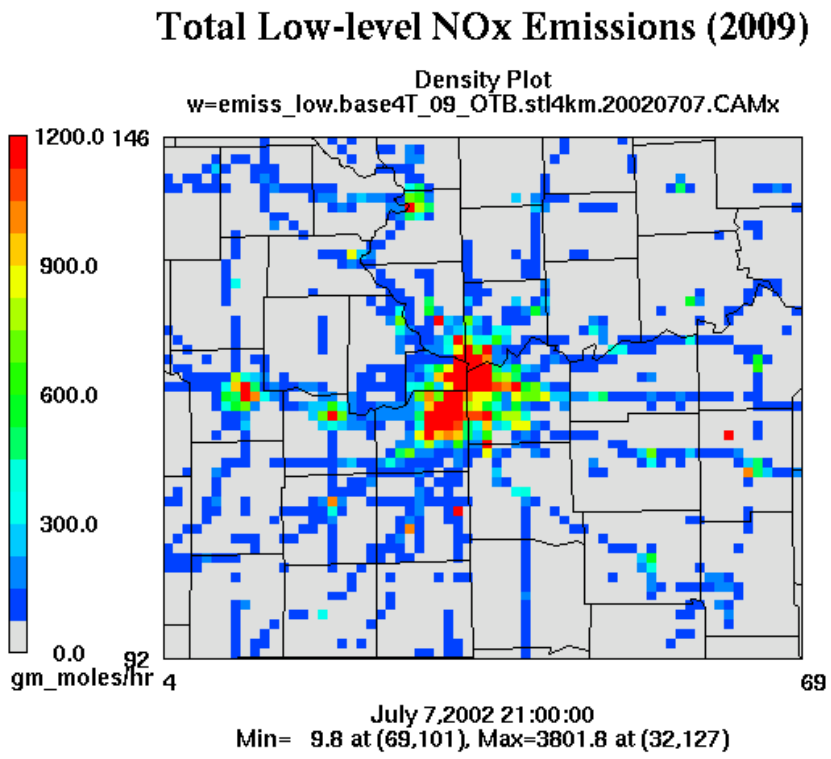


Missouri Department of Natural Resources
Division of Environmental Quality
Air Pollution Control Program
Prepared by Bern Johnson 10 SEP 08

Figure KC7 –
NOx Emission Density

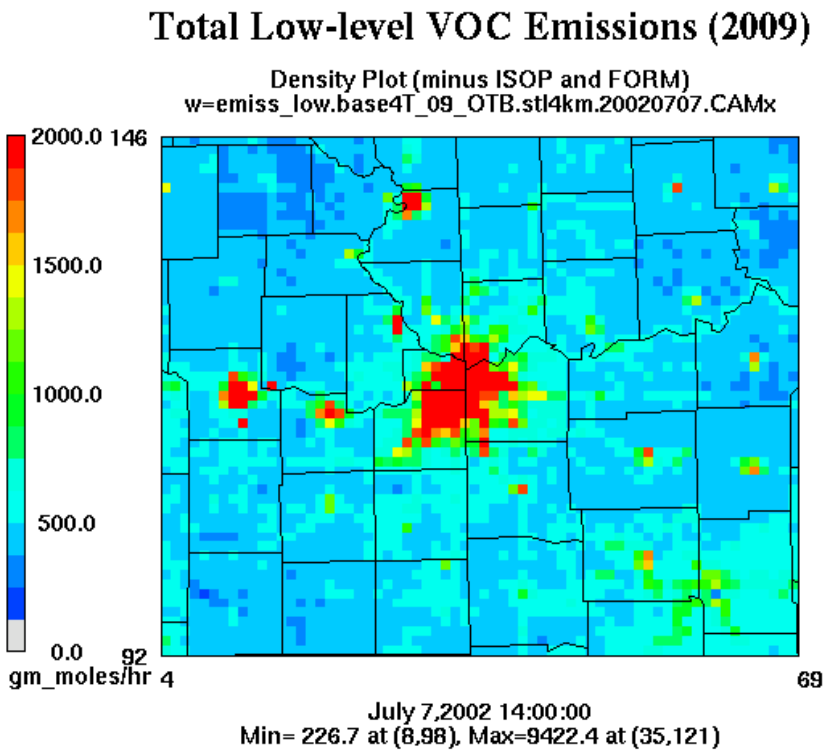


July 7, 2002 – 8 AM

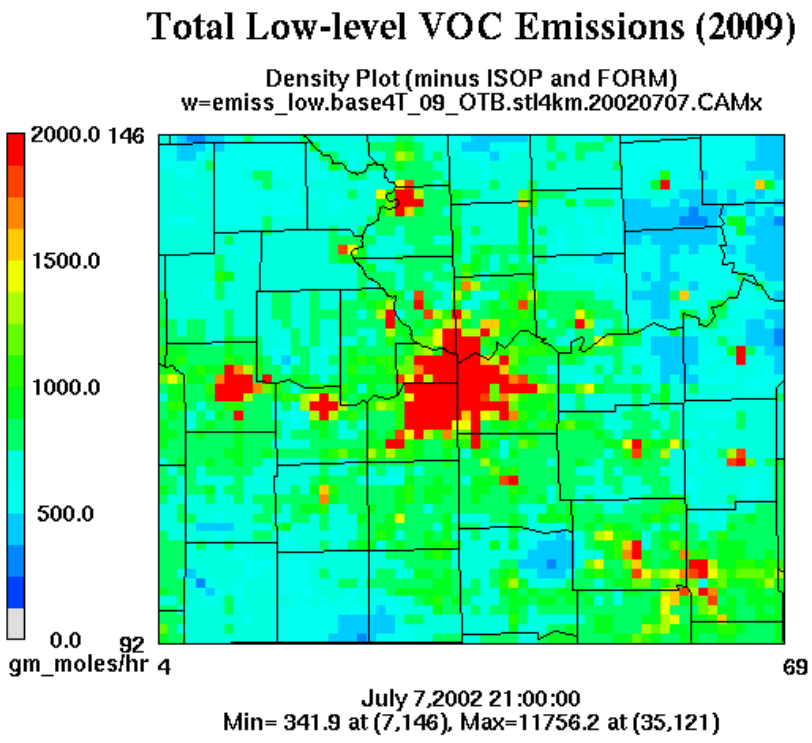


July 7, 2002 – 3 PM

Figure KC8 –
VOC Emission Density



July 7, 2002 – 8 AM



July 7, 2002 – 3 PM

TABLE KC3										
	2009	2009				2009			Pop. Growth	Employment
	Total VOC	Total Nox	2000	2007	2006	Million VMT	Main. Area	Main. Area	2000-07	% Main Area
	(TPD)	(TPD)	Population	Population	Employment	per year	VOC %	NOx %		
JACKSON	59.368	92.059	654,880	666,890	352,254	5,908.2	35.3%	35.6%	1.8%	41.8%
CLAY	24.775	23.637	184,006	211,952	87,438	2,275.5	14.7%	9.2%	15.2%	10.4%
PLATTE	11.323	42.991	73,781	84,881	39,639	1,374.4	6.7%	16.6%	15.0%	4.7%
CASS	8.866	9.410	82,092	97,133	19,516	1,064.3	5.3%	3.6%	18.3%	2.3%
JOHNSON	5.781	6.216	48,258	51,928	11,676	611.9	3.4%	2.4%	7.6%	1.4%
LAFAYETTE	6.200	8.376	32,960	32,677	7,274	759.3	3.7%	3.2%	-0.9%	0.9%
RAY	3.080	4.476	23,354	23,482	3,756	216.2	1.8%	1.7%	0.5%	0.4%
CLINTON	3.230	3.183	18,979	20,894	4,211	356.2	1.9%	1.2%	10.1%	0.5%
BATES	3.512	3.975	16,653	17,034	2,722	338.3	2.1%	1.5%	2.3%	0.3%
CALDWELL	1.269	2.267	8,969	9,284	1,109	177.1	0.8%	0.9%	3.5%	0.1%
Buchanon	10.396	14.953	85,998	86,485	41,943	803.0	6.2%	5.8%	0.6%	5.0%
Henry	8.261	24.095	21,997	22,398	7,306	410.8	4.9%	9.3%	1.8%	0.9%
Andrew	3.038	3.843	16,492	16,864	1,413	393.2	1.8%	1.5%	2.3%	0.2%
De Kalb	2.138	2.287	11,597	12,234	1,132	228.1	1.3%	0.9%	5.5%	0.1%
Missouri Main Area	95.466	158.687	912,667	963,723	479,331	9,558.0	56.7%	61.4%	5.6%	56.9%
Missouri MSA	127.404	196.589	1,143,932	1,216,155	529,595	13,081.4				
JOHNSON	48.981	55.464	451,086	526,319	298,778	5178.3	29.1%	21.5%	16.7%	35.4%
WYANDOTTE	23.881	44.134	157,882	153,956	64,876	1929.3	14.2%	17.1%	-2.5%	7.7%
LEAVENWORTH	6.470	6.818	68,691	73,603	15,800	624.0	3.8%	2.6%	7.2%	1.9%
MIAMI	4.464	12.686	28,351	31,078	6,948	493.1	2.7%	4.9%	9.6%	0.8%
FRANKLIN	4.465	7.057	24,784	26,479	8,622	417.0	2.7%	2.7%	6.8%	1.0%
LINN	3.518	41.924	9,570	9,767	1,250	134.4	2.1%	16.2%	2.1%	0.1%
Douglas	11.156	30.273	99,962	113,488	37,893	995.5	6.6%	11.7%	13.5%	4.5%
Atchison	2.304	3.341	16,774	16,571	6,457	137.0	1.4%	1.3%	-1.2%	0.8%
Jefferson	3.405	3.773	18,426	18,467	2,444	233.6	2.0%	1.5%	0.2%	0.3%
Anderson	2.042	3.563	8,110	7,908	1,570	107.2	1.2%	1.4%	-2.5%	0.2%
Kansas Main Area	72.863	99.598	608,968	680,275	363,654	7107.7	43.3%	38.6%	11.7%	43.1%
Kansas MSA	91.780	168.082	740,364	821,202	396,274	8776.2				
Main. Area Total	168.329	258.285	1,521,635	1,643,998	842,985		100.0%	100.0%		100.0%
MSA Total	219.184	364.671	1,884,296	2,037,357	925,869					

TABLE KC4

County	2000	2010	2020	2030	00-10 Growth %	00-20 Growth %
JACKSON	654,880	668,867	689,226	714,467	2.1%	5.2%
CLAY	184,006	220,635	261,469	300,021	19.9%	42.1%
PLATTE	73,781	88,964	102,810	114,904	20.6%	39.3%
CASS	82,092	102,491	121,499	136,933	24.8%	48.0%
JOHNSON	48,258	53,390	57,691	61,668	10.6%	19.5%
LAFAYETTE	32,960	32,791	32,869	32,947	-0.5%	-0.3%
RAY	23,354	23,616	24,012	24,435	1.1%	2.8%
CLINTON	18,979	22,015	24,821	27,124	16.0%	30.8%
BATES	16,653	17,232	18,129	18,923	3.5%	8.9%
CALDWELL	8,969	9,342	9,987	10,633	4.2%	11.4%
Buchanan	85,998	87,049	90,380	93,007	1.2%	5.1%
Henry	21,997	22,748	23,568	24,176	3.4%	7.1%
Andrew	16,492	17,099	18,434	19,670	3.7%	11.8%
DeKalb	13,077	12,372	12,564	12,755	-5.4%	-3.9%

County	2000	2010	2020	2030	00-10 Growth %	00-20 Growth %
JOHNSON	451,479	561,556	701,381	884,894	24.4%	55.4%
WYANDOTTE	157,882	153,838	151,492	151,038	-2.6%	-4.0%
LEAVENWORTH	68,691	77,489	87,741	100,274	12.8%	27.7%
MIAMI	28,351	32,611	37,564	43,595	15.0%	32.5%
FRANKLIN	24,784	26,848	29,282	32,222	8.3%	18.1%
LINN	9,570	10,108	10,679	11,359	5.6%	11.6%
Douglas	99,962	116,671	137,530	164,093	16.7%	37.6%
Jefferson	18,426	19,544	20,818	22,337	6.1%	13.0%
Atchison	16,774	16,836	17,125	17,615	0.4%	2.1%
Anderson	8,110	8,078	8,215	8,478	-0.4%	1.3%

Table KC5 Place of Residence/Employment Matrix (County by County)

Missouri Residence		Employment (Missouri) Andrew	Bates	Buchanon	Caldwell	Cass	Clay
	Jackson	17	120	1,447	20	4,286	19,714
	Clay	25	32	683	46	487	34,979
	Platte	18	21	694	7	179	7,372
	Cass	4	178	170	8	10,726	1,160
	Johnson	3	21	103	5	505	335
	Lafayette	3	11	102	15	105	640
	Ray	1	3	65	69	63	3,162
	Clinton	6	6	579	48	36	1,893
	Bates	0	2,423	36	1	728	89
	Caldwell	5	0	153	908	9	574
	Buchanon	576	12	27,111	29	130	1,034
	Henry	0	64	45	2	470	131
	Andrew	1,367	1	3,828	5	23	155
	De Kalb	42	3	827	26	18	195
	Missouri MA	60	173	2,824	73	4,952	62,065
	Missouri MSA	82	2,815	4,032	1,127	17,124	69,918
	Missouri Total	2,067	2,895	35,843	1,189	17,765	71,433

Kansas Residence		Andrew	Bates	Buchanon	Caldwell	Cass	Clay
	Johnson	5	17	244	2	565	4,165
	Wyandotte	2	4	79	3	89	1,783
	Leavenworth	3	2	46	0	38	365
	Miami	0	10	13	2	68	77
	Franklin	0	1	1	0	11	27
	Linn	0	20	4	0	16	16
	Douglas	0	2	14	0	35	139
	Atchison	6	0	280	1	5	56
	Jefferson	0	0	15	1	0	21
	Anderson	0	8	0	14	7	3
	Kansas MA	7	21	323	5	654	5,948
	Kansas MSA	10	54	387	7	787	6,433
	Kansas Total	16	64	696	23	834	6,652
	Total MA	67	194	3,147	78	5,606	68,013
	Total MSA	92	2,869	4,419	1,134	17,911	76,351
	Grand Total	2,083	2,959	36,539	1,212	18,599	78,085
	Connect TOT	2,388	3,720	44,057	1,556	27,576	87,405

Missouri Residence		Employment (Missouri) Clinton	De Kalb	Henry	Jackson	Johnson	Lafayette	Platte	Ray	Missouri Total
	Jackson	86	82	184	192,452	756	822	5,653	151	225,790
	Clay	171	79	47	28,420	128	117	9,397	394	75,005
	Platte	83	21	13	10,369	50	42	11,524	38	30,431
	Cass	32	21	133	14,807	312	46	389	23	28,009
	Johnson	7	8	394	3,452	7,549	521	117	23	13,043
	Lafayette	8	13	34	4,091	452	5,181	148	215	11,018
	Ray	48	30	16	1,663	33	296	232	2,530	8,211
	Clinton	2,016	480	12	1,214	37	23	623	113	7,086
	Bates	4	0	59	739	37	16	16	7	4,155
	Caldwell	345	203	6	403	26	29	84	84	2,829
	Buchanon	309	294	22	2,928	54	39	1,432	46	34,016
	Henry	3	3	5,070	779	470	36	35	7	7,115
	Andrew	45	93	2	460	9	9	157	8	6,162
	De Kalb	422	692	4	298	29	8	85	9	2,658
	Missouri MA	340	182	244	231,241	934	981	26,574	583	331,226
	Missouri MSA	2,800	937	898	257,610	9,380	7,093	28,183	3,578	405,577
	Missouri Total	3,579	2,019	5,996	262,075	9,942	7,185	29,892	3,648	455,528

Kansas Residence		Clinton	De Kalb	Henry	Jackson	Johnson	Lafayette	Platte	Ray	Missouri Total
	Johnson	9	9	21	36,476	84	36	1,687	21	43,341
	Wyandotte	3	7	6	8,849	11	10	1,314	6	12,166
	Leavenworth	1	0	0	1,266	4	2	675	3	2,405
	Miami	0	0	0	686	2	0	39	2	899
	Franklin	0	0	3	212	2	1	12	0	270
	Linn	0	0	0	122	0	0	8	0	186
	Douglas	0	0	1	1,148	0	4	77	0	1,420
	Atchison	0	1	2	212	0	0	180	0	743
	Jefferson	0	0	1	140	2	0	23	0	203
	Anderson	0	0	0	27	0	0	1	0	60
	Kansas MA	12	16	27	45,325	95	46	3,001	27	55,507
	Kansas MSA	13	16	30	47,611	103	49	3,735	32	59,267
	Kansas Total	13	17	34	49,138	105	53	4,016	32	61,693
	Total MA	352	198	271	276,566	1,029	1,027	29,575	610	386,733
	Total MSA	2,813	953	928	305,221	9,483	7,142	31,918	3,610	464,844
	Grand Total	3,592	2,036	6,030	311,213	10,047	7,238	33,908	3,680	517,221
	Connect TOT	4,324	3,170	7,893	355,445	12,640	8,730	38,349	4,356	

Missouri Residence	Employment (Kansas)										Kansas	
	Anderson	Atchison	Douglas	Franklin	Jefferson	Johnson	Leavenwo	Linn	Miami	Wyandotte	Total	Grand Total
Jackson	8	36	721	342	38	39,982	311	31	130	9,460	51,059	276,849
Clay	6	35	121	29	4	6,051	137	12	21	3,683	10,099	85,104
Platte	0	107	2	25	0	3,516	287	5	10	2,050	6,002	36,433
Cass	1	9	90	52	3	6,821	53	36	159	848	8,072	36,081
Johnson	0	0	2	1	0	465	7	6	1	161	643	13,686
Lafayette	0	4	13	3	0	299	4	0	3	189	515	11,533
Ray	0	5	4	1	0	228	6	3	5	248	500	8,711
Clinton	1	5	5	0	0	197	10	0	1	229	448	7,534
Bates	0	0	3	3	0	348	3	146	34	40	577	4,732
Caldwell	0	0	1	1	0	53	2	0	0	66	123	2,952
Buchanon	0	416	19	8	4	402	56	4	3	303	1,215	35,231
Henry	0	0	1	4	5	143	1	12	2	67	235	7,350
Andrew	0	24	0	0	0	71	20	0	0	34	149	6,311
De Kalb	0	3	0	0	0	34	2	0	0	20	59	2,717
Missouri MA	14	178	844	396	42	49,549	735	48	161	15,193	67,160	398,386
Missouri MSA	16	201	962	457	45	57,960	820	239	364	16,974	78,038	483,615
Missouri Total	16	644	982	469	54	58,610	899	255	369	17,398	79,696	535,224

Kansas Residence											Kansas	
	Anderson	Atchison	Douglas	Franklin	Jefferson	Johnson	Leavenwo	Linn	Miami	Wyandotte	Total	
Johnson	33	127	3,652	871	56	155,333	1,184	74	1,266	13,871	176,467	219,808
Wyandotte	8	81	7	335	18	24,585	843	23	166	22,419	48,485	60,651
Leavenworth	0	141	878	80	125	4,733	9,678	7	39	3,046	18,727	21,132
Miami	70	17	157	259	5	6,445	64	150	4,841	402	12,410	13,309
Franklin	107	18	893	4,953	7	3,205	96	23	344	315	9,961	10,231
Linn	39	2	19	33	6	709	172	1,043	417	70	2,510	2,696
Douglas	15	50	29,985	494	109	7,647	459	9	76	933	39,777	41,197
Atchison	0	4,409	121	54	141	369	312	1	21	138	5,566	6,309
Jefferson	0	109	1,573	43	1,836	630	299	3	27	273	4,793	4,996
Anderson	1,418	2	60	258	2	437	12	26	234	50	2,499	2,559
Kansas MA	41	208	3,659	1,206	74	179,918	2,027	97	1,432	36,290	224,952	280,459
Kansas MSA	257	386	5,606	6,531	217	195,010	12,037	1,320	7,073	40,123	268,560	327,827
Kansas Total	1,690	4,956	37,345	7,380	2,305	204,093	13,119	1,359	7,431	41,517	321,195	382,888

Total MA												
Total MSA	55	386	4,503	1,602	116	229,467	2,762	145	1,593	51,483	292,112	678,845
Grand Total	273	587	6,568	6,988	262	252,970	12,857	1,559	7,437	57,097	346,598	811,442
	1,706	5,600	38,327	7,849	2,359	262,703	14,018	1,614	7,800	58,915	400,891	918,112
Connect TOT												
	2,090	6,631	48,231	9,906	3,087	307,941	15,919	1,947	8,696	68,481		

	Work In MA Live in County	Live in MA Work in County	Work In MSA Live in County	Live in MSA Work in County
JACKSON	267,261	276,566	274,316	305,221
CLAY	82,530	68,013	84,104	76,351
PLATTE	34,831	29,575	35,578	31,918
CASS	24,025	5,606	35,650	17,911
JOHNSON	4,530	1,029	13,176	9,483
LAFAYETTE	5,367	1,027	11,364	7,142
RAY	5,533	610	8,590	3,610
CLINTON	4,156	352	6,446	2,813
BATES	1,232	194	4,634	2,869
CALDWELL	1,180	78	2,584	1,134
Buchanon	6,099	3,147	6,789	4,419
Henry	1,155	271	2,226	928
Andrew	877	67	997	92
De Kalb	632	198	1,149	953
JOHNSON	211,532	229,467	215,661	252,970
WYANDOTTE	58,950	51,483	60,443	57,097
LEAVENWORTH	10,085	2,762	19,939	12,857
MIAMI	7,649	1,593	13,047	7,437
FRANKLIN	3,771	1,602	9,202	6,988
LINN	925	145	2,626	1,559
Douglas	9,944	4,503	11,023	6,568
Atchison	955	386	1,349	587
Jefferson	1,087	116	1,462	262
Anderson	518	55	1,077	273

Missouri Residence		Residents Work in MO	Residents Work in KS	Total Residents Work in MO&KS	% Work in MA	% Work in MSA	% Work in MA+County	% Work in County	Work in MA	Work in MSA
	Jackson	255,134	58,334	313,468	85.26%	87.51%	85.26%	61.39%	267,261	274,316
	Clay	83,792	11,183	94,975	86.90%	88.55%	86.90%	36.83%	82,530	84,104
	Platte	34,355	6,799	41,154	84.64%	86.45%	84.64%	28.00%	34,831	35,578
	Cass	31,343	8,662	40,005	60.05%	89.11%	86.87%	26.81%	24,025	35,650
	Johnson	16,391	770	17,161	26.40%	76.78%	70.39%	43.99%	4,530	13,176
	Lafayette	13,521	517	14,038	38.23%	80.95%	75.14%	36.91%	5,367	11,364
	Ray	9,195	499	9,694	57.08%	88.61%	83.18%	26.10%	5,533	8,590
	Clinton	8,022	517	8,539	48.67%	75.49%	72.28%	23.61%	4,156	6,446
	Bates	5,233	688	5,921	20.81%	78.26%	61.73%	40.92%	1,232	4,634
	Caldwell	3,650	166	3,816	30.92%	67.71%	54.72%	23.79%	1,180	2,584
	Buchanon	38,273	2,093	40,366	15.11%	16.82%	82.27%	67.16%	6,099	6,789
	Henry	9,500	267	9,767	11.83%	22.79%	63.74%	51.91%	1,155	2,226
	Andrew	7,217	273	7,490	11.71%	13.31%	29.96%	18.25%	877	997
	De Kalb	3,179	100	3,279	19.27%	35.04%	40.38%	21.10%	632	1,149
	Missouri MA			449,597						
	Missouri MSA			548,771						
	Missouri Total			609,673	85.55%	86.82%				
Kansas Residence										
	Johnson	48,464	193,733	242,197	87.34%	89.04%	87.34%	64.13%	211,532	215,661
	Wyandotte	13,562	54,448	68,010	86.68%	88.87%	86.68%	32.96%	58,950	60,443
	Leavenworth	2,693	21,657	24,350	41.42%	81.89%	81.16%	39.75%	10,085	19,939
	Miami	1,019	13,581	14,600	52.39%	89.36%	85.55%	33.16%	7,649	13,047
	Franklin	348	11,652	12,000	31.43%	76.68%	72.70%	41.28%	3,771	9,202
	Linn	226	3,007	3,233	28.61%	81.22%	60.87%	32.26%	925	2,626
	Douglas	1,660	47,009	48,669	20.43%	22.65%	82.04%	61.61%	9,944	11,023
	Atchison	841	6,865	7,706	12.39%	17.51%	69.61%	57.22%	955	1,349
	Jefferson	237	8,234	8,471	12.83%	17.26%	34.51%	21.67%	1,087	1,462
	Anderson	74	3,253	3,327	15.57%	32.37%	58.19%	42.62%	518	1,077
	Kansas MA			310,207						
	Kansas MSA			364,390						
	Kansas Total			432,563	87.19%	88.07%				
	Total MA			759,804						
	Total MSA			913,161						
	Grand Total			1,042,236	86.22%	87.32%				

Missouri Department of Natural Resources

Springfield/Southwest Missouri Area

CURRENT AIR QUALITY

The current and recent past air quality information for 8-hour ozone in the Springfield/Southwest Missouri area is shown below in Tables SW1 and SW2. Table SW1 contains the 4th highest concentration and Table SW2 contains the design value for each monitor/year pair. Figure SW1 denotes the locations of the monitors within the Springfield/Southwest Missouri ozone network.

TABLE SW1

Monitor	2000	2001	2002	2003	2004	2005	2006	2007	2008
S. Charleston	78	72	78	71					
Hillcrest	74	71	74	72	64	77	74	80	67
Fellows Lake									69
El Dorado Springs	94	74	82	80	71	79	75	74	67

TABLE SW2

Monitor	00-02 Avg	01-03 Avg.	02-04 Avg	03-05 Avg	04-06 Avg	05-07 Avg	06-08 Avg
S. Charleston	76	73					
Hillcrest	73	72	70	71	71	77	73
Fellows Lake							N/A
El Dorado Springs	83	78	77	76	75	76	72

The Fellows Lake location is new to the monitoring network in 2008 and was sited as a maximum concentration site downwind of the Springfield area. The El Dorado Springs monitor was originally sited as a rural, upwind site for Kansas City. This site is located in Cedar County and Table SW2 illustrates the design values are higher for this site than the other Southwest Missouri monitors. Based on the meteorological analyses conducted for this designation, the program did not identify sources with the Springfield area as a significant contributor to ozone at the El Dorado Springs. The analysis demonstrates on high ozone concentration days at El Dorado Springs that the predominant transport direction is south-southwest. The metropolitan areas that are “upwind” would be the Joplin and Tulsa, Oklahoma.

Also, Little Rock, Arkansas, is a potential upwind metropolitan area for Springfield. For Tulsa, the 2004-06 design value was 79 ppb and the 2005-07 design value was 80 ppb. No monitoring data exists for Joplin, Missouri at this time, but the 2009 ozone monitor

network will include a monitor north of Joplin. The Little Rock design values for 2004-06 and 2005-07 were 80 and 83 ppb, respectively.

As noted previously, the 2006-08 sampling data for this area demonstrates attainment of the 2008 ozone standard. However, the evaluation for the ozone recommendations is a process that will continue through the 2009 ozone monitoring season. Therefore, two distinct recommendations are being proposed at this time. The first is based on the 2005-07 dataset along with the contribution analyses for those monitors not meeting the standard. The second provides an attainment designation for the entire Southwest Missouri area based on 2006-08 data.

SPRINGFIELD/SOUTHWEST MISSOURI AREA EMISSION, POPULATION, AND TRAFFIC/COMMUTER INFORMATION

Table SW3 illustrates the precursor emissions and population data for the counties in Southwest Missouri. For Springfield, the data illustrates that Greene County has the majority of anthropogenic emissions for VOC (59%) and NOx (73%) in the Springfield MSA. The next highest VOC emission totals are Taney County (38% MSA), Jasper County (34%), and Stone County (27%). The next highest NOx emissions totals are Jasper (23%) and Newton (12%). Stone and Taney County are part of the Branson MSA, while Jasper and Newton are part of the Joplin MSA.

The population data for the area also provides a similar picture. Greene County is the most populated (263,980) followed by Jasper (115,240), Christian (73,066), and Newton (56,038). All the other counties have less than 50,000 population. Population growth rates over 15 percent between 2000 and 2007 were projected for Christian, Webster, and Taney Counties. Figure SW2 provides population density information for the area. The Springfield/Greene County area is the most densely populated, but northern Christian County provides a contiguous area of higher population density with Springfield. Further, the Branson and Joplin areas also illustrate a much higher population density than surrounding areas. Figure SW3 provides the urbanized area information for the region. This figure illustrates a very similar outcome as Figure SW2.

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. These data illustrate a consistent pattern of higher VMT in the urbanized areas around Springfield and Joplin with almost 2.6 billion VMT/year in Greene County and 2.1 billion VMT/year in Jasper/Newton Counties. The next highest county VMTs are Webster (851 million/year) and Christian (728 million/year). Figure SW4 includes traffic count information from MoDOT for 2007. This data illustrates the high volume of traffic on Interstate 44 going through the area with Highway 60 (going east from Springfield) and 65 (Springfield to Branson) also seeing substantial traffic on a daily basis.

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 SW5 and SW6 contain

point source emission locations for NOx and VOC, respectively. As expected, the largest numbers of point sources are located in Greene County along with the two largest NOx sources in the region. The second set presented in Figures SW7 and SW8 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 SW7 presents the NOx information for the area and Figure SW8 presents the VOC information for the area. These two figures also show the highest emission density in Springfield with some areas of higher emission density in the Joplin and Branson MSAs (especially for VOC – Figure SW8).

The Springfield/Southwest Missouri area has not been regulated for VOC/NOx control under the previous ozone NAAQS. Therefore, there are few emission controls in this area related to reducing ozone formation. Nonetheless, the utility NOx rule (10 CSR 10-6.350) requires the large power plants in this area to control NOx emissions to a level of 0.35 pounds per million British thermal units (lb/MMBTU) or 0.68 lb/MMBTU for cyclone units firing tire-derived fuel. Also, the Clean Air Interstate Rule (CAIR) is expected to require a sizable NOx reduction in these utility sources, even though the courts have remanded it back to EPA for substantial changes.

METEOROLOGICAL IMPACTS IN SPRINGFIELD/SOUTHWEST MISSOURI

When evaluating all the meteorological information for the Springfield/Southwest Missouri area, the trajectory analysis, the regime analysis, and the windroses), the strongest conclusion that can be reached is that winds flowing from the north do not lead to high ozone concentrations at the Hillcrest monitor (in Greene County) or the El Dorado Springs monitor (in Cedar County). The trajectory analysis for El Dorado Springs illustrate that when elevated ozone concentrations occur that the Kansas City and Springfield areas are not contributing frequently (one day for each area). The trajectory analysis does illustrate transport from the Joplin/Tulsa areas and extreme Northwestern Arkansas/Southwestern Missouri more frequently. The trajectory analyses for the Hillcrest monitor illustrate short trajectory lengths for all trajectories. This leads to the conclusion that the surface wind speeds on these days are lower than some of the other trajectory analysis and the days when ozone concentrations exceed the standard are with light and variable winds. Also, the 2003-07 windrose for the area during the months with ozone exceedances (April – September) provide that almost one-third of the time the winds are from the south or south-southeast. Further, the windrose has a very similar pattern for the peak ozone months in Missouri (June – August).

One other 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 Springfield is sparse compared to other metropolitan areas around the state. The number of exceedances for the Hillcrest monitor is 17 for the 75 ppb standard and 3 for the 84 ppb standard. The number of exceedances for the El Dorado Springs monitor was 20 for the 75 ppb standard and 1 for the 84 ppb standard. These numbers reflect the overall lower concentration design values for this area compared to Kansas City and St. Louis.

Overall, based on the analysis conducted by the department, the Springfield/Southwest Missouri area is impacted by source regions to the south and southwest along with local impacts from emission sources within the region.

URBANIZATION AND OTHER INFORMATION REQUESTED IN THE EPA GUIDANCE

The three different MSA boundaries are of interest to the designation process: Springfield, Joplin, and Branson. These boundaries are shown with the monitoring site information in Figure SW1. As seen in Table SW4, there is population growth from 2000-2020 above 30% for the following counties in Southwest Missouri: Christian (98% growth), Taney (49% growth), Webster (48% growth), Polk (34% growth), Stone (31% growth), and Jasper (30% growth). The particular areas of interest with respect to growth are Christian County with over 100,000 projected in 2020, Jasper County with over 150,000 people projected in 2020, and Taney County with almost 60,000 people projected in 2020. It should be noted that Dade and Cedar Counties have a flat or decreasing population between 2000 and 2020 based on these projections.

Employment data were also incorporated into Table SW3. This data can provide a better understanding about counties with a small population, but large industrial/commercial activity. This trend can be found in the Branson area in southwest Missouri. The ratio of employment to population in Taney County is considerably higher than other counties in the area (excluding Greene and Jasper). It should be noted that Greene County has 83% of the employment in the Springfield MSA.

There are significant geographic or topographic features that impact ozone concentrations in the Springfield/Southwest region 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 individual block group level data points to summarize the commuter relationships between counties in each region of interest. This data is summarized in Table SW5 and provides a matrix of residence versus employment location. Several important pieces of information can be gained from review of this data.

1) The vast majority of employed people who live in any one of the 3 MSAs in southwest Missouri work in the same MSA (the only exception is Dallas County in the Springfield MSA).
2) There is some interconnection between the MSAs especially between the Springfield MSA and the Branson MSA. There are 7,999 people who commute either from the Springfield MSA to the Branson MSA or vice versa. Also, there are 5,908 people that commute from Springfield MSA to Joplin MSA or vice versa.

3) Christian County is the most connected to Greene County with over two-thirds of employed residents working in Greene County.
4) Stone and Dade Counties have the highest percentage of employed residents working in the Springfield MSA for counties outside the MSA (18% and 19%, respectively).
5) Cedar County and its 5,091 employed residents are not strongly connected to any of the MSAs in the area. For example, only 252 employed residents work in Greene County.

SUMMARY

Based on the first test for designation (the monitored violation test) using the 2005-07 design values, Greene County and Cedar County should be designated nonattainment for the 2008 ozone NAAQS. With the 2008 ozone season data verified and quality assured, the 2006-08 design values for both sites are in attainment of the NAAQS. Therefore, the ozone recommendation will provide two alternative scenarios for the Southwest Missouri region. One, based on 2005-07 data will highlight the counties with monitored violations and the contribution areas for each monitored area. The other, based on the 2006-08 data, will likely request a finding of attainment for all counties in the Southwest Missouri region. In order to understand the second test for designation (contribution to monitored violation), the following table summarizes the information for all fifteen (15) counties in the evaluation process.

TABLE SW6

County	MSA	2009 VOC Total % (TPD)	2009 NOx Total % (TPD)	2007 Pop. % (1000)	Total Non-Meteorological Summary
Greene	SPR	58.8 (23.3)	72.9 (44.1)	62.8 (264)	194.6
Jasper	JPLN	33.8 (13.4)	22.9 (13.9)	27.4 (115)	84.1
Taney	BRAN	37.8 (15.0)	8.5 (5.1)	10.9 (46)	57.2
Newton	JPLN	16.2 (6.4)	11.7 (7.1)	13.3 (56)	41.3
Stone	BRAN	27.2 (10.8)	6.0 (5.1)	7.5 (32)	40.7
Christian	SPR	14.2 (5.6)	8.4 (5.1)	17.4 (73)	40.0
Barry	None	17.6 (7.0)	7.1 (4.3)	8.6 (36)	33.4
Lawrence	None	13.8 (5.5)	9.2 (5.6)	9.0 (38)	32.3
Webster	SPR	11.8 (4.7)	10.0 (6.0)	8.6 (36)	30.3
Polk	SPR	9.2 (3.7)	5.8 (3.5)	7.2 (30)	22.1
McDonald	SPR	10.9 (4.3)	4.8 (2.9)	5.5 (23)	21.2
Cedar	None	11.7 (4.6)	3.4 (2.1)	3.3 (14)	18.3
Barton	None	6.9 (2.8)	6.1 (3.7)	3.0 (13)	16.1
Dallas	SPR	6.1 (2.4)	2.9 (1.8)	4.0 (17)	12.9
Dade	None	7.1 (2.8)	3.3 (2.0)	1.8 (8)	12.2

Percentages in Table SW6 are based on Springfield MSA 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 Southwest Missouri Region, the following counties will receive no additional evaluation due to lack of contribution: Polk, McDonald, Cedar, Barton, Dallas, and Dade.

Further, based on the findings of this analysis, Cedar County does not have sufficient ozone precursor emissions to be found to contribute to the ozone problem in Cedar County. Therefore, the recommendation for Cedar County is a nonattainment designation as a rural transport area under Clean Air Act, Section 182(h).

The meteorology of ozone formation in the Southwest Missouri Region should be considered into this summary, in at least a qualitative fashion. As discussed previously, northerly winds are not conducive to ozone formation in Southwest Missouri. For the two monitors in the region, all the remaining counties warrant some additional consideration because they are to the south, east, or west of the monitoring sites.

Greene County is already included in the 2005-07 nonattainment area due to monitored violation. However, of the counties in this area, it contributes the most ozone precursor emissions to the ozone problem.

The two counties in the Joplin MSA, also, contain a high level of VOC and NOx emissions. The population growth rate for Newton County also signals potentially higher emissions for the Joplin area. The Joplin area is also urbanized and includes an area of higher population density than the surrounding area. However, since these counties are more distant, are part of a stand-alone statistical area that serves as a regional employment center, and the connection to the Springfield MSA or Cedar County is not sufficiently strong; the counties within the Joplin MSA are not being recommended for inclusion in either area. This conclusion is based on the Clean Air Act language for contribution to "nearby" violations. Missouri has determined the lack of "connectivity", distance from the metropolitan complex, and the fact that Joplin is not contiguous with the Springfield MSA supports the exclusion from the Springfield and Cedar County nonattainment areas. Further, one of the major NOx sources in Jasper County is the Empire District – Asbury power plant. Under the Clean Air Interstate Rule and/or the Missouri statewide NOx rule (10 CSR 10-6.350), this source has control requirements to limit NOx emissions. Also, there is no continuous urbanized area along Highway 44 between Springfield and Joplin. It is important to note that under the most recent revision to Missouri's statewide ozone network, the Joplin area will begin ozone monitoring for the 2009 ozone season.

The two counties in the Branson MSA contain a high level of anthropogenic precursor emissions. This area is moderately connected to the Springfield MSA and is a high population growth area (Taney County nearly 50% growth between 2000 and 2020). The Branson area is upwind of and contiguous to the Springfield MSA and Hillcrest monitor on a frequent basis based on the windrose and trajectory analyses conducted by the department. The Branson area is also urbanized and includes areas of higher population

density than surrounding areas. Overall, the high level of emissions in these two counties and the large projected growth of the area are the primary rationale for the recommendation of a nonattainment designation using the 2005-07 design values.

Christian County is part of the Springfield MSA and the north-central portion of the county is part of a contiguous urbanized and population dense area near Springfield. The emission totals from Christian County are moderately high for the area and its location due south of the Greene County monitor also indicates a high frequency of potential contribution to violations to the north. Christian County is the most "connected" county to Greene County using the 2004 residence/employment data. The growth rate between 2000 and 2020 for Christian County is the highest in the entire state of Missouri at almost 100%. The projected population will exceed 100,000 and the growth of this county will impact ozone concentrations in the future. The level of existing emissions, the upwind nature of the county, and the extraordinary projected growth are the rationale for inclusion of Christian County in the recommended Springfield ozone nonattainment area using 2005-07 design values.

The remaining counties (Barry, Lawrence, and Webster) also have moderately high emission totals and are located upwind on a portion of the days for the Hillcrest monitor based on the trajectory analysis. The non-meteorological data composite for these counties is somewhat less than the other counties discussed above (low 30s vs. above 40 for the counties above). Further, the urbanization and population density for these counties is less than the counties documented above. All these counties have far less than 50,000 population although Webster County has a growth rate of 48% from 2000 to 2020. To be clear, the population for all three counties population is projected to be less than 50,000 people in 2020. Based on the combination of these contribution factors for Barry, Lawrence, and Webster Counties; the department has decided to recommend an attainment designation for these counties.

Based on Table SW6 and the meteorological conditions related to high ozone formation, there are several conclusions that can be drawn from the summarized data. Greene County emissions contribute most to ozone concentrations at the Hillcrest monitor. The high emission totals (along with corresponding ozone impact) for the Branson MSA counties (Taney and Stone) along their proximity to the Springfield MSA led to the conclusion that these counties also contribute to the Springfield ozone nonattainment area. Christian County contains a portion of the continuous urbanized complex including Springfield, has the highest projected population growth rate in Missouri from 2000-2020 (~100% growth), is upwind under certain meteorological conditions associated with high ozone concentrations in Springfield, is located inside the Springfield MSA, and has medium combined VOC/NOx emissions (>10 TPD). These factors lead to the finding of contribution for the Springfield monitoring site.

Webster, Polk, and Dallas Counties are in the Springfield MSA. However, the emissions and population from Polk and Dallas are not sufficient to warrant any further evaluation for contribution to the Hillcrest monitor. Further, these areas are downwind of Greene County during periods of elevated ozone concentration. Webster County is the next most

populated county after Christian County in the Springfield MSA, but does not include any portion of continuous urbanization from Springfield. Webster has a projected growth rate of nearly 50%, but the 2020 projected population is still less than 50,000. The combined emissions in Webster County are nearly the same as Christian and it is upwind of the Springfield monitor under certain meteorological conditions. However, it is not upwind under the predominant ozone season wind directions of south and south-southeast. The combination of these factors leads to the conclusion that Webster County does not contribute frequently and significantly to ozone in the proposed Springfield nonattainment area.

Barry County is not part of or contiguous with the Springfield MSA and is more rural in nature than other counties in this evaluation. Notwithstanding the moderately high emission totals for the area; the distance to the downwind monitor, the relatively small population, and the lack of connection to the Springfield area are sufficient to determine Barry County does not have a significant contribution to the Springfield monitor. Lawrence County is not part of, but is contiguous with the Springfield MSA. Lawrence has a very similar emission total to Barry County and is not strongly connected to either the Joplin or Springfield MSAs. Lawrence has a relatively low population and the population is projected to grow 20% between 2000 and 2020. The evaluation of these factors supports a finding of less than significant contribution to the Springfield ozone monitor. The Joplin MSA Counties (Jasper and Newton) were found to be a separate emission area due to distance from the Springfield urban center, status as a large employment center (>75,000 employees), and somewhat limited connection to the Springfield MSA. This finding led to the conclusion that Jasper and Newton Counties do not contribute to the downwind Hillcrest monitoring site.

To summarize, the recommendation for designations in the Springfield/Southwest Missouri region are as follows:

2006-08 design value	All counties in the region attainment
2005-07 design value	Springfield Nonattainment Area Greene, Christian, Taney, Stone
	Cedar County Nonattainment under Section 182(h)
	All other counties in the region attainment

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 Springfield 8-hour ozone nonattainment area. 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 (geography/topography, overall emission reductions).

Greene County

1) Largest emissions for both VOC (23.3 TPD) and NOx (44.1 TPD) in Southwest Missouri
2) Ozone monitoring for the 2005-07 period at the Hillcrest monitor shows a violation of the standard (77 parts per billion [ppb]); current 2006-08 data shows attainment of the standard (73 ppb)
3) Largest population in the area (263,980)
4) Core metropolitan area (Springfield) is in Greene County
5) Largest annual VMT in the area (2.1 billion VMT/year)
6) Meteorological analysis is supportive of frequent contribution
7) 27% population growth between 2000 and 2020 (over 300,000 in 2020)
8) Located in the Springfield MSA
9) Two largest industrial NOx sources are included in the Missouri statewide NOx rule and in CAIR

Jasper County

1) Second largest emission in Southwest Missouri for NOx (13.9 TPD) and third largest for VOC (13.4 TPD)
2) No ozone monitoring in the Joplin area (new monitoring will begin in 2009)
3) Second largest population in the area (115,240)
4) Limited connection to the core metropolitan area (Springfield) and contains part of its own economic/employment center
5) Second largest VMT in the area (1.2 billion VMT/year)
6) Meteorological analysis is supportive of contribution to El Dorado Springs monitor
7) 30% population growth between 2000 and 2020 (136,000 in 2020)
8) Located in the Joplin MSA and not contiguous with the Springfield MSA
9) Largest industrial NOx source is included in the Missouri statewide NOx rule and in CAIR

Taney County

1) Second largest emission in Southwest Missouri for VOC (15.0 TPD) and 5.1 TPD for NOx
2) No ozone monitoring in the Branson area
3) Population of less than 50,000 (45,721)
4) Some connection to the core metropolitan area (Springfield) 8,000 commuters per day from Branson area
5) Medium VMT (622 million VMT/year)

6) Meteorological analysis is supportive of contribution to the Hillcrest monitor
7) 49% population growth between 2000 and 2020 (59,000 in 2020)
8) Located in the Branson MSA and contiguous with the Springfield MSA

Newton County

1) Third largest emission in Southwest Missouri for NOx (7.1 TPD) and VOC (6.4 TPD)
2) No ozone monitoring in the Joplin area (new monitoring will begin in 2009)
3) Population of more than 50,000 (56,038)
4) Limited connection to the core metropolitan area (Springfield) and contains part of its own economic/employment center
5) Third largest VMT in the area (944 million/year)
6) Meteorological analysis is supportive of contribution to El Dorado Springs monitor
7) 18% population growth between 2000 and 2020 (62,000 in 2020)
8) Located in the Joplin MSA and not contiguous with the Springfield MSA

Stone County

1) Fourth largest emission in Southwest Missouri for VOC (10.8 TPD) and 5.1 TPD for NOx
2) No ozone monitoring in the Branson area
3) Population of less than 50,000 (31,552)
4) Some connection to the core metropolitan area (Springfield) 8,000 commuters per day from Branson area
5) Small VMT (400 million VMT/year)
6) Meteorological analysis is supportive of contribution to Hillcrest monitor
7) 31% population growth between 2000 and 2020 (40,000 in 2020)
8) Located in the Branson and contiguous with the Springfield MSA

Christian County

1) Combined emissions over 10 TPD (VOC - 5.6 TPD and NOx - 5.1 TPD)
2) No ozone monitoring in county
3) Second largest population in the Springfield MSA (73,066)
4) North central portion of county is contiguous with the Springfield metropolitan complex
5) Medium VMT (728 million VMT/year)
6) Meteorological analysis is supportive of contribution to Hillcrest monitor
7) Largest projected population growth in Missouri between 2000 and 2020 (nearly 100% - 107,000 in 2020)
8) Located in the Springfield MSA

Barry County

1) Combined emissions over 10 TPD (VOC - 7.0 TPD and NOx - 4.3 TPD)
2) No ozone monitoring in county
3) Population of less than 50,000 (36,197)
4) No strong connection to the Springfield or Joplin metropolitan areas
5) Low VMT (393 million VMT/year)
6) Meteorological analysis is somewhat supportive of contribution to both El Dorado Springs and Hillcrest monitor
7) 20% projected population growth between 2000 and 2020
8) Not located in or adjacent to the Springfield MSA

Lawrence County

1) Combined emissions over 10 TPD (VOC - 5.5 TPD and NOx - 5.6 TPD)
2) No ozone monitoring in county
3) Population of less than 50,000 (37,650)
4) Some connection to the Springfield or Joplin metropolitan area (I-44)
5) Medium VMT (851 million VMT/year)
6) Meteorological analysis is somewhat supportive of contribution to both El Dorado Springs and Hillcrest
7) 20% projected population growth between 2000 and 2020
8) Not located in, but adjacent to the Springfield MSA

Webster County

1) Combined emissions over 10 TPD (VOC - 4.7 TPD and NOx – 6.0 TPD)
2) No ozone monitoring in county
3) Population of less than 50,000 (35,927)
4) Somewhat connected to the Springfield metropolitan area (along I-44)
5) Medium VMT (689 million VMT/year)
6) Meteorological analysis is somewhat supportive of contribution to Hillcrest
7) 48% projected population growth between 2000 and 2020 (2020 population of 46,000)
8) Located in the Springfield MSA

Polk and Dallas Counties

1) Combined emissions under 10 TPD (Polk/Dallas VOC - 3.7 / 2.4 TPD and NOx – 3.5 / 1.8 TPD)
2) No ozone monitoring in counties
3) Population of less than 50,000 (Polk/Dallas - 30,216 / 16,831)
4) Some connection to the Springfield metropolitan area
5) Low VMT (Polk – 447 million and Dallas 216 million VMT/year)
6) Meteorological analysis suggests these counties are downwind of the Springfield area
7) Polk 34% and Dallas 27% projected population growth between 2000 and 2020 (2020 population of less than 40,000 for both counties)

8) Located in the Springfield MSA

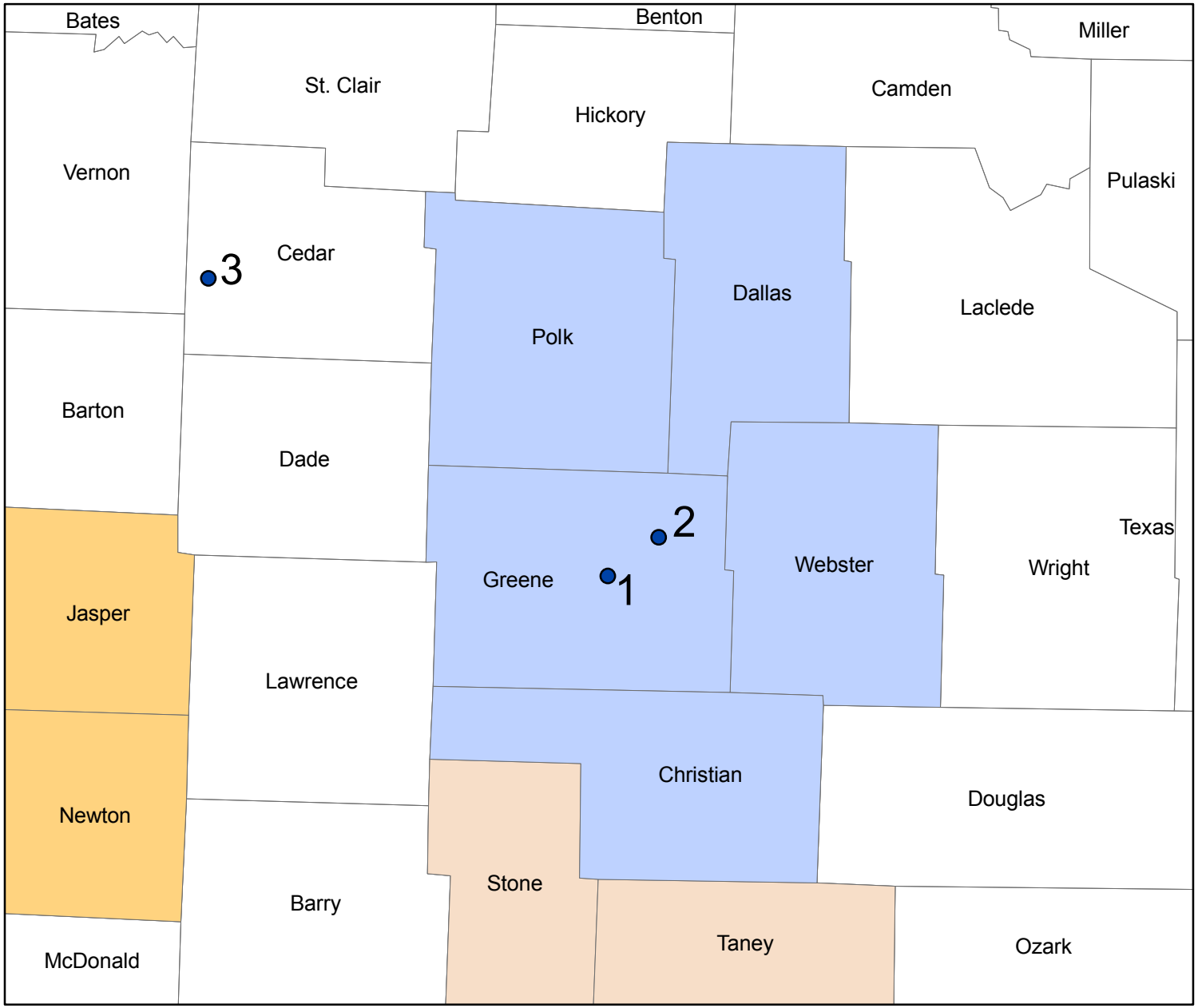
McDonald, Barton, and Dade Counties

1) Combined emissions under 10 TPD (all VOC less than 4.3 TPD and all NOx less than 3.7 TPD)
2) No ozone monitoring in counties
3) Population of less than 50,000 (all counties less than 25,000)
4) Limited connection to the Springfield metropolitan area
5) Low VMT (all counties less than 325 million VMT/year)
6) Meteorological analysis suggest these counties might contribute to the El Dorado Springs monitor
7) All counties are projected to grow less than 20% between 2000 and 2020 (2020 population of less than 30,000 for all counties)
8) Not located in, but Dade is adjacent to the Springfield MSA

Cedar County

1) Combined emissions under 10 TPD (VOC – 4.6 TPD and NOx – 2.1 TPD)
2) Ozone monitoring for 2005-07 at the El Dorado Springs monitor shows a violation of the standard (76 ppb); current 2006-08 data shows attainment of the standard (72 ppb)
3) Population of less than 50,000 (13,729)
4) Very limited connection to the Springfield metropolitan area
5) Low VMT (145 million VMT/year)
6) Meteorological analysis suggests this county is downwind of the Joplin/Tulsa or Northwest Arkansas areas
7) Projected population decrease between 2000 and 2020 (-1.7%)
8) Located not in, but adjacent to the Springfield MSA

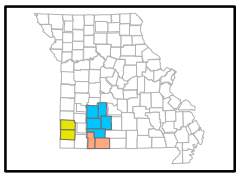
Figure SW1a - Ozone Sites and 06-08 Design Values



Ozone_sites
Springfield MSA
Joplin MSA
Branson MSA

- Site Name (ppb)
1 - Hillcrest (73)
2 - Fellows Lake (NA)
3 - El Dorado Springs (72)

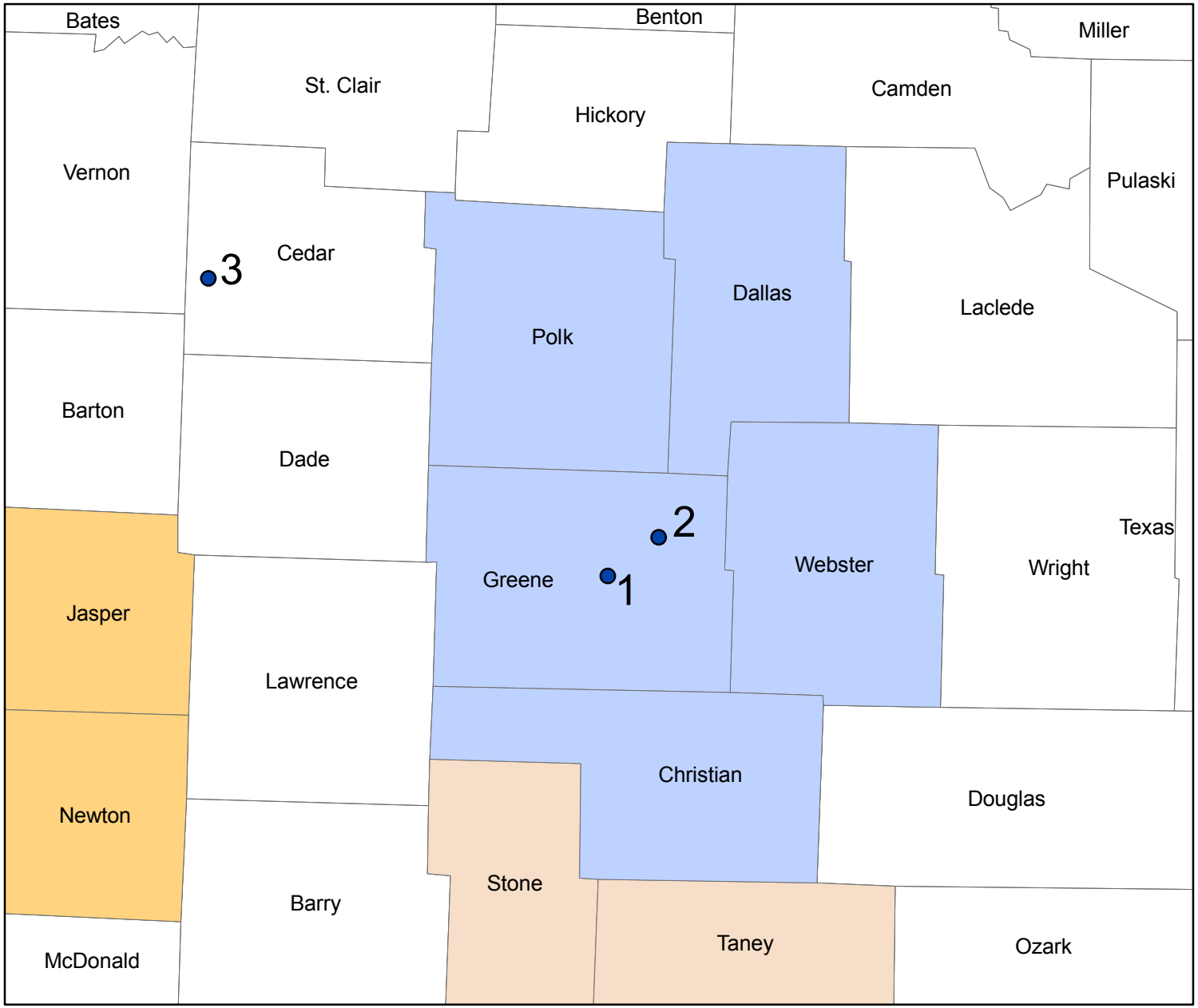
N



Department of Natural Resources
Division of Environmental Quality
Air Pollution Control Program
Prepared by Bern Johnson 18 FEB 09

0 20 40 80 Kilometers

Figure SW1b - Ozone Sites and 05-07 Design Values



Ozone_sites
Springfield MSA
Joplin MSA
Branson MSA

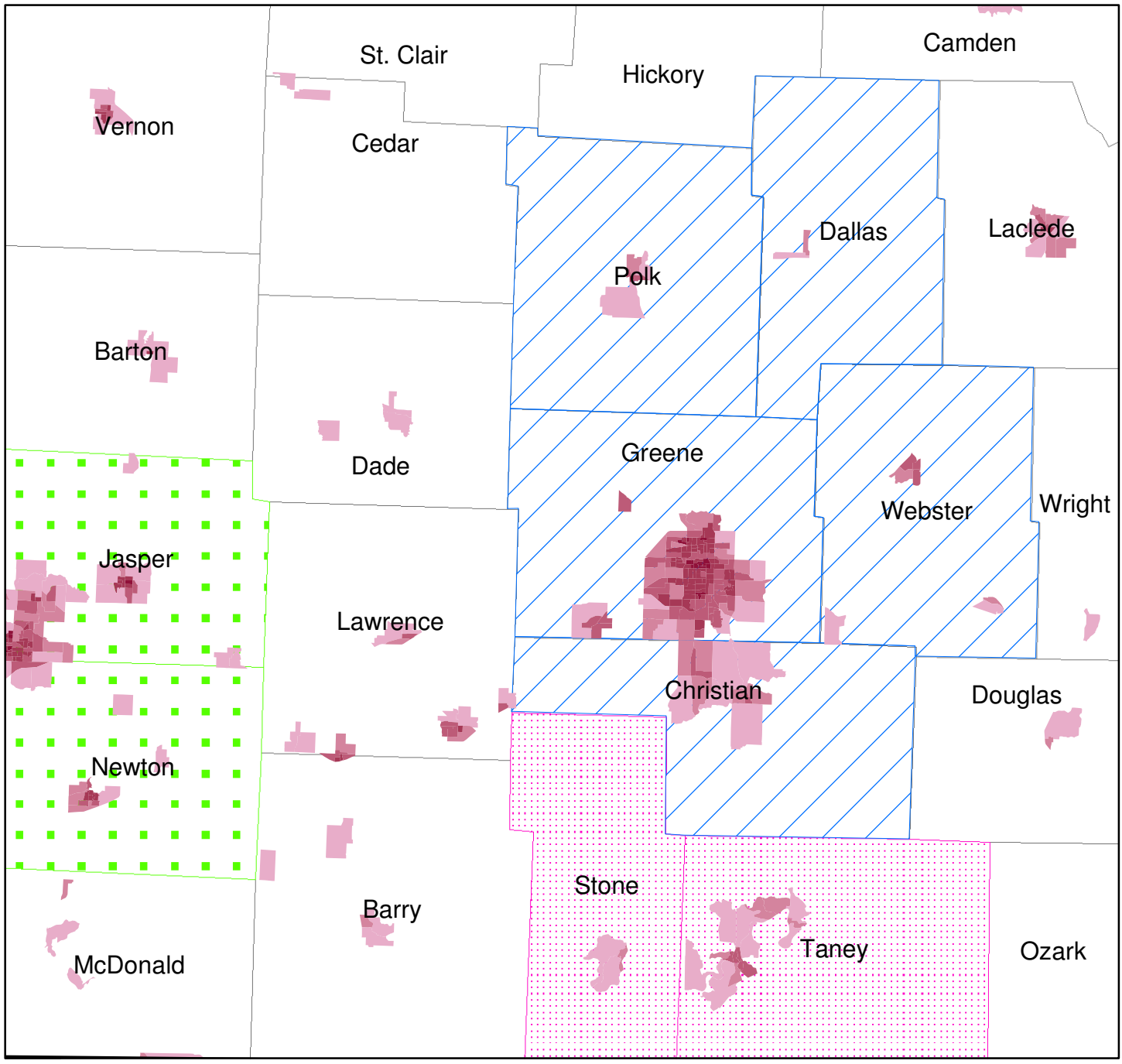
- Site Name (ppb)
1 - Hillcrest (77)
2 - Fellows Lake (NA)
3 - El Dorado Springs (76)

N

0 20 40 80 Kilometers

Department of Natural Resources
Division of Environmental Quality
Air Pollution Control Program
Prepared by Bern Johnson 18 FEB 09

Figure SW2 - Population Density 2000



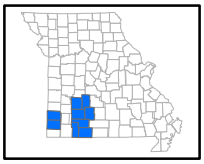
Population Density

Persons / sq mile

- 0 - 200
- 201 - 500
- 501 - 1,000
- 1,001 - 2,500
- 2,501 - 5,000
- > 5000

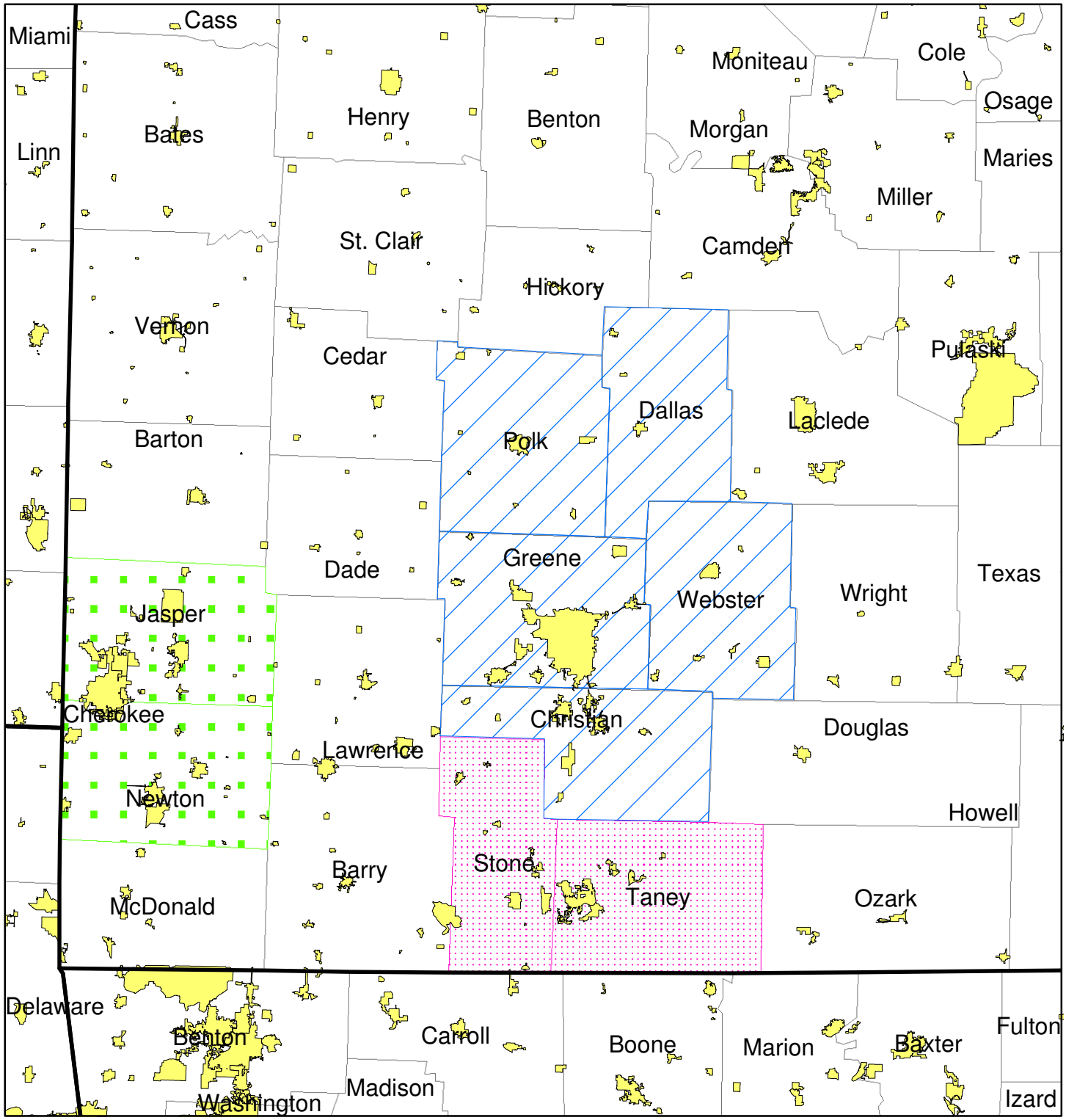
- Springfield MSA
- Joplin MSA
- Branson MSA

0 10 20 40 Kilometers



Department of Natural Resources
Division of Environmental Quality
Air Pollution Control Program
Prepared by Bern Johnson 9 JUL 2008

Figure SW3 - Urbanization 2000



Urban Areas

Springfield MSA

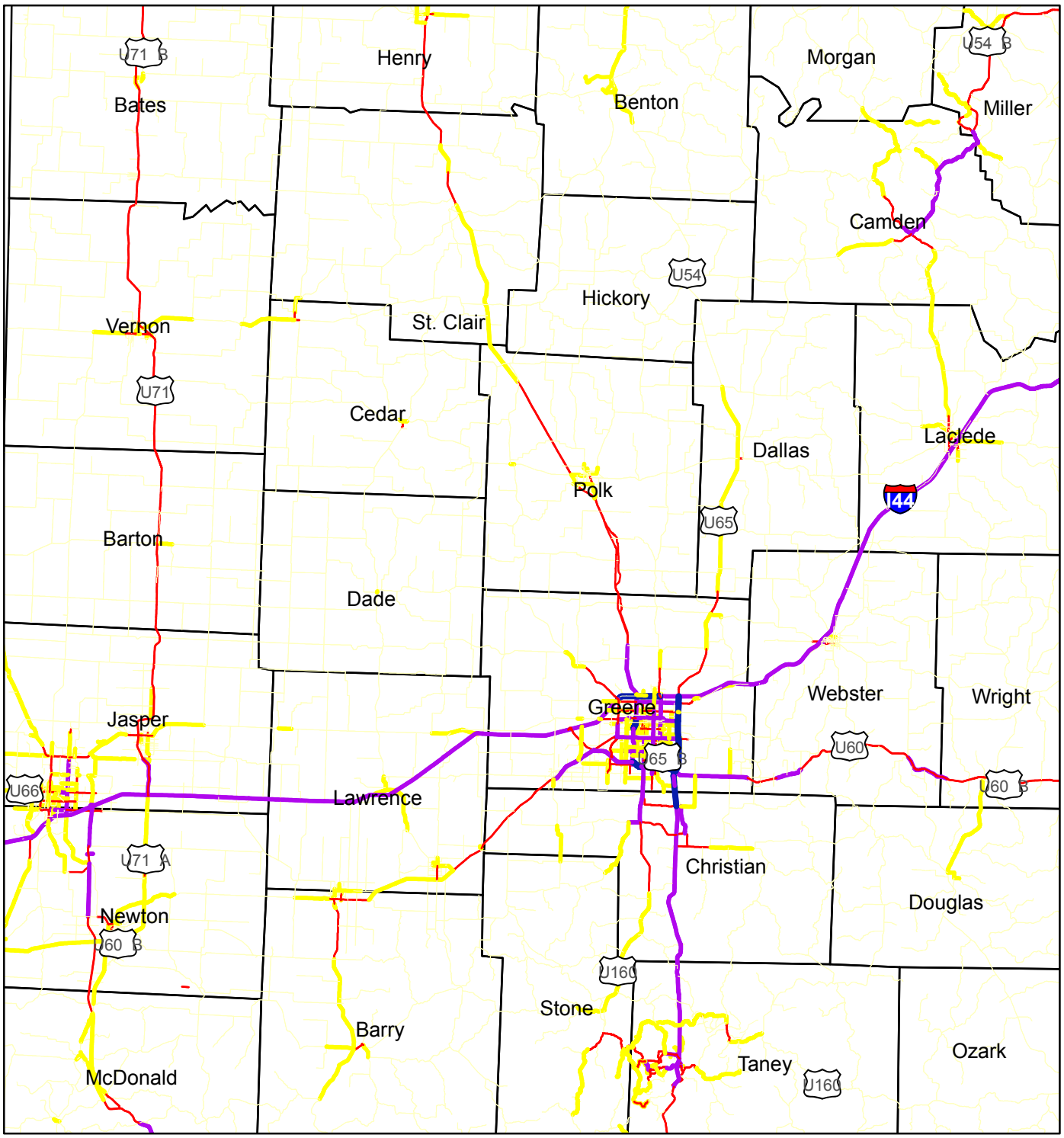
Joplin MSA

Branson MSA

0 10 20 40 Kilometers

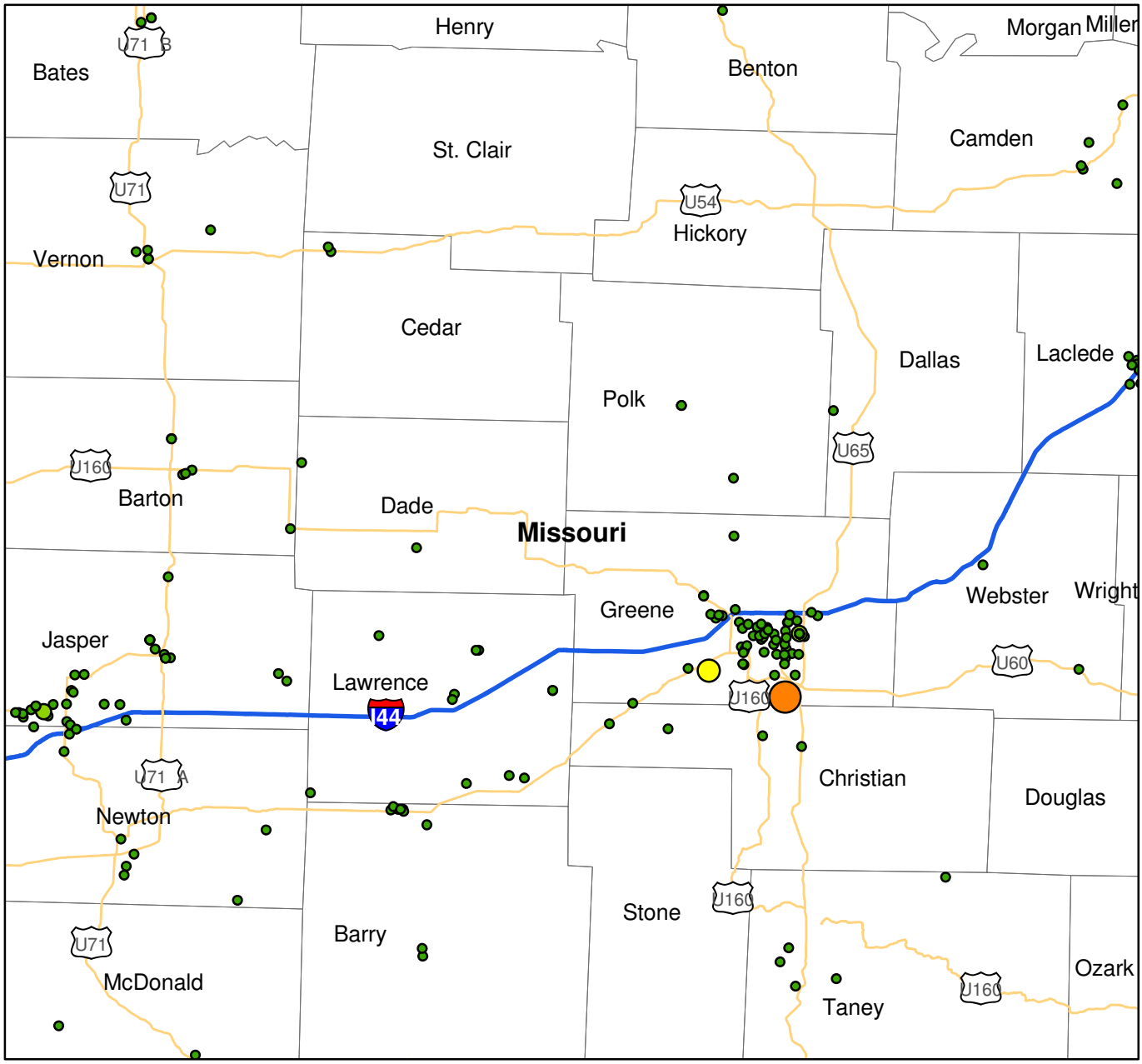
Department of Natural Resources
Division of Environmental Quality
Air Pollution Control Program
Prepared by Bern Johnson 9 JUL 2008

Figure SW4 - Traffic Count 2007



Missouri Department of Natural Resources
Division of Environmental Quality
Air Pollution Control Program
Prepared by Bern Johnson 5 SEP 2008

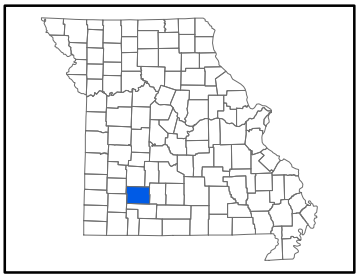
Figure SW5 - NOx Point Sources 2007



NOx emissions in tons per day

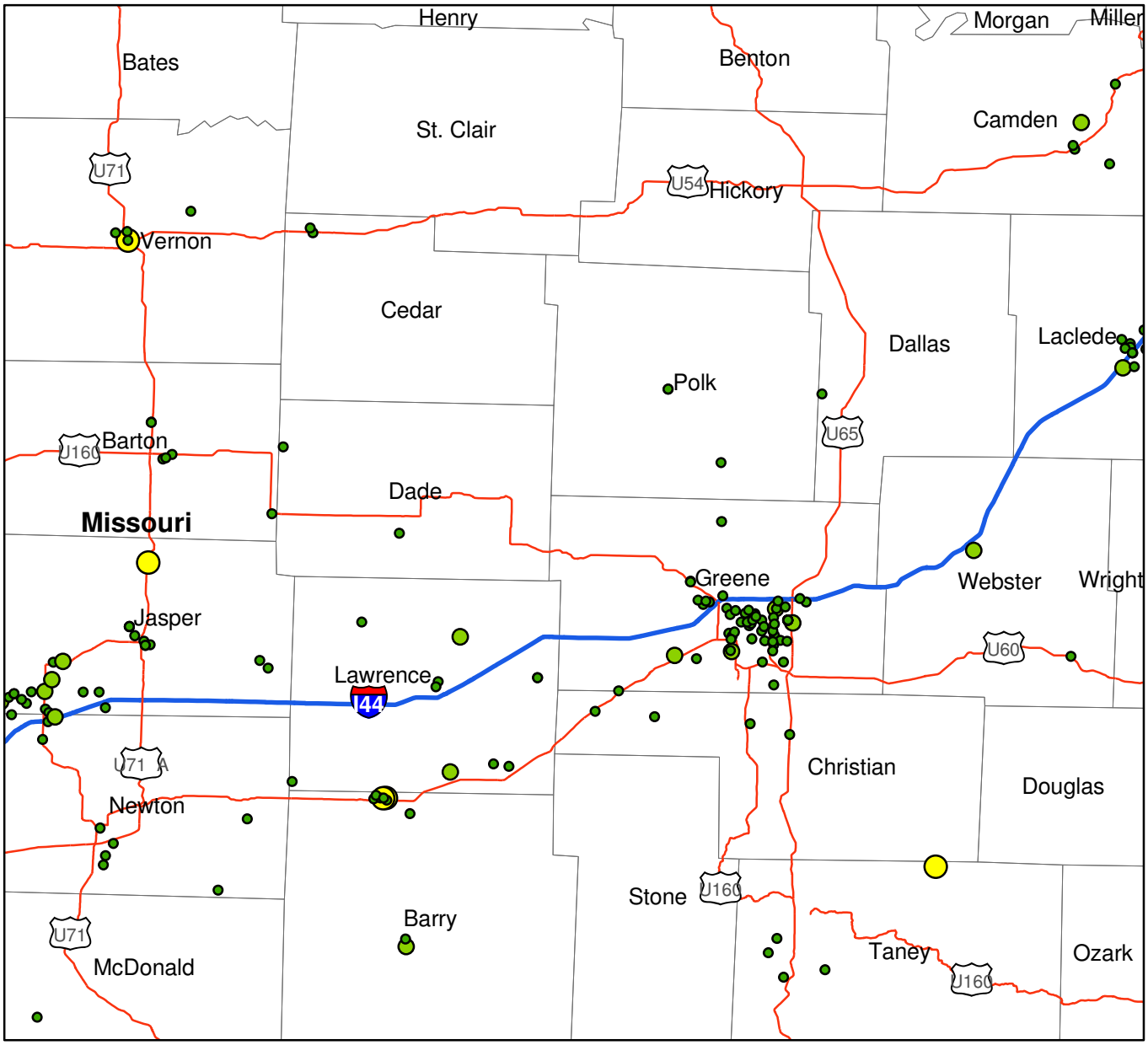
- 0 - 0.3
- 0.4 - 2
- 2.1 - 10
- 10.1 - 20
- > 20

0 12.5 25 50 Kilometers



Missouri Department of Natural Resources
Division of Environmental Quality
Air Pollution Control Program
Prepared by Bern Johnson 10 SEP 08

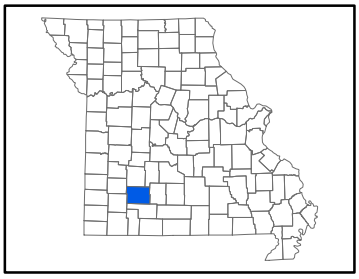
Figure SW6 - VOC Point Sources 2007



VOC emisssion in tons per day

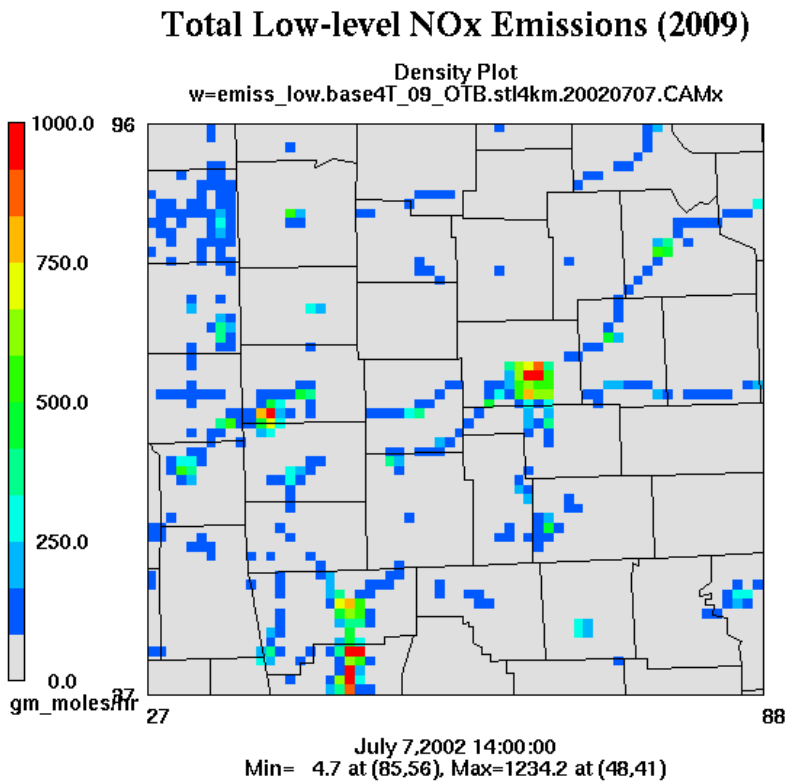
- 0 - 0.1
- 0.2 - 0.5
- 0.6 - 2
- 2.1 - 6
- > 6

0 12.5 25 50 Kilometers

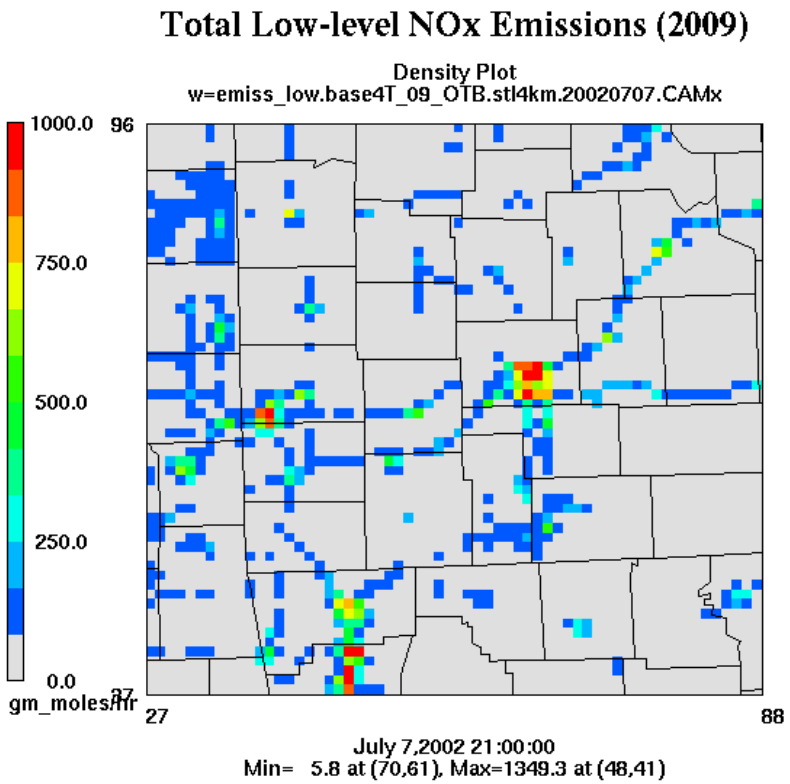


Missouri Department of Natural Resources
Division of Environmental Quality
Air Pollution Control Program
Prepared by Bern Johnson 22 SEP 08

Figure SW7 – NOx Emission Density

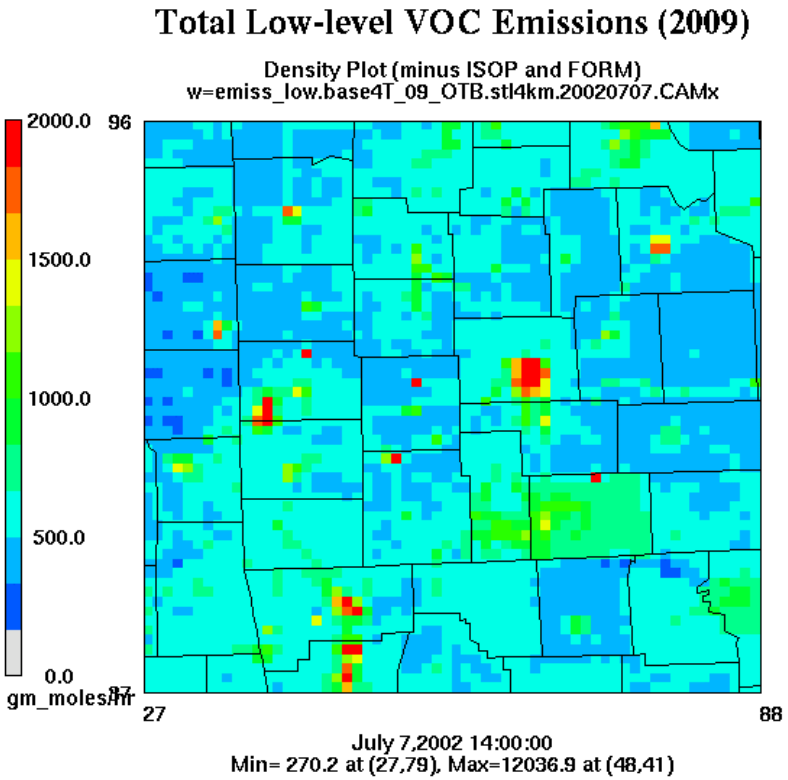


July 7, 2002 – 8 AM

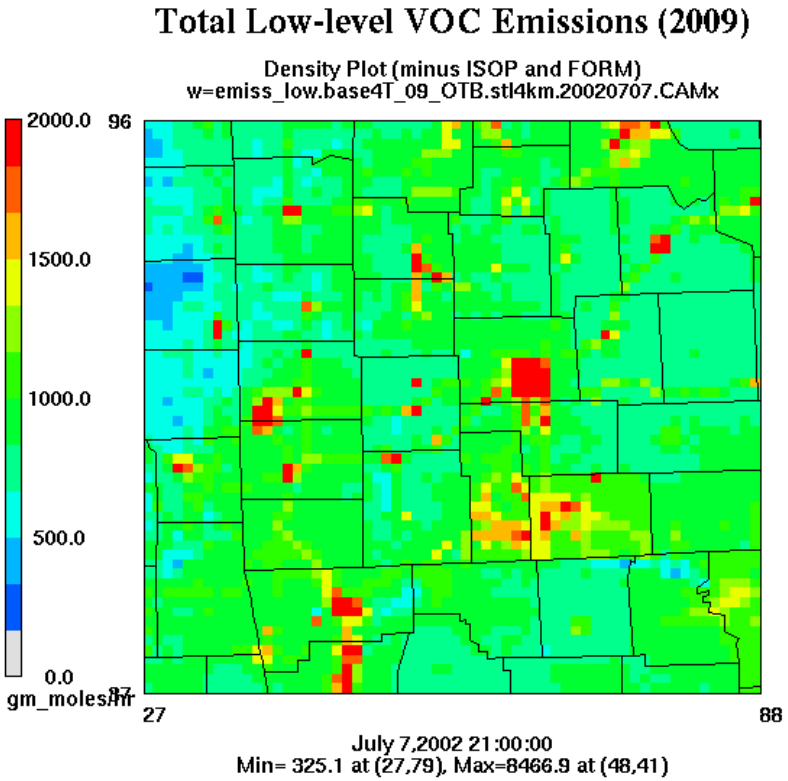


July 7, 2002 – 3 PM

Figure SW8 – VOC Emission Density



July 7, 2002 – 8 AM



July 7, 2002 – 3 PM

TABLE SW3

2009

COUNTY	2009 VOC Emission (TPD)	2009 NOx Emission (TPD)	2000 Population	2007 Population	2006 Employment	Million VMT per year	% VOC MSA	% NOx MSA	Pop. Growth 2000-07	Employment % (MSA)
GREENE	23.26	44.06	240,391	263,980	146,362	2592.4	58.8%	72.9%	9.8%	83.2%
CHRISTIAN	5.62	5.09	54,285	73,066	13,634	728.2	14.2%	8.4%	34.6%	7.8%
WEBSTER	4.66	6.04	31,045	35,927	5,530	851.2	11.8%	10.0%	15.7%	3.1%
DALLAS	2.39	1.75	15,661	16,831	2,736	216.2	6.0%	2.9%	7.5%	1.6%
POLK	3.63	3.49	26,992	30,216	7,585	447.2	9.2%	5.8%	11.9%	4.3%
MSA TOTAL	39.56	60.42	368,374	420,020	175,847	4,835.1	100.0%	100.0%	14.0%	100.0%
Cedar	4.61	2.07	13,733	13,729	2,785	144.7	11.7%	3.4%	0.0%	1.6%
Dade	2.82	2.00	7,923	7,523	1,442	94.7	7.1%	3.3%	-5.0%	0.8%
Lawrence	5.48	5.56	35,204	37,650	7,587	688.5	13.8%	9.2%	6.9%	4.3%
Barry	6.97	4.32	34,010	36,197	15,121	393.3	17.6%	7.1%	6.4%	8.6%
Stone	10.77	3.62	28,658	31,552	5,689	394.9	27.2%	6.0%	10.1%	3.2%
Taney	14.96	5.13	39,703	45,721	21,631	622.8	37.8%	8.5%	15.2%	12.3%
McDonald	4.33	2.90	21,681	22,895	5,535	323.7	10.9%	4.8%	5.6%	3.1%
Newton	6.42	7.07	52,636	56,038	17,061	944.1	16.2%	11.7%	6.5%	9.7%
Jasper	13.36	13.85	104,686	115,240	55,716	1235.0	33.8%	22.9%	10.1%	31.7%
Barton	2.75	3.71	12,541	12,719	4,631	258.6	6.9%	6.1%	1.4%	2.6%

2006 Employment Data from County Business Patterns dataset

TABLE SW4

County	2000	2010	2020	2030	00-10 Growth %	00-20 Growth %
GREENE	240,391	272,322	305,012	329,825	13.3%	26.9%
CHRISTIAN	54,285	79,937	107,318	131,066	47.3%	97.7%
WEBSTER	31,045	37,946	45,880	53,282	22.2%	47.8%
POLK	26,992	31,470	36,172	40,139	16.6%	34.0%
DALLAS	15,661	17,432	19,984	22,172	11.3%	27.6%
Jasper	104,686	119,317	136,389	152,490	14.0%	30.3%
Newton	52,636	57,265	62,218	66,663	8.8%	18.2%
Taney	39,703	48,463	59,227	68,041	22.1%	49.2%
Lawrence	35,204	38,905	43,272	47,249	10.5%	22.9%
Barry	34,010	37,072	40,917	44,295	9.0%	20.3%
Stone	28,658	32,994	37,427	40,346	15.1%	30.6%
McDonald	21,681	23,401	25,625	28,078	7.9%	18.2%
Cedar	13,733	13,756	13,493	13,207	0.2%	-1.7%
Barton	12,541	12,910	13,173	13,730	2.9%	5.0%
Dade	7,923	7,559	7,294	6,977	-4.6%	-7.9%

Table SW5

Place of Residence/Employment Matrix (County by County)

Missouri Residence	Employment										
	Barry	Barton	Cedar	Christian	Dade	Dallas	Greene	Jasper	Lawrence	McDonald	Newton
Greene	716	59	205	3,596	183	167	84,773	1,279	875	64	312
Christian	206	16	37	6,333	21	39	13,861	341	332	31	75
Webster	74	20	15	336	28	60	6,246	133	120	19	30
Polk	32	9	146	175	50	306	3,372	147	81	11	24
Dallas	20	2	18	40	4	1,155	837	24	24	22	6
Jasper	516	543	16	141	61	15	2,234	29,193	399	322	6,163
Newton	700	70	14	89	26	14	873	6,945	204	774	10,438
Taney	42	7	5	256	2	6	1,211	152	23	19	47
Lawrence	2,699	38	12	156	61	17	1,873	469	4,053	26	178
Barry	7,274	45	6	85	13	3	751	303	860	67	218
Stone	393	16	5	429	8	4	1,501	133	238	18	35
McDonald	88	6	1	14	2	1	98	196	10	2,114	776
Barton	49	3,343	35	22	110	7	170	660	44	13	158
Cedar	27	223	2,229	22	113	26	252	72	40	0	25
Dade	37	232	28	26	1,108	4	534	85	90	1	18
Springfield MSA	1,048	106	421	10,480	286	1,727	109,089	1,924	1,432	147	447
Missouri Total	12,873	4,629	2,772	11,720	1,790	1,824	118,586	40,132	7,393	3,501	18,503
Joplin MSA	1,216	613	30	230	87	29	3,107	36,138	603	1,096	16,601
Connect Total	15,416	5,704	3,784	13,711	2,610	2,752	145,580	50,488	8,359	6,645	25,460

Missouri Residence	Employment Polk	Stone	Taney	Webster	Joplin MSA	Total	Springfield MSA	Total Residents Who Work	% Work in MSA	% Work in County
Greene	663	508	1,850	764	1,591	96,014	89,963	118,211	76.10%	71.71%
Christian	102	360	1,371	204	416	23,329	20,539	27,049	75.93%	23.41%
Webster	47	56	225	3,720	163	11,129	10,409	13,329	78.09%	27.91%
Polk	4,775	17	90	37	171	9,272	8,665	11,606	74.66%	41.14%
Dallas	159	4	27	55	30	2,397	2,246	6,327	35.50%	18.26%
Jasper	61	59	214	56	35,356	39,993	2,507	46,387	5.40%	62.93%
Newton	31	33	126	23	17,383	20,360	1,030	23,461	4.39%	44.49%
Taney	14	472	12,367	37	199	14,660	1,524	18,191	8.38%	67.98%
Lawrence	36	112	105	42	647	9,877	2,124	15,521	13.68%	26.11%
Barry	10	119	119	50	521	9,923	899	12,930	6.95%	56.26%
Stone	31	2,786	3,463	29	168	9,089	1,994	11,110	17.95%	25.08%
McDonald	2	8	13	2	972	3,331	117	6,993	1.67%	30.23%
Barton	17	470	6	17	818	5,121	233	5,294	4.40%	63.15%
Cedar	233	16	19	21	97	3,318	554	5,091	10.88%	43.78%
Dade	58	3	7	12	103	2,243	634	3,342	18.97%	33.15%
Springfield MSA	5,746	945	3,563	4,780		142,141		176,522		
Missouri Total	6,239	5,023	20,002	5,069		260,056		324,842	40.58%	
Joplin MSA	92	92	340	79						
Connect Total	7,641	5,423	25,884	6,288						

	Working in MSA Living in	Living in MSA Working in	Working in Joplin MSA Living In	Living in Joplin MSA Working In
GREENE	89,963	109089	1,591	3107
CHRISTIAN	20,539	10480	416	230
WEBSTER	10,409	4780	163	79
POLK	8,665	5746	171	92
DALLAS	2,246	1727	30	29
Jasper	2,507	1924	35,356	36138
Newton	1,030	447	17,383	16601
Taney	1,524	3563	199	340
Lawrence	2,124	1432	647	603
Barry	899	1048	521	1216
Stone	1,994	945	168	92
McDonald	117	147	972	1096
Barton	233	106	818	613
Cedar	554	421	97	30
Dade	634	286	103	87

Missouri
Department of
Natural Resources

METEOROLOGY OF 8-HOUR OZONE FORMATION IN MISSOURI

The Environmental Protection Agency has defined the ozone season for Missouri as April 1st through October 31st. During this time, the synoptic scale climatological pattern over Missouri is one in which local weather conditions are dominated by subtle shifts in the position of the Bermuda high located over the western Atlantic Ocean. The flow around this high-pressure center typically brings southerly flow to the region along with warm, humid air that often leads to hazy conditions during the summer months. Other smaller-scale weather features that accompany the dominant Bermuda high – transient features such as frontal boundaries and thunderstorms can create highly variable spatial and temporal ozone concentrations.

In order to reduce the frequency and severity of future ozone exceedances, the Department's Air Pollution Control Program (APCP) conducted a study to identify key meteorological conditions that repeatedly led to ozone concentrations in excess of 75 parts per billion. Due to spatial, climate and/or source location differences the analysis was divided into Springfield, Kansas City, St. Louis and Southeast and Southwest Missouri regions. The meteorological parameters the APCP staff determined significant were analyzed using synoptic scale, mesoscale, and microscale information. The analysis included the identification of meteorological regimes, an air parcel trajectory analysis, and a wind rose evaluation.

The identification of the meteorological regimes revealed that the severity of meteorological conditions necessary to cause 8-hour ozone exceedances under the previous standard of 85 parts per billion did not have to be present for 8-hour ozone exceedances to occur under the revised standard of 75 parts per billion. Using air parcel trajectories, the transport path of pollution during and prior to exceedance days was revealed, which indicated where the plume was traveling from. Likewise, the wind rose plots provided an indication of localized pollution movement during the ozone season.

It is important to note that this evaluation is essential because it can aide in the selection of episodes for photochemical modeling, the determination of control strategies, tracking trends in ozone concentrations, and identifying areas that have emission sources which contribute to elevated ozone. The steps taken to during this analysis are documented below along with the results obtained from the analysis.

AIR QUALITY MONITORING AND METEOROLOGICAL DATA

Ambient air quality monitoring and meteorological data for the most recent five year period in which comprehensive data was available was selected for this analysis. The five year period included the following years: 2003, 2004, 2005, 2006, and 2007. The use of the latest five years of air quality data reduced concern regarding significant differences in ozone precursor emissions due to controls and/or growth within each area. However, the use of five years does

not provide a comprehensive examination of all meteorological conditions that will cause exceedances of the 8-hour ozone National Ambient Air Quality Standard (NAAQS).

For the purposes of this study, an ozone event was defined as one or more day(s) that either had concentrations over the 8-hour ozone NAAQS (75 parts per billion) or days that were part of an increasing pattern of ozone in the region. The days leading up to ozone concentrations in excess of the NAAQS allowed data reviewers to determine what type of meteorological pattern was in place during ozone events. The identification of these events will also provide valuable information regarding the appropriateness of these potential episodes for input into future photochemical modeling studies that may be required under the Clean Air Act. The events identified for the Springfield, Kansas City, St. Louis and Southeast and Southwest Missouri regions are contained in Tables 1, 2, 3, 4A, and 4B respectively.

Surface maps, 850 hectopascal (hPa) maps, and hourly surface data concerning the meteorological conditions surrounding these ozone events were obtained from the National Climatic Data Center (NCDC). The hourly surface data included National Weather Service ASOS measurements from the Springfield regional Airport (KSGF), Kansas City International Airport (KMCI), Lambert International Airport (KSTL), and St. Louis Downtown Airport (KCPS).

METEOROLOGICAL REGIME DEVELOPMENT

In order to identify typical meteorological conditions that led to elevated 8-hour ozone concentrations, the Department's Air Pollution Control Program reviewed each day contained within Tables 1, 2, 3, 4A and 4B. The events chosen for this analysis were based upon concentrations approaching, or exceeding the NAAQS standard of 75 parts per billion, and the majority of 8-hour exceedances were multi-day events, or "episodes".

Under the previous 8-hour ozone NAAQS of 85 ppb, only the very favorable conditions would produce monitored exceedances. To get an eight hour average reading over 85 ppb meant that solar, wind and thermal profiles had to coincide and persist for several hours. With the lowered 8-hour standard of 75 ppb, the weather pattern of influence did not necessarily require the strength or persistence of solar, wind, or thermal profiles as under the previous NAAQS. When developing regimes to categorize the ozone exceedance days, some of these less-ideal setups did not fit into a broad category of synoptic scale flow as analyzed in previous years. Instead, a smaller mesoscale or microscale weather feature was the dominant influence over ozone readings in a given area. The meteorological regimes identified in this section refer to the prevailing synoptic, mesoscale, or microscale meteorological conditions that impacted the monitor area of interest.

The weather systems influencing the formation, concentration, and transport of ozone and it's precursors vary in size and duration from the large synoptic scale features such as a Bermuda high, to smaller transient mesoscale high pressure systems, to narrow, microscale fronts. Because ozone forms in the presence of sunlight, weather features that affect the duration and intensity of incoming solar radiation, or insolation, are very influential on monitored ozone concentrations. Subsidence, or sinking motion, can concentrate ozone near the surface; the proximity of a mesoscale center of high pressure can be influential on ozone concentration on

small time and area scales. The horizontal near-field transportation of ozone is primarily determined by the low level wind direction and speed, both of which are determined by the prevailing pressure pattern at a regional or local scale.

Because of the transient nature of weather systems, the regime of influence may change for a given Missouri location over an ozone episode. In addition, when smaller scale weather features are the dominant influence on ozone exceedance, the regime classification may differ across the state on any given day. Maps containing examples of the synoptic conditions associated with each regime are contained in Figures 1 - 7. The maps were provided by the National Climatic Data Center (NCDC).

Meteorological Regime #1: "Progressive Northerly Flow"

Synoptic Features

Regime #1 occurs as a mobile high pressure system develops over the Ohio Valley or Great Lakes and moves toward the east coast. Frontal systems are often present over the Northern Plains and/or the Lower Mississippi Valley or Southeast United States. The large-scale surface wind flow over Missouri is from the east to south. Regime #1 frequently transitions into Regime #2 as the center of high pressure moves east off the Atlantic coast. Days, monitors that exceeded, and the values of the monitors that exceeded from Regime #1 can be found in Table 5.

Meteorological Regime #2: "Bermuda High"

Synoptic Features

Regime #2 occurs as a strong Bermuda high forms over the Atlantic Coast. The high pressure center may be present over the Southeastern US, Mid-Atlantic US, or off the Atlantic coast. The strength and location of the Bermuda high will determine the southern extent of a common frontal boundary that lies north of Missouri across the northern Plains. The large-scale surface flow is generally from the south across Missouri with Regime #2. It is important to note that this is a persistent pattern that generally lasts multiple days and often leads to severe ozone episodes. This regime can transition to Regime #3 if the Bermuda High moves southeast or weakens, allowing the frontal boundary north of Missouri to advance south through the state or Regime #6 if the front stalls over Missouri. This regime can also transition to Regime #7 if a secondary high center develops near Missouri and becomes the dominant influence over ozone formation and transport. Days, monitors that exceeded, and the values of the monitors that exceeded from Regime #2 can be found in Table 5.

Meteorological Regime #3: "Frontal Passage"

Synoptic Features

The synoptic setup over Missouri is usually in transition with Regime #3; one air mass is being displaced as a frontal boundary moves across an area of interest. The front acts on the microscale to concentrate and push the ozone plume in the direction of frontal motion. A specific pattern in monitor exceedances had to be seen across the area of interest, and wind flow patterns vary depending on the direction of air mass and frontal motion. This regime can transition into Regime #4 or #5 depending on the location of high pressure behind the front and proximity of a secondary front. Days, monitors that exceeded, and the values of the monitors that exceeded from Regime #3 can be found in Table 5.

Meteorological Regime #4: "Transient Northern High"

Synoptic Features

Regime #4 represents a localized high pressure system that moves towards the south from the Iowa vicinity into Missouri and then continues on an eastward path. This system is smaller in scale than the Bermuda high, bringing with it generally light easterly winds, subsidence, and clear skies. Days, monitors that exceeded, and the values of the monitors that exceeded from Regime #4 can be found in Table 5.

Meteorological Regime #5: "The Box"

Synoptic Features

This less-frequent regime occurs as an initial frontal boundary passes through Missouri and high pressure builds in behind the front. A second front approaches Missouri from the west and acts to trap pollutants in the lowest levels of the atmosphere between the boundaries, essentially boxing in the state of Missouri. Days, monitors that exceeded, and the values of the monitors that exceeded from Regime #5 can be found in Table 5.

Meteorological Regime #6: "Stationary Front"

Synoptic Features

As high pressure builds over the eastern US, a stationary front lies in an east-west orientation across Missouri. The boundary advances and retreats little over the course of several days. Each small push acts to concentrate ozone on one side of the boundary and push it toward a specific portion of the area of interest. Large scale wind flow is light and usually converges at the stationary frontal boundary. If the frontal boundary eventually migrates north of Missouri and a Bermuda high builds southeast of Missouri, then Regime #6 can transition to Regime #2. Days, monitors that exceeded, and the values of the monitors that exceeded from Regime #6 can be found in Table 5.

Meteorological Regime #7: "Bermuda High Retrogrades/Subsidence"

Synoptic Features

With the strong Bermuda High southeast of Missouri, secondary weaker centers of high pressure form near or just south of Missouri. These smaller highs tend to create light winds over the state, bring stronger subsidence to the region, and show little movement. Days, monitors that exceeded, and the values of the monitors that exceeded from Regime #7 can be found in Table 5.

METEOROLOGY AND SEVERITY/FREQUENCY OF OZONE EPISODES BASED ON REGIME

The number of monitor sites exceeding 75 parts per billion and the relative concentration reported at each site revealed that the severity and frequency of each ozone event differed from the Springfield, Kansas City, St. Louis, Southeast and Southwest Missouri regions. Additionally, when each day was placed within its meteorological regime it was noted that although the regimes overlap, the synoptic pattern leading to the most frequent and severe ozone concentrations also varied across the state, see Table 5.

In the St. Louis region the meteorological conditions associated with Regimes #2, #3, #5, #6, and #7 all resulted in at least one monitor reporting 8-hour concentrations greater than 100 parts per billion during the 5 year period; however, only Regimes #2, #3, #5 and #7 had multiple monitor exceedances over this threshold. Regimes #1 and #4 remained below 100 parts per billion.

In the Kansas City region the meteorological conditions associated with Regimes #2, #5, and #7 resulted in 8-hour average ozone concentrations exceeding 100 parts per billion. Only Regime #2 had multiple monitor exceedances over the 100 parts per billion threshold. The remaining regimes all had concentrations less than 100 parts per billion.

The Springfield and Southeast and Southwest Missouri regions had no exceedances greater than the 100 parts per billion threshold.

In addition to reviewing the severity of ozone concentrations under certain meteorological conditions, the likelihood that ozone concentrations in excess of the 8-hour ozone standard would occur was evaluated. In the St. Louis region, Regimes #1 and #2 occurred most frequently and often were associated with the same episode. Regimes #3, #4, and #7 all regularly occurred, with Regimes #5 and #6 being the least frequent.

Much like St. Louis, the Kansas City region had the most frequent ozone exceedances occur under Regimes #1 and #2. Unlike St. Louis, the Kansas City region only had Regimes #4 and #7 occur regularly, leaving the frontal passage regime, Regime #3, as a less frequent regime. Along with Regime #3, Regimes #5 and #6 also were relatively infrequent when compared to Regimes #1, #2, #4, and #7.

The Springfield region also had Regimes #1 and #2 result in the most frequent ozone exceedances. Like St. Louis, Regimes #3, #4, and #7 were the next most frequent, with Regimes #5 and #6 not occurring at all.

The Southeast and Southwest Missouri regions had Regimes #1, #2 and #3 occurring most frequently, with Regime #3 occurring as frontal passages through the St. Louis and Kansas City regions pushed ozone concentrations towards the El Dorado Springs, Bonne Terre, and Farrar monitors. Regimes #4, #5, and #7 were the next most frequent, with Regime #6 not occurring at all. It is important to note that since the Southeast and Southwest Missouri monitors are spread over a large area, comparing the frequencies of these regimes may not be as significant.

When looking specifically at the Farrar monitor, it showed the same pattern of meteorological regime influences. For the 36 days when the Farrar monitor exceeded the 8-hour average of 75 ppb, almost half of the days were under Regime #2 (see Table 6), under the influence of the Bermuda High. The southerly winds that dominate with Regime #2 do not favor ozone or precursor transport from St. Louis directly influencing the Farrar monitor; instead, the dominant southerly wind direction would indicate an influence from the Memphis area. Regimes #1 and #7 together account for another almost 38% of Farrar exceedance days, and with both regimes the dominant wind is from the east, suggesting an influence from the Ohio Valley. Meteorological Regime #3 on June 9, 2006 was analyzed with a frontal passage from north to south across the St. Louis area, favoring the transport of ozone and it's precursors toward the Farrar monitor; this is the only case out of 36 Farrar exceedance days where the meteorological regime favored St. Louis as an ozone source region for Farrar.

Bonne Terre exceedances number 41 days with 8-hour average ozone readings over 75 ppb between 2003 and 2007; meteorological Regimes #1, #2, and #3 account for over 70% of exceedance days. The general wind flow pattern with Regimes #1 and #2 are from the southwest to the east, all directions that favor transport regions from far southern Missouri or the Memphis region east to the Ohio Valley. Regime #3, associated with frontal passages that concentrate and transport ozone or its precursors, has a varied dominant wind direction because of the localized areal and temporal nature of frontal boundaries. On three of the nine frontal passage regime days, August 22, 2003, July 22, 2005, and June 9, 2006, frontal passages through the eastern half of Missouri created wind flow patterns passing south from St. Louis toward the Bonne Terre monitor site. These numbers indicate that less than 10% of Bonne Terre exceedances can be attributed to St. Louis when looking strictly at meteorological regimes. For a further analysis of Bonne Terre exceedances, see Table 7.

When comparing the Southeast exceedance regimes, notable differences were apparent. A higher percentage of Regime #1 exceedances occurred for Bonne Terre than Farrar. With a dominant easterly wind flow under Regime #1, a simple comparison shows that the transport region east of Bonne Terre contributes more toward the number of exceedances than does the region directly east of Farrar. In contrast, there is a higher percentage of Regime #2 occurrences on Farrar exceedance days than Bonne Terre; this result suggests that the transport region southwest to southeast of Farrar (mainly along the Mississippi and Ohio River corridors) contributes to more exceedances than the area southwest to southeast of Bonne Terre (mainly southeastern Missouri). Regime #3 exceedances that can be attributed to a general wind flow

from St. Louis were also more frequent for Bonne Terre than Farrar, possibly because Bonne Terre is closer to St. Louis.

The El Dorado Springs monitor is located between Kansas City and Springfield, and it experienced exceedances on 25 days from 2003 to 2007. The most frequent regime again is Regime #2 with 40% of days attributed to a Bermuda High pressure bringing general southerly flow to southwest Missouri, but subtle differences from SE to SW cause the source region of influence to vary. On five days, Springfield is more of an influence on the El Dorado Springs monitor under Regime #2 because of southeasterly flow and Springfield's upwind position, but three days showed more southwesterly flow, suggesting southeast Kansas or northeastern Oklahoma were the source regions of interest. The next most prevalent regime was #3 with a quarter of the events occurring with a frontal passage; the subtle deviation in wind direction away from south suggests transport regions from Oklahoma to Springfield. Regimes #1, #4, #5 and #6 do not indicate direct influences from either Kansas City or Springfield, leaving open the possibility of other transport regions. For a further analysis of El Dorado Springs exceedances, see Table 8.

The most notable difference in ozone exceedance regime between regions was the frequency of Regime #2. The St. Louis region had significantly more occurrences than the other regions. Being closer in proximity to the Bermuda High, St. Louis was more significantly influenced by this summer climatological feature, resulting in the higher number of Regime #2 events in St. Louis. Also important to note is that Regime #3 ozone exceedances were noted more frequently in the St. Louis and Kansas City regions than in the Springfield region. This occurred as fronts often stalled and/or fell apart prior to reaching southern Missouri. Ozone may have been focused and concentrated downwind of Springfield on frontal passage days, but with only two monitor locations, the direction of plume movement may not have been captured by the network.

Tables 9-12 were also used in the frequency/severity analysis. Table 9 includes the number of regime exceedances per year broken down by region. Table 10 is an incremental breakdown by monitor and by regime. Table 11 is broken down into the increments that were used in the trajectory analysis. More information on Table 11 can be found in the trajectory analysis section below. Table 12 includes exceedances by site and by regime for all levels of exceedance.

The analysis of the meteorological regimes and the exceedances associated with each provides insight into the severity of ozone episodes and the typical weather patterns that occurred. In agreement with the 2003 Eight Hour Ozone Boundary Recommendation, typically the most severe Missouri ozone episodes occurred with a strong, persistent Bermuda high pattern. The current analysis also points to a broadening of the weather patterns associated with exceedances of the new lowered 8-hour ozone standard.

TRAJECTORY ANALYSIS

Trajectory plots were created in order to understand air movement on a sub-regional scale. This understanding is important because it helps determine the main transport corridors where pollution sources can have downwind impacts and as a result cause elevated ozone concentrations.

Trajectory plots present an aerial view of the path an air parcel travels both horizontally and vertically before reaching its final destination. Ozone exceedances measured at a monitor location are directly influenced by transport of ozone precursors prior to the exceedance time and date; therefore, back trajectories were used to help identify the dominant precursor transport corridors.

The trajectory evaluation was conducted for every 8-hour ozone exceedance day at all monitors during 2003, 2004, 2005, 2006 and 2007 using the Hybrid Single-Particle Langrangian Integrated Trajectory (HYSPLIT) model. The model start time was at 00 Coordinated Universal Time (UTC) the day following the exceedance (either 6 pm or 7 pm local time on the day of the 8-hour average exceedance) and the air parcel was modeled to see the horizontal and vertical transport during the previous 24 hours. This start time captured the afternoon/morning hours of the exceedance date and the night from the day prior.

The HYSPLIT model allows the user to specify the type of meteorological dataset that will be used to compute the trajectory plots. For 2003, Eta Data Assimilation System (EDAS) data with a horizontal resolution of 80 km was used, and for 2004 - 2007 the newly available and higher-resolution 40 km horizontal resolution EDAS data was used. EDAS data covers the continental United States and contains three-hourly grids of wind, temperature, moisture, and surface characteristics; higher resolution data (the smallest available grid size) was chosen because the fine-scale details of flow patterns will be better depicted compared to a coarser grid. In all cases, the HYSPLIT model was used to analyze parcels beginning at the surface.

As stated previously, the trajectory plots included all exceedance days for each monitor. The trajectory was plotted starting at the monitor of interest and followed the meteorological conditions of the prescribed timeframe. After generating all of the trajectory plots, the outputs were formatted and then plotted in a Geographic Information System (GIS). In order to capture flow patterns, the plots were created by site and by the severity of the exceedances. In the St. Louis and Kansas City regions, the threshold for "high" exceedances were exceedances greater than or equal to 85 parts per billion and greater than or equal to 84 parts per billion respectively. The Farrar, Houston, and Bonne Terre monitor sites were set to the St. Louis threshold, while Linn County and El Dorado Springs were set to the Kansas City threshold. The threshold for the Springfield region included exceedances greater than or equal to 82 parts per billion. The upper thresholds included roughly 30%-35% of all monitor exceedances from each region, with the percentage of exceedances depending on which region was evaluated. The monitors broken down by threshold can be found in Table 11. Each site had the upper and lower exceedances plotted, with the upper limits on plotted over the lower limits. The upper limits are denoted in red and the lower limits in blue. These trajectory plots are Figures 8-47.

CONCLUSIONS

St. Louis – The wide array of monitor locations in the St. Louis region makes identifying a specific trajectory direction difficult; however, in many cases a southerly component was present. As the previous trajectory analysis revealed in 2003, the dominant pattern were exceedances at sites that were downwind of the metropolitan area. Even the Mark Twain monitor, located around 100 miles northwest of St. Louis, showed exceedance day transport when the monitor was downwind from the metropolitan area. A link to the

meteorological regimes appears in the clockwise curvature noted in many trajectories; the clockwise flow around high pressure systems such as the dominant Bermuda High and transient Northern High is a strong signal that there are some recurring weather patterns on ozone exceedance days. The visual results from the trajectory analysis can be found as Figures 8 – 30.

Kansas City – Unlike St. Louis, the bulk of the trajectories for the Kansas City region revealed a strong southerly component. As in St. Louis, the trajectories indicated that monitors were generally located downwind of the metropolitan area. Important to note is that a strong transport signal seemed apparent from Southeast Kansas and Northeast Oklahoma. The visual results from the trajectory analysis can be found as Figures 31 – 40.

Springfield – The sparse monitor coverage and recorded exceedances made the trajectory analysis in the Springfield area difficult and resulted in few identifiable patterns. A slim majority of trajectories ending at the Hillcrest monitor originated west to south of the site, corresponding to the location of the primary metropolitan area. The visual results from the trajectory analysis can be found as Figures 41 and 42.

Southwest Region – In the case of El Dorado Springs, only one trajectory originated near Kansas City and only one trajectory passed near Springfield. The majority of El Dorado Springs trajectories came from the southwestern quadrant, suggesting far Southwest Missouri and Northeast Oklahoma as likely transport regions. Linn County trajectories also showed little transport near Kansas City or Springfield, instead suggesting transport from Southeast Kansas or Northeast Oklahoma. The visual results from the trajectory analysis can be found as Figures 43 and 44.

Southeast Region – The Farrar monitor, southeast of St. Louis, showed no exceedance day trajectories directly from the St. Louis area, but a small sample of the lower limit exceedance days showed transport from a northwestern quadrant. The majority originated from southern to eastern directions, suggesting areas from Southern Illinois toward Memphis are important transport corridors 24 hours before the Farrar monitor exceedances. The Houston trajectories show only a small fraction of paths travelling from the St. Louis area; the majority of 24 hour trajectories travelled from Southeast Missouri into Southern Illinois. The trajectories ending at Bonne Terre travel from widely distributed regions with only a signal toward the St. Louis region in the high exceedance cases (85 ppb or higher concentration). Source or transport regions of interest for Bonne Terre stretch from south-central Missouri to Southern Illinois. The trajectory analysis results can be found as Figures 45 – 47.

The trajectory analysis allows the major transport corridors and geographic areas of influence to stand out on days with high ozone concentrations. The results obtained from the trajectory analysis will allow the APCP to combine meteorological and geographic components of ozone formation and transport to better assess the various influences on ozone concentrations across the state.

WINDROSE EVALUATION

In order to have a full understanding of meteorological significance on events during the ozone season, a wind rose evaluation was conducted at the airports in Kansas City (KMCI), Springfield (KSGF) , and St. Louis (KSTL) using data from the NCDC for 2003, 2004, 2005, 2006, and 2007. It is important to note that the winds were broken up into sixteen 22.5 degree sectors. When creating these plots three questions were considered: what is the entire season for that region, during what months did the bulk of the events occur and what months had relatively few events? After these questions were answered for each region, wind rose plots were generated using these parameters as variables.

In the St. Louis region (including Farrar, Houston, and Bonne Terre due to lack of meteorological data), ozone exceedances occurred from April to September. The bulk of the exceedances occurred from June to September with relatively few exceedances in April and May. In the Kansas City region (including Linn County and El Dorado Springs due to lack of meteorological data), ozone exceedances occurred from April to September. As in St. Louis, the bulk of the exceedances occurred from June to September with relatively few exceedances in April and May. In order to be consistent with the St. Louis and Kansas City regions, April to September was considered to be the time of possible ozone exceedances for the season, even though no exceedances occurred during May or September. The bulk of the exceedances occurred from June-August with a few exceedances in April. A wind rose was developed for each of these scenarios using a 24-hour or diurnal period (12am-12am).

In St. Louis, the diurnal cases in both the June to September and the April to September periods had a wide variance in wind direction but in general a southerly component was dominant. The wind roses for the monitors in the St. Louis area can be found as Figures 48 and 49. In Kansas City, the signals were much different with dominant directions very apparent. The diurnal rose during the April to September and June to September periods showed strong southerly components with significant signals between the south and east sectors. The wind roses for the monitors in the Kansas City area can be found as Figures 50 and 51. In Springfield, the signals were also very clear. The diurnal period showed very strong signals from the south and south-southeast sectors. The wind roses for the monitors in the Springfield area can be found as Figures 52 and 53.

Evaluating these roses was helpful in determining what was “normal” over the large time scale evaluated for this analysis. In many cases it revealed where normal transport of pollutants such as ozone would come from. However, it is important to note that in the future, comparisons of the trajectory analysis and the regime analysis with the data from the wind rose evaluations could also be used to find significant microscale or synoptic scale meteorological anomalies that lead to some monitor exceedances. The results obtained from the regime analysis, in conjunction with the trajectory and windrose analysis, will allow the Department’s Air Pollution Control Program to combine meteorological and geographic components of ozone formation, concentration, and transportation to better assess the various influences on ozone concentrations across the state.

Figure 1: Regime #1 Example

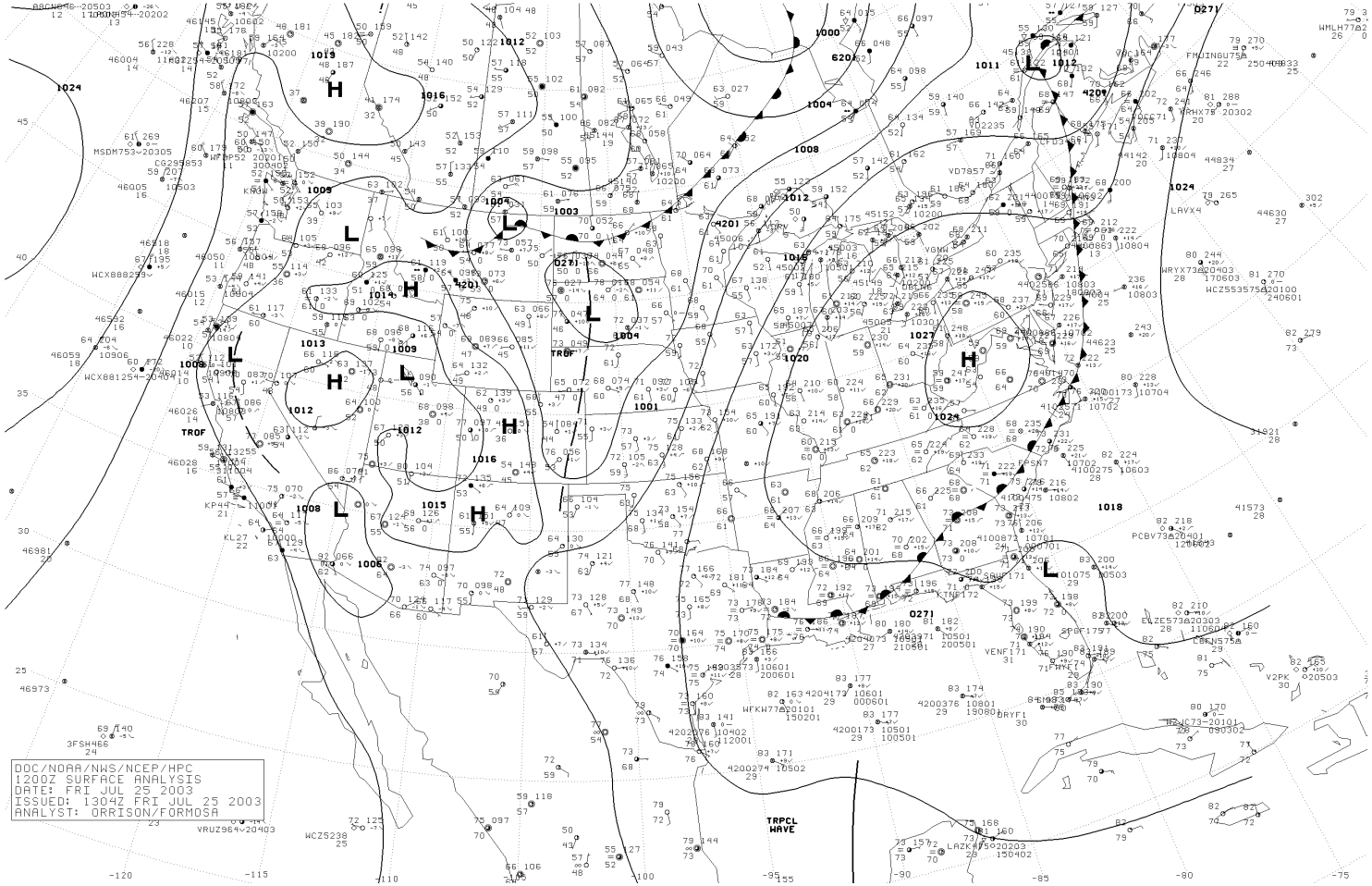


Figure 2: Regime #2 Example

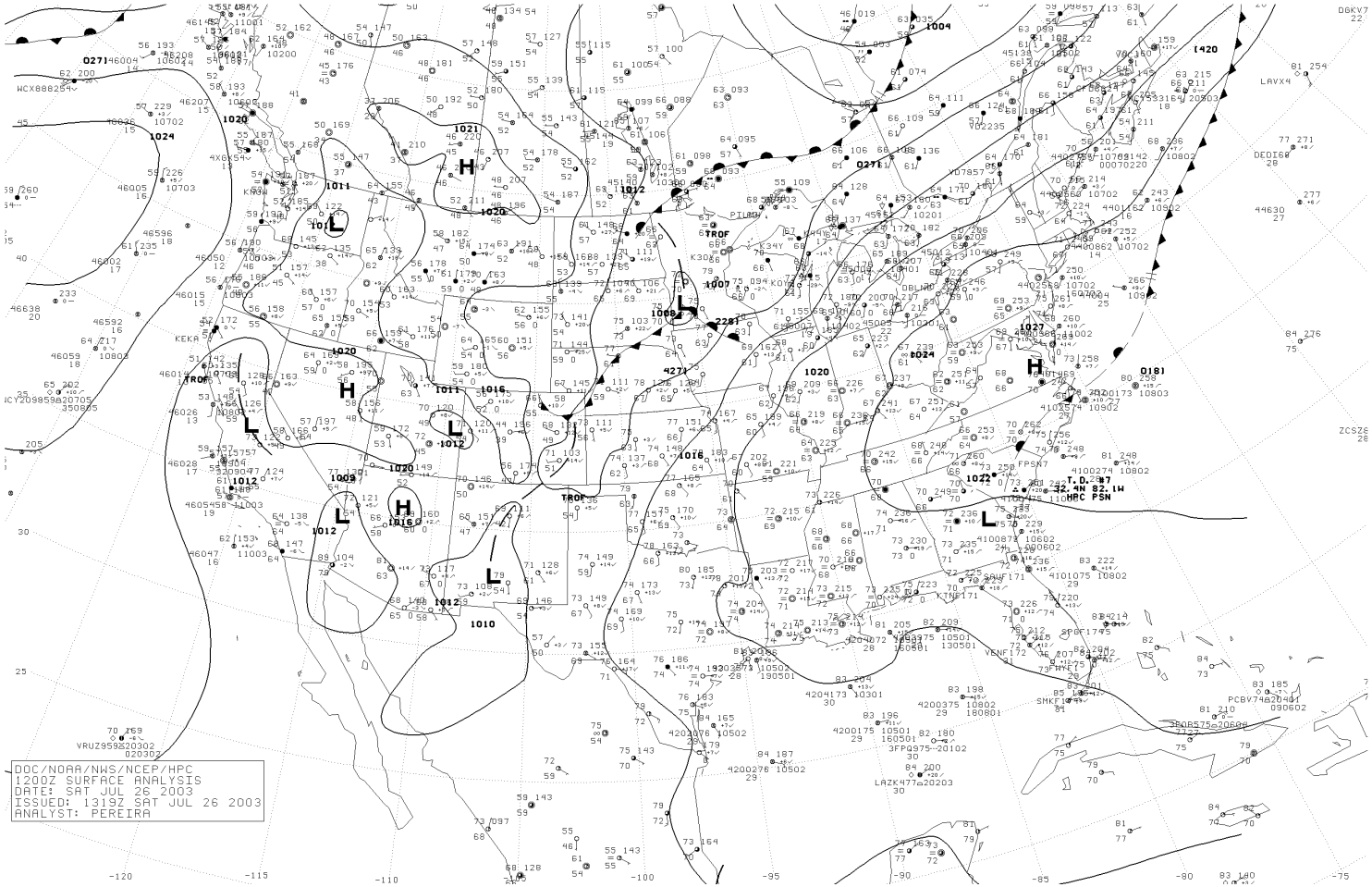
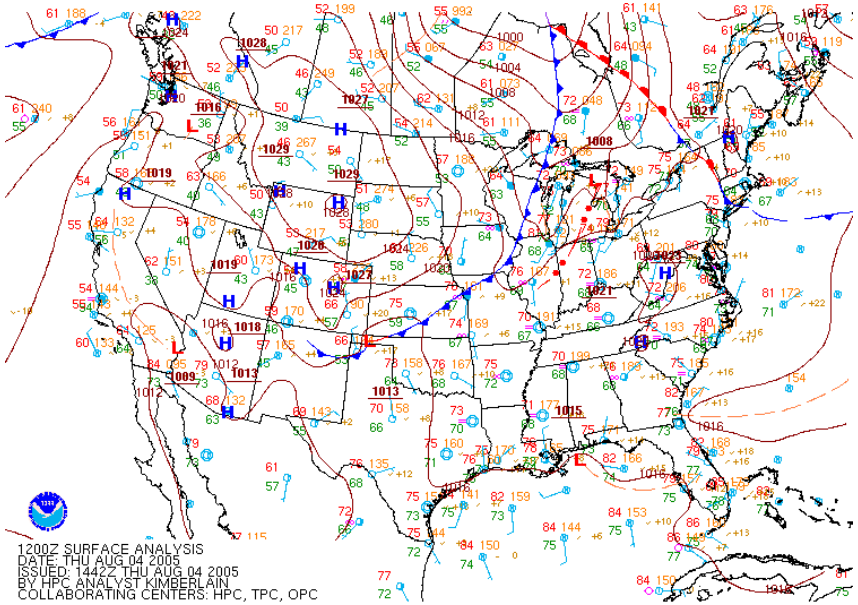


Figure 3: Regime #3 Example

7AM



4PM

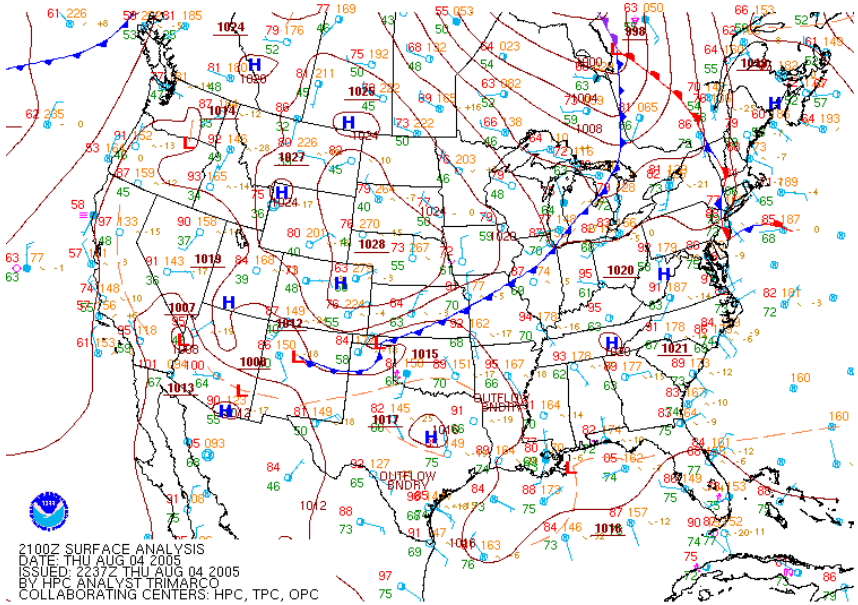


Figure 4: Regime #4 Example

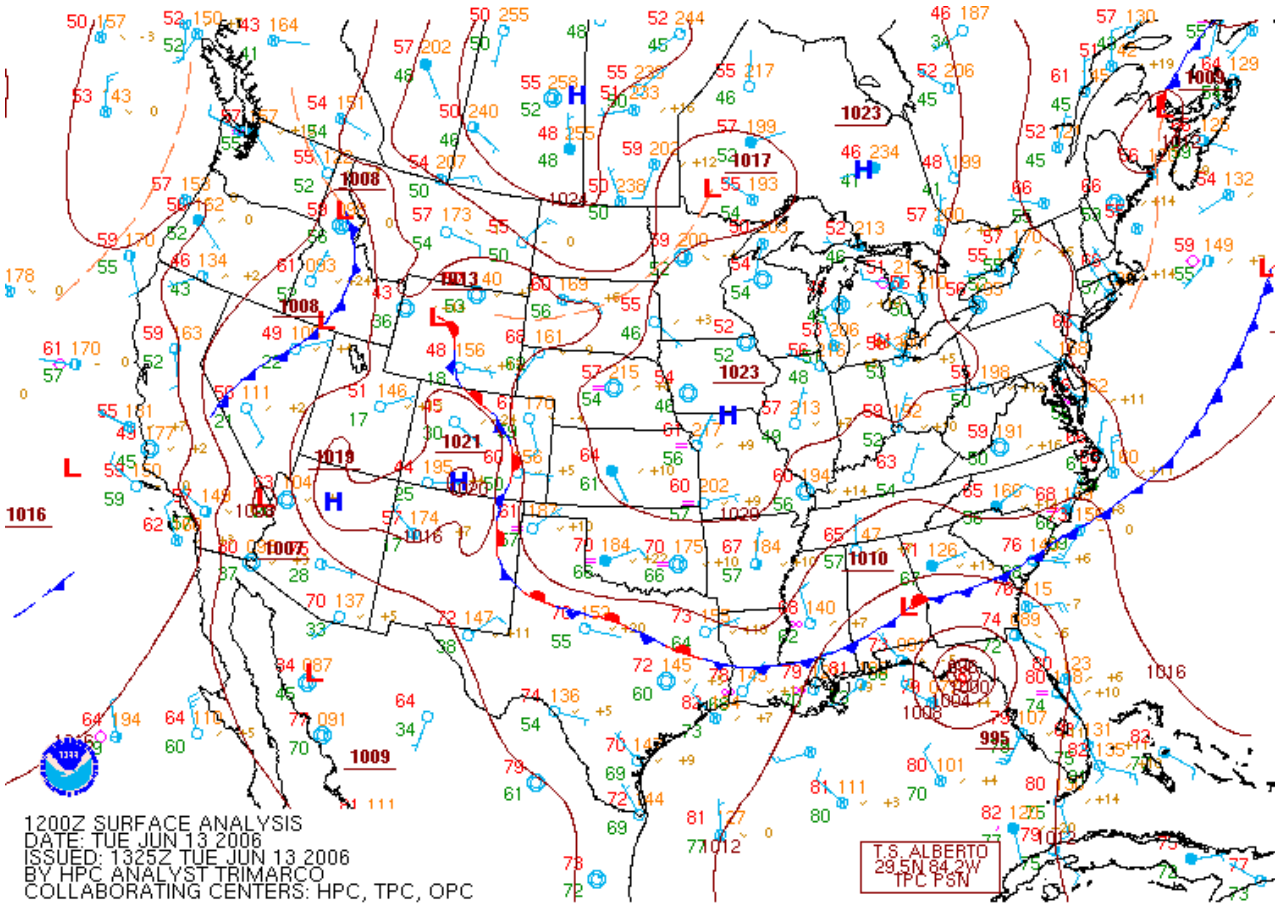


Figure 5: Regime #5 Example

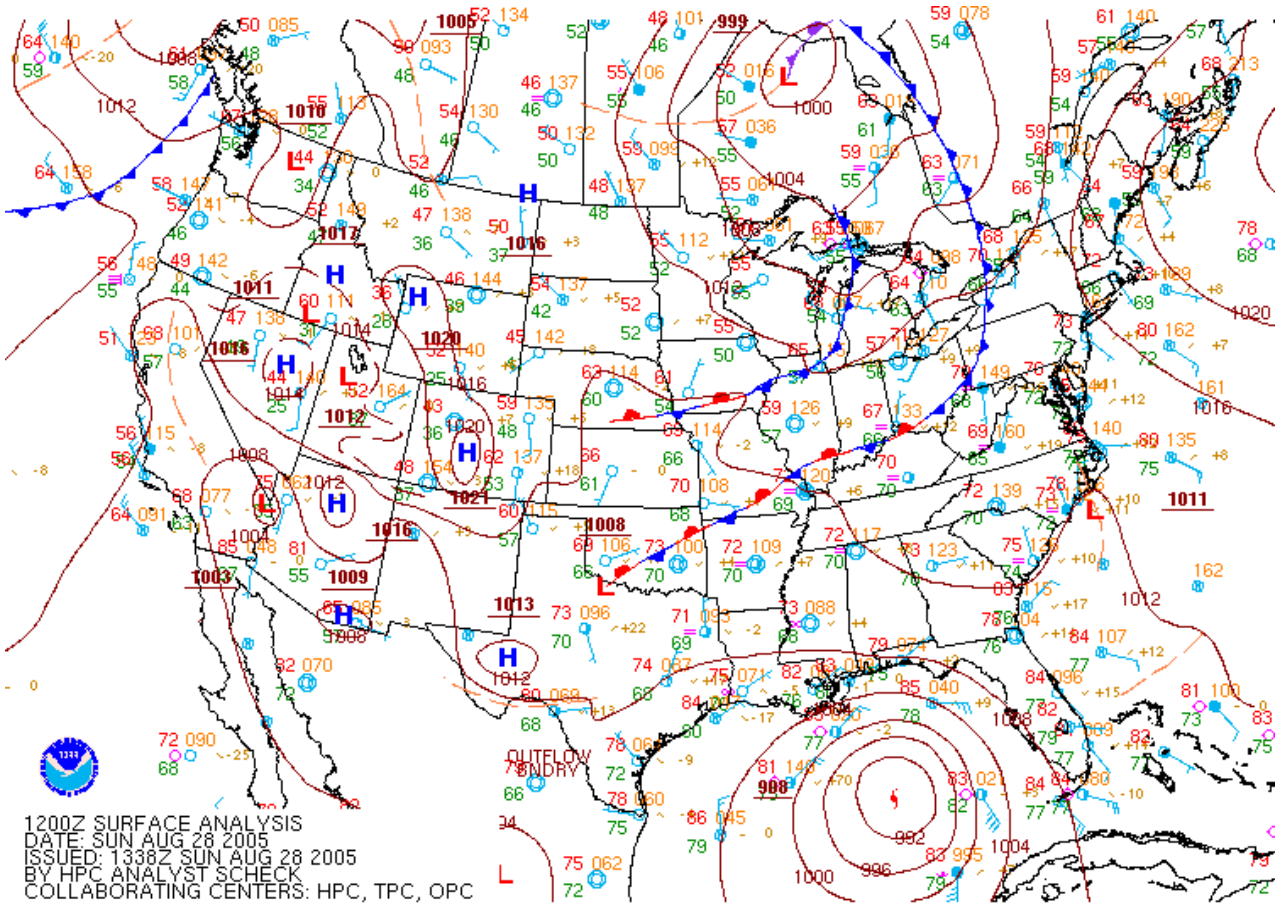


Figure 6: Regime #6 Example

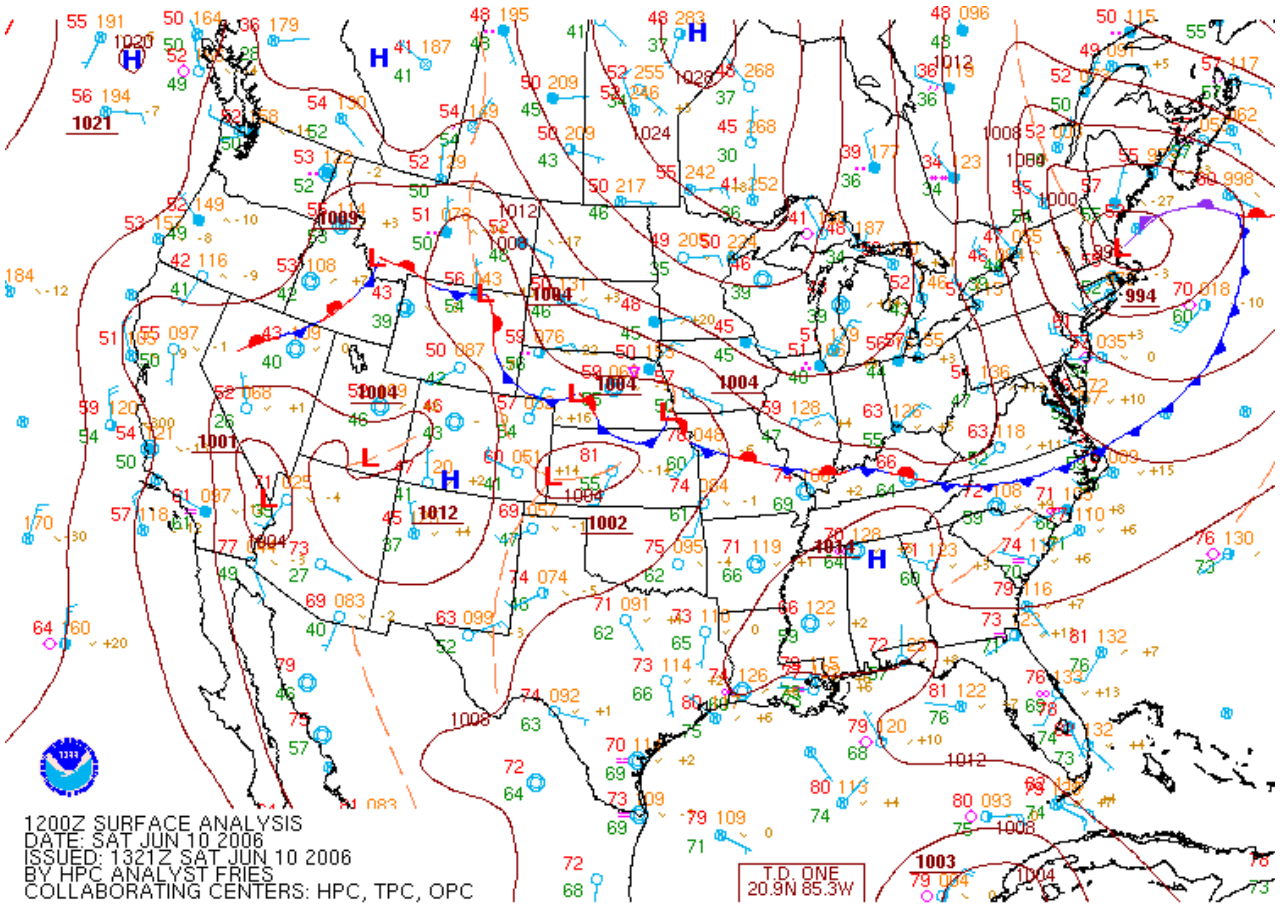


Figure 7: Regime #7 Example

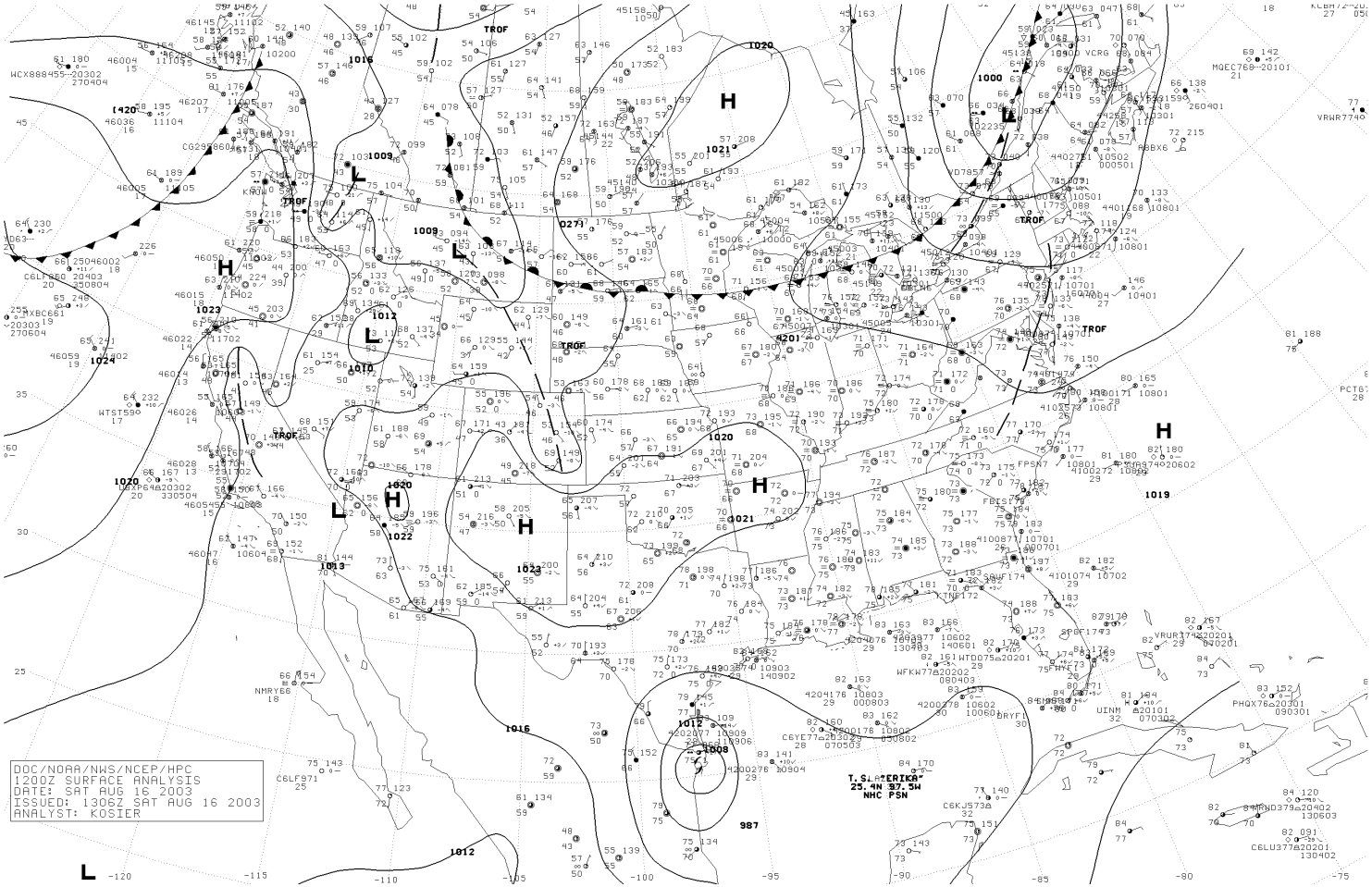


FIGURE 8

Site: W. Alton
Years of Operation: 2003-2007

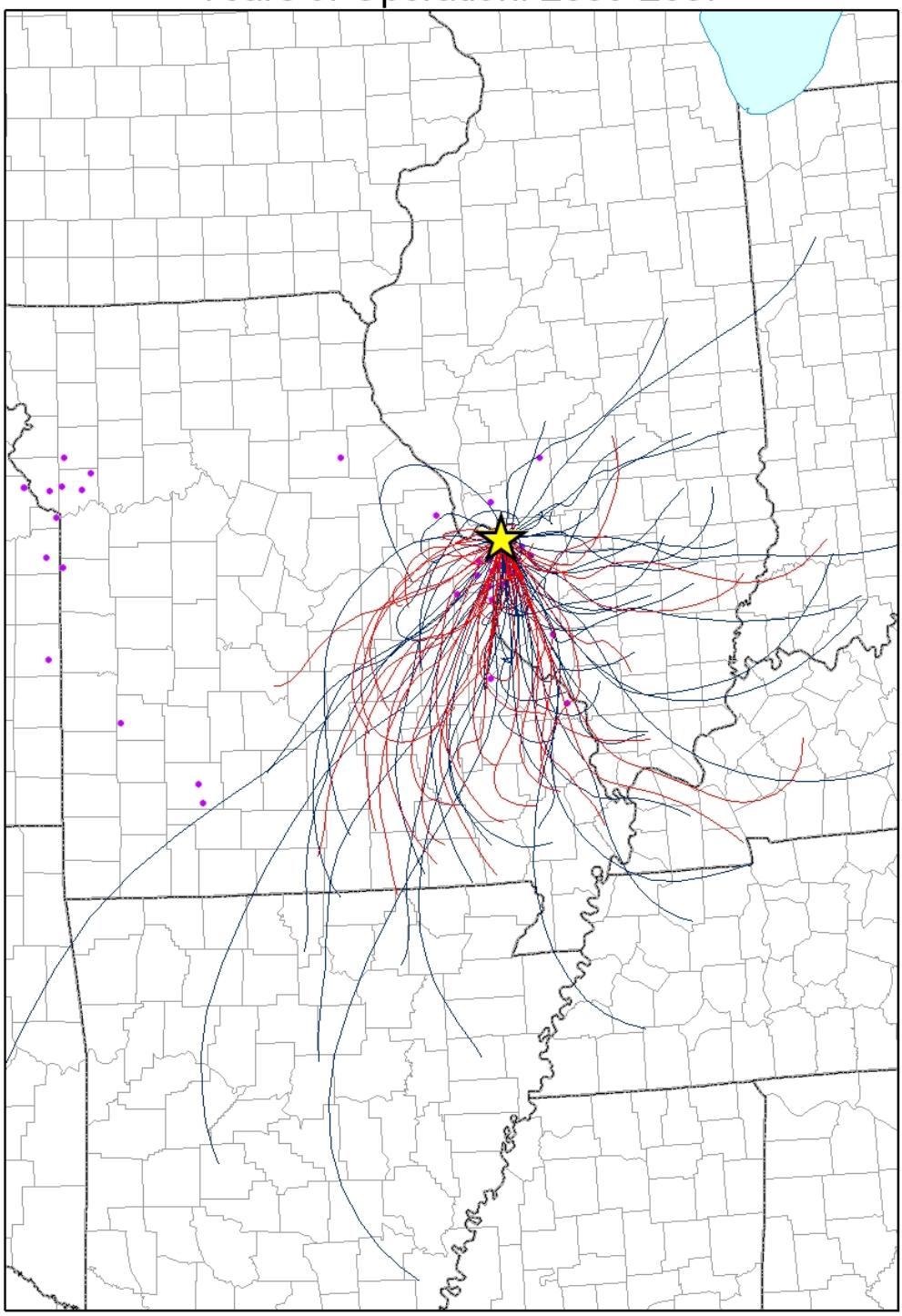


FIGURE 9

Site: Orchard Farm
Years of Operation: 2003-2007

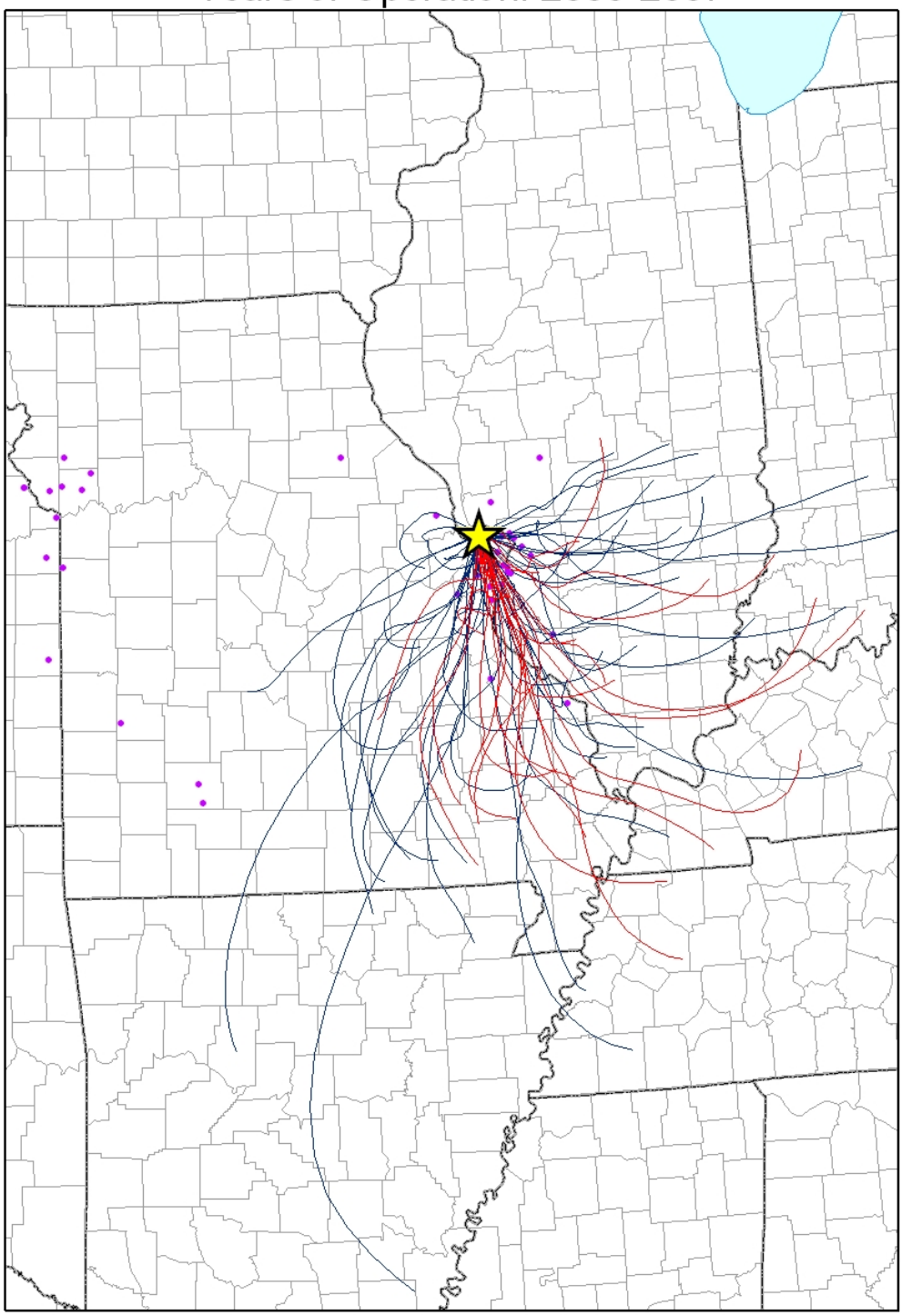


FIGURE 10

Site: Sunset Hills
Years of Operation: 2003-2007

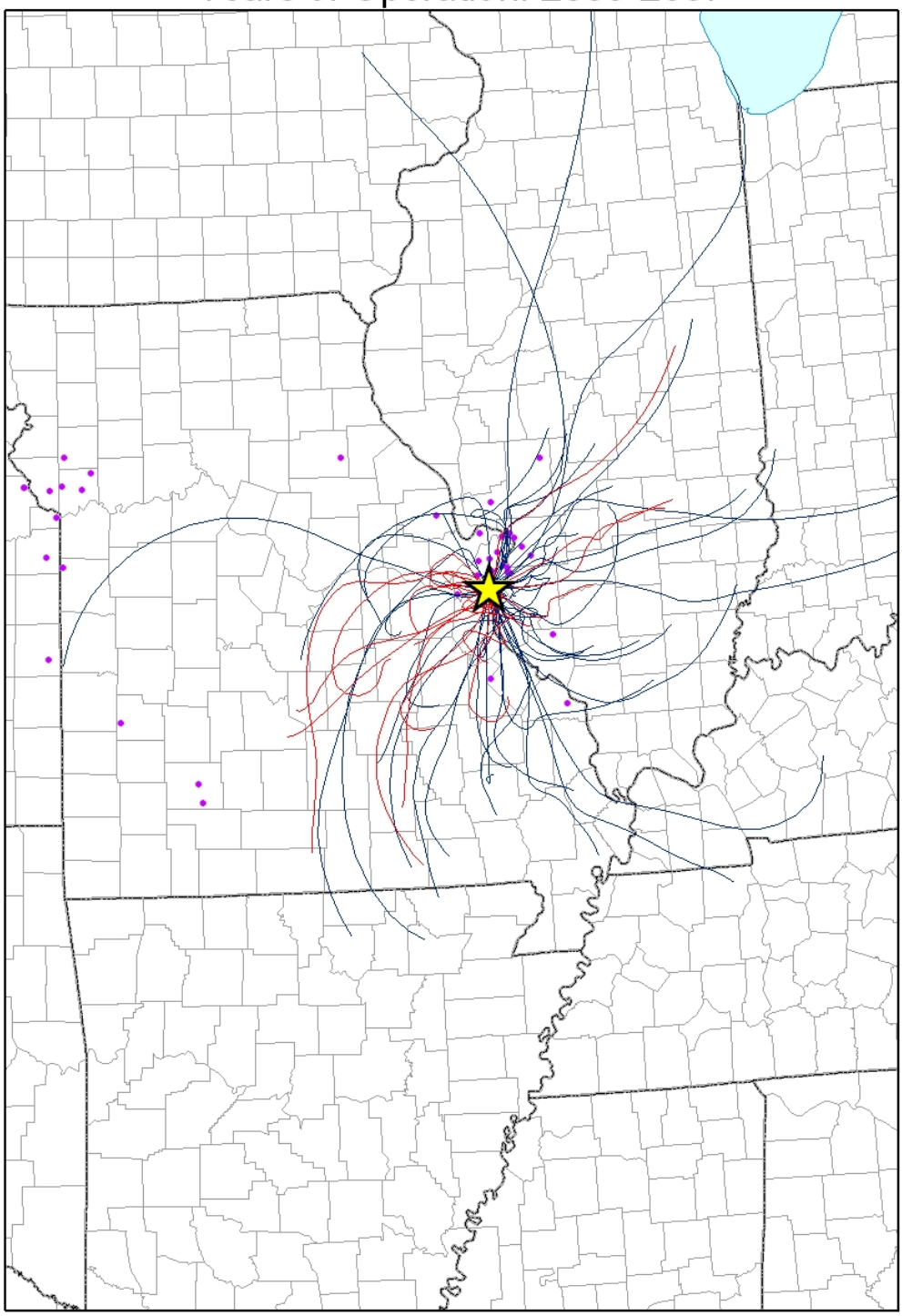


FIGURE 11

Site: Alton
Years of Operation: 2003-2007

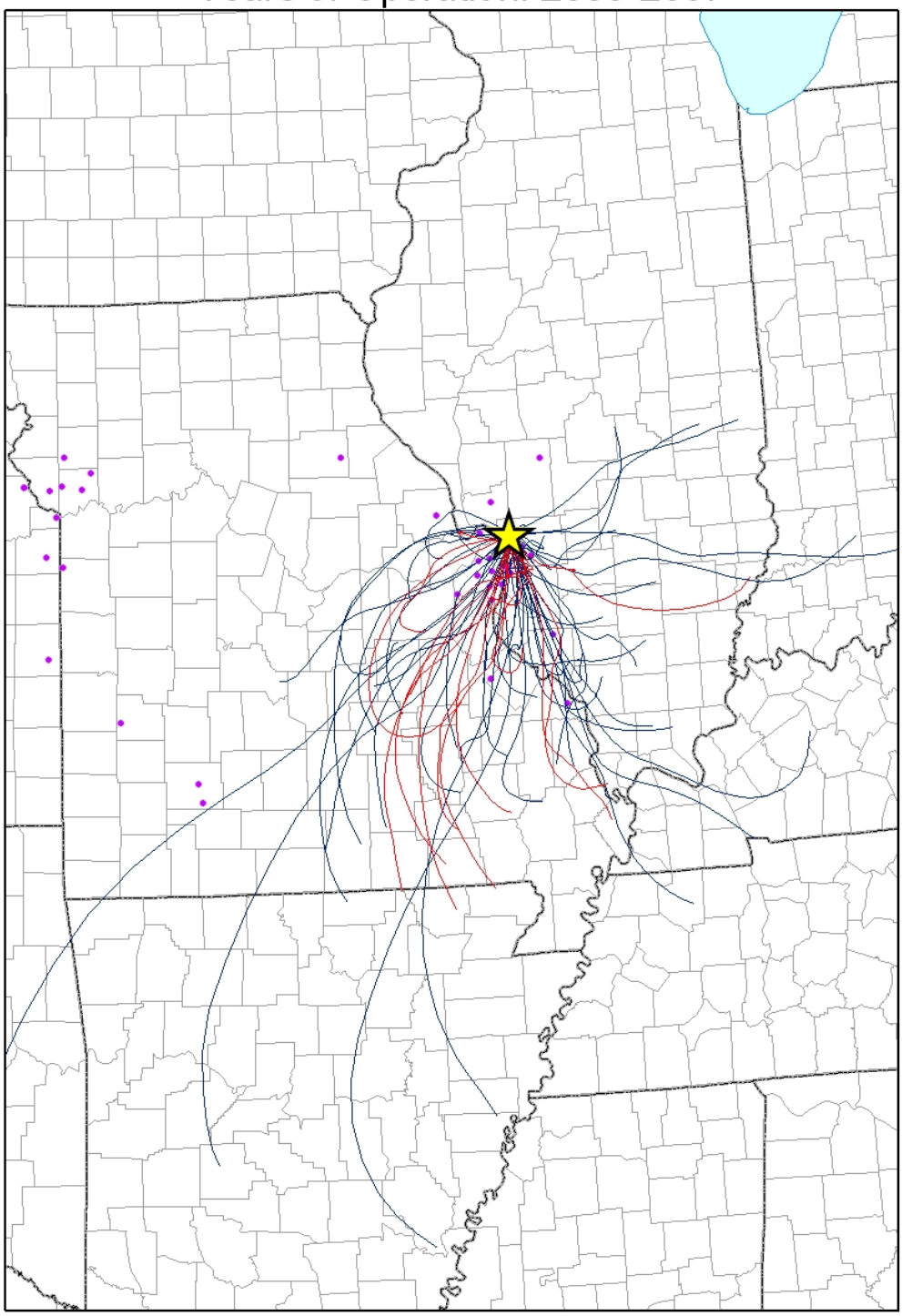


FIGURE 12

Site: Margaretta
Years of Operation: 2003-2007

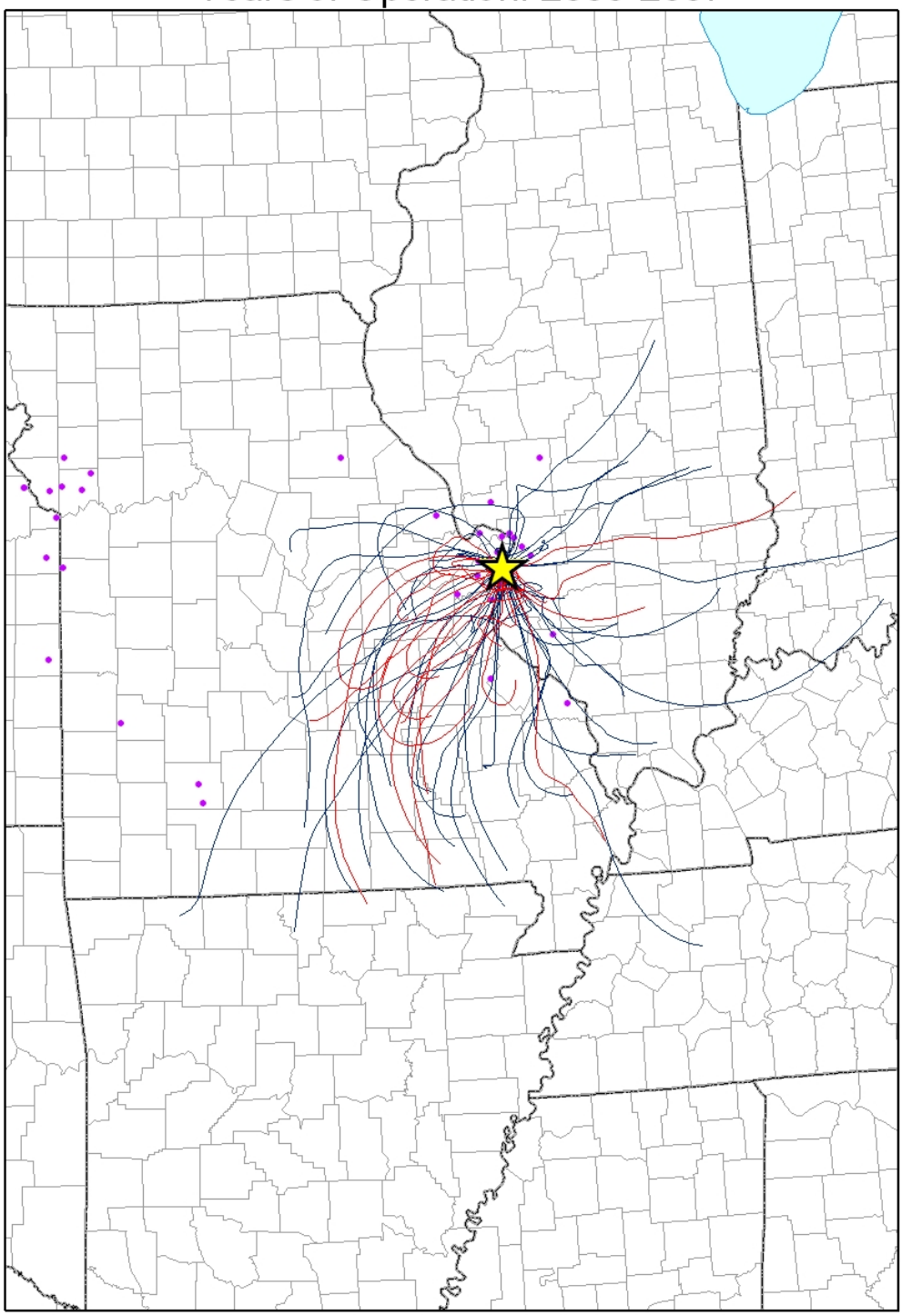


FIGURE 13

Site: Arnold
Years of Operation: 2003-2007

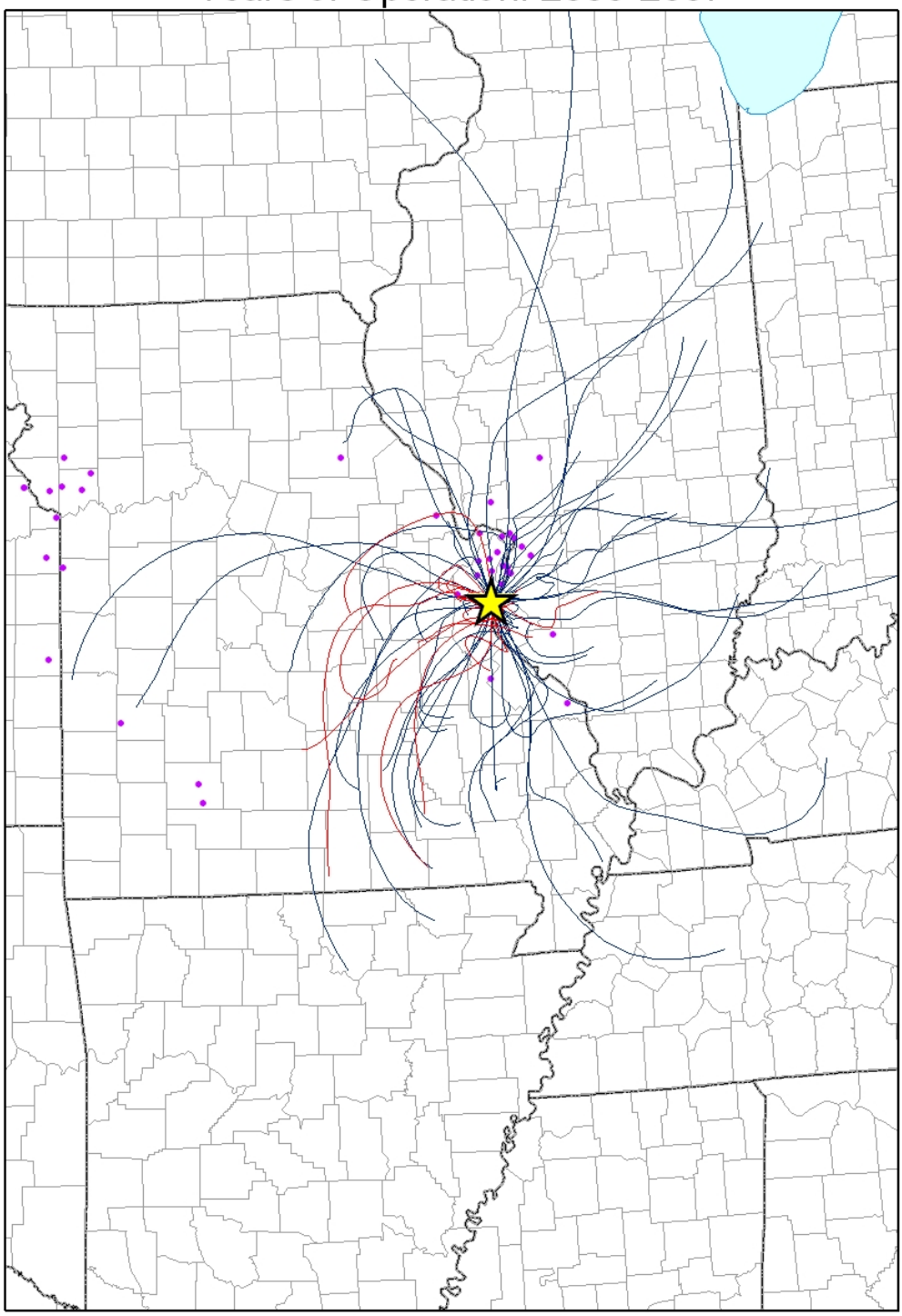


FIGURE 14

Site: Maryland Heights
Years of Operation: 2005-2007

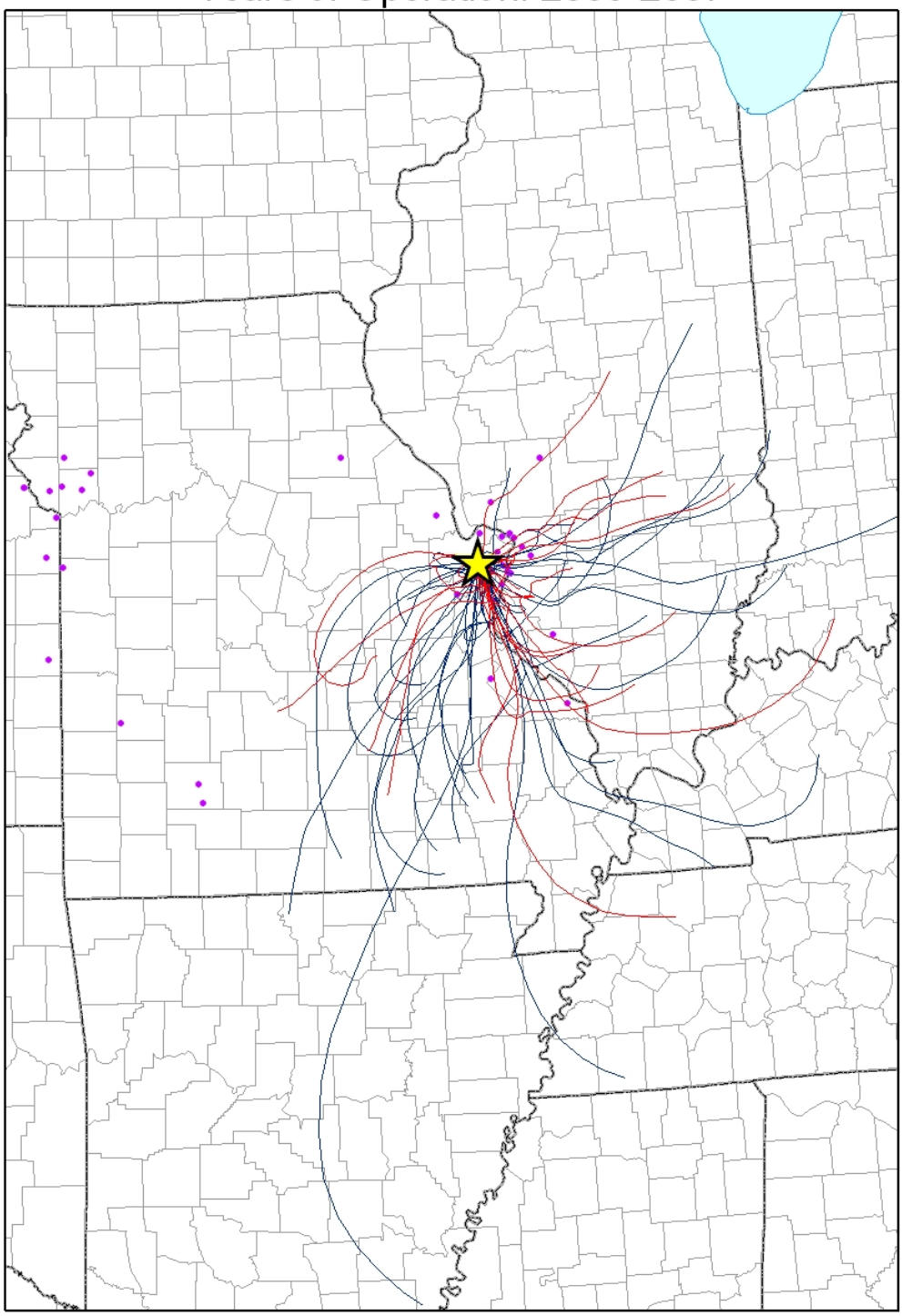


FIGURE 15

Site: Wood River
Years of Operation: 2003-2007

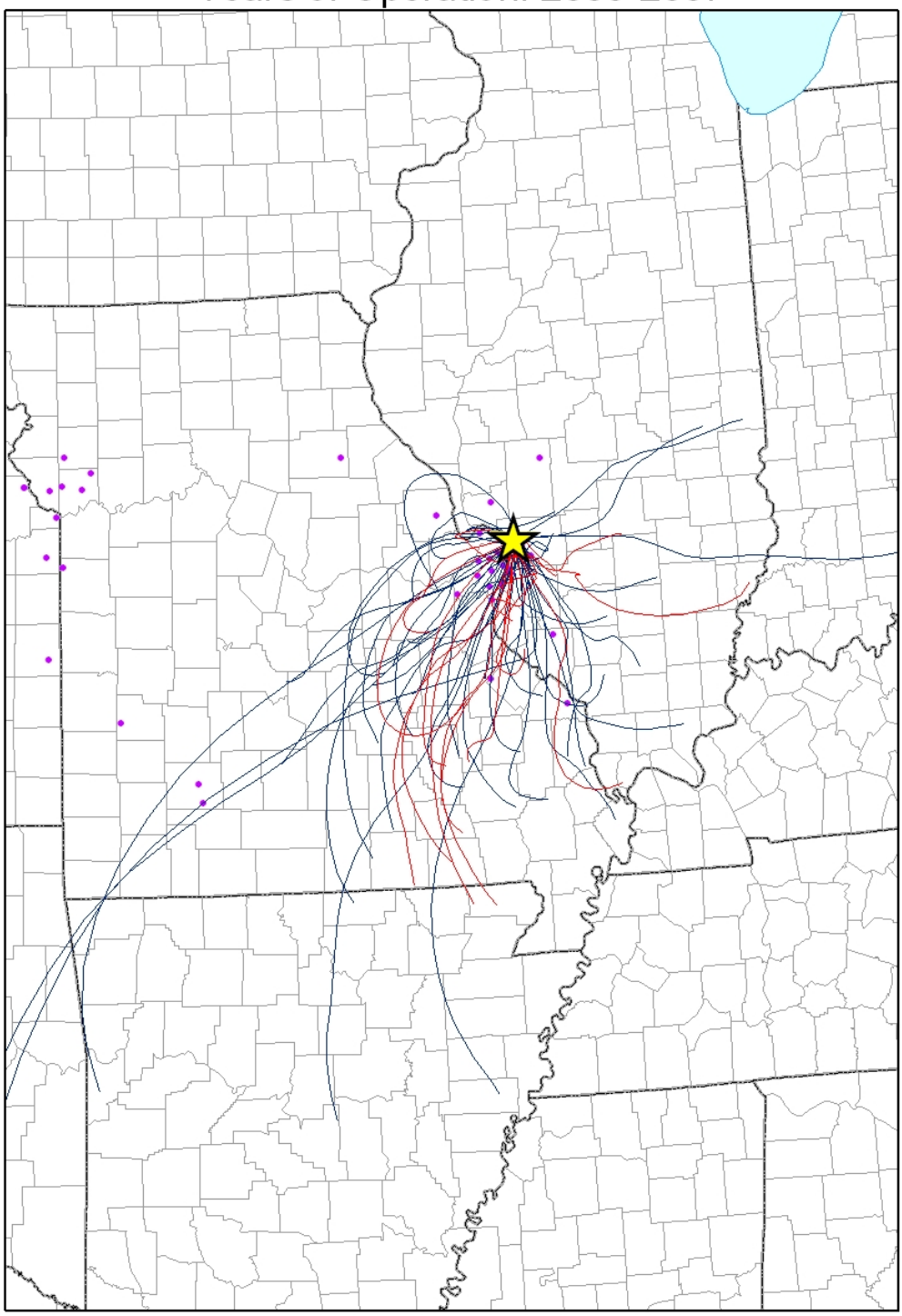


FIGURE 16

Site: Maryville
Years of Operation: 2003-2007

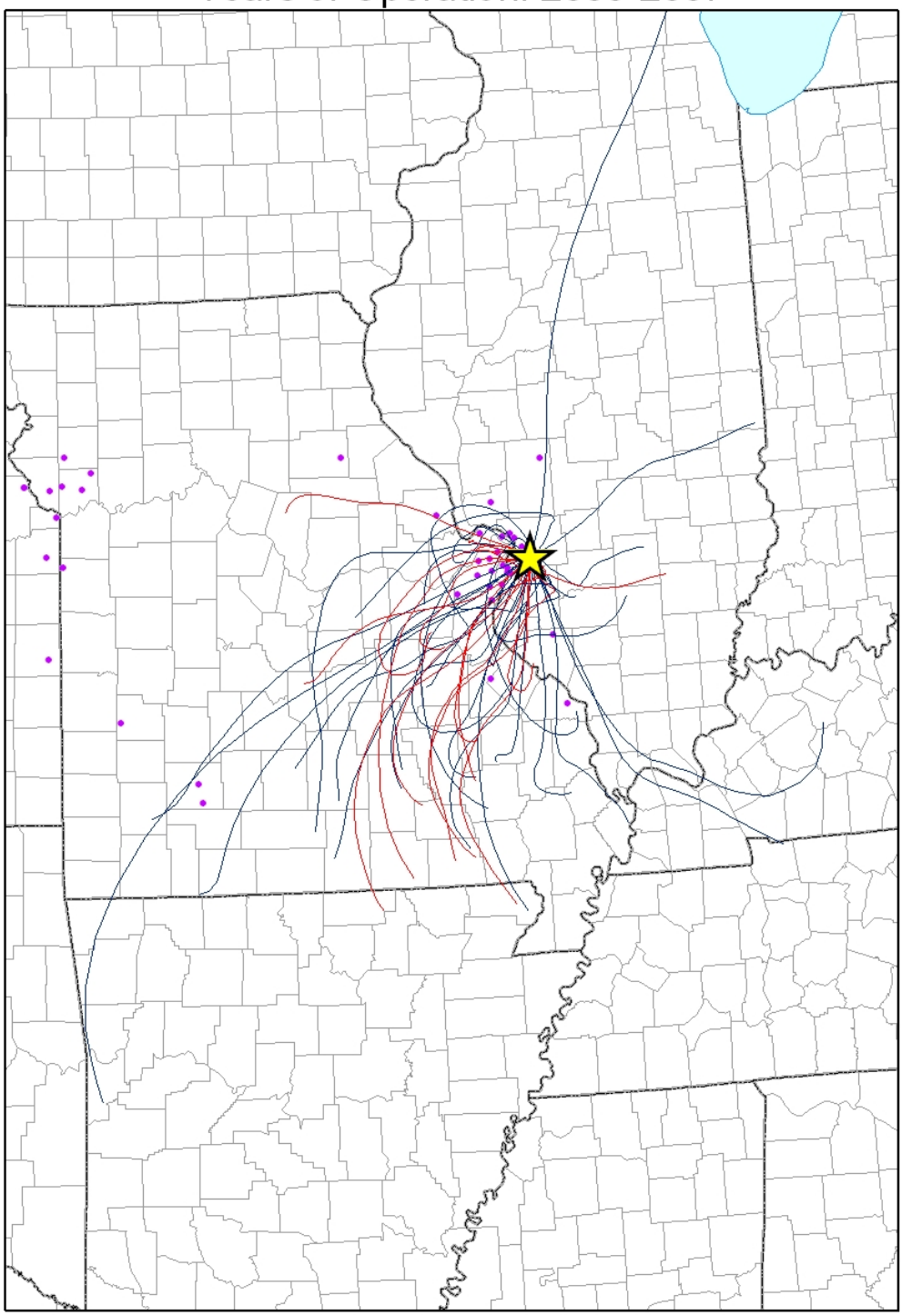


FIGURE 17

Site: Foley
Years of Operation: 2005-2007

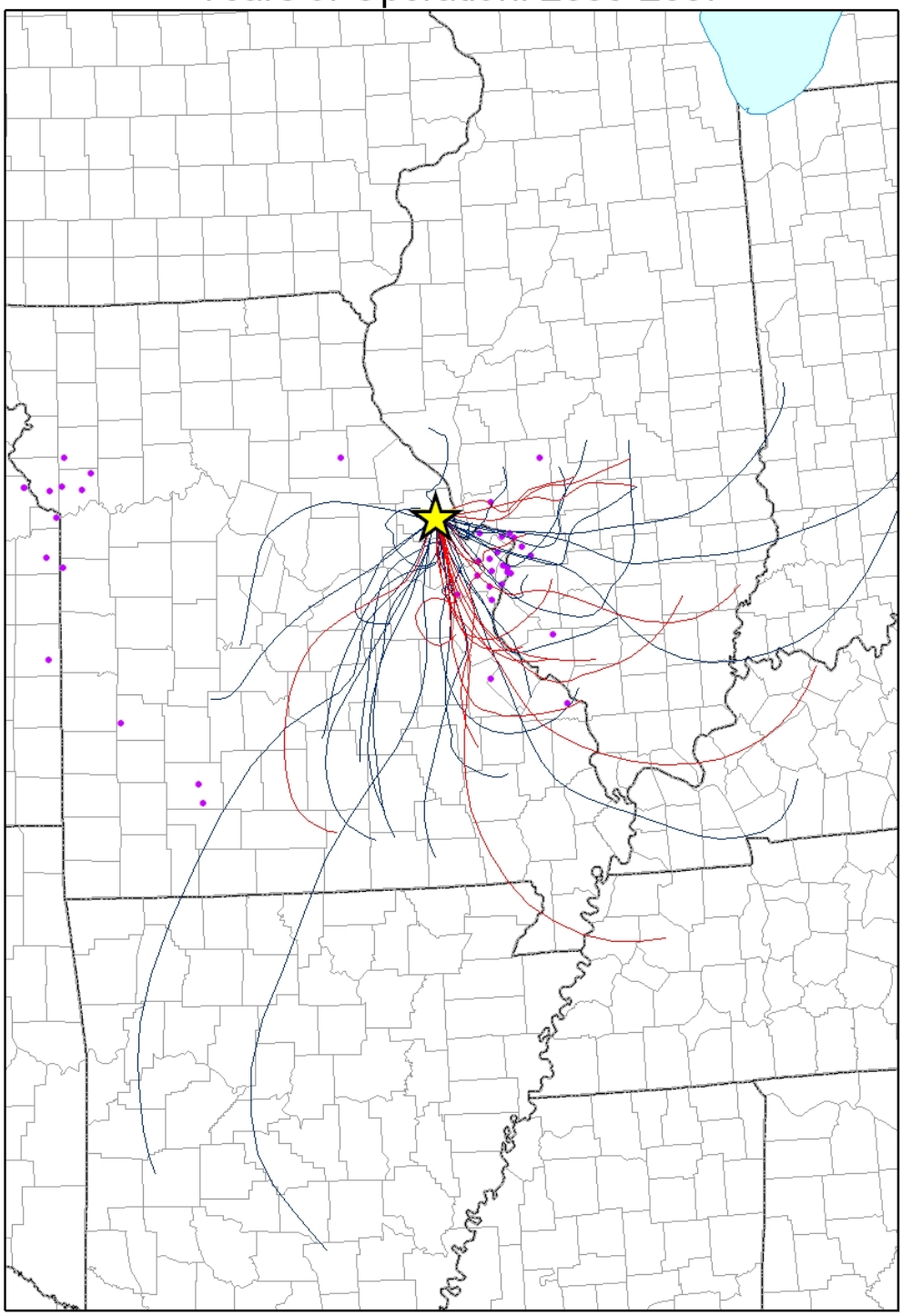


FIGURE 18

Site: Bonne Terre
Years of Operation: 2003-2007

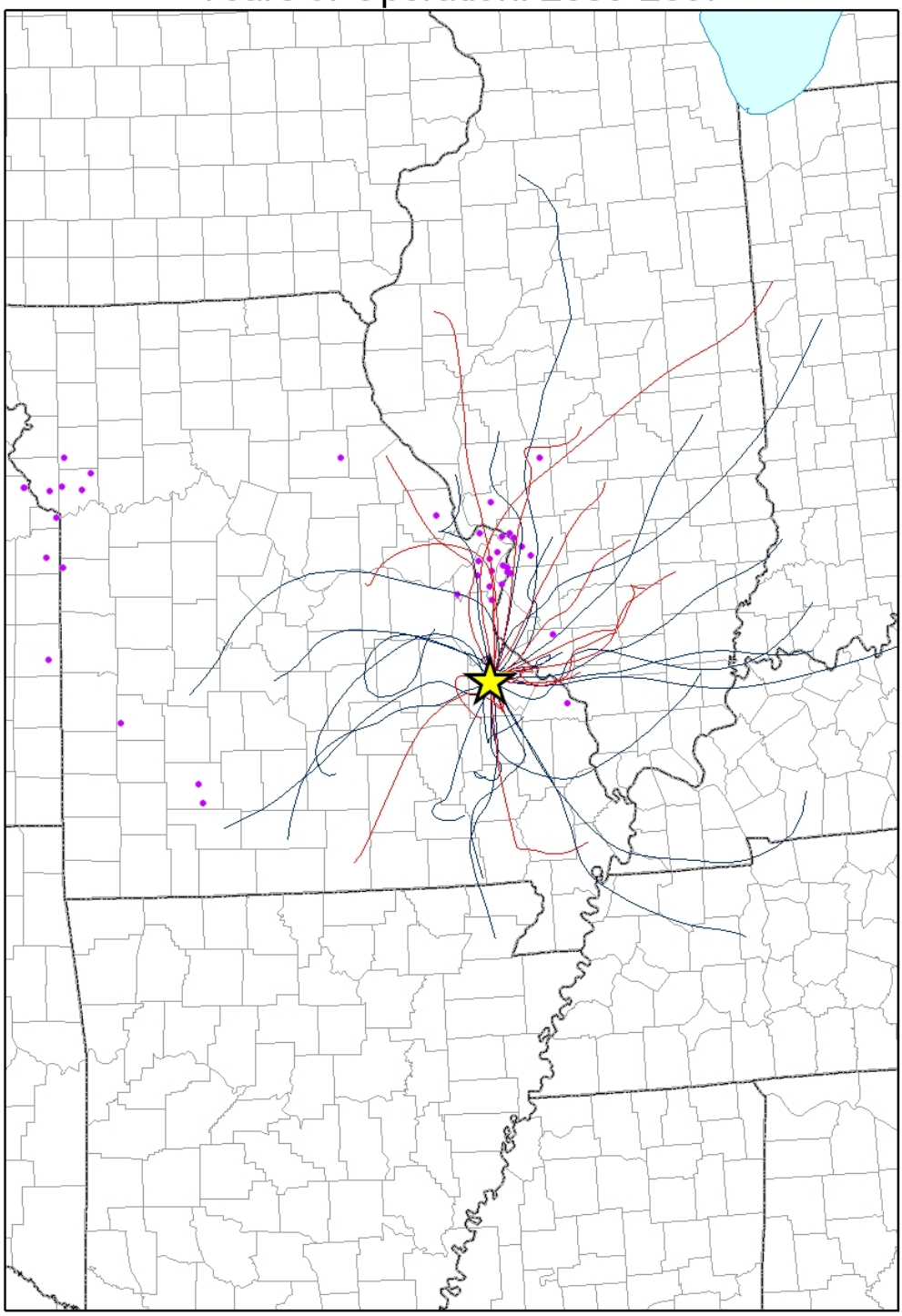


FIGURE 19

Site: E. Saint Louis
Years of Operation: 2003-2007

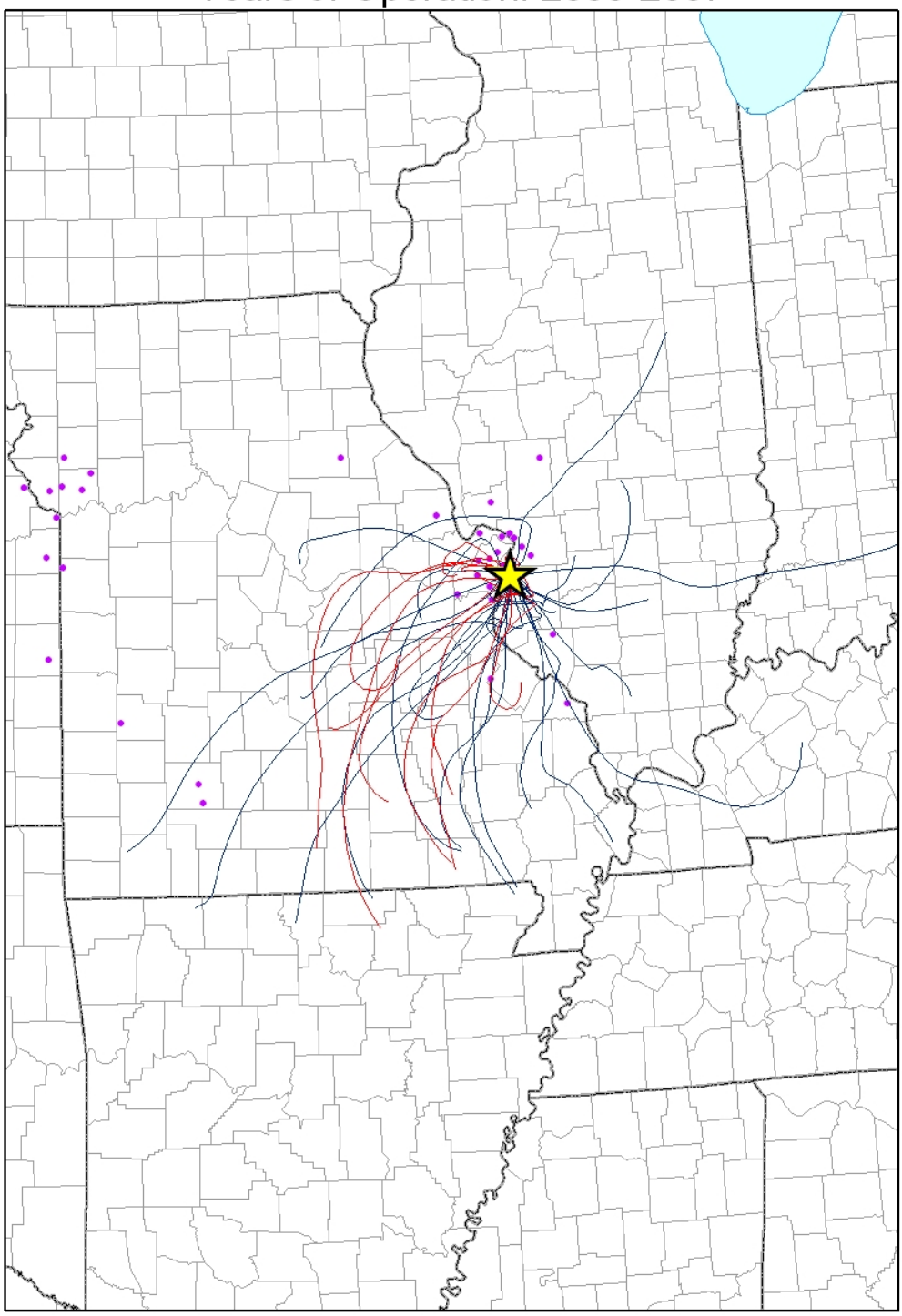


FIGURE 20

Site: Jerseyville
Years of Operation: 2003-2007

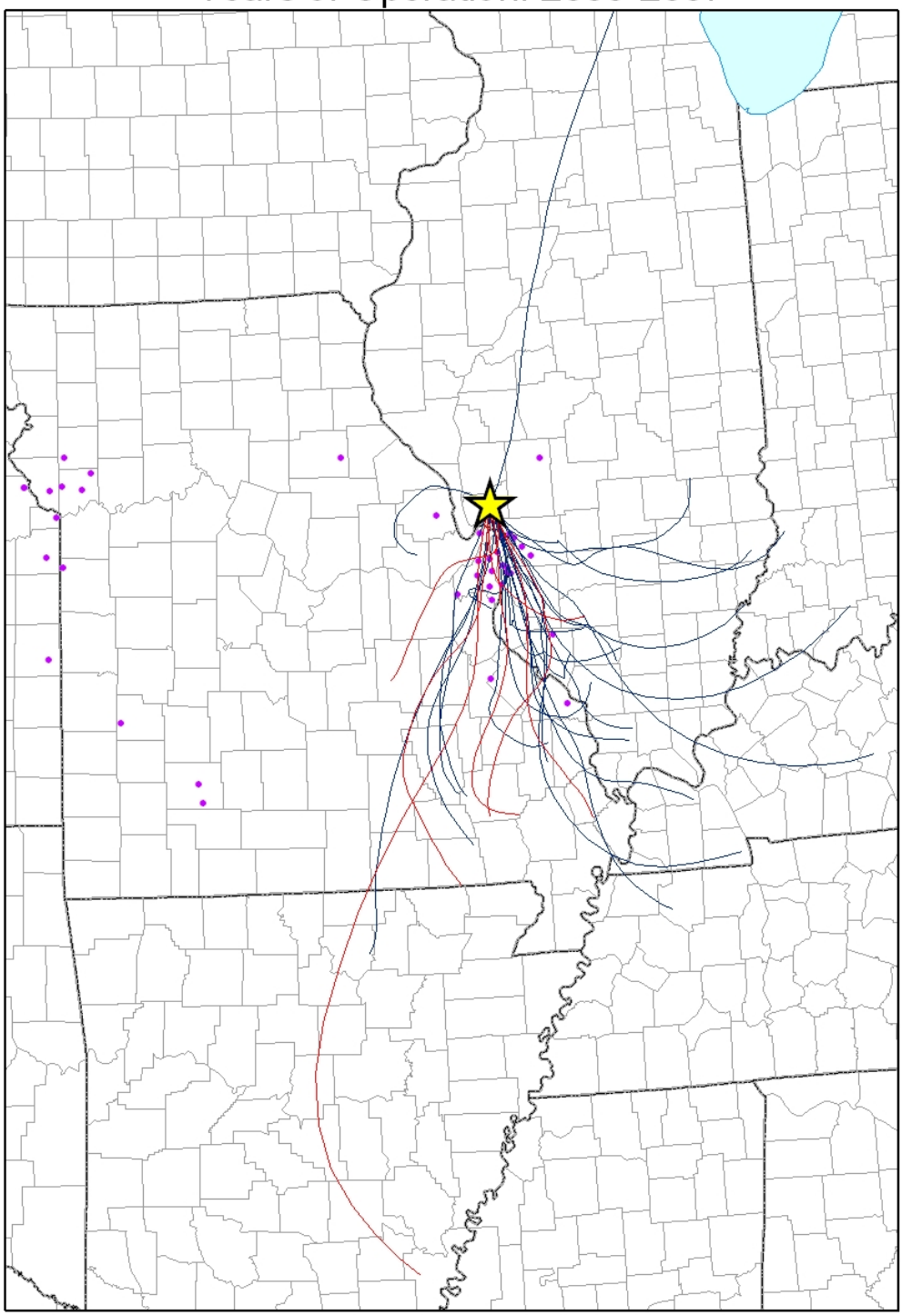


FIGURE 21

Site: Blair St.
Years of Operation: 2005-2007

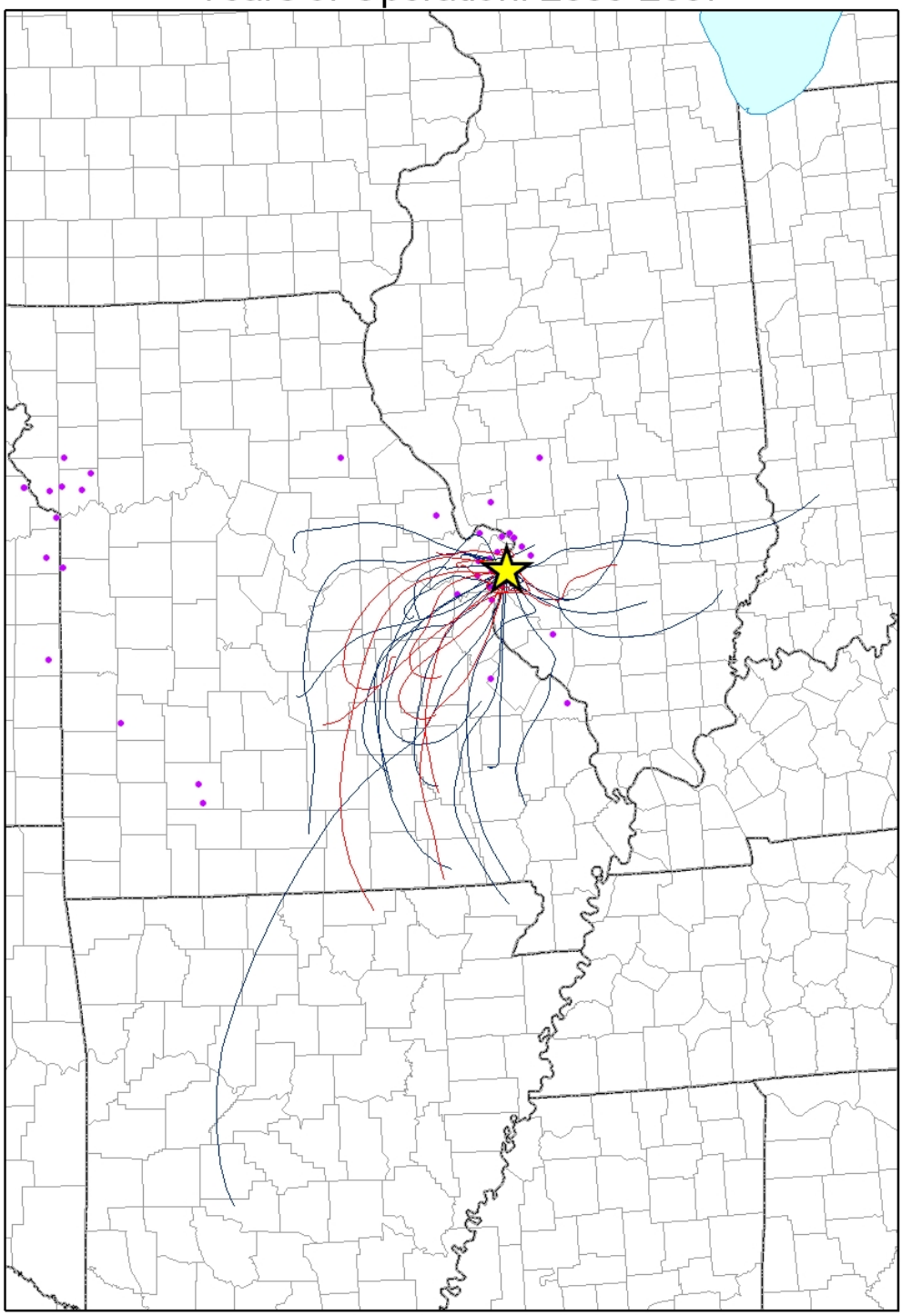


FIGURE 22

Site: Pacific
Years of Operation: 2005-2007

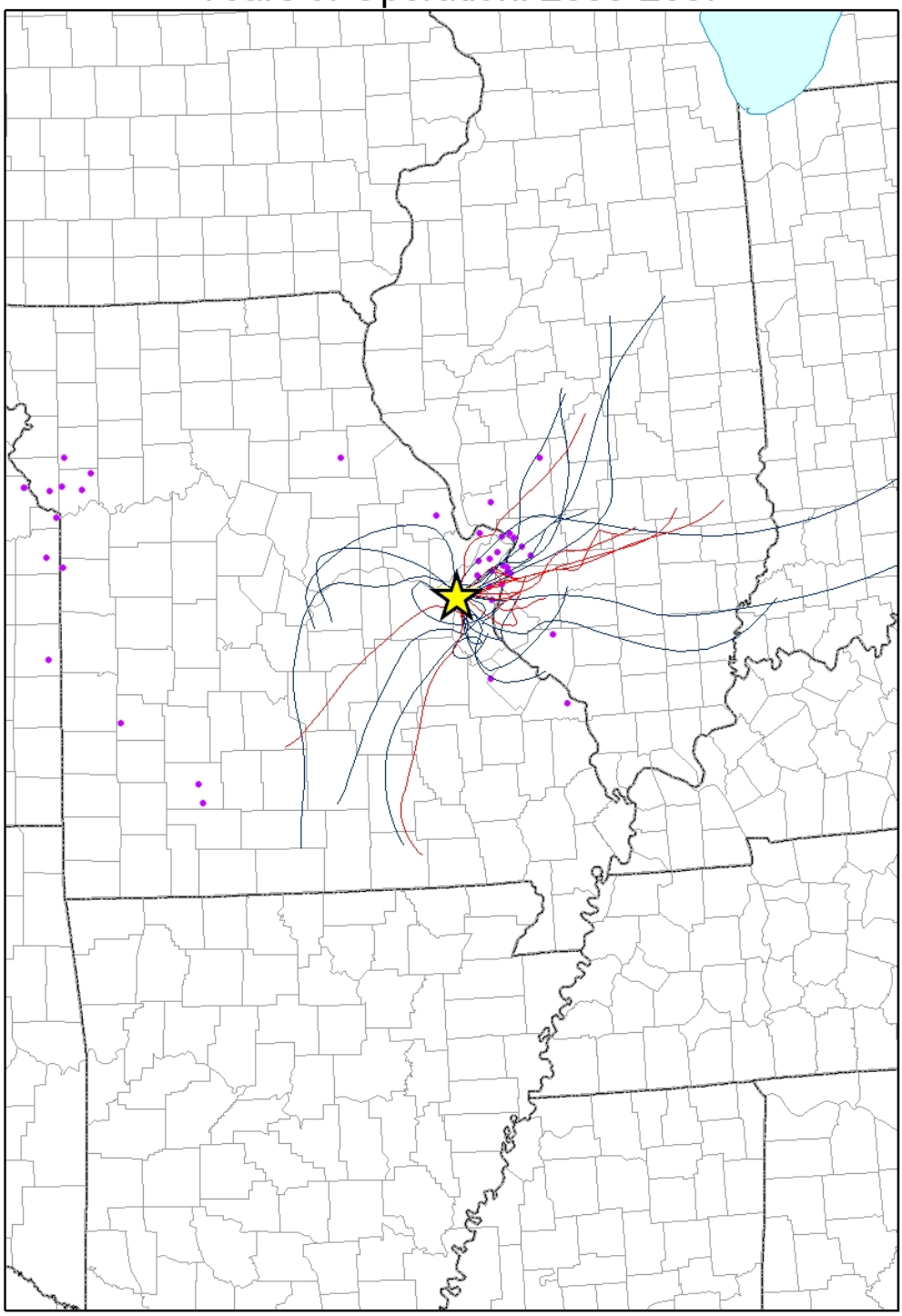


FIGURE 23

Site: Queeny Park
Years of Operation: 2003-2005

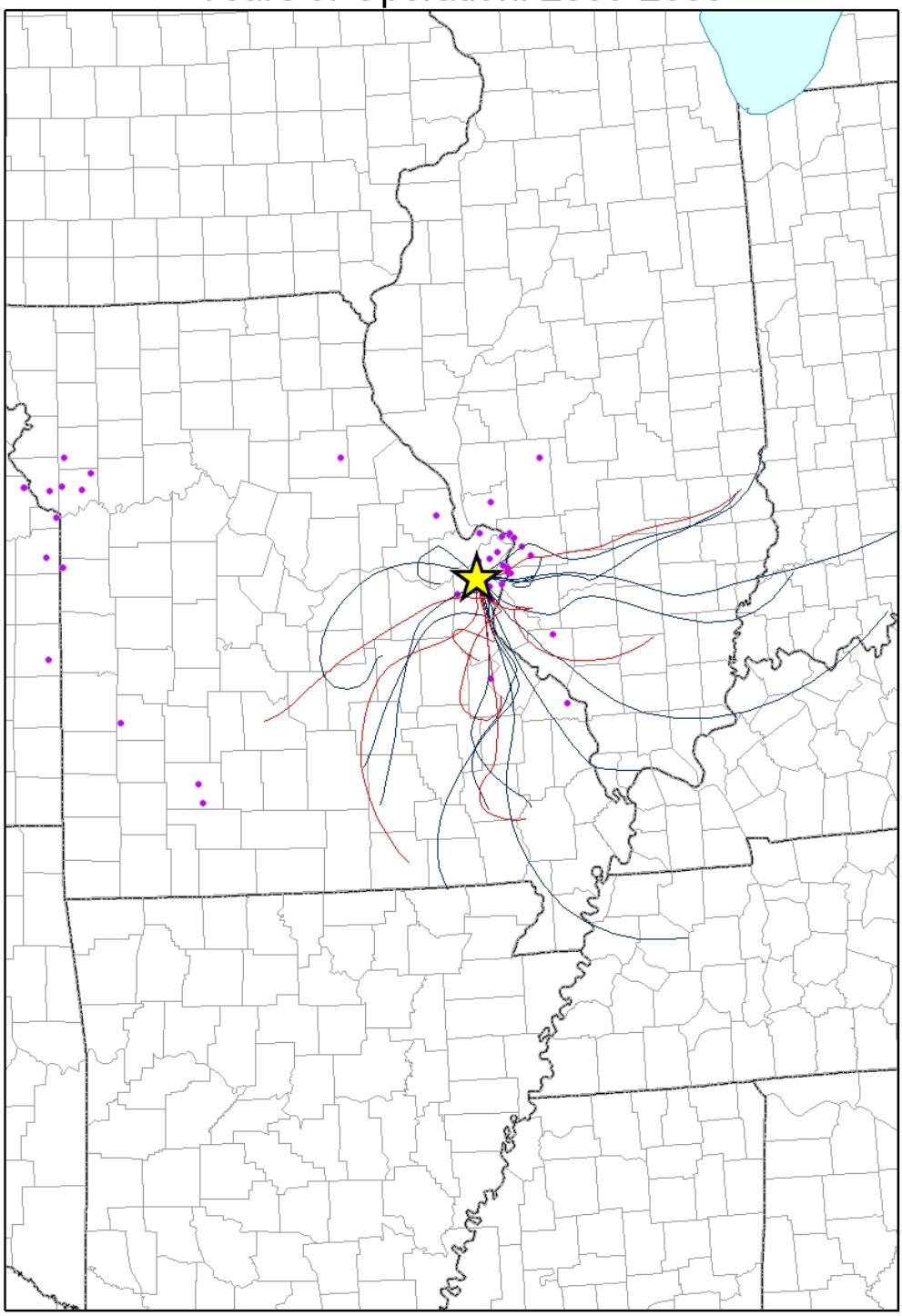


FIGURE 24

Site: Houston
Years of Operation: 2003-2007

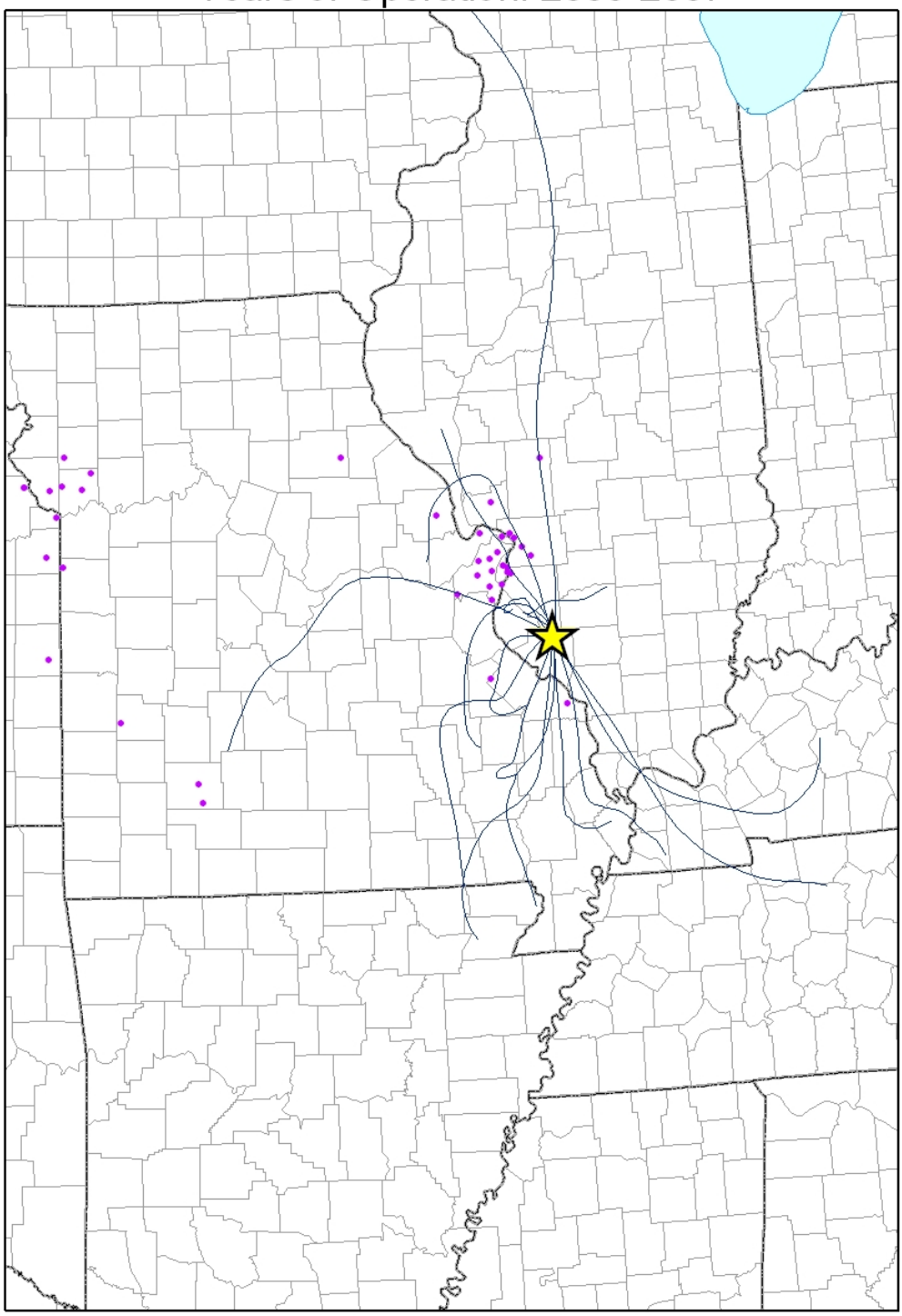


FIGURE 25

Site: Nilwood
Years of Operation: 2003-2007

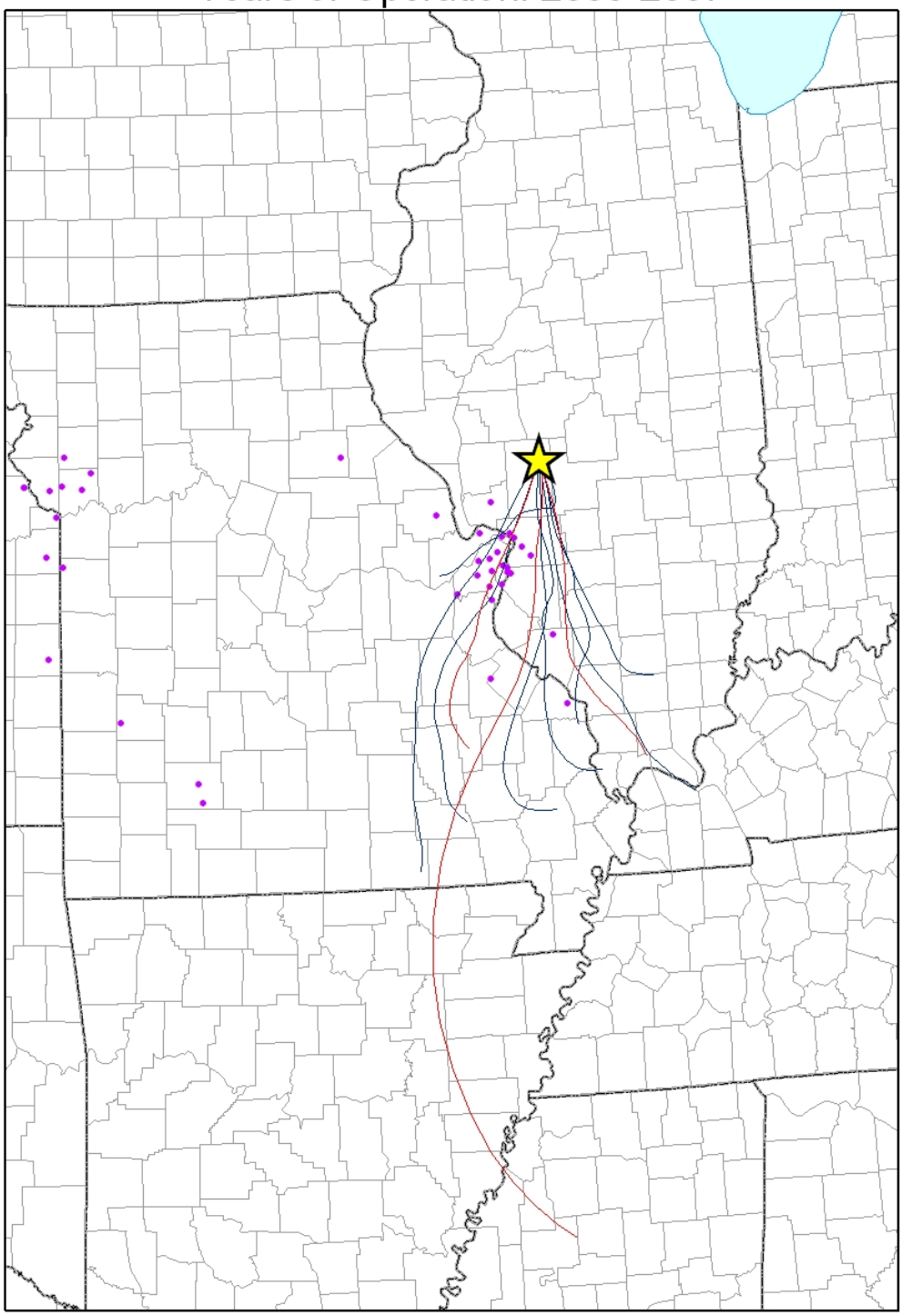


FIGURE 26

Site: Ferguson
Years of Operation: 2003-2004

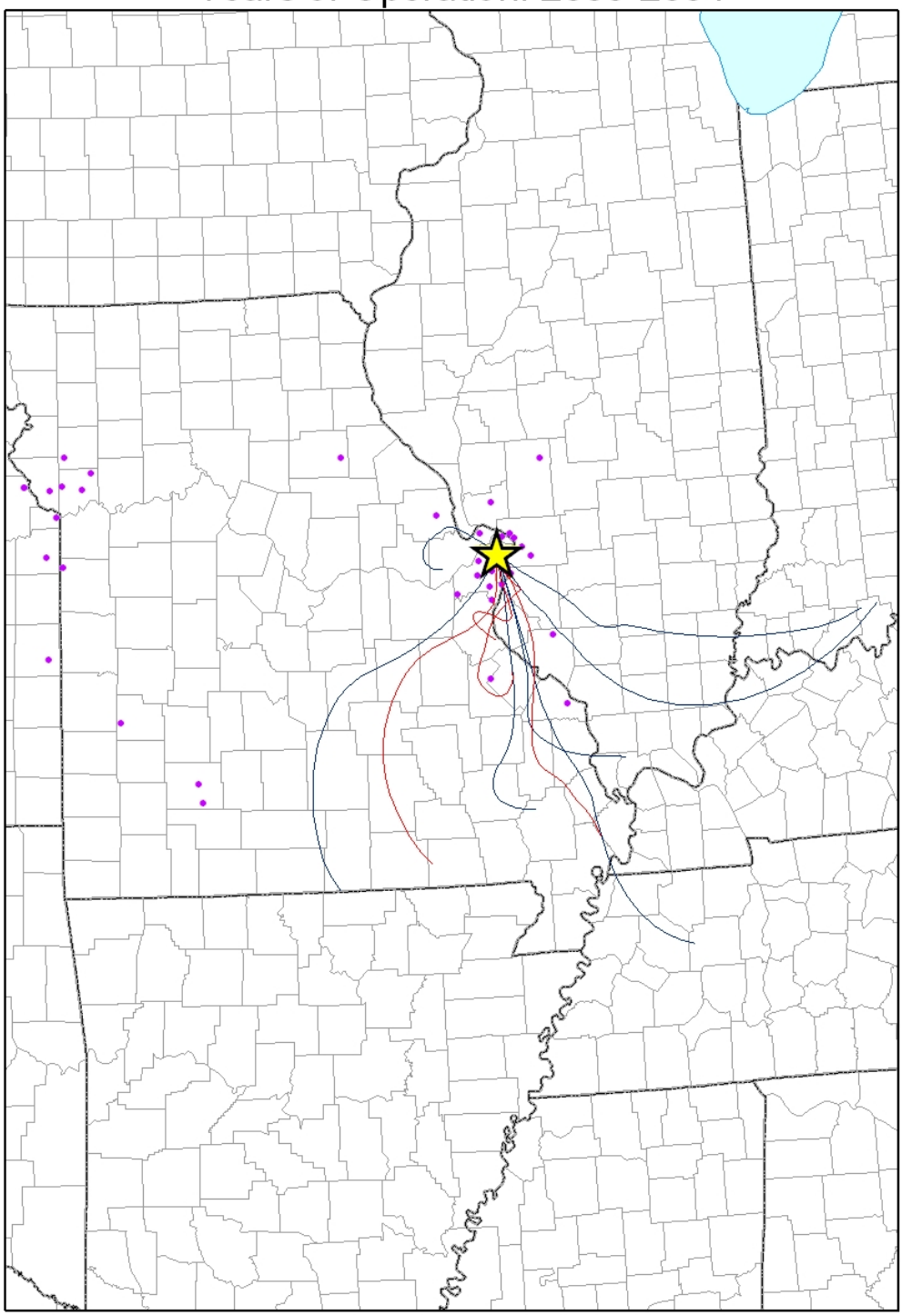


FIGURE 27

Site: S. Broadway
Year of Operation: 2003

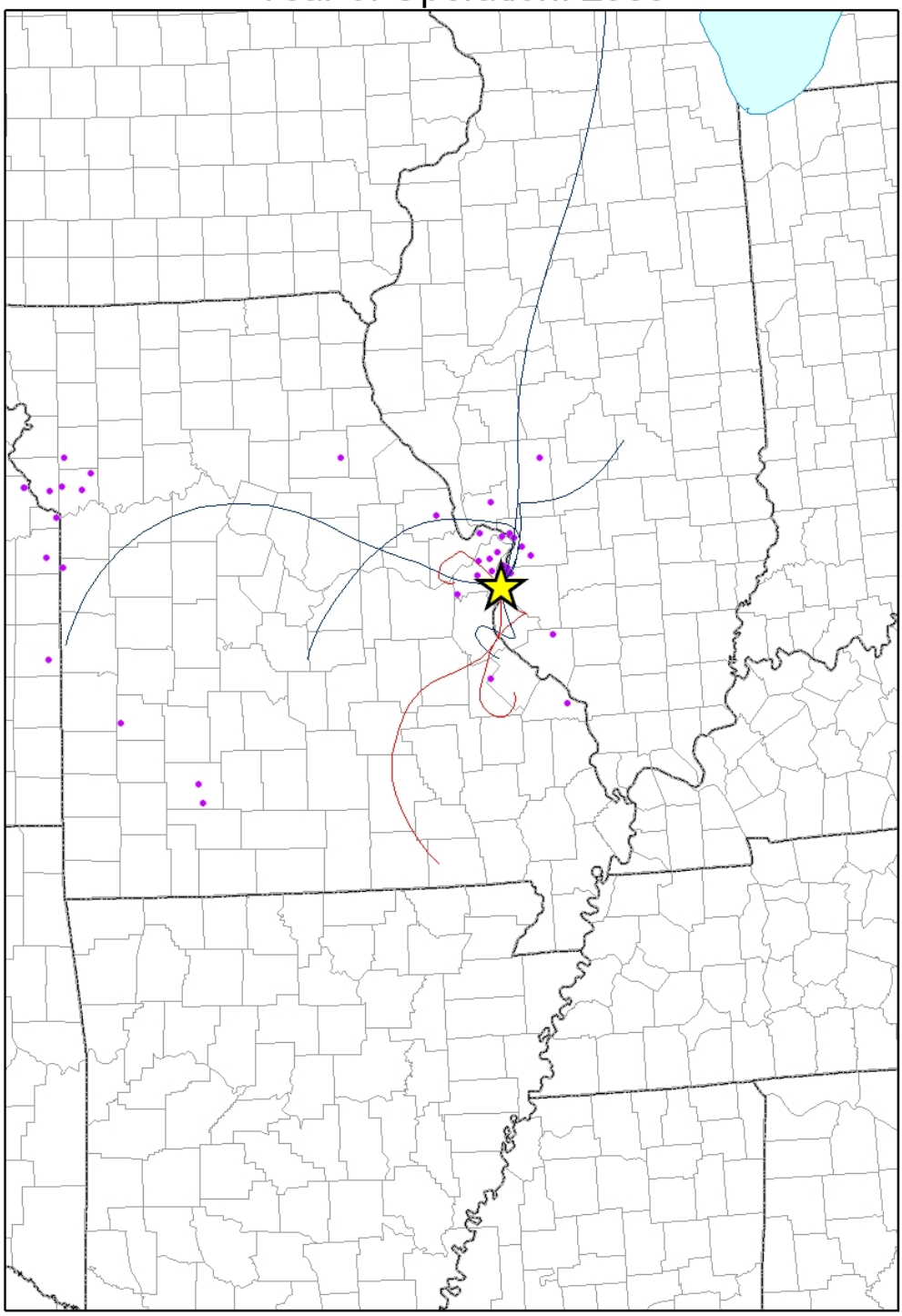


FIGURE 28

Site: Clayton
Years of Operation: 2003-2004

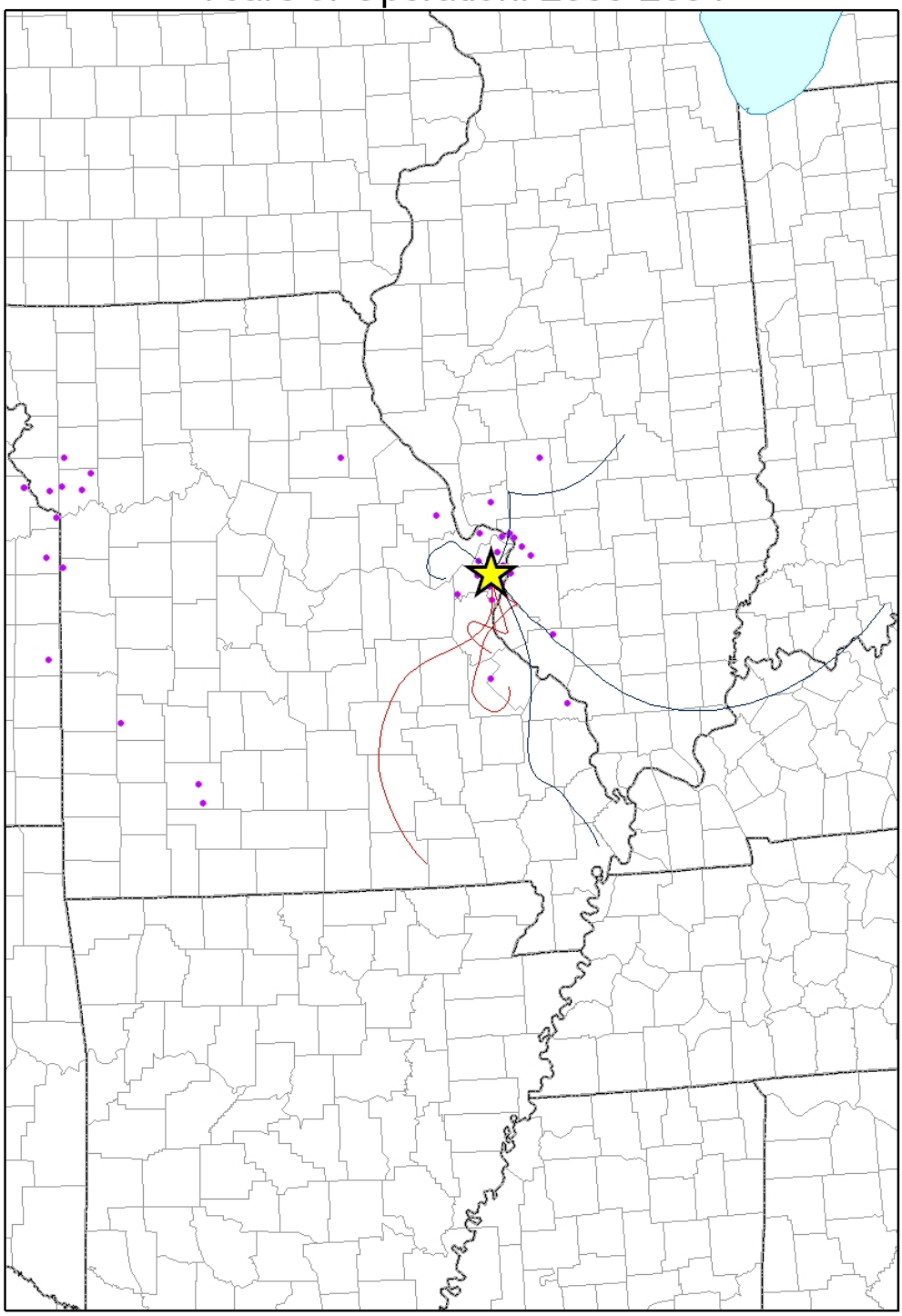


FIGURE 29

Site: Breckenridge Hills
Years of Operation: 2003-2004

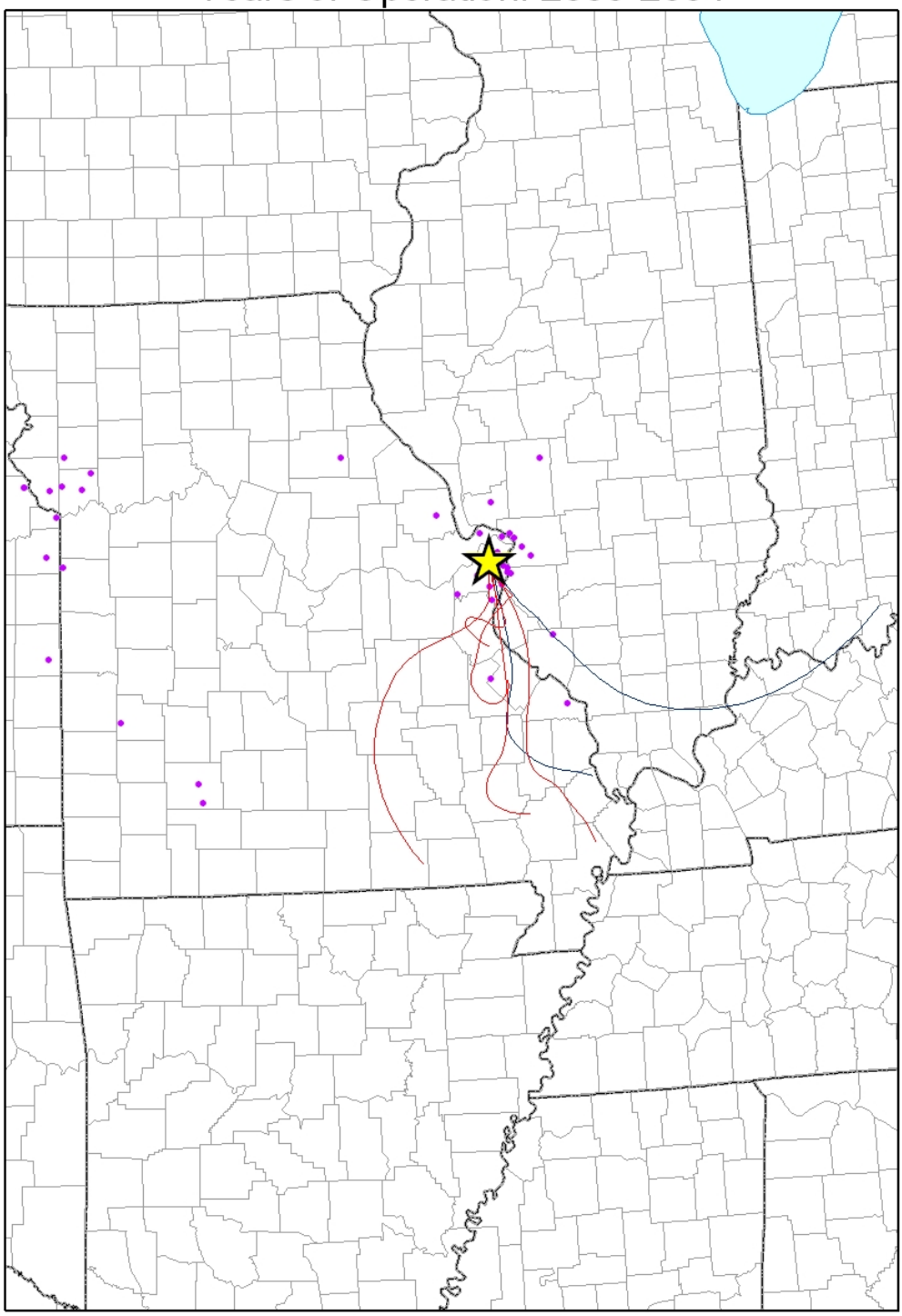


FIGURE 30

Site: Edwardsville
Years of Operation: 2003-2004

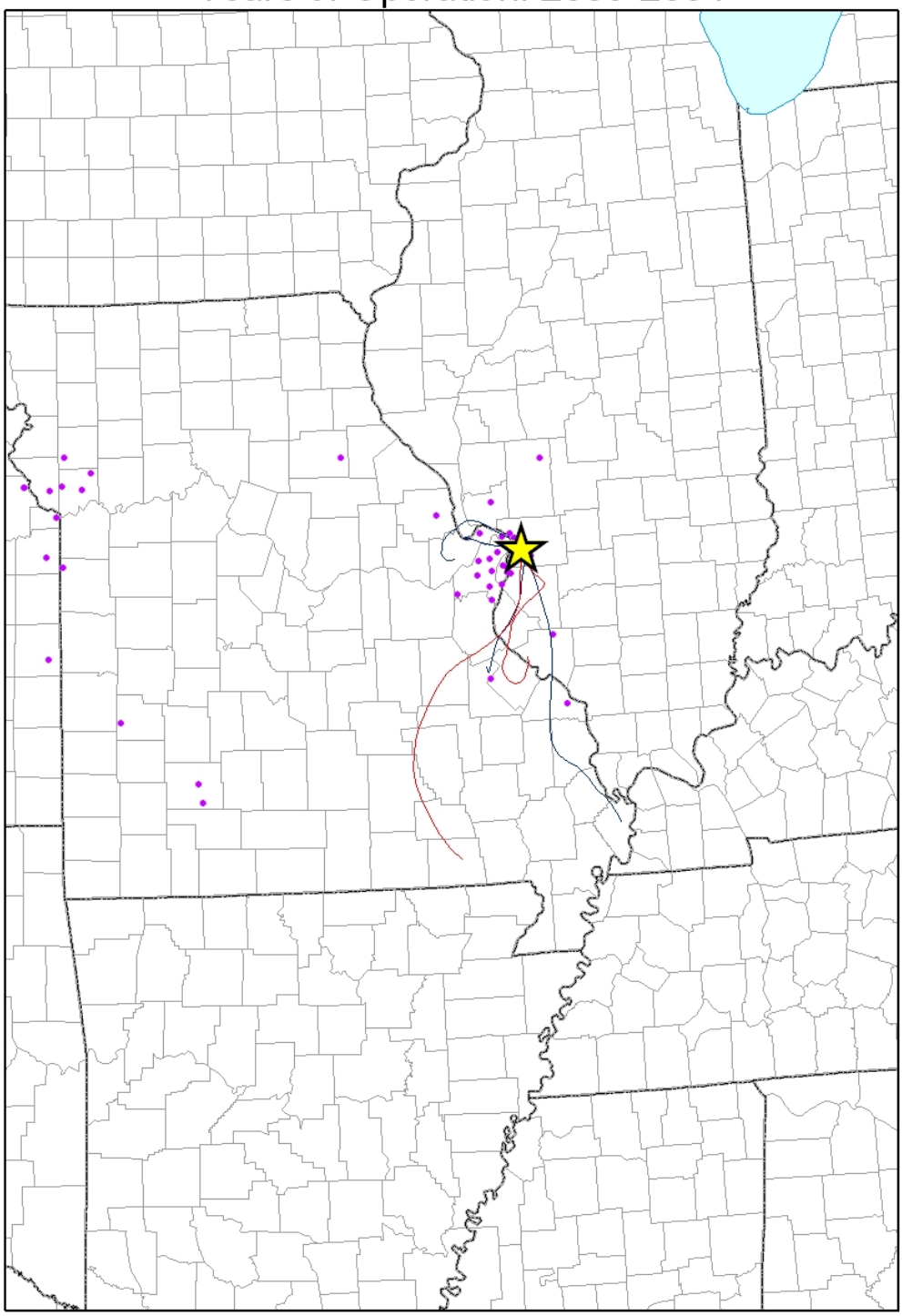


FIGURE 31

Site: Clark
Years of Operation: 2003-2004

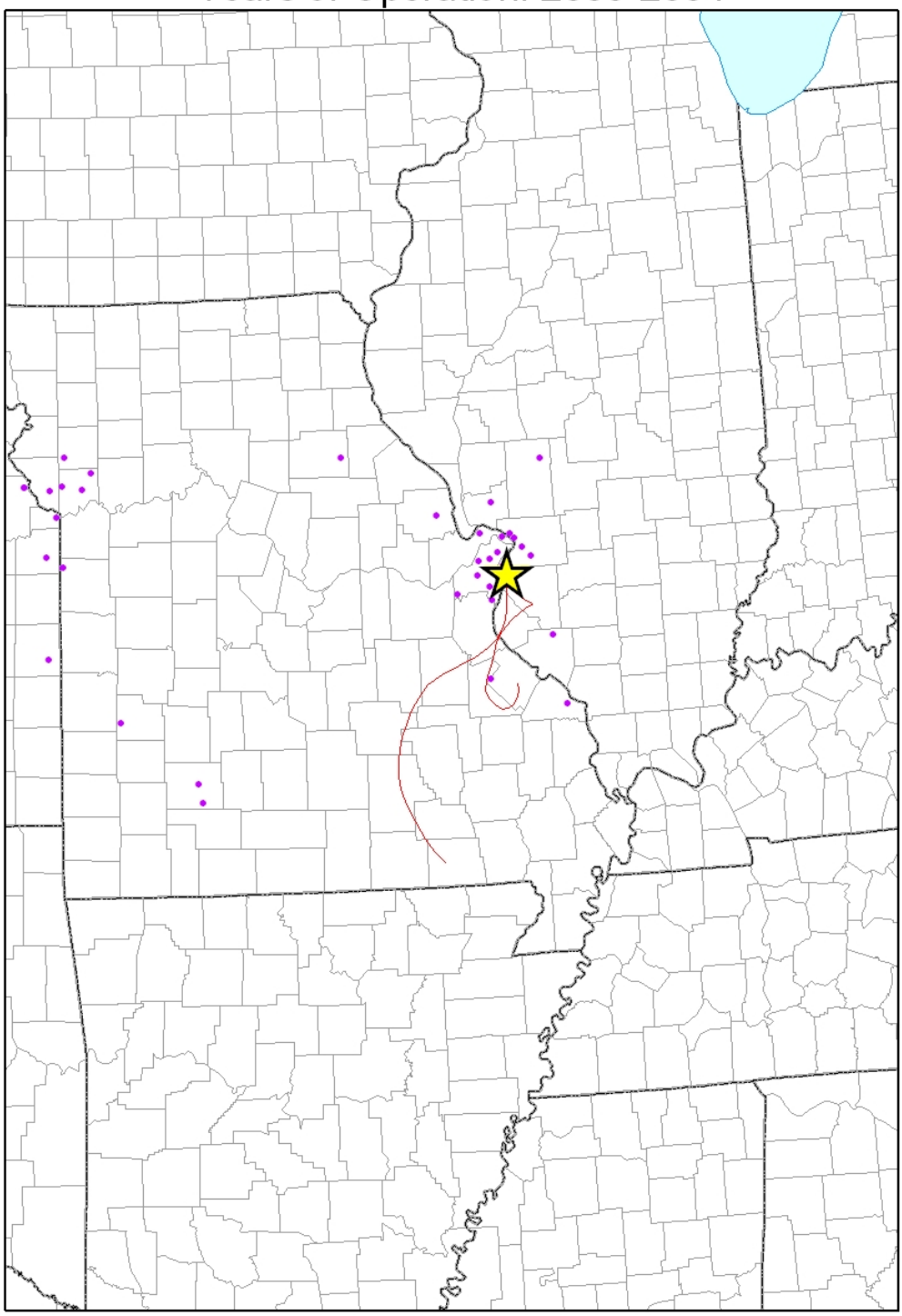


FIGURE 32

Site: Rocky Creek
Years of Operation: 2003-2007

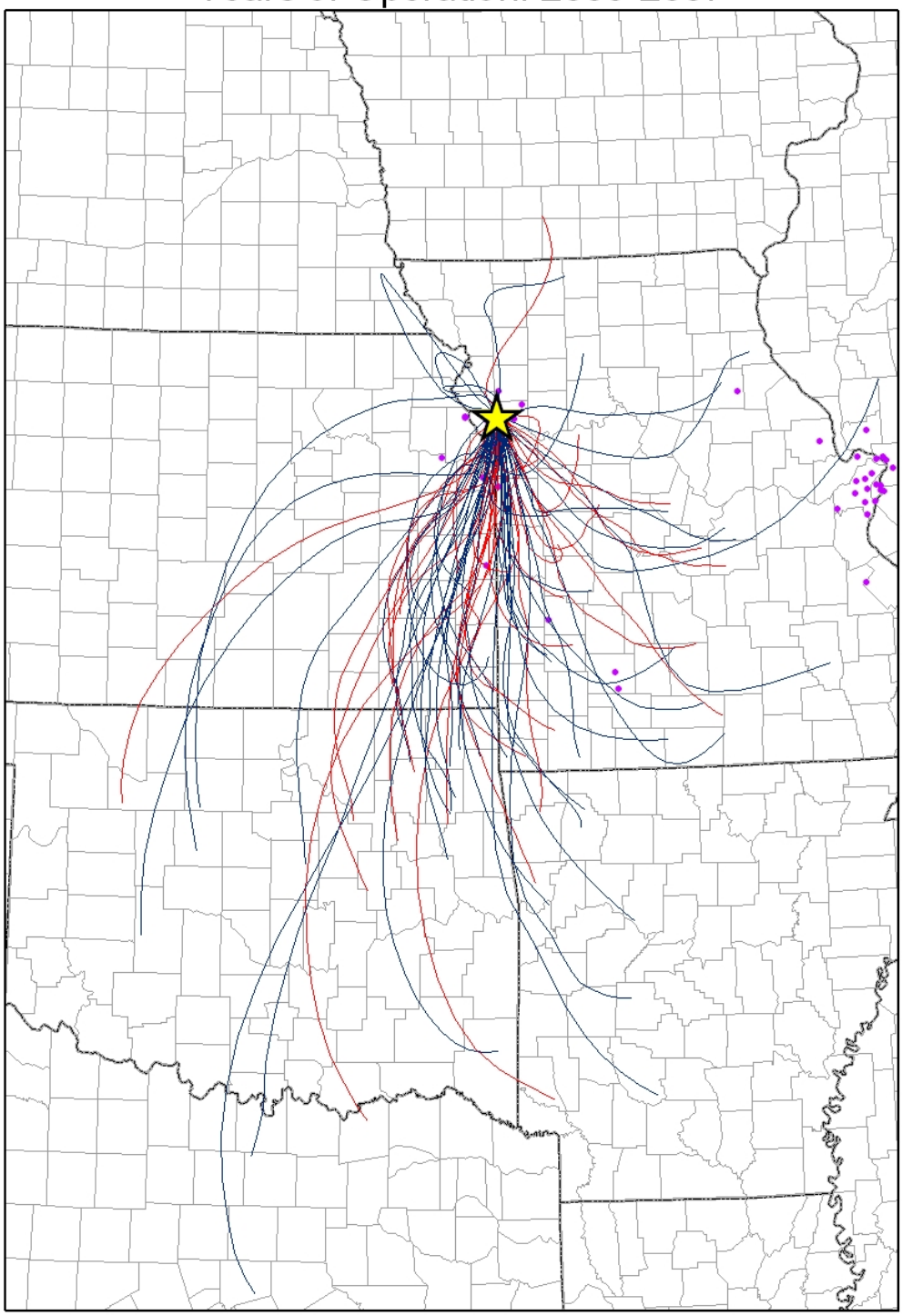


FIGURE 33

Site: Liberty
Years of Operation: 2003-2007

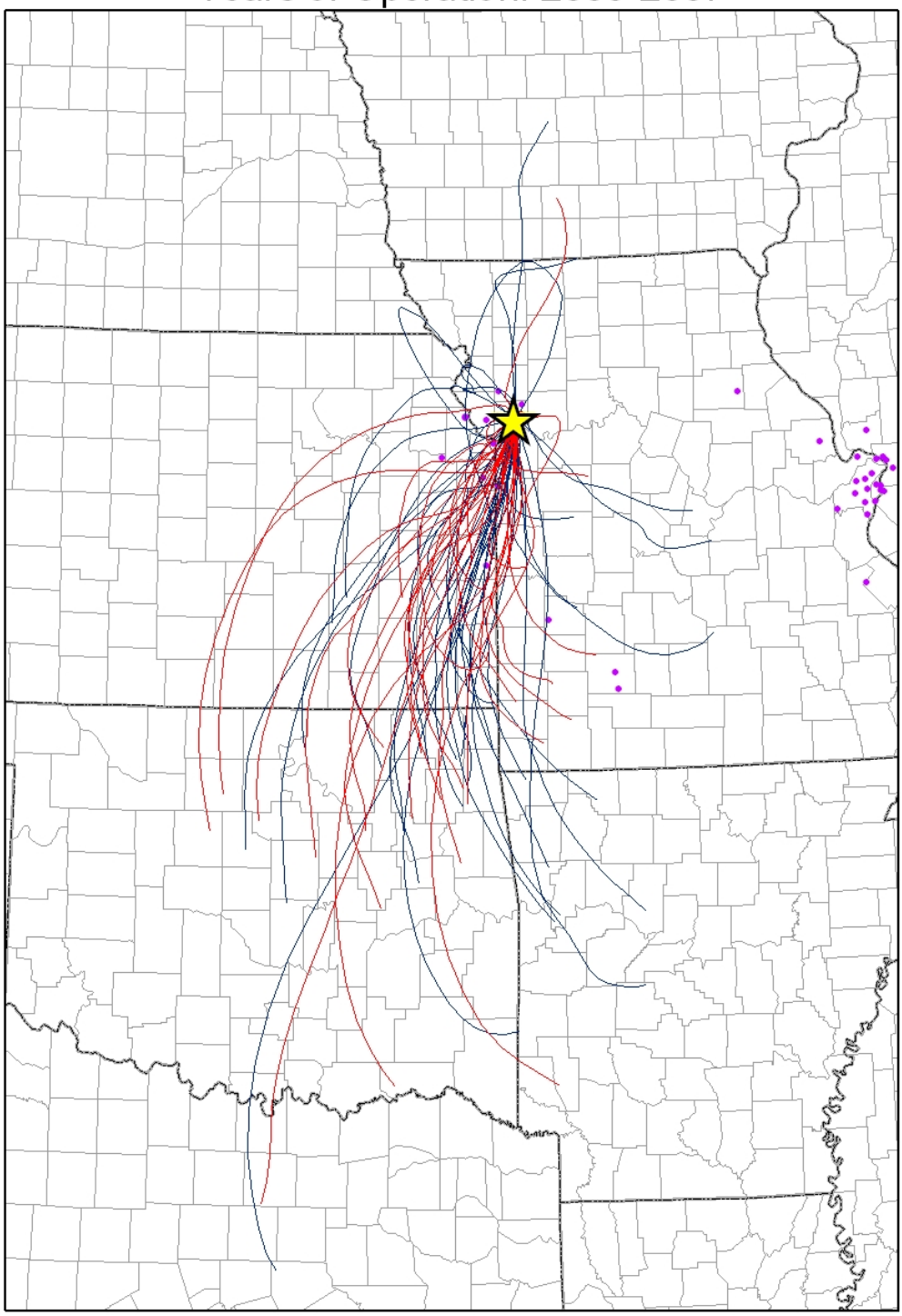


FIGURE 34

Site: Trimble
Years of Operation: 2004-2007

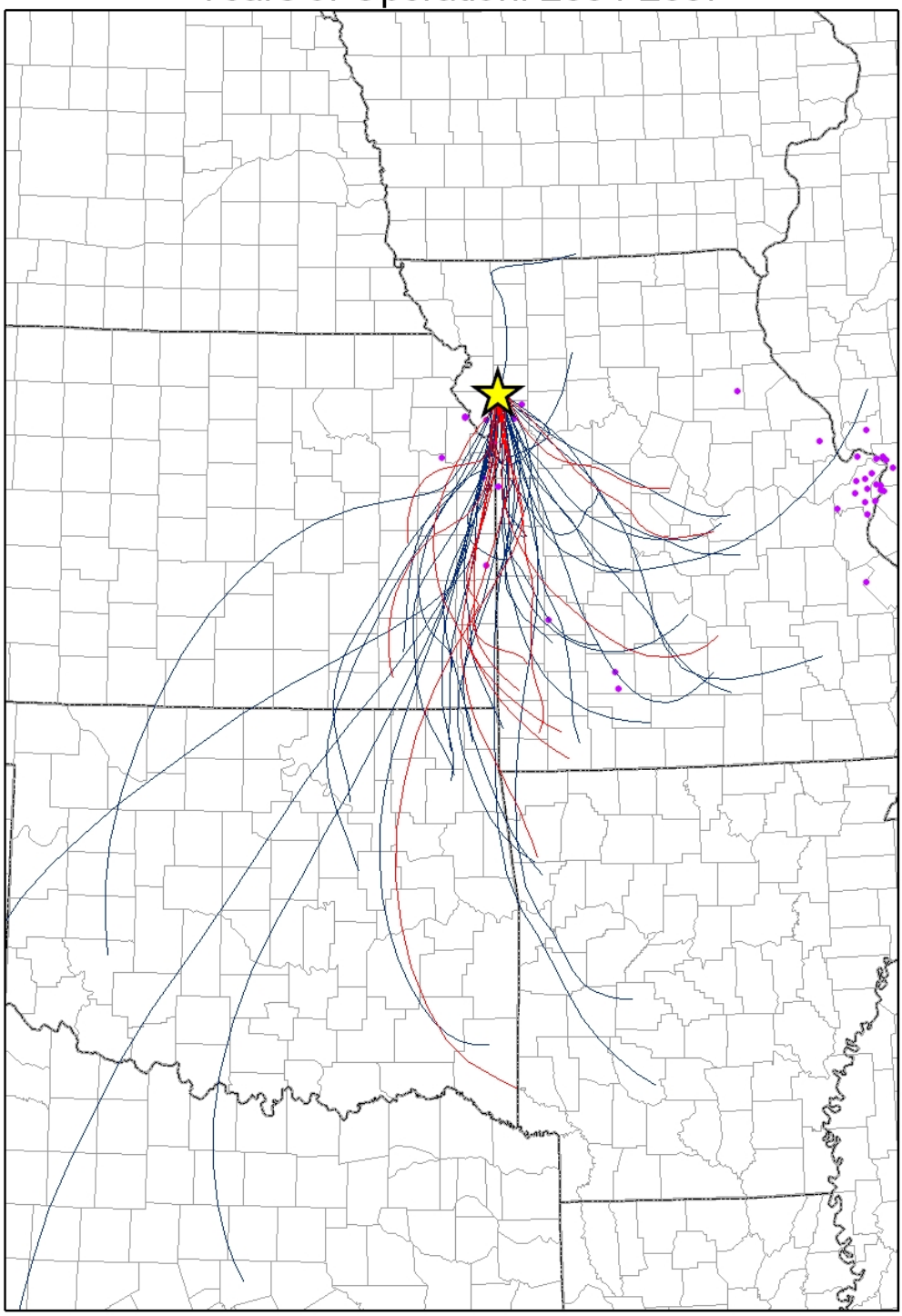


FIGURE 35

Site: Watkins Mill
Years of Operation: 2003-2007

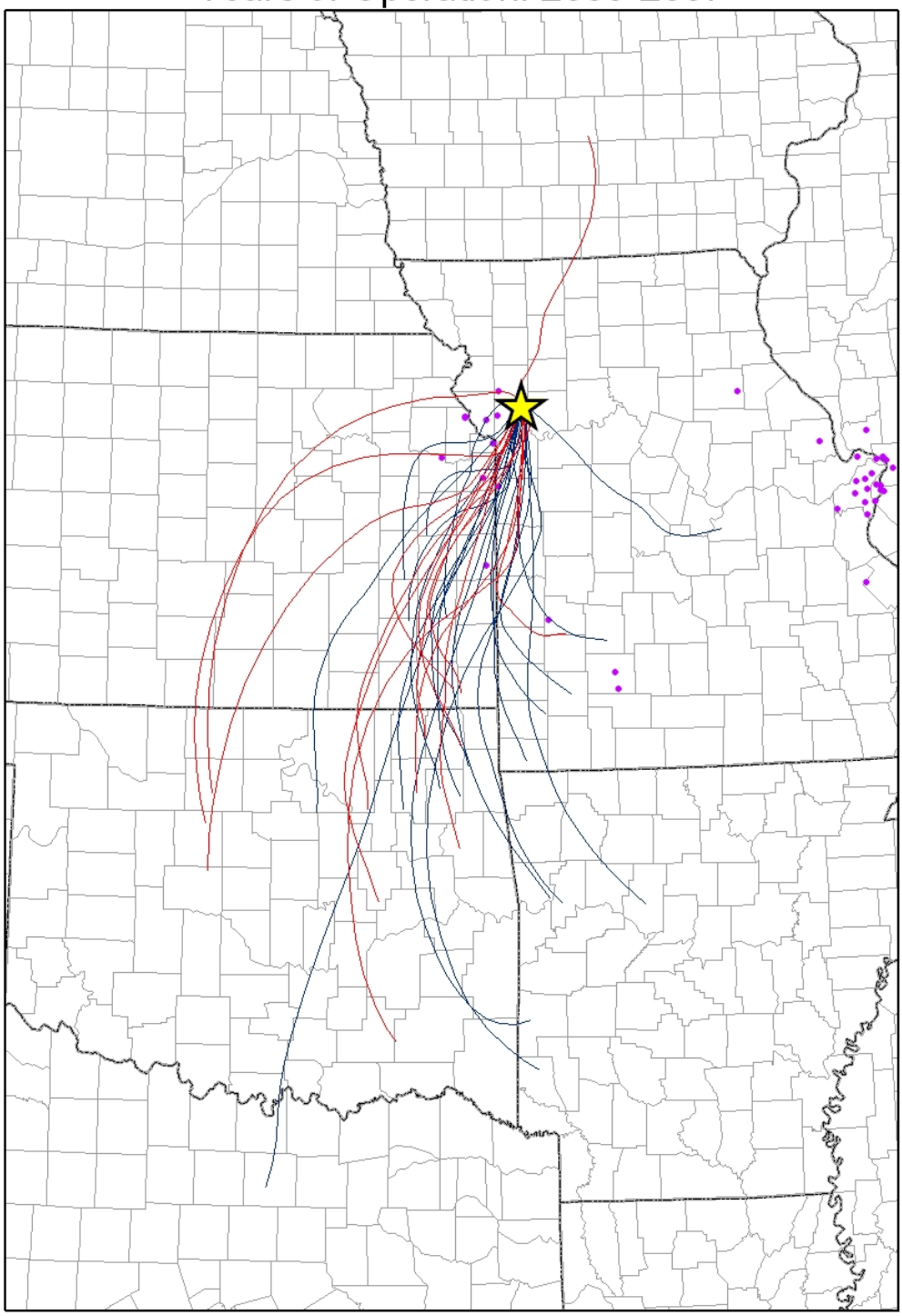


FIGURE 36

Site: JFK-Wyandotte
Years of Operation: 2003-2007

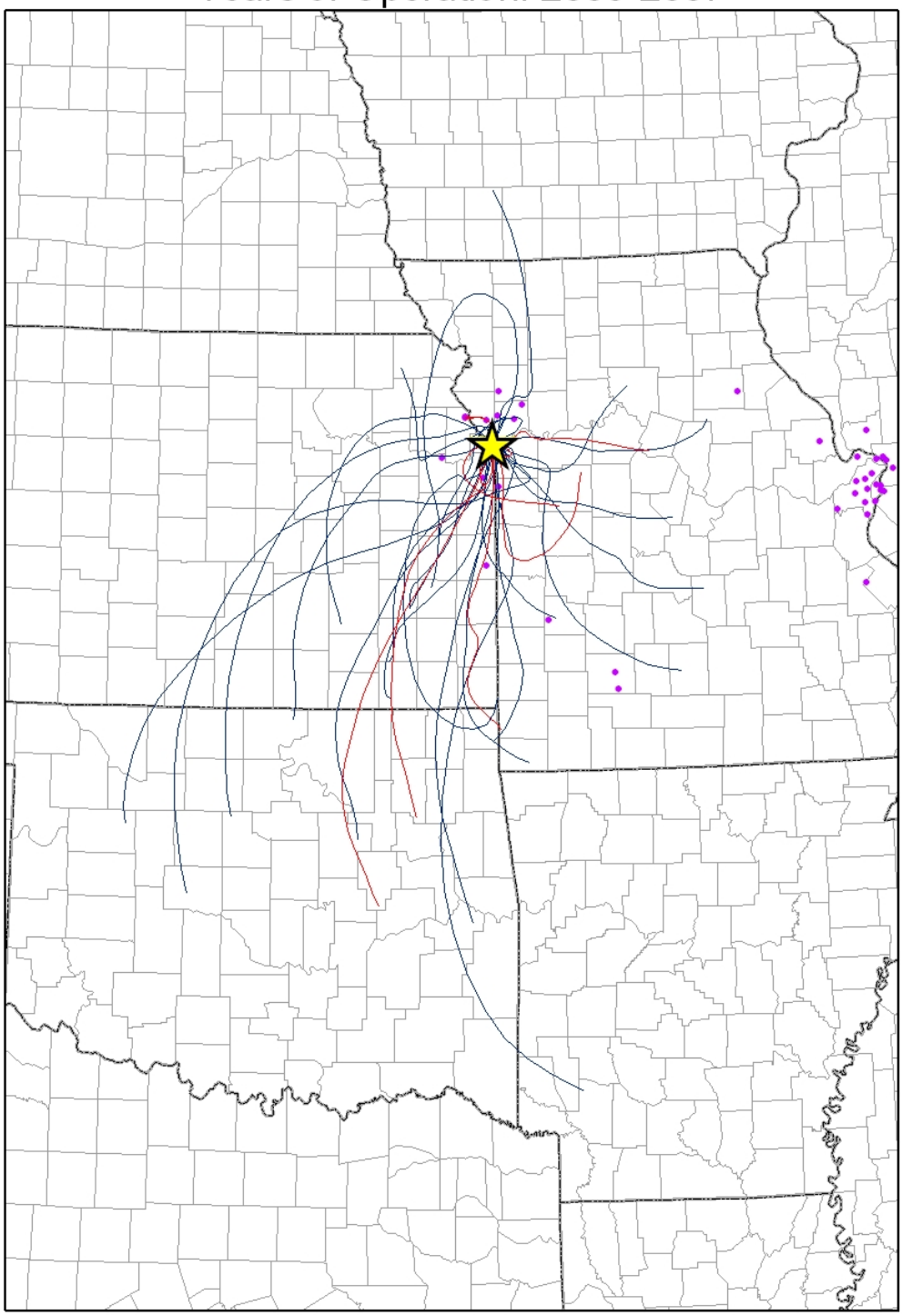


FIGURE 37

Site: Leavenworth
Years of Operation: 2003-2007

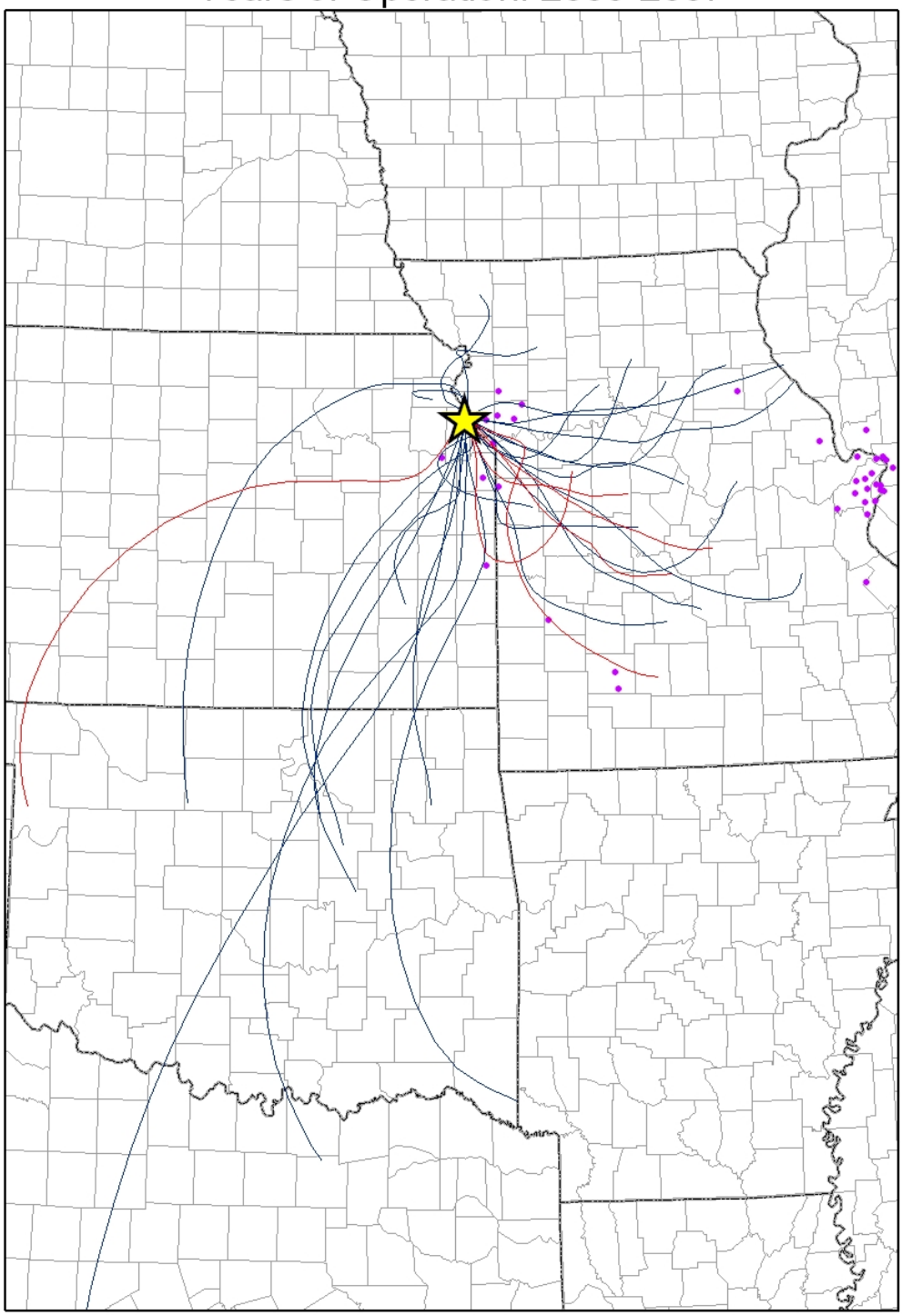


FIGURE 38

Site: RG South
Years of Operation: 2003-2007

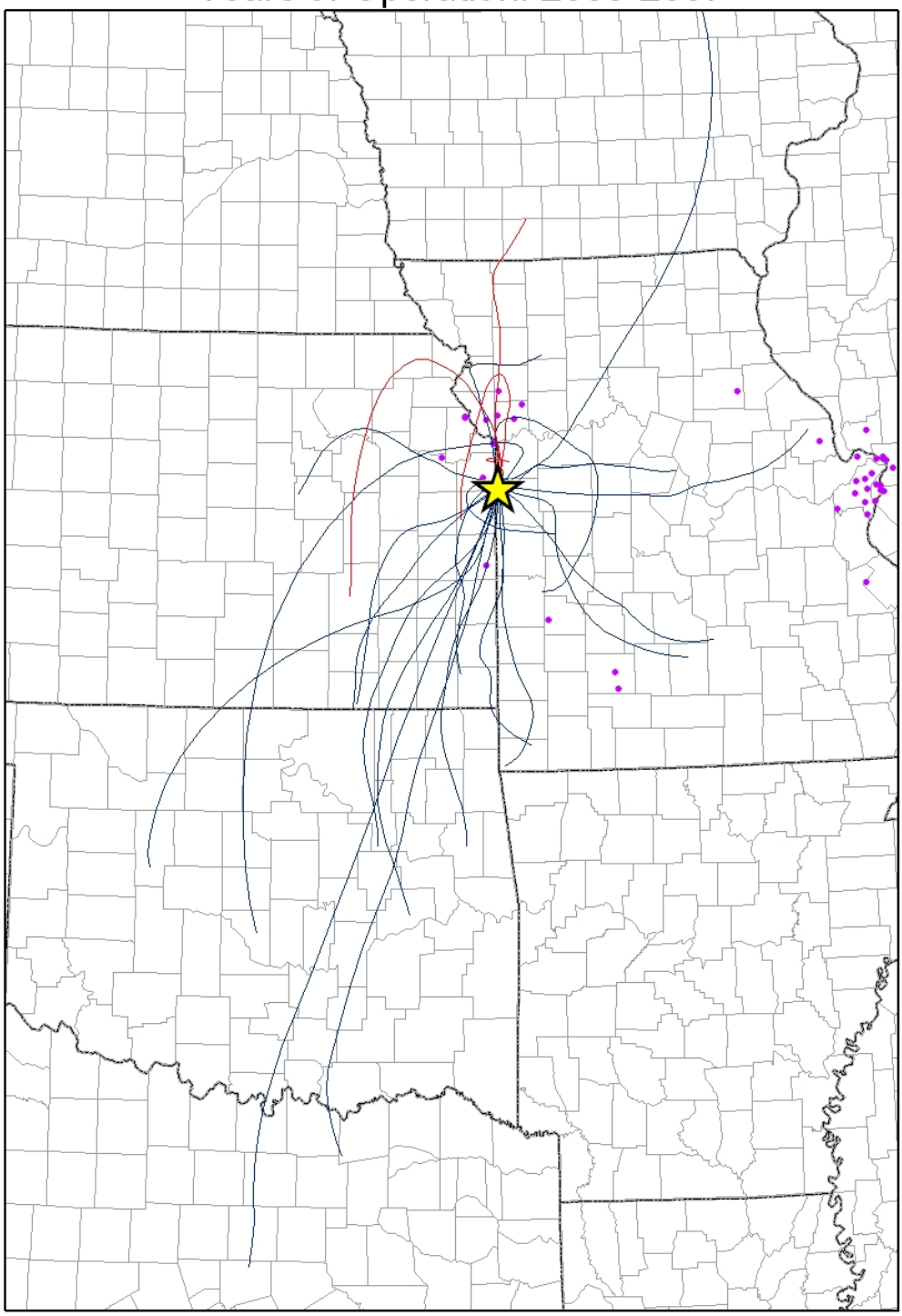


FIGURE 39

Site: Olathe
Years of Operation: 2003-2007

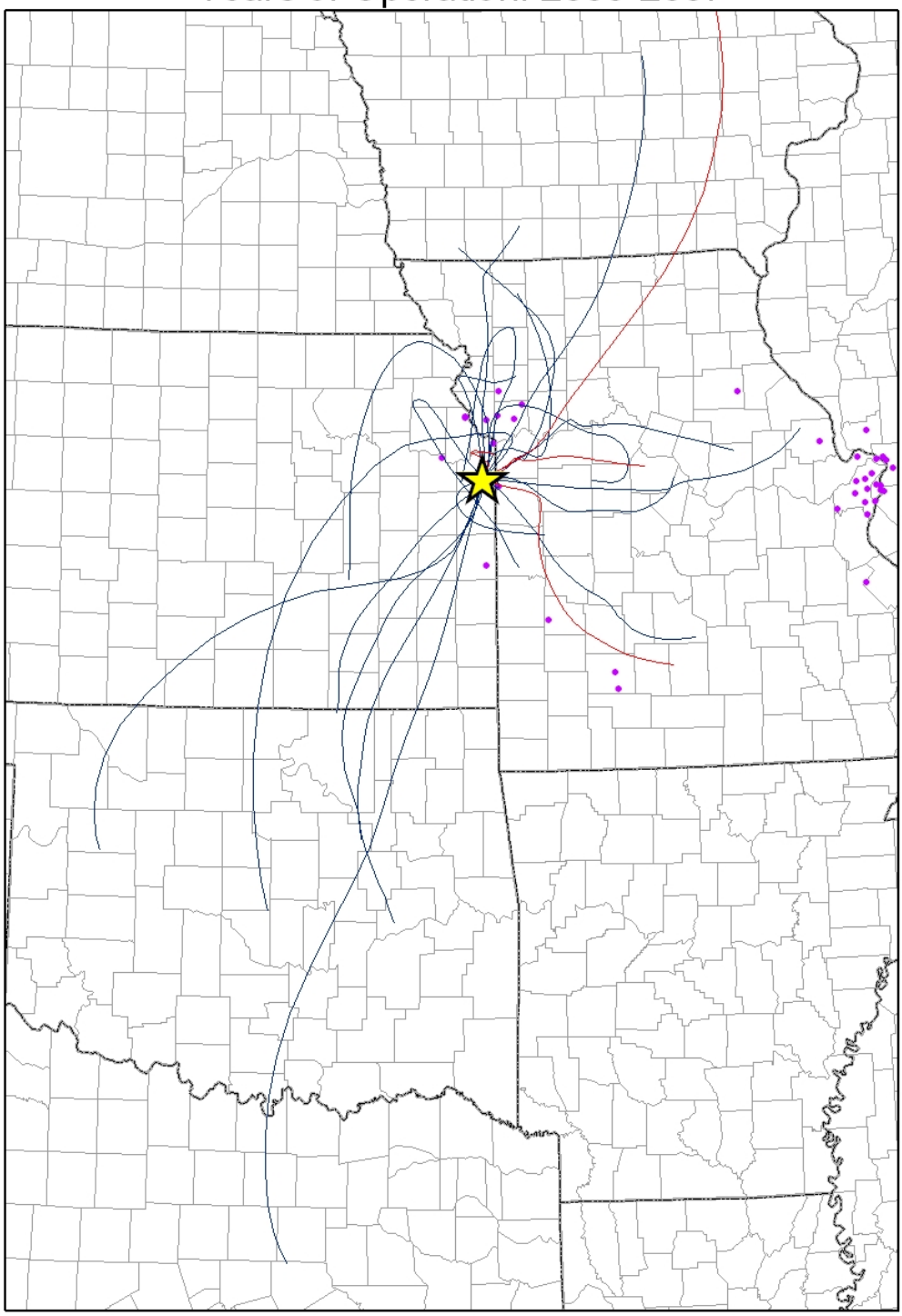


FIGURE 40

Site: KCI
Years of Operation: 2003-2005

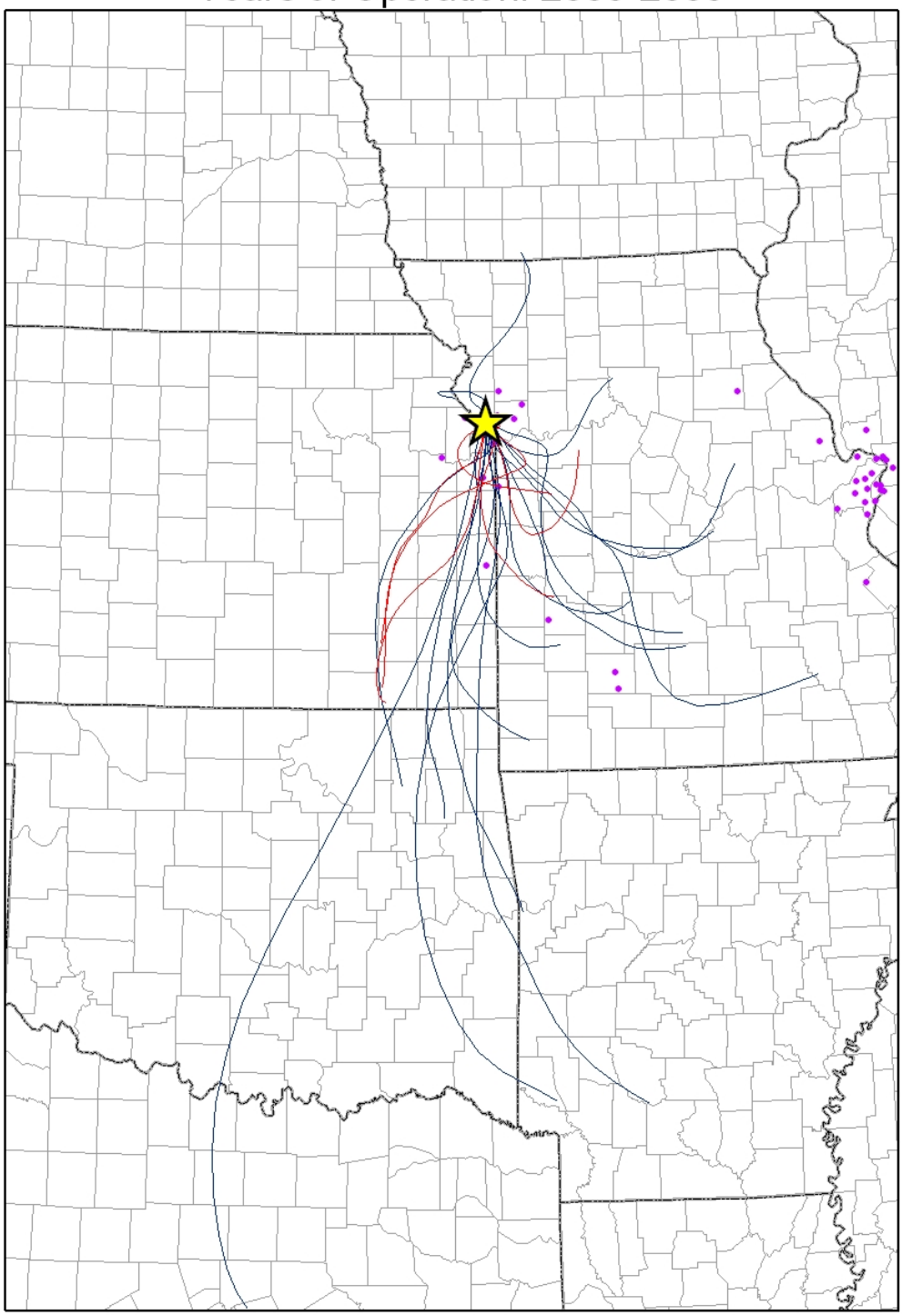


FIGURE 41

Site: Lawrence
Years of Operation: 2003-2006

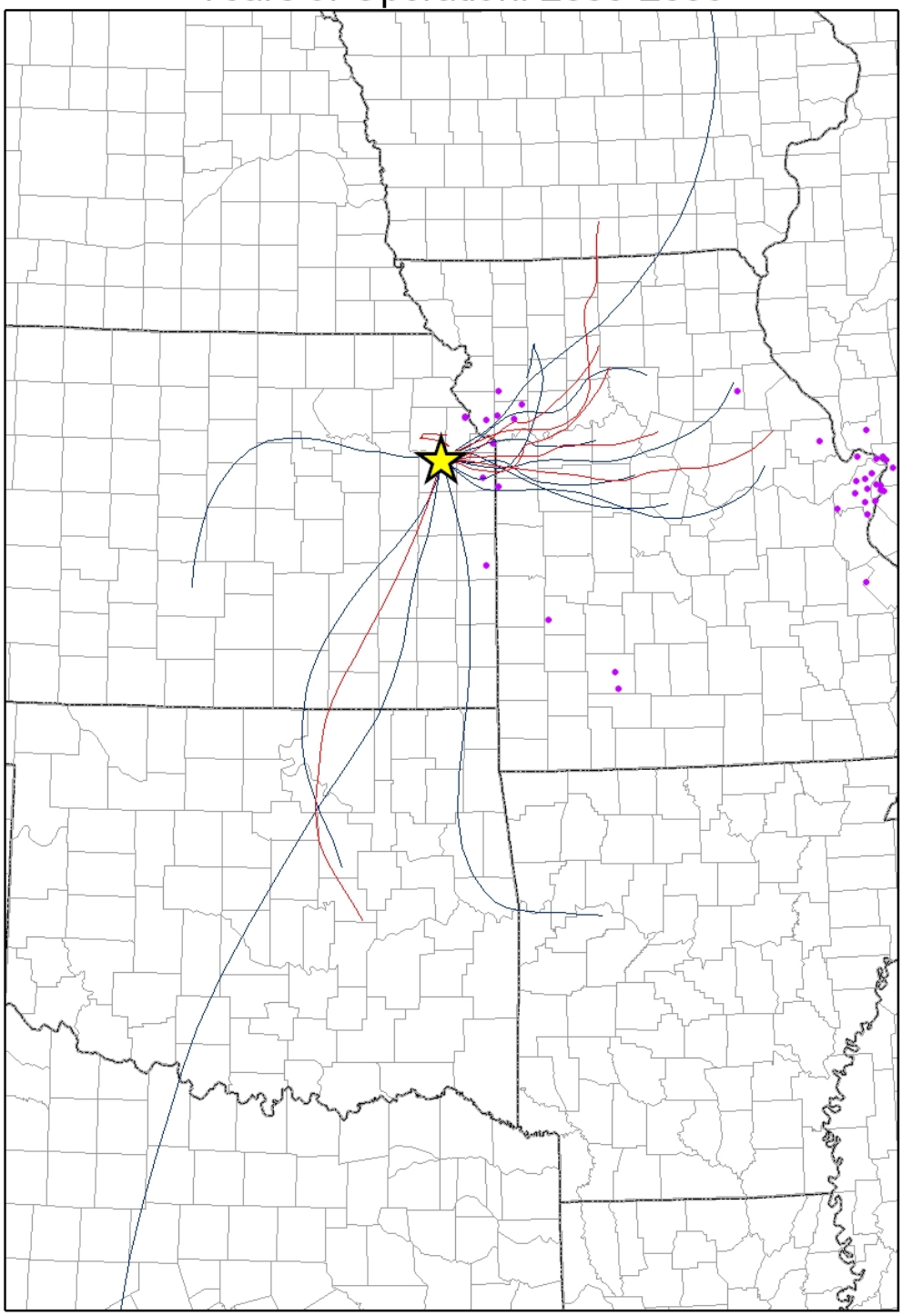


FIGURE 42

Site: Hillcrest
Years of Operation: 2003-2007

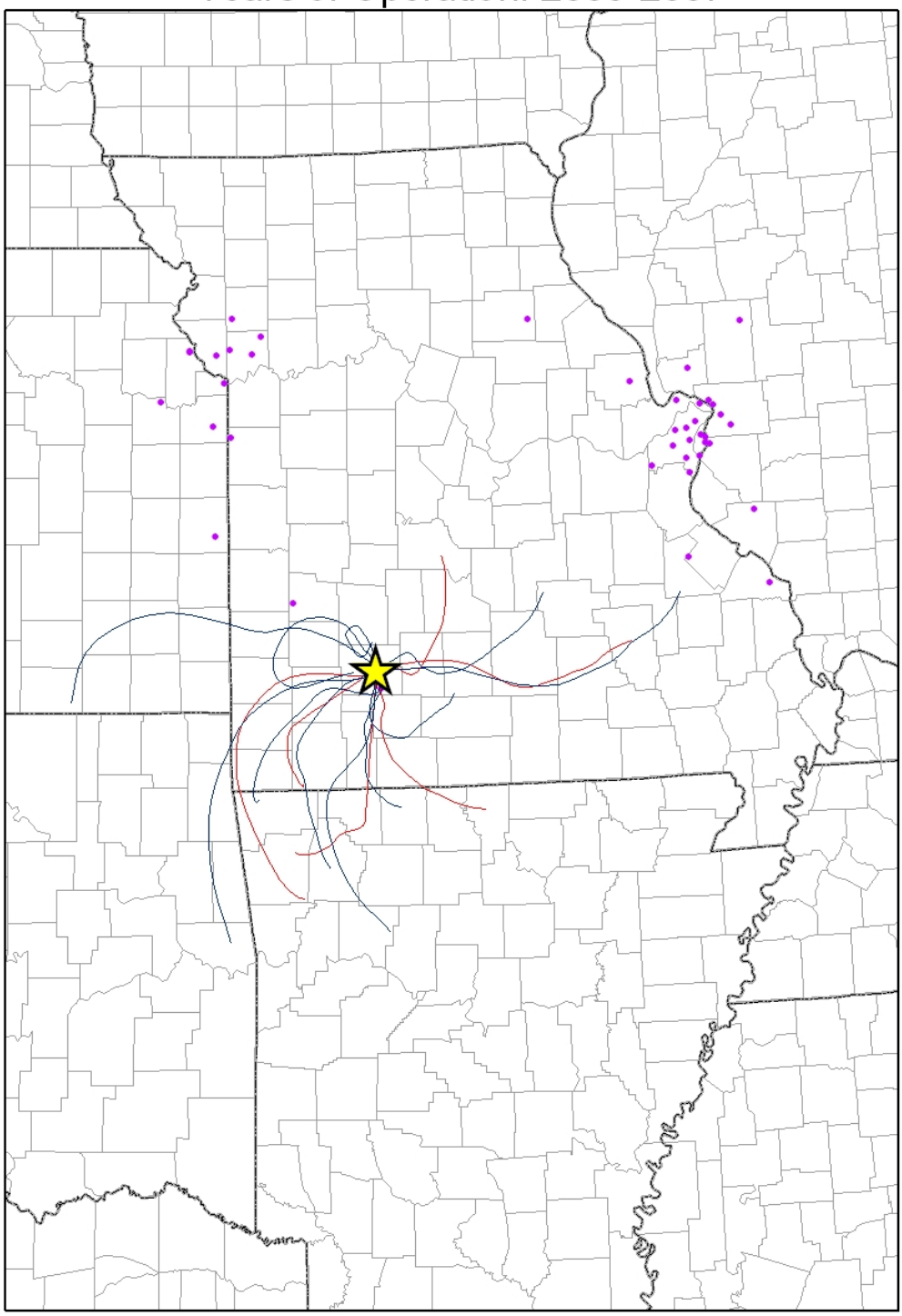


FIGURE 43

Site: S. Charleston
Years of Operation: 2003-2007

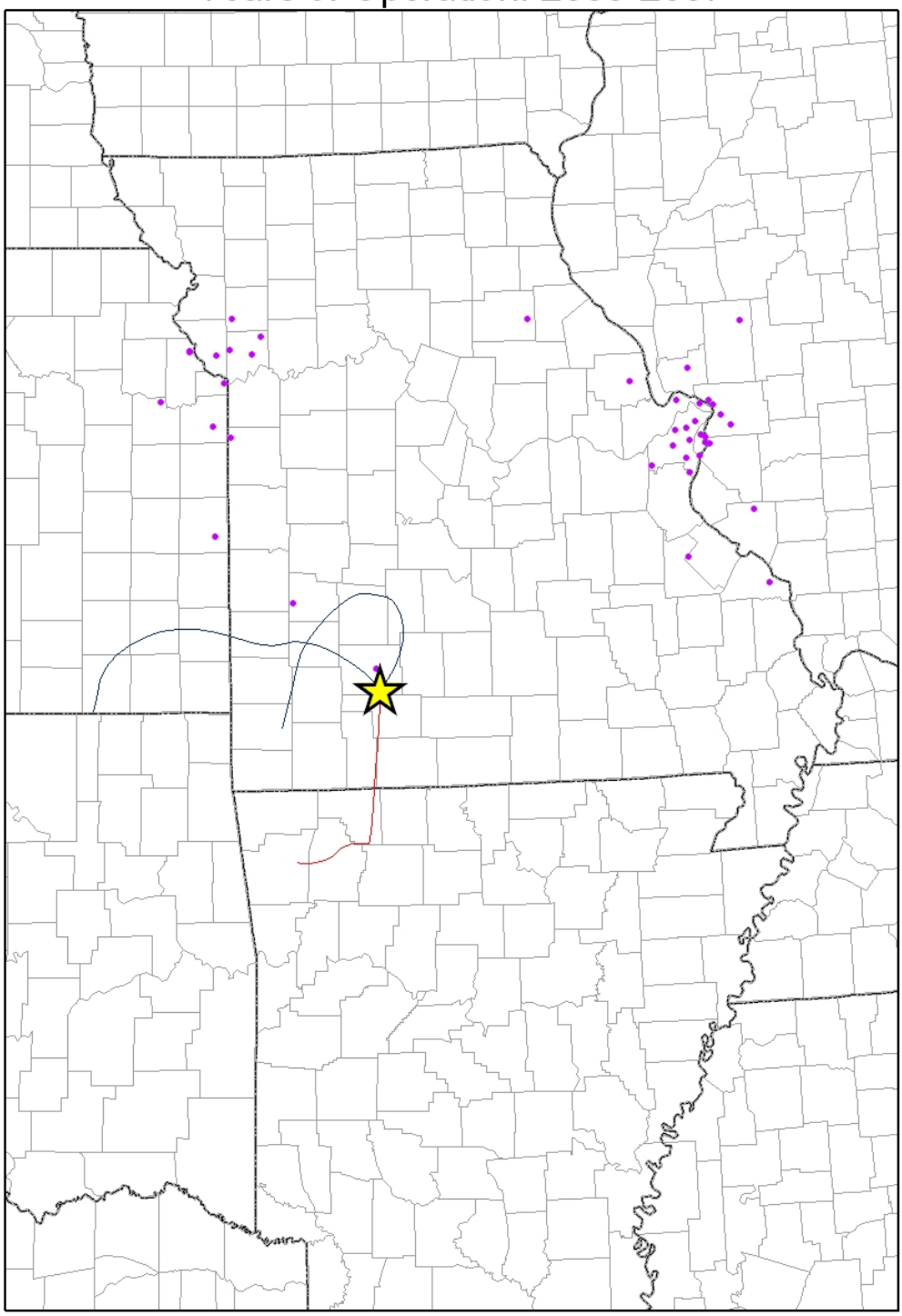


FIGURE 44

Site: Farrar
Years of Operation: 2004-2007

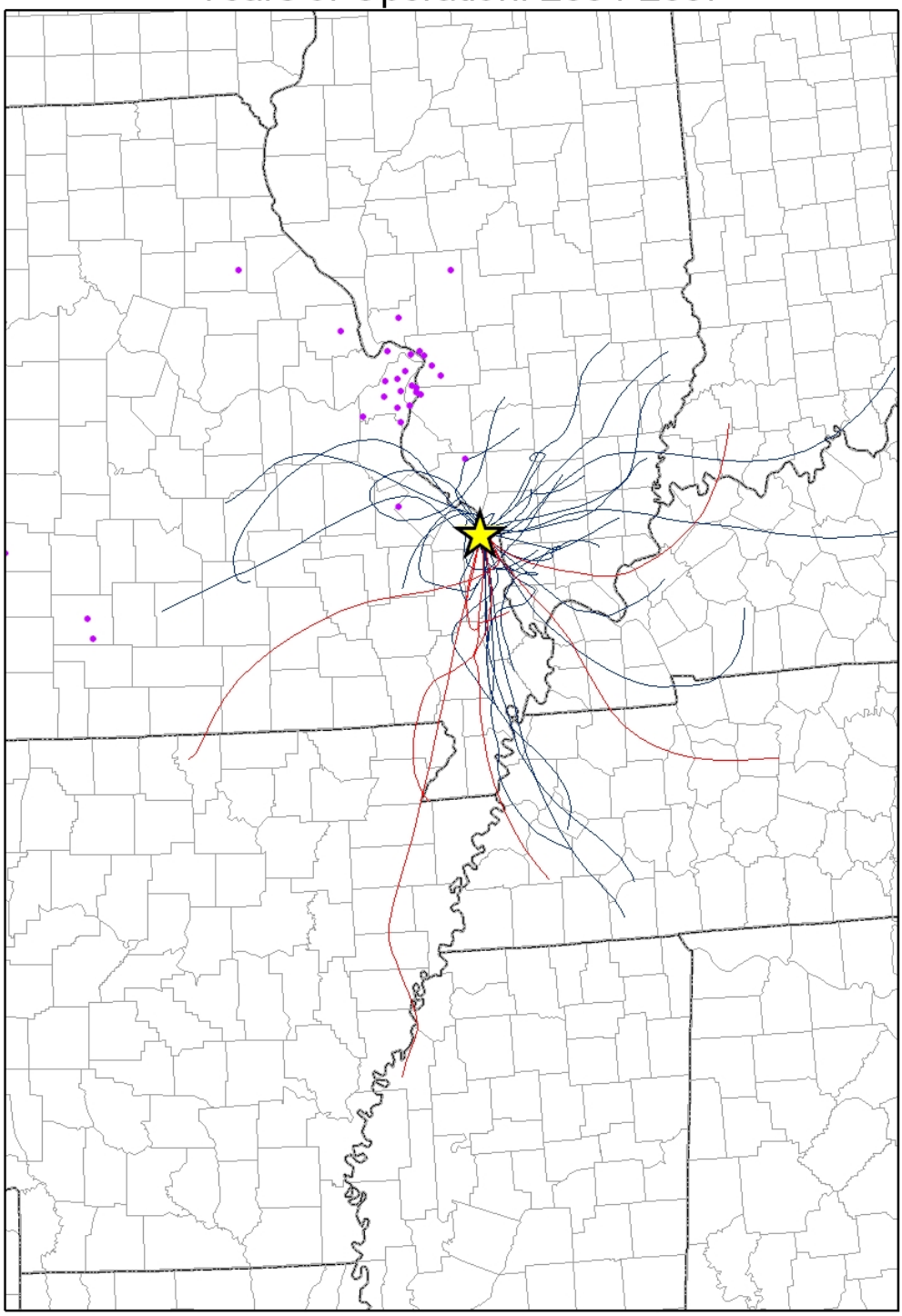


FIGURE 45

Site: El Dorado Springs
Years of Operation: 2003-2007

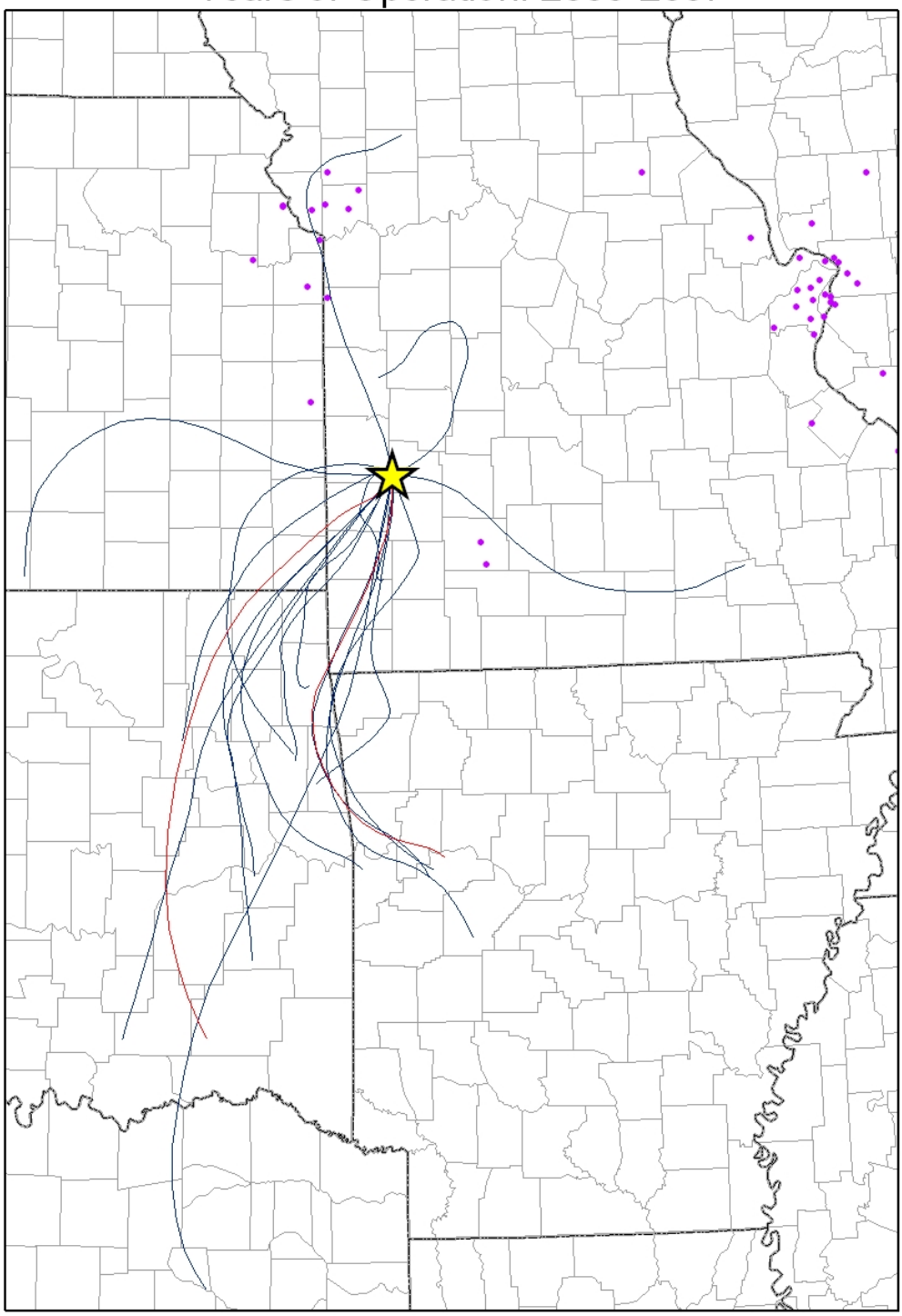


FIGURE 46

Site: Mark Twain
Years of Operation: 2003-2007

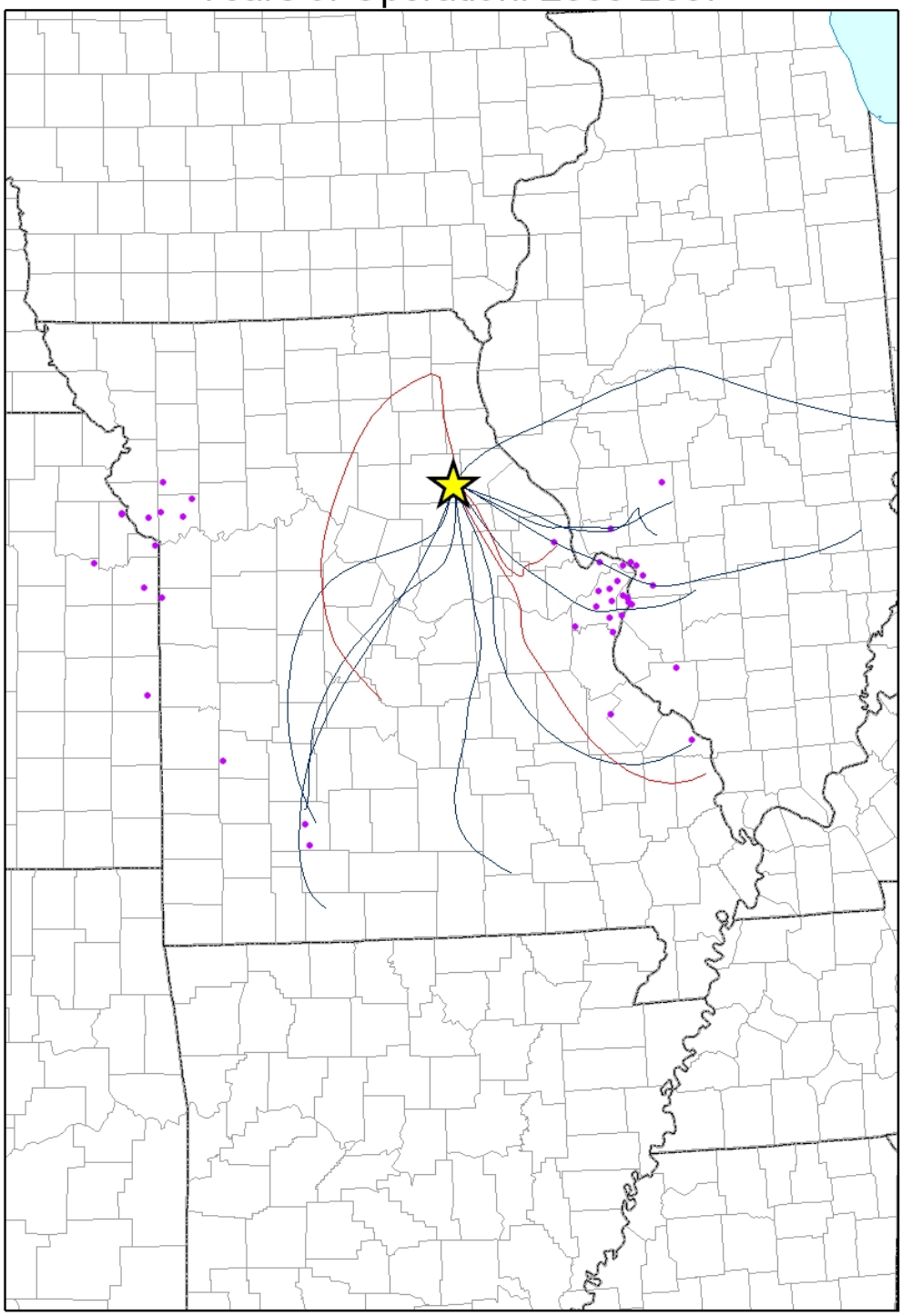


FIGURE 47

Site: Linn County
Years of Operation: 2003-2007

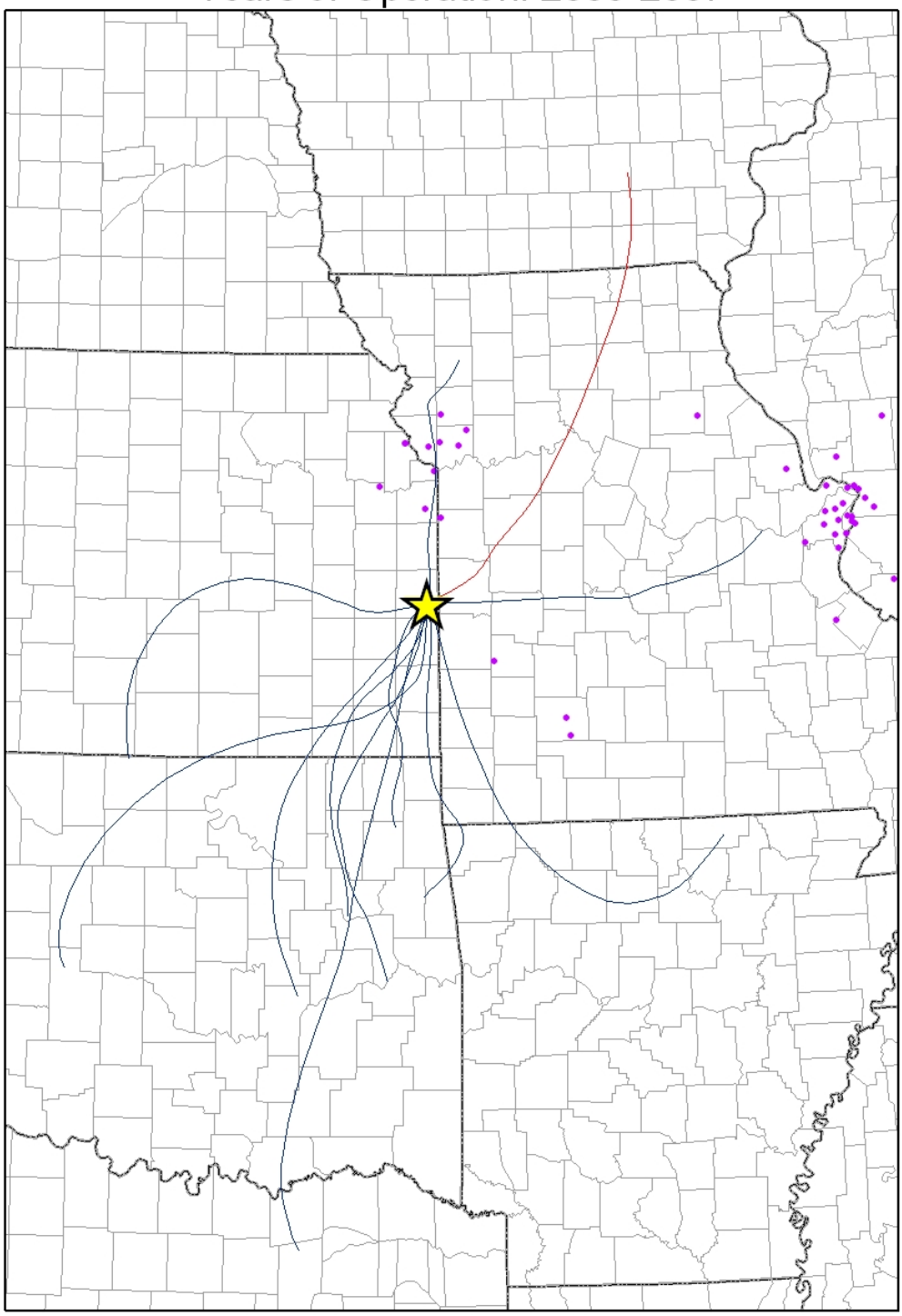


FIGURE 48
KSTL APRIL - SEPTEMBER (DIURNAL)

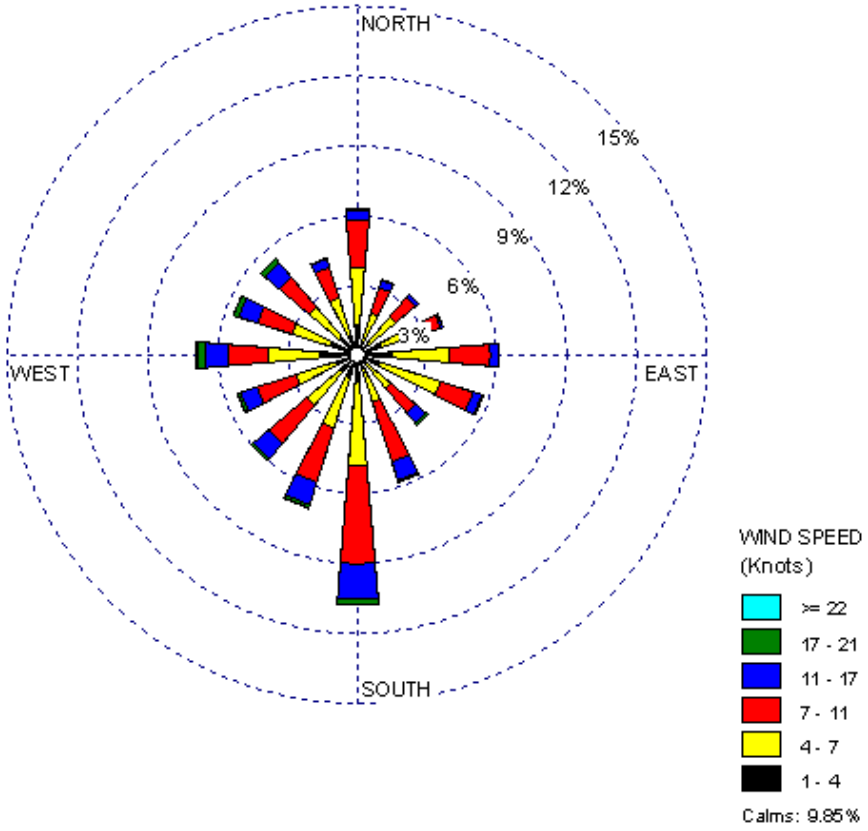


FIGURE 49
KSTL JUNE - SEPTEMBER (DIURNAL)

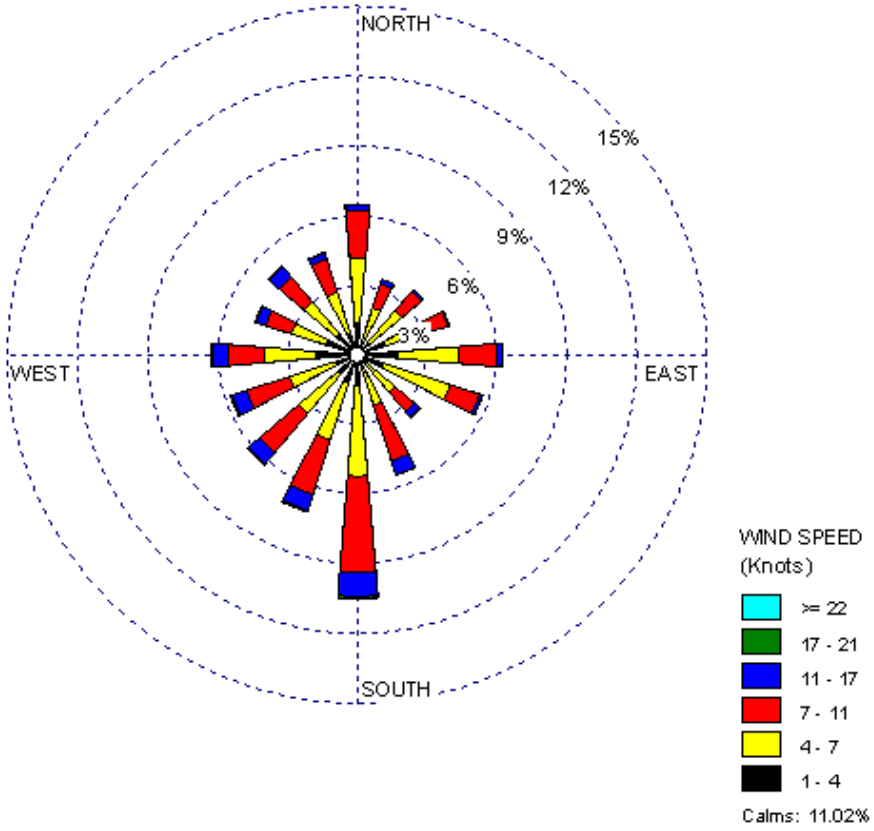


FIGURE 50
KMCI APRIL - SEPTEMBER (DIURNAL)

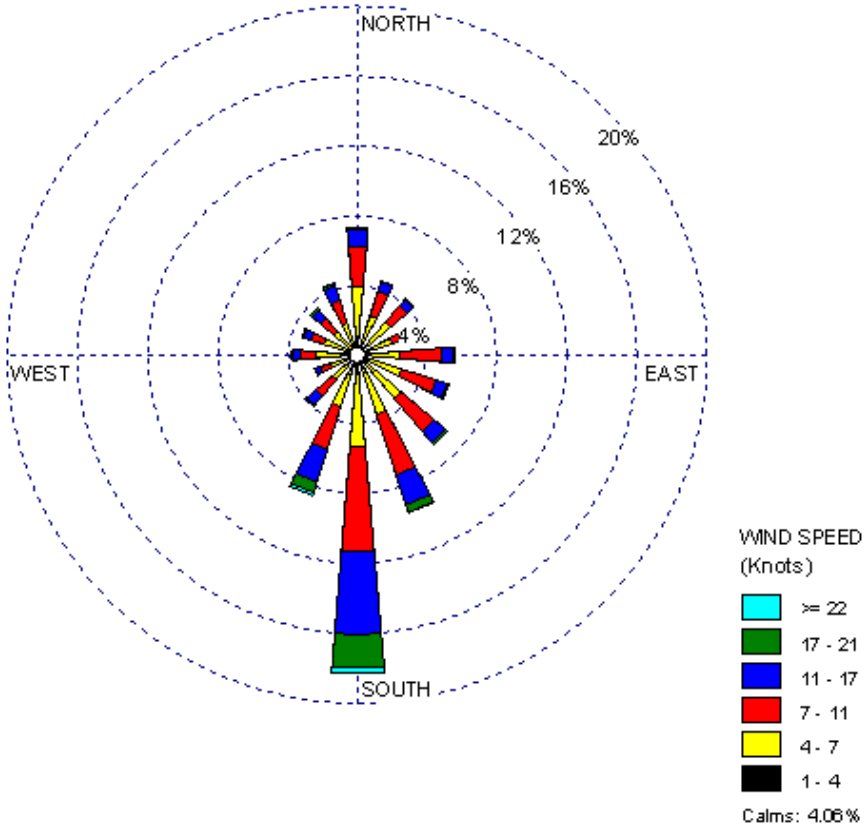


FIGURE 51
KMCI JUNE - SEPTEMBER (DIURNAL)

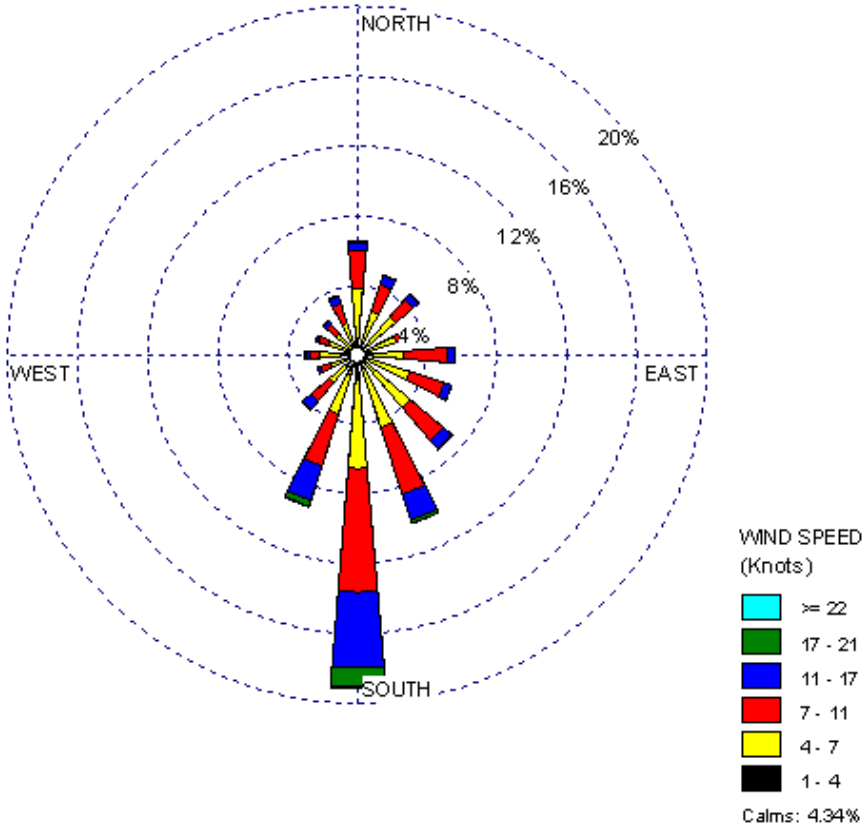


FIGURE 52
KSGF APRIL - SEPTEMBER (DIURNAL)

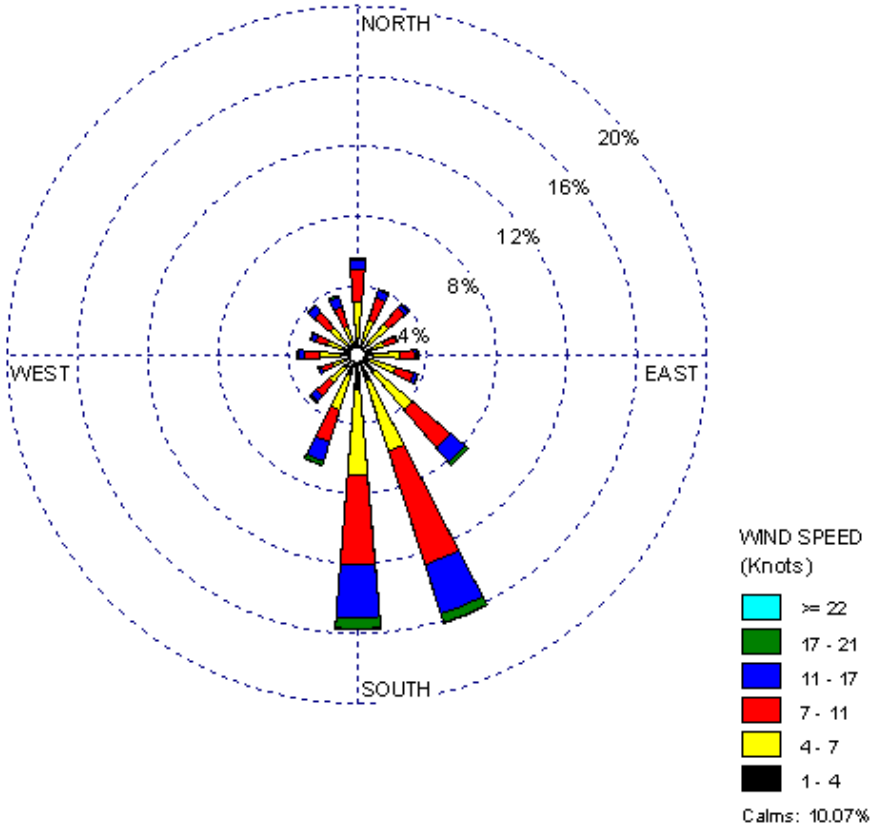


FIGURE 53
KSGF JUNE - AUGUST (DIURNAL)

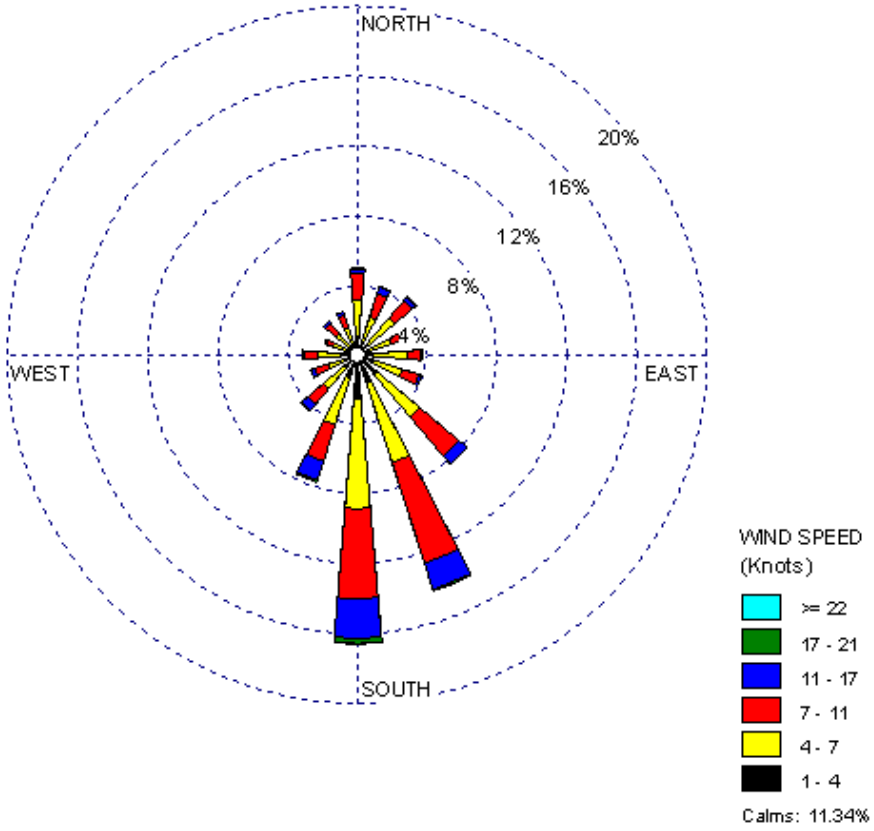


Table 1: Springfield Region Monitor Values During Exceedance Days (PPM)				
Date	Regime	Max	Hillcrest	S. Charleston
04/11/03	1	0.082	0.078	
04/12/03	1	0.079	0.078	0.079
04/13/03	1	0.085	0.085	0.082
08/22/03	4	0.081		0.081
07/22/04	2	0.086	0.076	
06/18/05	1	0.076	0.076	
06/21/05	7	0.078	0.078	
06/22/05	7	0.079	0.076	
06/28/05	3	0.084	0.076	
07/08/05	1	0.079	0.079	
08/01/05	1	0.083	0.083	
08/08/05	2	0.077	0.077	
07/19/06	2	0.077	0.077	
07/20/06	2	0.086	0.086	
06/13/07	7	0.082	0.082	
08/10/07	4	0.09	0.09	
08/11/07	2	0.08	0.08	
08/15/07	2	0.087	0.087	

Table 2: Kansas City Region Monitor Values During Exceedance Days (PPM)													
Date	**Regime**	**Max**	**RG South**	**Olathe**	**JFK-Wyandotte**	**Leavenworth A**	**Leavenworth B**	**Rocky Creek**	**Liberty**	**KCI**	**Watkins Mill**	**Trimble**	**Lawrence**
4/1/03	5	0.084	0.076		0.068	0.075		0.079	0.084	0.073	0.078		
4/11/03	1	0.080	0.076		0.070	0.068		0.075	0.077	0.070	0.080		0.071
4/12/03	3	0.093	0.082		0.074	0.076		0.091	0.093	0.076	0.089		0.077
4/13/03	3	0.082	0.082		0.076	0.075		0.051	0.053	0.073	0.056		0.074
5/30/03	3	0.079	0.065	0.079	0.072	0.071		0.076	0.078	0.065	0.075		0.057
6/15/03	1	0.081	0.068	0.074	0.069	0.071		0.070	0.068	0.063	0.061		0.081
6/17/03	1	0.089	0.070	0.075	0.072	0.072		0.073	0.071	0.066	0.067		0.089
6/18/03	1	0.097	0.097	0.092	0.088	0.078		0.083	0.083	0.077	0.074		0.084
7/1/03	2	0.082	0.051	0.057	0.035	0.082		0.066	0.051	0.064	0.050		0.052
7/2/03	2	0.081	0.057	0.060	0.062	0.059		0.081	0.069	0.063	0.065		0.055
7/3/03	2	0.084	0.065	0.066	0.066	0.062		0.075	0.082	0.059	0.084		0.053
7/4/03	2	0.078	0.063	0.067	0.067	0.067		0.074	0.076	0.061	0.078		0.063
7/11/03	4	0.080	0.066	0.074	0.080	0.070		0.069	0.066	0.061	0.055		0.064
7/13/03	4	0.076	0.060	0.062	0.063	0.076		0.066	0.058	0.064	0.057		0.059
7/14/03	7	0.082	0.065	0.063	0.069	0.059		0.082	0.065	0.069	0.063		0.061
7/16/03	4	0.094	0.074	0.074	0.085	0.094		0.089	0.069	0.092	0.062		0.064
7/19/03	4	0.078	0.056	0.058	0.061	0.078		0.064	0.056	0.065	0.054		0.064
7/20/03	2	0.101	0.072	0.065	0.067	0.072		0.101	0.087	0.079	0.080		0.065
7/25/03	1	0.083	0.070	0.075	0.068	0.075		0.083	0.076	0.067	0.076		0.073
7/26/03	2	0.078	0.067	0.068	0.064	0.064		0.073	0.076	0.057	0.078		0.057
7/27/03	3	0.096	0.063	0.066	0.096	0.079		0.086	0.081	0.076	0.074		0.070
7/30/03	5	0.106	0.082	0.106	0.084	0.073		0.069	0.071	0.063	0.067		0.080
8/4/03	6	0.079	0.070	0.076	0.079	0.070		0.067	0.066	0.062	0.056		0.064
8/5/03	6	0.083	0.068	0.079	0.083	0.076		0.078	0.073	0.064	0.065		0.065
8/7/03	4	0.076	0.073	0.076	0.057	0.059		0.059	0.063	0.047	0.057		0.061
8/10/03	4	0.079	0.059	0.066	0.059	0.064		0.058	0.056	0.051	0.052		0.079
8/14/03	1	0.082	0.057	0.060	0.066	0.082		0.080	0.070	0.069	0.064		0.063
8/15/03	7	0.086	0.057	0.056	0.062	0.065		0.072	0.086	0.057	0.079		0.056
8/16/03	7	0.079	0.069	0.069	0.077	0.067		0.074	0.079	0.060	0.072		0.060
8/18/03	1	0.088	0.072	0.069	0.070	0.069		0.086	0.088	0.063	0.085		0.062
8/19/03	1	0.090	0.075	0.074	0.073	0.079		0.088	0.090	0.070	0.087		0.073
8/20/03	2	0.087	0.071	0.073	0.073	0.071		0.079	0.087	0.063	0.084		0.063
8/22/03	4	0.096	0.082	0.096	0.071	0.072		0.075	0.074	0.064	0.069		0.082
8/23/03	4	0.099	0.077	0.081	0.072	0.083		0.074	0.074	0.070	0.071		0.099
8/24/03	1	0.084	0.067	0.069	0.071	0.078		0.084	0.075	0.079	0.073		0.071
8/25/03	2	0.099	0.078	0.076	0.080	0.085		0.089	0.099	0.073	0.096		0.074
8/26/03	2	0.094	0.076	0.074	0.078	0.077		0.081	0.094	0.068	0.086		0.071
4/6/04	2	0.077	0.069	0.067	0.067		0.074	0.071	0.077	0.073	0.073	0.070	0.069
7/22/04	3	0.080	0.080	0.076	0.043		0.048	0.050	0.052	0.051	0.047	0.046	0.056
8/3/04	4	0.076	0.056	0.052	0.056		0.058	0.070	0.071	0.068	0.065	0.076	0.052
9/11/04	2	0.079	0.056	0.061	0.061		0.066	0.072	0.071	0.071	0.067	0.079	0.059
4/3/05	7	0.079	0.068	0.070	0.065		0.077	0.074	0.068	0.075	0.065	0.076	0.079
4/17/05	2	0.080	0.080	0.075	0.073		0.076	0.080	0.080	0.078	0.075	0.079	0.073
5/23/05	4	0.078	0.062	0.078	****		0.060	0.057	0.056	0.057	0.048	0.057	0.067
5/25/05	2	0.083	0.063	0.067	0.073		0.073	0.083	0.072	0.080	0.062	0.081	0.062
6/2/05	1	0.077	0.062	0.060	0.063		0.075	0.077	0.070	0.077	0.063	0.076	0.067
6/20/05	2	0.096	0.080	0.085	0.079		0.096	0.073	0.069	0.078	0.057	0.068	0.073
6/21/05	7	0.104	0.082	0.079	0.104		0.077	0.072	0.085	0.093	0.067	0.073	0.064
6/22/05	7	0.097	0.074	0.074	0.079		0.074	0.097	0.092	0.084	0.079	0.093	0.070
6/23/05	2	0.080	0.069	0.070	0.067		0.073	0.079	0.079	0.074	0.074	0.080	0.072
6/24/05	2	0.088	0.070	0.075	0.070		0.073	0.087	0.083	0.082	0.075	0.088	0.068

Table 2: Kansas City Region Monitor Values During Exceedance Days (PPM)													
Date	Regime	Max	RG South	Olathe	JFK-Wyandotte	Leavenworth A	Leavenworth B	Rocky Creek	Liberty	KCI	Watkins Mill	Trimble	Lawrence
6/25/05	2	0.088	0.073	0.073	0.076		0.077	0.088	0.088	0.080	0.076	0.087	0.073
6/26/05	2	0.080	0.062	0.064	0.068		0.068	0.077	0.077	0.071	0.069	0.080	0.066
6/27/05	2	0.084	0.070	0.070	0.068		0.063	0.078	0.084	0.071	0.078	0.078	0.055
6/29/05	2	0.082	0.076	0.082	0.073		0.067	0.082	0.081	0.077	0.072	0.081	0.060
7/8/05	1	0.079	0.054	0.064	0.060		0.065	0.073	0.065	0.079	0.057	0.074	0.054
7/9/05	1	0.079	0.063	0.066	0.063		0.060	0.074	0.070	0.072	0.060	0.079	0.059
7/11/05	2	0.077	0.068	0.077	0.067		0.063	0.068	0.065	0.068	0.053	0.065	0.073
7/12/05	2	0.081	0.081	0.080	0.073		0.076	0.076	0.078	0.071	0.072	0.076	0.067
7/13/05	2	0.086	0.086	0.083	0.068		0.075	0.073	0.078	0.070	0.066	0.075	0.073
7/15/05	2	0.088	0.069	0.068	0.066		0.067	0.065	0.066	0.066	0.056	0.065	0.088
7/16/05	2	0.087	0.069	0.061	0.071		0.068	0.086	0.087	0.074	0.072	0.083	0.061
7/22/05	2	0.087	0.050	0.052	0.045		0.063	0.087	0.084	0.087	0.066	0.075	0.041
7/30/05	1	0.079	0.054	0.055	0.062		0.070	0.076	0.068	0.070	0.061	0.079	0.057
7/31/05	1	0.081	0.062	0.061	0.067		0.062	0.081	0.071	0.071	0.062	0.080	0.062
8/1/05	1	0.087	0.067	0.067	0.075		0.064	0.087	0.084	0.078	0.079	0.087	0.060
8/3/05	2	0.082	0.063	0.064	0.072		0.061	0.077	0.082	0.070	0.079	0.073	0.064
8/4/05	3	0.091	0.091	0.081	0.056		0.050	0.053	0.056	0.050	0.052	0.051	0.057
8/6/05	1	0.080	0.060	0.061	0.079		0.080	0.068	0.060	0.076	0.054	0.060	0.063
8/7/05	1	0.089	0.066	0.062	0.077		0.068	0.089	0.079	0.086	0.066	0.072	0.060
8/8/05	2	0.091	0.064	0.063	0.078		0.069	0.086	0.075	0.091	0.065	0.082	0.063
8/9/05	2	0.089	0.070	0.066	0.075		0.069	0.079	0.089	0.073	0.086	0.077	0.063
8/10/05	2	0.091	0.071	0.068	0.079		0.073	0.078	0.091	0.075	0.084	0.074	0.067
9/3/05	1	0.080	0.062	0.055	0.062		0.078	0.069	0.059	0.080	0.053	0.063	0.061
9/11/05	2	0.080	0.069	0.063	0.066		0.067	0.080	0.074	0.076	0.069	0.076	0.065
4/22/06	6	0.080	0.080	0.078	0.064		0.065	0.064	0.064		0.061	0.059	0.074
5/19/06	5	0.079	0.072	0.064	0.078		0.062	0.071	0.079		0.070	0.070	0.063
6/8/06	7	0.078	0.066	0.065	0.078		0.062	0.071	0.073		0.066	0.064	0.065
6/9/06	2	0.082	0.064	0.069	0.074		0.066	0.082	0.081		0.077	0.080	0.066
6/10/06	6	0.087	0.074	0.068	0.077		0.059	0.087	0.086		0.072	0.073	0.068
6/13/06	4	0.078	0.059	0.064	0.067		0.073	0.064	0.062		0.057	0.060	0.078
6/14/06	4	0.083	0.068	0.064	0.069		0.072	0.083	0.073		0.065	0.081	0.065
6/15/06	2	0.081	0.071	0.068	0.071		0.071	0.081	0.079		0.070	0.078	0.076
6/19/06	2	0.085	0.062	0.061	0.077		0.065	0.076	0.085		0.073	0.071	0.066
6/28/06	4	0.087	0.058	0.061	0.072		0.069	0.081	0.087		0.073	0.062	0.064
6/29/06	3	0.084	0.069	0.070	0.073		0.072	0.078	0.084		0.079	0.074	0.071
6/30/06	2	0.094	0.077	0.076	0.080		0.080	0.087	0.094		0.092	0.081	0.080
7/1/06	2	0.094	0.080	0.082	0.085		0.083	0.087	0.094		0.091	0.082	0.084
7/2/06	2	0.076	0.064	0.066	0.069		0.066	0.075	0.076		0.074	0.071	0.067
7/6/06	4	0.077	0.057	0.060	0.065		0.077	0.066	0.063		0.058	0.059	0.070
7/8/06	2	0.094	0.074	0.071	0.081		0.071	0.094	0.088		0.083	0.089	0.067
7/12/06	2	0.077	0.053	0.055	0.064		0.052	0.077	0.076		0.051	0.050	0.062
7/13/06	2	0.086	0.061	0.063	0.059		0.066	0.086	0.073		0.070	0.086	0.063
7/15/06	7	0.099	0.064	0.063	0.099		0.070	0.078	0.073		0.062	0.069	0.067
7/16/06	7	0.083	0.060	0.056	0.066		0.056	0.083	0.081		0.076	0.083	0.060
7/17/06	2	0.087	0.061	0.060	0.072		0.058	0.073	0.087		0.083	0.065	0.056
7/18/06	6	0.081	0.067	0.066	0.071		0.067	0.066	0.065		0.058	0.057	0.081
7/19/06	2	0.106	0.078	0.069	0.084		0.068	0.091	0.106		0.105	0.084	0.066
7/20/06	3	0.085	0.085	0.081	0.077		0.063	0.072	0.078		0.069	0.068	0.071
7/24/06	2	0.076	0.060	0.055	0.063		0.061	0.072	0.076		0.073	0.072	0.062
7/25/06	2	0.078	0.066	0.064	0.068		0.068	0.078	0.078		0.077	0.078	0.071
7/26/06	2	0.076	0.060	0.060	0.067		0.064	0.071	0.076		0.071	0.071	0.075

Table 2: Kansas City Region Monitor Values During Exceedance Days (PPM)													
Date	**Regime**	**Max**	**RG South**	**Olathe**	**JFK-Wyandotte**	**Leavenworth A**	**Leavenworth B**	**Rocky Creek**	**Liberty**	**KCI**	**Watkins Mill**	**Trimble**	**Lawrence**
7/28/06	3	0.085	0.056	0.057	0.066		0.070	0.085	0.073		0.065	0.081	0.058
8/5/06	1	0.084	0.070	0.064	0.072		0.066	0.084	0.072		0.067	0.077	0.066
8/6/06	2	0.092	0.065	0.066	0.073		0.065	0.078	0.092		0.071	0.069	0.067
8/7/06	3	0.085	0.074	0.070	0.062		0.066	0.070	0.066		0.059	0.060	0.085
8/8/06	6	0.080	0.066	0.066	0.061		0.065	0.065	0.064		0.059	0.058	0.080
8/9/06	3	0.093	0.062	0.061	0.066		0.067	0.083	0.093		0.093	0.083	0.066
8/11/06	1	0.076	0.065	0.070	0.061		0.053	0.054	0.056		0.050	0.050	0.076
8/17/06	2	0.087	0.064	0.062	0.065		0.061	0.079	0.079		0.068	0.087	0.064
8/22/06	5	0.084	0.063	0.068	0.060		0.060	0.056	0.056		0.049	0.052	0.084
8/23/06	5	0.085	0.064	0.068	0.070		0.067	0.082	0.079		0.072	0.085	0.066
8/24/06	5	0.081	0.068	0.068	0.066		0.063	0.081	0.075		0.065	0.080	0.066
5/13/07	5	0.083	0.065	0.061	0.073		0.067	0.082	0.073		0.068	0.083	
6/13/07	7	0.084	0.072	0.071	0.071		0.076	0.084	0.072		0.071	0.080	
6/14/07	7	0.095	0.081	0.079	0.078		0.095	0.089	0.083		0.077	0.090	
6/15/07	2	0.088	0.066	0.063	0.070		0.088	0.082	0.073		0.071	0.081	
6/16/07	7	0.089	0.063	0.064	0.072		0.080	0.089	0.081		0.079	0.087	
7/6/07	7	0.083	0.031	0.050	0.071		0.066	0.083	0.066		0.056	0.081	
7/16/07	2	0.081	0.044	0.048	0.052		0.051	0.075	0.061		0.048	0.081	
7/25/07	2	0.082	0.064	0.064	0.067		0.069	0.082	0.069		0.063	0.080	
7/26/07	2	0.086	0.070	0.066	0.067		0.070	0.079	0.086		0.084	0.073	
8/1/07	4	0.099	0.057	0.059	0.079		0.088	0.099	0.079		0.069	0.086	
8/10/07	4	0.084	0.057	0.057	0.060		0.069	0.084	0.075		0.064	0.082	
8/12/07	2	0.099	0.054	0.050	0.064		0.061	0.092	0.099		0.070	0.061	
8/14/07	2	0.078	0.059	0.061	0.064		0.070	0.073	0.078		0.072	0.065	
8/15/07	2	0.078	0.060	0.058	0.064		0.071	0.071	0.078		0.070	0.069	
8/16/07	3	0.080	0.078	0.080	0.077		0.067	0.070	0.070		0.061	0.055	
8/17/07	5	0.077	0.063	0.061	0.063		0.077	0.076	0.066		0.057	0.062	
8/28/07	2	0.078	0.069	0.061	0.065		0.064	0.076	0.078		0.073	0.072	
9/2/07	1	0.079	0.069	0.064	0.071		0.063	0.078	0.079		0.066	0.067	
9/3/07	2	0.078	0.072	0.064	0.068		0.069	0.078	0.077		0.073	0.073	
9/4/07	2	0.076	0.058	0.057	0.057		0.065	0.076	0.066		0.058	0.075	

Table 3: St. Louis Region Monitor Values During Exeedance Days

Date	Regime	Max	Arnold	Sunset Hills	Pacific	S. Broadway	Queeny Park	Clark	Margaretta	Blair St.	Clayton	E. Saint Louis	Maryland Heights	Breckenridge	Maryville	Ferguson	Edwardsville	Wood River	W. Alton	Orchard Farm	Alton	Jerseyville	Foley	Nilwood	Mark Twain
4/12/03	3	0.073	0.073	0.072		0.063	0.071	0.055	0.061		0.068			0.058	0.057	0.062	0.061	0.064	0.063	0.069	0.064	0.061		0.053	0.071
4/27/03	2	0.079	0.069	0.072		0.069	0.071	0.059	0.073		0.069	0.065		0.072	0.061	0.072	0.070	0.071	0.075	0.079	0.076	0.077		0.073	0.070
6/5/03	4	0.081	0.074	0.081		0.071	0.075	0.058	0.078		0.072	0.066		0.074	0.059	0.073	0.068	0.070	0.074	0.073	0.072	0.069		0.068	
6/14/03	3	0.066	0.066	0.066		0.064	0.056	0.052	0.060		0.062	0.055		0.052	0.050	0.055	0.057	0.060	0.060	0.060	0.060	0.059		0.065	0.062
6/17/03	1	0.081	0.080	0.080		0.076	0.073	0.062	0.081		0.077	0.074		0.068	0.065	0.070	0.068	0.072	0.074	0.073	0.073	0.072		0.073	0.071
6/18/03	1	0.093	0.093	0.088		0.089	0.080	0.071	0.090		0.082	0.086		0.075	0.077	0.077	0.082	0.080	0.082	0.078	0.080	0.078		0.074	0.066
6/22/03	1	0.082	0.072	0.073		0.069	0.076	0.060	0.077		0.070	0.072		0.074		0.075	0.072	0.073	0.081	0.081	0.078	0.082		0.078	0.068
6/23/03	1	0.087	0.067	0.070		0.064	0.064	0.054	0.078		0.062	0.068		0.075		0.079	0.072	0.072	0.084	0.087	0.080	0.083		0.077	0.057
6/24/03	2	0.097	0.079	0.080		0.075	0.075	0.060	0.085		0.080	0.076		0.088	0.084	0.088	0.082	0.078	0.095	0.097	0.090	0.095		0.090	0.056
6/29/03	2	0.077	0.058	0.058		0.059	0.058	0.057	0.075		0.064	0.068		0.063	0.077	0.070	0.067	0.065	0.068	0.066	0.073	0.061		0.065	0.069
7/2/03	2	0.091	0.074	0.071		0.072	0.059	0.054	0.072		0.063	0.072		0.071	0.091	0.071	0.082	0.073	0.087	0.080	0.086	0.065		0.068	0.066
7/14/03	7	0.080	0.068	0.070		0.063	0.068	0.053	0.068		0.065	0.062		0.073	0.064	0.071	0.061	0.067	0.074	0.080	0.070	0.077		0.060	0.059
7/16/03	4	0.077	0.077	0.073		0.069	0.064	0.052	0.061		0.058	0.065		0.052	0.062	0.054	0.053	0.059	0.054	0.056	0.054	0.054		0.061	0.046
7/17/03	3	0.108	0.082	0.106		0.097	0.087	0.089	0.108		0.106	0.106		0.099	0.095	0.092	0.090	0.101	0.091	0.069	0.101	0.074		0.075	0.061
7/19/03	4	0.080	0.044	0.059		0.046	0.059	0.044	0.058		0.058	0.050		0.065	0.052	0.065	0.050	0.069	0.080	0.067	0.069	0.054		0.057	0.056
7/25/03	1	0.076	0.061	0.063		0.057	0.063	0.047	0.063		0.057	0.057		0.069	0.062	0.067	0.055	0.067	0.070	0.076	0.067	0.074		0.059	0.060
7/27/03	2	0.078	0.057	0.072		0.063	0.062	0.058	0.072		0.062	0.064		0.065	0.078	0.071	0.064	0.076	0.063	0.062	0.064	0.058		0.049	0.067
7/30/03	5	0.079	0.055	0.065		0.062	0.068	0.054	0.069		0.072	0.061		0.070	0.063	0.068	0.056	0.070	0.079	0.078	0.068	0.075		0.059	0.068
7/31/03	5	0.106	0.088	0.102		0.084	0.097	0.071	0.097		0.096	0.079		0.106	0.075	0.104	0.073	0.093	0.094	0.090	0.089	0.076		0.065	0.070
8/5/03	6	0.079	0.071	0.079		0.070	0.069	0.055	0.069		0.072	0.064		0.063	0.059	0.055	0.048	0.059	0.062	0.055		0.051		0.054	0.061
8/16/03	7	0.078	0.078	0.078		0.077	0.073	0.061	0.070		0.072	0.065		0.063	0.068	0.069	0.058	0.068	0.066	0.070	0.064	0.062		0.059	0.072
8/17/03	3	0.082	0.078	0.079		0.082	0.072	0.072	0.080		0.075	0.077		0.066	0.076	0.070	0.056	0.071	0.066	0.065	0.054	0.061		0.069	0.070
8/18/03	1	0.075	0.065	0.075		0.064	0.074	0.055	0.067		0.070	0.063		0.065	0.062	0.065	0.054	0.062	0.066	0.075	0.063	0.060		0.051	0.073
8/19/03	1	0.098	0.064	0.072		0.063	0.070	0.055	0.073		0.073	0.066		0.073	0.065	0.078	0.059	0.072	0.076	0.080	0.073	0.073		0.062	0.098
8/20/03	2	0.095	0.075	0.077		0.067	0.078	0.054	0.077		0.071	0.068		0.080	0.071	0.080	0.059	0.079	0.085	0.095	0.078	0.084		0.068	0.075
8/21/03	2	0.088	0.065	0.069		0.072	0.071	0.063	0.080		0.069	0.079		0.070	0.088	0.076	0.046	0.083	0.080	0.072	0.079	0.066		0.068	0.070
8/22/03	3	0.080	0.080	0.078		0.077	0.072	0.059	0.071		0.072	0.069		0.063	0.076	0.067	0.074	0.073	0.072	0.073	0.069	0.076		0.071	0.067
8/24/03	1	0.090	0.066	0.073		0.072	0.077	0.060	0.078		0.077	0.068		0.080	0.068	0.081	0.068	0.075	0.084	0.090	0.066	0.082		0.061	0.075
8/25/03	2	0.096	0.075	0.075		0.067	0.086	0.055	0.075		0.072	0.068		0.086	0.079	0.081	0.074	0.076	0.085	0.096	0.081	0.090		0.077	0.080
8/26/03	2	0.116	0.107	0.107		0.108	0.093	0.094	0.116		0.104	0.111		0.095	0.096	0.095	0.104	0.102	0.097	0.080	0.095	0.074		0.074	0.084
8/27/03	2	0.074	0.043	0.042		0.038	0.055	0.026	0.044		0.030	0.033		0.044	0.045	0.048	0.047	0.060	0.067	0.065	0.065	0.070		0.071	0.074
9/8/03	7	0.076	0.069	0.071		0.065	0.067	0.052	0.065		0.066	0.060		0.064	0.064	0.062	0.062	0.068	0.074	0.076	0.068	0.064		0.059	0.072
9/9/03	7	0.083	0.068	0.072		0.065	0.064	0.050	0.069		0.061	0.061		0.065	0.071	0.072	0.068	0.070	0.080	0.083	0.073	0.069		0.073	0.065
9/18/03	2	0.081	0.074	0.068		0.061	0.072	0.050	0.068		0.060	0.060		0.065	0.068	0.068	0.067	0.071	0.078	0.081	0.073	0.078		0.069	0.069
5/7/04	2	0.081	0.062	0.063			0.057	0.046	0.064		0.059	0.063		0.067	0.072	0.067	0.068	0.081	0.075	0.074	0.074	0.075		0.068	0.055
6/6/04	2	0.076	0.055	0.058			0.056	0.037	0.057		0.058	0.055		0.063	0.059	0.061	0.059	0.064	0.071	0.076	0.064	0.073		0.067	0.054
6/14/04	2	0.082	0.057	0.062			0.055	0.059	0.077		0.066	0.078		0.064	0.082	0.066	0.075	0.073	0.067	0.058	0.070	0.059		0.056	0.046
6/30/04	2	0.080	0.063	0.066			0.065	0.048	0.065		0.062	0.063		0.070	0.068	0.068	0.068	0.073	0.077	0.080	0.074	0.077		0.062	0.068
7/16/04	3	0.081	0.060	0.063			0.057	0.057	0.065		0.057	0.065		0.058	0.081	0.060	0.065	0.062	0.061	0.056	0.059	0.063		0.060	0.045
7/20/04	2	0.077	0.052	0.055			0.065	0.045	0.064		0.059	0.054		0.066	0.047	0.065	0.043	0.063	0.077	0.070	0.070	0.076		0.051	0.061
7/21/04	2	0.080	0.063	0.065			0.064	0.057	0.068		0.061	0.076		0.061	0.080	0.067	0.063	0.072	0.072	0.066	0.069	0.061		0.050	0.057
7/22/04	3	0.080	0.080	0.069			0.066	0.062	0.073		0.069	0.075		0.069	0.071	0.069	0.061	0.068	0.066	0.067	0.062	0.064		0.053	0.051
7/27/04	4	0.076	0.074	0.076			0.064	0.052	0.064		0.068	0.065		0.061	0.062	0.060	0.057	0.061	0.062	0.058	0.062	0.059		0.063	0.057
8/1/04	7	0.081	0.051	0.051			0.046	0.056	0.069		0.055	0.066		0.060	0.078	0.003	0.076	0.080	0.081	0.065	0.080	0.057		0.051	0.046
8/17/04	2	0.080	0.057	0.057			0.057	0.043	0.060		0.054	0.059		0.060	0.060	0.065	0.060	0.066	0.071	0.068	0.068	0.064		0.080	0.059
9/2/04	2	0.080	0.067	0.072			0.069	0.058	0.072		0.067	0.068		0.072	0.063	0.068	0.063	0.067	0.076	0.080	0.070	0.068		0.066	0.061
9/3/04	2	0.077	0.060	0.066			0.065	0.046	0.056		0.060	0.061		0.065	0.064	0.066	0.061	0.068	0.077	0.075	0.069	0.073		0.058	0.055
9/11/04	2	0.078	0.068	0.073			0.075	0.056	0.074		0.072	0.068		0.071	0.064	0.068	0.061	0.067	0.075	0.078	0.067	0.073		0.065	0.055
4/17/05	2	0.077	0.072	0.072	0.074		0.073		0.074	0.076		0.071	0.075		0.072			0.071	0.077	0.076	0.077	0.068	0.076	0.073	0.073
5/18/05	2	0.078	0.070	0.069	0.065		0.065		0.069	0.066		0.066	0.071		0.070			0.070	0.077	0.078	0.072	0.077	0.074	0.075	0.064
6/1/05	1	0.076	0.068	0.068	0.073		0.064		0.067	0.056		0.066	0.075		0.066			0.069	0.074	0.076	0.073	0.070	0.075	0.067	0.071
6/3/05	2	0.082	0.061	0.066	0.055		0.062		0.075	0.066		0.072	0.072		0.068			0.073	0.082	0.080	0.078	0.076	0.072	0.053	0.060
6/17/05	4	0.070	0.070	0.068	0.067		0.060		0.063	0.060		0.062	0.060		0.058			0.059	0.059	0.058	0.059	0.055	0.059	0.051	0.056
6/20/05	2	0.082	0.078	0.082	0.077		0.072		0.072	0.065		0.068	0.068		0.064			0.063	0.064	0.060	0.063	0.060	0.066	0.060	0.070
6/21/05	7	0.101	0.092	0.090	0.074		0.082		0.094	0.091		0.101	0.086		0.095			0.078	0.074	0.075	0.077	0.074	0.073	0.069	0.068
6/22/05	7	0.108	0.097	0.108	0.087		0.098		0.091	0.089		0.094	0.097		0.073			0.083	0.078	0.067	0.083	0.063	0.075	0.064	0.060
6/23/05	2	0.092	0.073	0.072	0.059		0.062		0.082	0.075		0.079	0.074		0.076			0.087	0.087	0.080	0.092	0.072	0.063	0.080	0.061
6/24/05	2	0.096	0.075	0.079	0.067		0.073		0.090	0.087		0.085	0.080		0.092			0.093	0.089	0.084	0.096	0.073	0.066	0.065	0.068
6/25/05	2	0.091	0.073	0.071	0.069		0.073		0.078	0.080		0.076	0.077		0.076			0.091	0.084	0.070	0.091	0.060	0.066	0.056	0.067
6/26/05	2	0.089	0.079	0.078	0.074		0.076		0.079	0.077		0.077	0.086		0.074			0.081	0.087	0.087	0.084	0.084	0.089	0.069	0.058
6/27/05	2	0.087	0.070	0.071	0.064		0.072		0.073	0.071		0.070	0.080		0.065			0.072	0.083	0.083	0.077	0.087	0.079	0.073	0.060
6/28/05	2	0.110	0.100	0.093	0.072		0.081		0.096	0.099		0.110	0.086		0.088			0.078	0.086	0.074	0.078	0.072	0.078	0.063	0.071
6/29/05	2	0.102	0.071	0.072	0.063		0.065		0.081	0.079		0.082	0.073		0.086			0.099	0.101	0.086	0.102	0.087	0.072	0.072	0.068
6/30/05	7	0.093	0.093	0.085	0.081		0.072		0.076	0.080		0.086	0.072		0.081			0.072	0.073	0.072	0.074	0.066	0.071	0.067	0.055
7/3/05	2	0.081	0.067	0.065	0.060		0.060		0.071	0.072		0.070	0.066		0.068			0.079	0.081	0.070	0.081	0.077	0.073	0.064	0.055
7/7/05	1	0.078	0.078	0.073	0.070		0.065		0.067	0.067		0.069	0.064		0.061			0.063	0.064	0.062	0.063	0.061	0.062	0.065	0.058
7/8/05	1	0.099	0.082	0.089	0.099		0.070		0.080	0.075		0.076	0.085		0.070			0.071	0.076	0.070	0.069	0.065	0.068	0.069	0.068
7/9/05	1	0.087	0.079	0.080	0.087		0.079		0.074	0.070		0.074	0.079		0.072			0.074	0.074	0.065	0.072	0.065	0.070	0.071	0.071
7/10/05	1	0.083	0.078	0.081	0.081		0.076		0.079	0.074		0.078	0.083		0.075			0.077	0.079	0.077	0.078	0.072	0.082	0.072	0.076
7/11/05	3	0.081	0.056	0.055	0.058		0.049		0.051	0.043		0.046	0.051		0.045			0.056	0.062	0.063	0.057	0.061	0.070	0.064	0.081
7/16/05	2	0.089	0.081	0.086	0.071		0.073		0.089	0.089		0.082	0.076					0.074	0.074	0.068	0.075	0.059	0.071	0.058	0.066
7/22/05	3	0.082	0.080	0.082	0.074		0.066		0.066	0.063		0.067	0.067					0.066	0.067	0.060	0.067	0.055	0.068	0.063	0.071
7/23/05	2	0.093	0.068	0.075	0.065		0.074		0.067	0.065		0.064	0.085					0.070	0.080	0.089	0.072	0.075	0.093	0.055	0.061
7/25/05	2	0.076	0.049	0.051	0.053		0.053		0.042	0.063		0.061	0.065		0.021			0.076	0.076	0.067	0.075	0.054	0.058	0.065	0.061
7/29/05	1	0.087	0.077	0.081	0.087		0.082		0.074	0.064		0.068	0.072		0.059			0.064	0.070	0.061	0.064	0.056	0.062	0.057	0.063
7/30/05	1	0.081	0.064	0.068	0.069		0.067		0.067	0.058		0.064	0.069		0.062			0.068	0.069	0.073	0.068	0.062	0.081	0.057	0.071

Table 3: St. Louis Region Monitor Values During Exeedance Days

Date	Regime	Max	Arnold	Sunset Hills	Pacific	S. Broadway	Queeny Park	Clark	Margaretta	Blair St.	Clayton	E. Saint Louis	Maryland Heights	Breckenridge	Maryville	Ferguson	Edwardsville	Wood River	W. Alton	Orchard Farm	Alton	Jerseyville	Foley	Nilwood	Mark Twain
7/31/05	1	0.080	0.068	0.072	0.075		0.078		0.075	0.065		0.067	0.080		0.065			0.067	0.071	0.070	0.065	0.061	0.071	0.064	0.062
8/1/05	1	0.104	0.081	0.071	0.078		0.078		0.075	0.068		0.070	0.078		0.070			0.075	0.087	0.098	0.076	0.083	0.104	0.069	0.080
8/2/05	2	0.093	0.076	0.075	0.066		0.080		0.071	0.065		0.062	0.089		0.067			0.067	0.077	0.092	0.069	0.081	0.093	0.067	0.071
8/3/05	2	0.080	0.057	0.061	0.058		0.061		0.066	0.061		0.058	0.069		0.058			0.065	0.079	0.080	0.069	0.077	0.072	0.065	0.074
8/4/05	3	0.076	0.076	0.074	0.067		0.057		0.058	0.059		0.074	0.051		0.073			0.043	0.046	0.047	0.048	0.036	0.046	0.045	0.065
8/6/05	1	0.076	0.054	0.064	0.076		0.068		0.060	0.052		0.054	0.064		0.052			0.055	0.057	0.056	0.054	0.055	0.062	0.058	0.065
8/7/05	1	0.092	0.069	0.082	0.092		0.090		0.085	0.078		0.075	0.088		0.072			0.073	0.071	0.078	0.068	0.062	0.073	0.071	0.067
8/8/05	2	0.094	0.069	0.081	0.074		0.088		0.081	0.076		0.073	0.094		0.072			0.086	0.087	0.093	0.087	0.076	0.088	0.069	0.062
8/9/05	2	0.091	0.072	0.075	0.068		0.072		0.077	0.072		0.066	0.078		0.070			0.085	0.091	0.085	0.089	0.080	0.077	0.077	0.072
8/10/05	2	0.104	0.081	0.081	0.075		0.072		0.092	0.093		0.103	0.077		0.104			0.084	0.081	0.075	0.080	0.065	0.077	0.062	0.073
8/11/05	2	0.089	0.064	0.067	0.062		0.062		0.078	0.070		0.064	0.073		0.066			0.084	0.089	0.078	0.084	0.066	0.071	0.070	0.075
8/19/05	2	0.078	0.051	0.046	0.049		0.048		0.057	0.052		0.053	0.056					0.078	0.078	0.059	0.076	0.051	0.054	0.057	0.046
8/28/05	5	0.087	0.057	0.061	0.071		0.070		0.063	0.062		0.055	0.082		0.057			0.070	0.075	0.087	0.070	0.066	0.071	0.059	0.054
9/3/05	1	0.083	0.083	0.082	0.068		0.071		0.066	0.066		0.066	0.071		0.066			0.070	0.065	0.062	0.067	0.059	0.063	0.059	0.055
9/4/05	7	0.083	0.063	0.065	0.070		0.067		0.065	0.063		0.061	0.075		0.060			0.064	0.070	0.077	0.065	0.075	0.083	0.066	0.058
9/5/05	1	0.079	0.063	0.063	0.067		0.058		0.064	0.061		0.061	0.070		0.063			0.064	0.067	0.074	0.064	0.066	0.079	0.065	0.069
9/6/05	2	0.088	0.071	0.081	0.067		0.073		0.088	0.078		0.079	0.071		0.085			0.078	0.081	0.075	0.078	0.065	0.071	0.068	0.064
9/7/05	2	0.082	0.077	0.079	0.066		0.064		0.081	0.082		0.077	0.067		0.082			0.073	0.070	0.070	0.074	0.060	0.067	0.062	0.061
9/8/05	3	0.088	0.071	0.073	0.065		0.064		0.076	0.079		0.081	0.067		0.088			0.073	0.074	0.074	0.069	0.065	0.072	0.067	0.070
9/9/05	7	0.096	0.079	0.078	0.079		0.082		0.085	0.065		0.077	0.085		0.078			0.082	0.095	0.096	0.089	0.089	0.082	0.078	0.078
9/10/05	1	0.089	0.076	0.075	0.067		0.078		0.073	0.070		0.069	0.083		0.075			0.076	0.085	0.089	0.078	0.086	0.081	0.077	0.071
9/11/05	2	0.084	0.074	0.072	0.066		0.068		0.071	0.070		0.065	0.076		0.070			0.069	0.077	0.084	0.069	0.075	0.072	0.072	0.070
9/12/05	2	0.086	0.068	0.067	0.063		0.064		0.075	0.073		0.068	0.068		0.070			0.080	0.084	0.078	0.083	0.075	0.069	0.086	0.069
9/21/05	2	0.078	0.061	0.057	0.055		0.061		0.052	0.049		0.050	0.063		0.055			0.062	0.067	0.072	0.061	0.064	0.078	0.060	0.056
6/6/06	2	0.077	0.063	0.062	0.057				0.065			0.065	0.065		0.069			0.067	0.077	0.069	0.074	0.066	0.066	0.073	0.063
6/9/06	3	0.085	0.085	0.084	0.079				0.064			0.069	0.065		0.069			0.058	0.068	0.065	0.058	0.051	0.061	0.057	0.063
6/10/06	6	0.082	0.064	0.072	0.065				0.076			0.077	0.082		0.076			0.070	0.079	0.072	0.068	0.046	0.057	0.046	0.043
6/14/06	4	0.092	0.071	0.080	0.076				0.069			0.076	0.092		0.073			0.078	0.087	0.092	0.077	0.072	0.077	0.063	0.067
6/15/06	2	0.092	0.079	0.080	0.067				0.071			0.077	0.084		0.077			0.074	0.087	0.092	0.077	0.074	0.078	0.065	0.069
6/16/06	2	0.090	0.075	0.078	0.066				0.067			0.075	0.077		0.077			0.073	0.090	0.088	0.076	0.075	0.074	0.070	0.065
6/20/06	2	0.087	0.059	0.065	0.048				0.063			0.073	0.060		0.084			0.074	0.087	0.073	0.080	0.060	0.063	0.070	0.056
6/29/06	3	0.091	0.072	0.077	0.055				0.073	0.076		0.082	0.082		0.074			0.073	0.091	0.091	0.076	0.069	0.084	0.060	0.070
6/30/06	3	0.061	0.061	0.061	0.058				0.043	0.044		0.044	0.055		0.049			0.035	0.043	0.048	0.042	0.042	0.055	0.045	0.053
7/2/06	2	0.076	0.062	0.064	0.061				0.056	0.066		0.066	0.069		0.073			0.072	0.076	0.074	0.071	0.059	0.070	0.059	0.069
7/7/06	1	0.084	0.060	0.065	0.068				0.060	0.053		0.063	0.070		0.059			0.058	0.068	0.069	0.060	0.063	0.084	0.057	0.055
7/8/06	2	0.091	0.066	0.075	0.057				0.068	0.065		0.071	0.072		0.067			0.077	0.091	0.077	0.079	0.070	0.070	0.068	0.063
7/9/06	2	0.088	0.067	0.070	0.063				0.064	0.068		0.071	0.066		0.071			0.077	0.088	0.067	0.078	0.057	0.069	0.054	0.075
7/15/06	7	0.098	0.089	0.098	0.065				0.084	0.085		0.097	0.083		0.071			0.071	0.066	0.064	0.067	0.051	0.065	0.052	0.063
7/17/06	2	0.091	0.065	0.066	0.047				0.068	0.063		0.064	0.058		0.067			0.076	0.091	0.066	0.085	0.061	0.060	0.071	0.060
7/18/06	6	0.098	0.084	0.038	0.067				0.079	0.083		0.098	0.067		0.089			0.080	0.089	0.070	0.078	0.060	0.069	0.051	0.069
7/19/06	3	0.097	0.031		0.060				0.077			0.076	0.087		0.064			0.081	0.097	0.095	0.080	0.083	0.083	0.041	0.063
7/20/06	2	0.085	0.059		0.057				0.058				0.076		0.055			0.052	0.052	0.076	0.052	0.059	0.085	0.044	0.085
7/28/06	4	0.077	0.059	0.065	0.055				0.076	0.077		0.071	0.069		0.077			0.059	0.057	0.067	0.055	0.050	0.063	0.046	0.056
8/4/06	4	0.076	0.057	0.064	0.076				0.058	0.051		0.054	0.062		0.054			0.047	0.051	0.051	0.048	0.044	0.051	0.055	0.054
8/5/06	1	0.079	0.063	0.067	0.073				0.069	0.068		0.064	0.076		0.066			0.062	0.069	0.072	0.063	0.059	0.079	0.065	0.076
8/6/06	2	0.085	0.067	0.075	0.065				0.073	0.074		0.066	0.075		0.068			0.072	0.083	0.085	0.072	0.077	0.076	0.070	0.067
8/7/06	2	0.083	0.079	0.083	0.081				0.068	0.068		0.067	0.079		0.071			0.068	0.076	0.073	0.069	0.056	0.069	0.057	0.060
8/13/06	2	0.079	0.064	0.072	0.060				0.063	0.062		0.060	0.076		0.069			0.066	0.076	0.076	0.064	0.066	0.079	0.056	0.064
8/16/06	1	0.077	0.061	0.065	0.071				0.064	0.058		0.061	0.073		0.061			0.057	0.063	0.067	0.058	0.055	0.077	0.054	0.065
8/17/06	6	0.093	0.077	0.077	0.074				0.068	0.066		0.064	0.087		0.075			0.075	0.084	0.093	0.076	0.079	0.090	0.066	0.059
8/18/06	6	0.090	0.075	0.080	0.090				0.065	0.065		0.064	0.083		0.062			0.059	0.071	0.075	0.061	0.059	0.080	0.052	0.067
8/22/06	5	0.073	0.073	0.068	0.070				0.058	0.057		0.059	0.060		0.058			0.054	0.055	0.057	0.052	0.051	0.061	0.055	0.057
8/23/06	5	0.088	0.062	0.067	0.081				0.065	0.065		0.060	0.079		0.064			0.070	0.079	0.082	0.070	0.070	0.088	0.061	0.064
8/24/06	5	0.082	0.072	0.074	0.066				0.075	0.068		0.065	0.078		0.074			0.069	0.080	0.082	0.069	0.070	0.072	0.069	0.060
5/21/07	2	0.076	0.069	0.073	0.068					0.070		0.067	0.074		0.073			0.072	0.076	0.072	0.071	0.070	0.074	0.066	0.064
5/22/07	2	0.071	0.063	0.067	0.060				0.063	0.065		0.062	0.067		0.069			0.066	0.071	0.068	0.066	0.066	0.068	0.062	0.065
5/23/07	2	0.069	0.060	0.066	0.061				0.064	0.062		0.061	0.067		0.068			0.065	0.069	0.067	0.066	0.065	0.062	0.061	0.052
6/9/07	4	0.078	0.076	0.078	0.058				0.067	0.068		0.062	0.065		0.064			0.055	0.051	0.056	0.053	0.045	0.058	0.051	0.055
6/12/07	1	0.092	0.081	0.086	0.085				0.083	0.074		0.068	0.092		0.078			0.080	0.082	0.083	0.079	0.072	0.088	0.073	0.080
6/13/07	7	0.093	0.080	0.085	0.089				0.080	0.073		0.067	0.093		0.074			0.081	0.083	0.082	0.078	0.071	0.089	0.065	0.084
6/14/07	7	0.103	0.091	0.094	0.089				0.091	0.087		0.074	0.103		0.079			0.085	0.094	0.095	0.083	0.075	0.098	0.072	0.085
6/15/07	2	0.091	0.074	0.080	0.084				0.076	0.066		0.062	0.091		0.070			0.074	0.078	0.073	0.069	0.066	0.078	0.063	0.072
6/16/07	7	0.092	0.078	0.080	0.068				0.091	0.092		0.072	0.081		0.087			0.090	0.084	0.083	0.085	0.072	0.081	0.073	0.064
6/17/07	7	0.087	0.079	0.079	0.068				0.082	0.080		0.067	0.077		0.078			0.085	0.087	0.077	0.081	0.070	0.074	0.075	0.072
6/21/07	7	0.091	0.069	0.070	0.064				0.077	0.077		0.069	0.070		0.091			0.087	0.071	0.064	0.072	0.049	0.057	0.054	0.059
7/3/07	2	0.089	0.082	0.081	0.060				0.078	0.069		0.061	0.087		0.068			0.079	0.083	0.089	0.077	0.085	0.085	0.056	0.059
7/7/07	7	0.088	0.071	0.080	0.064				0.088	0.077		0.061	0.074		0.060			0.073	0.088	0.058	0.073	0.054	0.061	0.050	0.053
7/23/07	1	0.084	0.066	0.073	0.084				0.066	0.055		0.052	0.074		0.058			0.057	0.064	0.060	0.055	0.051	0.061	0.053	0.059
7/24/07	7	0.093	0.073	0.080	0.093				0.071	0.062		0.056	0.084		0.064			0.065	0.072	0.065	0.062	0.056	0.066	0.060	0.070
7/25/07	2	0.101	0.076	0.083	0.078				0.082	0.072		0.069	0.101		0.069			0.074	0.084	0.081	0.073	0.069	0.096	0.064	0.065
7/26/07	2	0.076	0.060	0.062	0.060				0.067	0.062		0.052	0.065		0.076			0.067	0.069	0.065	0.064	0.055	0.066	0.051	0.069
7/30/07	4	0.077	0.064	0.069	0.077				0.062	0.051		0.053	0.068		0.059			0.061	0.062	0.055	0.057	0.050	0.060	0.053	0.056
7/31/07	4	0.076	0.066	0.071	0.074				0.068	0.056		0.057	0.076		0.069			0.068	0.068	0.061	0.064	0.056	0.065	0.058	0.070
8/1/07	4	0.094	0.076	0.083	0.084				0.080	0.071		0.066	0.094		0.072			0.074	0.084	0.080	0.073	0.062	0.087	0.058	0.075
8/2/07	2	0.113	0.087	0.098	0.062				0.113	0.102		0.093	0.094		0.107			0.086	0.091	0.076	0.078	0.063	0.082	0.075	0.075
8/3/07	6	0.101	0.093	0.101	0.074				0.096	0.088		0.081	0.087		0.080			0.086	0.099	0.085	0.081	0.070	0.079	0.066	0.062

Table 3: St. Louis Region Monitor Values During Exeedance Days

Date	Regime	Max	Arnold	Sunset Hills	Pacific	S. Broadway	Queeny Park	Clark	Margaretta	Blair St.	Clayton	E. Saint Louis	Maryland Heights	Breckenridge	Maryville	Ferguson	Edwardsville	Wood River	W. Alton	Orchard Farm	Alton	Jerseyville	Foley	Nilwood	Mark Twain
8/4/07	2	0.076	0.059	0.063	0.059				0.073	0.066		0.051	0.066		0.068			0.076	0.071	0.059	0.068	0.054	0.062	0.054	0.059
8/8/07	3	0.082	0.054	0.057	0.052				0.071	0.067		0.057	0.062		0.079			0.082	0.082	0.066	0.073	0.061	0.062	0.056	0.053
8/9/07	3	0.075	0.075	0.073	0.068				0.068	0.064		0.055	0.067		0.065			0.062	0.061	0.061	0.059	0.051	0.061	0.053	0.051
8/10/07	4	0.076	0.076	0.071	0.070				0.061	0.056		0.054	0.062		0.058			0.058	0.057	0.056	0.054	0.051	0.064	0.057	0.063
8/11/07	2	0.086	0.066	0.072	0.082				0.072	0.065		0.057	0.084		0.062			0.072	0.080	0.083	0.067	0.075	0.086	0.059	0.065
8/12/07	2	0.079	0.079	0.079	0.079				0.077	0.072		0.068	0.075		0.078			0.076	0.076	0.070	0.070	0.058	0.071	0.066	0.059
8/13/07	3	0.080	0.076	0.080	0.068				0.066	0.062		0.056	0.069		0.062			0.059	0.061	0.055	0.055	0.051	0.058	0.058	0.047
8/14/07	2	0.089	0.062	0.063	0.063				0.085	0.081		0.072	0.077		0.080			0.089	0.089	0.076	0.086	0.066	0.069	0.069	0.066
8/15/07	2	0.094	0.073	0.085	0.073				0.081	0.078		0.078	0.074		0.094			0.080	0.087	0.079	0.076	0.064	0.080	0.063	0.069
8/16/07	3	0.071	0.070	0.071	0.069				0.063	0.056		0.050	0.062		0.059			0.058	0.060	0.056	0.054	0.050	0.061	0.042	0.052
8/17/07	5	0.080	0.063	0.066	0.080				0.056	0.045		0.050	0.068		0.053			0.055	0.058	0.052	0.050	0.046	0.057	0.045	0.056
8/18/07	1	0.087	0.080	0.084	0.069				0.075	0.068		0.065	0.084		0.071			0.068	0.075	0.075	0.067	0.069	0.087	0.053	0.059
8/27/07	2	0.086	0.070	0.074	0.061				0.070	0.059		0.051	0.086		0.063			0.063	0.074	0.081	0.064	0.072	0.079	0.054	0.060
8/28/07	2	0.089	0.071	0.077	0.064				0.074	0.062		0.056	0.072		0.073			0.076	0.089	0.068	0.080	0.077	0.068	0.075	0.066
8/29/07	3	0.081	0.081	0.073	0.073				0.069	0.064		0.060	0.065		0.071			0.069	0.066	0.054	0.062	0.058	0.068	0.060	0.046
9/2/07	1	0.093	0.093	0.089	0.081				0.081	0.076		0.072	0.077		0.075			0.078	0.073	0.059	0.072	0.063	0.071	0.060	0.069
9/3/07	2	0.087	0.082	0.087	0.067				0.081	0.080		0.077	0.081		0.083			0.082	0.086	0.066	0.080	0.070	0.073	0.071	0.066
9/4/07	2	0.082	0.065	0.068	0.054				0.068	0.059		0.053	0.067		0.068			0.071	0.082	0.063	0.072	0.071	0.069	0.068	0.063
9/19/07	2	0.077	0.057	0.060	0.056				0.068	0.060		0.053	0.062		0.070			0.068	0.077	0.062	0.073	0.058	0.063	0.057	0.069
9/20/07	1	0.078	0.077	0.075	0.055				0.072	0.062		0.059	0.076		0.067			0.065	0.078	0.075	0.070	0.071	0.071	0.051	0.062
9/21/07	2	0.091	0.076	0.075	0.069				0.080	0.072		0.071	0.075		0.081			0.083	0.088	0.073	0.081	0.075	0.081	0.091	0.077
9/22/07	3	0.075	0.075	0.072	0.064				0.058	0.050		0.052	0.056		0.056			0.050	0.050	0.049	0.049	0.044	0.051	0.047	0.052

Table 4A: Southeast Missouri Region Monitor Values During Exceedance Days					
Date	**Regime**	**Max**	**Farrar**	**Houston**	**Bonne Terre**
4/12/03	3	0.087		0.043	0.087
6/14/03	3	0.077		0.049	0.077
6/17/03	1	0.083		0.060	0.083
6/18/03	1	0.083		0.077	0.083
6/24/03	2	0.081		0.081	0.073
7/16/03	4	0.078		0.078	0.073
7/31/03	5	0.095		0.073	0.095
8/17/03	3	0.081		0.073	0.081
8/18/03	1	0.082		0.065	0.082
8/22/03	3	0.098		0.077	0.098
8/27/03	2	0.080		0.060	0.080
6/17/05	4	0.084	0.072	0.064	0.084
6/21/05	7	0.078	0.078	0.074	0.076
6/22/05	7	0.085	0.085	0.074	0.085
6/23/05	2	0.093	0.093	0.079	0.072
6/24/05	2	0.091	0.091	0.078	0.077
6/25/05	2	0.079	0.079	0.066	0.069
6/26/05	2	0.077	0.077	0.069	0.076
6/30/05	7	0.076	0.062	0.076	0.062
7/7/05	1	0.093	0.071	0.064	0.093
7/8/05	1	0.078	0.069	0.066	0.078
7/10/05	1	0.078	0.076	0.071	0.078
7/16/05	2	0.079	0.056	0.058	0.079
7/22/05	3	0.084	0.064	0.059	0.084
7/31/05	1	0.076	0.072	0.068	0.076
8/1/05	1	0.076	0.076	0.065	0.076
8/1/05	1	0.076	0.076	0.065	0.076
9/10/05	1	0.076	0.076	0.070	0.072
9/11/05	2	0.080	0.080	0.071	0.070
6/9/06	3	0.080	0.080	0.073	0.078
6/9/06	3	0.080	0.080	0.073	0.078
6/15/06	2	0.079	0.079	0.077	0.077
6/16/06	2	0.085	0.085	0.076	0.076
6/30/06	3	0.083	0.083	0.072	0.078
7/19/06	3	0.080	0.080	0.069	0.067
8/22/06	5	0.091	0.055	0.054	0.091
8/24/06	5	0.076	0.076	0.066	0.034
5/21/07	2	0.079	0.079	0.073	0.074
5/22/07	2	0.076	0.076	0.071	0.074
5/23/07	2	0.076	0.076	0.069	0.068
6/12/07	1	0.085	0.081	0.075	0.085
6/13/07	7	0.087	0.081	0.072	0.087
6/14/07	7	0.091	0.079	0.074	0.091
6/15/07	2	0.078	0.076	0.067	0.078
6/16/07	7	0.080	0.078	0.078	0.080
6/17/07	7	0.087	0.087	0.077	0.085
7/25/07	2	0.091	0.076	0.070	0.091
7/31/07	4	0.076	0.070	0.067	0.076
8/1/07	4	0.089	0.079	0.073	0.089
8/2/07	2	0.079	0.074	0.079	0.079
8/2/07	2	0.079	0.074	0.079	0.079
8/9/07	3	0.078	0.074	0.078	0.065
8/10/07	4	0.098	0.065	0.061	0.098
8/12/07	2	0.081	0.076	0.081	0.073
8/13/07	3	0.086	0.068	0.064	0.086
8/14/07	2	0.080	0.080	0.070	0.064
8/16/07	3	0.080	0.077	0.069	0.080
8/18/07	1	0.085	0.085	0.075	0.078
8/28/07	2	0.078	0.078	0.070	0.069
8/29/07	3	0.082	0.065	0.082	0.073

Table 4A: Southeast Missouri Region Monitor Values During Exceedance Days					
Date	**Regime**	**Max**	**Farrar**	**Houston**	**Bonne Terre**
9/2/07	1	0.082	0.082	0.074	0.074
9/20/07	1	0.081	0.081	0.073	0.075
9/21/07	2	0.093	0.093	0.082	0.081
9/22/07	3	0.080	0.080	0.074	0.072

Table 4B: Southwest Missouri Region Monitor Values During Exceedance Days				
Date	**Regime**	**Max**	**Linn County**	**El Dorado Springs**
4/11/03	1	0.082	0.077	0.082
4/12/03	3	0.083	0.083	0.078
4/13/03	3	0.082	0.077	0.082
8/22/03	4	0.084	0.084	0.080
8/23/03	4	0.082	0.082	0.070
8/25/03	2	0.080	0.079	0.080
7/21/04	3	0.078	0.063	0.078
7/22/04	3	0.086	0.075	0.086
8/18/04	2	0.079	0.066	0.079
6/22/05	7	0.079	0.075	0.079
6/24/05	2	0.076	0.071	0.076
6/27/05	2	0.082	0.068	0.082
6/28/05	3	0.084	0.075	0.084
6/29/05	2	0.077	0.077	0.076
7/12/05	2	0.081	0.074	0.081
7/13/05	2	0.078	0.078	0.072
6/14/06	4	0.079	0.079	0.066
6/29/06	3	0.082	0.082	0.078
6/30/06	2	0.081	0.081	0.067
7/1/06	2	0.081	0.081	0.077
7/20/06	3	0.076		0.076
6/13/07	7	0.079	0.068	0.079
7/26/07	2	0.076	0.065	0.076
8/16/07	3	0.076	0.070	0.076

Table 5: Ozone Concentrations Greater Than 75 Parts Per Billion												
Meteorological Regime #1												
St. Louis Region			Kansas City Region			Springfield Region			Southwest & Southeast Missouri Regions		
Date	Concentration (PPM)	Site	Date	Concentration (PPM)	Site	Date	Concentration (PPM)	Site	Date	Concentration (PPM)	Site
6/17/03	0.076	S. Broadway	04/11/03	0.076	RG South	04/11/03	0.078	Hillcrest	04/11/03	0.077	Linn County
6/17/03	0.077	Clayton	04/11/03	0.080	Watkins Mill	04/12/03	0.078	Hillcrest	04/11/03	0.082	El Dorado Springs
6/17/03	0.080	Arnold, Sunset Hills	06/15/03	0.081	Lawrence	04/12/03	0.079	S. Charleston	06/17/03	0.077	Houston
6/17/03	0.081	Margaretta	06/17/03	0.089	Lawrence	04/13/03	0.082	S. Charleston	6/17/03	0.083	Bonne Terre
6/18/03	0.077	Maryville, Ferguson	06/18/03	0.077	KCI	04/13/03	0.085	Hillcrest	06/18/03	0.077	Houston
6/18/03	0.078	Orchard Farm, Jerseyville	06/18/03	0.078	Leavenworth A	06/18/05	0.076	Hillcrest	6/18/03	0.083	Bonne Terre
6/18/03	0.080	Wood River, Alton, Queeny Park	06/18/03	0.083	Liberty, Rocky Creek	07/08/05	0.079	Hillcrest	08/18/03	0.082	Bonne Terre
6/18/03	0.082	Clayton, Edwardsville, W. Alton	06/18/03	0.084	Lawrence	08/01/05	0.083	Hillcrest	07/07/05	0.093	Bonne Terre
6/18/03	0.086	E. Saint Louis	06/18/03	0.088	JFK-Wyandotte				07/08/05	0.078	Bonne Terre
6/18/03	0.088	Sunset Hills	06/18/03	0.092	Olathe				07/10/05	0.076	Farrar
6/18/03	0.089	S.Broadway	06/18/03	0.097	RG South				07/10/05	0.078	Bonne Terre
6/18/03	0.090	Margaretta	07/25/03	0.076	Liberty, Watkins Mill				07/31/05	0.076	Bonne Terre
6/18/03	0.093	Arnold	07/25/03	0.083	Rocky Creek				08/01/05	0.076	Bonne Terre
06/22/03	0.076	Queeny Park	08/14/03	0.080	Rocky Creek				08/01/05	0.076	Farrar
06/22/03	0.077	Margaretta	08/14/03	0.082	Leavenworth A				09/10/05	0.076	Farrar
06/22/03	0.078	Alton, Nilwood	08/18/03	0.085	Watkins Mill				06/12/07	0.081	Farrar
06/22/03	0.081	Orchard Farm, W. Alton	08/18/03	0.086	Rocky Creek				06/12/07	0.085	Bonne Terre
06/22/03	0.082	Jerseyville	08/18/03	0.088	Liberty				08/18/07	0.078	Bonne Terre
06/23/03	0.077	Nilwood	08/19/03	0.079	Leavenworth A				08/18/07	0.085	Farrar
06/23/03	0.078	Margaretta	08/19/03	0.087	Watkins Mill				09/02/07	0.082	Farrar
06/23/03	0.079	Ferguson	08/19/03	0.088	Rocky Creek				09/20/07	0.081	Farrar
06/23/03	0.080	Alton	08/19/03	0.090	Liberty						
06/23/03	0.083	Jerseyville	08/24/03	0.078	Leavenworth A						
06/23/03	0.084	W. Alton	08/24/03	0.079	KCI						
06/23/03	0.087	Orchard Farm	08/24/03	0.084	Rocky Creek						
07/25/03	0.076	Orchard Farm	06/02/05	0.076	Trimble						
08/19/03	0.076	W. Alton	06/02/05	0.077	KCI, Rocky Creek						
08/19/03	0.078	Ferguson	07/08/05	0.079	KCI						
08/19/03	0.080	Orchard Farm	07/09/05	0.079	Trimble						
08/19/03	0.098	Mark Twain	07/30/05	0.076	Rocky Creek						
08/24/03	0.077	Clayton, Queeny Park	07/30/05	0.079	Trimble						
08/24/03	0.078	Margaretta	07/31/05	0.080	Trimble						
08/24/03	0.080	Breckenridge	07/31/05	0.081	Rocky Creek						
08/24/03	0.081	Ferguson	08/01/05	0.078	KCI						
08/24/03	0.082	Jerseyville	08/01/05	0.079	Watkins Mill						
08/24/03	0.084	W. Alton	08/01/05	0.084	Liberty						
08/24/03	0.090	Orchard Farm	08/01/05	0.087	Rocky Creek, Trimble						
06/01/05	0.076	Orchard Farm	08/06/05	0.076	KCI						
07/07/05	0.078	Arnold	08/06/05	0.079	JFK-Wyandotte						
07/08/05	0.076	E. Saint Louis, W. Alton	08/06/05	0.080	Leavenworth B						
07/08/05	0.080	Margaretta	08/07/05	0.077	JFK-Wyandotte						

Table 5: Ozone Concentrations Greater Than 75 Parts Per Billion												
Meteorological Regime #1												
St. Louis Region			Kansas City Region			Springfield Region			Southwest & Southeast Missouri Regions		
Date	Concentration (PPM)	Site	Date	Concentration (PPM)	Site	Date	Concentration (PPM)	Site	Date	Concentration (PPM)	Site
07/08/05	0.082	Arnold	08/07/05	0.079	Liberty						
07/08/05	0.085	Maryand Heights	08/07/05	0.086	KCI						
07/08/05	0.089	Sunset Hills	08/07/05	0.089	Rocky Creek						
07/08/05	0.099	Pacific	09/03/05	0.078	Leavenworth B						
07/09/05	0.079	Arnold, Maryland Heights, Queeny Park	09/03/05	0.080	KCI						
07/09/05	0.080	Sunset Hills	08/05/06	0.077	Trimble						
07/09/05	0.087	Pacific	08/05/06	0.084	Rocky Creek						
07/10/05	0.076	Mark Twain, Queeny Park	08/11/06	0.076	Lawrence						
07/10/05	0.077	Orchard Farm, Wood River	09/02/07	0.078	Rocky Creek						
07/10/05	0.078	Alton, Arnold, E. Saint Louis	09/02/07	0.079	Liberty						
07/10/05	0.079	Margaretta, W. Alton									
07/10/05	0.081	Pacific, Sunset Hills									
07/10/05	0.082	Foley									
07/10/05	0.083	Maryand Heights									
07/29/05	0.077	Arnold									
07/29/05	0.081	Sunset Hills									
07/29/05	0.082	Queeny Park									
07/29/05	0.087	Pacific									
07/30/05	0.081	Foley									
07/31/05	0.078	Queeny Park									
07/31/05	0.080	Maryand Heights									
08/01/05	0.076	Alton									
08/01/05	0.078	Maryand Heights, Pacific, Queeny Park									
08/01/05	0.080	Mark Twain									
08/01/05	0.081	Arnold									
08/01/05	0.083	Jerseyville									
08/01/05	0.087	W. Alton									
08/01/05	0.098	Orchard Farm									
08/01/05	0.104	Foley									
08/06/05	0.076	Pacific									
08/07/05	0.078	Blair St, Orchard Farm									
08/07/05	0.082	Sunset Hills									
08/07/05	0.085	Margaretta									
08/07/05	0.088	Maryand Heights									
08/07/05	0.090	Queeny Park									
08/07/05	0.092	Pacific									
09/03/05	0.082	Sunset Hills									
09/03/05	0.083	Arnold									
09/05/05	0.079	Foley									
09/10/05	0.076	Arnold, Wood River									
09/10/05	0.077	Nilwood									

Table 5: Ozone Concentrations Greater Than 75 Parts Per Billion												
Meteorological Regime #1												
St. Louis Region			Kansas City Region			Springfield Region			Southwest & Southeast Missouri Regions			
Date	Concentration (PPM)	Site	Date	Concentration (PPM)	Site	Date	Concentration (PPM)	Site	Date	Concentration (PPM)	Site
09/10/05	0.078	Alton, Queeny Park									
09/10/05	0.081	Foley									
09/10/05	0.083	Maryand Heights									
09/10/05	0.085	W. Alton									
09/10/05	0.086	Jerseyville									
09/10/05	0.089	Orchard Farm									
07/07/06	0.084	Foley									
08/05/06	0.076	Mark Twain, Maryland Heights									
08/05/06	0.079	Foley									
08/16/06	0.077	Foley									
06/12/07	0.078	Maryville									
06/12/07	0.079	Alton									
06/12/07	0.080	Mark Twain									
06/12/07	0.080	Wood River									
06/12/07	0.081	Arnold									
06/12/07	0.082	W. Alton									
06/12/07	0.083	Margaretta, Orchard Farm									
06/12/07	0.085	Pacific									
06/12/07	0.086	Sunset Hills									
06/12/07	0.088	Foley									
06/12/07	0.092	Maryand Heights									
07/23/07	0.084	Pacific									
08/18/07	0.080	Arnold									
08/18/07	0.084	Maryand Heights, Sunset Hills									
08/18/07	0.087	Foley									
09/02/07	0.076	Blair St									
09/02/07	0.077	Maryand Heights									
09/02/07	0.078	Wood River									
09/02/07	0.081	Margaretta, Pacific									
09/02/07	0.089	Sunset Hills									
09/02/07	0.093	Arnold									
09/20/07	0.076	Maryand Heights									
09/20/07	0.077	Arnold									
09/20/07	0.078	W. Alton									

Table 5: Ozone Concentrations Greater Than 75 Parts Per Billion

Table 5: Meteorological Regime #2

St. Louis Region			Kansas City Region			Springfield Region			Southwest & Southeast Missouri Regions		
Date	Concentration (PPM)	Site	Date	Concentration (PPM)	Site	Date	Concentration (PPM)	Site	Date	Concentration (PPM)	Site
04/27/03	0.076	Alton	07/01/03	0.082	Leavenworth A	07/22/04	0.076	Hillcrest	06/24/03	0.081	Houston
04/27/03	0.077	Jerseyville	07/02/03	0.081	Rocky Creek	08/08/05	0.077	Hillcrest	08/25/03	0.079	Linn County
04/27/03	0.079	Orchard Farm	07/03/03	0.082	Liberty	07/19/06	0.077	Hillcrest	08/25/03	0.080	El Dorado Springs
06/24/03	0.076	E. Saint Louis	07/03/03	0.084	Watkins Mill	07/20/06	0.086	Hillcrest	08/27/03	0.08	Bonne Terre
06/24/03	0.078	Wood River	07/04/03	0.076	Liberty	08/11/07	0.080	Hillcrest	08/18/04	0.079	El Dorado Springs
06/24/03	0.079	Arnold	07/04/03	0.078	Watkins Mill	08/15/07	0.087	Hillcrest	06/23/05	0.079	Houston
06/24/03	0.08	Clayton, Sunset Hills	07/20/03	0.079	KCI				06/23/05	0.093	Farrar
06/24/03	0.082	Edwardsville	07/20/03	0.080	Watkins Mill				06/24/05	0.076	El Dorado Springs
06/24/03	0.084	Maryville	07/20/03	0.087	Liberty				06/24/05	0.077	Bonne Terre
06/24/03	0.085	Margaretta	07/20/03	0.101	Rocky Creek				06/24/05	0.078	Houston
06/24/03	0.088	Breckenridge, Ferguson	07/26/03	0.076	Liberty				06/24/05	0.091	Farrar
06/24/03	0.09	Alton, Nilwood	07/26/03	0.078	Watkins Mill				06/25/05	0.079	Farrar
06/24/03	0.095	Jerseyville, W. Alton	08/20/03	0.079	Rocky Creek				06/26/05	0.076	Bonne Terre
06/24/03	0.097	Orchard Farm	08/20/03	0.084	Watkins Mill				06/26/05	0.077	Farrar
06/29/03	0.077	Maryville	08/20/03	0.087	Liberty				06/27/05	0.082	El Dorado Springs
07/02/03	0.08	Orchard Farm	08/25/03	0.076	Olathe				06/29/05	0.076	El Dorado Springs
07/02/03	0.082	Edwardsville	08/25/03	0.078	RG South				06/29/05	0.077	Linn County
07/02/03	0.086	Alton	08/25/03	0.080	JFK-Wyandotte				07/12/05	0.081	El Dorado Springs
07/02/03	0.087	W. Alton	08/25/03	0.085	Leavenworth A				07/13/05	0.078	Linn County
07/02/03	0.091	Maryville	08/25/03	0.089	Rocky Creek				07/16/05	0.079	Bonne Terre
07/27/03	0.076	Wood River	08/25/03	0.096	Watkins Mill				09/11/05	0.08	Farrar
07/27/03	0.078	Maryville	08/25/03	0.099	Liberty				06/15/06	0.077	Bonne Terre, Houston
08/20/03	0.077	Margaretta, Sunset Hills	08/26/03	0.076	RG South				06/15/06	0.079	Farrar
08/20/03	0.078	Alton, Queeny Park	08/26/03	0.077	Leavenworth A				06/16/06	0.076	Bonne Terre, Houston
08/20/03	0.079	Wood River	08/26/03	0.078	JFK-Wyandotte				06/16/06	0.085	Farrar
08/20/03	0.08	Breckenridge, Ferguson	08/26/03	0.081	Rocky Creek				06/30/06	0.081	Linn County
08/20/03	0.084	Jerseyville	08/26/03	0.086	Watkins Mill				07/01/06	0.077	El Dorado Springs
08/20/03	0.085	W. Alton	08/26/03	0.094	Liberty				07/01/06	0.081	Linn County
08/20/03	0.095	Orchard Farm	04/06/04	0.077	Liberty				05/21/07	0.079	Farrar
08/21/03	0.076	Ferguson	09/11/04	0.079	Trimble				05/22/07	0.076	Farrar
08/21/03	0.079	Alton, E. Saint Louis	04/17/05	0.076	Leavenworth B				05/23/07	0.076	Farrar
08/21/03	0.08	Margaretta, W. Alton	04/17/05	0.078	KCI				06/15/07	0.076	Farrar
08/21/03	0.083	Wood River	04/17/05	0.079	Trimble				06/15/07	0.078	Bonne Terre
08/21/03	0.088	Maryville	04/17/05	0.080	Rocky Creek, RG South, Liberty				07/25/07	0.076	Farrar
08/25/03	0.076	Wood River	05/25/05	0.080	KCI				07/25/07	0.091	Bonne Terre
08/25/03	0.077	Nilwood	05/25/05	0.081	Trimble				07/26/07	0.076	El Dorado Springs
08/25/03	0.079	Maryville	05/25/05	0.083	Rocky Creek				08/02/07	0.079	Bonne Terre
08/25/03	0.08	Mark Twain	06/20/05	0.078	KCI				08/02/07	0.079	Houston
08/25/03	0.081	Alton, Ferguson	06/20/05	0.079	JFK-Wyandotte				08/12/07	0.076	Farrar
08/25/03	0.085	W. Alton	06/20/05	0.080	RG South				08/12/07	0.081	Houston
08/25/03	0.086	Breckenridge, Queeny Park	06/20/05	0.085	Olathe				08/14/07	0.077	Farrar
08/25/03	0.09	Jerseyville	06/20/05	0.096	Leavenworth B				08/14/07	0.08	Farrar
08/25/03	0.096	Orchard Farm	06/23/05	0.079	Rocky Creek, Liberty				08/28/07	0.078	Farrar
08/26/03	0.08	Orchard Farm	06/23/05	0.080	Trimble				09/21/07	0.081	Bonne Terre
08/26/03	0.084	Mark Twain	06/24/05	0.082	KCI				09/21/07	0.082	Houston
08/26/03	0.093	Queeny Park	06/24/05	0.083	Liberty				09/21/07	0.093	Farrar
08/26/03	0.094	Clark	06/24/05	0.087	Rocky Creek						
08/26/03	0.095	Alton, Breckenridge, Ferguson	06/24/05	0.088	Trimble						
08/26/03	0.096	Maryville	06/25/05	0.076	Watkins Mill, JFK-Wyandotte						
08/26/03	0.097	W. Alton	06/25/05	0.077	Leavenworth B						

Table 5: Ozone Concentrations Greater Than 75 Parts Per Billion

Table 5: Meteorological Regime #2

St. Louis Region			Kansas City Region			Springfield Region			Southwest & Southeast Missouri Regions		
Date	Concentration (PPM)	Site	Date	Concentration (PPM)	Site	Date	Concentration (PPM)	Site	Date	Concentration (PPM)	Site
08/26/03	0.102	Wood River	06/25/05	0.080	KCI						
08/26/03	0.104	Clayton, Edwardsville	06/25/05	0.087	Trimble						
08/26/03	0.107	Arnold, Sunset Hills	06/25/05	0.088	Rocky Creek, Liberty						
08/26/03	0.108	S.Broadway	06/26/05	0.077	Rocky Creek, Liberty						
08/26/03	0.111	E. Saint Louis	06/26/05	0.080	Trimble						
08/26/03	0.116	Margaretta	06/27/05	0.078	Watkins Mill, Trimble, Rocky Creek						
09/18/03	0.078	Jerseyville, W. Alton	06/27/05	0.084	Liberty						
09/18/03	0.081	Orchard Farm	06/29/05	0.076	RG South						
05/07/04	0.081	Wood River	06/29/05	0.077	KCI						
06/06/04	0.076	Orchard Farm	06/29/05	0.081	Trimble, Liberty						
06/14/04	0.077	Margaretta	06/29/05	0.082	Rocky Creek, Olathe						
06/14/04	0.078	E. Saint Louis	07/11/05	0.077	Olathe						
06/14/04	0.082	Maryville	07/12/05	0.076	Trimble, Rocky Creek, Leavenworth B						
06/30/04	0.077	Jerseyville, W. Alton	07/12/05	0.078	Liberty						
06/30/04	0.08	Orchard Farm	07/12/05	0.080	Olathe						
07/20/04	0.076	Jerseyville	07/12/05	0.081	RG South						
07/20/04	0.077	W. Alton	07/13/05	0.078	Liberty						
07/21/04	0.076	E. Saint Louis	07/13/05	0.083	Olathe						
07/21/04	0.08	Maryville	07/13/05	0.086	RG South						
08/17/04	0.08	Nilwood	07/15/05	0.088	Lawrence						
09/02/04	0.076	W. Alton	07/16/05	0.083	Trimble						
09/02/04	0.08	Orchard Farm	07/16/05	0.086	Rocky Creek						
09/03/04	0.077	W. Alton	07/16/05	0.087	Liberty						
09/11/04	0.078	Orchard Farm	07/22/05	0.084	Liberty						
04/17/05	0.076	Blair St., Foley, Orchard Farm	07/22/05	0.087	Rocky Creek, KCI						
04/17/05	0.077	Alton, W. Alton	08/03/05	0.077	Rocky Creek						
05/18/05	0.077	Jerseyville, W. Alton	08/03/05	0.079	Watkins Mill						
05/18/05	0.078	Orchard Farm	08/03/05	0.082	Liberty						
06/03/05	0.076	Jerseyville	08/08/05	0.078	JFK-Wyandotte						
06/03/05	0.078	Alton	08/08/05	0.082	Trimble						
06/03/05	0.08	Orchard Farm	08/08/05	0.086	Rocky Creek						
06/03/05	0.082	W. Alton	08/08/05	0.091	KCI						
06/20/05	0.077	Pacific	08/09/05	0.077	Trimble						
06/20/05	0.078	Arnold	08/09/05	0.079	Rocky Creek						
06/20/05	0.082	Sunset Hills	08/09/05	0.086	Watkins Mill						
06/23/05	0.076	Maryville	08/09/05	0.089	Liberty						
06/23/05	0.079	E. Saint Louis	08/10/05	0.078	Rocky Creek						
06/23/05	0.08	Nilwood, Orchard Farm	08/10/05	0.079	JFK-Wyandotte						
06/23/05	0.082	Margaretta	08/10/05	0.084	Watkins Mill						
06/23/05	0.087	W. Alton, Wood River	08/10/05	0.091	Liberty						
06/23/05	0.092	Alton	09/11/05	0.076	Trimble, KCI						
06/24/05	0.079	Sunset Hills	09/11/05	0.080	Rocky Creek						
06/24/05	0.08	Maryland Heights	06/09/06	0.077	Watkins Mill						
06/24/05	0.084	Orchard Farm	06/09/06	0.080	Trimble						
06/24/05	0.085	E. Saint Louis	06/09/06	0.081	Liberty						
06/24/05	0.087	Blair St.	06/09/06	0.082	Rocky Creek						
06/24/05	0.089	W. Alton	06/15/06	0.076	Lawrence						
06/24/05	0.09	Margaretta	06/15/06	0.078	Trimble						
06/24/05	0.092	Maryville	06/15/06	0.079	Liberty						
06/24/05	0.093	Wood River	06/15/06	0.081	Rocky Creek						

Table 5: Ozone Concentrations Greater Than 75 Parts Per Billion

Table 5: Meteorological Regime #2

St. Louis Region			Kansas City Region			Springfield Region			Southwest & Southeast Missouri Regions		
Date	Concentration (PPM)	Site	Date	Concentration (PPM)	Site	Date	Concentration (PPM)	Site	Date	Concentration (PPM)	Site
06/24/05	0.096	Alton	06/19/06	0.076	Rocky Creek						
06/25/05	0.076	E. Saint Louis, Maryville	06/19/06	0.077	JFK-Wyandotte						
06/25/05	0.077	Maryland Heights	06/19/06	0.085	Liberty						
06/25/05	0.078	Margaretta	06/30/06	0.076	Olathe						
06/25/05	0.08	Blair St.	06/30/06	0.077	RG South						
06/25/05	0.084	W. Alton	06/30/06	0.080	Leavenworth B, Lawrence, JFK-Wyandotte						
06/25/05	0.091	Alton, Wood River	06/30/06	0.081	Trimble						
06/26/05	0.076	Queeny Park	06/30/06	0.087	Rocky Creek						
06/26/05	0.077	Blair St.. E. Saint Louis	06/30/06	0.092	Watkins Mill						
06/26/05	0.078	Sunset Hills	06/30/06	0.094	Liberty						
06/26/05	0.079	Arnold, Margaretta	07/01/06	0.080	RG South						
06/26/05	0.081	Wood River	07/01/06	0.082	Trimble, Olathe						
06/26/05	0.084	Alton, Jerseyville	07/01/06	0.083	Leavenworth B						
06/26/05	0.086	Maryland Heights	07/01/06	0.084	Lawrence						
06/26/05	0.087	Orchard Farm, W. Alton	07/01/06	0.085	JFK-Wyandotte						
06/26/05	0.089	Foley	07/01/06	0.087	Rocky Creek						
06/27/05	0.077	Alton	07/01/06	0.091	Watkins Mill						
06/27/05	0.079	Foley	07/01/06	0.094	Liberty						
06/27/05	0.08	Maryland Heights	07/02/06	0.076	Liberty						
06/27/05	0.083	Orchard Farm, W. Alton	07/08/06	0.081	JFK-Wyandotte						
06/27/05	0.087	Jerseyville	07/08/06	0.083	Watkins Mill						
06/28/05	0.078	Alton, Foley, Wood River	07/08/06	0.088	Liberty						
06/28/05	0.081	Queeny Park	07/08/06	0.089	Trimble						
06/28/05	0.086	Maryland Heights, W. Alton	07/08/06	0.094	Rocky Creek						
06/28/05	0.088	Maryville	07/12/06	0.076	Liberty						
06/28/05	0.093	Sunset Hills	07/12/06	0.077	Rocky Creek						
06/28/05	0.096	Margaretta	07/13/06	0.086	Trimble, Rocky Creek						
06/28/05	0.099	Blair St.	07/17/06	0.083	Watkins Mill						
06/28/05	0.1	Arnold	07/17/06	0.087	Liberty						
06/28/05	0.11	E. Saint Louis	07/19/06	0.078	RG South						
06/29/05	0.079	Blair St.	07/19/06	0.084	Trimble, JFK-Wyandotte						
06/29/05	0.081	Margaretta	07/19/06	0.091	Rocky Creek						
06/29/05	0.082	E. Saint Louis	07/19/06	0.105	Watkins Mill						
06/29/05	0.086	Maryville, Orchard Farm	07/19/06	0.106	Liberty						
06/29/05	0.087	Jerseyville	07/24/06	0.076	Liberty						
06/29/05	0.099	Wood River	07/25/06	0.077	Watkins Mill						
06/29/05	0.101	W. Alton	07/25/06	0.078	Trimble, Rocky Creek, Liberty						
06/29/05	0.102	Alton	07/26/06	0.076	Liberty						
07/03/05	0.077	Jerseyville	08/06/06	0.078	Rocky Creek						
07/03/05	0.079	Wood River	08/06/06	0.092	Liberty						
07/03/05	0.081	W. Alton, Alton	08/17/06	0.079	Rocky Creek, Liberty						
07/16/05	0.076	Maryland Heights	08/17/06	0.087	Trimble						
07/16/05	0.081	Arnold	06/15/07	0.081	Trimble						
07/16/05	0.082	E. Saint Louis	06/15/07	0.082	Rocky Creek						
07/16/05	0.086	Sunset Hills	06/15/07	0.088	Leavenworth B						
07/16/05	0.089	Margaretta, Blair St.	07/16/07	0.081	Trimble						
07/23/05	0.08	W. Alton	07/25/07	0.080	Trimble						
07/23/05	0.085	Maryland Heights	07/25/07	0.082	Rocky Creek						
07/23/05	0.089	Orchard Farm	07/26/07	0.079	Rocky Creek						
07/23/05	0.093	Foley	07/26/07	0.084	Watkins Mill						

Table 5: Ozone Concentrations Greater Than 75 Parts Per Billion

Table 5: Meteorological Regime #2

St. Louis Region			Kansas City Region			Springfield Region			Southwest & Southeast Missouri Regions		
Date	**Concentration (PPM)**	**Site**	**Date**	**Concentration (PPM)**	**Site**	**Date**	**Concentration (PPM)**	**Site**	**Date**	**Concentration (PPM)**	**Site**
07/25/05	0.076	Wood River, W. Alton	07/26/07	0.086	Liberty						
08/02/05	0.076	Arnold	08/12/07	0.092	Rocky Creek						
08/02/05	0.077	W. Alton	08/12/07	0.099	Liberty						
08/02/05	0.08	Queeny Park	08/14/07	0.078	Liberty						
08/02/05	0.081	Jerseyville	08/15/07	0.078	Liberty						
08/02/05	0.089	Maryland Heights	08/28/07	0.076	Rocky Creek						
08/02/05	0.092	Orchard Farm	08/28/07	0.078	Liberty						
08/02/05	0.093	Foley	09/03/07	0.077	Liberty						
08/03/05	0.077	Jerseyville	09/03/07	0.078	Rocky Creek						
08/03/05	0.079	W. Alton	09/04/07	0.076	Rocky Creek						
08/03/05	0.08	Orchard Farm									
08/08/05	0.076	Jerseyville, Blair St.									
08/08/05	0.081	Sunset Hills, Margaretta									
08/08/05	0.086	Wood River									
08/08/05	0.087	W. Alton, Alton									
08/08/05	0.088	Queeny Park, Foley									
08/08/05	0.093	Orchard Farm									
08/08/05	0.094	Maryland Heights									
08/09/05	0.077	Nilwood, Margaretta, Foley									
08/09/05	0.078	Maryland Heights									
08/09/05	0.08	Jerseyville									
08/09/05	0.085	Wood River, Orchard Farm									
08/09/05	0.089	Alton									
08/09/05	0.091	W. Alton									
08/10/05	0.077	Maryland Heights, Foley									
08/10/05	0.08	Alton									
08/10/05	0.081	Arnold									
08/10/05	0.084	Wood River									
08/10/05	0.092	Margaretta									
08/10/05	0.093	Blair St.									
08/10/05	0.103	E. Saint Louis									
08/10/05	0.104	Maryville									
08/11/05	0.078	Orchard Farm, Margaretta									
08/11/05	0.084	Wood River, Alton									
08/11/05	0.089	W. Alton									
08/19/05	0.076	Alton									
08/19/05	0.078	Wood River, W. Alton									
09/06/05	0.078	Blair St., Alton									
09/06/05	0.079	E. Saint Louis									
09/06/05	0.081	W. Alton, Sunset Hills									
09/06/05	0.085	Maryville									
09/06/05	0.088	Margaretta									
09/07/05	0.077	E. Saint Louis, Arnold									
09/07/05	0.079	Sunset Hills									
09/07/05	0.081	Margaretta									
09/07/05	0.082	Maryville, Blair St.									
09/11/05	0.076	Maryland Heights									
09/11/05	0.077	W. Alton									
09/11/05	0.084	Orchard Farm									
09/12/05	0.078	Orchard Farm									

Table 5: Ozone Concentrations Greater Than 75 Parts Per Billion

Table 5: Meteorological Regime #2

St. Louis Region			Kansas City Region			Springfield Region			Southwest & Southeast Missouri Regions		
Date	Concentration (PPM)	Site	Date	Concentration (PPM)	Site	Date	Concentration (PPM)	Site	Date	Concentration (PPM)	Site
09/12/05	0.08	Wood River									
09/12/05	0.083	Alton									
09/12/05	0.084	W. Alton									
09/12/05	0.086	Nilwood									
09/21/05	0.078	Foley									
06/06/06	0.077	W. Alton									
06/15/06	0.077	Maryville, E. Saint Louis, Alton									
06/15/06	0.078	Foley									
06/15/06	0.079	Arnold									
06/15/06	0.08	Sunset Hills									
06/15/06	0.084	Maryland Heights									
06/15/06	0.087	W. Alton									
06/15/06	0.092	Orchard Farm									
06/16/06	0.076	Alton									
06/16/06	0.077	Maryville, Maryland Heights									
06/16/06	0.078	Sunset Hills									
06/16/06	0.088	Orchard Farm									
06/16/06	0.09	W. Alton									
06/20/06	0.08	Alton									
06/20/06	0.084	Maryville									
06/20/06	0.087	W. Alton									
07/02/06	0.076	W. Alton									
07/08/06	0.077	Wood River, Orchard Farm									
07/08/06	0.079	Alton									
07/08/06	0.091	W. Alton									
07/09/06	0.077	Wood River									
07/09/06	0.078	Alton									
07/09/06	0.088	W. Alton									
07/17/06	0.076	Wood River									
07/17/06	0.085	Alton									
07/17/06	0.091	W. Alton									
07/20/06	0.076	Orchard Farm, Maryland Heights									
07/20/06	0.085	Foley, Mark Twain									
08/06/06	0.076	Foley									
08/06/06	0.077	Jerseyville									
08/06/06	0.083	W. Alton									
08/06/06	0.085	Orchard Farm									
08/07/06	0.076	W. Alton									
08/07/06	0.079	Maryland Heights, Arnold									
08/07/06	0.081	Pacific									
08/07/06	0.083	Sunset Hills									
08/13/06	0.076	W. Alton, Orchard Farm, Maryland Heights									
08/13/06	0.079	Foley									
05/21/07	0.076	W. Alton									
06/15/07	0.076	Margaretta									
06/15/07	0.078	W. Alton, Foley									
06/15/07	0.08	Sunset Hills									
06/15/07	0.084	Pacific									
06/15/07	0.091	Maryland Heights									
07/03/07	0.077	Alton									

Table 5: Ozone Concentrations Greater Than 75 Parts Per Billion

Table 5: Meteorological Regime #2

St. Louis Region			Kansas City Region			Springfield Region			Southwest & Southeast Missouri Regions		
Date	**Concentration (PPM)**	**Site**	**Date**	**Concentration (PPM)**	**Site**	**Date**	**Concentration (PPM)**	**Site**	**Date**	**Concentration (PPM)**	**Site**
07/03/07	0.078	Margaretta									
07/03/07	0.079	Wood River									
07/03/07	0.081	Sunset Hills									
07/03/07	0.082	Arnold									
07/03/07	0.083	W. Alton									
07/03/07	0.085	Jerseyville, Foley									
07/03/07	0.087	Maryland Heights									
07/03/07	0.089	Orchard Farm									
07/25/07	0.076	Arnold									
07/25/07	0.078	Pacific									
07/25/07	0.081	Orchard Farm									
07/25/07	0.082	Margaretta									
07/25/07	0.083	Sunset Hills									
07/25/07	0.084	W. Alton									
07/25/07	0.096	Foley									
07/25/07	0.101	Maryland Heights									
07/26/07	0.076	Maryville									
08/02/07	0.076	Orchard Farm									
08/02/07	0.078	Alton									
08/02/07	0.082	Foley									
08/02/07	0.086	Wood River									
08/02/07	0.087	Arnold									
08/02/07	0.091	W. Alton									
08/02/07	0.093	E. Saint Louis									
08/02/07	0.094	Maryland Heights									
08/02/07	0.098	Sunset Hills									
08/02/07	0.102	Blair St.									
08/02/07	0.107	Maryville									
08/02/07	0.113	Margaretta									
08/04/07	0.076	Wood River									
08/11/07	0.08	W. Alton									
08/11/07	0.082	Pacific									
08/11/07	0.083	Orchard Farm									
08/11/07	0.084	Maryland Heights									
08/11/07	0.086	Foley									
08/12/07	0.076	Wood River, W. Alton									
08/12/07	0.077	Margaretta									
08/12/07	0.078	Maryville									
08/12/07	0.079	Sunset Hills, Pacific, Arnold									
08/14/07	0.076	Orchard Farm									
08/14/07	0.077	Maryville									
08/14/07	0.081	Blair St.									
08/14/07	0.085	Margaretta									
08/14/07	0.086	Alton									
08/14/07	0.089	Wood River, W. Alton									
08/15/07	0.076	Alton									
08/15/07	0.078	E. Saint Louis, Blair St.									
08/15/07	0.079	Orchard Farm									
08/15/07	0.08	Wood River, Foley									
08/15/07	0.081	Margaretta									

Table 5: Ozone Concentrations Greater Than 75 Parts Per Billion

Table 5: Meteorological Regime #2

St. Louis Region			Kansas City Region			Springfield Region			Southwest & Southeast Missouri Regions		
Date	**Concentration (PPM)**	**Site**	**Date**	**Concentration (PPM)**	**Site**	**Date**	**Concentration (PPM)**	**Site**	**Date**	**Concentration (PPM)**	**Site**
08/15/07	0.085	Sunset Hills									
08/15/07	0.087	W. Alton									
08/15/07	0.094	Maryville									
08/27/07	0.079	Foley									
08/27/07	0.081	Orchard Farm									
08/27/07	0.086	Maryland Heights									
08/28/07	0.076	Wood River									
08/28/07	0.077	Sunset Hills, Jerseyville									
08/28/07	0.08	Alton									
08/28/07	0.089	W. Alton									
09/03/07	0.077	E. Saint Louis									
09/03/07	0.08	Blair St., Alton									
09/03/07	0.081	Maryland Heights, Margaretta									
09/03/07	0.082	Wood River, Arnold									
09/03/07	0.083	Maryville									
09/03/07	0.086	W. Alton									
09/03/07	0.087	Sunset Hills									
09/04/07	0.082	W. Alton									
09/19/07	0.077	W. Alton									
09/21/07	0.076	Arnold									
09/21/07	0.077	Mark Twain									
09/21/07	0.08	Margaretta									
09/21/07	0.081	Maryville, Foley, Alton									
09/21/07	0.083	Wood River									
09/21/07	0.088	W. Alton									
09/21/07	0.091	Nilwood									

Table 5: Ozone Concentrations Greater Than 75 Parts Per Billion

Meteorological Regime #3

St. Louis Region			Kansas City Region			Springfield Region			Southwest & Southeast Missouri Regions		
Date	Concentration (PPM)	Site	Date	Concentration (PPM)	Site	Date	Concentration (PPM)	Site	Date	Concentration (PPM)	Site
07/17/03	0.082	Arnold	04/12/03	0.076	Leavenworth A, KCI	06/28/05	0.076	Hillcrest	04/12/03	0.078	El Dorado Springs
07/17/03	0.087	Queeny Park	04/12/03	0.077	Lawrence				04/12/03	0.083	Linn County
07/17/03	0.089	Clark	04/12/03	0.082	RG South				04/12/03	0.087	Bonne Terre
07/17/03	0.090	Edwardsville	04/12/03	0.089	Watkins Mill				04/13/03	0.077	Linn County
07/17/03	0.091	W. Alton	04/12/03	0.091	Rocky Creek				04/13/03	0.082	El Dorado Springs
07/17/03	0.092	Ferguson	04/12/03	0.093	Liberty				06/14/03	0.077	Bonne Terre
07/17/03	0.095	Maryville	04/13/03	0.076	JFK-Wyandotte				08/17/03	0.081	Bonne Terre
07/17/03	0.097	S. Broadway	04/13/03	0.082	RG South				08/22/03	0.077	Houston
07/17/03	0.099	Breckenridge	05/30/03	0.076	Rocky Creek				08/22/03	0.098	Bonne Terre
07/17/03	0.101	Wood River, Alton	05/30/03	0.078	Liberty				07/21/04	0.078	El Dorado Springs
07/17/03	0.106	Sunset Hills, E. Saint Louis, Clayton	05/30/03	0.079	Olathe				07/22/04	0.086	El Dorado Springs
07/17/03	0.108	Margaretta	07/27/03	0.076	KCI				06/28/05	0.084	El Dorado Springs
08/17/03	0.076	Maryville	07/27/03	0.079	Leavenworth A				07/22/05	0.084	Bonne Terre
08/17/03	0.077	E. Saint Louis	07/27/03	0.081	Liberty				06/09/06	0.078	Bonne Terre
08/17/03	0.078	Arnold	07/27/03	0.086	Rocky Creek				06/09/06	0.080	Farrar
08/17/03	0.079	Sunset Hills	07/27/03	0.096	JFK-Wyandotte				06/29/06	0.078	El Dorado Springs
08/17/03	0.080	Margaretta	07/22/04	0.076	Olathe				06/29/06	0.082	Linn County
08/17/03	0.082	S. Broadway	07/22/04	0.080	RG South				06/30/06	0.078	Bonne Terre
08/22/03	0.076	Maryville, Jerseyville	08/04/05	0.081	Olathe				06/30/06	0.083	Farrar
08/22/03	0.077	S. Broadway	08/04/05	0.091	RG South				07/19/06	0.080	Farrar
08/22/03	0.078	Sunset Hills	06/29/06	0.078	Rocky Creek				07/20/06	0.076	El Dorado Springs
08/22/03	0.080	Arnold	06/29/06	0.079	Watkins Mill				08/09/07	0.078	Houston
07/16/04	0.081	Maryville	06/29/06	0.084	Liberty				08/13/07	0.086	Bonne Terre
07/22/04	0.080	Arnold	07/20/06	0.077	JFK-Wyandotte				08/16/07	0.076	El Dorado Springs
07/11/05	0.081	Mark Twain	07/20/06	0.078	Liberty				08/16/07	0.077	Farrar
07/22/05	0.080	Arnold	07/20/06	0.081	Olathe				08/16/07	0.080	Bonne Terre
07/22/05	0.082	Sunset Hills	07/20/06	0.085	RG South				08/29/07	0.082	Houston
08/04/05	0.076	Arnold	07/28/06	0.081	Trimble				09/22/07	0.080	Farrar
09/08/05	0.076	Margaretta	07/28/06	0.085	Rocky Creek						
09/08/05	0.079	Blair St.	08/07/06	0.085	Lawrence						
09/08/05	0.081	E. Saint Louis	08/09/06	0.083	Trimble, Rocky Creek						
09/08/05	0.088	Maryville	08/09/06	0.093	Watkins Mill, Liberty						
06/09/06	0.079	Pacific	08/16/07	0.077	JFK-Wyandotte						
06/09/06	0.084	Sunset Hills	08/16/07	0.078	RG South						
06/09/06	0.085	Arnold	08/16/07	0.080	Olathe						
06/29/06	0.076	Blair St., Alton									
06/29/06	0.077	Sunset Hills									
06/29/06	0.082	Maryland Heights, E. Saint Louis									
06/29/06	0.084	Foley									
06/29/06	0.091	W. Alton, Orchard Farm									
07/19/06	0.076	E. Saint Louis									
07/19/06	0.077	Margaretta									
07/19/06	0.080	Alton									
07/19/06	0.081	Wood River									
07/19/06	0.083	Jerseyville, Foley									
07/19/06	0.087	Maryland Heights									
07/19/06	0.095	Orchard Farm									
07/19/06	0.097	W. Alton									
08/08/07	0.079	Maryville									
08/08/07	0.082	Wood River, W. Alton									
08/13/07	0.076	Arnold									
08/13/07	0.080	Sunset Hills									
08/29/07	0.081	Arnold									

Table 5: Ozone Concentrations Greater Than 75 Parts Per Billion

Meteorological Regime #4

St. Louis Region			Kansas City Region			Springfield Region			Southwest & Southeast Missouri Regions		
Date	Concentration (PPM)	Site	Date	Concentration (PPM)	Site	Date	Concentration (PPM)	Site	Date	Concentration (PPM)	Site
06/05/03	0.078	Margaretta	07/11/03	0.080	JFK-Wyandotte	08/22/03	0.081	S. Charleston	07/16/03	0.078	Houston
06/05/03	0.081	Sunset Hills	07/13/03	0.076	Leavenworth A	08/10/07	0.090	Hillcrest	08/22/03	0.080	El Dorado Springs
07/16/03	0.077	Arnold	07/16/03	0.085	JFK-Wyandotte				08/22/03	0.084	Linn County
07/19/03	0.080	W. Alton	07/16/03	0.089	Rocky Creek				08/23/03	0.082	Linn County
07/27/04	0.076	Sunset Hills	07/16/03	0.092	KCI				06/17/05	0.084	Bonne Terre
06/14/06	0.076	Pacific, E. Saint Louis	07/16/03	0.094	Leavenworth A				06/14/06	0.079	Linn County
06/14/06	0.077	Foley, Alton	07/19/03	0.078	Leavenworth A				07/31/07	0.076	Bonne Terre
06/14/06	0.078	Wood River	08/07/03	0.076	Olathe				08/01/07	0.079	Farrar
06/14/06	0.080	Sunset Hills	08/10/03	0.079	Lawrence				08/01/07	0.089	Bonne Terre
06/14/06	0.087	W. Alton	08/22/03	0.082	RG South, Lawrence				08/10/07	0.098	Bonne Terre
06/14/06	0.092	Orchard Farm, Maryland Heights	08/22/03	0.084							
07/28/06	0.076	Margaretta	08/22/03	0.096	Olathe						
07/28/06	0.077	Maryville, Blair St.	08/23/03	0.077	RG South						
08/04/06	0.076	Pacific	08/23/03	0.081	Olathe						
06/09/07	0.076	Arnold	08/23/03	0.083	Leavenworth A						
06/09/07	0.078	Sunset Hills	08/23/03	0.099	Lawrence						
07/30/07	0.077	Pacific	08/03/04	0.076	Trimble						
07/31/07	0.076	Maryland Heights	05/23/05	0.078	Olathe						
08/01/07	0.076	Arnold	06/13/06	0.078	Lawrence						
08/01/07	0.080	Orchard Farm, Margaretta	06/14/06	0.081	Trimble						
08/01/07	0.083	Sunset Hills	06/14/06	0.083	Rocky Creek						
08/01/07	0.084	W. Alton, Pacific	06/28/06	0.081	Rocky Creek						
08/01/07	0.087	Foley	06/28/06	0.087	Liberty						
08/01/07	0.094	Maryland Heights	07/06/06	0.077	Leavenworth B						
08/10/07	0.076	Arnold	08/01/07	0.079	Liberty, JFK-Wyandotte						
			08/01/07	0.086	Trimble						
			08/01/07	0.088	Leavenworth B						
			08/01/07	0.099	Rocky Creek						
			08/10/07	0.082	Trimble						
			08/10/07	0.084	Rocky Creek						

Table 5: Ozone Concentrations Greater Than 75 Parts Per Billion

Meteorological Regime #5

St. Louis Region			Kansas City Region			Springfield Region			Southwest & Southeast Missouri Regions		
Date	Concentration (PPM)	Site	Date	Concentration (PPM)	Site	Date	Concentration (PPM)	Site	Date	Concentration (PPM)	Site
07/30/03	0.078	Orchard Farm	04/01/03	0.076	RG South				07/31/03	0.095	Bonne Terre
07/30/03	0.079	W. Alton	04/01/03	0.078	Watkins Mill				08/22/06	0.091	Bonne Terre
07/31/03	0.076	Jerseyville	04/01/03	0.079	Rocky Creek				08/24/06	0.076	Farrar
07/31/03	0.079	E. Saint Louis	04/01/03	0.084	Liberty						
07/31/03	0.084	S. Broadway	07/30/03	0.080	Lawrence						
07/31/03	0.088	Arnold	07/30/03	0.082	RG South						
07/31/03	0.089	Alton	07/30/03	0.084	JFK-Wyandotte						
07/31/03	0.090	Orchard Farm	07/30/03	0.106	Olathe						
07/31/03	0.093	Wood River	05/19/06	0.078	JFK-Wyandotte						
07/31/03	0.094	W. Alton	05/19/06	0.079	Liberty						
07/31/03	0.096	Clayton	08/22/06	0.084	Lawrence						
07/31/03	0.097	Queeny Park, Margaretta	08/23/06	0.079	Liberty						
07/31/03	0.102	Sunset Hills	08/23/06	0.082	Rocky Creek						
07/31/03	0.104	Ferguson	08/23/06	0.085	Trimble						
07/31/03	0.106	Breckenridge	08/24/06	0.080	Trimble						
08/28/05	0.082	Maryland Heights	08/24/06	0.081	Rocky Creek						
08/28/05	0.087	Orchard Farm	05/13/07	0.082	Rocky Creek						
08/23/06	0.079	W. Alton, Maryland Heights	05/13/07	0.083	Trimble						
08/23/06	0.081	Pacific	08/17/07	0.076	Rocky Creek						
08/23/06	0.082	Orchard Farm	08/17/07	0.077	Leavenworth B						
08/23/06	0.088	Foley									
08/24/06	0.078	Maryland Heights									
08/24/06	0.080	W. Alton									
08/24/06	0.082	Orchard Farm									
08/17/07	0.080	Pacific									

Table 5: Ozone Concentrations Greater Than 75 Parts Per Billion

Meteorological Regime #6

St. Louis Region			Kansas City Region			Springfield Region			Southwest & Southeast Missouri Regions		
Date	Concentration (PPM)	Site	Date	Concentration (PPM)	Site	Date	Concentration (PPM)	Site	Date	Concentration (PPM)	Site
08/05/03	0.079	Sunset Hills	08/04/03	0.076	Olathe						
06/10/06	0.076	Maryville, Margaretta	08/04/03	0.079	JFK-Wyandotte						
06/10/06	0.077	E. Saint Louis	08/05/03	0.076	Leavenworth A						
06/10/06	0.079	W. Alton	08/05/03	0.078	Rocky Creek						
06/10/06	0.082	Maryland Heights	08/05/03	0.079	Olathe						
07/18/06	0.078	Alton	08/05/03	0.083	JFK-Wyandotte						
07/18/06	0.079	Margaretta	04/22/06	0.078	Olathe						
07/18/06	0.080	Wood River	04/22/06	0.080	RG South						
07/18/06	0.083	Blair St.	06/10/06	0.077	JFK-Wyandotte						
07/18/06	0.084	Arnold	06/10/06	0.086	Liberty						
07/18/06	0.089	W. Alton, Maryville	06/10/06	0.087	Rocky Creek						
07/18/06	0.098	E. Saint Louis	07/18/06	0.081	Lawrence						
08/17/06	0.076	Alton	08/08/06	0.080	Lawrence						
08/17/06	0.077	Sunset Hills, Arnold									
08/17/06	0.079	Jerseyville									
08/17/06	0.084	W. Alton									
08/17/06	0.087	Maryland Heights									
08/17/06	0.090	Foley									
08/17/06	0.093	Orchard Farm									
08/18/06	0.080	Sunset Hills, Foley									
08/18/06	0.083	Maryland Heights									
08/18/06	0.090	Pacific									
08/03/07	0.079	Foley									
08/03/07	0.080	Maryville									
08/03/07	0.081	E. Saint Louis, Alton									
08/03/07	0.085	Orchard Farm									
08/03/07	0.086	Wood River									
08/03/07	0.087	Maryland Heights									
08/03/07	0.088	Blair St.									
08/03/07	0.093	Arnold									
08/03/07	0.096	Margaretta									
08/03/07	0.099	W. Alton									
08/03/07	0.101	Sunset Hills									

Table 5: Ozone Concentrations Greater Than 75 Parts Per Billion

Meteorological Regime #7

St. Louis Region			Kansas City Region			Springfield Region			Southwest & Southeast Missouri Regions		
Date	Concentration (PPM)	Site	Date	Concentration (PPM)	Site	Date	Concentration (PPM)	Site	Date	Concentration (PPM)	Site
07/14/03	0.077	Jerseyville	07/14/03	0.082	Rocky Creek	06/21/05	0.078	Hillcrest	06/21/05	0.076	Bonne Terre
07/14/03	0.080	Orchard Farm	08/15/03	0.079	Watkins Mill	06/22/05	0.076	Hillcrest	06/21/05	0.078	Farrar
08/16/03	0.077	S. Broadway	08/15/03	0.086	Liberty	06/13/07	0.082	Hillcrest	06/22/05	0.079	El Dorado Springs
08/16/03	0.078	Sunset Hills, Arnold	08/16/03	0.077	JFK-Wyandotte				06/22/05	0.085	Bonne Terre, Farrar
09/08/03	0.076	Orchard Farm	08/16/03	0.079	Liberty				06/30/05	0.076	Houston
09/09/03	0.080	W. Alton	04/03/05	0.076	Trimble				06/13/07	0.079	El Dorado Springs
09/09/03	0.083	Orchard Farm	04/03/05	0.077	Leavenworth B				06/13/07	0.081	Farrar
08/01/04	0.076	Edwardsville	04/03/05	0.079	Lawrence				06/13/07	0.087	Bonne Terre
08/01/04	0.078	Maryville	06/21/05	0.077	Leavenworth B				06/14/07	0.079	Farrar
08/01/04	0.080	Wood River, Alton	06/21/05	0.079	Olathe				06/14/07	0.091	Bonne Terre
08/01/04	0.081	W. Alton	06/21/05	0.082	RG South				06/16/07	0.078	Farrar, Houston
06/21/05	0.077	Alton	06/21/05	0.085	Liberty				06/16/07	0.080	Bonne Terre
06/21/05	0.078	Wood River	06/21/05	0.093	KCI				06/17/07	0.077	Houston
06/21/05	0.082	Queeny Park	06/21/05	0.104	JFK-Wyandotte				06/17/07	0.085	Bonne Terre
06/21/05	0.086	Maryland Heights	06/22/05	0.079	Watkins Mill, JFK-Wyandotte				06/17/07	0.087	Farrar
06/21/05	0.090	Sunset Hills	06/22/05	0.084	KCI						
06/21/05	0.091	Blair St.	06/22/05	0.092	Liberty						
06/21/05	0.092	Arnold	06/22/05	0.093	Trimble						
06/21/05	0.094	Margaretta	06/22/05	0.097	Rocky Creek						
06/21/05	0.095	Maryville	06/08/06	0.078	JFK-Wyandotte						
06/21/05	0.101	E. Saint Louis	07/15/06	0.078	Rocky Creek						
06/22/05	0.078	W. Alton	07/15/06	0.099	JFK-Wyandotte						
06/22/05	0.083	Wood River, Alton	07/16/06	0.076	Watkins Mill						
06/22/05	0.087	Pacific	07/16/06	0.081	Liberty						
06/22/05	0.089	Blair St.	07/16/06	0.083	Trimble, Rocky Creek						
06/22/05	0.091	Margaretta	06/13/07	0.076	Leavenworth B						
06/22/05	0.094	E. Saint Louis	06/13/07	0.080	Trimble						
06/22/05	0.097	Maryland Heights, Arnold	06/13/07	0.084	Rocky Creek						
06/22/05	0.098	Queeny Park	06/14/07	0.077	Watkins Mill						
06/22/05	0.108	Sunset Hills	06/14/07	0.078	JFK-Wyandotte						
06/30/05	0.076	Margaretta	06/14/07	0.079	Olathe						
06/30/05	0.080	Blair St.	06/14/07	0.081	RG South						
06/30/05	0.081	Pacific, Maryville	06/14/07	0.083	Liberty						
06/30/05	0.085	Sunset Hills	06/14/07	0.089	Rocky Creek						
06/30/05	0.086	E. Saint Louis	06/14/07	0.090	Trimble						
06/30/05	0.093	Arnold	06/14/07	0.095	Leavenworth B						
09/04/05	0.077	Orchard Farm	06/16/07	0.079	Watkins Mill						
09/04/05	0.083	Foley	06/16/07	0.080	Leavenworth B						
09/09/05	0.077	E. Saint Louis	06/16/07	0.081	Liberty						
09/09/05	0.078	Sunset Hills, Nilwood, Maryville	06/16/07	0.087	Trimble						
09/09/05	0.079	Pacific, Arnold	06/16/07	0.089	Rocky Creek						
09/09/05	0.082	Wood River, Queeny Park, Foley	07/06/07	0.081	Trimble						
09/09/05	0.085	Maryland Heights, Margaretta	07/06/07	0.083	Rocky Creek						
09/09/05	0.089	Jerseyville, Alton									
09/09/05	0.095	W. Alton									
09/09/05	0.096	Orchard Farm									
07/15/06	0.083	Maryland Heights									
07/15/06	0.084	Margaretta									
07/15/06	0.085	Blair St.									
07/15/06	0.089	Arnold									
07/15/06	0.097	E. Saint Louis									
07/15/06	0.098	Sunset Hills									
06/13/07	0.078	Alton									
06/13/07	0.080	Margaretta, Arnold									
06/13/07	0.081	Wood River									
06/13/07	0.082	Orchard Farm									
06/13/07	0.083	W. Alton									
06/13/07	0.085	Sunset Hills									
06/13/07	0.089	Pacific, Foley									
06/13/07	0.093	Maryland Heights									
06/14/07	0.079	Maryville									
06/14/07	0.083	Alton									
06/14/07	0.085	Wood River									
06/14/07	0.087	Blair St.									
06/14/07	0.089	Pacific									
06/14/07	0.091	Margaretta, Arnold									
06/14/07	0.094	W. Alton, Sunset Hills									
06/14/07	0.095	Orchard Farm									
06/14/07	0.098	Foley									

Table 5: Ozone Concentrations Greater Than 75 Parts Per Billion												
06/14/07	0.103	Maryland Heights										
06/16/07	0.078	Arnold										
06/16/07	0.080	Sunset Hills										
06/16/07	0.081	Maryland Heights, Foley										
06/16/07	0.083	Orchard Farm										
06/16/07	0.084	W. Alton										
06/16/07	0.085	Alton										
06/16/07	0.087	Maryville										
06/16/07	0.090	Wood River										
06/16/07	0.091	Margaretta										
06/16/07	0.092	Blair St.										
06/17/07	0.077	Orchard Farm, Maryland Heights										
06/17/07	0.078	Maryville										
06/17/07	0.079	Sunset Hills, Arnold										
06/17/07	0.080	Blair St.										
06/17/07	0.081	Alton										
06/17/07	0.082	Margaretta										
06/17/07	0.085	Wood River										
06/17/07	0.087	W. Alton										
06/21/07	0.077	Margaretta, Blair St.										
06/21/07	0.087	Wood River										
06/21/07	0.091	Maryville										
07/07/07	0.077	Blair St.										
07/07/07	0.080	Sunset Hills										
07/07/07	0.088	W. Alton, Margaretta										
07/24/07	0.080	Sunset Hills										
07/24/07	0.084	Maryland Heights										
07/24/07	0.093	Pacific										
09/09/05	0.078	Mark Twain										
06/13/07	0.084	Mark Twain										
06/14/07	0.085	Mark Twain										

Table 6: Farrar Regime Analysis

Date	Ozone (PPM)	Regime	Favors STL Influence?	Dominant Wind Direction
6/21/05	0.078	7	No	E
6/22/05	0.085	7	No	E
6/23/05	0.093	2	No	SW
6/24/05	0.091	2	No	S
6/25/05	0.079	2	No	S
6/26/05	0.077	2	No	SE
7/10/05	0.076	1	No	E
8/1/05	0.076	1	No	SW
9/10/05	0.076	1	No	S
9/11/05	0.080	2	No	S
6/9/06	0.080	3	Yes	N
6/15/06	0.079	2	No	SE
6/16/06	0.085	2	No	SE
6/30/06	0.083	3	No	NE
7/19/06	0.080	3	No	Calm/SE
8/24/06	0.076	5	No	Calm/SE
5/21/07	0.079	2	No	S
5/22/07	0.076	2	No	S
5/23/07	0.076	2	No	S
6/12/07	0.081	1	No	E
6/13/07	0.081	7	No	E
6/14/07	0.079	7	No	E
6/15/07	0.076	2	No	NE
6/16/07	0.078	7	No	E
6/17/07	0.087	7	No	E
7/25/07	0.076	7	No	SE
8/1/07	0.079	4	No	E
8/12/07	0.076	2	No	SW
8/14/07	0.080	2	No	SE
8/16/07	0.077	3	No	SW
8/18/07	0.085	1	No	E
8/28/07	0.078	2	No	SE
9/2/07	0.082	1	No	E
9/20/07	0.081	1	No	Calm/E
9/21/07	0.093	2	No	SW
9/22/07	0.080	3	No	Calm

Threshold	# of Days
0.09 and up	3
0.085 to 0.089	4
0.080 to 0.084	10
0.076 to 0.079	19
Total	36

Class	# Days By Regime	Dominant Wind
Regime #1	7	E
Regime #2	15	SW to SE
Regime #3	5	Varies with Fropa
Regime #4	1	E
Regime #5	1	Calm/SE
Regime #6	0	N/A
Regime #7	7	E

Table 7: Bonne Terre Regime Analysis				
Date	Ozone (PPM)	Regime	Favors STL Influence?	Dominant Wind Direction
4/12/03	0.087	3	No	SW
6/14/03	0.077	3	No	W
6/17/03	0.083	1	No	NE
6/18/03	0.083	1	No	Calm
7/31/03	0.095	5	No	Calm/S
8/17/03	0.081	3	No	W
8/18/03	0.082	1	No	NE
8/22/03	0.098	3	Yes	N
8/27/03	0.080	2	No	SW
6/17/05	0.084	4	No	Calm/SW
6/21/05	0.076	7	No	E
6/22/05	0.085	7	No	E
6/24/05	0.077	2	No	S
6/26/05	0.076	2	No	SE
7/7/05	0.093	1	No	NE
7/8/05	0.078	1	No	Calm/NE
7/10/05	0.078	1	No	E
7/16/05	0.079	2	No	E
7/22/05	0.084	3	Yes	N
7/31/05	0.076	1	No	E
8/1/05	0.076	1	No	SW
6/9/06	0.078	3	Yes	N
6/15/06	0.077	2	No	SE
6/16/06	0.076	2	No	SE
6/30/06	0.078	3	No	NE
8/22/06	0.091	5	No	Calm/E
6/12/07	0.085	1	No	E
6/13/07	0.087	7	No	E
6/14/07	0.091	7	No	E
6/15/07	0.078	2	No	NE
6/16/07	0.080	7	No	E
6/17/07	0.085	7	No	E
7/25/07	0.091	2	No	SE
7/31/07	0.076	4	No	NE
8/1/07	0.089	4	No	E
8/2/07	0.079	2	No	E
8/10/07	0.098	4	No	NE
8/13/07	0.086	3	No	SW
8/16/07	0.080	3	No	E
8/18/07	0.078	1	No	SE
9/21/07	0.081	2	No	SW

Threshold	# of Days
0.09 and up	7
0.085 to 0.089	7
0.080 to 0.084	10
0.076 to 0.079	17
Total	41

Class	# Days By Regime	Dominant Wind
Regime #1	10	E
Regime #2	10	SW to SE
Regime #3	9	Varies with Fropa
Regime #4	4	NE
Regime #5	2	Calm
Regime #6	0	N/A
Regime #7	6	E

Table 8: El Dorado Springs Regime Analysis

Date	Ozone (PPM)	KC Regime	Favors KC or SGF Influence?	Dominant Wind Direction
4/1/03	0.076	5	No	SW
4/11/03	0.076	1	No	Calm/SW
4/12/03	0.082	3	No	W
4/13/03	0.082	3	No	SW
6/18/03	0.097	1	No	Calm
7/30/03	0.082	5	No	Calm
8/22/03	0.082	4	No	NE
8/23/03	0.077	4	No	NE
8/25/03	0.078	2	No	S
8/26/03	0.076	2	No	S
7/22/04	0.080	3	No	S
4/17/05	0.080	2	No	S
6/20/05	0.080	2	SGF	SE
6/21/05	0.082	7	SGF	Calm/SE
6/29/05	0.076	2	SGF	SE
7/12/05	0.081	2	KC	N
7/13/05	0.086	2	KC	N
8/4/05	0.091	3	SGF	SE
4/22/06	0.080	6	No	SW
6/30/06	0.077	2	No	SW
7/1/06	0.080	2	No	SW
7/19/06	0.078	2	No	SW
7/20/06	0.085	3	No	SW
6/14/07	0.081	7	SGF	SE
8/16/07	0.078	3	No	SW

Threshold	# of Days
0.09 and up	2
0.085 to 0.089	2
0.080 to 0.084	12
0.076 to 0.079	9
Total	25

Class	# Days By Regime	Dominant Wind
Regime #1	2	Calm
Regime #2	10	SW to SE
Regime #3	6	S-SW
Regime #4	2	NE
Regime #5	2	Calm/SW
Regime #6	1	SW
Regime #7	2	SE

Table 9: Number of Regimes Per Year & Total # of Regimes						
St. Louis Region						
	2003	**2004**	**2005**	**2006**	**2007**	**Total**
Regime 1	8	0	14	3	5	**30**
Regime 2	11	10	27	12	19	**79**
Regime 3	5	2	4	4	6	**21**
Regime 4	3	1	1	3	5	**13**
Regime 5	2	0	1	3	1	**7**
Regime 6	1	0	0	4	1	**6**
Regime 7	4	1	5	1	7	**18**
Total	**34**	**14**	**52**	**30**	**44**	**174**
Kansas City Region						
	2003	2004	2005	2006	2007	**Total**
Regime 1	9	0	9	2	1	**21**
Regime 2	9	2	20	16	10	**57**
Regime 3	4	1	1	5	1	**12**
Regime 4	8	1	1	4	2	**16**
Regime 5	2	0	0	4	2	**8**
Regime 6	2	0	0	4	0	**6**
Regime 7	3	0	3	3	4	**13**
Total	**37**	**4**	**34**	**38**	**20**	**133**
Springfield Region						
	2003	**2004**	**2005**	**2006**	**2007**	**Total**
Regime 1	3	0	3	0	0	**6**
Regime 2	0	1	1	2	2	**6**
Regime 3	0	0	1	0	0	**1**
Regime 4	1	0	0	0	1	**2**
Regime 5	0	0	0	0	0	**0**
Regime 6	0	0	0	0	0	**0**
Regime 7	0	0	2	0	1	**3**
Total	**4**	**1**	**7**	**2**	**4**	**18**
Southwest Missouri Region						
	2003	**2004**	**2005**	**2006**	**2007**	**Total**
Regime 1	1	0	0	0	0	**1**
Regime 2	1	1	5	2	1	**10**
Regime 3	2	2	1	2	1	**8**
Regime 4	2	0	0	1	0	**3**
Regime 5	0	0	0	0	0	**0**
Regime 6	0	0	0	0	0	**0**
Regime 7	0	0	1	0	1	**2**
Total	**6**	**3**	**7**	**5**	**3**	**24**
Southeast Missouri Region						
	2003	**2004**	**2005**	**2006**	**2007**	**Total**
Regime 1	3	0	7	0	4	**14**
Regime 2	2	0	6	2	11	**21**
Regime 3	4	0	1	4	5	**14**
Regime 4	1	0	1	0	3	**5**
Regime 5	1	0	0	2	0	**3**
Regime 6	0	0	0	0	0	**0**
Regime 7	0	0	3	0	4	**7**
Total	**11**	**0**	**18**	**8**	**27**	**64**

Table 10: Exceedances by 0.05 PPM Threshold & By Site								
St. Louis Region								
Ozone Measurements > 0.075 PPM and < 0.081 PPM								
	Regime 1	**Regime 2**	**Regime 3**	**Regime 4**	**Regime 5**	**Regime 6**	**Regime 7**	**Total**
Arnold	8	10	6	4	0	1	5	**34**
Sunset Hills	2	10	4	3	0	3	6	**28**
Pacific	2	3	1	3	1	0	1	**11**
S. Broadway	1	0	1	0	0	0	1	**3**
Queeny Park	8	3	0	0	0	0	0	**11**
Clark	0	0	0	0	0	0	0	**0**
Margaretta	5	11	3	3	0	2	3	**27**
Blair St.	2	8	2	1	0	0	4	**17**
Clayton	2	1	0	0	0	0	0	**3**
E. Saint Louis	2	12	2	1	1	1	1	**20**
Maryland Heights	6	12	0	1	2	0	1	**22**
Breckenridge	1	1	0	0	0	0	0	**2**
Maryville	2	11	3	1	0	2	4	**23**
Ferguson	3	2	0	0	0	0	0	**5**
Edwardsville	0	0	0	0	0	0	1	**1**
Wood River	5	18	0	1	0	1	2	**27**
W. Alton	4	23	0	1	3	1	2	**34**
Orchard Farm	6	20	0	1	1	0	4	**32**
Alton	7	20	2	1	0	2	3	**35**
Jerseyville	1	12	1	0	1	1	1	**17**
Foley	3	12	0	1	0	2	0	**18**
Nilwood	3	4	0	0	0	0	1	**8**
Mark Twain	4	2	0	0	0	0	1	**7**
Total	**77**	**195**	**25**	**22**	**9**	**16**	**41**	**385**

Ozone Measurements > 0.080 PPM and < 0.086 PPM								
	Regime 1	**Regime 2**	**Regime 3**	**Regime 4**	**Regime 5**	**Regime 6**	**Regime 7**	**Total**
Arnold	4	4	3	0	0	1	0	**12**
Sunset Hills	5	8	2	2	0	0	2	**19**
Pacific	4	3	0	1	1	0	1	**10**
S. Broadway	0	0	1	0	1	0	0	**2**
Queeny Park	1	1	0	0	0	0	2	**4**
Clark	0	0	0	0	0	0	0	**0**
Margaretta	4	9	0	0	0	0	3	**16**
Blair St.	0	2	0	0	0	1	1	**4**
Clayton	1	0	0	0	0	0	0	**1**
E. Saint Louis	0	3	2	0	0	1	0	**6**
Maryland Heights	4	4	1	0	1	2	4	**16**
Breckenridge	0	0	0	0	0	0	0	**0**
Maryville	0	7	1	0	0	0	1	**9**
Ferguson	1	1	0	0	0	0	0	**2**
Edwardsville	1	2	0	0	0	0	0	**3**
Wood River	0	8	2	0	0	0	5	**15**
W. Alton	6	13	1	1	0	1	3	**25**
Orchard Farm	2	9	0	0	2	1	3	**17**
Alton	0	7	0	0	0	1	4	**12**
Jerseyville	4	4	1	0	0	0	0	**9**
Foley	4	4	2	0	0	0	3	**13**
Nilwood	0	0	0	0	0	0	0	**0**
Mark Twain	0	2	1	0	0	0	2	**5**
Total	**41**	**91**	**17**	**4**	**5**	**8**	**34**	**200**

Table 10: Exceedances by 0.05 PPM Threshold & By Site								
Ozone Measurements > 0.085 PPM and < 0.091 PPM								
	Regime 1	**Regime 2**	**Regime 3**	**Regime 4**	**Regime 5**	**Regime 6**	**Regime 7**	**Total**
Arnold	0	1	0	0	1	0	1	**3**
Sunset Hills	4	2	0	0	0	0	1	**7**
Pacific	2	0	0	0	0	1	3	**6**
S. Broadway	1	0	0	0	0	0	0	**1**
Queeny Park	1	2	1	0	0	0	0	**4**
Clark	0	0	1	0	0	0	0	**1**
Margaretta	1	3	0	0	0	0	1	**5**
Blair St.	0	2	0	0	0	1	2	**5**
Clayton	0	0	0	0	0	0	0	**0**
E. Saint Louis	1	0	0	0	0	0	1	**2**
Maryland Heights	1	5	1	0	0	2	1	**10**
Breckenridge	0	2	0	0	0	0	0	**2**
Maryville	0	3	1	0	0	1	1	**6**
Ferguson	0	1	0	0	0	0	0	**1**
Edwardsville	0	0	1	0	0	0	0	**1**
Wood River	0	4	0	0	0	1	2	**7**
W. Alton	1	16	0	1	0	1	2	**21**
Orchard Farm	3	5	0	0	2	0	0	**10**
Alton	0	5	0	0	1	0	1	**7**
Jerseyville	1	3	0	0	0	0	1	**5**
Foley	2	3	0	1	1	1	1	**9**
Nilwood	0	2	0	0	0	0	0	**2**
Mark Twain	0	0	0	0	0	0	0	**0**
Total	**18**	**59**	**5**	**2**	**5**	**8**	**18**	**115**

Ozone Measurements > 0.090 PPM and < 0.096 PPM								
	Regime 1	**Regime 2**	**Regime 3**	**Regime 4**	**Regime 5**	**Regime 6**	**Regime 7**	**Total**
Arnold	2	1	0	0	1	0	1	**5**
Sunset Hills	0	2	0	0	0	0	1	**3**
Pacific	1	0	0	0	0	1	3	**5**
S. Broadway	0	0	0	0	0	0	0	**0**
Queeny Park	0	2	1	0	0	0	0	**3**
Clark	0	0	1	0	0	0	0	**1**
Margaretta	0	3	0	0	0	0	1	**4**
Blair St.	0	2	0	0	0	1	2	**5**
Clayton	0	0	0	0	0	0	0	**0**
E. Saint Louis	0	0	0	0	0	0	1	**1**
Maryland Heights	1	5	1	0	0	2	1	**10**
Breckenridge	0	2	0	0	0	0	0	**2**
Maryville	0	3	1	0	0	1	1	**6**
Ferguson	0	1	0	0	0	0	0	**1**
Edwardsville	0	0	1	0	0	0	0	**1**
Wood River	0	4	0	0	0	1	2	**7**
W. Alton	0	16	0	1	0	1	2	**20**
Orchard Farm	0	5	0	0	2	0	0	**7**
Alton	0	5	0	0	1	0	1	**7**
Jerseyville	0	3	0	0	0	0	1	**4**
Foley	0	3	0	1	1	1	1	**7**
Nilwood	0	2	0	0	0	0	0	**2**
Mark Twain	0	0	0	0	0	0	0	**0**
Total	**4**	**59**	**5**	**2**	**5**	**8**	**18**	**101**

Table 10: Exceedances by 0.05 PPM Threshold & By Site								
Ozone Measurements > 0.096 PPM and < 0.101 PPM								
	Regime 1	**Regime 2**	**Regime 3**	**Regime 4**	**Regime 5**	**Regime 6**	**Regime 7**	**Total**
Arnold	0	1	0	0	0	0	1	**2**
Sunset Hills	0	1	0	0	0	0	1	**2**
Pacific	1	0	0	0	0	0	0	**1**
S. Broadway	0	0	1	0	0	0	0	**1**
Queeny Park	0	0	0	0	1	0	1	**2**
Clark	0	0	0	0	0	0	0	**0**
Margaretta	0	1	0	0	1	1	0	**3**
Blair St.	0	1	0	0	0	0	0	**1**
Clayton	0	0	0	0	1	0	0	**1**
E. Saint Louis	0	0	0	0	0	1	1	**2**
Maryland Heights	0	0	0	0	0	0	1	**1**
Breckenridge	0	0	1	0	0	0	0	**1**
Maryville	0	1	0	0	0	0	0	**1**
Ferguson	0	0	0	0	0	0	0	**0**
Edwardsville	0	0	0	0	0	0	0	**0**
Wood River	0	1	0	0	0	0	0	**1**
W. Alton	0	1	1	0	0	1	0	**3**
Orchard Farm	1	2	0	0	0	0	1	**4**
Alton	0	1	0	0	0	0	0	**1**
Jerseyville	0	0	0	0	0	0	0	**0**
Foley	0	1	0	0	0	0	1	**2**
Nilwood	0	0	0	0	0	0	0	**0**
Mark Twain	1	0	0	0	0	0	0	**1**
Total	**3**	**11**	**3**	**0**	**3**	**3**	**7**	**30**

Ozone Measurements > 0.100 PPM								
	Regime 1	**Regime 2**	**Regime 3**	**Regime 4**	**Regime 5**	**Regime 6**	**Regime 7**	**Total**
Arnold	0	1	0	0	0	0	0	**1**
Sunset Hills	0	1	1	0	1	0	1	**4**
Pacific	0	0	0	0	0	0	0	**0**
S. Broadway	0	1	0	0	0	0	0	**1**
Queeny Park	0	0	0	0	0	0	0	**0**
Clark	0	0	0	0	0	0	0	**0**
Margaretta	0	2	1	0	0	0	0	**3**
Blair St.	0	1	0	0	0	0	0	**1**
Clayton	0	1	1	0	0	0	0	**2**
E. Saint Louis	0	3	1	0	0	0	0	**4**
Maryland Heights	0	0	0	0	0	0	1	**1**
Breckenridge	0	0	0	0	1	0	0	**1**
Maryville	0	2	0	0	0	0	0	**2**
Ferguson	0	0	0	0	1	0	0	**1**
Edwardsville	0	1	0	0	0	0	0	**1**
Wood River	0	1	0	0	0	0	0	**1**
W. Alton	0	0	0	0	0	0	0	**0**
Orchard Farm	0	0	0	0	0	0	0	**0**
Alton	0	1	0	0	0	0	0	**1**
Jerseyville	0	0	0	0	0	0	0	**0**
Foley	1	0	0	0	0	0	0	**1**
Nilwood	0	0	0	0	0	0	0	**0**
Mark Twain	0	0	0	0	0	0	0	**0**
Total	**1**	**15**	**4**	**0**	**3**	**0**	**2**	**25**

Table 10: Exceedances by 0.05 PPM Threshold & By Site								
Kansas City Region								
Ozone Measurements > 0.075 PPM and < 0.081 PPM								
	Regime 1	**Regime 2**	**Regime 3**	**Regime 4**	**Regime 5**	**Regime 6**	**Regime 7**	**Total**
RG South	1	8	2	1	1	1	0	**14**
Olathe	0	4	3	2	0	3	2	**15**
JFK-Wyandotte	2	8	3	2	1	2	4	**22**
Leavenworth A	3	1	2	2	0	1	0	**9**
Leavenworth B	2	4	0	1	1	0	4	**12**
RockyCreek	4	19	2	0	2	1	1	**29**
Liberty	4	19	2	1	2	0	1	**29**
KCI	7	7	2	0	0	0	0	**16**
Watkins Mill	3	8	1	0	1	0	5	**18**
Trimble	5	12	0	1	1	0	2	**21**
Lawrence	1	2	1	2	1	1	1	**9**
Total	**32**	**92**	**18**	**12**	**10**	**9**	**20**	**194**

Ozone Measurements > 0.080 PPM and < 0.086 PPM								
	Regime 1	**Regime 2**	**Regime 3**	**Regime 4**	**Regime 5**	**Regime 6**	**Regime 7**	**Total**
RG South	0	1	3	1	1	0	2	**8**
Olathe	0	4	2	1	0	0	0	**7**
JFK-Wyandotte	0	3	0	1	1	1	0	**6**
Leavenworth A	1	2	0	1	0	0	0	**4**
Leavenworth B	0	1	0	0	0	0	0	**1**
RockyCreek	5	8	2	3	3	0	4	**25**
Liberty	2	8	2	0	1	0	4	**17**
KCI	0	1	0	0	0	0	1	**2**
Watkins Mill	1	6	0	0	0	0	0	**7**
Trimble	0	9	2	2	2	0	2	**17**
Lawrence	2	1	1	1	1	1	0	**7**
Total	**11**	**44**	**12**	**10**	**9**	**2**	**13**	**101**

Ozone Measurements > 0.085 PPM and < 0.091 PPM								
	Regime 1	**Regime 2**	**Regime 3**	**Regime 4**	**Regime 5**	**Regime 6**	**Regime 7**	**Total**
RG South	0	1	0	0	0	0	0	**1**
Olathe	0	0	0	0	0	0	0	**0**
JFK-Wyandotte	1	0	0	0	0	0	0	**1**
Leavenworth A	0	0	0	0	0	0	0	**0**
Leavenworth B	0	1	0	1	0	0	0	**2**
RockyCreek	4	9	1	1	0	1	2	**18**
Liberty	2	8	0	1	0	1	1	**13**
KCI	1	1	0	0	0	0	0	**2**
Watkins Mill	1	2	1	0	0	0	0	**4**
Trimble	1	5	0	1	0	0	2	**9**
Lawrence	1	1	0	0	0	0	0	**2**
Total	**11**	**28**	**2**	**4**	**0**	**2**	**5**	**52**

Ozone Measurements > 0.090 PPM and < 0.096 PPM								
	Regime 1	**Regime 2**	**Regime 3**	**Regime 4**	**Regime 5**	**Regime 6**	**Regime 7**	**Total**
RG South	0	0	1	0	0	0	0	**1**
Olathe	1	0	0	0	0	0	0	**1**
JFK-Wyandotte	0	0	0	0	0	0	0	**0**
Leavenworth A	0	0	0	1	0	0	0	**1**
Leavenworth B	0	0	0	0	0	0	1	**1**
RockyCreek	0	3	1	0	0	0	0	**4**
Liberty	0	5	2	0	0	0	1	**8**
KCI	0	1	0	1	0	0	1	**3**
Watkins Mill	0	2	1	0	0	0	0	**3**
Trimble	0	0	0	0	0	0	1	**1**
Lawrence	0	0	0	0	0	0	0	**0**
Total	**1**	**11**	**5**	**2**	**0**	**0**	**4**	**23**

Table 10: Exceedances by 0.05 PPM Threshold & By Site								
Ozone Measurements > 0.095 PPM and < 0.101 PPM								
	Regime 1	**Regime 2**	**Regime 3**	**Regime 4**	**Regime 5**	**Regime 6**	**Regime 7**	**Total**
RG South	1	0	0	0	0	0	0	**1**
Olathe	0	0	0	1	0	0	0	**1**
JFK-Wyandotte	0	0	1	0	0	0	1	**2**
Leavenworth A	0	0	0	0	0	0	0	**0**
Leavenworth B	0	1	0	0	0	0	0	**1**
RockyCreek	0	0	0	1	0	0	1	**2**
Liberty	0	2	0	0	0	0	0	**2**
KCI	0	0	0	0	0	0	0	**0**
Watkins Mill	0	1	0	0	0	0	0	**1**
Trimble	0	0	0	0	0	0	0	**0**
Lawrence	0	0	0	1	0	0	0	**1**
Total	**1**	**4**	**1**	**3**	**0**	**0**	**2**	**11**

Ozone Measurements > 0.100 PPM								
	Regime 1	**Regime 2**	**Regime 3**	**Regime 4**	**Regime 5**	**Regime 6**	**Regime 7**	**Total**
RG South	0	0	0	0	0	0	0	**0**
Olathe	0	0	0	0	1	0	0	**1**
JFK-Wyandotte	0	0	0	0	0	0	1	**2**
Leavenworth A	0	0	0	0	0	0	0	**0**
Leavenworth B	0	0	0	0	0	0	0	**0**
RockyCreek	0	1	0	0	0	0	0	**1**
Liberty	0	1	0	0	0	0	0	**1**
KCI	0	0	0	0	0	0	0	**0**
Watkins Mill	0	1	0	0	0	0	0	**1**
Trimble	0	0	0	0	0	0	0	**0**
Lawrence	0	0	0	0	0	0	0	**0**
Total	**0**	**3**	**0**	**0**	**1**	**0**	**1**	**6**

Springfield Region								
Ozone Measurements > 0.075 PPM and < 0.081 PPM								
	Regime 1	**Regime 2**	**Regime 3**	**Regime 4**	**Regime 5**	**Regime 6**	**Regime 7**	**Total**
Hillcrest	4	4	1	0	0	0	2	**11**
S. Charleston	1	0	0	0	0	0	0	**1**
Total	**5**	**4**	**1**	**0**	**0**	**0**	**2**	**12**

Ozone Measurements > 0.080 PPM and < 0.086 PPM								
	Regime 1	**Regime 2**	**Regime 3**	**Regime 4**	**Regime 5**	**Regime 6**	**Regime 7**	**Total**
Hillcrest	2	0	0	0	0	0	1	**3**
S. Charleston	1	0	0	1	0	0	0	**2**
Total	**3**	**0**	**0**	**1**	**0**	**0**	**1**	**5**

Ozone Measurements > 0.085 PPM and < 0.091 PPM								
	Regime 1	**Regime 2**	**Regime 3**	**Regime 4**	**Regime 5**	**Regime 6**	**Regime 7**	**Total**
Hillcrest	0	2	0	1	0	0	0	**3**
S. Charleston	0	0	0	0	0	0	0	**0**
Total	**0**	**2**	**0**	**1**	**0**	**0**	**0**	**3**

Ozone Measurements > 0.090 PPM and < 0.096 PPM								
	Regime 1	**Regime 2**	**Regime 3**	**Regime 4**	**Regime 5**	**Regime 6**	**Regime 7**	**Total**
Hillcrest	0	0	0	0	0	0	0	**0**
S. Charleston	0	0	0	0	0	0	0	**0**
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Ozone Measurements > 0.095 PPM and < 0.101 PPM								
	Regime 1	**Regime 2**	**Regime 3**	**Regime 4**	**Regime 5**	**Regime 6**	**Regime 7**	**Total**
Hillcrest	0	0	0	0	0	0	0	**0**
S. Charleston	0	0	0	0	0	0	0	**0**
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Ozone Measurements > 0.100 PPM								
	Regime 1	**Regime 2**	**Regime 3**	**Regime 4**	**Regime 5**	**Regime 6**	**Regime 7**	**Total**
Hillcrest	0	0	0	0	0	0	0	**0**
S. Charleston	0	0	0	0	0	0	0	**0**
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Table 10: Exceedances by 0.05 PPM Threshold & By Site								
Southwest Missouri Region								
Ozone Measurements > 0.075 PPM and < 0.081 PPM								
	Regime 1	**Regime 2**	**Regime 3**	**Regime 4**	**Regime 5**	**Regime 6**	**Regime 7**	**Total**
Linn County	1	3	1	1	0	0	0	**6**
El Dorado Springs	0	6	5	1	0	0	2	**14**
Total	**1**	**9**	**6**	**2**	**0**	**0**	**2**	**20**

Ozone Measurements > 0.080 PPM and < 0.086 PPM								
	Regime 1	**Regime 2**	**Regime 3**	**Regime 4**	**Regime 5**	**Regime 6**	**Regime 7**	**Total**
Linn County	0	2	2	2	0	0	0	**6**
El Dorado Springs	1	2	2	0	0	0	0	**5**
Total	**1**	**4**	**4**	**2**	**0**	**0**	**0**	**11**

Ozone Measurements > 0.085 PPM and < 0.091 PPM								
	Regime 1	**Regime 2**	**Regime 3**	**Regime 4**	**Regime 5**	**Regime 6**	**Regime 7**	**Total**
Linn County	0	0	0	0	0	0	0	**0**
El Dorado Springs	0	0	1	0	0	0	0	**1**
Total	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**1**

Ozone Measurements > 0.090 PPM and < 0.096 PPM								
	Regime 1	**Regime 2**	**Regime 3**	**Regime 4**	**Regime 5**	**Regime 6**	**Regime 7**	**Total**
Linn County	0	0	0	0	0	0	0	**0**
El Dorado Springs	0	0	0	0	0	0	0	**0**
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Ozone Measurements > 0.095 PPM and < 0.101 PPM								
	Regime 1	**Regime 2**	**Regime 3**	**Regime 4**	**Regime 5**	**Regime 6**	**Regime 7**	**Total**
Linn County	0	0	0	0	0	0	0	**0**
El Dorado Springs	0	0	0	0	0	0	0	**0**
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Ozone Measurements > 0.100 PPM								
	Regime 1	**Regime 2**	**Regime 3**	**Regime 4**	**Regime 5**	**Regime 6**	**Regime 7**	**Total**
Linn County	0	0	0	0	0	0	0	**0**
El Dorado Springs	0	0	0	0	0	0	0	**0**
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Table 10: Exceedances by 0.05 PPM Threshold & By Site								
Southeast Missouri Region								
Ozone Measurements > 0.075 PPM and < 0.081 PPM								
	Regime 1	**Regime 2**	**Regime 3**	**Regime 4**	**Regime 5**	**Regime 6**	**Regime 7**	**Total**
Farrar	4	12	5	1	1	0	3	**26**
Houston	1	6	2	1	0	0	3	**13**
Bonne Terre	6	9	5	1	0	0	2	**23**
Total	**11**	**27**	**12**	**3**	**1**	**0**	**8**	**62**

Ozone Measurements > 0.080 PPM and < 0.086 PPM								
	Regime 1	**Regime 2**	**Regime 3**	**Regime 4**	**Regime 5**	**Regime 6**	**Regime 7**	**Total**
Farrar	4	1	1	0	0	0	2	**8**
Houston	0	3	1	0	0	0	0	**4**
Bonne Terre	4	1	2	1	0	0	2	**10**
Total	**8**	**5**	**4**	**1**	**0**	**0**	**4**	**22**

Ozone Measurements > 0.085 PPM and < 0.091 PPM								
	Regime 1	**Regime 2**	**Regime 3**	**Regime 4**	**Regime 5**	**Regime 6**	**Regime 7**	**Total**
Farrar	0	0	0	0	0	0	1	**1**
Houston	0	0	0	0	0	0	0	**0**
Bonne Terre	0	0	2	1	0	0	1	**4**
Total	**0**	**0**	**2**	**1**	**0**	**0**	**2**	**5**

Ozone Measurements > 0.090 PPM and < 0.096 PPM								
	Regime 1	**Regime 2**	**Regime 3**	**Regime 4**	**Regime 5**	**Regime 6**	**Regime 7**	**Total**
Farrar	0	3	0	0	0	0	0	**3**
Houston	0	0	0	0	0	0	0	**0**
Bonne Terre	1	1	0	0	2	0	1	**5**
Total	**1**	**4**	**0**	**0**	**2**	**0**	**1**	**8**

Ozone Measurements > 0.095 PPM and < 0.101 PPM								
	Regime 1	**Regime 2**	**Regime 3**	**Regime 4**	**Regime 5**	**Regime 6**	**Regime 7**	**Total**
Farrar	0	0	0	0	0	0	0	**0**
Houston	0	0	0	0	0	0	0	**0**
Bonne Terre	0	0	1	1	0	0	0	**2**
Total	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**2**

Ozone Measurements > 0.100 PPM								
	Regime 1	**Regime 2**	**Regime 3**	**Regime 4**	**Regime 5**	**Regime 6**	**Regime 7**	**Total**
Farrar	0	0	0	0	0	0	0	**0**
Houston	0	0	0	0	0	0	0	**0**
Bonne Terre	0	0	0	0	0	0	0	**0**
Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Table 11: Exceedances by Trajectory Threshold								
St. Louis Region								
Ozone Measurements > 0.075 PPM and < 0.085 PPM								
	Regime 1	**Regime 2**	**Regime 3**	**Regime 4**	**Regime 5**	**Regime 6**	**Regime 7**	**Total**
Arnold	12	14	8	4	0	2	5	**45**
Sunset Hills	7	17	6	5	0	3	6	**44**
Pacific	5	6	1	4	2	0	2	**20**
S.Broadway	1	0	2	0	1	0	1	**5**
Queeny Park	9	4	0	0	0	0	2	**15**
Clark	0	0	0	0	0	0	0	**0**
Margaretta	8	18	3	3	0	2	5	**39**
Blair St	2	10	2	1	0	1	4	**20**
Clayton	3	1	0	0	0	0	0	**4**
E. Saint Louis	2	14	4	1	1	2	1	**25**
Maryland Heights	9	15	1	1	3	2	4	**35**
Breckenridge	1	1	0	0	0	0	0	**2**
Maryville	2	17	4	1	0	2	5	**31**
Ferguson	4	3	0	0	0	0	0	**7**
Edwardsville	1	2	0	0	0	0	1	**4**
Wood River	5	25	2	1	0	1	5	**39**
W. Alton	9	34	1	2	3	2	5	**56**
Orchard Farm	8	27	0	1	3	0	7	**46**
Alton	7	26	2	1	0	3	6	**45**
Jerseyville	5	15	2	0	1	1	1	**25**
Foley	7	14	2	1	0	2	3	**29**
Nilwood	3	4	0	0	0	0	1	**8**
Mark Twain	4	3	1	0	0	0	2	**10**
Total	**114**	**270**	**41**	**26**	**14**	**23**	**66**	**554**

Ozone Measurements > 0.084 PPM								
	Regime 1	**Regime 2**	**Regime 3**	**Regime 4**	**Regime 5**	**Regime 6**	**Regime 7**	**Total**
Arnold	2	3	1	0	1	1	5	**13**
Sunset Hills	4	6	1	0	1	1	6	**19**
Pacific	5	0	0	0	0	1	4	**10**
S.Broadway	1	1	1	0	0	0	0	**3**
Queeny Park	1	3	1	0	1	0	1	**7**
Clark	0	1	1	0	0	0	0	**2**
Margaretta	2	9	1	0	1	1	6	**20**
Blair St	0	5	0	0	0	1	5	**11**
Clayton	0	1	1	0	1	0	0	**3**
E. Saint Louis	1	5	1	0	0	1	4	**12**

Table 11: Exceedances by Trajectory Threshold								
St. Louis Region								
Maryland Heights	3	10	1	2	0	2	5	**23**
Breckenridge	0	3	1	0	1	0	0	**5**
Maryville	0	10	2	0	0	1	3	**16**
Ferguson	0	2	1	0	1	0	0	**4**
Edwardsville	0	1	1	0	0	0	0	**2**
Wood River	0	9	1	0	1	1	4	**16**
W. Alton	2	25	3	1	1	2	4	**38**
Orchard Farm	4	13	2	1	2	2	2	**26**
Alton	0	11	1	0	1	0	2	**15**
Jerseyville	1	5	0	0	0	0	1	**7**
Foley	3	8	0	1	1	1	2	**16**
Nilwood	0	3	0	0	0	0	0	**3**
Mark Twain	1	1	0	0	0	0	1	**3**
Total	**30**	**135**	**21**	**5**	**13**	**15**	**55**	**274**

Table 12: Exceedance By Regime (All Years)								
St. Louis Region								
	Regime 1	**Regime 2**	**Regime 3**	**Regime 4**	**Regime 5**	**Regime 6**	**Regime 7**	**Total**
Arnold	14	17	9	4	1	3	10	**58**
Sunset Hills	11	23	7	5	1	4	12	**63**
Pacific	10	6	1	4	2	1	6	**30**
S.Broadway	2	1	3	0	1	0	1	**8**
Queeny Park	10	7	1	0	1	0	3	**22**
Clark	0	1	1	0	0	0	0	**2**
Margaretta	10	27	4	3	1	3	11	**59**
Blair St	2	15	2	1	0	2	9	**31**
Clayton	3	2	1	0	1	0	0	**7**
E. Saint Louis	3	19	5	1	1	3	5	**37**
Maryland Heights	12	25	2	3	3	4	9	**58**
Breckenridge	1	4	1	0	1	0	0	**7**
Maryville	2	27	6	1	0	3	8	**47**
Ferguson	4	5	1	0	1	0	0	**11**
Edwardsville	1	3	1	0	0	0	1	**6**
Wood River	5	34	3	1	1	2	9	**55**
W. Alton	11	59	4	3	4	4	9	**94**
Orchard Farm	12	40	2	2	5	2	9	**72**
Alton	7	37	3	1	1	3	8	**60**
Jerseyville	6	20	2	0	1	1	2	**32**
Foley	10	22	2	2	1	3	5	**45**
Nilwood	3	7	0	0	0	0	1	**11**
Mark Twain	5	4	1	0	0	0	3	**13**
Total	**150**	**419**	**73**	**36**	**29**	**38**	**127**	**872**

Kansas City Region								
	Regime 1	**Regime 2**	**Regime 3**	**Regime 4**	**Regime 5**	**Regime 6**	**Regime 7**	**Total**
RG South	2	10	6	2	2	1	2	**25**
Olathe	1	8	5	4	1	3	2	**24**
JFK-Wyandotte	3	11	4	3	2	3	6	**32**
Leavenworth A	4	3	2	4	0	1	0	**14**
Leavenworth B	2	7	0	2	1	0	5	**17**
RockyCreek	13	40	6	5	5	2	8	**79**
Liberty	8	43	6	2	3	1	7	**70**
KCI	8	10	2	1	0	0	2	**23**
Watkins Mill	5	20	3	0	1	0	5	**34**
Trimble	6	26	2	4	3	0	7	**48**
Lawrence	4	4	2	4	2	2	1	**19**
Total	**56**	**182**	**38**	**31**	**20**	**13**	**45**	**385**

Springfield Region								
	Regime 1	**Regime 2**	**Regime 3**	**Regime 4**	**Regime 5**	**Regime 6**	**Regime 7**	**Total**
Hillcrest	6	6	1	1	0	0	3	**17**
S. Charleston	2	0	0	1	0	0	0	**3**
Total	**8**	**6**	**1**	**2**	**0**	**0**	**3**	**20**

Southwest Missouri Region								
	Regime 1	**Regime 2**	**Regime 3**	**Regime 4**	**Regime 5**	**Regime 6**	**Regime 7**	**Total**
Linn County	1	5	3	3	0	0	0	**12**
El Dorado Springs	1	8	8	1	0	0	2	**20**
Total	**2**	**13**	**11**	**4**	**0**	**0**	**2**	**32**

Southeast Missouri Region								
	Regime 1	**Regime 2**	**Regime 3**	**Regime 4**	**Regime 5**	**Regime 6**	**Regime 7**	**Total**
Houston	1	8	3	1	0	0	3	**16**
Bonne Terre	10	10	9	4	2	0	6	**41**
Farrar	7	16	5	1	1	0	6	**36**
Total	**18**	**34**	**17**	**6**	**3**	**0**	**15**	**93**

Table 13 SE MO Composite Regime Analysis

	Bonne Terre	Farrar	Houston	Regime	Bonne Terre	FARRAR EAST	FARRAR SOUTH	Comments
6/17/05	0.084	0.072	0.064	4	0.020			STL impact on BT
6/21/05	0.076	0.078	0.074	7				
6/22/05	0.085	0.085	0.074	7		0.011		Easterly impact on both
6/23/05	0.072	0.093	0.079	2			0.014	Mixed south impact on FAR
6/24/05	0.077	0.091	0.078	2			0.013	SSW impact on FAR
6/25/05	0.069	0.079	0.066	2			0.013	Mixed south impact on FAR
6/26/05	0.076	0.077	0.069	2			0.008	LV, some signal from S and E
6/30/05	0.062	0.062	0.076	3				LV, some NW influence (STL on HOU)
7/7/05	0.093	0.071	0.064	1	0.029			N, NE (STL impact on BT)
7/8/05	0.078	0.069	0.066	1	0.012			LV, mixed N (STL impact on BT - less pronounced)
7/10/05	0.078	0.076	0.071	1		0.005		East impact
7/16/05	0.079	0.056	0.058	2				LV, no strong wind signal
7/22/05	0.084	0.064	0.059	3	0.025			N winds (STL impact on BT)
7/31/05	0.076	0.072	0.068	1		0.004		LV, mixed E after 11:00
8/1/05	0.076	0.076	0.065	1		0.011		Early E, then S/E
9/10/05	0.072	0.076	0.070	1			0.006	SSE
9/11/05	0.070	0.080	0.071	2			0.009	SSE
6/9/06	0.078	0.080	0.073	3	0.005			W, N impact from STL on BT, impact from Ste. Gen on FAR
6/15/06	0.077	0.079	0.077	2				LV S/SE, high regional impact
6/16/06	0.076	0.085	0.076	2			0.009	SSE
6/30/06	0.078	0.083	0.072	3	0.006			W, N impact from STL on BT, impact from Ste. Gen on FAR
7/19/06	0.067	0.080	0.069	3			0.011	SSE
8/22/06	0.091	0.055	0.054	5	0.037			NE, N (STL impact on BT)
8/24/06	0.034	0.076	0.066	5		0.010		Null values at BT, E, NE
5/21/07	0.074	0.079	0.073	2			0.006	SSE
5/22/07	0.074	0.076	0.071	2			0.005	SSW
5/23/07	0.068	0.076	0.069	2			0.007	Mixed south impact on FAR
6/12/07	0.085	0.081	0.075	1		0.006		E, ESE
6/13/07	0.087	0.081	0.072	7		0.009		E
6/14/07	0.091	0.079	0.074	7		0.005		LV, mixed E
6/15/07	0.078	0.076	0.067	2		0.009		LV, E
6/16/07	0.080	0.078	0.078	7				LV, mixed E,S,W
6/17/07	0.085	0.087	0.077	7			0.010	S, SSW higher WS
7/25/07	0.091	0.076	0.070	2		0.006		LV, calm with mixed ESE
8/1/07	0.089	0.079	0.073	4		0.006		Calm, LV mixed E
8/2/07	0.079	0.074	0.079	2				CALM, LV
8/10/07	0.098	0.065	0.061	4	0.037			N, NNE (STL impact on BT)
8/12/07	0.073	0.076	0.081	2				mixed, late NNW (possible impact on HOU from STL)
8/13/07	0.086	0.068	0.064	3	0.022			N, NNE (STL impact on BT)
8/14/07	0.064	0.080	0.070	2			0.010	S, SSE
8/16/07	0.080	0.077	0.069	3				FROPA, no strong local signal
8/18/07	0.078	0.085	0.075	1			0.010	S, SSE
8/28/07	0.069	0.078	0.070	2		0.008		NE, E
9/2/07	0.074	0.082	0.074	1				no strong signal (maybe late E)
9/20/07	0.075	0.081	0.073	1			0.008	mixed SSE
9/21/07	0.081	0.093	0.082	2			0.011	SSW
9/22/07	0.072	0.080	0.074	3				calm, local impacts near monitor
Exceedances	32	36	10			12	16	
85+	11	7	0			0.0075	0.009375	
Farrar 85 S		6						
Farrar 85 E		1						
BT STL	10							
BT East	10							
Farrar S		16		9.3 ppb avg diff from HOU				
Farrar E		12		7.5 ppb avg diff from HOU				
Far NW		3						
Far Calms		1						
Far Other		4						

COMMENTS AND RESPONSES ON

PROPOSED 2008 8-HOUR OZONE BOUNDARY DESIGNATION RECOMMENDATION AND TECHNICAL SUPPORT DOCUMENT FOR THE DETERMINATION OF BOUNDARIES IN MISSOURI FOR THE 2008 8-HOUR OZONE NATIONAL AMBIENT AIR QUALITY STANDARD

AND

RECOMMENDATION FOR ADOPTION

On December 4, 2008, the Missouri Air Conservation Commission held a public hearing concerning a proposed recommendation to the U.S. Environmental Protection Agency (EPA) regarding the 8-Hour Ozone boundary designation recommendation for Missouri under the 2008 8-Hour Ozone National Ambient Air Quality Standard. The following is a summary of comments received and the Missouri Department of Natural Resources' corresponding responses. Any changes to the proposed designations and related documents are identified in the responses to the comments.

The Missouri Department of Natural Resources' Air Pollution Control Program recommends the commission adopt the plan action as amended. If the commission adopts this recommendation, it will be the department's intention to submit this recommendation to the U.S. Environmental Protection Agency.

SUMMARY OF COMMENTS: The Missouri Department of Natural Resources' Air Pollution Control Program received comments from thirty-six (36) sources: the U.S. Environmental Protection Agency (EPA); Regulatory Environmental Group for Missouri (REGFORM); Clinton County Commission; Johnson County, Kansas Environmental Department; Mid-America Regional Council (MARC); Boonslick Regional Planning Commission (BRPC); Farmington Chamber of Commerce; City of Farmington; Farmington Industrial Development Authority; the Presiding Commissioner of Cape Girardeau County; the Presiding Commissioner of Ste. Genevieve County; URS Corporation; Southeast Missouri Regional Planning and Economic Development Commission (SEMORPC); the Representative for Missouri's 8th District; the Representative for Missouri's 3rd District; the State Representative for Missouri's 104th District; Mississippi Lime Company; American Bottom Conservatory; Illinois Sierra Club; Respiratory Health Association of Metropolitan Chicago; Missouri Coalition for the Environment; City of St. Louis Air Pollution Control; The Bank of Missouri – Cape Girardeau; Mid-South Steel Products, Inc.; Cape Girardeau Area MAGNET; BioKyowa, Inc.; Cape Girardeau Area Chamber of Commerce; Jackson, MO Chamber of Commerce; the Mayor of Jackson, MO; Concerned Citizens for Economic Growth Coalition; Procter and Gamble Manufacturing Company; Malcolm Pirnie Incorporated; and four private citizens.

COMMENT #1: The EPA commented that it appreciated the work the department had done to involve the public in the ozone nonattainment boundary process. It noted that Missouri has one of the best programs for listening to the public concerns and ensuring that the public input is respected and evaluated. EPA also stressed that their primary goal is to maintain public heath. EPA also discussed the process that will follow the department's submittal of the ozone boundary recommendations in March 2009. After this, EPA will review the recommendation, then propose draft boundary recommendations back to the state in the fall of 2009. EPA noted that this will give the state one more opportunity for input on the standard.
RESPONSE: The department appreciates the acknowledgement from EPA for the boundary designation process. Although it required more staff and was time intensive, providing affected parties with the opportunity to take part in the process was very important in order to allow for better understanding of the designation requirements under the Clean Air Act. It is also anticipated that this open process will assist in future collaborations between the state and local agencies to decrease ozone levels and improve air quality throughout the state. No changes were made to the ozone boundary recommendations as a result of this comment.

COMMENT #2: REGFORM first noted that the air quality in Missouri, and across the nation, has been improving through the years. REGFORM also applauded the department's efforts for an open process that allowed for local stakeholder input. REGFORM also noted that the process was not one required by EPA, and was chosen by the department to involve as many affected parties as possible. It was also noted that designations have significant impact on an area that falls into nonattainment, and it was suggested that the commission consider all of the implications of a nonattainment designation, as well as their discretion while considering the proposed ozone boundaries to be submitted to EPA.
RESPONSE: The department acknowledges the appreciation of the effort to involve the stakeholders affected by the potential new ozone areas. No changes were made to the ozone boundary recommendations as a result of this comment.

COMMENT #3: The Clinton County Commission commented that although they acknowledge that their county will be designated nonattainment as part of the Kansas City Ozone Nonattainment Area under the new ozone standard, they feel they are unable to do anything to affect this designation. Rather, that the primary cause of their designation is coming from counties other than their own. They also request advice on how to improve the quality of life in their county.
RESPONSE: The department is aware of Clinton County's situation as a downwind county that is being negatively impacted by upwind counties' emissions. However, the Clean Air Act, requires states to designate a county as "nonattainment" if there is an ozone monitor violating the ozone standard within the county. This is the case for Clinton County. In addition, ozone exceedances at the Trimble monitor frequently occur as the result of emissions originating in the Kansas City metropolitan complex, and is the reason for the recommendation to include Clinton County in the Kansas City Ozone Nonattainment Area. Therefore, no changes were made to the ozone boundary recommendations as a result of this comment.

COMMENT #4: The Johnson County, Kansas Environmental Department and MARC both voiced their strong support of the department's ozone nonattainment boundary recommendation for the new Kansas City Ozone Nonattainment Area as proposed under the new 2008 8-hour

ozone standard. Both organizations specifically support the inclusion of two new counties in the Missouri portion of the bi-state proposed Kansas City ozone nonattainment area: Cass and Clinton counties. The organizations commented on the growth of the region as well as the apparent need for additional controls to reduce the formation of ozone in the Kansas City region.
RESPONSE: The department appreciates the support of the stakeholders in the affected counties after the stakeholder process has been completed, and looks forward to working with these organizations as the process continues through the steps necessary to achieve attainment for the Kansas City area. No changes were made to the ozone boundary recommendations as a result of these comments.

COMMENT #5: The BRPC submitted comments regarding their contention that two of the counties making up their regional planning area should not be considered for inclusion in the St. Louis Ozone Nonattainment Area. Their support for this recommendation included the lack of connectivity with the current St. Louis Ozone Nonattainment Area, as well as their comparatively low population density and urbanization. The BRPC did acknowledge that the monitor in Foley, Lincoln County, Missouri violated the ozone standard, but all information regarding ozone levels at the monitor were mainly impacted by the current nonattainment area. Therefore, the monitor's high readings were not likely impacted by the emission sources in Lincoln or Warren counties.
RESPONSE: Although Warren and Lincoln counties do not contribute to the elevated ozone concentrations recorded at any other ozone monitors in the nonattainment area, the Clean Air Act requires that any county with a violating monitor within its boundaries must be designated nonattainment. Therefore, the proposed St. Louis Ozone Nonattainment Area boundary includes Lincoln County for nonattainment designation. The inclusion of Lincoln County in the St. Louis nonattainment area is based on the fact that the monitored exceedances at the Foley monitor are largely influenced by emissions in the existing 8-hour St. Louis Nonattainment Area. No changes were made to the ozone boundary recommendations as a result of these comments.

COMMENT #6: Farmington Chamber of Commerce; City of Farmington; Farmington Industrial Development Authority; the Presiding Commissioner of Cape Girardeau County; the Presiding Commissioner of Ste. Genevieve County; and the Representative for Missouri's 8th District all commented that they strongly disagreed with the proposed classification of nonattainment for St. Francois County. All organizations cited the position paper prepared by the Southeast Missouri Regional Planning and Economic Development Commission in consultation with URS Corporation. Specifically, the organizations referenced the discussions in the position paper that there is no ozone monitor in the county to determine ozone levels and that there is no evidence that emission sources within the county significantly contribute to high ozone levels experienced by other ozone monitors in the region. The organizations associated with the city of Farmington also pointed out that no public hearing had been scheduled in St. Francois County. They also commented that no economic impact information if an area becomes a nonattainment area had ever been provided to them.
RESPONSE AND EXPLANATION OF CHANGE: The department made every effort to contact those counties, businesses, and other local stakeholders that were determined to be affected by the new ozone standard. Informational meetings were held in each region of the state, including St. Louis and Perryville/Cape Girardeau. In addition, at the request of the Farmington Chamber of Commerce, a special information session was held in their city on

November 20th to discuss the new ozone standard and the process required under the Clean Air Act. As stressed in previous discussions, the Clean Air Act does not allow for any considerations of economic impact on counties being considered for nonattainment designation for a criteria pollutant such as ozone. However, it has been determined that St. Francois County will be removed from the list of counties recommended for nonattainment designation under the 2008 8-hour ozone standard that will be submitted to EPA. Specifically, St. Francois County was not determined to have an impact on the Bonne Terre monitor site in Ste. Genevieve County or any of the other sites in the St. Louis area. Also, the Bonne Terre site was determined not to be representative of ozone concentrations in St. Francois County. As a result of these comments, the ozone boundary recommendation documents have been changed to reflect the removal of St. Francois County from the St. Louis Ozone Nonattainment Area.

COMMENT #7: Two private citizens commented that they were opposed to including St. Francois County in the St. Louis Ozone Nonattainment Designation.
RESPONSE: As a result of comment #6, the ozone boundary recommendation documents have been changed to reflect the removal of St. Francois County from the St. Louis Ozone Nonattainment Area. Therefore, no additional changes have been made to the ozone boundary recommendations as a result of these comments.

COMMENT #8: The SEMORPC and the URS Corporation, in consultation with the SEMORPC, provided substantial comments on the proposed designations of Ste. Genevieve, St. Francois, Perry, and Cape Girardeau counties as nonattainment under the 2008 8-hour ozone standard.
RESPONSE AND EXPLANATION OF CHANGE: The Ste. Genevieve and St. Francois County comments mainly discussed: (1) removing Ste. Genevieve County from the St. Louis ozone nonattainment area and (2) asking for a designation of attainment for St. Francois County. The Ste. Genevieve comments focused on the rural nature of Ste. Genevieve County, the existing political jurisdictions in the area, and the comparatively small emissions reductions that would be realized from existing St. Louis controls being imposed in this county. Based on these and other comments, the department conducted another set of meteorological analysis to determine the impact of St. Louis and other emission sources on the Bonne Terre monitor. The primary finding was that there are two predominant upwind areas for impacts on the monitor: north and east. This finding illustrated the impact of the Ste. Genevieve sources on the Bonne Terre monitor. Further, since the non-utility point source emissions in Ste. Genevieve County contribute over 85 percent of the total NOx emissions and are primarily from three industrial facilities, the control evaluation for these sources will be identical for any nonattainment designation. In addition, Ste. Genevieve County is not closely connected to the St. Louis area and is very rural in nature. Therefore, the department has determined that a distinct Ste. Genevieve nonattainment area is the appropriate designation.

St. Francois County was included based on the finding that the Bonne Terre monitor was representative of the air quality in St. Francois County. Since there is no guidance on the representativeness of monitors located in one county for another county's air quality, the department has found that the most appropriate designation for St. Francois County is unclassifiable for the 2008 ozone standard.

The recommended nonattainment designation for Cape Girardeau County was questioned in the position paper provided by the SEMORPC. Specifically, they mention that Cape Girardeau is not a metropolitan statistical area (MSA), the existing point sources are already controlled, and relatively low emission totals, along with some discussion of meteorological analysis. The department appreciates the effort expended by the SEMORPC to comment on the recommended designation. From these comments, the department conducted a policy-driven evaluation to better understand the potential outcomes of a nonattainment designation in Cape Girardeau. First of all, the existing requirements for metropolitan scale ozone nonattainment areas were not envisioned for rural areas like Cape Girardeau and Perry Counties. Some of these requirements do not make sense for these new nonattainment areas and these implementation issues must be addressed to provide a rational outcome for these areas impacted primarily by ozone and precursor transport with some local source ozone impact. The department has repeatedly expressed concerns to EPA regarding the unknown implementation requirements for rural areas in violation of or contributing to violations of the 2008 standard. The department has also asked that EPA provide additional national or regional controls to help address the elevated ozone and precursor transport to these more rural areas. As the standard is lowered, more areas will be required to implement measures that may not have a sizable impact on ozone, but will have a sizable impact on business and the overall economy of these smaller communities. Therefore, as a result of these comments and corresponding analysis, the ozone boundary recommendations have been changed to reflect the removal of Cape Girardeau County from the Southeast Missouri Ozone Nonattainment Area.

COMMENT #9: The Presiding Commissioner of Ste. Genevieve County; the Representative for Missouri's 8th District; the Representative for Missouri's 3rd District; the State Representative for Missouri's 104th District; Mississippi Lime Company; and the Presiding Commissioner of Cape Girardeau County all provided comments concerning their strong disagreement with the proposed placement of Ste. Genevieve County into the St. Louis Ozone Nonattainment Area. Although comments acknowledged that the ozone monitor in Ste. Genevieve County violates the 2008 ozone standard, they pointed out that the county was very different from those already included in the St. Louis Ozone Nonattainment Area. Alternatives proposed by those who commented were to establish Ste. Genevieve County as its own ozone nonattainment area, or to include it into a nonattainment area with the other Southeast Missouri counties proposed for nonattainment – Perry and Cape Girardeau. Reasons suggested for placing Ste. Genevieve into its own nonattainment area or including it in a nonattainment area with Perry and Cape Girardeau counties include its relatively rural nature, its current involvement in a large number of planning activities with the Southeast region, and its lack of connectivity with the St. Louis area. Local stakeholders voiced their concern that choices made to reduce emissions for the St. Louis area may not be appropriate for Ste. Genevieve County, and that Ste. Genevieve's needs and concerns would not be considered in the planning processes for the St. Louis Area.
RESPONSE AND EXPANATION OF CHANGE: As discussed in comment #8, based on further review of the overall characteristics of Ste. Genevieve County compared to the other counties in the St. Louis Ozone Nonattainment Area, comments made on the proposed recommendation to include the county in the St. Louis Ozone Nonattainment Area, as well as the county's overall rural nature and its unique circumstances, it has been determined that recommending Ste. Genevieve County as its own ozone nonattainment area is the most reasonable course of action. Also, the NOx emission controls already in place at the large point

sources in Ste. Genevieve County lead to the conclusion that some of those sources would not have additional controls available to reduce ozone concentrations in downwind St. Louis. Further, a nonattainment designation will require the development of a State Implementation Plan that will address control for Ste. Genevieve County impacts. Therefore, as discussed in comment #8, Ste. Genevieve County will be listed as its own nonattainment area in the list of counties recommended for nonattainment designation under the 2008 8-hour ozone standard that will be submitted to EPA. As a result of these and the above comments, the ozone boundary recommendations have been changed to reflect a new Ste. Genevieve Ozone Nonattainment Area.

COMMENT #10: Two private citizens commented that the department should reconsider the inclusion of Ste. Genevieve County with the St. Louis Ozone Nonattainment Area.
RESPONSE: As a result of comment #9, the ozone boundary designation recommendation documents have been changed to reflect a new Ste. Genevieve Ozone Nonattainment Area. No changes were made to the ozone boundary recommendations as a result of these comments.

COMMENT #11: American Bottom Conservatory, Illinois Sierra Club, Respiratory Health Association of Metropolitan Chicago, Missouri Coalition for the Environment, and City of St. Louis Air Pollution Control all voiced their strong support for the inclusion of Ste. Genevieve County as part of the St. Louis Ozone Nonattainment Area. The organizations specifically cited the high NOx emissions for the county and its location upwind of the St. Louis metropolitan area. They noted that the county's location results in the emissions from Ste. Genevieve County having a greater impact on the metropolitan area than other county's emissions. The City of St. Louis Air Pollution Control Program also voiced their appreciation that the process used to develop the proposed nonattainment area was open, transparent, and technically sound.
RESPONSE: As a result of comment #8, Ste. Genevieve County will be proposed as its own ozone nonattainment area. This will provide the county the flexibility to address its ozone issues independently of other nearby areas that have very different population, emission source, and urbanization characteristics. Proposing the county as its own nonattainment area will still address the concerns voiced by these organizations, as it will still require the development of a state plan to address the emissions sources in the county, and the air quality impacts associated with these emissions.

COMMENT #12: The Bank of Missouri – Cape Girardeau; Mid-South Steel Products, Inc.; Cape Girardeau Area MAGNET; BioKyowa, Inc.; Cape Girardeau Area Chamber of Commerce; the Presiding Commissioner of Cape Girardeau County; Jackson, MO Chamber of Commerce; the Mayor of Jackson, MO; the Representative for Missouri's 8th District; the State Representative for Missouri's 104th District; and the Presiding Commissioner of Ste. Genevieve County all commented that they did not support the inclusion of Cape Girardeau County in an ozone nonattainment area. Some of the rationale for requesting that the county not be included in a nonattainment area included: the ozone monitor in Farrar, Perry County being close to the standard, the current level of control on emission sources in the county, the economic impact of a nonattainment designation, lack of guidance from EPA for the ozone boundary recommendations, the Cape Girardeau area not meeting the definition of a metropolitan area, rural county emissions levels that include a large percentage of emissions from vegetative sources, and long range transport of ozone.

RESPONSE: Many of these comments have already been addressed in Response to #8. Some new issues/comments specific to these comments are presented here.

Based on the three most recent years of ozone monitoring data (2006-2008), the monitor in Farrar, Perry County violates the 2008 8-hour ozone standard. The 2008 ozone season recorded ozone levels much lower than those normally experienced in Southeast Missouri. However; these low levels did not reduce the three year average at the monitor to a value below the current standard.

In evaluating the ozone levels at a monitor, as well as the emission levels from particular counties, biogenic (vegetative) sources are considered, and only man-made emission sources are considered in determining if a county does have a significant impact on a violating monitor. Also, vegetation does not produce ozone. Rather, it produces one of the two compounds that combine to form ozone. If the second component, which is primarily created by human action, was not already present, vegetative sources would have no impact on ozone levels. The lowering of the ozone standard has increased interest in the topic of long range ozone transport. As mentioned previously, the department has continued to provide comments to EPA regarding the needs for additional comprehensive, regional and nationwide emission control strategies such as the Clean Air Interstate Rule and nationwide emissions controls for consumer products.

The department is also very concerned with the economic impact of nonattainment designation on smaller communities. While the primary mission of the air program is to ensure the citizens of Missouri breathe clean air, the secondary mission is to provide for maximum employment and full industrial development of the state. The designation of nonattainment areas for ozone under the current implementation paradigm could provide substantial economic hardship for communities without a corresponding benefit to air quality. This is due to the transported nature of ozone and the impacts from other states or more distant sources within Missouri on these rural monitoring sites. As a result of these comments, and those in comment #8, the Southwest Ozone Nonattainment Area has been changed to reflect the removal of Cape Girardeau County.

COMMENT #13: The Concerned Citizens for Economic Growth Coalition, Procter and Gamble Manufacturing Company, and Malcolm Pirnie Incorporated in consultation with Concerned Citizens for Economic Growth Coalition has provided substantial comments on the proposed designation of Cape Girardeau County as nonattainment under the 2008 8-hour ozone standard.
RESPONSE: Some of the rationale to designate Cape Girardeau as attainment provided in these comments included a strong regional ozone influence (not local) on the Farrar monitor in Perry County, no local ozone monitoring data, existing sources are already controlled, difficulty in attracting new businesses and expanding operations at existing facilities. While the department does not concur with many of the technical findings in these comments, the overall decision for inclusion of Cape Girardeau County in the Southeast Missouri Nonattainment Area is based on both the technical information and the policy issues associated with this designation. The department's concerns regarding the nonattainment designation of small communities that impact downwind violations, like Cape Girardeau, and the implementation of existing control regimens in those communities support a designation of unclassifiable for Cape Girardeau County. As a result of these comments, and similar ones made in comments #8 and #12, the

Southwest Ozone Nonattainment Area has been changed to reflect the removal of Cape Girardeau County.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VII
901 NORTH 5TH STREET
KANSAS CITY, KANSAS 66101

Dave Lamb, Chief
Operations Section
Missouri Department of Natural Resources
Air Pollution Control Program
P.O. Box 176
Jefferson City, Missouri 65102-0716

Dear Mr. Lamb:

We appreciate the opportunity to provide written comments on rules 10 C.S.R. 10-5.290, More Restrictive Emission Limitations for Particulate Matter in the South St. Louis Area; 10 C.S.R. 10-6.400, Restriction of Emission of Particulate Matter from Industrial Processes; 10 C.S.R. 10-5.381, On-Board Diagnostics Motor Vehicle Emissions Inspection; and 10 C.S.R. 10-6.061, Construction Permit Exemptions, the Eight-Hour Ozone Standard Boundary Recommendations, and the Request for Variance for Doe Run's Buick Recycling Facility.

10 C.S.R. 10-5.290, More Restrictive Emission Limitations for Particulate Matter in the South St. Louis

The Missouri Department of Natural Resources (MDNR) proposes to remove through rescission an obsolete regulation that applies to a specific area in South St. Louis. We have no comments in relation to this rule change.

10 C.S.R. 10-6.400, Restriction of Emission of Particulate Matter from Industrial Processes

MDNR proposes to amend this rule to add new exemptions to the rule for coating operations. We have one comment in relation to this rule change.

1. The Environmental Protection Agency (EPA) is requesting MDNR to provide a demonstration that this rule change will not adversely impact ambient air. We are available to discuss the demonstration in more detail if you would find that useful.

10 C.S.R. 10-5.381 On-Board Diagnostics Motor Vehicle Emissions Inspection

MDNR proposes to amend this rule to clarify the exemption, inspection station, vehicle inspection, and waiver provisions of the inspection/maintenance program rule in the St. Louis Area. We have one comment in relation to this rule change.

1. The EPA is requesting MDNR to provide a narrative describing the effect of the changes on emissions and a determination by MDNR regarding whether the program continues to meet the I/M performance standard.

10 C.S.R. 10-6.061, Construction Permit Exemptions

MDNR is proposing changes to exempt "temporary" storage facilities from construction permitting requirements at 10 C.S.R. 10-6.06(3)2.E.(c). This proposed rule amendment will add an exemption from construction permits for the construction of temporary storage structures throughout the state of Missouri that occur as a result of "exceptional events" (e.g., natural disasters or abundant harvests exceeding available storage capacity). We have six comments in relation to this rule change.

1. Lacking further demonstration, the scale of the exemption is one which may not protect air quality and as a consequence these installations should either be subject to case-by-case review or a well-justified permit by rule. Also, since the exemption lacks most elements of "practical enforceability," we are concerned about approval as part of the SIP. If MDNR anticipates a large number of these types of facilities, it might consider developing a "permit by rule" that would address enforceability (e.g., notification, recordkeeping, best management practices) and air quality concerns.

2. It appears, based on the criteria in 10 C.S.R. 10-6.061(1), that this exemption is intended only for temporary storage at minor sources not otherwise subject to the prevention of significant deterioration (PSD), Part D (nonattainment) and 112(g) major source permitting programs. However, given the uncertainty in how Missouri interprets "potential to emit" to grant preconstruction waivers, "no permit required" decisions and potentially misclassifying Title V permits, we view any permit exemption with extreme caution. Either way, MDNR has an obligation to ensure that minor sources are not jeopardizing the national ambient air quality standards (NAAQS) and should have adequate procedures in place to review ambient impacts.

3. In reference to the proposed rule changes for Section E.(II)(c), the EPA is concerned that with no definition for "abundant" or other threshold to know when the exemption applies, the provision is unenforceable as a practical matter. If Missouri intends to not require permitting for such storage facilities, subject to the further recommendations below, then it should not limit the exemption to "exceptional events" or "emergencies."

4. In reference to the proposed rule changes for Section E.(II)(c)III., annual mass caps, without appropriate methods for calculation and retention of records to demonstrate the source is eligible, are unenforceable as a practical matter and cannot be used to limit potential to emit for purposes of avoiding major source review. This principle would also apply to a rule which would have the same effect. As written, we could not approve this exemption in the SIP. For more details, see http://www.epa.gov/region07/programs/artd/air/nsr/nsrmemos/opinion.pdf.

5. If a temporary storage facility were constructed at an existing major stationary source, which is not prohibited by the rule, the source could be in violation of the PSD requirements because PM and PM_{10} emissions would exceed 25 and 15 tpy, respectively. The rule should either limit the allowable emissions increase to below the PSD significance thresholds (and include appropriate methods for calculation and retention of records as discussed in comment 4), or otherwise limit the increase to existing minor sources.

6. In reference to the proposed rule changes for Section E.(II)(c)IV., without a case-by-case demonstration, or a NAAQS demonstration on a "typical" model installation, there is no assurance these installations can demonstrate compliance with the NAAQS for PM, PM_{10} or $PM_{2.5}$; in particular at the proposed 100 tpy exemption threshold. At a minimum, the exemption should specify a suite of best management practices -- directly in the rule -- that a source must use to minimize dust during all periods of operation.

2008 Eight-Hour Ozone Standard Boundary Recommendations

We appreciate the work that MDNR has done to take this process to the public. Missouri has one of the best programs in the country when it comes to listening to public concerns about air quality. The EPA appreciates Missouri's due diligence on this important issue, particularly for ensuring the public's input is respected, and ensuring that further public health protection is afforded to the citizens of Missouri by timely implementing this revised ozone standard.

Request for Variance for Doe Run's Buick Recycling Facility

We understand the circumstances leading up to the most recent request for variance for Doe Run's Buick Recycling Facility. However, we continue to emphasize that variances are not recognized by the EPA unless they are approved as a SIP revision.

If you or your staff have any questions or would like to discuss these comments, please feel free to contact me at (913) 551-7147.

Sincerely,

Amy Bhesania

Amy Bhesania
Missouri State Coordinator
Air Planning and Development Branch

Randall Relford
Presiding Commissioner

James T. Crenshaw
1st District Commissioner

Larry C. King
2nd District Commissioner

Office of the
Clinton County Commission

State of Missouri

Clinton County Courthouse
207 North Main
Plattsburg, Missouri 64477
(816) 539-2536

October 7, 2008

Missouri Department
Of Natural Resources
P. O. Box 176
Jefferson City, MO 65102

Attn: Mr. Doyle Childers, Director

Re: Eight-hour Ozone Nonattainment Designation

Dear Mr. Childers:

In as much as it has been determined that Clinton County has been designated as a nonattainment area, we feel that we can do nothing to change this determination due to the fact that we can not take charge of our own environment. The primary cause of our designation is coming from counties other than our own.

Please advise the Clinton County Commission and the citizens of Clinton County what we might be able to do to improve the quality of life in our county.

Respectfully,

Randall Relford
Presiding Commissioner

Jim Crenshaw
1st District Commissioner

Larry King
2nd District Commissioner

Johnson County
Kansas

KANSAS DON'T SPOIL IT!

December 5, 2008

Jim Kavanaugh, Director
Air Pollution Control Program
MO Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65109

Dear Mr. Kavanaugh:

The purpose of this letter is to submit comments in strong support of the proposed MO Department of Natural Resources (MDNR) ozone nonattainment boundary recommendation for the Kansas City region.

As you know, the bi-state Kansas City air quality planning area, which includes Johnson and Wyandotte counties in KS and Jackson, Clay and Platte counties in MO, has violated the new federal ozone standard. As a result, the U.S. Environmental Protection Agency (EPA) requires the states of MO and KS to consider whether the boundaries of the current air quality planning area should be expanded to include contiguous counties that may also be experiencing unhealthy ozone levels or contributing to unhealthy air in downwind counties. Under federal law, counties that either experience unhealthy ozone levels or contribute to those levels in nearby counties are to be designated as "nonattainment" counties. KS and MO must submit their recommendations for counties to include in the new Kansas City ozone nonattainment area to EPA by March, 2009. After reviewing state recommendations, EPA must make final nonattainment boundary decisions by March, 2010.

The Johnson County Environmental Department participated in MDNR's public meetings held to share information and consider input from parties potentially affected by the Kansas City ozone nonattainment boundary decision. After consultation with those parties, technical analysis and consideration of EPA's guidance, MDNR has proposed to expand the MO nonattainment area to include Cass and Clinton counties, recognizing that those counties are either experiencing unhealthy air quality and/or contributing emissions that cause ozone violations in downwind areas.

Johnson County strongly supports MDNR's recommendation to include Cass and Clinton counties in an expanded ozone nonattainment area for several reasons.

First, in response to monitored violations of the new ozone standard, counties in the Kansas City nonattainment area are likely to face additional and potentially costly requirements to reduce emissions. The five counties in the current air quality planning area have been subject to increasingly stringent emission reduction requirements for decades. Despite significant economic costs to our residents and businesses, Johnson County has accepted these requirements because our emissions contribute to the region's ozone problems and we understand the greater public health benefits of achieving the ozone standard. However, the Kansas City region has grown significantly over the last few decades, and it is no longer fair or equitable to rely exclusively on the residents and businesses of the original five counties to further reduce their emissions.

Second, it may not be possible to achieve the ozone standard in the Kansas City region unless contiguous counties are included in the ozone nonattainment area and are contributing to emission reductions.

Third, any delay in expanding the area to include additional counties may also delay the benefits to public health associated with attaining the ozone standard.

Thank you for the opportunity to comment of this matter. Should you have questions or desire further information, please contact me at 913-715-6901.

Sincerely,

Cindy Kemper
Director

G:\Director\K.misc\Pollution\OzoneNonattainmentBoundaryLetterMDNR12-05-08.docx

C: Rick Brunetti, Director, KS Bureau of Air and Radiation
Tom Jacobs, Environmental Program Director, Mid-America Regional Council

600 Broadway, Suite 200
Kansas City, Missouri 64105-1659

816/474-4240
816/421-7758 FAX
www.marc.org

MARC
Mid-America Regional Council

c: Jim
David
Jeff

Jim Kavanaugh, Director
Air Pollution Control Program
Missouri Department of Natural Resources
PO Box 176
Jefferson City, MO 65109

Dear Mr. Kavanaugh,

The Mid-America Regional Council (MARC) Air Quality Forum, created in accordance with Section 174 of the Clean Air Act to coordinate the development and implementation of air quality policy in the bi-state Kansas City region, offers the following comments in support of the proposed MDNR ozone nonattainment boundary recommendation for the Kansas City region.

After consultation with the appropriate stakeholders as well as technical analysis and consideration of EPA's guidance, MDNR has proposed to expand the Missouri nonattainment area to include Cass and Clinton counties. The addition of these two counties to the existing boundary of Jackson, Clay and Platte counties shows that MDNR has recognized that these additional counties are also experiencing unhealthy air quality or may be contributing emissions that cause ozone violations in downwind counties.

In response to monitored violations of the new ozone standard, the counties included in the Kansas City nonattainment area are likely to experience additional requirements to reduce emissions. These additional requirements can also be costly to industry or the public. MARC's Air Quality Forum recognizes the importance of working with MDNR to develop emissions inventory and other data to support the air quality planning process necessary with the nonattainment designation and the addition of two counties.

We look forward to working with these additional counties as well as the existing three counties to identify ways to expand emissions reductions to help the region come into attainment more quickly, thereby increasing the health benefits of the lower standard for the entire Kansas City region.

Thank you for the opportunity to comment on this matter. If you have questions or need further information, please contact me at (816) 474 – 4240 or at agraor@marc.org.

Sincerely,

Amanda Graor

Amanda Graor
Air Quality Planner

BOONSLICK REGIONAL
PLANNING COMMISSION

LINCOLN COUNTY
Chain of Rocks
Elsberry
Foley
Fountain N Lakes
Hawk Point
Moscow Mills
Old Monroe
Silex
Troy
Truxton
Whiteside
Winfield

MONTGOMERY COUNTY
Bellflower
High Hill
Jonesburg
McKittrick
Middletown
Montgomery City
New Florence
Rhineland
Wellsville

WARREN COUNTY
Innsbrook
Marthasvillle
Pendleton
Truesdale
Warrenton
Wright City

CHAIRMAN
Charles H. Kemper
City of Troy

VICE-CHAIRMAN
Charles Korman
Montgomery County

SECRETARY
Floyd Weeks
City of High Hill

TREASURER
Randy Lewis
Warren County

EXECUTIVE DIRECTOR
Steve W. Etcher

Established: May 27, 1968

PO Box429
111 Steinhagen
Warrenton, MO 63383
Ph: (636)456-3473

September 3, 2008

Mr. Doyle Childers, Director
Missouri Department of Natural Resources
PO Box 176
Jefferson City, MO 65102

Mr. Jeffry D. Bennett, PE
Air Quality Modeling Unit Chief
Missouri Department of Natural Resources
PO Box 176
Jefferson City, MO 65102

Mr. John Rustige, PE
Missouri Department of Natural Resources
PO Box 176
Jefferson City, MO 65102

Mr. Michael Alesandrini, Ombudsman
Missouri Department of Natural Resources
7545 S. Lindbergh
St. Louis, MO 63125

Mr. Bruce Holt, Policy Advisor
Missouri Department of Natural Resources
97 North Outer Road, Suite 4
Eureka, MO 63025

Cpy To: Floyd
Jim
Dan
Let's Visit
Dale

RE: Air Quality Non-Attainment Area Designation Justification for Lincoln and Warren counties

Dear Director Childers & DNR Officials:

The Boonslick Regional Planning Commission (BRPC) has reviewed EPA's criteria for developing a recommendation for the designation of the air quality non-attainment area for St. Louis. BRPC has prepared the enclosed report which examines each of the criteria as it relates to Lincoln and Warren counties.

EPA has presumed the boundaries for air quality to be the St. Louis Metropolitan Statistical Area; however, I encourage you to closely examine the data contained in this report. I think you will find that there is an overwhelming lack of justification for the inclusion of Lincoln or Warren County in the St. Louis non-attainment area.

According to the schedule outlined in the St. Louis Area Ozone Designation meeting, DNR will be presenting a draft recommendation on the boundary designation in September, 2008. The Boonslick Regional Planning Commission understands there will be a public comment period following the release of this recommendation;

however, we believe the data contained in the attached report should be considered in making the initial draft recommendation.

In summary, each of the eleven criteria to be evaluated by EPA in determining the non-attainment area failed to provide sufficient justification for inclusion of Lincoln or Warren County in the St. Louis non-attainment area.

	Evaluation Criteria	Conclusion
1.	Emissions and air quality in adjacent areas (including adjacent C/MSAs)	There is insufficient justification to support the inclusion of Lincoln or Warren County in the non-attainment boundary.
2.	Population density and degree of urbanization including commercial development (significant difference from surrounding areas)	While some degree of development and urbanization is occurring within the Boonslick Region, there is insufficient justification to support the inclusion of Lincoln or Warren County in the non-attainment boundary.
3.	Monitoring data representing ozone concentrations in local areas and larger areas (urban or regional scale)	The violating monitor located in Foley is heavily influenced by transport emissions. Therefore, we conclude that there is insufficient justification to support the inclusion of Lincoln or Warren County in the non-attainment boundary.
4.	Location of emission sources (emission sources and nearby receptors should generally be included in the same non-attainment area)	There have been no recent major sources permitted or EGUs constructed in the region. Therefore there is insufficient justification to support the inclusion of Lincoln or Warren County in the non-attainment boundary.
5.	Traffic and commuting patterns	There is a certain amount of connectivity between Lincoln and Warren counties and the current non-attainment boundary. However the degree of connectivity and the influence of this connectivity is insufficient justification to support the inclusion of Lincoln or Warren County in the non-attainment boundary.
6.	Expected growth (including extent, pattern and rate of growth)	The population of Lincoln and Warren counties is expected to continue to increase. The percentage of population growth in the region is significant, however, the total number of people residing in, or projected to reside in Lincoln and Warren counties is insufficient justification to support the inclusion of Lincoln or Warren County in the non-attainment boundary.
7.	Meteorology (weather/transport patterns)	There is insufficient justification to support the inclusion of Lincoln or Warren County in the non-attainment boundary.

	Evaluation Criteria	Conclusion
8.	Geography/topography (mountain ranges or other air basin boundaries)	There is insufficient justification to support the inclusion of Lincoln or Warren County in the non-attainment boundary.
9.	Jurisdictional boundaries (e.g., counties, air districts, existing 1-hour non-attainment areas, Reservations, etc.)	The current non-attainment boundaries were adopted in 2003 and did not include Lincoln or Warren counties. There is still insufficient justification to support the inclusion of Lincoln or Warren County in the non-attainment boundary.
10.	Level of control of emission sources	There is insufficient justification to support inclusion of Lincoln or Warren County in the non-attainment boundary.
11.	Regional emission reductions (e.g., NOx SIP call or other enforceable regional strategies)	There is insufficient justification to support the inclusion of Lincoln or Warren County in the non-attainment boundary.

If you have any questions or need any additional information regarding this report please contact me at (636) 456-3473, or e-mail me at etcher@boonslick.org.

Sincerely,

Steve W. Etcher
Executive Director

Cc:

Senator John Griesheimer
Senator Scott Rupp
State Representative Bob Onder
State Representative Ed Schieffer
State Representative Mike Sutherland
State Representative Terry Witte
Sean O'Brien, Presiding Commissioner-Lincoln County Commission
Arden Engelage, Presiding Commissioner-Warren County Commission
Charles H. Kemper, Mayor-City of Troy
Mike Clynch, Mayor-City of Moscow Mills
Greg Costello, Mayor-City of Warrenton
Roy White, Mayor-City of Wright City

Non-Attainment Area Designation Recommendation and Justification Report for the Boonslick Region

Prepared by: Boonslick Regional Planning Commission
September 2008

Introduction

The Boonslick Region is located immediately west and north of the St. Louis area. This region has seen steady growth over the past two decades due to out-migration from the St. Louis area. The region consists of Lincoln, Montgomery and Warren counties. For the purpose of evaluating the merits of expanding the boundary for the St. Louis non-attainment area this report will focus on the impact and influence of only Lincoln and Warren counties on the St. Louis non-attainment boundary.

In 2003, EPA promulgated a presumptive boundary for the non-attainment area to be consistent with the boundary of the Metropolitan Statistical Area (MSA), which would incorporate Lincoln and Warren counties. The data did not sufficiently justify including counties from the Boonslick region in the non-attainment boundary designation.

In 2008, EPA is once again suggesting a presumptive boundary to include the MSA boundary or the MSA boundary plus adjacent counties that have violating monitors. This report will illustrate that there is insufficient justification to include Lincoln or Warren counties in the non-attainment boundary recommendation.

Eleven Evaluation Criteria

Emissions and Air Quality in Adjacent Areas

The tables below show the VOC and NOx levels for the current non-attainment area and the Boonslick Region counties of Lincoln and Warren. The data below illustrates the small percent of ozone precursors that would be contributed if Lincoln and/or Warren County were added to the non-attainment boundary. Lincoln and Warren counties' emissions are a mere fraction of those counties that are presently included in the 2003 non-attainment boundary designation. Lincoln County would contribute roughly 2% of VOC and NOx, Warren County would contribute less than 2% of VOC and NOx.

VOC

COUNTY	AREA TPD	NONROAD TPD	MOBILE TPD	EGU TPD	NONEGU TPD	TOTAL TPD	VOC % MSA	VOC % NAA
ST. LOUIS	39.223	19.575	32.659	0.329	13.433	105.220	35.00%	38.85%
ST. LOUIS CITY	14.063	3.819	9.533	0.000	10.776	38.190	12.70%	14.10%
ST. CHARLES	10.059	7.010	7.669	0.626	3.067	28.432	9.46%	10.50%
JEFFERSON	8.989	7.354	5.578	0.476	1.677	24.075	8.01%	8.89%
FRANKLIN	4.227	3.253	4.350	0.850	1.928	14.607	4.86%	5.39%
LINCOLN	2.158	1.889	1.340	0.000	0.499	6.136	2.04%	2.27%
WARREN	1.734	0.999	1.316	0.000	0.619	4.664	1.55%	1.72%

NOX

COUNTY	AREA TPD	NONROAD TPD	MOBILE TPD	EGU TPD	NONEGU TPD	TOTAL TPD	NOx %MSA	NOx %NAA
ST. LOUIS	10.222	30.714	73.863	17.893	2.315	135.006	30.67%	82.80%
ST. LOUIS CITY	4.394	10.245	19.556	0.000	5.140	39.335	8.94%	9.56%
JEFFERSON	1.464	2.109	13.134	15.202	18.331	50.240	11.41%	12.21%
ST. CHARLES	2.496	7.011	17.608	21.897	1.226	50.238	11.41%	12.21%
FRANKLIN	1.822	3.364	10.601	28.146	0.098	44.032	10.00%	10.70%
LINCOLN	0.869	3.068	2.695	0.000	0.528	7.160	1.63%	1.74%
WARREN	0.601	1.833	2.961	0.000	0.160	5.054	1.15%	1.23%

Summary: The emissions data for Lincoln and Warren counties does not justify inclusion in the non-attainment area and would support keeping the non-attainment area consistent with the 2003 designation.

Population Density and Degree of Urbanization

In general, the population density and degree of urbanization within the Boonslick Region pales in comparison to the population density and urbanization in the current non-attainment boundary area. Specifically, Lincoln and Warren counties, which are being considered due to their inclusion in the Metropolitan Statistical Area, have population densities that are mere fractions of other counties represented. The table below shows the population density variation between the Boonslick Region and the current non-attainment area.

Population Density and Urbanization		
County	2000 Population	Population per Square Mile
Lincoln	38,944	61.8
Warren	24,525	56.9
St. Louis City	348,189	5,622.9
St. Louis County	1,016,315	2,001.4
St. Charles County	283,883	506.6
Jefferson County	198,099	301.6
Franklin County	93,807	101.7

Table 1: Source-Missouri Census Data Center, 2000 Census

The largest municipality in Lincoln County is the City of Troy. Troy has a population of 6,737 according to the 2000 Census.

Summary: Including Lincoln and Warren counties in the non-attainment area, due to the fact they are included in the St. Louis MSA, is not justifiable based on the degree of urbanization and population density in comparison to the current non-attainment area.

Ozone Monitoring Data in Surrounding Area

Lincoln and Warren counties are located adjacent to the current non-attainment area. The only monitor located within these two counties is located in Foley, Missouri. The Foley monitor, like

virtually every other monitor in the State of Missouri, failed to meet the new attainment requirements. However, as can be clearly seen in the map below, the influence causing the Foley monitor to exceed the new limits is predominantly from the current non-attainment area. **The transport of emissions to this monitor from the non-attainment boundary is elevating the monitor readings and is not likely related to emission sources in Lincoln or Warren County.** The monitor was placed online in Foley in April 2005. The vast majority of monitoring days shows the monitor in compliance with the new standard. During the period of 2005-2007, only 45 days out of 177 failed to meet the standard. 75% of the monitoring days were in attainment. The monitoring data shows a daily average during the testing period of only 68 ppb, far below the attainment threshold.

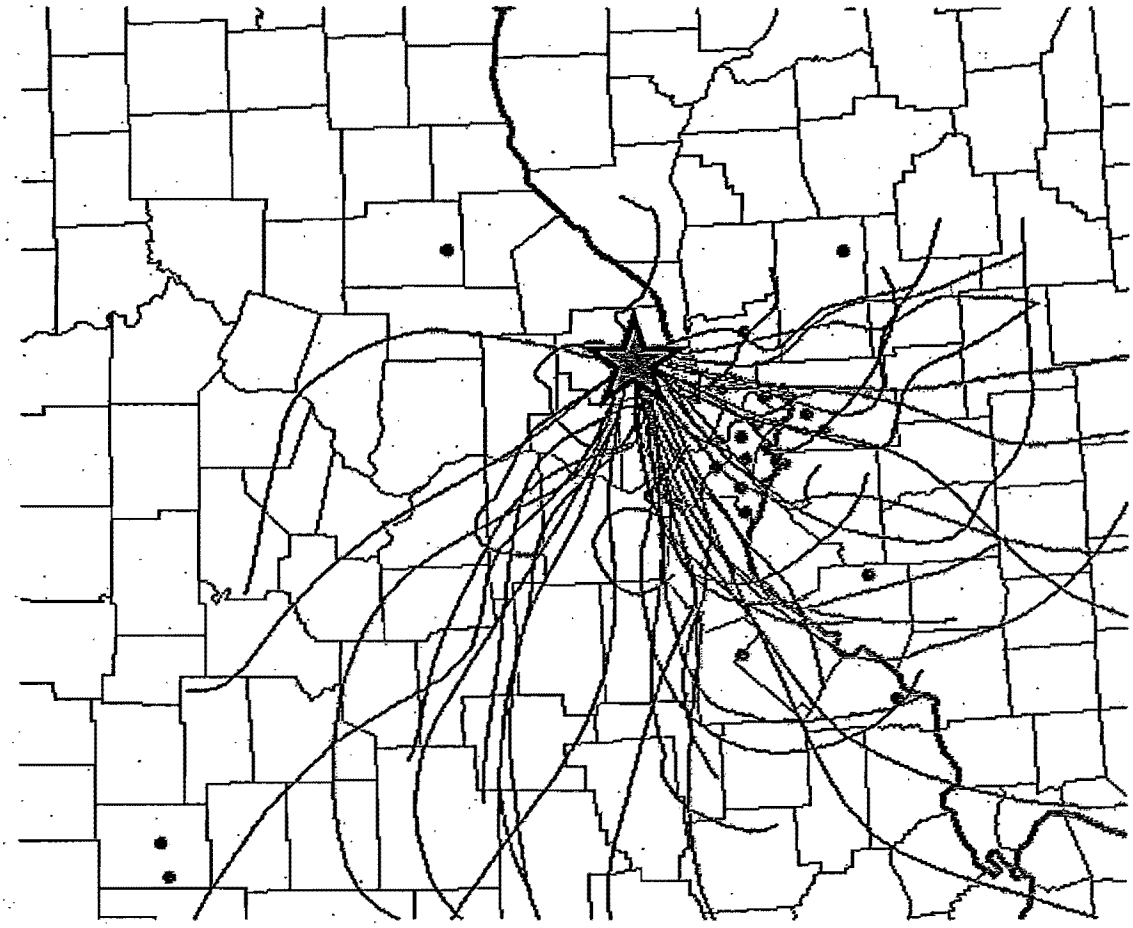


Figure 1: Foley Monitor Site–Years of Operation 2005-2007

Summary: The transport of emissions to the Foley monitor is insufficient justification to include Lincoln or Warren County in the non-attainment boundary designation.

Location of Emission Sources

There have been no significant changes to emission sources in Lincoln or Warren County since the 2003 designation process.

Traffic and Commuting Patterns

DNR has made the claim, in introductory meetings, that 95% of all the commuting originating in Lincoln and Warren counties is to destinations within the current MSA boundary area. While this claim is factual it misrepresents the impact to the current non-attainment area resulting from the connectivity of Lincoln and Warren counties. These two counties are included in the MSA boundary, so trips remaining in the county of origin are included in the calculation. Less than 10, 000 trips actually leave Lincoln County, and less than 7,000 trips leave Warren County; an insignificant amount considering the total trips in the area are near 1 million. **It would seem more reasonable to assess the impact of Lincoln and Warren counties on the current non-attainment boundary, rather than the MSA boundary. The impact by Lincoln and Warren counties on the current non-attainment area is minimal at best.** As can be seen in the table below, less than 1% (.95%) of the total trips within the current non-attainment area originate within Lincoln County, and even fewer trips originate within Warren County (.64%)

Work Flow Traffic Analysis

County of Destination	County of Origin: Lincoln	Warren	St. Charles	St. Louis City	St. Louis County	Franklin	Jefferson
Lincoln*	8,314	185	729	12	116	15	35
Warren*	465	5,176	722	45	180	343	24
St. Charles	5,529	2,967	70,058	1,439	12,859	766	1,291
St. Louis City	702	311	10,930	82,480	105,207	2,253	15,947
St. Louis County	2,738	1,972	62,353	50,997	358,742	11,842	42,181
Franklin	40	879	555	291	1,752	27,161	1,013
Jefferson	23	18	380	1,181	5,463	780	81,381
Other destinations	491	402	2,048	4,039	9,418	2,025	2,831
Total Number of Trips	18,302	11,910	147,775	140,484	493,737	45,185	97,653

Grand Total of all Trips	955,046
% of total trips originating in Lincoln County destined for non-attainment area	**0.95%**
% of total trips originating in Warren County destined for non-attainment area	**0.64%**

* not included in the 2003 non-attainment area designation

Table 2: Source 2000 Census Work Flow Data

Summary: While there is recognition of the connectivity resulting from a regional economy between the current non-attainment area and Lincoln and Warren counties the connectivity and commuting data is insufficient to justify inclusion of either county in the proposed non-attainment boundary area.

Expected Growth

Lincoln and Warren counties have experienced significant population growth during the past decade. These two counties are among the fastest growing in the State of Missouri when viewed on a percentage of population basis. However, the actual number of new residents within these counties is relatively minor in comparison to the population of the entire

metropolitan statistical area. As can be seen in the table below, Lincoln County accounts for only1.9% of the MSA population and Warren County accounts for only 1.2% of the MSA.

County	2000 Population	2007 Estimate	% of MSA Population
St. Louis County	1,016,300	995,118	50.7%
St. Louis City	348,189	350,759	17.4%
St. Charles County	283,893	343,952	14.2%
Jefferson County	198,099	216,076	9.9%
Franklin County	93,807	100,045	4.7%
Lincoln County	38,944	51,528	1.9%
Warren County	24,525	30,467	1.2%
Total 2000 Population	2,003,757		

Lincoln and Warren counties experienced rapid growth during the past decade due to a strong economy, low housing prices, affordable energy, and abundance of residential lending institutions. Over the past 24 months this growth has dramatically slowed. Many areas of these counties have seen stagnated growth and, in some cases, reverse migration is reducing the population.

According to a 2006-2007 County Migration profile for Lincoln County[1], which is based on tax returns for 2006-2007, more than 1,000 families migrated out of Lincoln County during 2006-2007. During this same period the County realized only 1,600 families moving into the region. This trend has continued through 2007 and into the first 2 quarters of 2008. If this trend persists, the County will fall short of the population projections prepared by the Missouri Office of Administration as illustrated below.

County	2020 Population Estimate	% of MSA Population
St. Louis County	967,196	48.3%
St. Louis City	350,385	17.5%
St. Charles County	439,068	21.9%
Jefferson County	244,003	12.2%
Franklin County	110,704	5.5%
Lincoln County	74,529	3.7%
Warren County	40,174	2.0%
Total 2020 Pop. Estimate	2,226,059	

As can be seen by the population projections released by the Missouri State Census Data Center, the population in the MSA will exceed 2.2 million people by the year 2020. While growth is recognized in most counties, the percent of total population in Lincoln County remains a small percentage of the MSA at 3.7%, and Warren County at 2.0%.

Summary: The population growth in Lincoln and Warren counties is dynamic and subject to influence by the changes in fuel prices, home financing, and the state of the economy. While most analysis projects the population growth to continue in Lincoln and Warren counties, the percentage of the MSA that resides in these two counties is relatively small. Combined, they

[1] County Migration Profile for Lincoln County 29113, Missouri Census Data Center
Source: IRS Migration Files

make up only 3% of the population of the presumptive non-attainment boundary. The current population base and potential for growth is not adequate justification for inclusion of Lincoln and Warren counties in the non-attainment area.

Meteorology

The analysis of meteorological conditions does not demonstrate the necessity of including Lincoln or Warren counties in the non-attainment area.

Geography/Topography

Geographical features are not a major influence on ozone levels in the St. Louis region.

Jurisdictional Boundaries

Lincoln and Warren counties are not included in the current non-attainment boundary designation. While these counties are included in the MSA for statistical purposes, that alone is insufficient justification for inclusion in the non-attainment area. Influence from these areas is very minimal when compared to the current non-attainment area.

Level of Control of Emission Sources

In Lincoln and Warren counties, major new sources of emissions or major modifications to emission sources permitted since 1975 have been subject to the best available control technology (BACT). Future major new sources construction and all modifications to existing sources in Lincoln and Warren counties will be subject to BACT limits. Therefore, the existing and future levels of control for ozone precursors support the exclusion of Lincoln and Warren counties from the St. Louis non-attainment area.

Regional Emission Reductions

The ability of DNR to adopt regional emission reductions, if necessary, is consistent with not including Lincoln and Warren counties in the St. Louis non-attainment boundary.

Summary

Below is a summary of the eleven evaluation criteria established by EPA to be used in developing a recommendation for the St. Louis non-attainment boundary: The table clearly illustrates there is insufficient justification for including Lincoln or Warren counties in the non-attainment area.

	Evaluation Criteria	Conclusion
1.	Emissions and air quality in adjacent areas (including adjacent C/MSAs)	There is insufficient justification to support the inclusion of Lincoln or Warren County in the non-attainment boundary.
2.	Population density and degree of urbanization including commercial development (significant difference from surrounding areas)	While some degree of development and urbanization is occurring within the Boonslick Region, there is insufficient justification to support the inclusion of Lincoln or Warren County in the non-attainment boundary.

Evaluation Criteria		Conclusion
3.	Monitoring data representing ozone concentrations in local areas and larger areas (urban or regional scale)	The violating monitor located in Foley is heavily influenced by transport emissions. Therefore, we conclude that there is insufficient justification to support the inclusion of Lincoln or Warren County in the non-attainment boundary.
4.	Location of emission sources (emission sources and nearby receptors should generally be included in the same non-attainment area)	There have been no recent major sources permitted or EGUs constructed in the region. Therefore there is insufficient justification to support the inclusion of Lincoln or Warren County in the non-attainment boundary.
5.	Traffic and commuting patterns	There is a certain amount of connectivity between Lincoln and Warren counties and the current non-attainment boundary. However the degree of connectivity and the influence of this connectivity is insufficient justification to support the inclusion of Lincoln or Warren County in the non-attainment boundary.
6.	Expected growth (including extent, pattern and rate of growth)	The population of Lincoln and Warren counties is expected to continue to increase. The percentage of population growth in the region is significant, however, the total number of people residing in, or projected to reside in Lincoln and Warren counties is insufficient justification to support the inclusion of Lincoln or Warren County in the non-attainment boundary.
7.	Meteorology (weather/transport patterns)	There is insufficient justification to support the inclusion of Lincoln or Warren County in the non-attainment boundary.
8.	Geography/topography (mountain ranges or other air basin boundaries)	There is insufficient justification to support the inclusion of Lincoln or Warren County in the non-attainment boundary.
9.	Jurisdictional boundaries (e.g., counties, air districts, existing 1-hour non-attainment areas, Reservations, etc.)	The current non-attainment boundaries were adopted in 2003 and did not include Lincoln or Warren counties. There is still insufficient justification to support the inclusion of Lincoln or Warren County in the non-attainment boundary.
10.	Level of control of emission sources	There is insufficient justification to support inclusion of Lincoln or Warren County in the non-attainment boundary.
11.	Regional emission reductions (e.g., NOx SIP call or other enforceable regional strategies)	There is insufficient justification to support the inclusion of Lincoln or Warren County in the non-attainment boundary.

A Celebration of the Centuries
FARMINGTON, MISSOURI
CHAMBER OF COMMERCE

Farmington Chamber of Commerce

302 N. Washington, P. O. Box 191
Farmington, MO 63640
Phone 573-756-3615 Fax 573-756-1003

November 20, 2008

Missouri Air Conservation Commission
PO Box 176
Jefferson City, MO 65102

Dear Members of the Commission:

The Farmington Chamber of Commerce and its' 360 + members have recently been made aware of a proposal to include St. Francois County in the St. Louis nonattainment area. There are a number of concerns that the St. Francois County business community would like to express regarding this proposal.

We are very disappointed that no public information meetings or hearings have been held in St. Francois County regarding the nonattainment designation, and the public is largely completely oblivious to the proceedings. We have been given no information, whatsoever, regarding what rules and regulations may or may not be imposed on businesses and individuals in our area, what the potential financial impact could be, or how it might benefit our area, for that matter. In fact, we have been told nothing.

On October 21, 2008 a position paper prepared by Southeast Missouri Regional Planning and Economic Development Commission in consultation with URS Corporation was submitted to the Missouri Department of Natural Resources. The paper clearly argues that no monitor measuring nonattainment is located in St. Francois County. The paper further argues that data prepared by URS and by DNR staff both appear to show the opposite of the contention that St. Francois County is a "contributor" to the St. Louis Nonattainment Area ozone problem. In fact the highest readings for the Bonne Terre monitor are association with pollution coming from the St. Louis Nonattainment Area.

In short, the Farmington Chamber of Commerce fully supports the position paper as presented by Southeast Missouri Regional Planning. We ask that you reconsider the proposal to place St. Francois County in the St. Louis Nonattainment Area. We ask that if St. Francois County must be designated in a Nonattainment Area, in spite of the available data, we should, in fact, be placed in a separate Southeast Missouri Nonattainment Area, which would include counties with more ozone commonality, as well as geographic location to us.

We appreciate your consideration, and look forward to your favorable reply.

Respectfully,

David Buerck, President

Laura Raymer, 1st Vice President

Kevin Thurman, 2nd Vice President

Greg Redfield, Treasurer

Ursula J. Kthiri, Executive Director

Keven Harrington, Im. Past President

Kraig Sutherland, Director

Jerry Watson, Director

Gil Kennon, Director

Michele King, Director

Lisa Sumpter, Director

Mark Toti, Director

Mary McEntire, Director

Shawn Merritt, Director

Doug Smith, Director

Marco vanRaalten, Director

Jerry Weems, Director

Tim Barton, Director

Andrea Wohlschlaeger, Director

Greg Beavers, Ex-Officio Director

Jim
David
Jeff

Dme 12/8
MS

City of Farmington

110 West Columbia • Farmington, Missouri 63640-0110 • Ph. 573-756-1701
City Hall Fax 573-756-0611 • Public Works Fax 573-756-5161

December 2, 2008

RECEIVED
2008 DEC -8 PM 12:19
AIR POLLUTION
CONTROL PGM

Missouri Department of Natural Resources
Clean Air Conservation Commission
1659 East Elm Street
Jefferson City, Missouri 65101

Subject: Ground Level Ozone Non-Attainment Area

Enclosed herewith is a copy of a resolution adopted by the City of Farmington regarding the designation of St. Francois County as a Ground Level Ozone Non-Attainment Area. The position supported by City Council is consistent with the position represented by the Southeast Missouri Regional Planning Commission position paper on the issue.

At the request of the Farmington Chamber of Commerce, Jeffry D. Bennett addressed the membership of the Chamber of Commerce at its general membership meeting on November 20th, 2008. During his presentation, Mr. Bennett stated that the pollutant levels in St. Francois County originate in the St. Louis MSA. Based on this statement, it seems that the regulatory intent can best be achieved by placing more stringent regulations on the generating sources in the St. Louis MSA, and not imposing regulations on an otherwise compliant region.

During the process to develop the proposed regulations, the Missouri Department of Natural Resources did not conduct any public hearings in St. Francois County. Adopting regulations that have such significant impact on economic development and the daily lives of residents of an area without the opportunity for public input seems unjust and unreasonable. If further consideration regarding this matter is given, we respectfully request an opportunity for a public hearing process to be given in the affected county.

If additional information is required, please call.

Sincerely,

Jeannie Roberts

Jeannie Roberts, Mayor
City of Farmington

Jim David Jeff

Farmington Industrial Development Authority

110 West Columbia Street Farmington, MO 63640
Phone (573) 756-1701

December 1, 2008

Missouri Department of Natural Resources
Clean Air Conservation Commission
1659 East Elm Street
Jefferson City, Missouri 65101

(Via Facsimile: 573.751.2706)

Attention: Mark A. Foley, Chair

Subject: Ground Level Ozone Non-Attainment Area

Dear Mr. Foley:

Enclosed herewith is a copy of a resolution adopted by the Farmington Industrial Development Authority regarding the designation of St. Francois County as a Ground Level Ozone Non-Attainment Area.

The draft recommendation by the staff of MDNR includes recommendations for the inclusion of St. Francois County in the proposed non-attainment area. Inclusion of St. Francois County is not warranted based on the monitoring of air quality in the region. Moreover, MDNR staff has been unable to determine the regulations that will be imposed on the businesses and residents of St. Francois County if included in the non-attainment area. It is unconscionable to support inclusion of an area without prior determination of the specific regulations to be imposed, and will result in a significant negative impact on industrial growth and development in the region. Stagnation of economic growth will result in a declining quality of life for the residents of the area.

Prior to making the proposed determination to include St. Francois County, there were no public hearings conducted to allow the business community and local residents the opportunity to voice concerns about this onerous regulatory revision.

In summary, based on the potential negative impacts and lack of opportunities to be included in the policy making process, the Farmington IDA requests your support of our position that St. Francois County should remain attainment or unclassified. If further consideration regarding this matter is given, we respectfully request an opportunity for a public hearing process to be given in the affected county.

Sincerely,

Harry "Chip" Peterson
President

Copy: Kevin P. Engler, Senator 3rd District
Steven Tilley, Representative 106th District

A RESOLUTION OF THE FARMINGTON INDUSTRIAL DEVELOPMENT AUTHORITY REGARDING THE DESIGNATION OF CERTAIN COUNTIES IN SOUTHEAST MISSOURI AS GROUND LEVEL OZONE NON-ATTAINMENT AREAS.

WHEREAS, the United States Environmental Protection Agency released new standards in March 2008 regarding ground level ozone standards; and,

WHEREAS, these standards required a review of areas and jurisdictions designated as Nonattainment Areas at present; and,

WHEREAS, the Missouri Department of Natural Resources is the agency designated to undertake these reviews at the State level; and,

WHEREAS, the Southeast Missouri Regional Planning and Economic Development Commission, in cooperation with Perry County, Ste. Genevieve County, the City of Perryville, the City of Ste. Genevieve, and local private businesses has been engaged in a project to evaluate the process by which such reviews are being accomplished; and,

WHEREAS, under contract with the Southeast Missouri Regional Planning and Economic Development Commission, URS, Incorporated was retained to undertake an independent study and review of this issue; and,

WHEREAS, the report prepared by URS, Incorporated under this contract concluded that the designation of a Nonattainment Area to include Perry County and Ste. Genevieve Counties was the proper course to meet the guidelines of the United States Environmental Protection Agency; and,

WHEREAS, this report further concluded that there was no scientific basis for designating either Cape Girardeau County or St. Francois County as Nonattainment Areas; and,

WHEREAS, the draft Recommendation prepared by staff of the Missouri Department of Natural Resources includes recommendations for St. Francois County and Ste. Genevieve County to be included within an expanded St. Louis Nonattainment Area; and,

WHEREAS, the draft Recommendation prepared by staff of the Missouri Department of Natural Resources further includes recommendations that Cape Girardeau County be included with Perry County in a newly designated Southeast Missouri Nonattainment Area;

WHEREAS, staff of the Southeast Missouri Regional Planning and Economic Development Commission, in cooperation with staff from URS, Incorporated and after soliciting comments from a wide range of local government and private sector persons, has prepared a Position Paper responding to the Missouri Department of Natural Resources draft Recommendation; and,

WHEREAS, the Position Paper specifically recommends that St. Francois County and Cape Girardeau County be designated as Attainment or Unclassifiable areas; and,

WHEREAS, the Position Paper further recommends that Perry County and Ste. Genevieve County be included into a newly designated Southeast Missouri Nonattainment Area; and,

WHEREAS, this body is in full agreement with the Position;

NOW, THEREFORE, BE IT RESOLVED THAT THE BOARD OF DIRECTORS OF THE FARMINGTON INDUSTRIAL DEVELOPMENT AUTHORITY, fully supports the Position Paper; and,

BE IT FURTHER RESOLVED THAT THE FARMINGTON INDUSTRIAL DEVELOPMENT AUTHORITY, urges the Missouri Department of Natural Resources to review the Position Paper from the Southeast Missouri Regional Planning and Economic Development Commission, the supporting documentation, and the jurisdiction realities and to adjust their draft Recommendations to agree with the recommendations contained in the Position Paper prior to submitting these recommendations contained in the Position Paper prior to submitting these recommendations to the Missouri Air Conversation Commission on December 4, 2008.

BE IT ALSO RESOLVED that the Farmington Industrial Development Authority, through this Resolution, their firm belief that the recommendations in the Position Paper would enhance efforts to achieve the mutually agreed upon goals of cleaner air.

DULY READ AND PASSED THIS 24TH DAY OF NOVEMBER, 2008

Harry "Chip" Peterson, President

11/15/08

RECEIVED
2000 NOV 19 AM 11:44
AIR POLLUTION CONTROL PGM

Dear Sirs,

I am against ~~Bremen~~ St. Francois County into St. Louis non-attainment designation. We are not contributing to their pollution. It is not fair. If anything, they are polluting us.

Sincerely,
James Bartolin

Mr. James Bartolin
2770 Flannery Rd.
Park Hills, MO 63601

December 3, 2008

Missouri Air Conservation Commission
PO Box 176
Jefferson City, MO 65102

Greg Redfield
114 Walker Drive
Farmington, MO 63640
(573) 701-0700

To Whom It May Concern:

I am very much opposed to the proposal to include St. Francois County in the St. Louis Nonattainment Area.

Sincerely,

Greg Redfield

cc:

Mark A. Fohey
Jack C. Baker
Kevin Rosenbohm
Richard Rocha
Gary J. Pendergrass
Mark Garnett
Ronald Boyer

JO ANN EMERSON
MEMBER OF CONGRESS
8TH DISTRICT, MISSOURI

COMMITTEE:
APPROPRIATIONS

SUBCOMMITTEES:
AGRICULTURE, RURAL DEVELOPMENT, FOOD AND DRUG ADMINISTRATION AND RELATED AGENCIES
ENERGY AND WATER
HOMELAND SECURITY

E-Mail and Web Page:
http://www.house.gov/emerson

Congress of the United States
House of Representatives
Washington, DC 20515–2508

OFFICES:
SUITE 2440
RAYBURN HOUSE OFFICE BUILDING
WASHINGTON, DC 20515
(202) 225–4404

THE FEDERAL BUILDING
339 BROADWAY
CAPE GIRARDEAU, MO 63701
(573) 335–0101

612 PINE
ROLLA, MO 65401
(573) 364–2455

22 EAST COLUMBIA
FARMINGTON, MO 63640
(573) 756–9755

December 1, 2008

Mr. James L. Kavanaugh, Director
Air Pollution Control Program
Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65102

Dear Director Kavanaugh:

I am writing to express my strong objection for the designation of St. Francois, Perry, and Cape Girardeau counties as non-attainment counties.

You have received a position paper from the Southeast Missouri Regional Planning Commission (SEMO RPC) which highlights why St. Francois and Cape Girardeau counties need not be designated as non-attainment counties. Specifically, St. Francois County's designation as a non-attainment county is incorrect because Hwy 67 is in fact a major "through traffic" artery and Cape Girardeau County's designation is questionable because there is no monitor in Cape Girardeau County. These points are well articulated and defended in the SEMO RPC position paper and I will not reiterate them here. I would also include Perry County's pending status as disputable given the fact that there is ongoing litigation that could ultimately render any decision null and void.

We have an ever-expanding list of economic challenges facing southern Missouri. My constituents can ill afford at this time another inhibitor towards economic stability.

Sincerely,

JO ANN EMERSON
Member of Congress

cc: Honorable Matt Blunt, Governor, State of Missouri
Mr. Doyle Childers, Director, MDNR
Mr. Chauncey Buchheit, Executive Director, SEMO RPC

Russ Carnahan
3RD DISTRICT, MISSOURI

SENIOR WHIP

FOREIGN AFFAIRS COMMITTEE
VICE CHAIRMAN
INTERNATIONAL ORGANIZATIONS, HUMAN RIGHTS AND OVERSIGHT SUBCOMMITTEE
MIDDLE EAST & SOUTH ASIA SUBCOMMITTEE

TRANSPORTATION AND INFRASTRUCTURE COMMITTEE
AVIATION SUBCOMMITTEE
WATER RESOURCES & ENVIRONMENT SUBCOMMITTEE

SCIENCE AND TECHNOLOGY COMMITTEE
RESEARCH AND SCIENCE EDUCATION SUBCOMMITTEE

Congress of the United States
House of Representatives
Washington, DC

WASHINGTON OFFICE:
1710 LONGWORTH HOUSE OFFICE BUILDING
WASHINGTON, DC 20515
PHONE: (202) 225-2671
FAX: (202) 225-7452

ST. LOUIS OFFICE:
8764 MANCHESTER ROAD, SUITE 203
ST. LOUIS, MO 63144
PHONE: (314) 962-1523
FAX: (314) 962-7169

JEFFERSON COUNTY OFFICE:
517 BAILEY ROAD
CRYSTAL CITY, MO 63019
PHONE: (636) 937-8039
FAX: (636) 937-7138

ONLINE OFFICE:
http://www.house.gov/carnahan

c: Jim
Dave
Jeff

December 12, 2008

RECEIVED
2008 DEC 15 AM 11:35
AIR POLLUTION CONTROL PGM

Mr. James L. Kavanaugh, Director
Air Pollution Control Program
Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65102

Dear Mr. Kavanaugh,

I am writing to voice my concern and disagreement with the designation of Ste. Genevieve County as part of the Metropolitan Statistical Area (MSA) of St. Louis for the 8 Hour Ozone Non-Attainment Designation for the 2008 National Ambient Air Quality Designation as made by the Missouri Department of Natural Resources (MDNR). The inclusion of Ste. Genevieve in this designation violates both common sense and MDNR's own guidelines. However, I acknowledge that according to the monitoring data, St. Genevieve County is in non-compliance with the 8 hour ozone standards. Yet, it should not be included in the metropolitan area, but should have its own designation or be designated with the Southeast region.

First, as a common sense approach, Ste. Genevieve is both miles away from the physical metropolitan area and is culturally miles away in terms of industrial and population capacity. What industrial emission sources located in the county are already controlled through applicable permitting processes. By including them in the St. Louis MSA appears on its face to be applying two standards (the permitted emission and the non-attainment designation) to the county. Moreover, emission data indicate VOC emissions and NOx emissions are substantially less than Franklin County, the county with the lowest such emissions in the existing St. Louis non-attainment area and as such, should not be included in the designation.

Second, Ste. Genevieve County should not be included in the designation because it does not fit much of the criteria set forth by the Environmental Protection Agency EPA) as interpreted by MDNR. I note that Ste. Genevieve County was not included in the 2003 designation by MDNR which was approved by EPA after it had requested more information on Ste. Genevieve. I do not believe the county has changed much since that 2003 designation. Indeed, MDNR's report, Summary For Proposed Missouri Recommendation 8-hour Ozone Nonattainment Designations 2008 National Ambient Air Quality Standard states, "Ste. Genevieve County is much more rural in nature (population density and urbanization) and has a 2007 population of 17,841. . . . Ste. Genevieve County has no projected population growth between 2000 and 2020." The rural aspect of Ste. Genevieve should, in and of itself, be a determining factor to NOT include it in the St. Louis MSA.

Further, the report also confusingly states that Ste. Genevieve's NOx emissions contribute to St. Louis' *downwind* monitors while Ste. Genevieve's monitor is, in fact, upwind from St. Louis. Finally, the report also acknowledges that polluted wind from St. Louis contributed to the monitor readings in Ste. Genevieve, and for that, Ste. Genevieve was included in the non-attainment area. It seems to be a reverse reading of the monitor in St. Genevieve.

I recognize that Ste. Genevieve is out of compliance with the 8 hour ozone regulations. Yet, it should be designated as a single non-compliant county and be able to do deal with this issue on a county-wide basis rather than be included in the area-wide St. Louis designation. I urge your reconsideration of this matter.

Thank you for your time and consideration of this issue.

Sincerely,

Russ Carnahan
Member of Congress

ROOM #1

HOURS
8:30 A.M. - 12:00 NOON
MONDAYS & THURSDAYS

PHONE #
1-573-883-7202 • 1-800-894-8125
Fax: 573-883-5312

GARRY L. NELSON
District #1 Commissioner

County Commission
OF
STE. GENEVIEVE COUNTY
55 S. Third Street
Ste. Genevieve, Missouri 63670

ALBERT J. FULTS
Presiding Commissioner

COUNTY SEAL

RAY H. GETTINGER
District #2 Commissioner

September 2, 2008

c: Floyd
Dan
Jim

Missouri Department of Natural Resources
Attn: Doyle Childers
1101 Riverside Dr.
PO Box 176
Jefferson City, MO 65102

Dear Doyle,

Ste Genevieve County and Perry Counties are rural communities with about 18,000 populations in each, and many of the families are involved with farming.

Both counties are involved in several organizations that work for the betterment of our communities. Both are active in the Southeast Solid Waste District, the Southeast Regional Planning Commission and the Southeast Missouri Workforce Investment Board. We are also active on the Transportation Advisory Committee, which works to plan highway construction in District 10 which is headquartered in Sikeston. We are working now with a newly formed air quality advisory committee of the SEMO RPC to find reasonable ways to address ozone issues. We feel we should NOT be non-attainment, but if that designation proves necessary, we certainly do not belong in an area with the St. Louis Region.

All of these organizations are an important part of planning for our area, which is mostly rural. We have worked hard to make improvements in the lives of the people in our area and we need to keep working with these groups to continue these improvements.

To be thrown in with the St. Louis non-attainment area would be a disaster as far as the planning and cooperation between the counties that we now have.

The Bonne Terre monitor is really not representative of Ste. Genevieve County. Located in the far western part of the county, it would monitor transport air and not the air of Ste. Genevieve County.

Regards,

Albert J. Fults

c: David
Jim
Jeff

CAPITOL OFFICE
State Capitol
201 West Capitol Avenue
Jefferson City, MO 65101-6806
Tele: (573) 751-7735
Fax: (573) 522-2466
E-Mail: joe.fallertjr@house.mo.gov

DISTRICT ADDRESS
19840 Lakeview Drive
Ste. Genevieve, MO 63670
Tele: (573) 883-3963

COMMITTEES
Member:
Administration and Accounts Committee
Fiscal Review Committee
Transportation Committee

MISSOURI HOUSE OF REPRESENTATIVES
JOSEPH FALLERT, JR.
State Representative
District 104

RECEIVED
2008 DEC 11 AM 11:55
AIR POLLUTION
CONTROL PGM

December 8, 2008

Mr. James L. Kavanaugh, Director
Air Pollution Control Program
Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65102

RE: Statement to Missouri Air Conversation Commission
8-Hour Ozone Standard Boundary Recommendation

Dear Mr. Kavanaugh;

As I stated before the Missouri Air Conversation Commission, I'm submitting the following written statement for consideration. My comments are intended to fully support the position of the Southeast Missouri Regional Planning & Economic Development Commission.

As Mr. Bennett pointed out during his presentation, we are talking about two very different regions. One very heavily populated urban area, St. Louis Metro; and Ste. Genevieve County, a very rural, low population growth area which has low connectivity to the I-55 corridor. Ste. Genevieve County has no involvement with the St. Louis Metro area, which is governed by the East-West Gateway Council, but has a long history with Southeast Missouri Regional Planning Commission.

I ask that you seriously consider Mr. Buchheit and the Southeast Missouri Regional Planning Commission's recommendations for all the counties included in the Southeast region. They provide logical and reasonable solutions to address the non-attainment situation for a rural region. As DNR Director Childers recently stated in an article in the DNR monthly publication, "*Protecting Missouri's Natural Resources*", "No one questions that ozone is a problem that must be addressed to protect the health of Missouri citizens. However, a one-size-fits-all solution won't work for the East Coast, West Coast and Midwest." The same applies to the comparisons of the St. Louis Metro area and the four counties of Southeast Missouri.

I again thank you for your time and consideration of the recommendations of the Southeast Missouri Regional Planning Commission..

Sincerely,

JOSEPH FALLERT, JR.
State Representative

cc: Mr. Doyle Childers, Director, MO Department of Natural Resources
Ms. Leanne Tippett Mosby, MO Department of Natural Resources
Mr. Chauncy Buchheit, Executive Director, SEMO Regional Planning Commission
Ste. Genevieve County Commission
Air Conservation Commissioners, MO Department of Natural Resources

Southeast Missouri
REGIONAL PLANNING & ECONOMIC DEVELOPMENT COMMISSION

1 WEST ST. JOSEPH ST. • P.O. BOX 366 • PERRYVILLE, MO 63775
(573) 547-8357 • FAX (573) 547-7283
E-MAIL semorpc@semorpc.org • WEBSITE www.semorpc.org

October 27, 2008

Mr. James L. Kavanaugh, Director
Air Pollution Control Program
Missouri Department of Natural Resources
P. O. Box 176
Jefferson City, Missouri 65102

Dear Mr. Kavanaugh:

Enclosed is a Position Paper prepared by staff of the Southeast Missouri Regional Planning and Economic Development Commission in consultation with staff from URS, Inc. I trust that this is self-explanatory, and so I will not belabor it here. I did, however, want to take a couple of minutes of your time to emphasize two points.

First, we are concerned that implementation of the recommendations in the DNR daft entitled *Summary for Proposed St. Louis/Southeast Missouri Recommendation* published at http://www.dnr.mo.gov/env/apcp/ozone/8hourdesignationprocess.htm as written would be counterproductive in our efforts to provide cleaner air for our citizens. Efforts needed by rural areas would certainly be lost in urban requirements. This is reality, and it is an issue with which I deal on a daily basis.

Second, it is our firm belief that the DNR draft recommendations are in error based on the science in the case of St. Francois County and Cape Girardeau County. We accept the requirement to designate Ste. Genevieve and Perry Counties as Nonattainment Areas based on EPA guidelines, although we continue to dispute this designation on the basis of common sense. We are strongly opposed to including Ste. Genevieve County into the St. Louis Nonattainment Area for the reasons specified in the Position Paper.

Thank you for your time and attention.

Sincerely,

Chauncy D. Buchheit
Executive Director

cc: Mr. Doyle Childers, Director, MDNR
Ms. Leanne Tippett Mosby, MDNR
U. S. Senator Christopher S. Bond
U. S. Senator Claire McCaskill
Congresswoman JoAnn Emerson
Congressman Russ Carnahan
State Senator Kevin Engler, District 3
State Senator Jason Crowell, District 27
State Representative Joseph Fallert, Jr., District 104
State Representative Steven Tilley, District 106
State Representative Brad Robinson, District 107
State Representative Belinda Harris, District 110
State Representative Scott Lipke, District 157
State Representative Mary Kasten, District 158
State Representative Billy Pat Wright, District 159
State Representative Ellen Brandom, District 160

Position Paper

in response to

Missouri Department of Natural Resources

Draft Recommendations Regarding Designation of Nonattainment Areas Under new Ground-Level Ozone Standards

Prepared by:

Southeast Missouri Regional Planning and
Economic Development Commission

In consultation with:

URS Corporation

October 21, 2008

Introduction

Elected officials, private sector representatives, and staff from the Southeast Missouri Regional Planning Commission have been involved in the Nonattainment Area designation process since it was initiated in April, 2008 after new standards were published by the U.S. Environmental Protection Agency (EPA). This involvement has included attending all informational meetings hosted by the Missouri Department of Natural Resources (DNR) regarding the St. Louis Nonattainment Area since officials from Ste. Genevieve County were invited to attend those meetings. Additionally, the Regional Planning Commission hosted the first two meetings regarding Ste. Genevieve and Perry Counties and what ultimately became the potential Perry/Cape Girardeau County Nonattainment Area.

Concern about this issue was strong enough that a Working Group was established. This Working Group included representatives from county and city governments in Perry and Ste. Genevieve Counties, representatives from the private sector, staff from the Southeast Missouri Regional Planning Commission, and representatives of U.S. Senators and Representatives. The Working Group agreed to contract with URS Corporation, a well respected engineering firm, to study the question of Perry County and Ste. Genevieve County monitors and to prepare recommendations regarding this process. That report was submitted to DNR prior to the publication of the DNR Staff Draft Recommendations.

With the publication of Draft Recommendations prepared by DNR staff, it is apparent that the recommendations and input from this group have been effectively ignored. To address this, one more meeting of the Nonattainment Working Group was held, with attendance from a broad cross-section of the public and private sectors within the affected counties. This meeting included representation from Cape Girardeau and St. Francois Counties, both of which had previously been relatively silent on the issue. The preparation of this Position Paper was the result of that meeting. This paper represents what is, in effect, the last effort to convince DNR staff to amend their recommendations before submitting them to the Missouri Air Conservation Commission.

Purpose and Scope

The purpose of this Position Paper is to present a case which will convince DNR staff to amend their recommendations regarding the designations of Cape Girardeau, Perry, St. Francois, and Ste. Genevieve Counties in regard to Nonattainment Areas. In scope it deals with only those four counties. The technical issues are presented only in terms of areas where there are questions or disagreements with conclusions drawn from data presented. In these cases, where there is more than one possible interpretation, the case is made for an alternative interpretation.

The issue of jurisdictions and political associations is addressed more fully than previously. The Working Group and the staff of the Southeast Missouri Regional Planning Commission believe that these are important considerations. It appears, from answers received in open meetings, that these issues were given a cursory review at best during the DNR staff review.

The following sections present a county-by-county assessment. Where there are areas of agreement with the DNR staff recommendations, they are noted. Where there are questions or plain disagreements, those are noted with explanations for the basis of the questions or disagreements.

Areas of Agreement

Ste. Genevieve County:

It is accepted that the designation of Ste. Genevieve County as a Nonattainment Area is necessary given EPA guidance.

Perry County:

It is accepted that the designation of Perry County as a Nonattainment Area is necessary given EPA guidance.

Areas in Question and Disagreement

Cape Girardeau County:

1. It is not at all clear that the case for designating Cape Girardeau County is made convincingly. Cape Girardeau County is included because it has been described as an "MSA" that borders a county with a noncompliant monitor and the MSA is by definition the presumptive boundary for 8-hour NAAQS Nonattainment Areas. However, EPA's recommendation is for inclusion of Metropolitan Statistical Areas (MSAs) or the Consolidated Metropolitan Statistical Area (C/MSA). No area within Cape Girardeau County meets the definition of a Metropolitan Statistical Area, which is an urban area containing over 50,000 people. Therefore, Cape Girardeau is not listed by OMB as a Metropolitan Statistical Area.

   It is believed that EPA presumes that metropolitan areas need to be considered because of their high population density, traffic congestion and concentrated industrial areas. It is further believed that EPA set the Metropolitan Statistical Area as the presumptive source of pollution, due to historic bad air in major metropolitan areas and a concentration of large emission sources. Cape Girardeau is not a major metropolitan area, is not a source of heavy industrial pollution and not a source of heavy traffic congestion. While OMB lists Cape Girardeau and surrounding counties as a Micropolitan Statistical Area, no EPA requirements to include Micropolitan areas have been cited. No compelling case for inclusion of Cape Girardeau County has been made.

   In addition, the following also relates to Cape Girardeau County:

   A. No monitor measuring nonattainment is present in the County.

B. The identifiable point sources are already controlled and the amounts of emissions inventoried are relatively low.

C. The meteorological data is arguable.

i. The supporting documentation provided by DNR staff (DNR Exhibit 1) presents a picture that suggests a primary inflow to the Farrar site from the east rather than from the South.

ii. Back trajectories analyses prepared by URS (URS Exhibit 1) similarly suggest importation of ozone from areas much more remote than Cape Girardeau County, primarily from the East.

2. Based on these factors, Cape Girardeau County should not be designated as a Nonattainment Area.

Additional Areas of Disagreement

St. Francois County:

1. No monitor measuring nonattainment is located in St. Francois County.

A. The Bonne Terre monitor cited in staff reports is located in Ste. Genevieve County.

B. While a monitor is near to St. Francois County, the assertion made that St. Francois County is identified as a Nonattainment Area based on a monitor located within the county is simply incorrect.

2. The conclusion drawn by DNR staff that St. Francois County "contributes" to ozone in the St. Louis Nonattainment Area is, at best, arguable, if not outright incorrect.

A. The inventory of emissions sources clearly shows relatively small amounts being produced in St. Francois County.

B. The contention by DNR staff that there is "no Interstate Highway through traffic" is technically correct, but arguable.

i. Major improvements have been made to U.S. Highway 67, including completion of a divided four lane highway through St. Francois County, with additional projects now underway to construct interchanges and to limit access to the highway.

ii. With this improvement providing four-lane limited access connections to I-55 at Festus, U.S. 67 has become a primary arterial

in the area and will be more and more so as additional improvements are completed, resulting in rapid traffic movement through the County.

iii. These improvements are underway to Poplar Bluff, and future plans call for this arterial to be extended to the Arkansas State Line and beyond.

iv. At present, then, it is clear that a significant portion of traffic on this arterial is "through" traffic generated from the south and west of St. Francois County.

C. While there is some "connectivity" between St. Francois County and the St. Louis Nonattainment Area, the total number of vehicles commuting from St. Francois County into the metropolitan area is miniscule when compared to the overall metropolitan traffic. Similarly, while the numbers of persons commuting to the St. Louis MSA from St. Francois County is significant for St. Francois County it is insignificant in terms of overall employment within the St. Louis MSA.

D. The data prepared by URS and by DNR staff both appear to show precisely the opposite of the contention that St. Francois County is a "contributor" to the St. Louis Nonattainment Area ozone problem.

i. DNR data presented as DNR Exhibit 2 demonstrates that the highest readings for the Bonne Terre monitor are associated with pollution coming from the St. Louis Nonattainment Area or other points to the east, and clearly not from St. Francois County.

ii. URS data presented as URS Exhibit 2 shows a very similar pattern in spite of using different methodology. Again, high reading days for the Bonne Terre monitor are clearly associated with inflow from the north and east. Essentially no local pollution is linked to these high reading days.

E. Based on these considerations, St. Francois County should not be designated a Nonattainment Area.

Ste. Genevieve County:

1. Regarding Ste. Genevieve County, EPA guidance requires that the county be designated nonattainment, but the Regional Planning Commission seriously disagrees with placing Ste. Genevieve County into the St. Louis Nonattainment Area.

A. A noncomplying monitor is located in Ste. Genevieve County. Therefore EPA guidelines require that the county be designated as a Nonattainment Area.

B. While there is connectivity between Ste. Genevieve County and the St. Louis Nonattainment Area, the absolute numbers of commuters is low.

C. The county is very rural.

D. The high point source emissions levels are clearly identifiable to a limited number of industries and these are already controlled through the permitting process.

E. Total VOC emissions are less than half of those in Franklin County, the county with the lowest total VOC emissions in the existing St. Louis nonattainment area.

F. Total NO_x emissions are less than 70% of those in Franklin County, the county with the lowest total NO_x emissions in the existing St. Louis nonattainment area.

G. According to DNR's information supporting the draft designation recommendation, approximately one third of the total NO_x emissions from Ste. Genevieve County are accounted for by a new source that is not yet fully built. When that source goes into operation, it will employ control equipment that represents Innovative Control Technology (ICT) a level of control that is higher than Best Available Control Technology (BACT), the level of control normally required of a new source. This is a significantly higher level of control than would be required on existing sources in a nonattainment area.

H. It is likely that the St. Louis area will be designated as a moderate nonattainment area under the new ozone standard. Section 182 of the Clean Air Act requires that attainment plans for moderate nonattainment areas include automobile emission inspection and maintenance and stage 2 vapor recovery at gas stations that sell more than 10,000 gallons of gasoline a month. DNR staff has acknowledged that these controls do not make sense for Ste. Genevieve County; yet, under the current recommendation, the Clean Air Act would require these controls. At best, considerable resources would have to be spent to develop a rationale as to why these controls would not be required in Ste. Genevieve County and at worst, these controls that would have a negligible effect on ozone levels would be required in a rural county that has a growth projection of 0% over the next several years.

I. There would have to be considerable resources invested to determine how transportation conformity analyses would be conducted since the East-West

Gateway Council of Governments (EWGCOG) is presently responsible for conformity analyses in the St. Louis nonattainment area. An easier and more beneficial transportation / air quality planning process could be carried out if EWGCOG continues this function in the St. Louis nonattainment area and the Southeast Missouri Regional Planning Commission carries out this function in the area that it serves. It is for reasons such as this that EPA guidance calls for consideration of jurisdictional boundaries.

J. EPA devised a mechanism called Early Action Compacts as part of their guidance for attainment planning for the previous ozone standard. This mechanism that could lead to emissions reductions sooner than would otherwise be the case would likely not be available if Ste. Genevieve County were part of the St. Louis nonattainment area.

2. Based on these considerations, while EPA guidelines require the designation of Ste. Genevieve County as a Nonattainment Area, the interests of cleaner air will be better served by simply designating the County as a Nonattainment Area but not including it in the metropolitan St. Louis Nonattainment Area.

A. During the presentation on September 30th, the question of "political jurisdictions" was raised. DNR staff response was that this had been "considered," but the clear impression was that it was a very minor consideration. Political jurisdictions are a significant consideration. The DNR should re-evaluate the importance of long-standing political jurisdictions.

i. Ste. Genevieve County, as is the case with virtually all small rural counties, has a suspicion of larger metropolitan areas, making cooperation and coordination difficult.

ii. Existing institutions, including the Southeast Missouri Regional Planning Commission, have a long history of providing a forum for cooperative approaches to problems. Other examples of this type of cooperation include the Southeast Missouri Solid Waste Management District and the Southeast Missouri Transportation Advisory Committee just to mention two.

iii. The Southeast Missouri Regional Planning Commission recently approved the creation of an Air Quality Committee, which will be available to serve as a vehicle for addressing Nonattainment Area issues.

iv. The Missouri Department of Transportation District 10 oversees State and Federal highway and transportation projects in Cape Girardeau, Perry, St. Francois and Ste. Genevieve Counties.

v. The Southeast Missouri Economic Development District, under the auspices of the U.S. Economic Development Administration was one of the earliest such Districts formed. It reflects a long standing commitment to a regional approach and cooperation. Documents such as the Comprehensive Economic Development Strategy (which replaced the Overall Economic Development Program) have a long history of formalizing this mutual support and cooperation.

vi. The Delta Regional Authority was created specifically to promote transportation and economic development within the "delta" region. The northern boundary of the Delta Regional Authority service area is the northern border of Ste. Genevieve County. This provides yet another example of an organization that has recognized the clear differences between the rural areas and the metropolitan St. Louis area.

B. As a rural area, there is virtually no area of overlap between Ste. Genevieve County solutions and implementation strategies and those appropriate for the metropolitan St. Louis Nonattainment Area.

Summary and Conclusions

1. EPA Guidelines require the designation of Perry and Ste. Genevieve Counties as Nonattainment Areas.

2. The designation of Cape Girardeau County as a Nonattainment Area is wrong. The County should be designated as Attainment or, at worst, Unclassified.

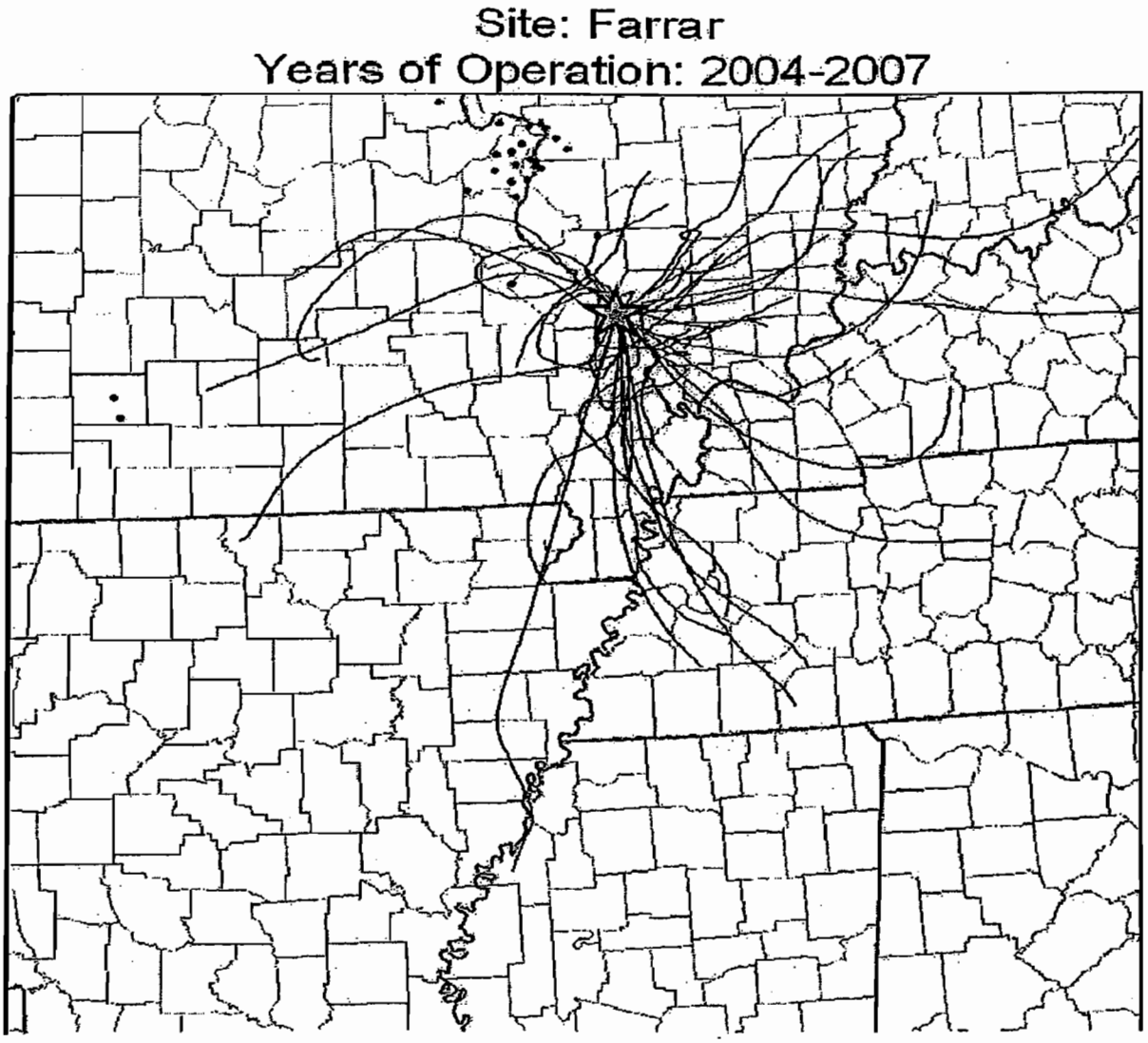
3. The designation of St. Francois County as a Nonattainment Area is in error. The County should be designated as Attainment.

4. The inclusion of Ste. Genevieve County in the St. Louis Nonattainment Area does little to promote cleaner air and the alignment with St. Louis should be reconsidered.

5. The structure of Missouri Department of Transportation Districts also supports the aligning of counties on either metropolitan or urban boundaries. District 10 includes Perry, St. Francois, Ste. Genevieve and Cape Girardeau Counties. The Southeast Missouri Transportation Advisory Committee recommends highway construction projects in these four counties. Under the structure presented by DNR staff, St. Francois and Ste. Genevieve Counties could be shifted into MoDOT District 6 and find themselves included in the East-West Gateway Metropolitan Planning Organization service area. Since these two counties are not part of the East-West Gateway Council of Governments, very little attention would be given to the two county's transportation needs, nor to assisting these two counties with projects to support cleaner air.

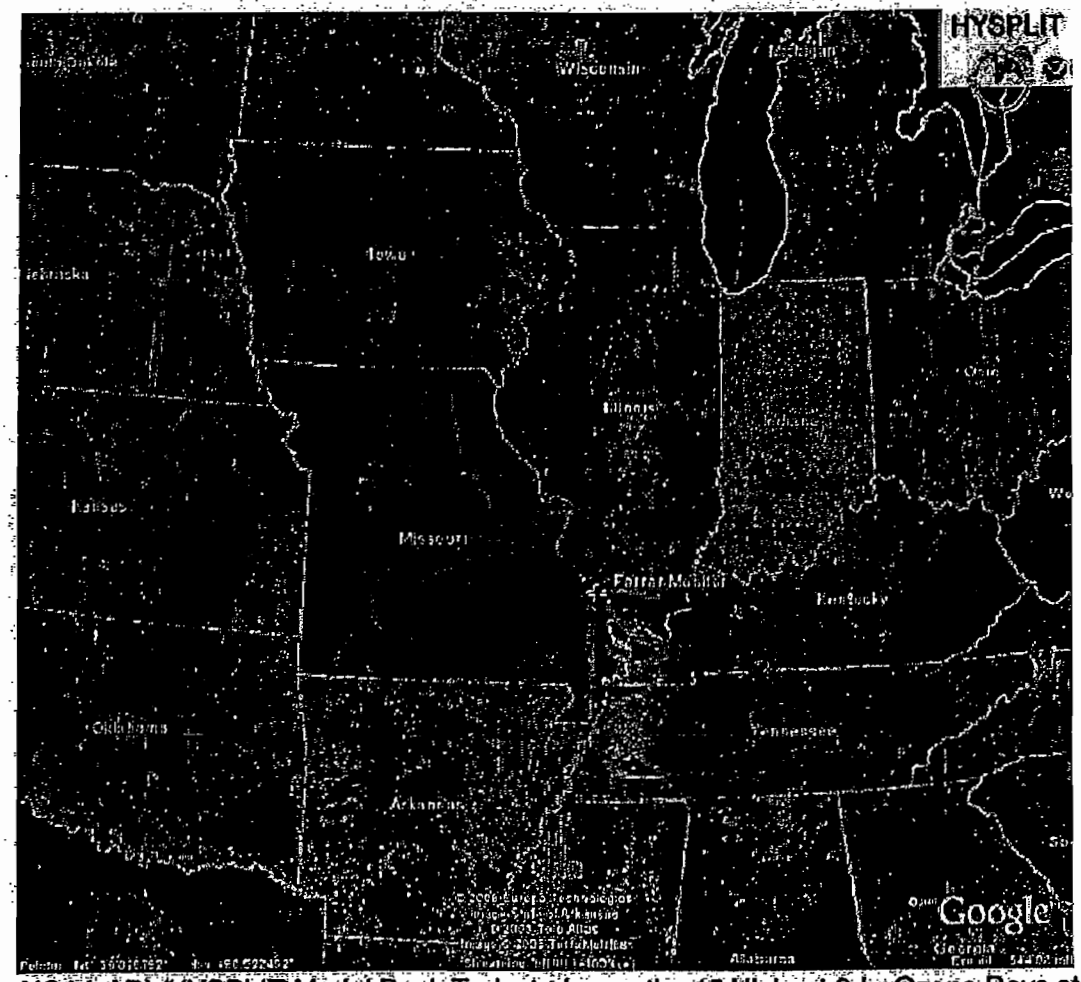
6. A Southeast Missouri Nonattainment Area, to include Perry and Ste. Genevieve Counties should be formed. The potential for achieving consensus and implementing policies or programs will be greatly enhanced when these rural counties are allowed to work together rather than simply be thrown into an unfamiliar and even actively hostile urban-oriented structure.

DNR Exhibit 1



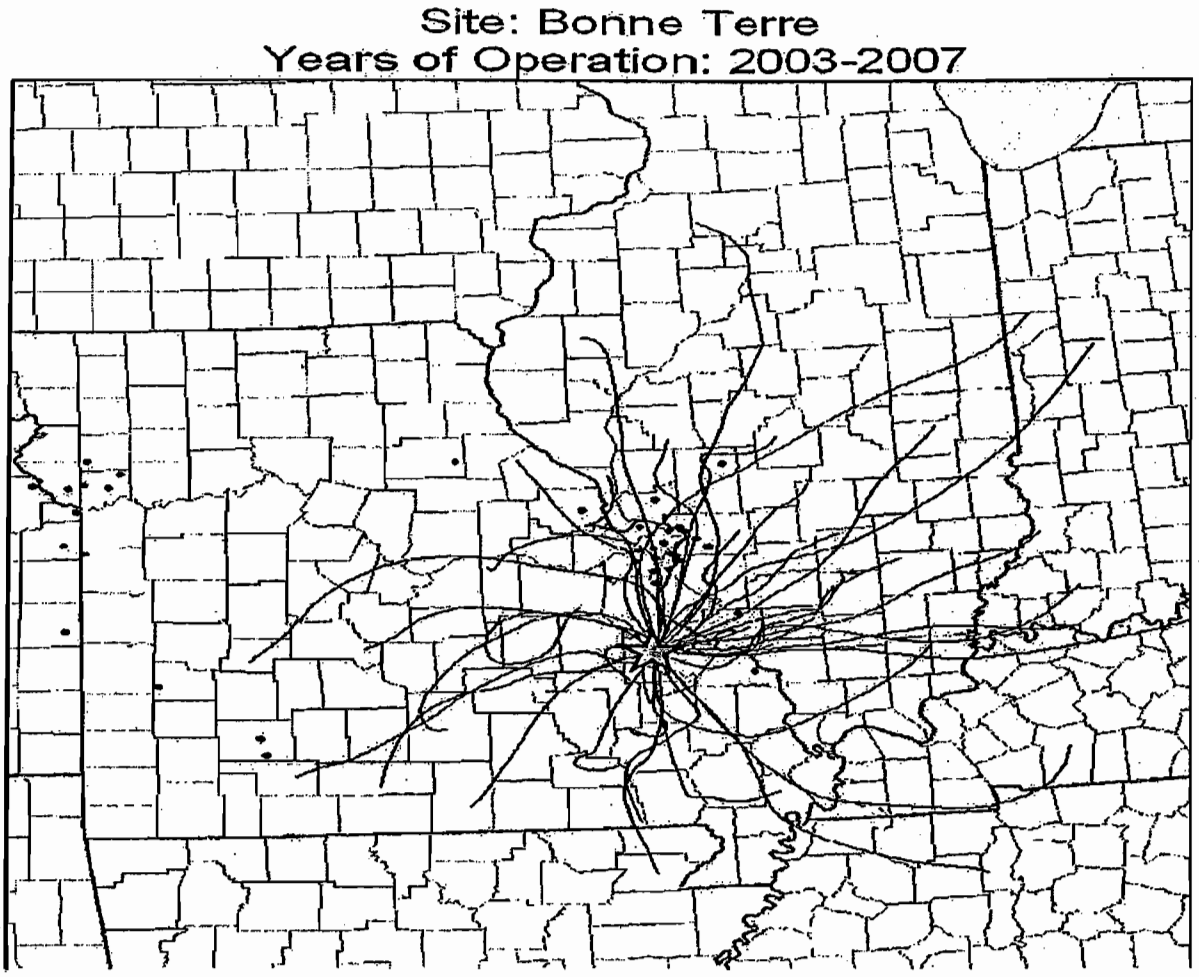
DNR back azimuth study of wind patterns on highest ozone days recorded at the Farrar Monitor.

URS Exhibit 1



NOAA ARL/HYSPLIT Model Back Trajectories on the 15 Highest 8-hr Ozone Days at the Farrar Monitor

DNR Exhibit 2



DNR back azimuth study of wind patterns on highest ozone days recorded at the Bonne Terre Monitor.

URS Exhibit 2

Conditional probability function (CPF) plots of hourly ozone at Arnold, Bonne Terre and Farrar.

MISSISSIPPI™ LIME

Discovering what's possible with calcium

Kimberly S. Lagomarsino, PhD - Director, Environmental Affairs
16147 U.S. Highway 61, Ste Genevieve, MO 63670
(573) 883-4046 Fax (573) 883-4363

November 13, 2008

Mr. Mark A. Fohey
MACC Chairman
8760 County Rd. 422
Hannibal, MO 63401

Mr. Mark Garnett
MACC Member
10363 County Rd. 9510
West Plains, MO 65775

Mr. Gary J. Pendergrass, P.E., R.G.
MACC Vice-Chairman
4032 S. Gatlin Court
Springfield, MO 65807

Mr. Richard Rocha
MACC Member
Bayer Crop Science LP
8400 Hawthorn Road
Kansas City, MO 64120

Mr. Jack C. Baker
MACC Member
Rt. 1, Box 259
Butler, MO 64730

Mr. Kevin Rosenbohm
MACC Member
18358 395th St.
Graham, MO 64455

Mr. Ronald Boyer
MACC Member
5654 E. State Highway AF
Fair Grove, MO 65648

Subject: **Position Concerning MDNR Draft Recommendations**
Designation of Ozone Non-Attainment Areas
Mississippi Lime Company
Ste. Genevieve, MO

Reference: **1) *Position Paper in response to Missouri Department of Natural Resources['] Draft Recommendations Regarding Designation of Nonattainment Areas Under New Ground-Level Ozone Standards*, Southeast Missouri Regional Planning and Economic Development Commission in consultation with URS Corporation, October 21, 2008.**
2) Letter to Mr. Chauncy D. Buchheit, Executive Director, Southeast Missouri Regional Planning and Economic Development Commission from Mr. James L. Kavanaugh, Director, Missouri Department of Natural Resources, November 4, 2008.

Dear Missouri Air Conservation Commissioners:

This correspondence is in response to the referenced documents (also attached) in which: 1) the Southeast Missouri Regional Planning and Economic Development Commission (SEMORPC) commented on Missouri Department of Natural Resources (MDNR) recommended designations of nonattainment areas under the 2008 ground-level ozone standards, and 2) the MDNR rejected suggestions put forth by SEMORPC concerning such recommended designations.

Mississippi Lime Company accepts as appropriate that Ste. Genevieve County be designated a nonattainment area, as determined by the MDNR based on data collected at the ozone monitor in western Ste. Genevieve County. However, we respectfully disagree with the MDNR's recommended designation of including Ste. Genevieve County in the St. Louis Ozone Nonattainment Area.

The SEMORPC *Position Paper* presents thorough rationale for not including Ste. Genevieve County in the St. Louis Ozone Nonattainment Area. And while we concur with the noted points and whole-heartedly support SEMORPC's positions, it is our estimation that the below arguments – taken directly from the MDNR's *St. Louis / Southeast Missouri Area Draft Technical Support Document*[1] – are particularly relevant to excluding Ste. Genevieve County from the St. Louis Ozone Nonattainment Area.

- Ste. Genevieve County is not located in the St. Louis Metropolitan Statistical Area (MSA) nor closely connected to the St. Louis MSA.

- The population growth rate and population for Ste. Genevieve County are low compared to other counties in the area, as well as counties in the St. Louis MSA.

- Ste. Genevieve County is rural and has only a small component of relatively high population density around the town of Ste. Genevieve. Also, Ste. Genevieve County has a population of less than 20,000 and a flat population projection between 2000 and 2020.

- Total VOC emissions within Ste. Genevieve County are less than half of those reported for the county with the lowest total VOC emissions in the existing St. Louis Ozone Nonattainment Area (i.e., Franklin County).

- Total NOx emissions within Ste. Genevieve County are less than 70% of those in Franklin County, the county with the lowest total NOx emissions in the existing St. Louis Ozone Nonattainment Area.

---

[1] The MDNR's *St. Louis / Southeast Missouri Area Draft Technical Support Document* corresponds to the MDNR's Summary *for Proposed Missouri Recommendation: 8-hour Ozone Nonattainment Designations, 2008 National Ambient Air Quality Standard.*

Additionally, we believe the below aspects, which have been communicated to the MDNR by the SEMORPC, are salient to our position that, while Ste. Genevieve County may be a nonattainment area, the county need not be included in the St. Louis Ozone Nonattainment Area.

- The conditional probability function plots of hourly ozone at the Arnold, Bonne Terre, and Farrar monitors indicate that all of these sites measure highest ozone concentrations when winds are from the east (not from Ste. Genevieve County as indicated by the MDNR) with air flows originating in the Ohio River Valley.[2]

- Long-standing political jurisdictions separate the St. Louis MSA and the rural counties, including Ste. Genevieve County, of southeastern Missouri. Although this matter has been elucidated to the MDNR as an issue of much importance, it is our impression that insufficient credence has been given this critical topic.

  Existing institutions, including the SEMORPC, the Missouri Department of Transportation – District 10, the Southeast Missouri Economic Development District, and the Delta Regional Authority were developed to focus actions specifically in the southeastern area of Missouri. Conversely, the East-West Gateway Council of Governments (EWGCOG) has been the lead air quality and transportation planning agency for the St. Louis MSA since 1977. Such examples of political jurisdictions exemplify the striking separation and distinct differences between rural southeastern Missouri, including Ste. Genevieve County, and the St. Louis MSA.

- Given the unique nature of the areas, it is obvious that dissimilar techniques will be required to improve air quality in southeastern Missouri, including Ste. Genevieve County, and in the existing St. Louis Ozone Nonattainment Area, which encompasses the majority of the St. Louis MSA.

Based on the comments presented herein, as well as those outlined in the SEMORPC *Position Paper*, it is our belief that those who live and work in Ste. Genevieve County would be better served by including the county into a newly created rural nonattainment area and NOT including Ste. Genevieve County in the St. Louis Ozone Nonattainment Area. In fact, Perry County, which borders Ste. Genevieve County to the southeast, is also designated a nonattainment area. As such, combining these two counties into a rural nonattainment area would enable air quality improvement endeavors to be implemented on a consistently rural basis as opposed to a disjointed rural and urban schematic.

---

[2] *Evaluation of Factors Related [to] the Eight Hour Ozone Attainment Status for Perry County & Ste. Genevieve County*. Prepared for Southeast Missouri Regional Planning Commission, Perryville MO. September 9, 2008. Prepared by URS Corporation, St. Louis, MO.

Mississippi Lime Company greatly appreciates your time and consideration of our position presented in this letter. Please contact me at (573) 883-4046 with questions or comments.

Sincerely,

Kimberly S. Lagomarsino, Ph.D.
Director – Environmental Affairs

cc: Mr. Doyle Childers, Director, MDNR
Ms. Leanne Tippett Mosby, MDNR
Mr. Roger Walker, REGFORM

"Kathy Andria" <kathyandria@gmail.com>
12/11/2008 03:15 PM

Subj: Comments on 2008 Ozone Boundary Recommendation

Mr. Bennett:

American Bottom Conservancy strongly supports the inclusion of Ste. Genevieve County as part of the St. Louis region 8-hour ozone nonattainment area.

Ste. Genevieve is the home of the new Holcim cement kiln, which is scheduled to begin operating in 2009. Holcim located its cement kiln right on the Ste Genevieve county line bordering nonattainment Jefferson County, thereby escaping stronger emission controls.

In your support document of projected NOx emissions for 2009, Ste. Genevieve will emit 30.2 tons of NOx PER DAY, which is more than 7 per cent of total NOx for the entire bi-state nonattainment region. As you indicate, the level of NOx emissions from Ste. Genevieve County is substantial and provides sufficient evidence that it contributes to the downwind monitors in St. Louis—and in Illinois.

Ste. Gen is immediately upwind of Illinois and the entire St. Louis nonattainment area. In fact, due to prevailing winds, Illinois will get most of the air pollution generated in Ste. Genevieve County.

We have thousands of children with asthma in St. Clair and Madison counties in Illinois and a high rate of heart and lung disease. The health of our families, especially our children, should outweigh all economic considerations put forth by Ste. Genevieve County and those opposed to its inclusion in the 8-hour ozone nonattainment area.

We appreciate that you included it in your proposed nonattainment area. Thank you for your consideration of our comments.

Kathy Andria, President

American Bottom Conservancy

P.O. Box 4242
Fairview Heights, IL 62208-4242

"Joyce Blumenshine" <joblumen@yahoo.com>
12/11/2008 03:02 PM

Subj.: Comments on 2008 Ozone Boundary Recommendation

TO: Mr. Jeff Bennett
Missouri DNR

RE: Comments in Support of Adding Ste. Genevieve County to the Nonattainment Area
for 8-hour Ozone Nonattainment Boundaries

Dear Mr. Bennett,

This letter is to request that Ste. Genevieve County be added to the 8-hour ozone Nonattainment boundaries
under consideration by your agency.

I am greatly concerned about the need to protect the elderly, young children, and individuals with asthma or
other breathing or health difficulties from the dangerous health impacts of ozone. It is essential that
accurate information be available for the considerations of human health and safety, and I urge that
Ste. Genevieve County be included in the Nonattainment Area.

Current issues in the county include an operating cement kiln, along with other industrial and polluting
sites that add huge amounts of ozone and other substances of concern to the area air. Other nonattainment
locations, such as St. Louis and Jefferson County are upwind of Ste. Genevieve. It is essential that Ste. Genevieve
be added to the Nonattainment Area so more awareness of the pollution load and impacts can be made. Pollution
from Ste. Genevieve impacts Illinois problem air locations, and I strongly urge this is an additional justification for
placing this county in the 8-hour ozone Nonattainment boundaries.

Thank you for your consideration of these remarks.

Sincerely,
Joyce Blumenshine
Conservation Committee Chair
Illinois Sierra Club
2419 E. Reservoir
Peoria, IL 61614-8029
309-688-0950
joblumen@yahoo.com

December 11, 2008

"Brian Urbaszewski" <burbaszewski@lungchicago.org>
12/11/2008 04:33 PM

Subj.: FINAL Comments on 2008 Ozone Boundary Recommendation

Re: **2008 Eight-Hour Ozone Boundary Recommendation**

Dear Mr. Bennett,

On behalf of my organization I would strongly encourage you to retain Ste. Genevieve County in the proposed St. Louis metropolitan nonattainment area for the new 0.075ppm/8hr ozone standard established by U.S. EPA earlier this year.

Ozone triggers asthma attacks, contributes to increased numbers of emergency room visits and hospitalizations, and has also been implicated in thousands of deaths annually. It continues to be a health problem on both sides of the border between our States and more effort will be needed to reduce emissions from sources both large and small. Reducing emissions from large industrial sources of emissions, including power plants, refineries and cement kilns will be critical to reducing ozone in coming years. Our understanding is that one source in Ste Genevieve County, the Holcim cement kiln, will by itself be allowed to emit over 30 tons of NOx per day into the bi-state region.

The fact that the facility is within a stones throw of the existing 0.08ppm/8hr ozone nonattainment boundary, which does not include Ste. Genevieve County, means that strategies to control emissions from local sources within a nonattainment area would not result in emissions reductions from this large facility and others in the County.

Thank you,

Brian Urbaszewski
Director of Environmental Health Programs
Respiratory Health Association of Metropolitan Chicago
(312) 628-0245 direct
(312) 243-3954 fax
Chicago's Lung Health Leader Since 1906

"Tyler Harris" <harrist@stlouiscity.com>
12/11/2008 09:53 PM

Subj: Comments on 2008 Ozone Boundary Recommendation

Dear Mr. Bennett:

I support the ozone non-attainment area designation as presented during the public meetings held at Powder Valley Nature Center and formalized in the SUMMARY FOR PROPOSED MISSOURI RECOMMENDATION document posted on the Missouri DNR website. I believe the process used to develop the proposed non-attainment area was open, transparent and technically sound. Specifically, I support the inclusion of Ste. Genevieve County in the non-attainment area. The nitrogen oxide emissions from large sources in that county contribute significantly to ozone formation in the St. Louis Metropolitan Area.

Thank you for your attention to this matter.

Tyler S. Harris
harrist@stlouiscity.com
(314) 613-7300

Tyler S. Harris
Chief of Permitting
City of St. Louis Air Pollution Control
1415 N. 13th Street
St. Louis, MO 63106
Tel.: (314) 613-7300
Fax: (314) 613-7275
Email: harrist@stlouiscity.com

"Caroline Ishida" <cishida@moenviron.org>
Sent by: caroline.ishida@gmail.com

12/11/2008 07:40 PM

Subj.: Comments on 2008 Ozone Boundary Recommendation

Mr. Bennett-

Please see the attached the attached comment letter regarding the 2008 8-hour Ozone Nonattainment Designations, submitted on behalf of Missouri Coalition for the Environment. Please feel free to contact me at this email or the phone number listed below if you have any questions or concerns.

Sincerely,
Caroline Ishida

Staff Attorney
Missouri Coalition for the Environment
6267 Delmar, Ste 2E
St. Louis, MO 63108
(314) 727-0600

MISSOURI COALITION FOR THE ENVIRONMENT
6267 Delmar Blvd. 2-E • St.Louis MO 63130 • 314-727-0600 Fax: 314-727-1665 • moenviron@moenviron.org • www.moenviron.org

December 11, 2008

Mr. Jeff Bennett
Missouri Department of Natural Resources
Air Pollution Control Program
P.O. Box 176
Jefferson City, MO 65101

Re: 8-hour Ozone Nonattainment Designations, 2008 National Ambient Air Quality Standard

Dear Mr. Bennett:

This letter is submitted on behalf of the Missouri Coalition for the Environment in response to the 2008 8-Hour Ozone Nonattainment Designations, and more specifically, to Ste. Genevieve County's inclusion in the St. Louis non-attainment area. Because of the significant impact Ste. Genevieve County has on the ambient air quality of the St. Louis region, the Coalition is in strong support of its designation as non-attainment.

Given the importance of improving air quality in Missouri, especially in the St. Louis region, it is imperative that Ste. Genevieve County be included among the counties listed as non-attainment for ozone in the St. Louis area. As you are aware, there is a Holcim, Inc. cement plant located near the border of Ste. Genevieve and Jefferson Counties, which is a significant source of area air pollution. Given the documented quantity of criteria pollutants that the Holcim facility emits each year, ignoring Ste. Genevieve County's contribution to ozone non-attainment in the St. Louis area would be a failure to account for a major contributor.

Certain comments on this issue currently posted on DNR's website suggest that, because of Ste. Genevieve County's population size and rural character, including it in the St. Louis non-attainment area is a mischaracterization of the County's emission contributions and would be a burden on local development. On the contrary, however, as stated in DNR's Summary for Proposed Recommendation, the County's contribution is notable. Page 11 of the Summary states, "The 2009 projected NOx emissions in Ste. Genevieve County are quite large, 30.2 tons per day, which account for over 7% of the total St. Louis nonattainment area inventory, and will be primarily generated from three large point sources in the county" (emphasis added). Additionally, as further stated in page 11 of the Summary, it is clear that emissions in Ste. Genevieve County contribute to

the readings on the downwind monitors in St. Louis. If DNR were to fail to consider the County's role in area non-attainment as a whole, it would misrepresent the collective contribution of the County's facilities and would make it extremely difficult, if not impossible, for the St. Louis region to be in attainment for ozone.

Additionally, given that NAAQS are set at levels "requisite to protect human health", it would be remiss to fail to include such a significant contribution to area ozone on the non-attainment list. 42 U.S.C. § 7409(b)(1). This is especially true because emitted pollutants have real potential for health consequences for area residents, both in St. Genevieve County and beyond. These health consequences, like asthma, are representative of the cost externalizations of area air emissions. Correctly recognizing and remediating non-attainment for ozone and other criteria pollutants in the County would be an affirmative step towards redressing pollutant-related illnesses.

Despite the percentage of the area population that Ste. Genevieve County comprises, it contributes significantly to criteria pollutants in the St. Louis region and therefore must necessarily be included among the ozone non-attainment counties in that area. Thank you for this opportunity to comment regarding the 8-hour Ozone Nonattainment Designations.

Sincerely,

Caroline C. Ishida, #58589
Staff Attorney
Missouri Coalition for the Environment

c: David
Jim
Jeff

Chief, Operations Section
Department of Natural Resources
Air Pollution Control Program
Director: Mr. James Kavanaugh

Terry & Kay Stewart
11045 Pleasant Heights
Bloomsdale, MO 63627

12/08/08

Dear Director Kavanaugh,

In regard to the proposed inclusion of Ste. Genevieve County in the St. Louis Ozone Nonattainment Zone (StLNA), it is our understanding that DNR 'Air Pollution Control' intends to recommend such inclusion.
We will attempt to express how *extremely* twisted and illogical this rational is by your department.

First: There are *not* enough strategically positioned 'air monitoring stations' within Ste. Genevieve County to *reasonably* make such determination, and *should be* the **first** initiative ***before*** making a determination!
Several years ago we recommended/**requested** an 'air monitoring station' to be placed at the Bloomsdale Elementary School in northern Ste. Genevieve County, and yet there is *not* one. The elementary school with our children and grand-children is ***'sandwiched'*** between Interstate 55 and US Highway 61 with Brickey's *quarry* within about 3 miles, and Holcim –*the world's largest cement plant*- within about 5 miles. An 'air monitoring station' at this location is ***imperative*** and *should be* the **first** initiative ***before*** making such an **imparity** determination!

Second: The DNR '*Air Pollution Control*' operates with a **retrogressive mentality!** To *approve* any/all "permits of operation" primacy, ***then*** see what **damage is done** is *not only* ***retrogressive*** it **is irresponsible!!**
With *all* the 'intellect' of the DNR, the Attorney General's office, etc., the ***allowing*** of Holcim and **so many** other ***industries and developments*** in the name of "***progress***" with the **'wait & see'** attitude in the ***global warming-climate change atmosphere*** in which we **live** is *not only* **irresponsible** *it is* **unconscionable!!**
With Holcim, as ***only one example***: (with *all* the 'intellect' considered!) it ***had*** to be known *prior to* their 'approval to permit' that by ***allowing*** their activity and the **removal of 1700 acres of carbon sequestering trees** it would ***automatically add 6800 metric TONS of carbon into our atmosphere annually!!!*** That's the equivalent to a fully loaded ***freight train***: 8818.48 TONS, or ***17,636,960 pounds of carbon!!!*** That's one hell-of-a ***'carbon footprint'!*** This does not take into account how ***much more carbon*** industries/developments and progress ***activities*** **add** to our atmosphere! Yet, they were ***allowed*** by the DNR 'Air Pollution Control' their 'permit to operate'!!
Now, after the fact, the **retrogressive mentality** wants to ***add*** yet *another burden* on the **people,** who are *against* such ***erroneous permitting,*** by the inclusion of our county with the St.LNA! ***And,*** without adequate monitoring ***prior to*** your decision!! Have you ever heard, "***Two wrongs*** **won't** ***make it right***"?!!

Terry & Kay Stewart
12/08/08

Third: The '*trickle-down*' mentality **MUST STOP!!!** It was *not* the decision of the ***people*** to **allow** the permitting of ***all*** the ***industries/developments and progress*** which **deplete** our **'AIR FILTERING, OXYGEN PRODUCING, EARTH COOLING TREES' thus *depleting our*** air quality!
With actions come consequences, and **their actions *should be* their consequences with them being accountable!!** Rather than an inclusion of the *entire county* with the St.LNA let the ***industries/developments and progress* 'pay the piper'!** Again, with Holcim as ***only one example***: if they were ***charged*** even ¼ per ***additional pound of carbon*** which is **now** being **un-sequestered** in our atmosphere that would amount to **$4,409,240.00 annually!!** How much ***more*** would it be with ***all industries/developments and progress* 'paying the piper'?!** Such revenue for ***their depletion of our environment*** would easily pay for ***more*** 'air monitoring stations', research, new innovations, ***the planting of*** **trees**, etc., etc.!!!

Fourth: Some would *attempt* to argue that, "***All the industries/developments and progress*** promote our economy with jobs, ***regardless*** of the **ill effects *to our environment***"! What a **JOKE** of a ***trade-off*****!!**
Have you seen the state of our economy?! And, yet ***more* economic burden** is being proposed ***on the people!***
As with Holcim, they are a *recent* and ***prime example in all scenarios,*** their investment of the $1 billion industry in northern Ste. Genevieve County with the *prelude promise* of about 250 jobs is all 'fine & well' (?), *until* you consider the ***fact*** that recently the company announced the **closing** of **two other American plants, including one in Clarksville, MO, which will result in a total layoff of about 340 employees!!** ***Where or what is the economic fortitude in* that?!** The closures of ***two existing plants*** which have ***already* depleted** our environment by their inception (***will they be mandated to replace thousands of acres of trees?!***) are now **closed** with **more jobs lost** than what the newest plant will produce!!
OH!! The **retrogressive mentality** ***and the* price we will *all pay!!! But,*** we should ***not all*** be **penalized** for ***judgments and actions of the* few *for the* few!**
The **one-sided, ill-informed, retrogressive, trickle down mentality MUST STOP!!**

In closing we ask that you ***reconsider*** the position of the inclusion of Ste. Genevieve County with the StLNA given the scenarios and ***facts***. We ask that all aspects be taken into consideration ***first, then give the responsibility and accountability to the perpetrators who are allowed to devastatingly* deplete *our air quality!***
"Thank you" for your time and consideration on this matter.

Sincerely,

Terry & Kay Stewart, Ste. Genevieve County

Terry Stewart, Kay Stewart

"Donna S. Oldham" <commish@capecounty.us>
11/26/2008 03:39 PM

Subj.: Cape Girardeau County Ozone Designation

CAPE GIRARDEAU STAKEHOLDER OZONE DESIGNATION INPUT

December 4, Public Hearing

TO: Air Quality Commission

From: Gerald W. Jones, Presiding Commissioner

SUBJECT: Cape Girardeau County Ozone Designation

DATE: November 26, 2008

Cape Girardeau County is in support of the Position Paper prepared by the Southeast Missouri Regional Planning Commission on behalf of Cape Girardeau, Perry, St. Francois and Ste. Genevieve Counties relating to the air quality changes by the Missouri Department of Natural Resources.

We specifically recommend that Cape Girardeau County and St. Francois County be designated as attainment or unclassifiable areas and that Perry and Ste. Genevieve Counties be included into a newly designated Southeast Missouri Nonattainment Area. The counties should not be included in an expanded St. Louis non-attainment zone. Efforts needed by rural areas would certainly be lost in urban requirements.

We believe the Missouri DNR did not fully review the documentation submitted by the Southeast Missouri DNR. Also, the Mo. DNR is currently in a lawsuit against the U. S. EPA over these very air quality standards that have been proposed for change by EPA.

We strongly feel the DNR draft recommendations are in error due to there being no scientific basis for designating either Cape Girardeau or St. Francois Counties as nonattainment areas. We believe DNR should take more time and do more studies before making any major changes in how our citizens lives are affected with higher costs and reduced economic opportunities.

Numerous factors impact the monitor in Farrar that came from outside our region and state. The monitor was very slightly out of compliance once in 2007 and none in 2008.

We stongly believe that Cape Girardeau County should not be included in any new Southeast Missouri nonattainment zone as currently recommended.

Thank you for your consideration.

Cape

"Maurice R. Sandfort" <msandfort@bankofmissouri.com>
11/26/2008 03:34 PM

Subj.: Non attainment area

Jeff, I currently serve on the Board of Directors of MAGNET, Cape Area Chamber of Commerce, and several other civic, church, and social boards and have been listening to some of the concerns of other business and professional associates wondering why we are included in the review of the air quality issue. We have a minimal amount of manufacturing in the Southeast Missouri region and in reviewing the measurements it appears that our area is very close to attainment by the standards MoDNR uses. I don't believe we should be included in the non-attainment area at this time. At the very least, we should be reviewed in future years as additional industry, if we can persuade any to locate in our County, opens a plant, or when our area wide population increases closer to the size of other larger regions in Missouri.

Thank you for considering my concern and I look forward to hearing the outcome of your review.

Maurice R. Sandfort
Community Bank President
The Bank of Missouri
3427 William Street
Cape Girardeau, MO 63703
573-335-3100 Voice
573-335-4994 Fax

"Sonny Underwood" <Sonny@midsouthsteel.com>
12/01/2008 02:59 PM

Subj.: Cape Girardeau 8-Hour Ozone Standard

Mr. Bennett:

It is my position that Cape Girardeau County should not be re-classified as a non-attainment area under the recently revised 8-hour Ozone (O_3) standard. My reasoning for this is as follows:

Definition of C/MSA may not have been properly defined and/or utilized for Cape Girardeau County. The Census Bureau has officially acknowledged that Cape Girardeau County does not meet the qualifications for a Metropolitan Statistical Area (MSA).

Because of the rural nature of Cape Girardeau County and extensive vegetation, it is very important that the MDNR have a better understanding of the potential affect of biogenic sources on the formation of O_3 in rural type counties (i.e., Cape Girardeau).

There doesn't seem to be available good, clean data to conclude that Cape Girardeau County significantly contributes to the high measured O_3 concentrations at the Farrar ambient O_3 monitor located in Perry County.

What existing data that is available, indicates that O_3 impacts at the Farrar monitor may also be caused by long range transport of VOC and NO_X emissions from other large metropolitan areas north, east and south of Cape Girardeau County. Thus, regulations to reduce source emissions in Cape Girardeau County may have minimal benefit or affect on O_3 concentration levels in Perry County.

I understand that your agency has some real concerns about these regulations, and are joining with other states to voice your concerns with the Federal EPA. My experience is that works with some people in the EPA. I spend a lot of time with the OUST (Office of Underground Storage Tanks) folks, and have on several occasions made them realize that certain regulations just aren't enforceable because they make no common sense in field applications. I am sure you have had similar experiences, so I applaud your efforts. Good luck with your protest.

And finally, some of my area business friends have plant expansions on hold for the moment, until these issues are resolved. If these regulations are applied to Cape Girardeau County, there will be loss of jobs and much worse, future opportunity for other businesses to locate in the area. In today's business climate, we can ill afford to lose any of our area manufacturers, or have new ventures turn to other areas for growth because of these proposed changes.

Thank you for considering my comments on the 8-hour Ozone process for Cape Girardeau County.

Best regards,

Sonny Underwood
Mid-South Steel Products, Inc
2071 Corporate Circle
Cape Girardeau, MO 63703
573.335.5529
sonny@midsouthsteel.com

"Mitch Robinson" <mrobinson@capeareamagnet.com>
12/01/2008 05:17 PM

Subj.: Comments concerning Southeast Missouri Non-Attainment Zone

Mr. Bennett:

This letter is in opposition to the effort by the Missouri Department of Natural Resources to establish a new Southeast Missouri Non-Attainment Zone. For numerous reasons we can not support this new zone inclusion of Cape Girardeau County into the zone. Those reasons include:

- MoDNR suing the federal EPA over the new regulations
- Long range transport of ozone from large metro areas
- Insufficient data to designate Cape Girardeau County as non-attainment
- EPA has not published rules for making recommendations
- Large man-made sources of ozone are already under DNR control via regulations
- Cape County is a rural county and natural sources of ozone can not be controlled
- There is no MSA designation for this area

Cape Girardeau County should be left as attainment or at the minimum unclassified. Thank you for your consideration of this critical issue for the future of Cape Girardeau County. The change to a non-attainment area would have a massive impact on the economy of Cape Girardeau County causing the lose of jobs with our existing companies and the restriction on future new jobs from expansions or new investment within the county. This change would put a halt on any positive growth.

Please call me or email me if you have any questions.

D. Mitch Robinson, CEcD
Executive Director
Cape Girardeau Area MAGNET
1267 N. Mount Auburn Road
Cape Girardeau MO 63701

573-334-5000 voice
573-335-4686 fax
573-270-3786 cell

mrobinson@capeareamagnet.com
www.capeareamagnet.com

"Bruce Blankenship" <bruce.blankenship@biokyowa.com>
12/01/2008 03:05 PM

Subj.: FW: PDF File

Mr. Bennet:

Please find the attached letter in regards to the Ozone non attainment issue.

PDF_File.pdf

"John Mehner" <jmehner@capechamber.com>
11/26/2008 08:35 AM

Subj.: Cape Girardeau County

Mr. Bennett:

The purpose of this email is to express my opposition to Cape Girardeau County being re-designated as a non-attainment area under the revised 8-hour Ozone Standard.

I agree with Director Childers comments that maintaining good air quality is important for the health of Missourians but that new federal regulations will place thousands of Missouri jobs at risk. This comes at a time when losing jobs is the LAST thing we need in Missouri.

There is insufficient data to re-designate Cape County. The issue of ozone transport from large metropolitan areas is hard, if not impossible, to measure and the large man-made sources of ozone (manufactures) are already controlled. Cape Girardeau and Cape Girardeau County are not even an MSA recognized by the federal government and therefore don't have the high population density generally associated with urban areas. The monitor in Perry County has had readings below 75 ppb in two of the last four years. So close even by the new standards.

It is my understanding that the EPA has not yet published rules for re-designated areas. For these, and so many other reasons, I believe Missouri DNR should minimize the counties classified as non-attainment - especially Cape Girardeau County.

JEM
John Mehner, CCE
President & CEO
Cape Girardeau Area Chamber of Commerce
1267 North Mount Auburn Road
Cape Girardeau, MO 63701
www.capechamber.com

Cape

Jackson Chamber of Commerce" <director@jacksonmochamber.org
11/25/2008 04:46 PM

Subj: Jackson, MO Chamber of Commerce

Mr. Bennett,

My name is Brian Gerau and I am the new Director of the Jackson, MO Chamber of Commerce. I am writing you this correspondence in regards to the Missouri Non-Attainment issue affecting Cape Girardeau County.

I implore you to assist our city of Jackson in not being included in the surrounding counties attainment measures. Like many proposals the intentions are very well and good but come up short on all practicality.

This measure would drastically affect business in Jackson, MO. The potential for large industry to move in our area would be decreased. The potential for current large industry to restructure and downsize would be increased. Gas stations and other industry would be affected as well. These good intentions will eventually fall on the shoulders of the people living in Jackson and they will bare the burden of trying to afford higher gas and the potential of job loss.

Being employed with the Jackson Chamber of Commerce it is my responsibility to increase new business in the area. It is also my responsibility to represent current business and look out for their best interest. This attainment is not in their best interest and will hurt the local economy. please record this as opposition to the Missouri Attainment issue.

Thank you.

Brian S. Gerau
Executive Director
Jackson Chamber of Commerce
125 E Main Street
Jackson, MO 63755
P) 573-243-8131
F) 573-243-0725

Barbara Lohr" <mayor@jacksonmo.org>
12/01/2008 01:43 PM

Subj.: Cape Girardeau Stakeholder Ozone Designation Input

Mr. Bennett:

Because there is insufficient information to declare Cape Girardeau County as a non-attainment area and because the large man-made sources of ozone in Cape Girardeau County are already carefully controlled, I am not in favor of the agency re-designating Cape Girardeau County as a non-attainment area.

Barbara Lohr

"Frey, Steve" <SFrey@PIRNIE.COM>
12/02/2008 11:44 AM

Subj.: Cape-Perryville Stakeholder Ozone Input

On behalf of the "Concerned Citizens for Economic Growth Coalition" we are providing the attached stakeholder input (i.e., formal comments) pertaining to the Cape-Perryville Ozone revised 8-hour NAAQS re-designation process.

We would appreciate you review of these comments and a formal response to our proposed recommendation for designating Cape Girardeau County as attainment under the revised 8-hour Ozone NAAQS.

If you have any questions related to our formal comments please feel free to contact Mr. Steven Frey at the phone number or email provided below. If possible can you please provide us with a confirmatory email acknowledging receipt of our formal comment.

The following individuals are members of the "Concerned Citizens for Economic Growth Coalition" and should be included in all correspondence as well.

D. Mitch Robinson, Executive Director Cape Girardeau Area MAGNET
1267 N. Mount Auburn Road
Cape Girardeau, MO 63701
Phone: 573-334-5000
Email: mrobinson@capeareamagnet.com

John Mehner, President & CEO
Cape Girardeau Area Chamber of Commerce
1267 N. Mount Auburn Road
Cape Girardeau, MO 63701
Phone: 573-335-3312
Email: jmehner@capechamber.com

Regards

Steven Frey

Senior Associate - Air Services Group Leader
Malcolm Pirnie, Inc.
1515 E. Woodfield Road, Suite 360
Schaumburg, IL 60173
Phone: 847-517-4062
Email: sfrey@pirnie.com

The 8-Hour Ozone Designation Process "Concerned Citizens for Economic Growth Coalition" Stakeholder Input – Formal Comment

Primary Objective:

This memo provides comments to the Missouri Department of Natural Resources (MoDNR), Division of Environmental Quality from the "Concerned Citizens for Economic Growth Coalition" (Coalition) representing Cape Girardeau County, MO. The Coalition is not in favor of the agency re-designating Cape Girardeau County as a non-attainment area under the revised 8-hour ozone standard.

It is the Coalition's position that Cape Girardeau County should not be re-classified as a non-attainment area under the recently revised 8-hour ozone (O_3) standard. This position is based on the following technical and procedural issues:

- There are insufficient data to define the existing ambient levels of O_3 present in Cape Girardeau County. Thus, no data are available to support reclassification of Cape Girardeau to non-attainment at this time.

- There are insufficient data to conclude that Cape Girardeau County ***significantly*** contributes to the elevated measured O_3 concentrations at the Farrar ambient O_3 monitor located in Perry County. Therefore, Cape Girardeau County should remain designated attainment.

- There are insufficient data to support MoDNR's position that further controlling VOC and NO_x emission sources in Cape Girardeau County will have a significant effect on ***reducing*** measured O_3 concentrations at the Farrar ambient O_3 monitor located in Perry County.

- The identifiable point sources are already controlled and the amounts of emissions inventoried are relatively low. A report submitted to MoDNR, which was prepared by URS Corporation for the Southeast Missouri Regional Planning and Economic

Development Commission, provided technical data related to 2009 projected VOC and NO_x emissions for counties in Southeast Missouri. As shown in that report, VOC and NO_x emissions from Cape Girardeau County are contributed by several categories of sources. These categories include area sources, non-road sources, mobile sources, Electric Generating Units (EGUs) and Non-Electric Generating Units. The distribution of VOC emissions based on percentages of the estimated tons per day of emissions are 45% from area sources, 17% from non-road sources, 15% from mobile sources, 0% from EGUs and 23% from Non-EGUs. The distribution of NO_x emissions based on percentages of the estimated tons per day of emissions are 10% from area sources, 22% from non-road sources, 26% from mobile sources, 0% from EGUs and 42% from Non-EGUs. The importance of this data is that it shows that a variety of sources contribute to the overall VOC and NO_x emissions for Cape Girardeau County. Because of this variation in emission sources, there is no single source category that can be targeted for potential VOC and NO_x emission reduction that would contribute to significantly reducing O_3 concentrations measured at the Perry monitor. Thus, regulations to reduce VOC and NO_x source emissions in Cape Girardeau County will likely have minimal benefit or effect on O_3 concentration levels in Perry County. Several sources in the county have already implemented BACT on NO_x and VOC sources, including low NO_x burners on combustion sources.

- Existing sources in Cape Girardeau County have obtained approval from the MoDNR for the construction and modification of air emission sources. This approval has required that these sources meet emission limits and standards established by the MoDNR, thus already incorporating design/operating procedures to ensure that potential emissions of VOC and NO_x are not adversely impacting human health and welfare. Further reduction of VOC and NO_x emissions from these sources will not have a significant effect on reducing measured O_3 concentration at the Farrar ambient monitor located in Perry County. Refer to Figures 1-A and 1-B for the VOC and NO_x emission sources in southeast Missouri and southwest Illinois, respectively.

- Existing data indicate that O_3 impacts at the Farrar monitor may also be caused by long range transport of VOC and NO_x emissions from other large metropolitan areas located north, east and south of Cape Girardeau County. MoDNR representatives commented about the significance of these emissions on Farrar monitor readings at the August 2008 stakeholders meeting. Controls are already in place to reduce NO_x and VOC emissions in these areas. On March 10, 2005 the USEPA finalized the Clean Air Interstate Rule (CAIR) with its primary objective being to reduce

substantial NO_x emissions from power plants and to help over 450 counties throughout the U.S. with meeting the protective air quality standard for O_3. Although the status of CAIR is currently in flux, because of its national significance, it is likely to be reinstated in some manner to address regional transport issues that are affecting this area. Thus, implementation of regulations requiring further controls to reduce VOC and NO_x emissions from existing sources operating in Cape Girardeau County will likely have minimal benefit or effect on O_3 concentration levels in Perry County. USEPA has initially estimated that implementation of CAIR will reduce NO_x emissions by 1.7 million tons, achieving a regional emissions level of 1.3 million tons, a 61% reduction from 2003 levels. This rule is designed to provide cleaner air while allowing for continued economic growth. The USEPA has concluded that initiation of this program in Missouri, will 1) reduce emissions of NO_x by 87,000 tons or by 60% by year 2015, 2) help Missouri meet and maintain the NAAQS for ground level O_3, and 3) because air emissions travel across state boundaries, reducing emissions from sources in Missouri will reduce potential impacts on neighboring states such as Ohio and Wisconsin. It should be noted that the USEPA supports the conclusion that sources can significantly contribute to ground-level O_3 in other states, thus supporting the presence of long range transport.

- Based on MoDNR's analysis in their recommendation for defining Perry County as non-attainment, the St Louis area, as well as other large metropolitan areas (i.e., Nashville, TN) can be seen to have some impact on the ozone readings at the Perry County monitor. Thus improvements to ambient air quality in St Louis and these other metropolitan areas will have a positive impact on the Perry County monitor readings, reducing the need for inclusion of Cape Girardeau County in the non-attainment region. Refer to Figure 2 which shows these larger metropolitan areas and their relationship to the Perry County monitor. Several large metropolitan areas are located within the predominant wind flow sectors for southeast Missouri (refer to Figure 3 for wind roses that show the predominant wind directions for this area). As shown in this figure, winds predominantly occur from the south, southwest, southeast and northwest directions. It is important to note the large metropolitan areas that exist within these wind direction sectors.

- Average 8-hour average O_3 concentrations for each individual year (i.e. 2005, 2006, 2007 and 2008 hourly O_3 and wind direction data as measured at the Farrar monitor) by wind direction sector (30 degree sectors with 0 degrees representing true north) show that the east-northeast through southwest wind directions result

in the highest average 8-hour average O_3 concentrations at the Farrar monitor located in Perry County. Additionally the data indicate that concentrations above 75 parts per billion occur when the wind is blowing from nine of the twelve wind direction sectors (i.e., 0, 30, 60, 90, 120, 150, 180, 210, 330 degrees). Refer to Figures 4 and 5 that provide O_3 concentrations (i.e., O_3 concentration wind roses) measured at the Perry County monitor based on individual wind direction sectors. These figures were created from the actual O_3 concentrations and wind direction data measured at the Perry County monitor over a period of time. This data was provided by the MoDNR. The data suggests that measured O_3 concentrations at the Farrar monitor in Perry County may be influenced by long range transport of emissions from major metropolitan areas located in these directions and non-man made sources (biogenic), and may not be significantly influenced by emission sources located in Cape Girardeau County. For point of reference, the City of Cape Girardeau lies within the 150 and 180 degree sectors.

- To better illustrate the impact of large urban areas on regional monitors, we offer the following discussion. Existing monitoring data show that O_3 concentrations increase as you move from south to north across the City of St. Louis, thus simulating the effects of urban sources on the formation of O_3. Figure 1 shows the O_3 concentration measured at monitors located throughout southeast Missouri. The data depict O_3 concentration and the affect of a large metropolitan area over a similar spatial distance that is represented by the distance from the cities of Cape Girardeau and Jackson to the Perry County monitor. The data show that O_3 concentrations over a six (6) year period increased from 0.006 to 0.012 ppm from the southern monitor to the northern monitor. This would suggest that a large urbanized area such as St. Louis (approximately 2,800,000 people) is increasing the potential for O_3 formation by around 10% or less depending on atmospheric conditions, etc. In trying to predict or establish the potential effects of the City of Cape Girardeau, with a population less than 50,000 people, on the formation of O_3 concentrations at the Farrar monitor, the potential change in O_3 concentration of less than 1% could be anticipated based on a review of the St. Louis monitoring data. If a large population area results in a potential change in the O_3 concentration by less than 0.012 ppm, than a smaller populated area such as Cape Girardeau might show a potential affect or change in O_3 concentrations of less than 0.001 ppm. Thus, the City of Cape Girardeau is not likely to be a major contributor or ***significant contributor*** to the formation of O_3, and future regulations on the sources operating within the County of Cape Girardeau will have almost no effect

on the concentrations being measured at the Farrar Monitor located in Perry County.

- An analysis was performed using the VOC/NO_x Point Source Screening Tables, developed by Richard D. Scheffe for the USEPA in September 1988. This analysis provides a simple, but conservative (high ozone increment predictions) screening procedure for calculating O_3 increment based on the ratio of VOC/NO_x emissions in tons/year. The O_3 increment estimates produced from this analysis are conservative predictions when compared to an actual event. This technique provides a simple, conservative and non-resource intensive tool for estimating O_3 increment. An estimate of predicted O_3 increment by wind sector using the VOC/NO_x Point Source Screening Tables using NO_x and VOC emissions data provided by the MoDNR and the Illinois Environmental Protection Agency (IEPA) for counties surrounding Perry County shows that predicted O_3 increment could potentially increase by 0.017 ppm and 0.004 ppm in wind direction sectors 150° and 180° (winds blowing from the southeast and south), respectively. Refer to Figure 6 which shows the potential incremental change in O_3 concentrations based on the Scheffe conversion approach for VOC and NO_x emissions sources. Additionally, O_3 increment for the east and southeast wind direction sectors were calculated to be 0.017 ppm and 0.016 ppm, respectively. The data show that VOC and NO_x sources other than those located in Cape Girardeau County are potentially influencing the O_3 concentrations at the Farrar Monitor. Therefore, further controlling VOC and NO_x emission sources currently operating in Cape Girardeau County is not likely to have a substantial impact on concentrations at the Farrar monitor since elevated O_3 concentrations have been shown to occur from multiple wind direction sectors.

- Because of the rural nature of Cape Girardeau County and extensive vegetation, it is very important that the MoDNR have a better understanding of the potential effect of biogenic sources on the formation of O_3 in rural counties (i.e., Cape Girardeau County). The California Regulatory Agency has established a study group and has been collecting data to determine the effect of biogenic sources on O_3 formation in southern California. It is recommended that the MoDNR also form a study group to investigate the feasibility of collecting similar data so that a better understanding of the overall affect biogenic sources located in Cape Girardeau and surrounding counties have on O_3 concentrations. It is important to understand the relationship between biogenic and man-made VOC and NO_x sources, thus better defining the source categories where reductions (if feasible) can be proposed so that future O_3 concentrations can be lowered at the Farrar monitor in Perry County.

MoDNR representatives explained this issue in the August 2008 meeting with local stakeholders. Those representatives indicated that this topic should be further evaluated so that it could be addressed as part of the analysis for the 8-hour ozone NAAQS designation process.

- MoDNR's director Doyle Childers' has stated that the agency is seeking to join a lawsuit to halt new nationwide federal ozone restrictions. Mr. Childers also stated "No one disputes the importance of maintaining good air quality for the health of Missourians. We believe the new federal regulation will place thousands of Missouri jobs at risk, jeopardizing income for Missouri families, and will result in unwarranted and burdensome regulations on industry". Residents of Cape Girardeau County express the same concern. MoDNR should minimize the number of counties designated non-attainment until this issue is resolved.

- Definition of C/MSA may not have been properly defined and/or utilized for Cape Girardeau County. The Census Bureau has officially acknowledged that Cape Girardeau County does not meet the qualifications for a Metropolitan Statistical Area (MSA), let alone a C/MSA. The U.S. Census Bureau defines MSA as "Areas having at least one urbanized area of 50,000 or more inhabitants". The entire county of Cape Girardeau has a population density of 72,740 based on an estimate for 2007. The largest urbanized areas in Cape Girardeau County, which includes the cities of Cape Girardeau and Jackson, have an estimated 2007 population of 37,158 and 13,514, respectively. Both of these urbanized areas are less than 50,000 inhabitants.

- The USEPA has not yet promulgated rules for defining the extent of non-attainment areas. MoDNR used criteria for defining the extent of the non-attainment area based on guidance provided in support of the initial 1997 8-hour O_3 standard, which may not be appropriate for the revised 8-hour O_3 standard. MoDNR should request guidance from the USEPA that supports the revised 8-hour standard for rural counties measuring O_3 concentration in excess of the revised standard. Guidance should be developed by USEPA and provided to the MoDNR on how to address rural counties that have measured exceedances of the revised 8-hour standard that are caused by regional O_3 contributions. It is important to note that for these regions, implementation of localized VOC and NO_x controls may have no significant contribution to reducing O_3 concentration in rural areas affected by regional O_3 formation influences. Because of the uniqueness of these areas, the criteria established by USEPA (March 28, 2000) in support of the initial 8-hour

standard can be considered out dated and new criteria need to be established for rural areas affected by regional influences.

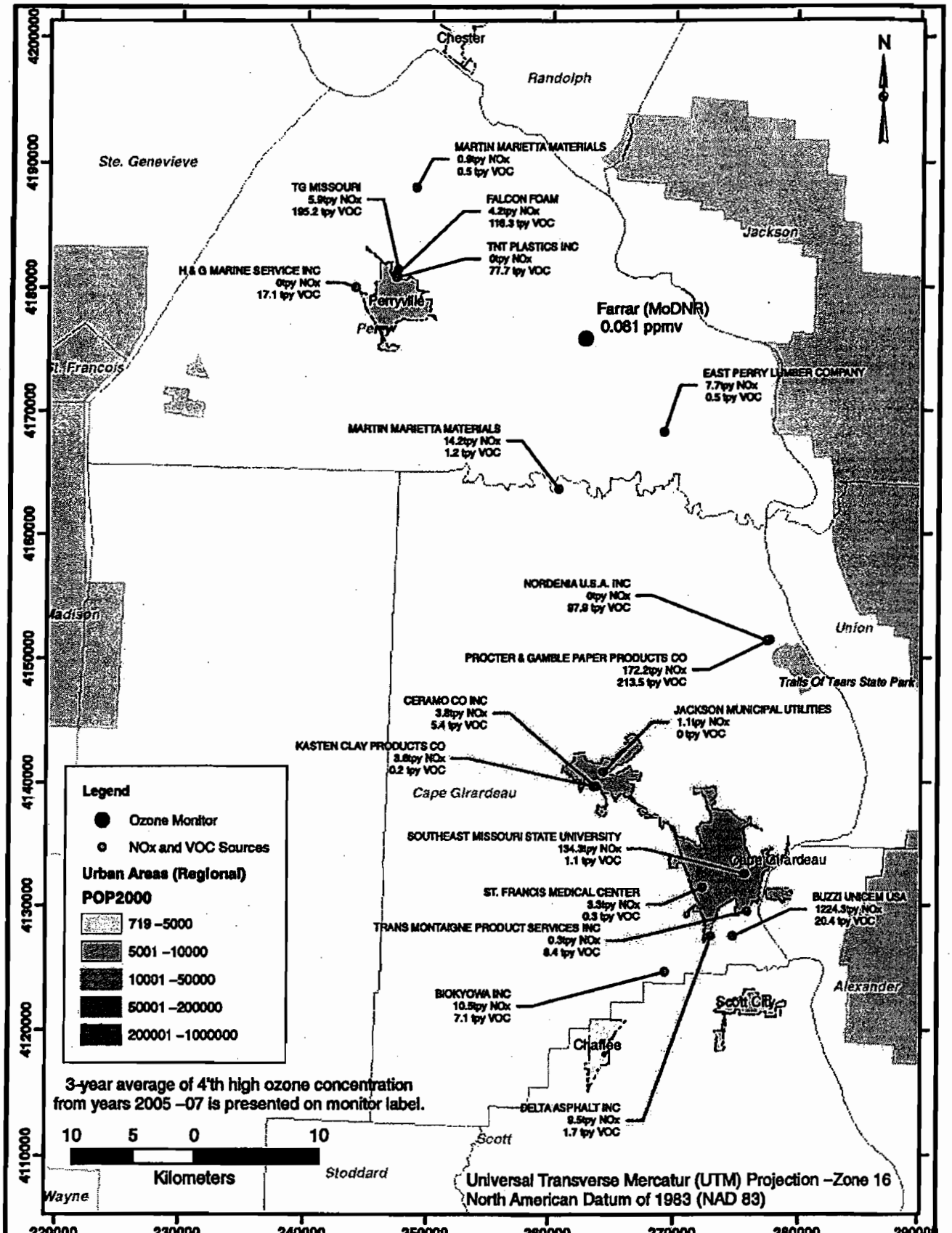
- Applying the eleven criteria provided by USEPA, MoDNR has defined Cape Girardeau as a significant contributor to O_3 concentrations at the Farrar monitor. This is based on two specific issues: 1) the level of VOC and NO_x emissions (i.e., 25 tons per day) and 2) the meteorological conditions present in the region. The data suggest that Cape Girardeau County has some influence on the O_3 data measured in Perry County. However, further review of the O_3 data and wind direction data measured over the last 5 year period does not suggest a significant contribution, but rather a normal contribution from a rural environment (i.e., regional influence). As stated previously, O_3 data are consistent from various wind direction sectors and no one sector can be considered a significant contributor. The data suggest that O_3 concentration in the southeast counties of Missouri are formed by regional influences and targeting reductions of VOC and NO_x emissions sources in Cape Girardeau County will not have a significant reduction in measured O_3 concentrations in Perry County. The final O_3 data set for 2008 shows a reduction in measured O_3 concentrations which may be reflective of the reduction in NO_x emission sources that is occurring because of regulatory mandates on large NO_x sources in the region (i.e., Clean Air Interstate Rule), as well as air quality improvement occurring within large metropolitan areas.

- Designation of an area as non-attainment may make it difficult to retain and attract new businesses to the region due to the increased regulatory requirements. Additionally, new projects at existing sources will be forced to install and operate additional controls with no proven data or analysis to demonstrate that these types of reductions will significantly affect O_3 concentrations at the Perry monitor. This may impact facilities located in Cape Girardeau County by losing opportunities for expansion, as there are other sites in the U.S. which may be more attractive for that expansion due to increased costs and longer time to permit and install new emissions sources in a non-attainment area. This change will likewise affect the economic development in the area by reducing future tax revenues and job opportunities for residents. Thus, the designation of a region as non-attainment may restrict or slow economic growth.

- In applying the eleven criteria provided by USEPA, MoDNR was able to show correlation, however limited, to 2 of those criteria. If we were to apply a similar procedure with regard to classification of PM attainment, meeting two of the

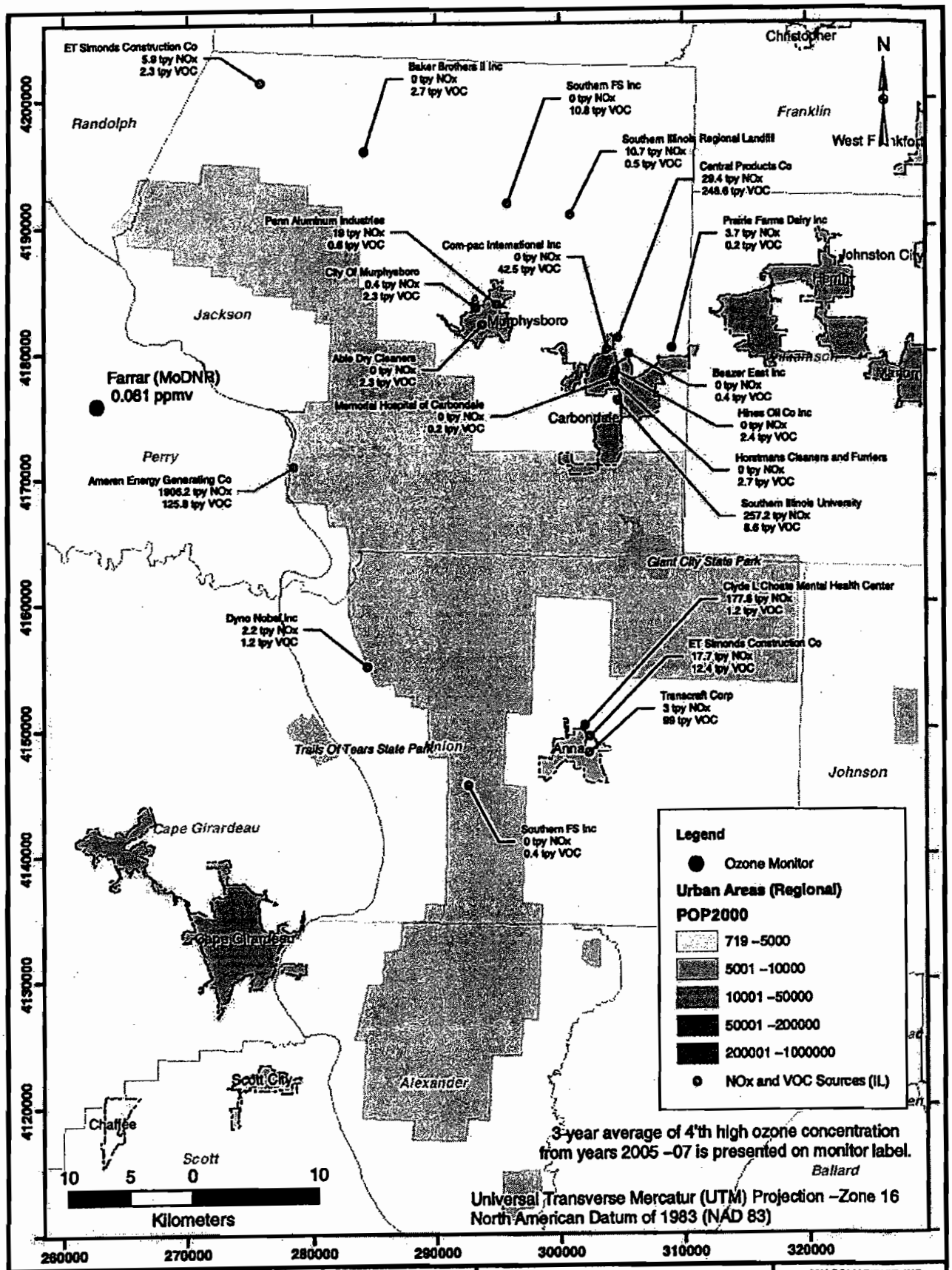
eleven criteria is certainly not evidence of a significant contribution of a county on an adjacent county's monitor readings. In fact, designating Cape Girardeau as an MSA is without support in the definitions of MSA provided by the Census Bureau. As Cape Girardeau is not an MSA, this would preclude even beginning the analysis of whether it should be included in the non-attainment area.

For the reasons set forth above, it is the Coalition's position that Cape Girardeau County should be classified as attainment.



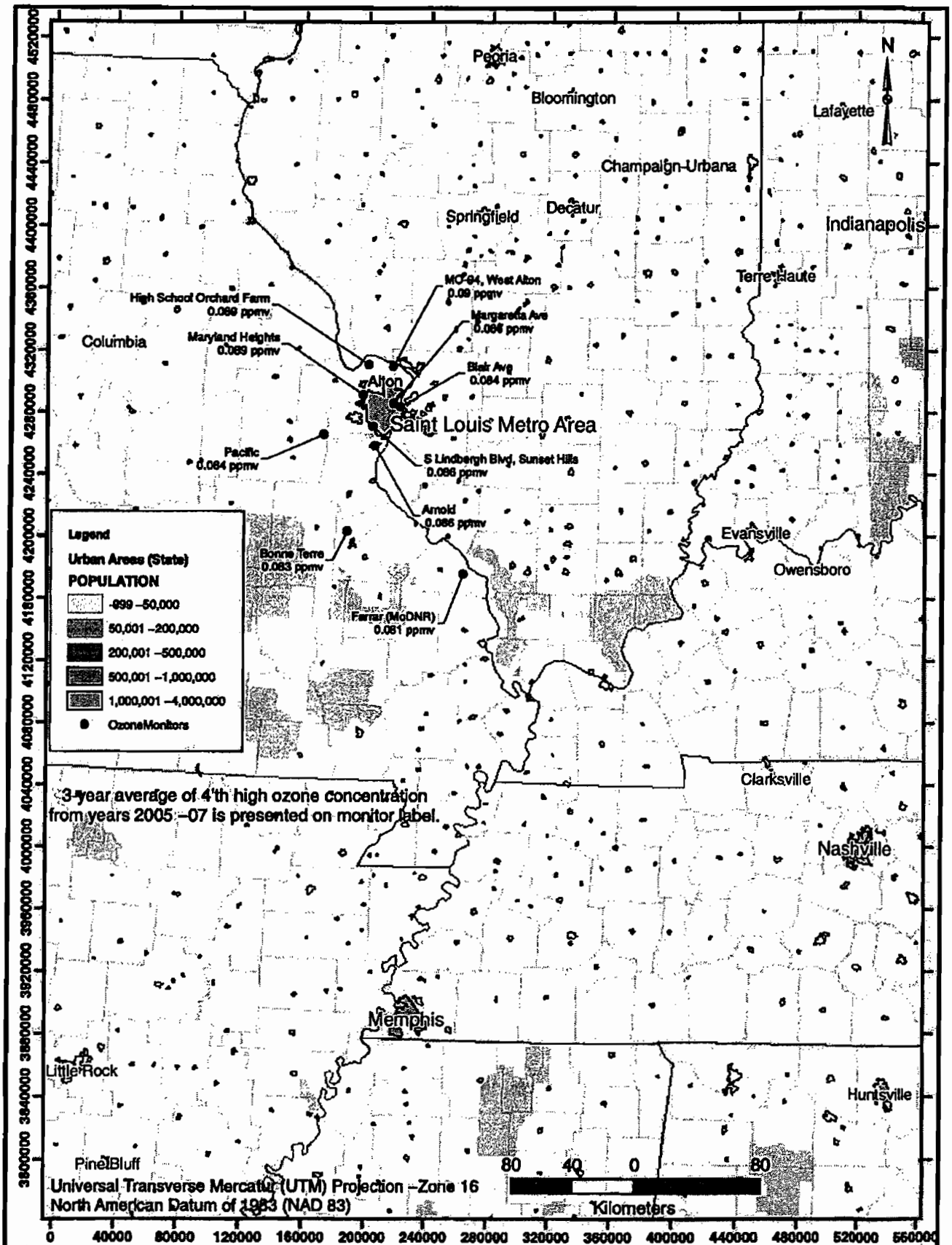
Map Document: (S:\GIS_Resources\Standards_Guidelines\Map Templates\GIS_TEMPLATES_2005\11X8.5_Portrait.mxd)
7/19/2008 – 5:12:41 PM

MALCOLM PIRNIE	Missouri Cape Girardeau County Ozone NAAQS Designation 0165464	Ozone Monitor, Populated Areas, and Industrial NOx and VOC Sources of Cape Girardeau and Perry Counties	MALCOLM PIRNIE, INC. October 2008 Figure 1-A



Map Document: (G:\GIS_Resources\Standards_Guidelines\MapTemplates\GIS_TEMPLATES_2005\11X8.5_Portrait.mxd)
7/19/2006 -- 8:12:41 PM

MALCOLM PIRNIE	Missouri Cape Girardeau County Ozone NAAQS Designation 0165464	Populated Areas and Industrial NOx and VOC Sources of Jackson and Union Counties (Illinois)	MALCOLM PIRNIE, INC. October 2008 Figure 1-B



Map Document: (S:\GIS_Resources\Standards_Guidelines\MapTemplates\GIS_TEMPLATES_2005\11X8.5_Portrait.mxd)
7/19/2005 -- 8:12:41 PM

MALCOLM PIRNIE

Missouri
Cape Girardeau County
Ozone NAAQS Designation
0165464

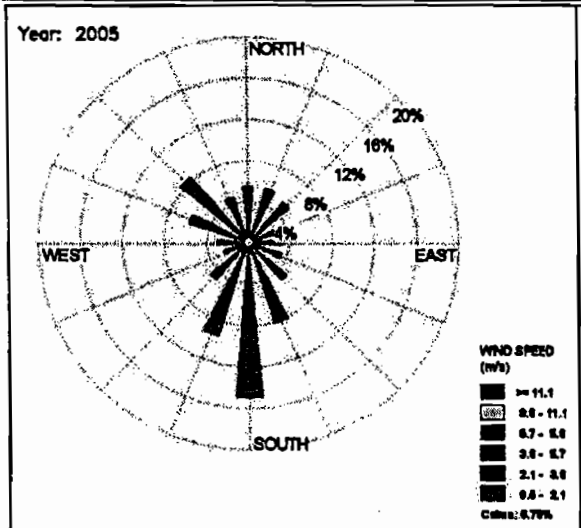
Populated Areas of the Neighboring States in the Cape Girardeau Region

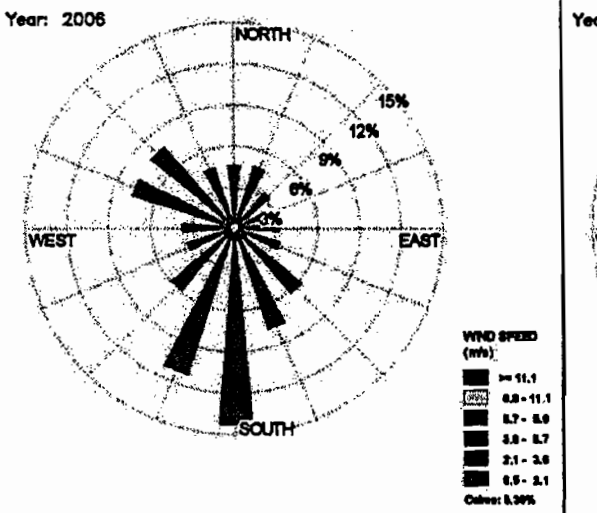
MALCOLM PIRNIE, INC.

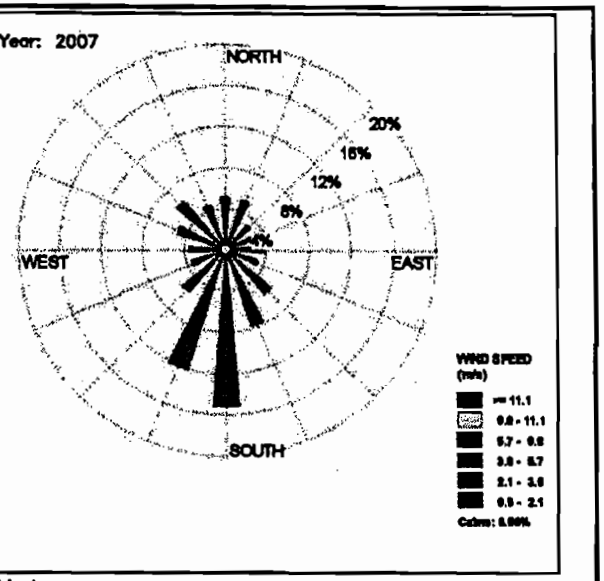
October 2008

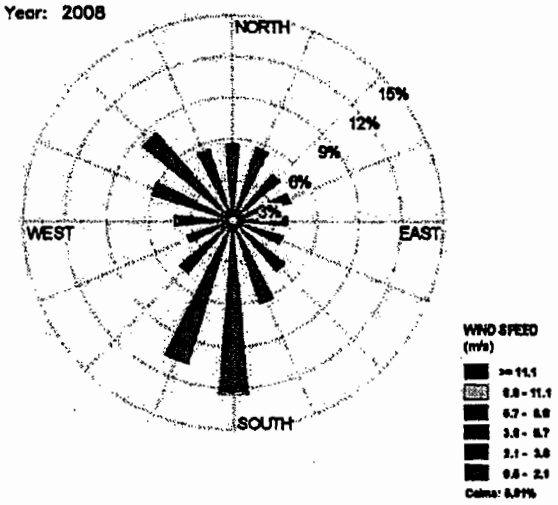
Figure 2

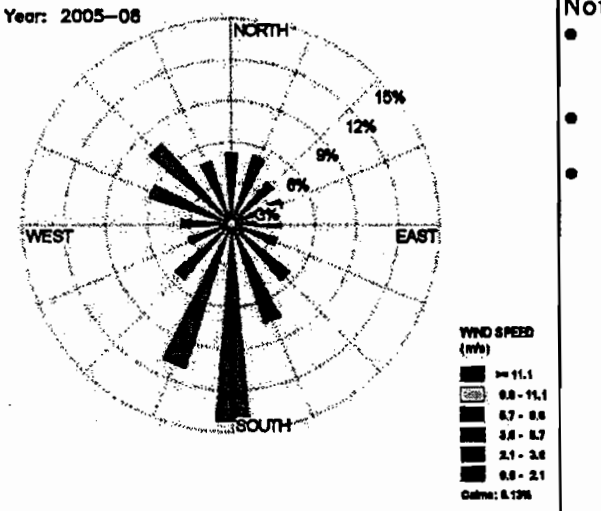
User: Carstensen Spec: PIRNIE STANDARD File: I:\PG\Cape Ozone Project\Figures\WINDROSEFIGUREFARRAR.DWG Scale: 1:1 Date: 11/17/2008 Time: 17:33 Layout: Layout1











Notes:

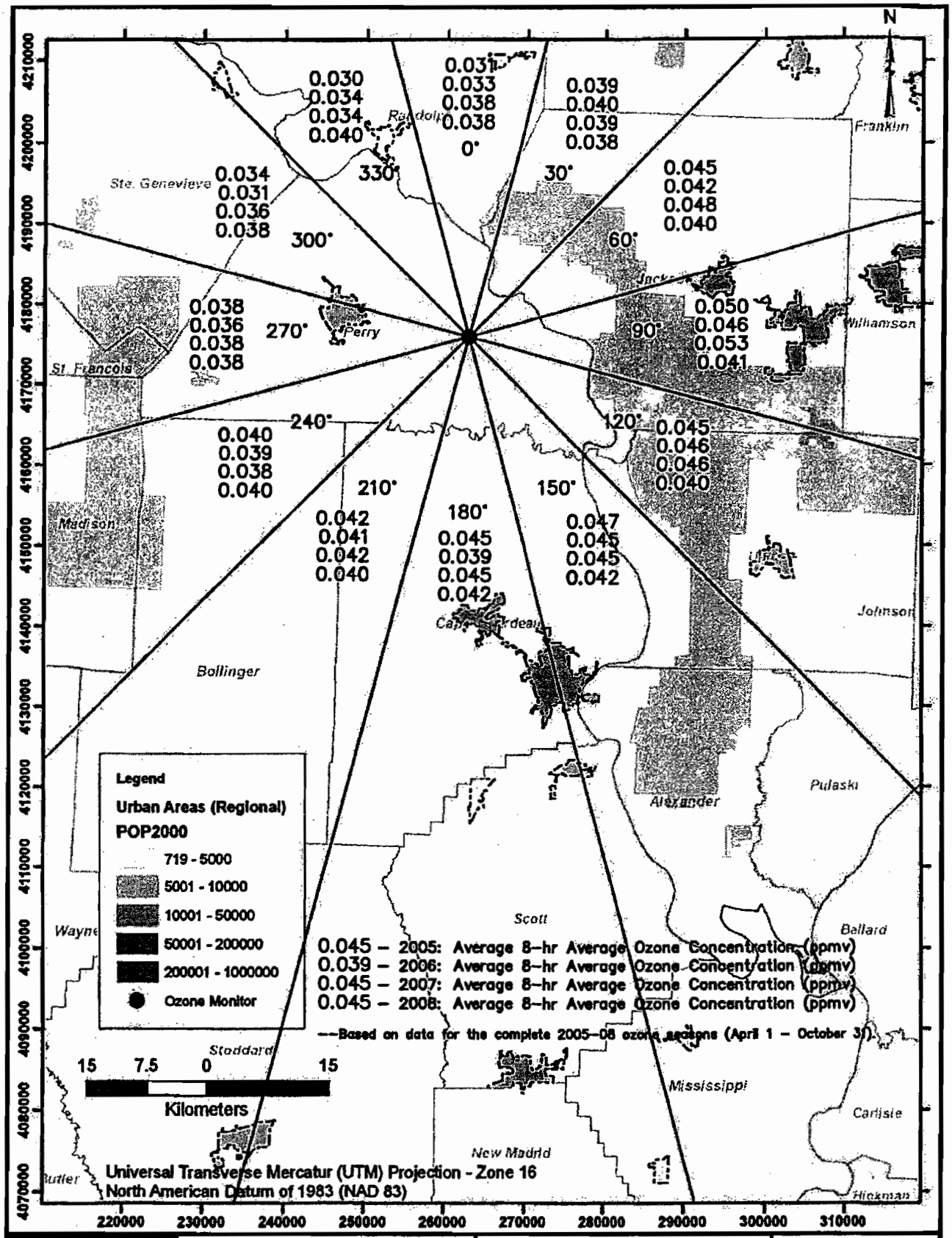
- Wind roses were based on meteorological data collected at the Farrar, Missouri ozone monitor.
- The ozone season is April 1 – October 31 of each year.
- The data for the 2008 ozone season was incomplete. The period reported was from April 1 – June 30, 2008.

MALCOLM PIRNIE

Missouri
Cape Girardeau County
Ozone NAAQS Designation
0165464

Cape Girardeau Wind Roses
For the Ozone Seasons of 2005–08
Farrar Ozone Monitor

MALCOLM PIRNIE, INC.
November 2008
Figure 3

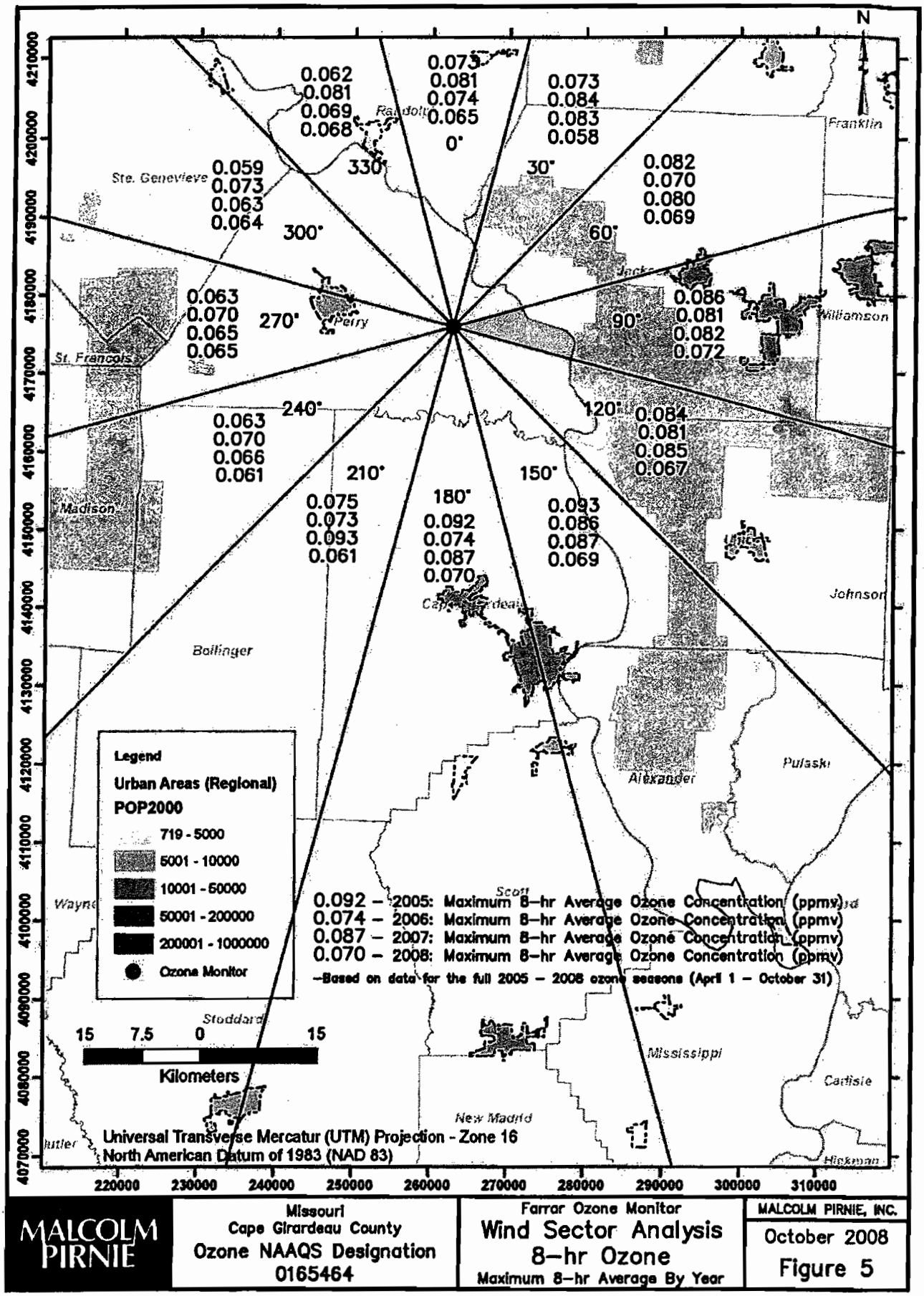


MALCOLM PIRNIE

Missouri
Cape Girardeau County
Ozone NAAQS Designation
0165464

Farrar Ozone Monitor
Wind Direction Sector Analysis: 8-hr Ozone
Average 8-hr Average By Year

MALCOLM PIRNIE, INC.
October 2008
Figure 4

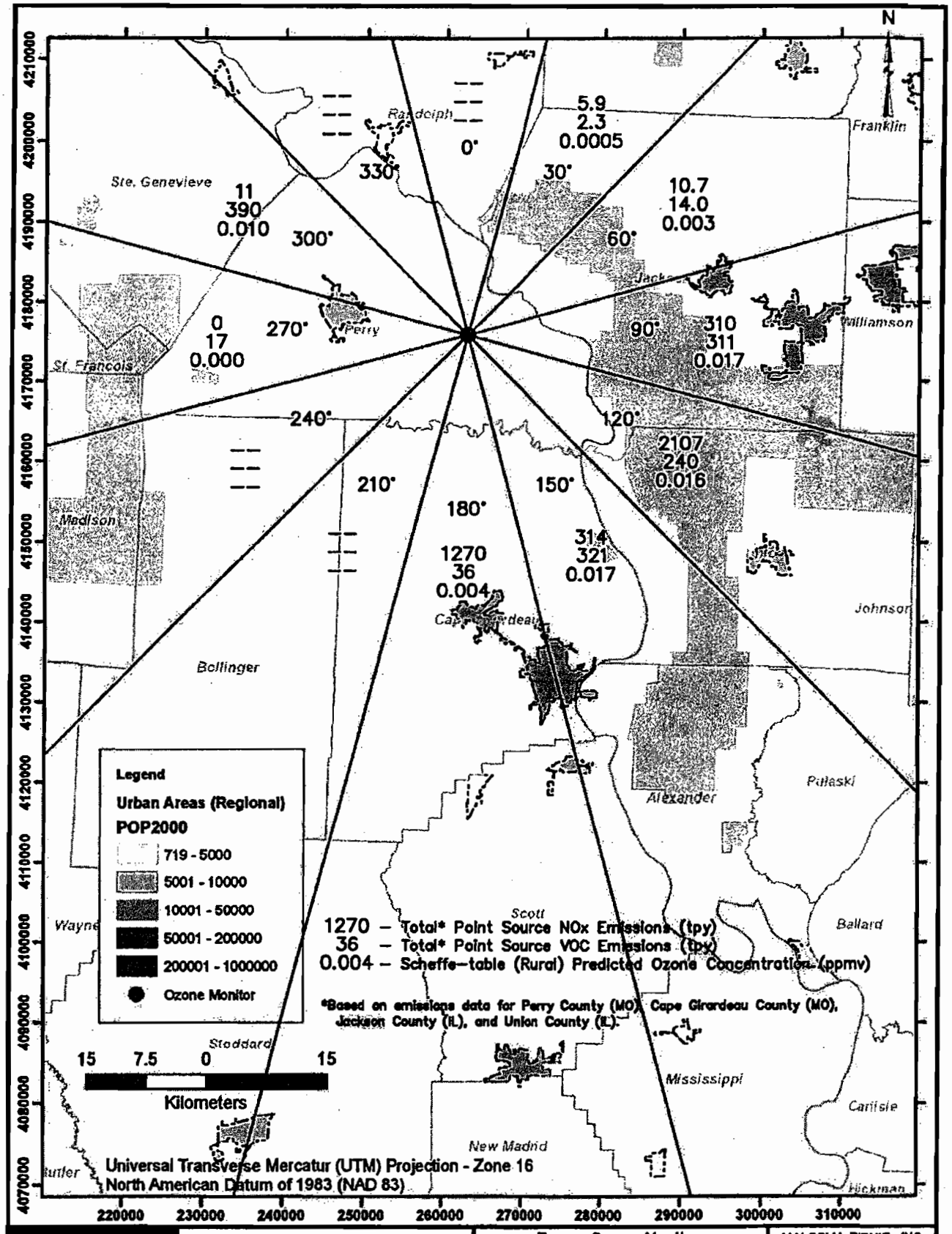


MALCOLM PIRNIE

Missouri
Cape Girardeau County
Ozone NAAQS Designation
0165464

Farrar Ozone Monitor
Wind Sector Analysis
8-hr Ozone
Maximum 8-hr Average By Year

MALCOLM PIRNIE, INC.
October 2008
Figure 5



MALCOLM PIRNIE

Missouri
Cape Girardeau County
Ozone NAAQS Designation
0165464

Farrar Ozone Monitor
Wind Direction Sector
Analysis of Ozone Precursors
NOx and VOC Point Sources

MALCOLM PIRNIE, INC.
October 2008
Figure 6

"Schoch, Marc" <schoch.mk@pg.com>
12/01/2008 10:48 PM

Comments on 2008 Ozone Boundary Recommendation

MR. JEFF BENNETT

We would like to submit comments to the MDNR's recommendation regarding Perry County ozone designation.
Myself and Regina Gray represent the Procter & Gamble facility located in Cape Girardeau County, Missouri.
Please contact us if you have questions or comments regarding the attached document.

Sincerely,

Regina Gray	Marc Schoch
Family Care	Baby Care
Plant Manager	Plant Manager

The 8-Hour Ozone Designation Process
Procter & Gamble Stakeholder Input – Formal Comment

This memo provides comments to the Missouri Department of Natural Resources, Division of Environmental Quality (MDNR) from Procter & Gamble Manufacturing Company (P&G), located in Cape Girardeau County, MO. P&G Cape Girardeau **is not** in favor of the agency re-designating Cape Girardeau County as a non-attainment area under the revised 8-hour Ozone Standard.

It is our position that Cape Girardeau County should not be re-classified as a non-attainment area under the recently revised 8-hour Ozone (O_3) standard. This position is based on the following technical and procedural issues:

- There are insufficient data to define the existing ambient levels of O_3 present in Cape Girardeau County. Thus no data are available to support reclassification of Cape Girardeau to non-attainment at this time.

- There are insufficient data to conclude that Cape Girardeau County ***significantly*** contributes to the high measured O_3 concentrations at the Farrar ambient O_3 monitor located in Perry County, so Cape Girardeau County should remain in attainment.

- There are insufficient data to support MDNR's position that controlling VOC and NO_x emission sources in Cape Girardeau County will have a significant effect on ***reducing*** measured O_3 concentrations at the Farrar ambient O_3 monitor located in Perry County.

- The identifiable point sources are already controlled and the amounts of emissions inventoried are relatively low (see URS report submitted to MDNR with Southeast Missouri Regional Planning and Economic Development Commission comment). Thus, regulations to reduce VOC and NO_x source emissions in Cape Girardeau County likely will have minimal benefit or effect on O_3 concentration levels in Perry County. P&G has implemented BACT on all NOx and VOC sources, including low NOx burners on combustion sources.

- Existing sources in Cape Girardeau County have obtained approval from the MDNR for the construction and modification of air emission sources. This approval has required that these sources meet emission limits and standards established by the MDNR, thus already incorporating designs / operating procedures to ensure that potential emissions of VOC and NO_x are not adversely impacting human health and welfare.

- Existing data indicate that O_3 impacts at the Farrar monitor may also be caused by long range transport of VOC and NO_x emissions from other large metropolitan areas north, east and south of Cape Girardeau County. MDNR representatives commented about the significance of these emissions on Farrar monitor readings at the August 2008 stakeholders meeting. Controls are already in place to reduce NO_x and VOC emissions in these areas, see CAIR data from USEPA studies attached below. Although the status of CAIR is currently in flux, because of its national significance, it is sure to be re-instated in some manner to address regional transport issues that are affecting this area. Thus, regulations or controls to reduce VOC and NO_x source emissions in Cape Girardeau County likely will have minimal benefit or affect on O_3 concentration levels in Perry County.

- Based on MDNR's analysis in their recommendation for defining Perry County as non-attainment, the St Louis area can be seen to have some impact on the readings at the Perry County monitor. Thus improvements to ambient air quality in St Louis will have a positive impact on the Perry County monitor readings, reducing the need for including Cape Girardeau County in the non-attainment region.

- Average 8-hour average O_3 concentrations for each individual year (i.e. 2005, 2006, 2007 and 2008 hourly O_3 and wind direction data as measured at the Farrar monitor) by wind direction sector (30 degree sectors with 0 degrees representing true north) show that the east-northeast through southwest wind directions result in the highest average 8-hour average O_3 concentrations at the Farrar monitor located in Perry County. Additionally the data indicate that concentrations above 75 parts per billion occur when the wind is blowing from nine of the twelve wind direction sectors (i.e., 0, 30, 60, 90, 120, 150, 180, 210, 330 degrees). The data also suggest that measured O_3 concentrations at the Farrar monitor in Perry County may be influenced by long range transport of emissions from major metropolitan areas located in these directions and non-man made sources (biogenic), and may not be significantly influenced by emission sources located in Cape Girardeau County. For

point of reference the City of Cape Girardeau lies within the 150 and 180 degree sectors.

- To better illustrate the impact of large urban areas on regional monitors, we offer the following discussion. Existing monitoring data show that O_3 concentrations increase as you move from south to north across the City of St. Louis, thus simulating the effects of urban sources on the formation of O_3. The data show that O_3 concentrations over a six (6) year period increased from 6 to 12 ppb from the southern monitor to the northern monitor. This would suggest that a large urbanized area such as St. Louis (approximately 2,800,000 people) is increasing the potential for O_3 formation by around 10% or less depending on atmospheric conditions, etc. In trying to predict or establish the potential effects of the City of Cape Girardeau, with a population less than 50,000 people, on the formation of O_3 concentrations at the Farrar monitor, the potential change in O_3 concentration of less than 1% could be anticipated based on a review of the St. Louis monitoring data. If a large population area results in a potential change in the O_3 concentration by less than 12 ppb, than a smaller populated area such as Cape Girardeau might show a potential affect or change in O_3 concentrations of less than 1 ppb. Thus, the City of Cape Girardeau is not likely to be a major contributor or ***significant contributor*** to the formation of O_3, and future regulations on the sources associated with the County of Cape Girardeau will have almost no effect on the concentrations being measured at the Farrar Monitor located in Perry County.

- An analysis was performed using the VOC/NO_x Point Source Screening Tables, developed by Richard D. Scheffe for the U.S. EPA in September 1988. This analysis provides a simple, but conservative (high ozone increment predictions) screening procedure for calculating O_3 increment based on the ratio of VOC/NO_x emissions in tons/year. The O_3 increment estimates produced from this analysis are conservative predictions when compared to an actual event. This technique provides a simple, conservative and non-resource intensive tool for estimating O_3 increment. An estimate of predicted O_3 increment by wind sector using the VOC/NO_x Point Source Screening Tables using NO_x and VOC emissions data provided by the MDNR and the Illinois Environmental Protection Agency (IEPA) for counties surrounding Perry County shows that predicted O_3 increment could potentially increase by 17 ppb and 4 ppb in wind direction sectors 150° and 180° (winds blowing from the southeast and south), respectively. Additionally, O_3 increment for the east and southeast wind direction sectors were calculated to be 17 ppb and 16 ppb, respectively. The data show that VOC and NO_x sources other

than those located in Cape Girardeau County are potentially influencing the O_3 concentrations at the Farrar Monitor. Therefore, controlling VOC and NO_x emission sources located in Cape Girardeau County is not likely to have a substantial impact on concentrations at the Farrar monitor since elevated O_3 concentrations have been shown to occur from multiple wind direction sectors.

- Because of the rural nature of Cape Girardeau County and extensive vegetation, it is very important that the MDNR have a better understanding of the potential affect of biogenic sources on the formation of O_3 in rural counties (i.e., Cape Girardeau County). The California Regulatory Agency has established a study group and has been collecting data in southern California to determine the affect of biogenic sources on O_3 formation in southern California. It is recommended that the MDNR should also form a study group to investigate the feasibility of collecting similar data so that a better understanding of the overall affect biogenic sources located in Cape Girardeau and surrounding Counties have on O_3 concentrations. It is important to understand the relationship between biogenic and man-made VOC and NO_x sources, thus better defining the source categories where reductions (if feasible) can be proposed so that future O_3 concentrations can be lowered at the Farrar monitor in Perry County. MDNR representatives explained this issue in the August 2008 meeting with local stakeholders. Those individuals indicated this topic was to be addressed as part of their analysis of designation.

- From the MDNR's website per news release 385 dated June 26, 2008, MDNR's director Doyle Childers' has stated that the agency is seeking to join a lawsuit to halt new nationwide federal ozone restrictions. Mr. Childers also stated "No one disputes the importance of maintaining good air quality for the health of Missourians. We believe the new federal regulation will place thousands of Missouri jobs at risk, jeopardizing income for Missouri families, and will result in unwarranted and burdensome regulations on industry". Residents of Cape Girardeau County express the same concern. MDNR should minimize the number of counties designated non-attainment until this issue is resolved.

- Definition of C/MSA may not have been properly defined and/or utilized for Cape Girardeau County. The Census Bureau has officially acknowledged that Cape Girardeau County does not meet the qualifications for a Metropolitan Statistical Area (MSA), let alone a C/MSA.

- US EPA has not yet promulgated rules for defining the extent of non-attainment areas. MDNR used criteria for defining the extent of the non-attainment area

based on guidance provided in support of the initial 1997 8-hour O_3 standard, which may not be appropriate for the revised 8-hour O_3 standard. MDNR should request guidance from the EPA that support the revised 8-hour standard.

- Applying the 11 criteria provided by USEPA, MDNR has defined Cape Girardeau as a significant contributor to O_3 concentrations at the Farrar monitor. This is based on two specific issues: 1) Level of VOC and NOx emissions (i.e., 25 tons per day) and the 2) meteorological conditions present in the region. The data suggest that Cape Girardeau County has some influence on the O_3 data measured in Perry County. However, further review of the O_3 data and wind direction data measured over the last 5 year period does not suggest a significant contribution, but rather a normal contribution from a rural environment. As stated previously, O_3 data are consistent from various wind direction sectors and no one sector can be considered a significant contributor. The data suggest that O_3 concentration in the southeast counties of Missouri are formed by regional influences and targeting reductions of VOC and NOx emissions sources in Cape Girardeau County will have no significant reduction in measured O_3 concentrations in Perry County. The final O_3 data set for 2008 shows a reduction in measured O_3 concentrations which may be reflective of the reduction in NO_x emission sources that is occurring because of regulatory mandates on large NO_x sources in the region (i.e., Clean Air Interstate Rule).

- Designation of an area as nonattainment may make it difficult to retain and attract new businesses to the region due to the increased regulatory requirements. Additionally, new projects at existing sources will be forced to install and operate additional controls. This may impact P&G's facility in Cape Girardeau County by losing opportunities for expansion. Other sites in the U.S. may be more attractive for expansion if Missouri has increased costs and longer time to permit and install new emission sources. This change will likewise affect the economic development in the area by reducing future tax revenues and job opportunities for residents. Thus, the designation of a region as nonattainment may restrict or slow economic growth.

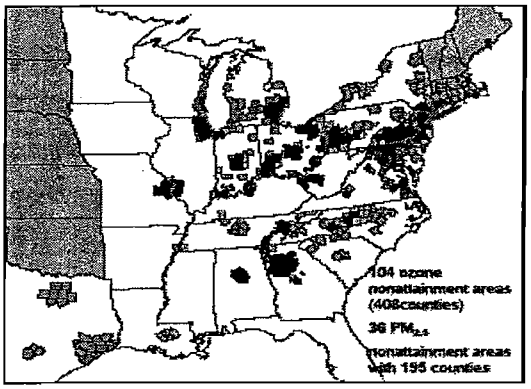
- In applying the 11 criteria provided by USEPA, MDNR was able to show correlation, however limited, to 2 of those criteria. If we were to apply a similar procedure with regard to classification of PM attainment, meeting two of the eleven criteria is certainly not evidence of a significant contribution of a county on an adjacent county's monitor readings. In fact, designating Cape Girardeau as an MSA is without support in the definitions of MSA provided by the Census Bureau or

USEPA's guidance. As Cape Girardeau is not an MSA, this would preclude even beginning the analysis of whether it should be included in the non-attainment area.

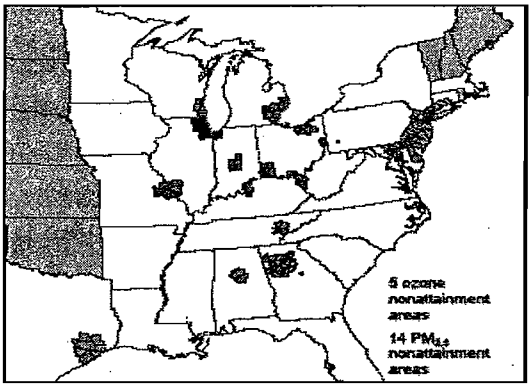
For the reasons set forth above, it is our position that Cape Girardeau County should be classified as attainment.

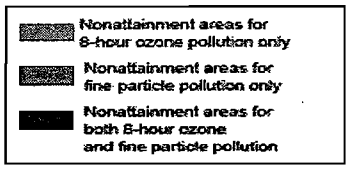
Ozone and Particle Pollution: CAIR, together with other Clean Air Programs, Will Bring Cleaner Air to Areas in the East - 2015

Ozone and Fine Particle Nonattainment Areas (April 2005)

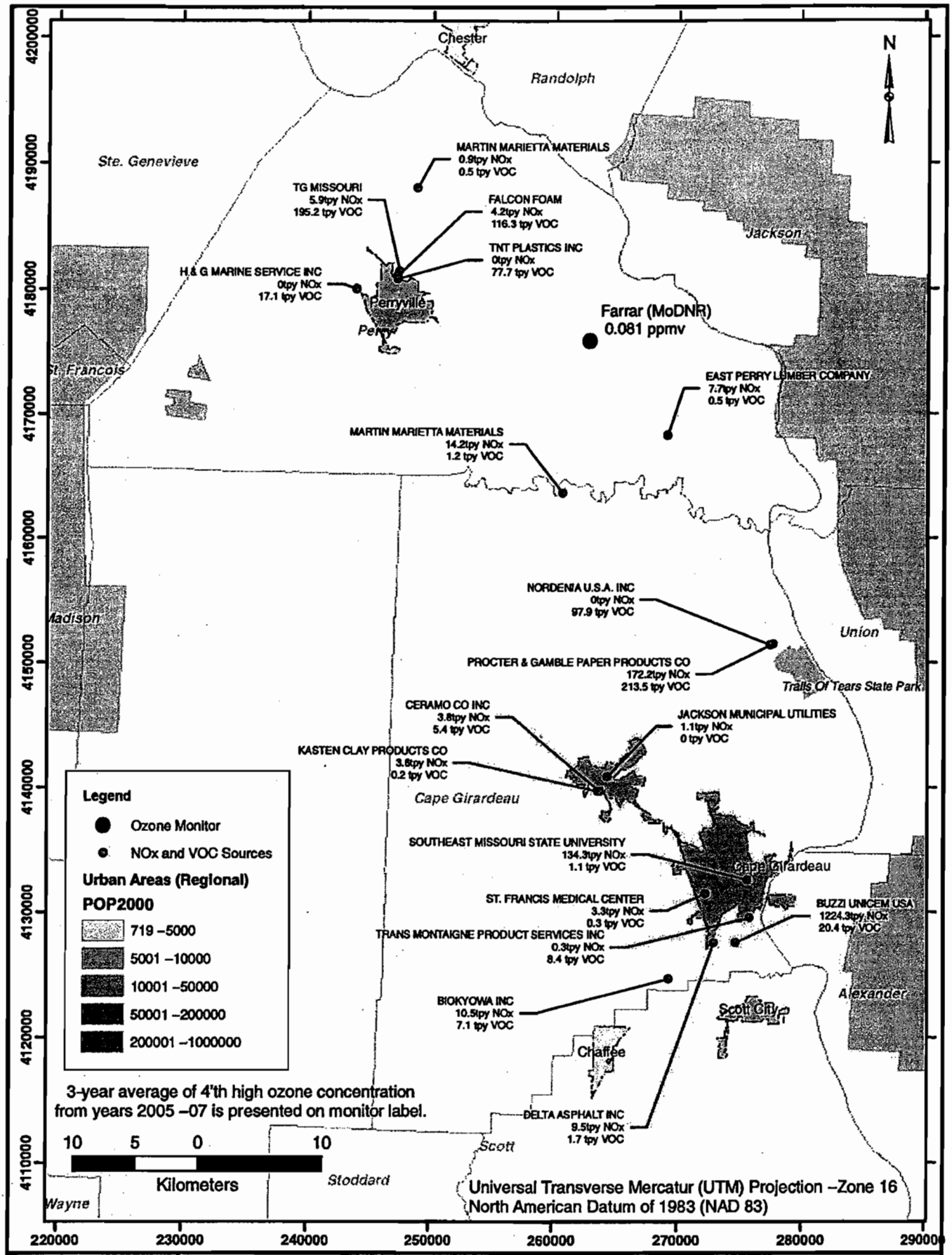


Projected Nonattainment Areas in 2015 after Reductions from CAIR and Existing Clean Air Act Programs



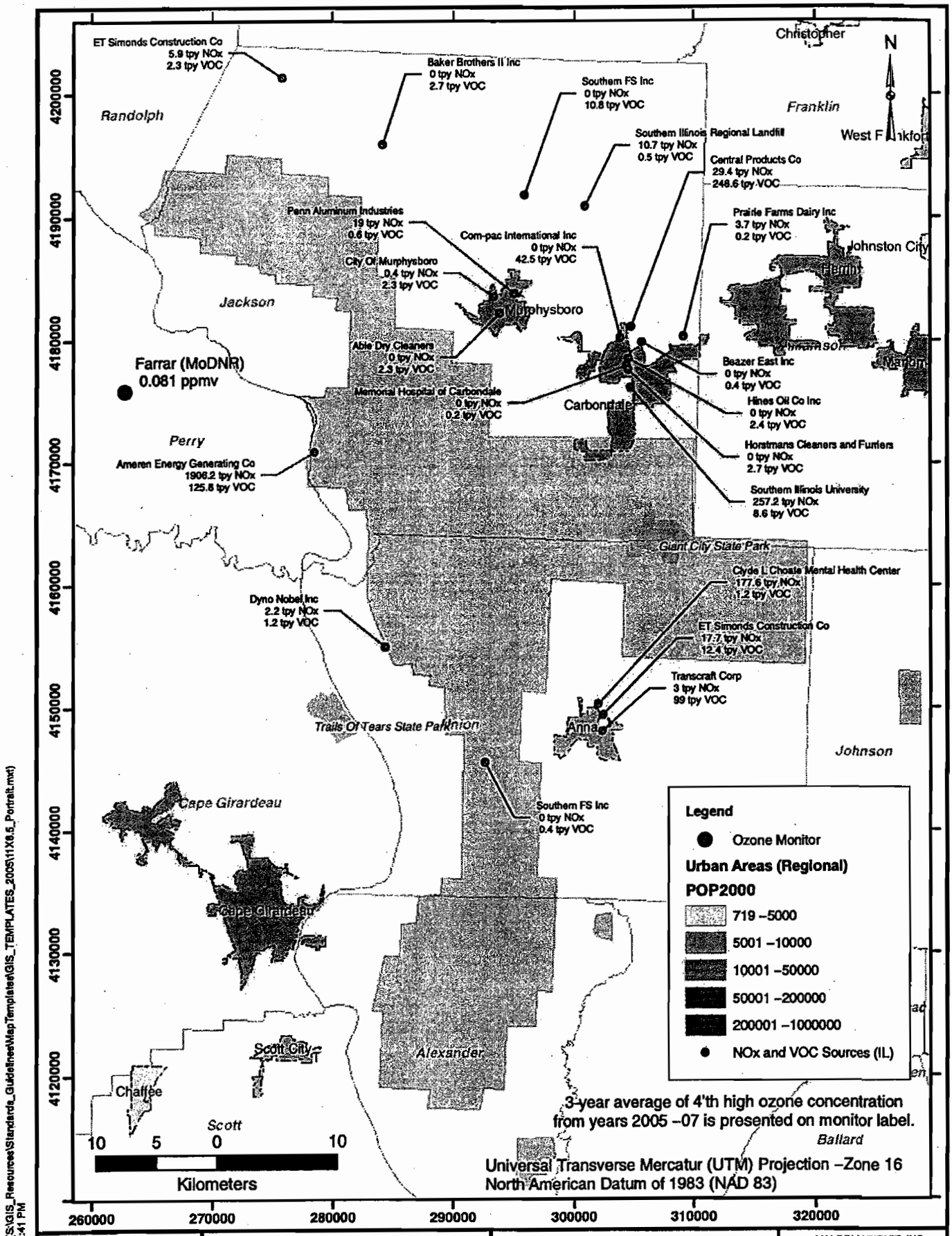


Projections concerning future levels of air pollution in specific geographic locations were estimated using the best scientific models available. They are estimations, however, and should be characterized as such in any description. Actual results may vary significantly if any of the factors that influence air quality differ from the assumed values used in the projections shown here.



Map Document: (S:\GIS_Resources\Standards_Guidelines\MapTemplates\GIS_TEMPLATES_2005\11X8.5_Portrait.mxt)
7/19/2005 --5:12:41 PM

MALCOLM PIRNIE	Missouri Cape Girardeau County Ozone NAAQS Designation 0165464	Ozone Monitor, Populated Areas, and Industrial NOx and VOC Sources of Cape Girardeau and Perry Counties	MALCOLM PIRNIE, INC. October 2008 Figure 1-A



Map Document: (S:\GIS_Resources\Standards_Guidelines\MapTemplates\GIS_TEMPLATES_2005\11X8.5_Portrait.mxt)
7/19/2005 – 5:12:41 PM

MALCOLM PIRNIE

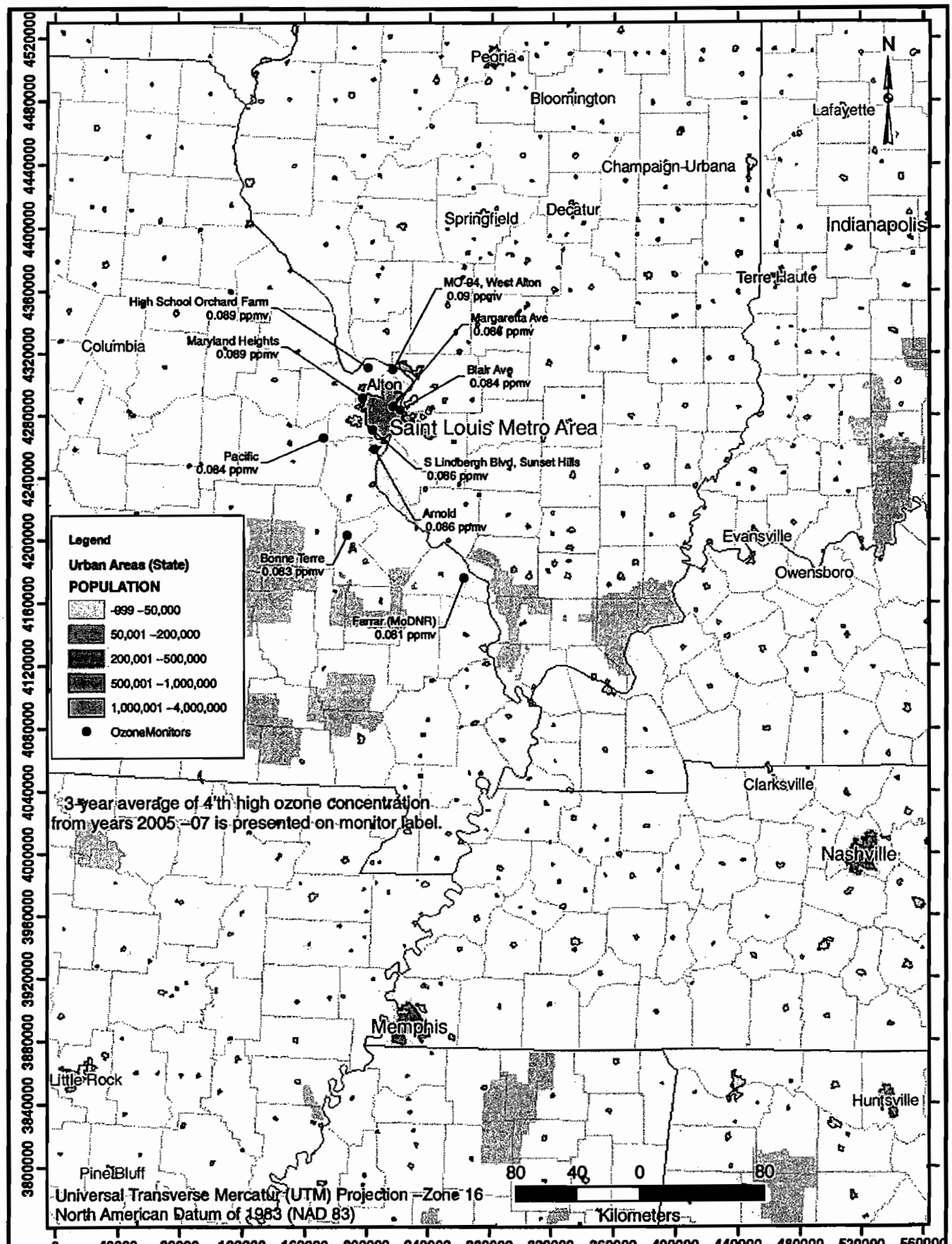
Missouri
Cape Girardeau County
Ozone NAAQS Designation
0165464

Populated Areas and Industrial
NOx and VOC Sources of
Jackson and Union Counties (Illinois)

MALCOLM PIRNIE, INC.

October 2008

Figure 1-B



Map Document: (S:\GIS_Resources\Standards_Guidelines\MapTemplates\GIS_TEMPLATES_2005\11X8.5_Portrait.mxt)
7/19/2005 -- 5:12:41 PM

MALCOLM PIRNIE

Missouri
Cape Girardeau County
Ozone NAAQS Designation
0165464

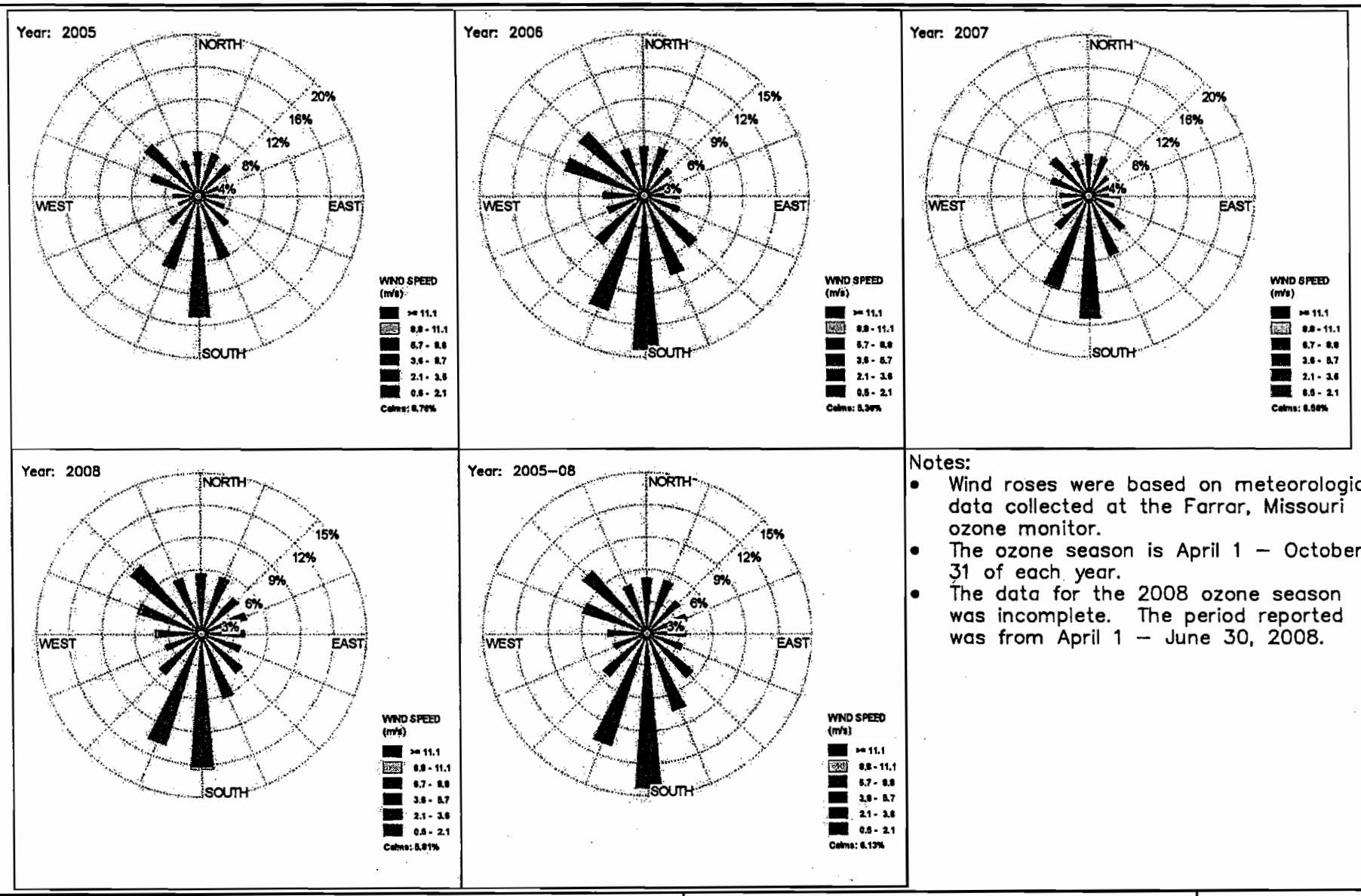
Populated Areas of the
Neighboring States in the
Cape Girardeau Region

MALCOLM PIRNIE, INC.

October 2008

Figure 2

User: Carstensen Spec: PIRNIE STANDARD File: I:\PG\Cape Ozone Project\Figures\WINDROSEFIGUREFARRAR.DWG Scale: 1:1 Date: 11/17/2008 Time: 17:33 Layout: Layout1



Notes:

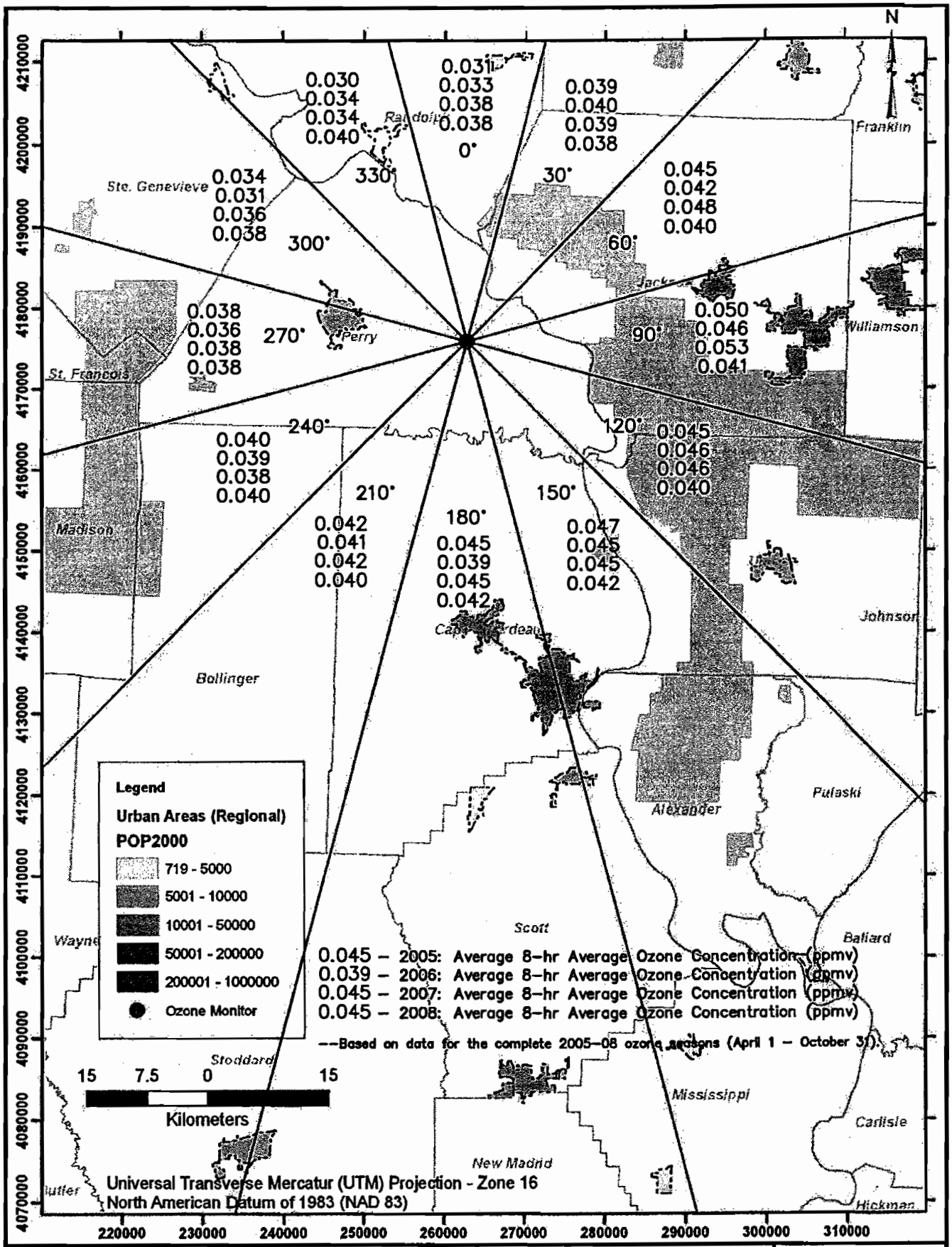
- Wind roses were based on meteorological data collected at the Farrar, Missouri ozone monitor.
- The ozone season is April 1 – October 31 of each year.
- The data for the 2008 ozone season was incomplete. The period reported was from April 1 – June 30, 2008.

MALCOLM PIRNIE

Missouri
Cape Girardeau County
Ozone NAAQS Designation
0165464

Cape Girardeau Wind Roses
For the Ozone Seasons of 2005–08
Farrar Ozone Monitor

MALCOLM PIRNIE, INC.
November 2008
Figure 3

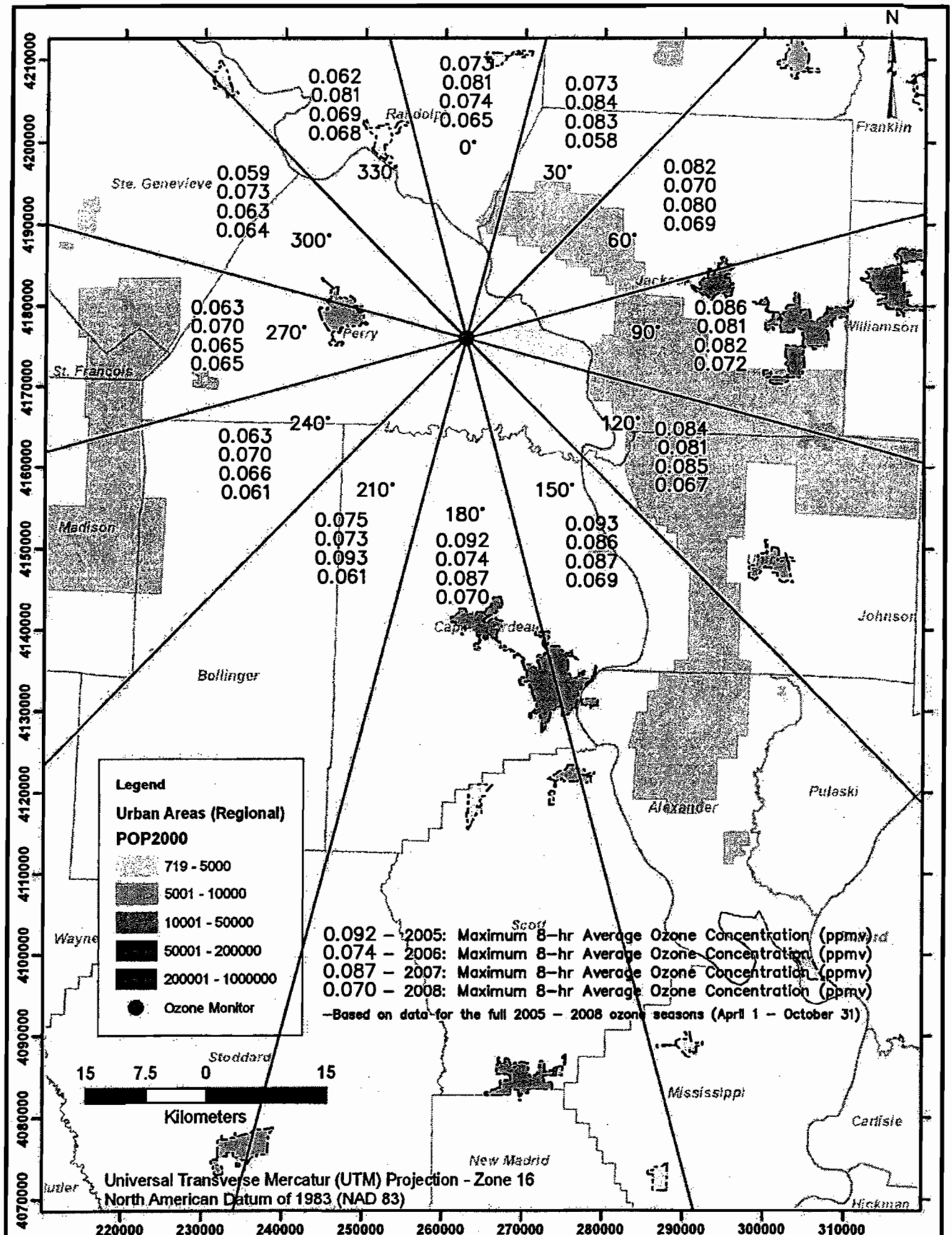


MALCOLM PIRNIE

Missouri
Cape Girardeau County
Ozone NAAQS Designation
0165464

Farrar Ozone Monitor
Wind Direction Sector Analysis: 8-hr Ozone
Average 8-hr Average By Year

MALCOLM PIRNIE, INC.
October 2008
Figure 4

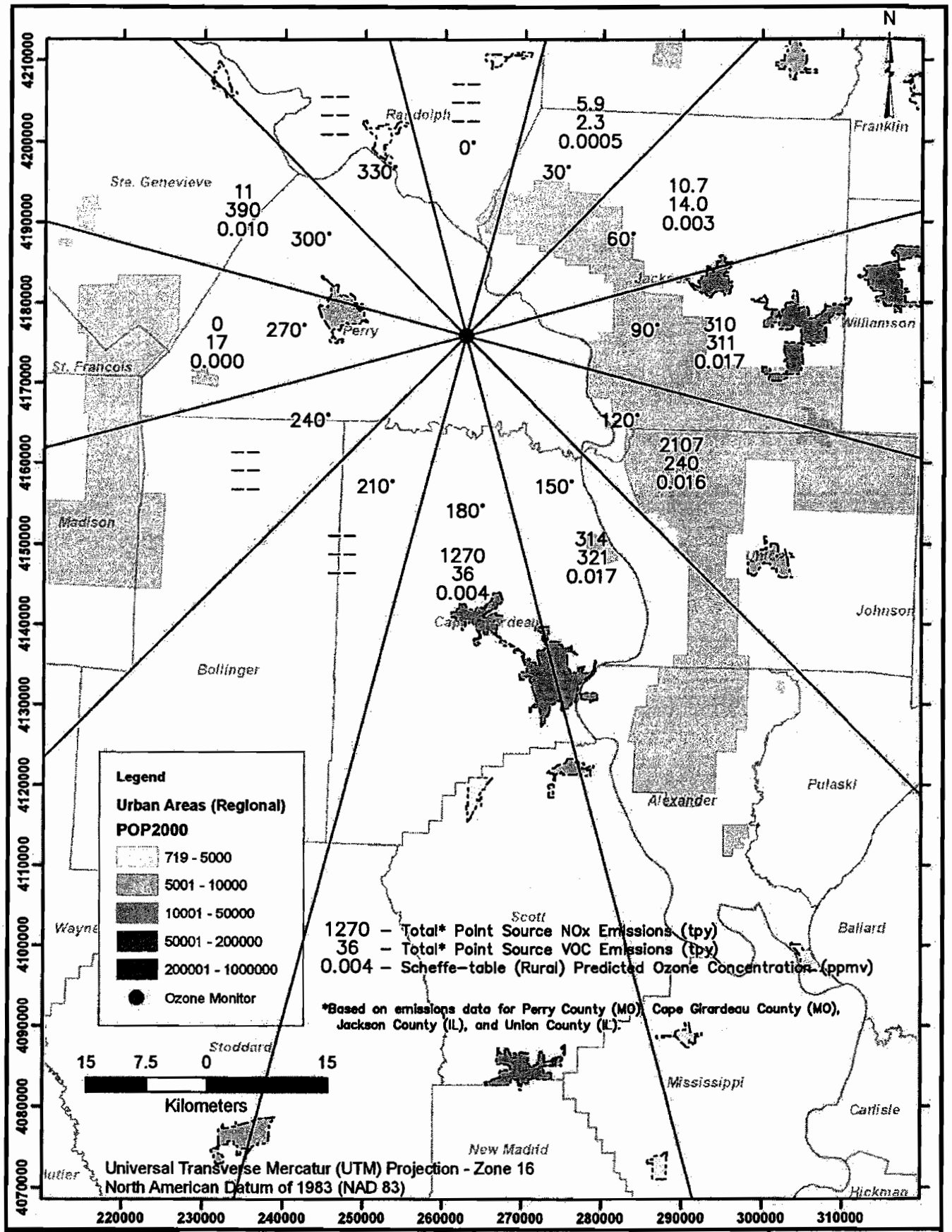


MALCOLM PIRNIE

Missouri
Cape Girardeau County
Ozone NAAQS Designation
0165464

Farrar Ozone Monitor
Wind Sector Analysis
8-hr Ozone
Maximum 8-hr Average By Year

MALCOLM PIRNIE, INC.
October 2008
Figure 5



MALCOLM PIRNIE

Missouri
Cape Girardeau County
Ozone NAAQS Designation
0165464

Farrar Ozone Monitor
Wind Direction Sector
Analysis of Ozone Precursors
NOx and VOC Point Sources

MALCOLM PIRNIE, INC.
October 2008
Figure 6

Southeast Missouri
REGIONAL PLANNING & ECONOMIC DEVELOPMENT COMMISSION

1 WEST ST. JOSEPH ST. • P.O. BOX 366 • PERRYVILLE, MO 63775
(573) 547-8357 • FAX (573) 547-7283
E-MAIL semorpc@semorpc.org • WEBSITE www.semorpc.org

September 10, 2008

Mr. James L. Kavanaugh, Director
Air Pollution Control Program
Missouri Department of Natural Resources
P. O. Box 176
Jefferson City, MO 65102

Dear Mr. Kavanaugh:

Since the announcement of the new 8-Hour Ozone Standard by the U. S. Environmental Protection Agency, and the initiation of the process for designating Nonattainment Areas (NAs) based on this standard, Ste. Genevieve and Perry Counties have taken an active role in addressing this question. They went to the extent of pooling their resources and hiring a consultant to provide a professional analysis of the questions surrounding the issue. The report that is enclosed is the result of that work.

This report speaks for itself and I won't belabor it here. I did, however, want to take a few minutes to stress a few things. I will stick with that which I know, the counties themselves.

First, I need to say that both Ste. Genevieve and Perry Counties have absolutely no history of involvement with the St. Louis Metropolitan Area. The simple fact is that, if these counties get melded into a group that includes the much more populous Metropolitan Area, it is a foregone conclusion that funding for any projects in the rural counties will be lost to metropolitan projects that can show a much greater impact. Both of these counties do have a history of working together, and within the larger Southeast Missouri Region, to address problems.

Second, we are addressing this issue on a regional level, and we believe we can do so more effectively than would be possible if Ste. Genevieve and/or Perry Counties were "rolled into" the larger metropolitan NA. We fully support air quality improvement. We do not, however, think that grouping a rural area into the metropolitan area would be effective in promoting our mutual goals. Indeed, we believe that including Ste. Genevieve and Perry Counties with those counties that are a part of the existing St. Louis ozone nonattainment area would complicate air quality planning. For example, complying with transportation conformity requirements would be unwieldy with two regional planning commissions (East-West Gateway Coordinating Council and the Southeast Missouri Regional Planning Commission) trying to coordinate a single conformity process.

Third, and I suppose the heart of the matter, is that these rural areas are insignificant to the overall problem. The fact that the monitors are located within the counties derives from DNR's desire for an "upwind" background monitor. Setting aside, for now, the question of whether or not we are truly monitoring background, or material transported from some remote location, or locally produced materials, the simple fact is that we can easily identify well into the 90th percentile of our point source emissions, and all of them are tightly regulated now. The Southeast Missouri Regional Planning Commission has recently authorized the creation of a Regional Air Quality Committee, and we will be using that vehicle to investigate what can be done about mobile and area sources of ozone precursor emissions.

I would hope that the conclusions from this report would carry the day and Ste. Genevieve and Perry Counties can be designated as Unclassified. Since I understand that the presumption is that a monitor measuring nonattainment means the county is in nonattainment status, I accept that this will probably be the case. Our "fallback position," then, would be to be designated as a Nonattainment Area but with the option of developing plans (similar to an Early Action Compact) that are suitable for a rural area such as ours pending our committee's review and recommendations. It is our understanding that, if this alternative is available, it would delay the effectiveness of a nonattainment designation, hopefully until further controls on sources upwind of us reduce precursor emissions to the point that we are attaining the standard.

Thank you for your time and attention.

Sincerely,

Chauncy Buchheit
Executive Director

CB/kh

Enclosure

cc: Mr. Doyle Childers, Director, Missouri Department of Natural Resources
Ms. Leanne Tippett-Mosby, Deputy, Environmental Quality, MDNR
Mr. Jeffry Bennett, Air Pollution Control Program, MDNR

Final Report

EVALUATION OF FACTORS RELATED THE EIGHT HOUR OZONE ATTAINMENT STATUS FOR PERRY COUNTY & STE. GENEVIEVE COUNTY

Prepared for
Southeast Missouri Regional Planning Commission
1 West Joseph Street
Perryville, Missouri 63775

September 9, 2008

Prepared by

URS Corporation
1001 Highlands Plaza Drive West
St. Louis, MO 63110
(314) 429-0100

TABLE OF CONTENTS

List of Tables

List of Figures

Executive Summary

On March 12, 2008, the United States Environmental Protection Agency (EPA) adopted a new National Ambient Air Quality Standard (NAAQS) for ozone (O_3). By adopting this new standard, the agency will commence a chain of events to ensure that all areas of the country meet the new NAAQS. These events include:

- Identifying areas that are not attaining the new NAAQS;
- Identifying areas that may contribute to nonattainment of the NAAQS in other areas;
- Developing plans to reduce emissions such that the NAAQS can be met;
- Implementing the plans that are developed, and culminating in attainment of the NAAQS.

This entire process can take a minimum of eight years and, depending on how far over the NAAQS ozone levels are, many more years.

In Missouri, based on the most recent complete monitoring data, all but one monitoring site in the state presently exceeds the new O_3 NAAQS. Included in the sites that presently measure O_3 levels above the NAAQS are sites in Bonne Terre (Ste. Genevieve County on the border of St. Francois County) and Farrar (Perry County).

Neither Ste. Genevieve nor Perry County had monitoring data in excess of the previous O_3 NAAQS. Now, the counties find themselves in the position of having to address the potential they might be found to not be in attainment of the new NAAQS. While a simple analysis would conclude that each of the two counties has a monitor that has recorded O_3 levels in excess of the new NAAQS, leaders in each of the counties believe that the question is not a simple one. This is because if the counties are designated as not attaining the new NAAQS, it not only means that residents of the counties may be breathing air that is not healthful; but also, it means that actions must be considered and possibly taken to reduce emissions that are precursors to O_3. These emissions include volatile organic compounds (VOC) and nitrogen oxides (NO_X). Leaders in the counties want their citizens to breath air that meets EPA standards. However, these are rural counties with limited emissions of O_3 precursors and being designated as not attaining the O_3 NAAQS will start a statutorily driven process which may include mandatory controls that would have little or no impact on the attainment of the O_3 NAAQS.

For this reason, the Southeast Missouri Regional Planning Commission (SEMORPC), which includes both Ste. Genevieve and Perry Counties, retained URS to evaluate whether the counties should be designated as not attaining the new O_3 NAAQS.

The governor of Missouri, relying on advice from the Missouri Department of Natural Resources (MDNR) has the opportunity to recommend to the EPA an appropriate attainment status for each county in the state. This recommendation must be made to

the EPA by March 12, 2009. The MDNR is expected to present its recommendation to the Missouri Air Conservation Commission (MACC) late in 2008 for their consideration.

This report is intended to provide information to SEMORPC to support their recommendations to the MDNR, the MACC and the governor of Missouri to support regarding the attainment status of Perry and Ste. Genevieve based upon a thorough science and policy based analysis.

1. Even though the governor of the state must make recommendations to EPA by March 12, 2009, there are no published criteria as yet as to what considerations the EPA will use in the designation process. Therefore, this report relies on the guidance issued by the EPA as part of the last process to designate O_3 nonattainment areas in 2003. At that time, the EPA identified eleven criteria to be considered when identifying nonattainment areas.

Each of these criteria are addressed in the report in relation to Ste. Genevieve and Perry Counties.

1. Emissions and air quality in adjacent areas (including adjacent C/MSAs)

The emissions data for Ste. Genevieve and Perry Counties clearly show that the emissions generated in the counties are small when compared to the existing St. Louis NA; and that the emissions patterns are indicative of the rural nature of the area.

2. Population density and degree of urbanization including commercial development (significant difference from surrounding areas)

The population density in counties within the St. Louis NA is significantly greater than it is in Ste. Genevieve and Perry Counties. These data support a recommendation to not include Ste. Genevieve or Perry Counties in the St. Louis NA.

3. Monitoring data representing ozone concentrations in local areas and larger areas (urban or regional scale)

Monitoring data show that while the monitors in Ste. Genevieve and Perry Counties show ozone levels slightly in excess of the new ozone NAAQS, the levels appear to be decreasing and with expected future emissions reductions due to requirements that have not yet been implemented, the monitors will likely show attainment of the ozone NAAQS in the future without the counties being designated as nonattainment.

4. Location of emission sources (emission sources and nearby receptors should generally be included in the same nonattainment area)

Ozone precursor emission sources in Ste. Genevieve Count and Perry Counties that emit more than 1 ton per day in the ozone season are at least 19 miles from the Bonne Terre monitor and at least 28 miles from the Farrar monitor. These sources are not local to the monitors in Ste. Genevieve and Perry Counties and, by that measure, these sources are not local to the West Alton and Orchard Farms monitors that measure the

highest levels in the St. Louis nonattainment area and are 80 or more miles from sources in Ste. Genevieve and Perry Counties.

5. Traffic and commuting patterns

DNR staff have noted the importance of "connectivity" as measured by factors such as commuting patterns in establishing whether areas that are outside an MSA should be considered for inclusion in an MSA based nonattainment area. The commuting patterns show that Perry and Ste. Genevieve Counties are not well connected to the St. Louis MSA and therefore they should not be included in a St. Louis nonattainment area.

6. Expected growth (including extent, pattern and rate of growth)

2000 to 2007 population growth in Ste. Genevieve and Perry Counties was less than that of each of the Missouri counties in the proposed NA, except for St. Louis City. Population growth does not make Ste. Genevieve or Perry Counties a candidate for inclusion in the St. Louis eight-hour ozone NA.

7. Meteorology (weather/transport patterns)

While it is difficult to draw extensive conclusions from observational data analyses, one can learn several things from evaluation of the data. First of all, while ozone concentrations at the Blair and Arnold monitoring sites in the St. Louis NA increase under southerly winds, the same occurs at Bonne Terre and Farrar. Without background sites to the south of Ste. Genevieve and Perry Counties to quantify regional transport, it can be concluded that a potentially significant regional contribution exists to the south. The increase at St. Louis area monitors under southerly winds cannot be specifically attributed to Ste. Genevieve and Perry Counties.

Several analyses indicate transport into Ste. Genevieve and Perry Counties contributing to elevated ozone concentrations at the Bonne Terre and Farrar monitors. Both CPF plots and back trajectories indicate high ozone levels originating in areas to the south and east of the monitors, particularly the Ohio River Valley. This transport is especially evident in the subset of days with high wind speeds as well as high ozone. Trajectories ending on these days show a consistently fast flow transporting air masses (and their constituents) from the Gulf Coast into Ste. Genevieve and Perry Counties.

8. Geography/topography (mountain ranges or other air basin boundaries)

Geographical features by themselves are not a major influence on ozone levels in the St. Louis region or in Ste. Genevieve and Perry Counties.

9. Jurisdictional boundaries (e.g., counties, air districts, existing one-hour nonattainment areas, Reservations, etc.)

The Southeast Missouri Regional Planning Commission (SEMORPC) requested that this report be prepared because they represent Ste. Genevieve and Perry Counties (as well as other southeast Missouri counties). Regional planning for the existing ozone nonattainment area is the responsibility of the East West Gateway Council of Governments (EWGCOG). This existing jurisdictional linkage sets Ste. Genevieve and

Perry Counties apart from the counties that presently comprise the St. Louis ozone nonattainment area. The SEMORPC represents Ste. Genevieve and Perry Counties.

The SEMORPC is presently in the process of constituting an Air Quality Advisory Committee similar to that established by the EWGCOG. This committee, as a part of the SEMORPC, will be well suited to deal with air quality planning issues in Southeast Missouri.

10. Level of control of emission sources

Within Ste. Genevieve and Perry Counties, major new sources or major modifications permitted since 1975 have been subject to Best Available Control Technology (BACT) emission limitations for ozone precursors. BACT represents a more stringent level of control than Reasonably Available Control Technology (RACT) limits applied to existing sources in the existing nonattainment area. Future major new source construction and all modifications to existing sources in the counties will be subject to more restrictive BACT limits. Thus the existing and future levels of control for ozone precursors support the exclusion of Ste. Genevieve and Perry Counties from an ozone nonattainment area.

11. Regional emission reductions (e.g., NO_X SIP call or other enforceable regional strategies)

The DNR has adopted NO_X emissions control requirements for Electric Generating Units (EGUs) located outside of the proposed eight-hour ozone NA. These reductions were initiated as a result of EPA's NO_X SIP Call, a federal initiative designed to reduce the impact of emissions transported from one area to another. There are no EGUs affected by this requirement in Ste. Genevieve or Perry Counties; however, this regional requirement demonstrates how the DNR can put in place requirements on existing sources outside of the St. Louis ozone NA if it is shown to be necessary to bring about attainment of the NAAQS.

It should also be noted that a more recent federal initiative, the Clean Air Interstate Rule (CAIR) would have provided for even more reduction of ozone precursor emissions. This rule, however, was recently vacated as a result of a court decision. EPA is now working on plans to further reduce the impact of transported emissions in a way that is consistent with the court's decision.

The ability of the DNR and the EPA to adopt regional emission reductions is consistent with and supports not including Ste. Genevieve and Perry Counties in the St. Louis eight-hour ozone NA.

Summary

Evaluation of the eleven factors which EPA previously identified in 2003 show that Ste. Genevieve and Perry Counties should not be classified as nonattainment for the new O_3 NAAQS. While it is true that there are monitoring sites in the two counties that exceed the new NAAQS, emission sources in the counties are not likely to significantly

contribute to O_3 NAAQS exceedances in the St. Louis region and exceedances at the Farrar and Bonne Terre monitoring sites are likely related to emissions generated in the St. Louis area or in areas south and east and transported into these counties.

Designation of the counties as nonattainment will not significantly advance the progress towards attainment at the monitoring sites in the counties or at monitoring sites in the St. Louis region.

Notwithstanding this finding, should MDNR determine that the counties must be designated as nonattainment due to the simple fact that O_3 levels at county monitoring sites are slightly in excess of the new O_3 NAAQS, the counties should be a nonattainment area separate from the St. Louis nonattainment area. The counties by all measures are rural in nature and unlike the urban St. Louis NA. Should the counties be designated nonattainment for the new O_3 NAAQS, the SEMORPC through its new air quality advisory committee is in a position to consider early action measures similar to those that were acceptable to EPA to attain the previous O_3 NAAQS. This option of early action to affect the effectiveness of a nonattainment designation would be unavailable to the counties if they were a part of a St. Louis nonattainment area.

If Ste. Genevieve and Perry Counties are ultimately to be designated as nonattainment of the new NAAQS, they should be provided with the tools to address their unique rural character. The State Implementation Plans which will be developed as a result of the designation process would need to be much different to address the issues in the rural counties versus the more urban areas.

The SEMORPC requested that this report be prepared with support of both county and affected city governments as well as, the business community within them.

1 INTRODUCTION

The Environmental Protection Agency (EPA) established a new eight-hour National Ambient Air Quality Standard (NAAQS) for ozone on March 12, 2008. That NAAQS has been challenged in court by a number of parties including the Missouri Department of Natural Resources (MDNR). The basis of that challenge is that the new NAAQS is too stringent and/or that it is not necessary since progress is being made in lowering ozone levels due to actions prompted by the previous eight-hour ozone NAAQS. There are other parties that have challenged the new NAAQS as not stringent enough. They claim that EPA's record and its outside advisory committee support a lower NAAQS for ozone. Despite these challenges, EPA is moving forward with the implementation process for the new NAAQS.

The first step in the implementation process is to determine those areas that do not meet the new standard. EPA's analysis of monitored ozone data in the St. Louis Region shows that there are monitors in the region that do not meet this new NAAQS. Thus further consideration is required.

That further consideration involves setting of the geographical boundaries that define the extent of the area not attaining the new NAAQS (called the nonattainment area or NA). EPA is at this point in the implementation process.

The State of Missouri, through its Governor, has the responsibility to recommend to EPA the boundaries of the Missouri portion of the St. Louis eight-hour ozone NA. These recommendations should be identified by the state by March 12, 2009. The EPA must notify any state of changes that EPA intends to make to the state recommended boundaries at least 120 days prior to March 12, 2010 and then must publish the final NA boundaries by March 12, 2010.

This document examines issues related to the establishment of the NA boundary for the St. Louis eight-hour NA and in particular, information related to the potential for inclusion of Ste. Genevieve and Perry Counties as part of the St. Louis NA area.

1.1 Statutory Background

The federal Clean Air Act (CAA) contains the requirements governing the establishment of boundaries of NAs. Section 107(d) of the CAA states:

> "(d) Designations.
> (1) (A) Submission by Governors of Initial Designations Following Promulgation of New or Revised Standards. — By such date as the Administrator may reasonably require, but not later than 1 year after promulgation of a new or revised national ambient air quality standard for any pollutant under section 109, the Governor of each State shall (and at any other time the Governor of a State deems appropriate the Governor

may) submit to the Administrator a list of all areas (or portions thereof) in the State, designating as—

(i) nonattainment, any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for the pollutant,

(ii) attainment, any area (other than an area identified in clause (i)) that meets the national primary or secondary ambient air quality standard for the pollutant, or

(iii) unclassifiable, any area that cannot be classified on the basis of available information as meeting or not meeting the national primary or secondary ambient air quality standard for the pollutant.

The Administrator may not require the Governor to submit the required list sooner than 120 days after promulgating a new or revised national ambient air quality standard.

(B) Promulgation by EPA of Designations. —

(i) Upon promulgation or revision of a national ambient air quality standard, the Administrator shall promulgate the designations of all areas (or portions thereof) submitted under subparagraph (A) as expeditiously as practicable, but in no case later than 2 years from the date of promulgation of the new or revised national ambient air quality standard. Such period may be extended for up to one year in the event the Administrator has insufficient information to promulgate the designations.

(ii) In making the promulgations required under clause (i), the Administrator may make such modifications as the Administrator deems necessary to the designations of the areas (or portions thereof) submitted under subparagraph (A) (including to the boundaries of such areas or portions thereof). Whenever the Administrator intends to make a modification, the Administrator shall notify the State and provide such State with an opportunity to demonstrate why any proposed modification is inappropriate. The Administrator shall give such notification no later than 120 days before the date the Administrator promulgates the designation, including any modification thereto. If the Governor fails to submit the list in whole or in part, as required under subparagraph (A), the Administrator shall promulgate the designation that the Administrator deems appropriate for any area (or portion thereof) not designated by the State.

(iii) If the Governor of any State, on the Governor's own motion, under subparagraph (A), submits a list of areas (or portions thereof) in the State designated as nonattainment, attainment, or unclassifiable, the Administrator shall act on such designations in accordance with the procedures under paragraph (3) (relating to redesignation).

(iv) A designation for an area (or portion thereof) made pursuant to this subsection shall remain in effect until the area (or portion thereof) is redesignated pursuant to paragraph (3) or (4)."

The recommendation of the State of Missouri called for in section 107(d)(1)(A) is presently the subject of consideration by MDNR. The agency has stated that they will

engage parties interested in this decision, develop a recommendation and then seek concurrence from the Missouri Air Conservation Commission (MACC).

1.2 Policy Background

The EPA issued a guidance document[1] in November of 2002 to suggest to states the factors that should be considered in making NA recommendations. EPA has not yet issued guidance for the determination of areas not meeting the new ozone NAAQS. That guidance is expected in the fourth quarter of 2008. However, the MDNR has stated that they expect the new guidance will be similar to that issued in 2002. Therefore, the analysis in this document is based on the November 2002 guidance and may need to be updated when new guidance is issued by the EPA.

1.2.1 Information to Support State Recommendations

The EPA outlines eleven types of information that should be considered and included with a state's recommended NA boundaries:

1. Emissions and air quality in adjacent areas (including adjacent C/MSAs)
2. Population density and degree of urbanization including commercial development (significant difference from surrounding areas)
3. Monitoring data representing ozone concentrations in local areas and larger areas (urban or regional scale)
4. Location of emission sources (emission sources and nearby receptors should generally be included in the same nonattainment area)
5. Traffic and commuting patterns
6. Expected growth (including extent, pattern and rate of growth)
7. Meteorology (weather/transport patterns)
8. Geography/topography (mountain ranges or other air basin boundaries)
9. Jurisdictional boundaries (e.g., counties, air districts, existing one-hour nonattainment areas, Reservations, etc.)
10. Level of control of emission sources
11. Regional emission reductions (e.g., NO_X SIP call or other enforceable regional strategies)

This document contains information related to the eleven factors listed by EPA.

1.3 DNR Process to Develop Recommendation

The DNR has started the process of developing their recommendation by convening meetings with parties that may be interested in the definition of the NA.

[1] Boundary Guidance on Air Quality Designations for the 8-Hour Ozone National Ambient Air Quality Standards (NAAQS or Standard), John Seitz, Director OAQPS, March 28, 2000.

The DNR has identified four areas where they are considering a potential NA designation. These are focused on Metropolitan (or Micropolitan) Statistical Areas (MSAs) and include:

- The Kansas City, MO-KS MSA
- Springfield MO MSA
- St. Louis, MO-IL MSA, and
- Cape Girardeau-Jackson, MO-IL Micropolitan Statistical Area

These MSAs were chosen for consideration because they either contain or are adjacent to an ozone monitoring site that has measured levels that are in excess of the new ozone NAAQS.

1.4 DNR Recommendation

The DNR recommends that the Missouri portion of the St. Louis eight-hour ozone NA include the following political subdivisions:

- St. Louis City,
- St. Louis County,
- St. Charles County,
- Franklin County, and
- Jefferson County

This recommendation sets the proposed NA boundary exactly as it was for the previous eight-hour ozone NAAQS.

1.5 Ste. Genevieve and Perry Counties Role and Interest

The DNR proposed recommendation considered the possible expansion of the NA to potentially include:

- Pike County
- St. Francois County
- Lincoln County
- Warren County
- Crawford County
- Bollinger County
- Washington County
- Cape Girardeau County
- Montgomery County
- Perry County
- Gasconade County, and
- Ste. Genevieve County.

MDNR has initially organized the information related to the designation process into two separate areas in the eastern part of the state. MDNR has included information concerning Ste. Genevieve County along with that of counties that are presently part of the St. Louis ozone nonattainment area. Perry County information has been included with an area that includes the Cape Girardeau Micropolitan area (Cape Girardeau, and Bollinger Counties in Missouri and a portion of Jackson County in Illinois).

As counties that are part of DNR's evaluation process, Ste. Genevieve and Perry Counties have a keen interest in DNR's proposed recommendation and the ultimate outcome of this process.

2 APPLICATION OF EPA REGULATIONS AND POLICY

EPA policy specifies the process that should be followed in order to develop boundaries for eight-hour ozone nonattainment areas. The policy says:

> "... In reducing ozone concentrations above the NAAQS, EPA believes it is best to consider controls on sources over a larger area due to the pervasive nature of ground level ozone and transport of ozone and its precursors. Thus, EPA recommends that the Metropolitan Statistical Area or the Consolidated Metropolitan Statistical Area (C/MSA) serve as the presumptive boundary for 8-hour NAAQS nonattainment areas.[2] We believe this approach will best ensure public health protection from the adverse effects of ozone pollution caused by population density, traffic and commuting patterns, commercial development, and area growth. In the past, areas within C/MSAs have generally experienced higher levels of ozone concentrations and ozone precursor emissions than areas not in C/MSAs. In addition, the 1990 Amendments to the CAA established the C/MSA as the presumptive boundary for ozone nonattainment areas classified as serious, severe and extreme."

2.1 Areas Which Must Be Considered

The EPA guidance on setting NA boundaries suggests that the boundaries of the Consolidated Metropolitan Statistical Area (CMSA) serve as the presumptive NA boundaries. In the case of the St. Louis NA, those counties include:

- Franklin County,

---

[2] C/MSAs are identified by the U.S. Bureau of the Census and can be found at: http://www.census.gov/population/www/estimates/aboutmetro.html.

- Jefferson County,
- Lincoln County,
- St. Charles County,
- St. Louis County,
- Warren County, and
- St. Louis City.

Each of these political subdivisions was considered by the DNR as part of the formulation of their proposed recommendation.

The second county grouping that MDNR is considering includes:

- Cape Girardeau County,
- Bollinger County, and
- Perry County.

In the case of this grouping, Perry County is the only county where there is presently a monitor that has recorded levels above the new ozone NAAQS. Neither Cape Girardeau nor Bollinger Counties (the counties that make up the Missouri portion of the Micropolitan Statistical Area) have an ozone monitor. They are adjacent to Perry County where there is presently an ozone monitor.

2.2 Areas Which May Be Considered

The EPA guidance on NA boundaries states:

> "In some cases, the most appropriate nonattainment area boundary may be larger than the C/MSA. For example, if sources located in a county or on Indian lands outside the C/MSA contribute to violations within the C/MSA, States or Tribes should consider whether it would be appropriate to expand the nonattainment area to include the area in which those sources are located."

Additional counties include:

- Pike County,
- St. Francois County,
- Ste. Genevieve County,
- Bollinger County,
- Perry County,
- Cape Girardeau County,
- Crawford County,
- Washington County,
- Montgomery County, and
- Gasconade County.

2.3 Consideration of Ste. Genevieve and Perry Counties

The sections below consider the possible designation of Ste. Genevieve and Perry Counties as nonattainment areas. These counties are considered relative to the eleven evaluation factors suggested in the EPA guidance. For those evaluation factors, where appropriate, this analysis uses the existing eight-hour ozone NA as the baseline for the evaluation of these counties' potential designation as nonattainment areas.

2.3.1 Emissions and Air Quality

Emissions of ozone precursors (Nitrogen Oxides [NO_X] and Volatile Organic Compounds [VOC]) are low in Ste. Genevieve and Perry Counties when compared to the emissions for the entire recommended Nonattainment Area.

Perry County VOC and NO_X emissions are about one sixth of the emissions recorded in Franklin County, the county with the least emissions of the counties in the present ozone nonattainment area. Likewise, Ste. Genevieve County VOC and NOx emissions equal approximately one half of the emissions recorded in Franklin County.

Table 1 below shows 2009 projected VOC and NO_X emissions for the present nonattainment area and the percent of those emissions that would be added if the nonattainment area were to include Ste. Genevieve and Perry Counties.

Table 1: 2009 Projected VOC and NO_X Emissions

County	VOC Source Category Emissions, Tons per day						
	Area	Non-road	Mobile	EGU	Non-EGU	Total	% of NA
St. Louis	39.22	19.57	32.66	0.33	13.43	105.22	49.98%
St. Charles	10.06	7.01	7.67	0.63	3.07	28.43	13.51%
Jefferson	8.99	7.35	5.58	0.48	1.68	24.07	11.44%
St. Louis City	14.06	3.82	9.53	0.00	10.78	38.19	18.14%
Franklin	4.23	3.25	4.35	0.85	1.93	14.61	6.94%
NA Area (Missouri portion)	76.56	41.01	59.79	2.28	30.88	210.52	
Cape Girardeau	4.04	1.53	1.37	0.00	2.04	8.98	4.27%
Perry	1.23	1.28	1.15	0.00	0.90	4.56	2.16%
Bollinger	0.79	0.49	0.44	0.00	0.08	1.80	0.86%
Ste. Genevieve	1.14	0.86	1.02	0.00	2.76	5.79	2.75%

County	NO_x Source Category Emissions, Tons per day						
	Area	Non-road	Mobile	EGU	Non-EGU	Total	% of NA
St. Louis	10.22	30.71	73.86	17.89	2.31	135.01	42.34%
St. Charles	2.50	7.01	17.61	21.90	1.23	50.24	15.76%
Jefferson	1.46	2.11	13.13	15.20	18.33	50.24	15.76%
St. Louis City	4.39	10.24	19.56	0.00	5.14	39.33	12.34%
Franklin	1.82	3.36	10.60	28.15	0.10	44.03	13.81%
NA Area (Missouri portion)	20.40	53.44	134.76	83.14	27.11	318.85	
Cape Girardeau	1.71	3.63	4.37	0.01	7.11	16.83	5.28%
Perry	1.47	2.84	1.98	0.00	0.09	6.39	2.00%
Bollinger	0.11	0.55	0.68	0.00	2.86	4.20	1.32%
Ste. Genevieve	1.03	1.68	2.27	0.00	25.17	30.16	9.46%

EPA has mapped 2001 emissions on their website,[3] shown in Figures 1 and 2.

[3] http://www.epa.gov/air/data/emisdist.html

Figure 1. 2001 NO_x Emissions (1000 tons per year)

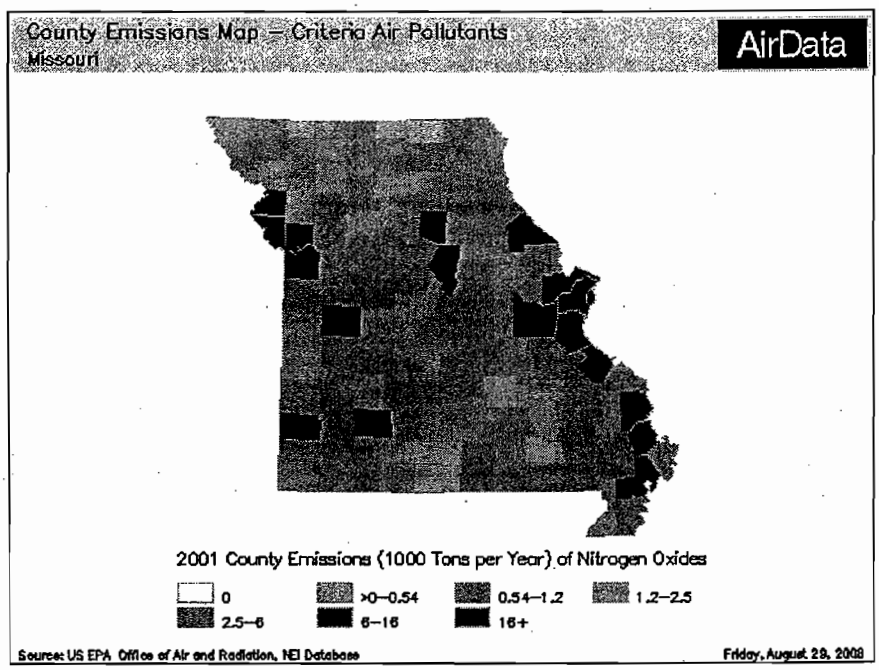
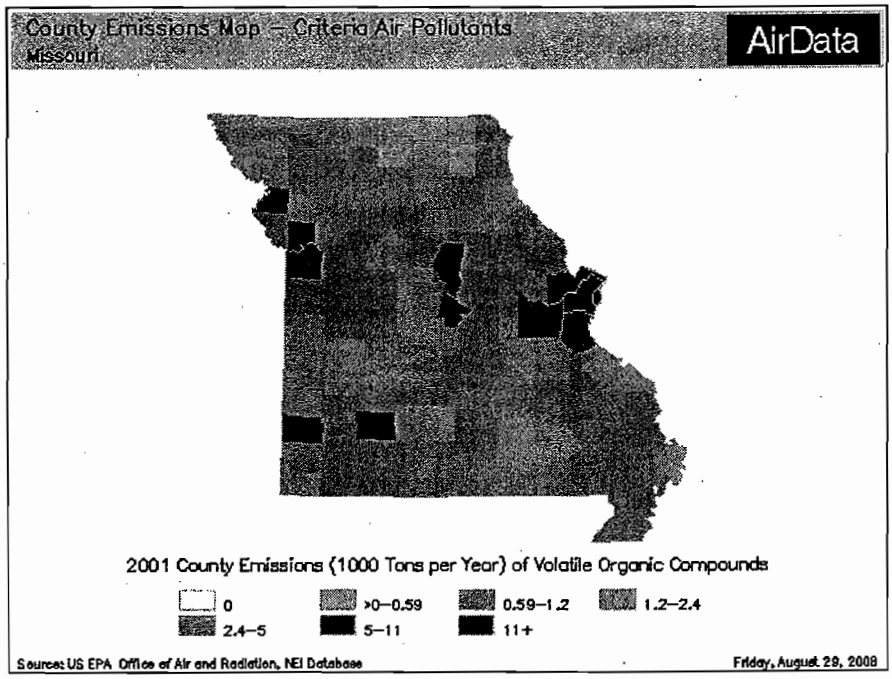


Figure 2. 2001 VOC Emissions (1000 tons per year)



The emissions data for Ste. Genevieve and Perry Counties clearly show that the emissions generated in the counties are small when compared to the existing St. Louis NA; and, that the emissions patterns are indicative of the rural nature of the area. The ozone precursor emissions in these counties are not consistent with the need to classify the counties as not attaining the new eight hour ozone standard,

2.3.2 Population Density

Ste. Genevieve and Perry Counties are rural areas with small populations and low population density. Table 2 shows population and population density statistics.

Table 2: St. Louis MSA and Southeast Missouri Counties Population Data

County	2007 Population Density[4] *(persons / sq. mi.)*	2007 Population[5] *(persons)*
St. Louis	1,960	995,118
St. Charles	614	343,952
Jefferson	329	216,076
St. Louis City	5,665	350,759
Franklin	108	100,045
NA Area (Missouri Portion)		2,005,950
Ste. Genevieve	36	17,841
Perry	40	18,794
Bollinger	20	12,118
Cape Girardeau	126	72,740

Figure 3[6] shows the population density for the counties that comprise the recommended NA and surrounding counties. This figure shows that the population density in counties within the St. Louis NA is greater than it is in Ste. Genevieve and Perry Counties. These data support a recommendation to not include Ste. Genevieve or Perry Counties in the St. Louis NA.

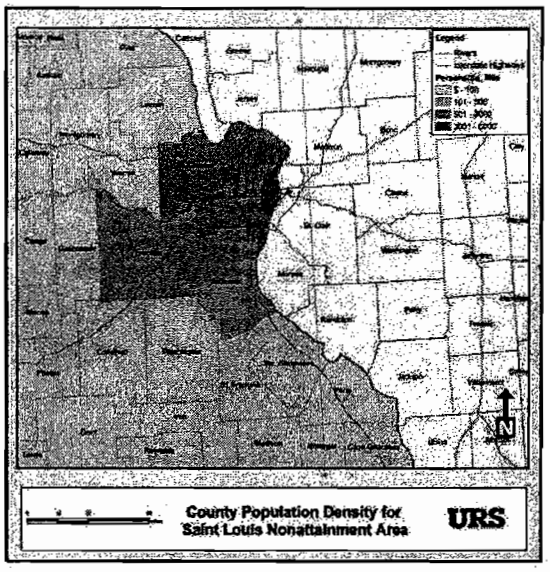
---

[4] Based on population data provided by Southeast Missouri Planning Commission and land area from Fact Finder on the U.S. Census web site.

[5] Data provided by the Southeast Missouri Regional Planning Commission

[6] Data taken from the US Census Bureau
http://factfinder.census.gov/servlet/ThematicMapFramesetServlet

Figure 3. Population Density by County.

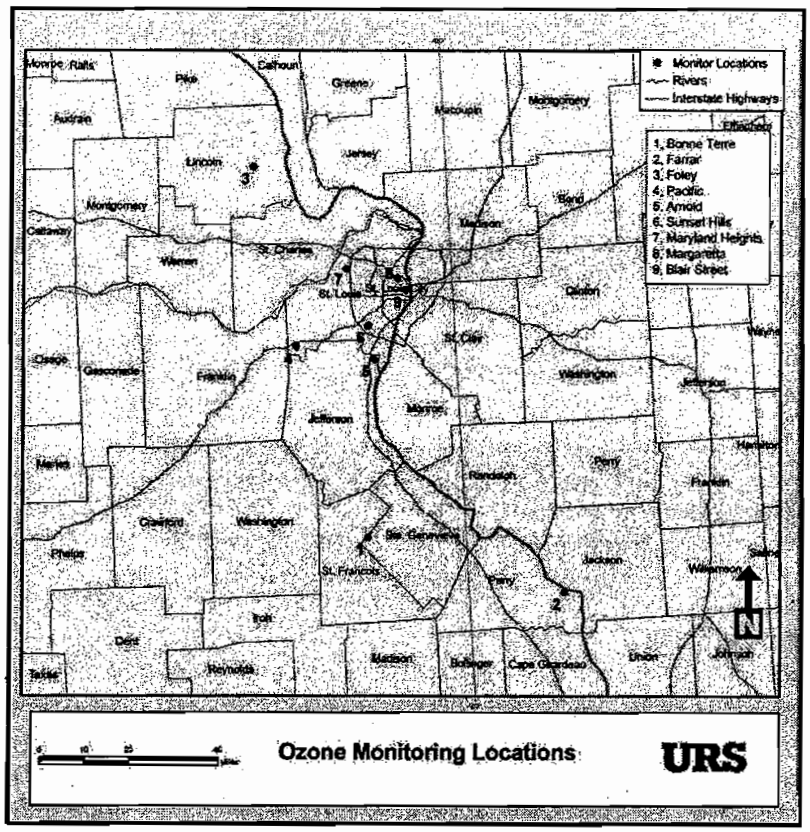


2.3.3 Monitoring Data

The ozone monitoring site in Ste. Genevieve County is located in Bonne Terre, while the Perry County ozone monitoring site is located in Farrar. **Figure** 4[7] shows the location of the sites. **Figure 4** below shows that the Bonne Terre and Farrar ozone monitors are not downwind of Ste. Genevieve County sources when there are wind flows from the south. Elevated ozone levels recorded at this monitor are not likely to be related to sources in Ste. Genevieve County or Perry County.

[7] Data from: Missouri Department of Natural Resources
http://www.dnr.mo.gov/env/apcp/docs/stl-dvmaps.pdf

Figure 4. St. Louis Area Ozone Monitors.



The data in Table 3 shows that the three-year average ozone level for the most recent period (2005-2007) is only slightly above the new NAAQS for ozone. This table also includes year-to-date data for the Bonne Terre and Farrar monitors. Those data show that with only a few weeks left of potentially high ozone levels, the 2006 to 2008 fourth high average has decreased significantly.

Table 3: Ozone Design Values – St. Louis Area and Southeast Missouri Monitors (ppb)

Monitor	02-04 Average	03-05 Average	04-06 Average	05-07 Average	06-08 Average
Arnold	81	77	80	83	
West Alton	89	85	85	87	
Orchard Farm	88	83	86	88	
Blair				80	
Sunset Hills	85	82	79	83	
Margaretta	86	84	79	83	
Maryland Heights				87	
Pacific				83	
Bonne Terre	82	79	77	83	77
Foley				84	
Farrar			76	81	76

Monitoring data show that while the monitors in Ste. Genevieve and Perry Counties show ozone levels slightly in excess of the ozone NAAQS, the levels appear to be decreasing and with expected future emissions reductions due to requirements that have not yet been implemented, the monitors will likely show attainment of the ozone NAAQS without designating the counties as nonattainment.

2.3.4 Location of Emission Sources

Ozone precursor emission sources in Ste. Genevieve Count and Perry Counties that emit more than 1 ton per day in the ozone season are at least 19 miles from the Bonne Terre monitor and at least 28 miles from the Farrar monitor. These sources are not local to the monitors in Ste. Genevieve and Perry Counties and, by that measure, these sources are not local to the West Alton and Orchard Farms monitors that measure the highest levels in the St. Louis nonattainment area and are 80 or more miles from sources in Ste. Genevieve and Perry Counties.

2.3.5 Traffic and Commuting Patterns

The 2004 data available from the U.S. Census Bureau contain information concerning commuting patterns between resident and workplace counties in Missouri[8]. These data show that over 50% of the work-trips from Ste. Genevieve County were to either Ste. Genevieve or Perry Counties and over 70% of the work-trips originating in Perry County were to either Perry County or Ste. Genevieve County. Conversely, less than 7% of the work-trips from the existing ozone NA were to Ste. Genevieve or Perry Counties. **Table 4** summarizes work trip information.

DNR staff have noted the importance of "connectivity" as measured by factors such as commuting patterns in establishing whether areas that are outside an MSA should be considered for inclusion in an MSA based nonattainment area. The commuting patterns

[8] U.S. Census Bureau, Longitudinal Employer-Household Dynamics, http://lehd.did.census.gov/led/.

shown here clearly show that Perry and Ste. Genevieve Counties are not well connected to the St. Louis MSA and therefore they should not be included in a St. Louis nonattainment area.

Table 4: Residence / Workplace Relationships

Location of Residence / Location of Employment	Ste. Genevieve County	Perry County	St. Louis Nonattainment Area
St. Louis Nonattainment Area	2,438 / 27.5%	632 / 8.6%	837,281 / 92.8%
Perry, Missouri	577 / 6.5%	329 / 68.0%	<31,245 / <3.5%
Ste. Genevieve, Missouri	4,149 / 46.7%	1,389 / 4.5%	<31,245 / <3.5%
All Other Locations	1,711 / 19.3%	7,341 / 18.9%	34,041 / 3.8%

Note: Units are (workers / % of total workers)

Reflecting less populated areas, fuel stations in both Perry and Ste. Genevieve are modest in number. Perry County has nineteen, while Ste. Genevieve has twelve[9].

These data support a DNR recommendation to not include Ste. Genevieve or Perry County in the eight-hour ozone NA.

2.3.6 Expected Growth

As shown in Table 5, population growth between the 1990 census and the 2000 census was 4.5% for the proposed NA. Population growth in Ste. Genevieve and Perry Counties averaged 11% in each case; however, because the 1990 population was small, this represented a growth of approximately 2,000 residents per county. In 1990, Ste. Genevieve and Perry Counties combined population equaled about 1.6% of the population of the proposed NA. In 2000, this percentage grew to about 1.8%.

[9] Information provided by the Southeast Missouri Regional Planning Commission.

Table 5: Population Growth

County	2000 Census (1,000)	2007 (estimated) (1,000)	Population Growth (1,000)	Population Growth (%)
St. Louis	1,016	995	-21	-2.1%
St. Charles	284	344	60	21.1%
Jefferson	198	216	18	9.1%
St. Louis City	348	351	3	0%
Franklin	94	100	6	6.4%
NA Area (Missouri Portion)	1,940	2,006	66	3.4%
Perry	18.13	18.79	0.66	3.7%
Bollinger	12.03	12.12	0.09	0.7%
Cape Girardeau	68.69	72.74	4.05	5.9%
Ste. Genevieve	17.84	17.84	0	0%

2000 to 2007 population growth in Ste. Genevieve and Perry Counties was less than that of each of the Missouri counties in the proposed NA, except for St. Louis City,. Population growth does not make Ste. Genevieve or Perry Counties a candidate for inclusion in the St. Louis eight-hour ozone NA.

2.3.7 Meteorology

A suite of observational data analysis techniques were applied to the relevant data to address the question of how meteorology affects ozone transport in the region. Hourly meteorology data was obtained from Mississippi Lime Company's onsite measurement tower. Hourly ozone data was obtained from the AQS DataMart for ozone seasons (April 1 – October 31) from 2005-2007. The following sites were used in the analyses: Orchard Farm, Blair Street, Arnold, Bonne Terre and Farrar.

Conditional probability function (CPF) plots use hourly wind speed/direction and ozone concentration data to determine how often winds from a given direction lead to high ozone. The result is a plot resembling a wind rose, showing which direction (if any) favors high ozone, and can be used to identify source regions or point sources. Back trajectories plot air mass history for a given period of time prior to arrival at the receptor. They are also used as a tool for source identification.

Another analysis method is to organize ozone concentration data by wind direction. Box plots of these distributions can then shed light on ozone behavior under certain transport regimes. Scatter plots of the ozone data versus wind speed, wind direction, and other monitoring sites are also useful. These are all tools used to better understand ozone and ozone precursor transport between counties in eastern Missouri.

AREA-WIDE OZONE

Regionally, all sites measure highest ozone concentrations when winds are from the eastern sector. This is seen in both the CPF plots (Figure 5) and box plots of ozone distributions in that sector. Trajectory analyses using NOAA's ARL/HYSPLIT model show that on the highest 8hr ozone days at all sites a number of days are characterized by flows originating in the Ohio River Valley and areas to the east with significant NO_x sources. The Farrar analysis is presented in Figure 6. This particular flow pattern is often associated with summer time high pressure systems over the Great Lakes which would be accompanied by conditions favorable for ozone formation: high temperatures, sunny skies, and minimal vertical mixing.

Figure 5. Conditional probability function (CPF) plots of hourly ozone at Arnold, Bonne Terre and Farrar.

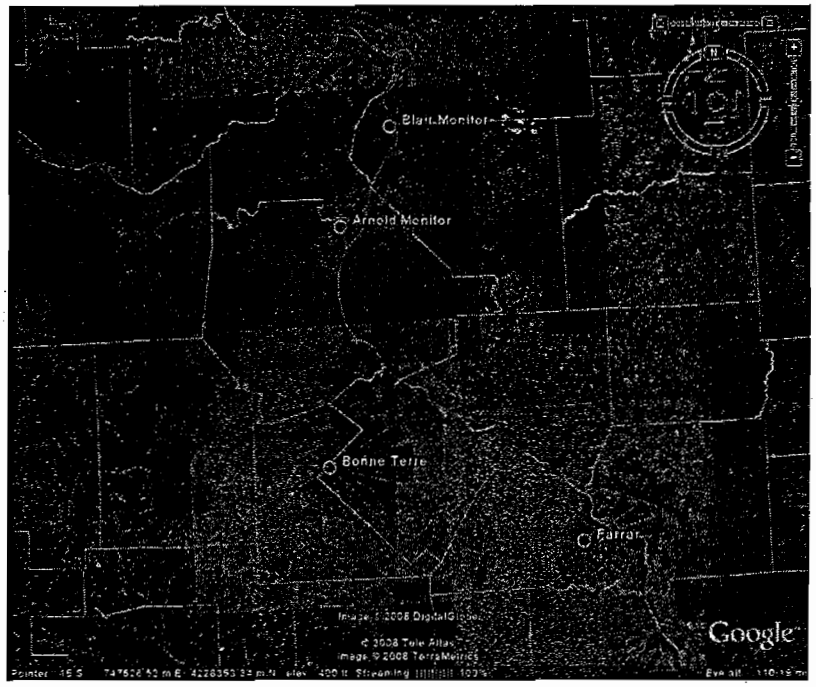
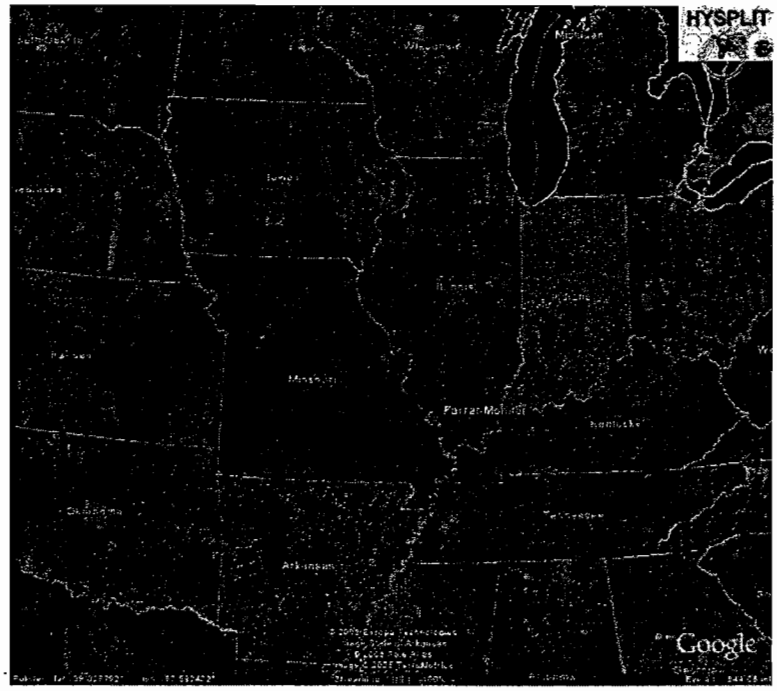


Figure 6. NOAA ARL/HYSPLIT Model Back Trajectories on the 15 Highest 8-hr Ozone Days at the Farrar Monitor.

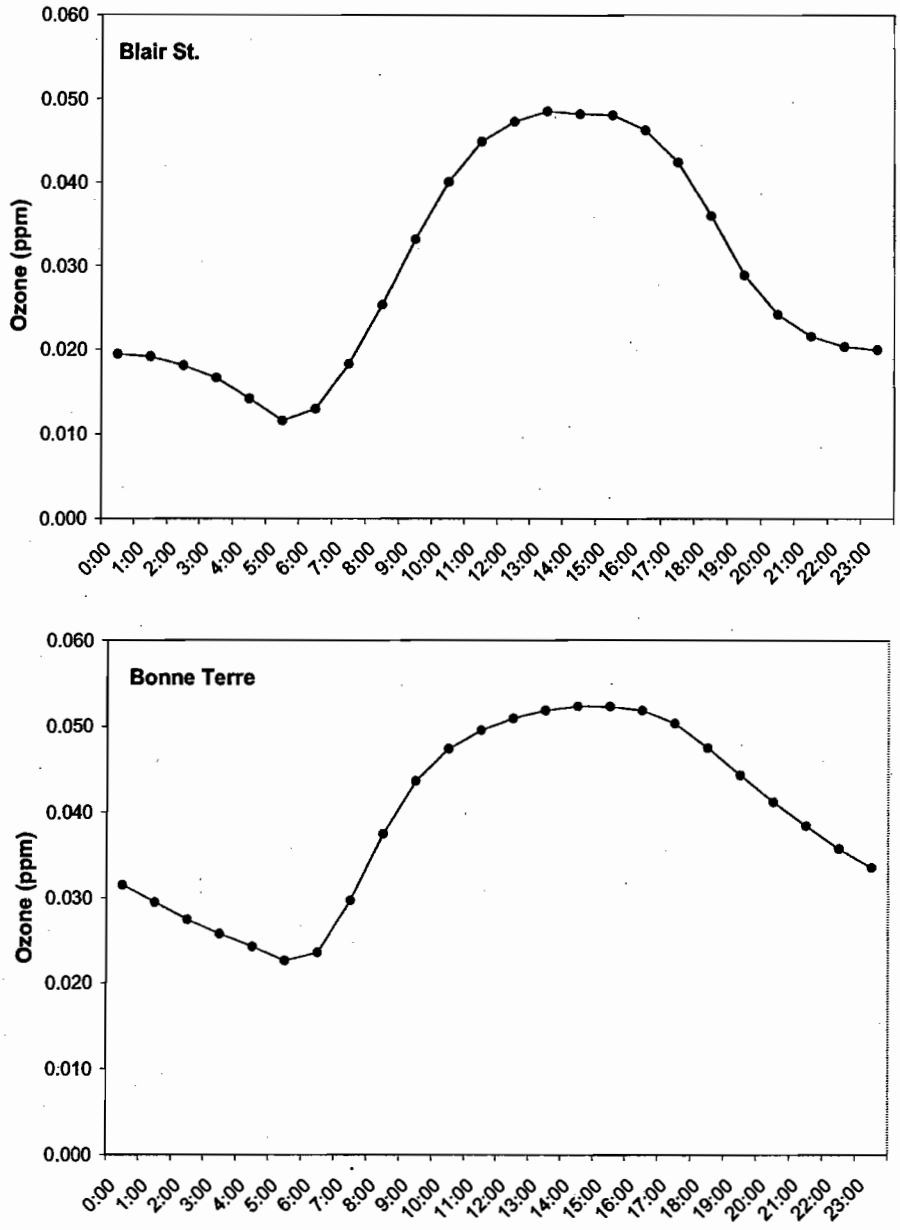


INTERSITE OZONE COMPARISONS

Plots were created of the average diurnal behavior at Orchard Farm, Blair, Arnold, Bonne Terre and Farrar, two of which are shown in Figure 7. Hourly ozone concentrations for three ozone seasons (April 1 – October 31, 2005-2007) were used to create the plot. Sites nearby the urban core (Orchard Farm, Blair, and Arnold) show a smooth bell-shaped curve. Sites furthest from the urban core, in Bonne Terre and Farrar, indicate a flatter curve that decreases more slowly in the afternoon and has an overnight average concentration higher than sites near the urban core. This behavior is indicative of a less reactive atmosphere away from the urban core that does not oxidize and deplete as much ozone as the urban core. Thus afternoon ozone concentrations fall more slowly and don't fall as low overnight. An indication that this hypothesis is correct is that on days when the monitor at Bonne Terre measures a higher ozone peak it also measures a lower nighttime valley. This more reactive atmosphere produces more ozone during the peak production time of day and depletes more ozone afterward. The Bonne Terre monitor behaves more like the city monitors at these times, but not on average.

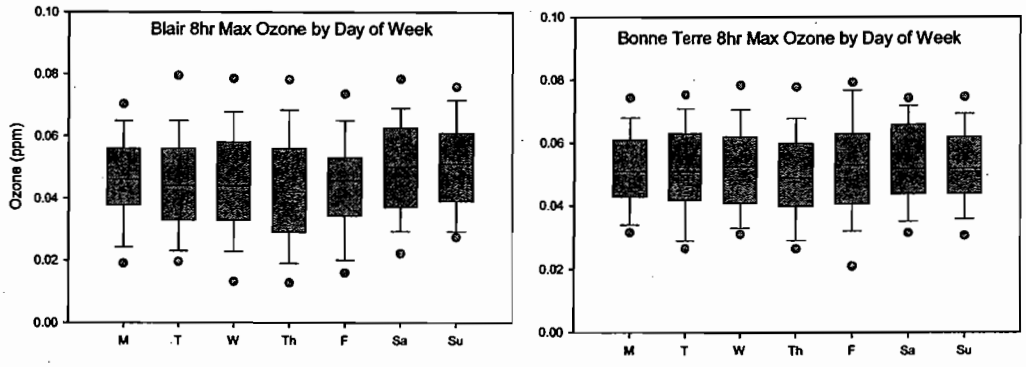
The effect of a more reactive atmosphere depleting ozone is called titration. Oxidants present in the atmosphere, such as NO_x, can scavenge ozone as they use the oxygen atoms for their own reactions. The result is a lower ozone measurement, even though the sum total of pollutants in the atmosphere is higher.

Figure 7. 2005-2007 Hourly Averaged Ozone at Blair (top) and Bonne Terre (bottom).



This effect is also observed when one looks at 8hr maximum ozone concentrations by day of week. As shown in Figure 8, Blair St. ozone concentrations are higher on the weekends when traffic emissions are lower and less ozone is depleted. At Bonne Terre, all days of the week have similar 8hr ozone distributions, showing that this site lacks the ozone titration effect.

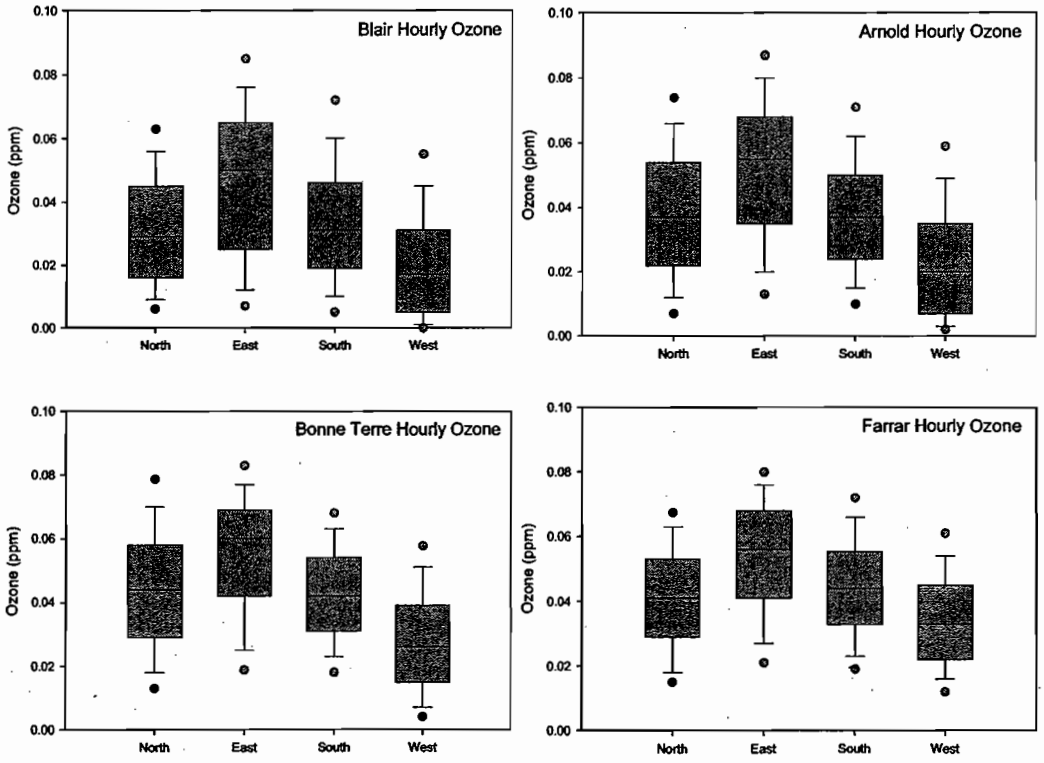
Figure 8. 8 hour Ozone Distributions by Day of Week at Blair (left) and Bonne Terre (right).



NORTH-SOUTH OZONE GRADIENT

Information about a north-south ozone gradient in eastern Missouri can be gathered by looking at the behavior of ozone under north-south transport regimes. Hourly ozone was segregated by hourly wind direction and put into bins by quadrant. These plots are shown in Figure 9. All sites (Blair, Arnold, Bonne Terre and Farrar) have their highest ozone distributions from the eastern quadrant. All sites have the lowest distribution when winds are from the west, with north and south in the middle. The northerly and southerly distributions at all sites are nearly identical. At Blair St. the lower end of the north and south distributions is the same, while the upper end of the distributions is slightly higher with winds from the south. At both Arnold and Bonne Terre the mean ozone concentrations from north and south are the same, but both lowest and highest ozone concentrations are measured from the north (more spread in the distribution). The fact that on a southerly wind ozone is higher at Arnold than Blair indicates that there must be some transport of ozone and/or precursors from the south, since with this wind direction the impact could not be from St. Louis.

Figure 9. Box plots Showing the Hourly Ozone Distribution at Four Sites in Eastern Missouri Under Different Wind Conditions



OZONE AND WIND SPEED

At Bonne Terre, days with 8 hour maximum ozone exceeding the new NAAQS of 0.075 ppm occur from low up to moderate wind speeds, indicating the combination of local production and transport. This is shown in Figure 10. Notice that even at the highest wind speeds ozone is elevated. While it does not exceed the NAAQS, one expects measured concentrations at such high wind speeds to be low due to atmospheric mixing. A trajectory analysis shows a consistent influence of southerly transport on this subset of high wind speed days (Figure 11).

Figure 10. Bonne Terre 8-hr ozone concentrations versus wind speed.

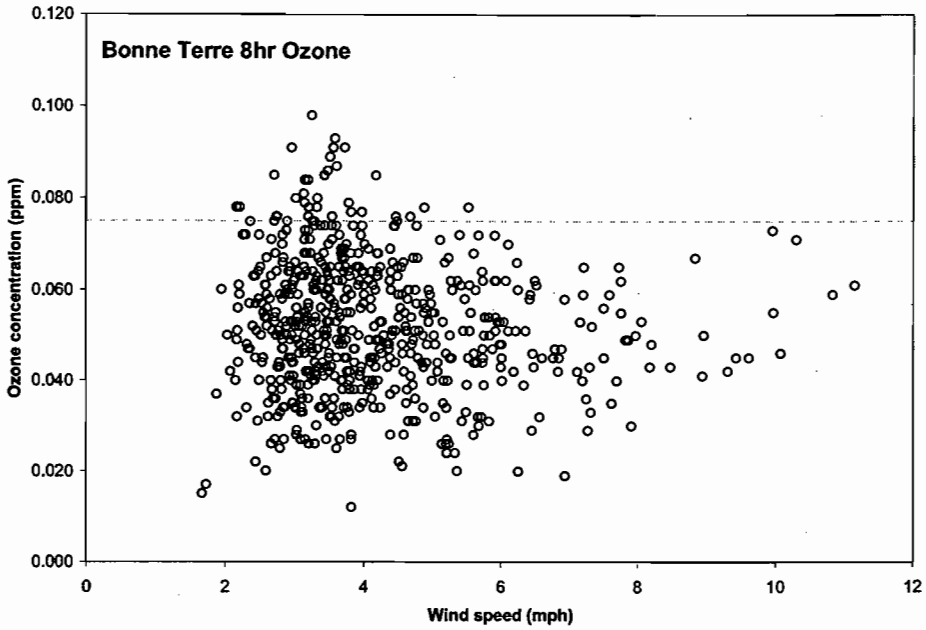
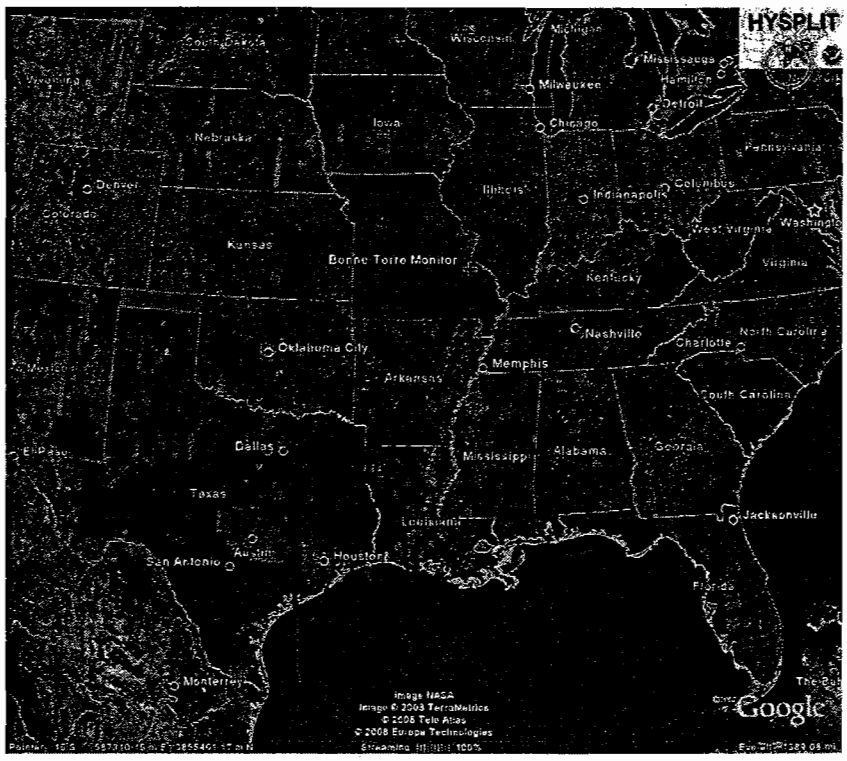


Figure 11. 24-hr Back Trajectories Ending at the Bonne Terre Monitor on High Wind Speed and Elevated Ozone Days.



BONNE TERRE – FARRAR COMPARISONS

The 8-hour daily maximum ozone concentrations at Bonne Terre and Farrar were put into a scatter plot and compared. While in general the scatter is along the 1:1 line (both sites measuring very similar ozone) there are some days where the sites differed significantly. It is more often the case that Bonne Terre is higher than Farrar. This is shown in Figure 12. An analysis of this subset of days indicates that 8hr ozone at Bonne Terre is significantly greater than at Farrar when winds are from the north or northeast. Many of these days have a number of hours with winds from around 30°. Figure 13 shows hourly ozone at these two sites when winds are from 25-35°. Clearly Bonne Terre is impacted by this wind direction more so than Farrar.

Figure 12. Scatter Plot of 8-hr Ozone at Bonne Terre and Farrar, 2005-2007.

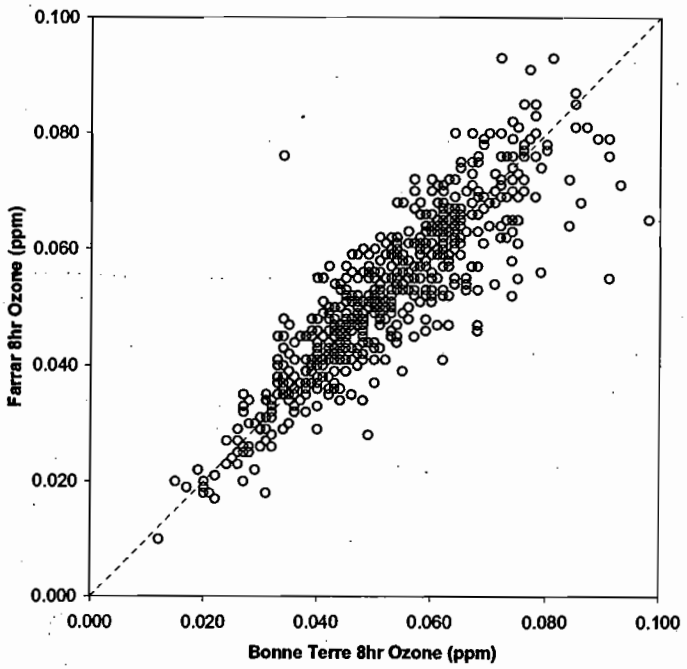
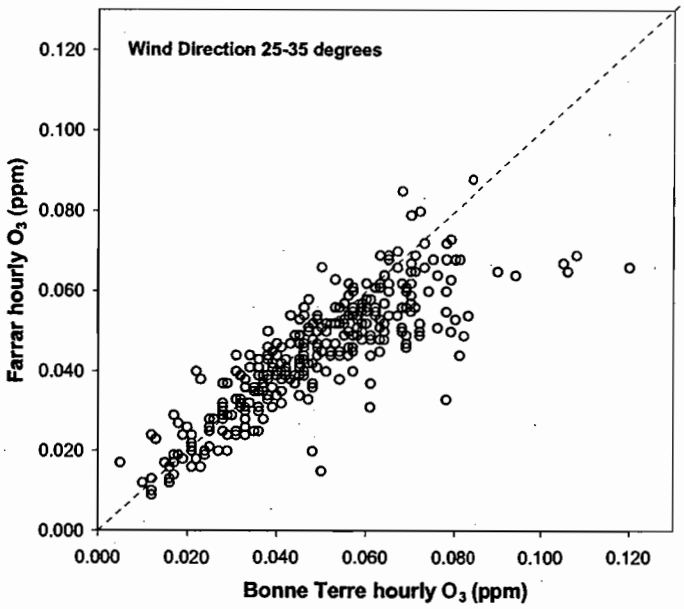


Figure 13. Scatter Plot of Hourly Ozone Concentrations at Bonne Terre and Farrar When Winds Are Between 25 and 35°.



When 8hr ozone is higher at Farrar than Bonne Terre it is of a smaller magnitude (than when Bonne Terre is higher) and no clear pattern emerges. Rather it is often a day with winds from the southwest, south or southeast. If this is regional transport it is unclear why Farrar would be impacted more strongly than Bonne Terre; however sources that may cause this effect have not been identified.

SUMMARY

While it is difficult to draw extensive conclusions from these observational data analyses, one can learn several things from the above discussion. First of all, while ozone concentrations at Blair and Arnold increase under southerly winds, the same occurs at Bonne Terre and Farrar. Without background sites to the south of Ste. Genevieve and Perry Counties to quantify regional transport, all that can be concluded is that a potentially significant regional contribution exists to the south. The increase at St. Louis area monitors under southerly winds cannot be specifically attributed to Ste. Genevieve and Perry Counties.

Secondly, several analyses indicate transport into Ste. Genevieve and Perry Counties contributing to elevated ozone concentrations at the Bonne Terre and Farrar monitors. Both CPF plots and back trajectories indicate high ozone levels originating in areas to the south and east of the monitors, particularly the Ohio River Valley. This transport is especially evident in the subset of days with high wind speeds as well as high ozone. Trajectories ending on these days show a consistently fast flow transporting air masses (and their constituents) from the Gulf Coast into Ste. Genevieve and Perry Counties.

2.3.8 Geography

Geographical features, by themselves are not a major influence on ozone levels in the St. Louis region or in Ste. Genevieve and Perry Counties.

2.3.9 Jurisdictional Boundaries

Ste. Genevieve and Perry Counties are not in the St. Louis CMSA or the previous nonattainment area for the one-hour ozone NAAQS.

Jurisdictional boundaries do not support the inclusion of Ste. Genevieve or Perry Counties in the St. Louis eight-hour NA. Emissions of ozone precursors (Nitrogen Oxides [NO_X] and Volatile Organic Compounds [VOC]) are low in these counties when compared to the emissions for the existing ozone nonattainment area.

It should also be noted that the Southeast Missouri Regional Planning Commission (SEMORPC) requested that this report be prepared because they represent Ste. Genevieve and Perry Counties (as well as other southeast Missouri counties). Regional planning for the existing ozone nonattainment area is the responsibility of the East West Gateway Council of Governments (EWGCOG). This existing jurisdictional linkage sets Ste. Genevieve and Perry Counties apart from the counties that presently comprise the St. Louis ozone nonattainment area.

The SEMORPC is presently in the process of setting up an Air Quality Advisory Committee similar to that established by the EWGCOG. This committee, as a part of the SEMORPC, will be well suited to deal with air quality planning issues in Southeast Missouri.

2.3.10 Level of Control

The counties in the present St. Louis eight-hour ozone NA are subject to the broad set of regulatory requirements that were put in place to achieve the previous eight-hour ozone NAAQS. Within Ste. Genevieve and Perry Counties, major new sources or major modifications permitted since 1975 have been subject to Best Available Control Technology (BACT) emission limitations for ozone precursors. BACT represents the best or highest level of emission control (taking into account economic, environmental, and energy considerations), determined on a case-by-case basis, for each major new source or modification. BACT represents a more stringent level of control than Reasonably Available Control Technology (RACT) limits applied to existing sources in the existing nonattainment area. Future major new source construction and all modifications to existing sources in the counties will be subject to the more restrictive BACT limits. Thus the existing and future levels of control for ozone precursors support the exclusion of Ste. Genevieve and Perry Counties from being designated as a nonattainment area.

2.3.11 Regional Emission Reductions

The DNR has adopted NO_X emissions control requirements for Electric Generating Units (EGUs) located outside of the proposed eight-hour ozone NA. There are no EGUs affected by this requirement in Ste. Genevieve or Perry Counties; however, this regional requirement demonstrates how the DNR can put in place requirements on existing sources outside of the St. Louis ozone NA if it is shown that that is necessary to bring about attainment of the NAAQS.

The ability of the DNR to adopt regional emission reductions, if necessary, is consistent with not including Ste. Genevieve County in the St. Louis eight-hour ozone NA.

2.3.12 Summary of Evaluation Factors

Table 6: Summary of Evaluation Factors and Applicability

Factor	Perry County	Ste. Genevieve County
1. Emissions and air quality in adjacent areas	Does not support inclusion	Does not support inclusion
2. Population and degree of urbanization	Does not support inclusion	Does not support inclusion
3. Monitoring data	Does not support inclusion	Does not support inclusion
4. Location of emission sources	Does not support inclusion	Does not support inclusion
5. Traffic and commuting patterns	Does not support inclusion	Does not support inclusion
6. Expected growth	Does not support inclusion	Does not support inclusion
7. Meteorology	Meteorology patterns are variable and do not fully support inclusion	Meteorology patterns are variable and do not fully support inclusion
8. Geography / topography	Does not support inclusion	Does not support inclusion
9. Jurisdictional boundaries	Does not support inclusion	Does not support inclusion
10. Level of control	Does not support inclusion	Does not support inclusion
11. Regional emission reductions	Does not support inclusion	Does not support inclusion

3 CONCLUSION

Evaluation of the eleven factors outlined in EPA's guidance concerning the definition of the eight-hour ozone NA leads to the recommendation proposed by the DNR.

The recommendation for the NA boundary as it relates to Ste. Genevieve and Perry Counties is clear and summarized in the following section.

3.1 Recommended Status of Ste. Genevieve and Perry Counties

Based on evaluation of the eleven criteria contained in EPA's guidance memorandum concerning boundaries for the eight-hour ozone NA, Ste. Genevieve and Perry Counties should not be a part of the NA.

Further, the potential for future growth due to major new sources or modifications should have no bearing on Missouri's recommendation to EPA regarding the NA boundary. Major new sources and modifications must be well controlled as a result of DNR's New Source Review Program in order to receive a permit - better controlled than existing sources.

3.2 Basis for Recommendation

For DNR to recommend that Ste. Genevieve or Perry Counties be part of the eight-hour ozone NA, the collective evaluation of the eleven factors outlined in EPA's guidance memorandum should point to adding these counties. As shown in the analysis above, this is not the case. In fact, only one of the eleven evaluation criteria even partially supports the inclusion of Ste. Genevieve or Perry Counties in the NA.