AWMD
cc: RA/DRA

KANSAS
OFFICE OF THE GOVERNOR

Kathleen Sebelius, Governor

www.governor.ks.gov

REC'D
FEB 18 2009
APCO

February 6, 2009

APDB RECEIVED
FEB 10 2009

Mr. William W. Rice
Acting Regional Administrator
USEPA, Region VII
901 N. 5th Street
Kansas City, KS 66101

Dear Mr. Rice:

This letter is in response to the requirement to submit area designations for the 8-hour National Ambient Air Quality Standard for ozone.

The following recommendations are being made regarding designation of areas within Kansas as nonattainment or attainment/unclassifiable for purposes of the 8-hour standard for ozone:

Nonattainment: Johnson County and Wyandotte County

Attainment/unclassifiable: The remaining counties of the state.

The recommendation regarding Johnson and Wyandotte counties is based upon the analysis of ozone monitoring data from 2006 through 2008, ozone precursor emissions, meteorological conditions, population data, vehicle miles traveled and additional criteria. The basis for this recommendation was formed through the work of the staff of KDHE and stakeholders located in the Kansas City region. The design value for the recommended Kansas City nonattainment area in relation to the 8-hour ozone standard is 0.081 parts per million, recorded at both the Liberty site, 29-047-0005, and the Rocky Creek site, 29-047-0006, in Clay County, Missouri.

Designation of only Johnson and Wyandotte counties within the Kansas portion of the Kansas City metropolitan statistical area (MSA) is consistent with EPA guidance. All Kansas counties inside the MSA were reviewed for possible inclusion in the nonattainment designation, along with Douglas County. Based upon the factors specified in EPA's December 4, 2008 guidance, no Kansas counties outside the recommended two-county nonattainment area significantly cause or contribute to ozone violations within the recommended Kansas City nonattainment area.

Capitol Building, Room 212S, Topeka, KS 66612-1590 • (785) 296-3232 • Fax: (785) 296-7973
e-mail: governor@ks.gov

The recommendation to designate the remainder of the state as attainment/unclassifiable is based upon the fact that no reference method monitoring of sufficient duration has been conducted in the counties designated attainment/unclassifiable except in Leavenworth, Linn, Sedgwick, Sumner and Trego Counties. Ozone monitoring data collected at monitoring sites located in these counties demonstrate that they meet the 8-hour ozone standard.

This recommendation does not include the following tribal lands: the Prairie Band of the Potawatomi Indian Reservation in Jackson County, and the Kickapoo Nation Indian Reservation, the Sac and Fox Tribe Indian Reservation and the Iowa Tribe Indian Reservation in Brown County.

Documentation supporting these recommendations is being submitted under separate cover and electronically by the Department of Health and Environment. The documentation justifies exclusion of Franklin, Leavenworth, Linn and Miami counties, which are located within the Kansas City MSA, from the recommended nonattainment designation. Feel free to contact John Mitchell, Director of the Division of Environment at 785-296-1535 if you have any questions regarding these recommendations or the analyses upon which the recommendations are made.

Sincerely,

Kathleen Sebelius
Governor of Kansas

Enclosures

cc: Roderick Bremby, Secretary, KDHE
John Mitchell, Director, Division of Environment

2009 Kansas 8-Hour Ozone Designations

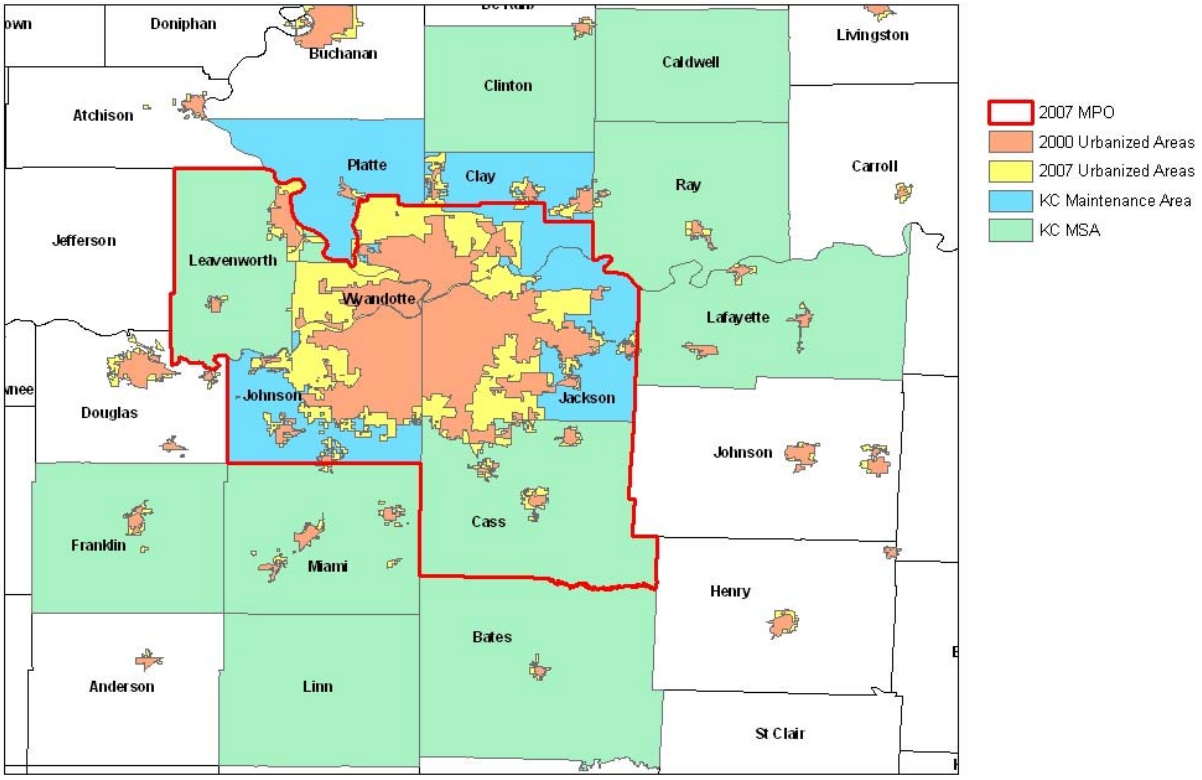
County	Designation
Allen	Attainment/Unclassifiable
Anderson	Attainment/Unclassifiable
Atchison	Attainment/Unclassifiable
Barber	Attainment/Unclassifiable
Barton	Attainment/Unclassifiable
Bourbon	Attainment/Unclassifiable
Brown	Attainment/Unclassifiable
Butler	Attainment/Unclassifiable
Chase	Attainment/Unclassifiable
Chautauqua	Attainment/Unclassifiable
Cherokee	Attainment/Unclassifiable
Cheyenne	Attainment/Unclassifiable
Clark	Attainment/Unclassifiable
Clay	Attainment/Unclassifiable
Cloud	Attainment/Unclassifiable
Coffey	Attainment/Unclassifiable
Comanche	Attainment/Unclassifiable
Cowley	Attainment/Unclassifiable
Crawford	Attainment/Unclassifiable
Decatur	Attainment/Unclassifiable
Dickinson	Attainment/Unclassifiable
Doniphan	Attainment/Unclassifiable
Douglas	Attainment/Unclassifiable
Edwards	Attainment/Unclassifiable
Elk	Attainment/Unclassifiable
Ellis	Attainment/Unclassifiable
Ellsworth	Attainment/Unclassifiable
Finney	Attainment/Unclassifiable
Ford	Attainment/Unclassifiable
Franklin	Attainment/Unclassifiable
Geary	Attainment/Unclassifiable
Gove	Attainment/Unclassifiable
Graham	Attainment/Unclassifiable
Grant	Attainment/Unclassifiable
Gray	Attainment/Unclassifiable
Greeley	Attainment/Unclassifiable
Greenwood	Attainment/Unclassifiable
Hamilton	Attainment/Unclassifiable
Harper	Attainment/Unclassifiable
Harvey	Attainment/Unclassifiable
Haskell	Attainment/Unclassifiable

County	Designation
Hodgeman	Attainment/Unclassifiable
Jackson	Attainment/Unclassifiable
Jefferson	Attainment/Unclassifiable
Jewell	Attainment/Unclassifiable
Johnson	Nonattainment
Kearny	Attainment/Unclassifiable
Kingman	Attainment/Unclassifiable
Kiowa	Attainment/Unclassifiable
Labette	Attainment/Unclassifiable
Lane	Attainment/Unclassifiable
Leavenworth	Attainment
Lincoln	Attainment/Unclassifiable
Linn	Attainment
Logan	Attainment/Unclassifiable
Lyon	Attainment/Unclassifiable
Marion	Attainment/Unclassifiable
Marshall	Attainment/Unclassifiable
McPherson	Attainment/Unclassifiable
Meade	Attainment/Unclassifiable
Miami	Attainment/Unclassifiable
Mitchell	Attainment/Unclassifiable
Montgomery	Attainment/Unclassifiable
Morris	Attainment/Unclassifiable
Morton	Attainment/Unclassifiable
Nemaha	Attainment/Unclassifiable
Neosho	Attainment/Unclassifiable
Ness	Attainment/Unclassifiable
Norton	Attainment/Unclassifiable
Osage	Attainment/Unclassifiable
Osborne	Attainment/Unclassifiable
Ottawa	Attainment/Unclassifiable
Pawnee	Attainment/Unclassifiable
Phillips	Attainment/Unclassifiable
Pottawatomie	Attainment/Unclassifiable
Pratt	Attainment/Unclassifiable
Rawlins	Attainment/Unclassifiable
Reno	Attainment/Unclassifiable
Republic	Attainment/Unclassifiable
Rice	Attainment/Unclassifiable
Riley	Attainment/Unclassifiable
Rooks	Attainment/Unclassifiable
Rush	Attainment/Unclassifiable
Russell	Attainment/Unclassifiable
Saline	Attainment/Unclassifiable

County	Designation
Scott	Attainment/Unclassifiable
Sedgwick	Attainment
Seward	Attainment/Unclassifiable
Shawnee	Attainment/Unclassifiable
Sheridan	Attainment/Unclassifiable
Sherman	Attainment/Unclassifiable
Smith	Attainment/Unclassifiable
Stafford	Attainment/Unclassifiable
Stanton	Attainment/Unclassifiable
Stevens	Attainment/Unclassifiable
Sumner	Attainment
Thomas	Attainment/Unclassifiable
Trego	Attainment
Wabaunsee	Attainment/Unclassifiable
Wallace	Attainment/Unclassifiable
Washington	Attainment/Unclassifiable
Wichita	Attainment/Unclassifiable
Wilson	Attainment/Unclassifiable
Woodson	Attainment/Unclassifiable
Wyandotte	Nonattainment

Technical Support Document for the Governor's Recommendation Regarding the 2009 8-hour Ozone Standard Designation for the Kansas City Area

Kansas City Region Boundaries:
MSA, MPO, Maintenance Area, 2000 Urbanized Areas and 2007 Urbanized Areas



Source: U.S. Census Bureau, U.S. Census 2000 and 2007 boundary files. Mid-America Regional Council.

PREPARED BY
THE KANSAS DEPARTMENT OF HEALTH AND ENVIRONMENT
BUREAU OF AIR AND RADIATION

December 2008

EXECUTIVE SUMMARY

The Bureau of Air and Radiation of the Kansas Department of Health and Environment (KDHE) prepared this document to inform and support the recommendation from the Governor of the State of Kansas to the U.S. Environmental Protection Agency (EPA) for designating the Kansas portion of the Kansas City area as nonattainment under the new 8-hour ozone National Ambient Air Quality Standard (NAAQS). This document outlines the criteria against which each county in the Kansas City area was evaluated and presents the data and technical analysis that form the basis of the recommendation. The State of Missouri Department of Natural Resources (MoDNR) is concurrently working on a technical support document for their Governor's reference in making recommendations regarding the designation of the Missouri counties of the Kansas City area.

Guidance developed from the EPA in 2008 recommends that the Cored Based Statistical Area (CBSA) or Combined Statistical Area (CSA) serve as the presumptive boundary for 8-hour ozone nonattainment areas. The guidance also identifies 9 criteria for States to consider in determining whether to recommend nonattainment area boundaries that are larger or smaller than the CBSA or CSA. The criteria are as follows:

1. Air quality data;
2. Emissions data;
3. Population density and degree of urbanization;
4. Traffic and commuting patterns;
5. Growth rates and patterns;
6. Meteorology;
7. Geography/topography;
8. Jurisdictional boundaries;
9. Level of control of emission sources.

The counties in the Kansas City CBSA plus Douglas County (i.e., the Lawrence, KS CBSA) were evaluated within this framework. The Kansas City CBSA includes Franklin, Johnson, Leavenworth, Linn, Miami, and Wyandotte Counties in Kansas, and Bates, Caldwell, Cass, Clay, Clinton, Jackson, Lafayette, Platte, and Ray Counties in Missouri. Although not part of the Kansas City CBSA, Douglas County was evaluated because it is of prior interest to EPA Region VII staff.

The KDHE Bureau of Air and Radiation established a process for developing this support document that included significant consultation with the local officials, the MoDNR, EPA Region VII, and the Mid-America Regional Council (MARC). This included holding two stakeholder meetings in conjunction with the MoDNR across the metropolitan area and developing an informational webpage specifically to address this process. KDHE and MoDNR agreed to hold their third and final Kansas City stakeholder meetings in separate venues. The information considered included air quality monitoring data from 2006-2008; maps of ozone concentration gradients; NO_x and VOC emissions from MoDNR, KDHE, and EPA databases; meteorological data from the NOAA National Data Center (NNDC); wind roses; population estimates from the U.S. Census Bureau's 2000 Census and 2007 population estimates; estimates of average daily vehicle miles traveled (ADVMT) from the Kansas Department of Transportation.

Of the 11 criteria in EPA's guidance, the three that most heavily influenced the recommendation were meteorological conditions, the contribution of precursor emissions (i.e., NO_x and VOC) to the magnitude of

monitored 8-hour ozone values, and population exposure to ozone concentrations in excess of the new 8-hour ozone standard. These criteria and others were all evaluated within the Multi-Criteria Integrated Resource Assessment (MIRA) tool. The following table summarizes the MIRA rankings and bins that followed from the criteria evaluation.

	County ***Ranked most to least nonattainment***	**Criteria Sum**	**Bin**
1	Jackson (MO)	5.89	1
2	Clay (MO)	5.70	2
3	Johnson (KS)	5.59	2
4	Platte (MO)	4.94	4
5	Wyandotte (KS)	4.77	5
6	Cass (MO)	4.26	7
7	Clinton (MO)	4.04	7
8	Douglas (KS)	3.99	7
9	Leavenworth (KS)	3.95	8
10	Lafayette (MO)	3.63	9
11	Miami (KS)	3.63	9
12	Ray (MO)	3.34	9
13	Franklin (KS)	3.29	10
14	Caldwell (MO)	3.19	10
15	Linn (KS)	3.08	10
16	Bates (MO)	3.02	10

Based on these criteria and the MIRA analysis, it is recommended that Johnson and Wyandotte Counties in Kansas be included in the Kansas City 8-hour ozone nonattainment area and that Leavenworth, Linn, Miami, Franklin, and Douglas Counties be excluded from the Kansas City nonattainment area.

TABLE OF CONTENTS

APPENDICES

INTRODUCTION/BACKGROUND

The Bureau of Air and Radiation of the Kansas Department of Health and Environment (KDHE) prepared this document to inform and support the recommendation from the Governor of the State of Kansas to the U.S. Environmental Protection Agency (EPA) for designating the Kansas portion of the Kansas City area as nonattainment under the new 8-hour ozone National Ambient Air Quality Standard (NAAQS). This document outlines the criteria against which each county in the Kansas City area was evaluated and presents the data and technical analysis that form the basis of the recommendation. The State of Missouri Department of Natural Resources (MoDNR) is concurrently working on a similar package regarding the designation of the Missouri counties of the Kansas City area.

The Governor's recommendation for the boundary of the Kansas City 8-hour ozone nonattainment area is due to the EPA by March 12, 2009. The EPA is required to promulgate its designations by March 12, 2010. The EPA is not bound by this recommendation, which simply provides the opportunity for the States to have input into the process, and to recommend changes from the presumptive boundaries established by the EPA.

Clean Air Act Requirements

The Clean Air Act, as amended, requires the EPA to designate air quality control regions as either attainment, nonattainment, or unclassified upon the promulgation or revision of a NAAQS."[1] These classifications are based on air quality monitoring data that indicate: an area meets the NAAQS for a given pollutant; does not meet the NAAQS; contributes to an area which does not meet the NAAQS; or there is insufficient data to indicate whether it does or does not meet the NAAQS. The adoption of the new 8-hour ozone standard on March 12, 2008 triggered the requirement to make such a designation.[2]

The New 8-Hour Ozone Standard

On March 12, 2008 EPA strengthened the primary NAAQS for ground-level ozone. The new 8-hour ozone standard is 0.075 parts per million (ppm) measured over an eight-hour time period. The previous standard, set in 1997, was 0.08 ppm. (Because ozone is measured out to three decimal places, the standard effectively became 0.084 ppm as a result of rounding. EPA is now specifying the level of the standard to the third decimal.) Compliance with the new standard is determined based on comparing the three-year average of the annual fourth-highest daily maximum 8-hour ozone concentration to the standard. Fourth-highest ozone concentrations less than or equal to 0.075 ppm are considered to be below the standard, and values greater than 0.075 ppm are considered to be in violation of the standard. EPA also strengthened the secondary ozone standard, making it identical to the primary standard.

---

[1] 42 U.S.C. §7407(d)(1)(B)(i)

[2] See 42 U.S.C. §7407(d)

EPA will also issue a separate rule to address monitoring requirements necessary to implement the new ozone standards. EPA intends to propose a monitoring rule in late 2008 and issue a final rule by summer of 2009. At the time this recommendation was being drafted, the EPA provided updated guidance to the States on what should be addressed in the designation package; therefore, KDHE has used the guidance provided in Attachment 2 of the Memorandum dated December 4, 2008 from EPA.

The Kansas City Situation

Current Status

The Kansas City maintenance area, consisting of Johnson and Wyandotte Counties in Kansas and Clay, Jackson, and Platte Counties in Missouri, is currently designated as attainment. Monitor readings on June 15, 2007 indicated the area violated the 0.08 ppm ozone standard, triggering Phase I contingency measures developed in the Kansas City Ozone Maintenance Plan. The Phase I contingency measures for Johnson and Wyandotte Counties include heavy duty diesel idle reductions and large source (>1000 tons/yr actual NO_x emissions) emissions control requirements on boilers and furnaces. The rules associated with these contingency measures are expected to be finalized by mid 2009.

Chronological History

The five-county Kansas City region was determined to be in violation of the ozone NAAQS in 1978.[3] Subsequently, the State of Kansas developed and implemented an Ozone State Implementation Plan (SIP) for the Kansas side of the region. EPA approved the 1979 Kansas SIP revision, which projected that the Kansas City area would meet the ozone NAAQS by December 31, 1982. In calendar years 1983 and 1984, the ambient air monitoring data for the region revealed that violations of the ozone NAAQS had occurred. These violations required the State to make revisions to the 1979 SIP.

Accordingly, the SIP was revised to include additional control measures for the region. With further reductions of VOC emissions in the area, the new SIP projected the area would be in attainment of the ozone NAAQS by December 31, 1987. In November 1989, the SIP was fully approved by the EPA. At the end of 1991, sufficient monitoring data was available to demonstrate that the area had attained the standard. The KDHE revised the Kansas Ozone Maintenance Plan portion of the SIP to reflect that the region had achieved the ozone standard. This Maintenance Plan was approved by EPA on June 23, 1992.

During the summer of 1995, the Kansas City area recorded its fourth exceedance for the period 1993–1995, resulting in a violation of the ozone standard at the Liberty, Missouri monitoring site for the three-year period. The recorded violation required KDHE to implement contingency measures. After much discussion of contingency measures in the SIP and the potential to implement alternative measures achieving similar reductions, Kansas implemented a low Reid vapor pressure (RVP) gasoline regulation in 1997.

EPA determined that the VOC reductions realized by the 7.2 RVP gasoline and other control measures implemented by the States were insufficient to meet the VOC reductions required to be equivalent to the contingency measures of the Maintenance Plan (64 FR 3896, January 26, 1999, Appendix D). On July 7,

[3] 43 *Federal Register* 8962, March 3, 1978

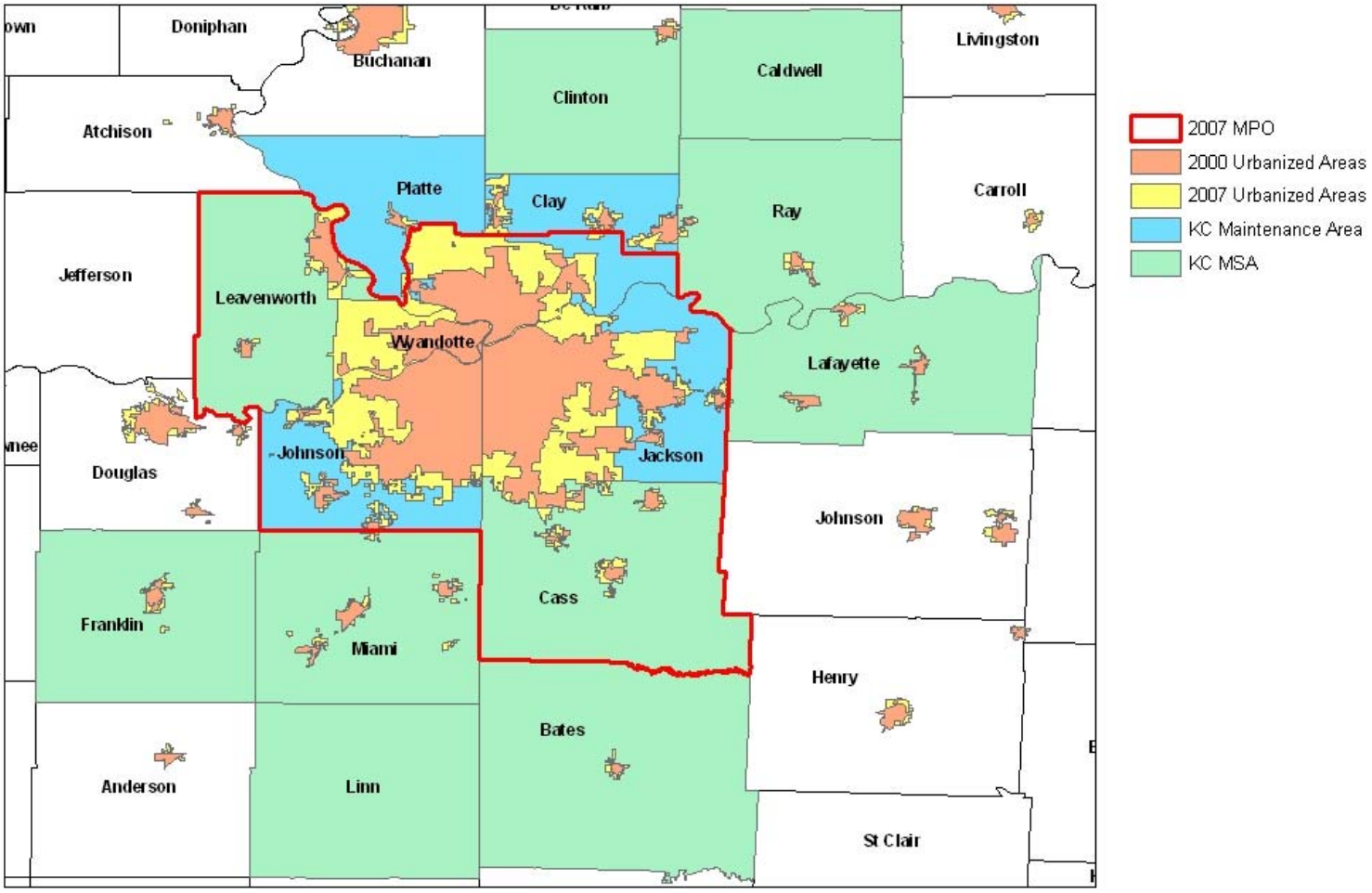
2000, the Governor of Kansas committed to implement a 7.0 RVP fuel program in Johnson and Wyandotte counties, with a target date of the summer of 2001. The State also committed to implementation of a phased program to reduce the vapor pressure of cold cleaning solvents to less than or equal to 1.0 mmHg. Both commitments were fulfilled. KDHE revised the Kansas City Maintenance Plan in December 2002.

In 1997, the EPA promulgated a new, more stringent health-based standard for ground-level ozone. It did so in response to a growing body of research that showed the old 1-hour ozone standard did not adequately protect human health. Where the old standard was set at 0.12 ppm in a one-hour period, the new standard established a limit of 0.08 ppm over an eight-hour period. The 8-hour standard faced a number of legal challenges after EPA first issued it, but the U.S. Supreme Court ultimately upheld it in 2001. A consent decree with environmental groups the following year required EPA to issue attainment and nonattainment designations for the new standard by April 15, 2004.

EPA originally announced designations under the 8-hour ozone standard April 15, 2004. That action designated several counties in the Kansas City area as unclassifiable because EPA had insufficient information to make a designation of attainment or nonattainment.

In May 2005, EPA designated the region attainment after the 2002-2004 monitoring data showed the region met the 8-hour ozone standard. The counties included in the redesignation were Johnson and Wyandotte in Kansas, and Clay, Jackson, and Platte in Missouri. This designation was due in large part to the unusually cool weather the area experienced in 2004. However, even though the area was designated attainment, a Maintenance Plan with contingency measures was required. This Maintenance Plan was approved by EPA on October 9, 2007. On June 15, 2007 the Kansas City area violated the 1997 8-hour ozone standard. This violation triggered the Phase I contingency measures in the Maintenance Plan. The Phase I contingency measures include heavy duty diesel idle reductions and large source (>1000 tons/yr actual NO_x emissions) emissions control requirements on boilers and furnaces in Johnson and Wyandotte Counties.

Kansas City Region Boundaries:
MSA, MPO, Maintenance Area, 2000 Urbanized Areas and 2007 Urbanized Areas



Source: U.S. Census Bureau, U.S. Census 2000 and 2007 boundary files. Mid-America Regional Council.

Figure 1

KDHE BAR Staff Analysis

During the development of this 2009 technical document, EPA provided updated designation guidance in a December 4, 2008 memorandum, "Area Designations for the 2008 Revised Ozone National Ambient Air Quality Standards."[4] KDHE has used the 2008 guidance to States and Tribes for this designation of 8-hour ozone nonattainment area boundaries. The guidance recommends that the Core Based Statistical Area (CBSA) or Combined Statistical Area (CSA)[5] as the presumptive boundary for 8-hour ozone nonattainment areas. In addition, the guidance identifies 9 criteria for States and Tribes to consider in determining whether to recommend nonattainment area boundaries that are larger or smaller than the CBSA. The criteria are as follows:

1. Air quality data;
2. Emissions data (location of sources and contribution to ozone concentrations);
3. Population density and degree of urbanization (including commercial development);
4. Traffic and commuting patterns;
5. Growth rates and patterns;
6. Meteorology (weather/transport patterns);
7. Geography/topography (mountain ranges or other air basin boundaries);
8. Jurisdictional boundaries (e.g., counties, air districts, existing nonattainment areas, Reservations, metropolitan planning organizations (MPOs));
9. Level of control of emission sources.

The counties in the Kansas City CBSA plus Douglas County were evaluated within this framework. The latest Kansas City CBSA[4] includes Franklin, Johnson, Leavenworth, Linn, Miami, and Wyandotte Counties in Kansas, and Bates, Caldwell, Cass, Clay, Clinton, Jackson, Lafayette, Platte, and Ray Counties in Missouri (See Figure 1). Although not part of the Kansas City CBSA, Douglas County, Kansas (identical with the Lawrence, KS CBSA) was evaluated because it is of interest to EPA Region VII staff.

Department staff determined that the 9 criteria could best be evaluated by using the Multi-Criteria Integrated Resource Assessment (MIRA) tool that was developed by EPA. Its purpose is to facilitate decision analysis through an improved understanding and interconnection between both the scientific data and the societal values that are present in all environmental policy questions. The MIRA process consists of nine major steps:

4 http://www.epa.gov/ozonedesignations/documents/032800_boundaryguidance.pdf
5 OMB Bulletin No. 08 – 01, November 20, 2007. http://www.whitehouse.gov/omb/bulletins/fy2008/b08-01.pdf

1. Define decision criteria;
2. Select the "problem set," which is the set of elements that are to be ranked using MIRA (e.g., the decision options or pollutant sources);
3. Gather the data needed for each criterion;
4. Index the data;
5. Weight the criteria;
6. Create an initial "decision set," which is a problem set whose elements are ranked on the basis of the data and criteria weighting;
7. Create many different decision sets for the initial problem set and modify that problem set if appropriate as learning occurs and additional options are discovered (iteration);
8. Conduct stakeholder deliberation; and
9. Make the final decision.

In the case of the Kansas City ozone designation process, the decision criteria and problem set are defined by the 9 criteria above. In Table 1, the MIRA analysis KDHE has used and EPA criteria guidance are outlined with a direct comparison of how the two relate to each other.

Table 1. Comparison of the 9 EPA guidance criteria and the KDHE MIRA analytical criteria.

EPA Guidance Memo (March 2000)	MIRA Analysis
1. Air quality monitoring data	1. Air quality monitoring data for counties with monitors
2. Emission sources	2. VOC/NO_x (point, nonpoint, mobile) emissions for all areas
3. Population density/urbanization	3. Population density/population in CBSA
4. Traffic/commuting patterns	4. CBSA, VMT, commute connectivity
5. Expected growth	5. VMT and population growth estimates
6. Meteorology	6. Meteorology considered in data for AQ modeling and in transport analysis
7. Geography/topography	7. Geography and topography considered in data for AQ modeling
8. Jurisdictional boundaries	8. County, CBSA
9. Level of emissions controls	9. Control margin

The tool, along with all the underlying data used in the analysis, is available in electronic form from the KDHE website or by request. A full discussion on the MIRA tool and the resulting outputs of the tool are included in Appendix G.

Section 2 of this document presents the data and analysis for each individual county. The counties on the Kansas side of the CBSA are presented first, followed by the counties on the Missouri side of the CBSA, and finally by Douglas County. Each county's analysis is organized into sections based on EPA's criteria:

- ❏ The air quality sections address air quality and ozone monitoring data from the most recent three-year period (2006–2008) in each county and in adjacent areas.
- ❏ The emissions sections discuss emissions of nitrogen oxides (NO_x) and volatile organic compounds (VOCs), locations of sources, and emissions growth.
- ❏ The meteorological conditions sections address meteorological data and transport patterns.
- ❏ The population sections address population and expected population growth.

- ❏ The transportation sections discuss traffic and commuting patterns and expected growth in vehicle miles traveled.
- ❏ The remaining sections address the geography/topography, jurisdictional boundaries, level of control of emissions, and regional emission reductions criteria.
- ❏ Finally a discussion of the MIRA results are presented for Kansas counties only

For each of the Kansas counties, a summary and recommendation are presented. The counties on the Missouri side were evaluated for comparative purposes only, and therefore no recommendations are presented for these counties.

Coordination with Other Agencies

The KDHE Bureau of Air and Radiation staff established a process for development of this support document that included significant consultation with the local officials, the State of Missouri Department of Natural Resources (MoDNR), EPA Region VII, and the Mid-America Regional Council (MARC). This included holding two stakeholder meetings in conjunction with the MoDNR across the metropolitan area and developing an informational webpage specifically to address this process. KDHE and MoDNR agreed to hold their third and final Kansas City stakeholder meetings in separate venues. Each meeting involved a presentation by KDHE staff, followed by a question and answer session with local officials and industry representatives to receive their input into this designation process.

Continuing Commitment to Assure Acceptable Regional Air Quality

The State of Kansas will continue to evaluate the air quality in the counties designated as attainment or attainment/unclassifiable, and, in the event that the data indicates that such counties are violating the ozone standard, the State will work with the EPA and Kansas City area partners to take appropriate actions, including, if appropriate, redesignation to nonattainment.

METEOROLOGY OF OZONE FORMATION IN KANSAS CITY

Weather patterns play a significant role in establishing conditions conducive to ozone formation and accumulation, and in terminating episodes of high ozone concentrations. High ozone episodes are usually associated with slow-moving high pressure weather systems that traverse the central and eastern United States from west to east and from northwest to southeast. There are numerous reasons why these slow-moving high pressure systems promote high concentrations of ozone:

- ❏ High pressure systems are characterized by widespread sinking of air through most of the lower atmosphere. The subsiding air is warmed adiabatically and thus tends to make the lower atmosphere more stable and less conducive to convective mixing. Adiabatic warming of the air occurs as the air compresses while sinking; i.e., no heat is added to it.
- ❏ The subsidence of air associated with large high pressure systems creates an inversion of the normal temperature profile (normally temperature decreases with height in the lower atmosphere), which serves as a strong lid to contain pollutants in a shallow layer of the lower atmosphere. During an inversion, the temperature of the air in the lower troposphere increases with height, and the cooler air below does not mix with the warmer air above.
- ❏ Because winds associated with major high pressure systems are generally light, there is a greater chance for pollutants to accumulate in the atmospheric boundary layer, the turbulent layer of air adjacent to the earth's surface.
- ❏ The often cloudless and warm conditions associated with large high pressure systems also are favorable for the photochemical production of ozone.

In the Kansas City area, meteorology of ozone formation is fairly consistent with this analysis. The ozone season for Kansas City runs from April 1 to October 31. During this time, surface conditions over much of the central United States are dominated by small-scale shifts in a large upper air high pressure system located over the western Atlantic Ocean.This large high pressure system, called the Bermuda High, brings light southerly winds and moisture from the Gulf of Mexico to the Kansas City area. This moisture often leads to the hazy conditions experienced in the region during the summer months.

Previous experience has indicated that elevated 1-hour ozone concentrations would only occur under ideal conditions with daytime temperatures greater than 85 degrees Fahrenheit, clear skies, and surface wind speeds less than 10 miles per hour. In contrast, it is important to note that the 8-hour exceedance threshold is lower than that of the 1-hour ozone standard. Because of this, a broader range of meteorological conditions can cause ozone concentrations in excess of 0.075 parts per million. In fact, there are indications in the Kansas City area that would suggest that much less severe meteorological conditions could lead to ozone exceedances under the new 8-hour standard. Under the old 8-hour ozone standard, several synoptic weather patterns seem to be prevalent during ozone episodes in Kansas City. The following scenarios describe the two most prevalent weather patterns that contributed to high ozone in the area:

- ❏ Surface high pressure area located over the New England States during the beginning of the episode slowly moves southward toward the Mid-Atlantic States and then drifts out to sea. A frontal boundary located over the upper Midwest slowly progresses southward to the Iowa-Missouri border before becoming nearly stationary. Stagnate conditions under the high pressure system allows build up of emissions and then emissions are trapped between approaching front and high pressure system to the southeast of the metropolitan area.

- ❑ A large area of high pressure is located over the Mid-Atlantic States and the four corners region of the Desert Southwest. A weak front located along the Kansas-Nebraska border remains nearly stationary but may occasionally meander across the Kansas City metropolitan area. High pressure systems lead to stagnant winds and build up of emissions over the area, with weak frontal boundary to the north concentrating emissions.

Table C-12 (Appendix C) lists the 8-hour exceedance days (>75ppb) in Kansas City for the years 2006-2008*, along with relevant meteorological data for each of those days. It is worth noting that although all the criteria mentioned above for 1-hour exceedance days were met on average, the temperatures and wind speed categories are especially interesting. Under the new standard, there were a number of days during the three-year period in which temperatures did not reach the 85 degree mark and yet ozone exceedances still occurred. In addition, although the average wind speed for all exceedance days over this three-year period remained below 10 miles per hour, there were 16 days that experienced wind speeds over the previous 10 miles per hour benchmark. In fact, on June 15, 2006, there were four monitors in the Kansas City area that exceeded the new 8-hour ozone standard with average winds greater than 17 miles per hour.

Wind roses from the Kansas City International Airport (KCI) during 2005, 2006, and 2007 are provided in Figures C-1, C-2, C-3, C-4, C-5, and C-6. Figure C-1 shows wind conditions for the entire three-year period, all hours of the day. This figure shows the strong southerly wind component exhibited over this period and especially with winds from due south. The resultant vector, viewed as the solid red line, shows that the mean (or average) wind direction for the entire year is generally from the south with a slight southwest component. Figure C-2 gives the wind rose over this same three-year period but only shows wind during the ozone season (April 1 to October 31). Once again, a strong southerly component is shown across the Kansas City area, but in contrast, the resultant vector shows a slightly more pronounced south-southeasterly component. Figure C-3 gives the wind rose over this same three-year period but only shows winds during the ozone season (April 1 to October 31) and only during daylight hours. Once again, a strong southerly component is shown across the Kansas City area, but in contrast, the resultant vector shows a slightly more pronounced southerly component. The next three figures (C-4, C-5, and C-6) show wind directions on 8-hour ozone exceedance days for the years 2005, 2006, and 2007, respectively. The roses only show the wind directions and speeds for the hours of 7:00 a.m. to 7:00 p.m. The wind rose for 2005 continues to show the long-term trend associated with high ozone in Kansas City with a strong southerly wind component, especially from due south. However, 2006 was a bit different in that the predominant wind direction on ozone days was from the south-southeast. Almost 16% of the winds were from the south-southeast on high ozone days in 2006. In 2007, once again the prevailing winds were from the south and south-southwest, with the resultant vector from the south. When viewing all this information, the conclusion is that winds with a strong southerly component continue to predominate during the daytime hours on high ozone exceedance days in Kansas City. Because of interest in Douglas County, a wind rose (C-7) was developed for the Lawrence Municipal Airport. It shows a markedly different wind profile than KCI during ozone season. The predominant wind direction has a more southeasterly component. Figure C-8 shows the wind rose for the Johnson County Executive Airport in Southern Johnson County, Kansas. This was developed to allow discussion on the southern counties in the Kansas City CBSA. It again shows a very similar pattern to the KCI wind roses with the predominant wind direction, during the ozone season, from the south.

In addition, back trajectories have been developed from the NOAA HYSPLIT trajectory model[6] for all of the 8-hour exceedance days in Kansas City during 2005-2007. Understanding the limitations of the model's

6 http://www.arl.noaa.gov/ready/hysplit4.html * - Oct. 2008 ozone season data has not been quality assured as of this draft

large grid cell makeup and thus its coarse wind field resolution, the HYSPLIT model can still be used to understand basic transport corridors and potential areas of ozone and ozone precursor originations. For the years 2005 and 2006 (Figures C-9 and C-10), the 24-hour back trajectories show the historical source regions for air on high ozone days in Kansas City. The majority of these trajectories originated in Texas, Oklahoma, and, to a lesser extent, Arkansas, with flow into the Kansas City area from the south and southwest. Figure C-11 shows the trajectories from 2007. This graphic clearly shows the differences observed in the air flow coming into the area on ozone days in 2007. Many of these trajectories originated in Missouri, Southern Illinois, and a couple from Iowa. These are clearly different source regions for Kansas City. Whether this pattern continues in 2008 or whether the pattern reverts back to the historical source regions is yet to be seen. With all this information in mind, some nearby, upwind CBSAs of interest are Oklahoma City, OK, Tulsa, OK and, potentially, Dallas, TX. The Oklahoma City CBSA when 2008 data has been quality assured will likely have a 2006-2008 ozone design value of 0.079 ppm. The Tulsa CBSA when 2008 data has been quality assured will likely have a 2006-2008 ozone design value of 0.078 ppm, while Dallas' 2006-2008 design value will likely be 0.091 ppm.

COUNTY EVALUATIONS

Sources of Data

The emissions and boundary maps were generated from shapefiles of county boundaries, urbanized areas, and CBSAs from the U.S. Census Bureau. A shapefile of the Metropolitan Planning Organization (MPO) boundary was also obtained from MARC. The figures in Appendix A were prepared using ArcMap software. ArcMap is a software application used to view and edit geographic data, query spatial data to find and understand relationships among geographic features, and create professional quality maps, graphs, and reports. The figures show 8-hour ozone concentrations in gradients of 0.05 ppm, based on krieged ozone monitoring results for the above three-year period. Results are for the Kansas City CBSA area.

Point source emissions for Kansas counties are from the KDHE Bureau of Air and Radiation point source emissions database for 2005. Missouri point source emissions are from MoDNR's 2005 point source emissions database. Nonpoint source emissions are derived from combining the 2005 National Emissions Inventory (NEI) Tier data and point source data.[7] Mobile source emissions for Kansas and Missouri counties are from the National Mobile Inventory Model (NMIM), available from EPA, which incorporates both the MOBILE6 and NONROAD models.[8] Year 2005 vehicle miles traveled (VMT) data for all Kansas and Missouri counties also come from NMIM2005.

Point source emissions projections for the year 2020 for the Kansas and Missouri counties were developed using the default REMI (www.remi.com) 6.0 SCC configuration growth factors from EPA's Economic Growth

7 At the time this document was prepared, nonpoint sector county emissions data were unavailable for the 2005 NEI, but "tiered" county summary data were. By subtracting known point source emissions from the "non-mobile" Tier1 values (i.e., tons NO_x and VOC remaining after subtracting all HIGHWAY VEHICLES and OFF-HIGHWAY values from total NO_x and VOC values), what remains is nonpoint values. This approach was tested using 2002 NEI data for several counties with no errors; nonetheless, for unknown reasons 2005 nonpoint emissions for six Kansas counties (including Miami Co.) using this method were negative and therefore unusable, and EGAS growth factors were applied to 2002 emissions in these cases.

8 http://www.epa.gov/OMS/nmim.htm

Analysis System (EGAS) version 5.0.[9] On-road mobile source emissions projections for Kansas counties were modeled from NMIM, using a VMT input file based on 2020 projections provided by the Kansas Department of Transportation. Year 2020 on-road emissions for Missouri counties were not modeled due to unavailable VMT projections. Nonroad mobile emissions in general were not available due to current limitations of the NMIM model.

Year 2000 population information for all Kansas and Missouri counties was developed from the 2000 U.S. Census. Year 2007 population estimates originated from the American FactFinder data set found at the U.S. Census Bureau. Population data from the 2000 Census TIGER files were also used to create the map of 2000 population density by census tract. Population projections through 2030 in Kansas were gathered from the Kansas University Institute for Policy & Social Research.[10] Population projections through 2030 in Missouri are from the Missouri Office of Administration.[11] Year 2000 employment figures are from the U.S. Census Bureau's County Business Patterns. Additional information on county growth patterns was provided by the MARC.

County-to-county worker flow counts are from the U.S. Census Bureau, 2000 Census. These data have not been updated since the last ozone designation process.

General meteorological data for the Kansas City area reported in this document were obtained from the NOAA National Data Center (NNDC). Wind roses were produced with WRplot View software developed by Lakes Environmental, and meteorology data also obtained from the NNDC. The back trajectories were produced using NOAA Air Resources Laboratory's HYSPLIT transport and dispersion model. EPA Region VII provided code to automate the back trajectories. EPA Region VII also provided code implementing the Patterns in Atmospheric Transport History (PATH) algorithm developed by Dr. J. Moody at the University of Virginia, which the HYSPLIT back trajectories as an input.

Where to Find the Data in This Document

Appendix A includes the air quality monitoring data. Table A-1 summarizes the 4th-highest 8-hour ozone values for each monitor for 2006 through 2008. Table A-2 summarizes 8-hour ozone exceedances from 2006 through 2008. Appendix A also includes krieged ozone concentration maps prepared using the ArcMap software package.

Appendix B contains the emissions information. Table B-1 summarizes 2005 NO_x and VOC emissions by source category type and county. Figures B-1 and B-3 graphically illustrate total county emissions of NO_x and VOC, respectively. Figures B-2 and B-4 are maps showing the locations of the significant point sources

9 http://www.epa.gov/ttnecas1/egas5.htm
10 http://www.ipsr.ku.edu/ksdata/ksah/population/2pop17.xls
11 http://oa.mo.gov/bp/projections/TotalPop.xls

of NO_x and VOC, respectively. Tables B-2 and B-3 summarize 2005 NO_x and VOC point source emissions by facility in Kansas and Missouri, respectively.

Appendix C contains the meteorological data. Figure C-1 shows wind conditions from KCI for the entire three-year period (2005-2007), all hours of the day. Figure C-2 shows a wind rose from KCI for the same time period of 2005-2007, but includes only the ozone season (April 1 to October 31) wind data. Figure C-3 gives the wind rose over this same three-year period but only shows winds during the ozone season (April 1 to October 31) and only during daylight hours. The next three figures (C-4, C-5, and C-6) show wind directions on 8-hour ozone exceedance days for the years 2005, 2006, and 2007, respectively. The roses only show the wind directions and speeds for the hours of 7:00 a.m. to 7:00 p.m. Interest in Douglas County led to a wind rose (C-7) being developed for the Lawrence Municipal Airport. Figure C-8 shows the wind rose for the Johnson County Executive Airport in Southern Johnson County, Kansas. Figures C-9, C-10, and C-11 illustrate 20m (meter) and 500m back trajectories from the Kansas City area on 8-hour ozone exceedance days (>75 ppb) during the years 2005, 2006, and 2007, respectively. Table C-12 lists the 8-hour exceedance days in Kansas City for the years 2006-2008, along with relevant meteorological data for each of those days.

Appendix D includes the population data. Table D-1 summarizes population from the 1990 and 2000 census and population forecasts from 2010 through 2030. Table D-2 is a summary of 2000 population, 2000 employment, and 1999 average daily VMT information. Figure D-1 is a bar chart of 2000 population by county, and Figure D-2 is a map of 2000 population density. Figure D-3 is a graph of population growth through 2030.

Appendix E contains the transportation data. Figure E-1 is a bar chart showing 1999 average daily VMT for each county. Table E-1 summarizes the numbers of round-trip work trips to and from the counties being considered.

Appendix F contains a topographical map of the Kansas City region. The map also shows the locations of the region's six ozone monitors.

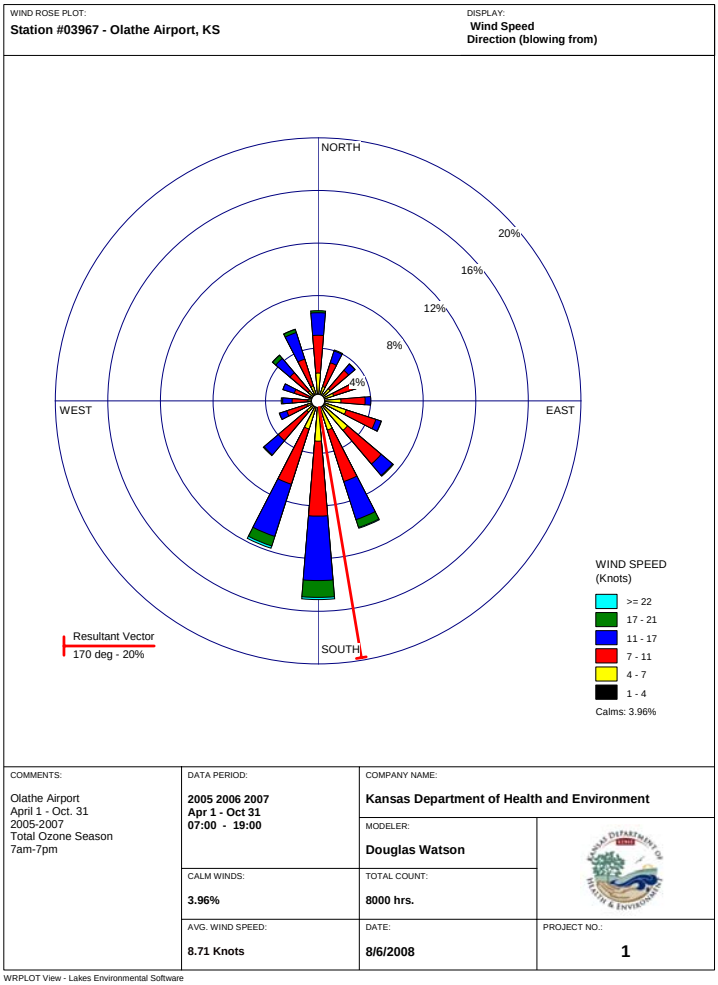
Appendix G contains a table of MIRA rankings of the Kansas City CBSA counties. These rankings weight various categories differently and provide the decision maker a range of possible choices for selecting a county as attainment or nonattainment.

KANSAS CITY CBSA — KANSAS COUNTIES

Franklin County

Air Quality: There are no monitors in Franklin County. The closest monitor is Heritage Park in Johnson County, northeast of Franklin County.

Emissions: Total Franklin County anthropogenic NO_x emissions for 2005 were 2,868 tons. This represents 2% of the total NO_x emissions for the CBSA. Point source emissions were 70 tons of this total, with the bulk (62 tons) coming from the Ottawa Municipal Power Plant. Nonpoint source emissions of NO_x were 277 tons. Projected growth of nonpoint source NO_x emissions can be assumed to correspond closely to projected population growth (13% increase from 2005 through 2020). On-road mobile source emissions in 2005 were 1,210 tons NO_x, while nonroad mobile emissions were 1,311 tons. On-road mobile source NO_x emissions are projected to be 277 tons by 2020, a decrease of 77% from 2005.



Total Franklin County anthropogenic VOC emissions for 2005 were 1,818 tons. This represents 2% of the total VOC emissions for the CBSA. Point source emissions were 12 tons of this total; nonpoint source VOC emissions in 2005 were 1,052 tons. Projected growth of nonpoint source VOC emissions is estimated as a 9% increase from 2005 through 2020. On-road mobile source VOC emissions were 582 tons and nonroad mobile emissions were 172 tons. On-road mobile source NO_x emissions are projected to be 201 tons by 2020, a decrease of 65% from 2005.

Meteorological Conditions: Franklin County is located southwest of the Kansas City urban core and southwest of the monitors with the highest ozone concentrations (Liberty and Rocky Creek). The Johnson County Executive Airport (OJC) wind rose (above), representing 2005-2007 data, shows emissions from Franklin County would have limited participation in ozone formation in the Kansas City area, with the possible exception of Leavenworth County.

Johnson County Executive Airport (OJC) wind roses for the ozone season show predominant winds from the south, with occasional variances from the southwest and southeast, and show minimal potential for Franklin County population being affected by short range transport of ozone from the Kansas City area.

Based on ozone season back trajectories for 2005-2007 (Figures C-9, C-10, C-11, Appendix C), Franklin County is located in the long-range transport corridor for ozone and ozone precursors. These back trajectories show a predominant wind flow from the south-southwest with occasional winds from the east or southeast on days with high ozone values.

Population/growth: The population of Franklin County in 2000 was 24,784, or 1.3% of the total population of the CBSA. In 2007 the population of Franklin County was 26,479. Franklin County's population is projected to increase 18% from 2000 to 2020, but will still only represent a small percentage (1.3%) of the CBSA total population in 2020. The population density of Franklin County was 43.2 persons per square mile in 2000.

Transportation: Average daily VMT in 2005 for Franklin County was 1,180,000 miles, or 2.2% of the total average daily VMT for the CBSA. The county's average daily VMT is projected to grow to 1,325,000 miles by 2020, a 12% increase from 2005 levels.

The following table summarizes the county's commuter trips to and from the other counties under consideration. The values in the charts are numbers of round-trip work trips. Of the total number of commuters residing in Franklin County, 37% leave the county and 63% remain in the county. The commuters that leave the county primarily travel to Johnson and Douglas counties. Of the total number of work trips with Franklin County as a destination, 15% begin outside the county and 85% originate within Franklin County. Of those trips originating outside of the county, most start in Douglas, Miami, and Johnson Counties. Overall, the commuters residing in Franklin County contribute about 1% of the work trips originating in the CBSA, and the county receives about 1% of the work trips that end in the CBSA.

Franklin County, Kansas (20059)			
To where do the county's commuters go?		***From where do the county's commuters come?***	
Franklin (KS)	7,290	Franklin (KS)	7,290
Johnson (KS)	2,474	Johnson (KS)	314
Leavenworth (KS)	21	Leavenworth (KS)	6
Linn (KS)	14	Linn (KS)	40
Miami (KS)	249	Miami (KS)	357
Wyandotte (KS)	240	Wyandotte (KS)	67
Douglas (KS)	961	Douglas (KS)	403
Bates (MO)	0	Bates (MO)	7
Caldwell (MO)	0	Caldwell (MO)	0
Cass (MO)	14	Cass (MO)	48
Clay (MO)	52	Clay (MO)	13
Clinton (MO)	0	Clinton (MO)	8
Jackson (MO)	270	Jackson (MO)	59
Lafayette (MO)	2	Lafayette (MO)	2
Platte (MO)	25	Platte (MO)	9
Ray (MO)	0	Ray (MO)	0
Total	**11,612**	**Total**	**8,623**

Geography/topography: Most of Franklin County consists of level or gently rolling uplands with hilly areas along the streams, particularly in the southeastern corner. The remaining 16% is bottomlands. The flood plain along the Marais des Cygnes River averages approximately 2 miles in width. The highest point in the county, about 1,177 feet above mean sea level, lies in the Chippewa Hills area in the southwest part; and the lowest point, about 843 feet, is along Pottawatomie Creek, near the town of Lane in the southeast corner, where it flows eastward into Miami County. Maximum relief in the county is about 334 feet. The area of Franklin County is 576 square miles. The topography of Franklin County should have no discernable effect on ozone formation or transport of precursor emissions.

Jurisdictional boundaries: Franklin County is located within the Kansas City Metropolitan Statistical Area. It is not part of the current 8-hour ozone maintenance area. It is not within the Kansas City Metropolitan Planning Organization (MPO) boundary.

Level of control of emission sources: Emissions sources in Franklin County are subject to the Kansas Air Quality Regulations generally, which include the State regulations adopting the NSPS, NESHAP, and the MACT standards.

Regional emissions reductions: The State of Kansas has not adopted any regional or statewide NO_x or VOC control regulations more stringent than those contained in the federal air program that would impact sources in Franklin County.

MIRA analysis: Franklin County ranked #13 in the MIRA tool and was included within Bin #10. Franklin County has a small population and emissions along with a commute connectivity indicating limited travel into the metro area, which all lead to the county being ranked low in the MIRA tool.

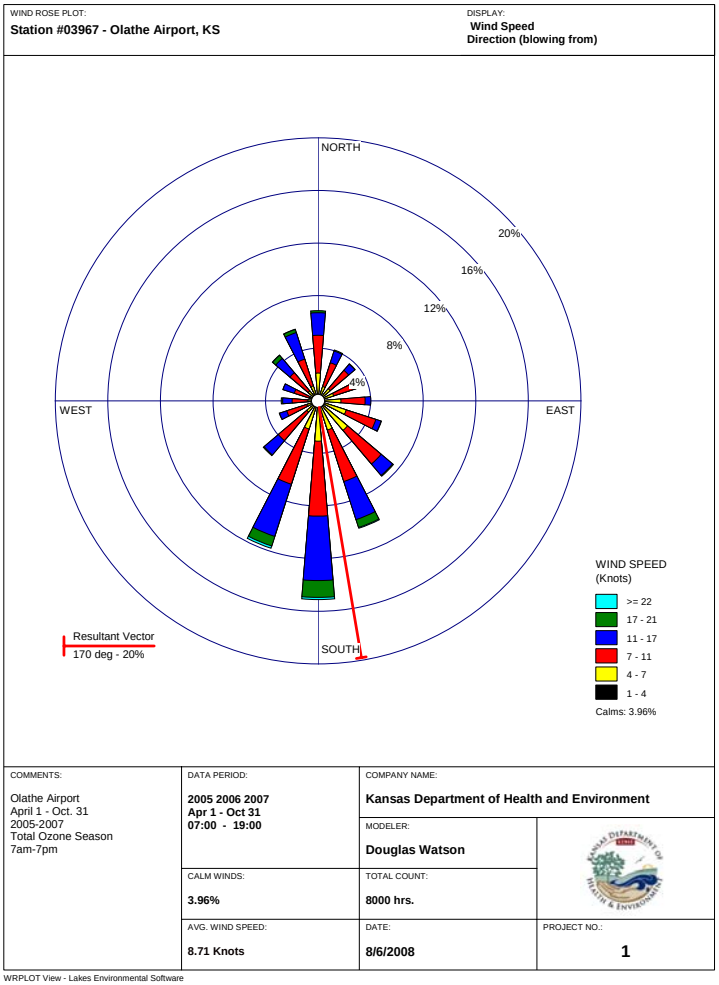
Summary: Franklin County is a rural county at the southern and western edge of the Kansas City CBSA. Franklin County has a very small population, very low ozone precursor emissions, and very low ADVMT. It has recently become part of the Kansas City CBSA, and is not part of the current maintenance area and not part of the MPO.

Recommendation: It is recommended that Franklin County not be included in the area designated as nonattainment for the 8-hour ozone standard for the Kansas City area.

Johnson County

Air quality: There is one ozone monitor operating in Johnson County, at the north end of Heritage Park. During the three year period from 2006 to 2008, the monitor recorded 6 exceedances of the new ozone standard. The design value for 2006 to 2008 is 0.069 ppm.

Emissions: Total Johnson County anthropogenic NO_x emissions for 2005 were 19,860 tons. This represents 13% of the total NO_x emissions for the CBSA. Point source emissions were 1,047 tons of this total, with the bulk (975 tons) coming from the AGC Flat Glass (formerly AFG) glass manufacturing facility located in the south central part of the county, near the Miami County border. Projected growth of NO_x point source emissions in Johnson County is 4% from 2005 to 2020. Nonpoint source emissions of NO_x were 2,465 tons. Projected growth of nonpoint source NO_x emissions is -2%. On-road mobile source NO_x emissions were 10,650 tons and nonroad mobile emissions were 5,698 tons. These values represent 24% and 15% of the CBSA's 2005 on-road and nonroad mobile emissions, respectively. The county's on-road mobile source NO_x emissions are projected to decrease 73% from 2005 to 2020.



Total Johnson County anthropogenic VOC emissions for 2005 were 25,153 tons. This represents 25% of the total VOC emissions for the CBSA. Point source emissions were 721 tons of this total, with only two facilities having emissions marginally greater than major source thresholds—the Robbie Manufacturing commercial printing facility (151 tons), located near the center of the county, and Packaging Products (131 tons), located in the northeast corner of the county. Projected growth of VOC point source emissions is 24% from 2005 to 2020. Nonpoint source VOC emissions were 13,609 tons in 2005. Projected growth of nonpoint source VOC emissions is estimated to be 15% from 2005 to 2020. Mobile source VOC emissions were 7,547 tons on-road and 3,275 tons nonroad in 2005. The county's on-road mobile source VOC emissions are projected to

decrease 58% from 2005 to 2020.

Meteorological conditions: Johnson County is located generally southwest of the Kansas City urban core and south-southwest of the monitors with the highest ozone concentrations (Liberty and Rocky Creek). The Johnson County Executive Airport (OJC) wind rose (Pg. 16), representing 2005-2007 ozone season data, shows that emissions from Johnson County would be very likely to participate in ozone formation in the Kansas City area.

Johnson County Executive Airport (OJC) wind roses for the ozone season show predominant winds from the south, with occasional variances from the southwest and southeast and show occasional potential for Johnson County population being affected by short range transport of ozone from the Kansas City area.

Based on ozone season back trajectories for 2005-2007 (C-9, C-10, C-11, Appendix C), Johnson County is located in the long-range transport corridor for ozone and ozone precursors. These back trajectories show a predominant wind flow from the south, southwest with occasional winds from the east or southeast on days with high ozone values.

Population/growth: The population of Johnson County in 2000 was 451,086, or 24.6% of the population of the CBSA. In 2007 the population was 526,319 or 26.5% of the CBSA. Johnson County's population increased 27% from 1990 to 2000. The county's growth has occurred primarily to the west, along the K-10 and K-7 corridors, and to the south, along the I-35 corridor. The county population is projected to grow 55% from 2000 to 2020. The population density of Johnson County was 946 persons per square mile in 2000.

Transportation: Average daily VMT in 2005 for Johnson County was 14,101,000 miles, or 26.3% of the total average daily VMT for the CBSA. The county's average daily VMT is projected to grow to 18,779,000 miles by 2020, a 33% increase from 2005 levels.

The following table summarizes the county's commuter trips to and from the other counties under consideration. The values in the charts are numbers of round-trip work trips. Of the total number of commuters residing in Johnson County, 31% leave the county, and 69% remain in the county. The commuters that leave the county primarily travel to Jackson and Wyandotte counties. Of the total number of work trips with Johnson County as a destination, 36% begin outside the county, and 64% originate within Johnson County. Of those trips originating outside of the county, most start in Jackson and Wyandotte counties. Overall, the commuters residing in Johnson County contribute about 26% of the work trips originating in the CBSA, and the county receives about 28% of the work trips that end in the CBSA.

Johnson County, Kansas (20091)			
To where do the county's commuters go?		***From where do the county's commuters come?***	
Franklin (KS)	314	Franklin (KS)	2,474
Johnson (KS)	165,924	Johnson (KS)	165,924
Leavenworth (KS)	847	Leavenworth (KS)	3,560
Linn (KS)	12	Linn (KS)	888
Miami (KS)	564	Miami (KS)	5,950
Wyandotte (KS)	14,791	Wyandotte (KS)	18,996
Douglas (KS)	1,462	Douglas (KS)	5,578
Bates (MO)	38	Bates (MO)	428
Caldwell (MO)	0	Caldwell (MO)	47
Cass (MO)	587	Cass (MO)	6,686

Clay (MO)	3,766	Clay (MO)	5,938
Clinton (MO)	0	Clinton (MO)	146
Jackson (MO)	49,687	Jackson (MO)	39,018
Lafayette (MO)	33	Lafayette (MO)	341
Platte (MO)	1,984	Platte (MO)	3,304
Ray (MO)	13	Ray (MO)	161
Total	**240,022**	**Total**	**259,439**

Geography/topography: Much of Johnson County consists of gently rolling uplands with hilly areas along the streams. The flood plain along the Kansas River ranges from 1 to 2 miles in width. The highest point in the county, about 1,134 feet above mean sea level, is in the southeastern part; and the lowest point, about 742 feet, is along the Kansas River where the river flows eastward into Wyandotte County. Maximum relief in the county is about 392 feet. The area of Johnson County is 477 square miles. The Kansas River flood plain, located on the northern border of Johnson County has the potential to provide a preferential pathway for ozone precursors and ozone both in and out of the Kansas City metro area. Prevailing winds during the ozone season indicate that such localized transport is more likely to occur into the Kansas City area. The topography of the balance of Johnson County should have no discernable effect on ozone formation or transport of precursor emissions.

Jurisdictional boundaries: Johnson County is located within the Kansas City Metropolitan Statistical Area. It is part of the current (0.080ppm) 8-hour ozone maintenance area. It is within the Kansas City Metropolitan Planning Organization boundary.

Level of control of emission sources: Emissions sources in Johnson County are subject to the Kansas Air Quality Regulations generally, which include the State regulations adopting the NSPS, NESHAP, and the MACT standards. In addition, the State has adopted Reasonably Available Control Technology (RACT) rules to control sources of VOCs within the former nonattainment area counties. These rules are contained in K.A.R. 28-19-61 through 77, and 28-19-714 through 28-19-717, and address the following sources of VOC emissions:

K.A.R.	Johnson & Wyandotte Counties RACT rule title
28-19-63	Automobile and light duty truck surface coating
28-19-64	Bulk gasoline terminals
28-19-65	VOC liquid storage in permanent fixed roof type tanks
28-19-66	VOC liquid storage in external floating roof tanks
28-19-67	Petroleum refineries
28-19-68	Leaks from petroleum refinery equipment
28-19-69	Cutback asphalt
28-19-70	Leaks from gasoline delivery vessels and vapor collection systems
28-19-71	Printing operations
28-19-72	Gasoline dispensing facilities
28-19-73	Surface coating of miscellaneous metal parts and products and metal furniture
28-19-74	Wool fiberglass manufacturing
28-19-76	Lithography printing operations
28-19-77	Chemical processing facilities that operate alcohol plants or liquid detergent plants
28-19-714	Solvent metal cleaning
28-19-717	Control of VOC emissions from commercial bakery ovens

An additional VOC control measure is the low-volatility fuel regulation, K.A.R. 28-19-719, which restricts the volatility of motor vehicle fuel during the ozone season in Johnson and Wyandotte Counties.

New and modified sources, prior to their construction in the Kansas City Maintenance Area must meet the applicable BACT requirements if subject to the PSD program.

Regional emissions reductions: The State of Kansas is working to implement regional NO_x controls as part of the ozone contingency measures in the Kansas City maintenance area as a result of a 2007 violation of the 0.080 ppm ozone standard. Point sources in Johnson County with actual emissions > 1000 tons/year will be subject to these NO_x controls. These controls may affect AGC Flat Glass North America, Inc, with potential reductions of several hundred tons/yr. There are no other adopted regulations more stringent than those contained in the federal air program.

MIRA analysis: Johnson County ranked #3 in the MIRA tool and was included in Bin #2 just behind Jackson and Clay counties in Missouri. As expected the county ranked high for many of the weighting criteria due to its large population and associated emissions and VMT. It's clear from the MIRA evaluation that Johnson County should be included as a nonattainment county.

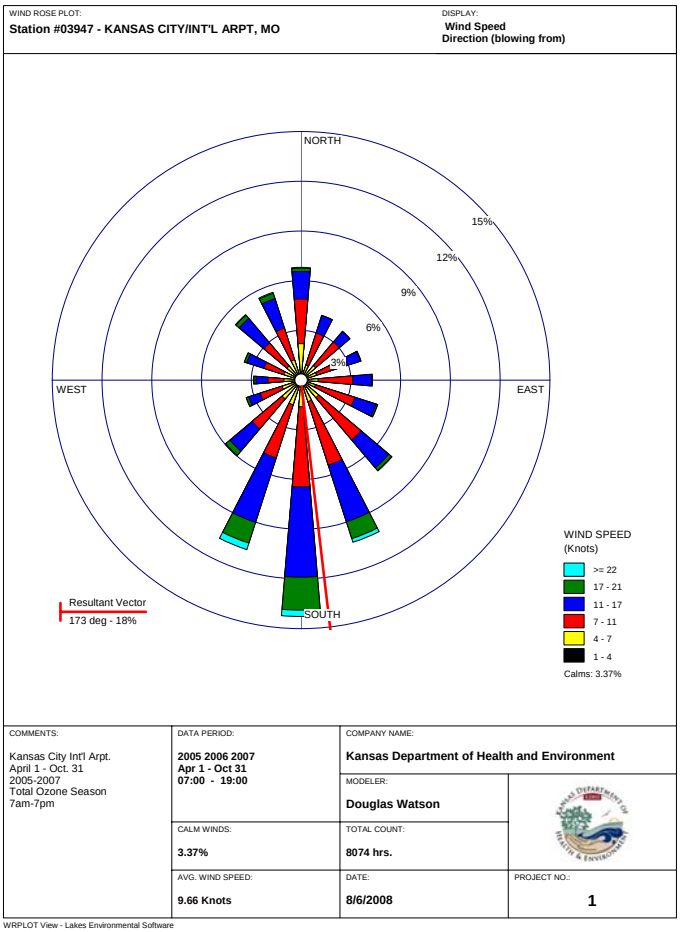
Summary: Johnson County is located south of the urban core of the CBSA. Meteorological conditions support strong contribution to ozone formation in the CBSA. It has the second largest NO_x and VOC emissions; the second largest population; the third greatest population density; and the second largest ADVMT in the CBSA. Significant population and employment growth is expected. There are no criteria that do not support including Johnson County in the 8-hour nonattainment designation area.

Recommendation: It is recommended that Johnson County be included in the area designated as nonattainment for the 8-hour ozone standard for the Kansas City area.

Leavenworth County

Air quality: There is one ozone monitor operating in Leavenworth County. The monitor is located in the northern area of the City of Leavenworth near the federal penitentiary. The monitor began operation in 2003. During the three-year period from 2006 to 2008, the monitor recorded 5 exceedances of the new ozone standard. The design value for 2006 to 2008 is 0.072 ppm.

Emissions: Total Leavenworth County anthropogenic NO_x emissions for 2005 were 2,800 tons. This represents 2% of the total NO_x emissions for the CBSA. Point source emissions were 88 tons. Nonpoint source emissions were 152 tons. Projected growth of point source emissions from 2005 to 2020 is expected to be 23%, and for nonpoint sources 51%. Mobile source NO_x emissions in 2005 were 1,526 tons on-road and 1,033 tons nonroad. Year 2020 on-road NO_x emissions are projected to be 385 tons, a decrease of 75% from 2005 levels.



Total Leavenworth County anthropogenic VOC emissions for 2005 were 2,777 tons. This represents 3% of the total VOC emissions for the CBSA. Point source emissions were 160 tons. The bulk of these emissions (113 total tons) were from two facilities owned by one large printer (Hallmark), located in the northeast area of the county in the City of Leavenworth. Nonpoint source emissions were 1,304 tons. Projected growth of point source emissions from 2005 to 2020 is expected to be 19%, and for nonpoint sources 5%. On-road mobile source VOC emissions were 982 tons and nonroad were 331 tons in 2005. Year 2020 on-road VOC emissions are projected to be 348 tons, which represents a decrease of 65% from 2005 levels.

Meteorological conditions: Leavenworth County is located west-northwest of the Kansas City urban core and west-southwest of the monitors in Clay County. Most of the county point sources are located generally west and west-southwest of the Clay County monitors. The Kansas City International Airport (MCI) wind rose

(Pg. 20), representing 2005-2007 data, shows that emissions from Leavenworth County would be unlikely to participate in ozone formation in the Kansas City area.

Kansas City (MCI) wind roses for the ozone season show predominant winds from the south, with occasional variances from the southwest and southeast, and show some potential for Leavenworth County population being affected by short range transport of ozone from the Kansas City urban core area.

Based on ozone season back trajectories for 2005-2007 (C-9, C-10, C-11, Appendix C), Leavenworth County is located in the long-range transport corridor for ozone and ozone precursors. These back trajectories show a predominant wind flow from the south, southwest with occasional winds from the east or southeast on days with high ozone values.

Population/growth: The population of Leavenworth County in 2000 was 68,691, or 3.7% of the population of the CBSA. In 2007 the population of Leavenworth County was 73,603 or 3.7% of the CBSA. Leavenworth County's population increased 7% from 1990 to 2000. The county's growth has occurred primarily in the existing urban areas of Leavenworth, Basehor, and Tonganoxie, as well as along the transportation corridors of I-70 and Hwy. 7. The county population is projected to grow by 28% from 2000 to 2020, and is projected to represent 3.8% of the CBSA population in 2020. The population density of Leavenworth County was 148 persons per square mile in 2000.

Transportation: Average daily VMT in 2005 for Leavenworth County was 1,790,000 miles, or 3.3% of the total average daily VMT for the CBSA. The county's average daily VMT is projected to grow to 2,104,000 miles by 2020, an 18% increase from 2005 levels.

The following table summarizes the county's commuter trips to and from the other counties under consideration. The values in the charts are numbers of round-trip work trips. Of the total number of commuters residing in Leavenworth County, 37% leave the county, and 63% remain in the county. The commuters that leave the county primarily travel to Johnson, Wyandotte and Jackson counties. Of the total number of work trips with Leavenworth County as a destination, 15% begin outside the county, and 85% originate within Leavenworth County. Of those trips originating outside the county, most start in Johnson, Platte, Wyandotte and Douglas counties. Overall, the commuters residing in Leavenworth County contribute about 3% of the work trips originating in the CBSA, and the county receives about 2% of the work trips that end in the CBSA.

Leavenworth County, Kansas (20103)			
To where do the county's commuters go?		***From where do the county's commuters come?***	
Franklin (KS)	6	Franklin (KS)	21
Johnson (KS)	3,560	Johnson (KS)	847
Leavenworth (KS)	19,105	Leavenworth (KS)	19,105
Linn (KS)	0	Linn (KS)	12
Miami (KS)	25	Miami (KS)	14
Wyandotte (KS)	3,793	Wyandotte (KS)	612
Douglas (KS)	785	Douglas (KS)	509
Bates (MO)	0	Bates (MO)	0
Caldwell (MO)	0	Caldwell (MO)	5
Cass (MO)	72	Cass (MO)	10
Clay (MO)	351	Clay (MO)	229
Clinton (MO)	0	Clinton (MO)	17

Jackson (MO)	1,701	Jackson (MO)	259
Lafayette (MO)	7	Lafayette (MO)	5
Platte (MO)	712	Platte (MO)	793
Ray (MO)	0	Ray (MO)	2
Total	**30,117**	**Total**	**22,440**

Geography/topography: The main topographic features of Leavenworth County are the valleys of the Kansas and Missouri Rivers and their tributaries. The Missouri River Valley, 2 to 3 miles wide, is along the eastern and northern boundaries of the county. The Kansas River Valley, slightly more than 1 mile wide, is along the southern boundary. The lowest points in Leavenworth County are about 770 feet above sea level on the Missouri River flood plain at Leavenworth and about 790 feet on the Kansas River flood plain at Loring. The highest point is about 1,100 feet on the uplands above the Oread escarpment. The area of Leavenworth County is 463 square miles. The Kansas River and Missouri River flood plains have the potential to provide preferential pathways for ozone precursors and ozone both in and out of the Kansas City metro area. The Kansas River is located on the southern border of Leavenworth County. Prevailing winds during the ozone season indicate that such localized transport is more likely to occur into the Kansas City area along the Kansas River. The Missouri River flood plain is located on the eastern border of Leavenworth County. Prevailing winds during the ozone season indicate that such localized transport along the Missouri River is more likely to occur from the Kansas City core toward Leavenworth County. The topography of the balance of Leavenworth County should have no discernable effect on ozone formation or transport of precursor emissions.

Jurisdictional boundaries: Leavenworth County is part of the Kansas City CBSA. It is not part of the current 8-hour ozone maintenance area. The county is within the Kansas City MPO boundary.

Level of control of emissions: The emissions sources in Leavenworth County are subject to State SIP rules and federal rules of general applicability, such as NSPS, NESHAPS, MACT, and PSD.

Regional emission reductions: The State of Kansas has not adopted any regional or statewide NO_x or VOC control regulations more stringent than those contained in the federal air program that would impact sources in Franklin County.

MIRA analysis: Leavenworth County ranked #9 in the MIRA tool and was included in Bin #8 just below Douglas County. Leavenworth's northern location makes it unlikely that emissions originating from the county would contribute to nonattainment based on the prevailing wind direction on high ozone days. The county does have a significant number of commuters that travel into the metropolitan area. The northerly location does allow for southerly CBSA emissions to contribute to occasional high ozone readings in the county.

Summary: Leavenworth County is primarily a rural county located northwest of the Kansas City urban core. Population and emissions sources are concentrated in the northeast corner of the county. The majority of meteorological regimes associated with high ozone concentrations in the Kansas City area would not support contribution by precursor emissions from Leavenworth County. Occasional conditions could result in a moderate area-wide contribution of Leavenworth County precursor emissions. Leavenworth County has the eighth largest VOC emissions; the ninth largest NO_x emissions; the seventh largest population; the sixth greatest population density; and the eighth largest average daily vehicle miles traveled in the CBSA. Leavenworth County is located in the Kansas City CBSA.

Recommendation: It is recommended that Leavenworth County not be included in the area designated as nonattainment for the 8-hour ozone standard for the Kansas City area. There is no evidence that controlling ozone precursor emissions, either current or projected, in Leavenworth County will contribute to the goal of attaining the 8-hour ozone standard in Kansas City. Because the current ozone monitor in Leavenworth is meeting the ozone standard, the county should be designated attainment.

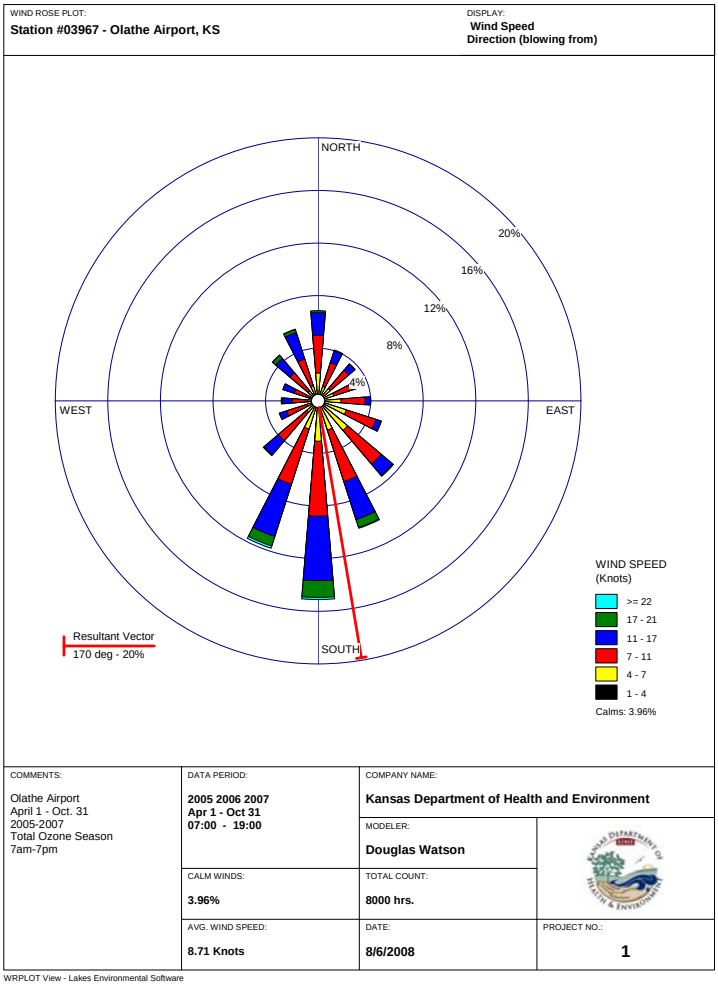
Linn County

Air quality: There is one ozone monitor in Linn County and it is located at the Mine Creek Battlefield site. This location is considered to be a transport monitor collecting ozone concentrations coming into the Kansas City region during the summer months with the predominant southern wind direction. During the three-year period from 2006 to 2008, the monitor recorded 4 exceedances of the new ozone standard. The design value for 2006 to 2008 is 0.070 ppm.

Emissions: Total Linn County anthropogenic NO_x emissions for 2005 were 32,783 tons. This represents 21% of the total NO_x emissions for the CBSA. Point source emissions were 29,109 tons, with 29,100 tons emitted by a single coal-fired power plant (KCPL&L - La Cygne) located in the northeastern portion of the county. Nonpoint source emissions of NO_x were 1,501 tons. Projected growth of both point and nonpoint source emissions from 2005 to 2020 is expected to be negative, -37% for point and -76% for nonpoint sources. Mobile source NO_x emissions in 2005 were 331 tons on-road and 1,842 tons nonroad. Year 2020 on-road NO_x emissions are expected to fall to 75 tons, which represents a decrease of 77% from 2005 levels.

Total Linn County anthropogenic VOC emissions for 2005 were 1,269 tons. This represents 1% of the total VOC emissions for the CBSA. Point source emissions of VOC were 230 tons, with 222 tons emitted by KCP&L - La Cygne. Nonpoint source emissions were 639 tons. Projected growth of point source VOC emissions from 2005 to 2020 is expected to be negative, -14%, and for nonpoint sources 6%. Mobile source VOC emissions in 2005 were 205 tons on-road and 196 tons nonroad. Year 2020 on-road VOC emissions are projected to be 66 tons, a decrease of 68% from 2005 levels.

Meteorological conditions: Linn County is located south-southwest of the Kansas City urban core and south-southwest of the monitors with the highest ozone concentrations (Liberty and Rocky Creek). The Johnson County Executive Airport (OJC) wind rose (right), representing 2005-2007 data, shows that



emissions from Linn County would be likely to participate in ozone formation in the Kansas City area.

Johnson County Executive Airport (OJC) wind roses for the ozone season show predominant winds from the south, with occasional variances from the southwest and southeast, and show minimal potential for Linn County population being affected by short range transport of ozone from the Kansas City area.

Based on ozone season back trajectories for 2005-2007 (C-9, C-10, C-11, Appendix C), Linn County is located in the long-range transport corridor for ozone and ozone precursors. These back trajectories show a predominant wind flow from the south-southwest with occasional winds from the east or southeast on days with high ozone values.

Population/growth: The population of Linn County in 2000 was 9,570, or 0.5% of the population of the CBSA. In 2007 the population of Linn County was 9,767 or 0.5% of the CBSA. Linn County's population increased 16% from 1990 to 2000. The county's growth has occurred primarily along transportation corridor of Hwy. 69. The county population is projected to grow by around 12% from 2000 to 2020, and is projected to represent less than 1% of the CBSA population in 2020. The population density of Linn County was 16 persons per square mile in 2000.

Transportation: Average daily VMT in 2005 for Linn County was 410,000 miles, or 0.8% of the total average daily VMT for the CBSA. The county's average daily VMT is projected to grow to 427,000 miles by 2020, a 4% increase from 2005 levels.

The following table summarizes the county's commuter trips to and from the other counties under consideration. The values in the charts are numbers of round-trip work trips. Of the total number of commuters residing in Linn County, 48% leave the county, and 52% remain in the county. The commuters that leave the county primarily travel to Johnson and Miami counties. Of the total number of work trips with Linn County as a destination, 16% begin outside the county, and 84% originate within Linn County. Of those trips originating outside the county, most start in Bates and Miami counties. Overall, the commuters residing in Linn County contribute less than 1% of the work trips originating in the CBSA, and the county receives less than 1% of the work trips that end in the CBSA.

Linn County, Kansas (20107)			
To where do the county's commuters go?		***From where do the county's commuters come?***	
Franklin (KS)	40	Franklin (KS)	14
Johnson (KS)	888	Johnson (KS)	12
Leavenworth (KS)	12	Leavenworth (KS)	0
Linn (KS)	2,094	Linn (KS)	2,094
Miami (KS)	497	Miami (KS)	103
Wyandotte (KS)	122	Wyandotte (KS)	18
Douglas (KS)	9	Douglas (KS)	27
Bates (MO)	66	Bates (MO)	168
Caldwell (MO)	0	Caldwell (MO)	0
Cass (MO)	37	Cass (MO)	35
Clay (MO)	19	Clay (MO)	0
Clinton (MO)	0	Clinton (MO)	8
Jackson (MO)	193	Jackson (MO)	8
Lafayette (MO)	9	Lafayette (MO)	2
Platte (MO)	13	Platte (MO)	0

Ray (MO)	0	Ray (MO)	0
Total	**3,999**	**Total**	**2,489**

Geography/topography: Most of Linn County consists of gently rolling uplands, with the remaining 20% bottomlands. The principal river in the county is the Marais des Cygnes, which flows southeasterly from the north central portion into Missouri at the county's east central border. The highest point in the county, about 1,116 feet above mean sea level, lies west of the city of Blue Mound in the southwest corner of the county; and the lowest point, about 754 feet, is along the eastern boundary of the Marais des Cygnes National Wildlife Refuge, where the Marais des Cygnes River meanders eastward into Missouri. Maximum relief in the county is about 362 feet. The area of Linn County is 599 square miles. The topography of Linn County should have no discernable effect on ozone formation or transport of precursor emissions.

Jurisdictional boundaries: Linn County is part of the Kansas City CBSA. It is not part of the current 8-hour ozone maintenance area. The county is not within the Kansas City MPO boundary.

Level of control of emission sources: The main source of emissions in Linn County is the La Cygne generating station operated by Kansas City Power & Light (KCP&L). The facility has two coal-fired electric generating units, characterized in the following table:

KCP&L - La Cygne electrical generating units					
Unit	**Capacity (MW)**	**Coal Source**	**Stack Height (ft)**	**NO_x Limits (lb/MMBtu)**	**Control Equipment**
1	893.4	85% Powder River Basin subbituminous 15% local bituminous	700	0.13*	None until 2006; currently selective catalytic reduction (SCR)
2	685.2	100% Powder River Basin subbituminous	700	0.13*	Older low NO_x burners until 2006; currently new low NO_x burners

*30 day rolling average for both Units 1 and 2, excluding periods of startup and shutdown. Regional Haze Agreement limits to be incorporated in facility's operating permit in 2009.

KCP&L - La Cygne's annual NO_x emissions from 2002 to 2007 are summarized in the following table:

KCP&L - La Cygne total facility NOx emissions 2002–2007	
Year	**Total NO_x emissions - Kansas Emissions Inventory (tons/yr)**
2002	37,380
2003	36,964
2004	38,377
2005	29,100
2006	33,462
2007	18,247

Unit 1 NO_x emissions are currently controlled with a SCR control system. This is considered state of the art control technology for this cyclone unit. Unit 2 has recently installed new low NO_x burners. As can be seen in the emissions table above, these new control technologies have significantly reduced the NO_x emissions from this facility. KCP&L is also considering installing a SCR on Unit 2 to meet the limits agreed upon in the December 2007 Regional Haze agreement with KDHE. This regional haze agreement has a NO_x limit of 0.13 lb/MMBtu based on a 30 day rolling average of both Units 1 and 2, excluding periods of startup and shutdown. The agreement also has provisions for an extended outage of a unit, as this could impact the rolling average calculation should one unit have an extended outage.

Regional emissions reductions: The State of Kansas has not adopted any regional or statewide NO_x or VOC control regulations more stringent than those contained in the federal air program that would impact sources in Linn County. The emission sources in Linn County are not subject to the NO_x SIP call or other enforceable regional strategies. The La Cygne coal-fired electric generating station is subject to controls as part of the Regional Haze program.

MIRA analysis: Linn County ranked #15 in the MIRA tool and was included in Bin #10. Linn ranked very low for all categories except emissions. The emissions from the KCPL La Cygne electric generating station were the sole reason this county was not ranked the least nonattainment of all 16 counties analyzed.

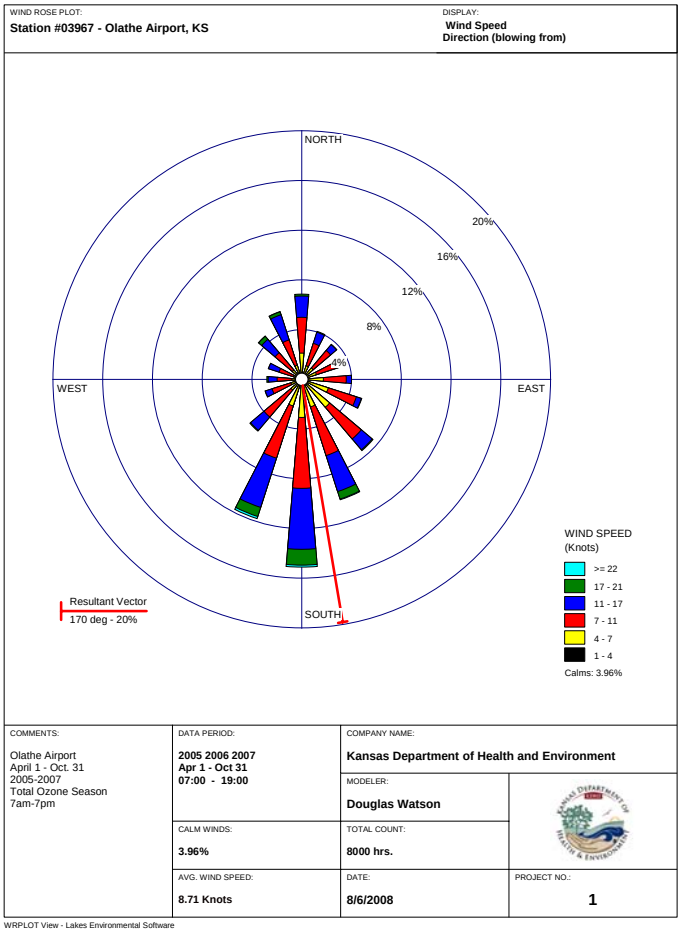
Summary: Linn County is a rural county at the southern edge of the Kansas City CBSA. Linn County has a very small population, very low ozone precursor emissions not associated with the La Cygne power generating facility, and very low ADVMT. It has recently become part of the Kansas City CBSA, but not part of the current maintenance area and not part of the MPO.

Recommendation: The sole reason for considering inclusion of Linn County within the Kansas City nonattainment area is emissions from the La Cygne Generating Station. The generating station is located approximately 60 miles south of the Kansas City urban core. Currently the source's two units are well controlled for NO_x, with an emissions rate limit of 0.13 lb/MMBtu averaged between the two units. 2007 emissions reported for the La Cygne Generating Station only showed a partial year of NO_x reductions as a result of NO_x controls installed on both units. With a full year of operation of this equipment in 2008, KDHE expects to see further reductions of NO_x. Should additional studies determine that additional controls are needed for the La Cygne Generating Station these can be addressed directly with this source, without placing the entire county in nonattainment. It is recommended that Linn County not be included in the area designated as nonattainment for the 8-hour ozone standard for the Kansas City area.

Miami County

Air quality: There are no ozone monitors located in Miami County. Evaluation of monitoring data from Mine Creek (located one county south of Miami) and Richards Gebaur (an upwind site on the Missouri side east of Miami County) will show 2006-2008 8-hour design values of 0.070 ppm and 0.072 ppm respectively.

Emissions: Total Miami County anthropogenic NO_x emissions for 2005 were 7,539 tons. This represents 5% of the total NO_x emissions for the CBSA. Point source emissions were 2,767 tons of this total, with over 99% of these emissions coming from one large and two moderate sized natural gas compressor stations located in the east-central and central parts of the county. Nonpoint NO_x source emissions were 162 tons. Projected growth of nonpoint source NO_x emissions is expected to be negative, -15% from 2005 to 2020. On-road mobile source NO_x emissions were 696 tons, while nonroad mobile emissions were 3,915 tons in 2005—chiefly from railroad emissions (3,551 tons), which are given in EPA's 2005 tier emissions but are probably too high. Projected growth of both point and nonpoint source emissions from 2005 to 2020 is expected to be 22% for point and 15% for nonpoint sources. Mobile source NO_x emissions in 2005 were 696 tons on-road and 3,915 tons nonroad. Year 2020 on-road NO_x emissions are expected to fall to 306 tons, which represents a decrease of 56% from 2005 levels.



Total Miami County VOC emissions for 2005 were 1,768 tons. This represents 2% of the total VOC emissions for the CBSA. Point source emissions were 179 tons of this total, with none of the facilities having emissions greater than the major source threshold. Nonpoint source emissions were 741 tons. Projected growth of both point and nonpoint source emissions from 2005 to 2020 is expected to be 24% for point and 14% for nonpoint sources. On-road mobile source emissions were 438 tons and nonroad emissions were 411 tons in 2005. Year 2020 on-road VOC emissions are expected to fall to 271 tons, which represents a decrease of 38% from 2005 levels.

Meteorological conditions: Miami County is located generally south-southwest of the Kansas City urban core and south-southwest of the monitors with the highest design values (Liberty and Rocky Creek). The Johnson County Executive Airport (OJC) wind rose (Pg. 28), representing 2005-2007 data, shows that emissions from Miami County would be likely to participate in ozone formation in the Kansas City area.

Johnson County Executive Airport (OJC) wind roses for the ozone season show predominant winds from the south, with occasional variances from the southwest and southeast, and show minimal potential for Miami County population being affected by short range transport of ozone from the Kansas City area.

Based on ozone season back trajectories for 2005-2007 (C-9, C-10, C-11, Appendix C), Miami County is located in the long-range transport corridor for ozone and ozone precursors. These back trajectories show a predominant wind flow from the south-southwest with occasional winds from the east or southeast on days with high ozone values.

Population/growth: The population of Miami County in 2000 was 28,351, or about 2% of the population of the CBSA. In 2007, the population of Miami County was 31,078. Miami County's population increased 21% from 1990 to 2000. The county's growth has occurred primarily in the urban areas of Paola, Osawatomie and Louisburg. Other areas for potential development include the 169 and 69 highway corridors. The county population is projected to grow around 33% from 2000 to 2020, but will remain less than 2% of the overall CBSA population in 2020. The population density of Miami County is 49 persons per square mile.

Transportation: Average daily VMT in 2005 for Miami County was 847,000 miles, or 1.6% of the total average daily VMT for the CBSA. The county's average daily VMT is projected to grow to 1,712,000 miles by 2020, a 102% increase from 2005 levels.

The following table summarizes the county's commuter trips to and from the other counties under consideration. The values in the charts are numbers of round-trip work trips. Of the total number of commuters residing in Miami County, 58% leave the county, and 42% remain in the county. The commuters that leave the county primarily travel to Johnson County. Of the total number of work trips with Miami County as a destination, 24% begin outside the county, and 76% originate within Miami County. Of those trips originating outside the county, most start in Johnson County. Overall, the commuters residing in Miami County contribute about 1% of the work trips originating in the CBSA, and the county receives about 1% of the work trips that end in the CBSA.

Miami County, Kansas (20121)			
To where do the county's commuters go?		***From where do the county's commuters come?***	
Franklin (KS)	357	Franklin (KS)	249
Johnson (KS)	5,950	Johnson (KS)	564
Leavenworth (KS)	14	Leavenworth (KS)	25
Linn (KS)	103	Linn (KS)	497
Miami (KS)	5,930	Miami (KS)	5,930
Wyandotte (KS)	427	Wyandotte (KS)	63
Douglas (KS)	120	Douglas (KS)	58
Bates (MO)	5	Bates (MO)	72
Caldwell (MO)	0	Caldwell (MO)	0
Cass (MO)	94	Cass (MO)	224

Clay (MO)	70	Clay (MO)	8
Clinton (MO)	0	Clinton (MO)	0
Jackson (MO)	934	Jackson (MO)	80
Lafayette (MO)	7	Lafayette (MO)	7
Platte (MO)	31	Platte (MO)	10
Ray (MO)	0	Ray (MO)	0
Total	**14,042**	**Total**	**7,787**

Geography/topography: The major topographic features in Miami County are the southeast-trending Marais des Cygnes River valley and the gently sloping upland plains formed by erosion of the flat-lying sedimentary rocks underlying the county. The highest point in the county, which is about 1,150 feet above mean sea level, is southeast of Louisburg. The lowest point, which is about 790 feet above mean sea level, is along the Marais des Cygnes River at the south edge of the county. Miami County has an area of 577 square miles. The topography of Miami County should have no discernable effect on ozone formation or transport of precursor emissions.

Jurisdictional boundaries: Miami County is part of the Kansas City CBSA. It is not part of the current 8-hour ozone maintenance area. It is not within the Kansas City MPO boundary.

Level of control of emissions: The emissions sources in Miami County are subject to State SIP rules and federal rules of general applicability, such as NSPS, NESHAPS, MACT, and PSD.

Regional emission reductions: The State of Kansas has not adopted any regional or statewide NO_x or VOC control regulations more stringent than those contained in the federal air program that would impact sources in Miami County. The emission sources in Miami County are not subject to the NO_x SIP call or other enforceable regional strategies.

MIRA analysis: Miami County ranked #11 in the MIRA tool and was included in Bin #9 between Lafayette and Ray counties in Missouri. The majority of the criteria evaluated for Miami County placed them in the middle of the pack, as they were ranked #9 for air quality, emissions and population. Miami does have a slightly higher number of commuters into the metropolitan area than Lafayette and Ray counties but three times less the number of commuters than Cass County has into the metropolitan area.

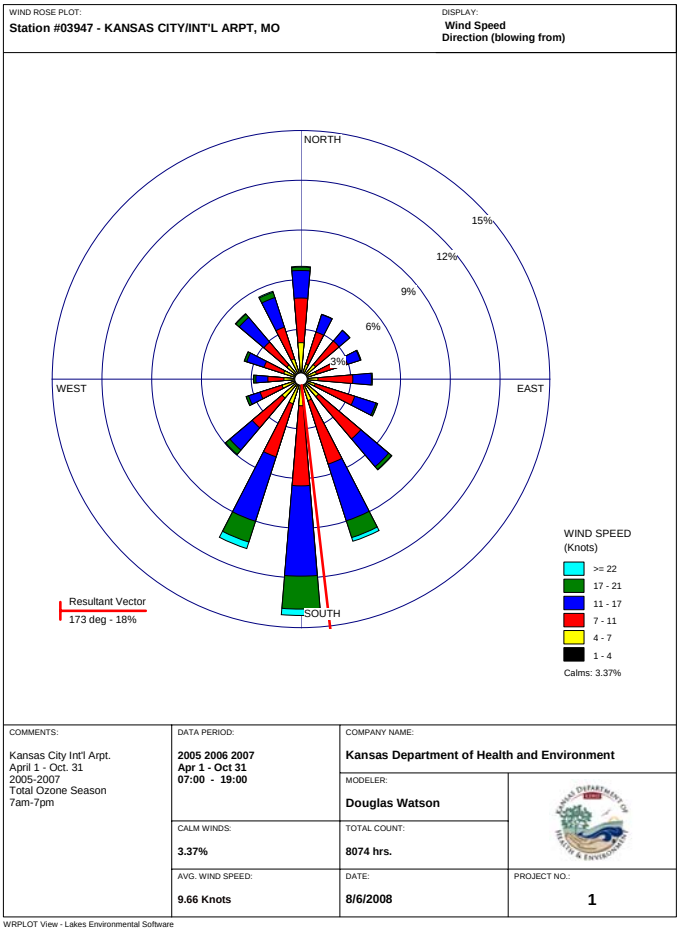
Summary: Miami County is a rural county located directly south of the existing five-county maintenance area. Meteorological conditions during the ozone season support significant contribution of Miami County precursor emissions to ozone formation in the CBSA. Among the 15 counties in the Kansas City CBSA, Miami County has the eleventh largest VOC emissions, the sixth largest NO_x emissions, the ninth largest population, the ninth greatest population density, and the ninth largest ADVMT. The county has one point source with substantial NO_x emissions (Panhandle Eastern Pipe Line - Louisburg Station, with 2,676 tons in 2005). Miami County NO_x and VOC emissions represent a very small proportion of the total emissions for the CBSA. Miami County is located in the CBSA but not the current 8-hour maintenance area.

Recommendation: It is recommended that Miami County be excluded from the area designated nonattainment for the 8-hour standard for the Kansas City area. There is not sufficient evidence that reducing anthropogenic VOC and NO_x emissions in Miami County would significantly affect ozone formation in those areas of the Kansas City region which have recorded violations of the 8-hour ozone standard. There is no evidence that Miami County residents are exposed to ozone concentrations exceeding the 8-hour ozone standard.

Wyandotte County

Air quality: There is one ozone monitor located in Wyandotte County at the JFK Community Center in downtown Kansas City, Kansas. During the three-year period from 2006 to 2008, the monitor recorded 13 exceedances of the new ozone standard. The design value for 2006 to 2008 is 0.072 ppm.

Emissions: Total Wyandotte County anthropogenic NO_x emissions for 2005 were 14,695 tons, representing 9% of the total NO_x emissions for the CBSA. Point sources contributed 8,281 tons of this total, with the bulk (7,488 tons) emitted by two Kansas City Board of Public Utilities power plants—the Nearman and Quindaro facilities—both located in the northeastern corner of the county. Projected growth of NO_x point source emissions is 18% from 2005 to 2020; however, the two BPU sources will be subject to NO_x controls as part of the contingency measures currently being implemented for ozone in the Kansas City area which will lower the overall NO_x emissions even with growth. Nonpoint source NO_x emissions were 828 tons. Projected nonpoint source NO_x emissions for 2020 are expected to increase 15% from 2005 to 2020, to 953 tons. On-road mobile source NO_x emissions were 3,462 tons, and nonroad mobile NO_x emissions were 2,123 tons. Year 2020 on-road NO_x emissions are expected to fall to 894 tons, which represents a decrease of 74% from 2005 levels.



Total Wyandotte County VOC emissions for 2005 were 10,786 tons, which represents 11% of the total VOC emissions for the CBSA. Point sources were 2,385 tons of this total. Approximately 48% (1,140 tons) of the point source VOC emissions came from the General Motors automobile manufacturing facility, located in the northeastern corner of the county. Projected growth of VOC point source emissions is 39% from 2005 to 2020. Within the transportation equipment source categories for the bulk of emissions from the General Motors facility, projected growth of VOC emissions is 49%. Nonpoint source emissions were 5,060 tons. Projected nonpoint source VOC emissions are estimated to increase

around 24% from 2005 to 2020, to 6,266 tons. On-road mobile source emissions were 2,506 tons and nonroad mobile emissions were 835 tons in 2005.Year 2020 on-road VOC emissions are expected to fall to 935 tons, which represents a decrease of 63% from 2005 levels.

Meteorological conditions: Wyandotte County is located generally west of the Kansas City urban core and southwest of the monitors with the highest design values (Liberty and Rocky Creek). The Kansas City International Airport (MCI) wind rose (Page 31), representing 2005-2007 data, show that emissions from Wyandotte County would be likely to participate in ozone formation in the Kansas City area.

Kansas City (MCI) wind roses for the ozone season show predominant winds from the south, with occasional variances from the southwest and southeast, and show potential for Wyandotte County population being affected by short range transport of ozone from the Kansas City urban core area.

Based on ozone season back trajectories for 2005-2007 (C-9, C-10, C-11, Appendix C), Wyandotte County is located in the long-range transport corridor for ozone and ozone precursors. These back trajectories show a predominant wind flow from the south-southwest with occasional winds from the east or southeast on days with high ozone values.

Population/growth: The population of Wyandotte County in 2000 was 157,882, or 9% of the population of the CBSA. In 2007, the population of Wyandotte County was 153,956. Wyandotte County's population decreased 3% from 1990 to 2000. Projections show a further population decrease of 4% from 2000 to 2020, which would represent around 7% of the CBSA population in 2020. The population density of Wyandotte County was 1,043 persons per square mile in 2000.

Transportation: Average daily VMT in 2005 for Wyandotte County was 4,632,000 miles, or 8.6% of the total average daily VMT for the CBSA. The county's average daily VMT is projected to grow to 5,468,000 miles by 2020, an 18% increase from 2005 levels.

The following table summarizes the county's commuter trips to and from the other counties under consideration. The values in the charts are numbers of round-trip work trips. Of the total number of commuters residing in Wyandotte County, 51% leave the county, and 49% remain in the county. The commuters that leave the county primarily travel to Johnson and Jackson counties. Of the total number of work trips with Wyandotte County as a destination, 56% begin outside the county, and 44% originate within Wyandotte County. Of those trips originating outside the county, most start in Jackson and Platte counties. Overall, the commuters residing in Wyandotte County contribute about 7% of the work trips originating in the CBSA, and the county receives about 8% of the work trips that end in the CBSA.

Wyandotte County, Kansas (20209)			
To where do the county's commuters go?		***From where do the county's commuters come?***	
Franklin (KS)	67	Franklin (KS)	240
Johnson (KS)	18,996	Johnson (KS)	14,791
Leavenworth (KS)	612	Leavenworth (KS)	3,793
Linn (KS)	18	Linn (KS)	122
Miami (KS)	63	Miami (KS)	427
Wyandotte (KS)	31,919	Wyandotte (KS)	31,919
Douglas (KS)	200	Douglas (KS)	796
Bates (MO)	0	Bates (MO)	77
Caldwell (MO)	0	Caldwell (MO)	99

Cass (MO)	75	Cass (MO)	977
Clay (MO)	1,707	Clay (MO)	4,267
Clinton (MO)	0	Clinton (MO)	291
Jackson (MO)	11,004	Jackson (MO)	11,585
Lafayette (MO)	3	Lafayette (MO)	281
Platte (MO)	1,163	Platte (MO)	2,452
Ray (MO)	0	Ray (MO)	300
Total	**65,827**	**Total**	**72,417**

Geography/topography: The main topographic features of Wyandotte County are the valleys of the Kansas and Missouri Rivers and their tributaries. The Missouri River Valley, 2 to 3 miles wide, is along the eastern and northern boundaries of the county. The Kansas River Valley, slightly more than 1 mile wide, is along the southern boundary. The lowest point in Wyandotte County is about 740 feet above sea level at the junction of the Kansas and Missouri Rivers. The highest point is about 1,060 feet on the uplands in the western part of the county. The area of Wyandotte County is 151 square miles. The Kansas River flood plain located on the southern border of Wyandotte County has the potential to provide a preferential pathway for ozone precursors and ozone in an easterly direction on days when high pressure systems do not allow dispersion. The topography of the balance of Wyandotte County should have no discernable effect on ozone formation or transport of precursor emissions.

Jurisdictional boundaries: Wyandotte County is located within the current 8-hour ozone maintenance area. It is within the Kansas City CBSA. It is within the Kansas City MPO boundary.

Level of control of emission sources: Emissions sources in Wyandotte County are subject to the Kansas Air Quality Regulations generally, which include the State regulations adopting the Federal New Source Performance Standards (NSPS), the Federal National Emission Standards for Hazardous Air Pollutants (NESHAP), and the Federal National Emission Standards for Hazardous Air Pollutants for Source Categories (MACT standards, for maximum achievable control technology). In addition, the State has adopted RACT rules to control sources of VOCs within the former nonattainment area counties. See RACT rules discussion and table under the corresponding section for Johnson County.

New and modified sources, prior to construction in the Kansas City Maintenance Area, must meet the applicable best available control technology (BACT) requirements if subject to the prevention of significant deterioration (PSD) program.

Regional emissions reductions: The State of Kansas is working to implement regional NO_x controls as part of the ozone contingency measures in the Kansas City maintenance area as a result of a 2007 violation of the 0.080 ppm ozone standard. Facilities in Wyandotte County with actual NO_x emissions greater than 1000 tons/year will be subject to controls. These controls are expected to affect three coal-fired EGUs, Nearman Unit 1 and Quindaro Units 1 and 2, owned by the Kansas City Board of Public Utilities, with expected reductions of more than 2,000 tons/yr at these two facilities. KDHE has not yet implemented the rule, thus the exact limits and exact reductions are not known at this time. There are no other adopted regulations more stringent than those contained in the federal air program.

MIRA analysis: Wyandotte County ranked #5 in the MIRA tool and was included in Bin #5. Wyandotte County has a significant population and associated emissions. Wyandotte County is expected to experience a slight contraction in population growth and had one of the lower ozone monitoring readings in the area, especially in 2008. The MIRA evaluation supports Wyandotte County as a nonattainment county.

Summary: Wyandotte County, which contains Kansas City, Kansas, is centrally located in the CBSA. Meteorological conditions support strong contribution to ozone formation in the CBSA. It has the third largest NO_x and VOC emissions, the fourth largest population, the second greatest population density, and the fourth largest ADVMT in the CBSA. It is located in the current 8-hour maintenance area and the CBSA. There are no criteria that do not support including Wyandotte County in the 8-hour ozone nonattainment area.

Recommendation: It is recommended that Wyandotte County be included in the area designated nonattainment for the 8-hour ozone standard for the Kansas City area.

KANSAS CITY CBSA — MISSOURI COUNTIES

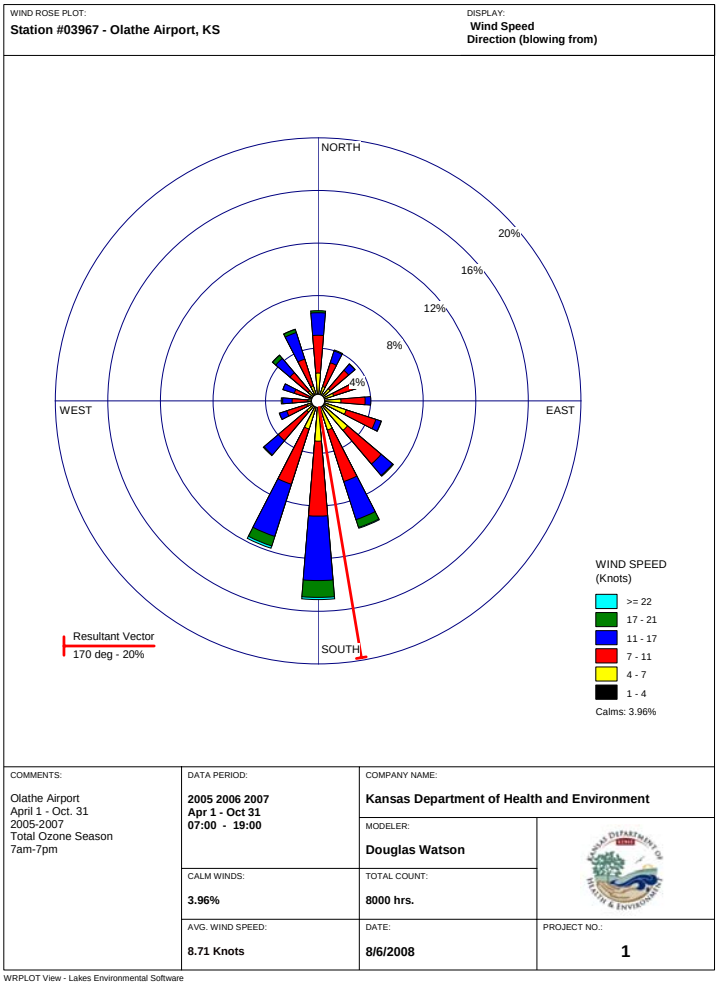
Bates County

Air quality: There are no ozone monitors located in this county.

Emissions: Total Bates County anthropogenic NO_x emissions for 2005 were 1,853 tons. This represents 1% of the total NO_x emissions for the CBSA. Point source emissions were 24 tons of this total; nonpoint source emissions of NO_x were 111 tons. On-road mobile source NO_x emissions in 2005 were 613 tons and nonroad mobile emissions were 1,105 tons.

Total Bates County anthropogenic VOC emissions for 2005 were 1,417 tons. This represents 1% of the total VOC emissions for the CBSA. Point source emissions were 2 tons of this total. Nonpoint source VOC emissions in 2005 were 722 tons. On-road mobile source VOC emissions were 405 tons and nonroad mobile emissions were 288 tons.

Meteorological conditions: Bates County is located south of the Kansas City urban core and south of the monitors with the highest ozone concentrations (Liberty and Rocky Creek). The Johnson County Executive Airport (OJC) wind rose (right), representing 2005-2007 data, shows that emissions from Bates County would be likely to participate in ozone formation in the Kansas City area.



Johnson County Executive Airport (OJC) wind roses for the ozone season show predominant winds from the south, with occasional variances from the southwest and southeast, and show minimal potential for Bates County population being affected by short range transport of ozone from the Kansas City area.

Based on ozone season back trajectories for 2005-2007 (C-9, C-10, C-11, Appendix C), Bates County is located in the long-range transport corridor for ozone and ozone

precursors. These back trajectories show a predominant wind flow from the south-southwest with occasional winds from the east or southeast on days with high ozone values.

Population/growth: The population of Bates County in 2000 was 16,653, or about 1% of the population of the CBSA. Bates County's population increased 11% from 1990 to 2000. Projections show a further population increase of 9% from 2000 to 2020, which would represent less than 1% of the CBSA population in 2020. The population density of Bates County in 2000 was 20 persons per square mile.

Transportation: Bates County's annual VMT was 338 million. The following table summarizes the county's commuter trips to and from the other counties under consideration. The values in the charts are numbers of round-trip work trips. Of the total number of commuters residing in Bates County, 39% leave the county, and 61% remain in the county. The commuters that leave the county primarily travel to Jackson, Cass and Johnson counties. Of the total number of work trips with Bates County as a destination, 6% begin outside the county, and 94% originate within Bates County. Of those trips originating outside the county, most start in Cass and Linn counties. Overall, the commuters residing in Bates County contribute about 1% of the work trips originating in the CBSA, and the county receives less than 1% of the work trips that end in the CBSA.

Bates County, Missouri (29013)			
To where do the county's commuters go?		***From where do the county's commuters come?***	
Franklin (KS)	7	Franklin (KS)	0
Johnson (KS)	428	Johnson (KS)	38
Leavenworth (KS)	0	Leavenworth (KS)	0
Linn (KS)	168	Linn (KS)	66
Miami (KS)	72	Miami (KS)	5
Wyandotte (KS)	77	Wyandotte (KS)	0
Douglas (KS)	13	Douglas (KS)	0
Bates (MO)	4,098	Bates (MO)	4,098
Caldwell (MO)	0	Caldwell (MO)	0
Cass (MO)	834	Cass (MO)	88
Clay (MO)	68	Clay (MO)	0
Clinton (MO)	0	Clinton (MO)	0
Jackson (MO)	937	Jackson (MO)	47
Lafayette (MO)	7	Lafayette (MO)	0
Platte (MO)	19	Platte (MO)	0
Ray (MO)	0	Ray (MO)	0
Total	**6,728**	**Total**	**4,342**

Jurisdictional boundaries: Bates County is located in the Kansas City CBSA.

Level of control of emission sources: The emissions sources are subject to the general State regulations adopting the Federal NSPS, NESHAP, and MACT standards. The State of Missouri has also submitted a SIP revision to incorporate controls on utilities in the western two-thirds of the State. This would limit NO_x emissions to 0.35 lb NO_x /MMBtu heat input. NO_x is also an ozone precursor.

Regional emissions reductions: The State of Missouri has submitted a SIP revision to incorporate controls

on utilities in the western two-thirds of the State. This would limit NO_x emissions to 0.35 lb NO_x /MMBtu heat input.

Caldwell County

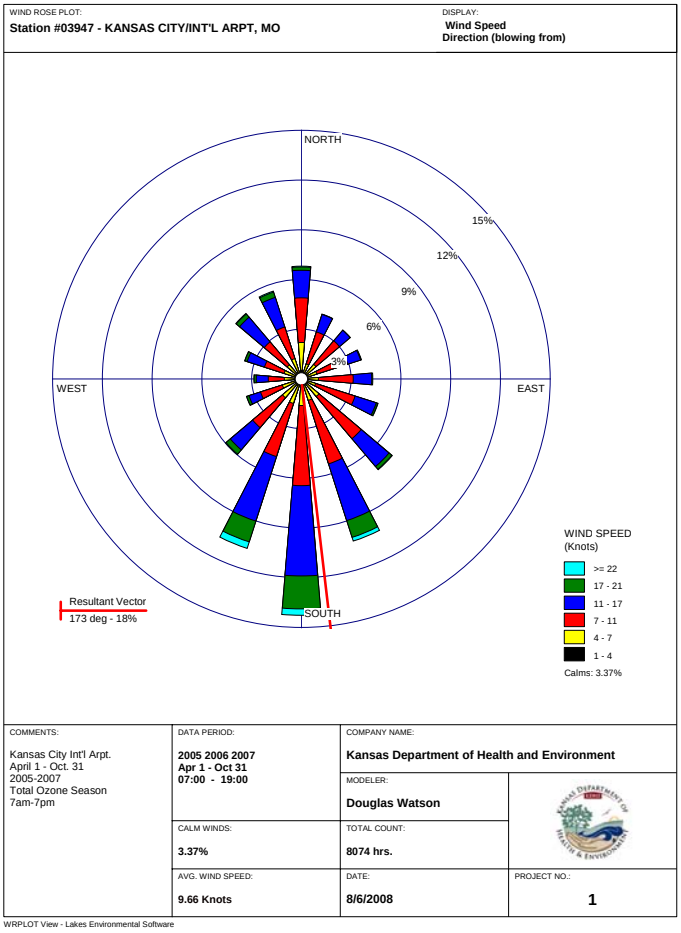
Air quality: There are no ozone monitors located in this county.

Emissions: Total Caldwell County anthropogenic NO_x emissions for 2005 were 981 tons. This represents 1% of the total NO_x emissions for the CBSA. Point source emissions were less than 1 ton; nonpoint source emissions of NO_x were 33 tons. On-road mobile source NO_x emissions in 2005 were 332 tons and nonroad mobile emissions were 617 tons.

Total Caldwell County anthropogenic VOC emissions for 2005 were 691 tons. This represents 1% of the total VOC emissions for the CBSA. Point source emissions were 3 tons of this total. Nonpoint source VOC emissions in 2005 were 318 tons. On-road mobile source VOC emissions were 218 tons and nonroad mobile emissions were 153 tons.

Meteorological conditions: Caldwell County is located northeast of the Kansas City urban core and northeast of the monitors with the highest ozone concentrations (Liberty and Rocky Creek). The KCI wind rose (right), representing 2005-2007 data, shows that emissions from Caldwell County would not likely participate in ozone formation in the Kansas City area.

KCI wind roses for the ozone season show predominant winds from the south, with occasional variances from the southwest and southeast, and show potential for Caldwell County population being affected by short range transport of ozone from the Kansas City area.



Based on ozone season back trajectories for 2005-2007 (C-9, C-10, C-11, Appendix C), Caldwell County is not located in the long-range transport corridor for ozone and ozone precursors. These back trajectories show a predominant wind flow from the south-southwest with occasional winds from the east or southeast on days with high ozone values.

Population/growth: The population of Caldwell County in 2000 was 8,969 or less than 1% of the population of the CBSA. Caldwell County's population increased 7% from 1990 to 2000. Projections show a further population increase of about 11% from 2000 to 2020, which would represent less than 1% of the CBSA population in 2020. The population density of Caldwell County in 2000 was 21 persons per square mile.

Transportation: Caldwell County's annual VMT was 177 million. The following table summarizes the county's commuter trips to and from the other counties under consideration. The values in the charts are numbers of round-trip work trips. Of the total number of commuters residing in Caldwell County, 53% leave the county, and 47% remain in the county. The commuters that leave the county primarily travel to Clay, Clinton and Jackson counties. Of the total number of work trips with Caldwell County as a destination, 8% begin outside the county, and 92% originate within Caldwell County. Of those trips originating outside the county, most start in Ray and Clinton counties. Overall, the commuters residing in Caldwell County contribute less than 1% of the work trips originating in the CBSA, and the county receives less than 1% of the work trips that end in the CBSA.

Caldwell County, Missouri (29025)			
To where do the county's commuters go?		***From where do the county's commuters come?***	
Franklin (KS)	0	Franklin (KS)	0
Johnson (KS)	47	Johnson (KS)	0
Leavenworth (KS)	5	Leavenworth (KS)	0
Linn (KS)	0	Linn (KS)	0
Miami (KS)	0	Miami (KS)	0
Wyandotte (KS)	99	Wyandotte (KS)	0
Douglas (KS)	0	Douglas (KS)	0
Bates (MO)	0	Bates (MO)	0
Caldwell (MO)	1,508	Caldwell (MO)	1,508
Cass (MO)	6	Cass (MO)	5
Clay (MO)	595	Clay (MO)	6
Clinton (MO)	390	Clinton (MO)	52
Jackson (MO)	385	Jackson (MO)	0
Lafayette (MO)	13	Lafayette (MO)	0
Platte (MO)	82	Platte (MO)	0
Ray (MO)	90	Ray (MO)	77
Total	**3,220**	**Total**	**1,648**

Jurisdictional boundaries: Caldwell County is in the Kansas City CBSA.

Level of control of emission sources: The emissions sources are subject to the general State regulations adopting the Federal NSPS, NESHAP, and MACT standards. The State of Missouri has also submitted a SIP revision to incorporate controls on utilities in the western two-thirds of the State. This would limit NO_x emissions to 0.35 lb NO_x /MMBtu heat input. NO_x is also an ozone precursor.

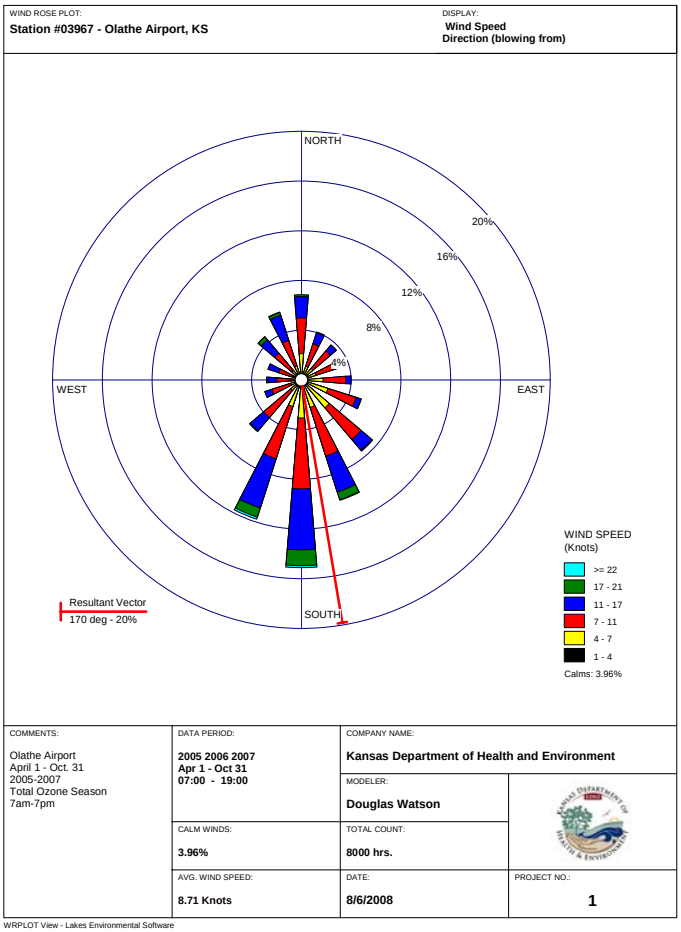
Regional emissions reductions: The State of Missouri has submitted a SIP revision to incorporate controls on utilities in the western two-thirds of the State. This would limit NO_x emissions to 0.35 lb NO_x /MMBtu heat input.

Cass County

Air quality: There was one ozone monitor operating in Cass County during the three-year period being evaluated for the designation process. The monitor is located in the northwest corner of Cass County. The design value for 2006 to 2008 will likely be 0.072 ppm once the 2008 data is quality assured.

Emissions: Total Cass County anthropogenic NO_x emissions for 2005 were 4,025 tons. This represents 3% of the total NO_x emissions for the Kansas City CBSA. Point source emissions were 139 tons of this total. Nonpoint source emissions were 301 tons. On-road mobile source NO_x emissions were 2,227 tons and nonroad mobile NO_x emissions were 1,358 tons.

Total Cass County anthropogenic VOC emissions for 2005 were 4,126 tons. This represents 4% of the total VOC emissions for the CBSA. Point source emissions were 37 tons of this total. Nonpoint source VOC emissions were 1,997 tons. On-road mobile source VOC emissions were 1,560 tons and nonroad mobile NO_x emissions were 533 tons.



Meteorological conditions: Cass County is located generally south of the Kansas City urban core and south or south-southwest of the monitors with the highest design values (Liberty and Rocky Creek. The Johnson County Executive Airport (OJC) wind rose (right), representing 2005-2007 data, show that emissions from Cass County would likely participate in ozone formation in the Kansas City area.

Johnson County Executive Airport (OJC) wind roses for the ozone season show predominant winds from the south, with occasional variances from the southwest and southeast and show occasional potential for Cass County population being affected by short range transport of ozone from the Kansas City area.
Based on ozone season back trajectories for 2005-2007 (C-9, C-10, C-11, Appendix C), Cass County is

located in the long-range transport corridor for ozone and ozone precursors. These back trajectories show a predominant wind flow from the south-southwest with occasional winds from the east or southeast on days with high ozone values.

Population/growth: The population of Cass County in 2000 was 82,092, or about 5% of the population of the CBSA. Cass County's population increased 29% from 1990 to 2000. The growth has occurred primarily in the northern portions of the county in the cities of Raymore, Pleasant Hill, and Peculiar. The county population is projected to grow 48% from 2000 to 2020. The population density of Cass County was 117 persons per square mile in 2000.

Transportation: Cass County's annual VMT was 1.1 billion. The following table summarizes the county's commuter trips to and from the other counties under consideration. The values in the charts are numbers of round-trip work trips. Of the total number of commuters residing in Cass County, 63% leave the county, and 37% remain in the county. The commuters that leave the county primarily travel to Jackson and Johnson Counties. Of the total number of work trips with Cass County as a destination, 25% begin outside the county, and 75% originate within Cass County. Of those trips originating outside the county, most start in Jackson County. Overall, the commuters residing in Cass County contribute about 4% of the work trips originating in the CBSA, and the county receives about 2% of the work trips that end the CBSA.

Cass County, Missouri (29037)			
To where do the county's commuters go?		***From where do the county's commuters come?***	
Franklin (KS)	48	Franklin (KS)	14
Johnson (KS)	6,686	Johnson (KS)	587
Leavenworth (KS)	10	Leavenworth (KS)	72
Linn (KS)	35	Linn (KS)	37
Miami (KS)	224	Miami (KS)	94
Wyandotte (KS)	977	Wyandotte (KS)	75
Douglas (KS)	38	Douglas (KS)	8
Bates (MO)	88	Bates (MO)	834
Caldwell (MO)	5	Caldwell (MO)	6
Cass (MO)	14,616	Cass (MO)	14,616
Clay (MO)	816	Clay (MO)	113
Clinton (MO)	0	Clinton (MO)	5
Jackson (MO)	16,208	Jackson (MO)	2,777
Lafayette (MO)	42	Lafayette (MO)	93
Platte (MO)	216	Platte (MO)	26
Ray (MO)	5	Ray (MO)	4
Total	**40,014**	**Total**	**19,361**

Geography/topography: The South Grand River is the largest stream in the county. Most of the county drains to the south and east into the South Grand River and Big Creek, which is a tributary of the South Grand River. A minor part of the county drains northward into the Blue and Little Blue Rivers. Elevation ranges from about 730 feet, where the South Grand River leaves the county, to 1,120 feet above sea level near the town of Belton in the northwest corner of the county. Cass County has a total area of 449,498 acres or 702.34 square miles. The topography of Cass County should have very little discernable effect on ozone formation or transport of precursor emissions.

Jurisdictional boundaries: Cass County is located within the Kansas City CBSA. It is not part of the

current 8-hour ozone maintenance area. It is not within the Kansas City Metropolitan Planning Organization boundary.

Level of control of emission sources: The emissions sources are subject to the general State regulations adopting the Federal NSPS, NESHAP, and MACT standards. The State of Missouri has submitted a SIP revision to incorporate controls on utilities in the western two-thirds of the State. This would limit NO_x emissions to 0.35 lb NO_x /MMBtu heat input. NO_x is an ozone precursor.

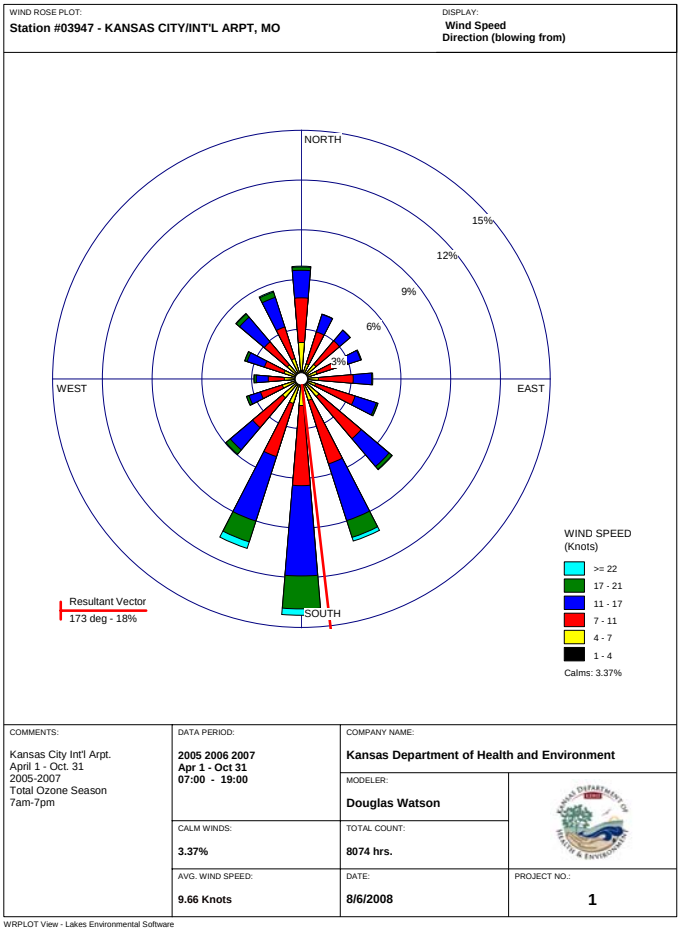
Regional emissions reductions: The State of Missouri has submitted a SIP revision to incorporate controls on utilities in the western two-thirds of the State. This would limit NO_x emissions to 0.35 lb NO_x /MMBtu heat input.

Clay County

Air quality: There were three ozone monitors operating in Clay County during the three-year period being evaluated for the designation process. These include the Watkins Mill monitor located in northeastern Clay County, the Liberty monitor located in central Clay County and the Rocky Creek monitor located in eastern Clay County. The Watkins Mill design value for 2006 to 2008 will be 0.077 ppm once the 2008 data is quality assured. The Liberty design value for 2006 to 2008 will be 0.080 ppm and the design value for Rocky Creek will be 0.081 once the 2008 data is quality assured. Clay County would represent a large population exposure to high ozone levels (184,006 persons in 2000 census).

Emissions: Total Clay County anthropogenic NO_x emissions for 2005 were 8,870 tons. This represents 6% of the total NO_x emissions for the Kansas City CBSA. Point source emissions were 1,076 tons of this total, with the bulk (881 tons) emitted by the Independence Power & Light - Missouri City power plant located in the southeast corner of the county. Nonpoint source emissions were 386 tons. On-road mobile source NO_x emissions were 5,077 tons and nonroad mobile NO_x emissions were 2,331 tons in 2005.

Total Clay County anthropogenic VOC emissions for 2005 were 11,541 tons. This represents 11% of the total VOC emissions for the Kansas City CBSA. Point source emissions were 2,084 tons of this total, with the majority of the emissions (1,723 tons) coming from the Ford Motor Company automobile manufacturing facility in the southwestern portion of the county. Nonpoint source VOC emissions were 4,959 tons. On-road mobile source VOC emissions were 3,353 tons and nonroad mobile NO_x emissions were 1,146 tons in 2005.



Meteorological conditions: The southwest portion of Clay County is part of the Kansas City urban core. Most of the county emissions sources are concentrated in the southwest corner of the county and are south of Rocky Creek and southwest of Liberty and Watkins Mill monitors. The Kansas City International Airport (MCI) wind rose (right), representing 2005-2007 data, shows that emissions from Clay County would be likely to participate

in ozone formation in the Kansas City area.
Kansas City (MCI) wind roses for the ozone season show predominant winds from the south, with occasional variances from the southwest and southeast and show potential for Clay County population being affected by short range transport of ozone from the Kansas City urban core area.

Based on ozone season back trajectories for 2005-2007 (C-9, C-10, C-11, Appendix C), Clay County is located in the long-range transport corridor for ozone and ozone precursors. These back trajectories show a predominant wind flow from the south-southwest with occasional winds from the east or southeast on days with high ozone values.

Population/growth: The population of Clay County in 2000 was 184,006, or 10% of the population of the CBSA. The county's population increased 20% from 1990 to 2000. The growth has occurred primarily in the City of Kansas City, with Liberty and Kearney experiencing population growth also. The county's population is projected to grow 42% from 2000 to 2020. The population density of Clay County was 464 persons per square mile in 2000.

Transportation: Clay County's annual VMT was 2.3 billion. The following table summarizes the county's commuter trips to and from the other counties under consideration. The values in the charts are numbers of round-trip work trips. Of the total number of commuters residing in Clay County, 50% leave the county, and 50% remain in the county. The commuters that leave the county primarily travel to Jackson and Platte Counties. Of the total number of work trips with Clay County as a destination, 43% begin outside the county, and 57% originate within Clay County. Of those trips originating outside the county, most start in Jackson and Platte Counties. Overall, the commuters residing in Clay County contribute about 10% of the work trips originating in the CBSA, and the county receives about 9% of the work trips that end in the CBSA.

Clay County, Missouri (29047)			
To where do the county's commuters go?		***From where do the county's commuters come?***	
Franklin (KS)	13	Franklin (KS)	52
Johnson (KS)	5,938	Johnson (KS)	3,766
Leavenworth (KS)	229	Leavenworth (KS)	351
Linn (KS)	0	Linn (KS)	19
Miami (KS)	8	Miami (KS)	70
Wyandotte (KS)	4,267	Wyandotte (KS)	1,707
Douglas (KS)	75	Douglas (KS)	149
Bates (MO)	0	Bates (MO)	68
Caldwell (MO)	6	Caldwell (MO)	595
Cass (MO)	113	Cass (MO)	816
Clay (MO)	47,238	Clay (MO)	47,238
Clinton (MO)	194	Clinton (MO)	2,257
Jackson (MO)	26,812	Jackson (MO)	14,451
Lafayette (MO)	11	Lafayette (MO)	502
Platte (MO)	10,039	Platte (MO)	7,119
Ray (MO)	372	Ray (MO)	3,806
Total	**95,315**	**Total**	**82,966**

Geography/topography: Clay County has a total area of 369 square miles. It is in several physiographic

areas. The southern part of the county is the flood plain along the Missouri River. This flood plain is less than 1/4 mile to about 7 miles wide at the widest point. It generally is level or nearly level, but the slope is more than 5 percent on some of the old natural levees. The uplands are highly dissected glacial till plains. Elevation ranges from about 670 feet above sea level in an area on the Missouri River in the southeast corner, to about 1,100 feet on the highest ridges in the uplands. The Missouri River flood plain, located on the southern border of Clay County has the potential to provide a preferential pathway for ozone precursors and ozone both in and out of the Kansas City metro area. The prevailing wind directions during the ozone season indicate that such localized transport is more likely to occur out of the Kansas City area.

Jurisdictional boundaries: Clay County is located within the Kansas City CBSA. It is part of the current 8-hour ozone maintenance area. The southern portion of the county is within the Kansas City MPO boundary.

Level of control of emission sources: There are several point and nonpoint source regulations in place in the Missouri portion of the maintenance area. In addition to the general State regulations adopting the Federal NSPS, NESHAP, and MACT standards, the following rules affect the Missouri sources within the maintenance area: aerospace manufacturing/rework; solvent metal cleaning; solvent cleanup operations; liquified cutback asphalt; industrial surface coating; petroleum storage/transfer (Stage I); rotogravure/flexographic printing; manufacturing of paint, lacquer, varnish, enamels; application of automotive underbody deadeners; pesticide and herbicide production; lithographic printing; and bakery ovens (commercial). The State of Missouri has submitted a SIP revision to incorporate controls on utilities in the western two-thirds of the State. This would limit NO_x emissions to 0.35 lb NO_x /MMBtu heat input. NO_x is also an ozone precursor.

Missouri has also adopted a fuel volatility regulation, which applies to the three maintenance area counties and has the same volatility limit as the fuel regulation for Kansas during the ozone season.

Regional emissions reductions: The State of Missouri has submitted a SIP revision to incorporate controls on utilities in the western two-thirds of the State. This would limit NO_x emissions to 0.35 lb NO_x /MMBtu heat input. NO_x is also an ozone precursor.

Clinton County

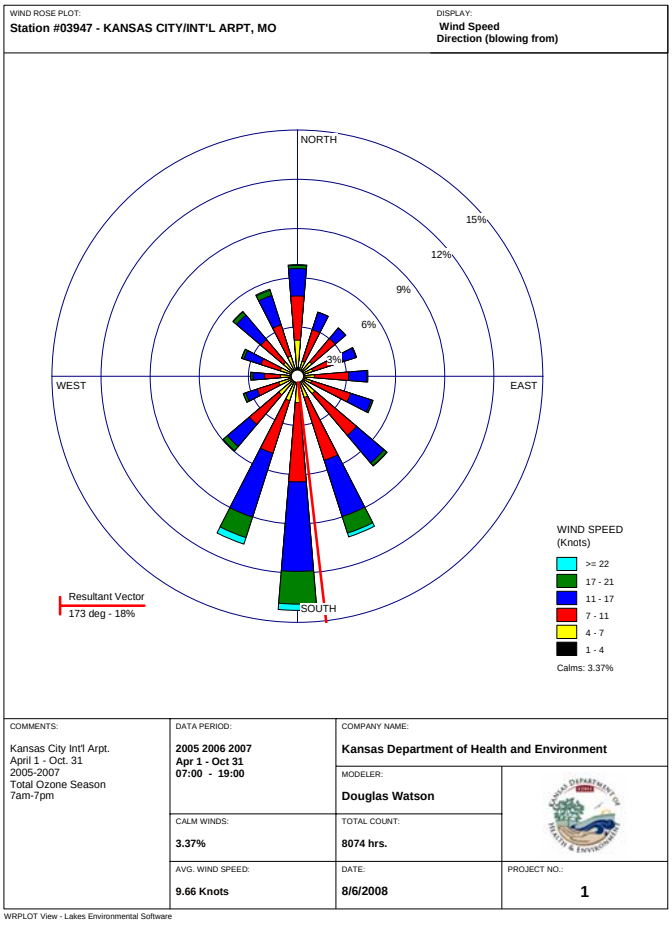
Air quality: There was one ozone monitor operating in Clinton County during the three-year period being evaluated for the designation process. The monitor is located in the southwest corner of Clinton County. The design value for 2006 to 2008 will likely be 0.079 ppm once the 2008 data is quality assured.

Emissions: Total Clinton County anthropogenic NO_x emissions for 2005 were 1,073 tons. This represents 1% of the total NO_x emissions for the Kansas City CBSA. Point source NO_x emissions in 2005 were less than 1 ton; nonpoint source NO_x emissions were 59 tons. On-road mobile source NO_x emissions were 745 tons and nonroad mobile NO_x emissions in 2005 were 269 tons.

Total Clinton County anthropogenic VOC emissions for 2005 were 1,191 tons. This represents 1% of the total VOC emissions for the CBSA. Point source VOC emissions were 1 ton of this total; nonpoint source VOC emissions were 535 tons. On-road mobile source VOC emissions were 455 tons and nonroad mobile VOC emissions in 2005 were 200 tons.

Meteorological conditions: Clinton County is located north-northeast of the Kansas City urban core and north of the Clay County monitors. The Kansas City International Airport (MCI) wind rose (right), representing 2005-2007 data, shows that emissions from Clinton County would not likely participate in ozone formation in the Kansas City area.

Kansas City (MCI) wind roses for the ozone season show predominant winds from the south, with occasional variances from the southwest and southeast and show Clinton County population being affected by short range transport of ozone from the Kansas City urban core area.



Based on ozone season back trajectories for 2005-2007 (C-9, C-10, C-11, Appendix C), Clinton County is located in the long-range transport corridor for ozone and ozone precursors. These back trajectories show a

predominant wind flow from the south-southwest with occasional winds from the east or southeast on days with high ozone values

Population/growth: The population of Clinton County in 2000 was 18,979, or 1% of the population of the Kansas City CBSA. Clinton County has experienced a growth rate of 14% from 1990 to 2000. The county's population is projected to grow 31% from 2000 to 2020.. The majority of future growth is expected to be low-density residential in the southeast and southwest areas of the county. The population density of Clinton County was 45 persons per square mile in 2000.

Transportation: Clinton County's annual VMT was 356 million. The following table summarizes the county's commuter trips to and from the other counties under consideration. The values in the charts are numbers of round-trip work trips. Of the total number of commuters residing in Clinton County, 59% leave the county, and 41% remain in the County. The commuters that leave the county primarily travel to Clay and Jackson Counties. Of the total number of work trips with Clinton County as a destination, 19% begin outside the county, and 81% originate within Clinton County. Of those trips originating outside the county, most start in Caldwell and Clay Counties. Overall, the commuters residing in Clinton County contribute about 1% of the work trips originating in the CBSA, and the county receives less than 1% of the work trips that end in the CBSA.

Clinton County, Missouri (29049)			
To where do the county's commuters go?		***From where do the county's commuters come?***	
Franklin (KS)	8	Franklin (KS)	0
Johnson (KS)	146	Johnson (KS)	0
Leavenworth (KS)	17	Leavenworth (KS)	0
Linn (KS)	8	Linn (KS)	0
Miami (KS)	0	Miami (KS)	0
Wyandotte (KS)	291	Wyandotte (KS)	0
Douglas (KS)	16	Douglas (KS)	0
Bates (MO)	0	Bates (MO)	0
Caldwell (MO)	52	Caldwell (MO)	390
Cass (MO)	5	Cass (MO)	0
Clay (MO)	2,257	Clay (MO)	194
Clinton (MO)	3,015	Clinton (MO)	3,015
Jackson (MO)	1,004	Jackson (MO)	36
Lafayette (MO)	6	Lafayette (MO)	2
Platte (MO)	441	Platte (MO)	64
Ray (MO)	47	Ray (MO)	32
Total	**7,313**	**Total**	**3,733**

Geography/topography: The landscape in Clinton County is mainly gently sloping to strongly sloping upland. A system of wide, gently sloping ridges extends southward through the county, beginning in the north-central part. The county drains generally to the south. The northeastern part, however, drains to the north and east. The county takes in an area of 268,800 acres, or 420 square miles. The topography of Clinton County should have no discernable effect on ozone formation or transport of precursor emissions.

Jurisdictional boundaries: Clinton County is located within the CBSA. It is not part of the current 8-hour ozone maintenance area. It is not within the Kansas City MPO boundary.

Level of control of emission sources: The emissions sources are subject to the general State regulations adopting the Federal NSPS, NESHAP, and MACT standards. The State of Missouri has also submitted a SIP revision to incorporate controls on utilities in the western two-thirds of the State. This would limit NO_x emissions to 0.35 lb NO_x /MMBtu heat input. NO_x is also an ozone precursor.

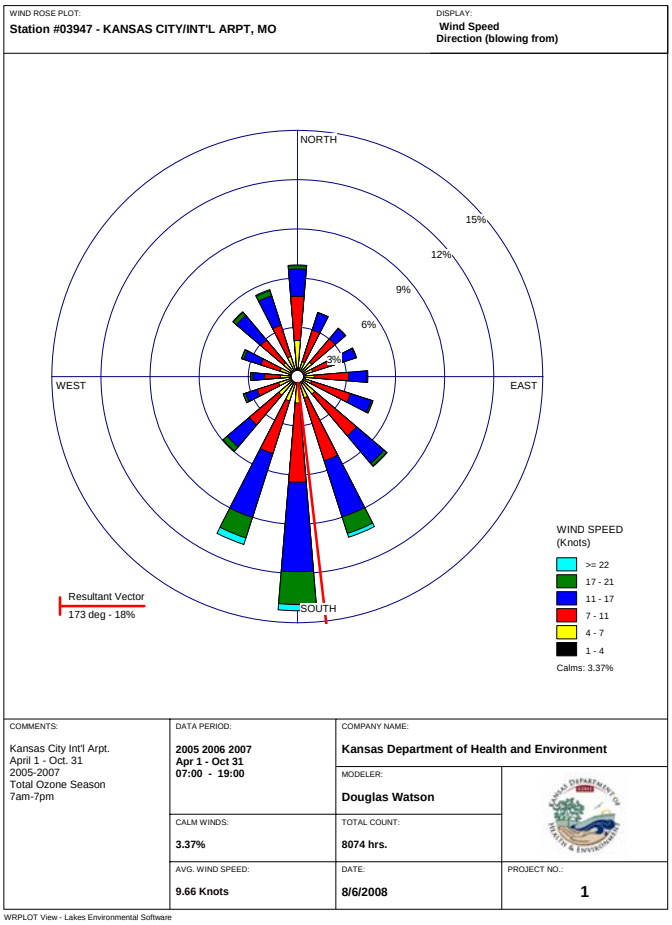
Regional emissions reductions: The State of Missouri has submitted a SIP revision to incorporate controls on utilities in the western two-thirds of the State. This would limit NO_x emissions to 0.35 lb NO_x /MMBtu heat input.

Jackson County

Air quality: There were no ozone monitors operating in Jackson County during the three-year period being evaluated for the designation process.

Emissions: Total Jackson County anthropogenic NO_x emissions for 2005 were 39,332 tons. This represents 25% of the total NO_x emissions for the Kansas City CBSA. Point source emissions were 14,875 tons of this total, with the bulk emitted by four sources: (1) the Aquila - Sibley power plant (9,186 tons) in the northeast corner of the county; (2) the Lafarge - Independence cement plant (1,853 tons) in the north-central portion of the county; (3) the KCP&L - Hawthorn power plant (1,557 tons) located in the northwest portion of the county; and (4) the Independence Power & Light - Blue Valley power plant (1,150 tons) in the north-central portion of the county. Note that Sibley Unit 3 is scheduled to complete construction of a selective catalytic reduction (SCR) NO_x control by the end of 2008. Nonpoint source NO_x emissions were 2,126 tons. On-road mobile source NO_x emissions were 13,149 tons and nonroad mobile emissions were 9,182 tons.

Total Jackson County anthropogenic VOC emissions for 2005 were 30,371 tons. This represents 30% of the total VOC emissions for the CBSA. Point source emissions were 1,473 tons of this total, with two facilities having emissions greater than major source thresholds—the Cargill - Kansas City soybean oil mill (283 tons), located in the northwestern corner of the county, and the Alliant Techsystems - Lake City Army Ammunition facility (113 tons), located in the northeastern portion of the county. Nonpoint source VOC emissions were 16,146 tons. On-road mobile source VOC emissions were 8,735 tons and nonroad mobile emissions were 4,017 tons.



Meteorological conditions: The northwest portion of Jackson County is part of the Kansas City urban core. VOC and NO_x point sources are primarily clustered in the northwest portion of the county and are located south and southwest of the monitors with the highest ozone concentrations (Liberty and Rocky Creek). The Kansas City International Airport (MCI) wind rose (Pg.

51), representing 2005-2007 data, shows that emissions from Jackson County would participate in ozone formation in the Kansas City area.

Kansas City (MCI) wind roses for the ozone season show predominant winds from the south, with occasional variances from the southwest and southeast and show potential for Jackson County population being affected by short range transport of ozone from the Kansas City urban core area.

Based on ozone season back trajectories for 2005-2007 (C-9, C-10, C-11, Appendix C), Jackson County is located in the long-range transport corridor for ozone and ozone precursors. These back trajectories show a predominant wind flow from the south-southwest with occasional winds from the east or southeast on days with high ozone values

Population/growth: The population of Jackson County in 2000 was 654,880, or 36% of the population of the Kansas City CBSA. Jackson County's population increased 3% from 1990 to 2000. The county population is projected to grow 5% from 2000 to 2020. The population density of Jackson was 1,083 persons per square mile in 2000.

Transportation: Jackson County's annual VMT was 5.9 billion. The following table summarizes the county's commuter trips to and from the other counties under consideration. The values in the charts are numbers of round-trip work trips. Of the total number of commuters residing in Jackson County, 24% leave the county, and 76% remain in the county. The commuters that leave the county primarily travel to Johnson, Clay and Wyandotte Counties. Of the total number of work trips with Jackson County as a destination, 35% begin outside the county, and 65% originate within Jackson County. Of those trips originating outside the county, most start in Johnson, Clay and Cass Counties. Overall, the commuters residing in Jackson County contribute about 33% of the work trips originating in the CBSA, and the county receives about 38% of the work trips that end in the CBSA.

Jackson County, Missouri (29095)			
To where do the county's commuters go?		***From where do the county's commuters come?***	
Franklin (KS)	59	Franklin (KS)	270
Johnson (KS)	39,018	Johnson (KS)	49,687
Leavenworth (KS)	259	Leavenworth (KS)	1,701
Linn (KS)	8	Linn (KS)	193
Miami (KS)	80	Miami (KS)	934
Wyandotte (KS)	11,585	Wyandotte (KS)	11,004
Douglas (KS)	308	Douglas (KS)	1,450
Bates (MO)	47	Bates (MO)	937
Caldwell (MO)	0	Caldwell (MO)	385
Cass (MO)	2,777	Cass (MO)	16,208
Clay (MO)	14,451	Clay (MO)	26,812
Clinton (MO)	36	Clinton (MO)	1,004
Jackson (MO)	233,408	Jackson (MO)	233,408
Lafayette (MO)	538	Lafayette (MO)	5,184
Platte (MO)	4,078	Platte (MO)	9,548
Ray (MO)	123	Ray (MO)	1,794
Total	**306,775**	**Total**	**360,519**

Geography/topography: The Missouri River flood plain is one of the major physiographic areas in

Jackson County. It is in the northern part of the county and ranges from less than 1/4 mile to more than 3 miles wide. Most of the flood plain is level or nearly level, except on some of the old natural levees, where the slope may be more than 5 percent. Adjacent to the flood plain and south are moderately sloping to steep, loess-covered bluffs and hills. The rest of the county consists of gently sloping to moderately sloping uplands and flood plains of the Blue River, Little Blue River, Sni-A-Bar Creek, and their tributaries. The flood plains of these streams are relatively narrow, and the adjacent, moderately sloping to steep uplands have numerous Rock outcrops of limestone. The county has a total area of about 394,419 acres or about 616.3 square miles, which includes about 3,456 acres of water areas more than 40 acres in size. Elevation in Jackson County ranges from 1,105 feet on the divide in the south-central part of the county to 690 feet at normal water level on the Missouri River at the county line on the eastern side of the county. The Missouri River flood plain, located on the northern border of Jackson County has the potential to provide a preferential pathway for ozone precursors and ozone both in and out of the Kansas City metro area. The topography of the balance of Jackson County should have no discernable effect on ozone formation or transport of precursor emissions.

Jurisdictional boundaries: Jackson County is located within the Kansas City CBSA. It is part of the current 8-hour ozone maintenance area. It is within the Kansas City MPO boundary.

Level of control of emission sources: There are several point and nonpoint source regulations in place in the Missouri portion of the maintenance area. In addition to the general State regulations adopting the Federal NSPS, NESHAP, and MACT standards, the following rules affect the Missouri sources within the maintenance area: aerospace manufacturing/rework; solvent metal cleaning; solvent cleanup operations; liquified cutback asphalt; industrial surface coating; petroleum storage/transfer (Stage I); rotogravure/flexographic printing; manufacturing of paint, lacquer, varnish, enamels; application of automotive underbody deadeners; pesticide and herbicide production; lithographic printing; and bakery ovens (commercial). The State of Missouri has also submitted a SIP revision to incorporate controls on utilities in the western two-thirds of the State. This would limit NO_x emissions to 0.35 lb NO_x /MMBtu heat input. Missouri has also adopted a fuel volatility regulation, which applies to the three maintenance area counties and has the same volatility limit as the fuel regulation for Kansas during the ozone season.

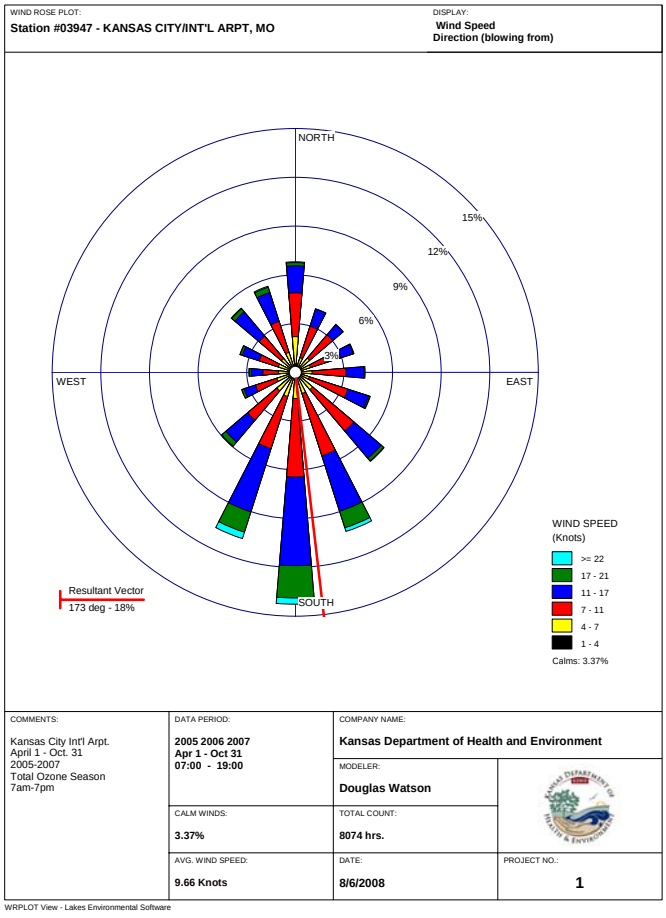
Regional emissions reductions: The State of Missouri has submitted a SIP revision to incorporate controls on utilities in the western two-thirds of the State. This would limit NO_x emissions to 0.35 lb NO_x /MMBtu heat input.

Lafayette County

Air quality: There were no ozone monitors operated in Lafayette County during the three year period being evaluated for the designation process.

Emissions: Total Lafayette County anthropogenic NO_x emissions for 2005 were 3,487 tons. This represents 2% of the total NO_x emissions for the Kansas City CBSA. Point source emissions were 55 tons of this total; nonpoint source NO_x emissions were 209 tons. On-road mobile source NO_x emissions were 1,509 tons and nonroad mobile emissions were 1,714 tons.

Total Lafayette County anthropogenic VOC emissions for 2005 were 2,516 tons. This represents 2% of the total VOC emissions for the CBSA. Point source emissions were 142 tons of this total, with none of the facilities having emissions greater than the major source threshold. Nonpoint source VOC emissions were 939 tons. On-road mobile source VOC emissions were 914 tons and nonroad mobile emissions were 521 tons.



Meteorological conditions: Lafayette County is located east of the Kansas City urban core and east-southeast of the monitors with the highest design values (Liberty and Rocky Creek). The Kansas City International Airport (MCI) wind rose (right), representing 2005-2007 data, shows that emissions from Lafayette County are not likely to participate in ozone formation in the Kansas City area.

Kansas City (MCI) wind roses for the ozone season show predominant winds from the south, with occasional variances from the southwest and southeast and show little potential for Lafayette County population being affected by short range transport of ozone from the Kansas City urban core area.

Based on ozone season back trajectories for 2005-2007 (C-9, C-10, C-11, Appendix C), Lafayette County is

occasionally located in the long-range transport corridor for ozone and ozone precursors. These back trajectories show a predominant wind flow from the south-southwest with occasional winds from the east or southeast on days with high ozone values

Population/growth: The population of Lafayette County in 2000 was 32,960, or 2 % of the population of the Kansas City CBSA. Lafayette County's population increased 6% from 1990 to 2000. The county population is projected to decrease less than 1% from 2000 to 2020. The population density of Lafayette was 52 persons per square mile in 2000.

Transportation: Lafayette County's annual VMT was 759 million. The following table summarizes the county's commuter trips to and from the other counties under consideration. The values in the charts are numbers of round-trip work trips. Of the total number of commuters residing in Lafayette County, 46% leave the county, and 54% remain in the county. The commuters that leave the county primarily travel to Jackson County. Of the total number of work trips with Lafayette County as a destination, 11% begin outside the county, and 89% originate within Lafayette County. Of those trips originating outside the county, most start in Jackson County. Overall, the commuters residing in Clinton County contribute about 2% of the work trips originating in the CBSA, and the county receives about 1% of the work trips that end in the CBSA.

Lafayette County, Missouri (29107)			
To where do the county's commuters go?		***From where do the county's commuters come?***	
Franklin (KS)	2	Franklin (KS)	2
Johnson (KS)	341	Johnson (KS)	33
Leavenworth (KS)	5	Leavenworth (KS)	7
Linn (KS)	2	Linn (KS)	9
Miami (KS)	7	Miami (KS)	7
Wyandotte (KS)	281	Wyandotte (KS)	3
Douglas (KS)	2	Douglas (KS)	0
Bates (MO)	0	Bates (MO)	7
Caldwell (MO)	0	Caldwell (MO)	13
Cass (MO)	93	Cass (MO)	42
Clay (MO)	502	Clay (MO)	11
Clinton (MO)	2	Clinton (MO)	6
Jackson (MO)	5,184	Jackson (MO)	538
Lafayette (MO)	7,926	Lafayette (MO)	7,926
Platte (MO)	72	Platte (MO)	17
Ray (MO)	258	Ray (MO)	297
Total	**14,677**	**Total**	**8,918**

Geography/topography: Lafayette County has a total area of 629 square miles. The topography of Lafayette County may be divided into three distinct regions. Along the northern edge of the county is the wide bottom land area of the Missouri River. This area is level or nearly level and has the lowest elevation in the county. Adjacent to the Missouri River, this area is level or nearly level and has the low-commonly called the River Hills. Slopes range from level or nearly level on the ridgetops to steep on the hillsides. This area has many deep gullies and ravines caused by the eroding away of the deep wind-deposited soil material. The rest of the county is a plain where slopes range from level or nearly level to sloping. Rising above this plain are a number of isolated hills and ridges where slopes range from gently sloping to moderately steep. These hills and ridges are at the highest elevation in the county. Cutting through the

plain are many small to moderately large stream valleys where slopes range from level or nearly level on the valley floor to moderately steep on the sides of valleys. The topography of Lafayette County should have very little discernable effect on ozone formation or transport of precursor emissions.

Jurisdictional boundaries: Lafayette County is located within the Kansas City CBSA. It is not part of the current 8-hour ozone maintenance area. It is not within the Kansas City MPO boundary.

Level of control of emission sources: The emissions sources are subject to the general State regulations adopting the Federal NSPS, NESHAP, and MACT standards. The State of Missouri has also submitted a SIP revision to incorporate controls on utilities in the western two-thirds of the State. This would limit NO_x emissions to 0.35 lb NO_x /MMBtu heat input. NO_x is also an ozone precursor.

Regional emissions reductions: The State of Missouri has submitted a SIP revision to incorporate controls on utilities in the western two-thirds of the State. This would limit NO_x emissions to 0.35 lb NO_x /MMBtu heat input.

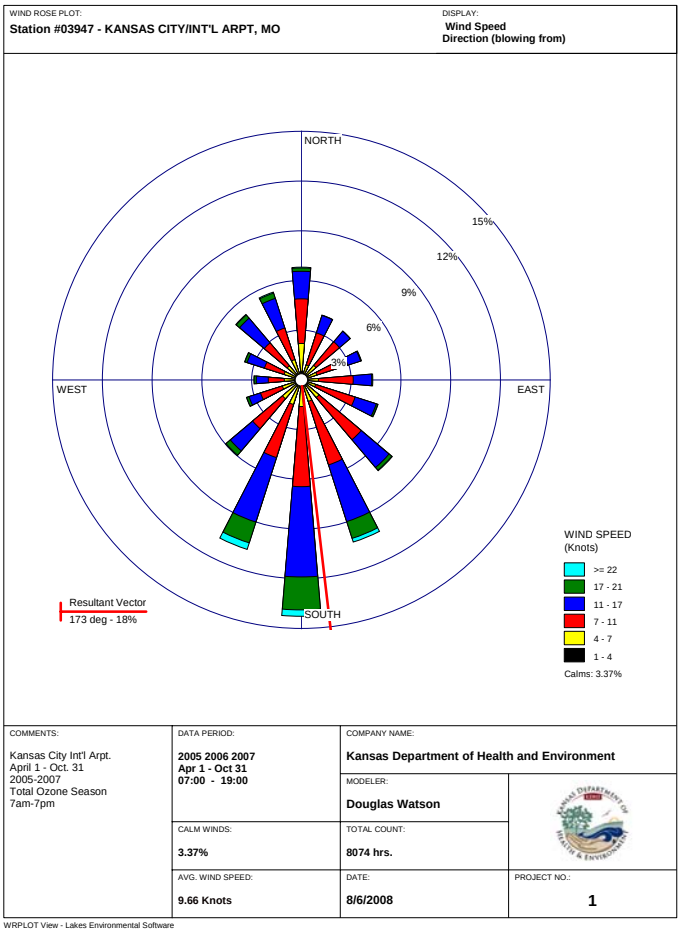
Platte County

Air quality: There were no ozone monitors operated in Platte County during the three year period being evaluated for the designation process.

Emissions: Total Platte County anthropogenic NO_x emissions for 2005 were 14,166 tons. This represents 9% of the total NO_x emissions for the Kansas City CBSA. Point source emissions were 8,220 tons of this total, with the bulk (6,430 tons) emitted by the KCP&L - Iatan power plant located in the northwestern corner of the county. Nonpoint source emissions were 616 tons. On-road mobile source NO_x emissions were 3,027 tons and nonroad mobile emissions were 2,303 tons.

Total Platte County anthropogenic VOC emissions for 2005 were 5,133 tons, representing 5% of the total VOC emissions for the CBSA.
Point source emissions were 353 tons of this total, with none of the facilities having emissions greater than the major source threshold. Nonpoint source VOC emissions were 1,878 tons. On-road mobile source VOC emissions were 1,915 tons and nonroad mobile emissions were 988 tons.

Meteorological conditions: Platte County is located northwest of the Kansas City urban core. Most of the county point sources are located generally west and north-northwest of Clay County monitors. The Kansas City International Airport (MCI) wind rose (right), representing 2005-2007 data, shows that emissions from Platte County are not likely to participate in ozone formation in the Kansas City area, with the exception of Leavenworth County.



Kansas City (MCI) wind roses for the ozone season show predominant winds from the south, with occasional variances from the southwest and southeast and show occasional potential for Platte County population being affected by short range transport of ozone from the Kansas

City urban core area.
Based on ozone season back trajectories for 2005-2007 (C-9, C-10, C-11, Appendix C), Platte County is located in the long-range transport corridor for ozone and ozone precursors. These back trajectories show a predominant wind flow from the south-southwest with occasional winds from the east or southeast on days with high ozone values

Population/growth: The population of Platte County was 73,781 in 2000, or 4% of the population of the CBSA. The county's population increased 27% from 1990 to 2000. The growth has occurred primarily in the southeastern corner of the county. The county population is projected to grow 39% from 2000 to 2020. The population density of Platte County was 176 persons per square mile in 2000.

Transportation: Platte County's annual VMT was 1.4 billion. The following table summarizes the county's commuter trips to and from the other counties under consideration. The values in the charts are numbers of round-trip work trips. Of the total number of commuters residing in Platte County, 59% leave the county, and 41% remain in the county. The commuters that leave the county primarily travel to Jackson and Clay Counties. Of the total number of work trips with Platte County as a destination, 54% begin outside the county, and 46% originate within Platte County. Of those trips originating outside the county, most start in Clay and Jackson Counties. Overall, the commuters residing in Platte County contribute about 4% of the work trips originating in the CBSA, and the county receives about 4% of the work trips that end in the CBSA.

Platte County, Missouri (29165)			
To where do the county's commuters go?		***From where do the county's commuters come?***	
Franklin (KS)	9	Franklin (KS)	25
Johnson (KS)	3,304	Johnson (KS)	1,984
Leavenworth (KS)	793	Leavenworth (KS)	712
Linn (KS)	0	Linn (KS)	13
Miami (KS)	10	Miami (KS)	31
Wyandotte (KS)	2,452	Wyandotte (KS)	1,163
Douglas (KS)	32	Douglas (KS)	60
Bates (MO)	0	Bates (MO)	19
Caldwell (MO)	0	Caldwell (MO)	82
Cass (MO)	26	Cass (MO)	216
Clay (MO)	7,119	Clay (MO)	10,039
Clinton (MO)	64	Clinton (MO)	441
Jackson (MO)	9,548	Jackson (MO)	4,078
Lafayette (MO)	17	Lafayette (MO)	72
Platte (MO)	16,264	Platte (MO)	16,264
Ray (MO)	9	Ray (MO)	246
Total	**39,647**	**Total**	**35,445**

Geography/topography: Relief in Platte County ranges from 1,190 feet near the headwaters of Bear Creek, in the northwest, to 730 feet at the point where the Missouri River leaves the county, in the southeast. Local relief varies as much as 310 feet from the crest of the River Bluff to the Missouri River flood plain north of Weston. The county has a total of 273,478 acres, or 427.3 square miles. The Missouri River flood plain has the potential to provide a preferential pathway for ozone precursors and ozone both in and out of the Kansas City metro area. The Missouri River flood plain is located on the western border of Platte County. Prevailing winds during the ozone season indicate that such localized transport along the Missouri

River is more likely to occur from the Kansas City urban core toward Platte County. The topography of the balance of Platte County should have no discernable effect on ozone formation or transport of precursor emissions.

Jurisdictional boundaries: Platte County is located within the Kansas City CBSA. It is part of the current 8-hour ozone maintenance area. The southern portion of the county is within the Kansas City MPO boundary.

Level of control of emission sources: There are several point and nonpoint source regulations in place in the Missouri portion of the maintenance area. In addition to the general State regulations adopting the Federal NSPS, NESHAP, and MACT standards, the following rules affect the Missouri sources within the maintenance area: aerospace manufacturing/rework; solvent metal cleaning; solvent cleanup operations; liquified cutback asphalt; industrial surface coating; petroleum storage/transfer (Stage I); rotogravure/flexographic printing; manufacturing of paint, lacquer, varnish, enamels; application of automotive underbody deadeners; pesticide and herbicide production; lithographic printing; and bakery ovens (commercial). The State of Missouri has also submitted a SIP revision to incorporate controls on utilities in the western two-thirds of the State. This would limit NO_x emissions to 0.35 lb NO_x /MMBtu heat input. NO_x is also an ozone precursor.

Missouri has also adopted a fuel volatility regulation, which applies to the three maintenance area counties and has the same volatility limit as the fuel regulation for Kansas during the ozone season.

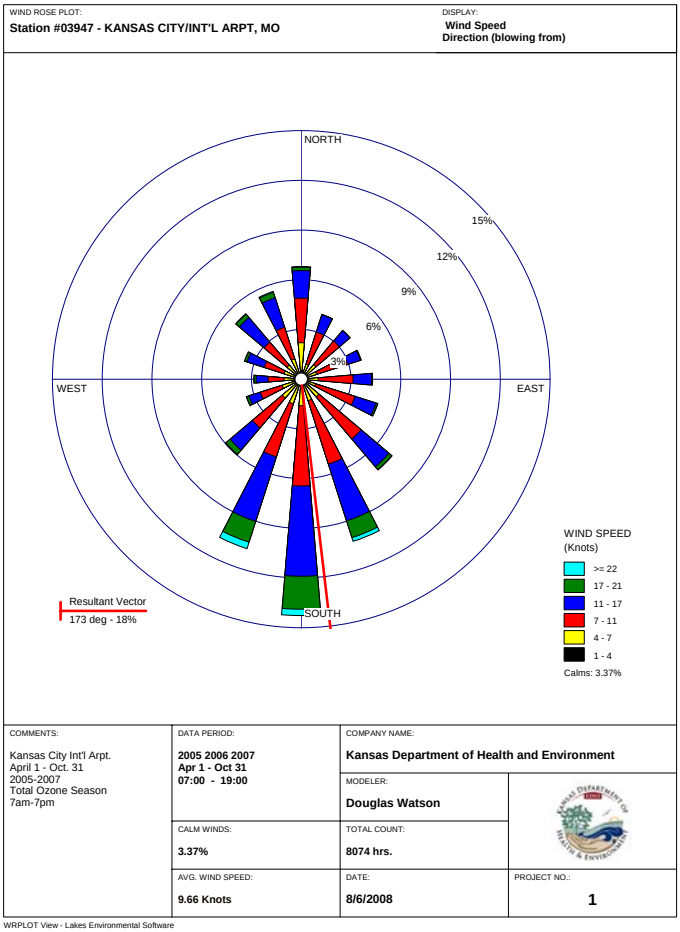
Regional emissions reductions: The State of Missouri has submitted a SIP revision to incorporate controls on utilities in the western two-thirds of the state. This would limit NO_x emissions to 0.35 lb NO_x /MMBtu heat input. NO_x is also an ozone precursor.

Ray County

Air quality: There were no ozone monitors operating in Ray County during the three year period being evaluated for the designation process.

Emissions: Total Ray County anthropogenic NO_x emissions for 2005 were 2,991 tons. This represents 2% of the total NO_x emissions for the Kansas City CBSA. Point source emissions were 43 tons of this total. Nonpoint source NO_x emissions were 158 tons. On-road mobile source NO_x emissions were 409 tons and nonroad mobile emissions were 2,382 tons.

Total Ray County anthropogenic VOC emissions for 2005 were 1,452 tons. This represents 1% of the total VOC emissions for the CBSA. Point source emissions were 14 tons of this total. Nonpoint source VOC emissions were 874 tons. On-road mobile source VOC emissions were 277 tons and nonroad mobile emissions were 287 tons.



Meteorological conditions: Ray County is located northeast of the Kansas City urban core. Most of the county emissions sources are concentrated in the south part of the county and are east or southeast of the monitors in Clay County. The Kansas City International Airport (MCI) wind rose (right), representing 2005-2007 data, shows that emissions from Ray County are not likely to participate in ozone formation in the Kansas City area.

Kansas City (MCI) wind roses for the ozone season show predominant winds from the south, with occasional variances from the southwest and southeast and show potential for Ray County population being affected by short range transport of ozone from the Kansas City urban core area.

Based on ozone season back trajectories for 2005-2007 (C-9, C-10, C-11, Appendix C), Platte County is

occasionally located in the long-range transport corridor for ozone and ozone precursors. These back trajectories show a predominant wind flow from the south-southwest with occasional winds from the east or southeast on days with high ozone values

Population/growth: The population of Ray County in 2000 was 23,354, or about 1 % of the population of the Kansas City CBSA. Ray County's population increased 6% from 1990 to 2000. The county population is projected to grow 3% from 2000 to 2020. The population density of Ray County was 41 persons per square mile in 2000.

Transportation: Ray County's annual VMT was 216 million. The following table summarizes the county's commuter trips to and from the other counties under consideration. The values in the charts are numbers of round-trip work trips. Of the total number of commuters residing in Ray County, 63% leave the county, and 37% remain in the county. The commuters that leave the county primarily travel to Clay and Jackson Counties. Of the total number of work trips with Ray County as a destination, 19% begin outside the county, and 81% originate within Ray County. Of those trips originating outside the county, most start in Clay, Lafayette and Jackson Counties. Overall, the commuters residing in Ray County contribute about 1% of the work trips originating in the CBSA, and the county receives about 1% of the work trips that end in the CBSA.

Ray County, Missouri (29177)			
To where do the county's commuters go?		***From where do the county's commuters come?***	
Franklin (KS)	0	Franklin (KS)	0
Johnson (KS)	161	Johnson (KS)	13
Leavenworth (KS)	2	Leavenworth (KS)	0
Linn (KS)	0	Linn (KS)	0
Miami (KS)	0	Miami (KS)	0
Wyandotte (KS)	300	Wyandotte (KS)	0
Douglas (KS)	0	Douglas (KS)	0
Bates (MO)	0	Bates (MO)	0
Caldwell (MO)	77	Caldwell (MO)	90
Cass (MO)	4	Cass (MO)	5
Clay (MO)	3,806	Clay (MO)	372
Clinton (MO)	32	Clinton (MO)	47
Jackson (MO)	1,794	Jackson (MO)	123
Lafayette (MO)	297	Lafayette (MO)	258
Platte (MO)	246	Platte (MO)	9
Ray (MO)	3,883	Ray (MO)	3,883
Total	**10,602**	**Total**	**4,800**

Geography/topography: Ray County has a total area of 569 square miles, covering several physiographic areas. The southern part of the county is the flood plain along the Missouri River. This flood plain is less than 1/4 mile to about 7 miles wide at the widest point. It generally is level or nearly level, but the slope is more than 5 percent on some of the old natural levees. The uplands are highly dissected glacial till plains. Elevation ranges from about 670 feet above sea level in an area on the Missouri River in the southeast corner, to about 1,100 feet on the highest ridges in the uplands. The Missouri River flood plain, located on the southern border of Ray County has the potential to provide a preferential pathway for ozone precursors and ozone both in and out of the Kansas City metro area. Prevailing winds during the ozone season indicates that such localized transport is more likely to occur out of the Kansas City area.

Jurisdictional boundaries: Ray County is located within the Kansas City CBSA. It is not part of the current 8-hour ozone maintenance area. It is not within the Kansas City MPO boundary.

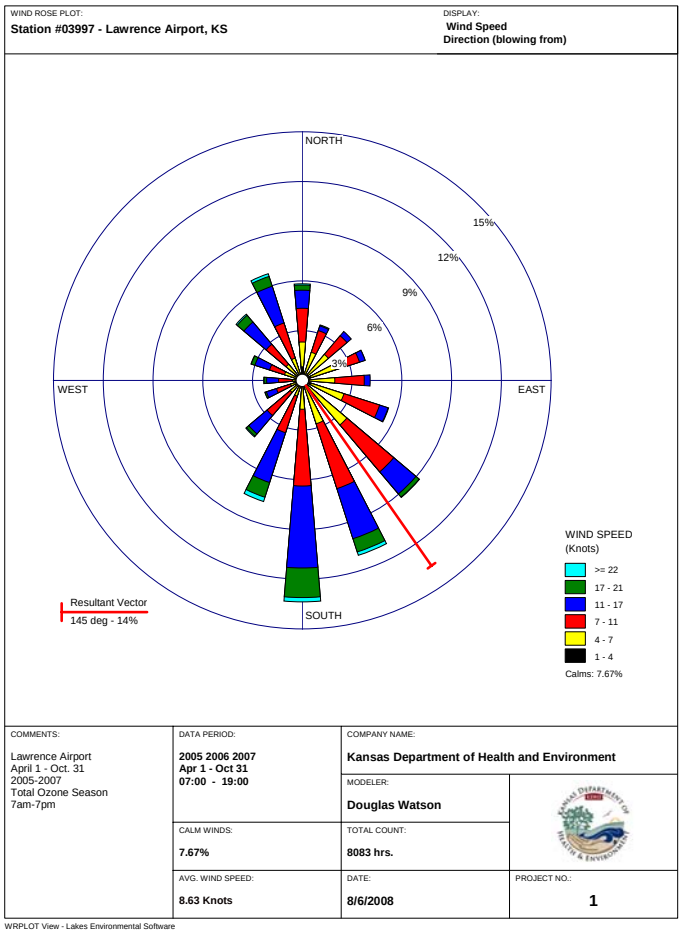
Level of control of emission sources: The emissions sources are subject to the general State regulations adopting the Federal NSPS, NESHAP, and MACT standards. The State of Missouri has submitted a SIP revision to incorporate controls on utilities in the western two-thirds of the State. This would limit NO_x emissions to 0.35 lb NO_x /MMBtu heat input. NO_x is an ozone precursor.

Regional emissions reductions: The State of Missouri has submitted a SIP revision to incorporate controls on utilities in the western two-thirds of the State. This would limit NO_x emissions to 0.35 lb NO_x /MMBtu heat input.

KANSAS CITY AREA — NON KC-CBSA COUNTIES OF INTEREST

Douglas County

Air quality: There was no ozone monitor operated in Douglas County for the entire three-year period from 2006 to 2008; however, KDHE operated an ozone monitor for the 2004 - 2006 ozone monitoring seasons in Lawrence. This monitor was located at the Lawrence Municipal Airport, north of the City of Lawrence. The 4th high 8-hour value for the monitor was 0.064 ppm in 2004, 0.073 ppm in 2005 and 0.081 ppm in 2006. The highest 8-hour average ozone value measured at this monitor was 0.088 ppm, in 2006. The 2004-06 design value was 0.072 ppm.



Emissions: Total Douglas County NO_x emissions for 2005 were 8,955 tons. Although the county is not part of the Kansas City CBSA, this represents 6% of the CBSA's total NO_x emissions. Point source emissions were 5,271 tons, with the bulk coming from the Westar Energy - Lawrence coal-fired power plant (5,151 tons) in the north-central part of the county. Projected 2020 point source NO_x emissions in Douglas county will likely decrease with the installation of low NO_x burners at the Lawrence Energy Center on units 3, 4 and 5 as agreed to as part of a regional haze agreement with Westar. Non-point source emissions were 415 tons in 2005. Projected 2020 nonpoint source NO_x emissions are 536 tons, which represents a 29% increase from 2005. On-road mobile source NO_x emissions were 1,771 tons and nonroad mobile emissions were 1,497 tons in 2005. Year 2020 on-road NO_x emissions are expected to decrease to 541 tons, which is a decline of 69% from 2005 levels.

Total Douglas County VOC emissions for 2005 were 5,719 tons. This represents 6% of the total VOC emissions for the Kansas City CBSA. Point source VOC emissions were 239 tons, with API Foils (128 tons), located in the north-central part of the county, having emissions greater than the major source threshold. Point source VOC emissions in the

county are expected to rise to 307 tons by 2020, which represents an increase of 28%. Nonpoint source emissions were 3,402 tons in 2005. Projected growth of nonpoint source VOC emissions is estimated to be a 26% increase from 2005 through 2020. On-road mobile source VOC emissions were 1,313 tons and nonroad mobile emissions were 764 tons in 2005. Year 2020 on-road VOC emissions are expected to decrease to 560 tons, which is a decline of 57% from 2005 levels.

Meteorological conditions: Douglas County is located generally west-southwest of the Kansas City urban core and west-southwest of the monitors with the highest design values (Liberty and Rocky Creek). Lawrence airport wind roses for ozone season days (Pg. 63) show very little potential for contribution of emissions from Douglas County to Kansas City ozone formation.

Lawrence airport wind roses for the ozone season show predominant winds from the south-southeast, with occasional variances from the southwest and show some potential for Douglas County population being affected by short range transport from the Kansas City area.

Based on ozone season back trajectories for 2005-2007 (C-9, C-10, C-11, Appendix C), Douglas County is occasionally located in the long-range transport corridor for ozone and ozone precursors. These back trajectories show a predominant wind flow from the south-southwest with occasional winds from the east or southeast on days with high ozone values

Population: The population of Douglas County in 2000 was 99,962 persons, or 6% of the population of the Kansas City CBSA. In 2007, the population of Douglas County was 113,488. The county's population increased 22% from 1990 to 2000. The county's growth has occurred primarily in the City of Lawrence, as well as in Eudora and Baldwin City. The county is projected to grow 27% from 2000 to 2020. The population density of Douglas County was 219 persons per square mile in 2000.

Transportation: Average daily VMT in 2005 for Douglas County was 2,262,000 miles, which would represent 4.1% of the total average daily VMT for the CBSA if the county were actually part of it. The county's average daily VMT is projected to grow to 3,362,000 miles by 2020, an 49% increase from 2005 levels.

The following table summarizes the county's commuter trips to and from the other counties under consideration. The values in the charts are numbers of round-trip work trips. Of the total number of commuters residing in Douglas County, 18% leave the county for a destination in a Kansas City CBSA county, and 82% remain in the county. The commuters that leave the county primarily travel to Johnson and Jackson counties. Of the total number of work trips with Douglas County as a destination, 9% begin in an CBSA county, and 91% originate within Douglas County. Of those trips originating outside the county, most start in Johnson County. Overall, the commuters residing in Douglas County contribute about 5% of the work trips originating in the Kansas City CBSA, and the county is the destination for about 5% of the work trips ending in the CBSA.

Douglas County, Kansas (20045)			
To where do the county's commuters go?		***From where do the county's commuters come?***	
Franklin (KS)	403	Franklin (KS)	961
Johnson (KS)	5,578	Johnson (KS)	1,462
Leavenworth (KS)	509	Leavenworth (KS)	785
Linn (KS)	27	Linn (KS)	9

Miami (KS)	58	Miami (KS)	120
Wyandotte (KS)	796	Wyandotte (KS)	200
Douglas (KS)	41,414	Douglas (KS)	41,414
Bates (MO)	0	Bates (MO)	13
Caldwell (MO)	0	Caldwell (MO)	0
Cass (MO)	8	Cass (MO)	38
Clay (MO)	149	Clay (MO)	75
Clinton (MO)	0	Clinton (MO)	16
Jackson (MO)	1,450	Jackson (MO)	308
Lafayette (MO)	0	Lafayette (MO)	2
Platte (MO)	60	Platte (MO)	32
Ray (MO)	0	Ray (MO)	0
Total	**50,452**	**Total**	**45,435**

Geography/topography: The major topographic features in Douglas County are the east-trending Kansas and Wakarusa River valleys and the upland cuestas formed by differential erosion of the limestone, shale, and sandstone beds. The highest point in the county is in the southwestern part and is about 1,200 feet above sea level; the lowest point is along Kansas River at the east edge of the county, about 778 feet above mean sea level. The Kansas River has an average gradient of about 2 feet per mile. Douglas County has an area of 457 square miles. The topography of Douglas County should have no discernable effect on ozone formation or transport of precursor emissions.

Jurisdictional boundaries: Douglas County is not part of the Kansas City CBSA. It is designated as a separate CBSA, the Lawrence, KS CBSA. It is not part of the current 8-hour ozone maintenance area. It is not within the Kansas City MPO boundary.

Level of control of emissions: The emissions sources in Douglas County are subject to State SIP rules and federal rules of general applicability, such as NSPS, NESHAPS, MACT, and PSD.

Regional emission reductions: The emission sources in Douglas County are not subject to the NO_x SIP call or other enforceable regional strategies. There is an emissions limit for Westar's Lawrence Energy Center as part of a regional haze agreement with Westar. This agreement requires rebuilt low NO_x burners to be installed and operated on units 3,4 and 5 with NO_x emissions rates of 0.18, 0.18 and 0.15 lb/MMBtu respectively. These reductions from Lawrence Energy center will be required five years after EPA's approval of KDHE's regional haze SIP.

MIRA analysis: Douglas County ranked #8 in the MIRA tool and was included in Bin #7 along with Cass and Clinton counties in Missouri. Douglas County has the 5th largest population of the 16 counties evaluated and also has a commute connectivity similar to Leavenworth County. The county's emissions are slightly lower than in Wyandotte County. The local emissions transport metric for the county was in the top 5 which caused the county to rank number #7 when looking just at emissions potential to nonattainment. Although the county is in the same MIRA bin as Cass and Clinton, the reasons for this are very different as Cass had a commute connectivity over twice that of Douglas and Clinton has a higher monitored ozone value. Douglas County was also the only county not included in the same CBSA jurisdiction which slightly lowered the county in the overall MIRA rankings.

Summary: Douglas County is located directly west of the Kansas City urban core. Population and emissions sources are concentrated in the north central area of the county. Wind roses for the ozone season

show minimal potential for contribution of Douglas County emissions to ozone formation in the Kansas City CBSA. The majority of meteorological regimes associated with high ozone concentrations in the Kansas City area would not support contribution by precursor emissions from Douglas County. Douglas County is not located in the Kansas City CBSA, but is a separate CBSA. Douglas County VOC emissions would rank fifth in the Kansas City CBSA; NO_x emissions would rank fifth in the Kansas City CBSA; population would rank fifth in the Kansas City CBSA; population density would rank fifth in the CBSA; and ADVMT would rank seventh in the Kansas City CBSA. While these emissions are fairly substantial in relation to the overall emissions of the Kansas City CBSA, their potential for contribution to ozone formation in Kansas City is minimal due to the meteorological conditions described above.

There was no ozone monitor operated in Douglas County for the entire three-year period from 2006 to 2008. There was a monitor located at the Lawrence Municipal Airport, north of the City of Lawrence that operated in 2004, 2005 and 2006. The 4th high 8-hour value for the monitor was 0.064 ppm in 2004, 0.073 ppm in 2005 and 0.081 ppm in 2006. The design value for 2004-06 was 0.072 ppm. This average over three years would not violate the new 8-hour ozone standard.

Recommendation: It is recommended that Douglas County be excluded from the area designated nonattainment in and around Kansas City for the new 8-hour ozone standard. There is no evidence that controlling ozone precursor emissions, either current or projected, in Douglas County will contribute to the goal of attaining the 8-hour ozone standard in Kansas City. There is no conclusive evidence that Douglas County residents are exposed to ozone concentrations exceeding the new 8-hour ozone standard.

Appendix A
Monitoring Data

Table A-1. 8-Hour Ozone Monitoring Data for Kansas City 2006-08

	4th-High 8-Hour Values (ppm)			
Site Name	**2006**	**2007**	**2008**	**06-08 Average**
JFK Community Center	0.081	0.073	0.063	0.072
Johnson Co. Heritage Park	0.076	0.071	0.062	0.069
Leavenworth	0.074	0.080	0.064	0.072
Liberty	0.093	0.081	0.070	0.081*
Mine Creek	0.079	0.070	0.063	0.070
Richards-Gebauer South	0.078	0.072	0.066	0.072
Rocky Creek	0.087	0.089	0.069	0.081*
Trimble	0.085	0.083	0.070	0.079
Watkins Mill	0.091	0.073	0.069	0.077

* Design value for Kansas City Area

Table A-2. 8-Hour Ozone Exceedances in 2006, 2007 and 2008

Site Name	2006		2007		2008	
	Date	8-Hr Daily Max Value (ppm)	Date	8-Hr Daily Max Value (ppm)	Date	8-Hr Daily Max Value (ppm)
JFK	05/19	0.078	06/14	0.078		
	06/08	0.078	08/01	0.079		
	06/10	0.077	08/16	0.077		
	06/19	0.077				
	06/30	0.080				
	07/01	0.085				
	07/08	0.081				
	07/15	0.099				
	07/19	0.084				
	07/20	0.077				
Heritage Park	04/22	0.078	06/14	0.079		
	06/30	0.076	08/16	0.080		
	07/01	0.082				
	07/20	0.081				
Leavenworth	06/30	0.080	08/01	0.088		
	07/01	0.083	08/17	0.077		
	07/06	0.077				
Liberty	05/19	0.079				
	06/09	0.081				
	06/10	0.086	06/14	0.083		
	06/15	0.079	06/16	0.081		
	06/19	0.085	07/26	0.086		
	06/28	0.087	08/01	0.079		
	06/29	0.084	08/12	0.099		
	06/30	0.094	08/14	0.078		
	07/01	0.094	08/15	0.078		
	07/02	0.076	08/28	0.078		
	07/08	0.088	09/02	0.079		
	07/12	0.076	09/03	0.077		

	07/16	0.081				
	07/17	0.087				
	07/19	0.106				
	07/20	0.078				
	07/24	0.076				
	07/25	0.078				
	07/26	0.076				
	08/06	0.092				
	08/09	0.093				
	08/17	0.079				
	08/23	0.079				
Mine Creek	06/14	0.079				
	06/29	0.082				
	06/30	0.081				
	07/01	0.081				
RG South	04/22	0.080	06/14	0.081	08/05	0.079
	06/30	0.077	08/16	0.078		
	07/01	0.080				
	07/19	0.078				
	07/20	0.085				
Rocky Creek	06/09	0.082	05/13	0.082	07/17	0.077
	06/09	0.087	06/13	0.084		
	06/14	0.083	06/14	0.089		
	06/15	0.081	06/15	0.082		
	06/19	0.076	06/16	0.089		
	06/28	0.081	07/06	0.083		
	06/29	0.078	07/25	0.082		
	06/30	0.087	07/26	0.076		
	07/01	0.087	08/01	0.099		
	07/08	0.094	08/10	0.084		
	07/12	0.077	08/12	0.092		
	07/13	0.086	08/17	0.076		
	07/15	0.078	08/28	0.076		
	07/16	0.083	09/02	0.078		

	07/19	0.091	09/03	0.078		
	07/25	0.078	09/04	0.076		
	07/28	0.085				
	08/05	0.084				
	08/06	0.078				
	08/09	0.083				
	08/17	0.079				
	08/23	0.082				
	08/24	0.081				
Trimble	06/09	0.080	05/13	0.083	06/18	0.078
	06/14	0.081	06/13	0.080	07/17	0.078
	06/15	0.078	06/14	0.090		
	06/30	0.081	06/15	0.081		
	07/01	0.082	06/16	0.087		
	07/08	0.089	07/06	0.081		
	07/13	0.086	07/16	0.081		
	07/16	0.083	07/25	0.080		
	07/19	0.084	08/01	0.086		
	07/25	0.078	08/10	0.082		
	07/28	0.081				
	08/05	0.077				
	08/09	0.083				
	08/17	0.087				
	08/23	0.085				
	08/24	0.080				
Watkins Mill	06/09	0.077	06/14	0.077		
	06/29	0.079	06/16	0.079		
	06/30	0.092	07/26	0.084		
	07/01	0.091				
	07/08	0.083				
	07/16	0.076				
	07/17	0.083				
	07/19	0.105				
	07/25	0.077				
	08/09	0.093				

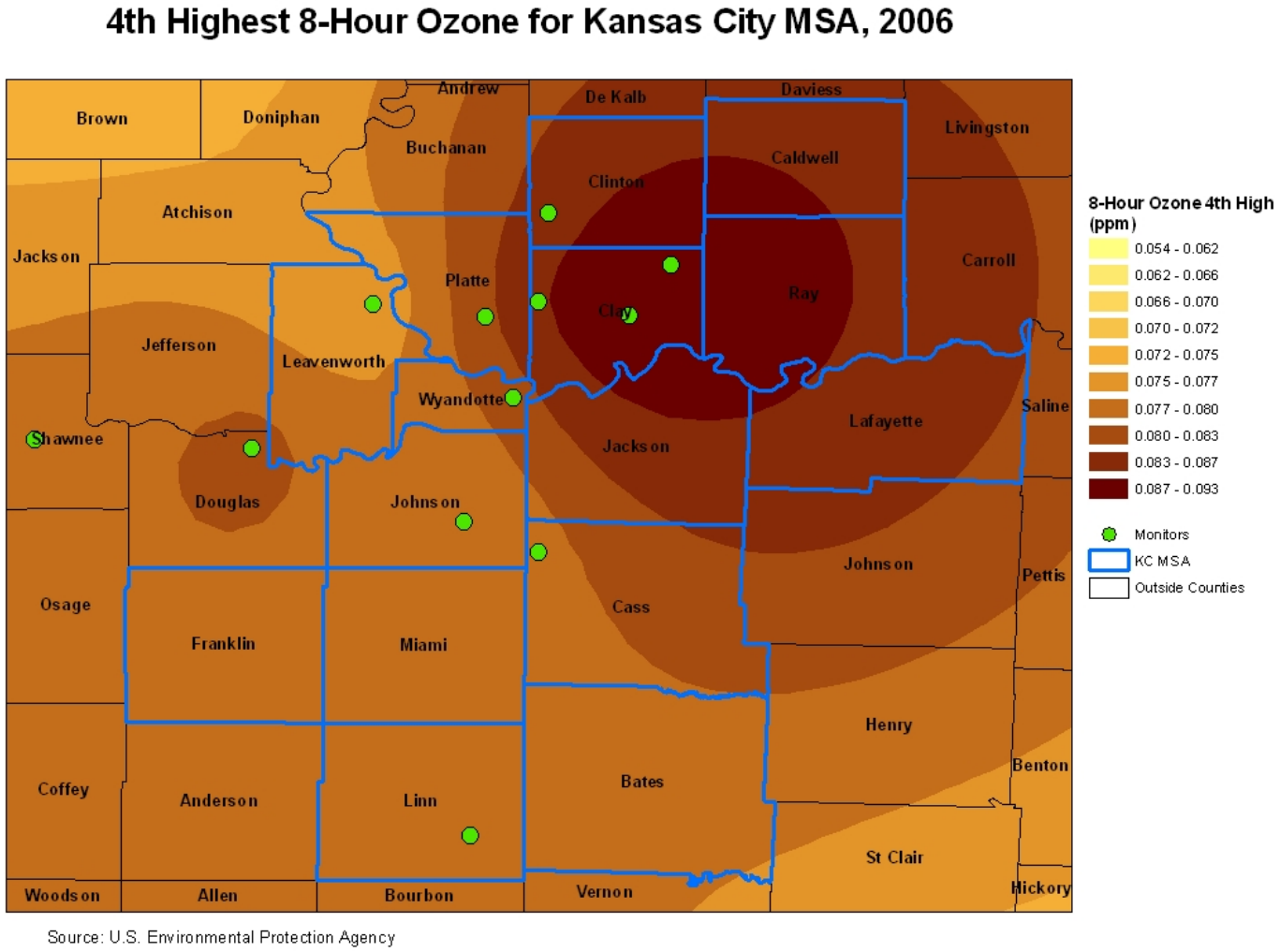


Figure A-1 Krieged 4th Highest 8-Hour Ozone for Kansas City MSA - 2006

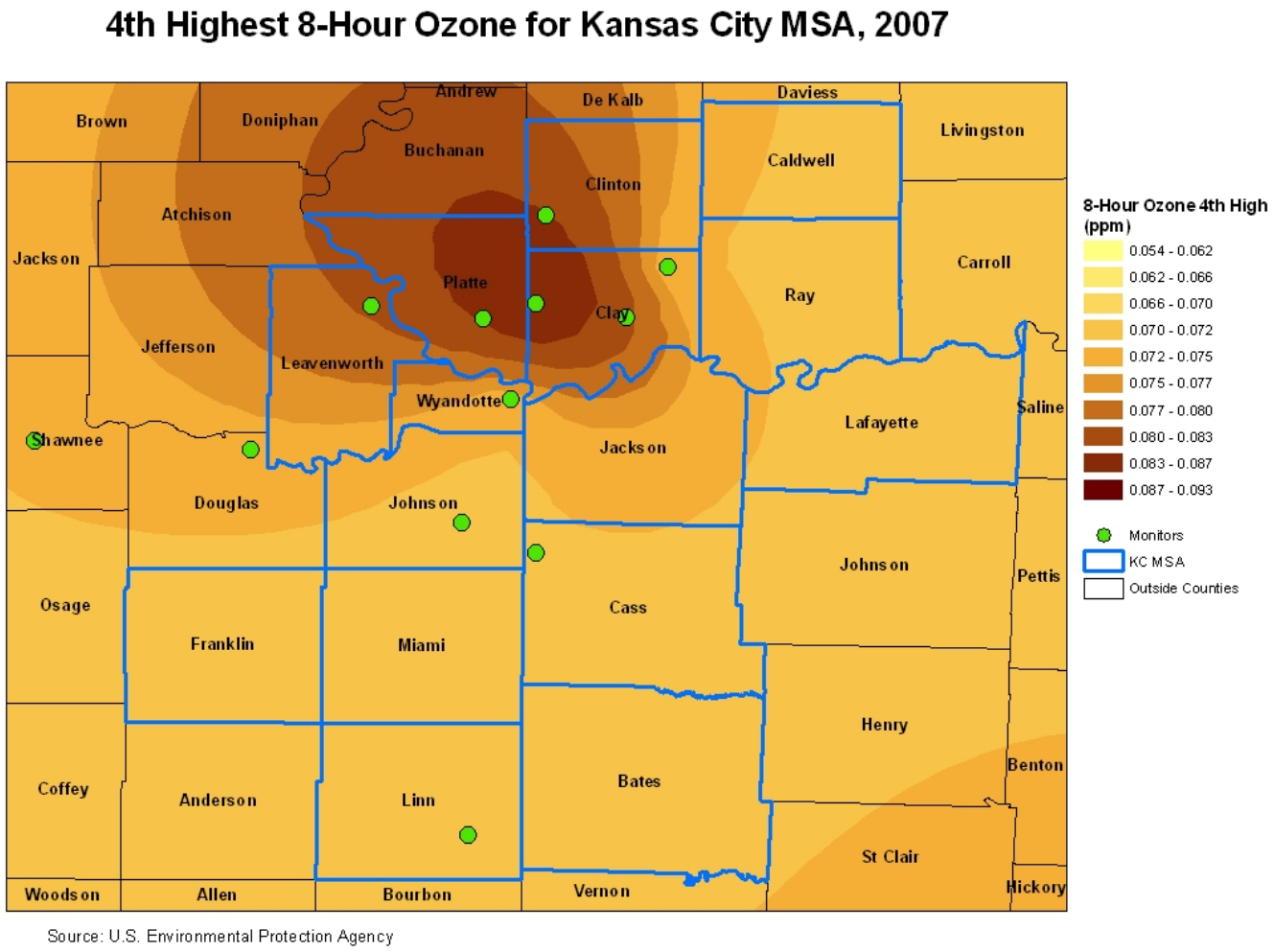


Figure A-2 Krieged 4th Highest 8-Hour Ozone for Kansas City MSA - 2007

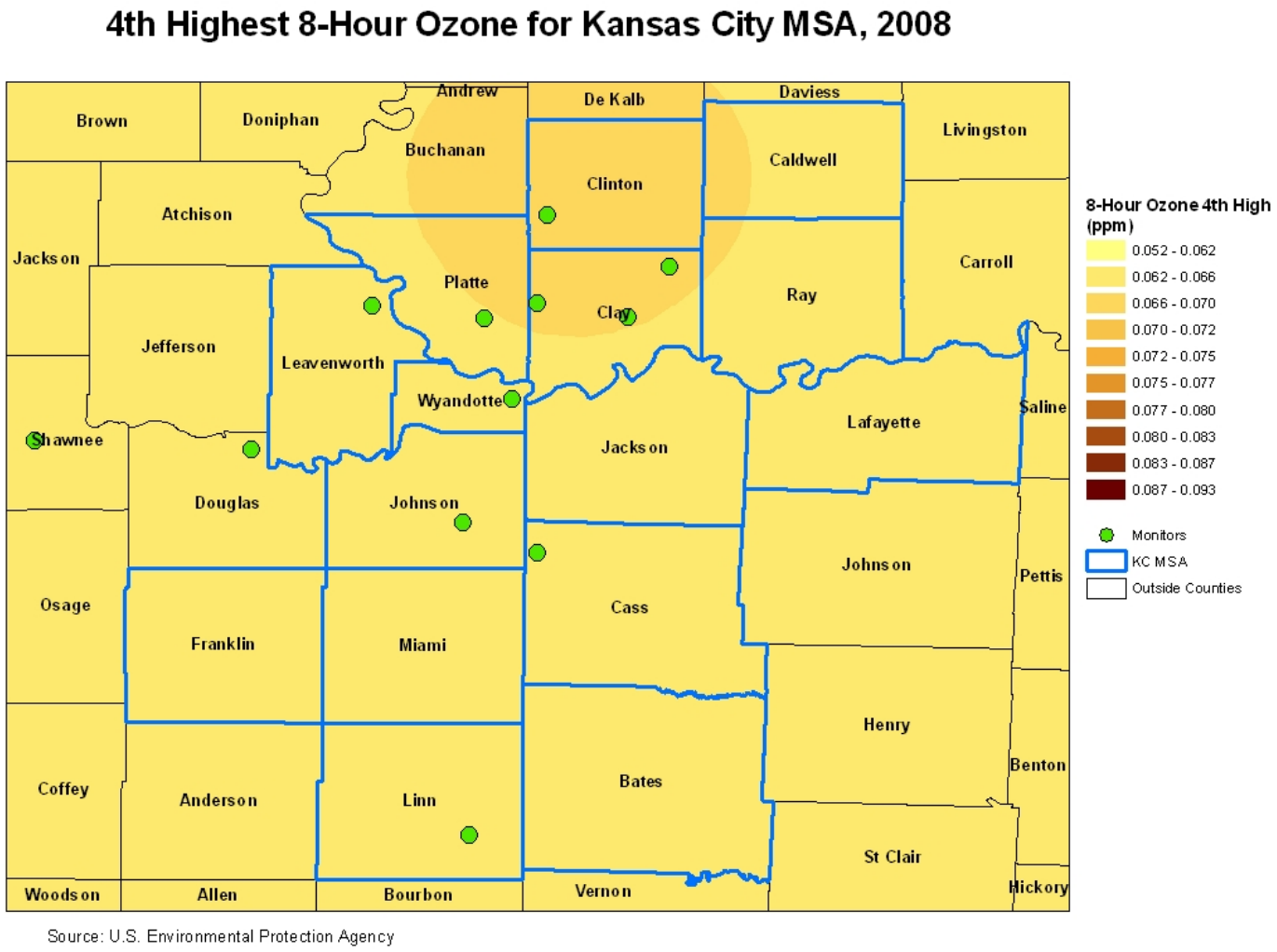


Figure A-3 Krieged 4th Highest 8-Hour Ozone for Kansas City MSA - 2008

Appendix B
Emissions Data

Table B-1. Summary of Annual NO_x and VOC Emissions in Kansas City Area Counties

2005	Annual NO_x (tons)						Annual VOC (tons)					
	Point	Nonpoint	On-Road	Nonroad	Total	% MSA	Point	Nonpoint	On-Road	Nonroad	Total	% MSA
Kansas City MSA												
KS Counties												
Franklin Co.	70	277	1,210	1,311	*2,868*	2%	12	1,052	582	172	*1,818*	2%
Johnson Co.	1,047	2,465	10,650	5,698	*19,860*	13%	721	13,609	7,547	3,275	*25,153*	25%
Leavenworth Co.	88	152	1,526	1,033	*2,800*	2%	160	1,304	982	331	*2,777*	3%
Linn Co.	29,109	1,501	331	1,842	*32,783*	21%	230	639	205	196	*1,269*	1%
Miami Co.	2,767	*162*	696	3,915	*7,539*	5%	179	741	438	411	*1,768*	2%
Wyandotte Co.	8,281	828	3,462	2,123	*14,695*	9%	2,385	5,060	2,506	835	*10,786*	11%
KS Subtotal	*41,361*	*5,386*	*17,875*	*15,923*	*80,545*	51%	*3,687*	*22,404*	*12,261*	*5,220*	*43,571*	43%
KS % total MSA	*63%*	*57%*	*40%*	*43%*	*51%*		*47%*	*44%*	*41%*	*39%*	*43%*	
MO Counties												
Bates Co.	23	111	613	1,105	*1,852*	1%	2	722	405	288	*1,417*	1%
Caldwell Co.	0	33	332	617	*981*	1%	3	318	218	153	*691*	1%
Cass Co.	142	301	2,227	1,358	*4,029*	3%	70	1,997	1,560	533	*4,159*	4%
Clay Co.	1,076	386	5,077	2,331	*8,870*	6%	2,096	4,959	3,353	1,146	*11,554*	11%
Clinton Co.	0	59	745	269	*1,073*	1%	21	535	455	200	*1,211*	1%
Jackson Co.	14,885	2,126	13,149	9,182	*39,342*	25%	1,492	16,146	8,735	4,017	*30,390*	30%
Lafayette Co.	55	209	1,509	1,714	*3,487*	2%	142	939	914	521	*2,516*	2%
Platte Co.	8,220	616	3,027	2,303	*14,166*	9%	347	1,878	1,915	988	*5,127*	5%
Ray Co.	43	158	409	2,382	*2,991*	2%	14	874	277	287	*1,452*	1%
MO Subtotal	*24,444*	*3,999*	*27,087*	*21,261*	*76,791*	49%	*4,188*	*28,367*	*17,830*	*8,133*	*58,518*	57%
MO % total MSA	*37%*	*43%*	*60%*	*57%*	*49%*		*53%*	*56%*	*59%*	*61%*	*57%*	
Total MSA	**65,805**	**9,385**	**44,962**	**37,183**	**157,336**		**7,874**	**50,771**	**30,091**	**13,353**	**102,089**	
% total MSA	42%	6%	29%	24%			8%	50%	29%	13%		
Lawrence MSA												
Douglas Co.	5,271	415	1,771	1,497	**8,955**		239	3,402	1,313	764	**5,719**	
% MSA	59%	5%	20%	17%			4%	59%	23%	13%		

Figure B-1. 2005 NO_x Emissions by County and Source Type

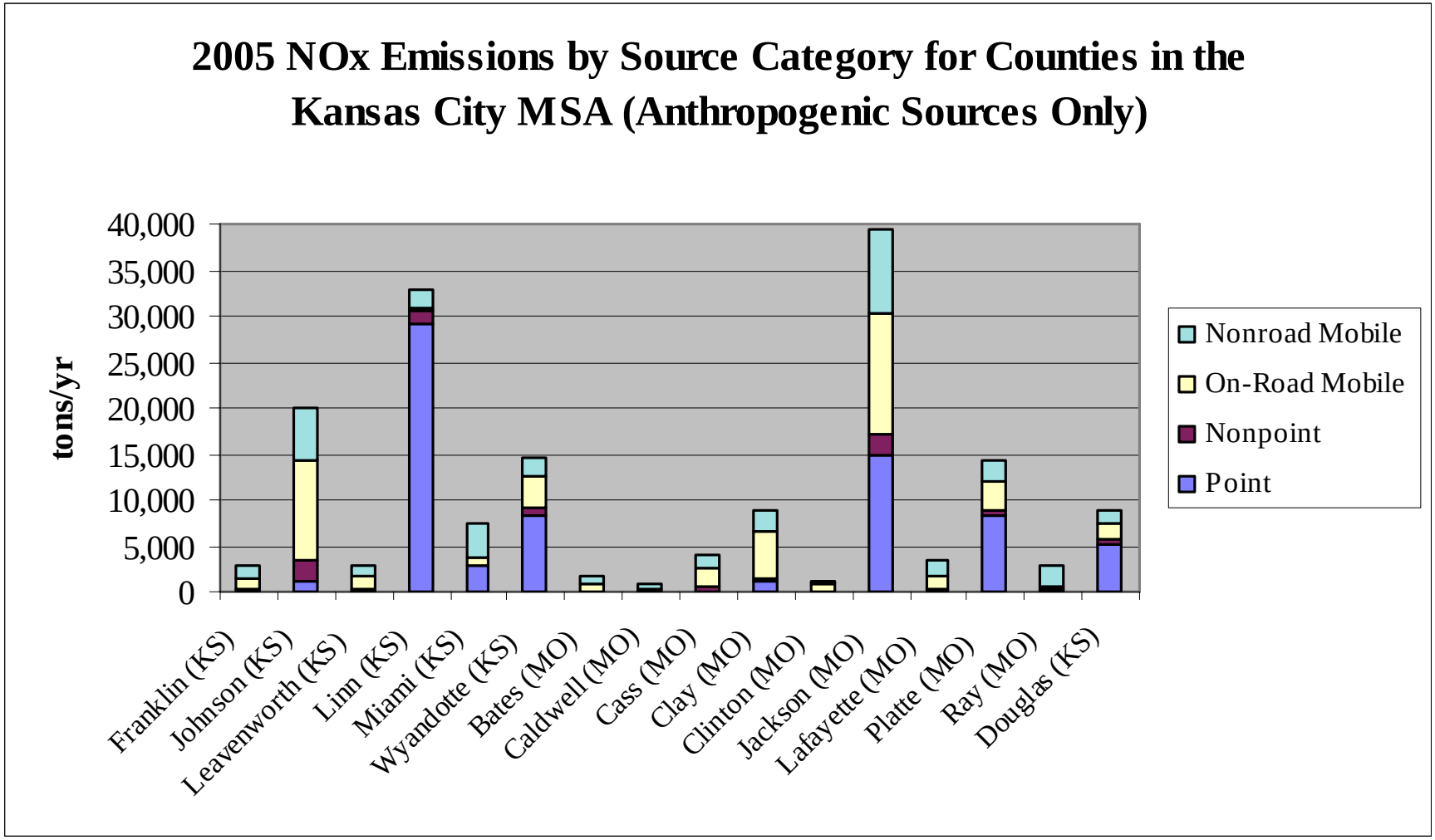


Figure B-2. 2005 NO_x Point Source Emissions Locations

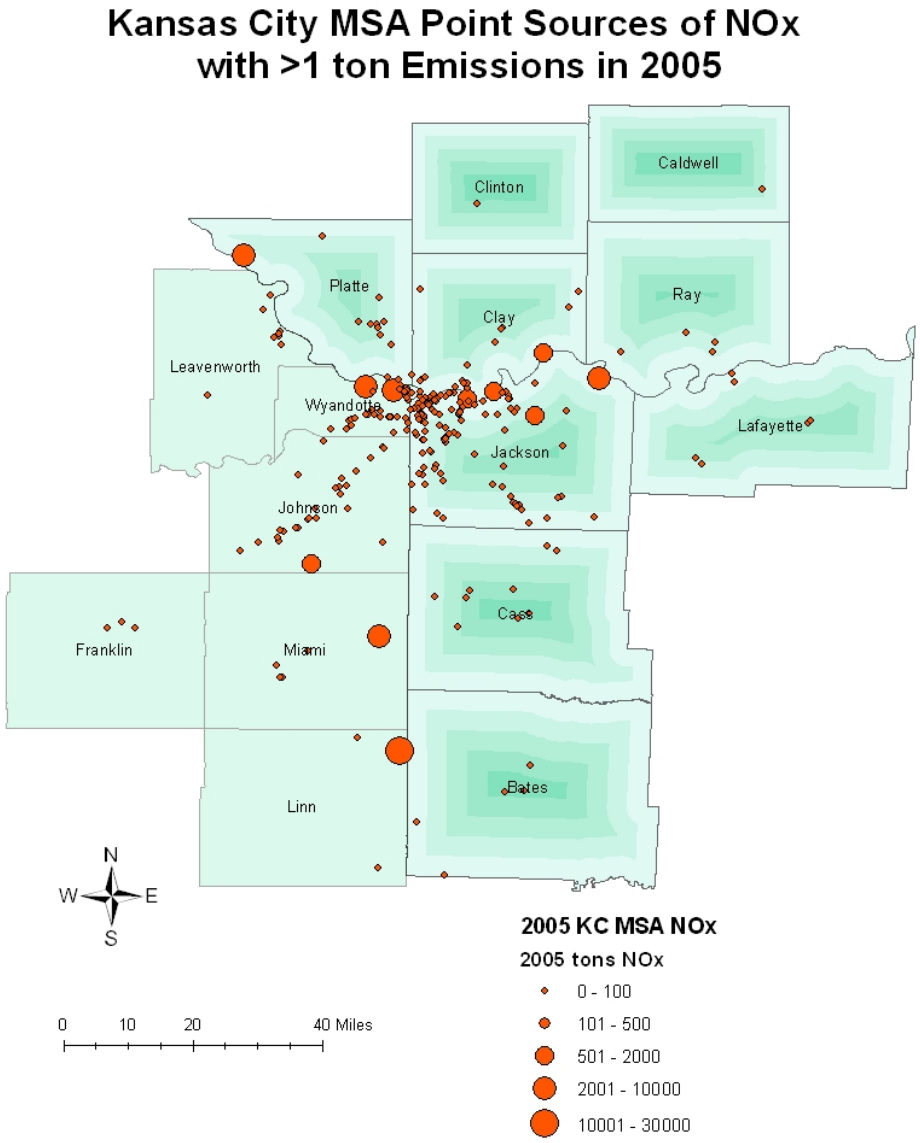


Figure B-3. 2005 VOC Emissions by County and Source Type

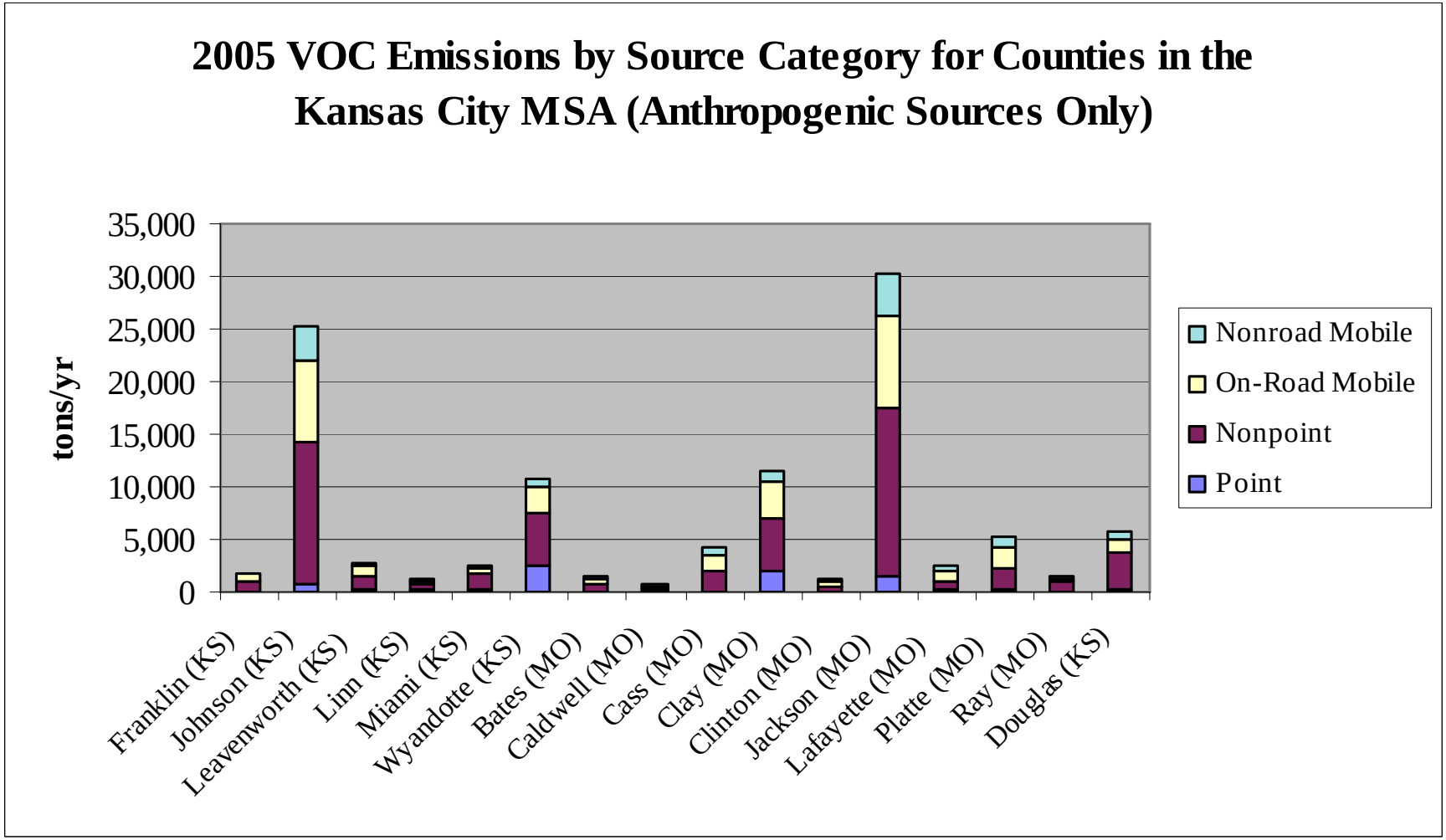
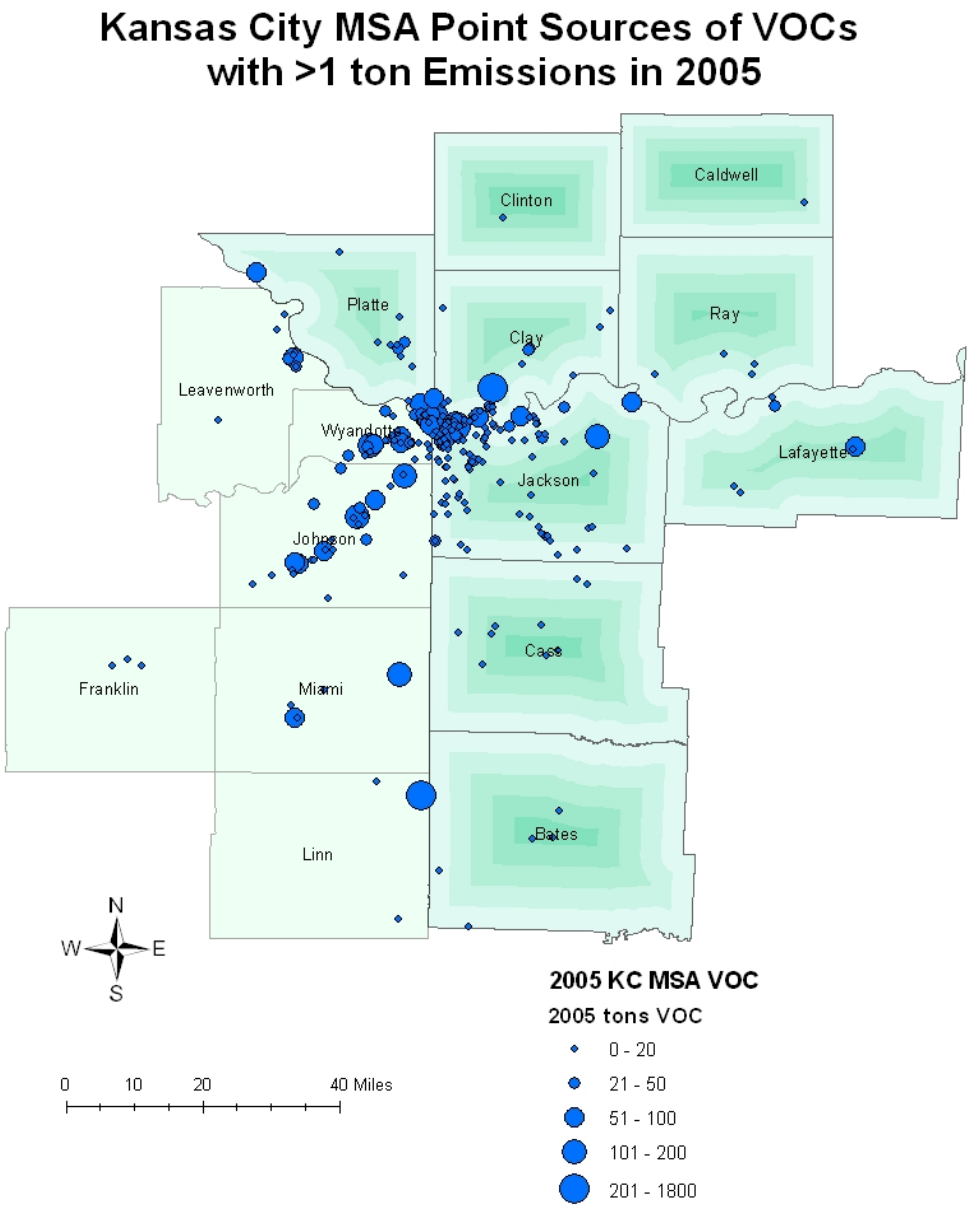


Figure B-4. 2005 VOC Point Source Emissions Locations



Appendix C
WindRoses and Back Trajectories for Kansas City

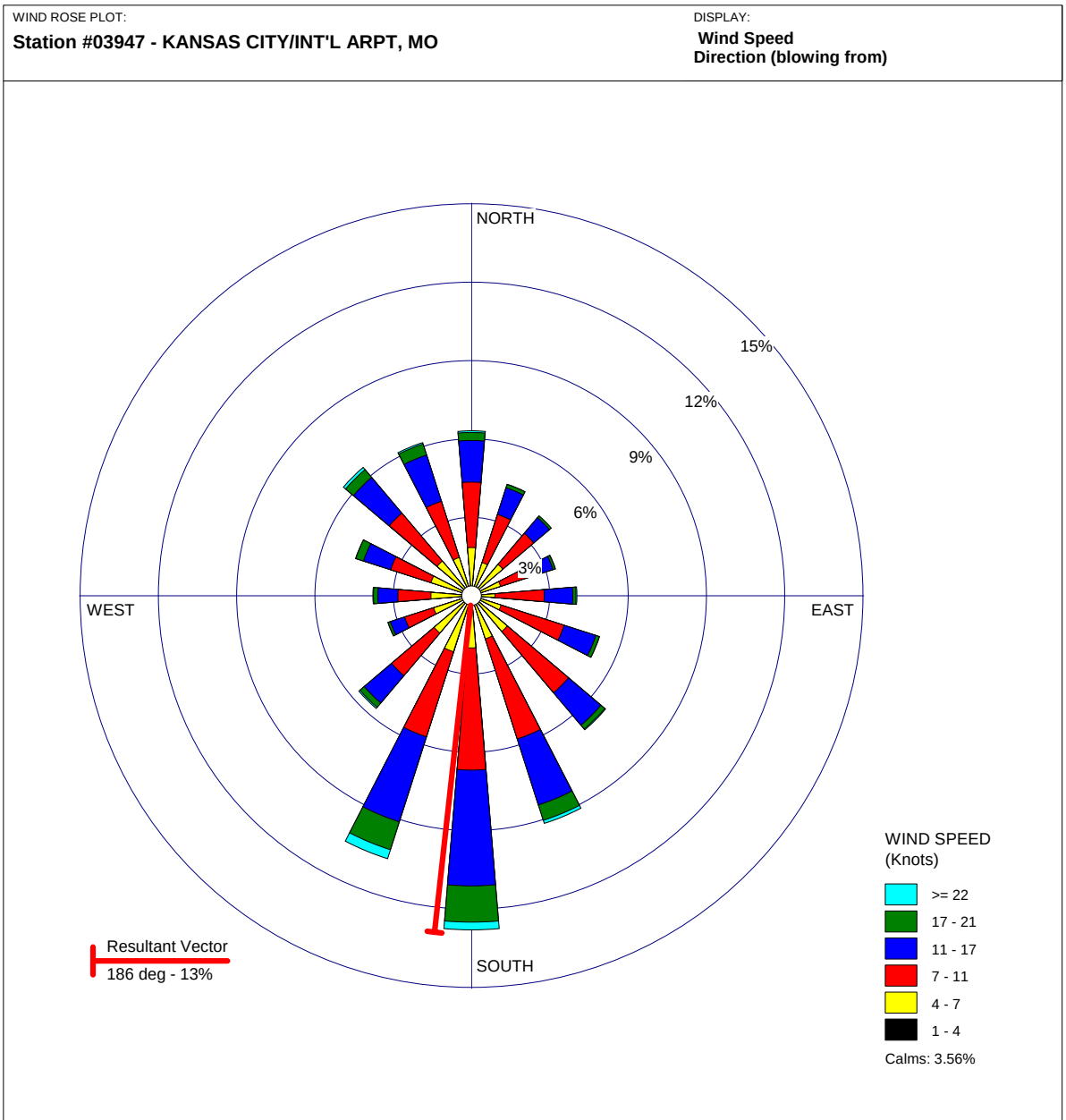


Figure C-1. KCI Airport Wind Rose (Jan. 1 - Dec. 31, 2005-2007)

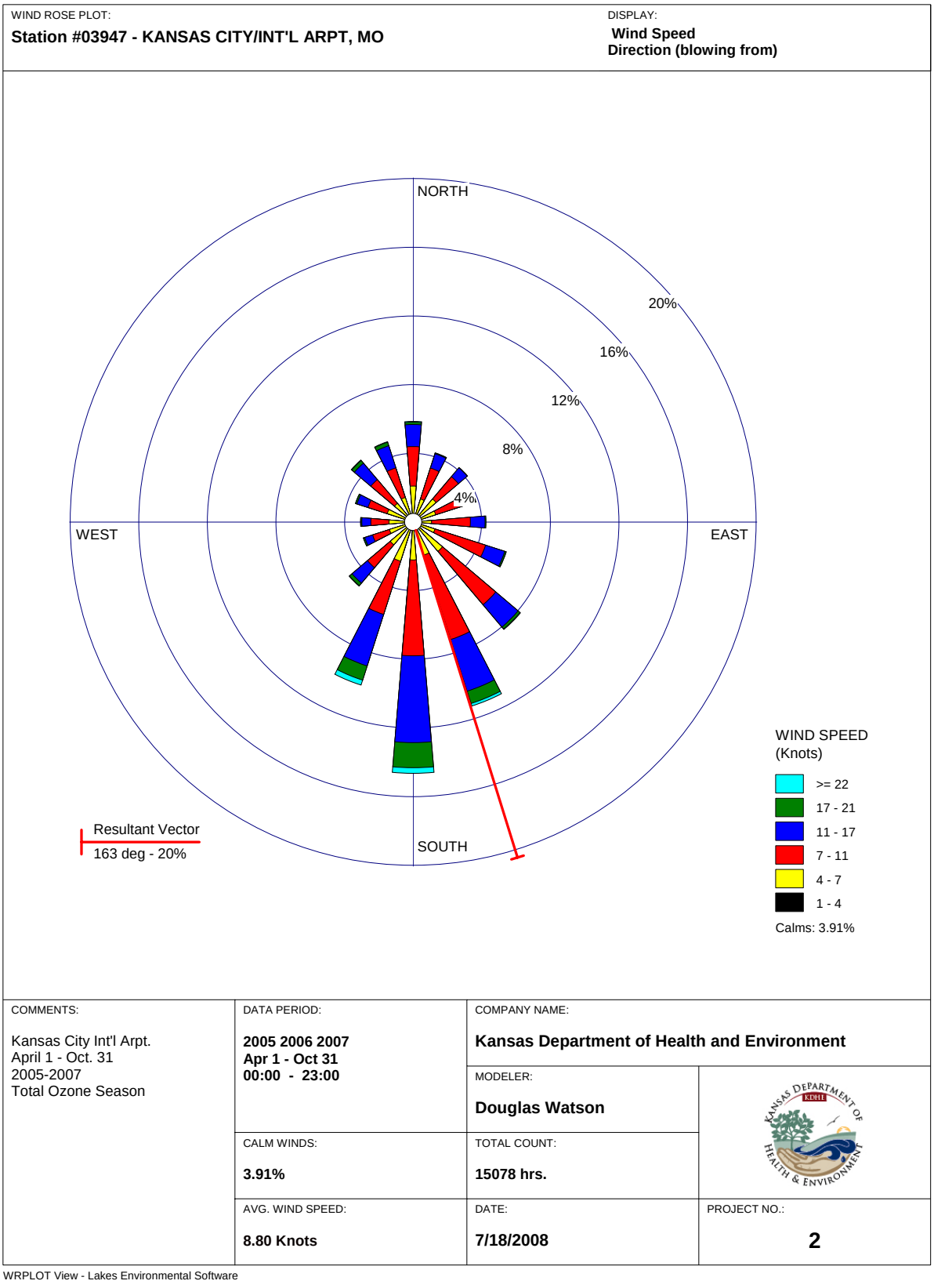


Figure C-2. KCI Airport Ozone Season Wind Rose (Apr. 1 – Oct. 31, 2005-2007)

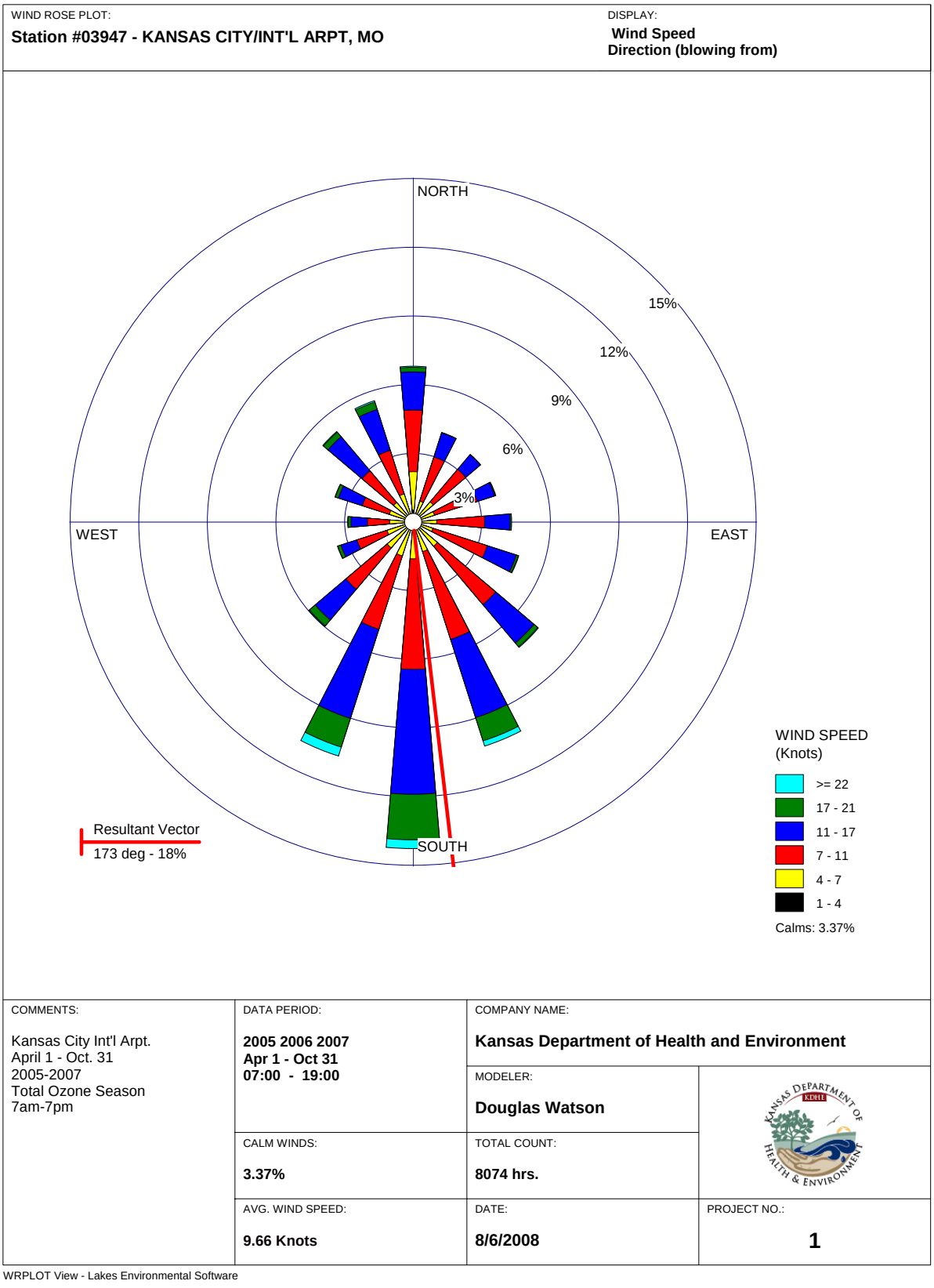


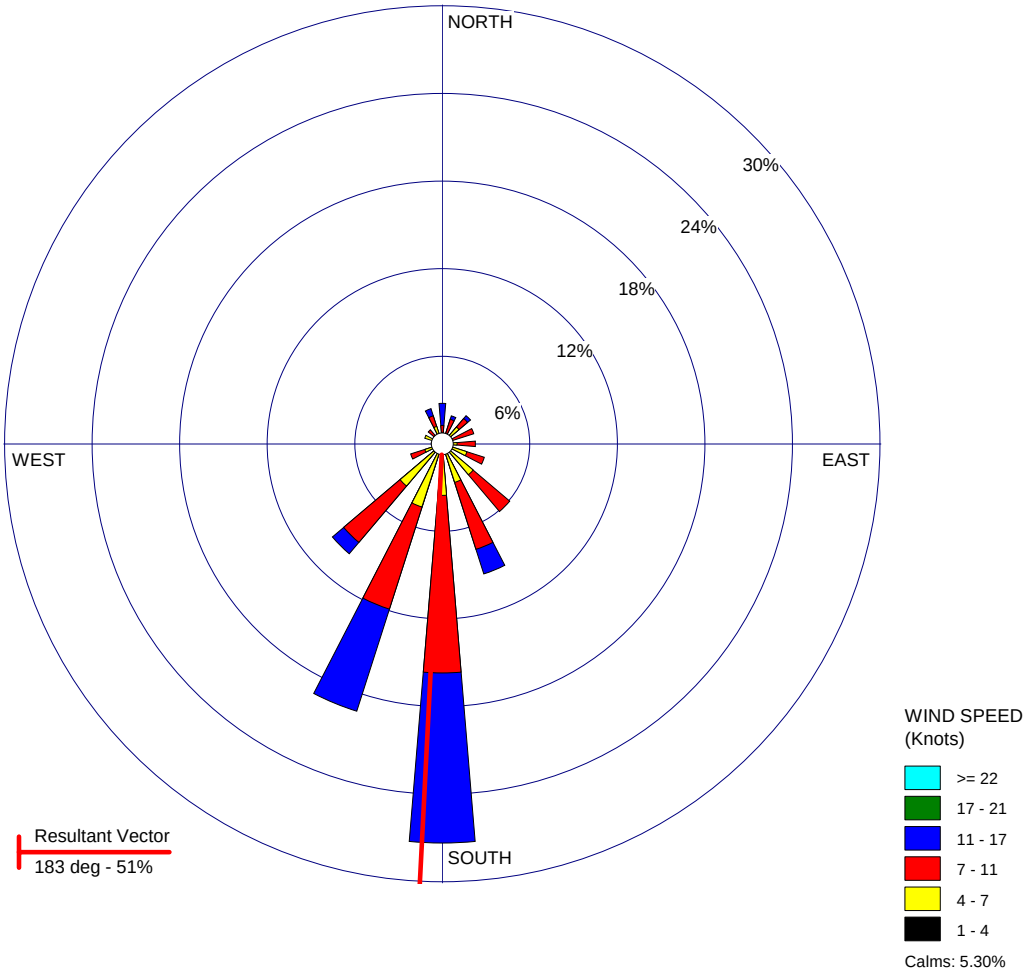
Figure C-3. KCI Airport Ozone Season Wind Rose (Apr. 1 – Oct. 31, 2005-2007) (7am-7pm)

WIND ROSE PLOT:

Station #03947 - KANSAS CITY/INT'L ARPT, MO

DISPLAY:

Wind Speed
Direction (blowing from)



COMMENTS: Kansas City Int'l Arpt. April 1 - Oct. 31 2005 8-Hr. Ozone Days >=0.076ppm 7am-7pm	DATA PERIOD: **2005** **Check Date Range Report** **07:00 - 19:00**	COMPANY NAME: **Kansas Department of Health and Environment**	
		MODELER: **Douglas Watson**	
	CALM WINDS: **5.30%**	TOTAL COUNT: **396 hrs.**	
	AVG. WIND SPEED: **7.97 Knots**	DATE: **7/30/2008**	PROJECT NO.: **3**

WRPLOT View - Lakes Environmental Software

Figure C-4. KCI Airport 8-Hour Ozone Exceedance Days Wind Rose, 2005

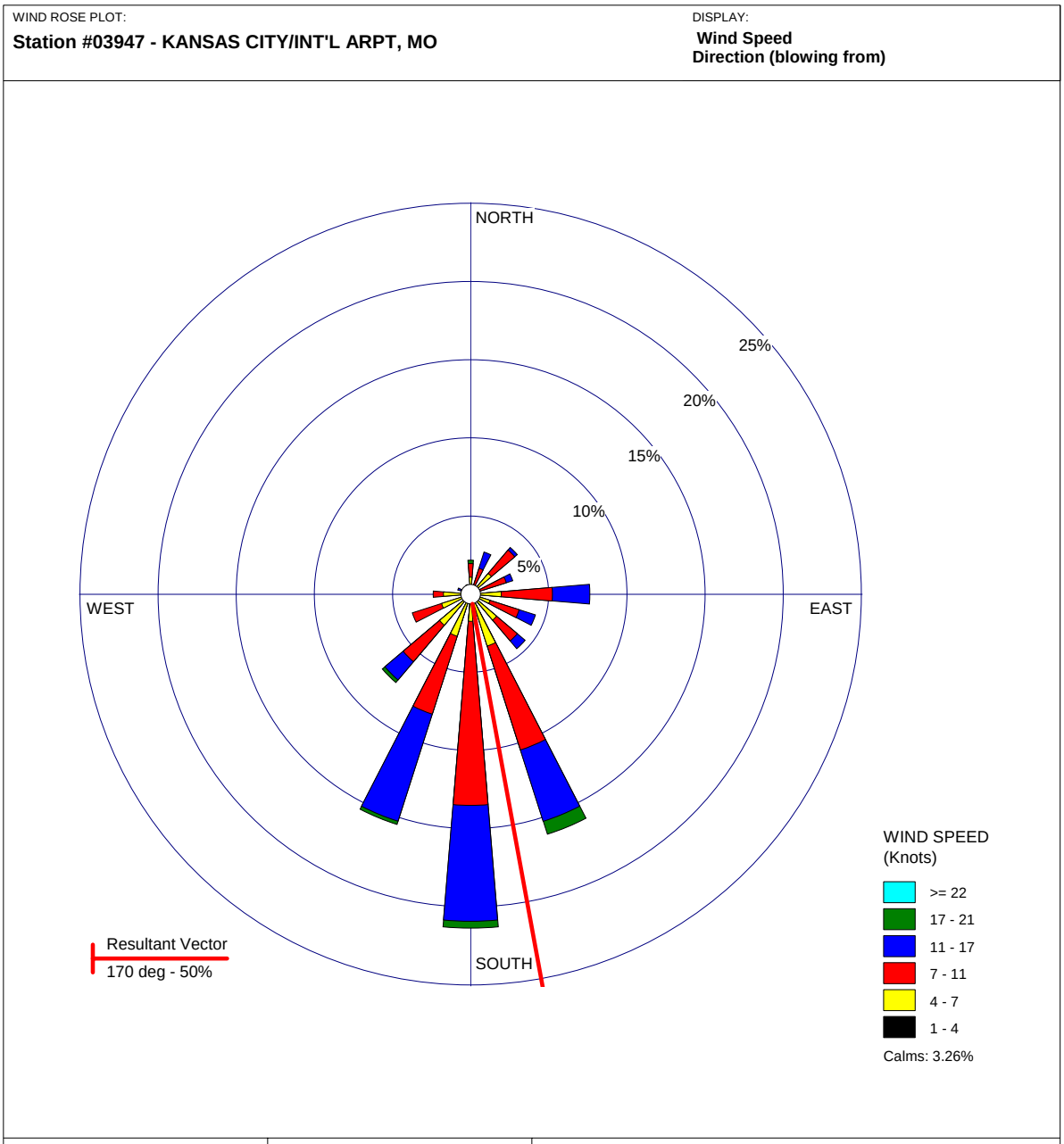


Figure C-5. KCI Airport 8-Hour Ozone Exceedance Days Wind Rose, 2006

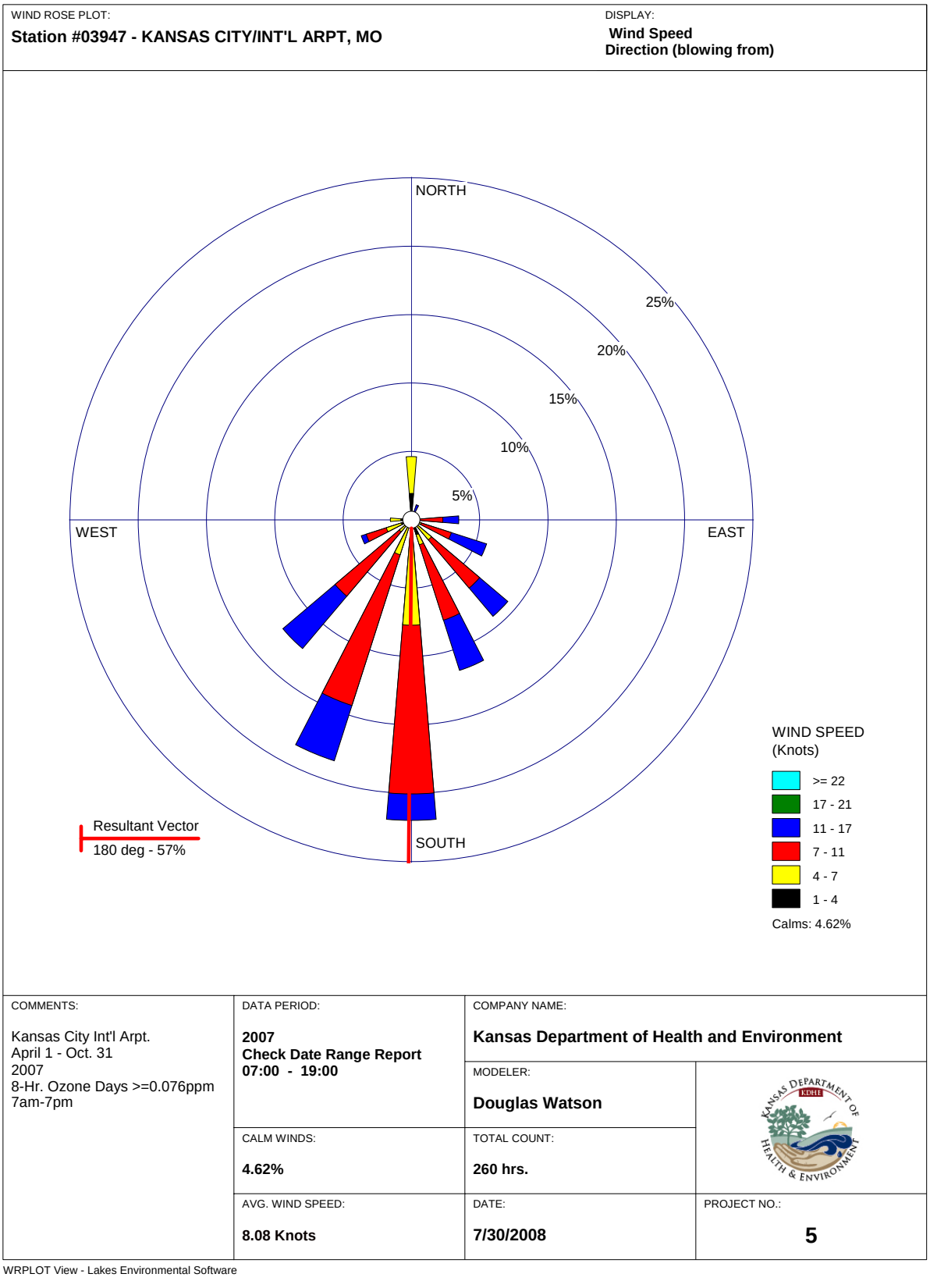


Figure C-6. KCI Airport 8-Hour Ozone Exceedance Days Wind Rose, 2007

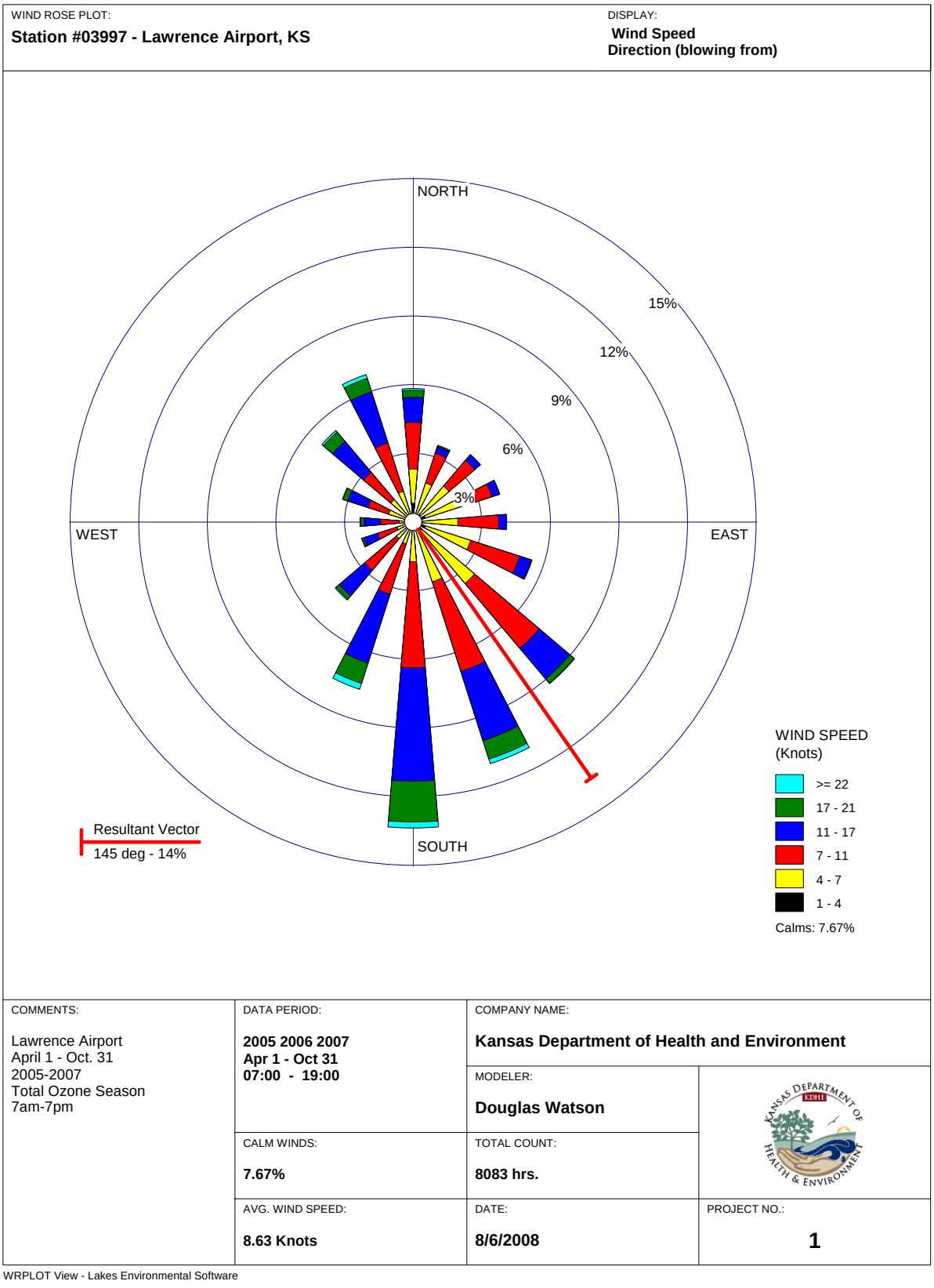


Figure C-7. Lawrence Airport Ozone Season Wind Rose (Apr. 1 – Oct. 31, 2005-2007) (7am-7pm)

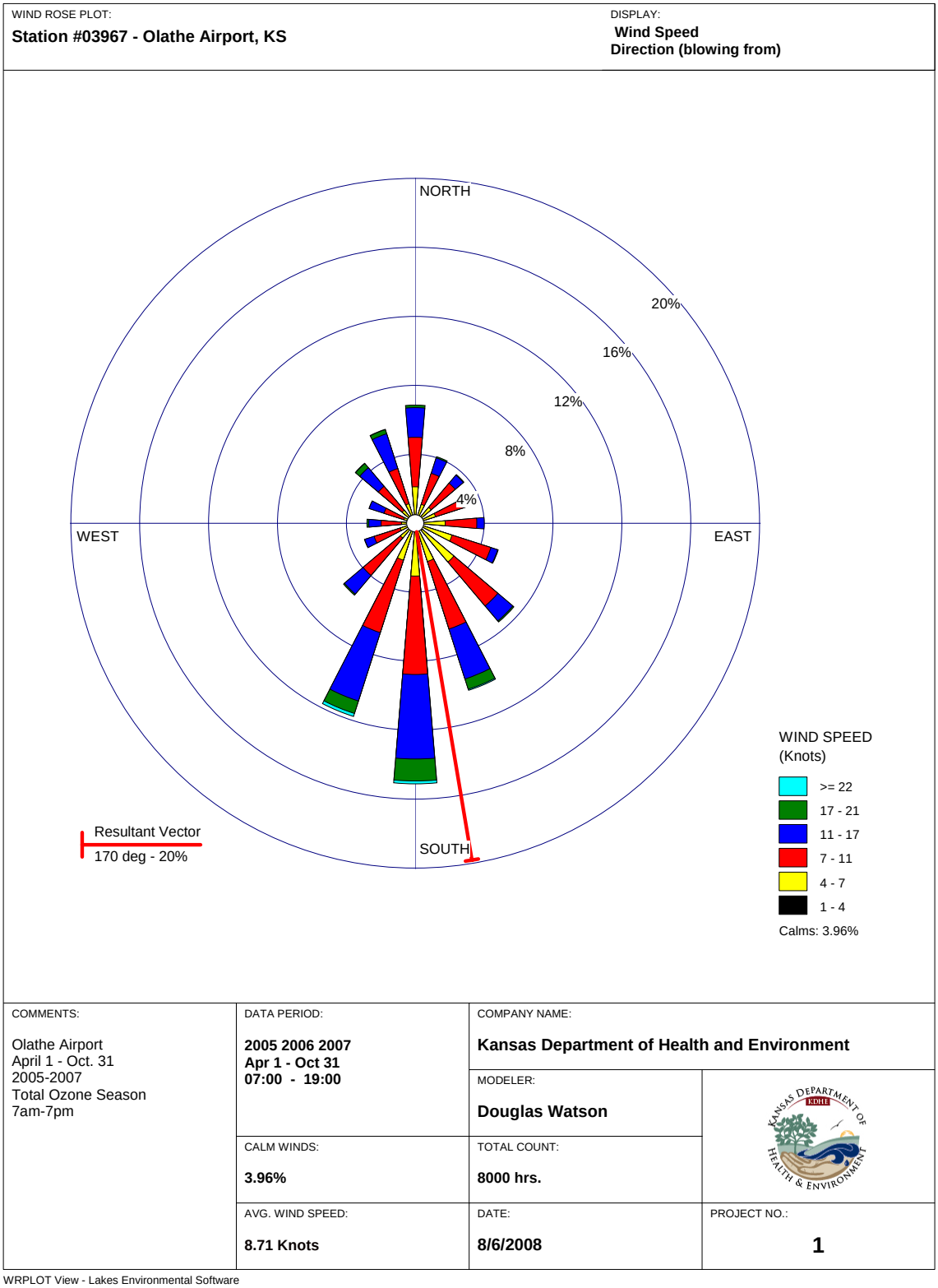
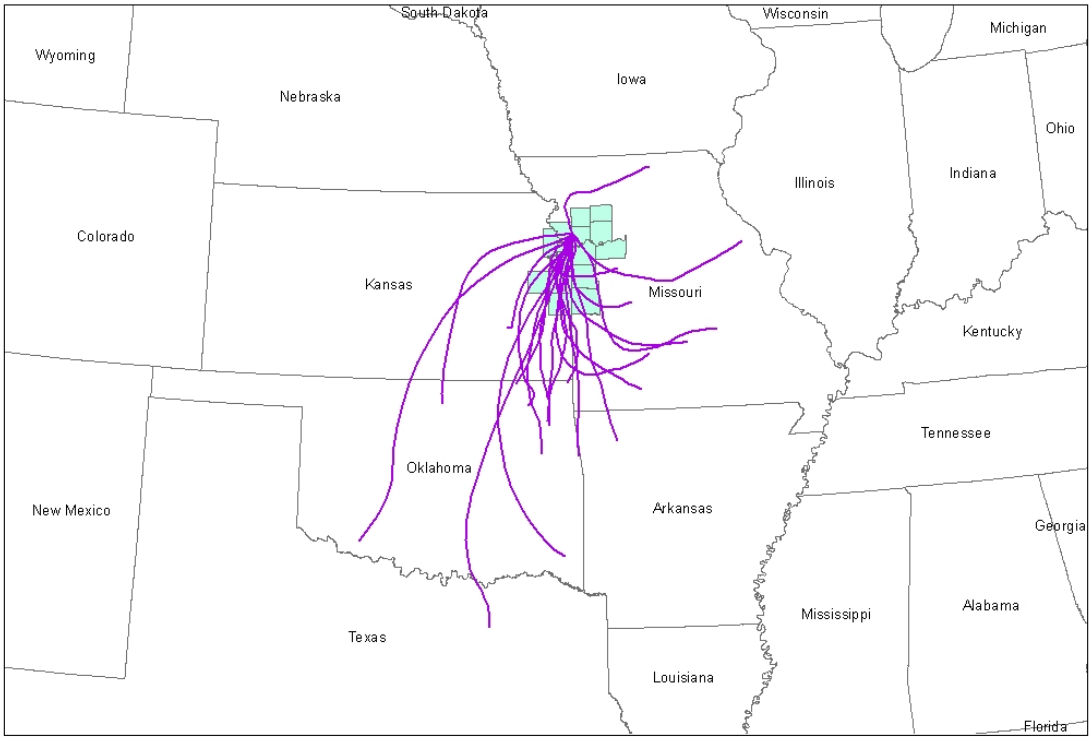


Figure C-8. Olathe Airport Ozone Season Wind Rose (Apr. 1 – Oct. 31, 2005-2007) (7am-7pm)

Back Trajectories

The following back trajectories were performed at the Rocky Creek monitoring site, the site which is driving the design value for the area. The trajectories are during periods with > 75 ppb ozone readings, 24 hours in duration, and end at 5pm on the day that the elevated ozone reading occurred. Trajectories were run for two elevations, 20m and 500m above ground level.

20-Meter Back Trajectories
with Ozone Values > 75 ppb for the Year 2005 at Ending Time 1700



500-Meter Back Trajectories
with Ozone Values > 75 ppb for the Year 2005 at Ending Time 1700

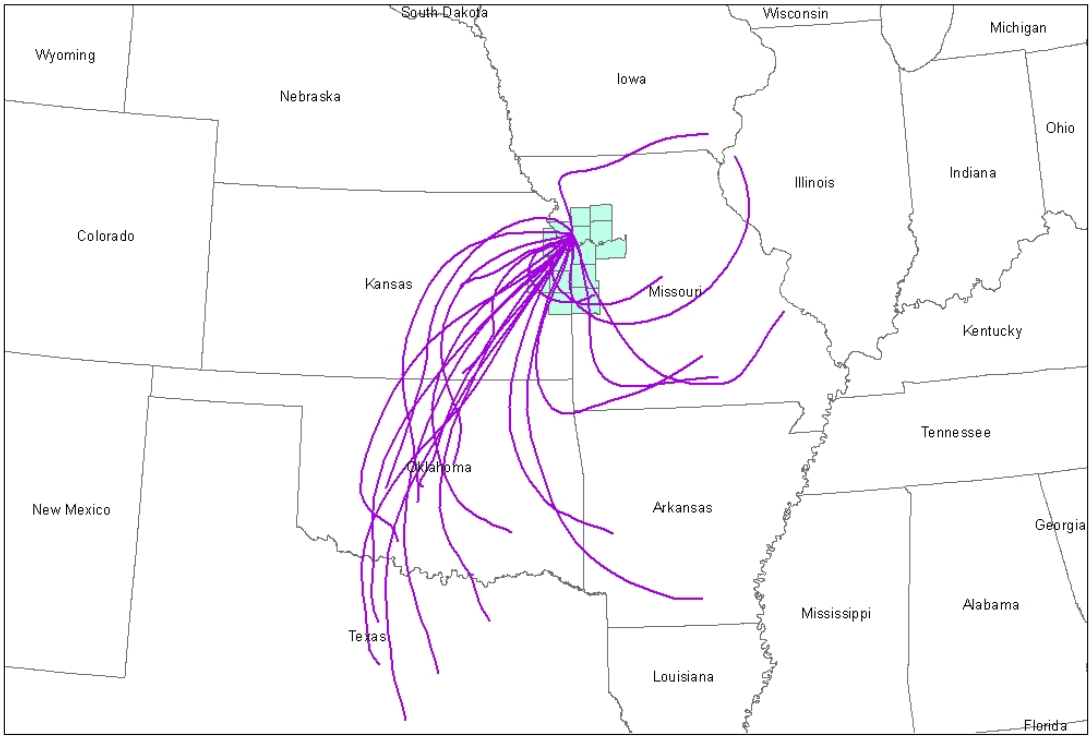
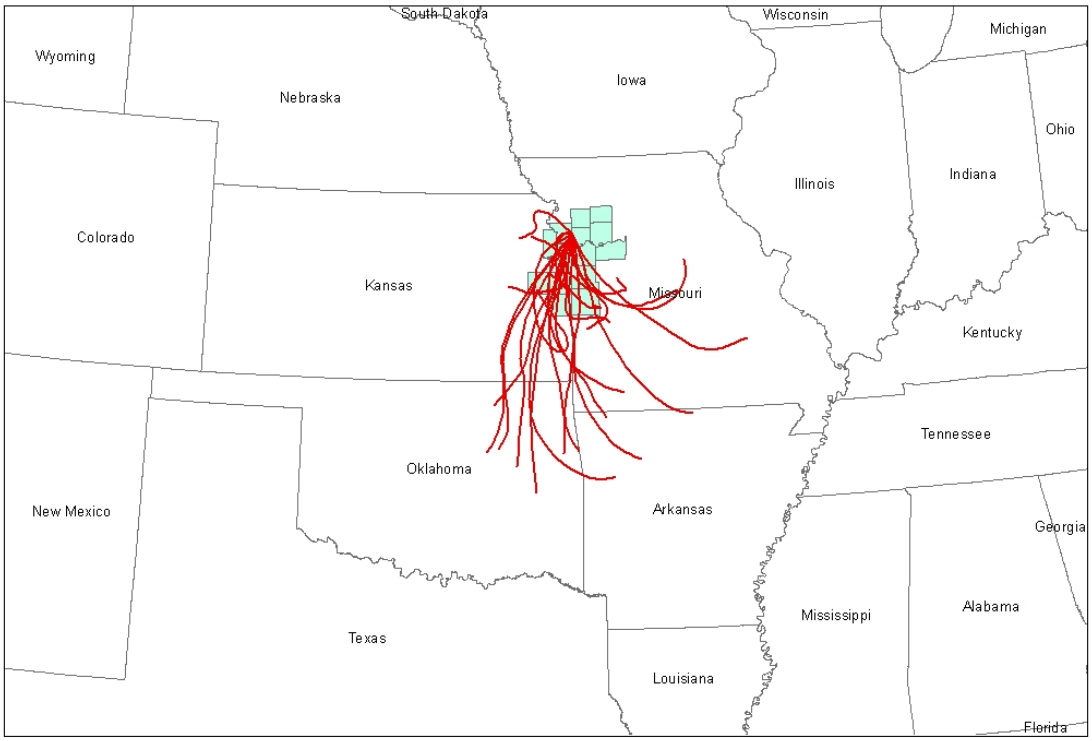


Figure C-9. Kansas City 20m and 500m Back Trajectories, 8-Hour Ozone Exceedance Days, 2005

20-Meter Back Trajectories
with Ozone Values > 75 ppb for the Year 2006 at Ending Time 1700



500-Meter Back Trajectories
with Ozone Values > 75 ppb for the Year 2006 at Ending Time 1700

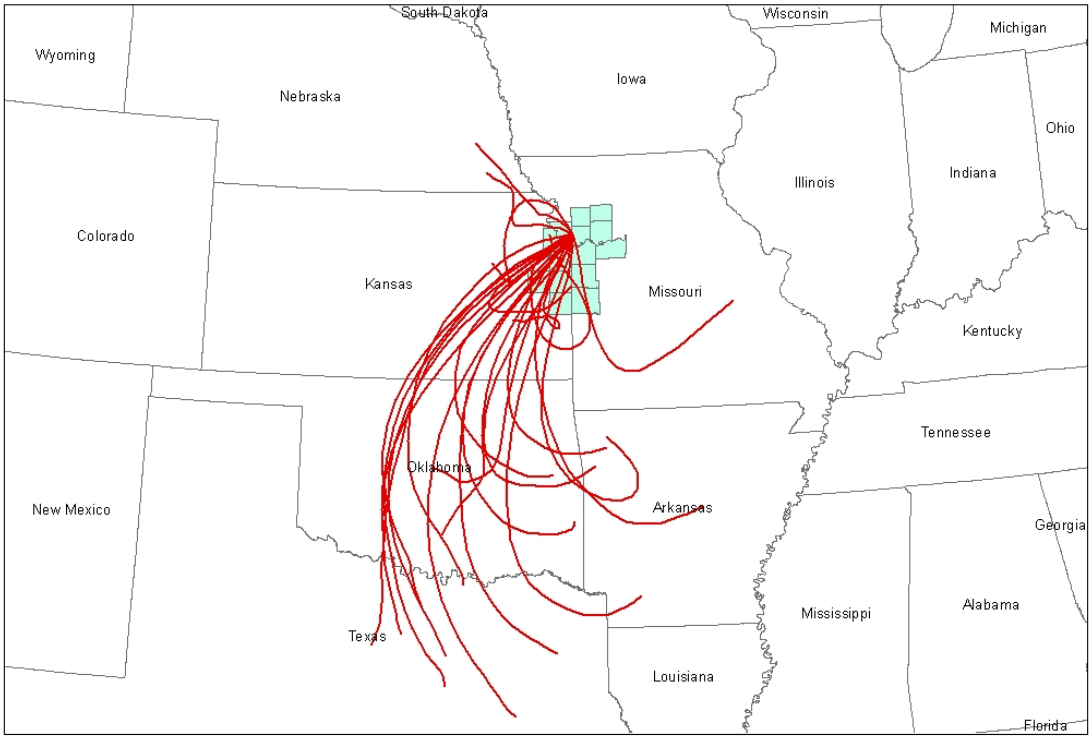
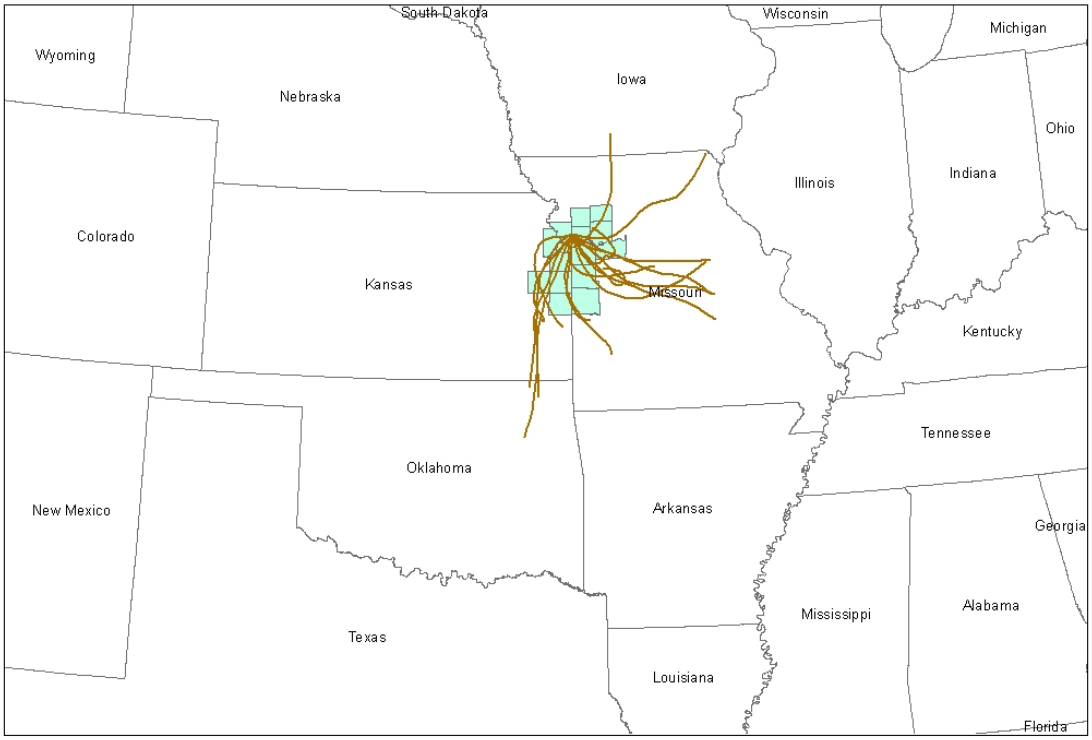


Figure C-10. Kansas City 20m and 500m Back Trajectories, 8-Hour Ozone Exceedance Days, 2006

20-Meter Back Trajectories
with Ozone Values > 75 ppb for the Year 2007 at Ending Time 1700



500-Meter Back Trajectories
with Ozone Values > 75 ppb for the Year 2007 at Ending Time 1700

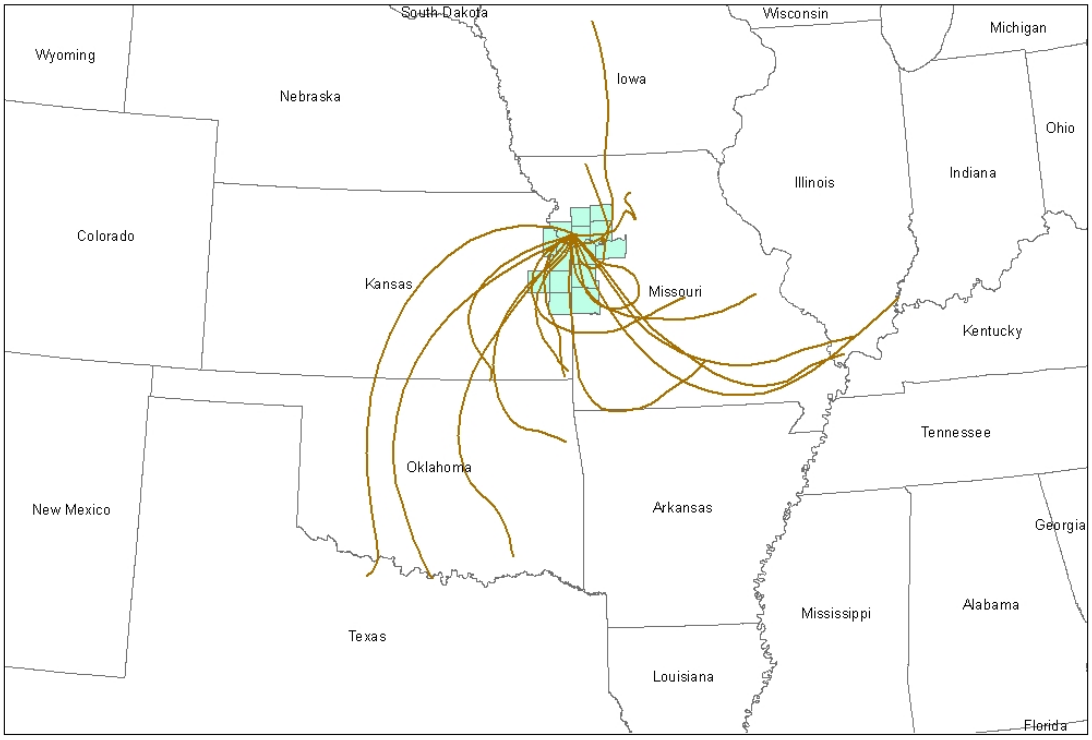


Figure C-11. Kansas City 20m and 500m Back Trajectories, 8-Hour Ozone Exceedance Days, 2007

YR.	MO.	DAY	SITE NAME	MAX. SAMPLE VALUE (PPM)	MAX. TEMP. (°F)	MIN. TEMP. (°F)	AVG. TEMP. (°F)	AVG. WIND SPEED (MPH)	AVG. WIND DIR. (DEG)
2006	APRIL	22	Heritage Park	0.078	80	54	67	6.2	40
		22	RG South	0.080					
	MAY	19	JFK	0.078	95	60	78	6.9	230
		19	Liberty	0.079					
	JUNE	8	JFK	0.078	92	66	79	6.6	230
		9	Watkins Mill	0.077	93	69	81	12.6	190
		9	Liberty	0.081					
		9	Rocky Creek	0.082					
		9	Trimble	0.080					
		10	JFK	0.077	91	66	79	10.4	150
		10	Liberty	0.086					
		10	Rocky Creek	0.087					
		13	Lawrence	0.078	83	57	70	5.7	100
		14	Mine Creek	0.079	89	59	74	11.0	160
		14	Rocky Creek	0.083					
		14	Trimble	0.081					
		15	Lawrence	0.076	91	69	80	17.7	170
		15	Liberty	0.079					
		15	Rocky Creek	0.081					
		15	Trimble	0.078					
		19	JFK	0.077	92	67	80	5.4	170
		19	Liberty	0.085					
		19	Rocky Creek	0.076					
		28	Liberty	0.087	92	59	76	5.2	150
		28	Rocky Creek	0.081					
		29	Mine Creek	0.082	95	65	80	9.5	190
		29	Watkins Mill	0.079					
		29	Liberty	0.084					

YR.	MO.	DAY	SITE NAME	MAX. SAMPLE VALUE (PPM)	MAX. TEMP. (°F)	MIN. TEMP. (°F)	AVG. TEMP. (°F)	AVG. WIND SPEED (MPH)	AVG. WIND DIR. (DEG)
		29	Rocky Creek	0.078					
		30	Lawrence	0.080	95	73	84	11.9	200
		30	Heritage Park	0.076					
		30	Leavenworth	0.080					
		30	Mine Creek	0.081					
		30	JFK	0.080					
		30	RG South	0.077					
		30	Watkins Mill	0.092					
		30	Liberty	0.094					
		30	Rocky Creek	0.087					
		30	Trimble	0.081					
	JULY	1	Lawrence	0.084	97	73	85	12.8	200
		1	Heritage Park	0.082					
		1	Leavenworth	0.083					
		1	Mine Creek	0.081					
		1	JFK	0.085					
		1	RG South	0.080					
		1	Watkins Mill	0.091					
		1	Liberty	0.094					
		1	Rocky Creek	0.087					
		1	Trimble	0.082					
		2	Liberty	0.076	98	72	85	12.0	190
		6	Leavenworth	0.077	83	63	73	8.0	90
		8	JFK	0.081	89	63	76	7.8	170
		8	Watkins Mill	0.083					
		8	Liberty	0.088					
		8	Rocky Creek	0.094					
		8	Trimble	0.089					

YR.	MO.	DAY	SITE NAME	MAX. SAMPLE VALUE (PPM)	MAX. TEMP. (°F)	MIN. TEMP. (°F)	AVG. TEMP. (°F)	AVG. WIND SPEED (MPH)	AVG. WIND DIR. (DEG)
		12	Liberty	0.076	91	71	81	4.1	240
		12	Rocky Creek	0.077					
		13	Rocky Creek	0.086	98	69	84	10.5	160
		13	Trimble	0.086					
		15	JFK	0.099	95	73	84	4.2	160
		15	Rocky Creek	0.078					
		16	Watkins Mill	0.076	99	73	86	8.9	170
		16	Liberty	0.081					
		16	Rocky Creek	0.083					
		16	Trimble	0.083					
		17	Watkins Mill	0.083	100	77	89	10.4	190
		17	Liberty	0.087					
		18	Lawrence	0.081	96	75	86	9.3	80
		19	JFK	0.084	104	79	92	9.7	170
		19	RG South	0.078					
		19	Watkins Mill	0.105					
		19	Liberty	0.106					
		19	Rocky Creek	0.091					
		19	Trimble	0.084					
		20	Heritage Park	0.081	98	82	90	10.4	300
		20	JFK	0.077					
		20	RG South	0.085					
		20	Liberty	0.078					
		24	Liberty	0.076	92	65	79	9.2	180
		25	Watkins Mill	0.077	98	73	86	14.0	180
		25	Liberty	0.078					
		25	Rocky Creek	0.078					
		25	Trimble	0.078					
		26	Liberty	0.076	98	78	88	12.6	210

YR.	MO.	DAY	SITE NAME	MAX. SAMPLE VALUE (PPM)	MAX. TEMP. (°F)	MIN. TEMP. (°F)	AVG. TEMP. (°F)	AVG. WIND SPEED (MPH)	AVG. WIND DIR. (DEG)
		28	Rocky Creek	0.085	96	69	83	7.2	170
		28	Trimble	0.081					
	AUG.	5	Rocky Creek	0.084	98	73	86	11.0	150
		5	Trimble	0.077					
		6	Liberty	0.092	104	78	91	9.5	160
		6	Rocky Creek	0.078					
		7	Lawrence	0.085	95	75	85	10.7	70
		8	Lawrence	0.080	91	76	84	11.7	90
		9	Watkins Mill	0.093	103	75	89	8.8	170
		9	Liberty	0.093					
		9	Rocky Creek	0.083					
		9	Trimble	0.083					
		11	Lawrence	0.076	93	71	82	8.6	60
		17	Liberty	0.079	93	72	83	8.3	160
		17	Rocky Creek	0.079					
		17	Trimble	0.087					
		22	Lawrence	0.084	89	69	79	6.9	70
		23	Liberty	0.079	94	68	81	9.2	160
		23	Rocky Creek	0.082					
		23	Trimble	0.085					
		24	Rocky Creek	0.081	96	71	84	9.5	160
		24	Trimble	0.080					
2007	MAY	13	Rocky Creek	0.082	87	60	74	8.7	170
		13	Trimble	0.083					
	JUNE	13	Rocky Creek	0.084	85	69	77	8.8	140
		13	Trimble	0.080					
		14	Heritage Park	0.079	86	66	76	9.4	130
		14	JFK	0.078					
		14	RG South	0.081					

YR.	MO.	DAY	SITE NAME	MAX. SAMPLE VALUE (PPM)	MAX. TEMP. (°F)	MIN. TEMP. (°F)	AVG. TEMP. (°F)	AVG. WIND SPEED (MPH)	AVG. WIND DIR. (DEG)
		14	Watkins Mill	0.077					
		14	Liberty	0.083					
		14	Rocky Creek	0.089					
		14	Trimble	0.090					
		15	Rocky Creek	0.082	90	68	79	7.5	130
		15	Trimble	0.081					
		16	Watkins Mill	0.079	89	65	77	4.6	180
		16	Liberty	0.081					
		16	Rocky Creek	0.089					
		16	Trimble	0.087					
	JULY	6	Rocky Creek	0.083	89	68	79	4.6	190
		6	Trimble	0.081					
		16	Trimble	0.081	91	68	80	7.2	190
		25	Rocky Creek	0.082	89	67	78	7.5	190
		25	Trimble	0.080					
		26	Watkins Mill	0.084	91	64	78	9.0	200
		26	Liberty	0.086					
		26	Rocky Creek	0.079					
	Aug.	1	Leavenworth	0.088	94	73	84	4.7	160
		1	JFK	0.079					
		1	Liberty	0.079					
		1	Rocky Creek	0.099					
		1	Trimble	0.086					
		10	Rocky Creek	0.084	96	72	84	7.5	150
		10	Trimble	0.082					
		12	Liberty	0.099	100	74	87	5.4	150
		12	Rocky Creek	0.092					
		14	Liberty	0.078	101	74	88	8.1	210
		15	Liberty	0.078	102	74	88	9.0	210

YR.	MO.	DAY	SITE NAME	MAX. SAMPLE VALUE (PPM)	MAX. TEMP. (°F)	MIN. TEMP. (°F)	AVG. TEMP. (°F)	AVG. WIND SPEED (MPH)	AVG. WIND DIR. (DEG)
		16	Heritage Park	0.080	97	77	87	7.1	60
		16	JFK	0.077					
		16	RG South	0.078					
		17	Leavenworth	0.077	94	74	84	9.5	100
		17	Rocky Creek	0.076					
		28	Liberty	0.078	98	70	84	10.4	200
		28	Rocky Creek	0.076					
	SEPT.	2	Liberty	0.079	91	59	75	4.5	170
		2	Rocky Creek	0.078					
		3	Liberty	0.077	94	63	79	6.6	190
		3	Rocky Creek	0.078					
		4	Rocky Creek	0.076	95	69	82	7.3	180
2008	JUNE	18	Trimble	0.078	82	61	72	3.2	180
	JULY	17	Rocky Creek	0.077	90	67	79	9.3	180
		17	Trimble	0.078					
	AUG.	5	RG South	0.079	91	76	84	9.8	20
				2006-2008 Averages	93.4	69.3	81.5	8.6	

Table C-1. Summary of Meteorological Conditions on 8-Hour Ozone Exceedance Days, 2006-2008

Appendix D
Population, Growth and Employment

Table D-1. Summary of Population Data by County, 2000-2025

County	Total Pop 2000 (people)	Total Pop 2005 (people)	Total Pop 2006 (people)	Total Pop 2007 (people)	Total Pop 2010 (people)	Total Pop 2015 (people)	Total Pop 2020 (people)	Total Pop 2025 (people)
Douglas County	100,288	104,466	108,517	113,488	116,671	126,485	137,530	149,986
Franklin County	24,784	25,708	26,007	26,479	26,848	28,004	29,282	30,686
Johnson County	451,479	486,752	506,299	526,319	561,556	626,723	701,381	786,890
Leavenworth County	68,691	71,233	71,816	73,603	77,489	82,361	87,741	93,690
Linn County	9,570	9,682	9,851	9,767	10,108	10,381	10,679	11,005
Miami County	28,351	28,951	29,944	31,078	32,611	34,967	37,564	40,429
Wyandotte County	157,882	156,230	154,381	153,956	153,838	152,431	151,492	151,021
Bates County	16,653	17,013	16,954	17,034	17,232	17,673	18,129	18,539
Caldwell County	8,969	9,086	9,165	9,284	9,342	9,656	9,987	10,312
Cass County	82,092	88,236	92,827	97,133	102,491	112,247	121,499	129,880
Clay County	184,006	193,769	201,195	211,952	220,635	241,150	261,469	281,228
Clinton County	18,979	20,023	20,440	20,894	22,015	23,459	24,821	26,049
Jackson County	654,880	661,668	662,647	666,890	668,867	678,274	689,226	701,350
Lafayette County	32,960	32,898	32,898	32,677	32,791	32,785	32,869	32,923
Platte County	73,781	79,334	82,207	84,881	88,964	95,966	102,810	109,228
Ray County	23,354	23,626	23,489	23,482	23,616	23,787	24,012	24,230

Source:
Population http://factfinder.census.gov
Kansas Projections http://www.ipsr.ku.edu/ksdata/ksah/population/2pop17.xls
Missouri Projections http://oa.mo.gov/bp/projections/TotalPop.xls

Figure D-1. Summary of Population Data by County 2000-2025

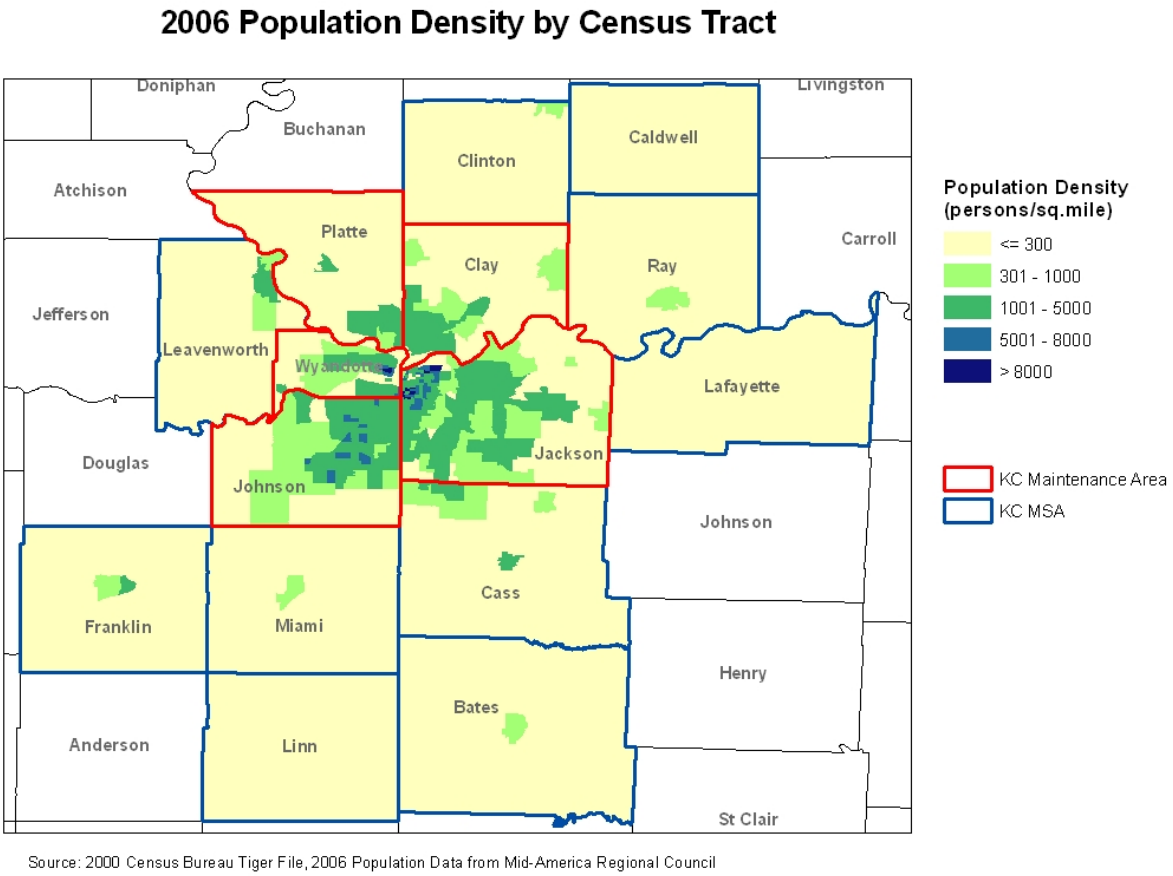
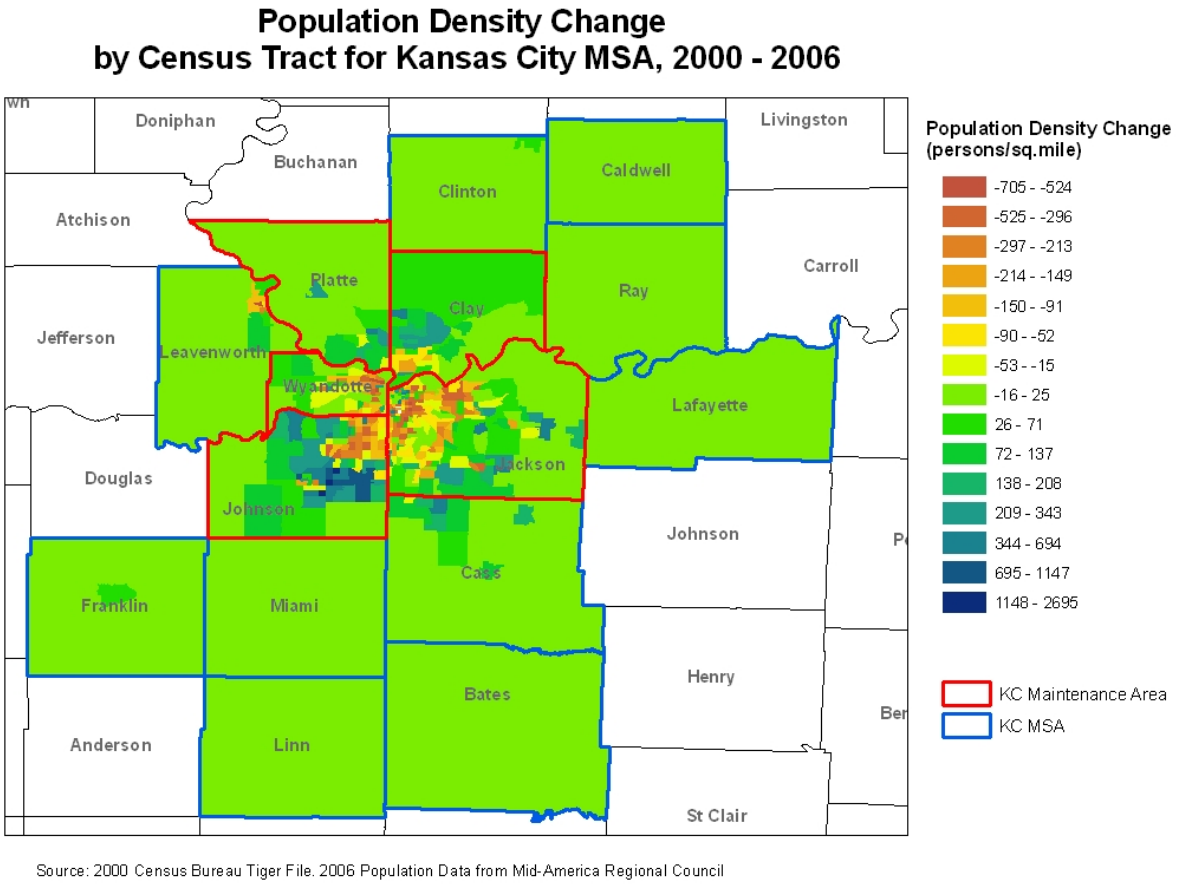
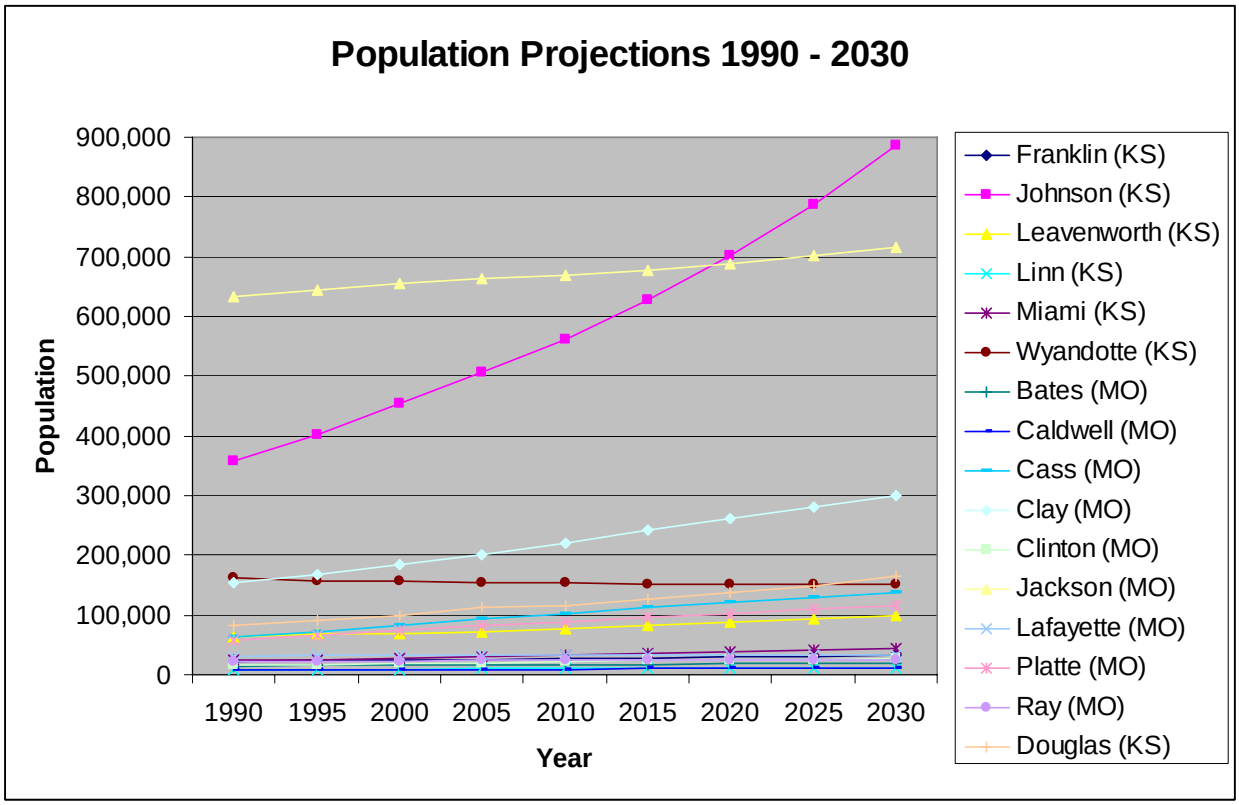


Figure D-2. 2000 to 2006 Population Density Change by Census Tract



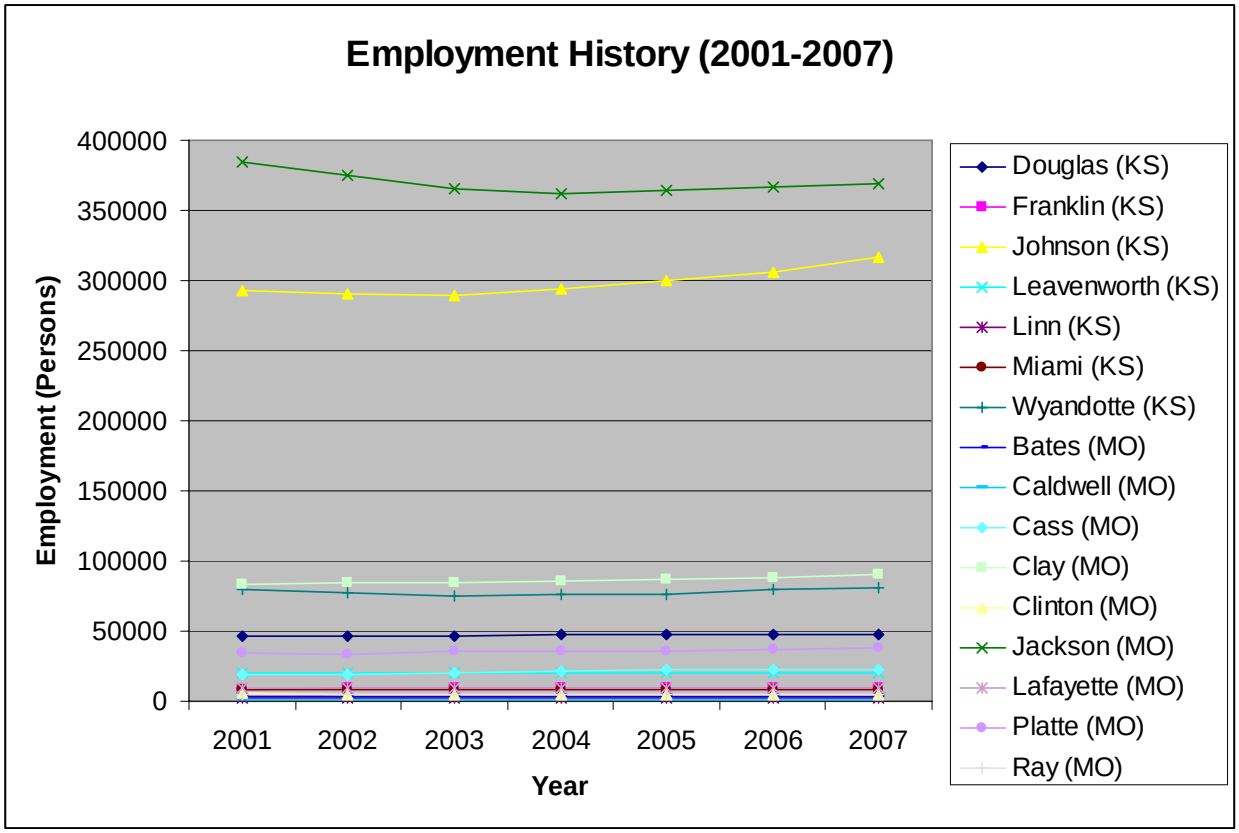
Source: 2000 Census Bureau Tiger File. 2006 Population Data from Mid-America Regional Council

Figure D-3. 1990 – 2030 Population Growth Projections by County



Source:
Kansas Projections http://www.ipsr.ku.edu/ksdata/ksah/population/2pop17.xls
Missouri Projections http://oa.mo.gov/bp/projections/TotalPop.xls

Figure D-4. Employment History 2001-2007



Source: U.S. Bureau of Labor Statistics

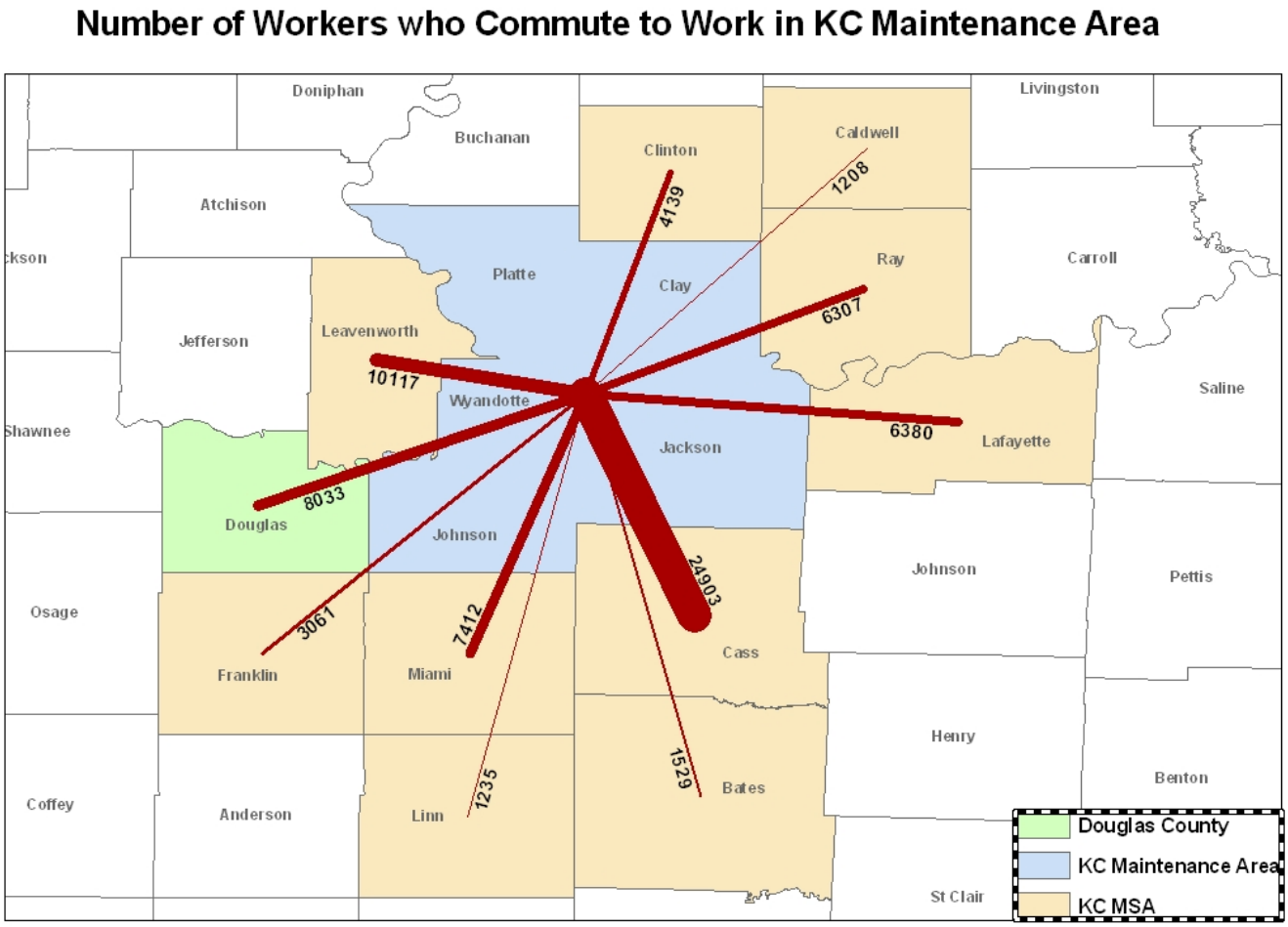
Appendix E
Transportation

Table E-1. 2002 and 2005 Total VMT Traveled by County

County Name	2002 total VMT (10^6 miles)	2005 total VMT (10^6 miles)
Franklin	430	431
Johnson	4,742	5,147
Leavenworth	649	653
Linn	156	150
Miami	283	309
Wyandotte	1,572	1,691
Douglas	737	826
Bates	300	278
Caldwell	157	149
Cass	936	971
Clay	2,000	2,069
Clinton	313	313
Jackson	5,195	5,333
Lafayette	668	643
Platte	1,209	1,237
Ray	190	182

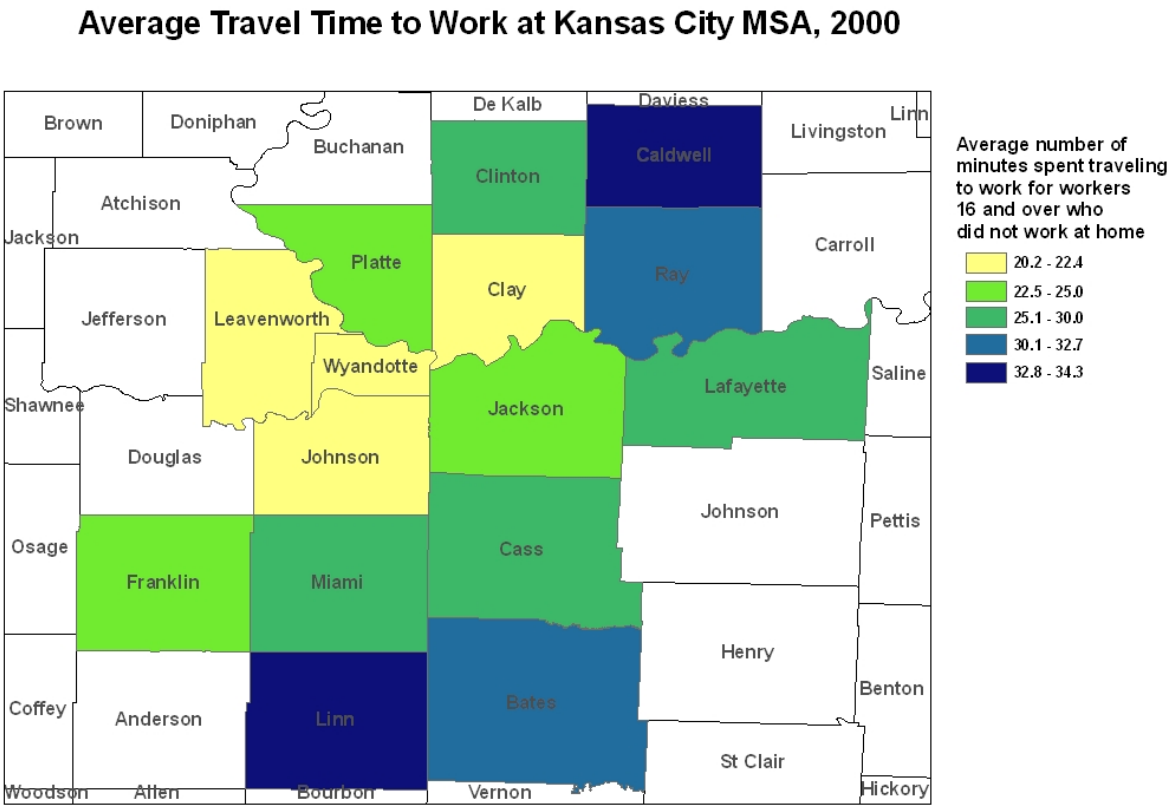
Source: EPA NMIM database

Figure E-1. Commute patterns from MSA counties into the current KC Maintenance Area



Source: U.S. Census Bureau. 2000 Census County-To-County Worker Flow Files

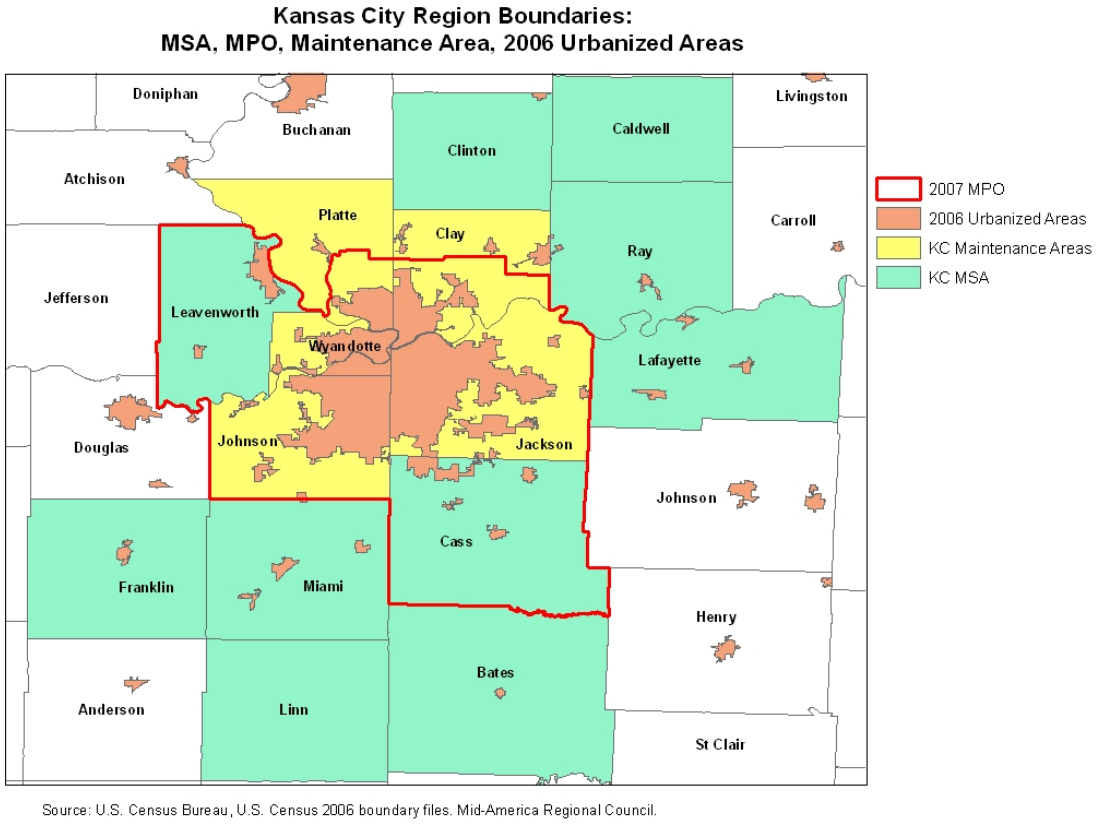
Figure E-2. Average Travel Time to Work



Source: http://factfinder.census.gov

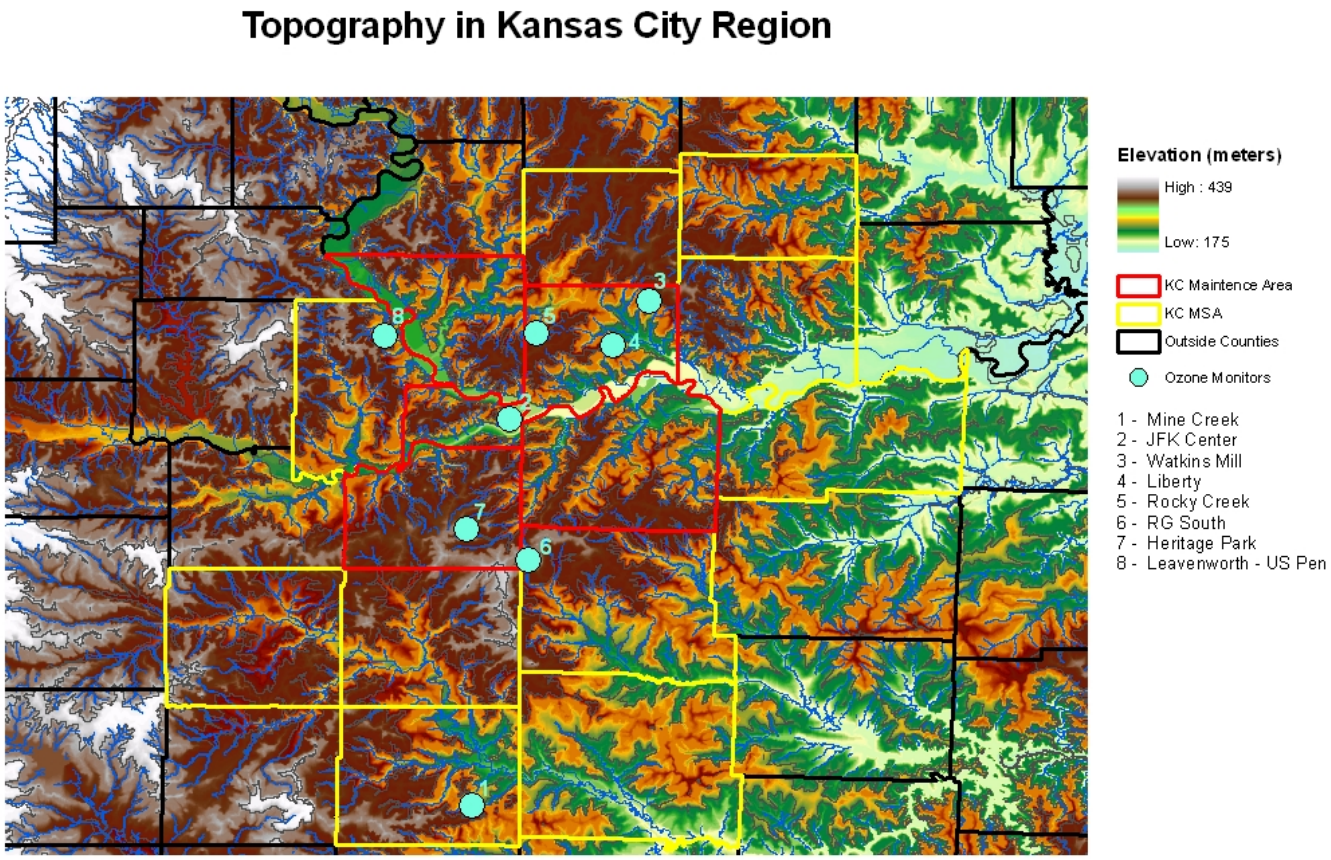
Appendix F
Topography & Geography

Figure F-1. Kansas City Region Boundaries



Source: U.S. Census Bureau, U.S. Census 2006 boundary files. Mid-America Regional Council.

Figure F-2. Topography of Kansas City Area and Locations of Ozone Monitoring Sites



Appendix G
Multi-Criteria Integrated Resource Assessment (MIRA) for the 2009 Kansas City Ozone Designation Process

Multi-Criteria Integrated Resource Assessment (MIRA) for the 2009 Kansas City Ozone Designation Process

Introduction

Multi-Criteria Integrated Resource Assessment (MIRA) is a new approach to environmental policy decision analysis developed by EPA Region III. Its purpose is to facilitate decision analysis through an improved understanding and interconnection between both the scientific data and the societal values that are present in all environmental policy questions. The MIRA process consists of nine major steps:

1. Define decision criteria;
2. Select the "problem set," which is the set of elements that are to be ranked using MIRA (e.g., the decision options or pollutant sources);
3. Gather the data needed for each criterion;
4. Index the data;
5. Weight the criteria;
6. Create an initial "decision set," which is a problem set whose elements are ranked on the basis of the data and criteria weighting;
7. Create many different decision sets for the initial problem set and modify that problem set if appropriate as learning occurs and additional options are discovered (iteration);
8. Conduct stakeholder deliberation; and
9. Make the final decision.

In the case of the Kansas City ozone designation process, the decision criteria and problem set are defined by the 2008 EPA guidance memo that describes the 9 criteria EPA has determined important for an ozone nonattainment designation. In Table 1, the MIRA analysis KDHE has used and EPA criteria guidance are outlined with a direct comparison of how the two relate to each other.

Table G-1. Comparison of the 9 EPA guidance criteria and the KDHE MIRA analytical criteria.

EPA Guidance Memo (March 2000)	MIRA Analysis
1. Air quality monitoring data	1. Air quality monitoring data for counties with monitors
2. Emission sources	2. VOC/NO_x (point, nonpoint, mobile) emissions for all areas
3. Population density/urbanization	3. Population density/population in CBSA
4. Traffic/commuting patterns	4. CBSA, VMT, commute connectivity
5. Expected growth	5. VMT and population growth estimates
6. Meteorology	6. Meteorology considered in data for AQ modeling and in transport analysis
7. Geography/topography	7. Geography and topography considered in data for AQ modeling
8. Jurisdictional boundaries	8. County, CBSA
9. Level of emissions controls	9. Control margin

Using the MIRA tool, KDHE gathered the data needed for each criterion. The tool then allows for the indexing and weighting of the datasets, and finally leads to a learning process that informs the final decision of whether a county should be designated attainment or nonattainment.

Inputs

KDHE obtained the latest MIRA tool used for national ozone designations from EPA Region III. KDHE also obtained the last MIRA evaluation performed by EPA Region VII during the 2003 designation process. With these two previous ozone evaluations, KDHE updated the tool for the new ozone standard and prepared various decision sets to evaluate the 9 criteria in the 2008 EPA designation guidance. These various decision sets were then used as a learning process to help form the ozone nonattainment recommendation for the Kansas counties within the Kansas City MSA.

The primary weighting criteria the KDHE used in the final analysis are found in Table G-2. Secondary weighting are found in Table 3. KDHE believes that this final weighting set is most applicable to the ozone designation for the Kansas City area. KDHE added the commute connectivity as one of the primary weighting criteria, while removing the NO_x SIP call criteria, which did not apply to Kansas.

Table G-2. Primary weighting criteria for KDHE's decision set.

Primary Level	Weight
AQ monitoring data	0.25
Emissions	0.30
Commute connectivity	0.10
Jurisdictional boundaries	0.15
Population	0.20

Several of the primary datasets have secondary weightings used to help form the final decision. For example, the air quality level includes as secondary weighting categories magnitude, uncertainty and attainment/nonattainment. The emissions and population categories also have secondary weightings. All of the weightings can be found in the MIRA spreadsheet. One of the notable weightings that deserve further discussion includes the secondary air quality weightings. Within this dataset the Department decided to put 85% of the weight on the magnitude of monitored values, 10% on the uncertainty of monitored values, and 5% on the attainment/nonattainment weighting. The Department believes this is justified because putting a high weight on just the nonattainment bright line of 76 ppb makes a very large impact on the ranking of monitors/counties that might only differ in their respective design values by 1 ppb. This became very apparent during the analysis when a new set of monitoring data became available, and certain monitors went from attainment to nonattainment. Uncertainty in air quality was also an issue with several counties not having monitors and relying upon krieged data. Therefore, the Department decided that the magnitudes of the monitored design values were much more important weighting criteria than those relating to uncertainty or attainment/nonattainment.

Table G-3. Secondary weighting criteria for KDHE's decision set.

AIR QUALITY	Weight	Jurisdiction	Weight
Magnitude	0.85	CBSA or CMSA's	1
Uncertainty	0.1		
Attn / NonAttn	0.05		
EMISSIONS	**Weight**	**Magnitude**	**Weight**
Magnitude	0.7	NOx Emissions	0.6
Control Margin	0	VOC Emissions	0.4
Growth	0.3		
NOx Emissions	**Weight**	**VOC Emissions**	**Weight**
Total Emissions	0.5	Total Emissions	0.5
Emissions Density	0.5	Emissions Density	0.5
NOX Total Emissions	**Weight**	**VOC Total Emissions**	**Weight**
Point	0.33	Point	0.33
Area	0.33	Area	0.34
Mobile	0.34	Mobile	0.33
NOx Emissions Density	**Weight**	**VOC Emissions Density**	**Weight**
Point	0.25	Point	0.25
Area	0.4	Area	0.4
Mobile	0.35	Mobile	0.35
GROWTH	**Weight**	**Population**	**Weight**
VMT Growth	0.4	Total Population	0.5
Pop. Growth	0.6	Population Density	0.5

The commute connectivity was also an addition to the MIRA tool that did not exist in the versions of MIRA obtained from EPA. The commute connectivity category gives an indication of how many workers living in counties outside the current five-county maintenance area commute into these five counties on a daily basis. This category is an indication of the commuting patterns that connect surrounding counties to the current maintenance area. KDHE believes it is important to look at this connectivity, along with the total VMT in each individual county, and has therefore assigned a primary weighting of 10% to this category.

Another change the Department made to the EPA version of the MIRA tool was the transport of pollutants. The original tool was designed and implemented for counties included in the NO_x SIP call and OTAG transport regions. The State of Kansas is not subject to the NO_x SIP call nor is it in the OTAG region, thus the Department devised a more appropriate local transport metric for this designation analysis and did not include a regional transport calculation. For the local transport metric, the Department used the back trajectories for three starting times on days with ozone concentration > 75 ppb from Rocky Creek, the monitor with the highest design value in the Kansas City area. From the back trajectories was taken the count of the trajectories crossing each county in the MSA plus Douglas County, weighting this count by both the total emissions and distance from the county centroid to Rocky Creek monitor. A county close to Rocky Creek with very few trajectories crossing it during high ozone days will have a very low local transport factor, while a county with many trajectories will have a higher transport factor, varying with both distance from the monitor and the ratio of emissions in that county to the total

MSA emissions. These local transport metric values are then used to enhance the total emissions from a county by a factor from 1 to 2, depending on the value of the transport metric for the respective county being evaluated.

The remaining inputs used for MIRA were updated with the latest available data, such as population, VMT, emissions, etc. These county-level data can be found directly in the MIRA tool under the inputs tab. Ozone monitoring data was assigned to each county. If two or more ozone monitors existed in a county, the highest monitored reading in that county was assigned. For those counties without an ozone monitor, a krieged monitoring value was derived at the county centroid and assigned to the county. The ozone monitoring data assigned to each county is found in Table G-4. Krieged air quality values are highlighted yellow in the table.

Table G-4. MIRA inputs: County air quality monitoring assigned values.

County	2008 Air Quality	2007 Air Quality	2006 Air Quality	2005 Air Quality
	Annual 4th highest 8 hr ozone concentration (ppb)			
Douglas (KS)	64	73	81	73
Franklin (KS)	63	71	78	74
Johnson (KS)	62	71	76	81
Leavenworth (KS)	64	80	74	77
Linn (KS)	63	70	79	75
Miami (KS)	63	70	77	78
Wyandotte (KS)	61	73	81	79
Bates (MO)	64	71	78	78
Caldwell (MO)	66	72	87	78
Cass (MO)	66	72	78	81
Clay (MO)	69	89	87	87
Clinton (MO)	70	83	85	87
Jackson (MO)	65	74	85	82
Lafayette (MO)	64	71	85	79
Platte (MO)	66	83	80	86
Ray (MO)	65	71	89	79

Results

Table G-5 contains the ranking of the counties when applying the final criteria KDHE chose as described above. The rankings are in order from most to least nonattainment, and also include bins which give the reviewer an indication of which counties group together in the rankings. From the results, KDHE believes there is a clear break between Wyandotte County and the remaining Kansas counties included in this analysis. Douglas and Leavenworth are very close in the rankings but for differing reasons. Douglas is ranked slightly higher than Leavenworth based on its connectivity and greater potential for local emissions transport during high ozone days in Kansas City, while Leavenworth is where it is in the ranking mainly because it's a downwind county receiving emissions

and ozone from the Kansas City metro area. Clearly all counties in bins 1-5 should be included as nonattainment counties, while counties in bins 7 and 8 are "on the bubble" with respect to a nonattainment designation. KDHE believes counties included in bins 9 and 10 should remain as attainment counties.

Table G-5. Ranking of nonattainment based on selected MIRA weighting criteria.

	County *Ranked most to least nonattainment*	**Criteria Sum**	**Bin**
1	Jackson (MO)	5.89	1
2	Clay (MO)	5.70	2
3	Johnson (KS)	5.59	2
4	Platte (MO)	4.94	4
5	Wyandotte (KS)	4.77	5
6	Cass (MO)	4.26	7
7	Clinton (MO)	4.04	7
8	Douglas (KS)	3.99	7
9	Leavenworth (KS)	3.95	8
10	Lafayette (MO)	3.63	9
11	Miami (KS)	3.63	9
12	Ray (MO)	3.34	9
13	Franklin (KS)	3.29	10
14	Caldwell (MO)	3.19	10
15	Linn (KS)	3.08	10
16	Bates (MO)	3.02	10

Many different scenarios were evaluated while performing the analysis within the MIRA tool. Many of these different analyses are included in the "Preferences" tab within the tool. Everything from 100% weightings of primary level criteria to various secondary level weightings were evaluated. During the analyses the air quality became one of the more interesting datasets to evaluate, as the addition of the 2008 ozone data changed both the magnitude and nonattainment readings for several ozone monitors.

Summary

MIRA has been used to help inform the process of determining which counties in the Kansas City metro area should be designated nonattainment for the new ozone standard. KDHE gathered and developed both inputs and new criteria for use in the existing EPA MIRA tool. KDHE reviewed many different weighting criteria before finalizing on the current weighting criteria used as part of the nonattainment designation. The final decision on which Kansas counties would be included in the Kansas City nonattainment designation relied heavily upon the learning process gained through the use of the MIRA tool. KDHE believes the chosen weighting criteria contain and address EPA's 9 criteria in a fair and transparent way.

Kansas City OSAT modeling in support of 8-hour Ozone Designation

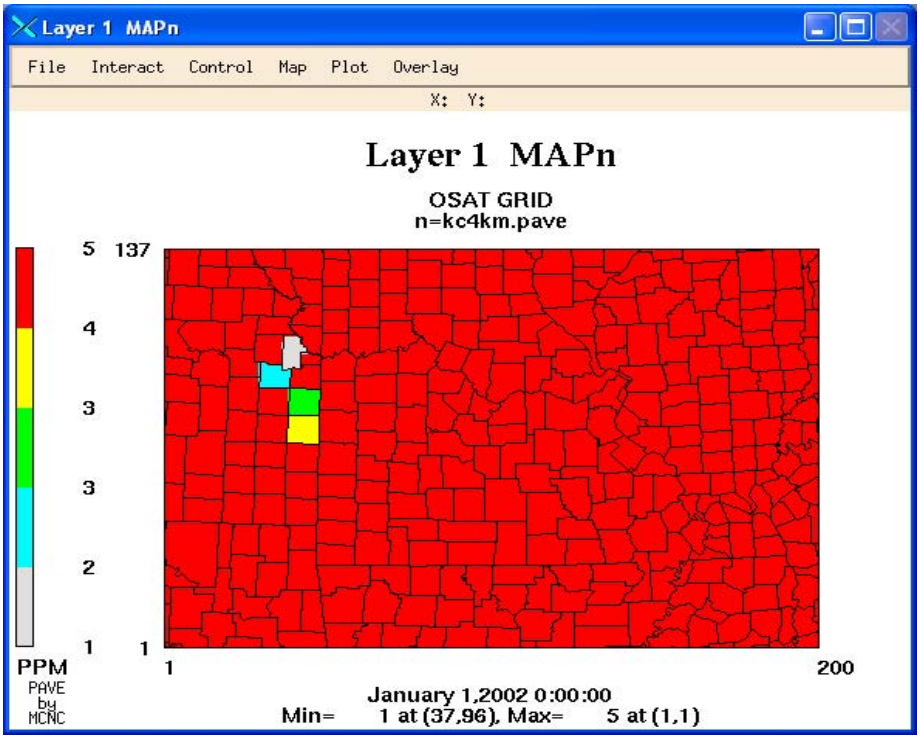
Introduction

CAMx is a state of the science photochemical model that contains a variety of source apportionment tools, including the ozone source apportionment tool (OSAT). OSAT allows for the attribution of ozone formation to various sources and receptors defined within a model. Use of source apportionment is more desirable than the use of the "zero-out" approach to determine geographic culpability. Zeroing out emissions for large regions potentially changes the modeled atmospheric chemistry and makes interpretation of the results difficult. In this study four source regions, Leavenworth, Douglas, Miami and Linn Counties in Kansas were defined in the OSAT run. No attempt was made to do sector contribution from within these counties. Seven receptors were defined in the analysis reflecting the current monitoring network in Kansas City.

Methodology

The same episode and grid domains described in the accompanying controls modeling document were utilized in this OSAT analysis. KDHE used the latest version of CAMx, v4.51, in order to utilize the most recent source apportionment code. The source regions for OSAT are:

1 – Leavenworth County
2 – Douglas County
3 – Miami County
4 – Linn County
5 – All remaining counties within the modeling domain



In addition to the emissions in the source regions above, the OSAT run also contains representative concentrations for initial conditions and boundary conditions. Boundary conditions represent pollution inflow into the model from the lateral edges of the grid domain and initial conditions provide an estimation of pollution that already exists within the domain at the beginning of the modeling episode. In this episode run, boundary conditions generally represent 20% of the ozone formation at any given time. Initial conditions generally trend towards zero as the model moves from spin-up days to episode days. Each source region includes all emission categories including point, non-point, onroad, nonroad, and biogenic.

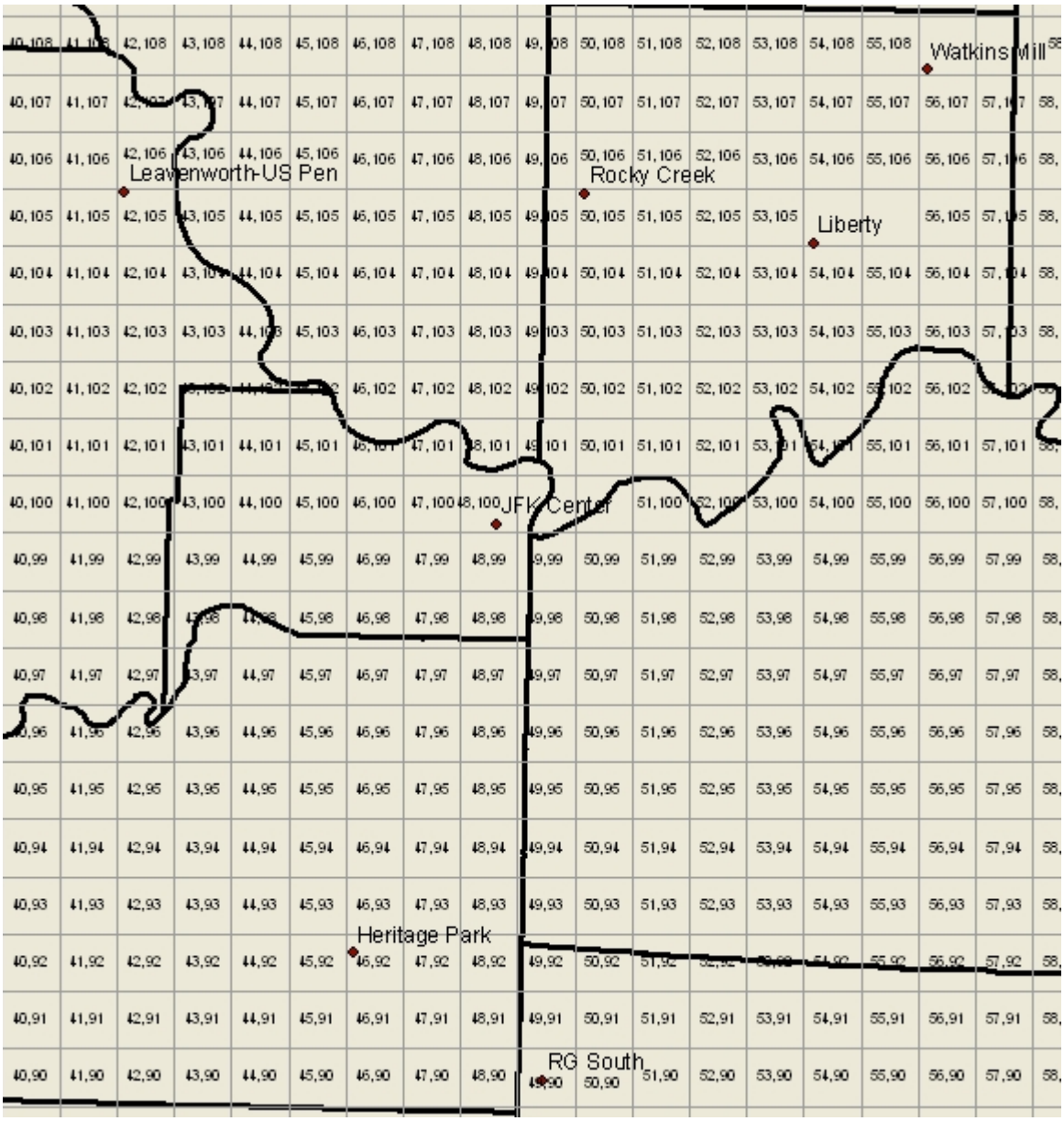
The ozone monitors used in the OSAT analysis as receptors are represented as points in the initial OSAT run. They are (with X, Y grid location):

Name	X (km)	Y (km)
Rocky Creek	-131.337	307.606
Leavenworth	-163.468	307.624
JFK	-137.458	284.689
Liberty	-115.291	304.293
Heritage Park	-147.452	254.963
Watkins Mill	-107.475	316.337
Richards Gebaur	-134.254	245.891

The above point receptors are included in the source apportionment receptor files included with this report.

In addition to the point receptors files, KDHE utilized the ranktrac program, provided by Bret Anderson, EPA Region 7 (developed by Environ), to review the OSAT run. Ranktrac allows for the calculation of the average contribution of a source area to a receptor area over a specific modeling period and ozone threshold. For this analysis, the same source areas were used with a 3 x 3 group of grid cells surrounding each of the ozone monitors. An ozone threshold of 75 ppb was used in the calculations across the modeling period Aug 17th thru Aug 21st, 1998.

Monitoring locations are shown in the figure below along with the 4km grid cells included in the monitoring domain. 4km grid cells have been labeled for identification in the ranktrac receptor setup.



Results

KDHE utilized two forms of post processing in the OSAT analysis, individual hourly receptor files and ranktrac. Because the hourly receptor files are best viewed interactively with a spreadsheet, the department is not including an analysis directly using these outputs in this document. The department has included the output files along with a spreadsheet to evaluate the results should that be desired.

Ranktrac provides average source apportionment results which are very useful for this analysis. The table below has 8-hour ozone contributions for the nine grid cells representing Rocky Creek. The source regions are similar as described above so each monitor will have contributions from initial conditions, boundary conditions, the four counties in question, and the remaining counties in the modeling domain excluding the four above which are tracked separately. For each source group ozone formation is apportioned to either NO_x or VOC emissions from each group. An average, a maximum

and minimum ozone contribution is provided for the entire modeling episode for all 8-hour periods where the ozone is above a certain threshold. In this analysis, a threshold of 75 ppb was used as representative value of the current ozone standard.

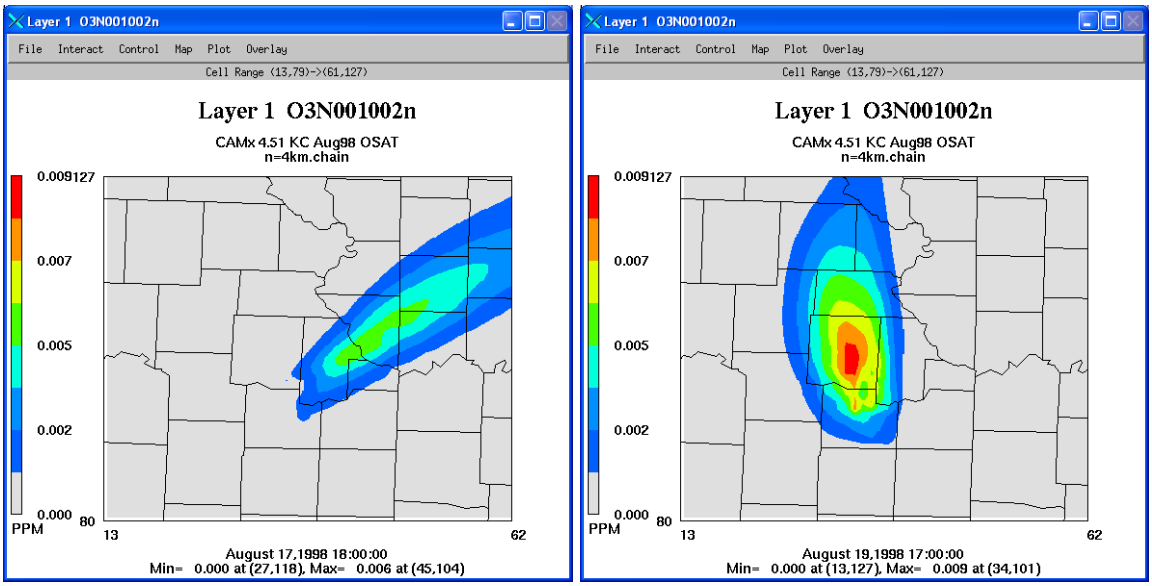
For Rocky Creek the analyses of contributions are:

Source	Pollutant	Average Contribution (ppb)	Maximum Contribution (ppb)	Minimum Contribution (ppb)
Domain remainder	NOx	41.3	51.5	26.7
Domain remainder	VOC	25.8	36.3	11.6
Boundary Conditions	NOx	8.7	12.0	4.7
Boundary Conditions	VOC	7.5	9.8	4.2
Linn County	NOx	1.7	3.2	0.0
Initial Conditions	NOx	1.5	4.2	0.3
Initial Conditions	VOC	1.5	4.1	0.3
Leavenworth County	NOx	0.2	3.4	0.0
Douglas County	NOx	0.2	2.7	0.0
Miami County	NOx	0.2	0.6	0.0
Leavenworth County	VOC	0.1	1.6	0.0
Linn County	VOC	0.1	0.2	0.0
Miami County	VOC	0.1	0.1	0.0
Douglas County	VOC	0.0	0.5	0.0

This OSAT run indicates that for Rocky Creek the majority of the emissions that are contributing to 8-hour ozone formation around this monitoring site come from areas within the 4km domain excluding the four counties of interest. So 67.0 ppb on average are attributed to the domain remainder, 16.2 ppb from boundary conditions, 3.0 ppb from initial conditions, 1.8 ppb from Linn County (mainly NOx – likely La Cygne), 0.3 ppb from Leavenworth and Miami, followed by 0.2 ppb from Douglas (all attributed to NOx). It should be noted that the inventory being used in this run does not reflect the significant reduction in NO_x emissions from the La Cygne power plant, thus the ozone contribution attributed to Linn County is likely overstated in this analysis. From this modeling run, it would appear that these four counties of interest on average contribute a very small fraction of the total ozone modeled at the Rocky Creek monitoring location. For this monitoring site, Linn County is the largest contributor with approximately 2% of the ozone formation attributable to this county. Leavenworth County contributes around 0.4% followed by Miami County at 0.3 % and finally Douglas County at 0.2%. So for this episode, the CAMx model is indicating that only 2.9% of ozone at the nine grid cells surrounding Rocky Creek comes from emissions originating in Leavenworth, Douglas, Miami and Linn Counties, further supporting the Department's designation recommendation.

OSAT results can also be visualized by species and source group. Included below are a couple of examples of 8-hour ozone attributed to the Douglas County source group. Visualizations allow the user to view the full extent of the impact a source group may have. In this case the reader can see the extent of the impacts emissions in Douglas County have on ozone formation in the surrounding area. In the case of this August 1998 episode, there is only one day (August 17) where emissions from Douglas County were

likely to impact Rocky Creek. During the remaining days during this episode the wind is predominantly from the South and impacts from Douglas County would not be seen at Rocky Creek.



Conclusion

Ozone source apportionment modeling in support of the Kansas City area designation indicates there is very little contribution from Leavenworth, Douglas, Miami and Linn Counties. For Rocky Creek, the current design monitor for the area, the OSAT analysis indicates that on average these four counties only contribute 2.9% of the ozone for this episode. These results add to the weight of evidence supporting the Department's recommendation that Johnson and Wyandotte Counties should be the only Kansas counties included as nonattainment for the Kansas City ozone designation.

Additional Supporting Files

All inputs and outputs are available upon request (ahawkins@kdheks.gov).

The individual hourly source apportionment receptor files are included below along with a spreadsheet to view them graphically.

camx.19980817.sa.receptor

camx.19980818.sa.receptor

camx.19980819.sa.receptor

camx.19980820.sa.receptor

camx.19980821.sa.receptor

L:\camx\outputs\O3TCOL.XLS

The raw ranktrac results for all monitors are also included below.

```
Extract region     :   6
```

Average file type : COARSE
Contribution type : PPB
Threshold value   :   75.00
COARSE Average file: ../avg8/camx.19980817.sa.8.grd03
COARSE Average file: ../avg8/camx.19980818.sa.8.grd03
COARSE Average file: ../avg8/camx.19980819.sa.8.grd03
COARSE Average file: ../avg8/camx.19980820.sa.8.grd03
COARSE Average file: ../avg8/camx.19980821.sa.8.grd03
No Boundary file   : Using edge cells.

Source	Pollutant	Average Contribution PPB	Maximum Contribution PPB	Minumum Contribution PPB
Domain	NOx	27.57	40.56	19.11
Domain	VOC	18.92	25.41	10.34
Linn	NOx	10.86	13.99	5.34
BC	NOx	9.27	11.26	5.56
BC	VOC	7.73	9.19	4.93
Miami	NOx	1.94	2.97	1.26
IC	NOx	1.00	2.59	0.64
IC	VOC	0.98	2.48	0.63
Miami	VOC	0.95	1.54	0.29
Linn	VOC	0.23	0.36	0.10
Dougla	NOx	0.02	0.04	0.01
Leaven	NOx	0.01	0.03	0.01
Leaven	VOC	0.00	0.01	0.00
Dougla	VOC	0.00	0.01	0.00

Extract region   :   2
Average file type : COARSE
Contribution type : PPB
Threshold value   :   75.00
COARSE Average file: ../avg8/camx.19980817.sa.8.grd03
COARSE Average file: ../avg8/camx.19980818.sa.8.grd03
COARSE Average file: ../avg8/camx.19980819.sa.8.grd03
COARSE Average file: ../avg8/camx.19980820.sa.8.grd03
COARSE Average file: ../avg8/camx.19980821.sa.8.grd03
No Boundary file   : Using edge cells.

Source	Pollutant	Average Contribution PPB	Maximum Contribution PPB	Minumum Contribution PPB
Domain	NOx	37.22	47.28	25.71
Domain	VOC	28.14	37.14	16.71
BC	NOx	8.78	11.75	4.53
BC	VOC	7.45	9.90	4.08
Linn	NOx	3.79	6.89	1.18
IC	NOx	1.16	2.81	0.27
IC	VOC	1.14	2.72	0.28
Miami	NOx	0.50	0.92	0.10
Miami	VOC	0.21	0.42	0.05
Linn	VOC	0.09	0.24	0.01
Dougla	NOx	0.02	0.07	0.00
Leaven	NOx	0.02	0.05	0.00

Leaven	VOC	0.01	0.02	0.00
Dougla	VOC	0.01	0.02	0.00

Extract region : 3
Average file type : COARSE
Contribution type : PPB
Threshold value : 75.00
COARSE Average file: ../avg8/camx.19980817.sa.8.grd03
COARSE Average file: ../avg8/camx.19980818.sa.8.grd03
COARSE Average file: ../avg8/camx.19980819.sa.8.grd03
COARSE Average file: ../avg8/camx.19980820.sa.8.grd03
COARSE Average file: ../avg8/camx.19980821.sa.8.grd03
No Boundary file : Using edge cells.

Source	Pollutant	Average Contribution PPB	Maximum Contribution PPB	Minumum Contribution PPB
Domain	NOx	42.41	51.60	33.16
Domain	VOC	17.79	29.24	9.67
BC	NOx	8.42	11.98	4.80
BC	VOC	7.24	9.72	4.33
IC	NOx	2.04	4.48	0.30
IC	VOC	1.99	4.38	0.30
Linn	NOx	1.35	3.64	0.00
Leaven	NOx	0.59	3.14	0.00
Dougla	NOx	0.54	2.46	0.00
Leaven	VOC	0.32	1.44	0.00
Miami	NOx	0.18	0.86	0.01
Dougla	VOC	0.13	0.62	0.00
Linn	VOC	0.03	0.11	0.00
Miami	VOC	0.02	0.08	0.00

Extract region : 5
Average file type : COARSE
Contribution type : PPB
Threshold value : 75.00
COARSE Average file: ../avg8/camx.19980817.sa.8.grd03
COARSE Average file: ../avg8/camx.19980818.sa.8.grd03
COARSE Average file: ../avg8/camx.19980819.sa.8.grd03
COARSE Average file: ../avg8/camx.19980820.sa.8.grd03
COARSE Average file: ../avg8/camx.19980821.sa.8.grd03
No Boundary file : Using edge cells.

Source	Pollutant	Average Contribution PPB	Maximum Contribution PPB	Minumum Contribution PPB
Domain	NOx	41.14	52.25	27.52
Domain	VOC	18.41	29.41	11.84
BC	NOx	9.36	12.36	5.55
BC	VOC	7.90	10.16	4.97
Linn	NOx	4.85	10.85	1.96
Leaven	NOx	3.52	7.52	1.01
IC	NOx	1.26	2.75	0.35
IC	VOC	1.22	2.65	0.35

Miami	NOx	1.14	2.26	0.34
Leaven	VOC	0.47	1.50	0.06
Dougla	NOx	0.37	1.35	0.02
Miami	VOC	0.20	0.33	0.06
Linn	VOC	0.10	0.25	0.01
Dougla	VOC	0.03	0.09	0.00

Extract region : 7
Average file type : COARSE
Contribution type : PPB
Threshold value : 75.00
COARSE Average file: ../avg8/camx.19980817.sa.8.grd03
COARSE Average file: ../avg8/camx.19980818.sa.8.grd03
COARSE Average file: ../avg8/camx.19980819.sa.8.grd03
COARSE Average file: ../avg8/camx.19980820.sa.8.grd03
COARSE Average file: ../avg8/camx.19980821.sa.8.grd03
No Boundary file : Using edge cells.

Source	Pollutant	Average Contribution PPB	Maximum Contribution PPB	Minumum Contribution PPB
Domain	VOC	25.13	28.97	19.01
Domain	NOx	23.14	27.25	19.78
BC	NOx	9.51	10.65	8.25
BC	VOC	7.90	8.75	6.96
Linn	NOx	7.22	9.64	5.15
Miami	VOC	1.52	1.96	1.00
Miami	NOx	1.02	1.47	0.75
IC	VOC	0.74	0.77	0.71
IC	NOx	0.73	0.76	0.71
Linn	VOC	0.29	0.39	0.20
Dougla	NOx	0.01	0.01	0.01
Leaven	NOx	0.01	0.01	0.01
Dougla	VOC	0.00	0.00	0.00
Leaven	VOC	0.00	0.00	0.00

Extract region : 1
Average file type : COARSE
Contribution type : PPB
Threshold value : 75.00
COARSE Average file: ../avg8/camx.19980817.sa.8.grd03
COARSE Average file: ../avg8/camx.19980818.sa.8.grd03
COARSE Average file: ../avg8/camx.19980819.sa.8.grd03
COARSE Average file: ../avg8/camx.19980820.sa.8.grd03
COARSE Average file: ../avg8/camx.19980821.sa.8.grd03
No Boundary file : Using edge cells.

Source	Pollutant	Average Contribution PPB	Maximum Contribution PPB	Minumum Contribution PPB
Domain	NOx	41.25	51.48	26.70
Domain	VOC	25.77	36.26	11.56

BC	NOx	8.74	11.95	4.67
BC	VOC	7.45	9.77	4.19
Linn	NOx	1.71	3.24	0.00
IC	NOx	1.49	4.22	0.32
IC	VOC	1.46	4.08	0.32
Leaven	NOx	0.23	3.41	0.00
Dougla	NOx	0.22	2.70	0.00
Miami	NOx	0.19	0.64	0.02
Leaven	VOC	0.09	1.58	0.00
Linn	VOC	0.05	0.18	0.00
Miami	VOC	0.05	0.13	0.00
Dougla	VOC	0.04	0.53	0.00

```
Extract region     :   4
Average file type  : COARSE
Contribution type  : PPB
Threshold value    :     75.00
COARSE Average file: ../avg8/camx.19980817.sa.8.grd03
COARSE Average file: ../avg8/camx.19980818.sa.8.grd03
COARSE Average file: ../avg8/camx.19980819.sa.8.grd03
COARSE Average file: ../avg8/camx.19980820.sa.8.grd03
COARSE Average file: ../avg8/camx.19980821.sa.8.grd03
No Boundary file   : Using edge cells.
```

Source	Pollutant	Average Contribution PPB	Maximum Contribution PPB	Minumum Contribution PPB
Domain	NOx	42.30	48.29	35.62
Domain	VOC	13.83	20.88	8.20
BC	NOx	7.88	11.52	5.01
BC	VOC	6.83	9.39	4.47
IC	NOx	2.40	4.23	0.31
IC	VOC	2.33	4.10	0.31
Leaven	NOx	1.19	4.48	0.00
Linn	NOx	0.88	3.20	0.00
Dougla	NOx	0.55	1.39	0.00
Leaven	VOC	0.41	1.04	0.00
Miami	NOx	0.16	0.54	0.00
Dougla	VOC	0.13	0.34	0.00
Linn	VOC	0.02	0.10	0.00
Miami	VOC	0.02	0.07	0.00

Receptor Regions (3 x 3 grid cells) used in Ranktrac

x, y, receptor #, receptor name

```
49 104    1  1  1 Rocky
 50 104   1  1  1 Rocky
 51 104   1  1  1 Rocky
 49 105   1  1  1 Rocky
 50 105   1  1  1 Rocky
 51 105   1  1  1 Rocky
```

49 106 1 1 1 Rocky
50 106 1 1 1 Rocky
51 106 1 1 1 Rocky
47 99 2 2 2 JFK
48 99 2 2 2 JFK
49 99 2 2 2 JFK
47 100 2 2 2 JFK
48 100 2 2 2 JFK
49 100 2 2 2 JFK
47 101 2 2 2 JFK
48 101 2 2 2 JFK
49 101 2 2 2 JFK
53 104 3 3 3 Liberty
54 104 3 3 3 Liberty
55 104 3 3 3 Liberty
53 105 3 3 3 Liberty
54 105 3 3 3 Liberty
55 105 3 3 3 Liberty
53 106 3 3 3 Liberty
54 106 3 3 3 Liberty
55 106 3 3 3 Liberty
55 107 4 4 4 Watkins
56 107 4 4 4 Watkins
57 107 4 4 4 Watkins
55 108 4 4 4 Watkins
56 108 4 4 4 Watkins
57 108 4 4 4 Watkins
55 109 4 4 4 Watkins
56 109 4 4 4 Watkins
57 109 4 4 4 Watkins
41 104 5 5 5 LV
42 104 5 5 5 LV
43 104 5 5 5 LV
41 105 5 5 5 LV
42 105 5 5 5 LV
43 105 5 5 5 LV
41 106 5 5 5 LV
42 106 5 5 5 LV
43 106 5 5 5 LV
45 91 6 6 6 Heritage
46 91 6 6 6 Heritage
47 91 6 6 6 Heritage
45 92 6 6 6 Heritage
46 92 6 6 6 Heritage
47 92 6 6 6 Heritage
45 93 6 6 6 Heritage
46 93 6 6 6 Heritage
47 93 6 6 6 Heritage
48 89 7 7 7 RG South

49	89	7	7	7	RG	South
50	89	7	7	7	RG	South
48	90	7	7	7	RG	South
49	90	7	7	7	RG	South
50	90	7	7	7	RG	South
48	91	7	7	7	RG	South
49	91	7	7	7	RG	South
50	91	7	7	7	RG	South

Analysis of potential ozone reductions resulting from controls in Douglas, Leavenworth, Linn, and Miami Counties for 8-hour ozone designation purposes

Overview

The Kansas Department of Health and Environment (KDHE) has recently prepared an 8-hour ozone designation analysis for the Kansas City area. In this analysis, the Department has recommended two counties to be designated nonattainment, Johnson and Wyandotte Counties. In this designation analysis multiple criteria were used following the recommendations from EPA guidance[1]. Although the guidance does not require the specific use of photochemical modeling, the EPA and others have requested a more rigorous analysis, based on photochemical modeling, explaining why additional Kansas counties should not be included in the nonattainment recommendation. Because of the short timeframe for completing this analysis, the Department has utilized previous photochemical modeling in the region to make a weight of evidence demonstration as to why these additional counties should not be included in the nonattainment area. The Department has chosen the August 15–21, 1998 ozone episode for this evaluation, with an emphasis on Reasonably Achievable Control Technology (RACT) and Low Reid Vapor Pressure (RVP) fuels in the potential nonattainment counties of Douglas, Leavenworth, Linn, and Miami.

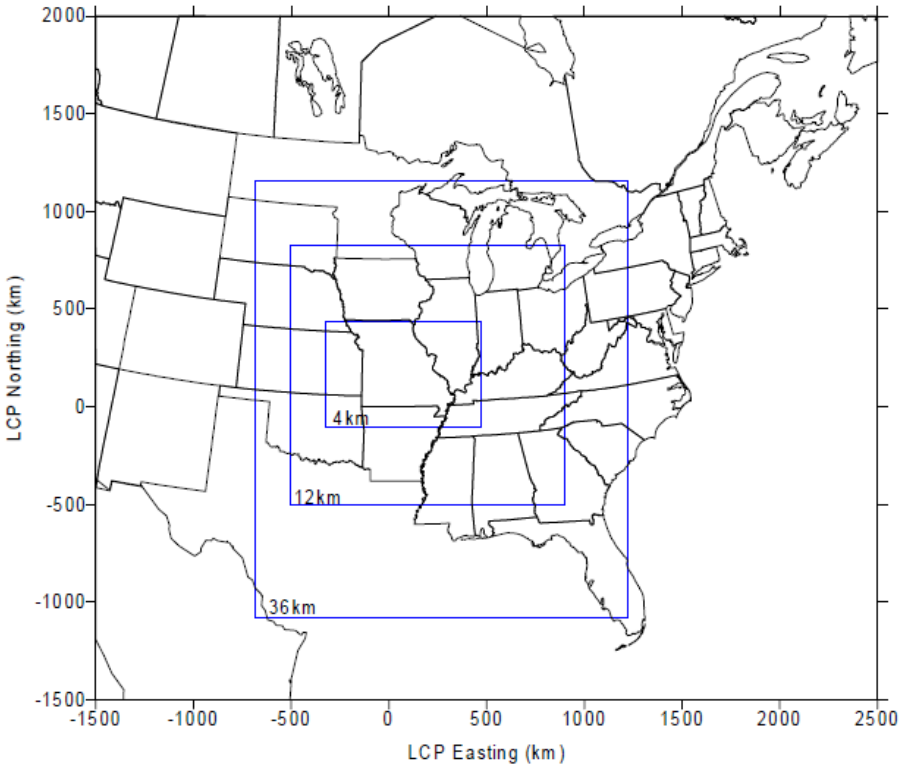
History

In the late 1990's, the Department undertook a modeling analysis to investigate potential ozone control strategies in the Kansas City area. Modeling was done for three periods during this analysis—two periods in 1995 and one period in 1998. In 2004, a detailed study was performed on potential controls, using the 1998 episode, resulting in a publication by the Mid America Regional Council (MARC) entitled "A Clean Air Action Plan for the Kansas City Region."

The modeling domain used in the analysis is shown in Figure 1 below.

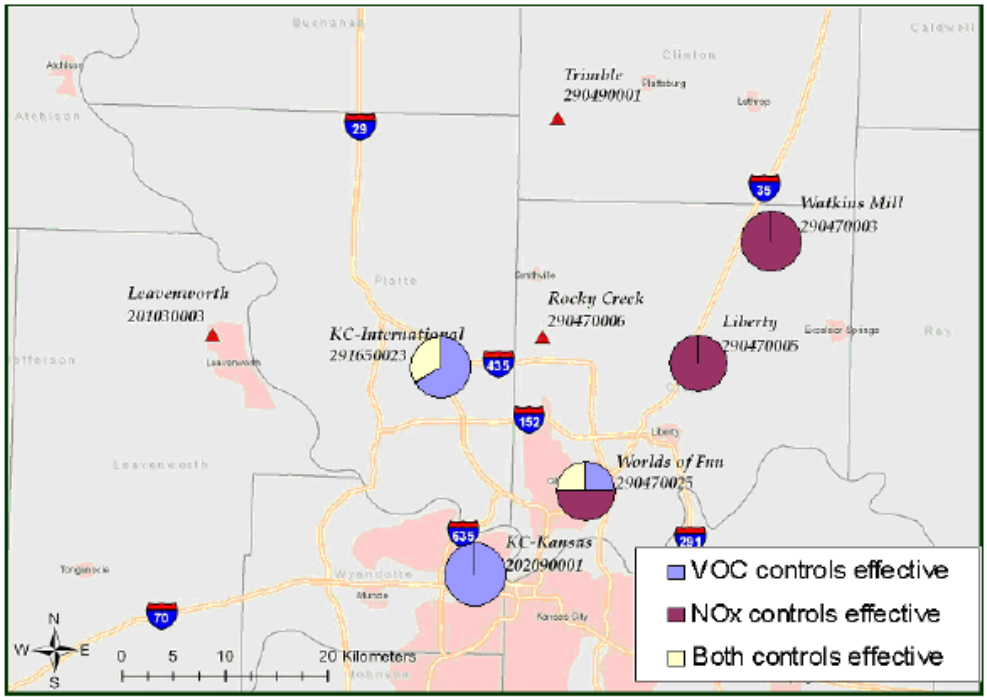
[1]http://www.epa.gov/ozonedesignations/documents/032800_boundaryguidance.pdf

Figure 1. CAMx modeling domain for 8-hour ozone analysis



The MARC publication provided an assessment of the VOC and NO_x sensitivity in the area based on the photochemical modeling mentioned above. This assessment included isopleth diagrams for the Kansas City area, as well as the potential effectiveness of controls at various monitoring locations in the Kansas City area. Figure 2 provides the results of this control effectiveness analysis. As can be seen is this figure, the monitors that are controlling the area's design value are modeled to be NO_x limited, meaning that NO_x controls implemented upwind of these monitors are likely to be more effective than VOC controls in reducing ozone formation. This exercise was used by the Department in preparing contingency measures for the ozone SIP at that time. These contingency measures included NO_x controls on large sources (>1000 tons/yr actual emissions) in Johnson and Wyandotte Counties. The contingency measures have been triggered based on recent monitoring and the Department is currently working with sources on their implementation.

Figure 2 Effectiveness of NO_x and VOC controls at Kansas City monitors.



On March 12, 2008, EPA revised the 8-hour ozone standard to 75 ppb from the previous standard which was effectively 84 ppb. This new standard will make reaching attainment more difficult in the Kansas City area. The Department believes the contingency measures that are now being implemented will help but additional reductions will likely be needed. These additional reductions will come from controls realized from other programs such as Regional Haze or voluntary agreements, such as the one reached with Panhandle Eastern Pipeline. The question then is what additional controls in the area will be needed to bring the area into attainment and which counties should these additional controls come from. Based on the recent ozone designation recommendation, the Department believes these additional controls need to come from Johnson and Wyandotte counties on the Kansas side.

Current Analysis

The Department is currently undertaking a new designation recommendation for the Kansas City area that is based on a new, more stringent 8-hour ozone standard. The Department has proposed two counties for designation as nonattainment, Johnson and Wyandotte Counties on the Kansas side of the greater Kansas City area. EPA Region 7 and others have commented that more justification is needed to support the designation. Specifically, more analysis in the form of photochemical modeling has been requested for four additional Kansas counties: Douglas, Leavenworth, Linn, and Miami. Because of the short timeframe to provide this information the Department has relied upon the photochemical modeling performed in the past. The Department has used the August 15–21, 1998 ozone episode in this work. This episode is the latest modeling episode currently available for use in a timely photochemical modeling analysis.

The focus of this work will be to analyze the impacts of reasonably available control technology (RACT) controls and fuel RVP standards in the four counties not recommended for inclusion in the nonattainment area for Kansas City. Specifically, three areas will be investigated:

1. Requiring 7.0 RVP fuel in these four counties;
2. RACT controls on permitted point sources; and
3. RACT controls on non-permitted (nonpoint) sources.

Each of these will be evaluated independently for their potential contribution to ozone formation.

1. Analysis of 7.0 RVP gasoline in Douglas, Leavenworth, Linn, and Miami counties

In order to evaluate the potential reduction in ozone formation from switching to low RVP gasoline in the four counties under discussion, an analysis of expected emission reductions was first performed. This analysis was done by taking 2005 VMT, along with the expected annual RVP profile for both low RVP and default gasoline blends, and running the National Mobile Inventory Model (NMIM) to determine the emissions from each scenario. Below are the results for Leavenworth County. Switching to low RVP gasoline will have the effect of lowering VOC emissions around 17% during the ozone season. The reduction will be slightly more or less depending on the time of year and the associated meteorological conditions. In order to be conservative, a 30% reduction in VOC emissions from all four counties was modeled using CAMx. This 30% reduction provides a factor of safety for potential emissions growth in these counties not originally anticipated in the original modeling study.

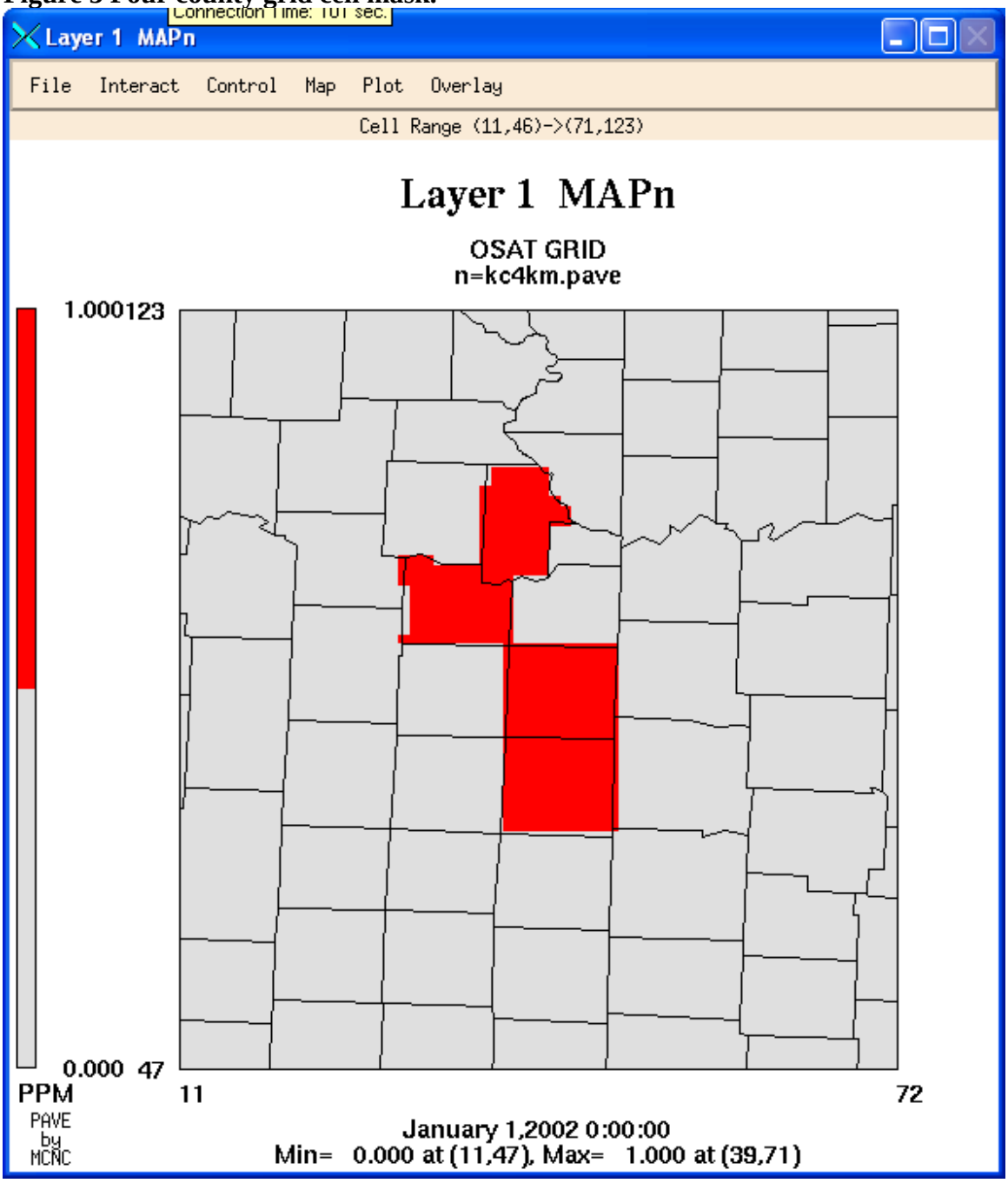
County	Month	2005 lowRVP	2005 defaultRVP
		tons/yr	
Leavenworth	Jan	74	74
Leavenworth	Feb	66	66
Leavenworth	Mar	73	77
Leavenworth	Apr	69	80
Leavenworth	May	64	73
Leavenworth	Jun	71	83

Leavenworth	Jul	74	89
Leavenworth	Aug	73	87
Leavenworth	Sep	65	74
Leavenworth	Oct	65	70
Leavenworth	Nov	67	72
Leavenworth	Dec	66	67
	Totals	***827***	***912***

In order to model the emission reductions, a grid cell mask was overlaid on the four counties in question. Mobile VOC emissions were then reduced by 30% for each 4km grid cell in this mask and a model run was performed. The 4km mask is pictured in Figure 3.

Ozone reductions were evaluated by incorporating these reduced mobile VOC emissions into the August 1998 ozone episode using the projected 2010 emissions. A difference plot was then produced between the base run and the control run to visualize the difference in ozone production. Slight differences were seen mainly originating around the Lawrence area in Douglas County. Figure 4 provides an example of the reductions in ozone during this modeled episode. On this day you can see that reductions in VOC emissions from these four counties are contributing to a very small (0.05–0.08 ppb) reduction in ozone in some of the Kansas City counties. This day and time had the worst modeled difference between the base and control run. The maximum domain wide hourly reduction in ozone during the episode was 0.00008 ppm over all days modeled.

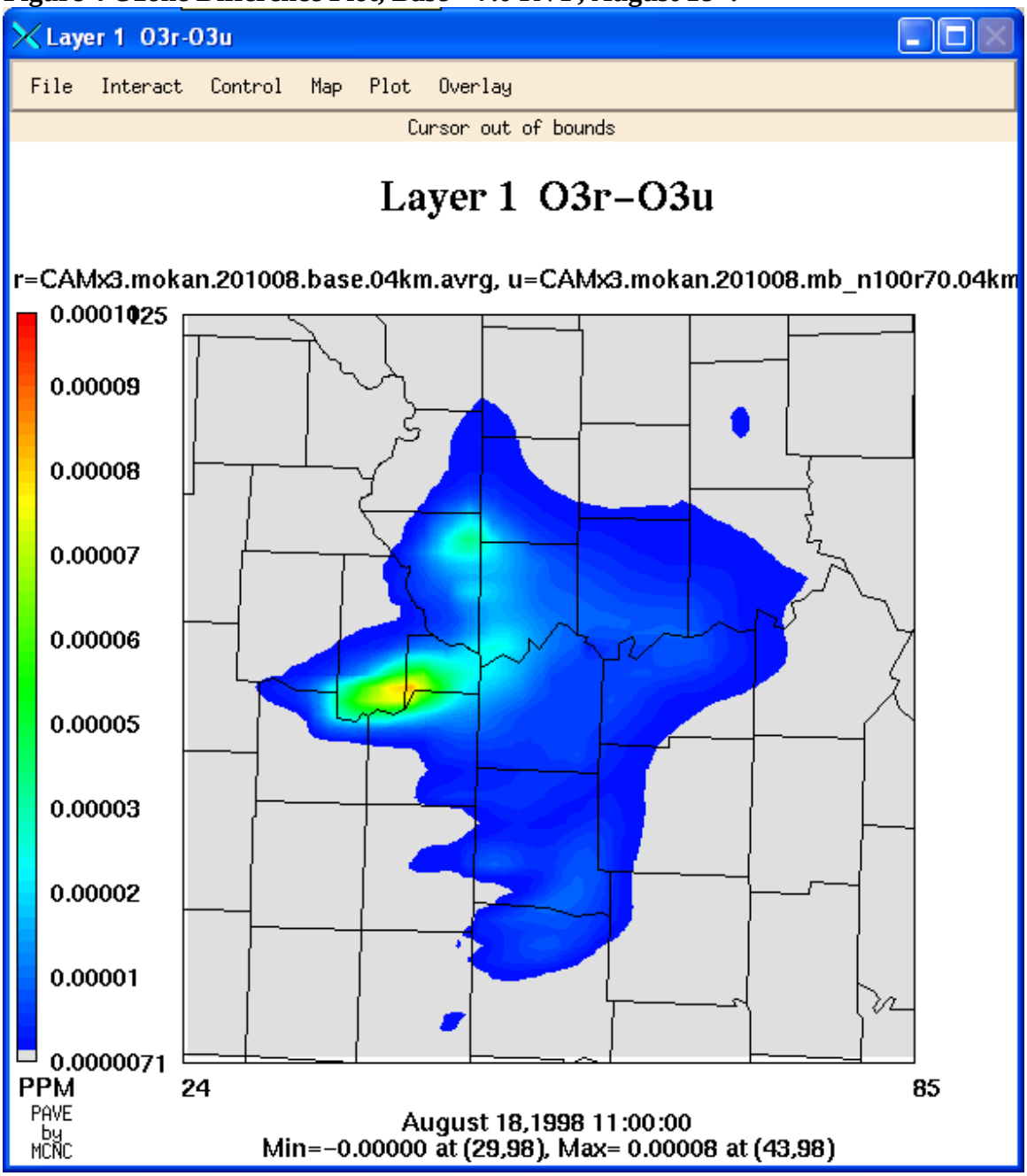
Figure 3 Four county grid cell mask.



Overall these small reductions in ozone realized from the introduction of low RVP in these four counties does not alone justify including them in the nonattainment area. It is very apparent that reductions in Douglas County would likely give the most benefit, although very small, as this county has the most VMT of the four analyzed. Low RVP gasoline in Miami and Linn counties would appear to have very little impact on ozone formation in the Kansas City region. This could be due to both the lower VMT in these

counties and they may also be NO_x limited rather than VOC limited for ozone production.

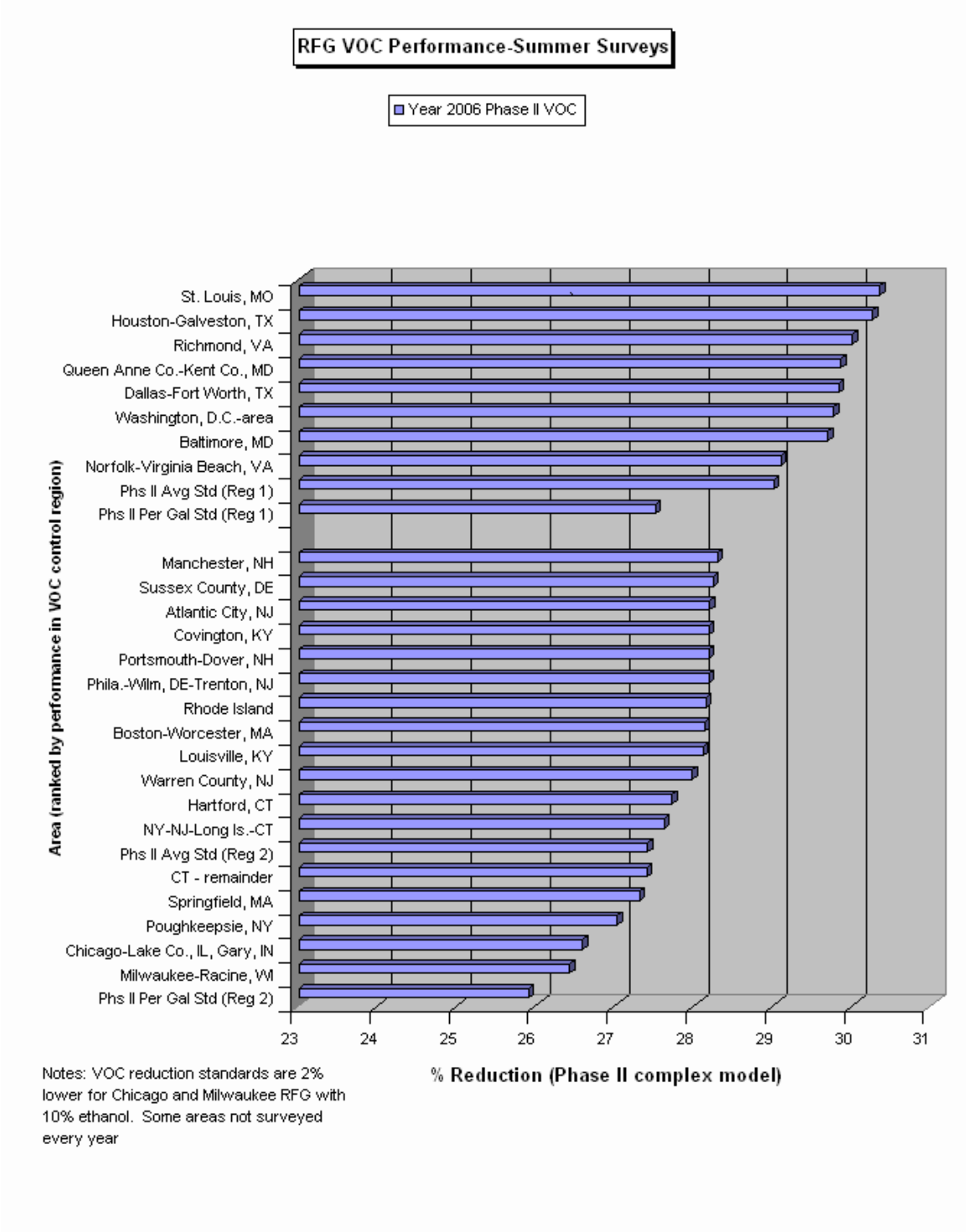
Figure 4 Ozone Difference Plot, Base – 7.0 RVP, August 18th.



In addition to the 7.0 RVP analysis the Department considered the potential of reformulated gasoline (RFG) in these four counties. RFG is currently not available as an option in the Kansas City area as the area has not yet been designated nonattainment and it was not allowed by EPA in the past. If and when the area is designated nonattainment RFG could then be a potential option for those counties included in the nonattainment area.

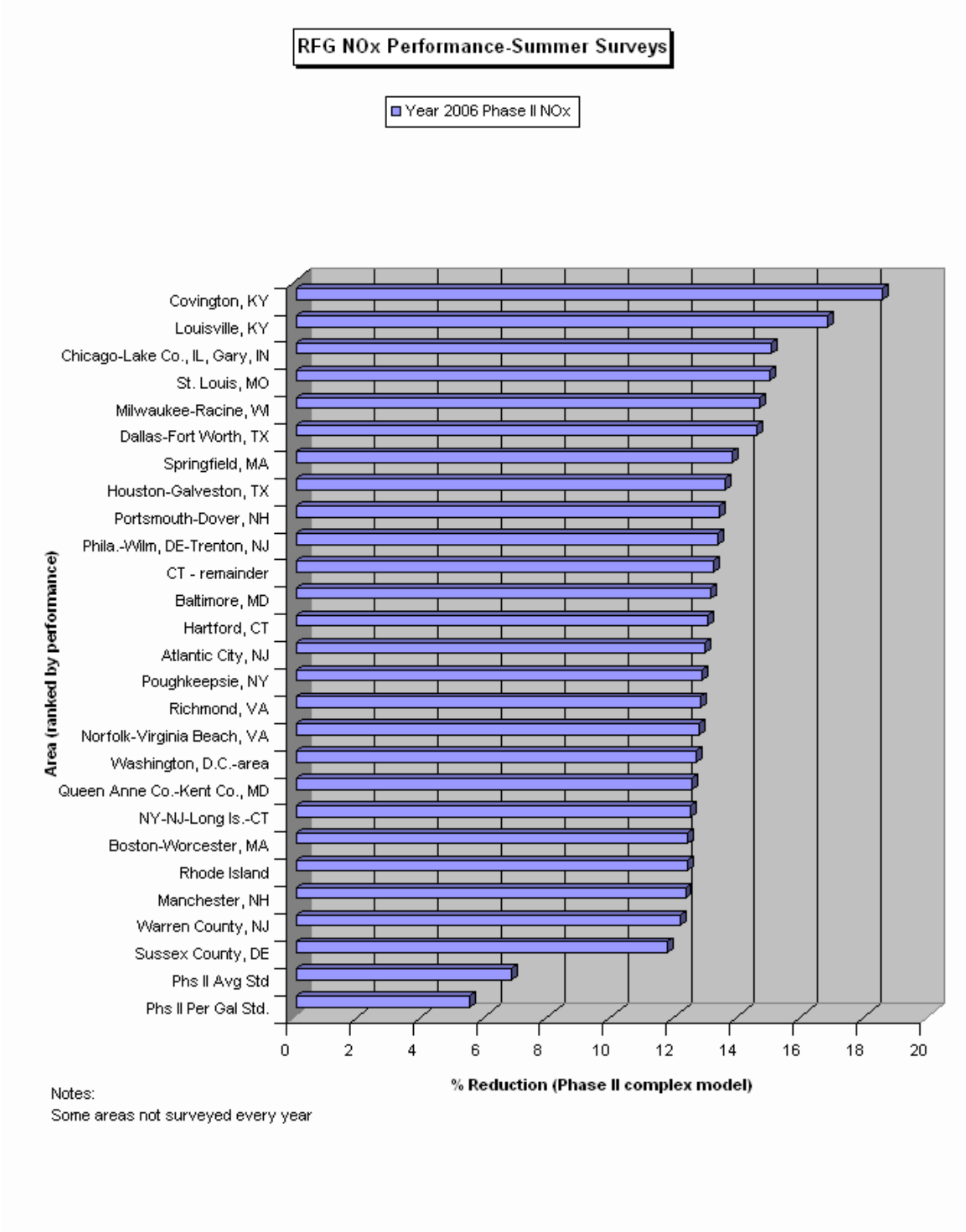
In order to estimate the potential ozone reductions of RFG use in these four counties the Department used the measured NOx and VOC reductions from RFG currently in use in the St Louis nonattainment area. Measurements indicate that the RFG being used in the St Louis nonattainment area were providing a reduction of 15% NOx emissions and 30% VOC emissions (31% in 2005) over conventional gasoline. Figure 5 and 6 shows the emissions reductions for VOC and NOx respectively realized in 2006 by use of RFG across the country. St Louis is ranked at the top of the list in terms of percent reduction for VOC and is 4th for NOx.

Figure 5 RFG VOC Percent Reduction



Source http://www.epa.gov/otaq/regs/fuels/rfg/properf/vocgraph-s06.gif

Figure 6 RFG NOx Percent Reduction

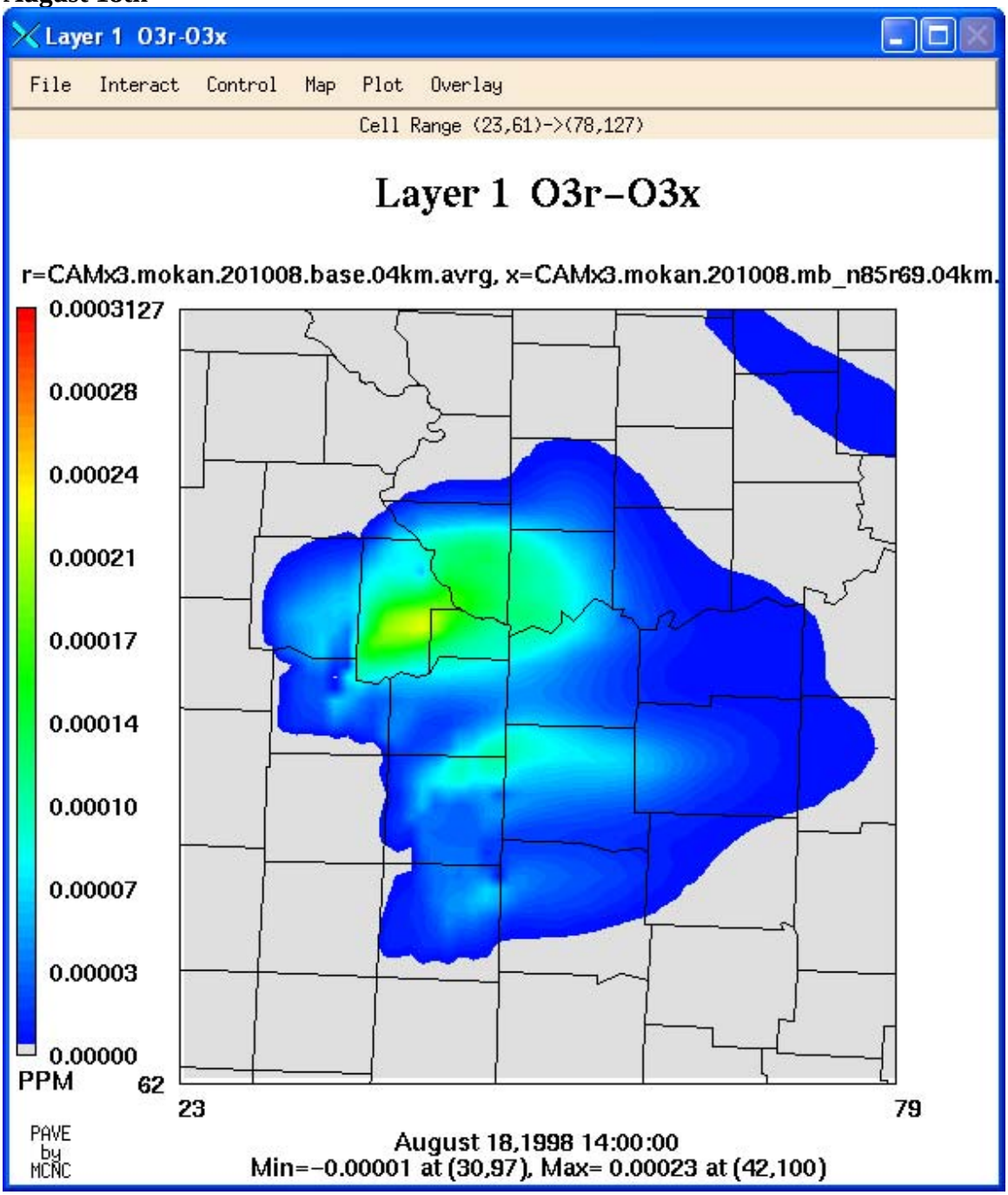


Source http://www.epa.gov/otaq/regs/fuels/rfg/properf/noxgraph-s06.gif

Incorporating these RFG emission reductions for NOx and VOC in the four counties resulted in modest ozone reductions when compared to the 7.0 RVP runs. Overall the maximum hourly domain wide reduction was 0.31 ppb occurring in Douglas County on August 20. The reductions in the Kansas City metro area ranged between 0.03 to 0.24

ppb on an hourly basis. Figure 7 shows the period with the largest reductions in the metro area.

Figure 7 Ozone Difference Base – RFG (31% VOC and 15% NOx reduction), August 18th



2. Analysis of extending NO_x and VOC RACT rules to Douglas, Leavenworth, Linn, and Miami Counties

Including RACT rules for Douglas, Leavenworth, Linn, and Miami Counties would have the potential for additional NO_x and VOC reductions in the Kansas City area. An approach similar to the mobile analysis was used to determine whether reductions realized from the addition of RACT rules in these four counties would result in reduced ozone formation. First the emissions in these areas were analyzed to determine the potential reductions available and then these reductions were modeled using the emissions masking approach described earlier.

Potential emissions reductions from RACT rules in these counties would cover both point and area sources. For the point sources the Department reviewed the emission inventory for all sources with actual emissions of either NO_x or VOC emissions greater than 100 tons over the last three years. The results of this review found only five sources meeting this criteria in the four counties:

Co FIPS	County	Source ID	Facility	2005 NO_x	2005 VOC	2006 NO_x	2006 VOC	2007 NO_x	2007 VOC
20045	Douglas	0450006	API Foils	2	128	1	16	1	17
20045	Douglas	0450014	Westar Energy – Lawrence	5,151	62	4,671	61	4,646	66
20103	Leavenworth	1030013	Hallmark Cards (Select Products) - Leavenworth	3	88	3	110	3	99
20107	Linn	1070005	KCP&L - La Cygne	29,100	222	33,462	167	18,247	186
20121	Miami	1210015	Panhandle Eastern Pipe Line - Louisburg Station	2,676	102	2,478	97	2,386	93

Three of the sources are already being controlled or are working on controls.

- The main source of emissions in these three counties is the La Cygne generating station operated by Kansas City Power & Light (KCP&L). The facility has two coal-fired electric generating units, characterized in the following table:

KCP&L - La Cygne electrical generating units					
Unit	Capacity (MW)	Coal Source	Stack Height (ft)	NO_x Limits (lb/MMBtu)	Control Equipment
1	893.4	85% Powder River Basin subbituminous 15% local bituminous	700	0.13*	None until 2006; currently selective catalytic reduction (SCR)
2	685.2	100% Powder River Basin subbituminous	700	0.13*	Older low NO_x burners until 2006; currently new low NO_x burners

*30 day rolling average for both Units 1 and 2, excluding periods of startup and shutdown. Regional Haze Agreement limits to be incorporated in facility's operating permit with limits in effect by 2014.

KCP&L - La Cygne's annual NO_x emissions from 2002 to 2007 are summarized in the following table:

KCP&L - La Cygne total facility NOx emissions 2002–2007	
Year	Total NO_x emissions - Kansas Emissions Inventory (tons/yr)

2002	37,380
2003	36,964
2004	38,377
2005	29,100
2006	33,462
2007	18,247

Unit 1 NO_x emissions are currently controlled with a SCR control system. This is considered state of the art control technology for this cyclone unit. Unit 2 has recently installed new low NO_x burners. As can be seen in the emissions table above, these new control technologies have significantly reduced the NO_x emissions from this facility. KCP&L is also considering installing a SCR on Unit 2 to meet the limits agreed upon in the December 2007 Regional Haze agreement with KDHE. This regional haze agreement has a NO_x limit of 0.13 lb/MMBtu based on a 30 day rolling average of both Units 1 and 2, excluding periods of startup and shutdown. The agreement also has provisions for an extended outage of a unit, as this could impact the rolling average calculation should one unit have an extended outage. 2007 emissions reported for the La Cygne generating station only showed a partial year of NOx reductions as the control equipment was not installed and operational for the entire year. The Department expects to see further reductions from this facility in future years as the control equipment will be available and operated year round.

- Westar Energy - Lawrence Energy Center has also agreed to combustion controls and limits for NO_x as part of the Regional Haze Rule. The three coal fired units at the Lawrence Energy Center, Units 3, 4 and 5, will be installing Low NOx burner systems as part of their Regional Haze agreement. Units 3 and 4 will have a 30 day rolling average limit of 0.18 lbs/MMBtu and Unit 5 with have 30 day rolling average limit of 0.15 lbs/MMBtu. The average actual operating NOx rate for these three units in 2007 was 0.23, 0.34, 0.18 lbs/MMBtu respectively. Thus the NOx reductions will range from 16% to 47% from 2007 levels once these controls are installed and operational.

- Panhandle Eastern Pipe Line – Working with Louisburg Station to sign an agreement to reduce NO_x emissions from their compressor stations.

This leaves two additional sources that have emitted over 100 tons of NO_x or VOC in these counties in the last three years.

- API Foils (in Douglas County) has reported a significant reduction in VOCs over the last two years because they are subject to a MACT, 40 CFR 63 Subpart JJJJ (Paper and Other Web Surface Coating), that had a compliance date in 2005. This MACT required the source to install a thermal oxidizer to reduce VOC emissions. This source could not be controlled for VOC further. The source's NO_x emissions were minimal over the last three years.

- Hallmark Cards (Select Products) in Leavenworth has emitted around 100 tons per year of VOC emissions over the last three years. The majority of these VOC emissions come from the Rotogravure presses. This source has terminated their Class I operating permit as of November 21, 2008, thus VOC emissions will no longer be significant at this location. The Department understands that these presses are being relocated to another location in Leavenworth (source ID 1030016), and emissions are likely to be similar from this equipment. It may be possible to further control this source for VOC emissions. NO_x emissions at this source were minimal. It should be noted that this source is northwest of the Kansas City core, thus any realized controls may have a minimal impact on ozone formation during many of the ozone periods in the Kansas City area.

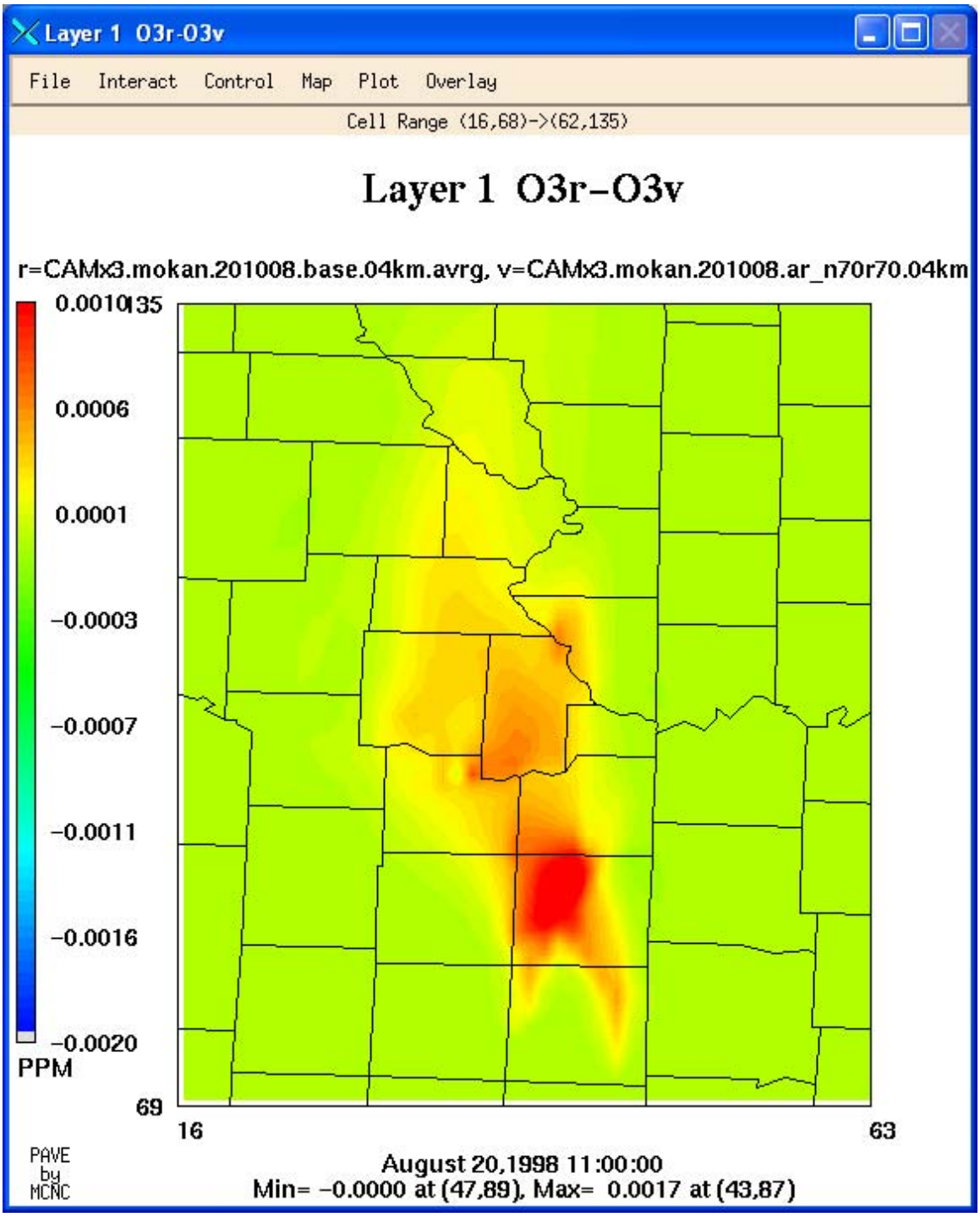
The remaining permitted sources in the area report less than 100 tons of NO_x or VOC emissions. It is possible that the RACT emissions threshold could be lowered below 100 tons to subject additional permitted sources to potential RACT rules. Appendix A has a list of all permitted sources in these four counties that reported emissions of greater than zero tons of either VOC or NO_x in the last three years.

3. RACT controls on non-permitted (nonpoint) sources.

Because all the large permitted sources in these four counties are either already controlling or located northwest of the Kansas City area, the Department chose to focus the remainder of the study on area source reductions with RACT rules. In order to do this the Department took a similar approach as the mobile source analysis and reduced the area source emissions for both NO_x and VOC emissions in these four counties by 30%. This was again done with the gridded mask described earlier.

Results of this run indicate that area source controls in Miami County would result in the most ozone reductions of the four counties evaluated. As was seen in the mobile reduction run the overall benefit of area controls in these counties is generally small with a maximum one hour reduction of 1.7 ppb that occurs in Miami County on August 20 (Figure 8).

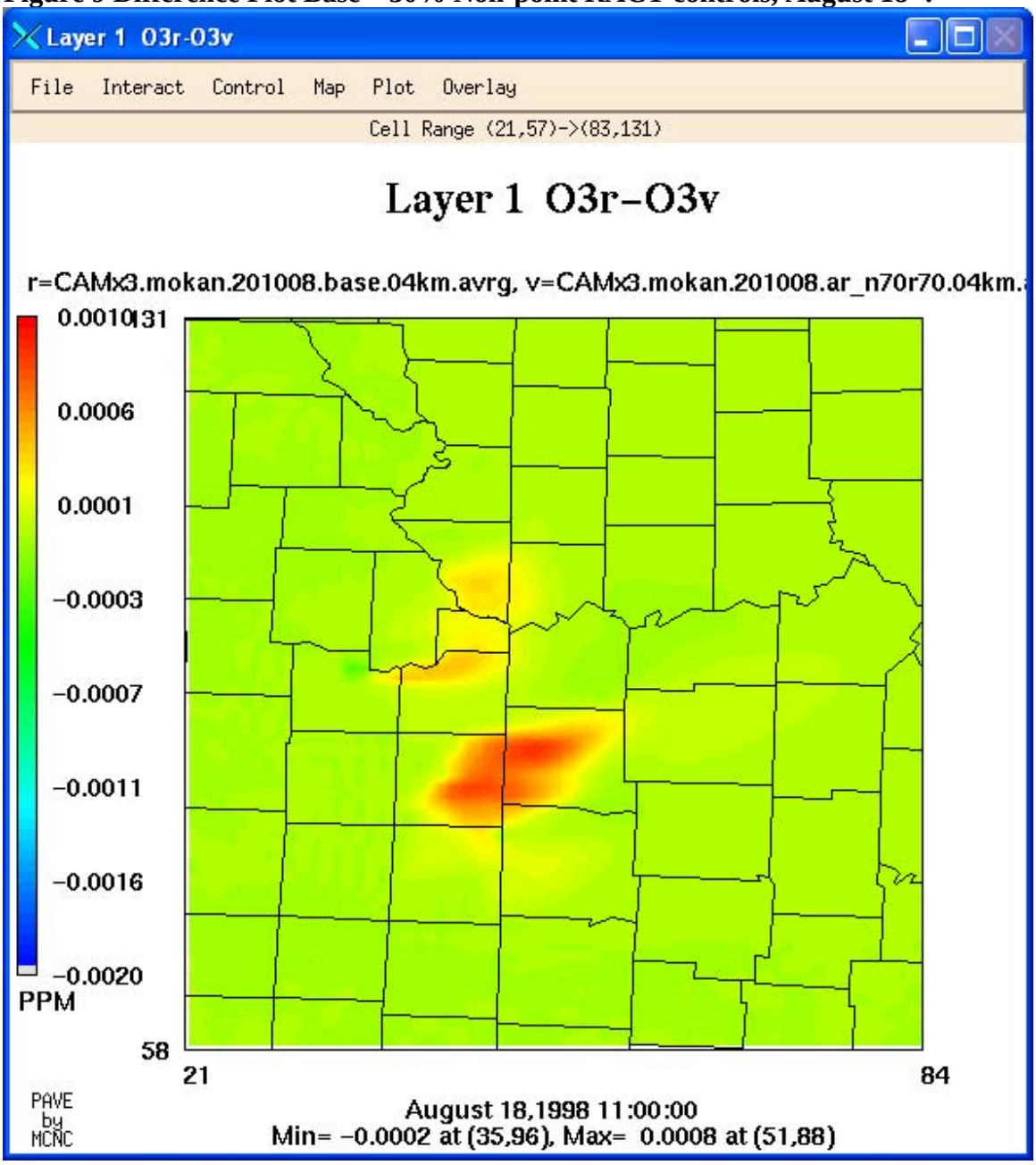
Figure 8 Ozone Difference Plot Base – 30% Non-point RACT controls, August 20th.



Generally the maximum hourly reductions throughout the episode days were smaller, on the order of 0.8 ppb (Figure 9). The 8-hour ozone reductions would obviously be much smaller with impacts at the monitors establishing the areas design value even smaller yet. Based on the modeling conducted to date it may be informative to further evaluate a more realistic reduction percentage of area source emissions if RACT controls are implemented in these counties. From these runs, where very optimistic area source

reductions were modeled in these four counties, it is clear that including these counties in a nonattainment designation for the purpose of obtaining area source RACT controls would likely not significantly reduce the areas design value for ozone.

Figure 9 Difference Plot Base – 30% Non-point RACT controls, August 18th.



Summary

A photochemical modeling evaluation was performed for four counties being considered for inclusion as nonattainment in the Kansas City 8-hour ozone designation process. The counties, Douglas, Leavenworth, Miami and Linn, were evaluated for 7.0 RVP gasoline, Reformulated gasoline, and RACT controls on non-permitted (non-point) sources of VOC and NOx emissions. The modeling indicates that small gains, generally less than 1 ppb on an hourly basis, could potentially be achieved in the area by requiring 7.0 RVP and RACT controls in these four counties. RFG showed slightly better ozone reductions than 7.0 RVP gas but overall reductions were still low. Additionally, the point source inventory was reviewed for potential sources in these counties that might be subject to additional controls should the county they reside in be included as a nonattainment county. This review identified several sources, although most are already being controlled or have entered into an agreement for controls. Hallmark Cards was the one source identified with the greatest potential for VOC reductions in the area. Unfortunately this source is located in Leavenworth County, which is generally not considered as a contributing county to the ozone problem in the area. Based on this analysis the Department believes the current designation recommendation which leaves all four of these counties in attainment is justified.

Appendix A - Point source NO_x and VOC emissions (in tons/yr) for Kansas sources in the Kansas City area, 2005-2007

County	Source ID	Facility	2005 NO_x	2005 VOC	2006 NO_x	2006 VOC	2007 NO_x	2007 VOC
Douglas	0450002	University of Kansas	28	2	37	2	30	2
Douglas	0450004	Hallmark Cards – Lawrence	3	41	2	42	2	39
Douglas	0450005	Asphalt Sales of Lawrence (asphalt plant)	1	0	1	0	1	0
Douglas	0450006	API Foils	2	128	1	16	1	17
Douglas	0450011	Baldwin City Mun. Power Plant #1	1	0	1	0	1	0
Douglas	0450013	ICL Performance Products	77	5	68	4	33	2
Douglas	0450014	Westar Energy – Lawrence	5,151	62	4,671	61	4,646	66
Douglas	0450055	Chemtrade Logistics	1	0	1	0	1	0
Douglas	0450056	Baldwin City Mun. Power Plant #2	6	1	14	3	15	3
Franklin	0590006	Ottawa Mun. Power Plant	62	4	50	3	72	5
Franklin	0590018	Southern Star Central - Ottawa Station	6	0	4	0	12	0
Franklin	0590022	Quest Pipelines - Ottawa Station	1	0	0	0	1	0
Franklin	0590035	Schuff Steel Midwest	1	8	2	25	0	29
Johnson	0910006	Magellan Pipeline - Olathe Tank Farm	0	47	0	46	0	46
Johnson	0910010	SPX Cooling Technologies	1	68	1	88	1	110
Johnson	0910014	ExxonMobil Lubricants & Specialties - Olathe	4	0	3	0	4	0
Johnson	0910031	Bayer Cropscience	5	0	1	0	0	0
Johnson	0910032	Danisco Cultor USA	0	1	0	1	0	0
Johnson	0910039	Vertis Inc.	10	47	12	52	12	48
Johnson	0910055	Robbie Mfg.	1	151	1	166	1	163
Johnson	0910057	AGC Flat Glass	975	0	1,039	12	868	8
Johnson	0910065	Gardner Energy Center	10	0	5	0	5	0
Johnson	0910074	Packaging Products	1	131	1	133	1	134
Johnson	0910077	Vestcom	0	72	0	67	0	76
Johnson	0910083	Nazdar	0	38	0	37	0	34
Johnson	0910085	Dimension Graphics	0	3	0	3	0	4
Johnson	0910095	Holland Corp. - Olathe Asphalt Plant	2	3	3	3	2	2
Johnson	0910117	Deffenbaugh Industries - Shawnee	11	36	11	40	11	39
Johnson	0910118	United Parcel Service - Lenexa	0	2	0	1	0	0
Johnson	0910127	Shawnee Mission Medical Center	7	0	3	0	5	0
Johnson	0910129	Husqvarna Const. Products	0	0	1	0	1	0
Johnson	0910133	Asphalt Sales - Olathe (asphalt plant)	5	2	5	2	3	1
Johnson	0910135	Kansas City Aviation Center	0	2	0	2	0	2
Johnson	0910149	Howell Mouldings	0	57	0	37	0	49
Johnson	0910151	Inland Mfg.	0	2	0	2	0	5
Johnson	0910154	Marble Creations	0	4	0	2	0	2
Johnson	0910171	Interstate Brands - Lenexa	3	54	0	53	0	50
Johnson	0910174	KCP&L - West Gardner	10	1	19	2	16	1
Johnson	0910175	Sprint Communications - Overland Park	3	0	5	0	5	0
Johnson	0910177	Farmers Insurance Exchange	1	0	0	0	0	0
Leavenworth	1030001	Lansing Correctional Facility	1	0	1	0	15	1
Leavenworth	1030011	Southern Star Central - Tonganoxie Station	14	1	8	0	33	1
Leavenworth	1030012	Fort Leavenworth	13	1	15	1	14	0
Leavenworth	1030013	Hallmark Cards (Select Products) - Leavenworth	3	88	3	110	3	99

County	Source ID	Facility	2005 NO_x	2005 VOC	2006 NO_x	2006 VOC	2007 NO_x	2007 VOC
Leavenworth	1030016	Hallmark Cards - Leavenworth	1	25	1	20	1	16
Leavenworth	1030018	St. Mary College (Sisters of Charity)	2	0	0	0	2	0
Leavenworth	1030019	FBOP Leavenworth	46	7	45	7	1	28
Leavenworth	1030020	Eisenhower VA Medical Center	7	0	7	0	7	0
Leavenworth	1030128	Kansas Correctional Industries	0	38	0	35	0	36
Linn	1070005	KCP&L - La Cygne	29,100	222	33,462	167	18,247	186
Linn	1070008	Reed Minerals Div. Harsco (coal slag dryer)	9	5	10	6	10	6
Linn	1070027	Tower Metal Products - Prescott	0	2	0	2	0	2
Miami	1210001	Osawatomie Mun. Power Plant	0	0	0	0	0	0
Miami	1210003	ConocoPhillips Pipe Line - Paola Station	44	60	48	63	33	48
Miami	1210015	Panhandle Eastern Pipe Line - Louisburg Station	2,676	102	2,478	97	2,386	93
Miami	1210017	Magellan Pipeline - Paola Station	45	3	22	2	11	1
Miami	1210030	KCP&L - Osawatomie	2	0	3	0	3	0
Miami	1210035	Doherty Steel	0	13	0	11	0	12
Wyandotte	2090001	CertainTeed - Kansas City	223	118	164	100	98	72
Wyandotte	2090003	Forest View Landfill	8	5	8	5	9	2
Wyandotte	2090008	Kansas City BPU - Nearman	4,079	32	3,820	28	4,594	34
Wyandotte	2090009	Griffin Wheel	40	36	40	36	40	36
Wyandotte	2090010	Owens Corning	262	144	237	139	173	92
Wyandotte	2090011	Procter & Gamble	30	23	27	27	13	19
Wyandotte	2090012	VVF Intervest	3	14	3	9	0	0
Wyandotte	2090018	J.M. Fahey Const. (asphalt plant)	3	0	2	0	2	0
~~Wyandotte~~	~~2090021~~	~~Armour Eckrich Meats - Kansas City~~	6	0	6	0	5	0
Wyandotte	2090029	Darling International - Kansas City	5	0	5	0	5	0
Wyandotte	2090035	Asphalt Sales - Kansas City (asphalt plant)	3	1	2	1	2	1
Wyandotte	2090039	PQ Corp.	84	15	104	17	101	15
Wyandotte	2090044	Propet LLC	0	0	0	0	3	0
Wyandotte	2090046	General Motors	36	1,140	35	1,110	35	968
Wyandotte	2090047	Pentair Water	0	9	0	10	0	12
Wyandotte	2090048	Kansas City BPU - Quindaro	3,409	33	3,472	29	3,531	30
Wyandotte	2090049	Kansas City BPU - Kaw	0	0	0	0	0	0
Wyandotte	2090060	Magellan Pipeline - Kansas City Terminal	12	215	12	204	12	215
Wyandotte	2090062	Harcros Chemicals - Kansas City	9	12	8	10	8	11
Wyandotte	2090063	Sinclair Transportation - Kansas City Products Terminal	1	91	1	91	1	93
Wyandotte	2090065	Fuch Lubricants	0	24	0	25	0	25
Wyandotte	2090066	Exide Corp.	4	0	4	0	4	0
Wyandotte	2090075	ConocoPhillips Pipe Line - Kansas City Terminal	18	81	18	77	0	48
Wyandotte	2090076	Forbo Adhesives	1	6	1	39	1	6
Wyandotte	2090077	Keebler Co.	6	7	7	4	7	5
Wyandotte	2090114	Midland Pharmaceutical	0	0	0	0	0	0
Wyandotte	2090115	Greystone Graphics	1	20	1	17	1	16
Wyandotte	2090169	Kansas University Medical Center	19	1	19	1	19	1
Wyandotte	2090186	Weyerhauser	3	5	3	5	3	5
Wyandotte	2090190	Meridian Automotive Systems	7	164	7	118	5	71
Wyandotte	2090194	Stericycle	11	0	10	0	11	0
Wyandotte	2090202	Barton Solvents - Kansas City	0	0	0	1	0	1

County	Source ID	Facility	2005 NO_x	2005 VOC	2006 NO_x	2006 VOC	2007 NO_x	2007 VOC
Wyandotte	2090206	Plastic Packaging Technologies	0	50	0	32	0	77
Wyandotte	2090212	ACH Foam - Kansas City (Kaw Dr)	0	91	0	83	0	26
Wyandotte	2090229	Garsite/Progress LLC	0	5	0	5	0	4
Wyandotte	2090232	Ashland Distribution	0	4	0	4	0	4
Wyandotte	2090236	Peerless Conveyor & Mfg.	0	3	0	3	0	1
Wyandotte	2090270	Cross Oil Refining & Marketing	0	1	1	1	1	0
Wyandotte	2090277	Kansas University Hospital	1	0	1	0	24	0
Wyandotte	2090280	Bennett-Rogers Pipe Coating	0	32	0	42	0	31
Wyandotte	2090300	ACH Foam - Kansas City (N 3rd)	0	0	0	0	0	63