MISSOURI
DEPARTMENT OF
NATURAL RESOURCES

AIR POLLUTION CONTROL PROGRAM

MISSOURI AIR MONITORING NETWORK ASSESSMENT 2015

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EXECUTIVE SUMMARY

Introduction

Each monitoring agency is required (40 **CFR)** 58.10 (d)) to perform and submit to the Environmental Protection Agency (EPA) an assessment of the air quality monitoring network every five years to determine whether the network meets the monitoring objectives defined in 40 **CFR** 58 Appendix D, whether new sites are needed, and whether existing sites are no longer needed. The first required assessment was completed in 2010. This report presents the results of the 2015 assessment for Missouri. This assessment follows EPA Region VII guidance. Currently, most of the National Ambient Air Quality Standards (NAAQS) have either been recently revised or are currently being revised or reviewed. These changes in the NAAQS and associated monitoring requirements must be considered in assessing the air quality monitoring network.

The assessment (and this summary) first discusses Missouri population, climate, and new emission sources. Then the network for monitoring of each of the following air pollutants is discussed: carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), particulate matter smaller than 10 micrometers (PM_{10}), ozone (O_3), particulate matter smaller than 2.5 micrometers ($PM_{2.5}$), and lead. This summary concludes with a table summarizing the characterization of monitoring sites as critical, credible, or marginal for each pollutant.

Population

The assessment includes consideration of population distribution, since one of the goals of an air monitoring network is to assess population exposure, and since some air pollutant emissions, especially from area and mobile sources, are associated with population. The 2010 population of Missouri was 6.0 million, an increase of 7 percent from the 2000 population. Missouri includes dominant population centers in the St. Louis and Kansas City areas, with the southwestern region (including Springfield and Joplin) also an area of some significance in population. The 2010 populations of the three largest metropolitan statistical areas (MSA) in Missouri were:

- St. Louis MSA (Missouri portion): 2.1 million
- Kansas City MSA (Missouri portion): 1.2 million
- Springfield MSA: 0.4 million

The largest recent and expected future growth in population is generally in suburban areas surrounding the St. Louis and Kansas City areas, not in the urban centers. There has also been population growth in the Springfield, Branson, Columbia, and Fort Leonard Wood areas.

Climate

Missouri is located in the middle of the North American continent and, therefore, normally experiences four full seasons, with extremes in temperature from 100°F or greater to below 0°F. The typical duration and dominant climatology of the four seasons is:

- Spring: March to May, the wettest season, variable winds, temperature 76°F to 33°F.
- Summer: June to August, warm moist air from the Gulf of Mexico, wind generally from the south, temperature 90°F to 62°F.
- Fall: September to November, wind generally from the south shifting to the northwest late in the season, temperature 81°F to 33°F .
- Winter: December to February, wind generally from the northwest, temperature 46°F to 18°F.

Ozone episodes generally occur in the summer when high pressure moves to the east of Missouri along with an upper level ridge over the area. High temperature, abundant sunshine, and light winds are characteristic of such episodes and contribute to the formation and accumulation of ozone. $PM_{2.5}$ levels, especially in the St. Louis area, are affected by regional weather patterns that bring air masses into the area from areas with emissions of $PM_{2.5}$ precursors. For example, summertime high pressure systems are often centered over the Ohio River Valley area, which not only bring air masses from that SO_2 emissions-rich region into the St. Louis area, but also create local stagnant or nearly stagnant conditions that allow accumulation of both regional and locally-generated air contaminants.

New Emission Sources

New large point emission sources are primarily those permitted under the Prevention of Significant Deterioration (PSD) program. There have been some increases in emissions of nitrogen oxides (NO_X), CO and volatile organic compounds (VOCs), at several facilities associated with these permits, but these increases do not appear to be significant enough to require additional monitoring of these pollutants. NO_X and VOC emissions do, however, contribute to ozone formation, and locations of these sources must be considered in future evaluation of potential ozone monitoring locations as ozone standards are made more stringent in the future.

Expansion plans have been changed at the facility with the largest permitted increase of PM_{10} and SO_2 emissions among permitted sources, and the permit reverted back to the 2008 permit. Post construction monitoring near the facility did indicate some high levels of PM_{10} (but no exceedances).

Carbon Monoxide

The primary NAAQS for CO are 35 parts per million (ppm) for one hour, and 9 ppm for eight hours. These concentrations must not be exceeded more than once per year. CO monitoring is required at the Blair Street NCore site and at the two initial near-roadway sites in the St. Louis and Kansas City areas (Forest Park and Blue Ridge I-70). CO is currently monitored at these three sites in Missouri. None of these sites has reported a violation of the NAAQS in recent years.

CO is primarily emitted as a component of motor vehicle exhaust, so that CO emissions are correlated with vehicle miles, which are highest on major roadways in population centers.

Sulfur Dioxide

The SO_2 primary NAAQS is 75 parts per billion (ppb); the form of the standard is the 3-year average of the 99th percentile of annual daily maximum 1-hour averages. The rule that revised the NAAQS in 2010 included minimum monitoring requirements based on a combination of population and SO_2 emissions in Core Based Statistical Areas (CBSAs). Four monitoring sites are required in Missouri CBSAs (two in the St. Louis area, two in the Kansas City Area). Each monitoring site may be determined on the basis of one or more of the following criteria: location near known emission sources, location to measure maximum concentrations, location to measure population exposure, location to measure regional transport, or location to measure regional background. The monitoring is to be supplemented by air quality simulation modeling of the impact of known SO_2 sources.

SO_2 is currently monitored by the state at five sites in Missouri, three sites in the St. Louis area and one in Kansas City, and one in a rural area. An additional site in the Kansas City CBSA is in the state of Kansas. SO_2 is also being (or soon will be) monitored by utilities or other industrial facilities near emission sources. Three state sites in Missouri are in violation of the standard: one in Jefferson County, one in Kansas City, and one in Iron County. The Jefferson County site is likely to come into compliance with the standard with the cessation of primary lead smelting in Herculaneum.

SO_2 is primarily emitted from coal or fuel oil combustion facilities, especially electric generating stations.

The Blair Street site in St. Louis is an NCore site, which requires SO_2 monitoring. Three of the current sites (Mott St. in Herculaneum, Troost, and South Charleston) are source-oriented sites that should be continued. The other site in the St. Louis area (Margaretta) is population-oriented, not source-oriented, but shows concentrations of SO_2 at about one-third of the standard. It is desirable to maintain such population-oriented sites

Nitrogen Dioxide

The NO_2 primary NAAQS is 100 ppb; the form of the standard is the 3-year average of the 99th percentile of annual daily maximum 1-hour averages. There is also an annual average NAAQS of 53 ppb. The rule that revised the NAAQS in 2010 included minimum monitoring requirements. Two near-road sites are required in the St. Louis area and one in the Kansas City area. A minimum of one population-oriented monitor must be sited in any urban area with population greater than or equal to 1 million people. Additional monitors are to be sited to monitor exposure to susceptible and vulnerable communities.

NO_2 is currently monitored by the state at six sites in Missouri, three sites in the St. Louis area (two of which are near road), two in the Kansas City area (one of which is near road), and one in a rural area. None of these sites is in violation of either the annual or 1-hour standard.

NO_X is emitted from a variety of source types: point (electricity generating stations and other stationary combustion sources), mobile (motor vehicles), and low level area sources. Some of the larger sources and a concentration of relatively smaller sources are located within the St. Louis, Kansas City, and Springfield urban areas. Some large sources are located outside the urban areas, especially along the Missouri and Mississippi rivers. Point source NO_X emissions have generally decreased over the last several years but increased slightly over the last few years. Mobile source NO_X emissions generally correlate with vehicular traffic density, and area source emissions generally correlate with population.

The Margaretta and Troost sites are judged to be **critical** because they are located in part to evaluate population exposure within the St. Louis and Kansas City urban areas. The Forest Park, Blue Ridge I-70, and Rider Trail S sites are also **critical** because they meet the requirement for near-road monitoring. The Mark Twain State Park site is judged to be **credible** to **critical** because it meets the need for measurement of regional background NO_2 concentration.

In addition to these NO_2 monitoring sites, NO_X/NO_Y (NO_Y represents total reactive nitrogen oxides) monitoring is being done as required at the Blair Street NCore site. This monitoring is also **critical**.

PM_{10}

The PM_{10} NAAQS is a 24-hour average of 150 micrograms per cubic meter ($\mu g/m^3$), not to be exceeded more than once per year. There are minimum monitoring requirements for PM_{10} in each MSA, based on MSA population and the monitored PM_{10} concentrations. A minimum of two to four sites is required to monitor PM_{10} levels in the St. Louis area, the same number in the Kansas City area, and zero to one in the Springfield area.

PM_{10} is currently monitored by the state at 17 sites in Missouri, seven sites in the St. Louis area, five sites in the Kansas City area, one site in Springfield, and four sites in other areas. Only the Branch Street and Carthage sites exceeded the NAAQS in recent years; only the Branch Street

site exceeded the NAAQS exceeded the NAAQS for the most recent three-year period (2012-2014).

PM_{10} point sources are concentrated in the St. Louis, Kansas City, and Springfield areas. Mobile source PM_{10} emissions generally correlate with vehicular traffic density, and area source emissions generally correlate with population.

The Blair Street site in St. Louis is an NCore site, which requires PM_{10} monitoring. The Branch Street and Carthage sites are source-oriented sites that have shown concentrations above the level of the standard in recent years, so are critical. The Front Street site is a source-oriented site that is considered to be critical. The St. Joseph Pump Station site has not shown recent exceedances, but has shown high enough concentrations that it should be maintained. The Mark Twain State Park site is considered to be critical as a monitor of regional background concentrations. The Margaretta and Troost sites have measure lower values, so are considered to be credible to critical in order to maintain monitoring of population exposure in the St. Louis and Kansas City areas. The Forest Park and Blue Ridge I-70 near-road sites are considered to be critical, because PM_{10} equipment for these sites was procured as a part of the grants that established them. Other PM_{10} sites are at least credible, since the $PM_{2.5}$ instruments at these sites now provide Federal Equivalent Method PM_{10} results at little additional expense.

Ozone

The current (2008) ozone primary NAAQS is an 8-hour average of 0.075 ppm (75 ppb), three-year average of fourth highest annual average. In 2014, EPA proposed to lower the level of the primary and secondary standards to a level in the range of 0.065 to 0.070 ppm and maintain the form of the standard. The final level of the standards is scheduled to be announced by October 1, 2015.

Ozone is currently monitored at 23 sites in Missouri. Seven sites are in the St. Louis area, and five are in the Kansas City area. Ste. Genevieve County and the Southeast areas each have one site. Two sites are in Springfield, and there are seven sites in other areas of the state.

In the St. Louis area, Orchard Farm, West Alton, and Maryland Heights remain in violation of the 75 ppb standard for the most recent three-year period (2012-2014). These sites are located relatively downwind of the St. Louis metropolitan area. Blair Street, Pacific, Arnold West, and Foley are in compliance for the most recent three-year period. Blair Street is in the core of the urban area. Pacific and Arnold West are located southerly and generally upwind of the St. Louis urban core, not in the most prevalent wind direction. Foley is located downwind but at a greater distance than the three sites that remain in violation. All of the St. Louis area sites would have exceeded the standard for the 2012-2014-period if the standard were lowered as proposed to between 0.065 and 0.070 ppm.

In the Kansas City area, all sites were within the standard for the most recent three-year period (2012-2014). Trimble, Watkins Mill, Liberty, and Rocky Creek have violated the standard in the past. These four sites are located north and downwind of central Kansas City. All of the Kansas

City area sites would have exceeded the standard for the 2012-2014-period if the standard were lowered as proposed to 0.065 ppm. The Richards Gebaur South site would be the only Kansas City area site to meet the standard if it were lowered to 0.070 ppm. That site is located generally upwind and at a distance from central Kansas City.

All of the other ozone sites in Missouri were in attainment of the standard for the most recent three-year period (2012-2014). However, the Bonne Terre, Farrar, and Alba sites would have exceeded the standard for the 2012-2014 period if the standard were lowered as proposed to 0.070 ppm, and only the Branson and Mark Twain State Park sites would have met the standard for 2012-2014 if the standard were lowered to 0.065 ppm.

Nitrogen oxides (NO_X) and VOCs emissions contribute to formation of ozone in the atmosphere. NO_X emissions are discussed above. VOC point source emissions are concentrated in the larger urban areas in Missouri and have shown a decrease in recent years. Area emissions correlate with population, and mobile source emissions, like those of NO_X correlate with vehicle miles.

Based on minimum monitoring requirements (current and proposed) and measured O_3 levels near the current standard and generally above the proposed standard, all of the current sites are considered to be critical.

$PM_{2.5}$

The level of the $PM_{2.5}$ annual primary standard is 12 $\mu g/m^3$. The level of the annual secondary standard is 15 $\mu g/m^3$. The form of both annual standards is the annual mean averaged over three years. The level of the 24-hour primary and secondary standards is 35 $\mu g/m^3$. The form of the 24-hour standards is the three-year average of the annual 98th percentile of 24-hour averages.

$PM_{2.5}$ is currently monitored at 15 sites in Missouri; including 13 sites for NAAQS compliance determination and two IMPROVE sites. Six sites are in the St. Louis area, and four are in the Kansas City area. One site is in the Springfield area, one is in the St. Joseph area, and one is in a rural area. There are also two $PM_{2.5}$ speciation samplers at Blair Street and Arnold West.

All Missouri monitors have met the annual standard beginning with the 2010-2012-period. All Missouri monitors have also met the 24-hour standard for all recent periods.

Airborne $PM_{2.5}$ at Missouri sites is dominated by the impact of regional or urban-scale influences (some of which are outside of Missouri) and by the contribution of secondary sources. However, primary $PM_{2.5}$ sources also contribute; identified point sources are generally distributed along the Missouri and Mississippi Rivers.

All of the Missouri $PM_{2.5}$ sites are considered to be critical, in large part because of specific minimum monitoring requirements.

Lead

The level of the primary NAAQS for airborne lead is 0.15 $\mu g/m^3$, measured as total suspended particulate matter (TSP). The averaging time is rolling three-month averages of monthly averages, evaluated over a three-year period. At a minimum, monitors must be placed in areas potentially impacted by sources of lead emissions greater than or equal to one-half ton per year. Lead monitoring is also required at NCore sites in urban areas of population 500,000 or larger.

Lead is currently being monitored by the state at 14 monitoring sites in Missouri: six in the Herculaneum area, one in the old lead belt area, five in the new lead belt area, one near a facility in northwest Missouri, and one in St. Louis. Lead monitoring sites are also operated by industries in some of these areas. Monitors in the Herculaneum area and near the two secondary lead smelters in Missouri have shown violation of the standard. However, the primary smelter in Herculaneum has ceased operation, and emission controls have been installed on both of the secondary smelters. If current trends continue, these monitors are expected to show attainment of the standard within the next few years.

Identified emission sources (in the 2013 emissions inventory) that may exceed one-half tpy of lead emissions include the primary smelter in Herculaneum, the secondary smelters at Buick and Forest City, and two of the mine/mill complexes in the New Lead Belt area. Emissions from these facilities are changing as a result of discontinuing operation of the primary smelter and installing emission controls on both of the secondary smelters.

Because of monitoring requirements as described above and because of recent violations of the standard, which must be evaluated over at least three years, at some sites, all of the current lead monitoring sites are considered to be critical. Some of the sites can, however, be re-evaluated in a few years if emissions estimates change and the sites continue to show attainment of the standard.

During the five years since the 2010 network assessment, the state assumed the responsibility for operation of all monitoring sites previously operated by local agencies.

Summary Table

Table ES-1 summarizes the assessment of current state air monitoring sites in Missouri for CO, SO_2, NO_2, PM_{10}, O_3, $PM_{2.5}$, and lead. Existing sites have been characterized as critical or credible for each pollutant. No sites or pollutants were characterized as marginal, because changes in the network about 2010 have already eliminated marginal sites or pollutants. The table also includes brief comments generally stating the primary reason for each site.

Table ES-1. Summary of Monitoring Site Assessments for Current State Sites

	Pollutant							Comments
Site	**CO**	**SO_2**	**NO_2**	**PM_{10}**	**O_3**	**$PM_{2.5}$**	**Lead**	
St. Louis Area								
Blair Street (NCore)*	critical	critical	critical	critical	critical	critical	critical	NCore site, $PM_{2.5}$ speciation, NATTS
West Alton*					critical			St. Louis area ozone design value
Margaretta		credible-critical	critical	credible-critical				Population exposure
South Broadway				credible		critical		Upwind of central St. Louis
Branch Street				critical		critical		Source oriented
Forest Park	critical		critical	critical		critical		Near-road
Rider Trail I-70			critical					Second near-road
Ladue				credible		critical		High $PM_{2.5}$ removal bias
Maryland Heights*					critical			Near St. Louis area ozone design value
Pacific*					critical			Upwind of central St. Louis
Arnold West*				credible	critical	critical		Upwind of central St. Louis, $PM_{2.5}$ speciation
Foley					critical			Near St. Louis area ozone design value
Orchard Farm*					critical			Near St. Louis area ozone design value
Herculaneum Area								
Pevely North							credible	Could be discontinued with EPA approval
Pevely							critical	Source oriented
Sherman**							critical	Source oriented
Dunklin High School**							critical	Source oriented
Mott Street**		critical					critical	Source oriented
Ursuline North							critical	Background for source area
Kansas City Area								
Troost		critical	critical	credible-critical		critical		Source oriented for SO_2
Front Street				critical				Source oriented
Blue Ridge I-70	critical		critical	critical		critical		Near-road
Liberty				credible	critical	critical		At or near KC area ozone design value
Trimble					critical			At or near KC area ozone design value
Watkins Mill					critical			At or near KC area ozone design value
Rocky Creek					critical			At or near KC area ozone design value
Richards Gebaur South				credible	critical	critical		Upwind of central KC area
Springfield Area								
Hillcrest High School				critical	critical			Springfield ozone design value
South Charleston		critical						Source oriented
Fellows Lake					critical			Required second ozone
Remainder of State								
Mark Twain State Park		credible-critical	credible-critical	critical	critical			Regional background
Bonne Terre					critical			St.Louis background ozone
Carthage				critical				Source oriented
St. Joseph Pump Station				critical		critical		Meets minimum area requirement
Farrar					critical			Potential maximum area ozone
Branson					critical			Potential maximum area ozone
Alba					critical			Potential maximum area ozone
Eldorado Springs				credible	critical	critical		Western Missouri regional background
New Bloomfield					critical			Potential maximum area ozone
Finger Lakes					critical			Potential maximum area ozone
Savannah					critical			Potential maximum area ozone
Buick NE*		critical					critical	Source oriented
Exide Levee							critical	Source oriented
Glover							critical	Source oriented
Oates*							critical	Source oriented
Bills Creek							critical	Source oriented
Fletcher							critical	Source oriented

*In ozone nonattainment area

**In lead nonattainment area

1.0 BACKGROUND AND INTRODUCTION

1.1 Regulatory Requirements

The regulatory requirement for an air monitoring network assessment is found in 40 **Code of Federal Regulations (CFR)** 58.10 (d):

> "The State, or where applicable local, agency shall perform and submit to the EPA Regional Administrator an assessment of the air quality surveillance system every 5 years to determine, at a minimum, if the network meets the monitoring objectives defined in Appendix D to this part, whether new sites are needed, whether existing sites are no longer needed and can be terminated, and whether new technologies are appropriate for incorporation into the ambient air monitoring network. The network assessment must consider the ability of existing and proposed sites to support air quality characterization for areas with relatively high populations of susceptible individuals (e.g., children with asthma), and, for any sites that are being proposed for discontinuance, the effect on data users other than the agency itself, such as nearby States and Tribes or health effects studies. For $PM_{2.5}$, the assessment also must identify needed changes to population-oriented sites. The State, or where applicable local, agency must submit a copy of this 5-year assessment, along with a revised annual network plan, to the Regional Administrator. The first assessment is due July 1, 2010."

This document is intended to meet this requirement. This is the second network assessment required by the regulation; the first one was completed in 2010.

1.2 Assessment Approach

Assessment of various portions of the air monitoring network in Missouri have been a part of past planning documents, including annual Monitoring Network Plans and the 2010 Air Monitoring Network Assessment. Changes in the network since the 2010 assessment, documented in annual network plans, have been made based in part on the 2010 assessment and also based on changes in regulations and on changes in the availability of resources. Some of the changes, including discontinuance of some monitors (especially carbon monoxide, sulfur dioxide, and nitrogen dioxide monitors) after 2010 will be evident in the air monitoring data presented in the following sections.

This assessment is intended to be consistent with the Environmental Protection Agency (EPA) Region VII guidance issued in advance of the 2010 Network Assessment (Appendix B).

This assessment includes analysis of sulfur dioxide (SO_2), nitrogen dioxide (NO_2), particulate matter smaller than 10 micrometers (PM_{10}), carbon monoxide (CO), ozone (O_3), particulate matter smaller than 2.5 micrometers ($PM_{2.5}$), and lead (Pb) monitoring networks.

In addition to identification of monitoring sites in the subsequent sections, Appendix C, the Network Table, includes a complete list of monitoring sites, locations of the sites, parameters being monitored, etc. in Missouri.

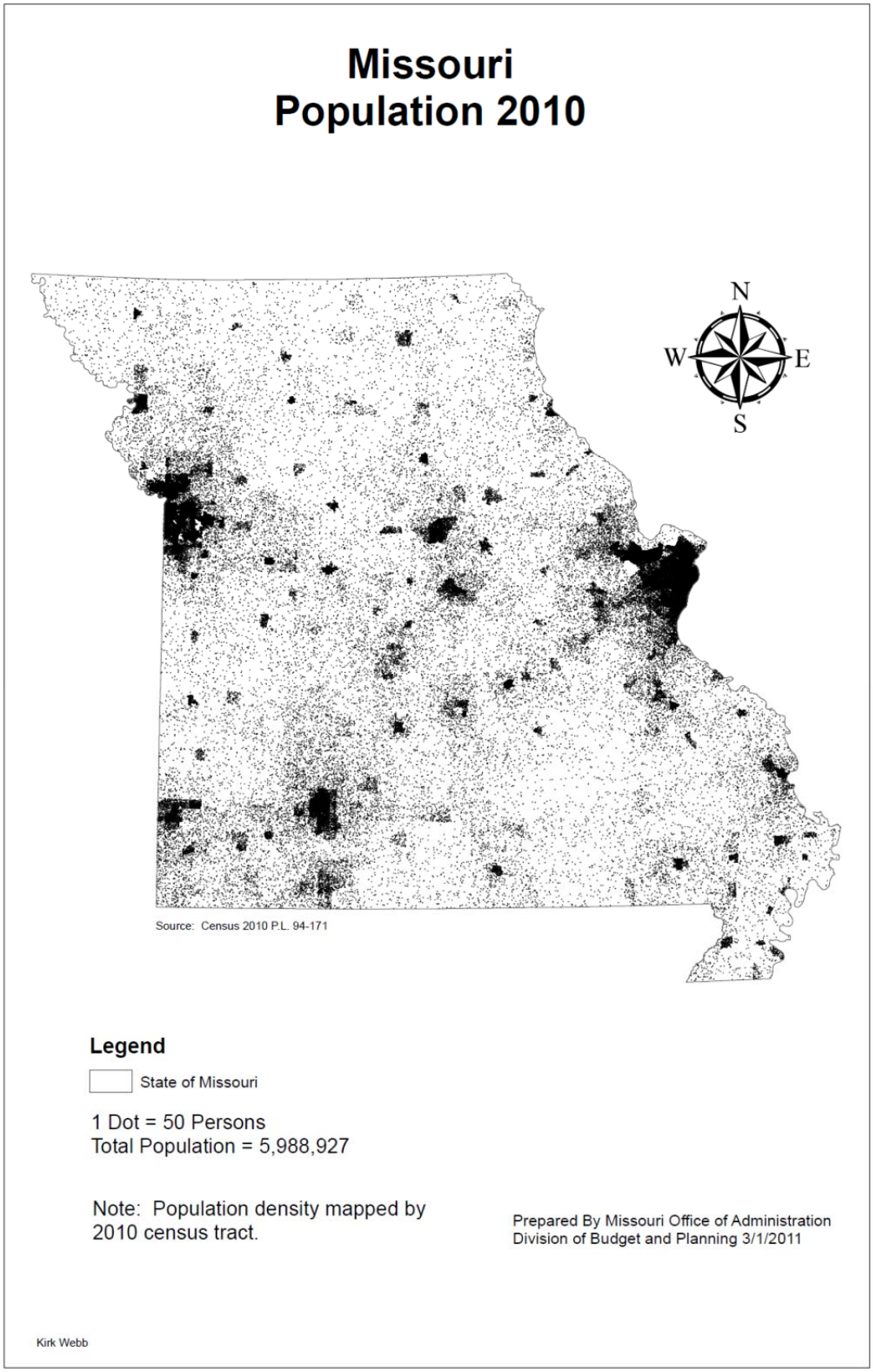
2.0 POPULATION

The 2010 census reported a Missouri population of 5,988,927, an increase of 7 percent from the 2000 population. Figure 2-1 shows the distribution of population in Missouri; each dot on the map represents 50 persons. This map shows the two largest population centers in the St. Louis and Kansas City areas and also other population centers including the Springfield, Joplin, Columbia, Jefferson City, and St. Joseph areas.

Figure 2-2 shows Missouri Core Based Statistical Areas (CBSAs) as defined in 2013. CBSAs include Metropolitan Statistical Areas (MSAs), with population of 50,000 or more and Micropolitan Statistical Areas, with populations of 10,000 or more but less than 50,000. Each CBSA includes one or more counties. Table 2-1 lists the 2010 populations of the Missouri portion of each of the Missouri MSAs. In summary, 4.4 million of the 6.0 million persons in Missouri lived in the 9 MSAs that lie in whole or in part in Missouri. 2.1 million of these persons lived in the Missouri portion of the St. Louis MSA, and 1.2 million of these persons lived in the Missouri portion of the Kansas City MSA.

Table 2-2 lists the 2000 and 2010 census populations, population change, and the percentage change in population for each Missouri County. Figure 2-3 shows the 2010 population by county, and Figure 2-4 shows the percentage changes from 2000 to 2010 by county. In the vicinity of the large urban areas, the principal growth areas were not in the urban core, but in suburban areas. Other growth areas included the Springfield, Branson, Columbia, and Fort Leonard Wood areas.

Population estimates for each county for the current year (2015) and five years from now (2020) have been estimated using the 2010 population as a base and ratios of projections done prior to 2010 for the year of interest to 2010 projections as multipliers. These projected populations are listed in Table 2-3 and shown in Figures 2-5 and 2-6. Population growth is expected to continue in the same areas described above.


Missouri
Population 2010
N
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Source: Census 2010 P.L. 94-171
Legend
State of Missouri
1 Dot = 50 Persons
Total Population = 5,988,927
Note: Population density mapped by
2010 census tract.
Prepared By Missouri Office of Administration
Division of Budget and Planning 3/1/2011
Kirk Webb

Figure 2-1

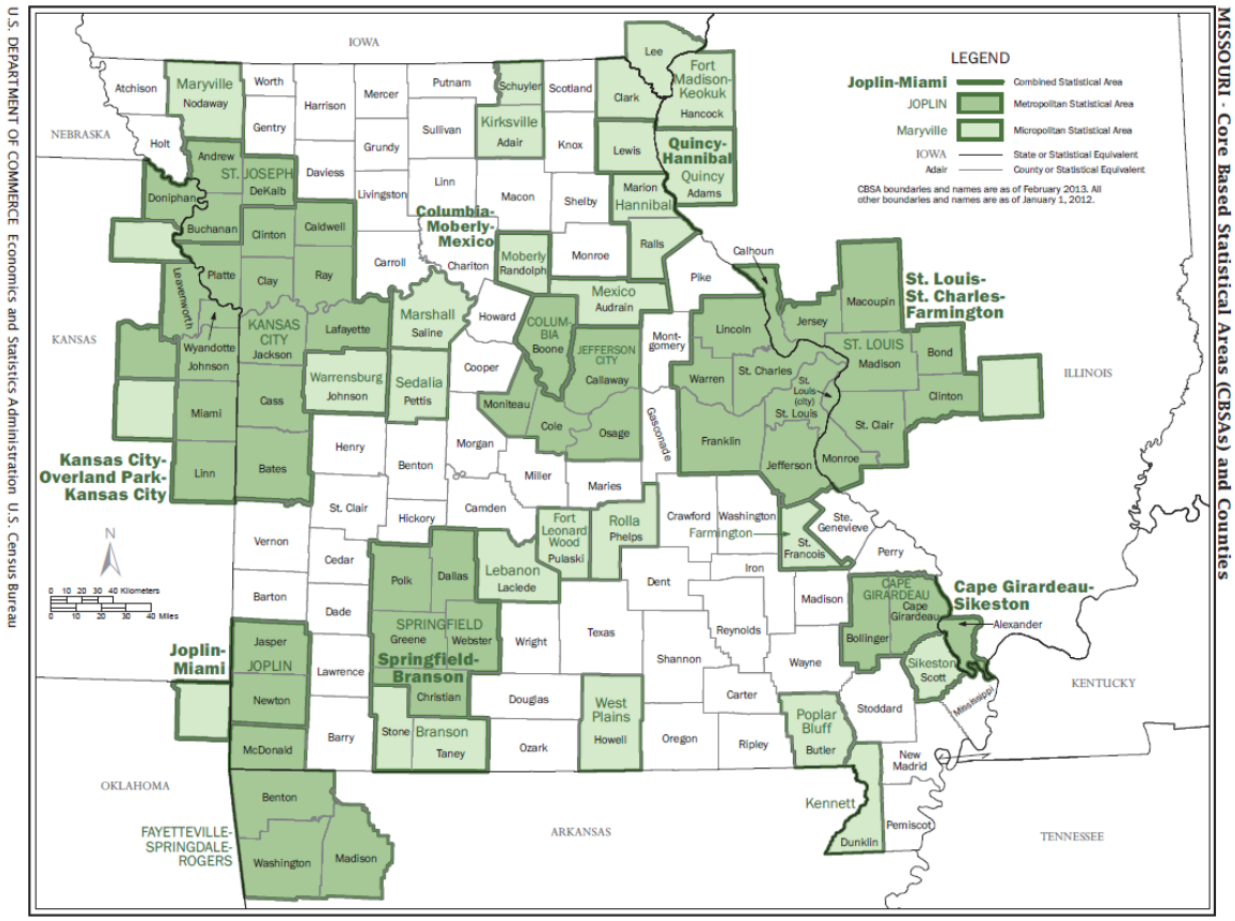

Figure 2-2

Table 2-1	
Missouri Metropolitan Statistical Areas	**2010 Population**
St. Louis (part)	2,084,037
Kansas City (part)	1,188,988
Springfield	436,712
Joplin	175,518
Columbia	162,642
Jefferson City	149,807
St. Joseph (part)	119,384
Cape Girardeau (part)	88,037
Fayetteville-Springdale-Rogers (part)	23,083
Total Population in Missouri MSAs	4,428,208

Table 2-2. Missouri
County Population Change 2000 to 2010
Numeric and Percent Change

Name	2000 Census Total Population	2010 Census Total Population	Population Change Over the Decade	Percent Change
Adair	24,977	25,607	630	3%
Andrew	16,492	17,291	799	5%
Atchison	6,430	5,685	-745	-12%
Audrain	25,853	25,529	-324	-1%
Barry	34,010	35,597	1,587	5%
Barton	12,541	12,402	-139	-1%
Bates	16,653	17,049	396	2%
Benton	17,180	19,056	1,876	11%
Bollinger	12,029	12,363	334	3%
Boone	135,454	162,642	27,188	20%
Buchanan	85,998	89,201	3,203	4%
Butler	40,867	42,794	1,927	5%
Caldwell	8,969	9,424	455	5%
Callaway	40,766	44,332	3,566	9%
Camden	37,051	44,002	6,951	19%
Cape Girardeau	68,693	75,674	6,981	10%
Carroll	10,285	9,295	-990	-10%
Carter	5,941	6,265	324	5%
Cass	82,092	99,478	17,386	21%
Cedar	13,733	13,982	249	2%
Chariton	8,438	7,831	-607	-7%
Christian	54,285	77,422	23,137	43%
Clark	7,416	7,139	-277	-4%
Clay	184,006	221,939	37,933	21%
Clinton	18,979	20,743	1,764	9%
Cole	71,397	75,990	4,593	6%
Cooper	16,670	17,601	931	6%
Crawford	22,804	24,696	1,892	8%
Dade	7,923	7,883	-40	-1%
Dallas	15,661	16,777	1,116	7%
Daviess	8,016	8,433	417	5%
DeKalb	11,597	12,892	1,295	11%
Dent	14,927	15,657	730	5%
Douglas	13,084	13,684	600	5%
Dunklin	33,155	31,953	-1,202	-4%
Franklin	93,807	101,492	7,685	8%
Gasconade	15,342	15,222	-120	-1%
Gentry	6,861	6,738	-123	-2%
Greene	240,391	275,174	34,783	14%
Grundy	10,432	10,261	-171	-2%
Harrison	8,850	8,957	107	1%
Henry	21,997	22,272	275	1%
Hickory	8,940	9,627	687	8%
Holt	5,351	4,912	-439	-8%
Howard	10,212	10,144	-68	-1%
Howell	37,238	40,400	3,162	8%
Iron	10,697	10,630	-67	-1%
Jackson	654,880	674,158	19,278	3%
Jasper	104,686	117,404	12,718	12%
Jefferson	198,099	218,733	20,634	10%
Johnson	48,258	52,595	4,337	9%
Knox	4,361	4,131	-230	-5%
Laclede	32,513	35,571	3,058	9%
Lafayette	32,960	33,381	421	1%
Lawrence	35,204	38,634	3,430	10%
Lewis	10,494	10,211	-283	-3%
Lincoln	38,944	52,566	13,622	35%
Linn	13,754	12,761	-993	-7%
Livingston	14,558	15,195	637	4%

Table 2-2 continued				
McDonald	21,681	23,083	1,402	6%
Macon	15,762	15,566	-196	-1%
Madison	11,800	12,226	426	4%
Maries	8,903	9,176	273	3%
Marion	28,289	28,781	492	2%
Mercer	3,757	3,785	28	1%
Miller	23,564	24,748	1,184	5%
Mississippi	13,427	14,358	931	7%
Moniteau	14,827	15,607	780	5%
Monroe	9,311	8,840	-471	-5%
Montgomery	12,136	12,236	100	1%
Morgan	19,309	20,565	1,256	7%
New Madrid	19,760	18,956	-804	-4%
Newton	52,636	58,114	5,478	10%
Nodaway	21,912	23,370	1,458	7%
Oregon	10,344	10,881	537	5%
Osage	13,062	13,878	816	6%
Ozark	9,542	9,723	181	2%
Pemiscot	20,047	18,296	-1,751	-9%
Perry	18,132	18,971	839	5%
Pettis	39,403	42,201	2,798	7%
Phelps	39,825	45,156	5,331	13%
Pike	18,351	18,516	165	1%
Platte	73,781	89,322	15,541	21%
Polk	26,992	31,137	4,145	15%
Pulaski	41,165	52,274	11,109	27%
Putnam	5,223	4,979	-244	-5%
Ralls	9,626	10,167	541	6%
Randolph	24,663	25,414	751	3%
Ray	23,354	23,494	140	1%
Reynolds	6,689	6,696	7	0%
Ripley	13,509	14,100	591	4%
St. Charles	283,883	360,485	76,602	27%
St. Clair	9,652	9,805	153	2%
Ste. Genevieve	17,842	18,145	303	2%
St. Francois	55,641	65,359	9,718	17%
St. Louis	1,016,315	998,954	-17,361	-2%
Saline	23,756	23,370	-386	-2%
Schuyler	4,170	4,431	261	6%
Scotland	4,983	4,843	-140	-3%
Scott	40,422	39,191	-1,231	-3%
Shannon	8,324	8,441	117	1%
Shelby	6,799	6,373	-426	-6%
Stoddard	29,705	29,968	263	1%
Stone	28,658	32,202	3,544	12%
Sullivan	7,219	6,714	-505	-7%
Taney	39,703	51,675	11,972	30%
Texas	23,003	26,008	3,005	13%
Vernon	20,454	21,159	705	3%
Warren	24,525	32,513	7,988	33%
Washington	23,344	25,195	1,851	8%
Wayne	13,259	13,521	262	2%
Webster	31,045	36,202	5,157	17%
Worth	2,382	2,171	-211	-9%
Wright	17,955	18,815	860	5%
St. Louis city	348,189	319,294	-28,895	-8%
Missouri	**5,595,211**	**5,988,927**	**393,716**	**7%**

Source: Census 2000 - SF1 and 2010 P.L. 94-171

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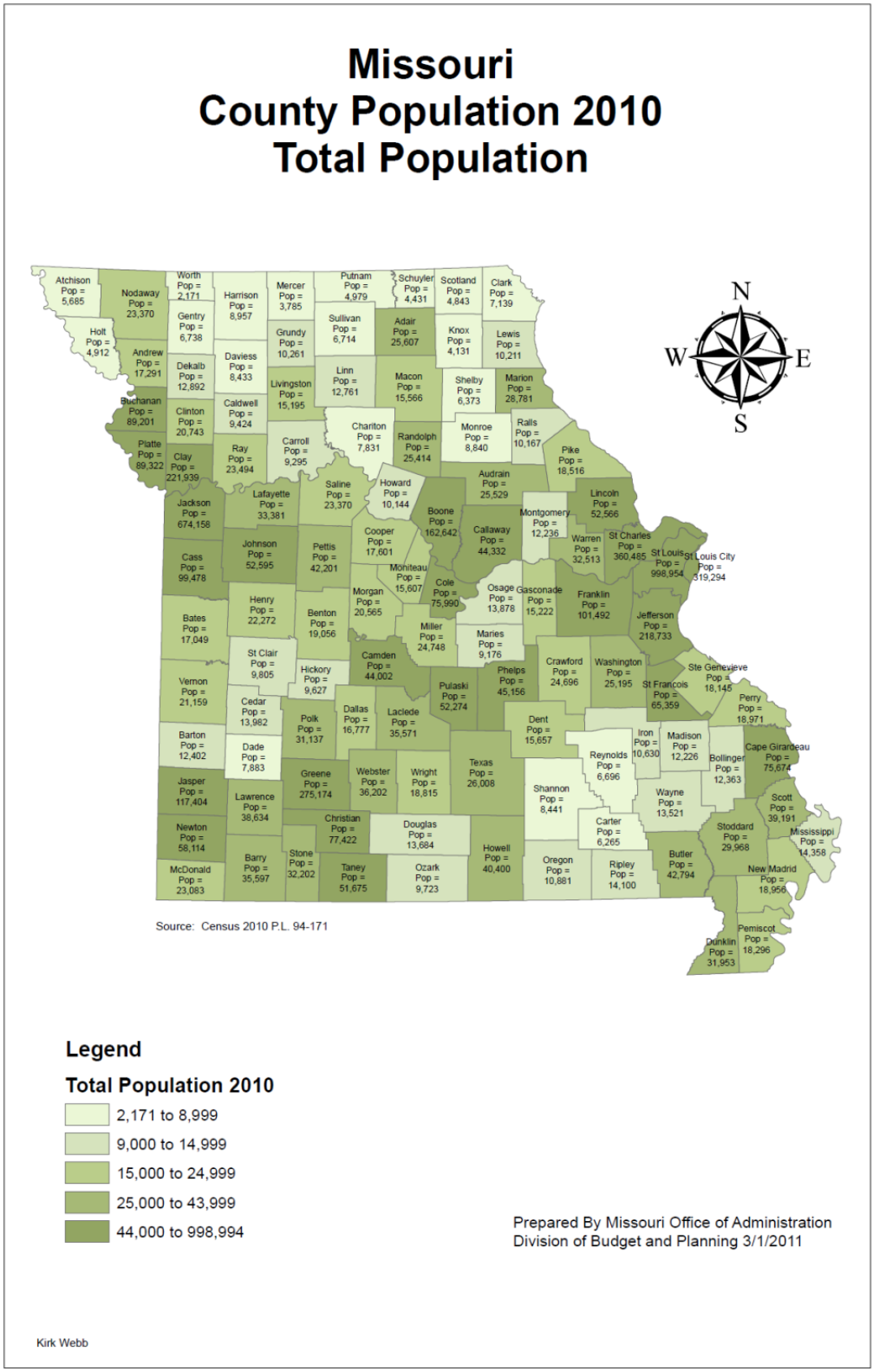

Missouri
County Population 2010
Total Population
N
W
E
S
Atchison Pop = 5,685
Nodaway Pop = 23,370
Worth Pop = 2,171
Harrison Pop = 8,957
Mercer Pop = 3,785
Putnam Pop = 4,979
Schuyler Pop = 4,431
Scotland Pop = 4,843
Clark Pop = 7,139
Holt Pop = 4,912
Gentry Pop = 6,738
Sullivan Pop = 6,714
Adair Pop = 25,607
Knox Pop = 4,131
Lewis Pop = 10,211
Andrew Pop = 17,291
Grundy Pop = 10,261
Daviess Pop = 8,433
Dekalb Pop = 12,892
Linn Pop = 12,761
Macon Pop = 15,566
Shelby Pop = 6,373
Marion Pop = 28,781
Buchanan Pop = 89,201
Clinton Pop = 20,743
Caldwell Pop = 9,424
Livingston Pop = 15,195
Chariton Pop = 7,831
Randolph Pop = 25,414
Monroe Pop = 8,840
Ralls Pop = 10,167
Platte Pop = 89,322
Clay Pop = 221,939
Ray Pop = 23,494
Carroll Pop = 9,295
Pike Pop = 18,516
Audrain Pop = 25,529
Saline Pop = 23,370
Howard Pop = 10,144
Lincoln Pop = 52,566
Jackson Pop = 674,158
Lafayette Pop = 33,381
Boone Pop = 162,642
Montgomery Pop = 12,236
Callaway Pop = 44,332
Cooper Pop = 17,601
Warren Pop = 32,513
St Charles Pop = 360,485
St Louis Pop = 998,954
St Louis City Pop = 319,294
Cass Pop = 99,478
Johnson Pop = 52,595
Pettis Pop = 42,201
Moniteau Pop = 15,607
Cole Pop = 75,990
Osage Pop = 13,878
Gasconade Pop = 15,222
Franklin Pop = 101,492
Jefferson Pop = 218,733
Henry Pop = 22,272
Morgan Pop = 20,565
Benton Pop = 19,056
Bates Pop = 17,049
Miller Pop = 24,748
Maries Pop = 9,176
St Clair Pop = 9,805
Hickory Pop = 9,627
Camden Pop = 44,002
Phelps Pop = 45,156
Crawford Pop = 24,696
Washington Pop = 25,195
Ste Genevieve Pop = 18,145
St Francois Pop = 65,359
Vernon Pop = 21,159
Pulaski Pop = 52,274
Perry Pop = 18,971
Cedar Pop = 13,982
Dallas Pop = 16,777
Laclede Pop = 35,571
Dent Pop = 15,657
Polk Pop = 31,137
Barton Pop = 12,402
Dade Pop = 7,883
Iron Pop = 10,630
Madison Pop = 12,226
Cape Girardeau Pop = 75,674
Reynolds Pop = 6,696
Bollinger Pop = 12,363
Texas Pop = 26,008
Greene Pop = 275,174
Webster Pop = 36,202
Wright Pop = 18,815
Jasper Pop = 117,404
Shannon Pop = 8,441
Wayne Pop = 13,521
Scott Pop = 39,191
Lawrence Pop = 38,634
Christian Pop = 77,422
Douglas Pop = 13,684
Carter Pop = 6,265
Stoddard Pop = 29,968
Mississippi Pop = 14,358
Newton Pop = 58,114
Howell Pop = 40,400
Oregon Pop = 10,881
Ripley Pop = 14,100
Butler Pop = 42,794
Stone Pop = 32,202
Barry Pop = 35,597
Taney Pop = 51,675
Ozark Pop = 9,723
McDonald Pop = 23,083
New Madrid Pop = 18,956
Pemiscot Pop = 18,296
Dunklin Pop = 31,953
Source: Census 2010 P.L. 94-171
Legend
Total Population 2010
2,171 to 8,999
9,000 to 14,999
15,000 to 24,999
25,000 to 43,999
44,000 to 998,994
Prepared By Missouri Office of Administration
Division of Budget and Planning 3/1/2011
Kirk Webb

Figure 2-3

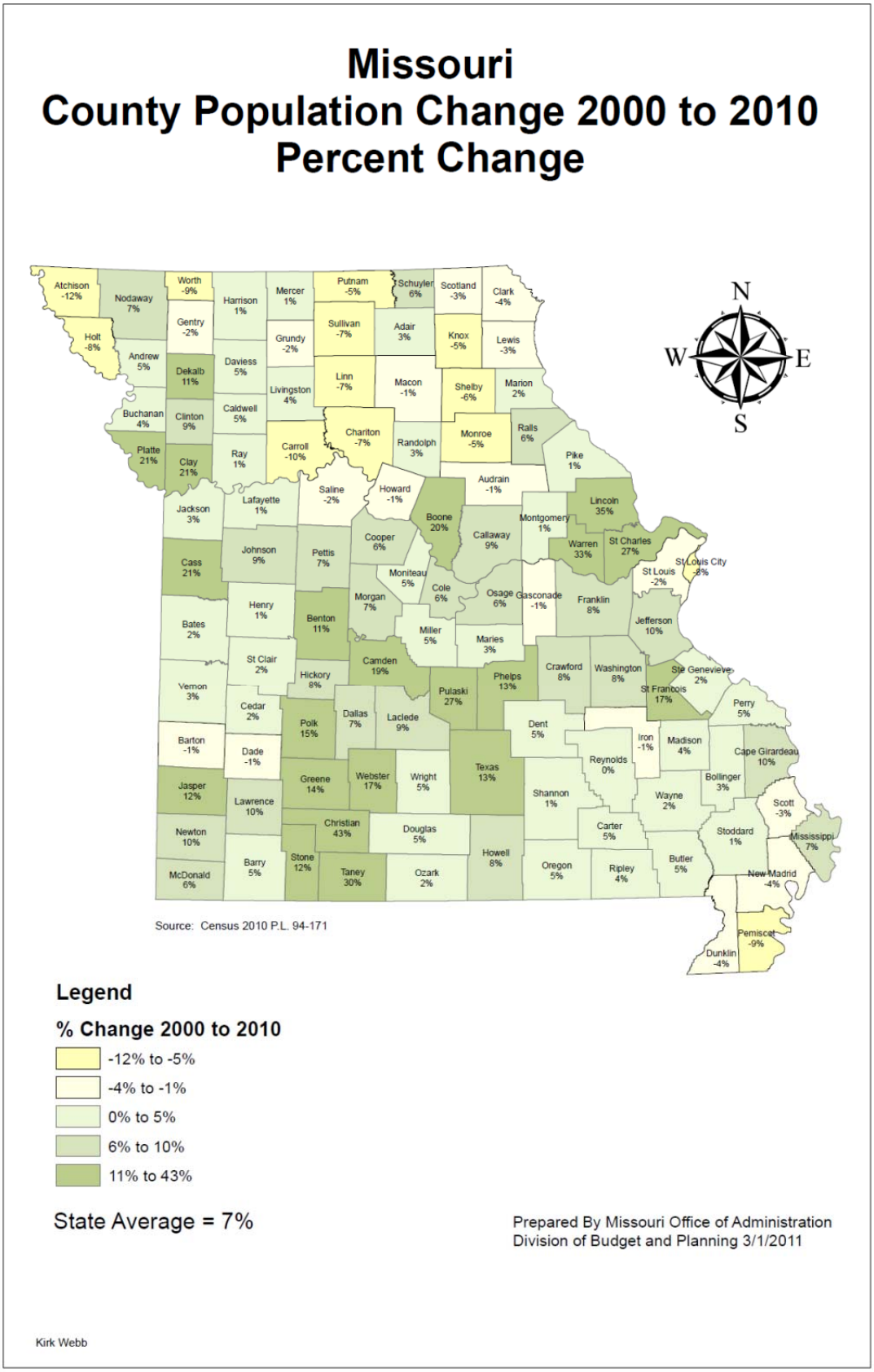

Missouri
County Population Change 2000 to 2010
Percent Change
Atchison -12%
Nodaway 7%
Worth -9%
Harrison 1%
Mercer 1%
Putnam -5%
Schuyler 6%
Scotland -3%
Clark -4%
Holt -8%
Gentry -2%
Sullivan -7%
Adair 3%
Knox -5%
Lewis -3%
Andrew 5%
Dekalb 11%
Daviess 5%
Grundy -2%
Linn -7%
Macon -1%
Shelby -6%
Marion 2%
Buchanan 4%
Clinton 9%
Caldwell 5%
Livingston 4%
Chariton -7%
Randolph 3%
Monroe -5%
Ralls 6%
Platte 21%
Clay 21%
Ray 1%
Carroll -10%
Pike 1%
Audrain -1%
Saline -2%
Howard -1%
Jackson 3%
Lafayette 1%
Boone 20%
Lincoln 35%
Montgomery 1%
Callaway 9%
Cooper 6%
Warren 33%
St Charles 27%
Cass 21%
Johnson 9%
Pettis 7%
St Louis City -8%
St Louis -2%
Moniteau 5%
Cole 6%
Osage 6%
Gasconade -1%
Franklin 8%
Morgan 7%
Henry 1%
Benton 11%
Jefferson 10%
Bates 2%
Miller 5%
Maries 3%
St Clair 2%
Camden 19%
Crawford 8%
Washington 8%
Ste Genevieve 2%
Hickory 8%
Phelps 13%
Vernon 3%
Pulaski 27%
St Francois 17%
Cedar 2%
Dallas 7%
Laclede 9%
Perry 5%
Polk 15%
Dent 5%
Barton -1%
Dade -1%
Iron -1%
Madison 4%
Cape Girardeau 10%
Reynolds 0%
Texas 13%
Greene 14%
Webster 17%
Wright 5%
Bollinger 3%
Jasper 12%
Shannon 1%
Wayne 2%
Lawrence 10%
Scott -3%
Christian 43%
Douglas 5%
Carter 5%
Stoddard 1%
Newton 10%
Mississippi 7%
Stone 12%
Howell 8%
Butler 5%
Barry 5%
Oregon 5%
Ripley 4%
New Madrid -4%
McDonald 6%
Taney 30%
Ozark 2%
Pemiscot -9%
Dunklin -4%
N
W
E
S
Source: Census 2010 P.L. 94-171
Legend
% Change 2000 to 2010
-12% to -5%
-4% to -1%
0% to 5%
6% to 10%
11% to 43%
State Average = 7%
Prepared By Missouri Office of Administration
Division of Budget and Planning 3/1/2011
Kirk Webb

Figure 2-4

Table 2-3 Missouri Projected Population by County			
County	Census Population	Projected Population	
	2010	2015	2020
Adair	25,607	25,680	25,779
Andrew	17,291	17,946	18,641
Atchison	5,685	5,482	5,332
Audrain	25,529	25,687	25,936
Barry	35,597	37,435	39,289
Barton	12,402	12,483	12,655
Bates	17,049	17,485	17,936
Benton	19,056	19,625	20,061
Bollinger	12,363	12,507	12,660
Boone	162,642	175,422	188,060
Buchanan	89,201	90,951	92,614
Butler	42,794	42,902	42,922
Caldwell	9,424	9,741	10,075
Callaway	44,332	46,914	49,597
Camden	44,002	46,617	48,892
Cape Girardeau	75,674	78,626	81,607
Carroll	9,295	9,021	8,777
Carter	6,265	6,288	6,291
Cass	99,478	108,947	117,927
Cedar	13,982	13,834	13,715
Chariton	7,831	7,447	7,088
Christian	77,422	90,909	103,942
Clark	7,139	7,075	7,013
Clay	221,939	242,575	263,014
Clinton	20,743	22,104	23,387
Cole	75,990	78,392	80,790
Cooper	17,601	18,413	19,220
Crawford	24,696	25,706	26,656
Dade	7,883	7,753	7,607
Dallas	16,777	18,019	19,233
Daviess	8,433	8,393	8,372
DeKalb	12,892	12,986	13,092
Dent	15,657	15,804	15,945
Douglas	13,684	13,861	14,017
Dunklin	31,953	31,150	30,432
Franklin	101,492	105,687	109,702
Gasconade	15,222	15,351	15,494
Gentry	6,738	6,317	5,955
Greene	275,174	292,282	308,206
Grundy	10,261	10,158	10,070
Harrison	8,957	9,112	9,276
Henry	22,272	22,696	23,075
Hickory	9,627	9,746	9,821
Holt	4,912	4,717	4,549
Howard	10,144	10,191	10,311
Howell	40,400	41,688	42,841
Iron	10,630	10,016	9,412
Jackson	674,158	683,639	694,678
Jasper	117,404	125,905	134,202
Jefferson	218,733	229,861	240,214
Johnson	52,595	54,693	56,832
Knox	4,131	4,017	3,945
Laclede	35,571	37,747	39,824
Lafayette	33,381	33,375	33,460
Lawrence	38,634	40,806	42,971
Lewis	10,211	10,182	10,209
Lincoln	52,566	61,278	69,946
Linn	12,761	12,238	11,805
Livingston	15,195	15,242	15,310

Table 2-3 continued

McDonald	23,083	24,133	25,277
Macon	15,566	15,643	15,744
Madison	12,226	12,579	12,871
Maries	9,176	9,461	9,743
Marion	28,781	29,115	29,441
Mercer	3,785	3,679	3,602
Miller	24,748	25,633	26,421
Mississippi	14,358	13,804	13,265
Moniteau	15,607	15,887	16,250
Monroe	8,840	8,917	9,011
Montgomery	12,236	12,156	12,077
Morgan	20,565	21,534	22,460
New Madrid	18,956	17,607	16,330
Newton	58,114	60,634	63,140
Nodaway	23,370	23,614	23,889
Oregon	10,881	10,928	11,005
Osage	13,878	13,981	14,101
Ozark	9,723	9,525	9,337
Pemiscot	18,296	17,702	17,175
Perry	18,971	19,553	20,124
Pettis	42,201	43,654	45,192
Phelps	45,156	46,569	47,892
Pike	18,516	18,541	18,596
Platte	89,322	96,352	103,224
Polk	31,137	33,508	35,789
Pulaski	52,274	52,889	53,486
Putnam	4,979	4,808	4,670
Ralls	10,167	10,327	10,481
Randolph	25,414	25,900	26,392
Ray	23,494	23,664	23,888
Reynolds	6,696	6,647	6,587
Ripley	14,100	14,277	14,396
St. Charles	360,485	397,968	434,104
St. Clair	9,805	9,778	9,726
Ste. Genevieve	18,145	18,250	18,411
St. Francois	65,359	68,206	70,703
St. Louis	998,954	986,021	978,118
Saline	23,370	22,950	22,595
Schuyler	4,431	4,415	4,408
Scotland	4,843	4,889	4,985
Scott	39,191	39,337	39,482
Shannon	8,441	8,757	9,066
Shelby	6,373	6,180	6,025
Stoddard	29,968	29,872	29,740
Stone	32,202	34,480	36,529
Sullivan	6,714	6,416	6,191
Taney	51,675	57,560	63,152
Texas	26,008	25,820	25,604
Vernon	21,159	20,940	20,757
Warren	32,513	36,563	40,343
Washington	25,195	26,034	26,725
Wayne	13,521	13,185	12,784
Webster	36,202	39,985	43,771
Worth	2,171	2,095	2,033
Wright	18,815	19,261	19,675
St. Louis city	319,294	319,096	318,916
Missouri total	5,988,927	6,192,399	6,396,385

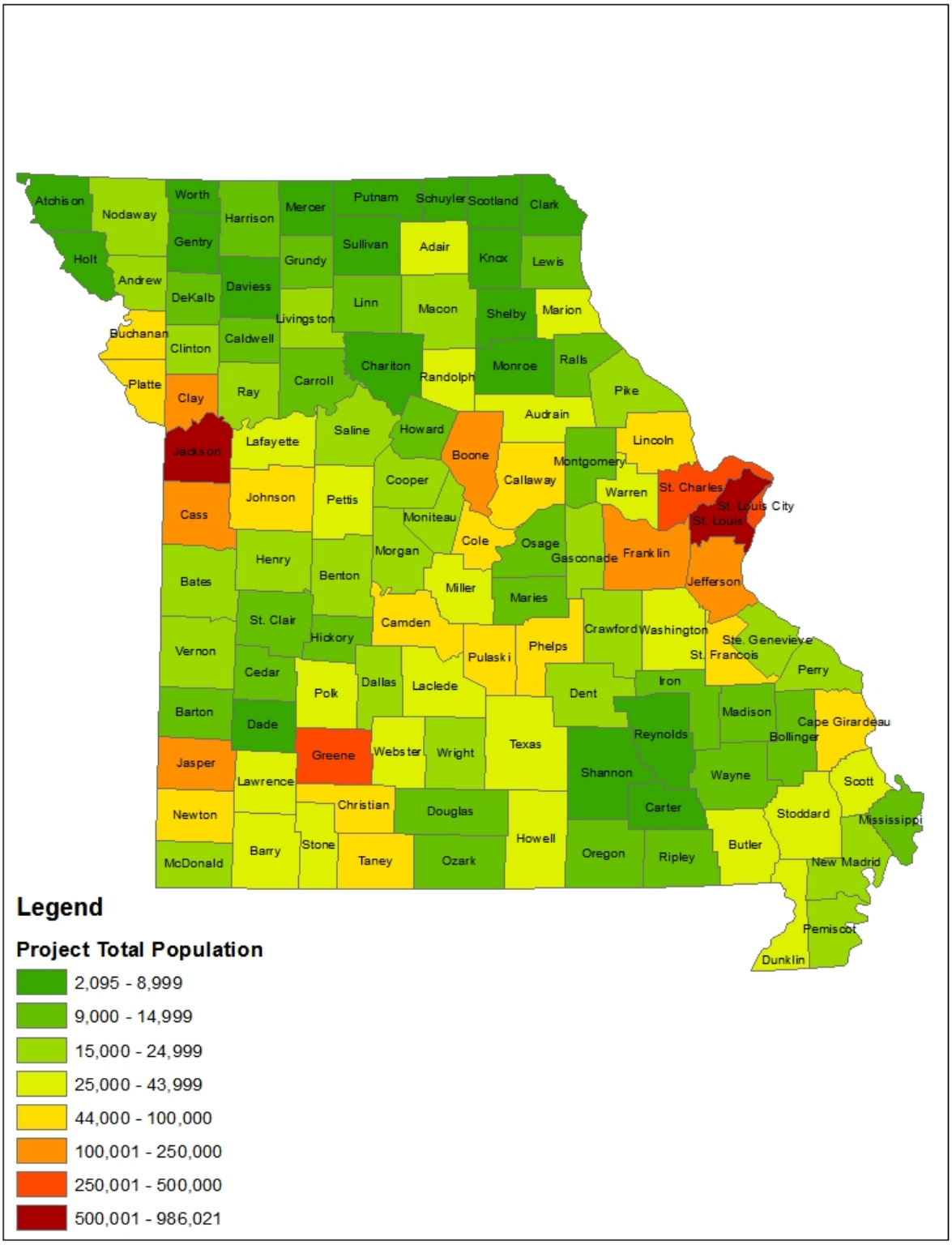


Figure 2-5. 2015 Projected Population by County

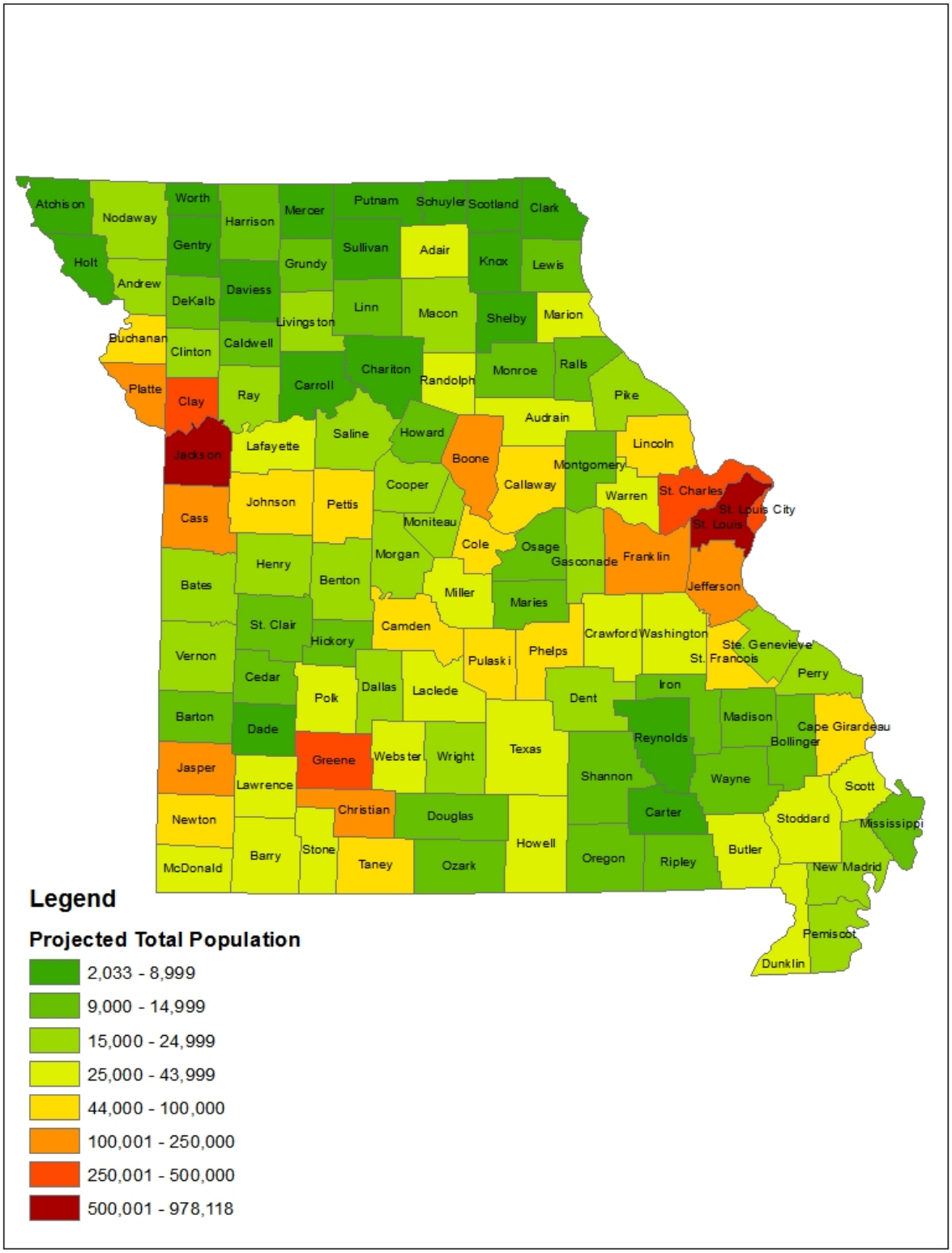


Figure 2-6. 2020 Projected Population by County

3.0 GENERAL CLIMATE OF MISSOURI

Missouri is located in the middle of a continent and normally has the full four seasons of spring, summer, fall, and winter. Summers are normally hot and humid and winters are cool to cold. Due to the location in the interior United States, Missouri often experiences extreme temperatures that can range throughout the year from 100 degrees Fahrenheit (°F) or greater to below 0°F. Not having either large mountains or oceans nearby to moderate the temperatures, the climate is influenced by air from the cold arctic in the winter to hot humid Gulf of Mexico air during the summer. There can be exceptionally high or low readings in temperatures throughout the year. Missouri will occasionally receive the remains of hurricanes. Thunderstorms also have occurred every month of the year.

3.1 Spring

Spring ranges from March through May and is normally the wettest season of the year as the jet stream fluctuates and develops disturbances along its path. Winds will range throughout the compass as systems move through.

Average Temperature Ranges: 76°F to 33°F

3.2 Summer

Summer normally runs from June through August, with less precipitation, as high pressure usually dominates the area with warm moist air being moved in from the Gulf of Mexico. Winds are generally from a southerly component.

Average Temperature Ranges: 90°F to 62°F

3.3 Fall

Fall is considered from September to November. At this time of year temperatures can move into the 80F or higher range in the early fall season, but will normally drop slowly toward the end of fall. Winds normally are still from the southern component but will slowly shift to a more northwesterly component later in the season as the jet stream shifts south.

Average Temperature Ranges: 81°F to 33°F

3.4 Winter

Winter is classified as running from December through February. Normally the northern portion of the state receives most of the frozen precipitation but occasionally with the location of the jet stream and fluctuations of it, southern Missouri may receive more. Winds are generally from a

northwesterly component but occasionally winds will become southerly allowing for a slight warming period.

Average Temperature Ranges: 46°F to18°F

3.5 Ozone

Generally, ozone episodes occur in the summer when high pressure moves to the east of Missouri along with an upper level ridge over the area. Ozone may form in the spring and fall but mainly during the summer months. Temperatures will be allowed to increase and abundant sunshine will prevail. Winds will generally be calm to light and from a southerly component. With the downward motion of the air an inversion will set up and hold the air stagnant and trapped allowing for readings to increase. This is the predominant condition, but there have been other conditions when an episode has occurred such as air transport. Fires and controlled burns have also influenced high readings at times.

3.6 $PM_{2.5}$

Both local surface meteorology and transport can affect $PM_{2.5}$ levels. Regional weather patterns bring air masses into St. Louis from various emission source regions, including those with large SO_2 and nitrogen oxide (NO_X) precursor gases, and some sources of direct $PM_{2.5}$. The $PM_{2.5}$ which moves over a moderately stable air mass (light surface winds) located over an area will allow infusion of the fine particle laden air to settle into the area. For example, summertime high pressure systems are often centered over the Ohio Valley area which not only bring air masses from the SO_2 emissions- rich regions of the Ohio River Valley and Tennessee Valley into St. Louis, but also create local conditions which are often stagnant or nearly stagnant. NO_X transport is not so clearly defined, although it can occur from north and northwest, or the south and southwest.

3.7 Wind Roses (Appendix A)

Wind roses based on data from major airports were selected to represent regions in Missouri. The selected airport representing the West was Wheeler Airport near downtown Kansas City (KMKC). For the South, the Springfield Airport (KSGF) was selected, and Lambert-St. Louis International Airport (KSTL) was selected for the East. Airport sites report official weather observations for the National Weather Service, and data are archived at the National Climatic Data Center for easy access.

4.0 NEW EMISSION SOURCES

New larger emission sources are primarily those permitted under the Prevention of Significant Deterioration (PSD) program. For some years those permits have been issued, in which potential increases are tracked (often times conditionally limited in the permit) and air quality analysis conducted as necessary. Table 4-1 lists PSD permits issued in Missouri from the years 2010 through 2014 and the associated emission increases. If air quality analysis was part of the permit it may include modeling and/or ambient air monitoring. Monitoring may be predicated either on the need to determine localized ambient levels associated with the increment analysis or in a few cases where modeled pollutant levels may have been close to the NAAQS to ensure that those are not exceeded in monitoring.

4.1 Carbon Monoxide (CO)

There have been some large increases in emissions of CO at several of the permitted facilities. However, CO point source emissions increases are not associated with NAAQS exceedances, but rather increment consumption. The increases also contribute to increases in urban-wide levels, which may contribute to background levels in the neighborhood of large mobile source emissions. Given the lack of association with direct NAAQS exceedance impacts, and the fact that the CO increases are not in the urban core areas, we do not believe that those type point source emission increases are by themselves a cause for increased ambient monitoring, particularly to evaluate NAAQS compliance.

4.2 Ozone

NO_X and VOCs are known precursors of ozone. NOx and VOCs emissions are not generally correlated in monitoring or air quality analysis with a localized ozone NAAQS problem but instead cause additions to urban area or at least downwind ozone concentrations. Some individual permits for various pollutants have generated additional monitoring to determine current ozone levels downwind of the source of large VOC emissions increases, when current monitoring nearby was not available.

Archer Daniels Midland Co (ADM) has the most VOC increase among the permitted facilities during the period. AMD permit did not require (as a condition) ozone monitoring for preconstruction. No model was at the time available which would have accurately predicted ambient ozone concentration by this installation's VOC increase. The state monitoring site at Mark Twain State Park is located approximately 25 miles northeast and relatively downwind of the ADM facility. Ozone 4th high values at the site have decreased by 17% since 2010. The site's 2014 4th high is at 60 Parts per Billion (ppb). VOC emissions are not likely to be a deciding component by themselves in monitoring site placement.

4.3 PM_{10} and SO_2

Noranda Aluminum Inc. has the largest increase of PM_{10} and SO_2 emissions among the permitted sources. Special condition of the permit included installing, operating, and maintaining a system of ambient monitoring stations for PM_{10} and SO_2. However, the permit was reverted back to the 2008 permit. Post construction monitoring near the facility did indicate some high levels of PM_{10} (no exceedances) at the two monitoring sites there.

Table 4-1. 2010 – 2014 Missouri PSD Permits and the Associated Emission Increase

						Emission Increase										
Facility Name	Easting	Northing	County	City	Permit Completion Date	PM	PM10	SOx	NOx	VOC	CO	Lead	HAPs	PM25	NH3	Comment
EFCO Corporation	419476	4086162	Barry	Monett	2/5/2010		1.39	0.015	2.44	20.8	2.05	N/A	13.4	N/A	N/A	Potential emissions of the project application
Mid America Brick	597261.6	4335609	Audrain	Mexico	6/15/2010		20.1	36.61	19.93	6.76	68.33	N/A	32	N/A	N/A	Potential emissions of project application
Noranda Aluminum Inc	807329.1	4046195	New Madr	New Madrid	8/4/2010		501	573	0.89	34	2841	N/A	N/A	322	N/A	Potential emissions of the application
Mark Twain Waste and Energy	N/A	N/A	Pike	Louisiana	9/15/2010											Never built out of business
Archer Daniels Midland Co	596784	4336181	Audrain	Mexico	10/5/2010	17.2	<15.2	3.57	<40.0	206.6	31.49	N/A	N/A	N/A	N/A	Emissions increases column
Associated Electric (Thomas Hill Plant)	531156.3	4377772	Randolph	Clifton Hill	12/17/2010	N/A	N/A	N/A	N/A	N/A	13873	N/A	N/A	N/A	N/A	Potential emissions of the application
A E C I New Madrid	807548.4	4046588	New Madr	New Madrid	12/17/2010	N/A	N/A	N/A	N/A	N/A	34449	N/A	N/A	N/A	N/A	Potential emissions of the application
Ford Motor Company - Kansas City Plant	372345.8	4340524	Clay	Kansas City	7/20/2011							N/A	N/A	N/A	N/A	Potential emissions of this application/not determined because it's a Pal. Determine a new baseline and allowed de minimis increases for all of the pollutants marked. Except the N/A pollutants
Archimica (Missouri) Inc	470907.4	4115735	Green	Springfield	9/19/2011							N/A	N/A	N/A	N/A	Potential emissions of this application/not determined because it's a Pal. Determine a new baseline and allowed de minimis increases for all of the pollutants marked. Except the N/A pollutants
Kansas City	418406.4	4240808	Henry	Clinton	4/9/2012		N/A	N/A	Decrease	N/A	7139	N/A	N/A	N/A	N/A	Emissions increase
General Motors	689428	4299090	St. Charles	Wentzville	5/16/2012		<15.0	<40.0	<40.0	N/A	<100.0	N/A	N/A	<10.0	N/A	Potential emissions of the Application
Kansas City Power & Light (Iatan)	329723.4	4368413	Platte	Weston	3/4/2014											Project was closed out and no longer needed. According to Pams

5.0 CARBON MONOXIDE NETWORK ASSESSMENT

5.1 Introduction: Carbon Monoxide Standards and Monitoring Requirements

The primary NAAQS for CO are

- 35 parts per million by volume (ppm) for one hour, and
- 9 ppm for eight hours.

These concentrations must not be exceeded more than once per year (http://www.epa.gov/air/criteria.html). There is no secondary CO standard. These CO NAAQS were reviewed but left unchanged by a final rule published in August 2011.

In 2006 the United States Environmental Protection Agency (US EPA) issued revised air monitoring requirements (71 **Federal Register** 61235, October 17, 2006). Unlike monitoring requirements for other pollutants, there are no required minimum numbers of CO monitoring sites in cities or metropolitan statistical areas. Because airborne CO results primarily from internal combustion engine exhaust, sites chosen for CO monitoring should be microscale or middle scale, as described in the following quotations from the monitoring regulations (71 **Federal Register** 61319, October 17, 2006; also 40 **CFR**, Part 58, Appendix D, 4.2.3):

- Microscale: "This scale applies when air quality measurements are to be used to represent distributions within street canyons, over sidewalks, and near major roadways. In the case with carbon monoxide, microscale measurements in one location can often be considered as representative of other similar locations in a city."
- Middle Scale: "Middle scale measurements are intended to represent areas with dimensions from 100 meters to 0.5 kilometer. In certain cases, middle scale measurements may apply to areas that have a total length of several kilometers, such as ''line'' emission source areas. This type of emission sources areas would include air quality along a commercially developed street or shopping plaza, freeway corridors, parking lots and feeder streets.

CO monitoring is specifically required at near-road sites (see Section 7.0) in CBSAs with a population of one million or larger (40 **CFR**, Part 58, Appendix D, 4.2.1).

5.2 CO Monitoring Results in Missouri

The locations of the current CO monitoring sites are shown on the map in Figure 5-1. Second maximum 1-hour and 8-hour average CO concentrations (design values) measured at locations in Missouri since 2010 are listed in Table 5-1 and shown in Figures 5-2 and 5-3. Design values at all of these sites were well below the NAAQS.

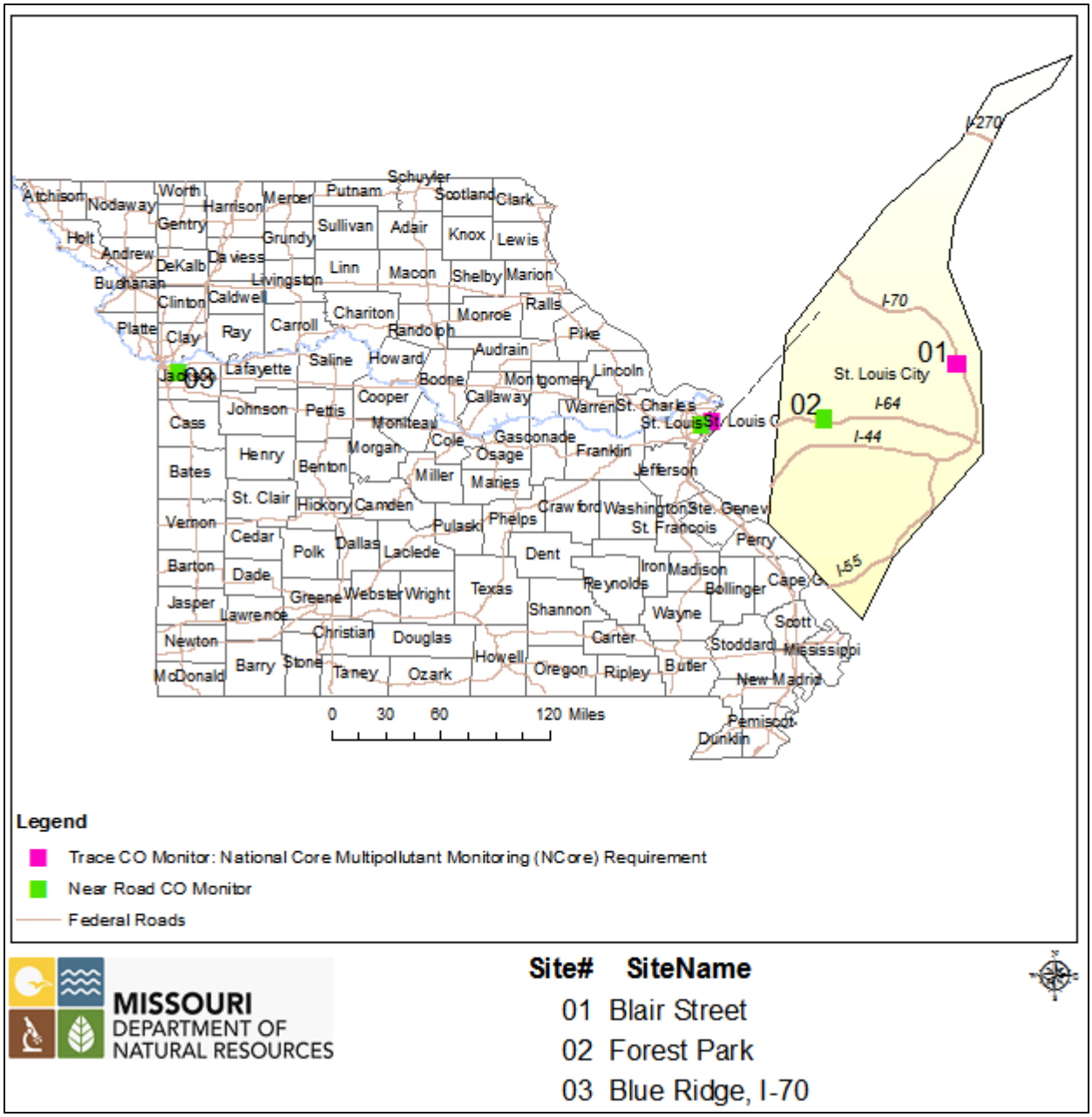


Figure 5-1. Missouri CO Monitoring Network, 2015

Table 5-1

Carbon Monoxide 1-Hour Design Value (annual second-highest 1-hour average)						
	2010	**2011**	**2012**	**2013**	**2014**	
Sunset Hills	0.8					
Blair Street	2.2	1.9	1.8	1.7	1.9	
Margaretta	1.9					
MSU	1.7					
Forest Park				1.4	1.4	
Blue Ridge I-70				1.6	1.5	
Carbon Monoxide 8-Hour Design Value (annual second-highest 8-hour average)						
	2010	**2011**	**2012**	**2013**	**2014**	
Sunset Hills	0.6					
Blair Street	1.8	1.5	1.1	1.1	1.4	
Margaretta	1.5					
MSU	1.1					
Forest Park				1.0	1.1	
Blue Ridge I-70				1.3	1.1	

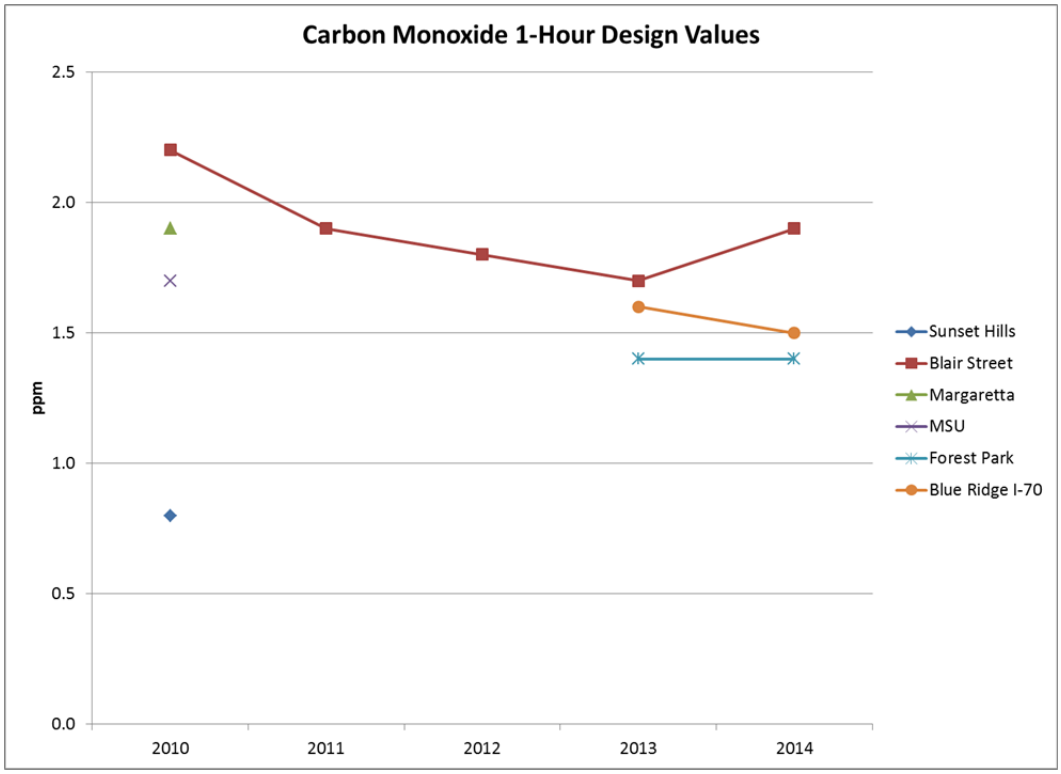


Figure 5-2

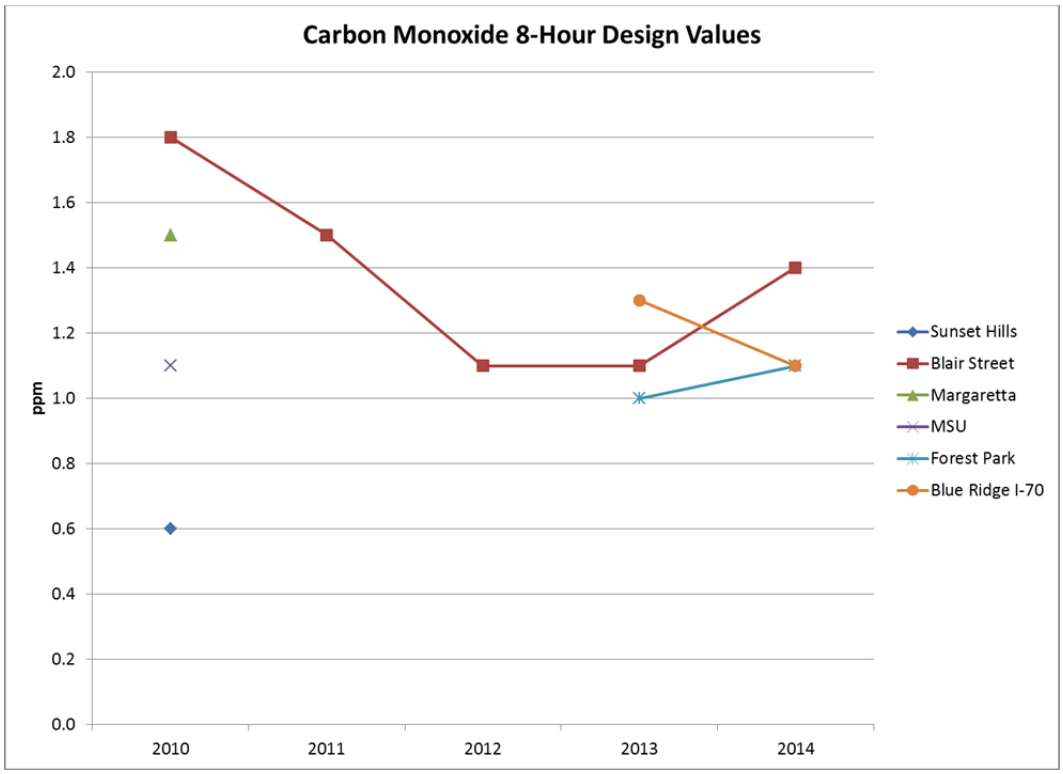


Figure 5-3

5.3 CO Emissions

CO emissions occur primarily from internal combustion engines, and the majority of such emissions are from motor vehicles. Figures 5-4 and 5-5 show portions of Missouri Department of Transportation maps with numbers indicating annual average daily traffic on major roadways in the St. Louis and Kansas City areas. The locations of the near-roadway sites were selected in part based on their proximity to highway segments with high traffic counts.

Area sources of CO other than mobile sources are not as significant as mobile sources and are generally consistent with areas of higher population, as may be seen in Figure 5-6.

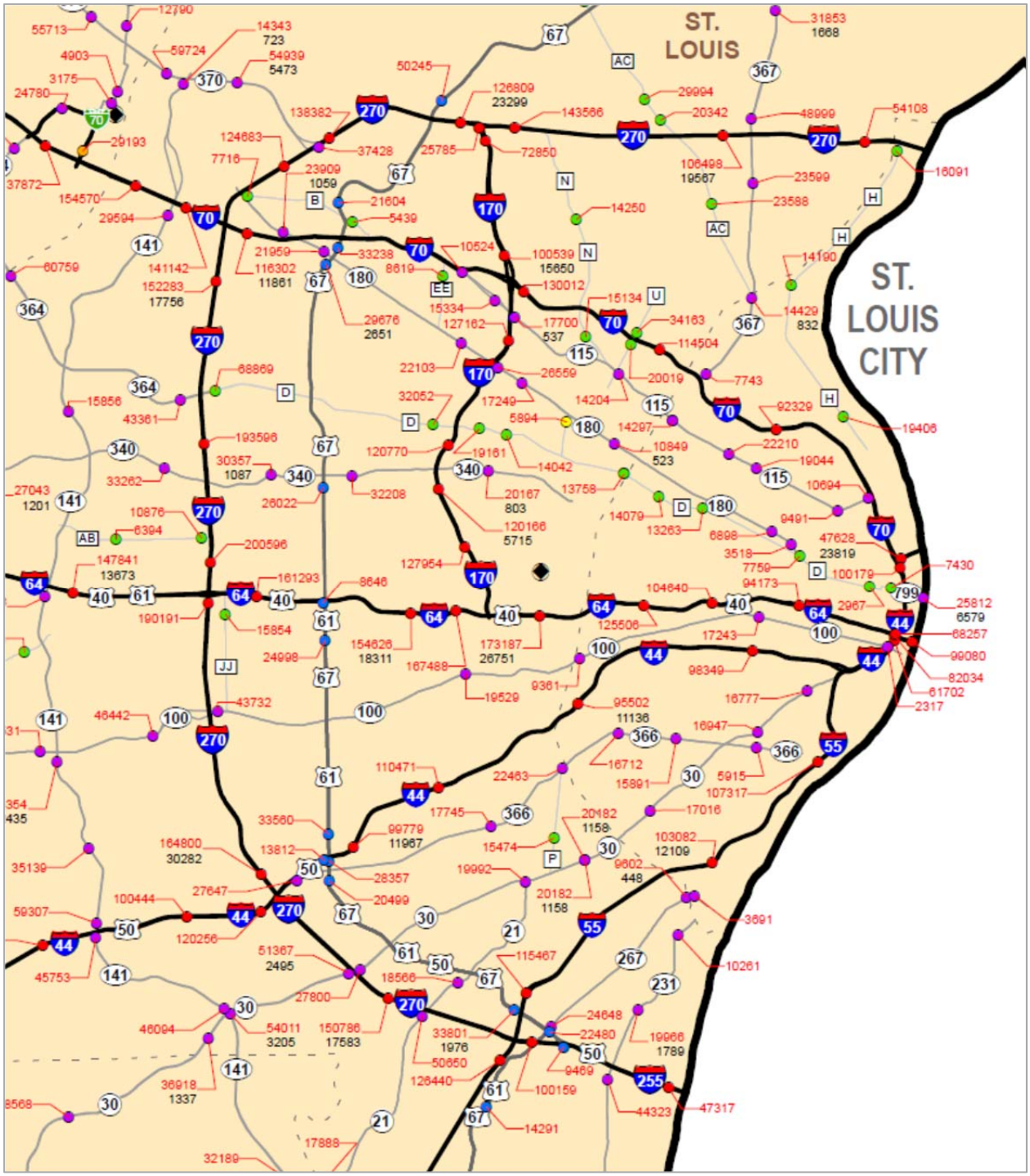


Figure 5-4. St. Louis Area Annual Average Daily Traffic (AADT; in red) and Truck Volume (in black) for 2013, from http://www.modot.mo.gov/safety/trafficvolumemaps.htm

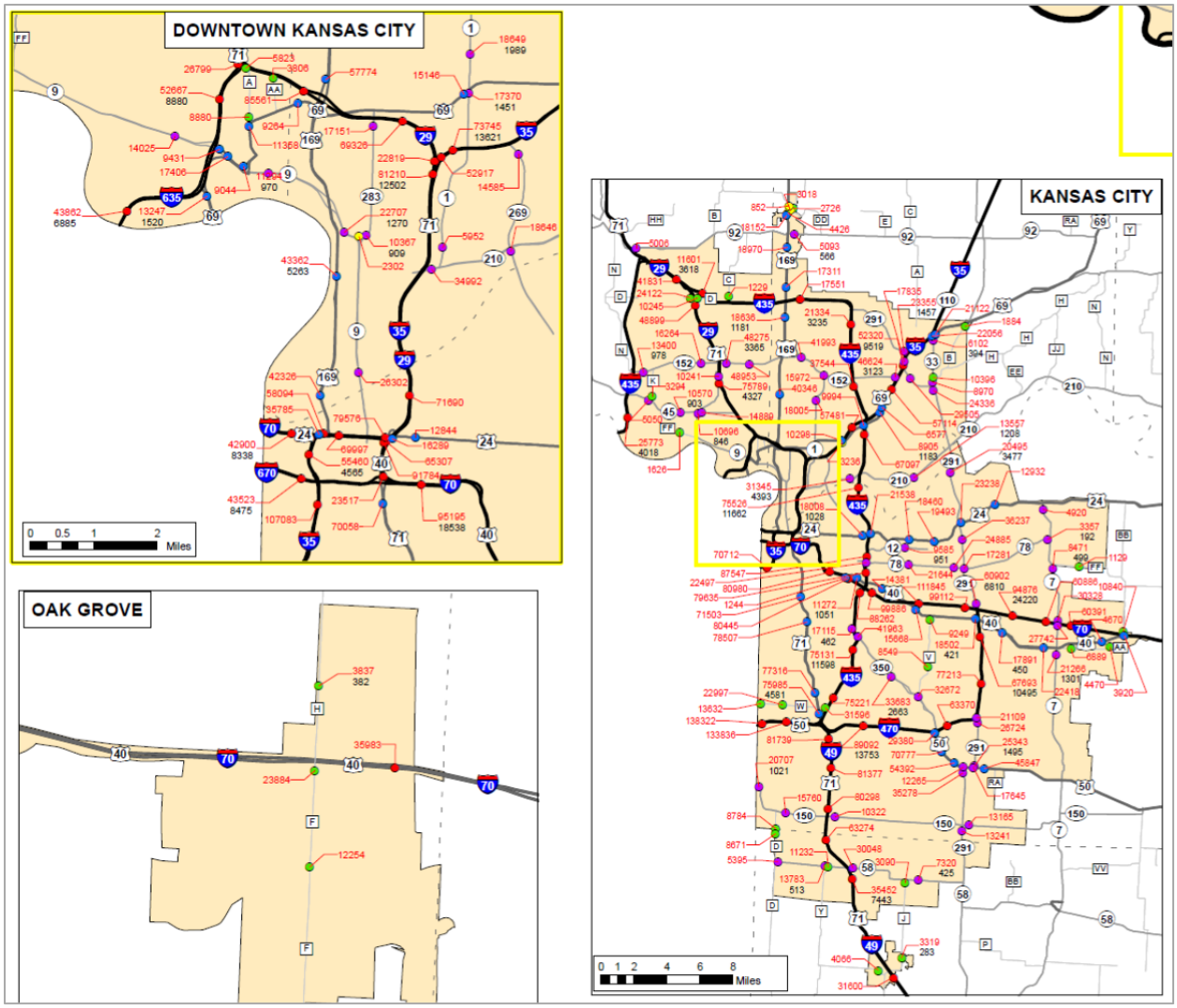


Figure 5-5. Kansas City Area Annual Average Daily Traffic (AADT; in red) and Truck Volume (in black) for 2013, from http://www.modot.mo.gov/safety/trafficvolumemaps.htm

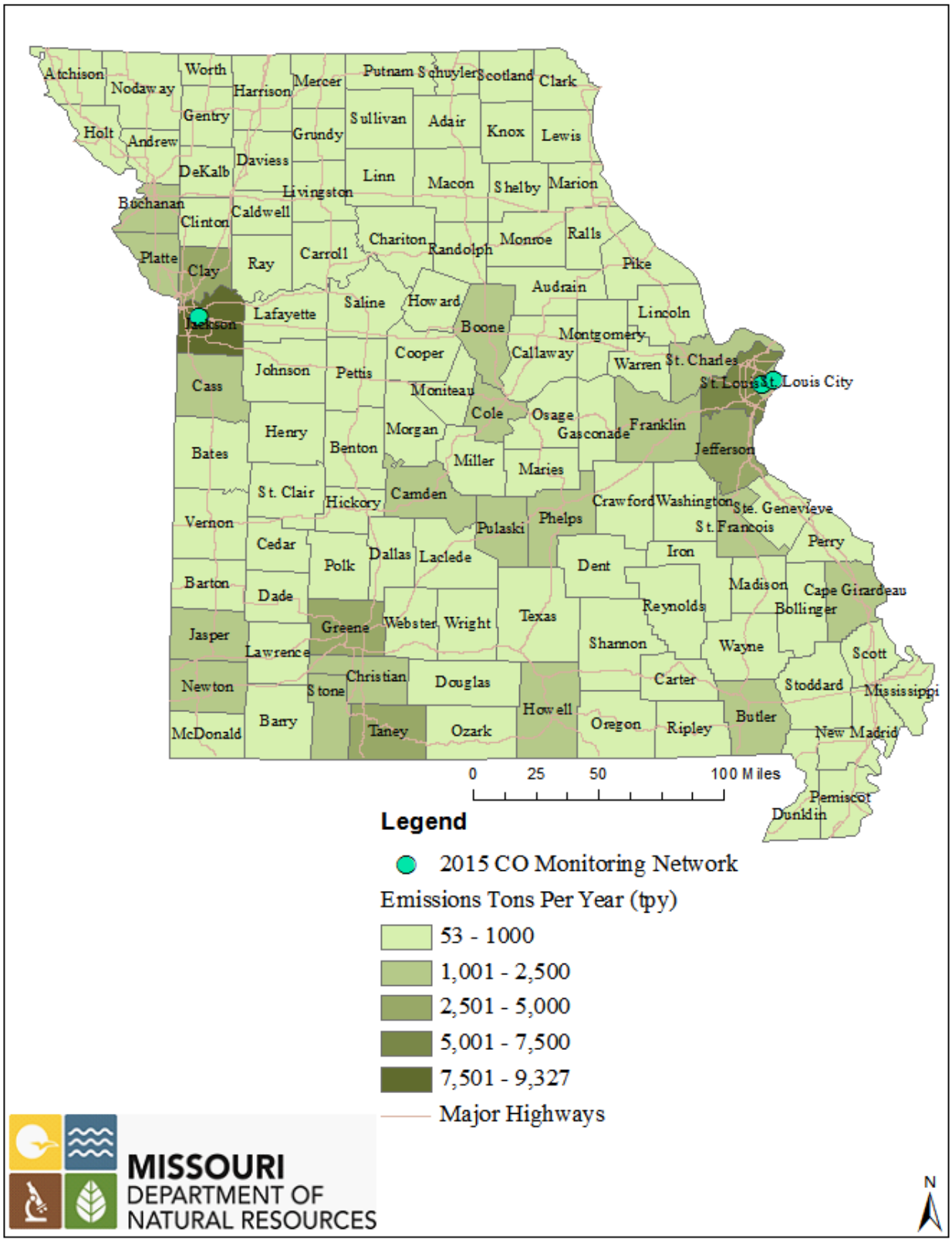


Figure 5-6. 2011 Missouri Statewide Area Source CO Emissions (not including mobile sources), Major Roadways, and the 2015 CO Monitoring Network

5.4 Evaluation of the CO Monitoring Network

As discussed above, CO emissions are primarily from motor vehicle exhaust, and CO monitoring sites should be either microscale, representing street canyons, or middle scale, representing areas including longer roadways or large parking areas. As shown in Table 5-1 and Figures 5-1 and 5-2, CO design values in 2010 at all sites were well below the standards. Therefore the CO network was reduced after 2010. The Forest Park and Blue Ridge I-70 near roadway sites were later added to the network. CO design values at all sites have remained well below the NAAQS. However, CO monitoring at the three remaining sites is **critical**, because the Blair Street site is an NCore site, and the other two sites are required near-roadway sites.

6.0 SULFUR DIOXIDE NETWORK ASSESSMENT

6.1 Introduction: Sulfur Dioxide Standards and Monitoring Requirements

The current primary National Ambient Air Quality Standards (NAAQS) for sulfur dioxide (SO_2) is 75 ppb. The form of the standard is the 3-year average of the 99th percentile of annual daily maximum 1-hour averages.

The secondary NAAQS is 0.5 ppm, 3-hour average, not to be exceeded more than once per year.

Minimum monitoring requirements are based on a combination of population and SO_2 emissions in Core Based Statistical Areas (CBSAs; 40 **CFR** Part 58, Appendix D). For each CBSA, population weighted emission index (PWEI) is calculated by multiplying the population of each CBSA by the total amount of SO_2 in tons per year emitted within the CBSA area based on National Emissions Inventory data. The resulting is then divided by one million, so that the units of the PWEI are million persons-tons per year. For any CBSA with a calculated PWEI value equal to or greater than 1,000,000, a minimum of three SO_2 monitors are required. For any CBSA with a calculated PWEI value equal to or greater than 100,000, but less than 1,000,000, a minimum of two SO_2 monitors are required. For any CBSA with a calculated PWEI value equal to or greater than 5,000, but less than 100,000, a minimum of one SO_2 monitor is required.

Table 6-1 lists the results of the PWEI calculation for CBSAs that are in whole or in part in Missouri using 2010 census data and 2011 NEI emissions data. Based on these results, two SO_2 monitors are required in the St. Louis CBSA and two are required in the Kansas City CBSA. In addition to these requirements, each NCore site must include a trace-level SO_2 analyzer.

A proposed "Data Requirements Rule for the 1-Hour Sulfur Dioxide (SO_2) Primary National Ambient Air Quality Standard (NAAQS)" was published in 2014 (*Federal Register*, volume 79, no. 92, May 14, 2014, page 27446). This proposed rule included a deadline (January 2016) for state or local air agencies to identify which areas around certain SO_2 sources (emission level to be determined by the final rule; possibly different in large CBSAs and rural areas) would be characterized by modeling and which would be characterized by monitoring. Monitoring around sources would be identified in the July 2016 monitoring network plan, and monitoring would begin in January 2017. Since this data requirements rule has not yet been finalized, these deadlines will likely change in the final rule, so that requirements for future monitoring near large sources are uncertain at this point in time.

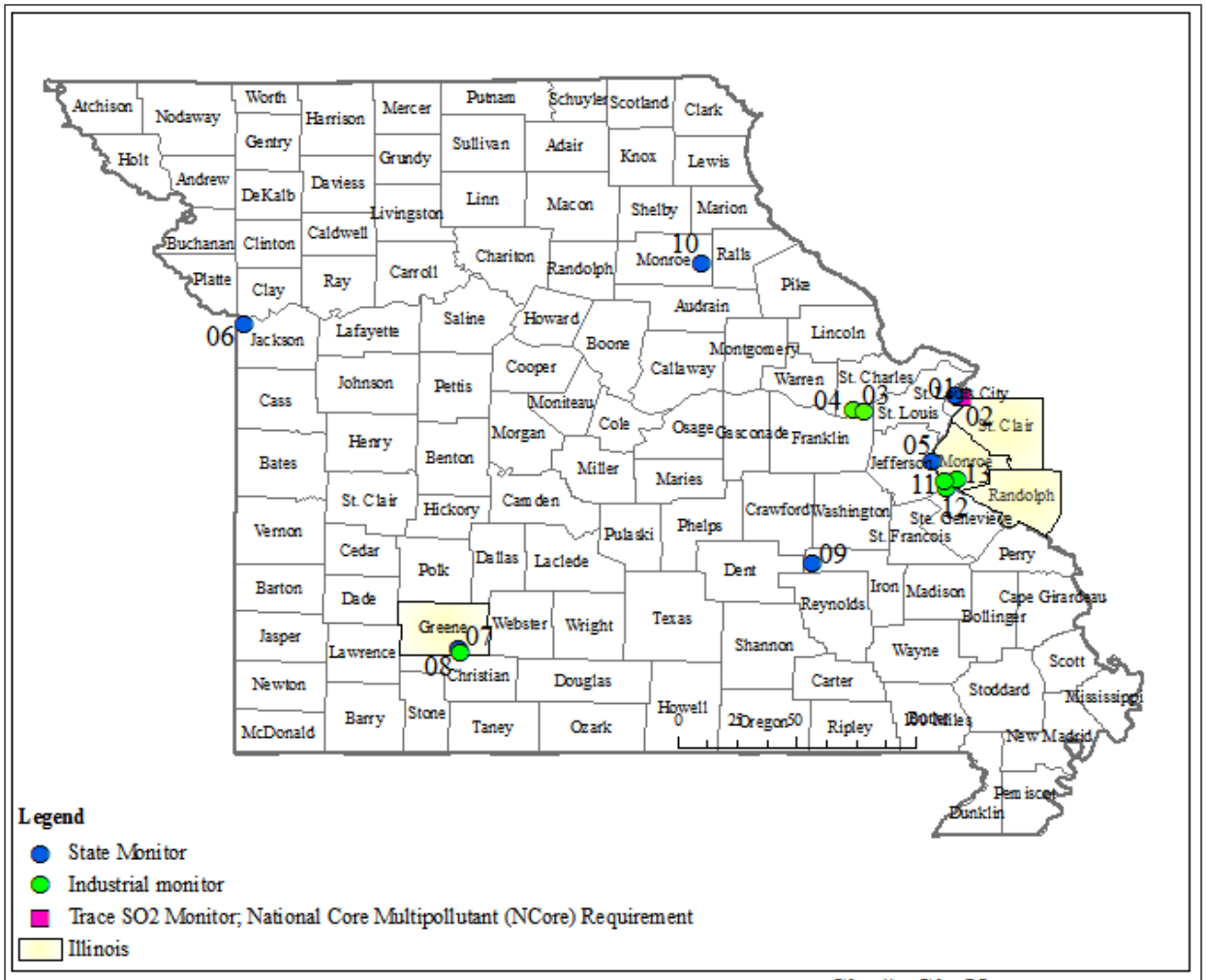
A recent court order includes deadlines for EPA to complete area designations with respect to the SO_2 NAAQS. Designation of some areas (areas showing exceedance of the standard and areas with sources larger than specified emission rates) is required by July 2, 2016. Because of the delay in finalizing the data requirements rule, combined with the approaching deadline for area designations, designation of some areas will of necessity be based on modeling, not monitoring, if monitors are not already in place. Nevertheless, monitoring near some large sources, as discussed below, will be useful in supplementing modeling results.

Table 6-1. PWEI Results for Missouri CBSAs		
calculated using 2010 census population and 2011 NEI SO2 emissions		
CBSA	**PWEI**	**No. of Monitors Required**
St. Louis	390,479	2
Kansas City	117,843	2
Springfield	3,868	0
Joplin	1,592	0
Fayetteville-Springdale-Rogers	4,038	0
Columbia	1,140	0
Jefferson City	498	0
St. Joseph	259	0
Cape Girardeau	111	0
Maryville	0	0
Warrensburg	2	0
Marshall	18	0
Sedalia	7	0
Branson	3	0
Kirksville	0	0
Moberly	489	0
Lebanon	1	0
Mexico	1	0
Fort Leonard Wood	1	0
Rolla	21	0
West Plains	1	0
Fort Madison-Keokuk	34	0
Quincy	80	0
Hannibal	86	0
Farmington	3	0
Poplar Bluff	2	0
Sikeston	238	0
PWEI $\geq$ 1,000,000: 3 monitors		
1,000,000 > PWEI $\geq$ 100,000: 2 monitors		
100,000 > PWEI $\geq$ 5,000: 1 monitor		

6.2 SO_2 Monitoring Results in Missouri

The current SO_2 monitoring network is shown on the map in Figure 6-1. Table 6-2 and Figure 6-2 show the SO_2 design values measured at Missouri sites in recent years. The Troost site in Kansas City, the Mott Street site in Herculaneum, and the Buick NE site exceeded the NAAQS

for the most recent 3-year period, 2012-2014. Each of these sites is (or was) impacted by a single source near the monitor. The Mott Street site is expected to meet the NAAQS in the future due to discontinuation of primary lead smelting in Herculaneum. The other two sites are expected to meet the NAAQS in the future as a result of implementation plans or controls in development for the relevant facilities.



Site#	SiteName
St. Louis Area, MO	
01	Margaretta
02	Blair Street
03	Valley^
04	Northwest^
05	Herculaneum, Mott Street
Kansas City Area, MO	
06	Troost
Springfield Area, MO	
07	South Charleston
08	James River-South

Site#	SiteName
Outstate Area, MO	
09	Buick NE
10	Mark Twain State Park
11	Weaver-AA^^
12	Natchez^^
Illinois	
13	Fults^^

^Began monitoring in 2015
^^Not monitoring; sites under review

MISSOURI DEPARTMENT OF NATURAL RESOURCES

Figure 6-1. Missouri SO_2 Monitoring Network, 2015

Table 6-2

SO2 Design Values (3-year average of 99th percentile 1-hour average)					
(yellow highlight indicates exceedance of NAAQS)					
	2008-2010	**2009-2011**	**2010-2012**	**2011-2013**	**2012-2014**
Blair St.				47	46
Margaretta	45	40	39	29	26
S. Broadway	42				
Ladue	44				
Maryland Heights	37				
Herculaneum Main St.	289				
Herculaneum Mott St.				188	140
Buick NE					76
Troost	164	159	157	162	150
MSU	30				
S. Charleston	72	62	54	44	35
Wildwood	76	72	67	49	
James River S	93	81	68	44	32
Mark Twain S. P.	12				8

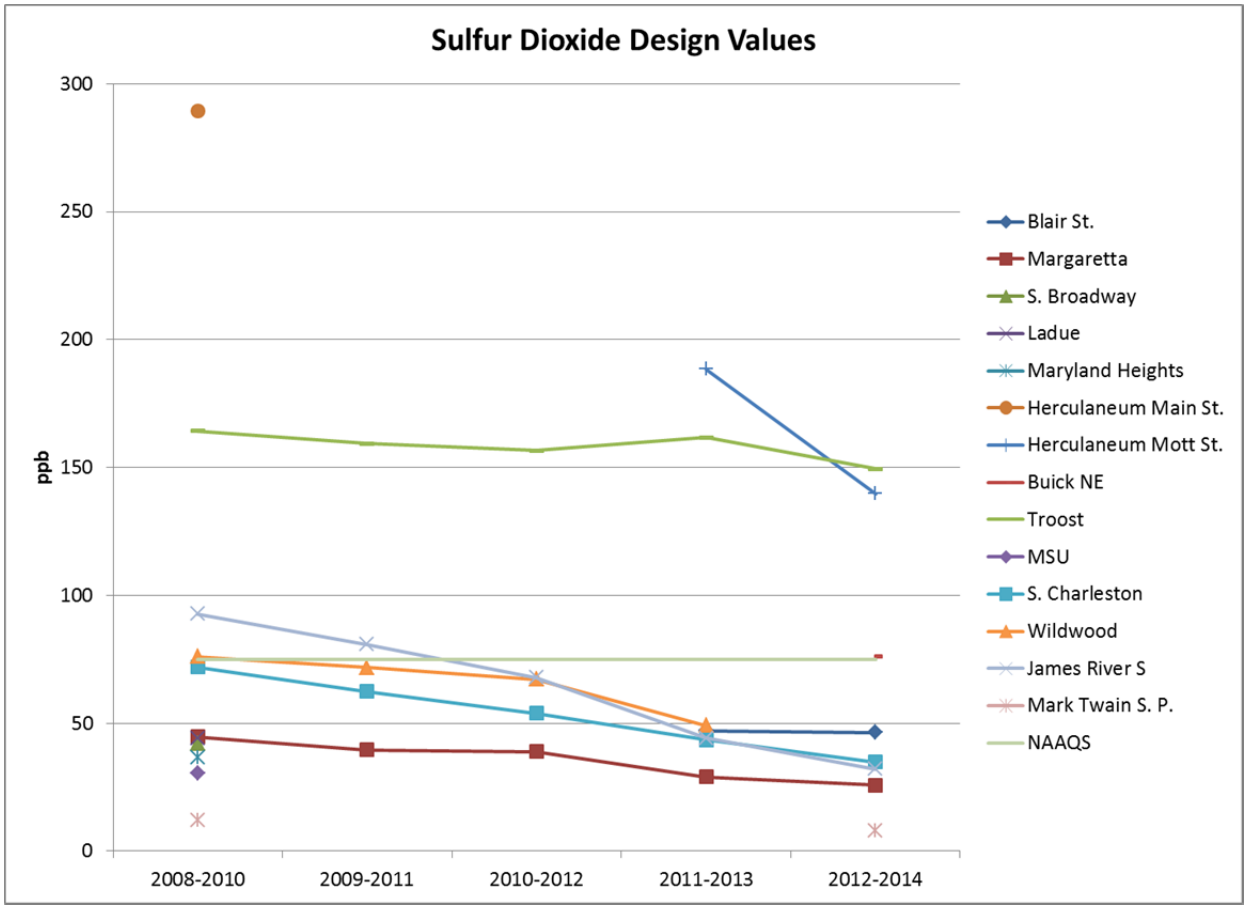

Sulfur Dioxide Design Values
ppb
300
250
200
150
100
50
0
2008-2010
2009-2011
2010-2012
2011-2013
2012-2014
Blair St.
Margaretta
S. Broadway
Ladue
Maryland Heights
Herculaneum Main St.
Herculaneum Mott St.
Buick NE
Troost
MSU
S. Charleston
Wildwood
James River S
Mark Twain S. P.
NAAQS

Figure 6-2

6.3 SO_2 Emissions

Fossil fuel combustion at electric generating stations (66% of emissions nationally) and other industrial facilities (29% of emissions nationally) are the predominant sources of SO_2 emissions. Other sources include other industrial processes and fuel combustion by mobile sources (motor vehicles, locomotives, ships, and off-road equipment). Figures 6-3 and 6-4 show the locations and relative size of SO_2 emission point sources in Missouri (based on the 2013 inventory) and the area source SO_2 by county (for 2011). Total SO_2 emissions from identified point sources were 192,000 tons in 2013. The area emissions are relatively small in comparison to those from point sources, totaling less than 1000 tons statewide.

The SO_2 design value near one relatively small steam generating facility (the Veolia Energy facility in Kansas City) continues to be on the order of 2 ppb per hundred tpy (at the Troost monitoring site). Because larger electric generating facilities (such as the Labadie and Rush Island facilities discussed below) have taller stacks, the ratio of design value to emissions is expected to be lower. Future modeling and monitoring will help to determine whether the NAAQS is met in the areas surrounding these facilities.

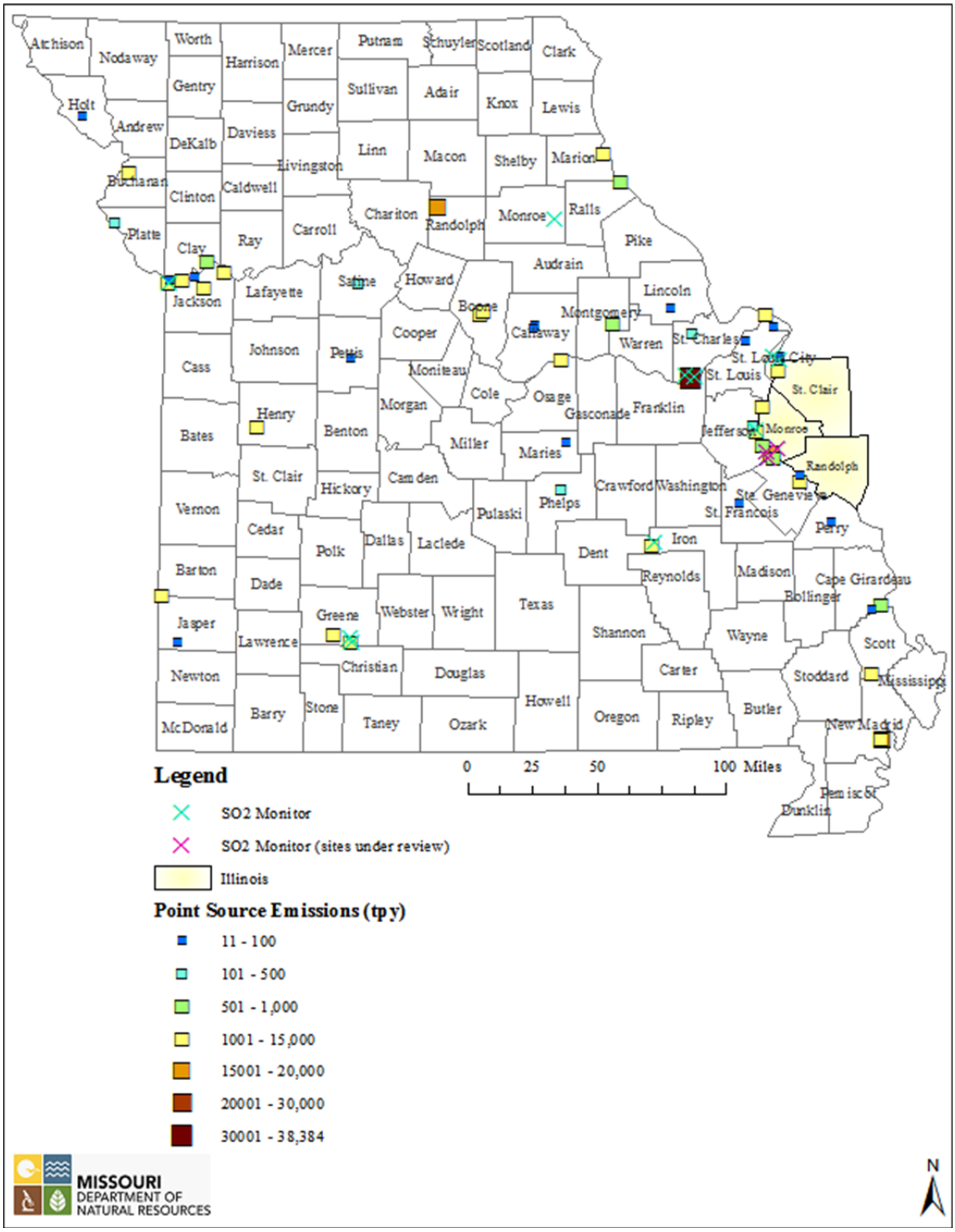


Figure 6-3. 2013 Statewide SO_2 Point Source Emissions and the 2015 SO_2 Monitoring Network

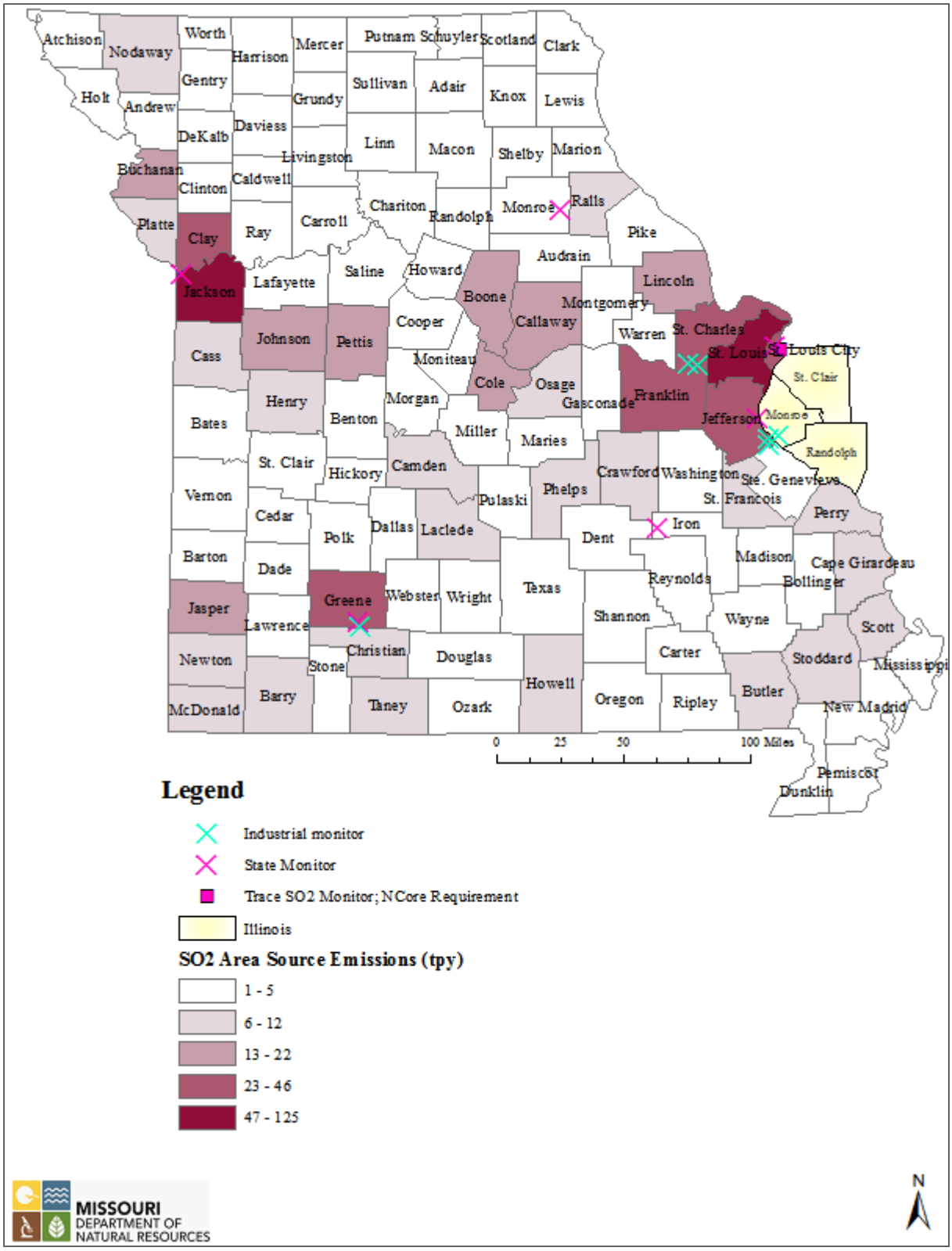


Figure 6-4. 2011 Statewide SO_2 Area Source Emissions and the 2015 Monitoring Network

6.4 Evaluation of the SO_2 Monitoring Network

The Troost and Buick NE sites are source-oriented and have the potential to continue to violate the primary NAAQS. These sites are, therefore, judged to be **critical**. The Troost site is also **critical** because of the PWEI requirement (the other Kansas City area SO_2 monitor is in Kansas but still within the CBSA). The South Charleston site in Springfield is also considered to be **critical** because of its source orientation.

The NCore site at Blair Street in St. Louis is also judged to be **critical** because of the requirement for trace-level SO_2 measurement at all NCore sites. Either the Margaretta site in St. Louis or the Mott St. site is also judged to be **critical** because a second St. Louis site is necessary to meet the PWEI requirement. The Margaretta site is at least **credible**, because the design value measured there is on the order of one third of the NAAQS. The Mott St. site is judged to be **critical** at least in the near term in order to determine whether operations at the Doe Run Herculaneum facility (following shutdown of primary smelting) impact SO_2 air quality and in order to assess the possible impact of other sources in the Jefferson County area. The Mark Twain State Park site is judged to be **credible** to **critical** because it meets the need for measurement of regional background SO_2 concentration.

As discussed in detail in the 2015 monitoring network plan and shown in Figure 6-2, Ameren Missouri is planning to install and operate SO_2 and meteorological monitors in the vicinity of the Labadie and Rush Island generating stations. The department has reviewed the modeling analysis used to site these monitors, department staff has visited the proposed sites, and the department will review quality assurance project plans. Because of uncertainty in finalizing the data requirements rule and because of deadlines for area designations, the monitoring results from these sites will be used, at least initially, to supplement modeling results, and the meteorological data will be used to improve the accuracy of modeling. These monitors will be considered to be special purpose monitors. Once the data requirements rule is finalized, SO_2 monitoring in the areas surrounding additional emissions sources may be necessary or advisable. Timing of installation of additional monitors will depend in part on deadlines in the final data requirements rule.

7.0 NITROGEN DIOXIDE NETWORK ASSESSMENT

7.1 Introduction: Nitrogen Dioxide Standards and Monitoring Requirements

The current primary National Ambient Air Quality Standards (NAAQS) for nitrogen dioxide (NO_2) is 100 ppb. The form of the standard is the 3-year average of the 98th percentile of annual daily maximum 1-hour averages. There is also a primary and secondary NAAQS set at an annual average of 53 ppb.

Minimum NO_2 monitoring requirements (40 **CFR** Part 58, Appendix D) include:

1. Near-road: At least one monitor near major road in any CBSA with population greater than or equal to 500,000 people.
2. Community-wide:
    a. A minimum of one monitor in any CBSA with population greater than or equal to 1 million people.
    b. A second monitor near a major road in CBSAs with either population greater than or equal to 2.5 million or one or more segments with an annual daily traffic count greater than or equal to 250,000 vehicles.
3. Susceptible and vulnerable communities: 40 additional NO_2 monitors to be sited nationally by the EPA Regional Administrators with states' assistance.

7.2 NO_2 Monitoring Results in Missou

The current NO_2 monitoring network is shown on the map in Figure 7-3. Table 7-1 and Figure 7-2 show the NO_2 one-hour design values measured at Missouri sites in recent years. Table 7-2 and Figure 7-3 show the NO_2 annual design values. Both one-hour and annual design values are well below the NAAQS at all sites.

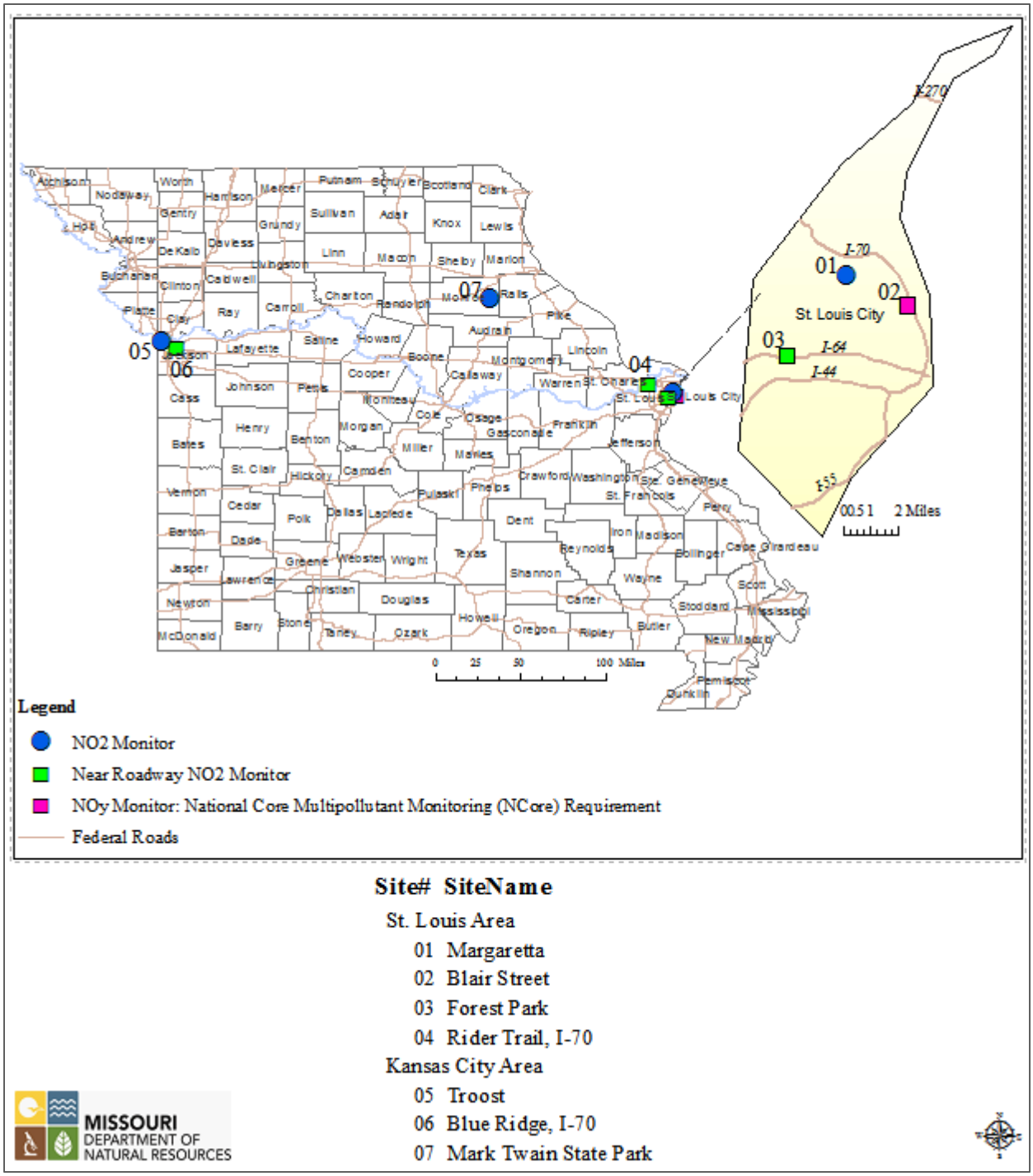


Figure 7-3. Statewide NO_2 Monitoring Network, 2015

Table 7-1

NO_2 Design Values (3-year average of 98th percentile 1-hour average)					
	2008-2010	**2009-2011**	**2010-2012**	**2011-2013**	**2012-2014**
W. Alton	33				
Sunset Hills	41				
Maryland Heights	35				
Ladue	43				
Margaretta	50	52	53	53	49
Liberty	36				
Troost	52	52	53	52	51
Hillcrest H. S.	49				
Bonne Terre	18				
Forest Park*					50
Blue Ridge I-70**					43
*Forest Park 2 years only, 2013 and 2014					
** Blue Ridge I-70, 2 years only, 2013 and 2014, and only about 1/2 year in 2013					

Table 7-2

NO_2 Design Values (annual average)					
	2010	**2011**	**2012**	**2013**	**2014**
W. Alton	6				
Sunset Hills	9				
Maryland Heights	7				
Ladue	12				
Margaretta	13	13	14	11	11
Liberty	5				
Troost	15	15	14	13	13
Hillcrest H. S.	8				
Bonne Terre	3				
Forest Park				13	14
Blue Ridge I-70*				14	12
Mark Twain S. P.**					2
* Blue Ridge I-70, only about 1/2 year in 2013					
**Mark Twain S. P., only about 1/2 year in 2014					

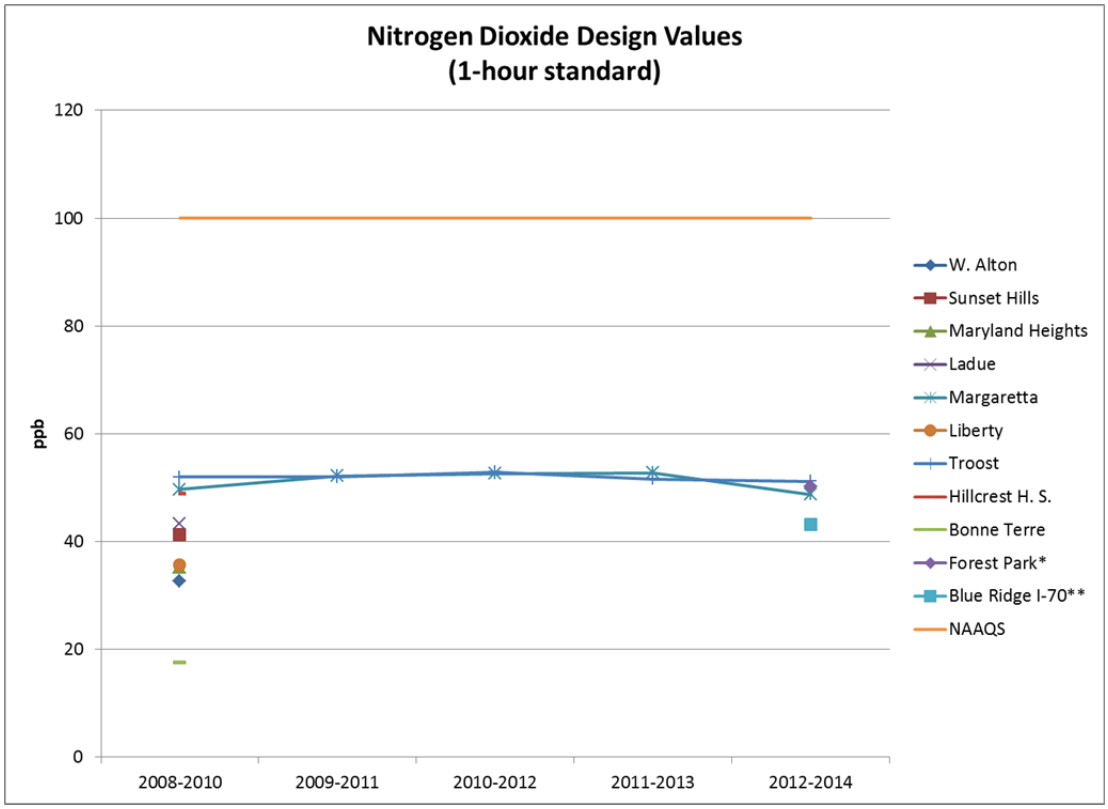


Figure 7-2

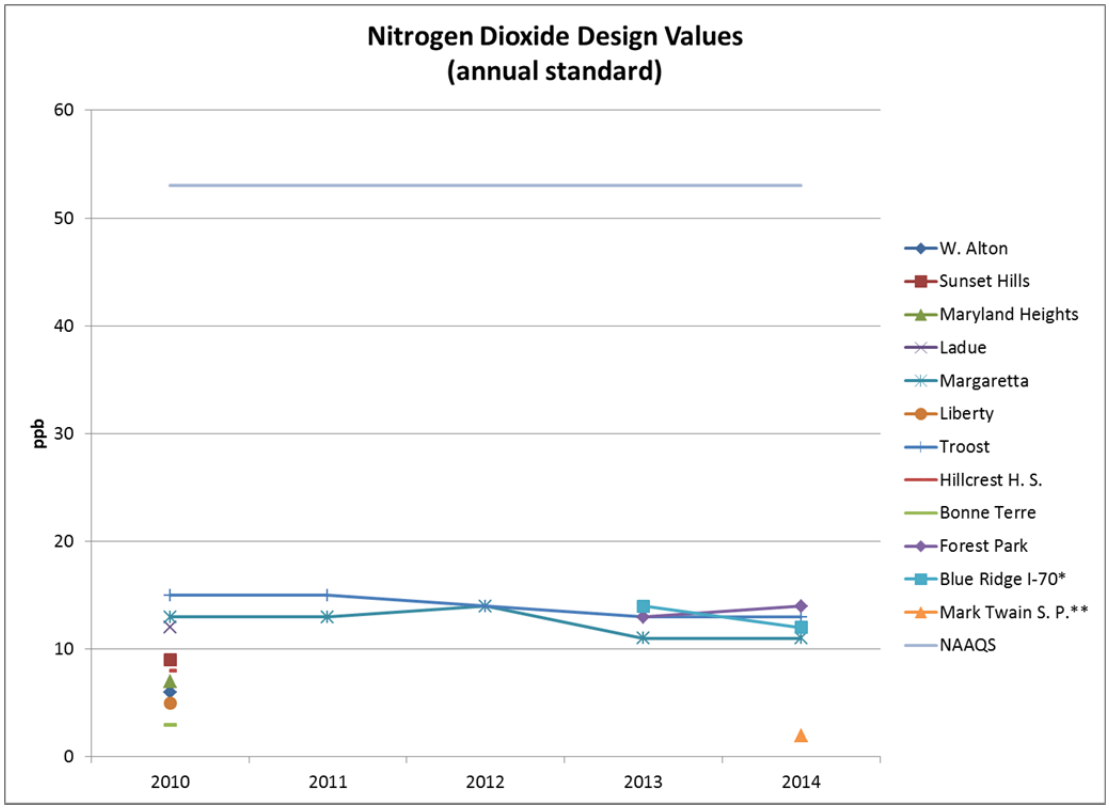


Figure 7-3

7.3 NO_X Emissions

Nitrogen oxides (NO_X) are emitted from a wide variety of source types; point (electricity generating units and other stationary combustion sources), mobile (motor vehicles), and low level area sources. Each of these categories is discussed in the following sections.

7.3.1 Point Source NO_X Emissions

Statewide 2013 point sources with their respective emissions are presented in Figure 7-4. As shown in the figure, some of the larger sources are located within the boundaries of the St. Louis, Kansas City, and Springfield urban cores. In addition, areas of higher concentrations of relatively smaller sources are located within these boundaries, especially in St. Louis and Kansas City. Impacts from these sources on the areas could be significant.

Some large sources are located outside the urban cores, especially along the Missouri and Mississippi rivers. A relatively large concentration of point sources is also noted in the southwest part of the state, which is a growing area in terms of population. New Madrid (New Madrid County) and Thomas Hill Energy (Randolph County) power plants are the first and second largest point sources in Missouri, respectively. However, neither plant is located within the urban core or metropolitan statistical areas.

Statewide point source NO_X emissions have decreased significantly over the last ten to fifteen years, but have been relatively constant or slightly increasing over about the last five years. Total point source NO_X emissions in 2013 were 108 thousand tons.

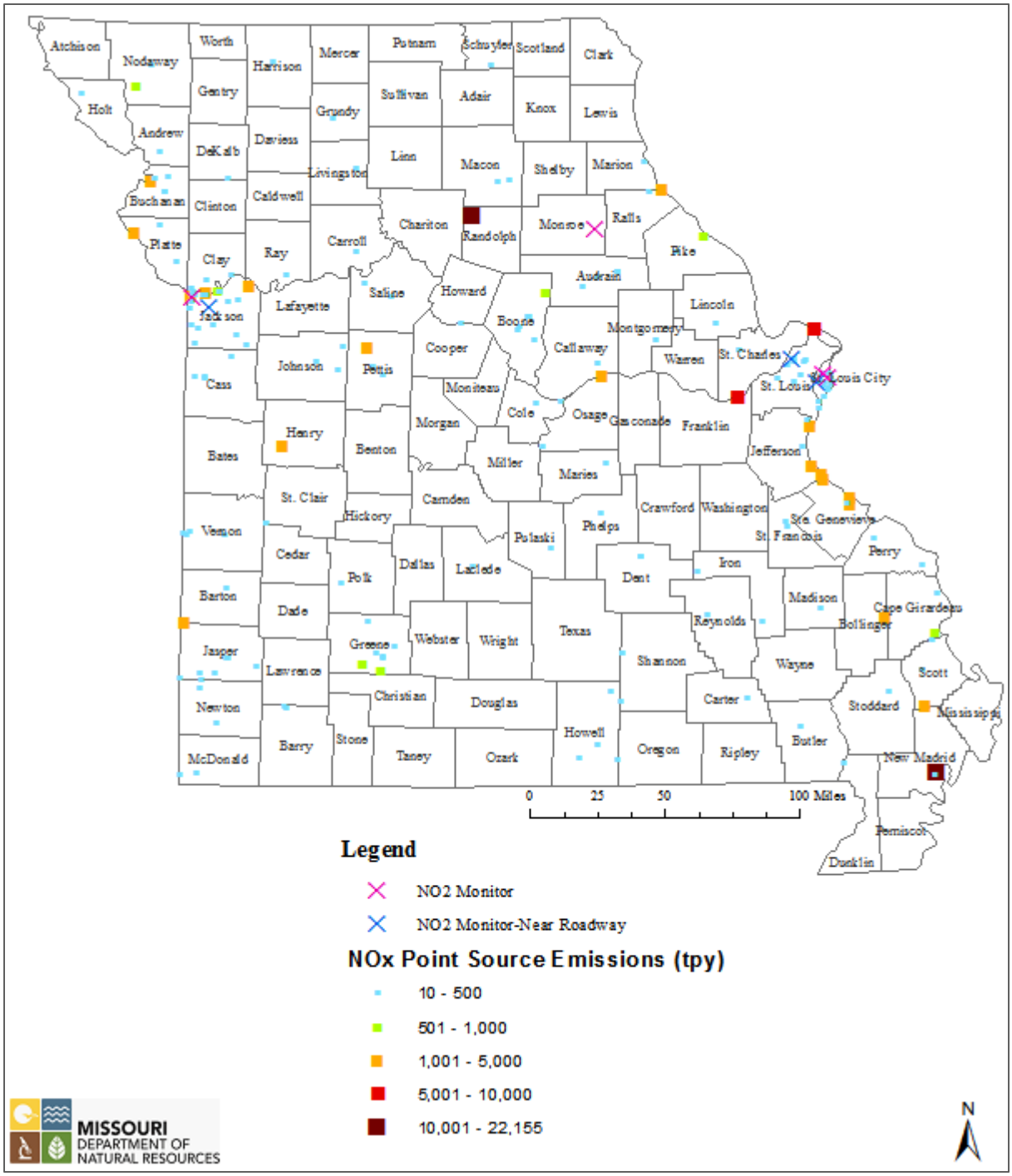


Figure 7-4. 2013 Statewide NO_x Point Source Emissions and the 2015 NO_2 Monitoring Network

7.3.2 Mobile Source NO_X Emissions

Onroad mobile source NO_X emissions, like CO emissions (discussed in Section 5), are highest in areas with the highest traffic count as shown in Figures 5-4 and 5-5. Statewide mobile source NO_X emissions (onroad and offroad) totaled about 259 thousand tons per year in 2011.

7.3.3 Area Source NO_X Emissions

Figure 7-6 shows the 2011 area source emissions. Area source emissions are highest in the St. Louis and Kansas City metropolitan areas and also somewhat elevated in the Springfield area. Area source emissions are less significant than point and mobile source emissions. Statewide area source emissions total about 14 thousand tons per year.

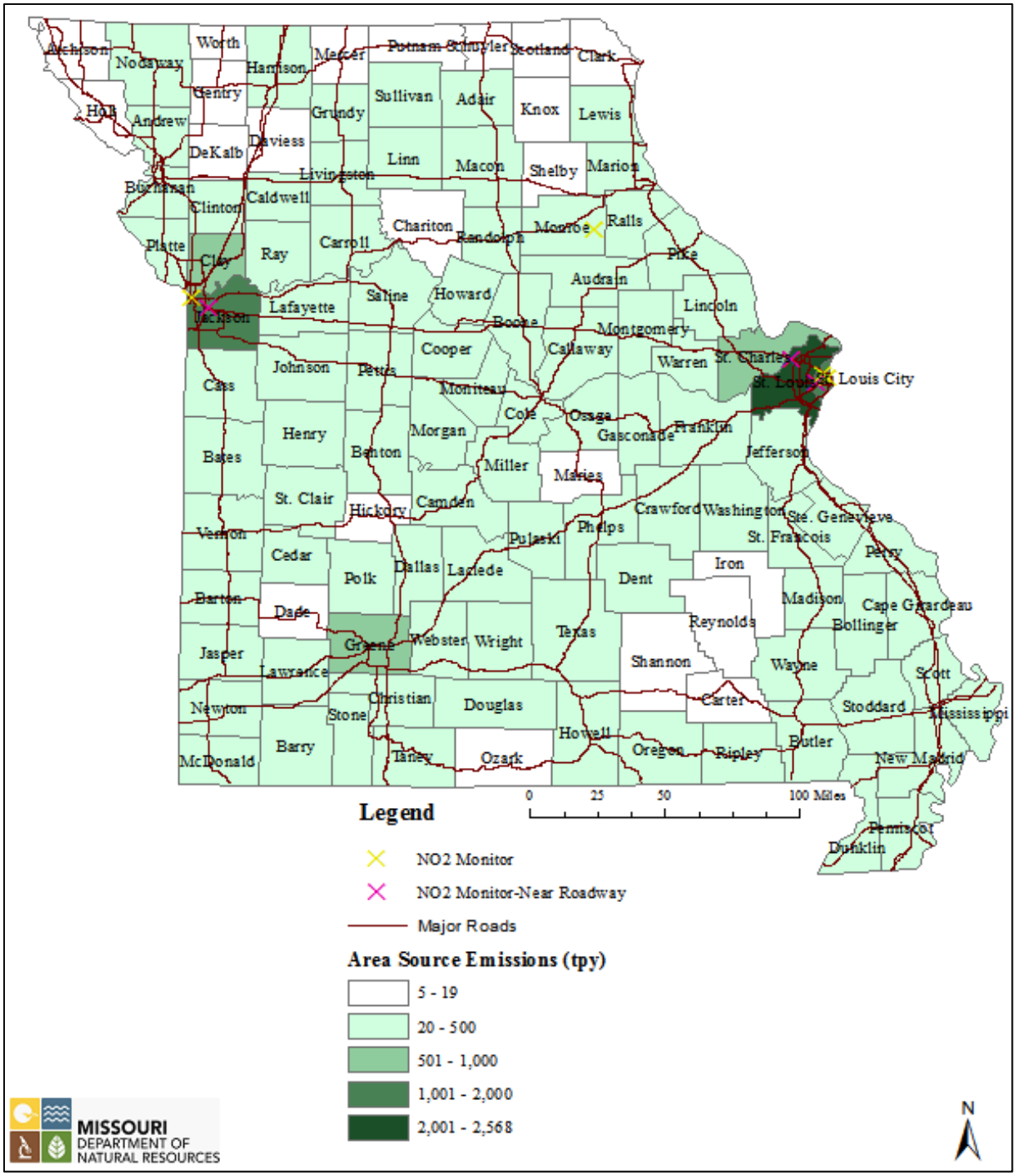


Figure 7-6. 2011 Missouri Statewide Area Source NO_X Emissions and the 2015 NO_2 Monitoring Network

7.4 Evaluation of the NO_2 Monitoring Network

As evidenced by the table and figure in Section 7.2, the NO_2 network was reduced significantly and revised to focus on the near-road monitoring requirements. None of the current NO_2 monitoring sites has shown a violation of the NAAQS in recent years. However, the Margaretta and Troost sites are judged to be **critical** because they are located in part to evaluate population exposure within the St. Louis and Kansas City urban areas. The Margaretta site has also been identified as specifically meeting the requirement for monitoring the exposure of susceptible and vulnerable populations (see http://www.epa.gov/ttn/amtic/svpop.html). The Forest Park, Blue Ridge I-70, and Rider Trail S sites are also **critical** because they meet the requirement for near-road monitoring. The Mark Twain State Park site is judged to be **credible** to **critical** because it meets the need for measurement of regional background NO_2 concentration.

In addition to the NO_2 monitoring sites listed above, NO_X/NO_Y (NO_Y represents total reactive nitrogen oxides) monitoring is being done at the Blair Street NCore site. This monitoring is also **critical**, because it is required at all NCore sites.

8.0 PM_{10} NETWORK ASSESSMENT

8.1 Introduction: PM_{10} Standards and Monitoring Requirements

The current primary and secondary PM_{10} NAAQS is 150 µg/m^3. The standards are met when the expected number of days with a 24-hour average concentration above 150 µg/m^3 does not exceed one on average over a 3-year period, as determined in accordance with 40 **CFR** Part 50, Appendix K. Therefore, the design value for PM_{10} is expressed as a number of days, not as a concentration.

There are minimum monitoring requirements for PM_{10} in each MSA. 40 **CFR** 58 Appendix D outlines the requirements as presented below in Table 8-1. The minimum requirements are based on the MSA population and the monitored PM_{10} concentrations relative to the NAAQS.

Table 8-1. PM_{10} Minimum Monitoring Requirements
(Approximate Number of Stations per MSA)[1]

Population category	High concentration[2]	Medium concentration[3]	Low concentration[4,5]
>1,000,000 (St. Louis and Kansas City)	6–10	4–8	2–4
500,000–1,000,000	4–8	2–4	1–2
250,000–500,000 (Springfield)	3–4	1–2	0–1
100,000–250,000	1–2	0–1	0

[1]Selection of urban areas and actual numbers of stations per area will be jointly determined by EPA.
[2]High concentration areas are those for which ambient PM_{10} data show ambient concentrations exceeding the PM_{10} NAAQS by 20 percent or more.
[3]Medium concentration areas are those for which ambient PM_{10} data show ambient concentrations exceeding 80 percent of the PM_{10} NAAQS.
[4]Low concentration areas are those for which ambient PM_{10} data show ambient concentrations less than 80 percent of the PM_{10} NAAQS.
[5]These minimum monitoring requirements apply in the absence of a design value.

8.2 PM_{10} Monitoring Results in Missouri

The current PM_{10} monitoring network is shown on the map in Figure 8-1. There are seven sites in the St. Louis area, five in the Kansas City area, one in Springfield, and four in the remainder of the state. Table 8-2 and Figure 8-2 show the PM_{10} design values measured at Missouri sites in recent years. The design values have been 1.0 or less at all but two of the sites. One of the two sites has, currently, a design value less than 1.0. The two sites are located in areas near industrial facilities whose operations may release PM_{10} into the air. Air Pollution Control Program Planning Section and Compliance and Enforcement Section are working with facilities in both of

these areas to reduce PM_{10} emissions so that these locations can meet the standard or to continue meeting the standard in the future.

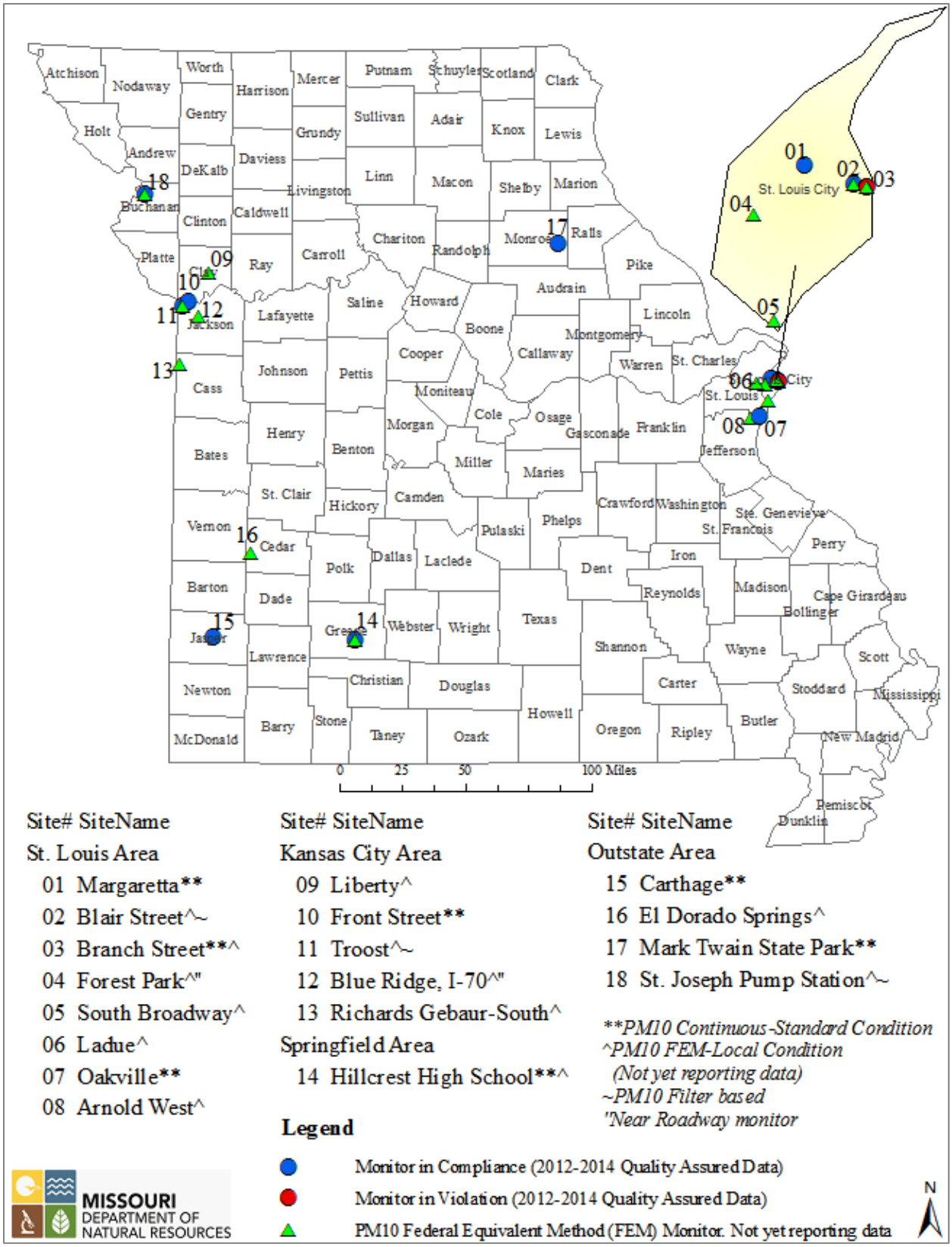


Figure 8-2. 2015 Statewide PM_{10} Monitoring Network

Table 8-2

PM_{10} Design Values (expected number of days per year that 150 µg/m^3 is exceeded)

Yellow highlights indicates expected exceedance days greater than 1.0. The standard is exceeded at these sites for the indicated period.

	2008-2010	2009-2011	2010-2012	2011-2013	2012-2014
St. Louis Area					
Hall St.	0.0	0.0	0.0	-	-
2nd and Mound	0.0	-	-	-	-
Margaretta	0.0	0.0	0.0	0.0	0.0
Blair St.	0.0	0.0	0.0	0.0	0.0
Branch St.	0.7	0.7	1.8	2.1	2.1
Forest Park*					
South Broadway*					
Ladue*					
Oakville**	0.0	0.0	0.0	0.0	0.0
Arnold West*					
Kansas City Area					
Van Brunt	0.0	-	-	-	-
Liberty*					
Front St.		0.0	0.0	0.0	0.0
Troost	0.0	0.0	0.0	0.0	0.0
Blue Ridge I-70*					
Richards Gebaur South*					
Springfield Area					
MSU***	0.0	0.0	0.0	0.0	0.0
Hillcrest High School*	-	-	-	-	-
Outstate Area					
Carthage	0.0	1.3	1.9	1.9	0.9
El Dorado Springs*					
Mark Twain State Park	0.0	0.0	0.0	0.0	0.0
St. Joseph Pump Station	0.0	0.0	0.0	0.0	0.0

*The only PM_{10} instruments at these sites are designated as Federal Equivalent Method as of July 2014. Data from these sites will be comparable to the standard in the future.

**The Oakville site is being discontinued in 2015.

***Was relocated to Hillcrest High School in 2015

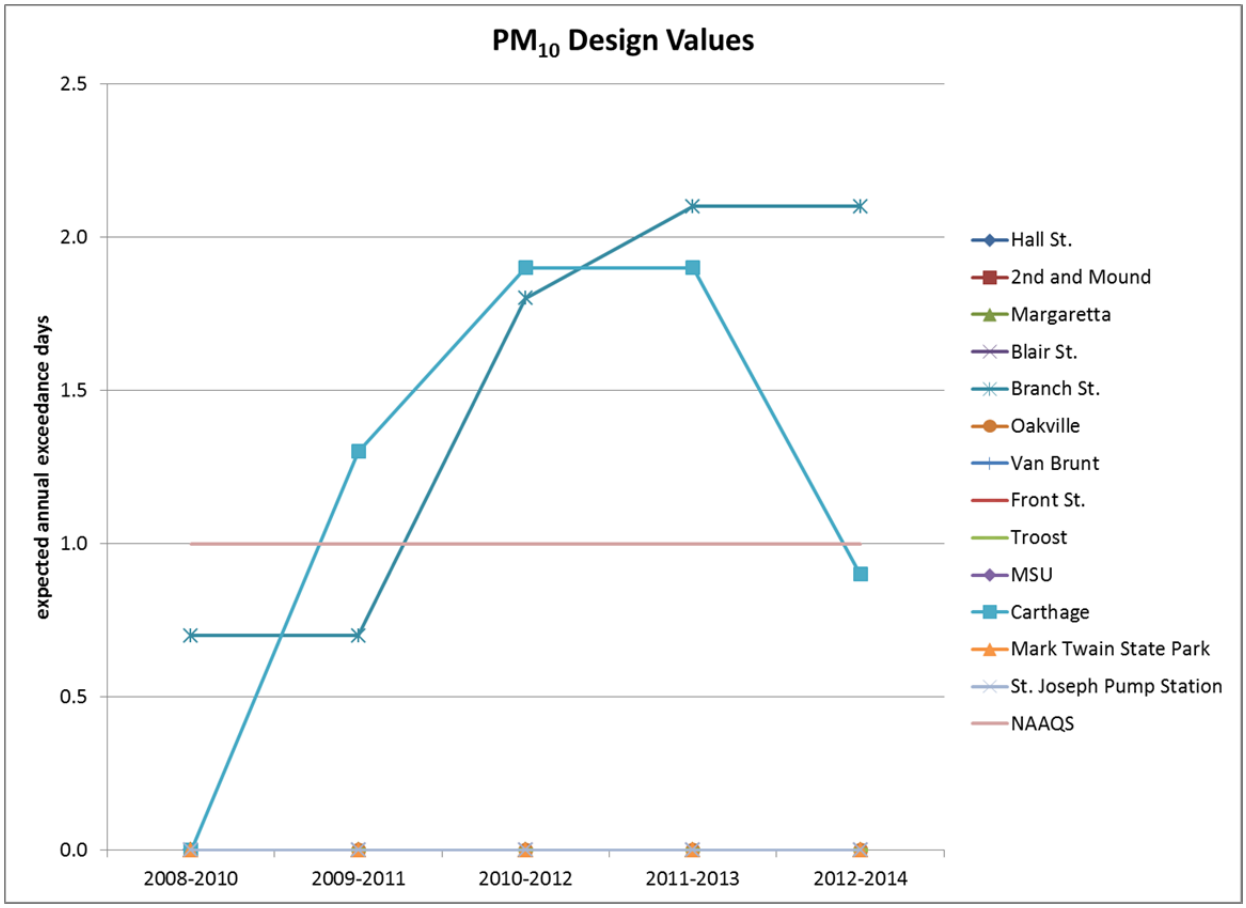

PM10 Design Values
expected annual exceedance days
2.5
2.0
1.5
1.0
0.5
0.0
2008-2010
2009-2011
2010-2012
2011-2013
2012-2014
Hall St.
2nd and Mound
Margaretta
Blair St.
Branch St.
Oakville
Van Brunt
Front St.
Troost
MSU
Carthage
Mark Twain State Park
St. Joseph Pump Station
NAAQS

Figure 8-2

Table 8-3 and Figure 8-3 show the first maximum 24-hour PM_{10} concentrations at Missouri sites in recent years. These results are presented for comparison to the monitoring requirements listed in Table 8-1 (discussed in Section 8.4 below). Only the two sites near industrial facilities discussed above show first maximum concentrations greater than 80 percent of the level of the standard (medium concentration in Table 8-1).

Table 8-3

Maximum 24-Hour PM_{10} Concentrations					
	2010	**2011**	**2012**	**2013**	**2014**
Hall St.	97	97	140		
2nd and Mound	104				
Margaretta	90	43	53	72	55
Blair St.	48	53	58	43	58
Branch St.	145	288	201	220	169
Oakville	56	63	63	58	58
Van Brunt	50				
Front St.	60	63	107	95	104
Troost	58	46	90	57	56
MSU	36	37	38	55	62
Carthage	151	258	222	142	159
Mark Twain State Park	26	38	37	39	46
St. Joseph Pump Station	102	107	111	82	74

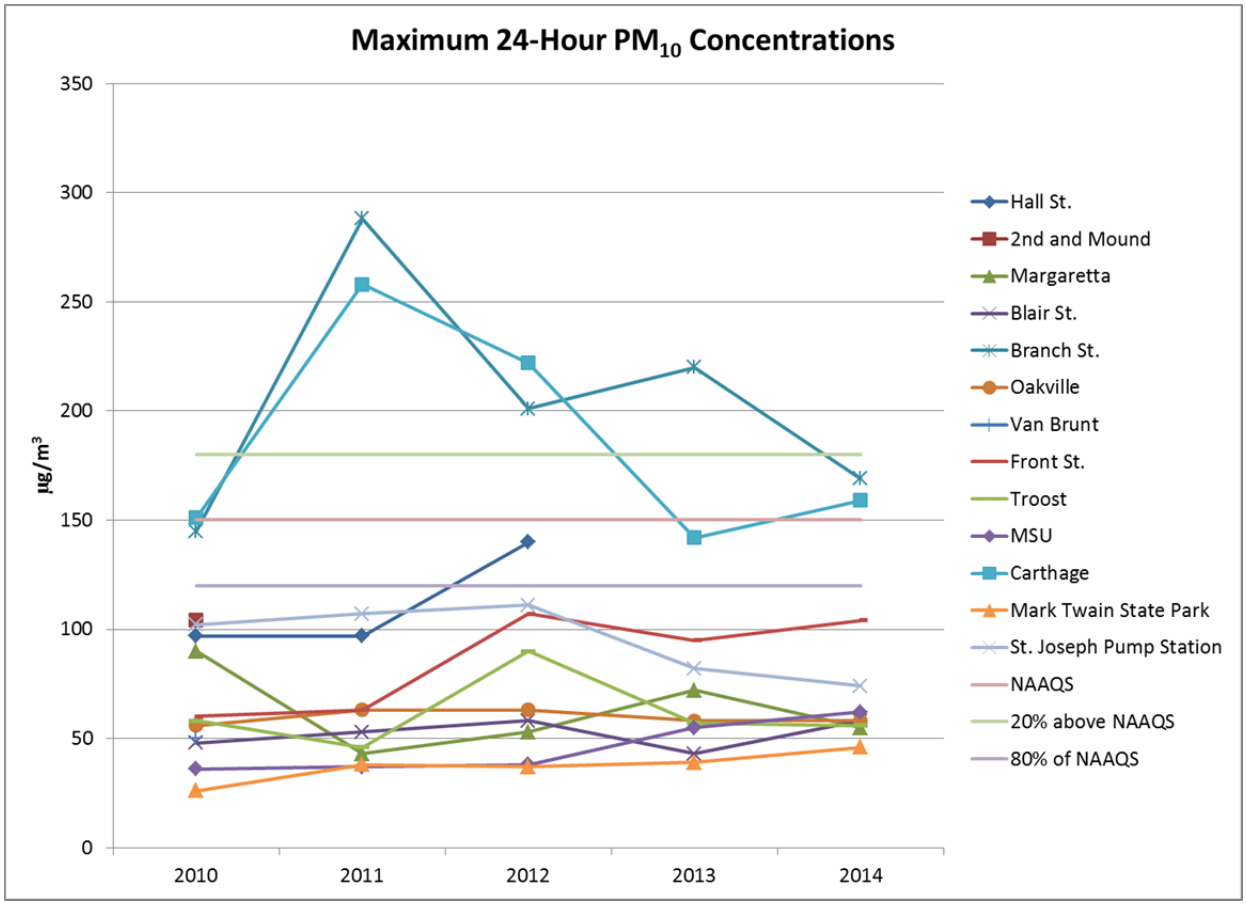

Maximum 24-Hour PM10 Concentrations
µg/m³
350
300
250
200
150
100
50
0
2010
2011
2012
2013
2014
Hall St.
2nd and Mound
Margaretta
Blair St.
Branch St.
Oakville
Van Brunt
Front St.
Troost
MSU
Carthage
Mark Twain State Park
St. Joseph Pump Station
NAAQS
20% above NAAQS
80% of NAAQS

Figure 8-3

8.4 PM_{10} Emissions

8.4.1 Point Sources

Statewide locations of the 2013 PM_{10} point sources with emissions greater than or equal to 10 tpy in MOEIS are presented in Figure 8-4. As expected, high concentrations of sources are in the metropolitan areas of St. Louis, Kansas City, and Springfield. Table 8-4 shows statewide MOEIS trends for facilities with at least 0.5 tpy.

Table 8-4. Statewide PM_{10} Point Source Emission Trends, 2009-2013

Year	2009	2010	2011	2012	2013
Yearly Total Emission (tpy)	20,231	22,296	20,876	20,569	21,190

8.4.2 Mobile Sources

Onroad mobile source PM_{10} emissions, like CO emissions (discussed in Section 5), are highest in areas with the highest traffic count as shown in Figures 5-4 and 5-5. Statewide mobile source PM_{10} emissions totaled about 594 thousand tons per year in 2011.

8.4.3 Area Sources

Area source emissions are shown by county in Figure 8-5. Area source emissions are greatest in the areas of St. Louis, Springfield, and Kansas City. Area sources correlate somewhat with population. Area sources of PM_{10} totaled about 828 thousand tons per year.

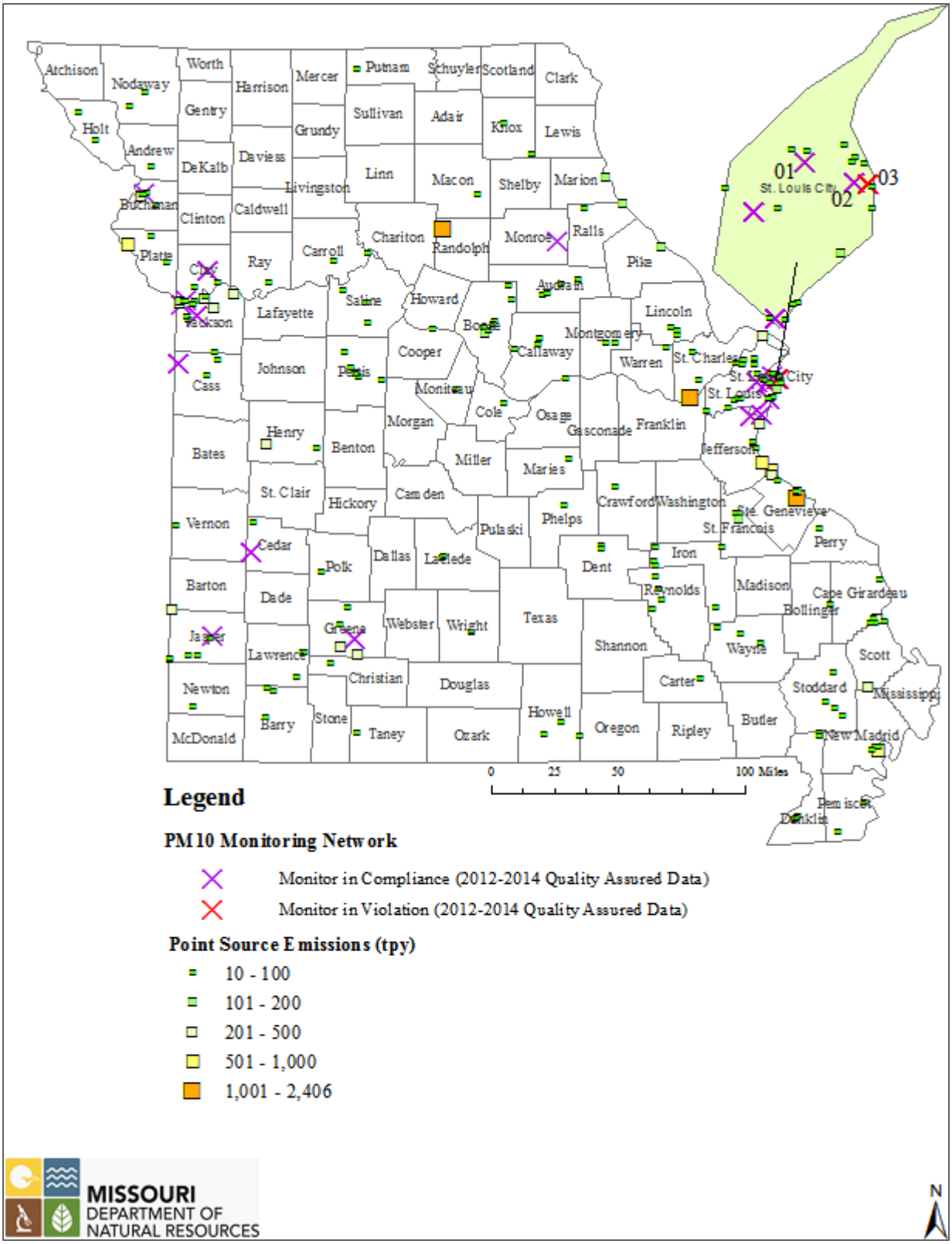


Figure 8-4. 2013 Statewide PM_{10} Point Source Emissions and the 2015 PM_{10} Monitoring Network

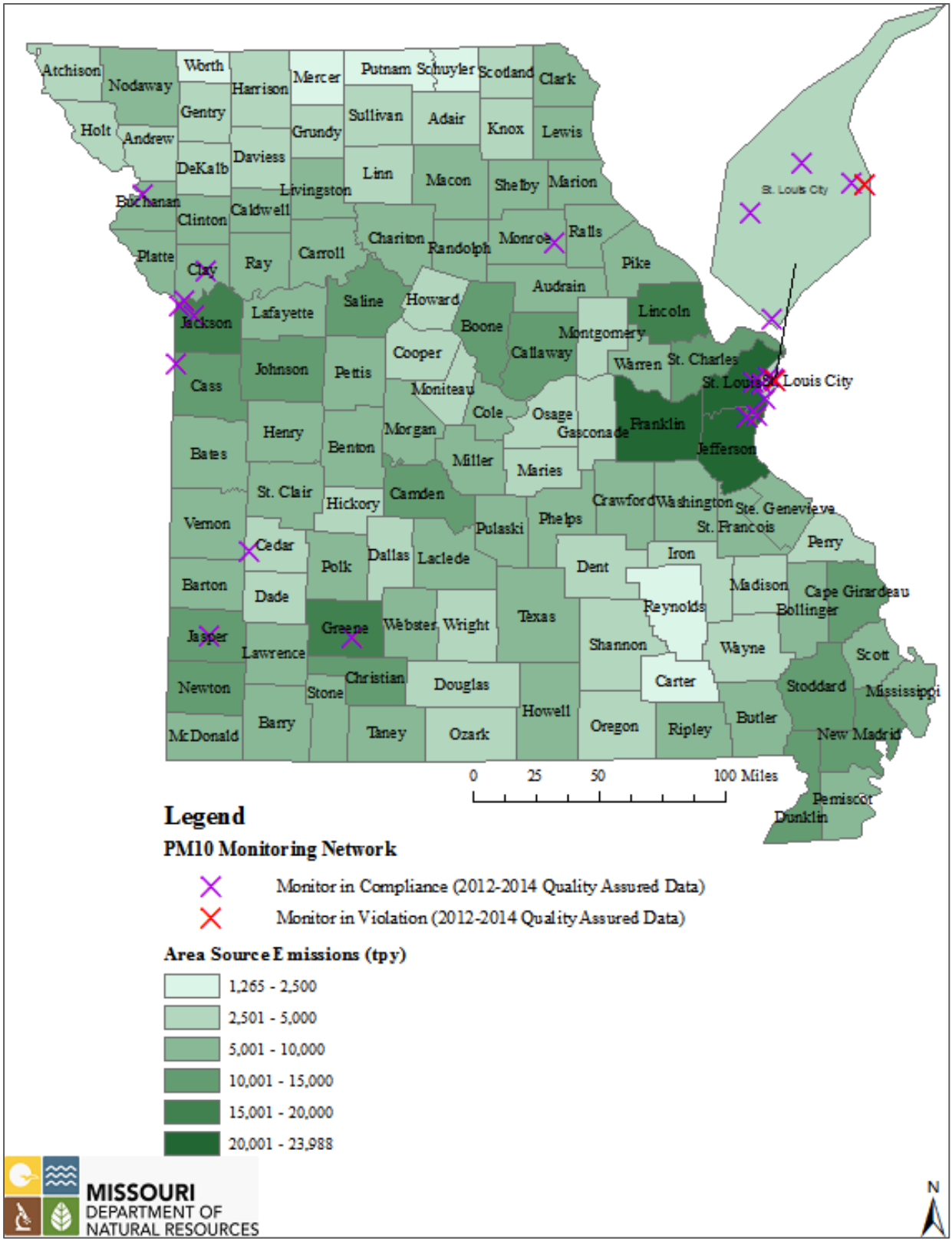


Figure 8-5. 2013 PM_{10} Area Source Emissions and the 2015 Statewide PM_{10} Monitoring Network

8.4 Evaluation of the PM_{10} Monitoring Network

There are 16 sites currently monitoring PM_{10} concentrations in Missouri. There are seven sites in the St. Louis area, five in the Kansas City area, one in Springfield, and four in the remainder of the state (see Figure 8-2).

As shown in Table 8-3 and Figure 8-3, only two of the existing sites (Branch Street and Carthage); located in industrial areas with identified local sources, show maximum 24-hour concentrations greater than 80 percent of the level of the standard. The middle column of Table 8-1 (medium) is the one that apply in the St. Louis area if the Branch Street site must be considered, requiring four to eight monitors. This number is more than met by the seven Missouri sites plus sites in Illinois within the St. Louis metropolitan area. In Kansas City, the right column of Table 8-1 is the one that applies, requiring two to four sites, more than met by the five Missouri sites plus sites in Kansas.

PM_{10} sites are selected to represent one of the following scales:

1. Middle Scale: Defines the concentration typical of area up to several city blocks in size with dimensions ranging from about 100 meters to 0.5 kilometers.
2. Neighborhood Scale: Defines the concentrations within some extended area of the city that has relatively uniform land use with dimensions in the 0.5 to 4.0 kilometers.
3. Regional Scale: Defines usually a rural area of reasonably homogeneous geography without large sources, and extends from tens to hundreds of kilometers.

Branch Street is a source-oriented middle scale site that has shown exceedance of the standard in recent years. The site is located in an area with significant sources and is **critical** in evaluating possible short-term exposure and also for evaluating the effectiveness of control of emission control strategies.

Similarly, Carthage has shown exceedance of the standard in recent years, is located in an area with significant sources, is valuable in evaluating the effectiveness of control strategies, and is therefore **critical**.

Low and stable PM_{10} concentrations have been monitored at Blair Street, located slightly downwind of the urban core and in a mixed residential/industrial area. Because Blair Street is an NCore site, this site is **critical**.

Monitoring at Margaretta has been ongoing for ten years in a residential area of north St. Louis City. Recent maximum concentrations at Margaretta have been about one-third to one-half the level of the standard. Because of the importance of monitoring long-term trends in population exposure, Margaretta is judged to be **credible** to **critical**.

PM_{10} monitoring at the Forest Park and Blue Ridge near road sites is judged to be **critical** because the PM_{10} instruments at these sites were procured in order to evaluate emissions from mobile sources.

These four sites meet the minimum requirement of Table 8-1.

At the other St. Louis area sites (South Broadway, Ladue, and Arnold West) FEM PM_{10} monitoring is done using the same instrument that measures $PM_{2.5}$, at little additional cost. Therefore these sites are judged to be at least **credible**, and should be continued.

As stated in the 2015 Monitoring Network Plan, the Oakville PM_{10} instrument is being relocated to Arnold West in 2015...

In the Kansas City area, the Front Street site, located in an area of significant intermodal freight traffic with potential for high particulate emissions, has shown maximum PM_{10} concentrations about two-thirds the level of the standard. Therefore it is judged to be **critical.**

Troost, similar in character to Margaretta, is judged to be **credible** to **critical**.

At the other Kansas City area sites (Liberty, generally downwind of Kansas City, and Richards Gebaur South, generally upwind of Kansas City) FEM PM_{10} monitoring is done using the same instrument that measures $PM_{2.5}$, at little additional cost. Therefore these sites are judged to be at least **credible**.

The Missouri State University site was the only one that monitored PM_{10} concentrations in the Springfield area. It has been relocated to the Hillcrest High School site because of a change in use of the MSU site location. Both sites are located in an area with high traffic and large population. Similar to Margaretta and Troost in character, the Hillcrest High School site is judged to be **critical** because it is the only monitor in the Springfield area.

St. Joseph Pump Station has shown maximum concentrations about half to two-thirds of the level of the standard, and it is the only site in the St. Joseph area. This site is judged to be **critical**.

Mark Twain State Park is a regional scale site. It located far from the metropolitan areas and larger sources. It monitors rural (background) and regional concentrations for the state and is therefore a **critical** site.

At the El Dorado Springs site FEM PM_{10} monitoring is done using the same instrument that measures $PM_{2.5}$, at little additional cost. Therefore this site is judged to be at least **credible**.

9.0 OZONE NETWORK ASSESSMENT

9.1 Introduction: Ozone Standards and Monitoring Requirements

The level of the current ozone (O_3) primary and secondary NAAQS is 0.075 ppm (75 ppb). The form of the standard is the three-year average of the annual fourth-highest daily maximum 8-hr concentration. In 2014, EPA proposed to lower the level of the primary and secondary standards to a level in the range of 0.065 to 0.070 ppm and maintain the form of the standard (79 **Federal Register** 75234, December 17, 2014). The final rule, and final determination of the level of the standards, is scheduled to be announced by October 1, 2015.

Table 9-1 from 40 **CFR**, Part 58, Appendix D presents the minimum requirements for O_3 monitoring. States (and/or local agencies) must operate O_3 sites for various locations depending on the size of the area and typical O_3 peak concentration. The NCore sites are expected to complement the SLAMS O_3 data. Both SLAMS and NCore sites can be used to meet the network minimum requirements. The total number of O_3 sites necessary to meet basic O_3 monitoring objectives will generally include more sites than the required minimums in Table 9-1. The break point of 85 percent of the NAAQS is currently 0.064 ppm.

Table 9-1. SLAMS Minimum O_3 Monitoring Requirements

MSA population[1,2]	Most recent 3-year design value concentrations ≥85% of any O_3 NAAQS[3]	Most recent 3-year design value concentrations <85% of any O_3 NAAQS[3,4]
>10 million	4	2
4–10 million	3	1
350,000–<4 million	2	1
50,000–<350,000[5]	1	0

[1]Minimum monitoring requirements apply to the metropolitan statistical area (MSA).
[2]Population based on latest available census figures.
[3]The O_3 National Ambient Air Quality Standards (NAAQS) levels and forms are defined in 40 **CFR** Part 50.
[4]These minimum monitoring requirements apply in the absence of a design value.
[5]Metropolitan statistical areas (MSA) must contain an urbanized area of 50,000 or more population.

One or more O_3 site(s) for each MSA must be designed to record the maximum concentration for that particular area. Network design must also consider other factors including geographic size, population density, complexity of terrain and meteorology, adjacent O_3 monitoring programs, and air pollution transport from neighboring areas.

The basic O_3 monitoring objectives include;

a. public data reporting,
b. air quality mapping
c. NAAQS compliance
d. understanding O_3-related atmospheric processes

Changes to monitoring requirements proposed in 2009 have not been finalized. The 2014 proposed rule discussed above proposed changes to the monitoring season that would require O_3 monitoring in Missouri from March (changed from April) through October of each year.

9.2 O_3 Monitoring Results in Missouri

9.2.1. Ozone Design Values

There are currently 23 sites that monitor O_3 in Missouri (Figure 9-1). Seven sites are within the St. Louis area, and five are in the Kansas City area. Ste. Genevieve County and the Southeast areas each have one site. Two sites are located in Springfield, and there are seven sites in other areas of the state.

These sites represent the following spatial scales defined in 40 **CFR**, Part 58, Appendix D:

1. Neighborhood: Defines the concentrations within some extended area of the city that has relatively uniform land use with dimensions in the range of 0.5 to 4.0 kilometers.
2. Urban: Defines the concentrations within an area of the city with dimensions of 4.0 to 50 kilometers.
3. Regional: Defines usually a rural area of reasonably homogeneous geography without large sources, and extends from tens to hundreds of kilometers.

Table 9-2 and Figures 9-2, 9-3, and 9-4 show the O_3 design values measured at Missouri sites in recent years. Yellow highlights in the table indicate design values that exceed the standard. Only three sites exceeded the standard in the most recent three-year period (2012-2014). However, if the level of the standard is lowered to 0.070 ppm, 14 of the 23 sites would be in violation of the standard. If the level of the standard is lowered to 0.065 ppm, 21 of the 23 sites would be in violation.

St. Louis Area

As shown in Table 9-2 and Figure 9-2, Orchard Farm, West Alton, and Maryland Heights in the St. Louis area remain in violation of the 75 ppb standard for the most recent three-year period (2012-2014). These sites are located relatively downwind (see Section 3.0 and Appendix A) and at the exterior of the St. Louis metropolitan area.

Blair Street, Pacific, Arnold West, and Foley are in compliance for the most recent three-year period. Blair Street is relatively close within the core of the urban area. Pacific and Arnold West are located southerly and generally upwind of the St. Louis urban core, not in the most prevalent wind direction. Foley is located downwind but at a greater distance from the core of the metropolitan area. All of the St. Louis area sites would have exceeded the standard for the 2012-2014-period if the standard were lowered as proposed to between 0.065 and 0.070 ppm.

Kansas City Area
As shown in Table 9-2 and Figure 9-3, all of the sites in the Kansas City area were within the standard for the most recent three-year period (2012-2014). However, Trimble, Watkins Mill, Liberty, and Rocky Creek, in the Kansas City area have violated the standard in the past. These four sites are located north and downwind relative to the central Kansas City and on the outskirts of the Kansas City metropolitan area.

All of the Kansas City area sites would have exceeded the standard for the 2012-2014-period if the standard were lowered as proposed to 0.065 ppm. The Richards Gebaur South site would be the only Kansas City area site to meet the standard if it were lowered to 0.070 ppm. The Richards Gebaur South site is located generally upwind and at a distance, beyond the immediate areas of the central part of the metropolitan area.

Remainder of the State
All of the other ozone sites in Missouri were in attainment of the standard for the most recent three-year period (2012-2014). However, the Bonne Terre, Farrar, and Alba sites would have exceeded the standard for the 2012-2014 period if the standard were lowered as proposed to 0.070 ppm, and only the Branson and Mark Twain State Park sites would have met the standard for 2012-2014 if the standard were lowered to 0.065 ppm.

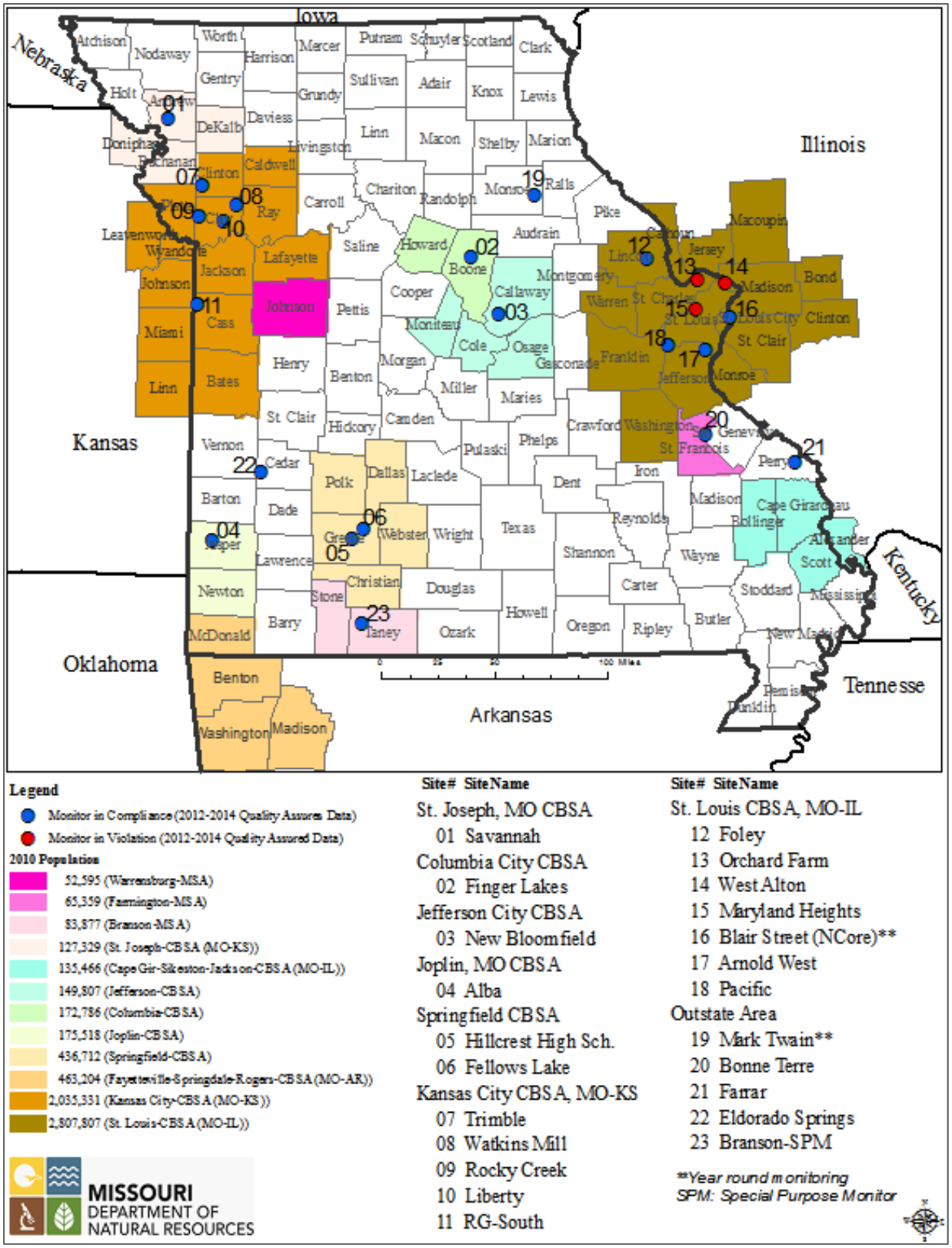


Figure 9-1. The 2015 Missouri Ozone Monitoring Network

Table 9-2

Ozone Design Values, ppm (3-Year Average of Annual fourth-highest daily maximum 8-hr concentration)							
Yellow highlights indicate design values that exceed the standard.							
	2008-2010	**2009-2011**	**2010-2012**	**2011-2013**	**2012-2014**		
Orchard Farm	0.074	0.076	0.080	0.078	0.076		
W Alton	0.077	0.080	0.087	0.082	0.078		
Maryland Heights	0.072	0.075	0.082	0.080	0.077		
Blair St.	0.070	0.072	0.079	0.077	0.073		
Pacific	0.066	0.068	0.075	0.074	0.072		
Arnold W	0.072	0.074	0.079	0.076	0.075		
Foley	0.073	0.074	0.080	0.078	0.075		
Bon Terre	0.071	0.070	0.075	0.073	0.072		
Farrar	0.074	0.075	0.078	0.074	0.071		
Trimble	0.074	0.077	0.080	0.078	0.073		
Watkins Mill	0.072	0.076	0.080	0.078	0.073		
Liberty	0.071	0.074	0.078	0.077	0.072		
Rocky Creek	0.072	0.075	0.080	0.078	0.074		
Richards Gebaur S	0.066	0.068	0.072	0.071	0.069		
Fellows Lake	0.068	0.069	0.074	0.072	0.068		
Hillcrest High School	0.065	0.067	0.071	0.070	0.066		
Branson			0.070	0.069	0.064		
Alba		0.075	0.078	0.077	0.073		
Eldorado Springs	0.066	0.068	0.074	0.073	0.070		
New Bloomfield		0.066	0.071	0.068	0.067		
Finger Lakes		0.066	0.072	0.070	0.068		
Mark Twain S. P.	0.065	0.067	0.071	0.068	0.065		
Savannah		0.073	0.076	0.074	0.068		

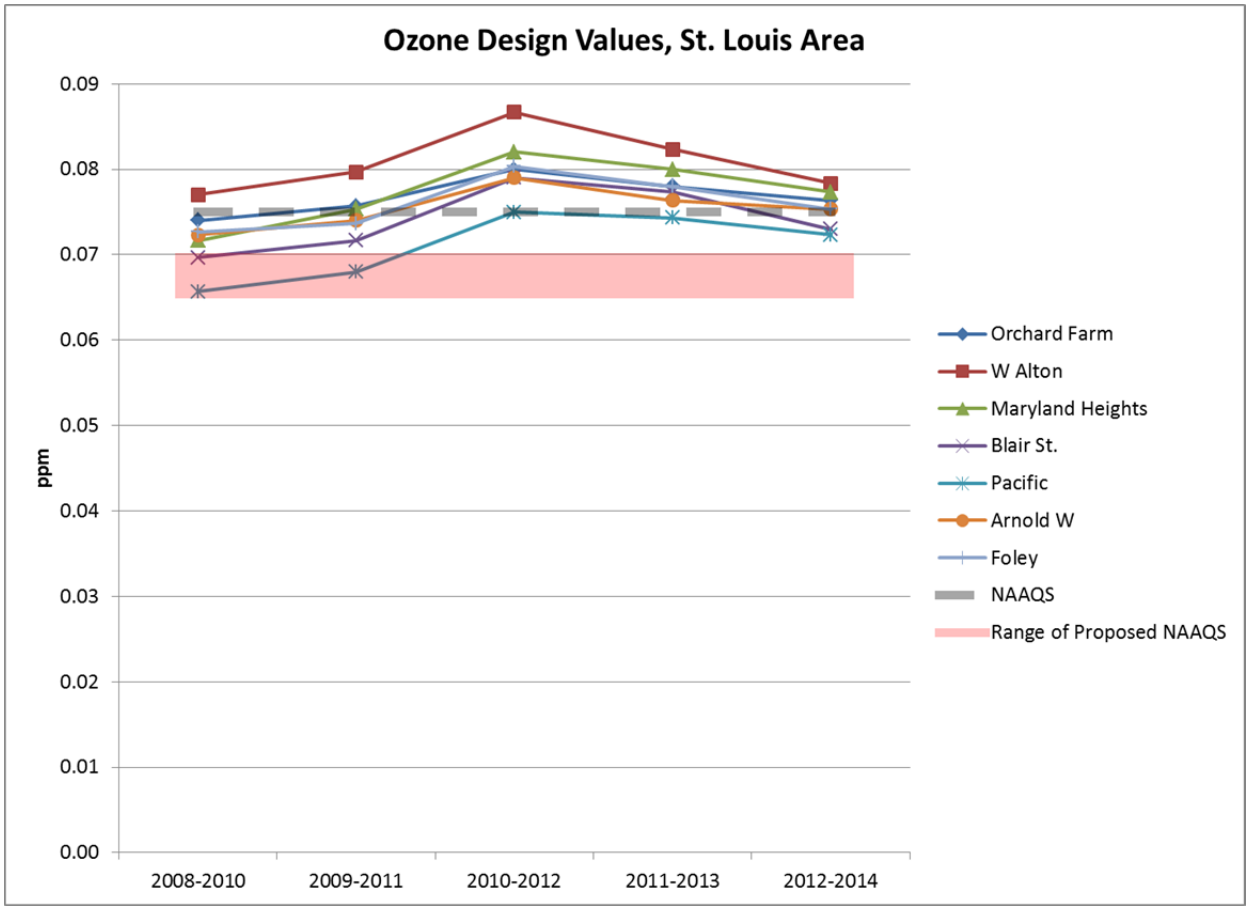

Ozone Design Values, St. Louis Area
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
ppm
2008-2010
2009-2011
2010-2012
2011-2013
2012-2014
Orchard Farm
W Alton
Maryland Heights
Blair St.
Pacific
Arnold W
Foley
NAAQS
Range of Proposed NAAQS

Figure 9-2

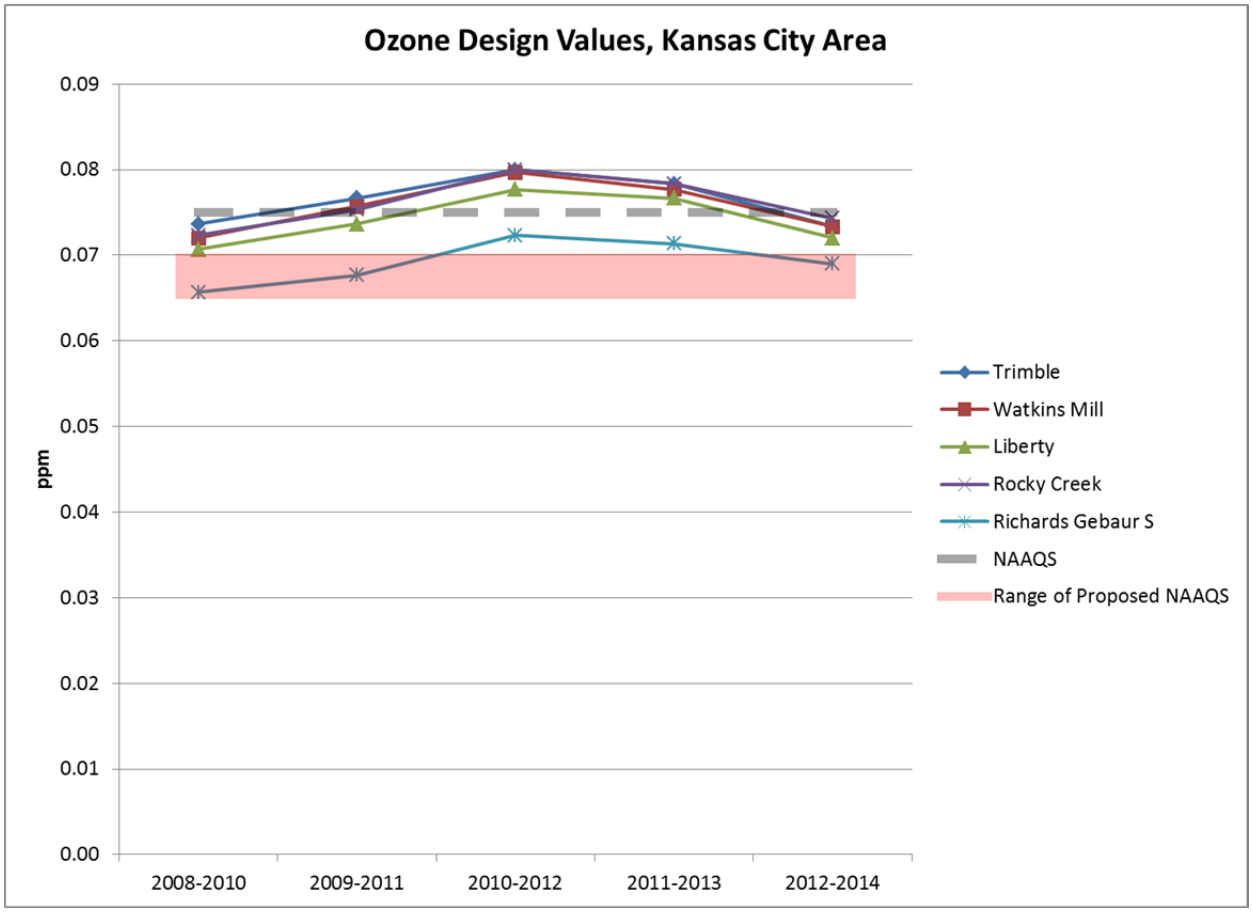

Ozone Design Values, Kansas City Area
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
ppm
2008-2010
2009-2011
2010-2012
2011-2013
2012-2014
Trimble
Watkins Mill
Liberty
Rocky Creek
Richards Gebaur S
NAAQS
Range of Proposed NAAQS

Figure 9-3

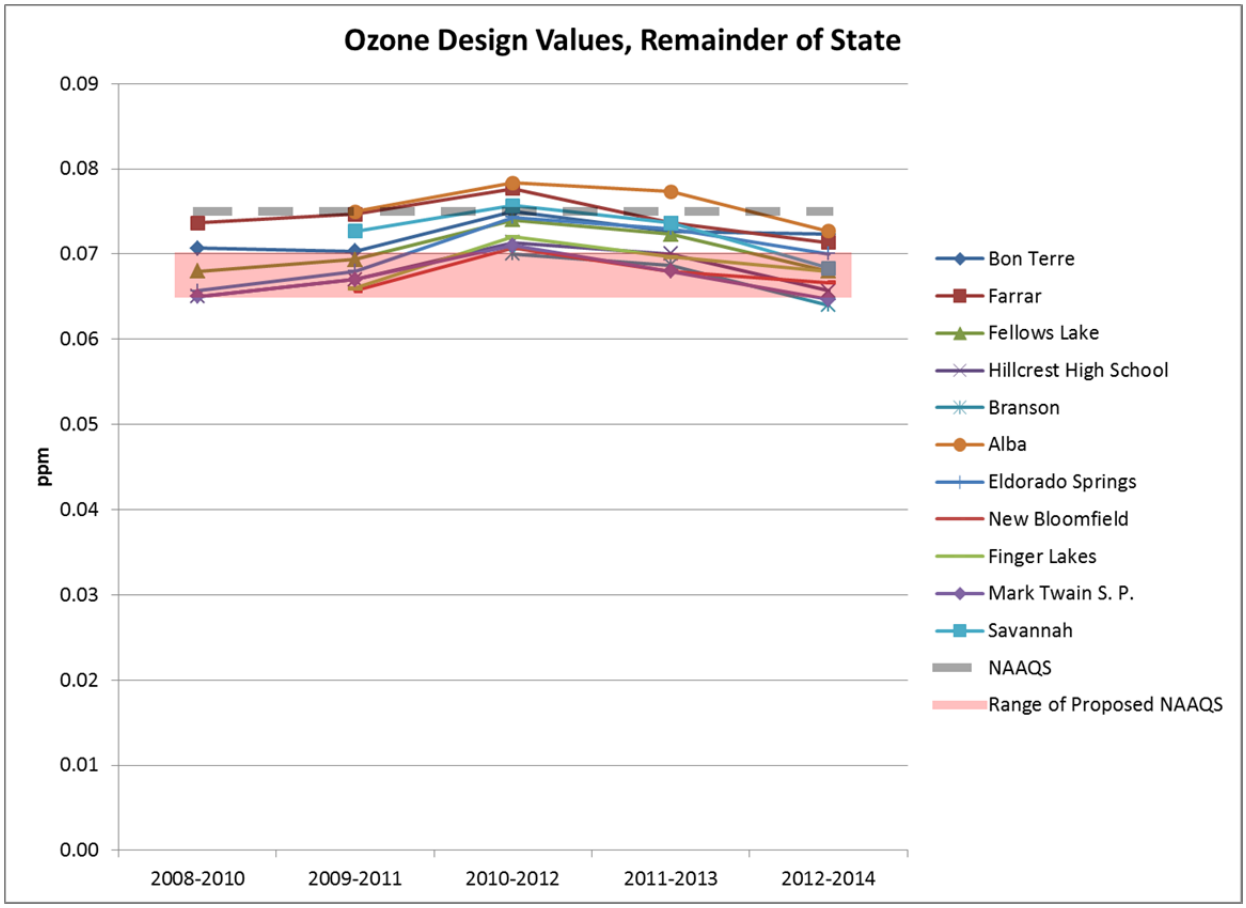

Ozone Design Values, Remainder of State
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
ppm
2008-2010
2009-2011
2010-2012
2011-2013
2012-2014
Bon Terre
Farrar
Fellows Lake
Hillcrest High School
Branson
Alba
Eldorado Springs
New Bloomfield
Finger Lakes
Mark Twain S. P.
Savannah
NAAQS
Range of Proposed NAAQS

Figure 9-4

9.2.2 Application of Ambient Air Monitoring Network Assessment Tools

Tools for use in network assessments were developed and made available online by EPA at the time of preparation of 2010 network assessments. The tools no longer work completely and have not been updated by EPA. However, a subset of these tools has been updated by air agency staff in some of the Region 5 states with support from the Lake Michigan Air Directors Consortium (LADCO). Information on the tools and a link to the actual assessment tools can be found at http://ladco.github.io/NetAssessApp/index.html. The tools are primarily applicable to assessment of O_3 and $PM_{2.5}$ networks. Results of the application of these tools to the Missouri O_3 network are presented in this section. The tools use data through 2013.

Area Served

The area served tool uses a spatial analysis technique to show the area represented by each monitoring site within a defined region. The shape and size of each polygon surrounding a site is determined by the proximity of the nearest neighboring sites. All points within a polygon are closer to the monitor in that polygon than to any other monitor. The tool only uses geometric analysis; there is no consideration of source locations, terrain, or meteorology. Figure 9-5 shows the area served polygons surrounding each Missouri O_3 site. The polygons are smaller in the St. Louis and Kansas City areas, because there are relatively more sites in those areas.

Correlation Matrices

The correlation matrix tool generates a display that summarizes the correlation, relative difference and distance between pairs of monitoring sites. The shape of the ellipses represents the Pearson correlation between sites. Circles represent zero correlation and straight diagonal lines represent a perfect correlation. The color of each ellipse represents the average relative difference between two sites, and the number within each ellipse is the distance between the two sites in kilometers.

Figure 9-6 shows the correlation matrix for sites in the St. Louis area, including both Missouri and Illinois sites. O_3 concentrations are fairly highly correlated at some sites in the St. Louis MSA as indicated by the shapes of the ellipses (thinner ellipses) and the small average relative differences (lighter color). Correlation between sites may be indicative of some redundancy in O_3 monitoring. West Alton is shown to be correlated with Orchard Farm in Missouri and with Alton and Wood River in Illinois. This result is reasonable since all of these sites are generally downwind of the central St. Louis urban area during periods with high O_3. Some correlation is evident between Pacific and Arnold West and Maryland Heights. This result is also reasonable, since these sites are generally upwind of the central St. Louis urban area. Blair Street is correlated with the nearby East St. Louis site in Illinois and also with the Maryville site in Illinois.

Figure 9-7 shows the correlation matrix for sites in the Kansas City area, including both Missouri and Kansas sites. Richards Gebaur South is correlated with Heritage Park in Olathe KS, as expected, since the two sites are 16 kilometers apart. Watkins Mill, Liberty, Rocky Creek, and Trimble are all somewhat correlated, as would be expected, since they are all generally

downwind of the Kansas City urban center during periods with high O_3. Savannah and Trimble are correlated despite their 53 kilometer separation.

Removal Bias

The removal bias tool uses the nearest neighbors to each site being evaluated to estimate the concentration at the location of the site if the site had never existed. This is done using an algorithm with inverse distance squared weighting. The squared distance allows for higher weighting on concentrations at sites located closer to the site being examined. The bias is calculated for each day at each site by taking the difference between the predicted value from the interpolation and the measured concentration. A positive average bias means that if the site being examined was removed, the estimated concentration from the neighboring sites would be larger than the measured concentration. A negative average bias means that the estimated concentration from the neighboring sites is less than the measured concentration.

Figure 9-8 shows graphically the removal bias results for St. Louis area sites based on 2011-2013 data. As indicated by the blue color, the average concentration at West Alton, which is the design value site for the St. Louis area, would be underestimated if estimated from neighboring sites. The concentration at Arnold West would also be underestimated if estimated from neighboring sites. As indicated by the red color, the concentration at Pacific would be overestimated if estimated from neighboring sites. The concentration at Orchard Farm would be slightly overestimated, and the concentration at Maryland Heights would be slightly underestimated. The concentration at Blair Street could be estimated from neighboring sites, but measurement at Blair Street is nevertheless critical, because it is an NCore site.

Figure 9-9 shows graphically the removal bias results for Kansas City area sites based on 2011-2013 data. As indicated by the blue color, the concentrations at Liberty, Rocky Creek, or Trimble would be slightly underestimated using neighboring sites. The concentrations at Richards Gebaur South and Watkins Mill could be estimated from neighboring sites. As indicated by the red color, the concentration at the JFK site in Kansas would be overestimated from neighboring sites, because the O_3 concentrations measured at that site are typically lower than at neighboring sites.

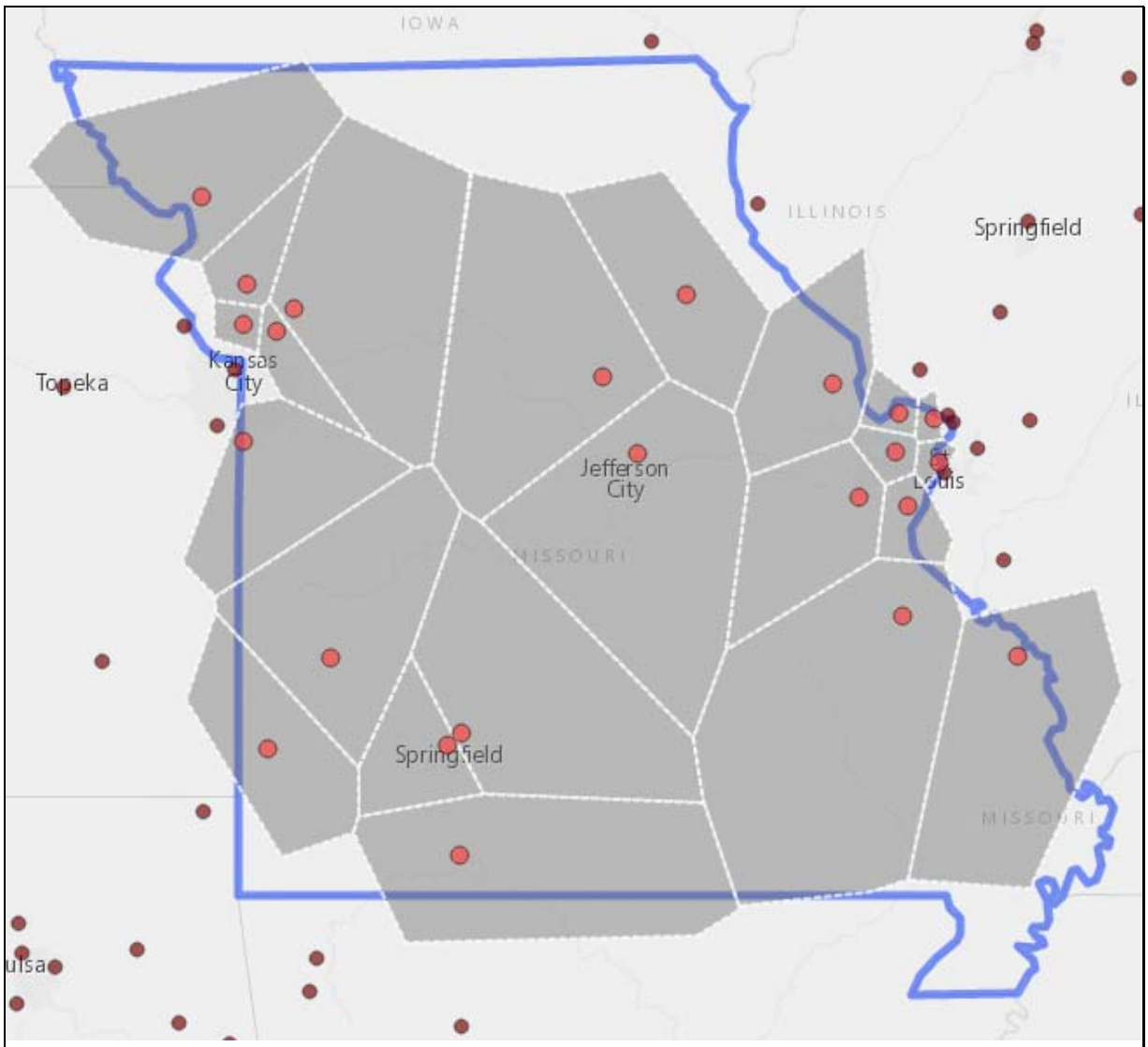


Figure 9-5. Area Served Polygons for Missouri O_3 Sites

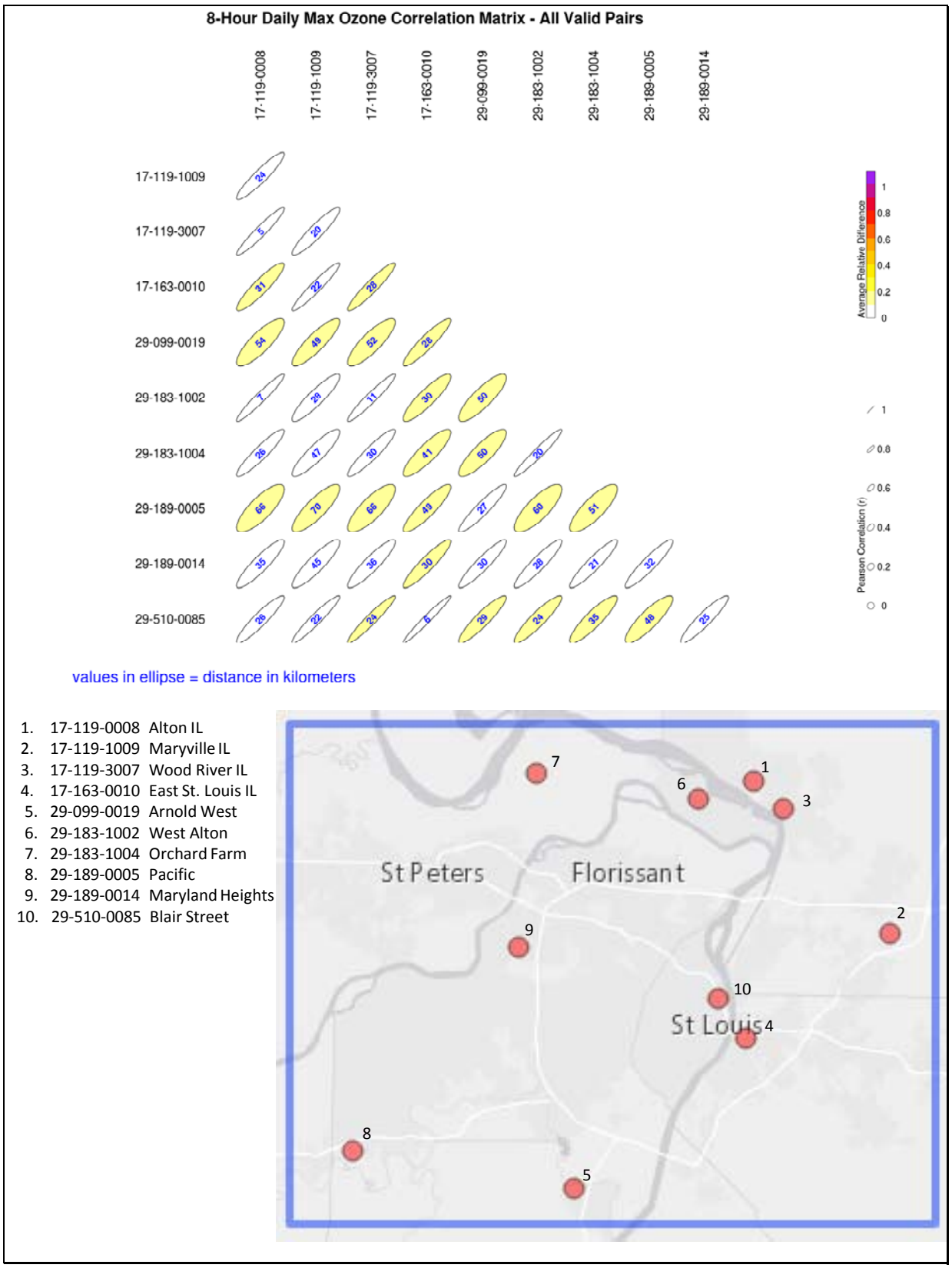


Figure 9-6. Correlation Matrix for St. Louis Area O_3 Sites

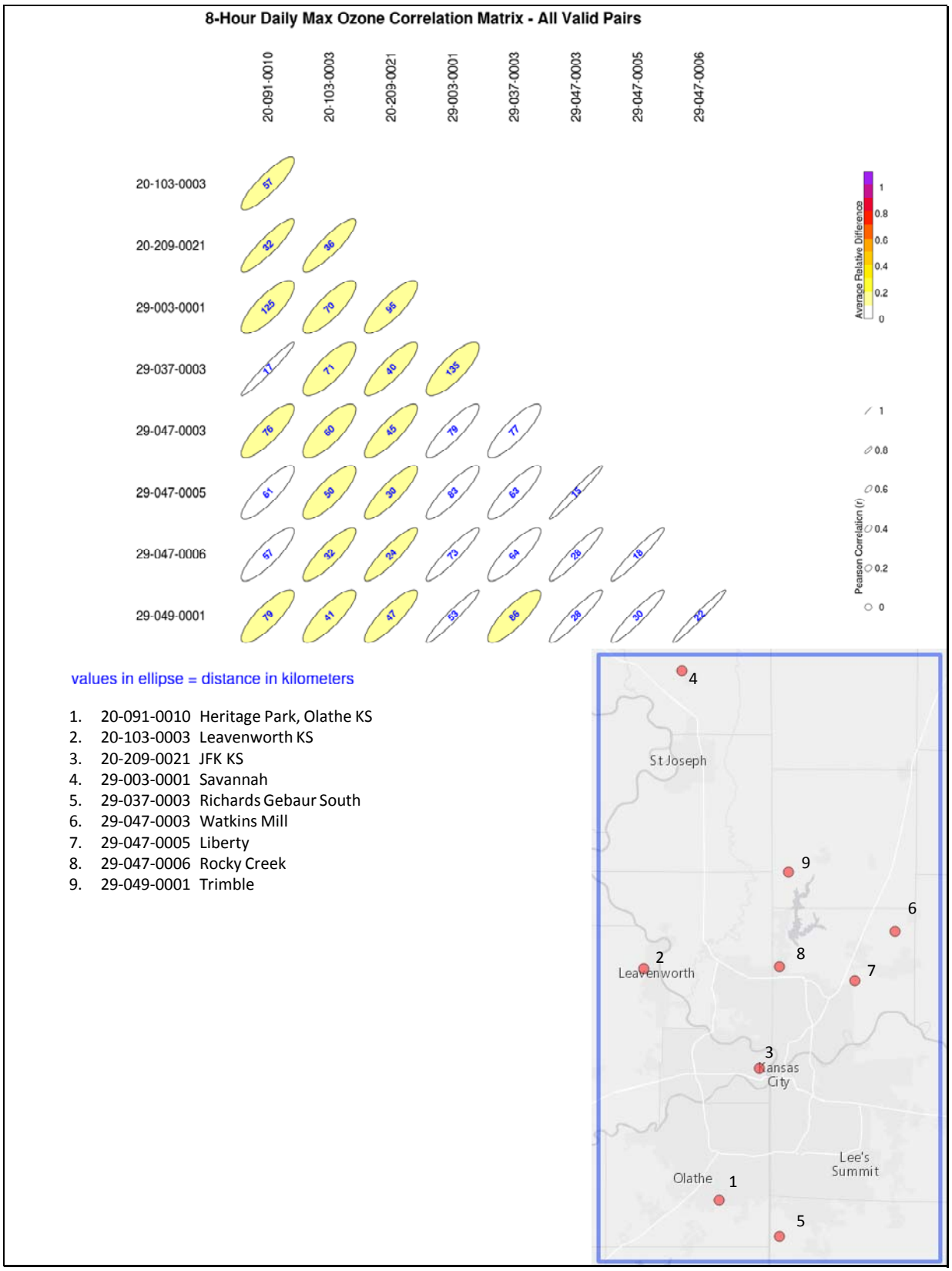


Figure 9-7. Correlation Matrix for Kansas City Area O_3 Sites

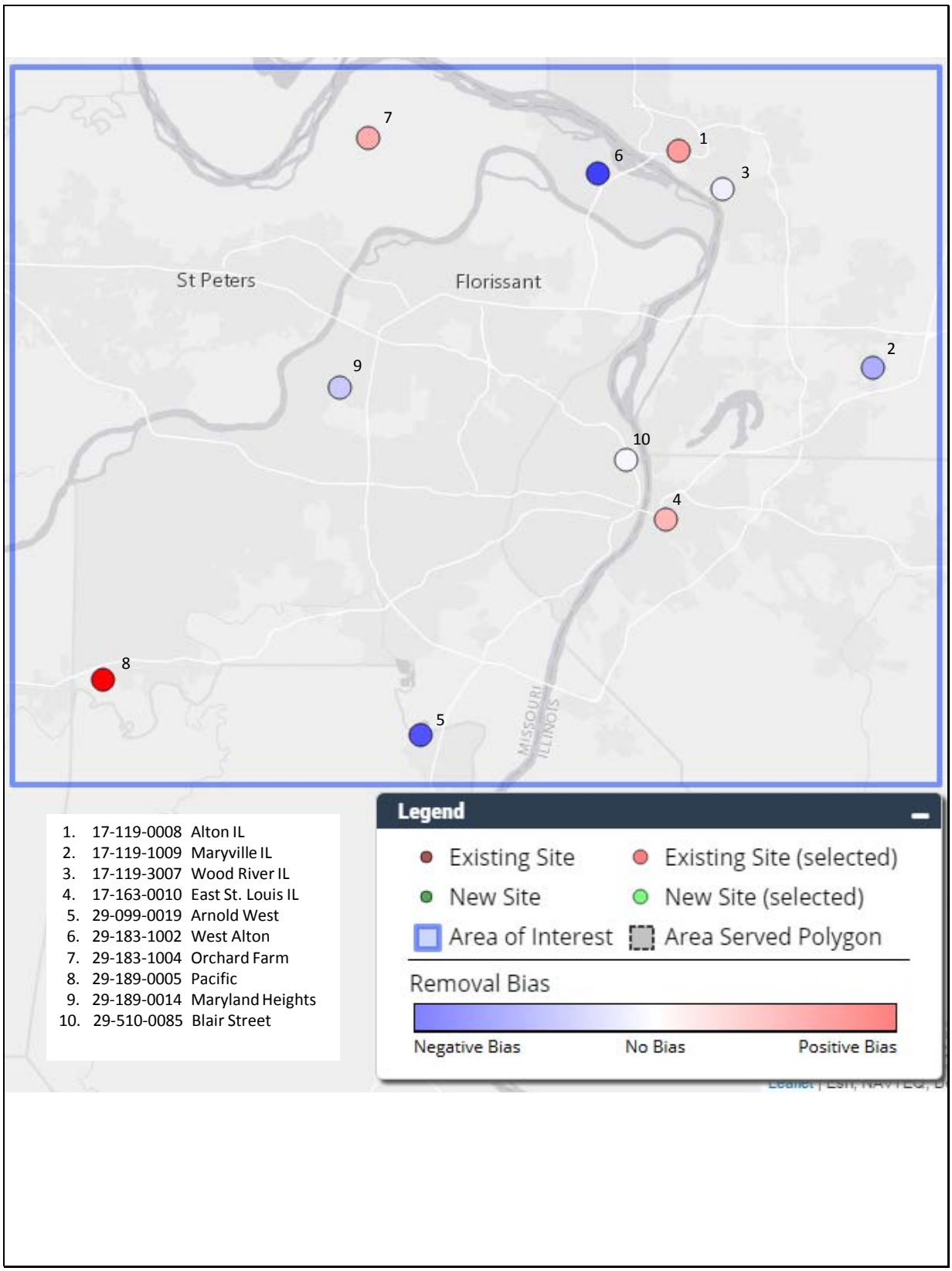


Figure 9-8. Removal Bias for St. Louis Area O_3 Sites

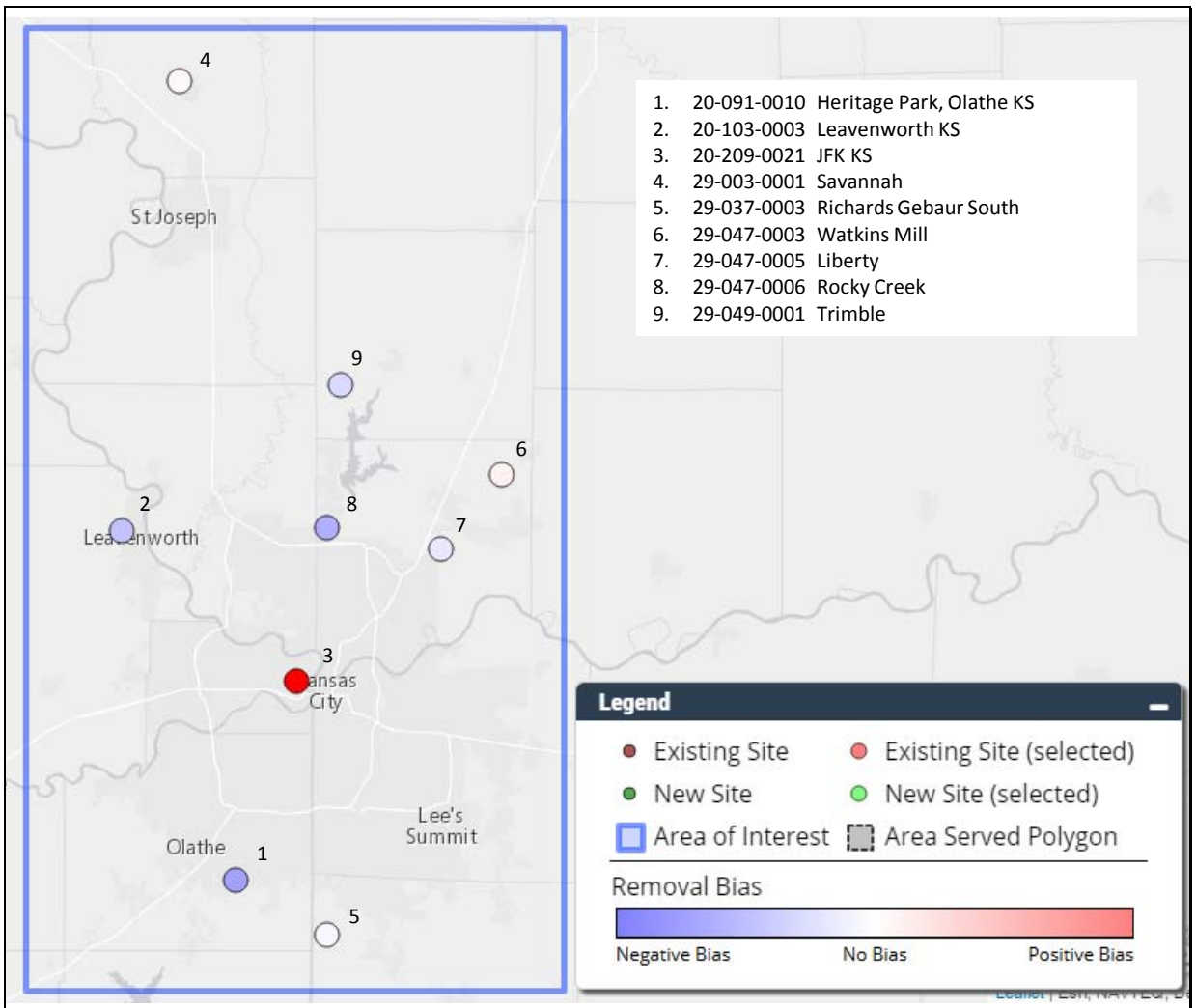


Figure 9-9. Removal Bias for Kansas City Area O_3 Sites

9.3 Ozone Precursor Emissions

NO_X and VOCs are known precursors of O_3. Point, mobile, and area NO_X emissions are discussed in Section 7.3. VOC emissions are discussed below.

9.3.1 Point Source Emissions

NO_X point source emissions and ozone monitoring sites are shown in Figure 9-10. VOC point sources emissions and ozone monitoring sites are shown in Figure 9-11. A great number of VOC sources are located in the central areas of the St. Louis and Kansas City metropolitan areas and along the Missouri and Mississippi rivers. Like NO_X sources, quite a few point sources are also located in the Joplin area. Total VOC point source emissions in 2013 were 16,000 tons. Point source VOC emissions have been fairly constant over the last five years (2009-2013).

9.3.2 Mobile Source Emissions

Figures 5-4 and 5-5 show traffic counts in the St. Louis and Kansas City areas. This information is used as a surrogate for mobile source emissions of both NO_X and VOCs. As shown in the figures, the central areas of the metropolitan areas contain some of the most traveled segments of traffic arteries and major interstate highways. It would, therefore, be expected that these areas have high levels of mobile emissions.

9.3.3 VOC Area Source Emissions

Figure 9-12 shows 2011 VOC area source emissions. Highest emissions are estimated for the St. Louis and Kansas City areas. The high VOC emissions in these areas coincide with high NO_X area emissions (see Figure 7-6). Moderate emissions are estimated for Greene and New Madrid counties. Area sources generally correlate with population density (see Section 2.0). Estimated area source emissions of VOC totaled about 100 thousand tons per year.

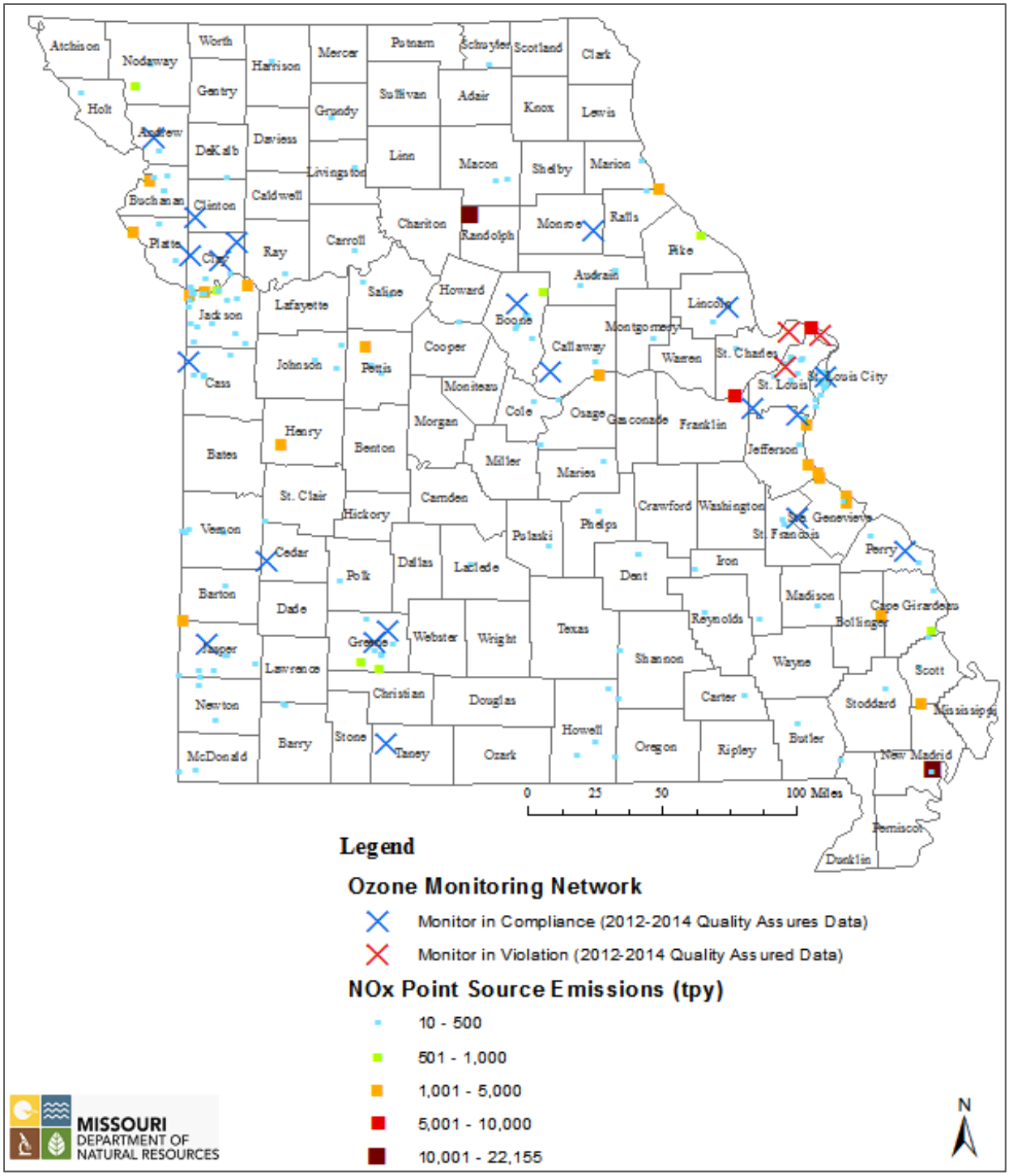


Figure 9-10. 2011 Missouri Statewide Area Source NOx Point Source Emissions and the 2015 Ozone Monitoring Network

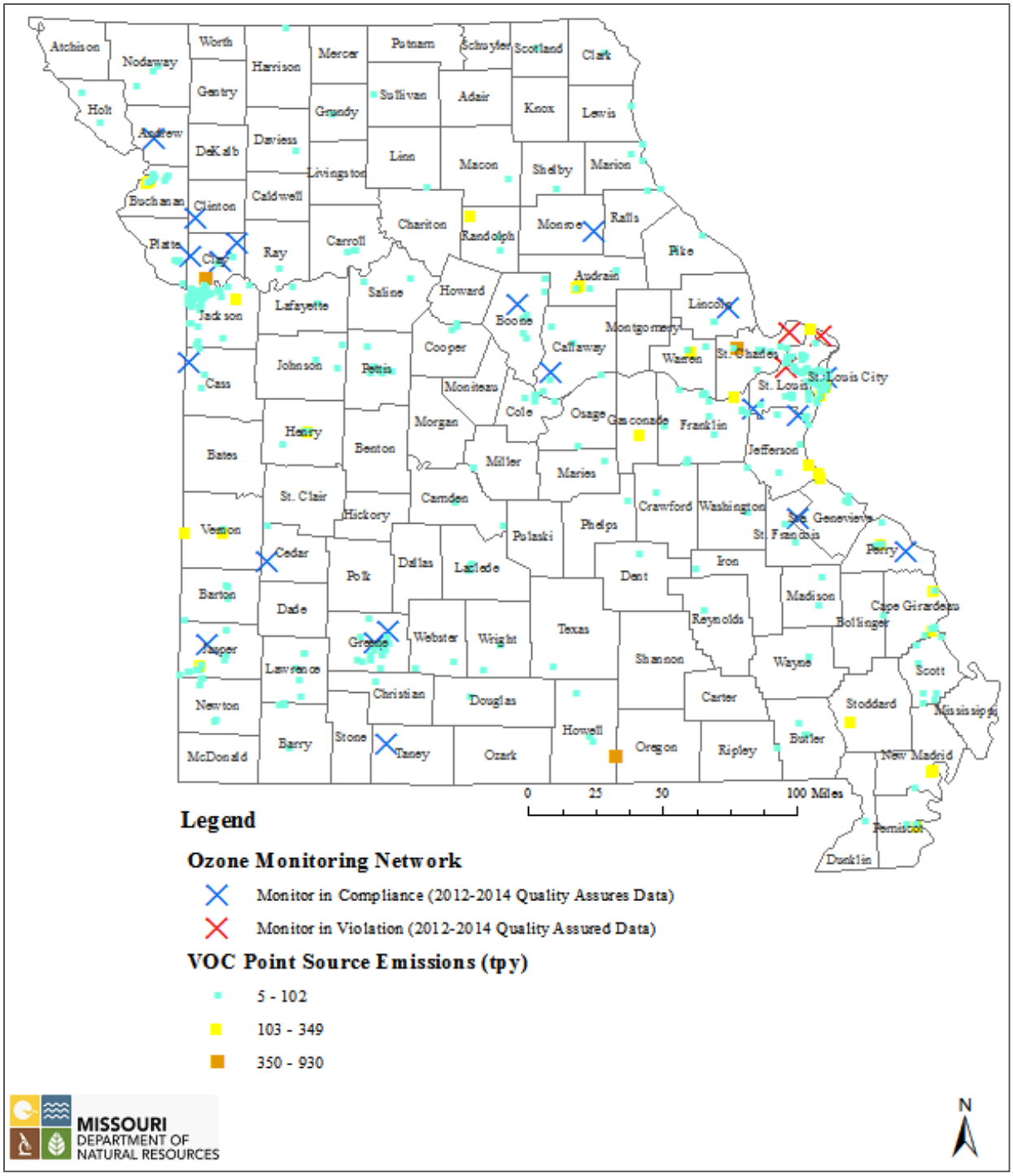


Figure 9-11. 2013 Statewide VOC Point Source Emissions and the 2015 Ozone Monitoring Network

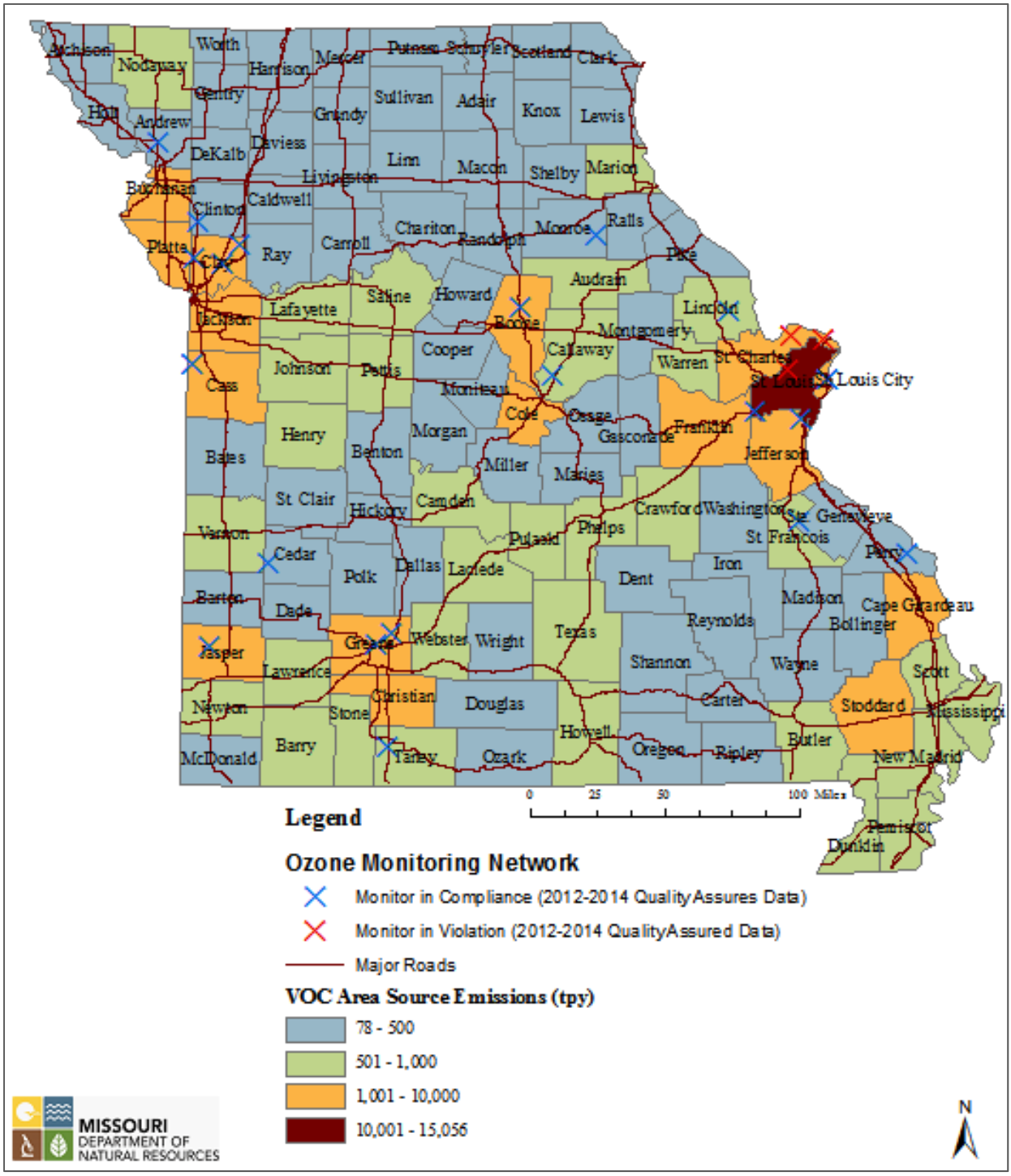


Figure 9-12. 2011 Missouri Statewide Area Source VOC Emissions and the 2015 Ozone Monitoring Network

9.4. Evaluation of O_3 Monitoring Sites

St. Louis Area

As discussed above and shown in Table 9-2 and Figure 9-2, Orchard Farm, West Alton, and Maryland Heights in the St. Louis area were in violation of the 75 ppb standard for the most recent three-year period (2012-2014). These sites are located relatively downwind and at the exterior of the St. Louis metropolitan area. West Alton is the design value site for the area and is therefore **critical**. Because they are still in violation of the standard and thus help to define the area that is not attaining the standard, and because they help to meet the recommendation that more than one site may be needed to measure the maximum O_3 concentration in the St. Louis area, Orchard Farm and Maryland Heights are also **critical**.

Blair Street, Pacific, Arnold West, and Foley are in compliance for the most recent three-year period. Blair Street is **critical** because it is an NCore site. Pacific and Arnold West are located southerly and generally upwind of the St. Louis urban core, and are therefore **critical** in determining regional background for the St. Louis area. Foley is located downwind but at a greater distance from the core of the metropolitan area and is therefore **critical** in helping to define the extent of nonattainment of the standard. All of these sites are therefore **critical** despite some correlation between some sites as discussed above.

Another factor supporting continuation of all of these sites is that all of the St. Louis area sites would have exceeded the standard for the 2012-2014-period if the standard were lowered as proposed to between 0.065 and 0.070 ppm.

From Table 9-1, the required number of sites in the St. Louis area is two, so that the existing network more than meets this requirement.

Kansas City Area

As discussed above and shown in Table 9-2 and Figure 9-3, all of the sites in the Kansas City area were within the standard for the most recent three-year period (2012-2014). However, Trimble, Watkins Mill, Liberty, and Rocky Creek, in the Kansas City area have violated the standard in the past, and all four of these sites, located north and downwind of central Kansas City, have measured similar concentrations. Therefore, all four of these sites are **critical** in measuring the maximum O_3 concentrations in the Kansas City area and defining the extent of potential exceedance of the standard if the standard is made more stringent.

The Richards-Gebaur South site, located generally upwind of the central Kansas City area, is **critical** in determining regional background for the Kansas City area.

From Table 9-1, the required number of sites in the Kansas City area is two, so that the existing network more than meets this requirement.

Remainder of the State

Alba, New Bloomfield, Finger Lakes, and Savannah are **critical** sites, because they are located in MSAs of 50,000 to 350,000 people, i.e., Joplin, Jefferson City, Columbia, and St. Joseph, respectively, and have measured concentrations greater than 85 percent of the standard.

Hillcrest High School and Fellows Lake are located about 10-15 miles downwind of the Springfield urban core. From Table 9-1, the required number of sites in the Springfield area is two, so that both of these sites are **critical**.

Bonne Terre, Mark Twain State Park, and El Dorado Springs are regional background sites for eastern, north-central, and western Missouri respectively. These sites are **critical** in determining regional background

Branson is located generally downwind of an area that experiences high visitor populations during the summer months and is also not far-removed from larger urban areas such as Fayetteville/Springdale/Rogers and Tulsa. The Branson site, which is a SPM site, is at least **credible**, and if the standard is lowered as planned, would become **critical**.

Farrar measured exceedance of the standard for the 2010-2012-period, and, if the standard is lowered as planned, could measure exceedance of the standard again. It is located generally downwind of in-state and out-of-state sources of NO_X and VOC that may impact the site. Therefore, the Farrar site is **critical**.

10.0 $PM_{2.5}$ NETWORK ASSESSMENT

10.1 Introduction: $PM_{2.5}$ Standards and Monitoring Requirements

The level of the $PM_{2.5}$ annual primary standard is 12 μg/m^3. The level of the annual secondary standard is 15 μg/m^3. The form of both annual standards is the annual mean averaged over three years. The level of the 24-hour primary and secondary standards is 35 μg/m^3. The form of the 24-hour standards is the three-year average of the annual 98th percentile of 24-hour averages.

Table 10-1 from 40 **CFR**, Part 58, Appendix D lists minimum $PM_{2.5}$ monitoring requirements. Eighty-five percent of the annual primary standard is 10.2 μg/m^3, and 85 percent of the 24-hour standard is 29.75 μg/m^3.

Table 10-1. Minimum Numbers of $PM_{2.5}$ Samplers Required

MSA population[1 2]	Most Recent 3-Year DV≥85% of any $PM_{2.5}$ NAAQS[3]	Most Recent 3-Year DV<85% of any $PM_{2.5}$ NAAQS[3 4]
>1,000,000	3	2
500,000-1,000,000	2	1
50,000-<500,000[5]	1	0

[1]Minimum monitoring requirements apply to the Metropolitan statistical area (MSA).

[2]Population based on latest available census figures.

[3]The $PM_{2.5}$ National Ambient Air Quality Standards (NAAQS) levels and forms are defined in 40 CFR Part 50.

[4]These minimum monitoring requirements apply in the absence of a design value.

[5]Metropolitan statistical areas (MSA) must contain an urbanized area of 50,000 or more population.

Based on population information in Section 2.0, the first line of the table applies to the St. Louis and Kansas City MSAs, and the third line applies to the Springfield, Joplin, Columbia, Jefferson City, St. Joseph, and Cape Girardeau MSAs. The Fayetteville-Springdale-Rogers area includes only one county in Missouri and no urban areas larger than 50,000 in Missouri.

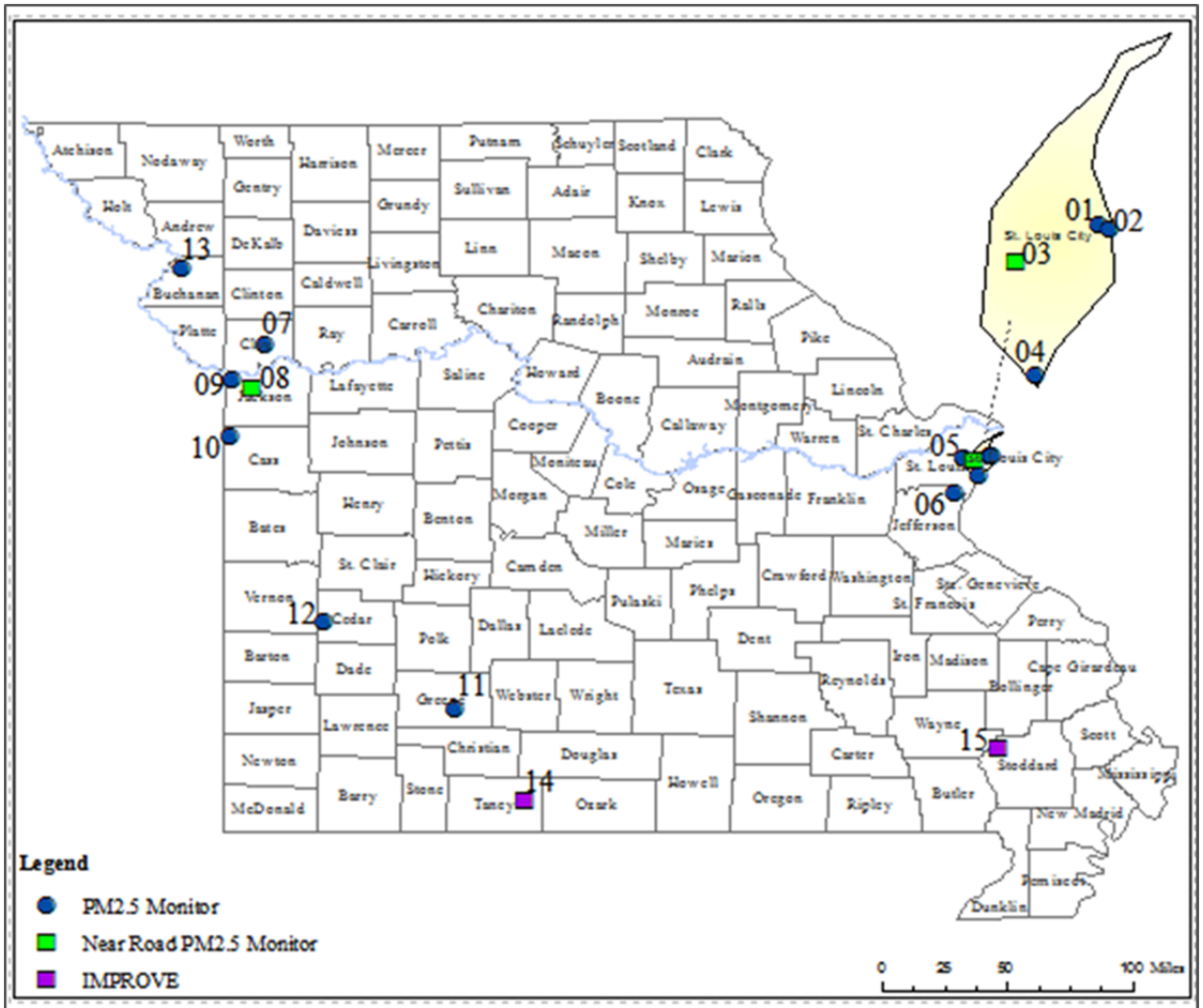
In addition to the minimum numbers of sites in each MSA, each state must monitor at one regional background site and one regional transport site. Continuous $PM_{2.5}$ monitors must be operated at a minimum of half of the required sites. At least one of the required FRM/FEM monitor in each MSA must be collocated, and at least 15 percent of the overall network must have collocated monitors. Near-roadway $PM_{2.5}$ monitoring is also required at one location in each urban area (a core-based statistical area, or CBSA) with a population of 1 million or more.

10.2 $PM_{2.5}$ Monitoring Results in Missouri

There are currently 15 sites that monitor $PM_{2.5}$ in Missouri (Figure 10-1), including 13 sites for NAAQS compliance determination and two IMPROVE samplers (at Hercules Glades and Mingo). Six of the NAAQS compliance sites are in the St. Louis area, and four are in the Kansas City area. One site is in the Springfield area and one in the St. Joseph area. One site is in a rural area. There are also two $PM_{2.5}$ speciation samplers at Blair Street and Arnold West.

10.2.1 $PM_{2.5}$ Design Values

$PM_{2.5}$ design values for the past five years in Missouri as determined according to the annual NAAQS are listed in Table 10-2 and shown in Figure 10-2. $PM_{2.5}$ design values determined according to the 24-hour NAAQS are listed in Table 10-3 and shown in Figure 10-3. Federal reference method (FRM) filter samplers and federal equivalent method (FEM) continuous monitors are listed separately. All Missouri monitors have met the annual standard beginning with the 2010-2012-period, even though Branch Street is designated as a middle scale site, not to be compared to the annual NAAQS. All Missouri monitors have also met the 24-hour standard for all of the periods under consideration.



Site#	SiteName
St. Louis Area	
01	Blair Street
02	Branch Street**
03	Forest Park
04	South Broadway
05	Ladue
06	Arnold West
Kansas City Area	
07	Liberty
08	Blue Ridge, I-70
09	Troost
10	Richard Gebaur-S

Site#	SiteName
Springfield Area	
11	Hillcest High Sch.
Outstate Area	
12	El Dorado Springs
13	St. Joseph Pump Station
14	Hercules Glades
15	Mingo

***Middle Scale; Not to be compared to the annual NAAQS*

MISSOURI DEPARTMENT OF NATURAL RESOURCES

Figure 10-1. 2015 Missouri $PM_{2.5}$ Monitoring Network

Table 10-2

$PM_{2.5}$ Annual Average Design Value, $\mu g/m^3$ (3-year average of annual averages)					
	2008-2010	**2009-2011**	**2010-2012**	**2011-2013**	**2012-2014**
Blair St. FRM	12.3	12.0	11.7	11.2	11.0
Blair St. FEM				11.3	10.7
Branch St. FRM	13.0	13.2			
Branch St. FEM				11.4	11.8
S Broadway FRM	12.2	12.2			
S Broadway FEM				10.0	10.0
Ladue FEM		11.0	10.9	10.9	10.9
Arnold W FEM			10.1	9.9	10.1
Forest Park FEM*					10.3
Liberty FEM			9.5	9.2	8.9
Troost FRM	11.4	10.8	10.5	10.2	10.1
Troost FEM			10.3	10.0	9.6
Richards Gebaur S FEM			11.5	11.1	11.1
MSU FRM	10.0	10.1			
MSU FEM				9.5	9.2
Eldorado Springs FEM			11.1	10.3	9.0
Saint Joseph FEM			11.1	10.8	10.9
*2 years only					

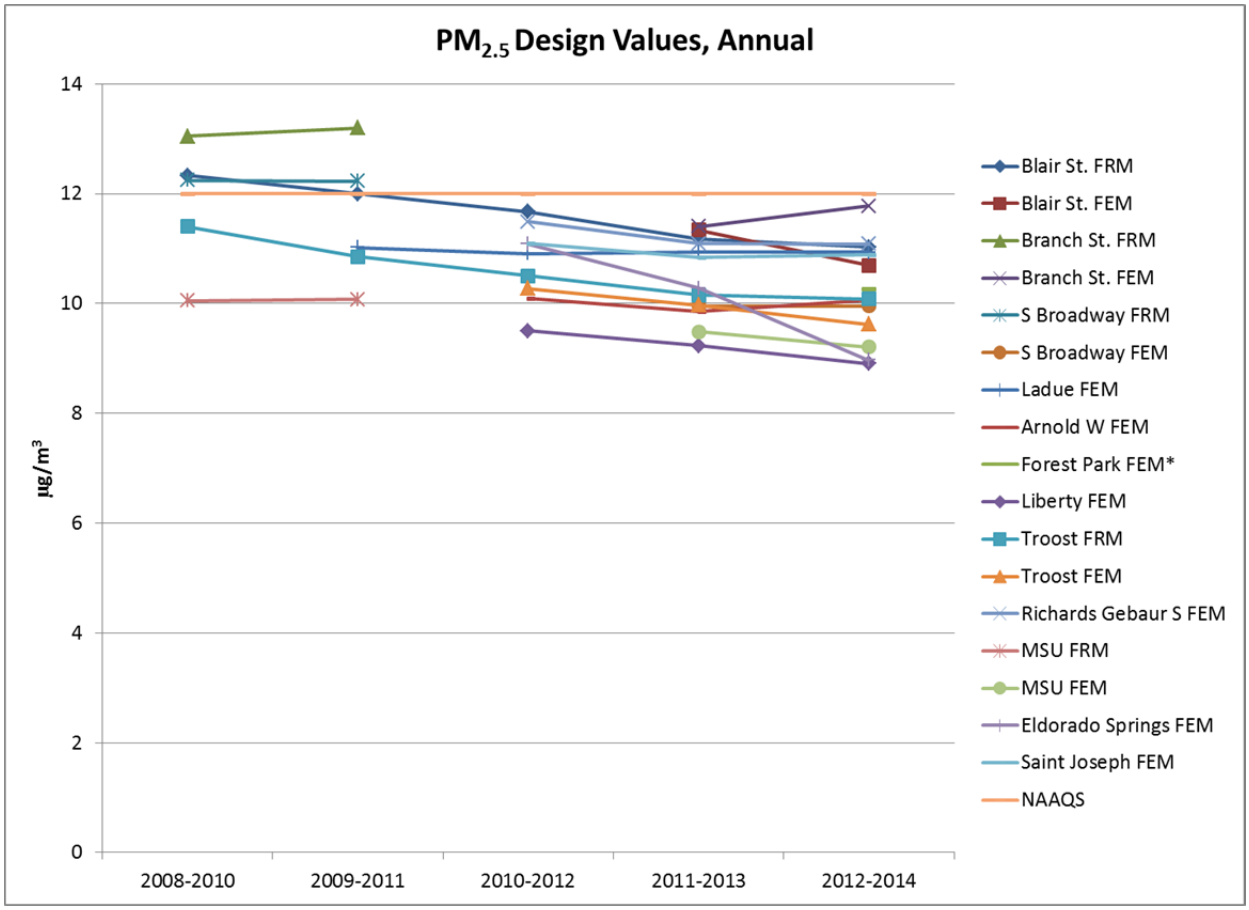

PM2.5 Design Values, Annual
14
12
10
8
6
4
2
0
µg/m³
2008-2010
2009-2011
2010-2012
2011-2013
2012-2014
Blair St. FRM
Blair St. FEM
Branch St. FRM
Branch St. FEM
S Broadway FRM
S Broadway FEM
Ladue FEM
Arnold W FEM
Forest Park FEM*
Liberty FEM
Troost FRM
Troost FEM
Richards Gebaur S FEM
MSU FRM
MSU FEM
Eldorado Springs FEM
Saint Joseph FEM
NAAQS

Figure 10-2

Table 10-3

$PM_{2.5}$ 24-hour Design Value, $\mu g/m^3$ (3-year average of annual 98th percentile 24-hour average)						
	2008-2010	**2009-2011**	**2010-2012**	**2011-2013**	**2012-2014**	
Blair St. FRM	27.5	26.0	25.6	24.4	24.9	
Blair St. FEM				24.9	23.7	
Branch St. FRM	25.7	27.2				
Branch St. FEM				25.6	26.4	
S Broadway FRM	25.9	26.3				
S Broadway FEM				22.9	22.8	
Ladue FEM		25.9	25.9	24.5	23.7	
Arnold W FEM			23.0	22.8	23.4	
Forest Park FEM*					24.8	
Liberty FEM			21.9	20.7	20.2	
Troost FRM	27.8	27.1	25.6	22.1	21.1	
Troost FEM			23.1	21.6	21.3	
Richards Gebaur S FEM			23.3	22.2	22.4	
MSU FRM	21.7	22.3				
MSU FEM				21.4	21.7	
Eldorado Springs FEM			23.1	21.6	19.4	
Saint Joseph FEM			23.9	23.1	24.2	
*2 years only						

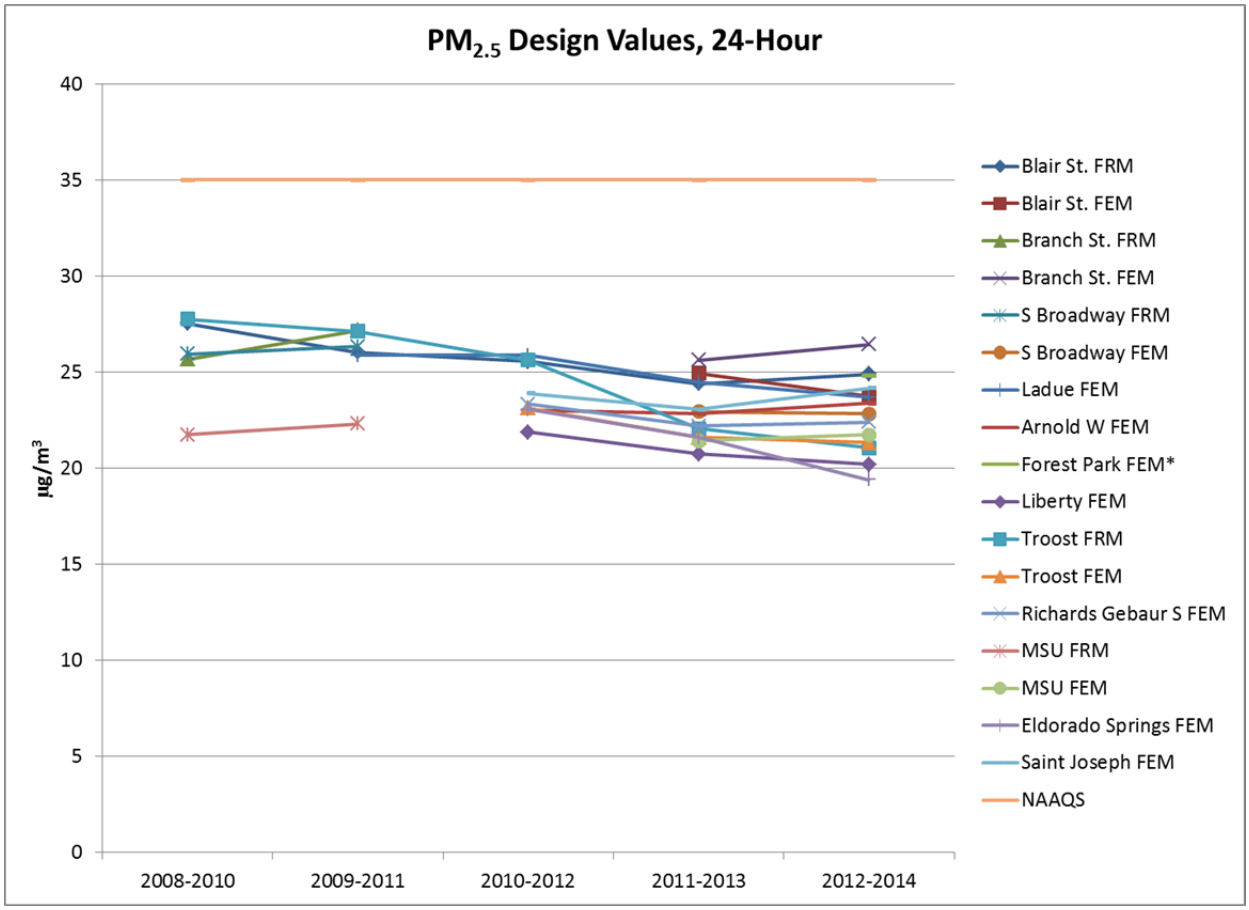


Figure 10-3

10.2.2 Application of Ambient Air Monitoring Assessment Tools

The ambient air monitoring assessment tools described in Section 9.2.2 were applied to the $PM_{2.5}$ network using data through 2013.

Correlation Matrices

As described in Section 9.2.2, circles would represent zero correlation and straight diagonal lines would represent perfect correlation. The color of each ellipse represents the average relative difference between two sites, and the number within each ellipse is the distance between the two sites in kilometers.

Figure 10-4 shows the correlation matrix for sites in the St. Louis area. The area shown in the figure was entered into the tool, but correlations were only shown for Missouri sites, not Illinois sites, because of past data quality issues with Illinois sites. Ladue and Forest Park each correlate well with most of the other sites, but the color in the ellipses indicates significant differences between each of these sites and other sites.

Figure 10-5 shows the correlation matrix for sites in the Kansas City area. Of the Missouri sites, Blue Ridge correlates well with Liberty and Troost, but the color in all of the ellipses indicates poor agreement between the average relative differences of any of the sites.

Removal Bias

As described in Section 9.2.2, blue indicates negative removal bias (the concentration would be underestimated if the site were removed), red indicates positive removal bias (the concentration would be overestimated if the site were removed), and the intensity of the color indicates the magnitude of the removal bias.

Figure 10-6 shows the removal bias for Missouri sites in the St. Louis area. The bias is highest (negative) at Ladue and Branch St. and (positive) at Forest Park. Arnold West and South Broadway have lower positive bias. Blair Street has the lowest bias.

Figure 10-7 shows the removal bias for Kansas City area sites. Of the Missouri sites, Richards Gebaur South and Troost show a high negative bias, and Blue Ridge I-70 shows a high positive bias. Liberty shows a lower positive bias.

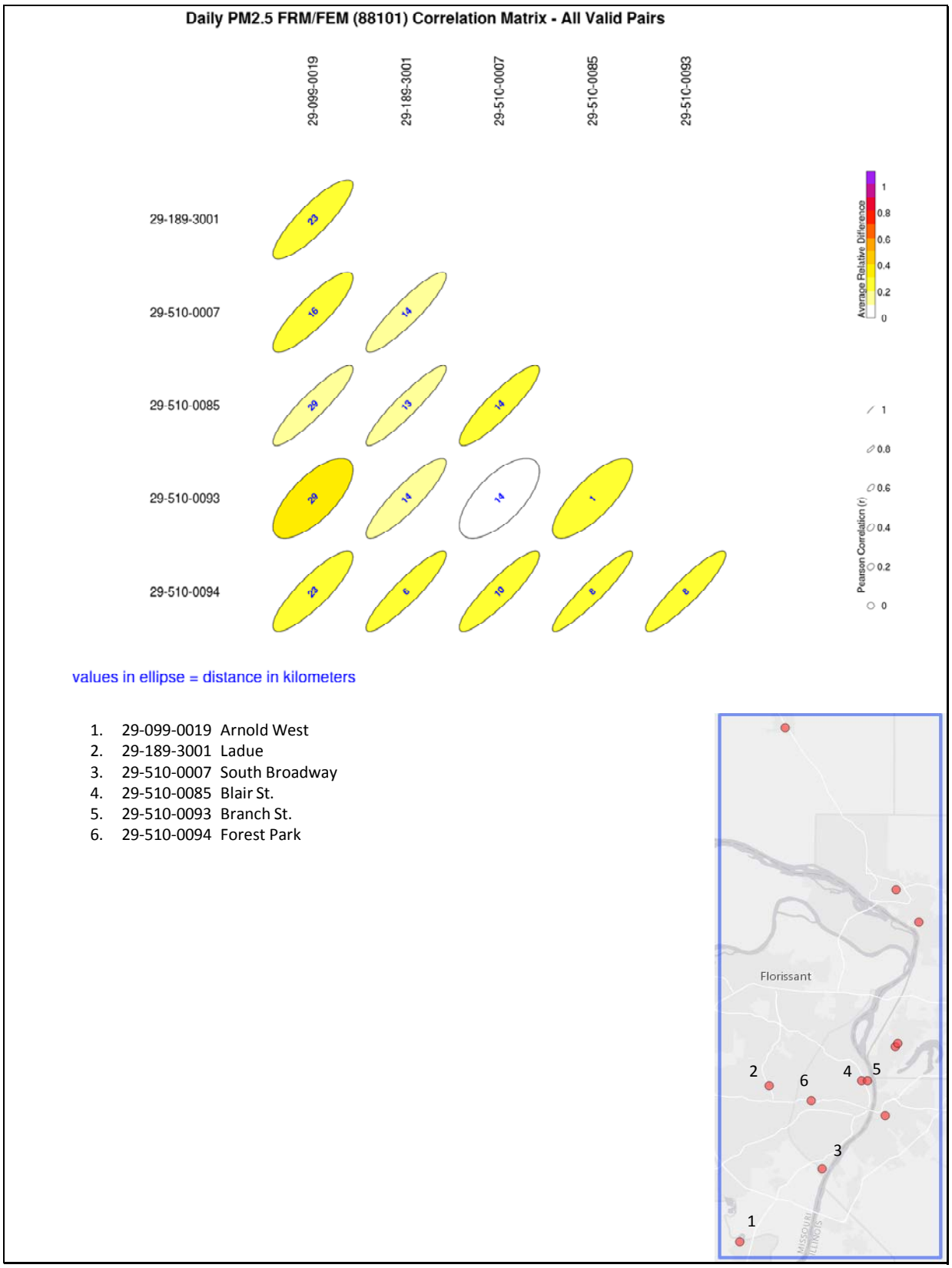


Figure 10-4. Correlation Matrix for St. Louis Area $PM_{2.5}$ Sites

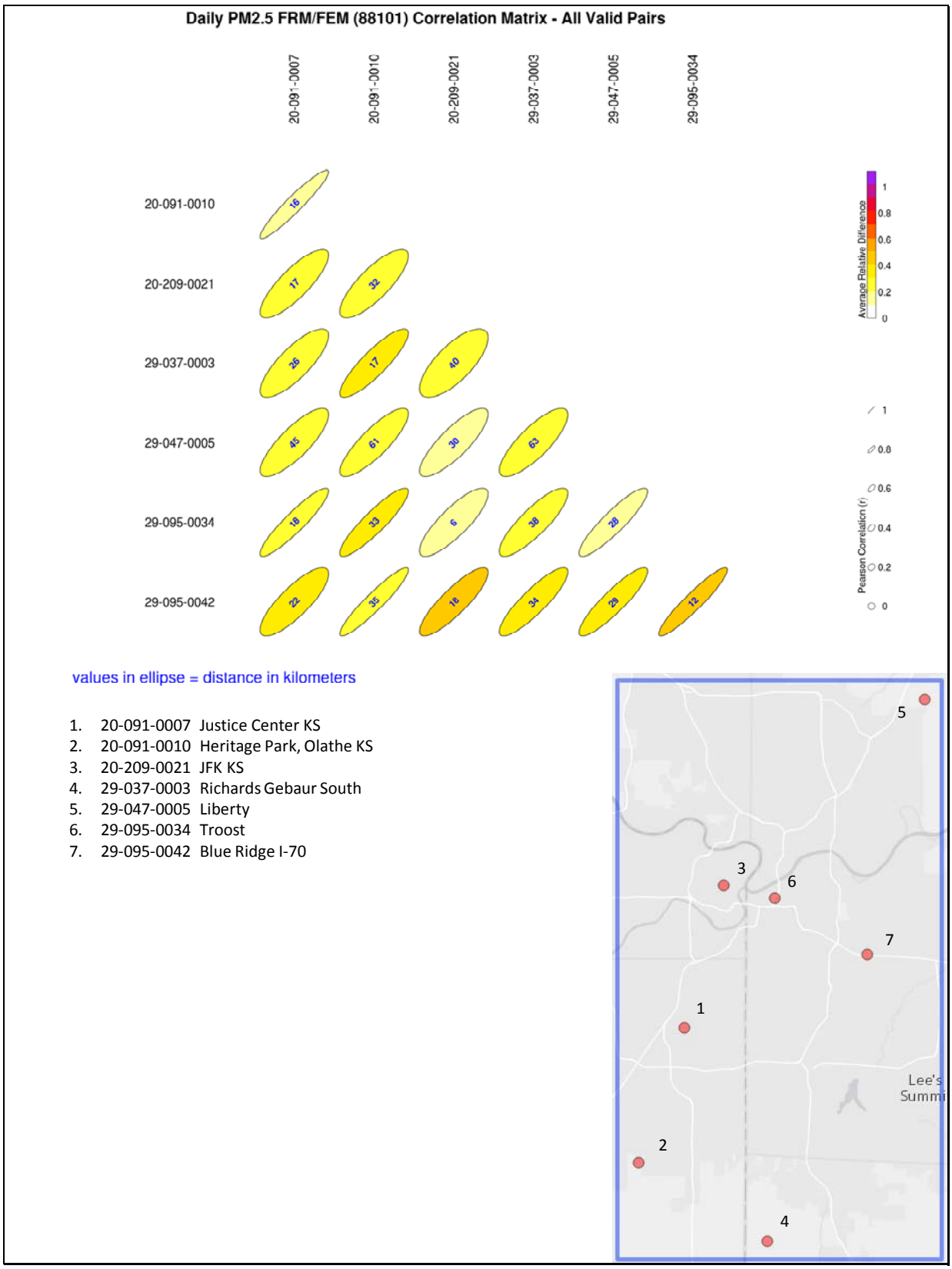


Figure 10-5. Correlation Matrix for Kansas City Area $PM_{2.5}$ Sites

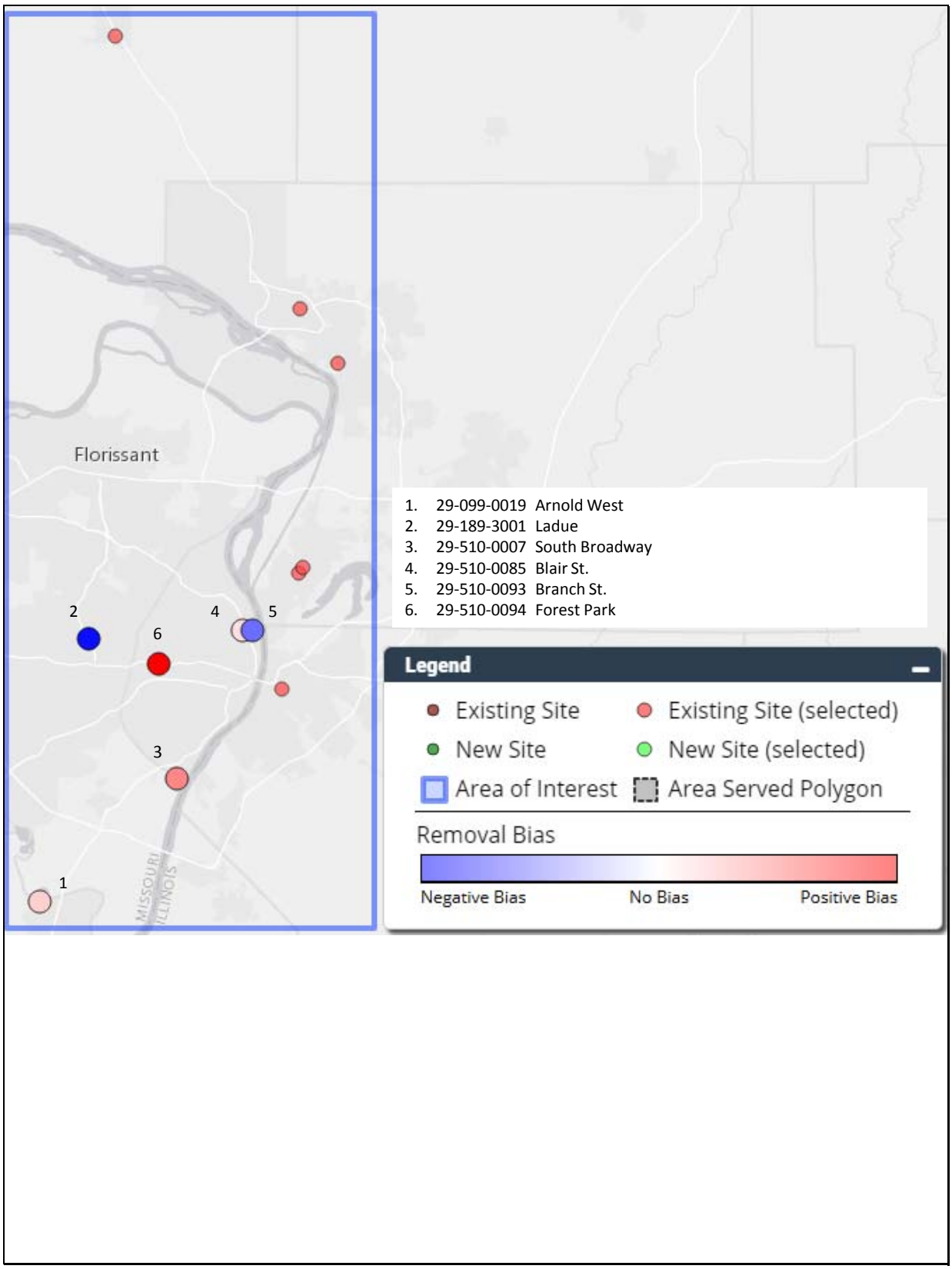


Figure 10-6. Removal Bias for St. Louis Area $PM_{2.5}$ Sites

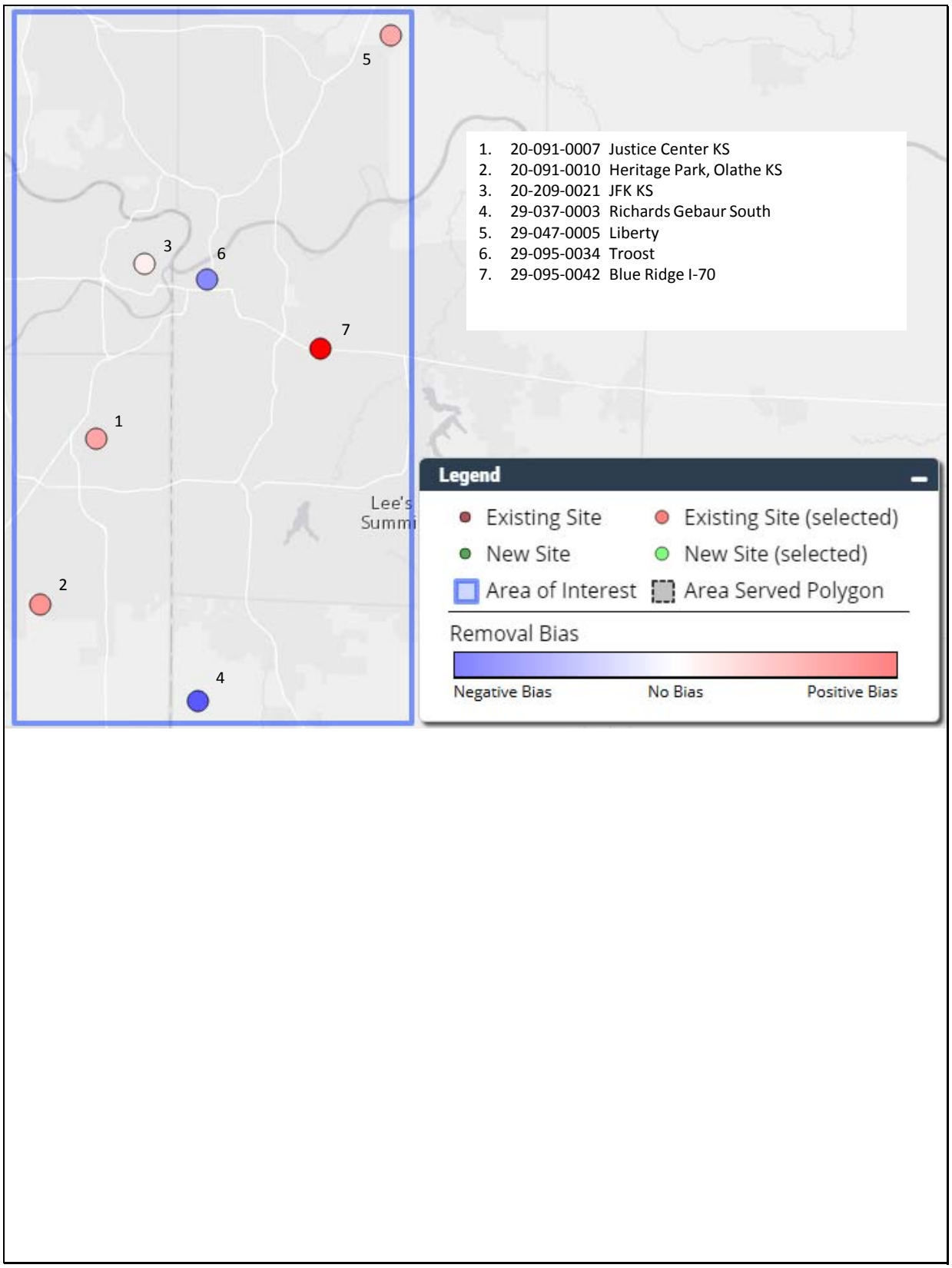


Figure 10-7. Removal Bias for Kansas City Area $PM_{2.5}$ Sites

10.3 $PM_{2.5}$ and Precursor Emissions

Fine particulate matter is chiefly composed of the effluent from combustion processes taking place in fossil fuel-fired power plants, transportation, industry, agriculture, construction, waste disposal, and other sectors. In addition to the primary $PM_{2.5}$ directly emitted from these processes, the majority of airborne $PM_{2.5}$ is secondary, formed downstream from emission points by the condensation of sulfur and nitrogen oxides (SO_X and NO_X), volatile organic compounds (VOC), and ammonia (NH_3) emitted by these same processes. The same sources that emit $PM_{2.5}$ and its precursors are largely responsible for emissions of the VOC and NO_X that cause the formation of ozone as well. Therefore, in addition to direct $PM_{2.5}$ emission sources, sources of PM_{10}, SO_X, NO_X, VOC, and NH_3 also contribute to atmospheric $PM_{2.5}$.

$PM_{2.5}$ speciation results in the St. Louis area indicate that the species contributing most of the $PM_{2.5}$ mass are ammonium sulfate, ammonium nitrate, and carbonaceous material (organic compounds and elemental carbon). The sulfate contribution is highest in the summer, and the nitrate contribution is highest in the winter. Analysis of speciation results on summer days with high mass concentration shows that the excess over average summer days is dominated by ammonium sulfate, which is widespread in the region. The combined effect of the regional and urban emissions in the area is to create levels of $PM_{2.5}$ during high pollution events that, in St. Louis, Missouri, are primarily due to either regional sources of sulfate and/or urban-wide/regional sources of nitrate.

Comparison of $PM_{2.5}$ mass and speciation measurement results for the St. Louis area to results for rural areas shows an urban excess of 4 to 6 $\mu g/m^3$, which (on an annual basis) is predominantly carbonaceous material (organic compounds and elemental carbon) and nitrate. Differences in these species (carbonaceous material and nitrate) also appear between urban core and suburban sites in the St. Louis area. Sulfate, on the other hand, appears to be more regional, with sulfate concentrations being higher in eastern Missouri and lower in western Missouri, likely because of the relative proximity to coal combustion sources in the general area along the Ohio River.

Airborne $PM_{2.5}$ in the St. Louis, Missouri area is dominated by the impact of regional or urban-scale influences and by the contribution of secondary sources, and large SO_X and NO_X sources generally have tall stacks that reduce their near-source impact. However, it is still worthwhile to consider the location of emission sources, in order to help ascertain that source influences are not being either overlooked or overemphasized because of the location of monitoring stations. Figure 10-8 shows the locations of primary $PM_{2.5}$ point sources, which are somewhat concentrated in the Kansas City and St. Louis areas. The locations of SO_2, NO_X, and VOC sources are shown in other sections of this assessment. Figure 10-9 shows the locations of $PM_{2.5}$ area sources by county, concentrated in the more populated areas of the state. Figure 10-10 shows the locations of ammonia sources by county, concentrated in areas with agricultural activities.

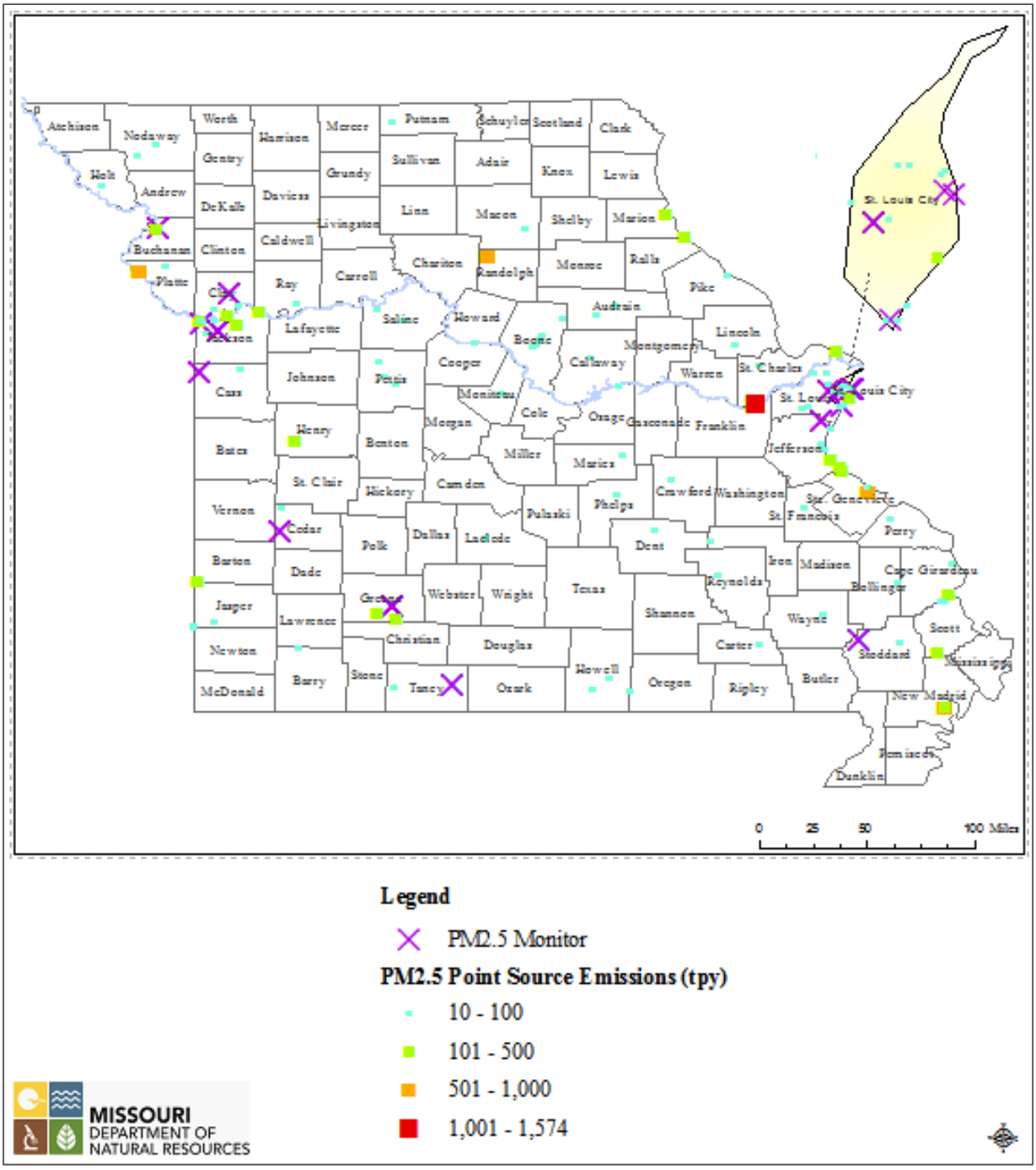


Figure 10-8. Statewide $PM_{2.5}$ Point Source Emissions and the 2015 $PM_{2.5}$ Monitoring Network

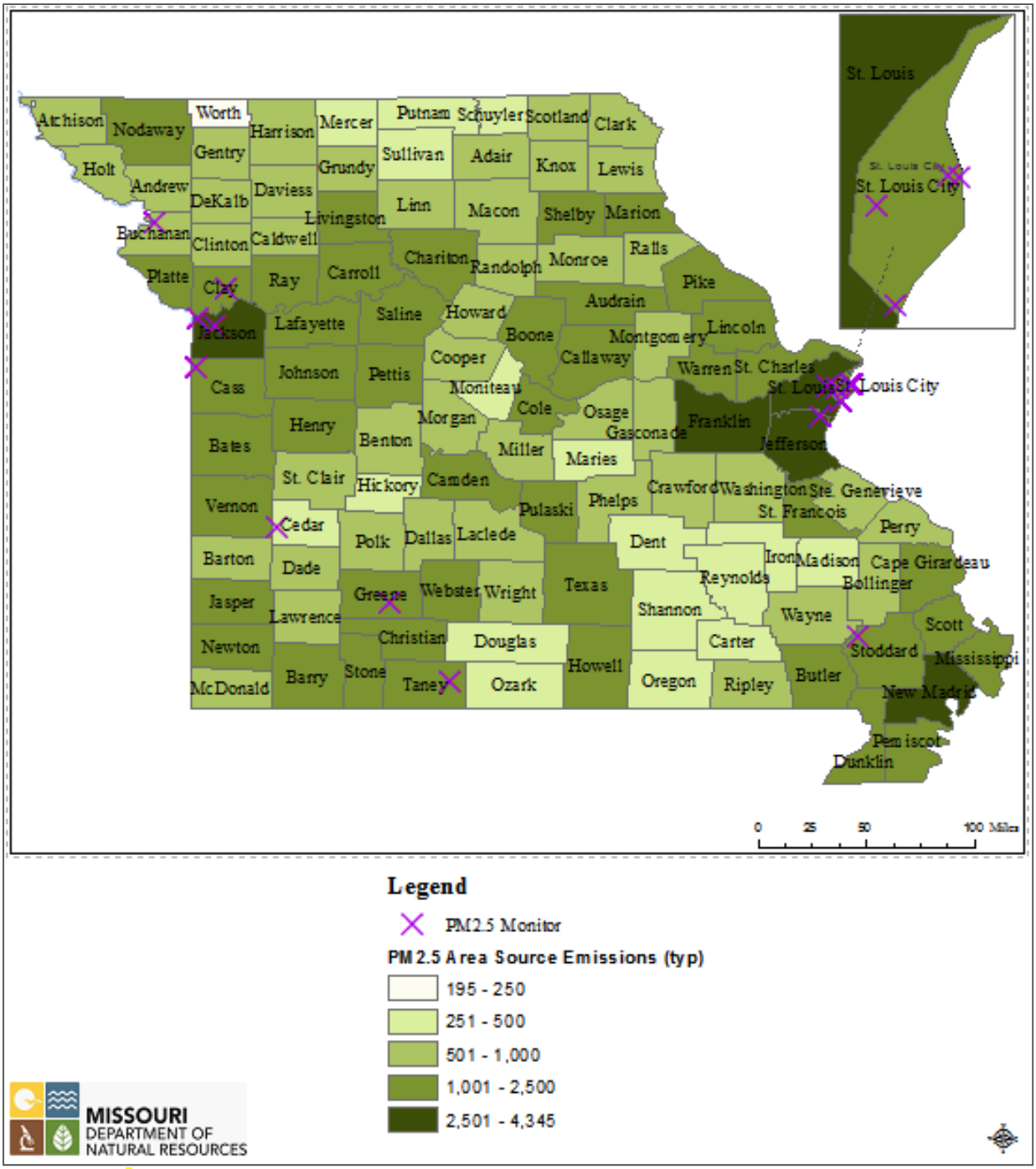


Figure 10-9. Statewide $PM_{2.5}$ Area Source Emissions and the 2015 $PM_{2.5}$ Monitoring Network

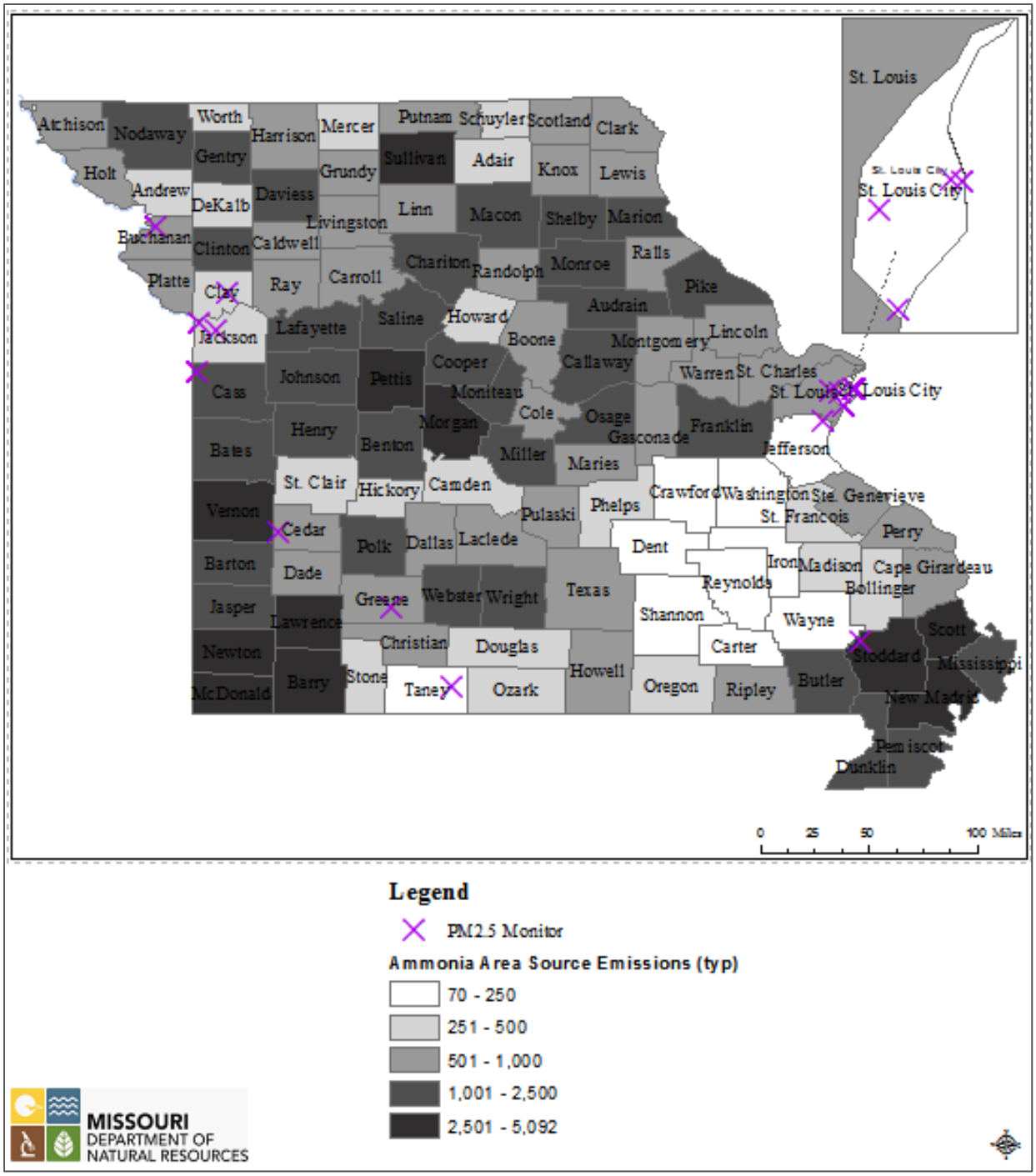


Figure 10-10. Statewide Ammonia Area Source Emissions and the 2015 $PM_{2.5}$ Monitoring Network

10.4 Evaluation of the $PM_{2.5}$ Monitoring Network

All of the 24-hour $PM_{2.5}$ design values are less than 85 percent (29.75 µg/m^3) of the standard. For the annual standard, the highest applicable St. Louis area design value is 11.0 µg/m^3, and the highest Kansas City area design value is 11.1 µg/m^3. Therefore, based on Table 10-1, a minimum of three $PM_{2.5}$ sites is required in each of these areas.

The annual design value at the MSU site in Springfield is less than 85 percent of the standard, so no sites are required based on Table 10-1. The annual design value at the St. Joseph site is greater than 85 percent of the standard, so one site is required based on Table 10-1.

Table 10-4 summarizes the required numbers of $PM_{2.5}$ monitoring sites based on Table 10-1 and the current numbers of sites. The required minimum numbers of sites are met or exceeded in each MSA.

Table 10-4. Required and Current Numbers of $PM_{2.5}$ Monitoring Sites in Missouri

MSA	Required Minimum Number of $PM_{2.5}$ Monitoring Sites	Current Number of $PM_{2.5}$ Monitoring Sites in MSA within Missouri
St. Louis	3	6
Kansas City	3	4
Springfield	0	1
Joplin	0	0
Columbia	0	0
Jefferson City	0	0
St. Joseph	1	1
Cape Girardeau	0	0
(not in a MSA)	0	1

Continuous $PM_{2.5}$ monitors must be operated at a minimum of half of these required sites (40 **CFR** Part 58, Appendix D). Continuous monitors are now being operated at all of the sites, and collocated FRM and FEM instruments are being operated in one site each in the St. Louis and Kansas City areas. Collocated FEM instruments are being operated at the St. Joseph site. Three collocated instruments at 13 sites meet the requirement for 15 percent collocation.

In addition to the minimum numbers of sites in each MSA, each state must monitor at one regional background site and one regional transport site. El Dorado Springs is a regional background site in southwestern Missouri. The Liberty site, generally downwind of Kansas City and the Alton IL site, generally downwind of St. Louis, provide regional transport information.

In addition to sites identified above, $PM_{2.5}$ speciation samplers are located at Blair Street in St. Louis and Arnold West, a suburban site south of St. Louis. An IMPROVE protocol sampler is located at El Dorado Springs, and IMPROVE samplers (operated by other agencies) are located at Mingo National Wildlife Refuge and Hercules Glades Wilderness.

In the St. Louis area, the Blair Street site is **critical**, in part because of its designation as an NCore site, and because of its location near the urban center and several large industrial sources. The Branch St. site is near the Blair Street site, but is located in a significant PM emission source area, so is also **critical**. The South Broadway and Ladue sites are fairly well correlated, but are 13 kilometers apart. The South Broadway site generally shows higher $PM_{2.5}$ concentration than Ladue, and is also more generally upwind of the central St. Louis area. Also, the Ladue site has a high negative removal bias. Therefore, the South Broadway and Ladue sites are both judged as **critical**. The Arnold West site is an important suburban site, generally downwind of the nearby Ameren UE Meramec plant and generally upwind of the central St. Louis area and also provides important speciation data so is judged to be **critical**. The Forest Park site is **critical** because $PM_{2.5}$ monitoring collocated with near-road NO_2 monitoring is required at a minimum of one site in an MSA with a population of one million or larger.

In the Kansas City area, the Troost site is **critical**, because it is the only $PM_{2.5}$ site near the center of the Kansas City metropolitan area. The Liberty site is **critical** because it is the only $PM_{2.5}$ site generally downwind of the Kansas City area. The Richards Gebaur South site is judged to be **critical**, because it provides important upwind background data for the Kansas City area and because it is also the maximum design value site for the area. The Blue Ridge I-70 site is a required near roadway site in the Kansas City CBSA with a population of one million or larger and is therefore **critical**.

The Hillcrest High School site (relocated from MSU) site is the only $PM_{2.5}$ site in the Springfield area and is therefore judged to be **critical**.

In the remainder of the state, the El Dorado Springs site is considered to be **critical**, because it provides important rural, regional background data for the Kansas City area. The IMPROVE protocol sampling at El Dorado Springs may be discontinued based on a national review of IMPROVE protocol sites, but at a minimum $PM_{2.5}$ measurement at this site should continue. The St. Joseph site is **critical**, because there is a requirement for at least one site in the St. Joseph area, as discussed above.

11.0 LEAD NETWORK ASSESSMENT

11.1 Introduction: Lead Standards and Monitoring Requirements

The level of the primary and secondary NAAQS for airborne lead is 0.15 $\mu g/m^3$, measured as total suspended particulate matter (TSP). The form of the standard is the rolling three-month average of monthly averages. The rolling three-month average considers each of the 12 three-month periods associated with a given year, not just the four calendar quarters within that year. Attainment of the standard is evaluated over a 3-year period.

At a minimum, monitors must be placed in areas potentially impacted by sources of lead emissions greater than or equal to one-half ton per year. EPA Regional Administrators may waive the source-oriented monitoring requirements if the monitoring agency can demonstrate that emissions from the source will not contribute to maximum air lead concentrations greater than 50 percent of the standard.

Lead monitoring is also required at NCore sites in urban areas with a population of 500,000 or more. Lead monitoring at NCore sites may be either TSP or PM_{10} (40 **CFR** Part 58, Appendix D).

11.2 Lead Monitoring Results in Missouri

The lead monitoring network in Missouri is shown in Figure 11-1. There are 14 state-operated monitoring sites in Missouri: six in the Herculaneum area, one in the old lead belt area, five in the new lead belt area, one near a facility in northwest Missouri, and one in St. Louis. All of these sites except the Blair St. site in St. Louis are located near identified or potential lead sources related to current or past lead mining, processing, and/or remediation activities. As indicated in the figure, there are also several sites operated by the Doe Run Company in the Herculaneum and new lead belt areas.

Table 11-1 lists maximum three-month rolling average lead concentrations for recent years. Figure 11-2 shows time series graphs of these same concentrations. As may be seen in the table and in the figure, the maxima are decreasing because of changes in facilities and/or facility operations.

Table 11-2 lists design values (maximum three-month rolling average concentrations during a three-year period) for the state-operated sites derived from the maximum annual three-month rolling averages listed in Table 11-1. The standard applies over a three-year period. Therefore, many of the concentrations listed in the table repeat because of the overlap of the three-year periods. As noted above and discussed in more detail below, annual maxima are decreasing, and design values are expected to decrease to levels below the level of the standard in the next few years.

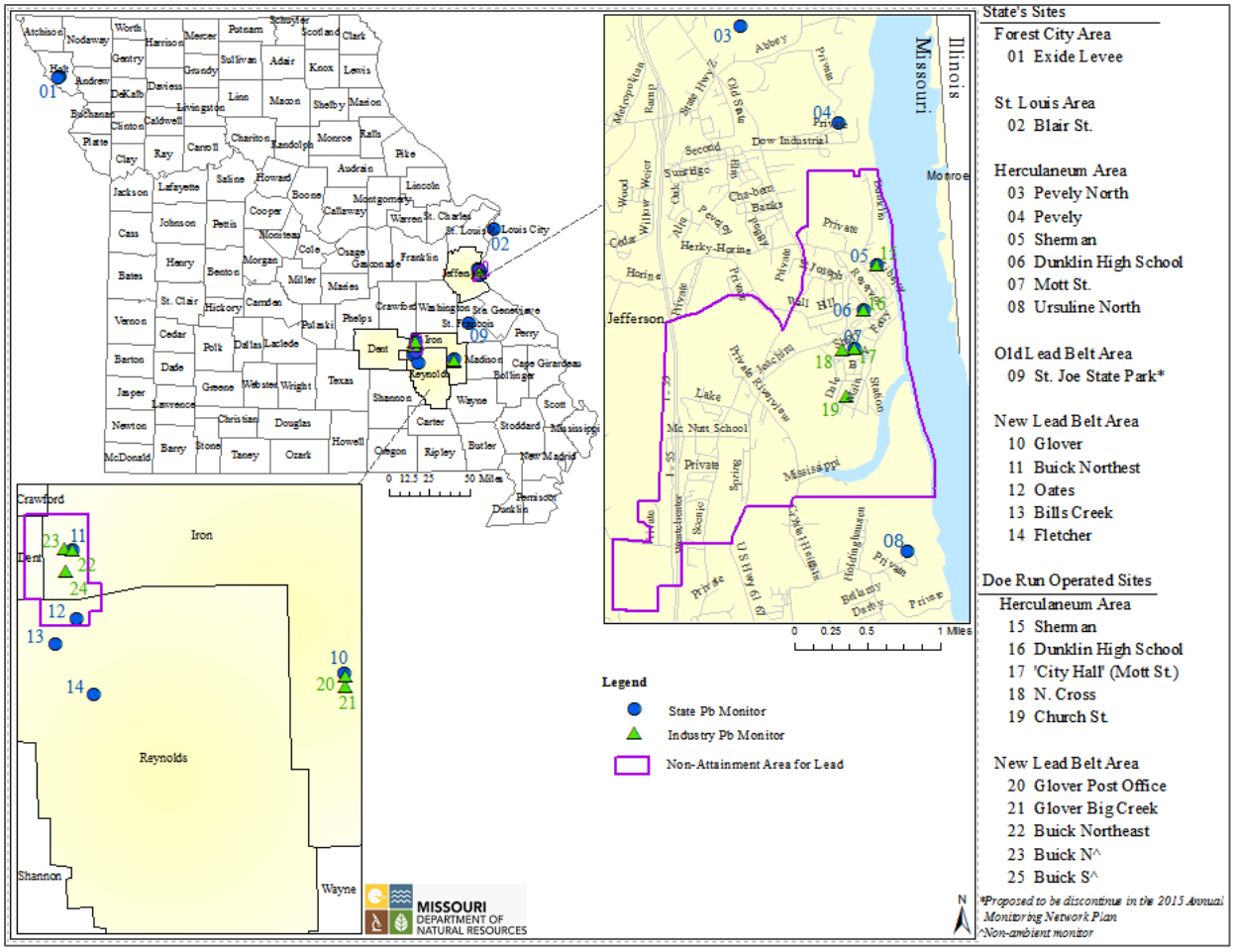


Figure 11-1. 2015 Missouri Lead Monitoring Network

Table 11-1

Lead Annual Maximum Three-month Average of Monthly Averages, μg/m^3

3-month averages tabulated by ending month. E.g., Nov 2010-Jan 2011 listed under 2011, etc.

	2010	2011	2012	2013	2014
Pevely North	0.072	0.038	0.080	0.062	0.032
Pevely	0.067	0.053	0.192	0.070	0.038
Sherman (Herculaneum)	0.198	0.170	0.305	0.237	0.131
Dunklin High School (Herculaneum)	0.332	0.396	0.292	0.306	0.141
Main St. (Herculaneum)	1.122	1.034			
Mott St. (Herculaneum)		0.571	0.592	0.578	0.316
Ursuline North	0.085	0.050	0.086	0.075	0.050
Park Hills	0.054	0.132	0.041	0.027	0.019
St. Joe State Park	0.041	0.141	0.134	0.080	0.053
Glover	0.053	0.057	0.034	0.260	0.082
Bixby West	0.557				
Buick NE		0.402	0.371	0.355	0.261
Oates	0.090	0.093	0.161	0.092	0.042
Bills Creek	0.047	0.059	0.045	0.046	0.026
Fletcher	0.042	0.068	0.045	0.029	0.034
Corridon	0.100	0.029			
Webb City	0.017	0.019			
Forest City Exide Levee PM_{10}			0.675	0.522	
Forest City Exide Levee TSP			0.994	0.726	0.151
Blair St. TSP			0.029	0.027	0.020

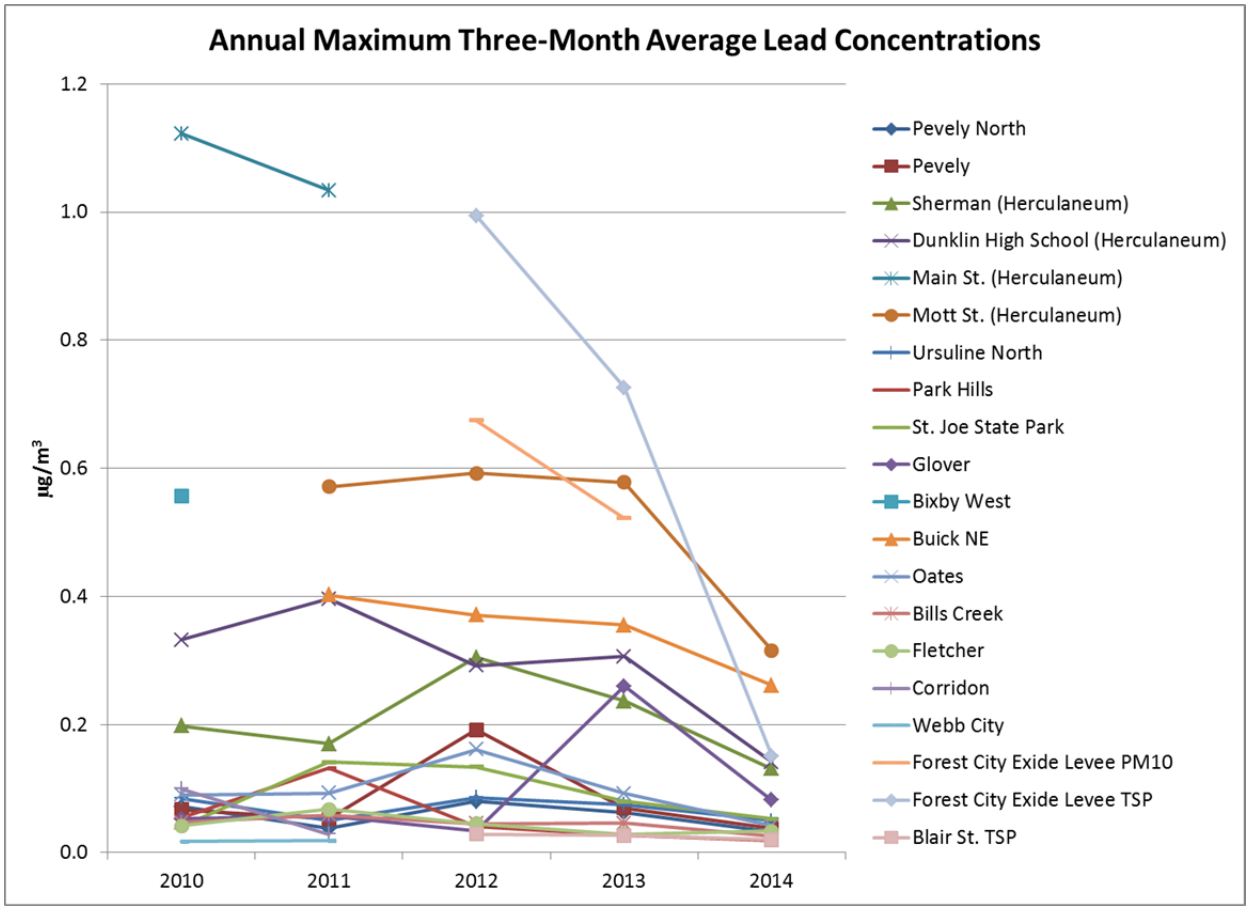

Annual Maximum Three-Month Average Lead Concentrations
µg/m³
1.2
1.0
0.8
0.6
0.4
0.2
0.0
2010
2011
2012
2013
2014
Pevely North
Pevely
Sherman (Herculaneum)
Dunklin High School (Herculaneum)
Main St. (Herculaneum)
Mott St. (Herculaneum)
Ursuline North
Park Hills
St. Joe State Park
Glover
Bixby West
Buick NE
Oates
Bills Creek
Fletcher
Corridon
Webb City
Forest City Exide Levee PM10
Forest City Exide Levee TSP
Blair St. TSP

Figure 11-2

Table 11-2

Lead Design Values (maximum three-month average of monthly averages), µg/m^3

Design values are tabulated beginning with the 2010-2012 period, because the network was changed significantly starting in 2010 due to the more stringent standard and accompanying monitoring requirements.

Yellow highlight indicates design values that exceed the standard.
3-month averages tabulated by ending month. E.g., Nov 2010-Jan 2011 listed under 2011, etc.

	2010-2012	2011-2013	2012-2014
Pevely North	0.080	0.080	0.080
Pevely	0.192	0.192	0.192
Sherman (Herculaneum)	0.305	0.305	0.305
Dunklin High School (Herculaneum)	0.396	0.396	0.306
Main St. (Herculaneum)	1.122		
Mott St. (Herculaneum)	0.592	0.592	0.592
Ursuline North	0.086	0.086	0.086
Park Hills	0.132	0.132	0.041
St. Joe State Park	0.141	0.141	0.134
Glover	0.057	0.260	0.260
Bixby West	0.557		
Buick NE	0.402	0.402	0.371
Oates	0.161	0.161	0.161
Bills Creek	0.059	0.059	0.046
Fletcher	0.068	0.068	0.045
Corridon	0.100		
Webb City	0.019		
Forest City Exide Levee PM_{10}		0.675	0.675
Forest City Exide Levee TSP		0.994	0.994
Blair St. TSP		0.029	0.029

11.3 Lead Emissions

Figure 11-3 shows point sources of lead emissions, including the Herculaneum smelter, the Buick secondary smelter, the Exide secondary smelter, and the Buick, Fletcher, and Brushy Creek mines and/or mills. Total emissions in 2013 from these facilities were 158 tons. Primary smelting at Herculaneum was discontinued at the end of 2013. Emission control equipment has been installed at the Buick and Exide secondary smelters. Therefore point source emissions from these facilities are greatly reduced; these reductions will be reflected in future inventories. Figure 11-3 also shows area emissions in Iron and Reynolds Counties, possibly from transportation related to mining operations or from tailings areas near mining operations.

Other potential lead sources include electric generating stations. Department staff has obtained waivers from lead monitoring requirements at these facilities on the basis of modeling analysis indicating that ground level airborne lead concentrations near these facilities do not exceed the level of the standard. As stated in the 2015 Monitoring Network Plan, department staff reviewed the 2011 National Emissions Inventory (NEI) and did not identify any additional lead sources emitting greater than 0.50 tons of lead per year for which ambient air monitoring is not currently being conducted or where EPA has not already granted a modeling waiver consistent with 40 **CFR**, Part 58 Appendix D. Department staff will review the 2014 NEI lead data, re-evaluate electric generating stations (and request waivers if appropriate), and evaluate any newly identified sources as part of the 2016 Monitoring Network Plan in order to identify any additional necessary lead monitoring locations.

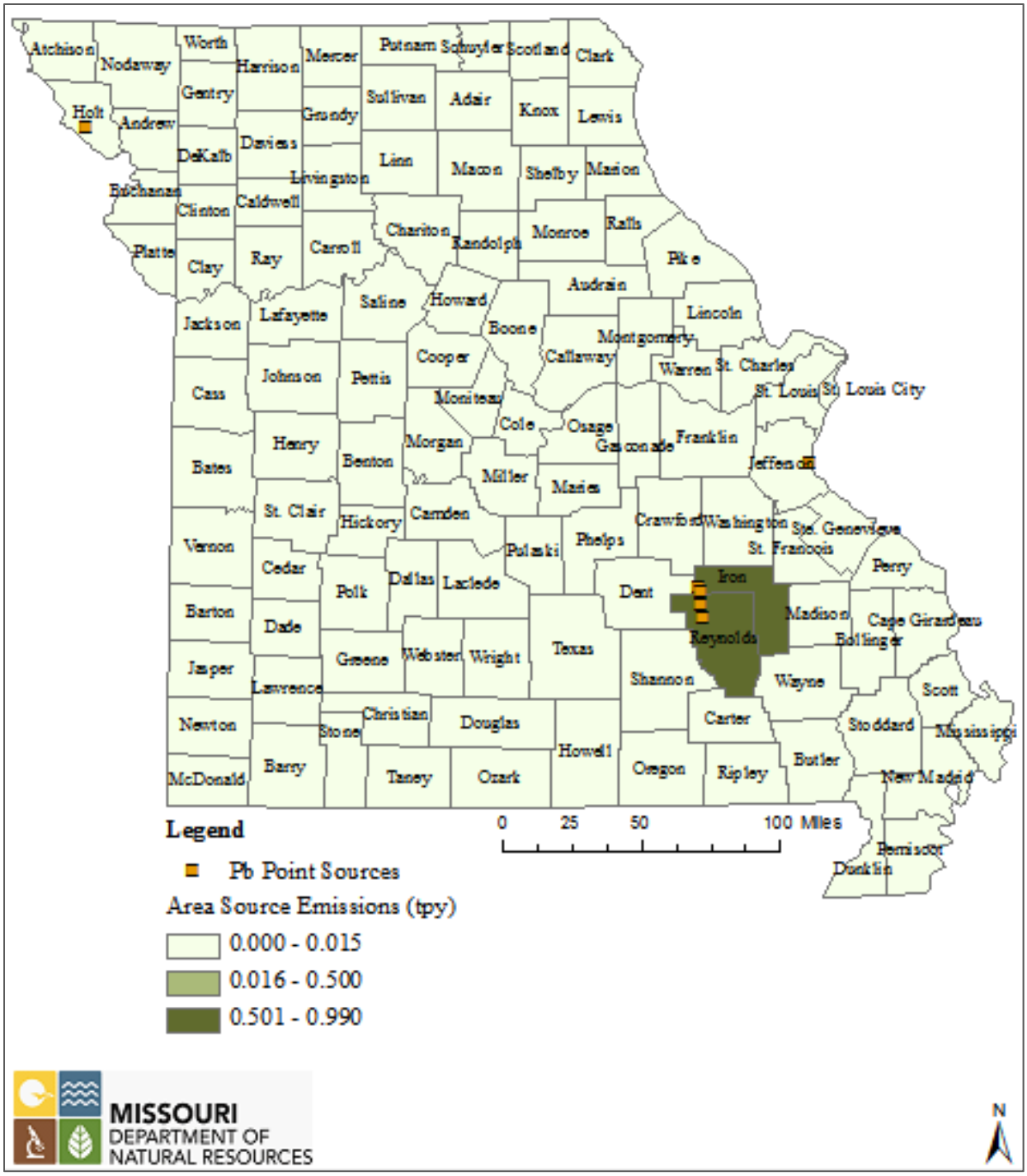


Figure 11-3. 2013 Point Source Lead Emissions and 2011 Area Source Emissions

11.4 Evaluation of the Lead Monitoring Network

Operation of the primary smelter at Herculaneum was discontinued at the end of 2013. However, some operations continue at the Herculaneum facility, and there may be considerable lead remaining within the facilities and/or in waste areas, etc. Also, monitoring must show no exceedance of the standard for at least three years to determine that an area is in attainment. Therefore, most of the six monitoring sites in the Herculaneum area (Pevely, Sherman, Dunklin High School, Mott St., and the background site at Ursuline North) are considered to be **critical**. The Herculaneum area network will be re-evaluated in future monitoring plans and network assessments, so that its makeup may change in the future, but it should be continued in essentially its present configuration at least into 2017 because of the three-year nature of the standard. The Pevely North site is outside of the Herculaneum nonattainment area and has never exceeded the standard. Therefore, it is considered to be **credible**.

The old lead belt area has multiple areas containing waste (tailings and chat) from past lead mining operations. Remediation activities in the Park Hills area are complete, and the Park Hills site has been discontinued. Remediation activities in St. Joe State Park are complete, and monitoring at that location will be discontinued pending approval of the 2015 Monitoring Network Plan.

The Glover smelter is no longer operational. The relatively high lead concentrations measured at Glover in 2013 resulted from demolition activities at the facility that disturbed old deposits of lead-containing dust. Because of the three-year nature of the standard, the Glover monitor will remain **critical** at least through 2016. It can then be re-evaluated depending on monitoring results and on plans for future activities at the facility.

Buick and Exide are both secondary smelters. Both facilities have been, or are being modified to include additional emission controls and may show attainment of the standard in the future. However, the monitors near these facilities are **critical** for the next few years, after which they can be re-evaluated depending on future monitoring results.

The monitors in the vicinity of operating lead mines and mills (Oates, Bills Creek, and Fletcher) have not shown exceedance of the standard, except for Oates, where the exceedance likely resulted from the Buick secondary smelter, not from the Buick mine or mill. However, these sites remain **critical** because of the level of reported lead emissions from these facilities. These monitors can be re-evaluated in the future depending on monitoring results and on reported emissions.

Lead monitoring in some form at Blair St. must continue, and is **critical**, because it is an NCore site in an urban area with more than 500,000 population. However, because the standard has never been exceeded there, it is planned to discontinue TSP lead monitoring and continue PM_{10} lead monitoring, which is being done using a Federal Equivalent Method (FEM) as a part of the NATTS program. In addition, EPA is proposing to remove the requirement for urban NCore site to measure lead in the revisions to Ambient Monitoring Quality Assurance and Other Requirements.

APPENDIX A: WINDROSES

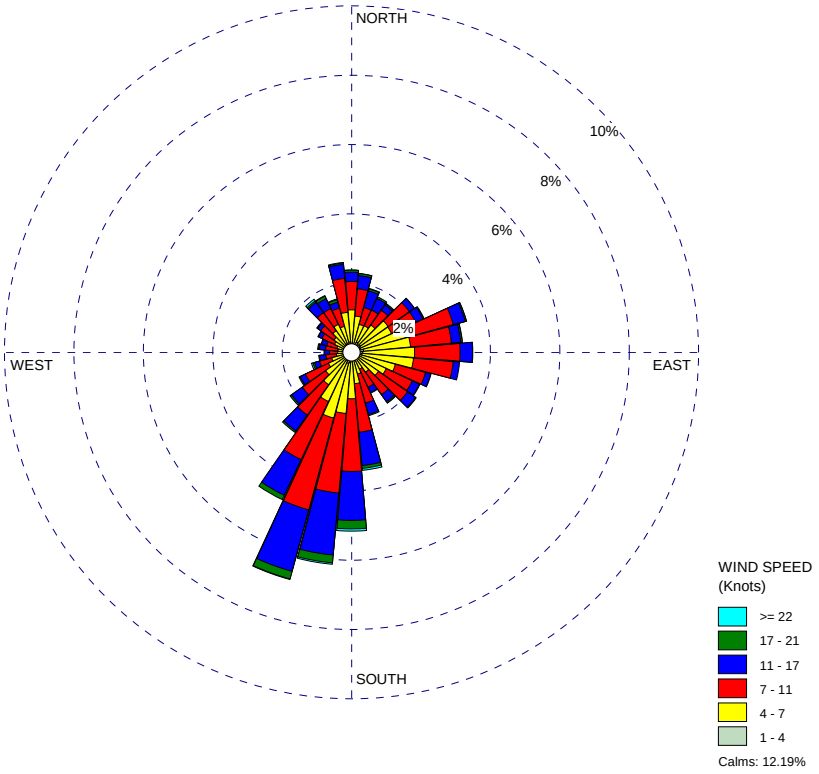
Wind roses based on data from major airports were selected to represent regions in Missouri. The selected airport representing the West was Wheeler Airport near downtown Kansas City (KMKC). For the South, the Springfield Airport (KSGF) was selected, and Lambert-St. Louis International Airport (KSTL) was selected for the East. Airport sites report official weather observations for the National Weather Service, and data are archived at the National Climatic Data Center for easy access.

WIND ROSE PLOT:

Kansas City Spring Combined 2009-2013

DISPLAY:

Wind Speed
Direction (blowing from)



COMMENTS:

Mar. - May winds for 2009 -2013 combined.

MODELER:

CALM WINDS:

12.19%

AVG. WIND SPEED:

6.79 Knots

PROJECT NO.:

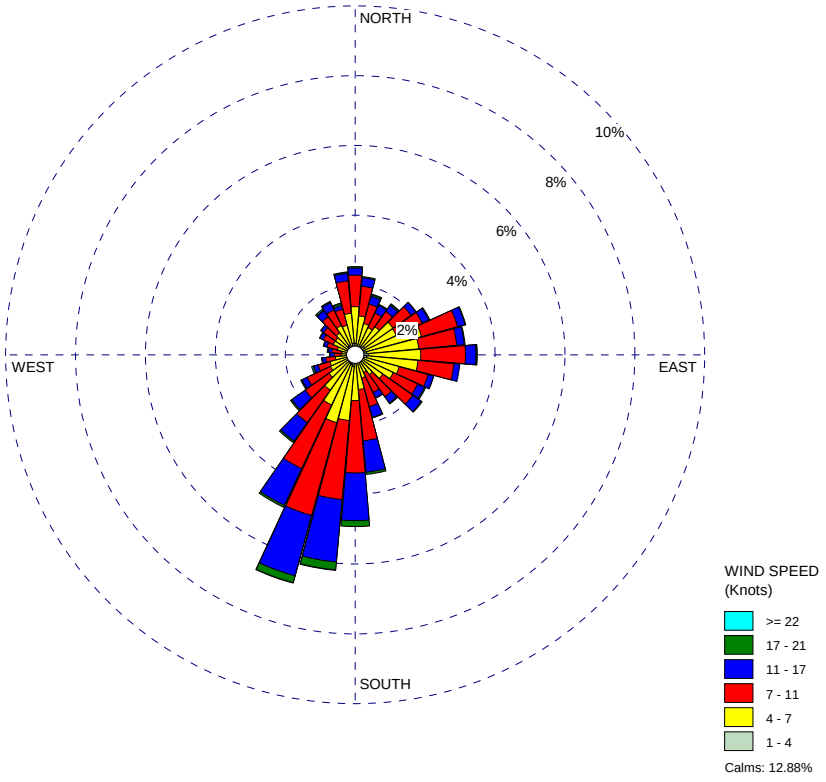
WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:

Kansas City Summer Combined 2009-2013

DISPLAY:

Wind Speed
Direction (blowing from)



COMMENTS:

Jun. - Jul. winds for 2009 -2013 combined.

MODELER:

CALM WINDS:

12.88%

AVG. WIND SPEED:

6.49 Knots

PROJECT NO.:

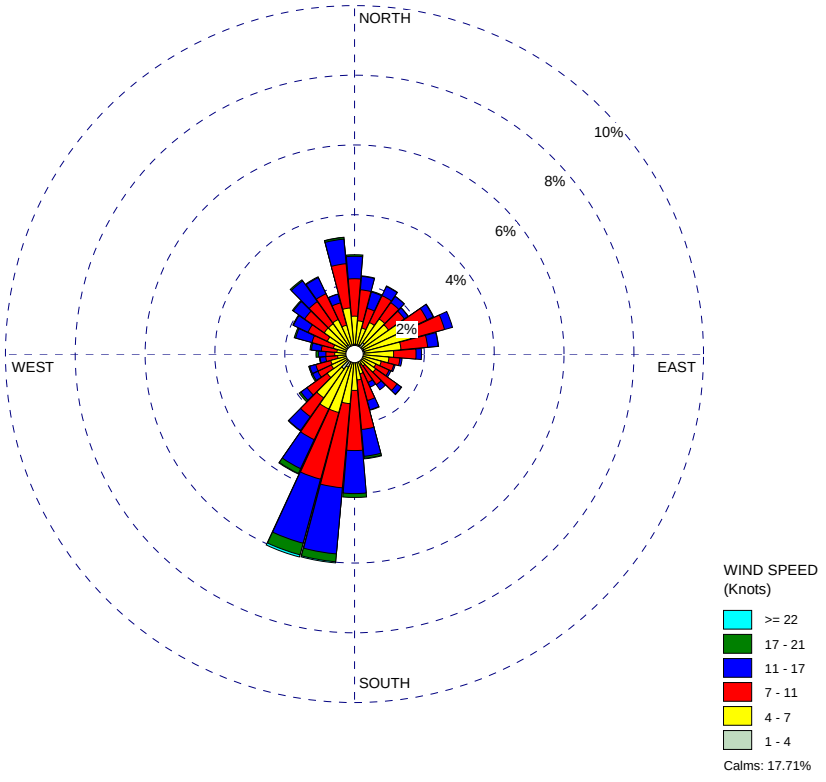
WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:

Kansas City Fall Combined 2009-2013

DISPLAY:

Wind Speed
Direction (blowing from)



COMMENTS:

Sep. - Nov. winds for 2009 -2013 combined.

MODELER:

CALM WINDS:

17.71%

AVG. WIND SPEED:

6.31 Knots

PROJECT NO.:

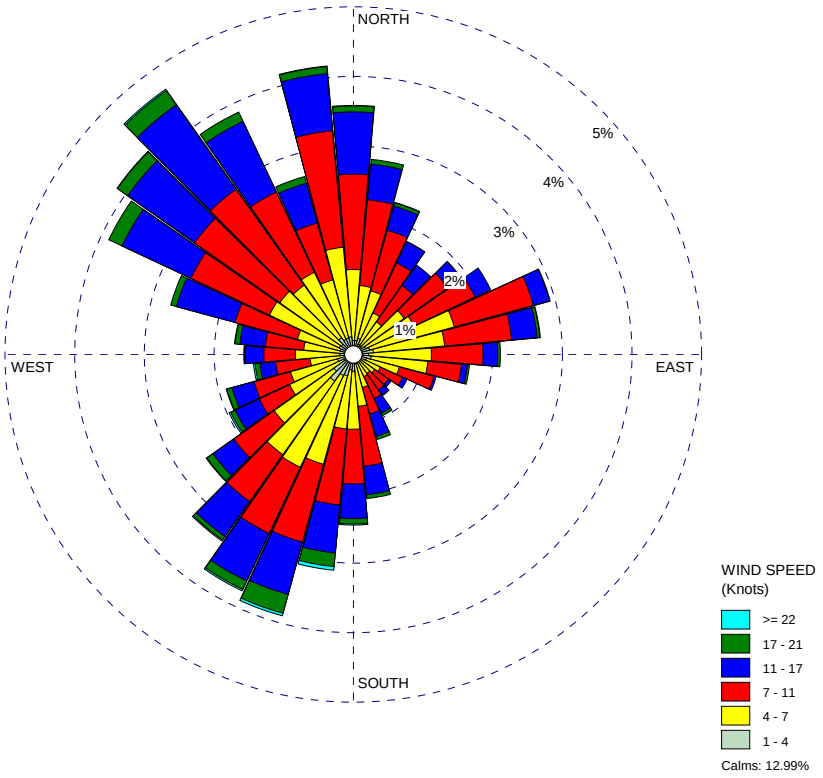
WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:

Kansas City Winter Combined 2009-2013

DISPLAY:

Wind Speed
Direction (blowing from)



COMMENTS:

Dec.- Feb. winds for 2009 -2013 combined.

MODELER:

CALM WINDS:

12.99%

AVG. WIND SPEED:

6.96 Knots

PROJECT NO.:

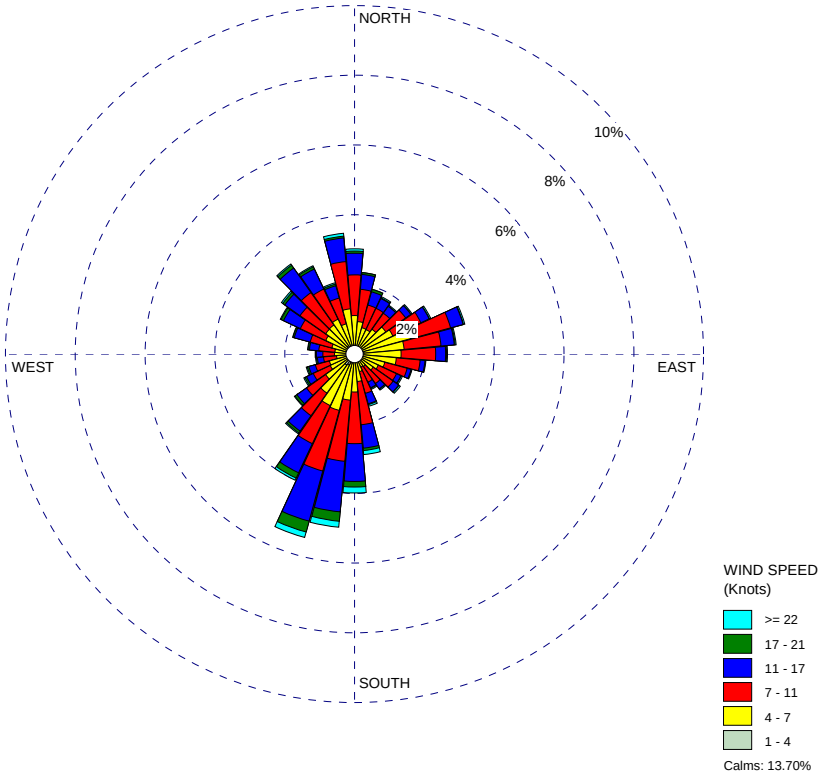
WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:

Kansas City 2009-2013 annual

DISPLAY:

Wind Speed
Direction (blowing from)



COMMENTS:

5 year annual winds for Kansas City 2009-2013

MODELER:

CALM WINDS:

13.70%

AVG. WIND SPEED:

8.94 Knots

PROJECT NO.:

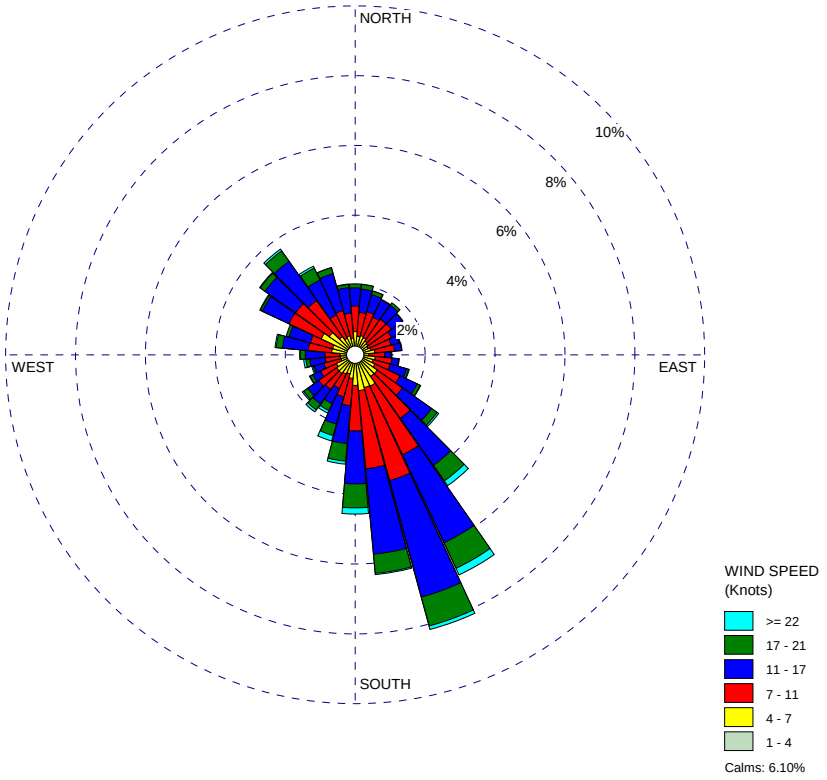
WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:

Springfield Spring Combined 2009-2013

DISPLAY:

Wind Speed
Direction (blowing from)



COMMENTS:

Mar. - May winds for 2009 -2013 combined.

MODELER:

CALM WINDS:

6.10%

AVG. WIND SPEED:

9.48 Knots

PROJECT NO.:

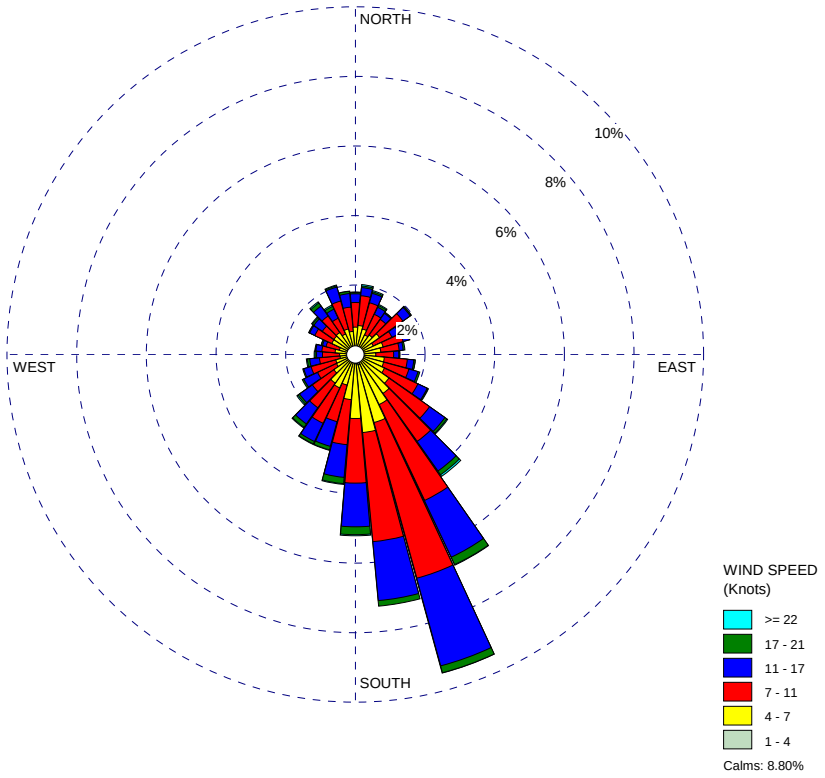
WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:

Springfield Summer Combined 2009-2013

DISPLAY:

Wind Speed
Direction (blowing from)



COMMENTS:

Jun. - Aug. winds for 2009 -2013 combined.

MODELER:

CALM WINDS:

8.80%

AVG. WIND SPEED:

7.54 Knots

PROJECT NO.:

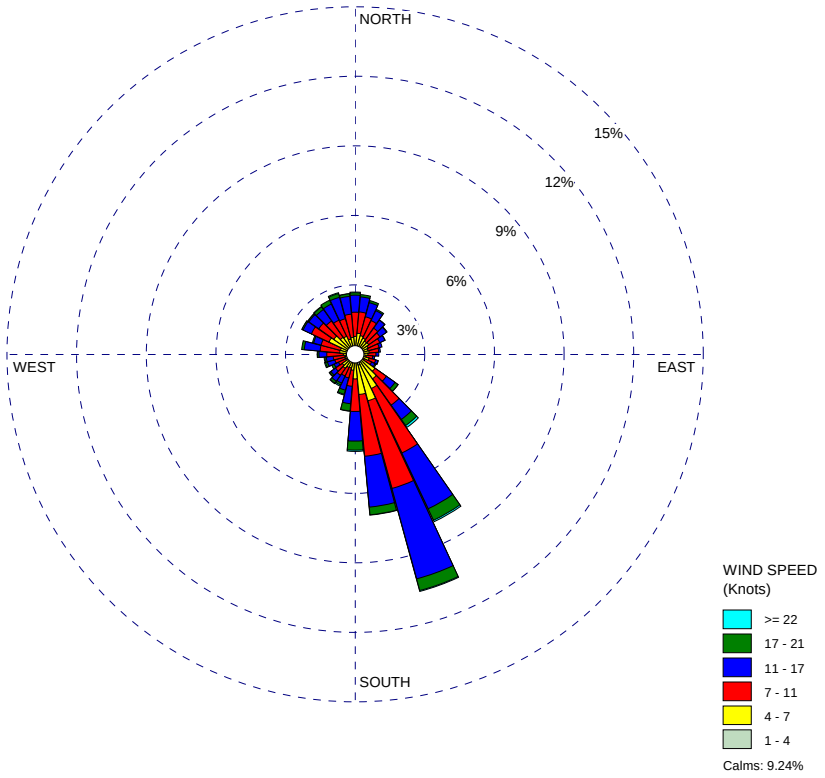
WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:

Springfield Fall Combined 2009-2013

DISPLAY:

Wind Speed
Direction (blowing from)



COMMENTS:

Sep. - Nov. winds for 2009 -2013 combined.

MODELER:

CALM WINDS:

9.24%

AVG. WIND SPEED:

8.12 Knots

PROJECT NO.:

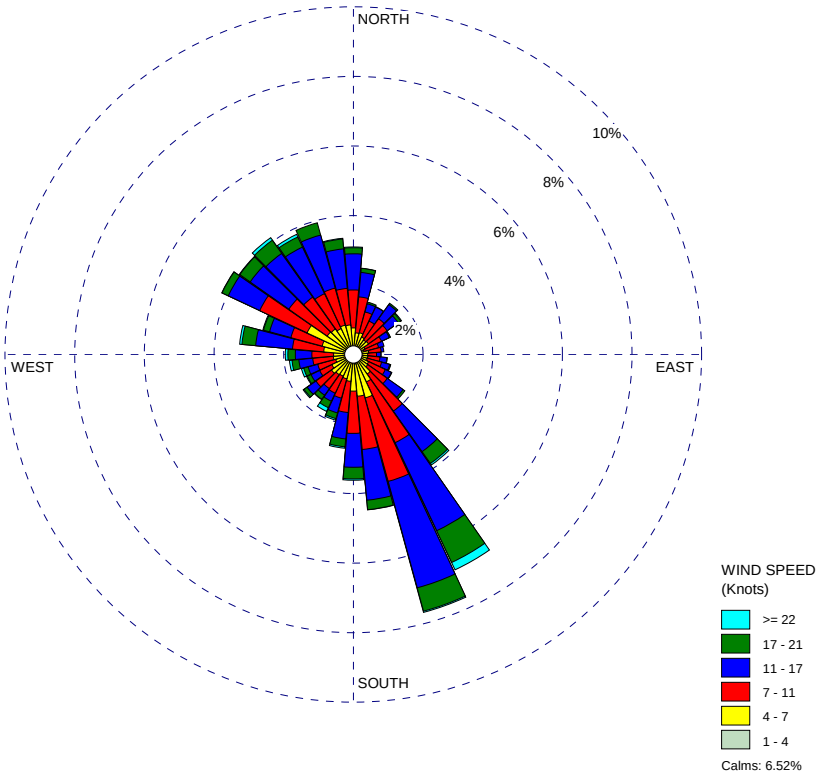
WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:

Springfield Winter Combined 2009-2013

DISPLAY:

Wind Speed
Direction (blowing from)



COMMENTS:

Dec. - Feb. winds for 2009 -2013 combined.

MODELER:

CALM WINDS:

6.52%

AVG. WIND SPEED:

9.11 Knots

PROJECT NO.:

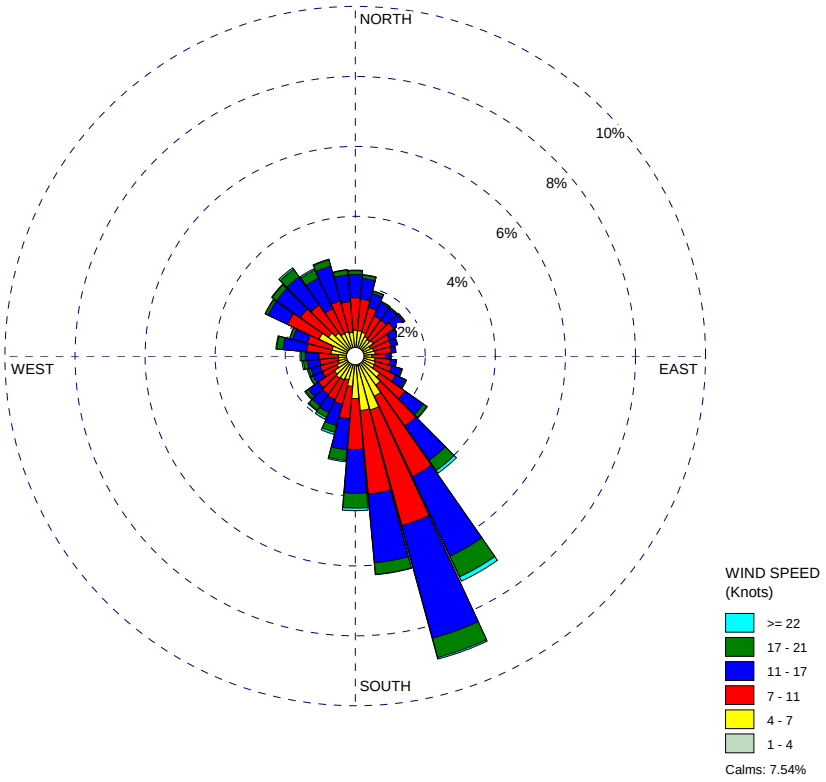
WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:

Springfield 2009-2013 annual

DISPLAY:

Wind Speed
Direction (blowing from)



COMMENTS:

5 year annual winds for
Springfield 2009-2013

MODELER:

CALM WINDS:

7.54%

AVG. WIND SPEED:

8.59 Knots

PROJECT NO.:

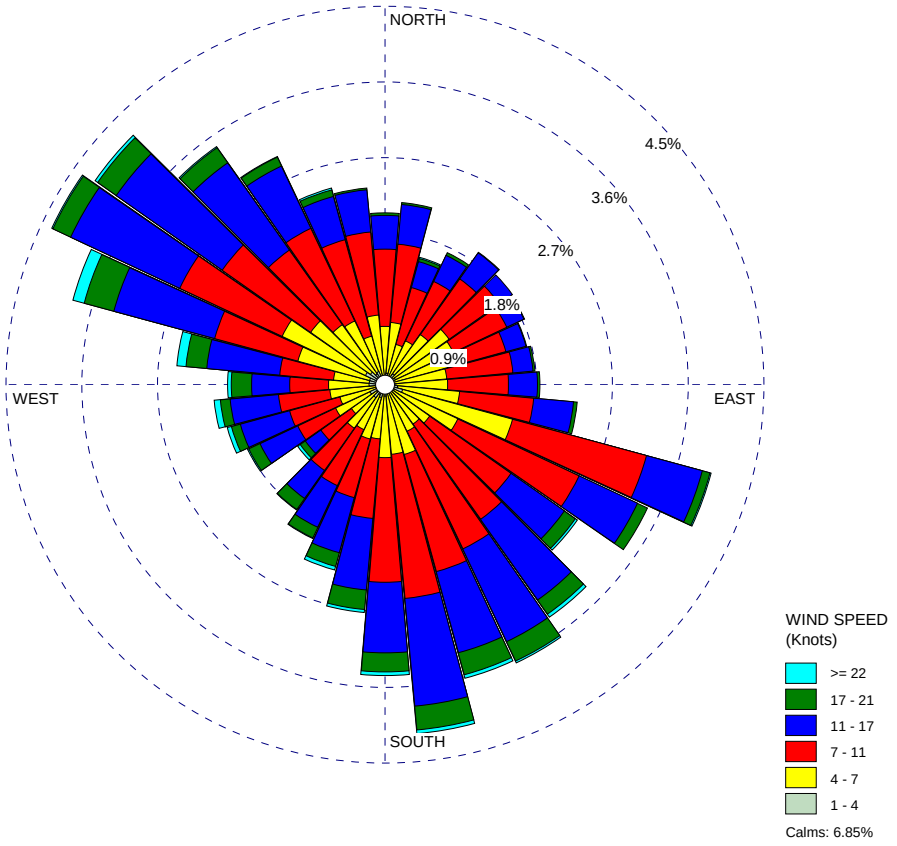
WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:

St. Louis Spring Combined 2009-2013

DISPLAY:

Wind Speed
Direction (blowing from)



COMMENTS:

Mar. - May. winds for 2009 -2013 combined.

MODELER:

CALM WINDS:

6.85%

AVG. WIND SPEED:

8.48 Knots

PROJECT NO.:

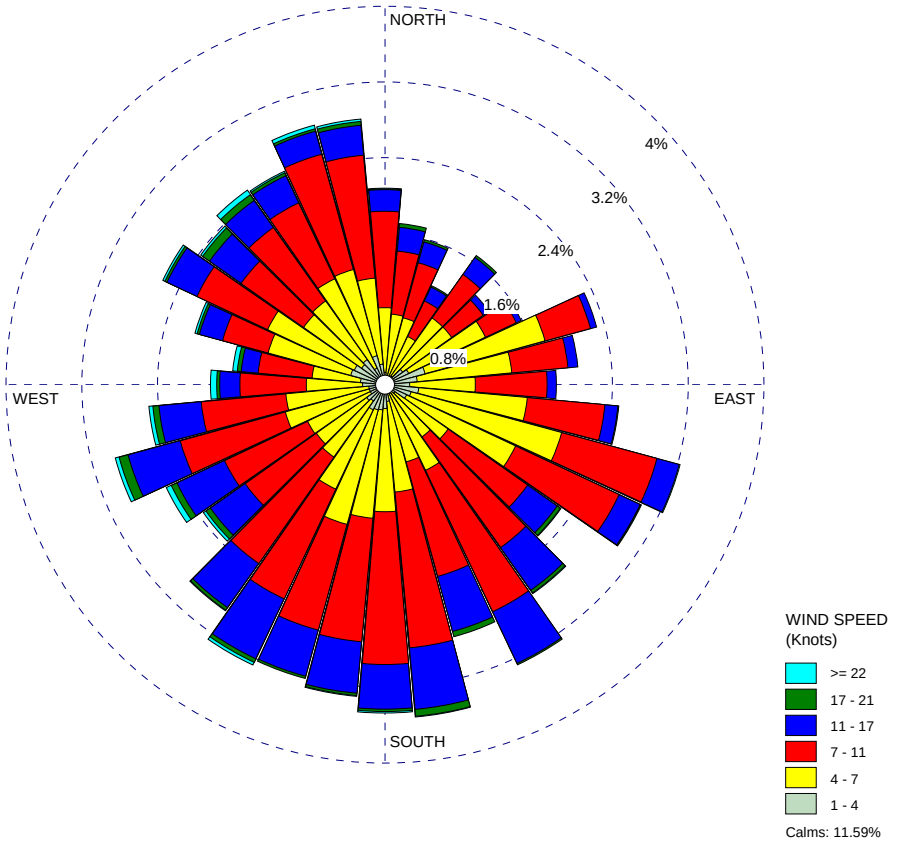
WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:

St. Louis Summer Combined 2009-2013

DISPLAY:

Wind Speed
Direction (blowing from)



COMMENTS:

Jun. - Aug. winds for 2009 -2013 combined.

MODELER:

CALM WINDS:

11.59%

AVG. WIND SPEED:

6.53 Knots

PROJECT NO.:

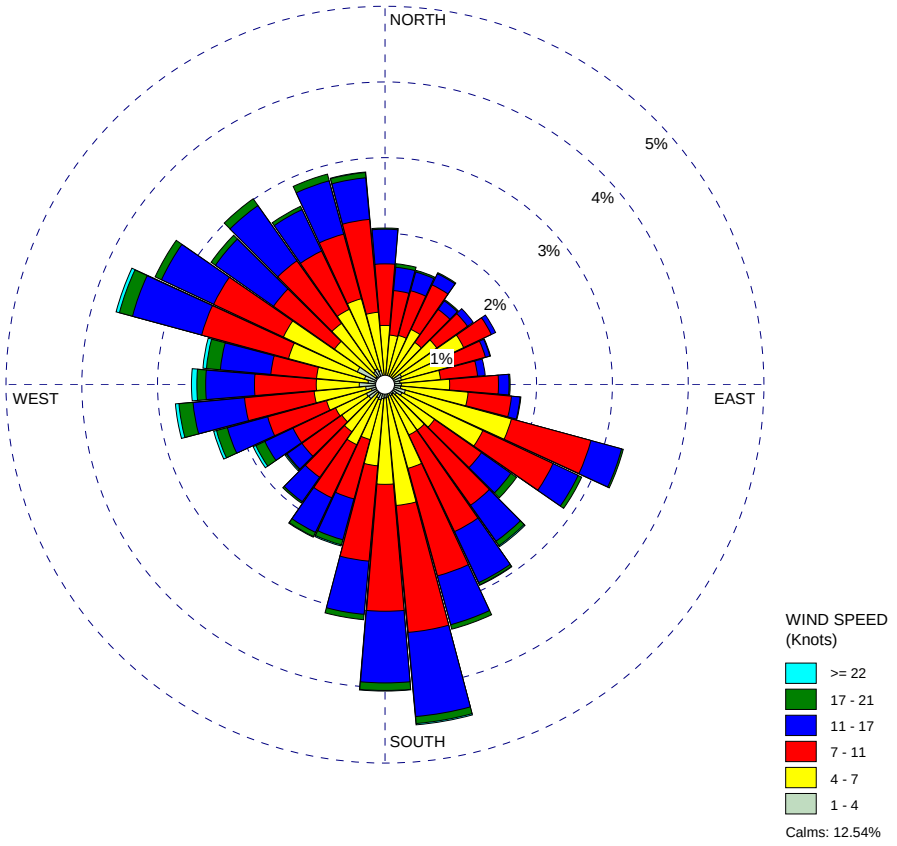
WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:

St. Louis Fall Combined 2009-2013

DISPLAY:

Wind Speed
Direction (blowing from)



COMMENTS:

Sep. - Oct. winds for 2009 -2013 combined.

MODELER:

CALM WINDS:

12.54%

AVG. WIND SPEED:

7.04 Knots

PROJECT NO.:

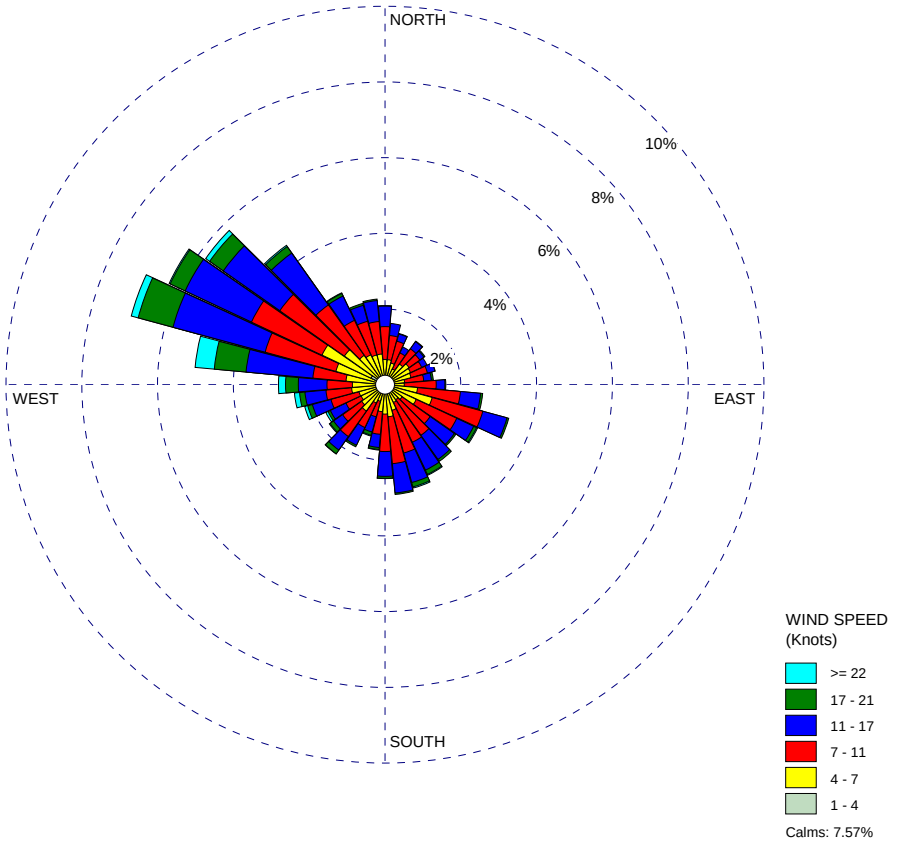
WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:

St. Louis Winter Combined 2009-2013

DISPLAY:

Wind Speed
Direction (blowing from)



COMMENTS:

Dec. - Feb.. winds for 2009 -2013 combined.

MODELER:

CALM WINDS:

7.57%

AVG. WIND SPEED:

8.51 Knots

PROJECT NO.:

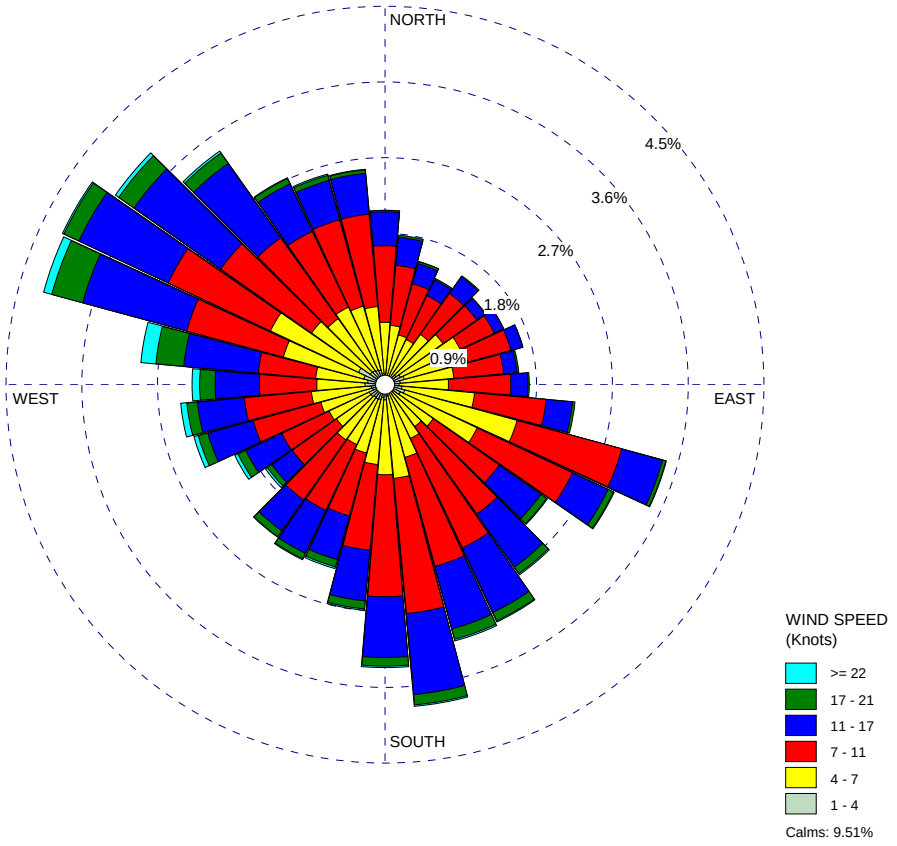
WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:

St. Louis Annual Combined 2009-2013

DISPLAY:

Wind Speed
Direction (blowing from)



COMMENTS:

Dec.- Feb. winds for 2009 -2013 combined.

MODELER:

CALM WINDS:

9.51%

AVG. WIND SPEED:

7.67 Knots

PROJECT NO.:

WRPLOT View - Lakes Environmental Software

APPENDIX B: EPA REGION VII AIR MONITORING NETWORK ASSESSMENT GUIDANCE

5-YEAR AIR QUALITY SYSTEM ASSESSMENT
CFR REQUIREMENTS & REGIONAL RECOMMENDATIONS

The five year air quality surveillance system assessment is required to determine at a minimum:

1) If the network meets the monitoring objectives defined in Appendix D
2) Whether new monitoring sites are needed
3) Whether existing sites are no longer needed and can be terminated
4) Whether new technologies are appropriate for incorporation into the air monitoring network.
5) Whether the network sufficiently supports characterization of air quality in areas with large populations of susceptible individuals
6) Whether discontinuance of a monitoring site would have an adverse impact on other data users or health studies.
7) For PM2.5 the assessment must identify needed changes to population oriented sites

In order to assess the network's suitability for the seven objectives listed above the State agency will need to assess the following information.

1) Statewide and local level population statistics
2) Statewide ambient air monitoring network pollutant concentration measurement trends for the past 5-years
3) Statewide and local level emission source trends, characteristics, and inventory
4) Statewide plans to modify, add, or remove emission sources
5) Statewide and local level meteorological impacts on pollutant concentrations.
6) Potential impacts of precursor chemical emissions on pollutant concentrations
7) Potential impacts of pollutant and precursor transport on measured concentrations.
8) Atmospheric dispersion modeling output generated as part of a permit application or control strategy effectiveness demonstration.
9) Network suitability to measure the appropriate spatial scale of representativeness for selected pollutants.
10) Monitoring data spatial redundancy or gaps that need to be eliminated.
11) Programmatic trends or shifts in emphasis or funding that lead toward different data needs.

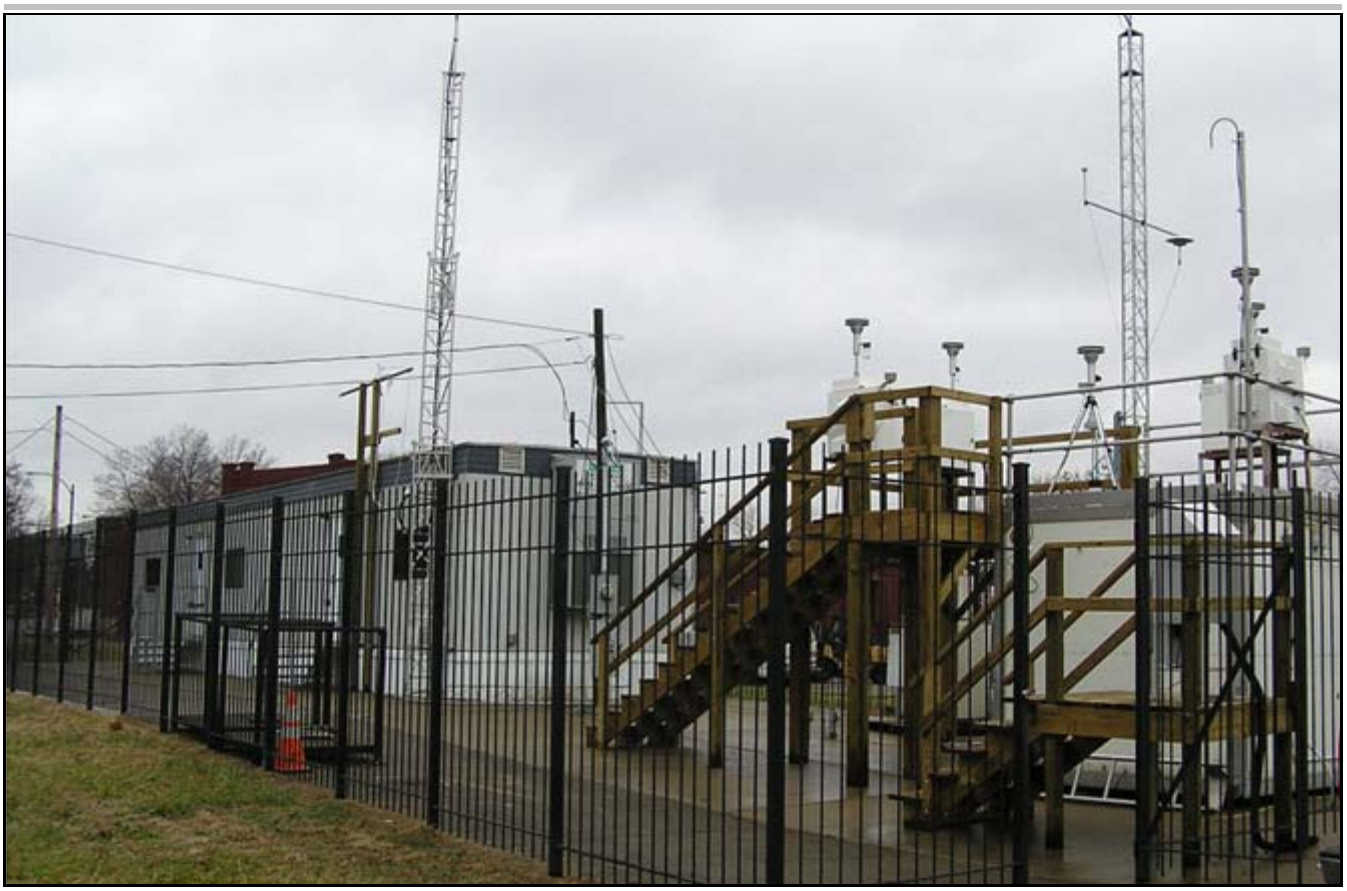
In order to generate the appropriate level of data necessary for this analysis the state agency should consider the following:

1) Statistical tools and methods
    a) Trend analysis of line charts and bar graphs of historical pollutant concentration trends in comparison with the NAAQS
    b) Correlation analysis to discern the similarity of measurements between individual monitoring stations on a single pollutant basis.
    c) Principal component analysis, if applicable for a given agency.

2) Graphical tools and methods
    a) Maps with multiple layers and overlays depicting:
        a.1) Monitor locations
        a.2) Emission inventory data
        a.3) Population data
        a.4) Affects of either adding or deleting a monitor from the network
        a.5) Spatial area served by a monitoring site for a given pollutant

APPENDIX C: MONITORING NETWORK TABLE

Missouri Ambient Air Monitoring Network



MIC	***Microscale***	***Several meters up to about 100 meters***
MID	***Middle***	***100 meters to 0.5 kilometer***
NBR	***Neighborhood***	***0.5 to 4.0 kilometers range***
URB	***Urban***	***4 to 50 kilometers***
REG	***Regional***	***Tens to hundreds of kilometers***
COM	***NAAQS Compliance***	
MET	***Meteorological Data***	
N/A	***Not Applicable***	
NCore	***National Multi-Pollutant Monitoring Stations***	
NON-A	***Non-Ambient Site***	
NON-R	***Non-Regulatory***	
RES	***Research***	
SLAMS	***State and Local Monitoring Stations***	
SIP	***State Implementation Plan***	
SPEC	***Speciation***	
STA	***State Standard***	
SPM	***Special Purpose Monitoring***	
SPP	***Special Purpose Project***	

Buck-Up A monitor where Quality Assurance/Quality Control is being performed but no data is reported to the EPA Air Quality System database unless the primary monitor does not produce a valid measurement.

Ameren Labadie & Rush Island

Labadie, Northwest

AQS Site Number 29-189-9002

Ameren, Labadie

Latitude: 38.5818 **AQCR:** 070 Metropolitan St. Louis

Longitude: -90.865528 **MSA:** 7040 St. Louis, MO-IL

Elevation (ft): 000

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective
Sulfur Dioxide	42401	SPM	1	☐	1	N/A	SPP	008	ppb	100	Ultra-violet Fluorescence	SPM-Other
Sulfur Dioxide Max 5-min Avg	42406	SPM	1	☐	1	N/A	SPP	008	ppb	100	Ultra-violet Fluorescence	SPM-Other

Labadie, Osage Ridge

AQS Site Number 29-189-9003

Ameren, Labadie

Latitude: 38.60586 **AQCR:** 070 Metropolitan St. Louis

Longitude: -90.9362 **MSA:** 7040 St. Louis, MO-IL

Elevation (ft): 000

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective
Outdoor Temperature	62101	SPM	1	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	SPM-Other (90m Probe Height)
Outdoor Temperature	62101	SPM	2	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	SPM-Other (56.4m Probe Height)
Outdoor Temperature Diff	62106	SPM	1	☐	1	N/A	MET	116	Temp Diff deg C	041	Instrumental: Elect or Mach Avg Lev 2-Lev1	SPM-Other (90m - 56.4m Probe Heights)

WD - Sigma Theta (Horizontal)	61106	SPM	1	☐	1	N/A	MET	014	deg	020	Arithmetic Standard Deviation	SPM-Other (90m Probe Height)
WD - Sigma Theta (Horizontal)	61106	SPM	2	☐	1	N/A	MET	014	deg	020	Arithmetic Standard Deviation	SPM-Other (56.4m Probe Height)
WD - Sigma Theta (Vertical)	61107	SPM	1	☐	1	N/A	MET	014	deg	020	Arithmetic Standard Deviation	SPM-Other (90m Probe Height)
WD - Sigma Theta (Vertical)	61107	SPM	2	☐	1	N/A	MET	014	deg	020	Arithmetic Standard Deviation	SPM-Other (56.4m Probe Height)
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	020	Vector Summation	SPM-Other (90m Probe Height)
Wind Direction - Resultant	61104	SPM	2	☐	1	N/A	MET	014	deg	020	Vector Summation	SPM-Other (56.4m Probe Height)
Wind Direction - Scalar	61102	SPM	1	☐	1	N/A	MET	014	deg	063	Climatronics	SPM-Other (90m Probe Height)
Wind Direction - Scalar	61102	SPM	2	☐	1	N/A	MET	014	deg	063	Climatronics	SPM-Other (56.4m Probe Height)
Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	011	m/s	020	Vector Summation	SPM-Other (90m Probe Height)
Wind Speed - Resultant	61103	SPM	2	☐	1	N/A	MET	011	m/s	020	Vector Summation	SPM-Other (56.4m Probe Height)
Wind Speed - Scalar	61101	SPM	1	☐	1	N/A	MET	011	m/s	063	Climatronics	SPM-Other (90m Probe Height)

Wind Speed - Scalar	61101	SPM	2	☐	1	N/A	MET	011	m/s	063	Climatronics	SPM-Other (56.4m Probe Height)
Wind Speed - Vertical	61109	SPM	1	☐	1	N/A	MET	011	m/s	020	Electronic Averaging	SPM-Other (90m Probe Height)
Wind Speed - Vertical	61109	SPM	2	☐	1	N/A	MET	011	m/s	020	Electronic Averaging	SPM-Other (56.4m Probe Height)
WS - Sigma Theta (Vertical)	61110	SPM	1	☐	1	N/A	MET	011	m/s	020	Arithmetic Standard Deviation	SPM-Other (90m Probe Height)
WS - Sigma Theta (Vertical)	61110	SPM	2	☐	1	N/A	MET	011	m/s	020	Arithmetic Standard Deviation	SPM-Other (56.4m Probe Height)

Labadie, Valley Site — AQS Site Number 29-189-9001

Ameren, Labadie

Latitude: 38.572522 **AQCR:** 070 Metropolitan St. Louis

Longitude: -90.796911 **MSA:** 7040 St. Louis, MO-IL

Elevation (ft): 000

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective
Barometric Pressure	64101	SPM	1	☐	1	N/A	MET	016	Millbars	015	Instrumental-Barometric Press Transducer	SPM-Other
Outdoor Temperature	62101	SPM	2	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	SPM-Other (10m Probe Height)
Outdoor Temperature	62101	SPM	3	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	SPM-Other (2m Probe Height)
Outdoor Temperature Diff	62106	SPM	1	☐	1	N/A	MET	116	Temp Diff deg C	041	Instrumental: Elect or Mach Avg Lev 2-Lev1	SPM-Other (10m - 2m Probe Heights)

Precipitation	65102	SPM	1	☐	1	N/A	MET	021	inches	014	Heated Tipping Bucket	SPM-Other
Relative Humidity	62201	SPM	1	☐	1	N/A	MET	019	%humidity	061	Met One 083D	SPM-Other
Solar Radiation	63301	SPM	1	☐	1	N/A	MET	079	W/m^2	011	Instrumental-Pyranometer	SPM-Other
Sulfur Dioxide	42401	SPM	1	☐	1	N/A	SPP	008	ppb	100	Ultra-violet Fluorescence	SPM-Other
Sulfur Dioxide Max 5-min Avg	42406	SPM	1	☐	1	N/A	SPP	008	ppb	100	Ultra-violet Fluorescence	SPM-Other
WD - Sigma Theta (Horizontal)	61106	SPM	1	☐	1	N/A	MET	014	deg	020	Arithmetic Standard Deviation	SPM-Other (10m Tower)
WD - Sigma Theta (Vertical)	61107	SPM	1	☐	1	N/A	MET	014	deg	020	Arithmetic Standard Deviation	SPM-Other (10m Tower)
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	020	Vector Summation	SPM-Other (10m Tower)
Wind Direction - Scalar	61102	SPM	1	☐	1	N/A	MET	014	deg	063	Climatronics	SPM-Other (10m Tower)
Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	011	m/s	020	Vector Summation	SPM-Other (10m Tower)
Wind Speed - Scalar	61101	SPM	1	☐	1	N/A	MET	011	m/s	063	Climatronics	SPM-Other (10m Tower)

Wind Speed - Vertical	61109	SPM	1	☐	1	N/A	MET	011	m/s	020	Electronic Averaging	SPM-Other (10m Tower)
WS - Sigma Theta (Vertical)	61110	SPM	1	☐	1	N/A	MET	011	m/s	020	Arithmetic Standard Deviation	SPM-Other (10m Tower)

Rush Island, Fults-Site, IL, (Not operating; under review) *AQS Site Number* **29-000-0000**

To be updated after site approval

Latitude: 38.15908 ***AQCR:*** 138 SE Missouri

Longitude: -90.22728 ***MSA:*** 0000 Not in a MSA

Elevation (ft): 446

Pollutant	*AQS Code*	*Monitor-Type*	*POC*	*Back-Up*	*Freq*	*Scale*	*State-Obj*	*Unit-Code*	*Unit*	*Method-Code*	*Method*	*Monitor-Objective*
Barometric Pressure	64101	SPM	1	☐	1	N/A	MET	016	Millbars	015	Instrumental-Barometric Press Transducer	SPM-Other
Outdoor Temperature	62101	SPM	2	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	SPM-Other (10m Probe Height)
Outdoor Temperature	62101	SPM	3	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	SPM-Other (2m Probe Height)
Outdoor Temperature Diff	62106	SPM	1	☐	1	N/A	MET	116	Temp Diff deg C	041	Instrumental: Elect or Mach Avg Lev 2-Lev1	SPM-Other (10m - 2m Probe Heights)
Precipitation	65102	SPM	1	☐	1	N/A	MET	021	inches	014	Heated Tipping Bucket	SPM-Other
Relative Humidity	62201	SPM	1	☐	1	N/A	MET	019	%humidity	061	Met One 083D	SPM-Other

Solar Radiation	63301	SPM	1	☐	1	N/A	MET	079	W/m^2	011	Instrumental-Pyranometer	SPM-Other
Sulfur Dioxide	42401	SPM	1	☐	1	N/A	SPP	008	ppb	100	Ultra-violet Fluorescence	SPM-Other
Sulfur Dioxide Max 5-min Avg	42406	SPM	1	☐	1	N/A	SPP	008	ppb	100	Ultra-violet Fluorescence	SPM-Other
WD - Sigma Theta (Horizontal)	61106	SPM	1	☐	1	N/A	MET	014	deg	020	Arithmetic Standard Deviation	SPM-Other (10m Tower)
WD - Sigma Theta (Vertical)	61107	SPM	1	☐	1	N/A	MET	014	deg	020	Arithmetic Standard Deviation	SPM-Other (10m Tower)
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	020	Vector Summation	SPM-Other (10m Tower)
Wind Direction - Scalar	61102	SPM	1	☐	1	N/A	MET	014	deg	063	Climatronics	SPM-Other (10m Tower)
Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	011	m/s	020	Vector Summation	SPM-Other (10m Tower)
Wind Speed - Scalar	61101	SPM	1	☐	1	N/A	MET	011	m/s	063	Climatronics	SPM-Other (10m Tower)
Wind Speed - Vertical	61109	SPM	1	☐	1	N/A	MET	011	m/s	020	Electronic Averaging	SPM-Other (10m Tower)
WS - Sigma Theta (Vertical)	61110	SPM	1	☐	1	N/A	MET	011	m/s	020	Arithmetic Standard Deviation	SPM-Other (10m Tower)

Rush Island, Natchez (Not Operating; under review) AQS Site Number 29-186-9003

To be updated after site approval

Latitude: 38.10525 **AQCR:** 138 SE Missouri

Longitude: -90.29842 **MSA:** 0000 Not in a MSA

Elevation (ft): 505

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective
Sulfur Dioxide	42401	SPM	1	☐	1	N/A	SPP	008	ppb	100	Ultra-violet Fluorescence	SPM-Other
Sulfur Dioxide Max 5-min Avg	42406	SPM	1	☐	1	N/A	SPP	008	ppb	100	Ultra-violet Fluorescence	SPM-Other

Rush Island, Rush Tall Tower (Not Operating;under Review AQS Site Number 29-186-9002

To be updated after site approval

Latitude: 38.11999 **AQCR:** 138 SE Missouri

Longitude: -90.28214 **MSA:** 0000 Not in a MSA

Elevation (ft): 656

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective
Outdoor Temperature	62101	SPM	1	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	SPM-Other (90m Probe Height)
Outdoor Temperature	62101	SPM	2	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	SPM-Other (60m Probe Height)
Outdoor Temperature Diff	62106	SPM	1	☐	1	N/A	MET	116	Temp Diff deg C	041	Instrumental: Elect or Mach Avg Lev 2-Lev1	SPM-Other (90m - 56.4m Probe Heights)
WD - Sigma Theta (Horizontal)	61106	SPM	1	☐	1	N/A	MET	014	deg	020	Arithmetic Standard Deviation	SPM-Other (90m Probe Height)

WD - Sigma Theta (Horizontal)	61106	SPM	2	☐	1	N/A	MET	014	deg	020	Arithmetic Standard Deviation	SPM-Other (60m Probe Height)
WD - Sigma Theta (Vertical)	61107	SPM	1	☐	1	N/A	MET	014	deg	020	Arithmetic Standard Deviation	SPM-Other (90m Probe Height)
WD - Sigma Theta (Vertical)	61107	SPM	2	☐	1	N/A	MET	014	deg	020	Arithmetic Standard Deviation	SPM-Other (60m Probe Height)
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	020	Vector Summation	SPM-Other (90m Probe Height)
Wind Direction - Resultant	61104	SPM	2	☐	1	N/A	MET	014	deg	020	Vector Summation	SPM-Other (60m Probe Height)
Wind Direction - Scalar	61102	SPM	1	☐	1	N/A	MET	014	deg	063	Climatronics	SPM-Other (90m Probe Height)
Wind Direction - Scalar	61102	SPM	2	☐	1	N/A	MET	014	deg	063	Climatronics	SPM-Other (60m Probe Height)
Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	011	m/s	020	Vector Summation	SPM-Other (90m Probe Height)
Wind Speed - Resultant	61103	SPM	2	☐	1	N/A	MET	011	m/s	020	Vector Summation	SPM-Other (60m Probe Height)
Wind Speed - Scalar	61101	SPM	1	☐	1	N/A	MET	011	m/s	063	Climatronics	SPM-Other (90m Probe Height)
Wind Speed - Scalar	61101	SPM	2	☐	1	N/A	MET	011	m/s	063	Climatronics	SPM-Other (60m Probe Height)

Wind Speed - Vertical	61109	SPM	1	☐	1	N/A	MET	011	m/s	020	Electronic Averaging	SPM-Other (90m Probe Height)
Wind Speed - Vertical	61109	SPM	2	☐	1	N/A	MET	011	m/s	020	Electronic Averaging	SPM-Other (60m Probe Height)
WS - Sigma Theta (Vertical)	61110	SPM	1	☐	1	N/A	MET	011	m/s	020	Arithmetic Standard Deviation	SPM-Other (90m Probe Height)
WS - Sigma Theta (Vertical)	61110	SPM	2	☐	1	N/A	MET	011	m/s	020	Arithmetic Standard Deviation	SPM-Other (60m Probe Height)

Rush Island, Weaver-AA (Not Operating: under review) *AQS Site Number* **29-186-9001**

To be updated after site approval

Latitude: 38.144972 ***AQCR:*** 138 SE Missouri

Longitude: -90.304783 ***MSA:*** 0000 Not in a MSA

Elevation (ft): 000

Pollutant	*AQS Code*	*Monitor-Type*	*POC*	*Back-Up*	*Freq*	*Scale*	*State-Obj*	*Unit-Code*	*Unit*	*Method-Code*	*Method*	*Monitor-Objective*
Sulfur Dioxide	42401	SPM	1	☐	1	N/A	SPP	008	ppb	100	Ultra-violet Fluorescence	SPM-Other
Sulfur Dioxide Max 5-min Avg	42406	SPM	1	☐	1	N/A	SPP	008	ppb	100	Ultra-violet Fluorescence	SPM-Other

City Utilities

James River South

AQS Site Number 29-077-0037

James River South, Springfield, MO 65804

Latitude: 37.104461 **AQCR:** 139 SW Missouri

Longitude: -93.25339 **MSA:** 7920 Springfield, MO

Elevation (ft): 1227

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective
Sulfur Dioxide	42401	Industrial	3	☐	1	MID	COM	008	ppb	060	Pulsed Fluorescent	Source Oriented
Sulfur Dioxide Max 5-min Avg	42406	Industrial	3	☐	1	MID	COM	008	ppb	060	Pulsed Fluorescent	Source Oriented

Doe Run Buick

Doe Run Buick - Buick NE

AQS Site Number 29-093-9008

347 Power Lane (Address, Elevation, Lati, and Longi to be confirmed)

Latitude: 37.65214 **AQCR:** 138 SE Missouri

Longitude: -91.11689 **MSA:** 0000 Not in a MSA

Elevation (ft): 1423

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective
Ambient Temperature	68105	Industrial	1	☐	1/6	N/A	COM	017	deg C	780	Instrumental-On Site Ambient Temperature	SPM-Other
Lead (TSP) - LC FRM/FEM	14129	Industrial	1	☐	1/6	MID	COM	105	ug/m^3-LC	113	Doe Run Mass Spectra ICAP	Source Oriented
Sample Barometric Pressure	68108	Industrial	1	☐	1/6	N/A	COM	059	mm (Hg)	780	Instrumental-On Site Sample Baro Pressure	SPM-Other

Doe Run Buick - North #5 (NON-A)

AQS Site Number 29-093-0021

Doe Run Buick - North#5, Buick, MO 65439

Latitude: 37.65178 **AQCR:** 138 SE Missouri

Longitude: -91.13094 **MSA:** 0000 Not in a MSA

Elevation (ft):

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective
Ambient Temperature	68105	Industrial	1	☐	1/6	N/A	COM	017	deg C	780	Instrumental-On Site Ambient Temperature	SPM-Other
Lead (TSP) - LC FRM/FEM	14129	Industrial	1	☐	1/6	MID	COM	105	ug/m^3-LC	113	Doe Run Mass Spectra ICAP	Source Oriented

Sample Barometric Pressure	68108	Industrial	1	☐	1/6	N/A	COM	059	mm (Hg)	780	Instrumental-On Site Sample Baro Pressure	SPM-Other

Doe Run Buick - South #1 (NON-A)

AQS Site Number 29-093-0016

Doe Run Buick - South#1, Buick, MO 65439

Latitude: 37.62400 **AQCR:** 138 SE Missouri

Longitude: -91.12827 **MSA:** 0000 Not in a MSA

Elevation (ft):

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective
Ambient Temperature	68105	Industrial	1	☐	1/6	N/A	SIP	017	deg C	780	Instrumental-On Site Ambient Temperature	SPM-Other
Ambient Temperature	68105	Industrial	2	☐	1/6	N/A	SIP	017	deg C	780	Instrumental-On Site Ambient Temperature	QA Collocated
Lead (TSP) - LC FRM/FEM	14129	Industrial	1	☐	1/6	MID	SIP	105	ug/m^3-LC	113	Doe Run Mass Spectra ICAP	Source Oriented
Lead (TSP) - LC FRM/FEM	14129	Industrial	2	☐	1/6	MID	SIP	105	ug/m^3-LC	113	Doe Run Mass Spectra ICAP	QA Collocated
Sample Barometric Pressure	68108	Industrial	1	☐	1/6	N/A	SIP	059	mm (Hg)	780	Instrumental-On Site Sample Baro Pressure	SPM-Other
Sample Barometric Pressure	68108	Industrial	2	☐	1/6	N/A	SIP	059	mm (Hg)	780	Instrumental-On Site Sample Baro Pressure	QA Collocated

Doe Run Glover

Doe Run Glover - Big Creek #5 (NON-A)

AQS Site Number 29-093-0029

Doe Run Glover - Big Creek #5, Glover, MO 65439

Latitude: 37.471667 **AQCR:** 138 SE Missouri

Longitude: -90.689444 **MSA:** 0000 Not in a MSA

Elevation (ft): 927

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective
Ambient Temperature	68105	Industrial	1	☐	1/6	N/A	COM	017	deg C	780	Instrumental-On Site Ambient Temperature	SPM-Other
Lead (TSP) - LC FRM/FEM	14129	Industrial	1	☐	1/6	MID	COM	105	ug/m^3-LC	189	Inter-Mountain Lab, Inc Mass Spectra ICAP	Source Oriented
Sample Barometric Pressure	68108	Industrial	1	☐	1/6	N/A	COM	059	mm (Hg)	780	Instrumental-On Site Sample Baro Pressure	SPM-Other

Doe Run Glover - Post Office #2 (NON-A)

AQS Site Number 29-093-0027

Doe Run Glover - Post Office #2, Glover, MO 65439

Latitude: 37.486111 **AQCR:** 138 SE Missouri

Longitude: -90.69 **MSA:** 0000 Not in a MSA

Elevation (ft): 927

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective
Ambient Temperature	68105	Industrial	1	☐	1/6	N/A	COM	017	deg C	780	Instrumental-On Site Ambient Temperature	SPM-Other
Ambient Temperature	68105	Industrial	2	☐	1/6	N/A	COM	017	deg C	780	Instrumental-On Site Ambient Temperature	QA Collocated

Lead (TSP) - LC FRM/FEM	14129	Industrial	1	☐	1/6	MID	COM	105	ug/m^3-LC	189	Inter-Mountain Lab, Inc Mass Spectra ICAP	Source Oriented
Lead (TSP) - LC FRM/FEM	14129	Industrial	2	☐	1/6	MID	COM	105	ug/m^3-LC	189	Inter-Mountain Lab, Inc Mass Spectra ICAP	QA Collocated
Sample Barometric Pressure	68108	Industrial	1	☐	1/6	N/A	COM	059	mm (Hg)	780	Instrumental-On Site Sample Baro Pressure	SPM-Other
Sample Barometric Pressure	68108	Industrial	2	☐	1/6	N/A	COM	059	mm (Hg)	780	Instrumental-On Site Sample Baro Pressure	QA Collocated

Doe Run Herculaneum

Herculaneum, Church Street (NON-A) — AQS Site Number 29-099-0024

951 Church St., Herculaneum, MO 63048

Latitude: 38.258667 **AQCR:** 070 Metropolitan St. Louis

Longitude: -90.380889 **MSA:** 7040 St. Louis, MO-IL

Elevation (ft): 463

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective
Ambient Temperature	68105	Industrial	1	☐	1/6	N/A	COM	017	deg C	780	Instrumental-On Site Ambient Temperature	SPM-Other
Ambient Temperature	68105	Industrial	2	☐	1/6	N/A	COM	017	deg C	780	Instrumental-On Site Ambient Temperature	QA Collocated
Lead (TSP) - LC FRM/FEM	14129	Industrial	1	☐	1/6	NBR	COM	105	ug/m^3-LC	192	Inductive Coupled Plasma Spectrometry	Source Oriented
Lead (TSP) - LC FRM/FEM	14129	Industrial	2	☐	1/6	NBR	COM	105	ug/m^3-LC	192	Inductive Coupled Plasma Spectrometry	QA Collocated
Sample Barometric Pressure	68108	Industrial	1	☐	1/6	N/A	COM	059	mm (Hg)	780	Instrumental-On Site Sample Baro Pressure	SPM-Other
Sample Barometric Pressure	68108	Industrial	2	☐	1/6	N/A	COM	059	mm (Hg)	780	Instrumental-On Site Sample Baro Pressure	QA Collocated

Herculaneum, City Hall (Mott Street) — AQS Site Number 29-099-0020

Mott Street, Herculaneum, MO, 63048

Latitude: 38.263394 **AQCR:** 070 Metropolitan St. Louis

Longitude: -90.379667 **MSA:** 7040 St. Louis, MO-IL

Elevation (ft): 468

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective

Ambient Temperature	68105	Industrial	1	☐	1/1	N/A	COM	017	deg C	780	Instrumental-On Site Ambient Temperature	SPM-Other
Ambient Temperature	68105	Industrial	2	☐	1/3	N/A	COM	017	deg C	780	Instrumental-On Site Ambient Temperature	QA Collocated
Lead (TSP) - LC FRM/FEM	14129	Industrial	1	☐	1/1	MID	COM	105	ug/m^3-LC	192	Inductive Coupled Plasma Spectrometry	Source Oriented & Highest Concentration
Lead (TSP) - LC FRM/FEM	14129	Industrial	2	☐	1/3	MID	COM	105	ug/m^3-LC	192	Inductive Coupled Plasma Spectrometry	QA Collocated
Sample Barometric Pressure	68108	Industrial	1	☐	1/1	N/A	COM	059	mm (Hg)	780	Instrumental-On Site Sample Baro Pressure	SPM-Other
Sample Barometric Pressure	68108	Industrial	2	☐	1/3	N/A	COM	059	mm (Hg)	780	Instrumental-On Site Sample Baro Pressure	QA Collocated

Herculaneum, Dunklin High School — AQS Site Number 29-099-9002

1 Black Cat Dr., Herculaneum, MO, 63048

Latitude: 38.26703 ***AQCR:*** 070 Metropolitan St. Louis

Longitude: -90.37875 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 445

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective
Ambient Temperature	68105	Industrial	1	☐	1/3	N/A	COM	017	deg C	780	Instrumental-On Site Ambient Temperature	SPM-Other
Lead (TSP) - LC FRM/FEM	14129	Industrial	1	☐	1/3	NBR	COM	105	ug/m^3-LC	192	Inductive Coupled Plasma Spectrometry	Source Oriented & Population Exposure

Sample Barometric Pressure	68108	Industrial	1	☐	1/3	N/A	COM	059	mm (Hg)	780	Instrumental-On Site Sample Baro Pressure	SPM-Other

Herculaneum, North Cross — AQS Site Number 29-099-0023

North Cross, Herculaneum, MO 63048

Latitude: 38.263378 **AQCR:** 070 Metropolitan St. Louis

Longitude: -90.381122 **MSA:** 7040 St. Louis, MO-IL

Elevation (ft): 463

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective
Ambient Temperature	68105	Industrial	1	☐	1/6	N/A	COM	017	deg C	780	Instrumental-On Site Ambient Temperature	SPM-Other
Lead (TSP) - LC FRM/FEM	14129	Industrial	1	☐	1/6	NBR	COM	105	ug/m^3-LC	192	Inductive Coupled Plasma Spectrometry	Source Oriented & Population Exposure
Sample Barometric Pressure	68108	Industrial	1	☐	1/6	N/A	COM	059	mm (Hg)	780	Instrumental-On Site Sample Baro Pressure	SPM-Other

Herculaneum, Sherman — AQS Site Number 29-099-9004

460 Sherman St., Herculaneum, MO, 63048

Latitude: 38.27176 **AQCR:** 070 Metropolitan St. Louis

Longitude: -90.37648 **MSA:** 7040 St. Louis, MO-IL

Elevation (ft): 462

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective
Ambient Temperature	68105	Industrial	1	☐	1/6	N/A	COM	017	deg C	780	Instrumental-On Site Ambient Temperature	SPM-Other
Lead (TSP) - LC FRM/FEM	14129	Industrial	1	☐	1/6	NBR	COM	105	ug/m^3-LC	192	Inductive Coupled Plasma Spectrometry	Source Oriented

Sample Barometric Pressure	68108	Industrial	1	☐	1/6	N/A	COM	059	mm (Hg)	780	Instrumental-On Site Sample Baro Pressure	SPM-Other

Environmental Services Program (ESP)

Alba — AQS Site Number 29-097-0004

20400 Millwood Rd., Alba, MO 64755

Latitude: 37.2385 **AQCR:** 139 SW Missouri

Longitude: -94.42468 **MSA:** 3710 Joplin, MO

Elevation (ft): 965

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	SPM-Other
Ozone	44201	SLAMS	1	☐	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	Max Ozone Concentration & Population Exposure
Ozone	44201	SLAMS	2	☑	1	NBR	BACK-UP	007	ppm	047	Ultraviolet Photometric	-

Arnold West — AQS Site Number 29-099-0019

1709 Lonedell Dr., Arnold, MO 63010

Latitude: 38.448581 **AQCR:** 070 Metropolitan St. Louis

Longitude: -90.398436 **MSA:** 7040 St. Louis, MO-IL

Elevation (ft): 636

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective
Barometric Pressure	64101	SPM	1	☐	1	N/A	MET	059	mm (Hg)	014	Instrumental-Barometric Sensor	SPM-Other
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	SPM-Other

Outdoor Temperature	62101	SPM	1	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	SPM-Other
Ozone	44201	SLAMS	1	☐	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	Population Exposure
Ozone	44201	SLAMS	2	☑	1	NBR	BACK-UP	007	ppm	047	Ultraviolet Photometric	-
PM10 - LC FRM/FEM	85101	SLAMS	8	☐	1	NBR	COM	105	ug/m^3-LC	208	FMDS-Gravimetric 1405-DF	Population Exposure
PM10 - STP FRM/FEM	81102	SLAMS	3	☐	1	NBR	COM	001	ug/m^3	079	R&P SA246B TEOM	Population Exposure
PM10 - STP FRM/FEM	81102	SLAMS	8	☐	1	NBR	COM	105	ug/m^3-LC	208	FMDS-Gravimetric 1405-DF	Population Exposure
PM2.5 - LC FRM/FEM	88101	SLAMS	4	☐	1	NBR	COM	105	ug/m^3-LC	182	FMDS-Gravimetric 1405-DF	Population Exposure
PM2.5 Tot Atmospheric	88500	SPM	1	☐	1	NBR	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Population Exposure
PM2.5 Volatile Channel	88503	SPM	1	☐	1	NBR	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Population Exposure
PMCoarse - LC FRM/FEM	86101	SLAMS	8	☐	1	NBR	COM	105	ug/m^3-LC	207	FMDS-Gravimetric 1405-DF	Population Exposure
Relative Humidity	62201	SPM	1	☐	1	N/A	MET	019	%humidity	020	Instrumental-Computed (Indirect)	SPM-Other

Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	067	Instrumental: RM Young Model 05103	SPM-Other (10m Tower)
Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	012	mph	067	Instrumental: RM Young Model 05103	SPM-Other (10m Tower)

Bill's Creek — AQS Site Number 29-179-0001

0.75 mile S. of 3229 County Rd., Boss, MO 65440

Latitude: 37.53467 ***AQCR:*** 138 SE Missouri

Longitude: -91.14857 ***MSA:*** 0000 Not in a MSA

Elevation (ft): 996

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective
Ambient Temperature	68105	SPM	1	☐	1/6	N/A	COM	017	deg C	803	Instrumental-Off Site Ambient Temperature	SPM-Other
Lead (TSP) - LC FRM/FEM	14129	SLAMS	1	☐	1/6	NBR	COM	105	ug/m^3-LC	192	Inductive Coupled Plasma Spectrometry	Source Oriented
Sample Barometric Pressure	68108	SPM	1	☐	1/6	N/A	COM	059	mm (Hg)	803	Instrumental-Off Site Sample Baro Pressure	SPM-Other

Blair Street — AQS Site Number 29-510-0085

3247 Blair Street, St. Louis, MO 63107

Latitude: 38.656449 ***AQCR:*** 070 Metropolitan St. Louis

Longitude: -90.198548 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 450

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective
Ambient Temperature	68105	SLAMS	1	☐	1/1	N/A	COM	017	deg C	145	R&P 2025 Sequential w/VSCC	SPM-Other

Ambient Temperature	68105	SLAMS	2	☐	1/6	N/A	COM	017	deg C	145	R&P 2025 Sequential w/VSCC	QA Collocated
Ambient Temperature	68105	SLAMS	3	☐	1/3	N/A	COM	017	deg C	127	Lo-Vol R&P 2025 Sequential	SPM-Other
Ambient Temperature	68105	SLAMS	4	☐	1/6	N/A	COM	017	deg C	127	Lo-Vol R&P 2025 Sequential	QA Collocated
Ambient Temperature	68105	SLAMS	7	☐	1/6	N/A	COM	017	deg C	780	Instrumental-On Site Ambient Temperature	SPM-Other
Antimony	85102	SPM	1	☐	1	NBR	RES	108	ng/m^3-LC	820	Cooper Environmental Service Model Xact 620	SPM-Other
Arsenic PM10 LC	85103	SPM	1	☐	1	NBR	RES	108	ng/m^3-LC	820	Cooper Environmental Service Model Xact 620	SPM-Other
Barium PM10 LC	85107	SPM	1	☐	1	NBR	RES	108	ng/m^3-LC	820	Cooper Environmental Service Model Xact 620	SPM-Other
Barometric Pressure	64101	SLAMS	1	☐	1	N/A	MET	059	mm (Hg)	014	Instrumental-Barometric Sensor	SPM-Other
Black Carbon PM2.5 STP	84313	SLAMS	1	☐	1	NBR	RES	001	ug/m^3	894	Magee Scientific TAPI M633 Aethalometer	Population Exposure
Bromine PM10 LC	85109	SPM	1	☐	1	NBR	RES	108	ng/m^3-LC	820	Cooper Environmental Service Model Xact 620	SPM-Other
Cadmium PM10 LC	85110	SPM	1	☐	1	NBR	RES	108	ng/m^3-LC	820	Cooper Environmental Service Model Xact 620	SPM-Other

Calcium PM10 LC	85111	SPM	1	☐	1	NBR	RES	108	ng/m^3-LC	820	Cooper Environmental Service Model Xact 620	SPM-Other
Carbon Monoxide	42101	NCORE	1	☐	1	NBR	COM	007	ppm	055	Gas Filter Corr Thermo Electron	Population Exposure
Chromium PM10 LC	85112	SPM	1	☐	1	NBR	RES	108	ng/m^3-LC	820	Cooper Environmental Service Model Xact 620	SPM-Other
Cobalt PM10 LC	85113	SPM	1	☐	1	NBR	RES	108	ng/m^3-LC	820	Cooper Environmental Service Model Xact 620	SPM-Other
Copper PM10 LC	85114	SPM	1	☐	1	NBR	RES	108	ng/m^3-LC	820	Cooper Environmental Service Model Xact 620	SPM-Other
EC CSN Unadj PM2.5 LC TOT	88307	SLAMS	1	☐	1	NBR	RES	105	ug/m^3-LC	867	Sunset Labs	Population Exposure
Indoor Temperature	62107	SLAMS	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	Other (Large Shelter)
Iron PM10 LC	85126	SPM	1	☐	1	NBR	RES	108	ng/m^3-LC	820	Cooper Environmental Service Model Xact 620	SPM-Other
Lead (TSP) - LC FRM/FEM	14129	NCORE	1	☐	1/6	NBR	COM	105	ug/m^3-LC	192	Inductive Coupled Plasma Spectrometry	Population Exposure
Lead PM10 LC	85128	SPM	1	☐	1	NBR	RES	108	ng/m^3-LC	820	Cooper Environmental Service Model Xact 620	SPM-Other
Manganese PM10 LC	85132	SPM	1	☐	1	NBR	RES	108	ng/m^3-LC	820	Cooper Environmental Service Model Xact 620	SPM-Other

Mercury PM10 LC	85142	SPM	1	☐	1	NBR	RES	108	ng/m^3-LC	820	Cooper Environmental Service Model Xact 620	SPM-Other
Nickel PM10 LC	85136	SPM	1	☐	1	NBR	RES	108	ng/m^3-LC	820	Cooper Environmental Service Model Xact 620	SPM-Other
Nitric Oxide	42601	NCORE	1	☐	1	NBR	COM	008	ppb	699	Teledyne API 200 EU/501	Population Exposure
Nitric Oxide	42601	SPM	2	☐	1	NBR	COM	008	ppb	200	Teledyne API T200UP Photolytic	Population Exposure
Nitrogen Dioxide	42602	SPM	2	☐	1	NBR	COM	008	ppb	200	Teledyne API T200UP Photolytic	Population Exposure
OC CSN Unadj PM2.5 LC TOT	88305	SLAMS	1	☐	1	NBR	RES	105	ug/m^3-LC	867	Sunset Labs	Population Exposure
Optical EC PM2.5 LC TOT	88316	SLAMS	1	☐	1	NBR	RES	105	ug/m^3-LC	895	Sunset Lab	Population Exposure
Outdoor Temperature	62101	NCORE	1	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	SPM-Other
Oxides of Nitrogen	42603	SPM	2	☐	1	NBR	COM	008	ppb	200	Teledyne API T200UP Photolytic	Population Exposure
Ozone	44201	NCORE	1	☐	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	Population Exposure
Ozone	44201	NCORE	2	☑	1	NBR	BACK-UP	007	ppm	047	Ultraviolet Photometric	-

PM10 - LC FRM/FEM	85101	SLAMS	1	☐	1/3	NBR	COM	105	ug/m^3-LC	127	Lo-Vol R&P 2025 Sequential	Population Exposure
PM10 - LC FRM/FEM	85101	SLAMS	2	☐	1/6	NBR	COM	105	ug/m^3-LC	127	Lo-Vol R&P 2025 Sequential	QA Collocated
PM10 - LC FRM/FEM	85101	SLAMS	8	☐	1	NBR	COM	105	ug/m^3-LC	208	FMDS-Gravimetric 1405-DF	Population Exposure
PM10 - STP FRM/FEM	81102	SLAMS	1	☐	1/3	NBR	COM	001	ug/m^3	127	Lo-Vol R&P 2025 Sequential	Population Exposure
PM10 - STP FRM/FEM	81102	SLAMS	2	☐	1/6	NBR	COM	001	ug/m^3	127	Lo-Vol R&P 2025 Sequential	QA Collocated
PM10 - STP FRM/FEM	81102	SLAMS	8	☐	1	NBR	COM	105	ug/m^3-LC	208	FMDS-Gravimetric 1405-DF	Population Exposure
PM2.5 - LC FRM/FEM	88101	NCORE	1	☐	1/1	NBR	COM	105	ug/m^3-LC	145	R&P 2025 Sequential w/VSCC	Population Exposure
PM2.5 - LC FRM/FEM	88101	NCORE	2	☐	1/6	NBR	COM	105	ug/m^3-LC	145	R&P 2025 Sequential w/VSCC	QA Collocated
PM2.5 - LC FRM/FEM	88101	SLAMS	4	☐	1	NBR	COM	105	ug/m^3-LC	182	FMDS-Gravimetric 1405-DF	Population Exposure
PM2.5 Tot Atmospheric	88500	SLAMS	1	☐	1	NBR	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Population Exposure
PM2.5 Volatile Channel	88503	SLAMS	1	☐	1	NBR	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Population Exposure

PMCoarse - LC FRM/FEM	86101	SLAMS	1	☐	1/3	NBR	COM	105	ug/m^3-LC	176	Thermo 2025 Sequential PM10-PM2.5	Population Exposure
PMCoarse - LC FRM/FEM	86101	SLAMS	2	☐	1/6	NBR	COM	105	ug/m^3-LC	176	Thermo 2025 Sequential PM10-PM2.5	QA Collocated
PMCoarse - LC FRM/FEM	86101	SLAMS	8	☐	1	NBR	COM	105	ug/m^3-LC	207	FMDS-Gravimetric 1405-DF	Population Exposure
Potassium PM10 LC	85180	SPM	1	☐	1	NBR	RES	108	ng/m^3-LC	820	Cooper Environmental Service Model Xact 620	SPM-Other
Reactive Oxides of N (NOY)	42600	NCORE	1	☐	1	NBR	COM	008	ppb	699	Teledyne API 200 EU/501	Population Exposure
Relative Humidity	62201	NCORE	1	☐	1	N/A	MET	019	%humidity	014	Instrumental-Hygromer C94 Probe	SPM-Other
Sample Barometric Pressure	68108	SLAMS	1	☐	1/1	N/A	COM	059	mm (Hg)	145	R&P 2025 Sequential w/VSCC	SPM-Other
Sample Barometric Pressure	68108	SLAMS	2	☐	1/6	N/A	COM	059	mm (Hg)	145	R&P 2025 Sequential w/VSCC	QA Collocated
Sample Barometric Pressure	68108	SLAMS	3	☐	1/3	N/A	COM	059	mm (Hg)	127	Lo-Vol R&P 2025 Sequential	SPM-Other
Sample Barometric Pressure	68108	SLAMS	4	☐	1/6	N/A	COM	059	mm (Hg)	127	Lo-Vol R&P 2025 Sequential	QA Collocated
Sample Barometric Pressure	68108	SLAMS	7	☐	1/6	N/A	COM	059	mm (Hg)	780	Instrumental-On Site Sample Baro Pressure	SPM-Other

Selenium PM10 LC	85154	SPM	1	☐	1	NBR	RES	108	ng/m^3-LC	820	Cooper Environmental Service Model Xact 620	SPM-Other
Silver PM10 LC	85166	SPM	1	☐	1	NBR	RES	108	ng/m^3-LC	820	Cooper Environmental Service Model Xact 620	SPM-Other
Solar Radiation	63301	SLAMS	1	☐	1	N/A	MET	079	W/m^2	011	Instrumental-Pyranometer	SPM-Other
Sulfur Dioxide	42401	NCORE	1	☐	1	NBR	COM	008	ppb	600	Ultraviolet Fluorenscence API 100 EU	Population Exposure
Sulfur Dioxide Max 5-min Avg	42406	NCORE	1	☐	1	NBR	COM	008	ppb	600	Ultraviolet Fluorenscence API 100 EU	Population Exposure
Thallium PM10 LC	85173	SPM	1	☐	1	NBR	RES	108	ng/m^3-LC	820	Cooper Environmental Service Model Xact 620	SPM-Other
Tin PM10 LC	85160	SPM	1	☐	1	NBR	RES	108	ng/m^3-LC	820	Cooper Environmental Service Model Xact 620	SPM-Other
Titanium PM10 LC	85161	SPM	1	☐	1	NBR	RES	108	ng/m^3-LC	820	Cooper Environmental Service Model Xact 620	SPM-Other
Total Carbon PM2.5 LC TOT	88312	SLAMS	1	☐	1	NBR	RES	105	ug/m^3-LC	867	Sunset Labs	Population Exposure
UV Carbon PM2.5 STP	84314	SLAMS	1	☐	1	NBR	RES	001	ug/m^3	894	Magee Scientific TAPI M633 Aethalometer	Population Exposure
Vanadium PM10 LC	85164	SPM	1	☐	1	NBR	RES	108	ng/m^3-LC	820	Cooper Environmental Service Model Xact 620	SPM-Other

WD - Sigma Theta (Horizontal)	61106	SPM	1	☐	1	N/A	MET	014	deg	020	Arithmetic Standard Deviation	SPM-Other (10m Tower)
Wind Direction - Resultant	61104	NCORE	1	☐	1	N/A	MET	014	deg	065	Instrumental: RM Young Model 05305	SPM-Other (10m Tower)
Wind Speed - Resultant	61103	NCORE	1	☐	1	N/A	MET	012	mph	065	Instrumental: RM Young Model 05305	SPM-Other (10m Tower)
Zinc PM10 LC	85167	SPM	1	☐	1	NBR	RES	108	ng/m^3-LC	820	Cooper Environmental Service Model Xact 620	SPM-Other

Blue Ridge, I-70 — *AQS Site Number* **29-095-0042**

4018 Harvard Lane, Kansas City, MO 64133

Latitude: 39.047911 ***AQCR:*** 094 Metropolitan Kansas City

Longitude: -94.450513 ***MSA:*** 3760 Kansas City, MO-KS

Elevation (ft): 960

Pollutant	*AQS Code*	*Monitor-Type*	*POC*	*Back-Up*	*Freq*	*Scale*	*State-Obj*	*Unit-Code*	*Unit*	*Method-Code*	*Method*	*Monitor-Objective*
Barometric Pressure	64101	SPM	1	☐	1	N/A	MET	059	mm (Hg)	014	Instrumental-Barometric Sensor	SPM-Other
Black Carbon PM2.5 STP	84313	SPM	1	☐	1	MIC	COM	001	ug/m^3	894	Magee Scientific TAPI M633 Aethalometer	Source Oriented
Carbon Monoxide	42101	SPM	1	☐	1	MIC	COM	007	ppm	055	Gas Filter Corr Thermo Electron	Source Oriented
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	SPM-Other

Nitric Oxide	42601	SPM	1	☐	1	MIC	COM	008	ppb	074	Chemiluminescence	Source Oriented
Nitrogen Dioxide	42602	SLAMS	1	☐	1	MIC	COM	008	ppb	074	Chemiluminescence	Source Oriented
Outdoor Temperature	62101	SPM	1	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	SPM-Other (4m Probe Height)
Outdoor Temperature	62101	SPM	2	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	SPM-Other (10m Probe Height)
Outdoor Temperature	62101	SPM	3	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	SPM-Other (2m Probe Height)
Outdoor Temperature Diff	62106	SPM	1	☐	1	N/A	MET	116	Temp Diff deg C	041	Instrumental: Elect or Mach Avg Lev 2-Lev1	SPM-Other (10m - 2m Probe Height)
Oxides of Nitrogen	42603	SPM	1	☐	1	MIC	COM	008	ppb	074	Chemiluminescence	Source Oriented
PM10 - LC FRM/FEM	85101	SLAMS	8	☐	1	MIC	COM	105	ug/m^3-LC	208	FMDS-Gravimetric 1405-DF	Source Oriented
PM10 - STP FRM/FEM	81102	SLAMS	8	☐	1	MIC	COM	105	ug/m^3-LC	208	FMDS-Gravimetric 1405-DF	Source Oriented
PM2.5 - LC FRM/FEM	88101	SPM	4	☐	1	MIC	COM	105	ug/m^3-LC	182	FMDS-Gravimetric 1405-DF	Source Oriented
PM2.5 Tot Atmospheric	88500	SPM	1	☐	1	MIC	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Source Oriented

PM2.5 Volatile Channel	88503	SPM	1	☐	1	MIC	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Source Oriented
PMCoarse - LC FRM/FEM	86101	SLAMS	8	☐	1	MIC	COM	105	ug/m^3-LC	207	FMDS-Gravimetric 1405-DF	Source Oriented
Precipitation	65102	SPM	1	☐	1	N/A	MET	021	inches	011	Bucket	SPM-Other
Relative Humidity	62201	SPM	1	☐	1	N/A	MET	019	%humidity	020	Instrumental-Computed (Indirect)	SPM-Other
Solar Radiation	63301	SPM	1	☐	1	N/A	MET	079	W/m^2	011	Instrumental-Pyranometer	SPM-Other
UV Carbon PM2.5 STP	84314	SPM	1	☐	1	MIC	COM	001	ug/m^3	894	Magee Scientific TAPI M633 Aethalometer	Source Oriented
WD - Sigma Theta (Horizontal)	61106	SPM	1	☐	1	N/A	MET	014	deg	020	Arithmetic Standard Deviation	SPM-Other (10m Tower)
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	065	Instrumental: RM Young Model 05305	SPM-Other (10m Tower)
Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	012	mph	065	Instrumental: RM Young Model 05305	SPM-Other (10m Tower)

Bonne Terre — AQS Site Number 29-186-0005

15797 Highway D, Bonne Terre, MO 63628

Latitude: 37.90084 **AQCR:** 138 SE Missouri

Longitude: -90.42388 **MSA:** 0000 Not in a MSA

Elevation (ft): 840

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	SPM-Other
Ozone	44201	SLAMS	1	☐	1	REG	COM	007	ppm	047	Ultraviolet Photometric	Regional Transport
Ozone	44201	SLAMS	2	☑	1	REG	BACK-UP	007	ppm	047	Ultraviolet Photometric	-
Solar Radiation	63301	SPM	1	☐	1	N/A	MET	079	W/m^2	011	Instrumental-Pyranometer	SPM-Other
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	067	Instrumental: RM Young Model 05103	SPM-Other (5.5 meters)
Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	012	mph	067	Instrumental: RM Young Model 05103	SPM-Other (5.5 meters)

Branch Street — AQS Site Number 29-510-0093

100 Branch St., St. Louis, MO 63102

Latitude: 38.65643 **AQCR:** 070 Metropolitan St. Louis

Longitude: -90.18977 **MSA:** 7040 St. Louis, MO-IL

Elevation (ft): 422

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective

Barometric Pressure	64101	SPM	1	☐	1	N/A	MET	059	mm (Hg)	014	Instrumental-Barometric Sensor	SPM-Other
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	SPM-Other
Outdoor Temperature	62101	SPM	1	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	SPM-Other
PM10 - LC FRM/FEM	85101	SLAMS	8	☐	1	MID	COM	105	ug/m^3-LC	208	FMDS-Gravimetric 1405-DF	Source Oriented
PM10 - STP FRM/FEM	81102	SLAMS	3	☐	1	MID	COM	001	ug/m^3	079	R&P SA246B TEOM	Source Oriented
PM10 - STP FRM/FEM	81102	SLAMS	8	☐	1	MID	COM	105	ug/m^3-LC	208	FMDS-Gravimetric 1405-DF	Source Oriented
PM2.5 - LC FRM/FEM	88101	SLAMS	4	☐	1	MID	COM	105	ug/m^3-LC	182	FMDS-Gravimetric 1405-DF	Source Oriented
PM2.5 Tot Atmospheric	88500	SPM	1	☐	1	MID	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Source Oriented
PM2.5 Volatile Channel	88503	SPM	1	☐	1	MID	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Source Oriented
PMCoarse - LC FRM/FEM	86101	SLAMS	8	☐	1	MID	COM	105	ug/m^3-LC	207	FMDS-Gravimetric 1405-DF	Source Oriented
Relative Humidity	62201	SPM	1	☐	1	N/A	MET	019	%humidity	020	Instrumental-Computed (Indirect)	SPM-Other

WD - Sigma Theta (Horizontal)	61106	SPM	1	☐	1	N/A	MET	014	deg	020	Arithmetic Standard Deviation	SPM-Other (10m Tower)
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	065	Instrumental: RM Young Model 05305	SPM-Other (10m Tower)
Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	012	mph	065	Instrumental: RM Young Model 05305	SPM-Other (10m Tower)

Branson — AQS Site Number 29-213-0004

251 SW. Outer Rd., Branson, MO 65616

Latitude: 36.70765 ***AQCR:*** 139 SW Missouri

Longitude: -93.22181 ***MSA:*** 0000 Not in a MSA

Elevation (ft): 1052

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	SPM-Other
Ozone	44201	SPM	1	☐	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	Max Ozone Concentration & Population Exposure
Ozone	44201	SPM	2	☑	1	NBR	BACK-UP	007	ppm	047	Ultraviolet Photometric	-
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	067	Instrumental: RM Young Model 05103	SPM-Other (5.5 meters)
Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	012	mph	067	Instrumental: RM Young Model 05103	SPM-Other (5.5 meters)

Buick NE

AQS Site Number 29-093-0034

346 Power Lane, Bixby West, MO 65439

Latitude: 37.65212 **AQCR:** 138 SE Missouri

Longitude: -91.11653 **MSA:** 0000 Not in a MSA

Elevation (ft): 1458

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective
Ambient Temperature	68105	SPM	1	☐	1/6	N/A	COM	017	deg C	780	Instrumental-On Site Ambient Temperature	SPM-Other
Ambient Temperature	68105	SPM	2	☐	1/6	N/A	COM	017	deg C	780	Instrumental-On Site Ambient Temperature	QA Collocated
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	SPM-Other
Lead (TSP) - LC FRM/FEM	14129	SLAMS	1	☐	1/6	MID	COM	105	ug/m^3-LC	192	Inductive Coupled Plasma Spectrometry	Source Oriented & Highest Concentration
Lead (TSP) - LC FRM/FEM	14129	SLAMS	2	☐	1/6	MID	COM	105	ug/m^3-LC	192	Inductive Coupled Plasma Spectrometry	QA Collocated
Sample Barometric Pressure	68108	SPM	1	☐	1/6	N/A	COM	059	mm (Hg)	780	Instrumental-On Site Sample Baro Pressure	SPM-Other
Sample Barometric Pressure	68108	SPM	2	☐	1/6	N/A	COM	059	mm (Hg)	780	Instrumental-On Site Sample Baro Pressure	QA Collocated
Sulfur Dioxide	42401	SPM	1	☐	1	MID	COM	008	ppb	060	Pulsed Fluorescent	Source Oriented

Sulfur Dioxide Max 5-min Avg	42406	SPM	1	☐	1	MID	COM	008	ppb	060	Pulsed Fluorescent	Source Oriented
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	067	Instrumental: RM Young Model 05103	SPM-Other (6 meters)
Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	012	mph	067	Instrumental: RM Young Model 05103	SPM-Other (6 meters)

Carthage — AQS Site Number 29-097-0003

530 Juniper, Carthage, MO 64836

Latitude: 37.19822 ***AQCR:*** 139 SW Missouri

Longitude: -94.31702 ***MSA:*** 3710 Joplin, MO

Elevation (ft): 986

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	SPM-Other
PM10 - STP FRM/FEM	81102	SLAMS	3	☐	1	MID	COM	001	ug/m^3	079	R&P SA246B TEOM	Source Oriented
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	065	Instrumental: RM Young Model 05305	SPM-Other (5.5 meters)
Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	012	mph	065	Instrumental: RM Young Model 05305	SPM-Other (5.5 meters)

El Dorado Springs — AQS Site Number 29-039-0001

Highway 97 & Barnes Road, El Dorado Springs, MO 64744

Latitude: 37.70097 ***AQCR:*** 139 SW Missouri

Longitude: -94.03474 ***MSA:*** 0000 Not in a MSA

Elevation (ft): 965

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective
Barometric Pressure	64101	SPM	1	☐	1	N/A	MET	059	mm (Hg)	014	Instrumental-Barometric Sensor	SPM-Other
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	SPM-Other
Outdoor Temperature	62101	SPM	1	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	SPM-Other
Ozone	44201	SLAMS	1	☐	1	REG	COM	007	ppm	047	Ultraviolet Photometric	Regional Transport
Ozone	44201	SLAMS	2	☑	1	REG	BACK-UP	007	ppm	047	Ultraviolet Photometric	-
PM10 - LC FRM/FEM	85101	SLAMS	8	☐	1	REG	COM	105	ug/m^3-LC	208	FMDS-Gravimetric 1405-DF	Regional Transport
PM10 - STP FRM/FEM	81102	SLAMS	8	☐	1	REG	COM	105	ug/m^3-LC	208	FMDS-Gravimetric 1405-DF	Regional Transport
PM2.5 - LC FRM/FEM	88101	SLAMS	4	☐	1	REG	COM	105	ug/m^3-LC	182	FMDS-Gravimetric 1405-DF	Regional Transport

PM2.5 Tot Atmospheric	88500	SPM	1	☐	1	REG	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Regional Transport
PM2.5 Volatile Channel	88503	SPM	1	☐	1	REG	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Regional Transport
PMCoarse - LC FRM/FEM	86101	SLAMS	8	☐	1	REG	COM	105	ug/m^3-LC	207	FMDS-Gravimetric 1405-DF	Regional Transport
Relative Humidity	62201	SPM	1	☐	1	N/A	MET	019	%humidity	020	Instrumental-Computed (Indirect)	SPM-Other
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	067	Instrumental: RM Young Model 05103	SPM-Other (5.5 meters)
Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	012	mph	067	Instrumental: RM Young Model 05103	SPM-Other (5.5 meters)

Farrar — *AQS Site Number* **29-157-0001**

County Rd. 342, Farrar, MO 63746

Latitude: 37.70264 ***AQCR:*** 138 SE Missouri

Longitude: -89.698640 ***MSA:*** 0000 Not in a MSA

Elevation (ft): 497

Pollutant	*AQS Code*	*Monitor-Type*	*POC*	*Back-Up*	*Freq*	*Scale*	*State-Obj*	*Unit-Code*	*Unit*	*Method-Code*	*Method*	*Monitor-Objective*
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	SPM-Other
Ozone	44201	SLAMS	1	☐	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	Max Ozone Concentration & Extreme Downwind

Ozone	44201	SLAMS	2	☑	1	NBR	BACK-UP	007	ppm	047	Ultraviolet Photometric	-
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	067	Instrumental: RM Young Model 05103	SPM-Other (5.5 meters)
Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	012	mph	067	Instrumental: RM Young Model 05103	SPM-Other (5.5 meters)

Fellows Lake — AQS Site Number 29-077-0042

4208 E. Farm Rd. 66, Springfield, MO 65803

Latitude: 37.319444 ***AQCR:*** 139 SW Missouri

Longitude: -93.204444 ***MSA:*** 7920 Springfield, MO

Elevation (ft): 1346

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	SPM-Other
Ozone	44201	SLAMS	1	☐	1	URB	COM	007	ppm	047	Ultraviolet Photometric	Max Ozone Concentration & Population Exposure
Ozone	44201	SLAMS	2	☑	1	URB	BACK-UP	007	ppm	047	Ultraviolet Photometric	-

Finger Lakes — AQS Site Number 29-019-0011

1505 E. Peabody Road, Columbia, MO 65202

Latitude: 39.07803 ***AQCR:*** 137 Northern Missouri

Longitude: -92.31632 ***MSA:*** 1740 Columbia, MO

Elevation (ft): 726

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective

Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	SPM-Other
Ozone	44201	SLAMS	1	☐	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	Max Ozone Concentration & Population Exposure
Ozone	44201	SLAMS	2	☑	1	NBR	BACK-UP	007	ppm	047	Ultraviolet Photometric	-

Fletcher — AQS Site Number 29-179-0002

Forest Rd. 2236, Westfork, MO 64498

Latitude: 37.46889 ***AQCR:*** 138 SE Missouri

Longitude: -91.08847 ***MSA:*** 0000 Not in a MSA

Elevation (ft): 1256

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective
Ambient Temperature	68105	SPM	1	☐	1/6	N/A	COM	017	deg C	803	Instrumental-Off Site Ambient Temperature	SPM-Other
Lead (TSP) - LC FRM/FEM	14129	SLAMS	1	☐	1/6	NBR	COM	105	ug/m^3-LC	192	Inductive Coupled Plasma Spectrometry	Source Oriented
Sample Barometric Pressure	68108	SPM	1	☐	1/6	N/A	COM	059	mm (Hg)	803	Instrumental-Off Site Sample Baro Pressure	SPM-Other

Foley — AQS Site Number 29-113-0003

#7 Wild Horse, Foley, MO 63347

Latitude: 39.0447 ***AQCR:*** 137 Northern Missouri

Longitude: -90.8647 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 715

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective

Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	SPM-Other
Ozone	44201	SLAMS	1	☐	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	Extreme Downwind
Ozone	44201	SLAMS	2	☑	1	NBR	BACK-UP	007	ppm	047	Ultraviolet Photometric	-
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	067	Instrumental: RM Young Model 05103	SPM-Other (5.5 meters)
Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	012	mph	067	Instrumental: RM Young Model 05103	SPM-Other (5.5 meters)

Forest City, Exide Levee — *AQS Site Number* **29-087-0008**

300 S. Washington St., Oregon MO, 64473

Latitude: 40.027222 ***AQCR:*** 137 Northern Missouri

Longitude: -95.235833 ***MSA:*** 0000 Not in a MSA

Elevation (ft): 904

Pollutant	*AQS Code*	*Monitor-Type*	*POC*	*Back-Up*	*Freq*	*Scale*	*State-Obj*	*Unit-Code*	*Unit*	*Method-Code*	*Method*	*Monitor-Objective*
Ambient Temperature	68105	SPM	3	☐	1/6	N/A	COM	017	deg C	803	Instrumental-Off Site Ambient Temperature	SPM-Other
Lead (TSP) - LC FRM/FEM	14129	SLAMS	1	☐	1/6	MID	COM	105	ug/m^3-LC	192	Inductive Coupled Plasma Spectrometry	Source Oriented
Sample Barometric Pressure	68108	SPM	3	☐	1/6	N/A	COM	059	mm (Hg)	803	Instrumental-Off Site Sample Baro Pressure	SPM-Other

Forest Park — AQS Site Number 29-510-0094

5600 Clayton Avenue, St. Louis, MO 63110

Latitude: 38.631057 **AQCR:** 070 Metropolitan St. Louis

Longitude: -90.281144 **MSA:** 7040 St. Louis, MO-IL

Elevation (ft): 531

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective
Barometric Pressure	64101	SPM	1	☐	1	N/A	MET	059	mm (Hg)	014	Instrumental-Barometric Sensor	SPM-Other
Black Carbon PM2.5 STP	84313	SPM	1	☐	1	MIC	COM	001	ug/m^3	894	Magee Scientific TAPI M633 Aethalometer	Source Oriented
Carbon Monoxide	42101	SPM	1	☐	1	MIC	COM	007	ppm	055	Gas Filter Corr Thermo Electron	Source Oriented
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	SPM-Other
Nitric Oxide	42601	SPM	1	☐	1	MIC	COM	008	ppb	074	Chemiluminescence	Source Oriented
Nitric Oxide	42601	SPM	2	☐	1	MIC	COM	008	ppb	200	Teledyne API T200UP Photolytic	Source Oriented
Nitrogen Dioxide	42602	SLAMS	1	☐	1	MIC	COM	008	ppb	074	Chemiluminescence	Source Oriented
Nitrogen Dioxide	42602	SPM	2	☐	1	MIC	COM	008	ppb	200	Teledyne API T200UP Photolytic	Source Oriented

Nitrogen Dioxide	42602	SPM	3	☐	1	MIC	COM	008	ppb	212	Teledyne Model T500U-Direct NO2	Source Oriented
Outdoor Temperature	62101	SPM	1	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	SPM-Other (4m Probe Height)
Outdoor Temperature	62101	SPM	2	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	SPM-Other (10m Probe Height)
Outdoor Temperature	62101	SPM	3	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	SPM-Other (2m Probe Height)
Outdoor Temperature Diff	62106	SPM	1	☐	1	N/A	MET	116	Temp Diff deg C	041	Instrumental: Elect or Mach Avg Lev 2-Lev1	SPM-Other (10m - 2m Probe Height)
Oxides of Nitrogen	42603	SPM	1	☐	1	MIC	COM	008	ppb	074	Chemiluminescence	Source Oriented
Oxides of Nitrogen	42603	SPM	2	☐	1	MIC	COM	008	ppb	200	Teledyne API T200UP Photolytic	Source Oriented
PM10 - LC FRM/FEM	85101	SLAMS	8	☐	1	MIC	COM	105	ug/m^3-LC	208	FMDS-Gravimetric 1405-DF	Source Oriented
PM10 - STP FRM/FEM	81102	SLAMS	8	☐	1	MIC	COM	105	ug/m^3-LC	208	FMDS-Gravimetric 1405-DF	Source Oriented
PM2.5 - LC FRM/FEM	88101	SPM	4	☐	1	MIC	COM	105	ug/m^3-LC	182	FMDS-Gravimetric 1405-DF	Source Oriented
PM2.5 Tot Atmospheric	88500	SPM	1	☐	1	MIC	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Source Oriented

PM2.5 Volatile Channel	88503	SPM	1	☐	1	MIC	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Source Oriented
PMCoarse - LC FRM/FEM	86101	SLAMS	8	☐	1	MIC	COM	105	ug/m^3-LC	207	FMDS-Gravimetric 1405-DF	Source Oriented
Precipitation	65102	SPM	1	☐	1	N/A	MET	021	inches	011	Bucket	SPM-Other
Relative Humidity	62201	SPM	1	☐	1	N/A	MET	019	%humidity	020	Instrumental-Computed (Indirect)	SPM-Other
Solar Radiation	63301	SLAMS	1	☐	1	N/A	MET	079	W/m^2	011	Instrumental-Pyranometer	SPM-Other
UV Carbon PM2.5 STP	84314	SPM	1	☐	1	MIC	COM	001	ug/m^3	894	Magee Scientific TAPI M633 Aethalometer	Source Oriented
WD - Sigma Theta (Horizontal)	61106	SPM	1	☐	1	N/A	MET	014	deg	020	Arithmetic Standard Deviation	SPM-Other (10m Tower)
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	065	Instrumental: RM Young Model 05305	SPM-Other (10m Tower)
Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	012	mph	065	Instrumental: RM Young Model 05305	SPM-Other (10m Tower)

Front Street — AQS Site Number 29-095-0018

1331 N. Jackson, Kansas City, MO 64120

Latitude: 39.13198 **AQCR:** 094 Metropolitan Kansas City

Longitude: -94.53128 **MSA:** 3760 Kansas City, MO-KS

Elevation (ft): 728

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	SPM-Other
PM10 - STP FRM/FEM	81102	SLAMS	3	☐	1	NBR	COM	001	ug/m^3	079	R&P SA246B TEOM	Highest Concentration & Population Exposure

Glover — AQS Site Number 29-093-0033

Highway 49, approx. 0.4m South Highways 21/49/72 Intersection, Glover, 63620

Latitude: 37.48964 **AQCR:** 138 SE Missouri

Longitude: -90.69247 **MSA:** 0000 Not in a MSA

Elevation (ft): 881

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective
Ambient Temperature	68105	SPM	1	☐	1/6	N/A	COM	017	deg C	803	Instrumental-Off Site Ambient Temperature	SPM-Other
Lead (TSP) - LC FRM/FEM	14129	SLAMS	1	☐	1/6	NBR	COM	105	ug/m^3-LC	192	Inductive Coupled Plasma Spectrometry	Source Oriented
Sample Barometric Pressure	68108	SPM	1	☐	1/6	N/A	COM	059	mm (Hg)	803	Instrumental-Off Site Sample Baro Pressure	SPM-Other

Herculaneum, Dunklin High School — AQS Site Number 29-099-0005

1 Black Cat Dr., Herculaneum, MO, 63048

Latitude: 38.26703 **AQCR:** 070 Metropolitan St. Louis

Longitude: -90.37875 **MSA:** 7040 St. Louis, MO-IL

Elevation (ft): 445

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective
Ambient Temperature	68105	SPM	1	☐	1/3	N/A	COM	017	deg C	780	Instrumental-On Site Ambient Temperature	SPM-Other
Lead (TSP) - LC FRM/FEM	14129	SLAMS	1	☐	1/3	NBR	COM	105	ug/m^3-LC	192	Inductive Coupled Plasma Spectrometry	Source Oriented & Population Exposure
Sample Barometric Pressure	68108	SPM	1	☐	1/3	N/A	COM	059	mm (Hg)	780	Instrumental-On Site Sample Baro Pressure	SPM-Other

Herculaneum, Mott Street — AQS Site Number 29-099-0027

Mott Street, Herculaneum, MO, 63048

Latitude: 38.263394 **AQCR:** 070 Metropolitan St. Louis

Longitude: -90.379667 **MSA:** 7040 St. Louis, MO-IL

Elevation (ft): 468

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective
Ambient Temperature	68105	SPM	1	☐	1/1	N/A	COM	017	deg C	780	Instrumental-On Site Ambient Temperature	SPM-Other
Ambient Temperature	68105	SPM	2	☐	1/2	N/A	COM	017	deg C	780	Instrumental-On Site Ambient Temperature	QA Collocated
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	SPM-Other

Lead (TSP) - LC FRM/FEM	14129	SLAMS	1	☐	1/1	MID	COM	105	ug/m^3-LC	192	Inductive Coupled Plasma Spectrometry	Source Oriented & Highest Concentration
Lead (TSP) - LC FRM/FEM	14129	SLAMS	2	☐	1/2	MID	COM	105	ug/m^3-LC	192	Inductive Coupled Plasma Spectrometry	QA Collocated
Sample Barometric Pressure	68108	SPM	1	☐	1/1	N/A	COM	059	mm (Hg)	780	Instrumental-On Site Sample Baro Pressure	SPM-Other
Sample Barometric Pressure	68108	SPM	2	☐	1/2	N/A	COM	059	mm (Hg)	780	Instrumental-On Site Sample Baro Pressure	QA Collocated
Sulfur Dioxide	42401	SLAMS	1	☐	1	MID	COM	008	ppb	060	Pulsed Fluorescent	Source Oriented & Highest Concentration
Sulfur Dioxide Max 5-min Avg	42406	SPM	1	☐	1	MID	COM	008	ppb	060	Pulsed Fluorescent	Source Oriented & Highest Concentration
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	067	Instrumental: RM Young Model 05103	SPM-Other (5.5 meters)
Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	012	mph	067	Instrumental: RM Young Model 05103	SPM-Other (5.5 meters)

Herculaneum, Sherman — *AQS Site Number* **29-099-0013**

460 Sherman St., Herculaneum, MO, 63048

Latitude: 38.27176 ***AQCR:*** 070 Metropolitan St. Louis

Longitude: -90.37648 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 462

Pollutant	*AQS Code*	*Monitor-Type*	*POC*	*Back-Up*	*Freq*	*Scale*	*State-Obj*	*Unit-Code*	*Unit*	*Method-Code*	*Method*	*Monitor-Objective*
Ambient Temperature	68105	SPM	1	☐	1/3	N/A	COM	017	deg C	780	Instrumental-On Site Ambient Temperature	SPM-Other

Lead (TSP) - LC FRM/FEM	14129	SLAMS	1	☐	1/3	NBR	COM	105	ug/m^3-LC	192	Inductive Coupled Plasma Spectrometry	Source Oriented
Sample Barometric Pressure	68108	SPM	1	☐	1/3	N/A	COM	059	mm (Hg)	780	Instrumental-On Site Sample Baro Pressure	SPM-Other

Hillcrest High School — AQS Site Number 29-077-0036

3319 N. Grant, Springfield, MO 65803

Latitude: 37.256069 ***AQCR:*** 139 SW Missouri

Longitude: -93.299692 ***MSA:*** 7920 Springfield, MO

Elevation (ft): 1321

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective
Barometric Pressure	64101	SPM	1	☐	1	N/A	MET	059	mm (Hg)	014	Instrumental-Barometric Sensor	SPM-Other
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	SPM-Other
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	SPM-Other
Outdoor Temperature	62101	SPM	1	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	SPM-Other
Ozone	44201	SLAMS	1	☐	1	URB	COM	007	ppm	047	Ultraviolet Photometric	Population Exposure
Ozone	44201	SLAMS	2	☑	1	URB	BACK-UP	007	ppm	047	Ultraviolet Photometric	-

PM10 - LC FRM/FEM	85101	SLAMS	8	☐	1	NBR	COM	105	ug/m^3-LC	208	FMDS-Gravimetric 1405-DF	Population Exposure
PM10 - STP FRM/FEM	81102	SLAMS	3	☐	1	NBR	COM	001	ug/m^3	079	R&P SA246B TEOM	Population Exposure
PM10 - STP FRM/FEM	81102	SLAMS	8	☐	1	NBR	COM	105	ug/m^3-LC	208	FMDS-Gravimetric 1405-DF	Population Exposure
PM2.5 - LC FRM/FEM	88101	SLAMS	4	☐	1	NBR	COM	105	ug/m^3-LC	182	FMDS-Gravimetric 1405-DF	Population Exposure
PM2.5 Tot Atmospheric	88500	SPM	1	☐	1	NBR	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Population Exposure
PM2.5 Volatile Channel	88503	SPM	1	☐	1	NBR	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Population Exposure
PMCoarse - LC FRM/FEM	86101	SLAMS	8	☐	1	NBR	COM	105	ug/m^3-LC	207	FMDS-Gravimetric 1405-DF	Population Exposure
Relative Humidity	62201	SPM	1	☐	1	N/A	MET	019	%humidity	020	Instrumental-Computed (Indirect)	SPM-Other

Ladue *AQS Site Number* **29-189-3001**

73 Hunter Ave., Ladue, MO 63124

Latitude: 38.65021 ***AQCR:*** 070 Metropolitan St. Louis

Longitude: -90.35036 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 528

Pollutant	*AQS Code*	*Monitor-Type*	*POC*	*Back-Up*	*Freq*	*Scale*	*State-Obj*	*Unit-Code*	*Unit*	*Method-Code*	*Method*	*Monitor-Objective*

Barometric Pressure	64101	SPM	1	☐	1	N/A	MET	059	mm (Hg)	014	Instrumental-Barometric Sensor	SPM-Other
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	SPM-Other
Outdoor Temperature	62101	SPM	1	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	SPM-Other
PM10 - LC FRM/FEM	85101	SLAMS	8	☐	1	NBR	COM	105	ug/m^3-LC	208	FMDS-Gravimetric 1405-DF	Population Exposure
PM10 - STP FRM/FEM	81102	SLAMS	8	☐	1	NBR	COM	105	ug/m^3-LC	208	FMDS-Gravimetric 1405-DF	Population Exposure
PM2.5 - LC FRM/FEM	88101	SLAMS	4	☐	1	NBR	COM	105	ug/m^3-LC	182	FMDS-Gravimetric 1405-DF	Population Exposure
PM2.5 Tot Atmospheric	88500	SPM	1	☐	1	NBR	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Population Exposure
PM2.5 Volatile Channel	88503	SPM	1	☐	1	NBR	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Population Exposure
PMCoarse - LC FRM/FEM	86101	SLAMS	8	☐	1	NBR	COM	105	ug/m^3-LC	207	FMDS-Gravimetric 1405-DF	Population Exposure
Relative Humidity	62201	SPM	1	☐	1	N/A	MET	019	%humidity	020	Instrumental-Computed (Indirect)	SPM-Other
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	067	Instrumental: RM Young Model 05103	SPM-Other (10m Tower)

Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	012	mph	067	Instrumental: RM Young Model 05103	SPM-Other (10m Tower)

Liberty — AQS Site Number 29-047-0005

Highway 33 & County Home Rd., Liberty, MO 64068

Latitude: 39.303056 **AQCR:** 094 Metropolitan Kansas City

Longitude: -94.376389 **MSA:** 3760 Kansas City, MO-KS

Elevation (ft): 930

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective
Barometric Pressure	64101	SPM	1	☐	1	N/A	MET	059	mm (Hg)	014	Instrumental-Barometric Sensor	SPM-Other
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	SPM-Other
Outdoor Temperature	62101	SPM	1	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	SPM-Other
Ozone	44201	SLAMS	1	☐	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	Population Exposure
Ozone	44201	SLAMS	2	☑	1	NBR	BACK-UP	007	ppm	047	Ultraviolet Photometric	-
PM10 - LC FRM/FEM	85101	SLAMS	8	☐	1	NBR	COM	105	ug/m^3-LC	208	FMDS-Gravimetric 1405-DF	Population Exposure
PM10 - STP FRM/FEM	81102	SLAMS	8	☐	1	NBR	COM	105	ug/m^3-LC	208	FMDS-Gravimetric 1405-DF	Population Exposure

PM2.5 - LC FRM/FEM	88101	SLAMS	4	☐	1	NBR	COM	105	ug/m^3-LC	182	FMDS-Gravimetric 1405-DF	Population Exposure
PM2.5 Tot Atmospheric	88500	SPM	1	☐	1	NBR	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Population Exposure
PM2.5 Volatile Channel	88503	SPM	1	☐	1	NBR	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Population Exposure
PMCoarse - LC FRM/FEM	86101	SLAMS	8	☐	1	NBR	COM	105	ug/m^3-LC	207	FMDS-Gravimetric 1405-DF	Population Exposure
Relative Humidity	62201	SPM	1	☐	1	N/A	MET	019	%humidity	020	Instrumental-Computed (Indirect)	SPM-Other
Solar Radiation	63301	SPM	1	☐	1	N/A	MET	079	W/m^2	011	Instrumental-Pyranometer	SPM-Other
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	067	Instrumental: RM Young Model 05103	SPM-Other (5.5 meters)
Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	012	mph	067	Instrumental: RM Young Model 05103	SPM-Other (5.5 meters)

Margaretta *AQS Site Number* **29-510-0086**

4520 Margaretta, St. Louis, MO 63105

Latitude: 38.673172 ***AQCR:*** 070 Metropolitan St. Louis

Longitude: -90.239086 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 514

Pollutant	*AQS Code*	*Monitor-Type*	*POC*	*Back-Up*	*Freq*	*Scale*	*State-Obj*	*Unit-Code*	*Unit*	*Method-Code*	*Method*	*Monitor-Objective*

Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	SPM-Other
Nitric Oxide	42601	SPM	1	☐	1	NBR	COM	008	ppb	074	Chemiluminescence	Population Exposure
Nitrogen Dioxide	42602	SLAMS	1	☐	1	NBR	COM	008	ppb	074	Chemiluminescence	Population Exposure
Oxides of Nitrogen	42603	SPM	1	☐	1	NBR	COM	008	ppb	074	Chemiluminescence	Population Exposure
PM10 - STP FRM/FEM	81102	SLAMS	3	☐	1	MID	COM	001	ug/m^3	079	R&P SA246B TEOM	Population Exposure
Sulfur Dioxide	42401	SLAMS	1	☐	1	NBR	COM	008	ppb	060	Pulsed Fluorescent	Population Exposure
Sulfur Dioxide Max 5-min Avg	42406	SLAMS	1	☐	1	NBR	COM	008	ppb	060	Pulsed Fluorescent	Population Exposure

Mark Twain State Park — *AQS Site Number* **29-137-0001**

20057 State Park Office Rd., Stoutville, MO 65283

Latitude: 39.47510 ***AQCR:*** 137 Northern Missouri

Longitude: -91.78899 ***MSA:*** 0000 Not in a MSA

Elevation (ft): 710

Pollutant	*AQS Code*	*Monitor-Type*	*POC*	*Back-Up*	*Freq*	*Scale*	*State-Obj*	*Unit-Code*	*Unit*	*Method-Code*	*Method*	*Monitor-Objective*
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	SPM-Other

Nitric Oxide	42601	SPM	1	☐	1	REG	COM	008	ppb	074	Chemiluminescence	General/Background
Nitrogen Dioxide	42602	SLAMS	1	☐	1	REG	COM	008	ppb	074	Chemiluminescence	General/Background
Oxides of Nitrogen	42603	SPM	1	☐	1	REG	COM	008	ppb	074	Chemiluminescence	General/Background
Ozone	44201	SLAMS	1	☐	1	REG	COM	007	ppm	047	Ultraviolet Photometric	General/Background
Ozone	44201	SLAMS	2	☑	1	REG	BACK-UP	007	ppm	047	Ultraviolet Photometric	-
PM10 - STP FRM/FEM	81102	SPM	3	☐	1	REG	SIP	001	ug/m^3	079	R&P SA246B TEOM	General/Background
Sulfur Dioxide	42401	SPM	1	☐	1	NBR	COM	008	ppb	060	Pulsed Fluorescent	General/Background
Sulfur Dioxide Max 5-min Avg	42406	SPM	1	☐	1	NBR	COM	008	ppb	060	Pulsed Fluorescent	General/Background
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	067	Instrumental: RM Young Model 05103	SPM-Other (10m Tower)
Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	012	mph	067	Instrumental: RM Young Model 05103	SPM-Other (10m Tower)

Maryland Heights — AQS Site Number 29-189-0014

13044 Marine Ave., Maryland Heights, MO 63146

Latitude: 38.7109 **AQCR:** 070 Metropolitan St. Louis

Longitude: -90.4759 **MSA:** 7040 St. Louis, MO-IL

Elevation (ft): 633

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	SPM-Other
Ozone	44201	SLAMS	1	☐	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	Population Exposure
Ozone	44201	SLAMS	2	☑	1	NBR	BACK-UP	007	ppm	047	Ultraviolet Photometric	-

New Bloomfield — AQS Site Number 29-027-0002

2625 Meadow Lake View, New Bloomfield, MO, 65063

Latitude: 38.70608 **AQCR:** 137 Northern Missouri

Longitude: -92.09308 **MSA:** 0000 Not in a MSA

Elevation (ft): 860

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	SPM-Other
Ozone	44201	SLAMS	1	☐	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	Max Ozone Concentration & Population Exposure
Ozone	44201	SLAMS	2	☑	1	NBR	BACK-UP	007	ppm	047	Ultraviolet Photometric	-

Oates — AQS Site Number 29-179-0034

13155 Highway KK, Boss, MO 65440

Latitude: 37.56485 **AQCR:** 138 SE Missouri

Longitude: -91.11423 **MSA:** 0000 Not in a MSA

Elevation (ft): 1134

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective
Ambient Temperature	68105	SPM	1	☐	1/6	N/A	COM	017	deg C	803	Instrumental-Off Site Ambient Temperature	SPM-Other
Lead (TSP) - LC FRM/FEM	14129	SLAMS	1	☐	1/6	NBR	COM	105	ug/m^3-LC	192	Inductive Coupled Plasma Spectrometry	Source Oriented
Sample Barometric Pressure	68108	SPM	1	☐	1/6	N/A	COM	059	mm (Hg)	803	Instrumental-Off Site Sample Baro Pressure	SPM-Other

Orchard Farm — AQS Site Number 29-183-1004

2165 Highway V, St. Charles, MO 63301

Latitude: 38.8994 **AQCR:** 070 Metropolitan St. Louis

Longitude: -90.44917 **MSA:** 7040 St. Louis, MO-IL

Elevation (ft): 441

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	SPM-Other
Ozone	44201	SLAMS	1	☐	1	URB	COM	007	ppm	047	Ultraviolet Photometric	Extreme Downwind
Ozone	44201	SLAMS	2	☑	1	URB	BACK-UP	007	ppm	047	Ultraviolet Photometric	-

Pacific — AQS Site Number 29-189-0005

18701 Old Highway 66, Pacific, MO 63039

Latitude: 38.4902 **AQCR:** 070 Metropolitan St. Louis

Longitude: -90.7052 **MSA:** 7040 St. Louis, MO-IL

Elevation (ft): 524

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	SPM-Other
Outdoor Temperature	62101	SPM	1	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	SPM-Other
Ozone	44201	SLAMS	1	☐	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	Population Exposure
Ozone	44201	SLAMS	2	☑	1	NBR	BACK-UP	007	ppm	047	Ultraviolet Photometric	-
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	067	Instrumental: RM Young Model 05103	SPM-Other (5.5 meters)
Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	012	mph	067	Instrumental: RM Young Model 05103	SPM-Other (5.5 meters)

Pevely — AQS Site Number 29-099-0009

500 Dow Industrial Dr., Pevely, MO 63070

Latitude: 38.2861 **AQCR:** 070 Metropolitan St. Louis

Longitude: -90.38094 **MSA:** 7040 St. Louis, MO-IL

Elevation (ft): 409

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective

Ambient Temperature	68105	SPM	1	☐	1/6	N/A	COM	017	deg C	780	Instrumental-On Site Ambient Temperature	SPM-Other
Lead (TSP) - LC FRM/FEM	14129	SLAMS	1	☐	1/6	NBR	COM	105	ug/m^3-LC	192	Inductive Coupled Plasma Spectrometry	Source Oriented
Sample Barometric Pressure	68108	SPM	1	☐	1/6	N/A	COM	059	mm (Hg)	780	Instrumental-On Site Sample Baro Pressure	SPM-Other

Pevely North

AQS Site Number 29-099-0026

Tiarre at the Abbey, Station 150N, Christine Drive, Pevely, MO 63070

Latitude: 38.296 ***AQCR:*** 070 Metropolitan St. Louis

Longitude: -90.393 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 582

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective
Ambient Temperature	68105	SPM	1	☐	1/6	N/A	COM	017	deg C	780	Instrumental-On Site Ambient Temperature	SPM-Other
Lead (TSP) - LC FRM/FEM	14129	SLAMS	1	☐	1/6	NBR	COM	105	ug/m^3-LC	192	Inductive Coupled Plasma Spectrometry	Source Oriented
Sample Barometric Pressure	68108	SPM	1	☐	1/6	N/A	COM	059	mm (Hg)	780	Instrumental-On Site Sample Baro Pressure	SPM-Other

Richards Gebaur - South

AQS Site Number 29-037-0003

1802 E. 203rd Street, Belton, MO, 64012

Latitude: 38.75976 ***AQCR:*** 094 Metropolitan Kansas City

Longitude: -94.57997 ***MSA:*** 3760 Kansas City, MO-KS

Elevation (ft): 1031

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective

Barometric Pressure	64101	SPM	1	☐	1	N/A	MET	059	mm (Hg)	014	Instrumental-Barometric Sensor	SPM-Other
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	SPM-Other
Outdoor Temperature	62101	SPM	1	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	SPM-Other
Ozone	44201	SLAMS	1	☐	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	Population Exposure
Ozone	44201	SLAMS	2	☑	1	NBR	BACK-UP	007	ppm	047	Ultraviolet Photometric	-
PM10 - LC FRM/FEM	85101	SLAMS	8	☐	1	NBR	COM	105	ug/m^3-LC	208	FMDS-Gravimetric 1405-DF	Population Exposure
PM10 - STP FRM/FEM	81102	SLAMS	8	☐	1	NBR	COM	105	ug/m^3-LC	208	FMDS-Gravimetric 1405-DF	Population Exposure
PM2.5 - LC FRM/FEM	88101	SLAMS	4	☐	1	NBR	COM	105	ug/m^3-LC	182	FMDS-Gravimetric 1405-DF	Population Exposure
PM2.5 Tot Atmospheric	88500	SPM	1	☐	1	NBR	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Population Exposure
PM2.5 Volatile Channel	88503	SPM	1	☐	1	NBR	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Population Exposure
PMCoarse - LC FRM/FEM	86101	SLAMS	8	☐	1	NBR	COM	105	ug/m^3-LC	207	FMDS-Gravimetric 1405-DF	Population Exposure

Relative Humidity	62201	SPM	1	☐	1	N/A	MET	019	%humidity	020	Instrumental-Computed (Indirect)	SPM-Other
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	067	Instrumental: RM Young Model 05103	SPM-Other (10m Tower)
Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	012	mph	067	Instrumental: RM Young Model 05103	SPM-Other (10m Tower)

Rider Trail, I-70 — AQS Site Number 29-189-0016

13080 Hollenberg Drive, Bridgeton, MO 63044

Latitude: 38.75264 ***AQCR:*** 070 Metropolitan St. Louis

Longitude: -90.44884 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 488

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	SPM-Other
Nitric Oxide	42601	SPM	1	☐	1	MIC	COM	008	ppb	074	Chemiluminescence	Source Oriented
Nitrogen Dioxide	42602	SLAMS	1	☐	1	MIC	COM	008	ppb	074	Chemiluminescence	Source Oriented
Outdoor Temperature	62101	SPM	2	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	SPM-Other (10m Probe Height)
Outdoor Temperature	62101	SPM	3	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	SPM-Other (2m Probe Height

Outdoor Temperature Diff	62106	SPM	1	☐	1	N/A	MET	116	Temp Diff deg C	041	Instrumental: Elect or Mach Avg Lev 2-Lev1	SPM-Other (10m - 2m Probe Height)
Oxides of Nitrogen	42603	SPM	1	☐	1	MIC	COM	008	ppb	074	Chemiluminescence	Source Oriented
Precipitation	65102	SPM	1	☐	1	N/A	MET	021	inches	011	Bucket	SPM-Other
Relative Humidity	62201	SPM	1	☐	1	N/A	MET	019	%humidity	020	Instrumental-Computed (Indirect)	SPM-Other
Solar Radiation	63301	SPM	1	☐	1	N/A	MET	079	W/m^2	011	Instrumental-Pyranometer	SPM-Other
WD - Sigma Theta (Horizontal)	61106	SPM	1	☐	1	N/A	MET	014	deg	020	Arithmetic Standard Deviation	SPM-Other (10m Tower)
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	065	Instrumental: RM Young Model 05305	SPM-Other (10m Tower)
Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	012	mph	065	Instrumental: RM Young Model 05305	SPM-Other (10m Tower)

Rocky Creek *AQS Site Number* **29-047-0006**

13131 Highway 169 NE., Smithville, MO 64089

Latitude: 39.33188 ***AQCR:*** 094 Metropolitan Kansas City

Longitude: -94.5806 ***MSA:*** 3760 Kansas City, MO-KS

Elevation (ft): 993

Pollutant	*AQS Code*	*Monitor-Type*	*POC*	*Back-Up*	*Freq*	*Scale*	*State-Obj*	*Unit-Code*	*Unit*	*Method-Code*	*Method*	*Monitor-Objective*

Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	SPM-Other
Ozone	44201	SLAMS	1	☐	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	Population Exposure
Ozone	44201	SLAMS	2	☑	1	NBR	BACK-UP	007	ppm	047	Ultraviolet Photometric	-

Savannah — AQS Site Number 29-003-0001

11796 Highway 71, Savannah, MO 64485

Latitude: 39.9544 ***AQCR:*** 137 Northern Missouri

Longitude: -94.849 ***MSA:*** 7000 St. Joseph, MO

Elevation (ft): 1120

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	SPM-Other
Ozone	44201	SLAMS	1	☐	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	Population Exposure
Ozone	44201	SLAMS	2	☑	1	NBR	BACK-UP	007	ppm	047	Ultraviolet Photometric	-

South Broadway — AQS Site Number 29-510-0007

8227 South Broadway, St. Louis, MO 63111

Latitude: 38.5425 ***AQCR:*** 070 Metropolitan St. Louis

Longitude: -90.263611 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 452

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective

Barometric Pressure	64101	SLAMS	1	☐	1	N/A	MET	059	mm (Hg)	014	Instrumental-Barometric Sensor	SPM-Other
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	SPM-Other
Outdoor Temperature	62101	SPM	1	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	SPM-Other
PM10 - LC FRM/FEM	85101	SLAMS	8	☐	1	NBR	COM	105	ug/m^3-LC	208	FMDS-Gravimetric 1405-DF	Population Exposure
PM10 - STP FRM/FEM	81102	SLAMS	8	☐	1	NBR	COM	105	ug/m^3-LC	208	FMDS-Gravimetric 1405-DF	Population Exposure
PM2.5 - LC FRM/FEM	88101	SLAMS	4	☐	1	NBR	COM	105	ug/m^3-LC	182	FMDS-Gravimetric 1405-DF	Population Exposure
PM2.5 Tot Atmospheric	88500	SPM	1	☐	1	NBR	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Population Exposure
PM2.5 Volatile Channel	88503	SPM	1	☐	1	NBR	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Population Exposure
PMCoarse - LC FRM/FEM	86101	SLAMS	8	☐	1	NBR	COM	105	ug/m^3-LC	207	FMDS-Gravimetric 1405-DF	Population Exposure
Relative Humidity	62201	SPM	1	☐	1	N/A	MET	019	%humidity	020	Instrumental-Computed (Indirect)	SPM-Other

South Charleston

AQS Site Number 29-077-0026

5012 S. Charleston, Springfield, MO 65804

Latitude: 37.122561 ***AQCR:*** 139 SW Missouri

Longitude: -93.263161 ***MSA:*** 7920 Springfield, MO

Elevation (ft): 1234

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	SPM-Other
Sulfur Dioxide	42401	SLAMS	1	☐	1	NBR	COM	008	ppb	060	Pulsed Fluorescent	Source Oriented
Sulfur Dioxide Max 5-min Avg	42406	SLAMS	1	☐	1	NBR	COM	008	ppb	060	Pulsed Fluorescent	Source Oriented

St. Joseph Pump Station

AQS Site Number 29-021-0005

S. Highway 759, St. Joseph, MO 64501

Latitude: 39.741667 ***AQCR:*** 094 Metropolitan Kansas City

Longitude: -94.858333 ***MSA:*** 7000 St. Joseph, MO

Elevation (ft): 845

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective
Ambient Temperature	68105	SPM	3	☐	1/3	N/A	COM	017	deg C	127	Lo-Vol R&P 2025 Sequential	SPM-Other
Ambient Temperature	68105	SPM	4	☐	1/6	N/A	COM	017	deg C	127	Lo-Vol R&P 2025 Sequential	QA Collocated
Barometric Pressure	64101	SPM	1	☐	1	N/A	MET	059	mm (Hg)	014	Instrumental-Barometric Sensor	SPM-Other

Barometric Pressure	64101	SPM	2	☐	1	N/A	MET	059	mm (Hg)	014	Instrumental-Barometric Sensor	SPM-Other
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	SPM-Other
Outdoor Temperature	62101	SPM	1	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	SPM-Other
Outdoor Temperature	62101	SPM	2	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	QA Collocated
PM10 - LC FRM/FEM	85101	SPM	1	☐	1/3	NBR	COM	105	ug/m^3-LC	127	Lo-Vol R&P 2025 Sequential	Population Exposure
PM10 - LC FRM/FEM	85101	SPM	2	☐	1/6	NBR	COM	105	ug/m^3-LC	127	Lo-Vol R&P 2025 Sequential	QA Collocated
PM10 - LC FRM/FEM	85101	SLAMS	8	☐	1	NBR	COM	105	ug/m^3-LC	208	FMDS-Gravimetric 1405-DF	Population Exposure
PM10 - LC FRM/FEM	85101	SLAMS	9	☐	1	NBR	COM	105	ug/m^3-LC	208	FMDS-Gravimetric 1405-DF	QA Collocated
PM10 - STP FRM/FEM	81102	SLAMS	1	☐	1/3	NBR	COM	001	ug/m^3	127	Lo-Vol R&P 2025 Sequential	Population Exposure
PM10 - STP FRM/FEM	81102	SLAMS	2	☐	1/6	NBR	COM	001	ug/m^3	127	Lo-Vol R&P 2025 Sequential	QA Collocated
PM10 - STP FRM/FEM	81102	SLAMS	8	☐	1	NBR	COM	105	ug/m^3-LC	208	FMDS-Gravimetric 1405-DF	Population Exposure

PM10 - STP FRM/FEM	81102	SLAMS	9	☐	1	NBR	COM	105	ug/m^3-LC	208	FMDS-Gravimetric 1405-DF	QA Collocated
PM2.5 - LC FRM/FEM	88101	SLAMS	4	☐	1	NBR	COM	105	ug/m^3-LC	182	FMDS-Gravimetric 1405-DF	Population Exposure
PM2.5 - LC FRM/FEM	88101	SLAMS	5	☐	1	NBR	COM	105	ug/m^3-LC	182	FMDS-Gravimetric 1405-DF	QA Collocated
PM2.5 Tot Atmospheric	88500	SPM	1	☐	1	NBR	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Population Exposure
PM2.5 Tot Atmospheric	88500	SPM	2	☐	1	NBR	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	QA Collocated
PM2.5 Volatile Channel	88503	SPM	1	☐	1	NBR	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Population Exposure
PM2.5 Volatile Channel	88503	SPM	2	☐	1	NBR	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	QA Collocated
PMCoarse - LC FRM/FEM	86101	SLAMS	8	☐	1	NBR	COM	105	ug/m^3-LC	207	FMDS-Gravimetric 1405-DF	Population Exposure
PMCoarse - LC FRM/FEM	86101	SLAMS	9	☐	1	NBR	COM	105	ug/m^3-LC	207	FMDS-Gravimetric 1405-DF	QA Collocated
Relative Humidity	62201	SPM	1	☐	1	N/A	MET	019	%humidity	020	Instrumental-Computed (Indirect)	SPM-Other
Relative Humidity	62201	SPM	2	☐	1	N/A	MET	019	%humidity	020	Instrumental-Computed (Indirect)	QA Collocated

Sample Barometric Pressure	68108	SPM	3	☐	1/3	N/A	COM	059	mm (Hg)	127	Lo-Vol R&P 2025 Sequential	SPM-Other
Sample Barometric Pressure	68108	SPM	4	☐	1/6	N/A	COM	059	mm (Hg)	127	Lo-Vol R&P 2025 Sequential	QA Collocated
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	067	Instrumental: RM Young Model 05103	SPM-Other (5.5 meters)
Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	012	mph	067	Instrumental: RM Young Model 05103	SPM-Other (5.5 meters)

Trimble — *AQS Site Number* **29-049-0001**

7536 SW. O Highway, Trimble, MO 64492

Latitude: 39.5306 ***AQCR:*** 137 Northern Missouri

Longitude: -94.556 ***MSA:*** 3760 Kansas City, MO-KS

Elevation (ft): 955

Pollutant	*AQS Code*	*Monitor-Type*	*POC*	*Back-Up*	*Freq*	*Scale*	*State-Obj*	*Unit-Code*	*Unit*	*Method-Code*	*Method*	*Monitor-Objective*
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	SPM-Other
Ozone	44201	SLAMS	1	☐	1	NBR	COM	007	ppm	047	Ultraviolet Photometric	Max Ozone Concentration
Ozone	44201	SLAMS	2	☑	1	NBR	BACK-UP	007	ppm	047	Ultraviolet Photometric	-

Troost

AQS Site Number 29-095-0034

724 Troost (Rear), Kansas City, MO 64106

Latitude: 39.104722 ***AQCR:*** 094 Metropolitan Kansas City

Longitude: -94.570556 ***MSA:*** 3760 Kansas City, MO-KS

Elevation (ft): 971

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective
Ambient Temperature	68105	SPM	1	☐	1/3	N/A	COM	017	deg C	145	R&P 2025 Sequential w/VSCC	SPM-Other
Ambient Temperature	68105	SPM	3	☐	1/6	N/A	COM	017	deg C	127	Lo-Vol R&P 2025 Sequential	SPM-Other
Barometric Pressure	64101	SPM	1	☐	1	N/A	MET	059	mm (Hg)	014	Instrumental-Barometric Sensor	SPM-Other
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	SPM-Other
Nitric Oxide	42601	SPM	1	☐	1	URB	COM	008	ppb	074	Chemiluminescence	Population Exposure
Nitrogen Dioxide	42602	SLAMS	1	☐	1	URB	COM	008	ppb	074	Chemiluminescence	Population Exposure
Outdoor Temperature	62101	SPM	1	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	SPM-Other
Oxides of Nitrogen	42603	SPM	1	☐	1	URB	COM	008	ppb	074	Chemiluminescence	Population Exposure

PM10 - LC FRM/FEM	85101	SPM	1	☐	1/6	NBR	COM	105	ug/m^3-LC	127	Lo-Vol R&P 2025 Sequential	Population Exposure
PM10 - LC FRM/FEM	85101	SLAMS	8	☐	1	NBR	COM	105	ug/m^3-LC	208	FMDS-Gravimetric 1405-DF	Population Exposure
PM10 - STP FRM/FEM	81102	SLAMS	1	☐	1/6	NBR	COM	001	ug/m^3	127	Lo-Vol R&P 2025 Sequential	Population Exposure
PM10 - STP FRM/FEM	81102	SLAMS	8	☐	1	NBR	COM	105	ug/m^3-LC	208	FMDS-Gravimetric 1405-DF	Population Exposure
PM2.5 - LC FRM/FEM	88101	SLAMS	1	☐	1/3	NBR	COM	105	ug/m^3-LC	145	R&P 2025 Sequential w/VSCC	QA Collocated
PM2.5 - LC FRM/FEM	88101	SLAMS	4	☐	1	NBR	COM	105	ug/m^3-LC	182	FMDS-Gravimetric 1405-DF	Population Exposure
PM2.5 Tot Atmospheric	88500	SPM	1	☐	1	NBR	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Population Exposure
PM2.5 Volatile Channel	88503	SPM	1	☐	1	NBR	AQI	105	ug/m^3-LC	790	FDMS-Gravimetric 1405-DF	Population Exposure
PMCoarse - LC FRM/FEM	86101	SLAMS	8	☐	1	NBR	COM	105	ug/m^3-LC	207	FMDS-Gravimetric 1405-DF	Population Exposure
Relative Humidity	62201	SPM	1	☐	1	N/A	MET	019	%humidity	020	Instrumental-Computed (Indirect)	SPM-Other
Sample Barometric Pressure	68108	SPM	1	☐	1/3	N/A	COM	059	mm (Hg)	145	R&P 2025 Sequential w/VSCC	SPM-Other

Sample Barometric Pressure	68108	SPM	3	☐	1/6	N/A	COM	059	mm (Hg)	127	Lo-Vol R&P 2025 Sequential	SPM-Other
Sulfur Dioxide	42401	SLAMS	1	☐	1	MID	COM	008	ppb	060	Pulsed Fluorescent	Source Oriented
Sulfur Dioxide Max 5-min Avg	42406	SLAMS	1	☐	1	MID	COM	008	ppb	060	Pulsed Fluorescent	Source Oriented

Ursuline North — AQS Site Number 29-099-0025

210 Glennon Heights Rd., Crystal City, MO 63019

Latitude: 38.243 ***AQCR:*** 070 Metropolitan St. Louis

Longitude: -90.37372 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 578

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective
Ambient Temperature	68105	SPM	1	☐	1/6	N/A	COM	017	deg C	780	Instrumental-On Site Ambient Temperature	SPM-Other
Lead (TSP) - LC FRM/FEM	14129	SLAMS	1	☐	1/6	NBR	COM	105	ug/m^3-LC	192	Inductive Coupled Plasma Spectrometry	Source Oriented & Upwind Background
Sample Barometric Pressure	68108	SPM	1	☐	1/6	N/A	COM	059	mm (Hg)	780	Instrumental-On Site Sample Baro Pressure	SPM-Other

Watkins Mill State Park — AQS Site Number 29-047-0003

Watkins Mill Road, Lawson, MO 64062

Latitude: 39.407419 ***AQCR:*** 094 Metropolitan Kansas City

Longitude: -94.265142 ***MSA:*** 3760 Kansas City, MO-KS

Elevation (ft): 1009

Pollutant	AQS Code	Monitor-Type	POC	Back-Up	Freq	Scale	State-Obj	Unit-Code	Unit	Method-Code	Method	Monitor-Objective

Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	SPM-Other
Ozone	44201	SLAMS	1	☐	1	URB	COM	007	ppm	047	Ultraviolet Photometric	Extreme Downwind
Ozone	44201	SLAMS	2	☑	1	URB	BACK-UP	007	ppm	047	Ultraviolet Photometric	-

West Alton — AQS Site Number 29-183-1002

General Elecric Store, Highway 94, West Alton, MO 63386

Latitude: 38.8725 ***AQCR:*** 070 Metropolitan St. Louis

Longitude: -90.226389 ***MSA:*** 7040 St. Louis, MO-IL

Elevation (ft): 425

Pollutant	*AQS Code*	*Monitor-Type*	*POC*	*Back-Up*	*Freq*	*Scale*	*State-Obj*	*Unit-Code*	*Unit*	*Method-Code*	*Method*	*Monitor-Objective*
Indoor Temperature	62107	SPM	1	☐	1	N/A	MET	017	deg C	013	Electronic Averaging	SPM-Other
Outdoor Temperature	62101	SPM	1	☐	1	N/A	MET	017	deg C	040	Electronic Averaging	SPM-Other
Ozone	44201	SLAMS	1	☐	1	URB	COM	007	ppm	047	Ultraviolet Photometric	Max Ozone Concentration & Population Exposure
Ozone	44201	SLAMS	2	☑	1	URB	BACK-UP	007	ppm	047	Ultraviolet Photometric	-
Solar Radiation	63301	SPM	1	☐	1	N/A	MET	079	W/m^2	011	Instrumental-Pyranometer	SPM-Other
Wind Direction - Resultant	61104	SPM	1	☐	1	N/A	MET	014	deg	067	Instrumental: RM Young Model 05103	SPM-Other (10m Tower)

Wind Speed - Resultant	61103	SPM	1	☐	1	N/A	MET	012	mph	067	Instrumental: RM Young Model 05103	SPM-Other (10m Tower)