

# 2014 Air Quality Report

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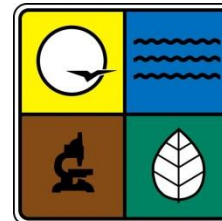
Stephen Hall

Air Quality Analysis Section

Air Pollution Control Program

St. Louis Area Monitoring Agencies Meeting, May 15, 2014

St. Louis County Library, St. Louis, MO



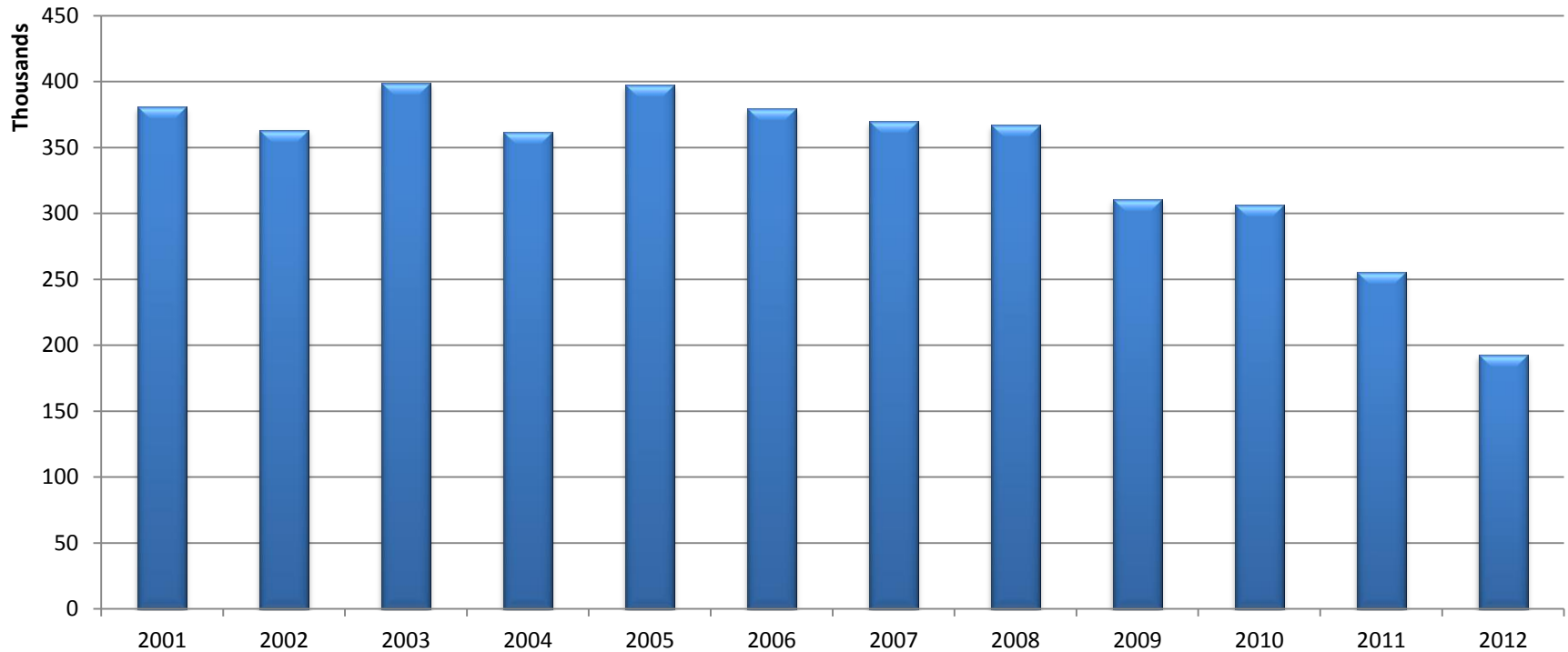
**MISSOURI**  
**DEPARTMENT OF**  
**NATURAL RESOURCES**

# Presentation Overview

- Emissions Inventory Trends
- Ambient Air Monitoring Trends
- New Projects
- Website Resources

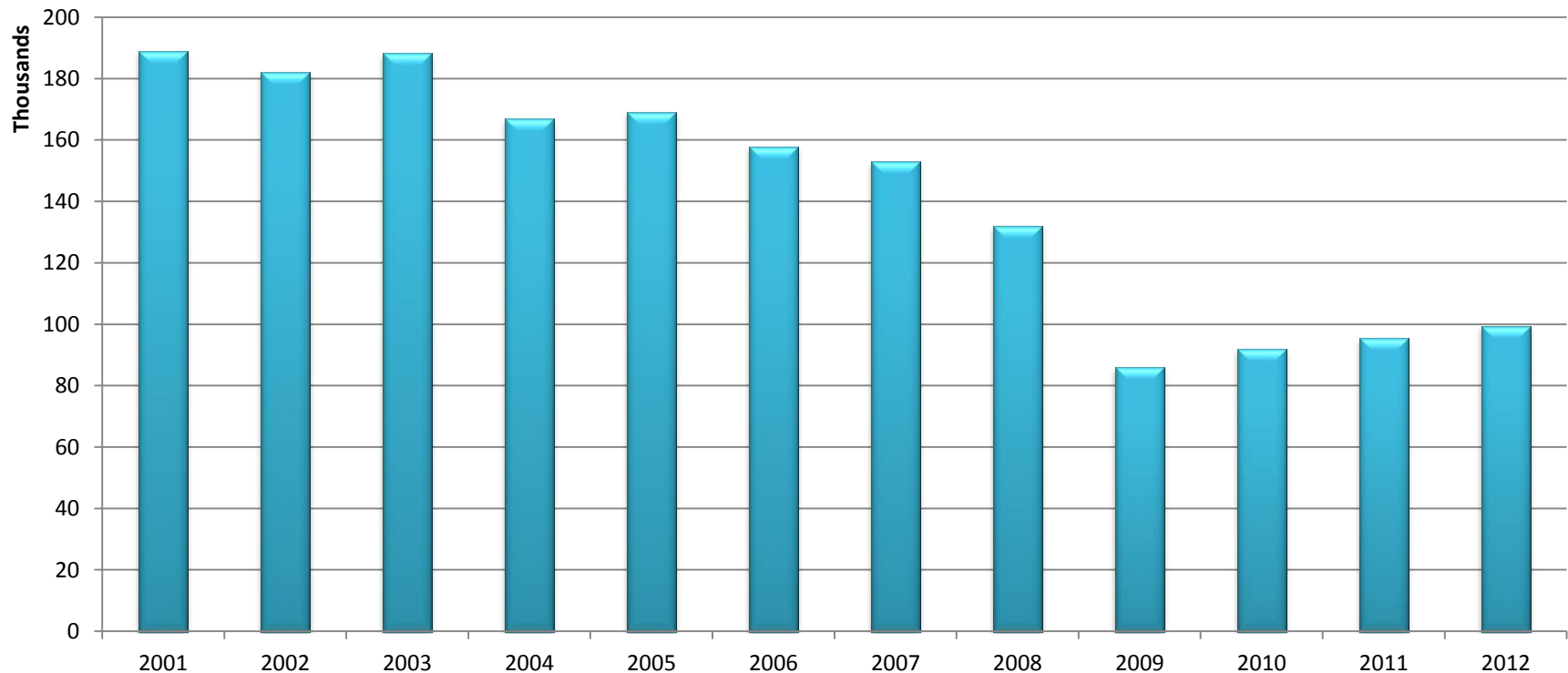
# Sulfur Dioxide (SO<sub>2</sub>) Point Source Emissions

**Sulfur Dioxide**  
Thousand Tons per Year

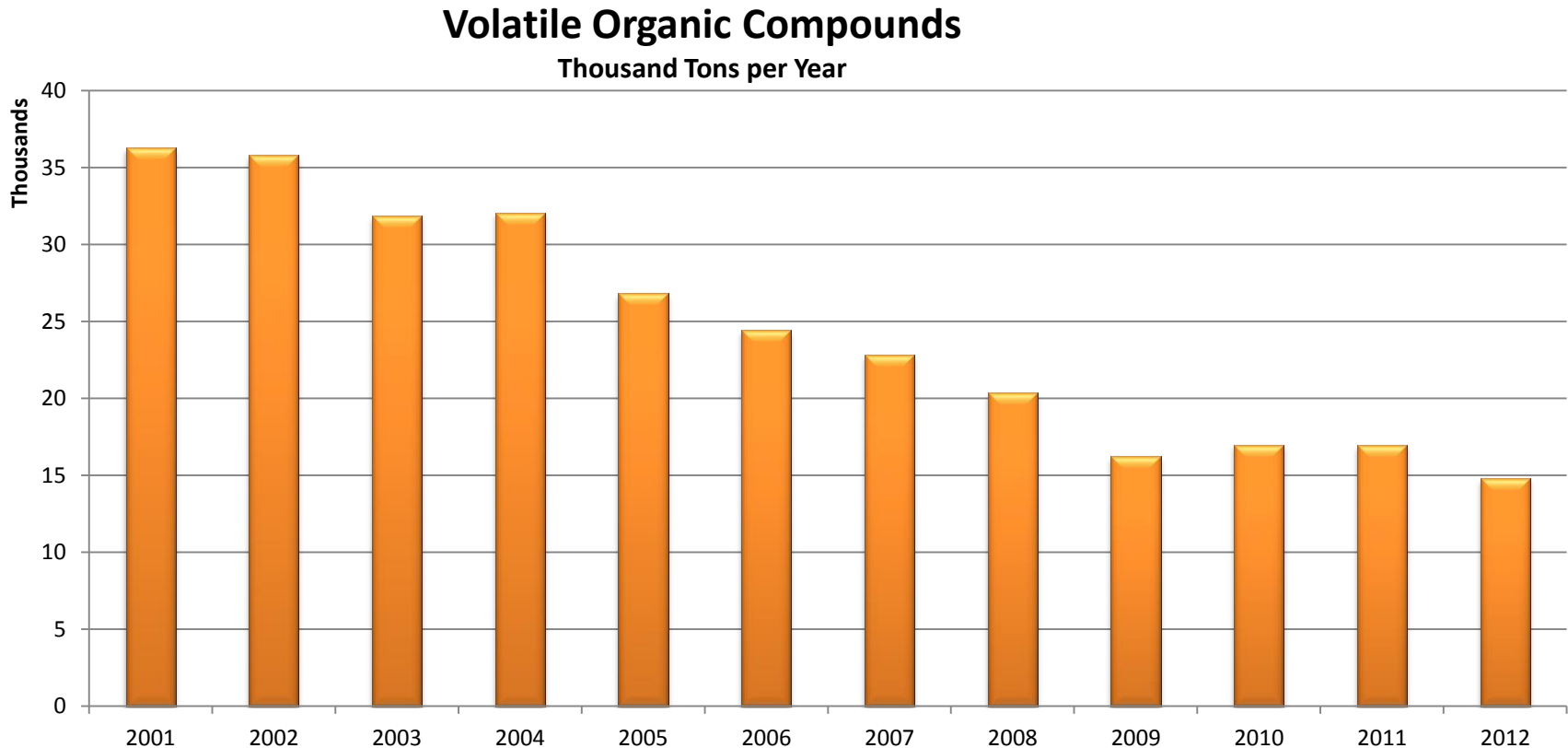


# Nitrogen Dioxide (NO<sub>2</sub>) Emissions

**Nitrogen Dioxide**  
**Thousand Tons per Year**

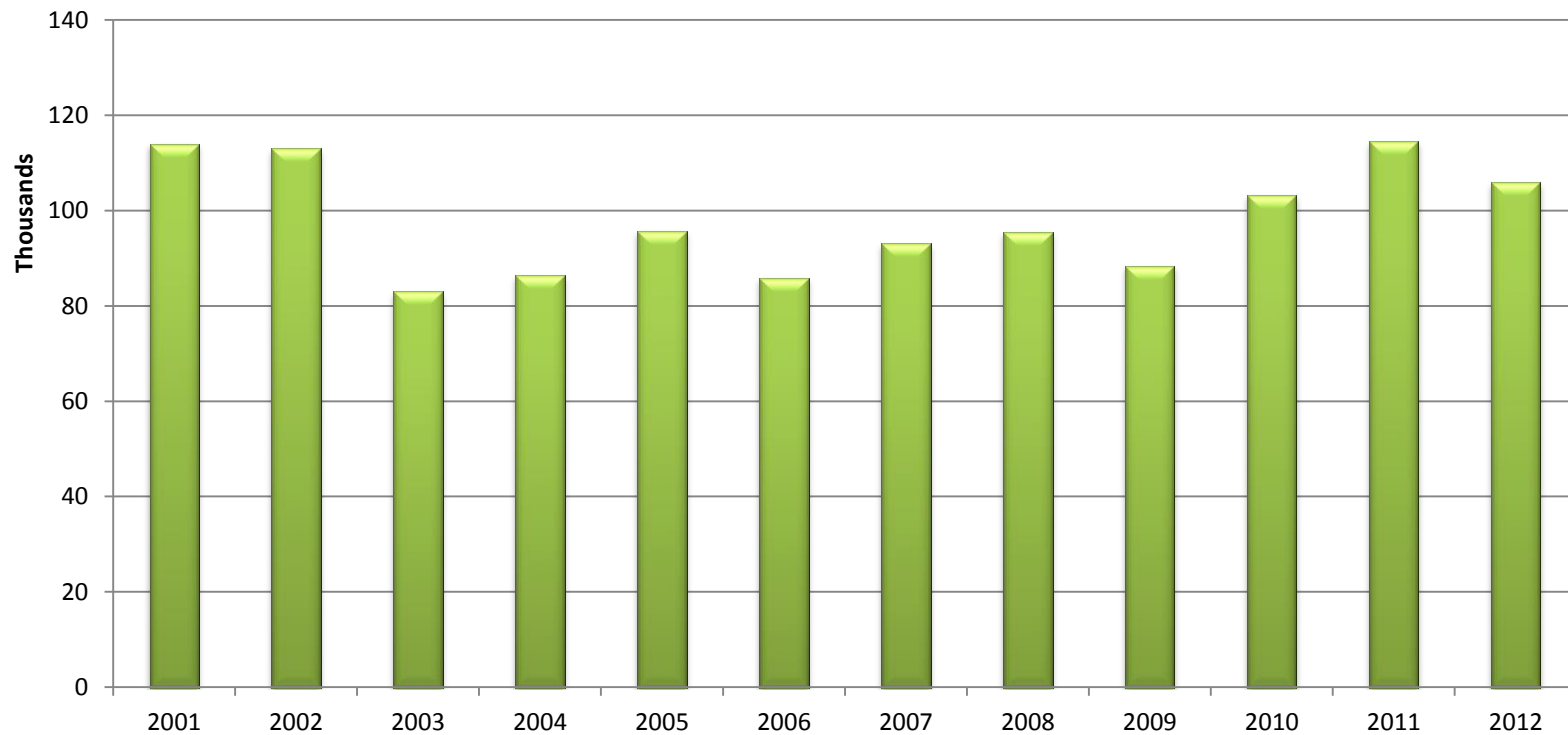


# Volatile Organic Compounds (VOC)



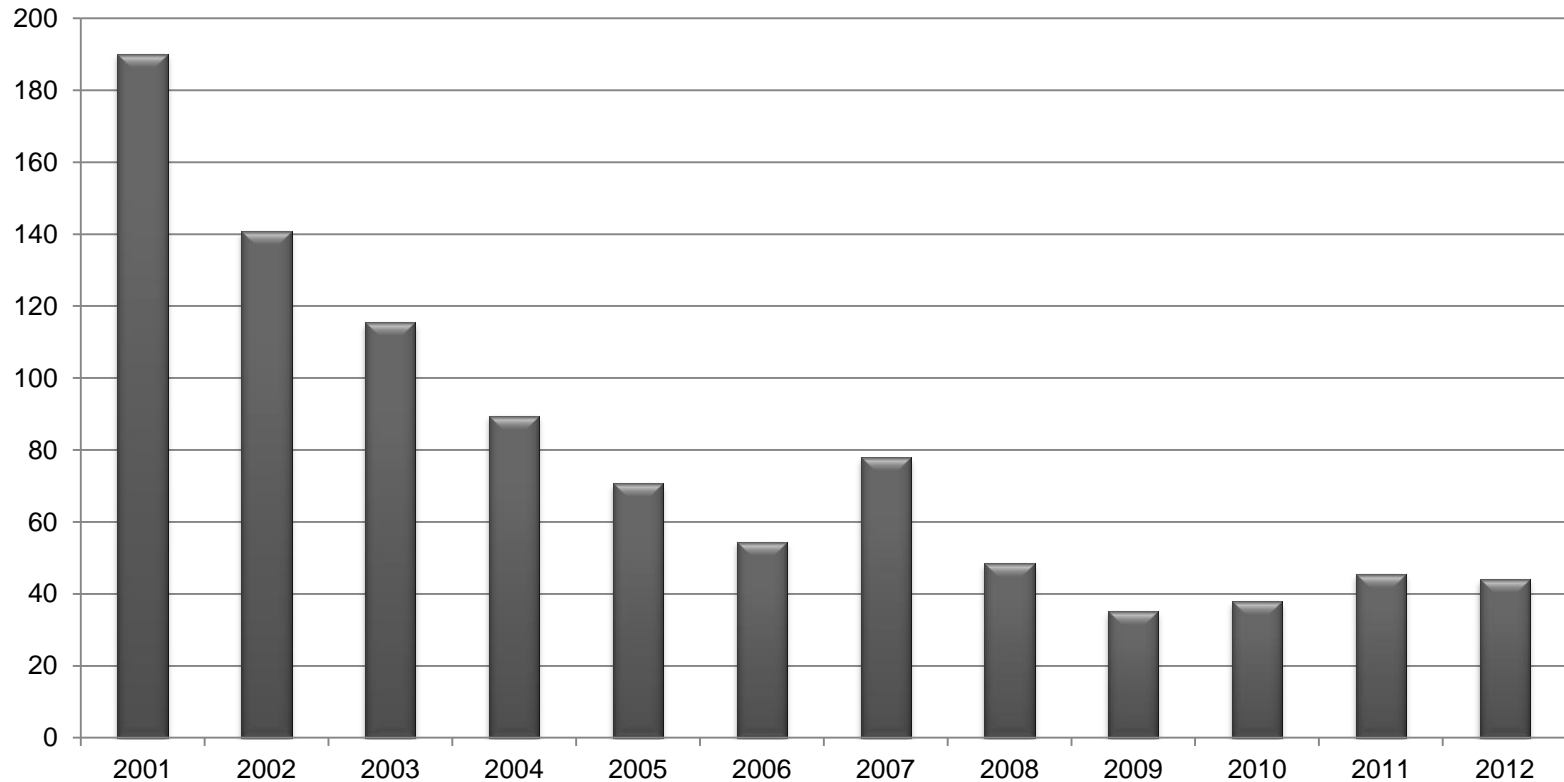
# Carbon Monoxide (CO) Emissions

**Carbon Monoxide**  
Thousand Tons per Year



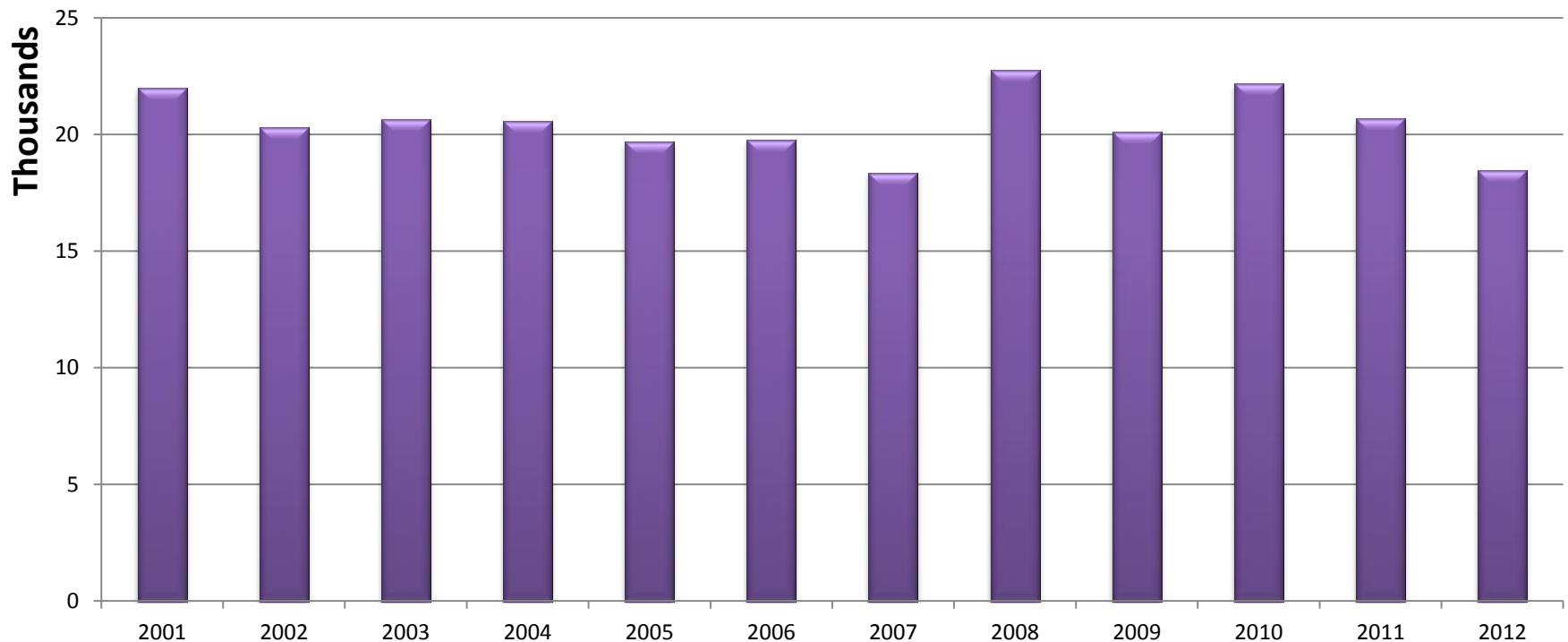
# Airborne Lead (Pb) Emissions

**Airborne Lead**  
Tons per Year



# Particulate Matter (PM<sub>10</sub>)

**Particulate Matter (PM<sub>10</sub>)**  
Thousand Tons per Year





# Ambient Air Monitoring Trends

- Area wide criteria pollutant monitoring indicates decreasing trends over time.
- Revisions to the SO<sub>2</sub>, NO<sub>2</sub>, Lead, and Ozone NAAQS and revised monitoring network requirements has 'lowered the bar' for some areas.
- Some single source and area specific NAAQS violations are being addressed.

# NAAQS Being Met

- **NO<sub>2</sub>**: No Missouri sites violate the 2010 1-hour (100 ppb) standard or annual standard (53 ppb)  
*– Near roadway NO<sub>2</sub> sites – two sites deployed in 2013. No issues yet...*
- **PM<sub>2.5</sub>**: No Missouri sites violate the 1997 annual standard, 2006 24-hour PM<sub>2.5</sub> standard, or the 2012 Annual (12 µg/m<sup>3</sup>) and 24-hour (35 µg/m<sup>3</sup>) standard.  
*– Near roadway PM<sub>2.5</sub> sites- two monitors deployed in 2013. No issues yet...*
- **CO**: No Missouri sites violate the 1-hour (35 ppm) or 8-hour (9 ppm) standard.  
*– Near roadway CO sites- two monitors deployed in 2013. No issues yet...*

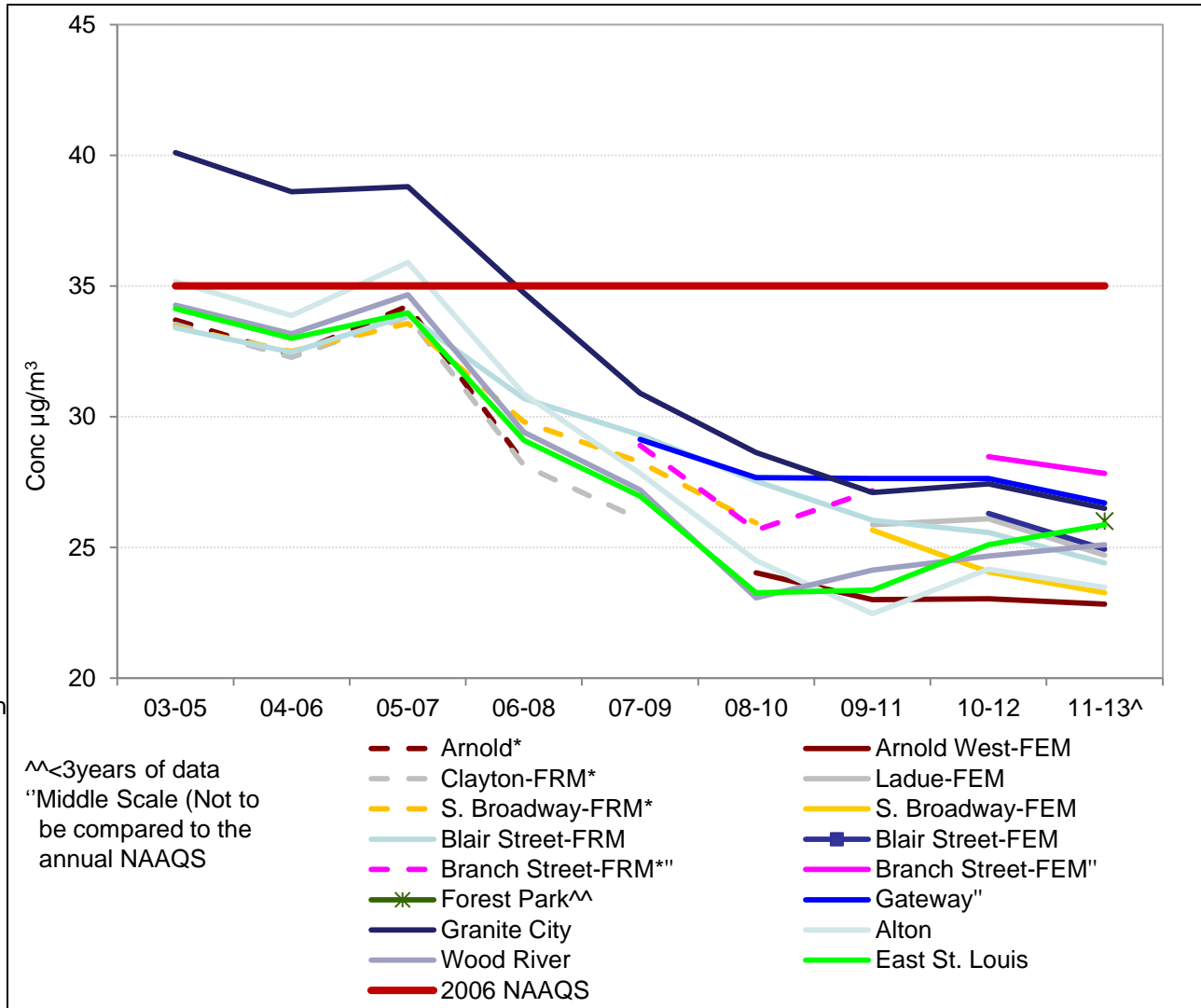
# PM<sub>2.5</sub>

- All MO Monitors are in compliance of the Annual and 24-hour PM<sub>2.5</sub> NAAQS.
- The Illinois side of the St. Louis CBSA has monitors violating the annual NAAQS. (EPA determines if MO sources contribute significantly to Illinois' violating monitors)
- PM<sub>2.5</sub> long term trends are downward.



# PM<sub>2.5</sub> 24-hour Average Ambient Air Monitoring Trends

## ➤ MO and KS Sites in Compliance



^MO sites Quality assured data through  
 Dec 31<sup>st</sup>, 2013.

\*Discontinued monitor

Forest Park (Near-road monitor)  
 2013 98<sup>th</sup> Percentile: **20.6** µg/m<sup>3</sup>  
 (January-December)

2014 98<sup>th</sup> Percentile (YTD to 5/09/14)  
**36.2** µg/m<sup>3</sup>  
 (Less than 3 years of data)

^^<3years of data  
 "Middle Scale (Not to  
 be compared to the  
 annual NAAQS

Data Source: Environmental Protection Agency Air Quality System (EPA AQS), AMP480 Report and AMP450 Report



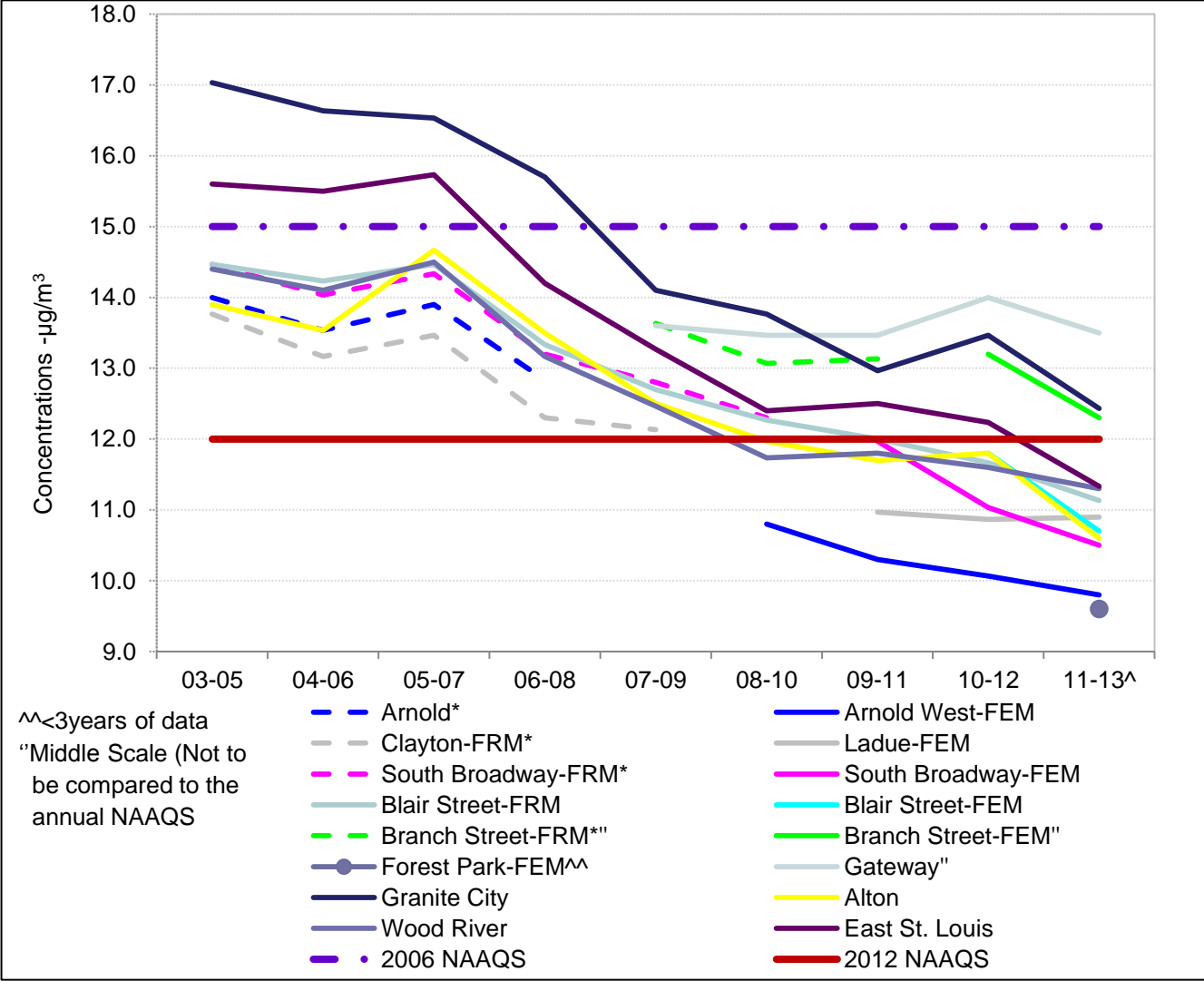
# PM<sub>2.5</sub> Annual Average Ambient Air Monitoring Trends

## ➤ MO and KS Sites in Compliance

^MO sites Quality assured data through  
 Dec 31<sup>st</sup>, 2013.

\*Discontinued monitor

Forest Park (Near-road monitor)  
 2013 Average: **9.6** µg/m<sup>3</sup>  
 (January-December)  
 2014 Average (YTD to 5/09/14)  
**11.3** µg/m<sup>3</sup>  
 (Less than 3 years of data)

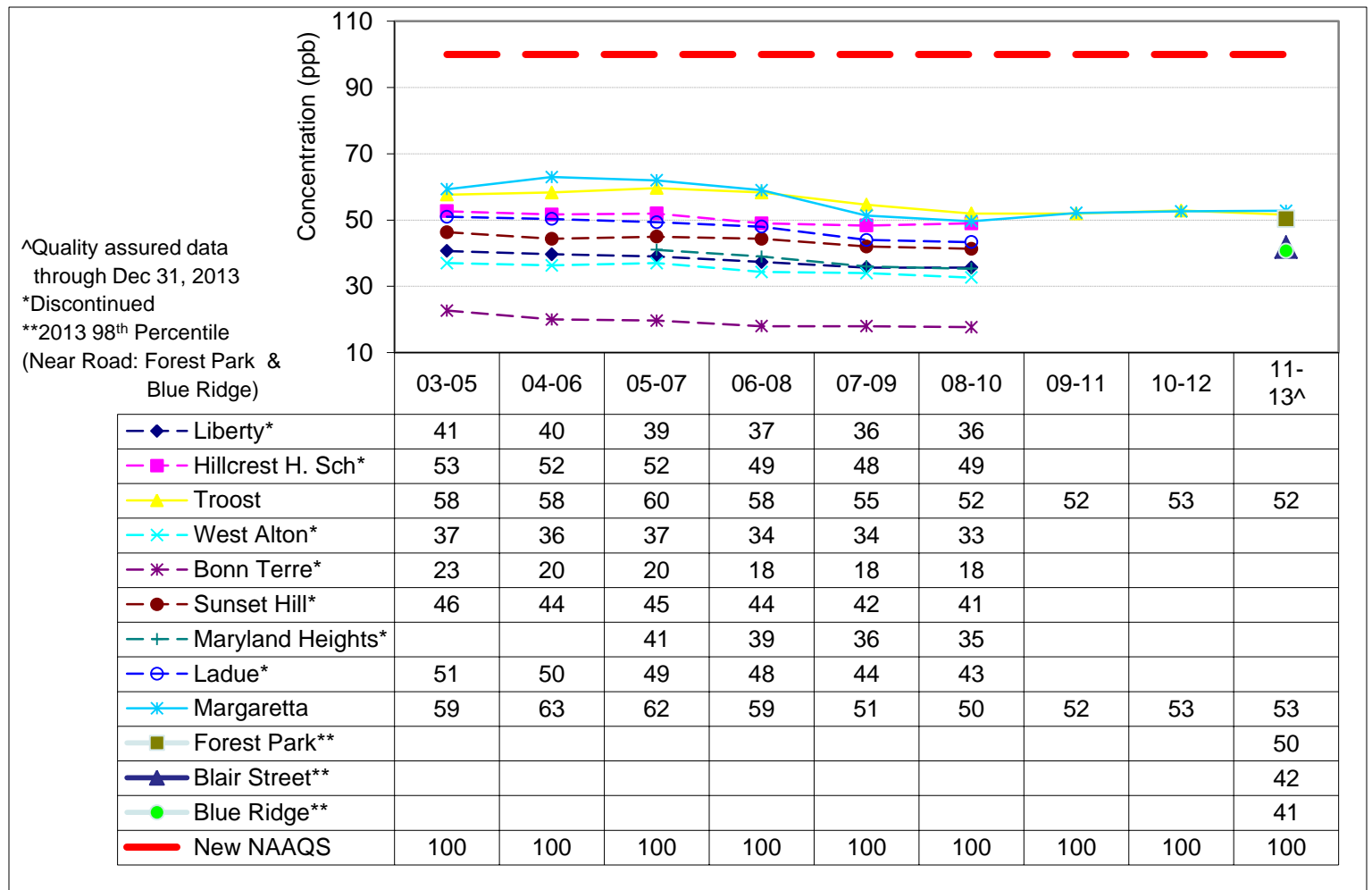


Data Source: Environmental Protection Agency Air Quality System (EPA AQS), AMP480 Report and AMP450 Report



# NO<sub>2</sub>

Missouri 3-year Average of the 98<sup>th</sup> Percentile of the Daily 1-hr Maximum NO<sub>2</sub> Concentrations  
 (1-hr NAAQS = 100ppb)

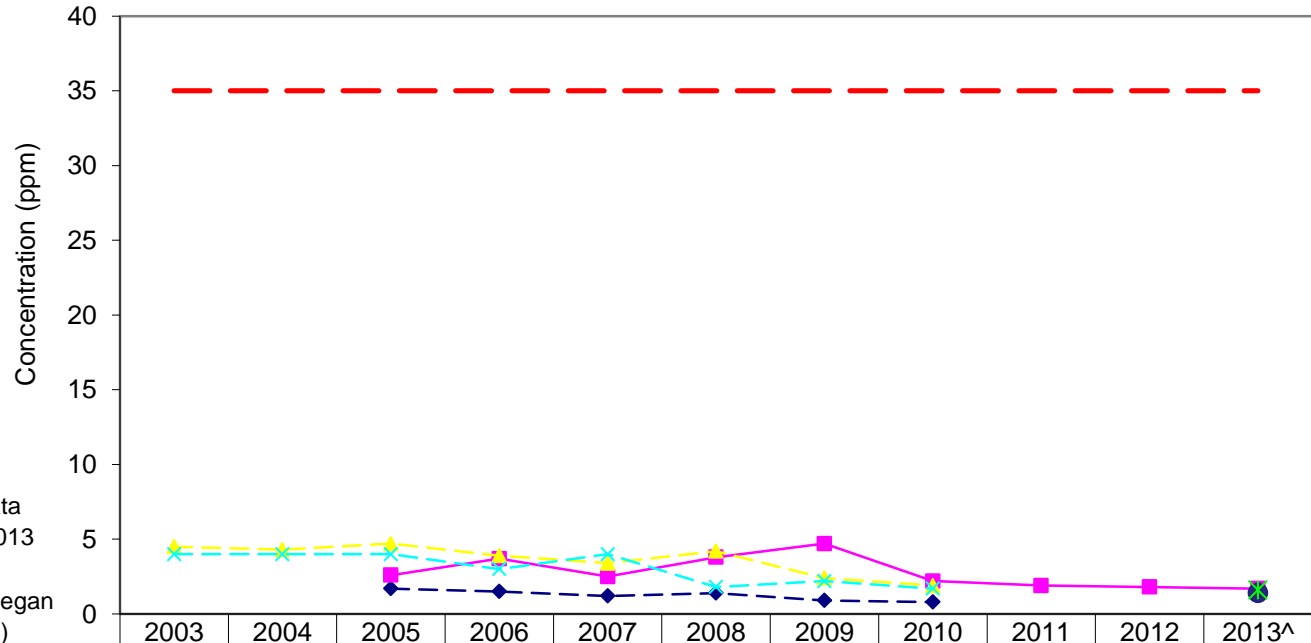


Data Source: Environmental Protection Agency Air Quality System (EPA AQS), AMP480 Report

# CO

## 1-Hour 2<sup>nd</sup> Maximum Annual Averages of the Carbon Monoxide (CO) Concentrations

1-hr NAAQS = 35 Parts Per Million (ppm)



<sup>^</sup>Quality assured data through Dec 31, 2013

\*Discontinued

\*\*Near-Road site (Began monitoring in 2013)

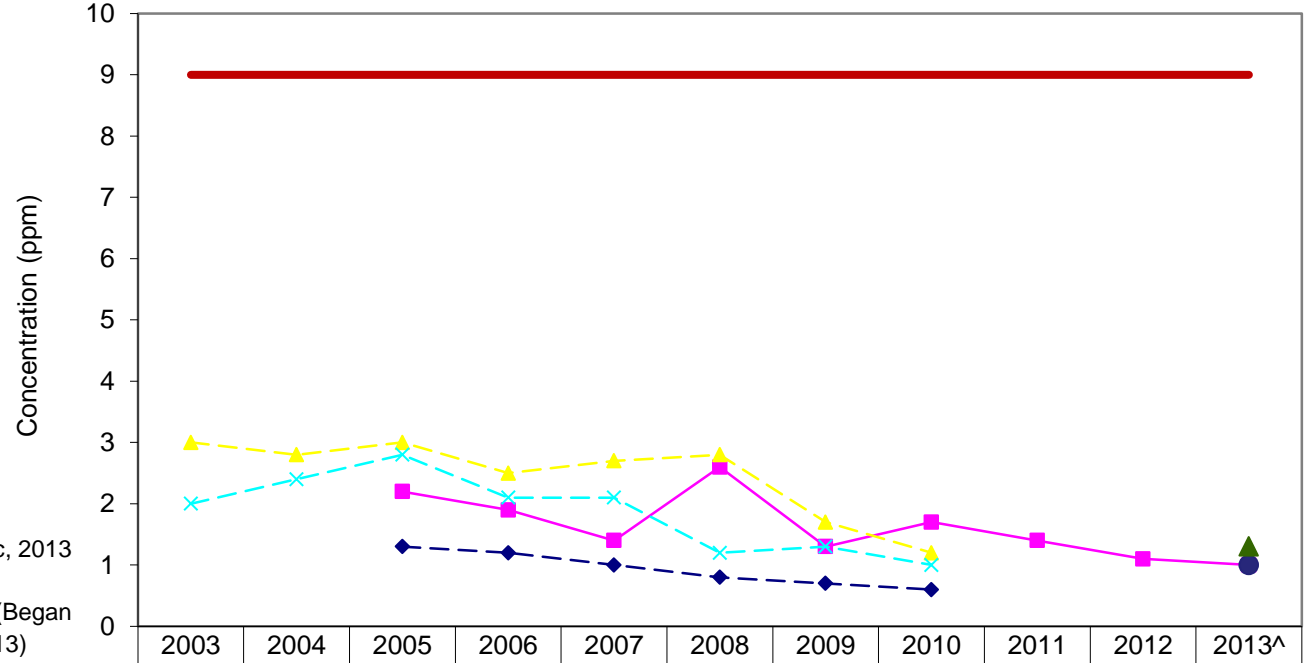
—◆— Sunset Hills*			1.7	1.5	1.2	1.4	0.9	0.8			
—■— Blair Street			2.6	3.7	2.5	3.8	4.7	2.2	1.9	1.8	1.7
—▲— Margaretta*	4.5	4.3	4.7	3.9	3.4	4.2	2.4	1.9			
—✧— MSU*	4.0	4.0	4.0	3.0	4.0	1.8	2.2	1.7			
—●— Forest Park**											1.4
—✱— Blue Ridge, I-70**											1.6
— — 1-hour NAAQS	35	35	35	35	35	35	35	35	35	35	35

Data Source: Environmental Protection Agency Air Quality System (EPA AQS), AMP450 Report



# CO

8-Hour 2<sup>nd</sup> Maximum Annual Averages of the Carbon Monoxide (CO) Concentrations  
 8-hr NAAQS = 9 Parts Per Million (ppm)



<sup>^</sup>Quality assured data through Dec, 2013  
 \*Discontinued  
 \*\*Near-Road site (Began monitoring in 2013)

◆ - Sunset Hills*			1.3	1.2	1.0	0.8	0.7	0.6			
■ - Blair Street			2.2	1.9	1.4	2.6	1.3	1.7	1.4	1.1	1.0
▲ - Margaretta*	3.0	2.8	3.0	2.5	2.7	2.8	1.7	1.2			
× - MSU*	2.0	2.4	2.8	2.1	2.1	1.2	1.3	1.0			
● - Forest Park**											1.0
▲ - Blue Ridge, I-70**											1.3
— 8-hour NAAQS	9	9	9	9	9	9	9	9	9	9	9

Data Source: Environmental Protection Agency Air Quality System (EPA AQS), AMP450 Report

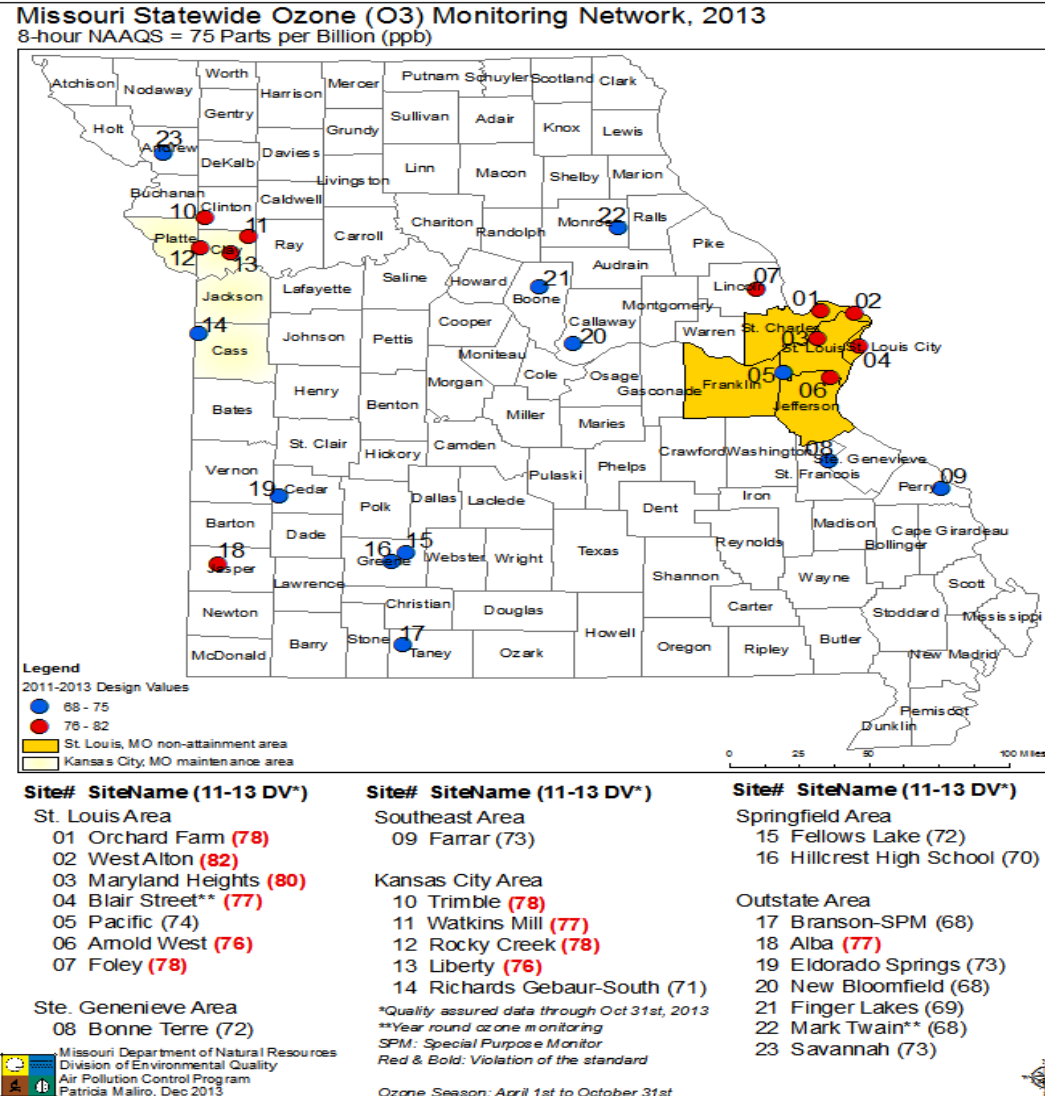


# Opportunities for Improvement

- **Ozone:** Six MO sites in the St. Louis area, four MO sites in Kansas City, and one site in Jasper Co. violate the 2008 standard of 75 ppb based on 2011-2013 data (2013 data is preliminary) The 2012 ozone season is driving design values.
  - Monitoring period over which EPA may designate areas determines path forward.
- **SO<sub>2</sub>:** Two areas: Jackson (partial), and Jefferson counties (partial), violate the 2010 1-hr standard.
  - *Attainment Demonstrations are being developed*
- **Lead:** Three areas: Herculaneum, Iron/Dent/Reynolds (partial counties) (Buick), and Holt Co. (Exide) violate the 2008 3-month standard of 0.15  $\mu\text{g}/\text{m}^3$ . One intermittent violation in the Glover MO area (not expected to be recurring).
  - *Attainment Demonstrations for each area (sans Glover) are being developed or have been submitted for SIP revisions.*
- **PM<sub>10</sub>:** Two small areas in St. Louis City and Carthage violate the 24-hour of 150  $\mu\text{g}/\text{m}^3$ 
  - Small area of impact, single source or cluster of sources. *Compliance plans/strategy for each area are being developed or have been submitted for SIP revisions.*



# Ozone Monitoring Network

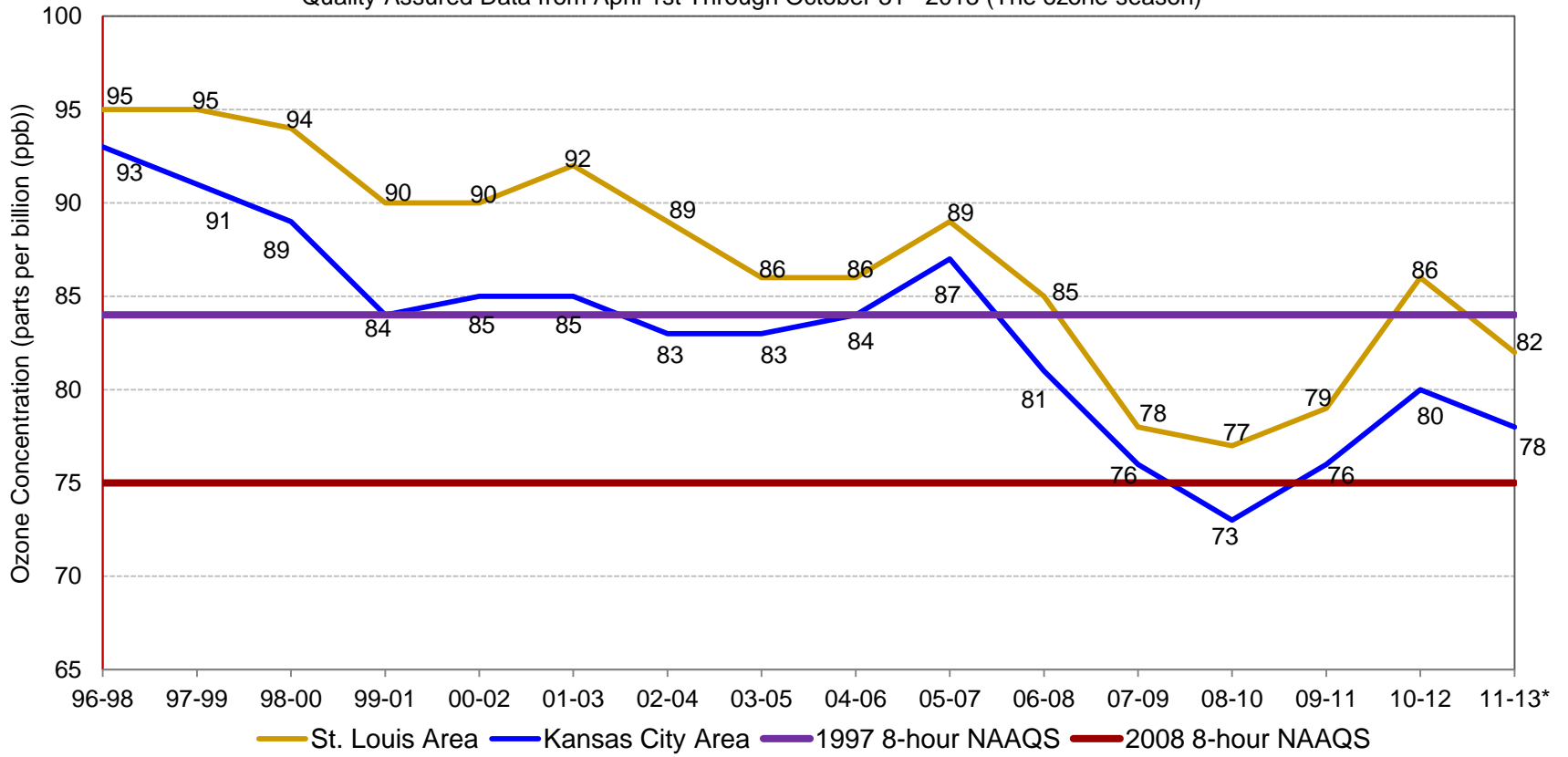




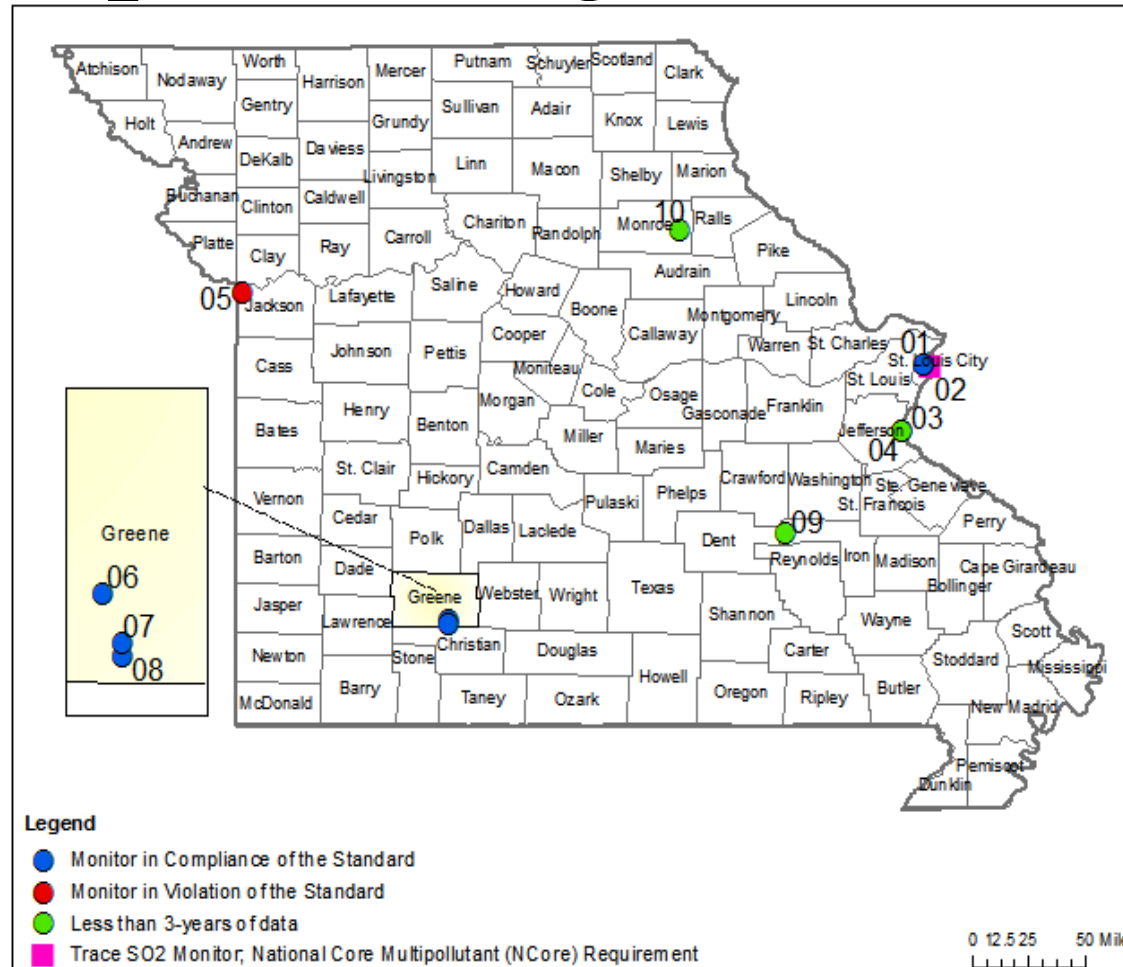
# Ozone (O<sub>3</sub>) Ambient Air Monitoring

1996-2013 8-hour O<sub>3</sub> Design Value Trends (ppb)  
 St. Louis & Kansas City

\*Quality Assured Data from April 1st Through October 31<sup>st</sup> 2013 (The ozone season)



# SO<sub>2</sub> Monitoring Network, 2013



**Site# Site Name (11-13 Design Values\*(ppb))**

St. Louis Area, MO

- 01 Margaretta (29)
- 02 Blair Street (47)
- 03 Herculaneum, Main Street\*\* (172<sup>^^</sup>)
- 04 Herculaneum, Mott Street (192<sup>^^</sup>)

Kansas City, MO

- 05 Troost (162)

Springfield Area, MO

- 06 South Charleston (44)
- 07 Wildwood Lane<sup>^^</sup> (49)
- 08 James River-South<sup>^</sup> (44)

Outstate Area

- 09 Buick NE (90<sup>^^</sup>)
- 10 Mark Twain State Park (8<sup>^^</sup>)

\*Quality assured data through December 31<sup>st</sup>, 2013

\*\*Discontinued monitor

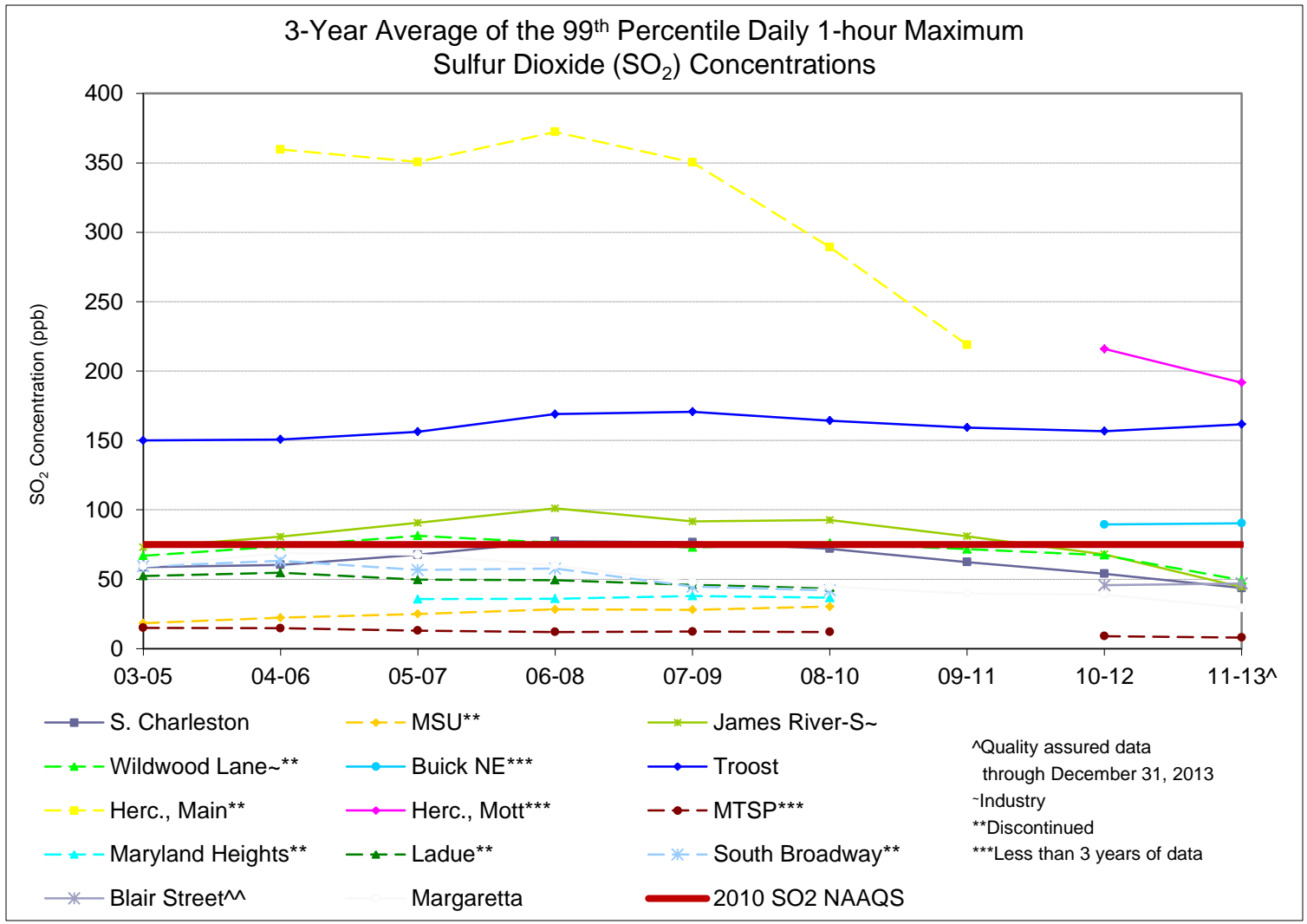
<sup>^</sup>Industry monitor

<sup>^^</sup>Not a valid indicator due to data incompleteness

No violations of the 24-hour and annual NAAQS

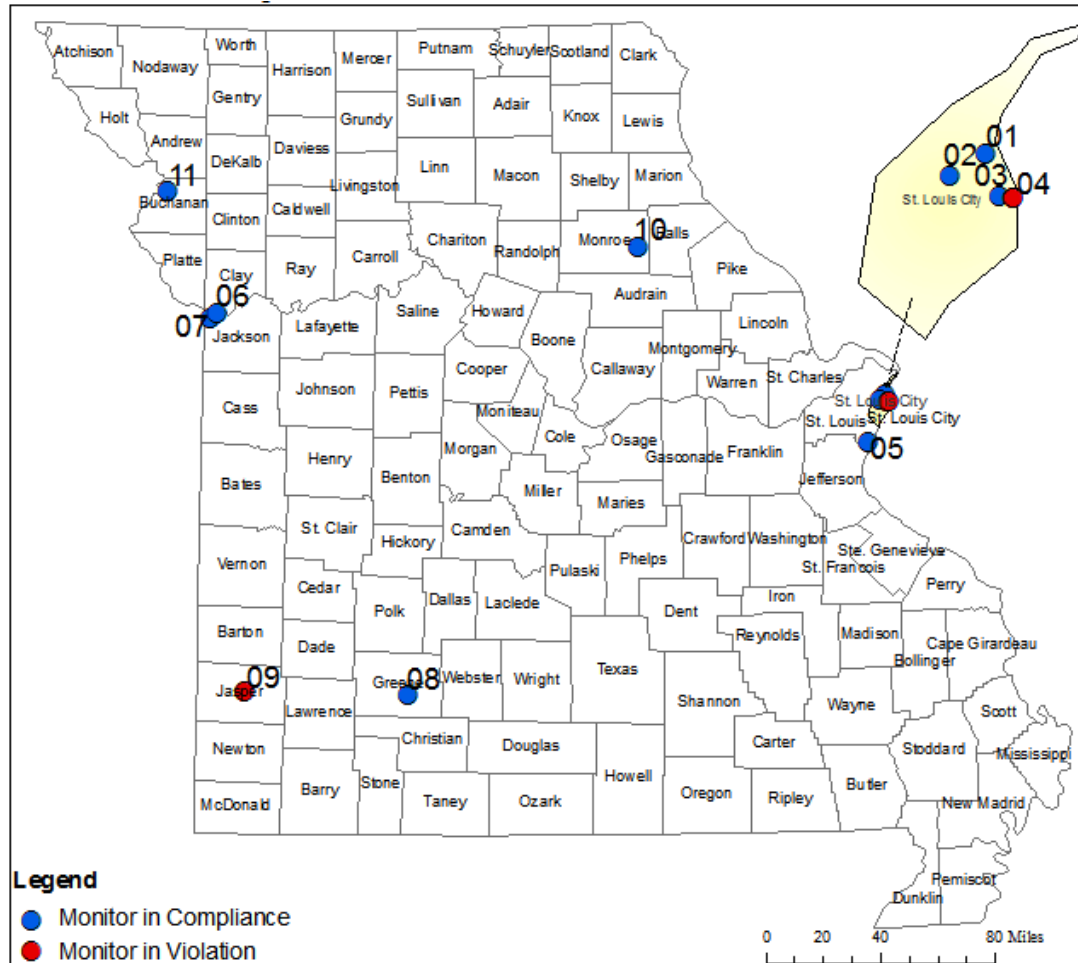


# SO<sub>2</sub>



Data Source: Environmental Protection Agency Air Quality System (EPA AQS), AMP480 Report

# PM<sub>10</sub> Monitoring Network, 2013



**Site# Site Name (11-13 # of Expected Exceedances\*)**

St. Louis Area, MO

- 01 Hall Street\*\* (0.0)
- 02 Margaretta\*\* (0.0)
- 03 Blair Street (0.0)
- 04 Branch Street\*\* (**2.1**)
- 05 Oakville\*\* (0.0)

Kansas City, MO

- 06 Troost (0.0)
- 07 Front Street\*\* (0.0)

Springfield Area, MO

- 08 Missouri State University\*\* (0.0)

Outstate Area

- 09 Carthage\*\* (**1.9**)
- 10 Mark Twain State Park\*\*^ (0.0)
- 11 St. Joseph Pump Station (0.0)

\*Quality assured data through December 31<sup>st</sup>, 2013

\*\*Continuous monitor.

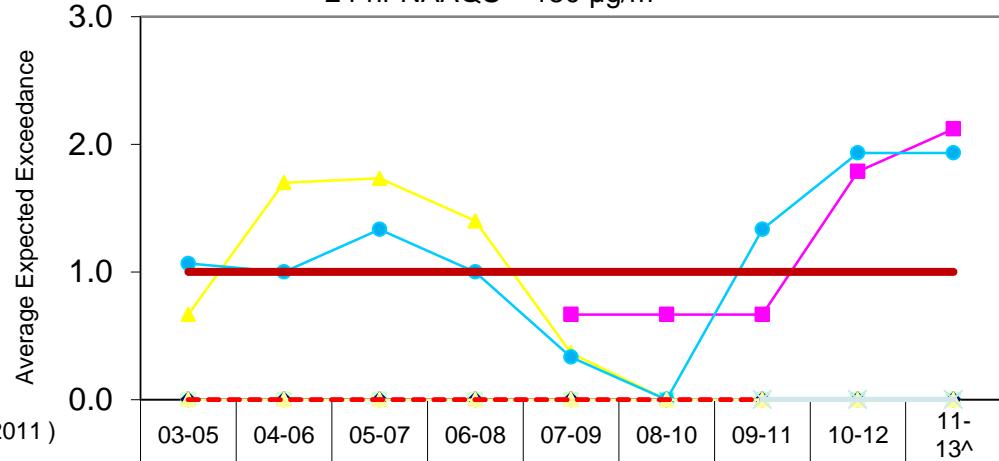
^Resumed sampling on 06/01/2011 as a continuous monitor.

Red & Bold: Violation of the 24-hour standard.

The 24-hour standard is attained when the expected number of exceedances is less than or equal to one (1) when averaged over three (3) calendar years.

# PM<sub>10</sub>

3-year Averages of the Expected Exceedance of the PM<sub>10</sub> 24-hour Standard  
 24-hr NAAQS = 150 µg/m<sup>3</sup>



<sup>^</sup>Quality assured data through December 30, 2013

\*Resumed monitoring (06/01/2011) as continuous monitoring

Blair Street	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Branch Street					0.7	0.7	0.7	1.8	2.1
Hall Street	0.7	1.7	1.7	1.4	0.4	0.0	0.0	0.0	0.0
Margaretta	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Van Brunt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MSU	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mark Twain State Park*	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Oakville						0.0	0.0	0.0	0.0
Carthage-TEOM	1.1	1.0	1.3	1.0	0.3	0.0	1.3	1.9	1.9
St. Joseph Pump Station	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Troost	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Front							0.0	0.0	0.0
3-yr Avg of the Exp Exceed =<1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Data Source: Environmental Protection Agency Air Quality System (EPA AQS), AMP480 Report, 03/17/2014

# New Projects-Near-Roadway

- The second Near Roadway Monitoring in St. Louis at Rider Trail I-70 (Proposed for installation by September, 2014)
- Xact
  - continuous metals monitoring
  - supplement the NATTS PM<sub>10</sub> metals sampling
- The Sunset OC/EC Monitoring at Blair
  - Organic and Elemental Carbon Monitor Evaluation Project
  - Began 2011



# Website Resources

- Air Pollutants Page: MDNR/Programs/Air Pollution Control Program/Program Links/Air Pollutants:

<http://dnr.mo.gov/env/apcp/airpollutants.htm>

- Design Value Reports
- Preliminary hourly data reports
- Monitoring Network Plans and More
- More improvements coming...

Division of Environmental Quality Director: Leanne Tippett Mosby

Date: May 15, 2014

Nothing in this document may be used to implement any enforcement action or levy any penalty unless promulgated by rule under chapter 536 or authorized by statute.