2015 Air Quality Report

Stephen Hall
Air Quality Analysis Section
Air Pollution Control Program

June 23, 2015, Air Quality Advisory Committee Meeting
East-West Gateway, St. Louis MO
Presentation Overview

- Statewide Emissions Inventory Trends
- Ambient Air Monitoring Trends
- New Projects
Sulfur Dioxide (SO$_2$) Point Source Emissions

### Sulfur Dioxide

*Thousand Tons per Year*

<table>
<thead>
<tr>
<th>Year</th>
<th>Thousands</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>380</td>
</tr>
<tr>
<td>2002</td>
<td>360</td>
</tr>
<tr>
<td>2003</td>
<td>380</td>
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<tr>
<td>2004</td>
<td>360</td>
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<td>2005</td>
<td>380</td>
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<td>2006</td>
<td>360</td>
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<td>2007</td>
<td>380</td>
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<tr>
<td>2008</td>
<td>360</td>
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<tr>
<td>2009</td>
<td>330</td>
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<tr>
<td>2010</td>
<td>300</td>
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<tr>
<td>2011</td>
<td>270</td>
</tr>
<tr>
<td>2012</td>
<td>240</td>
</tr>
<tr>
<td>2013</td>
<td>210</td>
</tr>
</tbody>
</table>
Missouri SO$_2$ Total Emissions (2011 NEI V2)
Tons per Year

- Fuel Combustion: 226,681
- Industrial Processes: 29,343
- Fires: 1,344
- Mobile: 140
- Miscellaneous: 0
- Solvent: 4,393

Source:
http://www.epa.gov/air/emissions/

Source Sector Category Details:
http://www.epa.gov/air/emissions/basic.htm
Nitrogen Dioxide (NO₂) Point Source Emissions

Nitrogen Dioxide
Thousand Tons per Year

Thousands
Volatile Organic Compounds (VOC) Point Source Emissions

Volatile Organic Compounds

Thousands per Year
Missouri VOC Total Emissions (2011 NEI V2)
Tons per Year

Source: http://www.epa.gov/air/emissions/
Source Sector Category Details: http://www.epa.gov/air/emissions/basic.htm
Carbon Monoxide (CO) Point Source Emissions

Carbon Monoxide
Thousand Tons per Year

Thousands

Total Missouri CO Emissions (2011 NEI V2)
Tons per Year

- Mobile: 856,560
- Fires: 632,119
- Biogenics: 140,153
- Fuel Combustion: 107,188
- Industrial Processes: 77,005
- Miscellaneous: 24,211
- Solvent: 68

Source:
http://www.epa.gov/air/emissions/
Source Sector Category Details:
http://www.epa.gov/air/emissions/basic.htm
Airborne Lead (Pb) Point Source Emissions

* Increased lead emissions for 2013 are a result of stack testing at a single facility. The facility shut down the processes that release emissions through the tested stacks at the end of the 2013 emission year, and the increased emissions are believed to be a result of the shut down activities. Lead emissions are expected to be below 2012 and 2011 levels for the 2014 emission year.
Particulate Matter (PM$_{10}$) Point Source Emissions

Particulate Matter (PM$_{10}$)
Thousand Tons per Year

Thousands

0 5 10 15 20 25


Missouri Department of Natural Resources
Area wide criteria pollutant monitoring indicates decreasing trends over time.

Revisions to the \( \text{SO}_2 \), \( \text{NO}_2 \), 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$_2$:** No Missouri sites violate the 2010 1-hour (100 ppb) standard or annual standard (53 ppb)
  – Near roadway NO$_2$ sites – two sites deployed in 2013.
  – Second NO$_2$ site in St. Louis – deployed in 2015.
  → No issues yet…

• **PM$_{2.5}$:** No Missouri sites violate the 1997 annual standard, 2006 24-hour PM$_{2.5}$ standard, or the 2012 Annual (12 µg/m$^3$) and 24-hour (35 µg/m$^3$) standard.
  – Near roadway PM$_{2.5}$ 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$_{2.5}$ 24-hour Average Ambient Air Monitoring Trends (2003-2014)

- MO Sites in Compliance

Data Source: Environmental Protection Agency Air Quality System (EPA AQS), AMP480 Report,
PM$_{2.5}$ Annual Average Ambient Air Monitoring Trends (2003-2014)

- MO Sites in Compliance

^Quality assured through Dec 2014
*Discontinued
^^<3years of data

Data Source: Environmental Protection Agency Air Quality System (EPA AQS), AMP480 Report
Missouri 3-year Average of the 98th Percentile of the Daily 1-hr Maximum NO$_2$ Concentrations

(1-hr NAAQS = 100ppb)

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

*Quality assured data through Dec, 2014
**Near Roadway Monitor (<3yrs of data)
*Discontinued
Opportunities for Improvement

• **Ozone**: Three MO sites in the St. Louis area violate the 2008 standard of 75 ppb based on 2012-2014 data. The 2012 ozone season is driving design values.
  – Monitoring period over which EPA may designate areas determines path forward.

• **SO₂**: Two areas: Jackson (partial), and Jefferson counties (partial), violate the 2010 1-hr standard. – *Attainment Demonstrations are being developed*
  Note: Jefferson county Mott St. and Buick North East SO₂ monitors anticipated to be in compliance by the end of 2015...

• **Lead**: Three areas: Herculaneum, Iron/Dent/Reynolds (partial counties) (Buick), and Holt Co. (Exide) violate the 2008 3-month standard of 0.15 µg/m³. One intermittent violation in the Glover MO area (not expected to be recurring).
  – *Attainment Demonstrations for each area (sans Glover) have been submitted for SIP revisions. No monitors are currently contributing to a lead NAAQS violation.*

• **PM₁₀**: One small area in St. Louis City violates the 24-hour of 150 µg/m³ NAAQS
  – Small area of impact, single source or cluster of sources. *Compliance plans/strategy for the area are being developed. Carthage is now in attainment and compliance plan has been submitted for SIP revision.*
Ozone Monitoring Network
Ozone ($O_3$) Ambient Air Monitoring

1996-2014 8-hour Ozone Design Value Trends (ppb)
St. Louis and Kansas City Areas and a Rural Site\(^a\)

\(^a\)Quality Assured Data Through December 31, 2014

Data Source: Environmental Protection Agency Air Quality System (EPA AQS), AMP480 Report
<table>
<thead>
<tr>
<th>Site#</th>
<th>Site Name (12-14 Design Values* (ppb))</th>
</tr>
</thead>
<tbody>
<tr>
<td>St. Louis Area, MO</td>
<td></td>
</tr>
<tr>
<td>01</td>
<td>Margaretta (26)</td>
</tr>
<tr>
<td>02</td>
<td>Blair Street (46)</td>
</tr>
<tr>
<td>03</td>
<td>Herculaneum, Main Street** (172^^)</td>
</tr>
<tr>
<td>04</td>
<td>Herculaneum, Mott Street (143)</td>
</tr>
<tr>
<td>Kansas City, MO</td>
<td></td>
</tr>
<tr>
<td>05</td>
<td>Troost (150)</td>
</tr>
<tr>
<td>Springfield Area, MO</td>
<td></td>
</tr>
<tr>
<td>06</td>
<td>South Charleston (35)</td>
</tr>
<tr>
<td>07</td>
<td>Wildwood Lane** (40^^)</td>
</tr>
<tr>
<td>08</td>
<td>James River-South^ (32)</td>
</tr>
<tr>
<td>Outstate Area</td>
<td></td>
</tr>
<tr>
<td>09</td>
<td>Buick NE (76)</td>
</tr>
<tr>
<td>10</td>
<td>Mark Twain State Park (8^^)</td>
</tr>
</tbody>
</table>

*Quality assured data through December 31st, 2013
**Discontinued monitor
^Industry monitor
^^Less than 3 years of data

Data Source: Environmental Protection Agency Air Quality System (EPA AQS), AMP480 Report
SO$_2$

3-Year Average of the 99th Percentile Daily 1-Hour Maximum Sulfur Dioxide (SO$_2$) Concentrations

*Quality assured data through Dec, 2014

~Industry

**Discontinued

***<3 years of data

Data Source: Environmental Protection Agency Air Quality System (EPA AQS), AMP480 Report
PM$_{10}$ Monitoring Network, 2014

<table>
<thead>
<tr>
<th>Site#</th>
<th>Site Name (12-14 # of Expected Exceedances*)</th>
</tr>
</thead>
<tbody>
<tr>
<td>St. Louis Area, MO</td>
<td>01 Hall Street** (0.0) 02 Margaretta** (0.0) 03 Blair Street (0.0) 04 Branch Street** (2.1) 05 Oakville** (0.0)</td>
</tr>
<tr>
<td>Kansas City, MO</td>
<td>06 Troost (0.0) 07 Front Street** (0.0)</td>
</tr>
<tr>
<td>Springfield Area, MO</td>
<td>08 Hillcrest High School**^ (0.0)</td>
</tr>
<tr>
<td>Outstate Area</td>
<td>09 Carthage** (0.9) 10 Mark Twain State Park**(0.0) 11 St. Joseph Pump Station (0.0)</td>
</tr>
</tbody>
</table>

*Quality assured data through December 31, 2013
*Relocated from MSU, April 2015 (-)
**Continuous monitor.

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.

Data Source: Environmental Protection Agency Air Quality System (EPA AQS), AMP480 Report
**PM$_{10}$**

3-year Averages of the Expected Exceedance of the PM10 24-hour Standard

- **Margaretta**
- **Branch Street**
- **Troost**
- **Mark Twain State Park**
- **Oakville**
- **Van Brunt**
- **Blair Street**
- **Front**
- **Carthage**
- **St. Joseph Pump Station**
- **Hall Street**
- **MSU**

| Quality Assured data through Dec 31, 2014 |
| Continuous Monitor |
| Discontinued |

Data Source: Environmental Protection Agency Air Quality System (EPA AQS), AMP480 Report, 04/30/2015
Lead Monitoring - Exide Trends

Forest City Levee Airborne Lead Concentrations, 3-Month Rolling Averages

- TSP
- PM10
- Standard
New Projects-Near-Roadway
The second St. Louis Near-Roadway Monitoring site at Rider Trail/I-70 was installed in January 2015
Other Projects - Blair St., St. Louis City

- Xact
  - continuous metals monitoring (1-hour averages)
  - supplement the NATTS PM$_{10}$ metals sampling

- The Sunset OC/EC Monitoring
  - Organic and Elemental Carbon Monitor Evaluation Project
  - Began 2011
  - Possible collocated sampling project

View and Download Site Data at: [http://www.epa.gov/airdata/](http://www.epa.gov/airdata/)

Design Value Reports: [http://dnr.mo.gov/env/apcp/airpollutants.htm](http://dnr.mo.gov/env/apcp/airpollutants.htm)

Division of Environmental Quality
Director: Leanne Tippett Mosby

June 23, 2015

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.