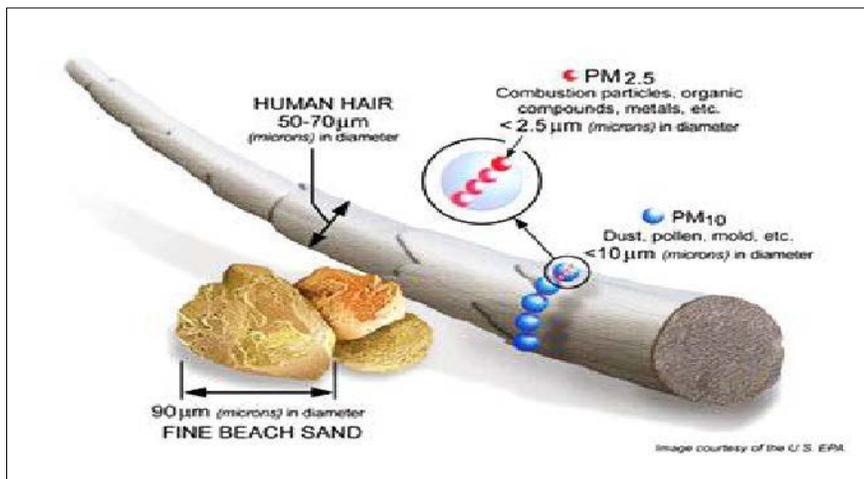




## Air Quality Analysis of PM<sub>10</sub>

PM<sub>10</sub> refers to airborne particles — particulate matter — smaller than 10 micrometers in diameter. People may inhale these particles, but no one can see them with the naked eye. Examples include microscopic mold, dust and pollen. The general public may encounter particulate matter in this size range near roads and industries, among other areas. These particles are so tiny that by comparison, the average human hair is seven times larger than the widest ones.



Due to their small size, these particles can entrench themselves in one's lungs and bloodstream. Studies have shown that particle pollution can impact people in all age groups. However, children, the elderly, and those with heart and/or lung disease are highest at risk. Particle pollution also impairs the environment and damages buildings. For more information, go to <http://www.epa.gov/airquality/particlepollution/index.html>.

Monitoring sites use filters to trap these particles. Some sites operated by the Missouri Department of Natural Resources require a chemist to weigh the filters and calculate the concentration of airborne PM<sub>10</sub>. The U.S. Environmental Protection Agency (EPA) classifies this process as a federal reference method, the gold standard of air monitoring. Other sites use newer methods that the EPA recently approved as federal equivalent methods. They also use filters, but the equipment does not require chemists to weigh the filters to determine the concentration of airborne PM<sub>10</sub>. These methods continuously measure PM<sub>10</sub>. Furthermore, some sites monitor PM<sub>10</sub> using a combination of methods.

The EPA has set a standard for PM<sub>10</sub> at 150 micrograms per cubic meter of ambient air (150 µg/m<sup>3</sup>), averaged over a 24-hour day. A site does not meet this standard if it exceeds the level more than once per year, averaged over a three-year period. The PM<sub>10</sub> standard is expressed as “expected number of days exceeding the standard.” The word *expected* is used because PM<sub>10</sub> is not always measured every day at a specific monitoring site. Consequently, determining the number of days of exceedance requires adjustment by the ratio of the number of days in the year (365 or 366) to the number of days on which PM<sub>10</sub> is measured.



A chemist in the department’s Environmental Services Program prepares to weigh a PM<sub>10</sub> filter.

The following pages show a map with PM<sub>10</sub> monitoring sites operated by the department and a table of PM<sub>10</sub> design values. A value greater than one indicates exceedance of the PM<sub>10</sub> standard; a value less than or equal to one indicates that a site is meeting the standard. As shown on the map and table, half of the sites use a PM<sub>10</sub> instrument that EPA only recently designated and approved as a federal equivalent method. The department currently does not publish all of this data.

All but two of the department’s sites have met the PM<sub>10</sub> standard in recent years. One site exceeded the standard for the 2011-2013 period, and the other exceeded the standard for the 2012-2014 period. Both are located in areas near industrial facilities whose operations may release PM<sub>10</sub> into the air. Staff members from the department’s Air Pollution Control Program continue to work with these facilities to ensure that the PM<sub>10</sub> standard will continue to be met in the future.



**Expected Numbers of Days that Air Monitoring Sites  
in Missouri Exceed the PM10 Standard**  
(150 micrograms per cubic meter)

Updated 1/26/2017

Site numbers correspond to map legend.

Expected exceedance days through September 2017 are based on quality assured data as reported to US EPA.

Yellow highlighting indicates expected exceedance days greater than 1. The standard is exceeded at these sites for the indicated period.

Site/3-Year Period	2007-2009	2008-2010	2009-2011	2010-2012	2011-2013	2012-2014	2013-2015	2014-2016†
<b>Nos. 01 - 07 in St. Louis area</b>								
01 Margaretta	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
02 Blair Street <sup>^</sup>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
03 Branch Street <sup>^</sup>	0.7	0.7	0.7	1.8	2.1	2.1	1.0	0.7
04 Forest Park, I-64 <sup>^</sup>								
05 South Broadway <sup>^</sup>								
06 Ladue <sup>^</sup>								
07 Arnold West <sup>^</sup>								0.0
<b>Nos. 08 -12 in Kansas City area</b>								
08 Liberty <sup>^</sup>								
09 Front Street			0.0	0.0	0.0	0.0	0.0	0.0
10 Troost <sup>^</sup>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11 Blue Ridge, I-70 <sup>^</sup>								
12 Richards Gebaur-South <sup>^</sup>								
<b>No. 13 in Springfield area</b>								
13 Hillcrest High School <sup>^</sup>								0.0
<b>Nos. 14 - 17 in Outstate area</b>								
14 Carthage in southwest Missouri	0.3	0.0	1.3	1.9	1.9	0.9	0.3	0.7
15 El Dorado Springs <sup>^</sup> in southwest Missouri								
16 Mark Twain State Park in northeast Missouri	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
17 St. Joseph Pump Station <sup>^</sup> in northwest Missouri	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

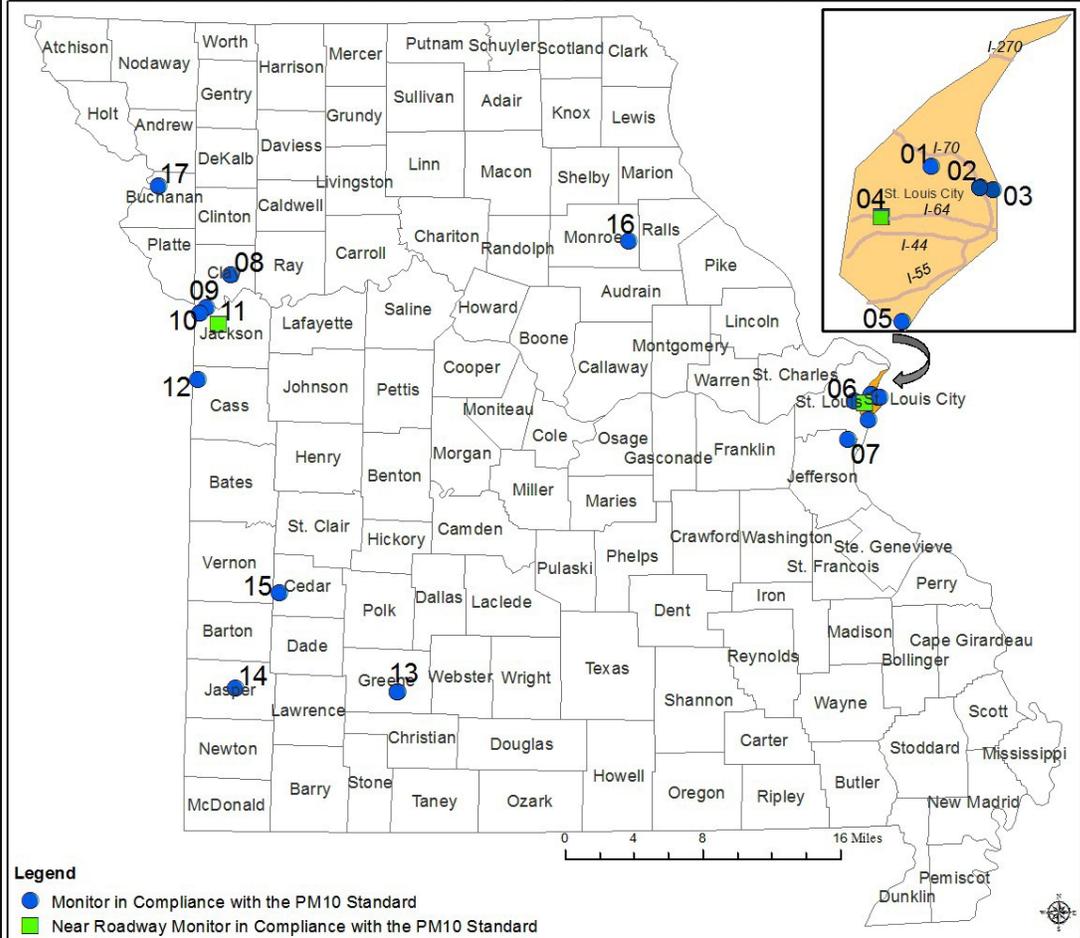
<sup>^</sup>The U.S. Environmental Protection Agency (EPA) approved the Federal Equivalent Method (FEM) monitoring instruments at these sites in July 2014.

Some of these sites also have Federal Reference Method (FRM) samplers, for which results are shown in the table.

The Missouri Department of Natural Resources is comparing data from the recently approved FEM instruments to data derived from FRM samplers, which air monitoring agencies consider to be the gold standard. The department anticipates publishing data from these FEM instruments in the near future.

†Data from 2016 are from first and third quarters only (January - September). Hillcrest High School and Arnold West data are from 2015-2016 only.

# Missouri Statewide PM10 Monitoring Network, 2016



**Legend**

- Monitor in Compliance with the PM10 Standard
- Near Roadway Monitor in Compliance with the PM10 Standard

**St. Louis Area**

Site#	Site Name
01	Margaretta**
02	Blair Street <sup>^</sup> ~
03	Branch Street <sup>**^</sup>
04	Forest Park, I-64 <sup>^</sup>
05	South Broadway <sup>^</sup>
06	Ladue <sup>^</sup>
07	Arnold West <sup>**^</sup>

**Kansas City Area**

Site#	Site Name
08	Liberty <sup>^</sup>
09	Front Street**
10	Troost <sup>**^</sup>
11	Blue Ridge, I-70 <sup>^</sup>
12	Richards Gebaur-South <sup>^</sup>

**Springfield Area**

Site#	Site Name
13	Hillcrest High School <sup>**^</sup>

**Outstate Area**

Site#	Site Name
14	Carthage**
15	El Dorado Springs <sup>^</sup>
16	Mark Twain State Park**
17	St. Joseph Pump Station <sup>**^</sup>



<sup>\*\*</sup>Measure PM10 continuously. Data reported to EPA.

<sup>^</sup>Measure PM10 continuously. Data not reported to EPA as Federal Equivalent Method.

<sup>~</sup>PM10 Filter-based, noncontinuous. Data reported to EPA.