

PM_{2.5} Air Quality Data Update 2005-2007 Design Values

The following is a brief summary of EPA's air quality update for PM_{2.5} based on ambient monitoring data for the three-year period, 2005-2007. During this three-year period:

- Thirty-two of the original 39 areas designated nonattainment for the PM_{2.5} NAAQS in April, 2005 (using 2001-2003 data) failed to meet the annual PM_{2.5} NAAQS in 2005-2007. Thirty of the original 39 nonattainment areas failed to meet the 24-hour NAAQS in 2005-2007. Thirty-eight of the 39 nonattainment areas failed to meet at least one of the two PM_{2.5} standards. (Table 1)
- Five of the original 39 designated nonattainment areas met the annual PM_{2.5} NAAQS in 2005-2007. Nine nonattainment areas met the 24-hour PM_{2.5} NAAQS for 2005-2007. One nonattainment area (Washington, DC-MD-VA) met both the annual and 24-hour PM_{2.5} NAAQS for 2005-2007. (Table 1)
- Two of the original 39 designated nonattainment areas, Philadelphia and Reading, had incomplete data with respect to the annual PM_{2.5} NAAQS; in the Philadelphia nonattainment area, all the sites with complete data for 2005-2007 showed attainment but several other monitors which previously showed nonattainment have incomplete data for 2005-2007. (Table 1)
- Forty counties outside of existing PM_{2.5} nonattainment areas violated one or both PM_{2.5} NAAQS in 2005-2007. (Table 2)
 - The single area (Greenville-Spartanburg, SC) designated as unclassifiable for the PM_{2.5} NAAQS in April 2005 again failed to meet the annual PM_{2.5} NAAQS in 2005-2007.
 - Seven additional areas (counties not part of nonattainment or unclassifiable areas) also failed to meet the annual PM_{2.5} NAAQS for 2005-2007.
 - Thirty-two additional counties violated the 24-hour PM_{2.5} NAAQS in 2005-2007.

In 1997, EPA established the PM_{2.5} NAAQS for the protection of public health. The annual standard was set at a level of 15.0 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) and the 24-hour standard was set at a level of 65 $\mu\text{g}/\text{m}^3$. In October 2006 the 24-hour PM_{2.5} NAAQS was strengthened to 35 $\mu\text{g}/\text{m}^3$. (The annual PM_{2.5} standard is met when the 3-year average of a site's annual mean concentration is 15.0 $\mu\text{g}/\text{m}^3$ or less. The 24-hour standard is met when the 3-year average of a site's annual 98th percentile values is 35 $\mu\text{g}/\text{m}^3$ or less.) The secondary PM_{2.5} standards, established for the protection of public welfare and the environment, are the same as the primary standards. [Note: Monitoring agencies are permitted to use a spatial average for a set of sites for comparisons to the annual mean standard if the set of sites meets criteria specified in 40 CFR Part 50, Appendix N.]

Air quality data from EPA's Air Quality System (AQS) were used to calculate PM_{2.5} design values. The specific calculations are explained in footnotes to the tables. The data used for these calculations were obtained from AQS on January 13, 2008. Detailed 2005-2007 information (plus information for previous 3-year periods from 1999-2001) for all PM_{2.5} FRM sites are available in the downloadable spreadsheet file.

For information concerning these data and/or calculations, contact:

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Table 1. 2005-2007 PM_{2.5} design values for areas previously designated nonattainment

<u>Designated Nonattainment Area</u>	<u>State</u>	<u>EPA Region</u>	<u>Designation Status</u> ¹	<u>2005-2007 Annual Design Value</u> ^{2,4}	<u>Met Annual NAAQS 2005-2007?</u> ^{2,4}	<u>2005-2007 24-hr Design Value</u> ³	<u>Met 24-hour NAAQS 2005-2007?</u> ³	<u>Met both NAAQS 2005-2007?</u>
				Value	2007?	Value	2007?	2005-2007?
Atlanta	GA	4	Nonattainment	16.2	No	35	Yes	No
Baltimore	MD	3	Nonattainment	15.6	No	37	No	No
Birmingham	AL	4	Nonattainment	18.7	No	44	No	No
Canton-Masillon	OH	5	Nonattainment	16.0	No	36	No	No
Charleston	WV	3	Nonattainment	16.6	No	38	No	No
Chattanooga	TN-GA-AL	4	Nonattainment	15.2	No	34	Yes	No
Chicago-Gary-Lake County	IL-IN	5	Nonattainment	15.7	No	40	No	No
Cincinnati-Hamilton	OH-KY-IN	4,5	Nonattainment	17.3	No	41	No	No
Cleveland-Akron-Lorain	OH	5	Nonattainment	16.8	No	42	No	No
Columbus	OH	5	Nonattainment	14.9	Yes	38	No	No
Dayton-Springfield	OH	5	Nonattainment	15.5	No	37	No	No
Detroit-Ann Arbor	MI	5	Nonattainment	17.2	No	43	No	No
Evansville	IN	5	Nonattainment	15.0	Yes	36	No	No
Floyd County	GA	4	Nonattainment	16.1	No	35	Yes	No
Greensboro-Winston Salem-High Point	NC	4	Nonattainment	15.1	No	31	Yes	No
Harrisburg-Lebanon-Carlisle	PA	3	Nonattainment	14.6	Yes	38	No	No
Hickory-Morgantown-Lenoir	NC	4	Nonattainment	15.2	No	34	Yes	No
Huntington-Ashland	WV-KY-OH	3,4,5	Nonattainment	16.6	No	37	No	No
Indianapolis	IN	5	Nonattainment	16.1	No	40	No	No
Johnstown	PA	3	Nonattainment	15.3	No	39	No	No
Knoxville	TN	4	Nonattainment	15.7	No	37	No	No
Lancaster	PA	3	Nonattainment	15.9	No	40	No	No
Libby	MT	8	Nonattainment	14.7	Yes	41	No	No
Liberty-Clairton	PA	3	Nonattainment	19.8	No	60	No	No
Los Angeles-South Coast Air Basin	CA	9	Nonattainment	19.6	No	55	No	No
Louisville	KY-IN	4,5	Nonattainment	16.6	No	39	No	No
Macon	GA	4	Nonattainment	16.6	No	34	Yes	No
Martinsburg, WV-Hagerstown	MD	3	Nonattainment	15.8	No	33	Yes	No
New York-N.J.-New Jersey-Long Island	NY-NJ-CT	1,2	Nonattainment	15.9	No	42	No	No
Parkersburg-Marietta	WV-OH	3,5	Nonattainment	15.4	No	37	No	No
Philadelphia-Wilmington	PA-NJ-DE	2,3	Nonattainment	15.0 ⁵	Incomplete ⁵	38	No	No
Pittsburgh-Beaver Valley	PA	3	Nonattainment	16.5	No	43	No	No
Reading	PA	3	Nonattainment	Incomplete	Incomplete	40	No	No
San Joaquin Valley	CA	9	Nonattainment	20.3	No	69	No	No
St. Louis	MO-IL	5,7	Nonattainment	16.5	No	39	No	No
Steubenville-Weirton	OH-WV	3,5	Nonattainment	16.4	No	44	No	No
Washington	DC-MD-VA	3	Nonattainment	14.2	Yes	35	Yes	Yes
Wheeling	WV-OH	3,5	Nonattainment	15.2	No	35	Yes	No
York	PA	3	Nonattainment	16.0	No	37	No	No

Note: Data that have been flagged for exceptional events, for which documentation has been submitted and approved by the EPA (AQS concurrence field set to 'Y'), were excluded from the design value calculations. In several situations, submitted documentation is still under review and as such, revisions to design values are possible. See footnote #4.

1. Area designation status as of January 13, 2009.

2. The annual standard design values shown here are calculated in accordance with 40 CFR Part 50, Appendix N (2006). The annual standard design value (i.e., the 3-year average annual mean concentration) is computed at each site by averaging the daily FRM samples taken each quarter, averaging these quarterly averages to obtain an annual average, and then averaging the three annual averages. (Note that special rules apply if an area has been approved for spatial averaging.) The NAAQS level for the annual standard is 15.0 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$). In general, EPA regulations require at least 75% data capture in each quarter of a consecutive 3-year period in order for a design value to be valid. However, if an annual mean (or 3-year annual design value) is over the level of the standard, less data (i.e., 11 samples per quarter for the corresponding 4 quarters) are sufficient to deem that mean valid. Further, EPA regulations and guidance permit data substitution under certain circumstances in order to consider design values as valid that otherwise would be considered incomplete. The information presented in this update is based on data after applying the substitution protocols.

3. The 24-hour standard design values shown here are calculated in accordance with 40 CFR Part 50, Appendix N (2006, amended 2007). The 24-hour (or 'daily') standard design value (i.e., the 3-year average 98th percentile concentration) is computed at each site by determining the 98th percentile of the daily FRM samples taken in a given year for each of the three years, and then averaging these three numbers. The NAAQS level for the 24-hour standard is 35 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$). In general, EPA regulations require at least 75% data capture in each quarter of a consecutive 3-year period in order for a design value to be valid. However, if an annual 98th percentile (or 3-year 24-hour design value) is over the level of the standard, less data (i.e., only 1 sample in that year) is sufficient to make that 98th percentile valid. Further, EPA regulations and guidance permit data substitution under certain circumstances in order to consider design values as valid that otherwise would be considered incomplete. The information presented in this update is based on data after applying the substitution protocols.

4. The EPA has approved exclusion of certain flagged exceptional event data for the 24-hour NAAQS (based on reviews of supporting documentation submitted by the applicable monitoring agencies), but the EPA has not made a final determination on the exclusion of such data with regards to the annual standard. In this report, these data have been excluded from the annual standard design values (and associated statistical components); hence, the stated annual standard design values (and related statistics) may actually be understated and may later be revised upwards.

5. The $15.0 \mu\text{g}/\text{m}^3$ design value shown for Philadelphia is valid (i.e., complete); however, there are incomplete sites in the nonattainment area that were violating the NAAQS when designations were made. Therefore, this area is marked as incomplete for the annual NAAQS.

Data Source: U.S. EPA's Air Quality System (AQS) as of January 13, 2009.

Table 2. 2005-2007 PM_{2.5} design values for violating counties not part of a designated nonattainment area

State	County	CBSA	EPA	State	County	Annual	Met annual	Met 24-hour	Met both	
			Region	FIPS	FIPS	Design Value ¹	NAAQS 2005, 2007?	24-hr Design Value ²	NAAQS 2005, 2007?	NAAQS 2005, 2007?
Alabama	Russell	Columbus, GA-AL	4	01	113	15.4	No	34	Yes	No
Alaska	Fairbanks North Star	Fairbanks, AK	10	02	090	Incomplete	Incomplete	39	No	No
Alaska	Juneau	Juneau, AK	10	02	110	7.8	Yes	36	No	No
Arizona	Santa Cruz	Nogales, AZ	9	04	023	13.7	Yes	39	No	No
California	Butte	Chico, CA	9	06	007	12.1	Yes	55	No	No
California	Imperial	El Centro, CA	9	06	025	12.7	Yes	39	No	No
California	Sacramento	Sacramento--Arden-Arcade--Roseville, CA	9	06	067	Incomplete	Incomplete	54	No	No
California	Santa Clara	San Jose-Sunnyvale-Santa Clara, CA	9	06	085	11.1	Yes	38	No	No
California	Solano	Vallejo-Fairfield, CA	9	06	095	9.8	Yes	36	No	No
California	Sutter	Yuba City, CA	9	06	101	9.7	Yes	39	No	No
Georgia	Muscogee	Columbus, GA-AL	4	13	215	15.2	No	30	Yes	No
Georgia	Richmond	Augusta-Richmond County, GA-SC	4	13	245	15.7	No	31	Yes	No
Georgia	Washington		4	13	303	15.1	No	30	Yes	No
Georgia	Wilkinson		4	13	319	15.2	No	32	Yes	No
Idaho	Franklin	Logan, UT-ID	10	16	041	7.7	Yes	37	No	No
Idaho	Shoshone		10	16	079	12.0	Yes	37	No	No
Indiana	Knox	Vincennes, IN	5	18	083	14.2	Yes	36	No	No
Indiana	Tippecanoe	Lafayette, IN	5	18	157	13.7	Yes	36	No	No
Iowa	Muscatine	Muscatine, IA	7	19	139	13.3	Yes	36	No	No
Iowa	Scott	Davenport-Moline-Rock Island, IA-IL	7	19	163	14.4	Yes	37	No	No
Kentucky	McCracken	Paducah, KY-IL	4	21	145	13.8	Yes	36	No	No
Michigan	Kent	Grand Rapids-Wyoming, MI	5	26	081	12.8	Yes	36	No	No
Ohio	Mahoning	Youngstown-Warren-Boardman, OH-PA	5	39	099	14.8	Yes	36	No	No
Oregon	Klamath	Klamath Falls, OR	10	41	035	11.2	Yes	45	No	No
Oregon	Lane	Eugene-Springfield, OR	10	41	039	11.5	Yes	47	No	No
Pennsylvania	Northampton	Allentown-Bethlehem-Easton, PA-NJ	3	42	095	13.4	Yes	37	No	No
Tennessee	Montgomery	Clarksville, TN-KY	4	47	125	13.9	Yes	38	No	No
Texas	Harris	Houston-Sugar Land-Baytown, TX	6	48	201	15.8	No	31	Yes	No
Utah	Cache	Logan, UT-ID	8	49	005	10.3	Yes	42	No	No
Utah	Davis	Ogden-Clearfield, UT	8	49	011	10.0	Yes	38	No	No
Utah	Salt Lake	Salt Lake City, UT	8	49	035	11.6	Yes	55	No	No
Utah	Utah	Provo-Orem, UT	8	49	049	10.4	Yes	45	No	No
Utah	Weber	Ogden-Clearfield, UT	8	49	057	10.6	Yes	36	No	No
Washington	Pierce	Seattle-Tacoma-Bellevue, WA	10	53	053	10.2	Yes	43	No	No
West Virginia	Marion	Fairmont, WV	3	54	049	15.3	No	34	Yes	No
West Virginia	Monongalia	Morgantown, WV	3	54	061	14.4	Yes	36	No	No
Wisconsin	Brown	Green Bay, WI	5	55	009	11.9	Yes	37	No	No
Wisconsin	Dane	Madison, WI	5	55	025	12.7	Yes	37	No	No
Wisconsin	Milwaukee	Milwaukee-Waukesha-West Allis, WI	5	55	079	14.9	Yes	41	No	No

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4. Greenville county, SC was designated "unclassifiable" in April 2005.

Data Source: U.S. EPA's Air Quality System (AQS) as of January 13, 2009