4.0 Analyses of Individual Nonattainment Area

4.5 Region 5 Nonattainment Areas

4.5.4` Ohio

Ohio Area Designations For the 24-Hour Fine Particle National Ambient Air Quality Standard

The table below identifies the counties in Ohio that EPA has designated as not attaining the 2006 24-hour fine particle ($PM_{2.5}$) standard.[1] A county or part thereof is designated as nonattainment if it has an air quality monitor that is violating the standard or if the county is determined to be contributing to the violation of the standard.

Area	Ohio Recommended Nonattainment Counties	EPA's Designated Nonattainment Counties
Canton-Massillon, OH	Stark	Stark
Cincinnati- Hamilton, OH-KY-IN	Butler Clermont Hamilton Warren	Butler Clermont Hamilton Warren
Cleveland- Akron-Lorain, OH	Cuyahoga Lake Lorain Medina Portage Summit	Cuyahoga Lake Lorain Medina Portage Summit
Columbus, OH	Delaware Fairfield Franklin Licking	Delaware Fairfield Franklin Licking Coshocton (partial)*
Dayton- Springfield, OH	Greene Montgomery	Clark Greene Montgomery
Huntington- Ashland, WV-KY-OH	None	Adams (partial)* Gallia (partial)* Lawrence Scioto

[1] EPA designated nonattainment areas for the 1997 fine particle standards in 2005. In 2006, the 24-hour PM2.5 standard was revised from 65 micrograms per cubic meter (average of 98th percentile values for 3 consecutive years) to 35 micrograms per cubic meter; the level of the annual standard for PM2.5 remained unchanged at 15 micrograms per cubic meter (average of annual averages for 3 consecutive years).

Parkersburg- Marietta, WV-OH	Washington	Washington
Steubenville- Weirton, OH-WV	Jefferson	Jefferson
Youngstown- Warren, OH	Mahoning Trumbull	Mahoning Trumbull

EPA is designating the remaining counties and portions of counties in the state as "attainment/unclassifiable."

*EPA is including the following portions of the noted counties in the respective nonattainment area:
Coshocton County – Franklin Township
Adams County – Monroe and Sprigg Townships
Gallia County – Cheshire Township

EPA Technical Analysis for Canton-Massillon, OH

In the Canton area, Stark County is designated nonattainment for the 1997 $PM_{2.5}$ standards. A monitor in Stark County is recording violations of the 2006 standards. Ohio recommended that the Canton nonattainment area consist of Stark County.

EPA concurs with the state's recommendation. Although Canton is near the Cleveland, Steubenville, and Youngstown areas, these areas are all separate metropolitan areas, and EPA believes that the four metropolitan areas are sufficiently distinct to warrant treatment as four separate nonattainment areas. Within the Canton metropolitan statistical area, Stark County sources emit about 90 percent of the emissions in this area. In addition, establishing nonattainment boundaries that match the boundaries established for the 1997 standards will simplify planning by assuring that the same areas are subject very similar nonattainment planning requirements.

In general, the only surrounding counties with emissions comparable to the emissions of Stark County are in either the Steubenville, Cleveland, or Youngstown areas, and no other factor warranted inclusion of any county other than Stark County in the Canton nonattainment area.

Figure 1 is a map of the counties in the nonattainment area and other relevant information such as the locations and design values of air quality monitors, and the metropolitan area boundary.

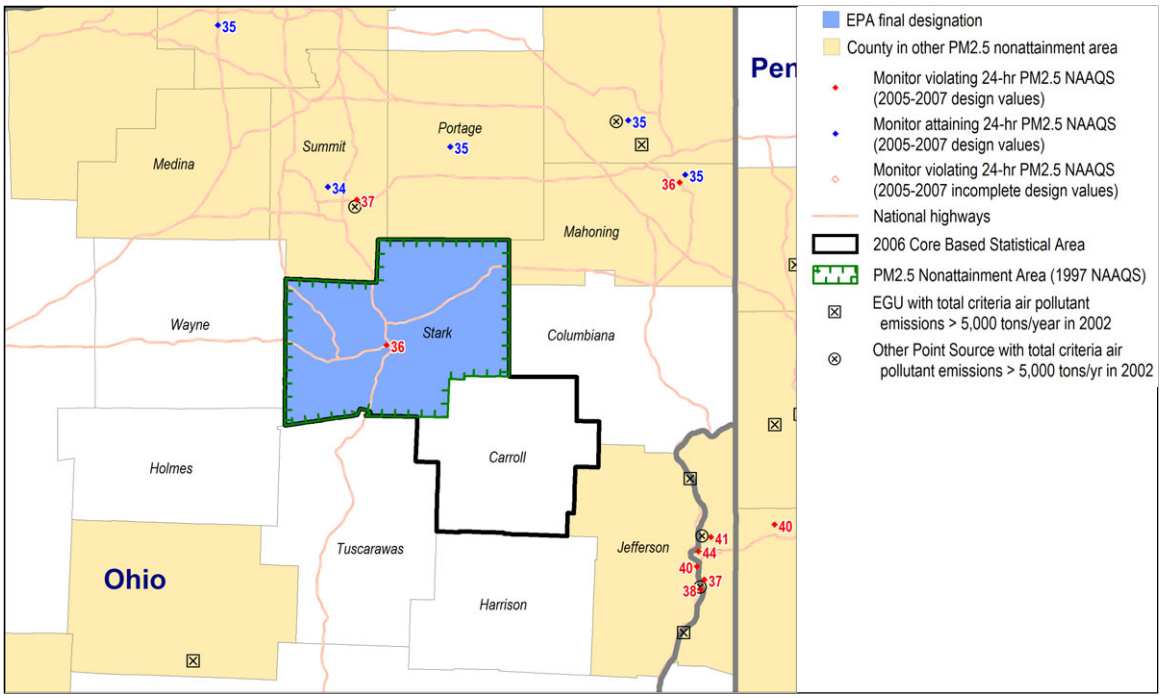


Figure 1

For this area, EPA previously established $PM_{2.5}$ nonattainment boundaries for the 1997 $PM_{2.5}$ NAAQS that included one county.

In its December 17, 2007 letter, Ohio recommended the same county in the Canton area be designated as "nonattainment" for the 2006 24-hour $PM_{2.5}$ standard based on air quality data from 2004-2006. These data are from Federal Reference Method (FRM) monitors located in the state.

In August 2008, EPA notified Ohio of its intended designations. In this letter, EPA also requested that if the State wished to provide comments on EPA's intended designation, it should do so by October 20, 2008. EPA stated that it would consider any additional information (e.g., on power plants or partial county areas) provided by the state in making final decisions on the designations.

Based on EPA's technical analysis described below, EPA designated one county, Stark County, Ohio as nonattainment for the 24-hour $PM_{2.5}$ air-quality standard as the Canton nonattainment area, based upon currently available information.

The following is a review of data for relevant factors for the Canton, Ohio area.

Factor 1: Emissions data

For this factor, EPA evaluated county level emission data for the following $PM_{2.5}$ components and precursor pollutants: "$PM_{2.5}$ emissions total," "$PM_{2.5}$ emissions carbon," "$PM_{2.5}$ emissions other," "SO_2," "NO_x," "VOCs," and "NH_3." "$PM_{2.5}$ emissions total" represents direct emissions of $PM_{2.5}$ and includes: "$PM_{2.5}$ emissions carbon," "$PM_{2.5}$ emissions other", primary sulfate (SO_4), and primary nitrate. (Although primary sulfate

and primary nitrate, which are emitted directly from stacks rather than forming in atmospheric reactions with SO_2 and NO_x, are part of "$PM_{2.5}$ emissions total," they are not shown in Table 1 as separate items). "$PM_{2.5}$ emissions carbon" represents the sum of organic carbon (OC) and elemental carbon (EC) emissions, and "$PM_{2.5}$ emissions other" represents other inorganic particles (crustal). Emissions of SO_2 and NO_x, which are precursors of the secondary $PM_{2.5}$ components sulfate and nitrate, are also considered. VOCs (volatile organic compounds) and NH_3 (ammonia) are also potential $PM_{2.5}$ precursors and are included for consideration.

Emissions data were derived from the 2005 National Emissions Inventory (NEI), version 1. See http://www.epa.gov/ttn/naaqs/pm/pm25_2006_techinfo.html.

EPA also considered the Contributing Emissions Score (CES) for each county. The CES is a metric that takes into consideration emissions data, meteorological data, and air quality monitoring information to provide a relative ranking of counties in and near an area. Note that this metric is not the exclusive manner for considering data for these factors. A more detailed description can be found at http://www.epa.gov/ttn/naaqs/pm/pm25_2006_techinfo.html#C.

Table 1 shows emissions of $PM_{2.5}$ and precursor pollutants components (given in tons per year) and the CES for violating and potentially contributing counties in the Canton area. Counties that are part of the Canton nonattainment area for the 1997 $PM_{2.5}$ NAAQS are shown in boldface. Counties are listed in descending order by CES.

Table 1. $PM_{2.5}$ 24-hour Component Emissions, and CESs

County	State Recommended Nonattainment?	CES	$PM_{2.5}$ emissions total	$PM_{2.5}$ emissions carbon	$PM_{2.5}$ emissions other	SO_2	NOx	VOCs	NH_3
Jefferson, OH	Other	100	11,409	722	10,686	224,025	46,158	3,693	297
Stark, OH	**Yes**	**11**	**1,488**	**574**	**915**	**2,334**	**13,046**	**19,011**	**1,902**
Summit, OH	Other	11	1,031	576	454	12,545	17,359	21,753	923
Tuscarawas, OH	No	5	636	295	342	2,890	4,919	5,477	1,238
Wayne, OH	No	5	1,408	468	938	4,812	7,546	6,934	3,702
Portage, OH	Other	2	1,011	496	514	548	7,269	8,365	564
Carroll, OH	No	1	338	141	196	123	1,627	1,482	409

Jefferson and Summit Counties have high emission. Jefferson County is part of the Steubenville nonattainment area for the 1997 $PM_{2.5}$ NAAQS. Summit and Portage Counties are part of the Cleveland nonattainment area for the 1997 $PM_{2.5}$ NAAQS. EPA feels these counties remain a part of the Steubenville and Cleveland areas. Stark County is the only remaining county with high emissions. The other counties not in other areas all have modest emissions.

Table 2 provides the data for CES weighting factors. The trajectory factors are used in CES calculations to account for seasonal meteorology. For the top 10% of days in both the cold and warm seasons, wind trajectories were run for a 48 hour period preceding the high monitor reading. The amount of time the air mass was over a county within the mixing height was calculated. The values were scaled so that the maximum value is 100.

Thus, the county that is most likely to be upwind of a monitor on a high concentration day in a season is given a score of 100. The scores for the other counties will reflect the relative likelihood of being upwind. As the concentration of a pollutant will decrease as it goes further downwind, a distance weighting factor is also used in calculating the CES. The distance factor listed on Table 2 provides the distance from the center of a county to the center of the violating county. If a county is violating, the distance used is the average distance from the center to the county line.

Table 2. CES Factor Data

County	CES	Trajectory Factor- Cold	Trajectory Factor- Warm	Distance (mi)
Jefferson	100	55	57	44.5
Stark	11	100	83	13.3
Summit	11	69	46	23.7
Tuscarawas	5	96	100	26.5
Wayne	5	84	53	27.3
Portage	2	57	42	26.2
Carroll	1	88	83	21.7

Factor 2: Air quality data

This factor considers the 24-hour $PM_{2.5}$ design values (in $\mu g/m^3$) for air quality monitors in counties in the Canton area based on data for the 2005-2007 period. A monitor's design value indicates whether that monitor attains a specified air quality standard. The 24-hour $PM_{2.5}$ standards are met when the 3-year average of a monitor's 98^{th} percentile values are 35 $\mu g/m^3$ or less. A design value is only valid if minimum data completeness criteria are met.

The 24-hour $PM_{2.5}$ design values for counties in the Canton area are shown in Table 3.

Table 3. Air Quality Data

County	State Recommended Nonattainment?	Design Values 2004-06 ($\mu g/m^3$)	Design Values 2005-07 ($\mu g/m^3$)
Stark, OH	Yes	37	36
Jefferson, OH	Other	43	40
Summit, OH	Other	38	37
Tuscarawas, OH	No		
Wayne, OH	No		
Portage, OH	Other	34	35
Carroll, OH	No		

Stark County has a design value exceeding the air quality standard. Jefferson and Summit also exceed the standards, but are in other nonattinment areas. Other area counties do not have monitoring data. However, the absence of a violating monitor alone does not eliminate counties from nonattainment status. Each county has been evaluated based on the weight of evidence of the nine factors and other relevant information.

For purposes of its review, EPA used data available from the Chemical Speciation Network and the Interagency Monitoring of Protected Visual Environments (IMPROVE) network to estimate the composition of fine particle mass on days with the highest fine particle concentrations. Analysis of these data indicates that the days with the highest fine particle concentrations in the Canton area occur about 83% in the warm season and 17% in the cool season. In the warm season, the average chemical composition of the highest days is 78% sulfate, no nitrate, 19% carbon, and 3% crustal. In the cool season, the average chemical composition of the highest days is 34% sulfate, 30% nitrate, 33% carbon, and 3% crustal. These data indicate that sources of SO_2, NOx, and direct $PM_{2.5}$ emissions contribute to violations in the area.

Factor 3: Population density and degree of urbanization (including commercial development)

Table 4 shows the 2005 population for each county in the area being evaluated, as well as the population density for each county in that area. Population data gives an indication of whether it is likely that population-based emissions might contribute to violations of the 24-hour $PM_{2.5}$ standards.

Table 4. Population

County	State Recommended Nonattainment?	2005 Population	2005 Population Density (pop/sq mi)
Stark, OH	Yes	380,275	655
Jefferson, OH	Other	70,631	172
Summit, OH	Other	546,285	1302
Tuscarawas, OH	No	91,791	161
Wayne, OH	No	113,496	204
Portage, OH	Other	155,150	307
Carroll, OH	No	29,252	73

The Stark County population and population density are much higher than Carroll Counties. Aside from counties included in other nonattainment areas, Stark County is larger than other nearby counties. Thus, the population data suggest that Stark County is a good candidate for inclusion in the nonattainment area.

Factor 4: Traffic and commuting patterns

This factor considers the number of commuters in each county who drive to another county within the Canton area, the percent of total commuters in each county who commute within the area, as well as the total Vehicle Miles Traveled (VMT) for each county in millions of miles (see Table 5). A county with numerous commuters is generally an integral part of an urban area and is likely contributing to fine particle concentrations in the area.

Table 5. Traffic and Commuting Patterns

County	State Recommended Nonattainment?	2005 VMT (10^6 mi)	Number Commuting to any violating	Percent Commuting to any violating	Number Commuting into statistical	Percent Commuting into statistical

			counties	counties	area	area
Stark, OH	**Yes**	**3,049**	**162,800**	**92**	**141,490**	**80**
Jefferson, OH	Other	684	20,090	70	460	2
Summit, OH	Other	4,929	201,840	78	7,670	3
Tuscarawas, OH	No	1,122	6,360	15	6,000	14
Wayne, OH	No	1,044	5,640	10	1,670	3
Portage, OH	Other	1,788	21,230	27	1,580	2
Carroll, OH	No	173	5,620	44	10,660	83
Mahoning, OH	Other	2,666	80,330	74	2,590	2

The listing of counties on Table 5 reflects a ranking based on the number of people commuting within the Canton area. The county that is in the Canton nonattainment area for the 1997 $PM_{2.5}$ NAAQS is shown in boldface. There is very limited commuting from Jefferson, Mahoning, Portage, and Summit Counties into the Canton area. This suggests these counties are not a part of the Canton area, but they are a part of separate areas instead. The Carroll County VMT is small. Thus, the commuting data support including only Stark County in the nonattainment area.

Note: The 2005 VMT data used for tables 5 and 6 of the technical analysis have been derived using methodology such as that described in "Documentation for the 2005 Mobile National Emissions Inventory, Version 2," December 2008, prepared for the Emission Inventory Group, U.S. EPA. This document may be found at: ftp://ftp.epa.gov/EmisInventory/2005_nei/mobile_sector/documentation/2005_mobile_nei_version_2_report.pdf.

Factor 5: Growth rates and patterns

This factor considers population growth for 2000-2005 and growth in vehicle miles traveled for 1996-2005 for counties in Canton area, as well as patterns of population and VMT growth. A county with rapid population or VMT growth is generally an integral part of an urban area and likely to be contributing to fine particle concentrations in the area.

Table 6 below shows population, population growth, VMT, and VMT growth for counties that are included in the Canton area. Counties are listed in descending order based on VMT growth between 1996 and 2005.

Table 6. Population and VMT Growth and Percent Change.

County	Population (2005)	Population % change (2000-2005)	2005 VMT (10^6 mi)	VMT % change (1996-2005)
Tuscarawas, OH	91,791	1	1,122	6
Wayne, OH	113,496	2	1,044	6
Portage, OH	155,150	2	1,788	6
Summit, OH	546,285	0	4,929	1
Stark, OH	380,275	1	3,049	-1
Carroll, OH	29,252	1	173	-1
Jefferson, OH	70,631	-4	684	-6

There is little growth in the Canton area and surrounding counties. VMT declined slightly in both Carroll and Stark Counties, while their population grew slightly. Thus, these data do not suggest trends in population of VMT that should influence the nonattainment area boundaries.

Factor 6: Meteorology (weather/transport patterns)

For this factor, EPA considered data from National Weather Service instruments and other meteorological monitoring sites in the area. Wind direction and wind speed data for 2005-2007 were analyzed, with an emphasis on "high $PM_{2.5}$ days" for each of two seasons, an October-April "cold" season and a May-September "warm" season. These high days are defined as days where any FRM or FEM air quality monitors had 24-hour $PM_{2.5}$ concentrations above 95% on a frequency distribution curve of $PM_{2.5}$ 24-hour values.

For each air quality monitoring site, EPA developed a "pollution rose" to understand the prevailing wind direction and wind speed on the days with highest fine particle concentrations. The figure identifies 24-hour $PM_{2.5}$ values by color; days exceeding 35 $\mu g/m^3$ are denoted with a red or black icon. A dot indicates the day occurred in the warm season; a triangle indicates the day occurred in the cool season. The center of the figure indicates the location of the air quality monitoring site, and the location of the icon in relation to the center indicates the direction from which the wind was blowing on that day. An icon that is close to the center indicates a low average wind speed on that day. Higher wind speeds are indicated when the icon is further away from the center.

The pollution rose for the Canton area is provided as Figure 2. Winds on high concentration days come from a variety of directions. So, it is appropriate to include counties in all directions from the violations.

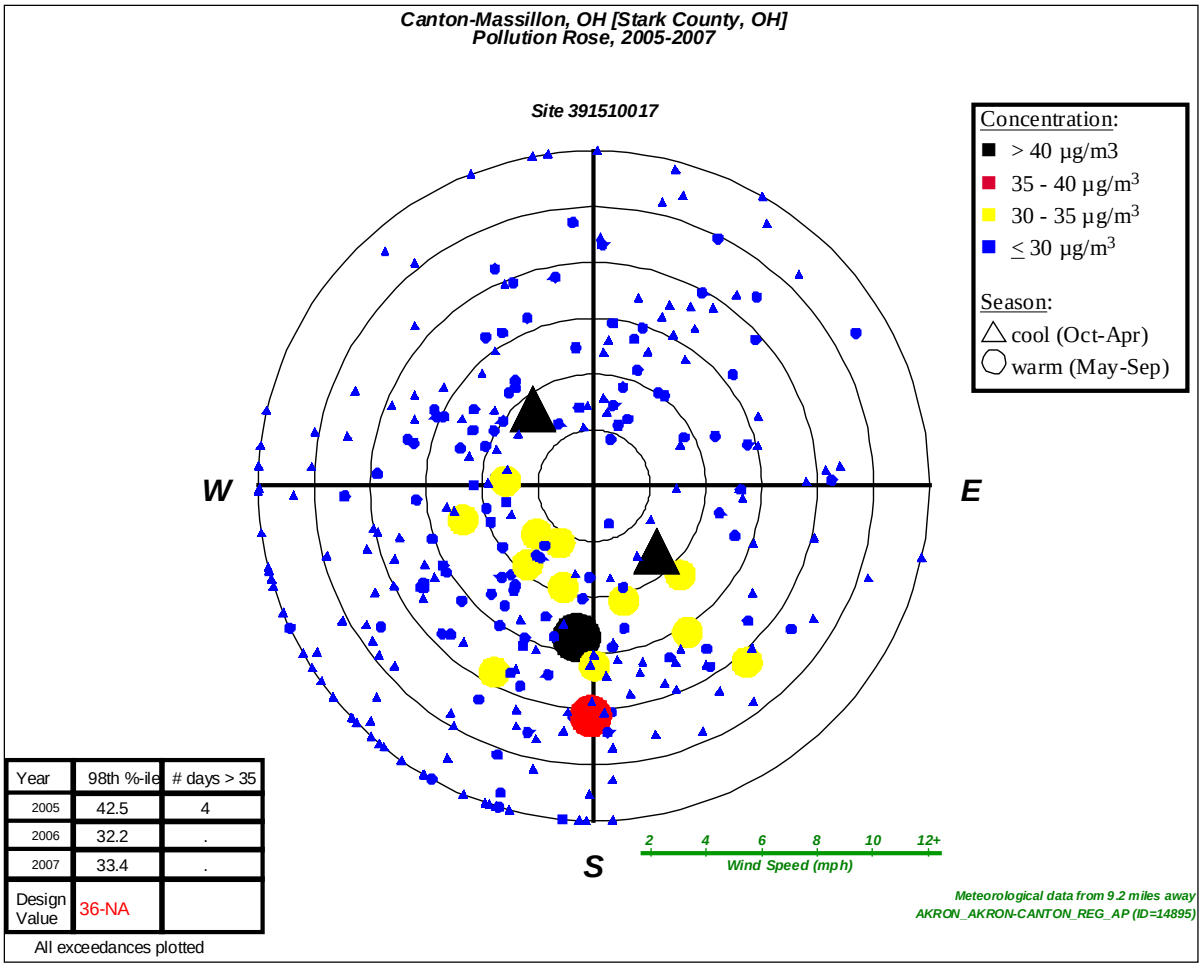


Figure 2

Note: the meteorology factor is also considered in each county's Contributing Emissions Score because the method for deriving this metric included an analysis of trajectories of air masses for high $PM_{2.5}$ days.

Factor 7: Geography/topography (mountain ranges or other air basin boundaries)

The geography/topography analysis evaluates the physical features of the land that might have an effect on the air shed and, therefore, on the distribution of $PM_{2.5}$ over the area.

The Canton area does not have any geographical or topographical barriers significantly limiting air-pollution transport within its air shed. Therefore, this factor did not play a significant role in the decision-making process.

Factor 8: Jurisdictional boundaries

In evaluating the jurisdictional boundary factor, EPA gave special consideration to areas that were already designated nonattainment in 2005 for violating the 1997 fine particle standards. Analysis of chemical composition data in these areas indicates that the same

components that make up most of the $PM_{2.5}$ mass in the area on an annual average basis such as sulfate and direct $PM_{2.5}$ carbon in many eastern areas also are key contributors to the $PM_{2.5}$ mass on days exceeding the 24-hour $PM_{2.5}$ standard. These data indicate that in many cities, the same source categories that contribute to violations of the annual standard also contribute to exceedances of the 24-hour standard.

EPA has generally concluded that counties that were designated as having emissions sources contributing to fine particle concentrations which exceeded the 1997 standards (all areas violated the annual standard, two also violated the previous 24-hour standard) also contribute to fine particle concentrations on the highest days. For this reason, EPA believes that for most existing nonattainment areas, the nonattainment area for the 2006 24-hour standard should be the same. Consideration also should be given to existing boundaries and organizations as they may facilitate air quality planning and the implementation of control measures to attain the standard. Areas already designated as nonattainment represent important boundaries for state air quality planning.

The Northeast Ohio Area wide Coordinating Agency is the Metropolitan Planning Organization (MPO) for the Cleveland area. It includes Cuyahoga, Geauga, Lake (Ohio), Lorain, and Medina Counties. The Eastgate Regional Council of Governments is the Youngstown MPO including Mahoning and Trumbull Counties in Ohio.

Factor 9: Level of control of emission sources

Under this factor, the existing level of control of emission sources is taken into consideration. The emissions data used by EPA in this technical analysis and provided in Table 1 under Factor 1 represent emissions levels taking into account any control strategies implemented in the Canton area before 2005 on stationary, mobile, and area sources. Data are presented for $PM_{2.5}$ components that are directly emitted, carbonaceous $PM_{2.5}$ and crustal $PM_{2.5}$, and for pollutants which react in the atmosphere to form fine particles such as SO_2, NOx, VOC, and ammonia.

In considering county-level emissions, EPA used data from the 2005 National Emissions Inventory, the most updated version of the national inventory available at the beginning of the designations process in late 2007. However, EPA recognized that for certain counties, emissions may have changed since 2005. For example, certain power plants or large sources of emissions in or near this area may have installed emission controls or otherwise significantly reduced emissions since 2005. Some States provided updated information on emissions and emission controls in their comments to EPA. EPA considered such additional information in making final designation decisions.

With regard to nearby power plants, EPA considered information about whether a specific plant installed federally enforceable emission controls by December 2008 resulting in significant emissions reductions. A control requirement is considered to be federally-enforceable if it is required by a State regulation adopted in a State implementation plan, if it is included in a federally-enforceable Title V operating permit, or if it is required by a consent decree which also requires the controls to be included in

federally enforceable permit upon termination of the consent decree. In making final decisions, EPA also considered whether a facility would continue to emit pollutants which contribute to $PM_{2.5}$ exceedances even after emission controls are operational.

Ohio did not provide other information regarding power plants or any other large sources in the Canton area.

EPA Technical Analysis for Cincinnati, Ohio

In the three-state Cincinnati area, part or all of eight counties are designated nonattainment for the 1997 standards. The four Ohio counties included in the Cincinnati nonattainment area are Butler, Clermont, Hamilton, and Warren Counties. Monitors in Butler and Hamilton Counties, Ohio, and Kenton County, Kentucky, are recording violations of the 2006 standards. Ohio recommended that the Cincinnati nonattainment area include the same four Ohio counties as are designated nonattainment for the 1997 standards.

EPA concurs with the state's recommendation. The four Ohio counties that Ohio recommended for nonattainment all have significant emissions that are geographically nearby to and commonly upwind of violating monitors. In addition, establishing nonattainment boundaries for the 2006 standards that match the boundaries established for the 1997 standards will simplify planning by providing that all locations have consistent nonattainment planning requirements for the two sets of standards. The surrounding Ohio counties have relatively low emissions, and no other factor warrants their inclusion in the nonattainment area.

Figure 1 is a map of the counties in the nonattainment area and other relevant information such as the locations and design values of air quality monitors, and the metropolitan area boundary.

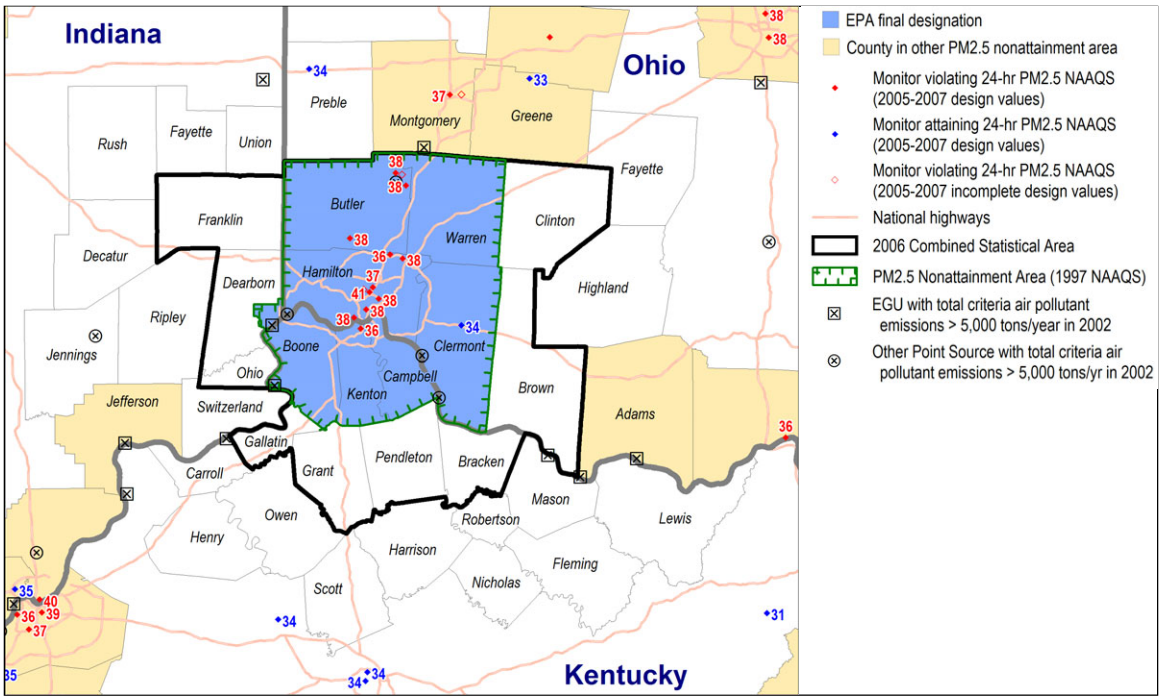


Figure 1

For this area, EPA previously established $PM_{2.5}$ nonattainment boundaries for the 1997 $PM_{2.5}$ NAAQS that included eight full and partial counties, with four being located in Ohio.

In its December 17, 2007 letter, Ohio recommended the same four Ohio counties be designated as "nonattainment" for the 2006 24-hour $PM_{2.5}$ standard based on air quality data from 2004-2006. These data are from Federal Reference Method (FRM) monitors located in the state.

In August 2008, EPA notified Ohio of its intended designations. In this letter, EPA also requested that if the State wished to provide comments on EPA's intended designation, it should do so by October 20, 2008. EPA stated that it would consider any additional information (e.g., on power plants or partial county areas) provided by the state in making final decisions on the designations.

Based on EPA's technical analysis described below, EPA designated four Ohio counties- Butler, Clermont, Hamilton, and Warren, and a partial county in Indiana- Dearborn, as nonattainment for the 24-hour $PM_{2.5}$ air-quality standard as part of the Cincinnati nonattainment area, based upon currently available information.

The following is a review of data for relevant factors for the Ohio portion of the Cincinnati, Ohio-Kentucky-Indiana area.

Factor 1: Emissions data

For this factor, EPA evaluated county level emission data for the following $PM_{2.5}$ components and precursor pollutants: "$PM_{2.5}$ emissions total," "$PM_{2.5}$ emissions carbon,"

"$PM_{2.5}$ emissions other," "SO_2," "NO_x," "VOCs," and "NH_3." "$PM_{2.5}$ emissions total" represents direct emissions of $PM_{2.5}$ and includes: "$PM_{2.5}$ emissions carbon," "$PM_{2.5}$ emissions other", primary sulfate (SO_4), and primary nitrate. (Although primary sulfate and primary nitrate, which are emitted directly from stacks rather than forming in atmospheric reactions with SO_2 and NO_x, are part of "$PM_{2.5}$ emissions total," they are not shown in Table 1 as separate items). "$PM_{2.5}$ emissions carbon" represents the sum of organic carbon (OC) and elemental carbon (EC) emissions, and "$PM_{2.5}$ emissions other" represents other inorganic particles (crustal). Emissions of SO_2 and NO_x, which are precursors of the secondary $PM_{2.5}$ components sulfate and nitrate, are also considered. VOCs (volatile organic compounds) and NH_3 (ammonia) are also potential $PM_{2.5}$ precursors and are included for consideration.

Emissions data were derived from the 2005 National Emissions Inventory (NEI), version 1. See http://www.epa.gov/ttn/naaqs/pm/pm25_2006_techinfo.html.

EPA also considered the Contributing Emissions Score (CES) for each county. The CES is a metric that takes into consideration emissions data, meteorological data, and air quality monitoring information to provide a relative ranking of counties in and near an area. Note that this metric is not the exclusive manner for considering data for these factors. A more detailed description can be found at http://www.epa.gov/ttn/naaqs/pm/pm25_2006_techinfo.html#C.

Table 1 shows emissions of $PM_{2.5}$ and precursor pollutants components (given in tons per year) and the CES for violating and potentially contributing counties in the Cincinnati area. Counties that are part of the Cincinnati nonattainment area for the 1997 $PM_{2.5}$ NAAQS are shown in boldface. Counties are listed in descending order by CES.

Table 1. $PM_{2.5}$ 24-hour Component Emissions, and CESs

County	State Recommended Nonattainment?	CES	$PM_{2.5}$ emissions total	$PM_{2.5}$ emissions carbon	$PM_{2.5}$ emissions other	SO_2	NOx	VOCs	NH_3
Hamilton, OH	**Yes**	**100**	**6,489**	**1,244**	**5,245**	**88,139**	**50,060**	**38,552**	**2,359**
Clermont, OH	**Yes**	**36**	**5,399**	**733**	**4,665**	**90,341**	**35,748**	**6,982**	**407**
Butler, OH	**Yes**	**24**	**2,269**	**563**	**1,706**	**10,636**	**16,661**	**12,734**	**1,105**
Dearborn, IN	**No**	**22**	**2,780**	**288**	**2,492**	**47,908**	**12,881**	**3,268**	**229**
Jefferson, IN	No	7	1,265	168	1,097	75,319	25,214	2,272	341
Boone, KY	**No**	**6**	**1,629**	**615**	**1,014**	**5,383**	**10,852**	**5,883**	**286**
Adams, OH	No	6	5,970	494	5,476	126,316	33,822	1,918	837
Warren, OH	**Yes**	**5**	**1,304**	**535**	**768**	**568**	**7,244**	**7,278**	**792**
Kenton, KY	**No**	**3**	**537**	**269**	**268**	**1,300**	**6,316**	**5,606**	**266**
Campbell, KY	**No**	**2**	**412**	**179**	**233**	**731**	**4,231**	**2,923**	**196**

The Ohio counties in the Cincinnati area all have fairly large emissions. Butler, Clermont, and Hamilton Counties all have high CES. Warren County has a lower CES, but its emissions are not insignificant. Adams County has significant emissions, especially sulfur dioxide, but it is in the Huntington-Ashland area and was evaluated with that area.

Table 2 provides the data for CES weighting factors. The trajectory factors are used in CES calculations to account for seasonal meteorology. For the top 10% of days in both the cold and warm seasons, wind trajectories were run for a 48 hour period preceding the high monitor reading. The amount of time the air mass was over a county within the mixing height was calculated. The values were scaled so that the maximum value is 100. Thus, the county that is most likely to be upwind of a monitor on a high concentration day in a season is given a score of 100. The scores for the other counties will reflect the relative likelihood of being upwind. As the concentration of a pollutant will decrease as it goes further downwind, a distance weighting factor is also used in calculating the CES. The distance factor listed on Table 2 provides the distance from the center of a county to the center of the violating county. If a county is violating, the distance used is the average distance from the center to the county line.

Table 2. CES Factor Data

County	CES	Trajectory Factor- Cold	Trajectory Factor- Warm	Distance (mi)
Hamilton, OH	100	100	100	10.6
Clermont, OH	36	77	71	23.2
Butler, OH	24	90	64	19
Dearborn, IN	22	73	61	21.8
Jefferson, IN	7	30	25	55.6
Boone, KY	6	77	78	16.6
Adams, OH	6	32	21	62.6
Warren, OH	5	80	57	27.4
Kenton, KY	3	79	82	15.4
Campbell, KY	2	82	84	17.4

Factor 2: Air quality data

This factor considers the 24-hour $PM_{2.5}$ design values (in $\mu g/m^3$) for air quality monitors in counties in the Cincinnati area based on data for the 2005-2007 period. A monitor's design value indicates whether that monitor attains a specified air quality standard. The 24-hour $PM_{2.5}$ standards are met when the 3-year average of a monitor's 98^{th} percentile values are 35 $\mu g/m^3$ or less. A design value is only valid if minimum data completeness criteria are met.

The 24-hour $PM_{2.5}$ design values for counties in the Cincinnati area are shown in Table 3.

Table 3. Air Quality Data

County	State Recommended Nonattainment?	Design Values 2004-2006	Design Values 2005-2007
Hamilton, OH	Yes	40	41
Clermont, OH	Yes		34
Butler, OH	Yes	38	38
Dearborn, IN	No		
Boone, KY	No		
Warren, OH	Yes		
Kenton, KY	No	35	36
Campbell, KY	No		

In EPA Region 5, Hamilton and Butler Counties in Ohio show violations of the 24-hour $PM_{2.5}$ standard. Therefore, these counties are included in the Cincinnati nonattainment area. However, the absence of a violating monitor alone does not eliminate counties from nonattainment status. Each county has been evaluated based on the weight of evidence of the nine factors and other relevant information.

For purposes of its review, EPA used data available from the Chemical Speciation Network and the Interagency Monitoring of Protected Visual Environments (IMPROVE) network to estimate the composition of fine particle mass on days with the highest fine particle concentrations. Analysis of these data indicates that the days with the highest fine particle concentrations in the Cincinnati area occur about 86% in the warm season and 14% in the cool season. In the warm season, the average chemical composition of the highest days is 82% sulfate, no nitrate, 17% carbon, and 2% crustal. In the cool season, the average chemical composition of the highest days is 50% sulfate, 25% nitrate, 23% carbon, and 2% crustal. These data indicate that sources of SO_2, NOx, and direct $PM_{2.5}$ emissions contribute to violations in the area.

Factor 3: Population density and degree of urbanization (including commercial development)

Table 4 shows the 2005 population for each county in the area being evaluated, as well as the population density for each county in that area. Population data gives an indication of whether it is likely that population-based emissions might contribute to violations of the 24-hour $PM_{2.5}$ standards.

Table 4. Population

County	State Recommended Nonattainment?	2005 Population	2005 Population Density (pop/mi^2)
Hamilton, OH	Yes	828,487	2007
Clermont, OH	Yes	190,329	417
Butler, OH	Yes	349,966	745
Dearborn, IN	No	48,930	160
Boone, KY	No	106,278	414
Warren, OH	Yes	196,793	484
Kenton, KY	No	153,314	930
Campbell, KY	No	87,048	547

All Ohio counties in the Cincinnati area have sizable populations and population densities.

Factor 4: Traffic and commuting patterns

This factor considers the number of commuters in each county who drive to another county within the Cincinnati area, the percent of total commuters in each county who

commute within the area, as well as the total Vehicle Miles Traveled (VMT) for each county in millions of miles (see Table 5). A county with numerous commuters is generally an integral part of an urban area and is likely contributing to fine particle concentrations in the area.

Table 5. Traffic and Commuting Patterns

County	State Recommended Nonattainment?	2005 VMT (10^6 mi)	Number Commuting to any violating counties	Percent Commuting to any violating counties	Number Commuting within statistical area	Percent Commuting within statistical area
Hamilton, OH	**Yes**	**8,132**	**364,380**	**92**	**391,410**	**98**
Butler, OH	**Yes**	**3,059**	**143,800**	**90**	**153,070**	**96**
Clermont, OH	**Yes**	**1,799**	**45,070**	**51**	**86,620**	**98**
Kenton, KY	**No**	**1,647**	**51,980**	**68**	**74,830**	**99**
Warren, OH	**Yes**	**1,692**	**41,510**	**54**	**62,590**	**82**
Boone, KY	**No**	**1,074**	**17,300**	**39**	**43,420**	**98**
Campbell, KY	**No**	**1,000**	**21,460**	**50**	**42,160**	**99**
Dearborn, IN	**No**	**708**	**8,920**	**40**	**20,700**	**92**
Montgomery, OH	other	5,533	216,610	84	10,610	4

The listing of counties on Table 5 reflects a ranking based on the number of people commuting within the Cincinnati area. The counties in bold type are all in the Cincinnati nonattainment area for the 1997 $PM_{2.5}$ NAAQS. These data show minimal commuting from Montgomery County into the Cincinnati area, reflecting the fact that Dayton (the core city in Montgomery County) is a separate urban area.

The Ohio counties all show high percent of commuting within the Cincinnati area. This suggests the counties are linked.

Note: The 2005 VMT data used for tables 5 and 6 of the technical analysis have been derived using methodology such as that described in "Documentation for the 2005 Mobile National Emissions Inventory, Version 2," December 2008, prepared for the Emission Inventory Group, U.S. EPA. This document may be found at: ftp://ftp.epa.gov/EmisInventory/2005_nei/mobile_sector/documentation/2005_mobile_nei_version_2_report.pdf.

Factor 5: Growth rates and patterns

This factor considers population growth for 2000-2005 and growth in vehicle miles traveled for 1996-2005 for counties in Cincinnati area, as well as patterns of population and VMT growth. A county with rapid population or VMT growth is generally an integral part of an urban area and likely to be contributing to fine particle concentrations in the area.

Table 6 below shows population, population growth, VMT, and VMT growth for counties that are included in the Cincinnati area. Counties are listed in descending order based on VMT growth between 1996 and 2005.

Table 6. Population and VMT Growth and Percent Change

County	Population (2005)	Population % change (2000-05)	2005 VMT (10^6 mi)	VMT % change (1996-05)
Boone, KY	106,278	22	1,074	48
Warren, OH	196,793	22	1,692	34
Dearborn, IN	48,930	6	708	30
Butler, OH	349,966	5	3,059	28
Clermont, OH	190,329	7	1,799	16
Campbell, KY	87,048	-2	1,000	4
Hamilton, OH	828,487	-2	8,132	3
Kenton, KY	153,314	1	1,647	3

There is robust growth in portions of the Cincinnati area. In the Ohio portion of the area, Warren County enjoyed high growth in both population and VMT. The other Ohio counties had more modest changes in population. Butler and Clermont Counties joined Warren County in having VMT growth of more that 15%.

Factor 6: Meteorology (weather/transport patterns)

For this factor, EPA considered data from National Weather Service instruments and other meteorological monitoring sites in the area. Wind direction and wind speed data for 2005-2007 were analyzed, with an emphasis on "high $PM_{2.5}$ days" for each of two seasons, an October-April "cold" season and a May-September "warm" season. These high days are defined as days where any FRM or FEM air quality monitors had 24-hour $PM_{2.5}$ concentrations above 95% on a frequency distribution curve of $PM_{2.5}$ 24-hour values.

For each air quality monitoring site, EPA developed a "pollution rose" to understand the prevailing wind direction and wind speed on the days with highest fine particle concentrations. The figure identifies 24-hour $PM_{2.5}$ values by color; days exceeding 35 $\mu g/m^3$ are denoted with a red or black icon. A dot indicates the day occurred in the warm season; a triangle indicates the day occurred in the cool season. The center of the figure indicates the location of the air quality monitoring site, and the location of the icon in relation to the center indicates the direction from which the wind was blowing on that day. An icon that is close to the center indicates a low average wind speed on that day. Higher wind speeds are indicated when the icon is further away from the center.

The pollution rose for the Cincinnati area is provided as Figure 2. Winds on high concentration days show a tendency to come from the Northeast or Southwest. Overall, the winds come from a variety of directions. So, it is appropriate to consider counties in all directions from the violations.

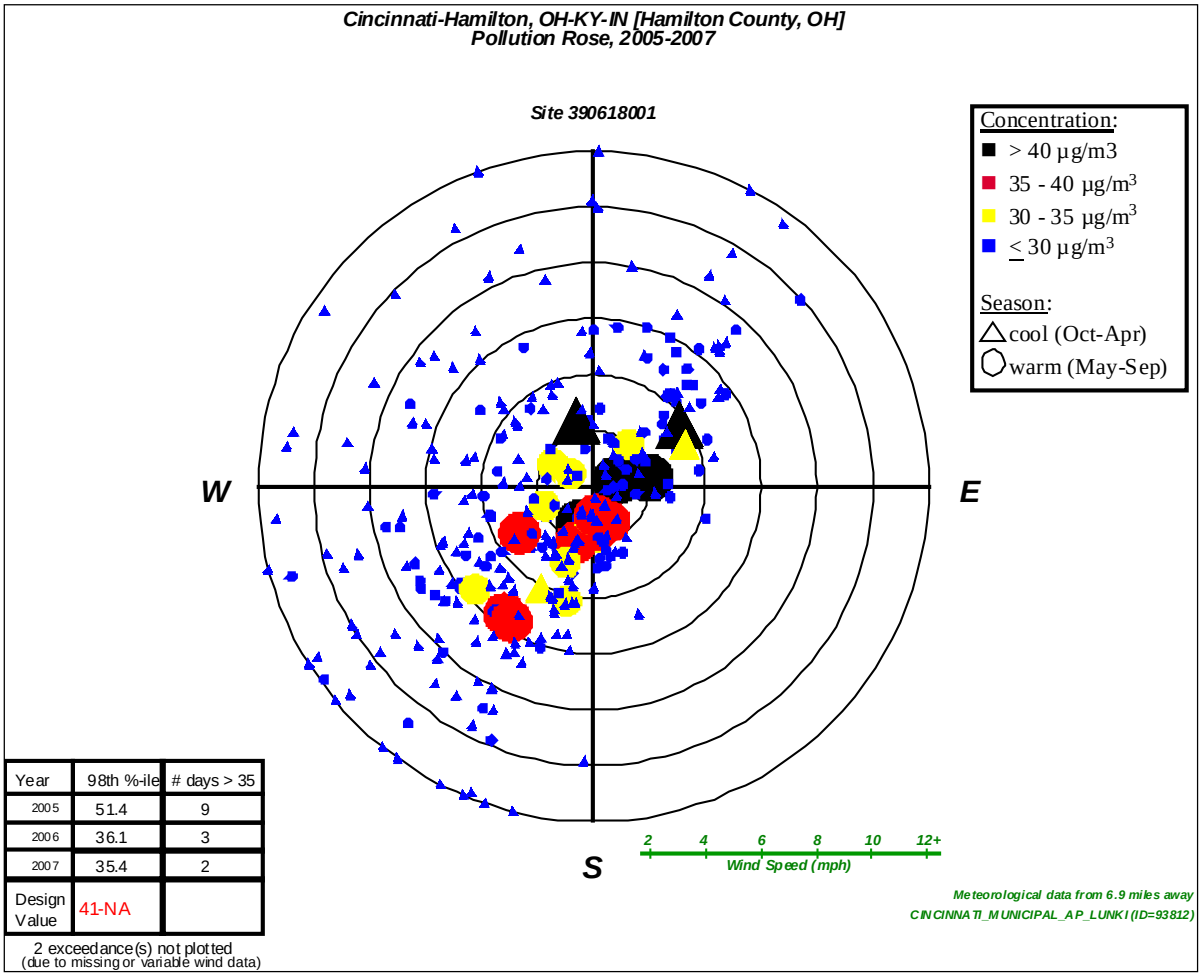


Figure 2

Note: the meteorology factor is also considered in each county's Contributing Emissions Score because the method for deriving this metric included an analysis of trajectories of air masses for high $PM_{2.5}$ days.

Factor 7: Geography/topography (mountain ranges or other air basin boundaries)

The geography/topography analysis evaluates the physical features of the land that might have an effect on the air shed and, therefore, on the distribution of $PM_{2.5}$ over the area.

The Cincinnati area does not have any geographical or topographical barriers significantly limiting air-pollution transport within its air shed. Therefore, this factor did not play a significant role in the decision-making process.

Factor 8: Jurisdictional boundaries

In evaluating the jurisdictional boundary factor, EPA gave special consideration to areas that were already designated nonattainment in 2005 for violating the 1997 fine particle standards. Analysis of chemical composition data in these areas indicates that the same components that make up most of the $PM_{2.5}$ mass in the area on an annual average basis

such as sulfate and direct $PM_{2.5}$ carbon in many eastern areas also are key contributors to the $PM_{2.5}$ mass on days exceeding the 24-hour $PM_{2.5}$ standard. These data indicate that in many cities, the same source categories that contribute to violations of the annual standard also contribute to exceedances of the 24-hour standard.

EPA has generally concluded that counties that were designated as having emissions sources contributing to fine particle concentrations which exceeded the 1997 standards (all areas violated the annual standard, two also violated the previous 24-hour standard) also contribute to fine particle concentrations on the highest days. For this reason, EPA believes that for most existing nonattainment areas, the nonattainment area for the 2006 24-hour standard should be the same. Consideration also should be given to existing boundaries and organizations as they may facilitate air quality planning and the implementation of control measures to attain the standard. Areas already designated as nonattainment represent important boundaries for state air quality planning.

The Ohio-Kentucky-Indiana Regional Council of Governments (OKI) is the Metropolitan Planning Organization (MPO) for Butler, Warren, Clermont, and Hamilton Counties in Ohio; Campbell, Kenton, and Boone Counties in Kentucky; and Dearborn County, Indiana. OKI webpage: http://www.oki.org/. Dayton has a separate MPO, the Miami Valley Regional Planning Commission which serves Greene, Miami, Montgomery, and portions of Warren Counties.

The Cincinnati ozone nonattainment area consists of the following counties: in Ohio- Butler, Clermont, Clinton, Hamilton, and Warren; in Indiana- Lawrenceburg Township in Dearborn; in Kentucky- Boone, Kenton, and Campbell.

Factor 9: Level of control of emission sources

Under this factor, the existing level of control of emission sources is taken into consideration. The emissions data used by EPA in this technical analysis and provided in Table 1 under Factor 1 represent emissions levels taking into account any control strategies implemented in the Cincinnati area before 2005 on stationary, mobile, and area sources. Data are presented for $PM_{2.5}$ components that are directly emitted, carbonaceous $PM_{2.5}$ and crustal $PM_{2.5}$, and for pollutants which react in the atmosphere to form fine particles such as SO_2, NOx, VOC, and ammonia.

In considering county-level emissions, EPA used data from the 2005 National Emissions Inventory, the most updated version of the national inventory available at the beginning of the designations process in late 2007. However, EPA recognized that for certain counties, emissions may have changed since 2005. For example, certain power plants or large sources of emissions in or near this area may have installed emission controls or otherwise significantly reduced emissions since 2005. Some States provided updated information on emissions and emission controls in their comments to EPA. EPA considered such additional information in making final designation decisions.

With regard to nearby power plants, EPA considered information about whether a specific plant installed federally enforceable emission controls by December 2008 resulting in significant emissions reductions. A control requirement is considered to be federally-enforceable if it is required by a State regulation adopted in a State implementation plan, if it is included in a federally-enforceable Title V operating permit, or if it is required by a consent decree which also requires the controls to be included in federally enforceable permit upon termination of the consent decree. In making final decisions, EPA also considered whether a facility would continue to emit pollutants which contribute to $PM_{2.5}$ exceedances even after emission controls are operational.

Ohio did not provide other information regarding power plants or any other large sources in the Cincinnati area.

EPA Technical Analysis for Cleveland-Akron-Lorain, Ohio

In the Cleveland area, Cuyahoga, Lake, Lorain, Medina, Portage, and Summit Counties along with Ashtabula Township in Ashtabula County are designated nonattainment for the 1997 $PM_{2.5}$ standards. In a December 17, 2007 letter, Ohio recommended the same six full counties as nonattainment for the 2006 standards. Ohio recommended the partial county, Ashtabula County, be designated attainment for the 2006 standards. Monitoring data shows violations of the 2006 standards in both Cuyahoga and Summit Counties.

The six counties recommended by Ohio for inclusion in the nonattainment area all have significant emissions in relatively close proximity to violating monitors and warrant being judged to contribute to the violations. In EPA's letter to Ohio dated August 18, 2008, EPA expressed intent to designate Ashtabula Township in Ashtabula County as nonattainment. Ohio responded that this township currently has low emissions and should not be considered to contribute to violations in the Cleveland area.

On December 9, 2008, Ohio provided supplemental information explaining the basis for recent drop in emissions in Ashtabula and providing information that this drop in emissions is permanent and enforceable. Until 2002, the Ashtabula Plant, under ownership of Cleveland Electric Illuminating Company, consisted of a Plant C and a Plant A/B. The company then shut down Plant C and sold it to the Ashtabula Port Authority, which is not using it to burn fuel or generate electricity. The Ashtabula Port Authority has acknowledged that it could not restart this plant without applying for and receiving a new source permit. Since the Title V permit for Plant C has expired, and no application for operation of this plant has been submitted, operation of this plant would constitute operation without a permit, which would violate permitting rules.

As a result of this permanent and enforceable shutdown, the emissions from the Cleveland Electric facility as a whole are substantially lower. In particular, the emissions are substantially lower than the levels that EPA considered for the plant in evaluating designations for the 1997 standards. Therefore, while EPA judged previous emission levels to be sufficient to conclude that Ashtabula Township was contributing to violations

in the Cleveland area, current emission levels are sufficiently low that EPA has concluded that Ashtabula does not now contribute to violations of the 2006 standards.

The Cleveland area is adjacent to the Canton and Youngstown-Mercer areas. These areas have counties with relatively high emissions. As discussed elsewhere, EPA intends to designate a Canton nonattainment area that includes Stark County and a Youngstown nonattainment area that includes Trumbull and Mahoning Counties. Based on the technical analysis below EPA concludes that the metropolitan areas are sufficiently distinct to warrant treatment as separate areas. Therefore, EPA does not intend to include any of these counties in the Cleveland-Akron nonattainment area.

In summary, EPA is designating the Cleveland nonattainment area under the 2006 $PM_{2.5}$ standards that would include Cuyahoga, Lake, Lorain, Medina, Portage, and Summit Counties, reflecting the same area as was designated under the 1997 standards except for the exclusion of Ashtabula Township in Ashtabula County. These boundaries match the nonattainment area recommended by the State. Establishing nonattainment boundaries similar to the boundaries established for the 1997 standards has the additional benefit of simplifying planning by assuring that similar areas are subject to very similar nonattainment planning requirements.

EPA also considered other nearby counties. Although Geauga County is part of the combined statistical area, its emissions are relatively low. Aside from Stark, Mahoning, and Trumbull Counties, the counties adjacent to the Cleveland-Akron area also have relatively low emissions, and no other factor warranted the inclusion of any of these counties in the Cleveland-Akron area.

Figure 1 is a map of the counties in the nonattainment area and other relevant information such as the locations and design values of air quality monitors, and the metropolitan area boundary.

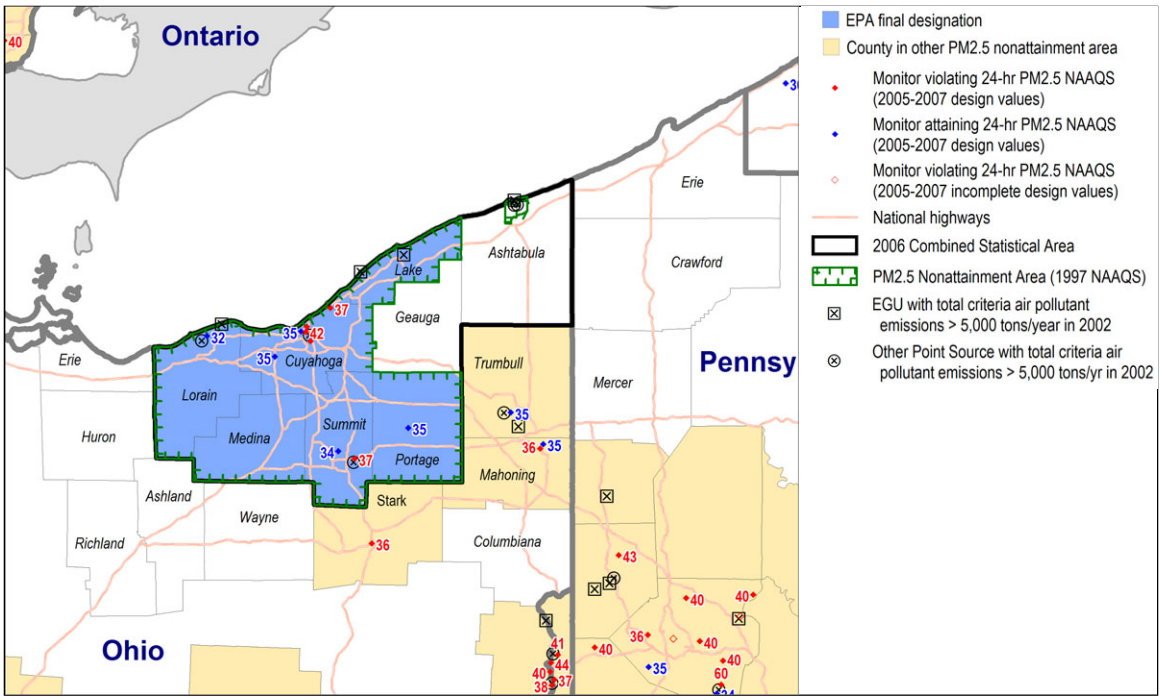


Figure 1

For this area, EPA previously established $PM_{2.5}$ nonattainment boundaries for the 1997 $PM_{2.5}$ NAAQS that included seven full and partial Ohio counties.

In its December 17, 2007 letter, Ohio recommended the above six Ohio counties be designated as "nonattainment" for the 2006 24-hour $PM_{2.5}$ standard based on air quality data from 2004-2006. These data are from Federal Reference Method (FRM) monitors located in the state.

In August 2008, EPA notified Ohio of its intended designations. In this letter, EPA also requested that if the State wished to provide comments on EPA's intended designation, it should do so by October 20, 2008. EPA stated that it would consider any additional information (e.g., on power plants or partial county areas) provided by the state in making final decisions on the designations. Ohio provided additional information on the recent emission reductions that occurred in Ashtabula County.

Based on EPA's technical analysis described below, EPA designated six Ohio counties as nonattainment for the 24-hour $PM_{2.5}$ air-quality standard as part of the Cleveland nonattainment area, based upon currently available information.

The following is a review of data for relevant factors for the Cleveland-Akron-Lorain, Ohio area.

Factor 1: Emissions data

For this factor, EPA evaluated county level emission data for the following $PM_{2.5}$ components and precursor pollutants: "$PM_{2.5}$ emissions total," "$PM_{2.5}$ emissions carbon," "$PM_{2.5}$ emissions other," "SO_2," "NO_x," "VOCs," and "NH_3." "$PM_{2.5}$ emissions total"

represents direct emissions of $PM_{2.5}$ and includes: "$PM_{2.5}$ emissions carbon," "$PM_{2.5}$ emissions other", primary sulfate (SO_4), and primary nitrate. (Although primary sulfate and primary nitrate, which are emitted directly from stacks rather than forming in atmospheric reactions with SO_2 and NO_x, are part of "$PM_{2.5}$ emissions total," they are not shown in Table 1 as separate items). "$PM_{2.5}$ emissions carbon" represents the sum of organic carbon (OC) and elemental carbon (EC) emissions, and "$PM_{2.5}$ emissions other" represents other inorganic particles (crustal). Emissions of SO_2 and NO_x, which are precursors of the secondary $PM_{2.5}$ components sulfate and nitrate, are also considered. VOCs (volatile organic compounds) and NH_3 (ammonia) are also potential $PM_{2.5}$ precursors and are included for consideration.

Emissions data were derived from the 2005 National Emissions Inventory (NEI), version 1. See http://www.epa.gov/ttn/naaqs/pm/pm25_2006_techinfo.html.

EPA also considered the Contributing Emissions Score (CES) for each county. The CES is a metric that takes into consideration emissions data, meteorological data, and air quality monitoring information to provide a relative ranking of counties in and near an area. Note that this metric is not the exclusive manner for considering data for these factors. A more detailed description can be found at http://www.epa.gov/ttn/naaqs/pm/pm25_2006_techinfo.html#C.

Table 1 shows emissions of $PM_{2.5}$ and precursor pollutants components (given in tons per year) and the CES for violating and potentially contributing counties in the Cleveland area. Counties that are part of the Cleveland nonattainment area for the 1997 $PM_{2.5}$ NAAQS are shown in boldface. Counties are listed in descending order by CES.

Table 1. $PM_{2.5}$ 24-hour Component Emissions, and CES

County	State Recommended Nonattainment?	CES	$PM_{2.5}$ emissions total	$PM_{2.5}$ emissions carbon	$PM_{2.5}$ emissions other	SO_2	NOx	VOCs	NH_3
Cuyahoga, OH	**Yes**	**100**	**2,929**	**1,619**	**1,310**	**12,958**	**48,300**	**57,105**	**11,300**
Summit, OH	**Yes**	**100**	**1,031**	**576**	**454**	**12,545**	**17,359**	**21,753**	**923**
Lorain, OH	**Yes**	**60**	**3,691**	**771**	**2,920**	**44,492**	**23,093**	**15,939**	**933**
Lake, OH	**Yes**	**43**	**3,310**	**463**	**2,846**	**80,601**	**22,288**	**12,228**	**350**
Stark, OH	Other	18	1,488	574	915	2,334	13,046	19,011	1,902
Medina, OH	**Yes**	**17**	**1,254**	**558**	**696**	**761**	**6,853**	**7,731**	**669**
Portage, OH	**Yes**	**15**	**1,011**	**496**	**514**	**548**	**7,269**	**8,365**	**564**
Wayne, OH	No	15	1,408	468	938	4,812	7,546	6,934	3,702
Trumbull, OH	Other	11	1,730	625	1,105	18,501	13,373	12,098	881
Geauga, OH	No	5	951	461	491	458	3,101	7,162	490
Mahoning, OH	Other	4	722	338	384	1,927	10,086	10,416	1,415
Ashtabula, OH	**No**	**3**	**1,407**	**648**	**758**	**5,713**	**14,555**	**10,988**	**860**

The emissions from several Cleveland area counties are high. The emissions from Medina and Portage are slightly lower than Stark County, which Ohio recommended as nonattainment in the separate Canton area. Trumbull and Wayne Counties also have moderate emissions. The relatively low CES for Ashtabula County reflects moderate emissions in the county which were concentrated within Ashtabula Township but a relatively low frequency of winds blowing from Ashtabula County to violating monitors

on high concentration days and the considerable distance from the county to the violating monitors. Ohio has provided information on unit shut downs that have greatly lowered the emissions from a power plant in Ashtabula County. This reduction is not reflected in the data on Table 1.

Cuyahoga, Lake, Lorain, and Summit Counties are strong candidates for nonattainment based on this factor. This factor also suggests Medina, Portage, and Wayne Counties are potential candidates for inclusion in the nonattainment area. Considering the recent emissions reductions, Ashtabula County is not a candidate for nonattainment based on this factor.

Table 2 provides the data for CES weighting factors. The trajectory factors are used in CES calculations to account for seasonal meteorology. For the top 10% of days in both the cold and warm seasons, wind trajectories were run for a 48 hour period preceding the high monitor reading. The amount of time the air mass was over a county within the mixing height was calculated. The values were scaled so that the maximum value is 100. Thus, the county that is most likely to be upwind of a monitor on a high concentration day in a season is given a score of 100. The scores for the other counties will reflect the relative likelihood of being upwind. As the concentration of a pollutant will decrease as it goes further downwind, a distance weighting factor is also used in calculating the CES. The distance factor listed on Table 2 provides the distance from the center of a county to the center of the violating county. If a county is violating, the distance used is the average distance from the center to the county line.

Table 2. CES Factor Data

County	CES	Trajectory Factor- Cold	Trajectory Factor- Warm	Distance (mi)
Cuyahoga	100	100	85	11.2
Summit	100	72	100	23.6
Lorain	60	73	49	25
Lake	43	56	43	28.9
Stark	18	32	79	47.3
Medina	17	75	83	25.6
Portage	15	50	75	31.9
Wayne	15	44	73	44.5
Trumbull	11	22	39	48.6
Geauga	5	59	54	25.6
Mahoning	4	16	52	56.6
Ashtabula	3	23	22	51.5

Factor 2: Air quality data

This factor considers the 24-hour $PM_{2.5}$ design values (in $\mu g/m^3$) for air quality monitors in counties in the Cleveland area based on data for the 2005-2007 period. A monitor's design value indicates whether that monitor attains a specified air quality standard. The 24-hour $PM_{2.5}$ standards are met when the 3-year average of a monitor's 98^{th} percentile values are 35 $\mu g/m^3$ or less. A design value is only valid if minimum data completeness criteria are met.

The 24-hour $PM_{2.5}$ design values for counties in the Cleveland area are shown in Table 3. The Cuyahoga and Summit County design values exceed the 2006 standards and therefore must be included within the nonattainment area. Lorain and Portage Counties have air quality that meets the standards. There is no monitoring data for Lake and Medina Counties. However, the absence of a violating monitor alone is not a sufficient reason to eliminate counties as candidates for nonattainment status. Each county has been evaluated based on the weight of evidence of the nine factors and other relevant information. The other counties showing violations have all been designated nonattainment as part of separate nonattainment areas based on historical practice, separate MSAs, and separate economic regions.

Table 3. Air Quality Data

County	State Recommended Nonattainment?	Design Values 2004-06 ($\mu g/m^3$)	Design Values 2005-07 ($\mu g/m^3$)
Cuyahoga, OH	Yes	43	42
Summit, OH	Yes	38	37
Lorain, OH	Yes	31	32
Lake, OH	Yes		
Medina, OH	Yes		
Portage, OH	Yes	34	35
Ashtabula, OH	No		
Stark, OH	Other	37	36
Wayne, OH	No		
Trumbull, OH	Other	36	35

For purposes of its review, EPA used data available from the Chemical Speciation Network and the Interagency Monitoring of Protected Visual Environments (IMPROVE) network to estimate the composition of fine particle mass on days with the highest fine particle concentrations. Analysis of these data indicates that the days with the highest fine particle concentrations in the Cleveland area occur about 63% in the warm season and 37% in the cool season. In the warm season, the average chemical composition of the highest days is 69% sulfate, no nitrate, 23% carbon, and 8% crustal. In the cool season, the average chemical composition of the highest days is 24% sulfate, 36% nitrate, 34% carbon, and 6% crustal. These data indicate that sources of SO_2, NOx, and direct $PM_{2.5}$ emissions contribute to violations in the area.

Factor 3: Population density and degree of urbanization (including commercial development)

Table 4 shows the 2005 population for each county in the area being evaluated, as well as the population density for each county in that area. Population data gives an indication of whether it is likely that population-based emissions might contribute to violations of the 24-hour $PM_{2.5}$ standards.

Table 4. Population

County	State Recommended	2005 Population	2005 Population Density (pop/sq

	Nonattainment?		mi)
Cuyahoga, OH	Yes	1,330,428	2900
Summit, OH	Yes	546,285	1302
Lorain, OH	Yes	300,266	608
Lake, OH	Yes	232,416	1004
Medina, OH	Yes	166,968	395
Portage, OH	Yes	155,150	307
Ashtabula, OH	No	103,044	145
Wayne, OH	No	113,496	204
Geauga, OH	No	95,060	233

Cuyahoga County with the city of Cleveland has the highest population. Summit County follows with about half the population. The other counties are lower with Ashtabula, Wayne, and Geauga having the smallest population in the Cleveland area. Based on this table, the six counties recommended for nonattainment by Ohio can be expected to have the great majority of the population-oriented emissions of the area, and EPA concludes that they all qualify for designation based on contribution under this factor.

Factor 4: Traffic and commuting patterns

This factor considers the number of commuters in each county who drive to another county within the Cleveland area, the percent of total commuters in each county who commute within the area, as well as the total Vehicle Miles Traveled (VMT) for each county in millions of miles (see Table 5). A county with numerous commuters is generally an integral part of an urban area and is likely contributing to fine particle concentrations in the area.

Table 5. Traffic and Commuting Patterns

County	State Recommended Nonattainment?	2005 VMT (10^6 mi)	Number Commuting to any violating counties	Percent Commuting to any violating counties	Number Commuting into statistical area	Percent Commuting into statistical area
Cuyahoga, OH	**Yes**	**11,017**	**596,930**	**96**	**615,890**	**99**
Summit, OH	**Yes**	**4,929**	**237,910**	**92**	**245,630**	**95**
Lorain, OH	**Yes**	**3,044**	**38,300**	**29**	**129,280**	**98**
Lake, OH	**Yes**	**1,881**	**111,000**	**95**	**115,760**	**99**
Medina, OH	**Yes**	**1,721**	**36,030**	**47**	**73,030**	**96**
Portage, OH	**Yes**	**1,788**	**35,070**	**45**	**73,350**	**94**
Ashtabula, OH	**No**	**1,182**	**9,280**	**20**	**44,070**	**97**
Wayne, OH	No	1,044	6,920	13	10,100	19
Geauga, OH	No	834	23,600	53	43,490	98
Stark, OH	Other	3,049	165,560	94	26,820	15
Trumbull, OH	Other	2,153	88,870	91	9,890	10
Mahoning, OH	Other	2,666	101,330	93	3,710	3

The listing of counties on Table 5 reflects a ranking based on the number of people commuting within the Cleveland area. The counties in bold type are all in the Cleveland nonattainment area for the 1997 $PM_{2.5}$ NAAQS. Cuyahoga, Lake, and Summit Counties all have a high percent of commuting into violating counties. Geauga, Medina, and Portage Counties have a fair amount of commuting into violating counties, though Geauga County has the lowest VMT in the area suggesting little contribution based on

this factor. The low percent of commuting into the Cleveland statistical area from Wayne and into the violating counties from both Wayne and Ashtabula Counties suggests that they are separate from the Cleveland area and therefore not contributing based on this factor. Thus, the six counties recommended for nonattainment by Ohio represent an integrated area that warrants being treated together as a single nonattainment area. These data show minimal commuting from Mahoning, Stark, and Trumbull Counties into the adjacent to the Cleveland area. Thus, these data support treating Canton and Youngstown as separate urban areas.

Note: The 2005 VMT data used for tables 5 and 6 of the technical analysis have been derived using methodology such as that described in "Documentation for the 2005 Mobile National Emissions Inventory, Version 2," December 2008, prepared for the Emission Inventory Group, U.S. EPA. This document may be found at: ftp://ftp.epa.gov/EmisInventory/2005_nei/mobile_sector/documentation/2005_mobile_nei_version_2_report.pdf.

Factor 5: Growth rates and patterns

This factor considers population growth for 2000-2005 and growth in vehicle miles traveled for 1996-2005 for counties in the Cleveland area, as well as patterns of population and VMT growth. A county with rapid population or VMT growth is generally an integral part of an urban area and likely to be contributing to fine particle concentrations in the area.

Table 6 below shows population, population growth, VMT, and VMT growth for counties that are included in the Cleveland area. Counties are listed in descending order based on VMT growth between 1996 and 2005.

Table 6. Population and VMT Growth and Percent Change.

County	Population (2005)	Population % change (2000-2005)	2005 VMT (10^6 mi)	VMT % change (1996-2005)
Lorain, OH	300,266	5	3,044	26
Ashtabula, OH	103,044	0	1,182	13
Medina, OH	166,968	10	1,721	12
Portage, OH	155,150	2	1,788	6
Wayne, OH	113,496	2	1,044	6
Summit, OH	546,285	0	4,929	1
Lake, OH	232,416	2	1,881	1
Geauga, OH	95,060	4	921	-2
Cuyahoga, OH	1,330,428	-4	10,482	-7

The population of Medina County grew by 10% during the 2000 to 2005 period. The population change for the other counties in the area was 5% or less. Lorain County had the largest VMT percent growth. Ashtabula and Medina Counties also experienced strong VMT growth. Cuyahoga and Geauga Counties had a decrease in VMT during the 1996 to 2005 period. The growth rates suggest that the distribution of population and

VMT will not change significantly during the SIP planning time horizon, thus this factor was less significant in determining the boundary of the nonattainment area.

Factor 6: Meteorology (weather/transport patterns)

For this factor, EPA considered data from National Weather Service instruments and other meteorological monitoring sites in the area. Wind direction and wind speed data for 2005-2007 were analyzed, with an emphasis on "high $PM_{2.5}$ days" for each of two seasons, an October-April "cold" season and a May-September "warm" season. These high days are defined as days where any FRM or FEM air quality monitors had 24-hour $PM_{2.5}$ concentrations above 95% on a frequency distribution curve of $PM_{2.5}$ 24-hour values.

For each air quality monitoring site, EPA developed a "pollution rose" to understand the prevailing wind direction and wind speed on the days with highest fine particle concentrations. The figure identifies 24-hour $PM_{2.5}$ values by color; days exceeding 35 $\mu g/m^3$ are denoted with a red or black icon. A dot indicates the day occurred in the warm season; a triangle indicates the day occurred in the cool season. The center of the figure indicates the location of the air quality monitoring site, and the location of the icon in relation to the center indicates the direction from which the wind was blowing on that day. An icon that is close to the center indicates a low average wind speed on that day. Higher wind speeds are indicated when the icon is further away from the center.

The pollution rose for the Cleveland area is provided as Figure 2. Winds on high concentration days show a tendency to come from the South. Overall, the winds come from a variety of directions. So, it is appropriate to consider counties in all directions from the violations. This factor indicates contribution from all surrounding counties that have sufficient emissions levels.

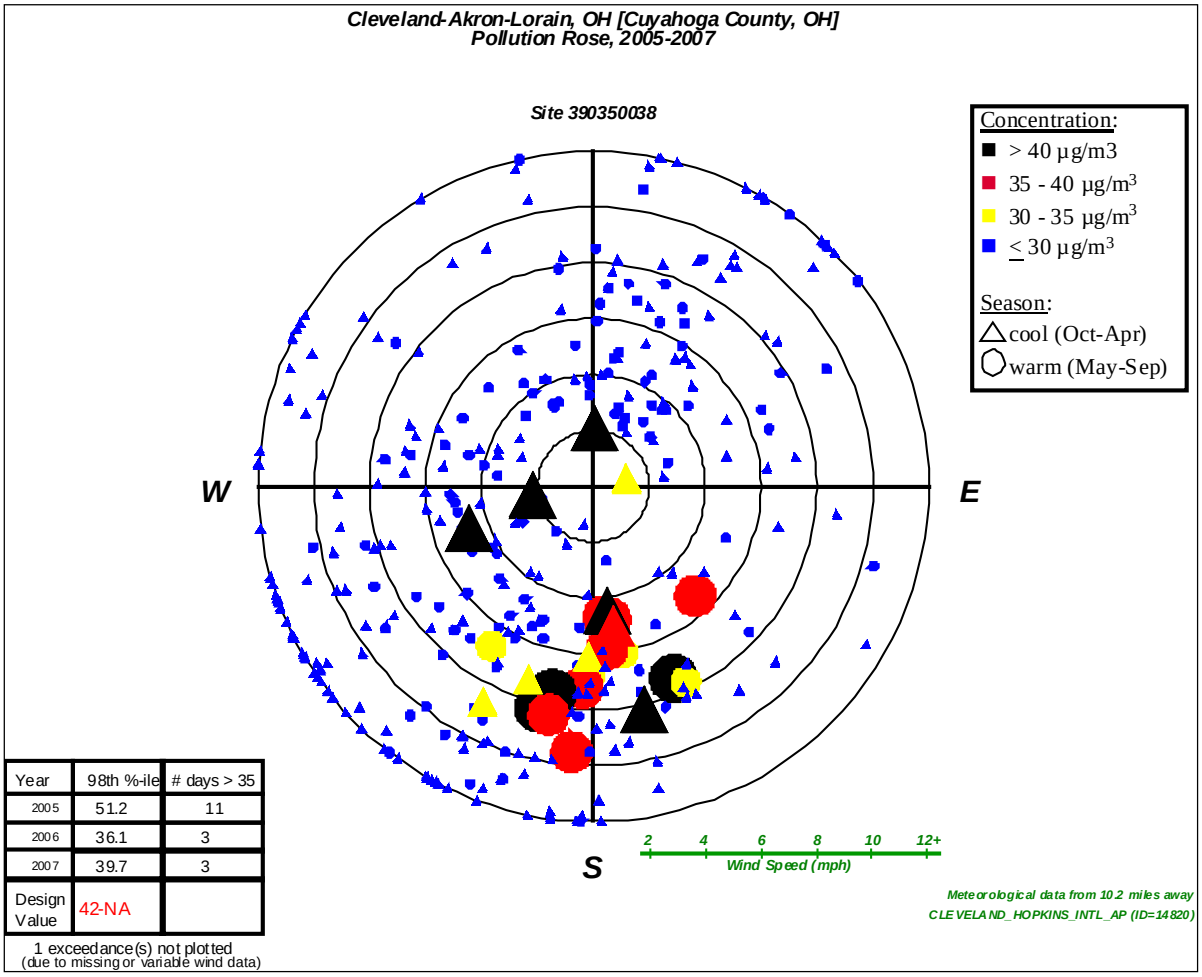


Figure 2

Note: the meteorology factor is also considered in each county's Contributing Emissions Score because the method for deriving this metric included an analysis of trajectories of air masses for high $PM_{2.5}$ days.

Factor 7: Geography/topography (mountain ranges or other air basin boundaries)

The geography/topography analysis evaluates the physical features of the land that might have an effect on the air shed and, therefore, on the distribution of $PM_{2.5}$ over the area.

The Cleveland area does not have any geographical or topographical barriers significantly limiting air-pollution transport within its air shed. Therefore, this factor did not play a significant role in the decision-making process.

Factor 8: Jurisdictional boundaries

In evaluating the jurisdictional boundary factor, EPA gave special consideration to areas that were already designated nonattainment in 2005 for violating the 1997 fine particle standards. Analysis of chemical composition data in these areas indicates that the same

components that make up most of the $PM_{2.5}$ mass in the area on an annual average basis such as sulfate and direct $PM_{2.5}$ carbon in many eastern areas also are key contributors to the $PM_{2.5}$ mass on days exceeding the 24-hour $PM_{2.5}$ standard. These data indicate that in many cities, the same source categories that contribute to violations of the annual standard also contribute to exceedances of the 24-hour standard.

EPA has generally concluded that counties that were designated as having emissions sources contributing to fine particle concentrations which exceeded the 1997 standards (all areas violated the annual standard, two also violated the previous 24-hour standard) also contribute to fine particle concentrations on the highest days. For this reason, EPA believes that for most existing nonattainment areas, the nonattainment area for the 2006 24-hour standard should be the same. Consideration also should be given to existing boundaries and organizations as they may facilitate air quality planning and the implementation of control measures to attain the standard. Areas already designated as nonattainment represent important boundaries for state air quality planning.

The Northeast Ohio Area wide Coordinating Agency (NOACA) is the Metropolitan Planning Organization (MPO) for Cuyahoga, Geauga, Lake (OH), Lorain, and Medina Counties. NOACA webpage, http://www.noaca.org/. Youngstown has a separate MPO, the Eastgate Regional Council of Governments which serves Mahoning and Trumbull Counties in Ohio.

The Cleveland ozone nonattainment area consists of the following counties: Ashtabula, Cuyahoga, Geauga, Lake, Lorain, Medina, Portage, and Summit.

The Cleveland nonattainment area is nearly identical to the nonattainment area designated under the 1997 $PM_{2.5}$ standard, which would facilitate planning. The partial county portion in Ashtabula County was previously designated nonattainment, but now is considered as attainment based on significantly lower emissions levels. The rest of the Cleveland area is the same.

Factor 9: Level of control of emission sources

Under this factor, the existing level of control of emission sources is taken into consideration. The emissions data used by EPA in this technical analysis and provided in Table 1 under Factor 1 represent emissions levels taking into account any control strategies implemented in the Cleveland area before 2005 on stationary, mobile, and area sources. Data are presented for $PM_{2.5}$ components that are directly emitted, carbonaceous $PM_{2.5}$ and crustal $PM_{2.5}$, and for pollutants which react in the atmosphere to form fine particles such as SO_2, NOx, VOC, and ammonia.

In considering county-level emissions, EPA used data from the 2005 National Emissions Inventory, the most updated version of the national inventory available at the beginning of the designations process in late 2007. However, EPA recognized that for certain counties, emissions may have changed since 2005. For example, certain power plants or large sources of emissions in or near this area may have installed emission controls or

otherwise significantly reduced emissions since 2005. Some States provided updated information on emissions and emission controls in their comments to EPA. EPA considered such additional information in making final designation decisions.

With regard to nearby power plants, EPA considered information about whether a specific plant installed federally enforceable emission controls by December 2008 resulting in significant emissions reductions. A control requirement is considered to be federally-enforceable if it is required by a State regulation adopted in a State implementation plan, if it is included in a federally-enforceable Title V operating permit, or if it is required by a consent decree which also requires the controls to be included in federally enforceable permit upon termination of the consent decree. In making final decisions, EPA also considered whether a facility would continue to emit pollutants which contribute to $PM_{2.5}$ exceedances even after emission controls are operational.

Ohio provided information regarding the large reductions at the Ashtabula power plant. Large emission reductions have resulted from unit shutdowns at the Ashtabula County facility. The units of Plant C at this facility have been sold to another company that does not intend to restart the units and acknowledges that restarting the units would require a new source permit authorizing their operation due to the current shutdown. Ohio also noted that the Title V permit covering Plant C has expired, no application for a Title V permit for Plant C has been received, and so operation of Plant C without a permit would be a violation of permitting rules. EPA concludes that the reduction of emissions from the shutdown of Plant C is permanent and enforceable. As a result of the shutdown of this facility, EPA concludes that the significantly lower emissions form Ashtabula County, which is not significant for any other factor, indicate that Ashtabula County is not contributing to the violating monitors at this time.

EPA Technical Analysis for Columbus, Ohio

The Columbus, Ohio nonattainment area under the 1997 standards is comprised of Delaware, Fairfield, Franklin, and Licking Counties along with Franklin Township in Coshocton County. For the 2006 standards, Ohio recommended Delaware, Fairfield, Franklin, and Licking Counties be designated nonattainment in its December 17, 2007 letter. The partial county area, Franklin Township in Coshocton County, was not included in Ohio's recommended nonattainment area. Monitored air quality values show that Franklin County has exceeded the 2006 standards. No other county in the combined statistical area has monitoring data.

EPA agrees that the four counties recommended by Ohio to be nonattainment warrant inclusion in the nonattainment area. Franklin County likely makes the greatest contribution to violations within the area, however Delaware, Fairfield, and Licking Counties all have substantial emissions, populations, traffic, and growth rates that indicate contribution to the violations in Franklin County.

Coshocton County emissions are also substantial. Direct fine particulate and nitrogen oxides emissions are among the highest of the candidate nonattainment counties in the

Columbus area, and winds sometimes carry those emissions to the violating monitor on high concentration days. Current sulfur dioxide emissions from Coshocton County far exceed the emissions from any other Columbus area county. These emissions arise predominantly from the Conesville power plant in Franklin Township. EPA understands that two units of this plant are well controlled. According to Ohio's comments, the owner of this plant is installing controls that will commence operation in mid-2009. However, current emissions are relatively high. Therefore, EPA believes at the present time that emissions in Franklin Township of Coshocton County are substantial and continue to contribute to nonattainment in the Columbus area. This reflects EPA's approach of designating according to current air quality and current contributions to violations as required by the Act, irrespective of whether emissions may be reduced in the future. However, as Coshocton County ranks low for all other factors EPA concludes that it is appropriate to designate only Franklin County as nonattainment for the 2006 standards.

EPA is designating a Columbus nonattainment area that includes Delaware, Fairfield, Franklin, and Licking Counties and Franklin Township in Coshocton County. Establishing nonattainment boundaries that match the boundaries established for the 1997 standards has the additional benefit of simplifying planning by assuring that the same areas are subject to very similar nonattainment planning requirements. EPA examined relevant information for other counties in and around the Columbus area and concluded that other counties have relatively low emissions, and no other factor warrants inclusion of these counties in the nonattainment area.

Figure 1 is a map of the counties in the nonattainment area and other relevant information such as the locations and design values of air quality monitors, and the metropolitan area boundary.

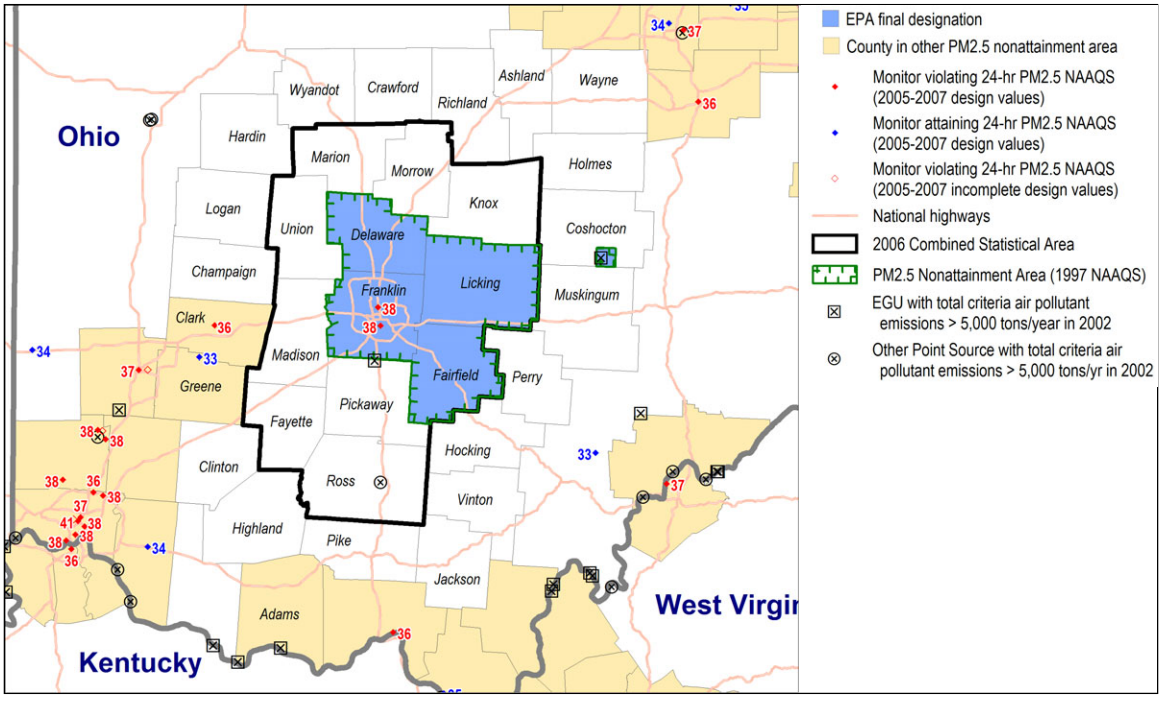


Figure 1

For this area, EPA previously established $PM_{2.5}$ nonattainment boundaries for the 1997 $PM_{2.5}$ NAAQS that included five full and partial counties in Ohio.

In its December 17, 2007 letter, Ohio recommended the four of the same Ohio counties be designated as "nonattainment" for the 2006 24-hour $PM_{2.5}$ standard based on air quality data from 2004-2006. Ohio recommended all of Coshocton County be designated as "attainment". One township of Coshocton County is included in the Columbus nonattainment area for the 2006 24-hour $PM_{2.5}$ standard. These data are from Federal Reference Method (FRM) monitors located in the state.

In August 2008, EPA notified Ohio of its intended designations. In this letter, EPA also requested that if the State wished to provide comments on EPA's intended designation, it should do so by October 20, 2008. EPA stated that it would consider any additional information (e.g., on power plants or partial county areas) provided by the state in making final decisions on the designations.

Based on EPA's technical analysis described below, EPA designated five full and partial counties in Ohio as nonattainment for the 24-hour $PM_{2.5}$ air-quality standard as part of the Columbus nonattainment area, based upon currently available information.

The following is a review of data for relevant factors for the Columbus, Ohio area.

Factor 1: Emissions data

For this factor, EPA evaluated county level emission data for the following $PM_{2.5}$ components and precursor pollutants: "$PM_{2.5}$ emissions total," "$PM_{2.5}$ emissions carbon," "$PM_{2.5}$ emissions other," "SO_2," "NO_x," "VOCs," and "NH_3." "$PM_{2.5}$ emissions total" represents direct emissions of $PM_{2.5}$ and includes: "$PM_{2.5}$ emissions carbon," "$PM_{2.5}$ emissions other", primary sulfate (SO_4), and primary nitrate. (Although primary sulfate and primary nitrate, which are emitted directly from stacks rather than forming in atmospheric reactions with SO_2 and NO_x, are part of "$PM_{2.5}$ emissions total," they are not shown in Table 1 as separate items). "$PM_{2.5}$ emissions carbon" represents the sum of organic carbon (OC) and elemental carbon (EC) emissions, and "$PM_{2.5}$ emissions other" represents other inorganic particles (crustal). Emissions of SO_2 and NO_x, which are precursors of the secondary $PM_{2.5}$ components sulfate and nitrate, are also considered. VOCs (volatile organic compounds) and NH_3 (ammonia) are also potential $PM_{2.5}$ precursors and are included for consideration.

Emissions data were derived from the 2005 National Emissions Inventory (NEI), version 1. See http://www.epa.gov/ttn/naaqs/pm/pm25_2006_techinfo.html.

EPA also considered the Contributing Emissions Score (CES) for each county. The CES is a metric that takes into consideration emissions data, meteorological data, and air quality monitoring information to provide a relative ranking of counties in and near an area. Note that this metric is not the exclusive manner for considering data for these

factors. A more detailed description can be found at http://www.epa.gov/ttn/naaqs/pm/pm25_2006_techinfo.html#C.

Table 1 shows emissions of $PM_{2.5}$ and precursor pollutants components (given in tons per year) and the CES for violating and potentially contributing counties in the Columbus area. Counties that are part of the Columbus nonattainment area for the 1997 $PM_{2.5}$ NAAQS are shown in boldface. Counties are listed in descending order by CES.

Table 1. $PM_{2.5}$ 24-hour Component Emissions, and CESs.

County	State Recommended Nonattainment?	CES	$PM_{2.5}$ emissions total	$PM_{2.5}$ emissions carbon	$PM_{2.5}$ emissions other	SO_2	NOx	VOCs	NH_3
Franklin, OH	**Yes**	**100**	**2,366**	**1,327**	**1,039**	**4,094**	**37,707**	**42,607**	**2,002**
Pickaway, OH	No	19	1,214	233	981	6,797	5,022	3,027	1,308
Adams, OH	No	18	5,970	494	5,476	126,316	33,822	1,918	837
Ross, OH	No	18	920	339	581	24,424	6,725	3,947	1,037
Coshocton, OH	**No**	**16**	**6,842**	**483**	**6,358**	**106,802**	**23,057**	**2,349**	**1,108**
Delaware, OH	**Yes**	**11**	**1,382**	**515**	**868**	**581**	**6,803**	**6,751**	**695**
Licking, OH	**Yes**	**10**	**1,949**	**759**	**1,192**	**766**	**7,437**	**7,326**	**2,626**
Fairfield, OH	**Yes**	**9**	**1,108**	**389**	**719**	**450**	**5,942**	**4,929**	**1,377**

The CES for Franklin County is distinctly higher than the scores for the other counties. None of the scores for the other counties stand out. Adams and Coshocton Counties are notable for the high sulfur dioxide emissions from both counties. However, Adams County is in the Huntington-Ashland nonattainment area under the 1997 standards and does not rank highly for any other factors. The other counties have moderate emissions.

Table 2 provides the data for CES weighting factors. The trajectory factors are used in CES calculations to account for seasonal meteorology. For the top 10% of days in both the cold and warm seasons, wind trajectories were run for a 48 hour period preceding the high monitor reading. The amount of time the air mass was over a county within the mixing height was calculated. The values were scaled so that the maximum value is 100. Thus, the county that is most likely to be upwind of a monitor on a high concentration day in a season is given a score of 100. The scores for the other counties will reflect the relative likelihood of being upwind. As the concentration of a pollutant will decrease as it goes further downwind, a distance weighting factor is also used in calculating the CES. The distance factor listed on Table 2 provides the distance from the center of a county to the center of the violating county. If a county is violating, the distance used is the average distance from the center to the county line.

Table 2. CES Factor Data.

County	CES	Trajectory Factor- Cold	Trajectory Factor- Warm	Distance (mi)
Franklin	100	100	100	13.1
Pickaway	19	85	97	22.8
Adams	18	21	24	82.9
Ross	18	52	60	43.5
Coshocton	16	27	15	62.9
Delaware	11	74	57	21.9

Licking	10	69	55	29.6
Fairfield	9	87	84	26.1

Factor 2: Air quality data

This factor considers the 24-hour $PM_{2.5}$ design values (in $\mu g/m^3$) for air quality monitors in counties in the Columbus area based on data for the 2005-2007 period. A monitor's design value indicates whether that monitor attains a specified air quality standard. The 24-hour $PM_{2.5}$ standards are met when the 3-year average of a monitor's 98^{th} percentile values are 35 $\mu g/m^3$ or less. A design value is only valid if minimum data completeness criteria are met.

The 24-hour $PM_{2.5}$ design values for counties in the Columbus area are shown in Table 3. Franklin County is the only area with monitoring data. Its design value exceeds the air quality standards.

Table 3. Air Quality Data

County	State Recommended Nonattainment?	Design Values 2004-2006	Design Values 2005-2007
Franklin, OH	Yes	38	38
Coshocton, OH	No		
Delaware, OH	Yes		
Licking, OH	Yes		
Fairfield, OH	Yes		

For purposes of its review, EPA used data available from the Chemical Speciation Network and the Interagency Monitoring of Protected Visual Environments (IMPROVE) network to estimate the composition of fine particle mass on days with the highest fine particle concentrations. Analysis of these data indicates that the days with the highest fine particle concentrations in the Columbus area occur about 74% in the warm season and 26% in the cool season. In the warm season, the average chemical composition of the highest days is 81% sulfate, no nitrate, 17% carbon, and 2% crustal. In the cool season, the average chemical composition of the highest days is 33% sulfate, 32% nitrate, 33% carbon, and 2% crustal. These data indicate that sources of SO_2, NOx, and direct $PM_{2.5}$ emissions contribute to violations in the area.

Factor 3: Population density and degree of urbanization (including commercial development)

Table 4 shows the 2005 population for each county in the area being evaluated, as well as the population density for each county in that area. Population data gives an indication of whether it is likely that population-based emissions might contribute to violations of the 24-hour $PM_{2.5}$ standards.

Table 4. Population

County	State	2005	2005

	Recommended Nonattainment?	Population	Population Density (pop/sq mi)
Franklin, OH	Yes	1,089,365	2007
Licking, OH	Yes	154,683	225
Delaware, OH	Yes	150,496	330
Fairfield, OH	Yes	138,403	272
Ross, OH	No	75,135	109
Pickaway, OH	No	52,837	104
Coshocton, OH	No	36,969	65
Adams, OH	No	28,454	49

Franklin County has the largest population. Delaware, Fairfield, and Licking Counties have moderate populations. Thus, these four counties would be included in the nonattainment area based on this factor. The other counties all have modest populations and would not be recommended for inclusion based on this factor.

Factor 4: Traffic and commuting patterns

This factor considers the number of commuters in each county who drive to another county within the Columbus area, the percent of total commuters in each county who commute within the area, as well as the total Vehicle Miles Traveled (VMT) for each county in millions of miles (see Table 5). A county with numerous commuters is generally an integral part of an urban area and is likely contributing to fine particle concentrations in the area.

Table 5. Traffic and Commuting Patterns

County	State Recommended Nonattainment?	2005 VMT (10^6 mi)	Number Commuting to any violating counties	Percent Commuting to any violating counties	Number Commuting into statistical area	Percent Commuting into statistical area
Franklin, OH	Yes	10,724	508,840	93	539,670	99
Licking, OH	Yes	1,669	23,780	34	68,970	97
Fairfield, OH	Yes	1,232	28,280	47	58,710	98
Delaware, OH	Yes	1,417	31,720	55	56,510	98
Ross, OH	No	654	2,360	8	27,510	91
Pickaway, OH	No	464	9,640	44	21,440	99
Coshocton, OH	No	307	270	2	970	6
Adams, OH	No	283	20	0	110	1

The listing of counties on Table 5 reflects a ranking based on the number of people commuting within the Columbus area. Adams and Coshocton Counties show little commuting into the Columbus area. The other counties all show high percent of commuting within the Columbus area. This suggests these counties are linked economically and likely contribute emissions to the violating monitors based on this factor.

Note: The 2005 VMT data used for table 5 and 6 of the 9-factor analysis has been derived using methodology similar to that described in "Documentation for the final 2002 Mobile National Emissions Inventory, Version 3, September 2007, prepared for the

Emission Inventory Group, U.S. EPA. This document may be found at: ftp://ftp.epa.gov/EmisInventory/2002finalnei/documentation/mobile/2002_mobile_nei_version_3_report_092807.pdf. The 2005 VMT data were taken from documentation which is still draft, but which should be released in 2008.

Factor 5: Growth rates and patterns

This factor considers population growth for 2000-2005 and growth in vehicle miles traveled for 1996-2005 for counties in Columbus area, as well as patterns of population and VMT growth. A county with rapid population or VMT growth is generally an integral part of an urban area and likely to be contributing to fine particle concentrations in the area.

Table 6 below shows population, population growth, VMT, and VMT growth for counties that are included in the Columbus area. Counties are listed in descending order based on VMT growth between 1996 and 2005.

Table 6. Population and VMT Growth and Percent Change.

Location	Population (2005)	Population % change (2000-2005)	2005 VMT (10^6 mi)	VMT % change (1996-2005)
Delaware, OH	150,496	35	1,417	38
Licking, OH	154,683	6	1,669	22
Fairfield, OH	138,403	12	1,232	21
Franklin, OH	1,089,365	2	10,724	19
Coshocton, OH	36,969	1	307	4

Delaware County grew rapidly during the 2000 to 2005 period. Fairfield County had substantial growth while the other area counties experienced limited population expansion during that time. Delaware County also had the most VMT growth. The other counties had significant VMT growth as well with one exception. Coshocton County had just a 4% increase to its small VMT. These data support continuing to include the three "collar counties" in the nonattainment area. However, Coshocton County as a whole would not be recommended for inclusion under this factor.

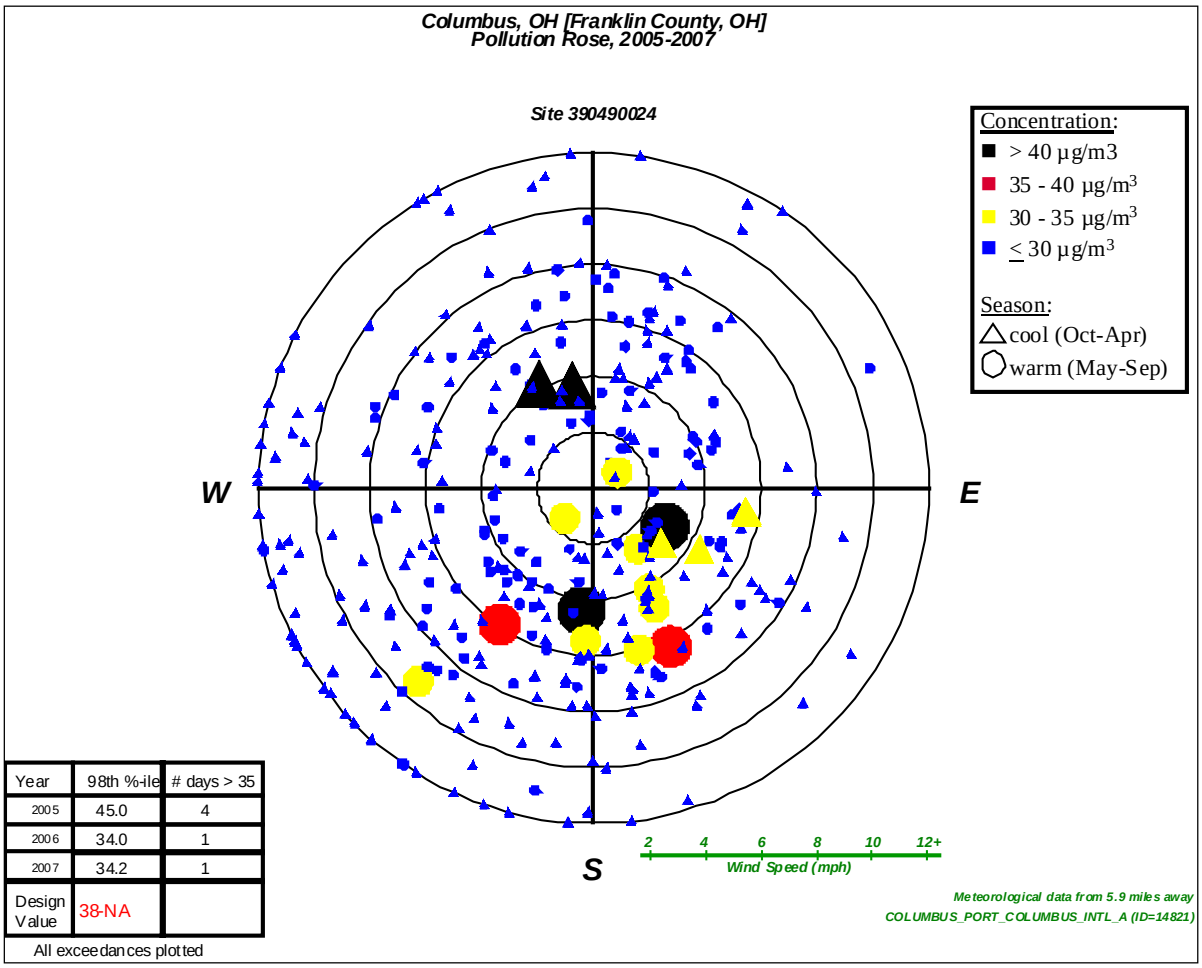
Factor 6: Meteorology (weather/transport patterns)

For this factor, EPA considered data from National Weather Service instruments and other meteorological monitoring sites in the area. Wind direction and wind speed data for 2005-2007 were analyzed, with an emphasis on "high $PM_{2.5}$ days" for each of two seasons, an October-April "cold" season and a May-September "warm" season. These high days are defined as days where any FRM or FEM air quality monitors had 24-hour $PM_{2.5}$ concentrations above 95% on a frequency distribution curve of $PM_{2.5}$ 24-hour values.

For each air quality monitoring site, EPA developed a "pollution rose" to understand the prevailing wind direction and wind speed on the days with highest fine particle concentrations. The figure identifies 24-hour $PM_{2.5}$ values by color; days exceeding 35

µg/m^3 are denoted with a red or black icon. A dot indicates the day occurred in the warm season; a triangle indicates the day occurred in the cool season. The center of the figure indicates the location of the air quality monitoring site, and the location of the icon in relation to the center indicates the direction from which the wind was blowing on that day. An icon that is close to the center indicates a low average wind speed on that day. Higher wind speeds are indicated when the icon is further away from the center.

The pollution rose for the Columbus area is provided as Figure 2. Winds on high concentration days come from a variety of directions. So, it is appropriate to consider counties in all directions from the violation. The wind rose indicates that any nearby surrounding counties with high emissions could contribute to the violating monitors.



Year	98th %-ile	# days > 35
2005	45.0	4
2006	34.0	1
2007	34.2	1
Design Value	38-NA	

Figure 2

Note: the meteorology factor is also considered in each county's Contributing Emissions Score because the method for deriving this metric included an analysis of trajectories of air masses for high $PM_{2.5}$ days.

Factor 7: Geography/topography (mountain ranges or other air basin boundaries)

The geography/topography analysis evaluates the physical features of the land that might have an effect on the air shed and, therefore, on the distribution of $PM_{2.5}$ over the area.

The Columbus area does not have any geographical or topographical barriers significantly limiting air-pollution transport within its air shed. Therefore, this factor did not play a significant role in the decision-making process.

Factor 8: Jurisdictional boundaries

In evaluating the jurisdictional boundary factor, EPA gave special consideration to areas that were already designated nonattainment in 2005 for violating the 1997 fine particle standards. Analysis of chemical composition data in these areas indicates that the same components that make up most of the $PM_{2.5}$ mass in the area on an annual average basis such as sulfate and direct $PM_{2.5}$ carbon in many eastern areas also are key contributors to the $PM_{2.5}$ mass on days exceeding the 24-hour $PM_{2.5}$ standard. These data indicate that in many cities, the same source categories that contribute to violations of the annual standard also contribute to exceedances of the 24-hour standard.

EPA has generally concluded that counties that were designated as having emissions sources contributing to fine particle concentrations which exceeded the 1997 standards (all areas violated the annual standard, two also violated the previous 24-hour standard) also contribute to fine particle concentrations on the highest days. For this reason, EPA believes that for most existing nonattainment areas, the nonattainment area for the 2006 24-hour standard should be the same. Consideration also should be given to existing boundaries and organizations as they may facilitate air quality planning and the implementation of control measures to attain the standard. Areas already designated as nonattainment represent important boundaries for state air quality planning.

The Mid-Ohio Regional Planning Commission (MORPC) is the Metropolitan Planning Organization (MPO) for the Columbus, Ohio area. MORPC webpage, http://www.morpc.org/MORPC.htm.

The area's ozone nonattainment area consists of the following counties: Delaware, Franklin, Licking, Fairfield, Madison, and Knox.

The designated Columbus, Ohio nonattainment area is identical to the nonattainment area designated under the 1997 $PM_{2.5}$ standard, which will facilitate air quality planning.

Factor 9: Level of control of emission sources

Under this factor, the existing level of control of emission sources is taken into consideration. The emissions data used by EPA in this technical analysis and provided in Table 1 under Factor 1 represent emissions levels taking into account any control strategies implemented in the Columbus area before 2005 on stationary, mobile, and area sources. Data are presented for $PM_{2.5}$ components that are directly emitted, carbonaceous

$PM_{2.5}$ and crustal $PM_{2.5}$, and for pollutants which react in the atmosphere to form fine particles such as SO_2, NOx, VOC, and ammonia.

In considering county-level emissions, EPA used data from the 2005 National Emissions Inventory, the most updated version of the national inventory available at the beginning of the designations process in late 2007. However, EPA recognized that for certain counties, emissions may have changed since 2005. For example, certain power plants or large sources of emissions in or near this area may have installed emission controls or otherwise significantly reduced emissions since 2005. Some States provided updated information on emissions and emission controls in their comments to EPA. EPA considered such additional information in making final designation decisions.

With regard to nearby power plants, EPA considered information about whether a specific plant installed federally enforceable emission controls by December 2008 resulting in significant emissions reductions. A control requirement is considered to be federally-enforceable if it is required by a State regulation adopted in a State implementation plan, if it is included in a federally-enforceable Title V operating permit, or if it is required by a consent decree which also requires the controls to be included in federally enforceable permit upon termination of the consent decree. In making final decisions, EPA also considered whether a facility would continue to emit pollutants which contribute to $PM_{2.5}$ exceedances even after emission controls are operational.

Ohio provided information regarding emission controls planned for the Conesville power plant in Coshocton County. This information indicates that sulfur dioxide emission controls are in place for two medium sized units, planned for June 2009 for one large unit, and are not planned for one small unit. Nitrogen oxide emissions are reduced with a staged combustion process and not with supplemental control systems except that the company is installing selective catalytic control equipment on the large unit by June 2009. EPA concludes that the 2005 emission estimates accurately represent current emissions, until further controls are completed. Ohio did not address the enforceability of the planned controls.

EPA Technical Analysis for Dayton-Springfield, Ohio

The Dayton-Springfield nonattainment area as designated under the 1997 standards included Clark, Greene, and Montgomery Counties. On December 17, 2007, Ohio recommended including only Greene and Montgomery Counties in the nonattainment area under the 2006 standards. Violations are being observed in Montgomery and Clark Counties.

EPA agrees with Ohio that Montgomery and Greene Counties should be included in the nonattainment area, because emissions in these counties are relatively high and wind patterns and commuting patterns support the conclusion that these counties contribute to the observed violations. EPA believes that Clark County must also be included in the nonattainment area, because Clark County has monitored violations of the standard. Clark County also has sufficient emissions to be judged to be contributing to violations in

both Clark and Montgomery Counties. Establishing nonattainment boundaries that match the boundaries established for the 1997 standards would have the additional benefit of simplifying planning by assuring that the same areas are subject to very similar nonattainment planning requirements.

Despite the proximity of the Dayton area to the Cincinnati area, EPA views these two nonattainment areas as sufficiently distinct to be treated as separate areas. Other counties in and around the Dayton area have relatively low emissions, and no other factor warrants inclusion of the counties in the nonattainment area.

Figure 1 is a map of the counties in the nonattainment area and other relevant information such as the locations and design values of air quality monitors, and the metropolitan area boundary.

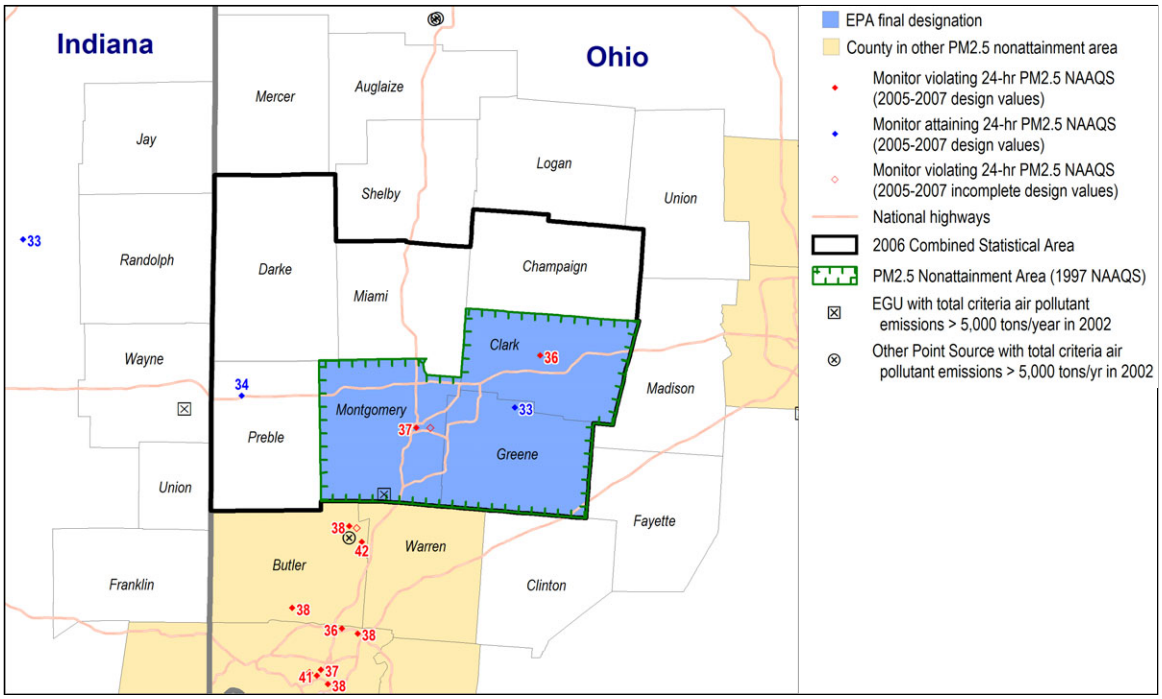


Figure 1

For this area, EPA previously established $PM_{2.5}$ nonattainment boundaries for the 1997 $PM_{2.5}$ NAAQS that included three Ohio counties.

In its December 17, 2007 letter, Ohio recommended two counties be designated as "nonattainment" for the 2006 24-hour $PM_{2.5}$ standard based on air quality data from 2004-2006. These data are from Federal Reference Method (FRM) monitors located in the state.

In August 2008, EPA notified Ohio of its intended designations. In this letter, EPA also requested that if the State wished to provide comments on EPA's intended designation, it should do so by October 20, 2008. EPA stated that it would consider any additional

information (e.g., on power plants or partial county areas) provided by the state in making final decisions on the designations.

Based on EPA's technical analysis described below, EPA designated three Ohio counties as nonattainment for the 24-hour $PM_{2.5}$ air-quality standard as part of the Dayton nonattainment area, based upon currently available information.

The following is a review of data for relevant factors for the Dayton-Springfield, Ohio area.

Factor 1: Emissions data

For this factor, EPA evaluated county level emission data for the following $PM_{2.5}$ components and precursor pollutants: "$PM_{2.5}$ emissions total," "$PM_{2.5}$ emissions carbon," "$PM_{2.5}$ emissions other," "SO_2," "NO_x," "VOCs," and "NH_3." "$PM_{2.5}$ emissions total" represents direct emissions of $PM_{2.5}$ and includes: "$PM_{2.5}$ emissions carbon," "$PM_{2.5}$ emissions other", primary sulfate (SO_4), and primary nitrate. (Although primary sulfate and primary nitrate, which are emitted directly from stacks rather than forming in atmospheric reactions with SO_2 and NO_x, are part of "$PM_{2.5}$ emissions total," they are not shown in Table 1 as separate items). "$PM_{2.5}$ emissions carbon" represents the sum of organic carbon (OC) and elemental carbon (EC) emissions, and "$PM_{2.5}$ emissions other" represents other inorganic particles (crustal). Emissions of SO_2 and NO_x, which are precursors of the secondary $PM_{2.5}$ components sulfate and nitrate, are also considered. VOCs (volatile organic compounds) and NH_3 (ammonia) are also potential $PM_{2.5}$ precursors and are included for consideration.

Emissions data were derived from the 2005 National Emissions Inventory (NEI), version 1. See http://www.epa.gov/ttn/naaqs/pm/pm25_2006_techinfo.html.

EPA also considered the Contributing Emissions Score (CES) for each county. The CES is a metric that takes into consideration emissions data, meteorological data, and air quality monitoring information to provide a relative ranking of counties in and near an area. Note that this metric is not the exclusive manner for considering data for these factors. A more detailed description can be found at http://www.epa.gov/ttn/naaqs/pm/pm25_2006_techinfo.html#C.

Table 1 shows emissions of $PM_{2.5}$ and precursor pollutants components (given in tons per year) and the CES for violating and potentially contributing counties in the Dayton area. Counties that are part of the Dayton nonattainment area for the 1997 $PM_{2.5}$ NAAQS are shown in boldface. Counties are listed in descending order by CES.

Table 1. $PM_{2.5}$ 24-hour Component Emissions, and CESs

County	State Recommended Nonattainment?	CES	$PM_{2.5}$ emissions total	$PM_{2.5}$ emissions carbon	$PM_{2.5}$ emissions other	SO_2	NOx	VOCs	NH_3
Montgomery, OH	**Yes**	**95**	**1,555**	**637**	**919**	**9,468**	**21,109**	**21,905**	**1,314**
Butler, OH	Other	32	2,269	563	1,706	10,636	16,661	12,734	1,105
Greene, OH	**Yes**	**14**	**984**	**265**	**719**	**1,798**	**8,499**	**5,712**	**682**
Clark, OH	**No**	**5**	**931**	**288**	**643**	**426**	**5,533**	**7,427**	**921**

The Montgomery County emissions are moderate, but are the highest in the Dayton area. Clark and Greene Counties have lower emissions. Butler County is in the Dayton area.

Table 2 provides the data for CES weighting factors. The trajectory factors are used in CES calculations to account for seasonal meteorology. For the top 10% of days in both the cold and warm seasons, wind trajectories were run for a 48 hour period preceding the high monitor reading. The amount of time the air mass was over a county within the mixing height was calculated. The values were scaled so that the maximum value is 100. Thus, the county that is most likely to be upwind of a monitor on a high concentration day in a season is given a score of 100. The scores for the other counties will reflect the relative likelihood of being upwind. As the concentration of a pollutant will decrease as it goes further downwind, a distance weighting factor is also used in calculating the CES. The distance factor listed on Table 2 provides the distance from the center of a county to the center of the violating county. If a county is violating, the distance used is the average distance from the center to the county line.

Table 2. CES Factor Data

County	CES	Trajectory Factor- Cold	Trajectory Factor- Warm	Distance (mi)
Montgomery	95	100	96	12.1
Butler	32	63	75	26.3
Greene	14	93	100	22.2
Clark	5	86	79	28.3

Factor 2: Air quality data

This factor considers the 24-hour $PM_{2.5}$ design values (in $\mu g/m^3$) for air quality monitors in counties in the Dayton area based on data for the 2005-2007 period. A monitor's design value indicates whether that monitor attains a specified air quality standard. The 24-hour $PM_{2.5}$ standards are met when the 3-year average of a monitor's 98^{th} percentile values are 35 $\mu g/m^3$ or less. A design value is only valid if minimum data completeness criteria are met.

The 24-hour $PM_{2.5}$ design values for counties in the Dayton area are shown in Table 3. Clark and Montgomery Counties both have design values that exceed the 2006 standards. Greene County meets the standards. However, the absence of a violating monitor alone is not a sufficient reason to eliminate counties as candidates for nonattainment status. Each county has been evaluated based on the weight of evidence of the nine factors and other relevant information.

Table 3. Air Quality Data

County	State Recommended Nonattainment?	Design Values 2004-2006	Design Values 2005-2007
Montgomery, OH	Yes	36	37
Greene, OH	Yes	31	33
Clark, OH	No	35	36

For purposes of its review, EPA used data available from the Chemical Speciation Network and the Interagency Monitoring of Protected Visual Environments (IMPROVE) network to estimate the composition of fine particle mass on days with the highest fine particle concentrations. Analysis of these data indicates that the days with the highest fine particle concentrations in the Dayton area occur about 67% in the warm season and 33% in the cool season. In the warm season, the average chemical composition of the highest days is 81% sulfate, no nitrate, 17% carbon, and 2% crustal. In the cool season, the average chemical composition of the highest days is 40% sulfate, 29% nitrate, 28% carbon, and 3% crustal. These data indicate that sources of SO_2, NOx, and direct $PM_{2.5}$ emissions contribute to violations in the area.

Factor 3: Population density and degree of urbanization (including commercial development)

Table 4 shows the 2005 population for each county in the area being evaluated, as well as the population density for each county in that area. Population data gives an indication of whether it is likely that population-based emissions might contribute to violations of the 24-hour $PM_{2.5}$ standards.

Table 4. Population

County	State Recommended Nonattainment?	2005 Population	2005 Population Density (pop/sq mi)
Montgomery, OH	Yes	545,603	1176
Greene, OH	Yes	151,823	365
Clark, OH	No	141,908	352

Montgomery County has the largest population in the area. The three area counties all have moderate populations.

Factor 4: Traffic and commuting patterns

This factor considers the number of commuters in each county who drive to another county within the Dayton area, the percent of total commuters in each county who commute within the area, as well as the total Vehicle Miles Traveled (VMT) for each county in millions of miles (see Table 5). A county with numerous commuters is generally an integral part of an urban area and is likely contributing to fine particle concentrations in the area.

Table 5. Traffic and Commuting Patterns

County	State Recommended Nonattainment?	2005 VMT (10^6 mi)	Number Commuting to any violating counties	Percent Commuting to any violating counties	Number Commuting within statistical area	Percent Commuting within statistical area
Montgomery, OH	**Yes**	**5,533**	**216,330**	**84**	**244,900**	**95**
Greene, OH	**Yes**	**1,515**	**27,800**	**38**	**68,710**	**95**

Clark, OH	**No**	**1,584**	**53,090**	**81**	**61,110**	**93**
Butler, OH	other	3,059	95,200	60	5,480	3

The listing of counties on Table 5 reflects a ranking based on the number of people commuting to other counties. The counties in bold type are all in the Dayton nonattainment area for the 1997 $PM_{2.5}$ NAAQS. The percent commuting within the Dayton statistical area is at least 93% for all three counties. This indicates the counties are highly integrated. The commuting data also show minimal commuting from Butler County, which is the nearest portion of the Cincinnati area. Thus, these data support treating Cincinnati and Dayton as separate urban areas.

Note: The 2005 VMT data used for tables 5 and 6 of the technical analysis have been derived using methodology such as that described in "Documentation for the 2005 Mobile National Emissions Inventory, Version 2," December 2008, prepared for the Emission Inventory Group, U.S. EPA. This document may be found at: ftp://ftp.epa.gov/EmisInventory/2005_nei/mobile_sector/documentation/2005_mobile_nei_version_2_report.pdf.

Factor 5: Growth rates and patterns

This factor considers population growth for 2000-2005 and growth in vehicle miles traveled for 1996-2005 for counties in Dayton area, as well as patterns of population and VMT growth. A county with rapid population or VMT growth is generally an integral part of an urban area and likely to be contributing to fine particle concentrations in the area.

Table 6 below shows population, population growth, VMT, and VMT growth for counties that are included in the Dayton area. Counties are listed in descending order based on VMT growth between 1996 and 2005.

Table 6. Population and VMT Growth and Percent Change.

County	Population (2005)	Population % change (2000-2005)	2005 VMT (10^6 mi)	VMT % change (1996-2005)
Greene, OH	151,823	2	1,515	19
Clark, OH	141,908	-2	1,584	12
Montgomery, OH	545,603	-2	5,533	-2

The population change is limited for all three area counties. The VMT declined slightly from 1996 to 2005 in Montgomery County. During that period, the VMT grew by moderate amounts in Clark and Greene Counties. Thus, the distribution of population and VMT is not expected to change significantly over the SIP planning time horizon.

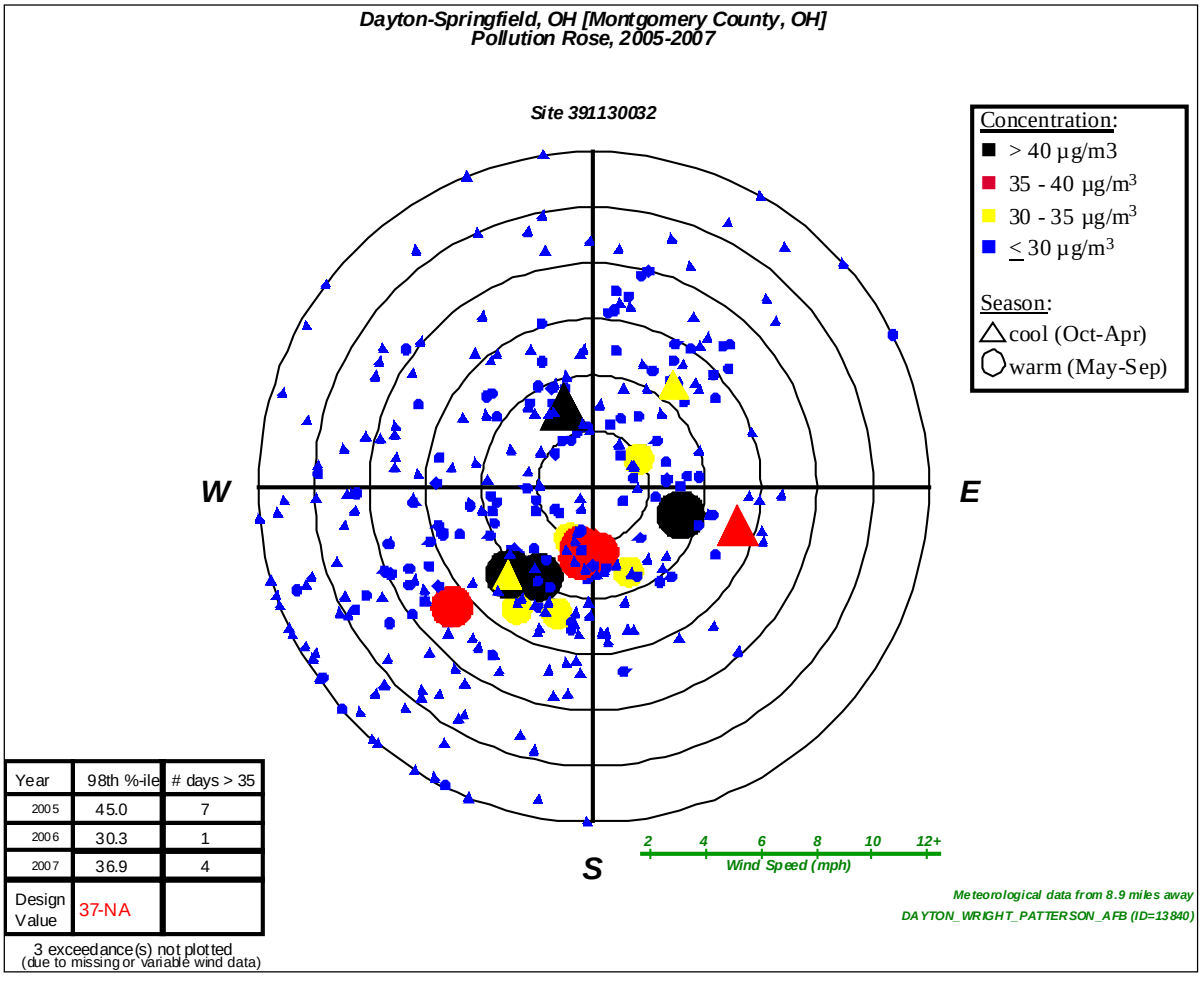
Factor 6: Meteorology (weather/transport patterns)

For this factor, EPA considered data from National Weather Service instruments and other meteorological monitoring sites in the area. Wind direction and wind speed data for 2005-2007 were analyzed, with an emphasis on "high $PM_{2.5}$ days" for each of two seasons, an October-April "cold" season and a May-September "warm" season. These

high days are defined as days where any FRM or FEM air quality monitors had 24-hour $PM_{2.5}$ concentrations above 95% on a frequency distribution curve of $PM_{2.5}$ 24-hour values.

For each air quality monitoring site, EPA developed a "pollution rose" to understand the prevailing wind direction and wind speed on the days with highest fine particle concentrations. The figure identifies 24-hour $PM_{2.5}$ values by color; days exceeding 35 $\mu g/m^3$ are denoted with a red or black icon. A dot indicates the day occurred in the warm season; a triangle indicates the day occurred in the cool season. The center of the figure indicates the location of the air quality monitoring site, and the location of the icon in relation to the center indicates the direction from which the wind was blowing on that day. An icon that is close to the center indicates a low average wind speed on that day. Higher wind speeds are indicated when the icon is further away from the center.

The pollution rose for the Dayton area is provided as Figure 2. Winds on high concentration days come from a variety of directions. So, it is appropriate to consider counties in all directions from the violations



Year	98th %-ile	# days > 35
2005	45.0	7
2006	30.3	1
2007	36.9	4
Design Value	37-NA	

Figure 2

Note: the meteorology factor is also considered in each county's Contributing Emissions Score because the method for deriving this metric included an analysis of trajectories of air masses for high $PM_{2.5}$ days.

Factor 7: Geography/topography (mountain ranges or other air basin boundaries)

The geography/topography analysis evaluates the physical features of the land that might have an effect on the air shed and, therefore, on the distribution of $PM_{2.5}$ over the area.

The Dayton area does not have any geographical or topographical barriers significantly limiting air-pollution transport within its air shed. Therefore, this factor did not play a significant role in the decision-making process.

Factor 8: Jurisdictional boundaries

In evaluating the jurisdictional boundary factor, EPA gave special consideration to areas that were already designated nonattainment in 2005 for violating the 1997 fine particle standards. Analysis of chemical composition data in these areas indicates that the same components that make up most of the $PM_{2.5}$ mass in the area on an annual average basis such as sulfate and direct $PM_{2.5}$ carbon in many eastern areas also are key contributors to the $PM_{2.5}$ mass on days exceeding the 24-hour $PM_{2.5}$ standard. These data indicate that in many cities, the same source categories that contribute to violations of the annual standard also contribute to exceedances of the 24-hour standard.

EPA has generally concluded that counties that were designated as having emissions sources contributing to fine particle concentrations which exceeded the 1997 standards (all areas violated the annual standard, two also violated the previous 24-hour standard) also contribute to fine particle concentrations on the highest days. For this reason, EPA believes that for most existing nonattainment areas, the nonattainment area for the 2006 24-hour standard should be the same. Consideration also should be given to existing boundaries and organizations as they may facilitate air quality planning and the implementation of control measures to attain the standard. Areas already designated as nonattainment represent important boundaries for state air quality planning.

The Miami Valley Regional Planning Commission (MVRPC) is the Metropolitan Planning Organization (MPO) for the following counties: Greene, Miami, Montgomery, and portions of Warren. The MVRPC website is http://www.mvrpc.org/index.htm. The Cincinnati area has a separate MPO, the Ohio-Kentucky-Indiana Regional Council of Governments which serves Butler, Warren, Clermont, and Hamilton Counties in Ohio; Campbell, Kenton, and Boone Counties in Kentucky; and Dearborn County, Indiana.

The Dayton ozone maintenance area consists of the following counties: Clark, Greene, Miami, and Montgomery.

The Dayton nonattainment area is identical to the nonattainment area designated under the 1997 $PM_{2.5}$ standard, which would facilitate planning.

Factor 9: Level of control of emission sources

Under this factor, the existing level of control of emission sources is taken into consideration. The emissions data used by EPA in this technical analysis and provided in Table 1 under Factor 1 represent emissions levels taking into account any control strategies implemented in the Dayton area before 2005 on stationary, mobile, and area sources. Data are presented for $PM_{2.5}$ components that are directly emitted, carbonaceous $PM_{2.5}$ and crustal $PM_{2.5}$, and for pollutants which react in the atmosphere to form fine particles such as SO_2, NOx, VOC, and ammonia.

In considering county-level emissions, EPA used data from the 2005 National Emissions Inventory, the most updated version of the national inventory available at the beginning of the designations process in late 2007. However, EPA recognized that for certain counties, emissions may have changed since 2005. For example, certain power plants or large sources of emissions in or near this area may have installed emission controls or otherwise significantly reduced emissions since 2005. Some States provided updated information on emissions and emission controls in their comments to EPA. EPA considered such additional information in making final designation decisions.

With regard to nearby power plants, EPA considered information about whether a specific plant installed federally enforceable emission controls by December 2008 resulting in significant emissions reductions. A control requirement is considered to be federally-enforceable if it is required by a State regulation adopted in a State implementation plan, if it is included in a federally-enforceable Title V operating permit, or if it is required by a consent decree which also requires the controls to be included in federally enforceable permit upon termination of the consent decree. In making final decisions, EPA also considered whether a facility would continue to emit pollutants which contribute to $PM_{2.5}$ exceedances even after emission controls are operational.

Ohio did not provide other information regarding power plants or any other large sources in the Dayton area.

EPA Technical Analysis for Huntington-Ashland, West Virginia-Kentucky-Ohio

In the three-state Huntington-Ashland area, part or all of nine counties are designated nonattainment for the 1997 standards. The four Ohio counties included in this nonattainment area are all of Lawrence and Scioto Counties, Monroe and Sprigg Townships in Adams County, and Cheshire Township in Gallia County. Monitors in Scioto County, Ohio, and Cabell County, West Virginia, are recording violations of the 2006 standards. Ohio recommended that no portion of the state be included in the Huntington-Ashland area designated as nonattainment for the 2006 standards.

EPA believes that several Ohio counties should be part of the Huntington-Ashland nonattainment area for the 2006 standards. Scioto County should be included in the nonattainment area because it is violating the standard, because it is contributing to the

violation within Scioto County, and because the county's emissions have a non-negligible impact on the violation in Cabell County, West Virginia. Lawrence County has a substantial fraction of the emissions in the Huntington-Ashland metropolitan statistical area, the winds very commonly blow these emissions into Cabell County, and Lawrence County is immediately adjacent to Cabell County.

The emissions from Monroe and Sprigg Townships in Adams County and from Cheshire Township in Gallia County are dominated by emissions from power plants. Ohio provided information on the status of emission controls at these plants. Some of the emissions have long been controlled with effective control equipment, some of these emissions have become well controlled more recently, and some of these emissions are expected to be controlled within a few years. The longstanding controls were installed in response to the acid rain program, and the controls at Stuart Station in Adams County are mandated by a consent decree, but other controls may not be required, particularly if the D.C. Circuit Court of appeals follows its adverse opinion on CAIR with vacatur of that program. More importantly, even with existing controls, emissions remain relatively high in both Adams and Gallia Counties. Therefore, EPA is including portions of both of these counties in the nonattainment area. Nevertheless, since the emissions in these counties are dominated by the power plant emissions, and the remainder of the counties can be considered not to contribute to the violations, EPA is only including the portions of the counties with the power plant in the nonattainment area. Therefore, in Ohio, EPA is only including Monroe and Sprigg Townships in Adams County and Cheshire Township in Gallia County, along with Scioto and Lawrence Counties, in the Huntington-Ashland nonattainment area.

The surrounding Ohio counties have relatively low emissions, and no other factor warrants their inclusion in the nonattainment area.

Figure 1 is a map of the counties in the nonattainment area and other relevant information such as the locations and design values of air quality monitors, and the metropolitan area boundary.

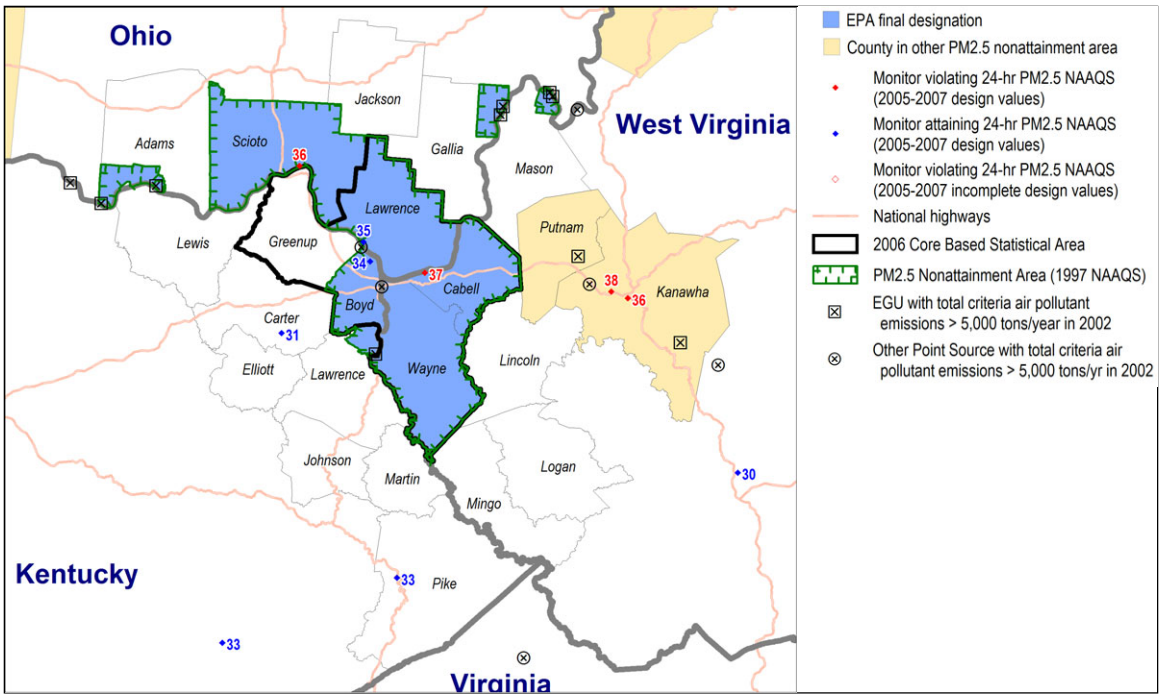


Figure 1

For this area, EPA previously established $PM_{2.5}$ nonattainment boundaries for the 1997 $PM_{2.5}$ NAAQS that included nine full and partial counties, with four being located in Ohio.

In its May 30, 2008 letter, Ohio recommended that no Ohio counties be designated as "nonattainment" for the 2006 24-hour $PM_{2.5}$ standard based on air quality data from 2005-2007. These data are from Federal Reference Method (FRM) monitors located in the state.

In August 2008, EPA notified Ohio of its intended designations. In this letter, EPA also requested that if the State wished to provide comments on EPA's intended designation, it should do so by October 20, 2008. EPA stated that it would consider any additional information (e.g., on power plants or partial county areas) provided by the state in making final decisions on the designations.

Based on EPA's technical analysis described below, EPA designated four full or partial Ohio counties as nonattainment for the 24-hour $PM_{2.5}$ air-quality standard as part of the Huntington-Ashland nonattainment area, based upon currently available information.

EPA responded to Ohio's comments in the State Response to Comments document.

The following is a review of data for relevant factors for the Ohio portion of the Huntington-Ashland, West Virginia-Kentucky-Ohio area.

Factor 1: Emissions data

For this factor, EPA evaluated county level emission data for the following $PM_{2.5}$ components and precursor pollutants: "$PM_{2.5}$ emissions total," "$PM_{2.5}$ emissions carbon," "$PM_{2.5}$ emissions other," "SO_2," "NO_x," "VOCs," and "NH_3." "$PM_{2.5}$ emissions total" represents direct emissions of $PM_{2.5}$ and includes: "$PM_{2.5}$ emissions carbon," "$PM_{2.5}$ emissions other", primary sulfate (SO_4), and primary nitrate. (Although primary sulfate and primary nitrate, which are emitted directly from stacks rather than forming in atmospheric reactions with SO_2 and NO_x, are part of "$PM_{2.5}$ emissions total," they are not shown in Table 1 as separate items). "$PM_{2.5}$ emissions carbon" represents the sum of organic carbon (OC) and elemental carbon (EC) emissions, and "$PM_{2.5}$ emissions other" represents other inorganic particles (crustal). Emissions of SO_2 and NO_x, which are precursors of the secondary $PM_{2.5}$ components sulfate and nitrate, are also considered. VOCs (volatile organic compounds) and NH_3 (ammonia) are also potential $PM_{2.5}$ precursors and are included for consideration.

Emissions data were derived from the 2005 National Emissions Inventory (NEI), version 1. See http://www.epa.gov/ttn/naaqs/pm/pm25_2006_techinfo.html.

EPA also considered the Contributing Emissions Score (CES) for each county. The CES is a metric that takes into consideration emissions data, meteorological data, and air quality monitoring information to provide a relative ranking of counties in and near an area. Note that this metric is not the exclusive manner for considering data for these factors. A more detailed description can be found at http://www.epa.gov/ttn/naaqs/pm/pm25_2006_techinfo.html#C.

Table 1 shows emissions of $PM_{2.5}$ and precursor pollutants components (given in tons per year) and the CES for violating and potentially contributing counties in the Huntington-Ashland area. Counties that are part of the Huntington-Ashland nonattainment area for the 1997 $PM_{2.5}$ NAAQS are shown in boldface. Counties are listed in descending order by CES.

Table 1. $PM_{2.5}$ 24-hour Component Emissions, and CESs.

County	State Recommended Nonattainment?	CES	$PM_{2.5}$ emissions total	$PM_{2.5}$ emissions carbon	$PM_{2.5}$ emissions other	SO_2	NOx	VOCs	NH_3
Cabell, WV	**No**	**100**	**1,082**	**434**	**649**	**4,355**	**10,644**	**5,878**	**181**
Gallia, OH	**No**	**100**	**7,087**	**499**	**6,588**	**100,704**	**59,035**	**1,939**	**327**
Putnam, WV	Other	92	4,838	468	4,370	113,590	37,387	3,117	106
Lawrence, OH	**No**	**78**	**1,078**	**672**	**406**	**573**	**3,769**	**4,847**	**316**
Scioto, OH	**No**	**58**	**775**	**416**	**359**	**555**	**4,981**	**4,111**	**1,349**
Mason, WV	**No**	**54**	**3,528**	**305**	**3,222**	**82,856**	**24,561**	**2,496**	**237**
Adams, OH	**No**	**46**	**5,970**	**494**	**5,476**	**126,316**	**33,822**	**1,918**	**837**
Boyd, KY	**No**	**44**	**1,729**	**412**	**1,317**	**10,501**	**10,123**	**5,762**	**477**
Wayne, WV	**No**	**33**	**657**	**446**	**210**	**1,041**	**7,619**	**2,577**	**70**
Lawrence, KY	**No**	**27**	**2,567**	**199**	**2,368**	**50,239**	**13,761**	**932**	**90**
Greenup, KY	No	24	319	151	169	2,183	4,102	1,694	155
Kanawha, WV	Other	15	2,016	857	1,159	21,633	23,985	15,652	527

In Ohio, Adams and Gallia Counties have high emissions. The sulfur dioxide and oxides of nitrogen emissions are very large. The emissions are not as large in Lawrence and

Scioto Counties, but they have high CES. This information suggests that emissions from all four of these counties are contributing to the $PM_{2.5}$ violations in the Huntington-Ashland area. This conclusion is supported by other information such as the geographic proximity of the sources and the meteorology of this area.

Table 2 provides the data for CES weighting factors. The trajectory factors are used in CES calculations to account for seasonal meteorology. For the top 10% of days in both the cold and warm seasons, wind trajectories were run for a 48 hour period preceding the high monitor reading. The amount of time the air mass was over a county within the mixing height was calculated. The values were scaled so that the maximum value is 100. Thus, the county that is most likely to be upwind of a monitor on a high concentration day in a season is given a score of 100. The scores for the other counties will reflect the relative likelihood of being upwind. As the concentration of a pollutant will decrease as it goes further downwind, a distance weighting factor is also used in calculating the CES. The distance factor listed on Table 2 provides the distance from the center of a county to the center of the violating county. If a county is violating, the distance used is the average distance from the center to the county line.

Table 2. CES Factor Data.

County	CES	Trajectory Factor- Cold	Trajectory Factor- Warm	Distance (mi)
Cabell, WV	100	100	85	9
Gallia, OH	100	70	82	28
Putnam, WV	92	66	54	21.1
Lawrence, OH	78	96	100	21.3
Scioto, OH	58	46	57	45.6
Mason, WV	54	62	66	27.6
Adams, OH	46	20	28	71.2
Boyd, KY	44	100	91	23.3
Wayne, WV	33	89	66	21.5
Lawrence, KY	27	78	58	35
Greenup, KY	24	71	74	38.3
Kanawha, WV	15	34	23	41.4

Factor 2: Air quality data

This factor considers the 24-hour $PM_{2.5}$ design values (in $\mu g/m^3$) for air quality monitors in counties in the Huntington-Ashland area based on data for the 2005-2007 period. A monitor's design value indicates whether that monitor attains a specified air quality standard. The 24-hour $PM_{2.5}$ standards are met when the 3-year average of a monitor's 98^{th} percentile values are 35 $\mu g/m^3$ or less. A design value is only valid if minimum data completeness criteria are met.

The 24-hour $PM_{2.5}$ design values for counties in the Huntington-Ashland area are shown in Table 3.

Table 3. Air Quality Data

County	State	Design Values	Design Values

	Recommended Nonattainment?	2004-2006	2005-2007
Cabell, WV	No	34	37
Gallia, OH	No		
Lawrence, OH	No	34	35
Scioto, OH	No	33	36
Mason, WV	No		
Adams, OH	No		
Boyd, KY	No	32	34
Wayne, WV	No		
Lawrence, KY	No		
Greenup, KY	No		

Scioto County, Ohio has a 2005 to 2007 design value that exceeds the 2006 standards and thus must be included in the nonattainment area. Cabell County in West Virginia also violated the standard. Lawrence County, Ohio attained the 2006 standards. Adams and Gallia Counties in Ohio do not have $PM_{2.5}$ air quality monitoring data. However, the absence of a violating monitor alone is not a sufficient reason to eliminate counties as candidates for nonattainment status. Each county has been evaluated based on the weight of evidence of the nine factors and other relevant information.

For purposes of its review, EPA used data available from the Chemical Speciation Network and the Interagency Monitoring of Protected Visual Environments (IMPROVE) network to estimate the composition of fine particle mass on days with the highest fine particle concentrations. Analysis of these data indicates that the days with the highest fine particle concentrations in the Huntington-Ashland area occur about 94% in the warm season and 6% in the cool season. In the warm season, the average chemical composition of the highest days is 70% sulfate, no nitrate, 27% carbon, and 3% crustal. In the cool season, the average chemical composition of the highest days is 58% sulfate, 4% nitrate, 34% carbon, and 4% crustal. These data indicate that sources of SO_2, NOx, and direct $PM_{2.5}$ emissions contribute to violations in the area.

Factor 3: Population density and degree of urbanization (including commercial development)

Table 4 shows the 2005 population for each county in the area being evaluated, as well as the population density for each county in that area. Population data gives an indication of whether it is likely that population-based emissions might contribute to violations of the 24-hour $PM_{2.5}$ standards.

Table 4. Population

County	State Recommended Nonattainment?	2005 Population	2005 Population Density (pop/mi^2)
Cabell, WV	No	93,988	327
Scioto, OH	No	76,506	124
Lawrence, OH	No	62,946	134
Boyd, KY	No	49,359	305
Wayne, WV	No	41,959	82
Greenup, KY	No	37,206	105

Gallia, OH	No	31,241	68
Adams, OH	No	28,454	49
Mason, WV	No	25,763	58
Lawrence, KY	No	16,162	39

The county populations in the Huntington-Ashland area are all moderate to low. In Ohio, Scioto and Lawrence Counties have second and third largest populations in the area which support including them in the nonattainment area. Adams and Gallia Counties both have low populations. The low population of Adams and Gallia Counties and the fact that virtually all the emissions in these counties are emitted in the townships with major power plants supports applying a nonattainment designation to just the townships within these counties that contain the power plants.

Factor 4: Traffic and commuting patterns

This factor considers the number of commuters in each county who drive to another county within the Huntington-Ashland area, the percent of total commuters in each county who commute within the area, as well as the total Vehicle Miles Traveled (VMT) for each county in millions of miles (see Table 5). A county with numerous commuters is generally an integral part of an urban area and is likely contributing to fine particle concentrations in the area.

Table 5. Traffic and Commuting Patterns

County	State Recommended Nonattainment?	2005 VMT (10^6 mi)	Number Commuting to any violating counties	Percent Commuting to any violating counties	Number Commuting into statistical area	Percent Commuting into statistical area
Cabell, WV	No	1,230	34,670	86	35,460	88
Lawrence, OH	No	650	7,970	35	21,160	92
Boyd, KY	No	574	1,380	7	17,580	93
Wayne, WV	No	438	7,170	46	14,040	90
Greenup, KY	No	371	1,770	13	11,130	83
Scioto, OH	No	591	22,040	78	1,330	5
Lawrence, KY	No	159	250	5	920	19
Mason, WV	No	249	1,080	12	670	7
Gallia, OH	No	247	300	3	330	3
Adams, OH	No	283	130	1	20	0

Lawrence County, Ohio has a high percent commuting within the metropolitan statistical area and a moderate percent commuting into violating counties, because the county is in the metropolitan statistical area and is not a violating county. Conversely, Scioto County has a low percent commuting into the metropolitan statistical area and a high percent commuting into violating counties, reflecting the fact that Scioto County is not part of the metropolitan statistical area but is a violating county. Both counties would be included in the designated area based on this factor. The commuting figures are low for both Adams and Gallia Counties in Ohio, suggesting that they were good candidates for partial county designations.

Note: The 2005 VMT data used for tables 5 and 6 of the technical analysis have been derived using methodology such as that described in "Documentation for the 2005 Mobile National Emissions Inventory, Version 2," December 2008, prepared for the Emission Inventory Group, U.S. EPA. This document may be found at: ftp://ftp.epa.gov/EmisInventory/2005_nei/mobile_sector/documentation/2005_mobile_nei_version_2_report.pdf.

Factor 5: Growth rates and patterns

This factor considers population growth for 2000-2005 and growth in vehicle miles traveled for 1996-2005 for counties in Huntington-Ashland area, as well as patterns of population and VMT growth. A county with rapid population or VMT growth is generally an integral part of an urban area and likely to be contributing to fine particle concentrations in the area.

Table 6 below shows population, population growth, VMT, and VMT growth for counties that are included in the Huntington-Ashland area. Counties are listed in descending order based on VMT growth between 1996 and 2005.

Table 6. Population and VMT Growth and Percent Change.

County	Population (2005)	Population % change (2000-2005)	2005 VMT (10^6 mi)	VMT % change (1996-2005)
Wayne, WV	41,959	-2	438	47
Cabell, WV	93,988	-3	1,230	41
Mason, WV	25,763	-1	249	36
Greenup, KY	37,206	1	371	23
Boyd, KY	49,359	-1	574	16
Lawrence, KY	16,162	4	159	11
Lawrence, OH	62,946	1	650	9
Adams, OH	28,454	4	283	7
Gallia, OH	31,241	0	247	0
Scioto, OH	76,506	-3	591	-3

Several of the Huntington-Ashland area counties encountered strong VMT growth from 1996 to 2005. In Ohio, the VMT growth was limited with Adams and Lawrence Counties having modest increases. The VMT did not change in Gallia County. It declined slightly in Scioto County. The populations of the area counties remained stable from 2000 to 2005 with small changes being observed. The Ohio counties in the area followed this pattern. Adams County, Ohio matched Lawrence County, Kentucky with 4% population growth as the largest changes in the area. These changes do not suggest any significant shifts in the distribution of population or VMT to be considered in the designations process. Thus, this factor was not significant in determining the boundary of the nonattainment area.

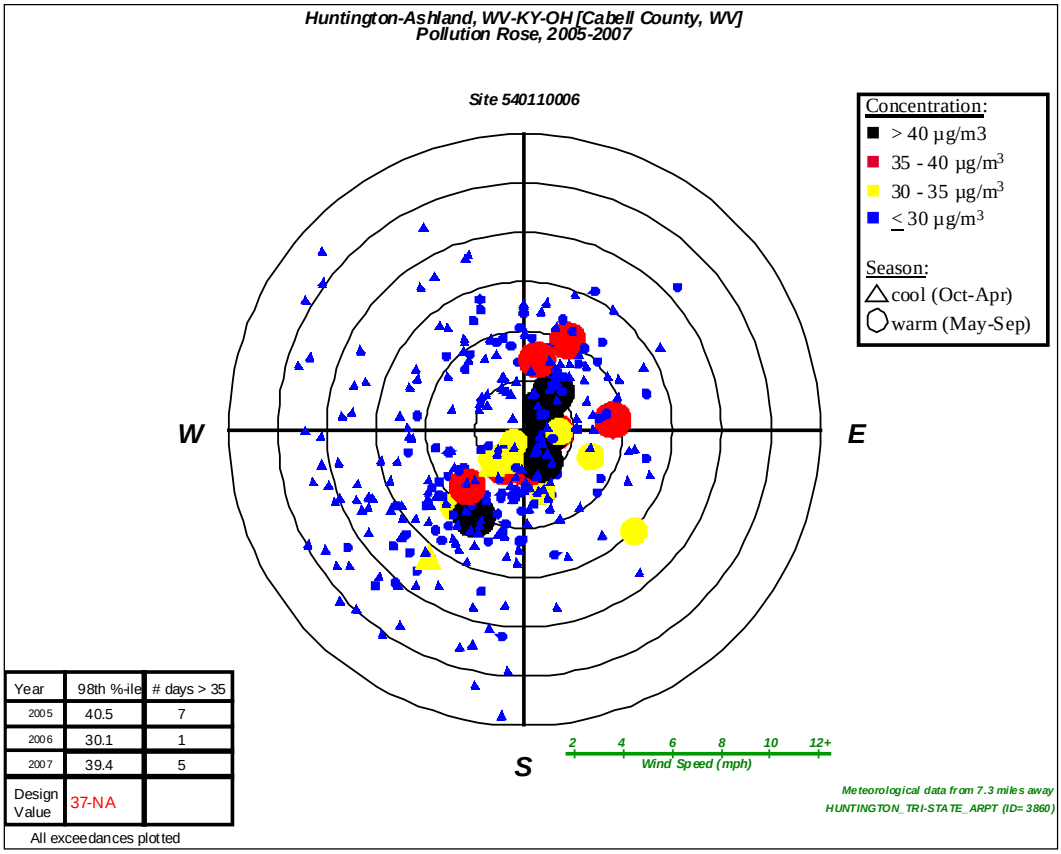
Factor 6: Meteorology (weather/transport patterns)

For this factor, EPA considered data from National Weather Service instruments and other meteorological monitoring sites in the area. Wind direction and wind speed data

for 2005-2007 were analyzed, with an emphasis on "high $PM_{2.5}$ days" for each of two seasons, an October-April "cold" season and a May-September "warm" season. These high days are defined as days where any FRM or FEM air quality monitors had 24-hour $PM_{2.5}$ concentrations above 95% on a frequency distribution curve of $PM_{2.5}$ 24-hour values.

For each air quality monitoring site, EPA developed a "pollution rose" to understand the prevailing wind direction and wind speed on the days with highest fine particle concentrations. The figure identifies 24-hour $PM_{2.5}$ values by color; days exceeding 35 $\mu g/m^3$ are denoted with a red or black icon. A dot indicates the day occurred in the warm season; a triangle indicates the day occurred in the cool season. The center of the figure indicates the location of the air quality monitoring site, and the location of the icon in relation to the center indicates the direction from which the wind was blowing on that day. An icon that is close to the center indicates a low average wind speed on that day. Higher wind speeds are indicated when the icon is further away from the center.

The pollution rose for the critical Cabell County monitoring site is provided as Figure 2, and the pollution rose for the Scioto County monitoring site is provided as Figure 3. Winds on high concentration days show a slight tendency to come from the north or northeast or the south or southwest, although on some high concentration days winds come from other directions as well. Therefore, it is appropriate to consider counties in all directions from the violations. The pollution roses indicate that any nearby surrounding counties with high emissions would be contributing to the violating monitors.



Year	98th %-ile	# days > 35
2005	40.5	7
2006	30.1	1
2007	39.4	5
Design Value	37-NA	

Figure 2

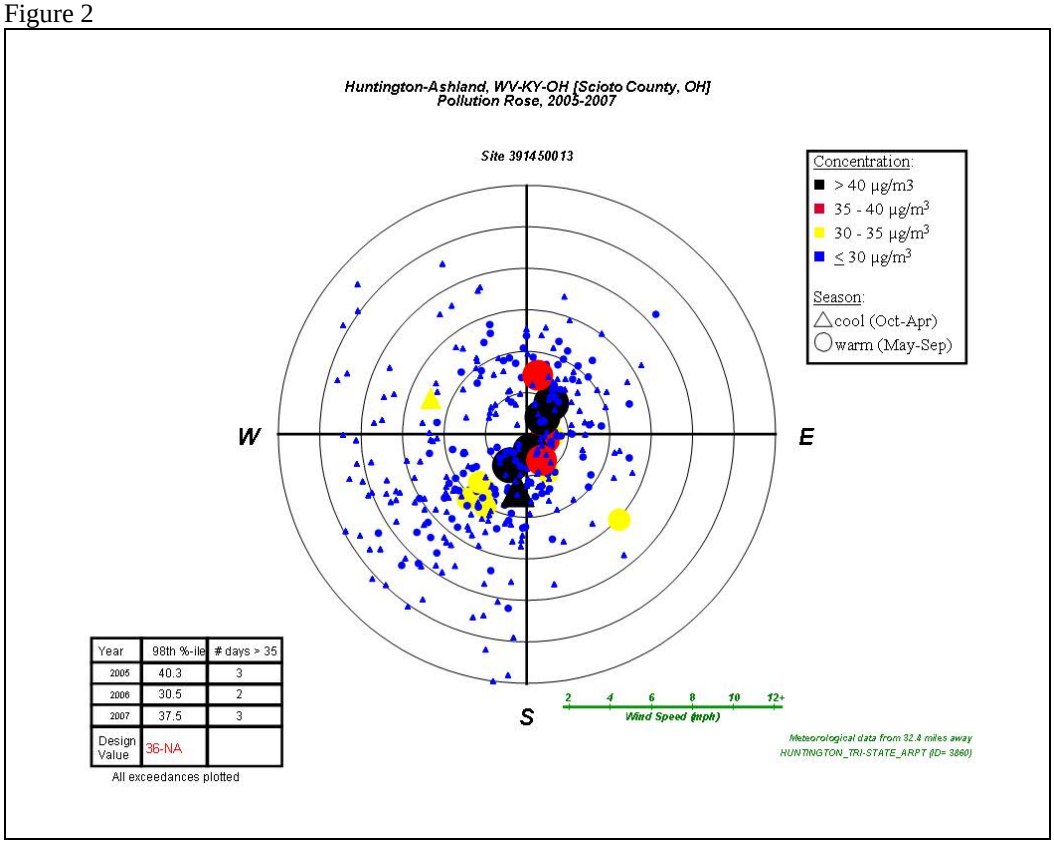


Figure 3

Note: the meteorology factor is also considered in each county's Contributing Emissions Score because the method for deriving this metric included an analysis of trajectories of air masses for high $PM_{2.5}$ days.

Factor 7: Geography/topography (mountain ranges or other air basin boundaries)

The geography/topography analysis evaluates the physical features of the land that might have an effect on the air shed and, therefore, on the distribution of $PM_{2.5}$ over the area.

The Huntington-Ashland area does not have any geographical or topographical barriers significantly limiting air-pollution transport within its air shed. Therefore, this factor did not play a significant role in the decision-making process.

Factor 8: Jurisdictional boundaries

In evaluating the jurisdictional boundary factor, EPA gave special consideration to areas that were already designated nonattainment in 2005 for violating the 1997 fine particle standards. Analysis of chemical composition data in these areas indicates that the same components that make up most of the $PM_{2.5}$ mass in the area on an annual average basis such as sulfate and direct $PM_{2.5}$ carbon in many eastern areas also are key contributors to the $PM_{2.5}$ mass on days exceeding the 24-hour $PM_{2.5}$ standard. These data indicate that in

many cities, the same source categories that contribute to violations of the annual standard also contribute to exceedances of the 24-hour standard.

EPA has generally concluded that counties that were designated as having emissions sources contributing to fine particle concentrations which exceeded the 1997 standards (all areas violated the annual standard, two also violated the previous 24-hour standard) also contribute to fine particle concentrations on the highest days. For this reason, EPA believes that for most existing nonattainment areas, the nonattainment area for the 2006 24-hour standard should be the same. Consideration also should be given to existing boundaries and organizations as they may facilitate air quality planning and the implementation of control measures to attain the standard. Areas already designated as nonattainment represent important boundaries for state air quality planning.

The KYOVA Interstate Planning Commission is the Metropolitan Planning Organization (MPO) for Lawrence County, OH. KYOVA website: http://www.state.wv.us/kyova/.

There are no counties in the Ohio portion of the Huntington-Ashland maintenance area for the ozone standard. Boyd County, Kentucky and Cabell and Wayne Counties in West Virginia comprise the ozone maintenance area.

The Huntington-Ashland nonattainment area is identical to the nonattainment area designated under the 1997 $PM_{2.5}$ standard, which will facilitate air quality planning.

Factor 9: Level of control of emission sources

Under this factor, the existing level of control of emission sources is taken into consideration. The emissions data used by EPA in this technical analysis and provided in Table 1 under Factor 1 represent emissions levels taking into account any control strategies implemented in the Huntington-Ashland area before 2005 on stationary, mobile, and area sources. Data are presented for $PM_{2.5}$ components that are directly emitted, carbonaceous $PM_{2.5}$ and crustal $PM_{2.5}$, and for pollutants which react in the atmosphere to form fine particles such as SO_2, NOx, VOC, and ammonia.

In considering county-level emissions, EPA used data from the 2005 National Emissions Inventory, the most updated version of the national inventory available at the beginning of the designations process in late 2007. However, EPA recognized that for certain counties, emissions may have changed since 2005. For example, certain power plants or large sources of emissions in or near this area may have installed emission controls or otherwise significantly reduced emissions since 2005. Some States provided updated information on emissions and emission controls in their comments to EPA. EPA considered such additional information in making final designation decisions.

With regard to nearby power plants, EPA considered information about whether a specific plant installed federally enforceable emission controls by December 2008 resulting in significant emissions reductions. A control requirement is considered to be federally-enforceable if it is required by a State regulation adopted in a State

implementation plan, if it is included in a federally-enforceable Title V operating permit, or if it is required by a consent decree which also requires the controls to be included in federally enforceable permit upon termination of the consent decree. In making final decisions, EPA also considered whether a facility would continue to emit pollutants which contribute to $PM_{2.5}$ exceedances even after emission controls are operational.

Ohio provided information on the status of emission controls at four plants in the Huntington-Ashland area. Some of the emissions have long been controlled with effective control equipment, some of the emissions have become well controlled more recently, and some of these emissions are expected to be controlled within a few years. In Gallia County, Gavin Station has long had control equipment reducing SO_2 emissions and more recently has installed controls to reduce NOx emissions, but emissions remain high. Also in Gallia County, Kyger Creek Station is expected to install SO_2 emission controls by 2010, but current emissions remain high. In Adams County, Stuart Station is subject to a consent decree requiring future control of both SO_2 and NOx. Also in Adams County, Killen Station has installed control equipment both for SO_2 and for NOx, although EPA is aware of no enforceable requirement for the company to operate this equipment, particularly if the D.C. Circuit Court of Appeals vacates CAIR. More importantly, even with these controls, total emissions from these plants remain somewhat high. The company, in comments submitted in response to EPA solicitation of public comments, stated that emissions with control are still 7200 tons per year of SO2 and 20,000 tons per year of NOx. Company emission reports posted on EPA's acid rain program web site suggest a comparable controlled SO_2 emission rate, but data on EPA's NOx budget program web site suggests a controlled emission rate from the two plants adding to 4800 tons for the five month ozone season, which if controls were operated full year would suggest an annual emission rate of 11,400 tons per year. In either case, the emissions from this facility even with controls are sufficient that coupled with meteorology EPA is judging that these facilities contribute to violations in Scioto and Cabell Counties. Also of concern is that no permit or other enforceable document requires operation of the NOx control equipment year round at Killen Station. As noted above EPA must base designations on current conditions notwithstanding any planned future emissions controls. Therefore, EPA is including Monroe and Sprigg Townships in Adams County and Cheshire Township in Gallia County, along with Scioto and Lawrence Counties, in the Huntington-Ashland nonattainment area. However, since neither Adams nor Gallia rank high for any factor other than emissions, EPA has designated only the townships where the power plant emissions are located.

EPA has responded in detail to all of the comments submitted by Ohio in the Response to State Comments document in the docket for this rulemaking.

EPA Technical Analysis for Parkersburg-Marietta, West Virginia-Ohio

Parkersburg-Marietta is a two-state nonattainment area. Under the 1997 standards, Washington County, Ohio along with Pleasants (partial) and Wood Counties, West Virginia comprised the nonattainment area. A violation is being observed in Wood

County, West Virginia. The analysis of the Parkersburg-Marietta area for designations under the 2006 standards examined the entire area, though this discussion only addresses the Ohio portion of the area. In a May 30, 2008 letter, Ohio recommended retaining Washington County in the Parkersburg-Marietta nonattainment area.

EPA agrees with Ohio's recommendation for this area. The emissions from Washington County are high. Sulfur dioxide emissions are especially high because of the two power plants in the county. Emission controls are limited for these facilities. The population and traffic in Washington County is comparable to the rest of the Parkersburg-Marietta area. There is no air quality monitoring in Washington County.

The surrounding Ohio counties have relatively low emissions, and no other factor warrants their inclusion in the nonattainment area.

Figure 1 is a map of the counties in the nonattainment area and other relevant information such as the locations and design values of air quality monitors, and the metropolitan area boundary.

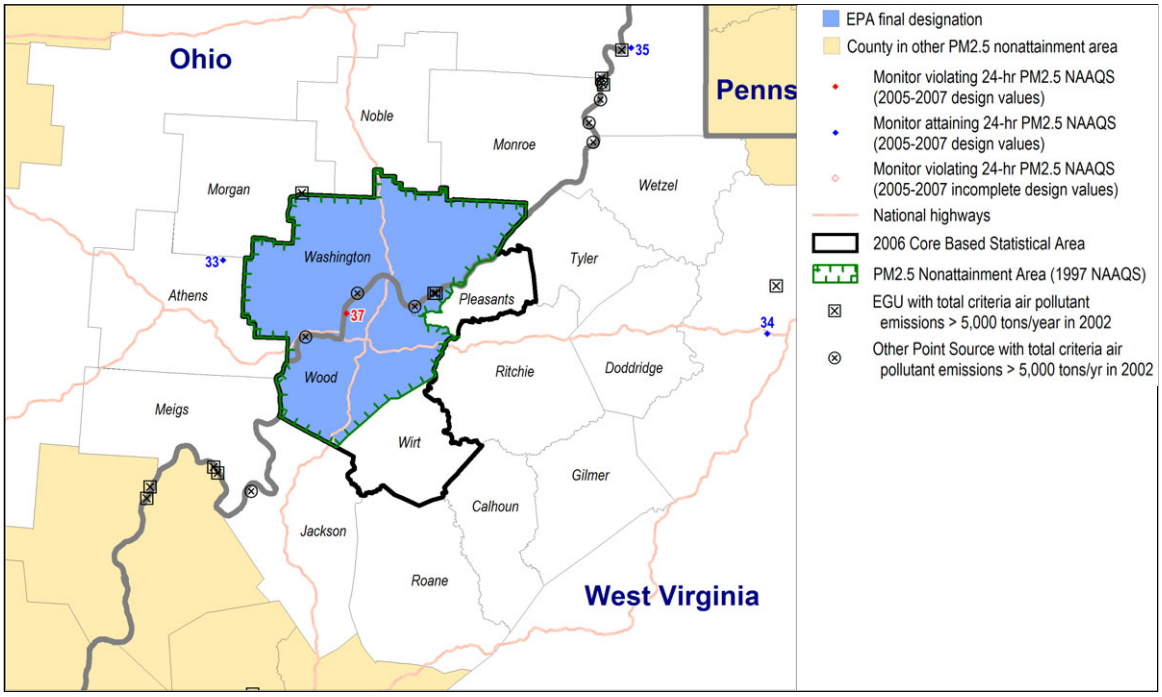


Figure 1

For this area, EPA previously established $PM_{2.5}$ nonattainment boundaries for the 1997 $PM_{2.5}$ NAAQS that included three full and partial counties including Washington County in Ohio.

In its May 30, 2008 letter, Ohio recommended the same Ohio county be designated as "nonattainment" for the 2006 24-hour $PM_{2.5}$ standard based on air quality data from 2005-2007. These data are from Federal Reference Method (FRM) monitors located in the state.

In August 2008, EPA notified Ohio of its intended designations. In this letter, EPA also requested that if the State wished to provide comments on EPA's intended designation, it should do so by October 20, 2008. EPA stated that it would consider any additional information (e.g., on power plants or partial county areas) provided by the state in making final decisions on the designations.

Based on EPA's technical analysis described below, EPA designated Washington County, Ohio and a full and a partial county in West Virginia nonattainment for the 24-hour $PM_{2.5}$ air-quality standard as part of the Parkersburg nonattainment area, based upon currently available information.

The following is a review of data for relevant factors for the Ohio portion of the Parkersburg, West Virginia-Ohio area.

Factor 1: Emissions data

For this factor, EPA evaluated county level emission data for the following $PM_{2.5}$ components and precursor pollutants: "$PM_{2.5}$ emissions total," "$PM_{2.5}$ emissions carbon," "$PM_{2.5}$ emissions other," "SO_2," "NO_x," "VOCs," and "NH_3." "$PM_{2.5}$ emissions total" represents direct emissions of $PM_{2.5}$ and includes: "$PM_{2.5}$ emissions carbon," "$PM_{2.5}$ emissions other", primary sulfate (SO_4), and primary nitrate. (Although primary sulfate and primary nitrate, which are emitted directly from stacks rather than forming in atmospheric reactions with SO_2 and NO_x, are part of "$PM_{2.5}$ emissions total," they are not shown in Table 1 as separate items). "$PM_{2.5}$ emissions carbon" represents the sum of organic carbon (OC) and elemental carbon (EC) emissions, and "$PM_{2.5}$ emissions other" represents other inorganic particles (crustal). Emissions of SO_2 and NO_x, which are precursors of the secondary $PM_{2.5}$ components sulfate and nitrate, are also considered. VOCs (volatile organic compounds) and NH_3 (ammonia) are also potential $PM_{2.5}$ precursors and are included for consideration.

Emissions data were derived from the 2005 National Emissions Inventory (NEI), version 1. See http://www.epa.gov/ttn/naaqs/pm/pm25_2006_techinfo.html.

EPA also considered the Contributing Emissions Score (CES) for each county. The CES is a metric that takes into consideration emissions data, meteorological data, and air quality monitoring information to provide a relative ranking of counties in and near an area. Note that this metric is not the exclusive manner for considering data for these factors. A more detailed description can be found at http://www.epa.gov/ttn/naaqs/pm/pm25_2006_techinfo.html#C.

Table 1 shows emissions of $PM_{2.5}$ and precursor pollutants components (given in tons per year) and the CES for violating and potentially contributing counties in the Parkersburg-Marietta area. Counties that are part of the Parkersburg-Marietta nonattainment area for the 1997 $PM_{2.5}$ NAAQS are shown in boldface. Counties are listed in descending order by CES.

Table 1. $PM_{2.5}$ 24-hour Component Emissions, and CES

County	State Recommended Nonattainment?	CES	$PM_{2.5}$ emissions total	$PM_{2.5}$ emissions carbon	$PM_{2.5}$ emissions other	SO_2	NOx	VOCs	NH_3
Washington, OH	**Yes**	**100**	**8,286**	**741**	**7,545**	**164,357**	**24,331**	**5,194**	**1,344**
Wood, WV	**No**	**54**	**977**	**421**	**557**	**6,243**	**5,866**	**6,295**	**200**
Pleasants, WV	**No**	**16**	**1,851**	**144**	**1,706**	**62,011**	**14,912**	**1,462**	**112**
Athens, OH	No	7	465	228	236	1,459	3,275	2,352	290
Jackson, WV	No	6	817	188	629	3,326	3,036	2,327	164
Meigs, OH	No	5	321	155	168	338	2,161	1,165	834

The emissions and CES of Washington County, Ohio are the largest in the area. The emissions and CES of Athens and Meigs Counties, Ohio are well below the values of counties designated nonattainment for the 1997 $PM_{2.5}$ standards.
Table 2 provides the data for CES weighting factors. The trajectory factors are used in CES calculations to account for seasonal meteorology. For the top 10% of days in both the cold and warm seasons, wind trajectories were run for a 48 hour period preceding the high monitor reading. The amount of time the air mass was over a county within the mixing height was calculated. The values were scaled so that the maximum value is 100. Thus, the county that is most likely to be upwind of a monitor on a high concentration day in a season is given a score of 100. The scores for the other counties will reflect the relative likelihood of being upwind. As the concentration of a pollutant will decrease as it goes further downwind, a distance weighting factor is also used in calculating the CES. The distance factor listed on Table 2 provides the distance from the center of a county to the center of the violating county. If a county is violating, the distance used is the average distance from the center to the county line. The cold season trajectory factors were not calculated for the Parkersburg area.

Table 2. CES Factor Data

County	CES	Trajectory Factor- Cold	Trajectory Factor- Warm	Distance (mi)
Washington, OH	100		85	14.7
Wood, WV	34		100	10.7
Pleasants, WV	19		75	21.5
Athens, OH	4		77	32
Jackson, WV	4		66	29
Meigs, OH	3		78	32.1

Factor 2: Air quality data

This factor considers the 24-hour $PM_{2.5}$ design values (in $\mu g/m^3$) for air quality monitors in counties in the Parkersburg-Marietta area based on data for the 2005-2007 period. A monitor's design value indicates whether that monitor attains a specified air quality standard. The 24-hour $PM_{2.5}$ standards are met when the 3-year average of a monitor's 98^{th} percentile values are 35 $\mu g/m^3$ or less. A design value is only valid if minimum data completeness criteria are met.

The 24-hour $PM_{2.5}$ design values for counties in the Parkersburg-Marietta area are shown in Table 3.

Table 3. Air Quality Data

County	State Recommended Nonattainment?	Design Values 2004-06 ($\mu g/m^3$)	Design Values 2005-07 ($\mu g/m^3$)
Washington, OH	Yes		
Wood, WV	No	35	37
Pleasants, WV	No		
Athens, OH	No	32	33
Jackson, WV	No		
Meigs, OH	No		

A violation of the 2006 $PM_{2.5}$ standards occurred in the West Virginia portion of the Parkersburg-Marietta area. Wood County, West Virginia has a 2005-2007 design value above the air quality standards. Athens County, Ohio meets the standards. There is no fine particulate air quality monitoring data for Meigs or Washington Counties, Ohio. However, the absence of a violating monitor alone is not a sufficient reason to eliminate counties as candidates for nonattainment status. Each county has been evaluated based on the weight of evidence of the nine factors and other relevant information.

For purposes of its review, EPA used data available from the Chemical Speciation Network and the Interagency Monitoring of Protected Visual Environments (IMPROVE) network to estimate the composition of fine particle mass on days with the highest fine particle concentrations. Analysis of these data indicates that the days with the highest fine particle concentrations in the Parkersburg area occur about 100% in the warm season and 0% in the cool season. In the warm season, the average chemical composition of the highest days is 72% sulfate, no nitrate, 24% carbon, and 3% crustal. In the cool season, the average chemical composition of the highest days is 34% sulfate, 34% nitrate, 29% carbon, and 3% crustal. These data indicate that sources of SO_2, NOx, and direct $PM_{2.5}$ emissions contribute to violations in the area.

Factor 3: Population density and degree of urbanization (including commercial development)

Table 4 shows the 2005 population for each county in the area being evaluated, as well as the population density for each county in that area. Population data gives an indication of whether it is likely that population-based emissions might contribute to violations of the 24-hour $PM_{2.5}$ standards.

Table 4. Population

County	State Recommended Nonattainment?	2005 Population	2005 Population Density (pop/sq mi)
Washington, OH	Yes	62,155	98
Wood, WV	No	86,881	231
Pleasants, WV	No	7,329	54
Athens, OH	No	62,028	121
Jackson, WV	No	28,306	60
Meigs, OH	No	23,179	54

The population of Washington County, Ohio is slightly smaller than Wood County, West Virginia. Athens County, Ohio has a similar population to Washington County, Ohio. Meigs County, Ohio has a low population.

Factor 4: Traffic and commuting patterns

This factor considers the number of commuters in each county who drive to another county within the Parkersburg-Marietta area, the percent of total commuters in each county who commute within the area, as well as the total Vehicle Miles Traveled (VMT) for each county in millions of miles (see Table 5). A county with numerous commuters is generally an integral part of an urban area and is likely contributing to fine particle concentrations in the area.

Table 5. Traffic and Commuting Patterns

County	State Recommended Nonattainment?	2005 VMT (10^6 mi)	Number Commuting to any violating counties	Percent Commuting to any violating counties	Number Commuting within/to statistical area	Percent Commuting within/to statistical area
Wood, WV	**No**	**976**	**31,700**	**85**	**35,720**	**96**
Washington, OH	**Yes**	**686**	**5,930**	**21**	**26,250**	**94**
Pleasants, WV	**No**	**67**	**640**	**22**	**2,460**	**86**
Athens, OH	No	480	560	2	1,030	4
Jackson, WV	No	444	610	6	690	6
Meigs, OH	No	186	290	3	630	7

The listing of counties on Table 4 reflects a ranking based on the number of people commuting within or to the Parkersburg-Marietta statistical area. The counties that are in the nonattainment area for the 1997 $PM_{2.5}$ NAAQS are shown in boldface. The percent commuting within the Parkersburg area information indicates that Washington, Pleasants, and Wood Counties are connected. The small commuting to the statistical area figures suggests that Athens and Meigs Counties, Ohio are separate from the Parkersburg-Marietta area.

Note: The 2005 VMT data used for tables 5 and 6 of the technical analysis have been derived using methodology such as that described in "Documentation for the 2005 Mobile National Emissions Inventory, Version 2," December 2008, prepared for the Emission Inventory Group, U.S. EPA. This document may be found at: ftp://ftp.epa.gov/EmisInventory/2005_nei/mobile_sector/documentation/2005_mobile_nei_version_2_report.pdf.

Factor 5: Growth rates and patterns

This factor considers population growth for 2000-2005 and growth in vehicle miles traveled for 1996-2005 for counties in Parkersburg-Marietta area, as well as patterns of population and VMT growth. A county with rapid population or VMT growth is generally an integral part of an urban area and likely to be contributing to fine particle concentrations in the area.

Table 6 below shows population, population growth, VMT, and VMT growth for counties that are included in the Parkersburg-Marietta area. Counties are listed in descending order based on VMT growth between 1996 and 2005.

Table 6. Population and VMT Growth and Percent Change

County	Population (2005)	Population % change (2000-05)	2005 VMT (10^6 mi)	VMT % change (1996-05)
Pleasants, WV	**7,329**	**-2**	**67**	**37**
Wood, WV	**86,881**	**-1**	**976**	**11**
Athens, OH	62,028	0	480	3
Meigs, OH	23,179	1	186	0
Washington, OH	**62,155**	**-2**	**686**	**-1**
Jackson, WV	28,306	1	444	-7

There was little population change for the counties. This is not the case for VMT change. The West Virginia counties, Pleasants and Wood Counties, had solid increases in VMT between 1996 and 2005. Washington County, Ohio had a slight decline in its VMT. The Ohio counties near the area showed little or no VMT growth.

Factor 6: Meteorology (weather/transport patterns)

For this factor, EPA considered data from National Weather Service instruments and other meteorological monitoring sites in the area. Wind direction and wind speed data for 2005-2007 were analyzed, with an emphasis on "high $PM_{2.5}$ days" for each of two seasons, an October-April "cold" season and a May-September "warm" season. These high days are defined as days where any FRM or FEM air quality monitors had 24-hour $PM_{2.5}$ concentrations above 95% on a frequency distribution curve of $PM_{2.5}$ 24-hour values.

For each air quality monitoring site, EPA developed a "pollution rose" to understand the prevailing wind direction and wind speed on the days with highest fine particle concentrations. The figure identifies 24-hour $PM_{2.5}$ values by color; days exceeding 35 $\mu g/m^3$ are denoted with a red or black icon. A dot indicates the day occurred in the warm season; a triangle indicates the day occurred in the cool season. The center of the figure indicates the location of the air quality monitoring site, and the location of the icon in relation to the center indicates the direction from which the wind was blowing on that day. An icon that is close to the center indicates a low average wind speed on that day. Higher wind speeds are indicated when the icon is further away from the center.

The pollution rose for the Parkersburg-Marietta area is provided as Figure 2. Winds on high concentration days show a slight tendency to come from the Northeast or Southwest. Overall, the winds come from a variety of directions. So, it is appropriate to consider counties in all directions from the violations.

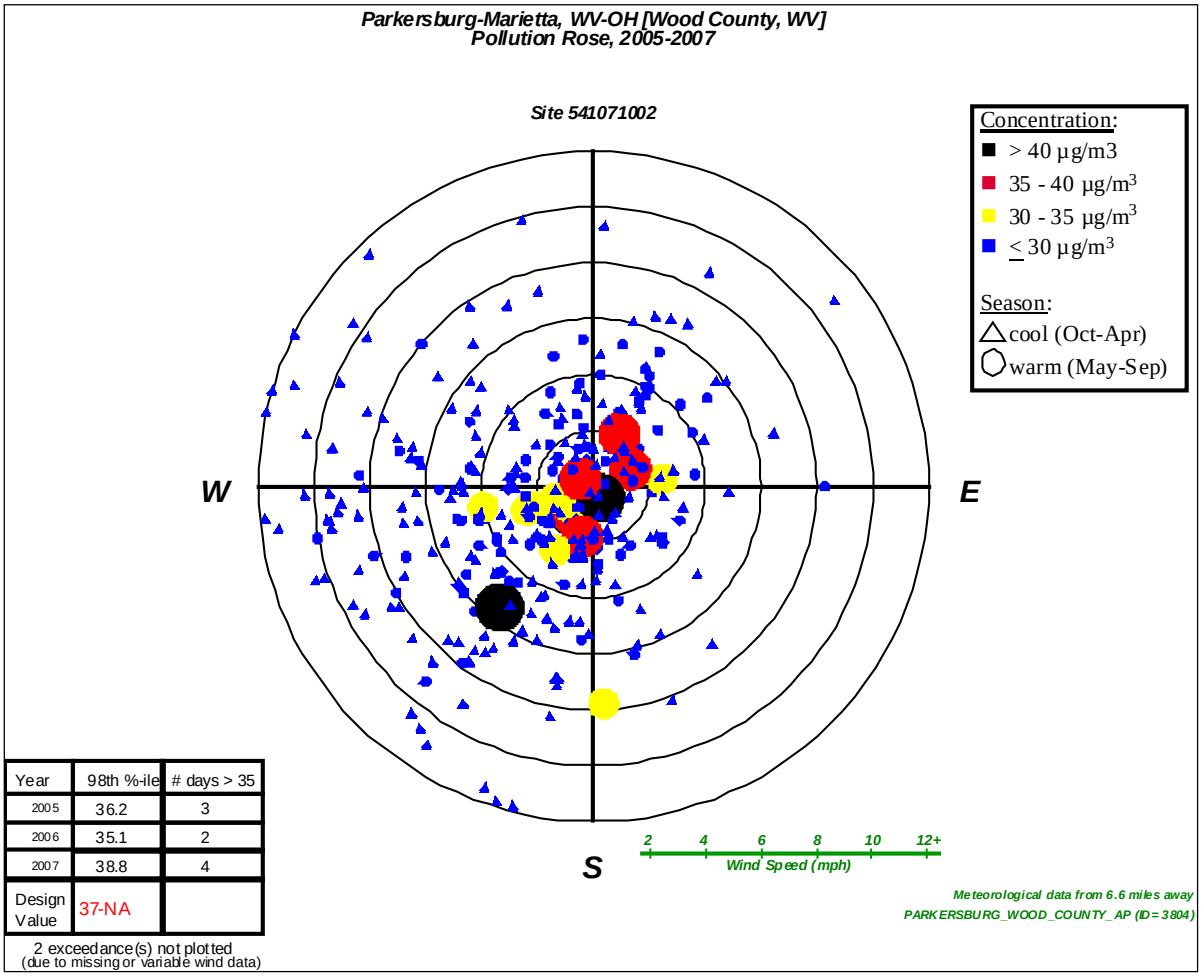


Figure 2

Note: the meteorology factor is also considered in each county's Contributing Emissions Score because the method for deriving this metric included an analysis of trajectories of air masses for high $PM_{2.5}$ days.

Factor 7: Geography/topography (mountain ranges or other air basin boundaries)

The geography/topography analysis evaluates the physical features of the land that might have an effect on the air shed and, therefore, on the distribution of $PM_{2.5}$ over the area.

The Parkersburg-Marietta area does not have any geographical or topographical barriers significantly limiting air-pollution transport within its air shed. Therefore, this factor did not play a significant role in the decision-making process.

Factor 8: Jurisdictional boundaries

In evaluating the jurisdictional boundary factor, EPA gave special consideration to areas that were already designated nonattainment in 2005 for violating the 1997 fine particle standards. Analysis of chemical composition data in these areas indicates that the same

components that make up most of the $PM_{2.5}$ mass in the area on an annual average basis such as sulfate and direct $PM_{2.5}$ carbon in many eastern areas also are key contributors to the $PM_{2.5}$ mass on days exceeding the 24-hour $PM_{2.5}$ standard. These data indicate that in many cities, the same source categories that contribute to violations of the annual standard also contribute to exceedances of the 24-hour standard.

EPA has generally concluded that counties that were designated as having emissions sources contributing to fine particle concentrations which exceeded the 1997 standards (all areas violated the annual standard, two also violated the previous 24-hour standard) also contribute to fine particle concentrations on the highest days. For this reason, EPA believes that for most existing nonattainment areas, the nonattainment area for the 2006 24-hour standard should be the same. Consideration also should be given to existing boundaries and organizations as they may facilitate air quality planning and the implementation of control measures to attain the standard. Areas already designated as nonattainment represent important boundaries for state air quality planning.

The Wood-Washington-Wirt Interstate Planning Commission (WWW) is the Metropolitan Planning Organization (MPO) for the following townships in Washington County, OH: Newport, Marietta, Fearing, Muskingum, Warren, Dunham, and Belpre Townships. WWW website: http://www.triplew.org/index.html.

The Parkersburg-Marietta ozone maintenance area consists of the following counties: Washington County, Ohio, and Wood County, West Virginia.

The Parkersburg-Marietta nonattainment area for the 2006 standards is identical to the nonattainment area designated under the 1997 $PM_{2.5}$ standards.

Factor 9: Level of control of emission sources

Under this factor, the existing level of control of emission sources is taken into consideration. The emissions data used by EPA in this technical analysis and provided in Table 1 under Factor 1 represent emissions levels taking into account any control strategies implemented in the Parkersburg-Marietta area before 2005 on stationary, mobile, and area sources. Data are presented for $PM_{2.5}$ components that are directly emitted, carbonaceous $PM_{2.5}$ and crustal $PM_{2.5}$, and for pollutants which react in the atmosphere to form fine particles such as SO_2, NOx, VOC, and ammonia.

In considering county-level emissions, EPA used data from the 2005 National Emissions Inventory, the most updated version of the national inventory available at the beginning of the designations process in late 2007. However, EPA recognized that for certain counties, emissions may have changed since 2005. For example, certain power plants or large sources of emissions in or near this area may have installed emission controls or otherwise significantly reduced emissions since 2005. Some States provided updated information on emissions and emission controls in their comments to EPA. EPA considered such additional information in making final designation decisions.

With regard to nearby power plants, EPA considered information about whether a specific plant installed federally enforceable emission controls by December 2008 resulting in significant emissions reductions. A control requirement is considered to be federally-enforceable if it is required by a State regulation adopted in a State implementation plan, if it is included in a federally-enforceable Title V operating permit, or if it is required by a consent decree which also requires the controls to be included in federally enforceable permit upon termination of the consent decree. In making final decisions, EPA also considered whether a facility would continue to emit pollutants which contribute to $PM_{2.5}$ exceedances even after emission controls are operational.

Ohio did not provide other information regarding other power plants or any other large sources in the Parkersburg-Marietta area.

EPA Technical Analysis for Steubenville-Weirton, Ohio-West Virginia

The Steubenville-Weirton nonattainment area designated for the 1997 standards is comprised of three counties: Jefferson County, Ohio, and Brooke and Hancock Counties, West Virginia. Violations of the 2006 standards have been monitored in all three of these counties. Ohio recommended Jefferson County to be nonattainment under the 2006 standards in its December 17, 2007 letter.

EPA agreed with Ohio's recommendation. The emissions from Jefferson County, Ohio, especially sulfur dioxide, are high. There are two power plants in Jefferson County that contribute to the high emissions. Emission controls have been added at some units of the Cardinal plant, but SO_2 emission controls at the remaining unit at Cardinal and at the several units at the Sammis plant are not expected to be installed until 2010 or later. Thus, Jefferson County emissions remain large, and continue to contribute to violations in this area

The Steubenville area is relatively near to the Pittsburgh area. However, EPA believes that these two areas are sufficiently distinct to warrant treatment as separate nonattainment areas.

Other counties around the Steubenville-Weirton area have relatively low emissions. No other factor warrants inclusion of any additional Ohio county in the Steubenville-Weirton nonattainment area.

Figure 1 is a map of the counties in the nonattainment area and other relevant information such as the locations and design values of air quality monitors, and the metropolitan area boundary.

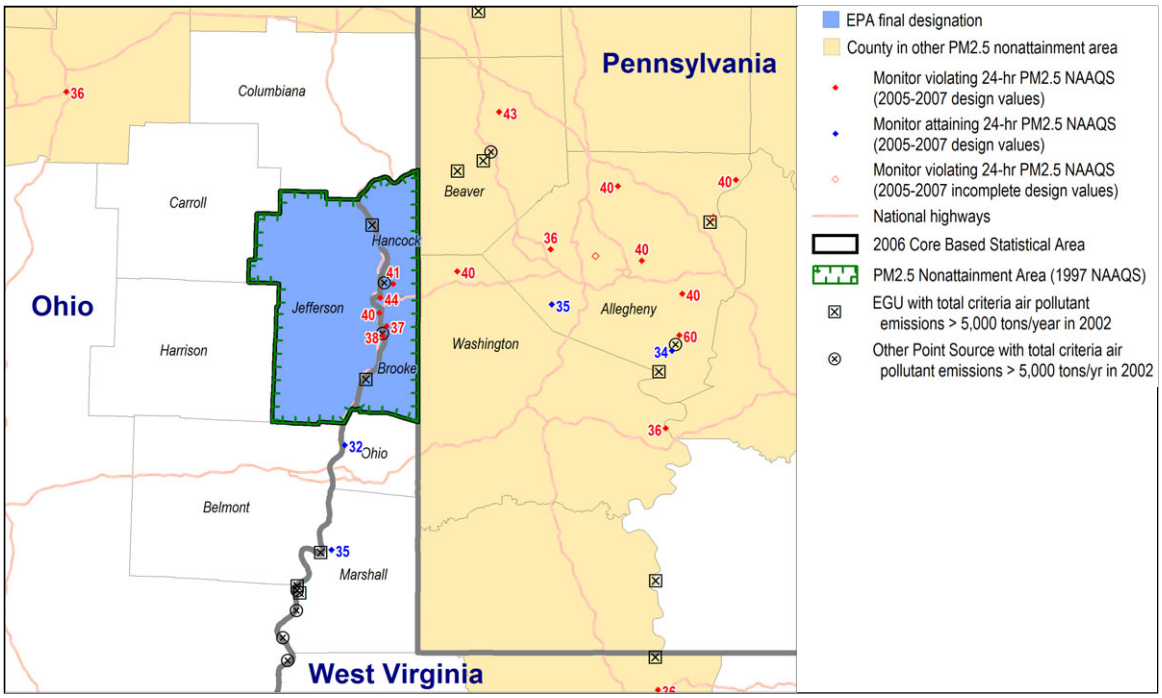


Figure 1

For this area, EPA previously established $PM_{2.5}$ nonattainment boundaries for the 1997 $PM_{2.5}$ NAAQS that included three counties including Jefferson County, Ohio.

In its December 17, 2007 letter, Ohio recommended the same Ohio counties be designated as "nonattainment" for the 2006 24-hour $PM_{2.5}$ standard based on air quality data from 2004-2006. These data are from Federal Reference Method (FRM) monitors located in the state.

In August 2008, EPA notified Ohio of its intended designations. In this letter, EPA also requested that if the State wished to provide comments on EPA's intended designation, it should do so by October 20, 2008. EPA stated that it would consider any additional information (e.g., on power plants or partial county areas) provided by the state in making final decisions on the designations.

Based on EPA's technical analysis described below, EPA designated one Ohio county and two West Virginia counties as nonattainment for the 24-hour $PM_{2.5}$ air-quality standard as part of the Steubenville nonattainment area, based upon currently available information.

The following is a review of data for relevant factors for the EPA Region 5 portion of the Steubenville-Weirton, Ohio-West Virginia area.

Factor 1: Emissions data

For this factor, EPA evaluated county level emission data for the following $PM_{2.5}$ components and precursor pollutants: "$PM_{2.5}$ emissions total," "$PM_{2.5}$ emissions carbon," "$PM_{2.5}$ emissions other," "SO_2," "NO_x," "VOCs," and "NH_3." "$PM_{2.5}$ emissions total"

represents direct emissions of $PM_{2.5}$ and includes: "$PM_{2.5}$ emissions carbon," "$PM_{2.5}$ emissions other", primary sulfate (SO_4), and primary nitrate. (Although primary sulfate and primary nitrate, which are emitted directly from stacks rather than forming in atmospheric reactions with SO_2 and NO_x, are part of "$PM_{2.5}$ emissions total," they are not shown in Table 1 as separate items). "$PM_{2.5}$ emissions carbon" represents the sum of organic carbon (OC) and elemental carbon (EC) emissions, and "$PM_{2.5}$ emissions other" represents other inorganic particles (crustal). Emissions of SO_2 and NO_x, which are precursors of the secondary $PM_{2.5}$ components sulfate and nitrate, are also considered. VOCs (volatile organic compounds) and NH_3 (ammonia) are also potential $PM_{2.5}$ precursors and are included for consideration.

Emissions data were derived from the 2005 National Emissions Inventory (NEI), version 1. See http://www.epa.gov/ttn/naaqs/pm/pm25_2006_techinfo.html.

EPA also considered the Contributing Emissions Score (CES) for each county. The CES is a metric that takes into consideration emissions data, meteorological data, and air quality monitoring information to provide a relative ranking of counties in and near an area. Note that this metric is not the exclusive manner for considering data for these factors. A more detailed description can be found at http://www.epa.gov/ttn/naaqs/pm/pm25_2006_techinfo.html#C.

Table 1 shows emissions of $PM_{2.5}$ and precursor pollutants components (given in tons per year) and the CES for violating and potentially contributing counties in the Steubenville area. Counties that are part of the Steubenville nonattainment area for the 1997 $PM_{2.5}$ NAAQS are shown in boldface. Counties are listed in descending order by CES.

Table 1. $PM_{2.5}$ 24-hour Component Emissions, and CESs

County	State Recommended Nonattainment?	CES	$PM_{2.5}$ emissions total	$PM_{2.5}$ emissions carbon	$PM_{2.5}$ emissions other	SO_2	NOx	VOCs	NH_3
Jefferson, OH	**Yes**	**100**	**11,409**	**722**	**10,686**	**224,025**	**46,158**	**3,693**	**297**
Hancock, WV	**Yes**	**60**	**3,781**	**704**	**3,077**	**2,039**	**4,404**	**2,298**	**830**
Allegheny, PA	Other	27	5,221	2,245	2,975	51,471	63,290	46,690	2,249
Marshall, WV	No	23	4,604	309	4,295	118,021	39,932	3,230	146
Brooke, WV	**Yes**	**19**	**579**	**192**	**388**	**1,349**	**2,131**	**3,436**	**210**

Jefferson County, Ohio has the highest emissions in the area. The emissions of direct $PM_{2.5}$, sulfur dioxide, and nitrogen oxides are all large. Jefferson County also has the highest CES, which indicates it contributes to the area violations. Although not shown on this table, the emissions and CES of other nearby Ohio counties that are not part of other areas designated nonattainment are low.

Table 2 provides the data for CES weighting factors. The trajectory factors are used in CES calculations to account for seasonal meteorology. For the top 10% of days in both the cold and warm seasons, wind trajectories were run for a 48 hour period preceding the high monitor reading. The amount of time the air mass was over a county within the mixing height was calculated. The values were scaled so that the maximum value is 100. Thus, the county that is most likely to be upwind of a monitor on a high concentration

day in a season is given a score of 100. The scores for the other counties will reflect the relative likelihood of being upwind. As the concentration of a pollutant will decrease as it goes further downwind, a distance weighting factor is also used in calculating the CES. The distance factor listed on Table 2 provides the distance from the center of a county to the center of the violating county. If a county is violating, the distance used is the average distance from the center to the county line.

Table 2. CES Factor Data

County	CES	Trajectory Factor- Cold	Trajectory Factor- Warm	Distance (mi)
Jefferson	100	76	75	10.8
Hancock	60	76	70	13.1
Brooke	19	98	95	11.4
Allegheny	27	43	33	38.9
Marshall	23	91	95	35

Factor 2: Air quality data

This factor considers the 24-hour $PM_{2.5}$ design values (in $\mu g/m^3$) for air quality monitors in counties in the Steubenville area based on data for the 2005-2007 period. A monitor's design value indicates whether that monitor attains a specified air quality standard. The 24-hour $PM_{2.5}$ standards are met when the 3-year average of a monitor's 98^{th} percentile values are 35 $\mu g/m^3$ or less. A design value is only valid if minimum data completeness criteria are met.

The 24-hour $PM_{2.5}$ design values for counties in the Steubenville area are shown in Table 3. Jefferson County, Ohio has a design value which exceeds the 2006 standards. The two West Virginia area counties also violate the air quality standards. So, all three counties in the Steubenville area have 2005-2007 design values over the standards.

Table 3. Air Quality Data

County	State Recommended Nonattainment?	Design Values 2004-2006	Design Values 2005-2007
Jefferson, OH	Yes	43	40
Hancock, WV	Yes		41
Brooke, WV	Yes	40	44

For purposes of its review, EPA used data available from the Chemical Speciation Network and the Interagency Monitoring of Protected Visual Environments (IMPROVE) network to estimate the composition of fine particle mass on days with the highest fine particle concentrations. Analysis of these data indicates that the days with the highest fine particle concentrations in the Steubenville-Weirton area occur about 86% in the warm season and 14% in the cool season. In the warm season, the average chemical composition of the highest days is 75% sulfate, no nitrate, 22% carbon, and 3% crustal. In the cool season, the average chemical composition of the highest days is 75% sulfate, no nitrate, 22% carbon, and 3% crustal. These data indicate that sources of SO_2, NOx, and direct $PM_{2.5}$ emissions contribute to violations in the area.

Factor 3: Population density and degree of urbanization (including commercial development)

Table 4 shows the 2005 population for each county in the area being evaluated, as well as the population density for each county in that area. Population data gives an indication of whether it is likely that population-based emissions might contribute to violations of the 24-hour $PM_{2.5}$ standards.

Table 4. Population

County	State Recommended Nonattainment?	2005 Population	2005 Population Density (pop/sq mi)
Jefferson, OH	Yes	70,631	172
Hancock, WV	Yes	31,191	354
Brooke, WV	Yes	24,474	265

Jefferson County, Ohio has a well larger population that both Brooke and Hancock Counties in West Virginia. However, the West Virginia counties are smaller in land area which gives both counties population densities larger that the Jefferson County population density.

Factor 4: Traffic and commuting patterns

This factor considers the number of commuters in each county who drive to another county within the Steubenville area, the percent of total commuters in each county who commute within the area, as well as the total Vehicle Miles Traveled (VMT) for each county in millions of miles (see Table 5). A county with numerous commuters is generally an integral part of an urban area and is likely contributing to fine particle concentrations in the area.

Table 5. Traffic and Commuting Patterns

County	State Recommended Nonattainment?	2005 VMT (10^6 mi)	Number Commuting to any violating counties	Percent Commuting to any violating counties	Number Commuting into statistical area	Percent Commuting into statistical area
Jefferson, OH	Yes	684	24,330	85	-	-
Hancock, WV	Yes	187	12,820	91	-	-
Brooke, WV	Yes	210	9,320	89	-	-

The listing of counties on Table 5 reflects a ranking based on the number of people commuting to violating counties. The commuting in the statistical area figures were not available in the Steubenville-Weirton area. All listed counties are in the nonattainment area for the 1997 $PM_{2.5}$ NAAQS. All three area counties are in violation of the air quality standards, so commuting to any area county is commuting to a violating county. All three Steubenville area counties have a fair percent of commuting to violating counties.

Note: The 2005 VMT data used for tables 5 and 6 of the technical analysis have been derived using methodology such as that described in "Documentation for the 2005 Mobile National Emissions Inventory, Version 2," December 2008, prepared for the Emission Inventory Group, U.S. EPA. This document may be found at: ftp://ftp.epa.gov/EmisInventory/2005_nei/mobile_sector/documentation/2005_mobile_nei_version_2_report.pdf.

Factor 5: Growth rates and patterns

This factor considers population growth for 2000-2005 and growth in vehicle miles traveled for 1996-2005 for counties in Steubenville area, as well as patterns of population and VMT growth. A county with rapid population or VMT growth is generally an integral part of an urban area and likely to be contributing to fine particle concentrations in the area.

Table 6 below shows population, population growth, VMT, and VMT growth for counties that are included in the Steubenville area. Counties are listed in descending order based on VMT growth between 1996 and 2005.

Table 6. Population and VMT Growth and Percent Change

County	Population (2005)	Population % change (2000-2005)	2005 VMT (10^6 mi)	VMT % change (1996-2005)
Brooke, WV	24,474	-4	210	0
Jefferson, OH	70,631	-4	684	-6
Hancock, WV	31,191	-4	187	-32

Jefferson County, Ohio joined the West Virginia counties in experiencing a population decline from 2000 to 2005. The VMT declined in Jefferson County, but not nearly as sharply as the 32% decline in Hancock County, West Virginia. The VMT was unchanged for Brooke County, West Virginia for the 1996 to 2005 period.

Factor 6: Meteorology (weather/transport patterns)

For this factor, EPA considered data from National Weather Service instruments and other meteorological monitoring sites in the area. Wind direction and wind speed data for 2005-2007 were analyzed, with an emphasis on "high $PM_{2.5}$ days" for each of two seasons, an October-April "cold" season and a May-September "warm" season. These high days are defined as days where any FRM or FEM air quality monitors had 24-hour $PM_{2.5}$ concentrations above 95% on a frequency distribution curve of $PM_{2.5}$ 24-hour values.

For each air quality monitoring site, EPA developed a "pollution rose" to understand the prevailing wind direction and wind speed on the days with highest fine particle concentrations. The figure identifies 24-hour $PM_{2.5}$ values by color; days exceeding 35 $\mu g/m^3$ are denoted with a red or black icon. A dot indicates the day occurred in the warm season; a triangle indicates the day occurred in the cool season. The center of the figure

indicates the location of the air quality monitoring site, and the location of the icon in relation to the center indicates the direction from which the wind was blowing on that day. An icon that is close to the center indicates a low average wind speed on that day. Higher wind speeds are indicated when the icon is further away from the center.

The pollution rose for the Steubenville area is provided as Figure 2. Winds on high concentration days show a tendency to come from the Southwest to Southeast. There are several large sources in the Steubenville area generally South of Brooke County, West Virginia, where the pollution rose was based. Overall, the winds come from a variety of directions. So, it is appropriate to consider counties in all directions from the violations.

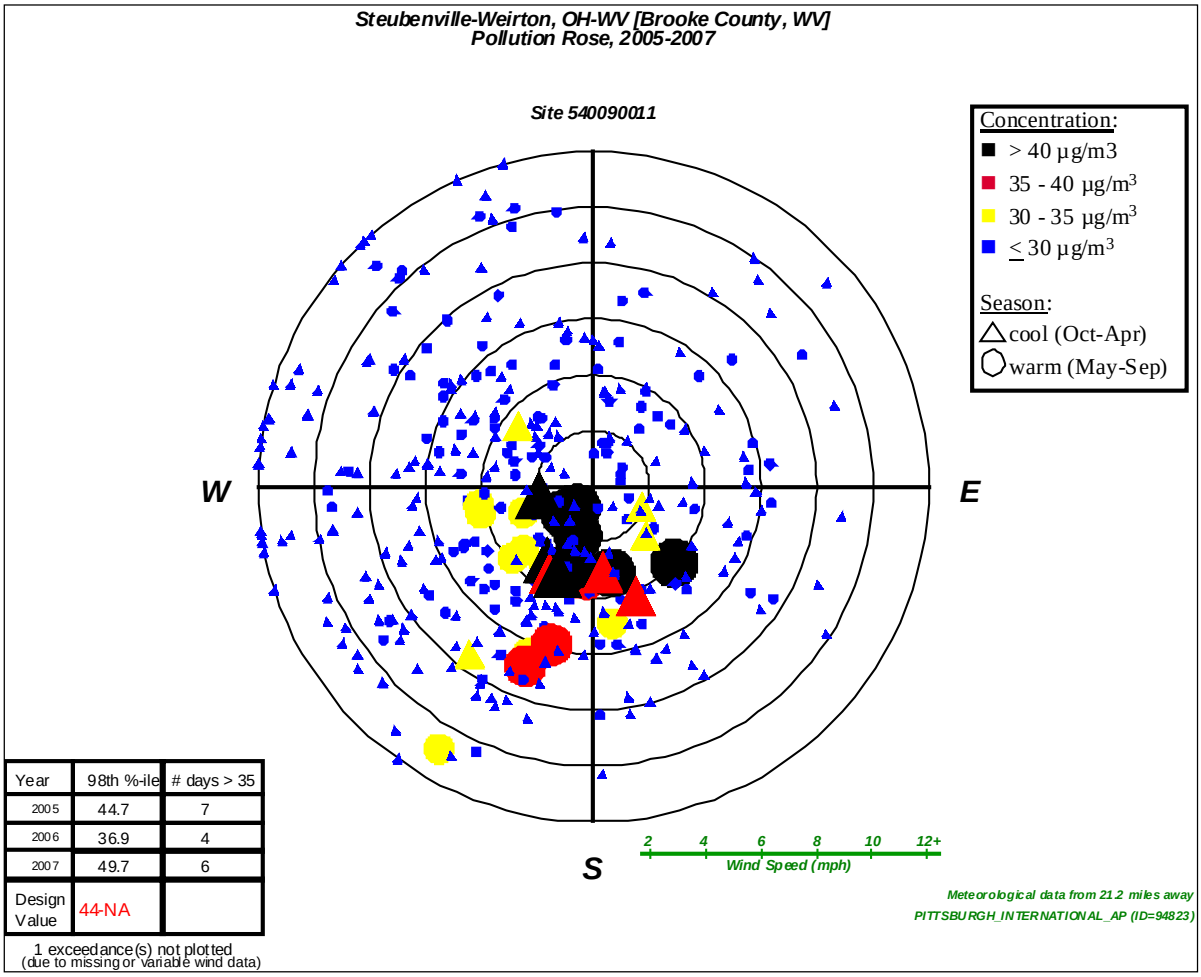


Figure 2

Note: the meteorology factor is also considered in each county's Contributing Emissions Score because the method for deriving this metric included an analysis of trajectories of air masses for high $PM_{2.5}$ days.

Factor 7: Geography/topography (mountain ranges or other air basin boundaries)

The geography/topography analysis evaluates the physical features of the land that might have an effect on the air shed and, therefore, on the distribution of $PM_{2.5}$ over the area.

The Steubenville area does not have any geographical or topographical barriers significantly limiting air-pollution transport within its air shed. Therefore, this factor did not play a significant role in the decision-making process.

Factor 8: Jurisdictional boundaries

In evaluating the jurisdictional boundary factor, EPA gave special consideration to areas that were already designated nonattainment in 2005 for violating the 1997 fine particle standards. Analysis of chemical composition data in these areas indicates that the same components that make up most of the $PM_{2.5}$ mass in the area on an annual average basis such as sulfate and direct $PM_{2.5}$ carbon in many eastern areas also are key contributors to the $PM_{2.5}$ mass on days exceeding the 24-hour $PM_{2.5}$ standard. These data indicate that in many cities, the same source categories that contribute to violations of the annual standard also contribute to exceedances of the 24-hour standard.

EPA has generally concluded that counties that were designated as having emissions sources contributing to fine particle concentrations which exceeded the 1997 standards (all areas violated the annual standard, two also violated the previous 24-hour standard) also contribute to fine particle concentrations on the highest days. For this reason, EPA believes that for most existing nonattainment areas, the nonattainment area for the 2006 24-hour standard should be the same. Consideration also should be given to existing boundaries and organizations as they may facilitate air quality planning and the implementation of control measures to attain the standard. Areas already designated as nonattainment represent important boundaries for state air quality planning.

The Brooke-Hancock-Jefferson Metropolitan Planning Commission (BHJMPC) is the Metropolitan Planning Organization (MPO) for Jefferson County, OH. BHJMPC website: http://www.bhjmpc.org/

The Steubenville-Weirton ozone maintenance area consists of Jefferson County in Ohio and Brooke and Hancock Counties in West Virginia. The Steubenville-Weirton nonattainment area under the 2006 standards is identical to the nonattainment area designated under the 1997 $PM_{2.5}$ standard.

Factor 9: Level of control of emission sources

Under this factor, the existing level of control of emission sources is taken into consideration. The emissions data used by EPA in this technical analysis and provided in Table 1 under Factor 1 represent emissions levels taking into account any control strategies implemented in the Steubenville area before 2005 on stationary, mobile, and area sources. Data are presented for $PM_{2.5}$ components that are directly emitted, carbonaceous $PM_{2.5}$ and crustal $PM_{2.5}$, and for pollutants which react in the atmosphere to form fine particles such as SO_2, NOx, VOC, and ammonia.

In considering county-level emissions, EPA used data from the 2005 National Emissions Inventory, the most updated version of the national inventory available at the beginning of the designations process in late 2007. However, EPA recognized that for certain counties, emissions may have changed since 2005. For example, certain power plants or large sources of emissions in or near this area may have installed emission controls or otherwise significantly reduced emissions since 2005. Some States provided updated information on emissions and emission controls in their comments to EPA. EPA considered such additional information in making final designation decisions.

With regard to nearby power plants, EPA considered information about whether a specific plant installed federally enforceable emission controls by December 2008 resulting in significant emissions reductions. A control requirement is considered to be federally-enforceable if it is required by a State regulation adopted in a State implementation plan, if it is included in a federally-enforceable Title V operating permit, or if it is required by a consent decree which also requires the controls to be included in federally enforceable permit upon termination of the consent decree. In making final decisions, EPA also considered whether a facility would continue to emit pollutants which contribute to $PM_{2.5}$ exceedances even after emission controls are operational.

Ohio provided information regarding other power plants in Jefferson County. Considering the emission control devices currently operating the emissions remain high. Additional controls are planned. The planned controls may improve the air quality in the future. Designations are based on current air quality and information. Jefferson County, Ohio has a design value exceeding the standard and it emissions remain large.

EPA Technical Analysis for Youngstown-Warren-East Liverpool, Ohio-Pennsylvania

The Youngstown area is designated attainment under the 1997 standards. However, monitoring indicates a violation of the 2006 standards in Mahoning County, Ohio. Trumbull County had shown a 2004-2006 violation, but data indicates it meets the standards in 2005-2007. There are four counties in the combined statistical area: Columbiana, Mahoning, and Trumbull Counties in Ohio and Mercer County, Pennsylvania. Ohio originally recommended Mahoning and Trumbull Counties as nonattainment, although Ohio subsequently recommended that the area be designated attainment based on 2006 to 2008 data. EPA analyzed these and other nearby counties. Many of the nearby counties are in other metropolitan areas and thus were evaluated as part of those other areas.

EPA agrees with the State's original recommendations. Within the Youngstown area, the greatest emissions and the greatest likely local contribution to the violations in the area are in Mahoning and Trumbull counties. Columbiana County emissions are moderate but are substantially lower than those of Mahoning and Trumbull Counties. Columbiana County is also excluded from the 8-hour ozone maintenance area.

EPA is providing an opportunity for states to quality assure, submit, and certify air quality data for 2008, which may indicate that areas like the Youngstown area warrant a different designation based on 2006 to 2008 data than EPA is applying based on 2005 to 2007 data. However, EPA cannot use 2006 to 2008 data as the basis for designations until such time and monitoring data for the full year is available, quality assured, submitted, and certified. Therefore, for now, EPA must base the designations it promulgates on 2005 to 2007 data. Since those data indicate a violation, EPA must designate the Youngstown area as nonattainment.

As noted earlier, Youngstown is near several other urban areas, including Cleveland, Canton, and Steubenville. However, EPA views these areas as sufficiently distinct to warrant treatment as separate nonattainment areas. Regarding the counties that are not being included in other nonattainment areas, EPA finds that emissions of these counties are relatively low, and no other factor warrants their inclusion in the nonattainment area.

Figure 1 is a map of the counties in the nonattainment area and other relevant information such as the locations and design values of air quality monitors, and the metropolitan area boundary.

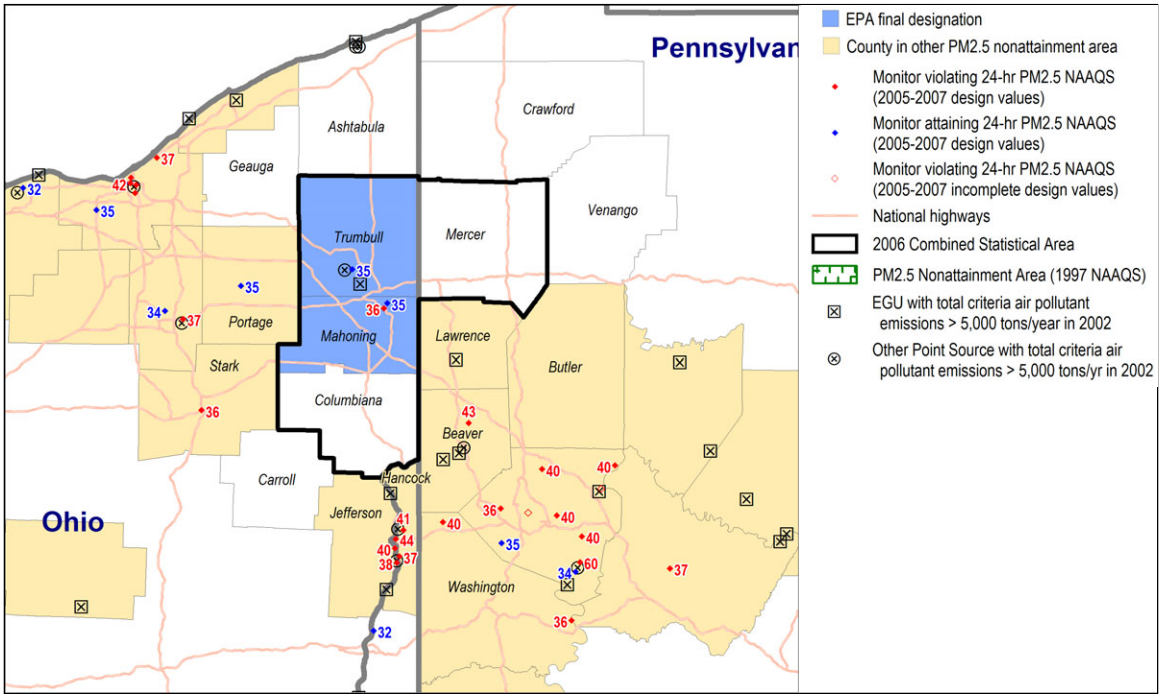


Figure 1

In its December 17, 2007 letter, Ohio recommended the Mahoning and Trumbull Counties be designated as "nonattainment" for the 2006 24-hour $PM_{2.5}$ standard based on air quality data from 2004-2006. These data are from Federal Reference Method (FRM) monitors located in the state.

In August 2008, EPA notified Ohio of its intended designations. In this letter, EPA also requested that if the State wished to provide comments on EPA's intended designation, it

should do so by October 20, 2008. EPA stated that it would consider any additional information (e.g., on power plants or partial county areas) provided by the state in making final decisions on the designations. In a letter dated October 8, 2008, Ohio revised its recommendation based on consideration of 2008 data.

Based on EPA's technical analysis described below, EPA is designating two Ohio counties as nonattainment for the 24-hour $PM_{2.5}$ air-quality standard as part of the Youngstown nonattainment area, based upon currently available information.

The following is a review of data for relevant factors for the Ohio portion of the Youngstown, Ohio-Pennsylvania area.

Factor 1: Emissions data

For this factor, EPA evaluated county level emission data for the following $PM_{2.5}$ components and precursor pollutants: "$PM_{2.5}$ emissions total," "$PM_{2.5}$ emissions carbon," "$PM_{2.5}$ emissions other," "SO_2," "NO_x," "VOCs," and "NH_3." "$PM_{2.5}$ emissions total" represents direct emissions of $PM_{2.5}$ and includes: "$PM_{2.5}$ emissions carbon," "$PM_{2.5}$ emissions other", primary sulfate (SO_4), and primary nitrate. (Although primary sulfate and primary nitrate, which are emitted directly from stacks rather than forming in atmospheric reactions with SO_2 and NO_x, are part of "$PM_{2.5}$ emissions total," they are not shown in Table 1 as separate items). "$PM_{2.5}$ emissions carbon" represents the sum of organic carbon (OC) and elemental carbon (EC) emissions, and "$PM_{2.5}$ emissions other" represents other inorganic particles (crustal). Emissions of SO_2 and NO_x, which are precursors of the secondary $PM_{2.5}$ components sulfate and nitrate, are also considered. VOCs (volatile organic compounds) and NH_3 (ammonia) are also potential $PM_{2.5}$ precursors and are included for consideration.

Emissions data were derived from the 2005 National Emissions Inventory (NEI), version 1. See http://www.epa.gov/ttn/naaqs/pm/pm25_2006_techinfo.html.

EPA also considered the Contributing Emissions Score (CES) for each county. The CES is a metric that takes into consideration emissions data, meteorological data, and air quality monitoring information to provide a relative ranking of counties in and near an area. Note that this metric is not the exclusive manner for considering data for these factors. A more detailed description can be found at http://www.epa.gov/ttn/naaqs/pm/pm25_2006_techinfo.html#C.

Table 1 shows emissions of $PM_{2.5}$ and precursor pollutants components (given in tons per year) and the CES for violating and potentially contributing counties in the Youngstown area. Counties that are part of the Youngstown nonattainment area for the 1997 $PM_{2.5}$ NAAQS are shown in boldface. Counties are listed in descending order by CES.

Table 1. $PM_{2.5}$ 24-hour Component Emissions, and CESs

County	State Recommended Nonattainment?	CES	$PM_{2.5}$ emissions total	$PM_{2.5}$ emissions carbon	$PM_{2.5}$ emissions other	SO_2	NOx	VOCs	NH_3
Jefferson, OH	Other	100	11,409	722	10,686	224,025	46,158	3,693	297

Trumbull, OH	Yes	89	1,730	625	1,105	18,501	13,373	12,098	881
Beaver, PA	Other	43	2,909	451	2,457	45,452	33,400	7,424	450
Lawrence, PA	Other	40	2,046	313	1,733	22,900	9,001	4,234	692
Mahoning, OH	Yes	34	722	338	384	1,927	10,086	10,416	1,415
Portage, OH	Other	18	1,011	496	514	548	7,269	8,365	564
Columbiana, OH	No	14	805	366	441	525	4,377	4,933	1,956
Mercer, PA	No	11	793	290	503	1,042	6,010	7,028	1,210

Mahoning and Trumbull Counties have the highest emissions and CES in the Youngstown area. The table indicates counties recommended as nonattainment for other areas have CES in the same range as Mahoning and Trumbull Counties. However, Jefferson County is in Steubenville-Weirton area. Beaver and Lawrence Counties in Pennsylvania are in the Pittsburgh area and Portage County, Ohio is in the Cleveland area. Within the Youngstown area, the emissions and CES from Columbiana County, Ohio and Mercer County, Pennsylvania are substantially smaller than Mahoning and Trumbull Counties.

Table 2 provides the data for CES weighting factors. The trajectory factors are used in CES calculations to account for seasonal meteorology. For the top 10% of days in both the cold and warm seasons, wind trajectories were run for a 48 hour period preceding the high monitor reading. The amount of time the air mass was over a county within the mixing height was calculated. The values were scaled so that the maximum value is 100. Thus, the county that is most likely to be upwind of a monitor on a high concentration day in a season is given a score of 100. The scores for the other counties will reflect the relative likelihood of being upwind. As the concentration of a pollutant will decrease as it goes further downwind, a distance weighting factor is also used in calculating the CES. The distance factor listed on Table 2 provides the distance from the center of a county to the center of the violating county. If a county is violating, the distance used is the average distance from the center to the county line.

Table 2. CES Factor Data

County	CES	Trajectory Factor- Cold	Trajectory Factor- Warm	Distance (mi)
Jefferson, OH	100	41	80	44.2
Trumbull, OH	89	88	74	20.7
Beaver, PA	43	56	93	33
Lawrence, PA	40	78	98	23.1
Mahoning, OH	34	100	98	11.3
Portage, OH	18	71	52	25.1
Columbiana, OH	14	76	100	18.2
Mercer, PA	11	60	71	31.8

Factor 2: Air quality data

This factor considers the 24-hour $PM_{2.5}$ design values (in $\mu g/m^3$) for air quality monitors in counties in the Youngstown area based on data for the 2005-2007 period. A monitor's design value indicates whether that monitor attains a specified air quality standard. The 24-hour $PM_{2.5}$ standards are met when the 3-year average of a monitor's 98^{th} percentile

values are 35 μg/m^3 or less. A design value is only valid if minimum data completeness criteria are met.

The 24-hour $PM_{2.5}$ design values for counties in the Youngstown area are shown in Table 3. Mahoning County, Ohio is in violation of the 2006 $PM_{2.5}$ air quality standards. Trumbull County, Ohio had a 2004-2006 design value above the standard, but its 2005-2007 design value shows it now meets the standards. There is no air quality data for Columbiana County, Ohio and Mercer County, Pennsylvania. There are violations in nearby counties that are in other nonattainment areas. However, the absence of a violating monitor alone is not a sufficient reason to eliminate counties as candidates for nonattainment status. Each county has been evaluated based on the weight of evidence of the nine factors and other relevant information.

Table 3. Air Quality Data

County	State Recommended Nonattainment?	Design Values 2004-2006	Design Values 2005-2007
Trumbull, OH	Yes	36	35
Mahoning, OH	Yes	37	36
Columbiana, OH	No		
Mercer, PA	No		
Jefferson, OH	Other	43	40
Beaver, PA	Other	45	43
Lawrence, PA	Other		
Portage, OH	Other	34	35

For purposes of its review, EPA used data available from the Chemical Speciation Network and the Interagency Monitoring of Protected Visual Environments (IMPROVE) network to estimate the composition of fine particle mass on days with the highest fine particle concentrations. Analysis of these data indicates that the days with the highest fine particle concentrations in the Youngstown area occur about 63% in the warm season and 38% in the cool season. In the warm season, the average chemical composition of the highest days is 70% sulfate, no nitrate, 24% carbon, and 6% crustal. In the cool season, the average chemical composition of the highest days is 26% sulfate, 29% nitrate, 37% carbon, and 7% crustal. These data indicate that sources of SO_2, NOx, and direct $PM_{2.5}$ emissions contribute to violations in the area.

Factor 3: Population density and degree of urbanization (including commercial development)

Table 4 shows the 2005 population for each county in the area being evaluated, as well as the population density for each county in that area. Population data gives an indication of whether it is likely that population-based emissions might contribute to violations of the 24-hour $PM_{2.5}$ standards.

Table 4. Population

County	State Recommended Nonattainment?	2005 Population	2005 Population Density (pop/mi^2)

Trumbull, OH	Yes	218,672	345
Mahoning, OH	Yes	253,181	599
Columbiana, OH	No	110,636	207
Mercer, PA	No	119,115	175
Jefferson, OH	Other	70,631	172
Beaver, PA	Other	176,825	399
Lawrence, PA	Other	92,412	255
Portage, OH	Other	155,150	307

Mahoning and Trumbull Counties are the largest counties in the area. Columbiana and Mercer Counties each have about half the population of the larger two counties. The population density statistics reinforce this as Mahoning and Trumbull Counties densities are well larger that the densities of Columbiana and Mercer Counties.

Factor 4: Traffic and commuting patterns

This factor considers the number of commuters in each county who drive to another county within the Youngstown area, the percent of total commuters in each county who commute within or to the area, as well as the total Vehicle Miles Traveled (VMT) for each county in millions of miles (see Table 5). A county with numerous commuters is generally an integral part of an urban area and is likely contributing to fine particle concentrations in the area.

Table 5. Traffic and Commuting Patterns

County	State Recommended Nonattainment?	2005 VMT (10^6 mi)	Number Commuting to any violating counties	Percent Commuting to any violating counties	Number Commuting within/to statistical area	Percent Commuting within/to statistical area
Mahoning, OH	Yes	2,666	99,310	91	100,200	92
Trumbull, OH	Yes	2,153	85,820	88	85,870	88
Mercer, PA	No	1,302	44,370	87	44,270	87
Columbiana, OH	No	872	16,360	33	39,050	79
Lawrence, PA	Other	769	7,390	18	4,730	12
Portage, OH	Other	1,788	35,070	45	2,250	3
Beaver, PA	Other	1,522	48,250	60	970	1
Jefferson, OH	Other	684	21,140	74	730	3
Ashtabula, OH		1,182	720	2	670	2
Stark, OH	Other	3,049	141,890	80	1,980	1

The listing of counties on Table 5 reflects a ranking based on the number of people commuting to other counties. The four Youngstown area counties have a fair amount of commuting within the statistical area. Columbiana County, Ohio has a moderate amount of commuting to any violating county. The other three Youngstown area counties have more workers commuting to and a higher percent of commuting into any violating county. There is little commuting from other Ohio counties into the Youngstown area. This includes the minimal commuting from Ashtabula and Stark Counties which are adjacent to the Youngstown area. Thus, these data support treating Canton and Cleveland as separate urban areas.

Note: The 2005 VMT data used for tables 5 and 6 of the technical analysis have been derived using methodology such as that described in "Documentation for the 2005 Mobile National Emissions Inventory, Version 2," December 2008, prepared for the Emission Inventory Group, U.S. EPA. This document may be found at: ftp://ftp.epa.gov/EmisInventory/2005_nei/mobile_sector/documentation/2005_mobile_nei_version_2_report.pdf.

Factor 5: Growth rates and patterns

This factor considers population growth for 2000-2005 and growth in vehicle miles traveled for 1996-2005 for counties in Youngstown area, as well as patterns of population and VMT growth. A county with rapid population or VMT growth is generally an integral part of an urban area and likely to be contributing to fine particle concentrations in the area.

Table 6 below shows population, population growth, VMT, and VMT growth for counties that are included in the Youngstown area. Counties are listed in descending order based on VMT growth between 1996 and 2005.

Table 6. Population and VMT Growth and Percent Change

County	Population (2005)	Population % change (2000-05)	2005 VMT (10^6 mi)	VMT % change (1996-2005)
Mahoning, OH	253,181	-2	2,666	9
Trumbull, OH	218,672	-3	2,153	8
Portage, OH	155,150	2	1,788	6
Mercer, PA	119,115	-1	1,302	0
Beaver, PA	176,825	-2	1,522	0
Lawrence, PA	92,412	-2	769	-1
Columbiana, OH	110,636	-1	872	-2
Jefferson, OH	70,631	-4	684	-6

The population for most counties near Youngtown has been slightly declining from 2000 to 2005. The exception is a 2% population gain in Portage County, Ohio. Mahoning and Trumbull Counties, Ohio had the highest VMT growth in the area. Portage County, Ohio, in the Cleveland area, also had VMT growth. The other counties had either no change or a decrease in VMT during the 1996-2005 period.

Factor 6: Meteorology (weather/transport patterns)

For this factor, EPA considered data from National Weather Service instruments and other meteorological monitoring sites in the area. Wind direction and wind speed data for 2005-2007 were analyzed, with an emphasis on "high $PM_{2.5}$ days" for each of two seasons, an October-April "cold" season and a May-September "warm" season. These high days are defined as days where any FRM or FEM air quality monitors had 24-hour $PM_{2.5}$ concentrations above 95% on a frequency distribution curve of $PM_{2.5}$ 24-hour values.

For each air quality monitoring site, EPA developed a "pollution rose" to understand the prevailing wind direction and wind speed on the days with highest fine particle concentrations. The figure identifies 24-hour $PM_{2.5}$ values by color; days exceeding 35 $\mu g/m^3$ are denoted with a red or black icon. A dot indicates the day occurred in the warm season; a triangle indicates the day occurred in the cool season. The center of the figure indicates the location of the air quality monitoring site, and the location of the icon in relation to the center indicates the direction from which the wind was blowing on that day. An icon that is close to the center indicates a low average wind speed on that day. Higher wind speeds are indicated when the icon is further away from the center.

The pollution rose for the Youngstown area is provided as Figure 2. Winds on high concentration days show a slight tendency to come from the South to Southeast. Pittsburg, Pennsylvania is well to the Southeast and other nonattainment areas are well to the South. These areas may be part of the regional background. Overall, the winds come from a variety of directions. So, it is appropriate to consider counties in all directions from the violations.

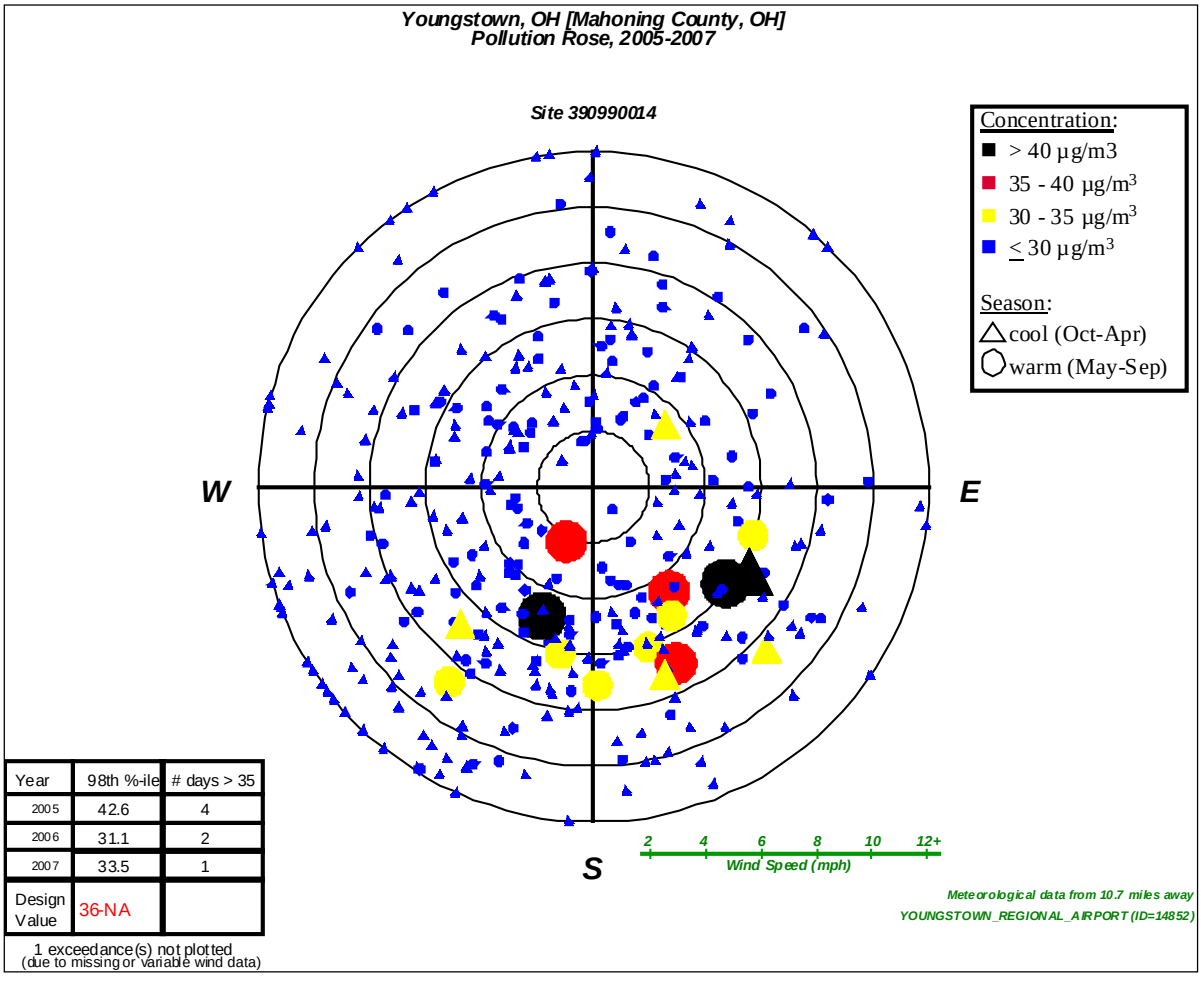


Figure 2

Note: the meteorology factor is also considered in each county's Contributing Emissions Score because the method for deriving this metric included an analysis of trajectories of air masses for high $PM_{2.5}$ days.

Factor 7: Geography/topography (mountain ranges or other air basin boundaries)

The geography/topography analysis evaluates the physical features of the land that might have an effect on the air shed and, therefore, on the distribution of $PM_{2.5}$ over the area.

The Youngstown area does not have any geographical or topographical barriers significantly limiting air-pollution transport within its air shed. Therefore, this factor did not play a significant role in the decision-making process.

Factor 8: Jurisdictional boundaries

In evaluating the jurisdictional boundary factor, EPA gave special consideration to areas that were already designated nonattainment in 2005 for violating the 1997 fine particle standards. However, this area was designated attainment for the 1997 standards, so nonattainment area boundaries for the 1997 standards were not a factor in determining this area's boundaries.

The Eastgate Regional Council of Governments (Eastgate) is the Metropolitan Planning Organization (MPO) for Mahoning and Trumbull Counties in Ohio. The Eastgate webpage is found at http://www.eastgatecog.org/. The Northeast Ohio Area wide Coordinating Agency (NOACA) is the Cleveland MPO for Cuyahoga, Geauga, Lake (Ohio), Lorain, and Medina Counties.

The Youngstown ozone maintenance area consists of Columbiana, Mahoning, and Trumbull in Ohio and Mercer in Pennsylvania.

Factor 9: Level of control of emission sources

Under this factor, the existing level of control of emission sources is taken into consideration. The emissions data used by EPA in this technical analysis and provided in Table 1 under Factor 1 represent emissions levels taking into account any control strategies implemented in the Youngstown area before 2005 on stationary, mobile, and area sources. Data are presented for $PM_{2.5}$ components that are directly emitted, carbonaceous $PM_{2.5}$ and crustal $PM_{2.5}$, and for pollutants which react in the atmosphere to form fine particles such as SO_2, NOx, VOC, and ammonia.

In considering county-level emissions, EPA used data from the 2005 National Emissions Inventory, the most updated version of the national inventory available at the beginning of the designations process in late 2007. However, EPA recognized that for certain counties, emissions may have changed since 2005. For example, certain power plants or large sources of emissions in or near this area may have installed emission controls or otherwise significantly reduced emissions since 2005. Some States provided updated

information on emissions and emission controls in their comments to EPA. EPA considered such additional information in making final designation decisions.

With regard to nearby power plants, EPA considered information about whether a specific plant installed federally enforceable emission controls by December 2008 resulting in significant emissions reductions. A control requirement is considered to be federally-enforceable if it is required by a State regulation adopted in a State implementation plan, if it is included in a federally-enforceable Title V operating permit, or if it is required by a consent decree which also requires the controls to be included in federally enforceable permit upon termination of the consent decree. In making final decisions, EPA also considered whether a facility would continue to emit pollutants which contribute to $PM_{2.5}$ exceedances even after emission controls are operational.

Ohio did not provide other information regarding power plants or any other large sources in the Youngstown area.

OhioEPA
State of Ohio Environmental Protection Agency

STREET ADDRESS:
Lazarus Government Center
50 W. Town St., Suite 700
Columbus, Ohio 43215

TELE: (614) 644-3020 FAX: (614) 644-3184
www.epa.state.oh.us

MAILING ADDRESS:
P.O. Box 1049
Columbus, OH 43216-1049

DEC 9 2008

Ms. Cheryl L. Newton
Director, Air and Radiation Division
Attn.: R-19J
U.S. EPA, Region 5
77 West Jackson Blvd.
Chicago, Illinois 60604

Re: Intended Designations for the 2006 Fine Particulate Matter Air Quality Standards: Supplemental information for Ashtabula County

Dear Director Newton:

On August 18, 2008, Ohio EPA received your letter and detailed description of areas where EPA intends to modify Ohio's recommendations on air quality designations for the 2006 24-hour $PM_{2.5}$ standards. On October 15, 2008 Ohio EPA sent you its comments on these proposed designations. Ohio EPA would like to take this opportunity to provide supplemental information which we believe further justifies a conclusion that emissions in Ashtabula Township (Ashtabula Co.) are and will remain low enough to warrant a designation of attainment for the 2006 24-hour PM2.5 standards.

First Energy Generation Corp. was issued a Title V permit for its power generating facility located in Ashtabula, Ohio on January 13, 2003. Until May 2006, the First Energy complex was comprised of emission sources divided in Plant A/B and Plant C. On May 24, 2006, Plant C was sold to the Ashtabula County Port Authority (ACPA). Ohio EPA received notification of the sale of Plant C on September 21, 2006 and their intent to operate only the water pumping station (see attached letter). Plant C also contained three coal-fired utility boilers (for electric generation) which are the subject of this letter. ACPA indicated that the boilers had not operated in years, were inactive and that ACPA did not have any plans to reactivate these units. ACPA requested Ohio EPA provide confirmation that no permit for the remaining insignificant emissions units would be necessary. Most importantly, ACPA recognized in their letter that if the emissions units ever were to be reactivated, ACPA would proceed through the appropriate new source review (NSR) process and obtain the appropriate permit(s).

On January 28, 2007 Ohio EPA received a letter from First Energy confirming the change in ownership of Plant C, ACPA's intention of no longer operating the boilers, and requested all emissions units no longer under their control be removed from the Title V permit (see attached).

Because Plant A/B and Plant C were authorized operation through one Title V permit, when a portion of the plant changed ownership both parties were obligated to operate their portion of the property in accordance with the terms of the Title V permit until such time Ohio EPA modified the permit or identified them as permanently shutdown. This included the obligation to submit appropriate applications for revisions if changes to the equipment under each respective owner changed and the obligation for each owner to submit a separate renewal application. However, based on the above information and additional discussions between Ohio EPA and each facility, we identified in our permitting system that these emissions units were permanently shutdown.

First Energy submitted an application to renew their Title V permit, on July 12, 2007, which did not include any emissions units from Plant C. Subsequently the Title V permit expired on January 13, 2008. Their renewal permit has not been issued to date. Because they submitted their application within the regulatory time frame, First Energy is able to continue to operate under their expired Title V permit under an "application shield". Ohio EPA did not receive a renewal application from ACPA. Therefore, the portion of the Title V permit applicable to ACPA, the owner of Plant C, expired on January 13, 2008. ACPA has no legal authority to operate any units under the expired Title V permit.

It is important to clarify that in order for ACPA to startup these units, NSR would be applicable. This fact, coupled with the expiration of their portion of the Title V permit, ensure that ACPA has no legal authority to reactivate the boilers of concern. In conclusion, based on the permanent closure of Plant C, we are recommending U.S. EPA designate Ashtabula Township (Ashtabula Co.) attainment for the 2006 24-hour PM2.5 standard.

I appreciate the opportunity to provide additional information and will work cooperatively with USEPA Region 5 staff as we both review new ambient data, including 2008 data, and USEPA prepares their announcement on their intended designations. If you have any questions concerning these recommendations, please feel free to contact Jennifer Hunter of the Division of Air Pollution Control at (614) 644-3696.

Sincerely,

Robert Hodanbosi
Chief, Division of Air Pollution Control

Enclosures

FirstEnergy
Generation Corp.

76 South Main St.
Akron, Ohio 44308

1-800-633-4766

January 18, 2007

RECEIVED
JAN 25 2007
OHIO EPA NEDO

Mr. Michael Ahern, Permits Supervisor
Ohio Environmental Protection Agency
Lazarus Government Center
122 South Front Street
Columbus, Ohio 43215

Re: Transfer of Ownership of Ashtabula C Plant – Impact on Title V Permit

Dear Mr. Ahern:

FirstEnergy Generation Corp is the holder of a Title V Permit (02-04-01-0000) to operate air emission sources located at the Ashtabula Plant, 2133 Lake Road in Ashtabula, Ohio. Seven non-insignificant and nine insignificant air emission sources located on contiguous properties are covered under this Title V permit. These properties are designated as Ashtabula A/B and Ashtabula "C" Plants (hereafter referred to as AT-C).

In May, 2006, the AT-C Plant was sold to a new owner, the Ashtabula County Port Authority. This letter provides written confirmation of the change in ownership for the AT-C air emission sources and requests that you revise the appropriate permit information. Attached in accordance with OAC 3745-77-01(C)(4) is a letter from the Port Authority to Ohio EPA's NEDO documenting the "specific date for transfer of permit responsibility, coverage, and liability between the current and new permit holder," and their intent to operate the facility as a water pumping station. With the exception of the roads/ parking areas, these coal-fired utility sources will remain inactive. (The roads/parking areas are *insignificant* emission sources:) Also, attached is a spreadsheet listing each Title V air emission source at the Ashtabula Plant. The AT-C emission sources have been highlighted (in blue) for easy identification of which sources should be removed from the permit.

Please note that while the AT-C Plant has been transferred to a new owner and will no longer operate as an electric generating plant, FirstEnergy Generation Corp retains the rights to any allowances, offset emission credits or other credits associated with the non-insignificant AT-C emission sources and will continue to operate the remaining air emission sources under the Ashtabula Title V Permit (see attached spreadsheet).

The Ashtabula Title V permit expires on January 13, 2008. Updated Starship files documenting the removal of the Ashtabula C emission units are being submitted during this application renewal process.

Please call me at (330) 761-4482 or Gail Twymon at (330) 761-4487 if there are any questions.

Sincerely,

Raymond L. Evans, P. E.
Designated Representative

MGT
cc/enc:

K. Djukic	(OEPA, NEDO)
C. F. Hartle	(Baker Engineering & Energy)
J. Palo	(Ashtabula County Port Authority)
R. G. Myers	
W. C. Shears	
F. J. Starheim	
D. J. Weber	
M. R. Widdersheim	(Baker Engineering & Energy)
L. A. Wrightnour	

FIRSTENERGY CORP - AIR PERMIT SOURCE TRANSFER LIST

FirstEnergy Generation Corp - Ashtabula Plant Title V Permit - Air Emission Sources

			Title V Permits		*Non-Insignificant*			
Operating Company Name	Facility Name	Facility Location	Facility ID No.	Emissions Unit ID No.	Equipment Description	Current Contact Person	Contact Mailing Address	Expiration Date
FirstEnergy Generation Corp	Ashtabula	2133 Lake Road Ashtabula, OH 44004-0000	02-04-01-0000	B008	Blr 7 - coal-fired 2333 mmBtu/hr	M. G. Twymon	76 S. Main Street Akron, OH 44308	1/13/2008
FirstEnergy Generation Corp	Ashtabula	2133 Lake Road Ashtabula, OH 44004-0000	02-04-01-0000	B009	PB 2 - gas fired 197.6 mmBtu/hr	M. G. Twymon	76 S. Main Street Akron, OH 44308	1/13/2008
[redacted]								
FirstEnergy Generation Corp	Ashtabula	2133 Lake Road Ashtabula, OH 44004-0000	02-04-01-0000	F001	"A" Plant - Paved Rds/Pkg	M. G. Twymon	76 S. Main Street Akron, OH 44308	1/13/2008
FirstEnergy Generation Corp	Ashtabula	2133 Lake Road Ashtabula, OH 44004-0000	02-04-01-0000	F002	Coal Pile	M. G. Twymon	76 S. Main Street Akron, OH 44308	1/13/2008
			Title V Permits		*Insignificant*			
Operating Company Name	Facility Name	Facility Location	Facility ID No.	Emissions Unit ID No.	Equipment Description	Current Contact Person	Contact Mailing Address	Expiration Date
FirstEnergy Generation Corp	Ashtabula	2133 Lake Road Ashtabula, OH 44004-0000	02-04-01-0000	F003	"A" Plant - Coal Handling	M. G. Twymon	76 S. Main Street Akron, OH 44308	1/13/2008
[redacted]								
FirstEnergy Generation Corp	Ashtabula	2133 Lake Road Ashtabula, OH 44004-0000	02-04-01-0000	P501	"A" Plant - Ash Handling	M. G. Twymon	76 S. Main Street Akron, OH 44308	1/13/2008
FirstEnergy Generation Corp	Ashtabula	2133 Lake Road Ashtabula, OH 44004-0000	02-04-01-0000	T003	30,000 gal. No. 2 oil Tank #3	M. G. Twymon	76 S. Main Street Akron, OH 44308	1/13/2008
FirstEnergy Generation Corp	Ashtabula	2133 Lake Road Ashtabula, OH 44004-0000	02-04-01-0000	Z001	335 Hp Emerg. Diesel Fire Pump	M. Gail Twymon	76 S. Main Street Akron, OH 44308	1/13/2008
FirstEnergy Generation Corp	Ashtabula	2133 Lake Road Ashtabula, OH 44004-0000	02-04-01-0000	Z002	12,000 gal No. 2 oil Tank #4	M. G. Twymon	76 S. Main Street Akron, OH 44308	1/13/2008
FirstEnergy Generation Corp	Ashtabula	2133 Lake Road Ashtabula, OH 44004-0000	02-04-01-0000	Z003	7,000 gal. No. 2 oil Tank #5	M. G. Twymon	76 S. Main Street Akron, OH 44308	1/13/2008
FirstEnergy Generation Corp	Ashtabula	2133 Lake Road Ashtabula, OH 44004-0000	02-04-01-0000	Z004	7,000 gal. No. 2 oil Tank #6	M. G. Twymon	76 S. Main Street Akron, OH 44308	1/13/2008
FirstEnergy Generation Corp	Ashtabula	2133 Lake Road Ashtabula, OH 44004-0000	02-04-01-0000	Z005	7,000 gal. turbine lube oil Tank #7	M. G. Twymon	76 S. Main Street Akron, OH 44308	1/13/2008
			Title V Permits		*Permanently Shutdown*			
Operating Company Name	Facility Name	Facility Location	Facility ID No.	Emissions Unit ID No.	Equipment Description	Current Contact Person	Contact Mailing Address	Expiration Date
FirstEnergy Generation Corp	Ashtabula	2133 Lake Road Ashtabula, OH 44004-0000	02-04-01-0000	B005	Oil-fired boiler for electric generation	M. G. Twymon	76 S. Main Street Akron, OH 44308	-
FirstEnergy Generation Corp	Ashtabula	2133 Lake Road Ashtabula, OH 44004-0000	02-04-01-0000	B006	Oil-fired boiler for electric generation	M. G. Twymon	76 S. Main Street Akron, OH 44308	-
FirstEnergy Generation Corp	Ashtabula	2133 Lake Road Ashtabula, OH 44004-0000	02-04-01-0000	B007	Package Blr #1 for space heat	M. G. Twymon	76 S. Main Street Akron, OH 44308	-
FirstEnergy Generation Corp	Ashtabula	2133 Lake Road Ashtabula, OH 44004-0000	02-04-01-0000	B102	Blr #9 - coal-fired 560 mmBtu/hr	M. G. Twymon	76 S. Main Street Akron, OH 44308	-
FirstEnergy Generation Corp	Ashtabula	2133 Lake Road Ashtabula, OH 44004-0000	02-04-01-0000	T001	4M gal oil tank	M. G. Twymon	76 S. Main Street Akron, OH 44308	-
FirstEnergy Generation Corp	Ashtabula	2133 Lake Road Ashtabula, OH 44004-0000	02-04-01-0000	T002	4M gal oil tank	M. G. Twymon	76 S. Main Street Akron, OH 44308	-

*Highlighted "C" Plant sources have been sold with property to Ashtabula County Port Authority. These sources to be removed from Ashtabula Title V Permit.

Ashtabula County Port Authority

September 21, 2006

Mr. Ken Djukic
Ohio EPA Northeast District Office
Division of Air Pollution Control
2110 E. Aurora Road
Twinsburg, OH 44087

Re: Air Emission Source Ownership Transfer:
First Energy "Plant C" to Ashtabula County Port Authority

Mr. Djukic:

First Energy Generation Corp. (First Energy) currently maintains a Title V Operating Permit (Facility ID: 02-04-01-0000) for its power generating facility located at 2133 Lake Road East in Ashtabula, Ohio. The First Energy complex is comprised of three areas: Plant A, Plant B and Plant C. On May 24, 2006, First Energy completed the sale of the Plant C property and associated infrastructure, a former coal-fired power generation facility, to the Ashtabula County Port Authority (ACPA). Presently, ACPA operates only a pumping station that supplies Lake Erie water to area industrial facilities for use as non-contact cooling water and other non-potable uses. A small wastewater treatment facility also is maintained on site by ACPA to treat low-volume wastewaters that may be generated during pumping operations.

Air emission sources at Plant C, as listed in the First Energy Title V Operating Permit, include:

Emissions Unit ID	Emissions Unit Activity Description	Status
B101 (Boiler #8)	Coal-fired utility boiler for electric generation – 550 mmbtu/hr	Inactive
B103 (Boiler #10)	Coal-fired utility boiler for electric generation – 550 mmbtu/hr	Inactive
B104 (Boiler #11)	Coal-fired utility boiler for electric generation – 550 mmbtu/hr	Inactive
F101	Plant roadways and parking lots at "C" Plant	Active – Insignificant
P101	Coal handling at "C" Plant	Inactive
P102	Ash handling at "C" Plant	Inactive

In previous discussions with ACPA, First Energy indicated that they will be petitioning the Division of Air Pollution Control (DAPC) to remove these sources from their Title V Operating Permit. With the exception of the plant roadways and parking lots (determined by OEPA to be "insignificant emission units" in the First Energy Title V Operating Permit), the remaining air emission sources at Plant C are inactive and have been for several years. ACPA has no

immediate or near-term plans to re-activate these sources. Only "insignificant emission units" associated with the plant roadways and parking lots will remain in use. It is ACPA's opinion that no further air permitting (Title V or minor source) is warranted for ACPA operations at Plant C. Therefore, ACPA respectfully requests a written determination by OEPA that the Plant C facility does not require an air quality operating permit.

In the future should operations at the site change, necessitating the re-activation of these sources or installation of additional air emission sources, ACPA will work with DAPC to apply for and obtain Permits to Install and Operate, as required by OEPA. If you have any questions regarding the transfer of ownership and associated air emission sources, please do not hesitate to call me at 440.576.6069.

Sincerely,

John Palo

Mr. John Palo
President, Ashtabula County Port Authority