4.0 Analyses of Individual Nonattainment Areas

4.3 Region 3 Nonattainment Areas

4.3.4 West Virginia

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

The table below identifies the counties in West Virginia 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	West Virginia Recommended Nonattainment Counties	EPA's Designated Nonattainment Counties
Charleston	Putnam County Kanawha County	Putnam County Kanawha County
Huntington-Ashland	None	Cabell County Wayne County Mason County (partial)
Morgantown	None	Monongalia County - Newly violating area with 2005 to 2007 data
Parkersburg-Marietta	None	Pleasants County (partial) Wood County
Steubenville-Weirton	Brooke County Hancock County	Brooke County Hancock County

EPA has designated the remaining counties in the state as "attainment/unclassifiable."

[1] EPA designated nonattainment areas for the 1997 fine particle standards in 2005. In 2006, the 24-hour $PM_{2.5}$ 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 $PM_{2.5}$ remained unchanged at 15 micrograms per cubic meter (average of annual averages for 3 consecutive years).

EPA Technical Analysis for the Charleston Area

Introduction

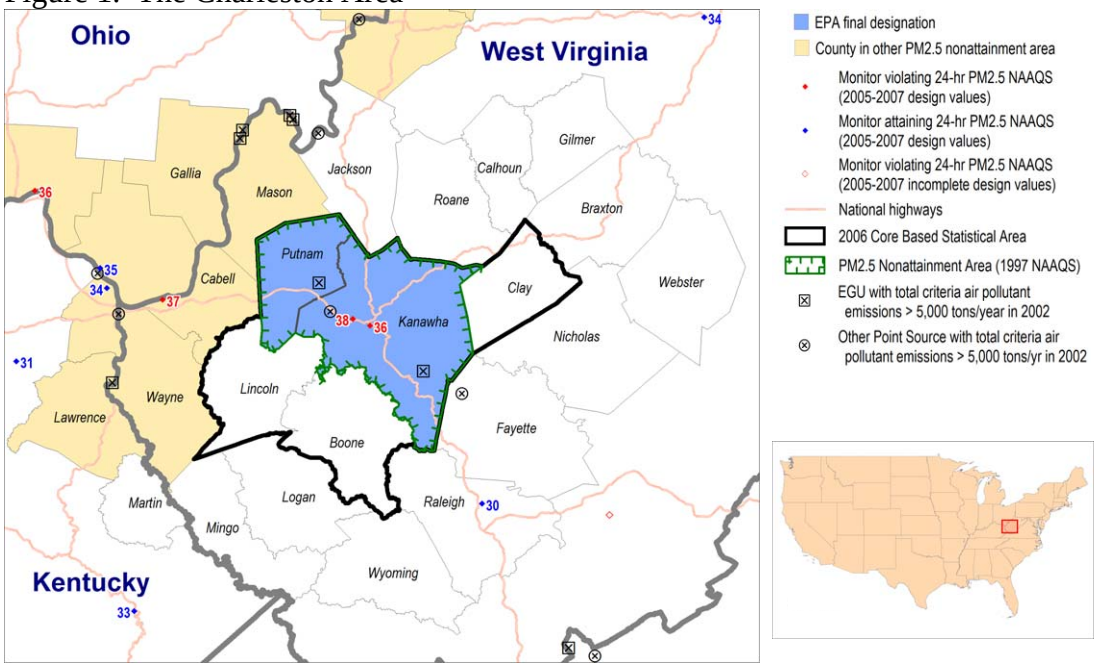
Pursuant to section 107(d) of the Clean Air Act, EPA must designate as nonattainment those areas that violate the NAAQS and those nearby areas that contribute to violations. This technical analysis for the Charleston area identifies the counties with monitors that violate the 2006 24-hour $PM_{2.5}$ standard and evaluates nearby counties for contributions to fine particle concentrations in the area. EPA has evaluated these counties based on the weight of evidence of the following nine factors recommended in EPA guidance and any other relevant information:

- pollutant emissions
- air quality data
- population density and degree of urbanization
- traffic and commuting patterns
- growth
- meteorology
- geography and topography
- jurisdictional boundaries
- level of control of emissions sources

We also used analytical tools and data such as pollution roses, fine particle composition monitoring data, back trajectory analyses, and the contributing emission score (CES) to evaluate these areas. (See additional discussion of the CES under Factor 1 below.)

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

Figure 1. The Charleston Area



For this area, EPA previously established $PM_{2.5}$ nonattainment boundaries for the 1997 $PM_{2.5}$ NAAQS that included two full counties, Putnam and Kanawha Counties, both located in West Virginia.

In November 2007, the State of West Virginia recommended that the same counties be designated as "nonattainment" for the 2006 24-hour $PM_{2.5}$ standard based on air quality data from 2004-2006. See the November 9, 2007 letter from the West Virginia Department of Environmental Protection to EPA. These data are from Federal Reference Method (FRM) monitors located in the state.

In August 2008, EPA notified West Virginia of its intended designations. In this letter, EPA also requested that if West Virginia 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 has designated Putnam and Kanawha Counties, the same counties as previously designated for the 1997 $PM_{2.5}$ NAAQS as nonattainment for the 2006 24-hour $PM_{2.5}$ air quality standard as part of the Charleston nonattainment area, based upon currently available information. These counties are listed in the table below.

Charleston Area	State-Recommended Nonattainment Counties	EPA Final Designated Nonattainment Counties within Region III
West Virginia	Putnam County Kanawha County	Putnam County Kanawha County

The following is a technical analysis for the Charleston 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, sulfur dioxide (SO_2), nitrogen oxides (NO_x), volatile organic compounds (VOCs), and ammonia (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 and NH_3 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 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 summary of the CES is included in Attachment 2, and 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 Charleston area. Counties that are part of the Charleston nonattainment area for the 1997 $PM_{2.5}$ NAAQS are shown in boldface. Counties are listed in descending order by CES.

Table 1. $PM_{2.5}$ Related Emissions and Contributing Emissions Score

County, State	State Recommended Nonattainment?	CES	$PM_{2.5}$ emissions total (tpy)	$PM_{2.5}$ emissions carbon (tpy)	$PM_{2.5}$ emissions other (tpy)	SO_2 (tpy)	NOx (tpy)	VOCs (tpy)	NH_3 (tpy)
Kanawha, WV	**Yes**	**100**	**2,016**	**857**	**1,159**	**21,633**	**23,985**	**15,652**	**527**
Putnam, WV	**Yes**	**81**	**4,838**	**468**	**4,370**	**113,590**	**37,387**	**3,117**	**106**
Mason, WV	No	20	3,528	305	3,222	82,856	24,561	2,496	237
Gallia, OH	No	11	7,087	499	6,588	100,704	59,035	1,939	327
Cabell, WV	No	10	1,082	434	649	4,355	10,644	5,878	181
Boone, WV	No	7	299	133	165	103	1,281	1,423	154
Fayette, WV	No	7	633	263	368	3,595	4,514	2,887	121
Jackson, WV	No	6	817	188	629	3,326	3,036	2,327	164
Wayne, WV	No	6	657	446	210	1,041	7,619	2,577	70
Raleigh, WV	No	5	675	324	352	349	3,395	4,462	141
Lawrence, KY	No	3	2,567	199	2,368	50,239	13,761	932	90
Lincoln, WV	No	3	217	90	129	48	568	879	51
Logan, WV	No	3	298	142	157	101	981	1,867	53
Clay, WV	No	2	145	50	95	44	311	513	27
Nicholas, WV	No	2	313	129	184	170	1,057	1,828	83
Roane, WV	No	2	158	57	100	86	600	916	100
Braxton, WV	No	1	269	105	164	243	1,701	1,323	83
Calhoun, WV	No	1	102	27	75	37	793	498	33
Mingo, WV	No	1	308	140	168	228	2,890	1,352	35
Wyoming, WV	No	1	465	115	351	340	3,099	1,681	47
Gilmer, WV	No	0	116	36	80	83	1,096	800	48
Martin, KY	No	0	199	70	129	174	863	518	23
Webster, WV	No	0	116	37	79	65	214	387	36

Based upon the above data, Kanawha County, WV, has the highest CES (100). As mentioned above, Kanawha County is also the location of the only violating monitors in the Charleston area. Of the twenty-three counties in this analysis, Kanawha County, WV, has the fifth highest $PM_{2.5\text{-total}}$ and SO_2 emissions, and the fourth highest NOx emissions. Putnam County, which is adjacent to Kanawha, has the second highest CES (81). Putnam County has the highest SO_2 emissions, and the second highest total $PM_{2.5}$ and NOx emissions. Other counties in this analysis have relatively low CES values, twenty and lower.

Gallia County, OH (CES = 11) has the second highest SO_2 emissions, and the highest total $PM_{2.5}$ NOx emissions. Mason County, WV (CES = 20) has the third highest SO_2, total $PM_{2.5}$, and NOx emissions. Lawrence County, KY (CES= 3) has the fourth highest SO_2 and total $PM_{2.5}$ emissions, and the fifth highest NOx emissions. Portions of Gallia, Mason, and Lawrence Counties are

included in the Huntington-Ashland nonattainment area for the 1997 $PM_{2.5}$ NAAQS. EPA is designating the West Virginia portion of the Huntington-Ashland nonattainment area for the 2006 $PM_{2.5}$ NAAQS to include Cabell and Wayne Counties and a portion of Mason County (Graham Tax District). (See the "EPA Technical Analysis for the Huntington-Ashland, West Virginia Area.").

The remaining counties in this analysis have relatively low emissions when compared to Putnam, Kanawha, Gallia, Mason, and Lawrence Counties.

Factor 2: Air quality data

This factor considers the 24-hour $PM_{2.5}$ design values in micrograms per cubic meter ($\mu g/m^3$) for air quality monitors in counties in the Charleston 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 2006 24-hour $PM_{2.5}$ standard is met when the 3-year average of a monitor's 98^{th} percentile values is 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 Charleston area are shown in Table 2, below, with the current 1997 $PM_{2.5}$ nonattainment area appearing in bold.

Table 2. Air Quality Data

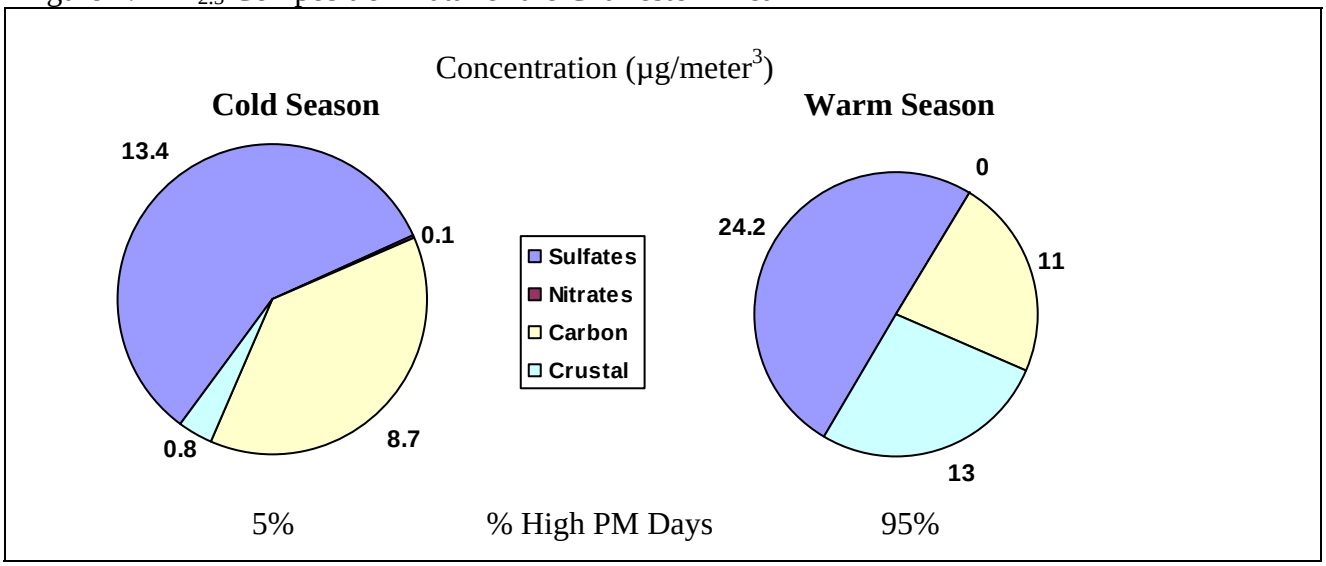
County, State	State Recommended Nonattainment?	Daily Design Values 2003-05 ($\mu g/m^3$)	Daily Design Values 2004-06 ($\mu g/m^3$)	Daily Design Values 2005-07 ($\mu g/m^3$)
Kanawha, WV	**Yes**	**36**	**37**	**38**
Putnam, WV	**Yes**	**No monitor**		
Mason, WV	No	No monitor		
Gallia, OH	No	No monitor		
Cabell, WV	No	35	34	37
Boone, WV	No	No monitor		
Fayette, WV	No	No monitor		
Jackson, WV	No	No monitor		
Wayne, WV	No	No monitor		
Raleigh, WV	No	31	31	30
Lawrence, KY	No	No monitor		
Lincoln, WV	No	No monitor		
Logan, WV	No	No monitor		
Clay, WV	No	No monitor		
Nicholas, WV	No	No monitor		
Roane, WV	No	No monitor		
Braxton, WV	No	No monitor		
Calhoun, WV	No	No monitor		
Mingo, WV	No	No monitor		
Wyoming, WV	No	No monitor		
Gilmer, WV	No	No monitor		
Martin, KY	No	No monitor		
Webster, WV	No	No monitor		

Based upon the above data, Kanawha and Cabell Counties have monitors which show violations of the 2006 24-hour $PM_{2.5}$ standard. Therefore, Kanawha County in included in the Charleston nonattainment area. However, Cabell County is in the Huntington-Ashland nonattainment area for the 1997 $PM_{2.5}$ NAAQS and the 2006 24-hour $PM_{2.5}$ NAAQS. See the "EPA Technical Analysis for the Huntington-Ashland Area."

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.

Under this factor, we also consider fine particle composition monitoring data. Air quality monitoring data on the composition of fine particle mass are available from the EPA Chemical Speciation Network and the IMPROVE monitoring network. Analysis of these data indicates that the days with the highest fine particle concentrations occur predominantly in the summer, and the average chemical composition is illustrated in Figure 2, below. This data indicates that sources of SO_2, direct $PM_{2.5}$ carbon, and crustal emissions are key contributors to exceedances in the area.

Figure 2. $PM_{2.5}$ Composition Data for the Charleston Area



Note: Eligible monitors for providing design value data generally include State and Local Air Monitoring Stations (SLAMS) at population-oriented locations with an FRM monitor. All data from Special Purpose Monitors (SPM) using an FRM is eligible for comparison to the relevant NAAQS, subject to the requirements given in the October 17, 2006 Revision to Ambient Air Monitoring Regulations (71 FR 61236). All monitors used to provide data must meet the monitor siting and eligibility requirements given in 71 FR 61236 to 61328 in order to be acceptable for comparison to the 2006 24-hr $PM_{2.5}$ NAAQS for designation purposes.

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

Table 3 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 2006 24-hour $PM_{2.5}$ standard.

Table 3. Population

County, State	State Recommended Nonattainment?	2005 Population	2005 Population Density (people/sq mi)
Kanawha, WV	**Yes**	**193,413**	**212**
Putnam, WV	**Yes**	**54,389**	**155**
Mason, WV	No	25,763	58
Gallia, OH	No	31,241	68
Cabell, WV	No	93,988	327
Boone, WV	No	25,613	51
Fayette, WV	No	46,558	70
Jackson, WV	No	28,306	60
Wayne, WV	No	41,959	82
Raleigh, WV	No	79,186	130
Lawrence, KY	No	16,162	39
Lincoln, WV	No	22,446	51
Logan, WV	No	36,216	80
Clay, WV	No	10,318	30
Nicholas, WV	No	26,369	40
Roane, WV	No	15,445	32
Braxton, WV	No	14,856	29
Calhoun, WV	No	7,367	26
Mingo, WV	No	27,165	64
Wyoming, WV	No	24,397	49
Gilmer, WV	No	6,962	20
Martin, KY	No	12,200	53
Webster, WV	No	9,739	18

Based upon the above data, Kanawha County has the highest population and the second highest population density of all the counties in this analysis. Cabell County, which is part of the Huntington-Ashland nonattainment area for the 1997 $PM_{2.5}$ NAAQS, has the second highest population, but the highest population density. EPA's designation of the West Virginia portion of the Huntington-Ashland nonattainment area for the 2006 $PM_{2.5}$ NAAQS includes Cabell County. See the "EPA Technical Analysis for the Huntington-Ashland Area." Putnam County has the third highest population density and the fourth highest population. Raleigh County has third highest population and the fourth highest population density. All other counties have lower populations, under 50,000, and population densities under one hundred.

Factor 4: Traffic and commuting patterns

This factor considers the number of commuters in each county who drive to another county within the Charleston area (See Figure 1), the percent of total commuters in each county who commute to other counties within the Charleston area, as well as the total Vehicle Miles Traveled (VMT) for

each county in millions of miles (see Table 4). 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.

The listing of counties in Table 4 reflects a ranking based on the number of people commuting to other counties. For example, this data indicates that 80,360 people from Kanawha County commute to counties in the Charleston area which have violating monitors (or "violating counties"). Of those 80,360 commuters, 79,906 work in Kanawha County. This indicates that residents of Kanawha County who commute within this county may be contributing to the 24-hour $PM_{2.5}$ design values for Kanawha County, which are set forth in Table 2 (under Factor 2). Other residences of Kanawha County commute to other violating counties, such as Cabell County, West Virginia. The counties that are in the nonattainment area for the 1997 $PM_{2.5}$ NAAQS are shown in boldface.

Table 4. Traffic and Commuting Patterns

County, State	State Recommended Nonattainment?	2005 VMT (millions of miles)	Number commuting into any violating counties	Percent commuting into any violating counties	Number commuting into & within statistical area	Percent commuting into & within statistical area
Kanawha, WV	**Yes**	**2,711**	**80,360**	**92**	**84,080**	**96**
Putnam, WV	**Yes**	**547**	**12,760**	**55**	**21,160**	**91**
Mason, WV	No	249	1,080	12	760	8
Gallia, OH	No	247	290	2	130	1
Cabell, WV	No	1,230	34,640	86	3,880	10
Boone, WV	No	302	2,910	34	7,700	91
Fayette, WV	No	617	1,890	12	2,160	14
Jackson, WV	No	444	2,070	19	2,190	20
Wayne, WV	No	438	7,090	45	420	3
Raleigh, WV	No	1,088	660	2	1,700	6
Lawrence, KY	No	159	240	5	50	1
Lincoln, WV	No	147	3,200	46	4,930	71
Logan, WV	No	335	850	7	1,730	15
Clay, WV	No	104	910	30	2,420	79
Nicholas, WV	No	333	100	1	210	3
Roane, WV	No	166	1,260	24	1,360	26
Braxton, WV	No	355	320	7	380	8
Calhoun, WV	No	51	150	6	230	10
Mingo, WV	No	282	100	1	210	3
Wyoming, WV	No	207	40	1	540	8
Gilmer, WV	No	53	10	0	60	3
Martin, KY	No	150	29	1	4	0
Webster, WV	No	63	20	1	20	1
NOTE: The Charleston Metropolitan Statistical Area (MSA) was changed in June 2003 from Kanawha and Putnam Counties to included Boone, Clay, and Lincoln Counties along with Kanawha and Putnam Counties. As of November 2007, the Charleston MSA remains those five counties.						

Note: The 2005 VMT data used for Tables 4 and 5 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

Based upon the above data, Kanawha County (CES=100) has the highest VMT, the highest number of people commuting into a violating county and the highest number commuting into the Charleston MSA. Putnam County (CES=81) has the second highest number of people commuting into a violating county and the second highest number commuting into the Charleston MSA, but due to its lower population, only the fourth highest VMT. The vast majority of Kanawha and Putman Counties' commuters travel within those two counties (over 84,000 from Kanawha County and over 21,000 from Putnam County), and not the other three counties in the MSA. Note that 11,367 Putnam County residents commute to Kanawha County.

The above data also indicates that Cabell (CES=10) and Raleigh (CES=5) Counties have the second and third highest VMT in this analysis; however, the VMT for each of these counties is half that of Kanawha County. Furthermore, compared to Kanawha and Putman Counties, both Cabell and Raleigh Counties have few commuters into the Charleston MSA.

An analysis of the data for Boone (CES=7), Lincoln (CES=3) and Clay (CES=2) Counties, which are part of the Charleston MSA, reveals that these counties have relatively low VMT, when compared to Kanawha and Putman Counties, as well as many other counties in this analysis.

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 Charleston 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 is likely to be contributing to fine particle concentrations in the area.

Table 5 below shows population, population growth, VMT, and VMT growth for counties that are included in the Charleston area. The counties that are in the nonattainment area for the 1997 $PM_{2.5}$ NAAQS are shown in boldface.

Table 5. Population and VMT Values and Percent Change

Location	Population (2005)	Population Density (2005)	Population % change (2000 - 2005)	2005 VMT (millions of miles)	VMT % change (1996 - 2005)
Kanawha, WV	**193,413**	**212**	**(3)**	**2,711**	**14**
Putnam, WV	**54,389**	**155**	**5**	**547**	**14**
Mason, WV	25,763	58	(1)	249	36
Gallia, OH	31,241	68	1	247	0
Cabell, WV	93,988	327	(3)	1,230	41
Boone, WV	25,613	51	1	302	49
Fayette, WV	46,558	70	(2)	617	23
Jackson, WV	28,306	60	1	444	(7)
Wayne, WV	41,959	82	(2)	438	47
Raleigh, WV	79,186	130	0	1,088	12
Lawrence, KY	16,162	39	4	159	11
Lincoln, WV	22,446	51	1	147	(24)
Logan, WV	36,216	80	(4)	335	4
Clay, WV	10,318	30	0	104	(3)

Nicholas, WV	26,369	40	(1)	333	74
Roane, WV	15,445	32	0	166	(19)
Braxton, WV	14,856	29	1	355	(5)
Calhoun, WV	7,367	26	(3)	51	4
Mingo, WV	27,165	64	(3)	282	54
Wyoming, WV	24,397	49	(5)	207	(11)
Gilmer, WV	6,962	20	(3)	53	14
Martin, KY	12,200	53	(3)	150	18
Webster, WV	9,739	18	1	63	55

Based upon the above data, Kanawha and Putnam Counties both experience moderate growth in VMT, fourteen percent, from 1996 to 2005. Many other counties in this analysis had similar moderate VMT growth; certain counties had much larger increases. Most of the counties that had high VMT growth still have low VMT in 2005, as compared to Kanawha and Putnam Counties. The exception is Cabell County, whose 2005 VMT is higher than that of Putnam County. As stated above, Cabell County, which is part of the Huntington-Ashland nonattainment area for the 1997 $PM_{2.5}$ NAAQS, has the second highest population, but the highest population density. EPA designation of the West Virginia portion of the Huntington-Ashland nonattainment area for the 2006 $PM_{2.5}$ NAAQS includes Cabell County. See the "EPA Technical Analysis for the Huntington-Ashland, West Virginia Area."

Most of the counties in this analysis have had either small decreases (1-5%) or small increases (1-5%) in population from 2000 to 2005. Although Kanawha's population did shrink by three percent, it is still the highest of all the counties in this analysis. Cabell County, which has the highest population density, also experienced a three percent decrease in population. Putnam County had a five percent increase in population during this time 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 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. Figures 6 and 6.1 identify 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.

Figure 6. Pollution Trajectory Plot for Kanawha County, WV (Site 54-039-0010)

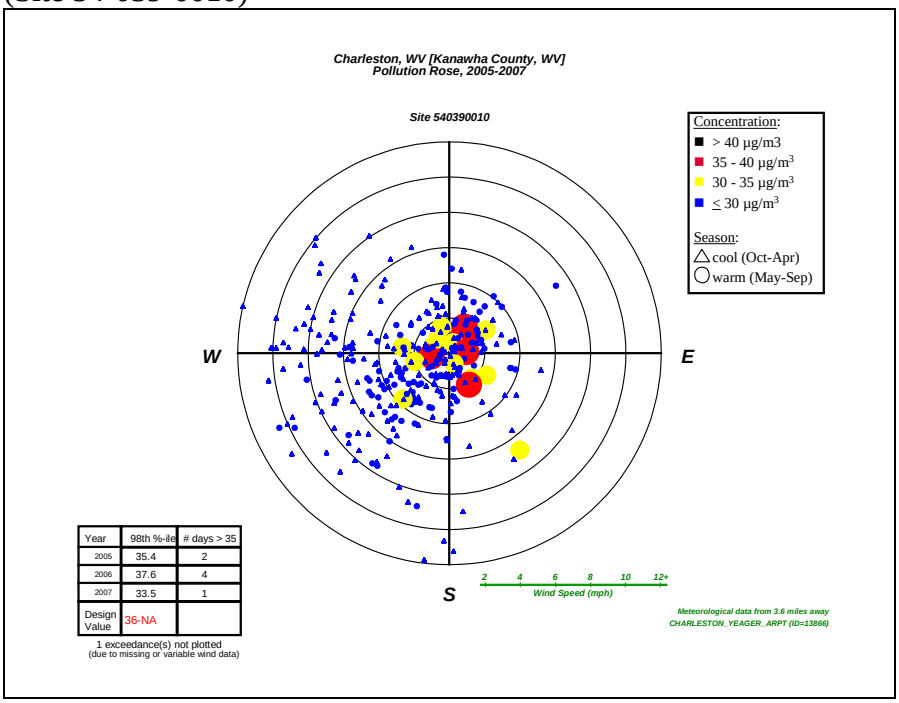
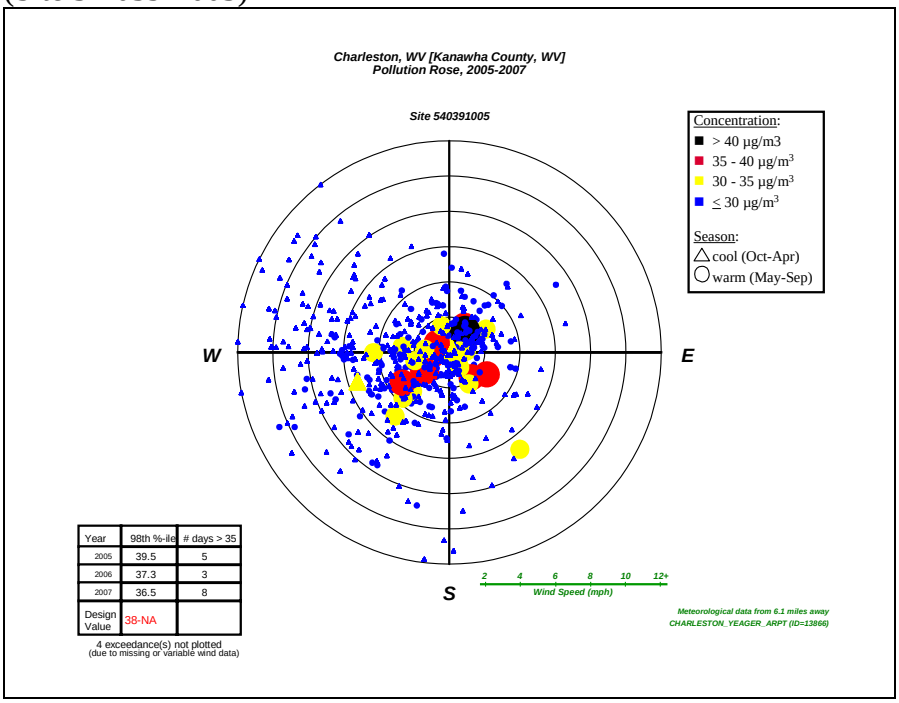


Figure 6.1 Pollution Trajectory Plot for Kanawha County, WV (Site 54-039-1005)



As shown in the pollution roses above, Figures 6 and 6.1, the average prevailing surface wind directions for moderate $PM_{2.5}$ days (days with $PM_{2.5} \leq 30$ µg/m^3, denoted with blue icons) are from the southwest and west. The pollution roses show that 24-hour $PM_{2.5}$ concentrations are influenced

by emissions from any direction at various times. High $PM_{2.5}$ days are characterized by low wind speeds and winds from most all directions. However, this data also suggests that emissions from the northeast and southeast are more likely to contribute to the violation than emissions from other directions.

The meteorology data 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 Charleston area.

The Charleston 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 (e.g., existing $PM_{2.5}$ areas)

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 2006 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 2006 24-hour standard.

Most areas that were originally designated nonattainment for the $PM_{2.5}$ standards still have not attained the standards. Thus, EPA has generally concluded that counties that were designated as having emissions sources contributing to fine particle concentrations which continue to exceed the 1997 standards (all areas violated the annual standard, three 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.

There are no major jurisdictional issues associated with the Charleston area. Air quality planning for both Kanawha and Putnam Counties is performed by the West Virginia Department of Environmental Protection. These counties comprise the Charleston nonattainment area for the 1997 $PM_{2.5}$ NAAQS. In addition, they were designated as a "Basic" (Subpart 1) area for the 1997 8-hour ozone NAAQS, but have been redesignated to attainment for that standard. Furthermore, Kanawha and Putnam Counties are in the same metropolitan planning organization (MPO), the Regional Intergovernmental Council (RIC). Boone and Clay Counties are also served by RIC.

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 Charleston 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 (e.g. 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.

Table 9 shows emissions and controls (current and projected) for electric generating units (EGUs) with SO_2 plus NO_x emissions greater than 5000 tons. Data was obtained from the 2006 National Electric Energy Data System (NEEDS) database. Table 9.1 shows emissions for the same EGUs for the years 2002 through 2007. The data was obtained from the emissions section of EPA's Clean Air Markets Division (CAMD) website: http://camddataandmaps.epa.gov/gdm/index.cfm?fuseaction=emissions.wizard.

Table 9. EGUs with SO_2 plus NO_x emissions > 5000 tons, from the 2006 NEEDS EGU database

County	Plant Name	Plant Type	Unique ID Final	2006 SO_2	2006 NOx	Scrubber Online Year	Scrubber Efficiency	SCR Online Year	Capacity MW
Kanawha, WV	Kanawha River	Coal Steam	3936_B_2	6,651	1,941				205.0
			3936_B_1	6,343	1,792				205.0
Putnam, WV	John E Amos	Coal Steam	3935_B_3	49,463	16,960	2007	95.0	2002	1300.0
			3935_B_1	34,571	8,506	2008	95.0	2005	800.0
			3935_B_2	33,264	8,481	2008	95.0	2004	800.0
Mason, WV	Mountaineer	Coal Steam	6264_B_1	31,052	7,661	2007	95.0	2002	1300.0
	Philip Sporn	Coal Steam	3938_B_41	7,475	1,709				150.0
			3938_B_31	7,069	1,617				150.0
			3938_B_11	5,458	1,273				150.0

County	Plant Name	Plant Type	Unique ID Final	2006 SO_2	2006 NOx	Scrubber Online Year	Scrubber Efficiency	SCR Online Year	Capacity MW
			3938_B_21	5,018	1,209				150.0
Gallia, OH	General James M Gavin	Coal Steam	8102_B_2	14,384	20,593	1995	98.0	2001	1300.0
			8102_B_1	10,403	13,364	1994	96.6	2001	1300.0
	Kyger Creek	Coal Steam	2876_B_4	14,629	3,903	2010	95.0	2003	217.0
			2876_B_1	13,937	3,708	2010	95.0	2003	217.0
			2876_B_2	13,830	3,628	2010	95.0	2003	217.0
			2876_B_3	12,793	3,456	2010	95.0	2003	217.0
			2876_B_5	11,968	3,168	2010	95.0	2003	217.0
Fayette, WV	Alloy Steam Station	Coal Steam	50012_B_BLR4	0	277				38.0
Lawrence, KY	Big Sandy	Coal Steam	1353_B_BSU2	35,100	10,426			2003	800.0
			1353_B_BSU1	11,376	3,419				260.0

Table 9.1. Selected EGU Emissions (2002-2007) from EPA's Clean Air Markets Division

Kanawha River, Kanawha County, WV, Facility ID: 3936					
Year	# of Months Reported	SO_2 Tons	NO_x Tons	CO_2 Tons	Heat Input (mmBtu)
2002	12	15,862.4	6,168.0	2,615,491.9	25,492,185
2003	12	15,686.5	6,006.0	2,473,188.5	24,105,186
2004	12	12,170.9	3,561.6	1,867,518.2	18,201,956
2005	12	12,850.8	3,602.2	2,047,546.3	19,956,615
2006	12	12,994.2	3,732.3	1,992,399.5	19,419,067
2007	12	13,384.1	4,033.2	2,182,018.3	21,267,243
John E Amos, Putnam County, WV, Facility ID: 3935					
Year	# of Months Reported	SO_2 Tons	NO_x Tons	CO_2 Tons	Heat Input (mmBtu)
2002	12	107,618.9	43,500.5	17,429,396.0	169,867,887
2003	12	114,017.9	45,422.9	17,650,105.5	172,028,289
2004	12	100,152.8	35,948.0	15,612,703.4	152,142,010
2005	12	112,412.3	34,619.8	17,798,214.5	173,471,966
2006	12	117,299.3	33,946.9	18,798,261.0	183,218,877
2007	12	103,546.1	33,103.6	17,418,609.0	169,772,075
Mountaineer, Mason County, WV, Facility ID: 6264					
Year	# of Months Reported	SO_2 Tons	NO_x Tons	CO_2 Tons	Heat Input (mmBtu)
2002	12	43,223.7	12,911.1	8,628,159.0	84,095,133
2003	12	48,035.7	16,733.5	9,477,985.4	92,378,031
2004	12	37,823.3	12,776.3	7,765,046.8	75,682,741
2005	12	42,981.9	12,746.4	9,526,714.7	92,852,958
2006	12	31,051.9	7,661.5	6,554,285.8	63,881,965
2007	12	2,301.9	12,147.4	9,846,830.5	95,972,918
Philip Sporn, Mason County, WV, Facility ID: 3938					
Year	# of Months Reported	SO_2 Tons	NO_x Tons	CO_2 Tons	Heat Input (mmBtu)
2002	12	40,246.1	13,184.6	5,052,085.6	49,240,608
2003	12	49,890.7	14,284.6	5,992,053.3	58,402,135

2004	12	42,473.8	10,510.9	5,559,465.4	54,185,844
2005	12	39,374.8	8,960.7	5,069,072.6	49,406,162
2006	12	39,741.0	9,239.6	5,054,471.3	49,263,839
2007	12	40,529.7	12,154.0	6,153,309.1	59,974,019
General James M Gavin, Gallia County, OH, Facility ID: 8102					
Year	# of Months Reported	SO_2 Tons	NO_x Tons	CO_2 Tons	Heat Input (mmBtu)
2002	12	32,380.1	43,839.2	15,353,813.6	149,647,267
2003	12	36,560.1	44,112.2	19,024,546.4	185,428,890
2004	12	33,715.7	40,631.7	19,061,592.6	185,785,491
2005	12	27,966.0	38,704.2	18,842,155.3	183,646,682
2006	12	24,786.8	33,956.7	16,997,448.8	165,667,179
2007	12	29,163.8	33,500.0	19,141,669.5	186,565,911
Kyger Creek, Gallia County, OH, Facility ID: 2876					
Year	# of Months Reported	SO_2 Tons	NO_x Tons	CO_2 Tons	Heat Input (mmBtu)
2002	12	74,451.7	25,317.6	6,625,110.4	64,572,199
2003	12	72,341.7	21,344.5	6,663,915.5	64,950,420
2004	12	72,850.1	18,708.5	7,531,790.2	73,409,278
2005	12	72,428.7	18,438.5	7,384,961.7	71,978,197
2006	12	67,156.7	17,862.6	7,167,983.1	69,863,416
2007	12	57,435.0	13,468.0	6,857,136.8	66,833,666
Alloy Steam Station Fayette County (WV Alloys, Inc.), WV, Facility ID: 50012					
Year	# of Months Reported	SO_2 Tons	NO_x Tons	CO_2 Tons	Heat Input (mmBtu)
2002	No Data				
2003					
2004	12	Not Reported	516.2	Not Reported	1,654,059
2005	12		441.9		1,835,243
2006	12		277.2		1,233,936
2007	12		500.4		1,734,898
Big Sandy, Lawrence County, KY, Facility ID: 1353					
Year	# of Months Reported	SO_2 Tons	NO_x Tons	CO_2 Tons	Heat Input (mmBtu)
2002	12	41,899.0	15,153.8	5,393,369.7	52,566,916
2003	12	46,959.7	12,362.4	5,961,168.3	58,101,023
2004	12	48,010.0	10,855.8	5,911,405.2	57,616,072
2005	12	50,098.4	12,490.2	6,952,256.8	67,760,805
2006	12	46,475.8	13,845.1	6,830,275.3	66,571,925
2007	12	46,750.9	14,984.7	7,177,085.6	69,952,051

As shown in Table 9, the scrubbers at the John E Amos plant in Putnam County, WV were projected to come on line during 2007 and 2008. However, Table 9.1 does not show any noticeable decreases in emissions from 2005 to 2007. EPA would need to review the additional information described below before it could take these reductions into consideration. Even if these controls are in place and federally enforceable by December 2008, EPA would still recommend including Putnam County in the Charleston nonattainment area. The other factors in this analysis indicate that Putnam County contributes to a violation(s) of the 2006 $PM_{2.5}$ NAAQS in Kanawha County.

As can be seen from Tables 9 and 9.1, since 2005, new controls have resulted in noteworthy reductions at the Mountaineer power plant in Mason County, WV. The Mountaineer facility reduced its SO_2 emissions from almost 43,000 tons in 2005 to 2,300 tons in 2007. If this 40,000 ton

reduction is shown to be federally enforceable, it would likely result in a reduction of Mason County's CES from its currently calculated value of twenty.

In addition, some EGUs are expected to put controls in place in the future. The Kyger Creek plant in Gallia County, OH is expected to install scrubbers in 2010. However, EPA is only considering controls in place and federally enforceable at the time of designation, i.e., by 2008. Therefore, these planned controls were not considered in this analysis.

Conclusion

EPA's technical analysis indicates that Putnam and Kanawha Counties contribute significantly to the $PM_{2.5}$ nonattainment problem in the Charleston Area. Compared to other counties, Kanawha has the highest CES, population, commuting both into a violating county and the Charleston Area, and VMT, as well as the second highest population density. Putnam County has the second highest CES, commuting into the MSA and commuting into a violating county, and ranked relatively high in population. Both counties had moderate growth in VMT.

Putnam and Kanawha Counties in West Virginia comprise the Charleston nonattainment area for the 1997 $PM_{2.5}$ NAAQS. Kanawha and Putnam Counties are in the same metropolitan planning organization (MPO), the Regional Intergovernmental Council (RIC). Kanawha County has two monitors showing violations of 2006 24-hour $PM_{2.5}$ NAAQS, considering 2005-2007 data. Putnam County has no monitors, but is economically linked to Kanawha County, with over 11,000 Putnam residences commuting to Kanawha County. In addition, emissions from Putnam County, such as those from vehicles and other small area sources, and emissions from one large source, the John E Amos electric generating unit contributes to the nonattainment problem. Local emissions from Kanawha County also contribute to the Charleston area's nonattainment, including emissions from the Kanawha River electric generating unit and Bayer Cropscience. In 2005, the Kanawha River Facility emitted over 12,000 tons of SO_2 and 3,600 tons of NOx, Bayer Cropscience emitted about 3000 tons each of SO_2 and NO_x that same year. Therefore, EPA has determined that it is appropriate to include both Putnam and Kanawha Counties in the Charleston nonattainment area for the 2006 24-hour $PM_{2.5}$ NAAQS.

EPA Technical Analysis for the West Virginia Portion of the Huntington-Ashland Area

Introduction

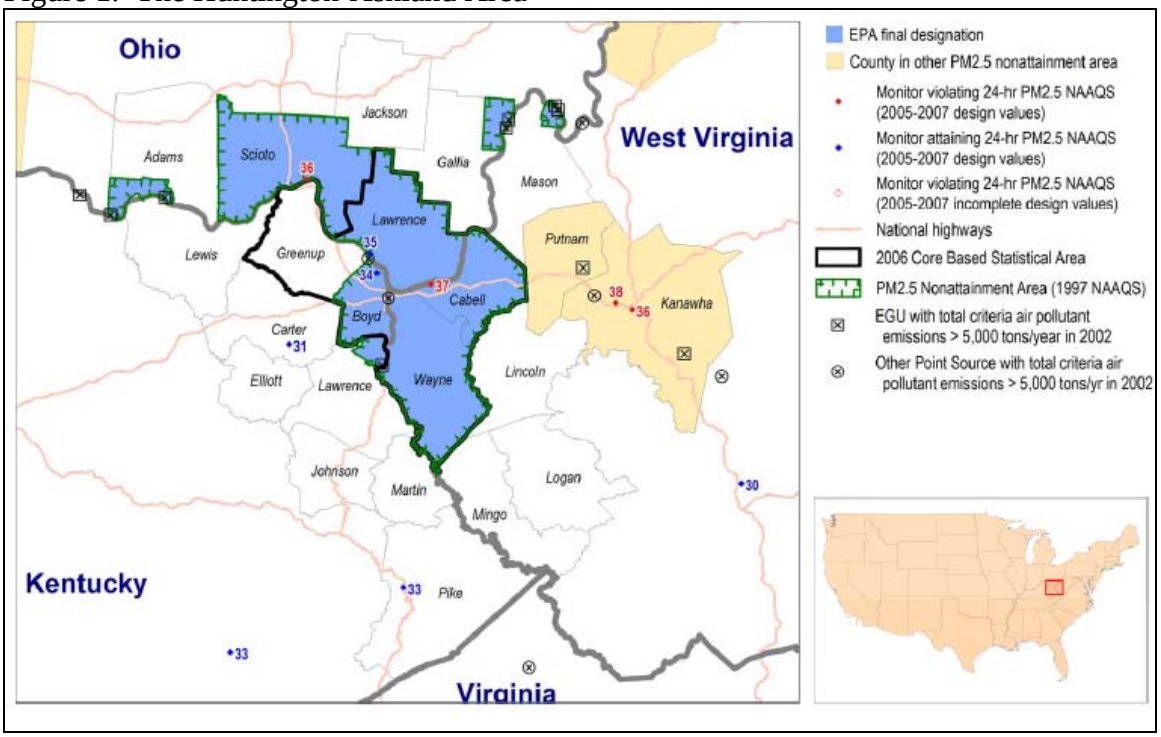
Pursuant to section 107(d) of the Clean Air Act, EPA must designate as nonattainment those areas that violate the NAAQS and those nearby areas that contribute to violations. This technical analysis for the Huntington-Ashland area identifies the counties with monitors that violate the 2006 24-hour $PM_{2.5}$ standard and evaluates nearby counties for contributions to fine particle concentrations in the area. EPA has evaluated these counties based on the weight of evidence of the following nine factors recommended in EPA guidance and any other relevant information:

- pollutant emissions
- air quality data
- population density and degree of urbanization
- traffic and commuting patterns
- growth
- meteorology
- geography and topography
- jurisdictional boundaries
- level of control of emissions sources

We also used analytical tools and data such as pollution roses, fine particle composition monitoring data, back trajectory analyses, and the contributing emission score (CES) to evaluate these areas. (See additional discussion of the CES under Factor 1).

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

Figure 1. The Huntington-Ashland Area



For the Huntington-Ashland area, EPA previously established $PM_{2.5}$ nonattainment boundaries for the 1997 $PM_{2.5}$ NAAQS that included five full and four partial counties, with 2 full and one partial county located in West Virginia.

In November 2007, the State of West Virginia recommended that the Huntington-Ashland area be designated as "attainment" for the 2006 24-hour $PM_{2.5}$ standard based on air quality data from 2004-2006. See the November 9, 2007 letter from the West Virginia Department of Environmental Protection, received on November 19, 2007. These data are from Federal Reference Method (FRM) monitors located in the state.

In March of 2008, EPA notified West Virginia that the monitor in Cabell County in the Huntington-Ashland area was violating based on 2005-2007 data. However, the state did not provide EPA with revised recommendations for this area.

In August 2008, EPA notified West Virginia of its intended designations. In this letter, EPA also requested that if West Virginia 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.

On October 16, 2008, West Virginia responded that it disagreed with inclusion of the partial county of Mason in the Huntington-Ashland nonattainment area. For further discussion addressing West Virginia's response stating that part of Mason County should not be included in the Huntington-Ashland nonattainment area, see our State and Tribal Comment Summary and Response Document in the Docket for this action.

Based on EPA's technical analysis described below, EPA has designated the same counties as previously designated for $PM_{2.5}$ as nonattainment for the 2006 24-hour $PM_{2.5}$ air-quality standard as part of the Huntington-Ashland nonattainment area, based upon currently available information. These counties are listed in the table below.

Huntington-Ashland Area	State-Recommended Nonattainment Counties	EPA Final Designated Nonattainment Counties within Region III
West Virginia	None	Cabell County Wayne County Mason County (partial)

The following is a technical analysis for the EPA Region III portion of the Huntington-Ashland 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, sulfur dioxide (SO_2), nitrogen oxides (NO_x), volatile organic compounds (VOCs), and ammonia (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 and NH_3 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 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 summary of the CES is included in attachment 2, and 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 are listed in descending order by CES. Counties in the Huntington-Ashland nonattainment area for the 1997 $PM_{2.5}$ NAAQS are in boldface. Note that the city of Huntington, WV includes parts of Cabell and Wayne counties. The city of Ashland, Kentucky is located in Boyd County.

Table 1. $PM_{2.5}$ Related Emissions and Contributing Emissions Score

County, State	State Recommended Nonattainment?	CES	$PM_{2.5}$ emissions total (tpy)	$PM_{2.5}$ emissions carbon (tpy)	$PM_{2.5}$ emissions other (tpy)	SO_2 (tpy)	NOx (tpy)	VOCs (tpy)	NH_3 (tpy)
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**
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**
Putnam, WV	Yes (other area)	92	4,838	468	4,370	113,590	37,387	3,117	106
Greenup, KY	No	24	319	151	169	2,183	4,102	1,694	155
Kanawha, WV	Yes (other area)	15	2,016	857	1,159	21,633	23,985	15,652	527
Jackson, OH	No	11	361	170	190	149	1,031	1,857	380
Carter, KY	No	8	372	145	228	160	2,365	1,601	207
Lewis, KY	No	6	295	139	156	491	2,951	879	172
Lincoln, WV	No	5	217	90	129	48	568	879	51
Pike, KY	No	3	808	370	438	386	3,823	3,108	146
Johnson, KY	No	2	260	118	143	141	1,028	948	54
Logan, WV	No	2	298	142	157	101	981	1,867	53
Mingo, WV	No	2	308	140	168	228	2,890	1,352	35
Elliott, KY	No	1	89	29	59	24	159	231	79
Martin, KY	No	1	199	70	129	174	863	518	23

Based upon the data set forth in Table 1, Gallia County, OH has a CES of 100 and year 2005 emissions of more than 100,000 tons of SO_2 in 2005 and the highest $PM_{2.5}$ and NOx emissions in the area. Two major power plants are located there. Adams County, OH, also with large power plants, has the highest level of SO_2 emissions in the area with 126,000 tons and second highest levels of $PM_{2.5}$ and NOx emissions. The CES for Adams County (46) is lower than the score for Gallia County probably due to its distance from the design value monitor in Cabell County, WV. Cabell County, WV and Gallia County, OH have the highest CESs, (100). There are seven counties with higher emissions than Cabell County, WV. However, Cabell County, WV contains a violating monitor (See Factor 2). Putnam County, WV (designated nonattainment as part of the Charleston area) has the third highest CES (92), as well as the third highest $PM_{2.5}$ and second highest NOx and SO_2 emissions. In addition, Putnam County, WV borders Cabell County, WV. The next highest CES (78) belongs to Lawrence County, OH. The violating monitor in Cabell County, WV is very close to the border between Lawrence County, OH and Cabell County, WV. Next is Scioto County, OH which has relatively low emissions, compared to the other counties with CESs greater than 50. However, Scioto County, OH also contains a violating monitor (See Factor 2). The next highest CES (54) is Mason County, WV, which has the third highest emissions of SO_2, NOx, and $PM_{2.5}$, primarily due to emissions from power plants and industrial sources. Of the three remaining counties in the Huntington-Ashland nonattainment area for the 1997 $PM_{2.5}$ NAAQS, (Boyd County, KY, Wayne County, WV, and Lawrence County, KY), Lawrence County, KY has the highest emissions and the lowest CES (27). Boyd County, KY and Wayne County, WV are closer to the design value monitor in Cabell County, WV. Greenup County, KY, part of the Huntington-Ashland metropolitan statistical area (MSA), has low emissions when compared to most of the counties in the Huntington-Ashland nonattainment area for the 1997 $PM_{2.5}$ NAAQS. Based on emission levels and CES values, Cabell, Wayne and Mason counties in West Virginia are candidates for a 2006 24-hour $PM_{2.5}$ nonattainment designation.

Factor 2: Air quality data

This factor considers the 24-hour $PM_{2.5}$ design values in micrograms per cubic meter ($\mu g/m^3$) 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 2006 24-hour $PM_{2.5}$ standard is met when the 3-year average of a monitor's 98^{th} percentile values is 35 $\mu g/m^3$ or less. A design value is only valid if minimum data completeness criteria are met.

Table 2. Air Quality Data

County, State	State Recommended Nonattainment?	Design Values 2003-05 ($\mu g/m^3$)	Design Values 2004-06 ($\mu g/m^3$)	Design Values 2005-07 ($\mu g/m^3$)
Cabell, WV	**No**	**35**	**34**	**37**
Gallia, OH	**No**	**No monitor**		
Lawrence, OH	**No**	**33**	**34**	**35**
Scioto, OH	**No**	**34**	**33**	**36**
Mason, WV	**No**	**No monitor**		
Adams, OH	**No**	**No monitor**		
Boyd, KY	**No**	**33**	**32**	**34**
Wayne, WV	**No**	**No monitor**		
Lawrence, KY	**No**	**No monitor**		
Putnam, WV	Yes (other area)	No monitor		

Greenup, KY	No	No monitor		
Kanawha, WV	Yes (other area)	36	37	38
Jackson, OH	No	No monitor		
Carter, KY	No	29	29	31
Lewis, KY	No	No monitor		
Lincoln, WV	No	No monitor		
Pike, KY	No	30	30	33
Johnson, KY	No	No monitor		
Logan, WV	No	No monitor		
Mingo, WV	No	No monitor		
Elliott, KY	No	No monitor		
Martin, KY	No	No monitor		

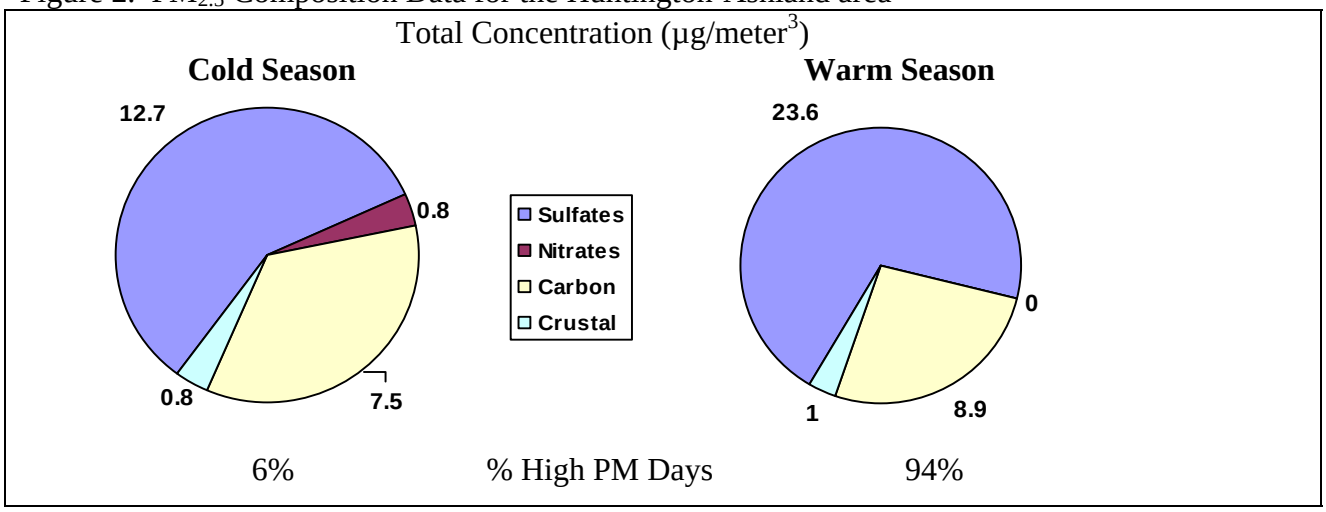
The 24-hour $PM_{2.5}$ design values for counties in the Huntington-Ashland area are shown in Table 2. The data set forth in Table 2 indicates that, in EPA Region III, Cabell County, WV shows a violation of the 2006 24-hour $PM_{2.5}$ standard. Therefore, this county is included in the Huntington-Ashland nonattainment area.

Also in EPA Region III, Kanawha County, WV shows a violation of the 2006 24-hour $PM_{2.5}$ standard. However, Kanawha County is part of the Charleston nonattainment area for the 1997 and 2006 $PM_{2.5}$ NAAQS.

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.

Under this factor, we also consider fine particle composition monitoring data. Air quality monitoring data on the composition of fine particle mass are available from the EPA Chemical Speciation Network and the IMPROVE monitoring network. Analysis of these data indicates that the days with the highest fine particle concentrations occur predominantly in the summer and the average chemical composition of the highest day is illustrated in Figure 2. The high proportion of sulfates (represented in Figure 2) support the conclusion that, particularly on high concentration days of the warm season, sulfur-based emissions predominate in this area. This data indicates that sources of SO_2 and direct $PM_{2.5}$ carbon emissions are key contributors to exceedances in the area.

Figure 2. $PM_{2.5}$ Composition Data for the Huntington-Ashland area



Note: Eligible monitors for providing design value data generally include State and Local Air Monitoring Stations (SLAMS) at population-oriented locations with an FRM monitor. All data from Special Purpose Monitors (SPM) using an FRM is eligible for comparison to the relevant NAAQS, subject to the requirements given in the October 17, 2006 Revision to Ambient Air Monitoring Regulations (71 FR 61236). All monitors used to provide data must meet the monitor siting and eligibility requirements given in 71 FR 61236 to 61328 in order to be acceptable for comparison to the 2006 24-hr $PM_{2.5}$ NAAQS for designation purposes.

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

Table 3 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 2006 24-hour $PM_{2.5}$ standard. Counties in the Huntington-Ashland nonattainment area for the 1997 $PM_{2.5}$ NAAQS are in boldface.

Table 3. Population

County, State	State Recommended Nonattainment	2005 Population	2005 Population Density (people/sq mi)
Cabell, WV	**No**	**93,988**	**327**
Gallia, OH	**No**	**31,241**	**68**
Lawrence, OH	**No**	**62,946**	**134**
Scioto, OH	**No**	**76,506**	**124**
Mason, WV	**No**	**25,763**	**58**
Adams, OH	**No**	**28,454**	**49**
Boyd, KY	**No**	**49,359**	**305**
Wayne, WV	**No**	**41,959**	**82**
Lawrence, KY	**No**	**16,162**	**39**
Putnam, WV	Yes (other area)	54,389	155
Greenup, KY	No	37,206	105
Kanawha, WV	Yes (other area)	193,413	212
Jackson, OH	No	33,576	80
Carter, KY	No	27,253	66
Lewis, KY	No	13,879	28
Lincoln, WV	No	22,446	51
Pike, KY	No	66,754	85
Johnson, KY	No	23,968	91
Logan, WV	No	36,216	80
Mingo, WV	No	27,165	64
Elliott, KY	No	6,967	30
Martin, KY	No	12,200	53

Based upon the data from Table 3, Kanawha County, WV in the Charleston, WV area has the highest population in the region. In the Huntington-Ashland area, Cabell County is the most populous and has the highest population density. With a population density of 305 people per

square mile, Boyd County, KY, also has a relatively high population density for this area. Of the other counties within the Huntington-Ashland nonattainment area for the 1997 $PM_{2.5}$ NAAQS, the next highest populations and population densities are in Lawrence and Scioto Counties, in Ohio. The remaining counties all have population densities under 100 people per square mile.

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 to other counties within the Huntington-Ashland area, as well as the total Vehicle Miles Traveled (VMT) for each county in millions of miles (see Table 4). 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 4. Traffic and Commuting Patterns

County, State	State Recommended Nonattainment?	2005 VMT (millions of miles)	Number Commuting to any violating counties	Percent Commuting to any violating counties	Number Commuting into and within statistical area	Percent Commuting into and within statistical area
Cabell, WV	**No**	**1,230**	**34,670**	**86**	**35,460**	**88**
Gallia, OH	**No**	**247**	**300**	**3**	**330**	**3**
Lawrence, OH	**No**	**650**	**7,970**	**35**	**21,160**	**92**
Scioto, OH	**No**	**591**	**22,040**	**78**	**1,330**	**5**
Mason, WV	**No**	**249**	**1,080**	**12**	**670**	**7**
Adams, OH	**No**	**283**	**130**	**1**	**20**	**0**
Boyd, KY	**No**	**574**	**1,380**	**7**	**17,580**	**93**
Wayne, WV	**No**	**438**	**7,170**	**46**	**14,040**	**90**
Lawrence, KY	**No**	**159**	**250**	**5**	**920**	**19**
Putnam, WV	Yes (other area)	547	12,760	55	1,560	7
Greenup, KY	No	371	1,770	13	11,130	83
Kanawha, WV	Yes (other area)	2,711	80,360	92	550	1
Jackson, OH	No	298	220	2	40	0
Carter, KY	No	664	280	3	2,090	21
Lewis, KY	No	170	340	7	170	4
Lincoln, WV	No	147	3,200	46	1,340	19
Pike, KY	No	800	60	0	60	0
Johnson, KY	No	224			160	2
Logan, WV	No	335	850	7	170	2
Mingo, WV	No	282	100	1	90	1
Elliott, KY	No	53	20	1	130	7
Martin, KY	No	150			70	2

The listing of counties on Table 4 reflects a ranking based on the number of people commuting to other counties. Counties in the Huntington-Ashland nonattainment area for the 1997 $PM_{2.5}$ NAAQS are in boldface. Based on the data in Table 4, Kanawha, WV has the highest VMT by far. However, Kanawha County is part of the Charleston nonattainment area for both the 1997 and 2006 $PM_{2.5}$ standards.

The 2006 Huntington-Ashland metropolitan statistical area (MSA) is comprised of Cabell County, WV, Wayne County, WV, Boyd County, KY, Greenup County, KY, and Lawrence County, OH. Cabell County, WV has the second highest VMT, and the largest number commuting into or within the Huntington-Ashland MSA. The county with the next highest VMT and commuters into or

within the MSA is Lawrence County, OH. Boyd County, KY, Wayne County, WV, and Scioto County, OH all have VMT between 400 and 600. However, Boyd County, KY and Wayne County, WV have many more commuters into and within the MSA. Adams County, OH, Mason County, WV, and Gallia County, OH all have VMT between 200 and 300, but, of the three, Mason County, WV has by far the most commuters into the MSA. Lawrence County, KY has lower VMT than the other counties in the Huntington-Ashland nonattainment area for the 1997 $PM_{2.5}$ standard. However, it has more commuters into the MSA than Adams County, OH, Mason County, WV, and Gallia County, OH.

Note: The 2005 VMT data used for Tables 4 and 5 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 VMT 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 5 shows population, population growth, VMT, and VMT growth for counties that are included in the Huntington-Ashland area. Counties in the Huntington-Ashland nonattainment area for the 1997 $PM_{2.5}$ NAAQS are in boldface.

Table 5. Population and VMT Values and Percent Change.

Location	Population (2005)	Population Growth (2000 - 2005)	Population % change (2000 - 2005)	2005 VMT (millions of miles)	VMT % change (1996 to 2005)
Cabell, WV	**93,988**	**-2,907**	**(3)**	**1,230**	**41**
Gallia, OH	**31,241**	**293**	**0.9**	**247**	**0**
Lawrence, OH	**62,946**	**623**	**1**	**650**	**9**
Scioto, OH	**76,506**	**-2,366**	**(3)**	**591**	**(3)**
Mason, WV	**25,763**	**-260**	**(1)**	**249**	**36**
Adams, OH	**28,454**	**1,094**	**4**	**283**	**7**
Boyd, KY	**49,359**	**-499**	**(1)**	**574**	**16**
Wayne, WV	**41,959**	**-856**	**(2)**	**438**	**47**
Lawrence, KY	**16,162**	**622**	**4**	**159**	**11**
Putnam, WV	54,389	2,590	5	547	14
Greenup, KY	37,206	368	1	371	23
Kanawha, WV	193,413	-5,982	(3)	2,711	14
Jackson, OH	33,576	978	3	298	14
Carter, KY	27,253	270	1	664	18
Lewis, KY	13,879	-283	(2)	170	39
Lincoln, WV	22,446	222	1	147	(24)
Pike, KY	66,754	-2,065	(3)	800	26
Johnson, KY	23,968	698	3	224	6
Logan, WV	36,216	-1,509	(4)	335	4

Mingo, WV	27,165	-840	(3)	282	54
Elliott, KY	6,967	203	3	53	15
Martin, KY	12,200	-377	(3)	150	18

Based on the data in Table 5, it appears that half of the counties in the Huntington-Ashland nonattainment area for the 1997 $PM_{2.5}$ standard experienced a decrease in populations, from 1 to 3 percent, from 2000 to 2005, while the other half experienced increases from about 1 percent to 4 percent. Overall, there is little change in population in the area. However, VMT in the majority of these counties increases from 1996 to 2005. Wayne, Cabell, and Mason Counties, WV had the largest percent increases in VMT, from 36 to 47 percent. Only Scioto County, OH, had decreased VMT.

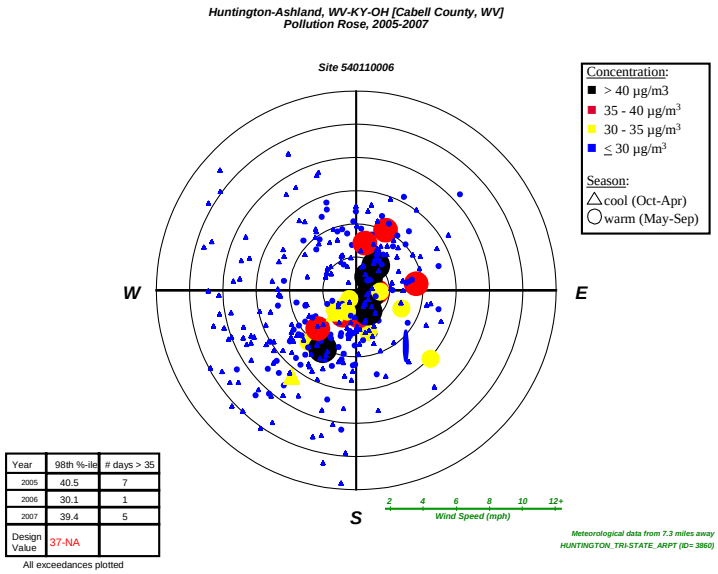
Factor 6: Meteorology (weather/transport patterns)

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 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. Figures 6 through 6.3 identify 24-hour $PM_{2.5}$ values by color; days exceeding 35 ug/m3 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 Cabell County, WV is shown in Figure 6. In general, it shows that impacts on high $PM_{2.5}$ days come from multiple directions, and often with relatively low wind speeds. The pollution rose shows that four days with monitored 24-hour $PM_{2.5}$ values greater than 35 and 40 $\mu g/m^3$ in Cabell County, WV in 2005-2007 occurred when the wind came from the north-northeast. This data suggests that emissions from the north-northeast, i.e., from Mason County, WV as well as Lawrence and Boyd Counties in Ohio, likely contribute to 2006 24-hour $PM_{2.5}$ NAAQS violations. Eight other days with monitored $PM_{2.5}$ values greater than 35 and 40 $\mu g/m^3$ show winds from the southwest, east, and south. This indicates likely $PM_{2.5}$ contributions from Wayne County, WV, and Boyd and Lawrence Counties in Kentucky.

Figure 6. Pollution Trajectory Plot for Cabell County, WV
(Huntington Monitor, Site 54-011-0006)



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 looks at 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 Huntington-Ashland 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 (e.g., existing $PM_{2.5}$ areas)

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 the Huntington-Ashland area indicates that the same components that make up most of the $PM_{2.5}$ mass in the area on an annual average basis (sulfate and direct $PM_{2.5}$ carbon) also are key contributors to the $PM_{2.5}$ mass on days exceeding the 2006 24-hour $PM_{2.5}$ standard. These data indicate that the same source categories that contribute to violations of the annual standard also contribute to exceedances of the 2006 24-hour standard.

The Huntington-Ashland area, which was designated nonattainment for violating the annual $PM_{2.5}$ standard, still violates the standard with a 2005-2007 design value of 16.6 ug/m3. Thus, EPA has

generally concluded that counties that were designated as having emissions sources contributing to fine particle concentrations which continue to exceed the 1997 standards (all areas violated the annual standard, twothree 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 major jurisdictional boundaries in the Huntington-Ashland area are the state lines between West Virginia and Kentucky and between West Virginia and Ohio. Counties in Kentucky and Ohio impact the violating monitor in Cabell County, WV. Furthermore, Scioto County, OH, in EPA Region V has an air-quality monitor that violates the 2006 $PM_{2.5}$ NAAQS. However, areas designated as 8-hour ozone nonattainment areas are also important boundaries for State air-quality planning. Cabell County, WV, Wayne County, WV and Boyd County, KY were included in the 8-hour ozone nonattainment area associated with the Huntington-Ashland area. These three counties now make up the Huntington-Ashland 8-hour ozone maintenance area. Other counties included in this technical analysis were also designated as 8-hour ozone nonattainment areas, but are not associated with the Huntington-Ashland area. A goal in designating $PM_{2.5}$ nonattainment areas is to achieve a degree of consistency with ozone nonattainment areas. To the degree appropriate based upon violations and contribution to violations of the respective NAAQS, EPA believes it can be helpful for air planning purposes and for attainment of both NAAQS for ozone and $PM_{2.5}$ nonattainment area boundaries to be consistent. Comparison of ozone areas with potential $PM_{2.5}$ nonattainment areas, therefore, gives added weight to designation of Cabell County, WV and Wayne County, WV and Boyd County, KY.

Mason County is not part of the KYOVA Interstate Planning Commission, the metropolitan planning organization for Cabell and Wayne Counties and the City of Huntington in West Virginia and Lawrence County and the City of Ironton in Ohio. However, EPA believes that including a portion of Mason County in the Huntington-Ashland nonattainment area will not pose an undue burden on KYOVA. In fact, under the 1997 $PM_{2.5}$ NAAQS, KYOVA has successfully completed its transportation planning with the inclusion of the Graham Tax District in Mason County.

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 (e.g. 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.

In West Virginia, Ohio, and Kentucky, there may be some emission reductions of SO_2 and NOx subsequent to 2005 that are not accounted for elsewhere in this analysis, due to new controls at large electric generating units (EGUs).

Table 9 shows emissions and controls (current and projected) for EGUs with SO_2 plus NO_x emissions greater than 5000 tons. Data was obtained from the 2006 National Electric Energy Data System (NEEDS) database. Table 9.1 shows emissions for the same EGUs for the years 2002 through 2008. The data was obtained from the emissions section of EPA's Clean Air Markets Division (CAMD) website: http://camddataandmaps.epa.gov/gdm/index.cfm?fuseaction=emissions.wizard.

Table 9. EGUs with SO_2 plus NO_x emissions > 5000 tons, from the 2006 NEEDS EGU database

County	Plant Name	Plant Type	Unique ID Final	2006 SO_2 tons	2006 NOx tons	Scrubber Online Year	Scrubber Efficiency	SCR Online Year	Capacity MW
Gallia, OH	General James M Gavin	Coal Steam	8102_B_2	14,384	20,593	1995	98.0	2001	1300.0
			8102_B_1	10,403	13,364	1994	96.6	2001	1300.0
	Kyger Creek	Coal Steam	2876_B_4	14,629	3,903	2010	95.0	2003	217.0
			2876_B_1	13,937	3,708	2010	95.0	2003	217.0
			2876_B_2	13,830	3,628	2010	95.0	2003	217.0
			2876_B_3	12,793	3,456	2010	95.0	2003	217.0
			2876_B_5	11,968	3,168	2010	95.0	2003	217.0
Mason, WV	Mountaineer	Coal Steam	6264_B_1	31,052	7,661	2007	95.0	2002	1300.0
	Philip Sporn	Coal Steam	3938_B_41	7,475	1,709				150.0
			3938_B_31	7,069	1,617				150.0
			3938_B_11	5,458	1,273				150.0
			3938_B_21	5,018	1,209				150.0
Adams, OH	JM Stuart	Coal Steam	2850_B_3	29,966	6,614	2008	95.0	2003	597.0
			2850_B_2	27,207	7,739	2008	95.0	2003	597.0
			2850_B_4	23,294	5,858	2008	95.0	2003	597.0
			2850_B_1	23,182	5,307	2008	95.0	2003	585.0
	Killen Station	Coal Steam	6031_B_2	22,825	7,185	2007	89.0	2003	615.0
Lawrence,	Big Sandy	Coal	1353_B_BSU2	35,100	10,426			2003	800.0

KY		Steam	1353_B_BSU1	11,376	3,419				260.0
Putnam, WV	John E Amos	Coal Steam	3935_B_3	49,463	16,960	2007	95.0	2002	1300.0
			3935_B_1	34,571	8,506	2008	95.0	2005	800.0
			3935_B_2	33,264	8,481	2008	95.0	2004	800.0
Kanawha, WV	Kanawha River	Coal Steam	3936_B_2	6,651	1,941				205.0
			3936_B_1	6,343	1,792				205.0

Table 9.1. EGU 2002 to 2007 Emissions from EPA's CAMD

General James M Gavin, Gallia County, OH, Facility ID: 8102

Year	# of Months Reported	SO_2 Tons	NO_x Tons	CO_2 Tons	Heat Input (mmBtu)
2002	12	32,380.1	43,839.2	15,353,813.6	149,647,267
2003	12	36,560.1	44,112.2	19,024,546.4	185,428,890
2004	12	33,715.7	40,631.7	19,061,592.6	185,785,491
2005	12	27,966.0	38,704.2	18,842,155.3	183,646,682
2006	12	24,786.8	33,956.7	16,997,448.8	165,667,179
2007	12	29,163.8	33,500.0	19,141,669.5	186,565,911

Kyger Creek, Gallia County, OH, Facility ID: 2876

Year	# of Months Reported	SO_2 Tons	NO_x Tons	CO_2 Tons	Heat Input (mmBtu)
2002	12	74,451.7	25,317.6	6,625,110.4	64,572,199
2003	12	72,341.7	21,344.5	6,663,915.5	64,950,420
2004	12	72,850.1	18,708.5	7,531,790.2	73,409,278
2005	12	72,428.7	18,438.5	7,384,961.7	71,978,197
2006	12	67,156.7	17,862.6	7,167,983.1	69,863,416
2007	12	57,435.0	13,468.0	6,857,136.8	66,833,666

Mountaineer, Mason County, WV, Facility ID: 6264

Year	# of Months Reported	SO_2 Tons	NO_x Tons	CO_2 Tons	Heat Input (mmBtu)
2002	12	43,223.7	12,911.1	8,628,159.0	84,095,133
2003	12	48,035.7	16,733.5	9,477,985.4	92,378,031
2004	12	37,823.3	12,776.3	7,765,046.8	75,682,741
2005	12	42,981.9	12,746.4	9,526,714.7	92,852,958
2006	12	31,051.9	7,661.5	6,554,285.8	63,881,965
2007	12	2,301.9	12,147.4	9,846,830.5	95,972,918

Philip Sporn, Mason County, WV, Facility ID: 3938

Year	# of Months Reported	SO_2 Tons	NO_x Tons	CO_2 Tons	Heat Input (mmBtu)
2002	12	40,246.1	13,184.6	5,052,085.6	49,240,608
2003	12	49,890.7	14,284.6	5,992,053.3	58,402,135
2004	12	42,473.8	10,510.9	5,559,465.4	54,185,844
2005	12	39,374.8	8,960.7	5,069,072.6	49,406,162
2006	12	39,741.0	9,239.6	5,054,471.3	49,263,839
2007	12	40,529.7	12,154.0	6,153,309.1	59,974,019

JM Stuart, Adams County, OH, Facility ID: 2850

Year	# of Months Reported	SO_2 Tons	NO_x Tons	CO_2 Tons	Heat Input (mmBtu)
2002	12	117,549.1	46,768.9	15,575,642.3	151,809,365

2003	12	124,199.3	47,368.6	15,149,597.4	147,656,929
2004	12	115,566.2	27,931.1	13,653,398.8	133,074,136
2005	12	106,225.5	24,420.7	13,817,921.8	134,677,617
2006	12	103,648.5	25,518.2	13,710,852.6	133,634,076
2007	12	107,318.1	25,137.4	14,268,966.6	139,073,870

Killen Station, Adams County, OH, Facility ID: 6031

Year	# of Months Reported	SO_2 Tons	NO_x Tons	CO_2 Tons	Heat Input (mmBtu)
2002	12	19,664.1	7,934.7	3,741,384.5	36,476,849
2003	12	23,724.4	10,819.8	4,592,312.8	44,834,155
2004	12	23,049.2	7,131.3	4,244,389.5	41,377,089
2005	12	19,565.4	5,966.6	3,637,462.0	35,471,017
2006	12	22,824.9	7,184.6	4,284,185.5	41,790,006
2007	12	8,600.9	8,409.9	4,414,558.6	43,064,968

Big Sandy, Lawrence County, KY, Facility ID: 1353

Year	# of Months Reported	SO_2 Tons	NO_x Tons	CO_2 Tons	Heat Input (mmBtu)
2002	12	41,899.0	15,153.8	5,393,369.7	52,566,916
2003	12	46,959.7	12,362.4	5,961,168.3	58,101,023
2004	12	48,010.0	10,855.8	5,911,405.2	57,616,072
2005	12	50,098.4	12,490.2	6,952,256.8	67,760,805
2006	12	46,475.8	13,845.1	6,830,275.3	66,571,925
2007	12	46,750.9	14,984.7	7,177,085.6	69,952,051

John E Amos, Putnam County, WV, Facility ID: 3935

Year	# of Months Reported	SO_2 Tons	NO_x Tons	CO_2 Tons	Heat Input (mmBtu)
2002	12	107,618.9	43,500.5	17,429,396.0	169,867,887
2003	12	114,017.9	45,422.9	17,650,105.5	172,028,289
2004	12	100,152.8	35,948.0	15,612,703.4	152,142,010
2005	12	112,412.3	34,619.8	17,798,214.5	173,471,966
2006	12	117,299.3	33,946.9	18,798,261.0	183,218,877
2007	12	103,546.1	33,103.6	17,418,609.0	169,772,075

Kanawha River, Kanawha County, WV, Facility ID: 3936

Year	# of Months Reported	SO_2 Tons	NO_x Tons	CO_2 Tons	Heat Input (mmBtu)
2002	12	15,862.4	6,168.0	2,615,491.9	25,492,185
2003	12	15,686.5	6,006.0	2,473,188.5	24,105,186
2004	12	12,170.9	3,561.6	1,867,518.2	18,201,956
2005	12	12,850.8	3,602.2	2,047,546.3	19,956,615
2006	12	12,994.2	3,732.3	1,992,399.5	19,419,067
2007	12	13,384.1	4,033.2	2,182,018.3	21,267,243

For this technical analysis, the level of emissions control factor is most relevant to consideration of the contribution from Mason County, West Virginia. In the current $PM_{2.5}$ nonattainment area, the partial county area of Mason County includes the Mountaineer and Philip Sporn power plants. As can be seen from Tables 9 and 9.1, since 2005 new controls have resulted in significant reductions at the Mountaineer power plant. At the Philip Sporn plant, emissions remain high (40,000 tons SO_2, 12,000 tons NOx). In comments to EPA, the State maintains that no additional controls are technically and economically feasible for the Philip Sporn plant and thus the current emission levels

should be considered to represent reasonably available control technology (RACT). The State suggests that since no additional controls are feasible to reduce emissions from Mason County, EPA should not designate the partial county area as nonattainment. (See response to comment document for this action for further discussion of issues raised by the State.)

However, as required by section 107 of the CAA, EPA determined violations of the 2006 24-hour fine particulate NAAQS based solely on the most recent three complete years of certified monitoring data. EPA set boundaries based on available data and analysis that best represents present-day conditions, and not on projected emissions reductions that may occur after area designations areas are finalized. Section 107 also requires EPA to designate as nonattainment any area that violates or contributes to an area that violates a NAAQS. The statute is written in the present tense and thus EPA believes it can only base designations on controls that are in place and federally enforceable at the time of designation. EPA finds that when considered with meteorological information, the level of emissions from Mason county, though reduced in recent years, continues to be substantial enough to contribute to high $PM_{2.5}$ days (typically dominated by sulfate) in the Huntington-Ashland area.

New controls are also in place at the Killen Station plant in Adams County, OH, and the scrubbers at the JM Stuart plant in Adams County, OH and the John E Amos plant in Putnam County, WV will come online some time in 2008 or 2009. Reductions from all of these plants should benefit air quality in the Huntington-Ashland area. States may account for other projected emissions reductions in their State Implementation Plans for achieving attainment, where appropriate.

Therefore, based upon consideration of the above data, EPA believes that it is appropriate to include portions of Mason County, WV (Graham Tax District) within the Huntington-Ashland nonattainment area for the 2006 24-hour $PM_{2.5}$ NAAQS.

Conclusion

After considering the nine factors described above, EPA has determined that it is appropriate to include the same West Virginia counties in the Huntington-Ashland nonattainment area for the 2006 24-hour $PM_{2.5}$ NAAQS as were designated nonattainment for the 1997 $PM_{2.5}$ NAAQS. Cabell and Wayne Counties, plus a portion of Mason County (Graham Tax District), in West Virginia, were included in the Huntington-Ashland nonattainment area for the 1997 $PM_{2.5}$ NAAQS, along with whole and partial counties in Ohio and Kentucky. Cabell County, WV and Wayne County, WV and Boyd County, KY made up the 8-hour ozone nonattainment area associated with the Huntington-Ashland area. These three counties now make up the Huntington-Ashland 8-hour ozone maintenance area. The air quality monitor in Cabell County, WV shows a violation of the 2006 24-hour $PM_{2.5}$ NAAQS, based on 2005-2007 data. Wayne County, WV and Mason County, WV do not have monitors. However, Wayne County is centrally located within the 2006 Huntington-Ashland metropolitan statistical area, is adjacent to Cabell County, and includes part of the city of Huntington, WV. Wayne County contributes to the particulate matter concentrations in Cabell County, WV through population-based emissions (e.g., vehicle emissions and other small area sources) and from commuters into Cabell County, WV. Mason County, WV, also adjacent to Cabell County, WV, has high $PM_{2.5}$ and SO_2 emissions from two large electric generating units. Meteorological data shows that on one-third of the days in 2004-2006 with monitored 24-hour $PM_{2.5}$ values greater than 35 and 40 $\mu g/m^3$ in Cabell County, WV, winds came from the north-northeast. This data suggests that emissions from the north-northeast, i.e., from Mason County, WV likely contribute to 2006 24-hour $PM_{2.5}$ NAAQS violations.

Putnam and Kanawha Counties in West Virginia ranked high for certain of the nine factors. However, these counties are part of another existing nonattainment area for the 1997 $PM_{2.5}$ NAAQS, the Charleston nonattainment area. Furthermore, EPA is designating these counties as part of the Charleston nonattainment area for the 2006 $PM_{2.5}$ NAAQS. Therefore, Putnam and Kanawha Counties, WV are not included within the Huntington-Ashland nonattainment area for the 2006 $PM_{2.5}$ NAAQS.

Thus, EPA is designating Cabell and Wayne Counties and a portion of Mason County (Graham Tax District) as the West Virginia portion of the Huntington-Ashland nonattainment area for the 2006 24-hour $PM_{2.5}$ NAAQS.

Please note that on October 16, 2008, West Virginia submitted comments and additional information in response to EPA's August 2008 letter notifying West Virginia of its intended designations. West Virginia objected to the inclusion of the Graham Tax District in Mason County in the Huntington-Ashland nonattainment area for the 2006 24-hour $PM_{2.5}$ NAAQS. However, as demonstrated in this analysis, EPA has determined that it is appropriate to include the Graham Tax District in Mason County in the Huntington-Ashland nonattainment area.

Additional information regarding responses to specific State comments can be found in EPA's Response to Comments document at http://www.epa.gov/pmdesignations/2006standards/tech.htm.

EPA Technical Analyses for the Morgantown Area

Introduction

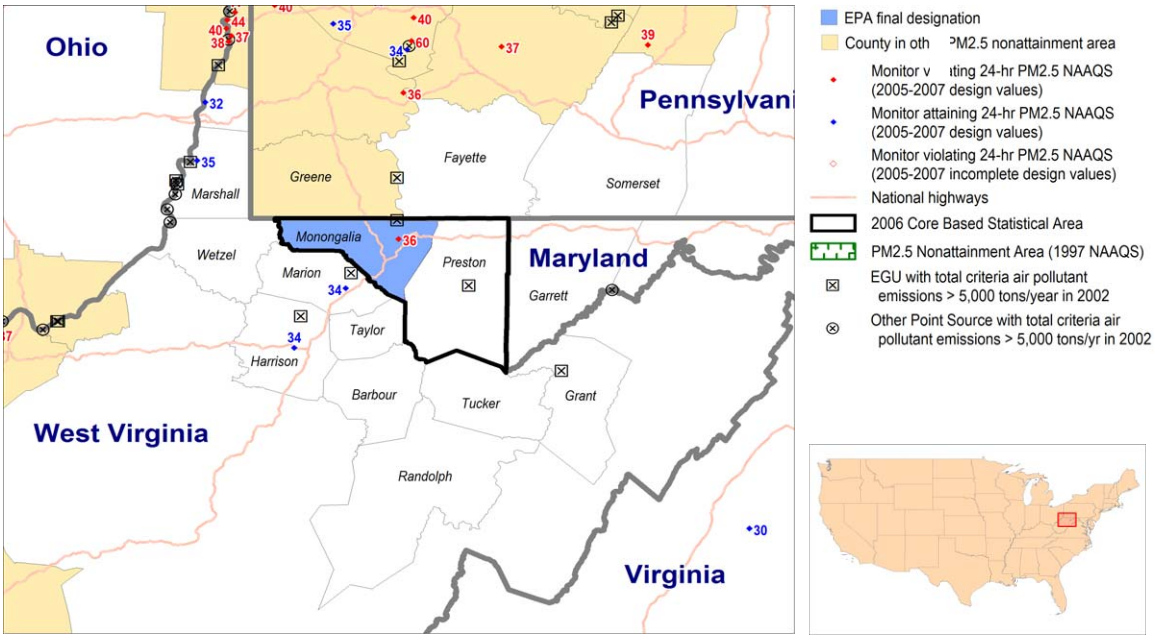
Pursuant to section 107(d) of the Clean Air Act, EPA must designate as nonattainment those areas that violate the NAAQS and those areas that contribute to violations. This technical analysis for the Morgantown area identifies the counties with monitors that violate the 2006 24-hour $PM_{2.5}$ standard and evaluates the counties that potentially contribute to fine particle concentrations in the area. EPA has evaluated these counties based on the weight of evidence of the following nine factors recommended in EPA guidance and any other relevant information:

- pollutant emissions
- air quality data
- population density and degree of urbanization
- traffic and commuting patterns
- growth
- meteorology
- geography and topography
- jurisdictional boundaries
- level of control of emissions sources

We also used analytical tools and data such as pollution roses, fine particle composition monitoring data, back trajectory analyses, and the contributing emission score (CES) to evaluate these areas. (See additional discussion of the CES under Factor 1 below.)

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

Figure 1. The Morgantown Area



In November 2007, the State of West Virginia recommended that no areas be designated as "nonattainment" for the 2006 24-hour $PM_{2.5}$ standard in the Morgantown area, based on air quality data from 2004-2006. See the November 9, 2007 letter from the West Virginia Department of Environmental Protection to EPA. These data are from Federal Reference Method (FRM) monitors located in the state.

In March of 2008, EPA notified West Virginia that a monitor in Monongalia County in the Morgantown area was violating the 24 hour PM 2.5 NAAQS based on 2005-2007 data. However, West Virginia did not provided EPA with a revised recommendation for this area.

In August 2008, EPA notified West Virginia of its intended designations. In this letter, EPA also requested that if West Virginia 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 has designated one county in West Virginia as nonattainment for the 2006 24-hour $PM_{2.5}$ air quality standard as part of the Morgantown nonattainment area, based upon currently available information. This county is listed in the table below.

Morgantown	State-Recommended Nonattainment Counties	EPA Final Designated Nonattainment Counties
West Virginia	None	Monongalia County - Newly violating area with 2005 to 2007 data

The following is a technical analysis for the Morgantown 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, sulfur dioxide (SO_2), nitrogen oxides (NO_x), volatile organic compounds (VOCs), and ammonia (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 and NH_3 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 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 consideration of data for these factors. A summary of the CES is included in Attachment 2, and 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 Morgantown area. Counties are listed in descending order by CES.

Table 1. $PM_{2.5}$ Related Emissions and Contributing Emissions Score

County, State	State Recommended Nonattainment?	CES	$PM_{2.5}$ emissions total (tpy)	$PM_{2.5}$ emissions carbon (tpy)	$PM_{2.5}$ emissions other (tpy)	SO_2 (tpy)	NOx (tpy)	VOCs (tpy)	NH_3 (tpy)
Monongalia, WV		100	5,105	469	4,636	84,301	12,953	5,081	211
Greene, PA		49	8,873	592	8,280	146,554	20,374	2,642	350
Allegheny, PA	Yes - other area	21	5,221	2,245	2,975	51,471	63,290	46,690	2,249
Harrison, WV		19	2,752	415	2,338	5,287	23,807	4,587	253
Marshall, WV		17	4,604	309	4,295	118,021	39,932	3,230	146
Marion, WV		14	561	189	372	3,513	4,099	3,016	112
Preston, WV		13	1,219	162	1,057	17,171	3,968	1,610	260
Fayette, PA		6	657	298	360	1,291	4,064	5,377	521
Taylor, WV		4	266	51	215	424	1,457	752	63
Grant, WV		3	6,241	343	5,897	4,642	24,190	1,145	824
Garrett, MD		3	552	288	264	858	2,499	3,527	556
Wetzel, WV		3	197	85	111	691	3,985	2,065	43
Barbour, WV		2	210	62	149	108	668	709	79
Somerset, PA		1	903	425	479	1,844	4,654	5,591	1,596
Randolph, WV		1	289	137	152	217	2,562	2,292	143
Tucker, WV		1	234	50	185	131	547	704	29

Based upon the data set forth on Table 1, Greene County, PA has the highest emissions, but the second highest CES. The violating monitor is located in Monongalia, WV. Monongalia County has the highest CES. This high score may be due to the fact that there is a large source (the Fort Martin Power Station) close to the violating monitor. Allegheny County, PA and Marshall and Harrison Counties, WV have the next highest emissions and comparable CESs. However, most of Allegheny County (except for the Liberty-Clairton area) and a portion of Greene County that contains a large electric generating unit are part of the Pittsburgh-Beaver Valley nonattainment area for the 1997 and 2006 $PM_{2.5}$ NAAQS. The Liberty-Clairton nonattainment area, comprised of the five municipalities within Allegheny County, is designated as a separate nonattainment area for the 1997 and 2006 $PM_{2.5}$ NAAQS. (See the "EPA Technical Analysis for the Pittsburgh Area" and "EPA Technical Analysis for the Liberty-Clairton Area.")

Note that Monongalia and Preston Counties in West Virginia make up the 2006 Morgantown Metropolitan Statistical Area (MSA). This new MSA was first defined in June 2003, based on Census 2000 data. Compared to Monongalia County, Preston County has a low CES value and low

emissions. Based upon the above data, it appears that emissions from Monongalia County are about four times those of Preston County. However, because Preston County is part of the Morgantown MSA, further analysis was warranted to determine its inclusion in the Morgantown nonattainment area for the 2006 24-hour $PM_{2.5}$ NAAQS.

Factor 2: Air quality data

This factor considers the 24-hour $PM_{2.5}$ design values in micrograms per cubic meter ($\mu g/m^3$) for air quality monitors in counties in the Morgantown area. A monitor's design value indicates whether that monitor attains a specified air quality standard. The 2006 24-hour $PM_{2.5}$ standard is met when the 3-year average of a monitor's 98th percentile value is 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 Morgantown area are shown in Table 2.

Table 2. Air Quality Data

County	State Recommended Nonattainment?	Design Values 2003-05 ($\mu g/m^3$)	Design Values 2004-06 ($\mu g/m^3$)	Design Values 2005-07 ($\mu g/m^3$)
Monongalia, WV	No	36	34	36
Greene, PA	No	No monitor		
Allegheny, PA [Liberty-Clairton]*	Yes - other area [Yes - other area]	52 [68]	45 [65]	40 [60]
Harrison, WV	No	32	35	34
Marshall, WV	No	33	34	35
Marion, WV	No	34	34	34
Preston, WV	No	No monitor		
Fayette, PA	No	No monitor		
Taylor, WV	No	No monitor		
Grant, WV	No	No monitor		
Garrett, MD	No	No monitor		
Wetzel, WV	No	No monitor		
Barbour, WV	No	No monitor		
Somerset, PA	No	No monitor		
Randolph, WV	No	No monitor		
Tucker, WV	No	No monitor		

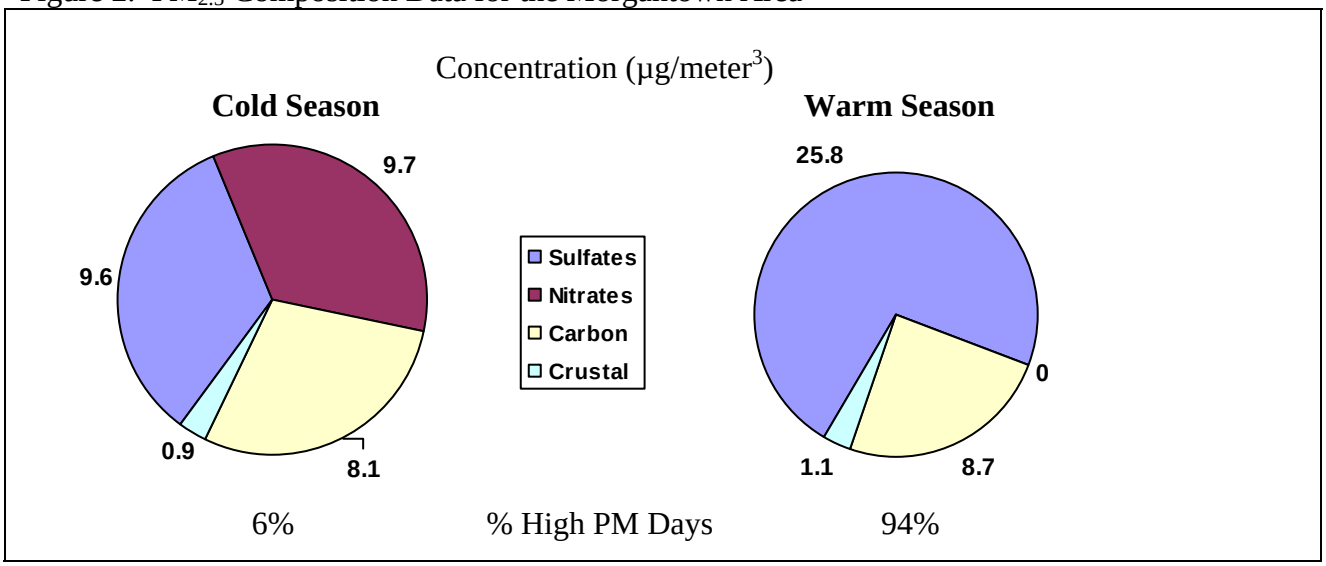
Note: * Allegheny County, except for the Liberty-Clairton area, is currently in the Pittsburgh-Beaver Valley 1997 $PM_{2.5}$ nonattainment area. The Liberty-Clairton area is currently a separate 1997 $PM_{2.5}$ nonattainment area.

Monongalia County in West Virginia shows a violation of the 2006 24-hour $PM_{2.5}$ standard. Therefore, this county is included in the Morgantown nonattainment area. In addition, Allegheny County in Pennsylvania shows a violation of the 2006 24-hour $PM_{2.5}$ standard. Most of Allegheny County (except for the Liberty-Clairton area) is part of the Pittsburgh-Beaver Valley nonattainment area for the 1997 and 2006 $PM_{2.5}$ NAAQS. The Liberty-Clairton nonattainment area, comprised of the five municipalities within Allegheny County, is designated as a separate nonattainment area for the 1997 and 2006 $PM_{2.5}$ NAAQS. Greene County does not have a monitor. Harrison, Marshall, and Marion Counties have monitors that do not show violations of the 2006 24-hour $PM_{2.5}$ NAAQS. 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.

Under this factor, we also consider fine particle composition monitoring data. Air quality monitoring data on the composition of fine particle mass are available from the EPA Chemical Speciation Network and the IMPROVE monitoring network. Analysis of these data indicates that the days with the highest fine particle concentrations occur predominantly in the summer. The average chemical composition of the highest days in the summer (warm season) is illustrated in Figure 2. This data indicates that sources of SO_2, direct $PM_{2.5}$ carbon, and NOx emissions are key contributors to exceedances in the area.

Figure 2. $PM_{2.5}$ Composition Data for the Morgantown Area



Note: Eligible monitors for providing design value data generally include State and Local Air Monitoring Stations (SLAMS) at population-oriented locations with an FRM monitor. All data from Special Purpose Monitors (SPM) using an FRM is eligible for comparison to the relevant NAAQS, subject to the requirements given in the October 17, 2006 Revision to Ambient Air Monitoring Regulations (71 FR 61236). All monitors used to provide data must meet the monitor siting and eligibility requirements given in 71 FR 61236 to 61328 in order to be acceptable for comparison to the 2006 24-hr $PM_{2.5}$ NAAQS for designation purposes.

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

Table 3 shows the 2005 population for each county in the Morgantown area being evaluated, as well as the population density for each county in that area. Population data provides an indication of whether it is likely that population-based emissions might contribute to violations of the 2006 24-hour $PM_{2.5}$ standard.

Table 3. Population

County	State Recommended Nonattainment?	2005 Population	2005 Population Density (pop/sq mi)
Monongalia, WV	No	84,592	231
Greene, PA	No	40,408	70

Allegheny, PA	Yes - other areas	1,233,036	1658
Harrison, WV	No	68,369	164
Marshall, WV	No	34,250	110
Marion, WV	No	56,662	182
Preston, WV	No	30,052	46
Fayette, PA	No	146,206	183
Taylor, WV	No	16,182	93
Grant, WV	No	11,688	24
Garrett, MD	No	29,863	46
Wetzel, WV	No	16,974	47
Barbour, WV	No	15,656	46
Somerset, PA	No	78,796	73
Randolph, WV	No	28,506	27
Tucker, WV	No	6,948	17

The above data indicates that Allegheny County, which is included in the Pittsburgh-Beaver Valley and Liberty-Clairton nonattainment areas for the 1997 and 2006 $PM_{2.5}$ standards (see "EPA Technical analysis for the Pittsburgh Area" and "EPA Technical Analysis for the Liberty-Clairton Area"), has the highest population, 1,233,036 people. All other counties with CESs higher than ten have 2005 populations less than 100,000. Fayette County, PA, with a CES of 6, has the second highest population, 146,206. As stated above, Preston County, WV is part of the Morgantown MSA. In 2005, Preston County's population was roughly less than half of Monongalia County's, and is low when compared with any urbanized area, such as Allegheny County, PA. Furthermore, Preston County's population density, 46, is extremely low compared to the population density of Monongalia County and many other counties in this analysis.

Factor 4: Traffic and commuting patterns

This factor considers the number of commuters in each county who drive to another county within the Morgantown area, the percent of total commuters in each county who commute to other counties within the Morgantown area, as well as the total Vehicle Miles Traveled (VMT) for each county in millions of miles (see Table 4). 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 4. Traffic and Commuting Patterns

County	State Recommended Nonattainment?	2005 VMT (millions of miles)	Number Commuting to any violating counties	Percent Commuting to any violating counties	Number Commuting into & within statistical area	Percent Commuting into & within statistical area
Monongalia, WV	No	727	32,120	88	32,630	89
Greene, PA	No	367	1,440	10	1,450	10
Allegheny, PA	Yes - other area	10,003	564,260	97	71	0
Harrison, WV	No	1,023	550	2	570	2
Marshall, WV	No	217	50	0	50	0
Marion, WV	No	656	3,010	13	3,060	13
Preston, WV	No	293	3,170	27	9,650	83
Fayette, PA	No	927	1,520	3	1,580	3
Taylor, WV	No	109	630	10	770	13
Grant, WV	No	104	26	1	18	0
Garrett, MD	No	487	100	1	430	3
Wetzel, WV	No	141	80	1	80	1
Barbour, WV	No	122	80	1	110	2

Somerset, PA	No	997	30	0	30	0
Randolph, WV	No	327	20	0	100	1
Tucker, WV	No	67	30	1	60	2

Note: The 2005 VMT data used for Tables 4 and 5 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

Table 4 indicates that VMT and numbers of commuters from Allegheny County dwarf all other counties, including the counties with CESs greater than ten: Monongalia, Greene, Harrison, Marshall, Marion, and Preston Counties. Monongalia County is bordered by Wetzel, Marion, Taylor, and Preston Counties in West Virginia, and Greene and Fayette Counties in Pennsylvania. Of those surrounding counties, Preston County has the highest number of commuters into the statistical area. Preston County, which is part of the Morgantown MSA, has 83 percent of the commuters into the MSA. However, the number of people commuting into any violating counties, or into the statistical area from Preston County, are one-tenth and one-third, respectively, that of the commuters from Monongalia County. More importantly, while 9,650 commuters from Preston County commute into the statistical area, 6,483 of those commuters are traveling within Preston County.

VMT in Preston County, WV is less than half that of the VMT in Monongalia County, WV which is also low when compared with any urbanized area, such as Allegheny County, PA. Finally, the VMT and commuting figures for Preston County are very low, in comparison to more populated areas where vehicle emissions are more relevant. As demonstrated in Table 4.1, vehicle emissions from Preston County are minimal when compared to a more populated area, such as, Allegheny County, PA.

Table 4.1. Highway Vehicle Emissions for the Morgantown Area and Selected Nearby Counties

Highway Vehicle Emissions (Tier 11) 2005 NEI, Version 1			Total County Emissions
County, State	Pollutant	Tons	Tons
Monongalia, WV	NOx	1767	12,953
Greene, PA		786	20,374
Allegheny, PA		18403	63,290
Harrison, WV		2454	24,055
Marshall, WV		427	39,932
Marion, WV		1567	4,099
Preston, WV		750	3,968
Monongalia, WV	PM25-PRI	33	5,105
Greene, PA		14	8,873
Allegheny, PA		311	5,221
Harrison, WV		46	3,256
Marshall, WV		7	4,604
Marion, WV		37	561
Preston, WV		15	1,219

Monongalia, WV	SO_2	41	84,301
Greene, PA		18	146,554
Allegheny, PA		392	51,471
Harrison, WV		57	5,302
Marshall, WV		10	118,021
Marion, WV		36	3,513
Preston, WV		18	17,171
Monongalia, WV	VOC	1102	5,081
Greene, PA		526	2,642
Allegheny, PA		14,938	46,690
Harrison, WV		1569	4,588
Marshall, WV		347	3,230
Marion, WV		996	3,016
Preston, WV		409	1,610
Monongalia, WV	NH3	73	211
Greene, PA		38	350
Allegheny, PA		1052	2,249
Harrison, WV		103	253
Marshall, WV		23	146
Marion, WV		66	112
Preston, WV		29	260

Factor 5: Growth rates and patterns

This factor considers population growth for 2000-2005 and growth in vehicle miles traveled (VMT) for 1996-2005 for counties in the Morgantown 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 is likely to be contributing to fine particle concentrations in the area.

Table 5 below shows population, population growth, VMT, and VMT growth for counties that are included in the Morgantown area.

Table 5. Population and VMT Values and Percent Change

Location	Population (2005)	Population Growth (2000 - 2005)	Population % change (2000 - 2005)	2005 VMT (millions of miles)	VMT% change (1996 to 2005)
Monongalia, WV	84,592	2,464	3	727	(18)
Greene, PA	40,408	-408	(1)	367	(19)
Allegheny, PA	1,233,036	-51,377	(4)	10,003	(3)
Harrison, WV	68,369	-283	(0.4)	1,023	(26)
Marshall, WV	34,250	-1,059	(3)	217	44
Marion, WV	56,406	-192	(0.3)	656	(11)
Preston, WV	30,052	875	3	293	70
Fayette, PA	146,206	-2,984	(2)	927	(14)
Taylor, WV	16,182	210	1.3	109	24
Grant, WV	11,688	450	4	104	(35)
Garrett, MD	29,863	60	0.2	487	8

Wetzel, WV	16,974	-707	(4)	141	8
Barbour, WV	15,656	155	1	122	1
Somerset, PA	78,796	-1,608	(2)	997	41
Randolph, WV	28,506	282	1	327	19
Tucker, WV	6,948	-366	(5)	67	3

Based on the data above, Monongalia and Preston Counties had small increases (3%) in population from 2000 to 2005. All other counties with CESs over ten and/or bordering Monongalia County experienced decreases in population during the same time period. Between 1996 and 2005, VMT decreased in most of these same counties, except for Preston and Marshall Counties, which had considerable VMT growth. However, the 2005 VMT in Preston and Marshall Counties are still extremely low, 293 million miles and 217 million miles, respectively.

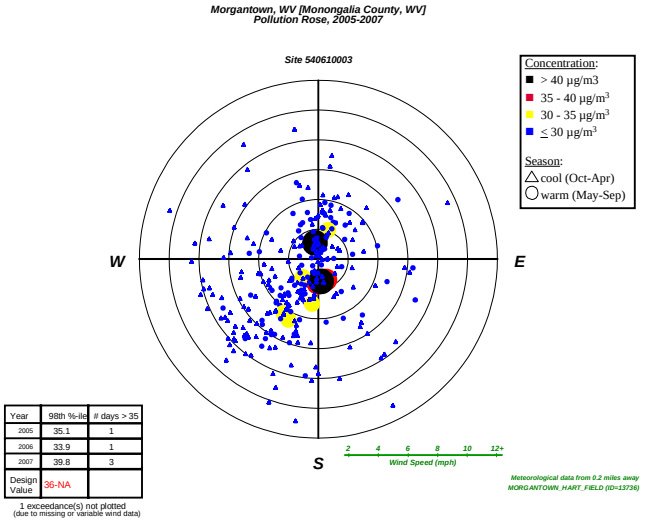
Factor 6: Meteorology (weather/transport patterns)

For this factor, EPA considered data from National Weather Service instruments and other meteorological monitoring sites in the Morgantown 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 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. Figure 6 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 and 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 an 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.

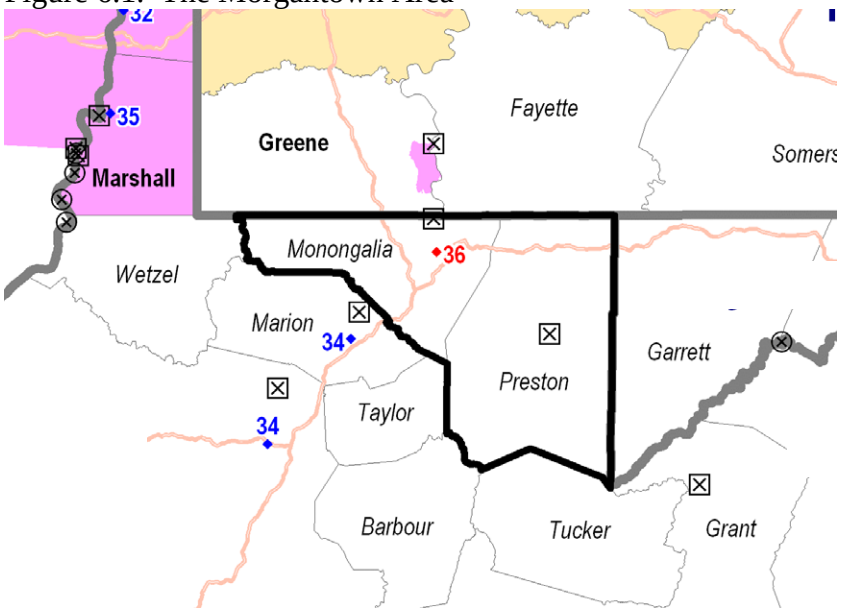
The following pollution rose for Monongalia County shows that days with monitored $PM_{2.5}$ values greater than 35 $\mu g/m^3$ occurred when the wind came from the south and the north at low speeds. Days with $PM_{2.5}$ in the 30 to 35 $\mu g/m^3$ range show winds from the north, south, and southwest. $PM_{2.5}$ concentrations less than or equal to 30 $\mu g/m^3$ are associated with winds all directions, but especially from the southwest, north, and northeast.

Figure 6. Pollution Trajectory Plot for Monongalia County, WV (Site 54-061-0003)



As shown in Figure 6.1, the violating monitor in the Morgantown area is in northern Monongalia County. Preston County is southeast of the violating monitor. Therefore, emissions from Preston County do not appear to impact the violating monitor on high days (with monitored values greater than 35 µg/m^3). Similarly, Fayette County is to the east of the violating monitor, and therefore is not likely contributing to violations there. Because high $PM_{2.5}$ days are associated with low wind speeds, it is likely that local emissions from local sources within Monongalia County are impacting the monitor in the Morgantown area.

Figure 6.1. The Morgantown Area



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 Morgantown area.

The Morgantown 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 (e.g., existing PM areas)

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 2006 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 2006 24-hour standard.

Most areas that were originally designated nonattainment for the $PM_{2.5}$ standards still have not attained the standards. Thus, EPA has generally concluded that counties that were designated as having emissions sources contributing to fine particle concentrations which continue to exceed the 1997 standards (all areas violated the annual standard, twothree 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.

Of the counties in this analysis, Greene County, PA has the highest emissions and the second highest CES value (See Table 1 under Factor 1). Greene County is just north of the violating monitor. A portion of Greene County (which contains a large power plant) is currently in the Pittsburgh nonattainment area for the 1997 $PM_{2.5}$ NAAQS. Because of jurisdictional boundaries and for ease of planning, EPA is including that same portion of the county in the Pittsburgh nonattainment area for the 2006 $PM_{2.5}$ NAAQS. Likewise, Allegheny County, PA has the third highest CES. Most of Allegheny County (except for the Liberty-Clairton area) and is part of the Pittsburgh-Beaver Valley nonattainment area for the 1997 and 2006 $PM_{2.5}$ NAAQS. The Liberty-Clairton nonattainment area, comprised of the five municipalities within Allegheny County, is designated as a separate nonattainment area for the 1997 and 2006 $PM_{2.5}$ NAAQS.

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 Morgantown 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 (e.g. 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.

The emission estimates on Table 1 under Factor 1 include any control strategies established by West Virginia State in the Morgantown area before 2005 that may influence emissions of any component of $PM_{2.5}$ emissions (i.e., total carbon, SO_2, NOx, and crustal $PM_{2.5}$).

In West Virginia and Pennsylvania, there may be some emission reductions of SO_2 and NOx subsequent to 2005 that are not accounted for elsewhere in this analysis, due to new controls at large electric generating units (EGUs).

Table 9 shows emissions and controls (current and projected) for EGUs with SO_2 plus NO_x emissions greater than 5000 tons. Data was obtained from the 2006 National Electric Energy Data System (NEEDS) database. Table 9.1 shows emissions for the same EGUs for the years 2002 through 2007. The data was obtained from the emissions section of EPA's Clean Air Markets Division (CAMD) website:
http://camddataandmaps.epa.gov/gdm/index.cfm?fuseaction=emissions.wizard.

Table 9. EGUs with SO_2 and NO_x emissions > 5000 tons, from the 2006 NEEDS EGU database

County	Plant Name	Plant Type	Unique ID Final	2006 SO_2	2006 NOx	Scrubber Online Year	Scrubber Efficiency	SCR Online Year	Capacity MW	1997 $PM_{2.5}$ Nonattainment Area
Monongalia, WV	Fort Martin Power Station	Coal Steam	3943_B_2	42,296	4,771	2006	95.0		555.0	None
			3943_B_1	45,269	5,319	2006	95.0		552.0	
Greene, PA	Hatfield's	Coal	3179_B_1	55,558	8,901	2009	95.0		530.0	Pittsburgh

	Ferry Power Station	Steam	3179_B_2	45,405	6,701	2009	95.0		530.0	(partial)
			3179_B_3	34,119	4,453	2009	95.0		530.0	
Allegheny, PA	Cheswick	Coal Steam	8226_B_1	32,373	4,221	2009	95.0	2003	580.0	Pittsburgh
Harrison, WV	Harrison Power Station	Coal Steam	3944_B_3	1,519	6,088	1995	98.0	2003	651.0	None
			3944_B_2	1,595	7,702	1995	98.0	2003	642.0	
			3944_B_1	1,949	7,365	1995	98.0	2001	640.0	
Marshall, WV	Mitchell	Coal Steam	3948_B_1	26,240	8,798	2007	95.0	1993	800.0	Wheeling
			3948_B_2	25,766	7,596	2006	95.0	1994	800.0	
	Kammer	Coal Steam	3947_B_1	14,251	3,858				210.0	
			3947_B_3	14,002	3,748				210.0	
			3947_B_2	12,497	3,193				210.0	
Marion, WV	Rivesville	Coal Steam	3945_B_8	1,700	761				91.0	None
			3945_B_7	25	16				46.0	
Preston, WV	Albright	Coal Steam	3942_B_3	8,469	979				137.0	None
			3942_B_2	3,660	608				73.0	
			3942_B_1	3,100	663				73.0	
Grant, WV	Mt Storm	Coal Steam	3954_B_2	1,191	7,478	2001	95.5	2003	524.0	None
			3954_B_1	1,067	6,442	2002	95.5	2003	524.0	
			3954_B_3	881	8,544	1994	95.0	2004	521.0	
	North Branch	Coal Steam	7537_B_1A	473	657		91.6		37.0	
			7537_B_1B	394	551		91.6		37.0	

Table 9.1. EGU 2002 to 2007 Emissions from EPA's CAMD

Fort Martin Power Station, Monongalia County, WV, Facility ID: 3943					
Year	# of Months Reported	SO_2 Tons	NO_x Tons	CO_2 Tons	Heat Input (mmBtu)
2002	12	91,119.3	11,235.7	7,551,652.1	73,602,855
2003	12	102,522.3	11,582.1	7,693,243.9	74,982,901
2004	12	99,869.0	10,889.8	7,461,624.9	72,725,403
2005	12	82,820.5	9,089.0	6,729,296.8	65,587,709
2006	12	87,565.1	10,090.0	7,726,961.8	75,311,502
2007	12	88,031.6	8,995.3	6,726,766.8	65,563,012
Hatfield's Ferry Power Station , Greene County, PA, Facility ID: 3179					
Year	# of Months Reported	SO_2 Tons	NO_x Tons	CO_2 Tons	Heat Input (mmBtu)
2002	12	158,712.6	23,064.7	10,043,621.5	97,891,124
2003	12	139,423.9	17,642.8	8,566,912.0	83,503,429
2004	12	148,458.6	19,198.8	9,130,158.0	88,987,877
2005	12	145,621.2	17,449.6	8,768,387.5	85,461,894
2006	12	135,082.2	20,055.6	9,139,990.4	89,083,716
2007	12	144,929.7	23,671.5	10,173,087.9	99,152,896
Cheswick, Allegheny County, PA, Facility ID: 8226					
Year	# of Months Reported	SO_2 Tons	NO_x Tons	CO_2 Tons	Heat Input (mmBtu)

2002	12	42,017.9	5,761.2	3,376,491.2	32,977,678
2003	12	45,432.8	4,704.7	3,727,784.1	36,352,654
2004	12	40,982.1	4,926.8	3,198,899.6	31,220,642
2005	12	37,320.1	3,913.6	2,921,151.9	28,510,285
2006	12	32,372.6	4,220.7	2,818,930.7	27,498,505
2007	12	34,088.9	4,455.0	2,903,425.1	28,314,056
Harrison Power Station, Harrison County, WV, Facility ID: 3944					
Year	# of Months Reported	SO_2 Tons	NO_x Tons	CO_2 Tons	Heat Input (mmBtu)
2002	12	8,691.5	28,629.2	13,997,732.0	136,430,137
2003	12	13,145.2	22,234.7	13,049,706.2	127,190,158
2004	12	9,868.6	23,872.6	14,488,660.3	141,214,989
2005	12	4,765.5	19,365.6	12,961,434.6	126,329,763
2006	12	5,062.6	21,154.2	13,450,027.5	131,091,928
2007	12	4,737.5	19,858.5	13,570,101.3	132,262,186
Mitchell, Marshall County, WV, Facility ID: 3948					
Year	# of Months Reported	SO_2 Tons	NO_x Tons	CO_2 Tons	Heat Input (mmBtu)
2002	12	56,009.2	29,593.1	8,641,347.9	84,222,423
2003	12	59,330.9	29,660.9	8,991,537.2	87,636,839
2004	12	62,617.0	23,575.2	8,627,594.8	84,089,902
2005	12	53,765.1	20,026.4	6,599,845.3	64,325,953
2006	12	52,005.5	16,394.6	7,076,633.7	68,972,995
2007	12	6,084.4	14,682.4	9,033,512.4	88,045,916
Kammer, Marshall County, WV, Facility ID: 3947					
Year	# of Months Reported	SO_2 Tons	NO_x Tons	CO_2 Tons	Heat Input (mmBtu)
2002	12	39,096.2	13,173.9	3,694,205.5	36,005,906
2003	12	42,216.1	11,968.5	3,562,163.2	34,718,914
2004	12	40,016.3	10,883.3	3,320,586.7	32,364,383
2005	12	42,574.0	11,516.3	3,722,892.7	36,285,498
2006	12	40,750.2	10,798.1	3,464,587.1	33,767,863
2007	12	43,126.6	11,100.7	3,991,447.0	38,902,989
Rivesville Power Station, Marion County, WV, Facility ID: 3945					
Year	# of Months Reported	SO_2 Tons	NO_x Tons	CO_2 Tons	Heat Input (mmBtu)
2002	12	4,412.2	2,027.1	570,549.6	5,560,922
2003	12	5,355.5	2,235.1	663,083.0	6,462,782
2004	12	1,921.5	757.3	236,062.5	2,300,787
2005	12	1,769.3	747.6	251,001.7	2,446,417
2006	12	1,725.1	777.0	244,100.5	2,379,179
2007	12	2,884.2	1,023.9	349,500.8	3,406,413
Albright Power Station, Preston County, WV, Facility ID: 3942					
Year	# of Months Reported	SO_2 Tons	NO_x Tons	CO_2 Tons	Heat Input (mmBtu)
2002	12	20,560.1	4,672.3	1,702,180.5	16,590,381
2003	12	25,424.6	5,599.6	2,138,410.0	20,842,162
2004	12	15,984.9	2,725.0	1,230,785.0	11,995,936
2005	12	16,922.8	2,495.6	1,290,853.3	12,581,428
2006	12	15,228.9	2,249.7	1,168,370.4	11,387,612
2007	12	20,792.9	3,185.7	1,610,136.3	15,693,371
Mount Storm Power Station, Grant County, WV, Facility ID: 3954					
Year	# of Months Reported	SO_2 Tons	NO_x Tons	CO_2 Tons	Heat Input (mmBtu)

2002	12	23,370.2	39,854.6	12,818,014.6	124,931,891
2003	12	7,133.6	21,961.9	10,711,229.8	104,397,987
2004	12	5,563.6	26,240.8	12,966,450.5	126,378,686
2005	12	3,471.4	22,555.9	12,047,554.9	117,422,557
2006	12	3,139.1	22,463.7	12,464,709.0	121,488,414
2007	12	2,773.4	17,868.1	10,700,711.1	104,295,430
North Branch Power Station, Grant County, WV, Facility ID: 7537					
Year	# of Months Reported	SO_2 Tons	NO_x Tons	CO_2 Tons	Heat Input (mmBtu)
2002	12	519.5	693.7	441,429.7	4,302,363
2003	12	559.4	840.4	569,294.2	5,548,857
2004	12	986.6	1,360.8	804,790.0	7,843,951
2005	12	1,072.8	1,365.2	817,330.1	7,966,229
2006	12	867.0	1,208.6	727,475.5	7,090,420
2007	12	1,033.5	1,378.6	771,565.4	7,520,154

As can be seen from Tables 9 and 9.1, since 2005, these new controls have resulted in significant reductions at the Mitchell power plant in Marshall County, WV. In 2005, the Mitchell plant emitted 53,765 tons of SO_2 and 20,026 tons of NOx, when the annual heat input was 64,325,953 million British Thermal Units (mmBTUs). In 2007, the Mitchell plant emitted 6,084 tons of SO_2 and 14,682 tons of NOx when the annual heat input was higher, 88,045,916 mmBTUs. These reductions of 47,681 tons of SO_2 and 5,344 tons of NOx from 2005 to 2007 are significant, especially when compared to the county's total emissions in 2005, 118,021 tons of SO_2 and 39,932 tons of NOx. Therefore, it is likely that Marshall County's CES would be lower than the calculated value of seventeen, if the 2007 emissions data was considered.

New controls also resulted in modest emission reductions at the Fort Martin Power Station in Monongalia County, WV. However, the reductions at Fort Martin are not nearly as substantial as those described above for the Mitchell plant.

Some EGUs are expected to put controls in place in the future. The Hatfield's Ferry Power Station in Greene County, PA and the Cheswick plant in Allegheny County, PA are expected to install scrubbers in 2009. However, EPA is only considering controls in place and federally enforceable at the time of designation, i.e., by 2008, as the Act requires designations based on current conditions. Therefore, these planned controls are not considered in this analysis

Conclusion

The Morgantown area was not a nonattainment area for either the 1997 $PM_{2.5}$ standard or the 1997 8-hour ozone standard. The Morgantown metropolitan statistical area is comprised of Monongalia and Preston Counties, in West Virginia. This technical analysis for the Morgantown area identifies the counties with monitors that violate the 2006 24-hour $PM_{2.5}$ standard and evaluates the counties that potentially contribute to fine particle concentrations in the area. Monongalia County has one monitor showing a violation of 2006 24-hour $PM_{2.5}$ NAAQS, considering 2005-2007 data. Thus, the area must be designated nonattainment consistent with Clean Air Act section 107(d). Preston County has no air quality monitor. Marshall County, Harrison County and Marion County each have monitors which show attainment with the 2006 $PM_{2.5}$ NAAQS.

Emissions from Monongalia County are about four times those of Preston County. Furthermore, Preston Counties population and VMT are less than half that of Monongalia County, and its population density is less than one-third that of Monongalia County. In addition, only about 3200 Preston County residents commute to Monongalia County. Moreover, meteorological data indicates that prevailing winds on high $PM_{2.5}$ days in the area are from the north and south. Preston County is east of the violating monitor in the Morgantown area, which is in northeastern Monongalia County. For these reasons, EPA has determined that Preston County does not contribute to the $PM_{2.5}$ nonattainment problem in the Morgantown area.

EPA's technical analysis shows that Monongalia County contributes the most to the nonattainment of the 2006 24-hour $PM_{2.5}$ standard in the area. Allegheny and Greene Counties in Pennsylvania also contribute to the nonattainment of the 2006 24-hour $PM_{2.5}$ standard in the area. However, most of Allegheny County (except for the Liberty-Clairton area) and a portion of Greene County that contains a large electric generating unit are part of the Pittsburgh-Beaver Valley nonattainment area for the 1997 and 2006 $PM_{2.5}$ NAAQS. The Liberty-Clairton nonattainment area, comprised of the five municipalities within Allegheny County, is designated as a separate nonattainment area for the 1997 and 2006 $PM_{2.5}$ NAAQS.

Fayette, Marion, Taylor and Wetzel Counties border Monongalia County. All four counties have very low emissions relative to Monongalia County and very few commuters into the Morgantown area. Taylor and Wetzel Counties have very low population and VMT. Fayette and Marion Counties have negative population and VMT growth, and Wetzel County has negative population growth. For these reasons, EPA has determined that Fayette, Marion, Taylor and Wetzel Counties do not contribute to the $PM_{2.5}$ nonattainment problem in the Morgantown area.

Marshall and Harrison Counties do not border Monongalia County, but are nearby. Harrison County has relatively low emissions compared to Monongalia County. Marshall County's 2005 emission are comparable to those of Monongalia County. However, new controls in place after 2005 have resulted in significant reductions at the Mitchell power plant in Marshall County. These reductions of 47,681 tons of SO_2 and 5,344 tons of NOx from 2005 to 2007 are significant, especially when compared to the county's total emissions in 2005, 118,021 tons of SO_2 and 39,932 tons of NOx. Marshall County has relatively low population and VMT. Both Marshall and Harrison Counties have very few commuters into the Morgantown area. Harrison County had negative population and VMT growth, and Marshall County had negative VMT growth. For these reasons, EPA has determined that Marshall and Harrison Counties do not contribute to the $PM_{2.5}$ nonattainment problem in the Morgantown area.

Based upon this technical analysis, EPA is designating the Morgantown nonattainment area for the 2006 $PM_{2.5}$ NAAQS as consisting of a single county, Monongalia County, West Virginia.

EPA Technical Analysis for Parkersburg-Marietta Area

Introduction

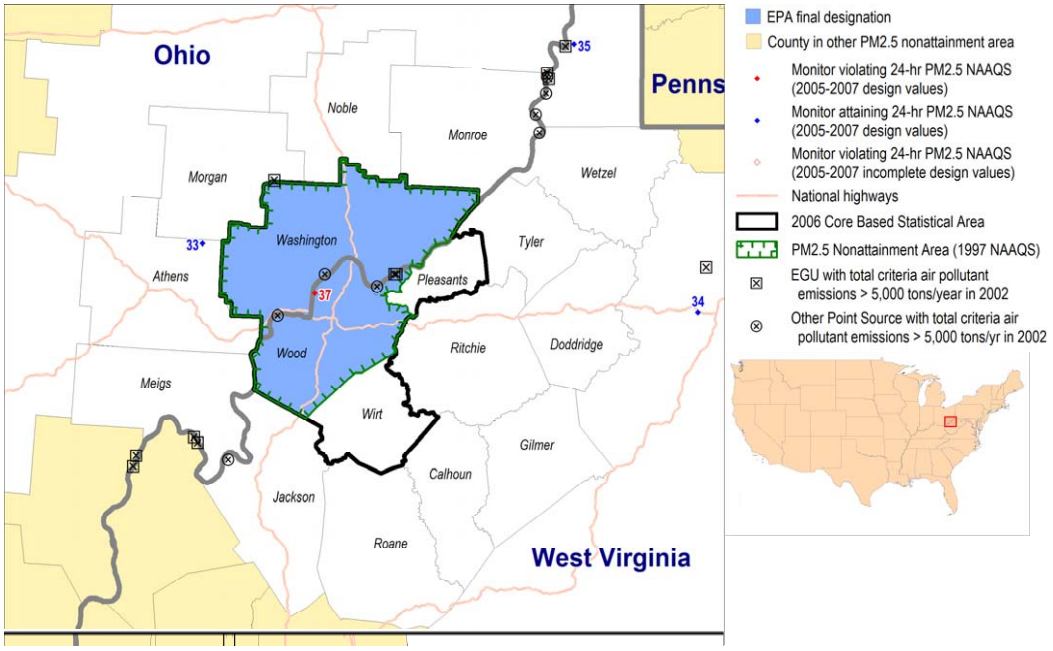
Pursuant to section 107(d) of the Clean Air Act, EPA must designate as nonattainment those areas that violate the NAAQS and those nearby areas that contribute to violations. This technical analysis for the Parkersburg-Marietta area identifies the counties with monitors that violate the 2006 24-hour $PM_{2.5}$ standard and evaluates nearby counties for contributions to fine particle concentrations in the area. EPA has evaluated these counties based on the weight of evidence of the following nine factors recommended in EPA guidance and any other relevant information:

- pollutant emissions
- air quality data
- population density and degree of urbanization
- traffic and commuting patterns
- growth
- meteorology
- geography and topography
- jurisdictional boundaries
- level of control of emissions sources

We also used analytical tools and data such as pollution roses, fine particle composition monitoring data, back trajectory analyses, and the contributing emission score (CES) to evaluate these areas. (See additional discussion of the CES under Factor 1).

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

Figure 1. The Parkersburg-Marietta Area



For this area, EPA previously established $PM_{2.5}$ nonattainment boundaries for the 1997 $PM_{2.5}$ NAAQS that included two full counties and one partial county, with one full county and one partial county being located in West Virginia.

In November 2007, the State of West Virginia recommended that no areas be designated as "nonattainment" for the 2006 24-hour $PM_{2.5}$ standard in the Parkersburg-Marietta area, based on air quality data from 2004-2006. See the November 9, 2007 letter from the West Virginia Department of Environmental Protection to EPA. These data are from Federal Reference Method (FRM) monitors located in the state.

In March of 2008, EPA notified West Virginia that a monitor Wood County in the Parkersburg-Marietta area was violating the 2006 24 hour $PM_{2.5}$ NAAQS based on 2005-2007 data. However, West Virginia did not provide EPA with a revised recommendation for this area.

In August 2008, EPA notified West Virginia of its intended designations. In this letter, EPA also requested that if West Virginia 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 has designated Wood County and a portion of Pleasants County, West Virginia (together with Washington County, Ohio) as nonattainment for the for the 2006 24-hour $PM_{2.5}$ air-quality standard as part of the Parkersburg-Marietta nonattainment area, based upon currently available information. These counties are listed in the table below.

Parkersburg-Marietta Area	State-Recommended Nonattainment Counties	EPA Final Designated Nonattainment Counties within West Virginia
West Virginia	None	Pleasants County (partial) Wood County

The following is a technical analysis for the West Virginia portion of the Parkersburg-Marietta 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, sulfur dioxide (SO_2), nitrogen oxides (NO_x), volatile organic compounds (VOCs), and ammonia (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 and NH_3 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 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 summary of the CES is included in attachment 2, and 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 are listed in descending order by CES. Counties in the Parkersburg-Marietta nonattainment area for the 1997 $PM_{2.5}$ NAAQS are in boldface.

Table 1. $PM_{2.5}$ Related Emissions and Contributing Emissions Score

County	State Recommended Nonattainment ?	CES	$PM_{2.5}$ emissions total (tpy)	$PM_{2.5}$ emissions carbon (tpy)	$PM_{2.5}$ emissions other (tpy)	SO_2 (tpy)	NOx (tpy)	VOCs (tpy)	NH_3 (tpy)
Washington, OH	**Yes**	**100**	**8,286**	**741**	**7,545**	**164,357**	**24,331**	**5,194**	**1,344**
Wood, WV	**No**	**34**	**977**	**421**	**557**	**6,243**	**5,866**	**6,295**	**200**
Pleasants, WV	**No**	**19**	**1,851**	**144**	**1,706**	**62,011**	**14,912**	**1,462**	**112**
Athens, OH	No	4	465	228	236	1,459	3,275	2,352	290
Jackson, WV	No	4	817	188	629	3,326	3,036	2,327	164
Meigs, OH	No	3	321	155	168	338	2,161	1,165	834
Monroe, OH	No	1	514	153	362	3,434	2,478	1,101	240
Morgan, OH	No	1	221	88	133	34	401	767	243
Noble, OH	No	1	213	92	121	57	1,395	1,043	197
Ritchie, WV	No	1	132	43	88	129	709	713	68
Roane, WV	No	1	158	57	100	86	600	916	100
Tyler, WV	No	1	171	56	115	491	1,418	1,946	52
Wirt, WV	No	1	94	24	70	18	134	473	45
Calhoun, WV	No	0	102	27	75	37	793	498	33
Wetzel, WV	No	0	197	85	111	691	3,985	2,065	43
Doddridge, WV	No	0	104	28	76	53	963	435	51
Gilmer, WV	No	0	116	36	80	83	1,096	800	48

Based upon the data set forth in Table 1, Washington County, OH, Wood County, WV, and Pleasants County, WV have the three highest CES scores in this area. Wood County is the location of the violating monitor in this area. Nearby Washington and Pleasants Counties have high levels of sulfur dioxide emissions, indicating a contribution to the high sulfate levels (more than 25 $\mu g/m^3$) observed on high $PM_{2.5}$ days in the area. EPA believes that the combination of the sulfur dioxide emissions from the two EGUs in Pleasants County contribute to the high sulfate levels (more than 25 $\mu g/m^3$) observed on high $PM_{2.5}$ days in the area. All other counties in this analysis have CESs less than five and appear to be low contributors.

Washington County has by far the highest $PM_{2.5}$, SO_2, NO_x, and NH_3 emissions. Pleasants County has the next highest emissions, but the third highest CES. Except for VOCs, Wood County has

much lower emissions than Pleasants County. It is likely that the CES for Wood County is higher than Pleasants simply because Wood County contains the violating monitor. Based in part on emissions levels and CES values, EPA believes that Washington County and a portion of Pleasants are contributing to violations of the 2006 24-hour $PM_{2.5}$ NAAQS in Wood County.

Factor 2: Air quality data

This factor considers the 24-hour $PM_{2.5}$ design values in micrograms per cubic meter ($\mu g/m^3$) 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 2006 24-hour $PM_{2.5}$ standard is met when the 3-year average of a monitor's 98^{th} percentile values is 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 2. Counties in the Parkersburg-Marietta nonattainment area for the 1997 $PM_{2.5}$ NAAQS are in boldface.

Table 2. Air Quality Data

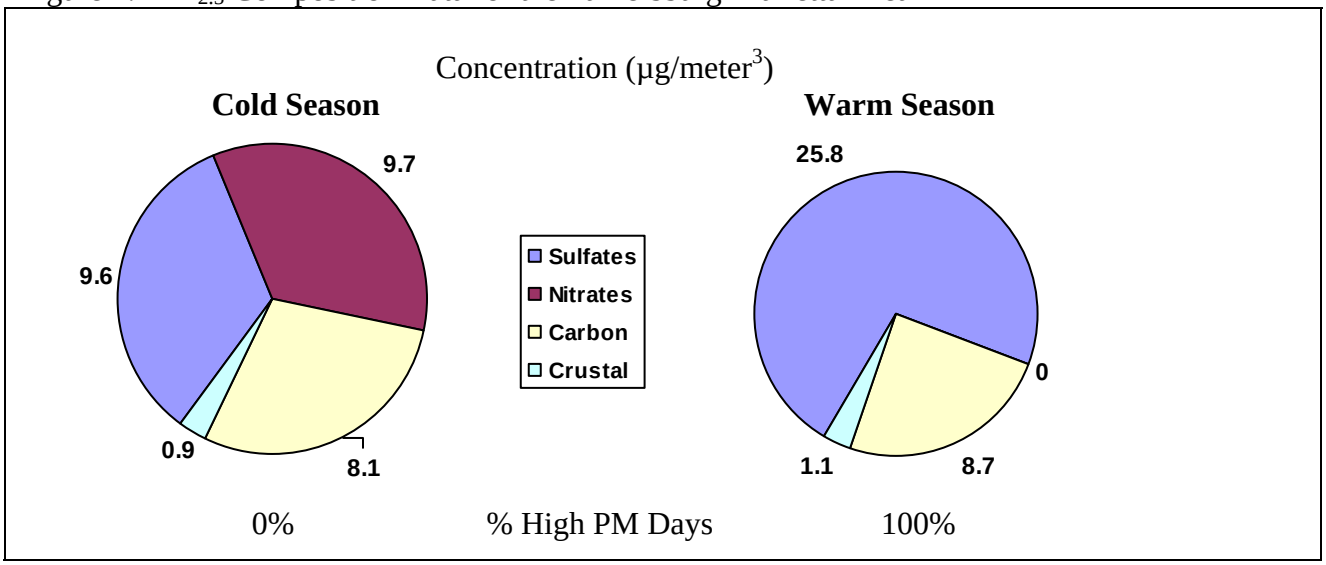
County, State	State Recommended Nonattainment?	24-hr $PM_{2.5}$ Design Values, 2003-2005 ($\mu g/m^3$)	24-hr $PM_{2.5}$ Design Values, 2004-2006 ($\mu g/m^3$)	24-hr $PM_{2.5}$ Design Values, 2005-2007 ($\mu g/m^3$)
Washington, OH	**Yes**	**No monitor**		
Wood, WV	**No**	**34**	**35**	**37**
Pleasants, WV	**No**	**No monitor**		
Athens, OH	No		32	33
Jackson, WV	No	No monitor		
Meigs, OH	No	No monitor		
Monroe, OH	No	No monitor		
Morgan, OH	No	No monitor		
Noble, OH	No	No monitor		
Ritchie, WV	No	No monitor		
Roane, WV	No	No monitor		
Tyler, WV	No	No monitor		
Wirt, WV	No	No monitor		
Calhoun, WV	No	No monitor		
Wetzel, WV	No	No monitor		
Doddridge, WV	No	No monitor		
Gilmer, WV	No	No monitor		

The data set forth in Table 2 indicates that Wood County, WV shows a violation of the 2006 24-hour $PM_{2.5}$ standard. Therefore, this county is included in the Parkersburg-Marietta nonattainment area. Wood County has the second highest CES and the third highest emissions, as explained above, in Factor 1. While other counties do not have a violating monitor, the absence of a violating monitor alone is not a sufficient reason to eliminate counties as candidates for inclusion in the

Parkersburg-Marietta nonattainment area. Each county has been evaluated based on the weight of evidence of the nine factors and other relevant information.

Under this factor, we also consider fine particle composition monitoring data. Air quality monitoring data on the composition of fine particle mass are available from the EPA Chemical Speciation Network and the IMPROVE monitoring network. Analysis of these data indicates that the days with the highest fine particle concentrations occur predominantly in the summer and the average chemical composition of the highest PM days is illustrated in Figure 2. This data indicates that sources of SO_2 emissions are key contributors to exceedances in the area.

Figure 2. $PM_{2.5}$ Composition Data for the Parkersburg-Marietta Area



Note: Eligible monitors for providing design value data generally include State and Local Air Monitoring Stations (SLAMS) at population-oriented locations with an FRM monitor. All data from Special Purpose Monitors (SPM) using an FRM is eligible for comparison to the relevant NAAQS, subject to the requirements given in the October 17, 2006 Revision to Ambient Air Monitoring Regulations (71 FR 61236). All monitors used to provide data must meet the monitor siting and eligibility requirements given in 71 FR 61236 to 61328 in order to be acceptable for comparison to the 2006 24-hr $PM_{2.5}$ NAAQS for designation purposes.

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

Table 3 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 2006 24-hour $PM_{2.5}$ standard. Counties in the Parkersburg-Marietta nonattainment area for the 1997 $PM_{2.5}$ NAAQS are in boldface.

Table 3. Population

County, State	State Recommended Nonattainment	2005 Population	2005 Population Density (people/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
Monroe, OH	No	14,736	32
Morgan, OH	No	14,895	35
Noble, OH	No	14,097	35
Ritchie, WV	No	10,529	23
Roane, WV	No	15,445	32
Tyler, WV	No	9,303	36
Wirt, WV	No	5,882	25
Calhoun, WV	No	7,367	26
Wetzel, WV	No	16,974	47
Doddridge, WV	No	7,474	23
Gilmer, WV	No	6,962	20

Based upon the data from Table 3, Wood County, WV, which is part of the Parkersburg-Marietta-Vienna metropolitan statistical area (MSA) and the 1997 and 2006 $PM_{2.5}$ nonattainment areas, has the highest population and highest population density. The next highest are Washington, OH, also part of the Parkersburg-Marietta-Vienna MSA and the 1997 and 2006 $PM_{2.5}$ nonattainment areas, and Athens, OH, which comprises the Athens MSA. Pleasants and Wirt Counties, which make up the remainder of the Parkersburg-Marietta-Vienna MSA, and all other counties in this analysis have very low populations and population densities. Therefore, these counties with lower populations were low ranking candidates for a nonattainment designation based upon this factor. The relatively low population and population density of Pleasants County is among the reasons EPA has concluded that it is appropriate to include only a portion of that county within the Parkersburg-Marietta area, instead of the entire county.

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 to other counties within the Parkersburg-Marietta area, as well as the total Vehicle Miles Traveled (VMT) for each county in millions of miles (see Table 4). 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 4. Traffic and Commuting Patterns

County, State	State Recommended Nonattainment?	Vehicle Miles Traveled in 2005 (millions)	Number commuting into any violating counties	Percent commuting into any violating counties	Number commuting into & within statistical area	Percent commuting into & within statistical area
Washington, OH	**Yes**	**686**	**5,930**	**21**	**26,250**	**94**
Wood, WV	**No**	**976**	**31,700**	**85**	**35,720**	**96**
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
Monroe, OH	No	159	50	1	280	5
Morgan, OH	No	104	50	1	560	10
Noble, OH	No	324	30	1	490	10
Ritchie, WV	No	125	780	20	1,110	29
Roane, WV	No	166	130	2	130	3
Tyler, WV	No	68	190	6	370	11
Wirt, WV	No	38	1,160	53	1,950	89
Calhoun, WV	No	51	80	3	110	5
Wetzel, WV	No	141	60	1	150	3
Doddridge, WV	No	87	80	3	100	4
Gilmer, WV	No	53	20	1	20	1

The listing of counties on Table 4 reflects a ranking based on the number of people commuting to other counties. Counties in the Parkersburg-Marietta nonattainment area for the 1997 $PM_{2.5}$ NAAQS are in boldface.

Washington and Wood Counties, which are part of the Parkersburg-Marietta-Vienna MSA, have the highest VMT, and the highest numbers of commuters into and within the statistical area. Pleasants and Wirt Counties, which make up the remainder of the Parkersburg-Marietta-Vienna MSA, have the next highest numbers of commuters into the statistical area, but very low VMT. However, based upon the data in Table 4, the number of commuters into the statistical area from these counties is less than the number of commuters within and from Washington and Wood Counties. Therefore, Pleasants and Wirt Counties were lower ranking candidates for a nonattainment designation based upon this factor. The relatively amount of commuting and VMT of Pleasants County, is among the reasons EPA has concluded that it is appropriate to include only a portion of that county within the Parkersburg-Marietta area, instead of the entire county.

Note: The 2005 VMT data used for Tables 4 and 5 of the technical analysis has 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 VMT 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 5 shows population, population growth, VMT, and VMT growth for counties that are included in the Parkersburg-Marietta area. Counties in the Parkersburg-Marietta nonattainment area for the 1997 $PM_{2.5}$ NAAQS are in boldface.

Table 5. Population and VMT Values and Percent Change

County, State	State Recommended Nonattainment	2005 Population	Percent Population Change (2000-05)	Vehicle Miles Traveled in 2005 (millions annually)	Percent VMT Growth (1996-2005)
Washington, OH	**Yes**	**62,155**	**(2)**	**686**	**(1)**
Wood, WV	**No**	**86,881**	**(1)**	**976**	**11**
Pleasants, WV	**No**	**7,329**	**(2)**	**67**	**37**
Athens, OH	No	62,028	-0.3	480	3
Jackson, WV	No	28,306	1	444	(7)
Meigs, OH	No	23,179	1	186	0
Monroe, OH	No	14,736	(3)	159	19
Morgan, OH	No	14,895	0.4	104	(7)
Noble, OH	No	14,097	0.7	324	(0)
Ritchie, WV	No	10,529	2	125	82
Roane, WV	No	15,445	-0.3	166	(19)
Tyler, WV	No	9,303	(3)	68	18
Wirt, WV	No	5,882	0.4	38	61
Calhoun, WV	No	7,367	(3)	51	4
Wetzel, WV	No	16,974	(4)	141	1
Doddridge, WV	No	7,474	1	87	79
Gilmer, WV	No	6,962	(3)	53	14

The Parkersburg-Marietta-Vienna MSA includes Washington, Wood, Pleasants, and Wirt Counties. Based on the data in Table 5**,** the counties with the highest CESs are Washington, Wood, and Pleasants Counties. These counties experienced slight decreases in population, one to two percent, from 2000 to 2005. However, Wood and Pleasants Counties experienced high VMT growth, 11 and 37 percent, respectively, from 1996 to 2005. Even with a large percentage increase, VMT in Pleasants County is still much lower than Washington and Wood Counties. Wirt County had a slight population increase, while the VMT increased by 61 percent. However, 2005 population and VMT in Wirt County are still much lower than Washington and Wood Counties, and somewhat lower than Pleasants County.

Factor 6: Meteorology (weather/transport patterns)

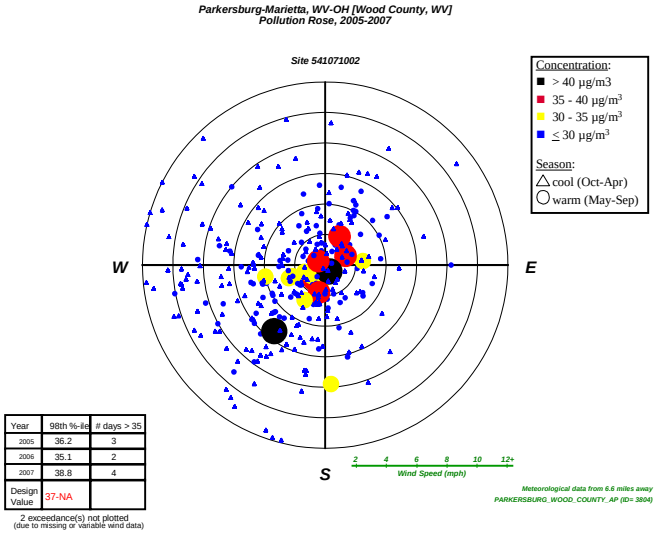
For this factor, EPA considered data from National Weather Service instruments and other meteorological monitoring sites in the area. Wind direction and wind speed data for 2005-2007 were analyzed, with an emphasis on "high $PM_{2.5}$ days" for each of two seasons (an October-April "cold" season and a May-September "warm" season). These high days are defined as days where any FRM 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. Figure 6 identifies 24-hour $PM_{2.5}$ values by color; days exceeding 35 ug/m3 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 Wood County, WV, below, shows that high $PM_{2.5}$ days occur more often on days with low average wind speeds. (See Figure 6.) The pollution rose shows high $PM_{2.5}$ days with low speed winds from most points of the compass, indicating that the Wood County monitor is influenced by the large sources that surround it. However, there are easterly and northeasterly components, indicating contribution from the three large emission sources just over the Wood County border in Pleasants County. These sources are the Pleasants Power Station, the Willow Island Power Station, and the Cabot Corporation Ohio River Plant. Figure 6 also shows several high $PM_{2.5}$ days with winds from the southwest, indicating that emissions from Wood County itself, and possibly emissions from the Huntington-Ashland area to the southwest, contribute to high $PM_{2.5}$ concentrations in Wood County. However, EPA has concluded that it is more appropriate to designate a separate Huntington-Ashland nonattainment area, that focuses upon the violating monitor in that area and includes the nearby areas that are contributing most directly to violations in that area.

Figure 6. Pollution Rose for Wood County, WV
(Site 54-107-1002)



Note: The meteorology data 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 looks at 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 Parkersburg-Marietta area. Wood County, WV and Washington County, OH are located directly across the Ohio River from one another, and the river does not create a barrier for transport of pollution from Ohio to the violating monitor in Wood County. Similarly, there are no geographical or topographical barriers between Pleasants County West Virginia and the violating monitor in Wood County that would significantly limit air-pollution transport within its air shed. This absence of limiting topography supports the conclusion that there is contribution from both Washington and Pleasants to violations of the 2006 24 hour $PM_{2.5}$ NAAQS in adjacent Wood County.

Factor 8: Jurisdictional boundaries (e.g., existing $PM_{2.5}$ areas)

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 2006 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 2006 24-hour standard.

Most areas that were originally designated nonattainment for the $PM_{2.5}$ standards still have not attained the standards. Thus, EPA has generally concluded that counties that were designated as having emissions sources contributing to fine particle concentrations which continue to exceed the 1997 standards (all areas violated the annual standard, three 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.

EPA believes that the major jurisdictional boundary in the Parkersburg-Marietta area is the State line between West Virginia and Ohio. The violating monitor is in Wood County, WV, but it is being affected by emissions from Washington County, OH. Due to the contribution of emissions from Washington County, OH, to the violating monitor in Wood County, WV, it is important that the states of West Virginia and Ohio work collaboratively to reduce such emissions.

On the other hand, areas designated as 8-hour ozone nonattainment areas are also important boundaries for State air quality planning. Wood County in West Virginia and Washington County in Ohio were included in the ozone nonattainment area associated with the Parkesburg-Marietta area. They now comprise the Parkesburg-Marietta ozone maintenance area. To the degree appropriate, based upon violations and contributions to violations of the ozone and $PM_{2.5}$ NAAQS in a particular area, EPA believes it may be helpful for air planning purposes and for attainment of both NAAQS, for there to be some consistency between ozone and $PM_{2.5}$ nonattainment area boundaries.

Pleasants County is part of the Parkersburg-Marietta-Vienna metropolitan statistical area, which also includes Wood and Wirt Counties in West Virginia and Washington County in Ohio. However, Pleasants County is not part of the Wood-Washington-Wirt Interstate Planning Commission (WWW), which is the metropolitan planning organization for Wood County, West Virginia and portions of Washington County, Ohio. EPA believes that including a portion of Pleasants County in the Parkesburg-Marietta nonattainment area will not pose an undue burden on KYOVA. In fact, under the 1997 $PM_{2.5}$ NAAQS, WWW has successfully completed its transportation planning with the inclusion of the Grant Tax District in Pleasants County.

Factor 9: Level of control of emission sources

Under this factor, the most current level of emission from 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 (e.g. 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 designation 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.

In West Virginia, Ohio, and Kentucky, there may be some emission reductions of SO_2 and NOx subsequent to 2005 that are not accounted for elsewhere in this analysis, due to new controls at large electric generating units (EGUs). However, as discussed below, there has been no change at the EGUs in Pleasants County.

Table 9 shows emissions and controls (current and projected) for EGUs with SO_2 plus NO_x emissions greater than 5000 tons. Data was obtained from the 2006 National Electric Energy Data System (NEEDS) database. Table 9.1 shows emissions for the same EGUs for the years 2002 through 2008. The data was obtained from the emissions section of EPA's Clean Air Markets Division (CAMD) website: http://camddataandmaps.epa.gov/gdm/index.cfm?fuseaction=emissions.wizard.

Table 9. EGUs with SO_2 plus NO_x emissions > 5000 tons, from the 2006 NEEDS EGU database

County, State	Plant Name	Plant Type	Unique ID Final	2006 SO_2 tons	2006 NOx tons	Scrubber Online Year	Scrubber Efficiency	SCR Online Year	Capacity MW
Washington County, OH	Muskingum River	Coal Steam	2872_B_5	49,594	7,567			2005	585.0
			2872_B_3	20,133	2,646				205.0
			2872_B_4	16,155	2,210				205.0
			2872_B_2	18,734	2,654				190.0
			2872_B_1	18,368	2,869				190.0
	Richard Gorsuch	Coal Steam	7286_B_2	5,781	732				50.0
			7286_B_1	5,261	665				50.0
			7286_B_4	4,841	645				50.0
			7286_B_3	4,599	594				50.0
Pleasants County, WV	Pleasants Power Station	Coal Steam	6004_B_1	23,336	5,444	1979	97.0	2003	639.0
			6004_B_2	19,532	4,069	1980	97.0	2003	639.0
	Willow Island	Coal Steam	3946_B_2	3,028	1,993				181.0
			3946_B_1	831	351				54.0

Table 9.1. EGU 2002 to 2007 Emissions from EPA's CAMD

Muskingum River, Washington County, OH, Facility ID: 2872					
Year	# of Months Reported	SO_2 Tons	NO_x Tons	CO_2 Tons	Heat Input (mmBtu)
2002	12	115,525.8	27,338.9	8,163,693.8	79,568,209
2003	12	139,120.4	25,443.2	7,553,225.2	73,618,137
2004	12	141,151.5	20,937.1	7,488,800.1	72,990,175
2005	12	134,562.8	15,696.9	7,093,557.6	69,138,013
2006	12	122,983.7	17,945.8	7,022,055.7	68,441,134
2007	12	132,458.9	21,005.9	8,050,570.1	78,465,661
Richard Gorsuch, Washington County, OH, Facility ID: 7286					
Year	# of Months Reported	SO_2 Tons	NO_x Tons	CO_2 Tons	Heat Input (mmBtu)
2002	12	31,006.4	3,227.7	1,731,019.9	16,871,555
2003	12	29,212.8	2,917.9	1,620,171.0	15,791,143
2004	12	29,664.5	2,625.0	1,623,635.8	15,824,934
2005	12	23,612.4	2,309.1	1,411,187.1	13,754,229
2006	12	20,482.7	2,635.7	1,459,806.4	14,228,154
2007	12	27,357.8	3,352.0	1,778,479.8	17,341,796
Pleasants Power Station, Pleasants County, WV, Facility ID: 6004					
Year	# of Months Reported	SO_2 Tons	NO_x Tons	CO_2 Tons	Heat Input (mmBtu)
2002	12	41,909.1	13,714.4	7,705,839.5	75,105,623
2003	12	44,396.2	9,273.4	7,931,743.2	77,307,448
2004	12	38,782.2	6,464.5	6,763,256.1	65,918,797
2005	12	47,203.5	9,790.7	8,782,931.2	85,603,621
2006	12	42,867.1	9,512.2	7,992,028.6	77,895,030
2007	12	38,437.5	8,762.7	7,471,145.8	72,818,187
Willow Island Power Station, Pleasants County, WV, Facility ID: 3946					
Year	# of Months Reported	SO_2 Tons	NO_x Tons	CO_2 Tons	Heat Input (mmBtu)
2002	12	14,456.5	5,945.8	1,369,016.7	13,314,118

2003	12	12,139.5	5,297.0	1,284,656.5	12,521,089
2004	12	5,527.0	2,744.3	609,979.6	5,945,251
2005	12	5,091.4	2,525.3	717,516.8	6,993,335
2006	12	3,859.2	2,344.3	744,192.0	7,253,283
2007	12	4,327.7	2,448.9	799,862.3	7,795,985

Washington County, OH and Pleasants County, WV are the only counties in the Parkersburg-Marietta area with EGUs which had 2006 SO_2 plus NO_x emissions greater than 5000 tons. As can be seen from Tables 9 and 9.1, emissions from the EGUs in Washington and Pleasants Counties have remained relatively constant since 2005. Therefore, there were not significant recent emissions reductions from these sources that indicate they are no longer contributing to violations in this area.

Emissions from Washington and Pleasants Counties appear to have high levels of sulfur dioxide, indicating a contribution to the high sulfate levels (more than 25 $\mu g/m^3$) observed on high $PM_{2.5}$ days in the Parkersburg-Marietta area. EPA believes that the combination of the sulfur dioxides emissions from the two EGUs in Pleasants County contribute to these high sulfate levels, and thus contribute to violations of the NAAQS in nearby Wood County.

Conclusion

After considering the nine factors described above, EPA has determined that it is appropriate to include Wood County, WV and a portion of Pleasants County, WV (Grant Tax District) in the Parkersburg-Marietta nonattainment area for the 2006 24-hour $PM_{2.5}$ NAAQS, along with Washington County in Ohio.

Wood, Pleasants, and Wirt Counties in West Virginia and Washington County in Ohio make up the Parkersburg-Marietta-Vienna metropolitan statistical area. Wood County, WV has an air quality monitor violating the 2006 24-hour $PM_{2.5}$ NAAQS, considering 2005-2007 data. Thus, the county must be designated nonattainment consistent with Clean Air Act section 107(d). In addition, however, Wood County has high population, population density, VMT, and number of commuters in the MSA. Wood County has the third highest emissions, behind Washington County, OH and Pleasants Count, WV. Therefore, local emissions within Wood County (including population based emissions, e.g., vehicle emissions and other small area sources) contribute to the violation of 2006 24-hour $PM_{2.5}$ NAAQS.

Pleasants County, WV ranks low for population, population density, VMT and commuting. However, emissions from three large sources in the Pleasants County, just over the border from Wood County, contribute to violations of the 2006 24-hour $PM_{2.5}$ NAAQS in the Parkersburg-Marietta area. These sources are the Pleasants Power Station, the Willow Island Power Station, and the Cabot Corporation Ohio River Plant. Due to these large sources, Pleasants County has the highest emissions in the West Virginia portion of the Parkersburg-Marietta-Vienna MSA. Its SO_2 emissions are nearly ten times higher than those of adjacent Wood County, which contains the violating monitor. Furthermore, Pleasants County's NOx emissions are more than twice those of Wood County and its total $PM_{2.5}$ emissions are close to two times higher than those of Wood County. Therefore, EPA determined that it is appropriate to only include the portion of Pleasants County containing these sources, namely the Grant Tax District, in the Parkersburg-Marietta nonattainment area. These emissions occur in an area that is geographically very close to the

violating monitor and well within the range for transport of $PM_{2.5}$ and $PM_{2.5}$ precursors. Meteorological data confirm that winds transport emissions from this area to the violating area in Wood County.

Wirt County and the remaining West Virginia counties in this analysis rank low for all factors, and therefore are not included in the Parkersburg-Marietta nonattainment area.

Thus, EPA is designating Wood County and a portion of Pleasants County (Grant Tax District) as the West Virginia portion of the Parkersburg-Marietta nonattainment area for the 2006 24-hour $PM_{2.5}$ NAAQS.

Please note that on October 16, 2008, West Virginia submitted comments and additional information in response to EPA's August 2008 letter notifying West Virginia of its intended designations. West Virginia objected to the inclusion of the Grant Tax District in Pleasants County in the Parkersburg-Marietta nonattainment area for the 2006 24-hour $PM_{2.5}$ NAAQS. However, as demonstrated in this analysis, EPA has determined that it is appropriate to include the Grant Tax District in Pleasants County in the Parkersburg-Marietta nonattainment area.

Additional information regarding responses to specific State comments can be found in EPA's Response to Comments document at http://www.epa.gov/pmdesignations/2006standards/tech.htm.

EPA Technical Analysis for the West Virginia portion of the Steubenville-Weirton Area

Introduction

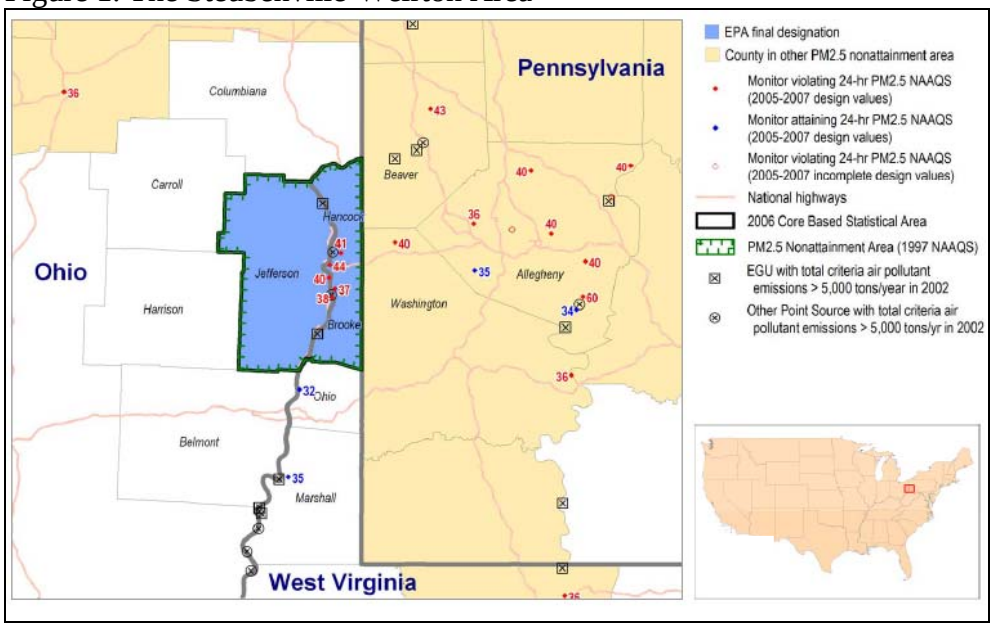
Pursuant to section 107(d) of the Clean Air Act, EPA must designate as nonattainment those areas that violate the NAAQS and those nearby areas that contribute to violations. This technical analysis for Steubenville-Weirton area identifies the counties with monitors that violate the 2006 24-hour $PM_{2.5}$ standard and evaluates nearby counties for contributions to fine particle concentrations in the area. EPA has evaluated these counties based on the weight of evidence of the following nine factors recommended in EPA guidance and any other relevant information:

- pollutant emissions
- air quality data
- population density and degree of urbanization
- traffic and commuting patterns
- growth
- meteorology
- geography and topography
- jurisdictional boundaries
- level of control of emissions sources

We also used analytical tools and data such as pollution roses, fine particle composition monitoring data, back trajectory analyses, and the contributing emission score (CES) to evaluate these areas. (See additional discussion of the CES under Factor 1 below.)

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

Figure 1. The Steubenville-Weirton Area



For this area, EPA previously established $PM_{2.5}$ nonattainment boundaries for the 1997 $PM_{2.5}$ NAAQS that included three full counties (Brooke, Hancock and Jefferson Counties), with Brooke County and Hancock County being located in West Virginia, and Jefferson County in Ohio..

In November 2007, West Virginia recommended that EPA designate Brooke and Hancock Counties as "nonattainment" for the 2006 24-hour $PM_{2.5}$ standard based on air quality data from 2004-2006. See the November 9, 2007 letter from the West Virginia Department of Environmental Protection, received on November 13, 2007. These data are from Federal Reference Method (FRM) monitors located in the state.

In August 2008, EPA notified the State of West Virginia of its intended designations. In this letter, EPA also requested that if the State of West Virginia 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 has designated Brooke and Hancock Counties in West Virginia (along with Jefferson County, Ohio), as nonattainment for the 2006 24-hour $PM_{2.5}$ air-quality standard as part of the Steubenville-Weirton nonattainment area, based upon currently available information. All three counties have monitored violations of the 2006 24 hour PM2.5 NAAQS. These counties are listed in the table below.

Steubenville-Weirton Area	State-Recommended Nonattainment Counties	EPA-Final Designated Nonattainment Counties within Region III
West Virginia	Brooke County Hancock County	Brooke County Hancock County

The following is a technical analysis for the EPA Region III portion of the Steubenville-Weirton 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, sulfur dioxide (SO_2), nitrogen oxides (NO_x), volatile organic compounds (VOCs), and ammonia (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 and NH_3 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 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 summary of the CES is included in Attachment 2, and 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-Weirton area. Counties that are part of the Steubenville-Weirton nonattainment area for the 1997 $PM_{2.5}$ NAAQS are shown in boldface. Counties are listed in descending order by CES.

Table 1. $PM_{2.5}$ Related Emissions and Contributing Emissions Score

County, State	State Recommended Nonattainment ?	CES	$PM_{2.5}$ emissions total (tpy)	$PM_{2.5}$ Emissions carbon (tpy)	$PM_{2.5}$ emissions other (tpy)	SO_2 (tpy)	NO_x (tpy)	VOCs (tpy)	NH_3 (tpy)
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**
Brooke, WV	**Yes**	**19**	**579**	**192**	**388**	**1,349**	**2,131**	**3,436**	**210**
Allegheny, PA	Yes- other area	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
Beaver, PA	Yes -other area	11	2,909	451	2,457	45,452	33,400	7,424	450
Belmont, OH	No	11	2,976	392	2,583	38,026	9,991	4,762	668
Washington, PA	Yes - other area	9	1,683	514	1,170	6,318	16,311	9,297	919
Ohio, WV	No	6	303	147	157	541	3,326	2,633	108
Columbiana, OH	No	3	805	366	441	525	4,377	4,933	1,956
Carroll, OH	No	1	338	141	196	123	1,627	1,482	409
Harrison, OH	No	1	215	96	120	130	659	1,079	355

The above data in Table 1 indicates that Jefferson County, OH has the highest CES and the highest emissions of $PM_{2.5}$ and SO_2 of all counties in the area EPA evaluated for the Steubenville –Weirton area. Allegheny County, PA has the second highest $PM_{2.5}$ emissions and Marshall County, WV has the second highest SO_2 emissions of the counties evaluated. Emissions from Hancock County, WV are low compared to Jefferson and Allegheny Counties. However, it has the second highest CES. This is likely due to high levels of direct $PM_{2.5}$ emissions from sources in the county, including the Weirton Steel facility.

EPA is designating most of Allegheny County as part of the Pittsburgh-Beaver Valley nonattainment area and the remainder as the Liberty-Clairton nonattainment area for the 2006 $PM_{2.5}$ NAAQS. As explained in detail in Factor 8, Allegheny County, PA, the Pittsburgh-Beaver Valley area, and the Liberty-Clairton area are separate and distinct areas from the Steubenville-Weirton area. They are separate urban areas, are in separate metropolitan statistical areas (MSAs), and are served by separate metropolitan planning organizations. Therefore, EPA has determined that it is more appropriate nit to include Allegheny County in the Steubenville-Weirton nonattainment areas for the 2006 24-hour $PM_{2.5}$ NAAQS, or vice versa. To the extent that emissions from the Allegheny County contribute to the Steubenville-Weirton nonattainment area,

that contribution will be lessened by emission controls put in place in those separate nonattainment areas.

As discussed below in Factor 9, emissions from Marshall County, WV have been greatly reduced since 2005. Therefore, the impact of emissions from Marshall County on the Steubenville-Weirton area has also been greatly reduced. Furthermore, Marshall County is in a separate MSA and is served by a separate metropolitan planning board. Furthermore, there is little commuting from Marshall County into the Steubenville-Weirton MSA. Therefore, EPA has determined that Marshall County should not be included in the Steubenville-Weirton nonattainment area for the 2006 24-hour $PM_{2.5}$ NAAQS.

Factor 2: Air quality data

This factor considers the 24-hour $PM_{2.5}$ design values in micrograms per cubic meter ($\mu g/m^3$) for air quality monitors in counties in the Steubenville-Weirton 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 2006 24-hour $PM_{2.5}$ standard is met when the 3-year average of a monitor's 98^{th} percentile values is 35 $\mu g/m^3$ or less. A design value is only valid if minimum data completeness criteria are met. Counties that are part of the Steubenville-Weirton nonattainment area for the 1997 $PM_{2.5}$ NAAQS are shown in boldface.

The 24-hour $PM_{2.5}$ design values for counties in the Steubenville-Weirton area are shown in Table 2.

Table 2. Air Quality Data

County, State	State Recommended Nonattainment?	24-hr $PM_{2.5}$ Design Values, 2004-2006 ($\mu g/m^3$)	24-hr $PM_{2.5}$ Design Values, 2004-2006 ($\mu g/m^3$)	24-hr $PM_{2.5}$ Design Values, 2004-2006 ($\mu g/m^3$)
Jefferson, OH	**Yes**	**46**	**43**	**40**
Hancock, WV	**Yes**	**45**	**40**	**41**
Brooke, WV	**Yes**	**42**	**43**	**44**
Allegheny, PA	Yes	68	65	60
Marshall, WV	No	33	34	35
Beaver, PA	Yes	43	45	43
Belmont, OH	No	No monitor		
Washington, PA	Yes	36	38	40
Ohio, WV	No	No monitor		
Columbiana, OH	No	No monitor		
Carroll, OH	No	No monitor		
Harrison, OH	No	No monitor		

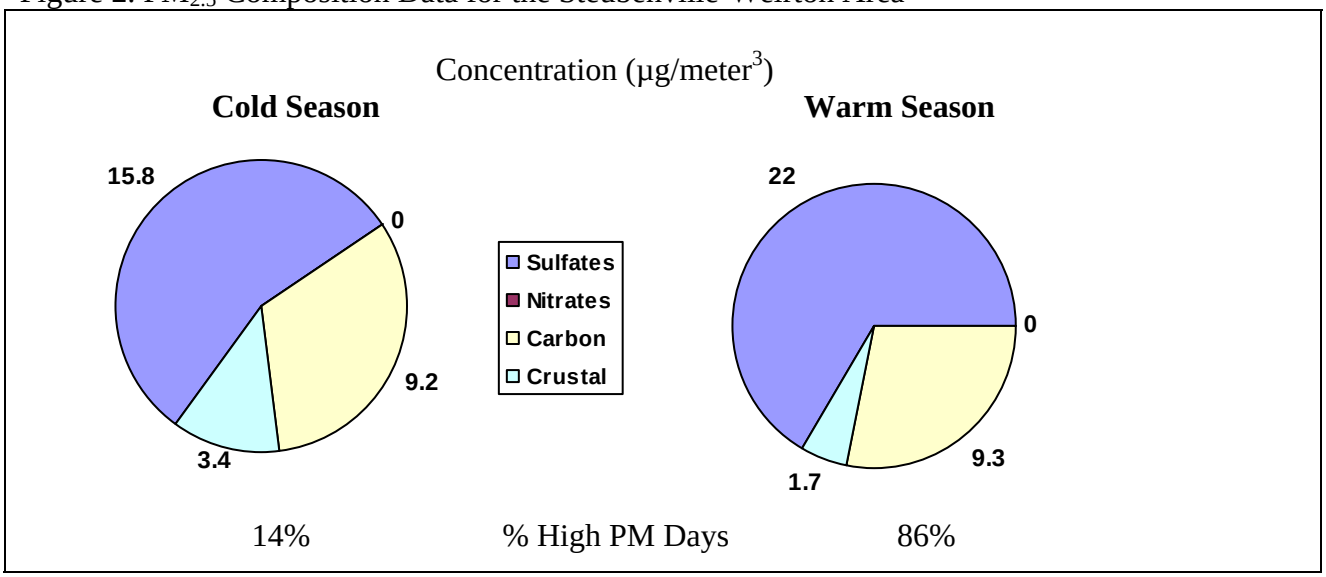
Hancock and Brooke Counties, in West Virginia have monitored violations of the 2006 24-hour $PM_{2.5}$ standard. Therefore, it is appropriate to include these counties in the Steubenville-Weirton nonattainment area along with Jefferson County in Ohio. Allegheny, Beaver, and Washington Counties in Pennsylvania also show violations of the 2006 24-hour $PM_{2.5}$ standard. However, Allegheny, Beaver, and Washington Counties are part of other areas EPA has designated nonattainment area for the 2006 $PM_{2.5}$ NAAQS. The Pittsburgh-Beaver Valley and Liberty-Clairton areas are separate and distinct from the Steubenville-Weirton area, and are not associated economically or jurisdictionally. They are in separate metropolitan statistical areas and are served

by separate metropolitan planning boards. Also, there is little commuting between the two areas. Therefore, EPA has included Allegheny, Beaver and Washington Counties in separate nonattainment areas for the 2006 24-hour $PM_{2.5}$ NAAQS, specifically the Pittsburgh Beaver Valley and Liberty-Clairton areas. To the extent that emissions from the Allegheny, Beaver and Washington Counties contribute to the Steubenville-Weirton nonattainment area, that contribution will be lessened by emission controls put in place in those separate nonattainment areas.

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.

Under this factor, we also consider fine particle composition monitoring data. Air quality monitoring data on the composition of fine particle mass are available from the EPA Chemical Speciation Network and the IMPROVE monitoring network. Analysis of these data indicates that the days with the highest fine particle concentrations occur predominantly in the warm seasons and the average chemical composition of the highest days is typically characterized by high levels of sulfates as illustrated in Figure 2, below. This data indicates that sources of SO_2 and direct $PM_{2.5}$ carbon emissions are key contributors to exceedances in the area.

Figure 2. $PM_{2.5}$ Composition Data for the Steubenville-Weirton Area



Note: Eligible monitors for providing design value data generally include State and Local Air Monitoring Stations (SLAMS) at population-oriented locations with an FRM monitor. All data from Special Purpose Monitors (SPM) using an FRM is eligible for comparison to the relevant NAAQS, subject to the requirements given in the October 17, 2006 Revision to Ambient Air Monitoring Regulations (71 FR 61236). All monitors used to provide data must meet the monitor siting and eligibility requirements given in 71 FR 61236 to 61328 in order to be acceptable for comparison to the 2006 24-hr $PM_{2.5}$ NAAQS for designation purposes.

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

Table 3 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 2006 24-hour $PM_{2.5}$

standard. Counties that are part of the Steubenville-Weirton nonattainment area for the 1997 $PM_{2.5}$ NAAQS are shown in boldface.

Table 3. 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**
Allegheny, PA	Yes	1,233,036	1,658
Marshall, WV	No	34,250	110
Beaver, PA	Yes	176,825	399
Belmont, OH	No	69,089	128
Washington, PA	Yes	206,418	240
Ohio, WV	No	44,958	414
Columbiana, OH	No	110,636	207
Carroll, OH	No	29,252	73
Harrison, OH	No	15,881	39

The data in Table 3 indicates that Jefferson, Hancock, and Brooke Counties, which are included in the Steubenville-Weirton MSA and the Steubenville-Weirton nonattainment area for the 1997 $PM_{2.5}$ NAAQS, all have much lower populations than Allegheny, Beaver, and Washington Counties in the Pittsburgh MSA. The Steubenville-Weirton and Pittsburgh MSAs are separate and distinct areas, with little commuting between them. They are not economically or jurisdictionally associated with each other. Therefore, EPA has included Allegheny, Beaver and Washington Counties in separate nonattainment areas for the 2006 24-hour $PM_{2.5}$ NAAQS. To the extent that population-based emissions from the Allegheny, Beaver and Washington Counties contribute to the Steubenville-Weirton nonattainment area, that contribution will be lessened by emission controls put in place in those separate nonattainment areas.

Marshall County, WV and Belmont, Carroll, and Harrison Counties, OH, have much lower population densities than the other counties in this analysis. Therefore, these counties rank low for 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 Steubenville-Weirton area, the percent of total commuters in each county who commute to other counties within the Steubenville-Weirton area, as well as the total Vehicle Miles Traveled (VMT) for each county in millions of miles (see Table 4). 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.

The listing of counties on Table 4 reflects a ranking based on the number of people commuting to other counties. The counties that are in the nonattainment area for the 1997 $PM_{2.5}$ NAAQS are shown in boldface.

Table 4. Traffic and Commuting Patterns

County, State	State Recommended Nonattainment?	2005 VMT (million miles)	Number Commuting to any violating	Percent Commuting to any violating	Number Commuting into & within

			counties	counties	statistical area
Jefferson, OH	**Yes**	**684**	**24,330**	**85**	**22,933**
Hancock, WV	**Yes**	**187**	**12,820**	**91**	**10,575**
Brooke, WV	**Yes**	**210**	**9,320**	**89**	**8,091**
Allegheny, PA	Yes	10,003	551,530	95	430
Marshall, WV	No	217	790	6	310
Beaver, PA	Yes	1,522	71,680	89	245
Belmont, OH	No	1,111	1,620	6	1,280
Washington, PA	Yes	2,399	82,330	92	859
Ohio, WV	No	514	1,650	8	880
Columbiana, OH	No	872	4,760	10	2,110
Carroll, OH	No	173	190	1	180
Harrison, OH	No	146	750	12	690

Jefferson, Hancock, and Brooke Counties have relatively small amounts of VMT and commuting among the counties in this area. The data in Table 4 indicates that the VMT for these counties is much lower than the VMT for Allegheny, Beaver, and Washington Counties in the Pittsburgh MSA, or Belmont, OH in the Wheeling MSA. However, very few commuters from Allegheny, Beaver, and Washington Counties commute into the Steubenville-Weirton MSA. Jefferson, Hancock, and Brooke Counties, which make up the Weirton-Steubenville MSA, have the highest numbers of commuters into and within the MSA. Jefferson and Hancock Counties have the highest CESs. Therefore, EPA has determined that it is appropriate to include Jefferson, Hancock, and Brooke Counties within the Steubenville-Weirton nonattainment area for the 2006 $PM_{2.5}$ NAAQS.

Marshall County, WV and Carroll and Harrison Counties, OH, have much lower VMT than the other counties in this analysis. They also have very few commuters traveling into the Steubenville-Weirton MSA. Therefore, these counties rank low for this factor.

Note: The 2005 VMT data used for Tables 4 and 5 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-Weirton 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 5 below shows population, population growth, VMT, and VMT growth for counties that are included in the Steubenville-Weirton area**.** Counties that are part of the Steubenville-Weirton nonattainment area for the 1997 $PM_{2.5}$ NAAQS are shown in boldface.

Table 5. Population and VMT Values and Percent Change.

Location	Population (2005)	Population Density (2005)	Population % change (2000 - 2005)	2005 VMT (millions of miles)	VMT % change (1996 to 2005)
Jefferson, OH	70,631	172	(4)	684	(6)

Hancock, WV	31,191	354	(4)	187	(32)
Brooke, WV	24,474	265	(4)	210	0
Allegheny, PA	1,233,036	1658	(4)	10,003	(3)
Marshall, WV	34,250	110	(3)	217	(11)
Beaver, PA	76,825	399	(2)	1,522	0
Belmont, OH	69,089	128	(1)	1,111	13
Washington, PA	206,418	240	2	2,399	25
Ohio, WV	44,958	414	(5)	514	5
Columbiana, OH	110,636	207	(1)	72	(2)
Carroll, OH	29,252	73	1	173	(7)
Harrison, OH	15,881	39	0.4	146	9

All counties with a CES greater than ten, as listed in Table 1, under Factor 1, have experienced decreases in population from 2000 to 2005. Similarly, these counties have experienced zero or negative growth in VMT from 1996 to 2005. Consequently, the data in Table 5 did not play a significant role in this recommendation.

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 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. Figures 6 through 6.4 identify 24-hour $PM_{2.5}$ values by color; days exceeding 35 ug/m3 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 roses" for the Steubenville-Weirton area indicate that the monitors in Hancock County, WV, Brooke County, WV, and Jefferson County, OH are influenced by winds from all directions. However, in Hancock and Brooke Counties, it appears that many more high $PM_{2.5}$ days (days with monitored values greater than 35 $\mu g/m^3$) coincide with winds from the southwest, south, and west. However, a few of these high $PM_{2.5}$ days show winds from the south east, and one rare day with winds from the northeast. High $PM_{2.5}$ days in Jefferson County are predominantly during days with winds from the west, but show more days with winds from the northeast and northwest than Hancock and Brooke Counties. This data indicates that the Steubenville-Weirton area is being influenced to some extent by the many metropolitan areas around it, including the Canton, Youngstown, Pittsburgh, and Wheeling area.

Figure 6. Pollution Trajectory Plot for Hancock County, WV (Site 54-029-1004)

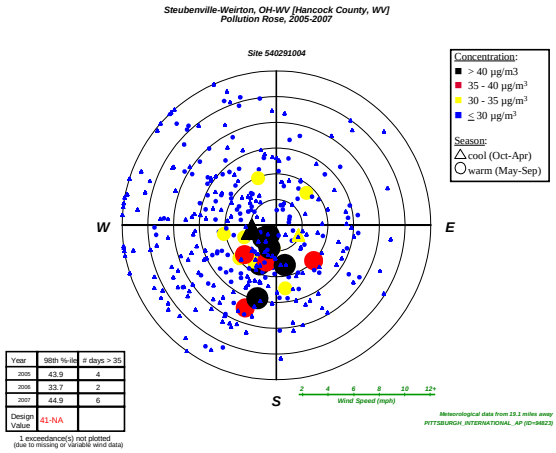


Figure 6.1. Pollution Trajectory Plot for Brooke County, WV (Site 54-009-0011)

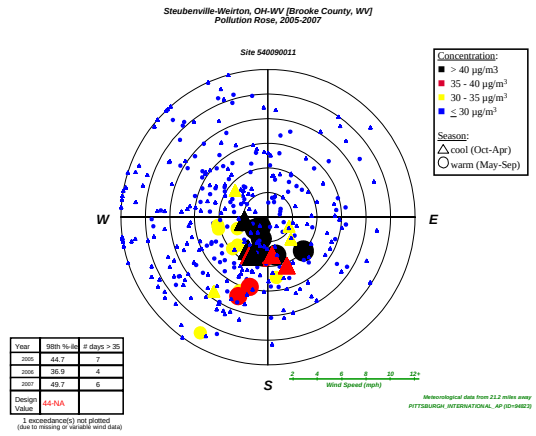


Figure 6.2. Pollution Trajectory Plot for Brooke County, WV
(Site 54-009-0005)

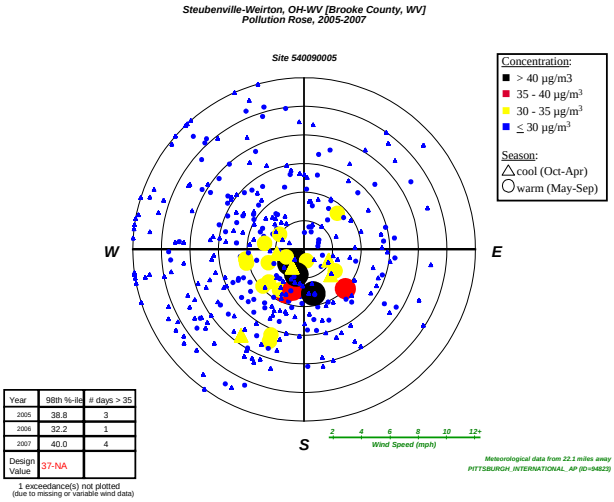


Figure 6.3. Pollution Trajectory Plot for Jefferson County, OH
(Site 39-081-0017)

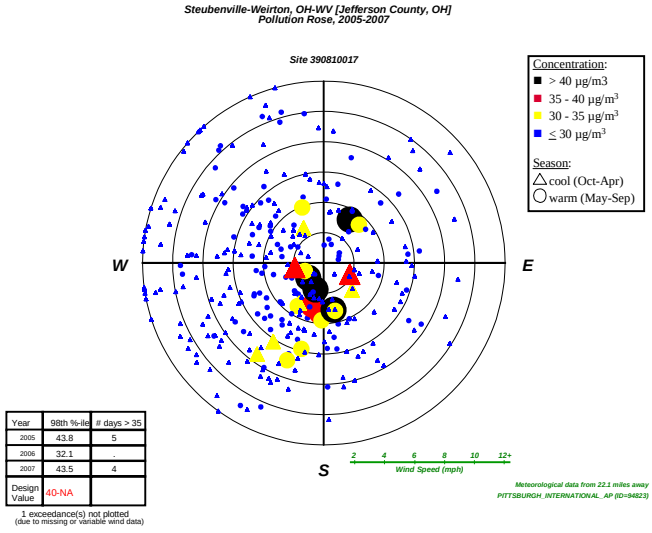
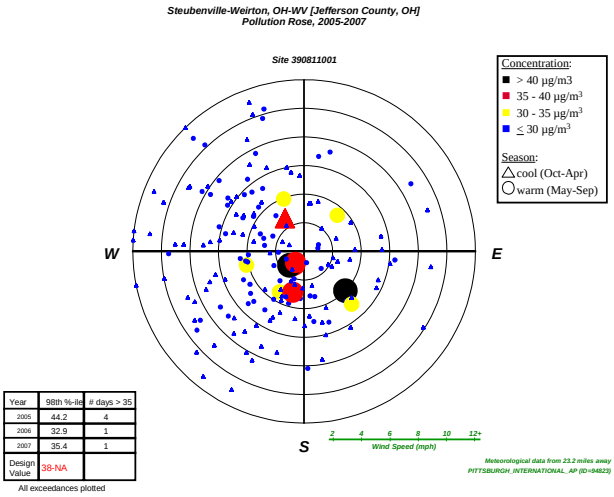


Figure 6.4. Pollution Trajectory Plot for Jefferson County, OH
(Site 35-081-1001)



The pollution rose for Hancock County, WV, and Brooke County, WV, Figures 6 and 6.1, respectively, show that high PM days occur predominantly when winds are from the southwest, i.e., Jefferson County, OH and other areas further southwest. Figures 6 and 6.1 also show occasional high PM days with winds from due south and from the northeast and southeast. This indicates an influence from Ohio and possibly Marshall Counties, as well as Beaver and Washington Counties. Figure 6.2, the pollution rose for Brooke County, WV shows that high PM days occur predominantly when winds are from the south-southwest and west, indicating that emissions from Jefferson County impact Brooke County. Figure 6.2 also shows occasional high PM days with winds from the northeast and southeast. This indicates influences from Hancock, Beaver and Washington Counties. The pollution roses for Jefferson County, OH, Figures 6.3 and 6.4, show high PM days with winds at low speeds from all points of the compass. This is indicative of an impact from a local emission source. Jefferson County has two large power plants accounting for close to 200,000 tons of SO_2 emissions in 2005. Figures 6.3 and 6.4 show occasional high PM days with winds from the southeast and southwest at higher speeds. This indicates influences from Belmont, Brooke, Ohio and Washington Counties.

Jefferson County ranks the highest for this factor. Beaver and Washington Counties also rank high for this factor. The pollution rose data indicates that Belmont, Brooke, Hancock Ohio and Marshall Counties occasional impacts the air quality monitors in the Steubenville-Weirton area. However, their ranking for this factor is relatively low, when compared to Jefferson, Beaver, and Washington Counties. Jefferson County is part of the Steubenville-Weirton nonattainment area for the 1997 $PM_{2.5}$ NAAQS, and is included in the Steubenville-Weirton nonattainment area for the 2006 24-hour $PM_{2.5}$ NAAQS.

Beaver and Washington Counties are part of the Pittsburgh-Beaver Valley nonattainment area for the 1997 $PM_{2.5}$ NAAQS, and are included in the same nonattainment area for the 2006 24-hour $PM_{2.5}$ NAAQS. Beaver and Washington Counties are in an area that is separate and distinct from the Steubenville-Weirton area. They are in separate MSAs and are served by separate metropolitan planning boards. Also, there is little commuting between the two areas. Therefore, EPA has determined that it is appropriate to include Beaver and Washington Counties in the Pittsburgh-

Beaver Valley nonattainment area for the 2006 24-hour $PM_{2.5}$ NAAQS. To the extent that emissions from the Beaver and Washington Counties contribute to the Steubenville-Weirton nonattainment area, that contribution will be lessened by emission controls put in place in that separate nonattainment area.

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 Steubenville-Weirton area.

The Steubenville-Weirton 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 (e.g., existing $PM_{2.5}$ areas)

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 2006 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 2006 24-hour standard.

Most areas that were originally designated nonattainment for the $PM_{2.5}$ standards still have not attained the standards. Thus, EPA has generally concluded that counties that were designated as having emissions sources contributing to fine particle concentrations which continue to exceed the 1997 standards (all areas violated the annual standard, three 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.

EPA notes that the major jurisdictional boundary in the Steubenville-Weirton area is the state line between West Virginia and Ohio. Counties with air-quality monitors that violate the 2006 24-hour $PM_{2.5}$ NAAQS in the Steubenville-Weirton area include Jefferson County, OH and Brooke and Hancock, WV. It is important that the states of West Virginia and Ohio work collaboratively to reduce such violations.

On the other hand, the areas designated as 8-hour ozone nonattainment areas are also important boundaries for State air-quality planning. Hancock and Brooke Counties in West Virginia, along

with Jefferson County in OH, were included in the ozone nonattainment area associated with the Steubenville-Weirton area. Now these counties comprise the Steubenville-Weirton ozone maintenance area. Other counties included in this technical analysis are also designated as 8-hour ozone nonattainment areas, but are not designated nonattainment within the Steubenville-Weirton area. To the degree appropriate, based upon violations and contributions to violations of the ozone and $PM_{2.5}$ NAAQS in a particular area, EPA believes it may be helpful for air planning purposes and for attainment of both NAAQS, for there to be some consistency between ozone and $PM_{2.5}$ nonattainment area boundaries. Comparison of ozone areas with potential $PM_{2.5}$ nonattainment areas, therefore, gives added weight to designation of Hancock and Brooke Counties as nonattainment for the 2006 $PM_{2.5}$ NAAQS.

The Steubenville-Weirton area borders other large metropolitan areas. These Metropolitan areas are in separate MSAs:

- The Steubenville-Weirton area includes Brooke and Hancock Counties, WV, and Jefferson County, OH.
- The Pittsburgh MSA includes Allegheny, Armstrong, Beaver, Butler, Fayette, Washington, and Westmoreland Counties in Pennsylvania. The Pittsburgh MSA plus the New Castle Micropolitan Statistical Area (Lawrence County) make up the Pittsburgh-New Castle Combined Statistical Area (CSA)
- The Wheeling MSA is comprised of Marshall and Ohio Counties, WV and Belmont County, OH.

These areas are served by separate metropolitan planning organizations (MPOs). The MPO for the Steubenville-Weirton area is the Brooke-Hancock-Jefferson Metropolitan Planning Commission. The Wheeling area is served by the Belomar Regional Council The Southwestern Pennsylvania Commission is the MPO for the Pittsburgh- New Castle CSA and Greene County, PA.

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-Weirton 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 (e.g. 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.

The emission estimates set forth in Table 1 (under Factor 1) reflect implementation of control strategies implemented by the states in the Steubenville-Weirton area before and during 2005 that may influence emissions of any component of $PM_{2.5}$ emissions (i.e., total carbon, SO_2, NOx, and crustal $PM_{2.5}$).

In West Virginia, Ohio and Pennsylvania, there may be some emission reductions of SO_2 and NOx subsequent to 2005 that are not accounted for elsewhere in this analysis, due to new controls at large electric generating units (EGUs).

Table 9 shows emissions and controls (current and projected) for EGUs with SO_2 plus NO_x emissions greater than 5000 tons. Data was obtained from the 2006 National Electric Energy Data System (NEEDS) database. Table 9.1 shows emissions for the same EGUs for the years 2002 through 2007. This data was obtained from the emissions section of EPA's Clean Air Markets Division (CAMD) website: http://camddataandmaps.epa.gov/gdm/index.cfm?fuseaction=emissions.wizard.

Table 9. EGUs with SO_2 plus NO_x emissions > 5000 tons, from the 2006 NEEDS EGU database

County, State	Plant Name	Unique ID Final	2006 SO2 (tons)	2006 NOx (tons)	Scrubber Online Year	Scrubber Efficiency	SCR Online Year	Capacity MW
Jefferson, OH	Cardinal	2828_B_3	25,320	6,715	2010	95.0	2003	630.0
		2828_B_1	37,115	4,190	2007	95.0	2003	600.0
		2828_B_2	24,445	6,243	2007	95.0	2003	600.0
	W H Sammis	2866_B_7	25,739	6,714	2011	95.0		630.0
		2866_B_6	26,028	6,292	2011	95.0		630.0
		2866_B_5	10,021	2,453		50.0		300.0
		2866_B_1	6,679	1,478		50.0		180.0
		2866_B_2	6,339	1,391		50.0		180.0
		2866_B_3	5,956	1,166		50.0		180.0
		2866_B_4	5,629	1,098		50.0		180.0
Allegheny, PA	Cheswick	8226_B_1	32,373	4,221	2010	95.0	2003	580.0
Marshall, WV	Mitchell	3948_B_1	26,240	8,798	2007	95.0	1993	800.0
		3948_B_2	25,766	7,596	2006	95.0	1994	800.0
	Kammer	3947_B_1	14,251	3,858				210.0
		3947_B_3	14,002	3,748				210.0
		3947_B_2	12,497	3,193				210.0
Beaver, PA	AES Beaver Valley Partners	10676_B_4	0	277	1980	92.0		43.0
		10676_B_2	0	261	1980	92.0		43.0
		10676_B_3	0	250	1980	92.0		43.0

	Bruce Mansfield	6094_B_3	13,307	9,055	1977	98.0	2004	850.0
		6094_B_2	6,984	7,349	1973	98.0	2003	830.0
		6094_B_1	3,140	9,321	1973	98.0	2003	830.0
	G F Weaton Power Station	50130_B_BLR1				28.6		56.0
		50130_B_BLR2				28.6		56.0
Belmont, OH	R E Burger	2864_B_7	8,730	1,720	2010	95.0		156.0
		2864_B_8	8,565	1,685	2010	95.0		156.0
		2864_B_5	0	0				47.0
		2864_B_6	0	0				47.0
Washington, PA	Beech Hollow Power Project	82704_B_1 -	new plant on line in 2011		2011	95.0	2011	272.0
	Elrama	3098_B_4	2,096	2,730	1975	89.0		173.5
		3098_B_3	922	1,218	1975	89.0		103.0
		3098_B_1	906	1,179	1975	89.0		94.0
		3098_B_2	896	1,169	1975	89.0		94.0
	Mitchell Power Station	3181_B_33	923	2,735	1980	96.9		277.0
		3181_B_3	5	3				27.3
		3181_B_1	2	1				27.3
		3181_B_2	1	0				27.3

Table 9.1. Selected EGU Emissions (2002-2007) from EPA's Clean Air Markets Division

Cardinal, Jefferson County, OH, Facility ID: 2828

Year	# of Months Reported	SO_2 Tons	NO_x Tons	CO_2 Tons	Heat Input (mmBtu)
2002	12	74,750.6	23,378.8	8,409,740.2	81,967,531
2003	12	96,928.5	20,742.0	9,961,957.8	97,095,065
2004	12	100,134.6	17,494.5	10,258,034.7	99,980,929
2005	12	115,847.6	15,849.9	10,874,807.3	105,992,276
2006	12	86,879.5	17,148.1	10,985,695.2	107,073,045
2007	12	81,288.3	15,595.6	10,598,681.6	103,301,042

WH Sammis, Jefferson County, OH, Facility ID: 2866

Year	# of Months Reported	SO_2 Tons	NO_x Tons	CO_2 Tons	Heat Input (mmBtu)
2002	12	145,113.8	38,623.2	15,854,575.9	154,533,809
2003	12	164,397.8	40,369.2	16,694,526.2	162,714,725
2004	12	127,113.9	29,626.0	14,196,168.4	138,364,289
2005	12	106,566.1	25,155.7	15,401,305.9	150,110,208
2006	12	86,391.7	20,591.8	15,761,761.9	153,623,312
2007	12	101,788.8	19,957.9	15,677,290.8	152,800,149

Cheswick, Allegheny County, PA, Facility ID: 8226

Year	# of Months Reported	SO_2 Tons	NO_x Tons	CO_2 Tons	Heat Input (mmBtu)
2002	12	42,017.9	5,761.2	3,376,491.2	32,977,678
2003	12	45,432.8	4,704.7	3,727,784.1	36,352,654
2004	12	40,982.1	4,926.8	3,198,899.6	31,220,642
2005	12	37,320.1	3,913.6	2,921,151.9	28,510,285
2006	12	32,372.6	4,220.7	2,818,930.7	27,498,505

2007	12	34,088.9	4,455.0	2,903,425.1	28,314,056

Mitchell, Marshall County, WV, Facility ID: 3948

Year	# of Months Reported	SO_2 Tons	NO_x Tons	CO_2 Tons	Heat Input (mmBtu)
2002	12	56,009.2	29,593.1	8,641,347.9	84,222,423
2003	12	59,330.9	29,660.9	8,991,537.2	87,636,839
2004	12	62,617.0	23,575.2	8,627,594.8	84,089,902
2005	12	53,765.1	20,026.4	6,599,845.3	64,325,953
2006	12	52,005.5	16,394.6	7,076,633.7	68,972,995
2007	12	6,084.4	14,682.4	9,033,512.4	88,045,916

Kammer, Marshall County, WV, Facility ID: 3947

Year	# of Months Reported	SO_2 Tons	NO_x Tons	CO_2 Tons	Heat Input (mmBtu)
2002	12	39,096.2	13,173.9	3,694,205.5	36,005,906
2003	12	42,216.1	11,968.5	3,562,163.2	34,718,914
2004	12	40,016.3	10,883.3	3,320,586.7	32,364,383
2005	12	42,574.0	11,516.3	3,722,892.7	36,285,498
2006	12	40,750.2	10,798.1	3,464,587.1	33,767,863
2007	12	43,126.6	11,100.7	3,991,447.0	38,902,989

AES Beaver Valley Partners, Beaver County, PA, Facility ID: 10676

Year	# of Months Reported	SO_2 Tons	NO_x Tons	CO_2 Tons	Heat Input (mmBtu)
2002	No Data	No Data	No Data	No Data	No Data
2003	6		964.7		4,966,487
2004	6		940.4		5,151,622
2005	6		885.5		4,703,946
2006	6		933.3		4,802,489
2007	6		1,098.8		5,363,531

Bruce Mansfield, Beaver County, PA, Facility ID: 6094

Year	# of Months Reported	SO_2 Tons	NO_x Tons	CO_2 Tons	Heat Input (mmBtu)
2002	12	30,312.6	29,868.7	15,411,598.8	150,210,585
2003	12	31,923.0	23,500.8	15,265,479.0	148,786,383
2004	12	37,987.8	24,077.3	17,654,260.5	172,068,960
2005	12	33,122.6	23,453.0	17,290,117.2	168,519,577
2006	12	23,431.0	25,724.6	17,375,622.9	169,353,166
2007	12	20,546.2	24,859.0	17,387,361.0	169,467,508

GF Weaton, Beaver County, PA, Facility ID: 50130

Year	# of Months Reported	SO_2 Tons	NO_x Tons	CO_2 Tons	Heat Input (mmBtu)
2002	No Data	No Data	No Data	No Data	No Data
2003	12		1,395.6		7,092,743
2004	9		914.0		5,043,710
2005	6		546.9		3,301,642
2006	6		521.8		3,742,986
2007	6		567.7		3,813,510

R E Burger, Belmont County, OH, Facility ID: 2864

Year	# of Months Reported	SO_2 Tons	NO_x Tons	CO_2 Tons	Heat Input (mmBtu)

2002	12	35,453.7	6,757.9	2,175,988.7	21,208,479
2003	12	29,929.8	3,603.4	1,783,723.4	17,385,166
2004	12	26,774.5	3,178.5	1,677,688.8	16,351,747
2005	12	37,598.3	5,358.6	2,465,490.1	24,031,261
2006	12	17,295.4	3,405.5	1,950,259.7	19,008,416
2007	12	22,508.5	3,403.3	2,038,237.3	19,865,844

Elrama, Washington County, PA, Facility ID:

Year	# of Months Reported	SO_2 Tons	NO_x Tons	CO_2 Tons	Heat Input (mmBtu)
2002	12	5,395.2	8,078.7	3,469,030.9	33,811,222
2003	12	3,563.2	5,874.7	2,687,750.0	26,196,355
2004	12	3,645.0	5,520.9	2,500,488.4	24,371,235
2005	12	3,216.0	4,686.0	2,009,719.2	19,587,977
2006	12	4,821.1	6,295.9	2,671,698.0	26,039,969
2007	12	4,267.4	6,027.7	2,343,388.4	22,840,062

Mitchell Power Station, Washington County, PA, Facility ID:

Year	# of Months Reported	SO_2 Tons	NO_x Tons	CO_2 Tons	Heat Input (mmBtu)
2002	12	1,164.3	2,275.2	1,288,266.5	12,598,036
2003	12	1,442.9	2,269.3	1,675,735.1	16,377,269
2004	12	1,268.2	1,859.1	1,520,854.4	14,830,174
2005	12	1,519.8	2,439.9	1,772,999.4	17,290,962
2006	12	930.3	2,739.7	1,734,947.8	16,921,756
2007	12	633.6	1,491.6	908,844.8	8,869,946

Based upon the data in Tables 9 and 9.1, it appears that, since 2005, new controls (scrubbers on-line in 2006 and 2007) have resulted in significant reductions at the Mitchell power plant in Marshall County, WV. In 2005, the Mitchell plant emitted 53,765 tons of SO_2 and 20,026 tons of NOx, when the annual heat input was 64,325,953 million British Thermal Units (mmBTUs). In 2007, the Mitchell plant emitted 6,084 tons of SO_2 and 14,682 tons of NOx when the annual heat input was higher, 88,045,916 mmBTUs. This reduction of 47,681 tons of SO_2 and 5,344 tons of NOx from 2005 to 2007 is significant. These reductions are significant compared to the county's total emissions in 2005, 118,021 tons of SO_2 and 39,932 tons of NOx. (These reductions in emissions are equivalent to a 40% reduction in SO_2 and a 13% reduction in NOx.) Therefore, if 2007 emissions data were considered, it is likely that the Marshall County's CES would be lower than the calculated value of 23.

To a lesser degree, SO_2 emissions from the Cardinal plant in Jefferson County have decreased from 2005 to 2007, due to new controls (scrubbers on-line in 2007). In 2005, the Cardinal plant emitted 115,848 tons of SO_2 when the annual heat input was 105,992,276mmBTUs. In 2007, the Cardinal plant emitted 81,288 tons of SO_2 when the annual heat input was 103,301,042mmBTUs. This reduction of 34,560 tons of SO_2 from 2005 to 2007 is 15% of the county's total emissions in 2005, 224,025 tons. NOx emissions in the same period were relatively unchanged. These reductions in emissions from the Cardinal plant are not nearly as substantial as those described above for the Mitchell plant, and would probably not impact Jefferson County's CES.

Because the emissions at the source in Marshall County are now significantly lower, EPA has determined that Marshall County is not contributing to violations in the Steubenville-Weirton nonattainment area for the 2006 24-hour $PM_{2.5}$ NAAQS. [0]Jefferson County, OH is the only other

county in this analysis that has an EGU with new controls since 2005. However, the level of reductions was small compared to what occurred in Marshall County. Therefore for Jefferson County and the other counties in this analysis, data relating to recent emissions reductions did not play a significant role in the decision-making process

Conclusion

Hancock and Brooke Counties, WV along with Jefferson County, OH, make up the Steubenville-Weirton nonattainment area for the 1997 $PM_{2.5}$ NAAQS as well as the Steubenville-Weirton MSA. All three of these counties have air quality monitors that show violations of 2006 24-hour $PM_{2.5}$ NAAQS, considering 2005-2007 data. These counties are economically linked to each other. The vast majority of commuters from these counties work within the MSA: Hancock (91%), Brooke (89%), and Jefferson (85%). Jefferson County, OH, has two large power plants accounting for close to 200,000 tons of SO_2 emissions in 2005. Weirton Steel, a large source of direct $PM_{2.5}$ emissions, is located in Hancock County, WV. Hancock and Brooke Counties also contribute to particulate matter concentrations in the Steubenville-Weirton area through population-based emissions sources, such as those from vehicles and other small area sources. Hancock and Brooke Counties have similar population densities and similar VMT data. These two counties also have experienced similar decreases in population in recent years. Meteorological data shows that the air quality monitors in the Steubenville-Weirton area are influenced by winds from all directions. However, in Hancock and Brooke Counties, it appears that many more high $PM_{2.5}$ days (days with monitored values greater than $35\mu g/m^3$) coincide with winds from the southwest, south, and west. This data indicates that the Steubenville-Weirton area is being influenced by local emissions as well as emissions and transported pollution from the many metropolitan areas around it and power plants in the Ohio River Valley. Considering these factors, EPA determined that it is appropriate to include Hancock and Brooke Counties, WV, in the EPA Region III portion of Steubenville-Weirton nonattainment area for the 2006 24-hour $PM_{2.5}$ NAAQS.

Most of Allegheny County, and Beaver and Washington Counties are part of the Pittsburgh-Beaver Valley nonattainment area for the 1997 and 2006 $PM_{2.5}$ NAAQS. A portion of Allegheny County is in the Liberty-Clairton nonattainment area for the 1997 and 2006 $PM_{2.5}$ NAAQS. The Pittsburgh-Beaver Valley and Liberty-Clairton areas are separate and distinct from the Steubenville-Weirton area, and are not associated economically or jurisdictionally. They are in separate metropolitan statistical areas and are served by separate metropolitan planning boards. Also, there is little commuting between the two areas. Accordingly, these areas are separate nonattainment areas for the 2006 $PM_{2.5}$ NAAQS, not included within the Steubenville-Weirton nonattainment area.

Additional information regarding responses to specific State comments can be found in EPA's Response to Comments document at http://www.epa.gov/pmdesignations/2006standards/tech.htm.

Attachment 2

Description of the Contributing Emissions Score

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. Using this methodology, scores were developed for each county in and around the relevant metro area. The county with the highest contribution potential was assigned a score of 100, and other county scores were adjusted in relation to the highest county. The CES represents the relative maximum influence that emissions in that county have on a violating county. The CES, which reflects consideration of multiple factors, should be considered in evaluating the weight of evidence supporting designation decisions for each area.

The CES for each county was derived by incorporating the following significant information and variables that impact $PM_{2.5}$ transport:

- Major $PM_{2.5}$ components: total carbon (organic carbon (OC) and elemental carbon (EC)), SO_2, NO_x, and inorganic particles (crustal).
- $PM_{2.5}$ emissions for the highest (generally top 5%) $PM_{2.5}$ emission days (herein called "high days") for each of two seasons, cold (Oct-Apr) and warm (May-Sept)
- Meteorology on high days using the NOAA HYSPLIT model for determining trajectories of air masses for specified days
- The "urban increment" of a violating monitor, which is the urban $PM_{2.5}$ concentration that is in addition to a regional background $PM_{2.5}$ concentration, determined for each $PM_{2.5}$ component
- Distance from each potentially contributing county to a violating county or counties

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