

US EPA ARCHIVE DOCUMENT

Technical Support Document for 2008 Ozone NAAQS Designations
EPA Region 2

New Jersey
Area Designations for the
2008 Ozone National Ambient Air Quality Standards

Note: New Jersey recommended that EPA designate the entire State as part of a large multi-state nonattainment area including all or portions of eleven states. Section 107(d) of the CAA requires EPA to designate as nonattainment all areas violating the ozone NAAQS and any nearby areas that are contributing to a violation in another area. Under the designation provision, only "nearby" areas that contribute to the violation must be included as part of the nonattainment area. There are other provisions of the CAA that address longer range transport of ozone pollutions, such as sections 110(a)(2)(D), 126, and 184. The phenomenon of ozone transport must be balanced against the need to have smaller areas that can focus on local control measures. We note that most of the States that New Jersey seeks to include as part of this large nonattainment area did not make a similar request. While a few other states did request that EPA designate a broad area in the eastern part of the United States as nonattainment, each of those recommendations varied from the others. In the absence of broad agreement among a large group of states to create such a large nonattainment area, demonstrating a commitment to work together to address both long-range and local transport of emissions, we do not intend to designate a large nonattainment area as suggested by New Jersey. The rest of this TSD will evaluate New Jersey's request for designations within its state only.

The table below identifies the areas and associated counties or parts of counties in the State of New Jersey that EPA intends to designate as nonattainment for the 2008 ozone national ambient air quality standards (2008 NAAQS). In accordance with section 107(d) of the Clean Air Act, EPA must designate an area (county part of a county) "nonattainment" if it is violating the 2008 ozone NAAQS or if it is contributing to a violation of the 2008 ozone NAAQS in a nearby area. The technical analyses supporting the boundaries for the individual nonattainment areas are provided below.

Table 1. Intended Nonattainment Areas in New Jersey

Area	New Jersey's Recommended Nonattainment Counties	EPA's Intended Nonattainment Counties
New York – Northern New Jersey – Long Island, NY- NJ-CT Area* (NJ portion)	Bergen, Essex, Hudson, Hunterdon, Middlesex, Monmouth, Morris, Passaic, Somerset, Sussex, Union, and Warren	Bergen, Essex, Hudson, Hunterdon, Middlesex, Monmouth, Morris, Passaic, Somerset, Sussex, Union, and Warren
Philadelphia-Wilmington-Atlantic City, PA-NJ-DE-MD Area* (NJ portion)	Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Mercer, Ocean, and Salem	Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Mercer, Ocean, and Salem

*This nonattainment area is a multi-state nonattainment area.

These proposed nonattainment areas in New Jersey, which EPA intends to designate as nonattainment, include all of the counties in New Jersey. Therefore, at New Jersey's request, no counties in New Jersey will be classified as "unclassifiable/attainment" for the 2008 ozone NAAQS.

The analysis below provides the technical basis for intended nonattainment area boundaries. It is based on an evaluation of which nearby areas are contributing to violations at monitors in New Jersey, particularly, Mercer and Ocean Counties. EPA has evaluated the boundaries proposed by New Jersey based on a weight of evidence analysis considering the factors identified below. EPA issued guidance on December 4, 2008 that identified these factors as ones EPA would consider in determining nonattainment area boundaries and recommended that states consider these factors in making their designations recommendations to EPA.¹

1. Air quality data (including the design value calculated for each FRM or FEM monitor in the area);
2. Emissions and emissions-related data (including location of sources and population, amount of emissions and emissions controls, and urban growth patterns);
3. Meteorology (weather/transport patterns);
4. Geography and topography (mountain ranges or other basin boundaries);
5. Jurisdictional boundaries (e.g., counties, air districts, existing nonattainment areas, Indian country, metropolitan planning organizations (MPOs))

Ground-level ozone is not emitted directly into the air, but is created by chemical reactions between oxides of nitrogen (NO_x) and volatile organic compounds (VOC) in the presence of sunlight. Because NO_x and VOC emissions from a broad range of sources over a wide area typically contribute to violations of the ozone standards, EPA believes it is important to consider whether there are contributing emissions from a broad geographic area. Accordingly, EPA chose to examine five factors with respect to the larger of the Combined Statistical Area (CSA) or Core Based Statistical Area (CBSA) associated with the violating monitor(s).² All data and information used by EPA in this evaluation are the latest available to EPA and/or provided to EPA by states or tribes.

In New Jersey's case, the State of New Jersey has asked EPA to use boundaries corresponding to the existing nonattainment areas for the 1997 eight-hour ozone NAAQS, as designated in 2004. EPA will focus its analysis on whether the boundaries for New Jersey's proposed nonattainment areas for the 2008 eight-hour ozone NAAQS are still supported by available data. EPA intends to approve New Jersey's request to use the previous 1997 eight-hour ozone standard's nonattainment area boundaries unless more recent information changes the preponderance of evidence that Ocean and Mercer Counties are properly affiliated with the Philadelphia-Wilmington-Atlantic City (PA-NJ-DE-MD) nonattainment area for ozone.

¹ The December 4, 2008 guidance memorandum "Area Designations for the 2008 Revised Ozone National Ambient Air Quality Standards" refers to 9 factors. In this technical support document we have grouped the emissions-related factors together under the heading of "Emissions and Emissions-Related Data," which results in 5 categories of factors.

² Lists of CBSAs and CSAs and their geographic components are provided at www.census.gov/population/www/metroareas/metrodef.html. The lists are periodically updated by the Office of Management and Budget. EPA used the most recent update, based on 2008 population estimates, issued on December 1, 2009 (OMB Bulletin No. 10-02).

Technical Analysis for Philadelphia-Wilmington-Atlantic City (PA-NJ-DE-MD) Area and the New York – Northern New Jersey – Long Island (NY, NJ, CT) Area

Figure 1

Philadelphia-Camden-Vineland, PA-NJ-DE-MD

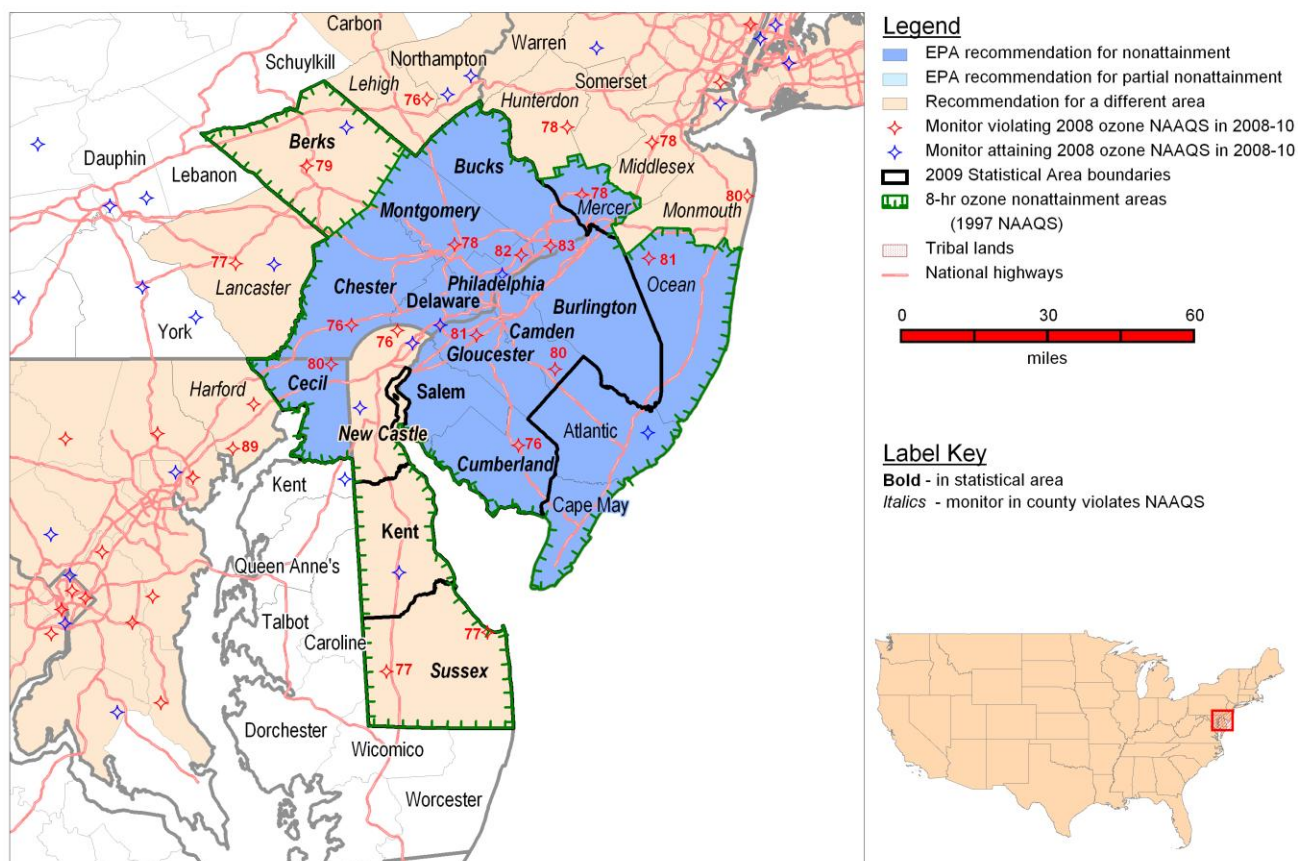


Figure 1 is a map of the Philadelphia-Wilmington-Vineland CSA and surrounding areas, with the Philadelphia-Wilmington-Atlantic City (PA-NJ-DE-MD) intended nonattainment area marked in blue. The map provides other relevant information including the locations and design values of air quality monitors, county and other jurisdictional boundaries.

The metropolitan area boundary is smaller than the nonattainment area proposed by New Jersey, which has requested that EPA continue with the boundaries approved for the New Jersey portion of the existing 1997 ozone NAAQS nonattainment area. New Jersey has not proposed any counties in New Jersey as attainment, so there will be no factor analysis for attaining counties. EPA believes the factors still support New Jersey's recommendation for which counties should be affiliated with the New York City or Philadelphia nonattainment areas. There are no recognized tribal lands in New Jersey for the purposes of air quality designations.

New Jersey's recommendation for boundaries for its nonattainment areas was submitted to EPA in its April 1, 2009 letter to EPA. Neither the New York City or Philadelphia areas were attaining the 2008

ozone NAAQS based on air quality data used in New Jersey's letter or the most recent data from 2008-2010. These data are from [Federal Reference Method \(FRM\) monitors](#) sited and operated in accordance with 40 CFR Part 58, in a network designed to be representative of ozone concentrations across the State and approved by EPA for this purpose.

After considering these recommendations and based on EPA's technical analysis described below, EPA intends to designate the counties listed in Table 1, above as "nonattainment" for the 2008 ozone NAAQS.

Figure 2

New York-Newark-Bridgeport, NY-NJ-CT-PA

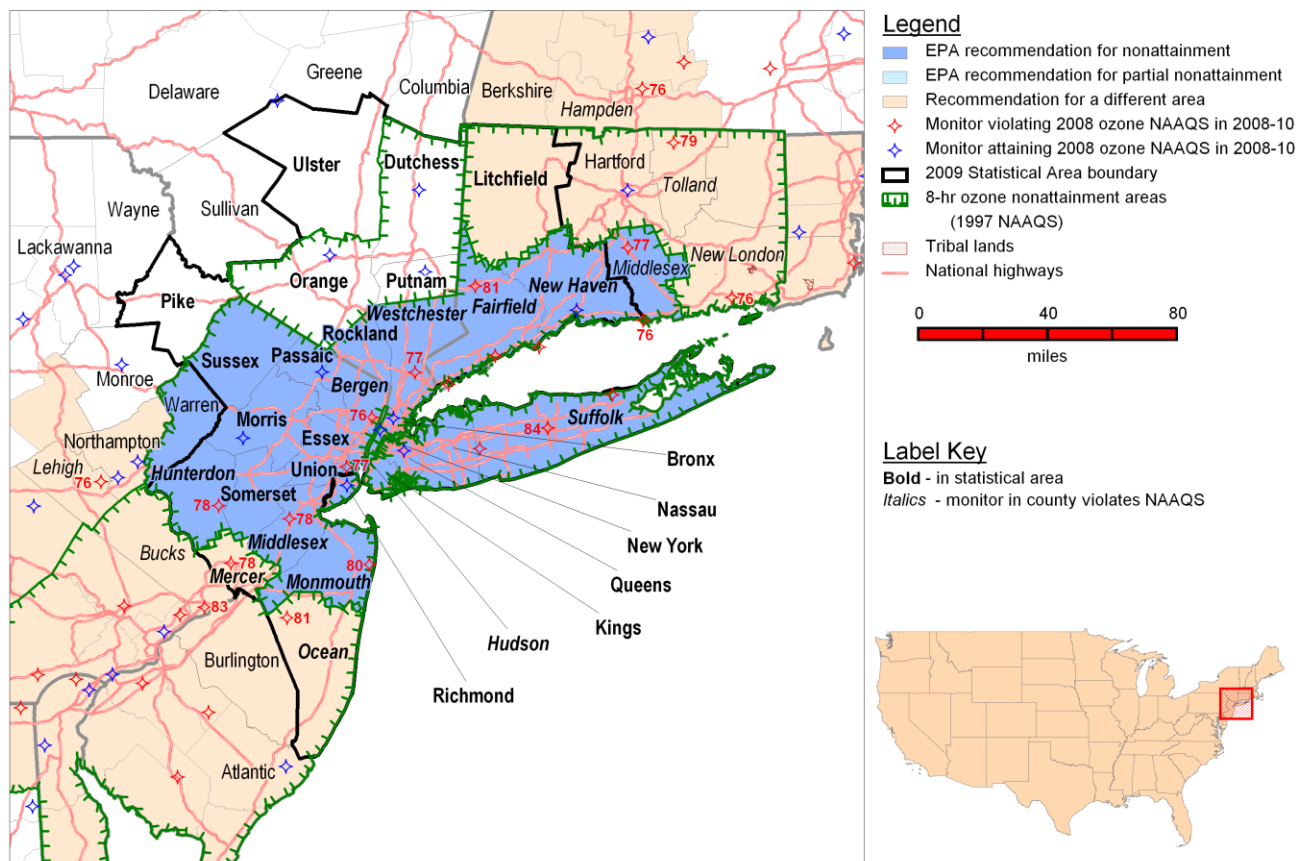


Figure 2 is a map of the New York-Northern New Jersey-Long Island (NJ-NY-CT-PA) CSA and surrounding areas, with the New York-Northern New Jersey-Long Island (NY-NJ-CT) intended nonattainment area marked in blue. The map provides other relevant information including the locations and design values of air quality monitors, county and other jurisdictional boundaries.

The nonattainment area proposed by New Jersey is different from the metropolitan area boundaries. New Jersey has requested that EPA continue with the boundaries approved for the New Jersey portion of the existing 1997 ozone NAAQS nonattainment area. New Jersey has not proposed any counties in New Jersey as attainment, so there will be no factor analysis for attaining counties. EPA believes the factors still support New Jersey's recommendation for which counties should be affiliated with the New York City or Philadelphia nonattainment areas. There are no recognized tribal lands in New Jersey for the purposes of air quality designations.

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After considering these recommendations and based on EPA's technical analysis described below, EPA intends to designate the counties listed in Table 1, above as "nonattainment" for the 2008 ozone NAAQS.

Factor Assessment For the Philadelphia-Wilmington-Atlantic City Area and the New York City-Northern New Jersey-Long Island Area

Since New Jersey proposes that the entire state be designated as nonattainment for the 2008 ozone NAAQS, the only issue for a factor analysis is the location of the boundary line between the New York City and Philadelphia nonattainment areas.

Here are the factors that EPA considers when determining the boundaries of a nonattainment area:

1. Air quality data (including the design value calculated for each FRM or FEM monitor in the area);
Both Ocean and Mercer Counties violate the air quality standard; with Ocean County having a higher design value than any monitors further downwind of Ocean County, except the peak monitors downwind of New York City.
2. Emissions and emissions-related data (including location of sources and population, amount of emissions and emissions controls, and urban growth patterns);
This factor has a limited relevance to this issue, as the issue is whether the Ocean and Mercer Counties are more affected by the Philadelphia nonattainment area than the New York City area. However, one factor from the 2004 analysis noted that more commuters stay in Ocean County or go to the Philadelphia area than go to the New York City area.³
3. Meteorology (weather/transport patterns);
The 2004 analyses of the evaluation of boundaries for the 1997 ozone NAAQSⁱ show that Ocean County is much more likely to be impacted by winds from the Philadelphia area than winds from

³ This factor uses Census Bureau data from 2000, which will be updated if newer data are available.

the New York City area. It is unlikely that more recent data would show a reversal of this wind pattern. However, more recent wind rose data will be evaluated to see if supports those analyses and continues to support Mercer and Ocean County as part of the Philadelphia area.

4. Geography and topography (mountain ranges or other basin boundaries);
Not much of a factor, since there are no major topographic features affecting conclusions from the wind flow analyses.

5. Jurisdictional boundaries (e.g., counties, air districts, existing nonattainment areas, Indian country, metropolitan planning organizations (MPOs))

Ocean County is part of the NYC transportation planning area and Mercer County is part of the Philadelphia planning area. However, Ocean and Mercer Counties have been in the Philadelphia nonattainment area since 2004. New Jersey's desire to continue to include Ocean and Mercer Counties in the Philadelphia area will tend to prevail, since New Jersey has to deal with any inconveniences due to transportation planning areas that are different from the nonattainment areas.

EPA finds that only some of the factors are relevant to determining if the boundaries of the New York City and Philadelphia areas in the State of New Jersey are approvable. The following sections provide additional information, as available and relevant.

Factor 1: Air Quality Data

Air quality data is based on the 8-hour ozone design values (in ppb) for air quality monitors in New Jersey, based on data for the 2008-2010 period (i.e., the 2010 design value, or DV). These are the most recent years with fully-certified air quality data. A monitor's DV is the metric or statistic that indicates whether that monitor attains a specified air quality standard. The 2008 ozone NAAQS are met when the annual fourth-highest daily maximum 8-hour average concentration, averaged over 3 years is 0.075 ppm (75ppb) or less. A DV is only valid if minimum data completeness criteria are met. See 40 CFR part 50 Appendix P. Where several monitors are located in a county (or a designated nonattainment area or maintenance area), the DV for the county or area is determined by the monitor with the highest level.

The 2010 DVs for the ozone NAAQS for counties in the Philadelphia-Wilmington-Atlantic City area and the New York – Northern New Jersey – Long Island, NY, NJ, CT nearby surrounding area are shown in Table 2.

Table 2. Air Quality Data.

The highest design value in NJ is 81ppb in Ocean and Gloucester Counties. The highest design value in the intended Philadelphia nonattainment area is 83ppb in Bucks Co., PA. The highest design value in the intended New York City nonattainment area is 84 ppb in Suffolk County, Long Island, NY



2010 NJ O3 DV.pdf

As shown in Figures 1 and 2, design values decrease further north and east from Ocean County, until the next set of peak design values occur downwind of New York City on Long Island and in Connecticut. This is an indication that Ocean County is affected strongly and mostly by sources to the south and west, which includes the Philadelphia area. This is typical of the northeastern United States, since most of peak ozone design values are found north and east of the centers of major urban areas.

Factor 2: Emissions and Emissions-Related Data

How does this factor support New Jersey's request for Ocean and Mercer Counties to be included in the prospective Philadelphia nonattainment area?

Emissions Data

Not evaluated because: There are no counties proposed to be attainment in New Jersey.

The only issue, whether Mercer and Ocean Counties should continue to be included with the Philadelphia area as opposed to the New York area, does not use this factor as a deciding factor. The question that needs a multi-factor analysis is about whose emissions affect Ocean and Mercer Counties the most.

Population density and degree of urbanization

Not evaluated since the question is the impact of urban ozone on Ocean and Mercer County and less so about whether Ocean and Mercer Counties affect other areas.

Traffic and commuting patterns

EPA evaluated the commuting patterns of residents in the area. A neighboring county with high VMT and/or a high number of commuters coming into the county with a violating monitor is generally an integral part of an urban area and indicates the presence of motor vehicle emissions that may contribute to ozone formation. Rapid population or VMT growth in a county on the urban perimeter signifies increasing integration with the core urban area, and indicates that the associated area source and mobile source emissions may be appropriate to include in the nonattainment area. The attached spreadsheet shows traffic and commuting pattern data, including total 2008 VMT* and 10-year VMT growth, number of commuters in each county who drive to another county within the area, the percent of total commuters in each county who commute to other counties within the area**, and the total vehicle miles traveled (VMT) for each county.

* MOBILE model VMTs are those inputs into the NEI version 1.5.

** U.S. Census Bureau estimates for 2000 County-to-County Worker Flow

<http://www.census.gov/hhes/commuting/data/commuting.html>.

The County-to-County Worker Flow data from 2000 was used in the previous 2004 analysis for the 1997 ozone standard. More up-to-date data will be used in the final analysis as available.

Based on 2000 data, the 2004 analysis noted that more commuters either stay in Ocean County or go to the Philadelphia area than go to the New York City area.

Factor 3: Meteorology (weather/transport patterns)

EPA evaluated any available meteorological data to help determine how meteorological conditions, such as weather, transport patterns and stagnation conditions, would affect the fate and transport of precursor emissions contributing to ozone formation.

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Factor 5: Jurisdictional boundaries

Once the general areas to be included in the nonattainment area were determined, EPA considered existing jurisdictional boundaries for the purposes of providing a clearly defined legal boundary and carrying out the air quality planning and enforcement functions for nonattainment areas. Examples of jurisdictional boundaries include existing/prior nonattainment areas for ozone or other urban-scale pollutants, counties, air districts, townships, metropolitan planning organizations, state lines, Reservations, urban growth boundary, etc. Where existing jurisdictional boundaries are not adequate to describe the nonattainment area, other clearly defined and permanent landmarks or geographic coordinates were considered.

EPA approved the inclusion of Ocean and Mercer Counties into the Philadelphia nonattainment area for the 2004 ozone nonattainment designations.

Ocean County is in the New York City metropolitan transportation planning organization. Mercer County is in the Philadelphia metropolitan transportation planning organization. Since 2004, New Jersey has worked with Ocean County being within the Philadelphia nonattainment area and in the New York City-centered transportation planning organization. If New Jersey requests that Ocean County should be included with the Philadelphia nonattainment area despite the possible difficulties of this situation, this factor should not be a reason for declining New Jersey's request.

New Jersey's nonattainment areas do not include Indian country for the purposes of this analysis. As defined at 18 U.S.C. 1151, "Indian country" refers to: "(a) all land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and, including rights-of-way running through the reservation, (b) all dependent Indian communities within the borders of the United States whether within the original or subsequently acquired territory thereof, and whether within or without the limits of a state, and (c) all Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same." EPA recognizes the sovereignty of tribal governments, and has attempted to take the desires of the tribes into account in establishing appropriate nonattainment area boundaries.

Conclusion

EPA will continue to evaluate updated information as to why Mercer and Ocean Counties should be in the Philadelphia ozone nonattainment area as it was for the previous 1997 eight-hour ozone standard. EPA's preliminary determination is to have the entire State of New Jersey designated as nonattainment for the 2008 eight-hour ozone NAAQS.

ⁱ <http://www.epa.gov/ozonedesignations/1997standards/documents/tsd/ch3.pdf>