

US EPA ARCHIVE DOCUMENT

Technical Support Document (TSD) for 2008 Ozone NAAQS Designations

Connecticut Area Designations for the 2008 Ozone National Ambient Air Quality Standards Greater Connecticut Area

The table below identifies the areas and associated counties or parts of counties in Connecticut that EPA is designating 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 or 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.

Final 2008 Ozone Nonattainment Areas in Connecticut (state-wide nonattainment)

Area	Connecticut Recommended Nonattainment Counties	EPA’s Nonattainment Counties
New York-N. New Jersey-Long Island, NY-NJ-CT area	Fairfield, New Haven and Middlesex	Fairfield, New Haven and Middlesex
Greater Connecticut, CT ¹	Hartford, Litchfield, New London, Tolland and Windham	Hartford, Litchfield, New London, Tolland and Windham

EPA is designating the entire state of Connecticut as nonattainment. The analysis below provides the basis for the nonattainment area boundaries. It relies on an analysis of whether and which monitors are violating the 2008 ozone NAAQS, based on certified air quality monitoring data from 2008-2010 and an evaluation of whether nearby areas are contributing to such violations. EPA has evaluated contributions from nearby areas based on a weight of evidence analysis considering the factors identified below. The analysis below provides the basis for the nonattainment area boundaries for the Greater Connecticut ozone nonattainment area. A separate TSD has been prepared for the rest of Connecticut. The rest of Connecticut is also designated nonattainment for the 2008 ozone NAAQS, and is referred to as the Connecticut portion of the New York-N. New Jersey-Long Island, NY-NJ-CT ozone nonattainment area. 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.²

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))

¹ Greater Connecticut is a multijurisdictional nonattainment area that includes areas of Indian Country.

² 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.

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 the 5 factors with respect to the larger of the Combined Statistical Area (CSA) or Core Based Statistical Area (CBSA) associated with the violating monitor(s).³ 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 EPA's designations guidance for the 2008 ozone NAAQS, EPA recommended examining CSA/CBSAs because certain factors used to establish CSAs and CBSAs are similar to the factors EPA is using in this technical analysis to determine if a nearby area is contributing to a violation of the 2008 ozone NAAQS. EPA used the same basic approach in the designation process for the 1997 ozone NAAQS. Where a violating monitor is not located in a CSA or CBSA, EPA's guidance recommended using the boundary of the county containing the violating monitor as the starting point for considering the nonattainment area's boundary.

Technical Analysis for Greater Connecticut

Figure 1 is a map of the Greater Connecticut, CT nonattainment area. The map provides other relevant information including the locations and design values of air quality monitors, county and other jurisdictional boundaries, CSA/CBSA boundaries, existing 1997 ozone nonattainment boundaries, state borders, and major highways.

The 2008 8-hour ozone NAAQS, nonattainment area's boundaries are the same as the State's 1997 8-hour ozone NAAQS boundaries.

In March 2009, Connecticut recommended that the entire State of Connecticut be designated nonattainment for the 2008 ozone NAAQS based on air quality data from 2006-2008. In its March 2009 letter, Connecticut recommended that the state be split between two ozone nonattainment areas, with the same boundaries as for the 1997 ozone NAAQS. On October 28, 2011 Connecticut submitted an updated recommendation in which it recommended including all of Connecticut as part of a large multi-state nonattainment area that included all or portions of 17 other States. On November 23, 2011, Connecticut clarified their position that, if EPA does not agree with creating a large 18 state nonattainment area, the State of Connecticut should be split between two 2008 ozone nonattainment areas, with the same boundaries as for the 1997 ozone NAAQS. On February 27, 2012, Connecticut submitted a response to EPA's 120-day letter, dated December 9, 2011. This February 2012 response reiterated the Connecticut position on a "super-regional" nonattainment area, but did not rescind the November 23, 2011 clarifying recommendation. EPA's position on "super-regional" nonattainment areas for ozone is discussed below.

After considering all available information, EPA is designating Hartford, Litchfield, New London, Tolland and Windham Counties as "nonattainment" for the 2008 ozone NAAQS as part of the Greater Connecticut area. EPA is designating the remaining three counties in Connecticut (Fairfield, New

³ 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).

Haven, and Middlesex counties) as nonattainment, but joining these counties with the New York-N. New Jersey-Long Island, NY-NJ-CT ozone nonattainment area. Our rationale is explained below.

Because Connecticut, in its clarifying recommendation of November 23, 2011 recommended that all areas in the State be designated nonattainment and included in one of two different nonattainment areas, EPA focused its analysis on whether the boundaries for Connecticut’s proposed nonattainment areas for the 2008 eight-hour ozone NAAQS are supported by available data. EPA is designating the areas as requested in the November 23, 2011 letter from Connecticut, in the absence of information strongly supporting that one or more of the counties should be included in an area different than the one recommended by the State.

Table 1. State's Recommended and EPA’s Final Designated Nonattainment Counties for Greater Connecticut and Connecticut Portion of the New York-N. New Jersey-Long Island, NY-NJ-CT Ozone Nonattainment Areas

Area	State-Recommended Nonattainment Counties	EPA Nonattainment Counties
Greater Connecticut, CT	Hartford	Hartford
	Litchfield	Litchfield
	New London	New London
	Tolland	Tolland
	Windham	Windham
New York-N. New Jersey-Long Island, NY-NJ-CT area	Fairfield	Fairfield
	New Haven	New Haven
	Middlesex	Middlesex

Factor Assessment

Factor 1: Air Quality Data

For this factor, we considered 8-hour ozone design values (in parts per million (ppm)) for air quality monitors in counties in the Greater Connecticut area based on data for the 2008-2010 period (i.e., the 2010 design value, or DV), which 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 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. All ozone data referenced in this TSD was submitted by the State, and are from Federal Reference Method monitors, sited and operated in accordance with 40 CFR Part 58. (See letter to EPA dated November 23, 2011.)

The 2010 DVs for the ozone NAAQS for counties in the Greater Connecticut ozone nonattainment area and the Connecticut Portion of the New York-N. New Jersey-Long Island, NY-NJ-CT ozone nonattainment area are shown in Tables 2a and 2b.

Table 2a. Air Quality Data for the Greater Connecticut Ozone Nonattainment Area

County	State Recommended Nonattainment?	2008-2010 Design Value (ppm)
Hartford	Yes	0.074
Litchfield	Yes	0.073 ⁴
New London	Yes	0.076
Tolland	Yes	0.079
Windham	Yes	No monitor in county

Table 2b. Air Quality Data for the Three Counties of the Connecticut Portion of the New York-N. New Jersey-Long Island, NY-NJ-CT Ozone Nonattainment Area

County	State Recommended Nonattainment?	2008-2010 Design Value (ppm)
Fairfield	Yes	0.081
New Haven	Yes	0.076
Middlesex	Yes	0.077

EPA believes that since Connecticut has recommended, and EPA is designating the entire state as nonattainment, air quality is not a significant factor for determining in which nonattainment area these counties should be placed, since all counties in the state are nonattainment. Therefore, this factor did not play a significant role in this evaluation.

Factor 2: Emissions and Emissions-Related Data

EPA evaluated emissions of ozone precursors (NO_x and VOC) and other emissions-related data that provide information on near-by areas contributing to violating monitors.

Emissions Data

EPA evaluated county-level emissions data for NO_x and VOC derived from the 2008 National Emissions Inventory (NEI), version 1.5. This is the most recently available NEI. (See <http://www.epa.gov/ttn/chief/net/2008inventory.html>.) Significant emissions levels in a nearby area would indicate the potential for the area to contribute to observed violations.

Tables 3a and 3b show emissions of NO_x and VOC (given in tons per year (tpy)) for violating and potentially contributing counties in the State of Connecticut.

⁴ 2008-2010 ozone data used to compute the Design Value for Litchfield County is incomplete. 40 CFR part 50 Appendix P requires a monitoring site to meet a 3-year data completeness of 90 percent. The Litchfield County monitor is meeting a 3-year data completeness of 89 percent.

Table 3a. Total 2008 NO_x and VOC Emissions for the Greater Connecticut Ozone Nonattainment Area

County	State Recommended Nonattainment?	NO _x (tpy)	VOC (tpy)
Hartford	Yes	20,253	20,808
Litchfield	Yes	3,429	6,115
New London	Yes	8,558	9,160
Tolland	Yes	3,553	3,764
Windham	Yes	3,469	3,626
Areawide:		39,262	43,473

Table 3b. Total 2008 NO_x and VOC Emissions for the Three Counties of the Connecticut Portion of the New York-N. New Jersey-Long Island, NY-NJ-CT Ozone Nonattainment Area

County	State Recommended Nonattainment?	NO _x (tpy)	VOC (tpy)
Fairfield	Yes	24,983	22,700
New Haven	Yes	20,789	19,705
Middlesex	Yes	4,484	5,130
Three County Total:		50,256	47,535

This factor indicates that these counties are likely contributing to nonattainment at one or more monitors within the county or at monitors in nearby counties. It does not provide any indication of which monitors are most likely affected by emissions from these counties. Therefore, this factor did not play a significant role in this evaluation.

Population density and degree of urbanization

EPA evaluated the population and vehicle use characteristics and trends of the area as indicators of the probable location and magnitude of non-point source emissions. These include ozone-creating emissions from on-road and off-road vehicles and engines, consumer products, residential fuel combustion, and consumer services. Areas of dense population or commercial development are an indicator of area source and mobile source NO_x and VOC emissions that may contribute to ozone formation. Rapid population or VMT growth (see below) 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. Tables 4a and 4b show the population, population density, and population growth information for each county in the state.

Table 4a. Population and Growth for the Greater Connecticut Ozone Nonattainment Area

County	State Recommended Nonattainment?	2010 Population	2010 Population Density (1000 pop/sq mi)	Absolute change in population (2000-2010)	Population % change (2000-2010)
Hartford	Yes	894,014	1.19	35,575	4.1
Litchfield	Yes	189,927	0.20	7,313	4.0
New London	Yes	274,055	0.39	14,519	5.6
Tolland	Yes	152,691	0.37	15,839	11.6
Windham	Yes	118,428	0.23	9,236	8.5
Areawide:		1,629,115		82,482	

Sources: U.S. Census Bureau population estimates for 2010 as of August 4, 2011

Table 4b. Population and Growth for the Three Counties of the Connecticut Portion of the New York-N. New Jersey-Long Island, NY-NJ-CT Ozone Nonattainment Area

County	State Recommended Nonattainment?	2010 Population	2010 Population Density (1000 pop/sq mi)	Absolute change in population (2000-2010)	Population % change (2000-2010)
Fairfield	Yes	916,829	1.41	32,348	3.7
New Haven	Yes	862,477	1.39	37,492	4.5
Middlesex	Yes	165,676	0.43	10,061	6.5

Sources: U.S. Census Bureau population estimates for 2010 as of August 4, 2011

The population in the Greater Connecticut ozone nonattainment area is growing modestly and the population density is rather high, since the area includes the State capital of Hartford. This factor indicates that the counties with the highest population density are likely contributing to nonattainment at one or more monitors within the county or at monitors in nearby counties. It does not provide any indication of which monitors are most likely affected by emissions from these counties. Therefore, this factor did not play a significant role in this evaluation.

Traffic and commuting patterns

EPA evaluated the commuting patterns of residents in the area, as well as the total Vehicle Miles Traveled (VMT) for each county. In combination with the population/population density data and the location of main transportation arteries (Figure 1), this information helps identify the probable location of non-point source emissions. A county with high VMT and/or a high number of commuters 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. Tables 5a and 5b show 2008 VMT for Connecticut.

Table 5a. Traffic for the Greater Connecticut Ozone Nonattainment Area

County	State Recommended Nonattainment?	2008 VMT* (million miles)
Hartford	Yes	8,330
Litchfield	Yes	1,258
New London	Yes	2,916
Tolland	Yes	1,499
Windham	Yes	1,202
Areawide:		15,205

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

Table 5b. Traffic for the Three Counties of the Connecticut Portion of the New York-N. New Jersey-Long Island, NY-NJ-CT Ozone Nonattainment Area

County	State Recommended Nonattainment?	2008 VMT* (million miles)
Fairfield	Yes	7,803

New Haven	Yes	7,248
Middlesex	Yes	1,394

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

This factor indicates that the counties with the highest VMT are likely contributing to nonattainment at one or more monitors within the county or at monitors in nearby counties. It does not provide any indication of which monitors are most likely affected by emissions from these counties. Therefore, this factor did not play a significant role in this evaluation.

Factor 3: Meteorology (weather/transport patterns)

EPA evaluated meteorological data to help determine how meteorological conditions, such as weather, and transport patterns, affect the fate and transport of precursor emissions contributing to ozone formation in Connecticut. In addition, Connecticut, in its February 2012 letter, did point out that Connecticut receives its ozone via several different meteorological conditions. EPA agrees that meteorology does affect ozone in Connecticut, but since the entire state is nonattainment EPA does not believe this is a significant factor for purposes of determining in which nonattainment area a particular Connecticut county should be placed. Therefore, this factor did not play a significant role in this evaluation.

Factor 4: Geography/topography (mountain ranges or other air basin boundaries)

The geography/topography analysis evaluates the physical features of the land that might affect the air shed and, therefore, the distribution of ozone over the area. The Greater Connecticut ozone nonattainment area does not have any geographical or topographical barriers significantly limiting air pollution transport within its air shed. Connecticut in its February 2012 letter did point out that Connecticut is on Long Island Sound, but since the entire state is nonattainment and both nonattainment areas border the Sound we do not believe this is a relevant factor for purposes of determining in which nonattainment area a particular Connecticut county should be placed. Therefore, this factor did not play a significant role in this evaluation.

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.

The Greater Connecticut ozone nonattainment area has previously established nonattainment boundaries associated with 1997 8-hour ozone NAAQS. The state has recommended, in its most recent clarifying letter to EPA dated November 23, 2011, that the boundary for nonattainment areas for the 2008 ozone NAAQS be the same as those that exist for the 1997 8-hour NAAQS. Connecticut's reasoning was to "avoid unnecessary confusion among Connecticut's regulated community and the general public that

may otherwise result from having three distinct nonattainment area boundaries within Connecticut for the 2008 8-hour ozone NAAQS.” This is the most significant factor for purposes of determining in which nonattainment area a particular Connecticut county should be placed.

The Greater Connecticut ozone nonattainment area also includes areas of Indian country. 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.

Two tribes’ areas of Indian country are included in the Greater Connecticut ozone nonattainment area: Mashantucket Pequot Tribe of Connecticut and the Mohegan Indian Tribe of Connecticut. Neither Tribe submitted a designation recommendation for the 2008 ozone NAAQS. EPA has concluded that all of Connecticut, including areas of Indian Country, are nonattainment for the 2008 ozone NAAQS.

EPA Position on the Connecticut Recommendation of a “Super-Regional” Ozone Nonattainment Area for the 2008 Ozone NAAQS

In a letters dated October 28, 2011 and February 23, 2012, Connecticut recommended that EPA designate the entire State as part of a large multi-state nonattainment area including all or portions of 17 other states, and the District of Columbia. EPA does not believe that creation of a super-regional nonattainment area to address pollution transport is the appropriate approach. As an initial matter, section 107(d)(1) provides that areas designated nonattainment should include any “nearby” area contributing to a violation of the NAAQS. We believe that broad super-regional areas go beyond this by including areas that are not necessarily “nearby” but contribute to nonattainment through long-range transport. The CAA has separate provisions to address this phenomenon. Section 110(a)(2)(D) requires states to address ozone transport that contributes to a violation of the NAAQS in another State. In addition, section 184, creates the northeast ozone transport region and also grants EPA authority to establish additional transport regions, as appropriate. Finally, we note that the approach taken by EPA is consistent with the approach Congress specified for serious and above areas for the 1-hour NAAQS, where in section 107(d)(4)A), Congress set the CMSA boundaries as the presumptive boundaries of the nonattainment area. In *Catawba Co. v. EPA*⁵, the Court upheld that “contribute” under §107(a)(1)(A) of the CAA does not necessarily mean “any contribution” to nonattainment but rather a *degree of contribution sufficient to deem an area nonattainment*, that is, sufficient enough to warrant designation as nonattainment. “Section 107(d) is ambiguous as to how EPA should measure contribution and *what degree of contribution is sufficient to deem an area nonattainment...*” *Catawba County v. EPA*, 571 F.3d 20, 39 (D.C. Cir. 2009) (Internal citation omitted but with emphasis added). “Thus, reasonably exercising the discretion that Congress delegated to it, EPA interpreted “contribute” to mean “sufficiently contribute,” and then applied the C/MSA presumption and nine-factor test precisely to identify those areas that meet that definition.” *Id.*

⁵ *Catawba County v. EPA*, 571 F.3d 20, (D.C. Cir. 2009)

Conclusion

Based on the assessment of factors described above, EPA is adopting the same nonattainment boundaries in Connecticut for the 2008 ozone NAAQS as for the 1997 ozone NAAQS, to avoid unnecessary confusion, and to aide in planning, permitting, transition and enforcement. All of Connecticut (including Indian Country) is designated as nonattainment for the 2008 ozone NAAQS. Based on our analysis of the factors above, we do not see a compelling reason to reject the State's recommendation for inclusion in the Greater Connecticut, CT ozone nonattainment area the following counties: Hartford, Litchfield, New London, Tolland and Windham. The remaining three Connecticut counties (Fairfield, New Haven, and Middlesex counties) will be joined with the multi-state New York-N. New Jersey-Long Island, NY-NJ-CT ozone nonattainment area and are fully discussed in the technical support document for that area. (See separate TSD.)

Figure 1. Map of Greater Connecticut, CT Ozone Nonattainment Area



