

DRAFT
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**Revision to the
State Implementation Plan
for Air Quality**

**Demonstration that Connecticut Complies with the
Good Neighbor Requirements of
Clean Air Act Section 110(a)(2)(D)(i)(I) for the
2008 Ozone National Ambient Air Quality Standard**

**Prepared by the
Bureau of Air Management**



Connecticut Department of

**ENERGY &
ENVIRONMENTAL
P R O T E C T I O N**

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Demonstration that Connecticut Complies with the Good Neighbor Requirements of Clean Air Act Section 110(a)(2)(D)(i)(I) for the 2008 Ozone National Ambient Air Quality Standard

Summary

Sections 110(a)(1) and (2) of the Clean Air Act (CAA) require all states to submit any necessary revisions to their State Implementation Plans (SIP) to provide for the implementation, maintenance and enforcement of any revised or new national ambient air quality standard (NAAQS). Such revisions are commonly referred to as “infrastructure SIPs.” The U.S. Environmental Protection Agency (EPA) revised the ozone NAAQS in March 2008 and completed the designation process to identify nonattainment areas in July 2012. The Connecticut Department of Energy and Environmental Protection (DEEP) subsequently submitted Connecticut’s infrastructure SIP¹ on December 28, 2012.

This current SIP revision supplements DEEP’s December 2012 submittal, further addressing the CAA §110(a)(2)(D)(i)(I) (i.e., good neighbor) requirements to demonstrate that emissions from sources in Connecticut do not contribute significantly to nonattainment in, or interfere with maintenance by, any other state with respect to the 2008 ozone NAAQS. DEEP’s analysis of recent ozone monitoring data, recent EPA modeling for the Cross State Air Pollution Rule (CSAPR) and a potential new transport rule², and projected future Connecticut emission trends demonstrates that Connecticut meets its good neighbor requirements for the 2008 NAAQS.

Background and Introduction

On March 12, 2008, EPA promulgated revisions³ to the primary and secondary ozone NAAQS. Specifically, EPA established identical primary and secondary 8-hour standards at a level of 75 parts per billion, based on the 3-year average of the fourth-highest value of the yearly distribution of 8-hour daily maximum concentrations. EPA promulgated initial designations⁴ on April 30, 2012, assigning two marginal nonattainment areas in Connecticut: the Greater Connecticut Nonattainment Area (Hartford, Litchfield, New London, Tolland and Windham Counties and Mashantucket Pequot and Mohegan Tribes of Connecticut); and the New York-Northern New Jersey-Long Island NY-NJ-CT Nonattainment Area (a multi-state area including Connecticut’s Fairfield, Middlesex and New Haven Counties, as well as counties in northern New Jersey and downstate New York).

¹ CT’s Infrastructure SIP is posted at: http://www.ct.gov/deep/cwp/view.asp?a=2684&Q=514044&depNAV_GID=1619

² [Memorandum](#) from Stephen Page to EPA Regional Air Directors, Regions 1-10 on Good Neighbor SIP Provision for the 2008 Ozone NAAQS, January 22, 2015.

³ The NAAQS revisions were published in the [3/27/2008 Federal Register](#) and became effective on 5/27/2008.

⁴ The designations rulemaking was published in the [5/21/2012 Federal Register](#), and became effective 7/20/2012.

Pursuant to CAA §110(a)(1) and (2), all states are required to submit any necessary revisions to their State Implementation Plans (SIP) to provide for the implementation, maintenance and enforcement of any revised or new NAAQS. States are required to maintain a comprehensive air quality management infrastructure, including enforceable emission limitations, an ambient monitoring program, an enforcement program, air quality modeling, and adequate personnel, resources, and legal authority. The “good neighbor” provisions of CAA §110(a)(2)(D)(i) further require each SIP to prohibit emissions from within the state that contribute significantly to nonattainment or maintenance of the ozone NAAQS in any other state, or which interfere with programs to prevent significant deterioration of air quality or to achieve reasonable progress toward the national visibility goal for Federal class I areas (national parks and wilderness areas).

Based on timing requirements set forth in the CAA, states were required to submit ozone infrastructure SIP revisions by March 2011. However, state nonattainment area designations remained unknown in March 2011 due to legal challenges to the 2008 ozone NAAQS and subsequent EPA reconsideration of the standard. As such, DEEP deemed it ineffective and inefficient to submit an infrastructure SIP until the level of the standard and area designations were known. Following EPA’s completion of designations in July 2012, DEEP submitted Connecticut’s ozone infrastructure SIP on December 28, 2012, after meeting the public participation requirements of 40 CFR 51, Appendix V, Section 2.1.

On January 3, 2013, EPA issued a finding that the Connecticut submittal was complete for the required elements of CAA §110(a)(2)(A), (B), (C), (D)(i)(II), (D)(ii), (E)-(H), and (J)-(M) because they met the completeness criteria outlined in 40 CFR Part 51 appendix V. EPA elected to make no finding with respect to CAA §110(a)(2)(D)(i)(I), citing the D.C. Circuit’s 2012 opinion in *EME Homer City Generation v. EPA*, 696 F.3d 7, 31 (D.C. Cir. 2012), which concluded that a SIP cannot be deemed to lack a required submission or deemed deficient for failure to meet the CAA §110(a)(2)(D)(i)(I) obligation until after the EPA quantifies that obligation. On review of this decision, the U.S. Supreme Court further clarified CAA §110(a)(2)(D)(i)(I) and held that despite the lack of EPA guidance, states are required to meet their good neighbor requirements in a timely manner.⁵

On January 22, 2015, EPA issued partial guidance to assist states with preparing SIP revisions to address compliance with CAA §110(a)(2)(D)(i)(I) for the 2008 ozone NAAQS. The guidance discusses elements previously used to address interstate transport for other NAAQS and presented new, preliminary EPA ozone modeling results for 2018 based on emission reductions anticipated from previously adopted air pollution control programs. EPA’s preliminary modeling identified states that are judged to significantly contribute (i.e., at least 1% of the NAAQS) to nonattainment/maintenance concerns in other states in 2018. EPA held a workshop on April 8, 2015 to facilitate discussions on potentially needed control remedies and emission budget approaches to meet the good neighbor obligations. At that meeting, EPA indicated plans to release updated modeling during the summer of 2015 incorporating inventory improvements, continue the transport discussions, and propose rulemaking towards the end of 2015 for a federal implementation plan (FIP) backstop, to take effect in states that do not submit approvable SIPs in a timely manner. Based on the fact that the CSAPR framework was upheld by the Supreme Court, EPA’s actions will likely focus on what it considers to be cost-effective actions that are

⁵ [EPA v. EME Homer City Generation, L.P.](#) 134 S.Ct 1584, 1600-01 (2014).

achievable by the start of the 2017 ozone season, the year that moderate areas are required to achieve compliance with the 2008 ozone NAAQS. Unfortunately, if EPA chooses a path focused solely on EGUs and an inadequate cost effectiveness threshold, air pollution from upwind states will not be addressed in accordance with CAA §110(a)(2)(D)(i)(I), leaving Connecticut citizens to continue suffering health impacts from transported air pollution and the State of Connecticut without the protections afforded by the CAA.

EPA's January 2015 guidance refers to a consistent four-step process used previously to address ozone transport:

- 1) Identify downwind air quality problems;
- 2) Identify upwind states that contribute enough to those downwind air quality problems to warrant further review and analysis;
- 3) Identify the emissions reductions necessary to prevent an identified upwind state from contributing significantly to those downwind air quality problems; and
- 4) Adoption of permanent and enforceable measures needed to achieve those emission reductions.

Connecticut's good neighbor SIP revision is consistent with the four-step process outlined in EPA's guidance. However, DEEP finds significant flaws with the following specific items described in EPA's January 2015 guidance and urges EPA to revise the guidance to create a means for Connecticut to provide the clean air that every citizen has the right to expect from EPA and the Clean Air Act.

- EPA's guidance includes the results of photochemical modeling used by EPA to identify states that contribute significantly to downwind attainment/maintenance issues in 2018, citing the moderate area attainment deadline⁶ as the reason for selecting 2018 as the analysis year. EPA's selection of 2018 disregards the plight of several marginal attainment areas with attainment deadlines of 2015 (with compliance based on 2014 design values). This oversight likely reduces the number of upwind states identified by EPA as significantly contributing to marginal areas and will lead to delays in securing needed upwind emission reductions. DEEP believes it is more appropriate to identify contributing states based on modeling for a year from the period of data (i.e., 2008-2011) used to establish designations, rather than a future year, since emissions from the 2008-2011 era directly influenced EPA's determination of whether an area should be designated as attainment or nonattainment.
- EPA's guidance indicates that the transport remedy for the 2008 ozone NAAQS will only focus on potential electric generating units (EGU) controls and budgets, with no mention included of potential reductions from other stationary sources or from mobile sources. CAA §110(a)(2)(D)(i)(I) addresses "any source or other type of emissions activity within the State", not just EGU sources. Modeling shows that ozone levels are heavily influenced by emissions from non-EGU source categories, so transport remedies should not be restricted to the EGU sector.

⁶ Note that Connecticut's nonattainment areas, along with those in many other states, are classified as marginal with a required attainment deadline of 2015 (based on 2014 design values).

- EPA’s guidance refers to a recent U.S. Supreme Court ruling⁷ upholding EPA’s approach that considers control costs in the Cross-State Air Pollution Rule (CSAPR), indicating that the same approach should be used for addressing transport for the 2008 NAAQS. DEEP agrees that cost-effectiveness must play a role in identifying appropriate controls and allowable emission levels, but not at the expense of failing to adequately address states’ transport contributions to downwind nonattainment. EPA’s CSAPR transport remedy for the 1997 NAAQS was tied to an inadequate cost-effectiveness limit of \$500/ton. The remedy provided only 0.2 ppb of ozone relief to Connecticut, while EPA’s CSAPR and most recent modeling both indicate that over 90% of the ozone problem at Connecticut’s worst-case monitors is due to emissions outside of Connecticut’s jurisdiction. Given this overwhelming contribution from upwind sources and Connecticut’s current ozone design value (i.e., 85 ppb compared to the 2008 NAAQS of 75 ppb), the transport remedy for the 2008 NAAQS must provide substantially more relief to Connecticut to make it possible to achieve and sustain NAAQS compliance. In the final analysis, models are only projections. The real test of EPA’s policies is actual measured air quality. The ozone monitors measuring the highest ozone values are located on the upwind border of Connecticut. Until these monitors demonstrate that incoming air is below the ozone NAAQS, transport has not been adequately addressed.

Through this SIP submittal, DEEP analyzes both ambient monitoring data and EPA modeling results to demonstrate that Connecticut’s existing control programs are sufficient to ensure that emissions from Connecticut do not significantly contribute to nonattainment or maintenance issues in any other state with respect to the 2008 ozone NAAQS. Therefore, Connecticut complies with the requirements of CAA §110(a)(2)(D)(i)(I).

Methodology

The “good neighbor” provisions of CAA §110(a)(2)(D)(i)(I) require each state’s SIP to prohibit emissions that significantly contribute to nonattainment in, or interfere with maintenance by, any other state with respect to any NAAQS. DEEP used the following methodology to implement the four-step process outlined in EPA’s January 2015 guidance to identify and address Connecticut’s good neighbor obligation.

1. As part of the development of the CSAPR⁸ program, EPA established a modeled impact level of 1% of the NAAQS as the threshold for identifying states that contribute significantly to monitors in downwind states. DEEP used CSAPR modeling results for 2012 to identify any monitors where Connecticut’s ozone contributions were at least 1% of the 2008 NAAQS (i.e., at least 0.75ppb). The 2012 analysis year was selected by DEEP because it is representative of contributions that occurred during the data period used by EPA to establish attainment/nonattainment designations for the 2008 NAAQS.
2. For those monitors identified by EPA’s CSAPR modeling as significantly impacted by Connecticut emissions in 2012, DEEP analyzed recent measured data to determine each

⁷ [EPA v. EME Homer City Generation, L.P.](#) 134 S.Ct. 1584, 1604-07 (2014).

⁸ See: <http://www.epa.gov/crossstaterule/techinfo.html>. Although CSAPR addresses the 1997 ozone NAAQS, the general approach and modeling results are applicable to the 2008 NAAQS.

monitor's current compliance status with the 2008 NAAQS based on preliminary 2014 design values.

3. In order to assess the likelihood of maintenance of the standard at the CT-impacted monitors, DEEP used 2013 and 2014 4th-high values to calculate the 4th-high measured ozone levels that would need to occur in 2015 and 2016 to violate the 2008 NAAQS. DEEP then examined historical ozone monitoring data to determine whether, and how often, such 4th-high values have actually occurred since 2007. Based on that analysis, DEEP judged whether it was likely that each monitor would continue to maintain compliance with the 2008 NAAQS through 2016.
4. To assess longer term maintenance prospects, DEEP then examined EPA's recently released preliminary modeling results for 2018. DEEP determined whether any of the CT-impacted monitors (from the 2012 CSAPR modeling) are projected to have nonattainment or maintenance concerns in 2018 and, if so, whether they are expected to be significantly impacted by Connecticut emissions.
5. As additional weight of evidence, DEEP also examined projected emission trends out to 2025 from Connecticut sources to further assess the longer term implications for maintenance at monitors that were significantly impacted by Connecticut in 2012.

The following sections document the application of the above methodology and DEEP's findings regarding Connecticut's compliance with CAA §110(a)(2)(D)(i)(I) for the 2008 ozone NAAQS.

Methodology Step 1: Identification of Monitors Significantly Impacted by Connecticut Emissions in 2012

As part of the CSAPR rule development process, EPA used modeling results⁹ for 2012 to determine each state's impacts on ozone levels at downwind monitors. If modeling showed a state's emissions caused an impact amounting to 1% or more of the 1997 NAAQS at a downwind monitor projected to have nonattainment or maintenance issues in 2012, then the state was identified as significantly contributing to that monitor. DEEP applied that same general approach for the 2008 ozone NAAQS, but extended it to include all monitors impacted at the 1% level for the 2008 NAAQS (i.e., ≥ 0.75 ppb) by Connecticut emissions in 2012, not just those modeled to have nonattainment/maintenance issues. Use of this conservative approach ensured that all monitors of potential concern would be tracked throughout DEEP's analysis.

Based on the conservative methodology described above, Connecticut's emissions were found to have significant impacts in 2012 at 32 monitors located in other states. These monitors are listed in Table 1 along with the current official designation status with respect to the 2008 ozone NAAQS. Of the 32 monitors, 21 are located in areas currently designated as unclassifiable/attainment for the 2008 NAAQS. The other 11 monitors are located in four areas currently designated as nonattainment by the EPA for the 2008 NAAQS (Seaford, DE; Dukes County, MA; Philadelphia-Wilmington-Atlantic City, PA-NJ-MD-DE; and New York-N. New Jersey-Long Island, NY-NJ-CT).

⁹ See the following three EPA links: <http://www.epa.gov/crossstaterule/pdfs/AQModeling.pdf>; http://www.epa.gov/crossstaterule/pdfs/CSAPR_Ozone%20and%20PM2.5_Design%20Values.xls; and http://www.epa.gov/crossstaterule/pdfs/CSAPR_Ozone%20and%20PM2.5_Contributions.xls.

Table 1
Monitors Identified by EPA CSAPR Modeling as Being
Significantly Impacted by Connecticut Emissions in 2012¹

State	County	Location	Official Designation for 2008 Ozone NAAQS
Delaware	Sussex	Lewes	Seaford, DE - Marginal Nonattainment
Maine	Cumberland	Cape Elizabeth	Unclassifiable/Attainment
	Hancock	Bar Harbor-Cadillac Mt Summit	Unclassifiable/Attainment
	Hancock	Bar Harbor-McFarland Hill	Unclassifiable/Attainment
	Knox	Port Clyde-Marshall Pt	Unclassifiable/Attainment
	York	Kennebunkport	Unclassifiable/Attainment
Massachusetts	Barnstable	Truro	Unclassifiable/Attainment
	Dukes	Wampanoag Laboratory - Martha's Vineyard	Dukes County, MA – Marginal Nonattainment
	Essex	Lynn	Unclassifiable/Attainment
	Essex	Newbury	Unclassifiable/Attainment
	Essex	Haverhill	Unclassifiable/Attainment
	Hampden	Chicopee	Unclassifiable/Attainment
	Hampshire	Amherst	Unclassifiable/Attainment
	Hampshire	Ware	Unclassifiable/Attainment
	Norfolk	E Milton (Blue Hill)	Unclassifiable/Attainment
	Suffolk	Boston-Long Island	Unclassifiable/Attainment
	Suffolk	Boston-Roxbury	Unclassifiable/Attainment
New Hampshire	Hillsborough	Peterborough	Unclassifiable/Attainment
	Rockingham	Portsmouth-Pierce Isle	Unclassifiable/Attainment
	Rockingham	Rye-Ordiorne State Park	Unclassifiable/Attainment
New Jersey	Atlantic	Brigantine	Philadelphia-Wilmington-Atlantic City, PA-NJ-MD-DE - Marginal Nonattainment
	Monmouth	Monmouth Univ	
	Passaic	Ramapo	
New York	Dutchess	Millbrook	New York-N. New Jersey-Long Island, NY-NJ-CT – Marginal Nonattainment
	Putnam	Mt Ninham	
	Richmond	NYC-Susan Wagner HS	
	Suffolk	Riverhead	
	Suffolk	Holtsville	
	Westchester	White Plains	
Rhode Island	Kent	W Greenwich	Unclassifiable/Attainment
	Providence	E Providence	Unclassifiable/Attainment
	Washington	Narragansett	Unclassifiable/Attainment

¹ Monitors listed are all those identified by EPA's CSAPR modeling results as incurring impacts from CT emissions amounting to at least 1% of the 2008 ozone NAAQS of 75 ppb in 2012, regardless of whether the impacted monitor was projected by the modeling to have nonattainment/maintenance issue in 2012. Six other monitors (4 in ME, 2 in MA) are no longer in operation and are not considered here. EPA's CSAPR modeling indicates that CT impacts at all other non-CT monitors are insignificant in 2012.

Methodology Steps 2 and 3: Analysis of Recent Measured Data for Monitors Significantly Impacted by Connecticut Emissions in 2012

DEEP next examined recent measured ozone levels for each of the 32 monitors identified by CSAPR modeling as being significantly impacted by Connecticut emissions for the 2008 NAAQS and found that preliminary 2014 design values for all 32 CT-impacted monitors are compliant with the 2008 ozone NAAQS. Table 2 summarizes preliminary 2014 ozone design values¹⁰ for each CT-impacted monitor. Table 2 also lists the calculated minimum 4th-high ozone value that would need to occur in 2015 for each monitor to violate the standard based on 2015 design values. The most recent year¹¹ that such a 4th-high value actually occurred is also noted for each monitor. Similarly, the table provides the critical sum of 4th-high values in 2015 and 2016 that would need to occur (or be surpassed) for the 2016 design value to violate the standard. The last column of Table 2 notes the most recent consecutive years for which the critical summed value actually occurred.

To illustrate how to interpret Table 2, note that the Dukes County MA (Martha's Vineyard) monitor has a compliant 2014 design value of 68 ppb. Dukes County is designated as nonattainment (see Table 1) for the 2008 NAAQS, despite measuring compliant design values for both 2013 and 2014. That monitor would need to record a 4th-high value of 104 ppb or greater in 2015 to result in a 2015 design value that violates the 2008 NAAQS. The monitor has not recorded such a 4th-high value since sometime prior to 2007 (if at all), indicating a strong likelihood that current measured attainment levels will continue through 2015. In addition, for 2016, the Dukes County monitor would need the sum of the 2014 and 2015 4th-high values to be 169 ppb or higher to produce a violating 2016 design value. Such a summed value hasn't happened over a consecutive two-year period since prior to 2007, providing added confidence that year-to-year meteorological differences are not likely to result in future violations at that monitor. Based on this information, DEEP concludes that it is highly likely that the Duke County monitor will continue to maintain compliance with the 2008 NAAQS through at least 2016 and likely beyond¹²; therefore, Connecticut complies with CAA §110(a)(2)(D)(i)(I) requirements in the Dukes County area.

Similarly, Table 2 shows that preliminary 2014 design values at all of the other 31 CT-impacted monitors are compliant with the 2008 ozone NAAQS of 75 ppb. Of the 24 monitors (including the Dukes County MA, discussed above) that are located outside the NY/NJ/CT nonattainment area, none have measured 4th-high values since at least 2008 that, if repeated, would result in violating design values in 2015 and/or 2016. When current design values are considered together with historical data, DEEP concludes there is a high probability that those 24 monitors will maintain compliance with the 2008 NAAQS through at least 2016.

¹⁰ States are required to officially certify 2014 data as complete and quality assured by May 1, 2015. The 2012 and 2013 data that are also part of the 2014 design value calculation have previously been certified by each state. DEEP used a data set maintained by Maine DEP to identify preliminary 2014 design values.

¹¹ DEEP examined data from 2007 through 2014, all contained in the Maine DEP data set.

¹² See the discussion below examining EPA's recent transport modeling for 2018 (released in January 2015), as well as DEEP's projected downward trends in NOx emissions through 2025.

Table 2
Compliance Status of Monitors Identified by EPA CSAPR Modeling
as Significantly Impacted by Connecticut Emissions^{1,2,3}

State	County & Location of Monitor	Prelim 2014 Design Value (ppb)	2015 4th-High That Would Cause 2015 Violation (ppb)	Most Recent Year with 4th-High \geq 2015 Critical Value	Sum of 2015 & 2016 4 th -Highs That Would Cause 2016 Violation (ppb)	Most Recent Consecutive Years with Sum \geq 2016 Critical Value
DE	Sussex (Lewes)	74	89	pre-2007	161	pre-2007
ME	Cumberland (Cape Elizabeth)	68	90	pre-2007	162	pre-2007
	Hancock (Bar Harbor-Cadillac Mt)	66	95	pre-2007	163	pre-2007
	Hancock (Bar Harbor-McFarland Hill)	63	97	pre-2007	166	pre-2007
	Knox (Port Clyde-Marshall Pt)	66	90	pre-2007	166	pre-2007
	York (Kennebunkport)	73	86	pre-2007	162	pre-2007
MA	Barnstable (Truro)	69	98	pre-2007	169	pre-2007
	Dukes (Martha's Vineyard)	68	104	pre-2007	169	pre-2007
	Essex (Lynn)	69	92	pre-2007	165	2007-2008
	Essex (Newbury)	69	93	pre-2007	164	pre-2007
	Essex (Haverhill)	68	96	pre-2007	164	pre-2007
	Hampden (Chicopee)	70	91	2007	162	2007-2008
	Hampshire (Amherst)	59	117	pre-2007	176	pre-2007
	Hampshire (Ware)	71	91	pre-2007	160	2007-2008
	Norfolk (E Milton-Blue Hill)	70	90	pre-2007	161	2007-2008
	Suffolk (Boston-Long Island)	66	97	pre-2007	168	pre-2007
	Suffolk (Boston-Roxbury)	58	115	pre-2007	174	pre-2007
NH	Hillsborough (Peterborough)	70	91	pre-2007	158	pre-2007
	Rockingham (Portsmouth-Pierce Isle)	68	94	pre-2007	160	pre-2007
	Rockingham (Rye-Ordiorne State Park)	68	89	pre-2007	158	2007-2008

Table 2 (continued)
Compliance Status of Monitors Identified by EPA CSAPR Modeling
as Significantly Impacted by Connecticut Emissions^{1,2,3}

State	County & Location of Monitor	Prelim 2014 Design Value (ppb)	2015 4th-High That Would Cause 2015 Violation (ppb)	Most Recent Year with 4th-High \geq 2015 Critical Value	Sum of 2015 & 2016 4th-Highs That Would Cause 2016 Violation (ppb)	Most Recent Consecutive Years with Sum \geq 2016 Critical Value
NJ	Atlantic (Brigantine)	69	97	pre-2007	167	pre-2007
	Monmouth (Monmouth Univ)	72	93	pre-2007	164	2011-2012
	Passaic (Ramapo)	70	91	pre-2007	160	2007-2008
NY	Dutchess (Millbrook)	69	95	pre-2007	160	pre-2007
	Putnam (Mt Ninham)	67	95	pre-2007	162	2007-2008
	Richmond (NYC-Susan Wagner HS)	73	85	2011	156	2011-2012
	Suffolk (Riverhead)	75	86	pre-2007	164	2007-2008
	Suffolk (Holtsville)	71	92	pre-2007	166	2007-2008
	Westchester (White Plains)	75	82	2008	154	2011-2012
RI	Kent (W Greenwich)	70	88	2007	161	2007-2008
	Providence (E Providence)	72	89	pre-2007	165	2007-2008
	Washington (Narragansett)	74	86	pre-2007	165	pre-2007

¹ Monitors listed are those identified by EPA’s CSAPR modeling results as incurring impacts from CT emissions amounting to at least 1% of the 2008 ozone NAAQS of 75 ppb. Six such monitors (4 in ME, 2 in MA) are no longer in operation and are not considered here. EPA’s CSAPR modeling indicates that CT impacts at all other non-CT monitors are insignificant.

² Monitors that are shaded in the table are located in the NY/NJ/CT nonattainment area.

³ All monitors significantly impacted by Connecticut emissions have 2014 design values that comply with the 2008 NAAQS. As shown in the last four columns of Table 2, all monitors located outside the NY/NJ/CT nonattainment area are likely to maintain compliance status through at least 2016, based on the recent history of 4th-high values compared to the calculated 4th-high values in 2015 and 2016 that would need to occur to cause a violation. When considered along with projected future emission reductions (see Section 5), DEEP concludes there is a high probability that maintenance of the 2008 NAAQS will continue beyond 2016 at these sites outside the NY/NJ/CT area. Although there are 3 monitors in NJ and NY that have recently (i.e., 2011/2012) measured 4th-highs that, if repeated, would cause them to fall back into violation in 2015 and/or 2016, they are located in the NY/NJ/CT nonattainment area. Therefore, Connecticut is obligated by the CAA to work with NY and NJ to achieve and maintain attainment with the NAAQS throughout the area.

There are a total of 8 monitors in the New York and New Jersey portions of the NY/NJ/CT area (shaded in Table 2) that were identified by EPA's CSAPR modeling as being significantly impacted by Connecticut emissions in 2012. All have preliminary measured 2014 design values that comply with the 2008 NAAQS. In addition, 5 of the monitors have not measured any 4th-high values since at least 2008 that, if repeated, would result in violations in 2015 and /or 2016. The remaining 3 monitors (i.e., Richmond County NY, Westchester County NY, and Monmouth County NJ) also currently comply with the 2008 NAAQS, but have measured 4th-high values as recently as 2011/2012 that, if repeated, would cause them to violate the 2008 NAAQS in 2015 and/or 2016. Note that all 3 of these higher risk monitors are located in the multi-state NY/NJ/CT nonattainment area.

Conclusion:

Based on the information presented above, DEEP concludes that Connecticut is currently meeting CAA §110(a)(2)(D)(i)(I) requirements based on 2014 design values and is likely to continue meeting those requirements through at least 2016. Although historical data indicate there is some risk that three monitors in New York and New Jersey could fall out of compliance in 2015/2016, the CAA requires Connecticut to work with the other two states to achieve and maintain compliance at all monitors in the multi-state NY/NJ/CT area, which includes the at-risk monitors.

Methodology Step 4: Analysis of EPA's Most Recent Transport Modeling for 2018

In January 2015, EPA released preliminary ozone modeling results¹³ for 2018 calculated based on emission reductions anticipated from previously adopted state and federal control programs. EPA's modeling identifies monitors throughout the country that are projected to have nonattainment or maintenance concerns in 2018 for the 2008 NAAQS. In addition, EPA's modeling results identify states whose emissions significantly contribute (i.e., at least 1% of the 2008 NAAQS) to the set of monitors with nonattainment/maintenance concerns in 2018.

For the eastern half of the country, EPA's modeling projects that 10 monitors in 8 states outside of Connecticut (i.e., KY, MD, MI, MO, NJ, NY, PA, WI) will have nonattainment and/or maintenance issues in 2018. Table 3 summarizes those results, showing the modeled 2018 ozone levels, as well as EPA's estimate of Connecticut's contribution at each monitor. Emissions from Connecticut are projected to have a maximum impact in 2018 of 0.41 ppb at the monitor in Suffolk County NY, with impacts at all other monitors of concern being 0.08 ppb or less. Connecticut impacts at the monitors of concern are all well below the 1% significant impact threshold of 0.75 ppb for the 2008 NAAQS. Since Connecticut's impacts are insignificant at all out-of-state monitors with modeled nonattainment/maintenance issues in 2018, DEEP concludes that Connecticut will continue to meet the CAA §110(a)(2)(D)(i)(I) good neighbor provisions through at least 2018.

¹³ EPA has posted a memorandum, technical support document, and related data files documenting the January 2015 preliminary modeling at: <http://www.epa.gov/airtransport/ozonetransportNAAQS.html>.

Table 3
Connecticut Contributions to Monitors Projected by EPA Modeling
to Have 2018 Nonattainment or Maintenance Issues

State	County	Projected 2018 Nonattainment Level¹ (ppb)	Projected 2018 Maintenance Level¹ (ppb)	Connecticut Contribution² (ppb)
Kentucky	Jefferson	73.7	76.4	0.00
Maryland	Harford	79.4	82.1	0.01
Michigan	Allegan	74.5	77.5	0.00
Missouri	Saint Charles	74.1	77.4	0.00
New Jersey	Camden	72.3	76.0	0.01
New Jersey	Gloucester	74.0	76.3	0.08
New York	Richmond	74.6	76.2	0.07
New York	Suffolk	78.2	79.8	0.41
Pennsylvania	Philadelphia	74.7	78.0	0.03
Wisconsin	Sheboygan	75.4	77.8	0.00

- 1) EPA has posted a memorandum, technical support document, and related data files documenting the January 2015 preliminary modeling at: <http://www.epa.gov/airtransport/ozonetransportNAAQS.html>. Note that the “Projected 2018 Nonattainment Level” in the table corresponds to EPA’s results for “average design values” and the “Projected 2018 Maintenance Level” in the table corresponds to EPA’s results for “maximum design values”.
- 2) EPA’s modeling result indicate Connecticut’s contributions at all these key locations are much less than the 1% significant impact threshold (i.e., 0.75 ppb for the 2008 NAAQS).

Methodology Step 5: Connecticut Emission Trends

Connecticut has implemented numerous regulations to reduce the emissions of both nitrogen oxides (NO_x) and volatile organic compounds (VOCs), the primary precursors to the formation of ground level ozone. Reasonably available control technology (RACT) has been required for major sources of NO_x in Connecticut since 1996, with multiple updates since, as well as a current effort to implement more stringent RACT for the 2008 ozone NAAQS. In cooperation with the other states of the Ozone Transport Commission (OTC), Connecticut co-initiated the first NO_x budget trading program for electricity generating units (EGUs) and other large point sources of NO_x in 1999. While many states outside of the ozone transport region (OTR) have since implemented EGU controls to meet CAA Title IV, NO_x Budget, CAIR¹⁴ and/or CSAPR requirements, many have not been required to implement RACT for all major NO_x sources. In addition, several nonattainment areas have been granted NO_x waivers under CAA section 182(f), avoiding otherwise required controls and negatively impacting downwind areas. This has resulted in significantly higher emissions and emission rates in most upwind states, as shown in Figures 2 and 3. By comparison, Connecticut's ozone season emissions and emission rates from EGUs and other large NO_x sources are among the very lowest of any state in the eastern US. Less stringent requirements in many upwind states, several of which have been identified by EPA as significantly contributing to Connecticut's ozone problem, continue to unnecessarily subject the people of Connecticut to unhealthy levels of air pollution while at the same time burdening Connecticut's economy by requiring in-state emission controls that are insufficient, by themselves, to attain the ozone NAAQS.

In addition to regulatory programs designed to achieve emission reductions from large point sources, Connecticut has implemented and regularly updates regulations to stay current with the strict California low emission vehicle program, establishing the most stringent new motor vehicle control program allowed, as stipulated by CAA section 177. Connecticut's long-standing statewide vehicle emission inspection and maintenance program ensures vehicles emission control systems remain effective as they age. Connecticut has also implemented various state and federal incentive programs for diesel vehicle retrofits and replacements, as well as incentives to establish a network of charging stations to encourage the growth of electric vehicle use in the state. In addition, Connecticut has long been a leader in funding and implementing a wide variety of energy efficiency strategies and recently finalized a Comprehensive Energy Strategy¹⁵ in 2013 that is designed to create a path toward a cheaper, cleaner, and more reliable energy future for the state. This effort has served to maintain emission reductions achieved on high electric demand days and reduces the need for older, smaller and relatively dirtier emission units to operate on days when air quality is already compromised by overwhelming interstate transport. Connecticut has also kept current with VOC RACT, including implementing rules consistent with all of EPA's control techniques guideline (CTG) requirements.

¹⁴ Recent analyses by the State of Maryland and other states indicate that EGUs in several states do not always operate installed NO_x controls at optimal levels, including during high ozone events. Although such practices are allowed under the seasonal budgets of the CAIR and CSAPR programs, the excess emissions contribute to downwind ozone violations. DEEP encourages EPA to require that upwind states' good neighbor SIPs include, among all other necessary actions, enforceable measures to ensure optimized operation of installed controls.

¹⁵ Connecticut's Comprehensive Energy Strategy is available at: <http://www.ct.gov/deep/cwp/view.asp?a=4120&q=500752>

Figure 2: 2007 and 2013 Ozone Season NOx Emissions from CAMD Sources

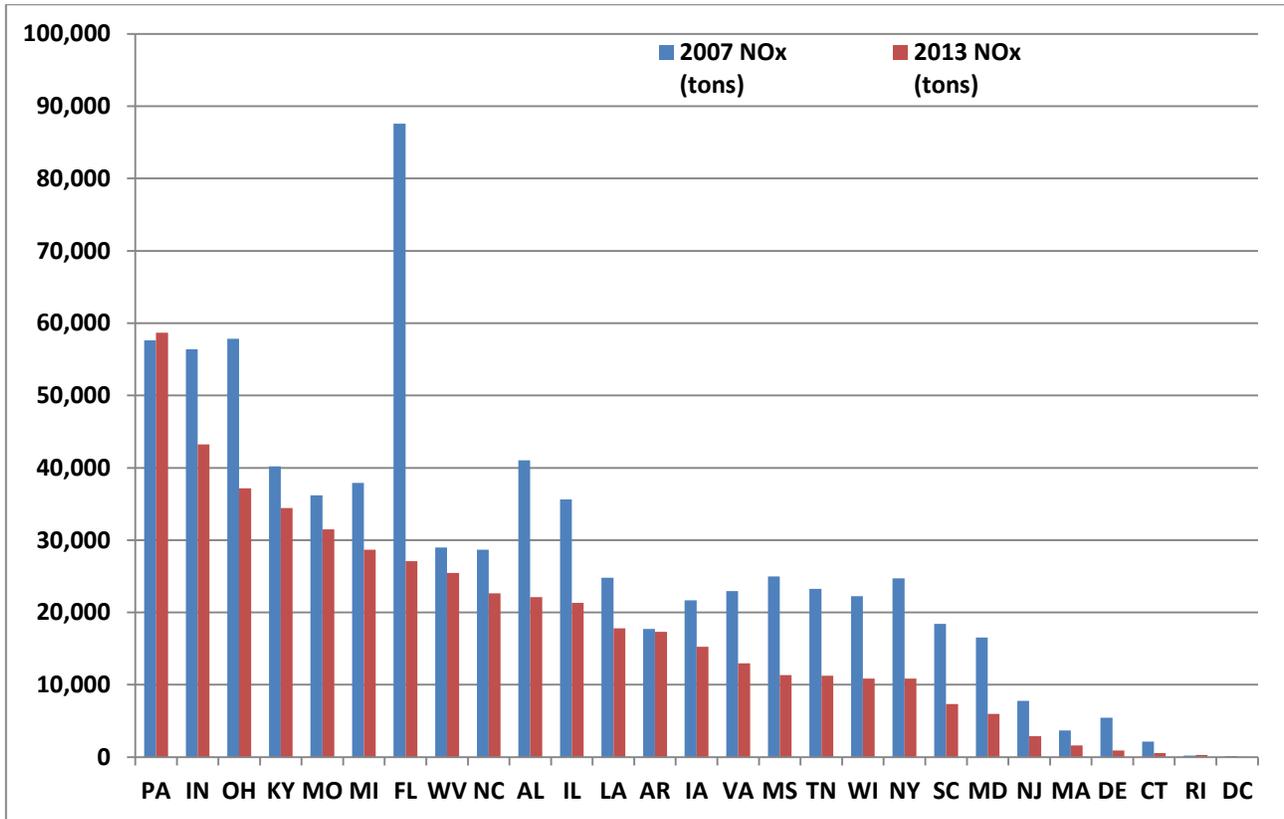
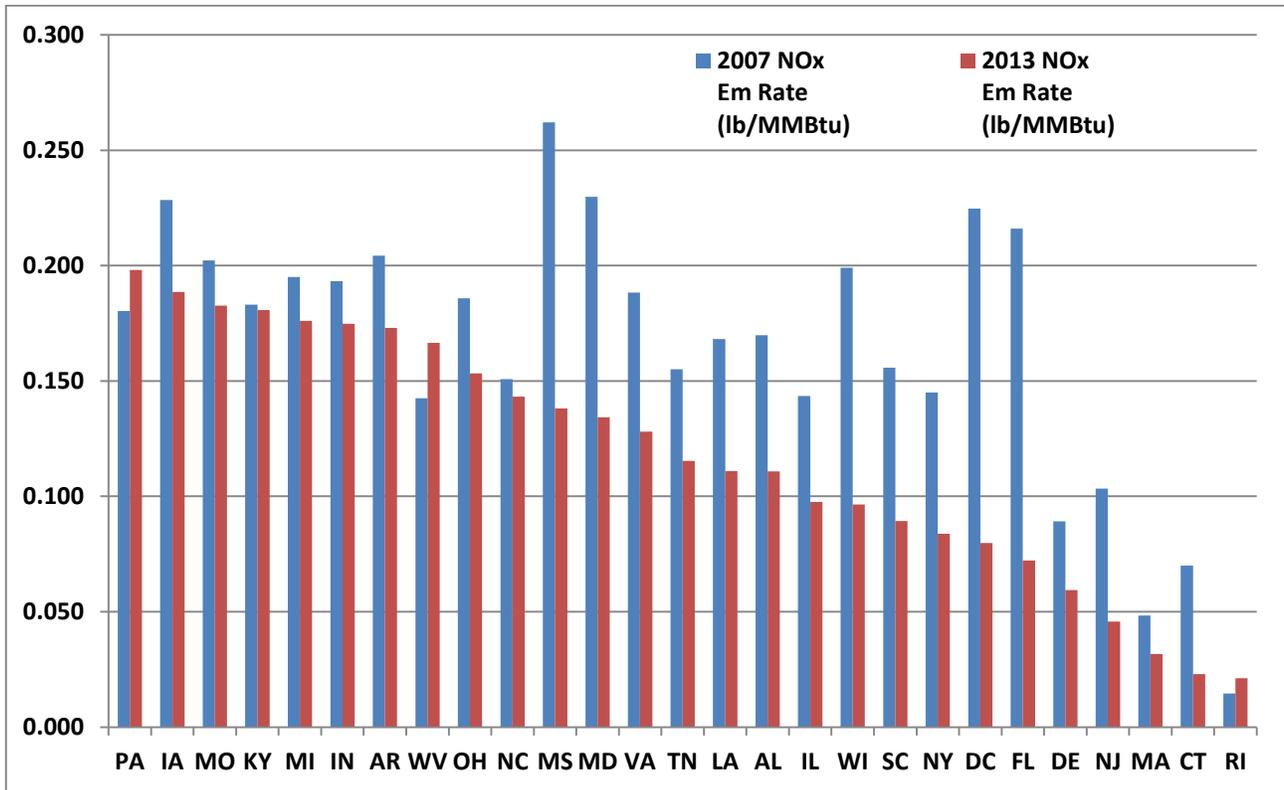
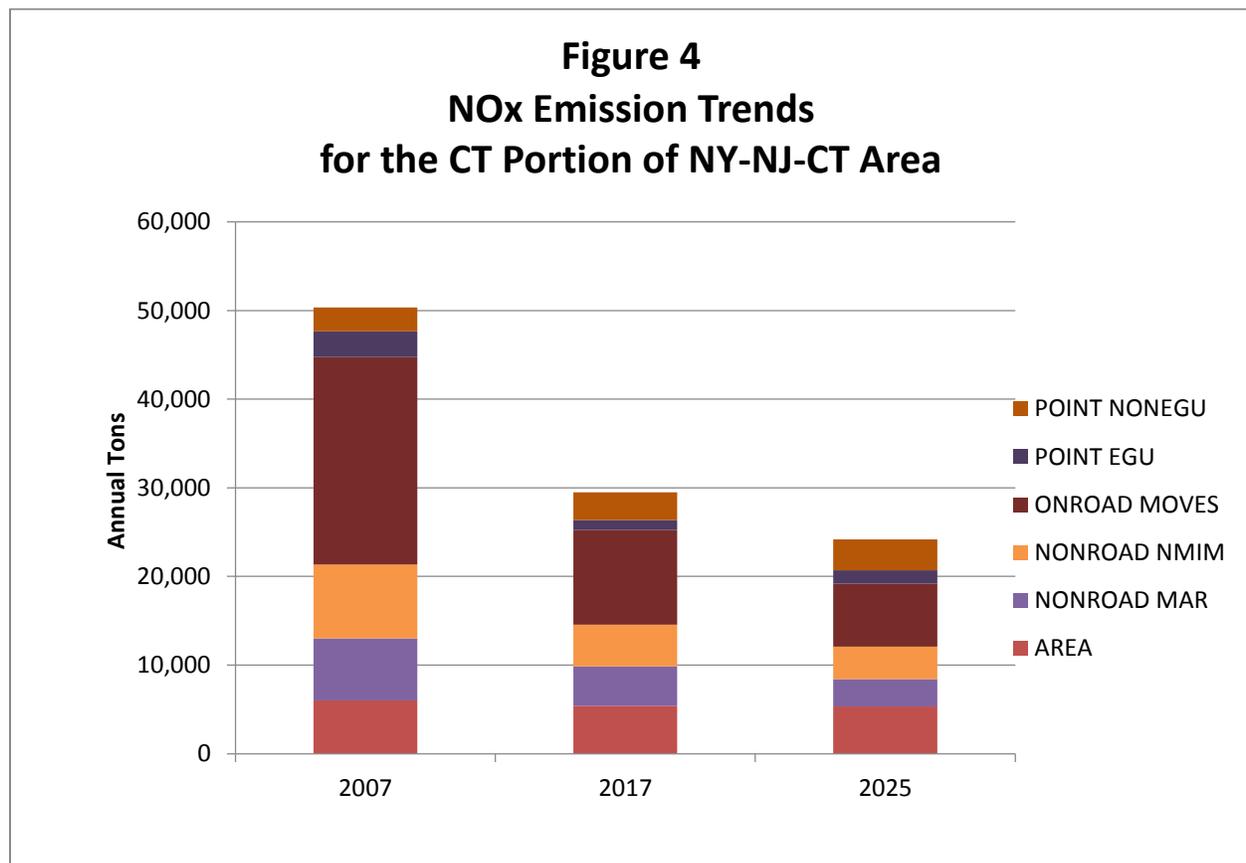


Figure 3: 2007 and 2013 Ozone Season NOx Emission Rates from CAMD Sources



Source: [EPA Clean Air Markets Division \(CAMD\) Air Markets Program Data](#)

Together with federal measures for non-road and onroad fuels, vehicles and engines, Connecticut’s control programs have been responsible for a steady decline in ozone precursor emissions for over two decades. Figure 4 shows recent trends in Connecticut’s NOx emissions since 2007, with projections out to 2025, including adopted control programs, as prepared for Connecticut’s recent PM_{2.5} Maintenance SIP¹⁶. Overall, total NOx emissions are projected to decline by 52% between 2007 and 2025, including an 18% decline between 2017 and 2025. Additional NOx emission reductions are expected in the post 2017 period because Figure 4 does not include programs such Connecticut’s most recent revisions to the low emission vehicle (LEV) regulations, EPA’s Tier 3 vehicle and fuel standards or Connecticut planned updates to its NOx RACT regulations.¹⁷



Note: Emission trends were prepared by DEEP for Connecticut’s Redesignation and Maintenance SIP for the PM_{2.5} NAAQS, which was approved by EPA in September 2013. Emission trends for all of Connecticut are similar to those depicted here for the Connecticut portion of the NY/NJ/CT PM_{2.5} area.

¹⁶ Connecticut’s Redesignation Request and Maintenance Plan for the 1997 and 2006 PM_{2.5} NAAQS is available at: http://www.ct.gov/deep/cwp/view.asp?a=2684&Q=506534&deepNav_GID=1619. The plan was approved by EPA on 9/24/2013. Note that Figure 4 provides emission trends for the Connecticut portion of the NY/NJ/CT PM_{2.5} maintenance area. Emission trends for the entire state of Connecticut are similar to those presented.

¹⁷ DEEP submitted Connecticut’s 2008 RACT SIP to EPA on July 17, 2014. For details, see: http://www.ct.gov/deep/cwp/view.asp?a=2684&q=546804&deepNav_GID=1619

The projected future decline in Connecticut's emissions adds to the weight of evidence presented earlier that Connecticut has met, and will continue to meet, the "good neighbor" provisions of CAA §110(a)(2)(D)(i)(I) through 2018 and beyond for the 2008 ozone NAAQS. In addition, Connecticut is required by the CAA to work with New York and New Jersey to achieve and maintain attainment with the NAAQS throughout the NY/NJ/CT area, addressing any remaining uncertainty regarding nonattainment/maintenance issues for monitors in the shared nonattainment area.

Summary and Conclusions

This SIP revision addresses Connecticut's "good neighbor" obligations under CAA §110(a)(2)(D)(i)(I), evaluating whether emissions from sources in Connecticut contribute significantly to nonattainment in, or interfere with maintenance by, any other state with respect to the 2008 ozone NAAQS. DEEP's analyses included a review of:

- Recent and historical ozone monitoring data;
- Results from two rounds of transport modeling conducted by EPA for the CSAPR program (1997 ozone NAAQS) and a potential future federal backstop program (2008 ozone NAAQS); and
- DEEP projections of expected emission trends in Connecticut through 2025.

As described earlier, DEEP's analyses resulted in the following findings:

- All 32 out-of-state monitors identified by EPA's CSAPR modeling (for 2012) as being significantly impacted by Connecticut emissions are currently measuring attainment with the 2008 NAAQS, based on 2014 preliminary data.
- An examination of recent and historical measured ozone data indicates that 29 of the 32 monitors are very likely to maintain compliance with the 2008 NAAQS through 2016. The other 3 monitors, which meet the NAAQS in 2014 but have some risk of non-compliance in 2015 and/or 2016, are all located in the multi-state NY/NJ/CT nonattainment area. The CAA requires Connecticut to work with the other two states to achieve and maintain compliance at all monitors in the multi-state area, which includes the at-risk monitors.
- Results from EPA's preliminary transport modeling for 2018 show that ozone contributions from Connecticut emissions are expected to be below the significant impacts level at all out-of-state monitors identified as having either nonattainment or maintenance concerns in 2018.
- DEEP projections show that emissions from Connecticut sources continue to decline, with a 40% reduction in NO_x emissions expected between 2007 and 2017, with more than an 18% additional reduction projected in the 2017-2025 timeframe. These emission declines will further reduce Connecticut's impacts on downwind areas and assist with long-term maintenance of the 2008 NAAQS in those areas.

Based on the analyses described in this SIP revision, DEEP concludes that Connecticut complies, and will remain in compliance with the good neighbor provisions of CAA §110(a)(2)(D)(i)(I) for the 2008 ozone NAAQS.