Connecticut Department of
ENERGY &
ENVIRONMENTAL
PROTECTION

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EXHIBIT C

Connecticut Department of Energy and Environmental Protection
Bureau of Air Management

Reasonably Available Control Technology Analysis under the 2008 8-Hour Ozone National Ambient Air Quality Standard

July 17, 2014

The Connecticut Department of Energy and Environmental Protection (DEEP) has prepared this Reasonably Available Control Technology (RACT) analysis to demonstrate that the State has met its obligation under the Clean Air Act, as amended in 1990 (CAA), for planning related to the 2008 8-hour ozone national ambient air quality standard (NAAQS). Most recently, the U.S. Environmental Protection Agency's (EPA's) proposed rule ***Implementation of the 2008 National Ambient Air Quality Standards for Ozone: State Implementation Plan Requirements*** (78 FR 34178 (2013)) (draft Implementation Rule) set out the requirements for RACT State Implementation Plans (SIPs). DEEP used the draft Implementation Rule, as well as earlier EPA guidance concerning RACT, as guides to make the determinations necessary to prepare this analysis.

I. Overview

On July 20, 2012, Connecticut's designation as marginal nonattainment for the 2008 8-hour ozone NAAQS became effective. Under CAA Section 182(a)(2)(A), the marginal nonattainment designation obligates the DEEP to correct pre-1990 RACT requirements (the RACT fix-up).[1] RACT is defined as "the lowest emission limitation that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility." (44 FR 53762 (1979))

However, Connecticut is a member of the Ozone Transport Region (OTR) and is required under CAA Section 184(b)(1)(B) to implement statewide RACT for all volatile organic compound (VOC) sources covered by a control techniques guideline (CTG). CAA Section 184(b)(2) adds that any stationary source that has the potential to emit at least 50 tons per year of VOC is considered a major stationary source and is subject to the requirements that would apply to a major stationary source in a moderate nonattainment area.[2] Under CAA Section 182(f), states must apply the same requirements to major stationary sources of nitrogen oxides (NOx) as are applied to major stationary sources of VOC in ozone nonattainment areas. As a result, DEEP is required to adopt RACT for (1) all VOC sources covered by a CTG; and (2) all major non-CTG sources of NOx and VOC.

Pursuant to the draft Implementation Rule (78 FR 34194; 6 June 2013), DEEP must submit a final RACT SIP to EPA by July 20, 2014. As a marginal nonattainment area, Connecticut is required to attain the 2008 ozone NAAQS by December 31, 2015. New requirements necessary to update RACT in Connecticut must be effective in the state by January 1, 2017 pursuant to the draft Implementation Rule.

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[1] Marginal nonattainment states are not required to submit attainment demonstrations.

[2] Section 302(j) of the CAA defines "major stationary source" as any stationary facility or source of air pollutants which directly emits, or has the potential to emit, one hundred tons per year or more of any air pollutant.

II. RACT implementation history in Connecticut

A. 1-hour ozone NAAQS

The 1990 CAA Amendments established nonattainment areas and attainment deadlines based on the severity of violations of the 1-hour ozone NAAQS (0.12 ppm averaged over one hour). The southwest portion of Connecticut,[3] as part of the New York-Northern New Jersey-Long Island area, was designated as severe nonattainment with a 2007 attainment date. The remainder of the state, the Greater Connecticut nonattainment area, was designated as serious nonattainment with a 1999 attainment date. An extension of the attainment date to 2007 for Greater Connecticut was approved by EPA on January 3, 2001 (66 FR 634).

DEEP submitted ozone attainment demonstrations for the Greater Connecticut serious nonattainment area and the Southwest Connecticut severe nonattainment area to EPA on September 16, 1998. These submissions were modified by submittals on February 8, 2000; October 15, 2001; June 17, 2003 and December 1, 2004. EPA issued the final approval of the 1-hour ozone NAAQS attainment demonstration for Greater Connecticut on January 3, 2001 (66 FR 634). On December 11, 2001, EPA published final approval of the 1-hour ozone NAAQS attainment demonstration for Southwest Connecticut (66 FR 63921).

In its attainment demonstrations, DEEP relied on photochemical grid modeling, air quality trends and other corroborating weight of evidence to demonstrate that adopted and mandated control programs within Connecticut and upwind areas were sufficient to enable all areas of the State to achieve attainment of the 1-hour ozone NAAQS by 2007. In response to comments received on the serious ozone nonattainment area attainment demonstration, EPA determined that the Greater Connecticut attainment demonstration did not include sufficient documentation concerning available Reasonably Available Control Measures (RACM)[4], and developed an analysis to help address this issue (65 FR 61134 (2000)). The analysis demonstrated that the possible emission control measures would not advance the attainment date and would therefore not be considered RACM. As RACT is a subset of RACM (*see* CAA Section 172(c)(1)), DEEP considered RACT satisfied for Greater Connecticut.

As part of a 1999 conditional approval of DEEP's ozone attainment demonstration for Southwest Connecticut, EPA required that DEEP, among other things, submit a mid-course review of attainment progress. In its 2005 mid-course review, DEEP submitted the control strategies implemented statewide in Connecticut to meet the 1-hour ozone NAAQS. These control strategies are listed in **Table 1**. EPA also required DEEP to submit measures achieving additional emission reductions identified by EPA as necessary for attainment by 2007, which are referred to as shortfall measures.

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[3] Includes the towns of Bethel, Bridgeport, Bridgewater, Brookfield, Danbury, Darien, Easton, Fairfield, Greenwich, Monroe, New Canaan, New Fairfield, New Milford, Newtown, Norwalk, Redding, Ridgefield, Sherman, Stamford, Stratford, Trumbull, Weston, Westport and Wilton.

[4] Required by subpart 1 of part D of the CAA for states submitting attainment demonstrations.

Table 1. Control Strategies Implemented Statewide in Connecticut to Meet the 1-Hour Ozone NAAQS[1]

Control Strategy	Pollutant		Federal Program	State Program	Rule Approval Date[2]	Initial Year of Implementation[3]
	VOC	NOx				
Stationary Sources[4]						
Consumer Products	•		•		09/11/98	1999
Architectural & Industrial Maintenance Coatings	•		•		09/11/98	2000
Autobody Refinishing VOC Limits	•		•		09/11/98	1999
Stage I Vapor Recovery at Gasoline Service Stations	•			•	10/18/91	1992
Stage II Vapor Recovery at Gasoline Service Stations	•			•	12/17/93	1994
VOC RACT	•			•	03/21/84	1984
Cutback Asphalt: Increased Rule Effectiveness	•			•	10/24/97	1998
Gasoline Loading Racks: Increased Rule Effectiveness	•			•	10/24/97	1998
CT NOx "RACT" Regulation		•		•	10/06/97	1994
OTC Phase II NOx Controls		•		•	09/28/99	1999
NOx Budget Program (EPA NOx SIP Call)		•		•	12/27/00	2003
Municipal Waste Combustor Controls		•		•	04/21/00; 12/06/01[5]	2000, 2003
Mobile Sources						
Enhanced I/M (ASM 2525 phase-in cutpoints)	•	•		•	03/10/99	2000
Enhanced I/M (ASM 2525 final cutpoints)	•	•		•	10/27/00	2004
OBD-II Enhanced I/M	•	•		•	[6]	2004
Reformulated Gasoline - Phase I[4]	•	•	•		12/23/91[7]	1995
Reformulated Gasoline - Phase II[4]	•	•	•		02/16/94[7]	2000
Tier 1 Motor Vehicle Controls	•	•	•		06/05/91	1994
On-board Refueling Vapor Recovery	•		•		04/06/94	1997-2005
National Low Emission Vehicle Program	•	•	•		03/02/98[8]	1998 (in CT)
Tier 2 Motor Vehicle Controls/Low Sulfur Gasoline	•	•	•		2/10/00	2004-2008
California Low Emission Vehicle Phase 2 (CALEV2)	•	•	•	•	[9]	2007
Heavy-Duty Diesel Vehicle Controls and Fuels	•	•	•		10/06/00	2004-2005
Non-Road Engine Standards[10]	•	•	•		1994-2000[11]	1996-2008

Footnotes to Table 1

1 Footnotes 2 through 9 are as they appeared in the Mid-Course Review in 2005.

2 Unless otherwise noted, this is the date of Federal Register publication of either a final federal rule or EPA's approval of a state SIP submittal, as appropriate for the indicated control strategy.

3 A range of implementation years is listed for some strategies due to phase-in of standards. In addition, all listed mobile source strategies (except enhanced I/M and reformulated gasoline) result in increased levels of emission reductions through and beyond 2007 due to the gradual turnover of the affected fleets.

4 Reformulated gasoline requirements also result in a reduction in evaporative VOC emissions throughout the gasoline distribution system.

5 These are the approval dates of municipal waste combustor state plan submissions as published in the Federal Register. The associated reductions were approved for attainment purposes on 12/1/01.

6 Amendment to incorporate OBD-II adopted 08/25/04. Not submitted to EPA as of the date of this submission.

7 Promulgated statewide under 40 CFR 80.70. Approved for 15% rate-of-progress on 03/10/99.

8 EPA Administrator Browner determined that the NLEV program was in place on 03/02/98. As a result, rules published on 06/06/97 and 01/07/98 went into effect.

9 Regulation adopted 12/03/04.

10 The initial implementation date for non-road vehicle standards varies by category (e.g., small gasoline engines, locomotives, construction equipment, etc). Does not include EPA's June 29, 2004 final Tier 4 rule requiring additional reductions from new non-road engines beginning in 2008.

11 Federal rule approval dates for on-road engine standards vary by category.

The 1-hour ozone NAAQS shortfall measures were identified as the following in the mid-course review:

- NOx reductions at municipal waste combustor facilities (adopted on October 26, 2000);
- VOC restrictions for automotive refinishing operations (adopted on March 15, 2002);
- Stage II vapor recovery at gasoline pumps (adopted on May 10, 2004); and
- Spillage and permeation controls on portable fuel containers (adopted on May 10, 2004).

The submission of the mid-course review satisfied the final outstanding commitment contained in EPA's attainment demonstration approval, and therefore RACT was satisfied for the Southwest Connecticut nonattainment area, although RACT was never explicitly addressed as such by EPA.[5]

B. 1997 8-hour ozone NAAQS

Under the 1997 8-hour ozone NAAQS (0.08 ppm averaged over eight hours), the entire state was designated as moderate nonattainment[6] with a June 2010 attainment date. EPA revoked the 1-hour ozone NAAQS effective June 15, 2005. However, under anti-backsliding provisions, Connecticut retained the more stringent major source thresholds (25 tpy in the severe nonattainment area and 50 tpy in the serious nonattainment area)[7] in implementing its current programs.[8] Such sources remain subject to the more stringent major source thresholds such as requirements imposed under new source review permitting and regulatory RACT controls. This practice is consistent with EPA's guidance.[9]

EPA approved the 1997 8-hour ozone attainment demonstration for Greater Connecticut on December 26, 2013 (78 FR 78272), after DEEP withdrew the Industrial, Commercial and Institutional (ICI) boiler NOx control strategy from the attainment demonstration on April 2, 2013. EPA proposed but has not finalized approval of the attainment demonstration for Southwest Connecticut. (78 FR 27161; May 9, 2013) However, EPA published a Clean Data Determination (CDD) on June 18, 2012 (77 FR 36163) indicating that, with respect to the NY-NJ-CT 1997 eight-hour ozone nonattainment area, the area attained the 1997 eight-hour ozone standard by the applicable deadline, June 15, 2010, based on complete, quality-assured and certified ozone monitoring data for 2007-2009. EPA also determined at that time that the area was currently attaining the 1997 eight-hour ozone standard based on complete, quality-assured and certified ozone monitoring data for both 2008-2010 and 2009-2011.

On April 7th and 24th , 2014, the EPA Region 2 and Region 1 Administrators, respectively, signed a notice proposing to determine that the air quality in the New York-New Jersey-Connecticut 1997 8-hour ozone nonattainment area is no longer attaining the 1997 ozone NAAQS based on complete, quality-assured and certified ozone monitoring data for 2010-2012 and preliminary data for 2011-2013. On May 17, 2014, EPA further proposed to rescind the CDD and issue a SIP call to New York, New Jersey and Connecticut to submit a new attainment demonstration to show how the area will re-attain the 1997 8-hour ozone NAAQS as expeditiously as practicable (79 FR 27830).

For the purposes of the 1997 8-hour ozone RACT analysis, submitted to EPA on December 8, 2006, DEEP addressed only those major sources as required under CAA Section 184, that is, 50 tpy VOC and 100 tpy NOx. In its RACT analysis, DEEP determined that Connecticut had no deficiencies under the RACT fix-up to correct. DEEP determined that the majority of CTG categories were addressed through Regulations of Connecticut State

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[5] EPA approved the regulations addressing the attainment shortfall measures on December 6, 2001 (66 FR 63311) (municipal waste combustors) and August 31, 2006 (71 FR 51761) (automotive refinishing operations, Stage II vapor recovery and portable fuel containers).

[6] As for the 1-hour ozone NAAQS, the state was divided into two nonattainment areas. The southwest Connecticut counties of Fairfield, New Haven and Middlesex were included with counties in northern New Jersey and southern New York as part of the NY-NJ-CT nonattainment area. The remaining five counties in Connecticut were included in the Greater Connecticut nonattainment area.

[7] Section 182(c), (d) and (f) of the CAA.

[8] The terms "serious nonattainment area for ozone" and "severe nonattainment area for ozone" are defined in RCSA section 22a-174-1 and continue to be used in a number of regulations, notably Connecticut's new source review program requirements (RCSA section 22a-174-3a).

[9] *See, e.g.*, the draft Implementation Rule, 78 FR 34192, footnote 36.

Agencies (RCSA) sections 22a-174-20, 22a-174-30 and 22a-174-32. DEEP further determined that two CTG categories, cutback asphalt paving and solvent cleaning (metal degreasing) were appropriate to update. DEEP also committed to analyze the need to adopt requirements to address EPA's 2006 CTGs for Lithographic Printing Materials, Letterpress Printing Materials, Flexible Packaging Printing Materials, Flat Wood Paneling Coatings, and Industrial Cleaning Solvents. DEEP reaffirmed its existing negative declarations for certain CTG sources.

Regarding major NOx sources, DEEP indicated that it was preparing an amendment to RCSA section 22a-174-38 to make certain necessary changes based on the federal requirements for municipal waste combustors, but that Connecticut's emission limits at that time represented RACT for the municipal waste combustors. At the time of the RACT SIP, DEEP had proposed revisions to RCSA section 22a-174-22 to include more stringent emissions and control requirements such that all major NOx sources would meet or exceed RACT.[10] The requirements of the proposed revisions to RCSA section 22a-174-22 were characterized as "beyond RACT" in the 1997 8-hour ozone RACT SIP analysis.

EPA approved DEEP's 1997 8-hour ozone RACT submission effective July 29, 2013 (78 FR 38587-38591). That approval is not affected by EPA Region 1's subsequent proposed rule to rescind the CDD.

C. 2008 8-hour ozone NAAQS

Under the 2008 8-hour ozone NAAQS (75 ppb averaged over eight hours), the entire state is designated as marginal nonattainment with a December 2015 attainment date, retaining the same nonattainment boundaries that were established for the 1997 ozone NAAQS (*see* footnote 6). As such, there is no requirement for DEEP to submit an attainment plan for either of these areas, nor would such plans be particularly useful given that nonattainment in these areas is heavily influenced by interstate pollution transport.

For this 2008 8-hour ozone RACT SIP analysis, DEEP continues to address only those major sources as required by CAA sections 184(b)(2) and 182(f) (*i.e.*, 50 tpy VOC and 100 tpy NOx). Connecticut's RACT analysis for the 2008 8-hour ozone NAAQS is set out in Section IV of this document.

III. Update on Federal, state and regional efforts to limit ozone precursor emissions

Connecticut has made significant progress in reducing both NOx and VOC emissions since the 1990 CAA Amendments. This section provides an update on the continuing federal, state and regional programs to limit ozone precursor emissions, as well as an update on efforts to address interstate air pollution transport.

A. Federal and state efforts

As can be seen in **Figure 1**, the ozone exceedance day trend has decreased dramatically with the implementation of post-1990 CAA federal and state emission control measures. The ozone exceedance day trend is expected to decrease further with the finalization of Tier 3 Motor Vehicle Emission and Fuel Standards[11] and the anticipated proposal of an air transport rule to address the 1997 and 2008 ozone NAAQS and implementation of the Cross State Air Pollution Rule.

Projected NOx emissions follow the same trend as the ozone exceedance days, decreasing significantly with time. **Figure 2** shows the NOx emissions estimated for Connecticut's portion of the NY-NJ-CT area in 2007, 2017 and 2025. Statewide NOx emissions would likely follow the same trend. The projected emissions include adopted NOx programs through 2012, but do not include Tier 3 motor vehicle emissions standards or post CAIR transport rules.

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[10] On February 8, 2008, DEEP indicated that it would suspend efforts to amend RCSA section 22a-174-22. http://www.ct.gov/deep/lib/deep/air/regulations/proposed_and_reports/control_of_nitrogen_oxides_emission_letter.pdf

[11] http://www.gpo.gov/fdsys/pkg/FR-2014-04-28/pdf/2014-06954.pdf

Figure 1. Connecticut 8-Hour Ozone NAAQS (75 ppb) Exceedance Day Trends and Implemented Control Strategies 1975-2013

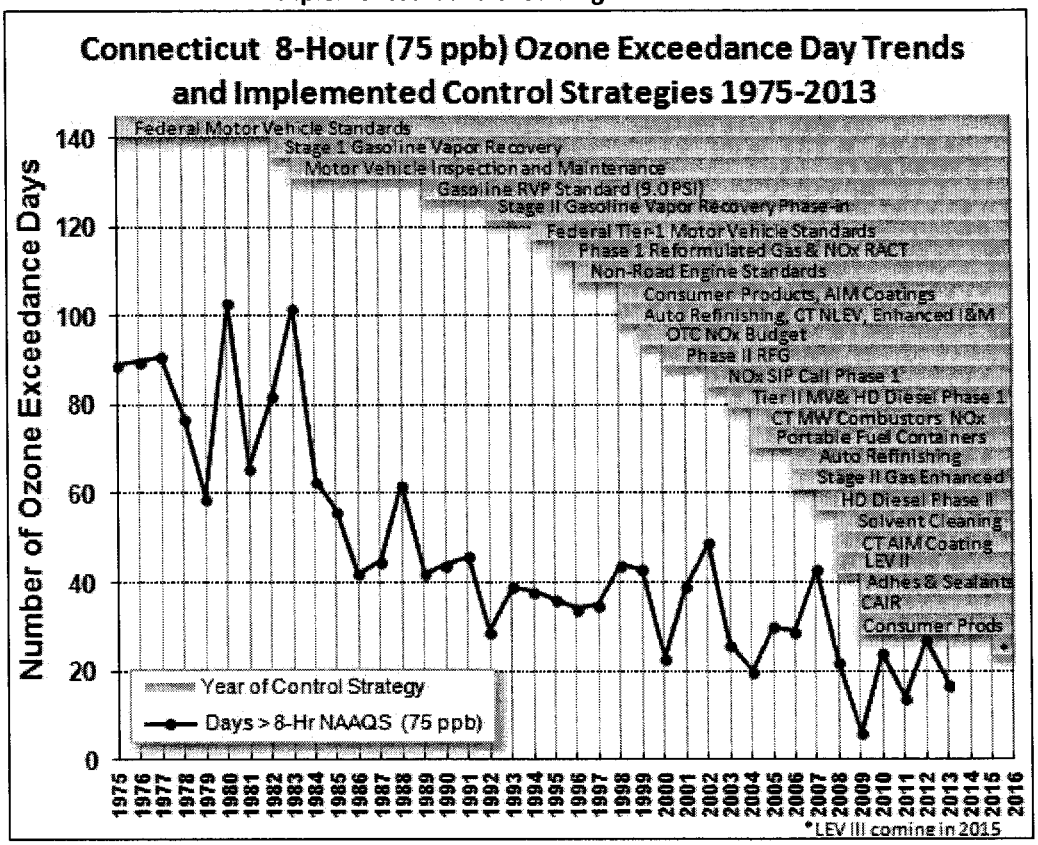
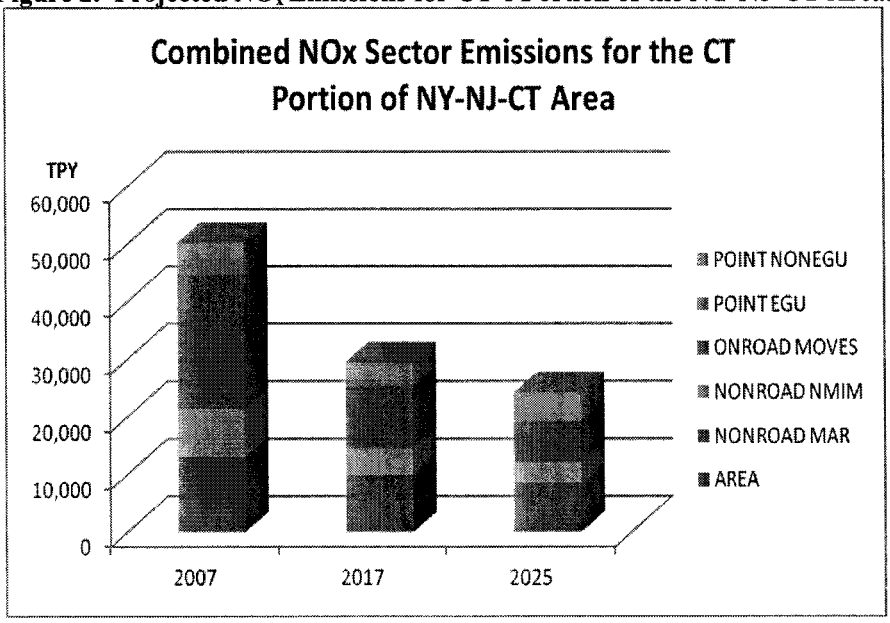


Figure 2. Projected NO_x Emissions for CT's Portion of the NY-NJ-CT Area.



Despite Connecticut's success in reducing ozone exceedance days experienced in the summer months in Connecticut over the last 30 years,[12] it important to recognize the limits of obtaining additional emissions reductions from sources in the state as a means to reduce ambient ozone levels. A comparison of contributions from all sources in the Connecticut inventory is instructive. **Table 2** shows the total VOC and NOx emissions from the thirteen major categories of emissions (Tier 1 Source Categories). These categories include all anthropogenic sources included in the 2011 National Emissions Inventory (NEI). Note that biogenic sources in Connecticut are estimated to emit an additional 48,070 tons of VOC annually. Thus, about 129,670 tons of VOC were emitted statewide in 2011.

Connecticut's major stationary sources of NOx emitted about 5902 tons of NOx in 2011, according to Connecticut's 2011 emissions statement reporting. These stationary sources account for approximately 7.5% of the NOx emissions inventory. Connecticut's major stationary sources of VOC emitted approximately 880 tons according to the 2011 emissions statement reporting. This amounts to approximately 1% of the statewide total annual VOC emissions (not including biogenic emissions). Thus, opportunities for Connecticut to reduce ambient ozone levels through control of its major stationary sources are severely limited. The impact of mobile and area source emissions, and pollution transported from other states, on ozone values in Connecticut, cannot be overstated. Significant reductions from sources in upwind states are crucial to Connecticut's ability to attain and maintain the ozone NAAQS.

Table 2. Connecticut State Emissions Summary by Tier 1 Source Category (NEI 2011)

Tier	Category	VOC Annual Emissions (Tons)	NOx Annual Emissions (Tons)
1	FUEL COMB. ELEC. UTIL.	82	1,277
2	FUEL COMB. INDUSTRIAL	168	3,397
3	FUEL COMB. OTHER	9,607	10,616
4	CHEMICAL & ALLIED PRODUCT MFG	48	0
5	METALS PROCESSING	0	0
6	PETROLEUM & RELATED INDUSTRIES	1	0
7	OTHER INDUSTRIAL PROCESSES	251	0
8	SOLVENT UTILIZATION	26,721	0
9	STORAGE & TRANSPORT	4,433	5
10	WASTE DISPOSAL & RECYCLING	317	3,182
11	HIGHWAY VEHICLES	22,676	38,933
12	OFF-HIGHWAY	17,165	21,310
14	MISCELLANEOUS	131	25
Total		81,601	78,744

B. Ozone Transport Commission efforts

One of the processes by which DEEP has worked to address upwind emissions is through the Ozone Transport Commission (OTC), of which Connecticut is a member state. Through Section 184 of the 1990 CAA amendments, the United States Congress established the OTC as the single ozone transport region (the Ozone Transport Region or OTR), comprised of eleven member states and the District of Columbia, to help coordinate plans for reducing ground-level ozone in the Northeast and Mid-Atlantic states. Over the years, the OTC has developed

[12] DEEP acknowledges that Connecticut's efforts alone are not wholly responsible for the reduction in ozone exceedance days. Federal measures and controls in upwind states are also responsible for the improvement.

recommendations for additional ozone control measures well beyond those required by the CAA to be applied within the OTR to ensure attainment and maintenance of the ozone NAAQS. Connecticut has, in part, relied on this regional effort to determine if current NOx and VOC controls continue to represent RACT for the 2008 8-hour ozone NAAQS.

In its 1997 8-hour ozone RACT SIP analysis, DEEP included a table titled "Control measures recommended by the OTC to pursue as regional ozone attainment measures and the status of Connecticut's efforts toward measure implementation." DEEP indicated that:

- The following VOC control measures were under development: Reformulation of Consumer Products (new RCSA section 22a-174-40), Design Improvements to Portable Fuel Containers (amendment of RCSA section 22a-174-43), Restrictions on Asphalt and for Paving Operations (amendment of RCSA section 22a-174-20(k), and Restrictions on the Manufacture and Use of Adhesives and Sealants (new RCSA section 22a-174-44). The identified regulations have since been finalized.

- The following NOx control measures were anticipated to occur: Reductions in the Sulfur Content of Heating Oil to Improve Combustion and Reduce NOx Emissions (former Connecticut Public Act 06-143; now Connecticut General Statute 16a-21a) and Emissions Limitations and Operation Practices for ICI Boilers (amendment of RCSA section 22a-174-22). While the Reductions in the Sulfur Content of Heating Oil were finalized in 2013, the amendment of RCSA section 22a-174-22 for Emissions Limitations and Operation Practices for ICI Boilers did not occur (*see* footnote 10).

- Standards for Asphalt Plants and Electric Generating Units were under development by OTC.[13]

Since the submission of DEEP's 1997 8-hour ozone RACT SIP in 2006, the OTC has finalized additional Model Rules for several source categories. Connecticut's status on adopting the recently finalized OTC Model Rules is indicated in **Table 3**. Details of the OTC regional model rules identified in **Table 3** can be found at the OTC website (http://otcair.org/). DEEP considers the amendments under development for RCSA sections 22a-174-40 and 22a-174-41, concerning consumer products and architectural coatings, to be RACT and commits to work to complete those regulatory amendment processes by December 31, 2016. DEEP also considers the amendment to RCSA section 22a-174-20 concerning aboveground storage tanks, which was effective on March 7, 2014, to be RACT and has included a reference to this amendment in Table 4.

[13] OTC did not finalize a model rule for either sector.

Table 3. Control measures recommended by the OTC to pursue as regional ozone attainment measures and the status of Connecticut's efforts toward measure implementation.		
VOC Control Measures	**Connecticut regulation (if applicable)**	**Status of Control Measure Implementation in Connecticut**
2013 Consumer Product Update Dual Purpose Air Freshener/Disinfectant	Amendment of RCSA section 22a-174-40	Amendment of existing Connecticut regulation now under development.
Consumer Products 2012 Update	Amendment of RCSA section 22a-174-40	Amendment of existing Connecticut regulation now under development.
Consumer Products (2010)	Amendment of RCSA section 22a-174-40	Amendment of existing Connecticut regulation now under development.
Solvent Degreasing	RCSA section 22a-174-20(l)	Existing regulation satisfies RACT. DEEP determined that it is not appropriate for CT to adopt OTC Model Rule because there is no significant air quality benefit.
Motor Vehicle and Mobile Equipment Non-Assembly Line Coating Operations (and alternate technical revisions)	RCSA section 22a-174-3b(d)	Existing regulation satisfies RACT. DEEP determined that it is not appropriate for CT to adopt OTC Model Rule because there is no significant air quality benefit. There is also a significant cost to the auto refinishers, many of which are small businesses.
AIM Coatings Update	Amendment of RCSA section 22a-174-41	Amendment of existing Connecticut regulation now under development.
Large Above Ground VOC Storage Tanks	Amendment of RCSA section 22a-174-20	Requirements adopted on March 7, 2014 and submitted as a SIP revision.
NOx Control Measures		
New Small Boilers Technical Revisions	Not applicable, but Connecticut General Statutes section 16a-48, amended in 2008 contains fuel efficiency standards for boilers.	TBD. DEEP to determine if adoption of the model rule is appropriate for Connecticut.
Stationary Generators	RCSA section 22a-174-22 contains provisions for stationary generators. RCSA section 22a-174-42 contains provisions for distributed generators.	RCSA section 22a-174-22 under reevaluation as discussed in Section IV.
HEDD Turbines	RCSA section 22a-174-22 contains NOx emission limits for turbines. Compliance is determined by three 1-hour tests.	DEEP submitted a letter to the EPA dated July 16, 2009 with a progress report demonstrating that the HEDD Performance Partnership Agreement commitment be considered complete, thereby satisfying the OTC HEDD MOU. In addition, HEDD will be a consideration in the reevaluation of RCSA section 22a-174-22 discussed in Section IV.

C. Transported emissions

OTC screening modeling , as well as EPA modeling for the Cross State Air Pollution Rule, indicate that Connecticut and several other states will struggle to attain the 2008 8-hour ozone NAAQS[14] as a result of overwhelming air pollution transport. Faced with few alternatives under the 1990 CAA, on December 10, 2013, Connecticut and seven other states filed a petition under CAA Section 176A requesting the EPA Administrator to add the states of Illinois, Indiana, Kentucky, Michigan, North Carolina, Ohio, Tennessee, Virginia and West Virginia to the OTR.[15] As EPA has 18 months to act on that petition, any timely action on this petition is unlikely to assist Connecticut's attainment of the 2008 ozone NAAQS by the December 31, 2015 attainment deadline for marginal nonattainment areas. Because of the magnitude of the transport problem and the small contribution to total NOx and VOC emissions by Connecticut's major stationary sources, no matter what RACT measures are implemented in Connecticut, all regional air quality modeling available to DEEP indicates that Connecticut will not attain and maintain the ozone NAAQS without significant additional upwind reductions and the implementation of stronger federal measures.

In addition to the need for strong transport rules to address the 1997 and 2008 ozone NAAQS, federal measures that would assist Connecticut and other states to attain and maintain the ozone NAAQS include national rules for consumer products and architectural coatings, such as those suggested by the OTC, and NOx emission limits for industrial, commercial, and institutional boilers. In addition, as federal and state requirements work to reduce stationary and area source emissions, the importance of reductions in the mobile source sector grows. Given the limitations on states to reduce mobile source emissions, EPA must take additional bold actions, including non-road idling restrictions, to reduce emissions from mobile sources. Finally, EPA must assure that each state with an ozone nonattainment area has in place a good neighbor SIP that adequately addresses the state's contribution to nonattainment in downwind states, so that air quality improvement from collective upwind reductions make it feasible for downwind states to achieve attainment.

IV. RACT analysis

This section sets out DEEP's analysis of its RACT adequacies and deficiencies for CTG sources and major sources of NOx and VOC. DEEP also identifies specific issues related to RACT controls for major stationary sources of NOx and Connecticut's attainment of the 2008 ozone NAAQS. This section also includes DEEP's commitments to address identified deficiencies.

A. CTG sources

For sources for which a CTG has been published, RACT is addressed if a state imposes controls equivalent to the CTG for that source or source category. **Table 4** lists the current CTG documents and identifies the corresponding regulations that Connecticut has adopted to achieve emissions reductions equivalent to the CTGs. **Table 4** also includes the effective dates of the state regulations and the date of SIP approval. As explained below, Connecticut reasserts that these regulations are consistent with the CTGs, or where appropriate, recertifies that the source category does not exist within the state.

DEEP has addressed the majority of the CTG source categories and requirements through three sections of the RCSA: 22a-174-20, 22a-174-30 and 22a-174-32. RCSA section 22a-174-20, for the control of organic compound emissions, was first promulgated in the early 1970's and has undergone numerous revisions since, the most recent effective on March 7, 2014. RCSA section 22a-174-20 generally contains the requirements for the initial source categories covered by the CTGs established prior to 1990. After the Clean Air Act Amendments of 1990, EPA promulgated additional CTGs and Connecticut updated its VOC RACT rules with the implementation of RCSA section 22a-174-32. RCSA section 22a-174-32, entitled "Reasonably Available Control Technology for Volatile

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[14] See second paragraph on page 4 of DEEP's September 4, 2013 comment letter on the draft Implementation Rule: http://www.ct.gov/deep/lib/deep/air/ozone/ozoneplanningefforts/ctdeep_comments_docket_epa-hq-oar-2010-0885.pdf

[15] http://www.ct.gov/deep/lib/deep/air/176a/Petition__2013dec10.pdf Pennsylvania joined the petition on December 10, 2013.

Organic Compounds," includes control measures for additional CTG categories and for major sources of VOC. RCSA section 22a-174-32 was first promulgated in 1993 and was revised in 1999 and 2010. The CTG category for Stage I Vapor Recovery, as well as for Stage II, is implemented through RCSA section 22a-174-30. RCSA section 22a-174-30 is entitled "Dispensing of Gasoline/Stage I and Stage II Vapor Recovery" and was implemented in late 1992 and revised in 2004.[16]

Since the submission of DEEP's 1997 8-hour ozone RACT SIP in 2006, EPA has adopted a number of new or revised CTGs, and DEEP has undertaken additional efforts to ensure that its programs are consistent with all the published CTGs.

2006 CTGs

On October 5, 2006, EPA finalized CTGs for the following source categories: Lithographic Printing Materials,[17] Letterpress Printing Materials, Flexible Packaging Printing Materials, Flat Wood Paneling Coatings, and Industrial Cleaning Solvents (71 FR 58745). On April 29, 2010, DEEP submitted a SIP revision to EPA for nine CTGs, including new RCSA section 22a-174-20(gg), "Offset Lithographic Printing and Letterpress Printing"; new RCSA section 22a-174-20(ff), "Flexible Package Printing"; and new RCSA sections 22a-174-20(ii), "Industrial Solvent Cleaning" and 22a-174-20(jj), "Spray Application Equipment Cleaning." In its final SIP approval on June 9, 2014 (79 FR 32873), EPA states that DEEP's newly adopted regulations are consistent with the recommendations for RACT found in EPA's CTGs for Offset Lithographic Printing and Letterpress Printing (EPA-453/R-06-002, September 2006), Flexible Package Printing (EPA-453/R-06-003, September 2006) and Industrial Cleaning Solvents (EPA-453/R-06-001, September 2006).

2007 CTGs

On October 9, 2007, EPA finalized CTGs for the following source categories: Large Appliance Coatings, Metal Furniture Coatings, and Paper, Film and Foil Coatings (72 FR 57215). DEEP's April 29, 2010 SIP revision included new RCSA section 22a-174-20(hh), "Large Appliance Coatings", revised RCSA section 22a-174-20(q), "Paper, Film and Foil Coatings", and revised RCSA section22a-174-20(p), "Metal Furniture Coating.

The revised RCSA section 22a-174-20(q) renames the regulation to address film and foil coating as well as paper coating; broadens the scope of activities addressed by the emission limit; includes additional VOC emission requirements for facilities with a potential to emit 25 tons or more VOCs per year; and updates work practices and general record keeping requirements. The revised RCSA section 22a-174-20(p) increases the number of coating categories and limits; requires work practices that limit VOC emissions and minimizes spills during material application, storage, containment, conveyance, and mixing; and clarifies record keeping requirements. In its proposed May 24, 2013 SIP approval, EPA states that DEEP's newly adopted regulation is consistent with the recommendations for RACT found in EPA's CTG for Large Appliance Coatings (EPA 453/R-07-004, September 2007), and that DEEP's revised RCSA sections 22a-174-20(q) and 22a-174-20(p) satisfy the anti-backsliding requirements in CAA Section 110(l). EPA issued final approval, and incorporated into the SIP, the changes to RCSA sections 22a-174-20(q) and 22a-174-20(p) on June 9, 2014 (79 FR 32873).

2008 CTGs

On October 7, 2008, EPA finalized CTGs for the following source categories: Miscellaneous Metal Products Coatings, Plastic Parts Coatings, Auto and Light-Duty Truck Assembly Coatings, Fiberglass Boat Manufacturing Materials,[18] and Miscellaneous Industrial Adhesives (73 FR 58481). DEEP's November 21, 2012 SIP revision included the revision of RCSA section 22a-174-20(s) to further limit volatile organic compounds (VOC) emissions from the coating of metal and plastic parts and the adoption of RCSA section 22a-174-20(kk) to limit VOC

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[16] DEEP is currently developing a proposal to repeal RCSA section 22a-174-30, given that the Connecticut legislature acted in 2013 to decommission Stage II vapor recovery equipment. DEEP will be submitting the changes to the SIP accompanied by a demonstration pursuant to CAA sections 110(l) and 184(b)(2).

[17] This CTG was addressed by a negative declaration.

[18] The auto and light-duty truck assembly coatings and fiberglass boat manufacturing materials CTGs are addressed by negative declarations.

emissions from the coating of pleasure craft. DEEP's November 18, 2008 $PM_{2.5}$ Attainment Demonstration SIP revision included new RCSA section 22a-174-44, "Adhesives and Sealants."

DEEP proposed to revise RCSA section 22a-174-20(s) to include plastic parts coating and update the pre-existing metal parts coating requirements. EPA included pleasure craft coating operations within the metal and plastic parts coatings category in the 2008 CTG. Recognizing the differences in parts coating operations and pleasure craft coating, DEEP proposed to address pleasure craft coating through new subsection RCSA section 22a-174-20(kk), distinct from the requirements applying to metal and plastic parts coating. DEEP also revised RCSA sections 22a-174-20(aa)(1) and (cc)(2) and (3), which was necessary given the revision to subsection (s) and adoption of subsection (kk). In its proposed May 24, 2013 SIP approval , EPA states that the revised rule satisfies the anti-backsliding requirements in CAA Section 110(l) and is consistent with the EPA guidance memorandum entitled "Approving SIP Revisions Addressing VOC RACT Requirements for Certain Coating Categories." EPA issued final approval, and incorporated into the SIP, the changes to RCSA sections 22a-174-20(s), 22a-174-20(aa)(1) and 22a-174-20(cc)(2) and (3) and new section 22a-174-20(kk) on June 9, 2014.

For the *Control Techniques Guidelines for Miscellaneous Industrial Adhesives* (EPA 453/R-08-005 2008/09), DEEP determined that an equivalent level of control is provided by an existing air quality regulation, RCSA section 22a-174-44. RCSA section 22a-174-44 is based on an OTC model rule that is, in turn, based on a RACT determination prepared by the California Air Resources Board in 1998 and regulations adopted in the California local air pollution control districts.

RCSA section 22a-174-44 achieves VOC reductions through two basic components: sale and manufacture restrictions that limit the VOC content of specified adhesives, sealants and primers sold in the state; and use restrictions that apply primarily to commercial/industrial operations. In addition to the VOC content limits and use requirements, RCSA section 22a-174-44 includes requirements for cleanup and preparation solvents and allows for compliance through the use of add-on air pollution control equipment. In its proposed May 24, 2013 SIP approval, EPA states that while there are differences between the adhesive categories and emission limits in the CTG and RCSA section 22a-174-44, those differences are inconsequential compared to the broader applicability of RCSA section 22a-174-44. EPA issued final approval, and incorporated into the SIP, section RCSA section 22a-174-44 on June 9, 2014.

Negative declarations

DEEP's April 29, 2010 SIP revision included negative declarations for three source categories that correspond to the sources covered in the Flat Wood Paneling Coatings (EPA-453/R-06-004, September 2006), Fiberglass Boat Manufacturing Materials (EPA 453/R-08-004, September 2008), and Automobile and Light-Duty Truck Assembly Coatings (EPA 453/R-08-006, September 2008) CTGs. To make this determination, DEEP reviewed the inventory of sources for facilities with North American Industrial Classification System codes that correspond to the sources covered by the CTGs, interviewed its field staff, and searched telephone directories and Internet Web pages, including other state government databases, to identify and evaluate sources that might meet the applicability requirements. DEEP ultimately determined that there are no sources covered by these CTGs in Connecticut. In its final June 9, 2014 SIP approval, EPA confirms that DEEP's process for determining the categories for which the state should make negative declarations is reasonable.

Stage I/Stage II vapor recovery

Connecticut addresses Stage I and II vapor recovery under the authority of CGS section 22a-174e and RCSA section 22a-174-30. In 2013, CGS section 22a-174e was revised by the Connecticut General Assembly to mandate decommissioning of all Stage II vapor recovery systems and require annual pressure decay testing.[19] DEEP is currently seeking to repeal RCSA section 22a-174-30 to remove the Stage II provisions and adopt a new regulatory section that includes test methods and other requirements for Stage I vapor recovery, consistent with CGS section 22a-174e. When the regulatory revision process is complete, DEEP will submit a SIP revision to demonstrate that the requirements of CAA Sections 184(b)(2) and 110(*l*) are addressed and EPA's widespread use rule (77 FR 28772, May 16, 2012) is satisfied. Connecticut may in the future consider enhanced Stage I vapor recovery

[19] Public Act 13-120, available at: http://www.cga.ct.gov/2013/ACT/PA/2013PA-00120-R00HB-06534-PA.htm

requirements, but that action is not included in the regulatory revision in process and is not considered RACT for the 2008 ozone NAAQS.

Aboveground storage tanks

On March 7, 2014, DEEP adopted revisions to subsections (a), (b), and (c) of RCSA section 22a-174-20 primarily to update requirements concerned with the control of VOC emissions from large aboveground storage tanks (AST). These revisions include those elements of the OTC Model Rule for Large Aboveground VOC Storage Tanks that are appropriate to Connecticut and meet or exceed control levels established in the applicable CTG.[20] Some of the new elements include removal of the option of using an undomed floating roof tank to store VOCs; improved inspection requirements; new restrictions on roof landing events and degassing and cleaning operations; and timely repair of leaks throughout any VOC storage and transfer facility. Based on the 2007 Connecticut emissions inventory, there are 45 AST in the state that are subject to the new AST requirements. All 45 AST are floating roof tanks. As a group, these tanks emit approximately 150 tons of VOC per year.

[20] Control of Volatile Organic Emissions from Petroleum Liquid Storage in External Floating Roof Tanks. EPA-450/2-78-047 1978/12.

Table 4. List of Issued CTGs and Connecticut Regulatory Requirements Corresponding to Each Listed CTG.

CTG Category	***CTG Document***	***Applicable Connecticut Regulation.***	***SIP Approval of Connecticut Regulation or Negative Declaration*** *Adopted by State/ Approved by EPA/ FR Cite/ 52.370*	***Comments***
Aerospace	Aerospace (CTG & MACT) (see 59 FR 29216, June 6, 1994); CTG (Final), EPA-453/R-97-004, December 1997.	*22a-174-32 Reasonably Available Control Technology (RACT) for volatile organic compounds.* *22a-174-20(s)Miscellaneous Metal and Plastic Parts Coating*	11/18/93 3/10/99 64 FR 12024 ..... (c)(76) 8/27/99 10/19/00 65 FR 62624 ..... (c)(84) 4/29/10	*Regulatory requirements are consistent with the CTG and represent RACT under the 2008 8-Hour Ozone NAAQS.*
Automobile Coating	Control Techniques Guidelines for Automobile and Light-Duty Truck Assembly Coatings (PDF 44 pp, 2.64MB) EPA 453/R-08-006-*2008/09* And Protocol for Determining the Daily Volatile Organic Compound Emission Rate of Automobile and Light-Duty Truck Primer-Surfacer and Topcoat Operations (PDF 129 pp, 450KB) EPA 453/R-08-002-2008/09	*Not Applicable*	*Negative declaration for coating of automobile and light-duty trucks*	*Connecticut reaffirms that no sources meeting the description of this CTG category are operating within the State.*
Cutback Asphalt	Control of Volatile Organic Compounds from Use of Cutback Asphalt, EPA-450/2-77-037, December 1977	*22a-174-20(k) Restrictions on cutback asphalt*	10/10/80 1/17/82 47 FR 762 ..... (c) 20 12/13/84 7/18/85 50 FR 29229 ..... (c) 34 10/31/89 10/18/91 56 FR 52205 ..... (c) 58 8/22/12; 77 FR 50595; ...(c)100	*Regulatory requirements are consistent with the CTG and represent RACT under the 2008 8-Hour Ozone NAAQS.*
Dry Cleaning (Large Petroleum)	Control of Volatile Organic Compound Emissions from Large Petroleum Dry Cleaners, EPA-450/3-82-009, September 1982	*Not Applicable*	40 CFR § 52.375 (a) Certification of no large petroleum dry cleaner sources.	*Connecticut reaffirms that no sources meeting the description of this CTG category are operating within the State.*
Fabric Coating	Control of Volatile Organic Emissions from Existing Stationary Sources, Volume II: Surface Coating of Cans, Coils, Paper, Fabrics, Automobiles, and Light-Duty Trucks, EPA-450/2-77-008, May 1977.	*22a-174-20(o) Fabric and vinyl coating;*	8/31/79 12/23/80 45 FR 84769 ..... (c) 11 10/31/89 10/18/91 56 FR 52205 ..... (c) 58	*Regulatory requirements are consistent with the CTG and represent RACT under the 2008 8-Hour Ozone NAAQS.*
Fiberglass Boat	Control Techniques Guidelines for Fiberglass Boat Manufacturing Materials (PDF 41 pp, 336KB) EPA 453/R-08-004-*2008/09*	*Not Applicable*	*Negative Declaration for* fiberglass boat manufacturers	*Connecticut reaffirms that no sources meeting the description of this CTG category are operating within the State.*
Flexible Package Printing	Control Techniques Guidelines for Flexible Package Printing (PDF 33 pp, 216KB) EPA-	*22a-174-20(ff)*	4/29/10 6/9/14 79 FR 32873	*Regulatory requirements are consistent with the CTG and represent RACT under*

CTG Category	***CTG Document***	***Applicable Connecticut Regulation.***	***SIP Approval of Connecticut Regulation or Negative Declaration*** *Adopted by State/ Approved by EPA/ FR Cite/ 52.370*	***Comments***
	453/R-06-003-*2006/09*			*the 2008 8-Hour Ozone NAAQS.*
Bulk Gasoline Plants	Control of Volatile Organic Emissions from Bulk Gasoline Plants, EPA-450/2-77- 035, December 1977	*22a-174-20(b) Loading of gasoline and other volatile organic compounds.*	4/4/72 5/31/72 37 FR 23085 ..... (b). 8/31/79 12/23/80 45 FR 84769 ..... (c) 11 10/10/80 2/17/82 47 FR 6827 ..... (c) 25 4/1/98 10/19/00 65 FR 62624 ..... (c)(84) 9/24/83 3/21/84 49 FR 10542 ..... (c) 32 12/13/84 7/18/85 50 FR 29229 ..... (c) 34 10/31/89 10/18/91 56 FR 52205 ..... (c) 58 4/1/98 10/19/00 65 FR 62624 ..... (c)(84) 3/07/2014	*Regulatory requirements are consistent with the CTG and represent RACT under the 2008 8-Hour Ozone NAAQS.*
Graphic Arts	Control of Volatile Organic Emissions from Existing Stationary Sources, Volume VIII: Graphic Arts - Rotogravure and Flexography, EPA-450/2-78-033, December 1978.	*22a-174-20(v) Graphic arts rotogravures and flexography.*	10/10/80 2/17/82 47 FR 6827 ..... (c) 25 10/31/89 10/18/91 56 FR 52205 ..... (c) 58 11/18/93 3/10/99 64 FR 12024 ..... (c)(75) 8/1/95 10/19/00 65 FR 62624 ..... (c)(84)	*Regulatory requirements are consistent with the CTG and represent RACT under the 2008 8-Hour Ozone NAAQS.*
Industrial Adhesives	Control Techniques Guidelines for Miscellaneous Industrial Adhesives (PDF 47 pp, 350KB) EPA 453/R-08-005-*2008/09*	*22a-174-44*	11/18/08 6/9/14 79 FR 32873	*Regulatory requirements are consistent with the CTG and represent RACT under the 2008 8-Hour Ozone NAAQS.*
Large Appliances	Control Techniques Guidelines for Large Appliance Coatings (PDF 44 pp, 374KB) EPA 453/R-07-004-*2007/09*	*22a-174-20(hh)*	4/29/10 6/9/14 79 FR 32873	*Regulatory requirements are consistent with the CTG and represent RACT under the 2008 8-Hour Ozone NAAQS.*
Magnet Wire	Control of Volatile Organic Emissions from Existing Stationary Sources, Volume IV: Surface Coating for Insulation of Magnet Wire, EPA-450/2-77-033, December 1977	*22a-174-20(r) Wire coating.*	8/31/79 12/23/80 45 FR 84769 ..... (c) 11 10/31/89 10/18/91 56 FR 52205 ..... (c) 58	*Regulatory requirements are consistent with the CTG and represent RACT under the 2008 8-Hour Ozone NAAQS.*
Metal Coil, Container and Closure	Control of Volatile Organic Emissions from Existing Stationary Sources, Volume II: Surface Coating of Cans, Coils, Paper, Fabrics, Automobiles, and Light-Duty Trucks, EPA-450/2-77-008, May 1977.	*22a-174-20(m) Can coating; 22a-174-20(n) Coil coating.*	8/31/79 12/23/80 45 FR 84769 ..... (c) 11 10/31/89 10/18/91 56 FR 52205 ..... (c) 58	*Regulatory requirements are consistent with the CTG and represent RACT under the 2008 8-Hour Ozone NAAQS.*
Metal Furniture	Control Techniques Guidelines for Metal	*22a-174-20(p) Metal furniture coating.*	8/31/79 12/23/80 45 FR 84769 ..... (c) 11	*Regulatory requirements are consistent*

CTG Category	***CTG Document***	***Applicable Connecticut Regulation.***	***SIP Approval of Connecticut Regulation or Negative Declaration*** *Adopted by State/ Approved by EPA/ FR Cite/ 52.370*	***Comments***
	Furniture Coatings (PDF 100 pp, 293KB) EPA 453/R-07-005-*2007/09*		10/31/89 10/18/91 56 FR 52205 ..... (c) 58 4/29/10 6/9/14 79 FR 32873	*with the CTG and represent RACT under the 2008 8-Hour Ozone NAAQS.*
Metal & Plastic Parts Coating	Control Techniques Guidelines for Miscellaneous Metal and Plastic Parts Coatings (PDF 143 pp, 897KB) EPA 453/R-08-003-*2008/09*	*22a-174-20(s) Miscellaneous metal and plastic parts coating* *22a-174-20(k) Pleasure craft coating*	10/10/80 2/17/82 47 FR 6827 ..... (c) 25 10/31/89 10/18/91 56 FR 52205 ..... (c) 58 11/18/93 3/10/99 64 FR 12024 ..... (c)(75) 8/1/95 10/19/00 65 FR 62624 ..... (c)(84) 11/21/12 6/9/14 79 FR 32873	*Regulatory requirements are consistent with the CTG and represent RACT under the 2008 8-Hour Ozone NAAQS.*
Natural Gas / Gasoline	Control of Volatile Organic Compound Equipment Leaks from Natural Gas/Gasoline Processing Plants, EPA-450/2-83-007, December 1983.	*Not Applicable*	40 CFR § 52.375(b) Certification of no Natural Gas/Gasoline Processing Plant sources.	*Connecticut reaffirms that no sources meeting the description of this CTG category are operating within the State.*
Paper, Film & Foil	Control Techniques Guidelines for Paper, Film, and Foil Coatings (PDF 102 pp, 488KB) EPA 453/R-07-003-*2007/09*	*22a-174-20(q) Paper coating;*	8/31/79 12/23/80 45 FR 84769 ..... (c) 11 10/31/89 10/18/91 56 FR 52205 (c) 58 4/29/10 6/9/14 79 FR 32873	*Regulatory requirements are consistent with the CTG and represent RACT under the 2008 8-Hour Ozone NAAQS.*
Pharmaceutical Products	Control of Volatile Organic Emissions from Manufacture of Synthesized Pharmaceutical Products, 450/2-78-029, December 1978.	*22a-174-20(t) Manufacture of synthesized pharmaceutical products.*	10/10/80 2/17/82 47 FR 6827 ..... (c) 25 10/31/89 10/18/91 56 FR 52205 ..... (c) 58	*Regulatory requirements are consistent with the CTG and represent RACT under the 2008 8-Hour Ozone NAAQS.*
Polyester Resin	Control of Volatile Organic Compound Emissions from Manufacture of High-Density Polyethylene, Polypropylene, and Polystyrene Resins, EPA-450/3-83-008, November 1983 AND Control of Volatile Organic Compound Fugitive Emissions from Synthetic Organic Chemical Polymer and Resin Manufacturing Equipment, EPA-450/3-83-006, March 1984	*22a-174-20(y) Manufacture of polystyrene resins.*	2/2/87 5/19/88 53 FR 17934 ..... (c) 38 10/31/89 10/18/91 56 FR 52205 ..... (c) 58 AND 40 CFR § 52.375 (d) Certification of no manufacturers of high-density polyethylene and polypropylene resins.	*Regulatory requirements are consistent with the CTG and represent RACT under the 2008 8-Hour Ozone NAAQS.*
Printing Industries - offset lithographic and letterpress	Control Techniques Guidelines for Offset Lithographic Printing and Letterpress Printing (PDF 52 pp, 349KB) EPA-453/R-06-002-*2006/09*	*22a-174-20(gg)*	4/29/10 6/9/14 79 FR 32873	*Regulatory requirements are consistent with the CTG and represent RACT under the 2008 8-Hour Ozone NAAQS.*

CTG Category	***CTG Document***	***Applicable Connecticut Regulation.***	***SIP Approval of Connecticut Regulation or Negative Declaration*** *Adopted by State/ Approved by EPA/ FR Cite/ 52.370*	***Comments***
Refineries	Control of Refinery Vacuum Producing Systems, Wastewater Separators, and Process Unit Turnarounds, EPA-450/2-77-025, October 1977. AND Control of Volatile Organic Compound Leaks from Petroleum Refinery Equipment, EPA-450/2-78-036, June 1978.	*22a-174-20(c) "Volatile organic compound" water separation.*	*Negative Declaration for refineries.*	*Connecticut reaffirms that no sources meeting the description of this CTG category are operating within the State.*
Rubber Tires	Control of Volatile Organic Emissions from Manufacture of Pneumatic Rubber Tires, EPA-450/2-78-030, December 1978.	*22a-174-20(u) Manufacture of pneumatic rubber tires.*	10/10/80 2/17/82 47 FR 6827 ..... (c) 25 10/31/89 10/18/91 56 FR 52205 ..... (c) 58	*Regulatory requirements are consistent with the CTG and represent RACT under the 2008 8-Hour Ozone NAAQS.*
Service Stations	Design Criteria for Stage I Vapor Control Systems - Gasoline Service Stations, November 1975.	*22a-174-30 Dispensing of Gasoline/Stage I and Stage II Vapor Recovery.*	1/12/93 12/17/93 58 FR 65930 ..... (c) 62 1/12/93 1/18/94 59 FR 2649 ..... (c) 62 05/10/04 8/31/06 71 FR 51761 ..... (c) 95	*Regulatory requirements are consistent with the CTG and represent RACT under the 2008 8-Hour Ozone NAAQS.*
Ships	Shipbuilding/repair ACT (EPA 453/R-94-032, April 1994) and CTG, see 61 FR 44050, August 27, 1996	*22a-174-32 Reasonably Available Control Technology (RACT) for volatile organic compounds.*	11/18/93 3/10/99 64 FR 12024 ..... (c)(76) 8/27/99 10/19/00 65 FR 62624 ..... (c)(84)	*Regulatory requirements are consistent with the CTG and represent RACT under the 2008 8-Hour Ozone NAAQS.*
Solvent Cleaning	Control Techniques Guidelines for Industrial Cleaning Solvents (PDF 290 pp, 7.6MB) EPA-453/R-06-001-*2006/09*	*22a-174-20(i) Metal cleaning* *22a-174-20(ii)* *22a-174-20(jj)*	8/31/79 12/23/80 45 FR 84769 ..... (c) 11 10/10/80 6/7/82 47 FR 24452 ..... (c) 23 12/10/82 2/1/84 49 FR 3989 ..... (c) 29 9/24/83 2/1/84 49 FR 3989 ..... (c) 29 9/24/83 3/21/84 49 FR 10542 ..... (c) 32 8/31/79 3/21/84 49 FR 10542 ..... (c) 32 10/31/89 10/18/91 56 FR 52205 ..... (c) 58 8/23/96 10/19/00 65 FR 62624 ..... (c)(84) 8/22/12 77 FR 50595 ....(c)(100) 4/29/10 6/9/14 79 FR 32873	*Regulatory requirements are consistent with the CTG and represent RACT under the 2008 8-Hour Ozone NAAQS.*
Synthetic Organic Chemical	Control of Volatile Organic Compound	*22a-174-20(x) Control of Volatile*		*Regulatory requirements are consistent*

CTG Category	***CTG Document***	***Applicable Connecticut Regulation.***	***SIP Approval of Connecticut Regulation or Negative Declaration*** *Adopted by State/ Approved by EPA/ FR Cite/ 52.370*	***Comments***
	Emissions from Air Oxidation Processes in Synthetic Organic Chemical Manufacturing Industry, EPA-450/3-84-015, December 1984. AND SOCMI Distillation and Reactor Processes CTG (EPA 450/4-91-031, August 1993).	*Organic Compound Leaks from Synthetic Organic Chemical & Polymer Manufacturing Equipment.*	2/2/87 5/19/88 53 FR 17934 ..... (c) 38 10/31/89 10/18/91 56 FR 52205 ..... (c) 58 *AND* 40 CFR § 52.375 (c) Certification of no Air Oxidation Processes/SOCMI.sources 40 CFR § 52.375 (e) Certification of no sources of Synthetic Organic Chemical Manufacturing Industry (SOCMI) distillation. 40 CFR § 52.375 (f) Certification of no sources of Synthetic organic chemical manufacturing industry (SOCMI) reactor vessels	*with the CTG and represent RACT under the 2008 8-Hour Ozone NAAQS.*
Tanks	Control of Volatile Organic Emissions from Storage of Petroleum Liquids in Fixed Roof Tanks, EPA-450/2-77-036, December 1977 AND Control of Volatile Organic Emissions from Petroleum Liquid Storage in External Floating Roof Tanks, EPA-450/2-78-047, December 1978.	*22a-174-20(a) Storage of "volatile organic compounds" and restrictions for the Reid Vapor Pressure of gasoline.* *22a-174-20(c) "Volatile organic compound" water separation.*	8/31/79 12/23/80 45 FR 84769 ...(c) 11 9/24/83 3/21/84 49 FR 10542 .... (c) 32 12/13/84 7/18/85 50 FR 29229 .. (c) 34 12/30/88 6/2/89 54 FR 23650 .... (c) 50 10/31/89 10/18/91 56 FR 52205 (c) 58 *03/07/2014*	*Regulatory requirements are consistent with the CTG and represent RACT under the 2008 8-Hour Ozone NAAQS.*
Tank Trucks	Control of Hydrocarbons from Tank Truck Gasoline Loading Terminals, EPA-450/2-77-026, December 1977. AND Control of Volatile Organic Compound Leaks from Gasoline Tank Trucks and Vapor	*22a-174-20(b) Loading of gasoline and other volatile organic compounds.*	8/31/79 12/23/80 45 FR 84769 ..... (c) 11 9/24/83 3/21/84 49 FR 10542 ..... (c) 32 12/13/84 7/18/85 50 FR 29229 ..... (c) 34 10/31/89 10/18/91 56 FR 52205 ..... (c) 58 4/1/98 10/19/00 65 FR 62624 ..... (c)(84)	*Regulatory requirements are consistent with the CTG and represent RACT under the 2008 8-Hour Ozone NAAQS.*

CTG Category	***CTG Document***	***Applicable Connecticut Regulation.***	***SIP Approval of Connecticut Regulation or Negative Declaration*** *Adopted by State/ Approved by EPA/ FR Cite/ 52.370*	***Comments***
	Collection Systems, EPA-450/2-78-051, December 1978.			
Wood Coating	Control Techniques Guidelines for Flat Wood Paneling Coatings (PDF 27 pp, 212KB) EPA-453/R-06-004-*2006/09*	*Not Applicable*	*Negative declaration of sources of surface coating of flat wood paneling.*	*Connecticut reaffirms that no sources meeting the description of this CTG category are operating within the State.*
Wood Furniture	Wood Furniture (CTG-MACT) - draft MACT out 5-94; Final CTG, EPA-453/R-96-007, April 1996; see also 61 FR 25223, and, 61 FR 50823, September 27, 1996.	*22a-174-32 Reasonably Available Control Technology (RACT) for volatile organic compounds.*	11/18/93 3/10/99 64 FR 12024 ..... (c)(76) 8/27/99 10/19/00 65 FR 62624 ..... (c)(84)	*Regulatory requirements are consistent with the CTG and represent RACT under the 2008 8-Hour Ozone NAAQS.*

B. Major non-CTG sources of NOx and VOC

According to the draft Implementation Rule, the state is required to conduct a RACT analysis for each major stationary source of VOC and for each major stationary source of NOx. "Major stationary source" is defined in CAA Section 302, as modified by Sections 182(b), (c), (d) or (e) of the CAA, as applicable to the classification of the nonattainment areas in which a stationary source is located. Additionally, Connecticut is in the OTR and subject to CAA Section 184. Therefore, because Connecticut is in the OTR and classified as marginal nonattainment for the 2008 ozone NAAQS, the term "major source" for the purposes of this review is limited to facilities that have the potential to emit (PTE) 100 tons per year or more of NOx or 50 tons per year or more of VOC.

In addition to RACT, individual sources may also be subject to more stringent technology control measures such as lowest achievable emissions rate (LAER), best available control technology (BACT) and maximum achievable control technology (MACT). LAER, applicable to new and modified major sources located in nonattainment areas, is the lowest achievable emission rate of the nonattainment pollutant that can be achieved by the source without respect to cost. BACT, or best available control technology, is applicable to new and modified sources located in attainment areas. BACT may be less stringent than LAER because consideration is given to energy, environmental and economic impacts, as well as other costs when evaluating the lowest emission rate. MACT, or maximum achievable control technology, is generally applicable to major sources of hazardous air pollutants. MACT is the control achieved by the best performing twelve percent of sources in a source group. For sources emitting volatile organic hazardous air pollutants subject to MACT, EPA has historically allowed states to rely on MACT standards for the purpose of showing that a source has met VOC RACT.[21] BACT and LAER determinations are made prior to construction as part of the new source review (NSR) permitting process. Under the federal National Emissions Standards for Hazardous Air Pollutants, the requirement to implement MACT-based controls applies directly to owners of major sources of hazardous air pollutants.

Each of these control requirements, LAER, BACT and MACT, at the time of review, would necessarily be more stringent than RACT. These control requirements would also be applied at thresholds, at least in Connecticut, equal to or lower than the major source threshold required for this RACT analysis. As these controls are generally more stringent, it is unlikely that any source that has recently undergone one of these control technology reviews would not meet RACT. Furthermore, to the extent that a source has undergone one of these reviews, it is generally unlikely that the marginal reductions achievable through further control measures will be cost effective, unless existing control equipment may be optimized to meet a lower emission limit that has become RACT since the installation of the control equipment. Otherwise, only in cases where the technology review is significantly outdated and the source has sufficient actual emissions and useful life remaining, is it plausible that a reevaluation of RACT, the control measure with the least associated burden, will be warranted. Note, however, that such a source might still warrant controls as part of an attainment plan or through future, necessarily more stringent, BACT, LAER, or MACT determinations as may become applicable.

Table 5 lists the major sources of NOx and VOC located in Connecticut. The list was obtained by reviewing the list of sources for which a Title V permit has been issued.[22] Because the Title V major source thresholds are based on the more stringent attainment designations under the 1-hour ozone NAAQS, namely 25 tons per year PTE in Southwest Connecticut and 50 tons per year PTE in Greater Connecticut, the active Title V sources were reduced to only those sources with a potential to emit more than 50 tons per year of VOC or 100 tons per year of NOx. Sources that are covered by a General Permit to Limit Potential to Emit (GPLPE) are not included on the list because the potential emissions of GPLPE sources are limited below 25 tons per year in Southwest Connecticut and 50 tons per year in Greater Connecticut. In general, all major sources of NOx are regulated under RCSA section 22a-174-22 while stationary sources of VOC are regulated by RCSA sections 22a-174-20 and 22a-174-32. RCSA section 22a-174-32 explicitly regulates major sources of VOC for the purpose of implementing RACT, and allows DEEP to conduct individual RACT analyses for sources. These regulations apply to major sources as that term was

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[21] Draft Implementation Rule at 34193.

[22] The list of active title V permits is available on DEEP's website:
http://www.ct.gov/deep/cwp/view.asp?a=2684&q=322176&deepNav_GID=1997

defined for the 1-hour ozone NAAQS non-attainment classifications. These thresholds apply to both VOC and NOx sources and are at least as stringent as the respective 50 and 100 tpy thresholds that apply under the current classification of marginal 8-hour ozone non-attainment for Connecticut and for the purpose of conducting this RACT analysis. Due to EPA's anti-backsliding requirements, and Connecticut's desire to come into attainment with the 8-hour ozone NAAQS as expeditiously as practical, the more stringent 25 and 50 tpy thresholds will not be relaxed for applicability and other requirements in existing rules even though the non-attainment area classification has changed.

In addition, many of the sources listed in **Table 5** are subject to a NSR permit and have therefore been required to implement BACT or LAER levels of control, as appropriate to the source at the time of determination. Furthermore, Connecticut requires top-down BACT in its minor NSR program, thereby requiring even minor sources to be held to a control level that is at least equivalent to RACT. While some facilities listed in **Table 5** include older equipment that is subject to a registration rather than a NSR permit, RCSA sections 22a-174-20, -22 and -32 apply to sources independent of the permitting status, thus ensuring that each source in **Table 5** is subject to a level of control that was RACT at the time the requirements were adopted.

EPA provides some guidance to states in the draft Implementation Rule for determining whether current requirements are still RACT for major stationary sources under the 2008 ozone NAAQS. EPA cautions states not to rely on older technical information when more recent information is available. The clearest instruction is as follows: "EPA generally considers controls that have been achieved in practice by other existing sources in the same source category to be technologically and economically feasible."[23] From this, DEEP understands that standards and NOx or VOC controls required by other states establish a presumptive RACT unless DEEP has information to establish that such standards or controls are not economically or technically feasible in Connecticut. EPA also notes that states have the discretion to require sources to meet requirements that are "beyond RACT." A valid reason for beyond RACT requirements is that the resulting emissions reductions are necessary to provide for timely attainment of the ozone NAAQS. "Timely" means as expeditiously as practicable.[24]

[23] Draft Implementation Rule at 34192.
[24] Draft Implementation Rule at 34193.

Table 5. Listing of the major sources of nitrogen oxides (NOx) and/or volatile organic compounds (VOC) located in Connecticut.

MUNICIPAL WASTE COMBUSTOR SOURCES (MAJOR for NOx)	**MAJOR SOURCES OF VOC DUE TO FUEL BURNING**
Covanta Bristol, Inc.	Algonquin Windsor Locks LLC
Covanta Projects of Wallingford, L.P. (formerly CRRA/Wallingford)	Bridgeport Energy
CRRA/Mid-Connecticut	Capitol District Energy Center
Covanta Southeastern Connecticut Company (formerly American Ref-Fuel of Southeast Connecticut)	CRRA/Mid Connecticut
Wheelabrator Bridgeport, L.P.	Devon Power, LLC
Wheelabrator Lisbon Inc.	Lake Road Generating
	MDC
MAJOR SOURCES OF NOx (RCSA section 22a-174-22)	Middletown Power LLC
Algonquin Gas Transmission Company, Cromwell	Montville Power LLC
Allnex USA, Inc. (formerly Cytec Industries, Inc.)	PSEG Power Connecticut LLC, Bridgeport Harbor Station
Bridgeport Energy LLC	PSEG Power Connecticut LLC, New Haven Harbor Station
Connecticut Natural Gas Corporation	University of Connecticut, Storrs
Electric Boat Corporation	Wheelabrator Bridgeport, L.P.
Frito Lay	Yale University/Central Power Plant
Hamilton Sundstrand	
Kleen Energy Systems, LLC	**MAJOR SOURCES OF VOC SUBJECT TO MACT STANDARDS**
Kimberly Clark	Magellan Terminals Holdings, L.P. (Forbes Avenue Terminal)
Lake Road Generating Co, L.P.	Magellan Terminals Holdings, L.P. (Waterfront Terminal)
MDC	Motiva Enterprises, LLC, New Haven
Milford Power Co, LLC	New Haven Terminal, Inc., East Haven
Norwalk Hospital	New Haven Terminal, Inc., New Haven
Plainfield Renewable Energy LLC	Sprague Operating Resources, LLC (formerly Motiva Enterprises, LLC), Bridgeport
Pratt & Whitney Div UTC, East Hartford	
Pratt & Whitney, Middletown	**SOURCES SUBJECT TO VOC RACT ORDERS**
PSEG Power Connecticut LLC, New Haven Harbor Station	Evonik Cyro, LLC
ReEnergy Sterling Limited Partnership (formerly Exeter Energy)	Kimberly-Clark
RockTenn CP, LLC (formerly Smurfit-Stone Container Corp.)	Sikorsky Aircraft
Sikorsky Aircraft Corporation	Hamilton-Sundstrand
University of Connecticut, Storrs	Pratt & Whitney, East Hartford
U.S. Navy Sub Base	
Yale University/Central Power Plant	**ADDITIONAL MAJOR VOC SOURCES**
Yale School of Medicine aka Sterling	Allnex USA, Inc. (formerly Cytec Industries, Inc.)
	Bridgeport Insulated Wire Company
MAJOR SOURCES OF NOx CONDUCTING NOx TRADING UNDER A SIP-APPROVED PROGRAM (RCSA section 22a-174-22)	Cray Valley USA, LLC (formerly Sartomer Company Inc.)
Algonquin Windsor Locks LLC	Electric Boat Corporation
Capitol District Energy Center	Gilman Brothers Company
Connecticut Jet Power, LLC	Gulf Oil Limited Partnership
CRRA South Meadows	Kingswood Kitchens
Devon Power, LLC	RockTenn CP, LLC (formerly Smurfit-Stone Container Corp.)
Dominion Nuclear Connecticut, Incorporated	Sikorsky Aircraft Corporation
Fusion Paperboard (formerly Cascades Boxboard)	Stanley Works
Middletown Power, LLC	Tegrant Diversified Brands, Inc.
Montville Power, LLC	United Aluminum Corporation
Pfizer Inc.	U.S. Navy Sub Base
PSEG Power Connecticut LLC, Bridgeport Harbor	

Several federal rules apply to Connecticut's major sources of NOx and VOC and require limitations on NOx or VOC. A few key programs are described below.

Clean Air Interstate Rule (CAIR)
Connecticut has participated in two distinct NOx Budget Programs (NBPs): the OTC NBP and the Federal NBP. Both programs were market-based emission cap-and-trade plans created to reduce emissions of NOx from power plants and other large combustion sources in the eastern United States. Connecticut and seven other states in the OTC implemented the original OTC NBP from 1999 through 2002 and the Federal NBP beginning in 2003; eleven non-OTC states began compliance with the Federal NBP in 2004.

Connecticut transitioned from the Federal NBP to the Clean Air Interstate Rule (CAIR) trading program as of the 2009 ozone season. Although CAIR was vacated and remanded to EPA after a successful challenge heard by the D.C. Circuit Court of Appeals (*North Carolina* v. EPA, 531 F.3d. 896 (D.C. Cir. 2008)), EPA and others successfully petitioned the D.C. Circuit Court to revise the remedy and remand CAIR without vacatur. *North Carolina v. EPA*, 550 F.3d 1176 (D.C. Cir. Dec. 23, 2008). EPA subsequently adopted the Cross State Air Pollution Rule (CSAPR) (76 FR 48208) but that program has not been implemented due to challenges in federal court. The Supreme Court of the United States heard oral arguments on December 10, 2013 regarding three issues in CSAPR and issued a decision validating CSAPR on April 29, 2014. How the Supreme Court decision will be implemented by EPA is not clear at this time.

DEEP intends to maintain the emissions reductions from implementation of CAIR via state regulation, if necessary, if CSAPR is implemented, as Connecticut is not subject to the CSAPR. Many of Connecticut's major sources of NOx are included in CAIR.

Major Source Industrial, Commercial, Institutional (ICI) Boiler and Process Heater National Emission Standards for Hazardous Air Pollutants (NESHAP)
In December 2012, EPA finalized changes to the National Emission Standards for Hazardous Air Pollutants for Area Sources: Industrial, Commercial, and Institutional Boilers (subpart JJJJJJ), as well as the National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters (subpart DDDDD). EPA intends to grant petitions for reconsideration of certain issues for both major and area sources. EPA has indicated that the notice will be published in the *Federal Register* by September 2014. There is no schedule, at this time, for completing reconsideration of the issues.

The proposed revisions should have a minor impact on boilers located in Connecticut. There are forty-two boilers/process heaters located at eleven Connecticut facilities that are major sources of hazardous air pollutants (HAP) and subject to this rule. Six of these units are small boilers (capacities <10 MMBtu/hr) and five burn clean gaseous fuels only. These eleven boilers are only subject to work practice requirements. One boiler is designed to burn #2 oil only and would be subject to the emission limits for light liquid fuel under the proposal. The remaining major source boilers are capable of burning both liquid and gaseous fuel. Those boilers that burn only gaseous fuels are subject only to work practice requirements. Those major source boilers that burn any liquid fuel (with exceptions for periods of maintenance, operator training, testing of liquid fuel, gas curtailment or gas supply emergencies and units defined as solid-fuel burners), either alone or in combination with gaseous fuels, are considered liquid-fuel boilers and are subject to numeric limits. As such standards are MACT-based, VOC RACT is presumed to be met for such boilers.

Mercury and Air Toxics Standard (MATS)
The final MATS was published in the Federal Register on February 16, 2012 (77 FR 9304). One coal-fired boiler and six oil-fired boilers are subject to MATS in Connecticut. Unless the oil-fired boilers increase operations such that the annual capacity factor exceeds 8% over a consecutive 24-month period after April, 2015, these oil-fired boilers will likely qualify for the limited use liquid oil-fired subcategory and not be subject to the HAP emission standards of MATS. However, Connecticut's MATS subject coal-fired boiler and oil-fired boilers are subject to NOx emission limits in RCSA section 22a-174-22 and would be subject to any amended requirements in RCSA section 22a-174-22, as explained below.

C. Issues for major sources of NOx

As a result of the review provided in Sections IV.A and IV.B of this document, DEEP has determined that the requirements for Connecticut's CTG sources are established at a RACT level, and no further action is required. For the major non-CTG sources of VOC, DEEP has also determined that the current requirements are RACT, and no further action is required. For the major non-CTG sources of NOx, DEEP has determined that the requirements of two programs are no longer RACT, requiring further analysis of the options to revise the NOx control requirements to a RACT level.

In the next section of this document, DEEP commits to perform the evaluation of Connecticut's municipal waste combustor and fuel-burning source NOx requirements and to seek any regulatory revisions necessary to revise the control requirements to a RACT level. Before reviewing the two programs and the current control requirements established by the two programs, we identify concerns relevant to controlling NOx emissions from Connecticut's major stationary sources, namely high electric demand days and planning timeframes. These concerns are related to Connecticut's ability to attain the 2008 ozone NAAQS as expeditiously as practicable.

High electric demand days

In the eastern United States, high electric demand days (HEDD) occur on the hottest days in summer. The demand for electricity increases primarily as a result of air conditioning. To meet the peak demand, the regional system operators call on additional electric generating units to operate. Both as a result of the operation of additional electric generating units, and due to the nature of the typical peak day generating unit, NOx emissions increase. This elevation in NOx emissions is a significant concern because the HEDD coincide with the highest monitored ozone levels, which often exceed the ozone NAAQS. The additional NOx emissions on these days exacerbate the ozone problem and are one of the keys, in conjunction with limitations on upwind state emissions, to solving Connecticut's resistant ozone problem.

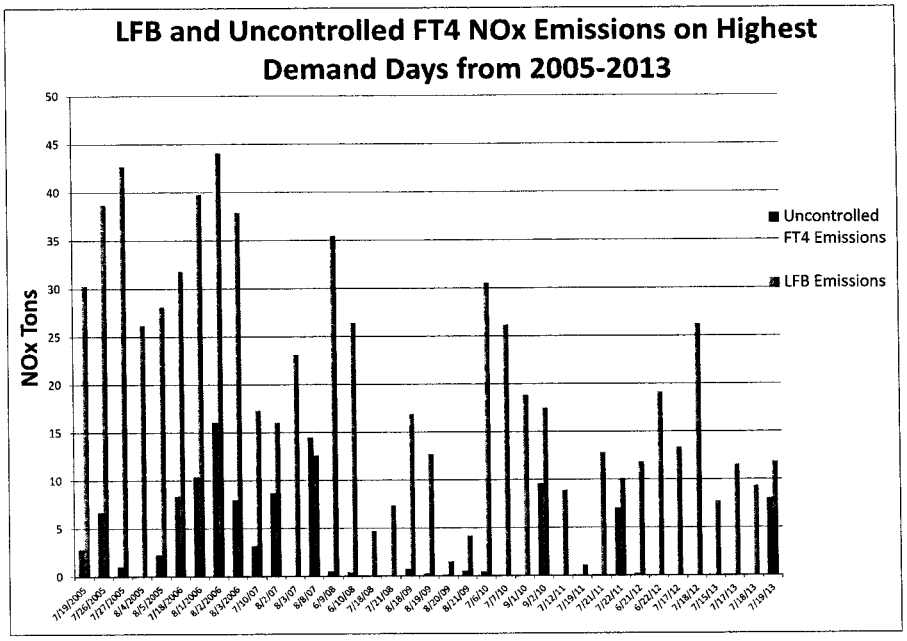
A typical HEDD unit operates less than 50%, often much less, of the available time and typically emits at an uncontrolled level higher than 0.15 lbs/mmBTU. In Connecticut, HEDD units are comprised of aeroderivative turbines (FT4), simple cycle combustion turbines and load-following boilers (LFBs). All of the simple cycle combustion turbines have NOx emissions control equipment (i.e., water injection), while only a few of the aeroderivative turbines are controlled. In Connecticut, the load-following boilers emit significantly more NOx on HEDD than the turbines.

DEEP reviewed the NOx emissions of the NOx Budget Program/CAIR units for 2005-2013, and the percent of the total NOx Budget Program/CAIR unit NOx from the load-following boilers and combustion turbines on the four highest HEDD in Connecticut for each year. This information is summarized in **Figure 3.** The load-following boilers were the highest emitters of NOx on the HEDD in each year. The load-following boilers' contribution to total NOx ranged from 40.3% to 71.1% while the combustion turbines'[25] contribution ranged from 1.2% to 24.6%.

The traditional cost effectiveness ($/ton of NOx emitted) evaluation of controlling NOx emissions from the load-following boilers and uncontrolled turbines will not address HEDD emissions because the addition of controls on existing units that operate infrequently will nearly always result in a cost of control that is not reasonable. For example, in 2010, sources using emission credit trading to comply with RCSA section 22a-174-22 were required to submit control technology evaluations including detailed descriptions of controls that are capable of reducing emissions to a rate or concentration that complies with the applicable limits of RCSA section 22a-174-22 without using NOx allowances or credits. The control technology evaluations included detailed cost information and an estimated schedule for installation and operation of controls. A summary of the results of the control technology evaluations is provided in **Attachment 1**. The resulting cost/ton figures indicate that these units may not be further controlled at a reasonable cost at this time.

[25] Turbines, for the sake of the percent contributions, means controlled aeroderivative turbines, controlled simple cycle turbines and uncontrolled aeroderivative turbines.

Figure 3. NOx emissions from load-following boilers and uncontrolled FT4 aeroderivative turbines on the four highest HEDD in each year from 2005 to 2013.



To reach attainment in the NY-NJ-CT nonattainment area, HEDD emissions need to be addressed in all three state portions of the area. DEEP recognizes that the appropriate approach to addressing HEDD emissions may differ in each state because the magnitude of emissions and type of units responsible for the emissions differs in each state's portion of the area. **Figures 4, 5 and 6** show the unit types emitting in each of the three states during a HEDD episode. New York is represented by 14 southern counties while Connecticut and New Jersey emissions are presented statewide. The magnitude of emissions differs from state to state: Connecticut averaged 18 tons of NOx per day, New Jersey averaged 52 tons per day and New York (downstate) averaged 126 tons per day. Among the peaking units in each state (Figures 4, 5, and 6 include all units that operate during the HEDD), Connecticut's emissions are dominated by the load-following boilers, as explained above. New York and New Jersey's emissions are dominated by turbines with an emission rate greater than 0.15 lbs/MMBtu, which are labeled as "dirty" turbines in Figures 4, 5 and 6.

Figure 4. Downstate NY CAMD NOx: June 20-21, 2012 Ozone Episode (CAMD average of 126 tons each day)

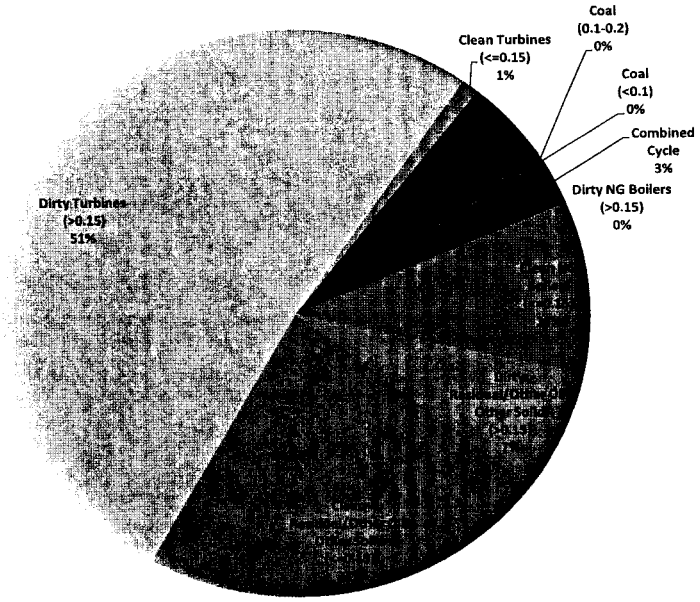


Figure 5. Statewide NJ CAMD NOx: June 20-21, 2012 Ozone Episode (CAMD average of 52 tons each day)

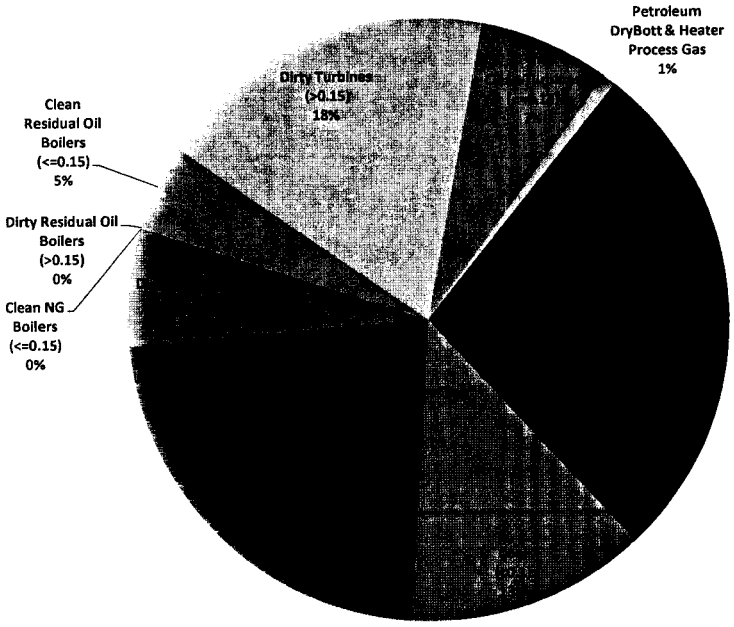
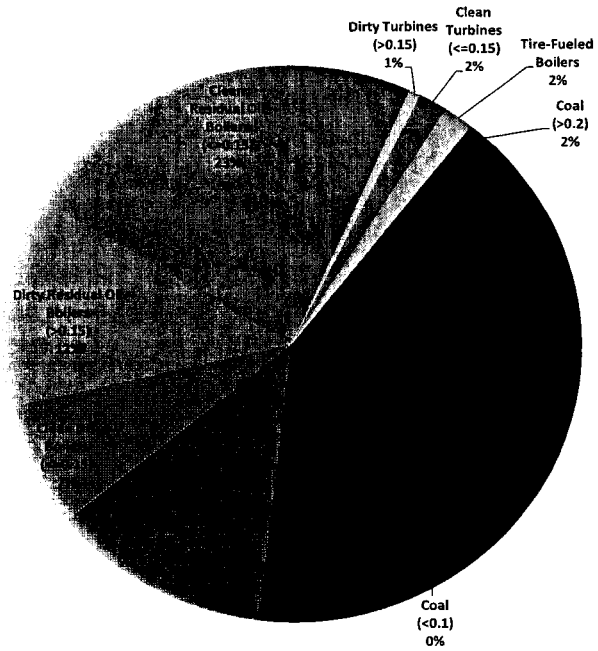


Figure 6. Statewide CT CAMD NOx: June 20-21, 2012 Ozone Episode (CAMD average of 18 tons each day)



In sum, to address Connecticut's ozone nonattainment, and Connecticut's good neighbor obligations to downwind states, peak day emissions must be reduced. Thus, "beyond RACT" measures may be warranted for HEDD units on HEDD to meet the state obligation of attainment of the ozone NAAQS as expeditiously as possible.

Planning

Adequate timeframes for new emissions limitations are important to an orderly transition that takes into account regional electric reliability planning concerns and business budgeting and planning cycles. This consideration is another factor that may result in DEEP's adoption of requirements that are beyond RACT for the 2008 ozone NAAQS, so that those requirements may represent mere RACT at the time of implementation.

When reviewing requirements for categories of EGUs, DEEP understands that regional electric system reliability planning cycles must be taken into account. For instance, the owner of an older, inefficient, high emitting EGU may choose to shut down rather than add controls to comply with a new air quality limitation. However, if the regional system operator requires the EGU in question to continue to operate to meet system reliability requirements, the EGU owner will then need to also consider the cost of obtaining replacement power to meet its capacity commitment. Each year ISO New England Inc. conducts the Forward Capacity Auction (FCA) setting the capacity commitments three years in the future. The most recent FCA was held in February 2014 and set the capacity commitments for 2017-2018. DEEP must take this iterative commitment cycle into account in developing new requirements that regulate EGUs. Furthermore, an adopted regulation is necessary to provide certainty so that EGU and industrial source owners may plan for compliance. Mere discussions or plans for future control requirements do not provide the certainty necessary for businesses to budget and schedule the installation of controls or replacement of a unit, particularly in difficult economic times.

While DEEP is now addressing the 2008 ozone NAAQS, DEEP is well aware that EPA intends to propose a new iteration of the ozone NAAQS in 2014 and finalize that new NAAQS in 2015. Regardless of Connecticut's future ozone attainment status, as an OTR state Connecticut will again be required to review RACT and address any shortcomings in the 2020-2023 timeframe. Because DEEP prefers to allow for a thorough stakeholder process in the development of RACT requirements and given that the regulatory process in Connecticut is lengthy, it makes good sense for Connecticut to take a long view when seeking to adopt RACT emissions limitations, even if it

means predicting what level of control will constitute RACT for a future ozone NAAQS. Thus, DEEP may take a phased approach to new standards, with an initial phase that is RACT followed by a beyond RACT future phase.

D. Commitments for major sources of NOx

DEEP commits to perform further evaluation of Connecticut's municipal waste combustor and fuel-burning source NOx requirements and to seek any regulatory revisions necessary to revise the control requirements to a RACT level for the 2008 ozone NAAQS. The main basis for the determination that these source categories are no longer subject to RACT is that other states now have in place emissions limitations that are more stringent than those required in Connecticut, so the more stringent emission limits, and the controls necessary to meet those emission limits, are technically and economically feasible. Furthermore, DEEP's concern about HEDD and planning timeframes may also result in DEEP's consideration of beyond RACT requirements, which DEEP would seek to establish in a regulation to meet the 2008 ozone NAAQS RACT requirement yet assign a future compliance date to such requirements. As DEEP intends to perform further analysis and work with stakeholders to develop such RACT or beyond RACT requirements, DEEP is not setting out precise emissions limitations or other requirements in this document.

Municipal Waste Combustors

Connecticut has six facilities that burn municipal waste to create electricity and are comprised of a total of 15 units. Only three of the units are small municipal waste combustors, as defined by EPA in 40 CFR 60 Subpart AAAA and the associated emissions guidelines. Together, these 15 units are one of the most significant sources of NOx emissions in Connecticut. In 2011, the municipal waste combustor NOx emissions exceeded those of Connecticut's electric generating sector to become the largest stationary source category of NOx emissions in Connecticut. These six facilities are regulated by RCSA section 22a-174-38, which is based on EPA's emissions guidelines for municipal waste combustors promulgated under Sections 129 and 111(d) of the CAA. RCSA section 22a-174-38 became effective on June 28, 1999 and included NOx emission limits that were equivalent to the emission limits established in the federal emissions guidelines for municipal waste combustors. An October 26, 2000 amendment to RCSA section 22a-174-38 reduced the NOx emission limits beyond the 1999 levels for the purposes of attaining the 1-hour ozone NAAQS. The amended regulation and associated emissions reductions were approved by EPA on December 6, 2001 (66 FR 63311).

In 2006, EPA promulgated amendments to the federal MACT-based emissions (71 FR 27324, May 10, 2006), and Connecticut's revisions to RCSA section 22a-174-38 in response to the amendments were effective on July 7, 2008. The amended regulation was approved by EPA effective June 11, 2013 (78 FR 38587; April 12, 2013). When Connecticut's most recent RACT SIP was submitted in 2006, DEEP indicated that the municipal waste combustor NOx limits were as stringent as the MACT-based 2006 EPA amendments to the emissions guidelines. Connecticut's 2008 revisions to RCSA section 22a-174-38 designated an end to creation and use of emission reduction credits and updated the regulation in accordance with revisions to the large municipal waste combustor emissions guidelines promulgated on May 10, 2006.

To meet the current NOx emissions limits of RCSA section 22a-174-38, the owners of all of the large municipal waste combustors have installed selective non-catalytic reduction (SNCR). However, the current emissions limits do not require that the SNCR be operated at an optimal level. Improved boiler modeling to predict combustion temperature profiles, monitoring and computerized controls available since the initial use of this control technology to meet the 1995 40 CFR 60 Subpart Cb NOx emissions limits have made SNCR potentially more effective today.

In addition to SNCR optimization, Covanta has developed a Low NOx (LN™) technology that, either alone or as an augmentation to SNCR, substantially reduces NOx emissions for traditional grate-based municipal waste combustor facilities. This system extends the combustion zone to effect staged combustion. The LN™ technology involves no new reagents or materials that would potentially pose an adverse impact to the environment or a facility's air emissions. Covanta first installed a test version of this system at the Bristol, Connecticut facility in 2006, and that combustor has, since April of 2009, been operating continuously and achieving NOx emission rates of about 100 to 120 ppmvd @ 7% O2. Covanta Bristol has made the emission reduction at unit no. 1 enforceable

by incorporating a NOx emission limit of 120 ppmvd into its air quality permits.[26] Since developing the LN™ technology, Covanta has installed the process in more than 20 units in North America.

Based on these observations, DEEP believes that it may be both technically and economically reasonable to reduce NOx emissions from the Connecticut municipal waste combustor facilities. The municipal waste combustor units at the Bristol facility, at which the LN™ technology has been installed, are mass burn waterwall units, which are the dominant combustor type in Connecticut.[27] New Jersey has adopted, and Massachusetts has proposed to adopt, a NOx emissions limit for mass burn waterwall units that is more stringent than Connecticut's emissions limit (*see* **Table 6**). In addition, Massachusetts has proposed to adopt a NOx emissions limit for mass burn refractory units that is more stringent than Connecticut's emissions limit (*see* **Table 6**). DEEP commits to investigate the cost and emissions reductions available from the municipal waste combustors and, if appropriate, initiate a stakeholder process to develop a regulatory amendment. DEEP would seek to move such an amendment through the regulatory adoption process to allow for adoption by December 31, 2016.

[26] *See* NSR permit number 026-0026 as modified on August 29, 2010 and Title V operating permit number 026-0055-TV (August 4, 2010).

[27] Nine of Connecticut's 15 municipal waste combustor units are mass burn waterwall units. Three units are refuse-derived fuel combustors. The three small municipal waste combustor units at the Wallingford facility are mass burn refractory units.

Table 6. Federal and Several State Municipal Waste Combustor NOx Emissions Limits (24-hour average parts per million by volume dry basis (ppmvd) corrected to 7% oxygen)

Combustor type	40 CFR 60 Subpart Cb Large Municipal Waste Combustors	40 CFR 62 Subpart JJJ Small Municipal Waste Combustors	RCSA section 22a-174-38	New Jersey Admin. Code 7:27-19.12	Massachusetts 310 CMR 7.08(2) (Proposed)
Mass burn waterwall constructed on or before December 31, 1985	205	No units in Connecticut	200	150	150
Mass burn waterwall constructed after December 31, 1985	205	No units in Connecticut	177	150	150
Refuse-derived fuel stoker	250	No units in Connecticut	146	n/a	146
Mass burn refractory	No limit	350	177	n/a	125 (See proposed 310 CMR 7.19)

Fuel-Burning Sources (Boilers, Turbines, Engines)

Revisions to the NOx emissions control requirements for boilers, turbines and engines in RCSA section 22a-174-22 are necessary to establish a RACT level of control under the 2008 ozone NAAQS. Several nearby states, including New York and New Jersey, have updated NOx RACT regulations, and other states, including Maryland, are currently reviewing existing NOx RACT requirements with respect to boilers, turbines and engines. The Ozone Transport Commission (OTC) has also recently reviewed the short-term NOx emissions limitations for fuel-burning equipment throughout the Ozone Transport Region in part to allow states to address emissions from demand response units and other units that operate intermittently to meet electric demand, particularly in the summer months.

Table 7 provides some examples of current NOx emission limits in OTC states for general unit/fuel types. The most stringent limit in each general unit/fuel type category is included; the table is not comprehensive and the unit sizes/specific unit types amongst states may not be comparable. When assessing the stringency of emission limits, averaging times should be taken into consideration. All other factors being equal, if there are two emission limits with the same numerical value, but different averaging times, the emission limit with the shorter averaging time would be considered more stringent.

Table 7. Examples of NOx Emission Limits in Some OTC States for the Identified Fuel and Unit Type.

General fuel/unit type	CT 5/31/95, 12/28/00 non-ozone season average lb/MMBtu unless noted	DE 1/1/2012 (coal/residual oil boilers), 11/24/93 all others lb/MMBtu unless noted	MD 11/9/08 lb/MMBtu unless noted	ME 1/1/05 lb/MMBtu unless noted	NJ On and after 5/1/15 (coal and residual oil boilers and turbines), 5/1/10 (distillate oil and natural gas boilers), 3/7/07 (engines) lb/MMBtu unless noted	NY On and after 7/1/14 (boilers), 7/8/10 (turbines and engines) lb/MMBtu unless noted	PA 5/1/05 lb/MMBtu unless noted	RI 5/31/95 lb/MMBtu unless noted
Coal boilers	0.38 (24-hr average by CEMS; average of three 1-hr tests by stack test); 0.15 (non-ozone season average), (RCSA section 22a-174-22(e) Table 22-1, -22(e)(3), -22(k)(1), -22(k)(4))	0.125 (rolling 24-hr average), (Regulation 1146 4.3)	0.38 (30-day rolling average or averages of stack test duration), (Regulation 26.11.09.08B.(1)(c), 26.11.09.08B.(2)(d) and (e))	0.15 (90 day rolling average), (Chapter 145 3.B.(2)(b))	1.50 lb/MWh (Calendar day over ozone season, 30-day over non-ozone season if CEMS, average of three 1-hr stack tests if no CEMS), (7:27-19.4 TABLE 3, 7:27-19.15(a))	0.12 (not including fluidized bed) (1-hr average unless CEMS (24-hr average)), (227-2.4(a))	0.17 (1 year average emission rate or maximum hourly permit rate if no CEMS), (129.201(c)(2), 129.204(b))	No limit identified
Residual Oil boilers	0.25 (24-hr average by CEMS; average of three 1-hr tests by stack test); 0.15 (non-ozone season average), (RCSA section 22a-174-22(e) Table 22-1, -22(e)(3), -22(k)(1), -22(k)(4))	0.125 (rolling 24-hr average), (Regulation 1146 4.3)	0.25 (30-day rolling average or averages of stack test duration), (Regulation 26.11.09.08B.(1)(c), 26.11.09.08B.(2)(d) and (e))	0.15 (90 day rolling average), (Chapter 145 3.B.(2)(b))	2.00 lb/MWh (Calendar day over ozone season, 30-day over non-ozone season if CEMS, average of three 1-hr stack tests if no CEMS), (7:27-19.4 TABLE 3, 7:27-19.15(a))	0.20 (1-hr average unless CEMS (24-hr average)), (227-2.4(c))	0.17 (1 year average emission rate or maximum hourly permit rate if no CEMS), (129.201(c)(2), 129.204(b))	0.25 (24-hr average), (Regulation 27.4.1, 27.5.4)
Distillate Oil boilers	0.20 (24-hr average by CEMS; average of three 1-hr tests by stack test); 0.15 (non-ozone season average), (RCSA section 22a-174-22(e) Table 22-1, -22(e)(3), -22(k)(1), -22(k)(4))	0.25 (rolling 24-hr average), (Regulation 12 Table I)	0.25 (30-day rolling average or averages of stack test duration), (Regulation 26.11.09.08B.(1)(c), 26.11.09.08B.(2)(d) and (e))	0.15 (90 day rolling average), (Chapter 145 3.B.(2)(b))	0.08 (Calendar day over ozone season, 30-day over non-ozone season if CEMS, average of three 1-hr stack tests if no CEMS), (7:27-19.7 TABLE 9, 7:27-19.15(a))	0.08 (1-hr average unless CEMS (24-hr average)), (227-2.4(c))	0.17 (1 year average emission rate or maximum hourly permit rate if no CEMS), (129.201(c))(2), 129.204(b))	0.12 (1-hr average), (Regulation 27.4.2, 27.5.5)
Natural gas boilers	0.20 (24-hr average by CEMS; average of three 1-hr tests by stack test); 0.15 (non-ozone season average), (RCSA section 22a-174-22(e) Table 22-1, -22(e)(3), -22(k)(1), -22(k)(4))	0.20 (rolling 24-hr average), (Regulation 12 Table I)	0.20 (30-day rolling average or averages of stack test duration), (Regulation 26.11.09.08B.(1)(c), 26.11.09.08B.(2)(d) and (e))	0.15 (90 day rolling average), (Chapter 145 3.B.(2)(b))	0.05 (Calendar day over ozone season, 30-day over non-ozone season if CEMS, average of three 1-hr stack tests if no CEMS), (7:27-19.7 TABLE 9, 7.27-19.15(a))	0.05 (1-hr average unless CEMS (24-hr average)), (227-2.4(c))	0.10 (1 year average emission rate or maximum hourly permit rate if no CEMS), (129.201(c)(1), 129.204(b))	0.10 (1-hr average), (Regulation 27.4.2, 27.5.5)
Oil-fired Simple Cycle Turbines	75 ppmvd (24-hr average by CEMS; average of three 1-hr tests by stack test); 0.15 (non-ozone season average), (RCSA section 22a-174-22(e) Table 22-1, -22(e)(3), -22(k)(1), -22(k)(4))	88 ppm (1-hr average), (Regulation 12 Table II)	No limit identified	No limit identified	1.60 lb/MWh (Calendar day over ozone season, 30-day over non-ozone season if CEMS, average of three 1-hr stack tests if no CEMS), (7:27-19.5 TABLE 7, 7:27-19.15(a))	100 ppmvd (1-hr average unless CEMS (24-hr average)), (227-2.4(e))	0.17 (1 year average emission rate or maximum hourly permit rate if no CEMS), (129.202(c)(2), 129.204(b))	No limit identified
Gas-fired Simple Cycle Turbines	55 ppmvd (24-hr average by CEMS; average of three 1-hr tests by stack test); 0.15 (non-ozone season average), (RCSA section 22a-174-22(e) Table 22-1, -22(e)(3), -22(k)(1), -22(k)(4))	42 ppm (1-hr average), (Regulation 12 Table II)	No limit identified	No limit identified	1.00 lb/MWh (Calendar day over ozone season, 30-day over non-ozone season if CEMS, average of three 1-hr stack tests if no CEMS), (7:27-19.5 TABLE 7, 7:27-19.15(a))	50 ppmvd (1-hr average unless CEMS (24-hr average)), 227-2.4(e))	0.17 (1 year average emission rate or maximum hourly permit rate if no CEMS), (129.202(c)(2), 129.204(b))	No limit identified
Lean burn oil-fired engines	8 gm/bk hp-hr (24-hr average by CEMS; average of three 1-hr tests by stack test), (RCSA section 22a-174-22(e) Table 22-1, -22(k)(1), -22(k)(4))	No limit identified	No limit identified	No limit identified	2.3 grams/Bhp-hr (Calendar day over ozone season, 30-day over non-ozone season if CEMS, average of three 1-hr stack tests if no CEMS), (7:27-19.8 TABLE 10, 7:27-19.15(a))	2.3 grams/Bhp-hr (1-hr average unless CEMS (24-hr average)), (227-2.4(f))	2.3 grams/Bhp-hr (1 year average emission rate or maximum hourly permit rate if no CEMS), (129.203(c)(2), 129.204(b))	9.0 grams/bhp-hr (1-hr average), (Regulation 27.4.3, 27.5.5)

Based on the comparison of Connecticut's NOx emissions limitations with those in other states as set out in **Table 7**, reductions in the emissions limitations of RCSA section 22a-174-22 are necessary, likely in conjunction with an elimination or adjustment of the NOx credit trading program, so that Connecticut's boilers, turbines and engines are controlled to a RACT level with respect to the 2008 ozone NAAQS.

The use of emissions trading to comply with RCSA section 22a-174-22 initially allowed for more stringent emission limits that resulted in significant system-wide reductions. Recognizing this benefit, DEEP offered emissions trading as a compliance mechanism in RCSA section 22a-174-22 beginning in 1995. Some emissions units use credits to comply with the emissions limitations because the units cannot operate in compliance. However, several units at Bridgeport Harbor Station, Middletown Power LLC, Montville Power LLC and Pfizer Inc. have over-controlled and/or burn lower emitting fuels, which allows these sources to generate credits. While the combination of emissions limits and trading initially lead to significant system-wide emission reductions throughout Connecticut in 1995, the efforts to "over-control" to generate credits are now merely RACT in many other states. DEEP must therefore consider elimination of the single source emissions trading program, as well as more stringent emission limits, to meet current RACT levels and realize additional reductions in Connecticut emissions.

DEEP commits to begin a review of NOx emissions and emissions controls for the sources now subject to RCSA section 22a-174-22 with the goal of developing changes to RCSA section 22a-174-22 sufficient to satisfy RACT under the 2008 ozone NAAQS. The evaluation and regulation development will be performed in conjunction with a stakeholder workgroup and will commence in 2014. To address emissions on HEDD and to provide a long planning horizon, DEEP may also consider beyond RACT requirements, particularly to address emissions over short timeframes as opposed to a 30-day average or ozone season average requirement. DEEP would seek to move such an amendment or replacement regulation adoption through the regulatory adoption process to allow for adoption by December 31, 2016.

V. Conclusion

Connecticut's programs to reduce NOx and VOC emissions are being implemented successfully, resulting in reduced emissions throughout the state and available to be transported downwind. DEEP continues to take action to develop local and regional control measures and influence national strategies to further reduce ozone levels as necessary to attain and maintain the 2008 8-hour ozone NAAQS and to address the ozone NAAQS expected in 2015.

Based on emissions statements submitted by Connecticut's Title V sources in 2013, municipal waste combustors and EGUs together are responsible for more than 70% of the stationary source NOx emissions in Connecticut. DEEP acknowledges that emissions limitations required of these sources in other states are more stringent than those now required in Connecticut. DEEP has committed in this document to evaluate additional NOx reductions appropriate to fuel-burning sources now regulated under RCSA section 22a-174-22 and additional NOx emissions reductions from the municipal waste combustors regulated by RCSA section 22a-174-38, and to work to adopt regulatory requirements, as may be appropriate, based on the results of the evaluation. With regard to the control of VOC emissions, all of Connecticut's CTG sources and major non-CTG sources are now controlled by RACT or better controls, and Connecticut's RACT requirement has been satisfied for these source categories for the 8-hour ozone NAAQS.