6560-50-P

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 52

[EPA-R01-OAR-2009-0469; A-1-FRL-9846-7]

Approval and Promulgation of Implementation Plans; Connecticut; Control of Visible Emissions, Record Keeping and Monitoring

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule.

SUMMARY: EPA is proposing to approve State Implementation Plan (SIP) revisions submitted by the State of Connecticut on December 1, 2004. Specifically, EPA is proposing to approve revisions to Connecticut's visible and particulate-matter (PM) emissions, record keeping and monitoring regulations. These revised rules establish and require limitations on visible and PM emissions for stationary sources, and clarify reporting requirements for operation of air-pollution-control and monitoring equipment. EPA is proposing approval of this SIP revision because the state has adequately demonstrated that it will not interfere with attainment or maintenance of the national ambient air quality standards (NAAQS) in Connecticut or any other applicable requirements of the Clean Air Act.

This action is being taken in accordance with the Clean Air Act (CAA).

DATES: Written comments must be received on or before [insert date 30 days after date of publication in the Federal Register].

ADDRESSES: Submit your comments, identified by Docket ID Number EPA-R01-OAR-2009-0469 by one of the following methods:

1. **www.regulations.gov**: Follow the on-line instructions for submitting comments.
2. E-mail: arnold.anne@epa.gov
3. Fax: (617) 918-0047.
4. Mail: "Docket Identification Number EPA-R01-OAR-2009-0469," Anne Arnold, U.S. Environmental Protection Agency, EPA New England Regional Office, 5 Post Office Square, Suite 100 (mail code: OEP05-2), Boston, MA 02109-3912.
5. Hand Delivery or Courier. Deliver your comments to: Anne Arnold, Manager, Air Quality Planning Unit, Office of Ecosystem Protection, U.S. Environmental Protection Agency, EPA New England Regional Office, 5 Post Office Square, Suite 100, Boston, MA 02109-3912. Such deliveries are only accepted during the Regional Office's normal hours of operation. The Regional Office's official hours of business are Monday through Friday, 8:30 to 4:30, excluding legal holidays.

Instructions: Direct your comments to Docket ID No. EPA-R01-OAR-2009-0469. EPA's policy is that all comments received will be included in the public docket without change and may be made available online at www.regulations.gov, including any personal information provided, unless the comment includes information claimed to be Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Do not submit through www.regulations.gov or e-mail, information that you consider to be CBI or otherwise protected. The www.regulations.gov website is an "anonymous access" systems, which means EPA will not know your identity or contact information unless you provide it in the body of your

comment. If you send an e-mail comment directly to EPA without going through www.regulations.gov, your e-mail address will be automatically captured and included as part of the comment that is placed in the public docket and made available on the Internet. If you submit an electronic comment, EPA recommends that you include your name and other contact information in the body of your comment and with any disk or CD-ROM you submit. If EPA cannot read your comment due to technical difficulties and cannot contact you for clarification, EPA may not be able to consider your comment. Electronic files should avoid the use of special characters, any form of encryption, and be free of any defects or viruses. For additional information about EPA's public docket visit the EPA Docket Center homepage at http://www.epa.gov/epahome/dockets.htm.

Docket: All documents in the electronic docket are listed in the www.regulations.gov index. Although listed in the index, some information is not publicly available, i.e., CBI or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the Internet and will be publicly available only in hard copy form. Publicly available docket materials are available either electronically in www.regulations.gov or in hard copy at Air Quality Planning Unit, Office of Ecosystem Protection, U.S. Environmental Protection Agency, EPA New England Regional Office, Office of Ecosystem Protection, Air Quality Planning Unit, 5 Post Office Square--Suite 100, Boston, MA. EPA requests that if at all possible, you contact the person listed in the **FOR FURTHER INFORMATION CONTACT** section to schedule your inspection. The Regional Office's official hours of business are Monday through Friday, 8:30 to 4:30, excluding legal holidays.

FOR FURTHER INFORMATION CONTACT: Alison C. Simcox, Air Quality Planning Unit, U.S. Environmental Protection Agency, EPA New England Regional Office, Office of Ecosystem Protection, Air Quality Planning Unit, 5 Post Office Square - Suite 100, (Mail code OEP05-2), Boston, MA 02109 - 3912, telephone number (617) 918-1684, fax number (617) 918-0684, email simcox.alison@epa.gov.

In addition to the publicly available docket materials available for inspection electronically in the Federal Docket Management System at www.regulations.gov, and the hard copy available at the Regional Office, which are identified in the **ADDRESSES** section of this Federal Register, copies of the state submittal are also available for public inspection during normal business hours, by appointment at the State Air Agency: Bureau of Air Management, Department of Energy and Environmental Protection, State Office Building, 79 Elm Street, Hartford, CT 06106-1630.

SUPPLEMENTARY INFORMATION:

Throughout this document whenever ‘‘we,’’ ‘‘us,’’ or ‘‘our’’ is used, we mean EPA.

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I. What should I consider as I prepare my comments for EPA?

When submitting comments, remember to:

1. Identify the rulemaking by docket number and other identifying information (subject heading, Federal Register date, and page number).
2. Follow directions - EPA may ask you to respond to specific questions or organize comments by referencing a Code of Federal Regulations (CFR) part or section number.
3. Explain why you agree or disagree; suggest alternatives and substitute language for your requested changes.
4. Describe any assumptions and provide any technical information and/or data that you used.
5. If you estimate potential costs or burdens, explain how you arrived at your estimate in sufficient detail to allow for it to be reproduced.
6. Provide specific examples to illustrate your concerns, and suggest alternatives.
7. Explain your views as clearly as possible, avoiding the use of profanity or personal threats.

8. Make sure to submit your comments by the comment period deadline identified.

II. What is the background for the proposal?

Visible emissions, also known as "opacity," provide a measure of the degree to which stack emissions from a stationary source (such as a power plant) reduce the transmission of light and obscure the view of an object in the background. See 40 CFR 60.2. In general, the more opaque the particles that pass through an emissions point, the more light that will be blocked, thus increasing the opacity percentage. Although opacity is not a criteria pollutant and there can be uncertainty in the relationship between opacity and the mass of particulate matter from a stack emission at any given source, opacity standards continue to be used as an indicator of the effectiveness of emission controls for PM emissions and to help implement and enforce emission standards for purposes of attaining the PM NAAQS. Connecticut, like many other states, has rules that limit opacity levels of emissions from certain sources to reduce pollutant releases.

Connecticut first adopted regulations to limit visible and PM emissions from stationary sources, including electric generating units (EGUs) and boilers, in the early 1980s. In 1981, EPA approved Regulations of Connecticut State Agencies (RCSA) Section 19-508-18, "Control of particulate emissions," into the Connecticut SIP (47 FR 41958). Section 19-508-18 has since been recodified as RCSA Section 22a-174-18.

In 2003, the Connecticut Department of Environmental Protection (now the Connecticut Department of Energy and Environmental Protection or CT DEEP) proposed revisions to Section 22a-174-18 "Control of particulate matter and visible emissions" (herein called the "visible

emissions regulation") to address short-term excursions from maximum allowed opacity levels that may occur and be measured at some stationary sources with continuous opacity monitoring systems (COMS)[1] during periods of startup, shutdown, stack testing, soot-blowing, fuel switching or sudden load changes. Facilities covered under the new exceptions in Section 22a-174-18 (j) include only those facilities that operate COMS.

In 2003, CT DEEP also proposed revisions to several other RCSA Sections, including 22a-174-4, "Source Monitoring, record keeping, reporting and authorization of inspection of air pollution sources" (codified as RCSA Section 19-508-4 in the Connecticut SIP, and herein called the "record keeping regulation"), and 22a-174-7, "Air pollution control equipment and monitoring equipment operation" (codified as RCSA Section 19-508-7 in the Connecticut SIP, and herein called the "monitoring regulation"). CT DEEP held a public hearing on revisions to these three (as well as several other) regulations, on April 29, 2003. Subsequently, CT DEEP amended its visible emissions, record keeping, and monitoring regulations based on comments received from EPA and others, with an effective date of April 1, 2004.

On December 1, 2004, CT DEEP submitted the revised regulations to EPA for inclusion in the Connecticut SIP. This submittal included a provision providing exceptions from maximum opacity levels for startup, shutdown, stack testing, soot-blowing, fuel switching or sudden load changes, and malfunctions of stationary sources with COMs (Section 22a-174-18(j)(1)). However, on July 8, 2013, CT DEEP sent a letter to EPA withdrawing Section 22a-174-18(j)(1) to the extent that it applies to malfunctions.

[1] CT regulations use the term "opacity continuous emissions monitoring systems" or "Opacity CEMS." However, EPA and others commonly refer to these monitors as "continuous opacity monitoring systems" or "COMS." Throughout this notice, we use the more common term "COMS."

Today's action addresses RCSA Sections 22a-174-4, 22a-174-7, and 22a-174-18. CT DEEP's December 1, 2004 SIP submittal also included three additional regulations. EPA has already taken action on these rules. Specifically, Section 22a-174-3b "Exemptions from permitting for construction and operation of external combustion units, automotive refinishing operations, emergency engines, nonmetallic mineral processing equipment and surface coating operations," Section 22a-174-30 "Dispensing of gasoline/Stage I and Stage II vapor recovery," and Section 22a-174-43 "Portable fuel container spillage control" were approved into the Connecticut SIP on August 31, 2006 (71 FR 51761).

After reviewing CT DEEP's December 1, 2004 SIP submittal for Sections 22a-174-4, 22a-174-7, and 22a-174-18 (including clarifying letters demonstrating consistency with 110(l) of the CAA and withdrawal of an exception provision for malfunctions), EPA is proposing to approve the Connecticut SIP revision for RCSA Sections 22a-174-4, 22a-174-7, and 22a-174-18 without the withdrawn portion, and is soliciting public comments on the issues discussed in this notice or on other relevant matters. These comments will be considered before taking final action. Interested parties may participate in the federal rulemaking procedure by submitting written comments to the EPA New England Regional Office listed in the **ADDRESSES** section of this Federal Register.

III. Summary of Connecticut's SIP Revision.

On December 1, 2004, CT DEEP submitted to EPA amendments to 22a-174-4 (record keeping), 22a-174-7 (monitoring) and 22a-174-18 (visible and PM emissions). Revisions to the

record keeping and monitoring regulations clarify and improve enforceability of requirements currently in the Connecticut SIP. For example, revised 22a-174-4 includes specific data availability requirements and revised 22a-174-7 includes explicit, specific time frames for various notifications (such as "no later than two business days"), as compared to prior requirements to notify the state "promptly."

Connecticut's revised visible and PM emissions regulation also contains new provisions concerning the emission limits applicable to sources, including alternative emission limits applicable to some sources during certain modes of source operation.

The state's pre-2004 regulation, which is currently in the Connecticut SIP (Section 19-508-18), prohibits stationary sources from emitting pollutants with more than 20 percent opacity at all times, except for up to five (5) aggregate minutes in a 60-minute period, during which emissions can have up to 40 percent opacity. The current regulation contains no impermissible exemptions for excess emissions during startup, shutdown, malfunction or other periods. The state's revised rule (Section 22a-174-18) includes new time-averaged opacity standards with specified compliance determination methods for sources both with and without COMs, and an alternative compliance option for sources that use COMs. The alternative compliance option provides an alternative emission limit applicable during certain modes of source operation.

For sources both with and without COMs, the revised regulation limits opacity to 20 percent during any 6-minute block average or to 40 percent during any one-minute block average (Section 22a-174-18(b)(1) and (2)). For sources without COMs, compliance with these limits is

determined using EPA's Reference Method 9, which is a standardized EPA method for visual determination of the opacity of emissions from stationary sources.

For sources with COMs, the revised regulation includes an alternative emission limit during periods of startup, shutdown, stack testing, soot-blowing, fuel switching or sudden load change (Section 22a-174-18(j)(1)). During these periods, emissions can have up to 60 percent opacity during any 6-minute block average. However, the period of time that the alternative emission limit can be used by the source cannot exceed one-half of one percent (0.5 percent) of a facility's total operating hours during any calendar quarter. In other words, the maximum time that the alternative emission limit can be used is slightly less than 11 hours under the scenario of a facility operating continuously for a three-month period. RCSA Section 22a-174-4, which is also proposed for approval herein, contains recordkeeping and reporting requirements that serve to ensure that records are available to provide evidence that elevated opacity occurs during specified modes of source operation, and that elevated opacity is restricted on a calendar quarter basis.

Connecticut's revised regulation also includes a new provision (Section 22a-174-18(j)(2)) that excludes emission sources that are separately subject to additional visible emissions standards under existing federal New Source Performance Standards (NSPS) set forth in 40 CFR 60 from the Section 22a-174-18 visible emissions standards. We considered the various NSPS applicable to these types of sources. The most relevant for today's discussion are the NSPS for boilers. In Connecticut, boilers subject to NSPS are mainly boilers subject to Subparts Db and

Dc.[2] During normal operating conditions, these NSPSs provide visible emission standards generally more stringent than Section 22a-174-18, limiting opacity to 20 percent (6-minute average), except for one 6-minute period per hour of not more than 27 percent opacity. See 40 CFR 60.43b(f) and 60.43c(c). However, these existing NSPSs include exemptions for emissions during periods of startup, shutdown, or malfunction. See 40 CFR 60.43b(g) and 60.43c(d). It should be noted that these existing exemptions do not include other modes of source operation, such as stack testing, soot blowing, fuel switching, or sudden load change. Accordingly, the opacity limits of these NSPS continue to apply during such periods.

PM emission standards currently in the Connecticut SIP (Section 19-508-18(d)) include limits of 0.10 pounds per million British thermal unit (lb/MMBtu) of heat input for stationary sources requiring a permit. Sources requiring permits are those with potential emissions of 15 tons per year (tpy) or more of any individual air pollutant. For smaller boilers that are required to register under Connecticut General Statute Chapter 540 Sec. 29-241 ("registration sources"), PM emission standards were 0.14 lb/MMBtu for sources burning residual oil and 0.20 lb/MMBtu for all other registration sources. The state's revised rule (Section 22a-174-18) retains the PM standard of 0.10 lb/MMBtu for sources requiring a permit, but tightens the PM standards from 0.20 to 0.12 lb/MMBtu for registration sources that burn distillate oil (no. 2 oil), and from 0.20 to 0.10 lb/MMBtu for registration sources that burn natural gas.

EPA's review of the SIP submittal indicates that all concerns that EPA has thus far expressed to CT DEEP about revisions to the state's visible and PM emissions, record keeping,

[2] EPA is unaware of any boilers in Connecticut that meet the applicability criteria for Subpart Da, nor any incinerators subject to Subparts Ea, Eb, or Ec.

and monitoring regulations have been adequately addressed. Most of the concerns that EPA expressed were in regard to the visible emissions regulation, especially Section 22a-174-18(j), which provides exceptions from maximum opacity levels for stationary sources with COMS. To address these concerns, CT DEEP submitted a clarifying letter to its SIP submittal, which is discussed below, demonstrating that revisions to its visible emissions regulation are consistent with section 110(l) of the CAA, and withdrew Section 22a-174-18(j)(1) to the extent that it applies to malfunctions. See letter to EPA dated July 8, 2013, available in the docket for today's action.

In the process of reviewing Connecticut's SIP revision and the addenda, EPA also considered other issues pertaining to the visible emissions regulation, including its relationship to EPA's recently proposed revisions to its policy regarding limits applicable during startup, shutdown, and malfunction.

IV. What is EPA's analysis of Connecticut's submittal?

On December 1, 2004, CT DEEP submitted revisions to its visible and PM emissions (Section 22a-174-18), record keeping (22a-174-4), and monitoring (22a-174-7) regulations. As previously noted, the record keeping and monitoring revisions clarify and improve enforceability of requirements currently in the Connecticut SIP. However, revisions to the visible and PM emissions regulation include new provisions that provide an alternative emission limit for maximum opacity levels for stationary sources with COMs during certain modes of source operation, and also excludes certain existing sources that are subject to NSPS visible-emissions standards from the SIP's visible-emissions standards. CT DEEP submitted a clarifying letter to

its SIP submittal to demonstrate that these provisions are consistent with section 110(l) of the CAA. As described below, EPA reviewed the SIP submittal, which includes the letter, and is proposing to find that it is consistent with section 110(l) of the CAA.[3]

The analysis below discusses the anti-backsliding provisions of CAA Section 110(l), since, as mentioned above, a previous version of the visible and PM emissions rule has already been approved into the Connecticut SIP. Section 193 of the CAA is not discussed because the entire State of Connecticut is attaining the 1997 and 2006 NAAQS for particulate matter.[4] On July 19, 2013, EPA proposed to redesignate New Haven and Fairfield Counties to attainment for the 1997 annual and 2006 24-hour fine particle ($PM_{2.5}$) NAAQS (78 FR 43096). EPA intends to finalize the redesignation action prior to taking final action on this proposal.

Section 110(l) of the CAA states: "The Administrator shall not approve a revision of a plan if the revision would interfere with any applicable requirement concerning attainment and reasonable further progress (as defined in section 171), or any other applicable requirement of this Act." EPA interprets section 110(l) to apply to all requirements of the CAA and to all areas of the country, whether attainment, nonattainment, unclassifiable, or maintenance for one or more of the six criteria pollutants. EPA interprets section 110(l) to require a basis for concluding that the SIP revision will not interfere with attainment or maintenance of the NAAQS for all criteria pollutants whose emissions and/or ambient concentrations may change as a result of the SIP revision. For areas designated as attainment for the relevant criteria pollutants, EPA believes

[3] Please note that our Section 110(l) analysis draws upon, but is not identical to, the analysis presented in CT DEEP's letter.

[4] Connecticut is designated as nonattainment under the 2008 ozone NAAQS, but additional periods of higher opacity as a result of the SIP revision are not expected to result in increases of ozone precursors.

it is appropriate to allow states to demonstrate that a SIP will not interfere with maintenance of the NAAQS by showing that, taking into consideration the change in emissions levels allowed under the SIP revision, there is a substantial margin of safety (i.e., "headroom" or "cushion of compliance") between ambient concentrations and the applicable NAAQS.

Alternatively, a state can show that a SIP revision will not interfere with attainment or maintenance of the NAAQS by demonstrating that the revision will not allow for an increase in emissions into the air over what is allowed under the existing EPA-approved SIP, taking into consideration SIP-approved measures that represent new emissions reductions achieved in a contemporaneous time frame to the change represented by the SIP revision. In addition to being contemporaneous, the emissions reductions must also be permanent and enforceable. States may also be able to demonstrate noninterference through alternative approaches, such as air quality analyses. For example, a maintenance plan may demonstrate that a control measure is no longer needed to maintain compliance with the NAAQS.

We evaluated CT DEEP's Section 110(l) demonstration to ensure that revisions to the state's visible and PM emissions regulation (Section 22a-174-18) will not interfere with attainment or maintenance of PM air quality standards, or any other applicable requirements of the CAA, as required by section 110(l) of the CAA. Our analysis, as set forth below, consists of several parts.

First, we consider (although we do not quantify precisely) potential emissions increases that could result from CT DEEP's revised regulation. These increases represent, very roughly,

potential increases attributable to the relaxed alternative opacity limit, plus potential increases attributable to removing NSPS-subject sources from SIP opacity standards, minus other reductions within the rule itself (e.g., the tighter PM standards in some circumstances).

Second, we discuss recent data regarding emissions inventories and ambient air quality to demonstrate that Connecticut's emissions have declined substantially in recent years, and that its present air quality is well below the federal primary and secondary PM NAAQS. As part of this discussion, we describe certain regulations that EPA has approved into the Connecticut SIP and, therefore, result in permanent, federally enforceable emissions reductions. Our purpose in discussing these regulations is to support our analysis regarding current statewide inventories and air quality.

Our analysis demonstrates that the current, relatively low emissions inventories are not solely attributable to non-regulatory factors (e.g., economic changes), but rather are, in significant part, attributable to the permanent, enforceable reductions achieved by Connecticut's SIP and other federal CAA programs. The combination of these three facts—that Connecticut's direct and precursor $PM_{2.5}$ emissions have been reduced, that these reductions are largely permanent reductions attributable to federally enforceable CAA measures (including SIP requirements), and that the measured ambient $PM_{2.5}$ concentrations are well below the NAAQS—persuade us that the weight of evidence shows that Connecticut's SIP has a sufficient margin of safety. In other words, even if overall emissions do increase as a result of this revision, this increase will not interfere with maintenance of the PM NAAQS.

Third, we discuss CAA Section 110(a)(2)(A)'s requirement for "enforceable emission limitations" in SIP provisions, which Section 302(k) defines as limiting emissions "on a continuous basis." EPA has longstanding guidance for SIP provisions that pertain generally to emissions during startup, shutdown, and malfunction. CT DEEP's revision raises three subcategories of issues potentially relevant here. First, we discuss each of the seven criteria EPA recommends for the SIP provision that provides for an alternative emission limit during specific modes of source operation, such as startup and shutdown, to meet CAA SIP requirements, and why we believe that CT DEEP's revision is consistent with these criteria. Second, we very briefly discuss an alternate limit for malfunction that was contained in CT DEEP's original submission, that has since been withdrawn from consideration. Third, we discuss some unique issues regarding Section 22a-174-18(j)(2), and why our approval of this provision—which exempts sources subject to NSPS opacity standards from the current EPA-approved SIP-based opacity standard— is not inconsistent with CAA requirements applicable to SIP provisions.

Fourth, we discuss why CT DEEP's revision will not interfere with Regional Haze requirements. Our analysis here is very similar to that in the first and second sections. We discuss Connecticut's Regional Haze plan and its modeled reductions and the "compliance cushion" available, and explain why, overall, potential increases from the alternative emission limit and the exclusion of certain sources from the current SIP opacity standards in CT DEEP's revised regulation will not interfere with Regional Haze requirements.

A. Potential emissions increases attributable CT DEEP's revised regulation

In this section, we discuss (although we do not quantify precisely) potential emissions increases that could result from CT DEEP's revised regulation. These increases represent potential increases attributable to the relaxed alternative emission limit, plus potential increases attributable to removing NSPS-subject sources from SIP opacity standards, minus other reductions within the rule itself (e.g., the tighter PM standards in some circumstances).

Emissions from sources with COMS

CT DEEP looked at the current operating status of 20 units for which the alternative emission limit during certain modes of source operation (Section 22a-174-18(j)(1)) was developed.[5] As shown in Table 1 below, since adoption of the revised regulation, eight of the 20 units have been permanently removed from service. CT DEEP revoked registrations for the five Pratt and Whitney Units at the Andrew Willgoos Turbine Lab in East Hartford in 2004 and 2005. The status of these units as inoperable was verified by a field inspector. Pfizer rendered Boiler No. 8 inoperable and CT DEEP revoked the New Source Review (NSR) permit (no. 070-0001) on October 7, 2008. The shutdown of Boiler No. 8 is also included on Consent Order No. 8314. At Devon Station, CT DEEP revoked registrations for two utility boilers (nos. 7 and 8) in 2008. An inspection of the premises conducted by CT DEEP on May 13, 2008 verified that the units were inoperable.

[5] These units are not subject to NSPSs with opacity standards, and are therefore not eligible for the exemption in Section 22a-174-18(j)(2).

Table 1. Original 20 units with COMS. Operations before 2004 compared with current conditions.

Source/Unit	Town/County	Pre-2004 Fuel	Current Operating Status & Fuel	Air Pollution Control
Devon Station #7	Milford/ New Haven	Residual Oil/Natural Gas (NG)	Unit retired	N/A
Devon Station #8	Milford/ New Haven	Residual Oil/NG	Unit retired	N/A
Norwalk Station #1	Norwalk/ Fairfield	Residual Oil	Operating Residual Oil	Electrostatic Precipitator Selective Non-catalytic Reduction
Norwalk Station #2	Norwalk/ Fairfield	Residual Oil	Operating Residual Oil	Electrostatic Precipitator Selective Non-catalytic Reduction
Middletown Station #2	Middletown/ Middlesex	Residual Oil/NG	Operating NG/Residual Oil	Electrostatic Precipitator Overfire Air
Middletown Station #3	Middletown/ Middlesex	Residual Oil/NG	Operating NG/Residual Oil	Electrostatic Precipitator Water Injection Selective Non-catalytic Reduction
Middletown Station #4	Middletown/ Middlesex	Residual Oil	Operating Residual Oil	Best Engineering Practices: optimizing fuel-to-air ratio
Montville Station #5	Montville/ New London	Residual Oil/NG	Operating Residual Oil/NG	Electrostatic Precipitator
Montville Station #6	Montville/ New London	Residual Oil	Operating Residual Oil	Best Engineering Practices: optimizing fuel-to-air ratio
Bridgeport Harbor #2	Bridgeport/ Fairfield	Residual Oil	Operating Residual Oil	Electrostatic Precipitator
Bridgeport Harbor #3	Bridgeport/ Fairfield	Coal/Oil	Operating Adaro Coal/ Residual Oil	Adaro Coal Electrostatic precipitator Activated carbon injection Pulse jet fabric filter baghouse Low NOx Burner Technology w/ Separated Overfire Air
New Haven Harbor #1	New Haven/ New Haven	Residual Oil/NG	Operating Residual Oil/NG	Electrostatic Precipitator Overfire Air Flue Gas Recirculation Waterwall Lances Low NOx Burners
Pfizer #5	Groton/ New London	Residual Oil/NG	Operating by Order can only combust NG	Low NOx burner Flue Gas Recirculation
Pfizer #8	Groton/ New London	Residual Oil	Unit rendered permanently inoperable	N/A
Fusion Paperboard	Sprague/	NG/Residual Oil	Operating	Low NOx Burner Technology

PFI Boiler	New London		NG/Residual Oil	(Dry Bottom only)
Pratt & Whitney Willgoos Labs Units 2-6	E. Hartford/ Hartford	Residual Oil	All 5 units removed	N/A

Moreover, three of the units (Middletown Station no. 2 and 3 and Pfizer no. 5) have changed their primary fuel from residual oil to natural gas, resulting in a reduction in emissions of $PM_{2.5}$ and $PM_{2.5}$ precursors. On April 26, 2010, CT DEEP issued a consent order (No. 8306; included in docket for today's action) to NRG Energy, Inc., which included their Middletown facility. The order contains an ozone-season (May 1st through September 30th each year) restriction (Paragraph B.6) that, depending on fuel availability and supply, requires NRG facilities to burn the lowest NOx-emitting fuel possible. NRG can trade to meet the seasonal limit, but to minimize use of Discrete Emission Reduction Credits (DERCs), it is typically in NRG's best interest to burn natural gas as often as possible. Each DERC is equivalent to 1 ton of NOx emissions and may be used for emissions trading in accordance with Connecticut regulations. For the non-ozone season, SIP-approved Section 22a-172-22 (described in more detail below) sets a seasonal emission limit of 0.15 lb/MMBtu for sources in the NOx Budget Program (described in more detail below). In sum, although use of natural gas is not a permanent and enforceable requirement for the two Middletown units, a combination of requirements make it likely that this is, and will remain, the fuel of choice.

On May 4, 2012, CT DEEP issued a consent order to Pfizer Inc. (No. 8314; included in docket for today's action), which contains an enforceable provision (paragraph B.1.) requiring Pfizer to combust only natural gas in boiler 5.

For purposes of examining potential emissions increases from Section 22a-174-18(j)(1), we focus on the remaining nine facilities. Emissions at these sources during startup and shutdown can only be roughly characterized because the time it takes to "warm up" a given unit depends on whether it is a single-cycle or combined-cycle unit, and on the make and model of the unit. Emissions also depend on whether the startup is a cold, warm, or hot startup, with higher emissions levels and longer startup times generally associated with cold startups. In addition, because emissions during startup periods are not steady-state emissions, they tend to be more variable than under steady-state operation. Although Section 22a-174-18(j)(1) authorizes emissions levels to be higher during startup, shutdown, stack testing, soot-blowing, fuel switching or sudden load changes, the regulation also imposes a strict limit on the amount of time that the alternative emission limit can apply (less than 11 hours during any calendar quarter). Revisions to Section 22a-174-4 provide recordkeeping and reporting requirements that serve to ensure that sources use the alternative emission limit only during appropriate modes of operation and for the requisite time per quarter. Moreover, revisions to Section 22a-174-18 reduces potential PM emissions by tightening PM standards for units that burn natural gas. These tightened PM standards apply at all times.

Additionally, Section 22a-174-18(j)(2) exempts facilities that are subject to an NSPS visible emissions standard from the Connecticut SIP's visible emissions standards. Like the non-NSPS facilities in Table 1, NSPS facilities are expected to have higher emissions during startup, shutdown, and malfunctions.[6] These higher emissions can only be roughly characterized because

[6] We discuss later the fact that certain older NSPS subparts exempt visible emissions during malfunctions, and the implications of this for approval of Connecticut's SIP revision. For now, the point is only to characterize possible emissions increases that could result from approval of the revision.

of differences in the make, model, and operation of the combustion units, as previously discussed. On the other hand, the SIP revision may reduce PM emissions from NSPS-subject facilities that are also subject to the PM emissions standards of Section 22a-174-18(e)(2). As noted before, the revision tightens the PM standards for registration sources that burn distillate oil from 0.20 lb to 0.12 lb/MMBtu, and the SIP's PM standards apply at all times. In contrast, for example, NSPS Subpart Db's PM emissions standard for oil-burning units is 0.10 lb/MMBtu, but with an exemption for startup, shutdown, and malfunction. While the NSPS provides a more stringent steady-state PM emissions limit, Connecticut's SIP has provided a PM emissions limit that applies at all times, including startup, shutdown, or malfunction, and this revision tightens that limit. Sources must comply with all limits that apply during a given time. Again, because of differences in the make, model, and operation of the combustion units, it is difficult to characterize the extent to which a source could increase its PM emissions due to the higher opacity limit without violating the reduced PM emissions limit.

Neither the state nor EPA has attempted to quantify the exact increase in PM emissions that could be allowed under this SIP revision. However, taking into consideration the universe of sources subject to the revised opacity standard, the fuels and emissions limits applicable to those sources (including those that are more stringent under the revision), and nature of the alternative emission limit (which only allows an increase from 40% to 60% opacity during certain modes of source operation with a limit of just under 11 hours per quarter), EPA believes that while there may be an increase in PM emissions associated with this SIP revision, any such increase would be small.

B. Emissions inventories and ambient air quality analysis.

Connecticut's statewide emissions inventories have declined substantially in recent years. These reductions are in large part attributable to federally enforceable CAA measures, some of which we summarize. These measures have resulted in decreases in ambient pollutant concentrations that, as we explain below, provides an adequate "compliance cushion" below the NAAQS.

For example, Table 2 shows the decline in emissions of SO_2 and NO_x for point sources (and other sectors) between 2002 and 2007 for Fairfield and New Haven Counties.[7] The table appears to show an increase in point-source $PM_{2.5}$ between 2002 and 2007. However, this increase most likely reflects a change in the method used to estimate $PM_{2.5}$ emissions rather than a true increase in $PM_{2.5}$. The 2002 estimates include only primary (or filterable) $PM_{2.5}$, whereas the 2007 estimates also include condensable emissions. EPA agrees with CT DEEP that estimates for 2002 would likely be higher if the condensable portion of $PM_{2.5}$ was included.

Table 2. Change in Actual Emissions 2002 to 2007 for the Connecticut Portion of the NY/NJ/CT $PM_{2.5}$ Nonattainment Area (Fairfield and New Haven Counties)*

$PM_{2.5}$	2002 (tons)	2007 (tons)	Change 2002-2007 (tons)
Point	392.8	456.7	63.9
Area	4,775.7	3,891.8	-883.9
Onroad	487.2	794.0	306.8
Nonroad	949.9	970.5	20.6
Total	**6,605.6**	**6,113.0**	**-492.6**

SO_2	2002 (tons)	2007 (tons)	Change 2002-2007 (tons)

[7] The focus here on Fairfield and New Haven Counties is because they are the only two counties in Connecticut that were designated nonattainment for the $PM_{2.5}$ standards. All other counties were designated attainment for the $PM_{2.5}$ standards.

Point	10,582.4	4,344.3	-6,238.1
Area	5,800.5	7,625.0	1,824.5
Onroad	753.1	176.1	-577.0
Nonroad	1,363.4	1,470.7	107.3
Total	**18,499.4**	**13,616.1**	**-4,883.3**

NO_x	2002 (tons)	2007 (tons)	Change 2002-2007 (tons)
Point	6,196.8	5,606.2	-590.6
Area	6,070.8	6,024.9	-45.9
Onroad	31,854.4	23,391.6	-8,462.8
Nonroad	14,985.8	15,316.3	330.5
Total	**59,107.8**	**50,339.0**	**-8,768.8**

*2002 emissions are from CT DEEP's November 2008 $PM_{2.5}$ NAAQS Attainment Demonstration. 2007 emissions are from CT DEEP's June 2012 Redesignation Request and Maintenance Plan SIP submission.

Monitored $PM_{2.5}$ levels

Significantly, monitored levels of $PM_{2.5}$ have declined since April 1, 2004, when the revision of Section 22a-174-18 became effective.[8] As shown in Table 3, air quality design values (DVs) for Fairfield and New Haven Counties, the two counties proposed for redesignation to attainment and at most risk of future $PM_{2.5}$ nonattainment, are well below the 1997 annual $PM_{2.5}$ NAAQS of 15 $\mu g/m^3$ and the 2006 24-hour $PM_{2.5}$ NAAQS of 35 $\mu g/m^3$. (All other Connecticut counties were designated as attaining the 1997 and 2006 $PM_{2.5}$ standards.) Likewise, although EPA has not yet issued designations for the 2013 annual NAAQS, the design values in Table 3 indicate that recent (2009-2011) monitoring data are well below the 2013 annual NAAQS of 12 $\mu g/m^3$.

[8]This date is relevant because the state regulation's tightened PM limits became effective as a matter of state law, and it is useful to examine how it may have impacted emissions. Obviously, sources could not legally take advantage of the alternative compliance option in Section 22a-174-18(j)(1) nor the exemption for NSPS sources in Section 22a-174-18(j)(2) at this time, since these exemptions are not effective under federal law unless and until approved as a SIP revision.

Table 3. Air-Quality ($PM_{2.5}$) Design Values ($\mu g/m^3$) for Fairfield and New Haven Counties.

County	1997 annual NAAQS 2007-2009	1997 annual NAAQS 2008-2010	1997 annual NAAQS 2009-2011	2006 24-hr NAAQS 2007-2009	2006 24-hr NAAQS 2008-2010	2006 24-hr NAAQS 2009-2011
Fairfield	11.3	10.0	9.4	31	28	26
New Haven	11.4	10.3	9.6	31	29	28

Table 4. Maximum 24-Hour PM_{10} Concentration ($\mu g/m^3$) for Fairfield, Hartford, Litchfield, and New Haven Counties.

County	Max 24-hr PM_{10} ($\mu g/m^3$) 2008	Max 24-hr PM_{10} ($\mu g/m^3$) 2009	Max 24-hr PM_{10} ($\mu g/m^3$) 2010	Max 24-hr PM_{10} ($\mu g/m^3$) 2011	Max 24-hr PM_{10} ($\mu g/m^3$) 2012
Fairfield	76	45	42	33	54
Hartford	36	32	26	24	23
Litchfied	-	-	19	25	24
New Haven	63	61	56	55	39

Regarding PM_{10}, Table 4 shows the maximum 24-hour PM_{10} concentrations for all Connecticut counties with PM_{10} monitors. As shown in the table, all four counties have PM_{10} levels well below the 1997, 2006 and 2012 24-hour PM_{10} NAAQS of 150 $\mu g/m^3$. Connecticut has not recorded a 24-Hr PM_{10} concentration in excess of the 150 $\mu g/m^3$ since 1994.

In addition, emission projections from the maintenance plan for CT's redesignation request indicate that there is a substantial margin of safety that ensures maintenance of the NAAQS even if small increases in emissions were to occur (see Table 5).

Table 5. Comparison of 2007, 2017, and 2025 SO_2, NOx, and Direct $PM_{2.5}$ Emission Totals for the Southwestern CT Area (Fairfield and New Haven Counties)(in tpy)

	SO_2	NOx	$PM_{2.5}$
2007 (attainment)	13,615.9	50,339.1	6,113.0
2017 (interim)	7,909.0	29,501.3	5,029.1
2025 (maintenance)	7,783.7	24,192.2	4,741.7
2007 to 2025 (change)	-5,832.2 (-43%)	-26,146.9 (-55%)	-1,371.2 (-22%)

Furthermore, modeling analysis conducted for the Regulatory Impact Analysis (RIA) for the 2012 $PM_{2.5}$ NAAQS[9] indicates that DVs in southwestern Connecticut are expected to continue to decline through 2020. In the RIA for the 2012 $PM_{2.5}$ NAAQS, the highest annual DV projected for 2020 is 8.79 $\mu g/m^3$ for Fairfield County and 8.62 $\mu g/m^3$ for New Haven County. The highest 24-hour DV projected for 2020 is 22.27 $\mu g/m^3$ for Fairfield County and 21.78 $\mu g/m^3$ for New Haven County. Given that precursor emissions are projected to decrease through 2025, it is reasonable to conclude that monitored $PM_{2.5}$ levels in this area will also continue to decrease through 2025.

These reductions are in large part attributable to permanent, federally enforceable requirements under the Clean Air Act. These permanent and enforceable measures, which are discussed below, include RCSA Sections 22a-174-19a ("Control of sulfur dioxide emissions from power plants and other large stationary sources of air pollution"), 22a-174-22 ("Control of Nitrogen Oxide Emissions"), and 22a-174-22c ("The Clean Air Interstate Rule (CAIR) Nitrogen Oxides (NO_x) Ozone Season Trading Program").

RCSA Section 22a-174-19a

In 2000, CT DEEP adopted RCSA section 22a-174-19a and revised RCSA section 22a-174-22. These regulations now require large EGUs and industrial boilers to reduce SO_2 emissions by 30 to 50 percent and NO_x emissions by 20 to 30 percent.

[9] The "Regulatory Impact Analysis for the Proposed Revisions to the National Ambient Air Quality Standards for Particulate Matter" is available in the docket for today's rulemaking action.

Section 22a-174-19a, which became effective December 28, 2000 and has been approved into the Connecticut SIP,[10] includes a two-tiered timeframe for reducing SO_2 emissions from large EGUs and industrial sources (about 59 sources). Starting January 1, 2002, every industrial boiler or EGU subject to Connecticut's post-2002 NO_x Budget Program was required to:

- Combust liquid fuel, gaseous fuel or a combination of each, provided that each fuel possesses a fuel sulfur limit of equal to or less than 0.5 percent sulfur, by weight;
- Meet an average SO_2 emission rate of equal to or less than 0.55 lb/MMBtu for each calendar quarter for an affected unit; or
- Meet an average SO_2 emission rate of equal to or less than 0.5 lb/MMBtu calculated for each calendar quarter, if such owner or operator averages the emissions from two or more affected units at the premises.

Starting on January 1, 2003, all sources in Connecticut that are Acid Rain Sources under Title IV of the Clean Air Act and that are subject to Connecticut's Post-2002 NO_x Budget Program were required to:

- Combust liquid fuel, gaseous fuel or a combination of each, provided that each fuel possesses a fuel sulfur limit of equal to or less than 0.3 percent sulfur, by weight;
- Meet an average SO_2 emission rate of equal to or less than 0.33 lb/MMBtu for each calendar quarter for an affected unit at a premises; or
- Meet an average SO_2 emission rate of equal to or less than 0.3 lb/MMBtu calculated from two or more affected units at a premise.

[10] The final rulemaking notice approving CT's Section 22a-174-19a was signed by the Regional Administrator on April 26, 2013 but has not yet been published in the Federal Register. A copy of the signed notice is available in the docket for today's action.

Before January 1, 2005, Connecticut allowed sources subject to the January 1, 2003 emission rates to meet such emission rates by using SO_2 discrete emission reduction credits certified by CT DEEP or EPA's SO_2 Acid Rain Program allowances (also known as emissions credit trading). Connecticut General Statutes (CGS) section 22a-198 suspended SO_2 emission credit trading starting January 1, 2005.

The effectiveness of Section 22a-174-19a is detailed in Attachment X of CT DEEP's November 2009 Regional Haze SIP submittal (see docket EPA-R01-OAR-2009-0919). In that submittal, CT DEEP estimates that potential emissions from all sources statewide subject to RCSA 22a-174-19a were reduced from 89,537 tons in 2002 to 60,304 tons in 2006, a reduction of 29,233 tons.

RCSA Section 22a-174-22

Pursuant to the ozone reasonably available control technology (RACT) provisions of the 1990 Clean Air Act Amendments, CT DEEP adopted RCSA Section 22a-174-22 in 1995, achieving substantial reductions in NO_x emission rates from a variety of sources. For example, the maximum allowable NO_x emission rate for cyclone furnaces was reduced by 52 percent, the maximum allowable NO_x emission rate for existing coal-fired boilers was reduced by 58 percent, and the maximum allowable NO_x emission rate for No. 6 oil-fired boilers was reduced by 17 percent when compared to previously adopted NO_x limits. Section 22a-174-22 was approved into the Connecticut SIP on October 6, 1997. See 62 FR 52016.

CT DEEP also made revisions to Section 22a-174-22 that had a compliance date of October 1, 2003. New Section 22a-174-22(e)(3) required NO_x Budget Program sources subject to Section 22a-174-22 to meet a non-ozone seasonal NO_x emission rate of 0.15 lb/MMBtu.[11] In the first year of implementation, CT DEEP estimates that this non-ozone season limit resulted in NO_x emissions being reduced by 3,483 tons compared to 1999 emissions.

NO_X budget trading programs

Since 1999, CT DEEP has adopted several NO_x budget trading programs which have progressively reduced allowances allocated to Connecticut's NO_x Budget Program sources (i.e., EGUs 15 MW and greater and certain large industrial sources) during the ozone season (May 1 through September 30). Section 22a-174-22a limited the ozone-season NO_x emissions budget to 5,866 tons beginning in 1999. Section 22a-174-22b reduced the ozone-season NO_x budget further to 4,466 tons beginning in 2003. Sections 22a-174-22a and 22a-174-22b were superseded by Section 22a-174-22c, the CAIR NO_x Ozone Season Trading Program (approved into the Connecticut SIP in January 2008 (73 FR 4105)). The CAIR program includes a NO_x budget for Connecticut sources of 2,691 tons that is not to be exceeded during the ozone season.[12]

[11] The final rulemaking notice approving CT's Section 22a-174-22(e)(3) was signed by the Regional Administrator on April 26, 2013 but has not yet been published in the Federal Register. A copy of the signed notice is available in the docket for today's action.

[12] The status of CAIR generally, and Connecticut Section 22a-174-22c in particular, is complex and is discussed in detail at 78 FR 5158. Because Connecticut's proposal does not critically depend on CAIR or Section 22a-174-22c, it is not necessary to repeat that analysis here. For purpose of today's proposal, it suffices to note that, while CAIR has been remanded by the Court of Appeals for the District of Columbia Circuit, EPA has been ordered to continue to administer CAIR until a replacement has been developed, and that Section 22a-174-22c will remain in effect for some time.

The effectiveness of the state's NO_x budget trading programs is detailed in Attachment X of CT DEEP's November 2009 Regional Haze SIP submittal. In that submittal, CT DEEP noted that between 1994 and 2006, NO_x potential emissions from all Post-2002 NO_x Budget Program sources were reduced from 89,812 tons to 34,833 tons (a difference of 54,979 tons).

In addition to CT DEEP's demonstration that the revision of Section 22a-174-18, along with other regulations addressing SO_2 and NO_x emissions, will not interfere with attainment or maintenance of air quality standards as required by section 110(l) of the CAA, CT DEEP notes that revised Section 22a-174-18 has improved CT DEEP's ability to enforce visible-emissions requirements by identifying a standardized method for determining compliance for sources without COMS (Method 9). Notably, within six months of the effective date of the revision (April 1, 2004), CT DEEP had taken enforcement action against three sources based on submitted data from COMS. These actions were resolved by orders that required the sources to develop opacity compliance plans. Analysis by CT DEEP shows that, between 2002 and 2008, total opacity excursions and opacity excursions as a percent of operating hours dropped dramatically for these facilities.

In addition, the SIP revision requires more stringent PM emission limits for registered (i.e., non-permitted) boilers that burn distillate oil and natural gas than are required by the previously EPA-approved rule. Although NSPS boilers are specifically excluded from the opacity standards of Section 22a-174-18, they remain subject to the PM emission standards in the state's rule that apply at all times, even during periods of startup, shutdown, and malfunction.

In sum, Connecticut's monitored ambient PM concentrations are well below the NAAQS. This is attributable in large part to permanent, federally enforceable reductions of direct and precursor particulate emissions. Thus, Connecticut has a substantial "margin of safety" or "compliance cushion" such that small emissions increases would not interfere with attainment or maintenance of the NAAQS. EPA concludes that these factors, taken together, ensure that potential PM emissions increases that could result from revisions to Section 22a-174-18 will not interfere with attainment or maintenance of the PM_{10} or $PM_{2.5}$ NAAQS in Connecticut.

C. Revisions to existing opacity standards.

a. Alternative emission limitation provisions.

Section 110(a)(2)(A) requires that SIPs contain "enforceable emission limitations and other control measures, means, or techniques . . . as may be necessary or appropriate to meet the applicable requirements of [the CAA]." Section 302(k) defines the term "emission limitation" as "a requirement that limits the quantity, rate, or concentration of emissions of air pollutants on a continuous basis." For this reason, EPA interprets the CAA to preclude SIP provisions that include exemptions for emissions that occur during periods such as startup, shutdown, or malfunction. While emission limitations in SIPs must be continuous to meet CAA requirements, they do not necessarily have to be continuous at the same level during all modes of source operation. Thus, for example, it may be appropriate to establish an emission limit that allows one level of emissions during ordinary day to day source operation and a different, higher level of emissions during other specific modes of source operation, such as during startup or shutdown. All such limits, however, must meet basic CAA requirements for SIP provisions.

EPA has longstanding SIP guidance that recommends criteria relevant to development of alternative emission limits or other control measures that apply during specific modes of source operation such as startup and shutdown.[13] EPA has also recently reiterated these criteria in a proposed rulemaking relevant to its interpretation of CAA requirements applicable to SIP provisions.[14] These criteria are intended to ensure that emission limitations or other control measures or techniques in SIPs that apply during specific modes of source operation, such as startup or shutdown, are designed to minimize emissions in order to provide for attainment and maintenance of the NAAQS and meet other CAA requirements (e.g., enforceability).

Therefore, EPA will analyze the alternative emission limit established by CT DEEP in Section 22a-174-18 (j)(1) for facilities with COMS according to the specific criteria enumerated in EPA's guidance for such SIP provisions. Because the alternative emission limitation applies during startup, shutdown, stack testing, soot-blowing, fuel switching or sudden load changes, EPA will evaluate the revision with respect to these modes of source operation. Each of the seven (7) criteria is discussed below.

(1) The revision must be limited to specific, narrowly defined source categories using specific control strategies (e.g., cogeneration facilities burning natural gas and using selective catalytic reduction (SCR))

As described in IV.1 and as listed in Table 1 above, the specific source categories eligible to use the alternate emission limits under Section 22a-174-18 (j)(1) include sources (mostly EGUs) with a capacity greater than 250 MMBtu/hr that are not subject to the federal NSPS set

[13] See Memorandum entitled "State Implementation Plans (SIPs): Policy Regarding Excess Emissions During Malfunctions, Startup, and Shutdown," from Steven A, Herman, Assistant Administrator for Enforcement and Compliance Assurance, and Robert Perciasepe, Assistant Administrator for Air and Radiation, to the Regional Administrators, Regions I – X on September 20,1999.

[14] See, "State Implementation Plans; Response to Petition for Rulemaking; Findings of Substantial Inadequacy; and SIP Calls to Amend Provisions Applying to Excess Emissions During Periods of Startup, Shutdown, and Malfunction; Proposed Rule," 78 FR 12459 (Feb, 22, 2013).

forth in 40 CFR part 60. The universe of existing sources affected by this revision is listed in Table 1. Most of the units in Table 1 use some combination of electrostatic precipitators, selective non-catalytic reduction, and/or low NOx burners. Two of the affected units, (Montville Station #4 and Montville Station #6) do not have control measures comparable to the other sources, but they are subject to numerical PM emission limitations in the SIP and in their permits. Operators of these units use best engineering practices to ensure compliance with the SIP. This entails optimizing the fuel-to-air ratio in a manner that minimizes emissions. As discussed under criterion (3) below, optimization is more difficult to achieve during startup, shutdown, stack testing, soot-blowing, fuel switching or sudden load changes.

(2) Use of the control strategy for this source category must be technically infeasible during startup, shutdown, or other periods

CT DEEP established a workgroup in 1997 to recommend visible-emissions limits for a small number of sources (see Table 1). See letter to EPA dated January 14, 2013, in the docket for today's action summarizing workgroup effort. The workgroup considered technical issues that make it difficult for some facilities to consistently meet opacity limits that apply during normal steady-state operating conditions (i.e., 20 percent during any 6-minute block average or 40 percent during any one-minute block average) during periods such as startup and shutdown. For example, combustion turbines may have higher emissions during startup than during steady-state operation, and post-combustion control systems, such as Selective Catalytic Reduction (SCR) systems for reducing NO_x (a precursor of $PM_{2.5}$), work most effectively after operating temperatures are reached. In addition, the duration of an individual startup event, and the emissions levels during such an event, depend on the amount of time since a unit has operated, with cold startups (about 3 days since shutdown) resulting in higher initial emission levels than

warm or hot startups. Such factual considerations are appropriate for consideration in establishing an alternative emission limit that applies during such periods in a SIP provision, as long as the limit meets other CAA requirements.

In addition to startup and shutdown operations, Section 22a-174-18(j)(1) allows for an alternative emission limit during these other types of operations: stack testing, soot-blowing, fuel switching or sudden load changes. Sudden load changes are similar to startup and shutdown operations in that the emission unit is subject to large load swings during a short time period, which makes it difficult to optimize unit operation, and can lead to short-term higher emission rates.

Fuel switching can also result in short-term emission increases. For example, fuel switching in a combustion unit makes it difficult to optimize the oxygen/fuel ratio for efficiency as well as for minimizing emissions. The sources currently subject to 22a-174-18(j)(1) are combustion units that produce steam. These types of units operate by injecting more air than is required for stoichiometric purposes for complete combustion. However, there is a balance regarding how much excess air can be added without adversely impacting emissions and efficiency. Too much excess air generally results in increases in NO_x, whereas not enough excess air can result in unburned carbon. Sudden changes in operation due to fuel switching can make it difficult for a source to optimize its operations by changing the air-to-fuel ratio. For soot blowing, a facility injects high-pressure steam into a combustion unit in order to clean the outside of the steam tubes. The injection of steam dramatically increases water vapor in the

combustion unit. Water vapor can interfere with the opacity reading in EPA's performance specifications for COMS, causing a higher opacity reading than would be obtained using EPA's Reference Method 9 for opacity.

(3) The frequency and duration of operation in startup, shutdown, or other modes must be minimized to the maximum extent practicable

The frequency and duration of periods of startup, shutdown, stack testing, soot-blowing, fuel switching or sudden load changes depend on the type, age, and operational characteristics of a given combustion unit. For example, modern combined-cycle units generally have shorter startup times than older units and can respond more quickly to load changes than older units. As noted above, the duration of operation in startup or shutdown mode depends on whether a unit is single-cycle or combined-cycle, and whether the startup is a cold, warm, or hot startup, with higher emissions levels and longer startup times generally associated with cold startups.

As discussed under criterion (2) above, other modes of operation, including stack testing, soot-blowing, fuel switching or sudden load changes can also result in short-term higher emission levels and operational difficulties. Operators of the units listed in Table 1 use best engineering practices to optimize the fuel-to-air ratio in a manner that minimizes emissions.

Based on COMS data (1-minute and 6-minute averages) for the combustion units listed in Table 1, as well as on information about the make, model, age, and operation of the units, the aforementioned workgroup recommended a 60 percent opacity limit (during any 6-minute block

average) for periods of startup, shutdown, stack testing, soot-blowing, fuel switching or sudden load change.[15]

In its revised regulation, to minimize the frequency and duration of operation in a startup, shutdown, stack testing, soot-blowing, fuel switching or sudden load change mode, CT DEEP set a strict limit on the cumulative amount of time per calendar quarter (less than 11 hours) that a facility can be subject to the alternative emission limit under Section 22a-174-18 (j)(1). The recordkeeping and reporting requirements in sections 22a-174-4 and 22a-174-7, which are proposed for approval herein, will serve to assure that these sources will be subject to the alternative emission limit only during the relevant periods and within the applicable time.

(4) As part of its justification of the SIP revision, the state should analyze the potential worst-case emissions that could occur during startup and shutdown

CT DEEP's workgroup (described above) determined the periods of highest opacity, which represent worst-case conditions, based on submitted COMS data from 20 combustion units in various state locations. These periods tend to occur during periods of startup, shutdown, and other specific modes of operation described in Section 22a-174-18(j)(1).

The worst-case emissions scenario that could occur during startup and shutdown would be if all twelve of the subject units (see Table 1) simultaneously emitted at the maximum allowed

[15] During CT DEEP's public comment period for Section 22a-174-18, one commenter argued that the 60 percent opacity limit over a 6-minute average was excessively stringent. The commenter noted that power boilers can be subject to malfunctions such as a boiler tube blowout, a precipitator fire or a plugged oil gun, and that in such events, equipment operators must shut the unit down as quickly as possible, but safely. The commenter argued that in certain cases, shutdown may take longer than six minutes, and that a 60% opacity limit over a 6-minute period "could force the operators to bring the unit's load down too quickly, possibly causing additional damage to the equipment and jeopardizing personal safety." CT DEEP Hearing Report (Apr. 29, 2003), at 21-22. After considering this comment, CT DEEP decided to retain the 60% opacity limit in its final rule.

under Section 22a-174-18(j)(1)'s alternative emission limit by all (1) engaging in startup, shutdown, or other listed modes of operation, (2) for the same full nearly-11-hour period, and (3) at the uppermost allowed 60% opacity. Even under this worst-case emissions scenario, however, emissions would continue to be limited by the federally applicable PM emissions standards in Section 22a-174-18(e), which apply at all modes of operation, including startup and shutdown.

In such a worst-case scenario, the applicable PM emissions standards would be 0.20 pounds of particulate matter per million BTU of heat input for the one subject unit (Bridgeport Harbor #3) authorized to burn coal, 0.14 pounds of particulate matter per million BTU for the ten subject units authorized to burn residual oil, and 0.10 pounds of particulate matter per million BTU for the subject unit (Pfizer #5) that by order can only combust natural gas. These PM emissions limits are federally enforceable under the CAA, and apply during startup, shutdown, or other modes of source operation. Thus, they represent the worst-case emissions scenario under Section 22a-174-18(j)(1)'s alternative emissions limit. In sum, the likely worst-case emissions scenario would be that, for a simultaneous period of almost 11 hours in a given calendar quarter, all twelve subject sources emit at 60% opacity, with ten units emitting 0.14 pounds of particulate matter per million BTU, one unit emitting 0.20 pounds of particulate matter per million BTU, and one unit emitting 0.10 pounds of particulate matter per million BTU.

Even under this worst-case scenario, various other federally enforceable restrictions ensure that overall PM emissions in Connecticut keep ambient PM levels well below all federal PM NAAQS. These other restrictions, the state emissions inventories, and an analysis of ambient concentration trends are explained in detail in Section IV.A of this document. In the

event that these elevated emissions were to cause future violations of the PM NAAQS, EPA has additional authorities under the CAA to address any such potential problems.

(5) All possible steps must be taken to minimize the impact of emissions during startup and shutdown on ambient air quality

RCSA Section 22a-174-4, which is proposed for approval herein, requires submission of all COMS data quarterly, along with a quarterly quality-assurance audit, which can occur at any time, including startup, shutdown, stack testing, soot-blowing, fuel switching or sudden load periods. This regulation also requires submission of corrective actions for a failed audit.

In addition, the exception in Section 22a-174-18(j)(1) is designed to minimize emissions during startup, shutdown, stack testing, soot-blowing, fuel switching or sudden load change. The operator must limit the time period during which the alternative emission limit applies to less than 11 hours per calendar quarter, and must limit opacity levels during such periods to no more than 60% opacity during any 6-minute block average. Furthermore, the PM emissions standards in Section 22a-174-18(e) continue to apply during startup, shutdown, stack testing, soot-blowing, fuel switching or sudden load change.

(6) At all times, the facility must be operated in a manner consistent with good practice for minimizing emissions, and the source must have used best efforts regarding planning, design, and operating procedures to meet the otherwise applicable emission limitation

The alternative emission limit in Section 22a-174-18(j)(1) is designed to minimize emissions at all times by limiting the time period during which the higher opacity limits are used on a calendar quarter basis, and by limiting opacity emissions during periods when the alternative emission limit applies to 60% opacity during any 6-minute block average. As

discussed under criterion (2) above, during startup, shutdown and other modes of operation, including stack testing, soot-blowing, fuel switching or sudden load changes, operators of all the units listed in Table 1 use best engineering practices to optimize the fuel-to-air ratio in a manner that minimizes emissions.

(7) The owner or operator's actions during startup, shutdown, or other periods must be documented by properly signed, contemporaneous operating logs, or other relevant evidence.

RCSA section 22a-174-4 requires all sources with COMS to submit quarterly reports to CT DEEP. These reports must contain all relevant information for determining compliance with emissions limits, including information for periods when a source claims to have been operating in one of the modes stated in 22a-174-18(j)(1) (i.e., startup, shutdown, stack testing, soot-blowing, fuel switching or sudden load change). During these periods, opacity readings may be above 40% but, for compliance, must be less than 60% (for 6-minute block averages). The COMS data from the affected sources is available to verify the opacity during the different modes of source operation during the relevant periods and, thus, provide a mechanism for compliance assurance. In addition, all of the sources that are regulated by 22a-174-18(j)(1) are also regulated by 22a-174-33 for Connecticut's title V program. This means that all of the quarterly reports must be signed by a responsible official and are subject to the due diligence clause of title V of the CAA.

b. Withdrawn malfunction emission limit provision.

CT DEEP's December 1, 2004 SIP submittal included a provision that provides an alternative emission limit for sources during malfunctions. (Section 22a-174-18(j)(1)). However,

on July 8, 2013, CT DEEP sent a letter to EPA withdrawing Section 22a-174-18(j)(1) to the extent that it applies to malfunction.

c. Exclusion of sources subject to NSPS.

In addition to revising applicable emission limits, Connecticut's SIP revision also removes certain sources from coverage under existing SIP opacity standards if those sources are also separately regulated under existing EPA NSPS regulations. EPA notes that one practical effect of this revision is that these sources will now only be subject to the existing opacity limits of NSPS regulations and that within these regulations there may be exemptions from emission limits for excess emissions during certain startup, shutdown, or malfunction events. The decision of the U.S. Court of Appeals for the District of Columbia has indicated that exemptions from emission limitations during such periods are not consistent with the requirements of the CAA, in particular with the requirements of section 112 and section 302. *See Sierra Club v. Johnson*, 551 F.3d 1019 (D.C. Cir. 2008). EPA has concluded that such exemptions from emission limitations are also inappropriate in NSPS regulations under section 111. Accordingly, new NSPS regulations promulgated by EPA do not have such exemptions.[16]

EPA has long interpreted the CAA to prohibit exemptions for excess emissions during startup, shutdown, and malfunction in SIP provisions. Since 1982, EPA guidance has stated that such exemptions are inconsistent with CAA requirements for SIPs.[17] That guidance was

[16] See, e.g., National Emissions Standards for Hazardous Air Pollutants from Portland Cement Manufacturing Industry and Standards of Performance for Portland Cement Plants, 75 FR 54970 (Sept. 9, 2010).
[17] See, Memorandum entitled "Policy on Excess Emissions During Startup, Shutdown, Maintenance, and Malfunctions," from Kathleen M. Bennett, Assistant Administrator for Air, Noise, and Radiation, to the Regional Administrators, Regions I – X on Sept. 28, 1982.

reiterated in 1983, 1999, and 2001.[18] EPA has applied this guidance in numerous actions on SIP revisions and courts have upheld this interpretation of the CAA.[19] In addition, EPA recently proposed action upon a petition for rulemaking in which it reiterated this guidance for SIP provisions.[20] Because of the implications with respect to treatment of excess emissions from the sources that Connecticut is excluding from coverage under the SIP opacity standards, EPA also evaluated whether this revision is consistent with fundamental CAA requirements for purposes of SIP provisions, beyond the issue of potential impacts on attainment and maintenance of the NAAQS for purposes of section 110(l) discussed above. EPA specifically considered whether relying on existing NSPS regulations in lieu of the prior SIP emission limitation for visible emissions is inconsistent with CAA requirements governing SIP provisions.

As noted above, NSPS subparts Db and Dc apply to the sources that the state is removing from coverage under the SIP for purposes of opacity standards. These NSPS currently contain exemptions for excess emissions during startup, shutdown, and malfunction. These subparts were originally promulgated in the 1980s and apply to sources that were constructed, modified, or reconstructed since 1984 or 1989, respectively. Thus, these NSPS predate the court's decision in *Sierra Club v. EPA,* and have not been revised, and the existing sources would likely not be affected by any future revisions to the NSPS with respect to opacity standards for new sources. Section 22a-174-18(j)(2) of CT DEEP's revised regulation exempts sources that are separately

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[18] EPA's 1999 guidance addressed this issue most comprehensively. See, Memorandum entitled State Implementation Plans (SIPs): Policy Regarding Excess Emissions During Malfunctions, Startup, and Shutdown," from Steven A. Herman, Assistant Administrator for Enforcement and Compliance Assurance, and Robert Perciasepe, Assistant Administrator for Air and Radiation, to the Regional Administrators, Regions I –X on Sept. 20, 1999.

[19] See, e.g., Michigan Dept. of Envt. Quality v. Browner, 230 F.3d 181 (6th Cir, 2000).

[20] See, "State Implementation Plans: Response to Petition for Rulemaking; Findings of Substantial Inadequacy; and SIP Calls to Amend Provisions Applying to Excess Emissions During Periods of Startup, Shutdown, and Malfunction; Proposed Rule," 78 FR 12460 (Feb. 22, 2013). EPA notes that the comment period on that proposal has closed and that it is not reopening comment on that proposal here.

subject to NSPS visible emissions standards from any SIP-based visible emissions standards. EPA evaluated Section 22a-174-18(j)(2) to determine whether this revision to exclude these sources from coverage is consistent with CAA requirements for SIP provisions, and, in particular, if it is consistent with CAA Section 110(a)(2)(A)'s requirement for "emission limitations," which Section 302(k) defines as limiting emissions "on a continuous basis."

In this context, we have determined that Section 22a-174-18(j)(2) is best analyzed not as an exemption for emission from sources during startup, shutdown, and malfunction for Subpart Db and Dc boilers in a SIP provision, but rather as an exclusion for a category of sources (i.e., sources subject to NSPS visibility standards) from SIP visibility standards.[21] In other words, CT DEEP's revision is best seen not as exempting these sources from Section 110 visibility limits in particular circumstances that may raise questions under Section 110(a)(2)(A) and Section 302(k), but rather as exempting these sources from Section 110 visibility limits altogether because they are regulated by Section 111 visibility limits. Section 22a-174-18(j)(2), therefore, does not interfere with Section 110(a)(2)(A)'s requirement that emission limitations must apply on a continuous basis. Our approval of CT DEEP's revision to exclude these sources from the SIP opacity standards, therefore, does not suggest that CT DEEP could add new exemptions for excess emissions from startup, shutdown, or malfunction events to its SIP. Rather, it means only that EPA has determined that it is within CT DEEP's discretion to structure its SIP and determine which sources require SIP opacity limits, and, for the reasons discussed earlier, EPA has concluded that the pre-existing opacity limits are not necessary for these sources to ensure that Connecticut meets the NAAQS and other applicable CAA requirements.

[21] Moreover, as noted above, SIP *particulate emissions* standards apply to these sources at all times.

EPA emphasizes that approval of the revision to Connecticut's SIP to exclude certain sources from coverage under a SIP emission limit when such sources are separately covered by an NSPS does not constitute approval of the NSPS, and any exemptions they may contain, into the state's SIP. Approval of new SIP provisions with such exemptions into the SIP would be inconsistent with CAA requirements for SIP. Instead, EPA believes that Connecticut has adequately addressed the requirements of section 110(l) to justify exclusion of these sources from coverage under the SIP opacity standards.

D. Regional Haze

Connecticut's Regional Haze program is based on reasonable progress goals (RPGs) for Class I areas for each (approximately) 10-year planning period, and an alternative to BART demonstration that relies on SO_2 emission reductions required by RCSA Section 22a-174-19a (Control of Sulfur Dioxide Emissions from Power Plant and Other Large Stationary Sources of Air Pollution) and on NO_x emissions reductions required by Section 22a-174-22 (Control of Nitrogen Oxide Emissions), as well as Section 22a-174-22c (Connecticut's CAIR rule). See 77 FR 17367 and 78 FR 5158. Also see descriptions of these RCSA Sections below.

As set forth in more detail at 77 FR 17367, actual emissions of SO_2 from all post-2002 NO_x Budget Program sources are estimated to have been reduced from 35,625 tpy in 2001 to 7,146 tpy in 2006, a reduction of 28,479 tpy. The significant reduction in actual SO_2 emissions started in 2002, the effective year of Tier 1 of Section 22a-174-19a, and continued in 2006 (Tier 2 of RCSA section 22a-174-19a was effective in 2003).

Potential emissions of NOx from all post-2002 NOx Budget Program sources are estimated to have been reduced from 46,188 tpy in 2002 to 34,833 tpy in 2006, a reduction of 11,355 tpy. CT DEEP attributes these reductions largely to implementation of RCSA Sections 22a-174-22 and 22a-174-22c.

Today's proposed approval does not modify any of the measures relied upon in Connecticut's Regional Haze program. Furthermore, the alternative emission limit (Section 22a-174-18 (j)(1)) has a sufficient margin of safety, as discussed in IV.2 above, that the potential increases attributable to CT DEEP's revised regulation would not imperil Connecticut's trend towards meeting its RPGs.

For the reasons discussed above, EPA concludes that revisions to Section 22a-174-18 "Control of Particulate Matter and Visible Emissions," are approvable under section 110(l) of the CAA.

V. Proposed Action.

EPA is proposing to approve and incorporate into the Connecticut SIP three regulations submitted by the State of Connecticut on December 1, 2004. Specifically, EPA is proposing to approve CT DEEP's revised RCSA Section 22a-174-18 "Control of particulate matter and visible emissions," except for the phrase "or malfunction" in Section 22a-174-18(j)(1) which CT DEEP has withdrawn. EPA is also proposing to approve CT DEEP's revised RCSA Section 22a-174-4 "Source monitoring, record keeping and reporting," and Section 22a-174-7 "Air pollution control equipment and monitoring equipment operation." These latter two regulations

strengthen monitoring, record keeping, and reporting requirements, which improve the state's ability to detect violations of emissions limits.

Revised Section 22a-174-18 establishes and requires limitations on visible and PM emissions from certain stationary sources, identifies a standardized method for determining compliance for sources without COMS, and establishes an alternative emission limit of up to 60 percent opacity (during any 6-minute block average) during certain modes of operation for sources with COMS. In addition, the revised regulation sets a strict limit on the amount of time (0.5 percent of a facility's total operating hours during any calendar quarter) that sources with COMS can operate under the alternative emission limit. As described above, the state has adequately demonstrated that the revision of Section 22a-174-18 will not interfere with attainment or maintenance of air quality standards or other applicable CAA requirements as required by section 110(l) of the CAA.

EPA is soliciting public comments on the issues discussed in this document. These comments will be considered before taking final action.

VI. Statutory and Executive Order Reviews.

Under the CAA, the Administrator is required to approve a SIP submission that complies with the provisions of the Act and applicable Federal regulations. 42 U.S.C. 7410(k); 40 CFR 52.02(a). Thus, in reviewing SIP submissions, EPA's role is to approve state choices, provided that they meet the criteria of the CAA. Accordingly, this action merely approves state

law as meeting Federal requirements and does not impose additional requirements beyond those imposed by state law. For that reason, this action:

- is not a "significant regulatory action" subject to review by the Office of Management and Budget under Executive Order 12866 (58 FR 51735, October 4, 1993);
- does not impose an information collection burden under the provisions of the Paperwork Reduction Act (44 U.S.C. 3501 *et seq.*);
- is certified as not having a significant economic impact on a substantial number of small entities under the Regulatory Flexibility Act (5 U.S.C. 601 *et seq*.);
- does not contain any unfunded mandate or significantly or uniquely affect small governments, as described in the Unfunded Mandates Reform Act of 1995 (Public Law 104-4);
- does not have Federalism implications as specified in Executive Order 13132 (64 FR 43255, August 10, 1999);
- is not an economically significant regulatory action based on health or safety risks subject to Executive Order 13045 (62 FR 19885, April 23, 1997);
- is not a significant regulatory action subject to Executive Order 13211 (66 FR 28355, May 22, 2001);
- is not subject to requirements of Section 12(d) of the National Technology Transfer and Advancement Act of 1995 (15 U.S.C. 272 note) because application of those requirements would be inconsistent with the CAA; and

- does not provide EPA with the discretionary authority to address, as appropriate, disproportionate human health or environmental effects, using practicable and legally permissible methods, under Executive Order 12898 (59 FR 7629, February 16, 1994).

In addition, this proposed rule does not have tribal implications as specified by Executive Order 13175 (65 FR 67249, November 9, 2000), because the SIP is not approved to apply in Indian country located in the state, and EPA notes that it will not impose substantial direct costs on tribal governments or preempt tribal law.

List of Subjects in 40 CFR Part 52

Environmental protection, Air pollution control, Incorporation by reference, Intergovernmental relations, Particulate matter.

AUTHORITY: 42 U.S.C. 7401 et seq.

Dated: July 31, 2013.

H. Curtis Spalding,
Regional Administrator,
EPA New England.

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