Appointment

From: Dravis, Samantha [dravis.samantha@epa.gov]
Sent: 4/18/2017 5:15:29 PM
To: Dravis, Samantha [dravis.samantha@epa.gov]; Anthony.P.Campau@omb.eop.gov; Bolen, Brittany [bolen.brittany@epa.gov]; Schwab, Justin [schwab.justin@epa.gov]; McGartland, Al [McGartland.Al@epa.gov]; Greenwalt, Sarah [greenwalt.sarah@epa.gov]; Fotouhi, David [fotouhi.david@epa.gov]; Nickerson, William [Nickerson.William@epa.gov]
CC: Inge, Carolyn [Inge.Carolyn@epa.gov]; Kime, Robin [Kime.Robin@epa.gov]; Irving, Verna [Irving.Verna@epa.gov]

Subject: WOTUS and CPP Call - Conference Line/Code / Ex. 6
Location: DCRoomARN3500/OPEI

Start: 4/19/2017 3:00:00 PM
End: 4/19/2017 3:30:00 PM
Show Time As: Busy

Appointment

From: Dravis, Samantha [dravis.samantha@epa.gov]
Sent: 4/4/2017 11:39:14 AM
To: Dravis, Samantha [dravis.samantha@epa.gov]; Bolen, Brittany [bolen.brittany@epa.gov]; Greenwalt, Sarah [greenwalt.sarah@epa.gov]; Schwab, Justin [schwab.justin@epa.gov]; McGartland, Al [McGartland.Al@epa.gov]; Rees, Sarah [rees.sarah@epa.gov]

Subject: Call with OMB - WOTUS and CPP
Location: Samantha's Office - 3505

Start: 4/4/2017 7:00:00 PM
End: 4/4/2017 7:45:00 PM
Show Time As: Busy

Samantha will dial Anthony Campau at 3pm.

Appointment

From: Schmidt, Lorie [Schmidt.Lorie@epa.gov]
Sent: 3/31/2017 9:12:35 PM
To: Schmidt, Lorie [Schmidt.Lorie@epa.gov]; Zenick, Elliott [Zenick.Elliott@epa.gov]; Schwab, Justin [schwab.justin@epa.gov]; Marks, Matthew [Marks.Matthew@epa.gov]; Jordan, Scott [Jordan.Scott@epa.gov]; Skinner-Thompson, Jonathan [Skinner-Thompson.Jonathan@epa.gov]; Conrad, Daniel [conrad.daniel@epa.gov]; Vijayan, Abi [Vijayan.Abi@epa.gov]

Subject: CPP legal discussion
Location: 7340 (Lorie's office)

Start: 4/3/2017 3:00:00 PM
End: 4/3/2017 4:00:00 PM
Show Time As: Busy

Call in - Conference Line/Code / Ex. 6
Call code: Conference Line/Code / Ex. 6
Participant code: Conference Line/Code / Ex. 6

Appointment

From: Shapiro, Mike [Shapiro.Mike@epa.gov]
Sent: 3/28/2017 2:58:04 PM
To: Shapiro, Mike [Shapiro.Mike@epa.gov]; Penman, Crystal [Penman.Crystal@epa.gov]; Schwab, Justin [schwab.justin@epa.gov]; Frithsen, Jeff [Frithsen.Jeff@epa.gov]; Campbell, Ann [Campbell.Ann@epa.gov]; Loop, Travis [Loop.Travis@epa.gov]; Pollins, Mark [Pollins.Mark@epa.gov]; Christensen, Damaris [Christensen.Damaris@epa.gov]; FertikEdgerton, Rachel [FertikEdgerton.Rachel@epa.gov]; Dravis, Samantha [dravis.samantha@epa.gov]; jennifer.a.moyer@usace.army.mil; Bowles, Jack [Bowles.Jack@epa.gov]; Neugeboren, Steven [Neugeboren.Steven@epa.gov]; Greenwalt, Sarah [greenwalt.sarah@epa.gov]; Klasen, Matthew [Klasen.Matthew@epa.gov]; McGartland, Al [McGartland.Al@epa.gov]; Schmauder, Craig R SES (US [craig.r.schmauder.civ@mail.mil]; Keating, Jim [Keating.Jim@epa.gov]; Evalenko, Sandy [Evalenko.Sandy@epa.gov]; ian.p.osullivan@usace.army.mil; Kwok, Rose [Kwok.Rose@epa.gov]; McDavit, Michael W. [Mcdavit.Michael@epa.gov]; Nickerson, William [Nickerson.William@epa.gov]; Lousberg, Macara [Lousberg.Macara@epa.gov]; Kaiser, Sven-Erik [Kaiser.Sven-Erik@epa.gov]; Stokely, Peter [Stokely.Peter@epa.gov]; Bahk, Benjamin [Bahk.Benjamin@epa.gov]; Bangerter, Layne [bangerter.layne@epa.gov]; Cindy Barger [cindy.s.barger.civ@mail.mil]; Lamont, Douglas W SES (US [douglas.w.lamont2.civ@mail.mil]; Peck, Gregory [Peck.Gregory@epa.gov]; Cherry, Andrew [Cherry.Andrew@epa.gov]; Downing, Donna [Downing.Donna@epa.gov]; Best-Wong, Benita [Best-Wong.Benita@epa.gov]; Kupchan, Simma [Kupchan.Simma@epa.gov]; Frazer, Brian [Frazer.Brian@epa.gov]; Brown, Byron [brown.byron@epa.gov]; Wendelowski, Karyn [wendelowski.karyn@epa.gov]; Eisenberg, Mindy [Eisenberg.Mindy@epa.gov]; Orvin, Chris [Orvin.Chris@epa.gov]; David.F.Dale@usace.army.mil; Wehling, Carrie [Wehling.Carrie@epa.gov]; Borum, Denis [Borum.Denis@epa.gov]; Theis, Joseph [Theis.Joseph@epa.gov]
CC: Thomas, Latosha [Thomas.Latosha@epa.gov]

Subject: WOTUS C[redacted] Conference Line/Code / Ex. 6
Attachments: Agenda -- WOTUS 12 April 2017 v2.docx
Location: 3233 WJCE

Start: 4/12/2017 2:00:00 PM
End: 4/12/2017 2:45:00 PM
Show Time As: Tentative

AGENDA
WOTUS MEETING

Wednesday, April 12, 2017

10:00-10:45am
WJC EAST 3233

Telecom: Personal Phone / Ex. 6 **access** Personal Phone / Ex. 6

1. Introductions (3 minutes)

2. Rulemaking Updates (30 minutes)
   a. Federalism and Tribal consultation
   b. Step 1 draft rule text and preamble outline
   c. Schedule
   d. Senior leadership check-ins

3. Communications Planning (10 minutes)

4. Next Steps (2 minutes)

Appointment

From: Minoli, Kevin [Minoli.Kevin@epa.gov]
Sent: 3/21/2017 11:09:51 AM
To: Minoli, Kevin [Minoli.Kevin@epa.gov]; Schwab, Justin [schwab.justin@epa.gov]; Schmidt, Lorie [Schmidt.Lorie@epa.gov]; Talty, Mark [Talty.Mark@epa.gov]; Simons, Andrew [Simons.Andrew@epa.gov]; Zenick, Elliott [Zenick.Elliott@epa.gov]; Jordan, Scott [Jordan.Scott@epa.gov]; Srinivasan, Gautam [Srinivasan.Gautam@epa.gov]; Dunham, Sarah [Dunham.Sarah@epa.gov]
CC: Greenwalt, Sarah [greenwalt.sarah@epa.gov]

Subject: CPP (Call in number: **Conference Line/Code / Ex. 6**
Location: DCRoomARN4045/DC-Ariel-Rios-OGC

Start: 3/21/2017 5:30:00 PM
End: 3/21/2017 6:00:00 PM
Show Time As: Busy

Appointment

From: Minoli, Kevin [Minoli.Kevin@epa.gov]
Sent: 3/20/2017 12:35:34 PM
To: Minoli, Kevin [Minoli.Kevin@epa.gov]; Neugeboren, Steven [Neugeboren.Steven@epa.gov]; Wehling, Carrie [Wehling.Carrie@epa.gov]; Wendelowski, Karyn [wendelowski.karyn@epa.gov]; Kupchan, Simma [Kupchan.Simma@epa.gov]
CC: Greenwalt, Sarah [greenwalt.sarah@epa.gov]; Schwab, Justin [schwab.justin@epa.gov]

Subject: WOTUS Prep.
Location: 4000

Start: 3/20/2017 2:15:00 PM
End: 3/20/2017 3:00:00 PM
Show Time As: Tentative

Appointment

From: Hogan, Stephanie [Hogan.Stephanie@epa.gov]
Sent: 3/15/2017 8:36:06 PM
To: Hogan, Stephanie [Hogan.Stephanie@epa.gov]; Smith, Kristi [Smith.Kristi@epa.gov]; Risley, David [risley.david@epa.gov]; Pilche
[Pilchen.Zach@epa.gov]; Haeuber, Richard [Haeuber.Richard@epa.gov]; Bowker, George [Bowker.George@epa.gov]; Ling, Mich
[Ling.Michael@epa.gov]; McKinley, Gobeail [McKinley.Gobeail@epa.gov]; Werner, Christopher [Werner.Christopher@epa.gov];
[Jones.Rhea@epa.gov]; Sasser, Erika [Sasser.Erika@epa.gov]; Weatherhead, Darryl [Weatherhead.Darryl@epa.gov]; Langdon, R
[Langdon.Robin@epa.gov]; Sorrels, Larry [Sorrels.Larry@epa.gov]; Wayland, Richard [Wayland.Richard@epa.gov]; Timin, Brian [
Possiel, Norm [Possiel.Norm@epa.gov]; Eyth, Alison [Eyth.Alison@epa.gov]; Lifland, David [Lifland.David@epa.gov]; Houyoux, M
[Houyoux.Marc@epa.gov]; Stenhouse, Jeb [Stenhouse.Jeb@epa.gov]
CC: Srinivasan, Gautam [Srinivasan.Gautam@epa.gov]; Schmidt, Lorie [Schmidt.Lorie@epa.gov]; Schwab, Justin [schwab.justin@epa
[Palma.Elizabeth@epa.gov]

Subject: Attorney Client Deliberative / Ex. 5
Attachments: ENV_DEFENSE-#787411-v1-
DN_61_MOTION_for_Summary_Judgment_filed_by_State_of_New_York__Motion_Hearing_set_for_3_9_2017_10_00_AM_in_
(003).pdf; Sierra Club Motion for Summary Judgment - KY 2008 Ozone Transport FIP.pdf; EPA Response to Summ Judg & Cross-M
in Support of Cross-Motion.pdf; ENV_DEFENSE-#794366-v1-DN_66_REPLY_(re__61__MOTION_for_Summary_Judgment_....pdf;
#794389-v1-DN_67_OPPOSITION_RESPONSE_(re__62__MOTION_for_Sum....pdf
Location: Department of Justice, 601 D St NW

Start: 3/20/2017 2:00:00 PM
End: 3/20/2017 4:00:00 PM
Show Time As: Tentative

Hearing scheduled 3/23 at 10am Pacific at the Northern District of California.

Conference Info: Conference Line/Code / Ex. 6
Code: Conference Line/Code / Ex. 6

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Attorneys for Plaintiff-Intervenor

UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA

SIERRA CLUB, Plaintiff, STATE OF NEW YORK, Plaintiff-Intervenor, v. GINA MCCARTHY, in her official capacity as Administrator of the United States Environmental Protection Agency, Defendant.	Civil Case No.: 3:15-CV-4328-JD **PLAINTIFF-INTERVENOR STATE OF NEW YORK'S MOTION FOR SUMMARY JUDGMENT** NOTICED FOR HEARING MARCH 9, 2017 AT 10:00 A.M.

ED_002401_00000037-00001

GLOSSARY

Act:	Clean Air Act
CSAPR Update:	Cross State Air Pollution Rule Update
EPA:	Administrator of the United States Environmental Protection Agency
FIP:	federal implementation plan
Good Neighbor Provision:	Clean Air Act § 110(a)(2)(D)(i)(I), 42 U.S.C. § 7410(a)(2)(D)(i)(I)
NAAQS	National Ambient Air Quality Standard
NOx:	nitrogen oxides
SIP:	state implementation plan
VOCs:	volatile organic compounds

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NOTICE OF MOTION

Please take notice that on March 9, 2017 at 10:00 a.m., or as soon thereafter as counsel can be heard, Plaintiff-Intervenor State of New York will move this Court, pursuant to Fed. R. Civ. P. 56(a), for summary judgment on its claim for relief in its Complaint in Intervention for the failure of Defendant Gina McCarthy, in her official capacity as Administrator of the U.S. Environmental Protection Agency (EPA), to perform a mandatory duty under the Clean Air Act (Act).

RELIEF REQUESTED

New York requests that this Court enter judgment against Defendant EPA: (1) declaring that EPA is in violation of section 110(c)(1) of the Act, 42 U.S.C. § 7410(c)(1), for failing to perform a mandatory duty to promulgate a federal implementation plan (FIP) that fully addresses Kentucky's obligations under 42 U.S.C. § 7410(a)(2)(D)(i)(I), i.e., the "Good Neighbor Provision," with regard to the 2008 ozone national ambient air quality standards (NAAQS); (2) enjoining EPA to perform its mandatory duty to promulgate a FIP fully addressing Kentucky's obligations by June 11, 2018; (3) awarding New York the costs of litigation, including reasonable attorneys' fees; and (4) retaining jurisdiction over this matter for purposes of enforcing and effectuating the Court's order.

POINTS AND AUTHORITIES IN SUPPORT OF THE MOTION

I. ISSUE TO BE DECIDED

This case concerns the undisputed failure of EPA to satisfy its mandatory duty to promulgate a FIP that fully addresses the interstate transport of pollution from Kentucky sources that contributes significantly to nonattainment in, or interferes with maintenance by, any other state with respect to the 2008 ozone NAAQS. EPA has admitted that it had a mandatory obligation to issue a FIP addressing Kentucky's Good Neighbor Provision obligations at least by June 2, 2016. Although EPA promulgated a FIP for Kentucky as part of the final Cross State Air Pollution Rule Update for the 2008 Ozone NAAQS, 81 Fed. Reg. 74,504 (Oct. 26, 2016) (CSAPR Update), EPA has conceded that the FIP does not fully address its obligations under the Act to prohibit Kentucky's interstate transport of pollution that

contributes significantly to nonattainment, or interferes with maintenance in downwind states with respect to the 2008 ozone NAAQS. *Id.* at 74,521-22.

The only issue in dispute is the deadline by which EPA must take final action to fulfill its obligation under the Act to issue a FIP that fully addresses Kentucky's Good Neighbor Provision obligations. Given the adverse impacts to New York from EPA's continued delay in providing a full remedy for the interstate transport of air pollution from Kentucky, the severe and widespread harm to New York's citizens and environment from ozone pollution, EPA's long history of delay, and the fact that EPA has the information and resources necessary to act expeditiously to complete its mandatory duty, the Court should require EPA to take final action no later than June 2018.

II. STATEMENT OF RELEVANT STATUTORY AND FACTUAL BACKGROUND

A. Legal Background of the Clean Air Act and National Ambient Air Quality Standards

Under the cooperative federalism framework of the Act, to protect public health and welfare, both EPA and the states are required to work together to achieve healthy air quality throughout the country. To promote this, the Act requires EPA to establish and periodically revise NAAQS, which establish maximum allowable ambient air concentrations for certain pollutants. 42 U.S.C. §§ 7408-7409. States are then primarily responsible for ensuring that their air quality meets the NAAQS. *Id.* 7407(a).

The Act requires each state to submit a state implementation plan (SIP) for every promulgation or revision of a NAAQS, within three years of that standard's promulgation or revision, that provides for the "implementation, maintenance, and enforcement" of the standard. 42 U.S.C. § 7410(a)(1). These plans are often referred to as "Infrastructure" SIPs. A state that fails to develop a SIP that can demonstrate the likelihood of attainment with a NAAQS is subject to sanctions under the Act, including requiring new or modified source emissions offsets at an increased 2 to 1 ratio and the loss of highway funding, 42 U.S.C. § 7509.

An Infrastructure SIP must meet the requirements listed under 42 U.S.C. § 7410(a)(2), including the requirements of the Good Neighbor Provision, 42 U.S.C. § 7410(a)(2)(D)(i)(I). The Good Neighbor Provision requires states to prohibit sources within their state from emitting any air pollution in amounts

that will "contribute significantly to nonattainment in, or interfere with maintenance by, any other State with respect to any" NAAQS, or what EPA refers to as the "interstate transport" of air pollution.

EPA has a mandatory duty to take final action on any SIP submittal by approving or disapproving, in full or in part, the SIP within twelve months of the date the submittal is complete. 42 U.S.C. § 7410(k)(2), (3) and (4). If a state fails to submit a SIP that satisfies its obligation under the Good Neighbor Provision, the Act requires EPA to fill a backstop role by issuing a FIP within two years that prohibits interstate transport of air pollution that will significantly contribute to nonattainment in, or interfere with maintenance by, any other state with respect to any NAAQS. *Id.* § 7410(c)(1).

B. Relevant Factual Background

EPA promulgated a revised NAAQS for ozone on March 12, 2008, 73 Fed. Reg. 16436 (Mar. 27, 2008) (2008 ozone NAAQS), which triggered the states' duty under 42 U.S.C. § 7410(a)(1) to submit Infrastructure SIPs to EPA within three years providing for implementation and enforcement of the standard, including satisfying their Good Neighbor Provision obligations. Ozone is a gas that forms when other atmospheric pollutants, known as ozone "precursors," such as nitrogen oxides (NOx) and volatile organic compounds (VOCs), react in the presence of sunlight. 80 Fed. Reg. 65,292, 65,299 (Oct. 26, 2015). EPA has found significant negative health effects in individuals exposed to elevated levels of ozone, including coughing, throat irritation, lung tissue damage, and aggravation of existing conditions, such as asthma, bronchitis, heart disease, and emphysema. *Id.* at 65,302-11. Exposure to ozone has also been linked to premature mortality. *Id.* Some subpopulations are particularly at risk from exposure to ozone pollution, including children, the elderly, and those with existing lung diseases, such as asthma. *Id.*

Kentucky is an upwind state from New York and contributes significantly to violations of the ozone NAAQS in New York. 81 Fed. Reg. at 74,538; Declaration of Robert Sliwinski, New York Department of Environmental Conservation, sworn to on November 14, 2016 (Sliwinski Decl.), ¶ 18. Kentucky submitted an Infrastructure SIP to EPA for approval on September 8, 2009. Kentucky's SIP failed to address its interstate transport of ozone-causing pollutants contributing to nonattainment in, or interfering with maintenance by, downwind states, such as New York, with the ozone NAAQS. EPA did

not take action to approve or disapprove Kentucky's SIP within the twelve-month statutory deadline. This Court, in *WildEarth Guardians v. Jackson*, Case No. 11-cv-5651-YGR (N.D. Cal.), entered an order on December 7, 2012 (Doc. No. 69) directing EPA to take final action on Kentucky's Infrastructure SIP by March 4, 2013, a delay of over two years from when EPA was required under the statute to act.

On March 7, 2013, EPA published notice of its disapproval of Kentucky's good neighbor SIP for the 2008 ozone NAAQS. *See* 78 Fed. Reg. 14,681 (Mar. 7, 2013). This rule became effective April 8, 2013. Pursuant to 42 U.S.C. § 7410(c)(1), EPA was required to promulgate a FIP for Kentucky's Good Neighbor Provision obligations within two years, or by March 7, 2015. However, EPA has taken the position that the two-year FIP "clock" for the Kentucky Good Neighbor Provision did not begin to run until the Supreme Court issued its judgment in *EPA v. EME Homer City Generation*, 134 S. Ct. 1584 (2014) on June 2, 2014. *See* Joint Case Management Statement at 5-6, Case 3:15-cv-4328-JD (Doc. No. 26). That case concerned challenges to an EPA regulation, the Cross State Air Pollution Rule, which required Kentucky and other upwind states to cut pollution to meet their good neighbor obligations. EPA has stated that it had a mandatory obligation to issue a FIP addressing Kentucky's good neighbor obligations within two years of that date, or by June 2, 2016. *Id.*

Finding the 2008 ozone NAAQS insufficient to protect public health and welfare, EPA in 2015 promulgated another revised ozone NAAQS. 80 Fed. Reg. at 65,292 (2015 ozone NAAQS). Both of these standards remain in effect.[1]

The New York City metropolitan area was reclassified to "moderate" nonattainment of the 2008 ozone NAAQS, effective on June 3, 2016, with an attainment SIP due date of January 1, 2017. Sliwinski Decl., ¶ 14. Pursuant to a SIP Requirements Rule for the 2008 ozone NAAQS, New York is required to

[1] EPA's and the states' mandatory obligations with respect to implementation of the 2015 ozone NAAQS do not supplant their obligations with respect to the 2008 ozone NAAQS and are not otherwise at issue in this case.

attain the NAAQS of 0.075 parts per million by a statutory deadline of July 20, 2018. *See* 80 Fed. Reg. 12,264 (Mar. 6, 2015).

On September 7, 2016, EPA finalized the CSAPR Update to address interstate transport of ozone pollution with respect to the 2008 ozone NAAQS. 81 Fed. Reg. 74,504. The CSAPR Update promulgates FIPs for 22 eastern states, including Kentucky, with respect to Good Neighbor Provision requirements. *Id.* at 74,521. However, as EPA expressly acknowledges, the FIP for Kentucky does not fully address its outstanding obligation under the Act to prohibit interstate transport of air pollution that significantly contributes to nonattainment or interferes with maintenance of the NAAQS in downwind states. *Id.* at 74,506, 74-521-22.

EPA modeling for the CSAPR Update shows that the interstate transport of air pollution from emission sources in Kentucky contribute significantly to violations of the ozone NAAQS in the New York City metropolitan area. *Id.* at 74,538. EPA has determined that, even after implementation of the emission reductions measures required by the CSAPR Update, a downwind receptor located in Richmond County, New York (Staten Island) will continue to have problems maintaining the 2008 ozone NAAQS in 2017. *Ozone Transport Policy Analysis Final Rule Technical Support Document for the CSAPR Update*, Docket ID No. EPA-HQ-OAR-2015-0500 (Aug. 2016).[2] EPA has further determined that emissions from Kentucky are expected to continue to exceed the threshold amount that EPA considers to significantly interfere with maintenance of the NAAQS at that downwind receptor. *Id.*

C. Procedural History of This Matter

Plaintiff-Intervenor New York incorporates by reference the procedural history set forth in Plaintiff Sierra Club's motion for summary judgment filed concurrently herewith, and adds the following:

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[2] *Available at* https://www3.epa.gov/airmarkets/CSAPRU/Ozone%20Transport%20Policy%20Analysis%20Final%20Rule%20TSD.PDF.

New York filed a Complaint in Intervention in this case on September 20, 2016 alleging that EPA failed to perform its mandatory duty under section 110(c)(1) of the Act, 42 U.S.C. § 7410(c)(1), to promulgate a FIP that fully addresses Kentucky's requirements under the Good Neighbor Provision of the Act for the 2008 ozone NAAQS. *See* Doc. No. 45. This violation constitutes a "failure of the Administrator to perform any act or duty under this chapter which is not discretionary with the Administrator" under 42 U.S.C. § 7604(a)(2), thus entitling New York to bring a citizen suit compelling such agency action. EPA has not yet answered New York's complaint.

III. JURISDICTION AND STANDING

Section 304(a)(2) of the Act, 42 U.S.C. § 7604(a)(2), authorizes any person, including states, after duly giving sixty-days' notice of their intent to file suit, to commence a citizen suit against EPA where the Administrator has failed to perform a nondiscretionary duty under the Act. In accordance with section 304(b)(2) and 40 C.F.R. Part 54, New York sent a citizen suit notice letter by certified mail to the EPA Administrator on June 23, 2016 providing notice of New York's intention to file suit against EPA for failure to perform a non-discretionary duty under section 110(c)(1) of the Act, 42 U.S.C. § 7410(c)(1), to promulgate a FIP that fully addresses Kentucky's obligations under the Good Neighbor Provision with regard to the 2008 ozone NAAQS within two years of disapproving Kentucky's Good Neighbor Provision SIP. A copy of the letter and return receipt are attached to the Declaration of Morgan A. Costello as Exhibit 1. When New York filed its Complaint in Intervention in this action, more than sixty days had passed since the notice letter, and EPA had not, and still has not, fulfilled its mandatory duty. When EPA has failed to discharge a nondiscretionary duty under the Act, a district court has jurisdiction pursuant to 42 U.S.C. § 7604(a)(2) to compel EPA to fulfill that obligation. *See Sierra Club v. Thomas*, 658 F. Supp. 165, 170 (N.D. Cal. 1987).

New York has standing to sue EPA concerning its failure to fulfill its mandatory duty under the Act to promulgate a FIP that fully addresses Kentucky's Good Neighbor Provision obligations. As a result of EPA's failure, New York has suffered and will continue to suffer harm from the delay in addressing the transport of air pollution from sources in Kentucky, an upwind state that significantly

contributes to New York's ozone nonattainment. Unless ozone transport is effectively reduced, New York cannot, by itself, meet the 2008 ozone NAAQS and comply with the Act. Sliwinski Decl., ¶ 10. Continued nonattainment with the ozone NAAQS, and consecutive reclassifications, administratively burdens the state and economically disadvantages its citizens. *Id.*, ¶¶ 16, 20. But even more importantly, without timely action by EPA to fully address interstate ozone transport from upwind states such as Kentucky, the citizens and environment of New York will continue to be harmed by exposure to higher pollutant levels for a longer period of time, meaning more harmful health impacts to those citizens. *Id.*, ¶ 21. These injuries establish standing. *See, e.g.*, *Massachusetts v. EPA*, 549 U.S. 497, 516-26 (2007) (states had standing under section 307(b) of the Act to challenge EPA denial of a rulemaking petition to regulate greenhouse gases from automobiles based on threatened injury to public health and property).

IV. LEGAL STANDARD

Summary judgment is appropriate "if the movant shows that there is no genuine dispute as to any material fact and the movant is entitled to judgment as a matter of law." Fed. R. Civ. P. 56(a); *Summers v. Teichert & Son, Inc.*, 127 F.3d 1150, 1152 (9th Cir. 1997). When there is no dispute that an agency has failed to timely meet its statutorily-mandated deadline for rulemaking action, summary judgment is the appropriate mechanism to determine when compliance is due and the district court has broad discretion to fashion an equitable remedy. *Alaska Ctr. for Env't v. Browner*, 20 F.3d 981, 986 (9th Cir. 1994) (recognizing that "to bring about any progress for achieving the congressional objectives of the [Clean Water Act], the EPA would have to be directed to take specific steps"). The court may "set enforceable deadlines both of an ultimate and in intermediate nature." *Sierra Club v. Johnson*, 444 F. Supp. 2d 46, 52 (D.D.C. 2006) (citations omitted).

To avoid imposition of an "immediate deadline," the agency must establish that it has used the "'utmost diligence in discharging [its] statutory responsibilities.'" *Id.* at 52-53. The agency bears a "heavy burden to demonstrate the existence of an impossibility." *Alabama Power Co. v. Costle*, 636 F.2d 323, 359 (D.C. Cir. 1979); *see also Communities for a Better Env't v. EPA*, 2008 U.S. Dist. LEXIS 36647, *6 (N.D. Cal., May 5, 2008) (applying "impossibility" standard in setting expedited schedule

after EPA missed statutory deadline for issuing NAAQS). Mere apprehension that the agency cannot meet a deadline is not enough. *Alabama Power Co.*, 636 F.2d at 359. The agency can prove that a deadline is infeasible by demonstrating either: (1) the "budgetary" and "manpower" demands required are "beyond the agency's capacity or would unduly jeopardize the implementation of other essential programs"; or (2) an agency's need to have more time to sufficiently evaluate complex, technical problems. *Natural Res. Def. Council v. Train*, 510 F.2d 692, 712 (D.C. Cir. 1974) (providing the possibility of an extension subsequent to the court-ordered deadline).

V. ARGUMENT

A. EPA IS LIABLE FOR FAILURE TO PERFORM ITS MANDATORY DUTY TO PROMULGATE A FIP TO FULLY ADDRESS KENTUCKY'S REQUIREMENTS UNDER THE GOOD NEIGHBOR PROVISION FOR THE 2008 OZONE NAAQS

New York is entitled to summary judgment on its claim that EPA failed to perform its mandatory duty under section 110(c)(1) of the Act, 42 U.S.C. § 7410(c)(1), to promulgate a FIP that fully addresses Kentucky's requirements under the Good Neighbor Provision of the Act for the 2008 ozone NAAQS. EPA does not dispute that the requirements of section 110(c)(1) are non-discretionary. The Act specifically requires EPA to promulgate a FIP within two years after the Administrator disapproves a SIP submittal. *Id.* EPA disapproved Kentucky's SIP as to the Good Neighbor Provision requirements on March 7, 2013, over three and a half years ago. EPA has admitted that it had a mandatory obligation to issue a FIP for Kentucky addressing Kentucky's Good Neighbor Provision obligations at least by June 2, 2016. 81 Fed. Reg. at 74,513. Although EPA promulgated a FIP for Kentucky as part of the final CSAPR Update on September 7, 2016, EPA also has admitted that the FIP does not fully address EPA's obligation under the Act to prohibit Kentucky's interstate transport of pollution that contributes significantly to nonattainment in, or interferes with maintenance by, any other state with respect to the 2008 ozone NAAQS. *Id.* at 74,506. Therefore, there is no dispute that EPA is in violation of its mandatory duty under section 110(c)(1) of the Act and the Court should grant New York's motion for summary judgment.

B. AN ORDER REQUIRING EPA TO EXPEDITIOUSLY PERFORM ITS MANDATORY DUTY TO PROMULGATE A FIP FOR KENTUCKY BY JUNE 2018 IS WARRANTED AND ACHIEVABLE

If EPA is in violation of a statutory deadline, a court should exercise its equitable authority to set enforceable deadlines to obtain "expeditious compliance" with the statute. *Train*, 510 F.2d at 705; *see also Sierra Club v. Johnson*, 444 F. Supp. 2d 46 (D.D.C. 2006) (ordering a more expedited schedule for rulemaking than EPA proposed after it missed a statutory deadline). The court's discretion should be guided by Congress' express intent. *See Delaney v. EPA*, 898 F.2d 687, 695 (9th Cir. 1990) (disapproving of the extensions EPA gave to delinquent nonattainment areas to attain NAAQS because it contradicted Congress' intent to achieve the NAAQS "as soon as possible"); *Thomas*, 658 F. Supp. 172 ("[I]f the statutory deadline has passed by the time the court issues its decree, the EPA remains obligated to issue regulations within the time frame mandated by Congress."). Moreover, courts have broader and more flexible equitable powers where the public interest is involved, as opposed to when only a private controversy is at stake. *Northwest Envtl. Defense Ctr. v. Bonneville Power Admin.*, 477 F.3d 668, 680 (9th Cir. 2007).

Here, to cure EPA's admitted violation of the statute, the agency should be required to issue a final FIP by June 11, 2018. This schedule is warranted given the unfair burdens on New York and the serious public health risks from Kentucky's continued violation of the Good Neighbor Provision, in contravention of the express intent of Congress. This schedule also is achievable considering the period of time that EPA has been on notice that it must complete its undisputed statutory obligation.

1. Requiring EPA to meet an expedited schedule to finalize a FIP for Kentucky's requirements under the Good Neighbor Provision is warranted because any delay unfairly burdens downwind states, such as New York, and harms public health and welfare.

EPA's failure to timely fulfill its statutory duty under the Good Neighbor Provision to fully address interstate transport from Kentucky sources places unfair administrative and economic burdens on downwind states like New York, in contravention of Congressional intent. New York is required, subject to punitive consequences, to timely meet its SIP submittal and attainment obligations under the Act. Sliwinski Decl., ¶¶ 14-16. New York has some of the strictest air quality regulations in the country

and pollutants, such as NOx and VOCs, which cause the formation of ground-level ozone, are well controlled. *Id.*, ¶¶ 12-13. Statewide emission rates of NOx and VOCs are among the lowest in the country. *Id.* Notwithstanding New York's best efforts to comply with the Act, the New York City metropolitan area has struggled for years to attain the ozone NAAQS. *Id.*, ¶¶ 11, 14-15. EPA air quality modeling demonstrates that emissions from Kentucky are significantly contributing to New York's ozone problem. 81 Fed. Reg. at 74,538. Thus, New York needs EPA to fully address interstate transport from Kentucky to meet its ozone NAAQS requirements under the Act.

EPA's partial solution to transport for the 2008 ozone NAAQS leaves Kentucky in violation of the Good Neighbor Provision of the Act. As the U.S. Supreme Court recognized in *EME Homer City Generation*, Congress included the Good Neighbor Provision to tackle the complex problem of air pollution emitted in one state that causes harm in another state:

> Left unregulated, the emitting or upwind State reaps the benefits of the economic activity causing the problem without bearing all of the costs. . . . Conversely, downwind States to which the pollution travels are unable to achieve clean air because of the influx of out-of-state pollution they lack authority to control. *See* S. Rep. No. 101-228, p. 49 (1989).

134 S. Ct. 1584, 1593 (2014). EPA's illegal delay here has placed New York in precisely the position that Congress intended to prevent through the Good Neighbor Provision. In the absence of additional emission reductions from Kentucky, as well as other upwind states, DEC must promulgate new, more stringent control measures for already well-controlled local sources of ozone precursors such as NOx and VOCs. Sliwinski Decl.,¶ 20. As control measures become more stringent, they are more expensive. *Id.* The more expensive controls that New York must require for its in-state sources are a significant deterrent to new businesses in New York and a burden to existing businesses. *Id.* These expensive local reductions will be required under the Act even though controls from upwind states such as Kentucky (implemented to eliminate their significant contribution) would cost less per ton and would provide more relief from ozone in New York. *Id.* This result advances the economic inequity between New York and upwind states that lack pollution controls of necessary stringency to eliminate their downwind contributions.

Conversely, relying only on in-state controls measures, it will be extremely difficult, if not impossible, for the New York metropolitan area to either plan for how it will attain, or in fact attain, the 2008 ozone NAAQS. New York must submit a SIP to EPA by January 1, 2017 demonstrating how it will attain and maintain the 2008 ozone NAAQS by the "moderate" nonattainment deadline of July 20, 2018. *Id.*, ¶ 14. Failure to attain the NAAQS by the deadline would likely result in yet another reclassification, this time to "serious" nonattainment, with a statutory attainment deadline of July 20, 2021. *Id.* Reclassification to a lower standard of air quality will result in increased burdens on the state, including requiring New York to reduce NOx and VOCs by an additional 3 percent per annum, which will in turn require additional air quality modeling to demonstrate attainment and adoption of any additional, necessary programs. *Id.* However, unless and until EPA promulgates a FIP that provides for implementation of emission reduction measures that fully addresses interstate transport by the 2020 ozone season, New York also will not be able to plan for attainment and maintenance of the 2008 ozone NAAQS by the July 20, 2021 deadline. *Id.*, ¶¶ 15, 18, 22.

As EPA recognized in the CSAPR Update, requiring downwind areas to plan for attainment and maintenance before requiring upwind reductions is contrary to the Act's statutory structure and places an "inequitable burden" on downwind areas. 81 Fed. Reg. at 74516 ("If states or the EPA waited until Moderate area attainment plans were due before requiring upwind reductions, then these upwind reductions would be delayed several years beyond the mandatory CAA schedule. Further, the CAA implementation timeline implies that requiring local reductions first would place an inequitable burden on downwind areas by requiring them to plan for attainment and maintenance without any upwind actions."); *see also North Carolina v. EPA*, 531 F.3d 896, 911-12 (D.C. Cir. 2008) (EPA must coordinate interstate transport compliance deadlines with downwind attainment deadlines).

EPA's delay in fully addressing Kentucky's requirements under the Good Neighbor Provision also harms public health and welfare. New York has a sovereign duty and responsibility to protect the health and welfare of its citizens and the quality of its environment. The higher concentrations of ozone in the New York City metropolitan area from transported ozone will cause a greater number of New York citizens to be exposed to higher pollutant levels for a longer period of time, meaning more harmful

health impacts to those citizens. Sliwinski Decl., ¶ 21. Both short-term and prolonged exposures to ambient ozone have been linked to a number of adverse health effects, including reduced lung function and increased asthma attacks. *Id.*

Under all of these circumstances, the Court should exercise its discretion to mandate that EPA act as expeditiously as possible to comply with its mandatory obligations under the Act.

2. Plaintiffs' requested schedule for EPA to propose and finalize a FIP that fully addresses Kentucky's Good Neighbor Provision obligations for the 2008 ozone NAAQS is necessary and achievable.

For the reasons set forth in plaintiff Sierra Club's motion for summary judgment and supporting declarations, a June 2018 deadline for EPA to finalize a FIP that fully addresses Kentucky's Good Neighbor Provision obligations is achievable. *See also* Sliwinski Decl. ¶ 23.

If Congress found that a certain amount of time was appropriate for the agency to complete its statutory duty in the first instance, that timeframe limits the Court's discretion in fashioning an equitable remedy. *Thomas*, 658 F. Supp. at 171. The burden on an agency of establishing impossibility or infeasibility of acting within the statutory timeframe is heavy and must be carefully scrutinized by the court. *See Communities for a Better Env't*, 2008 U.S. Dist. LEXIS 36647, at * 8. "Excuses for delay must go beyond the general proposition that further study and analysis of materials will make final agency action better, . . . because further study will always make everything better, and it is always easier to do something with more rather than less time." *Id.* (internal citations omitted).

A June 2018 timeframe for EPA to take final action is warranted because EPA has not and cannot meet its heavy burden to prove impossibility. Congress provided for a two-year period for EPA to promulgate a FIP after disapproving a state's Good Neighbor Provision SIP. 42 U.S.C. § 7410(c)(1). Thus, the Court should not set a deadline of more than two years to require EPA to perform its statutory obligation. Where, as here, an agency does not dispute its liability, the statutory time frame should start counting down, at the latest, on the date that EPA had notice that it would be compelled to comply with its undisputed mandatory duty. Here, that date was in June 2016, when both Sierra Club and New York sent EPA citizen suit notice letters of their intent to file suit against EPA and seek an injunction

requiring EPA to fulfill its mandatory duty to promulgate a FIP that fully addresses Kentucky's Good Neighbor Provision obligations.

VI. CONCLUSION

For the reasons explained above and in the motion for summary judgment submitted by plaintiff Sierra Club, New York respectfully requests that the Court grant summary judgment to New York and order EPA perform its mandatory duty to promulgate a FIP fully addressing Kentucky's Good Neighbor Provision obligations by June 2018.

Dated: November 14, 2016

Respectfully Submitted,

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UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA

SIERRA CLUB, Plaintiff, STATE OF NEW YORK, Plaintiff-Intervenor, v. GINA MCCARTHY, in her official capacity as Administrator of the United States Environmental Protection Agency, Defendant.	Civil Case No.: 3:15-CV-4328-JD **DECLARATION OF ROBERT SLIWINSKI, P.E. IN SUPPORT OF PLAINTIFF-INTERVENOR STATE OF NEW YORK'S MOTION FOR SUMMARY JUDGMENT**

I, Robert Sliwinski, P.E., declare as follows:

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1. I am the Assistant Director of the Division of Air Resources of the New York State Department of Environmental Conservation (DEC). I currently assist with the oversight of nine regional offices, which are responsible for permitting and enforcement throughout the state, and the Albany central office, which supports the efforts of the regional offices and carries out air quality planning, monitoring and research functions. I have held this position since August 2016. I have worked at DEC since 1983 and since 1991 have also held the positions of Director, Bureau of Air Quality Planning; Director, Bureau of Stationary Sources; Chief of the Stationary Source Planning Section; and Environmental Engineer 2 in the Division of Air Resources.

2. I received my Bachelor's degree in Forest Engineering from the State University of New York College of Environmental Science and Forestry in 1979. I received my Master's degree in Environmental Engineering from Rensselaer Polytechnic Institute in 1982.

3. One of my responsibilities as Assistant Director of the Division of Air Resources is to oversee DEC's air quality planning efforts, including the development of State Implementation Plans (SIP). SIPs detail how DEC will assure that, among other things, the air quality in New York will come into and/or maintain compliance with the National Ambient Air Quality Standards (NAAQS) for criteria pollutants, including ozone, established by the United States Environmental Protection Agency (EPA) under the federal Clean Air Act (CAA or Act). States are primarily responsible for ensuring attainment and maintenance of a NAAQS once EPA has established it.

4. Ground-level ozone is formed in the atmosphere through a series of complex chemical reactions involving nitrogen oxides (NOx) and volatile organic compounds (VOCs) in the presence of sunlight and warm temperatures. Breathing ozone can trigger a variety of health problems including chest pain, coughing, throat irritation, and airway inflammation. It also can reduce lung function and harm lung tissue. Ozone can worsen bronchitis, emphysema, and asthma, leading to increased medical costs. People most at risk from breathing air containing ozone include people with asthma, children, older adults, and people who are active outdoors, especially outdoor workers.

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5. In 2008, EPA promulgated a revised ozone NAAQS based on the annual fourth-highest daily maximum 8-hour ozone concentration, averaged over three years, set at a level of 0.075 parts per million (ppm). Finding the 2008 NAAQS insufficient to protect public health and welfare, EPA in 2015 promulgated another revised ozone NAAQS at a level of 0.070 ppm. Both of these standards remain in effect.

6. New York has for decades known of the regional nature of the ground-level ozone air quality problem, and that an essential part of reducing ozone concentrations in downwind states such as New York is to reduce interstate transport of the NOx and VOC emissions in upwind states.

7. As part of my job responsibilities over the last 25 years, I have worked on efforts inside New York to adopt every feasible control program that could provide some meaningful benefit to reducing VOC and NOx emissions, the main precursors to ozone formation. This includes reasonably available control technology for NOx (NOx RACT), 6 NYCRR 227-2; the Pre-2003 NOx Budget Program, 6 NYCRR 227-3; the NOx Budget Trading Program, 6 NYCRR Part 204; the Acid Deposition Reduction Program, 6 NYCRR Parts 237 and 238; the Clean Air Interstate Rule (CAIR) and Cross State Air Pollution Rule (CSAPR) trading programs, 6 NYCRR Parts 243, 244 and 245; Architectural and Industrial Maintenance Coatings, 6 NYCRR Part 205; Consumer Products, 6 NYCRR Part 235; and, Distributed Generation, 6 NYCRR Part 222.

8. In my professional capacity, I have served on various working committees for the Ozone Transport Commission (OTC), a multi-state organization created under the Act that is responsible for advising EPA on transport issues and for developing and implementing regional solutions to the ground-level ozone problem in the Northeast and Mid-Atlantic regions. This includes the OTC NOx Budget program, the predecessor of EPA's regional ozone season NOx trading programs, as well as several other regional control programs to reduce ozone precursor emissions and ozone transport. I have also served on work groups that advise EPA on various elements of SIP preparation and implementation; participated in the Ozone Transport Assessment Group (OTAG), an EPA-led effort to address transport for an earlier ozone NAAQS; and contributed to the development of the Northeast States for

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Coordinated Air Use Management's (NESCAUM) recommendations for NOx RACT on large stationary sources, including electricity generating units (EGUs) that were the blueprint for EPA's original NOx RACT guidance.

9. Addressing ozone transport is one of the biggest challenges to working on air pollution control in New York. In addition to my work with NESCAUM, OTC and OTAG, I worked with seven other northeastern states to file a petition in August 1997 under section 126 of the Act, 42 U.S.C. § 7426, that sought to have EPA address ozone transport from large NOx sources in upwind states under a previous ozone NAAQS. EPA granted the petition and instituted a control remedy, a Federal NOx Trading Program, 63 Fed. Reg. 57,356. I also worked on a petition, submitted by New York and eight other states to EPA in December 2013 under section 176A of the Act, 42 U.S.C. § 7506a(a), that requested EPA add nine upwind states to the Ozone Transport Region (OTR) that Congress established in the Act to help states address the pervasive ozone nonattainment problems in the Northeast. EPA has not yet acted on that petition despite a statutory obligation to do so within 18 months.

10. Unless ozone transport is effectively reduced, New York cannot, by itself, comply with the Act. More importantly, over 12.7 million New Yorkers continue to breathe unhealthy air. Without an effective solution to the ozone transport issue, public health and welfare in New York remains at risk.

11. The New York-Northern New Jersey-Long Island, NY-NJ-CT area (New York City metropolitan area), consisting of the New York Counties of Bronx, Kings, Nassau, New York, Queens, Richmond, Rockland, Suffolk, and Westchester, as well as portions of Connecticut and New Jersey, was designated as nonattainment for the 2008 ozone NAAQS on July 20, 2012. (The New York City metropolitan area is collectively designated due to its interrelated nature across Connecticut, New Jersey, and New York.) Its marginal classification carried a statutory attainment deadline of July 20, 2015, based on air quality during the 2012 through 2014 ozone seasons.

12. New York currently has some of the most stringent NOx and VOC control programs in the country, aggressively regulating power plants, factories, and motor vehicles. These programs include:

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- Stringent Reasonably Available Control Technology (RACT) on all major NOx and VOC stationary sources in New York, including electric generating units (EGUs) and major non-EGUs. 6 NYCRR § 212-3; 6 NYCRR § 220; 6 NYCRR § 227-2.
- Adoption of California's motor vehicle emission standards, which place more stringent controls on the amount of NOx emitted from motor vehicles than federal emission standards. New York most recently adopted the LEV III standards which set emissions standards on all 2017 through 2025 model year vehicles up to 14,000 pounds gross vehicle weight rating. 6 NYCRR § 218.
- Statewide Vehicle Inspection and Maintenance (I&M) requirements that include testing of older, high emitting vehicles to significantly reduce on-road mobile emissions. 6 NYCRR § 217-6.
- Adoption of regional measures to reduce VOC emissions from a variety of large source categories that have been recommended by the Ozone Transport Commission including consumer products, architectural and industrial maintenance coatings, portable fuel containers, adhesives and sealants, asphalt paving, and solvent metal cleaning processes. 6 NYCRR § 235; 6 NYCRR § 205; 6 NYCRR § 239; 6 NYCRR § 228; 6 NYCRR § 241; 6 NYCRR § 226.
- Lowest Achievable Emission Rate (LAER) standards on all new sources with the potential to emit 25 tons per year or more of NOx or VOC, and on all existing minor sources that would undergo modifications with emissions above these thresholds. 6 NYCRR § 231.

13. Based on EPA's Air Market Programs Data, New York EGUs and major non-EGUs included in regional trading programs reduced ozone-season NOx emissions by 56 percent and NOx emission rates by 51 percent between 2008 and 2016. These reductions can largely be attributed to the strong NOx RACT regulations adopted by New York.

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14. Despite the significant emission reductions achieved through New York's in-state controls, due in large part to transported pollution, the New York City metropolitan area did not attain the 2008 NAAQS by the statutory deadline for marginal areas and was therefore reclassified to moderate nonattainment on June 3, 2016, with an attainment SIP due date of January 1, 2017. The moderate classification carries a statutory attainment deadline of July 20, 2018, based on air quality during the 2015 through 2017 ozone seasons and requires DEC to prepare and submit an attainment SIP to EPA that includes a minimum of three percent per annum reductions of VOC and NOx and an air quality modeling demonstration detailing how the area will come into compliance with the 2008 NAAQS, including the adoption of additional costly emissions reductions.

15. Preliminary monitoring data through 2016 indicate the area is unlikely to attain the 2008 ozone NAAQS by the July 20, 2018 statutory deadline for a moderate nonattainment area. Failure to attain by the deadline is expected to result in further reclassification to serious nonattainment with a statutory attainment deadline of July 20, 2021, based on air quality from the 2018 through 2020 ozone seasons. This reclassification will require DEC to prepare and submit another attainment SIP to EPA and will require an additional three percent per annum reduction in NOx and VOC and the requisite air quality modeling to demonstrate attainment, including the adoption of any additional, necessary programs.

16. Continued nonattainment and consecutive reclassifications present an administrative burden to DEC. Development of an attainment SIP under these circumstances requires the agency to expend additional, already-strained resources. Failure to develop a SIP that can demonstrate the likelihood of attainment could subject New York to sanctions under the Act, including requiring new or modified source emissions offsets at an increased two to one ratio and the loss of highway funding, CAA section 179, 42 U.S.C. § 7509.

17. CAA section 110(a)(2)(D)(i)(I), 42 U.S.C. § 7410 (a)(2)(D)(i)(I), known as the "good neighbor" provision, requires that each state's SIP contains adequate provisions to prohibit emissions that will significantly contribute to nonattainment of a NAAQS, or interfere with maintenance of a

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NAAQS, in a downwind state. Section 110(c)(1) of the Act, 42 U.S.C. 7410(c)(1), requires EPA to promulgate a Federal Implementation Plan (FIP) as a "backstop" in the event that a state fails to submit, or EPA disapproves, a good neighbor SIP.

18. Air quality modeling performed by EPA and released on January 22, 2015 and updated on August 4, 2015 demonstrated that multiple upwind states, including Kentucky, were projected to significantly contribute to nonattainment or interfere with maintenance of the 2008 NAAQS in the New York City metropolitan nonattainment area in its target attainment year, thus failing to comply with the good neighbor provision and making it more difficult for the area to reach compliance with the NAAQS. This modeling projected that the Richmond County (New York) monitor will be in nonattainment in 2017, and that 34.8 percent of the monitored ozone can be attributed to significantly contributing states outside of the New York City metropolitan area, including Kentucky.

19. The Cross-State Air Pollution Rule (CSAPR) was initially promulgated by EPA in 2011 as the federal backstop for states' good neighbor obligations for the 1997 ozone, 1997 annual fine particulate matter, and 2006 24-hour fine particulate matter NAAQS. On September 7, 2016 (effective December 27, 2016) EPA finalized an update to CSAPR that addressed the 2008 ozone NAAQS. EPA admitted, however, that the CSAPR update did not completely fulfill its CAA obligation to assist downwind states: "This final rule **partially** addresses the EPA's obligation under the [CAA] to promulgate FIPs to address interstate emission transport for the 2008 ozone NAAQS." (81 FR 74504) (emphasis added).

20. In the absence of additional emission reductions from upwind states, DEC must promulgate new, more stringent control measures for local sources of ozone precursors. As control measures become more stringent, they are more expensive. For instance, New York's RACT requirements for EGUs and major non-EGUs is based on control cost thresholds of $5,000 per ton of NOx reduced, whereas EPA only used a $1,400 per ton threshold in setting ozone-season NOx budgets for upwind states in the CSAPR Update. This advances the economic inequity between New York and upwind states that lack pollution controls of necessary stringency to eliminate their downwind

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contributions. The more expensive controls that New York must require for its in-state sources are a significant deterrent to new businesses in New York and a burden to existing businesses. These expensive local reductions will be required under the Act even though controls from upwind states such as Kentucky (implemented to eliminate their significant contribution) would cost less per ton and would provide more relief from ozone in New York.

21. In addition to planning and economic impacts, prolonged nonattainment will harm New York's citizens. The higher concentrations of ozone in the New York City metropolitan area will cause a greater number of New York citizens to be exposed to higher pollutant levels for a longer period of time, meaning more harmful health impacts to those citizens. Both short-term and prolonged exposures to ambient ozone have been linked to a number of adverse health effects, including reduced lung function and increased asthma attacks requiring a doctor's appointment.

22. Without timely supplemental action by EPA to fully address interstate ozone transport from upwind states such as Kentucky, the citizens and environment of New York will continue to be economically and environmentally burdened by ozone pollution transported to it by states with SIPs that fail to contain adequate good neighbor provisions.

23. Based on my extensive background in air quality planning and regulation, I believe that EPA can complete the work, and needs to be held to a schedule, to promulgate a full remedy for addressing Kentucky's significant contribution to transport for the 2008 NAAQS no later than June 2018. EPA already has a reliable CSAPR methodology and framework in place to analyze and determine Kentucky's significant contribution for purposes of allocation among multiple upwind states. EPA can streamline its rulemaking schedule by utilizing existing work product and working concurrently on multiple efforts. For example, EPA does not need to prepare a new base year and projection base case inventories. EPA can build on the work it has already done for the CSAPR Update by using these inventories for the full remedy work. Also, EPA is performing contribution modeling to identify downwind receptors and upwind state contributions for the 2015 ozone NAAQS, which is expected by the end of the year. This effort can be easily replicated to produce relevant information for

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the projection year control case for the full remedy for the 2008 ozone NAAQS. This can eliminate up to 8 months from any schedule EPA proposes. EPA also already has sufficient information on operations and potential controls of non-EGU operations that was developed for the CSAPR Update, making any additional Notice of Data Availability unnecessary. This can reduce rulemaking time by another 8 months or more.

I declare under penalty of perjury under the laws of the United States that the foregoing is true and correct.

So declared this 14th day of November, 2016.

Robert Sliwinski, P.E.

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UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA

SIERRA CLUB, Plaintiff, STATE OF NEW YORK, Plaintiff-Intervenor, v. GINA MCCARTHY, in her official capacity as Administrator of the United States Environmental Protection Agency, Defendant.	Civil Case No.: 3:15-CV-4328-JD **DECLARATION OF ASSISTANT ATTORNEY GENERAL MORGAN A. COSTELLO**

I, Morgan A. Costello, declare as follows:

1. I am an Assistant Attorney General in the Environmental Protection Bureau in the office of Eric T. Schneiderman, Attorney General of the State of New York, attorney for the State of New York in this matter. I submit this declaration in support of Plaintiff-Intervenor State of New York's Motion for Summary Judgment in the above-captioned case.

2. On June 23, 2016, pursuant to section 304(b)(2) of the Clean Air Act and 40 C.F.R. Part 54, on behalf of New York I sent a citizen suit notice of intent to sue letter via certified mail, return receipt requested to Gina McCarthy, Administrator of the United States Environmental Protection Agency, notifying her of the violation of the mandatory duty to timely promulgate a federal implementation plan to address Kentucky's obligations under the Good Neighbor Provision, 42 U.S.C. § 7410(a)(2)(D)(i)(I), and of New York's intention to commence a lawsuit if EPA did not correct the violation within 60 days. A true and accurate copy of the notice letter and the return receipt evidencing EPA's receipt of the letter are attached hereto as Exhibit 1.

I declare under penalty of perjury under the laws of the United States that the foregoing is true and correct.

So declared this 14th day of November, 2016.

/s/ Morgan A. Costello
Morgan A. Costello

EXHIBIT 1

FILE COPY

STATE OF NEW YORK
OFFICE OF THE ATTORNEY GENERAL

ERIC T. SCHNEIDERMAN
ATTORNEY GENERAL

DIVISION OF SOCIAL JUSTICE
ENVIRONMENTAL PROTECTION BUREAU

BY CERTIFIED MAIL
RETURN RECEIPT REQUESTED

June 23, 2016

Gina McCarthy
Administrator
Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Avenue, N. W.
Washington, DC 20460

RE: Clean Air Act notice of intent to sue for failure to perform non-discretionary duty to promulgate Federal Implementation Plan for Kentucky's Good Neighbor provision requirements for the 2008 ozone NAAQS

Dear Administrator McCarthy:

The State of New York respectfully gives notice of its intent to file suit against you in your official capacity as the Administrator of the Environmental Protection Agency (EPA) for failure to perform a non-discretionary duty under the Clean Air Act.

Pursuant to 42 U.S.C. § 7410(c)(1), EPA is required to "promulgate a Federal implementation plan [FIP] at any time within 2 years after the Administrator – (A) finds that a State has failed to make a required submission or finds that the plan or plan revision submitted by the State does not satisfy the minimum criteria established under subsection (k)(1)(A) of this section, or (B) disapproves a State implementation plan [SIP] submission in whole or in part, unless the State corrects the deficiency, and the Administrator approves the plan or plan revision, before the Administrator promulgates such Federal implementation plan."

On March 7, 2013, EPA published notice of its disapproval of Kentucky's 2008 ozone infrastructure SIP addressing the requirements for Clean Air Act section 110(a)(2)(D)(i)(I), 42 U.S.C. § 7410(a)(2)(D)(i)(I), i.e., the "Good Neighbor provision." *See* 78 Fed. Reg. 14,681 (Mar. 7, 2013). This rule became effective April 8, 2013. EPA therefore had a mandatory duty to promulgate a FIP for this element no later than April 8, 2015.

EPA has taken the position that the 2 year FIP "clock" for the Kentucky Good Neighbor provision did not begin to run until the Supreme Court issued its judgment in *EPA v. EME Homer City Generation*, 134 S. Ct. 1584 (2014) on June 2, 2014. Assuming without admitting that EPA is correct, EPA agrees that it had a mandatory obligation to issue a FIP addressing Kentucky's obligations under the Good Neighbor provision within two years of that date, or by June 2, 2016. *See, e.g.*, Joint Case Management Statement at 5-6, *Sierra Club v. McCarthy*, Case No. 3:15-cv-04328 (N.D. Cal., Feb. 3, 2016).

To date, EPA has failed to perform its mandatory duty to take final action to promulgate a FIP to address Kentucky's good neighbor provision requirements for the 2008 ozone National Ambient Air Quality Standard (NAAQS). EPA's failure to fulfill its mandatory duty harms New York because, as shown most recently in the technical support documents and associated data files for EPA's proposed update to the Cross State Air Pollution Rule, 80 Fed. Reg. 75,706 (Dec. 3, 2015), Kentucky's upwind emissions interfere with maintenance and/or contribute significantly to New York's nonattainment of the 2008 ozone NAAQS.

Consequently, this letter provides notice as required under section 304 of the Act, 42 U.S.C. § 7604, and 40 C.F.R. part 54, that New York intends to file suit against you and EPA for failing to timely promulgate a FIP for Kentucky's Good neighbor provision requirements for the 2008 ozone NAAQS. Unless EPA takes the required actions before the end of the applicable notice period, we intend to bring a suit in United States District Court under section 304 for EPA's failure to perform the non-discretionary duties outlined in 42 U.S.C. § 7410(c)(1). The suit will seek injunctive and declaratory relief, the costs of litigation, and may seek other relief.

Sincerely,

ERIC T. SCHNEIDERMAN
Attorney General of New York

By: Morgan Costello

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UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA

SIERRA CLUB, Plaintiff, STATE OF NEW YORK, Plaintiff-Intervenor, v. GINA MCCARTHY, in her official capacity as Administrator of the United States Environmental Protection Agency, Defendant.	Civil Case No.: 3:15-CV-4328-JD **PLAINTIFF-INTERVENOR STATE OF NEW YORK'S REPLY IN SUPPORT OF MOTION FOR SUMMARY JUDGMENT AND OPPOSITION TO CROSS MOTION** NOTICED FOR HEARING MARCH 9, 2017 AT 10:00 A.M.

GLOSSARY

Act:	Clean Air Act
CSAPR Update:	Cross State Air Pollution Rule Update
EGU:	electric generating unit
EPA:	Administrator of the United States Environmental Protection Agency
FIP:	federal implementation plan
Good Neighbor Provision:	Clean Air Act § 110(a)(2)(D)(i)(I), 42 U.S.C. § 7410(a)(2)(D)(i)(I)
NAAQS	National Ambient Air Quality Standard
NODA:	Notice of Data Availability
NOx:	nitrogen oxides
SIP:	state implementation plan
VOCs:	volatile organic compounds

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I. INTRODUCTION AND SUMMARY

This case concerns the undisputed failure of the Administrator of the U.S. Environmental Protection Agency (EPA) to perform a mandatory duty under the Clean Air Act (Act) to promulgate a federal implementation plan (FIP) that fully addresses the interstate transport of pollution from Kentucky sources that contributes significantly to nonattainment in, or interferes with maintenance by, any other state with respect to the 2008 ozone national ambient air quality standards (NAAQS). The Act requires EPA to promulgate a FIP *within two years* of disapproving a state's plan to address its interstate pollution transport obligations under 42 U.S.C. § 7410(a)(2)(D)(i)(I) (the Good Neighbor Provision). *See* 42 U.S.C. § 7410(c)(1).

EPA admits that it failed to promulgate a FIP that fully addresses Kentucky's Good Neighbor Provision obligations by the statutory deadline. Thus, New York is entitled to an injunction compelling EPA to perform its statutory duty. The only questions the Court must answer here are: the deadline by which EPA must take final action to fulfill its mandatory statutory obligation under the Act and the date on which this deadline was triggered. The two-year statutorily-mandated time frame for EPA's promulgation of a FIP cabins the Court's discretion in determining such deadline. Further, because EPA does not dispute its liability, the statutory time frame should be counted from June 23, 2016, the date that EPA had notice that it would be compelled to comply with its undisputed mandatory duty, which would make a final FIP for Kentucky due no later than June 2018.

In flagrant disregard for this statutory timetable, EPA asks this Court to allow it until February 1, 2020 to promulgate a final FIP for Kentucky, a period of over *three and a half years* from when EPA admits it started to perform its statutory duty. *See* EPA's Mem. of Law in Opp. to Mots. for Summ. J. & in Support of Cross-Mot. for Summ. J. (EPA Opp.), at 1. EPA has failed to meet its heavy burden to demonstrate that it is impossible or infeasible to issue a FIP that fully addresses Kentucky' Good Neighbor Provision obligations within the presumptive two-year statutory time frame. Further, EPA's proposed three-and-a-half-year schedule must be rejected because it: (1) is based on EPA's

policy preferences, rather than actions that are statutorily-mandated, and overstates the time absolutely necessary to complete certain tasks; (2) disregards the clear public health threat and burden to downwind states such as New York from continued delay of EPA action; and (3) ignores EPA's history of delay and foot-dragging in fulfilling its statutory obligations with respect to the 2008 ozone NAAQS and, in fact, would allow EPA to escape such obligation completely.

For these reasons, the Court should not deviate from the presumptive two-year statutory deadline for EPA to perform its obligation to issue a FIP that fully addresses Kentucky' Good Neighbor Provision obligations. Further, the Court should determine that EPA's statutory deadline began to run no later than June 2016 and therefore require EPA to take final action no later than June 2018.

II. ARGUMENT

A. EPA RELIES ON THE INCORRECT LEGAL STANDARD

In highlighting the Court's discretion in fashioning an equitable remedy to address its clear statutory violation, EPA Opp. at 5, EPA ignores the strict limits on that discretion where, as here, Congress provided a clear statutory time frame for agency action. If Congress found that a certain amount of time was appropriate for the agency to complete its statutory duty in the first instance, that timeframe "limits the Court's discretion in fashioning an equitable remedy." *Sierra Club v. Thomas*, 658 F. Supp. 165, 171 (N.D. Cal. 1987) ("[I]f the statutory deadline has passed by the time the court issues its decree, the EPA remains obligated to issue regulations within the time frame mandated by Congress."); *see also Sierra Club v. Johnson*, 444 F. Supp. 2d 46 (D.D.C. 2006) (ordering a more expedited schedule for rulemaking than EPA proposed after it missed a statutory deadline); *New York v. Gorsuch*, 554 F. Supp. 1060 (S.D.N.Y. 1983) (ordering EPA to comply with the statutory timetable); *Sierra Club v. Gorsuch*, 551 F. Supp. 785 (N.D. Cal. 1982) (same).

Congress provided for a two-year period for EPA to promulgate a FIP after disapproving a state's Good Neighbor Provision SIP. 42 U.S.C. § 7410(c)(1). Ignoring this statutory time period, EPA claims that "the most expeditious schedule under which EPA could sign a proposed rule is November 1,

2018, and a final rule by February 1, 2020," EPA Opp. at 1, thereby attempting to give itself *over three-and-a-half years* from when it admittedly began the work it claims is necessary to promulgate Kentucky's FIP. However, Congress expressly considered and concluded that a timetable of no longer than two years for EPA to promulgate a FIP was necessary to ensure that EPA fulfilled its role as a federal backstop for states' Good Neighbor Provision obligations to prevent an unfair burden on and harms to public health in downwind states, such as New York, from the interstate transport of air pollutants. EPA's proposed three-and-a-half-year schedule ignores the burden on downwind states in direct contravention of this congressional intent and, therefore, must be rejected. *New York v. Gorsuch*, 554 F. Supp. at 1065 (declining to relieve the EPA Administrator from her duty to meet the statutory deadlines because "[t]o do so would be to grant her unbridled discretion to administer the Clean Air Act according to her own time schedule, regardless of specific congressional directions to the contrary.").

While EPA claims that the two-year schedule sought by plaintiff and plaintiff-intervenor is "unreasonable," EPA Opp. at 1, EPA fails to demonstrate—and fails to even acknowledge that it is required to demonstrate—that compliance with such time frame is "impossible or infeasible," which is required to obtain an extension from an explicitly-mandated time limit. *See Sierra Club v. Gorsuch*, 551 F. Supp. at 787 (court "may extend the time for compliance within Congressionally-mandated time limit, if the Court finds that it would be infeasible or impossible for the EPA, acting in good faith, to meet the Congressional deadline—either because of limited staff or budget or because of the need for further study"). Further, the burden was on EPA to make such demonstration. *See id.* (the "heavy burden" of proving such an impossibility rests squarely on the agency and a court must "scrutinize such claims carefully," citing *Natural Resources Defense Council v. Train,* 510 F.2d 692, 713 (D.C.Cir. 1974)); *see also Alabama Power Co. v. Costle*, 636 F.2d 323, 359 (D.C. Cir. 1979) (the agency bears a "heavy burden to demonstrate the existence of an impossibility" and mere apprehension that the agency cannot meet a deadline is not enough); *Sierra Club v. Johnson*, 444 F. Supp.2d at 52-53 (to avoid imposition of an "immediate deadline," the agency must establish that it has used the "utmost diligence

in discharging [its] statutory responsibilities."); *New York v. Gorsuch*, 554 F. Supp. at 1064 ("The burden of justification in such a case is especially heavy"); *Communities for a Better Env't v. EPA*, No. 07-03678 JSW, 2008 WL 1994898, *1 (N.D. Cal., May 5, 2008) (applying "impossibility" standard in setting expedited schedule after EPA missed statutory deadline for issuing NAAQS).

EPA also mistakenly claims that the Court should give deference to its "technical judgments" regarding what "information or analysis is necessary to prepare a technically and legally defensible FIP" and its "determination of a schedule upon which the agency will act." EPA Opp. at 16. Where "Congress has established a clear time frame for regulatory action, deferring to the agency [as to an alternative time frame] is inappropriate." *Sierra Club v. Thomas,* 658 F.Supp. at 171, n.6; *Sierra Club v. Johnson*, 444 F. Supp. 2d at 56 ("Although in most circumstances the Court defers to agency expertise about appropriate rulemaking procedures, such deference is inappropriate where Congress unambiguously has expressed its intent that these regulations be promulgated by a date certain and the agency manifestly has failed to fulfill this statutory obligation.").

B. EPA HAS FAILED TO MEET ITS HEAVY BURDEN OF PROVING THAT THE PRESUMPTIVE TWO-YEAR STATUTORY DEADLINE IS IMPOSSIBLE OR INFEASIBLE.

Summarized in EPA's Opposition, and detailed in the Declaration of Janet G. McCabe, EPA's Acting Assistant Administrator for the Office of Air and Radiation (McCabe Decl.), EPA sets out five groups of tasks that it believes are necessary to promulgate a FIP for Kentucky and the time it believes is needed for each task: (1) improve data on inventory and nitrogen oxide (NO_X) control strategies for non-electric generating units (EGUs) through a Notice of Data Availability (NODA) public comment process [9.5-11.5 months]; (2) perform air quality modeling to identify downwind receptors and upwind state contributions [12 months]; (3) quantify upwind state emission limits [5-6 months]; (4) issue a proposed FIP [11 months]; (5) promulgate a final FIP [14 months]. EPA Opp. at 14-25. Ignoring the fact that the deadline for all of this work has long since passed, EPA is requesting a normal, or even more generous than normal, time to complete many of these tasks, including some that are not even required by the

Clean Air Act. *See* Declaration of Robert Sliwinski, dated January 26, 2017 (Sliwinski Reply Decl.), ¶ 6. While the time-consuming tasks outlined by EPA may have been appropriate under normal circumstances, where, as here, the agency has failed to meet a statutory deadline, courts reject such "discretionary delay in the face of a congressional directive." *Sierra Club v. Jackson*, No. 01-1537, 2011 WL 181097, at *7 (D.D.C. Jan. 20, 2011) ("Although EPA, like all agencies, should always strive to develop the most effective and sound regulations, 'that quest must give ground in favor of expedition where Congress expressly directs the Administrator to establish standards promptly.'"), *enforcement granted in part, denied in part sub nom. Sierra Club v. McCarthy*, 61 F. Supp. 3d 35 (D.D.C. 2014); *Sierra Club v. Johnson*, 444 F. Supp. 2d at 53-54 (courts "tend to reject as contrary to the relevant statute agency approaches to rulemaking that sacrifice the timely implementation of the statute in favor of extensive agency information gathering.").

Further, rather than demonstrate the impossibility of complying with the presumptive statutorily-mandated two-year time frame to complete a FIP for Kentucky, EPA attempts to justify its requested three-and-a-half-year schedule by claiming that the level of analysis it seeks to perform is "necessary to ensure that EPA's final rule is technically and legally defensible." EPA Opp. at 12; *see also, e.g.*, McCabe Decl. ¶ 123 ("The agency believes that providing this EGU data in advance of a proposal is necessary to develop the [sic] a technically defensible proposal"). However, courts have soundly rejected this argument as a justification for application of the impossibility exception. *See Sierra Club v. Johnson*, 444 F. Supp. 2d at 56 ("courts evaluating claims of impossibility when an agency has failed to meet a mandatory deadline [established by Congress] generally have rejected claims that additional time is needed to ensure substantively adequate regulations."); *Sierra Club v. Jackson*, 2011 WL 181097, at *11 (finding that EPA failed to establish that it would be impossible to promulgate substantively adequate rules where EPA argued that extending its deadline to undertake a mandatory statutory duty would result in final standards "more likely to withstand substantive review").

Carefully scrutinizing EPA's proposed schedule demonstrates that EPA has not and cannot show impossibility as required for the Court to allow it to deviate from the statutorily-mandated two-year time frame in favor of its proposed three-and-a-half-year schedule. New York shares the same goal as EPA in wanting promulgation of a legally-defensible FIP. Nonetheless, the schedule EPA has proposed provides for regulatory tasks that, while helpful, are not mandated by statute, or that can be performed in less time. EPA simply cannot justify additional delay beyond the presumptive statutorily-mandated two-year FIP deadline based on such tasks.

1. EPA's Task Group 1, Providing for a Discretionary NODA Process, Is Not Required.

EPA's proposed schedule provides for up to 11.5 months for improving data on inventory and NO_X control strategies for non-EGUs through a NODA process that involves requesting and incorporating public comment. *See* EPA Opp. at 15; McCabe Decl. ¶ 110. Substantial time can be cut from EPA's proposed schedule by eliminating the NODA process. While the ability to comment on such data would typically be welcome, there is no statutory obligation for EPA to issue the NODA. Sliwinski Reply Decl. ¶ 7(a). Given that time is of the essence to complete this effort so that downwind areas can realize the benefits from the control of sources contributing significantly to nonattainment or interfering with maintenance, the additional time is simply not justified. *Id.* In any event, the non-EGU information and analysis will be subject to public review in the normal rulemaking process through notice and public comment on the proposed FIP. *Id.*

EPA claims that an initial, discretionary round of public input on this non-EGU information and analysis, in addition to the required public notice and comment on this information as part of the proposed FIP, is "necessary to prepare a technically and legally defensible FIP." EPA Opp. at 16. "Unfortunately for EPA, the impossibility test is not concerned with whether—as a matter of policy—[gathering this additional information and public input] will produce more effective rules." *Sierra Club v. Jackson*, 2011 WL 181097, at *11 (rejecting a nearly identical argument by EPA, stating "the policy

arguments EPA raises have no place in a case where Congress has mandated expedition, and its statutorily-mandated deadlines have long since passed."); *see also Communities for a Better Env't v. EPA*, 2008 WL 1994898, at *3 ("Excuses for delay must go beyond the general proposition that further study and analysis of materials will make final agency action better, ... because further study will always make everything better, and it is always easier to do something with more rather than less time.") (internal citations omitted).

Also, the amount of time EPA seeks to perform the non-EGU analysis is commensurate with starting from scratch. Sliwinski Reply Decl. at ¶ 7(a). EPA has already compiled much of the necessary information regarding NO_X reductions available from non-EGU sources in its earlier regulatory reviews, most recently as part of the Cross State Air Pollution Rule Update for the 2008 Ozone NAAQS, 81 Fed. Reg. 74,504 (Oct. 26, 2016) (CSAPR Update). *See, e.g.*, McCabe Decl., Attachment 4, Final Non-EGU Technical Support Document. Even if, as EPA claims, this does not contain all of the information necessary, EPA has failed to meet its heavy burden to demonstrate that it is not possible to obtain the necessary information in less time.

2. EPA Significantly Overstates the Time Necessary to Complete the Air Quality Modeling in Task Group 2.

EPA's proposed schedule provides for a total of 12 months to perform air quality modeling. EPA Opp. at 16-18; McCabe Decl. ¶ 129. New York has particular expertise in evaluating EPA's proposed time frame for completing the air quality modeling tasks. Among other sources of its expertise, the New York State Department of Environmental Conservation (DEC) hosts one of only a few modeling centers across the country that performs the complex, regional- and national-scale inventory and modeling work used by states to develop their state implementation plans (SIPs). Sliwinski Reply Decl. ¶ 3. This work is equivalent to the inventory and modeling work that EPA will develop for the Kentucky FIP. *Id.* According to the expert opinion of Mr. Sliwinski, DEC's Assistant Director of the Division of Air

Resources, EPA's air quality modeling schedule can be cut by at least six months. Sliwinski Reply Decl. ¶ 7(b).

For instance, EPA requests three months to develop the air quality modeling inputs, including selecting a base year and a future analytic year. EPA Opp. at 16-17. However, EPA has already fully developed a 2011-based emissions inventory, which it used as the base year for both the recently-updated CSAPR Update and in the even-more-recent Notice of Availability of the Environmental Protection Agency's Preliminary Interstate Ozone Transport Modeling Data for the 2015 Ozone NAAQS, 82 Fed. Reg. 1,733 (Jan. 6, 2017). Sliwinski Reply Decl. ¶ 7(b)(1). If the 2011 base year is suitable for EPA to use in these recent rulemakings, it is also suitable for use in completing states' Good Neighbor Provision obligations for the 2008 NAAQS. *Id.* Also, a number of states, including New York, New Jersey and Connecticut, are currently developing attainment plans for the 2008 ozone NAAQS using this same 2011 base year inventory, as required by EPA, and EPA has set an aggressive schedule for states to develop attainment plans that preclude the use of any not-yet-developed inventory. *Id.*

Apart from the risk that using this inventory may produce projections that are not representative of what may actually occur, McCabe Decl. ¶ 136—which is always a risk associated with future modeling—EPA fails to adequately explain why it cannot continue to use the 2011 base year inventory. Although an updated base year would be acceptable if timing were not an issue, EPA does not have the luxury of time. *See, e.g.*, *Sierra Club v. Johnson*, 444 F. Supp. 2d at 53 ("The courts, however, have rejected agency claims that additional time is needed simply to improve the quality or soundness of the regulations to be enacted."). Based on EPA's ability to use the 2011 base year, along with other time-saving measures identified by Mr. Sliwinski, *see* Sliwinski Reply Decl. ¶¶ 7(b)(1), (2) & (3), EPA has failed to meet its heavy burden of proving that it is impossible to perform the necessary air quality modeling tasks in less than 12 months.

3. EPA's Schedule for Completing Task Groups 3, 4 and 5, Including Preparing the Proposed and Final FIPs, Provides for the Maximum, Rather than Minimum, Amount of Time Necessary.

EPA's proposed schedule provides for 11 months to develop a proposed FIP and 14 months to prepare a final FIP. EPA Opp. at 23-25. While, as a matter of policy, EPA may prefer to take its time in drafting and promulgating a FIP, including giving itself at least eight whole months just for intra-and interagency review on the proposed and final FIPs, *see* McCabe Decl. ¶ 170, that amount of time is simply not acceptable when EPA is already so far past its deadline.

More specifically with regard to interagency review by the Office of Management and Budget (OMB), courts have found that such review does not justify EPA's delay. *See Natural Resources Defense Council v. EPA*, 797 F. Supp. 194, 198 (E.D.N.Y. 1992) (explaining that OMB derives its authority to review EPA regulations from Executive Order No. 12291, 46 Fed. Reg. 13193, 1981 WL 404143, at § 8(a)(2) (Feb. 17, 1981), which expressly acknowledges that OMB's review of regulations does not apply where it would conflict with statutory deadlines).

In addition, EPA's proposed schedule gives itself more than 14 months to take comment on and finalize the FIP. EPA's own prior interstate transport rulemakings, not to mention its prior FIPs, demonstrate that this amount of time is excessive. *See* Sliwinski Reply Decl. ¶ 7(e) (explaining that the NO_X SIP Call took 11.5 months between proposal [10/10/97; supplemental notice 4/28/98] and final [9/24/98]; CSAPR took 10 months between proposal [9/14/10] and final [7/6/11]; and the CSAPR Update took 9 months between proposal [12/3/15] and final [9/7/16]). Thus, EPA has shown it can go from proposal of a FIP to a final FIP in less than 1 year.

EPA is also asking for five months to re-do the air quality modeling it performed for the proposal to develop the final remedy. McCabe Decl. ¶ 170. Based on New York's substantial air quality modeling experience, EPA does not need all of this time to complete this work. Sliwinski Reply Decl. ¶ 7(e). The adjustments that will need to be made will be limited and not a wholesale, new modeling exercise. *Id.* Once again, EPA wishes to wait until well into the process to start development of the final rule text and

supporting documents. *Id.* By shortening the schedule to complete this work, the rulemaking can be completed in a significantly shorter time period. *Id.*

As with the other tasks included in its proposed schedule, EPA has failed to meet its heavy burden of proving that it is impossible to prepare the proposed and final FIPs in less than 25 months.

4. EPA Has Failed to Demonstrate Impossibility Based on Budgetary or Manpower Constraints

EPA does not seriously argue that budgetary or manpower constraints make it impossible for the agency to complete a Good Neighbor FIP for Kentucky within the statutory two-year period. *See Sierra Club v. Thomas*, 658 F. Supp. at 170-71 (citing *Train*, 510 F.2d at 712). Rather, EPA argues that plaintiffs' proposed schedule is "unreasonable" because it "does not consider the many other important and mandatory tasks that EPA must complete." McCabe Decl. ¶ 193. Again, EPA misunderstands the applicable standard where, as here, the agency is overdue on a statutory deadline. "The will of Congress, as expressed in the Act, is that the promulgation of standards according to ... mandatory deadlines should take precedence over all other rulemaking that EPA has not been expressly ordered to complete by Congress, as well as (arguably) over mandatory rulemaking for which the authorizing statute does not set a date certain." *Sierra Club v. Johnson*, 444 F. Supp. 2d at 57; *see also Sierra Club v. Jackson*, 2011 WL 181097, at *12. Therefore, the Court should reject any argument that competing priorities justify deviating from the two-year statutory time period.

C. EPA'S PROPOSED SCHEDULE IGNORES THE INEQUITABLE BURDENS AND PUBLIC HEALTH HARMS TO DOWNWIND STATES, IN CONTRAVENTION OF LAW.

In its over 250 pages of briefing and declarations in opposition to plaintiff Sierra Club's and plaintiff-intervenor New York's motions for summary judgment, EPA fails to rebut, or even to acknowledge, New York's argument that EPA must be required to meet an expeditious schedule because any delay unfairly burdens downwind states, such as New York, and harms public health and welfare. Nor does EPA dispute that such delay contravenes clear Congressional intent.

As explained in detail in the declaration of Robert Sliwinski that New York submitted in support of its summary judgment motion, New York is required, subject to punitive consequences, to timely meet its SIP submittal and attainment obligations under the Act and needs EPA to fully address interstate transport from Kentucky to meet such obligations. Sliwinski Decl. ¶¶ 11-15. EPA's proposed three-and-a-half-year schedule, with a final Kentucky FIP signed on February 1, 2020, should be rejected because it would make it impossible for New York to meet its "moderate" nonattainment deadline of July 20, 2018, resulting in another reclassification to "serious" nonattainment with a statutory attainment deadline of July 20, 2021. Sliwinski Reply Decl. ¶ 5; *see North Carolina v. EPA*, 531 F.3d 896, 911-12 (D.C. Cir. 2008) (finding EPA good neighbor rule flawed because it failed to require emission reductions from upwind sources enabling downwind states to attain the NAAQS). It would also make it impossible for New York to meet the July 20, 2021 deadline because upwind sources in Kentucky would not have implemented the rule prior to the time New York would have to demonstrate attainment. *Id.* Reclassification to a lower standard of air quality will result in increased burdens on the state, including requiring New York to reduce NOx and VOCs by an additional 3 percent per annum, which will in turn require additional air quality modeling to demonstrate attainment and adoption of any additional, necessary programs. Sliwinski Decl. ¶ 15

EPA also does not dispute that its delay in fully addressing Kentucky's requirements under the Good Neighbor Provision also harms public health and welfare. Courts have broader and more flexible equitable powers where the public interest is involved, as opposed to when only a private controversy is at stake. *Northwest Envtl. Defense Ctr. v. Bonneville Power Admin.*, 477 F.3d 668, 680 (9th Cir. 2007). Under these circumstances, the Court should exercise its discretion to mandate that EPA act as expeditiously as possible, and within the prescribed two-year time period, to comply with its mandatory obligations under the Act.

D. EPA'S HISTORY OF DELAY AND ITS ATTEMPT HERE TO AVOID ITS STATUTORY OBLIGATIONS WITH RESPECT TO THE 2008 OZONE NAAQS WARRANTS TREATING ANY IMPOSSIBILITY CLAIM WITH SKEPTICISM.

Time and again EPA has failed in its statutory obligation to provide a federal backstop when states do not fulfill their Good Neighbor Provision requirements for the 2008 ozone NAAQS, or for the 1997 ozone NAAQS. Sliwinski Reply Decl. ¶¶ 8-9. As just one example directly relevant to its delay here, EPA failed to take action to approve or disapprove Kentucky's SIP within the twelve-month statutory deadline, and did so over two years late only after being ordered to by this Court in *Wildearth Guardians v. Jackson*, Case No. 11-cv-5651-YGR (N.D. Cal.), Order, Dec. 7, 2012 (Doc. No. 69).

States continue to wait for EPA to complete its obligations for the 2008 ozone NAAQS, which by statute states rightfully expected when the NAAQS was promulgated to be completed by 2013. Sliwinski Reply Decl. ¶ 9. EPA is now attempting to get the Court's approval for a schedule that will allow it to delay completing this work until 2020, well beyond the statutory period for addressing interstate transport for the 2008 ozone NAAQS. Further, EPA asks this Court to approve a proposed schedule that would admittedly place it in violation of its mandatory duty with respect not just to Kentucky, but *thirty-four* additional states. McCabe Decl. ¶¶ 54-56 (setting forth the various dates on which EPA's 2-year deadline to issue FIPs to address the good neighbor provision for these states will run, the latest of which is November 18, 2018).

Further, it is clear from the Declaration of Janet McCabe that EPA has proposed this schedule so as to avoid having to perform its remaining obligations under the 2008 ozone. McCabe Decl. ¶¶ 187-192. The delay from EPA's proposed schedule will allow EPA to synchronize the efforts for the 2008 ozone NAAQS with its Good Neighbor Provision FIP for the 2015 ozone NAAQS, rather than perform two distinct analyses and rulemakings, thereby essentially escaping its separate obligation with respect to the 2008 NAAQS. While this would simplify the work for EPA, the agency should not be allowed to do so in violation of its statutory obligation and at the expense of the downwind states that require these emission reductions so desperately in a more expeditious time frame. Sliwinski Reply Decl. ¶ 10.

Finally, EPA's timely completion of its 2008 ozone NAAQS Good Neighbor Provision obligations with respect to Kentucky is even more important now that EPA recently proposed to deny a Clean Air Act section 176A petition filed by states in the Ozone Transport Region (OTR), including New York. Sliwinski Reply Decl. ¶¶ 11-12 & Attach. 1 ("Resp. to Dec. 9, 2013, Clean Air Act Section 176A Petition from Conn., Del., Md., Mass., N.H., N.Y., Penn., R.I., & Vt.," 82 Fed. Reg. 6,509 (Jan. 19, 2017)). The section 176A petition called on EPA to exercise its authority under the Act to add nine upwind states, including Kentucky, to the OTR, which would have required those states to implement additional control measures for ozone precursors, thereby reducing their ozone contributions to the downwind states, and engage in a process for states to collectively address ozone transport. *Id.* Rather than addressing the petitioning states' claims regarding the harm from ozone precursor emissions from the upwind states, EPA based its proposed decision on the availability of other Clean Air Act provisions that it claims would more efficiently address the interstate transport of ozone, including the Good Neighbor Provision under which this suit arises. Sliwinski Reply Decl., Attach. 1, 82 Fed. Reg. at 6,511 ("For purposes of addressing interstate transport of ozone with respect to the 2008 ozone NAAQS, the EPA believes that continuing its longstanding and effective utilization of the existing and expected control programs under the CAA's mandatory good neighbor provision embodied in CAA section 110(a)(2)(D)(i)(I) is a more effective means of addressing regional ozone pollution transport with respect the 2008 ozone NAAQS for the areas within the OTR that must attain the NAAQS.") EPA's denial of the petition furthers the need for a timely, complete remedy to violations, such as Kentucky's, of the Good Neighbor Provision through promulgation of the FIP. *Id.* ¶ 11.

E. EPA'S TWO-YEAR DEADLINE FOR COMPLETING ITS STATUTORY OBLIGATION BEGAN IN JUNE 2016, REQUIRING EPA TO PROMULGATE A FIP FOR KENTUCKY BY JUNE 2018

Where, as here, an agency does not dispute its liability, the Court, in its discretion, should determine that the statutory time frame was triggered, at the latest, on the date that EPA had notice that it would be compelled to comply with its undisputed mandatory duty. Here, that date was in June 2016,

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when both Sierra Club and New York sent EPA citizen suit notice letters of their intent to file suit against EPA and seek an injunction requiring EPA to fulfill its mandatory duty to promulgate a FIP that fully addresses Kentucky's Good Neighbor Provision obligations. Thus, to cure EPA's admitted violation of the statute, the Court should require the agency to issue a final FIP by June 11, 2018.

III. CONCLUSION

For the reasons explained above, in New York's motion for summary judgment, and in the motion for summary judgment and reply submitted by plaintiff Sierra Club, New York respectfully requests that the Court grant summary judgment to New York and order EPA perform its mandatory duty to promulgate a FIP fully addressing Kentucky's Good Neighbor Provision obligations by June 2018.

Dated: January 26, 2017

Respectfully Submitted,

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UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA

SIERRA CLUB, Plaintiff, STATE OF NEW YORK, Plaintiff-Intervenor, v. GINA MCCARTHY, in her official capacity as Administrator of the United States Environmental Protection Agency, Defendant.	Civil Case No.: 3:15-CV-4328-JD **DECLARATION OF ROBERT SLIWINSKI, P.E. IN SUPPORT OF PLAINTIFF-INTERVENOR STATE OF NEW YORK'S REPLY IN SUPPORT OF MOTION FOR SUMMARY JUDGMENT AND OPPOSITION TO CROSS MOTION**

I, Robert Sliwinski, P.E., declare as follows:

1. I am the Assistant Director of the Division of Air Resources of the New York State Department of Environmental Conservation (DEC). In this capacity, and through other positions I have held at DEC, I have acquired the knowledge and skills necessary to critically comment on Federal Implementation Plans (FIPs), such as the one that the United States Environmental Protection Agency (EPA) is preparing to fully address Kentucky's significant contribution to transport for the 2008 ozone National Ambient Air Quality Standard (NAAQS).

2. My qualifications and relevant experience are laid out in detail in paragraphs 1 through 9 of my declaration, dated November 14, 2016 (Nov. 14, 2016 Declaration), submitted in support of plaintiff intervenor New York's motion for summary judgment, also dated November 14, 2016.

3. ***New York is qualified to critically comment on EPA's proposed schedule to complete a FIP for Kentucky.*** For instance, New York was a partner in developing the Ozone Transport Commission's (OTC) NOx Budget program, the predecessor to EPA's regional ozone season NOx trading programs, and has participated in the Ozone Transport Assessment Group, an EPA-led effort to address transport for an earlier ozone NAAQS (see also Nov. 14, 2016 Declaration ¶ 8). New York has also used its technical knowledge to critically review EPA's transport modeling and policy choices in each iteration of the NOx trading programs. DEC hosts one of the few modeling centers located across the country that performs the complex, regional- and national-scale inventory and modeling work used by states in the development of their State Implementation Plans (SIPs). This work is equivalent to the inventory and modeling work developed by EPA for FIPs, such as the one at issue in this case. Therefore, New York has the requisite expertise to speak to EPA's plan to address transport and the timeline within.

4. ***EPA is asking for more time to prepare a FIP than the two (2) years allowed under Clean Air Act Sect. 110(c)(1).*** EPA's latest proposed schedule for a FIP that fully addresses Kentucky's good neighbor SIP deficiencies projects the proposal date as November 1, 2018 with final signature on February 1, 2020. Despite being beyond its deadline to issue an adequate FIP for the 2008 ozone NAAQS, EPA proposes more time for this effort than the two (2) years that the Clean Air Act (CAA) dictates. EPA needs to stay within the time frame prescribed by Congress. Yes, this work is complicated, but EPA's

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goldbricking in order to come to a schedule for its own convenience is something the court should not allow.

5. ***EPA's proposed schedule ignores the unfair burden on downwind states, such as New York, and the harm to public health from ozone pollution that was detailed in my initial declaration dated November 14, 2016.*** With measured air quality data from 2015 and 2016, the New York City metropolitan area (NYCMA) will, most certainly, miss its 2018 moderate attainment deadline (the Westport, CT monitor within the tri-state area would require a 2017 4th-highest 8-hour value of 0.053 ppm for the area to comply). Failing to meet the July 20, 2018 moderate attainment deadline would lead to a reclassification of the NYCMA to serious nonattainment for the 2008 ozone NAAQS. The NYCMA will, therefore, be required to attain by July 20, 2021, based on 2018-2020 air quality data. EPA's currently proposed schedule would preclude the emission reductions needed during those years since controls would not be installed and operating until several years after the February 1, 2020 final rule date. EPA must not delay this work past the deadline for serious nonattainment – July 20, 2021. New York will be required to develop an attainment plan for the New York City area based on 2018-2020 ozone data. Because EPA and states are required to act as expeditiously as practicable to meet the NAAQS, EPA needs to complete its work in time to affect this next attainment deadline, which will only happen if EPA completes its work within the time frame set in the CAA.

6. ***Opportunities are available for EPA to shorten its proposed schedule.*** EPA calls for deference to its expert opinion as to the amount of time it needs to complete various tasks. But when Congress provided for a specific statutory time frame, it is not appropriate to defer to the agency on an alternative schedule. Based on my extensive experience in this area, EPA can and should be required to complete the Kentucky transport FIP in the two (2) year statutory time period afforded in the CAA. EPA is requesting a normal or even more generous than normal time to complete certain tasks, including some that are not required by the CAA, while also requesting fifteen (15) months between proposed and final signatures – essentially asking for maximum time on both ends of the process. However, the deadline for completing this work has long passed and EPA needs to act with all due haste to complete this effort.

7. The following are measures EPA could take to save time in its development of its full transport FIP:

a. EPA's proposed schedule provides for up to eleven and a half (11.5) months for improving data on inventory and NO_X control strategies for non-EGUs through a Notice of Data Availability (NODA) process. EPA can save that time by eliminating the NODA process. The NODA process on non-EGU controls is unnecessary. While the ability to comment on such data would typically be welcome, there is no statutory obligation for EPA to issue the NODA. Given that time is of the essence to complete this effort so that downwind areas can realize the benefits from the control of sources contributing significantly to nonattainment or interfering with maintenance, the additional time is not justified. Still, this information will be subject to public review in the normal rulemaking process, making an extensive NODA process unnecessary, given the time constraints. Also, the amount of time EPA is asking for to perform this analysis is commensurate with starting from scratch. For this effort, EPA has been compiling this non-EGU information for more than three (3) years (see Declaration of Janet McCabe, dated Dec. 15, 2016 (McCabe Declaration) ¶ 116). It is time for EPA to finish this work.

b. EPA's proposed schedule provides for a total of twelve (12) months to perform air quality modeling. EPA can take at least six (6) months off of that schedule by:

1. Using the already existing 2011 base year inventory. This would cut five (5) months from EPA's proposed schedule. There is no need to update the 2011 base year inventory to a more recent year, e.g. 2014. An updated base year would be acceptable if timing were not an issue. The development of a base year inventory is a significant undertaking and the 2011 base year inventory is complete and has already been utilized for two (2) recently-completed transport analyses: the "Cross State Air Pollution Rule Update for the 2008 Ozone NAAQS," 81 Fed. Reg. 74,504 (Oct. 26, 2016) and the "Notice of Availability of the Environmental Protection Agency's

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Preliminary Interstate Ozone Transport Modeling Data for the 2015 Ozone National Ambient Air Quality Standard (NAAQS)," 82 Fed. Reg. 1733 (Jan. 6, 2017). EPA determined that the 2011 base year was suitable for EPA to use in its recent update to the Cross-State Air Pollution Rule and for states to reference in their good neighbor SIPs for the 2015 ozone NAAQS; therefore it should also be considered suitable for use in completing states' good neighbor obligations for the 2008 ozone NAAQS. In addition, a number of states, including New York, New Jersey and Connecticut, are currently developing attainment plans for the 2008 ozone NAAQS using this same 2011 base year inventory as required by EPA. EPA has set an aggressive schedule for states to develop attainment plans that preclude the use of any not-yet-developed inventory. Reliance on the 2014 National Emission Inventory is not needed for any of the control cost data, or feasibility work; EPA will update information based on whatever future year inventory is used. If future year scenarios and emissions are projected correctly, either 2011 or 2014 would be adequate as the base year.

2. Using already-completed base case modeling would save six (6) months. EPA has performed base case modeling with the 2011 inventory. The 2023 projection modeling recently done, however, is not representative of the timeframe in which reductions are currently needed for the 2008 ozone NAAQS. EPA now needs to project the 2011 inventory to 2020 in order to model the appropriate future year for serious nonattainment areas under the 2008 ozone NAAQS.

3. Within the Cross State Air Pollution Rule (CSAPR) framework, EPA completed step one (1) (identifying downwind areas with air quality problems based on air quality modeling projections to a future compliance year) and step two (2) (identifying upwind states as "linked" to downwind receptors) for a projected 2017 and for a projected 2023, through its recent transport contribution modeling for the

2015 ozone NAAQS. EPA can utilize much of the background done for these efforts (i.e., EPA has developed growth factors and determined when controls will be implemented) to complete a projection inventory for a 2020 analysis, also saving substantial time over a completely new analysis with a 2014 base year inventory. Additionally, Integrated Planning Model cost threshold work does not need to be re-done. EPA recently finished the CSAPR Update rulemaking that relied on these values, and control cost information does not appreciably change that quickly.

c. EPA's proposed schedule provides for twenty-two (22) months from when it claims to have begun the process (Sept. 2016) to develop a proposed rule. By using 2011 as the base year, EPA can advance the schedule so work on the proposal text and supporting documents can begin immediately. By starting work on these documents now, this work can be completed much sooner and the proposal can be signed at least a full year earlier than under EPA's extended schedule.

d. EPA's proposed schedule provides for two (2) months for internal review at two (2) separate points of the process. That amount of time is simply not acceptable when EPA is already so far past its deadline.

e. EPA's proposed schedule gives itself more than fourteen (14) months to take comment and finalize the rule. This is excessive. With proper motivation, EPA has shown it can complete this work in less than one (1) year (e.g., the NOx SIP Call (eleven and a half (11.5) months between proposal [10/10/97] and final [9/24/98]); CSAPR (ten (10) months between proposal [9/14/10] and final [7/6/11]); and the CSAPR Update (nine (9) months between proposal [12/3/15] and final [9/7/16])). EPA is asking for six (6) months to re-do the air quality modeling it performed for the proposal and develop the final remedy. EPA does not need all of this time to complete this work. The adjustments that will need to be made will be limited and not a wholesale, new modeling exercise. Once again, EPA wishes to wait until well into the process to start development of the final rule text and

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supporting documents. By shortening the schedule to complete this work, the rulemaking can be complete in significantly less time.

f. EPA provided eight (8) months for New York to prepare an attainment SIP for the NYCMA for the 2008 ozone NAAQS. This SIP includes modeling similar in scope to the modeling to be conducted by EPA for Kentucky's FIP.

8. ***History of missed deadlines and inadequate measures to address transport.*** EPA has failed time and again in its statutory obligation to provide a federal backstop when states do not fulfill their good neighbor requirements for the 2008 ozone NAAQS or for the 1997 ozone NAAQS. While litigation has impacted this schedule, EPA's policy decisions regarding the amount of reductions it was willing to require has also played a substantial role in the continued significant contribution to nonattainment and interference with maintenance of these standards from sources in upwind states. With the 1997 ozone NAAQS, EPA determined that emissions reductions costing $500/ton would eliminate transported ozone from upwind states and set emissions budgets based on those costs. First, EPA overestimated the costs required to meet these emission levels. Since April 2015, ozone season NOx emissions allowances have generally traded between $200-$300/ton (and at times as low as $125/ton), which provides a truer barometer of emission reduction cost. This resulted in lost opportunity for cost effective emissions reductions and addressing transport from upwind states. Second, for reasons outside EPA's control, emissions from contributing states were actually reduced below the levels set by EPA for the 1997 ozone NAAQS and, still, upwind states contributed significantly to downwind nonattainment of the 1997 ozone NAAQS, and, subsequently, the 2008 ozone NAAQS. As a result, downwind states like New York and New Jersey have been forced to undertake more and more expensive controls – including RACT levels set at $5,000/ton, mobile source measures in excess of $10,000/ton, and the further control of minor sources with costs far exceeding $10,000/ton while leaving far less expensive upwind controls on the table.

9. Knowing this, EPA continued to set a very low bar for addressing transport. The CSAPR Update rule for the 2008 ozone NAAQS (a "partial remedy") used a cost threshold of $1,400/ton and only applied it to a subset of sources (EGUs). This effectively only required sources with controls installed in

response to earlier transport rules to operate those controls; a great many of the sources covered by CSAPR had been able to turn off their NOx controls because of market forces and EPA's weak rules. States continue to wait for EPA to complete a regulation that was required by statute (and that states would have rightfully expected when the NAAQS was promulgated) to be completed by 2013. EPA is now saying it will not be able to complete this work until 2020, and the remaining significant contributions will not be eliminated until several years after that.

10. ***EPA is more interested in combining its transport efforts of the 2008 and 2015 ozone NAAQS than meeting its statutory obligations under the 2008 ozone NAAQS.*** Paragraphs 189-192 of Janet McCabe's declaration reveal the true reason EPA is attempting to delay the Kentucky full remedy FIP for the 2008 ozone NAAQS: This delay will allow EPA to synchronize the efforts for the 2008 ozone NAAQS with its good neighbor FIP for the 2015 ozone NAAQS, rather than perform two (2) distinct analyses and rulemakings. While this would simplify the work for EPA, EPA should not do so at the expense of the downwind states that require these emission reductions so desperately in a more expeditious time frame. Since addressing transport is a state obligation, EPA should not be focusing its efforts on states' failure to meet the transport requirements for the 2015 ozone NAAQS until after it has addressed those same obligations for the 2008 ozone NAAQS. If EPA is intent on doing so, it could address the 2015 ozone NAAQS within their proposed schedule for the 2008 ozone NAAQS (or sooner, given the above corrections to the schedule); paragraph 190 of the McCabe declaration states that a FIP for good neighbor contributions under the 2015 NAAQS can be promulgated anytime on or after October 1, 2018.

11. ***EPA's reliance on this action to address a history of missed deadlines and inadequate transport solutions makes the timely completion of the work on the 2008 ozone NAAQS even more important now.*** EPA has not acted on CAA Section 110 "good neighbor" SIPs or CAA Section 126 petitions filed by downwind states in anything resembling the time frames spelled out in the CAA. This results in delayed solutions to transport that do not provide adequate levels of emission reductions in suitable timeframes. The OTC has repeatedly made the case for timely solutions, most recently in a June 3,

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2016 resolution to EPA. A number of Section 126 petitions were filed in 2016 and EPA has yet to act on any of them. Even when it was provided with a six (6) month extension, to January 25, 2017, to respond to a petition submitted by Connecticut, EPA has failed to take any timely action. EPA also has a record of failing to act on requests to re-designate areas to higher nonattainment classifications which would put states on a stricter regime of controls and SIP development. Without these additional control measures in upwind states, New York is even more reliant on Kentucky fully meeting its good neighbor obligations as soon as possible. EPA's recent proposed denial of the CAA section 176A petition filed by existing OTR states furthers the need for a timely, complete remedy to violations, such as Kentucky's, of the good neighbor provision. See "Response to Dec. 9, 2013, Clean Air Act Section 176A Petition from Connecticut, Delaware, Maryland, Massachusetts, New Hampshire, New York, Pennsylvania, Rhode Island, and Vermont," 82 Fed. Reg. 6,509 (Jan. 19, 2017) (attached to my declaration as Attachment 1). The petition called on EPA to exercise its authority under section 176A to add nine (9) upwind states to the Ozone Transport Region (OTR), which would require those states to implement additional control measures for ozone precursors, thereby reducing their ozone contributions to the downwind states; it would also bring these states together with the existing OTR states to collectively develop solutions to ozone transport. EPA has identified several mechanisms that it prefers states use to address transport. Remarkably, states, including New York, have done exactly that to little affect. Sadly, EPA's record is one of inaction or delay of which the proposed Section 176A petition proposed denial is an excellent example. This denial wasn't even proposed until more than a year and a half after EPA was required by statute to make a final decision.

12. EPA appears to have made a policy decision, rather than one resulting from technical analysis, in proposing to deny the section 176A petition. Rather than comment on the petitioning states' claims of the harm done by ozone precursor emissions from the upwind states, EPA based its decision on the availability of other CAA provisions that it claims would more efficiently address the interstate transport of ozone – namely, sections 110(a)(2)(D)(i)(I) and 126(b). Pertaining to the former option, EPA states: "For purposes of addressing interstate transport of ozone with respect to the 2008 ozone NAAQS,

the EPA believes that continuing its longstanding and effective utilization of the existing and expected control programs under the CAA's mandatory good neighbor provision embodied in CAA section 110(a)(2)(D)(i)(I) is a more effective means of addressing regional ozone pollution transport with respect the 2008 ozone NAAQS for the areas within the OTR that must attain the NAAQS." See Attachment 1, 82 Fed. Reg. at 6,511. New York agrees with the sentiment that these are valuable CAA provisions for addressing transport, but EPA must do its part by addressing its FIP obligation and by acting on CAA petitions in a timely and scientifically sound manner.

13. ***EPA's position on the length of time needed to implement the relevant controls is exaggerated.*** The controls resulting from this effort should not be delayed past August 2020. Two (2) years provides more than adequate time to realize these reductions and reflects the timeframe that Congress envisioned for such actions. Paragraph 119 of McCabe's Declaration notes that EPA's preliminary estimates of installation times for non-EGU NOx controls from its Technical Support Document "do not account for time required for programmatic adoption of measures, such as permitting and installation of monitoring equipment," but Ms. McCabe exaggerates the time associated with incorporating new requirements into permits and installing control equipment. States have extensive experience addressing new control equipment in permits, and the time required for installation is likely closer to twelve (12) months rather than eighteen (18). Additionally, the installation of monitoring equipment can be done concurrently with the installation of controls.

I declare under penalty of perjury under the laws of the United States that the foregoing is true and correct.

So declared this 26th day of January, 2017.

Robert Sliwinski, P.E.

ATTACHMENT 1

businesses and to furnish the notice of opportunity to submit comments. The Agency's decision to follow this course was made in recognition of the administrative difficulty and impracticality of directly contacting potentially thousands of individual businesses.

4. Submission of Your Response in the English Language

All responses to this notice must be in the English language.

5. The Effect of Failure To Respond to This Notice

In accordance with 40 CFR 2.204(e)(1) and 2.205(d)(1), EPA will construe your failure to furnish timely comments in response to this notice as a waiver of your business's claim(s) of business confidentiality for any information in the types of documents identified in this notice.

6. What To Include in Your Comments

If you believe that any of the information contained in the types of documents which are described in this notice and which are currently, or may become, subject to FOIA requests, is entitled to business confidential treatment, please specify which portions of the information you consider business confidential. Information not specifically identified as subject to a business confidentiality claim may be disclosed to the requestor without further notice to you.

For each item or class of information that you identify as being subject to your claim, please answer the following questions, giving as much detail as possible:

1. For what period of time do you request that the information be maintained as business confidential, *e.g.,* until a certain date, until the occurrence of a specified event, or permanently? If the occurrence of a specific event will eliminate the need for business confidentiality, please specify that event.

2. Information submitted to EPA becomes stale over time. Why should the information you claim as business confidential be protected for the time period specified in your answer to question no. 1?

3. What measures have you taken to protect the information claimed as business confidential? Have you disclosed the information to anyone other than a governmental body or someone who is bound by an agreement not to disclose the information further? If so, why should the information still be considered business confidential?

4. Is the information contained in any publicly available material such as the Internet, publicly available data bases, promotional publications, annual reports, or articles? Is there any means by which a member of the public could obtain access to the information? Is the information of a kind that you would customarily not release to the public?

5. Has any governmental body made a determination as to the business confidentiality of the information? If so, please attach a copy of the determination.

6. For each category of information claimed as business confidential, explain with specificity why and how release of the information is likely to cause substantial harm to your competitive position. Explain the specific nature of those harmful effects, why they should be viewed as substantial, and the causal relationship between disclosure and such harmful effects. How could your competitors make use of this information to your detriment?

7. Do you assert that the information is submitted on a voluntary or a mandatory basis? Please explain the reason for your assertion. If the business asserts that the information is voluntarily submitted information, please explain whether and why disclosure of the information would tend to lessen the availability to EPA of similar information in the future.

8. Any other issue you deem relevant.

Please note that you bear the burden of substantiating your business confidentiality claim. Conclusory allegations will be given little or no weight in the determination. If you wish to claim any of the information in your response as business confidential, you must mark the response "BUSINESS CONFIDENTIAL" or with a similar designation, and must bracket all text so claimed. Information so designated will be disclosed by EPA only to the extent allowed by, and by means of, the procedures set forth in, 40 CFR part 2, subpart B. If you fail to claim the information as business confidential, it may be made available to the requestor without further notice to you.

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

1. Submitting CBI. Do not submit this information to EPA through *http://www.regulations.gov* or email. Please submit this information by mail to the address identified in the **ADDRESSES** section of today's notice for inclusion in the non-public CBI docket. Clearly mark the part or all of the information that you claim to be CBI. For CBI information in a disk or CD ROM that you mail to EPA, mark the outside of the disk or CD ROM as CBI and then identify electronically within the disk or CD ROM the specific information that is claimed as CBI. Information so marked will not be disclosed except in accordance with the procedures set forth in 40 CFR part 2, subpart B. In addition to the submission of one complete version of the comment that includes information claimed as CBI, a copy of the comment that does not contain the information claimed as CBI must be submitted for inclusion in the public docket.

2. Tips for Preparing Your Comments. When submitting comments, remember to:

- Identify the notice by docket number and other identifying information (subject heading, **Federal Register** date and page number).
- Explain your views as clearly as possible, avoiding the use of profanity or personal threats.
- Describe any assumptions and provide any technical information and/or data that you used.
- Provide specific examples to illustrate your concerns, and suggest alternatives.
- Make sure to submit your comments by the comment period deadline identified.

Dated: January 4, 2017.

Robert Tomiak,

Director, Office of Federal Activities.

[FR Doc. 2017–01101 Filed 1–18–17; 8:45 am]

BILLING CODE 6560–50–P

ENVIRONMENTAL PROTECTION AGENCY

[EPA–OAR–2016–0596; FRL–9958–48–OAR]

RIN 2060–AT22

Response to December 9, 2013, Clean Air Act Section 176A Petition From Connecticut, Delaware, Maryland, Massachusetts, New Hampshire, New York, Pennsylvania, Rhode Island and Vermont

AGENCY: Environmental Protection Agency (EPA).

ACTION: Notice of proposed action on petition.

SUMMARY: The Environmental Protection Agency (EPA) is proposing to deny the Clean Air Act (CAA or Act) petition filed on December 9, 2013 (and amended on December 17, 2013), by the states of Connecticut, Delaware, Maryland, Massachusetts, New Hampshire, New York, Pennsylvania, Rhode Island and Vermont. The petition requested that the EPA add the states of

Illinois, Indiana, Kentucky, Michigan, North Carolina, Ohio, Tennessee, West Virginia and Virginia to the Ozone Transport Region (OTR). As a result of this denial, the geographic scope or requirements of the OTR will remain unchanged.

DATES: *Comments.* Comments must be received on or before February 21, 2017.

Public Hearing. If anyone contacts us requesting to speak at a public hearing by January 30, 2017, we will hold a public hearing. Additional information about the hearing would be published in a subsequent **Federal Register** notice. For updates and additional information on a public hearing, please check the EPA's Web site for this notice at *https://www.epa.gov/implementation-2008-national-ambient-air-quality-standards-naaqs-ozone-state.*

ADDRESSES: Submit your comments, identified by Docket ID No. EPA–HQ–OAR–2016–0596, at *http://www.regulations.gov.* Follow the online instructions for submitting comments. Once submitted, comments cannot be edited or removed from *Regulations.gov.* The EPA may publish any comment received to its public docket. Do not submit electronically any information you consider to be Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Multimedia submissions (audio, video, etc.) must be accompanied by a written comment. The written comment is considered the official comment and should include discussion of all points you wish to make. The EPA will generally not consider comments or comment contents located outside of the primary submission (*i.e.,* on the Web, Cloud, or other file sharing system). For additional submission methods, the full EPA public comment policy, information about CBI or multimedia submissions, and general guidance on making effective comments, please visit *http://www2.epa.gov/dockets/commenting-epa-dockets.*

FOR FURTHER INFORMATION CONTACT: Questions concerning this proposed notice should be directed to Ms. Gobeail McKinley, U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Air Quality Policy Division, Mail code C539–01, Research Triangle Park, NC 27711, telephone (919) 541–5246; email at *mckinley.gobeail@epa.gov.*

To request a public hearing or information pertaining to a public hearing on this document, contact Ms. Pamela Long, U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Air Quality Policy Division, (C504–01), Research Triangle Park, NC 27711; telephone number (919) 541–0641; fax number (919) 541–5509; email at: *long.pam@epa.gov* (preferred method of contact).

SUPPLEMENTARY INFORMATION:

I. General Information

Throughout this document wherever "we," "us," or "our" is used, we mean the U.S. EPA.

The information in this Supplementary Information section of this preamble is organized as follows:

I. General Information
- A. Where can I get a copy of this document and other related material?
- B. What acronyms, abbreviations and units are used in this preamble?

II. Executive Summary of the EPA's Proposed Decision on the CAA Section 176A Petition

III. Background and Legal Authority
- A. Ozone and Public Health
- B. Sections 176A and 184 of the CAA and the OTR Process
- C. Legal Standard for this Action
- D. The CAA Section 176A Petition and Related Correspondence

IV. The EPA's Proposed Decision on the CAA Section 176A Petition
- A. The CAA Good Neighbor Provisions
- B. The EPA's Interstate Transport Rulemakings under the Good Neighbor Provision
- C. Additional Rules that Reduce NO_X and VOC Emissions
- D. Rationale for the Proposed Decision on the CAA 176A Petition

V. Judicial Review and Determinations Under Section 307(b)(1) of the CAA

VI. Statutory Authority

I. General Information

A. Where can I get a copy of this document and other related information?

In addition to being available in the docket, an electronic copy of this document will be posted at *https://www.epa.gov/implementation-2008-national-ambient-air-quality-standards-naaqs-ozone-state.*

B. What acronyms, abbreviations and units are used in this preamble?

APA Administrative Procedures Act
CAA or Act Clean Air Act
CFR Code of Federal Regulations
CH_4 Methane
D.C. Circuit United States Court of Appeals for the District of Columbia Circuit
EGU Electric Generating Unit
EPA U.S. Environmental Protection Agency
FIP Federal Implementation Plan
FR Federal Register
NAAQS National Ambient Air Quality Standard
NEI National Emissions Inventory
NESHAP National Emission Standard for Hazardous Air Pollutants
NO_X Nitrogen Oxides
NSPS New Source Performance Standard
NSR New Source Review
OMB Office of Management and Budget
OTAG Ozone Transport Assessment Group
OTC Ozone Transport Commission
OTR Ozone Transport Region
PM Particulate Matter
RACT Reasonably Available Control Technology
SIP State Implementation Plan
SO_2 Sulfur Dioxide
UMRA Unfunded Mandates Reform Act
VOC Volatile Organic Compound

II. Executive Summary of the EPA's Proposed Decision on the CAA Section 176A Petition

The EPA is proposing to deny a petition filed pursuant to CAA section 176A(a) that requests the states of Illinois, Indiana, Kentucky, Michigan, North Carolina, Ohio, Tennessee, West Virginia and Virginia [1] (the upwind states) be added to the OTR, which was established pursuant to section 184 of the CAA. The petitioning states of Connecticut, Delaware, Maryland, Massachusetts, New Hampshire, New York, Pennsylvania, Rhode Island and Vermont (the petitioning states, downwind states, or petitioners) submitted a technical analysis intended to demonstrate that these nine upwind states significantly contribute to violations of the 2008 ozone national ambient air quality standard (NAAQS) in one or more of the current OTR states.

Section 176A(a) of the CAA provides the Administrator with the authority to develop interstate transport regions for particular pollutants where the Administrator determines that interstate transport of air pollutants from one or more states contributes significantly to violations of air quality standards in other states. The creation of such an interstate transport region requires the establishment of a transport commission with representatives from each state that make recommendations for the mitigation of the interstate pollution. Congress created one such transport region by statute in CAA section 184(a) in 1990 in order to address the interstate transport of ozone pollution, referred to as the OTR. The statute establishes certain minimum control requirements that apply to sources of emissions in each state in the OTR intended to address transported ozone pollution and provides the Ozone Transport Commission (OTC), comprised of representatives of each state in the OTR, with the authority to recommend

[1] The parts of northern Virginia included in the Washington, DC Consolidated Metropolitan Statistical Area are already in the OTR. The petition seeks to add the remainder of the state of Virginia to the OTR as well.

additional controls within the region. The downwind states' petition seeks to expand the OTR to include additional states and would thereby subject sources in those states to the requirements applicable in the OTR.

The CAA provides other provisions for addressing the interstate transport of ozone pollution besides sections 176A and 184. In particular, the Act includes a specific provision addressing how the EPA and the states are to mitigate the specific sources of emissions that contribute to interstate ozone pollution transport. Section 110(a)(2)(D)(i)(I) of the CAA, also referred to as the "good neighbor" provision, requires that states develop state implementation plans (SIPs) to prohibit emissions that will "contribute significantly to nonattainment in, or interfere with maintenance by, any other state" with respect to a NAAQS. Pursuant to this provision, states have the primary responsibility for reducing the interstate transport of pollutants, including ozone. Should the states fail to fulfill this responsibility, the EPA is obligated to develop federal implementation plans (FIPs) to ensure that appropriate emissions reductions are achieved and that the air quality standards downwind are attained and maintained. The CAA also contains a provision in section 126(b) that permits states and political subdivisions to petition the Administrator for a finding that any major source or group of stationary sources emits in violation of the prohibition in the good neighbor provision. In response to such a finding, the EPA may promulgate additional limits on such sources, and these limits must then be included in a state's good neighbor SIP pursuant to CAA section 110(a)(2)(D)(ii). This provision provides a means for the EPA to mediate disputes between the states regarding the compliance of specific sources with the requirements of the good neighbor provision. As described in detail later in this document, states and the EPA have historically used their authority under CAA sections 110(a)(2)(D)(i)(I) and section 126 to develop SIPs and FIPs that target specific sources of ozone precursor emissions to address interstate ozone transport across the U.S., including with respect to air quality concerns stemming from interstate transport of ozone within the OTR.

Pursuant to these and other CAA authorities, the EPA and states within and outside the OTR have taken significant actions independently and in collaboration for many years to address ozone pollution problems by reducing precursor emissions (*i.e.,* nitrogen oxides (NO_X) and volatile organic compounds (VOC)) that contribute to the formation of ozone. The EPA and states have promulgated a number of rules that have already or are expected in the future to result in reductions in ozone concentrations that will help areas attain the 2008 ozone NAAQS. Several of these rules were developed specifically to address the interstate transport of ozone pollution. With respect to the 2008 ozone NAAQS, the EPA recently promulgated FIPs to address the requirements of CAA section 110(a)(2)(D)(i)(I) to specifically address interstate transport of ozone pollution in the eastern U.S. from power plants during the ozone season.[2] Other rules reduce ozone precursor emissions to address other ozone pollution challenges (*e.g.,* ozone attainment demonstrations) and impact the interstate transport of ozone pollution as a co-benefit. Further, several other state and federal air quality regulations reduce emissions of other air pollutants, such as rules targeted to reduce air toxics from industrial boilers, which often also result in the reduction of ozone precursors (*e.g.,* NO_X) and thereby reduce interstate ozone transport as a co-pollutant benefit.

Section 176A of the CAA provides the Administrator with discretion to determine whether to establish a new transport region or expand an existing transport region. The EPA has reviewed the request of the petitioners in light of the control requirements that apply to sources located in states now included in the OTR and that would apply to states if they were added and the other statutory authorities provided for addressing the interstate transport of ozone pollution. The EPA proposes to deny the CAA section 176A petition to add states to the OTR for the purpose of addressing the interstate ozone transport problem with respect to the 2008 ozone NAAQS. The EPA believes that, based on the reasons fully described in Section IV of this document, other CAA provisions (*e.g.,* CAA sections 110 or 126) provide a better alternative pathway for states and the EPA to develop a targeted remedy to address interstate ozone transport that focuses on the precursor pollutants and sources most effective at addressing the nature of the downwind air quality problems identified by the petitioning states. The states and the EPA have historically and effectively reduced ozone and the interstate transport of ozone pollution using these CAA authorities to implement necessary emissions reductions. For purposes of addressing interstate transport of ozone with respect to the 2008 ozone NAAQS, the EPA believes that continuing its longstanding and effective utilization of the existing and expected control programs under the CAA's mandatory good neighbor provision embodied in CAA section 110(a)(2)(D)(i)(I) is a more effective means of addressing regional ozone pollution transport with respect the 2008 ozone NAAQS for the areas within the OTR that must attain the NAAQS. Thus, the EPA believes that regulation pursuant to these other CAA authorities together with the implementation of existing EPA and state rules expected to further reduce precursor pollutant emissions that contribute to the interstate transport of ozone are the more effective means for addressing the interstate ozone transport problem with respect to the 2008 ozone NAAQS. Accordingly, the EPA is proposing to deny the CAA section 176A petition filed by the petitioning states. This proposed denial is specific to the 2008 ozone NAAQS, but the EPA notes that under different circumstances the OTR provisions have been an effective tool for air quality management, and could be similarly effective in the future. The EPA requests comment on the proposed denial of the petition based on the EPA's preferred approach to addressing interstate transport with respect to the 2008 ozone NAAQS pursuant to these other CAA authorities.

III. Background and Legal Authority

A. Ozone and Public Health

Ground-level ozone causes a variety of negative effects on human health, vegetation, and ecosystems. In humans, acute and chronic exposure to ozone is associated with premature mortality and a number of morbidity effects, such as asthma exacerbation. In ecosystems, ozone exposure causes visible foliar injury, decreases plant growth, and affects ecosystem community composition. Ground-level ozone is not emitted directly into the air, but is a secondary air pollutant created by chemical reactions between NO_X, carbon monoxide (CO), methane (CH_4), and non-methane VOCs in the presence of sunlight. Emissions from electric generating utilities (EGUs), industrial facilities, motor vehicles, gasoline vapors, and chemical solvents are some of the major anthropogenic sources of ozone precursors. The potential for ground-level ozone formation increases during periods with warmer temperatures and stagnant air masses;

[2] *See* 81 FR 74504, October 26, 2016, Cross-State Air Pollution Rule Update for the 2008 Ozone NAAQS.

therefore ozone levels are generally higher during the summer months.[3] Ground-level ozone concentrations and temperature are highly correlated in the eastern U.S. with observed ozone increases of 2–3 parts per billion (ppb) per degree Celsius reported.[4] Increased temperatures may also increase emissions of volatile man-made and biogenic organics and can indirectly increase anthropogenic NO_X emissions as well (*e.g.,* through increased electricity generation to power air conditioning).

Precursor emissions can be transported downwind directly or, after transformation in the atmosphere, as ozone. Studies have established that ozone formation, atmospheric residence, and transport occurs on a regional scale (*i.e.,* hundreds of miles) over much of the eastern U.S., with elevated concentrations occurring in rural as well as metropolitan areas. As a result of ozone transport, in any given location, ozone pollution levels are impacted by a combination of local emissions and emissions from upwind sources. The transport of ozone pollution across state borders compounds the difficulty for downwind states in meeting the health-and-welfare based NAAQS. Numerous observational studies have demonstrated the transport of ozone and its precursors and the impact of upwind emissions on high concentrations of ozone pollution.

While substantial progress has been made in reducing ozone in many urban areas, regional-scale ozone transport is still an important component of peak ozone concentrations during the summer ozone season. Model assessments have looked at impacts on peak ozone concentrations after potential emission reduction scenarios for NO_X and VOCs for NO_X-limited and VOC-limited areas. For example, one study[5] concluded that NO_X emission reductions strategies would be effective in lowering ozone mixing ratios in urban areas and another study showed NO_X reductions would reduce peak ozone concentrations in non-attainment areas in the Mid-Atlantic (*i.e.,* a 10 percent reduction in electric generating unit (EGU) and non-EGU NO_X emissions would result in approximately a 6 ppb reduction in peak ozone concentrations in Washington, DC).[6]

On March 12, 2008, the EPA promulgated a revision to the NAAQS, lowering both the primary and secondary standards to 75 ppb.[7] On October 1, 2015, the EPA strengthened the ground-level ozone NAAQS, based on extensive scientific evidence about ozone's effects on public health and welfare.[8] This document does not address any CAA requirements with respect to the 2015 ozone NAAQS.

B. Sections 176A and 184 of the CAA and the OTR Process

Subpart 1 of part D of title I of the CAA provides provisions governing general plan requirements for designated nonattainment areas. This subpart includes provisions providing for the development of transport regions to address the interstate transport of pollutants that contribute to NAAQS violations. In particular, section 176A(a) of the CAA provides that, on the EPA's own motion or by a petition from the Governor of any state, whenever the EPA has reason to believe that the interstate transport of air pollutants from one or more states contributes significantly to a violation of the NAAQS in one or more other states, the EPA may establish, by rule, a transport region for such pollutant that includes such states. The provision further provides that the EPA may add any state or portion of a state to any transport region whenever the Administrator has reason to believe that the interstate transport of air pollutants from such state significantly contributes to a violation of the standard in the transport region.

Section 176A(b) of the CAA provides that when the EPA establishes a transport region, the Administrator shall establish an associated transport commission, comprised of (at a minimum) the following: Governor or designee of each state, the EPA Administrator or designee, the Regional EPA Administrator and an air pollution control official appointed by the Governor of each state. The purpose of the transport commission is to assess the degree of interstate transport throughout the transport region and assess control strategies to mitigate the interstate transport.

Subpart 2 of part D of title I of the CAA provides provisions governing additional plan requirements for designated ozone nonattainment areas. Consistent with CAA section 176A found in subpart 1, subpart 2 included specific provisions focused on the interstate transport of ozone. In particular, CAA section 184(a) established a single transport region for ozone—the OTR—comprised of the states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont and the Consolidated Metropolitan Statistical Area that includes the District of Columbia and certain parts of northern Virginia.

Section 184(b) of the CAA established certain control requirements that each state in the OTR is required to implement within the state and which require certain controls on sources of NO_X and VOCs statewide. These include the following. Section 184(b)(1)(A) of the CAA requires OTR states to include in their SIPs enhanced vehicle inspection and maintenance (I/M) programs.[9] Section 184(b)(2) of the CAA requires SIPs to subject major sources of VOCs in ozone transport regions to the same requirements that apply to major sources in designated ozone nonattainment areas classified as moderate, regardless of whether the source is located in a nonattainment area. Thus, the state must adopt rules to apply the nonattainment new source review (NNSR) (pursuant to CAA section 173) and reasonably available control technology (RACT) (pursuant to CAA section 182(b)(2)) provisions for major VOC sources statewide. Section 184(b)(2) of the CAA further provides that, for purposes of implementing these requirements, a major stationary source shall be defined as any source that emits or has the potential to emit at least 50 tons per year of VOCs. Under CAA section 184(b)(2) states must also implement Stage II vapor recovery programs, incremental to Onboard Refueling Vapor Recovery achievements, or measures that achieve comparable emissions reductions for both attainment and nonattainment areas.[10] These programs are required to be implemented statewide in any state

[3] Rasmussen, D.J. et al. (2011) Ground-level ozone-temperature relationship in the eastern US: A monthly climatology for evaluating chemistry-climate models. Atmospheric Environment 47: 142–153.

[4] Bloomer, B.J., J.W. Stehr, C.A. Piety, R.J. Salawitch, and R.R. Dickerson (2009), Observed relationships of ozone air pollution with temperature and emissions, Geophysical Research Letters, 36, L09803.

[5] Jiang, G.; Fast, J.D. (2004) Modeling the effects of VOC and NO_X emission sources on ozone formation in Houston during the TexAQS 2000 field campaign. Atmospheric Environment 38: 5071–5085.

[6] Liao, K. et al. (2013) Impacts of interstate transport of pollutants on high ozone events over the Mid-Atlantic U.S. Atmospheric Environment 84, 100–112.

[7] *See* National Ambient Air Quality Standards for Ozone, Final Rule, 73 FR 16436 (March 27, 2008).

[8] *See* National Ambient Air Quality Standards for Ozone, Final Rule, 80 FR 65292 (October 26, 2015).

[9] Enhanced vehicle inspection and maintenance programs are required in metropolitan statistical areas in the OTR with a 1990 Census population of 100,000 or more regardless of ozone attainment status.

[10] *See* 72 FR 28772, May 16, 2012, Air Quality: Widespread Use for Onboard Refueling Vapor Recovery and Stage II Waiver.

included within the OTR, not just in areas designated as nonattainment.

Section 182(f) of the CAA requires states to apply the same requirements to major stationary sources of NO_X as are applied to major stationary sources of VOCs under subpart 2. Thus, the same NNSR and RACT requirements that apply to major stationary sources of VOC in the OTR also apply to major stationary sources of NO_X.[11] While NO_X emissions are necessary for the formation of ozone in the lower atmosphere, a local decrease in NO_X emissions can, in some cases, increase local ozone concentrations, creating potential "NO_X disbenefits." Accordingly, CAA section 182(f) provides for an exemption of the NO_X requirements where the Administrator determines that such NO_X reductions would not contribute to the attainment of the NAAQS in a particular area. Areas granted a NO_X exemption under CAA section 182(f) may be exempt from certain requirements of the EPA's motor vehicle I/M regulations and from certain federal requirements of general and transportation conformity.[12]

Additionally, under CAA section 184(c), the OTC may, based on a majority vote of the Governors on the Commission, recommend additional control measures not specified in the statute to be applied within all or part of the OTR if necessary to bring any areas in the OTR into attainment by the applicable attainment dates. If EPA approves such a recommendation, under CAA section 184(c)(5) the Administrator must declare each state's implementation plan inadequate and it must order the states to include the approved control measures in their revised plans pursuant to CAA section 110(k)(5) for the state to meet the requirements of CAA section 110(a)(2)(D). If a CAA section 110(k)(5) finding is issued, states have 1 year to revise their SIPs to include the approved measures.

States included in the OTR by virtue of CAA section 184(b)(1) were required to submit SIPs to the EPA addressing these requirements within 2 years of the 1990 CAA Amendments, or by November 15, 1992. Section 184(b)(1) of the CAA further provides that if states are later added to the OTR pursuant to CAA section 176A(a)(1), such states must submit SIPs addressing these requirements within 9 months after inclusion in the OTR.

C. Legal Standard for This Action

Section 176A(a)(1) of the CAA states that the Administrator *may* add a state to a transport region if the Administrator has reason to believe that emissions from the state significantly contribute to a violation of the NAAQS within the transport region. For the reasons discussed in this section, the use of the discretionary term "may" in CAA section 176A(a) means that the Administrator may exercise reasonable discretion in implementing the requirements of the CAA with respect to interstate pollution by determining whether or not to approve or deny a CAA section 176A petition.

The Administrator's discretion pursuant to CAA section 176A(a) has been affirmed by the U.S. District Court for the District of Columbia Circuit (D.C. Circuit). In *Michigan* v. *EPA,* plaintiffs challenged whether the EPA may exercise its authority pursuant to CAA sections 110(k)(5) and 110(a)(2)(D) of the statute to address interstate transport without first forming a transport commission pursuant to CAA section 176A(b). 213 F.3d 663, 672 (2000). The D.C. Circuit held that the agency shall only establish a transport commission "if the agency exercises its discretion to create a transport region pursuant to section 176A(a)." *Id.* The court explained that "EPA can address interstate transport apart from convening a 176A/184 transport commission as subsection (a) provides that EPA 'may' establish a transport region . . . ." *Id.* Thus, the court held that the statute clearly provides that the discretion to create a transport region rests with the Administrator. So, too, does the discretion to add states to or remove states from a transport commission.

Several courts have held that the use of similarly non-mandatory language such as that found in CAA section 176A confers discretion on the agency to grant or deny a petition so long as it is supported by a "reasonable explanation." For example, in *Massachusetts* v. *Environmental Protection Agency,* the Supreme Court was considering whether the EPA's denial of a petition to regulate greenhouse gases under CAA section 202(a)(1) was reasonable. 549 U.S. 497 (2007). Section 202(a)(1) of the CAA states that the Administrator "shall by regulation prescribe (and from time to time revise) . . . standards applicable to the emission of any air pollutant from any class or classes of new motor vehicles or new motor vehicle engines, which in his judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare." The EPA denied the petition, reasoning that the Act does not authorize the agency to issue mandatory regulations to address global climate change. *Id.* at 500. The Court concluded that the EPA has statutory authority to regulate emissions of greenhouse gases, and that the phrases "from time to time" and "in his judgment" conferred discretion on the Administrator to determine whether to promulgate an endangerment finding. Thus, "[u]nder the clear terms of the Clean Air Act, EPA can avoid taking further action . . . if it provides some reasonable explanation as to why it cannot or will not exercise its discretion." *Id.* at 533. The Supreme Court confirmed that the review of an agency's denial of a petition for rulemaking is very narrow: "Refusals to promulgate rules are . . . susceptible to judicial review, though such review is extremely limited and highly deferential." *Id.* at 527–28 (quotations omitted). Further, the court explained that the EPA's reason should conform to the authorizing statute, and that the agency could avoid taking further regulatory action if it provides some reasonable explanation as to why it cannot or will not exercise its discretion. *Id.* at 533 (citations omitted).

Consistent with *Massachusetts,* the D.C. Circuit has held that agencies have the discretion to determine how to best allocate resources in order to prioritize regulatory actions in a way that best achieve the objectives of the authorizing statute. In *Defenders of Wildlife* v. *Gutierrez,* the court rejected a challenge to the National Marine Fisheries Service's (NMFS) denial of a petition for emergency rulemaking to impose speed restrictions to protect the right whale from boating traffic pursuant to section 553(e) of the Endangered Species Act, which requires agencies to "give an interested person the right to petition for the issuance, amendment, or repeal of a rule." 532 F.3d 913 (D.C. Cir. 2008). The NMFS denied the petition on the grounds that imposing such restrictions would divert resources from, and delay development of, a more comprehensive strategy for protecting the whale population. *Id. at 916.* The court determined that NMFS's explanation for the denial was a reasonable decision to focus its resources on a comprehensive strategy, which in light of the information before the NMFS at the time, was reasoned and adequately supported by the record. *Id.*

[11] *See* 57 FR 55622 (Nitrogen Oxides Supplement to the General Preamble, published November 25, 1992).

[12] As stated in the EPA's I/M (November 5, 1992; 57 FR 52950) and conformity rules (60 FR 57179 for transportation rules and 58 FR 63214 for general rules), certain NO_X requirements in those rules do not apply where the EPA grants an area-wide exemption under CAA section 182(f).

Similarly, in *WildEarth Guardians* v. *EPA,* the court reviewed the EPA's denial of a petition to list coal mines for regulation under CAA section 111(b)(1)(A). 751 F.3d 651 (D.C. Cir. 2014). Section 110(b)(1)(A) of the CAA provides that, as a means of developing standards of performance for new stationary sources, the EPA shall, by a date certain publish "(and *from time to time* thereafter shall revise) a list of categories of stationary sources." (emphasis added) The provision provides that the Administrator "shall include a category of sources in such list if *in his judgment* it causes, or contributes significantly to, air pollution which may reasonably be anticipated to endanger public health and welfare." The EPA denied the petition, explaining that it must prioritize its actions in light of limited resources and ongoing budget uncertainties, and that denial of the petition was not a determination as to whether coal mines should be regulated as a source of air pollutants. *751 F.3d at 650.* The EPA also noted as part of its denial that it might in the future initiate a rulemaking to do so. The D.C. Circuit held that the language in CAA section 111(b)(1)(A)—"from time to time" and "in his judgment"—means that the Administrator may exercise reasonable discretion in determining when to add new sources to the list of regulated pollutants, and that such language afforded agency officials discretion to prioritize sources that are the most significant threats to public health to ensure effective administration of the agency's regulatory agenda. *Id.* at 651.

In each of these cases previously discussed, the acting agency has been entitled to broad discretion to act on a pending petition so long as the agency provided a reasoned explanation. Notably, as each of these decisions focused on the case-specific circumstances relied upon by the acting agency to deny the pending petition, the courts did not speak to whether the agency might reach a different conclusion under different circumstances. Like the statutory provisions evaluated by the courts in these cases, the term "may" in CAA section 176A(a) means that the Administrator is permitted to exercise reasonable discretion in determining when to add new states to a transport region. While the Administrator must adequately explain the facts and policy concerns she relied on in acting on the petition and conform such reasons with the authorizing statute, review of such a decision is highly deferential. Thus, the agency is entitled to broad discretion when determining whether to grant or deny such a petition.

D. The CAA Section 176A Petition and Related Correspondence

On December 9, 2013, the states of Connecticut, Delaware, Maryland, Massachusetts, New Hampshire, New York, Rhode Island and Vermont submitted a petition under CAA section 176A requesting that the EPA add to the OTR the states of Illinois, Indiana, Kentucky, Michigan, North Carolina, Ohio, Tennessee, West Virginia and the portion of Virginia currently not within the OTR. On December 17, 2013, the petition was amended to add the state of Pennsylvania as an additional state petitioner.

The petitioning states submitted a technical analysis which the petitioning states contend demonstrates that the nine named upwind states significantly contribute to violations of the 2008 ozone NAAQS in the OTR. The petitioning states acknowledge and include data used to support rulemakings promulgated by the EPA that addressed interstate transport with respect to both the 2008 ozone NAAQS and prior ozone NAAQS in order to further support their request. Moreover, the petitioners identified those areas that are designated nonattainment with respect to the 2008 ozone NAAQS within and outside the OTR and conducted a linear extrapolation to predict that certain areas will continue to be in nonattainment or will have difficulty maintaining attainment of the NAAQS after the EPA's 2008 ozone NAAQS final area designations in 2012. The petitioning states' 2018 modeling showed that, with on-the-way OTR measures, areas within the OTR and non-OTR would continue to have problems attaining the 2008 ozone NAAQS. Lastly, their 2020 modeling showed that with a 58 percent NO_X and 3 percent VOC emissions reduction over the eastern U.S., there would only be one area in New Jersey that could have trouble maintaining the NAAQS.

The petitioners further note that the OTR states have adopted and implemented numerous and increasingly stringent controls on sources of VOCs and NO_X that may not currently be required for sources in the upwind states. Petitioners contend that expansion of the OTR to include these upwind states will help the petitioning states attain the 2008 ozone NAAQS. The petitioning states include two case studies that identify the types of measures adopted throughout the current OTR including mobile source and stationary source control measures that have been enacted to minimize emissions of NO_X and VOCs. The petitioners contend that the expansion of the OTR is warranted so that the downwind states and the upwind states can work together to address interstate ozone transport for the 2008 ozone NAAQS. Also, the petitioners assert that without immediate expansion of the OTR, attainment of the 2008 ozone NAAQS in many areas in the U.S. will remain elusive.

At the time the petition was submitted, the EPA's most recent effort to address the interstate transport of ozone pollution was subject to litigation in the D.C. Circuit. As discussed in more detail later in this document, the EPA issued the Cross-State Air Pollution Rule (CSAPR) pursuant to section 110(a)(2)(D)(i)(I) of the CAA in order to address interstate transport with respect to the 1997 ozone NAAQS as well as the 1997 and 2006 fine particulate matter ($PM_{2.5}$) NAAQS. 76 FR 48208 (August 8, 2011). On August 21, 2012, the D.C. Circuit issued a decision in *EME Homer City Generation, L.P.* v. *EPA,* 696 F.3d 7 (D.C. Cir. 2012), vacating CSAPR based on several holdings that would have limited the EPA's authority pursuant to section 110(a)(2)(D)(i)(I). The petitioners subsequently submitted the section 176A petition. Thereafter, on April 29, 2014, the Supreme Court issued a decision reversing the D.C. Circuit's decision and upholding the EPA's interpretation of its authority pursuant to CAA section 110. *EPA* v. *EME Homer City Generation, L.P.,* 134 S. Ct. 1584 (2014).

Since the petition was submitted, the EPA has received correspondence from both the upwind states and the petitioning states regarding the EPA's pending action on the petition. On February 14, 2014, the EPA received a letter from the environmental commissioners and directors representing the states of Illinois, Ohio, Indiana, Tennessee, Kentucky, Virginia, Michigan, West Virginia and North Carolina (in collaboration with LADCO) disagreeing with the basis for the petition and requesting that the EPA deny the petition. On May 29, 2015, the EPA received a letter from the Midwest Ozone Group urging that the EPA consider recent air quality, on-the-books measures between now and 2018 and other related information prior to any action on the petition. On July 7, 2015, the EPA received a letter from state representatives from the states of Ohio, Kentucky, Indiana, West Virginia, North Carolina and Michigan communicating the progress of the voluntary dialogue called the State Collaborative on Ozone Transport (SCOOT) that according to the letter, resulted in commitments, from

utilities in the upwind states to operate NO_X controls during the summer of 2015. The upwind states believed that the requests from some Northeast states to sign a memorandum of understanding to require additional emission control and reporting requirements from facilities and place such requirements into SIPs to be unnecessary and requested that the CAA section 176A petition be withdrawn by the petitioning states or denied by the EPA given the forecasted air quality improvements and declining ozone trends. On October 30, 2015, the EPA received a letter from environmental commissioners (or their designated representatives) from the petitioning states that provided an update on the SCOOT process and responded to the July 7, 2015, letter expressing a need for federally enforceable commitments from states to operate exiting controls.

On April 6, 2016, the EPA received a letter from the petitioning states requesting immediate action to grant the CAA section 176A petition. The letter acknowledged the EPA's recent proposal to update the CSAPR to address interstate transport for the 2008 ozone NAAQS and urged the EPA to grant the petition because the proposed rulemaking would only partially address ozone transport problems in the eastern U.S. Further, the letter noted that granting the petition will also facilitate efforts to attain the 2015 ozone NAAQS, as well as future updates to the ozone NAAQS. On May 16, 2016, the EPA received a letter from the upwind states of Ohio, Kentucky, Indiana, West Virginia and Michigan requesting that the EPA deny the petition, claiming that the technical information used to support the petition was not comparable to current air quality and noting the EPA's proposed transport rule to address the 2008 ozone NAAQS. These communications can be found in the docket for this action.

IV. The EPA's Proposed Decision on the CAA Section 176A Petition

This section describes the basis for the EPA's proposed denial of this CAA section 176A petition. Section IV.A of this document describes the alternative authorities provided by the CAA for addressing the interstate transport of ozone pollution and the flexibilities those provisions provide. Section IV.B of this document describes EPA's historical use of these authorities to address the interstate transport of ozone pollution and the advantages of those rulemakings for addressing current ozone nonattainment problems. Section IV.C of this document describes other measures that have achieved, and will continue to achieve, significant reductions in emissions of NO_X and VOCs resulting in lower levels of transported ozone pollution that impact downwind attainment and maintenance of the 2008 ozone NAAQS. Finally, Section IV.D of this document describes the EPA's rationale, based on these considerations, for proposing to deny this CAA section 176A petition.

As explained more fully later, the EPA believes an expansion of the OTR is unnecessary at this time and would not be the most efficient way to address the remaining interstate transport issues for the 2008 ozone NAAQS in states currently included in the OTR. Additional local and regional ozone precursor emissions reductions are expected in the coming years from already on-the-books rules (*see* Sections IV. B and C of this document for more details) and as described elsewhere in this document, the EPA has the authority through other CAA provisions (including CAA sections 110 and 126) to develop a more effective remedy to address the particular pollutants and sources for this air quality situation.

A. The CAA Good Neighbor Provisions

The CAA provision that states and the EPA have used most for addressing interstate transport is section 110(a)(2)(D)(i)(I), often referred to as the "good neighbor" or "interstate transport" provision, requires states to prohibit certain emissions from in-state sources if such emissions impact the air quality in downwind states. Specifically, in keeping with the CAA's structure of shared state and federal regulatory responsibility, CAA section 110(a)(2)(D)(i)(I) requires all states, within 3 years of promulgation of a new or revised NAAQS, to submit SIPs that contain adequate provisions prohibiting any source or other type of emissions activity within the state from emitting any air pollutant in amounts which will contribute significantly to nonattainment in, or interfere with maintenance by, any other state with respect to any NAAQS. Thus, each state is required to submit a SIP that demonstrates the state is adequately controlling sources of emissions that would impact downwind states' air quality relative to the NAAQS in violation of the good neighbor provision.

Once a state submits a good neighbor SIP, the EPA must evaluate the SIP to determine whether it meets the statutory criteria of the good neighbor provision, and then approve or disapprove, in whole or in part, the state's submission in accordance with CAA section 110(k)(3). In the event that a state does not submit a required SIP addressing the good neighbor provision, the EPA publishes in the **Federal Register** a "finding of failure to submit" that a state has failed to make the required SIP submission. If the EPA disapproves a state's SIP submission or if the EPA issues a finding of failure to submit, then the action triggers the EPA's obligations under section 110(c) of the CAA, to promulgate a FIP within 2 years, unless the state corrects the deficiency, and the EPA approves the plan or plan revision before the EPA promulgates a FIP. Thus, in the event that a state does not address the good neighbor provision requirements in a SIP submission, the statute provides that the EPA must address the requirements in the state's stead.

Section 110(k)(5) of the CAA also provides a means for the EPA to reopen previously approved SIPs, including good neighbor SIPs, if the EPA determines that an approved SIP is substantially inadequate to attain or maintain the NAAQS, to adequately mitigate interstate pollutant transport, or to otherwise comply with requirements of the CAA. The EPA can use its authority under CAA section 110(k)(5) to call for re-submission of the SIP to correct the inadequacies under CAA 110(a)(2)(D)(i)(I), and if the state fails to make the required submission, the EPA can promulgate a FIP under CAA section 110(c) to address the inadequacies.

Finally, section 126 of the CAA provides states with an additional opportunity to bring to the EPA's attention specific instances where a source or a group of sources in a specific state may be emitting in excess of what the good neighbor provision would allow. Section 126(b) of the CAA provides that any state or political subdivision may petition the Administrator of the EPA to find that any major source or group of stationary sources in upwind states emits or would emit any air pollutant in violation of the prohibition of CAA section 110(a)(2)(D)(i).[13] Petitions submitted pursuant to this section are referred to as CAA section 126 petitions. Section 126(c) of the CAA explains the impact of such a finding and establishes the conditions under which continued operation of a source subject to such a finding may be permitted. Specifically,

[13] The text of CAA section 126 codified in the U.S. Code cross references CAA section 110(a)(2)(D)(ii) instead of CAA section 110(a)(2)(D)(i). The courts have confirmed that this is a scrivener's error and the correct cross reference is to CAA section 110(a)(2)(D)(i), *See Appalachian Power Co.* v. *EPA*, 249 F.3d 1032, 1040–44 (D.C. Cir. 2001).

CAA section 126(c) provides that it would be a violation of section 126 of the Act and of the applicable SIP: (1) For any major proposed new or modified source subject to a CAA section 126 finding to be constructed or operate in violation of the good neighbor prohibition of CAA section 110(a)(2)(D)(i); or (2) for any major existing source for which such a finding has been made to operate more than 3 months after the date of the finding. The statute, however, also gives the Administrator discretion to permit the continued operation of a source beyond 3 months if the source complies with emission limitations and compliance schedules provided by the EPA to bring about compliance with the requirements contained in CAA sections 110(a)(2)(D)(i) and 126 as expeditiously as practicable but no later than 3 years from the date of the finding. Where the EPA provides such limitations and compliance schedules, it promulgates these as a revision to the upwind state's good neighbor SIP, and CAA section 110(a)(2)(D)(ii) further requires that good neighbor SIPs ensure compliance with these limitations and compliance schedules.[14]

The flexibility provided by these statutory provisions is different from that provided by the requirements imposed upon states in the OTR. With limited exceptions described previously, states in the OTR must impose a uniform set of requirements on sources within each state. While the OTR states may impose additional requirements with the consent of the OTC and the EPA, the states generally must comply with the minimum requirements imposed by the statute. The good neighbor provision, by contrast, provides both the states and the EPA with the flexibility to develop a remedy targeted at a particular air quality problem, including the flexibility to tailor the remedy to address the particular precursor pollutants and sources that would most effectively address the downwind air quality problem. As described later, the EPA has previously promulgated four interstate transport rulemakings pursuant to these authorities in order to quantify the specific emission reductions required in certain eastern states in order to comply with the requirements of CAA section 110(a)(2)(D)(i)(I) with respect to downwind nonattainment and maintenance concerns with respect to the NAAQS for ozone and $PM_{2.5}$. In Section IV.B. of this document, the EPA describes the importance of these transport rules as they relate to regional ozone pollution transport.

B. The EPA's Interstate Transport Rulemakings Under the Good Neighbor Provision

In order to address the regional transport of ozone pursuant to the CAA's good neighbor provision under section 110(a)(2)(D)(i)(I), the EPA has promulgated four regional interstate transport rules focusing on the reduction of NO_X emissions, as the primary meaningful precursor to address regional ozone, from certain sources located in states in the eastern half of the U.S.[15] [16] States and the EPA have implemented the emission reductions required by these rulemakings pursuant to the various authorities for implementing the good neighbor provision, including CAA sections 110(a)(1), 110(c), 110(k)(5) and 126.

In each of these rulemakings, the EPA identified those sources and pollutants that were most effective in addressing the particular air quality problem identified through the course of the EPA's analysis. This allowed the EPA to craft targeted remedies that provided efficient and effective means of addressing the particular air quality problem. In each of the regional transport rules, the EPA analysis has continued to demonstrate that NO_X is the ozone precursor that is most effective to reduce when addressing regional transport of ozone in the eastern U.S. The EPA has also focused each rule on those sources that can most cost-effectively reduce emissions of NO_X, such as EGUs and, in one rule, certain large non-EGUs. These rulemakings demonstrate that the EPA has used and is continuing to use its authority under CAA section 110(a)(2)(D)(i)(I) to target those sources and precursors that most efficiently address the particular interstate ozone transport problem. Accordingly, the EPA believes that it is unnecessary to include additional states, and sources within those states, in OTR in order to address the current nonattainment situation for the 2008 ozone NAAQS in the petitioning states. Prior to the EPA's promulgation of some of those federal transport rules, the EPA worked with states and provided guidance to help states submit approvable good neighbor SIPs to address the CAA good neighbor provision. States have the first responsibility to address these CAA requirements pursuant to section 110(a)(1), and the EPA issued those transport rules only after states had the opportunity to address their CAA interstate transport obligation. While some states have state-developed and EPA-approved good neighbor SIPs, other states are covered by EPA-issued FIPs.

1. NO_X SIP Call

Through a 2-year effort (starting in 1995 and ending in 1997) known as the Ozone Transport Assessment Group (OTAG), the EPA worked in partnership with the 37 eastern-most states and the District of Columbia, industry representatives, and environmental groups to address the interstate transport of ozone pollution. OTAG identified and evaluated flexible and cost-effective strategies for reducing long-range transport of ozone and ozone precursors. Based on the OTAG process, the EPA engaged in a rulemaking to promulgate a final action commonly referred to as the NO_X SIP Call in order to address the requirements of the good neighbor provision (CAA section 110(a)(2)(D)(i)(I)) with respect to the 1979 1-hour ozone NAAQS and the 1997 8-hour ozone NAAQS. 63 FR 57356 (October 27, 1998). The rule required 22 eastern states and the District of Columbia to amend their SIPs and limit NO_X emissions that contribute to ozone nonattainment. The rule set a NO_X ozone season emission budget for each covered state, essentially a cap on all ozone season NO_X emissions in the state. Covered states were given the option to participate in a regional allowance trading program, known as the NO_X Budget Trading Program (NBP) in order to achieve most of the necessary emissions reductions.

Through the OTAG process, the states concluded that widespread NO_X reductions were necessary to enable areas to attain and maintain the ozone NAAQS.[17] The OTAG's recommendations identified control

[14] The EPA has received, but not yet acted upon, several CAA section 126 petitions from a number of the petitioning states regarding the contribution of specific EGUs to interstate ozone transport with respect to the 2008 and 2015 ozone NAAQS. Petitions have been submitted by Delaware, Maryland, and Connecticut. The list of EGUs identified in one or more of these petitions includes EGUs operating in Pennsylvania, West Virginia, Ohio, Kentucky, and Indiana.

[15] For purposes of these rulemakings, the western U.S. (or the West) consists of the 11 western contiguous states of Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington and Wyoming.

[16] Two of these rulemakings also addressed the reduction of NO_X and SO_2 emissions for the purposes of addressing the interstate transport of particulate matter pollution pursuant to the good neighbor provision.

[17] *See* 62 FR 60320, November 7, 1997, Notice of proposed rulemaking, Finding of Significant Contribution and Rulemaking for Certain States in the Ozone Transport Assessment Group Region for Purposes of Reducing Regional Transport of Ozone.

measures for states to achieve additional reductions in emissions of NO_X but did not identify such measures for VOC, beyond the EPA's promulgation of national VOC measures, at that time. The OTAG Regional and Urban Scale Modeling and Air Quality Analysis Work Groups reached the following relevant conclusions (with which the EPA agreed): Regional NO_X emissions reductions are effective in producing ozone benefits; the more NO_X emissions reduced, the greater the benefit to air quality; and VOC controls are effective in reducing ozone locally and are most advantageous to urban nonattainment areas. The EPA concluded in its rulemaking that, "a regional strategy focusing on NO_X reductions across a broad portion of the region will help mitigate the ozone problem in many areas of the East ." 63 FR 57381. The EPA did not propose any new SIP requirements for VOC reductions for the purpose of reducing the interstate transport of ozone, however, the agency suggested that states may consider additional reductions in VOC emissions as they develop local attainment plans.

In order to quantify necessary NO_X emission reductions, the EPA developed statewide NO_X emissions budgets based on recommendations from OTAG on how to cost-effectively reduce emissions from utilities and other sources of NO_X. Thus, the EPA established NO_X emission budgets based on the conclusion that EGUs and large non-EGU point sources could cost-effectively achieve emissions reductions by the implementation of controls costing $2,000 per ton of NO_X emissions reduced, including controls such as selective catalytic reduction (SCR) and selective non-catalytic reduction (SNCR) that could be required on a number of units in the OTAG region. Although the NO_X SIP Call did not specify which sources must reduce NO_X, consistent with OTAG's recommendations, the EPA encouraged states to consider controls on EGUs and large non-EGU point sources under an allowance trading program as a cost effective strategy for complying with the NO_X emissions budgets.

At the time the NO_X SIP Call was finalized, the EPA had already approved good neighbor SIPs for many states with respect to the 1-hour ozone standard. Accordingly, the EPA initiated a SIP call pursuant to CAA section 110(k)(5) requiring states covered by the rule to amend their SIPs in order to limit NO_X emissions that significantly contribute to ozone nonattainment in other states consistent with the budgets finalized in the rule.

In parallel with issuing the SIP call, the EPA reviewed petitions submitted pursuant to CAA section 126(b) by eight states requesting that the EPA find that stationary sources in upwind states contribute significantly to ozone nonattainment in the petitioning states. Because the section 126 petitions raised many of the same issues as those being addressed in NO_X SIP call, the EPA coordinated its response to the CAA section 126 petitions with the NO_X SIP Call rulemaking. The EPA issued findings that NO_X emissions in twelve states and the District of Columbia contribute significantly to nonattainment of the 1-hour ozone NAAQS in three downwind states, but the EPA determined that it was appropriate to postpone CAA section 126 findings pending the resolution of the NO_X SIP call process. 64 FR 28250 (May 25, 1999). Accordingly, the EPA issued a rule providing that the findings would automatically be deemed made with regard to sources from a given state should that state fail to submit a SIP revision as required by the NO_X SIP Call. The rulemaking further established the NBP as the remedy that would apply pursuant to CAA section 126(c) for any state subject to such a finding.

The D.C. Circuit subsequently issued two orders affecting implementation of the NO_X SIP Call: (1) An order remanding the 1997 8-hour ozone standard to the EPA, *American Trucking Ass'ns* v. *EPA,* 175 F.3d 1027, *reh'g granted in part and denied in part,* 195 F.3d 4 (D.C. Cir.1999), *rev'd in part sub nom. Whitman* v. *American Trucking Ass'ns,* 531 U.S. 457, 121 S.Ct. 903 (2001), and (2) an order staying the NO_X SIP Call deadline pending further litigation, *Michigan* v. *EPA,* No. 98–1497 (D.C. Cir. May 25, 1999) (order granting stay in part). In response to these court decisions, the EPA took two actions. First, the EPA indefinitely stayed the technical determinations of the prior section 126 action as they applied to the 8-hour ozone NAAQS, pending further developments in the litigation. 65 FR 2674, 2685 (January 18, 2000). Second, with respect to the 1-hour standard, the EPA made the requested findings of significant contributions, granting the relevant portions of the section 126 petitions. *Id.* at 2684–85. The EPA further imposed the NBP on affected sources as the remedy pursuant to section 126(c). *Id.* at 2686.

Ultimately, the NO_X SIP Call was largely upheld by the D.C. Circuit in *Michigan* v. *EPA,* 213 F.3d 663 (D.C. Cir. 2000), *cert. denied,* 532 U.S. 904 (2001).[18] States chose to use the NBP to achieve the majority of the NO_X reductions required by the NO_X SIP Call. Subsequent rules have required additional reductions from certain sources regulated by the NO_X SIP Call, but the rules have not replaced the NO_X SIP Call reduction requirements and the rule remains in effect.

2. Clean Air Interstate Rule (CAIR)

The CAIR was published in May 2005 and addressed both the 1997 $PM_{2.5}$ and the 1997 ozone standards under the good neighbor provision. 70 FR 25162 (May 12, 2005). CAIR required SIP revisions in 28 eastern states and the District of Columbia to ensure that certain emissions of sulfur dioxide (SO_2) and/or NO_X—important precursors of regionally transported $PM_{2.5}$ (SO_2 and NO_X) and ozone (NO_X)—were prohibited.

The rule set statewide emission budgets for large EGUs that reduced emissions of annual SO_2 and annual NO_X (particulate matter precursors) and summertime NO_X (ozone precursor). As in the NO_X SIP Call, the EPA identified reductions in NO_X emissions as the most efficient and effective way to achieve the greatest reduction of interstate ozone pollution. *Id.* at 25185–8, 25195. The EPA also determined that emissions reductions from EGUs were the most cost-effective and efficient means of achieving necessary NO_X emissions reductions. 70 FR 25173. As in the NO_X SIP Call, affected states were given the option to participate in a regional allowance trading program to satisfy their SIP obligations.

When the EPA promulgated the final CAIR, the EPA also issued a national rule finding that certain states had failed to submit SIPs to address the requirements of CAA section 110(a)(2)(D)(i) with respect to the 1997 $PM_{2.5}$ and the 1997 ozone NAAQS by the CAA deadline for those standards of July 2000. 70 FR 21147. The findings of failure to submit triggered a 2-year clock for the EPA to issue FIPs to address the good neighbor provision with respect to those standards, and the EPA subsequently promulgated FIPs to ensure that the emission reductions required by CAIR would be achieved on schedule. 71 FR 25328 (April 28, 2006). Upon review, the D.C. Circuit determined that CAIR was "fundamentally flawed," and the rule was remanded to the EPA to be replaced "from the ground up." *North Carolina* v.

[18] The EPA's January 18, 2000, action on the CAA section 126 petitions was also challenged and upheld by the D.C. Circuit in *Appalachian Power Company* v. *EPA,* 249 F.3d 1032 (2001).

EPA, 531 F.3d 896, 929 (D.C. Cir. 2008), *modified on reh'g,* 550 F.3d 1176.

3. CSAPR

In response to the court's remand of CAIR, on July 6, 2011, the EPA promulgated CSAPR, which requires certain states to significantly improve air quality by reducing power plant emissions that contribute to ozone and/or fine particle pollution in other states. CSAPR requires sources in a total of 28 states to reduce annual SO_2 emissions, annual NO_X emissions and/or ozone season NO_X emissions to assist in attaining the 1997 ozone and $PM_{2.5}$ and 2006 $PM_{2.5}$ NAAQS. 76 FR 48208. The EPA found that each CSAPR state had failed to submit a complete SIP or the EPA disapproved a submitted SIP for the relevant NAAQS. To accomplish implementation aligned with the applicable NAAQS attainment deadlines, the EPA promulgated FIPs for each affected state which require affected sources to participate in the regional allowance trading program to achieve the necessary emission reductions. These states have the option of replacing each FIP with a SIP that could achieve the same emissions reductions in other ways.

CSAPR set emissions budgets for certain states according to the applicable NAAQS—annual NO_X and annual SO_2 budgets for $PM_{2.5}$, and ozone season NO_X budgets for ozone—to eliminate a state's significant contribution or interference with maintenance of a NAAQS in other states. With respect to the ozone NAAQS, the EPA determined that NO_X emissions had the most meaningful interstate impacts based on air quality modeling that examined upwind state emissions of all ozone precursors (including VOCs and NO_X). 75 FR 45230 (August 2, 2010) and 76 FR 48222. Moreover, the EPA noted that the other recent assessments of ozone, for example those conducted for the Regulatory Impact Analysis for the ozone standards in 2008, continue to show the importance of NO_X emissions on ozone transport. 75 FR 45236. Accordingly, the EPA quantified NO_X emissions budgets for each affected state by quantifying the emissions reductions achievable by applying cost-effective controls to EGUs. 76 FR 48256. The EPA determined that controls at other sources were generally not available at similar cost levels.

The timing of CSAPR's implementation was affected by a number of court actions. CSAPR was the subject to nearly four years of litigation in both the D.C. Circuit and the Supreme Court. CSAPR was generally upheld by the courts, but for the remand of certain state budgets, and implementation of the trading programs began in 2015. *See EPA* v. *EME Homer City Generation, L.P.,* 134 S. Ct. 1584 (2014); *EME Homer City Generation, L.P.* v. *EPA,* 795 F.3d 118 (D.C. Cir. 2015).

4. The CSAPR Update To Address the 2008 Ozone NAAQS

On October 26, 2016, the EPA published an update to CSAPR intended to respond to the D.C. Circuit's remand of certain NO_X ozone season budgets from the original CSAPR and to address the good neighbor provision with respect to the 2008 ozone NAAQS. 81 FR 74504 (CSAPR Update). The CSAPR Update requires 22 states to reduce ozone season NO_X emissions that significantly contribute to nonattainment or interfere with maintenance of the 2008 ozone NAAQS in certain downwind states. The EPA found that each CSAPR state had failed to submit a complete SIP or the EPA disapproved a submitted SIP for the 2008 ozone NAAQS. To accomplish implementation aligned with the applicable attainment deadline for the 2008 ozone NAAQS, the EPA promulgated FIPs for each of the 22 states covered by CSAPR Update which require affected sources to participate in the regional allowance trading program to achieve the necessary emission reductions beginning with the 2017 ozone season.

The CSAPR Update analysis found that emissions from eight of the nine states named in the section 176A petition, in addition to a number of other states, were linked to downwind projected nonattainment and/or maintenance receptors, in the eastern U.S., in 2017 with respect to the 2008 ozone NAAQS. 81 FR 74506, 74538–39. For one state named in the CAA section 176A petition, North Carolina, the EPA determined in the CSAPR Update that the state was not linked to any downwind receptors and, therefore, will not significantly contribute to nonattainment or interfere with maintenance of the 2008 ozone NAAQS in any other state pursuant to the good neighbor provision. 81 FR 74506, 74537–38.

For those states linked to downwind air quality problems, the EPA evaluated timely and cost-effective emissions reductions achievable in each state in order to quantify the amount of emissions constituting each state's significant contribution to nonattainment and interference with maintenance of the standard pursuant to the good neighbor provision. The EPA focused its analysis on: (1) Emissions reductions achievable by 2017 in order to assist downwind states with meeting the applicable attainment deadline for the 2008 ozone NAAQS (81 FR 74521), (2) reductions in only NO_X emissions, consistent with past ozone transport rules (81 FR 74514), and (3) achievable, cost effective NO_X emissions reductions from EGUs. The EPA, therefore, calculated emissions budgets for each affected state based on the cost-effective NO_X emissions reductions achievable from EGUs by the 2017 ozone season.

The EPA concluded that the emissions reductions achieved by implementation of the budgets constitute a portion of most affected states' significant contribution to nonattainment or interference with maintenance of the 2008 ozone NAAQS at these downwind receptors. 81 FR 74508, 74522.[19] However, because downwind air quality problems were projected to remain after implementation of the quantified emissions reductions, the EPA could not determine that it had fully quantified the affected states' emissions reduction obligations pursuant to the good neighbor provision to the extent upwind states remain linked to the downwind receptors and further emission reductions from EGUs and non-EGUs could be available. In order to determine the level of NO_X control stringency necessary to quantify those emissions reductions that fully constitute each state's significant contribution to downwind nonattainment or interference with maintenance, the EPA explained in promulgating the final CSAPR Update that it must evaluate further emission reductions from EGU and non-EGU strategies that can be implemented on longer timeframes. The CSAPR Update represents a significant first step by the EPA to quantify states' emission reduction obligations under the good neighbor provision for the 2008 ozone NAAQS. Even though the CSAPR Update did not fully address upwind states' emission reduction obligation pursuant to the good neighbor provision, the implementation of the emissions budgets quantified in that rule will help to resolve a number of projected air quality problems in the Philadelphia, Pennsylvania, Jefferson County, Kentucky and Hamilton County, Ohio areas and will help make progress to reduce upwind

[19] For one state named in the CAA section 176A petition, Tennessee, the EPA determined that the emissions reductions required by the CSAPR Update would fully address the state's significant contribution to nonattainment and interference with maintenance of the 2008 ozone NAAQS in other states.

contributions to high ozone levels in Baltimore, Maryland, and the New York City area (including parts of Connecticut and New Jersey).

The EPA is continuing the work necessary to address its remaining obligation to promulgate FIPs fully addressing the good neighbor provision with respect to the 2008 ozone NAAQS for 21 states. The EPA intends to continue to collect information and undertake analyses to evaluate potential future emission reductions from non-EGUs and EGUs that may be necessary to fully quantify each state's interstate transport obligations for the 2008 ozone NAAQS in a future action.[20] The EPA expects to continue to fulfill its obligation to promulgate FIPs fully addressing interstate transport with respect to the 2008 ozone NAAQS consistent with the authority and flexibility provided by the good neighbor provision to tailor a remedy based on those sources and precursor pollutants (*i.e.,* NO_X) that can most effectively address the downwind air quality problems identified by the EPA's analysis.

C. Additional Rules That Reduce NO_X and VOC Emissions

In addition to the significant efforts to implement the good neighbor provision for the 2008 and prior ozone NAAQS described in Section IV.B of this document, there are numerous federal and state emission reduction rules that have already been adopted which have resulted or will result in the further reduction of ozone precursor emissions, including emissions from states named in the section 176A petition. Many of these rules directly require sources to achieve reductions of NO_X, VOC, or both, and others require actions that will indirectly result in such reductions. As a result of these emissions reductions, the interstate transport of ozone has been and will continue to be reduced over time.

The majority of man-made NO_X and VOC emissions that contribute to ozone formation in the U.S. comes from the following sectors: on-road and nonroad mobile sources, industrial processes (including solvents), consumer and commercial products, and the electric power industry. In 2014, the most recent year for which the National Emissions Inventory (NEI) is available, on-road and nonroad mobile sources accounted for about 56 percent of annual NO_X emissions; and the electric power industry (EGUs) accounted for about 13 percent. With respect to VOCs, industrial processes (including solvents) accounted for about 48 percent of manmade VOC emissions; and mobile sources accounted for about 27 percent.[21] [22]

The EPA establishes emissions standards under various CAA authorities for numerous classes of automobile, truck, bus, motorcycle, earth mover, aircraft, and locomotive engines, and for the fuels used to power these engines. The pollutant reduction benefits from new engine standards increase each year as older and more-polluting vehicles and engines are replaced with newer, cleaner models. The benefits from fuel programs generally begin as soon as a new fuel is available. Further, the ongoing emission reductions from mobile source federal programs such as those listed previously will provide for substantial emissions reductions well into the future, and will complement state and local efforts to attain the 2008 ozone NAAQS.

There are several existing national rules that continue to achieve emission reductions through 2025 and beyond with more protective emission standards for on-road vehicles that include: Control of Air Pollution from Motor Vehicles: Tier 3 Motor Vehicle Emission and Fuel Standards; [23] Control of Air Pollution from New Motor Vehicles: Tier 2 Motor Vehicle Emissions Standards and Gasoline Sulfur Control Requirements; [24] Control of Air Pollution from New Motor Vehicles: Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements; [25] Model Year 2017 and Later Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards; [26] Model Year 2012–2016 Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards; [27] Greenhouse Gas Emissions and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles—Phase 2; [28] Phase 1 Greenhouse Gas Emissions Standards and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles [29] and Control of Hazardous Air Pollutants from Mobile Sources.[30]

Similarly, already adopted regulations for non-road engines and equipment that will achieve further reductions include: Control of Emissions of Air Pollution from Nonroad Diesel Engines and Fuel; [31] Republication for Control of Emissions of Air Pollution from Locomotive Engines and Marine Compression-Ignition Engines Less Than 30 Liters per Cylinder; [32] Control of Emissions from New Marine Compression-Ignition Engines at or Above 30 Liters per Cylinder; [33] the International Maritime Organization's Emission Control Area to Reduce Emissions from Ships in the U.S. Caribbean; Control of Air Pollution From Aircraft and Aircraft Engines; [34] Emission Standards and Test Procedures; Control of Emissions from Nonroad Large Spark-Ignition Engines, and Recreational Engines (Marine and Land-Based); [35] and Control of Emissions from Nonroad Spark-Ignition Engines and Equipment.[36]

Similarly, a number of already-adopted stationary source rules will drive further regional reductions in ozone precursor emissions, including: boiler maximum achievable control technology standards under CAA section 112 and the Mercury and Air Toxics Standards. These rules target specific sources and have the co-benefit of reducing ozone precursors which also reduce interstate ozone pollution transport. For example, the measures to address Regional Haze best available retrofit technology determinations often include power plant pollution controls that can achieve NO_X reductions of at least 80 to 90 percent from a particular source.

Other existing rules that will achieve NO_X and VOC emissions reductions include: New Source Performance Standards (NSPS) for reciprocating internal combustion engines; NSPS for gas turbines; NSPS for process heaters;

[20] Moreover, in support of this effort, on December 28, 2016, the EPA shared updated preliminary modeling information providing air quality projections for areas in the contiguous U.S. for the 2015 ozone NAAQS, which the EPA anticipates will assist states with the development of SIPs. *See,* "Notice of Availability of the Environmental Protection Agency's Preliminary Interstate Ozone Transport Modeling Data for the 2015 Ozone National Ambient Air Quality Standard (NAAQS)" available at: *https://www.epa.gov/airmarkets/notice-data-availability-preliminary-interstate-ozone-transport-modeling-data-2015-ozone.*

[21] The VOC percentages are for manmade VOCs only. Emissions from natural sources, such as trees, also comprise around 70 percent of total VOC emissions nationally, with a higher proportion during the ozone season and in areas with more vegetative cover.

[22] For more information, *see* the "2014 NEI Summary Spreadsheet" in the docket.

[23] 81 FR 23414 (April 28, 2014).

[24] 65 FR 6698 (February 10, 2000).

[25] 66 FR 5002 (January 18, 2001).

[26] 77 FR 62624 (October 15, 2012).

[27] 75 FR 25324, (May 7, 2010).

[28] 81 FR 73478, (October 25, 2016).

[29] 76 FR 57106, (September 15, 2011).

[30] 72 FR 8428, (February 26, 2007).

[31] 69 FR 38958, (June 29, 2004).

[32] 73 FR 37096, (June 30, 2008).

[33] 75 FR 22896, (April 30, 2010).

[34] 77 FR 36342, (June 18, 2012).

[35] 67 FR 68242, (November 8, 2002).

[36] 73 FR 59034, (October 8, 2008).

Hospital/Medical/Infectious Waste Incinerators: New Source Performance Standards and Emission Guidelines: Final Rule Amendments; and NO_X Emission Standard for New Commercial Aircraft Engines. The EPA's regulations for commercial, industrial and solid waste incinerators set standards for NO_X and several air toxics for all commercial incinerators, as required under CAA section 129. Air toxics rules for industrial boilers will yield co-benefit NO_X reductions as a result of tune-ups and energy efficiency measures, especially from boilers that burn coal.

The EPA expects existing federal and state rules, and also those that may be promulgated in the future, will have the co-benefit of reducing ozone precursor emissions even if they do not directly address interstate transport of ozone pollution. These rules will result in reductions in ozone concentrations that will help areas attain the 2008 ozone NAAQS. For example, the Regional Haze Rule requires states to revise their regional haze SIPs [37] to assess whether additional measures are necessary for continued visibility progress. On December 14, 2016, the EPA signed a final rule that could influence state regional haze plans to include measures to further reduce NO_X in light of its role as a visibility impairing pollutant.[38] Further, to address interstate transport with respect to the 2015 ozone NAAQS, states are required to submit additional SIPs addressing the good neighbor provision by October 2018. Measures designed to address the interstate transport of ozone with respect to the 2015 standard will necessarily assist with addressing interstate transport with respect to the less-stringent 2008 standard. Lastly, in response to actions such as the 2012 $PM_{2.5}$ SIP Requirements Rule and nonattainment designations under the 2010 primary SO_2 NAAQS, many states will be submitting SIPs that reduce pollution, some of which reduce ozone precursor emissions as a co-benefit.

As a result of the rules and programs listed previously, various other state programs and efforts, and wider economic trends, ozone levels across the nation and the OTR have been declining. Ozone levels across the nation are expected to further decline over the next several years due to emissions controls already in place. The EPA's emissions projections in support of the 2015 ozone NAAQS modeling show declining emissions of NO_X and VOCs between 2017 and 2025. In the states comprising the OTR plus the nine upwind states named in the CAA section 176A petition, total NO_X emissions over the upcoming 7-year period (2017–2025) are expected to decline by almost 20 percent on average and VOC emissions are expected to decline by more than 10 percent on average over the same period.

D. Rationale for the Proposed Decision on the CAA 176A Petition

The EPA is proposing to deny the CAA section 176A petition because we believe that the statute provides other, more effective means of addressing the impact of interstate ozone transport on the states within the OTR with respect to the 2008 ozone NAAQS. As described in Section IV of this document, the statute provides several provisions that allow states and the EPA to address interstate ozone transport with a remedy better tailored to the nature of the air quality problem, focusing on those precursor emissions and sources that most directly impact downwind ozone nonattainment and maintenance problems and which can be controlled most cost-effectively. The EPA and states are actively using these provisions, as demonstrated by the numerous federal and state measures that have reduced, and will continue to reduce, the VOC and NO_X emissions that contribute to ozone formation and the interstate transport of ozone pollution. The EPA does not believe that it is necessary to add more states to the OTR at this time in order to effectively address transported pollution in the OTR relative to the 2008 ozone NAAQS.

While the Act contains several provisions, both mandatory and discretionary, to address interstate pollution transport, the EPA's decision whether to grant or deny a CAA section 176A petition to expand an existing transport region is discretionary. Section 176A of the CAA states that the Administrator *may* add any state or portion of a state to an existing transport region whenever the Administrator has reason to believe that the interstate transport of air pollutants from such state significantly contributes to a violation of the standard in the transport region. The EPA does not dispute that certain named upwind states in the petition might significantly contribute to violations of the 2008 ozone NAAQS in one or more downwind states. However, the EPA believes that it can fully and more effectively address the upwind states' impacts on downwind ozone air quality through the good neighbor provision and the various statutory provisions that provide for its implementation. The EPA has already taken steps to address interstate transport with respect to the 2008 ozone NAAQS through the promulgation of the CSAPR Update, which reduces emissions in the 2017 ozone season and beyond. The EPA used the authority of CAA sections 110(a)(2)(D)(i)(I) and 110(c) to tailor a remedy focused on the precursor pollutant most likely to improve ozone levels (currently NO_X) and those sources that can most cost-effectively reduce emissions (*i.e.*, EGUs). The EPA further implemented the remedy through an allowance trading program that achieves necessary emission reductions while providing sources with the flexibility to implement the control strategies of their choice.

We believe that the continued use of the authority provided by the good neighbor provision to address the interstate transport of ozone pollution plus other regulations that are already in place will permit the states and EPA to achieve necessary additional reductions to address the 2008 ozone NAAQS without the need to implement the additional requirements that inclusion in the OTR would entail. As described in Section IV.A and B of this document, this approach to address the interstate transport of ozone is a proven, efficient, and cost-effective means of addressing downwind air quality concerns that the agency has employed and refined over nearly two decades. However, the EPA notes that the addition of states to the OTR pursuant to the section 176A authority—and the additional planning requirements that would entail—could be given consideration as an appropriate means to address the interstate transport requirements of the CAA should the agency depart from its current approach to addressing these requirements.

As described in this document, the CAA provides the agency with the authority to mitigate the specific sources that contribute to interstate pollution through the approval of SIPs or promulgation of FIPs to satisfy the requirements of the good neighbor provision, CAA section 110(a)(2)(D)(i)(I), and through the related petition process under section 126. This authority gives the EPA and states numerous potential policy approaches to address interstate pollution transport of ozone, and the EPA has consistently and repeatedly used its authority under CAA section 110(a)(2)(D)(i)(I) to approve state plans

[37] The EPA extended the due date to 2021, but is not changing dates for the implementation of further pollution reductions needed to address regional haze, which are required over the 2018–2028 time frame. *See https://www.epa.gov/visibility/final-rulemaking-amendments-regulatory-requirements-state-regional-haze-plans.*

[38] *See https://www.epa.gov/sites/production/files/2016-12/documents/regional_haze_2060-as55_final_preamblerule_final_12-14-16_disclaimer_0.pdf.*

for reducing ozone transport or to promulgate its own federal implementation plan to specifically target the sources of ozone transport both within and outside the OTR. The NO_X SIP call, CAIR, CSAPR, CSAPR Update and numerous individual SIP approvals demonstrate that the EPA has a long history of using its section 110 authority to specifically address interstate pollution transport in a targeted way that is tailored to a specific NAAQS and set of pollution sources which are the primary contributors to interstate pollution transport. As described in Section IV.B of this document, using the authority of the good neighbor provision has allowed the EPA to focus its efforts on pollution sources that are responsible for the largest contributions to ozone transport and that can cost-effectively reduce emissions, and also enables the agency to focus on NO_X as the primary driver of long range ozone transport—an approach the courts have found to be a reasonable means of addressing interstate ozone transport. *EPA* v. *EME Homer City Generation, L.P.,* 134 S. Ct. at 1607 (affirming as "efficient and equitable" the EPA's use of cost to apportion emission reduction responsibility pursuant to the good neighbor provision); *Michigan* v. *EPA,* 213 F.3d at 688 ("EPA reasonably concluded that long-range ozone transport can only be addressed adequately through NO_X reductions").

As explained previously, it does not appear that adding states to an OTR under CAA section 176A will afford the states and EPA with the flexibility to focus on specific sources and ozone precursor emissions tailored to address the downwind state's current air quality and needed remedy to achieve attainment of the 2008 NAAQS. The statute prescribes a specific set of controls for a variety of sources to control emissions of both VOCs and NO_X. CAA section 110(a)(2)(D)(i)(I) on the other hand permits the EPA and the regulated community the flexibility to focus controls on specific sources and pollutants that most efficiently address the air quality problem being targeted. The EPA determined in the CSAPR Update that regional NO_X emissions reductions from upwind states are the most effective means for providing ozone benefits to an area in the OTR currently violating the 2008 ozone NAAQS, and that NO_X reductions can be most efficiently achieved by focusing on those sources that can cost-effectively reduce emissions. Accordingly, the EPA does not believe that the requirements imposed upon states added to the OTR would be the most effective means of addressing any remaining interstate transport concerns with respect to the 2008 ozone NAAQS.

The implementation of controls within the OTR, when combined with the numerous federal and state emission reduction programs that have already been adopted that have resulted in the reduction of ozone precursor emissions either directly or as a co-benefit of those regulations, have helped to significantly reduce ozone levels. These programs will continue to reduce ozone precursor emissions and ozone concentrations both within and outside of the OTR over many years to come. However, the EPA believes the most efficient way to address the current 2008 ozone NAAQS nonattainment and interstate transport problems is to continue to rely on the ability to flexibly target the necessary reductions through this combination of targeted programs such as the implementation of the CSAPR Update Rule, the further utilization of the CSAPR framework, development of local attainment plans, and consideration of additional emissions limitations resulting from action on CAA section 126 petitions.

As discussed in Section III.C. of this document, CAA section 176A provides that the Administrator may exercise reasonable discretion in administering the agency's regulatory agenda by determining whether or not to approve or deny a section 176A petition, so long as the EPA's action is supported by a reasonable interpretation within the context of the statute. The EPA has reviewed the request of the petitioners to add additional states to the OTR in light of required control strategies for ozone transport regions and the other statutory tools available to the agency and states to address the interstate transport of ozone pollution. The agency believes that continuing its longstanding and effective use of the existing and expected control programs under the CAA's mandatory good neighbor provision embodied in section 110(a)(2)(D)(i)(I), including implementation of the CSAPR Update beginning in 2017 and technical work now underway to establish a full remedy for the 2008 NAAQS as well as to implement the good neighbor provision for the more stringent 2015 NAAQS, is a more effective approach for addressing regional interstate ozone transport problems relative to the 2008 ozone standard.

The EPA is proposing to deny the petitioning states' request to add additional states to the OTR for the purpose of addressing interstate transport of the 2008 ozone NAAQS at this time. The agency will instead continue to use other authorities available within the CAA in order to address the long range interstate transport of ozone pollution. This document is specific to the 2008 ozone NAAQS, but the EPA notes that under different circumstances the OTR provisions have been an effective tool for air quality management, and could be similarly effective in the future for addressing interstate transport of ozone pollution. Accordingly, nothing in this document should be read to limit states' ability to file a different petition under 176A or to prejudge the outcome of such a petition if filed. The EPA requests comment on the proposed denial of the petition based on the EPA's preferred approach to addressing interstate transport with respect to the 2008 ozone NAAQS pursuant to these other CAA authorities.[39]

V. Judicial Review and Determinations Under Section 307(b)(1) of the CAA

Section 307(b)(1) of the CAA indicates which Federal Courts of Appeal have venue for petitions of review of final actions by the EPA. This section provides, in part, that petitions for review must be filed in the Court of Appeals for the District of Columbia Circuit if (i) the agency action consists of "nationally applicable regulations promulgated, or final action taken, by the Administrator," or (ii) such action is locally or regionally applicable, if "such action is based on a determination of nationwide scope or effect and if in taking such action the Administrator finds and publishes that such action is based on such a determination." The EPA finds that any final action related to this document is "nationally applicable" and of "nationwide scope and effect" within the meaning of CAA section 307(b)(1). Through this document, the EPA interprets section 176A of the CAA, a provision which has nationwide applicability. In addition, this document is a response to a petition which would, if granted, extend

[39] The EPA's proposal as to the pending section 176A petition is focused on the appropriate mechanism to address interstate transport issues relative to the 2008 ozone NAAQS rather than the scope of remaining air quality problems or the level of controls necessary to address any such problems. Comment on any determinations made in prior rulemaking actions to identify downwind air quality problems relative to the ozone NAAQS or to quantify upwind state emission reduction obligations relative to those air quality problems, including the EPA's decision to focus on certain precursor emissions or sources, are not within the scope of this proposal. To the extent the EPA evaluates these issues in a future rulemaking to address remaining air quality problems relative to the 2008 ozone NAAQS, comments will be welcomed in the context of that rulemaking.

regulatory requirements to nine states in multiple different circuits, and if denied could impact the 13 states within the ozone transport region established in CAA section 184. This proposed action also discusses at length prior EPA action and analyses concerning the transport of pollutants between the different states under CAA section 110. For these reasons, the Administrator determines that, when finalized, this action is of nationwide scope and effect for purposes of section 307(b)(1). Thus, pursuant to CAA section 307(b) any petitions for review of any final action regarding this document would be filed in the Court of Appeals for the District of Columbia Circuit within 60 days from the date any final action is published in the **Federal Register**.

VI. Statutory Authority

42 U.S.C. 7401 *et seq.*

Dated: January 11, 2017.

Gina McCarthy,

Administrator.

[FR Doc. 2017–01097 Filed 1–18–17; 8:45 am]

BILLING CODE 6560–50–P

ENVIRONMENTAL PROTECTION AGENCY

[EPA–HQ–OPPT–2017–0026; FRL–9958–34]

Statutory Requirements for Substantiation of Confidential Business Information (CBI) Claims Under the Toxic Substances Control Act (TSCA)

AGENCY: Environmental Protection Agency (EPA).

ACTION: Notice.

SUMMARY: In June 2016, the Frank R. Lautenberg Chemical Safety for the 21st Century Act amended the Toxic Substances Control Act (TSCA). EPA is announcing an interpretation of TSCA section 14 concerning confidential business information (CBI) claims for information submitted to EPA. EPA interprets the revised TSCA section 14(c)(3) as requiring substantiation of non-exempt CBI claims at the time the information claimed as CBI is submitted to EPA.

FOR FURTHER INFORMATION CONTACT:

For general information contact: Colby Lintner, Regulatory Coordinator, Environmental Assistance Division (7408M), Office of Pollution Prevention and Toxics, Environmental Protection Agency, 1200 Pennsylvania Ave. NW., Washington, DC 20460–0001; telephone number: (202) 554–1404; email address: *TSCA-Hotline@epa.gov.*

For technical information contact: Scott M. Sherlock, Attorney Advisor, Environmental Assistance Division, Office of Pollution Prevention and Toxics, Environmental Protection Agency, 1200 Pennsylvania Ave. NW., Washington, DC 20460–0001; telephone number: (202) 564–8257; email address: *sherlock.scott@epa.gov.*

DATES: This action is effective on March 20, 2017.

SUPPLEMENTARY INFORMATION:

I. General Information

A. Does this action apply to me?

This announcement is directed to the public in general. It may, however, be of particular interest to you if you manufacture (defined by statute to include import) and/or process chemicals covered by TSCA (15 U.S.C. 2601 *et seq.*). This may include businesses identified by the North American Industrial Classification System (NAICS) codes 325 and 32411. Because this action is directed to the general public and other entities may also be interested, the Agency has not attempted to describe all the specific entities that may be interested in this action. If you have any questions regarding the applicability of this action to a particular entity, consult the technical person listed under **FOR FURTHER INFORMATION CONTACT.**

B. How can I get copies of this document and other related information?

1. *Docket.* EPA has established a docket for this action under docket identification (ID) number EPA–HQ–OPPT–2017–0026. All documents in the docket are listed in the docket index available at *http://www.regulations.gov.* Although listed in the index, some information is not publicly available, *e.g.,* CBI or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, will be publicly available only in hard copy. Publicly available docket materials are available electronically at *http://www.regulations.gov,* or, if only available in hard copy, at the OPPT Docket. The OPPT Docket is located in the EPA Docket Center (EPA/DC) at Rm. 3334, EPA West Bldg., 1301 Constitution Ave. NW., Washington, DC. The EPA/DC Public Reading Room hours of operation are 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number of the EPA/DC Public Reading Room is (202) 566–1744, and the telephone number for the OPPT Docket is (202) 566–0280. Docket visitors are required to show photographic identification, pass through a metal detector, and sign the EPA visitor log. All visitor bags are processed through an X-ray machine and subject to search. Visitors will be provided an EPA/DC badge that must be visible at all times in the building and returned upon departure.

2. *Other related information.* For information about EPA's programs to evaluate new and existing chemicals and their potential risks and the amended TSCA, go to *https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/frank-r-lautenberg-chemical-safety-21st-century-act.*

II. What action is the Agency taking?

The amended TSCA provides new requirements relating to the assertion, substantiation and review of CBI claims. EPA is interpreting the revised TSCA section 14(c)(3) as requiring substantiation of all CBI claims at the time the information claimed as CBI is submitted to EPA, except for claims for information subject to TSCA section 14(c)(2).

This action facilitates the Agency's implementation of TSCA section 14(g) to review all CBI claims for chemical identity, with limited exceptions, as well as to review a representative sample of at least 25% of other non-exempt claims.

III. What is the Agency's authority for taking this action?

EPA has determined that TSCA section 14(c)(3), 15 U.S.C. 2613(c)(3), requires an affected business to substantiate all TSCA CBI claims, except for information subject to TSCA section 14(c)(2), at the time the affected business submits the claimed information to EPA.

TSCA section 14(c)(1)(a) requires an affected business to assert a claim for protection from disclosure concurrent with submission of the information in accordance with existing or future rules. TSCA section 14(c)(3) in turn requires an affected business submitting a claim to protect information from disclosure to substantiate the claim, also in accordance with existing or future rules. The language of TSCA section 14(c)(3) is as follows:

> "(3) Substantiation requirements. Except as provided in paragraph (2), a person asserting a claim to protect information from disclosure under this section shall substantiate the claim, in accordance with such rules as the Administrator has promulgated or may promulgate pursuant to this section."

EPA interprets TSCA section 14(c)(3) to require substantiation for all TSCA CBI claims, except for information

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UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA

SIERRA CLUB, Plaintiff, v. CATHERINE McCABE,[1] in her official capacity as Acting Administrator of the United States Environmental Protection Agency, Defendant.	Case No. 3:15-cv-4328-JD **SIERRA CLUB'S REPLY IN SUPPORT OF MOTION FOR SUMMARY JUDGMENT AND OPPOSITION TO CROSS MOTION** (Clean Air Act, 42 U.S.C. §§ 7401 *et. seq.*) NOTICED FOR HEARING MARCH 9, 2017 AT 10 A.M.

[1] Pursuant to Fed. R. Civ. P. 25(d), Acting Administrator McCabe is automatically substituted for her predecessor in office.

GLOSSARY

AQAT	Air Quality Assessment Tools
CAIR	Clean Air Interstate Rule
CAMx	Comprehensive Air Quality Modeling with Extensions
CSAPR:	Cross State Air Pollution Rule a/k/a Transport Rule
CSAPR Update:	Cross-State Air Pollution Rule Update for the 2008 Ozone NAAQS
EGU	Electric Generating Unit, *i.e.* power plant
EPA:	Administrator of the United States Environmental Protection Agency
FIP:	Federal Implementation Plan
Good Neighbor Provision:	Clean Air Act § 110(a)(2)(D)(i)(I), 42 U.S.C. § 7410(a)(2)(D)(i)(I)
NAAQS:	National Ambient Air Quality Standard
NODA	Notice of Data Availability
Non-EGU	Non-Electric Generating Unit
PPA	Power Purchase Agreement
PPB	Parts Per Billion
SIP:	State Implementation Plans

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1 I. INTRODUCTION

2 This is a Clean Air Act deadline case in which Defendant Catherine McCabe, Acting
3 Administrator,[1] [hereinafter "EPA"] admits that it is illegally delaying a congressionally imposed
4 mandatory duty. EPA's illegal delay endangers the health, welfare and very lives of a great
5 many people.

6 The Court should order EPA to perform its mandatory duty by June 2018 because the
7 mandatory duty at issue in this case is limited to a federal implementation plan ("FIP") for only
8 Kentucky. EPA has taken similar actions on a tighter schedule than the schedule EPA proposed
9 to this Court. EPA is also basing its schedule on multi-analyses and multi-public comment
10 periods on the issue of pollution controls for non-electric generating units ("non-EGUs"), that
11 EPA is basing the schedule on policy preferences, like using a base year in its analysis other than
12 2011—which is the year for which EPA already has a complete analysis. In addition, there are
13 several modest reductions available in EPA's schedule that will cumulatively get us to a June
14 2018 deadline. Perhaps most importantly, EPA's schedule appears to be an attempt to
15 effectively negate its congressionally mandated duty to promulgate a complete Good Neighbor
16 FIP for Kentucky.

17 Furthermore, this case occurs in a clear context. The context includes EPA's pernicious
18 history of delay in meeting congressionally mandated deadlines to protect people from ozone
19 pollution. The context also includes EPA's 20 some years of experience working on addressing
20 interstate ozone pollution. The context also includes the precipitous drop in the cost of non-
21 polluting electric generating sources, such as wind and solar, such that emitting less ozone
22 precursors saves utilities, and their customers, money.

[1] Pursuant to Fed. R. Civ. P. 25(d), Acting Administrator McCabe is substituted for her predecessor in office.

In light of this context and these facts, the Court should reject EPA's request for further delay. The Court should require EPA to promulgate a final FIP for Kentucky's 2008 ozone National Ambient Air Quality Standards ("NAAQS") Good Neighbor provision by June 11, 2018.

II. RESPONSE TO EPA'S BACKGROUND, LEGAL FRAMEWORK AND PRIOR RULEMAKING ON INTERSTATE TRANSPORT OF AIR POLLUTION

Before turning to specific arguments in support of Sierra Club's requested schedule, Sierra Club will provide a response to various important points EPA made in EPA's background, legal framework and prior rulemaking sections in its brief.

A. RESPONSE TO SPECIFIC STATEMENTS IN THE STATUTORY AND REGULATORY BACKGROUND SECTION

EPA generally correctly describes the workings of the Clean Air Act. *See* EPA Br. at 1 - 3. However, EPA claims that when EPA promulgates a FIP it is "stepping into the State's traditional role of determining how to manage emissions in the State[.]" EPA Br. at 3. EPA's use of the term "traditional role" is inaccurate in the context of interstate ozone pollution.

Rather, the undisputed facts are that EPA, and not the individual states, has for decades been the creator of regulations to limit the interstate transport of ozone and ozone precursors. *See* EPA Br. at 7-11 (explaining EPA's long history of regulating interstate ozone pollution beginning with the NOx SIP Call which EPA proposed almost 20 years ago in 1997). States have traditionally done nothing to ensure that their interstate ozone pollution complies with the Clean Air Act's Good Neighbor provisions. Thus, this case is just another step in EPA's long history of regulating interstate ozone pollution. The fact that EPA tried to spin this history otherwise is telling of EPA's overreach in its requested schedule.

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1 One key consideration regarding the relevant legal framework is that the *EME Homer*
2 *City* case was a review of the Cross-State Air Pollution Rule ("CSAPR"). But in this case, the
3 only issue is a deadline for EPA to act on Kentucky. Thus, the question presented in the case at
4 bar is **not**: "How should EPA allocate among multiple contributing upwind States responsibility
5 for a downwind state's excess pollution?" EPA Br. at 6. Rather, the question presented is: How
6 should EPA completely resolve Kentucky's 2008 ozone NAAQS Good Neighbor provision
7 obligations which EPA already partially resolved with the CSAPR Update?

8 B. RESPONSE TO FACTUAL BACKGROUND

9 EPA also completely ignores the critical sea change in the electric market which greatly
10 lessens the burden it faces in creating a complete Kentucky FIP. That is the dramatic drop in the
11 cost of electricity generated from sources which produce no ozone precursor pollution, like wind
12 and solar. For example, Georgia Power Company, a utility in Georgia, signed a contract, called
13 a power purchase agreement ("PPA"), for wind power that was cheaper than its avoided cost.
14 *See e.g.* Declaration of Robert Ukeiley (Ukeiley Decl.), Ex. 1 at 5. That means the Georgia
15 Power Company added a source of electricity which produces zero ozone precursor pollution and
16 saves the utility, and, thus, its customers', money.

17 Turning specifically to Kentucky, the marginal cost—that is how much more expensive is
18 it to turn a coal plant on versus to leave it idle, of Kentucky coal plants ranges from $40.57 per
19 megawatt-hour ("mwh") to $22.32/mwh in 2015, based on data from SNL Energy, a subsidiary
20 of S&P Global Market Intelligence. *See* Ukeiley Decl. Ex. 2. Presumably, the marginal cost of
21 Kentucky coal plants will increase in 2017 when the CSAPR Update becomes effective because,
22 as explained above, Kentucky is not currently using renewable energy to reduce its NOx
23 emissions. In contrast, wind power in 2016 ranged from $14/mwh to $48/mwh. *See* Lazard's

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1 Levelilzed cost of energy Analysis – Version 10.0, ("Lazard") available at
2 https://www.lazard.com/media/438038/levelized-cost-of-energy-v100.pdf . That means that
3 wind power at the lower end of the range is cheaper for a Kentucky utility to purchase than
4 operating any of the coal fired power plants in Kentucky.
5 In other words, if utilities in Kentucky can secure wind power at the lower end of the
6 price range, they can save money for this zero emissions electricity compared to operating any of
7 their coal plants. It is true that it is unlikely that a utility in Kentucky can secure wind power at
8 the very bottom of the price range. However, coal burning units like E.W. Brown Unit 1 had a
9 marginal cost of $40.57/mwh in 2015. Ukeiley Decl., Ex. 2. All but the most expensive wind
10 power in the country is cheaper than operating the NOx spewing E.W. Brown. Even most utility
11 scale thin film solar PV is cheaper than E.W. Brown Unit 1. *See* Lazard at 4.
12 Sierra Club does not present this cost information of zero-NOx emitting sources versus
13 significant NOx emitting sources to try to litigate the substance of the Kentucky Good Neighbor
14 FIP. Rather, Sierra Club offers this information for the limited purpose of showing that EPA's
15 schedule is based on an assumption of the necessity of doing a cost analysis of "end of the pipe"
16 pollution control technologies, but the cost of clean energy has dropped so significantly that that
17 assumption is questionable at best.
18 EPA seems to still be stuck in the mindset that it must analyze reducing ozone precursor
19 pollution by assuming utilities will have to pay to install additional pollution controls to make
20 their fossil fuel power plants less polluting. *See e.g.* McCabe Decl. ¶99. As demonstrated above,
21 that paradigm is disintegrating and with it EPA's concern about analyzing and determining what
22 ozone pollution controls are cost effective.

The opportunities for renewable electric generating sources are especially ripe in Kentucky because it does not have any to speak of, solely as a result of a purely political decision. Kentucky still gets 81.5 percent of its electricity from burning coal versus the national average of 30.1 percent. *See* US Energy Information Agency, Electric Power Monthly, Table 1.4.B versus Table 1.3.B, available at http://www.eia.gov/electricity/monthly/ . Kentucky is at 0.0 percent wind power. *See* Electric Power Monthly, Table 1.14.B. Yet six of the seven states which border Kentucky have utility scale wind power. *Id.* Kentucky's solar generation is also at 0.0 percent, although at least it is not zero in absolute terms. *See* Electric Power Monthly, Table 1.17.B. Six of Kentucky's neighboring states generate more zero ozone pollution solar electricity than Kentucky. *See* Table 1.17.B.

C. RESPONSE TO SPECIFIC POINTS IN THE LEGAL FRAMEWORK AND PRIOR RULEMAKING

For the CSAPR Update, EPA states that it will requires emission reductions in May 2017 "to assist downwind states with meeting the July 2018 attainment date for the 2008 ozone NAAQS." EPA Br. at 9. While strictly speaking this is a true statement, it does not convey the whole truth. The whole truth is that once again EPA's illegal delays in addressing interstate ozone pollution unfairly make it more difficult for downwind states to bring their ozone pollution down to levels that EPA deemed acceptably safe in 2008. *See e.g. North Carolina v. EPA*, 531 F.3d 896, 929, *modified on reh'g*, 550 F.3d 1176 (D.C. Cir. 2008) (Striking down the Clean Air Interstate Rule (the CSAPR's predecessor) for ozone pollution because it was not implemented quickly enough to provided needed pollution relief to downwind areas).

To begin with, most 2008 ozone nonattainment areas originally had an attainment date of July 20, 2015, which required consideration of ozone levels in 2012 – 2014. *See* 81 Fed. Reg. 26,697 (May 4, 2016). However, EPA failed to ensure there were Good Neighbor provisions in

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place to help these nonattainment areas attain the 2008 ozone NAAQS by their July 2015 attainment date. Partially as a result, numerous nonattainment areas got "bumped up" from a marginal classification to a moderate classification and got a new attainment date of July 2018. *Id.*

The July 2018 attainment date is based on ozone levels from 2015 – 2017. Thus, again, for two out of the three years, downwind areas will not have the benefit of any Good Neighbor provisions being in place for upwind states because of EPA's illegal delay. EPA claims that 2017 was the soonest year feasible for them to address. *See* EPA Br. at 11, n. 14.

But that conclusion is built on accepting EPA's delays, both legal and illegal. EPA could have issued a FIP for Kentucky on March 13, 2011.[2] That FIP could have provided emission reductions for downwind areas for 2012-2014, which is what EPA really should have done to comply with the *North Carolina* decision.

Sierra Club does not raise this point as a request to change the past. Rather, Sierra Club raises this point in the hopes that the past will inform the Court's decision so as not to allow EPA to repeat its same mistakes yet again.

EPA's proposed deadline of February 2020 would create the same problem that nonattainment areas have had when they were classified as marginal and reclassified as moderate. That is, if moderate areas like New York fail to attain by the July 2018 attainment date, EPA will again be required to "bump" them up to serious classification with a July 20,

[2] EPA makes the argument that this statement ignores the requirement of the Clean Air Act that the EPA must "take a prerequisite action to determine that the state has failed to submit a SIP addressing the statutory requirements before [EPA] has the authority to promulgate a FIP." McCabe Decl. at n. 10. This is not so but it is understandable that Ms. McCabe, with a near perfect record of illegal delay on rulemakings that require emission reductions, cannot conceive of how to act so quickly. EPA could make the prerequisite finding of failure to submit, pursuant to 42 U.S.C. § 7410(k)(1)(b), and immediately follow this with a FIP. *EME Homer City Generation*, 134 S. Ct. at 1601.

2021 deadline. Attainment will be based on 2018 through 2020 ozone levels. Sierra Club's proposed deadline of June 11, 2018 will give the downwind areas partial relief in 2018 and full relief in 2019 and 2020. However, EPA's proposed deadline will only give the downwind areas relief in one of three years used to determine attainment for serious nonattainment areas. The D.C. Circuit has already told EPA that this approach is inappropriate. *North Carolina*, 531 F.3d at 929. Here, this Court can proactively keep EPA from denying downwind areas the timely pollution reductions they are entitled to under the Clean Air Act by setting a June 2018 deadline for the Kentucky Good Neighbor FIP.

III. ARGUMENT

A. KENTUCKY'S FIP IS THE ONLY ISSUE CURRENTLY BEFORE THE COURT.

The only issue before this Court is what schedule to impose on EPA to promulgate a FIP for the Kentucky 2008 ozone NAAQS Good Neighbor provision. EPA has actually fought mightily to make sure that the scope of this case is so limited. *See e.g. WildEarth Guardians v. McCarthy*, 4:11-cv-5651-YGR consolidated with 4:11-cv-5694-YGR, [Dk.#95] Order Denying Motion to Modify Judgment (N.D. Cal. 11/10/14) (denying Rule 60(b) motion to require EPA to make findings of failure to submit for 2008 ozone NAAQS Good Neighbor provisions for several states other than Kentucky); *Sierra Club v. McCarthy*, 4:14-cv-5091-YGR consolidated with 4:14-cv-3198, [Dk.#52] Judgment (N.D. Cal. 5/5/15) (after cross motions for summary judgment, require EPA to make findings of failure to submit for 2008 ozone NAAQS Good Neighbor provisions for several states other than Kentucky). Having fought to delay the FIP clock for the other states, EPA is now stuck with its decision. It should not be allowed to use the other states as an excuse to ask for more delay in this case.

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1 EPA claims that: "Given the interconnected nature of ozone transport, the Supreme Court
2 has acknowledged that EPA must determine 'how to differentiate among otherwise like
3 contributions of multiple upwind states.' 134 S. Ct. at 1607." EPA Br. at 13. That is not
4 accurate. Rather, the Supreme Court did not point to any requirement in the Clean Air Act that
5 EPA address multiple states' contributions at the same time. Rather, *EME Homer City* was a
6 case in which the Supreme Court was reviewing CSAPR—a rule in which EPA chose to address
7 multiple states. *See* 134 S.Ct at 1593. Faced with a rule dealing with multiple states' pollution,
8 the Supreme Court merely stated the obvious: "EPA must decide how to differentiate among the
9 otherwise like contributions of multiple upwind States." 134 S.Ct. at 1607.
10 But in this case, EPA is facing an order to create a FIP for Kentucky only. In such a
11 context EPA has several options to address Kentucky's pollution consistent with the Act and
12 EPA's past approach. For example, EPA could issue a FIP which requires Kentucky to limit is
13 pollution such that it does not have a significant contribution to any downwind state, i.e. it
14 contributes less than 1 percent of the 2008 ozone NAAQS. The Supreme Court held that EPA
15 cannot require a state to reduce its emissions by **more** than an amount that results in its
16 contribution being less than 1 percent to every downwind state. 134 S.Ct. at 1608. If limiting
17 Kentucky's contribution to the 1 percent level results in all the downwind receptors no longer
18 being in violation, then EPA could ratchet up Kentucky's allowable emissions level until that is
19 no longer the case. This is a much simpler (and quicker) approach than EPA is proposing.
20 Although denying this as a plausible approach in several places in its brief and affidavits, EPA
21 also explicitly says this is an acceptable approach on page 48 of the McCabe Declaration.
22 McCabe Decl. ¶91 ("the upwind state's contribution to downwind air quality problems can be
23 reduced, through the implementation of cost-effective emissions reductions, to the 1 percent

1 screening threshold such that the EPA can conclude the state's remaining impact on the
2 downwind air quality problem is insignificant, even if the downwind air quality problem
3 persists").

4 EPA's unsupported conclusion that if it looks at Kentucky in isolation and does not
5 consider other states, it will not be able to demonstrate that it has not under or over controlled
6 Kentucky's emissions simply does not make sense. *See* EPA Br. at 13 (citing McCabe Decl.
7 ¶88). If EPA can tell what the combined impact of multiple states' impacts are on downwind
8 areas, it can logically tell what the impacts of each of these states are. We also know that this is
9 true because EPA tells us so earlier in its brief. EPA acknowledges that its analysis showed that
10 Kentucky is linked at above the 1 percent threshold level to two receptors in Maryland and New
11 York that EPA predicts may have problems maintaining the 2008 ozone NAAQS in 2017. EPA
12 Br. at 11. EPA also explains that it models predicted contributions from upwind states using the
13 CAMx ozone source apportionment modeling tool. EPA Br. at 17.

14 Digging deeper, we find that EPA's analysis under the CSAPR Update shows that
15 Kentucky will contribute 2.115766 parts per billion (ppb) to the Harford, Maryland receptor.
16 Ukeiley Decl. Ex. 3. Kentucky would have to reduce its emissions such that its contribution to
17 the Harford receptor was reduced by 1.365766 ppb which would leave its remaining contribution
18 at 0.75 ppb which is the significance threshold used by EPA. Because EPA found that this
19 Harford, Maryland receptor would be at 78.8 ppb, a reduction of 1.365766 ppb created in
20 Kentucky would not over control this receptor. That is, the Harford, Maryland receptor would be
21 at 77.434234 ppb after Kentucky's contribution was brought down to the significant level.
22 77.434234 ppb is still in violation of the 2008 ozone NAAQS of 75 ppb. A similar analysis can
23 be performed for the Richmond, New York receptor.

1 This FIP would be entirely consistent with EPA's four step CSAPR framework. EPA
2 would simply impose an emission limit that ensures Kentucky no longer contributes emissions in
3 amounts sufficient to link Kentucky to the downwind air quality problems using contribution
4 modeling—that is CSAPR Framework Step 2. *See* EPA Br. at 13. Eliminating the need for
5 Steps 3 and 4 of the CSAPR Framework for Kentucky would save EPA considerable time in
6 meeting its congressionally mandated obligation to promulgate a FIP for Kentucky.
7 EPA claims, however, that it can only require these reductions if they are cost effective.
8 McCabe Decl. ¶104. While the Supreme Court has upheld EPA's approach of using cost rather
9 than actually resolving the downwind pollution problems as acceptable, the statute and the Court
10 have not said that a cost effective analysis is required. *See* 42 U.S.C. § 7410(a)(2)(D)(i)(I)
11 (requiring prevention of significant, not cost effective, emissions). In any event, zero emission
12 generation sources which are cheaper than polluting generation sources are cost effective under
13 any reasonable definition of cost effective. Similarly, requiring coal fired power plants to
14 operate at emission levels at which they have operated before is cost effective under any
15 reasonable definition of cost effective.
16 Regarding this last point, EPA fails to provide any non-conclusory rebuttal evidence to
17 the Maryland analysis, which was attachment 2 to David Howekamp's declaration, [Dk.#62-3].
18 This Maryland analysis demonstrates that coal fired power plants can operate over the long term
19 at NOx emission rates which are the equivalent to their best NOx emission rates. Dk.#62-3 at 3-
20 4. This includes coal units with very low NOx emission rates for a coal plant, *e.g.* Lansing Unit
21 4 and Jeffrey Unit 1. *Id.*
22 EPA is concerned about the "inequity" of requiring Kentucky to make reductions while
23 not requiring other states to do the same. McCabe Decl. ¶104. It is a shame that EPA does not

express equal concern about the inequity of exposing people in some, but not all, downwind areas to ozone pollution levels which can make them sick or kill them. Furthermore, the D.C. Circuit has explicitly told EPA that it is not allowed to use its desire to have all states have to meet the same cost threshold as an excuse to not do what the Good Neighbor provision actually requires. *EME Homer City v. EPA,* 795 F.3d 118, 127 – 132 (D.C. Cir. 2015).

In any event, if EPA were truly concerned about this inequity, it should have made the finding of failure to submit for the other upwind states rather than drag out litigation against Sierra Club which eventually forced EPA to make that finding. Now that EPA has created a situation in which Kentucky's FIP is past due before other states, it is beyond the pale for EPA to argue that this situation entitles EPA to further delay in addressing Kentucky's 2008 ozone Good Neighbor provision. Again, what is before EPA is only Kentucky's Good Neighbor FIP.

B. EVEN WHEN COMPLETELY ACCEPTING EPA'S FRAMEWORK, THERE IS ENOUGH "FAT" THAT CAN BE TRIMMED OUT OF EPA'S SCHEDULE TO GET TO A JUNE 2018 DEADLINE.

1. EPA'S PAST PERFORMANCE INDICATES ITS REQUESTED SCHEDULE IS UNREASONABLY LONG

Even if one completely accepts the framework and methodology EPA claims it needs to follow to promulgate a FIP for the Kentucky 2008 ozone Good Neighbor provision, EPA's proposed schedule can still be tightened to get to a June 2018 deadline. Before turning to the specific items in EPA's schedule that can be shortened, it is worth addressing a few general points.

For example, even when EPA was first starting to address the issue of interstate transport of ozone pollution, EPA issued the NOx SIP Call with less than a year between the proposed and final rule. *See* 63 Fed. Reg. 57,356, 57,358 (Oct. 27, 1998). And that process required a supplemental proposal. *Id.* For the original CSAPR, it took EPA 11 months to go from the

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1 proposed to final rule. *See* 76 Fed. Reg. 48,208, 48,217, 48,353 (Aug. 8, 2011) (Proposed rule
2 published August 2, 2010. Final rule signed July 6, 2011). EPA took ten months to finalize the
3 CSAPR Update. McCabe Decl. ¶179. There is no basis to assume that EPA will have to provide
4 a supplemental proposal for the complete Kentucky FIP. Yet, in EPA's proposed schedule, it is
5 asking for fourteen months between the proposed and final rule. McCabe Decl. Attachment 1. It
6 does not make sense that the fifth time around, EPA needs more time than the previous exercises
7 which included addressing non-EGUs or the NOx SIP Call, in which EPA first addressed this
8 issue.

9 2. EPA IS REQUESTING EXCESSIVE ANALYSIS FOR NON-EGUs

10 One of the most clear examples of the excess of EPA's schedule is it request for multiple
11 rounds of analysis and public comment on the issue of NOx emissions from non-EGU sources of
12 pollution. EPA anticipates that public comments on a Notice of Data Availability ("NODA"),
13 particularly from non-EGU sources, will result in the need to update many data elements
14 informing its analysis. McCabe Decl. ¶¶119-21. EPA requested comments on non-EGUs for the
15 CSAPR Update. EPA calls its analysis of non-EGUs in the CSAPR Update a "preliminary
16 analysis." EPA Br. at 14. But to be accurate, EPA would have to call it a "post post-preliminary
17 preliminary" analysis or some other Orwellian term.

18 This is because approximately six and a half years ago, in the original CSAPR, EPA
19 explained it "conducted a preliminary assessment of reductions available for source categories
20 other than EGUs." 75 Fed. Reg. 45,272 (Aug. 2, 2010). EPA went on to explain that after this
21 preliminary assessment, it "reexamined non-EGUs to determine the accuracy of its initial
22 assumptions[.]" *Id.*

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1 EPA has already undertaken two analyses of non-EGUs under CSAPR, another analysis
2 of non-EGUs under the CSAPR Update, a public comment period under each of these rules, and
3 five months of stakeholder review of non-EGU data and implementing comments on non-EGU
4 data from September 2016 to January 2017. *See* Declaration of Janet G. McCabe Attachment 1.
5 EPA also has its emission inventory for the 2015 ozone NAAQS transport rule, aka CSAPR 3.0.
6 *See* 82 Fed. Reg. 1,733 (Jan. 6, 2017). EPA also has National Emission Inventories, EPA Br. at
7 14, and a variety of other recent rulemakings on non-EGU pollution sources such as the New
8 Source Performance Standard for the Oil and Natural Gas Sector and Regional Haze Rules
9 addressing NOx controls for cement plants. *See e.g.* 81 Fed. Reg. 35,824 (June 3, 2016) (Oil and
10 Gas New Source Performance Standards); 81 Fed. Reg. 83,144 (Nov. 21, 2016) (rulemaking
11 based on NOx control technology demonstration results at cement plants). And in addition to all
12 this, EPA has the 1998 NOx SIP Call, which regulated interstate transport of ozone pollution
13 including regulation of certain non-EGU sources. McCabe Dec. at ¶18.
14 Yet EPA comes to this Court and says it need *two* more analyses and *two* more public
15 comment periods, EPA Br. at 14, on the issue of non-EGUs while people downwind of Kentucky
16 are exposed to ozone levels that EPA has determined can make them sick or even kill them. It
17 should be clear that we have reached the point where EPA simply needs to take the data it has, as
18 well as the data it will gain in the public comment period on the proposed complete Kentucky
19 FIP, and implement the congressional mandated protections. *See e.g. Communities for a Better*
20 *Env't v. EPA*, 2008 WL 1994898 (N.D. Cal., May 5, 2008) at *3 ("Excuses for delay must go
21 beyond the general proposition that further study and analysis of materials will make final
22 agency action better, . . . because further study will always make everything better, and it is
23 always easier to do something with more rather than less time.") (internal citations omitted).

1 EPA's brief claims that EPA "**anticipates** that public comments on a NODA, particularly
2 from non-EGU sources, will result in the need to update many data elements informing its
3 analysis. McCabe Decl. ¶¶ 119-21." EPA Br. at 15 (emphasis added). But EPA's brief and the
4 McCabe Declaration provide no basis for anticipating, after numerous public comments periods
5 on the same issue of ozone precursor controls for non-EGUs, why this NODA will generate
6 comments that the previous public comment period did not. The Court should not approve a
7 schedule based on irrational speculation. EPA also does not explain why, if EPA actually
8 believes this data exists and it is important, EPA does not use its congressionally authorized
9 power, under Section 114 of the Act, 42 U.S.C. § 7414(a), to obtain this specific information
10 rather than wishfully thinking that one more public comment period in a series of public
11 comment periods will yield the data EPA wants.
12 Moreover, if EPA anticipates getting this data on non-EGUs, EPA does not explain why
13 it does not issue a proposed rule with alternative regulations based on the anticipated data. This
14 would eliminate the need for a supplemental proposal which EPA says "could" be needed. EPA
15 Br. at 15.
16 Perhaps realizing the unreasonableness of asking for significant time for multiple
17 analyses and multiple public comment periods on an issue on which EPA has already conducted
18 multiple analyses and had multiple public comment periods and for which EPA has clear
19 statutory authority to obtain the information if it should so choose, EPA makes a half-hearted
20 attempt to claim it should get deference. EPA Br. at 16. EPA admits that the case it cites does
21 not apply to this situation because this is not a challenge to final agency action. *Id.*
22 EPA ignores the case law that says in setting a schedule, the agency must demonstrate
23 that it is acting with the "utmost diligence" and that the burden on the agency in this deadline

litigation is "heavy." *Sierra Club v. Thomas*, 658 F. Supp. 165, 171-172 (N.D. Cal. 1987) (Clean Air Act deadline case thirty years ago to require, as in the case at bar, EPA to issue regulations to control NOx emissions).

EPA states that Sierra Club does not know better than EPA what information or analysis is necessary to prepare this FIP. EPA Br. at 16. But Sierra Club is not arguing that EPA does not need information and analysis on non-EGUs. Sierra Club is just saying that EPA should only get five "bites at this apple," rather than six. EPA also ignores the fact that Sierra Club's expert, David Howekamp, worked for EPA making air regulations, including FIPs, for some 31 years.

3. EPA'S DESIRE TO USE A FUTURE YEAR OTHER THAN 2017 FOR ITS ANALYSIS IS A POLICY CHOICE THAT DOES NOT JUSTIFY FURTHER DELAY

The CSAPR Update used a future year analysis of 2017. EPA says that for the complete Kentucky FIP, it will not re-use this analysis. The D.C. Circuit has held that EPA can, but is not required to, interpret the Good Neighbor provision as addressing future violations. *North Carolina v. EPA*, 531 F.3d 896, 914 (D.C. Cir. 2008). The D.C. Circuit has also upheld the use of 2007 air quality data for CSAPR even though CSAPR was promulgated after 2007. *EME Homer City Generation v. EPA*, 795 F.3d 118, 135 (D.C. Cir. 2015). Thus, nothing actually prohibits EPA from re-using its 2017 future analysis for the complete Kentucky FIP. EPA always has the option of requiring future phased emission reductions in the complete Kentucky FIP to accommodate emission control strategies that will take additional time to implement. After all, EPA concedes that it took this approach with regard to Arkansas in the CSAPR Update. McCabe Decl. n. 33.

4. THERE ARE MODEST REDUCTIONS IN EPA'S SCHEDULE THAT CUMULATIVELY CAN GET TO A JUNE 2018 DEADLINE

The schedule for EPA to come into compliance with its missed deadline must reflect the utmost diligence. *Sierra Club v. Thomas*, 658 F. Supp. at 171-172. There are a series of relatively small reductions in EPA's proposed schedule which cumulatively can get us to a June 2018 deadline. However, it is important to keep in mind that Sierra Club is not requesting the Court set deadlines for each one of these steps. Therefore, EPA will be free to re-arrange this schedule as it sees fit so long as EPA complies with the court ordered deadline for signing the proposed and final rules.

Referring to the schedule in Attachment 1 to the McCabe Declaration, EPA can cut out the "Engage Stakeholders on Emission Reductions and Costs" element of its proposed schedule. This is simply EPA wanting more analysis rather than required analysis. As discussed above, this process is redundant of numerous other analyses and public comment periods EPA has had on non-EGU emissions and redundant of the public comment period on the proposed rule. By cutting out this element, EPA can run the "Develop AQ Modeling Inputs - Non-Emissions" and "Develop Base and Future Analytic Year Emissions" concurrently, thus saving three months.

EPA can also cut the time to "Develop the Base and Future Analytic Year Emissions" in half in light of the fact that it can use 2011 as the base year. It does not make any sense for EPA to use another base year for the 2008 ozone NAAQS Good Neighbor provision considering that it using 2011 as its base year for the 2015 ozone NAAQS Good Neighbor provision. It can also use 2017 or 2018 as its future year, in which case it would have all or almost all of the work done already from the CSAPR Update. This would save another three months.

EPA spends significant time talking about the difficulty of choosing its base year. McCabe Decl. ¶136. EPA has already chosen 2011 as its base year for its analysis of the 2015

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ozone NAAQS Good Neighbor provisions. *See* 82 Fed. Reg. at 1,735. There does not appear to be any rational basis for using a later base year for the 2008 ozone NAAQS Good Neighbor provision than for the 2015 ozone NAAQS Good Neighbor provision. Thus, the Court should dismiss all of EPA's discussion about the effort and time needed to address the analysis of base year as the work is already done.

EPA can cut the time to "Develop Briefings, Preamble, Reg Text, RIA, and Convene SBREFA Panel" down to three months for the proposed rule and two months for the final rule as these are all actions completely within EPA's control and simply reflect the amount of effort put forth. This would be a seven month savings.

Similarly, EPA can cut the agency review of the proposed rule from two to one month with added EPA staff effort, especially in light of the fact that Agency reviewers can stay abreast of developments as they happen. Interagency review, which is not required by the Clean Air Act, can also be reduced to one month for two months total savings in the review process. *See e.g. Am. Lung Ass'n v. Browner*, 884 F. Supp. 345, 347 (D. Ariz. 1994) (Court adjusted EPA's proposed schedule to provide for only those review activities required by Congress and essential to ensuring that within the context of five–year intervals, EPA standards reflect the latest scientific knowledge so as to fully protect the public). Doing this for both the proposed and final rule will reduce the schedule by four months total.

The ministerial act of sending the proposed and final rule from EPA to the Office of the Federal Register can be cut down to a half month, saving a month in total.

Finally, having worked on this project of so long, EPA should be able to cut the "Establish Full Remedy Emission Limits" to two months. This would be a saving of two months.

C. EPA ACKNOWLEDGES THAT ITS REAL DESIRE IS TO COMBINE THE COMPLETE KENTUCKY FIP WITH THE CSAPR FOR THE 2015 OZONE NAAQS. THIS WOULD LIKELY EFFECTIVELY OBLITERATE THE STATUTORY REQUIREMENT FOR A COMPLETE KENTUCKY 2008 OZONE NAAQS GOOD NEIGHBOR FIP.

EPA acknowledges that the time frame that it claims it needs for the complete Kentucky FIP just so happens to be the time frame that it also needs for a CSAPR for the 2015 ozone NAAQS. McCabe Decl. ¶190. EPA acknowledges that for the complete Kentucky FIP, the nonattainment and maintenance problems for receptors downwind from Kentucky could either be diminished or resolved if it can just delay long enough so as to use a post 2017 future year for its analysis. McCabe Decl. ¶98. EPA also acknowledges that EPA could address the "remaining FIP obligation to address interstate transport with respect to the 2008 ozone NAAQS together with the 2015 ozone NAAQS." McCabe Decl. ¶189. EPA spends dozens of pages trying to explain how the CSAPR Update is so different from the complete Kentucky FIP but then explains that much of the work needed for the complete Kentucky FIP is the same as for the CSAPR for the 2015 ozone NAAQS.

It turns out that by 2023, which bears no rational relation to the 2008 ozone NAAQS, EPA's prediction of the average and maximum design value for the Harford, MD monitor and the Richmond, NY monitor will be below the 75 ppb 2008 ozone NAAQS. *See* 82 Fed. Reg. 1,733 (Jan. 6, 2017) and EPA-HQ-OAR-2016-0751 available at https://www.regulations.gov/document?D=EPA-HQ-OAR-2016-0751-0007. Thus, if EPA is allowed enough delay that it can combine the complete Kentucky FIP and the CSAPR for the 2015 ozone NAAQS, EPA can declare that it no longer has any obligations with regard to the Kentucky 2008 ozone NAAQS Good Neighbor provision. Thus, EPA's delay in meeting its

1 Kentucky FIP obligation would turn into an obliteration of its obligation. The Court should not
2 allow EPA to use delay to effectively remove substantive protections from the statute.
3 Sierra Club's concern is rooted in EPA's past practice. The original CSAPR addressed
4 the 1997 ozone NAAQS, but it was only a partial remedy for the 1997 ozone NAAQS Good
5 Neighbor obligations for the states it covered in the same way that the CSAPR Update is only a
6 partial remedy for the 2008 ozone NAAQS Good Neighbor obligations for Kentucky. 81 Fed.
7 Reg. at 74,525. By the time EPA finally promulgated the CSAPR Update, EPA's modeling
8 predicted that by 2017, all the downwind receptors which were in violation of the 1997 ozone
9 NAAQS for the original CSAPR would no longer be in violation. *Id.* Thus, EPA did not have
10 to impose any additional emission reductions on the upwind states for which the original CSAPR
11 had only been a partial remedy. *Id.*
12 There are two major problems with EPA's approach of delaying regulatory action long
13 enough for the air pollution problem to go away on its own. One is we do not actually know if
14 the problem will go away. EPA's computer model often under-predicts future ozone levels. For
15 example, EPA's 2023 ozone level predictions are based in part on actual ozone levels in 2009.
16 2009 was the Great Recession, which saw ozone levels drop as the economy melted down.
17 There is no rational reason to believe that 2023 will see another Great Recession.
18 More importantly, Congress provided that people are entitled to timely reductions in
19 ozone levels by the reduction of interstate ozone pollution. *See* 42 U.S.C. § 7410(a)(1)(Good
20 Neighbor provisions and other infrastructure SIP provisions must be in place within three years
21 of the promulgation of a NAAQS—for the 2008 ozone NAAQS, that was 2011). EPA is not free
22 to ignore this congressional mandate in the hopes that the problem will go away by 2023. The
23 Court should not permit the EPA to turn a blind eye to the sickness, ecological and agricultural

damage, and even death which people will suffer between 2011 and 2023 in light of the congressional mandate. A deadline for the final rule of July 2018 will ensure that EPA does not effectively avoid its obligations because EPA does not have authority to issue a FIP for the 2015 ozone NAAQS Good Neighbor provision until October 2018. *See* McCabe Decl. ¶190.

IV. CONCLUSION

Therefore, for the reasons explains above and in Plaintiffs' opening brief, the Court should order EPA to sign a proposed rule no later than January 31, 2018, promulgate a final FIP by no later than June 11, 2018, and forward the proposed and final rules to the Office of the Federal Register for publication within three working days of signature.

Respectfully submitted,

/s Robert Ukeiley

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UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA

SIERRA CLUB, Plaintiff, v. GINA MCCARTHY, in her official capacity as Administrator of the United States Environmental Protection Agency, Defendant.	Case No. 3:15-cv-4328-JD **DECLARATION OF ROBERT UKEILEY** (Clean Air Act, 42 U.S.C. §§ 7401 *et. seq.*) NOTICED FOR HEARING MARCH 9, 2017 AT 10 A.M.

I, Robert Ukeiley, declare as follows:

1. I am counsel for Plaintiff Sierra Club in the above captioned case. I submit this declaration in support of Sierra Club's Motion for Summary Judgment.

2. Attached as Exhibit 1 is a true and correct copy of the public disclosure version of Georgia Power Company's Application for the Certification of the Power Purchase Agreements for Wind Resources from the Blue Canyon II and Blue Canyon VI Wind Farms in Docket No. 37854 in the Georgia Public Service Commission.

3. Attached as Exhibit 2 is a true and correct copy of marginal costs of coal fired power plants in Kentucky. This data is from SNL Energy, a subsidiary of S&P Global Market Intelligence.

4. Attached as Exhibit 3 is a true and correct copy of the worksheet found at the "1400_control links" tab in the United States Environmental Protection Agency's document EPA-HQ-OAR-2015-0500-0492. This document is available at www.regulations.gov.

I declare under penalty of perjury under the laws of the United States that the foregoing is true and correct.

So declared this 26th day of January, 2017.

/s/ Robert Ukeiley

Robert Ukeiley

EXHIBIT 1

Georgia Power Company's Application for the Certification of the Power Purchase Agreements for Wind Resources from the Blue Canyon II and Blue Canyon VI Wind Farms

Docket No. 37854

Georgia Power Company's Application for the Certification of the Power Purchase Agreements for Wind Resources from the Blue Canyon II and Blue Canyon VI Wind Farms

Docket No. 37854

Applicant name, address and principal place of business:

Georgia Power Company
241 Ralph McGill Blvd NE
Atlanta, Georgia 30308

Authorized person to receive notices or communications with respect to application:

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Location for public inspection:

Georgia Power Company
241 Ralph McGill Blvd NE
Atlanta, Georgia 30308

PUBLIC DISCLOSURE

Affidavit and Basis for the Assertion That Redacted Portions of Georgia Power Company's Application for the Certification of the Power Purchase Agreements for Wind Resources from the Blue Canyon II and Blue Canyon VI Wind Farms are Protected as Trade Secret

As part of its Application for the Certification of the Power Purchase Agreements for Wind Resources from the Blue Canyon II and Blue Canyon VI Wind Farms in Docket No. 37854, (the "Application") Georgia Power Company ("Georgia Power" or the "Company") is submitting to the Georgia Public Service Commission ("Commission") copies of certain Power Purchase Agreements ("PPAs"), forecast data, cost information, financial analysis and strategic information (the "Information"). The Information (as highlighted) constitutes trade secret information of Georgia Power and its affiliates, and its PPA counterparty, and is therefore protected from disclosure under Commission Rule 515-3-1-.11.

The Information derives economic value from not being generally known to, and not being readily ascertainable by proper means by other persons who can obtain economic value from its disclosure or use. Specifically, certain PPA terms that have been redacted contain pricing and other delivery parameters that are specific to the designation of being an extraordinary advantage. This Information is proprietary to the Company and the counterparty to the PPAs, and not generally known by the public. Revealing these terms would compromise the Company's ability to procure the best cost resources from other independent power suppliers in the future. In the event such Information was released, it is quite likely that future counterparties would use this information to set the floor in constructing their own offers, thus artificially and inefficiently setting a market price and affecting other contract terms, resulting in agreements that may not be representative of the best cost resource that the market could offer. In addition, parties to the PPAs have agreed to maintain the confidentiality of these terms. Compromising the confidentiality of such Information could also harm the Company in its attempts to negotiate PPAs in the future, as counterparties may fear compelled disclosure of key contractual terms.

In addition, the Information reveals demand forecast information that would give competitors of Georgia Power a competitive advantage. Disclosure of the Information would reveal detailed energy usage data of the Company and would reveal the Company's needs in the short-term, thereby potentially harming the Company's ability to make cost-effective sales or purchases of energy on behalf of its customers. Furthermore, the Company has expended significant resources to develop its market forecasts and such forecasts reflect the accumulated expertise of the Company. To allow competitors access to such market forecast data without being required to expend similar resources would bestow an unfair economic advantage on competitors. Similarly, the Company's fuel forecasts are created by the Company through the expenditure of resources and are a reflection of the Company's market knowledge. To grant access to the Company's fuel forecasts would grant an unfair benefit to competitors by giving insight into the Company's future resource plans.

Disclosure of the Information could also give suppliers and vendors information related to the processes and timing of the Company's project schedules, thus granting an unfair advantage in any future negotiations. The Information also contains economic screening data

performed by the Company. Disclosure of such information would harm the Company by revealing the likelihood of potential resource actions, thereby giving competitors insight into the Company's future decisions.

The Information is subject to extensive efforts to maintain its confidentiality. Only select Georgia Power and Southern Company affiliate personnel and their legal counsel are granted access to the Information. Those personnel receive access only on a "need to know" basis. If a party outside of Georgia Power and Southern Company affiliates and their legal counsel are granted access to the Information, the party is required to sign a confidentiality agreement with respect to the Information.

PUBLIC DISCLOSURE

Kyle C. Leach, first being duly sworn, deposes and states that he has reviewed the Application and all other related documents included in this filing in Docket No. 37854, and that the specific information designated as trade secret constitutes trade secrets in accordance with O.C.G.A. Article 27 of Chapter 1 of Title 10.

_____
Kyle C. Leach
Director, Resource Policy & Planning
Georgia Power Company

Subscribed and sworn to before me this _____ day of November, 2013.

_____
Notary Public

Georgia Power Company's Application for the Certification of the Power Purchase Agreements for Wind Resources from the Blue Canyon II and Blue Canyon VI Wind Farms

Docket No. 37854

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Appendix A: Blue Canyon II PPA

Appendix B: Blue Canyon VI PPA

Georgia Power's Application for the Certification of the Power Purchase Agreements for Wind Resources from the Blue Canyon II and VI Wind Farms

1. Executive Summary

1.1 Wind Resources

In an effort to continue the diversification of energy resources in its portfolio and to provide reliable cost-effective electric service to its customers, Georgia Power Company ("Georgia Power" or the "Company") seeks the Certification of two Power Purchase Agreements ("PPAs"), which represent an opportunity to diversify the Company's generation portfolio and add renewable resources that have energy and capacity value at a price below avoided energy cost projections. The two PPAs are:

(1) A twenty (20) year PPA with EDP Renewables North America, LLC ("EDP") that will provide energy and capacity benefits from a 151 megawatt ("MW") wind facility beginning on January 1, 2016. The Blue Canyon II ("BCII") wind farm consists of 84 Vestas 1.8 MW wind turbines in Comanche and Caddo Counties, Oklahoma and this PPA will terminate on December 31, 2035.

(2) A twenty (20) year PPA with EDP that will provide energy and capacity benefits from a 99 MW wind facility beginning on January 1, 2016. The Blue Canyon VI ("BCVI") wind farm consists of 55 Vestas 1.8 MW wind turbines in Caddo County, Oklahoma and this PPA will terminate on December 31, 2035.

The Company believes these resources represent an extraordinary advantage, as that term is used in Commission Rule 515-3-4-.04(3)(f)(3), and therefore would be exempt from the Commission's Request for Proposal ("RFP") process. Because of the significant capacity benefit reflected in these PPAs, the Company is seeking Certification of these PPAs. This is a long term power purchase for firm energy and capacity. While EDP is paid a single energy payment, a request for Certification is appropriate because the structure of the PPAs is designed to deliver both firm energy and capacity. These resources reinforce the Company's commitment to provide safe, reliable and cost-effective electricity to its customers. The BCII and BCVI wind PPAs represent an additional opportunity to diversify the Company's generation portfolio and add

renewable resources that have energy and capacity benefits, at a price below the avoided energy cost projections contained within the 2013 Integrated Resource Plan ("IRP").

1.2 Renewables History

Georgia Power has diligently pursued cost-effective opportunities to expand its renewable generation portfolio in a responsible manner. As a result, there are currently 796 MW of solar generation, 330 MW of biomass generation, including landfill methane gas, and 1,088 MW of hydro generation online or scheduled to serve customers by 2016. Along with these wind resources from the Blue Canyon wind farms, the Company's purchases from renewable generation will grow to almost 2.4 gigawatts by 2016. Georgia Power also continues to engage in the research and demonstration of renewable and emerging technologies as part of its renewable strategy to assess the benefits these technologies can provide to our customers. In all of these efforts, the Company seeks to responsibly expand the fuel diversity of our supply mix, demonstrating our commitment to cost-effective renewable generation.

2. Terms of Agreement

2.1 Terms of Purchase

The PPAs are structured such that the Company purchases firm delivered energy, capacity and environmental attributes from the BCII and BCVI wind facilities (or alternate resources as allowed per the provisions of the PPAs) via two transmission wheels through the Southwest Power Pool ("SPP") and the Entergy transmission balancing authorities. This firm delivered energy is below the avoided energy cost projections contained within the 2013 IRP and below the Company's avoided cost projections filed with the Commission under Docket No. 4822 on November 1, 2012. The firm nature of the delivery also carries a capacity benefit to the electric system that is not quantified in the purchase price but is calculated in the cost benefit analysis. That is, the economic analyses presented in Section 2.4 reflect the unique advantage offered by these PPAs because of the added value for capacity at no additional cost to customers. The energy based purchase is for a fixed delivery of MWs, as outlined in Table 2.1, which

shows the quantities of energy to be delivered **REDACTED**. Throughout the twenty year terms for both PPAs, the **REDACTED REDACTED** are **REDACTED REDACTED REDACTED**. Energy will originate at the BCII and BCVI wind farms in the SPP **REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED** interface ("Interface").

Table 2.1

	Blue Canyon PPAs Delivery Schedule	
REDACTED	**REDACTED**	**REDACTED**
REDACTED	**REDACTED**	**REDACTED**
REDACTED	**REDACTED**	**REDACTED**
REDACTED	**REDACTED**	**REDACTED**
REDACTED	**REDACTED**	**REDACTED**
REDACTED	**REDACTED**	**REDACTED**
REDACTED	**REDACTED**	**REDACTED**
REDACTED	**REDACTED**	**REDACTED**
REDACTED	**REDACTED**	**REDACTED**
REDACTED	**REDACTED**	**REDACTED**
REDACTED	**REDACTED**	**REDACTED**
REDACTED	**REDACTED**	**REDACTED**
REDACTED	**REDACTED**	**REDACTED**

2.2 Transmission and Energy Delivery

REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED. The Company will obtain a Network Resource Designation of the PPAs to enable use of the network transmission system to move the energy from the Interface to load centers. **REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED.**

REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED.

2.3 Renewable Energy Credits

REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED REDACTED, EDP has agreed to provide the environmental attributes, including Renewable Energy Credits ("RECs"), from the contracted wind facilities and certify the energy delivered is green energy. This certification will be verified by Green-e, or an authority similar to that of Green-e, at Georgia Power's discretion. Green-e is the company that currently certifies the RECs in the Company's Green Energy Program. The Company did not assign any financial value to these RECs in the economic analysis and considers them a supplemental benefit in addition to the energy and capacity benefit of the PPAs.

All environmental attributes of the wind facilities will accompany each MW-hour of energy delivered to Georgia Power. EDP will provide attestation to allow each REC delivered to Georgia Power to be certified in the Green-e voluntary marketplace. These RECs have nominal value at the time of execution, but are being delivered to Georgia Power with no assigned value in the transaction. Georgia Power has several options for using the RECs to provide value to its customers. Among those options are to retire RECs on behalf of Georgia Power customers or to use the RECs to meet Georgia Power's compliance obligation in any future compliance program.

2.4 Cost Benefit Analysis

The twenty year energy pricing for each PPA reflects significant long-term savings for customers. Energy is priced the same for each megawatt-hour of energy received in a year and escalates at the negotiated schedule shown in Table 2.2. In both PPAs, Georgia Power is only purchasing the energy associated with the wind farms' capacity; however the energy received has a clear capacity benefit because of the guaranteed energy delivery schedule as outlined in Table 2.1.

Table 2.2: PPA Pricing for both BCII and BCVI

Calendar Year	Applicable Price (in $ per MWh)
2016	REDACTED
2017	REDACTED
2018	REDACTED
2019	REDACTED
2020	REDACTED
2021	REDACTED
2022	REDACTED
2023	REDACTED
2024	REDACTED
2025	REDACTED
2026	REDACTED
2027	REDACTED
2028	REDACTED
2029	REDACTED
2030	REDACTED
2031	REDACTED
2032	REDACTED
2033	REDACTED
2034	REDACTED
2035	REDACTED

The net present value of the combined energy and capacity benefit is shown in Tables 2.3 and 2.4 for BCII and BCVI, respectively. For both BCII and BCVI, the cost of the PPA for the twenty-year term is below marginal replacement costs as demonstrated by the positive values in the tables. In addition, the Company ran sensitivities to determine the impact of alternative fuel and carbon assumptions, and the results of those sensitivities likewise came in below marginal replacement costs.

Table 2.3: Blue Canyon II

Mid-Year 20-yr NPV 2013 $M	Existing CO2
Moderate Fuel	REDACTED

Table 2.4: Blue Canyon VI

Mid-Year 20-yr NPV 2013 $M	Existing CO2
Moderate Fuel	REDACTED

3. Certification Requirements

3.1 Commission Rule Exception for Extraordinary Advantage

Commission Rule 515-3-4-.04(3)(f)(3) provides an exception to the Commission's traditional rule that requires the Company to procure supply-side resources through an RFP process. When the resource provides an extraordinary advantage to the Company's customers and requires immediate action, this rule allows the Company to proceed without issuing an RFP. Tables 2.3 and 2.4 above provide evidence to support why Georgia Power believes the BCII and BCVI PPAs, which include the delivery of firm energy and capacity through one energy payment, represent an extraordinary advantage for customers that required immediate action.

3.2 Impact to 2013 IRP

The analysis of these PPAs, as presented in Section 2.4, utilizes identical input data and assumptions contained within the Company's recently approved 2013 IRP under Docket No. 36498. An assessment of the Company's projected planning reserve margins, including the effects of the BCII and BCVI PPAs as well as the additional 525 MW of solar capacity included in the Final Order in the 2013 IRP, is provided in Section 3.3.

3.3 Revised Near-term Action Plan

To reflect the impact the inclusion of the wind capacity benefit from BCII and BCVI and the additional solar ordered in the 2013 IRP has on the Company's projected planning reserve margins, the Company has updated Table 4.1.1 from the "IRP Main Document

Reference Tables" in Technical Appendix Volume 1 of the 2013 IRP. This results in a slight increase in the Company's planning reserve margins.

Impact to GPC 2013 IRP Table 4.1.1 - Georgia Power Territorial Base Case Load vs. Existing Capability

Year	Peak Demand (MW) (A)	Owned Generating Capacity (MW) (B)	Purchased Generating Capacity (MW) (C)	Dispatchable DSOs (MW) (D)	Total Capacity (MW)	Capacity Required to Meet GPC Target (MW)	GPC Reserve Margin (%) (E)
2013	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED
2014	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED
2015	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED
2016	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED
2017	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED
2018	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED
2019	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED
2020	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED
2021	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED
2022	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED
2023	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED
2024	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED
2025	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED
2026	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED
2027	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED
2028	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED
2029	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED
2030	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED
2031	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED
2032	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED	REDACTED

Notes
(A) Territorial Load requirements less non-dispatchable DSOs
(B) 1. Reflects committed retirements as contained and approved in the GPC 2013 IRP
2. Reflects Mitchell 3 unavailable 4/1/2015 through 12/31/2016 then available on biomass starting 1/1/2017
3. Reflects McIntosh 1 available through 2015, then available 2016 and beyond at derated amount of **REDACTED**
4. Excludes any wholesale-to-retail capacity associated with retired units
(C) Includes territorial and imported power purchases
1. Reflects 998 MW associated with the 2015 RFP
2. Includes planned solar capacity additions associated with the Advanced Solar Initiative and Large Scale Solar
3. Includes the Blue Canyon purchase reflecting the **REDACTED REDACTED REDACTED REDACTED REDACTED**
4. Reflects the additional 525 MW of solar capacity included in the Final Order in the 2013 IRP
(D) Values stated in combustion turbine equivalence terms
(E) Does not consider planning reserve sharing

3.4 Proposed Ratemaking Treatment of Costs

Georgia Power proposes to recover the energy expenses associated with the BCII and BCVI PPAs through the fuel cost recovery mechanism. This proposed accounting treatment is consistent with other energy-only purchases, as well as the net energy cost of energy purchases, exclusive of capacity or demand charges from PPAs.

3.5 Additional Sum

The IRP statute, O.C.G.A. § 46-3A-8, specifies the Company is entitled to an "additional sum" for purchased power resources. When calculating an additional sum, the statute requires that lost revenues, changed risks and an equitable sharing of benefits between the utility and its retail customers shall be considered. The Company's shareholders may lose the opportunity to earn a return when Georgia Power enters into purchase power agreements. The additional sum component of the IRP statute was intended to encourage purchases by the Company.

The Company is requesting an additional sum of $2.30/kW-year for the nameplate capacity of the Blue Canyon II and VI generating facilities as identified in Section 1.1., which is consistent with previous certification requests.

4. Conclusion

In Summary, Georgia Power requests the following of the Georgia Public Service Commission to ensure reliable cost-effective electric service to its customers and the continued diversification of energy resources in its portfolio:

(1) Grant a certificate of public convenience and necessity for the two wind PPAs and the Company's proposed treatment for recovery of the related costs.

(2) Approve an additional sum as requested by the Company in Section 3.5.

Appendix A: Blue Canyon II PPA

Appendix B: Blue Canyon VI PPA

EXHIBIT 2

State	Plant Name	GEN ID	Nameplate Capacity (MW)	SNL Unit Key	7 2015 Net Generation (MWh)	9 Non-Fuel Non-Allowance Variable O&M Cost per MWh ($/MWh)	10 Allowance Cost per MWh ($/MWh)	11 Non-Fuel Variable O&M Cost per MWh ($/MWh)	12 Fuel Cost per MWh ($/MWh)	13 Total Cost SMC per MWh ($/MWh)	14 Total SMC per kW-yr ($/kW-yr)	15 Fixed Operating & Maintenance Expense per kW-yr ($/kW-yr)	16 Total Net Annual Variable O&M Cost ($)	17 Allowance Cost ($)	18 Non-Fuel Variable O&M Cost ($)	19 Fuel Cost ($)	20 Var. Fuel O&M Cost ($)	21 Total SMC Cost ($)	22 Total Operating & Maintenance Expense ($)	Short Run Variable (Marginal) Costs ($/MWh)
KY	E W Brown	1	114	10362	206,889	$5.42	$0.00	$5.42	$35.15	$21.00	$30.13	$56.15	$1,120,865	$204	$1,121,068	$7,272,643	$4,345,119	$3,224,050	$11,617,762	$40.57
KY	Cooper	1	114	13099	194,110	$8.99	NA	$8.99	$30.98	$23.39	$24.09	$54.37	$1,745,658	NA	$1,745,658	$6,013,183	$4,539,744	$2,794,086	$10,552,926	$39.97
KY	Cooper	2	230	13100	330,399	$8.99	NA	$8.99	$30.13	$25.40	$24.09	$55.52	$2,971,323	NA	$2,971,323	$9,953,741	$8,390,887	$5,419,563	$18,344,628	$39.12
KY	E W Brown	3	464	10366	1,204,770	$5.42	$0.00	$5.42	$32.39	$15.82	$30.13	$48.21	$6,527,094	$1,187	$6,528,282	$39,022,506	$19,062,908	$12,534,626	$58,085,414	$37.81
KY	E W Brown	2	180	10365	621,091	$5.42	$0.00	$5.42	$30.99	$13.57	$30.13	$44.56	$3,364,891	$612	$3,365,503	$19,246,436	$8,427,563	$5,062,061	$27,673,999	$36.41
KY	HMP&L Station Two Henderson	1	200	2568	914,277	$3.57	NA	$3.57	$29.96	$7.68	$24.55	$37.64	$3,266,788	NA	$3,266,788	$27,389,665	$7,022,454	$3,755,666	$34,412,118	$33.53
KY	HMP&L Station Two Henderson	2	205	2569	477,759	$3.57	NA	$3.57	$27.82	$11.74	$24.55	$39.56	$1,707,073	NA	$1,707,073	$13,292,291	$5,610,019	$3,902,947	$18,902,311	$31.40
KY	Robert A Reid	1	96	2570	NA	$2.87	NA	$2.87	$27.03	$8.48	$29.24	$35.51	NA	NA	NA	NA	NA	$1,900,601	NA	$29.90
KY	H L Spurlock	1	358	13105	915,518	$3.24	NA	$3.24	$25.79	$12.62	$28.62	$38.41	$2,965,863	NA	$2,965,863	$23,615,735	$11,551,780	$8,585,917	$35,167,514	$29.03
KY	H L Spurlock	2	592	13106	2,358,435	$3.24	NA	$3.24	$25.22	$9.43	$28.62	$34.65	$7,640,259	NA	$7,640,259	$59,482,389	$22,236,318	$14,596,059	$81,718,707	$28.46
KY	Mill Creek	3	463	9704	2,177,256	$3.17	$0.00	$3.17	$25.11	$7.84	$25.80	$32.95	$6,902,379	$78	$6,902,458	$54,675,068	$17,066,175	$10,163,717	$71,741,243	$28.28
KY	Trimble County	1	566	9720	2,879,113	$3.25	$0.00	$3.25	$24.86	$9.30	$34.11	$34.16	$9,346,120	$2,498	$9,348,618	$71,586,077	$26,777,549	$17,428,930	$98,363,626	$28.11
KY	Kenneth C Coleman	2	205	2566	-2,960	$5.73	NA	$5.73	$22.05	$16.58	$25.79	$38.63	$0	NA	$0	$0	$3,559,089	$3,559,089	$3,559,089	$27.78
KY	East Bend	2	669	14806	4,031,692	$3.50	$0.00	$3.50	$24.28	$8.39	$32.87	$32.67	$14,122,167	$0	$14,122,167	$97,875,892	$33,843,409	$19,721,242	$131,719,301	$27.78
KY	Mill Creek	2	356	9703	1,445,319	$3.17	$0.00	$3.17	$24.58	$8.54	$25.80	$33.13	$4,581,979	$52	$4,582,031	$35,529,883	$12,346,698	$7,764,667	$47,876,581	$27.75
KY	Mill Creek	1	356	9702	1,479,740	$3.17	$0.00	$3.17	$24.21	$8.45	$25.80	$32.67	$4,691,101	$53	$4,691,154	$35,830,461	$12,507,414	$7,816,260	$48,337,875	$27.38
KY	Ghent	3	557	10374	3,019,318	$3.54	$0.00	$3.54	$23.77	$8.10	$28.16	$31.87	$10,676,746	$1,950	$10,678,696	$71,778,497	$24,450,812	$13,772,116	$96,229,309	$27.31
KY	Paradise	1	704	4128	3,772,602	$2.63	NA	$2.63	$24.60	$7.67	$28.84	$32.27	$9,934,862	NA	$9,934,862	$92,789,387	$28,939,353	$19,004,491	$121,728,740	$27.23
KY	Mill Creek	4	544	9705	2,832,909	$3.17	$0.00	$3.17	$24.02	$7.60	$25.80	$31.62	$8,980,943	$102	$8,981,046	$68,057,223	$21,518,016	$12,536,971	$89,575,240	$27.19
KY	Ghent	4	556	10375	3,270,022	$3.54	$0.00	$3.54	$23.62	$7.73	$28.16	$31.35	$11,563,272	$2,112	$11,565,384	$77,224,137	$25,281,172	$13,715,788	$102,505,309	$27.15
KY	Paradise	2	704	4129	3,929,464	$2.63	NA	$2.63	$24.33	$7.28	$28.84	$31.61	$10,347,946	NA	$10,347,946	$95,600,874	$28,602,639	$18,254,693	$124,203,513	$26.96
KY	Kenneth C Coleman	1	205	2565	-2,962	$5.73	NA	$5.73	$21.15	$16.82	$25.79	$37.97	$0	NA	$0	$0	$3,868,575	$3,868,575	$3,868,575	$26.88
KY	Paradise	3	1150	4130	4,306,083	$2.63	NA	$2.63	$24.09	$9.44	$28.84	$33.54	$11,339,744	NA	$11,339,744	$103,752,292	$40,668,374	$29,328,630	$144,420,666	$26.73
KY	Ghent	1	557	10372	2,529,485	$3.54	$0.00	$3.54	$23.11	$8.89	$28.16	$32.01	$8,944,625	$1,634	$8,946,259	$58,467,762	$22,493,064	$13,546,805	$80,960,827	$26.65
KY	Ghent	2	556	10373	2,549,072	$3.54	$0.00	$3.54	$22.97	$9.01	$28.16	$31.97	$9,013,888	$1,647	$9,015,535	$58,541,000	$22,956,633	$13,941,099	$81,497,633	$26.50
KY	Kenneth C Coleman	3	192	2567	-2,959	$5.73	NA	$5.73	$20.56	$16.05	$25.79	$36.61	$0	NA	$0	$0	$3,997,528	$3,997,528	$3,997,528	$26.30
KY	H L Spurlock	4	329	20232	1,294,706	$3.24	NA	$3.24	$23.01	$9.16	$28.62	$32.18	$4,194,260	NA	$4,194,260	$29,794,233	$11,864,346	$7,670,086	$41,658,579	$26.25
KY	H L Spurlock	3	329	17092	999,983	$3.24	NA	$3.24	$23.00	$10.91	$28.62	$33.91	$3,239,491	NA	$3,239,491	$22,996,807	$10,909,577	$7,670,086	$33,906,384	$26.24
KY	Big Sandy	1	281	1875	1,245,893	$1.72	$0.65	$2.37	$23.20	$6.66	$20.56	$29.86	$2,141,042	$810,807	$2,951,848	$28,903,595	$8,296,318	$5,344,469	$37,199,912	$26.22
KY	Elmer Smith	1	163	7576	895,920	$2.86	NA	$2.86	$22.96	$6.78	$24.90	$29.74	$2,566,016	NA	$2,566,016	$20,570,671	$6,071,390	$3,505,373	$26,642,061	$25.82
KY	R D Green	2	293	2573	1,252,279	$2.67	NA	$2.67	$22.56	$7.41	$26.66	$29.97	$3,339,165	NA	$3,339,165	$28,249,359	$9,285,408	$5,946,243	$37,534,767	$25.22
KY	R D Green	1	293	2572	1,331,749	$2.67	NA	$2.67	$22.41	$7.29	$26.66	$29.70	$3,551,069	NA	$3,551,069	$29,839,925	$9,710,630	$6,159,561	$39,550,555	$25.07
KY	Trimble County	2	834	20233	5,399,401	$3.25	$0.00	$3.25	$21.28	$8.05	$34.11	$29.33	$17,527,430	$4,685	$17,532,115	$114,885,072	$43,453,811	$25,921,697	$158,338,883	$24.53
KY	Shawnee	3	175	4134	632,621	$2.87	NA	$2.87	$21.49	$8.94	$27.79	$30.43	$1,818,476	NA	$1,818,476	$13,595,785	$5,653,415	$3,834,939	$19,249,200	$24.37
KY	Elmer Smith	2	282	7577	1,404,305	$2.86	NA	$2.86	$21.41	$7.57	$24.90	$28.98	$4,022,089	NA	$4,022,089	$30,064,665	$10,634,498	$6,612,409	$40,699,162	$24.27
KY	Shawnee	1	175	4131	722,891	$2.87	NA	$2.87	$21.25	$8.18	$27.79	$29.43	$2,077,958	NA	$2,077,958	$15,359,273	$5,912,897	$3,834,939	$21,272,170	$24.12
KY	Shawnee	9	175	4140	695,524	$2.87	NA	$2.87	$20.72	$8.39	$27.79	$29.11	$1,999,291	NA	$1,999,291	$14,414,676	$5,834,230	$3,834,939	$20,248,906	$23.60
KY	Shawnee	7	175	4138	631,750	$2.87	NA	$2.87	$20.65	$8.94	$27.79	$29.59	$1,815,972	NA	$1,815,972	$13,044,980	$5,650,911	$3,834,939	$18,695,891	$23.52
KY	Shawnee	2	175	4133	744,370	$2.87	NA	$2.87	$20.61	$8.03	$27.79	$28.63	$2,139,700	NA	$2,139,700	$15,340,116	$5,974,638	$3,834,939	$21,314,755	$23.48
KY	Shawnee	5	175	4136	629,875	$2.87	NA	$2.87	$20.30	$8.96	$27.79	$29.27	$1,810,583	NA	$1,810,583	$12,788,665	$5,645,521	$3,834,939	$18,434,187	$23.18
KY	Shawnee	8	175	4139	685,392	$2.87	NA	$2.87	$20.01	$8.47	$27.79	$28.48	$1,970,167	NA	$1,970,167	$13,717,804	$5,805,106	$3,834,939	$19,522,910	$22.89
KY	Shawnee	4	175	4135	707,503	$2.87	NA	$2.87	$19.75	$8.29	$27.79	$28.04	$2,033,725	NA	$2,033,725	$13,973,112	$5,868,664	$3,834,939	$19,841,776	$22.62
KY	Shawnee	6	175	4137	691,881	$2.87	NA	$2.87	$19.53	$8.42	$27.79	$27.94	$1,988,819	NA	$1,988,819	$13,510,499	$5,823,758	$3,834,939	$19,334,257	$22.40
KY	D B Wilson	1	566	2574	3,250,811	$2.04	NA	$2.04	$20.28	$5.48	$26.85	$25.76	$6,630,200	NA	$6,630,200	$65,923,079	$17,828,507	$11,198,307	$83,751,586	$22.32

EXHIBIT 3

site	state	county	bdv	bdvma	fdv	fdvma	home state	AL	AZ	AR	CA	CO	CT	DE	DC	FL	GA	ID
					linked states		1	-0.026977	-0.008354	-0.044473	1.123E-05	8.504E-05	-1.51E-05	2.576E-10	9.138E-06	-0.001399	-0.021671	1.707E-05
					non-linked st		1	-0.026977	-0.008354	-0.044473	1.123E-05	8.504E-05	-1.51E-05	2.576E-10	9.138E-06	-0.001399	-0.021671	1.707E-05
					row # in "emission frac			1	2	3	4	5	6	7	8	9	10	11
					original links			1		1								
								1		1								
90010017	Connecticu	Fairfield	80.3	83	74.2	76.7	CT	0	0	0	0	0	0	0	0	0	0	0
90013007	Connecticu	Fairfield	84.3	89	75.6	79.8	CT	0	0	0	0	0	0	0	0	0	0	0
90019003	Connecticu	Fairfield	83.7	87	76.6	79.6	CT	0	0	0	0	0	0	0	0	0	0	0
90099002	Connecticu	New Haver	85.7	89	76.3	79.2	CT	0	0	0	0	0	0	0	0	0	0	0
211110067	Kentucky	Jefferson	85	85	77	77	KY	0	0	0	0	0	0	0	0	0	0	0
240251001	Maryland	Harford	90	93	78.8	81.4	MD	0	0	0	0	0	0	0	0.854233	0	0	0
260050003	Michigan	Allegan	82.7	86	74.7	77.7	MI	0	0	2.055562	0	0	0	0	0	0	0	0
360850067	New York	Richmond	81.3	83	75.9	77.4	NY	0	0	0	0	0	0	0	0	0	0	0
361030002	New York	Suffolk	83.3	85	76.9	78.4	NY	0	0	0	0	0	0	0	0	0	0	0
390610006	Ohio	Hamilton	82	85	74.7	77.4	OH	0	0	0	0	0	0	0	0	0	0	0
421010024	Pennsylvar	Philadelphi	83.3	87	73.7	76.9	PA	0	0	0	0	0	0	0	0	0	0	0
480391004	Texas	Brazoria	88	89	79.9	80.8	TX	0	0	0.994827	0	0	0	0	0	0	0	0
481210034	Texas	Denton	84.3	87	75.1	77.5	TX	0	0	0	0	0	0	0	0	0	0	0
482010024	Texas	Harris	80.3	83	75.5	78	TX	0	0	0	0	0	0	0	0	0.759498	0	0
482011034	Texas	Harris	81	82	75.7	76.6	TX	0	0	0	0	0	0	0	0	0.751965	0	0
482011039	Texas	Harris	82	84	77	78.6	TX	0	0	1.222694	0	0	0	0	0	0	0	0
484392003	Texas	Tarrant	87.3	90	77.3	79.7	TX	0.786764	0	0	0	0	0	0	0	0	0	0
484393009	Texas	Tarrant	86	86	76.4	76.4	TX	0.987822	0	0	0	0	0	0	0	0	0	0
551170006	Wisconsin	Sheboygan	84.3	87	76.3	78.7	WI	0	0	0	0	0	0	0	0	0	0	0

site	IL	IN	IA	KS	KY	LA	ME	MD	MA	MI	MN	MS	MO	MT	NE
	0.0060149	-0.10365	-0.005427	-0.016887	-0.093481	0.0003156	5.39E-11	0.0065145	0.0006138	-0.031917	-0.012443	-0.005428	0.0226932	0.001623	-3.28E-06
	0.0060149	-0.10365	-0.005427	-0.016887	-0.093481	0.0003156	5.39E-11	0.0065145	0.0006138	-0.031917	-0.012443	-0.005428	0.0226932	0.001623	-3.28E-06
	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
	1	1	1	1	1	1		1		1		1	1		
	1	1	1	1	1	1		1		1		1	1		
90010017	0	0	0	0	0	0	0	1.615666	0	0	0	0	0	0	0
90013007	0	0	0	0	0	0	0	2.120468	0	0.856549	0	0	0	0	0
90019003	0	0.746956	0	0	0	0	0	2.125643	0	0.841453	0	0	0	0	0
90099002	0	0	0	0	0	0	0	1.608218	0	0	0	0	0	0	0
211110067	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
240251001	0.791557	2.056735	0	0	2.115756	0	0	0	0	0.777703	0	0	0	0	0
260050003	23.65099	8.129452	0.811698	1.219683	0	0	0	0	0	0	0	0	3.802166	0	0
360850067	0	0.813742	0	0	1.005483	0	0	2.504428	0	0	0	0	0	0	0
361030002	0.765118	0.994357	0	0	0	0	0	1.424953	0	1.266149	0	0	0	0	0
390610006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
421010024	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
480391004	0.878357	0	0	0	0	3.013859	0	0	0	0	0	0.809505	1.022837	0	0
481210034	0	0	0	0	0	1.882065	0	0	0	0	0	0	0	0	0
482010024	0	0	0	0	0	2.213636	0	0	0	0	0	0	0	0	0
482011034	0	0	0	0	0	3.030297	0	0	0	0	0	0	0.947408	0	0
482011039	0.875337	0	0	0	0	3.20849	0	0	0	0	0	0.795062	1.169007	0	0
484392003	0	0	0	1.125051	0	1.752374	0	0	0	0	0	0	0	0	0
484393009	0	0	0	0	0	1.931574	0	0	0	0	0	0	0	0	0
551170006	17.924	6.363433	0	0.953361	0	1.055826	0	0	0	2.609851	0	0	1.680057	0	0

site	NV	NH	NJ	NM	NY	NC	ND	OH	OK	OR	PA	RI	SC	SD	TN	TX	UT
	-0.009237	2.504E-10	-0.000894	0.0016417	-0.004625	-0.002509	-0.043058	-0.05786	-0.016651	0	-0.1545	4.274E-11	-0.000274	-3.66E-05	0.0021124	-0.004562	-4.37E-05
	-0.009237	2.504E-10	-0.000894	0.0016417	-0.004625	-0.002509	-0.043058	-0.05786	-0.016651	0	-0.1545	4.274E-11	-0.000274	-3.66E-05	0.0021124	-0.004562	-4.37E-05
	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43
			1		1			1	1		1				1	1	
			1		1			1	1		1					1	
90010017	0	0	9.385165	0	16.73329	0	0	1.408045	0	0	7.503824	0	0	0	0	0	0
90013007	0	0	8.147432	0	16.81242	0	0	1.812429	0	0	8.497097	0	0	0	0	0	0
90019003	0	0	9.318848	0	17.20567	0	0	1.812101	0	0	9.026165	0	0	0	0	0	0
90099002	0	0	7.27391	0	18.43941	0	0	1.510393	0	0	7.213593	0	0	0	0	0	0
211110067	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
240251001	0	0	0	0	0	0	0	3.52219	0	0	4.413552	0	0	0	0	0.808584	0
260050003	0	0	0	0	0	0	0	0	1.614308	0	0	0	0	0	0	2.644755	0
360850067	0	0	11.20411	0	0	0	0	2.362083	0	0	13.85212	0	0	0	0	0	0
361030002	0	0	11.07742	0	0	0	0	2.328136	0	0	8.559591	0	0	0	0	0	0
390610006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
421010024	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
480391004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
481210034	0	0	0	0	0	0	0	0	1.275375	0	0	0	0	0	0	0	0
482010024	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
482011034	0	0	0	0	0	0	0	0	1.024699	0	0	0	0	0	0	0	0
482011039	0	0	0	0	0	0	0	0	0.790249	0	0	0	0	0	0	0	0
484392003	0	0	0	0	0	0	0	0	2.235658	0	0	0	0	0	0	0	0
484393009	0	0	0	0	0	0	0	0	0.855537	0	0	0	0	0	0	0	0
551170006	0	0	0	0	0	0	0	0	1.557834	0	0	0	0	0	0	2.163759	0

site	VT	VA	WA	WV	WI	WY	TRIBAL	CNMX	OFFSH	FIRE	ICBC	BIOG	calibrat	MATC	calibr	estimated	estimated	Row number
	-2.34E-12	0.0033299	1.144E-11	-0.148982	0.0008095	0.0011335	0											
	-2.34E-12	0.0033299	1.144E-11	-0.148982	0.0008095	0.0011335	0											
	44	45	46	47	48	49	50											
		1		1	1													
		1		1	1													
90010017	0	1.723747	0	0.726241	0	0	0	0.96	0.74	0.17	15.7	3.22	0.237	245	0.24	73.7	76.1	229
90013007	0	1.773014	0	0.914178	0	0	0	1.21	1.29	0.19	16.4	3.93	0.206	247	0.21	75.1	79.3	231
90019003	0	1.924628	0	1.014073	0	0	0	1.19	1.19	0.2	16.2	3.93	0.182	248	0.18	76.1	79.1	232
90099002	0	1.119916	0	0	0	0	0	1.22	2.5	0.17	17	3.59	0.138	253	0.14	75.9	78.9	237
211110067	0	0	0	0	0	0	0	0.45	0.05	0.19	21.9	6.54	0.441	446	0.44	75.1	75.1	423
240251001	0	5.220912	0	3.143994	0	0	0	0.56	0.29	0.31	15.6	5.46	0.351	498	0.35	78.1	80.8	474
260050003	0	0	0	0	2.524698	0	0	0.28	0.31	0.7	11.2	8.46	0.234	524	0.23	74.4	77.4	499
360850067	0	2.316584	0	1.831442	0	0	0	1.41	0.86	0.26	17.1	4.86	0.334	674	0.33	74.8	76.3	639
361030002	0	1.558093	0	0.961556	0	0	0	1.25	1.38	0.29	15.7	4.7	0.159	677	0.16	76.4	78.6	641
390610006	0	0	0	0	0	0	0	0.65	0.18	0.5	17	6.9	0.938	746	0.94	71.7	74.3	708
421010024	0	0	0	0	0	0	0	0.46	0.71	0.38	15.6	5.57	0.381	840	0.38	71.9	75.1	802
480391004	0	0	0	0	0	0	0	0.36	1.06	1.53	20	6.33	0.231	901	0.23	79.8	80.7	862
481210034	0	0	0	0	0	0	0	0.39	1.62	0.82	24.3	6.25	0.31	909	0.31	74.9	77.3	869
482010024	0	0	0	0	0	0	0	0.13	5.72	0.77	27.7	2.57	0.18	921	0.18	75.3	77.8	881
482011034	0	0	0	0	0	0	0	0.21	3.74	1.79	23.3	4.29	0.195	934	0.2	75.6	76.5	893
482011039	0	0	0	0	0	0	0	0.27	2.91	2.56	21.1	4.99	0.178	936	0.18	76.8	78.7	895
484392003	0	0	0	0	0	0	0	0.52	1.62	1.55	24.1	5.79	0.315	963	0.32	77.1	79.5	922
484393009	0	0	0	0	0	0	0	0.39	2.01	1.3	23.9	5.2	0.286	964	0.29	76.3	76.3	923
551170006	0	0	0	0	0	0	0	0.42	0.73	0.51	14.4	7.32	0.167	1039	0.17	76	78.4	992

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IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF CALIFORNIA
SAN FRANCISCO DIVISION

SIERRA CLUB, Plaintiff, STATE OF NEW YORK, Intervenor-Plaintiff, v. SCOTT PRUITT, in his official capacity as the Acting Administrator of the United States Environmental Protection Agency,[1] Defendant.	Case No. 3:15-cv-04328-JD (JSC) **EPA'S REPLY TO PLAINTIFF'S AND PLAINTIFF-INTERVENOR'S OPPOSITION TO EPA'S CROSS-MOTION FOR SUMMARY JUDGMENT** Date: March 9, 2017 Time: 10:00 a.m. Place: Courtroom 11, 19th Floor

[1] Pursuant to Fed. R. Civ. P. 25(d), Defendant Gina McCarthy's successor, Scott Pruitt, Administrator of the U.S. Environmental Protection Agency, is automatically substituted as the Defendant in this case.

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ACRONYMS

CSAPR	Cross-State Air Pollution Rule
FIP	Federal implementation plan
NAAQS	National Ambient Air Quality Standards
NODA	Notice of Data Availability
NO_X	Nitrogen oxides or oxides of nitrogen
SIP	State implementation plan

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Pursuant to Civil L.R. 7-2 and Fed. R. Civ. P. 56(a), Defendant Scott Pruitt, in his official capacity as the Administrator of the United States Environmental Protection Agency (hereinafter "EPA"), files this reply to Plaintiff Sierra Club's and Plaintiff-Intervenor State of New York's oppositions to EPA's cross-motion for summary judgment (respectively, Dkt. No. 67 ("Pl.'s. Opp.") and Dkt. No. 66 ("Pl.-Inv.'s Opp.")) and the Declaration of Sarah Dunham attached as Exhibit A.

I. ARGUMENT

Sierra Club continues to fundamentally misstate EPA's task here and misunderstand the implications of the Supreme Court's opinion in *EPA v. EME Homer City Generation, L.P.*, 134 S. Ct. 1584, 1603-04 (2014), incorrectly arguing that EPA need not "allocate among multiple contributing upwind States responsibility for a downwind State's excess pollution." Pl.'s Opp. at 3. On the contrary, upwind emissions travel to more than one downwind receptor and downwind receptors receive emissions from more than one upwind state. Thus, in order to identify the amount of upwind emissions that constitute Kentucky's significant contribution to nonattainment or interference with maintenance of the 2008 ozone national ambient air quality standard ("NAAQS") at each of the downwind receptors, EPA must necessarily perform a regional analysis to determine how much emissions from Kentucky and other upwind states must be addressed under the statute. *See* McCabe Decl. ¶¶86-90 (Dkt. No. 63-1). EPA must do so to ensure that it does not unnecessarily over- or under-control transported emissions from Kentucky in violation of the statute. *See* 134 S. Ct. at 1604.

A. The Substance of Any Future Federal Implementation Plan is Not at Issue Here.

The only issue before the Court is the deadline by which EPA must promulgate a Federal implementation plan ("FIP") pursuant to 42 U.S.C. § 7410(c)(1) addressing the requirements of the so-called "good neighbor" provision which requires a plan for Kentucky prohibiting "any source or other type of emissions activity within the State from emitting any air pollutant in amounts which will--(I) contribute significantly to nonattainment in, or interfere with maintenance by, any other State with respect to" the 2008 NAAQS. 42 U.S.C.

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§ 7410(a)(2)(D)(i)(I).[2]

Much of Sierra Club's opposition to EPA's proposed schedule consists of Sierra Club's desire to advocate for the use of electricity produced by either solar or wind power. Sierra Club suggests that it would not take EPA so long to promulgate a FIP if EPA would somehow require Kentucky to use wind or solar power which it posits does not emit pollutants that cause the formation of ground-level ozone, thus eliminating the difficult work EPA proposes. Pl.'s Opp. at 3-4. Though Sierra Club claims it is not trying to litigate the substance of the FIP, it nonetheless proceeds to explain that it disagrees with how EPA intends to prepare the FIP and propose the ultimate remedy of the FIP – that is, the substance of the FIP. *Id.*

Sierra Club's basis for this solution to EPA's lengthy technical analysis and rulemaking process is its back of the envelope calculation that the cost for utilities to procure power generated from wind at the lower end of its alleged range of costs, $14/MWh to $48/MWh, is less than the cost Sierra Club describes as the "how much more expensive is it to turn a coal plant on versus to leave it idle," an alleged range from $22.32/MWh to $40.57/MWh.[3] However, Sierra Club's reliance on nationwide costs for implementation of wind energy does

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[2] EPA's obligation could also be discharged by a determination that, after collecting necessary data, conducting air quality modeling, and identifying available emissions reductions as described in Paragraphs 91 and 98 of the McCabe Declaration, emissions from Kentucky no longer contribute significantly to any state's nonattainment or interfere with any state's maintenance of a NAAQS. Moreover, EPA's duty could be discharged by approving a SIP revision from Kentucky addressing these requirements. 42 U.S.C. § 7410(c)(1).

[3] Sierra Club also offers a heavily redacted copy of Georgia Power Company's application for certification of two Power Purchase Agreements as evidence that utilities in Kentucky could enter into a similar agreement. Dkt. No. 67-2 at 1, 10. However, the fact that Georgia Power was able to enter into this agreement does not provide proof that Kentucky sources have the same ability. *See* Dunham Decl. ¶19. Likewise, Sierra Club offers either a page of a report or a spreadsheet created from a report allegedly prepared by SNL Energy purporting to describe marginal costs related to Kentucky coal-fired power plants in 2015. Dkt. 67-3. No information regarding the source of this data or more than a cursory explanation of the data fields is presented. Both documents are inadmissible hearsay under Fed. R. Evid. 801 and 802 because they are out of court statement offered to prove the truth of the matter asserted. Neither should not be considered by the Court.

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not speak either to the feasibility or cost-effectiveness of either building new wind energy in Kentucky or transmitting wind energy to Kentucky from other states. *See* Dunham Decl. ¶19.

Moreover, Sierra Club fails to explain the framework or methodology that would be used to equate some quantity of power from alternative sources to the appropriate level of ozone precursor emissions that constitute Kentucky's significant contribution to nonattainment or interference with maintenance of the NAAQS under the statute. Sierra Club seems to assume that if Kentucky were required to obtain some or all of its electric from wind or solar sources, apparently located outside of Kentucky,[4] existing electric generation units ("EGUs") would then shut down, thus eliminating emissions of ozone precursors from Kentucky and thereby preventing such emission from contributing to the formation of ozone impacting downwind states. However, Sierra Club does not explain how this result would necessarily satisfy EPA's statutory obligation pursuant to the good neighbor provision to prohibit a certain "amount" of pollution from Kentucky.

Sierra Club also does not offer an estimate of the time it would take to develop an analytical framework for its novel regulatory approach to a FIP for Kentucky. Sierra Club fails to acknowledge that its desired policy outcome would need to be translated into an approach that could be used in preparation of a FIP – instead offering its unsupported conclusion that requiring Kentucky to use solar or wind generated electricity would be so straightforward that it would certainly take less time than EPA proposes.[5] Based on the time EPA has invested in developing the framework of the Cross-State Air Pollution Rule ("CSAPR"), *see Final Rule*, 76

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[4] Sierra Club concedes that there are no sources of electricity generated by solar or wind power within Kentucky.

[5] Sierra Club's insistence that EPA require Kentucky to meet its needs for electricity from solar and wind power is belied by its own claims that EPA's determination that it expects to consider both EGUs and non-EGUs in development of a FIP is a "policy" preference. Pl.'s Opp. at 1, 15. Although Sierra Club states (without citation) that Kentucky's lack of wind or solar power generation is the "result of a purely political decision," Pl.'s Opp. at 5, and complains about EPA's alleged "policy" choices, it nonetheless advocates for its own policy choice – reliance on solar- and wind-generated power.

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Fed. Reg. 48,208 (Aug. 8, 2011), and the time devoted to litigation regarding CSAPR, *see* McCabe Decl. ¶¶33-45, it is likely such a shift would take longer than EPA proposes here, *see* Dunham Decl. ¶17.

Thus, as EPA explained in its opening brief, EPA Br. at 12-25, and the McCabe Declaration, ¶¶58-74, 82-169, it intends to determine the amount of Kentucky emissions that contribute significantly to nonattainment or interfere with maintenance of the 2008 ozone NAAQS using the CSAPR framework, which courts have held is consistent with the statute. If Sierra Club wants to take issue with the consideration of renewable energy sources in the context of the Kentucky FIP, it can do so (at least) during the notice-and-comment phase of the rulemaking process.

EPA also cannot, as Sierra Club suggests, simply discharge its FIP obligation by requiring sources in Kentucky to reduce their impact on downwind ozone concentrations by 1.36 ppb, the difference between Kentucky's contribution to the Harford County, Maryland receptor, 2.11 ppb, and the 0.75 ppb screening threshold EPA applied in the 2016 CSAPR Update Rule, *Final Rule*, 81 Fed. Reg. 74,504 (Oct. 26, 2016). Pl.'s Opp. at 9. As explained in EPA's opening brief, that approach would be inconsistent with both the past interstate transport rulemakings and the *EME Homer City* decisions. EPA Br. at 21.[6] Moreover, such a reduction is not likely achievable in practice because ozone contribution levels are based on the modeled impacts from all anthropogenic (man-made) emissions sources in the state, including EGUs, non-EGUs, and mobile sources. Reducing Kentucky's contributions to the Harford County receptor by this magnitude would likely require a statewide emissions reduction of at least 64% (reducing emission from 2.11 to 0.75 ppb), which is the equivalent of the emissions from all EGUs, non-EGUs, and cars and trucks in the Commonwealth of Kentucky. Dunham Decl. ¶16. And because there is not a linear relationship between reductions in upwind state nitrogen oxides ("NO_X") emissions reductions and reductions in the state's contribution to ozone

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[6] *See EME Homer City*, 134 S. Ct. at 1609; 81 Fed. Reg. 74,504; 76 Fed. Reg. 48,208; *see also* McCabe Decl. ¶104.

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pollution in other states (e.g., a 64% NO_X reduction does not necessarily lead to a 64% reduction in ozone contributions), an even larger NO_X emissions reduction would likely be required to reduce Kentucky's contribution to the 1 percent threshold. It is therefore nearly impossible to reduce statewide emissions by that magnitude within the timeframe that Sierra Club anticipates the EPA can implement emission reductions. Dunham Decl. ¶16.

B. EPA's Proposed Schedule is Mindful of the Court's Direction in *North Carolina v. EPA* to Align Implementation of Emissions Reductions with the Relevant Attainment Date.

Sierra Club and New York overstate the burden that could be imposed if EPA promulgates a FIP in February 2020. Both suggest that if the downwind nonattainment areas fail to attain the 2008 ozone NAAQS by the relevant attainment date, i.e. by July 20, 2018, they will be reclassified, or "bumped up," from a moderate to serious classification and subject to additional in-state control requirements. Pl.'s Opp. at 6-7; NY Opp. at 10-11; Sliwinski Decl. ¶5 (Dkt. No. 66-1).

While attainment with the standard is measured based on air quality data from the three years preceding the attainment date, data from the attainment year – 2017 for those areas classified as moderate[7] – has particular weight. Pursuant to section 181(a)(5)(B), 42 U.S.C. § 7511(a)(5)(B), and 40 C.F.R. § 51.1107, if the measured data from the attainment year is at or below the standard, the state is entitled to up to two one-year extensions of the attainment date. Therefore, if the measured data for 2017 is at or below the standard, the state could apply for an extension so that the EPA would not reclassify the area from moderate to serious. 42 U.S.C. § 7511(a)(5) If the measured data in 2018 is again at or below the standard, the EPA could grant another one-year extension of the attainment date. *Id.*

Kentucky is linked in EPA's 2017 analysis with a downwind maintenance receptor in Harford County, Maryland. McCabe Decl. ¶¶93, 96. This receptor is identified as

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[7] In order to demonstrate attainment by the July 20, 2018 attainment deadline, the state must rely on data collected during the 2015 through 2017 ozone seasons (May-September), because the July 20, 2018 deadline does not afford a full ozone season of measured data for 2018.

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"maintenance" because the EPA determined it is at risk of violating the NAAQS in the future, even though it is currently in attainment. Dunham Decl. ¶19. This receptor is located in the Baltimore, Maryland Moderate Nonattainment Area (the "Baltimore Area") for the 2008 ozone NAAQS. *Final Rule*, 77 Fed. Reg. 30,088 (May 21, 2012). In 2015, the EPA determined that the Baltimore Area attained the 2008 ozone NAAQS based on air quality monitoring data from 2012-2014. *Final Rule*, 80 Fed. Reg. 30,941 (June 1, 2015). This determination suspended the obligation of the state to comply with certain planning requirements so long as the area continues to attain the standard. The Harford County receptor has continued to show attainment of the 2008 ozone NAAQS. Dunham Decl. ¶19. Thus, it is unlikely that the Baltimore Area will be reclassified from moderate to serious based on recent air quality monitoring data, and the Baltimore Area will not be subjected to additional planning requirements that apply to areas classified as serious.

Kentucky is also linked to the Richmond County maintenance receptor, one of six receptors in the New York moderate nonattainment area (the "New York Area"). McCabe Decl. ¶¶93, 96; Dunham Decl. ¶ 22. Data from all of these receptors are considered when evaluating whether the New York Area is attaining the standard. Dunham Decl. ¶22. While the New York Area is in nonattainment of the standard because four of the other receptors in the area continue to exceed the standard, the three-year design value at the Richmond County receptor for 2013-2015 is 74 ppb, below the standard. *Id.* EPA's air quality modeling projects that this area would likely be in attainment of the standard in 2017, and will benefit from further emissions reductions once the CSAPR Update is implemented in this year. *Id.* Thus, while additional emissions reductions may be necessary to ensure that this receptor maintains the standard beyond 2017, attainment in the New York Area will likely depend on emissions reductions affecting the other receptors to which Kentucky is not linked, but to which other upwind states may contribute. This reality only serves to reinforce the need to conduct a regional analysis to evaluate those emissions reductions that may be necessary across the region to address the New York Area's downwind nonattainment problem. *Id.*

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Nonetheless, EPA is mindful of the need to align implementation of emission reductions in upwind states with the applicable attainment dates in downwind areas, as instructed by the court in *North Carolina v. EPA*, 531 F.3d 896, 911-12 (D.C. Cir. 2008). *See* McCabe Decl. ¶138. Although it is not at this time possible to implement additional reductions in 2017 to assist other downwind states with meeting the July 20, 2018 attainment date, EPA's proposed schedule would provide the opportunity for sources to implement emissions reductions by the serious area attainment date of July 20, 2021, and as described above, to seek extensions of the attainment date.

C. EPA's Proposed Schedule is Reasonable and Identifies Necessary Tasks to Promulgate a FIP.

New York argues that EPA should be allowed only two years from June 23, 2016, the date its obligation accrued, to promulgate a FIP for Kentucky because section 110(c)(1), 42 U.S.C. § 7410(c)(1), provides for promulgation of a FIP anytime within two years after disapproval of a State implementation plan ("SIP"). NY Opp. at 1-4. Similarly, Sierra Club argues that EPA should be required to promulgate a FIP by June 2018. Pl.'s Opp. at 1. However, both Sierra Club and New York fail to consider that EPA has provided a detailed schedule identifying and justifying each task required, showing concurrent tasks, and thereby demonstrating the real-world time needed. While EPA's proposed schedule does allow for more than two years to address its FIP obligation, as the Supreme Court noted, Congress provided no indication of how to accomplish the difficult task of identifying those "amounts" of upwind state emissions that should be prohibited to meet the statutory requirements: "Nothing in *either* clause of the Good Neighbor Provision provides the criteria by which EPA is meant to apportion responsibility." 134 S. Ct. at 1604 n.18 (emphasis in original); *see also* 134 S. Ct. at 1604 (calling interstate transport analysis "a thorny causation problem"). Preparing of FIP addressing this requirement is more involved and technically complicated than FIPs for most other elements of section 110(a)(2), 42 U.S.C. § 7410(a)(2). Moreover, given the degree of scrutiny typically given to EPA's interstate transport rulemakings by the public and the courts,

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it is of no benefit to the downwind states if the EPA promulgates a rule on a faster timeframe if it is not technically and legally defensible. [8]

EPA addresses arguments related to specific elements of its proposed schedule below.

1. Development of Non-Electric Generating Unit Data is Necessary.

New York suggests that EPA need not issue a Notice of Data Availability ("NODA") to collect additional information on controls and costs for both EGU and non-EGU sources because "there is no statutory obligation for EPA to issue the NODA" and because it views EPA's goal as simply producing a more effective rule, not a necessity. NY Opp. at 6. Sierra Club claims that EPA has already had opportunities to collect this data and that it is "irrational speculation" to think that a future NODA will yield more data. Pl.'s Opp. at 12-15. Further, Sierra Club claims that National Emissions Inventories ("NEI"), the New Source Performance Standards for the Oil and Gas Sector, Regional Haze Rules, and the 1998 NO_X SIP Call provide EPA with enough information and analyses of non-EGU sources to obviate the need for data collection or analysis related to non-EGU sources in the context of a FIP for Kentucky. *Id.* at 13.

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[8] Sierra Club's characterization of EPA's history of issuing regulations related to interstate transport, Pl.'s Opp. at 2, does not diminish that the Act declares that "air pollution prevention (that is, the reduction or elimination, through any measures, of the amount of pollutants produced or created at the source) and air pollution control at its source is the *primary responsibility of States and local governments*." 42 U.S.C. § 7401(a)(3) (emphasis added); *see also Whitman v. Am. Trucking Ass'ns*, 531 U.S. 457, 470 (2001) ("It is to the States that the CAA assigns initial and primary responsibility for deciding what emissions reductions will be required from which sources."). Further, while the complicated and difficult nature of the task has often been left to EPA, contrary to Sierra Club's inaccurate claim that "States have traditionally done nothing . . . [to] compl[y] with the [Act's good neighbor provisions]," Pl.'s Opp. at 2, many states' plans *have been approved*. *See, e.g.*, *See, e.g.*, *Final Rule*, 81 Fed. Reg. 70,631 (Oct. 13, 2016) (Maine, New Hampshire, Rhode Island, and Vermont); *Final Rule*, 81 Fed. Reg. 31,513 (May 19, 2016) (Arizona); *Final Rule*, 81 Fed. Reg. 7706 (Feb. 16, 2016) (Colorado, Montana, North Dakota and South Dakota); *Final Rule*, 81 Fed. Reg. 1122; (Jan. 11, 2016) (Nebraska); *Final Rule*, 80 Fed. Reg. 79,266 (Dec. 21, 2015) (Oregon); *Final Rule*, 80 Fed. Reg. 78,981 (Dec. 18, 2015) (Idaho); *Final Rule*, 80 Fed. Reg. 77,578 (Dec. 15, 2015) (Washington); *Final Rule*, 80 Fed. Reg. 78,981 (Dec. 18, 2015) (Idaho); *Final Rule*, 79 Fed. Reg. 45,103 (Aug. 4, 2014) (Alaska).

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Although EPA has attempted to gather data related to available controls for non-EGUs and analyze NO_X reduction potential, EPA has received insufficient data on existing and available NO_X control measures, control measure efficiencies, control measure installation times for non-EGUs, and the estimated costs for such controls during prior rulemakings. Dunham Decl. ¶7; *see* McCabe Decl. ¶¶123-25. More recent rulemakings to address interstate ozone transport did not propose to impose emissions limits for non-EGUs and thus, these entities were likely less interested in providing feedback on the data included in the records for those rulemakings. This is not irrational speculation; rather, it is common sense that entities not expected to be regulated by a proposed rule would be less likely to expend the resources necessary to review and comment on that rulemaking. Dunham Decl. ¶7. Further, as explained in the McCabe Declaration, ¶118, while the NEI is a necessary input for analyzing NO_X reduction potential from non-EGUs, the NEI itself does not provide an analysis of potential additional control measures for under-controlled emissions sources or analyze the potential to install control measures on uncontrolled emissions sources. *See* Dunham Decl. ¶9. Likewise, recently implemented SIPs and FIPs addressing regional haze focused on controls for individual EGUs and provide very little information related to non-EGUs.[9] The rulemaking promulgating New Source Performance Standards for the oil and gas sector focused on control of emissions other than NO_X and therefore produced very little useable information to analyze NO_X emissions reduction potential at non-EGUs. *See Final Rule*, 81 Fed. Reg. 35,824 (June 3, 2016) (codified at 40 C.F.R. pt. 60, subpart OOOO). Lastly, the NO_X SIP Call analysis, *Final Rule*, 63 Fed. Reg. 57,356 (Oct. 27, 1998), considered very few of the more than 40 non-EGU emissions source categories and the non-EGU control device information that was collected is significantly out of date. Dunham Decl. ¶10.

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[9] *See, e.g.*, *Final Rule*, 81 Fed. Reg.43,894 (July 5, 2016) (partially approving and partially disapproving Utah SIP as to four EGUs); *Final Rule*, 81 Fed. Reg. 296 (Jan. 5, 2016) (promulgating a FIP for Texas as to 15 EGUs); *Final Rule*, 78 Fed. Reg. 53,250 (Aug. 29, 2013) (approving Florida SIP as to certain EGUs); *Final Rule*, 77 Fed. Reg. 72,512 (Dec. 5, 2012) (partially approving and partially disapproving Arizona SIP as to three EGUs).

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Sierra Club further suggests that EPA should just use the data collection authority provided by CAA section 114(a). 42 U.S.C. § 7414(a). Section 114(a) provides that, for the purpose of developing an implementation plan such as a FIP, EPA may "require any person who owns or operates any emission source, who manufactures emission control equipment or process equipment, who the Administrator believes may have information necessary for the purposes set forth in this subsection, or who is subject to [particular] requirement[s]" of the Act to, *inter alia*, sample emissions, keep records relating to control equipment, provide reports of such, or provide "other information as the Administrator may reasonably require." *Id.* Although the section 114(a) process is generally not used to collect data across such a wide and diverse range of sources, even if it were used here, EPA expects that could take longer than a notice-and-comment process because a request for information made to 10 or more entities is subject to the Paperwork Reduction Act, 44 U.S.C. § 3501, *et seq.* (1980), which requires that such request be conducted via an Information Collection Request that requires approval by the Office of Management and Budget. Dunham Decl. ¶12.

Lastly, shortening or even eliminating EPA's effort to collect non-EGU emissions data (e.g., emissions inventories from various non-EGU source categories) and non-emissions data (e.g., meteorological information) as suggested by Sierra Club, Pl.'s Opp. at 15, will not significantly impact the overall schedule because this would not allow EPA to begin air quality modeling any sooner. Dunham Decl. ¶15.

2. Selection of the Base and Future Analytic Year is Appropriate.

Sierra Club states that EPA can use 2011 as the base year for its projections to save time and claims that there is no "rational basis for using a later base year." Pl.'s Opp. at 16-17. Likewise, New York argues that EPA can use the 2011 base year because it was used in recent rulemakings. NY Opp. at 8. Neither is correct. EPA's basis for considering a different base year is rational. As the McCabe Declaration explains, EPA must choose the appropriate modeling platform in order to avoid over- or under-controlling upwind state emissions. McCabe Decl. ¶¶135-36. Using a more recent modeling platform than the 2011 base year used in the CSAPR Update would allow EPA to "re-anchor" the projected design values and

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contributions to more recently measured data.[10] Re-anchoring to a more recent base year will allow the EPA to include the more updated emissions inventories from the 2014 NEI and more accurate data on non-EGU emissions. Dunham Decl. ¶15. Further, even if EPA were to use 2011 as a base year, it would still need to make updates to the existing base year modeling platform and prepare future year emissions inventories. *Id.* Thus, Sierra Club's suggestion that significant time could be saved by using a 2011 base year modeling platform is incorrect.

Sierra Club also alleges that EPA can use 2017 or 2018 as its future year. Pl.'s Opp. at 16. Sierra Club argues that EPA should re-use "its 2017 future analysis for the complete Kentucky FIP" because it would then "have all or almost all of the work done already from the CSAPR Update." Pl.'s Opp. at 15, 16. Sierra Club ignores the explanation already provided that explains why EPA must choose an appropriate future analytic year in order to avoid unnecessary over- or under-control of upwind state emissions. McCabe Decl. ¶¶ 138-140. As explained in the McCabe Declaration, any subsequent rulemaking to fully quantify emissions reductions necessary to address the good neighbor provision with respect to the 2008 ozone NAAQS will necessarily require compliance in a year later than 2017. *Id.* ¶¶97-98. Accordingly, EPA anticipates that it will be necessary to conduct air quality modeling to project air quality levels in an appropriate future year later than 2017 that considers implementation timeframes for necessary emission reductions and applicable attainment dates. *Id.* Thus, EPA does not agree that it can reasonably save the time necessary to prepare the emissions inventories for that appropriate future year. *Id.* ¶¶142-144.

II. CONCLUSION

For the reasons explained above and in EPA's cross-motion for summary judgment, the Court should grant that motion and allow EPA until November 1, 2018 to sign a proposed rule and until February 1, 2020 to sign a final rule fully addressing the requirements of the "good neighbor" provision for Kentucky with respect to the 2008 ozone NAAQS.

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[10] While the 2011 modeling platform was the most recent data available at the time the CSAPR Update was promulgated in 2016, it will be several years older by the time EPA promulgates a subsequent rulemaking to address its remaining FIP obligation as to Kentucky and other states.

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Respectfully submitted,

Date: February 22, 2017

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IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF CALIFORNIA
SAN FRANCISCO DIVISION

SIERRA CLUB, Plaintiff, STATE OF NEW YORK, Intervenor-Plaintiff, v. SCOTT PRUITT[1], in his official capacity as the Administrator of the United States Environmental Protection Agency, Defendant.	Case No. 3:15-cv-04328-JD (JSC)

DECLARATION OF SARAH DUNHAM

A. General Background

1. I, Sarah Dunham, declare that the following statements are true and correct to the best of my knowledge and belief and that they are based upon my personal knowledge, or on information contained in the records of the United States Environmental Protection Agency (EPA or the Agency), or on information supplied to me by EPA employees.

2. I am the Acting Assistant Administrator for the Office of Air and Radiation (OAR) at the EPA, a position I have held since January 22, 2017. OAR is the headquarters-based EPA office that administers the Clean Air Act (CAA or the Act) and develops national

[1] Pursuant to Fed. R. Civ. P. 25(d), Defendant Gina McCarthy's successor, Scott Pruitt, Administrator of the U.S. Environmental Protection Agency, is automatically substituted as the Defendant in this case.

programs, technical policies and regulations for controlling air pollution and protecting public health and welfare. OAR is concerned with preventing and responding to air quality issues including industrial air pollution, pollution from vehicles and engines, toxic air pollutants, acid rain, stratospheric ozone depletion, and climate change. As part of my duties as Acting Assistant Administrator of OAR, I oversee the development and implementation of regulations, policy, and guidance under section 110 of the CAA, 42 U.S.C. § 7410, including the interstate transport requirements of section 110(a)(2)(D)(i)(I), 42 U.S.C. § 7410(a)(2)(D)(i)(I), that are the subject of this litigation.

3. My permanent job at the EPA is the Director of the EPA's Office of Atmospheric Programs (OAP) within OAR, a position I have held since 2011. I joined the EPA in 1998. I received a Bachelor of Science in biology from Yale University in 1992 and a Master in Public Policy from Harvard University in 1995.

4. This declaration is filed in support of the EPA's reply in Support of its Cross-Motion for Summary Judgment in *Sierra Club v. Pruitt*, Case No. 3:15-cv-04328-JD. This declaration supplements the December 15, 2016 declaration of Acting Assistant Administrator Janet G. McCabe submitted with the EPA's Cross-Motion for Summary Judgment and Opposition to Plaintiff's Motion for Summary Judgment in that case ("McCabe Declaration") (Dkt. No. 63-1). At this time, the EPA continues to expect that the analysis described in the McCabe Declaration is necessary to address the EPA's obligation to promulgate a FIP for the state of Kentucky addressing the good neighbor provision for the 2008 ozone NAAQS.[2] Given

[2] As noted in paragraph 173 of the McCabe Declaration, due to the federal government's change in administration, which took place on January 20, 2017, EPA career staff will need to brief incoming administration officials with decision-making responsibility, so that they may become

the time required to conduct such analysis, together with the procedural requirements of an administrative rulemaking, the EPA continues to expect that the earliest date we could sign a notice addressing its FIP obligation is November 1, 2018, and the earliest date the EPA could sign a notice of final action is February 1, 2020.

5. In the following paragraphs, the EPA responds to certain factual assertions made in Plaintiff Sierra Club's and Plaintiff-Intervenor State of New York's oppositions to the EPA's Cross-Motion for Summary Judgment (respectively, Dkt. No. 67 ("Pl.'s. Opp.") and Dkt. No. 66 ("Pl.-Inv.'s Opp.")).

B. Responses to Specific Allegations in Sierra Club's and New York's Oppositions to the EPA's Cross-Motion for Summary Judgment

6. Contrary to Sierra Club's assertions, the EPA believes that it needs to improve its data regarding potential control devices, installation times, costs, and potential emissions reductions for non-electric generating unit stationary sources (non-EGUs) before promulgating a proposed rulemaking. *See* Pl.'s. Opp. at 12-15. As explained in the McCabe Declaration at paragraph 124, if the EPA were to propose a rule without gathering this data, the EPA could expect to receive extensive comments during the public comment period that may change its analysis so significantly that a supplemental proposal would be necessary to avoid promulgating a procedurally deficient final rule. Taking comment on this information before issuing a proposal is more likely to save time in the rulemaking process, especially to the extent the EPA is concurrently beginning the work necessary to conduct the air quality modeling described at paragraphs 127-148 of the McCabe Declaration.

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familiar with the subject matter and issues associated with implementing the good neighbor provision.

7. Sierra Club incorrectly suggests that the EPA has iteratively conducted the same analysis five times and thus does not need another opportunity to collect information regarding non-EGUs. *See* Pl.'s. Opp. at 12. Sierra Club is correct that the EPA evaluated non-EGU control potential in 2010 when it proposed the Cross-State Air Pollution Rule (CSAPR). Although Sierra Club frames this effort as two separate analyses (a preliminary assessment and a reexamination), the analysis described in the Federal Register notice were steps in a single evaluation of the availability of non-EGU controls conducted in 2010 in conjunction with the development of the CSAPR. *See* 75 Fed. Reg. 45,210, 45,272, 45,289 to 45,290 (Aug. 2, 2010). This effort was documented in a technical support document which accompanied the proposed CSAPR.[3] As described in the McCabe Declaration at paragraph 116, the EPA also conducted a non-EGU analysis when the EPA proposed the Cross-State Air Pollution Rule Update (CSAPR Update). However, these analyses are not the same and have not yielded sufficiently comprehensive data on which the EPA could issue a proposal to address the remaining 2008 ozone transport obligation at issue in this case. This is true for two reasons. First, the baseline that the Agency anticipated in the 2010 analysis is now more than seven years old and does not reflect significant developments in non-EGU sources (e.g., the plentiful availability of cheap natural gas). Second, because both CSAPR and the CSAPR Update proposed to regulate EGUs rather than non-EGUs, the EPA received relatively little data during the public comment period on existing and available control measures for nitrogen oxide (NO_X) emissions, control measure efficiencies, and control measure installation times for non-EGUs. Stakeholders might have been less interested in providing non-EGU data because the proposed rules only regulated EGUs.

[3] Technical Support Document for the Transport Rule, Non-EGU Emissions Reductions Cost and Potential (May 2010), available at https://www.regulations.gov/document?D=EPA-HQ-OAR-2009-0491-0044.

These prior efforts therefore added little to the EPA's ability to evaluate controls for such sources.

8. Further, Sierra Club mischaracterizes the purposes of the stakeholder engagement process described in paragraphs 112-114 of the McCabe Declaration. That process was conducted to gather data on whether emissions from each non-EGU stationary point source are *already* controlled, by what control device, and at what level of control device efficiency. Consistent with the schedule described in the McCabe Declaration, that process is almost complete.[4] However, this effort is distinct from the work the EPA described in paragraphs 115-125 of the McCabe Declaration to gather information regarding potential control devices, including costs and installation times, that could be installed on *un*controlled or *under*-controlled sources. It is therefore inaccurate to say that the EPA's intention to seek comment on this latter category of information represents a request for a sixth "bite at the apple."

9. Sierra Club's suggestion that the EPA has sufficient information regarding non-EGUs because the EPA has the National Emissions Inventory (NEI) is also misplaced. While the EPA relies on data from the NEI to assess NO_X emissions reduction potential, the NEI itself does not provide an analysis of potential additional control measures for under-controlled emissions sources or analyze the potential to install control measures on uncontrolled emissions sources. As discussed in the McCabe Declaration at paragraph 118, in conjunction with the NEI the EPA will use its control measures database (CMDB) and the Control Strategy Tool (CoST) to estimate the amount of potential NO_X emissions reductions and their costs from non-EGU sources identified in the NEI.

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[4] Although the EPA anticipated that this process would be complete by this date, the full incorporation of the data into the National Emissions Inventory was slightly delayed until mid-February.

10. While the EPA has attempted to gather information regarding non-EGU controls in recent rulemakings, comments on these rulemakings did not provide sufficiently comprehensive non-EGU information of the type the EPA currently anticipates it will need for the EPA to evaluate all of the different emissions source groups that would be part of an assessment of NOx reduction potential to address the regional problem of interstate ozone transport. For example, Regional Haze SIPs and FIPs that have recently been implemented have focused on additional controls for certain EGUs with little coverage of non-EGUs or other EGUs. The rulemaking promulgating New Source Performance Standards for the oil and gas sector focused on control of emissions other than NO_X and therefore produced very little useable information to analyze NO_X emissions reduction potential at non-EGUs. Moreover, the EPA does not anticipate that relying on information from the NO_X SIP Call, promulgated in 1998, would provide information that is relevant today due to changes in the covered sectors. Only a few non-EGU emissions source groups or categories were included in the original NOx SIP call analysis. Information from the NO_X SIP Call would therefore not address many of the 40 different non-EGU emissions source groups or categories that the EPA currently anticipates would be part of a sufficiently comprehensive regional assessment of NO_X reduction potential. Further, all control device information collected as a result of the NOx SIP call is significantly out of date, thus diminishing its reliability.

11. The EPA also does not agree that the process provided for the collection of information in CAA section 114(a), 42 U.S.C. § 7413(a), provides an alternative to a notice-and-comment process that could save significant time. *See* Pl.'s. Opp. at 14. Section 114(a) of the Clean Air Act authorizes the Administrator to require owners and operators of sources to submit information necessary for the development of implementation plans and other rulemakings.

There are generally two scenarios that result in issuance of a section 114(a) request. First, the Agency may be developing regulations to address certain activities or emissions at a specific industry, in which case the Agency is seeking information about the industry and activities to support regulatory development. Second, the Agency may be requesting information as part of an enforcement investigation. The section 114(a) process is not typically used for development of data across a wide variety of sources and thus, in the EPA's experience, would not save significant time if used for this purpose.

12. In particular, because obtaining non-EGU data would require requesting data from more than 10 entities, data collection under section 114(a) would be subject to the Paperwork Reduction Act, 44 U.S.C. § 3501, et seq. (1980). The Paperwork Reduction Act requires approval from the Office of Management and Budget (OMB) before collecting the same or similar information from 10 or more entities through an Information Collection Request (ICR). An ICR must include a description of the information to be collected, the reason the information is needed, and an estimate of the time and cost for the public to answer the request. An ICR can also include surveys, questionnaires, and standardized data collection requirements. While an ICR could be a mechanism for collecting information to comprehensively assess NOx emissions reduction potential from non-EGU emissions sources, the Agency would need to seek OMB approval to issue an ICR. The Agency's recent experience with obtaining OMB review and approval of an ICR is that the process of issuing the ICR, and collecting and organizing the requested information generally takes a year. Comprehensively assessing NOx emissions reduction potential from non-EGU emissions sources would clearly require collecting information from 10 or more entities and would thus require OMB approval of an ICR. Conducting an ICR would likely take significantly more time than using a notice-and-comment

process such as a Notice of Data Availability (NODA). As such, a section 114(a) request is not a feasible alternative to accomplish this necessary task.

13. Consistent with the proposed timetable described in the McCabe Declaration, the EPA is currently in the process of developing and collecting the data on which it expects to seek public comment with respect to non-EGUs, as described in paragraph 122 of the McCabe Declaration, as well as EGUs, as described at paragraph 123.

14. The EPA does not agree with Sierra Club's contention that the elimination of the data gathering for non-EGUs would permit the Agency to complete the necessary technical analysis significantly faster. *See* Pl.'s. Opp. at 15. The EPA has already initiated the process of developing both the non-emissions and emissions data required for the air quality modeling, described in paragraphs 135-137 and 142-144 of the McCabe Declaration, independent of the timing for the process of gathering additional data on non-EGU NO_X control potential and costs. Although this work is already underway, the EPA does not believe it can hasten the steps necessary to conduct the air quality modeling. On January 6, 2017, the EPA issued a NODA that included preliminary air quality modeling assessing interstate transport for the 2015 ozone NAAQS (the January 6, 2017 NODA).[5] 82 Fed. Reg. 1,733 (Jan. 6, 2017). While these data were issued with respect to the 2015 ozone NAAQS, and not the 2008 ozone NAAQS that is the subject of this case, the methodologies used for the analysis and on which the EPA requested comment (i.e., projecting downwind air quality and upwind state contributions) are the same. Such comments will be relevant generally for the EPA's future air quality modeling projections

[5] The EPA discussed its intention to release such modeling in the McCabe Declaration at paragraph 192. As the EPA explained, the future year the EPA used for purposes of evaluating the 2015 ozone NAAQS may not be appropriate for evaluating the 2008 ozone NAAQS, and thus this modeling effort does not supplant the modeling necessary to fulfill the EPA's FIP obligation as to Kentucky.

and specifically for the air quality modeling that will be performed to address the EPA's FIP obligation for Kentucky. The EPA believes it is important to incorporate meaningful comments received on the January 6, 2017 NODA into its projected inventories for the modeling conducted to support its analysis of the remaining emission reduction obligation for the 2008 ozone NAAQS. The comment period for this NODA closes April 6, 2017. The EPA anticipates it will need 5 months to review and evaluate the usefulness and appropriateness of these comments, to fold new methodologies into the procedures for developing future year emission inventories, and to process the updated inventories for input to the future year air quality modeling. This process could be completed by the end of August 2017. Accordingly, at best, the EPA believes it could begin to conduct the future year air quality modeling in September 2017. Thus, the timeline for developing the data necessary for conducting the air quality modeling is independent of whether or not the EPA pursues a process of gathering additional data on non-EGU NOx control potential and costs.

15. The EPA does not agree with Sierra Club and New York that it would necessarily be appropriate to use the 2011 base year modeling platform again as it did in CSAPR. *See* Pl.'s. Opp. at 16-17; Pl.-Inv.'s Opp. at 7-8. The CSAPR Update relied upon a 2011 base year modeling platform because the modeling and analysis for the proposal and final rule took place prior to the September 15, 2016 release of the 2014 NEI. As described in paragraphs 135-136 of the McCabe Declaration, there are now more recent and technically updated base year emissions inventories (i.e., the 2014 NEI) as well as more recent ozone measurements that closely align with the updated emission inventories. In light of this updated data, the EPA must consider the appropriate base year modeling platform in order to avoid over- or under-controlling upwind state emissions relative to the downwind air quality problems the EPA is charged to address by

the good neighbor provision. Using a more recent modeling platform as the base year would allow the EPA to "re-anchor" our projected design values and contributions using more recent measured ambient ozone data. Moreover, a new platform would allow the EPA to include the more updated emissions inventories (via the 2014 NEI) along with more accurate data on non-EGU point source emissions.[6] Nonetheless, even if the EPA were to use 2011 as a base year, some updates to previously prepared data for the 2011 base year would likely be warranted as we address comments received on the EPA's January 6, 2017 NODA.[7] Moreover, the EPA would still need to prepare future year emissions inventories for the specified future year with the appropriate EGU emissions scenario, and thus would still need the time described in the McCabe Declaration for this task.

16. Contrary to Sierra Club's assertions, the EPA does not believe it can simply issue a FIP reducing Kentucky's emissions below the 1 percent screening threshold. *See* Pl.'s. Opp. at 8-9. Sierra Club points out that, after implementation of the CSAPR Update, the EPA estimates

[6] While the 2011 modeling platform was the most recent data available at the time the CSAPR Update was promulgated in 2016, it will be several years older by the time the EPA promulgates a subsequent rulemaking to address its remaining FIP obligation as to Kentucky and other states.

[7] Although the EPA also used a 2011 modeling platform for the January 6, 2017 NODA, as Sierra Club notes, this was again because it was the most recent data available at the time. Nonetheless, the EPA has not proposed any rulemaking based on that modeling. Moreover, in addition to advocating that the EPA continue to use the 2011 modeling platform, Sierra Club complains that the modeling conducted to evaluate interstate transport with respect to the 2015 ozone NAAQS (found in the January 6, 2017 NODA) is based in part on ozone levels from 2009, which it contends leads to under-predictions. *See* Pl.'s. Opp. at 19. However, the 2009 data Sierra Club dislikes is incorporated in the 2011 modeling platform as part of the 2009 to 2013 average design values used as the base period for projecting design values to the future analytic year.

that Kentucky's contribution to the Harford County receptor would be approximately 2.11 ppb,[8] and suggests that relative to the 0.75 ppb screening threshold, the EPA could simply reduce Kentucky's emissions so that the impact at the downwind receptor would be reduced by 1.36 ppb (2.11 ppb minus 0.75 ppb). The EPA explained at paragraph 104 of the McCabe Declaration why that approach is likely inconsistent with the Agency's past rulemakings and the holdings of the D.C. Circuit and the Supreme Court, *see EPA v. EME Homer City Generation, L.P.*, 134 S. Ct. 1584 (2014); *EME Homer City Generation, L.P. v. EPA*, 795 F.3d 118 (D.C. Cir. 2015). Even aside from these concerns, the EPA anticipates that the magnitude of emission reductions necessary to achieve this reduction in Kentucky's contribution is likely unachievable in practice. The ozone contribution levels from each state to each downwind receptor are based on the modeled impacts from all anthropogenic (man-made) emissions sources in the state, including EGUs, non-EGU point sources, mobile sources, and area sources. A 1.36 ppb reduction in Kentucky's upwind contribution to the Harford County receptor is equivalent to a 64 percent reduction in the contribution. Even if the relationship between a reduction in emissions and a reduction in contribution were linear, which it is not, this would equate to a 64 percent reduction in 2017 emissions from all sources in Kentucky – not just from EGUs. Based on the EPA's 2017 emissions inventory data, this level of emissions reduction could require, for example, elimination of all the EGUs, non-EGU point sources, and onroad cars and trucks in Kentucky.[9]

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[8] *See* Excel file entitled "AQAT final calibrated," available at https://www.regulations.gov/document?D=EPA-HQ-OAR-2015-0500-0492 ("1400_control links" tab at row 12, column X).

[9] Specifically, EGUs represent 23 percent, non-EGU point sources represent 13 percent, and onroad cars and trucks represent 30 percent of Kentucky's projected NOx emissions in 2017. The remaining categories are other mobile sources (19 percent) and stationary nonpoint sources that are inventoried at the county level instead of as points at specific locations, such as many

However, the relationship between reducing emissions and the resultant reduction in ozone contributed is nonlinear. That is, it would likely require more than a 64 percent reduction in emissions to achieve a 64 percent reduction in Kentucky's contribution to the Harford County receptor. For example, in the CSAPR Update, for the Harford County receptor, the EPA estimated that a 1 percent reduction in NO_X emissions would only result in a 0.35 percent reduction in ozone.[10] Considering all of these factors, the EPA does not believe that Sierra Club's seemingly simple solution to calculating Kentucky's emissions reduction obligation would be reasonable to implement given the potentially extreme consequences. Instead, the EPA believes it will need to consider additional factors to determine what level of emissions above the 1 percent screening threshold actually constitutes the state's significant contribution to nonattainment and interference with maintenance of the NAAQS in other states under the good neighbor provision.

17. The EPA does not agree that significant time could be saved if we focused on renewable energy as a means of achieving the necessary emission reductions. *See* Pl.'s. Opp. at 3-5. The EPA's approach to evaluating upwind states' emission reduction obligations pursuant to the good neighbor provision in step 3 of the CSAPR framework does not preclude and in fact could be an appropriate methodology for considering renewable energy. Step 3 of the CSAPR framework, as described at paragraph 152 of the McCabe Declaration, considers uniform levels

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small oil and gas sources (15 percent). *See* Excel file entitled "2017ek cntl cb6v2 v6 11g state sector totals," available at https://www.regulations.gov/document?D=EPA-HQ-OAR-2015-0500-0497 (percentages are calculated by dividing total source sector emissions found in appropriate tabs, e.g. Kentucky EGU NO_X emissions are the sum of values found in the "ptegu_summer" and "ptegu_winter" tabs, by the total anthropogenic NO_X emissions found in the "State Totals" tab in row 18, column Y).

[10] *See* McCabe Decl., Attachment 2, Ozone Transport Policy Analysis Final Rule Technical Support Document (TSD), at 27, Table D-2.

of emission control stringency and evaluates these levels with respect to cost, emission reductions, downwind air quality improvements, and over-control. The same methodology could be used to evaluate renewable energy to the extent the EPA concludes that is appropriate. Specifically, when the Agency evaluates levels of uniform NO_X control stringency using the Integrated Planning Model (IPM), the model can provide estimates of how much new renewable energy penetration is cost-effective and by which technologies (e.g., wind, solar, etc.). The model also, importantly, can estimate the extent to which that new zero-emitting generation would replace electricity generation from the existing power plant fleet. We did not specifically evaluate new renewable energy in the CSAPR Update because the rulemaking focused on near-term NO_X mitigation strategies and we did not have sufficient data indicating that new renewable energy projects could be sited, constructed, and integrated into the electricity grid prior to the 2017 ozone season. In order to consider renewable technology in a subsequent rulemaking, were the EPA to determine that was appropriate, the EPA would likely need to spend more, not less time, developing and refining our methodology to include important zero-emitting renewable energy resources.

18. To the extent Sierra Club recommends that the EPA completely restructure its approach to addressing the good neighbor provision because Sierra Club believes an alternative approach that focuses on renewable energy is inherently more cost-effective, Sierra Club does not explain how its alternative would permit the EPA to conduct the technical and policy analysis necessary for such a rulemaking any more quickly. Given Sierra Club apparently proposes that the EPA pursue a new analytic and policy approach to the statutory requirements, it is likely that it would take more time to develop than to apply the EPA's current CSAPR framework, which has been thoroughly tested both in the rulemaking process and in the courts.

Should the Sierra Club wish to advocate that the EPA significantly modify its approach to addressing the good neighbor provision, such proposals are best raised directly with the Agency rather than in the context of litigation regarding a deadline for the EPA's action.

19. Moreover, Sierra Club does not provide adequate support for its claim that existing electricity generating resources in Kentucky could be displaced with renewable energy at a cost savings. As Sierra Club acknowledges, there are no utility-scale wind projects currently in Kentucky, suggesting that there are likely structural challenges to integrating renewable energy resources into the state's electricity generation mix. For example, Kentucky has relatively low wind energy potential (i.e., low wind speeds) [11] and low electricity prices with its existing electricity generation fleet.[12] These factors would make it relatively difficult for renewable energy to compete on an economic basis. Further, the $14-$48/MWh figure that Sierra Club cites as the marginal cost of wind energy appears to be a nationwide figure, rather than a figure specifically applicable to Kentucky. Sierra Club does not demonstrate that the lower end of that range, which it relies upon for its cost-savings claim, represents a feasible estimate for Kentucky. It is likely that the cost estimates at the lower end of that range represent projects in states where wind is more plentiful or where end-users are nearby such that long-range transmission costs are minimized. While Sierra Club may assume that wind generation from other states can supply electricity to Kentucky, it does not demonstrate that necessary transmission lines (e.g., high-voltage lines) exist such that the EPA could rely on these

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[11] *See, e.g.*, the U.S. 80-meter wind resource map from the National Renewable Energy Laboratory, available at http://www.nrel.gov/gis/wind.html.

[12] *See* Electric Power Monthly with Data for November 2016, Table 5.6.B, U.S. Energy Information Administration (January 2017), available at http://www.eia.gov/electricity/monthly/pdf/epm.pdf.

generating resources in developing a FIP for Kentucky. Similarly, Sierra Club's presentation of power purchase agreements for Georgia Power to receive electricity generated by wind projects in Oklahoma does not demonstrate that electric utilities in Kentucky incontrovertibly have the same ability or that the EPA could rely on such projects in establishing a FIP for Kentucky. The Agency also finds that to the extent that Sierra Club suggests that solar energy is cost-effective, it does not address the technical feasibility of implementing this approach. Accordingly, Sierra Club's assertions regarding the feasibility of implementing renewable energy in Kentucky are speculative and would require significantly more time for the EPA to evaluate.

20. Sierra Club and New York over-state the administrative repercussions that could accrue if the EPA were to promulgate a FIP for Kentucky by February 2020 instead of by 2018. *See* Pl.'s. Opp. at 6-7; Pl.-Inv.'s Opp., Sliwinski Decl. ¶ 5. In particular, Sierra Club and New York suggest that if the downwind nonattainment areas fail to attain the standard by the July 20, 2018 attainment date, based on air quality monitoring data from 2015-2017, the areas will be reclassified – or "bumped up" – from a moderate classification to a serious classification. Nonattainment areas can also be reclassified to the severe classification if the area fails to attain the standard by July 20, 2021. Under CAA sections 181(b)(2) and 182(c), the reclassification of an area from moderate to serious – if and when it were to occur – would require the implementation of additional controls within the nonattainment area and establish a new attainment date of July 20, 2021, with which compliance will be measured based on air quality data from 2018-2020. Reclassification of an area from serious to severe would similarly require the implementation of controls and establish a new attainment deadline of July 20, 2027. However, as explained below, there are other factors that affect whether a nonattainment area will be reclassified.

21. While attainment with the standard is measured based on a three-year design value, data from the attainment year – 2017 for those areas classified as moderate – has particular weight in determining whether or not the area would be eligible for an extension of the attainment date. Under section 181(a)(5)(B) and 40 C.F.R. § 51.1107, a state is eligible for to up to two one-year extensions of the attainment date if the nonattainment area's fourth highest daily maximum eight-hour average is at or under the NAAQS in the last year of data considered for measuring attainment. That is, if in 2017, the fourth highest reading (which is measured as an eight-hour average over one day) is 75 ppb or less, the state could apply for a one-year extension so that the EPA would not reclassify a moderate nonattainment area to serious in 2018. The Act and the EPA's regulations also provide for a second one-year extension if the average of the area's fourth highest daily maximum eight-hour value from both the original attainment year and the first extension year, that is, 2017 and 2018, meets the 75 ppb NAAQS. Similarly, for a serious nonattainment area, if the fourth highest value for 2020 is at or below the standard, the EPA would not be required to reclassify the area to severe but could instead extend the attainment date if requested by the state. Thus, Sierra Club's and New York's concerns regarding reclassification of downwind nonattainment areas would only come to pass under limited circumstances.

22. As explained in the McCabe Declaration at paragraph 93, after implementation of the CSAPR Update FIPs, Kentucky remains "linked" in 2017 to two downwind maintenance receptors in Harford County, Maryland, and Richmond County, New York. These areas are identified as "maintenance" receptors because the EPA determined they are at risk of violating the NAAQS if future meteorological conditions are more conducive to ozone formation than average, even if the areas are currently in attainment or are modeled to be in attainment based on

average conditions. The Harford County receptor is located in the Baltimore, Maryland Moderate Nonattainment Area (Baltimore Area) for the 2008 ozone NAAQS. In 2015, the EPA issued a determination that the Baltimore Area had attained the 2008 Ozone NAAQS based on 2012-2014 air quality monitoring data. 80 Fed. Reg. 30,941 (June 1, 2015). This determination suspended the obligation of the state to submit certain planning requirements as long as the Baltimore Area continues to attain the standard. The Harford County receptor in particular has continued to monitor attainment of the 2008 ozone NAAQS. The three-year design value for 2013-2015 is 71 ppb and the preliminary design value for 2014-2016 is 73 ppb, both well below the standard of 75 ppb. Thus, it is unlikely that the Baltimore Area will be reclassified from moderate to serious based on recent air quality monitoring data. Given that the Harford County receptor is currently in attainment of the standard, any additional emissions reductions that may be necessary to address the requirements of the good neighbor provision will be needed to ensure that the receptor maintains, rather than attains, the NAAQS.

23. The Richmond County receptor to which Kentucky is linked is one of six receptors in the larger New York Moderate Nonattainment Area (New York Area), and data from all of these receptors are considered when evaluating whether the New York Area is attaining the standard. However, emissions from Kentucky are linked only to the Richmond County receptor and not to the other five receptors in the New York Area. While the New York Area broadly is in nonattainment of the standard, the three-year design value at the Richmond County receptor for 2013-2015 is 74 ppb, below the standard. The EPA's air quality modeling for 2017 projected that this receptor would likely be in attainment of the standard, classifying this receptor as a maintenance rather than a nonattainment receptor. Moreover, additional emissions reductions from the CSAPR Update can be expected to further improve air quality at

this receptor once the reductions from this rule are implemented in 2017.[13] Meanwhile, four other receptors in the New York Area to which Kentucky is not linked have 2013-2015 design values above the standard, and two of those receptors are projected to likely continue exceeding the standard in 2017 based on the EPA's air quality modeling. Thus, while additional emissions reductions may be necessary to ensure that the Richmond County receptor maintains the standard beyond 2017, additional reductions to help the New York Area *attain* the 2008 ozone NAAQS will likely be needed at other receptors in the New York Area to which Kentucky is not linked, but to which other upwind states may contribute. Under the CSAPR framework, the EPA believes it is appropriate to determine the level of contributions from these other upwind states, and the level of cost-effective emission reductions achievable in such states, through a regional technical analysis that includes complex air quality modeling. *See* McCabe Decl. ¶¶ 82- 108. Thus, any suggestion that the EPA need not conduct a regional analysis to evaluate those emissions reductions that may be necessary across the region to address downwind nonattainment problems such as those in the New York Area is spurious.

I declare under penalty of perjury that the foregoing is true and correct.

Executed this 22nd day of February, 2017.

Sarah Dunham
Acting Assistant Administrator
Office of Air and Radiation
United States Environmental Protection Agency

[13] The EPA calculates that, after implementation of the CSAPR Update, the average design value at the Richmond County receptor in 2017 will be 75.0 ppb, which is the level of the NAAQS. *See* McCabe Decl., Attachment 2, Ozone Transport Policy Analysis Final Rule Technical Support Document (TSD), at 34, Table D-6 ($1,400 column).

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IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF CALIFORNIA
SAN FRANCISCO DIVISION

SIERRA CLUB, Plaintiff, STATE OF NEW YORK, Intervenor-Plaintiff, v. GINA McCARTHY, in her official capacity as the Administrator of the United States Environmental Protection Agency, Defendant.	Case No. 3:15-cv-04328-JD (JSC) **EPA'S MEMORANDUM IN OPPOSITION TO PLAINTIFF'S AND PLAINTIFF-INTERVENOR'S MOTIONS FOR SUMMARY JUDGMENT, AND IN SUPPORT OF EPA'S CROSS-MOTION FOR SUMMARY JUDGMENT, AND [PROPOSED] ORDER** Date: March 9, 2017 Time: 10:00 a.m. Place: Courtroom 11, 19th Floor

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NOTICE OF CROSS-MOTION

Please take notice that on March 9, 2017 at 10:00 a.m. or as soon thereafter as counsel can be heard, Defendant, Gina McCarthy, in her official capacity as Administrator of the United States Environmental Protection Agency (hereinafter, "EPA"), will move this Court, located in Courtroom 11, 19th Floor, United States Court House located at 450 Golden Gate Avenue, San Francisco, California, to grant summary judgment as to remedy and enter EPA's Proposed Order.

RELIEF REQUESTED

The relief EPA seeks is denial of Plaintiff's and Plaintiff-Intervenor's motion for summary judgment and granting of EPA's cross-motion as to remedy and entry of EPA's Proposed Order.

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ACRONYMS

AQAT	Air quality assessment tool
CAIR	Clean Air Interstate Rule
CAMx	Comprehensive Air Quality Modeling with extensions
CoST	Control Strategy Tool
CMDB	Cost measures database
CSAPR	Cross-State Air Pollution Rule
FIP	Federal implementation plan
IPM	Integrated planning model
NAAQS	National Ambient Air Quality Standards
NODA	Notice of Data Availability
NO_X	Nitrogen oxides or oxides of nitrogen
$PM_{2.5}$	Fine particulate matter
SIP	State implementation plan
SO_2	Sulfur dioxide

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Pursuant to Civil L.R. 7-2 and Fed. R. Civ. P. 56(a), Defendant Gina McCarthy, in her official capacity as Administrator of the United States Environmental Protection Agency (hereinafter "EPA"), files this opposition to Plaintiff Sierra Club's and Plaintiff-Intervenor State of New York's motions for summary judgment (Dkt. No. 62 ("Pl.'s. Br.") and 61 ("Pl.-Inv.'s Br.")) and concurrently cross-moves for summary judgment as to remedy.

I. INTRODUCTION

Plaintiff Sierra Club and Plaintiff-Intervenor State of New York allege that EPA has failed to perform a non-discretionary duty under the Clean Air Act ("CAA"), 42 U.S.C. §§ 7401-7671q, section 110(c)(1), 42 U.S.C. § 7410(c)(1), to promulgate a Federal implementation plan ("FIP") within two years of disapproving Kentucky's state implementation plan ("SIP") submission addressing the requirements of CAA section 110(a)(2)(D)(i)(I), 42 U.S.C. § 7410(a)(2)(D)(i)(I) -- the "good neighbor" provision -- for the 2008 ozone National Ambient Air Quality Standard ("NAAQS"). 2nd Am. Compl. ¶¶39-44 (Dkt. No. 39); Pl.-Int. Compl. ¶¶25-28 (Dkt. No. 45). While EPA recently promulgated a FIP that partially addresses the deficiency in Kentucky's SIP, EPA does not dispute that it has not fully performed its statutory obligation. However, Plaintiff and Plaintiff-Intervenor ask this Court to impose an unreasonable schedule on the Agency, one that would direct EPA to sign a proposed rule by January 31, 2018 and to sign a final FIP by June 11, 2018. Pl.'s Br. at 1, Pl.-Int.'s Br. at 1. In order to fulfill EPA's obligation to promulgate a FIP that fully considers the nature of the remaining air quality problems and imposes reasonable emission controls that neither impermissibly over- nor under-control the sources impacted by the FIP, consistent with the statutory requirements, the most expeditious schedule under which EPA could sign a proposed rule is November 1, 2018, and a final rule by February 1, 2020.

II. STATUTORY AND REGULATORY BACKGROUND

A. National Ambient Air Quality Standards

"The Clean Air Act sets forth a cooperative state-federal scheme for improving the nation's air quality." *Vigil v. Leavitt*, 381 F.3d 826, 830 (9th Cir. 2004). In this "cooperative federalism regime[,] . . . the federal agency sets required air quality standards but the state is a

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primary actor in creating plans to achieve them, followed by potential enforcement at both state and federal levels and by private citizens." *Comm. for a Better Arvin v. EPA*, 786 F.3d 1169, 1173 (9th Cir. 2015). As part of this scheme, EPA must establish NAAQS that limit concentrations of certain pollutants in the "ambient," or outdoor, air. 42 U.S.C. §§ 7408 (a)(1), 7409 (a)-(b). These are generally referred to as "criteria pollutants." Specifically, EPA is tasked with developing "air quality criteria," which must reflect the latest scientific knowledge on "all identifiable effects on public health or welfare" that may result from a criteria pollutant's presence in the ambient air. *Id.* § 7408(a)(2). Based on the air quality criteria, EPA must promulgate "primary" and "secondary" NAAQS to protect against a criteria pollutant's "adverse" effects on public health and public welfare, respectively. *Id.* § 7409. To ensure that the NAAQS keep pace with scientific advances, EPA is required to review air quality criteria and NAAQS at least once every five years. *Id.* § 7409(d). This case relates to the standard for ozone.

B. The Clean Air Act's "Infrastructure" State Implementation Plans

States have primary responsibility for ensuring that their air quality meets the NAAQS. *Id.* § 7407(a). The CAA requires States to develop SIPs that provide for the implementation, maintenance, and enforcement of the NAAQS in each air quality control region within the State. *Id.* § 7410(a)(1)-(2). These SIPs are referred to as "infrastructure" SIPs because they address basic structural requirements for a new or revised NAAQS. The States must submit such SIPs within no more than three years after promulgation or revision of a NAAQS. *Id.* § 7410(a)(1).[1]

Section 110(a)(2) lists specific elements that States must meet, as applicable, in their general infrastructure SIP submissions. *Id.* § 7410(a)(2). The requirements include basic SIP infrastructure elements such as provisions to provide for monitoring, enforcement, and general legal authority, which are designed to assure attainment and maintenance of the NAAQS. In

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[1] For areas that do not attain the NAAQS, states must also submit attainment SIPs designed to help states meet the NAAQS. Based on the severity of an area's ozone air quality problem, the Act specifies different dates by which states are to bring areas into attainment with the ozone NAAQS.

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particular, the "good neighbor" provision requires SIPs to "contain adequate provisions . . . prohibiting, consistent with the provisions of this subchapter, any source or other type of emissions activity within the State from emitting any air pollutant in amounts which will . . . *contribute significantly to nonattainment in*, or *interfere with maintenance by*, any other State" with respect to any NAAQS. *Id.* § 7410(a)(2)(D)(i)(I) (emphasis added). These two requirements address the "interstate transport" of air pollution.

C. EPA Review of SIP Submissions and Promulgation of Federal Implementation Plans

CAA section 110(k) sets forth procedural mechanisms relating to SIP submissions or revisions. 42 U.S.C. § 7410(k). EPA must determine no later than six months after the date by which a State is required to submit a SIP whether a State has made a submission that meets minimum completeness criteria. *Id.* § 7410(k)(1)(B). If EPA does not determine completeness of the plan or revision within six months, then the submittal is deemed complete by operation of law. *Id.* Pursuant to CAA section 110(k)(2)-(4), EPA must approve, disapprove, or conditionally approve, in whole or in part, each plan or revision, within 12 months of a determination of completeness by EPA or by operation of law. *Id.* § 7410(k)(2)-(4).

If EPA has determined that a State has failed to submit a required SIP or has disapproved a SIP, EPA must promulgate a FIP within two years, unless the State submits and EPA approves a SIP correcting the deficiency before EPA promulgates such a FIP. *Id.* § 7410(c). Thus, when EPA is required to put a FIP in place, it is stepping into the State's traditional role of determining how to manage emissions in the State, including determining which sources will bear the burden of emissions reductions.

III. FACTUAL BACKGROUND

Pursuant to 42 U.S.C. § 7409(d)(1), EPA promulgated a final rule revising the ozone NAAQS in 2008 (the "2008 ozone NAAQS"). *Final Rule*, 73 Fed. Reg. 16,436 (Mar. 27, 2008). In response, the Commonwealth of Kentucky, through the Division of Air Quality of the Kentucky Energy and Environment Cabinet, submitted an infrastructure SIP addressing most of the requirements of CAA section 110(a)(2), 42 U.S.C. § 7410(a)(2), on July 17, 2012 (replacing its original September 8, 2009 submission). On March 7, 2013, EPA took final action on the

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submission, disapproving the portion addressing the requirements of CAA section 110(a)(2)(D)(i)(I), 42 U.S.C. § 7410(a)(2)(D)(i)(I), for the 2008 ozone NAAQS. *Final Rule*, 78 Fed. Reg. 14,681 (Mar. 7, 2013).

EPA's action on the Kentucky SIP submission was in accord with a D.C. Circuit opinion regarding EPA and state obligations under the good neighbor provision. The court held that no state was required to submit a SIP under that provision until EPA notified it of the quantity of emissions reductions necessary to address the state's obligation pursuant to 42 U.S.C. § 7410(a)(2)(D)(i)(I). It further held that EPA could not promulgate a FIP addressing that provision until the Agency took such action. *EME Homer City Generation, L.P. v. EPA*, 696 F.3d 7 (D.C. Cir. 2012) (*EME Homer City I*) (considering challenges to the implementation of the "good neighbor" provision with respect to other NAAQS).[2] Based upon *EME Homer City I*, in disapproving Kentucky's SIP submission on July 17, 2014, EPA explained that because it had not yet quantified Kentucky's emission reduction obligation pursuant to 42 U.S.C. § 7410(a)(2)(D)(i)(I), the mere disapproval of the submission was insufficient to trigger the Agency's obligation to promulgate a FIP.[3]

Subsequently, the Supreme Court reversed the D.C. Circuit. *EPA v. EME Homer City Generation, L.P.*, 134 S. Ct. 1584 (2014). The D.C. Circuit opinion remained effective until June 2, 2014, when the Supreme Court issued its judgment.[4] In a challenge to EPA's disapproval of the Kentucky SIP submission, the Sixth Circuit then partially vacated and remanded the portion of EPA's action determining that "a requirement for the EPA to issue a [FIP] under the Clean Air Act, 42 U.S.C. § 7410(c), regarding the 'good neighbor' provision, 42 U.S.C. § 7410(a)(2)(D)(i)(I), was not triggered when EPA disapproved the SIP."[5]

In response to the remand, on September 7, 2016, EPA issued a final action that, among

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[2] 78 Fed. Reg. at 14,684 (discussing the case).
[3] *Id.*
[4] Although the Supreme Court's opinion issued on April 29, 2014, the Supreme Court's opinions are not effective until the judgment issues.
[5] Order, at 1-2, *Sierra Club v. EPA*, No. 13-3546 (6th Cir. Mar. 13, 2015) (Dkt. No. 74-1).

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other things, corrected or updated statements in the final action disapproving Kentucky's SIP submission.[6] In particular, EPA found that the Agency's FIP obligation as to Kentucky was triggered on June 2, 2014, the date that the Supreme Court clarified state and federal obligations with respect to the good neighbor provision. Thus, EPA's mandatory duty to promulgate a FIP accrued two years later, on June 2, 2016.

IV. LEGAL STANDARD

EPA does not dispute that it has not taken the required action to resolve its FIP obligation regarding the good neighbor requirements for Kentucky for the 2008 ozone NAAQS. The only dispute concerns the length of time EPA should be given to perform its obligations. Courts adjudicating similar disputes concerning the remedy for an agency's failure to meet a statutory deadline commonly resolve such disputes through summary judgment. *See, e.g.*, *Sierra Club v. McCarthy*, No. 14-cv-5091, 2015 WL 3666419, at *3 (N.D. Cal. May 7, 2015); *Sierra Club v. Johnson*, 444 F. Supp. 2d 46, 52 (D.D.C. 2006) ("Because defendant does not contest the issue of liability, the entry of summary judgment is appropriate, and it remains only for the Court to fashion an appropriate equitable remedy.") (citing cases). The Court may properly enter an order setting deadlines for EPA to perform an obligation for which it admits liability. *See Nat. Res. Def. Council, Inc. v. Train*, 510 F.2d 692, 713 (D.C. Cir. 1974).

A district court has broad discretion to fashion equitable remedies. *Weinberger v. Romero-Barcelo*, 456 U.S. 305, 311-13 (1982); *Am. Lung Ass'n v. Browner*, 884 F. Supp. 345, 347 (D. Ariz. 1994); *see also Envtl. Def. Fund v. Thomas*, 627 F. Supp. 566, 569-70 (D.D.C. 1986) (adopting compliance schedule proposed by EPA in a case where the Agency had failed to comply with a nondiscretionary statutory duty, after finding that EPA's proposed schedule was "reasonable"). *Sierra Club v. Johnson*, 444 F. Supp. 2d at 58 (focusing on amount of time "necessary for the promulgation of workable regulations").

In a suit alleging violation of a Congressionally mandated duty, courts have recognized circumstances that can make it infeasible for an agency to comply with a particular deadline:

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[6] *Final Rule*, 81 Fed. Reg. 74,504, 74,513 (Oct. 26, 2016).

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(1) the "budgetary" and "manpower demands" required are "beyond the agency's capacity or would unduly jeopardize the implementation of other essential programs," and (2) an agency's need to have more time to sufficiently evaluate complex technical issues. *Train*, 510 F.2d at 712-13. When an agency concludes that such constraints require an extension of the deadline, it may so demonstrate to the district court. *Id.* at 713. In *Train*, the D.C. Circuit reasoned that a federal court may exercise its equitable discretion to extend a deadline if the agency has "in good faith employed the utmost diligence in discharging [its] statutory responsibilities." *Id.*

In short, when an agency has missed a statutory deadline, the court should examine the relevant facts and circumstances and evaluate the time needed by the agency to take action.

V. LEGAL FRAMEWORK AND PRIOR RULEMAKINGS ON INTERSTATE TRANSPORT FEDERAL IMPLEMENTATION PLANS

Plaintiff grossly oversimplifies EPA's task and the legal certainty relating to the requirements of CAA section 110(a)(2)(D)(i)(I), 42 U.S.C. § 7410(a)(2)(D)(i)(I). *See* Pl.'s Br. at 8-9. That task is particularly difficult and fraught with the potential for over- or under-shooting the mark, in violation of the statute, as the Supreme Court emphasized, calling the task "a thorny causation problem." *EME Homer City Generation, L.P.*, 134 S. Ct. at 1604.

The statute requires States to eliminate those "amounts" of pollution that "contribute significantly to nonattainment" or "interfere with maintenance" of the NAAQS in downwind States. 42 U.S.C. § 7410(a)(2)(D)(i)(I). "Thus, EPA's task is to reduce upwind pollution, but only in 'amounts' that push a downwind State's pollution concentrations above the relevant NAAQS." 134 S. Ct. at 1603-04. The question presented to EPA is: "How should EPA allocate among multiple contributing upwind States responsibility for a downwind State's excess pollution?" *Id.* at 1604. EPA is similarly limited by the second part of the good neighbor provision, 42 U.S.C. § 7410(a)(2)(D)(i), "to reduce only by 'amounts' that 'interfere with *maintenance*,' i.e., by just enough to permit an already-attaining State to maintain satisfactory air quality." *Id.* at 1604 n.18. Moreover, "while EPA has a statutory duty to avoid over-control, the Agency also has a statutory obligation to avoid 'under-control,' *i.e.*, to maximize achievement of attainment downwind." *Id.* at 1609. Thus, as interpreted by the

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courts, EPA's task requires a level of precision that the Plaintiff and Plaintiff-Intervenor fail to appreciate.[7]

Once EPA determines the amount of Kentucky's emissions that must be addressed, EPA must then step into the state's shoes and determine how to reduce those emissions, from what sources and to what extent. *See Whitman v. Am. Trucking Ass'ns*, 531 U.S. 457, 470-72 (2001) (explaining that "[i]t is to the States that the Act assigns initial and primary responsibility for deciding what emissions reductions will be required from which sources."). EPA has previously addressed the requirements of the good neighbor provision for multi-state regions in four rulemakings, each of which has been subject to extensive litigation, demonstrating the complexity of the issues raised in applying the good neighbor provision. *See* 134 S. Ct. at 1604 n.18 ("Nothing in *either* clause of the Good Neighbor Provision provides the criteria by which EPA is meant to apportion responsibility."). The four prior rulemakings and associated litigation described below provide context and some guidance as to the requirements for preparing a FIP.

A. NO_X SIP Call.

The "NO_X SIP Call," promulgated in 1998, was EPA's first regional rule addressing the good neighbor provision and addressed the 1979 1-hour ozone NAAQS.[8] The rule required 22 states and the District of Columbia to amend their SIPs and limit nitrogen oxide ("NO_X") emissions that contribute to ozone nonattainment in other states. EPA set a cap on ozone season NO_X emissions for each covered state and states were given the option to participate in a regional cap-and-trade program, known as the NO_X Budget Trading Program. While the NO_X SIP Call was largely upheld by the D.C. Circuit, the court vacated and remanded certain portions of the rulemaking. *Michigan v. EPA*, 213 F.3d 663 (D.C. Cir. 2000).

B. Clean Air Interstate Rule.

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[7] Individual states have greater flexibility in developing SIPs to address the good neighbor provision because they can select a level of control that is independent from other states (e.g., the statute permits states to impose greater emissions reductions than the statute may require).
[8] *Final Rule*, 63 Fed. Reg. 57,356 (Oct. 27, 1998).

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The Clean Air Interstate Rule ("CAIR"), promulgated in 2005, addressed both the 1997 fine particulate matter ("$PM_{2.5}$") and the 1997 8-hour ozone standards under the good neighbor provision.[9] CAIR required SIP revisions in 28 states and the District of Columbia to ensure that certain emissions of sulfur dioxide ("SO_2") and/or NO_X -- important precursors of regionally transported $PM_{2.5}$ (SO_2 and NO_X) and ozone (NO_X) -- were prohibited. As under the NO_X SIP Call, states were given the option to participate in a regional cap-and-trade program to satisfy their SIP obligations. EPA also promulgated FIPs to ensure that the emission reductions required by CAIR would be achieved on schedule.[10] Upon review, the D.C. Circuit determined that CAIR was "fundamentally flawed," and the rule was remanded to EPA to be replaced "from the ground up." *North Carolina v. EPA*, 531 F.3d 896, 929, *modified on reh'g*, 550 F.3d 1176 (D.C. Cir. 2008).

C. Cross-State Air Pollution Rule ("CSAPR").

In 2011, EPA promulgated CSAPR to address the issues raised by the remand of CAIR and to address the good neighbor provision for the 2006 $PM_{2.5}$ NAAQS.[11] CSAPR requires 28 states to reduce SO_2 and NO_X emissions that significantly contribute to other states' nonattainment or interfere with other states' abilities to maintain the NAAQS. To align implementation with the applicable NAAQS attainment deadlines, EPA promulgated FIPs for the 28 states. These FIPs establish regional cap-and-trade programs to achieve the necessary emission reductions.

CSAPR was subject to four years of litigation in both the D.C. Circuit and the Supreme Court. The D.C. Circuit initially stayed and eventually vacated implementation of CSAPR. *EME Homer City I*, 696 F.3d 7. The Supreme Court reversed this decision and remanded the case to the D.C. Circuit. *EPA v. EME Homer City Generation, L.P.*, 134 S. Ct. 1584. On July 28, 2015, the D.C. Circuit ruled on the remaining legal issues. *EME Homer City Generation, L.P. v. EPA*, 795 F.3d 118 (D.C. Cir. 2015) (*EME Homer City II*). While this decision largely

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[9] *Final Rule*, 70 Fed. Reg. 25,162 (May 12, 2005).
[10] *Final Rule*, 71 Fed. Reg. 25,328 (April 28, 2006).
[11] *Final Rule*, 76 Fed. Reg. 48,208 (Aug. 8, 2011).

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upheld EPA's approach to addressing interstate transport in CSAPR, the court also remanded the rule (without vacatur) for reconsideration of fifteen state emission budgets because the court determined that EPA had or may have over-controlled emissions in those states. *Id.* at 138.

D. Cross-State Air Pollution Rule Update ("CSAPR Update").

On October 26, 2016, EPA published the Cross-State Air Pollution Rule Update, or CSAPR Update.[12] The rule promulgates FIPs for 22 states, including Kentucky, to address the good neighbor provision with respect to the 2008 ozone NAAQS at issue in this case. The FIPs require power plants, or electric generation units ("EGUs"), to participate in a regional allowance trading program beginning in May 2017 that will reduce emissions of NO_X, which contributes to ozone formation, in time to assist downwind states with meeting the July 2018 attainment date for the 2008 ozone NAAQS.

In promulgating the CSAPR Update, EPA took the same analytical approach that the Supreme Court had approved in CSAPR. In the first step of that analysis, EPA conducted complex air quality modeling to determine which states contribute to air quality problems in other states. The key factor is whether the modeling projects a state's emissions contribute one percent or more of the level of the NAAQS to areas (called receptors) that are either projected to not attain or may have trouble maintaining the NAAQS.

Of particular relevance here, the modeling showed that emissions from Kentucky were contributing above the one percent screening threshold and therefore "linked" to four downwind maintenance receptors. 81 Fed. Reg. at 74,538-39. Between seven and ten other states also contributed above the one percent screening threshold to each of these four receptors. *Id.* A total of 23 states and the District of Columbia were identified as "linked" to 19 different receptors in nine different states. *Id.* at 74,533, 74,538-39. EPA determined that these linkages warranted further evaluation of potential emissions reductions from each of these upwind states.

After determining which states were linked to problems in other states, EPA next determined what "amount" of emissions above the screening threshold would significantly

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[12] *Final Rule*, 81 Fed. Reg. 74,504 (Oct. 26, 2016).

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contribute to nonattainment or interfere with maintenance at those receptors. EPA did so by analyzing various levels of uniform NO_X control stringency, represented by an estimated incremental cost per ton of NO_X reduced. Specifically, EPA evaluated the incremental cost of various power plant NO_X control strategies, available emission reductions, and downwind air quality improvements at different levels of control (or cost-thresholds) to determine the appropriate level of uniform NO_X control stringency necessary to address the impacts of interstate ozone transport on downwind nonattainment or maintenance receptors. *Id.* at 74,549. This multi-factor test generated a "knee in the curve" at a point where emission budgets reflected a control stringency with an estimated incremental cost of $1,400 per ton of NO_X emissions reduced. This was the level at which the ratio of emission reductions to incremental cost and the ratio of ozone improvements to incremental cost is maximized relative to the other levels of NO_X control stringency evaluated. Thus, EPA determined that cost-effective emissions reductions from EGUs could be achieved at a level of control stringency equivalent to $1,400 per ton of NO_X emissions reduced and EPA calculated EGU emissions budgets for each state based on these emissions reductions. *Id.* at 74,508, 74,549-50.

EPA concluded that the emissions reductions achieved by implementation of the budgets constitute a portion of each upwind state's significant contribution to nonattainment or interference with maintenance of the 2008 ozone NAAQS at these receptors. For Kentucky, the emissions budget quantified by the rule requires EGU emissions reductions of 6,616 tons (24%) from 2015 emissions levels. Kentucky's and other states' budgets are implemented through FIPs that require affected EGUs in each state to participate in a regional cap-and-trade program beginning with the 2017 ozone season. *Id.* at 74,550-53.

The CSAPR Update is a significant first step to quantifying Kentucky's emission reduction obligations with respect to the 2008 ozone NAAQS and to addressing EPA's FIP obligation pursuant to the good neighbor provision. McCabe Decl. ¶¶67-70. However, EPA could not conclude that the reductions required by the CSAPR Update represent the full amounts of emission reductions necessary for Kentucky (or 20 other states) to satisfy the requirements of the good neighbor provision. After implementation of the budgets finalized in

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the CSAPR Update, EPA determined that Kentucky is linked to two receptors in Harford County, Maryland, and Richmond County, New York, that may continue to have problems maintaining the 2008 ozone NAAQS in 2017.[13] EPA further determined that emissions from Kentucky and other linked states are expected to continue to exceed the one percent screening threshold for these two receptors in 2017.

Because the CSAPR Update focused on achieving emissions reductions by the July 2018 attainment date,[14] EPA only evaluated emissions reductions achievable from EGUs by the 2017 ozone season, the last full ozone season before that date. Since EPA did not evaluate emissions reductions from EGUs on a longer timeframe or from other non-EGU point sources, EPA could not conclude that the CSAPR Update would implement *all* available cost-effective emissions reductions. Therefore, EPA could not conclude that the emissions reductions achieved through the CSAPR Update necessarily represent the full "amounts" of emissions reductions necessary to address these states' significant contribution to nonattainment and interference with maintenance of the 2008 ozone NAAQS. Thus, as discussed below, in order to fully quantify a state's significant contribution to nonattainment or interference with maintenance, EPA believes it must consider both emissions reductions available from EGUs that are achievable on a timeframe longer than 2017 and emissions reductions achievable from other sources, including non-EGU point sources. 81 Fed. Reg. at 74,521-22; *see also* McCabe Decl. ¶69.

The CSAPR Update was published in the *Federal Register* on October 26, 2016, 81 Fed. Reg. at 74,586, and thus petitions for review of that rule must be filed by December 27 2016. 42 U.S.C. § 7607(a)(1). Thus far, five states have challenged the CSAPR Update in the D.C. Circuit. *See Wisconsin v. EPA*, No. 16-1406 (D.C. Cir. filed Nov. 23, 2016).

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[13] *See* Ozone Transport Policy Analysis, Final Rule Technical Support Document (Attach. 2 to the McCabe Declaration).

[14] EPA's decision to focus on 2017 is consistent with *North Carolina v. EPA* which requires EPA to implement upwind emission reductions, *to the extent feasible*, aligned with the relevant attainment dates, which for the 2008 ozone NAAQS meant implementation starting with the 2017 ozone season. 531 F.3d at 911-12.

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VI. ARGUMENT

Although it has promulgated a FIP that partially addresses the good neighbor provision for Kentucky, EPA does not dispute that it has not promulgated a FIP that fully satisfies its statutory obligation. The only dispute is over the date by which EPA must promulgate such a FIP. EPA has presented a detailed schedule of the work necessary to complete this obligation and fully explains the necessity and timeframe for each step in the Declaration of Janet G. McCabe, Acting Assistant Administrator for the Office of Air and Radiation (attached as Exhibit A). As detailed in that declaration, the most expeditious schedule under which EPA could sign a proposed and final rule addressing this obligation is November 1, 2018, and February 1, 2020, respectively. The timetable reflects the fact that EPA is not waiting for this litigation to conclude to begin the analytical work necessary to propose FIPs that fully address the good neighbor provision with respect to the 2008 ozone NAAQS for Kentucky and for other states.

The tasks required to promulgate a FIP for Kentucky are complex and interconnected, with some tasks on the critical path (i.e., shortest possible timeline) and some that can be completed concurrently with critical path or other elements. This level of analysis is necessary to ensure that EPA's final rule is technically and legally defensible, particularly in light of existing case law and pending litigation on EPA's prior regional transport rulemakings. The McCabe Declaration describes in great detail each of the steps necessary to promulgate a FIP for Kentucky and the time needed for each task, which we will not duplicate here. Instead we summarize the five groups of tasks and, to the extent any were presented, respond to Plaintiff's and Plaintiff-Intervenor's arguments or comments related to these tasks. A Gantt chart that depicts the tasks in a more easily understood visual format, including those tasks that necessarily must be completed before or after others as well as tasks that can be completed concurrently, is also attached to the McCabe Declaration (Attach. 1 to the McCabe Decl.).

Through the nearly 20 years of interstate transport rulemaking, EPA has consistently found that the ozone transport problem is regional: downwind air quality problems result from contributions of emissions from multiple upwind states; and upwind states routinely contribute

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to multiple downwind air quality problems in varying amounts. McCabe Decl. ¶86. Air emissions from each upwind state do not simply travel neatly to a single downwind state and, conversely, impacted downwind states do not simply receive air emission from one upwind state. *Id.* (linkage graphic). Given the interconnected nature of ozone transport, the Supreme Court has acknowledged that EPA must determine "how to differentiate among otherwise like contributions of multiple upwind states." 134 S. Ct. at 1607. Because the ozone air quality problems are regional in nature, and EPA has a responsibility to avoid impermissible under- and over-control,[15] it is an enormous challenge to quantify the amount of emission reductions that comprise one state's good neighbor obligation without evaluating the contribution of all other states linked to the same air quality problem.[16] If EPA were to look at Kentucky in isolation, and not consider these interconnections, it would be unable to demonstrate that it had not controlled more or less of Kentucky's emissions than necessary to address the state's significant contribution to nonattainment and interference with maintenance of the NAAQS. McCabe Decl. ¶88.

In light of these constraints, EPA developed a four-step framework (referred to as the "CSAPR framework") to evaluate, quantify, and implement emissions reductions necessary to address the requirements of the good neighbor provision. The four steps are: (1) identify downwind areas (referred to as "receptors") that are expected to have problems attaining or maintaining the NAAQS using air quality modeling; (2) determine which upwind states contribute emissions in amounts sufficient to "link" them to the downwind air quality problems using contribution modeling; (3) for states linked to downwind air quality problems, identify the "amounts" of upwind emissions that significantly contribute to nonattainment or interfere with maintenance of a standard; and (4) implement the necessary emissions reductions. 81 Fed. Reg. at 74,507. Although EPA recently completed these steps in the CSAPR Update, that analysis was focused on the 2017 compliance year. As discussed more fully below, the analysis for a

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[15] *EPA v. EME Homer City Generation, L.P.*, 134 S. Ct. at 1609.
[16] *See supra* n.7.

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subsequent rulemaking will necessarily focus on an analytic year later than 2017 and thus will require EPA to complete each of the steps for an appropriate future year. McCabe Decl. ¶97.

A. Task Group 1: Improve Data on Inventory and NOx Control Strategies for Non-EGUs [9.5-11.5 months]

As a first preliminary step, EPA must take steps to improve the quality of its information regarding the current status of existing controls for the non-EGU inventory and data on potential control devices that could be installed on uncontrolled or under-controlled sources. This information is necessary to quantify potential emissions impacts and reductions from non-EGU sources. If EPA does not gather this information with respect to non-EGUs, the results of EPA's subsequent analyses might be inaccurate and might result in either over- or under-control of emissions relative to downwind air quality problems, a scenario that is prohibited by 42 U.S.C. § 7410(a)(2)(D)(i). *EME Homer City Generation*, 134 S. Ct. at 1604.

Although the CSAPR Update included a preliminary assessment of non-EGU NOx emission controls that could be installed for the 2017 compliance year, EPA believes that this information is insufficient to support an evaluation of longer-term NOx emissions reduction potential for non-EGUs. McCabe Decl. ¶¶98-100. [17] Presently, EPA is completing its inventory of non-EGUs and a review of National Emissions Inventory ("NEI") to ensure that the NEI's control measures and control measure efficiency information is accurate. *Id.* ¶¶109-12. These data serve as inputs to EPA's air quality modeling platform. Concurrently, EPA is updating its control measures database to improve the data regarding existing NOx controls and NOx reduction potential from additional controls at non-EGUs. *Id.* ¶¶113-17. The database serves as a primary input for the Control Strategy Tool ("CoST"). As discussed below, the CoST model evaluates potential emissions reductions and control costs that result from the use of control devices (physical equipment) or control measures (operational changes) by matching

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[17] Final Technical Support Document for the Cross-State Air Pollution Rule for the 2008 Ozone NAAQS, Assessment of Non-EGU NOx Emission Controls, Cost of Controls, and Time for Compliance (Attach. 4 to the McCabe Declaration).

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the devices or measures to the non-EGU emissions sources identified in the NEI. *Id.* ¶¶116, 120.

Once EPA has completed these tasks in January 2017, the Agency intends to conduct analyses of potential NO_X emissions reductions and costs from EGUs and the various types of non-EGU emissions sources or units and request public comment, likely through the publication of a Notice of Data Availability ("NODA"). The Agency would request comment on a number of data elements, potentially including the appropriateness of certain control measures for various sources; current costs for installation, operation, and maintenance of these control measures; and installation times for NOx control measures. The NODA would ensure that a proposed rulemaking to address the remaining interstate transport obligations for the 2008 ozone NAAQS is based on data of adequate quality. McCabe Decl. ¶¶122-24. EPA expects to issue the NODA in March 2017 and complete the public comment period in June 2017. Assessing and incorporating comments received in response to the NODA into EGU analysis, the control measures database, the CoST model, and the NEI is estimated to take between three and five months and be completed between September and November of 2017. *Id.* ¶¶125-26.

Contrary to Plaintiff's suggestion that EPA has sufficient information, Pl.'s Br. at 17, EPA anticipates that public comments on a NODA, particularly from non-EGU sources, will result in the need to update many data elements informing its analysis. McCabe Decl. ¶¶119-21. If EPA were to instead issue a proposed rule based on outdated or inaccurate information, EPA would still have to complete the same data collection effort. *Id.* ¶125. Depending on the significance of both the comments received, EPA could find it necessary to issue a supplemental proposal based on the new analysis before issuing a final rule, thus further delaying issuance of a final rule, or if the agency proceeded without a supplemental proposal, subjecting the final rule to significant legal risk, including potential vacatur of the rule.[18]

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[18] *See, e.g.*, *Ala. Envtl. Council v. EPA*, 711 F.3d 1277 (11th Cir. 2013) (vacating a SIP disapproval); *Nat. Res. Def. Council v. EPA*, 489 F.3d 1250 (D.C. Cir. 2007) (vacating emission standards).

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Sierra Club does not know better than EPA what information or analysis is necessary to prepare a technically and legally defensible FIP. Deference to the agency "is highest when reviewing an agency's technical analyses and judgments involving the evaluation of complex scientific data within the agency's technical expertise." *League of Wilderness Defs. Blue Mountains Biodiversity Project v. Allen*, 615 F.3d 1122, 1130 (9th Cir. 2010). Although this case will not fix the technical decisions that EPA makes, and thus traditional agency deference is not at issue, these technical decisions regarding, for example, the need for additional data on non-EGUs, are integral to the determination of a schedule upon which the agency will act. In that vein, EPA's technical judgments should be given deference, particularly where Plaintiff and Plaintiff-Intervenor offer nothing more than conclusory estimates or their own policy choices.

B. Task Group 2: Identify Downwind Receptors and Upwind State Contributions [12 Months]

As described in the McCabe Declaration in significant detail, *see* ¶¶124-146, EPA's first step in applying the CSAPR framework is to identify downwind receptors (i.e., areas with nonattainment or maintenance issues) and the upwind states that contribute to those receptors in amounts sufficient to "link" the upwind states for purposes of further analysis. Although EPA determined that Kentucky would contribute to two maintenance receptors after implementation of the CSAPR Update emissions budgets, that finding was based on analysis of data for the 2017 compliance year. 81 Fed. Reg. at 74,507. Because the determination of what constitutes a significant contribution rests upon both whether there continue to be future downwind receptors and whether Kentucky continues to contribute to those receptors at or above the one percent screening threshold, preparing an additional FIP for Kentucky will require analysis with respect to a future analytic year. McCabe Decl. ¶¶85, 96-97, 129, 146.

The air quality modeling that EPA does for these types of assessments necessitates a determination of both a base year and the future analytic year -- that is, EPA conducts modeling to determine the air quality at some point in the future in response to known changes in air emissions between the base year and the future year. The selection of the base year requires analysis of several factors, including the available emissions inventories, measured ozone

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concentrations, and meteorological conditions for the potential base years. The selection of the future analytic year for purposes of the good neighbor provision considers several factors including the relevant NAAQS attainment date and the anticipated compliance timeframes for implementation of available control strategies. The analysis to inform these selections, which can be completed concurrent with development of the NODA described above, is expected to take three months, and be completed by April 2017. During this time EPA will also create the meteorological data for the base year for the air quality modeling. *Id.* ¶¶137-40 & Attach. 1.

EPA must then assemble base year and future year emissions inventories necessary for air quality modeling. These inventories form the basis for EPA's modeling platform to project emissions in the future analytic year absent any additional control measures resulting from implementation of the good neighbor FIP. The future year emissions inventory reflects the growth in emissions from the base year, taking into account federal and state control programs as well as other changes affecting emissions in that timeframe. *Id.* ¶141. Determination of the emissions growth over the period requires consideration of each emissions source category, e.g., EGUs and non-EGUs, cars, trucks, and off-road vehicles, etc. Different analytical tools are used to forecast emissions for the various categories to the future year. *Id.* This effort can be completed in six months, or by October 2017. *Id.* ¶129, 141.

EPA must run air quality models to project ozone concentrations in the future year to identify the extent of the remaining downwind air quality problems. *Id.* ¶144. Air quality models use mathematical techniques to simulate the physical and chemical processes that affect air pollutants as they disperse and react in the atmosphere. These model runs are not simple and the programs run for up to two weeks. *Id.* ¶145. EPA must conduct the following sequential model runs using the Comprehensive Air Quality Model with Extensions ("CAMx"):

1. model-predicted ozone concentrations in the base year;
2. model-predicted ozone concentrations in the future year; and
3. model-predicted contributions from upwind states using the CAMx ozone source apportionment modeling tool. *Id.*

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These scenarios are run sequentially in order to include time for quality assurance review of modeling results and possible corrections to inputs which would then require rerunning the particular simulation before proceeding on to the next run. *Id.* ¶146.

After running the models, EPA must extract and evaluate the results of the modeling (post-processing) to identify the future year receptors and quantify the upwind state contributions. *Id.* ¶¶144-45. The result of this process is a geographic and quantitative picture of which upwind emissions impact which downwind receptors, thus identifying the linkages. *Id.* at 145. The process for conducting the air quality modeling, including the development of model inputs, running the model, and post-processing and evaluation of results, as described above, is expected to take 12 months and be completed by January 2018. *Id.* ¶146.

Though Sierra Club appears to concede that additional air quality modeling will be necessary, it misunderstands the effort required and the utility of modeling work conducted for the CSAPR Update. Pl.'s Br. at 19-20; Howekamp Decl. ¶¶13, 19. Sierra Club is incorrect in its belief that "no revisions to the modeling tools are required," Howekamp Decl. ¶19, and that EPA can simply evaluate emissions reductions in a future year using the ozone air quality assessment tool ("AQAT") developed for the CSAPR Update. McCabe Decl. ¶149. The ozone AQAT was developed so that EPA could evaluate the impacts of different levels of emissions controls on downwind air quality *in 2017*, and it has not been not calibrated for any other future year. *Id.* Though Mr. Howekamp appears to concede this point, he fails to recognize that development of a new ozone AQAT will require the outputs from new air quality modeling conducted for the future analytic year. Thus, whether or not EPA utilizes the ozone AQAT tool in some manner, it must nonetheless complete the modeling described above. *Id.*

C. Task Group 3: Quantify Upwind State Obligations [5-6 months]

Once EPA completes the process to improve its non-EGU data, it can then quantify the amounts of each "linked" upwind state's emissions that constitute significant contribution to nonattainment and interference with maintenance of the 2008 ozone NAAQS. McCabe Decl. ¶150. This process consists of several stages of complex evaluations, including: identifying NO_X reduction strategies at both EGUs and non-EGUs and their associated compliance timing

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and costs for sources in relevant sectors; assessing NO_X emission reduction potential through modeling using various NOx reduction strategies (i.e., tons of emissions reduced); analyzing downwind air quality impacts of such emissions reductions (i.e., improvements in ozone concentrations); selecting a level of control by applying a multi-factor test; ensuring that emissions reductions do not constitute impermissible over-control relative to the downwind air quality problems; and establishing emission limits (e.g., budgets) that represent emissions remaining following the elimination of significant contribution to nonattainment and interference with maintenance of the NAAQS downwind. *Id.* This effort requires analysis of both the potential EGU and non-EGU NO_X reductions available in Kentucky and other states. Here again, the McCabe Declaration presents an extensive and detailed justification for each of the four steps required to develop the emissions budget for Kentucky. *Id.* ¶153.

In order to quantify upwind state emission reduction obligations, EPA must first evaluate the types of emission reduction strategies that can be applied to EGUs and non-EGUs and their associated implementation timing and cost. EPA then uses this information to organize the NO_X control strategies into uniform levels of NO_X control stringency represented by uniform cost-thresholds (e.g., $5,000 per ton of NO_X emissions reduced). *Id.* ¶¶153-54. These cost-thresholds will help EPA apportion responsibility for making emissions reductions among the multiple upwind states collectively contributing to a downwind receptor. EPA can then assess the NOx emission reduction potential in the linked states at each cost-threshold, i.e., tons of emissions reductions estimated for the various control devices and measures, using two tools. *Id.* ¶155.

EPA uses the CoST model, including updates reflecting the data on non-EGU NO_X reduction control devices or measures developed in Task Group 1, to evaluate non-EGU control strategies for their NO_X emission reduction potential. *Id.* ¶¶118, 160. Specifically, EPA runs CoST at the various cost-thresholds and assesses the resulting emissions reduction potential. To address control strategies for EGUs, EPA uses an integrated planning model ("IPM"), which can model emission reductions in the power sector. *Id.* ¶¶157-59. EPA runs a series of IPM assessments that impose increasing cost thresholds representing uniform levels of NO_X controls

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and assesses the resulting emission reduction potential. The CoST and IPM analyses can occur concurrently, require 2-3 months to complete, and could be completed by December 2017.

EPA then converts the projected emissions reductions from CoST and IPM into an emissions limitation for further air quality analysis. The limitation represents the remaining allowable emissions after the reductions are imposed in each state and at each cost-threshold. For example, in the CSAPR Update, EPA quantified limitations for EGU in terms of state-wide budgets representing remaining EGU emissions after implementation of the emissions reductions. The process for developing potential emissions limitations for EGUs and non-EGUs at each cost-threshold is expected to take one month and be completed in January 2018.

After EPA has quantified potential emissions limitations, the second step is to analyze downwind air quality impacts of these emissions reductions, i.e., improvements in ozone concentrations, at each level of potential NO_X control stringency. *Id.* ¶161. EPA has used the ozone AQAT to estimate the air quality impacts of the EGU NO_X emission limitations on downwind ozone pollution levels for various NO_X emission levels. *Id.* ¶162. This analysis also permits EPA to ensure that the selected level of control neither impermissibly under- nor over-controls upwind emissions relative to the downwind air quality problems. *Id.* ¶163. This task will take one month and is scheduled to be completed by February 2018. *Id.* ¶164.

Once EPA has calculated emissions limitations and improvements in air quality at downwind receptors at the various levels of NOx control stringency, EPA applies a multi-factor test to determine the appropriate level of control. The multi-factor test evaluates cost, available emissions reductions, and resulting downwind air quality impacts to determine the appropriate stopping point for quantifying upwind state obligations to address interstate ozone transport, including whether the identified downwind ozone problems are resolved. *Id.* ¶165. EPA must look at various levels of NO_X control stringency for each downwind receptor (represented by the cost thresholds) and evaluates the magnitude of the change in the ambient ozone concentration. *Id.* ¶¶152, 155, 165. EPA must then determine whether the estimated concentration would resolve each receptor's nonattainment or maintenance problem by lowering the average ozone concentration to or below the level of the NAAQS. *Id.* ¶161. As

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required by the Supreme Court's holding in *EPA v. EME Homer City*, EPA must also evaluate the estimated improvement in ozone concentrations at downwind receptors to ensure that the expected ozone improvements would not be greater than necessary to resolve the downwind ozone pollution problem or that the estimated ozone improvements would not reduce Kentucky's ozone contributions to below the screening threshold, i.e., one percent of the ozone NAAQS. *Id.* ¶161; *see* 134 S. Ct. at 1608 (EPA cannot "require[ ] an upwind State to reduce emissions by more than the amount necessary to achieve attainment in *every* downwind State to which it is linked"). These tasks will take one month and could be completed by March 2018.

In total, completing the reduction potential analysis and determining the emissions budgets for the upwind states that contribute to the downwind states that Kentucky contributes to will take five to six months.

EPA does not agree with Plaintiff that there are significant short-cuts that can reduce the amount of time necessary for EPA to evaluate the remaining emissions reduction obligation for Kentucky. First, EPA could not simply impose emissions reductions on sources in Kentucky until the state's contribution to downwind receptors meets the one percent threshold. *See* Howekamp Decl. ¶12. Under the CSAPR framework, the "amounts" of emissions that must be prohibited pursuant to the good neighbor provision are those emissions that *both* exceed the one percent threshold *and* which can be eliminated through the implementation of cost-effective controls, considering downwind air quality and the contributions of other states.[19] 81 Fed. Reg. at 74,518-21; *see also* McCabe Decl. ¶¶88, 104. Thus, EPA cannot simply reduce one state's emissions reductions without considering the interrelated factors of cost-effectiveness, downwind air quality, and the contributions of other linked upwind states. *Id.*

Second, though Plaintiff suggests that EPA left readily available emissions reductions on the table, EPA explicitly included emissions reductions achievable from the optimized operation of existing selective catalytic reduction units (pollution control devices commonly referred to as

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[19] *EME Homer City Generation*, 134 S. Ct. at 1606 (holding it to be a permissible interpretation of the statute to apportion responsibility considering "both the magnitude of upwind States' contributions and the cost associated with eliminating them").

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SCRs) and from plant retirements in calculating emissions budgets in the CSAPR Update. McCabe Decl. ¶¶105-7. Mr. Howekamp suggests that if a list of EGUs were operated at the lowest reported ozone season average emission rate identified at some time between 2005 and 2015, resulting emissions reductions, along with the retirement of the two EGUs, might be enough to satisfy Kentucky's obligation. *See* Howekamp Decl. ¶10 & Attach. 2 & 3. In fact, the CSAPR Update considered the extent to which certain EGUs could operate "optimally" and imposed emissions limitations based on those calculations. 81 Fed. Reg. at 74,543-44. EPA determined that the lowest rate at which an EGU has operated in the past is not cost-effectively sustainable over time. McCabe Decl. ¶¶105-6. To the extent Plaintiff disagrees, the appropriate venue to challenge those conclusions is the D.C. Circuit, where the CSAPR Update rulemaking is already being challenged.[20]

Similarly, EPA does not agree with Howekamp's spurious suggestion that, because NO_X allowances were trading at $1,100/ton (below the CSAPR Update cost-threshold of $1,400/ton) as of October 31, 2016, there are "readily available" emissions reductions. Howekamp Decl. ¶11. Mr. Howekamp fails to explain how that figure can be a means to establish Kentucky's remaining emissions reductions. McCabe Decl. ¶108. Further, to the extent this claim is cognizable, it makes an inapt comparison of the cost of an allowance on the open market, i.e., how much industry will value the allowance to emit pollutants, with the cost-threshold that acts as a proxy for available control strategies in the aggregate. *Id.*

Thus, additional analysis is required to identify both the level and source of emissions reductions required to satisfy Kentucky's obligation, McCabe Decl. ¶106, a point Mr. Howekamp concedes, Howekamp Decl. ¶14 ("In the event that the readily achievable emission reductions are not sufficient for fulfillment of Kentucky's 'good neighbor' obligation, then EPA will need to evaluate and apply additional control strategies that can be applied to completely fulfill the obligation.").

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[20] *See* 42 U.S.C. § 7607(b)(1) (exclusive jurisdiction over petitions for review of FIP is vested in the courts of appeals).

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D. Task Group 4: Issue Proposed Federal Implementation Plan [11 months]

After EPA completes the technical analysis, determining the appropriate level of emissions controls, senior EPA management must make the policy decisions that will define the scope of the proposed rulemaking, and EPA must develop the rulemaking proposal. McCabe Decl. ¶¶169-173. The notice of proposed rulemaking must include a preamble that explains the legal, policy and technical bases for the proposed action in addition to presenting the actual regulatory language that will be codified if the rule, as proposed, is finalized. *See* 42 U.S.C. § 7607(d)(3). The proposal also requires detailed technical support documents ("TSD") explaining the various technical analyses supporting the proposed action. Further, EPA must prepare a variety of impact analyses to address other Federal requirements. McCabe Decl. ¶174. This process can be expected to take four to five months in total, a portion of which is concurrent with previously discussed analytic and rulemaking activities.

The proposed rulemaking must then undergo review within the Agency by various offices and levels of management, which would take two months, and then go through an interagency review process, which can take up to three months. In total, the process to develop a proposed rulemaking for signature by the Administrator requires at least seven additional months after completion of the technical analysis, and is expected to be completed by November 1, 2018.

Sierra Club severely underestimates the time required to prepare a proposed rule, claiming that only 5.5 months is required. Contrary to Plaintiff's assertion that this effort should take significantly less time than the CSAPR Update, Pl.'s Br. at 17, the opposite is actually true. McCabe Decl. ¶179. As is abundantly clear, evaluation of interstate ozone transport, even if EPA is only required to address one state's significant contribution, must necessarily evaluate the contributions of other upwind states to ensure that the state is neither impermissibly under- nor over-controlled. *Id.* ¶¶43, 98, 109. Moreover, though Plaintiff's declarant, Mr. Howekamp, has experience in various rulemakings while on the staff at EPA's Regional Office, he has never prepared a FIP addressing the good neighbor provision, an effort that is more difficult to navigate than other more straightforward FIPs that he might have

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worked on. *See* Howekamp Decl. ¶¶3, 24-25. [21] In contrast to Mr. Howekamp's conclusory and unsupported opinions, the McCabe Declaration presents a detailed discussion of the amount of time that EPA expects will be necessary to issue the proposed rule. McCabe Decl. ¶¶169-79.

E. Task Group 5: Promulgate Final Federal Implementation Plan [14 months]

As Sierra Club acknowledges, the Clean Air Act requires EPA to provide 30-days' notice of the proposed rulemaking and an opportunity to provide written comments. 42 U.S.C. § 7607(d)(5). The Act also requires EPA to provide an opportunity for a public hearing, *id.*, for which the agency must provide sufficient notice -- a requirement that is presumptively satisfied if EPA provides 15 days-notice. 44 U.S.C. § 1508. If a public hearing is held, the Clean Air Act then imposes a second timing requirement -- that EPA must keep the public comment period open for 30 days after any public hearing. 42 U.S.C. § 7607(d)(5). Therefore, EPA must plan for at least a 45-day public comment period. McCabe Decl. ¶180. Moreover, rulemakings of this nature are often the subject of public requests for extensions of the comment period based on the volume of technical information provided for public review. Thus, EPA's schedule provides for a 60-day public comment period, and, if requested, a public hearing. Given that a proposed notice can take approximately a month to appear in the *Federal Register*, EPA anticipates the public comment period would close in January 2018.

EPA must then review and evaluate comments to determine whether they impact the technical analysis or the policy decisions made for purposes of developing the final rule, which would require two to three months to complete. *Id.* ¶182. The time estimates EPA presents for preparing the final rule are predicated on the issuance of the NODA described above, such that EPA does not expect to receive comments or data that would force it to prepare a supplemental proposal. However, EPA does expect to receive highly technical comments that might require it

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[21] The Howekamp Declaration identifies him as an environmental consultant. Although Mr. Howekamp provides a resume, his declaration fails to present the information required for an expert witness: the facts or data considered by the witness, a list of publications authored in the last ten years, a list of all cases the witness testified at in the past four years, and a statement of the compensation paid for his report and any testimony. Fed. R. Civ. P. 26(a)(2)(B).

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to update various parts of the technical analysis, work that would be partially concurrent with evaluation of the public comments. *Id.* ¶183. Updating could include revisions to the emissions inventories, additional air quality modeling, or updates to the EGU and non-EGU cost and NO_X reduction potential analyses. *Id.* ¶184. Based on its experience, EPA estimates that the effort to update the technical analyses would take six months, partially concurrent with its review of its public comments. *Id.* & Attach. 1.

Once the updated technical analyses are completed, EPA will again need to identify issues requiring decisions by senior management, e.g., if the technical updates cause changes in the results. *Id.* ¶185. Then, as with the proposed rule, EPA will have to develop the notice of final rulemaking, the text of the regulatory requirements to be codified in the Code of Federal Regulations, updated technical support documents, and an updated regulatory impact analysis. As part of this effort, EPA must prepare responses to all significant public comments, which is a time consuming undertaking. *Id.* Considering these tasks and others described in more detail in the McCabe Declaration, EPA expects that it would take 14 months from the publication of the proposed rule to sign the final rule, i.e. by February 1, 2020. *Id.* ¶¶182-87.

Further, Plaintiff's suggestion that the Court should order EPA to transmit the final FIP to the Office of the Federal Register is unnecessary. The Court need not impose interim deadlines for ministerial acts. EPA understands that it must promulgate a FIP, a process that requires publication in the *Federal Register*. If the Court finds it necessary, it should merely order EPA to promptly transmit the final rule for publication.

VII. CONCLUSION

For the reasons explained above and in the McCabe Declaration, the Court should allow EPA until November 1, 2018 to sign a proposed rule and until February 1, 2020 to sign a final rule fully addressing the requirements of the "good neighbor" provision for Kentucky with respect to the 2008 ozone NAAQS.

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Respectfully submitted,

Date: December 15, 2016

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IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF CALIFORNIA
SAN FRANCISCO DIVISION

SIERRA CLUB, Plaintiff, STATE OF NEW YORK, Intervenor-Plaintiff, v. GINA McCARTHY, in her official capacity as the Administrator of the United States Environmental Protection Agency, Defendant.	Case No. 3:15-cv-04328-JD (JSC)

DECLARATION OF JANET G. MCCABE

A. General Background

1. I, Janet G. McCabe, declare under penalty of perjury under the laws of the United States of America that the following statements are true and correct to the best of my knowledge and belief and that they are based upon my personal knowledge, or on information contained in the records of the United States Environmental Protection Agency (EPA), or on information supplied to me by EPA employees.

2. I am the Acting Assistant Administrator for the Office of Air and Radiation (OAR) at the EPA, a position I have held since July 19, 2013. I previously served as the Principal Deputy to the Assistant Administrator for this office from November 2009 to July 18, 2013. OAR is the headquarters-based EPA office that administers the Clean Air Act (CAA or the Act) and develops national programs, technical policies and regulations for controlling air

pollution and protecting public health and welfare. OAR is concerned with preventing and responding to air quality issues including industrial air pollution, pollution from vehicles and engines, toxic air pollutants, acid rain, stratospheric ozone depletion and climate change.

3. Prior to joining the EPA, I served as the Executive Director of Improving Kids' Environment, Inc., and as an adjunct faculty member at the Indiana University School of Medicine, Department of Public Health. From 1993 to 2005, I held several leadership positions in the Indiana Department of Environmental Management's Office of Air Quality and was the office's Assistant Commissioner from 1998 to 2005. Before coming to Indiana in 1993, I served as Assistant Attorney General for environmental protection for the Commonwealth of Massachusetts and Assistant Secretary for Environmental Impact Review. I received an undergraduate degree from Harvard College in 1980 and a J.D. from Harvard Law School in 1983.

4. This declaration is filed in support of the EPA's Cross-Motion for Summary Judgment and Opposition to Plaintiff's Motion for Summary Judgment in *Sierra Club v. McCarthy*, Case No. 3:15-cv-04328-JD. Claim two of this case pertains, in part, to the EPA's statutory obligation to promulgate a federal implementation plan (FIP) for the state of Kentucky addressing the interstate transport requirements of section 110(a)(2)(D)(i)(I) of the CAA, 42 U.S.C. 7410(a)(2)(D)(i)(I), for the 2008 ozone national ambient air quality standards (NAAQS) and for which plaintiffs seek a schedule by which the EPA will promulgate such a FIP pursuant to CAA section 110(c)(1), 42 U.S.C. 7410(c)(1).

5. As part of my duties as Acting Assistant Administrator of OAR, I oversee the development and implementation of regulations, policy and guidance under section 110 of the

CAA, 42 U.S.C. 7410, including the interstate transport requirements of section 110(a)(2)(D)(i)(I), 42 U.S.C. 7410(a)(2)(D)(i)(I), that are the subject of this litigation.

6. OAR is responsible for the development and implementation of regulations, policy and guidance associated with state implementation plan (SIP) requirements under the CAA. These SIP requirements include the "infrastructure" SIP revisions required by section 110(a)(1) and (2). In general, the infrastructure SIP submissions address a broad range of statutory requirements relevant to the attainment, maintenance and enforcement of the NAAQS in each state. The applicable elements of section 110(a)(2) address various regulatory concerns, including legal authority and substantive requirements, for a range of issues relevant to the CAA. In particular, section 110(a)(2)(D)(i)(I) (also referred to as the "good neighbor provision") requires each state to address the interstate transport of pollutants in its infrastructure SIP (this subset of the infrastructure SIP is also referred to as the "good neighbor SIP") in order to assist other states in attaining and maintaining the relevant NAAQS. The good neighbor provision specifically requires that state plans "contain adequate provisions . . . prohibiting . . . any source or other type of emissions activity within the State from emitting any air pollutant in amounts which will . . . contribute significantly to nonattainment in, or interfere with maintenance by, any other State with respect to any . . . national ambient air quality standard [NAAQS]." 42 U.S.C. 7410(a)(2)(D)(i)(I).

7. Once a state submits a SIP, including a good neighbor SIP required by section 110(a)(2)(D)(i)(I), the EPA must determine whether the submission meets certain minimum completeness criteria, which are defined pursuant to CAA section 110(k)(1)(A), 42 U.S.C. 7410(k)(1)(A). The statute provides that the EPA shall make such a determination within 60 days of receipt of the plan, but no later than 6 months after the date, if any, by which the state

was required to make the submission per section 110(k)(1)(B), 42 U.S.C. 7410(k)(1)(B). That section further provides that if the Administrator has not determined whether the plan is complete within 6 months after receipt of the submission, the SIP is deemed to be complete by operation of law. Section 110(k)(2) then provides that the EPA has 12 months from the determination of completeness (whether by the EPA or by operation of law) to approve or disapprove, in whole or in part, the state's submission in accordance with section 110(k)(3). 42 U.S.C. 7410(k)(2) and (3).

8. In the event that a state does not submit a required SIP addressing the applicable elements of section 110(a)(2), including the requirements of the good neighbor provision, the EPA publishes in the *Federal Register* a "finding of failure to submit" constituting the EPA's official determination, per section 110(k)(1)(B), that a state has failed to make a required SIP submission.

9. If the EPA disapproves a state's SIP submission or if the EPA issues a finding of failure to submit, the action triggers obligations for the EPA under section 110(c)(1) of the CAA, which requires the EPA to promulgate a FIP within two years, unless the state corrects the deficiency and the EPA approves the plan or plan revision before the EPA promulgates a FIP. 42 U.S.C. 7410(c)(1).

10. As part of my duties as Acting Assistant Administrator of OAR, I am involved in the prioritization and allocation of resources to meet the legal requirements of the CAA as well as the air quality needs of the country. I am familiar with the processes and time periods allotted for the EPA to take regulatory actions under the CAA, including actions concerning the interstate pollution transport requirements pursuant to CAA section 110(a)(2)(D)(i)(I) and the timeframe for promulgating FIPs pursuant to CAA section 110(c)(1). Given the funding and other resource

constraints upon the agency, the EPA is unable to perform all activities that we may have or want to perform, and that we are authorized to perform, at any given time. Meeting all mandatory duties imposed by the CAA with limited resources requires the EPA to make choices in the prioritization and scheduling of projects. In determining the allocation of resources and the prioritization of particular projects, OAR looks at several factors, including: (1) whether or not a project must be completed by a time certain; (2) the environmental and public health impact of proceeding with a particular project compared to other projects; (3) the amount of resources that would be needed to complete a particular project; (4) the other mandatory duties under the CAA that are assigned to a particular office; and (5) the amount of information (including needs for additional information) required in order to appropriately support a project.

11. As described in section B.iii.c below, the EPA recently promulgated a rulemaking that partially addresses the EPA's obligation to promulgate a FIP for the state of Kentucky addressing the interstate transport requirements of the good neighbor provision for the 2008 ozone NAAQS. That partial FIP implements emissions reductions in Kentucky that will improve downwind air quality problems to which Kentucky contributes. However, in order to fully address the EPA's FIP obligation, the EPA needs to conduct a significant amount of technical analysis to quantify any remaining emissions reductions that may be necessary to address the good neighbor provision for Kentucky. Section C of this declaration describes the steps and timeframe necessary to conduct this technical analysis. Once the EPA has completed this technical analysis, we must make appropriate policy decisions, prepare a written rulemaking package, engage in appropriate intra- and inter-agency review of the rulemaking package in order to issue a proposed rulemaking for review and comment by the public. Moreover, the EPA must consider the public comments received on the proposed rulemaking and conduct certain

additional technical analysis before we can issue a final rule. This process is described in more detail in section D below. A Gantt chart laying out the steps required for this action, the timeframes required for each step, and the chronology of these steps is attached to the declaration as Attachment 1.

12. Considering the totality of the steps necessary to evaluate Kentucky's emission reduction obligation pursuant to the good neighbor provision and to complete the administrative process necessary to promulgate a FIP, the EPA anticipates that the most expeditious schedule by which the Administrator can sign a notice of proposed rulemaking to promulgate a FIP for the state of Kentucky fully addressing the interstate transport requirements of the good neighbor provision for the 2008 ozone NAAQS is November 1, 2018, and the Administrator can sign a notice of final action by February 1, 2020.

13. I have relied upon my staff to provide the factual information concerning the regulatory steps and schedule needed for the particular action at issue in the case for which I make this declaration. The declaration's purpose is to:

- Explain the amount of time the EPA would likely need in order to complete necessary technical analyses and to issue *Federal Register* notices to propose and finalize promulgation of a FIP fully addressing the good neighbor provision with respect to the 2008 ozone NAAQS for Kentucky;
- Explain the significant workload of other duties and obligations related to air pollution that the EPA anticipates having to complete in the coming year, including significant actions subject to statutory deadlines; and

- Explain the timeframe in which the EPA believes it would be reasonable to take actions at issue in an expeditious fashion that takes into account competing obligations and provides appropriate opportunities for public input.

B. Background Regarding Federal Rulemakings to Address Interstate Transport

14. Ground-level ozone causes a variety of negative effects on human health, vegetation, and ecosystems. In humans, acute and chronic exposure to ozone is associated with premature mortality and a number of morbidity effects, such as asthma exacerbation. Ozone exposure can also negatively impact ecosystems, for example, by limiting tree growth.

15. Ground-level ozone is not emitted directly into the air, but is a secondary air pollutant created by chemical reactions between oxides of nitrogen (NO_X), carbon monoxide (CO), methane (CH_4), and non-methane volatile organic compounds (VOCs) in the presence of sunlight. Emissions from electric utilities, industrial facilities, motor vehicles, gasoline vapors, and chemical solvents are some of the major anthropogenic sources of ozone precursors. The potential for ground-level ozone formation increases during periods with warmer temperatures and stagnant air masses; therefore ozone levels are generally higher during the summer months.[1] Ground-level ozone concentrations and temperature are highly correlated in the eastern U.S. with observed ozone increases of 2-3 ppb per degree Celsius reported.[2] Increased temperatures may also increase emissions of volatile man-made and biogenic organics and can indirectly increase

[1] Rasmussen, D.J. et. al. (2011), Ground-level ozone-temperature relationships in the eastern US: A monthly climatology for evaluating chemistry-climate models. Atmospheric Environment 47: 142-153.

[2] Bloomer, B. J., J. W. Stehr, C. A. Piety, R. J. Salawitch, and R. R. Dickerson (2009), Observed relationships of ozone air pollution with temperature and emissions, Geophysical Research Letters, 36, L09803.

anthropogenic NO_X emissions as well (e.g., increased electricity generation to power air conditioning).

16. Precursor emissions can be transported downwind directly or, after transformation in the atmosphere, as ozone. Studies have established that ozone formation, atmospheric residence, and transport occur on a regional scale (i.e., hundreds of miles) over much of the eastern United States, with elevated concentrations occurring in rural as well as metropolitan areas. As a result of ozone transport, in any given location, ozone pollution levels are impacted by a combination of local emissions and emissions from upwind sources. The transport of ozone pollution across state borders compounds the difficulty for downwind states in meeting health-based air quality standards (i.e., NAAQS). Numerous observational studies have demonstrated the transport of ozone and its precursors and the impact of upwind emissions on high concentrations of ozone pollution. One study, for example, examined the impacts of statewide emissions of NO_X, SO_2, and VOCs on concentrations of ozone and fine particulate matter in the eastern United States. They found on average 77 percent of each state's ground-level ozone is produced by precursor emissions from upwind states.[3] Another showed the impacts of interstate transport of anthropogenic NO_X and VOC emissions on peak ozone formation in 2007 in the Mid-Atlantic United States. Results suggest reductions in anthropogenic NO_X emissions from electric generating unit (EGU) and non-EGU sources from the Great Lakes region as well as

[3] Bergin, M.S. et. al. (2007), Regional air quality: local and interstate impacts of NOx and SO2 emissions on ozone and fine particulate matter in the eastern United States. Environmental Sci. & Tech. 41: 4677-4689.

northeastern and southeastern United States would be effective for decreasing area-mean peak ozone concentrations in the Mid-Atlantic.[4]

17. In order to address the regional transport of ozone pursuant to the good neighbor provision, the EPA has promulgated four regional rules focusing on the reduction of NO_X emissions from states in the eastern half of the United States.[5] Each of these rulemakings essentially followed the same four steps for quantifying and implementing emission reductions necessary to address the interstate transport requirements of the good neighbor provision: (1) identifying downwind air quality problems relative to the NAAQS; (2) determining which upwind states contribute to these identified downwind air quality problems; (3) for states linked to downwind air quality problems, identifying upwind emissions that significantly contribute to nonattainment or interfere with maintenance of a standard; and (4) for states that are found to have emissions that significantly contribute to nonattainment or interfere with maintenance of the NAAQS downwind, implementing the necessary emission reductions. The EPA's rulemakings to address the interstate transport of ozone have continued to be the subject of significant public interest and garner a substantial number of public comments challenging the EPA's legal, policy, and technical decisions. Each of these rulemakings was subject to litigation, and the resulting court decisions have guided and focused the EPA's approach to addressing the interstate transport of ozone pollution pursuant to CAA section 110(a)(2)(D)(i)(I). While the decisions resulting from the litigation have clarified and validated various aspects of the EPA's approach

[4] Liao, K. et. al. (2013), Impacts of interstate transport of pollutants on high ozone events over the Mid-Atlantic United States. Atmospheric Environment 84, 100-112.
[5] For purposes of these rulemakings, the western United States (or the West) consists of the 11 western contiguous states of Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming. The eastern United States consists of the remaining contiguous states.

to addressing the interstate transport of ozone pollution pursuant to the good neighbor provision, the public has continued to raise challenges to the various and complicated steps of these rulemakings.

i. NO_X SIP Call

18. The first regional rulemaking that the EPA promulgated to address the interstate transport of ozone pollution is referred to as the NO_X SIP Call, which was promulgated in 1998 in order to address the good neighbor provision for the 1979 1-hour ozone NAAQS and the 1997 8-hour ozone NAAQS. 63 Fed. Reg. 57,356 (Oct. 27, 1998). The rule required 22 eastern states and the District of Columbia to amend their SIPs and limit NO_X emissions that contribute to ozone nonattainment. The EPA set a NO_X ozone season emission budget (i.e., limit on statewide allowable emissions) for each covered state, essentially a cap on ozone season NO_X emissions in the states. The covered states were given the option of meeting the budgets by amending their SIPs to require their EGU sources and certain non-EGU sources to participate in a regional allowance trading program known as the NO_X Budget Trading Program (NBP); states were also given the option to develop alternative approaches to meeting the NOx ozone season emissions budgets.

19. In order to calculate the necessary emissions reductions under the good neighbor provision pursuant to these NAAQS, the EPA first evaluated three air quality factors to determine whether each state had emissions whose contributions to downwind nonattainment problems are large and/or frequent enough to be of concern: (1) the overall nature of the ozone problem; (2) the extent of the downwind nonattainment problems to which the upwind state's emissions are linked; and (3) the ambient impact of the emissions from the upwind state's sources on the downwind nonattainment problems.

20. As to the first consideration, the EPA found that "ozone generally results from the collective contribution of emissions from numerous sources over a large geographic area." *Id.* at 57,377. "[F]or urban nonattainment areas under the [1979] 1-hour [ozone] NAAQS, the downwind sources, [sic] comprise numerous stationary sources as well as mobile onroad sources, mobile off-road sources, and consumer and commercial products. Further, additional contributions are made by numerous upwind States, both adjacent to and further away from the nonattainment area itself." *Id.* at 57,377. With respect to the NAAQS being addressed by the NOx SIP Call, the EPA cited multiple modeling studies which indicate that upwind States contribute significantly to those downwind nonattainment problems under both standards:

> In general, under the [1979] 1-hour standard, emissions from each upwind State affect at least several, primarily urban, nonattainment areas downwind. For example, each of the midwest/southern States of Ohio, Kentucky, Tennessee, West Virginia, Virginia, and North Carolina affects between five and eight downwind nonattainment areas. Under the [1997] 8-hour standard, emissions from each upwind State affect nonattainment problems that comprise an even larger geographic area. For example, Ohio, Kentucky, Tennessee, West Virginia, Virginia, and North Carolina each affect between eight to thirteen downwind States with nonattainment problems.

Id. at 57403.

21. The EPA concluded that the regional nature of the ozone transport problem supported the need for a regional analysis in order to evaluate which upwind emissions should be reduced to address downwind air quality. We noted, "[t]he fact that virtually every nonattainment problem is caused by numerous sources over a wide geographic area is a factor suggesting that the solution to the problem is the implementation over a wide area of controls on many sources, each of which may have a small or unmeasurable ambient impact by itself." *Id.* at 57,377.

22. With respect to the second consideration, the extent of the downwind nonattainment problems to which the upwind state's emissions are linked, the EPA first

identified those downwind areas expected to have air quality problems relative to the NAAQS. The EPA explained that we relied on both current monitored data and projections of air quality to a future year to identify these areas because the term "will" in section 110(a)(2)(D)(i)(I) "means that SIPs are required to eliminate the appropriate amounts of emissions that presently, or that are expected in the future to, contribute significantly to nonattainment downwind." *Id.* at 57,375. Thus,

> [i]n determining whether a downwind area has a nonattainment problem under the [1979] 1-hour standard to which an upwind area may be determined to be a significant contributor, EPA determined whether the downwind area currently has a nonattainment problem, and whether that area would continue to have a nonattainment problem as of the year 2007 assuming that in that area, all controls specifically required under the CAA were implemented, and all required or otherwise expected Federal measures were implemented. If, following implementation of such required CAA controls and Federal measures, the downwind area would remain in nonattainment, then EPA considered that area as having a nonattainment problem to which upwind areas may be determined to be significant contributors.

Id. at 57,377. The EPA concluded, "The fact that a nonattainment problem persists, notwithstanding fulfillment of CAA requirements by the downwind sources, is a factor suggesting that it is reasonable for the upwind sources to be part of the solution to the ongoing nonattainment problem." *Id.* The EPA therefore used air quality modeling to identify projected air quality problems in 2007, considering other control requirements that were expected to be implemented by that date and the growth in emissions due to economic growth and the anticipated greater use of vehicles. *Id.* at 57,375. The EPA determined that the contribution of each affected state to a downwind nonattainment problem, in conjunction with the contribution from other upwind States, "comprised a relatively large percentage of the nonattainment problem." *Id.* at 57,377.

23. With respect to the third consideration, the EPA conducted additional air quality modeling to evaluate the ambient impact of emissions from upwind sources. The EPA evaluated

the downwind contribution from emissions in upwind states considering three factors: (a) the magnitude of the contribution; (b) the frequency of the contribution; and (c) the relative amount of the contribution. *Id.* at 57,387. The EPA determined that "the impacts from each affected upwind State's NO_X emissions are sufficiently large and/or frequent so that the amounts of that State's emissions should be considered to be significant contributions, depending on the cost factor and other relevant considerations." *Id.* at 57,377.

24. For those states whose ozone contributions were determined to be large and/or frequent enough to be of concern, the EPA then determined what amount of emissions reductions should be required of sources in each of these states. The EPA quantified emissions reductions for each state based on

> whether any amounts of the NO_X emissions may be eliminated through controls that, on a cost-per-ton basis, may be considered to be highly cost effective. By examining the cost effectiveness of recently promulgated or proposed NO_X controls, EPA determined that an average of approximately $2,000 per ton removed is highly cost effective. The EPA then determined a set of controls on NO_X sources that would cost no more than an average of $2,000 per ton reduced.

Id. at 57,377-78. In order to quantify emissions reductions that would be required of upwind states contributing to multiple downwind air quality problems, the EPA followed a number of steps: (1) the EPA determined the amount of NO_X emissions in each State by the year 2007, based on assumptions concerning both growth and emissions controls that are required under the CAA or that will be implemented due to Federal actions, referred to as the "2007 base case"; (2) the EPA applied the control measures identified as highly cost effective to the 2007 base case amount for the appropriate source categories; (3) the EPA determined each State's 2007 budget as the amount of NO_X emissions remaining in the State after application of controls to the affected source categories. *Id.* at 57,378. The difference between the 2007 base case and the 2007 budget is the amount of NO_X emissions in that State by the year 2007 that the EPA

determined would contribute significantly to nonattainment and that, therefore, the SIPs must prohibit. *Id.* The EPA concluded that "the downwind impact from each individual upwind State's reductions may be relatively small, but the impact from all upwind reductions, collectively, is appreciable." *Id.* at 57,403.

25. The EPA then required states covered by the rule to amend their SIPs in order to limit NO_X emissions that significantly contribute to ozone nonattainment in other states consistent with the budgets finalized in the rule. With respect to the 1979 1-hour ozone NAAQS, the EPA initiated a "SIP call" pursuant to CAA section 110(k)(5) because the EPA had already approved states' infrastructure SIPs with respect to that NAAQS, but now found those previously approved SIPs to be deficient. *Id.* at 57,367. With respect to the 1997 8-hour ozone NAAQS, the EPA required the submission of SIPs pursuant to CAA section 110(a)(1) because the deadline for the submission of good neighbor SIPs for that NAAQS had not yet passed. *Id.* at 56,370. The emissions reductions identified by the EPA as necessary to address states' obligations under section 110(a)(2)(D)(i)(I) were the same with respect to both NAAQS. However, in order to resolve legal uncertainty for the NO_X SIP Call created by a subsequent court decision regarding the 1997 8-hour ozone NAAQS, the EPA later amended the NO_X SIP Call to indefinitely stay the portions of the rule making findings of significant contribution with respect to the 1997 ozone NAAQS. 65 Fed. Reg. 56,245 (Sept. 18, 2000).

26. The NO_X SIP Call was largely upheld by the D.C. Circuit in *Michigan v. EPA*, 213 F.3d 663 (D.C. Cir. 2000), *cert. denied*, 532 U.S. 904 (2001). The court addressed a number of issues, among them several that have guided the EPA's further efforts to address the interstate transport of ozone. In particular, the petitioners challenged the EPA's interpretation of the term "significance" in section 110(a)(2)(D)(i)(I) in two pertinent ways. First, the petitioners

challenged the EPA's consideration of the cost of reducing ozone in quantifying those amounts of emissions from upwind states that would constitute "significant" contribution. *See id.* at 674. Second, petitioners challenged the EPA's application of a uniform control strategy to quantify upwind states' emission reduction obligations. *See id.* at 679. The court concluded as to both decisions that "there is nothing in the text, structure, or history of [section] 110(a)(2)(D) that bars EPA from considering cost in its application." *Id.* The court also considered arguments by petitioners that EPA's approach to quantifying emission reductions was not based on any "intelligible principles" and therefore was in violation of the non-delegation doctrine. *See id.* at 680. The court held that the doctrine was not violated because "[b]efore assessing 'significance,' EPA must find (1) emissions activity within a state; (2) show with modeling or other evidence that such emissions are migrating into other states; and (3) show that the emissions are contributing to nonattainment." *Id.*

ii. Clean Air Interstate Rule

27. The Clean Air Interstate Rule (CAIR), promulgated in 2005, addressed both the 1997 PM2.5 and the 1997 ozone standards under the good neighbor provision. 70 Fed. Reg. 25,162 (May 12, 2005). CAIR required SIP revisions in 28 states and the District of Columbia to ensure that certain emissions of sulfur dioxide (SO_2) and/or NO_X – important precursors of regionally transported PM2.5 (SO_2 and NO_X) and ozone (NO_X) – were prohibited.

28. As in the NO_X SIP Call, the EPA used air quality modeling techniques to assess the impact of each upwind State's inventory of NO_X and VOC emissions on downwind ozone nonattainment. The EPA determined that upwind NO_X emissions contribute significantly to 8-hour ozone nonattainment as of the year 2010. Therefore, the EPA projected NO_X emissions to

the year 2010, assuming certain required controls, and then modeled the impact of those projected emissions on downwind 8-hour ozone nonattainment in that year. *Id.* at 25,175.

29. The EPA then identified those states that would be subject to the rule based on the same criteria employed in the NO_X SIP Call. Regarding the contribution to downwind pollution from upwind states, the EPA explained that "[t]ypically, two or more States contribute transported pollution to a single downwind area, so that the 'collective contribution' is much larger than the contribution of any single State." *Id.* at 25,186. The EPA determined that "emissions from an upwind State contribute significantly to nonattainment if the maximum contribution is at least 2 parts per billion, the average contribution is greater than one percent, and certain other numerical criteria are met." *Id.* at 25,175.

30. Finally, the EPA adopted the same approach to quantifying the level of states' significant contribution to downwind nonattainment areas in CAIR as it used in the NO_X SIP Call, based on the determination in the NO_X SIP Call that downwind ozone nonattainment is due to the impact of emissions from numerous upwind sources and states. *See id.* at 25,172. Therefore, in order to apportion emission reduction responsibility among multiple upwind states contributing to an identified downwind nonattainment receptor, the EPA interpreted the statute as requiring emissions reductions in "amounts that would result from application of highly cost-effective controls" in each state significantly contributing to downwind nonattainment. *Id.* at 25,175. The EPA determined that control costs up to $2,000 per ton (1990$) were highly cost-effective for reducing ozone season NO_X emissions, in part because this same level of cost-effective control was also used in the NO_X SIP Call. *Id.* at 25,173. The EPA determined that this level of reductions represented each upwind states' significant contribution to downwind nonattainment under the good neighbor provision. In determining the appropriate level of

controls, the EPA considered feasibility issues including the applicability, performance, and reliability of different types of pollution control technologies for different types of sources, along with other implementation costs for particular groups of sources. *Id.* The EPA determined that, at that time, EGUs were the only source category for which highly cost-effective controls were available. *Id.* at 25,213-15.

31. As under the NO_X SIP Call, to satisfy their SIP obligations states were given the option of requiring their sources to participate in regional allowance trading programs. When the EPA promulgated the final CAIR in May 2005, the EPA also issued a national rule finding that states had failed to submit SIPs to address the requirements of CAA section 110(a)(2)(D)(i) with respect to the 1997 PM2.5 and the 1997 ozone NAAQS. 70 Fed. Reg. 21,147. Those states were required by the CAA to have submitted good neighbor SIPs for those standards by July 2000. *Id.* at 21,148. These findings of failure to submit triggered a 2-year clock for the EPA to issue FIPs to address interstate transport, and the EPA subsequently promulgated FIPs to ensure that the emissions reductions required by CAIR would be achieved on schedule. 71 Fed. Reg. 25,328 (April 28, 2006). The FIPs required EGUs in each covered state to participate in federal allowance trading programs unless and until the state submitted and the EPA approved a SIP revision to achieve the required emission reductions either through comparable state allowance trading programs or in some other way.

32. CAIR was remanded to the EPA by the D.C. Circuit in *North Carolina v. EPA*, 531 F.3d 896 (D.C. Cir. 2008), *modified on reh'g*, 550 F.3d 1176. The court addressed a number of issues, among them several that have guided the EPA's further efforts to address the interstate transport of ozone. In particular, the court held that the implementation of the emissions budgets quantified in CAIR through a trading program that permitted the unrestricted use for compliance

of surplus allowances obtained from sources in other states did not achieve "something measurable toward the goal of prohibiting the sources 'within the State' from contributing to nonattainment or interfering with maintenance 'in any other State'." 531 F.3d at 908. The court also held that, because CAIR was designed as a complete remedy for the good neighbor requirements, it "must actually require elimination of emissions from sources that contribute significantly and interfere with maintenance in downwind areas." *Id.* The court further held that the EPA erred by regulating only those upwind states tied to downwind nonattainment problems, holding that the EPA must give "independent effect" to the interfere with maintenance clause of CAA section 110(a)(2)(D)(i)(I) by identifying downwind areas that might struggle to maintain the NAAQS independent of whether the area is or ever was in nonattainment. *Id.* at 910-11. Finally, the court evaluated the EPA's interpretation of the requirement in section 110(a)(2)(D)(i)(I) that states prohibit emissions in amounts that "will" significantly contribute to nonattainment or interfere with maintenance of the NAAQS. The court determined that the EPA's approach to defining nonattainment relative to both present-day violations and projected future nonattainment was a reasonable interpretation of the statute. *Id.* at 913-914. While the court instructed the EPA to replace CAIR "from the ground up," *Id.* at 929, the EPA was permitted to continue implementing CAIR during the development of its replacement.

iii. Cross-State Air Pollution Rule

33. In 2011, the EPA promulgated the Cross-State Air Pollution Rule (CSAPR) to address the issues raised by the remand of CAIR, to replace CAIR with respect to the 1997 ozone NAAQS and 1997 PM2.5 NAAQS, and additionally to address the good neighbor provision for the 2006 PM2.5 NAAQS. 76 Fed. Reg. 48,208, 48,217 (Aug. 8, 2011). CSAPR, which replaces CAIR entirely, requires 28 states to reduce SO_2 emissions, annual NO_X emissions, and/or ozone

season NO_X emissions that significantly contribute to other states' nonattainment or interfere with other states' abilities to maintain these air quality standards.

34. CSAPR used a four-step framework to address the good neighbor provision as to the 2008 ozone NAAQS, an approach that reflects the evolution of the EPA's approach to address regional interstate ozone transport since the NO_X SIP Call and CAIR. The four steps of the CSAPR framework are: (1) identifying downwind receptors that are expected to have problems attaining or maintaining clean air standards (i.e., NAAQS); (2) determining which upwind states contribute to these identified problems in amounts sufficient to "link" them to the downwind air quality problems; (3) for states linked to downwind air quality problems, identifying upwind emissions that significantly contribute to nonattainment or interfere with maintenance of a standard; and (4) for states that are found to have emissions that significantly contribute to nonattainment or interfere with maintenance of the NAAQS downwind, implementing reductions through regional emission allowance trading programs.

35. As in the NO_X SIP Call and CAIR, in step 1 of the CSAPR framework, the EPA identified downwind areas with air quality problems based on air quality modeling projections to a future compliance year, in this case 2012. *See id.* at 48,229. The modeling was used to identify not only those areas projected to be in nonattainment with one of the three NAAQS addressed by the rule, but also to identify those areas that may, despite projected attainment, struggle to maintain the NAAQS, in response to the court's holding in *North Carolina*, 531 F.3d at 910-11 (holding that the EPA must give "independent effect" to the interfere with maintenance clause of the good neighbor provision).

36. Citing to prior determinations made in the NO_X SIP Call and CAIR, the EPA continued to find that multiple upwind states contributed to downwind ozone nonattainment.

Specifically, the EPA found "that the total 'collective contribution' from upwind sources represents a large portion of PM2.5 and ozone at downwind locations and that the total amount of transport is composed of the individual contribution from numerous upwind states." *Id.* at 48,237. Accordingly, in step 2 of the CSAPR framework, the EPA identified upwind states as "linked" to downwind receptors as those states that were modeled to contribute at or above a threshold equivalent to one percent of the applicable NAAQS. *Id.* at 48,236. Upwind states linked to one of these downwind nonattainment or maintenance areas were then evaluated to determine what level of emissions reductions should be required of each state. *Id.*

37. In order to apportion emissions reduction responsibility among multiple upwind states contributing to an identified downwind nonattainment or maintenance problem in step 3 of the CSAPR framework, the EPA used cost- and air-quality-based criteria to quantify the amount of emissions that represent a linked state's significant contribution to nonattainment and inference with maintenance in another state. *Id.* at 48,246. The EPA refined its approach for quantifying state emissions reductions used in the NO_X SIP Call and CAIR, considering both cost and air quality improvements to identify the portion of a state's contribution to a downwind air quality problem that constitutes its significant contribution to nonattainment and interference with maintenance of the NAAQS. *Id.* at 48,248. These refinements were intended to be responsive to both the *Michigan* and *North Carolina* decisions regarding the Agency's use of cost to apportion upwind state emission reduction responsibility. *Id.*

38. The EPA explained that "using both air quality and cost factors allows EPA to consider the full range of circumstances and state-specific factors that affect the relationship between upwind emissions and downwind nonattainment and maintenance problems." *Id.* The EPA continued, "considering cost takes into account the extent to which existing [power] plants

are already controlled as well as the potential for, and relative difficulty of, additional emission reductions." *Id.* "The methodology defines each state's significant contribution to nonattainment and interference with maintenance as the emissions reductions available at a particular cost threshold in a specific upwind state which effectively address nonattainment and maintenance of the relevant NAAQS in the linked downwind state of concern." *Id.*

39. The methodology, which the EPA refers to as its multi-factor test for quantifying significant contribution to nonattainment and interference with maintenance, includes the following: identification of available NOx control strategies and the associated costs of such controls; identification of upwind "cost thresholds" representing uniform levels of NO_X control stringency; identification of each state's emission reduction potential available at these cost thresholds; quantification of state emissions budgets (i.e., remaining emissions) reflecting the upwind emissions reductions previously assessed at each cost threshold; assessment of the impact of upwind emissions reductions on downwind air quality at each cost threshold; selection of the level of emissions limits (i.e., emissions budgets) that deliver cost-effective emissions reductions and downwind air quality improvement without over-controlling.

40. The EPA determined that cost-effective emissions reductions were available from EGUs, and that there were few or no reductions available from non-EGUs at costs below the thresholds the EPA identified in the final rulemaking. *Id.* at 48,249. Specifically, with respect to ozone season NO_X, CSAPR finalized EGU ozone season NO_X budgets using uniform cost of $500 per ton (2007$). *Id.* at 48,256-57. Accordingly, the EPA quantified state emissions budgets for certain EGUs in each state and, to accomplish implementation aligned with the applicable attainment deadlines in step 4 of the CSAPR framework, the EPA promulgated FIPs for each of the 28 states covered by CSAPR which require affected EGUs to participate in

regional allowance trading programs to achieve the necessary emissions reductions. *Id.* at 48,210-11.

41. CSAPR was subject to nearly four years of litigation in the D.C. Circuit and the Supreme Court, which resulted in long periods of significant uncertainty regarding the EPA's authority and obligations pursuant to the good neighbor provision during the litigation. On December 30, 2011, the D.C. Circuit granted a number of motions from state and industry petitioners to stay the implementation of the CSAPR allowance trading programs pending further litigation, days before the first compliance period was scheduled to begin. *EME Homer City Generation, L.P. v. EPA*, No. 11-1302 (D.C. Cir. Dec. 30, 2011), ECF No. 1350421. Subsequently, on August 21, 2012, the D.C. Circuit issued a decision in *EME Homer City Generation, L.P. v. EPA*, 696 F.3d 7 (D.C. Cir. 2012) (*EME Homer City I*), vacating CSAPR based on two holdings. First, the court held that states had no obligation to submit good neighbor SIPs until the EPA had first quantified each state's good neighbor obligation. *Id.* The implication of this decision was that the EPA did not have authority to promulgate the CSAPR FIPs as a result of states' failure to submit or the EPA's disapproval of good neighbor SIPs. The D.C. Circuit also held that the EPA erred in apportioning upwind emission reduction obligations using uniform cost thresholds, and that such an approach may result in unnecessary over-control of upwind state emissions. The EPA sought review, first with the D.C. Circuit *en banc* and then with the Supreme Court. While the D.C. Circuit declined to consider the EPA's appeal *en banc*, *EME Homer City Generation, L.P. v. EPA*, No. 11-1302 (D.C. Cir. Jan. 24, 2013), ECF No. 1417012, on January 23, 2013, the Supreme Court granted the EPA's petition for certiorari, *EPA v. EME Homer City Generation, L.P.*, 133 S. Ct. 2857 (2013).

42. On April 29, 2014, the Supreme Court issued a decision reversing the D.C. Circuit's *EME Homer City I* opinion on CSAPR. *EPA v. EME Homer City Generation, L.P.*, 134 S. Ct. 1584 (2014). The Court held that under the plain language of the CAA, states must submit SIPs addressing the good neighbor provision within three years of promulgation of a new or revised NAAQS, regardless of whether the EPA first provides guidance, technical data or rulemaking to quantify the state's obligation. *Id.* at 1600-01. The Court also reversed the D.C. Circuit's holding that the EPA's use of cost to apportion upwind states' emission reduction obligations was impermissible, finding that the EPA's approach was a "permissible construction of the statute." *Id.* at 1606-07. The Court explained that "EPA must decide how to differentiate among otherwise like contributions of multiple upwind states," and that the EPA's approach to apportion such responsibility based on those emissions that can be reduced at a uniform cost-threshold "is an efficient and equitable solution to the allocation problem the Good Neighbor Provision requires the Agency to address." *Id.* at 1607.

43. The Supreme Court agreed with the D.C. Circuit to the extent the court held that "EPA cannot require a State to reduce its output of pollution by more than is necessary to achieve attainment in every downwind State or at odds with the one-percent threshold the Agency has set." *Id.* at 1608. The Court acknowledged that

> instances of "over-control" in particular downwind locations . . . may be incidental to reductions necessary to ensure attainment elsewhere. Because individual upwind States often "contribute significantly" to nonattainment in multiple downwind locations, the emissions reductions required to bring one linked downwind State into attainment may well be large enough to push other linked downwind States over the attainment line. As the Good Neighbor Provision seeks attainment in *every* downwind State, however, exceeding attainment in one State cannot rank as "over-control" unless unnecessary to achieving attainment in *any* downwind State. Only reductions unnecessary to downwind attainment *anywhere* fall outside the Agency's statutory authority.

Id. at 1608-09 (footnotes excluded). The Court further explained that "while EPA has a statutory duty to avoid over-control, the Agency also has a statutory obligation to avoid 'under-control,' *i.e.*, to maximize achievement of attainment downwind." *Id.* at 1609. The Supreme Court remanded the litigation to the D.C. Circuit for further proceedings.

44. Following the Supreme Court's remand, on October 23, 2014, the D.C. Circuit granted the EPA's request to lift the stay of implementation and toll the CSAPR implementation deadlines by three years. *EME Homer City Generation, L.P. v. EPA*, No. 11-1302 (D.C. Cir. Oct. 23, 2014), ECF No 1518738. Accordingly, implementation of CSAPR formally began in January 2015. *See* 79 Fed. Reg. 71,663 (Dec. 3, 2014).

45. On July 28, 2015, the D.C. Circuit issued its opinion on CSAPR regarding the remaining legal issues raised by the petitioners on remand from the Supreme Court, *EME Homer City Generation, L.P. v. EPA*, 795 F.3d 118 (*EME Homer City II*). This decision largely upheld the EPA's approach to addressing interstate transport in CSAPR, leaving the rule in place and affirming the EPA's interpretation of various statutory provisions and the EPA's technical decisions. However, the decision also remanded the rule without vacatur for reconsideration of the CSAPR emission budgets for certain states, finding that those budgets over-control or may over-control upwind state emissions in violation of the Supreme Court's holding. In particular, the court declared invalid the CSAPR NO_X ozone season emission budgets of 11 states, holding that those budgets over-control with respect to the downwind air quality problems to which those states were linked for the 1997 ozone NAAQS. *Id.* at 130. The court also remanded without vacatur the CSAPR SO_2 annual emission budgets for four states (Alabama, Georgia, South Carolina, and Texas) for reconsideration, holding that those budgets may over-control with respect to the downwind air quality problems to which those states were linked for the PM2.5

NAAQS. *Id.* at 129, 138. The court instructed the EPA to act "promptly" in addressing these issues on remand. *Id.* at 132.[6]

iv. The 2008 Ozone NAAQS Good Neighbor Obligation and the CSAPR Update

a. The 2008 Ozone NAAQS

46. On March 12, 2008, the EPA promulgated a revision to the NAAQS, lowering both the primary and secondary standards for ozone to 75 ppb. *See* National Ambient Air Quality Standards for Ozone, Final Rule, 73 Fed. Reg. 16,436 (March 27, 2008). These revisions of the NAAQS, in turn, triggered a 3-year deadline of March 12, 2011, for states to submit SIP revisions addressing infrastructure requirements under CAA sections 110(a)(1) and 110(a)(2), including the good neighbor provision. During this 3-year SIP development period, on September 16, 2009, the EPA announced[7] that we would reconsider the 2008 ozone NAAQS. To reduce the workload for states during the interim period of reconsideration, the EPA also announced its intention to propose staying implementation of the 2008 standards. On January 6, 2010, the EPA proposed to revise the 2008 NAAQS for ozone from 75 ppb to a level within the range of 60 to 70 ppb. *See* National Ambient Air Quality Standards for Ozone, 75 Fed. Reg. 2,938 (Jan. 19, 2010). The EPA indicated its intent to issue final standards based upon the reconsideration by summer 2011.

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[6] In 2011, the EPA finalized a supplemental rule that added five states to the CSAPR NO_X ozone season allowance trading program. 76 Fed. Reg. 80,760 (Dec. 27, 2011). In 2012, the EPA also finalized two rules making certain revisions to CSAPR. 77 Fed. Reg. 10,324 (Feb. 21, 2012); 77 Fed. Reg. 34,830 (June 12, 2012). Various petitioners filed legal challenges to these rules in the D.C. Circuit. *See Public Service Company of Oklahoma v. EPA*, No. 12–1023 (D.C. Cir., filed Jan. 13, 2012); *Wisconsin Public Service Corp. v. EPA*, No. 12–1163 (D.C. Cir., filed Apr. 6, 2012); *Utility Air Regulatory Group v. EPA*, No. 12–1346 (D.C. Cir., filed Aug. 9, 2012). These cases were held in abeyance during the pendency of the litigation in *EME Homer City*, and remain pending in the D.C. Circuit as of the date of signature of this rule.

[7] Fact Sheet. The EPA to reconsider Ozone Pollution Standards, available at http://www.epa.gov/groundlevelozone/pdfs/O3_Reconsideration_FACT%20SHEET_091609.pdf

47. As described above at paragraph 33, on August 8, 2011, the EPA published the original CSAPR rulemaking, in response to the D.C. Circuit's remand of the EPA's prior federal transport rule, CAIR. *See* 76 Fed. Reg. 48,208. The original CSAPR addressed ozone transport under the 1997 ozone NAAQS, but did not address the 2008 ozone standard, because the 2008 ozone NAAQS was under reconsideration when CSAPR was finalized.

48. On September 2, 2011, consistent with the direction of the President, the Administrator of the Office of Information and Regulatory Affairs of the Office of Management and Budget returned the draft final 2008 ozone rule the EPA had developed upon reconsideration to the agency for further consideration.[8] In view of that action and the timing of the agency's ongoing periodic review of the ozone NAAQS required under CAA section 109 (as announced on September 29, 2008), the EPA decided to coordinate further proceedings on its voluntary reconsideration of the 2008 ozone standards with its ongoing periodic review of the ozone NAAQS. Implementation efforts for the original 2008 ozone standards were renewed.

49. As described in paragraphs 41-45, a number of legal developments pertaining to the EPA's promulgation of the original CSAPR rulemaking also created uncertainty surrounding the EPA's statutory interpretation and implementation of the good neighbor provision as it applied to the 2008 ozone NAAQS. On August 21, 2012, the D.C. Circuit issued a decision in *EME Homer City I* addressing several legal challenges to CSAPR and holding, among other things, that states had no obligation to submit good neighbor SIPs until the EPA had first quantified each state's good neighbor obligation. 696 F.3d at 31. According to that decision, the submission deadline for good neighbor SIPs under the CAA would not necessarily be tied to the

[8] *See* Letter from Cass R. Sunstein, Administrator, Office of Information and Regulatory Affairs, to Lisa Jackson, Administrator, U.S. Environmental Protection Agency (Sept. 2, 2011), available at http://www.reginfo.gov/public/return/EPA_Return_Letter_9-2-2011.pdf.

promulgation of a new or revised NAAQS. While the EPA disagreed with this interpretation of the statute and sought review of the decision in the D.C. Circuit and the Supreme Court, the EPA complied with the D.C. Circuit's ruling during the pendency of its appeal. In particular, the EPA indicated that, consistent with the D.C. Circuit's opinion, we would not at that time issue findings that states had failed to submit good neighbor SIPs for the 2008 ozone NAAQS.[9] On April 29, 2014, the Supreme Court reversed the D.C. Circuit's *EME Homer City I* opinion on CSAPR and held, among other things, that under the plain language of the CAA, states must submit SIPs addressing the good neighbor provision within 3 years of promulgation of a new or revised NAAQS, regardless of whether the EPA first provides guidance, technical data, or rulemaking to quantify the state's obligation. *EPA v. EME Homer City Generation, L.P.*, 134 S. Ct. at 1600-01. Thus, the Supreme Court affirmed that states have an obligation in the first instance to address the good neighbor provision after promulgation of a new or revised NAAQS, a holding that also applies to the states' obligation to address transport for the 2008 ozone NAAQS. This decision confirmed that states were therefore required to submit SIPs addressing the good neighbor provision with respect to the 2008 ozone NAAQS by March 12, 2011, but the uncertainty engendered by that litigation constrained the EPA's and states' ability to address the good neighbor provision as to that NAAQS before the Supreme Court's decision was issued.

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[9] *See, e.g.*, Memorandum from the Office of Air and Radiation former Assistant Administrator Gina McCarthy to the Air Division Directors, Regions 1-10, "Next Steps for Pending Redesignation Requests and State Implementation Plan Actions Affected by the Recent Court Decision Vacating the 2011 Cross-State Air Pollution Rule" (Nov. 19, 2012), available at https://www3.epa.gov/ttn/naaqs/aqmguide/collection/cp2/20121119_mccarthy_redesig_sips_csapr_vacature.pdf; 78 Fed. Reg. 65,559 (Nov. 1, 2013) (final action on Florida infrastructure SIP submission for 2008 8-hour ozone NAAQS); 78 Fed. Reg. 14,450 (Mar. 6, 2013) (final action on Tennessee infrastructure SIP submissions for 2008 8-hour ozone NAAQS); Final Rule, Findings of Failure To Submit a Complete State Implementation Plan for section 110(a) Pertaining to the 2008 Ozone National Ambient Air Quality Standard, 78 Fed. Reg. 2,884 (Jan. 15, 2013).

b. The EPA's FIP Obligation with Respect to the Good Neighbor Provision and the 2008 Ozone NAAQS

50. On September 8, 2009, the State of Kentucky submitted a SIP purporting to address infrastructure SIP requirements of CAA section 110(a)(2) for the 2008 ozone NAAQS. On July 17, 2012, Kentucky withdrew its September 8, 2009 SIP submission and concurrently provided a new submission addressing the infrastructure SIP requirements for the 2008 ozone NAAQS, including the good neighbor provision.

51. On March 7, 2013, the EPA finalized action on the State of Kentucky's SIP submission addressing, among other things, the good neighbor provision requirements for the 2008 ozone NAAQS. 78 Fed. Reg. 14,681 (March 7, 2013). The EPA disapproved the submission as to the good neighbor requirements. In the notice, the EPA explained that the disapproval of the good neighbor portion of the state's infrastructure SIP submission did not trigger a mandatory duty for the EPA to promulgate a FIP to address these requirements. *Id.* at 14,683. Citing the D.C. Circuit's decision *EME Homer City I*, the EPA explained that the court concluded states have no obligation to make a SIP submission to address the good neighbor provision for a new or revised NAAQS until the EPA first defines a state's obligations pursuant to that section. *Id.* Therefore, because a good neighbor SIP addressing the 2008 ozone standard was not at that time required, the EPA indicated that its disapproval action would not trigger an obligation for the EPA to promulgate a FIP to address the interstate transport requirements. *Id.*

52. On April 30, 2013, Sierra Club filed a petition for review of the EPA's final action in the United States Court of Appeals for the Sixth Circuit based on the agency's conclusion that the FIP obligation was not triggered by the disapproval of Kentucky's good neighbor SIP. *Sierra Club v. EPA*, Case No. 13-3546 (6th Cir., filed Apr. 30, 2013). Subsequently, on April 29, 2014, the Supreme Court issued a decision reversing and vacating the

D.C. Circuit's decision in *EME Homer City I*. Following the Supreme Court decision, the EPA requested, and the Sixth Circuit granted, vacatur and remand of the portion of the EPA's final action on Kentucky's good neighbor SIP that determined that the FIP obligation was not triggered by the disapproval. *See* Order, *Sierra Club v. EPA*, Case No. 13-3546 (Mar. 13, 2015), ECF No. 74-1.

53. On October 24, 2016, the EPA issued a final action correcting the portion of the Kentucky disapproval notice indicating that the FIP obligation would not be triggered by the SIP disapproval, but rather on the date of the judgment issued in *EPA v. EME Homer City Generation*, or on June 2, 2014. 81 Fed. Reg. 74,504, 74,513. The EPA explained that we do not believe that the FIP obligation was triggered as of the date of the SIP disapproval because the controlling law as of that date was the D.C. Circuit decision in *EME Homer City I*, which held that states had no obligation to submit a SIP and the EPA had no authority to issue a FIP until the EPA first quantified each state's emission reduction obligation under the good neighbor provision. Rather, the EPA concluded that the FIP obligation was triggered when the Supreme Court clarified the state and federal obligations with respect to the good neighbor provision. Thus, the EPA finalized its determination that the FIP obligation was triggered as of June 2, 2014, and that the EPA was obligated to promulgate a FIP that corrects the deficiency by June 2, 2016. *Id.*[10]

54. Subsequent to the disapproval of the Kentucky SIP, on July 13, 2015, the EPA published a rule finding that 24 additional states failed to make complete submissions that

[10] Plaintiff Sierra Club's contention that the EPA could have promulgated a FIP for Kentucky on March 12, 2011, Pl.'s Br. at 4, ignores the requirements of CAA section 110(c)(1) that the EPA must take a prerequisite action to determine that the state has failed to submit a SIP addressing the statutory requirements before we have the authority to promulgate a FIP.

address the requirements of section 110(a)(2)(D)(i)(I) related to the interstate transport of pollution as to the 2008 ozone NAAQS. *See* 80 Fed. Reg. 39,961 (July 13, 2015) (effective Aug. 12, 2015). The finding action triggered a 2-year deadline for the EPA to issue FIPs to address the good neighbor provision for these states by August 12, 2017. The states included in this finding of failure to submit are: Alabama, Arkansas, California, Florida, Georgia, Illinois, Iowa, Kansas, Maine, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, New Hampshire, New Mexico, North Carolina, Oklahoma, Pennsylvania, South Carolina, Tennessee, Vermont, Virginia, and West Virginia.

55. The EPA issued separate notices finding that Maryland and New Jersey failed to make complete submissions that address the requirements of section 110(a)(2)(D)(i)(I) related to the interstate transport of pollution as to the 2008 ozone NAAQS. *See* 81 Fed. Reg. 47,040 (July 20, 2016) (Maryland, effective Aug. 19, 2016); 81 Fed. Reg. 38,963 (June 15, 2016) (New Jersey, effective July 15, 2016). The finding actions triggered a 2-year deadline for the EPA to issue FIPs to address the good neighbor provision for Maryland by August 19, 2018 and New Jersey by July 15, 2018.

56. The EPA has also finalized disapprovals or partial disapprovals of the good neighbor SIPs from Indiana, Louisiana, New York, Ohio, Texas, Utah, and Wisconsin, triggering the EPA's authority and obligation to promulgate FIPs that implement the requirements of the good neighbor provision for those states. The deadlines for the EPA to issue FIPs to address the good neighbor provision for these states are two years from the effective dates of the individual notices disapproving the states' SIPs: July 15, 2018 (Indiana, Ohio, and New Jersey); September 12, 2018 (Louisiana, Texas, and Wisconsin); September 26, 2018 (New York); and November

18, 2018 (Utah).[11] The EPA has also proposed to partially disapprove the good neighbor SIP for the State of Wyoming with respect to the 2008 ozone NAAQS. 81 Fed. Reg. 81,712 (Nov. 18, 2016).

c. The CSAPR Update

57. On October 26, 2016, the EPA published an update to CSAPR intended to respond to the D.C. Circuit's remand of the NO_X ozone season emission budgets and to address the good neighbor provision for the 2008 ozone NAAQS, referred to as the CSAPR Update. *See* Cross-State Air Pollution Rule Update for the 2008 ozone NAAQS, 81 Fed. Reg. 74,504.[12] The CSAPR Update requires EGUs in 22 states, including Kentucky, to reduce ozone season NO_X emissions that significantly contribute to other states' nonattainment or interfere with other states' abilities to maintain the 2008 ozone NAAQS.

58. The CSAPR Update used the same four-step framework as the original CSAPR rulemaking to address the good neighbor provision as to the 2008 ozone NAAQS: (1) identifying downwind receptors that are expected to have problems attaining or maintaining clean air standards (i.e., NAAQS); (2) determining which upwind states contribute to these identified problems in amounts sufficient to "link" them to the downwind air quality problems; (3) for states linked to downwind air quality problems, identifying upwind emissions that significantly contribute to nonattainment or interfere with maintenance of a standard; and (4) for states that

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[11] The EPA also approved SIPs addressing the good neighbor provision with respect to the 2008 ozone NAAQS for 14 states: Alaska, Arizona, Colorado, Idaho, Maine, Montana, Nebraska, New Hampshire, North Dakota, Oregon, Rhode Island, South Dakota, Vermont, and Washington.

[12] The CSAPR Update also addressed remaining FIP obligations as to the 1997 ozone NAAQS. 81 Fed. Reg. at 74,525-26. It is worth noting that while Plaintiff Sierra Club cites this as an example of "extreme delay," Pl.'s Br. at 24, the EPA had issued three prior rulemakings intended to address the good neighbor provision as to this standard, including the NO_X SIP Call, CAIR, and CSAPR.

are found to have emissions that significantly contribute to nonattainment or interfere with maintenance of the NAAQS downwind, implementing reductions through regional emission allowance trading programs. *Id.* at 74,517.

59. The four-steps of the CSAPR framework were developed considering the various aspects of the regional, interconnected nature of interstate ozone transport. Steps 1 and 2 identify the extent of the regional interstate ozone transport problem. Step 3 identifies the appropriate regional level or levels of uniform emission reduction stringency (represented by cost) that upwind states should collectively make in order to address interstate pollution transport. And step 4 ensures that these reductions are implemented across the region.

60. To evaluate the scope of the interstate ozone transport problem, CSAPR step 1 identifies downwind areas that are expected to have problems attaining and maintaining the ozone NAAQS using modeling that projected air quality to a future compliance year. *Id.* The EPA aligned the analysis and implementation of the CSAPR Update with the 2017 ozone season (May 1 – September 30) in order to assist downwind states with timely attainment of the 2008 ozone NAAQS. *Id.* at 74,516. The EPA's final 2008 Ozone NAAQS SIP Requirements Rule, 80 Fed. Reg. 12,264, 12,268 (Mar. 6, 2015), revised the attainment deadline for ozone nonattainment areas currently designated as Moderate to July 20, 2018. *See* 40 CFR 51.1103. In order to demonstrate attainment by this deadline, states will need to rely on design values calculated using ozone season data from 2015 through 2017, since the July 20, 2018 deadline does not afford enough time for measured data of the full 2018 ozone season. [13]

[13] The EPA released a memorandum in January 2015 with air quality modeling conducted for a 2018 analytic year intended to assist states with developing SIPs to address the good neighbor provision with respect to the 2008 ozone NAAQS. *See* Memorandum from Steve Page, Director of Office of Air Quality Planning and Standards, to Regional Air Division Directors, Regions 1-

61. CSAPR step 2 identifies upwind states that collectively contribute to these identified downwind areas. In the CSAPR Update, the EPA used a screening threshold of one percent of the NAAQS to identify states that are "linked" to downwind ozone problems sufficient for further evaluation for significant contribution to nonattainment or interference with maintenance of the NAAQS under the good neighbor provision. *Id.* at 74,518. This same threshold for analysis was used in the original CSAPR as to the 1997 ozone NAAQS. The EPA found this threshold to be reasonable because the agency determined that much of the ozone nonattainment problem in the eastern half of the United States results from collective impacts of relatively small contributions from a number of upwind states. *Id.* As discussed at paragraphs 20, 29, and 36, the EPA has consistently determined in past analyses conducted for the NO_X SIP Call, CAIR, and CSAPR that ozone nonattainment problems generally result from relatively small contributions from many upwind states, along with contributions from in-state sources and in some cases, substantially larger contributions from a subset of particular upwind states. *Id.* Thus, to address this collective air pollution problem, the EPA has consistently found it to be appropriate to use a low air quality threshold when analyzing states' collective contributions to downwind nonattainment and maintenance for ozone. *Id.*

62. CSAPR step 3 quantifies emission budgets to reduce interstate ozone pollution transport. The CSAPR Update emission budgets limit allowable emissions and represent the

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10, "Information on Interstate Transport 'Good Neighbor' Provision for the 2008 Ozone National Ambient Air Quality Standards (NAAQS) Under Clean Air Act (CAA) Section 110(a)(2)(D)(i)(I)" (Jan. 22, 2015), available at https://www.epa.gov/sites/production/files/2015-11/documents/goodneighborprovision2008naaqs.pdf. Subsequent to the release of this memo, the EPA issued the 2008 Ozone SIP Requirements Rule revising the original December 2018 attainment date to July 2018 in response to a court decision. This revision required the EPA to revise the selected future analytic year for purposes of evaluating interstate ozone transport with respect to the 2008 ozone NAAQS.

emission levels that remain after each state makes EGU NO_X emission reductions that are necessary to reduce interstate ozone transport for the 2008 NAAQS. The EPA's assessment of upwind state emission budgets reflects analysis of uniform NO_X emission control stringency. Each level of uniform NO_X control stringency represents an estimated incremental cost per ton of NO_X reduced and is characterized by a set of pollution control measures. *Id.* at 74,519.

63. As noted at paragraph 60, the EPA aligned implementation of the CSAPR Update with the 2017 ozone season in order to assist downwind states with the July 20, 2018 attainment date. Therefore, consistent with the court's instruction in *North Carolina*, 531 F.3d at 911-12, the EPA identified achievable upwind emissions reductions and aligned implementation of these reductions, to the extent possible, for the 2017 ozone season. These 2017 reductions can positively influence air quality that would be used to demonstrate attainment. To the extent that ozone improvements in 2017 yield clean data for that year, states can request a 1-year attainment date extension under CAA section 181(a)(5), as interpreted in 40 CFR 51.1107.

64. Given the unique circumstances surrounding the implementation of the 2008 ozone standard that delayed efforts by states and the EPA to address interstate transport with respect to that standard, described above, the EPA had limited time in which to finalize a rulemaking that would achieve emission reductions by the 2017 ozone season in time to assist downwind states with demonstrating attainment by the July 2018 attainment date. *Id.* at 74,516. Accordingly, the EPA decided to focus its efforts in the CSAPR Update rulemaking on the immediately available and cost-effective emission reductions that are achievable in that timeframe.

65. The EPA applied a multi-factor test, the same multi-factor test that was used in the original CSAPR, to evaluate increasing levels of uniform NO_X control stringency. The multi-

factor test considers cost, available emission reductions, and downwind air quality impacts to determine the appropriate level of uniform NO_X control stringency that addresses the impacts of interstate transport on downwind nonattainment or maintenance receptors. *Id.* at 74,519. The uniform NO_X emission control stringency, represented by incremental cost, also serves to apportion the reduction responsibility for downwind air quality problems among collectively-contributing upwind states. This approach to quantifying upwind state emission reduction obligations using uniform cost was reviewed by the Supreme Court in *EPA v. EME Homer City Generation*, which held that using such an approach to apportion emission reduction responsibilities among upwind states that are collectively responsible for downwind air quality impacts "is an efficient and equitable solution to the allocation problem the Good Neighbor Provision requires the Agency to address." 134 S. Ct. at 1607.

66. To accomplish implementation aligned with the applicable NAAQS attainment deadline, the EPA promulgated FIPs for each of the 22 states covered by the CSAPR Update which require affected sources to participate in a regional allowance trading program to achieve the necessary emission reductions by 2017. *Id.* at 74,516.

67. While these reductions are necessary to assist downwind states in attaining and maintaining the 2008 ozone NAAQS, and are necessary to address good neighbor obligations for these states, the EPA acknowledges that they may not be sufficient to fully address these states' good neighbor obligations. *Id.* at 74,521. With respect to the 2008 ozone standard, the EPA has not attempted to quantify the ozone season NO_X reductions that may be necessary to eliminate all significant contribution to nonattainment or interference with maintenance in other states. Given the time constraints for implementing NO_X reduction strategies, the EPA believed that implementation of a full remedy that included emission reductions from EGUs as well as other

sectors was not achievable for 2017. However, a partial remedy was achievable for 2017 and therefore the CSAPR Update focused on these more immediately available reductions.

68. As the EPA explained in the CSAPR Update, it was not feasible for the EPA to complete the analysis necessary to evaluate full elimination of each state's significant contribution to nonattainment or interference with maintenance in that rulemaking and also ensure that emissions reductions would be achieved by 2017. 81 Fed. Reg. at 74,522. In order to evaluate states' full good neighbor obligation, we must consider both non-EGU ozone season NO_X reductions and further EGU reductions that are achievable after 2017. *Id.* at 74,521. The EPA did not quantify non-EGU stationary source emissions reductions to address interstate ozone transport for the 2008 ozone NAAQS in the CSAPR Update for two reasons. First, the EPA explained that there was greater uncertainty in the EPA's assessment of non-EGU NOx mitigation potential, and that more time would be required for states and the EPA to improve non-EGU point source data and pollution control assumptions before we could develop emission reduction obligations based on that data. *Id.* at 74542. Second, the EPA explained that we did not believe that significant, certain, and meaningful non-EGU NOX reduction is in fact feasible for the 2017 ozone season. *Id.* Commenters generally agreed with the EPA that non-EGU emission reductions were not readily available for the 2017 ozone season but advocated that such reductions should be included as appropriate in future mitigation actions. *Id.*at 74,521-22.

69. Because the reductions required by the CSAPR Update are EGU-only and because the EPA focused the policy analysis for the CSAPR Update on reductions available by the beginning of the 2017 ozone season, the EPA determined that, for most states including Kentucky, the CSAPR Update reductions represent a first, partial step to addressing a given upwind state's significant contribution to downwind air quality impacts for the 2008 ozone

NAAQS. *Id.* at 74,521. Generally, a final determination of whether the EGU NO_X reductions quantified in the CSAPR Update represent a full or partial elimination of a state's good neighbor obligation for the 2008 NAAQS is subject to an evaluation of the contribution to interstate transport from non-EGUs and further EGU reductions that are achievable after 2017. However, the EPA explained that it was beneficial to implement, without further delay, EGU NO_X reductions that were achievable in the near term as quantified in the CSAPR Update. The NO_X emission reductions in the CSAPR Update are needed (although they may not be all that is needed) for these states to eliminate their significant contribution to nonattainment or interference with maintenance of the 2008 ozone NAAQS.

70. Thus, for 21 of the CSAPR Update states, including Kentucky, the EPA determined that the emission reductions achieved through implementation of the budgets finalized in the rule will partially satisfy the EPA's good neighbor FIP obligation to fully prohibit emissions that contribute to downwind air quality problems with respect to the 2008 ozone NAAQS pursuant to CAA section 110(a)(2)(D)(i)(I). *Id.* at 74,508.

71. The EPA also currently has an obligation to issue FIPs for an additional three western states not addressed by the CSAPR Update: California, New Mexico, and Utah.[14]

72. For one state, Tennessee, the EPA determined that the emission reductions achieved through implementation of its emission budget will fully satisfy the EPA's good neighbor FIP obligation for the 2008 ozone NAAQS. *Id.* at 74,508 n.19. The EPA was able to draw this conclusion because the downwind air quality problem to which Tennessee contributed was projected to be resolved after implementation of the emissions reductions required by the

[14] *See* 80 Fed. Reg. 39,961 (finding of failure of California and New Mexico to submit good neighbor SIPs addressing the good neighbor provision); 81 Fed. Reg. 71,991 (Oct. 19, 2016) (partial disapproval of Utah good neighbor SIP for 2008 ozone NAAQS).

CSAPR Update. Accordingly, no further emissions reductions would be required to address these air quality problems.

73. The EPA also determined that we have fully satisfied our FIP obligation as to 9 states (Florida, Georgia, Maine, Massachusetts, Minnesota, New Hampshire, North Carolina, South Carolina, and Vermont), which the EPA determined do not contribute significantly to nonattainment in, or interfere with maintenance by, any other state with respect to the 2008 ozone NAAQS.[15] *Id.* at 74,506.

74. Accordingly, the CSAPR Update fully addressed the EPA's FIP obligation with respect to the good neighbor provision for 10 states for the 2008 ozone NAAQS. While the EPA issued partial FIPs for 21 states, the EPA has a remaining obligation to promulgate FIPs for a total of 24 states, including Kentucky, to fully address the good neighbor provision with respect to the 2008 ozone NAAQS.

75. The CSAPR Update was published in the *Federal Register* on October 26, 2016, and petitions for review of that rulemaking must be filed within 60 days of publication. *Id.* at 74,586. Thus far, five states have filed a petition for review of the CSAPR Update in the D.C. Circuit. *See Wisconsin v. EPA*, No. 16-1406 (D.C. Cir., filed Nov. 23, 2016).

v. Timeframes for Conducting Regional Transport Rulemakings

76. The development of regional transport rulemakings to address the good neighbor provision for the ozone NAAQS typically requires an extensive amount of technical and policy analysis, as described in sections B.i through B.iii and explained in more detail below. Such

[15] The EPA subsequently received and approved good neighbor SIPs addressing the 2008 ozone NAAQS from four additional states: Maine, New Hampshire, Rhode Island, and Vermont. 81 FR 70631, October 13, 2016.

actions are also conducted as notice-and-comment rulemakings, including a public hearing. Such rulemakings typically involve relatively lengthy comment periods so that the public has ample time to review and develop documents on the detailed technical analysis. As prior regional interstate transport rulemakings have resulted in numerous detailed technical and legal comments that require careful consideration by the Agency, the EPA must conduct additional technical analysis between the proposal and the final action promulgating the rulemaking. As a result, rulemakings to promulgate a remedy to address the regional transport of ozone pollution require a significant amount of time in order to ensure that the final action is technically sound and legally defensible.

77. The NO_X SIP Call rulemaking was the result of a two-year engagement known as the Ozone Transport Assessment Group (OTAG), through which, from 1995-1997, the EPA worked in partnership with the 37 eastern-most states and the District of Columbia, industry representatives, and environmental groups to address the interstate transport of ozone pollution. OTAG identified and evaluated flexible and cost-effective strategies for reducing long-range transport of ozone and ozone precursors. Based on information and recommendations resulting from the OTAG process, the EPA issued the proposed NO_X SIP Call on November 7, 1997, 62 Fed. Reg. 60,320. The final NO_X SIP Call was issued approximately one year later on October 27, 1998. 63 Fed. Reg. 57356. Overall, the NOx SIP Call rulemaking process lasted over three years.

78. The development of CAIR included two distinct regulatory processes – a regulation to define significant contribution (i.e., the emission reduction obligation) under the good neighbor provision and a regulation to promulgate FIPs. These rulemakings were developed between 2003 and 2006. While a precise date on which EPA began work on the

proposal is uncertain, the EPA held workshops to inform the proposal in July and August of 2003. While it is likely that work on the proposal preceded these workshops, these dates provide milestones that can be used to consider the time it took to develop this rule. Using this milestone to represent the starting point, subsequent milestones in the development of CAIR include: the proposed obligation rule on January 30, 2004; the final obligation rule on May 12, 2005; the proposed FIP on August 24, 2005; and the final FIP on April 28, 2006. Considering these dates, it is clear that the complete development timeline ran from July 2003 (or earlier) to April 2006. It is reasonable to conclude that the development of CAIR FIPs took approximately three years.

79. The development of CSAPR began with the remand of CAIR by the D.C. Circuit in July 2008, and the final CSAPR rulemaking was published in August 2011, more than three years later. Charged with the obligation to replace CAIR "from the ground up," *North Carolina*, 531 F.3d at 929, the EPA was required to redo its entire analysis and develop a means of implementing the good neighbor provision consistent with the D.C. Circuit's instructions. This meant that EPA needed to reevaluate downwind air quality and upwind contributions anew consistent with the D.C. Circuit's decision, including new technical analysis and new policy development. The EPA published a proposed rule on August 2, 2010. 75 Fed. Reg. 45,210. Subsequent to the proposed rule, the EPA determined that it was necessary to take comment on several additional issues not addressed in the proposed rule through the issuance of three notices of data availability (NODAs). A NODA regarding revisions to emissions inventories was published on October 27, 2010 (75 Fed. Reg. 66,055); a NODA related to EPA's updated EGU modeling inputs was published on September 1, 2010 (75 Fed. Reg. 53,613); and a NODA to request comment on allocations and the CSAPR assurance provisions was published on January

7, 2011 (76 Fed. Reg. 1,109). The EPA published the final rule on August 8, 2011, 76 Fed. Reg. 48,208, three years after the D.C. Circuit's remand of CAIR.

80. As described previously, the original CSAPR underwent a lengthy period of legal uncertainty. While CSAPR was being litigated, the EPA conducted work intended to support a subsequent rulemaking addressing the interstate transport of ozone pollution, but due to the shifting legal landscape resulting from the D.C. Circuit and Supreme Court decisions, the EPA did not propose or finalize any further regulations. However, following the Supreme Court decision largely upholding the original CSAPR rulemaking, the EPA began the process of developing the CSAPR Update. The Supreme Court decision upholding CSAPR was issued in April 2014 and the final CSAPR Update was published in October 2016, two and a half years later.

81. Several factors facilitated a relatively expeditious development of the CSAPR Update following the Supreme Court decision. For example, the EPA was able to apply the previously used CSAPR framework and did not have to develop significant new policy approaches for addressing interstate ozone transport. Moreover, the CSAPR Update was relatively limited in scope because it focused on near-term pollution reductions in the east that could be made for the 2017 ozone season, which limited the scope of NO_X reductions strategies that could feasibly be implemented and caused the EPA to focus only on EGUs for potential emissions reductions. Despite these expediting factors, it still took 30 months from the Supreme Court decision (April 2014) for the EPA to finalize the CSAPR Update (October 2016).

C. Analysis Necessary to Promulgate a FIP to Address Kentucky's Remaining Emissions Reduction Obligation Pursuant to the Good Neighbor Provision with Respect to the 2008 Ozone NAAQS

i. Kentucky's Good Neighbor Obligation with Respect to the 2008 Ozone NAAQS

82. While the EPA has issued the CSAPR Update, which promulgates a FIP partially addressing Kentucky's good neighbor obligation with respect to the 2008 ozone NAAQS, the EPA acknowledges that we have not fully addressed the requirements of good neighbor provision. However, before the EPA can impose a FIP to fully address Kentucky's remaining good neighbor obligation, the EPA must quantify the remaining "amounts" of emissions from the state that "contribute significantly to nonattainment" and "interfere with maintenance" of the 2008 ozone NAAQS in other states pursuant to CAA section 110(a)(2)(D)(i)(I).

83. As described in section B, over the course of four regional rulemakings conducted by the EPA since 1998, the EPA has developed a four-step process, referred as the CSAPR framework, for quantifying necessary emissions reductions to address interstate ozone pollution and to implement those reductions: (1) identifying downwind receptors that are expected to have problems attaining or maintaining clean air standards (i.e., NAAQS); (2) determining which upwind states contribute to these identified problems in amounts sufficient to "link" them to the downwind air quality problems; (3) for states linked to downwind air quality problems, identifying upwind emissions that significantly contribute to nonattainment or interfere with maintenance of a standard; and (4) for states that are found to have emissions that significantly contribute to nonattainment or interfere with maintenance of the NAAQS downwind, implementing reductions in the identified upwind states.

84. As described in the paragraphs that follow, although the EPA promulgated the CSAPR Update, which partially addresses Kentucky's obligation pursuant to the good neighbor

provision, the EPA has not yet calculated the full amount of Kentucky's emissions that must be prohibited to address the good neighbor provision requirements with respect to the 2008 ozone NAAQS, nor does the EPA currently have the data and technical analysis necessary to conduct such a calculation. Rather the process required to calculate the appropriate amount of emissions reductions required of sources in Kentucky to address the good neighbor provision requires a series of steps.

85. First, the EPA is in the process of improving data relevant to calculating potential emissions reductions from non-EGU stationary sources, which the EPA anticipates may constitute a portion of the "amounts" of Kentucky's emission that must be prohibited pursuant to the good neighbor provision. As described in section C.ii below, the EPA anticipates this process will be complete in 9.5-11.5 months. Second, the EPA must conduct air quality modeling for a future analytic year that is aligned with the anticipated compliance timeframe for any additional emissions reductions in order to identify downwind air quality problems and the level of contribution from upwind states to those downwind air quality problems (CSAPR framework steps 1 and 2). As described in section C.iii below, the EPA anticipates this process will require between 9 and 12 months to complete and can, in part, overlap with the work being conducted to improve our data relevant to calculating potential emissions reductions from non-EGUs. Further, the EPA must evaluate available emissions reductions from both EGUs and non-EGUs and calculate appropriate emissions limitations for sources in Kentucky to ensure emissions reductions are achieved (CSAPR framework step 3). As described in section C.iv below, the EPA anticipates this process will require between five and six months to complete, some of which can occur concurrently with the air quality modeling. In total, the EPA will require until at least March 2018, to complete these steps necessary for the EPA's technical

analysis to quantify Kentucky's emissions reductions obligation pursuant to the good neighbor provision. The EPA also notes that, as discussed in section C.v below, the EPA will need to take steps to develop FIPs to implement the emissions reductions required by the good neighbor provision to address the 2008 ozone NAAQS (CSAPR framework step 4). Given the EPA's expectation that emissions reductions from non-EGUs may be required, this decision is not ready-made and may require technical analysis to develop appropriate FIPs. However, the EPA does not anticipate that this step would add additional time to the rulemaking schedule described in this declaration. The EPA explains why this technical analysis is necessary in the following paragraphs.

86. The EPA believes that we must conduct a regional analysis in order to fully evaluate Kentucky's remaining obligation pursuant to the good neighbor provision with respect to the 2008 ozone NAAQS. As the EPA has routinely found throughout nearly 20 years of interstate transport rulemakings, the ozone transport problem is regional in nature, wherein downwind states' problems attaining and maintaining the ozone NAAQS result from the contribution of pollution from multiple upwind states, with upwind states routinely contributing to multiple downwind air quality problems in varying amounts. For example, with respect to the 2008 ozone NAAQS, the EPA determined in the recent CSAPR Update rulemaking that, collectively, 22 upwind states contribute at or above the 1 percent threshold to downwind air quality problems at 19 different receptor locations in the eastern United States. Individual upwind states contribute to between 1 and 8 downwind nonattainment or maintenance receptors and, in a number of cases, also contain at least one receptor indicating a downwind air quality problem to which other states contribute. The following graphic depicts the upwind state-to-

downwind state linkages identified in the CSAPR Update between pollution from upwind states and downwind states that have problems meeting or maintaining the 2008 ozone NAAQS:

87. Given the multi-faceted nature of ozone transport, the Supreme Court has acknowledged that the EPA is faced with the burden to determine "how to differentiate among otherwise like contributions of multiple upwind states." 134 S. Ct. at 1607. As the Supreme Court acknowledged, the statute does not provide the EPA with the metric by which EPA is to decide the apportionment of the shared obligation to address a downwind air quality problem

among multiple upwind states, what the Court refers to as the "thorny causation problem." *Id.* at 1603-04.

88. Accordingly, because the ozone air quality problems are regional in nature, EPA has developed – and the Supreme Court has endorsed – a regional approach for quantifying individual states' emission reduction obligation.[16] In particular, the EPA has developed a two-step metric to quantify the amounts of a state's emissions that "contribute significantly to nonattainment" or "interfere with maintenance" of the ozone NAAQS in another state to which it is linked: those emissions that both (1) contribute 1 percent or more of the NAAQS to an identified downwind air quality problem (CSAPR framework step 2) and (2) can be eliminated through implementation of cost-effective control strategies, applied uniformly to all states linked to an air quality problem (CSAPR framework step 3). When evaluating whether a control strategy is cost-effective for this purpose, the EPA considers the incremental cost per ton of emissions reduced, the magnitude of emissions that can be reduced using a particular control strategy, and the downwind air quality benefits of implementing such emissions reductions. 81 Fed. Reg. at 74,519. The Supreme Court found this approach, as applied in the original CSAPR rulemaking, to be "an efficient and equitable solution to the allocation problem the Good

[16] Plaintiff Sierra Club misrepresents the EPA's statements in an action disapproving portions of Utah's good neighbor SIP with respect to the 2008 ozone NAAQS. *See* Pl.'s Br. at 23. In response to comments advocating that the EPA conduct a comprehensive rulemaking to address interstate transport for western states, the EPA explained that the statute did not require us to conduct such a rulemaking before states were required to submit good neighbor SIPs. *See* 81 Fed. Reg. 71,991, 71,993 (Oct. 19, 2016). The EPA did not speak to the type of analysis that would be required to promulgate a FIP quantifying western states' emissions reductions obligations pursuant to the good neighbor provision. On the contrary, the EPA relied in part on the type of regional air quality modeling described in this declaration to support its final action disapproving Utah's SIP submission. *Id.* at 71,991-92.

Neighbor Provision requires the Agency to address." *Id.* at 1607. The Court held that this approach is:

> [e]fficient because EPA can achieve the levels of attainment, i.e., of emission reductions, the proportional approach aims to achieve, but at a much lower overall cost. Equitable because, by imposing uniform cost thresholds on regulated States, EPA's rule subjects to stricter regulation those States that have done relatively less in the past to control their pollution. Upwind States that have not yet implemented pollution controls of the same stringency as their neighbors will be stopped from free riding on their neighbors' efforts to reduce pollution. They will have to bring down their emissions by installing devices of the kind in which neighboring States have already invested.

Id.

89. Pursuant to this approach, it is simply not possible to quantify the amount of emission reductions that comprise one state's good neighbor obligation in a vacuum. Instead, the EPA must also evaluate the contributions of all other states linked to the same air quality problem. Accordingly, in order to quantify Kentucky's emission reduction obligation under the good neighbor provision with respect to the 2008 ozone NAAQS in the efficient and equitable manner upheld by the Supreme Court, it is necessary for the EPA to evaluate Kentucky's contribution to downwind air quality problems relative to the contributions of other states contributing to the same air quality problems. The EPA likewise must evaluate each of the other states' remaining contributions to downwind air quality problems relative to the contribution of the other contributing states, including Kentucky.

90. The CSAPR Update represents a significant first step to quantify Kentucky's and other states' emission reduction obligations under the good neighbor provision relative to the 2008 ozone NAAQS. However, as noted at paragraphs 69, the EPA could not conclude that the reductions required by the CSAPR Update represent the full amounts of emission reductions necessary for many states, including Kentucky, to address the good neighbor provision as to the 2008 ozone NAAQS. As noted in paragraphs 74, the EPA has an obligation to promulgate FIPs

fully addressing the good neighbor provision with respect to the 2008 ozone NAAQS for 23 states other than Kentucky. Although the deadlines for the EPA to promulgate these additional FIPs will not pass until 2017 and 2018, the EPA expects these deadlines will pass during the period in which we will be conducting the analysis necessary to address its FIP obligation as to Kentucky. Accordingly, conducting the necessary regional analysis to address Kentucky will also permit the Agency to address the outstanding FIP obligations for these 23 other states. If the EPA were to instead focus its analysis on developing a FIP for Kentucky alone – if that were even possible given the regional, interconnected nature of ozone transport – the EPA would necessarily need to delay action to address its FIP obligation as to these 23 other states, thereby missing a number of additional statutory deadlines. A schedule sufficiently robust to permit the EPA to conduct this necessary regional analysis will also permit the agency to address these other outstanding FIP obligations.

91. Based on the EPA's and the courts' interpretation of the good neighbor provision, there are three ways in which the EPA can determine that an upwind state has fully addressed the good neighbor provision with respect to the 2008 ozone NAAQS: (1) the downwind air quality problem (both nonattainment and maintenance) to which the state is linked can be resolved from collective, cost-effective emission reductions occurring in both upwind and downwind states; (2) the upwind state's contribution to downwind air quality problems can be reduced, through the implementation of cost-effective emissions reductions, to the 1 percent screening threshold such that the EPA can conclude the state's remaining impact on the downwind air quality problem is insignificant, even if the downwind air quality problem persists; or (3) upwind states have implemented all cost-effective emissions reductions (considering cost, emission reductions, and downwind air quality impacts) that constitute each state's significant contribution to

nonattainment or interference with maintenance of the NAAQS downwind, even if the downwind air quality problem persists.[17] Thus, the EPA can either conclude that the emissions reductions from linked states resolve the downwind air quality problem, or, if not resolved, that the upwind states has reduced any emissions from the state that would be qualified as "significant." The EPA could not conclude that the emissions reductions required by the CSAPR Update were sufficient to address the requirements of the good neighbor provision for Kentucky with respect to the 2008 ozone NAAQS under any of these three scenarios.

92. The CSAPR Update analysis found that emissions from Kentucky were linked to four downwind maintenance receptors based on the 2017 air quality modeling conducted to support that rule. After implementation of the emission reductions required by the CSAPR Update, two of the downwind maintenance receptors to which Kentucky is linked in Hamilton County, Ohio, and Philadelphia, Pennsylvania, are not expected to have remaining air quality problems. *See* Attachment 2, Ozone Transport Policy Analysis Final Rule Technical Support Document (TSD) at p. 34, table D-7. As to those receptors, the EPA need not require further emissions reductions from sources in Kentucky or any other states in order to address the good neighbor provision with respect to the 2008 ozone NAAQS.

93. However, the other two downwind maintenance receptors to which Kentucky is linked in Harford County, Maryland, and Richmond County, New York, are expected to have remaining air quality problems following implementation of the CSAPR Update in 2017. *Id.*

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[17] *See, e.g.*, *EPA v. EME Homer City Generation, L.P.*, 134 S. Ct. at 1608-09 (holding that the EPA cannot require states to reduce emissions more than necessary to bring the downwind air quality into attainment or maintenance of the NAAQS or by more than the 1 percent threshold); 76 Fed. Reg. at 48,259 (quantifying necessary SO2 emissions reductions based on a $2,300 per ton cost threshold even though downwind air quality problems remained because additional reductions were not cost-effective).

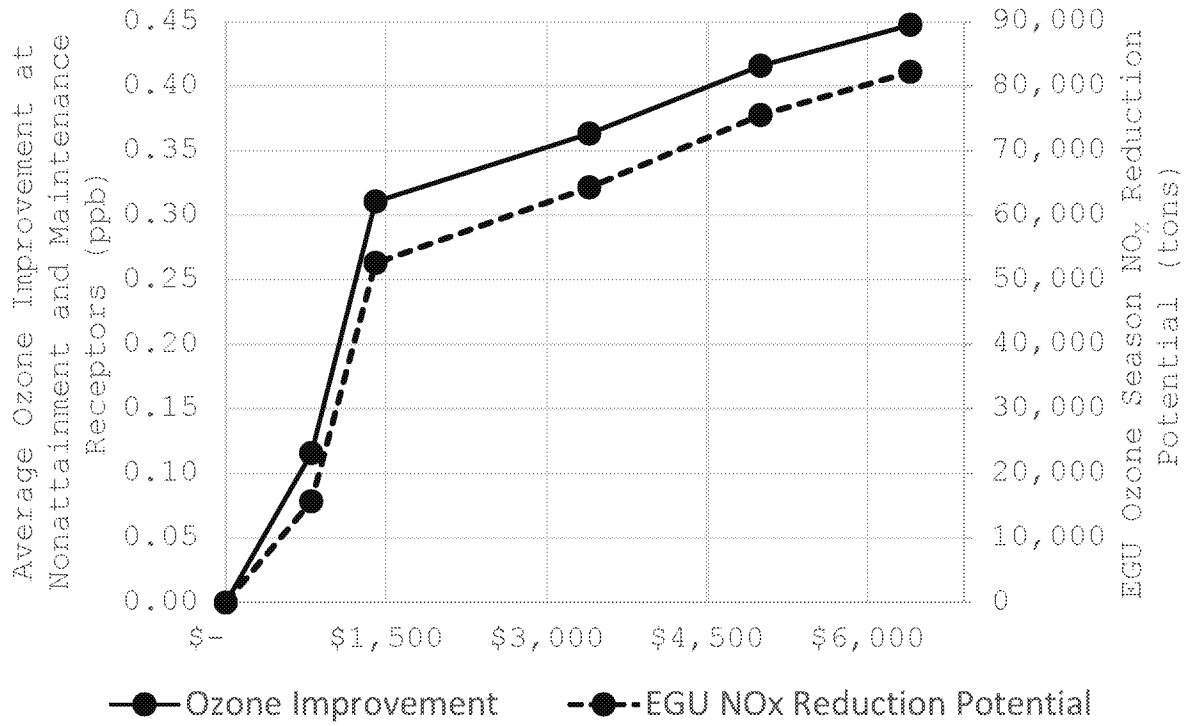
The EPA's modeling conducted for the CSAPR Update projected that, before implementing any emissions reductions pursuant to the good neighbor provision, Kentucky would be expected to contribute 2.18 parts per billion (ppb) of ozone pollution to the air quality levels at the Harford receptor in 2017 and 1.03 ppb to air quality levels at the Richmond receptor, both levels of contribution above the 0.75 ppb screening threshold used to identify those states that are "linked" to downwind receptors should be subject to further analysis to determine whether cost-effective emissions reductions were available in the state. *See* Air Quality Modeling Final Rule Technical Support Document, Appendix C at C-3.[18] The EPA's modeling further demonstrated that eight other states and the District of Columbia would also be expected to contribute above the 0.75 ppb screening threshold to the Harford receptor and that seven other states would be expected to contribute above the screening threshold to the Richmond receptor. *Id.* Thus, in step 2 of the CSAPR framework, these states were all considered "linked" the Harford and Richmond receptors.

94. Applying step 3 of the CSAPR framework, the EPA determined that cost-effective emissions reductions from EGUs could be achieved at a level of control stringency equivalent to $1,400 (2011$), and calculated EGU emissions budgets for each state based on the emissions reductions achievable at that level of control stringency. 81 Fed. Reg. at 74,550. The EPA's analysis of costs, EGU NO_X reductions, and corresponding improvements in downwind ozone concentrations resulted in a "knee in the curve" at a point where emission budgets reflected a control stringency with an estimated marginal cost of $1,400 per ton of emissions reduced. This level of stringency in emission budgets represented the level at which incremental

[18] Available at https://www3.epa.gov/airmarkets/CSAPRU/AQ%20Modeling%20TSD%20Final%20CSAPR%20Update.pdf.

EGU NO_X reduction potential and corresponding downwind ozone air quality improvements were maximized with respect to marginal cost. That is, the ratio of emission reductions to marginal cost and the ratio of ozone improvements to marginal cost were maximized relative to the other emission budget levels evaluated.

Figure 1: Multi-factor test for EGUs in the CSAPR Update



95. The EPA concluded that the emissions reductions achieved by implementation of the budgets constitute a portion of each state's significant contribution to nonattainment or interference with maintenance of the 2008 ozone NAAQS at these receptors. For Kentucky, the emissions budget quantified by the rule requires emissions reductions of 6,616 tons from 2015 emissions levels. Kentucky's and other states' budgets are implemented through FIPs that require affected EGUs in each state to participate in a regional allowance trading program beginning with the 2017 ozone season. 81 Fed. Reg. at 74,553.

96. The EPA determined that Harford and Richmond receptors would continue to have problems maintaining the 2008 ozone NAAQS in 2017 after implementation of the budgets finalized in the CSAPR Update. *See* Attachment 2, Ozone Transport Policy Analysis TSD at 34, Table D-7. Moreover, even after implementation of the CSAPR Update budget in Kentucky, emissions from Kentucky and from other states linked to these receptors are expected to continue to exceed the 1 percent screening threshold in 2017. *See* Final Ozone AQAT Results at "1400 eng EB links" tab.[19] Furthermore, as described earlier at paragraphs 69, the budgets quantified for Kentucky and for other states linked to these same receptors reflect only the emission reductions that are achievable from EGUs by the 2017 ozone season. Additional cost-effective emissions reductions may be achievable from EGUs on a timeframe longer than 2017 and/or from source sectors other than EGUs. Accordingly, the EPA could not conclude that the emissions reductions achieved through implementation of the budgets necessarily represent the full amount of emissions reductions necessary to address these states' interference with maintenance of the 2008 ozone NAAQS at these two receptors. Instead, the EPA must evaluate whether additional emissions reductions should be required from sources in Kentucky and in the other 10 states and the District of Columbia which are linked to these same air quality problems.

97. Without further analysis, the EPA will not be not able to establish the level of control that represents Kentucky's full emissions reduction obligation to address the good neighbor provision with respect to the 2008 ozone NAAQS. First, although the EPA identified downwind areas in the CSAPR Update that are expected to have problems attaining or maintaining the 2008 ozone NAAQS in the 2017 compliance year, the EPA must analyze downwind air quality in a future compliance year. Any subsequent rulemaking to fully quantify

[19] Available at https://www.regulations.gov/document?D=EPA-HQ-OAR-2015-0500-0492.

emissions reductions necessary to address the good neighbor provision with respect to the 2008 ozone NAAQS will necessarily require compliance in a year later than 2017. The nature of the air quality problems may be different in that future year, considering the implementation of additional state and federal requirements (such as upcoming requirements to reduce mobile source emissions) and other changes in emissions due to economic factors and changes in the energy sector in terms of growth in oil and gas production and electricity demand.

98. The EPA therefore believes it is necessary to conduct air quality modeling to project air quality levels in an appropriate future year that is later than 2017 in order to identify the extent of remaining downwind nonattainment and maintenance problems in that future year (CSAPR framework step 1). The results of this analysis could show, for example, that the nonattainment and maintenance problems projected to persist in 2017 are either diminished or resolved in a later year because of emissions reductions expected to occur between 2017 and that future year. Similarly, the EPA believes we must conduct air quality modeling to evaluate upwind state contributions to downwind nonattainment and maintenance problems in that future year, the results of which could show a change in the level of contribution from Kentucky relative to the one percent screening threshold (CSAPR framework step 2). Such modeling is necessary to ensure that the EPA does not require more or fewer emissions reductions than necessary in that future year to address the downwind air quality problems. The EPA's failure to conduct such an analysis could result in over- or under-control of sources in Kentucky and other upwind states in violation of the good neighbor provision, consistent with the Supreme Court's holding in *EPA v. EME Homer City Generation*, 134 S. Ct. at 1608-09. The steps necessary to conduct this analysis are described in section C.iii below.

99. Moreover, the EPA must conduct a technical analysis to evaluate the level of emissions reductions available from control strategies that can be implemented in a future year and the impacts on air quality from implementation of those emission reductions. In the CSAPR Update, the EPA considered emissions reductions available from the implementation of control strategies that could be implemented by the 2017 ozone season including: restarting inactive selective catalytic reduction (SCR) controls; fully operating SCRs that were operating at less than full capacity; restarting inactive selective non-catalytic reduction controls (SNCR); and replacing outdated combustion controls with newer advanced technology (e.g., state-of-the-art low NO_X burners). *See* Attachment 3, EGU NO_X Mitigation Strategies Final Rule TSD. The EPA explained that additional reductions could be achieved from EGUs with the installation of post-combustion controls, such as SCR or SNCR, but that, feasibly, such controls require several years to install. *See id.*; 81 Fed. Reg. at 74,541-42. Accordingly, the emissions reductions achievable from the installation of post-combustion controls could not be implemented by 2017 and were not considered for purposes of calculating budgets in the CSAPR Update. Therefore, in order to determine the level of NO_X control stringency necessary to quantify those emissions reductions that constitute fully eliminating significant contribution to downwind nonattainment or interference with maintenance for the region, and therefore also for Kentucky, the EPA must evaluate further emission reductions from EGU strategies that take longer to implement than those considered in the CSAPR Update rulemaking.

100. Moreover, the EPA believes we must evaluate emission reductions available from non-EGU stationary sources that may be able to implement cost-effective emission reductions on a timeline similar to that necessary for additional EGU controls. As described earlier, the EPA's CSAPR rulemakings have focused on the cost-effective emissions reductions achievable from

EGUs. Prior rulemakings have determined that cost-effective emissions reductions were achievable at incremental costs ranging from $560 to $3,300/ton (2011$) as shown below in the table.

Rule	$/ton NOx Reduced	$/ton NOx Reduced (2011$)[20]
NOx SIP Call	$2,000 (1990$)	$3,300
CAIR	$500 (1999$)	$750
CSAPR	$500 (2007$)	$560
CSAPR Update	$1,400 (2011$)	$1,400

In the CSAPR Update, the EPA calculated the incremental cost of additional emissions controls for EGUs, including the installation of new post-combustion controls. The EPA calculated that the installation of new post-combustion controls would incur an incremental cost of $5,000 (2011$) per ton of NOx reduced for SCR and $6,400 (2011$) per ton of NOx reduced for SNCR, significantly higher than the incremental costs used to calculate emissions budgets in prior ozone interstate transport rulemakings.

101. The EPA also included data in the docket for the CSAPR Update regarding the cost and NO_X reduction potential for controls on various categories of non-EGU stationary emissions point sources. Those data demonstrate that substantial emissions reductions are likely achievable from non-EGUs at costs of $3,400 (2011$) per ton of NOx reduced or less, which is significantly lower than the costs of remaining NOx control strategies available for EGUs]. *See* Attachment 4, Final Technical Support Document for the Cross-State Air Pollution Rule for the 2008 Ozone NAAQS, Assessment of Non-EGU NOx Emission Controls, Cost of Controls, and Time for Compliance (Final Non-EGU TSD) at 11-19. Accordingly, given that implementation

[20] The cost per ton numbers were escalated to 2011$ using the Chemical Engineering Plant Cost Index annual index values. More information on the CEPCI can be found at http://www.chemengonline.com/pci.

of additional EGU controls such as the installation of new SCR and SNCR is much costlier than the implementation of controls at certain non-EGUs, the EPA believes it would be inequitable and inefficient to require additional reductions from EGUs without also considering potential emissions reductions from non-EGUs that can be implemented in similar timeframes. Moreover, such an approach would be inconsistent with the EPA's precedent defining significant contribution to nonattainment and interference with maintenance pursuant to the good neighbor provision as those emissions reductions achievable through the implementation of cost-effective control strategies. Were the EPA to quantify emissions budgets based solely on those additional and more expensive reductions achievable from EGUs without also considering available emissions reductions from non-EGUs, the EPA would not necessarily be quantifying a state's emissions reductions obligation based on the most cost-effective control strategies.[21]

102. Thus, while the EPA may determine that additional emissions reductions from EGUs are justified to fully address the 2008 ozone NAAQS when we considers the incremental air quality benefits to downwind receptors, the EPA also believes that we must evaluate cost-effective emissions reductions available from non-EGUs in order to fully evaluate and quantify upwind state emission reductions that constitute states' significant contribution to nonattainment and interference with maintenance of the 2008 ozone NAAQS. However, as explained in the CSAPR Update rulemaking, the EPA currently lacks sufficient data on control measure installation times to evaluate timely emissions reductions available from non-EGUs. 81 Fed. Reg. at 74,542. Accordingly, the EPA believes that it is necessary to engage in certain efforts to improve the EPA's data and information regarding non-EGUs as part of the next rulemaking

[21] As discussed at paragraph 68, the EPA did not evaluate emissions reductions available from non-EGUs in the CSAPR Update because they could not be implemented by the 2017 compliance period.

process. The steps that the EPA intends to take to improve these data, a process which is currently ongoing, are described in section C.ii below.

103. Once the EPA has completed the process to improve our data regarding non-EGUs, the EPA will need to evaluate emissions reductions available through the implementation of various NOx control strategies at both EGUs and non-EGUs, considering both the incremental cost per ton of implementing the strategies and the downwind air quality impacts of associated emissions reductions. The EPA must quantify emissions reductions at various cost thresholds, convert those emissions reductions into emissions budgets for the states and sources, evaluate air quality impacts of those budgets, and then select an appropriate level of control considering all of this information. This process is described in more detail in section C.iv below.

104. The EPA does not agree with the assertion by David Howekamp that the EPA could simply impose emissions reductions on sources in Kentucky until the state's contribution to downwind receptors meets the 1 percent threshold. *See* Howekamp Decl. para. 12. The 1 percent threshold is a screening threshold used to identify those states that contribute to identified downwind air quality problems. While states contributing below that threshold do not contribute to downwind air quality and, by definition, do not *significantly* contribute to downwind nonattainment, the EPA does not define all emissions above the 1 percent threshold as significant contribution or interference with maintenance. Rather, the "amounts" of emissions that must be prohibited pursuant to the good neighbor provision are those emissions that *both* meet or exceed the 1 percent contribution threshold *and* which can be eliminated through the implementation of cost-effective controls, considering downwind air quality and relative to the

contributions of other states linked to the same downwind air quality problems.[22] The 1 percent threshold, per the Supreme Court's holding in *EPA EME Homer City Generation*, 134 S. Ct. at 1609, is a backstop that prevents the EPA from requiring a level of emissions reductions that would result in the state's contribution being reduced below the 1 percent contribution threshold even if those additional reductions would be cost-effective and would improve a downwind air quality problem. Thus, if the amount of emissions reductions achievable through the implementation of cost-effective controls would reduce the state's contribution below the 1 percent threshold, the EPA must increase the state's budget so that it is equal to the 1 percent threshold even if the downwind air quality problem persists. Similarly, if the EPA determines that a state has implemented all cost-effective controls, but the state's contribution is still above the 1 percent threshold and the downwind air quality problem persists, the EPA can nonetheless determine that the state has eliminated a sufficient "amount" of emissions to satisfy its good neighbor obligation. On the other hand, if the EPA required Kentucky to reduce its emissions to the level 1 percent threshold to a particular downwind air quality problem but did not consider whether those emissions reductions were cost-effective or the contributions of other linked upwind states, the EPA might be imposing an inefficient burden by requiring Kentucky to make emissions reductions that are not cost-effective (and therefore not "significant") or an inequitable

[22] The EPA also has not concluded that Kentucky power plants *continue* to significantly contribute to nonattainment and interfere with maintenance of the 2008 ozone NAAQS in downwind states after implementation of the CSAPR Update. *See* Pl.'s Br. at 6. Plaintiff mischaracterize the EPA's Answer and the CSAPR Update. First, Plaintiff wrongly presumes that all contribution above the 1 percent threshold *significantly* contribute to nonattainment or interfere with the NAAQS, which is inconsistent with the EPA's interpretation of the statute. Second, the EPA's analysis evaluates whether emissions from the entire *state* significantly contribute to nonattainment and interfere with maintenance of the NAAQS in other states; the EPA does not evaluate whether emissions from a particular source sector make such a contribution, even though emissions reductions may ultimately be imposed upon individual source sectors where they can be most cost-effectively implemented.

burden by requiring Kentucky to make more emissions reductions than would represent its "fair share" relative to other states. Requiring such draconian reductions from a single state or one subset of states that is contributing to interstate ozone problems (e.g., Kentucky) but not another subset of states is inherently inequitable and would create an uneven regulatory playing field across the region. This approach ignores the fact that other upwind states contribute to an interconnected, regional ozone problem and is inconsistent with the approach endorsed by the Supreme Court in *EPA v. EME Homer City Generation*, 134 S. Ct. at 1607. Thus, the EPA cannot simply reduce a state's emissions reductions to the level of the 1 percent threshold without considering the interrelated factors of cost-effectiveness, downwind air quality, and the contributions of other linked upwind states.

105. Moreover, the EPA does not agree with Plaintiff and Mr. Howekamp that there are "readily available emission reductions" that the EPA did not consider in the CSAPR Update. Pl.'s Br. at 19, Howekamp Decl. para. 10. In the CSAPR Update, the EPA calculated state budgets based on those emissions reductions available if EGUs operated their NO_X control equipment at "optimum efficiency"; in fact, this control strategy was the primary source of emissions reductions that the EPA calculated in that rulemaking. 81 Fed. Reg. at 74,543, 74,544. In particular, the EPA calculated state emission budgets based on those NO_X reductions available if EGUs operated their SCRs at a maximum rate of 0.10 lb/mmBtu, which is the same "optimum" rate assumed in the Sierra Club's analysis described in Katherine Clements's declaration. *Compare* 81 Fed. Reg. at 74,543-44 *with* Clements Decl. para. 5. Thus, emission reductions attributed to this lowered emissions rate in Sierra Club's analysis have already been accounted for in the EPA's analysis. The agency believes that it quantified all reasonable emission reductions from SCR in the CSAPR Update rule. All of the analysis and assumptions

that the agency finalized in that rule were informed by robust stakeholder input on the proposed rule. As described below, the agency does not find the information cited in Mr. Howekamp's declaration, provided by Ms. Clements and the Maryland Department of the Environment, Attachments 2 and 3 to the Howekamp Declaration, to provide compelling evidence that the CSAPR Update failed to quantify all reasonable near-term emission reductions from EGUs.

106. The EPA also considered the extent to which certain EGUs were able to operate at a rate better than 0.10 lb/mmBtu. However, the EPA did not assume and does not agree with Ms. Clements that it is appropriate to assume that EGUs can necessarily operate at the best rate ever achieved in the last 10 years. In the context of evaluating achievable NO_X emission rates for EGUs with existing SCR, the EPA found that it is not reasonable to assume that it is cost-effective for an EGU with SCR to achieve its best ever rate over the course of its operating life. Specifically, the EPA found that the lowest NO_X year for SCRs often reflects installation of a brand new system, including brand new catalyst. The NO_X removal efficiency under brand new conditions is not necessarily cost-effectively sustainable over time. This conclusion was informed by comments on the CSAPR Update. The CSAPR Update proposal relied on the second best ozone season NO_X rate for EGUs with SCR. In response to this proposal, stakeholders suggested that this rate is not representative of ongoing operation and maintenance, such as replacing the multiple layers of catalyst on a rotating basis. In response to these comments, the agency concluded that an achievable NO_X rate for EGUs with SCR would be based on the third best historical NO_X rate. The third best rate is representative of an ongoing and cost-effectively achievable NO_X rate. We also note that EPA's analysis specifically considered cost-effective reductions whereas the analysis provided by Ms. Clements does not

consider the cost involved in the hypothetical scenario of maintaining an SCR and all of its components, including catalyst, in mint condition.

107. Moreover, the EPA did not find it appropriate in the CSAPR Update to assume that 100 percent of EGU NO_X emissions will permanently disappear from the power sector when a unit retires as Ms. Clements's analysis imagines, *see* Clements Decl. para. 8. Specifically, zeroing out emissions from these EGUs does not consider that the electricity generation from retiring units will be replaced by generation from other EGUs in the fleet. The agency described its approach for anticipating replacement generation in light of EGU retirement in the CSAPR Update Ozone Transport Policy Analysis TSD at 13, Attachment 2. Finally, the EPA's analysis considered the extent to which units in states such as Kentucky were scheduled to retire prior to the 2017 ozone season. *Id.* The agency did not find it appropriate to account for the expected retirement of Paradise 1 and 2 in Kentucky in the CSAPR Update because this retirement is not expected to occur until the end of 2017, after the ozone season for which the CSAPR Update established emission budgets.[23]

108. Finally, the EPA does not agree that the current value at which CSAPR ozone season NO_X allowances are trading necessarily indicates that additional emissions reductions are readily achievable. *See* Howekamp decl. para 11. As explained in the CSAPR Update, the EPA uses uniform stringency levels of EGU NO_X control strategies (e.g., turning on idled existing SCR) to establish emissions budgets. The CSAPR Update emission budgets are in turn calculated using changes in NO_X emission rates reflecting these strategies. While the agency uses cost thresholds to inform this analysis, the EPA's intent is to establish emission budgets that reflect emission reduction potential from the available NO_X control strategies. The CSAPR

[23] *See* https://www.tva.gov/Energy/Our-Power-System/Coal/Paradise-Fossil-Plant.

Update does not intend to regulate the cost at which an allowance is sold in the CSAPR Update compliance market, as suggested by Mr. Howekamp's claim. Further, current allowance prices are not determinative of future allowance prices at a time when they will be needed for compliance. The CSAPR Update was published on October 26, 2016 with implementation beginning in May 2017 and compliance to be determined in March of 2018. Allowance prices in the fall of 2016 (more than a year from when they are needed for compliance) are a reflection of conjecture on future supply and demand for allowances and are not a guarantee of future prices. Finally, allowances prices below $1,400 are not necessarily indicative of significant further NO_X reduction potential. Allowance prices are set by aggregate demand from many EGUs. To the extent that any individual EGU finds a more cost-effective method to achieve the emission reductions implemented by the CSAPR Update (e.g., turns on its SCR at lower cost), then allowance prices may drop. However, this occurrence does not necessarily mean that the EGU could achieve further reductions beyond optimizing its SCR. A determination that further EGU NO_X reduction potential is achievable would require a new analysis of EGU behavior under the CSAPR Update. It is incorrect to draw such conclusions at this time. The sections that follow describe the steps and timeframes necessary to complete the technical work required to analyze Kentucky's and other states' remaining emissions reduction obligation pursuant to the good neighbor provision with respect to the 2008 ozone NAAQS. These sections address the efforts being made to improve the EPA's data regarding NO_X reduction potential from non-EGUs, which is ongoing (section C.ii); the steps necessary to conduct air quality modeling to evaluate downwind air quality and contributions from upwind states (section C.iii); the technical analysis necessary to evaluate necessary emissions reductions from sources in upwind states

(section C.iv); and the considerations affecting the implementation of such emissions reductions (section C.v).

ii. Steps Necessary to Improve Data to Evaluate NO_X Reduction Potential from Non-EGUs

109. Before the EPA can begin the analysis necessary to quantify the amounts of emissions reductions necessary to address the good neighbor provision with respect to the 2008 ozone NAAQS for Kentucky and other states, the EPA must first take certain steps to improve its information regarding the emissions reductions achievable from non-EGUs. In particular and as discussed in more detail below, the EPA lacks information regarding existing controls at non-EGUs and data on potential control devices that could be installed on uncontrolled or under-controlled sources. This information is necessary to quantify potential emissions reductions from non-EGU sources and their costs. In contrast to non-EGUs, emissions data and control device information for EGUs is more readily available and accessible because of continuous emissions monitoring and other specific source monitoring and reporting requirements for these sources. Moreover, the EPA has significantly better data regarding the control devices that could be installed on EGUs. If the EPA does not take the necessary steps to improve this information with respect to non-EGUs, the results of the EPA's analysis may be inaccurate and result in either over- or under-control of emissions relative to downwind air quality problems, in violation of the good neighbor provision and Supreme Court's decision in *EPA v. EME Homer City Generation*, 134 S. Ct. at 1608-09.

110. The steps necessary to improve the EPA's data are already ongoing, and are expected to require 9.5-11.5 months, or until September to November 2017, to complete. The following table summarizes those steps which are described in more detail in the following

paragraphs. The EPA's Gantt chart shows how these steps interrelate with one another and with the other tasks described in this declaration. *See* Attachment 1.

Task	Timeframe	Earliest Target Date
Complete Inventory of Non-EGUs		
• Stakeholder Review of Non-EGU Data	Complete	November 2016
• Implementing Comments on Non-EGU Data	1.5 months	January 2017
Engage Stakeholders on Emission Reductions and Cost		
• Prepare Non-EGU and EGU Cost and NOx Analysis	3 months	March 2017
• Stakeholder Review of Data	3 months	June 2017
• Incorporating Stakeholder Feedback	3-5 months	September 2017

111. The first component needed for purposes of the EPA's analysis of non-EGUs is data on the emissions from non-EGU sources. Data on emissions from non-EGU sources are used as the baseline from which to calculate potential emissions reductions from these sources. The National Emissions Inventory (NEI) provides a comprehensive and detailed estimate of air emissions of criteria pollutants and criteria pollutant precursors, including NOx, from air emissions sources. The NEI is released every three years by the EPA and is based primarily on data provided by State, Local, and Tribal air agencies for sources within their jurisdictions and supplemented by data developed by the EPA. The NEI contains information on point sources of emissions, including large industrial facilities, airports, and smaller industrial, non-industrial and commercial facilities. The EPA recently released a new version of the NEI in September 2016

that represents emissions that occurred during the year 2014. The previous NEI represented emissions that occurred during the year 2011.

112. The second input needed to inform an analysis of potential emission reductions from non-EGUs is information on whether emissions from each non-EGU stationary emissions point source are already controlled, by what control device, and at what level of control device efficiency. This information is to be reported by states under the Air Emissions Reporting Requirements (AERR) used to collect data for the NEI. This information is only required to be provided when control devices, measures, or technologies are present on the emissions sources. Because controls are not present on every non-EGU emissions source, it is very difficult to enforce the requirement to report control device information. As a result, this control-related information is not complete for non-EGU sources in the NEI. Without more complete information on what control devices are currently on non-EGU emissions sources and what level of emissions reductions those devices already achieve, the EPA is not able to prepare a comprehensive and accurate assessment of potential additional NOx emissions reductions from the various types of non-EGU emissions sources or units. Were the EPA to proceed to develop emissions budgets without accurate information about current control devices on non-EGUs, the resulting emissions budgets could either over- or under-control emissions relative to downwind air quality problems and the statutory requirements of the good neighbor provision.

113. In September 2016, the EPA initiated an effort to work with several multi-jurisdictional organizations and states to conduct a review of the control information on non-EGU stationary NOx emissions point sources or units in the 2014 NEI version 1 (2014NEIv1). The 2014NEIv1 includes over 110,000 records for non-EGU stationary NOx emissions units, with approximately 2,500 units with emissions over 100 tons per year (tpy) and an additional

6,000 units with emissions between 25 and 100 tpy. The EPA requested that the states prioritize their review to focus on the approximately 8,500 non-EGU stationary NOx emissions units that emit more than 25 tpy. After forwarding the 2014NEIv1 information to the states, the EPA provided a 30-day review period, and the review by states was largely complete at the end of November, with responses submitted back to the EPA.

114. The EPA is currently compiling the updated information and will transfer this information into the 2014NEIv2. The EPA will likely need an additional month to ensure the information is in the appropriate electronic format to submit as updates to the 2014 NEI. Accordingly, the process to collect the information from the states, compile the information, and include it in the 2014NEIv2 is expected to be completed between the end of December and the end of January 2017. [24]

115. In addition to the above information, a critical third component needed for analyzing the potential emissions reductions from non-EGU emissions sources is comprehensive data on potential control devices that could be installed on uncontrolled or under-controlled sources. As compared to EGUs, there are a substantially greater number and variety of non-EGU source categories that the EPA must evaluate, and that can be controlled by a larger variety of potential control devices. The EPA has taken steps to improve its data on control device or measure information, including information on installation times, control efficiency, and costs, for non-EGU emissions sources, but its work on this front is incomplete for purposes of NO_X control strategy analysis on non-EGUs. The EPA collects and reviews control measure information from many sources and uses this information for many purposes. Historically, most

[24] The draft version of the 2014NEIv2 will be available for internal EPA use starting in February 2016, but the public release of the final 2014NEIv2 will not be made available until late summer of 2016.

of the EPA's efforts to improve NOx control measure information were conducted to support control strategy analyses associated with rulemakings in which states decide on which sources to control and at what level (e.g., the NAAQS). In these cases, EPA's analyses were only intended to illustrate possible control options and associated costs; the states were free to substitute whatever controls they found most effective and least costly in their particular circumstances. However, in developing a FIP to address interstate ozone transport, the use of cost thresholds as a factor in defining states' emissions control obligations requires highly accurate information on control costs, applicability, and achievable emissions reductions.[25] Accordingly, to support a regulatory assessment of the NOx reduction potential from non-EGU sources, the EPA must take additional steps to ensure that the quality of control measure information for these sources is sufficiently accurate and reliable to support regulatory analyses.

116. The EPA does regularly update its information on available control devices or control measures for non-EGU stationary emissions sources or units. The Agency's most recent efforts to update this information can be found in the Final Non-EGU TSD, which was completed in August 2016 and focused on whether control measures could be installed by the 2017 compliance timeframe of the CSAPR Update. The Final Non-EGU TSD is a product of more than three years of data collection and review, as well as preliminary control strategy analyses of the potential for NOx emissions reductions from non-EGU point emissions sources.

[25] Individual states have greater flexibility in developing SIPs to address the good neighbor provision because they can select a level of control that is independent from other states (e.g., the statute permits states to impose greater emissions reductions than the statute may require). To the extent the EPA promulgates a FIP addressing the good neighbor provision for any NAAQS, states have the authority to replace the FIP with a SIP based on the state's preferred mix of controls so long as the SIP satisfies the statutory requirements. *See, e.g.*, 81 Fed. Reg at 74,569.

However, for the reasons explained below, the information necessary to evaluate NOx emission reduction potential is not yet complete.

117. Updating information regarding potential controls for the number and variety of non-EGU stationary emissions point sources or units requires extensive staff time and resources. One of the ongoing challenges the Agency faces in updating this type of NO_X control measure information can be illustrated by the information presented in Table 3 of the Final Non-EGU TSD. *See* Attachment 4, Final Non-EGU TSD at 11-17. Table 3 provides details on costs, installation times and other information regarding potential control technologies for up to 40 different non-EGU emissions source groups or categories (e.g., industrial boilers, stationary internal combustion engines, and cement kilns). In general, this is accomplished through a continuous series of smaller updates, each focusing on particular sources or control devices. Conducting a major update involving control measure information for as many as 40 different emissions source groups simultaneously will require a very substantial effort and a large quantity of data. Once the EPA collects new information, staff review the information for relevance, compare the new information to information the EPA already maintains, and determine what portion of the new information should be reflected in its control measure datasets and tools. The information must be then compiled and formatted specifically for use in the EPA's datasets and tools. To incorporate the formatted information into its datasets and tools, the EPA relies on specific software development and computer programming expertise outside of the Agency, through managed contracts. The EPA must also ensure that new control measure data are appropriately quality assured. Because of the number and variety of source categories involved, this is a time intensive, iterative process.

118. The Agency has been and is continuing to incorporate information from Appendix A and Appendix B of the Final Non-EGU TSD into the control measures database (CMDB) that serves as a primary input for the Control Strategy Tool (CoST).[26] CoST models emissions reductions and control costs associated with the application of control devices or measures by matching the devices or measures to non-EGU emissions sources in the NEI. The CMDB contains emissions reduction and cost data for control devices or measures that can be applied to non-EGU emissions sources within CoST. The CMDB and CoST will be used for any analyses of the potential NOx emissions reductions and costs from the various types of non-EGU emissions sources or units identified in the NEI. Appendix A of the Final Non-EGU TSD includes updated or new data on reduction efficiency and costs for NOx control measures for the several non-EGU source groups. Appendix B of the Final Non-EGU TSD includes an assessment of CoST run results and recommendations for changing the applicability of control measure assignments for non-EGU NOx emissions sources. These recommendations were based on review of source permits, state regulations, enforcement actions, and other available information as of 2014 for a 24-state area in the eastern U.S.

119. The information from Appendix A and Appendix B of the Final Non-EGU TSD will be fully incorporated in CoST and the CMDB in January 2017. However, contrary to Plaintiff and Plaintiff-Intervenor's contention, Howekamp Decl. para. 14-16, Sliwinski Decl. para. 23, the Final Non-EGU TSD does not contain all of the information necessary for the EPA to fully quantify emissions reductions necessary to address the good neighbor provision with respect to the 2008 ozone NAAQS. For example, EPA included preliminary estimates of

[26] *See* https://www.epa.gov/economic-and-cost-analysis-air-pollution-regulations/cost-analysis-modelstools-air-pollution.

installation times for individual non-EGU NOx control measures in its Final Non-EGU TSD ranging from 6 to 18 months. However, these preliminary estimates of installation times do not account for time required for programmatic adoption of measures, such as permitting and installation of monitoring equipment. Permitting requirements include submission of a draft permit application, technical review of the permit by government bodies, interactions between government bodies and the applicant, scheduling and holding of public hearings, time for responses to public comments on the permit, and final review and approval of the permit. Moreover, compared to EGUs that are currently equipped with monitors to comply with monitoring requirements and to participate in the current CSAPR program, non-EGUs of any type (e.g., industrial/commercial/institutional boilers or combustion turbines) that are not currently required to continuously monitor and report emissions in accordance with EPA regulations, 40 C.F.R. pt. 75, will require additional time to install monitoring equipment.

120. In addition, the preliminary estimates of installation time shown in the Final Non-EGU TSD are for installation at a single source, but do not account for the time required for installing controls to achieve sector-wide compliance. For installing control measures on sources across non-EGU industry sectors, time for full sector-wide compliance is currently uncertain, but it is longer than the installation time shown for control measures for individual sources in the Final Non-EGU TSD. Though EPA is currently engaged in efforts to improve its data, we do not have sufficient information on pollution control vendor capacity and has limited experience with both the suppliers of control measures and major engineering firms that design control measure installation. This information is critical to estimate the time needed for sector-wide compliance.[27]

[27] The EPA did not encounter this specific compliance concern in the CSAPR Update because the majority of near-term EGU NO_X reduction potential was available from optimizing existing

121. Furthermore, the Agency is currently updating the Air Pollution Control Cost Manual (Cost Manual)[28] as required by the 2014 Consolidated Appropriations Act. The EPA's Cost Manual provides guidance for the development of accurate and consistent costs for air pollution control devices. The Cost Manual focuses on stationary point source and stationary area (non-point) source air pollution controls for volatile organic compounds (VOCs), particulate matter (PM), oxides of nitrogen (NOx), sulfur dioxide (SO_2), and some acid gases. Section 4, Chapters 1 and 2 of the Cost Manual cover specific NOx control technologies and have been updated as of May 2016, and the Agency is working to ensure that the updated information on control efficiencies and cost equations is incorporated into the CMDB and CoST for future analyses of the potential for NOx emissions reductions from non-EGU sources. Before incorporating information from the Cost Manual into the CMDB and CoST, EPA staff will evaluate information from the updates to Section 4, Chapters 1 and 2 and compare it to information and cost equations already in the CMDB and CoST. Once staff review is complete, and again because updating the CMDB and CoST requires specific control measure expertise, the EPA will identify and work with an entity that has the appropriate expertise to ensure that any updates are correctly incorporated. This process is expected to take three months and be completed by the end of February 2017.

122. Once the EPA has included the updated information on non-EGU emissions controls in the 2014NEIv1, the Agency intends to conduct analyses of potential NO_X emissions reductions from the various types of non-EGU emissions sources or units using the CoST model.

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post-combustion controls, which does not require significant new capital investment. For more information on EPA's compliance feasibility analysis, see the EGU NO_X Mitigation Strategies Final Rule TSD, Attachment 3.

[28] Available at https://www.epa.gov/economic-and-cost-analysis-air-pollution-regulations/cost-reports-and-guidance-air-pollution.

The analyses of NO_X emissions reduction potential would likely reflect both estimated emissions reductions from a relatively smaller number of higher NO_X-emitting sources as well as estimated emissions reductions from a much larger number of lower NO_X-emitting sources. With the above improvements and updates to the CMDB, CoST, and the 2014NEIv1, the EPA believes it is important to provide the public and states with an opportunity to review and comment on this analysis in order to ensure we have the most comprehensive and accurate information about controls on emissions sources and the potential for NOx emissions reductions from non-EGU emissions sources. Therefore, the Agency would request comment on a number of data elements, potentially including: (a) appropriate application of and related emissions reductions for certain types of control measures on various emissions sources or units in the EPA's analyses; (b) availability of alternative (i.e., non-end-of-pipe) or emerging NOx control measures or technologies for the various emissions sources or units; (c) availability of upgrades or improvements to NOx control devices, measures or technologies currently on non-EGU emissions sources; (d) current costs for installation, operation, and maintenance of control measures; and (e) installation times for NOx control devices, measures or technologies.

123. While the EPA's EGU data are derived from relatively more accurate and robust data sources (e.g., continuous emissions monitors on many EGUs and data that are reported to both EPA and the Energy Information Agency), because the EPA believes it is necessary to perform this developmental work with respect to non-EGUs, the agency also intends to solicit feedback on the EPA's evaluation of longer-term EGU NO_X reduction potential and cost. Because the CSAPR Update focused on near-term EGU NO_X reductions from EGU emission reduction strategies that could be implemented very quickly (i.e., for the 2017 ozone season), the agency's analysis and notice and comment process for the CSAPR Update was especially

focused on these types of emissions reductions and costs as opposed to the reductions and cost of further EGU NO_X mitigation strategies that would be necessary to fully address the good neighbor provision, such as emission reductions from new SCR systems on uncontrolled or under-controlled EGUs. The agency intended to develop this information in the same time that is already allotted to developing the non-EGU work. The agency believes that providing this EGU data in advance of a proposal is necessary to develop the a technically defensible proposal so that the final rule can follow reasonably from the proposal and comments the EPA receives.

124. There are numerous approaches that the EPA could use to collect additional information on controls and costs for both EGU and non-EGU sources. Typically, given the number of data elements involved and the wide array of commenters likely to provide input, the Agency would consider publishing a notice of data availability (NODA). This would enable commenters to evaluate the data through a defined comment process and ensure the EPA could incorporate all updates to the data prior to issuing a proposed rulemaking to address the remaining interstate transport obligations for the 2008 ozone NAAQS. If, instead, the EPA issued a proposal based on incomplete and inaccurate information, the EPA expects that we would receive significant comments on these data, which would in turn require substantial changes from the proposed rule. If the changes to the proposed rule were sufficiently substantial, the EPA could find it necessary to issue a supplemental proposal based on new analysis before issuing a final rule. Failure to issue a supplemental proposal under such circumstances could result in procedural defects in the promulgation of the final rule and subject the rule to significant legal risk. Even if a supplemental proposal were not ultimately necessary, if the EPA receives significant comments on these data elements in a proposed rule, we would need additional time between proposal and final to incorporate necessary changes into the Agency's emissions

inventories, control strategies, and air quality modeling needed for a final rulemaking. Accordingly, the EPA believes that the time allotted in the EPA's proposed rulemaking schedule for the development and promulgation of a NODA would ultimately save valuable time between proposal and final by reducing the number of significant comments received on a proposed rule and reducing the number of changes that might need to be made between a proposed and final rule.

125. Beyond the efforts described above to collect, compile, and include information from the Agency's regular control measure information updates, as well as the states' reviews of control measure information in the 2014NEIv1, the process to prepare and publish a NODA is expected to take no less than three months from the conclusion of those activities. Over the three months, the EPA would run CoST several times to assess the potential for cost-effective NOx emissions reductions from non-EGU point emissions sources. The EPA would also prepare the appropriate *Federal Register* Notice and data files that support the EPA's analysis and on which commenters would be invited to comment. The EPA estimates that given the amount and complexity of the information about controls, emissions reductions, and costs for the many non-EGU source groups that would likely be part of a NODA, the public should be provided a 90-day period in which to review and prepare comments on the information. From the close of the public comment period, it would likely take three to five months to review, compile, and integrate the information received on the non-EGU emissions control measures received through public comments, depending on the volume of comments received.

126. The steps detailed above are estimated to take between 9.5 to 11.5 months to complete and are summarized as follows: (i) between 2 weeks and 1 month to make updates to the CMDB, CoST, and the 2014 NEIv1; (ii) 3 months to prepare and publish a NODA; (iii) 3

months for a public comment period on the NODA; and (iv) based on the volume and type of comments received, between 3 and 5 months to compile, review, and integrate information from the public comments. The EPA therefore expects that the steps necessary to improve the EPA's data for the evaluation of non-EGU NO_X reduction potential could be completed between September and November of 2017.

iii. Identifying downwind receptors and upwind state contributions

127. As described above at paragraph 83, the first step of the EPA's analysis to calculate a state's emissions reduction obligation pursuant to the good neighbor provision is to identify those downwind areas that are expected to have a problem attaining and maintaining the NAAQS in a future year. The EPA refers to these areas as nonattainment and maintenance "receptors." The second step of the analysis is to determine which upwind states contribute emissions to these downwind areas identified in step 1 and in what amounts. If an upwind state contributes at or above a screening threshold, which has been set in recent rulemakings equivalent to 1 percent of the NAAQS, to a downwind nonattainment or maintenance receptor then that upwind state is determined to be "linked" to that particular receptor. States that are linked to downwind receptors based on the screening threshold are then further evaluated in the third step of EPA's analysis to determine whether the state makes a significant contribution to the receptor(s) to which it is linked. This third step is discussed in more detail at section C.iv.

128. In order to complete both steps 1 and 2 of the EPA's analysis, the EPA must conduct air quality modeling. Air quality modeling is needed to project ozone concentrations in order to identify the extent of expected downwind nonattainment and maintenance problems for the appropriate future analytic year. In addition, air quality modeling is needed to quantify the

contributions from emissions in upwind states to the downwind nonattainment and maintenance problems in this analytic year.

129. The EPA anticipates that we will require 12 months to complete the air quality modeling step before a proposed rule can be issued. Much of this work can occur concurrently with the remaining work to improve the EPA's non-EGU data, and is expected to be completed between January and March 2018. The following table summarizes those steps which are described in more detail in the following paragraphs. The EPA's Gantt chart shows how these steps interrelate with one another and with the other tasks described in this declaration. *See* Attachment 1.

Task	Timeframe	Earliest Target Date
Develop Air Quality Modeling Inputs – Non-Emissions Data	3 months	April 2017
Develop Base and Future Analytic Year Emissions	6 months	October 2017
Run Air Quality Model	3 months	December 2017
Complete Post-Processing of Air Quality Modeling Data	1 month	January 2018

130. As discussed above at paragraph 60, the air quality modeling conducted for the CSAPR Update focused on 2017, but additional emissions reductions will necessarily occur in a later year. Therefore, the EPA must conduct air quality modeling for an appropriate future analytic year for a subsequent rulemaking in order to ensure any additional emissions reductions required from sources in Kentucky or other states do not over- or under-control relative to the downwind air quality problems to which the states are linked.

131. The air quality metric used for determining whether or not a particular monitoring site is violating the ozone NAAQS is referred to as the "design value." The design value is calculated as the three-year average of the 4th highest 8-hour daily maximum ozone concentration in each of the three years (e.g., the design value for 2011 is the average of the 4th highest concentrations in 2009, 2010, and 2011). Monitoring sites with a design value that exceeds the NAAQS are considered to be violating the NAAQS. Whether a monitoring site is a nonattainment and/or a maintenance receptor in the future analytic year depends on whether certain projected design values for that future year exceed the NAAQS.

132. In brief, the procedure for projecting future design values begins with design values based on measured data. The measured design values are projected to the future using model predictions from two air quality modeling scenarios. One scenario simulates ozone concentrations for a base year of emissions and the second scenario simulates ozone concentrations using emissions for the future analytic year. The ratios of future year to base year ozone model predictions applicable to monitoring sites are used to adjust measured concentrations up or down depending on the relative change in model predicted concentrations. EPA's air quality modeling guidance for ozone attainment demonstration modeling[29] recommends using a 5-year weighted average of the measured design values as the starting point for projecting whether or not a monitoring site will be nonattainment in the future. This 5-year weighted average is used in order to lessen the effects of inter-annual variability of meteorological conditions and thereby provide an estimate of future design values under average

[29] *See* Memorandum from Richard Wayland, Division Director, to Regional Air Division Directors, Regions 1-10, "Draft Modeling Guidance for Demonstrating Attainment of Air Quality Goals for Ozone, PM2.5, and Regional Haze" (Dec. 3, 2014), available at https://www3.epa.gov/ttn/scram/guidance/guide/Draft_O3-PM-RH_Modeling_Guidance-2014.pdf.

conditions. The guidance recommends that the 5-year base period be defined such that the center year corresponds to the time of base year modeling scenario. For example, the average design value that corresponds to a 2011 base year is calculated as the average of the design values in 2011 (i.e., 2009 – 2011), 2012 (i.e., 2010 – 2012), and 2013 (i.e., 2011 – 2013). Thus, these three design values reflect ozone concentrations over the 5-year period 2009 through 2013 with the greatest weighting given to the 2011 base year in this example. In the CSAPR Update, the EPA identified monitoring sites that have projected average design values that exceed the NAAQS and are also violating the NAAQS based on the most recent air quality measurements as future year "nonattainment receptors."

133. In addition to projecting the 5-year weighted average design value, EPA also projects the design values for each of the three design values that comprise the 5-year weighted average (i.e., the 2011, 2012, and 2013 design values). The highest (i.e., maximum) of these three values, as projected to the future analytic year, is used to determine whether or not a receptor is at risk of violating the NAAQS if future meteorological conditions are more conducive to ozone formation than average. Monitoring sites with future *average* design values that are below the NAAQS, but with *maximum* design values above the NAAQS may have a problem maintaining the NAAQS due to meteorological conditions. Such sites are referred to as "maintenance receptors." In addition, monitoring sites that are currently measuring clean data but have future year average design values that exceed the NAAQS, are also considered to be maintenance receptors. The air quality modeling that is used to project future year average and maximum design values for the future analytic year is described below.

134. Once the EPA has identified downwind nonattainment and maintenance receptors, the second step of the analysis requires the EPA to determine which upwind states contribute at

or above the contribution screening threshold to nonattainment and/or maintenance receptors in other states. The evaluation of interstate contributions against the screening threshold is based upon the magnitude of EPA's contribution metric. This contribution metric is calculated using future year contributions based on air quality source apportionment modeling coupled with the future year average design value. The source apportionment modeling involves using an air quality modeling tool that tracks the formation, chemical transformation, and transport of ozone from emissions of nitrogen oxides (NOx) and volatile organic compounds (VOCs) in individual states to those downwind air quality problems.

135. The first step in the air quality modeling process is to develop the air quality modeling inputs. This process includes selecting the appropriate base year and future analytic year, and developing the requisite emissions, meteorology, and other non-emissions air quality modeling inputs for the ozone season, and the base-period design values calculated from measured ozone concentrations. The base year emissions inventory quantifies the amount of pollutants that are emitted from individual sources (e.g., electric generating units) or by county for other source categories (e.g., cars and trucks). The NEI is developed on a three-year cycle (e.g, 2005, 2008, 2011, and 2014 are each NEI years). The base year emissions are projected to the future analytic year by considering (1) the effects of forecast economic changes (i.e., positive and negative growth) based largely on the U.S. Energy Information Administration (EIA) Annual Energy Outlook (AEO) data and (2) the expected reductions in emissions from federal and state "on-the-books" air pollution control programs.[30] Another factor in the selection of the base year is the geographic extent of measured high ozone concentrations indicative of

[30] "On-the-books" rules are finally promulgated state and federal rulemakings that are expected to result in emissions reductions between the base and future analytic year.

meteorological conditions that are conducive to the formation of ozone concentrations close to or above the NAAQS. Since the air quality modeling is being used to identify locations that are expected to have ozone air quality problems in the future as well as to quantify interstate ozone transport it is necessary to model ozone season meteorological conditions from a year that actually had ozone-conducive meteorology. Modeling a year with meteorology that resulted in low ozone concentrations could lead to understating the magnitude and geographic extent of future year ozone problems and interstate contributions and a failure to protect public health and the environment from the harmful effects of ozone that occur when meteorological conditions are conducive for ozone formation.

136. For the CSAPR Update, EPA used a 2011-based emissions inventory for the base year, a projection of this base year inventory to 2017, ozone season meteorology for 2011, and 2009 – 2013 design values, which the Plaintiffs propose the EPA continue to use for subsequent rulemakings, *see* Howekamp Decl. at para. 21. Given that there are now more recent and technically updated base year emissions inventories as well as more recent ozone measurements, it is necessary to reevaluate whether the 2011-based modeling platform is still the most appropriate for analyzing ozone transport or whether EPA should update its modeling platform to utilize data from a more recent time period. This requires consideration of several factors. For example, ozone concentrations declined significantly in many areas of the East in 2013 and 2014, compared to 2010 through 2012. However, despite continued reductions in emissions, ozone concentrations began to rise again in 2015 and 2016. The process for selecting an appropriate modeling platform will involve a comparative evaluation analysis of measured ozone concentrations and the associated meteorological conditions in 2015 and 2016 in terms of the potential for forming and transporting ozone concentrations relative to the concentrations and

meteorology used in the 2011-based platform. A failure to fully consider the appropriateness of a particular modeling platform could lead to projections of future air quality and interstate contributions that are not representative of what may actually be expected to occur in the future year which could lead to over- or under-control of downwind air quality.

137. The analysis of measured ozone concentrations and meteorology and the development of meteorological and other non-emissions inputs for air quality modeling will require 3 months to complete. The process involves creating and evaluating tabular and graphical summaries of measured ozone concentrations in multiple subregions across the U.S. for years that are candidate choices for the modeling platform. In addition, it is necessary to tabulate and review specific meteorological data that influence the formation and transport of ozone (e.g., temperature and air trajectories) for the candidate update years and a comparison to more historical ozone episodes in order to select meteorological periods to model that collectively represent conditions conducive to ozone formation and the multiple interstate transport patterns that are likely to occur in the future. Once the periods for air quality modeling are identified it is necessary to run meteorological models and associated pre-and post-processors to obtain the 3-dimensional meteorological data for input to the air quality modeling.

138. In order to establish the appropriate future analytic year for purposes of the EPA's analysis, including the air quality modeling, the EPA considers several factors related to anticipated compliance timing of the rulemaking. It is essential to consider how best to align the future analytic year with compliance timing in order for the assessment of significant contribution to nonattainment and interference with maintenance to align with the identified air quality challenge. Compliance timing is informed by the D.C. Circuit's decision in *North Carolina*, where the court held that the EPA should align implementation of its interstate

transport rules with a date by which states are required to demonstrate attainment with the applicable NAAQS. 531 F.3d at 911-12. However, the determination as to how to align implementation with the attainment is not ready-made. Rather, the EPA considers several factors including the relevant attainment dates for the NAAQS, timelines necessary for installing appropriate control technologies, whether or not emission reductions preceding the relevant attainment dates (if possible) would further assist downwind areas in demonstrating attainment and maintenance of the NAAQS, or in the event that emission reductions are not feasible by the relevant attainment deadline, what date is as soon as practicable for EPA to require reductions following the relevant attainment deadline.

139. As part of this decision-making process, the EPA considers which emission reduction strategies are feasible to implement when evaluating an appropriate timeframe for compliance. Different EGU and non-EGU control strategies have very different timeframes for implementation. For example, the CSAPR Update found that operating existing post-combustion NO_X controls could be done quickly (i.e., within 7 months) while installation of new post-combustion NO_X controls would require several years for contract, construction, and commissioning. These differences in implementation timing necessitate that the agency evaluate which strategies are appropriate to consider given the timing for compliance and the relevant attainment date. In the CSAPR Update, the EPA limited its analysis of potential NO_X reductions in each upwind state to those that could be feasibly implemented for the 2017 ozone season in order to provide reductions in advance of the July 2018 attainment date. However, as discussed at paragraph 69, we will need to evaluate other control strategies that may require longer timeframes to implement in order to evaluate upwind states' full reduction obligation with respect to the 2008 ozone NAAQS.

140. The EPA does not agree with Plaintiff Sierra Club's contention that 2018 should be designated as the future analytic year simply because the EPA conducted a 2018 analysis using its integrated planning model, which provided one of the inputs for the EPA's air quality modeling for the CSAPR Update. *See* Pl.'s Br. at 19-20. First, Mr. Howekamp, concedes that the EPA will need to choose a future analytic year later than 2017 because additional control strategies cannot be implemented in that timeframe. *See* Howekamp Decl. para. 19. The Plaintiff and Plaintiff-Intervenor have proposed that the EPA can promulgate a final rulemaking by June 2018, but Mr. Howekamp further concedes that additional controls will require up to 18 months to install. *See id.* para. 20. If it were even possible for the EPA to finalize a FIP by that date, considering the timeframes outlined by Mr. Howekamp, additional controls could not be implemented until at least the 2020 ozone season. Accordingly, it might be inappropriate for the EPA to select 2018 as the appropriate future analytic year for the 2008 ozone NAAQS because the EPA might promulgate emissions reductions that would not be implemented until a later year, creating a discontinuity within our analysis. Such discontinuity may result in under- or over-control relative to the later, future compliance year that a Court might find impermissible.

141. These steps, determining which future analytic year and compliance year is appropriate and which emission reduction strategies are available based on that compliance timing, have significant implications for the ultimate scope of the interstate transport obligation. Due to the significance of the decisions and the significant breadth of options that the agency must evaluate, the EPA typically allots between 2 and 3 months to scope options and brief management on these decisions. This work can occur concurrently with the selection of the base year modeling platform and the creation of meteorological and other non-emissions air quality modeling inputs. The majority of this time is allocated to scoping the various combinations of

emission source categories (e.g., large coal-fired EGU, medium sized natural gas-fired EGU, small institutional boiler, large cement plant, emissions from combustion of fuels for energy, process emissions) and emission reduction strategies (e.g., various types of combustion control, selective catalytic reduction post-combustion control, selective non-catalytic reduction post-combustion control, shifting energy production to lower-emitting sources). The EPA must consider not only that there are thousands of emission sources to evaluate, but also that each emission source category has multiple potential

142. Following the process of selecting the appropriate modeling platform and creating meteorological and other non-emissions air quality modeling inputs and selecting an appropriate future analytic year, another 6 months are needed to construct the appropriate base year and future year emissions inventories (the latter of which reflects expected growth in emissions from the base year coupled with the effects of federal and state "on-the-books" control programs). Though work on this step can begin in the spring of 2017, this step cannot be completed until the agency has been able to apply to the modeling inventories the feedback on its non-EGU and EGU cost and NO_X analysis described in paragraphs 122-25, pursuant to which we expect commenters will also submit updates to the base case inventory assumptions. The development of base year emissions includes the review of existing data and the associated methodologies used to calculate these emissions to identify any methodological changes or corrections that might be needed to reduce the uncertainties and potential for errors in the data. Once the base year emissions data are constructed these data are projected to the future analytic year. This step is performed for each source category, individually. Examples of source categories are electric generating units (EGUs), non-EGU industrial point sources, on-road cars and trucks, off-road

equipment (e.g., construction vehicles), railroad locomotives, ships in ports and underway, airport operations, and oil and gas production.

143. Because of the different nature and diversity of the emissions and emissions processes across the range of source categories, there are category-specific, computer-based tools that must be applied to appropriately forecast emissions for each category. For example, the EPA uses the Integrated Planning Model (IPM) to establish a base case future projection of EGU emissions, accounting for the most up to date data and comments received on IPM modeling inputs. The EPA typically updates the IPM model platform annually to account for the most recent available power sector economics projections (e.g., electricity demand forecasts, fuel prices, etc.) available from the Energy Information Administration (EIA). Additionally, the EPA surveys the most recent power sector announcements impacting the electricity generating unit fleet, including gathering the latest available data on power plant construction, modification, or retirement information. This work is necessary to ensure that the base case represents, to the greatest extent possible, an accurate projection of emissions in the base case. Surveying these datasets and making system-wide or unit-level updates in the model generally requires three to four months, which is a component of the time it takes to develop the future year emission inventories for air quality modeling.[31]

144. As noted above, the future year projection process includes the consideration of growth in emissions and the effects of "on-the-books" federal and state control programs. Accordingly, EPA must gather a diverse set of economic and other information to construct

[31] Moreover, Plaintiff's contention that the EPA can save time by selecting 2018 future analytic year because the agency has already conducted an IPM model run for EGUs in 2018, as discussed at paragraph 140, does not account for the EPA's need to develop future year emissions inventories for all other source sectors.

growth factors (i.e., estimates that represent the percent change in emissions between the base year and future year due to expected changes in economic conditions) and information on the emissions reductions at individual sources that are expected to result from specific federal and state air pollution rules. The EPA does not agree with Mr. Howekamp that this complex task can be conducted in only two months' time, *see* Howekamp Decl. para 21, and Mr. Howekamp does not explain the basis for his estimate.

145. Once the EPA has constructed the base and future year emissions inventories, the EPA can begin to conduct the air quality modeling. Air quality modeling to identify nonattainment and maintenance receptors involves three separate model runs for the base year and the future analytic year. Each air quality modeling run can take up to 2 weeks. The first run predicts ozone concentrations for the base year, and the second run predicts ozone concentrations for the future year. Then, in order to project ozone design values for the future analytic year, the model-predicted ozone concentrations from the base-year and future-year air quality model runs are applied in a relative sense to modulate measured design values up or down following the methodologies in EPA's guidance for ozone attainment demonstration modeling, as described below. In addition, the predictions from the base year model run are compared to corresponding measured concentrations as part of a model evaluation process to gain confidence in the ability of the modeling platform to provide a credible representation of ozone formation and transport. A third model run is conducted for the future analytic year using an ozone source apportionment modeling tool. The outputs of this source apportionment model simulation are used to calculate the contributions from each upwind state, as described below.

146. The model runs are performed sequentially in order to include time for quality assurance review of modeling results and possible corrections to inputs which would then require

rerunning the particular simulation before proceeding on to the next run. The gridded hourly concentrations of pollutant concentrations from each model run undergo extensive post-processing, including (1) extracting ozone concentrations from model output files, (2) time-shifting model predictions from Greenwich Mean Time (GMT), which is the native time zone used in air quality model runs, to local standard time, (3) calculating 8-hour ozone concentrations and (4) selecting the maximum daily 8-hour ozone concentrations in each grid cell on each day. The base year predictions are further processed to pair the predictions with the corresponding observed concentrations for use in the model performance evaluation. Base year and future year ozone concentrations are also processed to format these data for input into the Modeled Attainment Test Software (MATS), which is used to combine model predictions with measured base period design values for the purpose of projecting these base period design values to the future analytic year. The future year source apportionment model results are post-processed to prepare the hourly contribution data for calculating the 8-hour contribution metric following the steps described below. The air quality modeling process requires 3 months to complete depending on the availability of shared computer resources and the need to repeat any model runs to account for corrections.

147. After the model runs are complete and the post-processed output files are created, the base year and future year outputs are run through MATS together with measured base period design values to calculate design values for the future analytic year at the location of each monitoring site. The source apportionment modeling outputs are processed in combination with the future year design values to calculate the contribution metric which represents the amount of ozone contribution from each state to the future year design value at each monitoring site. The resulting contributions from each state to each monitoring site are analyzed to cull out the design

values and contributions for the subset of monitoring sites that are identified to be nonattainment or maintenance receptors in the future analytic year. The contributions from each upwind state to each downwind receptor are then evaluated to identify "linkages" in which an upwind state contributes at or above the screening threshold to a downwind receptor. A period of 1 month is required to calculate the future year design values and contribution metric for each monitoring site and to evaluate the results.

148. The total amount of time required to conduct the air quality modeling necessary to inform the development of a proposed rule is 12 months.

149. Plaintiffs appear to concede that the EPA will be required to conduct additional air quality modeling in order to evaluate emissions reductions in a future analytic year, *see* Howekamp Decl. at para. 19, but at the same time assert the EPA can evaluate future emissions reductions in a future year using the air quality assessment tool (AQAT) developed for the CSAPR Update based on the outputs from the Comprehensive Air Quality Model with Extensions (CAMx). AQAT was developed so that the EPA could evaluate the impacts of different levels of emissions controls on downwind air quality in 2017, the analytic year for the CSAPR Update. However, this version of the tool is not calibrated for any time period other than 2017. The version of the AQAT used for the CSAPR Update is calibrated for a relatively narrow range of emission changes from only EGUs and only for 2017. A future year would have different emission levels and a different mix of sources, such that the EPA would need to develop a new version of AQAT for a future compliance period, which Mr. Howekamp appears to concede, *see* Howekamp Decl. at para. 19. Development of a new version of AQAT requires the outputs from new air quality modeling conducted for that future year reflecting the commensurate anticipated emission reductions from mobile sources, EGUs, and non-EGUs.

Even if the EPA could to implement some of the "simple" controls that Plaintiffs contend are available[32], *see* Pl.'s Br. at 19, those controls would be installed in a future year and therefore the EPA would need to evaluate air quality levels in that future year. Accordingly, even if the EPA could use the AQAT tool in some manner, the EPA must still complete the modeling described above in order to identify downwind air quality problems that need to be addressed relative to the 2008 ozone NAAQS in the future compliance year and to identify those upwind states that contribute to these downwind air quality problems at sufficient levels to justify further analysis for potential emission reductions.

iv. Quantifying upwind state obligations

150. Once the EPA has identified downwind air quality problems and upwind states contributing above the screening threshold to those air quality problems, the EPA can then take steps to quantify the amounts of emissions that constitute each upwind state's significant contribution to nonattainment and interference with maintenance of the 2008 ozone NAAQS in other states. This is step 3 of the CSAPR framework described at paragraphs 83, which like the other steps, consists of several stages of complex evaluations, including: identifying NO_X reduction strategies and their associated compliance timing and costs for sources in relevant sectors; assessing NO_X emission reduction potential using various NOx reduction strategies (i.e., tons of emissions reduced); analyzing downwind air quality impacts of such emissions reductions (i.e., improvements in ozone air quality); selecting a level of control by applying the CSAPR multi-factor test; ensuring that emissions reductions do not constitute over-control relative to the downwind air quality problems; and establishing emission limits (e.g., budgets)

[32] As explained at paragraphs 105-108, the EPA disputes that there are readily available emissions reductions "left on the table" by the CSAPR Update.

that represent emissions remaining following the elimination of significant contribution to nonattainment and interference with maintenance of the NAAQS downwind.

151. The EPA anticipates that it will take 5-6 months to complete the elements required by step 3 of the CSAPR framework. Because the EPA needs to evaluate potential emissions reductions from non-EGUs in this step of the analysis, we cannot proceed until the EPA completes the remaining work to improve the EPA's non-EGU data described in section C.ii. However, much of this work can occur concurrently with the air quality modeling described in section C.iii and is expected to be completed by March 2018. The following table summarizes this work which are described in more detail in the following paragraphs. The EPA's Gantt chart shows how these steps interrelate with one another and with the other tasks described in this declaration. *See* Attachment 1.

Task	Timeframe	Earliest Target Date
Evaluate EGU and non-EGU NOx Reductions and Cost	2-3 months	December 2017
Translate NOx Reduction Potential into Emission Limits	1 month	January 2018
Construct Air Quality Assessment Tool	1 month	February 2018
Evaluating the Multi-Factor Test to Establish Full Remedy	1 month	March 2018

152. A key component of step 3 of the CSAPR framework is the multi-factor test, which considers cost, available emission reductions, and downwind air quality impacts to determine the appropriate level of uniform NO_X control stringency that addresses the impacts of interstate transport. This test evaluates these factors to determine the appropriate stopping point for quantifying upwind state obligations to address interstate ozone transport, including whether

the identified downwind ozone problems (i.e., nonattainment or maintenance problems) are resolved. The following paragraphs describe the development of inputs to this test and the application of the test itself.

153. To quantify upwind state obligations, the first step is for EPA to consider the types of emission reduction strategies that can be applied to relevant source sectors and their associated compliance timing and cost. This stage is complex and time consuming given the many types of ozone season NO_X emissions sources (both EGU and non-EGU) that the agency must consider and the many NO_X reduction strategies that are possible for each source category and in each state. As noted at paragraphs 138-39, the compliance timing for emission reduction strategies is informative to the analysis year selected for CSAPR steps 1 and 2. In addition, in CSAPR Step 3, the EPA may also consider whether compliance timing lends itself to single phase implementation or multi-phase implementation of emissions reductions. For example, in the context of the CSAPR Update, EPA found that single phase implementation was appropriate. The CSAPR Update evaluated the 2017 ozone season in its assessment of CSAPR Steps 1 and 2 and the establishment of emission budgets in Step 3.[33] In contrast, the original CSAPR analysis of Steps 1 and 2 resulted in Phase 1 emissions budgets focused on 2012 while EPA also finalized Phase 2 emissions budgets for 2014.[34] In this case, the 2012 emission budgets represented emission levels that were achievable in the near-term and the 2014 emission budgets represented further emission reductions that could be achieved over the longer-term (i.e., installation of new scrubbers to reduce emissions of SO_2 to address fine particulate matter pollution). The EPA

[33] For one state, Arkansas, EPA finalized a separate and less stringent emission budget for the 2017 ozone season as compared to the budgets for the ozone seasons in 2018 and later years.
[34] As noted above, following litigation, CSAPR Phase 1 was implemented starting in 2015 and CSAPR Phase 2 will be implemented starting in 2017.

believes that the robust evaluation of NO_X reduction strategies and their associated compliance timing and cost is essential to promulgating an analytically consistent and legally defensible full remedy FIP for the 2008 ozone NAAQS. As described above, this step in EPA's analysis is anticipated to take two to three months.

154. We note that the CSAPR Update established emission budgets reflecting near-term EGU NO_X reduction potential from actions that could be reasonably implemented within one year (e.g., turning on and optimizing existing post-combustion controls). The agency believes that further EGU and non-EGU NO_X reduction strategies will take longer to implement. These further strategies could include installing new post-combustion SCRs and building new low- or zero-NO_X generation to complement the existing electricity generation fleet. Such activities are anticipated to take longer to implement due to their more complex nature, including procuring land parcels for new generation projects, obtaining permits, construction, connecting to the electricity grid, and integrating with the dynamic electricity market.

155. Once the EPA has identified potential NO_X reduction strategies (e.g., new SCRs on EGUs), the EPA uses this information to organize the strategies into uniform levels of NO_X control stringency represented by uniform cost (e.g., $5,000 per ton). The purpose of this step is to develop data that can be used to apportion responsibility for making necessary total emissions reductions among the multiple upwind states that collectively contribute to the air quality problems identified at downwind receptors. Each level of uniform NO_X control stringency is characterized by a set of pollution control measures and represents an estimated incremental cost per ton of NO_X emissions reduced. The EPA identifies incremental cost thresholds where control technologies are widely available and therefore where the most significant incremental emission reduction potential is expected across the relevant source sector. To evaluate cost, the EPA

develops engineering analyses considering the types of sources to be considered for potential emission control and the types of emission reduction strategies that are available for those sources. For example, in the CSAPR Update, the EPA focused its analysis on EGU controls limited to optimizing existing SCRs, turning on idled existing SCRs and turning on idled existing SNCRs. To establish costs for each of these strategies, the EPA applied engineering analyses (e.g., Sargent and Lundy[35] cost estimators for EGU NO_X controls) to available economic data (e.g., the cost of ammonia, a reagent used to react with NO_X in SCR operation). Following the assignment of cost to individual emission reduction strategies, the agency next develops uniform levels of NO_X control stringency by grouping strategies together based on similarities in cost of control.

156. After establishing uniform levels of NO_X control stringency, the EPA assesses NO_X emission reduction potential (i.e., tons reduced) in each state and across the analytic region for each level of uniform control stringency. Preparing this analysis to develop full remedy FIPs for the 2008 ozone NAAQS will require separate evaluations of NO_X reduction potential from EGUs and non-EGUs.

157. With respect to EGUs, EPA has used the Integrated Planning Model (IPM) to evaluate NO_X reduction potential and to inform interstate transport obligations under the original CSAPR and the CSAPR Update. IPM is a multi-regional, dynamic, deterministic linear programming model of the U.S. electric power sector. It provides forecasts of least-cost capacity expansion, electricity dispatch, and emission control strategies for meeting energy demand and

[35] Sargent and Lundy is an engineering firm EPA contracted with to develop cost and performance models for control options for pollutants, including NO_X.

environmental, transmission, dispatch, and reliability constraints. IPM can be used to evaluate the emissions impacts of levels of uniform NO_X control stringency.

158. To evaluate levels of uniform NO_X control stringency for EGUs, the EPA typically designs a series of IPM assessments that impose increasing cost thresholds representing uniform levels of NO_X controls and tabulates those projected emissions for each state at each cost level. For the CSAPR Update, the EPA imposed cost thresholds of $800, $1,400, $3,400, $5,000, and $6,400 per ton (all in 2011$) of ozone season NO_X. In the CSAPR Update, the EPA referred to such analysis as "Cost Threshold Runs" and the tabulations as "cost curves." The cost curves report the remaining emissions in each state at each cost threshold after the state has made emission reductions that are available up to the particular cost threshold analyzed. These cost-threshold analyses would take between 2 to 3 months to complete to support a proposed rule to address the remaining interstate transport obligations with respect to the 2008 ozone NAAQS, including approximately three to four weeks to run and test each set of cost threshold analyses for initial review and quality assurance, two to three weeks to review and make any necessary updates to the modeling, and another four to five weeks to run the full suite of cost threshold analyses.

159. Next, the EPA develops EGU control requirements that reflect the emission reductions evaluated in the IPM analysis. For the final CSAPR Update rule, the EPA established emission budgets reflecting EGU NO_X reduction potential by using historical state-level NO_X emission rates adjusted by IPM modeled NO_X reduction potential. The final CSAPR Update budget-setting approach for EGUs was developed in a specific context – setting emission budgets that would be implemented in the near-term. Given that the full remedy transport FIP for Kentucky would need to evaluate longer-term NO_X reduction strategies and would be

implemented further in the future after its promulgation, it may be appropriate for the EPA to adjust the budget setting methodology for this different context. As a result, the EPA believes that it is necessary to allocate one month to develop and quality-assure approaches to limit EGU emissions consistent with the requirements of the good neighbor provision. This month is addition to the time needed to develop the EGU cost threshold analysis because the NOx reduction potential identified in that analysis is needed as an input to this phase of developing EGU NO_X limits.

160. With respect to non-EGUs, the EPA has not previously finalized NO_X emissions limitations for these sources under the original CSAPR or the CSAPR Update rulemakings. To evaluate NO_X reduction potential, the EPA would use the CoST tool. As described at paragraph 118, CoST estimates emissions reductions and control costs associated with the application of control devices or measures by matching the devices or measures to non-EGU emissions sources in the NEI. To evaluate levels of uniform NO_X control stringency for non-EGUs, the EPA would run CoST at different cost per ton thresholds and assess resulting reduction potential, similar to the method used to evaluate EGU reduction potential with IPM. As with EGUs, the non-EGU assessment would also consider the form of the obligation that is appropriate (e.g., emissions budgets or rate-based emissions limits). The agency would need to develop a process for translating potential non-EGU NO_X reduction potential into limits on NO_X emissions that reflect remaining emissions after reductions are made. While there is some experience with respect to establishing limits on non-EGU NO_X emissions (e.g., emissions budgets under the NO_X SIP Call and rate-based limits for the reasonably available control technology (RACT) requirements for NO_X), the EPA has not developed such requirements with respect to non-EGU reductions for interstate transport under the good neighbor provision in either CAIR, the original CSAPR, or

the CSAPR Update rulemaking. This work would be concurrent with the IPM analysis of EGUs for the proposal and could begin following the development of baseline future projections that are used for this analysis and also for air quality modeling.

161. Once the EPA has developed a series of potential emissions limitations at ascending levels of NO_X control stringency, represented by the cost thresholds, the EPA must evaluate the impact on the downwind air quality problems identified in the CSAPR framework step 1. To assess downwind air quality impacts for each nonattainment or maintenance receptor identified, the EPA would evaluate the air quality change at that receptor expected from the progressively more stringent upwind EGU and non-EGU NO_X emission limits established for each uniform NO_X control stringency level. This assessment would provide the downwind ozone improvements for consideration and would provide air quality data to be used to evaluate whether such reductions are cost-effective and whether they would constitute under- or over-control relative to the downwind air quality problem.

162. For this assessment, the EPA anticipates using an ozone Air Quality Assessment Tool (AQAT) to estimate the air quality impacts of the EGU and non-EGU NO_X emission limitations on downwind ozone pollution levels for various NO_X emission levels. The ozone AQAT uses simplifying assumptions regarding the relationship between each state's change in NO_X emissions and the corresponding change in ozone concentrations at nonattainment and maintenance receptors to which that state is linked. In order to assess the air quality impacts of the various control stringencies, the EPA would evaluate changes resulting from the application of the EGU and non-EGU emission limitations to all states that are linked to each receptor, as well as the state containing the receptor. Generally, the EPA would evaluate the air quality improvements at each monitoring site for each progressively more stringent EGU and non-EGU

NO_X emissions limitation. For each level of control stringency and for each receptor, the EPA would evaluate the magnitude of the change in concentration using the ozone AQAT and determine whether the estimated concentration would resolve the receptor's nonattainment or maintenance concern by lowering the average or maximum design values below the level of the NAAQS. The EPA would also evaluate the change in each state's contribution to each receptor and evaluate that change against the 1 percent screening threshold.

163. As part of this analysis, the EPA would evaluate potential under- or over-control with respect to whether (1) the expected ozone improvements would be sufficient or greater than necessary to resolve the downwind ozone pollution problem (i.e., resolving nonattainment or maintenance problems) or (2) the expected ozone improvements would reduce upwind state ozone contributions to below the screening threshold (i.e., one percent of the NAAQS). This step is taken to ensure compliance with the Supreme Court's holding, in *EPA v. EME Homer City*, that the "EPA cannot require a State to reduce its output of pollution by more than is necessary to achieve attainment in every downwind State or at odds with the one-percent threshold the Agency has set." 134 S. Ct. at 1608. On remand from the Supreme Court, the D.C. Circuit held that this means that the EPA might overstep its authority "when those downwind locations would achieve attainment even if less stringent emissions limits were imposed on the upwind States linked to those locations." *EME Homer City II*, 795 F.3d at 127. The D.C. Circuit qualified this statement by noting that this "does not mean that every such upwind State would then be entitled to less stringent emission limits. Some of those upwind States may still be subject to the more stringent emissions limits so as not to cause *other* downwind locations to which those States are linked to fall into nonattainment." *Id.* at 14-15. As the Supreme Court explained, "while EPA has a statutory duty to avoid over-control, the Agency also has a statutory

obligation to avoid 'under-control,' *i.e.*, to maximize achievement of attainment downwind." 134 S. Ct. at 1609.

164. The EPA must construct the ozone AQAT tool using data from the CAMx modeling runs described in section C.iii of this declaration. The ozone AQAT assumes that a change in ozone season NO_X emissions leads to a proportional change in downwind ozone contributions. This proportional relationship is then modified using calibration factors created using the base case contribution air quality modeling and a representative control case. To construct a calibrated AQAT, we need two CAMx air quality modeling runs and the associated emission inventories (the base case with source apportionment contributions and a control case where there have been substantial emission reductions). As a result, construction of this tool cannot begin until the air quality modeling, including post-processing, is complete. With the air quality modeling results and emission inventories in hand, AQAT can be constructed in approximately one month.

165. After quantifying available emissions reductions and remaining emissions at each level of control for EGUs and non-EGUs, the EPA evaluates that suite of options to determine the level of control that is appropriate to address significant contribution to nonattainment or interference with maintenance of the NAAQS downwind. Pursuant to the CSAPR framework, the EPA applies a multi-factor test that considers cost, available emission reductions, and downwind air quality impacts to determine the appropriate level of uniform NO_X control stringency that addresses the impacts of interstate transport on downwind nonattainment or maintenance receptors. This test evaluates these factors to determine the appropriate stopping point for quantifying upwind state obligations to address interstate ozone transport, including

whether the identified downwind ozone problems (i.e., nonattainment or maintenance problems) are resolved. This process is expected to take 1 month after the AQAT analysis is complete.

166. The steps to establish EGU and non-EGU emission limits that quantify the full ozone transport remedy for the good neighbor provision with respect to the 2008 ozone NAAQS combine to take between 5 and 6 months. Two of these steps, representing three to four months can occur concurrently with the air quality modeling. However, two months are required, after the air quality modeling is complete to construct the air quality assessment tool and use it to inform the multi-factor test to quantify significant contribution to nonattainment and interference with maintenance of the 2008 ozone NAAQS downwind.

v. Implementation of Emission Reductions: Development of FIPs

167. Once the EPA has quantified the emissions reductions necessary to eliminate states' significant contribution to downwind nonattainment and interference with maintenance, and has converted those reductions into appropriate emissions limitations in step 3 of the CSAPR framework, the emissions limitations must be implemented in a manner that makes them enforceable and ensures that necessary emissions reductions will actually occur. This is referred to as step 4 of the CSAPR framework. As discussed above at paragraphs 6-9, states have the primary responsibility to develop SIPs to implement necessary emission reductions pursuant to CAA section 110(a)(2)(D)(i)(I), but where states fail to develop a plan to satisfy the statutory requirements, the CAA directs the EPA to promulgate FIPs to ensure the statutory requirements are being met. As described at paragraphs 74, the EPA has already determined that Kentucky and 23 other states have failed to satisfy the requirements of the good neighbor provision with respect to the 2008 ozone NAAQS, and the EPA therefore has an obligation to promulgate a FIP

that sets appropriate emissions limitations on sources in those states consistent with the requirements of the good neighbor provision.

168. The emissions limitations that the EPA developed to address states' transport obligations under the NO_X SIP Call, CAIR, and CSAPR have been implemented through allowance trading programs. Under a trading program, each affected source is not subject to a limit on its actual emissions, but instead is subject to requirements to monitor its emissions during each control period and at the end of the control period to surrender allowances equal to its monitored emissions. The emissions reductions are enforced by limiting the total quantities of allowances that are made available to sources. Sources may be required to participate in the trading programs either by the states (through SIP revisions) or through FIP provisions under which the EPA regulates the sources directly. Through the experience gained in implementing several successive trading programs, the EPA has developed a well-established set of trading program rules, and was able to implement the CSAPR Update with only minor changes to the trading program rules already put in place for CSAPR. Similarly, the EPA expects we could implement any further emissions limitations required for EGUs using this well-established approach to ensuring emissions reductions.

169. The EPA is not assuming that the well-established trading program approach for implementing regional emissions limitations for EGUs under the good neighbor provision will necessarily be the most appropriate approach for implementing regional emissions limitations for all types of non-EGUs as well. A primary complication for developing FIPs for non-EGUs as compared to EGUs is defining appropriate emissions monitoring requirements for these sources. Emissions monitoring and reporting are important for ensuring that sources comply with the emissions limitations quantified in step 3 of the CSAPR framework. Many non-EGU

emissions source categories do not have experience with the installation and operation of continuous emissions monitors (CEMs), which are used by EGUs to monitor and report emissions, and many non-EGU sources are not currently required to monitor and report in accordance with 40 CFR Part 75. Monitoring and reporting emissions using CEMs provides direct and accurate information on sources' emissions, which is essential for participation in existing trading programs under CSAPR and the CSAPR Update. Development of alternative approaches to implementing emissions limitations for certain non-EGU source categories will require time to scope potential approaches and prepare options for consideration, including the scoping of practical, legal, and technical feasibility of various approaches, and to brief Agency management to obtain decisions regarding the preferred approach to implementing the emissions limitations. The EPA believes that the development and consideration of these alternative approaches to implementing emissions limitations for the relevant non-EGU source categories can occur concurrent with the other analytical and rule development steps described in sections C.iii and C.iv of this declaration.

D. Administrative Procedures for Rule Development

170. In addition to the time required to conduct the technical analyses described in section C of this declaration, the EPA must complete certain procedural and administrative steps in order to issue a proposed rule addressing our remaining FIP obligation with respect to Kentucky, and to develop a final rule after review and analysis of the public comments received on the proposal. As described in the following paragraphs, the EPA will require an additional 7 months from the conclusion of the technical analysis to sign a notice of proposed rulemaking, and 14 months from the publication of the proposed rule to sign a notice of final action addressing the FIP obligation. The following table summarizes those steps, which are described

in more detail in the following paragraphs. The EPA's Gantt chart shows how these steps interrelate with one another and with the other tasks described in this declaration. *See* Attachment 1.

Task	Timeframe	Earliest Target Date
Proposed Rule Development		
• Brief Senior Management	1-2 months	April 2018
• Develop Preamble, Reg. Text, RIA, and Convene SBREFA Panel	4-5 months	June 2018
• Agency Review of Draft Rule	2 months	August 2018
• Interagency Review of Draft Rule	2 months	October 2018
Proposed Rule Signature		**November 1, 2018**
Publication of Proposed Rule		December 2018
Comment Period		January 2019
Final Rule Analysis		
• AQ Modeling to Identify Receptors and "Linked" States o Update Model Inputs (3 months) o Run Air Quality Model (3 months) o Complete Post-Processing (1 month)	5 months	June 2019
• Establish Full Remedy Emission Limits (four to five months)	4-5 months	July 2019
Final Rule Development		
• Brief Senior Management, Develop Preamble, Reg. Text, RIA, and Response to Comments	5 months	October 2019

Task	Timeframe	Earliest Target Date
• Agency Review of Draft Rule	2 months	November 2019
• Interagency Review of Draft Rule[36]	2 months	January 2020
Final Rule Signature		**February 1, 2020**

171. Throughout the process of developing the technical analyses to identify downwind air quality problems, quantify upwind state contributions, and identify cost-effective emissions reductions, the EPA's senior management must make policy decisions regarding a number of issues that define the scope of the proposed rulemaking. Some decisions can be made, or at least considered, while analyses are underway; however, certain decisions will not be properly informed until the completion of the various steps of the analyses. In particular, the decision-makers must make determinations regarding: the level of control stringency (represented by cost) to require of linked upwind states to address downwind air quality problems and the form of the remedy that will be used to implement the emissions limits resulting from the chosen control stringency. Various other issues may arise in the process of conducting the technical analysis that will also require consideration by senior management, but which will be dependent on the facts and circumstances of the particular rulemaking.

172. Such issues will be raised to senior management in an organized process. First, the staff level workgroup will evaluate the issues and develop various options for addressing each issue, including legal, policy and technical considerations supporting each option. The EPA workgroup includes staff with a wide range of expertise, including engineers, health researchers,

[36] Development a separate Response to Comments document typically continues during interagency review.

attorneys, compliance and enforcement staff, and regional office representatives. Workgroup staff will then prepare briefing papers that explain each issue and the options for addressing the issue, and participate in a series of briefings with various levels of agency management in order to obtain policy direction and decisions. Before final decisions are made, the most significant issues are typically raised to both the Assistant Administrator for the Office of Air and Radiation and to the EPA Administrator. This process will occur throughout the development of the technical analyses and can reasonably be expected to continue 1 to 2 months after the conclusion of the policy analysis previously described.

173. It is worth noting that the upcoming change in Administration on January 20, 2017, will likely require additional internal meetings and other steps to brief new agency decision-makers, for both informational and decision-making purposes, regarding the EPA's history of addressing interstate ozone transport, the nature of the current ozone air quality problems, legal precedent governing the good neighbor provision, and the various policy choices that might be considered. While the EPA has not estimated any particular amount of time that may be required to conduct these additional briefings, the EPA expects that it would not be possible to shorten the time alloted for briefing new senior management given these considerations.

174. Once the senior management has made necessary policy decisions governing the requirements of the proposed rulemaking, the EPA must develop a written record to explain and support the proposed action. This includes the development of a notice of proposed rulemaking including a preamble explaining the legal, policy and technical bases for the proposed action. *See* CAA section 307(d)(3) (requiring the notice of proposed rulemaking to include a statement of basis and purposes summarizing the factual data on which the rule is based, the methodology

used in obtaining the data and in analyzing the data, and the major legal interpretations and policy considerations underlying the proposed rule). The EPA also develops for public comment proposed regulatory text to implement the proposed action and detailed technical support documents that explain the various technical analyses supporting the proposed action. The EPA is also typically required pursuant to Executive Order 13563 to prepare a regulatory impact analysis (RIA) that evaluates the costs and benefits of the proposed action when we promulgate a regional interstate transport rulemaking. This includes preparing further EGU and non-EGU modeling analyses of the selected remedy as well as air quality modeling to estimate the improvements in air quality and evaluating the benefits and co-benefits of such air quality improvements using the Benefits Mapping and Analysis Program (BenMAP). This process can be expected to take 4-5 to five months in total, a portion of which is concurrent with previously discussed analytic and rulemaking activities. However, this step is expected to take 2 to 3 months from the time the final policy decisions are made, particularly to develop RIA analyses of the selected option and alternative options.

175. The EPA is also required to prepare an analysis of the impact of rules that include Federal requirements (e.g., a FIP) on small entities (i.e., businesses, governments, and nonprofit organizations) pursuant to the Small Business Regulatory Enforcement Fairness Act (SBREFA). If EPA cannot certify that there is not a significant economic impact on a substantial number of small entities (or SISNOSE) for the selected remedy, then SBREFA requires the formation of a panel, which is made up of representatives of the EPA, the Small Business Administration (SBA), and the Office of Management and Budget (OMB), to identify ways to potentially mitigate this significant economic impact. The process for panel formation and activities, which includes meetings with representatives of affected small entities, can typically last up to 6

months and must occur in the proposal stage of the rulemaking prior to interagency review. Much of the work to comply with SBREFA can be concurrent with previously discussed rulemaking activities.

176. Once the notice of proposed rulemaking is drafted, it must undergo review both by the workgroup staff and by several levels of EPA management including the Office of General Counsel, and Assistant Administrators for the Office of Air and Radiation and the Office of Policy. The review process is expected to take 2 months total.

177. The EPA's regional interstate transport rulemakings pursuant to the good neighbor provision typically require interagency review, including review by the Office of Management and Budget (OMB), because the rulemakings are considered significant regulatory actions pursuant to Executive Order 12866. OMB review can take up to 3 months.

178. Once OMB review is complete, the Administrator may sign the notice of proposed rulemaking. The EPA estimates that a notice of proposed rulemaking could be signed by November 1, 2018. Upon signature, the signed notice is transmitted to the Office of the Federal Register for publication pursuant to CAA section 307(d)(3). Publication of the notice of proposed rulemaking can take approximately 1 month from the signature of the rule and triggers the start of a public comment period, depending on the length and complexity of the rulemaking and the workload of the Office of Federal Register.

179. The EPA also does not agree that five and a half months is a sufficient amount of time to complete the rulemaking following signature of the proposed rule. As explained at paragraphs 76-81, the EPA has historically needed between 10 and 16 months in order to finalize a rulemaking addressing the regional transport of ozone after a proposal has been published. Although the EPA took only 10 months to finalize the CSAPR Update after the proposal was

published, for the reasons explained in section C.i, the EPA expects that the next regional interstate transport rulemaking will be more complicated, will garner a greater number of comments from a broader array of commenters (e.g., parties interested in controls at non-EGUs), and will therefore require more time to analyze between the proposed and final rules. Accordingly, the EPA estimates that it is more reasonable to permit the EPA an additional 14 months after publication of the proposed rule to sign a notice of final action.

180. The EPA is first required to permit the public an opportunity to provide written comments on a notice of proposed rulemaking pursuant to CAA section 307(d)(5). The EPA is also required pursuant to this section to provide the public with an opportunity to provide an oral presentation at a public hearing. The Federal Register Act requires the agency to provide sufficient notice of a public hearing, which requirement is presumptively satisfied if the EPA provides 15 days' notice. 44 U.S.C. § 1508. Section 307(d)(5) further provides that the EPA must keep the record for the proposed rulemaking open for public comment for 30 days after any public hearing. Accordingly, the EPA should reasonably allow for at least 45 days for public comment on the notice of proposed rulemaking. Given the complexity of the technical analysis and policy requirements of the EPA's rulemakings pursuant to the good neighbor provision, the EPA typically provides a longer comment period so that the public has sufficient time to review and analyze the materials provided with the proposed rulemaking. For the CSAPR Update, for example, the EPA received numerous requests to extend the original 45-day comment period given the technical nature of the rule, and responded by providing provided a total of 60 days to comment on the proposed action.[37]

[37] Commenters were also permitted a total of 80 days to comment on the air quality modeling in advance of the proposed rule via the issuance of a NODA. *See* 80 Fed. Reg. 46,271 (Aug. 4, 2015); 80 Fed. Reg. 52,271 (Aug. 28, 2015) (extending comment period).

181. Once the comment period is closed, the EPA must review the comments received and evaluate whether those comments warrant further analyses or affect the technical analysis or the policy decisions made for purposes of developing the final rule. While some comments that are submitted early during the comment period can be reviewed during the comment period, most commenters make their submissions in the final few days of the comment period. Accordingly, review of the public comments received on the notice of proposed rulemaking largely occurs after the close of the comment period. The EPA typically receives several thousand comments on its rulemakings addressing the good neighbor provision because they garner significant public interest from industry, states, and environmental and public health advocates. For example, the EPA received over 6,700 comments on the CAIR proposal, 42,470 comments on the CSAPR proposal, and 15,449 comments on the CSAPR Update proposal. The EPA must allot at least 3 months to conduct an initial review comments and evaluate potential impacts on the rulemaking.

182. The EPA typically receives a significant number of comments regarding the data inputs underlying the various steps of its technical analysis. The revisions to the data inputs required to respond to these comments will typically result in the need to redo the technical analysis, which in turn often leads to changes to the final parameters of the rule, including which upwind states are subject to the rulemaking and the level of the state budgets finalized in the rule. For example, as a result of comments received during the comment period for the CSAPR Update and other updates to the modeling platforms, the EPA updated the technical analysis, and the update identified 18 fewer receptors in the final rule, one state was removed from the allowance trading program altogether, and the final rule budgets for each state were revised. *Compare* 80 Fed. Reg. 75,706, 75,725-26 (Dec. 3, 2015), *with* 81 Fed. Reg. at 74,533. The EPA

anticipates that we will receive similar comments on its next rulemaking pursuant to the good neighbor provision that could result in changes to the rule geography and the level of the budgets between proposal and final. Accordingly, although the EPA would not need to repeat every step of the analyses described in section C, the EPA must plan for sufficient time to reanalyze each step of the CSAPR framework between proposal and promulgation of a final rule.

183. The EPA expects we must plan for an additional six months in order to take the following steps: (a) update modeling inputs based on comment and conduct updated air quality modeling and contribution modeling to identify downwind air quality problems and upwind contributions, as described in paragraphs 145-47; (b) conduct updated IPM modeling to quantify potential emissions reductions from EGUs; and (c) conduct updated CoST modeling in order to quantify potential emissions reductions from non-EGUs.

184. Once the updated analysis is complete, the EPA will again need to identify issues that require decisions from senior management, identify options for addressing those issues, prepare written briefing materials outlining the issues and options, and brief senior management to obtain the necessary decisions. The EPA will also need to develop final rulemaking materials including a notice of final rulemaking, final regulatory text, and detailed technical support documents detailing the policy analysis underlying the final rulemaking. In addition to these materials, the EPA will need to prepare a response-to-comment document detailing the EPA's response to all significant comments received on the notice of proposed rulemaking, including responses to various policy, legal, and technical issues raised in the comments. The EPA will also need to develop a revised RIA evaluating the policy being finalized. This process can reasonably be expected to take five to six months total, including three months from the conclusion of the technical analysis previously described.

185. Once the notice of final rulemaking is drafted, it must undergo review both by the workgroup staff and by several levels of EPA management including the Office of General Counsel, and the Assistant Administrators for the Office of Air and Radiation and the Office of Policy. The review process is expected to take 2 months total.

186. The EPA also anticipates that we may once again be required to submit the rulemaking to OMB in order to go through interagency review, a process that again can take up to 3 months. Once interagency and OMB review is complete, the Administrator can sign a notice finalizing the rulemaking and promulgating any necessary FIP for Kentucky to address the good neighbor provision as to the 2008 ozone NAAQS. The EPA believes this final step can be expeditiously accomplished by February 1, 2020.

E. 2015 Ozone NAAQS

187. On October 1, 2015, the EPA promulgated a rulemaking strengthening the ground-level ozone NAAQS to 70 ppb, based on extensive scientific evidence about ozone's effects on public health and welfare. 80 Fed. Reg. 65,291 (Oct. 26, 2015). All states are required to submit plans addressing the good neighbor provision with respect to the 2015 ozone NAAQS by October 1, 2018. 80 Fed. Reg. at 65,437. The EPA has an obligation to evaluate whether states have made timely and complete submissions within 6 months of the deadline for any submission of good neighbor SIPs, by April 1, 2019. CAA section 110(k)(1). For those states that made timely and complete SIP submissions, the EPA has an obligation to act on the submission within 12 months of a determination of completeness. CAA section 110(k)(2). For

SIPs timely submitted by October 1, 2018, that means the EPA would have an obligation to approve or disapprove the SIP submissions by no later than April 1, 2020.

188. The EPA will have an obligation to promulgate FIPs addressing the good neighbor provision for states that fall into one of two categories: (1) those states that the EPA finds failed to submit a complete SIP addressing the good neighbor provision with respect to the 2015 ozone NAAQS, and (2) those states for which the EPA disapproves a state's SIP addressing the good neighbor provision with respect to the 2015 ozone NAAQS. These actions will trigger an obligation for the EPA to promulgate a FIP addressing these requirements by no later than two years after the EPA's final action taken for each state. Thus, as early as October 2018, the EPA may take an action that triggers the requirement to promulgate good neighbor FIPs addressing the 2015 ozone NAAQS for certain states.

189. Much of the analytical work necessary to address interstate transport obligations with respect to the 2008 ozone NAAQS is the same work that the EPA will need to conduct to address interstate transport with respect to the 2015 ozone NAAQS. Although the stringency of the standards differs, the type of modeling, data, resources, stakeholder input, and analysis necessary to quantify emissions reduction obligations for sources in upwind states is the same for both NAAQS. The EPA also expects that the types of sources from which emissions reductions would be required to address the good neighbor provision may also be similar or the same. Accordingly, given this overlap in necessary analysis and the forthcoming deadlines to address interstate transport with respect to the 2015 ozone NAAQS, the EPA could address the remaining FIP obligation to address interstate transport with respect to the 2008 ozone NAAQS together with the 2015 ozone NAAQS.

190. The EPA cannot promulgate FIPs to address interstate transport with respect to the 2015 ozone NAAQS prior to the deadline for states' to submit SIPs addressing the good neighbor provision as to that standard, *i.e.* before October 1, 2018, because section 110(c) requires certain prerequisite actions that trigger the EPA's authority to promulgate a FIP, described in paragraphs 7-9. As described in this declaration, the EPA believes that we require until February 1, 2020 to conduct the necessary analysis and rulemaking to promulgate FIPs to address the good neighbor provision with respect to the 2008 ozone NAAQS for Kentucky and other similarly-situated states. This timeframe also accommodates the EPA's interest in efficiently promulgating a rulemaking that addresses interstate transport with respect to the 2015 ozone NAAQS.

191. However, if the EPA were to conduct separate rulemakings to address each standard, limited agency resources would require the EPA to conduct the rulemakings consecutively, rather than concurrently. The EPA would need to duplicate much of the analysis for each separate NAAQS, rather than combine the efforts into one analysis. For example, the EPA would be required to first develop a budget to quantify the remaining obligation for the 2008 ozone standard, that neither over- nor under-controls with respect to that NAAQS consistent with the Supreme Court's holding in *EPA v. EME Homer City Generation*; the EPA would then in a separate rulemaking need to develop a budget to quantify the emissions reduction obligation for the 2015 ozone NAAQS that similarly does not over- or under-control with respect to that standard. Separate rulemakings would likely result in separate compliance timeframes, which would necessitate separate air quality modeling exercises tailored to each compliance deadline. This means that the overall emissions reductions that must be achieved to address interstate transport as to both standards would be significantly delayed. If the EPA

instead conducted a single rulemaking that promulgates FIPs for both standards, we could combine the efforts into one analysis and quantify combined emissions limits to address both standards collectively. This would result in a more efficient use of resources for states developing plans to address both standards and the regulated community which must plan for compliance, and overall emissions reductions that must be achieved to address interstate transport for both standards could be achieved significantly sooner and with a significantly lower expenditure of scarce agency resources.

192. To assist states in their planning to address their interstate transport obligations for the 2015 ozone NAAQS, the EPA has recently conducted air quality modeling which evaluates downwind air quality problems and upwind state contributions based on projections to 2023, which would be the attainment deadline for nonattainment areas classified as Moderate with respect to the 2015 ozone NAAQS. The EPA expects to release this information for comment in the near future. While the EPA expects comments received on this modeling could inform subsequent modeling, the 2023 modeling results may not be appropriate to rely upon for a rulemaking addressing the remainder of the 2008 ozone transport obligations for Kentucky and other states. The EPA may determine that a different base year and future analytic year are more appropriate for evaluating the remaining emission reduction obligations with respect to the 2008 NAAQS, considering the factors discussed at paragraphs 135-141. Accordingly, while this work is a helpful first step to evaluating interstate transport obligations for the 2015 ozone NAAQS, the amount of time required for the EPA to evaluate Kentucky's remaining good neighbor obligation with respect to the 2008 ozone NAAQS, as described in this declaration, is not impacted.

F. Limited Resources and Competing Agency Priorities

193. Plaintiffs' proposed schedule for these actions is further unreasonable because they do not consider the many other important and mandatory tasks that EPA must complete.

194. The EPA's proposed schedule for issuing *Federal Register* notices promulgating a FIP for Kentucky assumes that the EPA could prioritize these actions over other important competing duties and obligations. In reality, the EPA's air program in both OAR and the Regions is currently extremely burdened by a large number of mandatory actions that affect the resources available to develop and promulgate a FIP for Kentucky addressing interstate transport for the 2008 ozone NAAQS. The EPA is already required to complete a large number of regulatory actions in the upcoming year under both statutory and court-ordered deadlines.

195. Meeting all mandatory duties imposed by the CAA with limited resources necessarily requires the EPA to make choices in the prioritization and scheduling of projections. In determining the allocation of resources and the prioritization of particular projects, OAR looks at several factors, including: (1) whether or not a project must be completed by a time certain and the CAA statutory requirements to complete a project or act on a SIP; (2) the environmental and public health impact of proceeding with a particular project compared to other projects; and (3) the amount of resources that would be needed to complete a particular projection. With respect to the prioritization of the actions at issue in this litigation, the EPA must necessarily weigh the importance of other actions underway at the present time.

196. The most recent edition of EPA's unified regulatory agenda—a public, comprehensive report describing regulations under development—listed nearly 80 rulemaking efforts that OAR alone was currently undertaking. Attachment 5 is a list of OAR rulemaking efforts taken from the most recent regulatory agenda. Several of these actions are mandated by

the Clean Air Act or judicial orders or settlement agreements with a range of stakeholders including industry groups, or are necessary for states to be able to complete their own regulatory actions required by the Act. These regulatory efforts are consistent with the EPA's mission to protect human health and the environment, and can require a substantial commitment of time and employee resources. For example, one of the OAR divisions with key responsibilities for developing the FIP sought in this case would be simultaneously developing framework rules for implementing the 2015 ozone NAAQS—an enormous undertaking that includes rules for classifying nonattainment areas and establishing SIP requirements. Even under the best circumstances, EPA cannot simultaneously undertake all the actions related to Agency priorities, and thus as a practical matter must devote greater precedence and resources to some actions while deferring others.

197. The EPA is also particularly busy with respect to SIP actions. In general, the Clean Air Act requires the EPA to take a substantial number of actions with respect to SIPs, year in and year out, on statutorily defined timeframes. Because of the realities of the CAA's cooperative federalism structure and the EPA's limited resources, the Agency has historically received more SIP submissions each year than we resolve, resulting in a so-called "SIP backlog" of state plans awaiting final EPA review. As of December 5, 2016, there were 713 SIP submissions awaiting action by EPA, with states regularly submitting more for review. The EPA has committed significant resources to reduce the SIP backlog, and has been able to reverse the trend so that the Agency now acts on more SIP submissions each year than we receive. In the four most recent fiscal years, for example, the EPA received an average of 366 submissions per year, and was able to annually act on an average of 472 per year—including 539 SIPs in fiscal year 2015 alone. Nevertheless, as of December 5, 2016 there were still 713 SIP submissions

awaiting action by EPA, some of which the Agency is obligated to act upon as a result of statutory deadlines or, as exemplified by the other claims in this very case, pursuant to consent decrees and settlement agreements. These SIP actions regularly require resources not only from the EPA Regional Offices, but also from offices at EPA Headquarters that provide legal, technical, and policy guidance, including those offices involved in the development of EPA's regional interstate ozone transport rulemakings.

G. Requested Schedule

198. The EPA has carefully considered the steps necessary to conduct a rulemaking that addresses our remaining FIP obligation for Kentucky to address the good neighbor provision with respect to the 2008 ozone NAAQS, including the significant technical analysis described in section C and the administrative processes described in section D. Those steps and processes are summarized in a table found at Attachment 1, which demonstrates which actions described in this declaration must precede other actions and which actions can occur concurrently.

199. The EPA believes that this schedule represents the most expeditious timeframe in which we can promulgate a final action that fully addresses the good neighbor provision as to the state of Kentucky that is compliant with the statute and with the numerous court decisions guiding the EPA's actions with respect to addressing transported ozone pollution pursuant to CAA section 110(a)(2)(D)(i)(I). Although not the subject of this claim, this schedule will also permit the agency to address outstanding FIP obligations for up to 23 additional states. Moreover, as described in section E, while not adding additional time to the EPA's projected schedule, the proposed schedule would also provide the agency with the opportunity to address the interstate transport obligations with respect to the 2015 ozone NAAQS in a timely and efficient manner. Any shorter timeframe would not only compromise the technical and legal

defensibility of the EPA's final action, but it would potentially preclude the ability of the agency to promulgate such a holistic rulemaking and significantly delay the potential public health benefits that could be achieved, and be an efficient use of resources for the agency, states, potentially regulated parties, and all other interested stakeholders.

200. In light of these considerations, and considering the EPA's limited resources and competing obligations described in section F of this declaration, the EPA believes that we can expeditiously sign a notice of proposed rulemaking by November 1, 2018, and a notice of final action fully addressing its FIP obligation as to Kentucky's good neighbor obligation with respect to the 2008 ozone NAAQS by February 1, 2020.

I declare under penalty of perjury that the foregoing is true and correct.

Executed this 15th day of December, 2016.

Janet G. McCabe
Acting Assistant Administrator
Office of Air and Radiation
United States Environmental Protection Agency

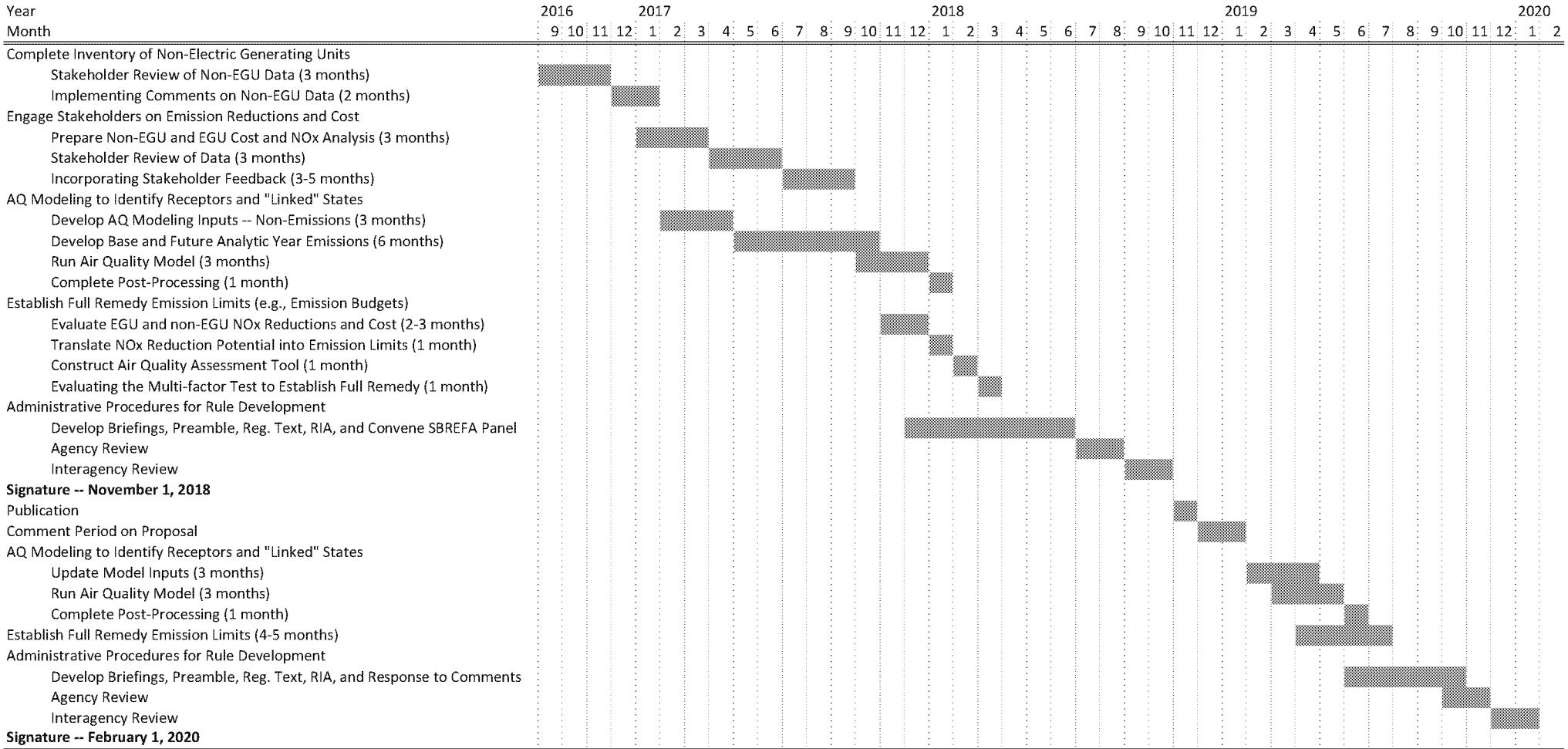
Sierra Club v. McCarthy

Case No. 3:15-cv-04328-JD (JSC)

Declaration of Janet G. McCabe

Attachment 1

Proposed Schedule to Address Good Neighbor FIP Obligation for 2008 Ozone NAAQS for Kentucky



The timeframes depicted in this gantt chart reflect the lower end of the ranges that EPA believes are necessary. In other words, this gantt chart reflects each step in the promulgation of the FIP being as expeditious as possible.

Steps associated with the proposed rule are shaded blue

Steps associated with the final rule are shaded green

Sierra Club v. McCarthy
Case No. 3:15-cv-04328-JD (JSC)

Declaration of Janet G. McCabe
Attachment 2

Technical Support Document (TSD)
for the Cross-State Air Pollution Rule Update for the 2008 Ozone NAAQS
Docket ID No. EPA-HQ-OAR-2015-0500

Ozone Transport Policy Analysis
Final Rule TSD

U.S. Environmental Protection Agency
Office of Air and Radiation
August 2016

The analysis presented in this document supports the EPA's Final Cross-State Air Pollution Rule Update for the 2008 Ozone National Ambient Air Quality Standards (CSAPR Update). This TSD includes analysis to quantify upwind state emissions that significantly contribute to nonattainment or interfere with maintenance of the 2008 ozone NAAQS in downwind states and quantification of emission budgets (i.e., limits on emissions). The analysis is described in Section VI of the preamble to the final rule. This TSD also broadly describes how the EPA used the Integrated Planning Model (IPM) to inform air quality modeling, budget setting, and policy analysis aspects of this rule. This TSD is organized as follows:

A. Background on EPA's Analysis to Quantify Emissions that Significantly Contribute to Nonattainment or Interfere with Maintenance of the 2008 Ozone NAAQS

B. Using the Integrated Planning Model (IPM) to Assess Air Quality Modeling, Ozone-Season NO_X Cost Thresholds, and Policy Impacts

C. Calculating Budgets From IPM Run and Historical Data

D. Analysis of Air Quality Responses to Emission Changes Using an Ozone Air Quality Assessment Tool (AQAT)

1. Introduction: Development of the assessment tool
2. Details on the construction of the assessment tool
3. Description of analytical results
4. Comparison between the air quality assessment tool estimates and CAMx air quality modeling estimates

A. Background on EPA's Analysis to Quantify Emissions that Significantly Contribute to Nonattainment or Interfere with Maintenance of the 2008 Ozone NAAQS

In the preamble, we describe the four-step CSAPR framework that the EPA is applying to identify upwind states' emissions that significantly contribute to nonattainment or interfere with maintenance with respect to the 2008 ozone NAAQS in other states and to implement appropriate emission reductions. This framework was also used in the original CSAPR rulemaking to address interstate transport with respect to the 1997 ozone NAAQS and the 1997 and 2006 PM2.5 NAAQS. See section IV of the preamble for an overview of the CSAPR framework.

The first step of the CSAPR framework uses air quality analysis to identify nonattainment and maintenance receptors with respect to interstate transport for the 2008 ozone NAAQS. The second step of the framework uses further air quality analysis to identify upwind states whose ozone pollution contributions to these monitoring sites meet or exceed a specified threshold amount of 1% of the NAAQS and therefore merit further analysis. See section V of the preamble for details on applying these steps with respect to interstate emissions transport for the 2008 ozone NAAQS.

The third step in the framework quantifies upwind state emissions that significantly contribute to nonattainment or interfere with maintenance of the 2008 ozone NAAQS at the downwind receptors, and identifies the EGU NO_X emission budgets for each state that represent the reduction of these emissions levels. See section VI of the preamble with respect to interstate emissions transport for the 2008 ozone NAAQS. Finally, the fourth step of the framework implements the emission budgets in each state via the CSAPR NO_X ozone season allowance trading program. See section VII of the preamble for details on implementation of this CSAPR trading program.

This TSD primarily addresses step three of the CSAPR framework, which itself consists of several steps. In order to establish final EGU NO_X emissions budgets for each linked upwind state, we first identify levels of uniform levels NOx control stringency based on available EGU NO_X control strategies and represented by cost thresholds.[1] These levels of uniform NO_X control stringency are modeled in IPM, as described in section B in this TSD for a discussion of this analysis. This data is then combined with historic data in order to quantify a series of potential EGU NO_X emission budgets for each linked upwind state at each levels of uniform NO_X control stringency. Next, we use the ozone Air Quality Assessment Tool (AQAT) to estimate the air quality impacts of the upwind state EGU NO_X emission budgets on downwind ozone pollution levels for each of the assessed EGU NO_X emission budget levels. Specifically, we look at the magnitude of air quality improvement at each receptor at each level of control, we examine whether receptors are "solved", and we look at the individual contributions of each state to each of its receptors. See section D in this TSD for discussion of the development and use of the ozone AQAT.

Finally, the EPA uses this air quality information in a multi-factor test, along with EGU NO_X reductions and cost, to select a particular level of uniform EGU NO_X control stringency that addresses each state's significant contribution to nonattainment and interference with maintenance (see Section VI of the preamble for additional information).

In this TSD, we assessed the EGU NO_X mitigation potential for all states in the contiguous U.S. We also assessed the air quality impacts for all monitors in the contiguous U.S. However, in applying the multi-factor test for purposes of identifying the appropriate level of control, the EPA only evaluated EGU NO_X reductions and air quality improvements from upwind states that were "linked" to downwind receptors in step two of the CSAPR framework. These states are listed in Table A-1 below.

[1] See the EGU NOx Mitigation Strategies Final Rule TSD

As described in preamble section VI, Delaware and the District of Columbia (D.C.) are "linked" to downwind ozone problems but are not included in the final rule. Consequently, EPA did not include Delaware or D.C. in applying the multi-factor test.

Table A-1. States Evaluated in the Multi-factor Test	
Ozone Season NO_X	
Alabama	Missouri
Arkansas	New Jersey
Illinois	New York
Indiana	Ohio
Iowa	Oklahoma
Kansas	Pennsylvania
Kentucky	Tennessee
Louisiana	Texas
Maryland	Virginia
Michigan	West Virginia
Mississippi	Wisconsin

B. Using the Integrated Planning Model (IPM) to Project Impact of Ozone-Season NO_X Cost Thresholds, Budgets, and Policy Impacts

EPA used the Integrated Planning Model (IPM) v5.15 platform to inform air quality modeling for the final rule. IPM was also used to analyze the ozone season NO_X emission reductions available from electric generating units (EGUs) at various uniform levels of NO_X control stringency, represented by cost, in each upwind state. Finally, IPM was used to evaluate illustrative compliance with the rule's regulatory control alternatives (i.e., compliance with the finalized emission budgets, with a more stringent alternative, and with a less stringent alternative).

IPM is a multiregional, dynamic, deterministic linear programming model of the U.S. electric power sector that EPA uses to analyze cost and emissions impacts of environmental policies.[2] All IPM cases for this rule included representation of the Title IV SO_2 cap and trade program; the NO_X SIP Call; the CSAPR regional cap and trade programs;[3] consent decrees and settlements; and state and federal rules as listed in the IPM documentation referenced above. The cases did not include the final Clean Power Plan (CPP), as explained in Preamble section IV.B.

Application of the CSAPR 4-step framework requires robust data collection, IPM modeling, and analysis and is in and of itself time consuming. Rather than freezing all IPM data sets at the outset of EPA's analysis for the final rule, the EPA allowed for ongoing improvement of the relied upon EGU data. As a result, each step of EPA's analysis for the final rule is informed by the best available data at the time the analysis was conducted. For example, after the EPA began its analysis for the final rule, Pennsylvania published its rule addressing requirements for Reasonable Available Control Technologies (RACT) that would result in NO_X emissions reductions during 2017. Rather than ignore a significant new rule the EPA incorporated the rule into its analysis.[4] One factor that enabled the EPA to ensure that each step of its analysis is informed by the best available data is the agency's use of AQAT (as described in section D of this TSD). Within a short period of time, AQAT allows the agency to estimate the changes in air quality design values and air quality contributions as a result of the changes in emissions. For example, EPA was able to estimate the changes in air quality as a result of PA RACT and found that the 19 receptors identified in the final air quality modeling using CAMx

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[2] See "Documentation for EPA Base Case v.5.13 Using the Integrated Planning Model", "EPA Base Case v.5.14 Using IPM Incremental Documentation. March 25, 2015", and "EPA Base Case v.5.15 Using IPM Incremental Documentation. August, 2015," and "EPA v5.15 Supplemental Documentation for the Final CSAPR Update Rule" for further description of the IPM model, available at https://www.epa.gov/airmarkets/power-sector-modeling

[3] The D.C. Circuit issued its final decision in the litigation of CSAPR, remanding 11 states phase 2 NOx ozone season budgets for reconsideration, finding that the budgets over-controlled. *See EME Homer City Generation, L.P. v. EPA*, 795 F.3d 118, 138 (2015) (*EME Homer City II*). In light of this remand, the projected base case for the final rule accounts for compliance with the original CSAPR by including as constraints all original CSAPR emission budgets with the exception of remanded phase 2 NO_X ozone season emission budgets for 11 states. The EPA has also excluded the phase 2 NO_X ozone season emission budgets that were finalized in the original CSAPR supplemental rule for four additional states because those state budgets would over-control in the same manner as the remanded budgets. Specifically, to reflect original CSAPR ozone season NO_X requirements, the modeling includes as constraints the original CSAPR NO_X ozone season emission budgets for 10 states: Alabama, Arkansas, Georgia, Illinois, Indiana, Kentucky, Louisiana, Mississippi, Missouri, and Tennessee.

[4] See the Memo to the Docket "Pennsylvania RACT memo to the docket for the final CSAPR Update" for details about this rule.

remained with design values greater than 76 ppb.[5] EPA also found that each state included in the rule maintained at least one linkage to one of those 19 receptors. EPA recognizes that AQAT is not the equivalent of photochemical air quality modeling using tools such as CAMx. However, AQAT is directly informed by robust CAMx data. Further, AQAT has evolved through iterative development under the original CSAPR, the CSAPR Update proposal, and the final CSAPR Update. One such evolution is its calibration to an emission reduction scenario that is very similar to the final rule NO_X control stringency. As a result, the version of AQAT used for the final CSAPR Update is a reliable analytic tool that is specifically created and calibrated to the policy it is being used to evaluate. To confirm its reliability for these purposes, the EPA used both AQAT and CAMx to evaluate the illustrative policy analysis for the RIA, finding that AQAT provides results that are nearly identical to CAMx. This assessment can be found in section D-4, below.

In the body of power sector modeling done for this rule, the EPA needed to quantify emissions for three different analytic purposes. The first purpose was construct an Air Quality Modeling Base Case to identify nonattainment and maintenance receptors and perform contribution analysis. This base case was necessary given the long lead time required for air quality modeling. This base case incorporated the most important fleet changes and retrofits identified through comments on the August 4, 2015 Notice of Data Availability (NODA)[6] and EPA's continuous review of the power sector.

The second purpose was to construct an illustrative, and internally consistent, base case and control case to study the potential costs and benefits of this rulemaking, as described in the Regulatory Impact Analysis, or RIA, for this rule. This set of cases is referred to as the "Illustrative Cases." To allow time for air quality modeling and analysis of the policy, illustrative budgets were quantified from the Illustrative Cost Threshold Runs. These Illustrative Cases incorporated additional comments from the NODA and the proposal, as well as other modeling updates.

The third purpose was to quantify the final state emission budgets for the rule and to confirm that the results of the illustrative analysis are representative of the final CSAPR Update. This set of cases is referred to as the "Final Cases." For the Final Cases, the EPA conducted a new base case, cost threshold cases, and policy case. This final set of analysis allowed EPA to incorporate the most updated information possible for the calculation of emission budgets in the final regulation.

As a result, while EPA used the same budget quantification approach described in this document in both the Illustrative and Final sets of analysis cases, the quantified results for budgets in each track differ due to minor differences in the modeling projections within each track. Table B-1 below summarizes the various IPM runs conducted and Appendix A provides further details on each of these scenarios.

[5] For example, EPA was able to estimate the changes in air quality as a result of PA RACT and found that the 19 receptors identified in the final air quality modeling using CAMx remained with design values greater than 76 ppb.

[6] Notice of Availability of the Environmental Protection Agency's Updated Ozone Transport Modeling Data for the 2008 Ozone National Ambient Air Quality Standard (NAAQS), 80 FR 46271 (Aug. 4, 2015). available at http://www.epa.gov/airtransport/pdfs/FR_Version_Transport_NODA.pdf.

Table B-1. Summary of Sets of Scenarios

	Air Quality Modeling Base Case	**Illustrative Cases**	**Final Cases**
Scenarios Run	Base Case	Base Case Cost Threshold Cases Policy Cases	Base Case Cost Threshold Cases Policy Cases
What Analysis Each Set of Runs Inform	Base Case air quality modeling (CAMx) to identify nonattainment and maintenance receptors	Budgets used for the Illustrative Policy Cases Air quality analysis (CAMx and AQAT) of the Illustrative Policy Case Illustrative Policy Analysis for the RIA	Final Budgets AQAT Analysis Appended analysis for the RIA
Updates Captured In Each Set of Runs	Unit retirements, additions and retrofits flagged In NODA comments See "NEEDS v.5.15 AQM CSAPR Update" in the docket for full set of unit level characteristics	Additional comments on the NODA and Proposed Rule Updated certain unit-specific NO_X rates based on historical trends Emission rate of units with SCRs is 0.081 lbs/mmBtu or lower See "NEEDS v.5.15 Illustrative CSAPR Update" in the docket for full set of unit level characteristics	Updated additional NO_X rates based on historical trends Emission rate of units with SCRs is 0.1 lbs/mmBtu or lower See "NEEDS v.5.15 Final CSAPR Update" in the docket for full set of unit level characteristics

For the Illustrative and Final Cases, the EPA modeled the emissions that would occur within each state in a Base Case. The EPA then designed a series of IPM runs that imposed increasing cost thresholds representing uniform levels of NO_X controls and tabulated those projected emissions for each state at each cost level. The EPA has referred to these runs as "Cost Threshold Runs" and these

tabulations as "cost curves".[7] The cost curves report the remaining emissions at each cost threshold after the state has made emission reductions that are available up to the particular cost threshold analyzed.

In each Cost Threshold run, the EPA applied ozone season cost thresholds to all fossil-fuel-fired EGUs with a capacity greater than 25 MW in all states. As described in the EGU NO_X Mitigation Strategies Final Rule TSD, because of the time required to build advanced pollution controls, the model was prevented from building any new post-combustion controls, such as SCR or SNCR, before 2020, in response to the cost thresholds.[8] The modeling allows turning on idled existing SCR and SNCR, optimization of existing SCR, shifting generation to lower-NO_X emitting EGUs, and adding or upgrading NO_X combustion controls in 2017,[9] such as state-of-the-art low NO_X burners (LNB).

In these scenarios, EPA imposed cost thresholds of $800, $1,400, $3,400, $5,000, and $6,400 per ton of ozone season NO_X. See Preamble Section VI for a discussion of how the cost thresholds were determined. Table B-2 below summarizes the reduction measures that are broadly available at various cost thresholds.

Table B-2. Reduction strategies available to EGUs at each cost threshold.

Cost Threshold ($ per ton Ozone-Season NO_X)	Reduction Options
$800	-Optimize extant operating SCRs -generation shifting
$1,400	all above options and - retrofitting state-of-the-art combustion controls -Turning on and optimizing extant idled SCRs -additional generation shifting
$3,400	all above options and -Turning on extant idled SNCRs -additional generation shifting
$5,000	all above options and additional generation shifting
$6,400	all above options and additional generation shifting

[7] These projected state level emissions for each "cost threshold" run are presented in several formats. The IPM analysis outputs available in the docket contain a "state emissions" file for each analysis. The file contains two worksheets. The first is titled "all units" and shows aggregate emissions for all units in the state. The second is titled "all fossil > 25MW" and shows emissions for a subset of these units that have a capacity greater than 25 MW. The emissions in the "all fossil > 25 MW" worksheet are used to derive the budgets for each upwind state at the cost thresholds, in an average year.

[8] IPM results do include certain newly built post-combustion NO_X control retrofits in base case modeling, cost curve runs, and remedy runs. These pre-2020 retrofits do not reflect any controls installed in response to the rule, but instead represent those that are already announced and/or under construction and expected to be online by 2018, or controls that were projected to be built in the base case in response to existing consent decree or state rule requirements.

[9] As described in Preamble Section IV.B, the EPA is aligning the analysis and implementation of this final rulemaking with the 2017 ozone season in order to assist downwind states with the timely attainment of the 2008 ozone NAAQS. As described in Preamble Section V.B.2., EPA adjusted the IPM v5.15 2018 run year results to account for differences between 2017 and 2018 in the power sector, because IPM v5.15 does not have an output year of 2017.

Within IPM, units with extant SCRs are defined as SCR equipped units with ozone season NO_X emission rates less than 0.2 lbs/mmbtu in the Base Case. These units had their emission rates lowered to the lower of their mode 4 NO_X rate in NEEDS[10] and the "widely achievable" optimized emissions rate of 0.081 lbs/mmbtu in the Illustrative Cost Threshold Cases and 0.10 lbs/mmBtu in the Final Cost Threshold Cases.

Units equipped with SCRs with an emissions rate exceeding 0.20 lbs/mmBtu were considered to have idled SCRs. These units had their emission rates lowered to the lower of their mode 4 NO_X rate in NEEDS and the "widely achievable" optimized emissions rate of 0.081 lbs/mmbtu in the Illustrative Cost Threshold Cases of $1,400 per ton and higher, and 0.10 lbs/mmBtu in the Final Cost Threshold Cases of $1,400 per ton and higher.

Units with idled SNCRs were identified as units equipped with SNCR and mode 4 NO_X rates in NEEDS greater than 0.30 lbs/mmbtu. These units were given NO_X rates 25% lower to reflect reflect SNCR operation in Cost Threshold cases of $3,400 per ton and higher.

Finally, unit combustion control configurations listed in NEEDS were compared against Table 3-11 in the Documentation for EPA Base Case v.5.13 Using the Integrated Planning Model IPM v.5.13, which lists state-of-the-art combustion control configurations based on unit firing type. This allowed EPA to identify units that would receive state-of-the-art combustion control upgrades in IPM. EPA then followed the procedure in Attachment 3-1 of the documentation to calculate the each of these unit's new NO_X emission rate.

As described in preamble section VI, the EPA limited its assessment of shifting generation to other EGUs within the same state as a proxy for the amount of generation shifting that could occur for the 2017 ozone season. EPA did this by limiting state generation in each Cost Threshold case to the level in its respective Base Case.

Section C.2 of this TSD describes how budgets were calculated based on each Cost Threshold case. Once these budgets were calculated, EPA used the budgets for covered states to conduct IPM runs to investigate the impact of compliance with the budgets calculated from the $800, $1,400, and $3,400 per ton Cost Threshold Cases. These Cases are referred to as Policy Cases. Specifically, the budgets calculated from the Illustrative $1400 per ton Cost Threshold case were used for the Illustrative Policy Case, and the budgets calculated from the Illustrative $800 and $3400 per ton Cost Threshold cases informed the Illustrative Less- and More-Stringent Policy Cases. Lastly, the budgets calculated from the Final $1400 per ton Cost Threshold case were used for the Final Policy Case. These Policy Cases were used to inform air quality impact analysis of the rule and inform the RIA.

To model the policy cases in IPM, EPA used the calculated budget and assurance levels to set state and regional ozone-season NO_X emissions. Additionally, EPA assumed a starting bank of allowances equal to 21% of the sum of the state budgets. States could individually emit up to their assurance levels in each run year, and collectively could not have emissions exceeding the sum of their budget and banked allowances in each run year. In all policy cases, units with extant operating SCRs were assumed to operate them at the lower of their mode 4 NO_X rate in NEEDS and the "widely achievable" emissions rate, as EPA determined this was a cost-effective mitigation strategy. For all of the Policy Cases except the Illustrative Less Stringent Policy Case, all units with SCRs were assumed

[10] The mode 4 NO_X rate, as described in Chapter 3 of the Documentation for EPA Base Case v.5.13 Using Integrated Planning Model, represents post-combustion controls operating and state-of-the-art combustion controls, where applicable. For units determined to be operating their SCR, the rate is typically equal to the unit's rate reported in the 2011 ETS data. For some units, as described in the EPA v.5.15 CSAPR Update Rule Base Cases Using IPM Incremental Documentation, this data was updated. For units not operating their SCRs, the mode 4 rate is calculated as described in Attachment 3-1 of the Documentation for EPA Base Case v.5.13 Using Integrated Planning Model.

to operate them at the "widely achievable" emissions rate and units that did not already have state-of-the-art combustion controls were assumed to retrofit them. In the Illustrative More Stringent Policy Case, units with idled SNCRs were assumed to operate them. Finally, no state-level generation constraints were imposed in the policy cases. While the EPA conservatively limited generation shifting in developing the budgets, through use of state-level generation constraints, the EPA believes that generation shifting may occur broadly among states and so removed that constraint for the IPM cases modeling the policy.

C. Calculating Budgets From IPM Run and Historical Data

1. Overview of the State Budget Formula

As described in preamble section VI, EPA developed state EGU NO_X emissions budgets for each of the cost thresholds. This section walks through the details of how each state emissions budget was calculated for each cost threshold. As described in Section B of this TSD, the same process was used to calculate two sets of budgets: an Illustrative for analysis of the rule and a Final set for quantifying the final CSAPR Update budgets

As described in Preamble Section VI, the EPA determined it was appropriate to calculate budgets by combining historical emissions and heat input data with projections from IPM. In the proposed rule, the EPA calculated state budgets with the following formula:

State 2017 OS NO_X Budget =
2015 State OS Heat Input * State 2017 IPM OS NO_X Emissions Rate

(note: "OS" stands for Ozone Season, and is equivalent to the "summer" label in some IPM outputs)

EPA intended this formula to root the state emissions budgets in historical data by tying them to state-level historic heat input as opposed to using emission projections that reflect interstate generation patterns that occur in IPM. However, commenters raised a related concern that notwithstanding this approach's use of state-level historic heat input, the model may still project a substantially cleaner generation profile within the state than might be possible to achieve in the relatively short timeframe of this rule. In other words, the proposal's application of an IPM-projected state-level emission rate to historical state-level heat input data could still yield potentially insufficient tons for a state budget if that state's EGUs were to maintain a similar total generation to 2015 but were unable to collectively achieve that projected emission rate by the 2017 ozone season. To address this concern, EPA updated the formula for the final rule to:

State 2017 OS NO_X Budget = 2015 State OS Heat Input $*$
[2015 $State\ OS\ NO_X\ Emissions\ Rate -$
(2017 $IPM\ Base\ Case\ OS\ NO_X\ Emissions\ Rate -$ 2017 IPM Cost Threshold $OS\ NO_X$ Emissions Rate)]

This formula subtracts the change in emissions rate between the IPM Base Case and a Cost Threshold Case from the actual 2015 emissions rate. This modified approach ensures that state budgets are informed by IPM projections of state-level emission rate *improvement* (change from base case to cost threshold case) while tying that improvement potential directly to observed emission rate performance in 2015.

This change in analytic approach means that unit retirements and retrofits known to occur after 2015 but before 2017, which were automatically captured in the proposal's use of IPM-projected emission rates, now need to be explicitly accounted for in the quantification of state budgets. In the proposal methodology, these fleet changes were captured in the State 2017 IPM Emissions Rate. In the formula above used to quantify budgets in this final rule, these fleet changes between 2015 and 2017 are reflected in both the IPM Base Case Rate and the Cost Threshold Case Rate, such that the effect of these fleet changes on the state-level emission rates cancels itself out. In other words, the degree of

state-level IPM-projected emission rate improvement represented in this formula only captures what EGUs in that state can do to reduce emissions *beyond* the already-known retrofit and retirement changes expected in that state between 2015 and 2017. Accordingly, EPA determined it was necessary to adjust the 2015 State Emissions Rates to account for these known changes, so that the full degree of emission reductions expected in the state by 2017 is captured in the budget. Therefore, the final budget equation is:

$$\textbf{State 2017 Budget} = 2015 \text{ State OS Heat Input} * [Adjusted\ 2015\ OS\ NO_X\ State\ Emissions\ Rate - (2017\ IPM\ Base\ Case\ OS\ NO_X\ Emissions\ Rate - 2017 \text{ IPM Cost Threshold } OS\ NO_X \text{ Emissions Rate})]$$

Finally, EPA notes that in rare instances, it is possible for a state's emission rate to increase in a cost threshold case relative to its base case rate, even if a state's emissions decrease overall. This situation could yield a result greater than the state's 2015 (unadjusted) emissions. This outcome can be due to model-projected regional fuel prices and generation shifting among units. Therefore, EPA assigned state budgets as the lower of the calculated state budget or the state's 2015 (unadjusted) emissions.

2. Detailed Explanation of State Budget Calculations

Below is a detailed walk-through of how the formula for calculating state emissions budgets was applied to each cost threshold run to generate a corresponding budget for each state. For comparison and the purpose of AQAT modeling, this formula was also applied to the Base Case to generate base case "budgets" (alternatively, this could be considered a $0 per ton ozone season NO_X cost threshold run). The budgets calculated from this process for the Final Cost Threshold cases appear in table C-1. The detailed calculations for all Cost Threshold cases appear in Appendix E (Excel spreadsheet).

First, the EPA tabulated each state's 2015 reported historical state-level ozone season heat input and NO_X emissions from affected sources. To capture the emissions impact of committed fleet changes occurring before 2017, the EPA calculated an adjusted 2015 historical ozone-season NO_X emissions level for each state. For units with planned new state-of-the-art SCR retrofits to be in place by the 2017 ozone season, heat input was assumed to match 2015 levels, but the units were given emission rates of 0.075 lbs/mmBtu[11] to reflect the control being in place for 2017 and in lieu of whatever emission rate the unit reported in 2015 (before its SCR was in place). For units with planned combustion control retrofits before 2017, the EPA recalculated emissions for the unit assuming heat input matched 2015 levels and the emission rate was improved to the Mode 4 NO_X Emissions Rate for the unit listed in NEEDS.[12] For units with coal-to-gas conversions planned to occur by the 2017 ozone season, heat input was assumed to match 2015 levels, but the units were given an emissions rate equal to half of its 2015 rate[13] to reflect the NO_X reductions associated with their conversion to gas for 2017.

[11] This is a conservative estimate, based on the floor rates for new SCRs in the IPM documentation, ranging from 0.05 to 0.07 lbs/mmBtu, depending on coal type. See "Documentation for EPA Base Case v.5.13 Using the Integrated Planning Model," table 5-5.

[12] The Mode 4 NO_X Emission Rate reflects the emission rate for a unit if state-of-the-art combustion controls were installed. See NEEDS v5.15 Final CSAPR Update

[13] This is consistent with NO_X rate change used in IPM. See "Documentation for EPA Base Case v.5.13 Using the Integrated Planning Model.", table 5-21.

Lastly, the heat input and emissions for units retiring before 2017 was changed to zero. However, the EPA assumed that the generation from the retiring unit would be replaced by other units. The displaced heat input, which EPA used as a proxy for generation, from these units was assumed to be replaced by generation within the state with an emission rate equal to the state's overall emission rate for the remaining units.[14] This heat input and associated emissions from replacement generation was then added to the state's total, yielding adjusted 2015 historical ozone season heat input and NO_X emissions. With this data, EPA was also able to calculate each state's adjusted 2015 ozone season emissions rate.

Second, the EPA calculated each covered state's 2017 modeled ozone season NO_X emission rate for the base case and each cost threshold. To do this, EPA started with the IPM projected 2018 ozone season heat input and NO_X emissions from affected sources for each state. Next, EPA added an adjustment to account for differences in unit and SCR availability and operation between the IPM run year of 2018 and the expected conditions applicable to calendar year 2017.[15] Appendix C explains the 2017 adjustments and shows the adjustments made by model plant. Lastly, the state-level 2017 emissions rate was calculated as the total 2017 emissions from affected sources within the state, divided by the total 2017 heat input from these sources.

Third, the EPA calculated the change in emissions rate between the IPM base case and each cost threshold case.[16] The EPA then subtracted this change in emissions rate from the adjusted 2015 emissions rate. This yielded state-level historically based emission rates reflecting modeled NO_X reduction potential.

Fourth, the EPA multiplied these rates by each state's adjusted 2015 heat input to yield emission budgets for each cost threshold. In instances where this calculated budget was greater than the state's 2015 (unadjusted) emissions, the state budget was set equal to the state's 2015 (unadjusted) emissions. However, for the budgets finalized in this rule, all states had calculated budgets lower or equal to their 2015 historical emissions. The state budgets for the Final Cost Threshold cases are displayed in table C-1. Note that budgets are calculated for all states for the purpose of AQAT analysis, as explained section D of this TSD, even if the state is not covered by the final CSAPR Update Rule.

Finally, the EPA calculated the variability limits and assurance levels for each state based on the calculated emission budgets. Each state's variability limit is 21% of its budget, and its assurance level is the sum of its budget and variability limit (or 121% of its budget), shown in Table C-2. Under the methodology established in the original CSAPR, the state-specific portion of the new unit set aside (NUSA) (including the Indian Country NUSA) is calculated as the percentage equal to the projected emissions from "planned units" divided by the state budget plus a base two percent. The calculated existing unit allocation and NUSA, including the Indian Country NUSA, for the Final budgets is

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[14] Therefore, the 2015 adjusted heat input for each state is equal to its 2015 reported historical heat input.

[15] Unlike the manner in which the EPA calculated state budgets that were finalized in this rule, the EPA did not include the 2017 emissions and heat input adjustments in the calculating the budgets that were included in the IPM modeling of the Illustrative for Final Policy Cases. This is because the 2017 adjustments are done to account for emissions that are not captured in the IPM 2018 run year, emissions that the model would not need allowances to cover. Including these 2017 adjustments in the budgets modeled in IPM would artificially inflate the state budgets and assurance levels in the model. Therefore, analogous budgets without the 2017 adjustments were calculated for the purpose of modeling in IPM. For the Final Policy Case, this only resulted in a total regional budget difference of 907 tons. The state budgets and assurance levels used in IPM are shown in Appendix E.

[16] The Base Case can be considered equivalent to a $0 per ton cost threshold run, with a corresponding "budget." To calculate the equivalent "budget" for the Base Case using this process, the change in emissions rate for any state is zero. Applied through the rest of the budget calculation process, this means that the base case "budgets" are equal to the adjusted 2015 historical emissions.

shown in table C-3.[17] The variability limits, assurance levels, New Unit Set-Asides and Indian Country New Unit Set-Asides as further described in section VII of the preamble for the final CSAPR Update.

A complicating factor of this analysis was the Pennsylvania RACT (PA RACT) Rule that was finalized in April 2016. The PA RACT Rule will lead to reductions in ozone season NO_X in Pennsylvania, but not have an impact until 2017, the first year the Final CSAPR Rule would be in effect. The EPA determined it was reasonable to not include it in its IPM modeling because it would lead to a budget for Pennsylvania that does not reflect achievable emission reductions by way of applying a regional uniform NO_X control stringency for the 22 CSAPR Update states. In other words, if EPA included PA RACT in the IPM modeling, then Pennsylvania's resulting budget would not be commensurate with other state budgets for the final CSAPR Update. That is because the budget setting methodology uses the change in emissions rate between a Base Case and a Cost Threshold case, and 2015 historical emissions data. Including the PA RACT in the Base Case for this rule would lead to a small change in emissions rates between cases and apply that to historical data that does not reflect the PA RACT Rule. Mixing 2015 historical data that does not reflect the impact of the PA RACT with IPM cases that does reflect the PA RACT would yield budgets that were too large. However, as explained in the Memo to the Docket "The Pennsylvania Additional RACT Requirements for Major Sources of NO_X and VOCs," the EPA found it reasonable to factor the PA RACT requirements into air quality modeling using AQAT, and reflect its costs and emissions reductions in the Illustrative and Final Base Cases and $800 per ton Cost Threshold Cases in the RIA.

As explained in the preamble, the EPA is promulgating EGU NO_X ozone season emission budgets reflecting the uniform cost threshold of $1,400 per ton to reduce significant contribution to nonattainment and interference with maintenance. These budgets were calculated from the Final $1,400 per ton Cost Threshold run.

For the RIA analysis, budgets calculated from the Illustrative $1,400 per ton Cost Threshold run were used for the Illustrative Policy case. Additionally, the RIA includes analysis of the Illustrative Less Stringent policy option, using the budgets from the Illustrative $800 per ton Cost Threshold case, and an Illustrative More Stringent policy alternative, using the budgets from the Illustrative $3,400 per ton Cost Threshold case. The EPA also included additional analysis of the Final Policy case in Appendix 4-A of the RIA.

The IPM runs performed for the cost threshold analyses are listed in Appendix A of this TSD. Table Appendix A-1 lists the name of each IPM run next to a description of the run. The output files of these model runs can be found in the rulemaking docket. Detailed budget calculations for all Cost Threshold cases and the assurance levels used for Policy Cases can be found in Appendix E.

[17] See 'O3 NAAQS CSAPR Update -- NUSA Calculations' (Excel spreadsheet) in the docket.

Table C-1. Calculated Budgets for States for Final Cost Threshold Runs.

State	State Covered by Final CSAPR Update Rule?	Final Base Case	Final $800/ton Cost Threshold	Final $1400/ton Cost Threshold	Final $3400/ton Cost Threshold	Final $5000/ton Cost Threshold	Final $6400/ton Cost Threshold
Alabama	Y	15,179	14,332	13,211	12,620	11,928	11,573
Arkansas[18]	Y	12,560	12,048	9,210	9,048	8,518	8,050
Arizona		10,710	10,680	9,810	9,788	9,710	9,486
California		1,905	1,905	1,905	1,905	1,810	1,810
Colorado		14,010	14,008	13,994	13,645	13,495	12,950
Connecticut		605	584	558	558	554	554
Delaware		497	497	497	494	494	494
Florida		22,779	21,611	17,123	16,631	16,481	16,375
Georgia		8,762	8,495	8,481	8,525	8,532	7,764
Iowa	Y	11,478	11,477	11,272	11,065	10,891	10,491
Idaho		152	152	152	152	152	152
Illinois	Y	14,850	14,682	14,601	14,515	14,248	14,054
Indiana	Y	31,382	28,960	23,303	21,634	19,990	18,720
Kansas	Y	8,031	8,030	8,027	7,975	7,962	7,767
Kentucky	Y	26,318	24,052	21,115	21,007	20,273	19,496
Louisiana	Y	19,101	19,096	18,639	18,452	18,442	18,426
Massachusetts		1,119	1,119	1,112	1,098	1,071	1,072
Maryland	Y	3,871	3,870	3,828	3,308	2,938	2,926
Maine		109	109	109	109	109	109
Michigan	Y	19,811	19,558	16,545	15,298	12,616	12,115
Minnesota		7,068	7,068	6,864	6,761	6,651	6,451
Missouri	Y	18,443	17,250	15,780	15,299	14,673	14,555
Mississippi	Y	6,438	6,438	6,315	6,243	6,203	6,205
Montana		6,540	6,540	6,540	6,535	6,535	6,535
North Carolina		17,419	14,424	14,326	13,189	12,460	12,207
North Dakota		18,738	18,398	18,016	17,655	17,497	17,435
Nebraska		9,737	9,678	8,970	7,197	6,467	6,448
New Hampshire		416	416	416	416	415	415
New Jersey	Y	2,114	2,100	2,062	2,008	1,867	1,879
New Mexico		9,443	9,443	9,055	8,921	8,746	8,650
Nevada		2,405	2,301	2,241	2,112	1,559	886
New York	Y	5,531	5,220	5,135	5,006	4,746	4,594
Ohio	Y	27,382	23,659	19,522	19,165	18,561	18,348
Oklahoma	Y	13,747	13,746	11,641	9,174	8,790	8,439
Oregon		---	---	---	---	---	---
Pennsylvania	Y	35,607	30,852	17,952	17,928	17,621	17,374
Rhode Island		283	283	283	283	283	283
South Carolina		5,486	5,288	5,288	5,293	5,300	5,318
South Dakota		853	853	853	853	853	853
Tennessee	Y	7,779	7,736	7,736	7,735	7,724	7,729
Texas	Y	54,839	54,521	52,301	50,011	48,795	47,994
Utah		16,949	16,949	14,149	13,592	11,356	11,324
Virginia	Y	9,367	9,365	9,223	8,754	8,619	8,416
Vermont		52	52	52	52	52	52
Washington		3,085	3,085	3,085	3,085	3,085	3,085
Wisconsin	Y	7,939	7,924	7,915	7,790	7,435	7,023
West Virginia	Y	26,874	25,984	17,815	17,380	17,388	17,373
Wyoming		16,005	15,828	14,691	13,728	12,371	12,121
CSAPR State Total		**378,641**	**360,900**	**313,148**	**301,415**	**290,228**	**283,547**

[18] The calculated budgets shown in this table for Arkansas correspond to its budget for 2018 and subsequent control periods. As discussed in Preamble Section VI.D, Arkansas's 2017 is 12,048 tons.

Table C.2. State Budgets, Variability Limits, and Assurance Levels for the CSAPR Update Rule.

State	Budget	Variability Limit	Assurance Level
Alabama	13,211	2,774	15,985
Arkansas[19]	12,048 (2017) 9,210 (2018+)	2,530 (2017) 1,934 (2018+)	11,144 (2017) 14, 478 (2018+)
Iowa	11,272	2,367	13,639
Illinois	14,601	3,066	17,667
Indiana	23,303	4,894	28,197
Kansas	8,027	1,686	9,713
Kentucky	21,115	4,434	25,549
Louisiana	18,639	3,914	22,553
Maryland	3,828	804	4,632
Michigan	16,545	3,474	20,019
Missouri	15,780	3,314	19,094
Mississippi	6,315	1,326	7,641
New Jersey	2,062	433	2,495
New York	5,135	1,078	6,213
Ohio	19,522	4,100	23,622
Oklahoma	11,641	2,445	14,086
Pennsylvania	17,952	3,770	21,722
Tennessee	7,736	1,625	9,361
Texas	52,301	10,983	63,284
Virginia	9,223	1,937	11,160
Wisconsin	7,915	1,662	9,577
West Virginia	17,815	3,741	21,556
CSAPR Update Region Total	**313,986 (2017)** **313,148 (2018+)**	**N/A**	**N/A**

[19] As discussed in Preamble Section VI.D, Arkansas's 2017 is 12,048 tons and 9,210 tons in 2018 and subsequent control periods.

Table C-3. Existing unit allocation and NUSA, including the Indian Country NUSA, for the Final CSAPR Update Budgets.

State	Final 2017* EGU NO_X Emission Budgets (tons)	New unit set-aside amount (percent)	New unit set-aside amount (tons)[1]	Indian country new unit set-aside amount (tons)
Alabama	13,211	2	255	13
Arkansas*	12,048/9,210	2/2	240/185	
Illinois	14,601	2	302	
Indiana	23,303	2	468	
Iowa	11,272	3	324	11
Kansas	8,027	2	148	8
Kentucky	21,115	2	426	
Louisiana	18,639	2	352	19
Maryland	3,828	4	152	
Michigan	16,545	4	643	17
Mississippi	6,315	2	120	6
Missouri	15,780	2	324	
New Jersey	2,062	9	192	
New York	5,135	5	252	5
Ohio	19,522	2	401	
Oklahoma	11,641	2	221	12
Pennsylvania	17,952	3	541	
Tennessee	7,736	2	156	
Texas	52,301	2	998	52
Virginia	9,223	6	562	
West Virginia	17,815	2	356	
Wisconsin	7,915	2	151	8

[1] New-unit set-aside amount (tons) does not include the Indian country new unit set-aside amount (tons).
*The EPA is finalizing CSAPR EGU NO_X ozone season emission budgets for Arkansas of 12,048 tons for 2017 and 9,210 tons for 2018 and subsequent control periods.

3. Assessing the Impact of Limiting Inter-State Generation Shifting

As described in preamble section VI, the EPA limited its assessment of shifting generation to other EGUs within the same state as a proxy for the amount of generation shifting that could occur for the 2017 ozone season. The amount of NO_X reductions between the IPM cases that were used to quantify the emission budgets under this assumption can be found in Appendix F. To determine the impact of this assumption, the EPA conducted a separate analysis similar to the $1,400 per ton cost threshold scenario, except without limiting IPM's ability to shift generation between states. EPA calculated budgets from this alternative case and compared them to the final budgets, also shown in Appendix F. This analysis showed that budgets would only be 1,101 tons lower in the CSAPR region compared to the final budgets if the EPA assumed generation shifting was unrestricted between the states, or 0.35% of the sum of the final CSAPR state budgets.

At the state level, 19 of the 22 states had budgets less than 1% different and two additional states had changes of less than 2%, when comparing this alternative case to the approach used in the final rule. One state, Maryland, had an alternative budget 20% lower than its final budget. These results show two things. First, overall, this constraint had minimal impacts on state budgets. Second, in one case, the constraint did significantly impact a state budget, lowering Maryland's budget 20% as generation was shifted out of state. This evaluation supports EPA's determination that it was reasonable to use a conservative estimate of the potential for emissions reductions from generation shifting in the relatively short timeframe of this particular rule by limiting IPM's ability to shift generation among states in the modeling projections to inform state budget quantification.

D. Analysis of Air Quality Responses to Emission Changes Using an Ozone Air Quality Assessment Tool (AQAT)

EPA has defined each linked upwind state's significant contribution to nonattainment and interference with maintenance of downwind air quality using a multi-factor test (described in the preamble at section VI in step three of the CSAPR framework) which is based on cost, emissions, and air quality factors. A key quantitative input for determining the amount of each state's emission reduction obligation is the predicted downwind ambient air quality impacts of upwind EGU emission reductions under the budgets at various levels of NO_X emission control (see in section C of this TSD). The emission reductions under the various levels of emission budgets can result in air quality improvements such that individual receptors drop below the level of the NAAQS based on the cumulative air quality improvement from the states, as well as decrease each upwind state's contributions such that they possibly drop below the 1% threshold that was used to identify the states for further analysis in step 2 of the CSAPR framework.

Direct simulation of air quality in CAMx would be the optimal way to examine these questions at each level of emission budgets. However, time and resource limitations (in particular the amount of time needed to set up, run the CAMx model, and analyze the results for a single model run) precluded the use of full air quality modeling for all but a few emissions scenarios. Therefore, in order to estimate the air quality impacts for the various levels of emission budgets and for the illustrative control alternative, EPA used a simplified air quality assessment tool (AQAT).[20] The simplified tool allows the Agency to analyze many more NO_X emission budget levels than would otherwise be possible. The inputs and outputs of the tool can be found in the "AQAT_final_calibrated.xlsx" excel workbook.

The remainder of section D of this document will:

- Present an introduction and overview of the ozone AQAT;
- Describe the construction of the ozone AQAT; and
- Provide the results of the NO_X emission budget level analyses.

1. Introduction: Development of the ozone AQAT

The ozone AQAT was developed for use in the rule's step three air quality analysis as part of the multi-factor test. Specifically, the AQAT was designed to evaluate air quality changes in response to emissions changes in order to quantify necessary emission reductions under the good neighbor provision and to evaluate potential budgets for over-control as to either the 1% threshold or the downwind receptor status. EPA described and used a similar tool in the original CSAPR to evaluate good neighbor obligations with respect to the fine particulate matter ($PM_{2.5}$) NAAQS and in the proposed CSAPR Update to evaluate good neighbor obligations with respect to ozone. For the CSAPR Update, EPA refined both the construction and application of the assessment tool for use in estimating changes in ozone concentrations in response to changes in NO_X emissions. One important change

[20] EPA used CAMx to model both the base case (i.e., to determine the receptors and the contributions of each state to those receptors) and the final budget policy scenario. The air quality estimates in AQAT were comparable to design values in CAMx for the final illustrative control scenario, suggesting that the air quality estimates for alternative control scenarios performed using AQAT are also reasonable.

between the original CSAPR and this effort is to use AQAT to examine changes in ozone rather than $PM_{2.5}$. We followed the methodology developed in the original CSAPR rulemaking where we calibrate the response of a pollutant using two CAMx simulations at different emission levels.[21,22]

A critical factor in the assessment tool is the establishment of a relationship between ozone season NO_X emission reductions and reductions in ozone. Within AQAT, we assume that the reduction of a ton of emissions of NO_X from the upwind state results in a particular level of improvement in air quality downwind.[23] For the purposes of developing and using an assessment tool to compare the air quality impacts of NO_X emission reductions under various emission budget levels, we determine the relationship between changes in emissions and changes in ozone contributions on a receptor-by-receptor basis. Specifically, EPA assumed that, within the range of total NO_X emissions being considered (as defined by the emission budget levels), a change in ozone season NO_X emissions leads to a proportional change in downwind ozone contributions.[24] This proportional relationship was then modified using calibration factors created using the 2017 base case contribution air quality modeling and the 2017 illustrative control case from the proposal to account for the majority of the nonlinearity between emissions and ozone concentrations.[25] For example, we assume that a 20% decrease in the upwind state's emissions leads to a 20% decrease in its downwind ozone contribution in the

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[21] In CSAPR, we estimated changes in sulfate using changes in SO_2 emissions.

[22] In this rule, we used CAMx to calibrate the assessment tool's predicted change in ozone concentrations to changes in NO_X emissions. This calibration is receptor-specific and is based on the changes in NO_X emissions and resulting ozone concentrations between the 2017 base case and the modeled "illustrative control case" in 2017 from the modeling conducted for the proposed rule. This "illustrative control case" was created during the development of the assessment tool for the proposed rule and is an EGU NO_X ozone-season emission budget sensitivity scenario at $1,300/ton for ozone-season NO_X, reflecting emission reductions from sources in the 23 eastern states that the EPA proposed to regulate under the rule. One intent of this control scenario was to create a calibration point within the range of all emission reductions for the geography examined by EPA using the AQAT. This calibration point was used to create site-specific calibration factors so that the response of ozone concentrations to upwind NO_X emission changes would more-closely align with ozone estimates from CAMx.

[23] This downwind air quality improvement is assumed to be indifferent to the source sector or the location of the particular emission source within the state where the ton was reduced. For example, reducing one ton of NO_X emissions from the power sector is assumed to have the same downwind ozone reduction as reducing one ton of NO_X emissions from the mobile source sector. Because the emission reductions from base case to the 2017 illustrative control case at proposal and the resulting air quality improvements per ton of reduction occur exclusively from the power sector, the calibration factor and thereby calibrated ozone AQAT is tuned to changes in emissions in the power sector.

[24] As noted by EPA at proposal and as stated by commenters, the relationship between NO_X emissions and ozone concentrations is known to be non-linear when examined over large ranges of NO_X emissions (e.g., J.H. Seinfeld and S.N. Pandis, Atmospheric Chemistry and Physics From Air Pollution to Climate Change, 2nd Edition, John Wiley and Sons, 2006, Hoboken, NJ, pp 236-237). However, for some ranges of NO_X, VOC, and meteorological conditions, the relationship may be reasonably linear. In this assessment tool, we are assuming a linear relationship between NO_X emissions and ozone concentrations calibrated between two CAMx simulations. To the extent that the changes in concentrations are the result of small changes in emissions, EPA disagrees with commenters assertions that these relationships are highly nonlinear. The nonlinearities are evident over tens of ppb of ozone changes with tens of percent changes in the overall emission inventories. For most states examined here, under the various control scenarios, most changes in the emission inventory are on the order of a few percent and most air quality changes are on the order of a fraction of a ppb. A significant portion of the nonlinearity is accounted for by using the calibration factor and having the air quality estimates occur at levels of emissions around the base case and the illustrative control case (which were both modeled in CAMx). In the EPA's air quality estimates using the calibrated AQAT, to the extent that uncertainties and non-linearities are present, they are more-likely to be the result of assuming uniform percent changes in statewide emissions, rather than changes in emissions at particular sources.

[25] *See* the Ozone Transport Policy Analysis TSD, EPA-HQ-OAR-2015-0500-0186 and the Ozone AQAT ,EPA-HQ-OAR-2015-0500-0069, both from the prosed rule, for the values and a description of the calibration factors from proposal.

"uncalibrated" ozone AQAT, while it may only decrease by 10% decrease in "calibrated" AQAT (where the calibration factor is 0.5).

The creation of the calibration factors is described in detail in section D.2.c (1).

In summary, because the tool is only being used over a fairly narrow emissions range (for which a calibration factor has been developed), and because other options such as using CAMx to model all scenarios is cost and time-prohibitive, EPA used ozone AQAT to estimate the downwind ozone reductions due to upwind NO_X emission reductions for the air quality input to the multi-factor test for this rule. Other options, such as directly scaling the results (i.e., an "uncalibrated ozone AQAT") will likely greatly overestimate the air quality impacts of emission reductions. The successful comparison of the AQAT estimates with the CAMx results for the $1,400/ton final illustrative control scenario demonstrates that, for the purposes here, the AQAT can sufficiently estimate the air quality impacts of relatively small emission changes.

Section D.2, below, is a technical explanation of the construction of the ozone AQAT. Readers who prefer to access the results of the analysis using the ozone AQAT are directed to section D.3.

2. Details on the construction of the ozone AQAT

(a) Overview of the ozone AQAT

This section describes the step-by-step development process for the ozone AQAT. All of the input and output data can be found in the Excel worksheets described in Appendix B. In the ozone AQAT, EPA links state-by-state NO_X emission reductions (derived from the IPM EGU modeling) with CAMx modeled ozone contributions in order to predict ozone concentrations at different levels of emission budgets at monitoring sites. The reduction in ozone contributions at each level of emissions budgets and the resulting air quality improvement at monitoring sites with projected nonattainment and/or maintenance problems in the 2017 base case were then considered in a multi-factor test for identifying the level of emissions reductions that define significant contribution to nonattainment and interference with maintenance.

In applying AQAT to analyze air quality improvements at a given receptor, emissions were reduced in only those upwind states that were "linked" to that receptor in step 2 of the CSAPR framework (i.e., those states that contributed an air quality impact at or above the 1 percent of the NAAQS). Emissions were also reduced in the state that contained that receptor (regardless of the level of that state's contribution) at a level of control stringency consistent with the budget level applied in upwind states.

Specifically, the key estimates from the ozone AQAT for each receptor are:

- The ozone contribution as a function of emissions at each budget level, for each upwind state that is contributing above the 1 percent air quality threshold and the state containing the receptor.
- The ozone contribution under base case NO_X emissions (i.e., the adjusted historic IPM 5.15 base case, or $0 per ton emission budget), for each upwind state that is not above the 1 percent air quality threshold for that receptor.

- The non-anthropogenic (i.e., background, boundary, biogenic, and wildfire) ozone concentrations. These are assumed to be constant and equal to the contributions from the 2017 final base case source apportionment modeling.

The results of the ozone AQAT analysis for each emission budget level can be found in section D.3 of this document.

(b) Data used to construct the ozone AQAT for this rule

Several air quality modeling and emissions inventory sources were used to construct the calibrated ozone AQAT for this rule. Several data sources from proposal provide the necessary information to construct the calibration factors.[26] Using the calibration factors, EPA modulated the final 2017 CAMx ozone season contributions for each upwind state to each downwind receptor. For each scenario, EPA multiplied each state's percent change in emissions at each emission budget level relative to the 2017 base case ozone season NO_X emission inventories from all source sectors used in the source apportionment CAMx air quality modeling (this includes all anthropogenic sources and excludes biogenic sources and wildfires) by the receptor-specific calibration factor and the state's base case contribution. Note that the change in emissions for each emission budget level is compared with the IPM emission estimates from the base case that was modeled in CAMx. The base case emission inventories for the 2017 base case and the CAMx 2017 base case source apportionment air quality modeling results are discussed in the Air Quality Modeling Technical Support Document for the Final Cross-State Air Pollution Rule Update. The ozone season NO_X EGU emissions for each emission budget level including the base case as modeled in AQAT, are listed in Table D-3 and described in section C of this TSD.

As described in the Air Quality Modeling Technical Support Document for the Final Cross-State Air Pollution Rule Update and the preamble at section V, the air quality contributions and emissions were modeled for all states in the contiguous United States and the District of Columbia. Thus, in the ozone AQAT, any emission differences between the air quality modeling base case and the base case emissions budget scenario or the emission budget cost levels (for linked states) would result in changes in air quality contributions and ozone concentrations at the downwind monitors.[27]

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[26]EPA used the proposal calibration factors, rather than calibration factors based on the final modeling because we found them to have more-representative emission reductions throughout the 22 state geography. The final budget control scenario has smaller emission reductions compared with the proposal budget control scenarios. In addition, for the final modeling, the geographic distribution of emissions changed between the air quality modeling base and $1,400/ton illustrative control cases, leading to calibration factors that seemed to be unusually large or small. The datasets required to construct the calibration factors were: the proposed 2017 base case ozone-season NO_X emission inventories from all source sectors used in the source apportionment CAMx air quality modeling (this includes all anthropogenic sources and excludes biogenic sources and wildfires); the proposed CAMx 2017 ozone-season contributions for each upwind state to each downwind receptor; and the proposed 2017 illustrative control case ozone-season NO_X emissions inventories from all source sectors. An additional dataset, the proposed 2017 ozone concentrations from CAMx for the illustrative control case, was used to compare the ozone AQAT-estimated ozone concentrations for this scenario to the corresponding air quality modeling results, and develop calibration factors to align the response of ozone to changes in NO_X emissions in the ozone AQAT with the response predicted by CAMx. See the Ozone AQAT ,EPA-HQ-OAR-2015-0500-0069 from the proposed rule for the data and results.

[27] Because the illustrative control case does not include emission changes in some upwind states (e.g., states in the western portion of the domain), calibration factors developed for monitors in these states, and any resulting changes in air quality projected by AQAT, may not be representative.

(c) Detailed outline of the process for constructing and utilizing the ozone AQAT

The ozone AQAT was created and used in a multi-step process. First, using the data sets and the AQAT from the proposed CSAPR Update, calibration factors were created. Next, a calibrated ozone AQAT was created using the contributions and emission inventory from the 2017 base case air quality modeling for the final rule. For each emissions budget scenario evaluated, for each state, EPA identified the percent change in anthropogenic NO_X emissions relative to the 2017 base case and multiplied this by the receptor-specific calibration factor as well as by the state- and receptor-specific contribution. This resulted in a state- and receptor-specific "change in contribution" relative to the 2017 base case. Each state's change in contribution value was then added to its 2017 base case contribution and the results summed for all states for each receptor. To this total of each state's contribution to each receptor, the receptor-specific base case contributions from the other source-categories was added, resulting in an estimated design value for each receptor.[28] The calibrated ozone AQAT was used to project the ozone concentrations for each NO_X emission budget level on a receptor-by-receptor basis for every monitor throughout the domain.

In order to facilitate understanding of the calibration process, EPA describes below a demonstrative example used at proposal: monitor number 240251001 in Harford County, Maryland, with a 2017 base case projected ozone average design value of 81.3 ppb and maximum design value of 84.0 ppb, at proposal.

(1) Create the calibration factors

The process for creating the calibration factors remains unchanged from the proposal. Furthermore, EPA used those data sets and retained the same calibration factors used at proposal (i.e., in the remainder of this subsection D.2.c.(1), we refer to data sets from the proposal). To create the calibration factors, EPA used emissions and contributions from proposal to estimate the change in predicted ozone due to NO_X emission reductions under the proposed illustrative control case relative to the proposed 2017 base case.

First, EPA calculated ozone season state-level 2017 base case total NO_X emissions from all source sectors from the proposal. These emissions estimates were used for the proposed rule's CAMx 2017 source apportionment modeling. This emissions data is divided into multiple source sectors for the purposes of air quality modeling: power sector point, non-power sector point, non-point, onroad, nonroad, C3 marine, alm, and fires (see the Emissions Inventory TSD from the proposed rule for additional details on the emissions inventories used in the CAMx air quality modeling).[29] The state-level total NO_X emissions are the sum of emissions from all these source sectors. Next, EPA calculated the ozone season 2017 total NO_X emissions across all source sectors for the illustrative control case. EPA calculated the ratio of the emissions for the illustrative control case to the total emissions for the base case for each state modeled in CAMx. More information on the emissions inventories can be found in the preamble to the proposed rule and in the August 4, 2015 Notice of Data

[28] Details on procedures for calculating average and maximum design values can be found in the Air Quality Modeling Technical Support Document for the Final Cross-State Air Pollution Rule Update.

[29] "Technical Support Document (TSD) Preparation of Emissions Inventories for the Version 6.2, 2011 Emissions Modeling Platform", available at www.epa.gov/ttn/chief/emch/2011v6/2011v6_2_2017_2025_EmisMod_TSD_aug2015.pdf

Availability, or NODA.[6] The total emissions data and resulting ratios from the proposal can be found in Table D-1.

For each monitor, the "uncalibrated" change in concentration from proposal was found by multiplying the 2017 base case ozone contribution by the difference in the ratio of emissions. The difference in the ratio of emissions was calculated as the difference in total ozone season NO_X emissions between the illustrative control case and the 2017 base case scenario divided by the 2017 base case emission. Thus, when the illustrative control case had smaller emissions than the base case, the net result was a negative number. The change in concentrations summed across all states was the total "uncalibrated" change in concentration.

Table D-1. From the Proposed Rule, the 2017 Base Case and 2017 Illustrative Control Case Ozone Contributions (ppb) for Monitor Number 240251001 in Harford County, Maryland, as well as Total NO_X Emissions from all Source-Sectors (tons) for Each State.

State/Source	2017 Base Case Ozone Contributions	2017 Base Case NO_X Emissions	2017 Illustrative Control Case NO_X Emissions	Ratio of Illustrative Control Case Emissions to Base Case Emissions	Difference between the Illustrative Control Case Emissions and Base Case Emissions as a Fraction of Base Case Emissions	Estimated 2017 Contribution of Ozone (Uncalibrated Ozone AQAT)
AL	0.4053	88,805	85,721	0.97	-0.03	-0.01
AZ	0.0958	71,906	71,906	1.00	0.00	0.00
AR	0.2264	69,737	69,039	0.99	-0.01	0.00
CA	0.1106	236,322	236,322	1.00	0.00	0.00
CO	0.1942	90,756	90,756	1.00	0.00	0.00
CT	0.011	17,672	17,672	1.00	0.00	0.00
DE	0.1559	7,786	7,786	1.00	0.00	0.00
DC	0.7334	2,252	2,252	1.00	0.00	0.00
FL	0.1141	177,514	177,513	1.00	0.00	0.00
GA	0.3035	103,536	103,526	1.00	0.00	0.00
ID	0.0349	27,893	27,893	1.00	0.00	0.00
IL	0.672	148,178	147,770	1.00	0.00	0.00
IN	1.8904	139,133	127,487	0.92	-0.08	-0.16
IA	0.1933	70,467	70,045	0.99	-0.01	0.00
KS	0.285	79,939	79,513	0.99	-0.01	0.00
KY	1.973	106,830	97,311	0.91	-0.09	-0.18
LA	0.2597	173,330	172,886	1.00	0.00	0.00
ME	0.0005	17,576	17,576	1.00	0.00	0.00
MD	24.619	46,029	45,312	0.98	-0.02	-0.38
MA	0.0037	35,369	35,369	1.00	0.00	0.00
MI	0.8339	131,486	124,374	0.95	-0.05	-0.05
MN	0.1142	89,328	89,332	1.00	0.00	0.00
MS	0.1596	54,832	54,706	1.00	0.00	0.00
MO	0.5299	101,035	99,736	0.99	-0.01	-0.01
MT	0.0688	38,504	38,504	1.00	0.00	0.00
NE	0.1569	70,005	70,005	1.00	0.00	0.00
NV	0.0279	28,192	28,192	1.00	0.00	0.00
NH	0.0009	8,932	8,932	1.00	0.00	0.00
NJ	0.4374	52,743	52,031	0.99	-0.01	-0.01
NM	0.1688	65,263	65,263	1.00	0.00	0.00
NY	0.4009	109,910	107,416	0.98	-0.02	-0.01
NC	0.4684	98,064	91,850	0.94	-0.06	-0.03
ND	0.0848	74,118	74,118	1.00	0.00	0.00
OH	4.0022	160,110	150,516	0.94	-0.06	-0.24
OK	0.4683	131,763	129,215	0.98	-0.02	-0.01
OR	0.0232	40,507	40,507	1.00	0.00	0.00
PA	6.0769	174,664	147,166	0.84	-0.16	-0.96
RI	0.0006	5,845	5,844	1.00	0.00	0.00
SC	0.1097	55,897	55,846	1.00	0.00	0.00
SD	0.0587	22,192	22,192	1.00	0.00	0.00
TN	0.7044	85,759	85,693	1.00	0.00	0.00
TX	1.0563	467,245	465,179	1.00	0.00	0.00
UT	0.0942	66,486	66,486	1.00	0.00	0.00
VT	0.0015	5,473	5,473	1.00	0.00	0.00
VA	5.3016	87,754	87,514	1.00	0.00	-0.01
WA	0.0327	75,833	75,833	1.00	0.00	0.00
WV	2.9988	64,839	53,954	0.83	-0.17	-0.50
WI	0.2178	75,047	75,035	1.00	0.00	0.00
WY	0.2063	68,864	68,864	1.00	0.00	0.00
TRIBAL	0.0436	26,717	26,717	1.00	0.00	0.00
CNMX	0.7368			1.00	0.00	0.00
OFFSHORE	0.4494			1.00	0.00	0.00
FIRE	0.3074			1.00	0.00	0.00
ICBC	16.652			1.00	0.00	0.00
BIOG	6.0915			1.00	0.00	0.00

Next, the estimate of the monitor specific ozone responses under the illustrative control case was used to calibrate the ozone AQAT to CAMx and to derive the calibration factor. First, the changes in ozone predicted by the ozone AQAT and CAMx for the average design values were calculated for each monitor for the illustrative control case relative to the 2017 base case concentrations. The change in ozone predicted by CAMx was then divided by the change in ozone predicted by the uncalibrated AQAT, resulting in a monitor-specific calibration factor (see Table D-2 for an example calculation). The calculation of these monitor-specific calibration factors provided EPA with the ability to align the ozone response predicted by the ozone AQAT to the ozone response predicted by CAMx at a level of NO_X reductions that EPA expected to be close to the range of all emission reductions examined by EPA for the final rule.

The ozone AQAT and CAMx concentration differences from proposal can be found in the "ozone_AQAT.xlsx" excel workbook on worksheet "2017 contributions uncalibrated" in columns BN and BO, respectively.[25] The resulting calibration factor from the proposal can be found in column BP of the aforementioned excel worksheet.

Following the completion of the AQAT analysis and modeling of the $1,400/ton level of the budget control scenario in CAMx, EPA was able to calculate updated calibration factors using the differences in concentrations and emissions between the base case and budget control cases. EPA examined all of the AQAT estimates for receptors using the final calibration factors and did not observe differences that would have resulted in substantive changes in the application of the multi-factor test (i.e., the status of receptors remained unchanged, either attainment, nonattainment, or maintenance at each emission budget level).

A comparison of the calibrations is shown in Figure 1, for the receptors in the rule (left panel) and overall, for all receptors in the eastern US (right panel). During the course of this analysis, EPA noticed, for some monitors (generally ones that were not nonattainment and/or maintenance receptors in the base case and often were located in the western US) that the final calibration factors led to nonintuitive results. In part, this may be a result of changes in the EGU emission estimates between the initial base case CAMx modeling and the final budget scenarios (particularly for states that are not in the geography of the final rule). Consequently, EPA elected to continue its use of the calibration factors from the proposal.[26] Using the calibration factors from the proposal in the creation of the final calibrated AQAT also enabled EPA to evaluate the AQAT estimates for the final rule by comparing them to the final air quality modeling of the illustrative budget control scenario since this air quality modeling was not used in the creation of AQAT (*see* section D.4 of this document for details of this comparison).

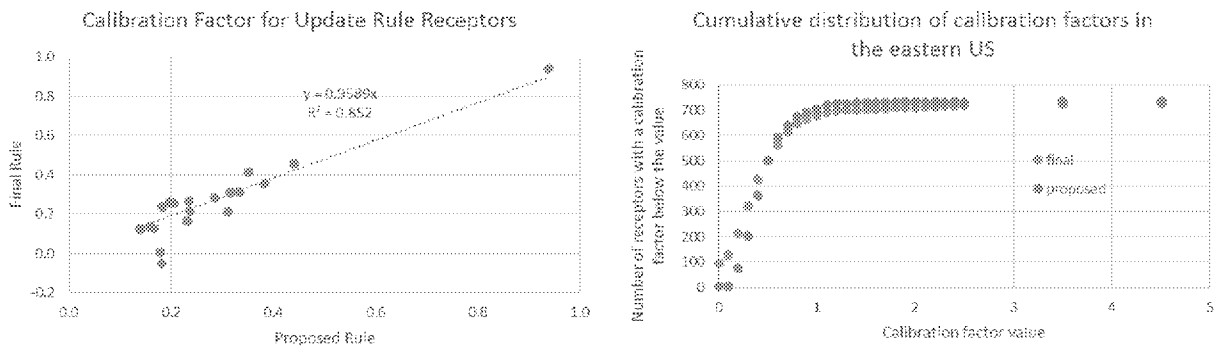

Figure 1. (left panel) A comparison of the calibration factors from the proposed and final rule. (left panel) A cumulative distribution, showing the number of monitors that have calibration factors below a particular value.

Table D-2. From the Proposal, Ozone Contributions in the 2017 Base Case and 2017 Illustrative Control Case Calibration Scenario from CAMx and Uncalibrated Ozone AQAT for Monitor Number 240251001 in Harford County, Maryland (See Table D-1). These Values are then Used to Create a Calibration Factor.

	2017 Base Case Ozone Concentration (ppb)	Estimated 2017 Illustrative Control Case Calibration Scenario Ozone Concentration (ppb)	Estimated Change in Concentration
CAMx	81.369	80.469	-0.900
Ozone AQAT	81.369	78.803	-2.566
Calibration Factor – Change in Concentration from CAMx Divided by Change in Concentration from the Ozone AQAT			0.3508

(2) Create a calibrated version of the ozone AQAT for emission budget analysis for the final rule

Next, EPA used 2017 base case emissions and 2017 base case air quality ozone contributions from the final rule air quality modeling along with the calibration factors from the proposal to create a "calibrated" AQAT for the final rule. EPA examined the changes in the final rule contributions from changes in emissions relative to the final rule base case emissions (while using the calibration factor). This calibrated AQAT was then used to estimate the change in predicted ozone due to NO_X emission reductions under each emission budget level evaluated.

First, as described above in section C of this TSD, EPA identified various levels of emissions budgets based on projected changes in emissions rates and adjusted historic data. For each state, the EGU emissions examined in AQAT are presented in Table D-3 (some additional columns as well as some minor differences in emissions can be found compared with the budgets in Tables C.1 and C.2). In all emission budget simulations, the contributions for all states were adjusted to the adjusted historic level or to an emission budget level using IPM.[30] For this assessment, because the emissions from all other sectors are constant, the EPA focused only on the differences in EGU emissions between each cost threshold[31] and the 2017 base case used in the modeling (see Table D-4 for the emission differences).[32] Finally, for each emission budget level, EPA calculated the ratio of the emission differences to the total NO_X emissions for the 2017 base case used in the air quality modeling for each state modeled in CAMx (see Table D-5).[33]

[30] For Pennsylvania, this included an adjustment to reflect the estimated impact of the PA RACT Rule, as described in the Memo to the Docket "The Pennsylvania Additional RACT Requirements for Major Sources of NO_X and VOCs."

[31] For Pennsylvania, the EPA used cost thresholds adjusted to reflect the PA RACT.

[32] We note that the total ozone-season NO_X emissions from the IPM outputs used in the assessment tool air quality analysis and the EGU emissions used in the CAMx air quality modeling were slightly different (i.e., some EGU emissions are apportioned to different sectors in the emission inventory used in CAMx). However, within ozone AQAT, because the difference in emissions were consistently calculated using IPM's "all fossil >25 MW", the resulting air quality estimates are not affected.

[33] The total emissions from all anthropogenic sources (excluding Biogenics and Fires), coinciding with the emissions that were "tagged" in the source-apportionment modeling.

For each emission budget level analyzed, on a receptor-by-receptor basis, the emissions change for each upwind state is associated with one of two emission budget levels (either the adjusted historic base case emission level or the particular threshold cost level) depending on whether the upwind state is "linked" to that receptor or if the receptor is located within the state. States that are contributing above the air quality threshold (i.e., greater than or equal to 1 percent of the NAAQS) to the monitor, as well as the state containing the monitor, make NO_X emission reductions available at the particular emission budget level. The emissions for all other states are adjusted to the adjusted historic base case level.

For the $1,400/ton final illustrative control alternative for the RIA, all states were adjusted to the emission levels in the illustrative control case, regardless of whether the state was "linked." These scenarios examine the emission results when budgets have been applied to the geography. This scenario was modeled in CAMx allowing a comparison with the AQAT estimates.

For each monitor, the predicted 2017 change in contribution of ozone from each state is calculated by multiplying the state-specific 2017 base case ozone contributions from the final air quality modeling by the calibration factor as well as by the ratio of the change in emissions (Table D-5, for either the emission budget level or the adjusted historic base case emission budget level adjusted for PA RACT depending on whether the state is linked, to the total 2017 base case emissions for all sectors used in the air quality modeling (*see* Table D-4 for the emission differences)).[34] This calibrated change in ozone is then added to the ozone contribution from the 2017 base case final air quality modeling. The result is the state and receptor specific "calibrated" total ozone contribution after implementation of the emission budgets at a particular level of control.

For each monitor, these state-level "calibrated" contributions are then summed to estimate total ozone contribution from the states to a particular receptor in the CAMx modeling domain. Finally, "other" modeled ozone contributions ("TRIBAL", "CNMX", "OFFSHORE", "FIRE", "ICBC", and "BIOG") are added from the 2017 base case final air quality modeling to the state contributions to account for other sources of ozone affecting the modeling domain. The total ozone from all the states and "other" contributions equals the average design values estimated in the assessment tool. The maximum design values were estimated by multiplying the estimated average design values by the ratio of the modeled 2017 base case maximum to average design values.

Generally, as the emission budget stringency increased, the estimated average and maximum design values at each receptor decreased. In the assessment tool, the estimated value of the average design value was used to estimate whether the location will be out of attainment, while the estimated maximum design value was used to estimate whether the location will have problems maintaining the NAAQS. The area was noted as having a nonattainment or maintenance issue if either estimated air quality level was greater than or equal to 76 ppb.

[34] The change in concentration can be positive or negative, depending on whether the state's emissions are larger or smaller than the 2017 air quality modeling base case emission level.

Table D-3. 2017 Ozone Season EGU NOx Emissions (Tons) for Each State at Various Emission Budget Levels (Tons) as Modeled in AQAT.

	Air Quality Modeling Base Case	Final Base Case $0/ton Emission Budgets	Final Base Case $0/ton Emission Budgets with PA RACT	Final $800/ton Emission Budgets	Final $1400/ton Emission Budgets	Final $3400/ton Emission Budgets	Final $5000/ton Emission Budgets	Final $6400/ton Emission Budgets	Final $1,400/ton Illustrative Scenario AQ Model
Alabama	10,902	15,179	15,179	14,332	13,211	12,620	11,928	11,573	8,521
Arkansas	9,890	12,560	12,560	12,048	9,210	9,048	8,518	8,050	6,862
Arizona	8,328	10,710	10,710	10,680	9,810	9,788	9,710	9,486	7,766
California	1,624	1,905	1,928	1,905	1,905	1,905	1,810	1,810	1,626
Colorado	13,426	14,010	14,010	14,008	13,994	13,645	13,495	12,950	13,434
Connecticut	387	605	605	584	558	558	554	554	386
Delaware	155	497	497	497	497	494	494	494	155
Florida	24,617	22,779	22,779	21,611	17,123	16,631	16,481	16,375	24,374
Georgia	11,120	8,762	8,762	8,495	8,481	8,525	8,532	7,764	8,840
Iowa	11,127	11,478	11,478	11,477	11,272	11,065	10,891	10,491	10,729
Idaho	15	152	152	152	152	152	152	152	16
Illinois	13,252	14,850	14,850	14,682	14,601	14,515	14,248	14,054	14,130
Indiana	40,223	31,382	31,382	28,960	23,303	21,634	19,990	18,720	26,047
Kansas	11,257	8,031	8,031	8,030	8,027	7,975	7,962	7,767	9,416
Kentucky	27,500	26,318	26,318	24,052	21,115	21,007	20,273	19,496	18,535
Louisiana	9,824	19,101	19,101	19,096	18,639	18,452	18,442	18,426	9,877
Massachusetts	939	1,119	1,119	1,119	1,112	1,098	1,071	1,072	961
Maryland	3,218	3,871	3,871	3,870	3,828	3,308	2,938	2,926	3,509
Maine	188	109	109	109	109	109	109	109	188
Michigan	21,415	19,811	19,811	19,558	17,023	15,782	13,110	12,612	17,524
Minnesota	9,710	7,068	7,068	7,068	6,864	6,761	6,651	6,451	8,596
Missouri	15,836	18,443	18,443	17,250	15,780	15,299	14,673	14,555	18,125
Mississippi	7,793	6,438	6,438	6,438	6,315	6,243	6,203	6,205	7,498
Montana	7,151	6,540	6,540	6,540	6,540	6,535	6,535	6,535	7,212
North Carolina	19,713	17,419	17,419	14,424	14,326	13,189	12,460	12,207	19,469
North Dakota	14,392	18,738	18,738	18,398	18,016	17,655	17,497	17,435	11,557
Nebraska	12,196	9,737	9,737	9,678	8,970	7,197	6,467	6,448	12,195
New Hampshire	140	416	416	416	416	416	415	415	140
New Jersey	1,776	2,114	2,114	2,100	2,062	2,008	1,867	1,879	1,731
New Mexico	5,626	9,443	9,443	9,443	8,834	8,633	8,367	8,219	5,735
Nevada	3,597	2,405	2,405	2,301	2,241	2,112	1,559	886	3,339
New York	4,275	5,531	5,531	5,220	5,135	5,006	4,746	4,594	3,783
Ohio	27,038	27,382	27,384	23,659	19,522	19,165	18,561	18,348	18,434
Oklahoma	16,718	13,747	13,747	13,746	11,641	9,174	8,790	8,439	14,642
Oregon	-	---	0	---	---	---	---	---	-
Pennsylvania	39,987	35,607	20,200	17,514	15,452	15,428	15,121	14,874	14,461
Rhode Island	180	283	283	283	283	283	283	283	180
South Carolina	5,839	5,486	5,486	5,288	5,288	5,293	5,300	5,318	5,824
South Dakota	537	853	853	853	853	853	853	853	537
Tennessee	6,944	7,779	7,779	7,736	7,736	7,735	7,724	7,729	7,129
Texas	56,331	54,839	54,839	54,521	52,301	50,011	48,795	47,994	54,345
Utah	21,618	16,949	16,949	16,949	14,149	13,592	11,356	11,324	21,616
Virginia	2,586	9,367	9,367	9,365	9,223	8,754	8,619	8,416	2,858
Vermont	0	52	52	52	52	52	52	52	0
Washington	136	3,085	3,085	3,085	3,085	3,085	3,085	3,085	136
Wisconsin	6,488	7,939	7,939	7,924	7,915	7,790	7,435	7,023	6,548
West Virginia	26,110	26,874	26,874	25,984	17,815	17,380	17,388	17,373	16,298
Wyoming	11,216	16,005	16,005	15,828	14,691	13,728	12,371	12,121	11,290

* EPA analyzed all segments of the PA RACT Rule. For the EGU sector, this was primarily a cap on emission rates at coal EGUs with SCRs (12,848 tons), but also included a number of less impactful provisions on EGU emission rates (59 tons). This results in 12,907 tons of reduction from EGU PA RACT. These EGU PA Ract reductions are only included in the PA estimates for the final base case $0/ton emission budgets with PA RACT and the final $800/ton emissions budgets cases. A separate 2,500 tons of reductions from non-EGU PA RACT is included in the PA estimates for all cases except the air quality modeling base case, the final base case, and the final $1,400/ton illustrative scenario AQ model.

Table D-4. 2017 Ozone Season EGU NO_X Emission Differences (Thousand Tons) for Each State Relative to the Air Quality Modeling Base Case Emission Level as Modeled in AQAT.

	Total Antro-pogenic NO_X	Final Base Case	Final Base Case $0/ton Emission Budgets	Final Base Case $0/ton Emission Budgets with PA RACT	Final $800/ton Emission Budgets	Final $1400/ton Emission Budgets	Final $3400/ton Emission Budgets	Final $5000/ton Emission Budgets	Final $6400/ton Emission Budgets	Final $1,400/ton Illustrative Scenario AQ Model
Alabama	88.3	-0.5	4.3	4.3	3.4	2.3	1.7	1.0	0.7	-2.4
Arizona	67.3	-2.4	2.4	2.4	2.4	1.5	1.5	1.4	1.2	-0.6
Arkansas	68.1	0.0	2.7	2.7	2.2	-0.7	-0.8	-1.4	-1.8	-3.0
California	210.4	0.0	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.0
Colorado	89.3	0.0	0.6	0.6	0.6	0.6	0.2	0.1	-0.5	0.0
Connecticut	17.5	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.0
Delaware	7.7	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.0
District of Columbia	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Florida	173.9	-0.2	-1.8	-1.8	-3.0	-7.5	-8.0	-8.1	-8.2	-0.2
Georgia	105.2	-2.3	-2.4	-2.4	-2.6	-2.6	-2.6	-2.6	-3.4	-2.3
Idaho	28.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
Illinois	146.0	1.3	1.6	1.6	1.4	1.3	1.3	1.0	0.8	0.9
Indiana	136.8	2.0	-8.8	-8.8	-11.3	-16.9	-18.6	-20.2	-21.5	-14.2
Iowa	73.4	-0.2	0.4	0.4	0.3	0.1	-0.1	-0.2	-0.6	-0.4
Kansas	109.0	-0.4	-3.2	-3.2	-3.2	-3.2	-3.3	-3.3	-3.5	-1.8
Kentucky	95.9	-4.2	-1.2	-1.2	-3.4	-6.4	-6.5	-7.2	-8.0	-9.0
Louisiana	168.9	0.2	9.3	9.3	9.3	8.8	8.6	8.6	8.6	0.1
Maine	17.8	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	0.0
Maryland	44.7	0.4	0.7	0.7	0.7	0.6	0.1	-0.3	-0.3	0.3
Massachusetts	35.4	0.0	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.0
Michigan	121.9	-0.9	-1.6	-1.6	-1.9	-4.4	-5.6	-8.3	-8.8	-3.9
Minnesota	89.5	-1.1	-2.6	-2.6	-2.6	-2.8	-2.9	-3.1	-3.3	-1.1
Mississippi	54.4	-0.2	-1.4	-1.4	-1.4	-1.5	-1.6	-1.6	-1.6	-0.3
Missouri	100.9	4.8	2.6	2.6	1.4	-0.1	-0.5	-1.2	-1.3	2.3
Montana	37.4	0.0	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	-0.6	0.1
Nebraska	68.2	0.0	-2.5	-2.5	-2.5	-3.2	-5.0	-5.7	-5.7	0.0
Nevada	27.9	-0.2	-1.2	-1.2	-1.3	-1.4	-1.5	-2.0	-2.7	-0.3
New Hampshire	8.9	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.0
New Jersey	49.8	0.0	0.3	0.3	0.3	0.3	0.2	0.1	0.1	0.0
New Mexico	66.2	0.0	3.8	3.8	3.8	3.2	3.0	2.7	2.6	0.1
New York	106.3	-0.1	1.3	1.3	0.9	0.9	0.7	0.5	0.3	-0.5
North Carolina	97.0	0.7	-2.3	-2.3	-5.3	-5.4	-6.5	-7.3	-7.5	-0.2
North Dakota	65.8	-2.8	4.3	4.3	4.0	3.6	3.3	3.1	3.0	-2.8
Ohio	148.7	3.1	0.3	0.3	-3.4	-7.5	-7.9	-8.5	-8.7	-8.6
Oklahoma	124.7	-0.2	-3.0	-3.0	-3.0	-5.1	-7.5	-7.9	-8.3	-2.1
Oregon	40.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pennsylvania	165.2	-5.0	-4.4	-19.8	-22.5	-24.5	-24.6	-24.9	-25.1	-25.5
Rhode Island	5.9	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
South Carolina	56.4	-0.1	-0.4	-0.4	-0.6	-0.6	-0.5	-0.5	-0.5	0.0
South Dakota	22.3	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.0
Tennessee	87.5	0.4	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.2
Texas	435.5	-0.4	-1.5	-1.5	-1.8	-4.0	-6.3	-7.5	-8.3	-2.0
Utah	62.8	0.0	-4.7	-4.7	-4.7	-7.5	-8.0	-10.3	-10.3	0.0
Vermont	5.4	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
Virginia	81.6	0.2	6.8	6.8	6.8	6.6	6.2	6.0	5.8	0.3
Washington	76.1	0.0	2.9	2.9	2.9	2.9	2.9	2.9	2.9	0.0
West Virginia	65.9	0.3	0.8	0.8	-0.1	-8.3	-8.7	-8.7	-8.7	-9.8
Wisconsin	74.2	0.1	1.5	1.5	1.4	1.4	1.3	0.9	0.5	0.1
Wyoming	65.8	0.1	4.8	4.8	4.6	3.5	2.5	1.2	0.9	0.1

* EPA analyzed all segments of the PA RACT Rule. For the EGU sector, this was primarily a cap on emission rates at coal EGUs with SCRs (12,848 tons), but also included a number of less impactful provisions on EGU emission rates (59 tons). This results in 12,907 tons of reduction from EGU PA RACT. These EGU PA Ract reductions are only included in the PA estimates for the final base case $0/ton emission budgets with PA RACT and the final $800/ton emissions budgets cases. A separate 2,500 tons of reductions from non-EGU PA RACT is included in the PA estimates for all cases except the air quality modeling base case, the final base case, and the final $1,400/ton illustrative scenario AQ model.

Table D-5. 2017 Ozone Season EGU NOx Emission Fractions for Each State Relative to the Air Quality Modeling Base Case Emission Level as Modeled in AQAT.

	Final Base Case	Final Base Case $0/ton Emission Budgets	Final Base Case $0/ton Emission Budgets with PA RACT	Final $800/ton Emission Budgets	Final $1400/ton Emission Budgets	Final $3400/ton Emission Budgets	Final $5000/ton Emission Budgets	Final $6400/ton Emission Budgets	Final $1,400/ton Illustrative Scenario AQ Model
Alabama	-0.0056	0.0485	0.0485	0.0389	0.0262	0.0195	0.0116	0.0076	-0.0270
Arizona	-0.0351	0.0354	0.0354	0.0349	0.0220	0.0217	0.0205	0.0172	-0.0084
Arkansas	0.0000	0.0392	0.0392	0.0317	-0.0100	-0.0124	-0.0201	-0.0270	-0.0445
California	0.0000	0.0013	0.0014	0.0013	0.0013	0.0013	0.0009	0.0009	0.0000
Colorado	0.0001	0.0065	0.0065	0.0065	0.0064	0.0024	0.0008	-0.0053	0.0001
Connecticut	0.0000	0.0125	0.0125	0.0113	0.0098	0.0098	0.0096	0.0096	0.0000
Delaware	0.0000	0.0445	0.0445	0.0445	0.0445	0.0441	0.0441	0.0441	0.0000
District of Columbia	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Florida	-0.0013	-0.0106	-0.0106	-0.0173	-0.0431	-0.0459	-0.0468	-0.0474	-0.0014
Georgia	-0.0214	-0.0224	-0.0224	-0.0250	-0.0251	-0.0247	-0.0246	-0.0319	-0.0217
Idaho	0.0000	0.0049	0.0049	0.0049	0.0049	0.0049	0.0049	0.0049	0.0000
Illinois	0.0089	0.0109	0.0109	0.0098	0.0092	0.0087	0.0068	0.0055	0.0060
Indiana	0.0143	-0.0646	-0.0646	-0.0824	-0.1237	-0.1359	-0.1479	-0.1572	-0.1036
Iowa	-0.0025	0.0048	0.0048	0.0048	0.0020	-0.0008	-0.0032	-0.0087	-0.0054
Kansas	-0.0032	-0.0296	-0.0296	-0.0296	-0.0296	-0.0301	-0.0302	-0.0320	-0.0169
Kentucky	-0.0440	-0.0123	-0.0123	-0.0360	-0.0666	-0.0677	-0.0754	-0.0835	-0.0935
Louisiana	0.0011	0.0549	0.0549	0.0549	0.0522	0.0511	0.0510	0.0509	0.0003
Maine	0.0000	-0.0044	-0.0044	-0.0044	-0.0044	-0.0044	-0.0044	-0.0044	0.0000
Maryland	0.0081	0.0146	0.0146	0.0146	0.0136	0.0020	-0.0063	-0.0065	0.0065
Massachusetts	0.0005	0.0051	0.0051	0.0051	0.0049	0.0045	0.0037	0.0038	0.0006
Michigan	-0.0075	-0.0132	-0.0132	-0.0152	-0.0360	-0.0462	-0.0681	-0.0722	-0.0319
Minnesota	-0.0124	-0.0295	-0.0295	-0.0295	-0.0318	-0.0329	-0.0342	-0.0364	-0.0124
Mississippi	-0.0031	-0.0249	-0.0249	-0.0249	-0.0272	-0.0285	-0.0292	-0.0292	-0.0054
Missouri	0.0472	0.0258	0.0258	0.0140	-0.0006	-0.0053	-0.0115	-0.0127	0.0227
Montana	0.0006	-0.0164	-0.0164	-0.0164	-0.0164	-0.0165	-0.0165	-0.0165	0.0016
Nebraska	0.0000	-0.0361	-0.0361	-0.0369	-0.0473	-0.0733	-0.0840	-0.0843	0.0000
Nevada	-0.0072	-0.0428	-0.0428	-0.0465	-0.0487	-0.0533	-0.0732	-0.0973	-0.0092
New Hampshire	0.0000	0.0309	0.0309	0.0309	0.0309	0.0309	0.0308	0.0308	0.0000
New Jersey	-0.0001	0.0068	0.0068	0.0065	0.0057	0.0047	0.0018	0.0021	-0.0009
New Mexico	0.0004	0.0576	0.0576	0.0576	0.0484	0.0454	0.0414	0.0392	0.0016
New York	-0.0011	0.0118	0.0118	0.0089	0.0081	0.0069	0.0044	0.0030	-0.0046
North Carolina	0.0072	-0.0236	-0.0236	-0.0545	-0.0555	-0.0672	-0.0748	-0.0774	-0.0025
North Dakota	-0.0422	0.0660	0.0660	0.0609	0.0551	0.0496	0.0472	0.0462	-0.0431
Ohio	0.0210	0.0023	0.0023	-0.0227	-0.0505	-0.0529	-0.0570	-0.0584	-0.0579
Oklahoma	-0.0017	-0.0238	-0.0238	-0.0238	-0.0407	-0.0605	-0.0636	-0.0664	-0.0167
Oregon	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Pennsylvania	-0.0306	-0.0265	-0.1198	-0.1360	-0.1485	-0.1486	-0.1505	-0.1520	-0.1545
Rhode Island	0.0000	0.0174	0.0174	0.0174	0.0174	0.0174	0.0174	0.0174	0.0000
South Carolina	-0.0016	-0.0063	-0.0063	-0.0098	-0.0098	-0.0097	-0.0096	-0.0092	-0.0003
South Dakota	0.0000	0.0142	0.0142	0.0142	0.0142	0.0142	0.0142	0.0142	0.0000
Tennessee	0.0050	0.0095	0.0095	0.0091	0.0091	0.0090	0.0089	0.0090	0.0021
Texas	-0.0009	-0.0034	-0.0034	-0.0042	-0.0093	-0.0145	-0.0173	-0.0191	-0.0046
Utah	0.0000	-0.0744	-0.0744	-0.0744	-0.1190	-0.1279	-0.1635	-0.1640	0.0000
Vermont	0.0000	0.0096	0.0095	0.0096	0.0096	0.0096	0.0096	0.0096	0.0000
Virginia	0.0026	0.0831	0.0831	0.0831	0.0813	0.0756	0.0739	0.0715	0.0033
Washington	0.0000	0.0388	0.0388	0.0388	0.0388	0.0388	0.0388	0.0388	0.0000
West Virginia	0.0048	0.0116	0.0116	-0.0019	-0.1259	-0.1325	-0.1324	-0.1327	-0.1490
Wisconsin	0.0009	0.0195	0.0195	0.0193	0.0192	0.0175	0.0128	0.0072	0.0008
Wyoming	0.0009	0.0728	0.0728	0.0701	0.0528	0.0382	0.0176	0.0138	0.0011

* EPA analyzed all segments of the PA RACT Rule. For the EGU sector, this was primarily a cap on emission rates at coal EGUs with SCRs (12,848 tons), but also included a number of less impactful provisions on EGU emission rates (59 tons). This results in 12,907 tons of reduction from EGU PA RACT. These EGU PA Ract reductions are only included in the PA estimates for the final base case $0/ton emission budgets with PA RACT and the final $800/ton emissions budgets cases. A separate 2,500 tons of reductions from non-EGU PA RACT is included in the PA estimates for all cases except the air quality modeling base case, the final base case, and the final $1,400/ton illustrative scenario AQ model.

3. Description of the results of the analysis using the assessment tool for the approach.

EPA used the ozone AQAT to estimate improvements in downwind air quality at base case levels, then $800 per ton and, then, at higher emission budget levels . At each emission budget level, using AQAT, EPA examined whether the average and maximum design values for each of the receptors decreased to values below 76 ppb at which point their nonattainment and maintenance issues would be considered resolved. EPA also examined each states' air quality contributions at each emission budget level, assessing whether a state maintained at least one linkage to a receptor that was estimated to remain in nonattainment and/or maintenance. EPA examined emission budget levels of $0/ton, $0/ton including adjustments due to PA RACT, $800/ton, $1,400/ton, $3,400/ton, $5,000/ton, and $6,400/ton. PA RACT was included in all of the scenarios that were more stringent than the $0/ton including adjustments due to PA RACT scenario. The preamble explains at section VI.D how EPA considered the results of the air quality analyses described in this TSD to determine the appropriate set of emission budgets for reducing significant contribution to nonattainment and interference with maintenance.

The average and maximum design values (ppb) estimated using the assessment tool for each identified receptor for each emission budget level have been truncated to a tenth of a ppb and can be found in Tables D-6 and D-7, respectively. The monitors are in alphabetical order by state. Notably, no monitors are projected to have either their average or maximum design values drop below 76 ppb in the transition from the air quality modeling base case to the adjusted historic base cases (i.e., $0/ton emissions budget with or without PA RACT). At each of the NO_X emission budget levels examined, we found that only one additional monitor is projected to have resolved its average design value problems (i.e., nonattainment). We project that monitor 211110067 in Kentucky is resolved at the $1,400/ton threshold, meaning that we estimate its average design value will drop below 76 ppb.

Many monitors are projected to have maintenance issues at all emission budget levels. However, three monitors have their maintenance issues solved at various emission budget levels. At the $800/ton emission budget level, we estimate that the maintenance problems at monitor 421010024 in Pennsylvania to be resolved (when PA RACT is also considered). Delaware is solely linked to this receptor (*see* the discussion of Delaware in preamble section VI). At the $1,400/ton emission budget level, two additional monitors are projected to have their maintenance concerns resolved. These are monitors 211110067 in Kentucky and 390610006 in Ohio. Tennessee is uniquely linked to the latter receptor in Ohio following the resolution of its other linkage (monitor 421010024 in Pennsylvania) which is projected to occur at the less stringent $800/ton emission budget. *See* the discussion of Tennessee in preamble section VI for additional details.

We observe no additional change in receptor status between the $3,400/ton and $6,400/ton emission budget levels.

In the assessment of air quality using the calibrated assessment tool, we are able to estimate the change in the air quality contributions of each upwind state to each receptor (see the description of the state and receptor-specific contributions in section D.2.c.(2)) in order to determine whether any state's contribution is below the 1 percent threshold used in step 2 of the CSAPR framework to identify "linked" upwind states. For this over-control assessment, we compared each state's adjusted ozone concentration against the 1% air quality threshold at each of the emission budgets levels up to $6,400/ton at each remaining receptor, using AQAT (see the "links" worksheets in the AQAT

workbook, referred to in Appendix B). For Delaware at $800/ton and Tennessee at $1,400/ton, where their final monitors have all of their nonattainment and maintenance issues resolved, the reductions required by the emissions budgets would not reduce their contributions below the 1% threshold. For all other linked states, we did not see instances where a state's contributions dropped below 1% of the NAAQS for all of its linkages to downwind receptors. This is not a surprising result because, for a linkage to be resolved by emission reductions of just a few percent, the contribution would need to be within a few percent of the threshold. As a hypothetical example, if the state is making a 6% emission reduction in its overall anthropogenic ozone season NO_X emissions, and the calibration factor was 0.5, its base case maximum contribution to a remaining unresolved nonattainment and/or maintenance receptor would need to be just under 1.03% of the NAAQS or 0.77 ppb, to drop below the 0.75 ppb linkage threshold.

Lastly, once the budgets for the rule were established (based on the results of the multi-factor test) and IPM was used to model compliance with the rule, it was possible to estimate air quality concentrations at each downwind receptor using the ozone AQAT for the $1,400 final illustrative control air quality case. This scenario was directly modeled in CAMx. The average and maximum design value estimates from AQAT and CAMx can be found in Table D-8. The results are described in the following section (D.4). The design value results from AQAT (i.e., which receptors are estimated to have nonattainment and/or maintenance problems) for the final emissions budgets scenario are similar to that of the $1,400/ton emission budget level.

Table D-6. Average Ozone DVs (ppb) for NOx Emissions Budget Levels ($/ton) Assessed Using the Ozone AQAT for all Nineteen Nonattainment and Maintenance Receptors.

Monitor Identification Number	State	County	CAMx 2017 Base Case (ppb)	Assessment Tool Average Ozone Design Values (ppb).						
				Adjusted Historic Base Case	Adjusted Historic Base Case w/ PA RACT	$800	$1,400	$3,400	$5,000	$6,400
90010017	Connecticut	Fairfield	74.1	74.1	73.9	73.9	73.8	73.8	73.8	73.8
90013007	Connecticut	Fairfield	75.5	75.5	75.3	75.3	75.2	75.2	75.2	75.2
90019003	Connecticut	Fairfield	76.5	76.5	76.3	76.3	76.2	76.2	76.2	76.2
90099002	Connecticut	New Haven	76.2	76.2	76.1	76.1	76.0	76.0	76.0	76.0
211110067	Kentucky	Jefferson	76.9	76.4	76.4	76.0	75.4	75.3	75.1	75.0
240251001	Maryland	Harford	78.8	79.0	78.8	78.7	78.4	78.3	78.2	78.2
260050003	Michigan	Allegan	74.7	74.6	74.6	74.6	74.4	74.4	74.3	74.3
360850067	New York	Richmond	75.8	75.7	75.3	75.2	75.0	74.9	74.9	74.9
361030002	New York	Suffolk	76.8	76.8	76.6	76.6	76.5	76.5	76.5	76.5
390610006	Ohio	Hamilton	74.6	74.1	74.1	73.3	72.1	71.9	71.7	71.5
421010024	Pennsylvania	Philadelphia	73.6	73.4	72.7	72.5	72.2	72.1	72.1	72.0
480391004	Texas	Brazoria	79.9	79.9	79.9	79.9	79.8	79.7	79.7	79.7
481210034	Texas	Denton	75.0	74.9	74.9	74.9	74.9	74.8	74.8	74.8
482010024	Texas	Harris	75.4	75.4	75.4	75.3	75.3	75.3	75.3	75.3
482011034	Texas	Harris	75.7	75.7	75.7	75.7	75.6	75.6	75.6	75.5
482011039	Texas	Harris	76.9	76.9	76.9	76.9	76.8	76.8	76.8	76.7
484392003	Texas	Tarrant	77.3	77.2	77.2	77.2	77.2	77.1	77.1	77.0
484393009	Texas	Tarrant	76.4	76.3	76.3	76.3	76.3	76.2	76.2	76.2
551170006	Wisconsin	Sheboygan	76.2	76.2	76.2	76.1	76.1	76.0	76.0	76.0

Table D-7. Maximum Ozone DVs (ppb) for NOx Emissions Budget Levels ($/ton) Assessed Using the Ozone AQAT for all Nineteen Nonattainment and Maintenance Receptors.

Monitor Identification Number	State	County	CAMx 2017 Base Case (ppb)	Assessment Tool Maximum Ozone Design Values (ppb).						
				Adjusted Historic Base Case	Adjusted Historic Base Case w/ PA RACT	$800	$1,400	$3,400	$5,000	$6,400
90010017	Connecticut	Fairfield	76.6	76.6	76.4	76.4	76.3	76.3	76.3	76.3
90013007	Connecticut	Fairfield	79.7	79.7	79.5	79.5	79.4	79.4	79.4	79.3
90019003	Connecticut	Fairfield	79.5	79.5	79.3	79.3	79.2	79.2	79.2	79.2
90099002	Connecticut	New Haven	79.2	79.1	79.0	79.0	79.0	79.0	78.9	78.9
211110067	Kentucky	Jefferson	76.9	76.4	76.4	76.0	75.4	75.3	75.1	75.0
240251001	Maryland	Harford	81.4	81.6	81.4	81.3	81.0	80.9	80.8	80.8
260050003	Michigan	Allegan	77.7	77.6	77.6	77.5	77.4	77.3	77.3	77.2
360850067	New York	Richmond	77.4	77.3	76.9	76.7	76.5	76.5	76.5	76.4
361030002	New York	Suffolk	78.4	78.3	78.2	78.2	78.1	78.1	78.1	78.1
390610006	Ohio	Hamilton	77.4	76.8	76.8	76.0	74.7	74.6	74.3	74.1
421010024	Pennsylvania	Philadelphia	76.9	76.7	76.0	75.7	75.4	75.3	75.3	75.2
480391004	Texas	Brazoria	80.8	80.8	80.8	80.8	80.7	80.7	80.6	80.6
481210034	Texas	Denton	77.4	77.3	77.3	77.3	77.3	77.2	77.2	77.2
482010024	Texas	Harris	77.9	77.9	77.9	77.9	77.9	77.8	77.8	77.8
482011034	Texas	Harris	76.6	76.6	76.6	76.6	76.5	76.5	76.5	76.5
482011039	Texas	Harris	78.8	78.7	78.7	78.7	78.7	78.7	78.6	78.6
484392003	Texas	Tarrant	79.7	79.6	79.6	79.6	79.5	79.5	79.4	79.4
484393009	Texas	Tarrant	76.4	76.3	76.3	76.3	76.3	76.2	76.2	76.2
551170006	Wisconsin	Sheboygan	78.7	78.6	78.6	78.6	78.5	78.5	78.4	78.4

4. Comparison between the air quality assessment tool estimates and CAMx air quality modeling estimates.

As described earlier, because the AQAT was calibrated using data from the proposal, it was possible to evaluate the estimates from the tool with the independent model design value predictions from CAMx for the final modeling 2017 illustrative control scenario. The average and maximum design values from AQAT and CAMx, as well as the differences, are shown in Table D-8. The AQAT values and the differences in the table have been truncated to a tenth of a ppb.

Strong correlations are observed (nearly one to one) between the estimated average and maximum design values from AQAT and CAMx (Figure 2). The slopes of the least-squares linear regression lines are almost exactly equal to 1, and the regression coefficients are also nearly 1. The differences in estimates are also small, averaging less than 0.1 ppb and reaching a maximum of about 0.2 ppb for several receptors. These small differences suggest that each of the state contributions are being reasonably approximated. The results of this demonstrate that, considering the constraints faced by the EPA, the AQAT provides reasonable estimates of air quality concentrations for each receptor, can provide reasonable inputs for the multi-factor assessment, and can serve as a method to test for linkages dropping below the threshold.

Table D-8. Average and Maximum DVs (ppb) in the 2017 Budget Control Scenario as Modeled in CAMx and as Estimated in Calibrated AQAT, for Receptors with Maximum DVs Greater than or Equal to 76 ppb in the 2017 Base Case Modeled in CAMx.

Monitor Identification Numbe	State	County	2017 Budget Control Scenario					
			CAMx Avg. DV	CAMx Max. DV	AQAT Avg. DV	AQAT Max. DV	Difference, Avg. DV (CAMx-AQAT)	Difference, Max. DV (CAMx-AQAT)
90010017	Connecticut	Fairfield	73.7	76.2	73.7	76.1	0.0	0.1
90013007	Connecticut	Fairfield	75.0	79.2	75.1	79.3	-0.1	-0.1
90019003	Connecticut	Fairfield	76.0	79.0	76.1	79.1	-0.1	-0.1
90099002	Connecticut	New Haven	76.0	78.9	75.9	78.9	0.1	0.0
211110067	Kentucky	Jefferson	75.1	75.1	75.1	75.1	0.0	0.0
240251001	Maryland	Harford	78.0	80.6	78.1	80.8	-0.1	-0.2
260050003	Michigan	Allegan	74.4	77.4	74.4	77.4	0.0	0.0
360850067	New York	Richmond	74.8	76.4	74.8	76.3	0.0	0.1
361030002	New York	Suffolk	76.5	78.0	76.4	78.0	0.1	0.0
390610006	Ohio	Hamilton	71.7	74.3	71.7	74.3	0.0	0.0
421010024	Pennsylvania	Philadelphia	72.1	75.3	71.9	75.1	0.2	0.2
480391004	Texas	Brazoria	79.8	80.7	79.8	80.7	0.0	0.0
481210034	Texas	Denton	74.9	77.3	74.9	77.3	0.0	0.0
482010024	Texas	Harris	75.4	77.9	75.3	77.8	0.1	0.1
482011034	Texas	Harris	75.6	76.5	75.6	76.5	0.0	0.0
482011039	Texas	Harris	76.8	78.7	76.8	78.7	0.0	0.0
484392003	Texas	Tarrant	77.1	79.5	77.1	79.5	0.0	0.0
484393009	Texas	Tarrant	76.3	76.3	76.3	76.3	0.0	0.0
551170006	Wisconsin	Sheboygan	76.0	78.5	76.0	78.4	0.0	0.1

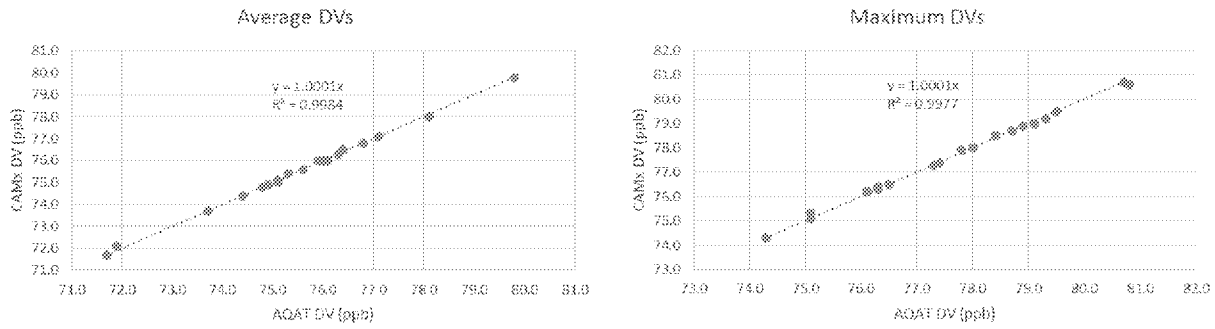

Figure 2. Least squares linear regression plots showing correlations between CAMx and calibrated AQAT for the 2017 illustrative budget control scenario base case for estimated average and maximum design values (ppb) in the left and right panels, respectively.

Sierra Club v. McCarthy
Case No. 3:15-cv-04328-JD (JSC)

Declaration of Janet G. McCabe
Attachment 3

Technical Support Document (TSD)

for the Cross-State Air Pollution Rule Update for the 2008 Ozone NAAQS

Docket ID No. EPA-HQ-OAR-2015-0500

EGU NO_X Mitigation Strategies Final Rule TSD

U.S. Environmental Protection Agency

Office of Air and Radiation

August 2016

Introduction:

The analysis presented in this document supports the EPA's Final Cross-State Air Pollution Rule Update for the 2008 Ozone National Ambient Air Quality Standards (CSAPR Update). In developing the CSAPR Update, the EPA considered all NO_X control strategies that are widely in use by EGUs, listed below. This Technical Support Document (TSD) discusses costs, emission reduction potential, and feasibility related to these EGU NO_X emission control strategies. Specifically, this TSD explores four topics: (1) the appropriate representative cost resulting from "widespread" implementation of a particular NO_X emission control technology; (2) the NO_X emission rates commonly achievable by "fully operating" emission control equipment; and (3) the time required to implement these EGU NO_X control strategies (e.g., installing and/or restoring an emission control system to full operation or shifting generation to reduce NO_X emissions). These analyses inform the EPA's evaluation of costs and emission reductions with the Integrated Planning Model (IPM) v 5.15 and compliance feasibility for the CSAPR Update.

NO_X control strategies that are widely in use by EGUs include:

- Returning to full operation existing SCRs that have operated at fractional design capability;
- Restarting inactive SCRs and returning them to full operation;
- Restarting inactive SNCRs;
- Replacing outdated combustion controls with newer advanced technology (e.g., state-of-the-art low NO_X burners);
- Installing new SCR systems;
- Installing new SNCR systems; and
- Shifting generations (i.e., changing dispatch) from high- to low-emitting or zero-emitting units.

To evaluate the cost for these EGU NO_X reduction strategies, the agency used the capital expenses, fixed and variable operation and maintenance costs for installing and fully operating emission controls researched by Sargent & Lundy, a nationally recognized architect/engineering firm (A/E firm) familiar with the EGU sector.[1] EPA also used the Integrated Planning Model (IPM) to analyze power sector response while accounting for electricity market dynamics such as generation shifting.

Cost Estimate for Fully Operating Existing SCR that Already Operate to Some Extent

EPA sought to examine costs for full operation of SCR. SCR are post-combustion controls that reduce NO_x emissions by reacting the NO_X with either ammonia or urea. The SCR technology utilizes a catalyst and produces high conversion of NO_X. Fully operating an SCR includes maintenance costs, labor, auxiliary power, catalyst (if utilized), and reagent cost. The chemical reagent (typically ammonia or urea) is a significant portion of the operating cost of these controls.

EPA received comment on the costs to fully operate a SCR that was already being operated to some extent. At proposal, EPA stated that the cost could be apportioned to adding additional reagent at a cost of about $500/ton of NO_X removed. Commenters recommended that EPA include additional variable costs to the proposed cost of $500 per ton, including the costs of catalyst in addition to the cost of reagent. In response, EPA examined three of the variable operations and maintenance (VOM) costs: reagent, catalyst, and auxiliary power. Depending on circumstances, SCR operators may operate the system while

[1] See: Attachment 5-3: SCR Cost Methodology (PDF) and Attachment 5-4: SNCR Cost Methodology (PDF) available at https://www.epa.gov/airmarkets/documentation-base-case-v513-emission-control-technologies

achieving less than "full" removal efficiency by using less reagent (as EPA stated at proposal), and/or not replacing degraded catalyst which allows the SCR to perform at lower reduction capabilities. Consequently, the EPA finds it reasonable to consider the costs of both additional reagent and catalyst maintenance and replacement in representing the cost of optimizing existing and operating SCR systems.

In contrast, EPA finds that units running their SCR systems have incurred the complete set of fixed operating and maintenance (FOM) costs. In addition, EPA finds that the auxiliary power component of VOM is also largely indifferent to the NO_X removal. That is, auxiliary power is indifferent to reagent consumption, catalyst degradation, or NO_X removal rate. Thus, the FOM and auxiliary power VOM cost components are not included in the cost estimate to achieve "full" operation for units that are already operating.

In conclusion, EPA finds that only the VOM reagent and catalyst replacement costs should be included in cost estimates to ensure an operating SCR operates fully.

In an SCR, the chemical reaction consumes approximately 0.57 tons of ammonia or 1 ton of urea reagent for every ton of NO_X removed. During development of CAIR and the original CSAPR, the agency identified a marginal cost of $500 per ton of NO_X removed (1999$) with reagent costing $190 per ton of ammonia, which equated to $108 per ton of NO_x removed for the reagent procurement portion of operations. The remaining balance reflected other operating costs. Over the years, reagent commodity prices have changed, affecting the operational cost in relation to reagent procurement. To understand the relationship between reagent price and its associated cost regarding NO_X reduction, see Appendix A: Table 1; "Historical Anhydrous Ammonia and Urea Costs and their Associated Cost per NO_X ton Removed in a SCR." Commenters suggested that in the future, prices could increase as demand increases for these commodities. However, these commodities are created in large quantities for use in the agriculture sector. Demand from the power sector for use in controls is small relative to the magnitude used in agriculture. Fluctuations in price are expected and are demonstrated in the pricing data presented in Appendix A, Table 1. Some of these prices reflect conditions where demand and commodity prices are high. Consequently, the reagent costs used by EPA in this rule are representative. In the cost estimates presented here, EPA uses the cost for urea, which is greater than ammonia costs, to arrive at a conservative estimate. EPA conservatively assumed a cost of $310/ton for a 50% weight solution of urea. This results in a cost of between $400 and $500/ton of NO_X removed for the reagent cost alone.

As suggested by commenters, EPA also estimated the cost of catalyst replacement and disposal in addition to the costs of reagent. EPA identified the cost for returning a partially operating SCR to full operation applying the Sargent & Lundy cost equations for all coal-fired units that operated in 2015 in the United States on a per ton of NO_X removed basis. This assessment covered up to 255 units. EPA was able to identify the costs of individual VOM and FOM cost components, including reagent, catalyst, auxiliary fans. Some of these expenses, as modeled by the Sargent & Lundy cost tool, vary depending on factors such as unit size, NO_X generated from the combustion process, and reagent utilized. The EPA performed multiple assessments with this tool's parameters to investigate sensitivity relating to cost per ton of NO_X removed. Additionally, the agency conservatively modeled costs with urea, the higher-cost reagent for NO_X mitigation. The key input parameters in the cost equations are the size of the unit, the uncontrolled, or "input", NOx rate, the NOx removal efficiency, the type of coal, and the capacity factor. For the input NO_X rate, each unit's maximum monthly emission rate was examined from the period 2002-2014 (inclusively) for the purpose of identifying the unit's maximum emission rate prior to the control's installation or alternatively during time periods when the control was not operating. The long timeframe allowed examination prior to the onset of annual NO_X trading programs (e.g., CAIR and CSAPR).

In the analysis, we assumed these units burned bituminous coal at a 54.1% capacity factor.[2] We assumed that the SCRs operate with an 87.55% NO_x removal efficiency.[3] In this section, where we are assessing the cost to return a partially operating SCR to full operation, we examined only the sum of the VOM reagent and catalyst cost components. EPA ranked the quantified VOM costs for each unit and identified the cost at the 90th percentile level rank, which rounded to $800 per ton of NO_x removed. EPA also identified the average cost, which rounded to $670 per ton of NO_x removed. EPA selected the 90th percentile value because a substantial portion of units had combined reagent and catalyst costs at or less than this $800/ton of NO_x removed.

Thus, $800 per ton NO_x removed represents a reasonable estimate of the cost for operating these post combustion controls based on current market prices and typical operation. For purposes of the IPM modeling, the agency assumes that $800 per ton of NO_X removed is a broadly available cost point for units that currently are partially-operating SCRs to fully operate their NO_X controls.

Cost Estimates for Restarting Idled Existing SCR

For a unit with an idled, bypassed, or mothballed SCR, all FOM and VOM costs such as auxiliary fan power, catalyst costs, and additional administrative costs (labor) are realized upon resuming operation through full potential capability. To understand the costs, the agency applied the Sargent & Lundy cost equations for two "typical" units with varying input NO_X rates in a bounding analysis and then did a more detailed analysis encompassing all coal-fired units with SCR that operated in 2015 in the contiguous United States. For both analyses, the agency assumed the same input parameters as was used for the partially-operating SCR analysis described above, but in keeping with this assessment's focus on restarting SCRs that are not already operating, these analyses included the auxiliary fan power VOM component and all of the FOM components along with the reagent and catalyst VOM components in the total cost estimate.

First, to better-understand the effect of input NO_X rate on costs, using the Sargent & Lundy cost equations, the EPA performed a bounding analysis to identify reasonable high and low per-ton NO_X control costs from reactivating an existing but idled SCR across a range of potential uncontrolled NO_X rates.[4] Similar to what was described at proposal, for a hypothetical unit with a high uncontrolled NO_X rate (e.g., 0.7 lb NO_X/mmBtu, 80 percent removal efficiency, 54.1% capacity factor, and 10,000 Btu/kWh heat rate), VOM and FOM costs were around $750/ton of NO_X removed. Conversely, a unit with a low

[2] Commenters suggested that EPA evaluate costs of SCR operation utilizing a capacity factor value representing recent unit operation. EPA identified the 2015 heat input weighted ozone season capacity factor of 54.1 percent for 213 coal units with SCR on-line at the start of 2015 and which have nonzero 2015 heat input and are in the CSAPR Update region.

[3] A NO_X removal efficiency of 87.6 percent is based on the median ratio of the month with the highest NO_X rate to the second best ozone season value for the time-period 2003-2014. The agency selected the median value to ensure exclusion of outliers. Commenters questioned the particular values EPA selected for this analysis. The highest month was selected as the "uncontrolled" NO_X rate because it had a good possibility of being a time when the SCR was not operating. As averaging time increases, there is increased likelihood that the unit would be using its SCR, resulting in an "uncontrolled" NO_X rate that includes some control. The second-lowest ozone season rate was selected as the "controlled" rate. This was selected because it represented a time when the unit was consistently and efficiently operating its SCR. This is consistent with the proposal.

[4] For these hypothetical cases, the "uncontrolled" NO_X rate includes the effects of existing combustion controls present (i.e., low NO_x burners).

uncontrolled NO_X rate (e.g., 0.2 lb NO_X/mmBtu and 60 percent removal) experienced a higher cost range revealing VOM and FOM costs about $1,800/ton of NO_X removed.

Next, using the Sargent & Lundy cost equations and same input parameters described above, EPA evaluated all of the VOM and FOM costs for the 255 coal-fired units with SCR in the contiguous United States that were operating in 2015. As before, EPA ranked the sum of the VOM and FOM costs for each unit and identified the 90th percentile cost. When rounded, this was $1,400/ton of NO_X removed. EPA also identified the average cost, which rounded to $1,000 per ton of NOx removed. Specifically, this assessment found that 229 of the 255 units demonstrated VOM plus FOM costs lower than $1,400/ton of NO_X removed.[5]

Examining the results, the EPA concludes that a cost of $1,400/ton of NO_X removed is reasonably representative of the cost to resume and fully operate idled SCRs.

<u>NO_X Emission Rate Estimates for Full SCR Operation</u>

Similar to what was done at proposal, the agency examined the ozone season average NO_X rates for 271 coal-fired units in the contiguous US with an installed SCR over the time-period 2009-2015, then identified each unit's lowest, second lowest, and third-lowest ozone season average NO_X rate. Commenters suggested that EPA examine ozone season average NO_x rates over a shorter time period than proposed (specifically not predating 2009) since annual NO_x programs, rather than just seasonal programs, became widespread in the eastern US with the start of CAIR in 2009, and this regulatory development could affect SCR operation. While the proposal focused on second-lowest ozone season NO_X rates, commenters expressed concern that such rates may not be achievable on a routine basis.[6] Certain commenters also suggested that units were not operating at capacity factors conducive to efficient SCR operation and that units were facing additional constraints on NO_X removal by using the SCR to comply with other regulations (i.e., MATS). For responses to these comments, see the general Response to Comments document. Following comments, EPA focused on the third lowest ozone season rate over the 2009-2015 time period to ensure that the rate represents efficient but routine SCR operation (i.e., the performance of the SCR is not simply the result of being new, or having a highly aggressive catalyst replacement schedule, but is the result of being well-maintained and well-run). EPA found that, between 2009 and 2015, EGUs on average achieved a rate of 0.10 lbs NO_X/mmBtu for the third-lowest ozone season rate. The EPA selected 0.10 lbs NO_X/mmBtu as a reasonable representation for full operational capability of an SCR. EPA notes that over half of the EGUs achieved a rate of 0.076 lbs NO_X/mmBtu over their third-best entire ozone season (see Figure 1).

For the next step, the agency examined each ozone season over the time period from 2009-2015 and identified the lowest monthly average NO_x emission rates for each year. Examining the third-lowest historical monthly NO_x rate, the EPA found that, on average EGUs achieved a rate of 0.085 lbs NO_X/mmBtu. The third-lowest historical monthly NO_x rate analysis showed that a large proportion of units displayed NO_x rates below 0.10 lb/mmBtu (see Figure 2).

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[5] Given the sensitivity of the cost to the input uncontrolled NOx rates, EPA examined the units with higher costs and observed that some exhibited low, uncontrolled NO_X rates suggesting that, perhaps, the SCR may have been consistently operated year-round over the entire time-period. A low uncontrolled NO_X rate would result in a low number of tons of NOx removed, and, thus, a high cost on a "per ton of NO_X removed" basis when modest fixed and variable costs are divided by just a few tons of NO_X removed.

[6] Other commenters noted that a large group of EGUs with SCRs routinely achieved rates well below 0.075 lbs NO_x/mmBtu. EPA agrees that a large number of units can achieve these low rates. In the setting of the state budgets, EPA notes that units were given the lower of their actual rate from NEEDS or 0.10 lbs/mmBtu.

Based on the ozone season emission rates, and supported by the monthly rates, the agency concludes a 0.10 lb NO_X/mmBtu average rate is widely achievable by the EGU fleet.

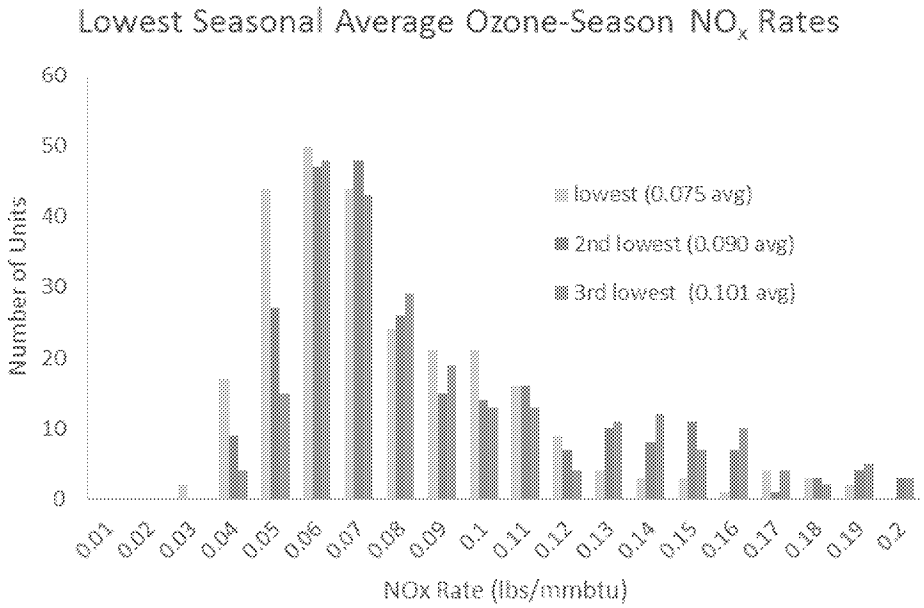

Figure 1. "Frequency" distribution plots for coal-fired units with an SCR showing their NO_X emission rates (lbs/mmBtu) during ozone seasons from 2009-2015. For each unit, the lowest, second lowest, and third lowest ozone season average NO_X rates are illustrated.

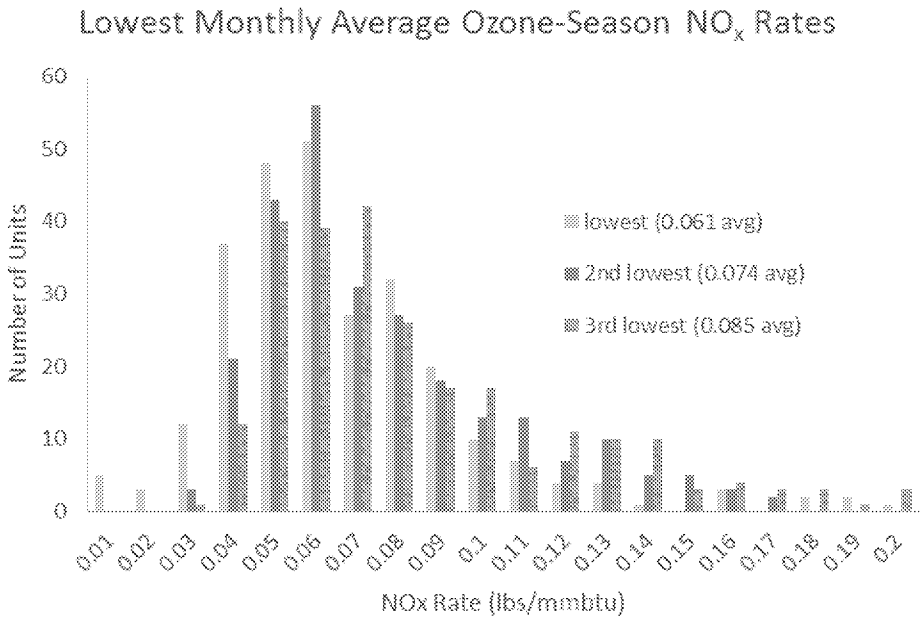

Figure 2. "Frequency" distribution plots for coal-fired units with an SCR showing their NO_X emission rates (lbs/mmBtu) during ozone seasons from 2009-2015. For each unit, the lowest, second lowest, and third lowest monthly average NO_X rates are illustrated.

Cost Estimates for Restarting Idled Existing SNCR

EPA sought to examine costs for full operation of SNCR. SNCR are post-combustion controls that reduce NO_x emissions by reacting the NO_X with either ammonia or urea, without catalyst. Because the reaction occurs without catalyst and is thereby a less efficient reaction, several times the amount of reagent must be injected to achieve a level of NOx removal comparable to SCR technology. Usually, an SNCR system does not achieve the level of emission reductions which an SCR can achieve. For the SNCR analysis, as with the SCR analyses described above, the agency used the Sargent & Lundy cost equations to perform a bounding analysis for examining operating expenses associated with a "generic" unit returning an SNCR to full operation.[1] For units with a mothballed SNCR returning to full operation, the owner incurs the full suite of VOM and FOM costs. Reagent consumption represents the largest portion of the VOM cost component. For this bounding analysis, the agency examined two cases: first, a unit with a high input uncontrolled NO_x rate 0.70 lb/mmBtu; second, a unit with a low input uncontrolled NO_x rate 0.20 lb /mmBtu – both assuming a 25 percent removal efficiency.[7] For the high rate unit case, VOM and FOM costs were calculated as approximately $1,970/ton NO_x with about $1,620/ton of that cost associated with urea procurement. For the low rate unit case, VOM and FOM costs approached $3,420/ton NO_x with nearly $2,700/ton of that cost associated with urea procurement. Despite equivalent reduction percentages for each unit, the cost dichotomy results from differences in the input NO_x rates for the units and the type of boiler, resulting in a modeled step-change difference in urea rate (either a 15% or 25% reagent usage factor).[1] EPA also examined SNCR cost sensitivity by varying NO_X removal efficiency while maintaining the uncontrolled NO_X emission rate. In these studies, SNCR NO_X removal efficiency was assumed to be 40 percent for the first cost estimate and 10 percent for the second cost estimate. For a high rate unit with an uncontrolled rate of 0.70 lb NO_X/mmBtu, the associated costs were $1,920/ton and $2,110/ton. For a low rate unit with an uncontrolled rate of 0.20 lb NO_X/mmBtu, the associated costs were $3,310/ton and $3,900/ton. This analysis illustrates that SNCR costs ($/ton) are more sensitive to a unit's uncontrolled input NO_X rate than the potential NO_X removal efficiency of the SNCR itself. Examining the results across all of the simulations, but focusing on the 25 percent removal efficiency scenario for the low input uncontrolled NO_X rate, which is more representative of typical removal efficiency, EPA finds that costs for fully operating idled SNCR are substantially higher than for SCR. We conclude that a cost of $3,400/ton of NO_X removed is representative of the cost to resume and fully operate idled SNCRs.

Cost Estimates for Installing Low NOx Burners and / or Over Fire Air

Combustion control technology has existed for many decades. Its emission control premise depends on limiting NO_X formation during the combustion process by extending the combustion zone. Over time, as the technology has advanced, combustion controls have become more efficient at achieving lower NO_X rates than those installed years ago. Modern combustion control technologies routinely achieve rates of

[7] For both cases, we examined a 500 MW unit with a heat rate of 10,000 Btu/kWh operated at a 42 percent annual capacity factor while burning bituminous coal. The 2015 heat input weighted ozone season capacity factor for 105 coal units with SNCR on-line at the start of 2015 and which have nonzero 2015 heat input and are in the CSAPR Update region was 42 percent. Furthermore, in the cost assessment performed here, the agency conservatively assumes SNCR NO_X removal efficiency to be 25 percent, noting that multiple installations have achieved better results in practice. 25% removal efficiency is the default NO_X removal efficiency value from the IPM documentation. See https://www.epa.gov/sites/production/files/2015-08/documents/attachment_5-4_sncr_cost_methodology.pdf for details.

0.20 – 0.25 lb NO_X/mmBtu and, for some units, depending on unit type and fuel combusted can achieve rates well below 0.18 lb NO_X/mmBtu. Table 1 shows average NO_X rates from units with various combustion controls for different time periods.

Table 1: Ozone Season NO_X Rate (lb/mmbtu) Over Time for Units with Various Combustion Controls*

	Years Between 2003 and 2008		Years Between 2009 and 2014		Year = 2015	
NOx Control Technology	**NOx Rate (lb/mmBtu)**	**Number of Unit-Years**	**NOx Rate (lb/mmBtu)**	**Number of Unit-Years**	**NOx Rate (lb/mmBtu)**	**Number of Unit-Years**
Overfire Air	0.346	987	0.275	828	0.222	114
Low NOx Burner Technology (Dry Bottom only)	0.339	1654	0.276	1421	0.229	193
Low NOx Burner Technology w/ Overfire Air	0.299	673	0.235	641	0.223	85
Low NOx Burner Technology w/ Closed-coupled OFA	0.265	432	0.240	329	0.203	48
Low NOx Burner Technology w/ Separated OFA	0.218	501	0.194	475	0.185	79
Low NOx Burner Technology w/ Closed-coupled/Separated OFA	0.206	455	0.177	485	0.156	69

* Source: Air Markets Program Data (AMPD), ampd.epa.gov, EPA, 2016

Current combustion control technology reduces NO_X formation through a suite of technologies. Whereas early combustion controls focused only on either Low NOx Burners (LNB) or Overfire Air (OFA), modern controls employ both, and sometimes include a second, separated overfire air system. Further advancements in fine-tuning the multitude of burners and overfire air system(s) as a complete assembly have enabled suppliers to obtain better results than tuning individual components. For this regulation, the agency evaluated EGU NO_X reduction potential based on upgrading units to modern combustion controls. Combustion control upgrade paths are shown in Table 3-11 of the IPM 5.13 documentation (*see* Chapters 3 and 5 of the IPM documentation for additional information). The fully upgraded configuration for units with wall-fired boilers is LNB with OFA. For units with tangential-fired boilers, the fully upgraded configuration is LNC3 (or, Low NOx burners with Close-Coupled and Separated Overfire Air).

With the wide range of LNB configurations available and furnace types present in the fleet, the agency decided to assess compliance costs based on an illustrative unit. This was the same unit examined at proposal.[8] The agency selected this illustrative unit because its attributes (e.g., size, input NO_X emission rate) are representative of the EGU fleet, and, thus, the cost estimates are also representative. In the final rule modeling, we observe that most of the NO_X reductions projected to occur from combustion control

[8] For this analysis, EPA assumed a 500 MW unit with a heat rate of 10,000 Btu/kWh and an 85% annual capacity factor. We assumed the unit was burning bituminous coal and had an input uncontrolled NO_x rate of 0.50 lb NO_x / mmBtu initial rate and had a 41 percent NO_X removal efficiency after the combustion control upgrades. This 0.50 lbs/mmBtu input NO_x rate is comparable to the observed average rate of 0.48 lbs/mmBtu for the coal-fired wall-fired units from 2003-2008 that had not installed controls. This rate is exhibited by a number of coal fired units and EPA notes that there are still units with wall and tangentially-fired boilers which continued to have rates higher than 0.50 lbs/mmBtu in 2015. Using 2015 data for uncontrolled wall-fired coal units and comparing these rates against controlled units of the same type, EPA observes a 41% difference in rate. Similarly, EPA observes a 51% reduction for coal units with tangentially-fired boilers. To be conservative, EPA used the 41 percent reduction from wall-fired coal units.

retrofits occurred at units that were larger than the illustrative unit.[9] Accordingly, the agency calculated the costs for various combustion control paths. The cost estimates utilized the equations found in Table 5-4 "Cost (2011$) of NO_X Combustion Controls for Coal Boilers (300 MW Size)" from Chapter 5 of the IPM documentation.[10] For these paths, EPA found that the cost ranges from $430 to $1200 per ton NO_X removed ($2011). EPA examined lower capacity factors (i.e., 70%) and found the costs increased from $520 to $1,400 per ton. At lower capacity factors (i.e., 54.1%), costs increased to a max of $1,780 per ton for one type of installation. Examining the estimates for all of the simulations, the agency finds that the costs of combustion control upgrades typically fall below the costs for returning a unit with an inactive SCR to full operation (i.e., $1,400/ton), but in some cases, above the cost for returning a partially operating SCR to full operation (i.e., $800/ton). Consequently, EPA identifies $1,400/ton as the cost level where upgrades of combustion controls would be widely available and cost-effective.

Cost Estimates for Retrofitting with SCR and Related Costs

For coal-fired units, an SCR retrofit is the state-of-the-art technology used to limit NO_X emissions to their lowest extent. The agency examined the cost for newly retrofitting a unit with SCR technology. As was done at proposal, using the Sargent & Lundy cost tool to examine the costs of SCR retrofit for an illustrative unit, a 500 MW unit operating at an 85% percent capacity factor with an uncontrolled rate of 0.35 lb NO_X / mmBtu, retrofitted with an SCR to a lower emission rate of 0.07 lb NO_X / mmBtu, results in a compliance cost of $5,000 / ton of NO_X removed. For this illustrative unit, at lower capacity factors, costs increased. Consequently, SCR installation is most often seen for large units generating substantial electricity with high capacity factors. Because of the substantial capital cost required for retrofitting a unit with an SCR, owners with low utilized units may adopt SNCR as a more appropriate economical choice for NO_X control, thereby reducing the "cost per ton" for of NO_X reduction.

Cost Estimates for Retrofitting with SNCR and Related Costs

SNCR technology is an alternative method of NO_X emission control that incurs a much lower capital cost compared with an SCR, albeit at the expense of greater operating costs and less NO_X emission reduction. Some units with anticipated shorter operational lives or with low utilization may benefit from this control technology. The higher cost per ton of NO_X removed reflects this technology's lower removal efficiency which necessitates greater reagent consumption, thereby escalating VOM costs. The agency examined the costs of retrofitting a unit with SNCR technology using the Sargent & Lundy tool. The agency conservatively set the NO_X emission reduction rate at 25 percent. For the unit examined above (500 MW, 0.35 lbs NO_X/mmBtu) with a 42 percent capacity factor, the cost is $6,400 / ton of NO_X removed.

Feasibility Assessment: Implementation Timing for Each EGU NO_X Control Strategy

The agency evaluated the implementation time required for each compliance option to assess the feasibility of achieving reductions during the 2017 ozone season.

EPA evaluated the feasibility of turning on idled SCRs for the 2017 ozone season. The EGU sector is very familiar with restarting SCR systems. Based on past practice and the possible effort to restart the

[9] Generally, there is an inversely proportional relationship between cost of control and unit size (on a dollars per ton basis). That is, assuming a constant NO_X removal efficiency, more absolute tons of NO_X are removed as units increase in size while absolute capital costs increase at a lower rate. Thus, we would expect it may be even more cost-effective to control these units than has been assumed here.

[10] https://www.epa.gov/sites/production/files/2015-07/documents/chapter_5_emission_control_technologies_0.pdf

controls (e.g., re-stocking reagent, bringing the system out of protective lay-up, performing inspections), returning these idled controls to operation is possible within the compliance timeframe of this rule. This timeframe is informed by many electric utilities' previous, long-standing practice of utilizing SCRs to reduce EGU NO_X emissions during the ozone season while putting the systems into protective lay-up during non-ozone season months when the EGUs did not have NO_X emission limits that warranted operation of these controls. For example, this was the long-standing practice of many EGUs that used SCR systems for compliance with the NO_X Budget Trading Program. Based on the seasonality of EGU NO_X emission limits, it was typical for EGUs to turn off their SCRs following the September 30 end of the ozone season control period. They would then lay-up the pollution control for seven months of non-use. By May 1 of the following ozone season, the control would be returned to operation. In the 22 state CSAPR Update region, 2005 EGU NO_X emission data suggest that 125 EGUs operated SCR systems in the summer ozone season, likely for compliance with the NO_X Budget Trading program, while idling these controls for the remaining seven non-ozone season months of the year.[11] In order to comply with the seasonal NO_X limits, these SCR controls regularly were taken out of and put back into service within seven months.

Based on EGUs' past experience and the frequency of this practice of idling controls for periods of time, the EPA finds that idled controls can be restored to operation in less than seven months. The lead-time for compliance with this rule is longer than this timeframe.

Full operation of existing SCRs that are already operating to some extent involves increasing reagent (i.e., ammonia or urea) flow rate, and maintaining and replacing catalyst to sustain higher NO_X removal rate operations. As described regarding restarting idled SCR systems, EGU data demonstrate that operators have the capability to fully idle SCR systems during winter months and return these units to operation in the summer to comply with ozone season NO_X limits.[12] The EPA believes that this widely demonstrated behavior also supports our finding that fully operating existing SCR systems currently being operated, which would necessitate fewer changes to SCR operation relative to restarting idled systems, is also feasible for the 2017 ozone season. Increasing NO_X removal by SCR controls that are already operating can be implemented by procuring more reagent and catalyst. EGUs with SCR routinely procure reagent and catalyst as part of ongoing operation and maintenance of the SCR system. In many cases, where the EPA has identified EGUs that are operating their SCR at non-optimized NO_X removal efficiencies, EGU data indicates that these units historically have achieved more efficient NO_X removal rates. Therefore, the EPA finds that optimizing existing and SCR systems currently being operated could generally be done by reverting back to previous operation and maintenance plans. Regarding full operation activities, existing SCRs that are only operating at partial capacity still provide functioning, maintained systems that may only require increased chemical reagent feed rate up to their design potential and catalyst maintenance for mitigating NO_X emissions. Units must have adequate inventory of chemical reagent and catalyst deliveries to sustain operations. Considering that units have procurement programs in place for operating

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[12] In the 22 state CSAPR Update region, 2005 EGU NO_X emissions data suggest that 125 EGUs operated SCR systems in the summer ozone season while idling these controls for the remaining 7 non-ozone season months of the year. Units with SCR were identified as those with 2005 ozone season average NO_X rates that were less than 0.12 lbs/mmBtu and 2005 average non-ozone season NO_X emission rates that exceeded 0.12 lbs/mmBtu and where the average non-ozone season NO_X rate was more than double the ozone season rate.

SCR, this may only require updating the frequency of deliveries. This may be accomplished within a few weeks or months.

Combustion control, such as LNB and/or OFA, represent mature technologies requiring a short installation time – typically, four weeks to install along with a scheduled outage (with order placement, fabrication, and delivery occurring beforehand and taking a few months). Construction time for installing combustion controls was examined by the EPA during the original CSAPR development and are reported in the TSD for that rulemaking entitled, "Installation Timing for Low NO_X Burners (LNB)", Docket ID No. EPA-HQ-OAR-2009-0491-0051.[13] Industry has demonstrated retrofitting LNB technology controls on a large unit (800 MW) in under six months. This TSD is in the docket for the CSAPR Update.

This rule does not consider retrofitting SCR or SNCR technology as a viable compliance option in the 2017 compliance timeframe. The time requirements for an SCR retrofit exceed 18 months from contract award through commissioning. SNCR is similar to activated carbon injection (ACI) and dry sorbent injection (DSI) installation and requires about 12 months from award through commissioning. Conceptual design, permitting, financing, and bid review require additional time. A detailed analysis for a single SCR system can be found in Exhibit A-3 and an ACI system (equivalent to an SNCR) in Exhibit A-5 in: "Final Report: Engineering and Economic Factors Affecting the Installation of Control Technologies for Multipollutant Strategies", EPA-600/R-02/073, Oct 2002.[14] Note that EPA received comments that, in certain instances, individual SNCR installation could be done in 8 to 12 months from contract award. While EPA has not considered new SNCR installations to be a widely available EGU NO_X control strategy in establishing emission budgets, from both cost and compliance timing perspectives, some limited installations may be possible as a compliance option.

Shifting generation to lower NO_X- or zero-emitting EGUs, similar to operating existing post-combustion controls, uses investments that have already been made, can be done quickly, and can significantly reduce EGU NO_X emissions. For example, natural gas combined cycle (NGCC) facilities can achieve NO_X emission rates of 0.0095 lb/mmBtu, compared to existing coal steam facilities, which emitted at an average rate of 0.18 lb/mmBtu of NO_X across the 22 states included in the CSAPR Update in 2014. Similarly, generation could shift from uncontrolled coal to coal units that have SCR. Shifting generation to lower NO_X -emitting EGUs would be a cost-effective, timely, and readily available approach for EGUs to reduce NO_X emissions, and EPA analyzed EGU NO_X reduction potential from this control strategy for the CSAPR Update.

Shifting generation to lower NO_X-emitting or zero-emitting EGUs occurs in response to economic factors. As the cost of emitting NO_X increases, combined with all other costs of generation, it becomes increasingly cost-effective for units with lower NO_X rates to increase generation, while units with higher NO_X rates reduce generation. Because the cost of generation is unit-specific, this generation shifting occurs incrementally on a continuum. Consequently, there is more generation shifting at higher cost NO_X levels. Because we have identified discrete cost thresholds resulting from the full implementation of particular types of emission controls, it is reasonable to simultaneously quantify the reduction potential

[13] http://www.epa.gov/airmarkets/airtransport/CSAPR/pdfs/TSD_Installation_timing_for_LNBs_07-6-10.pdf
[14] http://nepis.epa.gov/Adobe/PDF/P1001G0O.pdf

from generation shifting strategy at each cost level. Including these reductions is important, ensuring that other cost-effective reductions (e.g., fully operating controls) can be expected to occur.

As described in the preamble, EPA limited shifting generation to units with lower NO_X emission rates within the same state as a proxy for the amount of generation that could be shifted in the near-term (i.e., 2017).

To study the potential implications of the generation shifting projected to occur as a result of implementation of the CSAPR Update, EPA reviewed all shifts in generation that were projected to occur between the base case and the $1,400 per ton cost threshold scenario used for constructing state budgets (cost threshold case). The shifts in generation between the base and cost threshold cases happen on an economic basis, whenever shifting of generation will lead to lower overall costs given a NO_X price, and thus can be studied by comparing the threshold scenario and base case results.

EPA examined generation changes from the base case to the threshold scenario at the regional level in each of the major regions that encompass the 22 states covered by the rule. Table 2 shows the changes in generation from coal and natural gas in each of these regions. As the table shows, shifts in generation are minimal. Overall, the decrease in coal generation is matched by an increase in natural gas generation from combined cycle units, and both shifts are generally only around one half of one percent. Generally, combined cycle increases are comparable to coal decreases in terms of magnitude, but are slightly larger in percentage terms because the base generation from combined cycle generation is lower than coal.

The data in Table 2 show a small shift from coal generation to natural gas generation as a result of the cost to emit NO_X assumed in the cost threshold scenario. Table 3 shows generation shifting among coal units because coal units with higher NOx rates will incur higher costs compared to coal units with lower NOx rates when a cost to emit NO_X is imposed in the model. To examine these types of changes within the units of the coal fleet, EPA first classified units by the level of projected change and then compared the resulting generation. Units were classified by whether they had changes (increases or decreases) of more than 5 percent. The number of units and generation from these units were then analyzed to determine the contribution of units with larger changes as a percentage of the overall fleet and generation level. The results of this analysis are shown in Table 3.

The regional results in Tables 2 and 3 show that potential generation shifts resulting from the policy are small compared to the typical range of year-on-year variation in generation for the ozone season, and therefore that the shifts are fully feasible in the normal course of power system planning and dispatch operations. Table 4 shows total coal and gas ozone season generation over time, using generation data submitted to EPA's Clean Air Markets Division. The absolute year over year variation in generation from all sources, and particularly for coal units and gas units when viewed separately, is clearly larger than the variations expected as a result of the update rule.

Table 2: Regional Coal and Gas Generation Changes Base to Cost Threshold Case (2018, GWh)

	Coal Steam Plants				Combined Cycle Plants			
Region	Base	Policy	Change	Percent Change	Base	Policy	Change	Percent Change
ERCOT	52,318	51,855	-463	-0.9%	76,801	77,280	479	0.6%
MISO	113,211	112,184	-1,027	-0.9%	20,952	21,893	941	4.5%
PJM	138,870	139,841	971	0.7%	86,994	87,483	489	0.6%
SERC	90,171	89,489	-682	-0.8%	109,897	111,098	1,201	1.1%
SPP	33,705	33,246	-458	-1.4%	16,895	17,375	480	2.8%
Total	428,275	426,615	-1,660	-0.4%	311,539	315,129	3,590	1.2%

Table 3: Regional Changes for Coal Unit Generation from the Base to the Cost Threshold Case (2018, GWh)

		Units with Generation Increases Greater than 5%		Units with Generation Decreases Greater than 5%	
Region	Generation from All Coal Units	Generation	Percent of All Generation	Generation	Percent of All Generation
ERCOT	52,318	0	0.0%	473	0.9%
MISO	113,211	1,330	1.2%	2,427	2.1%
PJM	138,870	2,027	1.5%	2,514	1.8%
SERC	90,171	473	0.5%	426	1.1%
SPP	33,705	0	0.0%	481	1.4%
Total	428,275	3,829	0.9%	7,471	1.7%

Table 4: Historical Regional Coal and Gas Generation

Region	2011 OS Generation (MWh)	2012 OS Generation (MWh)	2013 OS Generation (MWh)	2014 OS Generation (MWh)	2015 OS Generation (MWh)	Average Generation (MWh)	Avg Absolute Year by Year Percent Variation Relative to Average
Coal and Gas Units							
ERCOT	139,056,059	131,017,786	134,609,803	131,050,654	133,810,294	133,908,919	3%
MISO	160,949,929	156,042,518	153,290,509	147,230,881	146,926,308	152,888,029	2%
PJM	229,450,597	221,741,383	208,027,957	199,406,847	203,781,613	212,481,679	4%
SERC	233,358,240	234,646,108	206,222,693	217,363,373	224,542,889	223,226,660	5%
SPP	97,941,842	98,084,372	89,549,899	84,083,357	82,857,267	90,503,347	4%
Coal Units							
ERCOT	65,038,747	56,554,882	63,224,502	61,517,184	54,402,901	60,147,643	10%
MISO	148,334,711	133,249,813	140,020,963	136,262,295	128,886,797	137,350,916	6%
PJM	184,721,925	158,866,391	154,847,790	141,913,576	127,455,196	153,560,976	9%
SERC	148,516,082	127,689,539	121,980,881	127,428,908	114,298,673	127,982,817	8%
SPP	62,722,427	58,935,064	59,850,375	58,832,359	52,854,669	58,638,979	5%
NGCC Units							
ERCOT	61,802,830	64,931,240	63,193,163	61,164,396	70,188,494	64,256,025	6%
MISO	9,504,516	17,786,818	9,889,392	8,849,343	14,562,007	12,118,415	52%
PJM	36,865,556	53,442,540	46,836,760	50,831,308	64,972,340	50,589,701	23%
SERC	65,269,995	83,971,104	69,413,532	75,766,788	90,487,154	76,981,715	19%
SPP	18,208,854	23,909,298	17,328,211	17,373,825	21,751,986	19,714,435	21%

Feasibility Assessment: Historical Emissions Analysis to Show Compliance with Budgets

As an independent check to demonstrate EGUs' ability to comply with the CSAPR Update Rule requirements, EPA created an emissions assessment based on each unit's historical emissions. This assessment uses historical ozone season emissions to assess compliance feasibility independent of IPM modeling conducted to evaluate the rule. EPA created state-level emission estimates starting with reported unit level 2015 ozone season NO_X emissions. Committed (i.e., already announced) controls and upgrades were accounted for along with historical NO_X rates for units with existing SCRs and SNCRs. Known retirements were also included. EPA accounted for the "retired" heat input, by adding back in a comparable amount of heat input assumed to be combusted at each state's average emission rate after previous steps have been accounted for. Table 5 shows the emission estimates, by state. Column 7 shows the results of the bottom-up engineering analysis (before accounting for state-of-the-art combustion controls, or SOA CC). The totals accounting for SOA CC can be found in column 8. Each of the columns can be compared with the budgets in column 11. Comparing columns 10 and 11, for each state, the larger value is highlighted in red. The columns in Table 5 are as follows:

(1) 2015 reported unit-level ozone season NO_X emissions were summed to the state level
(2) Emissions associated with units committed to retire before January 1, 2017 were removed
(3) Emissions associated with units committed to convert from coal to gas before January 1, 2017 were reduced by 50 percent
(4) Emissions associated with units committed to add SCR before January 1, 2017 were reduced to a NO_X rate of 0.075 lb/mmBtu
(5) Emissions associated with units committed to add SOA CC before January 1, 2017 were reduced to a NO_X rate appropriate tor the individual unit
(6) Emissions associated with units that added an SCR in 2014 or 2015 were reduced to a NO_X rate of 0.075 lb/mmBtu
(7) Emissions associated with units with an existing SCR were reduced to a NO_X rate equivalent to the unit's third lowest historical ozone season NO_X rate, if that NO_X rate was lower than the unit's 2015 NO_X rate
(8) Emissions associated with units able to install SOA CC before the beginning of the 2017 ozone season period were reduced to a NO_X rate appropriate for the individual unit
(9) Emissions associated with units with an existing SNCR were reduced to a NO_X rate equivalent to the unit's third lowest historical ozone season NO_X rate, if that NO_X rate was lower than the unit's 2015 NO_X rate[15]
(10) As generation associated with retired units will need to be replaced, the heat input from retired units [in (2), above] is added to each state using the further updated state level NO_X rate at the end of (9)
(11) Each state's bottom-up analysis at the end of (10) is compared to the final CSAPR Update Rule State budgets

EPA found that after aggregating all states at the regional level, this bottom-up analysis shows that sources are about 3 percent below the sum of the CSAPR Update Rule state budgets and all states are individually below their assurance levels. This assessment confirms EPA's determination that EGUs can

[15] Although EPA did not consider the operation of idled SNCR in calculating the budgets finalized in the CSAPR Update, EPA finds that the operation of these controls is feasible by the 2017 and therefore represent a valid compliance option for EGUs subject to the CSAPR Update. As Table 5 (column 9) demonstrates, the emissions reductions associated with SNCR controls are small relative to emissions reductions achievable via other control strategies and EGUs can comply with the requirements of the CSAPR Update even without operation of SNCR.

collectively achieve the budgets finalized in the CSAPR Update by implementing a variety of control strategies that can be implemented by the 2017 ozone season.

Sources can also comply with the requirements of the CSAPR Update without implementing all of the control strategies listed above. By way of example, in Table 6, EPA compared the compliance value where sources fully operate all existing SCR controls (column 7) along with the incremental emissions associated with adding back in heat input from retired units with the budgets at this intermediate step (column 12). Aggregating all states at the regional level in this analysis, EPA finds a total of 319,377 tons which is under 1% above the total of the regional final budget (column 11) and all states are within the 21% variability limits. Given the bank of additional allowances that will be available for the 2017 compliance period, this means that sources can fully comply with the requirements of the CSAPR Update without any capital expenditures by simply turning on and operating all existing SCR controls at historical levels.

As we have demonstrated above, generation shifting provides an additional feasible method of compliance. This bottom-up analysis did not include this generation shifting, which would decrease the emissions even further.

Table 5. Bottom-Up Analysis to Show Compliance Feasibility

State	(1) 2015 NOx (tons)	(2) Retired Before 2017 (tons)	(3) Coal to Gas Conversion (tons)	(4) New SCRs (Committed) (tons)	(5) New SOA CC (Committed) (tons)	(6) SCRs Completed for 2015 Adjusted to 0.075 lbs/mmBtu (tons)	(7) 3nd Lowest OS NOx Rate with 2015 Heat Input for Existing SCRs (or 2015 NOx Rate if Lower) (tons)	(8) $1,400 SOA CC (Remedy Case) (tons)	(9) 3nd Lowest OS NOx Rate with 2015 Heat Input for Existing SNCRs (or 2015 NOx Rate if Lower) (tons)	(10) Retired Heat Input Added Back At Remaining State NOx Rate (tons)[2]	(11) Final CSAPR Update Rule EGU NO_X Emission Budgets (tons)
Alabama	20,369	16,140	14,073	14,073	14,073	14,073	13,038	12,689	12,678	13,673	13,211
Arkansas [1]	12,560	12,560	12,560	12,560	12,560	12,560	12,550	8,362	8,362	8,362	12,048
Georgia	10,786	8,602	8,602	8,602	8,602	8,602	8,244	8,139	8,139	8,291	8,481
Illinois	15,976	15,976	15,116	15,116	14,850	14,850	13,907	13,907	13,892	13,892	14,601
Indiana	36,353	35,560	34,476	31,042	31,042	31,042	25,374	25,050	25,050	25,325	23,303
Iowa	12,178	11,407	11,140	11,140	11,140	11,140	11,082	10,743	10,743	11,070	11,272
Kansas	8,136	7,751	7,736	7,736	7,736	7,565	7,556	7,556	7,556	7,845	8,027
Kentucky	27,731	26,513	25,826	25,826	25,826	25,826	21,316	21,062	20,871	21,269	21,115
Louisiana	19,257	19,253	19,098	19,098	19,098	19,098	19,062	18,337	18,247	18,250	18,639
Maryland	3,900	3,855	3,855	3,855	3,855	3,855	3,805	3,805	3,799	3,815	3,828
Michigan	21,530	16,854	16,854	16,854	16,854	16,854	16,811	15,966	15,960	17,960	17,023
Mississippi	6,438	6,438	6,438	6,438	6,438	6,438	6,394	6,296	6,296	6,296	6,315
Missouri	18,855	18,533	18,325	18,325	18,325	18,325	16,372	16,372	16,221	16,326	15,780
New Jersey	2,114	2,114	2,114	2,114	2,114	2,114	2,049	2,049	2,048	2,048	2,062
New York	5,593	5,489	5,489	5,489	5,489	5,489	5,365	5,365	5,365	5,406	5,135
Ohio	27,382	27,269	27,269	27,269	27,269	27,269	18,129	17,080	16,412	16,481	19,522
Oklahoma	13,922	13,055	13,055	13,055	13,055	13,055	13,053	12,382	12,382	13,039	11,641
Pennsylvania	36,033	36,033	35,607	35,607	35,607	32,934	17,465	17,465	17,262	17,262	17,952
Tennessee	9,201	9,201	9,201	9,201	7,779	7,779	6,817	6,569	6,569	6,569	7,736
Texas	55,409	54,441	54,441	54,441	54,441	54,441	53,245	52,504	52,265	52,647	52,301
Virginia	9,651	9,618	9,357	9,357	9,357	9,357	9,229	8,690	8,661	8,670	9,223
West Virginia	26,937	26,785	26,785	26,785	26,785	26,785	13,090	12,661	12,195	12,236	17,815
Wisconsin	9,072	8,347	8,273	7,726	7,726	7,726	7,640	7,640	7,603	7,813	7,915
CSAPR Update Region (no GA)	398,596	383,190	377,088	373,106	371,418	368,573	313,349	302,549	300,437	306,252	316,464

[1] For Arkansas, the state's 2017 budget is shown. Their final budget (2018 and beyond) is 9,210 tons.
[2] Reductions from generation shifting are not included in this bottom-up analysis

Table 6. Bottom-Up Analysis to Show Compliance Feasibility by Stopping at Step 7, Operating Existing SCR Controls at Historic Rates[1]

State	(7) 3nd Lowest OS NOx Rate with 2015 Heat Input for Existing SCRs (or 2015 NOx Rate if Lower) (tons)	(12) Retired Heat Input Added Back at Remaining State NOx Rate at this Intermediate Step (tons)	(11) Final CSAPR Update EGU NO_X Emission Budgets (tons)	(13) Intermediate Compliance Feasibility vs Final CSAPR Update Budgets (%)
Alabama	13,038	14,062	13,211	-6%
Arkansas	12,550	12,550	12,048	-4%
Georgia	8,244	8,398	8,481	1%
Illinois	13,907	13,907	14,601	5%
Indiana	25,374	25,652	23,303	-10%
Iowa	11,082	11,419	11,272	-1%
Kansas	7,556	7,845	8,027	2%
Kentucky	21,316	21,723	21,115	-3%
Louisiana	19,062	19,065	18,639	-2%
Maryland	3,805	3,822	3,828	0%
Michigan	16,811	18,919	17,023	-11%
Mississippi	6,394	6,394	6,315	-1%
Missouri	16,372	16,477	15,780	-4%
New Jersey	2,049	2,049	2,062	1%
New York	5,365	5,406	5,135	-5%
Ohio	18,129	18,206	19,522	7%
Oklahoma	13,053	13,745	11,641	-18%
Pennsylvania	17,465	17,465	17,952	3%
Tennessee	6,817	6,817	7,736	12%
Texas	53,245	53,634	52,301	-3%
Virginia	9,229	9,239	9,223	0%
West Virginia	13,090	13,134	17,815	26%
Wisconsin	7,640	7,851	7,915	1%
CSAPR Update Region (no GA)	313,349	319,377	316,464	-1%

[1] Data in Table 6 include replicates of Table 5 (columns 7 and 11) with additional comparisons (columns 12 and 13).

Appendix A: Historical Anhydrous Ammonia and Urea Costs and their Associated Cost per NO_X ton Removed in a SCR

Minimum Cost to Operate

Anhydrous NH_3 & Urea costs ($/ton) [from USDA]

year	NH_3 (anh)	Cost / ton NO_x	Urea cost	Cost / ton NO_x
1999	$ 190	$ 108	$ 165	$ 165
2000	$ 209	$ 118	$ 194	$ 194
2001	$ 385	$ 218	$ 277	$ 277
2002	$ 228	$ 129	$ 179	$ 179
2003	$ 374	$ 212	$ 258	$ 258
2004	$ 366	$ 207	$ 264	$ 264
2005	$ 394	$ 223	$ 319	$ 319
2006	$ 489	$ 277	$ 345	$ 345
2007	$ 500	$ 283	$ 445	$ 445
2008	$ 731	$ 414	$ 537	$ 537
2009	$ 640	$ 363	$ 450	$ 450
2010	$ 474	$ 269	$ 421	$ 421
2011	$ 744	$ 422	$ 501	$ 501
2012	$ 812	$ 460	$ 547	$ 547
2013	$ 877	$ 497	$ 574	$ 574
2014	$ 888	$ 503	$ 550	$ 550

USDA

http://www.neo.ne.gov/statshtml/181.htm

Sierra Club v. McCarthy
Case No. 3:15-cv-04328-JD (JSC)

Declaration of Janet G. McCabe
Attachment 4

Final Technical Support Document (TSD)
for the Cross-State Air Pollution Rule for the 2008 Ozone NAAQS
Docket ID No. EPA-HQ-OAR-2015-0500

Assessment of Non-EGU NOx Emission Controls, Cost of Controls, and Time for Compliance Final TSD

U.S. Environmental Protection Agency
Office of Air and Radiation
August 2016

1 Introduction/Purpose

The purpose of this Technical Support Document (TSD) is to discuss the currently available information on emissions and control measures for sources of NO_X other than electric generating units (EGUs). This information provides more detail about why EGUs are the focus of the final rulemaking, namely the uncertainty that exists regarding whether significant aggregate NO_X mitigation is achievable from non-EGU point sources by the 2017 ozone season, and the fact that the limited available information points to an apparent scarcity of non-EGU reductions that could be accomplished in this timeframe. Notwithstanding these conclusions as regards the 2017 ozone season, the EPA continues to assess the role of NO_X emissions from non-EGU sources to downwind nonattainment problems.

This TSD begins by briefly discussing the non-EGU emissions inventories used in the proposed and final Cross-State Air Pollution Rule (CSAPR) Update analyses, both for the 2011 base year and 2017 future baseline assessed for this rule. The TSD then presents an evaluation of whether non-EGU emissions can be reduced in a cost-effective manner for particular categories. Then, it assesses the available NO_X emission reductions from such categories and presents the category-by-category emissions reduction potential. This assessment considers and presents the annualized costs per ton of these reductions, with a focus on technologies that achieve cost-effective reductions within a range of costs similar to that evaluated for EGUs. The TSD then presents estimates of the time required to install and implement the control measures, both for comparison to the 2017 compliance timeframe, and for discussion of installation time should such measures be required in the future. It should be noted that no changes to these data or estimates have been made for this final TSD compared to the draft version of this TSD provided in the docket for the proposed rule. Finally, the TSD presents a summary of comments received on the proposed rule TSD, along with responses as appropriate.

For the reasons stated in the preamble, the data and discussion in this TSD are intended to focus on the eastern states that are included in the CSAPR Update rule. Information inclusive of western states[1] is presented where available and appropriate.

[1] For the purpose of this action, the western United States (or the West) consists of the 11 western contiguous states of Arizona, California, Colorado, Idaho, Montana, New Mexico, Nevada, Oregon, Utah, Washington, and Wyoming, and the eastern U.S. (or East) consists of the remaining states in the contiguous U.S.

2 Background

In this section we present annual and ozone-season NOx emission inventory totals and the relative percentages for non-EGU source categories statewide and/or nationally. This information is summary in nature and is not meant to replace other, more detailed information available from the EPA, such as the EPA's 2011v6.2 Emissions Modeling Platform TSD[2] as well as the Notice of Data Availability[3] (NODA) and Regulatory Impact Analysis[4] (RIA) for the proposed and final rule.

Table 1 lists 2011 and 2017 projected NOx emissions by sector, in summary form, for the 48 contiguous states of the United States (CONUS).

Table 1: 2011 Base Year and 2017 Projected NOx Emissions by Sector (tons), for the 48 CONUS

Sector	2011 NOx, annual	2017 NOx, annual	2011 NOx, ozone season	2017 NOx, ozone season
EGU-point	2,000,000	1,500,000	942,000	689,000
NonEGU-point	1,200,000	1,200,000	515,000	502,000
Point oil and gas	500,000	410,000	213,000	172,000
Wild and prescribed fires	330,000	330,000	165,000	165,000
Nonpoint oil and gas	650,000	690,000	275,000	293,000
Residential wood combustion	34,000	35,000	3,000	3,000
Other nonpoint	760,000	730,000	204,000	211,000
Nonroad	1,600,000	1,100,000	825,000	582,000
Onroad	5,700,000	3,200,000	2,417,000	1,329,000
C3 commercial marine vessel (CMV)	130,000	130,000	58,000	58,000
Locomotive and C1/C2 CMV	1,100,000	910,000	451,000	384,000
Biogenics	1,000,000	1,000,000	630,000	630,000
TOTAL	**15,000,000**	**11,200,000**	**6,698,000**	**5,018,000**

It is clear from Table 1 that NOx emissions are projected to remain constant or decrease for most sectors in the 48 states between 2011 and 2017, and this is true whether examining annual or ozone season (OS) tons. Emissions from the non-EGU point source sector and the other nonpoint source sector are not projected to change significantly, while emissions

[2] Technical Support Document (TSD), Preparation of Emissions Inventories for the Version 6.2, 2011 Emissions Modeling Platform, August 2015, available at: https://www.epa.gov/air-emissions-modeling/2011-version-62-technical-support-document

[3] Notice of Availability of the Environmental Protection Agency's Updated Ozone Transport Modeling Data for the 2008 Ozone National Ambient Air Quality Standard (NAAQS). The official version is available in the docket for this rulemaking.

[4] Regulatory Impact Analysis for the Proposed Cross-State Air Pollution Rule (CSAPR) for the 2008 Ozone National Ambient Air Quality Standards (NAAQS) and Regulatory Impact Analysis for the Cross-State Air Pollution Rule (CSAPR) Update for the 2008 Ozone National Ambient Air Quality Standards (NAAQS). The official versions are available in the docket for this rulemaking.

from the nonpoint oil and gas source sector are projected to grow (approximately 6%)during this time period. Based on the values in Table 1, Figures 1 and 2 show the relative contributions of the various sectors to overall NOx emissions (left panel) in the CONUS and for the non-EGU sectors (right panel) for 2011 and 2017, respectively.

Figure 1: 2011 NOx emissions by sector, with further non-EGU breakout (48 states)

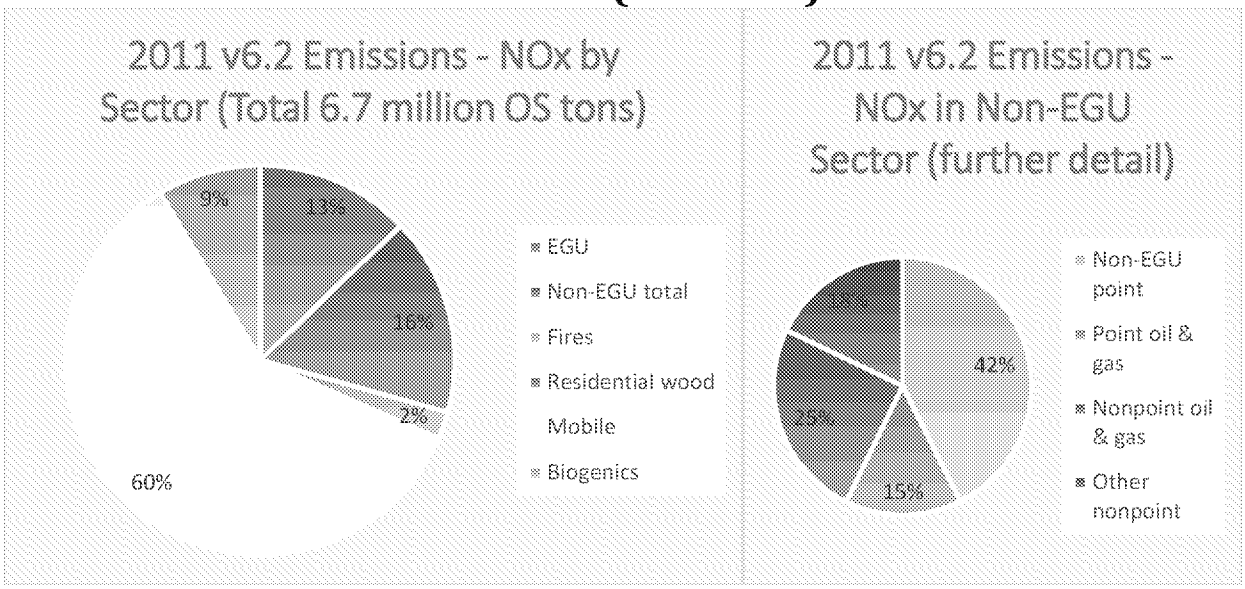

Figure 2: Projected 2017 NOx emissions by sector, with further non-EGU breakout (48 states)

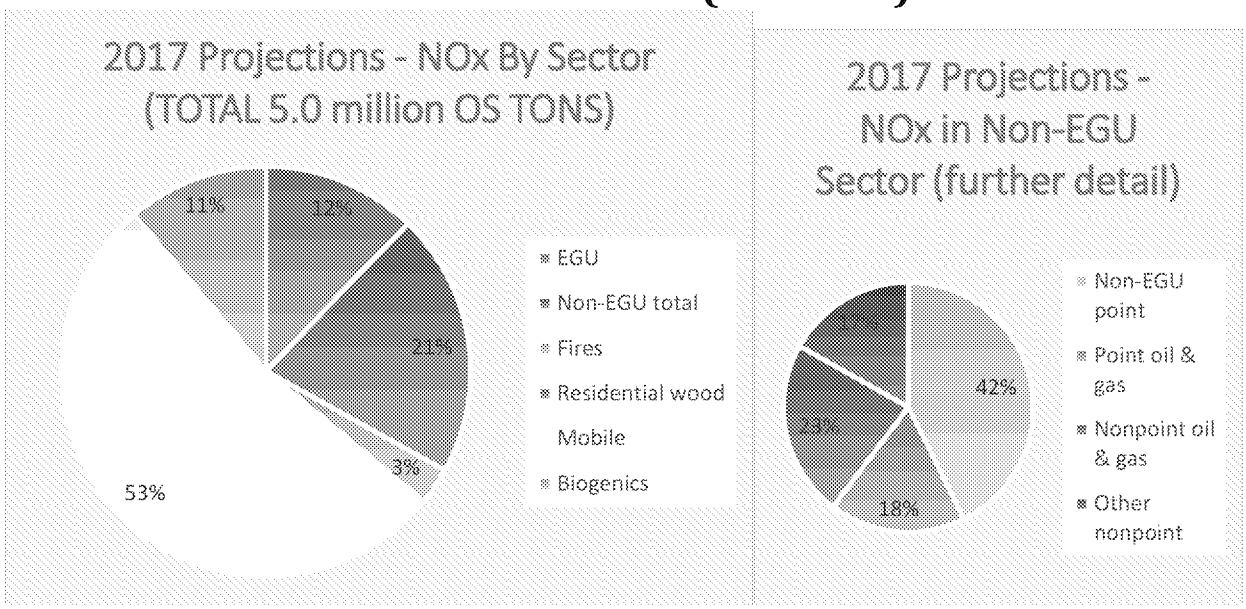

Figure 1 depicts the CONUS total ozone season NOx emissions of 6,698,000 tons in 2011 and Figure 2 depicts the CONUS total ozone season NOx emissions of 5,018,000 tons in 2017. In both 2011 and 2017, the mobile source sector has the largest NOx emissions.[5] Substantial reductions in mobile source NOx emissions are projected to occur by 2017. Mobile source emissions are projected to decrease because of sector-specific standards related to fuels, fuel economy, pollution controls, and repair and replacement of the existing fleet. Because these reductions are already expected to occur, mobile source emission reductions are not included in this analysis of non-EGU emission reductions achievable by the 2017 ozone season.

For the purposes of preliminary analysis in this TSD, "non-EGU total" refers to four separate categories of sources: non-EGU point, point oil and gas, nonpoint oil and gas, and other nonpoint (and does not include mobile sources). The oil and gas point and nonpoint sources are separated from the remaining non-EGU point and nonpoint sources due to the magnitude of their contribution to the inventory and other aspects related to the inventory development, emissions modeling, and future year projections for that industry. The point oil and gas sources are also separated out from the other non-EGU point sources according to the North American Industry Classification System (NAICS) code specified for the various sources. Note that point oil and gas sources include a variety of types of processes, and there is overlap with the processes included in the rest of the non-EGU point inventory. More information on the emissions sectors is available in the 2011v6.2 Emissions Modeling Platform TSD.

Comparing the proportions of the total inventory for non-EGUs (Figures 1 and 2), it becomes clear that, although they are decreasing in the absolute sense, non-EGU NOx emissions are becoming a larger share of overall ozone-season NOx emissions (16% in 2011 compared with 21% in 2017).

Table 2 compares statewide projected total anthropogenic NOx emissions (inclusive of all sectors listed in Table 1 with the exception of fires and biogenics) for the 2017 ozone season to non-EGU NOx emissions for the 2017 ozone season for each of the 48 contiguous United States . Totals are given for the 48 contiguous United States (the 37 eastern states plus the District of Columbia that are addressed in the rule are highlighted below in blue). Non-EGU sources in this table are broken down into two groups (non-EGU point sources, including point oil & gas sources, and other nonpoint and nonpoint oil & gas sources).

[5] The mobile source sector comprises multiple different types of sources (onroad cars & trucks, boats, ships, trains, construction equipment, mining equipment, tractors, etc.).

Table 2: Projected Total Anthropogenic Ozone-Season NOx Emissions vs. Projected Non-EGU Source Group NOx Emissions, 2017 Projections, Tons[6]

State	Total Anthropogenic	Non-EGU Point + Oil & Gas Point	% Anthro	Oil & Gas Nonpoint+ Other Nonpoint	% Anthro	Oil & Gas Point + Oil & Gas Nonpoint	% Anthro
Alabama	88,805	22,187	25	7,952	9	7,442	8
Arizona	71,906	5,015	7	2,310	3	612	1
Arkansas	69,737	13,400	19	5,308	8	9,164	13
California	236,322	29,342	12	20,220	9	3,105	1
Colorado	90,756	19,594	22	16,899	19	27,284	30
Connecticut	17,672	1,105	6	2,626	15	98	1
Delaware	7,786	628	8	615	8	0	0
District of Columbia	2,252	212	9	312	14	0	0
Florida	177,514	16,293	9	7,543	4	1,112	1
Georgia	103,536	18,816	18	4,559	4	1,495	1
Idaho	27,893	3,752	13	1,989	7	503	2
Illinois	148,178	24,668	17	15,409	10	9,424	6
Indiana	139,133	27,222	20	6,864	5	5,931	4
Iowa	70,467	7,888	11	3,861	5	153	0
Kansas	79,939	6,968	9	12,619	16	10,697	13
Kentucky	106,830	11,456	11	11,905	11	12,251	11
Louisiana	173,330	45,506	26	30,160	17	31,503	18
Maine	17,576	4,639	26	809	5	26	0
Maryland	46,029	6,213	13	3,508	8	522	1
Massachusetts	35,369	4,144	12	4,807	14	105	0
Michigan	131,486	21,867	17	12,245	9	9,398	7
Minnesota	89,328	15,541	17	6,414	7	46	0
Mississippi	54,832	11,684	21	2,122	4	6,557	12
Missouri	101,035	9,238	9	3,594	4	122	0
Montana	38,504	2,948	8	3,630	9	3,390	9
Nebraska	70,005	3,884	6	1,163	2	467	1
Nevada	28,192	4,018	14	1,003	4	115	0
New Hampshire	8,932	680	8	1,028	12	0	0
New jersey	52,743	4,544	9	5,506	10	173	0
New Mexico	65,263	10,559	16	19,940	31	27,759	43
New York	109,910	13,738	12	14,624	13	904	1
North Carolina	98,064	15,711	16	3,657	4	1,203	1
North Dakota	74,118	4,047	5	18,125	24	19,185	26
Ohio	160,110	21,280	13	11,617	7	2,906	2
Oklahoma	131,763	32,203	24	33,178	25	51,257	39
Oregon	40,507	6,130	15	4,348	11	365	1

[6] EGUs are not provided a separate breakout in Table 2 since state-level emissions are presented in the Preparation of Emissions Inventories for the Version 6.3, 2011 Emissions Modeling Platform TSD and other TSDs for the proposed and final rules.

State	Total Anthropogenic	Non-EGU Point + Oil & Gas Point	% Anthro	Oil & Gas Nonpoint+ Other Nonpoint	% Anthro	Oil & Gas Point + Oil & Gas Nonpoint	% Anthro
Pennsylvania	174,664	23,735	14	33,508	19	26,713	15
Rhode Island	5,845	544	9	1,370	23	12	0
South Carolina	55,897	10,144	18	3,980	7	348	1
South Dakota	22,192	1,241	6	432	2	75	0
Tennessee	85,759	13,494	16	5,846	7	1,922	2
Texas	467,245	95,671	20	115,180	25	145,285	31
Tribal Data	26,717	3,799	14	0	0	3,700	14
Utah	66,486	8,004	12	9,781	15	9,349	14
Vermont	5,473	163	3	937	17	0	0
Virginia	87,754	14,039	16	7,318	8	4,775	5
Washington	75,833	8,666	11	1,150	2	164	0
West Virginia	64,839	9,678	15	12,642	19	16,723	26
Wisconsin	75,047	11,181	15	5,351	7	178	0
Wyoming	68,864	26,488	38	4,018	6	10,905	16
Eastern States	***3,411,193***	***545,649***	***16***	***418,692***	***12***	***378,171***	***11***
US Total	***4,248,436***	***673,964***	***16***	***503,980***	***12***	***465,421***	***11***

Table 2 indicates that, in the projected 2017 inventory, non-EGU sources comprising non-EGU point and point oil and gas sources are estimated to make up 16% of anthropogenic NOx emissions in the 48 contiguous United States. In individual states, the percentage of anthropogenic emissions contributed by these two non-EGUs categories range from 3% to 26% (eastern states) and from 7% to 38% (western states).

We also note that in the projected 2017 inventory, non-EGU sources comprising nonpoint oil & gas and other nonpoint sources are estimated to make up 12% of anthropogenic NOx emissions in the entire continental U.S. In individual states, the percentage of anthropogenic emissions contributed by these non-EGUs ranges from 2% to 25% (eastern states) and from 4% to 31% (western states).

The EPA's preliminary analysis indicates that NOx emissions from oil and gas sources (inclusive of emissions from the point oil and gas and nonpoint oil and gas sectors) comprise an average of 11% of the total ozone season NOx emissions inventory. For some states, this percentage increases up to 43%, with oil and gas emissions exceeding non-EGU point totals in a number of states. The key sources of NOx emissions in the oil and gas sector are from the combustion of fossil fuel (primarily drilling rigs, internal combustion (IC) engines and pipeline compressors) and flares. Please refer to the EPA's 2011v6.2 Emissions Modeling Platform TSD for more information on emissions from these sectors.

3 Preliminary Analysis

For the purposes of the proposed rule, the EPA performed a preliminary analysis to characterize whether there are non-EGU source groups with a substantial amount of available cost-effective NOx reductions achievable by the 2017 ozone season. The EPA received no comments that would substantively change this analysis, therefore there was no need to repeat this preliminary analysis for the final CSAPR Update rule.

3.1 Methodology

The EPA's preliminary analysis of potential non-EGU NOx emission reductions was performed using the Control Strategy Tool (CoST). CoST is the software tool the EPA uses to estimate the emission reductions and costs associated with future-year control strategies, and then to generate emission inventories that result from the control strategies applied. CoST tracks information about control measures, their costs, and the types of emissions sources to which they apply. The purpose of CoST is to support national- and regional-scale multi-pollutant analyses, primarily for Regulatory Impact Analyses (RIAs) of the National Ambient Air Quality Standards (NAAQS). CoST is also a component of the Emissions Modeling Framework (EMF) that was used to generate the 2017 non-EGU emissions presented above and in the Emissions Modeling Platform TSD for the proposed CSAPR Update rule. Further discussion and documentation of CoST is available on the EPA's website at http://www.epa.gov/ttnecas1/cost.htm.

Appendices to this TSD discuss recommendations for updates to CoST, including corrections for inapplicable controls, sources already controlled by state rules, sources with permit emissions limits or that have clearly identified controls in place, and sources subject to future NOx emission limits. Appendix A discusses contractor RTI International's work to review estimates for lean burn internal combustion (IC) engines, glass manufacturing, ammonia reformers, and gas turbines.[7] Appendix B discusses contractor SRA International's work on a variety of other categories including many of the others evaluated in this TSD.[8]

EPA has prepared a set of data called the Control Measure Data Base (CMDB) that is used as an important input to CoST. This data includes all control measures utilized by the tool for control strategy analysis. It should be noted that most of the NOx measures included in this report are currently in the Control Measure Data Base used by CoST, and generally do not reflect the updates suggested in these contractor reports. Obstacles to full incorporation of the recommended changes include availability of accurate costs for these measures, and to have cost equations rather than average cost/ton to estimate costs. Control efficiencies are readily available for measures, but costs, particularly those that can be estimated using equations that consider source size or capacity, often are not. In addition, the Pennsylvania

[7] "Update of NOx Control Measure Data in the CoST Control Measure Database for Four Industrial Source Categories: Ammonia Reformers, NonEGU Combustion Turbines, Glass Manufacturing, and Lean Burn Reciprocating Internal Combustion Engines," Revised Draft Report, RTI International, 2014.

[8] "Review of CoST Model Emission Reduction Estimates," SRA International, 2014; "Summary of State NOx Regulations for Selected Stationary Sources," SRA International, 2014.

Department of Environmental Protection's Additional RACT Requirements for Major Sources of NOx and VOCs rule,[9] which was recently finalized, is not included in these contractor reports. The EPA will consider whether or not to incorporate these recommendations for changes or additions to the NOx controls for non-EGUs to support NOx control efforts for future rules and other efforts. The EPA will also consider updates to reflect state emission control requirements (i.e., Pennsylvania's RACT rule). Nonetheless, the information from these reports helped inform our assessment in terms of uncertainty surrounding non-EGU emission reduction potential. Further details on the CMDB can be found on the CoST web site shown above.

For the purpose of identifying a list of non-EGU NOx source groups with controls available, the EPA ran CoST for non-EGU point sources for the 37 eastern U.S. with NOx emissions of greater than 25 tons/year in 2017. The analysis using CoST was a basis for the review of NOx control measures for non-EGUs undertaken by two different contractors for EPA. Through a contractual agreement with EPA, SRA International and RTI International provided reports within which CoST examined a number of source categories of non-EGUs with annualized control costs up to $10,000 per ton (in 2011 dollars). These reports are included in the Appendices of this TSD. CoST selected particular control technologies based on application of a least-cost criterion for control measures applied as part of the control strategy. Other NOx control measures are available for some of these categories, but on average, annualized costs for these measures were at higher cost.

3.2 Uncertainties and Limitations

The EPA acknowledges several important limitations of the non-EGU cost analysis included in this TSD, which include the following:

Boundary of the cost analysis: In this cost analysis we include only the impacts to the regulated industry, such as the costs for purchase, installation, operation, and maintenance of control equipment over the lifetime of the equipment. Recordkeeping, reporting, testing and monitoring costs are not included. Additional profit or income may be generated by industries supplying the regulated industry, especially for control equipment manufacturers, distributors, or service providers. These types of secondary impacts are not included in this cost analysis.

Cost and effectiveness of control measures: Our application of control measures reflect nationwide average retrofit factors and equipment life. We do not account for regional or local variation in capital and annual cost items such as energy, labor, materials, and others. Our estimates of control measure costs may over- or under-estimate the costs depending on how the difficulty of actual retrofitting and equipment life compares with our control assumptions. In addition, our estimates of control efficiencies for control measures included in our analysis assume that the control devices are properly installed and maintained. There is also variability in scale of application that is difficult to reflect for small area sources of emissions.

[9] Available at: http://www.pabulletin.com/secure/data/vol46/46-17/694.html

Discount (interest) rate: Because we obtain control cost data from many sources, we are not always able to obtain consistent data across original data sources. If disaggregated control cost data are not available (i.e., where capital, equipment life value, and operation and maintenance [O&M] costs are not shown separately), the EPA assumes that the estimated control costs are annualized using a 7 percent discount rate, which is the discount (interest) rate used in accordance with OMB guidance in Circular A-4. In general, we have some disaggregated data available for non-EGU point source controls. In addition, while these interest rates are consistent with OMB guidance, the actual interest rates may vary regionally or locally.

Accuracy of control costs: We estimate that there is an accuracy range of +/- 30 percent for non-EGU point source control costs. This level of accuracy is described in the EPA Air Pollution Control Cost Manual, which is a basis for the estimation of non-EGU control cost estimates included in this TSD. This level of accuracy is consistent with either the budget or bid/tender level of cost estimation as defined by the American Association for Cost Engineering (AACE) International. In addition, the accuracy of costs is also influenced by the availability of data underlying the cost estimates for individual control measures. For some control measures, we recognize that there is limited data available to generate robust cost estimates. This is reflected in the derivation of costs for some of the non-EGU NOx control measures discussed in Appendix A for this TSD.

3.3 CoST Results

The results of the CoST analysis are displayed in Table 3. In Table 3, we display the source groups selected by CoST, the Source Classification Codes (SCCs) included in those groups[10], the least-cost control technology for a given source group (selected by CoST), the current estimate (in dollars per ton, using 2011 dollars) of the annualized cost per ton NOx reduced of the control technology, the current estimate of the time necessary to install the selected control technology (not including permitting time), the estimated ozone season emissions in the East from the non-EGU source group in 2017 in the absence of the installation of the selected controls, and the estimated potential ozone season reductions in the East from the non-EGU source group in 2017 assuming the CoST selected controls could be fully installed and operational prior to the 2017 ozone season (which as discussed in more detail later, is not the case for many of the categories examined). Note that CoST does not account for installation time or time required for the permitting process. Instead it provides information on the control measures applicable to sources in the inventory, along with the cost of installation and operation and maintenance of the selected measures.

[10] The CoST results do not indicate applicability of the recommended control technology to all sources in the source group but only to the specific SCCs for which control technologies are applicable. For example, for the cement kilns source group, Biosolid Injection Technology (BSI) is applicable only for the types of cement kilns covered by the listed SCCs.

Table 3: CoST Results: Non-EGU Source Groups with NOx Reductions

Non-EGU Source Group	SCCs	Control Technology Recommended by CoST	Current estimate of NOx $/ton, CoST (2011 $)	Time to install[11] [12](excluding permitting, reporting preparation, programmatic and administrative considerations[13])	2017[14] NOx Emissions (37 States + DC), OS tons, CoST	2017 Potential Reductions [15] (37 States + DC), OS tons, CoST
Cement Kilns	30500622 (preheater kiln), 30500623 (preheater/precalciner); 39000201 (kiln/dryer); 39000288 (kiln in process coal)	Biosolid Injection Technology (BSI)	$410	Uncertain	24,760	4,207

[11] Time to install is not an output of CoST, but are rather estimates determined by the EPA based on research from a variety of sources. See, "Typical Installation Timelines for NOx Emissions Control Technologies on Industrial Sources," Institute of Clean Air Companies, December 2006 (all sources except Cement Kilns and RICE (Reciprocating Internal Combustion Engines)), "Cement Kilns Technical Support Document for the NOx FIP," EPA, January 2001 (cement kilns), and "Availability and Limitations of NOx Emission Control Resources for Natural Gas-Fired Reciprocating Engine Prime Movers Used in the Interstate Natural Gas Transmission Industry," Innovative Environmental Solutions Inc., July 2014 (prepared for the INGAA Foundation).

[12] In general, for control retrofits to non-EGU sectors, it appears that the full sector-wide compliance time is uncertain, but is longer than the installation time shown above for a typical unit. We have insufficient information on capacity and experience within the OEM suppliers and major engineering firms supply chain to offer conclusions on their availability to execute the project work for non-EGU sectors.

[13] Non-EGUs of any type – boiler or turbine – that are not currently required to monitor and report in accordance with 40 CFR Part 75 and/or not currently participating in the CSAPR program will require additional time relative to EGUs that are currently equipped with Part 75 monitoring and reporting and/or participating in the current CSAPR program. Installation of NOx monitors for the reporting of NOx mass requires the construction of platforms, CEM shelters, procurement of equipment, certification testing, and electronic data reporting programming of a data handling system. These added timing considerations for infrastructure on the non-EGU sources combined with the additional programmatic adoption measures necessary make installation of controls by the 2017 timeframe established in this rule less likely and more uncertain for industrial sources.

[14] Emissions and potential reductions for Gas Turbines ($163/ton grouping), Cement Kiln/Dryer (Bituminous Coal) ($942/ton grouping), Coal Cleaning – Thermal Dryer (2), Spreader Strokers, Petroleum Refinery Process Heaters, Incinerators, Boilers & Process Heaters, Gas-Fired Process Heaters, Coal Boilers, By-Product Coke Manufacturing, ICI Boilers – Residual Oil, Ammonia Production, Glass Manufacturing, ICI Boilers, Iron & Steel - In-Process Combustion - Bituminous Coal, Industrial Processes Miscellaneous, Catalytic Cracking, Process Heaters, & Coke Ovens, Petroleum Refinery Gas-Fired Process Heaters, Glass Manufacturing – Pressed, Glass Manufacturing – Container, Petroleum Refinery Gas-Fired Process Heaters, and RICE source groups were calculated for 2018, however they are likely to be virtually identical to projections for 2017. Non-EGU source groups with projected aggregate 2017 NOx emissions below 100 OS tons are excluded from this table.

[15] Potential reductions assume fully implemented controls by the start of the 2017 ozone season.

Cement Mfg (dry)	30500606 Industrial Processes, Mineral Products, Cement Manufacturing (Dry Process), Kilns	Selective Non-Catalytic Reduction (SNCR)	$1,255	42-51 weeks	13,006	6,501
Cement Mfg (wet)	30500706 Industrial processes, mineral products, Cement Manufacturing (Wet Process), Kilns	Mid-Kiln Firing	$73	5-7 months	7,971	2,287
Coal Cleaning – Thermal Dryer (1)	30502508 Construction Sand & Gravel, Dryer; 30501001 Industrial Processes, Mineral Products, Coal Mining, Cleaning, and Material Handling, Fluidized Bed Reactor	Low NOx Burner (LNB)	$1,125	6-8 months	503	165
Coal Cleaning – Thermal Dryer (2)	30501001 Industrial Processes, Mineral Products, Coal Mining, Cleaning, and Material Handling, Fluidized Bed Reactor	Low NOx Burner (LNB)	$1,640	6-8 months	154	63
Cement Kiln/Dryer (Bituminous Coal)	39000201 Industrial Processes, In-process Fuel Use, Bituminous Coal, Cement Kiln/Dryer (Bituminous Coal)	SNCR	$942	42-51 weeks	520	260
Iron and Steel Mills - Reheating	30300934 (303015) Primary Metal Production: Steel; 30300933	Low NOx Burner (LNB) & Flue Gas Recirculation (FGR)	$620	6-8 months	1,064	664
Steel Production	30490033 Industrial Processes, Secondary Metal Production, Fuel Fired Equipment, Natural Gas: Furnaces; 30400704 Industrial Processes, Secondary Metal Production, Steel Foundries, Heat Treating Furnace	Low NOx Burner (LNB)	$928	6-8 months	281	141
Nitric Acid Mfg	30101301 Chemical Manufacturing, Nitric Acid, Absorber Tail Gas (Pre-1970 Facilities); 30101302 Chemical Manufacturing, Nitric Acid, Absorber Tail Gas (Post-1970 Facilities)	NSCR	$900	6-14 weeks	1,290	724
Petroleum Refinery Process Heaters	30600106 Industrial Processes, Petroleum Industry, Process Heaters, Process Gas-fired	SCR-95%	$940-$1101	28-58 weeks	179	177

Gas Turbines	20200201 Natural Gas, Turbine; 20200203 Natural Gas, Turbine: Cogeneration; 20300202 Natural Gas, Turbine	Low NOx Burner (LNB)	$163	12 months	945	793
Gas Turbines	20200201 Natural Gas, Turbine; 20200203 Natural Gas, Turbine: Cogeneration; 20300202 Natural Gas, Turbine; 20300203 Natural Gas, Turbine: Cogeneration	Low NOx Burner (LNB)	$800	6-8 months	16,036	4,713
Natural Gas RICE Pipeline Compressors	20200202 Internal Combustion Engines, Industrial, Natural Gas, Reciprocating	Adjust Air to Fuel Ratio and Ignition Retard	$249	Uncertain	10,099	2,958
Natural Gas RICE Miscellaneous	20100202 Internal Combustion Engines, Electric Generation, Natural Gas, Reciprocating; 20200202 Internal Combustion Engines, Industrial, Natural Gas, Reciprocating; 20200204, Internal Combustion Engines, Industrial, Natural Gas, Reciprocating: Cogeneration; 20300201, Internal Combustion Engines, Commercial/Institutional, Natural Gas, Reciprocating	Adjust Air to Fuel Ratio and Ignition Retard	$447	Uncertain	27,600	8,085
Natural Gas RICE Pipeline Compressors, Rich Burn	20200253 Internal Combustion Engines, Industrial, Natural Gas, 4-cycle Rich Burn	NSCR	$517	Uncertain	11,758	10,571
Natural Gas RICE Pipeline Compressors, Lean Burn / Clean Burn	20200252 Internal Combustion Engines, Industrial, Natural Gas, 2-cycle Lean Burn; 20200254 Internal Combustion Engines, Industrial, Natural Gas, 4-cycle Lean Burn; 20200255 Internal Combustion Engines, Industrial, Natural Gas, 2-cycle Clean Burn; 20200256 Internal Combustion Engines, Industrial, Natural Gas, 4-cycle Clean Burn	Low Emission Combustion (LEC)	$649	Uncertain	47,321	41,169
Diesel / Dual Fuel RICE	20200401 Internal Combustion Engines, Industrial, Large Bore Engine, Diesel; 20200402 Internal Combustion Engines, Industrial, Large Bore Engine, Dual Fuel (Oil/Gas)	Ignition Retard	$1,255	Uncertain	865	216

Catalytic Cracking (1)	30600201 Industrial Processes, Petroleum Industry, Catalytic Cracking Units, Fluid Catalytic Cracking Unit	Low NOx Burner (LNB) & Flue Gas Recirculation (FGR)	$1,375	6-8 months	255	140
Spreader Strokers	10100204 External Combustion Boilers, Electric Generation, Bituminous/Subbituminous Coal, Spreader Stroker (Bituminous Coal)	SNCR	$1,390	42-51 weeks	394	158
Petroleum Refinery Process Heaters	30600106 Industrial Processes, Petroleum Industry, Process Heaters, Process Gas-fired	SCR-95%	$1,406-$1,501	28-58 weeks	161	157
Incinerators	50200102, 50200103, 50200104, 50200504, 30190013, 30190014, 50300101, 50300106, 50300112, 50300113, 50300501, 50300503, 50300504, 50300599, 50100101, 50100102, 50100103, 50100506, 50100515, 50100516, 39990024 Incineration	SNCR	$1,842	42-51 weeks	6,556	2,950
Boilers & Process Heaters	10200203, 10200217, 10300216, 10200204, 10200205, 10300207, 10300209, 10200799 External Combustion Boilers; 30190002, 30600103 Industrial Process Heaters	SCR	$2,235	28-58 weeks	13,146	10,358
Natural Gas RICE Electric Generation	20100206 Internal Combustion Engines, Electric Generation, Natural Gas, Reciprocating: Evaporative Losses (Fuel Delivery System)	Adjust Air to Fuel Ratio and Ignition Retard	$2,347	Uncertain	107	32
Catalytic Cracking (2)	30600201 Industrial Processes, Petroleum Industry, Catalytic Cracking Units, Fluid Catalytic Cracking Unit; 30600202 Industrial Processes, Petroleum Industry, Catalytic Cracking Units, Catalyst Handling System	Low NOx Burner (LNB) & Flue Gas Recirculation (FGR)	$2,369	6-8 months	274	97
Gas-Fired Process Heaters (1)	30600104 Industrial Processes, Petroleum Industry, Process Heaters, Gas-fired	SCR-95%	$2,376	28-58 weeks	211	204
Coal Boilers	10200206, 10200224, 10200225, 10300102, 10300208, 10300224, 10300225	SNCR	$2,413	42-51 weeks	1099	495

Gas-Fired Process Heaters (2)	30600104 Industrial Processes, Petroleum Industry, Process Heaters, Gas Fired	Ultra-Low NOx Burners	$2,419-$2,638	6-8 months	137	64
By-Product Coke Manufacturing	30300306 Industrial Processes, Primary Metal Production, By-Product Coke Manufacturing, Oven Underfiring	SNCR	$2,673	42-51 weeks	2,366	1,420
ICI Boilers – Residual Oil	10200401, 10200402, 10200404, 10300401, 10300402 External Combustion Boilers, Residual Oil	LNB & SNCR	$2,850	6-8 months	991	689
Ammonia Production	30100306 Industrial Processes, Chemical Manufacturing, Ammonia Production, Primary Reformer: Natural Gas Fired	SCR	$2,896	28-58 weeks	2,508	2,257
Glass Manufacturing - Flat	30501403 Industrial Processes, Mineral Products, Glass Manufacture, Flat Glass: Melting Furnace	OXY-Firing	$3,097	Uncertain	9,721	7,880
ICI Boilers	10200201, 10200202, 10200212, 10300205, 10200501, 10200504, 10200601, 10200602, 10200603, 10200604, 10201401, 10300601, 10300602, 10200701, 10200704, 10200707, 10201402 External Combustion Boilers	Low NOx Burner & SCR	$3,456	6-8 months (LNB) 28-58 weeks (SCR)	31,005	28,204
Iron & Steel - In-Process Combustion - Bituminous Coal	30300819, 30300824, 30300913, 30300914, 30301522 Industrial Processes, Primary Metal Production	SCR	$3,705	28-58 weeks	829	746
Diesel RICE Miscellaneous	20100102 Internal Combustion Engines, Electric Generation, Distillate Oil (Diesel), Reciprocating; 20100107 Internal Combustion Engines, Electric Generation, Distillate Oil (Diesel), Reciprocating: Exhaust; 20200102 Internal Combustion Engines, Industrial, Distillate Oil (Diesel), Reciprocating; 20200106 Internal Combustion Engines, Industrial, Distillate Oil (Diesel), Reciprocating: Evaporative Losses (Fuel Storage and Delivery System);	SCR	$3,814	28-58 weeks	1,091	869

	20200107 Internal Combustion Engines, Industrial, Distillate Oil (Diesel), Reciprocating: Exhaust; 20300101 Internal Combustion Engines, Commercial/Institutional, Distillate Oil (Diesel), Reciprocating; 20400403 Internal Combustion Engines, Engine Testing, Reciprocating Engine, Distillate Oil					
Catalytic Cracking, Process Heaters, & Coke Ovens	30600201, 30390004, 39000701, 39000702, 39000797	LNB & FGR	$5,199	6-8 months	1,989	1,094
Petroleum Refinery Gas-Fired Process Heaters (3)	30600104 Industrial Processes, Petroleum Industry, Process Heaters, Gas-fired, 30600106 Industrial Processes, Petroleum Industry, Process Heaters, Process Gas-fired	SCR-95%	$8,885-$9,140	28-58 weeks	370	316
Glass Manufacturing - Pressed	30501404 Industrial Processes, Mineral Products, Glass Manufacture, Pressed and Blown Glass: Melting Furnace	OXY-Firing	$6,356	Uncertain	1,001	851
Petroleum Refinery Gas-Fired Process Heaters (2)	30600104 Industrial Processes, Petroleum Industry, Process Heaters, Gas-fired, 30600106 Industrial Processes, Petroleum Industry, Process Heaters, Process Gas-fired	SCR-95%	$7,533-$8,120	28-58 weeks	362	304
Industrial Processes Miscellaneous	30600201 Industrial Processes, Petroleum Industry, Catalytic Cracking Units, Fluid Catalytic Cracking Unit; 39000701 Industrial Processes, In-process Fuel Use, Process Gas, Coke Oven or Blast Furnace	LNB & FGR	$4,026	6-8 months	871	479
Glass Manufacturing - Container	30501402 Industrial Processes, Mineral Products, Glass Manufacture, Container Glass: Melting Furnace	OXY-Firing	$7,481	Uncertain	3,107	2,628
Petroleum Refinery Gas-	30600104 Industrial Processes, Petroleum Industry, Process Heaters, Gas-fired; 30600106 Industrial	SCR-95%	$5,609-$5,884	28-58 weeks	372	338

Fired Process Heaters (1)	Processes, Petroleum Industry, Process Heaters, Process Gas-fired					
Taconite Ore Processing	30302351, 30302352, 30302359 Industrial Processes, Primary Metal Production, Taconite Ore Processing, Induration	SCR	$6,449	28-58 weeks	1,188	991
Diesel RICE Electric Generation	20200102 Internal Combustion Engines, Electric Generation, Distillate Oil (Diesel), Reciprocating	SCR	$1,499	28-58 weeks	778	622

3.4 Discussion of Non-EGU Source Groups

The below discussion utilizes the information in Table 3 in order to assess whether significant aggregate NOx mitigation is achievable from non-EGU sources by the 2017 ozone season.

It is clear that a number of source categories have been identified by CoST using the least-cost procedure that have the potential for non-EGU stationary source emissions reductions. There are some notable source categories that have the potential for substantial non-EGU stationary source emissions reductions below $10,000 per ton.[16] However, for the purposes of this analysis, the EPA did not further examine control options above $3,400 per ton. This is consistent with the range we analyzed for EGUs in the proposed and final rules, and is also consistent with what the EPA has identified in previous transport rules as highly cost-effective, including the NOx SIP call.[17] Again, this was done because the objective of this analysis is to characterize whether significant aggregate NOx mitigation is achievable from non-EGU sources by the 2017 ozone season, so we focused the search on categories with highly cost-effective technologies. This focus excludes several source groups with high emissions reduction potential because reductions from those source groups are not available for $3,400 per ton or less, including: ICI boilers using SCR & LNB; Catalytic Cracking, Process Heaters, & Coke Ovens using LNB & FGR; and Pressed and Container Glass Manufacturing using OXY-Firing.

At a cost level of $3,400 per ton or less, there are a number of source groups with substantial reduction potential. However the table also identifies several source groups whose reduction potential is not significant, and which the EPA did not weigh heavily in assessing the aggregate non-EGU NOx emission reduction potential. This is because the aggregate potential reductions from these "insignificant" source groups is small. These "insignificant" source groups comprise those source groups with many small sources, as well those containing a limited number of larger sources; for either of these types of groups, potential aggregate emission reductions are small relative to reductions available from other source categories. The EPA does not believe that small sources have significant emission reduction potential in the aggregate because most small sources emit less than 100 tons of NOx per year. (It is worth noting that small sources account for a significant percentage of the total number of non-EGU point sources. See Appendix A/B for more information on the number of sources within certain states.) The EPA therefore excludes from the focus of this analysis these insignificant source groups, namely, those with aggregate potential reductions of 1,000 tons per year or less (which represents less than 0.1 percent of the anthropogenic ozone season inventory).

The EPA will now focus on the several source groups with significant cost-effective reductions identified in Table 3. These source groups include cement kilns, two types of cement manufacturing (dry and wet), gas turbines, four separate groups of natural gas reciprocating IC engines (RICE), incinerators, boilers & process heaters, by-product coke

[16] $10,000 per ton represents the cost/ton for Best Available Control Technology (BACT) determinations, which usually do not exceed $10,000/ton in the Eastern U.S.

[17] $3,400 per ton represents the $2,000 per ton value (in 1990 dollars) used in the NOx SIP call, adjusted to the 2011 dollars used throughout this proposal Adjustment of costs was made using the Chemical Engineering Plant Cost Index (CEPCI) annual values for 1990 and 2011.

manufacturing, ammonia production, and flat glass manufacturing. These source groups are listed below with their control technologies, estimated annualized control costs, and estimated installation time. These groups have been organized into 7 categories for clarity, based on either common control technologies (categories 1 through 6) or similarity of source groups (category 7).

Category 1	**Control Tech.**	**Est. Cost**	**Est. Inst. Time**
-Cement Mfg (dry)	SNCR	$1,255	42-51 weeks
-Incinerators	SNCR	$1,842	42-51 weeks
-By-Product Coke Manufacturing	SNCR	$2,673	42-51 weeks
Category 2			
-Cement Kilns	Biosolid Injection Technology (BSI)	$410	Uncertain
Category 3			
-Gas Turbines	Low NOx Burner (LNB)	$800	6-8 months
Category 4			
-Cement Mfg (wet)	Mid-Kiln Firing	$73	5-7 months
Category 5			
-Boilers & Process Heaters	SCR	$2,235	28-58 weeks
-Ammonia Production	SCR	$2,896	28-58 weeks
Category 6			
-Glass Manufacturing - Flat	OXY-Firing	$3,097	Uncertain
Category 7			
-Gas RICE Pipeline Compressors	Adjust AFR and Ignition Retard	$249	Uncertain
-Gas RICE Miscellaneous	Adjust AFR and Ignition Retard	$447	Uncertain
-Gas RICE Pipeline Compressors, Rich Burn	NSCR	$517	Uncertain
-Gas RICE Pipeline Compressors, Lean/Clean Burn	Low Emission Combustion (LEC)	$649	Uncertain

The EPA makes the following observations about the potential reductions from these significant cost-effective categories.

The source groups listed in Category 1 would utilize SNCR as the recommended control technology. The time necessary to install SNCR equipment is generally well known. A typical installation timeline of 42-51 weeks is generally needed to complete a SNCR project

going from the bid evaluation through startup, which installation timeline is specific to non-EGUs. Based on this fact alone (which does not consider additional time likely necessary for permitting or installation of monitoring equipment), the ability for SNCR technology to be installed and operational in time for the 2017 ozone season seems very unlikely.

The source group listed in Category 2 contains a specific source of uncertainty in regards to biosolid injection technology (BSI). Due in large part to the lack of widespread use of this control technology, research performed by the EPA has been unable to uncover any reliable information on the time required to install the necessary BSI equipment on cement kilns. Compliance timing with regard to biosolid injection technology should therefore be considered extremely uncertain. Based on this fact alone (and aside from additional time likely necessary for permitting or installation of monitoring equipment), the ability for this technology to be installed and operational at all facilities in this category in time for the 2017 ozone season is unknown.

The source group listed in Category 3 would utilize LNB as the recommended control technology, with a necessary installation time of approximately 6-8 months. Some of the LNB combustion control technology identified for non-EGU sources reflects a different technology that may have different timing considerations than that considered for EGU boilers. For instance, LNB at non-EGU combustion turbines in this assessment refers to "dry low-NOx burners" (DLNB) which, in addition to the usual diffusion burner, typically also include provisions to "premix" natural gas and combustion air prior to combustion. In spite of the similarity in naming, this is a different technology than the LNB technology examined and assumed for reductions at EGU boilers. Therefore, the same timing assumptions assumed and demonstrated on the EGU side are not necessarily applicable to combustion control technology for non-EGU sources. Moreover, non-EGUs of any type – boiler or turbine – that are not currently required to monitor and report in accordance with 40 CFR Part 75 will require additional time relative to EGUs that are currently equipped with Part 75 monitoring and reporting (such as those EGUs covered under federal transport rulemakings and this one). Installation of NOx monitors for the reporting of NOx mass requires the construction of platforms, Continuous Emissions Monitoring (CEM) shelters, procurement of equipment, certification testing, and electronic data reporting programming of a data handling system. These timing considerations on the non-EGU sources make installation of controls by the 2017 timeframe established in this rule less likely and more uncertain for industrial sources.

The source group listed in Category 4 would utilize mid-kiln firing as the recommended control technology. A fairly well-known aspect is the time necessary to install this equipment; typically, 5-7 months is needed to complete a mid-kiln firing project going from the bid evaluation through startup. However, the above-discussed issues regarding monitoring and reporting of NOx mass on non-EGU sources that currently lack such monitoring equipment make installation of controls by the 2017 timeframe of this rule less likely and more uncertain for industrial sources such as those in the cement manufacturing (wet) source group.

The source groups listed in Category 5 would utilize SCR as the recommended control technology, with an installation time of 28-58 weeks for SCR (dependent on exhaust gas flow rates; larger systems require longer installation times). Based on the installation time frame alone (which does not consider additional time likely necessary for permitting or installation of monitoring equipment), the ability for SCR technology to be installed and operational in time for the 2017 ozone season seems unlikely. In addition to this uncertainty, the above-discussed issues regarding monitoring and reporting of NOx mass on non-EGU sources that currently lack such monitoring equipment make installation of controls by the 2017 timeframe established in this rule less likely and more uncertain for industrial sources such as those in Category 5 source groups.

The source group listed in Category 6 would utilize OXY-Firing as the recommended control technology, with an uncertain necessary installation. A specific source of uncertainty with regard to the estimated installation time of this control technology is that OXY-Firing is generally installed only at the time of a furnace rebuild, which rebuilds may occur at infrequent intervals of a decade or more.[18] In addition to this uncertainty, the above-discussed issues regarding monitoring and reporting of NOx mass on non-EGU sources that currently lack such monitoring equipment make installation of controls by the 2017 timeframe established in this rule less likely and more uncertain for industrial sources such as those in Category 6 source group.

Finally, the source groups listed in Category 7 are all RICE. While some of the recommended control technologies may involve installation timelines that are relatively short on a per-engine basis, there is substantial uncertainty in large-scale installation over numerous sources. References indicate that implementation of NOx controls of any type on a large number of RICE will require significant lead time to train and develop resources to implement emission reduction projects; market demand could significantly exceed the available resource base of skilled professionals.[19] Additionally, in order not to disrupt pipeline capacity, engine outages must be staggered and scheduled during periods of low system demands for those engines involved in natural gas pipelines (as is the case with 3 of the 4 RICE source groups with significant cost-effective reductions). In addition to this uncertainty, the above-discussed issues regarding monitoring and reporting of NOx mass on non-EGU sources that currently lack such monitoring equipment make installation of controls by the 2017 timeframe established in this rule less likely and more uncertain for industrial sources such as RICE.

4 Summary of Comments Received on Proposed Rule TSD

The EPA received relatively few comments on the draft Assessment of Non-EGU NOx Emission Controls, Cost of Controls, and Time for Compliance TSD provided in the docket for this rule. None of these comments changed our conclusions reached in the draft TSD, as commenters generally agreed with the EPA's assessment with respect to the regulation of

[18] See Appendix B.

[19] "Availability and Limitations of NOx Emission Control Resources for Natural Gas-Fired Reciprocating Engine Prime Movers Used in the Interstate Natural Gas Transmission Industry," Innovative Environmental Solutions Inc., July 2014.

non-EGUs in this rule. Detailed responses to these comments can be found in the response to comments document available in the docket for this final rule. A brief discussion of one comment containing data on control information is presented below.

Commenter Fuel Tech, Inc. (FTI) provided information on the installation time required for SNCR equipment, stating that "FTI has provided SNCR systems in 8-12 months (from contract award to performance guarantee certification)..."[20] This timeframe is largely consistent with the 42-51 week (9.7-11.7 month) timeframe estimate presented by the EPA in the draft TSD.

In addition, FTI provided information on a range of SNCR cost per ton based on installations from 2010 to 2015 on non-EGU sources, stating that "these recent examples show NOx reduction cost effectiveness in the range of $2,200 to $2,900 per ton of NOx removed on an annual basis."[21] FTI's "Figure 1"[22] also provided a chart of cost effectiveness ($/ton) versus unit size (mmBTU/hr) for both annual and ozone season NOx. A log fit of the ozone season curve shows cost effectiveness in the range of approximately $2,000 to approximately $6,500 per ton of ozone season NOx removed, with installations tending to be more expensive for smaller unit sizes. Although FTI's estimates are based on different interest rates and capital investments than our estimates, they are worthwhile to note in comparison to our stated estimate of $1,300 to $2,700 per ton of NOx removed on an ozone season basis.

5 Conclusion

The above preliminary analysis performed by the EPA indicates that uncertainty exists regarding whether significant aggregate NOx mitigation is achievable from non-EGU point sources by the 2017 ozone season. Reducing this uncertainty requires further understanding of potentially available control measures that could have annualized costs of $3,400 per ton or less. In addition, further implementation of the recommendations in the Appendices to this TSD, the extent of which as determined by the EPA to be needed, may also reduce our uncertainty regarding the credibility of data for control measures included in future non-EGU NOx control strategy efforts. Please note that while the information in these Appendices supports our conclusion regarding whether significant aggregate NOx mitigation is achievable from non-EGU point sources by the 2017 ozone season, this final TSD is making no conclusions about the recommendations for further improvements.

While a number of source groups with control options were identified, the EPA did not further examine control options above $3,400 per ton, consistent with the range analyzed for EGUs in the proposed and final rules and with what the EPA has identified in previous transport rules as highly cost-effective. A number of source groups were identified at a cost level of $3,400 per ton or less, however the EPA believes several of these source groups may not be significant. Of the remaining source groups, a variety of factors indicated the ability for control technology to be installed and operational in time for the 2017 ozone

[20] EPA-HQ-OAR-2015-0500-0356, page 3.
[21] EPA-HQ-OAR-2015-0500-0356, page 7.
[22] EPA-HQ-OAR-2015-0500-0356, page 6.

season seemed unlikely, with an overarching consideration being that non-EGUs of any type that are not currently required to monitor and report in accordance with 40 CFR Part 75 will require additional time for implementation relative to EGUs that are currently equipped with Part 75 monitoring and reporting. These added timing considerations on the non-EGU sources make installation of controls by the 2017 timeframe established in this rule less likely and more uncertain for industrial sources.

With all of these factors being considered, the limited available information points to an apparent scarcity of non-EGU reductions that could be accomplished by the beginning of the 2017 ozone season. As noted in the proposed and final rule, this conclusion has led the EPA to focus the final FIPs on EGU reductions. Both the proposal and the final rule acknowledge that this may not be the full remedy that is ultimately needed to eliminate an upwind state's significant contribution to nonattainment or interference with maintenance of the 2008 ozone NAAQS (or, for that matter, the 2015 ozone NAAQS) in other states. Emissions reductions from the non-EGU categories discussed above may be necessary, though on a longer timeframe than the 2017 compliance deadline being finalized in this rulemaking. The EPA intends to explore this question further in future ozone transport rulemakings.

Sierra Club v. McCarthy

Case No. 3:15-cv-04328-JD (JSC)

Declaration of Janet G. McCabe

Attachment 5

Please note that the following includes active and long-term projects for EPA's Office of Air and Radiation as of publication of the Fall 2016 regulatory agenda. Some of these dates are target dates and may have shifted, or the project may be completed.

The regulatory agenda is available at https://www.reginfo.gov/.

1. **Section 610 Review of Control of Hazardous Air Pollutants From Mobile Sources (Completion of a Section 610 Review) (2060-AS88)**

The rulemaking "Control of Hazardous Air Pollutants From Mobile Sources" was finalized by the EPA in February 2007 (72 FR 8428, February 26, 2007). This program established stringent new controls on gasoline, passenger vehicles, and gas cans to further reduce emissions of benzene and other mobile source air toxics. The EPA developed a Small Entity Compliance Guide, which provides descriptions of the regulations and small entity provisions, Q&As, and other helpful compliance information. This new entry in the regulatory agenda announces that EPA has reviewed this action pursuant to section 610 of the Regulatory Flexibility Act (5 U.S.C. 610) to determine if the provisions that could affect small entities should be continued without change, or should be rescinded or amended to minimize adverse economic impacts on small entities. As part of this review, EPA solicited comments on the following factors: (1) The continued need for the rule; (2) the nature of complaints or comments received from the public concerning the rule; (3) the complexity of the rule; (4) the extent to which the rule overlaps, duplicates, or conflicts with other Federal, State, or local government rules; and (5) the degree to which the technology, economic conditions or other factors have changed in the area affected by the rule. The EPA received one comment about the program unrelated to the impact of the rulemaking on small entities. The current mobile source air toxics standards program provided substantial flexibility for regulated entities, especially small entities, and does not warrant revision at this time. See EPA's report summarizing the results of this review in the docket EPA-HQ-OAR-2016-0175. This docket can be accessed at www.regulations.gov.

End Review 11/00/2016

2. **Mid Term Evaluation of the Model Year 2022-21025 Light Duty Vehicle Greenhouse Gas Standards (2060-AS97)**

As part of the rulemaking establishing the model year (MY) 2017-2025 light-duty vehicle GHG standards in 2012, EPA made a regulatory commitment to conduct a Midterm Evaluation (MTE) of the standards established for the later years of the program - 2022-2025. EPA will coordinate with the National Highway Traffic Safety Administration (NHTSA) and the California Air Resources Board (CARB) in conducting the MTE.

Through the MTE, EPA will decide whether the standards for model years 2022-2025, established in 2012, are still appropriate given the latest available data and information. EPA's decision could go one of three ways: the standards remain appropriate, the standards should be less stringent, or the standards should be more stringent. EPA will examine a wide range of factors, such as developments in powertrain technology, vehicle electrification, light-weighting and vehicle safety impacts, the penetration of fuel efficient technologies in the marketplace, consumer acceptance of fuel efficient technologies, trends in fuel prices and the vehicle fleet, employment impacts, and many others.

EPA's regulations require several formal steps in the MTE process, including several opportunities for public input. The first step in the process was the issuance jointly by EPA, NHTSA, and CARB of a Draft Technical Assessment Report (TAR) for public comment in July 2016. The Draft TAR is a technical report, not a decision document, and examines a wide range of factors relevant to the 2022-2025 standards. Public input on the Draft TAR, along with any new data and information, will inform a subsequent Proposed Determination which will undergo public comment, and a Final Determination, required by EPA's regulations by April 2018. The MTE will be conducted through a collaborative, data-driven, and transparent process. To gather the most robust data and information to inform the MTE, EPA, in coordination with NHTSA and CARB, is conducting extensive outreach with a wide range of stakeholders including auto manufacturers, automotive suppliers, NGOs, consumer groups, labor unions, automobile dealers, states, and others.

Notice 07/17/2016 (81 FR 49217)

Second Notice To Be Determined

3. New Source Performance Standards (NSPS) and Emission Guidelines (EG) for Large Municipal Waste Combustors (MWCs) – Risk and Technology Review (2060-AO18)

This action will address the agency's residual risk and technology review (RTR) of the Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources for Large Municipal Waste Combustors. The New Source Performance Standards (NSPS), subpart Eb, and the Emission Guidelines, subpart Cb, were promulgated pursuant to section 129 of the Clean Air Act (CAA) on May 10, 2006. The NSPS and emission guidelines established emission limitations based on maximum achievable control technology for controlling emissions of hazardous air pollutants and criteria pollutants from large municipal waste combustors. The regulated pollutants, as required under CAA section 129(a)(4), are particulate matter, sulfur dioxide, hydrogen chloride, oxides of nitrogen, carbon monoxide, lead, cadmium, mercury, and dioxins/furans. This action will implement the residual risk review requirements of CAA section 129(h)(3) and the technology review requirements of CAA section 129(a)(5). The statute directs the EPA to promulgate emission standards under CAA 112(f) for a category of solid waste incineration units if such standards are required under CAA section 112(f). Any such standards are to be promulgated within eight years after promulgation of the original standards under CAA section 129. CAA section 129(h)(3) also specifies that only the pollutants listed under CAA section 129(a)(4) shall be considered and regulated, if required, under the residual risk review. CAA section 129(a)(5) requires the EPA to review and revise the standards and other requirements as necessary, no less often than every five years.

Notice 03/20/2007 (72 FR 13016)

NPRM 07/00/2017

4. **Air Quality: Revision to Definition of Volatile Organic Compounds -- Exclusion of Benzotrifluoride (2060-AR93)**

This direct final with parallel proposal would revise EPA's definition of Volatile Organic Compounds (VOCs) for purposes of preparing State Implementation Plans (SIPs) to attain the National Ambient Air Quality Standards (NAAQS) for ozone. The action would add benzotrifluoride (also known as trifluorotoluene, CASNR 98-08-8) to the list of compounds excluded from the definition of VOC on the basis that this compound makes a negligible contribution to tropospheric ozone formation. VOC exemption petition submitted by Kowa American Corp. (Prior: OCC) on 7/29/12.

NPRM 08/00/2017

Direct Final Rule 08/00/2017

5. **Petition to Add n-Propyl Bromide to the List of Hazardous Air Pollutants (2060-AS26)**

The Clean Air Act (CAA) requires the EPA to regulate compounds that are listed as air toxics, also known as hazardous air pollutants (HAP). Air toxics are those pollutants known, or suspected, to cause cancer and other serious human health problems. The CAA allows the EPA to consider petitions to modify the list, by adding or removing substances. Individuals seeking to add a substance must demonstrate the substance is an air pollutant and that emissions, ambient concentrations, bioaccumulation or deposition of the substance are known to cause or may reasonably be anticipated to cause adverse effects to human health or adverse environmental effects. The Agency received two petitions to add n-Propyl Bromide to the HAP list from the Halogenated Solvents Industry Alliance in October 2010 and from the State of New York in November 2011. Once the EPA receives a petition, it conducts two reviews: (1) a completeness review, to determine whether there is sufficient information on which to base a decision; and, (2) a technical review, to evaluate the merits of the petition. The petitions were determined to be complete and a notice of receipt of a complete petition was published in the Federal Register on 2/6/15. This action addresses the technical review of the petitions based on the CAA section 112(b)(3) requirements.

Notice 12/00/2016

6. **National Emissions Standards for Hazardous Air Pollutants From Secondary Lead Smelting (2060-AS32)**

This action addresses reconsideration petitions filed by environmental and industry groups following the January 5, 2012, Residual Risk and Technology Review for Secondary Lead Smelters. The EPA agreed to reconsider limited aspects of the final rule.

NPRM 04/00/2017

Final Rule 01/00/2018

7. Risk and Technology Review for the National Emission Standards for Hazardous Air Pollutants for Pulp and Paper Combustion Sources (2060-AS46)

Abstract: This action will address the agency's residual risk and technology review (RTR) of the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Pulp and Paper Combustion Sources. The Pulp and Paper Combustion Sources NESHAP, subpart MM, was promulgated pursuant to section 112(d) of the Clean Air Act (CAA) on 1/12/01, and amended in 2003. The NESHAP established emission limitations based on maximum achievable control technology (MACT) for controlling emissions of hazardous air pollutants (HAP) from recovery furnaces, lime kilns and smelt dissolving tanks at kraft, soda, sulfite and semi-chemical pulp mills. The main HAP emitted from these sources are HAP metals. This action will implement the residual risk review requirements of CAA section 112(f)(2) and the technology review requirements of CAA section 112(d)(6). The statute directs the EPA to promulgate emission standards under CAA 112(f)(2) if such standards are required to provide an ample margin of safety to protect public health or to prevent, taking relevant factors into account, an adverse environmental effect. Any such standards are to be promulgated within 8 years after promulgation of MACT standards under CAA section 112(d). CAA section 112(d)(6) requires the EPA to review and revise the MACT standards as necessary, taking into account developments in practices, processes and control technologies, no less often than every 8 years. Pursuant to a court order, the EPA is obligated to complete the final action by 10/1/17.

NPRM 12/00/2016

Final Rule 10/00/2017

8. Revisions to the Prevention of Significant Deterioration and Title V Greenhouse Gas (GHG) Permitting Regulations and Establishment of a GHG SER for GHG Emissions Under the PSD Program (2060-AS62)

The EPA is taking this action to propose a Greenhouse Gas (GHG) Significant Emission Rate (SER) under the Prevention of Significant Deterioration (PSD) air permitting program and propose certain revisions to the provisions of the Prevention of Significant Deterioration (PSD) and Title V Greenhouse Gas (GHG) Tailoring Rule. The proposed GHG SER would establish an appropriate threshold level below which Best Available Control Technology (BACT) is not required for a source's GHG emissions. The Tailoring Rule revisions will allow us to revise certain GHG permitting regulatory provisions, which include the PSD GHG Plantwide Applicability Limits (PALs), and will also implement a recent Court of Appeals for the District of Columbia decision that ordered, among other things, that the Tailoring Rule regulations under review be vacated to the extent they

require a stationary source to obtain a title V permit solely because the source emits or has the potential to emit GHG above the applicable thresholds.

NPRM 10/03/2016 (81 FR 68110)

NPRM Comment Period End 12/02/2016

Final Rule To Be Determined

9. Renewables Enhancement and Growth Support Rule (2060-AS66)

This action proposes to make numerous changes to promote the production of renewable fuels and clarify certain requirements under the RFS program. This action would propose to allow for feedstocks partially converted at a facility other than a renewable fuel production facility to be fully converted at a renewable fuel production facility into finished renewable fuel. These partially converted feedstocks are referred to as biointermediate feedstocks. Further, this action would also propose to add new registration, recordkeeping, and reporting requirements for certain renewable fuel production facilities using carbon capture and storage (CCS) if the EPA were to allow CCS as a lifecycle GHG emissions reduction technology in the context of the RFS program. Additionally, this action also proposes to require obligated parties to report a breakdown of their gasoline, diesel, and heating oil production; provide an additional RIN-generating pathway that is an extension of an existing pathway; and make numerous technical corrections. Finally, this action would implement fuel quality specifications for blends containing 16 to 83 volume percent ethanol. This action would provide substantial additional flexibility for ethanol flex fuel (EFF) producers that accommodate current market realities while continuing to ensure EFF quality is consistent with controlling pollution when used in flexible fuel vehicles.

Final Rule 12/00/2017

10. Electronic Reporting and Recordkeeping Requirements for National Emission Standards for Hazardous Air Pollutants, Phase I (2060-AS67)

The EPA is proposing the electronic submission of performance testing information already collected by industry by revising the reporting requirements in 40 CFR part 63 for national emission standards for hazardous air pollutants (NESHAP). In addition to performance test data, this rulemaking proposes to require the electronic submission of other selected compliance data, such as excess emissions reports, that are already being compiled and submitted by industry to regulatory authorities. These data can be used for regulation development, control strategy development, rule effectiveness studies, risk analyses and other air pollution control activities. Revision of the subparts in 40 CFR part 63 will be handled by a phased approach. This rulemaking is the first phase in the revision process and will address select subparts in 40 CFR part 63. A similar rulemaking for the subparts in 40 CFR part 60 was proposed on March 20, 2015.

NPRM 09/00/2017

Final Rule 09/00/2018

11. Stationary Engine NESHAP/NSPS Amendments (2060-AS77)

On May 1, 2015, the U.S. Court of Appeals for the D.C. Circuit vacated the provisions in the RICE NESHAP and NSPS allowing emergency engines to operate for up to 100 hours per year for emergency demand response when an Energy Emergency Alert Level 2 has been called, and in situations where the voltage or frequency deviates by 5 percent or greater below standard. Subsequent to the court decision, EPA asked the court for a voluntary remand of provisions in the same regulations allowing emergency engines to operate for up to 50 hours per year to mitigate local transmission and/or distribution limitations in a local area or region. This action will address the provision for operation for up to 50 hours per year for local reliability, for which EPA has requested a voluntary remand.

NPRM 09/00/2017

Final Rule 08/00/2018

12. National Emission Standards for Hazardous Air Pollutant Emissions: Manufacture of Amino/Phenolic Resins (2060-AS79)

The EPA promulgated amendments to the National Emission Standards for Hazardous Air Pollutants (NESHAP): Manufacture of Amino/Phenolic Resins on September 16, 2015. The Sierra Club, Georgia-Pacific and Tembec BTLSR filed petitions for reconsideration. On March 27, 2015, the EPA granted reconsideration of this rule on issues related to the emission standards for continuous process vents and pressure relief devices (PRDs). This proposal would address the issues raised in the petitions and give an opportunity for public comment on the EPA's responses.

NPRM 01/00/2017

Final Rule 09/00/2017

13. Implementation of the 2015 National Ambient Air Quality Standards for Ozone: Nonattainment Area Classifications and State Implementation Plan Requirements (2060-AS82)

This proposed rule will address a range of implementation requirements for the 2015 National Ambient Air Quality Standards (NAAQS) for ozone, including the nonattainment area classification system, and the timing of State Implementation Plan (SIP) submissions. It will also discuss and outline relevant guidance on meeting the Clean Air Act's requirements pertaining to attainment demonstrations, reasonable further progress,

reasonably available control measures, nonattainment new source review, and emission inventories. Other issues addressed in this proposed rule are the potential revocation of the 2008 ozone NAAQS and anti-backsliding requirements that would apply if the 2008 NAAQS are revoked. The items covered in this rulemaking have been covered in similar rulemakings for two prior 8-hour ozone NAAQS (1997 and 2008).

NPRM 11/00/2016

14. National Emission Standards for Hazardous Air Pollutants: Publicly Owned Treatment Works Risk and Technology Review (2060-AS85)

This action will address the agency's residual risk and technology review (RTR) of the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Publicly Owned Treatment Works (POTW). The POTW NESHAP, subpart VVV, was promulgated pursuant to section 112(d) of the Clean Air Act (CAA) on 10/26/99. The NESHAP established emission limitations and work practice requirements based on maximum achievable control technology (MACT) for controlling emissions of hazardous air pollutants (HAP) from wastewater treatment units up to, but not including the secondary influent pumping station or the secondary treatment units. The HAP emitted from POTW include methanol, chloroform, acetaldehyde, methylene chloride, toluene and xylenes. This action will implement the residual risk review requirements of CAA section 112(f)(2) and the technology review requirements of CAA section 112(d)(6). The statute directs the EPA to promulgate emission standards under CAA 112(f)(2) if such standards are required to provide an ample margin of safety to protect public health or to prevent, taking relevant factors into account, an adverse environmental effect. Any such standards are to be promulgated within 8 years after promulgation of MACT standards under CAA section 112(d). CAA section 112(d)(6) requires the EPA to review and revise the MACT standards as necessary, taking into account developments in practices, processes and control technologies, no less often than every 8 years. Pursuant to a consent decree with Sierra Club and California Communities Against Toxics, the EPA is obligated to complete this proposed action by 12/8/16.

NPRM 12/00/2016

Final Rule 10/00/2017

15. Air Quality: Revision to Definition of Volatile Organic Compounds -- Exclusion of Dimethyl Succinate (DMS) (2060-AS87)

This direct final with parallel proposal would address whether to revise the Environmental Protection Agency's definition of volatile organic compounds (VOC) for purposes of preparing State Implementation Plans to attain the National Ambient Air Quality Standards for ozone. The action would address whether to add dimethyl succinate (DMS) to the list of compounds excluded from the regulatory definition of VOC on the basis that this

compound may make a negligible contribution to tropospheric ozone formation. A VOC exemption petition was submitted by Invista on December 14, 2011.

NPRM 12/00/2016

Direct Final Rule 12/00/2016

16. Revisions to Method 202: Dry Impinger Method for Determining Condensable Particulate Emissions From Stationary Sources (2060-AS91)

States are now required to account for Condensable Particulate Matter (CPM) in establishing emissions limits for particulate matter (PM2.5 and PM10) in all applicable Prevention of Significant Deterioration (PSD) and nonattainment New Source Review (NSR) permits issued. The NSR regulations require that the measurement and control of PM from major stationary sources and major modifications include the condensable component for both PM2.5 and PM10 emissions. Accordingly, CPM must be considered (1) in the Prevention of Significant Deterioration (PSD) program in areas that are classified attainment or unclassifiable for the 1997 annual secondary, 2008 24-hour primary or secondary or 2012 annual primary PM2.5 NAAQS or the PM10 NAAQS, and (2) in nonattainment NSR in areas that are nonattainment for any of the PM2.5 or PM10 NAAQS. Stakeholders have expressed concern that source-specific CPM test results obtained with Method 202 could include positive bias that translates into overestimations of emissions. Some of these stakeholder issues involve the quality of reagent chemicals used in the method, while other issues involve equipment preparation or contamination pre- and post-sampling. Such overestimation could inappropriately affect determinations as to whether major source nonattainment NSR or PSD applies to a new source or modification, required air quality impact analyses and emission offset requirements. The EPA is considering revising sections of Method 202 including, but not limited to, the proof blank train preparation and recovery requirements in the method and use of the proof and field train blanks. The proposed revision would address consistency in the execution of Method 202, which has shown wide variation in its implementation, and allow many performance-based options and procedures.

NPRM 11/00/2016

Final Rule 08/00/2017

17. Portland Cement Risk and Technology Review (2060-AS92)

This action will address the agency's residual risk and technology review (RTR) of the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Portland Cement Manufacturing. The Portland Cement Manufacturing NESHAP, subpart LLL, initially was promulgated pursuant to section 112(d) of the Clean Air Act (CAA) in 1999. The EPA promulgated the current version of the rule on 9/9/10, with amendments on 2/12/13 and 07/27/15. The NESHAP established emission limitations and work practice requirements

based on maximum achievable control technology (MACT) for controlling emissions of hazardous air pollutants (HAP) from kilns, clinker coolers, raw material dryers and finish mills, as well as clinker piles, storage bins, conveying systems, bagging systems, bulk loading and unloading systems. The HAP emitted from kilns and clinker coolers include particulate matter, metals including mercury, volatile organic compounds and hydrogen chloride. This action will implement the residual risk review requirements of CAA section 112(f)(2) and the technology review requirements of CAA section 112(d)(6). The statute directs the EPA to promulgate emission standards under CAA 112(f)(2) if such standards are required to provide an ample margin of safety to protect public health or to prevent, taking relevant factors into account, an adverse environmental effect. Any such standards are to be promulgated within 8 years after promulgation of MACT standards under CAA section 112(d). CAA section 112(d)(6) requires the EPA to review and revise the MACT standards as necessary, taking into account developments in practices, processes and control technologies, no less often than every 8 years. Pursuant to a consent decree, the EPA is obligated to complete this proposed action by 6/15/17. As a result of promulgating the 2013 rule, the EPA estimated benefits would range from $6.7 billion to $18 billion annually, due to reductions in fine particle pollution (PM2.5). This included the value of avoiding 960 to 2,500 premature deaths in people with heart disease. The EPA also estimated the rule would prevent other serious health effects each year, including 17,000 cases of aggravated asthma, 1,500 heart attacks, 650 cases of chronic bronchitis, 1,000 emergency room visits for respiratory problems, such as asthma, 740 hospital admissions for respiratory or cardiovascular problems, 32,000 cases of upper and lower respiratory symptoms, 130,000 days when people miss work and 750,000 days when people must restrict their activities because of particle pollution-related symptoms. This RTR action will assure these continued public health benefits, through further analysis and, if warranted, revisions to the rule.

NPRM	07/00/2017
Final Rule	07/00/2018

18. Risk and Technology Review of the National Emission Standards for Hazardous Air Pollutants From Manufacturing of Nutritional Yeast (2060-AS93)

This action will address the agency's residual risk and technology review (RTR) of the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Manufacturing of Nutritional Yeast. The Manufacturing of Nutritional Yeast NESHAP, subpart CCCC, was promulgated pursuant to section 112(d) of the Clean Air Act (CAA) on 5/21/01. The NESHAP established emission limitations based on maximum achievable control technology (MACT) for controlling emission of hazardous air pollutants (HAP) from nutritional yeast fermenters. The HAP emitted from fed-batch last stage, second-to-last stage and third-to-last stage fermenters is acetaldehyde. This action will implement the residual risk review requirements of CAA section 112(f)(2) and the technology review requirements of CAA section 112(d)(6). The statute directs the EPA to promulgate emission

standards under CAA 112(f)(2) if such standards are required to provide an ample margin of safety to protect public health or to prevent, taking relevant factors into account, an adverse environmental effect. Any such standards are to be promulgated within 8 years after promulgation of MACT standards under CAA section 112(d). CAA section 112(d)(6) requires the EPA to review and revise the MACT standards as necessary, taking into account developments in practices, processes and control technologies, no less often than every 8 years. Pursuant to a court order, the EPA is obligated to complete the final action by 10/1/17.

NPRM 12/00/2016

Final Rule 10/00/2017

19. Renewable Fuel Volume Standards for 2018 and Biomass Based Diesel Volume (BBD) for 2019 (2060-AT04)

The Clean Air Act requires EPA to promulgate regulations that specify the annual standards requirements for renewable fuels under the Renewable Fuel Standard (RFS) program. Standards are to be set for four different categories of renewable fuels: cellulosic biofuel, biomass based diesel (BBD), advanced biofuel, and total renewable fuel. The statute requires the standards be finalized by November 30 of the year prior to the year in which the standards would apply. In the case of biomass based diesel, the statute requires applicable volumes be set no later than 14 months before the year for which the requirements would apply.

NPRM 06/00/2017

Final Rule 12/00/2017

20. Noise Emission Standards for Transportation Equipment: High Speed Rail (2060-AT06)

The EPA, in consultation with the Department of Transportation's Federal Railroad Administration (FRA), is considering revisions to the rule that sets noise emissions standards for interstate rail carriers under the Noise Control Act of 1972 (NCA) (42 U.S.C. section 4901 et seq.). Noise emissions are the noise produced by an object-in this case, a train and all of its parts such as the locomotive, power units, and passenger coaches. Current noise standards limit the noise generated by trains when they are operating under a specified set of conditions in order to protect the health and welfare of individuals. The revisions under consideration would address changes in rail technology related to high-speed rail (i.e., trains operating at speeds in excess of 150-160 mph).

NPRM 05/00/2017

21. Revision to Method 23--Determination of Polychlorinated Dibenzo-P-Dioxins and Polychlorinated Dibenzofurans From Stationary Sources (2060-AT09)

The EPA is taking action to revise 40 CFR part 60, appendix A, method 23, "Determination of Polychlorinated Dibenzo-P-Dioxins and Polychlorinated Dibenzofurans from Stationary Sources," which was last revised on March 31, 1995 (60 FR 28378). This update to Method 23 is a complete republication of the method to determine polychlorinated dibenzo-p-dioxins (PCDD's) and dibenzofurans (PCDF's) which will now include an option to determine polycyclic aromatic hydrocarbons (PAH's), and/or polychlorinated biphenyls (PCB's). This update revises the analytical procedure to include isotope dilution mass spectrometry combined with high resolution gas chromatography which is consistent with industry practice. The update moves the method from a prescriptive to a performance-based methodology and removes requirements in the method to use outdated standards or materials. This revision will provide industry an appropriate method in the execution of method 23, which has shown wide variation in its implementation and allows many performance-based options and procedures.

NPRM	12/00/2016
Final Rule	08/00/2017

22. Wool Fiberglass Manufacturing Rotary Spin Bonded Lines Technology Review (2060-AT13)

Amendments to the Wool Fiberglass Manufacturing source category were finalized on July 29, 2015. The risk assessment was conducted under the 2015 final rule, and no adjustments to that risk assessment are contemplated under this action. Due to industry's phase-out of formaldehyde on rotary spin (RS) lines, the industry data that were collected for the 2015 amendments were no longer relevant for technology review use. Consequently, due to the lack of accurate and complete data for such processes, that final rule did not include technology review for RS lines. Prior to signature of the final rule, the EPA began an information collection effort under Clean Air Act section 114 authority for the remaining RS lines in the wool fiberglass manufacturing industry. The results of the emissions testing on the three remaining RS lines are being used to review the technology for this process and to amend the rule, if necessary, under this action.

NPRM	03/00/2017
Final Rule	01/00/2018

23. Reconsideration of the Phosphoric Acid Manufacturing and Phosphate Fertilizer Production Risk and Technology Review (2060-AT14)

The Risk and Technology Review (RTR) for the Phosphoric Acid Manufacturing and the Phosphate Fertilizer Production NESHAP were proposed on November 7, 2014 (79 FR 66512) and promulgated on August 19, 2015, (80 FR 50386). On October 15 and 16, 2015, the Fertilizer Institute (TFI) and the Potash Corporation of Saskatchewan (PCS) petitioned the Agency for reconsideration on three issues: the final monitoring requirements for low pressure scrubbers, the compliance date for existing air oxidation reactors, and the final total fluoride emission limit for calciners. On December 3, 2015, the EPA granted reconsideration on these matters and intends to propose a response to the petitions in the fall of 2016.

NPRM 11/00/2016

Final Rule 05/00/2017

24. Revisions to Procedure 2--Quality Assurance Requirements for Particulate Matter Continuous Emission Monitoring Systems at Stationary Sources (2060-AT15)

The purpose of Procedure 2 is to establish the minimum requirements for evaluating the effectiveness of quality control (QC) and quality assurance (QA) procedures and the quality of data produced by particulate matter (PM) continuous emission monitoring system (CEMS). Procedure 2 applies to PM CEMS used for continuously determining compliance with emission standards or operating permit limits as specified in an applicable regulation or permit. Other QC procedures may apply to diluent (e.g., O2) monitors and other auxiliary monitoring equipment included with your CEMS to facilitate PM measurement or determination of PM concentration in units specified in an applicable regulation. Procedure 2 requires you to perform periodic evaluations of PM CEMS performance and to develop and implement QA/QC programs to ensure that PM CEMS data quality is maintained. We have recently become aware that facilities, especially those that have installed control devices, are having difficulty passing their annual QA/QC test because their emissions are lower than they were during the original testing. Procedure 2 currently contains a requirement that the annual QA/QC test results must fall within the same response range as was used to develop the initial correlation curve. We are proposing to modify Procedure 2, to remove the requirement that the response ranges be the same at the low end, so that facilities that have lowered their emissions and have results lower than their initial correlation testing are no longer being penalized.

NPRM 11/00/2016

Direct Final Rule 11/00/2016

25. Interstate Transport of Fine Particulate Matter: Revision of Federal Implementation Plan Requirements for Texas (2060-AT16)

A 2015 court decision regarding the Cross-State Air Pollution Rule (CSAPR) remanded Texas' CSAPR Phase 2 SO2 budgets to EPA for reconsideration. In response to the remand, the EPA is proposing to withdraw the FIP provisions that require affected EGUs in Texas to participate in the CSAPR trading programs for annual emissions of sulfur dioxide and nitrogen oxides.

NPRM 11/00/2016

Final Rule 08/00/2017

26. Revisions to Method 301: Field Validation of Pollutant Measurement Methods From Various Waste Media (2060-AT17)

The purpose of Method 301 is to provide a set of procedures that the owner or operator of an affected source subject to requirements under 40 CFR part 63 can use to validate an alternative test method to a test method required in 40 CFR part 63, or to validate a stand-alone alternative test method based on established precision and bias criteria. The EPA is proposing revisions to existing Method 301. The proposed revisions include editorial, technical, and consistency changes in the language, tables, and equations of Method 301. Method 301 was originally published on December 29, 1992 [57 FR 61970], as a field validation protocol method. On March 16, 1994, Method 301 was included in 40 CFR 63.7 [59 FR 12430] to validate alternative test method requests. To date, subsequent revisions of Method 301 have not been changed to distinguish requirements for site-specific applications of the method versus a single validation for multiple sources.

NPRM 11/00/2016

Final Rule 04/00/2017

27. Petroleum Refinery Sector Reconsiderations (2060-AT18)

The final Refinery Sector Rule was promulgated on December 1, 2015 (80 FR 7178). Following promulgation, the EPA received three petitions for reconsideration of the final rules. These petitions raised a number of issues, including notice and comment. Accordingly, this action will address some of these issues by seeking public comment on five aspects of the final rule for which the EPA did not provide adequate opportunity for notice and comment. This action will also propose a technical correction to amend the provisions related to overlap of equipment leak regulations that was raised in one of the petitions.

NPRM 10/18/2016 (81 FR 71661)

NPRM Comment Period End 12/19/2016

Final Rule 01/00/2017

28. National Emission Standards for Hazardous Air Pollutant Emissions: Hard and Decorative Chromium Electroplating and Chromium Anodizing Tanks (2060-AT20)

The EPA is taking direct final action to promulgate amendments to a final rule that revised national emission standards for hazardous air pollutants (NESHAP) for the Hard and Decorative Chromium Electroplating and Chromium Anodizing Tanks source category. The final rule was published on September 19, 2012 (77 FR 58219). This action, which will be a direct final rule and parallel proposal, will add provisions back into the rule that were inadvertently deleted when the EPA published the 2012 final amendments. These provisions, which were in the original 1995 NESHAP, provided facilities the opportunity to increase the duration of time between surface tension measurements after a certain number of compliant measurements. The EPA never intended these provisions to be deleted. The direct final rule will also provide a correction regarding the requirement to phase-out the use of fume suppressants that contain perfluorooctane sulfonic acid (PFOS) for chromium electroplating and chromium anodizing tanks. In addition, the direct final rule will correct several typographical errors, incorrect references, and other minor inadvertent errors that the EPA discovered after promulgation of the 2012 final amendments.

NPRM 08/00/2017

Direct Final Rule 08/00/2017

29. Vehicle Test Procedure Adjustments for Tier 3 Test Fuel (2060-AT21)

Abstract: In the joint Light Duty (LD) Greenhouse Gas and Fuel Economy rules adopted by EPA and NHTSA (October 15, 2012), the program required that vehicle laboratory emissions testing be performed using the long-standing vehicle test gasoline, which contains no ethanol ("E0" fuel) and higher levels of aromatics. EPA's Tier 3 light-duty vehicle rule (April 28, 2014), which affected essentially the same universe of LD vehicles as the GHG rules, focused on reductions in non-greenhouse gas emissions. As a part of the Tier 3 rule, EPA changed the laboratory test fuel to be more similar to typical fuels today, which on average contain about 10 percent ethanol ("E10") and lower levels of aromatics. Rulemaking action is necessary in order to make vehicle test procedure adjustments that account for the Tier 3 test fuel changes as they begin to apply to CO2 and fuel economy testing. This will ensure that testing results are consistent across both programs and avoid changes in the stringency of the GHG/Fuel Economy program.

NPRM 04/00/2017

Final Rule 03/00/2018

30. Determinations of Attainment by the Attainment Date, and Determinations of Failure To Attain and Reclassification of Certain Areas, for the 2006 24-hour PM2.5 NAAQS (2060-AT24)

This action relates to the December 31, 2015, attainment date for nonattainment areas classified as Moderate for the 2006 24-hour PM2.5 NAAQS. In this notice, EPA will find that certain areas attained the NAAQS by the attainment date and that others failed to attain the NAAQS by the attainment date and will be reclassified to Serious by operation of law.

NPRM 11/00/2016

31. NESHAP for Brick and Structural Clay Manufacturing; and NESHAP for Ceramics Manufacturing Reconsideration (2060-AT25)

This action will address a granted reconsideration issue and several technical corrections for the agency's promulgated final National Emission Standards for Hazardous Air Pollutants (NESHAP) for Clay Ceramics Manufacturing, as well as address several technical corrections for the NESHAP for Brick and Structural Clay Manufacturing. These two final rules were promulgated on October 26, 2015 (80 FR 65470), 40 CFR part 63, subparts KKKKK and JJJJJ respectively, with a small final technical correction amendment for subpart KKKKK promulgated on December 4, 2015. The two NESHAP established emission limitations and work practice requirements based on maximum achievable control technology for control of hazardous air pollutants from kilns and dryers at new and existing brick and clay products, and clay ceramics plants. The granted reconsideration issue is based on a revision for subpart KKKKK, to the location of the temperature probe when demonstrating dioxin compliance (changed from a kiln probe to a stack probe for the final rule), which occurred as an outcome of comments received on the proposal. Since the public did not have a chance to comment on the revision during the comment period, the reconsideration was granted. In addition to this proposed revision to the temperature location related to dioxin limit compliance, several technical corrections will be proposed covering compliance parameters for water curtains, and visible emission location sites. The Brick and Structural Clay rule will also be opened only for technical corrections related to visible emission levels and using opacity as an indicator of compliance with the particulate matter standard.

NPRM 04/00/2017

Final Rule 11/00/2017

32. Oil & Natural Gas Sector Technical Corrections (2060-AT27)

On June 3, 2016, the EPA published the final rule titled "Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources." In this action, we are correcting a typographical error that omitted the regulatory text indicating that applicable

standards apply throughout startup, shutdown, and malfunction. In addition, we plan to provide additional clarifications and make minor corrections related to cross-references within the regulatory text.

NPRM 12/00/2016

Final Rule 06/00/2017

33. Commercial, Industrial Solid Waste Incineration Federal Plan (2060-AT28)

On February 7, 2013, the EPA promulgated the final Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources: Commercial and Industrial Solid Waste Incineration (CISWI) Units. The EPA granted reconsideration on a select few issues, and the final reconsideration was published on June 23, 2016. The Clean Air Act (CAA) directs states with existing CISWI units subject to the emission guidelines to submit plans to the EPA that implement and enforce the emission guidelines. The emission guidelines contain model rule language that states can use for implementation. If a state with existing CISWI unit does not submit an approvable plan within 2 years after promulgation of the emission guidelines, the CAA requires the EPA to develop, implement and enforce a federal plan for CISWI units in the state. This action proposes the CISWI federal plan, which will consist of the model rule language presented in the emission guidelines.

NPRM 01/00/2017

34. National Emission Standards for Hazardous Air Pollutants: Site Remediation (2060-AN36)

The EPA promulgated the Site Remediation National Emission Standards for Hazardous Air Pollutants (NESHAP) standards on October 8, 2003. The Sierra Club filed a petition for reconsideration challenging the exemptions for federally ordered cleanups under CERCLA and RCRA in the final rule. The EPA granted reconsideration of this petition issue and published a proposed notice of reconsideration in the Federal Register on May 13, 2016 (81 FR 29821).

Final Rule 01/00/2017

35. Standards of Performance for Grain Elevators (2060-AP06)

Abstract: The New Source Performance Standards for Grain Elevators was promulgated in 1978 with the latest amendments made in 1984. Since that time, there have been a number of changes in the technology used for storing and loading/unloading grain at elevators. Also, increased production of corn used for ethanol fuel has created a demand for more grain

storage. These standards are being updated again now to ensure that they protect human health while minimizing the compliance burden on grain elevators.

NPRM 07/09/2014 79 FR 39241

Final Rule 12/00/2016

36. National Emission Standards for Hazardous Air Pollutants (NESHAP) Subpart W: Standards for Radon Emissions From Operating Uranium Mill Tailings: Review (2060-AP26)

National Emission Standards for Hazardous Air Pollutants (NESHAP) subpart W protects human health and the environment by setting radon emission standards and work practices for operating uranium mill tailings impoundments. The EPA is in the process of reviewing this standard. If necessary, the Agency will revise the NESHAP requirements for radon emissions from operating uranium mill tailings.

Final Rule 11/00/2016

37. Electronic Reporting and Recordkeeping Requirements for New Source Performance Standards (2060-AP63)

The EPA published an advance notice of proposed rulemaking (ANPRM) in October 2009 seeking comment on proposed approaches to improving the emissions factors program, including proposing to require the submission (via electronic reporting) of performance testing information already collected by industry by revising the reporting requirements in 40 CFR part 60 for new source performance standards (NSPS). Performance tests are conducted periodically to measure the air pollutant emissions from an industrial process and are used as an indicator of compliance with regulations. The March 20, 2015, proposed rule would amend approximately 75 NSPS to require electronic submission to the EPA of performance test data, as well as other selected compliance data, such as excess emissions reports, that are already being compiled and submitted by industry to regulatory authorities. These data can be used for regulation development, control strategy development, rule effectiveness studies, risk analyses and other air pollution control activities. Electronic submittal of these reports increases the usefulness of the data, is in keeping with current trends in data availability and further assists in the protection of public health and the environment. The EPA published an extension to the public comment period for the NPRM on 5/19/15 (80 FR 28571), providing the public an additional 30 days to comment, increasing the public comment period to a total of 90 days.

Final Rule 12/00/2016

38. Clarification of Requirements for Method 303 Certification Training (2060-AR97)

The EPA finalized changes to Method 303 to better define the requirements associated with conducting Method 303 certification courses. Method 303 is an air pollution test method used to determine the visible emissions from coke ovens. This action adds additional language that clarifies the criteria used by the EPA to determine the competency of training providers, but does not change the requirements for conducting the test method. These changes will help entities interested in conducting training classes to better understand the requirements necessary to be approved to conduct these training courses.

Final Rule 11/00/2016

39. Treatment of Data Influenced by Exceptional Events – Rule Revisions (2060-AS02)

This final action will revise the Exceptional Events Rulemaking to clarify and streamline certain rule elements, including, but not limited to, those associated with high wind dust events, wildfire and prescribed fire events, normal historical fluctuations including background, the "not reasonably controllable or preventable" criterion, and the "but for' criterion." On March 22, 2007, the EPA promulgated the "Treatment of Data Influenced by Exceptional Events; Final Rule" pursuant to the 2005 amendment of Clean Air Act. This rule, known as the Exceptional Events Rule (EER), superseded the EPA's previous natural events guidance and those sections of the interim fire policy document that address exceptional events. The EER created a regulatory process by which air agencies can request, and the EPA can approve, exclusion for data influenced by exceptional events. The Exceptional Events Rulemaking regulatory sections contain definitions, procedural requirements, requirements for air agency demonstrations, and criteria for the EPA approval for the exclusion of air quality data from regulatory decisions under the EER. Since EPA promulgated the EER in 2007, numerous interested parties have raised questions and issues regarding implementation of the rule.

Final Rule 11/00/2016

40. Model Trading Rules for Greenhouse Gas Emissions From Electric Utility Generating Units Constructed on or Before January 8, 2014 (2060-AS47)

In the final Clean Power Plan (CPP) promulgated in August 2015, the EPA set Emission Guidelines for the best system of emission reductions for carbon dioxide from existing power plants. States were tasked in the CPP with developing plans to achieve reductions in carbon dioxide emissions from the existing power plants in each state. In these model trading rules, the EPA will finalize models that provide two optional approaches (rate-based and mass-based emission trading programs) that states may use in developing a plan.

Final Rule 12/00/2016

41. Protection of Stratospheric Ozone: Update to the Refrigerant Management Requirements under Section 608 of the Clean Air Act (2060-AS51)

This rule is expected to update existing requirements under section 608 that currently apply for ozone-depleting refrigerants, including changes to reduce emissions of such refrigerants. This rule would improve the structure and readability of, and compliance with, the regulations. It is also expected to implement the prohibition under section 608 of the Clean Air Act against knowingly venting, releasing or disposing of ozone-depleting refrigerants or refrigerant substitutes during the course of maintaining, servicing, repairing, and disposing of appliances and industrial process refrigeration by extending, as appropriate, the requirements under section 608 that apply for ozone-depleting refrigerants to non-ozone-depleting refrigerant substitutes, such as hydrofluorocarbons (HFCs).

Final Rule 11/00/2016

42. Revision to the Guideline on Air Quality Models: Enhancements to the AERMOD Dispersion Modeling System and Incorporation of Approaches to Address Ozone and Fine Particulate Matter (2060-AS54)

This action finalizes revisions to the Guideline on Air Quality Models, published as Appendix W to 40 CFR part 51. The Guideline provides EPA-recommended models and other techniques for use in predicting ambient concentrations of pollutants for controlling air pollution sources in programs ranging from the Prevention of Significant Deterioration (PSD) permitting program to State Implementation Plans (SIPs). The Guideline fulfills a Clean Air Act mandate for the EPA to specify models with reasonable particularity to be used under specified conditions for purposes of the PSD permitting program. This action includes important enhancements to the EPA's AERMOD near-field dispersion modeling system that will establish AERSCREEN as the recommended screening level model for simple and complex terrain settings, significantly improve the model performance under stable/light wind conditions, allow for the use of meteorological input data derived from prognostic meteorological models, provide additional options for the modeling of nitrogen dioxide, incorporate the treatment of buoyant line sources within AERMOD, and incidental modifications to the modeling system that have received peer and external review. Additionally, these revisions would incorporate the use of photochemical modeling techniques to more adequately account for the secondary chemical formation of fine particulate matter and ozone associated with precursor emissions from single sources.

Final Rule 12/00/2016

43. Protection of Visibility: Amendments to Requirements for State Plans (2060-AS55)

This final rule will contain EPA's final approach to the issues raised and revisions proposed in the Notice of Proposed Rulemaking of May 4, 2016. These issues and revisions include (1)

a proposed change in the deadline for the submittal of the next comprehensive revision of each states' regional haze State Implementation Plan (SIP) from July 31, 2018 to July 31, 2021; (2) proposed changes to the timing, format, and required content of periodic progress reports; (3) proposed clarifications regarding the relationship between long-term strategies and reasonable progress goals; (4) proposed changes related to how days are selected for tracking progress; (5) proposed treatment of impacts on visibility from anthropogenic sources outside the U.S. and from wildland fires within the U.S.; (6) proposed changes to reasonably attributable visibility impairment provisions; and (7) proposed changes to federal land manager consultation requirements.

Final Rule 11/00/2016

44. Prevention of Significant Deterioration (PSD): Revisions to PSD Permit Rescission Provisions in EPA Regulations at 40 CFR 52.21(w) (2060-AS56)

This final rule will update the Prevention of Significant Deterioration (PSD) permit rescission provisions at 40 CFR 52.21(w) to enable all PSD permits to potentially qualify for rescission. The current "permit rescission" provision at 40 CFR 52.21(w) stipulates that a permittee can request that the EPA Administrator rescind their PSD permit (or a part of their PSD permit) if: (1) they can show that PSD no longer applies to the source or modification, and (2) the permit was issued under EPA rules that were in effect on or before July 30, 1987.

Final Rule 11/00/2016

45. Greenhouse Gas Reporting Program--General Revisions (2060-AS60)

This action would improve the Greenhouse Gas Reporting (GHG) Program by clarifying rule requirements, enhancing data quality to ensure that the data collected is representative of industry and comparable to the US GHG Inventory, and streamlining requirements to improve implementation efficiency. This action would make targeted technical amendments to the reporting rule for municipal solid waste landfills as well as improve and streamline the regulations for multiple source categories covered by the program.

Final Rule 12/00/2016

46. Revision to the Near-Road NO2 Monitoring Requirements (2060-AS71)

This action will remove the existing network design requirement to install near-road NO2 monitoring stations in Core Based Statistical Areas (CBSAs) having populations between 500,000 and 1,000,000 persons, due by January 1, 2017. The EPA is finalizing this action based on a review of research data and routine NO2 monitor data generated by existing near-road NO2 sites that were established in larger CBSAs beginning in 2012. The data

from these near-road NO2 sites, the majority of which are located in higher populated CBSAs having 1,000,000 or more persons, indicate that the current NO2 air quality concentrations in the near-road environment are generally well below both the annual and 1-hour daily maximum NAAQS levels of 53 ppb and 100 ppb, respectively. Due to the correspondence between population, traffic, and expected NO2 concentrations in the near-road environment, it is anticipated that measured near-road NO2 concentrations in relatively smaller CBSAs (e.g., CBSAs with populations less than 1,000,000 persons) would typically exhibit similar, if not lower, concentrations than what is being seen in larger urban areas. Therefore, this action will reduce additional burden on state and local air monitoring agencies by removing monitoring requirements in locations where measured NO2 air quality is expected to be well below the NAAQS. This action does not address the existing requirements for near-road NO2 monitoring in CBSAs having 1,000,000 or more persons.

Final Rule 12/00/2016

47. Renewable Fuel Volume Standards for 2017 and Biomass Based Diesel Volume (BBD) for 2018 (2060-AS72)

The Clean Air Act requires the EPA to promulgate regulations that specify the annual standards requirements for renewable fuels under the Renewable Fuel Standard (RFS) program. Standards are to be set for four different categories of renewable fuels: cellulosic biofuel, biomass based diesel (BBD), advanced biofuel, and total renewable fuel. The statute requires that the standards be finalized by November 30 of the year prior to the year in which the standards would apply. In the case of biomass based diesel, the statute that requires applicable volumes be set no later than 14 months before the year for which the requirements would apply. This action would propose the applicable volumes for all renewable fuel categories for 2017, and would also propose the BBD standard for 2018.

Statutory Deadline 11/30/2016

Final Rule 12/00/2016

48. Greenhouse Gas Reporting Rule: Leak Detection Methodology Revisions and Confidentiality Determinations for Petroleum and Natural Gas Systems (2060-AS73)

This Greenhouse Gas Reporting Program action would revise methods for monitoring emissions at petroleum and natural gas systems facilities to align with other Agency actions and to provide additional flexibility for reporters who may be using these methods.

Final Rule 11/00/2016

49. Mercury and Air Toxics Standards (MATS) Completion of Electronic Reporting Requirements (2060-AS75)

This action will propose to complete a transition to just one electronic reporting systems for the Mercury Air Toxic Standards (MATS) requirements. The action was requested by electric generating unit (EGU) owners and operators, who sought to expand the familiar Emissions Collection Monitoring Plan System (ECMPS) Client Tool already in use to handle all electronic reporting required by the MATS. This action will complete the steps necessary to merge electronic reporting requirements into the ECMPS.

Final Rule 02/00/2017

50. Protection of Stratospheric Ozone: Listings and Listing Modifications for Certain Substitutes Under the Significant New Alternatives Policy Program (2060-AS80)

This action would list a number of substances as acceptable, subject to use conditions, where such alternatives may be used safely and do not pose significantly more risk than other available substitutes when used in accordance with the proposed restrictions. This action also would list as unacceptable alternatives that cannot be used as safely as other available alternatives. In addition, it would modify the listing status for certain alternatives from acceptable to unacceptable or acceptable, subject to narrowed use limits, where other alternatives are available that pose lower overall risk to human health and the environment. This action also would exempt propane in certain refrigeration end-uses from the venting prohibition under Clean Air Act section 608. In addition, this action would apply unacceptability determinations for foam-blowing agents to closed cell foam products and products containing closed cell foam that are manufactured or imported using these foam-blowing agents. Affected industrial sectors under consideration include refrigeration and air conditioning, foam blowing, and fire suppression and explosion protection.

Final Rule 11/00/2016

51. Technical Amendments to Performance Specification 18 and Procedure 6 (2060-AS86)

Abstract: Performance Specification 18 (PS18) and Procedure 6 were originally promulgated in the Federal Register on July 7, 2015. In this action, the EPA will make several minor technical amendments to PS18 and Procedure 6 which will help clarify several aspects of the original rulemaking. The PS18 amendments became effective August 17, 2016. A partial withdrawal of the direct final rule was issued to withdraw the Procedure 6 amendments. This action clarifies and finalizes those amendments.

Final Rule 11/00/2016

52. Technical Correction to Part 50 of the National Ambient Air Quality Standards for Particulate Matter (2060-AS89)

The EPA modified an equation used when calculating the level of particulate matter (PM2.5) in the air, namely Equation 2 in appendix N to part 50, section 4.4(b). Original equation 2 was not appropriate as written and did not accurately reflect the intended calculation of the annual mean PM2.5 concentration. Equation 2 was modified to include calculation of the annual mean PM2.5 concentration in cases where a site does not have four complete quarters of data, but passes one of two substitution tests described in sections 4.1(c)(i) and 4.1(c)(ii). This adjustment to Equation 2 is a currently used calculation of the PM2.5 annual design value, is consistent with the text of section 4.1 within appendix N to Part 50, and does not affect the calculation of annual mean PM2.5 concentrations when four complete quarters of data are available.

Final Rule 12/00/2016

53. National Emission Standards for Hazardous Air Pollutants: Ferroalloys Production Reconsideration (2060-AS90)

On June 30, 2015, the EPA issued final amendments to the National Emission Standards for Hazardous Air Pollutants: Ferroalloys Production (40 CFR part 63, subpart XXX). The EPA received two petitions for reconsideration of the final amendments. This action would address three issues identified in the petitions for reconsideration. This proposal requested comment on three requirements in the final rule. The first issue is continuous baghouse monitoring with bagleak detection systems for positive-pressure baghouses. The second issue is the increase in polyaromatic hydrocarbon (PAH) compliance test frequency in the final rule. The third issue is the use of digital camera opacity technique (DCOT) for determining compliance with the shop building opacity standards. The proposed rule was published in the Federal Register 7/12/16 (81 FR 45089).

Final Rule 12/00/2016

54. Removal of Title V Emergency Affirmative Defense Provisions From State Operating Permit Programs and Federal Operating Permit Program (2060-AS96)

This final rule is removing the "emergency" affirmative defense provisions from both sets of Title V implementing regulations, currently located at 40 CFR 70.6(g) (for State Operating Permit Programs) and 40 CFR 71.6(g) (for Federal Operating Permit Programs), in order to ensure consistency with Clean Air Act requirements.

Final Rule 12/00/2016

55. Amendments to Implementing Regulations for Acting on State Plans (2060-AT23)

The EPA is finalizing a suite of amendments to implementing regulations under 40 CFR part 60, subpart B. The EPA proposed six amendments governing the process for acting on Clean Air Act (CAA) section 111(d) state plans. These changes include: (1) Partial approval/disapproval mechanisms similar to CAA section 110(k)(3); (2) a conditional approval mechanism similar to CAA section 110(k)(4); (3) a mechanism for the EPA to make calls for plan revisions similar to the "SIP-call' provisions of CAA section 110(k)(5); (4) an error correction mechanism similar to CAA section 110(k)(6); (5) completeness criteria and a process for determining completeness of state plans and submittals similar to CAA section 110(k)(1) and (2); and (6) updates to the deadlines for the EPA action. These amendments are being finalized as a stand-alone final rule because once final, they will then be applicable to any future state and federal plans relating to Emission Guidelines promulgated pursuant to CAA section 111(d). The amendments to implementing regulations were proposed in the Clean Power Plan Federal Plan and Model Rule published on October 23, 2015.

Final Rule 12/00/2016

56. Revision of 40 CFR 192--Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings and Uranium In Situ Leaching Processing Facilities (2060-AP43)

The EPA's regulations in 40 CFR 192 establish standards for the protection of public health, safety, and the environment from radiological and nonradiological hazards associated with uranium ore processing and disposal of resulting waste materials. These cross-media standards, which apply to pollutant emissions and site restoration, must be adopted by the Nuclear Regulatory Commission, their Agreement States, and the Department of Energy. The EPA reviewed the standards in the existing rule and proposed to revise the regulations in January 2016 (80 FR 4155), taking into particular account the significant changes in uranium industry extraction technologies and their potential impacts to groundwater. In addition, new facilities being proposed in states from Virginia to Alaska add to the importance of this effort. The final rule will incorporate comments from industry and public stakeholders received during the proposal, as well as the intra-agency workgroup.

Final Rule 11/00/2016

57. Plywood and Composite Wood Products (PCWP) Residual Risk and Technology Review and Amendments (2060-AO66)

This action will address the agency's residual risk and technology review (RTR) of the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Plywood and Composite Wood Products (PCWP). The PCWP NESHAP, subpart DDDD, was promulgated

pursuant to section 112(d) of the Clean Air Act (CAA) on 7/30/04, and was amended on 2/16/06 and 10/29/07. The NESHAP established emission limitations and work practice requirements based on maximum achievable controlling technology (MACT) for control emissions of hazardous air pollutants (HAP) from PCWP. The HAP emitted from lumber dry kilns and plywood, particleboard, medium density fiberboard, hardboard, (structural) fiberboard, oriented strand board (OSB) and engineered wood products processes include formaldehyde, methanol, acetaldehyde, acrolein, phenol and propionaldehyde. This action will implement the residual risk review requirements of CAA section 112(f)(2) and the technology review requirements of CAA section 112(d)(6). The statute directs the EPA to promulgate emission standards under CAA 112(f)(2) if such standards are required to provide an ample margin of safety to protect public health or to prevent, taking relevant factors into account, an adverse environmental effect. Any such standards are to be promulgated within eight years after promulgation of MACT standards under CAA section 112(d). CAA section 112(d)(6) requires the EPA to review and revise the MACT standards as necessary, taking into account developments in practices, processes and control technologies, no less often than every eight years. This RTR is subject to an ongoing deadline suit, but does not have established proposal or final rule dates yet. In addition, this rulemaking will respond to the remand by the U.S. Court of Appeals of the original MACT standards.

NPRM To Be Determined

58. Prevention of Significant Deterioration (PSD) and Nonattainment New Source Review (NSR): Reasonable Possibility in Recordkeeping; Reconsideration (2060-AP71)

The EPA is convening a proceeding for reconsideration of a final rule published in the Federal Register on December 21, 2007 (72 FR 62607). The subject rule was promulgated in response to a remand by the U.S. Court of Appeals for the District of Columbia Circuit in New York v. EPA, 413 F.3d 3 (D.C. Cir. 2005), in order to clarify the "reasonable possibility" recordkeeping and reporting standard under the New Source Review (NSR) program. After review of issues raised by the State of New Jersey by petition and letter, we have decided to exercise our discretion to conduct a reconsideration of this final rule and will therefore be reopening the public comment period for the rule. The rule will remain in effect while our reconsideration proceeding is under way.

NPRM To Be Determined

59. Reconsideration of the Prevention of Significant Deterioration and Nonattainment New Source Review (NSR) Project Aggregation (2060-AP80)

In January 2009, the EPA issued a final rule that addressed when a source must combine (i.e., "aggregate") nominally-separate physical and operational changes for the purpose of determining whether they are a single change and subject to review under the New Source Review program. Following promulgation of the rule, the Natural Resources Defense

Council submitted a petition for reconsideration as provided for in the Clean Air Act. The EPA responded to the petition by announcing the convening of a reconsideration proceeding and staying the effective date of the rule to allow time to conduct the reconsideration. This final reconsideration will address a range of legal and policy issues related to the 2009 Aggregation rule and complete any revisions of the rule that become necessary as a result of the reconsideration process.

Final Rule To Be Determined

60. Withdrawal of the Prior Determination or Presumption That Compliance With the CAIR or the NOx SIP Call Constitutes RACT or RACM for the 1997 8-Hour Ozone and 1997 Fine Particle NAAQS (2060-AQ07)

This final will withdraw any prior determination or presumption for the 1997 8-hour ozone national ambient air quality standards (NAAQS) and the 1997 Fine Particulate Matter NAAQS that compliance with the Clean Air Interstate Rule (CAIR) or the NOx SIP Call constitutes reasonably available control technology or reasonably available control measures for oxides of nitrogen or sulfur dioxide emissions from electric generating unit sources participating in these regional cap-and-trade programs.

Final Rule To Be Determined

61. Prevention of Significant Deterioration (PSD) and Nonattainment New Source Review (NSR): Reconsideration of Inclusion of Fugitive Emissions; Reconsideration (2060-AQ47)

The EPA is proposing a rule based on the results of its reconsideration of the final rule titled, "Prevention of Significant Deterioration (PSD) and Nonattainment New Source Review (NSR): Reconsideration of Inclusion of Fugitive Emissions" (Fugitive Emissions Rule), published on December 19, 2008. Through a letter signed on April 24, 2009, the EPA granted reconsideration on a petition submitted by the National Resources Defense Council (NRDC), as well as an administrative stay of the Fugitive Emissions Rule provisions. On March 30, 2011, the EPA issued an interim rule that stayed the Fugitive Emissions Rule by reverting the text of the affected sections of the Code of Federal Regulations back to the prior rule language. This stay will remain in effect until the EPA completes its reconsideration and undertakes any associated rulemaking. In this action, the EPA will consider the petition for reconsideration, public comments, and information contained in the rulemaking docket to reach a decision on the reconsideration and finalize the rule.

NPRM To Be Determined

62. Ozone and Fine Particulate Matter (PM2.5) Significant Impact Levels (SILs) for Prevention of Significant Deterioration (PSD) Program (2060-AR28)

This proposed action will establish Significant Impact Levels (SILs) for ozone and PM2.5 to facilitate implementation of the Prevention of Significant Deterioration (PSD) program in areas attaining the national ambient air quality standards (NAAQS) for Ozone or PM2.5. The SILs for Ozone and PM2.5 would be used as compliance demonstration tools by permitting authorities to help determine whether the projected emissions from a proposed new major source or major modification will cause or contribute to a violation of the NAAQS. This proposed action is, in part, in response to the January 22, 2013, D.C. Circuit's decision that vacated the PM2.5 Significant Monitoring Concentration (SMC) and vacated and remanded two provisions in the EPA's PSD regulations containing SILs that were contained in the 2010 rule promulgating increments, SMCs, and SILs for PM2.5. Furthermore, in August 2011, the Texas Commission on Environmental Quality (TCEQ) filed a Petition for Reconsideration to the Administrator regarding several provisions contained in the 2010 PM2.5 final rule, claiming that EPA did not provide an opportunity for public comment prior to issuing the provisions as part of the final rule. In response to the TCEQ petition, EPA will reconsider the following provisions: 1) The revised definition of "baseline area" that includes a new significance level for PM2.5, which is used for determining whether a particular attainment or unclassifiable area should be included in the baseline area for the PM2.5 increments; and 2) The requirement that PM2.5 precursor emissions be included in the significant impact analysis. The EPA intends to address all of the above mentioned items with this rulemaking. This proposed action will be the first to add SILs for ozone to the PSD regulations.

NPRM To Be Determined

63. Reconsideration of the Polyvinyl Chloride and Copolymers National Emission Standards for Hazardous Air Pollutants (2060-AR73)

This action is in response to four petitions for reconsideration by industry and environmental stakeholders of the April 2012 Polyvinyl Chloride and Copolymers National Emission Standards for Hazardous Air Pollutants (PVC NESHAP). The petitions identify notice and comment issues, as well as several technical consistency and policy issues.

NPRM 12/00/2017

Final Rule 12/00/2018

64. National Emission Standards for Hazardous Air Pollutants Risk and Technology Review Reconsideration: Oil and Natural Gas Sector (2060-AS13)

Abstract: On August 16, 2012, the EPA completed its residual risk and technology review (RTR) and promulgated amendments to National Emission Standards for Hazardous Air Pollutants (NESHAP) that regulate hazardous air pollutants (HAP) from new and existing stationary sources in the oil and natural gas production and transmission/storage major source categories. The 2012 rule amended the NESHAP for these two major source

categories (40 CFR part 63, subparts HH and HHH) for the oil and natural gas industry which were promulgated in 1999. On October 15, 2012, the EPA received several petitions for reconsideration to reconsider, clarify and amend certain provisions of the final 2012 rule. At this time we are evaluating potential issues to reconsider.

NPRM To Be Determined

65. Revisions to the Petition Provisions of the Title V Permitting Program (2060-AS61)

This proposal is expected to identify potential requirements for and provide guidance on the substance and format of title V petitions submitted to the Agency as well as requirements for the electronic submittal of title V petitions by the specific method identified in the rule. The proposal is also expected to discuss other elements around the Agency's review of petitions. The proposal is expected to be consistent with the Digital Government Strategy issued by the White House in 2012 that calls for the EPA to take advantage of new technology and improve transparency for our stakeholders, and to support E-enterprise, a U.S. EPA-state initiative to improve environmental performance and enhance services to the regulated community, environmental agencies, and the public. Furthermore, this rule is expected to be responsive to certain title V Task Force recommendations.

Final Rule To Be Determined

66. General Revisions to Emissions Monitoring and Reporting Requirements for Fossil Fuel-Fired Electric Generating Units (2060-AS74)

The original Acid Rain Program core regulations (40 CFR parts 72 through 78) were published on January 11, 1993. Since then, a number of revisions have been made to these rules based on lessons learned during implementation. In addition, substantive changes have been made to the part 75 continuous monitoring regulation and to the associated definitions in part 72, in order to adapt part 75 monitoring to other State and Federal air programs. However, these various rule revisions have, for the most part, been narrow in scope, focusing on critical needs in specific areas. This rule takes a more comprehensive approach by examining parts 72 through 78 in entirety, and then revising the definitions in part 72, updating test methods that are incorporated by reference, correcting known errors,

NPRM 11/00/2017

Final Rule 10/00/2018

67. National Emission Standards for Hazardous Air Pollutants for Coke Ovens: Pushing, Quenching, and Battery Stacks (2060-AS81)

This action will address the agency's residual risk and technology review (RTR) of the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Coke Ovens:

Pushing, Quenching, and Battery Stacks. The Coke Ovens: Pushing, Quenching, and Battery Stacks NESHAP, subpart CCCCC, was promulgated pursuant to section 112(d) of the Clean Air Act (CAA) on 04/14/03. The NESHAP established emission limitations and work practice requirements based on maximum achievable control technology (MACT) for controlling emissions of hazardous air pollutants (HAP) from pushing, quenching and battery stacks. The HAP emitted from pushing, quenching and battery stacks include coke oven emissions, as well as polycyclic organic matter and volatile organic compounds such as benzene and toluene. This action will implement the residual risk review requirements of CAA section 112(f)(2) and the technology review requirements of CAA section 112(d)(6). The statute directs the EPA to promulgate emission standards under CAA 112(f)(2) if such standards are required to provide an ample margin of safety to protect public health or to prevent, taking relevant factors into account, an adverse environmental effect. Any such standards are to be promulgated within 8 years after promulgation of MACT standards under CAA section 112(d). CAA section 112(d)(6) requires the EPA to review and revise the MACT standards as necessary, taking into account developments in practices, processes and control technologies, no less often than every 8 years. This RTR is subject to an ongoing deadline suit, but does not have established proposal or final rule dates yet. In addition, the NESHAP for Coke Ovens (subpart L), which was reviewed under CAA sections 112(f)(2) and 112(d)(6) and promulgated on 04/15/05, will undergo a technology review under CAA section 112(d)(6) simultaneous with the review of subpart CCCCC.

NPRM To Be Determined

68. Clean Energy Incentive Program Design Details (2060-AS84)

With the final Clean Power Plan (CPP), the EPA provided a Clean Energy Incentive Program (CEIP), a program that states may use at their own option to incentivize early investments in renewable power generation, as well as measures in low-income communities that help reduce rate-payers burdens. On February 9, 2016, the Supreme Court stayed implementation of the Clean Power Plan pending judicial review. While the stay is in place, the CPP is unenforceable. However, the stay does not stop states, tribes, utilities and other stakeholders from continuing to act on climate change. The EPA will move forward developing this action in a way that is consistent with the stay. In the final CPP, the agency laid out the general parameters of the CEIP and stated that we would undertake additional public and stakeholder engagement and seek input before fully developing the design details of the program. In the EPA's proposed Federal Plan and Model Rules, published on October 23, 2015, the EPA proposed CEIP Federal Plan and Model Rule provisions and solicited comment on a number of issues related to design details of the CEIP. On June 30, 2016, the EPA proposed design details of the CEIP for public comment, including some changes to the original CEIP as finalized in the CPP, and re-proposed optional example CEIP rule text for States that choose to incorporate CEIP provisions. When finalized, this action will provide a fully-implementable CEIP, including parameters for eligible programs and projects, matching allocation provisions, conditions on program participation and final optional example CEIP rule text that states may use.

Final Rule To Be Determined

69. Stationary Combustion Turbine RTR (2060-AT00)

This action will address the agency's residual risk and technology review (RTR) of the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Stationary Combustion Turbines. The Stationary Combustion Turbine NESHAP, subpart YYYY, was promulgated pursuant to section 112(d) of the Clean Air Act (CAA) on March 5, 2004. The NESHAP established emission limitations based on maximum achievable control technology (MACT) for controlling emissions of hazardous air pollutants (HAP) from stationary combustion turbines. The HAP emitted from stationary combustion turbines include formaldehyde, toluene, benzene, and acetaldehyde. This action will implement the residual risk review requirements of CAA section 112(f)(2) and the technology review requirements of CAA section 112(d)(6). The statute directs the EPA to promulgate emission standards under CAA 112(f)(2) if such standards are required to provide an ample margin of safety to protect public health or to prevent, taking relevant factors into account, an adverse environmental effect. Any such standards are to be promulgated within 8 years after promulgation of MACT standards under CAA section 112(d). CAA section 112(d)(6) requires the EPA to review and revise the MACT standards as necessary, taking into account developments in practices, processes and control technologies, no less often than every 8 years. This RTR is subject to an ongoing deadline suit, but does not have established proposal or final rule dates yet.

NPRM To Be Determined

70. Engine Test Cells NESHAP RTR (2060-AT01)

This action will address the agency's residual risk and technology review (RTR) of the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Engine Test Cell/Stands. The Engine Test Cell NESHAP, subpart PPPPP, was promulgated pursuant to section 112(d) of the Clean Air Act (CAA) on May 27, 2003. The NESHAP established emission limitations and work practice requirements based on maximum achievable control technology (MACT) for controlling emissions of hazardous air pollutants (HAP) from engine test cells. The HAP emitted from engine test cells include formaldehyde, toluene, and benzene. This action will implement the residual risk review requirements of CAA section 112(f)(2) and the technology review requirements of CAA section 112(d)(6). The statute directs the EPA to promulgate emission standards under CAA 112(f)(2) if such standards are required to provide an ample margin of safety to protect public health or to prevent, taking relevant factors into account, an adverse environmental effect. Any such standards are to be promulgated within 8 years after promulgation of MACT standards under CAA section 112(d). CAA section 112(d)(6) requires the EPA to review and revise the MACT standards as necessary, taking into account developments in practices, processes and control technologies, no less often than every 8 years. This RTR is subject to an ongoing deadline suit, but does not have established proposal or final rule dates yet.

NPRM To Be Determined

71. National Emission Standards for Hazardous Air Pollutants for Source Categories: Generic Maximum Achievable Control Technology Standards--Ethylene Production (Subparts XX and YY) (2060-AT02)

This action will address the agency's residual risk and technology review (RTR) of the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Ethylene Production. The Ethylene Production NESHAPs, subparts XX and YY, were promulgated pursuant to section 112(d) of the Clean Air Act (CAA) on July 12, 2002, and further amended on April 13, 2005. The NESHAP established emission limitations and work practice requirements based on maximum achievable control technology (MACT) for controlling emissions of hazardous air pollutants (HAP) from ethylene process vents, storage vessels, transfer racks, equipment, heat exchange systems and waste streams. The HAP emitted from ethylene process vents, storage vessels, transfer racks, equipment, heat exchange systems and waste streams include benzene, 1,3-butadiene, hexane, toluene and naphthalene. This action will implement the residual risk review requirements of CAA section 112(f)(2) and the technology review requirements of CAA section 112(d)(6). The statute directs the EPA to promulgate emission standards under CAA 112(f)(2) if such standards are required to provide an ample margin of safety to protect public health or to prevent, taking relevant factors into account, an adverse environmental effect. Any such standards are to be promulgated within 8 years after promulgation of MACT standards under CAA section 112(d). CAA section 112(d)(6) requires the EPA to review and revise the MACT standards as necessary, taking into account developments in practices, processes and control technologies, no less often than every 8 years. This RTR is subject to an ongoing deadline suit, but does not have established proposal or final rule dates yet.

NPRM To Be Determined

72. National Emission Standards for Hazardous Air Pollutants for Integrated Iron and Steel Manufacturing Facilities (2060-AT03)

This action will address the agency's residual risk and technology review (RTR) of the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Integrated Iron and Steel Manufacturing Facilities. The Iron and Steel Manufacturing Facilities NESHAP, subpart FFFFF, was promulgated pursuant to section 112(d) of the Clean Air Act (CAA) on 5/20/03. The NESHAP established emission limitations and/or work practice requirements based on maximum achievable control technology (MACT) for controlling emissions of hazardous air pollutants (HAP) from iron-making blast furnaces; steel-making oxygen furnaces; ancillary operations, such as ladling, hot metal transfer, skimming and desulfurization; and sinter plants. The HAP emitted from iron and steel sources include metal HAP (all sources) and volatile HAP (sinter plant only). We also will address unregulated HAP, such as mercury, dioxins/furans and hydrogen cyanide. In addition to conducting the RTR, the EPA will complete its reconsideration of the issues identified in the 3/18/05 response to Earthjustice's petition for administrative reconsideration. The

action will also complete the voluntary remand without vacatur pursuant to the D.C. Circuit's 6/10/10 order in Case No. 03-1205. This action will implement the residual risk review requirements of CAA section 112(f)(2) and the technology review requirements of CAA section 112(d)(6). The statute also directs the EPA to promulgate emission standards under CAA 112(f)(2) if such standards are required to provide an ample margin of safety to protect public health or to prevent, taking relevant factors into account, an adverse environmental effect. Any such standards are to be promulgated within 8 years after promulgation of MACT standards under CAA section 112(d). CAA section 112(d)(6) requires the EPA to review and revise the MACT standards as necessary, taking into account developments in practices, processes and control technologies, no less often than every 8 years. This RTR is subject to an ongoing deadline suit, but does not have established proposal or final rule dates yet.

NPRM To Be Determined

73. National Emission Standards for Hazardous Air Pollutants: Taconite Iron Ore Processing Risk and Technology Review (2060-AT05)

This action will address the agency's residual risk and technology review (RTR) of the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Taconite Iron Ore Processing. The Taconite Iron Ore Processing NESHAP, subpart RRRRR, was promulgated pursuant to section 112(d) of the Clean Air Act (CAA) on 10/30/03 (68 FR 61867). The NESHAP established emission limitations and/or work practice requirements based on maximum achievable control technology (MACT) for controlling emissions of hazardous air pollutants (HAP) from ore crushing and handling operations, indurating furnaces, finished pellet handling operations and ore dryers. The HAP emitted from these sources include metal HAP (e.g., mercury, manganese and lead), formaldehyde and acid gases (i.e., hydrogen chloride and hydrogen fluoride). This action will implement the residual risk review requirements of CAA section 112(f)(2) and the technology review requirements of CAA section 112(d)(6). The statute directs the EPA to promulgate emission standards under CAA section 112(f)(2) if such standards are required to provide an ample margin of safety to protect public health or to prevent, taking relevant factors into account, an adverse environmental effect. Any such standards are to be promulgated within 8 years after promulgation of MACT standards under CAA section 112(d). CAA section 112(d)(6) requires the EPA to review and revise the MACT standards as necessary, taking into account developments in practices, processes and control technologies, no less often than every 8 years. This RTR is subject to an ongoing deadline suit, but does not have established proposal or final rule dates yet. The National Wildlife Federation filed a petition for review of the initial 10/30/03 NESHAP, raising several issues, including the alleged failure of EPA to establish emission standards for mercury and asbestos. EPA requested and was granted a voluntarily partial remand of the rule with the intention to gather information on emissions of mercury and abestos and to develop proposed emissions standards for those HAP, if appropriate. RIN 2060-AM87 has been subsumed into this action and the EPA plans to address these issues in this RTR.

NPRM To Be Determined

74. Rubber Tire Manufacturing Risk and Technology Review (2060-AT07)

This action will address the agency's residual risk and technology review (RTR) of the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Rubber Tire Manufacturing. The Rubber Tire Manufacturing NESHAP, subpart XXXX, was promulgated pursuant to section 112(d) of the Clean Air Act (CAA) on July 9, 2002, with corrections promulgated on March 12, 2003. The NESHAP established emission limitations and work practice requirements based on maximum achievable control technology for control of hazardous air pollutants (HAP) from manufacturers of rubber tires and components integral to rubber tires, as well as tire cord producers and puncture sealant operations. The primary HAP emitted from the rubber tire production process and puncture sealant operations are toluene and hexane. Tire cord operations also emit these HAP, but the more significant emissions from tire cord production are formaldehyde, styrene, and methanol. This action will implement the residual risk review requirements of CAA section 112(f) and the technology review requirements of CAA section 112(d)(6). The statute directs the EPA to promulgate emission standards under CAA 112(f)(2) if such standards are required to provide an ample margin of safety to protect public health or to prevent, taking relevant factors into account, an adverse environmental effect. Any such standards are to be promulgated within 8 years after promulgation of MACT standards under CAA section 112(d). CAA section 112(d)(6) requires the EPA to review and revise the MACT standards as necessary, taking into account developments in practices, processes and control technologies, no less often than every 8 years. This RTR is subject to an ongoing deadline suit, but does not have established proposal or final rule dates yet.

NPRM To Be Determined

75. Lime Manufacturing Risk and Technology Review (2060-AT08)

This action will address the agency's residual risk and technology review (RTR) of the National Emission Standards for Hazardous Air Pollutants (NESHAP) for lime manufacturing. The Lime Manufacturing NESHAP, subpart AAAAA, was promulgated pursuant to section 112(d) of the Clean Air Act (CAA) in January 2004. The NESHAP established emission limitations and work practice requirements based on maximum achievable control technology (MACT) for control of hazardous air pollutants (HAP) from kilns at new and existing lime manufacturing plants. The pollutants emitted from lime manufacturing kilns include metallic HAP, hydrogen chloride, particulate matter, sulfur dioxide, nitrogen oxides and carbon dioxide. These pollutants are predominantly originating from the limestone feed material and the fuels used, and are formed from the combustion of fuels and the heating of feed material in the kiln. This action will implement the residual risk review requirements of CAA section 112(f) and the technology review requirements of CAA section 112(d)(6). The statute directs the EPA to promulgate emission standards under CAA 112(f)(2) if such standards are required to provide an ample margin of safety to protect public health or to prevent, taking relevant factors into account, an adverse

environmental effect. Any such standards are to be promulgated within 8 years after promulgation of MACT standards under CAA section 112(d). CAA section 112(d)(6) requires the EPA to review and revise the MACT standards as necessary, taking into account developments in practices, processes and control technologies, no less often than every 8 years. This RTR is subject to an ongoing deadline suit, but does not have established proposal or final rule dates yet.

NPRM To Be Determined

76. Endangerment Finding for Lead Emissions From Piston-Engine Aircraft Using Leaded Aviation Gasoline (2060-AT10)

The EPA is analyzing air quality modeling and monitoring information to make a determination, under section 231 of the Clean Air Act, of whether lead emissions from aircraft operating on leaded fuel cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare. This action follows a previous ANPRM on the topic. The NPRM will describe the endangerment determination that EPA proposes on lead emissions from general aviation aircraft. This will include a description of analyses that EPA conducted to inform the endangerment finding, such as the lead inventory relevant to use of leaded avgas, air quality monitoring, air quality modeling, and potential exposure information.

NPRM 12/20/2017

NPRM 12/00/2017

Final Rule 01/00/2019

77. National Emission Standard for Hazardous Air Pollutants (NESHAP) Risk and Technology Review: Reinforced Plastics Composites and Boat Manufacturing (2060-AT12)

This action will address the agency's residual risk and technology review (RTR) of the National Emission Standards for Hazardous Air Pollutants (NESHAP) for Reinforced Plastics Composites and Boat Manufacturing. The Reinforced Plastics Composites NESHAP, subpart WWWW, was promulgated pursuant to section 112(d) of the Clean Air Act (CAA) on 4/21/03, and the Boat Manufacturing NESHAP, subpart VVVV, was promulgated pursuant to section 112(d) of the Clean Air Act (CAA) on 8/22/01. The NESHAP established emission limitations and work practice requirements based on maximum achievable control technology (MACT) for controlling emissions of hazardous air pollutants (HAP) from the production of fiberglass bath tubs, showers, automobile, storage tanks and recreational vehicles (Reinforced Plastics Composites) and the manufacture and coating of fiberglass and aluminum boats (Boat Manufacturing). The HAP emitted from these sources include styrene, methylene chloride, toluene, xylene and methyl chloroform. This action will implement the residual risk review requirements of CAA section 112(f)(2)

and the technology review requirements of CAA section 112(d)(6). The statute directs the EPA to promulgate emission standards under CAA 112(f)(2) if such standards are required to provide an ample margin of safety to protect public health or to prevent, taking relevant factors into account, an adverse environmental effect. Any such standards are to be promulgated within 8 years after promulgation of MACT standards under CAA section 112(d). CAA section 112(d)(6) requires the EPA to review and revise the MACT standards as necessary, taking into account developments in practices, processes and control technologies, no less often than every 8 years. This RTR is subject to an ongoing deadline suit, but does not have established proposal or final rule dates yet. In 2005, industry and states asked for clarification and amendments of some rule requirements. This action addresses these issues, and will modify certain requirements related to the startup, shutdown and malfunction provisions in light of a recent court decision. RIN 2060-AP05 has been subsumed into this action and the EPA plans to address these issues in this RTR.

NPRM To Be Determined

78. Control of Air Pollution From Aircraft and Aircraft Engines: Proposed GHG Emissions Standards and Test Procedures (2060-AT26)

This rulemaking follows on the EPA's final endangerment and cause or contribute findings for aircraft GHG emissions which was published on August 15, 2016. As a result of these positive findings, the EPA is obligated under section 231 of the Clean Air Act to set emission standards applicable to GHG emissions from the classes of aircraft engines used in certain types of aircraft included in the contribution finding.

NPRM 01/00/2018

Final Rule 12/00/2018

79. Emission Guidelines for the Existing Oil and Natural Gas Sector (2060-AT29)

On March 10, 2016, the Administration and EPA announced the next step in reducing emissions of greenhouse gases (in the form of methane) from the oil and natural gas industry: moving to regulate emissions from existing sources. Methane from the oil and gas industry comes packaged with other pollutants, including volatile organic compounds that help form harmful smog, and a number of harmful pollutants known as air toxics. The agency is currently undergoing a formal process to require companies operating existing oil and natural gas sources to provide information to assist in the development of comprehensive regulations to reduce greenhouse gas emissions. The Agency will use this information, along with existing agency data, to help us determine how to effectively reduce emissions across existing oil and natural gas sources.

NPRM To Be Determined

UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF CALIFORNIA
SAN FRANCISCO DIVISION

SIERRA CLUB, Plaintiff, STATE OF NEW YORK, Plaintiff-Intervenor, v. GINA McCARTHY, in her official capacity as the Administrator of the United States Environmental Protection Agency, Defendant.	Case No. 3:15-cv-04328-JD (JSC) **[PROPOSED] ORDER ON REMEDY**

The Court, having considered Plaintiff Sierra Club's Motion for Summary Judgment (Dkt. No. 62), Plaintiff-Intervenor State of New York's Motion for Summary Judgment (Dkt. No. 61), Defendant Gina McCarthy's, in her official capacity as Administrator of the United States Environmental Protection Agency (hereinafter, "EPA"), Cross-Motion for Summary Judgment as to Remedy (Dkt. No. 63), all parties' memoranda in opposition and replies thereto, and otherwise being sufficiently advised, hereby **GRANTS** EPA's Cross-Motion for Summary Judgment as to Remedy and **DENIES** Plaintiff's and Plaintiff-Intervenor's motions for summary judgment to the extent they relate to remedy.

1. The appropriate EPA official shall:

a. sign a notice of proposed rulemaking which proposes to fully address EPA's obligation to promulgate a Federal implementation plan ("FIP") for Kentucky that addresses the requirements of 42 U.S.C. § 7410(a)(2)(D)(i)(I) for the 2008 ozone National Ambient Air Quality Standard as to Kentucky no later than November 1,

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2018, unless, prior to that date, EPA proposes to approve a SIP submission for Kentucky addressing these requirements; and

b. sign a notice of final rulemaking which fully addresses EPA's obligation to promulgate a FIP for Kentucky that addresses the requirements of 42 U.S.C. § 7410(a)(2)(D)(i)(I) for the 2008 ozone National Ambient Air Quality Standard as to Kentucky no later than February 1, 2020, unless, prior to that date, EPA signs a notice of final action to approve a SIP submission for Kentucky addressing these requirements.

2. EPA shall expeditiously deliver notices of the proposed and final rulemaking described in Paragraph 1 to the Office of the Federal Register for publication after signature of such notices.

3. The deadlines established by this Order may be extended (a) by written stipulation of Plaintiff, Plaintiff-Intervenor, and EPA with notice to the Court, or (b) by the Court upon motion of EPA for good cause shown pursuant to the Federal Rules of Civil Procedure and upon consideration of any response by Plaintiff and/or Plaintiff-Intervenor and any reply by EPA. Any other provision of this Judgment may be modified by the Court following motion of a party or parties for good cause shown pursuant to the Federal Rules of Civil Procedure and upon consideration of any response by the non-moving party or parties and any reply.

4. If a lapse in EPA appropriations occurs within one hundred and twenty (120) days prior to a deadline in Paragraph 1, that deadline shall be extended automatically one day for each day of the lapse in appropriations.

5. In the event of a dispute between Plaintiff or Plaintiff-Intervenor and EPA concerning the interpretation or implementation of any aspect of this Judgment and Order, the disputing party shall provide the other party with a written notice outlining the nature of the dispute and requesting informal negotiations. The parties shall meet and confer in order to attempt to resolve the dispute. If the parties are unable to resolve the dispute within ten (10) business days after receipt of the notice, either party may petition the Court to resolve the dispute.

IT IS SO ORDERED.

DATED this _____ day of March __, 2017.

_____
JAMES DONATO
UNITED STATES DISTRICT JUDGE

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UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

SIERRA CLUB, Plaintiff, v. GINA MCCARTHY, in her official capacity as Administrator of the United States Environmental Protection Agency, Defendant.	Case No. 3:15-cv-4328-JD (JSC) **SIERRA CLUB'S MOTION FOR SUMMARY JUDGMENT** (Clean Air Act, 42 U.S.C. §§ 7401 *et. seq.*) NOTICED FOR HEARING MARCH 9, 2017 AT 10 A.M.

GLOSSARY

AQAT	Air Quality Assessment Tools
CAIR	Clean Air Interstate Rule
CAMx	Comprehensive Air Quality Modeling with Extensions
CSAPR:	Cross State Air Pollution Rule a/k/a Transport Rule
CSAPR Update:	Cross-State Air Pollution Rule Update for the 2008 Ozone NAAQS
EGU	Electric Generating Unit, *i.e.* power plant
EPA:	Administrator of the United States Environmental Protection Agency
FIP:	Federal Implementation Plan
Good Neighbor Provision:	Clean Air Act § 110(a)(2)(D)(i)(I), 42 U.S.C. § 7410(a)(2)(D)(i)(I)
NAAQS:	National Ambient Air Quality Standard
NODA	Notice of Data Availability
PPB	parts per billion
SIP:	State Implementation Plans

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NOTICE OF MOTION

Please take notice that on March 9, 2017 at 10:00 a.m. or as soon thereafter as counsel can be heard, Plaintiff Sierra Club will move, pursuant to Fed. R. Civ. P. 56(c), this Court to grant summary judgment on Claim Two of Sierra Club's Second Amended Complaint with regard to Defendant's failure to promulgate a complete federal implementation plan for the Kentucky Good Neighbor provision for the 2008 ozone national ambient air quality standard.

RELIEF REQUESTED

Sierra Club seeks an order requiring Defendant Gina McCarthy to promulgate a federal implementation plan which completely addresses Kentucky's Good Neighbor obligations, pursuant to 42 U.S.C. § 7410(a)(2)(D)(i)(I), for the 2008 ozone national ambient air quality standard by no later than June 11, 2018.

POINTS AND AUTHORITIES IN SUPPORT OF THE MOTION

I. ISSUE TO BE DECIDED

The issue to be decided in this case is the amount of time the Court should grant EPA to comply with its mandatory duty to promulgate a federal implementation plan (FIP) which completely resolves Kentucky's obligation under the Good Neighbor provision, 42 U.S.C. § 7410(a)(2)(D)(i)(I) for the 2008 ozone national ambient air quality standard (NAAQS).

II. FACTS

The air pollutant ground-level ozone, which is commonly referred to as smog, can kill people. 81 Fed. Reg. 74,504, 74,514 (Oct. 26, 2016) (CSAPR Update) ("ozone is associated with premature mortality"). It also causes other adverse health impacts like asthma attacks. *Id.* Sierra Club member Laura Fox-Lyngholm, who lives and worked downwind from Kentucky's

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pollution, describes her asthma attacks as feeling like she is drowning and her throat is closing in. Decl. of Laura Fox-Lyngholm at ¶7. Those most at risk of harm from ozone pollution are children, the elderly, individuals with chronic lung diseases like asthma, and people who work or exercise outside. *See, e.g.*, 80 Fed. Reg. 65,292, 65,322 (Oct. 26, 2015).

Ozone has adverse impacts beyond public health. Ozone can decrease vegetation's ability to sequester carbon, thus making climate change worse. 80 Fed. Reg. at 65,370. Ozone can also cause visible foliar injury, decrease plant growth in both native ecosystems and agricultural crops, and even affect ecosystem community composition. 81 Fed. Reg. at 74,514.

> Ground-level ozone is not emitted directly into the air, but is a secondary air pollutant created by chemical reactions between oxides of nitrogen (NOX), carbon monoxide (CO), methane (CH4), and non-methane volatile organic compounds (VOCs) in the presence of sunlight. Emissions from electric utilities [*i.e.* power plants], industrial facilities, motor vehicles, gasoline vapors, and chemical solvents are some of the major anthropogenic sources of ozone precursors.
>
> . . .
>
> Precursor emissions can be transported downwind directly or, after transformation in the atmosphere, as ozone.

81 Fed. Reg. at 74,513. "Further, studies have found that EGU [*i.e.* power plants] NOX emission reductions, particularly, can be effective in reducing ozone pollution as quantified by the form of the 2008 ozone standard, 8-hour peak concentrations." 81 Fed. Reg. at 74,514

On March 12, 2008, the EPA promulgated a new NAAQS for ozone. *See* 73 Fed. Reg. 16,436-16,514 (Mar. 27, 2008). The 2008 ozone NAAQS is one of four ozone NAAQS. The other ones are the 1979, 1997 and 2015 ozone NAAQS. The 2015 ozone NAAQS is more stringent than the 2008 ozone NAAQS but EPA and the states have yet to implement the 2015 ozone NAAQS.

EPA set the 2008 ozone NAAQS to limit ambient concentrations to no more 75 parts per billion (ppb), over an 8-hour averaging period. *See* 40 C.F.R. § 50.15. The 2008 ozone NAAQS is evaluated by the 3-year average of the 4th highest daily maximum 8-hour average.

In accordance with Section 110(a)(1) of the Clean Air Act, 42 U.S.C. § 7410(a)(1), states are required to submit SIPs to attain and maintain the NAAQS within three years of the promulgation or revision of a NAAQS. *See* 42 U.S.C. § 7410(a)(1). These SIP submittals are referred to as Infrastructure SIPs. The Clean Air Act requires a new Infrastructure SIP for each new or revised NAAQS.

Infrastructure SIPs must include requirements set forth under Section 110(a)(2) including Section 110(a)(2)(D)(i)(I) which is known as the Good Neighbor provision. *See* 42 U.S.C. § 7410(a)(2). The Good Neighbor provision, 42 U.S.C. § 7410(a)(2)(D)(i)(I), requires that a SIP:

> (D) contain adequate provisions . . .
>
> (i) prohibiting, consistent with the provisions of this subchapter, any source or other type of emissions activity within the State from emitting any air pollutant in amounts which will . . . (I) contribute significantly to nonattainment in, or interfere with maintenance by, any other State with respect to any such national primary or secondary ambient air quality standard

States were required to submit Infrastructure SIPs for the 2008 ozone NAAQS by no later than March 12, 2011. *See* 73 Fed. Reg. at 16,503; 81 Fed. Reg. at 74,512. This due date was before the *Homer City I* decision in the D.C. Circuit, which EPA believed— until it was overturned by the Supreme Court—called into question, EPA's authority to issue FIPs for Good Neighbor provisions. *EME Homer City Generation, L.P.* v. *EPA*, 696 F.3d 7, 31 (D.C. Cir. 2012) (*EME Homer City I*). As the Supreme Court confirmed in *EPA* v. *EME Homer City Generation*, ''EPA is not obliged to wait two years or postpone its action even a single day: The Act empowers the Agency to promulgate a FIP 'at any time' within the two-year limit.'' 134 S. Ct. 1584, 1601

(2014). Thus, EPA could have promulgated a FIP to fully meet Kentucky's Good Neighbor obligation for the 2008 ozone NAAQS on March 12, 2011, over seven years earlier than the date Sierra Club is requesting in this case.

EPA has extensive experience and knowledge addressing the interstate transport of ozone pollution and its precursors. For example, "EPA has previously issued three rules interpreting and clarifying the requirements of section 110(a)(2)(D)(i)(I) for states in the eastern half of the United States. These rules, and the associated court decisions addressing these rules, provide important guidance regarding the requirements of section 110(a)(2)(D)(i)(I)." 81 Fed. Reg. at 74,510. These three rules are known as the NOx SIP Call, the Clean Air Interstate Rule (CAIR), and the Cross State Air Pollution Rule (CSAPR, pronounced "casper"). The NOx SIP Call addressed the 1979 ozone NAAQS, while CAIR and CSAPR addressed the 1997 ozone NAAQS. The NOx SIP Call addressed both power plants, *i.e.* EGUs, and non-EGUs. 81 Fed. Reg. at 74,571, fn. 184. The substance of these rules has been extensively litigated. *See, e.g.*, *Michigan v. EPA*, 213 F.3d 663 (D.C. Cir. 2000) (reviewing 1998 NOx SIP Call); *North Carolina v. EPA*, 531 F.3d 896 (D.C. Cir. 2008) (reviewing CAIR); *EPA v. EME Homer City Generation, LP*, 134 S.Ct. at 1584 (reviewing CSAPR).

Kentucky submitted a Good Neighbor provision SIP for the 2008 ozone NAAQS on September 8, 2009, and submitted a replacement on July 17, 2012. 78 Fed. Reg. 3,867 (Jan. 17, 2013). EPA missed its Clean Air Act imposed deadline to take final action on Kentucky's Good Neighbor provision submittal so Sierra Club and others sued EPA for violating this mandatory duty. This Court ordered EPA to take final action on the Kentucky Good Neighbor provision submittal by no later than January 4, 2013. *WildEarth Guardians v. Jackson*, 11-cv-5651-YGR consolidated with 11-cv-5694-YGR, Order Granting in Part Plaintiffs' Motion for Summary

Judgment; Granting Defendant's Cross-Motion for Summary Judgment; Vacating Case Management and Other Hearing Dates [Dk#64] (Oct. 17, 2012) at 6. The Court extended that deadline until March 4, 2013 pursuant to EPA's request. *WildEarth Guardians v. Jackson*, 11-cv-5651-YGR consolidated with 11-cv-5694-YGR, Order Granting in Part EPA's Motion to Amend Order, [Dk.69] (Dec. 7, 2012) at 4.

Pursuant to the Court's order, on March 1, 2013, EPA disapproved Kentucky's 2008 ozone NAAQS Good Neighbor provision. 78 Fed. Reg. 14,681 (March 7, 2013). However, EPA claimed that the disapproval did not trigger a mandatory duty to promulgate a FIP for the Kentucky 2008 ozone NAAQS Good Neighbor provision because of the *Homer City I* decision, which at that point had not yet been overturned by the Supreme Court. *Id.*

Sierra Club, along with the states of Connecticut, Delaware, and Maryland, appealed to the Sixth Circuit EPA's final rule disapproving the Kentucky SIP submittal, but only with regard to EPA's claim that the disapproval did not trigger a mandatory duty for EPA to promulgate a FIP. During the pendency of that appeal, the Supreme Court reversed the D.C. Circuit's *Homer City I*. Thus, the parties agreed to partial vacatur and remand with regard to EPA's claim that its disapproval of the Kentucky submittal did not trigger a mandatory duty to promulgate a FIP. *Sierra Club, State of Connecticut, State of Delaware, State of Maryland v. US EPA*, 13-3546/3556 (6th Cir.) Dk.#74-1, March 13, 2015 Order at 2.

On June 1, 2015, Sierra Club provided EPA with a notice of intent to sue letter, (as required by 42 U.S.C. § 7604(b)), informing EPA that Sierra Club intended to sue EPA for its violation of its mandatory duty to promulgate a FIP which completely addressed Kentucky's Good Neighbor obligations for the 2008 ozone NAAQS. On September 22, 2015, Sierra Club filed this current case.

EPA has taken the position in this case that EPA's authority to issue a FIP for Kentucky's 2008 ozone NAAQS Good Neighbor provision did not commence June 2, 2014, when the Supreme Court issued its mandate in *Homer City* and thus 42 U.S.C. § 7410(c) mandates that EPA promulgate a complete FIP for the Kentucky 2008 ozone NAAQS Good Neighbor provision before June 2, 2016. 81 Fed. Reg. at 74,513 ("Thus, the EPA finds that the FIP obligation was triggered as of June 2, 2014, and that the EPA was obligated to promulgate a FIP that corrects the deficiency by June 2, 2016").

In order to avoid having to litigate the issue of when the FIP mandatory duty ran, Sierra Club provided EPA with an additional notice of intent to sue letter on June 6, 2016 and filed a second amended complaint on August 29, 2016. Dk.#39. EPA admitted liability on failure to promulgate a FIP which completely addresses Kentucky's 2008 ozone NAAQS Good Neighbor obligation on September 8, 2016. Defendant's Answer to Plaintiff's Second Amended Complaint for Declaratory Injunctive Relief, [Dk#41], at ¶44.

On September 7, 2016, EPA promulgated the Cross-State Air Pollution Rule Update for the 2008 Ozone NAAQS rule (CSAPR Update), which is a FIP which partially addressed Kentucky's 2008 ozone NAAQS Good Neighbor obligations along with other states. 81 Fed. Reg. at 74,504. The CSAPR Update sets a NOx emission budget for power plants in Kentucky of 21,115 tons of NOx per ozone season (May 1 to September 30). 81 Fed. Reg. at 74,508. EPA admits that even after imposing this NOx emission budget, Kentucky power plants will still significantly contribute to nonattainment and interference with maintenance of the 2008 ozone NAAQS in downwind states, in particular New York and Maryland. Defendant's Answer to Plaintiff's Second Amended Complaint for Declaratory Injunctive Relief, [Dk#41], at ¶44; 81 Fed. Reg. at 74,521. *See also* EPA-HQ-OAR-2015-0500-0492 (1400 control links tab).

However, there is a lot of technical work in the administrative record of the CSAPR Update which EPA could use to issue a FIP which fully addresses the Kentucky 2008 ozone NAAQS Good Neighbor provision. For example, EPA chose to only create a NOx emission budget based on emission reductions that have an incremental cost of less than $1,400 per ton of NOx. However, EPA assembled and evaluated information about NOx reductions from power plants at higher costs of $3,400, $5,000 and $6,400 per ton of NOx. 81 Fed. Reg. at 74,541-74,543, 74,548. However, EPA believed that the NOx reductions available at above the $1,400 level could not be installed at power plants by May 1, 2017 and EPA's claimed purpose in creating the CSAPR Update was to achieve emission reductions by May 1, 2017.

Similarly, the administrative record of the CSAPR Update includes extensive information on NOx emission reductions from Non-EGUs. "Non-EGUs" includes things like industrial boilers, refineries, cement kilns and oil and gas extraction and transmission equipment. The administrative record for the CSAPR Update includes a Non-EGU NOx Mitigation Potential Technical Support Document (TSD). 81 Fed. Reg. at 74,542. The administrative record also included two completed contractor reports which were referenced but not analyzed covering non-EGU NOx emissions. Howekamp Dec. at ¶16.

III. SUMMARY OF ARGUMENT

EPA has failed to promulgate a FIP which fully addresses Kentucky's "Good Neighbor" obligations for the 2008 ozone NAAQS by the Congressionally mandated deadline. The Good Neighbor FIP for Kentucky would ensure that Kentucky does not significantly contribute to violations of, or interfere with maintenance of the 2008 ozone NAAQS in "downwind" states, specifically Richmond County, New York and Hanford County, Maryland. Almost three

quarters of a million people live in these counties. They are exposed to ozone levels which can kill them, trigger asthma attacks, damage native ecosystems and cause other adverse impacts.

EPA admits liability. Thus, the issue before the Court is how long the Court should grant EPA to issue a FIP.

Sierra Club requests the Court order EPA to promulgate a complete Kentucky 2008 ozone NAAQS FIP by no later than June 11, 2018. The June 11, 2018 deadline is based on a 15-month schedule developed by Sierra Club's expert witness David Howekamp. Mr. Howekamp is a former EPA career employee including 18 years as the Director of the Air Division for EPA's Region 9 office in San Francisco.

The 15-month schedule assumes that EPA will not start working on this FIP until the March 9, 2017 hearing on this motion. Yet EPA could have promulgated this FIP on March 12, 2011, some seven and a quarter years before Sierra Club's requested deadline. Furthermore, EPA should have known that a court order to promulgate the Kentucky FIP was coming when it got Sierra Club's first notice of intent to sue letter June 1, 2015, some three years before the requested deadline. In any event, EPA had to have known that a court order to promulgate the Kentucky FIP was coming when it got Sierra Club's subsequent notice of intent to sue letter June 6, 2016 because EPA has conceded liability to the claim in that notice of intent to sue letter. June 6, 2016 is approximately two years before Sierra Club's requested due date. Two years is the maximum time frame Congress has given EPA to promulgate any FIP. *See* 42 U.S.C. § 7410(c)(1).

Sierra Club's proposed schedule is reasonable because EPA has already done much of the work needed to promulgate a complete Kentucky Good Neighbor FIP when it promulgated the CSAPR Update. Moreover, EPA also enjoys a high level of legal clarity and certainty in

creating a complete Kentucky Good Neighbor FIP because it has litigated Good Neighbor provisions extensively, including in the Supreme Court. As tight a schedule as practicable is imperative because EPA's delay endangers innocent people's lives, health and economic wellbeing. In addition, EPA's delay in promulgating the FIP provides Kentucky with an unfair advantage over other states which have complied with the Good Neighbor requirement for the 2008 ozone NAAQS and/or receive Kentucky's pollution, *see, e.g.*, *EME Homer City*, 134 S. Ct. at 1593. For example, Kentucky's neighbor Tennessee is in full compliance with its obligations for the 2008 ozone NAAQS Good Neighbor provision. 81 Fed. Reg. at 74,508, n. 19.

EPA has no legitimate argument that it might need more time. Potential policy preferences (such as addressing the 2008 ozone NAAQS transport obligations along with upcoming 2015 ozone NAAQS transport obligations, or doing a programmatic, multistate rule) cannot justify a schedule longer than necessary to resolve the only mandatory duty EPA has violated before this Court.

IV. INTRODUCTION

Pursuant to Fed. R. Civ. P. 56(c) and the Court's October 28, 2016 Amended Scheduling Order, [Dk#59], Plaintiff Sierra Club moves for summary judgment on Claim Two of the Second Amended Complaint with regard to the FIP for the Kentucky Good Neighbor provision for the 2008 ozone NAAQS. Sierra Club does not move for summary judgment on the other claims because the Parties have filed a Joint Motion to enter Partial Consent Decree [Dk#57] which covers all of the claims except the FIP for the Kentucky 2008 ozone NAAQS Good Neighbor provision. This joint motion is still pending.

As detailed below, at issue in this motion is a "missed deadline" claim against a federal agency that has blatantly missed a statutory deadline designed to protect public health and welfare and ensure a level economic playing field between the states. Specifically, the Clean Air

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Act sets a mandatory deadline of no later than June 2, 2016 for EPA to promulgate a FIP which completely addresses Kentucky's 2008 ozone NAAQS Good Neighbor provision obligation. EPA does not dispute that it has missed this deadline.

EPA's missed mandatory duty has serious consequences for implementation of the 2008 ozone NAAQS, and thus for public health and welfare. Ozone represents a serious air quality issue in many parts of the United States including areas downwind of Kentucky like New York and Maryland. Exhaustive scientific review by EPA has determined that ozone also causes emergency department visits, hospital admissions for respiratory causes, and even death. 79 Fed. Reg. 75,234, 75,236 (Dec. 17, 2014). Those most at risk from ozone pollution are children; active people, such as runners and people who do manual labor outside; people with pre-existing lung and heart diseases such as asthma; and older people. 79 Fed. Reg. at 75,236, 75,242. Moreover, the detrimental effects extend beyond public health. Ozone pollution also interferes with vegetation's ability to function properly. This interference results in injuries such as decreased crop yields and damage to native ecosystems. 81 Fed. Reg. at 74,514.

In addition, EPA's illegal refusal to hold polluters in Kentucky accountable for their interstate pollution provides Kentucky with an unfair advantage over other compliant states such as Tennessee, as well as Florida, Georgia, Maine, Massachusetts, Minnesota, New Hampshire, North Carolina, South Carolina, and Vermont. *See* 81 Fed. Reg. at 74,506, 74,508, n. 19. As the Supreme Court explained: "Left unregulated, the emitting or upwind State [*e.g.*, Kentucky] reaps the benefits of the economic activity causing the pollution without bearing all the costs. . . . Conversely, downwind States [*e.g.*, Maryland and New York] to which the pollution travels are unable to achieve clean air because of the influx of out-of-state pollution they lack authority to control."). *EME Homer City*, 134 S. Ct. at 1593.

Despite these serious consequences—and Congressional mandates—EPA has failed to promulgate a FIP that fully addresses Kentucky's 2008 ozone NAAQS Good Neighbor obligation. In light of the grave nature of the injury from ozone pollution, EPA's history of delay, the inequality between the states, and the amount of work EPA has already done for the task at hand, Sierra Club requests that the Court not countenance any EPA request for further delay and require EPA promulgate a FIP fully resolving Kentucky's 2008 ozone NAAQS Good Neighbor obligations no later than June 11, 2018.

V. LEGAL BACKGROUND

Congress enacted the Clean Air Act to "**speed up**, expand, and intensify the war against air pollution in the United States with a view to assuring that the air we breathe throughout the Nation is wholesome once again." H.R. Rep. No. 1146, 91st Cong., 2d Sess. 1, 1, 1970 U.S. Code Cong. & Admin. News 5356, 5356 (emphasis added). To promote this, the Act requires EPA to set NAAQS for certain pollutants, including ozone. 42 U.S.C. § 7409(a). The Act also requires EPA to review and revise as appropriate the NAAQS every five years, 42 U.S.C. § 7409(d)(1). Because EPA consistently misses Congressionally mandated deadlines, including the deadline to review and revise the NAAQS every five years, there is a 1997 ozone NAAQS and then the next ozone NAAQS is the 2008 ozone NAAQS, some 11 years, rather than five years, later.

Within three years of a NAAQS's promulgation or revision, each state must submit a SIP that provides for the "implementation, maintenance, and enforcement" of the standard. 42 U.S.C. § 7410(a)(1). These SIPs are known as "Infrastructure" SIPs because they establish the infrastructure of a state's basic air pollution control program. Other SIPs address other aspects of air pollution control, such as SIPs to clean up the air in specific nonattainment areas, or

regional haze SIPs to get rid of haze in specific national parks. These SIPs are known as Nonattainment area SIPs and Regional Haze SIPs, respectively.

The requirements for Infrastructure SIPs are set forth in 42 U.S.C. § 7410(a)(2)(A)-(M). These include, for example, enforceable emission limits for sources of pollution, 42 U.S.C. § 7410(a)(2)(A), and a network of ambient air pollution monitors and monitors of emissions from sources of pollution. 42 U.S.C. § 7410(a)(2)(B) & (F).

The Infrastructure SIP element at 42 U.S.C. § 7410(a)(2)(D)(i) is referred to as the Good Neighbor provision. Kentucky's Good Neighbor provision, or lack thereof, is the basis for the dispute in this motion. Good Neighbor provisions require each state to ensure that its pollution is not causing certain adverse impacts in downwind states such as contributing to nonattainment areas or interfering with maintenance of the NAAQS. *Id.* at § 7410(a)(2)(D)(i)(I). EPA implemented the Good Neighbor provisions for the 1979 and 1997 ozone NAAQS through programs called the NOx SIP Call, the Clean Air Interstate Rule, and the Transport Rule which is also known as the Cross State Air Pollution Rule (CSAPR). *See* 63 Fed. Reg. 57,356 (Oct. 27, 1998); 70 Fed. Reg. 25,162 (May 12, 2005); 76 Fed. Reg. 48,208 (Aug. 8, 2011). The NOx SIP Call and CAIR have resulted in reductions of hundreds of thousands of tons of air pollution which has lowered ambient pollution levels for millions of people.[1] However, the NOx SIP Call, CAIR, and CSAPR were designed to comply with the 85 parts per billion (ppb) 1997 ozone NAAQS, not the more protective 75 ppb 2008 ozone NAAQS.

The Clean Air Act requires EPA to take final action on any administratively complete state implementation plan submittal by approving in full, disapproving in full, approving in part and disapproving in part, or conditionally approving, within 12 months of the date the submittal

[1] CSAPR was affirmed by the Supreme Court in *EPA v. EME Homer City Generation, L.P.*, 574 U.S. ___, 134 S. Ct. 1584, 1593 (2014).

is deemed administratively complete. 42 U.S.C. § 7410(k)(2), (3) and (4). If EPA disapproves a SIP submittal, EPA must promulgate a FIP to take the place of the disapproved SIP submittal within two years of the disapproval. 42 U.S.C. § 7410(c)(1). A state can subsequently submit a SIP to replace a FIP even after EPA promulgates the FIP if EPA finds that the SIP submittal meets the applicable Clean Air Act requirements. *See, e.g.*, 81 Fed. Reg. at 74,569.

VI. ARGUMENT

A. SIERRA CLUB HAS ESTABLISHED LIABILITY BY VIRTURE OF EPA ADMITTING THAT IT HAS NOT PROMULGATED A FIP WHICH FULLY RESOLVES KENTUCKY'S 2008 OZONE NAAQS GOOD NEIGHBOR OBLIGATIONS

The relevant part of Sierra Club's Claim Two alleges a violation of the mandatory duty in 42 U.S.C. § 7410(c)(1) for EPA to promulgate a FIP which fully resolves Kentucky's Good Neighbor obligations for the 2008 ozone NAAQS. EPA has already admitted that it is in violation of this mandatory duty. Defendant's Answer to Plaintiff's Second Amended Complaint for Declaratory Injunctive Relief, [Dk#41], at ¶44. Thus, Sierra Club is entitled to summary judgment and declaratory relief on this issue.

B. SIERRA CLUB HAS STANDING

An organization has standing when: (1) the organization's members have standing in their own right; (2) the interests which the organization seeks to protect in the lawsuit are germane to the purposes of the organization; and (3) neither the claim asserted nor the relief requested requires the individual participation of members in the lawsuit directly. *See Friends of the Earth, Inc. v. Laidlaw Envtl. Servs. (TOC), Inc.*, 528 U.S. 167, 180-81 (2000). The latter two conditions are easily satisfied here: Sierra Club's interests in safeguarding air quality and in protecting public health and the environment from the effects of ozone pollution are germane to

its organizational purposes, *see* Declaration of Nahaliel Kanfer ("Kanfer Decl.") ¶¶ 4-7, and this suit will not require individual participation of members.

With regard to the first condition, individual organizational members have standing to sue in their own right if they have suffered "an 'injury in fact' that is (a) concrete and particularized and (b) actual or imminent, not conjectural or hypothetical . . ." *See Friends of the Earth*, 528 U.S. at 180. These injuries must be "fairly traceable to the challenged action of defendant; and . . . . it is likely, as opposed to merely speculative, that the [injuries] will be redressed by a favorable decision." *Id.* at 180-81. As demonstrated below, this condition is likewise satisfied.

Sierra Club members live, work, recreate, and otherwise spend time in areas where they are adversely impacted by Kentucky's ozone pollution. *See* EPA-HQ-OAR-2015-0500-0492[2] (1400 control links tab) (showing Kentucky will contribute above the 0.75 ppb threshold to the Harford, MD and Richmond, NY monitors even after the CSAPR Update is implemented); Declaration of Huda Fashho ("Fashho Decl.") ¶ 5(Sierra Club has over 40,000 members in New York and over 13,000 in Maryland); Declaration of Elizabeth Bennett ("Bennett Decl."); Declaration of Laura Fox-Lyngholm ("Fox-Lyngholm Decl."); Declaration of Janet Eikenberg ("Eikenberg Decl."). For example, Sierra Club member Elizabeth Bennett lives in Prospect, Kentucky, and is concerned with the impacts to her health from ozone pollution. *See* Bennett Decl. ¶¶ 2, 5, 8. Ms. Bennett has suffered from asthma since she was a child and is, therefore, particularly susceptible to harm from ozone. *Id.* ¶¶ 3-4. "[W]hen air quality is poor, [she] can feel it in [her] lungs—breathing becomes heavy and labored, and [she is] forced to stay indoors and miss out on the recreational activities [she] enjoy[s]." *Id.* ¶ 5. Sierra Club member Laura

[2] This large excel file is available at www.regulations.gov.

Fox-Lyngholm lives downwind of Kentucky in Richmond County, New York. *See* Fox-Lyngholm Decl. ¶ 2. As someone with a preexisting respiratory issue, *id.* ¶ 7, who is sixty-four years old, *id.* ¶ 2, and enjoys being active outdoors, *id.* ¶ 5, Ms. Fox-Lyngholm must remain vigilant of air quality in her area in order to avoid having acute asthma attacks, during which "it feels like [she is] drowning and [her] throat is closing in." *Id.* ¶ 7. Similarly, sixty-five-year-old Sierra Club member Janet Eikenberg lives downwind of Kentucky in Harford County, Maryland. *See* Eikenberg Decl. ¶ 2. Ms. Eikenberg suffers from asthma and often finds it difficult to breathe on hot days when ozone levels tend to be the highest, forcing her to limit her time outside. *Id.* ¶¶ 2, 5-6. As a result, not only are Ms. Eikenberg's recreational values lessened, but her ability to care for the horses on her property is also negatively affected by ozone. *Id.* ¶ 6.

These injuries of exposure to unsafe levels of ozone pollution are traceable to, and would be redressed by, the Administrator resolving her failure to promulgate a FIP to completely address Kentucky's 2008 ozone Good Neighbor obligation, as this mandatory duty is designed to lessen people's exposure to harmful ozone pollution. Thus, standing is established here.

C. THE COURT SHOULD REQUIRE EPA TO PROMULGATE THE KENTUCKY FIP BY JUNE 11, 2018.

The Court should order that EPA promulgate by no later than June 11, 2018 a FIP fully resolving Kentucky's 2008 ozone NAAQS Good Neighbor obligations. This would mean that, even under EPA's interpretation of when its FIP clock started, EPA would have illegally delayed the critical public health and welfare protection by approximately two years.

This remedy is appropriate because, as detailed below, (1) a 15 month schedule, starting from the hearing date on this motion, is reasonable as demonstrated by Sierra Club's expert David Howekamp and the facts that EPA has already done a significant amount of work which

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can be used for this FIP and that the Courts have given EPA considerable direction; (2) the complete Good Neighbor FIP for Kentucky is needed to provide increased public health and welfare protection for the almost three-quarters of a million people who live in areas which EPA says are currently not getting the protection they are entitled to; (3) EPA should have resolved this issue seven years ago and should have known that it was going to be ordered to resolve this issue on June 1, 2015 when Sierra Club sent out its first notice of intent to sue; (4) EPA's delay in promulgating the FIP provides Kentucky with an unfair advantage over other states which have complied with the Good Neighbor requirement for the 2008 ozone NAAQS and/or receive Kentucky's pollution; and (5) EPA's request for a longer schedule based on policy preferences and bureaucratic convenience should be rejected because EPA is in violation of a Congressionally mandated deadline.

1. A JUNE 2018 DEADLINE IS REASONABLE IN LIGHT OF THE ANALYSIS OF FORMER EPA EMPLOYEE DAVID HOWEKAMP AND CONSIDERING THE SIGNIFICANT AMOUNT OF WORK EPA HAS ALREADY DONE AND THE CONSIDERABLE DIRECTIONS COURTS HAVE ALREADY PROVIDED

a. EPA IS FAR FROM WRITING ON A CLEAN SLATE

A June 2018 deadline is reasonable because EPA has dealt with the Good Neighbor provision many times and has extensively litigated over it. EPA has created four multi-state trading programs to address the Good Neighbor provision: the NOx SIP Call, CAIR, CSAPR and the CSAPR Update. 81 Fed. Reg. at 74,510. The first three programs were extensively litigated. *See Michigan*, 213 F.3d 663; *North Carolina*, 531 F.3d 896; *EME Homer City*, 134 S.Ct. 1584. EPA has also dealt with individual states' Good Neighbor provision. *See e.g.* 81 Fed. Reg. 31,513 (May 19, 2016)(EPA approving Arizona's 2008 ozone NAAQS Good Neighbor

provision). All of this experience means that EPA should be able to work on the complete Kentucky FIP efficiently and rapidly. *See* Howekamp Decl. at ¶7.

In addition, the recently completed CSAPR Update rule provides EPA with much of the technical information and analysis it needs for a new FIP. For example, the CSAPR Update provides EPA with the scope of the problem. The final CSAPR Update analysis shows Kentucky will be contributing 2.1158 ppb to the violating ozone monitor in Harford County, Maryland and 1.0055 ppb to the violating ozone monitor in Richmond County, New York after the CSAPR Update is implemented. *See* EPA-HQ-OAR-2015-0500-0492 (1400 control links tab). The CSAPR Update includes an analysis of additional NOx reductions which can be obtained from EGUs at price points above the price point EPA chose to use in the CSAPR Update. 81 Fed. Reg. at 74,541-74,543, 74,548. While EPA imposed a constraint on itself in the CSAPR Update of only including measures available by 2017, that constraint need not apply to the Kentucky FIP, providing EPA with more flexibility in terms of the NOx reductions from EGUs which it can choose to require. The CSAPR Update also includes extensive information about NOx reductions available from non-EGU sources of NOx. *See* 81 Fed. Reg. at 74,542; Howekamp Decl. at ¶16. Finally, the CSAPR Update includes modeling, including the air quality assessment tool (AQAT) which greatly simplifies the creation of a complete Good Neighbor FIP for Kentucky. Howekamp Decl. at ¶8.

EPA may ask the Court for more time to do more studies and analysis. But that is not a legitimate reason to extend the deadline beyond June 2018: EPA's obligation to act is not outweighed by a desire to do additional study—as EPA well knows from its experience with the particulate matter NAAQS. There, the Court held:

In such circumstances, the agency carries a heavy burden to show that

> compliance with statutory mandated deadlines is impossible or infeasible. Excuses for delay must go beyond the general proposition that further study and analysis of materials will make final agency action better, because further study will always make everything better, and it is always easier to do something with more rather than less time.

American Lung Ass'n v. Browner, 884 F. Supp. 345, 347 (D.Ariz. 1994) (internal citations omitted).

b. DAVID HOWEKAMP'S 15 MONTH SCHEDULE IS REASONABLE

The reasonableness of the June 2018 deadline is demonstrated by David Howekamp, whom Plaintiff retained as an expert on an appropriate schedule in this case. Before becoming an environmental consultant specializing in air quality management, Mr. Howekamp was a career employee at EPA for 31 years. Howekamp Dec. at ¶¶2-3. For the last 18 of those years, he was the Director of the Air Division for EPA's Region 9 office in San Francisco. *Id.* In that position, he managed a budget of over $40 million and directed a staff of 120 scientists, engineers and planners in implementing the Clean Air Act. *Id.*

Mr. Howekamp has extensive experience in establishing and negotiating rulemaking schedules; most of the rulemakings produced by his Division were performed as a result of court orders or settlement agreements. *Id.* He was personally responsible for preparing Federal Register notices making findings of failure to submit all or portions of SIPs, so he has first-hand knowledge of the technical and policy considerations in such matters and the management demands and resource requirements for producing these notices. *Id.* Mr. Howekamp uses that experience in his current consulting work to provide expert advice to organizations in numerous cases regarding appropriate Clean Air Act rulemaking schedules. *Id.* at ¶2.

Applying his experience to the present situation, Mr. Howekamp developed a 15 month schedule for EPA to finalize a complete Kentucky 2008 ozone NAAQS Good Neighbor FIP. *Id.* at ¶26. The first step in Mr. Howekamp's schedule is for EPA to assess the NOx reductions they "left on the table" in the CSAPR Update. *Id.* at ¶10. That is, EPA needs to look at emission reductions which can be achieved simply by Kentucky power plants operating their pollution controls at levels they actually achieved in the past as well as emission reductions which will be achieved because of power plants retiring. *Id.* at ¶10-13. Two recent studies, one by Maryland and one by Sierra Club, indicate that EPA could set a substantially lower emission budget for Kentucky based just on these readily available emission reductions. *Id.* at ¶10. The current price of NOx emission credits also supports this conclusion. *Id.* at ¶11. Mr. Howekamp explains that this simple analysis could be completed in a month.

Mr. Howekamp explains that if such readily available emission reductions, that is what was left on the table in the CSAPR Update, were not enough, EPA can use the data it already has from the CSAPR Update to identify additional emission reductions. *Id.* at ¶14-17. Mr. Howekamp states that this step would take three months and can be concurrent with the first step. *Id.* Although EPA may want to hold an extra public comment period through a notice of data availability (NODA) process, Mr. Howekamp explains that this is not necessary and would cause needless further delay. *Id.* at ¶18.

The next step, according to Mr. Howekamp, would be to update the CAMx and AQAT modeling (although this step would only be needed if EPA needed to require emission reductions beyond those described as readily available in step 1). *Id.* at ¶19-22. It is worth noting that one of the most important and complicated inputs in the CAMx modeling, that is the Integrated Planning Model (IPM) outputs, were actually available for 2018 and EPA had to adjust them

back to 2017. 81 Fed. Reg. at 74,528. Thus, if EPA used 2018 as its year of analysis in the complete Kentucky FIP, it will have another time-saving opportunity. Mr. Howekamp states that this modeling step would take four months, partially concurrent with the first two steps. Howekamp Decl. at ¶19-22.

The final two steps are for EPA to prepare the proposed and final rules. *Id.* at ¶23-25. These could be completed in 11 months combined. *Id.* All of these steps, some of which can be concurrent and which can use the building blocks from the CSAPR Update, would take a total of 15 months according to Mr. Howekamp. *Id.* at ¶26.

2. THE SERIOUS PUBLIC HEALTH IMPACTS CAUSED BY EPA'S DELAY FAVOR A JUNE 2018 DEADLINE.

As explained above, EPA acknowledges that exposure to ozone pollution can kill innocent people as well as cause expensive emergency department visits and hospital admissions. 73 Fed. Reg. at 16,436. Children are most at risk from ozone pollution, as are people who exercise or perform manual labor outside, people with pre-existing lung and heart diseases such as asthma, and the elderly. 79 Fed. Reg. at 75,236, 75,242.

The detrimental effects of ozone pollution extend beyond public health. Ozone interferes with vegetation's ability to function properly, which results in injuries such as decreased crop yields, damage to native ecosystems, and the acceleration of climate change. 80 Fed. Reg. at 65,370; 81 Fed. Reg. at 74,514. With such severe consequences and such extensive delay already baked in, it only makes sense that the remedy should be as expeditious as possible.

3. EPA WAS LONG AWARE OF ITS OBLIGATION SO IT EFFECTIVELY HAD MORE THAN 15 MONTHS

As explained above, Sierra Club is basing its request for a June 2018 deadline on the assumption that EPA does no work on the Kentucky complete FIP until after the hearing on this motion However, given that EPA could have and should have begun work on a Kentucky FIP long ago, a June 2018 deadline is actually quite generous. EPA has long been on notice that a Kentucky FIP would be necessary, and thus cannot now claim that it needs extensive extra time.

Kentucky's 2008 ozone NAAQS Good Neighbor SIP was due March 12, 2011. 73 Fed. Reg. at 16,503. Kentucky did not submit its SIP by that date, and thus EPA had the legal authority to issue a FIP the very next day. *EME Homer City*, 134 S. Ct. at 1601.

Sierra Club sent its first notice of intent to sue letter regarding the Kentucky FIP claim on June 1, 2015. Even if EPA thought the FIP clock began to run on June 2, 2014, it knew its FIP clock was running when it got Sierra Club's notice letter. In any event, EPA admitted liability on September 9, 2016, when it filed its Answer to Plaintiff's Second Amended Complaint. At that time, EPA had also finalized the CSAPR Update. Thus, if EPA started working on the complete Kentucky FIP at that point, it would covert Sierra Club's proposed deadline into a 21 month schedule. All of this notice makes an order setting a June 2018 deadline entirely reasonable.

4. EPA'S DELAY IN PROMULGATING THE COMPLETE FIP PROVIDES KENTUCKY WITH AN UNFAIR ECONOMIC ADVANTAGE OVER STATES WHICH HAVE COMPLIED WITH THE GOOD NEIGHOBOR PROVISION AND/OR RECEIVE KENTUCKY'S POLLUTION

The Clean Air Act is an example of "cooperative federalism" in which states and the federal EPA both play key roles in ensuring that we have clean, productive air. One of EPA's

key roles it to ensure that the Clean Air Act does not become a "race to the bottom" in which certain states avoid or delay action to give certain polluting industries in their state an advantage over those same polluting industries in other states. However, when EPA illegally delays fulfilling its mandatory duties, it enables the race to the bottom and allows certain states to gain an advantage over other states.

EPA's failure to timely fulfill its obligation to see that Good Neighbor provisions are fully implemented creates inequity in certain downwind states such as New York and Maryland. As New York is a party to this case, Sierra Club will leave it to New York's brief to fully explain this situation.

In addition, there are states like Tennessee, Florida, Georgia, Maine, Massachusetts, Minnesota, New Hampshire, North Carolina, South Carolina, and Vermont which EPA claims are already in full compliance with the Good Neighbor obligations. *See* 81 Fed. Reg. at 74,506, 74,508, fn. 19. EPA's delay in promulgating a complete Kentucky FIP gives Kentucky polluters an unfair economic advantage over these states.

5. EPA's ABYSMAL RECORD OF DELAY AND ATTEMPT TO USE POLICY PREFERENCES AND BUREACRATIC CONVENIENCE TO JUSTIFY FURTHER DELAY MAKES ANY SCHEDULE IT PROPOSES SUSPECT

EPA's consistent missing of Congressional deadlines demonstrates that a rapid, reasonable deadline for action is required here. As one district court explained, EPA has an "unblemished record of nonperformance in this corner of the Clean Air Act," referring to implementing the ozone NAAQS. *Sierra Club v. Johnson*, Civ. Act. No. 04-2163-JR, Slip. Op. at 7 (D.D.C. Apr. 6, 2005).

The Court should reject any arguments by EPA that Sierra Club's proposed deadlines are

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impossible to meet. In *Alabama Power Co. v. Costle*, 636 F.2d 323, 359 (D.C. Cir. 1979), the court held that the "agency's burden of justification in such a case is especially heavy." In justifying its decision to order a shorter timeline than that proposed by EPA for the review process, the Arizona district court pointed out that by allowing the NAAQS review deadline to lapse, "the EPA has not merely missed a deadline, it has nullified the congressional scheme for a fixed interval review and revision process." *American Lung Ass'n v. Browner*, 884 F. Supp. at 348. Notably, although EPA contended that it simply could not perform the review for particulate matter in less than 4 years and 3 months, *id.* at 346-347, the agency was nonetheless able to complete this PM NAAQS review in less than three years. *See* 62 Fed. Reg. 38,652 (July 18, 1997) (finalizing the revised NAAQS for PM). Moreover, the product of that PM NAAQS review process survived legal challenges raised by both industrial and environmental groups. *See American Trucking Assns. v. EPA*, 283 F.3d 355, 358 (D.C. Cir. 2002), *rev'd in part on other grounds, aff'd in part sub nom. Whitman v. American Trucking Associations*, 531 U.S. 457 (2001).

Similarly, this Court should reject any attempt by EPA to try to justify a longer schedule based on policy preferences or bureaucratic convenience. These are not legitimate grounds for a longer schedule now that EPA is in violation of a congressionally mandated deadline. *American Lung Ass'n*, 884 F. Supp. at 347. For example, EPA may want to combine the Kentucky complete FIP with a FIP for other states. However, EPA itself has been clear that the Clean Air Act does not require EPA to do multi-state rules. *See, e.g.*, 81 Fed. Reg. 71,991, 71,993 (Oct. 19, 2016). Thus, EPA's preference for a multi-state rule cannot justify a longer schedule.

Similarly, EPA may claim that it wishes to do one rule that addresses both the residual obligations for the 2008 ozone NAAQS as well as the obligations for the 2015 ozone NAAQS.

The CSAPR Update actually addressed residual obligations for the 1997 ozone NAAQS as well as the 2008 ozone NAAQS. 81 Fed. Reg. at 74,504. However, the CSAPR Update was promulgated some 16 years after Good Neighbor SIPs were due for the 1997 ozone NAAQS. So much time had passed that the CSAPR Update claimed the violations of the less protective 1997 ozone NAAQS had resolved themselves so that no additional emission reductions were necessary. 81 Fed. Reg. at 74,507. The Court should not countenance an approach based on extreme delay causing the problem to eventually go away.

D. THE REMEDY NEEDS TO INCLUDE A DUE DATE FOR THE PROPOSED RULE AND A REQUIREMENT TO SEND THE RULES TO THE OFFICE OF THE FEDERAL REGISTER WITHIN THREE WORKING DAYS.

As explained above, EPA has a long and consistent history of missing Clean Air Act deadlines. This includes deadlines in consent decrees and court orders. In order to ensure that EPA is on track to meet a June 2018 deadline, the Court should also impose a deadline for a proposed rule. This will prevent EPA from coming to Sierra Club or the Court a few weeks before the June 2018 deadline with a claim that they are significantly behind schedule and need a major extension. A January 31, 2018 deadline for signature of a proposed rule would ensure that EPA stays on track.

Similarly, EPA often causes delay by taking an unreasonable amount of time to provide signed rules to the Office of the Federal Register for publication. Rules' effective dates are triggered by their publication date and rules can only be challenged after publication. Therefore, the Court should require EPA to send the proposed and final rule to the Office of Federal Register for publication within three business days of when EPA signs the rules.

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VII. CONCLUSION

For the reasons explained above, Sierra Club respectfully requests that the Court grant summary judgment as to Sierra Club's Kentucky FIP claim and order EPA to sign a proposed rule no later than January 31, 2018, promulgate a final FIP by no later than June 11, 2018 and forward the proposed and final rules to the Office of the Federal Register for publication within three working days of signature.

Dated: Nov. 14, 2016

Respectfully submitted,

/s Robert Ukeiley

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Counsel for Sierra Club

UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF CALIFORNIA

SIERRA CLUB, Plaintiff, v. GINA MCCARTHY, in her official capacity as Administrator of the United States Environmental Protection Agency, Defendant.	Case No. 3:15-cv-4328-JD **DAVID HOWEKAMP DECLARATION** (Clean Air Act, 42 U.S.C. §§ 7401 *et. seq.*)

1. I, David Howekamp, make this declaration based on my personal knowledge:

2. I am an environmental consultant specializing in air quality management. In my practice I have provided expert advice to companies, governmental agencies, nongovernmental organizations and citizen groups. Much of my practice involves issues regarding stationary and mobile combustion sources, such as power plants, industrial, commercial and institutional boilers, combustion turbines and cement plants. Also, I have provided expert advice to organizations in numerous cases regarding appropriate rulemaking schedules for Clean Air Act requirements contested in Federal District Court. The recommended schedules in my declarations entered into the record in these judicial proceedings have frequently been the same schedules ordered by the court. For example, see Our Children's Earth Foundation v. USEPA, (N. D. Cal.) No.4:03-cv-0770-CW and Communities for a Better Environment, et al v. USEPA, N. D. Cal. e No. 3:07-cv-03678-JSW. I have a Master's Degree in Business Administration and

a Bachelor's Degree in Mechanical Engineering from the University of California at Berkeley. My CV is attached as Attachment 1.

3. Prior to becoming an environmental consultant in April 2000, I was a career employee at the U.S. Environmental Protection Agency for 31 years. From 1982 to 2000, I was the Director of the Air Division for EPA's Region 9 office in San Francisco. In this position I was the principal advisor to the Regional Administrator on policy, political and technical issues involving air quality management. I managed a budget of over $40 million and directed a staff of 120 scientists, engineers and planners in implementing the requirements of the Clean Air Act. My specific responsibilities included issuing permits and developing and enforcing regulations for stationary sources, including electrical generating units. I was also personally responsible for the preparation of numerous Federal rulemakings, so I have first-hand knowledge of the technical and policy considerations in such matters and the management demands and resource requirements for producing complex Federal rulemakings. These Federal Implementation Plans (FIPs) addressed control requirements for multiple categories of sources in California, Arizona and Nevada that established national precedents requiring the involvement and approval of EPA headquarters. I also have extensive experience in establishing or negotiating rulemaking schedules since most of the rulemakings produced by my division were performed as a result of court orders or settlement agreements.

4. On September 7, 2016, the EPA promulgated Federal Implementation Plans for several states, including Kentucky, that updated the Cross-State Air Pollution Rule (CSAPR) ozone season program by issuing the CSAPR Update. Starting in May, 2017, this final rule will reduce ozone season emissions of nitrogen oxides (NOx) from electrical generating units (EGUs) in 22 states in the eastern United States. The FIPs partially address the EPA's outstanding Clean Air

Act (CAA) obligations under section 110(a)(2)(D)(i)(I), sometimes called the "good neighbor provision," to prohibit interstate transport of air pollution which will contribute significantly to nonattainment in, or interfere with maintenance by, any other state with respect to the 2008 ozone National Ambient Air Quality Standards (NAAQS). In order to measure compliance with the "good neighbor provision", EPA established an air quality screening threshold calculated as one percent of the 2008 ozone NAAQS (0.75 parts per billion). States whose contributions to a specific downwind location meet or exceed the screening threshold are considered linked to that receptor. States whose contributions are below that threshold are not linked and, therefore, meet the "good neighbor" requirement.

5. A FIP is required for each of the 22 states subject to this rule, because EPA found they failed to submit a complete good neighbor SIP (15 states) or EPA issued a final rule disapproving their good neighbor SIP (7 states). Upon such EPA actions, EPA is then obligated under the CAA to issue a FIP at any time within two years of those actions. In the case of Kentucky, the facts are clear that EPA had a mandatory duty to promulgate a Federal Implementation Plan (FIP) which completely addresses the Kentucky "good neighbor" provision for the 2008 ozone national ambient air quality standard (NAAQS) by no later than June 2, 2016. EPA has failed to complete this mandatory duty.

6. Because the reductions in the FIPs are EGU-only and because the EPA has focused the policy analysis for the action on reductions available by the beginning of the 2017 ozone season, CSAPR update reductions represent, for most states, including Kentucky, a first, partial step to addressing a given upwind state's significant contribution to downwind air quality impacts for the 2008 ozone NAAQS. As noted in the CSAPR Update rulemaking, in the case of Kentucky, EPA determined that emissions from Kentucky will continue to exceed the 1 percent screening

threshold at two receptors to which Kentucky was linked (Harford County, Maryland and Richmond County, New York) after application of the prescribed emission budgets. The question remaining is how long the Court should grant EPA to finalize a FIP that completely addresses Kentucky's "good neighbor" obligation.

7. In addressing this obligation, it is critically important to recognize that EPA has the benefit of a structure and methodology that has been extensively litigated all the way up to the Supreme Court and back down. From a technical standpoint, the partial FIP signed on September 7, 2016 was designed using a rigorous modeling approach and extensive analysis of the abilities of EGU's to control and substantially reduce NOx emissions. With these key building blocks in place, EPA should be able to expeditiously prepare a FIP that completely fulfills Kentucky's "good neighbor" obligation.

8. For the CSAPR update modeling, the EPA used the Comprehensive Air Quality Model with Extensions (CAMx) to simulate pollutant concentrations for the base year of 2011 and the 2017 future year scenarios. In addition to the CAMx model, the EPA used a simplified ozone air quality assessment tool (AQAT) to estimate downwind changes in ozone concentrations related to upwind changes in emission levels. AQAT was calibrated with the results from the more sophisticated CAMx modeling and allows many calculations to be made in a relatively short amount of time. Importantly, AQAT can be used to evaluate the linkage test described above on a state by state basis, which greatly simplifies the development of an adequate, complete "good neighbor" FIP for Kentucky.[1]

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[1] "In the assessment of air quality using the calibrated assessment tool, we are able to estimate the change in the air quality contributions of each upwind state to each receptor . . . . in order to determine whether any state's contribution is below the 1 percent threshold used in step 2 of the CSAPR framework to identify 'linked' upwind states." Page 32, Ozone Transport Policy Analysis Final Rule TSD.

9. EPA will need to complete several activities in order to promulgate a complete FIP for Kentucky. The individual activities with timeframes for completion are described below. In some cases, the activities can be completed in parallel, which will hasten promulgation.

I. Identification and assessment of readily achievable NOx emission reductions from shutdown EGUs and from non-optimized EGU control equipment. 1 month.

10. Two recent studies have identified emission reductions that should have been included in the control strategies adopted in the CSAPR update. The Maryland Department of the Environment prepared "An Assessment of Optimization of Controls At Coal-Fired Units in the Eastern Modeling Domain" dated August 3, 2016 (Attachment 2). The Sierra Club prepared a similar assessment of achievable NOx emissions reductions at Kentucky coal-fired EGUs dated November 11, 2016 (Attachment 3). Both of these studies indicate that substantial emission reductions are achievable at several Kentucky EGUs if the NOx control equipment is operated at its optimum efficiency. This optimum efficiency is defined by the lowest demonstrated ozone season average emission rate from the past (2005-2015) as reported by EGUs to regulatory agencies. Kentucky-specific data is not readily available in the recently published CSAPR update, but apparently EPA chose not to include data from the 2005 to 2009 time period in calculating the benefits of operating the NOx controls at their optimum efficiency. If data from this time period is included, it is clear that several large Kentucky EGUs could operate their control equipment more efficiently with concomitant substantial emission reductions.

In addition, the Sierra Club study identified several EGUs that have been or are scheduled to be retired by 2017. EPA did address retired units in the CSAPR update calculations but it is not clear if the units identified in the Sierra Club study were actually included.

11. Another recent report by SNL Energy, dated October 31, 2016 (Attachment 4), also supports the findings in these studies that readily achievable emission reductions are indeed available. This report indicates that CSAPR ozone season NOx allowances are currently trading at $1100 for the year 2017. In contrast, the EPA control requirements in the CSAPR update are based on costs of $1400/ton for 2017. This $300 differential between the real world and what EPA assumed as achievable for 2017 would support a conclusion that more emission reductions are readily available.

12. It is quite possible that these readily achievable emission reductions could be sufficient for fulfillment of Kentucky's "good neighbor" obligation if they were added to the partial FIP promulgated for Kentucky in the CSAPR update. Therefore, EPA's first step should be to identify and quantify these emission reductions. Then, using the AQAT tool described above, it can be determined if, in fact, these additional emission reductions will result in Kentucky no longer exceeding the 1 percent screening threshold at the Harford County, Maryland and Richmond County, New York receptors. (Note: sensitivity analyses may need to be performed to insure that over control does not occur.) Since these reductions could have been achieved in the 2017 ozone season, it is technically valid to use the AQAT assumptions and inputs as used in the CSARP update to determine if the 1 percent screening test would be met.

13. Since no revisions to the modeling tools are required, this straightforward analysis can be completed in 1 month or less. If indeed the 1 percent screening test is met, EPA can proceed directly to a proposed and final rulemaking that modifies the CSAPR update for Kentucky to require these readily achievable emission reductions. Since the rulemaking process will likely extend beyond the 2017 ozone season, the deadline for implementing the revised Kentucky

statewide emission budget reflecting these additional reductions would need to shift to the 2018 ozone season.

II. Identification and assessment of new NOx emission reductions from non-EGUs and EGUs. 3 months.

14. In the event that the readily achievable emission reductions are not sufficient for fulfillment of Kentucky's "good neighbor" obligation, then EPA will need to evaluate and apply additional control strategies that can be applied to completely fulfill the obligation.

15. EPA discussed these possible control strategies in the CSAPR update, identifying further NOx controls on EGUs, including interstate dispatching to low- and no-emitting power sources, as well as controls on several categories of non-EGU sources. The CSAPR update includes several Technical Support Documents (TSDs), including the *EGU NOx Mitigation Strategies Final Rule TSD* and the *Assessment of Non-EGU NOx Emission Controls, Cost of Controls, and Time for Compliance Final TSD*. These provide extensive detail on the possible control strategies. Because the controls generally could not be required and installed by the start of the 2017 ozone season, EPA chose not to include them in the CSAPR update.

16. Because of the extensive information in the existing TSDs, EPA can now expeditiously use this information to assess which strategies are appropriate to include in amending the Kentucky FIP to fully comply with the "good neighbor" requirement. EPA has specific tools that are available for this assessment, namely, the National Emissions Inventory (NEI), the Integrated Planning Model (IPM) for EGUs, the Control Measures Database (CMDB) and the Control Strategy Tool (CoST). The TSDs describe these tools and their application to specific control strategies in detail. The specific activities and timeframes for their completion are as follows:

- Update the CMDB and review the latest version of the NEI. - 1 month
  (Upon completion of the CSPAR update, EPA should have already started updating the CMDB to include several completed contractor reports[2] [3]referenced, but not analyzed.[4] The NEI is an ongoing EPA program to update the nationwide emission inventory for a variety of EPA programs. While the NEI continues to be continually updated, the Kentucky FIP should generally use the version used in the CSAPR update modeling, unless there are major issues identified, in order to avoid delays.)
- Refine control strategy assessments in the existing TSDs using the CoST and IPM tools - 2 months.
  (EPA is not starting from scratch - much of this work was completed in preparation of the existing TSDs)

17. This work should commence concurrently with Step I, the identification and assessment of readily achievable NOx emission reductions from shutdown EGUs and from non-optimized EGU control equipment. This work is not dependent on the results of Step I.

18. In the past, EPA has used an optional Notice of Data Availability (NODA) process to solicit further public comment on technical issues related to Federal rulemakings. Such a process is not required by the Clean Air Act and typically adds at least six months to the rulemaking schedule. In this case, public comment was already requested on the draft of the TSDs during the proposal stage of the CSAPR update. Interested parties have already had an opportunity to provide input and it is not clear that substantial additional information would be forthcoming. Therefore, a NODA process should be avoided since it would significantly delay a Kentucky FIP that is already many months overdue in order to refine information that is already

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[2] "Update of NOx Control Measure Data in the CoST Control Measure Database for Four Industrial Source Categories: Ammonia Reformers, NonEGU Combustion Turbines, Glass Manufacturing, and Lean Burn Reciprocating Internal Combustion Engines," Revised Draft Report, RTI International, 2014.

[3] "Review of CoST Model Emission Reduction Estimates," SRA International, 2014; "Summary of State NOx Regulations for Selected Stationary Sources," SRA International, 2014.

[4] "The EPA will consider whether or not to incorporate these recommendations for changes or additions to the NOx controls for non-EGUs to support NOx control efforts for future rules and other efforts". Page 9, "Assessment of Non-EGU NOx Emission Controls, Cost of Controls, and Time for Compliance Final TSD."

reasonably complete.) Interested parties will still have an opportunity to address any issue they would have addressed in the NODA process in the proposed Kentucky FIP rule.

III. Revise the CAMx air quality modeling tool and AQAT assessment tool. 4 months.

19. If new non-EGU and EGU control strategies are required to fulfill Kentucky's "good neighbor" obligation and because they will likely not be in place in 2017, then a future year later than 2017 will need to be chosen and re-modeled using CAMx. Likewise, the AQAT assessment tool will need to be recalibrated using the revised CAMX outputs. As before, the revised models will be used to assess the new emission reductions to determine if, in fact, these additional emission reductions will result in Kentucky no longer exceeding the 1 percent screening threshold at the Harford County, Maryland and Richmond County, New York receptors. (Again, analysis will need to be performed to insure that over control is not occurring)

20. As noted in the TSDs, new controls will generally require several months to over a year to install on non-EGUs and from several months for combustion controls and 18 months or more for Selective Catalytic Reduction on EGUs. These installation time frames will likely be a helpful guide for EPA in choosing a new future analytic year to model. However, these timeframes should not effect when EPA can sign the final rule. These timeframes will only impact the *compliance* date in the final rule which is a substantive issue.

21. The specific activities and time for their completion are as follows:

- Select model base year - 0 months.

  (EPA should be able to continue to use the base year of 2011 in the original modeling. The CSAPR update cited in detail why 2011 was appropriate technically and meteorologically. Given that the Kentucky "good neighbor" requirement is well overdue, there is no need to delay by spending time selecting a new base year and re-inputting significant amounts of new data.

- Select future analytical year and load needed emissions data into the model - 2 months.
- Run air quality model and evaluate results – 2 months.

  (Given that this effort is focused on Kentucky, evaluating the modeling results should be much faster than the CSAPR update which involved 22 states.)

22. This work should commence concurrently with the first two steps, (I) the identification and assessment of readily achievable NOx emission reductions from shutdown EGUs and from non-optimized EGU control equipment and (II) the identification and assessment of new NOx emission reductions from non-EGUs and EGUs. With careful planning and scheduling, the critical path tasks involved in the modeling and emission reduction strategies analysis can be integrated to produce an expedited schedule.

IV. Prepare Proposed Rulemaking - 5.5 months.

23. Because this FIP only involves 1 state, the time required to prepare the proposal should be considerably shorter than for the 22 state CSAPR update. As mentioned earlier, EPA also has the benefit of having a regulatory scheme that is well thought out and legally established, so the groundwork and thought process needed for writing the proposal is well in hand and the actual rulemaking language can be modeled on the recently completed CSAPR update.

24. In developing its proposed and final regulations, EPA uses a formal Action Development Process that spells out specific steps that must be followed. The key Action Development Process activities and time for their completion are as follows:

- Using the technical results of either Sections I and II/III, prepare the proposed rulemaking including the background, technical results, control strategy options, selected approach, Regulatory Impact Analysis and regulatory language – 3.5 months.
- Final agency review – 1 month.
- Interagency review (if needed) – 1 month.

V. Promulgate Final Rulemaking - 5.5 months.

25. For the recently published CSAPR update, the final rulemaking was signed in just over 9.5 months after the proposal. Because this FIP only involves 1 state, the comment period and time required to promulgate the final rulemaking should be considerably shorter than for the 22 state CSAPR update. The major activities and time for their completion are as follows:

- Comment period – 1 month.
- Review public comments and concurrently revise any of the technical analyses regarding modeling and control strategies – 1.5 months.
- Revise the propose rulemaking language based on public comments and any revised technical analyses – 1 month.
- Final agency review – 1 month.
- Interagency review (if needed) – 1 month.

26. In summary, based on the foregoing analysis and my experience, my recommended schedule would allow for 15 months[5] for EPA to promulgate a Federal Implementation Plan (FIP) which completely addresses the Kentucky "good neighbor" provision. The timeline for the key steps expressed in months from the present date are:

• Identification and assessment of readily achievable NOx emission reductions from shutdown EGUs and from non-optimized EGU control equipment	1 month
• Identification and assessment of new NOx emission reductions from non-EGUs and EGUs	3 months
• Revise the CAMx air quality modeling tool and AQAT assessment tool	4 months
• Prepare Proposed Rulemaking	9.5 months

[5] If the analysis in Section I demonstrates that readily achievable NOx emission reductions from shutdown EGUs and from non-optimized EGU control equipment are sufficient for fulfillment of Kentucky's "good neighbor" obligation, then the FIP could be promulgated in no more than 13 months.

- Promulgate Final Rulemaking 15 months

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct. Executed this 10th day of November, 2016.

s/David Howekamp

_____
David Howekamp

HOWEKAMP DECL.

ATTACHMENT 1

David P. Howekamp
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Lafayette, CA 94549
925-284-8045
email: howekamp@gmail.com

ENVIRONMENTAL CONSULTANT
2000-present

Provide expert witness declarations for several environmental organizations regarding lawsuits against the Environmental Protection Agency.

Provide expert technical support to the Cy Pres Administrator for a $20 million class action settlement funding a vehicle repair and scrappage program in California.

Provide expert witness analysis and testimony for an environmental organization regarding permitting requirements for a major deep water port LNG facility.

Provide expert witness analysis and testimony for an environmental organization regarding control technology permitting requirements for a major coal fired power plant.

Act as expert advisor to the Port Community Advisory Committee at the Port of Los Angeles providing advice and recommendations to the citizens regarding environmental studies and impacts and controls for port expansion projects.

As member of the Technical Working Group, participate in the development of the San Pedro Bay Clean Air Action Plan which describes the measures that the Ports of Los Angeles and Long Beach will jointly take toward reducing emissions related to port operations.

Participate on consultant team that analyzed the possibility of providing shore power for berthed ships at the Port of Long Beach.

Provide expert witness analysis of damage claims for a state attorney general in lawsuit regarding motor vehicle inspection program.

Provide expert witness analysis of Clean Air Act civil penalties for alleged violations by a major glass manufacturer and by a major wood products manufacturer.

Provide policy and regulatory advice to several electric utility clients and sugar refinery regarding air quality issues affecting their industry

Provide expert witness analysis of alleged Clean Air Act criminal violations for a major petroleum refinery and a gas/electric utility.

Prepare a voluntary Clean Air Plan for the cities of the Tri-Valley Area of Alameda County.

ENVIRONMENTAL PROTECTION AGENCY
REGION 9, SAN FRANCISCO, CA

DIRECTOR, AIR DIVISION
1982-2000

Primary responsibility to oversee implementation of the Clean Air Act and radiation programs in California, Arizona, Nevada and Hawaii. For seven years, also responsible for pesticides and toxic substances programs.

Principal advisor to the Regional Administrator on policy, political and technical issues involving air quality management and radiation. As member of the senior management team, provided advice on broader, cross-media issues involving water pollution, toxic chemicals and hazardous waste.

Facilitate or negotiate settlements between agencies, industries and public interest groups.

Interpret applicable state and local laws and regulations and integrate with Federal laws. Work closely with elected officials in state legislatures and on local air district boards to adopt needed laws, regulations and measures.

Manage a budget of over $40 million and a staff of 120 scientists, engineers and planners to accomplish the following program activities:

- initiating Federal administrative or judicial enforcement against violating sources of air pollution
- reviewing project proposals and issuing Federal air quality permits to major industrial sources
- developing and approving State Air Quality Management Plans
- developing state motor vehicle emissions testing programs and other mobile source control programs
- providing program grants to state/local air management agencies
- delegation to, support and oversight of state/local air quality programs
- collection and quality assurance of ambient and source emission air quality data for planning or compliance
- implementation of public information and outreach programs
- developing emission limiting rules and regulations for source categories
- development of emissions trading and other economic incentive programs
- negotiation and implementation of international border agreements with the Government of Mexico

ENVIRONMENTAL PROTECTION AGENCY
REGION 9, SAN FRANCISCO, CA

Prior to 1982, held progressively more responsible positions in the following areas:

- Managing development and approval of Air Quality Management Plans.
- Managing all permit programs in Region 9 including permits for air quality, wastewater discharge, dredge and fill, hazardous waste, PCB disposal and ocean dumping
- Developing emission inventories, ambient data and control strategies.
- Conducting mechanical engineering research and development of control technologies for emissions from stationary combustion sources.

PACIFIC GAS AND ELECTRIC CO.
SAN FRANCISCO, CA

As staff engineer, measured meteorological phenomena to determine the diffusion patterns, possible temperature inversions, and other atmospheric characteristics of the future Diablo Canyon Power Plant.

ORGANIZATIONS

Air and Waste Management Association
Lafayette-Moraga Youth Association Board

AWARDS

Presidential Rank Award of Meritorious Executive
Awarded by the President of the United States
Environmental Protection Agency Bronze, Silver and Gold Medals
National Merit Scholar

EDUCATION

Master of Business Administration
University of California, Berkeley

BS, Mechanical Engineering
University of California, Berkeley

HOWEKAMP DECL.

ATTACHMENT 3

DECLARATION OF KATHERINE A. CLEMENTS

I, Katherine A. Clements, declare as follows:

1. I am a legal assistant for the Sierra Club. As part of my duties, I perform factual analyses of power plant air emissions data available from public sources.

2. Attached as Exhibit 1 is a true and correct copy of a spreadsheet containing and consisting of data and analysis concerning nitrogen oxides ("NOx") emissions from power plants in Kentucky. This spreadsheet shows the tonnage of NOx emissions reductions that are readily available in Kentucky from power plants.

3. The data in this spreadsheet was taken from the Environmental Protection Agency ("EPA")'s Clean Air Markets Program Data tool, available at https://ampd.epa.gov/ampd/. Specifically, I used data from the NOx Budget Program ("NBP") for data from ozone seasons 2005 through 2008, the Clean Air Interstate Rule Ozone Season ("CAIROS") records for data from ozone seasons 2009 through 2014, and the Transport Rule NOx Ozone Season Program ("TRNOXOS") for data from the 2015 ozone season.

4. To perform my analysis, I first downloaded from the EPA's Air Markets Program Data tool on September 15th, 2016 the NOx emissions (in tons), heat input (in millions of British thermal units, or MMBtu), and average NOx emission rates (in lbs./MMBtu) for all Kentucky EGUs for the ozone seasons in each year from 2005 to 2015.

5. Next, for each unit, I extracted the lowest reported ozone season NOx emission rate that was achieved during the time frame of 2005 to 2015; if the unit was equipped with a selective catalytic reduction (or "SCR") NOx control system but whose best historical ozone season NOx emission rate was nonetheless above 0.10 lbs./MMbtu, I assumed a substitute NOx emission rate of 0.10 lbs./MMBtu. The resulting emission rates are reported in column E of Exhibit 1.

6. As an example, for the EW Brown facility, the lowest historical ozone season emission rate for EW Brown Unit 1 during from 2005 to 2015 was 0.20 lbs./MMbtu, while for EW Brown Unit 3, the lowest historical emission rate was 0.18 lbs./MMbtu. Unit 3 has an SCR installed, whereas Unit 1 does not. Therefore, Unit 3's calculated achievable rate in column E was set to 0.10 lbs./MMbtu while Unit 1's best achievable rate was derived from the historical data.

7. With the information in column E, the achievable NOx emissions for 2017 can be estimated by multiplying this calculated achievable NOx emission rate by the ozone season 2015 heat input generated for each unit. For example, as explained above, EW Brown Unit 1's calculated achievable rate was 0.20 lbs./MMbtu, and so assuming the unit operates at the same level as in 2015 (with a heat input equal to 1,208,634 MMBtu) and assuming it once again achieves a 0.20 lbs./MMbtu NOx emission rate, the achievable 2017 ozone season NOx emission total is roughly 121

tons. This achievable ozone season 2017 NOx emissions total for EW Brown Unit 1, along with all the other power plant units in Kentucky, is reported in column H.

8. For units whose lowest ozone season emission rate occurred in 2015, the 2017 achievable emissions are simply the actual 2015 tonnage of emissions, carried over into column H. Additionally, units that are retiring by ozone season 2017 are assumed to have zero emissions in ozone season 2017, regardless of their 2015 emissions. This assumption is likewise reflected in column H.

9. Column G lists the actual total tonnage of NOx emissions from each power plant unit in Kentucky for ozone season 2015. Comparison between these actual emissions and the calculated achievable ozone season 2017 emissions is reported in column I. Based on this analysis, the total reduction in emissions that could be readily achieved in 2017 is 12,354 tons from the ozone season 2015 baseline.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct. Executed on November 12, 2016, in Washington, D.C.

/s/ Katherine A. Clements

Katherine A. Clements

Facility	Unit ID	SNL Notes	SCR Technology	Acheivable Rate
Big Sandy	BSU2	Retired May 2015	n/a	0.097
Big Sandy	BSU1	Converted to NG May 2016	no	0.120
Cane Run	6	Retired March 2015	n/a	0.246
Cane Run	4	Retired June 2015	n/a	0.325
Cane Run	5	Retired June 2015	n/a	0.352
Coleman	C2	Out of Service	n/a	0.283
Coleman	C3	Out of Service	n/a	0.294
Coleman	C1	Out of Service	n/a	0.060
D B Wilson	W1	Operating	yes	0.048
E W Brown	2	Operating	no	0.212
E W Brown	3	Operating	yes	0.100
E W Brown	1	Operating	no	0.201
East Bend	2	Operating	yes	0.052
Elmer Smith	1	Operating	yes	0.100
Elmer Smith	2	Operating	no	0.218
Ghent	3	Operating	yes	0.027
Ghent	4	Operating	yes	0.027
Ghent	1	Operating	yes	0.045
Ghent	2	Operating	yes	0.100
Green River	5	Retired September 2015	n/a	0.369
Green River	4	Retired September 2015	n/a	0.359
H L Spurlock	2	Operating	yes	0.073
H L Spurlock	3	Operating	no	0.058
H L Spurlock	4	Operating, online April 2009	no	0.060
H L Spurlock	1	Operating	yes	0.083
Henderson I	6	Retired December 2008	n/a	0.459
HMP&L Station 2	H2	Operating	yes	0.067
HMP&L Station 2	H1	Operating	yes	0.061
John S. Cooper	2	Operating	yes	0.100
John S. Cooper	1	Operating	no	0.192
Mill Creek	4	Operating	yes	0.037
Mill Creek	3	Operating	yes	0.045
Mill Creek	2	Operating	no	0.280
Mill Creek	1	Operating	no	0.266
Paradise	2	Operating, planned retirement 2017	n/a	0.090
Paradise	3	Operating	yes	0.100
Paradise	1	Operating, planned retirement 2017	n/a	0.098
R D Green	G1	Operating	no	0.200
R D Green	G2	Operating	no	0.193
Robert Reid	R1	Operating	no	0.015
Shawnee	10	Retired June 2014	n/a	0.220
Shawnee	7	Operating	no	0.260
Shawnee	6	Operating	no	0.262
Shawnee	9	Operating	no	0.262
Shawnee	8	Operating	no	0.261
Shawnee	1	Operating	yes	0.100
Shawnee	2	Operating	no	0.235
Shawnee	3	Operating	no	0.235
Shawnee	5	Operating	no	0.235
Shawnee	4	Operating	yes	0.100
Trimble County	2	Operating, online February 2011	yes	0.041
Trimble County	1	Operating	yes	0.031
Tyrone	5	Retired February 2013	n/a	0.014

William C. Dale	4	Retired April 2016	n/a	0.186
William C. Dale	3	Retired April 2016	n/a	0.266
William C. Dale	1	Retired April 2014	n/a	0.349
William C. Dale	2	Retired April 2014	n/a	0.351

2015 Heat Input (MMBtu)	2015 NOx (tons)	Acheivable 2017 NOx (tons)	NOx Reductions
1782384	177	0	177
5825314	1373	348.6450216	1025
0	0	0	0
468283	82	0	82
908088	157	0	157
0	0	0	0
0	0	0	0
0	0	0	0
16941539	534	404.0557057	130
3036205	322	322.1413432	0
7329426	619	366.4713029	253
1208634	150	121.286449	29
19808040	2151	513.0282436	1638
3414643	611	170.7321748	440
6625227	954	721.8184779	232
14008036	1151	190.509283	961
14680899	476	199.6602258	277
13385333	523	299.8314654	223
12620306	1230	631.0153113	599
2243773	479	0	479
1493847	312	0	312
12248766	549	446.4675025	102
6364019	177	177	0
5515343	167	166.5633574	0
5250042	227	217.6142364	10
0	0	0	0
2626837	128	87.4736721	41
4756903	230	144.1341632	86
2108732	130	105.4365909	24
1003247	108	108	0
12146238	968	227.1346507	741
8475434	800	190.6972687	610
7221327	1004	1004	0
6229088	865	829.7144998	35
20854819	943	0	943
24977341	1749	1248.867053	500
19338907	884	0	884
6355459	768	635.5458975	133
6097757	643	588.7384721	55
212	0	0	0
0	0	0	0
3461087	452	452	0
3894986	516	516	0
3721618	489	489	0
3931737	518	518	0
3874886	453	193.744315	259
3976392	465	465	0
3859188	452	452	0
3910942	459	459	0
4080570	478	204.028485	274
22229365	395	395	0
14149409	850	218.6083762	631
0	0	0	0

	44562	8	0	8
	21248	4	0	4
	0	0	0	0
	0	0	0	0
Totals		**27180**	**14827**	**12354**

State	Facility Na	Facility ID	Unit ID	Year	ID	Avg. NOx	NOx (tons)	Heat Input (MM
KY	Big Sandy	1353	BSU1	2015	Big Sandy-	0.4	1373.2	5825313.6
KY	Big Sandy	1353	BSU2	2015	Big Sandy-	0.2	176.8	1782383.9
KY	Bluegrass (	55164	GTG1	2015	Bluegrass Generating Station-GTG1			
KY	Bluegrass (	55164	GTG2	2015	Bluegrass Generating Station-GTG2			
KY	Bluegrass (	55164	GTG3	2015	Bluegrass (	0.1	16.0	526098.2
KY	Cane Run	1363	4	2015	Cane Run-	0.3	81.5	468282.7
KY	Cane Run	1363	5	2015	Cane Run-	0.3	156.9	908088.1
KY	Cane Run	1363	7A	2015	Cane Run-	0.0	75.4	4980279.1
KY	Cane Run	1363	7B	2015	Cane Run-	0.0	65.2	4589249.3
KY	Coleman	1381	C1	2015	Coleman-C1			
KY	Coleman	1381	C2	2015	Coleman-C2			
KY	Coleman	1381	C3	2015	Coleman-C3			
KY	D B Wilson	6823	W1	2015	D B Wilson	0.1	534.3	16941539.0
KY	E W Browr	1355	1	2015	E W Browr	0.2	150.3	1208634.3
KY	E W Browr	1355	10	2015	E W Browr	0.1	25.8	427956.5
KY	E W Browr	1355	11	2015	E W Browr	0.1	25.8	459611.0
KY	E W Browr	1355	2	2015	E W Browr	0.2	322.5	3036204.9
KY	E W Browr	1355	3	2015	E W Browr	0.2	619.1	7329426.1
KY	E W Browr	1355	5	2015	E W Browr	0.1	21.1	808424.1
KY	E W Browr	1355	6	2015	E W Browr	0.0	3.8	183630.3
KY	E W Browr	1355	7	2015	E W Browr	0.1	2.4	85883.5
KY	E W Browr	1355	8	2015	E W Browr	0.1	15.8	227077.0
KY	E W Browr	1355	9	2015	E W Browr	0.1	37.8	602417.4
KY	East Bend	6018	2	2015	East Bend-	0.2	2151.5	19808040.3
KY	Elmer Smit	1374	1	2015	Elmer Smit	0.4	610.7	3414643.5
KY	Elmer Smit	1374	2	2015	Elmer Smit	0.3	954.1	6625227.0
KY	Ghent	1356	1	2015	Ghent-1	0.1	523.3	13385333.3
KY	Ghent	1356	2	2015	Ghent-2	0.2	1230.1	12620306.2
KY	Ghent	1356	3	2015	Ghent-3	0.2	1151.5	14008035.5
KY	Ghent	1356	4	2015	Ghent-4	0.1	476.4	14680899.0
KY	Green Rive	1357	4	2015	Green Rive	0.4	311.6	1493847.0
KY	Green Rive	1357	5	2015	Green Rive	0.4	478.8	2243772.6
KY	H L Spurlo	6041	1	2015	H L Spurlo	0.1	227.2	5250041.9
KY	H L Spurlo	6041	2	2015	H L Spurlo	0.1	548.5	12248765.5
KY	H L Spurlo	6041	3	2015	H L Spurlo	0.1	177.0	6364019.1
KY	H L Spurlo	6041	4	2015	H L Spurlo	0.1	166.8	5515343.0
KY	HMP&L Sta	1382	H1	2015	HMP&L Sta	0.1	230.4	4756903.1
KY	HMP&L Sta	1382	H2	2015	HMP&L Sta	0.1	128.2	2626837.0
KY	John S. Co	1384	1	2015	John S. Co	0.2	107.7	1003246.9
KY	John S. Co	1384	2	2015	John S. Co	0.1	129.6	2108731.8
KY	Marshall	55232	CT1	2015	Marshall-C	0.0	0.5	40186.3
KY	Marshall	55232	CT2	2015	Marshall-C	0.0	0.6	44157.8
KY	Marshall	55232	CT3	2015	Marshall-C	0.0	0.8	62503.5
KY	Marshall	55232	CT4	2015	Marshall-C	0.0	0.5	40461.9
KY	Marshall	55232	CT5	2015	Marshall-C	0.0	0.6	50415.1
KY	Marshall	55232	CT6	2015	Marshall-C	0.0	0.8	61936.2
KY	Marshall	55232	CT7	2015	Marshall-C	0.0	0.9	71017.1
KY	Marshall	55232	CT8	2015	Marshall-C	0.0	0.8	61028.6
KY	Mill Creek	1364	1	2015	Mill Creek-	0.3	864.7	6229087.8
KY	Mill Creek	1364	2	2015	Mill Creek-	0.3	1003.5	7221327.2
KY	Mill Creek	1364	3	2015	Mill Creek-	0.2	800.4	8475434.2
KY	Mill Creek	1364	4	2015	Mill Creek-	0.2	967.8	12146238.0
KY	Paddy's Ru	1366	12	2015	Paddy's Ru	0.7	1.5	4380.0
KY	Paddy's Ru	1366	13	2015	Paddy's Ru	0.1	23.2	615183.6

KY	Paducah P	56556	EU01A		2015	Paducah P	0.2	1.3	26565.2
KY	Paducah P	56556	EU01B		2015	Paducah P	0.2	1.3	27111.4
KY	Paducah P	56556	EU02A		2015	Paducah P	0.2	1.4	25919.4
KY	Paducah P	56556	EU02B		2015	Paducah P	0.1	1.2	25237.4
KY	Paradise	1378		1	2015	Paradise-1	0.1	884.0	19338907.2
KY	Paradise	1378		2	2015	Paradise-2	0.1	943.2	20854819.3
KY	Paradise	1378		3	2015	Paradise-3	0.2	1749.0	24977341.1
KY	R D Green	6639	G1		2015	R D Green	0.2	768.5	6355459.0
KY	R D Green	6639	G2		2015	R D Green	0.2	643.5	6097757.4
KY	Riverside C	55198	GTG101		2015	Riverside C	0.1	29.0	1109960.4
KY	Riverside C	55198	GTG201		2015	Riverside C	0.1	32.2	1083394.2
KY	Riverside C	55198	GTG301		2015	Riverside C	0.1	27.5	1056084.7
KY	Riverside C	55198	GTG401		2015	Riverside C	0.1	32.8	1035804.0
KY	Riverside C	55198	GTG501		2015	Riverside C	0.1	19.1	633611.9
KY	Robert Rei	1383	R1		2015	Robert Rei	0.0	0.0	211.7
KY	Robert Rei	1383	RT		2015	Robert Rei	0.7	9.9	28327.2
KY	Shawnee	1379		1	2015	Shawnee-1	0.2	452.9	3874886.3
KY	Shawnee	1379		2	2015	Shawnee-2	0.2	465.2	3976391.7
KY	Shawnee	1379		3	2015	Shawnee-3	0.2	451.7	3859187.6
KY	Shawnee	1379		4	2015	Shawnee-4	0.2	478.1	4080569.7
KY	Shawnee	1379		5	2015	Shawnee-5	0.2	458.7	3910941.9
KY	Shawnee	1379		6	2015	Shawnee-6	0.3	515.8	3894985.9
KY	Shawnee	1379		7	2015	Shawnee-7	0.3	451.7	3461087.0
KY	Shawnee	1379		8	2015	Shawnee-8	0.3	517.9	3931737.2
KY	Shawnee	1379		9	2015	Shawnee-9	0.3	488.7	3721618.1
KY	Smith Gen	54	SCT1		2015	Smith Gen	0.1	4.2	166843.6
KY	Smith Gen	54	SCT10		2015	Smith Gen	0.0	2.4	403571.4
KY	Smith Gen	54	SCT2		2015	Smith Gen	0.1	6.0	188080.9
KY	Smith Gen	54	SCT3		2015	Smith Gen	0.1	5.5	162450.0
KY	Smith Gen	54	SCT4		2015	Smith Gen	0.0	3.2	247309.8
KY	Smith Gen	54	SCT5		2015	Smith Gen	0.0	2.9	203372.3
KY	Smith Gen	54	SCT6		2015	Smith Gen	0.0	3.6	255434.4
KY	Smith Gen	54	SCT7		2015	Smith Gen	0.0	3.0	249790.5
KY	Smith Gen	54	SCT9		2015	Smith Gen	0.0	2.5	413672.5
KY	Trimble Co	6071		1	2015	Trimble Co	0.1	849.7	14149409.5
KY	Trimble Co	6071		10	2015	Trimble Co	0.0	2.2	126764.0
KY	Trimble Co	6071		2	2015	Trimble Co	0.0	395.0	22229365.0
KY	Trimble Co	6071		5	2015	Trimble Co	0.0	9.4	558165.1
KY	Trimble Co	6071		6	2015	Trimble Co	0.0	8.7	558077.8
KY	Trimble Co	6071		7	2015	Trimble Co	0.0	10.4	645907.9
KY	Trimble Co	6071		8	2015	Trimble Co	0.0	2.5	180933.2
KY	Trimble Co	6071		9	2015	Trimble Co	0.0	9.1	535540.4
KY	William C.	1385		3	2015	William C.	0.3	4.4	21248.3
KY	William C.	1385		4	2015	William C.	0.3	8.2	44561.7

/Btu)

State	Facility Name	Facility ID	Unit ID	ID	Avg. NOx Rate (lb/MMB
KY	Smith Generating Fa	54	SCT10	Smith Gen	0.01
KY	Smith Generating Fa	54	SCT9	Smith Gen	0.01
KY	Smith Generating Fa	54	SCT10	Smith Gen	0.01
KY	Smith Generating Fa	54	SCT9	Smith Gen	0.01
KY	Smith Generating Fa	54	SCT9	Smith Gen	0.01
KY	Smith Generating Fa	54	SCT10	Smith Gen	0.01
KY	Tyrone	1361	5	Tyrone-5	0.01
KY	Smith Generating Fa	54	SCT9	Smith Gen	0.01
KY	Smith Generating Fa	54	SCT9	Smith Gen	0.02
KY	Smith Generating Fa	54	SCT10	Smith Gen	0.02
KY	Smith Generating Fa	54	SCT10	Smith Gen	0.02
KY	Smith Generating Fa	54	SCT5	Smith Gen	0.02
KY	Smith Generating Fa	54	SCT5	Smith Gen	0.02
KY	Marshall	55232	CT2	Marshall-C	0.02
KY	Marshall	55232	CT1	Marshall-C	0.03
KY	Marshall	55232	CT5	Marshall-C	0.03
KY	Marshall	55232	CT4	Marshall-C	0.03
KY	Marshall	55232	CT4	Marshall-C	0.03
KY	Marshall	55232	CT4	Marshall-C	0.03
KY	Marshall	55232	CT4	Marshall-C	0.03
KY	Marshall	55232	CT1	Marshall-C	0.03
KY	Smith Generating Fa	54	SCT4	Smith Gen	0.03
KY	Marshall	55232	CT4	Marshall-C	0.03
KY	Marshall	55232	CT6	Marshall-C	0.03
KY	Trimble County	6071	5	Trimble Co	0.03
KY	Trimble County	6071	8	Trimble Co	0.03
KY	Trimble County	6071	9	Trimble Co	0.03
KY	Ghent	1356	3	Ghent-3	0.03
KY	Ghent	1356	4	Ghent-4	0.03
KY	Marshall	55232	CT8	Marshall-C	0.03
KY	Marshall	55232	CT2	Marshall-C	0.03
KY	Marshall	55232	CT8	Marshall-C	0.03
KY	Marshall	55232	CT2	Marshall-C	0.03
KY	Marshall	55232	CT5	Marshall-C	0.03
KY	Marshall	55232	CT6	Marshall-C	0.03
KY	Trimble County	6071	9	Trimble Co	0.03
KY	Trimble County	6071	6	Trimble Co	0.03
KY	Smith Generating Fa	54	SCT6	Smith Gen	0.03
KY	Marshall	55232	CT6	Marshall-C	0.03
KY	Marshall	55232	CT2	Marshall-C	0.03
KY	Trimble County	6071	9	Trimble Co	0.03
KY	Marshall	55232	CT7	Marshall-C	0.03
KY	Trimble County	6071	7	Trimble Co	0.03
KY	Marshall	55232	CT8	Marshall-C	0.03
KY	Smith Generating Fa	54	SCT7	Smith Gen	0.03
KY	Marshall	55232	CT3	Marshall-C	0.03

KY	Marshall	55232	CT2		Marshall-C	0.03
KY	Trimble County	6071		6	Trimble Co	0.03
KY	Marshall	55232	CT5		Marshall-C	0.03
KY	Trimble County	6071		5	Trimble Co	0.03
KY	Marshall	55232	CT1		Marshall-C	0.03
KY	Marshall	55232	CT7		Marshall-C	0.03
KY	Marshall	55232	CT2		Marshall-C	0.03
KY	Trimble County	6071		9	Trimble Co	0.03
KY	Trimble County	6071		5	Trimble Co	0.03
KY	Smith Generating Fa	54	SCT4		Smith Gen	0.03
KY	Trimble County	6071		5	Trimble Co	0.03
KY	Marshall	55232	CT1		Marshall-C	0.03
KY	Marshall	55232	CT3		Marshall-C	0.03
KY	Trimble County	6071		8	Trimble Co	0.03
KY	Smith Generating Fa	54	SCT7		Smith Gen	0.03
KY	Smith Generating Fa	54	SCT5		Smith Gen	0.03
KY	Marshall	55232	CT3		Marshall-C	0.03
KY	Marshall	55232	CT5		Marshall-C	0.03
KY	Trimble County	6071		7	Trimble Co	0.03
KY	Trimble County	6071		10	Trimble Co	0.03
KY	Trimble County	6071		9	Trimble Co	0.03
KY	Smith Generating Fa	54	SCT6		Smith Gen	0.03
KY	Trimble County	6071		9	Trimble Co	0.03
KY	Trimble County	6071		8	Trimble Co	0.03
KY	Marshall	55232	CT6		Marshall-C	0.03
KY	Trimble County	6071		5	Trimble Co	0.03
KY	Trimble County	6071		1	Trimble Co	0.03
KY	Ghent	1356		4	Ghent-4	0.03
KY	Trimble County	6071		8	Trimble Co	0.03
KY	Smith Generating Fa	54	SCT5		Smith Gen	0.03
KY	Trimble County	6071		8	Trimble Co	0.03
KY	Trimble County	6071		10	Trimble Co	0.03
KY	Smith Generating Fa	54	SCT6		Smith Gen	0.03
KY	Trimble County	6071		5	Trimble Co	0.03
KY	Trimble County	6071		8	Trimble Co	0.03
KY	Ghent	1356		3	Ghent-3	0.03
KY	Smith Generating Fa	54	SCT5		Smith Gen	0.03
KY	Trimble County	6071		10	Trimble Co	0.03
KY	Trimble County	6071		6	Trimble Co	0.03
KY	Trimble County	6071		7	Trimble Co	0.03
KY	Trimble County	6071		7	Trimble Co	0.03
KY	Smith Generating Fa	54	SCT6		Smith Gen	0.03
KY	Trimble County	6071		7	Trimble Co	0.03
KY	Smith Generating Fa	54	SCT6		Smith Gen	0.03
KY	Trimble County	6071		10	Trimble Co	0.03
KY	Trimble County	6071		5	Trimble Co	0.03
KY	Trimble County	6071		6	Trimble Co	0.03

KY	E W Brown	1355		7	E W Brown	0.03
KY	Trimble County	6071		8	Trimble Co	0.03
KY	Marshall	55232	CT7		Marshall-C	0.03
KY	Marshall	55232	CT1		Marshall-C	0.03
KY	Smith Generating Fa	54	SCT7		Smith Gen	0.03
KY	Trimble County	6071		7	Trimble Co	0.03
KY	Smith Generating Fa	54	SCT7		Smith Gen	0.03
KY	Trimble County	6071		7	Trimble Co	0.03
KY	Marshall	55232	CT7		Marshall-C	0.03
KY	Trimble County	6071		6	Trimble Co	0.03
KY	Trimble County	6071		5	Trimble Co	0.03
KY	Marshall	55232	CT2		Marshall-C	0.03
KY	E W Brown	1355		7	E W Brown	0.03
KY	Trimble County	6071		7	Trimble Co	0.03
KY	Trimble County	6071		10	Trimble Co	0.03
KY	Marshall	55232	CT3		Marshall-C	0.03
KY	Trimble County	6071		10	Trimble Co	0.03
KY	Smith Generating Fa	54	SCT7		Smith Gen	0.03
KY	Smith Generating Fa	54	SCT5		Smith Gen	0.03
KY	Smith Generating Fa	54	SCT6		Smith Gen	0.03
KY	Trimble County	6071		8	Trimble Co	0.03
KY	Smith Generating Fa	54	SCT7		Smith Gen	0.03
KY	Trimble County	6071		9	Trimble Co	0.03
KY	E W Brown	1355		7	E W Brown	0.03
KY	Marshall	55232	CT3		Marshall-C	0.03
KY	Smith Generating Fa	54	SCT6		Smith Gen	0.03
KY	Trimble County	6071		6	Trimble Co	0.03
KY	Marshall	55232	CT7		Marshall-C	0.03
KY	Trimble County	6071		7	Trimble Co	0.03
KY	Smith Generating Fa	54	SCT7		Smith Gen	0.03
KY	Smith Generating Fa	54	SCT5		Smith Gen	0.03
KY	Smith Generating Fa	54	SCT4		Smith Gen	0.03
KY	Marshall	55232	CT8		Marshall-C	0.04
KY	Trimble County	6071		9	Trimble Co	0.04
KY	Marshall	55232	CT1		Marshall-C	0.04
KY	Smith Generating Fa	54	SCT4		Smith Gen	0.04
KY	Smith Generating Fa	54	SCT4		Smith Gen	0.04
KY	Trimble County	6071		5	Trimble Co	0.04
KY	Trimble County	6071		6	Trimble Co	0.04
KY	Trimble County	6071		6	Trimble Co	0.04
KY	Trimble County	6071		8	Trimble Co	0.04
KY	Trimble County	6071		6	Trimble Co	0.04
KY	Marshall	55232	CT3		Marshall-C	0.04
KY	Smith Generating Fa	54	SCT5		Smith Gen	0.04
KY	Trimble County	6071		5	Trimble Co	0.04
KY	Smith Generating Fa	54	SCT7		Smith Gen	0.04
KY	E W Brown	1355		6	E W Brown	0.04

KY	Trimble County	6071		8	Trimble Co	0.04
KY	Trimble County	6071		9	Trimble Co	0.04
KY	Marshall	55232	CT5		Marshall-C	0.04
KY	Trimble County	6071		10	Trimble Co	0.04
KY	Smith Generating Fa	54	SCT7		Smith Gen	0.04
KY	Smith Generating Fa	54	SCT4		Smith Gen	0.04
KY	Marshall	55232	CT8		Marshall-C	0.04
KY	Trimble County	6071		6	Trimble Co	0.04
KY	Smith Generating Fa	54	SCT6		Smith Gen	0.04
KY	Smith Generating Fa	54	SCT7		Smith Gen	0.04
KY	Mill Creek	1364		4	Mill Creek-	0.04
KY	Trimble County	6071		10	Trimble Co	0.04
KY	Smith Generating Fa	54	SCT4		Smith Gen	0.04
KY	Trimble County	6071		9	Trimble Co	0.04
KY	Marshall	55232	CT4		Marshall-C	0.04
KY	Marshall	55232	CT5		Marshall-C	0.04
KY	Marshall	55232	CT7		Marshall-C	0.04
KY	Marshall	55232	CT8		Marshall-C	0.04
KY	Smith Generating Fa	54	SCT5		Smith Gen	0.04
KY	Smith Generating Fa	54	SCT4		Smith Gen	0.04
KY	Ghent	1356		4	Ghent-4	0.04
KY	Smith Generating Fa	54	SCT4		Smith Gen	0.04
KY	E W Brown	1355		7	E W Brown	0.04
KY	Trimble County	6071		7	Trimble Co	0.04
KY	Smith Generating Fa	54	SCT6		Smith Gen	0.04
KY	Smith Generating Fa	54	SCT4		Smith Gen	0.04
KY	Marshall	55232	CT4		Marshall-C	0.04
KY	Smith Generating Fa	54	SCT6		Smith Gen	0.04
KY	Smith Generating Fa	54	SCT5		Smith Gen	0.04
KY	Marshall	55232	CT6		Marshall-C	0.04
KY	Marshall	55232	CT6		Marshall-C	0.04
KY	E W Brown	1355		6	E W Brown	0.04
KY	Marshall	55232	CT7		Marshall-C	0.04
KY	Marshall	55232	CT4		Marshall-C	0.04
KY	Trimble County	6071		10	Trimble Co	0.04
KY	Trimble County	6071		10	Trimble Co	0.04
KY	E W Brown	1355		6	E W Brown	0.04
KY	Marshall	55232	CT5		Marshall-C	0.04
KY	DTE Calvert City, LLC	55308	B		DTE Calver	0.04
KY	Riverside Generating	55198	GTG101		Riverside G	0.04
KY	Mill Creek	1364		4	Mill Creek-	0.04
KY	Mill Creek	1364		4	Mill Creek-	0.04
KY	Ghent	1356		1	Ghent-1	0.04
KY	Riverside Generating	55198	GTG101		Riverside G	0.04
KY	Mill Creek	1364		3	Mill Creek-	0.05
KY	E W Brown	1355		6	E W Brown	0.05
KY	Bluegrass Generatin	55164	GTG1		Bluegrass (	0.05

KY	Marshall	55232	CT6		Marshall-C	0.05
KY	E W Brown	1355		6	E W Brown	0.05
KY	Bluegrass Generatin	55164	GTG1		Bluegrass (	0.05
KY	Marshall	55232	CT7		Marshall-C	0.05
KY	Marshall	55232	CT1		Marshall-C	0.05
KY	Ghent	1356		4	Ghent-4	0.05
KY	D B Wilson	6823	W1		D B Wilson	0.05
KY	Mill Creek	1364		3	Mill Creek-	0.05
KY	Mill Creek	1364		3	Mill Creek-	0.05
KY	Trimble County	6071		1	Trimble Co	0.05
KY	Riverside Generating	55198	GTG101		Riverside G	0.05
KY	Marshall	55232	CT3		Marshall-C	0.05
KY	E W Brown	1355		6	E W Brown	0.05
KY	Marshall	55232	CT5		Marshall-C	0.05
KY	Marshall	55232	CT6		Marshall-C	0.05
KY	Bluegrass Generatin	55164	GTG1		Bluegrass (	0.05
KY	Marshall	55232	CT8		Marshall-C	0.05
KY	D B Wilson	6823	W1		D B Wilson	0.05
KY	Bluegrass Generatin	55164	GTG3		Bluegrass (	0.05
KY	DTE Calvert City, LLC	55308	A		DTE Calver	0.05
KY	Trimble County	6071		1	Trimble Co	0.05
KY	Mill Creek	1364		4	Mill Creek-	0.05
KY	Riverside Generating	55198	GTG401		Riverside G	0.05
KY	Bluegrass Generatin	55164	GTG1		Bluegrass (	0.05
KY	Riverside Generating	55198	GTG401		Riverside G	0.05
KY	Mill Creek	1364		3	Mill Creek-	0.05
KY	Bluegrass Generatin	55164	GTG1		Bluegrass (	0.05
KY	Bluegrass Generatin	55164	GTG1		Bluegrass (	0.05
KY	Riverside Generating	55198	GTG501		Riverside G	0.05
KY	East Bend	6018		2	East Bend-	0.05
KY	Bluegrass Generatin	55164	GTG2		Bluegrass (	0.05
KY	Riverside Generating	55198	GTG101		Riverside G	0.05
KY	Riverside Generating	55198	GTG501		Riverside G	0.05
KY	Riverside Generating	55198	GTG401		Riverside G	0.05
KY	Bluegrass Generatin	55164	GTG2		Bluegrass (	0.05
KY	Bluegrass Generatin	55164	GTG1		Bluegrass (	0.05
KY	Mill Creek	1364		4	Mill Creek-	0.05
KY	Riverside Generating	55198	GTG501		Riverside G	0.05
KY	Ghent	1356		1	Ghent-1	0.05
KY	D B Wilson	6823	W1		D B Wilson	0.05
KY	Riverside Generating	55198	GTG201		Riverside G	0.05
KY	Riverside Generating	55198	GTG101		Riverside G	0.05
KY	Trimble County	6071		2	Trimble Co	0.05
KY	Trimble County	6071		1	Trimble Co	0.05
KY	Riverside Generating	55198	GTG101		Riverside G	0.05
KY	Trimble County	6071		1	Trimble Co	0.05
KY	Riverside Generating	55198	GTG401		Riverside G	0.05

KY	Marshall	55232	CT1		Marshall-C	0.05
KY	Riverside Generating	55198	GTG101		Riverside G	0.05
KY	Bluegrass Generatin	55164	GTG2		Bluegrass (	0.05
KY	Riverside Generating	55198	GTG401		Riverside G	0.05
KY	Marshall	55232	CT8		Marshall-C	0.05
KY	Bluegrass Generatin	55164	GTG2		Bluegrass (	0.05
KY	Trimble County	6071		1	Trimble Co	0.06
KY	Mill Creek	1364		3	Mill Creek-	0.06
KY	Mill Creek	1364		4	Mill Creek-	0.06
KY	Marshall	55232	CT3		Marshall-C	0.06
KY	Riverside Generating	55198	GTG101		Riverside G	0.06
KY	E W Brown	1355		6	E W Brown	0.06
KY	Riverside Generating	55198	GTG501		Riverside G	0.06
KY	Riverside Generating	55198	GTG201		Riverside G	0.06
KY	Marshall	55232	CT2		Marshall-C	0.06
KY	Bluegrass Generatin	55164	GTG3		Bluegrass (	0.06
KY	E W Brown	1355		7	E W Brown	0.06
KY	E W Brown	1355		7	E W Brown	0.06
KY	Riverside Generating	55198	GTG101		Riverside G	0.06
KY	Bluegrass Generatin	55164	GTG3		Bluegrass (	0.06
KY	Riverside Generating	55198	GTG301		Riverside G	0.06
KY	D B Wilson	6823	W1		D B Wilson	0.06
KY	Bluegrass Generatin	55164	GTG2		Bluegrass (	0.06
KY	Riverside Generating	55198	GTG401		Riverside G	0.06
KY	DTE Calvert City, LLC	55308	A		DTE Calver	0.06
KY	Ghent	1356		1	Ghent-1	0.06
KY	E W Brown	1355		7	E W Brown	0.06
KY	Bluegrass Generatin	55164	GTG3		Bluegrass (	0.06
KY	Riverside Generating	55198	GTG501		Riverside G	0.06
KY	Bluegrass Generatin	55164	GTG1		Bluegrass (	0.06
KY	E W Brown	1355		7	E W Brown	0.06
KY	D B Wilson	6823	W1		D B Wilson	0.06
KY	Ghent	1356		1	Ghent-1	0.06
KY	DTE Calvert City, LLC	55308	A		DTE Calver	0.06
KY	Ghent	1356		1	Ghent-1	0.06
KY	Bluegrass Generatin	55164	GTG2		Bluegrass (	0.06
KY	E W Brown	1355		6	E W Brown	0.06
KY	E W Brown	1355		7	E W Brown	0.06
KY	Coleman	1381	C1		Coleman-C	0.06
KY	D B Wilson	6823	W1		D B Wilson	0.06
KY	E W Brown	1355		6	E W Brown	0.06
KY	Riverside Generating	55198	GTG501		Riverside G	0.06
KY	H L Spurlock	6041		4	H L Spurloc	0.06
KY	E W Brown	1355		5	E W Brown	0.06
KY	Riverside Generating	55198	GTG501		Riverside G	0.06
KY	Mill Creek	1364		3	Mill Creek-	0.06
KY	HMP&L Station 2	1382	H1		HMP&L Sta	0.06

KY	H L Spurlock	6041		4	H L Spurloc	0.06
KY	Riverside Generating	55198	GTG501		Riverside G	0.06
KY	Riverside Generating	55198	GTG301		Riverside G	0.06
KY	E W Brown	1355		5	E W Brown	0.06
KY	E W Brown	1355		5	E W Brown	0.06
KY	E W Brown	1355		5	E W Brown	0.06
KY	D B Wilson	6823	W1		D B Wilson	0.06
KY	Riverside Generating	55198	GTG301		Riverside G	0.06
KY	Riverside Generating	55198	GTG101		Riverside G	0.06
KY	Riverside Generating	55198	GTG501		Riverside G	0.06
KY	Riverside Generating	55198	GTG401		Riverside G	0.06
KY	Riverside Generating	55198	GTG201		Riverside G	0.06
KY	HMP&L Station 2	1382	H1		HMP&L Sta	0.06
KY	Bluegrass Generatin	55164	GTG3		Bluegrass (	0.06
KY	DTE Calvert City, LLC	55308	A		DTE Calver	0.06
KY	H L Spurlock	6041		4	H L Spurloc	0.06
KY	Paddy's Run	1366		13	Paddy's Ru	0.06
KY	Riverside Generating	55198	GTG201		Riverside G	0.06
KY	Riverside Generating	55198	GTG301		Riverside G	0.06
KY	Riverside Generating	55198	GTG201		Riverside G	0.06
KY	Bluegrass Generatin	55164	GTG3		Bluegrass (	0.06
KY	Riverside Generating	55198	GTG401		Riverside G	0.06
KY	Riverside Generating	55198	GTG301		Riverside G	0.06
KY	Riverside Generating	55198	GTG301		Riverside G	0.06
KY	Riverside Generating	55198	GTG201		Riverside G	0.06
KY	Smith Generating Fa	54	SCT3		Smith Gen	0.06
KY	H L Spurlock	6041		4	H L Spurloc	0.06
KY	H L Spurlock	6041		4	H L Spurloc	0.06
KY	Riverside Generating	55198	GTG401		Riverside G	0.06
KY	D B Wilson	6823	W1		D B Wilson	0.06
KY	Trimble County	6071		2	Trimble Co	0.06
KY	Mill Creek	1364		3	Mill Creek-	0.06
KY	H L Spurlock	6041		3	H L Spurloc	0.06
KY	D B Wilson	6823	W1		D B Wilson	0.07
KY	Bluegrass Generatin	55164	GTG3		Bluegrass (	0.07
KY	Smith Generating Fa	54	SCT3		Smith Gen	0.07
KY	H L Spurlock	6041		3	H L Spurloc	0.07
KY	H L Spurlock	6041		3	H L Spurloc	0.07
KY	DTE Calvert City, LLC	55308	A		DTE Calver	0.07
KY	Riverside Generating	55198	GTG201		Riverside G	0.07
KY	HMP&L Station 2	1382	H2		HMP&L Sta	0.07
KY	HMP&L Station 2	1382	H2		HMP&L Sta	0.07
KY	Riverside Generating	55198	GTG201		Riverside G	0.07
KY	Trimble County	6071		1	Trimble Co	0.07
KY	Riverside Generating	55198	GTG301		Riverside G	0.07
KY	Smith Generating Fa	54	SCT1		Smith Gen	0.07
KY	Ghent	1356		4	Ghent-4	0.07

KY	Smith Generating Fa	54	SCT3		Smith Gen	0.07
KY	Riverside Generating	55198	GTG201		Riverside G	0.07
KY	Smith Generating Fa	54	SCT3		Smith Gen	0.07
KY	Smith Generating Fa	54	SCT2		Smith Gen	0.07
KY	Smith Generating Fa	54	SCT2		Smith Gen	0.07
KY	Smith Generating Fa	54	SCT2		Smith Gen	0.07
KY	Riverside Generating	55198	GTG301		Riverside G	0.07
KY	H L Spurlock	6041		3	H L Spurloc	0.07
KY	Smith Generating Fa	54	SCT3		Smith Gen	0.07
KY	DTE Calvert City, LLC	55308	A		DTE Calver	0.07
KY	DTE Calvert City, LLC	55308	B		DTE Calver	0.07
KY	Riverside Generating	55198	GTG201		Riverside G	0.07
KY	DTE Calvert City, LLC	55308	B		DTE Calver	0.07
KY	DTE Calvert City, LLC	55308	B		DTE Calver	0.07
KY	D B Wilson	6823	W1		D B Wilson	0.07
KY	HMP&L Station 2	1382	H2		HMP&L Sta	0.07
KY	E W Brown	1355		5	E W Brown	0.07
KY	Riverside Generating	55198	GTG301		Riverside G	0.07
KY	DTE Calvert City, LLC	55308	B		DTE Calver	0.07
KY	Smith Generating Fa	54	SCT2		Smith Gen	0.07
KY	Riverside Generating	55198	GTG301		Riverside G	0.07
KY	Smith Generating Fa	54	SCT3		Smith Gen	0.07
KY	DTE Calvert City, LLC	55308	A		DTE Calver	0.07
KY	Smith Generating Fa	54	SCT1		Smith Gen	0.07
KY	Riverside Generating	55198	GTG401		Riverside G	0.07
KY	Riverside Generating	55198	GTG501		Riverside G	0.07
KY	E W Brown	1355		5	E W Brown	0.07
KY	Smith Generating Fa	54	SCT2		Smith Gen	0.07
KY	DTE Calvert City, LLC	55308	B		DTE Calver	0.07
KY	E W Brown	1355		5	E W Brown	0.07
KY	Smith Generating Fa	54	SCT1		Smith Gen	0.07
KY	Smith Generating Fa	54	SCT1		Smith Gen	0.07
KY	H L Spurlock	6041		2	H L Spurloc	0.07
KY	Smith Generating Fa	54	SCT3		Smith Gen	0.07
KY	H L Spurlock	6041		3	H L Spurloc	0.07
KY	Bluegrass Generatin	55164	GTG2		Bluegrass (	0.07
KY	Smith Generating Fa	54	SCT3		Smith Gen	0.07
KY	DTE Calvert City, LLC	55308	C		DTE Calver	0.07
KY	E W Brown	1355		5	E W Brown	0.07
KY	Smith Generating Fa	54	SCT1		Smith Gen	0.07
KY	Smith Generating Fa	54	SCT3		Smith Gen	0.07
KY	Paddy's Run	1366		13	Paddy's Ru	0.07
KY	Paddy's Run	1366		13	Paddy's Ru	0.07
KY	Ghent	1356		1	Ghent-1	0.07
KY	Smith Generating Fa	54	SCT1		Smith Gen	0.07
KY	E W Brown	1355		5	E W Brown	0.08
KY	E W Brown	1355		6	E W Brown	0.08

KY	H L Spurlock	6041		4	H L Spurloc	0.08
KY	Smith Generating Fa	54	SCT1		Smith Gen	0.08
KY	DTE Calvert City, LLC	55308	C		DTE Calver	0.08
KY	East Bend	6018		2	East Bend-	0.08
KY	H L Spurlock	6041		2	H L Spurloc	0.08
KY	HMP&L Station 2	1382	H1		HMP&L Sta	0.08
KY	Smith Generating Fa	54	SCT1		Smith Gen	0.08
KY	Smith Generating Fa	54	SCT3		Smith Gen	0.08
KY	H L Spurlock	6041		3	H L Spurloc	0.08
KY	H L Spurlock	6041		2	H L Spurloc	0.08
KY	Smith Generating Fa	54	SCT2		Smith Gen	0.08
KY	Smith Generating Fa	54	SCT2		Smith Gen	0.08
KY	Smith Generating Fa	54	SCT2		Smith Gen	0.08
KY	Smith Generating Fa	54	SCT1		Smith Gen	0.08
KY	E W Brown	1355		7	E W Brown	0.08
KY	DTE Calvert City, LLC	55308	B		DTE Calver	0.08
KY	HMP&L Station 2	1382	H2		HMP&L Sta	0.08
KY	Paddy's Run	1366		13	Paddy's Ru	0.08
KY	HMP&L Station 2	1382	H2		HMP&L Sta	0.08
KY	H L Spurlock	6041		3	H L Spurloc	0.08
KY	Paddy's Run	1366		13	Paddy's Ru	0.08
KY	Smith Generating Fa	54	SCT2		Smith Gen	0.08
KY	Ghent	1356		4	Ghent-4	0.08
KY	DTE Calvert City, LLC	55308	A		DTE Calver	0.08
KY	HMP&L Station 2	1382	H2		HMP&L Sta	0.08
KY	HMP&L Station 2	1382	H1		HMP&L Sta	0.08
KY	Ghent	1356		1	Ghent-1	0.08
KY	H L Spurlock	6041		2	H L Spurloc	0.08
KY	HMP&L Station 2	1382	H2		HMP&L Sta	0.08
KY	Paddy's Run	1366		13	Paddy's Ru	0.08
KY	DTE Calvert City, LLC	55308	A		DTE Calver	0.08
KY	HMP&L Station 2	1382	H1		HMP&L Sta	0.08
KY	E W Brown	1355		5	E W Brown	0.08
KY	Ghent	1356		1	Ghent-1	0.08
KY	H L Spurlock	6041		1	H L Spurloc	0.08
KY	Ghent	1356		3	Ghent-3	0.08
KY	DTE Calvert City, LLC	55308	B		DTE Calver	0.08
KY	HMP&L Station 2	1382	H2		HMP&L Sta	0.08
KY	Paddy's Run	1366		13	Paddy's Ru	0.08
KY	H L Spurlock	6041		2	H L Spurloc	0.08
KY	Paddy's Run	1366		13	Paddy's Ru	0.08
KY	DTE Calvert City, LLC	55308	C		DTE Calver	0.08
KY	Paddy's Run	1366		13	Paddy's Ru	0.08
KY	H L Spurlock	6041		1	H L Spurloc	0.08
KY	DTE Calvert City, LLC	55308	C		DTE Calver	0.08
KY	Catlettsburg Refining	880038		61	Catlettsbur	0.08
KY	DTE Calvert City, LLC	55308	C		DTE Calver	0.09

KY	H L Spurlock	6041		2	H L Spurloc	0.09
KY	DTE Calvert City, LLC	55308	A		DTE Calver	0.09
KY	HMP&L Station 2	1382	H2		HMP&L Sta	0.09
KY	H L Spurlock	6041		2	H L Spurloc	0.09
KY	Ghent	1356		1	Ghent-1	0.09
KY	Ghent	1356		1	Ghent-1	0.09
KY	Ghent	1356		3	Ghent-3	0.09
KY	DTE Calvert City, LLC	55308	B		DTE Calver	0.09
KY	H L Spurlock	6041		1	H L Spurloc	0.09
KY	Paddy's Run	1366		13	Paddy's Ru	0.09
KY	Catlettsburg Refining	880038		61	Catlettsbur	0.09
KY	H L Spurlock	6041		1	H L Spurloc	0.09
KY	H L Spurlock	6041		3	H L Spurloc	0.09
KY	HMP&L Station 2	1382	H1		HMP&L Sta	0.09
KY	HMP&L Station 2	1382	H2		HMP&L Sta	0.09
KY	Paducah Power Syst	56556	EU02B		Paducah P	0.09
KY	H L Spurlock	6041		1	H L Spurloc	0.09
KY	Paradise	1378		2	Paradise-2	0.09
KY	H L Spurlock	6041		1	H L Spurloc	0.09
KY	H L Spurlock	6041		2	H L Spurloc	0.09
KY	H L Spurlock	6041		2	H L Spurloc	0.09
KY	DTE Calvert City, LLC	55308	B		DTE Calver	0.09
KY	Paducah Power Syst	56556	EU01A		Paducah P	0.09
KY	Mill Creek	1364		4	Mill Creek-	0.09
KY	H L Spurlock	6041		3	H L Spurloc	0.09
KY	H L Spurlock	6041		1	H L Spurloc	0.09
KY	Paducah Power Syst	56556	EU02A		Paducah P	0.10
KY	HMP&L Station 2	1382	H1		HMP&L Sta	0.10
KY	Big Sandy	1353	BSU2		Big Sandy-I	0.10
KY	East Bend	6018		2	East Bend-	0.10
KY	HMP&L Station 2	1382	H1		HMP&L Sta	0.10
KY	Paradise	1378		2	Paradise-2	0.10
KY	Paradise	1378		2	Paradise-2	0.10
KY	Paradise	1378		1	Paradise-1	0.10
KY	Paradise	1378		3	Paradise-3	0.10
KY	Paducah Power Syst	56556	EU01B		Paducah P	0.10
KY	Paducah Power Syst	56556	EU01A		Paducah P	0.10
KY	Paducah Power Syst	56556	EU02B		Paducah P	0.10
KY	DTE Calvert City, LLC	55308	C		DTE Calver	0.10
KY	Paradise	1378		2	Paradise-2	0.10
KY	Ghent	1356		4	Ghent-4	0.10
KY	Paducah Power Syst	56556	EU02A		Paducah P	0.10
KY	East Bend	6018		2	East Bend-	0.10
KY	HMP&L Station 2	1382	H1		HMP&L Sta	0.10
KY	H L Spurlock	6041		2	H L Spurloc	0.10
KY	HMP&L Station 2	1382	H1		HMP&L Sta	0.10
KY	Bluegrass Generatin	55164	GTG2		Bluegrass (	0.10

KY	Trimble County	6071		1	Trimble Co	0.11
KY	Mill Creek	1364		4	Mill Creek-	0.11
KY	Smith Generating Fa	54	SCT2		Smith Gen	0.11
KY	DTE Calvert City, LLC	55308	C		DTE Calver	0.11
KY	Mill Creek	1364		3	Mill Creek-	0.11
KY	Paradise	1378		1	Paradise-1	0.11
KY	Paradise	1378		3	Paradise-3	0.11
KY	Paradise	1378		3	Paradise-3	0.11
KY	Bluegrass Generatin	55164	GTG1		Bluegrass (	0.11
KY	Paradise	1378		1	Paradise-1	0.11
KY	Paradise	1378		1	Paradise-1	0.11
KY	Paradise	1378		1	Paradise-1	0.11
KY	E W Brown	1355		11	E W Brown	0.11
KY	E W Brown	1355		11	E W Brown	0.11
KY	E W Brown	1355		9	E W Brown	0.11
KY	DTE Calvert City, LLC	55308	C		DTE Calver	0.11
KY	E W Brown	1355		9	E W Brown	0.11
KY	E W Brown	1355		11	E W Brown	0.11
KY	E W Brown	1355		9	E W Brown	0.11
KY	Paradise	1378		1	Paradise-1	0.11
KY	East Bend	6018		2	East Bend-	0.11
KY	E W Brown	1355		11	E W Brown	0.11
KY	H L Spurlock	6041		1	H L Spurloc	0.11
KY	E W Brown	1355		9	E W Brown	0.11
KY	DTE Calvert City, LLC	55308	C		DTE Calver	0.11
KY	Catlettsburg Refining	880038		61	Catlettsbu	0.11
KY	Paradise	1378		1	Paradise-1	0.11
KY	H L Spurlock	6041		1	H L Spurloc	0.11
KY	E W Brown	1355		9	E W Brown	0.11
KY	E W Brown	1355		11	E W Brown	0.11
KY	Mill Creek	1364		4	Mill Creek-	0.12
KY	DTE Calvert City, LLC	55308	C		DTE Calver	0.12
KY	H L Spurlock	6041		3	H L Spurloc	0.12
KY	Catlettsburg Refining	880038		61	Catlettsbu	0.12
KY	Smith Generating Fa	54	SCT1		Smith Gen	0.12
KY	Bluegrass Generatin	55164	GTG2		Bluegrass (	0.12
KY	E W Brown	1355		8	E W Brown	0.12
KY	Paradise	1378		3	Paradise-3	0.12
KY	E W Brown	1355		9	E W Brown	0.12
KY	Paradise	1378		1	Paradise-1	0.12
KY	Big Sandy	1353	BSU1		Big Sandy-I	0.12
KY	Wickliffe Paper Com	880065		2	Wickliffe P	0.12
KY	Catlettsburg Refining	880038		61	Catlettsbu	0.12
KY	Paradise	1378		1	Paradise-1	0.12
KY	Paradise	1378		2	Paradise-2	0.12
KY	Paradise	1378		1	Paradise-1	0.12
KY	Wickliffe Paper Com	880065		2	Wickliffe P	0.12

KY	E W Brown	1355		11	E W Brown	0.12
KY	E W Brown	1355		11	E W Brown	0.12
KY	Wickliffe Paper Com	880065		2	Wickliffe P	0.12
KY	E W Brown	1355		11	E W Brown	0.12
KY	E W Brown	1355		11	E W Brown	0.12
KY	Wickliffe Paper Com	880065		2	Wickliffe P	0.12
KY	Trimble County	6071		1	Trimble Co	0.12
KY	Trimble County	6071		1	Trimble Co	0.12
KY	E W Brown	1355		9	E W Brown	0.12
KY	Elmer Smith	1374		1	Elmer Smit	0.12
KY	E W Brown	1355		9	E W Brown	0.12
KY	Wickliffe Paper Com	880065		2	Wickliffe P	0.12
KY	E W Brown	1355		9	E W Brown	0.12
KY	Wickliffe Paper Com	880065		2	Wickliffe P	0.12
KY	E W Brown	1355		11	E W Brown	0.12
KY	Big Sandy	1353	BSU2		Big Sandy-I	0.13
KY	Big Sandy	1353	BSU2		Big Sandy-I	0.13
KY	Paducah Power Syst	56556	EU01A		Paducah P	0.13
KY	Paradise	1378		2	Paradise-2	0.13
KY	Elmer Smith	1374		1	Elmer Smit	0.13
KY	East Bend	6018		2	East Bend-	0.13
KY	E W Brown	1355		8	E W Brown	0.13
KY	Paducah Power Syst	56556	EU01B		Paducah P	0.13
KY	E W Brown	1355		8	E W Brown	0.13
KY	E W Brown	1355		8	E W Brown	0.13
KY	E W Brown	1355		8	E W Brown	0.13
KY	E W Brown	1355		10	E W Brown	0.13
KY	E W Brown	1355		10	E W Brown	0.13
KY	E W Brown	1355		10	E W Brown	0.13
KY	E W Brown	1355		10	E W Brown	0.13
KY	E W Brown	1355		10	E W Brown	0.13
KY	Paradise	1378		2	Paradise-2	0.13
KY	John S. Cooper	1384		2	John S. Co	0.13
KY	Big Sandy	1353	BSU2		Big Sandy-I	0.14
KY	Wickliffe Paper Com	880065		1	Wickliffe P	0.14
KY	Wickliffe Paper Com	880065		1	Wickliffe P	0.14
KY	E W Brown	1355		8	E W Brown	0.14
KY	Wickliffe Paper Com	880065		1	Wickliffe P	0.14
KY	Wickliffe Paper Com	880065		1	Wickliffe P	0.14
KY	Wickliffe Paper Com	880065		1	Wickliffe P	0.14
KY	E W Brown	1355		10	E W Brown	0.14
KY	Wickliffe Paper Com	880065		1	Wickliffe P	0.14
KY	H L Spurlock	6041		1	H L Spurlo	0.14
KY	Wickliffe Paper Com	880065		1	Wickliffe P	0.14
KY	Wickliffe Paper Com	880065		1	Wickliffe P	0.14
KY	East Bend	6018		2	East Bend-	0.14
KY	Elmer Smith	1374		1	Elmer Smit	0.14

KY	Wickliffe Paper Com	880065		1	Wickliffe P	0.14
KY	E W Brown	1355		9	E W Brown	0.14
KY	E W Brown	1355		10	E W Brown	0.14
KY	E W Brown	1355		10	E W Brown	0.14
KY	E W Brown	1355		10	E W Brown	0.14
KY	Big Sandy	1353	BSU2		Big Sandy-I	0.14
KY	Wickliffe Paper Com	880065		1	Wickliffe P	0.14
KY	Paradise	1378		2	Paradise-2	0.14
KY	Big Sandy	1353	BSU2		Big Sandy-I	0.14
KY	Big Sandy	1353	BSU1		Big Sandy-I	0.14
KY	E W Brown	1355		10	E W Brown	0.14
KY	Bluegrass Generatin	55164	GTG3		Bluegrass (	0.14
KY	Paducah Power Syst	56556	EU02A		Paducah P	0.14
KY	Big Sandy	1353	AUX2		Big Sandy-	0.15
KY	Big Sandy	1353	AUX2		Big Sandy-	0.15
KY	Big Sandy	1353	AUX2		Big Sandy-	0.15
KY	Big Sandy	1353	AUX2		Big Sandy-	0.15
KY	Paradise	1378		2	Paradise-2	0.15
KY	Wickliffe Paper Com	880065		2	Wickliffe P	0.15
KY	Wickliffe Paper Com	880065		2	Wickliffe P	0.15
KY	Wickliffe Paper Com	880065		2	Wickliffe P	0.15
KY	Wickliffe Paper Com	880065		2	Wickliffe P	0.15
KY	E W Brown	1355		8	E W Brown	0.15
KY	E W Brown	1355		8	E W Brown	0.15
KY	E W Brown	1355		8	E W Brown	0.15
KY	Big Sandy	1353	AUX2		Big Sandy-	0.15
KY	E W Brown	1355		8	E W Brown	0.15
KY	Big Sandy	1353	AUX2		Big Sandy-	0.15
KY	Big Sandy	1353	AUX2		Big Sandy-	0.15
KY	Big Sandy	1353	AUX2		Big Sandy-	0.15
KY	Big Sandy	1353	AUX2		Big Sandy-	0.15
KY	John S. Cooper	1384		2	John S. Co	0.15
KY	Paradise	1378		3	Paradise-3	0.15
KY	Paducah Power Syst	56556	EU02B		Paducah P	0.16
KY	East Bend	6018		2	East Bend-	0.16
KY	Ghent	1356		3	Ghent-3	0.16
KY	Ghent	1356		3	Ghent-3	0.16
KY	Big Sandy	1353	AUX2		Big Sandy-	0.16
KY	Big Sandy	1353	BSU1		Big Sandy-I	0.16
KY	Big Sandy	1353	BSU2		Big Sandy-I	0.16
KY	Ghent	1356		3	Ghent-3	0.16
KY	Big Sandy	1353	BSU2		Big Sandy-I	0.17
KY	Paradise	1378		2	Paradise-2	0.17
KY	Paradise	1378		3	Paradise-3	0.17
KY	Mill Creek	1364		4	Mill Creek-	0.17
KY	Ghent	1356		3	Ghent-3	0.17
KY	Paradise	1378		3	Paradise-3	0.17

KY	Ghent	1356		2	Ghent-2	0.17
KY	Trimble County	6071		2	Trimble Co	0.18
KY	Mill Creek	1364		3	Mill Creek-	0.18
KY	Ghent	1356		4	Ghent-4	0.18
KY	E W Brown	1355		3	E W Brown	0.18
KY	John S. Cooper	1384		2	John S. Coo	0.18
KY	Ghent	1356		2	Ghent-2	0.18
KY	Ghent	1356		2	Ghent-2	0.18
KY	Ghent	1356		4	Ghent-4	0.18
KY	Ghent	1356		2	Ghent-2	0.18
KY	Paducah Power Syst	56556	EU02A		Paducah P	0.18
KY	E W Brown	1355		3	E W Brown	0.18
KY	Big Sandy	1353	BSU1		Big Sandy-I	0.18
KY	Ghent	1356		3	Ghent-3	0.19
KY	William C. Dale	1385		4	William C.	0.19
KY	Elmer Smith	1374		1	Elmer Smit	0.19
KY	Big Sandy	1353	BSU2		Big Sandy-I	0.19
KY	Ghent	1356		3	Ghent-3	0.19
KY	East Bend	6018		2	East Bend-	0.19
KY	Paducah Power Syst	56556	EU01B		Paducah P	0.19
KY	R D Green	6639	G2		R D Green-	0.19
KY	R D Green	6639	G2		R D Green-	0.19
KY	R D Green	6639	G2		R D Green-	0.19
KY	Ghent	1356		2	Ghent-2	0.19
KY	Big Sandy	1353	BSU1		Big Sandy-I	0.19
KY	Paradise	1378		3	Paradise-3	0.20
KY	Ghent	1356		2	Ghent-2	0.20
KY	R D Green	6639	G2		R D Green-	0.20
KY	Big Sandy	1353	BSU1		Big Sandy-I	0.20
KY	R D Green	6639	G1		R D Green-	0.20
KY	E W Brown	1355		1	E W Brown	0.20
KY	R D Green	6639	G1		R D Green-	0.20
KY	R D Green	6639	G1		R D Green-	0.20
KY	R D Green	6639	G2		R D Green-	0.20
KY	Trimble County	6071		2	Trimble Co	0.20
KY	Mill Creek	1364		3	Mill Creek-	0.20
KY	Paducah Power Syst	56556	EU01A		Paducah P	0.20
KY	R D Green	6639	G1		R D Green-	0.21
KY	Paradise	1378		3	Paradise-3	0.21
KY	R D Green	6639	G1		R D Green-	0.21
KY	R D Green	6639	G2		R D Green-	0.21
KY	R D Green	6639	G1		R D Green-	0.21
KY	R D Green	6639	G1		R D Green-	0.21
KY	E W Brown	1355		2	E W Brown	0.21
KY	R D Green	6639	G2		R D Green-	0.21
KY	Bluegrass Generatin	55164	GTG3		Bluegrass (	0.21
KY	R D Green	6639	G2		R D Green-	0.21

KY	R D Green	6639	G1		R D Green-	0.22
KY	Elmer Smith	1374		2	Elmer Smit	0.22
KY	Shawnee	1379		10	Shawnee-1	0.22
KY	Paducah Power Syst	56556	EU02B		Paducah P	0.22
KY	R D Green	6639	G1		R D Green-	0.22
KY	Elmer Smith	1374		2	Elmer Smit	0.22
KY	R D Green	6639	G1		R D Green-	0.22
KY	Shawnee	1379		10	Shawnee-1	0.23
KY	R D Green	6639	G2		R D Green-	0.23
KY	East Bend	6018		2	East Bend-	0.23
KY	Elmer Smith	1374		2	Elmer Smit	0.23
KY	Shawnee	1379		10	Shawnee-1	0.23
KY	R D Green	6639	G2		R D Green-	0.23
KY	Elmer Smith	1374		1	Elmer Smit	0.23
KY	Paducah Power Syst	56556	EU02B		Paducah P	0.24
KY	Paducah Power Syst	56556	EU01A		Paducah P	0.24
KY	Ghent	1356		4	Ghent-4	0.24
KY	Elmer Smith	1374		2	Elmer Smit	0.24
KY	Big Sandy	1353	BSU1		Big Sandy-I	0.24
KY	John S. Cooper	1384		1	John S. Co	0.24
KY	Elmer Smith	1374		2	Elmer Smit	0.24
KY	Cane Run	1363		6	Cane Run-6	0.25
KY	E W Brown	1355		2	E W Brown	0.25
KY	Big Sandy	1353	BSU1		Big Sandy-I	0.25
KY	Cane Run	1363		6	Cane Run-6	0.26
KY	Ghent	1356		2	Ghent-2	0.26
KY	E W Brown	1355		1	E W Brown	0.26
KY	Cane Run	1363		6	Cane Run-6	0.26
KY	Elmer Smith	1374		2	Elmer Smit	0.26
KY	Ghent	1356		2	Ghent-2	0.27
KY	William C. Dale	1385		3	William C.	0.27
KY	Mill Creek	1364		1	Mill Creek-	0.27
KY	Shawnee	1379		6	Shawnee-6	0.27
KY	Shawnee	1379		7	Shawnee-7	0.27
KY	Shawnee	1379		8	Shawnee-8	0.27
KY	Ghent	1356		2	Ghent-2	0.27
KY	Elmer Smith	1374		2	Elmer Smit	0.27
KY	Shawnee	1379		9	Shawnee-9	0.27
KY	Ghent	1356		2	Ghent-2	0.27
KY	Cane Run	1363		6	Cane Run-6	0.27
KY	Shawnee	1379		10	Shawnee-1	0.27
KY	Cane Run	1363		6	Cane Run-6	0.28
KY	Elmer Smith	1374		2	Elmer Smit	0.28
KY	Mill Creek	1364		1	Mill Creek-	0.28
KY	Big Sandy	1353	BSU1		Big Sandy-I	0.28
KY	Mill Creek	1364		1	Mill Creek-	0.28
KY	Coleman	1381	C2		Coleman-C	0.28

KY	Mill Creek	1364		1	Mill Creek-	0.28
KY	Shawnee	1379		7	Shawnee-7	0.28
KY	Shawnee	1379		8	Shawnee-8	0.28
KY	Cane Run	1363		6	Cane Run-6	0.28
KY	Shawnee	1379		10	Shawnee-1	0.29
KY	John S. Cooper	1384		1	John S. Coo	0.29
KY	Shawnee	1379		9	Shawnee-9	0.29
KY	Coleman	1381	C2		Coleman-C	0.29
KY	Paducah Power Syst	56556	EU02A		Paducah P	0.29
KY	Shawnee	1379		6	Shawnee-6	0.29
KY	Mill Creek	1364		2	Mill Creek-	0.29
KY	Mill Creek	1364		2	Mill Creek-	0.29
KY	Elmer Smith	1374		2	Elmer Smit	0.29
KY	Elmer Smith	1374		2	Elmer Smit	0.29
KY	Shawnee	1379		10	Shawnee-1	0.29
KY	Cane Run	1363		6	Cane Run-6	0.29
KY	Shawnee	1379		3	Shawnee-3	0.29
KY	Coleman	1381	C1		Coleman-C	0.29
KY	Mill Creek	1364		2	Mill Creek-	0.29
KY	Shawnee	1379		1	Shawnee-1	0.29
KY	Coleman	1381	C3		Coleman-C	0.29
KY	Shawnee	1379		2	Shawnee-2	0.29
KY	Shawnee	1379		5	Shawnee-5	0.29
KY	Shawnee	1379		4	Shawnee-4	0.29
KY	Mill Creek	1364		2	Mill Creek-	0.30
KY	Coleman	1381	C2		Coleman-C	0.30
KY	E W Brown	1355		2	E W Brown	0.30
KY	Coleman	1381	C1		Coleman-C	0.30
KY	Mill Creek	1364		2	Mill Creek-	0.30
KY	Coleman	1381	C3		Coleman-C	0.30
KY	Mill Creek	1364		2	Mill Creek-	0.30
KY	Mill Creek	1364		1	Mill Creek-	0.30
KY	Cane Run	1363		6	Cane Run-6	0.30
KY	Shawnee	1379		1	Shawnee-1	0.30
KY	Coleman	1381	C2		Coleman-C	0.30
KY	E W Brown	1355		3	E W Brown	0.31
KY	Mill Creek	1364		2	Mill Creek-	0.31
KY	Elmer Smith	1374		1	Elmer Smit	0.31
KY	Coleman	1381	C1		Coleman-C	0.31
KY	Coleman	1381	C3		Coleman-C	0.31
KY	Shawnee	1379		5	Shawnee-5	0.31
KY	Shawnee	1379		2	Shawnee-2	0.31
KY	Shawnee	1379		3	Shawnee-3	0.31
KY	Shawnee	1379		4	Shawnee-4	0.31
KY	Mill Creek	1364		1	Mill Creek-	0.31
KY	Coleman	1381	C1		Coleman-C	0.31
KY	Mill Creek	1364		2	Mill Creek-	0.31

KY	Coleman	1381	C3	Coleman-C	0.31
KY	Paducah Power Syst	56556	EU01B	Paducah P	0.31
KY	Coleman	1381	C2	Coleman-C	0.31
KY	Mill Creek	1364	2	Mill Creek-	0.31
KY	Mill Creek	1364	1	Mill Creek-	0.31
KY	Mill Creek	1364	2	Mill Creek-	0.31
KY	Shawnee	1379	7	Shawnee-7	0.31
KY	Mill Creek	1364	1	Mill Creek-	0.31
KY	Shawnee	1379	9	Shawnee-9	0.31
KY	John S. Cooper	1384	1	John S. Co	0.32
KY	Shawnee	1379	8	Shawnee-8	0.32
KY	Shawnee	1379	6	Shawnee-6	0.32
KY	Mill Creek	1364	1	Mill Creek-	0.32
KY	Cane Run	1363	6	Cane Run-6	0.32
KY	Mill Creek	1364	1	Mill Creek-	0.32
KY	Elmer Smith	1374	1	Elmer Smit	0.32
KY	E W Brown	1355	3	E W Brown	0.32
KY	E W Brown	1355	3	E W Brown	0.32
KY	E W Brown	1355	3	E W Brown	0.32
KY	Cane Run	1363	4	Cane Run-4	0.32
KY	Shawnee	1379	9	Shawnee-9	0.32
KY	Cane Run	1363	6	Cane Run-6	0.33
KY	Shawnee	1379	7	Shawnee-7	0.33
KY	Shawnee	1379	6	Shawnee-6	0.33
KY	Coleman	1381	C2	Coleman-C	0.33
KY	Cane Run	1363	4	Cane Run-4	0.33
KY	Shawnee	1379	8	Shawnee-8	0.33
KY	E W Brown	1355	2	E W Brown	0.33
KY	Coleman	1381	C3	Coleman-C	0.33
KY	Coleman	1381	C1	Coleman-C	0.33
KY	Cane Run	1363	4	Cane Run-4	0.33
KY	E W Brown	1355	2	E W Brown	0.33
KY	Coleman	1381	C2	Coleman-C	0.33
KY	Coleman	1381	C3	Coleman-C	0.33
KY	Coleman	1381	C1	Coleman-C	0.33
KY	Cane Run	1363	4	Cane Run-4	0.34
KY	Coleman	1381	C1	Coleman-C	0.34
KY	E W Brown	1355	3	E W Brown	0.34
KY	Cane Run	1363	4	Cane Run-4	0.34
KY	Shawnee	1379	6	Shawnee-6	0.34
KY	Shawnee	1379	7	Shawnee-7	0.34
KY	Shawnee	1379	9	Shawnee-9	0.34
KY	Coleman	1381	C3	Coleman-C	0.34
KY	Shawnee	1379	8	Shawnee-8	0.34
KY	E W Brown	1355	2	E W Brown	0.34
KY	Coleman	1381	C2	Coleman-C	0.34
KY	Coleman	1381	C1	Coleman-C	0.34

KY	Cane Run	1363		4 Cane Run-4	0.35
KY	E W Brown	1355		2 E W Brown	0.35
KY	Coleman	1381	C3	Coleman-C	0.35
KY	E W Brown	1355		3 E W Brown	0.35
KY	Elmer Smith	1374		1 Elmer Smit	0.35
KY	William C. Dale	1385		1 William C.	0.35
KY	Shawnee	1379		3 Shawnee-3	0.35
KY	Shawnee	1379		4 Shawnee-4	0.35
KY	Shawnee	1379		1 Shawnee-1	0.35
KY	E W Brown	1355		1 E W Brown	0.35
KY	William C. Dale	1385		2 William C.	0.35
KY	Shawnee	1379		5 Shawnee-5	0.35
KY	Coleman	1381	C3	Coleman-C	0.35
KY	Shawnee	1379		8 Shawnee-8	0.35
KY	Cane Run	1363		5 Cane Run-5	0.35
KY	Shawnee	1379		2 Shawnee-2	0.35
KY	William C. Dale	1385		1 William C.	0.35
KY	William C. Dale	1385		2 William C.	0.35
KY	Coleman	1381	C2	Coleman-C	0.35
KY	Coleman	1381	C2	Coleman-C	0.35
KY	Shawnee	1379		9 Shawnee-9	0.35
KY	Shawnee	1379		8 Shawnee-8	0.36
KY	Shawnee	1379		6 Shawnee-6	0.36
KY	Shawnee	1379		7 Shawnee-7	0.36
KY	William C. Dale	1385		3 William C.	0.36
KY	William C. Dale	1385		4 William C.	0.36
KY	Coleman	1381	C1	Coleman-C	0.36
KY	E W Brown	1355		3 E W Brown	0.36
KY	Shawnee	1379		7 Shawnee-7	0.36
KY	Shawnee	1379		9 Shawnee-9	0.36
KY	Coleman	1381	C3	Coleman-C	0.36
KY	Green River	1357		4 Green Rive	0.36
KY	Shawnee	1379		6 Shawnee-6	0.36
KY	Shawnee	1379		8 Shawnee-8	0.36
KY	Shawnee	1379		7 Shawnee-7	0.36
KY	Shawnee	1379		9 Shawnee-9	0.36
KY	Cane Run	1363		4 Cane Run-4	0.36
KY	E W Brown	1355		2 E W Brown	0.36
KY	Shawnee	1379		6 Shawnee-6	0.36
KY	William C. Dale	1385		4 William C.	0.36
KY	Shawnee	1379		9 Shawnee-9	0.36
KY	Shawnee	1379		7 Shawnee-7	0.36
KY	Shawnee	1379		8 Shawnee-8	0.36
KY	Cane Run	1363		4 Cane Run-4	0.36
KY	William C. Dale	1385		3 William C.	0.36
KY	William C. Dale	1385		4 William C.	0.37
KY	Cane Run	1363		5 Cane Run-5	0.37

KY	Shawnee	1379		7	Shawnee-7	0.37
KY	Cane Run	1363		4	Cane Run-4	0.37
KY	Shawnee	1379		9	Shawnee-9	0.37
KY	Shawnee	1379		6	Shawnee-6	0.37
KY	William C. Dale	1385		3	William C.	0.37
KY	William C. Dale	1385		3	William C.	0.37
KY	Shawnee	1379		6	Shawnee-6	0.37
KY	Cane Run	1363		5	Cane Run-5	0.37
KY	Green River	1357		5	Green Rive	0.37
KY	Shawnee	1379		4	Shawnee-4	0.37
KY	Shawnee	1379		8	Shawnee-8	0.37
KY	Shawnee	1379		2	Shawnee-2	0.37
KY	William C. Dale	1385		4	William C.	0.37
KY	E W Brown	1355		2	E W Brown	0.37
KY	Shawnee	1379		3	Shawnee-3	0.37
KY	Shawnee	1379		1	Shawnee-1	0.37
KY	Shawnee	1379		5	Shawnee-5	0.37
KY	Cane Run	1363		5	Cane Run-5	0.37
KY	Shawnee	1379		3	Shawnee-3	0.37
KY	Shawnee	1379		4	Shawnee-4	0.37
KY	Shawnee	1379		2	Shawnee-2	0.37
KY	Paducah Power Syst	56556	EU01B		Paducah P	0.37
KY	Shawnee	1379		1	Shawnee-1	0.37
KY	Shawnee	1379		5	Shawnee-5	0.37
KY	William C. Dale	1385		2	William C.	0.37
KY	Cane Run	1363		4	Cane Run-4	0.37
KY	William C. Dale	1385		1	William C.	0.37
KY	Robert Reid	1383	R1		Robert Rei	0.38
KY	Big Sandy	1353	BSU2		Big Sandy-I	0.38
KY	Cane Run	1363		5	Cane Run-5	0.38
KY	E W Brown	1355		3	E W Brown	0.38
KY	E W Brown	1355		1	E W Brown	0.38
KY	E W Brown	1355		2	E W Brown	0.38
KY	Green River	1357		4	Green Rive	0.38
KY	Tyrone	1361		5	Tyrone-5	0.38
KY	William C. Dale	1385		4	William C.	0.38
KY	Green River	1357		5	Green Rive	0.38
KY	Cane Run	1363		5	Cane Run-5	0.38
KY	William C. Dale	1385		3	William C.	0.38
KY	Green River	1357		5	Green Rive	0.38
KY	Shawnee	1379		1	Shawnee-1	0.39
KY	Shawnee	1379		5	Shawnee-5	0.39
KY	Shawnee	1379		3	Shawnee-3	0.39
KY	Shawnee	1379		2	Shawnee-2	0.39
KY	Shawnee	1379		4	Shawnee-4	0.39
KY	Paradise	1378		3	Paradise-3	0.39
KY	Shawnee	1379		3	Shawnee-3	0.39

KY	Shawnee	1379		1	Shawnee-1	0.39
KY	Shawnee	1379		2	Shawnee-2	0.39
KY	Cane Run	1363		5	Cane Run-5	0.39
KY	William C. Dale	1385		1	William C.	0.39
KY	Shawnee	1379		1	Shawnee-1	0.39
KY	Tyrone	1361		5	Tyrone-5	0.39
KY	Shawnee	1379		3	Shawnee-3	0.39
KY	Shawnee	1379		5	Shawnee-5	0.39
KY	Shawnee	1379		4	Shawnee-4	0.39
KY	Shawnee	1379		2	Shawnee-2	0.39
KY	Shawnee	1379		4	Shawnee-4	0.39
KY	William C. Dale	1385		2	William C.	0.39
KY	Green River	1357		4	Green Rive	0.39
KY	Big Sandy	1353	BSU1		Big Sandy-I	0.39
KY	Green River	1357		5	Green Rive	0.40
KY	Green River	1357		4	Green Rive	0.40
KY	William C. Dale	1385		1	William C.	0.40
KY	Cane Run	1363		5	Cane Run-5	0.40
KY	William C. Dale	1385		4	William C.	0.40
KY	Shawnee	1379		5	Shawnee-5	0.40
KY	Green River	1357		4	Green Rive	0.40
KY	Green River	1357		5	Green Rive	0.40
KY	William C. Dale	1385		3	William C.	0.40
KY	Cane Run	1363		5	Cane Run-5	0.40
KY	William C. Dale	1385		4	William C.	0.40
KY	William C. Dale	1385		2	William C.	0.40
KY	Shawnee	1379		5	Shawnee-5	0.40
KY	Shawnee	1379		1	Shawnee-1	0.41
KY	Green River	1357		5	Green Rive	0.41
KY	Green River	1357		5	Green Rive	0.41
KY	Shawnee	1379		2	Shawnee-2	0.41
KY	Shawnee	1379		4	Shawnee-4	0.41
KY	Shawnee	1379		3	Shawnee-3	0.41
KY	William C. Dale	1385		3	William C.	0.41
KY	William C. Dale	1385		4	William C.	0.41
KY	Shawnee	1379		4	Shawnee-4	0.41
KY	Shawnee	1379		3	Shawnee-3	0.41
KY	Shawnee	1379		5	Shawnee-5	0.41
KY	Shawnee	1379		2	Shawnee-2	0.41
KY	Shawnee	1379		1	Shawnee-1	0.41
KY	Robert Reid	1383	R1		Robert Rei	0.41
KY	William C. Dale	1385		3	William C.	0.41
KY	Green River	1357		4	Green Rive	0.41
KY	Green River	1357		5	Green Rive	0.41
KY	Tyrone	1361		5	Tyrone-5	0.41
KY	Green River	1357		5	Green Rive	0.42
KY	Robert Reid	1383	R1		Robert Rei	0.42

KY	Green River	1357		5	Green Rive	0.42
KY	Robert Reid	1383	R1		Robert Rei	0.42
KY	Cane Run	1363		5	Cane Run-5	0.42
KY	Green River	1357		4	Green Rive	0.42
KY	Green River	1357		4	Green Rive	0.43
KY	Green River	1357		4	Green Rive	0.43
KY	Green River	1357		4	Green Rive	0.43
KY	Tyrone	1361		5	Tyrone-5	0.43
KY	William C. Dale	1385		4	William C.	0.43
KY	William C. Dale	1385		3	William C.	0.44
KY	E W Brown	1355		1	E W Brown	0.44
KY	John S. Cooper	1384		1	John S. Coc	0.44
KY	John S. Cooper	1384		1	John S. Coc	0.44
KY	John S. Cooper	1384		2	John S. Coc	0.44
KY	E W Brown	1355		1	E W Brown	0.44
KY	E W Brown	1355		1	E W Brown	0.44
KY	John S. Cooper	1384		2	John S. Coc	0.45
KY	Robert Reid	1383	R1		Robert Rei	0.45
KY	Henderson I	1372		6	Henderson	0.46
KY	Tyrone	1361		5	Tyrone-5	0.46
KY	John S. Cooper	1384		2	John S. Coc	0.47
KY	John S. Cooper	1384		1	John S. Coc	0.47
KY	Robert Reid	1383	R1		Robert Rei	0.47
KY	E W Brown	1355		1	E W Brown	0.47
KY	E W Brown	1355		1	E W Brown	0.48
KY	John S. Cooper	1384		2	John S. Coc	0.48
KY	John S. Cooper	1384		1	John S. Coc	0.48
KY	E W Brown	1355		1	E W Brown	0.48
KY	John S. Cooper	1384		2	John S. Coc	0.49
KY	John S. Cooper	1384		1	John S. Coc	0.49
KY	John S. Cooper	1384		1	John S. Coc	0.49
KY	Henderson I	1372		6	Henderson	0.49
KY	John S. Cooper	1384		2	John S. Coc	0.49
KY	John S. Cooper	1384		2	John S. Coc	0.49
KY	John S. Cooper	1384		1	John S. Coc	0.49
KY	Henderson I	1372		6	Henderson	0.50
KY	Robert Reid	1383	R1		Robert Rei	0.50
KY	Robert Reid	1383	R1		Robert Rei	0.50
KY	Robert Reid	1383	R1		Robert Rei	0.57
KY	Robert Reid	1383	R1		Robert Rei	0.57
KY	William C. Dale	1385		1	William C.	0.70
KY	Robert Reid	1383	RT		Robert Rei	0.70
KY	Robert Reid	1383	RT		Robert Rei	0.70
KY	Paddy's Run	1366		12	Paddy's Ru	0.70
KY	Robert Reid	1383	RT		Robert Rei	0.70
KY	Paddy's Run	1366		12	Paddy's Ru	0.70
KY	Robert Reid	1383	RT		Robert Rei	0.70

KY	Paddy's Run	1366		12	Paddy's Ru	0.70
KY	Paddy's Run	1366		12	Paddy's Ru	0.70
KY	Paddy's Run	1366		12	Paddy's Ru	0.70
KY	Robert Reid	1383	RT		Robert Rei	0.71
KY	William C. Dale	1385		2	William C.	0.72
KY	Elmer Smith	1374		1	Elmer Smit	0.81
KY	William C. Dale	1385		2	William C.	0.81
KY	William C. Dale	1385		1	William C.	0.82
KY	Elmer Smith	1374		1	Elmer Smit	1.04
KY	Robert Reid	1383	RT		Robert Rei	1.20
KY	Robert Reid	1383	RT		Robert Rei	1.20
KY	Robert Reid	1383	RT		Robert Rei	1.20
KY	Robert Reid	1383	RT		Robert Rei	1.20
KY	Marshall	55232	CT1		Marshall-CT1	
KY	Marshall	55232	CT1		Marshall-CT1	
KY	Marshall	55232	CT2		Marshall-CT2	
KY	Marshall	55232	CT2		Marshall-CT2	
KY	Marshall	55232	CT3		Marshall-CT3	
KY	Marshall	55232	CT3		Marshall-CT3	
KY	Marshall	55232	CT4		Marshall-CT4	
KY	Marshall	55232	CT4		Marshall-CT4	
KY	Marshall	55232	CT5		Marshall-CT5	
KY	Marshall	55232	CT5		Marshall-CT5	
KY	Marshall	55232	CT6		Marshall-CT6	
KY	Marshall	55232	CT6		Marshall-CT6	
KY	Marshall	55232	CT7		Marshall-CT7	
KY	Marshall	55232	CT7		Marshall-CT7	
KY	Marshall	55232	CT8		Marshall-CT8	
KY	Marshall	55232	CT8		Marshall-CT8	
KY	Tyrone	1361		1	Tyrone-1	
KY	Tyrone	1361		1	Tyrone-1	
KY	Tyrone	1361		2	Tyrone-2	
KY	Tyrone	1361		2	Tyrone-2	
KY	Tyrone	1361		3	Tyrone-3	
KY	Tyrone	1361		3	Tyrone-3	
KY	Tyrone	1361		4	Tyrone-4	
KY	Tyrone	1361		4	Tyrone-4	
KY	Henderson I	1372		6	Henderson I-6	
KY	Robert Reid	1383	RT		Robert Reid-RT	
KY	Bluegrass Generatin	55164	GTG1		Bluegrass Generating Station-GTG1	
KY	Bluegrass Generatin	55164	GTG2		Bluegrass Generating Station-GTG2	
KY	Bluegrass Generatin	55164	GTG3		Bluegrass Generating Station-GTG3	
KY	Shawnee	1379		10	Shawnee-10	
KY	Shawnee	1379		10	Shawnee-10	
KY	William C. Dale	1385		1	William C. Dale-1	
KY	William C. Dale	1385		1	William C. Dale-1	
KY	William C. Dale	1385		2	William C. Dale-2	

KY	William C. Dale	1385	2	William C. Dale-2
KY	Paddy's Run	1366	12	Paddy's Run-12
KY	Shawnee	1379	10	Shawnee-10
KY	Shawnee	1379	10	Shawnee-10
KY	Tyrone	1361	5	Tyrone-5
KY	Tyrone	1361	5	Tyrone-5

NOx (tons)	Heat Input (MMBtu)	Year	Program
4.74	802379.10	2012	CAIROS
3.92	665362.28	2012	CAIROS
3.39	581124.18	2010	CAIROS
3.39	584274.05	2010	CAIROS
3.74	618836.48	2011	CAIROS
3.65	602597.25	2011	CAIROS
0.00	185.48	2011	CAIROS
1.14	191766.04	2013	CAIROS
1.02	160917.32	2014	CAIROS
0.08	12151.53	2013	CAIROS
0.78	110259.28	2014	CAIROS
4.68	552790.98	2005	NBP
2.00	229974.05	2006	NBP
1.73	170258.48	2010	CAIROS
1.75	169668.53	2010	CAIROS
1.02	91143.90	2011	CAIROS
1.36	129351.17	2012	CAIROS
1.65	154216.01	2010	CAIROS
0.20	19964.92	2009	CAIROS
0.68	60875.11	2011	CAIROS
1.07	97939.73	2011	CAIROS
4.29	358860.33	2006	NBP
0.78	74035.00	2013	CAIROS
1.82	151449.39	2010	CAIROS
1.20	101912.94	2006	NBP
9.85	797507.47	2012	CAIROS
9.82	709469.49	2011	CAIROS
189.99	14338699.96	2005	NBP
187.93	14351476.34	2005	NBP
1.11	96074.36	2011	CAIROS
1.32	114938.90	2012	CAIROS
2.09	172574.84	2010	CAIROS
0.19	20542.78	2009	CAIROS
1.74	152906.11	2012	CAIROS
1.13	94263.38	2011	CAIROS
19.32	1367913.53	2012	CAIROS
13.42	997945.23	2010	CAIROS
7.71	644174.50	2012	CAIROS
2.06	163929.25	2012	CAIROS
0.80	71143.08	2013	CAIROS
6.64	455661.10	2013	CAIROS
1.18	96015.17	2011	CAIROS
9.69	854290.87	2007	NBP
1.85	146817.70	2012	CAIROS
7.24	623079.42	2011	CAIROS
1.48	120619.12	2012	CAIROS

1.03	84727.77	2011	CAIROS
2.58	202043.41	2006	NBP
1.86	155581.02	2010	CAIROS
4.08	281029.38	2013	CAIROS
1.13	95298.53	2013	CAIROS
2.34	174837.18	2010	CAIROS
0.37	29485.48	2008	NBP
13.91	959181.89	2010	CAIROS
9.98	777097.31	2007	NBP
7.75	599149.48	2007	NBP
14.79	1010885.85	2010	CAIROS
1.31	110111.58	2012	CAIROS
1.19	100325.78	2013	CAIROS
6.09	454233.22	2011	CAIROS
4.25	355537.80	2006	NBP
7.80	620363.86	2012	CAIROS
2.06	171026.66	2010	CAIROS
0.92	70458.97	2013	CAIROS
8.54	573767.46	2011	CAIROS
5.44	369017.08	2012	CAIROS
7.60	589514.34	2006	NBP
5.68	473588.23	2006	NBP
12.71	1049897.42	2007	NBP
9.17	666686.36	2010	CAIROS
0.93	72914.57	2013	CAIROS
23.65	1538889.71	2012	CAIROS
246.35	16557881.36	2005	NBP
186.00	12802812.27	2006	NBP
13.36	1041267.49	2007	NBP
5.76	483590.18	2011	CAIROS
8.29	652780.11	2006	NBP
2.30	150094.11	2013	CAIROS
3.83	317403.91	2011	CAIROS
8.46	550857.47	2014	CAIROS
2.46	191150.29	2014	CAIROS
206.35	13757234.13	2006	NBP
0.60	53561.06	2008	NBP
12.50	843186.14	2010	CAIROS
8.97	643257.09	2007	NBP
6.47	525796.99	2006	NBP
14.54	948621.05	2010	CAIROS
8.53	675566.48	2007	NBP
6.14	408086.76	2013	CAIROS
3.44	274611.88	2013	CAIROS
1.50	99566.77	2014	CAIROS
10.23	638249.73	2011	CAIROS
6.46	428233.18	2013	CAIROS

6.26	379748.64	2007	NBP
2.67	190140.92	2013	CAIROS
2.23	160469.57	2012	CAIROS
2.06	162685.52	2007	NBP
10.26	754823.82	2012	CAIROS
6.32	469556.54	2008	NBP
1.54	130144.05	2009	CAIROS
10.74	698228.48	2012	CAIROS
0.84	64006.28	2013	CAIROS
10.18	639946.59	2011	CAIROS
6.30	466671.12	2008	NBP
2.00	151420.67	2007	NBP
17.67	1064075.93	2006	NBP
8.41	511887.30	2014	CAIROS
6.95	467110.06	2011	CAIROS
0.21	14916.83	2008	NBP
8.99	675858.49	2006	NBP
4.73	394936.49	2010	CAIROS
2.98	218729.47	2013	CAIROS
11.26	865700.16	2005	NBP
4.54	341567.34	2008	NBP
1.26	103960.08	2008	NBP
5.55	418137.48	2005	NBP
2.96	170036.55	2008	NBP
0.97	69115.25	2011	CAIROS
2.36	165400.47	2009	CAIROS
20.88	1277355.48	2012	CAIROS
2.04	143922.64	2007	NBP
2.41	179610.56	2009	CAIROS
8.75	661657.53	2005	NBP
5.98	434221.78	2007	NBP
12.80	890659.72	2012	CAIROS
1.95	141217.73	2007	NBP
8.63	484660.78	2014	CAIROS
0.43	31235.19	2008	NBP
16.82	1056447.85	2005	NBP
2.89	197191.04	2013	CAIROS
4.00	262106.92	2009	CAIROS
3.55	239696.12	2005	NBP
8.16	475845.93	2014	CAIROS
8.99	657087.83	2005	NBP
2.11	137960.30	2009	CAIROS
1.75	132489.62	2007	NBP
1.41	97997.25	2014	CAIROS
1.36	99378.49	2005	NBP
1.15	88176.12	2014	CAIROS
13.96	694987.03	2007	NBP

4.15	298605.29	2009	CAIROS
2.52	166389.80	2009	CAIROS
0.24	20288.11	2009	CAIROS
10.65	765136.04	2005	NBP
3.05	234519.65	2007	NBP
1.39	108548.18	2008	NBP
0.72	54955.49	2013	CAIROS
8.13	535388.65	2008	NBP
7.01	480660.57	2010	CAIROS
2.33	164382.73	2013	CAIROS
274.40	14958778.31	2007	NBP
15.49	974165.50	2007	NBP
6.12	400397.24	2011	CAIROS
5.57	397478.57	2008	NBP
2.24	150760.15	2007	NBP
0.38	30860.90	2014	CAIROS
0.30	18852.21	2008	NBP
0.26	17072.70	2008	NBP
4.47	299815.97	2010	CAIROS
0.44	33311.08	2009	CAIROS
230.05	13921747.44	2007	NBP
1.76	116183.57	2014	CAIROS
23.03	1199070.73	2005	NBP
6.35	429938.09	2005	NBP
1.23	85052.22	2014	CAIROS
6.94	434734.58	2010	CAIROS
0.32	25290.59	2014	CAIROS
0.95	61814.78	2008	NBP
1.17	83975.09	2009	CAIROS
1.80	124728.64	2007	NBP
0.42	28775.34	2014	CAIROS
8.18	456688.87	2010	CAIROS
0.37	26761.02	2014	CAIROS
0.35	19359.42	2008	NBP
1.44	86973.14	2009	CAIROS
8.97	546470.40	2008	NBP
24.52	1065960.52	2006	NBP
1.75	117688.59	2007	NBP
7.05	321567.30	2013	CAIROS
4.60	238908.84	2011	CAIROS
320.56	15651163.82	2006	NBP
232.45	11824984.37	2005	NBP
339.18	16866260.70	2005	NBP
0.99	49699.00	2006	NBP
261.05	12716275.19	2005	NBP
22.39	1099281.94	2012	CAIROS
11.39	587590.16	2008	NBP

0.50	29547.28	2008	NBP
37.97	1559184.94	2005	NBP
0.72	34545.40	2006	NBP
0.33	24668.56	2009	CAIROS
0.22	21147.29	2009	CAIROS
251.63	11746726.33	2009	CAIROS
344.03	15017670.68	2006	NBP
284.36	12815966.31	2006	NBP
307.14	13251716.20	2008	NBP
361.71	15490668.79	2010	CAIROS
9.94	466077.59	2012	CAIROS
0.33	25184.78	2014	CAIROS
7.40	339237.22	2013	CAIROS
0.43	24316.10	2008	NBP
0.23	20026.88	2009	CAIROS
3.18	144473.86	2011	CAIROS
0.21	17979.21	2009	CAIROS
377.82	15229923.95	2010	CAIROS
1.20	47836.95	2006	NBP
7.58	302433.60	2013	CAIROS
374.44	15613675.04	2006	NBP
360.16	15433707.24	2009	CAIROS
10.41	457298.13	2012	CAIROS
7.01	340129.74	2010	CAIROS
3.75	162188.70	2011	CAIROS
337.06	14245769.79	2007	NBP
11.14	512250.76	2009	CAIROS
4.93	219361.20	2012	CAIROS
2.82	122553.55	2011	CAIROS
509.94	19752266.85	2006	NBP
2.82	122073.68	2005	NBP
9.72	413781.75	2013	CAIROS
1.50	62908.85	2006	NBP
9.18	390754.95	2013	CAIROS
0.85	34458.25	2006	NBP
2.75	116216.13	2005	NBP
361.75	15053936.83	2008	NBP
10.72	454173.09	2012	CAIROS
379.04	16061493.92	2010	CAIROS
423.82	16371621.85	2005	NBP
8.94	365843.63	2013	CAIROS
2.64	111768.77	2014	CAIROS
431.23	19687884.68	2011	CAIROS
434.94	16746075.75	2008	NBP
2.41	104646.71	2005	NBP
416.56	15653215.73	2011	CAIROS
1.63	66637.80	2009	CAIROS

0.25	15746.66	2014	CAIROS
1.70	75852.08	2010	CAIROS
5.47	221986.55	2012	CAIROS
1.60	63571.58	2006	NBP
0.41	26720.34	2014	CAIROS
3.54	144028.47	2011	CAIROS
394.81	15337312.40	2007	NBP
315.10	12388448.27	2009	CAIROS
420.57	15968888.91	2010	CAIROS
0.29	21323.07	2009	CAIROS
2.19	98866.45	2007	NBP
12.41	477517.19	2014	CAIROS
11.97	456841.02	2013	CAIROS
1.19	47784.94	2006	NBP
0.30	19744.23	2014	CAIROS
4.58	183064.95	2012	CAIROS
9.59	372595.86	2010	CAIROS
24.48	876409.00	2012	CAIROS
1.94	85670.81	2009	CAIROS
7.43	307439.93	2010	CAIROS
3.88	152915.76	2011	CAIROS
444.93	15726963.28	2011	CAIROS
8.38	340228.55	2010	CAIROS
1.55	61882.52	2010	CAIROS
6.61	227957.10	2006	NBP
428.00	16403068.17	2006	NBP
7.52	259519.62	2013	CAIROS
2.33	92105.72	2011	CAIROS
2.84	112749.40	2007	NBP
0.97	45792.69	2007	NBP
18.64	638589.59	2014	CAIROS
498.61	17107743.03	2008	NBP
421.92	15597471.68	2014	CAIROS
9.21	312072.00	2005	NBP
397.23	14953833.28	2009	CAIROS
0.49	18401.48	2009	CAIROS
4.05	160945.83	2008	NBP
10.05	336461.86	2011	CAIROS
0.01	218.95	2014	CAIROS
415.81	13940353.38	2012	CAIROS
8.16	291958.90	2011	CAIROS
3.26	126090.83	2008	NBP
260.44	8689775.67	2012	CAIROS
1.68	57911.31	2013	CAIROS
1.68	63515.38	2010	CAIROS
346.49	12003460.44	2010	CAIROS
158.39	5328359.20	2007	NBP

223.48	7446299.34	2013	CAIROS
3.24	123458.47	2005	NBP
2.86	114320.14	2007	NBP
1.21	41325.84	2014	CAIROS
2.87	97630.77	2012	CAIROS
1.84	62614.18	2011	CAIROS
395.44	13075008.68	2013	CAIROS
11.81	431001.26	2012	CAIROS
2.58	108637.69	2008	NBP
1.74	65281.99	2009	CAIROS
3.00	103944.37	2014	CAIROS
2.44	87131.53	2014	CAIROS
164.94	5481725.30	2011	CAIROS
1.09	41811.57	2007	NBP
6.39	204300.70	2007	NBP
207.78	6965151.81	2014	CAIROS
25.27	784893.98	2006	NBP
3.07	102080.78	2010	CAIROS
1.19	41471.31	2006	NBP
6.60	221952.57	2011	CAIROS
4.79	168170.63	2005	NBP
3.33	117833.29	2005	NBP
1.82	65660.67	2009	CAIROS
8.25	277301.46	2013	CAIROS
2.66	95274.85	2005	NBP
6.25	200965.11	2013	CAIROS
227.01	7131736.75	2011	CAIROS
245.39	7787754.71	2010	CAIROS
3.48	126183.15	2007	NBP
484.15	15812170.25	2009	CAIROS
410.22	16125168.85	2012	CAIROS
362.29	11420440.42	2012	CAIROS
195.09	6349171.86	2014	CAIROS
343.60	10746586.15	2014	CAIROS
0.44	15246.32	2009	CAIROS
2.76	86979.42	2014	CAIROS
208.77	6727111.14	2013	CAIROS
300.64	9185329.30	2011	CAIROS
7.62	231056.30	2008	NBP
10.24	332506.53	2012	CAIROS
185.43	5773106.73	2009	CAIROS
178.52	5369949.28	2010	CAIROS
3.32	123437.57	2007	NBP
513.67	15864515.56	2009	CAIROS
1.70	58804.03	2005	NBP
2.70	84801.04	2014	CAIROS
414.21	12549865.40	2010	CAIROS

9.57	303712.33	2012	CAIROS
2.40	78536.56	2009	CAIROS
8.73	225694.17	2011	CAIROS
2.91	79684.46	2011	CAIROS
2.77	77188.05	2008	NBP
1.95	53398.30	2010	CAIROS
1.66	53156.50	2010	CAIROS
234.85	7234376.79	2012	CAIROS
16.94	434906.99	2008	NBP
6.87	199036.30	2009	CAIROS
7.58	217894.00	2009	CAIROS
3.16	107275.71	2008	NBP
11.29	322526.20	2005	NBP
8.74	249783.90	2006	NBP
538.72	16005768.75	2007	NBP
187.71	5528273.50	2007	NBP
12.25	357103.38	2006	NBP
1.92	64069.15	2014	CAIROS
8.84	249814.50	2007	NBP
2.47	66427.93	2009	CAIROS
3.40	117047.99	2008	NBP
14.38	362959.58	2010	CAIROS
9.99	281391.60	2010	CAIROS
0.93	25235.33	2011	CAIROS
3.51	117269.06	2008	NBP
2.21	68426.53	2014	CAIROS
0.54	17352.23	2008	NBP
4.47	118377.46	2012	CAIROS
9.35	260203.30	2008	NBP
2.38	72960.48	2010	CAIROS
25.67	725734.43	2007	NBP
3.13	89547.90	2005	NBP
645.20	17675376.10	2006	NBP
6.19	151798.28	2007	NBP
307.53	8932025.47	2010	CAIROS
0.74	24331.69	2007	NBP
6.09	166561.63	2006	NBP
28.99	787651.43	2005	NBP
0.39	11762.74	2009	CAIROS
6.58	182841.20	2006	NBP
13.10	323468.88	2009	CAIROS
7.96	214159.70	2013	CAIROS
11.92	318690.50	2014	CAIROS
531.64	15094679.49	2011	CAIROS
6.60	169747.46	2010	CAIROS
8.19	237285.23	2007	NBP
6.92	203350.67	2009	CAIROS

267.40	7494827.18	2009	CAIROS
5.37	135575.87	2008	NBP
28.89	752936.90	2008	NBP
660.19	18667702.43	2005	NBP
626.12	16579599.01	2010	CAIROS
207.96	5589305.23	2010	CAIROS
10.23	259555.20	2009	CAIROS
9.60	255525.38	2005	NBP
304.15	8208832.84	2009	CAIROS
500.59	13176154.95	2009	CAIROS
17.21	447179.05	2007	NBP
12.23	317063.23	2006	NBP
34.34	877942.38	2005	NBP
6.37	159057.54	2012	CAIROS
3.74	100146.51	2009	CAIROS
12.16	311759.50	2010	CAIROS
177.50	4882749.88	2012	CAIROS
18.62	486465.57	2007	NBP
204.26	5517963.20	2005	NBP
326.64	8624082.46	2008	NBP
20.11	501149.78	2012	CAIROS
3.48	92476.45	2014	CAIROS
425.13	11795494.47	2011	CAIROS
13.39	337621.20	2014	CAIROS
202.03	5088765.15	2014	CAIROS
201.29	5494015.90	2006	NBP
564.43	15135791.44	2012	CAIROS
410.50	11224440.33	2008	NBP
165.82	4205336.68	2013	CAIROS
5.77	146043.68	2010	CAIROS
11.49	283205.50	2011	CAIROS
213.05	5553791.60	2005	NBP
45.72	1123374.14	2005	NBP
615.29	16118502.08	2007	NBP
378.16	9265905.39	2008	NBP
574.13	15054170.84	2008	NBP
14.57	349865.30	2014	CAIROS
190.67	5121192.05	2011	CAIROS
0.52	12730.28	2009	CAIROS
712.32	17051322.55	2007	NBP
46.51	1137945.12	2005	NBP
33.80	792920.44	2006	NBP
2.30	55622.24	2008	NBP
234.40	5464401.82	2013	CAIROS
35.58	825151.85	2007	NBP
10.28	240655.84	2009	CAIROS
32.50	762786.29	2009	CAIROS

702.50	16404972.41	2013	CAIROS
13.09	305276.50	2012	CAIROS
214.05	5681371.75	2008	NBP
712.14	16649332.83	2011	CAIROS
657.78	16591839.56	2008	NBP
640.96	15642252.86	2013	CAIROS
394.31	10312156.84	2007	NBP
13.34	305719.90	2011	CAIROS
397.11	9084776.83	2010	CAIROS
12.56	285413.30	2011	CAIROS
17.85	404001.14	2006	NBP
373.74	8335578.24	2011	CAIROS
365.97	8789720.28	2007	NBP
197.57	5047150.50	2009	CAIROS
226.16	5582053.30	2006	NBP
3.13	72313.84	2010	CAIROS
290.43	6426355.49	2014	CAIROS
972.25	22270211.60	2005	NBP
330.13	7296347.22	2012	CAIROS
490.60	10873520.78	2012	CAIROS
686.83	15240232.69	2014	CAIROS
13.74	302197.40	2012	CAIROS
3.34	75283.76	2010	CAIROS
567.09	12705723.53	2013	CAIROS
273.47	6433301.28	2006	NBP
318.88	6924306.22	2009	CAIROS
2.47	57808.43	2010	CAIROS
228.27	4783244.48	2013	CAIROS
1105.24	22830240.75	2005	NBP
737.89	16656608.21	2009	CAIROS
219.68	5318928.78	2008	NBP
812.12	17607504.42	2013	CAIROS
885.73	18902901.22	2014	CAIROS
839.56	18179995.30	2006	NBP
1127.26	26095901.28	2005	NBP
3.65	77202.16	2010	CAIROS
3.85	85386.44	2011	CAIROS
3.83	86278.11	2011	CAIROS
50.07	978471.14	2014	CAIROS
930.91	19667129.41	2009	CAIROS
539.30	11211320.18	2012	CAIROS
1.85	41330.23	2011	CAIROS
1035.25	20238222.76	2008	NBP
210.95	4543226.70	2014	CAIROS
717.32	14213120.63	2005	NBP
243.12	4794312.73	2012	CAIROS
0.01	132.74	2013	CAIROS

869.24	16874854.70	2012	CAIROS
700.58	13496551.03	2011	CAIROS
8.93	178274.99	2013	CAIROS
49.22	925245.85	2011	CAIROS
322.43	6605378.48	2011	CAIROS
793.74	18384696.65	2005	NBP
1491.72	31200077.33	2006	NBP
1479.97	29922154.20	2008	NBP
0.01	125.44	2013	CAIROS
965.71	19468355.32	2013	CAIROS
1090.74	20561604.98	2007	NBP
1105.36	21558527.15	2014	CAIROS
2.20	39753.13	2014	CAIROS
2.51	44247.21	2007	NBP
0.61	10999.38	2009	CAIROS
53.85	965871.51	2010	CAIROS
1.18	21139.36	2008	NBP
0.66	11725.20	2005	NBP
3.91	70219.42	2010	CAIROS
1083.28	19374364.80	2009	CAIROS
828.46	15426937.25	2007	NBP
0.60	10095.13	2008	NBP
507.57	8980416.10	2006	NBP
7.27	127302.72	2007	NBP
53.52	938801.74	2012	CAIROS
31.23	549747.20	2008	NBP
1129.45	21015285.73	2012	CAIROS
521.81	9270855.83	2007	NBP
18.63	318135.26	2006	NBP
11.01	187456.00	2006	NBP
374.83	6708816.65	2012	CAIROS
48.30	832012.62	2013	CAIROS
367.05	7108055.12	2005	NBP
39.63	689273.57	2005	NBP
9.22	174261.09	2013	CAIROS
0.01	136.96	2008	NBP
1.04	17117.93	2005	NBP
1314.37	25724544.64	2009	CAIROS
0.81	13402.89	2005	NBP
1003.49	18131634.35	2008	NBP
336.12	5265252.46	2005	NBP
2.06	33473.70	2009	CAIROS
34.06	563751.40	2007	NBP
1093.09	19277008.61	2010	CAIROS
1329.31	22580755.11	2012	CAIROS
1107.52	19296237.63	2011	CAIROS
2.35	38162.00	2011	CAIROS

2.50	41623.45	2011	CAIROS
3.75	62062.62	2012	CAIROS
1.15	18631.10	2012	CAIROS
1.59	26233.42	2013	CAIROS
3.75	61758.89	2010	CAIROS
1.82	29553.70	2010	CAIROS
998.79	16343714.40	2013	CAIROS
865.22	14186510.90	2014	CAIROS
5.00	82583.32	2012	CAIROS
288.56	4834733.79	2006	NBP
2.08	34798.71	2013	CAIROS
0.74	11964.80	2013	CAIROS
3.47	57289.72	2011	CAIROS
0.69	10558.50	2014	CAIROS
1.38	22248.16	2009	CAIROS
718.10	11143895.15	2012	CAIROS
1379.72	22067232.64	2007	NBP
0.55	11378.86	2012	CAIROS
1171.13	20422491.90	2007	NBP
278.63	4349540.64	2009	CAIROS
1089.90	17882922.75	2010	CAIROS
3.49	52619.37	2009	CAIROS
3.19	62549.14	2011	CAIROS
2.52	38001.70	2008	NBP
3.03	45732.85	2010	CAIROS
12.38	185401.40	2007	NBP
2.30	34932.65	2012	CAIROS
1.06	16095.24	2013	CAIROS
3.35	50577.80	2010	CAIROS
2.41	36323.83	2011	CAIROS
0.46	7019.12	2009	CAIROS
1401.61	21547881.01	2011	CAIROS
77.80	1302878.11	2014	CAIROS
1238.37	19162302.81	2006	NBP
1.96	29081.10	2014	CAIROS
2.39	34652.20	2007	NBP
36.99	534317.79	2006	NBP
3.23	46772.50	2010	CAIROS
2.99	43336.50	2013	CAIROS
1.68	24305.60	2006	NBP
0.93	13413.39	2008	NBP
2.96	42880.60	2005	NBP
601.41	8673878.38	2005	NBP
3.81	55226.40	2011	CAIROS
1.15	16643.20	2012	CAIROS
1163.38	17020166.28	2011	CAIROS
271.79	4272436.12	2008	NBP

3.63	52655.70	2008	NBP
3.35	46437.80	2014	CAIROS
19.02	273343.10	2006	NBP
4.71	67040.91	2007	NBP
0.94	13461.94	2005	NBP
928.23	14436849.27	2008	NBP
1.44	20830.10	2009	CAIROS
926.47	15291614.07	2010	CAIROS
1125.28	16348483.57	2009	CAIROS
494.87	6562474.13	2007	NBP
0.67	9413.97	2014	CAIROS
0.01	100.38	2013	CAIROS
0.78	15594.17	2012	CAIROS
5.90	81367.00	2006	NBP
2.00	27541.80	2007	NBP
0.68	9437.40	2005	NBP
8.66	119412.00	2008	NBP
1292.88	20477124.40	2006	NBP
1.19	16021.40	2008	NBP
1.74	23544.30	2007	NBP
1.75	23644.40	2005	NBP
1.11	14932.80	2006	NBP
2.54	34862.53	2013	CAIROS
2.53	34419.97	2011	CAIROS
1.70	23296.99	2014	CAIROS
8.61	115463.50	2009	CAIROS
1.47	20054.00	2012	CAIROS
3.22	43232.40	2013	CAIROS
2.96	39746.40	2011	CAIROS
2.75	36947.10	2010	CAIROS
1.57	20999.90	2012	CAIROS
88.52	1351913.35	2013	CAIROS
1195.83	18117034.61	2013	CAIROS
0.56	11096.24	2012	CAIROS
1259.81	15797159.49	2012	CAIROS
1054.04	14197323.49	2009	CAIROS
1260.71	16265762.45	2010	CAIROS
3.37	42070.10	2014	CAIROS
280.20	3066624.64	2012	CAIROS
1763.43	21387892.36	2010	CAIROS
1245.31	15533494.08	2012	CAIROS
1317.53	15775488.43	2014	CAIROS
996.83	15384174.40	2008	NBP
2025.31	25852999.89	2012	CAIROS
1030.86	12130582.30	2014	CAIROS
1074.87	13403327.19	2011	CAIROS
2140.26	27109347.09	2014	CAIROS

1136.66	13289190.25	2010	CAIROS
407.94	17686320.09	2013	CAIROS
954.91	10801180.81	2013	CAIROS
1169.01	12998839.53	2014	CAIROS
720.98	8278997.74	2014	CAIROS
351.40	4374973.39	2012	CAIROS
943.58	10348705.92	2009	CAIROS
1197.44	13215130.89	2011	CAIROS
1123.92	12083867.25	2013	CAIROS
1143.72	12343881.17	2012	CAIROS
0.56	11759.47	2014	CAIROS
720.33	7985161.08	2013	CAIROS
667.75	6850557.29	2006	NBP
1353.83	14914684.87	2014	CAIROS
1.22	7181.87	2014	CAIROS
431.71	4730116.11	2005	NBP
1735.26	18397859.81	2011	CAIROS
1449.08	15466243.20	2013	CAIROS
1565.60	16577521.89	2013	CAIROS
0.52	9454.20	2012	CAIROS
718.91	7449683.48	2012	CAIROS
592.61	6003986.23	2009	CAIROS
867.06	8926539.78	2011	CAIROS
1404.97	14368561.24	2013	CAIROS
377.11	3658178.15	2014	CAIROS
2236.96	25039992.48	2010	CAIROS
1554.83	15231523.36	2014	CAIROS
852.40	8593381.45	2008	NBP
460.10	4255920.58	2010	CAIROS
789.31	7820468.48	2010	CAIROS
194.30	1914366.31	2014	CAIROS
760.57	7549046.50	2008	NBP
841.91	8307867.73	2011	CAIROS
888.52	8765794.20	2006	NBP
374.77	15550266.29	2014	CAIROS
1192.48	11388890.99	2014	CAIROS
0.95	15222.22	2013	CAIROS
887.00	8543002.55	2005	NBP
1599.83	20422079.05	2007	NBP
908.24	8737882.35	2006	NBP
881.54	8376526.78	2005	NBP
941.46	8896875.58	2007	NBP
834.55	7821411.25	2012	CAIROS
437.76	4127500.57	2014	CAIROS
884.79	8332990.65	2007	NBP
0.02	136.79	2008	NBP
890.12	8411654.30	2010	CAIROS

729.74	6928329.95	2014	CAIROS
768.69	6714595.39	2005	NBP
107.05	1056080.09	2010	CAIROS
0.53	9470.41	2014	CAIROS
880.98	7916943.88	2009	CAIROS
978.36	8410361.57	2007	NBP
895.88	8078243.48	2013	CAIROS
857.33	4677737.53	2005	NBP
893.94	7992516.40	2013	CAIROS
1470.99	12119815.79	2014	CAIROS
924.69	8016058.00	2006	NBP
338.09	2837368.21	2009	CAIROS
1002.57	8574610.88	2014	CAIROS
481.70	4404017.98	2007	NBP
0.64	9301.36	2013	CAIROS
0.41	8312.35	2014	CAIROS
1318.13	11049234.73	2008	NBP
1010.52	8082371.03	2008	NBP
673.81	4639474.54	2009	CAIROS
264.37	2086372.09	2012	CAIROS
923.49	7426284.35	2009	CAIROS
742.12	5692627.40	2011	CAIROS
557.74	4170883.78	2013	CAIROS
901.82	6685558.84	2011	CAIROS
746.56	5715853.31	2012	CAIROS
1559.55	12168184.47	2006	NBP
281.16	2036546.88	2013	CAIROS
537.01	4078189.08	2014	CAIROS
1086.58	8132344.00	2010	CAIROS
1718.54	12854699.80	2007	NBP
1.25	5768.64	2014	CAIROS
791.21	5707296.76	2013	CAIROS
489.66	3662179.20	2014	CAIROS
553.96	4130617.00	2014	CAIROS
537.42	4010714.20	2014	CAIROS
1641.05	12011589.12	2008	NBP
971.08	7113622.12	2011	CAIROS
489.40	3638850.78	2014	CAIROS
1620.30	12151209.80	2005	NBP
832.69	5783159.81	2010	CAIROS
852.70	4745019.50	2008	NBP
853.82	5974067.06	2009	CAIROS
855.87	6061503.80	2012	CAIROS
1091.26	7583124.18	2012	CAIROS
886.08	5778524.09	2008	NBP
1178.15	8148667.55	2014	CAIROS
2.77	15215.93	2014	CAIROS

1222.86	8478236.64	2011	CAIROS
485.69	3417522.27	2013	CAIROS
524.57	3684675.98	2013	CAIROS
812.45	5595170.72	2008	NBP
804.26	4510388.13	2006	NBP
209.33	1384747.89	2013	CAIROS
511.93	3561853.92	2013	CAIROS
503.18	3428473.64	2007	NBP
0.93	11359.24	2013	CAIROS
492.39	3409057.70	2013	CAIROS
1243.16	8515839.37	2014	CAIROS
1149.32	7918839.25	2013	CAIROS
954.26	6421231.22	2014	CAIROS
1205.88	8132707.10	2013	CAIROS
562.32	3093308.63	2007	NBP
614.96	4384730.42	2013	CAIROS
487.17	3291551.30	2014	CAIROS
761.72	5149362.43	2007	NBP
1204.13	8129256.22	2012	CAIROS
424.71	2872796.66	2014	CAIROS
762.23	5150461.10	2007	NBP
458.32	3083687.55	2014	CAIROS
450.51	3036028.62	2014	CAIROS
472.95	3187019.11	2014	CAIROS
1491.50	10002356.61	2011	CAIROS
635.95	4250662.58	2005	NBP
551.55	3756530.64	2005	NBP
378.81	2503172.13	2008	NBP
1129.05	7283455.71	2005	NBP
755.73	5030138.10	2005	NBP
1265.32	8312786.64	2008	NBP
1308.12	8514204.02	2010	CAIROS
798.10	5055318.71	2007	NBP
521.33	3397433.66	2013	CAIROS
865.31	5654412.49	2008	NBP
1093.08	7283476.34	2005	NBP
1465.31	9366426.65	2010	CAIROS
739.70	4910727.89	2011	CAIROS
736.96	4766965.53	2005	NBP
907.58	5882466.34	2008	NBP
580.46	3739563.00	2013	CAIROS
563.88	3618864.20	2013	CAIROS
546.40	3522298.80	2013	CAIROS
557.83	3580890.16	2013	CAIROS
1266.19	8119296.16	2008	NBP
809.82	5199754.14	2006	NBP
1289.63	8357746.00	2006	NBP

657.23	4192132.46	2006	NBP
0.90	13075.30	2013	CAIROS
772.76	4887854.06	2006	NBP
1360.31	8551889.77	2009	CAIROS
1285.03	8070193.99	2009	CAIROS
1406.82	8921294.56	2007	NBP
477.90	3022290.15	2009	CAIROS
1292.96	8095675.43	2007	NBP
565.90	3574040.24	2009	CAIROS
201.63	1213673.46	2014	CAIROS
623.20	3911251.70	2009	CAIROS
620.83	3884939.92	2009	CAIROS
1151.86	7117112.81	2006	NBP
947.23	5889926.87	2006	NBP
1280.12	7956622.03	2005	NBP
675.66	4502451.07	2010	CAIROS
1509.29	9561167.55	2010	CAIROS
1619.42	10707642.13	2008	NBP
1504.54	9486976.16	2011	CAIROS
765.02	4549921.82	2009	CAIROS
600.32	3640461.41	2012	CAIROS
1144.80	7102829.01	2005	NBP
668.09	4024367.30	2012	CAIROS
666.39	4006951.31	2012	CAIROS
689.60	4235538.20	2009	CAIROS
754.90	4565746.70	2011	CAIROS
604.95	3619999.53	2012	CAIROS
687.92	4367659.95	2008	NBP
552.18	3370792.75	2009	CAIROS
733.50	4413566.38	2010	CAIROS
549.08	3169000.70	2014	CAIROS
559.36	3408350.68	2011	CAIROS
735.44	4391647.45	2010	CAIROS
856.63	5084415.08	2010	CAIROS
674.59	4065347.53	2009	CAIROS
838.49	4968355.75	2010	CAIROS
785.55	4697269.93	2012	CAIROS
961.11	6042861.07	2009	CAIROS
421.06	2381469.71	2013	CAIROS
794.75	4629062.82	2011	CAIROS
750.63	4382845.62	2011	CAIROS
709.75	4141347.51	2011	CAIROS
874.11	5155368.78	2012	CAIROS
743.91	4305992.01	2011	CAIROS
694.38	4231990.22	2006	NBP
835.12	4894492.40	2012	CAIROS
775.74	4482691.18	2013	CAIROS

934.07	5311220.77	2007	NBP
754.60	4579162.76	2007	NBP
52.63	287661.30	2014	CAIROS
1795.63	11011820.07	2007	NBP
823.94	4706006.16	2012	CAIROS
97.02	539983.16	2009	CAIROS
657.14	3666820.40	2012	CAIROS
696.78	3873218.97	2012	CAIROS
659.99	3682386.05	2012	CAIROS
370.27	2170611.30	2011	CAIROS
90.98	504924.76	2009	CAIROS
648.75	3591875.78	2012	CAIROS
952.00	5435682.70	2013	CAIROS
572.95	3213009.14	2010	CAIROS
760.59	4054746.48	2014	CAIROS
607.58	3369771.25	2012	CAIROS
115.36	639274.89	2008	NBP
108.91	599488.03	2008	NBP
859.45	4852317.33	2013	CAIROS
893.64	5046490.55	2011	CAIROS
776.80	4362342.55	2006	NBP
815.56	4583405.10	2006	NBP
798.47	4478801.69	2006	NBP
783.41	4400847.52	2006	NBP
320.79	1777945.34	2011	CAIROS
322.37	1785100.07	2011	CAIROS
921.78	5193205.13	2011	CAIROS
1251.55	7471485.31	2006	NBP
790.07	4349709.40	2010	CAIROS
719.40	3980941.70	2010	CAIROS
998.58	5593347.68	2011	CAIROS
421.81	2297679.87	2007	NBP
779.73	4287773.57	2008	NBP
770.41	4244527.88	2008	NBP
761.93	4200526.79	2008	NBP
761.76	4193611.60	2008	NBP
824.20	4514546.90	2006	NBP
593.26	3161696.01	2010	CAIROS
749.13	4095692.73	2010	CAIROS
129.34	701454.92	2012	CAIROS
952.11	5207524.01	2007	NBP
929.13	5076684.18	2007	NBP
895.45	4886249.33	2007	NBP
763.38	4168441.91	2008	NBP
115.30	621408.68	2012	CAIROS
343.41	1878934.14	2010	CAIROS
843.88	4436966.87	2012	CAIROS

821.86	4420551.66	2005	NBP
861.88	4635921.49	2005	NBP
849.70	4560917.48	2005	NBP
851.17	4562997.08	2005	NBP
293.85	1574095.52	2009	CAIROS
312.47	1677047.79	2010	CAIROS
790.47	4245036.27	2007	NBP
862.85	4576438.87	2013	CAIROS
144.93	747027.52	2005	NBP
730.25	3932139.37	2006	NBP
818.26	4356206.79	2005	NBP
836.59	4468744.85	2006	NBP
289.74	1517627.56	2009	CAIROS
488.04	2715435.53	2009	CAIROS
878.79	4682421.02	2006	NBP
851.39	4536665.26	2006	NBP
846.35	4503045.68	2006	NBP
816.86	4271074.79	2009	CAIROS
859.73	4563349.02	2007	NBP
832.60	4425680.78	2007	NBP
848.75	4506095.92	2007	NBP
1.48	8028.66	2014	CAIROS
852.27	4523890.54	2007	NBP
849.26	4509861.73	2007	NBP
74.83	378894.58	2011	CAIROS
681.13	3589910.99	2012	CAIROS
75.68	382510.00	2011	CAIROS
68.04	335413.30	2012	CAIROS
26.23	432664.48	2013	CAIROS
802.25	4064303.91	2011	CAIROS
1870.81	9765685.89	2012	CAIROS
453.29	2342531.07	2012	CAIROS
804.21	4192117.96	2012	CAIROS
258.38	1322366.07	2006	NBP
321.65	1654268.61	2005	NBP
84.94	437583.52	2013	CAIROS
397.10	2048431.66	2006	NBP
989.45	5027282.20	2010	CAIROS
79.02	404922.78	2013	CAIROS
405.89	2091502.24	2009	CAIROS
678.77	3492273.67	2009	CAIROS
753.59	3863912.61	2009	CAIROS
749.58	3834426.81	2009	CAIROS
712.05	3655230.76	2009	CAIROS
765.81	3914936.08	2011	CAIROS
2431.20	14648845.57	2011	CAIROS
719.48	3663079.64	2011	CAIROS

814.39	4168804.12	2011	CAIROS
796.26	4069729.82	2011	CAIROS
909.51	4580722.78	2007	NBP
14.29	70628.92	2012	CAIROS
847.01	4312069.49	2005	NBP
320.43	1613199.51	2006	NBP
901.95	4600375.94	2005	NBP
885.37	4506347.61	2005	NBP
868.42	4416962.00	2005	NBP
847.48	4312706.19	2005	NBP
668.71	3380204.61	2009	CAIROS
13.99	67542.91	2012	CAIROS
333.41	1671384.07	2005	NBP
1012.50	4637314.80	2013	CAIROS
519.97	2642904.84	2007	NBP
242.24	1195501.37	2009	CAIROS
119.02	590060.70	2010	CAIROS
909.04	4495793.54	2006	NBP
321.19	1589673.38	2008	NBP
682.63	3354185.13	2011	CAIROS
402.73	1970286.03	2008	NBP
373.40	1837952.06	2011	CAIROS
404.02	1986991.28	2008	NBP
772.38	3841460.33	2008	NBP
399.33	1959785.88	2007	NBP
125.86	617961.55	2010	CAIROS
714.12	3488010.58	2010	CAIROS
729.35	3591358.39	2010	CAIROS
500.57	2457924.91	2010	CAIROS
556.09	2718221.72	2008	NBP
880.39	4288094.20	2010	CAIROS
854.46	4139918.60	2010	CAIROS
819.31	3984388.80	2010	CAIROS
372.00	1808760.39	2007	NBP
306.24	1516211.32	2006	NBP
942.19	4556179.93	2008	NBP
917.33	4463083.50	2008	NBP
912.26	4415525.31	2008	NBP
878.58	4256224.93	2008	NBP
833.87	4048149.94	2008	NBP
227.90	1096753.38	2014	CAIROS
432.83	2110126.89	2006	NBP
436.06	2094308.08	2010	CAIROS
568.45	2753538.79	2012	CAIROS
488.70	2326022.55	2007	NBP
569.47	2723591.31	2013	CAIROS
195.29	902306.90	2011	CAIROS

594.71	2801566.42	2014	CAIROS
281.60	1244849.60	2007	NBP
996.81	4651116.35	2005	NBP
446.52	2058273.84	2014	CAIROS
370.05	1721560.62	2012	CAIROS
440.30	2038970.70	2011	CAIROS
376.37	1734469.52	2013	CAIROS
403.96	1749489.83	2008	NBP
544.58	2515587.35	2005	NBP
480.83	2200190.55	2005	NBP
167.73	718113.26	2009	CAIROS
466.97	2135088.30	2010	CAIROS
529.54	2404092.21	2011	CAIROS
739.11	3341276.96	2011	CAIROS
646.28	2827118.03	2005	NBP
543.02	2379089.23	2008	NBP
892.85	3957495.74	2010	CAIROS
192.69	824447.43	2010	CAIROS
19.25	83611.80	2006	NBP
357.04	1478835.72	2010	CAIROS
986.66	4238104.90	2009	CAIROS
284.32	1222512.74	2009	CAIROS
60.72	246491.95	2013	CAIROS
689.58	2872447.76	2006	NBP
600.91	2436428.33	2007	NBP
1221.92	5062076.60	2006	NBP
698.89	2889981.70	2006	NBP
581.97	2344116.04	2010	CAIROS
1348.80	5509115.31	2005	NBP
572.72	2347003.45	2007	NBP
740.91	2997129.59	2005	NBP
10.56	42270.14	2005	NBP
1229.47	4999034.19	2008	NBP
1188.48	4825835.55	2007	NBP
615.09	2493783.82	2008	NBP
16.56	65313.80	2007	NBP
125.89	456770.48	2008	NBP
432.63	1698223.30	2005	NBP
43.39	152654.43	2009	CAIROS
219.42	755014.53	2006	NBP
206.96	601074.38	2007	NBP
28.31	80889.10	2011	CAIROS
33.38	95364.90	2012	CAIROS
13.95	39858.00	2010	CAIROS
8.78	25082.40	2013	CAIROS
7.97	22776.00	2012	CAIROS
4.34	12406.10	2014	CAIROS

2.45	7008.00	2011 CAIROS
1.84	5256.00	2013 CAIROS
0.31	876.00	2014 CAIROS
33.46	95539.80	2010 CAIROS
206.72	579979.39	2007 NBP
1677.31	4033607.65	2013 CAIROS
268.85	668445.37	2006 NBP
275.28	681648.50	2006 NBP
2042.29	3802096.98	2014 CAIROS
7.37	12290.10	2009 CAIROS
4.45	7420.00	2006 NBP
38.15	63576.30	2008 NBP
22.63	37719.10	2005 NBP
		2005 NBP
		2006 NBP
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		2013 CAIROS

2014 CAIROS
2009 CAIROS
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2009 CAIROS
2012 CAIROS

HOWEKAMP DECL.

ATTACHMENT 4

As Of: 10/31/2016
Location: All
Instrument: All

NOX/SO2 Allowances ($)

			10/21/2016	10/24/2016		10/25/2016		10/26/2016		10/27/2016		10/28/2016		10/31/2016	
Location	Instrument	Year	Price	Price	Change (%)	Price	Change (%)	Price	Change (%)	Price	Change (%)	Price	Change (%)	Price	Change (%)
Acid Rain SO2	SO2 Allowance Annual	2016	0.56	0.56	0.00	0.56	0.00	0.56	0.00	0.56	0.00	0.56	0.00	0.56	0.00
CSAPR NOx	NOx Allowance Annual	2016	9.00	9.00	0.00	7.50	(16.67)	7.50	0.00	7.50	0.00	7.50	0.00	7.50	0.00
CSAPR NOx	NOx Allowance Seasonal	2016	300.00	300.00	0.00	275.00	(8.33)	257.50	(6.36)	257.50	0.00	257.50	0.00	257.50	0.00
CSAPR NOx	NOx Allowance Seasonal	2017	1,150.00	1,150.00	0.00	1,100.00	(4.35)	1,100.00	0.00	1,100.00	0.00	1,100.00	0.00	1,100.00	0.00
CSAPR SO2 Group 1	SO2 Allowance Annual	2016	1.75	1.75	0.00	1.75	0.00	1.75	0.00	1.75	0.00	1.75	0.00	1.75	0.00
CSAPR SO2 Group 2	SO2 Allowance Annual	2016	3.50	3.50	0.00	3.50	0.00	3.50	0.00	3.50	0.00	3.50	0.00	3.50	0.00

SAMPLE

DECLARATION OF NAHALIEL ("NACHY") KANFER

I, Nahaliel ("Nachy") Kanfer, declare as follows:

1. My name is Nachy Kanfer, and I am of legal age and competent to give this declaration. All information herein is based on my own personal knowledge unless otherwise indicated.
2. I am a Sierra Club employee. I serve as the East Region Deputy Director for Sierra Club's Beyond Coal Campaign. I am responsible for ensuring that all of Sierra Club's state-based teams in the East Region successfully execute the Campaign's goals in furtherance of Sierra Club's mission. I supervise five Sierra Club employees who each manage project teams and/or other employees throughout the thirteen states in Sierra Club's East Region. I regularly interact with dozens of employees and volunteers as part of my job responsibilities.
3. Sierra Club is a national non-profit organization with 64 chapters and over 645,000 members incorporated under the laws of the State of California.
4. Sierra Club's mission is to explore, enjoy, and protect the wild places of the Earth; to practice and promote the responsible use of the Earth's resources and ecosystems; to educate and enlist humanity to protect and restore the quality of the natural and human environment; and to use all lawful means to carry out these objectives.
5. Sierra Club members have a strong interest in protecting air quality and in protecting wild places and their ambient environment from the effects of air pollution. A significant component of the work that Sierra Club does is geared towards reducing the harmful impacts of air pollution from mobile and stationary sources, including, in particular, fossil fuel-fired power plants.

6. As a result of my position and responsibilities, I am well-aware of Sierra Club's efforts to address air pollution from fossil fuel-fired power plants. These efforts include public organizing and education, media work, advocacy before governmental decision-makers, and legal action. In pertinent part, this has included efforts to reduce ozone pollution, specifically the interstate transport of ozone pollution from upwind states to downwind areas, and to help prevent the local health impacts of elevated ozone levels.
7. A key component of this work—and one in which the Sierra Club actively engages—is ensuring that EPA complies with statutory deadlines for implementing plans to reduce cross-state impacts of ozone pollution. Because downwind residents can do nothing to reduce their exposure to air pollution blowing into their area from upwind states, it is essential that EPA take action where a polluting upwind state has failed to prevent the transport of its ozone pollution across state lines.
8. EPA's failure to promulgate a Federal Implementation Plan for Kentucky within the time frame it was statutorily required to do so has resulted in increased exposure to ozone pollution for Sierra Club staff and members who live, work, recreate, and travel throughout Kentucky and downwind states.
9. Because many of the Sierra Club's members rely on Sierra Club to take efforts on their behalf to protect air quality, by failing to comply with statutorily set deadlines to address the interstate transport of Kentucky's ozone pollution, EPA has inhibited Sierra Club's ability to protect its members' interests from such pollution.
10. Promulgating a Federal Implementation Plan to address the interstate transport of Kentucky's ozone pollution would improve air quality both in Kentucky and in downwind states. This would materially improve the Club's ability to fulfill its mission

and would protect the health, environmental, recreational, and aesthetic interests of Sierra Club staff and members in Kentucky and downwind states.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct. Executed this 19th day of October, 2016

Nahaliel ("Nachy") Kanfer

DECLARATION OF HUDA FASHHO

I, Huda Fashho, declare as follows:

1. The Sierra Club is a non-profit membership organization.

2. I am the Member Services Manager at the Sierra Club. I have had this position for five years.

3. In this role, I manage the Sierra Club's customer service functions related to members, including maintaining an accurate list of members and managing the organization's member databases.

4. When an individual becomes a member of the Sierra Club, his or her current residential address is recorded in our membership database. The database entry reflecting the member's residential address is verified or updated as needed.

5. The Sierra Club currently has 645,750 members nationally, including 5,119 members in Kentucky, 18,451 members in Ohio, 40,472 members in New York, 13,838 members in Maryland, and 25,447 members in Pennsylvania.

6. Sierra Club members have a strong interest in protecting air quality and in protecting wild places and their ambient environment from the effects of air pollution.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct. Executed on October 24, 2016.

Huda Fashho

DECLARATION OF ELIZABETH BENNETT

I, Elizabeth Bennett, declare that the following statements are true and correct to the best of my knowledge, information, and belief, and are based on my personal experiences and my review of publicly available information:

1. I have been a continuous Sierra Club member since 1983. I chair the Sierra Club's Cumberland Group through which I am involved in community organizing, transportation, air quality and water quality issues across Kentucky. I have served in that capacity for close to 10 years.

2. I live at 1 Wolf Pen Lane, Prospect, KY 40059 with my husband. I have two grown children and several grandchildren that live in Lexington, KY and New York City. My family in Lexington often comes to visit.

3. I enjoy regularly spending time outdoors being active—gardening in my yard, walking my dog and swimming in my neighborhood, and hiking and canoeing throughout Kentucky.

4. I have suffered from asthma since I was a child. My asthma is typically well controlled through use of a daily inhaler, although I do occasionally need to use a rescue inhaler to treat acute asthma symptoms. I also have to avoid going outside on bad-air days; when air quality is poor, I can feel it in my lungs—breathing becomes heavy and labored, and I am forced to stay indoors and miss out on the recreational activities I enjoy.

5. I worry about poor air quality in my area and the impact air pollution has on my health. As such, I rely on a number of sources, including the newspapers and television weather reports, to keep informed of air quality conditions. When I hear that ozone levels in my area are elevated, I avoid outdoor activities in order to protect my health.

6. I have a four year old granddaughter who also has asthma. She lives in Lexington, KY with her parents but visits me often. When there is a bad-air day during one of her visits we likewise have to forgo outdoor activities in order to minimize our exposure to harmful air pollutants, including ozone.

7. I understand that pollution in and emitted from Kentucky and other upwind states blows across state lines and into my community. I know that EPA has the authority to require upwind states to limit their ozone emissions, thereby reducing pollution impacts within their borders as well as impacts on air quality in downwind states. I further understand that while EPA had a deadline to develop an implementation plan for Kentucky to address upwind ozone emissions and cross-state impacts under the 2008 national ambient air quality standards, it failed to do so. Accordingly, if EPA continues to fail to act in accordance with this obligation, excessive ozone pollution in Kentucky will continue to not only harm Kentucky citizens like myself, but also cause cross-state impacts in downwind states, in violation of the Clean Air Act.

8. I consider myself harmed by ozone pollution in Kentucky.

9. I understand that the Sierra Club has brought a lawsuit against EPA for failing to meet its deadline to promulgate the necessary infrastructure plan for the 2008 ozone national ambient air quality standards. If Sierra Club succeeds in this suit, EPA will be required to develop a plan to adequately address the transport of ozone pollution in Kentucky. Under such a plan, the required reduction in source emissions from within Kentucky necessary to address and decrease impacts on downwind states will likewise reduce ambient ozone pollution levels in Kentucky, where I reside. Accordingly, once EPA acts, I will worry less about the negative impacts to my health from ozone pollution and will be able to more fully enjoy the outdoor activities I love.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct.

Executed this 18th day of October, 2016.

Elizabeth Bennett

Elizabeth Bennett

DECLARATION OF LAURA FOX-LYNGHOLM

1. I, Laura Fox-Lyngholm, declare that the following statements are true and correct to the best of my knowledge, information, and belief, and are based on my personal experiences and my review of publicly available information.

2. I am 64 years old. I live on Sterling Avenue, Staten Island, in Richmond County, New York. I have lived at this address for 23 years.

3. I am a member of the Sierra Club. I joined the Sierra Club in 2009 because I support its mission to preserve and protect our environment, and I feel that the Club is able to promote my environmental interests through its state and national level efforts. As a child, I traveled across the country with my parents camping at the big national parks. Those experiences instilled in me a great respect and admiration for the natural treasures our country has to offer. As a result, I have always been passionate about experiencing our natural environment, preserving our country's wildlife and wild areas, and protecting our environment from pollution.

4. I understand that one of the significant air pollutants that can reduce lung function and trigger a variety of health problems is ground level ozone. I also understand that ozone pollution is particularly dangerous to those individuals with pre-existing respiratory issues, as well as older adults and people who are active outdoors.

5. I enjoy being outdoors and regularly engage in outdoor activities. I do a lot of gardening in my yard and enjoy walks with my dog around my neighborhood. In addition, Richmond County has a lot of parks—city, state, and a national, as well—so I spend a great deal of time enjoying walks and hikes through those natural areas of my community. Because of the way my parents raised me—with camping and outdoor

experiences being such an important part of our family life—being able to enjoy the outdoors and not worry about potential impacts to my health from ozone and other pollution is extremely important to me. This is especially true given that I just retired from work last week and expect to be able to spend even more time outdoors now.

6. I worked for the same company, Verizon, for 39 years. I spent most of my time working indoors, but frequently traveled to different buildings in and around Richmond County, New York for my job.

7. As someone who was diagnosed with asthma about ten years ago, I must constantly stay aware of air quality in my area. Because of the risk ozone pollution poses to me, I am very much concerned with the impact ozone pollution in my county has on my health. The thing about suffering from asthma is that air pollution and air quality are constantly on your mind. My asthma is relatively under control, but I do occasionally have acute attacks—last summer I have two pretty severe attacks. When I have an asthma attack, it feels like I am drowning and my throat is closing in. As a result, I am very much concerned with the quality of the air I am breathing; if the air is heavy or if there is noticeable air pollution, I worry a great deal about my ability to breathe and its effects on my general health. I have to make sure to carry my rescue inhaler at all times. I also limit my time outdoors on bad air quality days and make sure to stay inside with air conditioning.

8. I am aware that Richmond County, New York is impacted by unsafe levels of ground level ozone caused by pollutants that blow across state lines from upwind sources in places like Kentucky.

9. I understand that, because Kentucky failed to do so, the U.S. Environmental Protection Agency (EPA) was required to create a plan to address cross-state impacts from Kentucky's ozone pollution in upwind states, including New York. I also understand that EPA failed to fully address impacts to my county—Richmond Co., New York— from Kentucky's ozone pollution by the deadline mandated by the Clean Air Act and, as a result, Sierra Club has brought a lawsuit against EPA to compel it to promulgate an adequate plan.

10. I consider myself negatively impacted by the pollution that blows into Richmond County, New York from polluters in Kentucky and other upwind states. If Sierra Club succeeds in its lawsuit, EPA will be required to develop a plan to adequately address the interstate transport of Kentucky's ozone pollution, including known impacts to Richmond County, New York, in which case, I will worry less about the negative impacts to my health from such air pollution when I am outdoors. However, if EPA is not required to promulgate the necessary plan, I will not receive such benefits, and I will continue to worry about the excess ozone pollution in my area and resulting impacts to my health.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct. Executed this 27 day of October, 2016.

Laura Fox-Lyngholm

Laura Fox-Lyngholm

DECLARATION OF JANET EIKENBERG

1. I, Janet Eikenberg, declare that the following statements are true and correct to the best of my knowledge, information, and belief, and are based on my personal experiences and my review of publicly available information.
2. I am 65 years old. I live on Harford Road, in Fallston, Maryland, in Harford County. I have lived at this address for 6 years.
3. I am a Sierra Club member. I joined the Sierra Club in 1999 because I think we—our citizens and government—ought to be doing a whole lot more to clean up and preserve our environment. I support the Sierra Club's causes and believe the Club to be a strong advocate for my environmental concerns.
4. I am a very active person and enjoy being outdoors. My husband and I have a horse farm on our property in the countryside in Harford County, so I spend a great deal of time outside. Being able to regularly engage in outdoor activities, such as horseback riding, tending to our horses, and hiking, is extremely important to me. I also frequently enjoy visiting nearby Gunpowder Falls State Park in Harford County—riding and hiking the trails and taking my dog for swims in the river.
5. I was diagnosed with asthma about 15 years ago. At times, I experience respiratory symptoms related to this condition such as shortness of breath and difficulty breathing. I was prescribed a daily inhaler but no longer use it because of resulting heart palpitations; as a result, I must control my asthma symptoms naturally.
6. As someone who suffers from asthma, I am concerned about impacts to my health from air pollutants, including ozone pollution. For instance, on hot days—and it gets quite hot

here in Maryland in the summer—I often find it difficult to breathe, and, consequently, I have to limit my time outside in order to protect my health. As a result, not only is the enjoyment of my recreational activities impacted, but my ability to care for my horses is also negatively affected.

7. I am aware that ozone pollution from Kentucky and other upwind states is blowing across state borders and impacting air quality in Harford County, Maryland, where I live.

8. I understand that because Kentucky failed to address the interstate transport of its ozone pollution, the Clean Air Act requires the Environmental Protection Agency (EPA) to promulgate a plan to address the impact of Kentucky's upwind ozone pollution on downwind states. I further understand that, because EPA missed its deadline to create such a plan which would address impacts from Kentucky's ozone pollution in my county —Harford Co., Maryland—Sierra Club has brought a lawsuit seeking to compel EPA to do so.

9. I consider myself negatively impacted by the pollution that blows into Harford County from polluters in Kentucky and other upwind states. If the Sierra Club is successful in its lawsuit, EPA is more likely to be required to develop a plan to adequately address this air pollution. However, if the Sierra Club is not successful, I will not receive such benefits, and I will continue to worry about the air pollution in my area and my health, environmental, and recreational interests will continue to suffer.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct. Executed this 30 day of OCTOBER, 2016.

Janet Eikenberg