Attachment B

Notice of Availability of the Environmental Protection Agency's Updated Ozone Transport Modeling Data for the 2008 Ozone National Ambient Air Quality Standard (NAAQS) and North Carolina's Comments on the Notice

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Attachment B1 contains the U.S. Environmental Protection Agency's July 23, 2015, "Notice of Availability of the Environmental Protection Agency's Updated Ozone Transport Modeling Data for the 2008 Ozone National Ambient Air Quality Standard (NAAQS)" (Published in Federal Register, Vol. 80, No. 149, Tuesday, August 4, 2015). Attachment B2 contains the North Carolina Department of Environmental Quality's (DEQ) comments on the EPA's 2017 ozone transport modeling analysis provided in the EPA's Notice of Availability provided in Attachment B1. Note that reference to Appendices A and B in the DEQ's comments are not included in Attachment B2 because they are included in separate attachments to this certification submittal. Appendix A (North Carolina Division of Air Quality Review of Integrated Planning Model Results Based on NEEDS v5.14) referenced in the DEQ's comments is included in Attachment E of this certification. Appendix B (Trajectory Analysis for the Essex, Maryland Ozone Monitoring Site) referenced in the DEQ's comments is included in Attachment C of this certification.

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Attachment B1

Notice of Availability of the Environmental Protection Agency's Updated Ozone Transport Modeling Data for the 2008 Ozone National Ambient Air Quality Standard (NAAQS)

(Published in Federal Register, Vol. 80, No. 149, Tuesday, August 4, 2015)

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the potential for serious delivery problems on the pipeline's own system or the pipeline grid.

Filings (in accordance with the provisions of section 4(d) of the NGA) [2] must contain information necessary to advise the Commission when a change in service has occurred. Section 7(d) of the NGA [3] authorizes the Commission to issue a temporary certificate in cases of emergency to assure maintenance of adequate service or to serve particular customers, without notice or hearing.

Respondents to the FERC–576 are encouraged to submit the reports by email to *pipelineoutage@ferc.gov* but also have the option of faxing the reports to the Director of the Division of Pipeline Certificates. 18 CFR 260.9(b) requires that a report of service interruption or damage to natural gas facilities state: (1) The location of the service interruption or damage to natural gas pipeline or storage facilities; (2) The nature of any damage to pipeline or storage facilities; (3) Specific identification of the facilities damaged; (4) The time the service interruption or damage to the facilities occurred; (5) The customers affected by the service interruption or damage to the facilities; (6) Emergency actions taken to maintain service; and (7) Company contact and telephone number. The Commission may contact pipelines reporting damage or other pipelines to determine availability of supply, and if necessary, authorize transportation or construction of facilities to alleviate constraints in response to these reports.

A report required by 18 CFR 260.9(a)(1)(i) of damage to natural gas facilities resulting in loss of pipeline throughput or storage deliverability shall be reported to the Director of the Commission's Division of Pipeline Certificates at the earliest feasible time when pipeline throughput or storage deliverability has been restored.

In any instance in which an incident or damage report involving jurisdictional natural gas facilities is required by Department of Transportation (DOT) reporting requirements under the Natural Gas Pipeline Safety Act of 1968, a copy of such report shall be submitted to the Director of the Commission's Division of Pipeline Certificates, within 30 days of the reportable incident.[4]

If the Commission failed to collect these data, it would lose the ability to monitor and evaluate transactions, operations, and reliability of interstate pipelines and perform its regulatory functions. These reports are kept by the Commission Staff as non-public information and are not made part of the public record.

Type of Respondents: Natural gas companies.

Estimate of Annual Burden [5]: The Commission estimates the annual public reporting burden for the information collection as:

FERC–576—REPORT OF SERVICE INTERRUPTIONS

	Number of respondents (1)	Annual number of responses per respondent (2)	Total number of responses (1) * (2) = (3)	Average burden & cost per response [6] (4)	Total annual burden hours & total annual cost (3) * (4) = (5)	Cost per respondent ($) (5) ÷ (1)
Submittal of Original Email/Fax	22	2	44	1 $72	44 $3,168	72
Submittal of Damage Report	22	2	44	0.25 $18	11 $198	18
Submittal of DOT Incident Report	22	1	22	0.25 $18	5.5 $99	18
Total					60.5 $3,465	108

Comments: Comments are invited on: (1) Whether the collection of information is necessary for the proper performance of the functions of the Commission, including whether the information will have practical utility; (2) the accuracy of the agency's estimate of the burden and cost of the collection of information, including the validity of the methodology and assumptions used; (3) ways to enhance the quality, utility and clarity of the information collection; and (4) ways to minimize the burden of the collection of information on those who are to respond, including the use of automated collection techniques or other forms of information technology.

Dated: July 29, 2015.

Kimberly D. Bose,

Secretary.

[FR Doc. 2015–19058 Filed 8–3–15; 8:45 am]

BILLING CODE 6717–01–P

ENVIRONMENTAL PROTECTION AGENCY

[EPA–HQ–OAR–2015–0500; FRL–9931–68–OAR]

Notice of Availability of the Environmental Protection Agency's Updated Ozone Transport Modeling Data for the 2008 Ozone National Ambient Air Quality Standard (NAAQS)

AGENCY: Environmental Protection Agency (EPA).

ACTION: Notice of data availability (NODA); request for public comment.

[2] (15 U.S.C. 717c).

[3] (15 U.S.C. 717f).

[4] 18 CFR 260.9(d).

[5] The Commission defines burden as the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal agency. For further explanation of what is included in the information collection burden, reference 5 Code of Federal Regulations 1320.3.

[6] The estimates for cost per response are derived using the following formula: Average Burden Hours per Response * $72.00 per Hour = Average Cost per Response. The hourly cost figure comes from the FERC average salary ($149,489/year). Commission staff believes the FERC average salary to be representative wage for industry respondents.

SUMMARY: The Environmental Protection Agency (EPA) is providing notice that interstate ozone transport modeling and associated data and methods are available for public review and comment. These data and methods will be used to inform a rulemaking proposal that the EPA is developing and expects to release later this year to address interstate ozone transport for the 2008 ozone national ambient air quality standards (NAAQS). This notice also meets the EPA's expressed intent to update the air quality modeling data that were released on January 22, 2015, and to share the updated data with states and other stakeholders. The information available includes: (1) Emission inventories for 2011 and 2017, supporting data used to develop those emission inventories, methods and data used to process emission inventories into a form that can be used for air quality modeling; and (2) base year 2011 and projected 2017 ozone concentrations and projected 2017 ozone state contribution data at individual ozone monitoring sites based on air quality modeling, supporting data including 2009–2013 base period and 2017 projected ozone design values, and methods used to process air quality model outputs to calculate 2017 ozone concentrations and contributions at individual monitoring sites. A docket has been established to facilitate public review of the data and to track comments.

DATES: Comments must be received on or before September 23, 2015.

ADDRESSES: Submit your comments, identified by Docket ID No. EPA–HQ–OAR–2015–0500, by one of the following methods:

- *Federal eRulemaking Portal: http://www.regulations.gov.* Follow the online instructions for submitting comments.
- *Fax:* (202)566–9744. Attention Docket ID No. EPA–HQ–OAR–2015–0500.
- *Mail:* EPA Docket Center, WJC West Building, Attention Docket ID No. EPA–HQ–OAR–2015–0500, U.S. Environmental Protection Agency, Mailcode: 28221T, 1200 Pennsylvania Ave. NW., Washington, DC 20460. Please include a total of 2 copies.
- *Hand Delivery:* U.S. Environmental Protection Agency, WJC West Building, 1301 Constitution Avenue NW., Room 3334, Washington, DC 20004, Attention Docket ID No. EPA–HQ–OAR–2015–0500. Such deliveries are only accepted during the Docket's normal hours of operation, and special arrangements should be made for deliveries of boxed information.

Instructions: Direct your comments to Docket ID No. EPA–HQ–OAR–2015–0500. The EPA's policy is that all comments received will be included in the public docket without change and may be made available online at *www.regulations.gov,* including any personal information provided, unless the comment includes information claimed to be Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Do not submit information that you consider to be CBI or otherwise protected through *www.regulations.gov* or email. Clearly mark the part or all of the information that you claim to be CBI. For CBI information on a disk or CD–ROM that you mail to the EPA docket office, 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 procedures set forth in 40 CFR part 2. In addition to 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.

The *www.regulations.gov* Web site is an ''anonymous access'' system, which means the EPA will not know your identity or contact information unless you provide it in the body of your comment. If you send an email comment directly to the EPA without going through *www.regulations.gov,* your email address will be automatically captured and included as part of the comment that is placed in the public docket and made available on the Internet. If you submit an electronic comment, the EPA recommends that you include your name and other contact information in the body of your comment and with any disk or CD–ROM you submit. If the EPA cannot read your comment due to technical difficulties and cannot contact you for clarification, the EPA may not be able to consider your comment. Electronic files should avoid the use of special characters, any form of encryption, and be free of any defects or viruses.

When submitting comments, remember to:

1. Identify the notification by docket number and other identifying information (subject heading, **Federal Register** date and page number).
2. Explain your comments, why you agree or disagree; suggest alternatives and substitute data that reflect your requested changes.
3. Describe any assumptions and provide any technical information and/or data that you used.
4. Provide specific examples to illustrate your concerns, and suggest alternatives.
5. Explain your views as clearly as possible, avoiding the use of profanity or personal threats.
6. Make sure to submit your comments by the comment period deadline identified.

For additional information about the EPA's public docket, visit the EPA Docket Center homepage at *http://www.epa.gov/epahome/dockets.htm.*

Docket: All documents in the docket are listed in the *www.regulations.gov* index. 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 either electronically in *www.regulations.gov* or in hard copy at the Air and Radiation Docket and Information Center, EPA/DC, WJC West Building, Room 3334, 1301 Constitution Ave. NW., Washington, DC. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566–1744, and the telephone number for the Air Docket is (202) 566–1742.

FOR FURTHER INFORMATION CONTACT: For questions on the emissions data and on how to submit comments on the emissions data and related methodologies, contact Alison Eyth, Air Quality Assessment Division, Environmental Protection Agency, C339–02, 109 T.W. Alexander Drive, Research Triangle Park, NC 27709; telephone number: (919)541–2478; fax number: (919)541–1903; email: *eyth.alison@epa.gov.* For questions on the air quality modeling and ozone contributions and how to submit comments on the air quality modeling data and related methodologies, contact Norm Possiel, Air Quality Assessment Division, Environmental Protection Agency, C439–01, 109 T.W. Alexander Drive, Research Triangle Park, NC 27709; telephone number: (919)541–5692; fax number: (919)541–0044; email: *possiel.norm@epa.gov.*

SUPPLEMENTARY INFORMATION:

I. Background

On January 22, 2015, the EPA issued a memo and preliminary air quality modeling data that would help states as they develop State Implementation Plans to address cross-state transport of air pollution under the ''Good Neighbor'' Provision of the Clean Air Act (CAA), section 110(a)(2)(D)(i)(I), as it pertains to the 2008 ozone NAAQS.[1] That information included the EPA's preliminary air quality modeling data that applies the Cross-State Air Pollution Rule (CSAPR—76 FR 48208) approach to contribution projections for the year 2018 for the 2008 8-hour ozone NAAQS. Specifically, the EPA provided data identifying ozone monitoring sites that are projected to be nonattainment or have maintenance problems for the 2008 ozone NAAQS in 2018. The EPA also provided the projected contribution estimates from 2018 anthropogenic oxides of nitrogen (NO_X) and volatile organic compound (VOC) emissions in each state to ozone concentrations at each of these sites. The year 2018 was used as the analytic year for the preliminary modeling because at the onset of the modeling assessment, that year aligned with the December 2018 attainment date for Moderate ozone nonattainment areas. However, subsequent to the completion of the 2018 modeling, the EPA issued the final 2008 Ozone NAAQS SIP Requirements Rule,[2] which revised the attainment deadline for ozone nonattainment areas currently designated as Moderate for the 2008 ozone NAAQS to July 2018. The EPA established this deadline in the 2015 Ozone SIP Requirements Rule after previously establishing a deadline of December 31, 2018, that was vacated by the DC Circuit in *Natural Resources Defense Council* v. *EPA.* In order to demonstrate attainment by the revised attainment deadline, the demonstration would have to be based on design values calculated using 2015 through 2017 ozone season data, since the July 2018 deadline does not afford a full ozone season of measured data. Therefore, the EPA has adopted 2017 as the analytic year for the updated ozone transport modeling information being released as part of this NODA.

The 2011 and 2018 emissions inventory data used for the preliminary air quality modeling were released for public review on November 27, 2013 (78 FR 70935), and January 14, 2014 (79 FR 2437), respectively. Based in part on comments received from the public review process, the EPA updated the 2011 emissions inventory data, developed emissions inventory data for 2017, and used these data in air quality modeling to develop updated projections of future year ozone concentrations and contributions.

In the January 22, 2015 memo, the EPA expressed its intent to update the preliminary air quality modeling data and to share the updated data with states and other stakeholders. This notice meets this intent. Additionally, the EPA, together with its state partners, is assessing the next steps to address interstate air pollution transport for the 2008 ozone NAAQS under the CAA. The EPA recognizes its backstop role to develop and promulgate federal implementation plans, as appropriate. We are planning to take this action, if necessary, by issuing a proposal for a federal rule later this year. This notice provides an opportunity to review and comment on the agency's ozone transport modeling data that EPA intends to use in this forthcoming proposal.

II. Air Quality Modeling Data and Methodologies

Using the updated emissions inventories, the EPA performed photochemical air quality modeling to project ozone concentrations at air quality monitoring sites to 2017, and to estimate state-by-state contributions to those 2017 concentrations. We then used the air quality modeling results to identify nonattainment or maintenance sites for the 2008 ozone NAAQS in 2017, consistent with the CSAPR approach to identify such sites. We used the contribution information to quantify projected interstate contributions from emissions in each upwind state to ozone concentrations at each of the projected 2017 nonattainment and maintenance sites in downwind states.

The EPA's air quality modeling used the updated version of the 2011-based air quality modeling platform. This platform includes emissions for the 2011 base year and a 2017 future base case as well as meteorology for 2011. The 2011 meteorology was used in air quality model simulations for both 2011 and 2017. The 2011 and 2017 emissions data are described in more detail in Section III.

The EPA used the Comprehensive Air Quality Model with Extensions (CAMx version 6.11) for modeling the 2011 base year and 2017 future base case emissions scenarios to identify sites with projected nonattainment and maintenance problems in 2017. The air quality model runs were performed for a modeling domain that covers the 48 states in the contiguous U.S. along with adjacent portions of Canada and Mexico. The spatial resolution (*i.e.,* grid size) for this modeling domain is 12 km x 12 km. The 2011 and 2017 scenarios were both modeled for the full year with 2011 meteorology. The meteorological data used as input to the air quality modeling was obtained from an annual simulation of version 3.4 of the Weather Research Forecast Model (WRF) for 2011. The initial and boundary concentration inputs to the air quality modeling were derived from an annual simulation of the Goddard Earth Observing System global chemical transport model (GEOS-Chem). The CAMx predictions for 2011 were compared to corresponding measurements as part of a model performance evaluation. Information on the development of the 2011 meteorological and initial and boundary concentration inputs to the CAMx simulations and the model performance evaluation methodologies and results are described in the ''Updated Air Quality Modeling Technical Support Document'' (AQM TSD) for the 2008 Ozone NAAQS Interstate Transport Assessment, which is available in the docket for this notice. Also in this docket is a report on the performance evaluation for the annual 2011 WRF meteorological model simulation.

A. Identification of Projected 2017 Nonattainment and Maintenance Sites

The ozone predictions from the 2011 and 2017 CAMx model runs were used to project measured ozone design values to 2017 following the approach described in the EPA's draft guidance for attainment demonstration modeling.[3] We selected 2011 as the base year to reflect the most recent National Emissions Inventory (NEI). In addition, the meteorological conditions during the summer of 2011 were generally conducive for ozone formation across much of the U.S., particularly the eastern U.S. We selected 2017 as the projected analysis year to coincide with the attainment date for Moderate nonattainment areas under the 2008 ozone NAAQS. The draft attainment modeling guidance recommends using 5-year weighted average ambient design values[4] centered on the base year as the starting point for projecting design values to the future. Because 2011 is the

[1] Memorandum from Stephen D. Page, Information on the Interstate Transport ''Good Neighbor'' Provision for the 2008 Ozone National Ambient Air Quality Standards (NAAQS) under CAA section 110(a)(2)(D)(i)(I), January 22, 2015, *available at http://www.epa.gov/airtransport/GoodNeighborProvision2008NAAQS.pdf.*

[2] 80 FR 12264, 12268 (Mar. 6, 2015); 40 CFR 51.1103.

[3] The December 3, 2014, draft ozone, fine particulate matter and regional haze SIP modeling guidance is available at *http://www.epa.gov/ttn/scram/guidance/guide/Draft_O3–PM–RH_Modeling_Guidance-2014.pdf.*

[4] The air quality design value for a site is the 3-year average annual fourth-highest daily maximum 8-hour average ozone concentration.

base year of emissions, we started with the average ambient 8-hour ozone design values for the period 2009 through 2013 (*i.e.,* the average of design values for 2009–2011, 2010–2012, and 2011–2013). The 5-year weighted average ambient design value at each site was projected to 2017 using model-predicted Relative Response Factors (RRFs) [5] that were calculated based on procedures described in the draft attainment demonstration modeling guidance. The 2017 projected average ozone design values were evaluated to identify those sites with design values that exceed the 2008 ozone NAAQS.[6] Consistent with the approach used in CSAPR, those sites with 2017 average design values that exceed the NAAQS are projected to be in nonattainment in 2017.

As noted above, we followed the CSAPR approach to identify sites with projected maintenance problems in 2017. As part of the approach for identifying sites with projected future maintenance problems, the highest (*i.e.,* maximum) ambient design value from the 2011-centered 5-year period (*i.e.,* the maximum of design values from 2009–2011, 2010–2012, and 2011–2013) was projected to 2017 for each site using the site-specific RRFs. Following the CSAPR approach, monitoring sites with a maximum design value that exceeds the NAAQS, even if the average design value is below the NAAQS, are projected to have a maintenance problem in 2017. In this regard, nonattainment sites are also maintenance sites because the maximum design value at nonattainment sites is always greater than or equal to the 5-year weighted average. Monitoring sites with a 2017 average design value below the NAAQS, but with a maximum design value that exceeds the NAAQS, are considered maintenance-only sites. These sites are projected to have a maintenance problem, but not a nonattainment problem in 2017.

The base period ambient and projected 2017 average and maximum design values at individual nonattainment sites and maintenance-only sites are provided in Tables 1 and 2, respectively.

TABLE 1—2009–2013 AND 2017 AVERAGE AND MAXIMUM DESIGN VALUES AT PROJECTED NONATTAINMENT SITES IN THE EAST (TOP) AND WEST (BOTTOM)

[Units are ppb]

Monitor ID	State	County	2009–2013 average design value	2009–2013 maximum design value	2017 average design value	2017 maximum design value
90013007	Connecticut	Fairfield	84.3	89.0	77.1	81.4
90019003	Connecticut	Fairfield	83.7	87.0	78.0	81.1
90099002	Connecticut	New Haven	85.7	89.0	77.2	80.2
240251001	Maryland	Harford	90.0	93.0	81.3	84.0
360850067	New York	Richmond	81.3	83.0	76.3	77.8
361030002	New York	Suffolk	83.3	85.0	79.2	80.8
390610006	Ohio	Hamilton	82.0	85.0	76.3	79.1
480391004	Texas	Brazoria	88.0	89.0	81.4	82.3
481210034	Texas	Denton	84.3	87.0	76.9	79.4
482011034	Texas	Harris	81.0	82.0	76.8	77.8
482011039	Texas	Harris	82.0	84.0	78.2	80.2
484392003	Texas	Tarrant	87.3	90.0	79.6	82.1
484393009	Texas	Tarrant	86.0	86.0	78.6	78.6
551170006	Wisconsin	Sheboygan	84.3	87.0	77.0	79.4
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60190007	California	Fresno	94.7	95.0	89.0	89.3
60190011	California	Fresno	93.0	96.0	87.6	90.4
60190242	California	Fresno	91.7	95.0	87.1	90.3
60194001	California	Fresno	90.7	92.0	84.2	85.4
60195001	California	Fresno	97.0	99.0	90.6	92.5
60251003	California	Imperial	81.0	82.0	79.3	80.3
60290007	California	Kern	91.7	96.0	86.2	90.2
60290008	California	Kern	86.3	88.0	80.6	82.2
60290011	California	Kern	80.0	81.0	76.2	77.1
60290014	California	Kern	87.7	89.0	82.8	84.0
60290232	California	Kern	87.3	89.0	82.2	83.8
60295002	California	Kern	90.0	91.0	84.5	85.5
60296001	California	Kern	84.3	86.0	79.7	81.3
60311004	California	Kings	87.0	90.0	81.1	83.9
60370002	California	Los Angeles	80.0	82.0	79.0	81.0
60370016	California	Los Angeles	94.0	97.0	92.8	95.8
60371002	California	Los Angeles	80.0	81.0	77.1	78.1
60371201	California	Los Angeles	90.0	90.0	87.9	87.9
60371701	California	Los Angeles	84.0	85.0	82.2	83.2
60372005	California	Los Angeles	79.5	82.0	78.1	80.6
60376012	California	Los Angeles	97.3	99.0	94.5	96.2
60379033	California	Los Angeles	90.0	91.0	86.0	86.9
60392010	California	Madera	85.0	86.0	79.8	80.8
60470003	California	Merced	82.7	84.0	78.1	79.3
60610006	California	Placer	84.0	86.0	78.2	80.0

[5] In brief, the RRF for a particular location is the ratio of the 2017 ozone model prediction to the 2011 ozone model prediction. The RRFs were calculated using model outputs for the May through September period.

[6] In determining compliance with the NAAQS, ozone design values are truncated to integer values. For example, a design value of 75.9 ppb is truncated to 75 ppb which is attainment. In this manner, design values at or above 76.0 ppb are considered nonattainment.

TABLE 1—2009–2013 AND 2017 AVERAGE AND MAXIMUM DESIGN VALUES AT PROJECTED NONATTAINMENT SITES IN THE EAST (TOP) AND WEST (BOTTOM)—Continued

[Units are ppb]

Monitor ID	State	County	2009–2013 average design value	2009–2013 maximum design value	2017 average design value	2017 maximum design value
60650004	California	Riverside	85.0	85.0	82.3	82.3
60650012	California	Riverside	97.3	99.0	93.5	95.1
60651016	California	Riverside	100.7	101.0	95.7	96.0
60652002	California	Riverside	84.3	85.0	79.8	80.5
60655001	California	Riverside	92.3	93.0	87.6	88.2
60656001	California	Riverside	94.0	98.0	88.1	91.9
60658001	California	Riverside	97.0	98.0	93.3	94.3
60658005	California	Riverside	92.7	94.0	89.2	90.4
60659001	California	Riverside	88.3	91.0	82.7	85.2
60670012	California	Sacramento	93.3	95.0	85.7	87.3
60675003	California	Sacramento	86.3	88.0	80.5	82.0
60710005	California	San Bernardino	105.0	107.0	103.6	105.6
60710012	California	San Bernardino	95.0	97.0	91.8	93.8
60710306	California	San Bernardino	83.7	85.0	81.2	82.4
60711004	California	San Bernardino	96.7	98.0	94.3	95.6
60712002	California	San Bernardino	101.0	103.0	99.5	101.5
60714001	California	San Bernardino	94.3	97.0	92.3	95.0
60714003	California	San Bernardino	105.0	107.0	101.8	103.8
60719002	California	San Bernardino	92.3	94.0	88.0	89.6
60719004	California	San Bernardino	98.7	99.0	95.7	96.0
60731006	California	San Diego	81.0	82.0	76.6	77.6
60990006	California	Stanislaus	87.0	88.0	83.0	83.9
61070006	California	Tulare	81.7	85.0	77.0	80.1
61070009	California	Tulare	94.7	96.0	87.3	88.5
61072002	California	Tulare	85.0	88.0	78.6	81.4
61072010	California	Tulare	89.0	90.0	82.7	83.6
61112002	California	Ventura	81.0	83.0	78.3	80.2
80350004	Colorado	Douglas	80.7	83.0	76.0	78.1
80590006	Colorado	Jefferson	80.3	83.0	76.3	78.8

TABLE 2—2009–2013 AND 2017 AVERAGE AND MAXIMUM DESIGN VALUES AT PROJECTED MAINTENANCE-ONLY SITES IN THE EAST (TOP) AND WEST (BOTTOM)

[Units are ppb]

Monitor ID	State	County	2009–2013 average design value	2009–2013 maximum design value	2017 average design value	2017 maximum design value
90010017	Connecticut	Fairfield	80.3	83.0	75.8	78.4
211110067	Kentucky	Jefferson	82.0	85.0	75.8	78.6
211850004	Kentucky	Oldham	82.0	86.0	73.7	77.3
240053001	Maryland	Baltimore	80.7	84.0	73.2	76.2
260050003	Michigan	Allegan	82.7	86.0	75.5	78.5
261630019	Michigan	Wayne	78.7	81.0	74.0	76.2
340071001	New Jersey	Camden	82.7	87.0	74.2	78.1
340150002	New Jersey	Gloucester	84.3	87.0	75.1	77.5
340230011	New Jersey	Middlesex	81.3	85.0	73.0	76.3
340290006	New Jersey	Ocean	82.0	85.0	73.9	76.6
360810124	New York	Queens	78.0	80.0	75.7	77.6
420031005	Pennsylvania	Allegheny	80.7	82.0	75.3	76.5
421010024	Pennsylvania	Philadelphia	83.3	87.0	75.1	78.4
480850005	Texas	Collin	82.7	84.0	74.9	76.0
481130069	Texas	Dallas	79.7	84.0	74.0	78.0
481130075	Texas	Dallas	82.0	83.0	75.8	76.7
481211032	Texas	Denton	82.7	84.0	75.1	76.3
482010024	Texas	Harris	80.3	83.0	75.9	78.5
482010026	Texas	Harris	77.3	80.0	73.5	76.1
482010055	Texas	Harris	81.3	83.0	75.4	77.0
482011050	Texas	Harris	78.3	80.0	74.6	76.2
484390075	Texas	Tarrant	82.0	83.0	75.5	76.4
484393011	Texas	Tarrant	80.7	83.0	74.5	76.6
40131004	Arizona	Maricopa	79.7	81.0	75.0	76.2
60170020	California	El Dorado	82.7	84.0	75.1	76.3
60390004	California	Madera	79.3	81.0	75.3	76.9
60610003	California	Placer	83.0	85.0	75.4	77.2

TABLE 2—2009–2013 AND 2017 AVERAGE AND MAXIMUM DESIGN VALUES AT PROJECTED MAINTENANCE-ONLY SITES IN THE EAST (TOP) AND WEST (BOTTOM)—Continued

[Units are ppb]

Monitor ID	State	County	2009–2013 average design value	2009–2013 maximum design value	2017 average design value	2017 maximum design value
60670006	California	Sacramento	78.7	81.0	74.0	76.1
60773005	California	San Joaquin	79.0	80.0	75.9	76.8
80050002	Colorado	Arapahoe	76.7	79.0	74.4	76.6
80590011	Colorado	Jefferson	78.7	82.0	75.8	78.9

B. Quantification of Interstate Ozone Contributions

The EPA performed nationwide, state-level ozone source apportionment modeling using the CAMx Ozone Source Apportionment Technology/Anthropogenic Precursor Culpability Analysis (OSAT/APCA) technique[7] to quantify the contribution of 2017 base case NO_X and VOC emissions from all sources in each state to projected 2017 ozone concentrations at each air quality monitoring site. In the source apportionment model run, we tracked the ozone formed from each of the following contribution categories (*i.e.,* ''tags''):

- States—anthropogenic NO_X and VOC emissions from each state tracked individually (emissions from all anthropogenic sectors in a given state were combined);
- Biogenics—biogenic NO_X and VOC emissions domain-wide (*i.e.,* not by state);
- Boundary Concentrations—concentrations transported into the modeling domain;
- Tribes—the emissions from those tribal lands for which we have point source inventory data in the 2011 NEI (we did not model the contributions from individual tribes);
- Canada and Mexico—anthropogenic emissions from sources in the portions of Canada and Mexico included in the modeling domain (we did not model the contributions from Canada and Mexico separately);
- Fires—combined emissions from wild and prescribed fires; and
- Offshore—combined emissions from offshore marine vessels and offshore drilling platforms.

The CAMx OSAT/APCA model run was performed for the period May 1 through September 30 using the 2017 future base case emissions and 2011 meteorology for this time period. The hourly contributions[8] from each tag were processed to obtain the 8-hour average contributions corresponding to the time period of the 8-hour daily maximum concentration on each day in the 2017 model simulation. This step was performed for those model grid cells containing monitoring sites in order to obtain 8-hour average contributions for each day at the location of each site. The model-predicted contributions were then applied in a relative sense to quantify the contributions to the 2017 average design value at each site. Additional details on the source apportionment modeling and the procedures for calculating contributions can be found in the AQM TSD.

The average contribution metric is intended to provide a reasonable representation of the contribution from individual states to the projected 2017 design value, based on modeled transport patterns and other meteorological conditions generally associated with modeled high ozone concentrations in the vicinity of the monitoring site. An average contribution metric constructed in this manner is beneficial since the magnitude of the contributions is directly related to the magnitude of the design value at each site.

The resulting 2017 contributions from each tag to each monitoring site are provided in the AQM TSD. The largest contributions from each state to projected 2017 downwind nonattainment sites and to projected downwind maintenance-only sites are provided in Table 3.

TABLE 3—LARGEST OZONE CONTRIBUTIONS FROM EACH STATE TO DOWNWIND 2017 PROJECTED NONATTAINMENT AND TO 2017 PROJECTED MAINTENANCE-ONLY SITES

[Units are ppb]

Upwind state	Largest contribution to a 2017 nonattainment site in downwind states	Largest contribution to a 2017 maintenance-only site in downwind states
Alabama	0.79	1.28
Arizona	1.78	0.41
Arkansas	1.24	2.15
California	1.75	3.44
Colorado	0.36	0.34
Connecticut	0.46	0.41
Delaware	0.68	2.23
District of Columbia	0.73	0.64
Florida	0.57	0.72
Georgia	0.58	0.56
Idaho	0.23	0.35

[7] As part of this technique, ozone formed from reactions between biogenic VOC and NO_X with anthropogenic NO_X and VOC are assigned to the anthropogenic emissions.

[8] Contributions from anthropogenic emissions under ''NO_X-limited'' and ''VOC-limited'' chemical regimes were combined to obtain the net contribution from NO_X and VOC anthropogenic emissions in each state.

TABLE 3—LARGEST OZONE CONTRIBUTIONS FROM EACH STATE TO DOWNWIND 2017 PROJECTED NONATTAINMENT AND TO 2017 PROJECTED MAINTENANCE-ONLY SITES—Continued

[Units are ppb]

Upwind state	Largest contribution to a 2017 nonattainment site in downwind states	Largest contribution to a 2017 maintenance-only site in downwind states
Illinois	17.48	23.17
Indiana	7.15	14.95
Iowa	0.61	0.85
Kansas	0.80	1.03
Kentucky	11.17	2.14
Louisiana	3.81	4.23
Maine	0.00	0.08
Maryland	2.39	7.11
Massachusetts	0.10	0.37
Michigan	2.69	1.79
Minnesota	0.40	0.47
Mississippi	0.78	1.48
Missouri	1.63	3.69
Montana	0.15	0.17
Nebraska	0.51	0.36
Nevada	0.84	0.73
New Hampshire	0.02	0.07
New Jersey	12.38	11.48
New Mexico	1.05	0.54
New York	16.96	17.21
North Carolina	0.55	0.93
North Dakota	0.14	0.28
Ohio	3.99	7.92
Oklahoma	1.70	2.46
Oregon	0.65	0.65
Pennsylvania	13.51	15.93
Rhode Island	0.02	0.08
South Carolina	0.19	0.21
South Dakota	0.08	0.12
Tennessee	1.67	0.90
Texas	2.44	2.95
Utah	1.59	1.66
Vermont	0.01	0.05
Virginia	5.29	4.70
Washington	0.22	0.09
West Virginia	2.99	3.11
Wisconsin	0.56	2.59
Wyoming	1.22	1.22

In CSAPR, the EPA used a contribution screening threshold of 1 percent of the NAAQS to identify upwind states in the eastern U.S. that may significantly contribute to downwind nonattainment and/or maintenance problems and which warrant further analysis. The EPA will take comment on the appropriate threshold to be applied for purposes of the 2008 ozone NAAQS in the upcoming rulemaking proposal to address interstate ozone transport for that standard. The EPA is not proposing or taking comment on this threshold as part of this NODA.

C. Air Quality Modeling Information Available for Public Comment

The EPA is requesting comment on the components of the 2011 air quality modeling platform, the air quality model applications and model performance evaluation, and the projected 2017 ozone design value concentrations and contribution data. The EPA is also seeking comment on the methodology for calculating contributions at individual monitoring sites. The EPA encourages all states and sources to review and comment on the information provided in this NODA.

The EPA has placed key information related to the air quality modeling into the electronic docket for this notice (EPA–HQ–OAR–2015–0500) which is available at *www.regulations.gov.* This includes the AQM TSD, an Excel file which contains the 2009–2013 base period and 2017 projected average and maximum ozone design values at individual monitoring sites, and an Excel file with the ozone contributions from each state and all other source tags to each monitoring site. However, the air quality modeling input and output data files are too large to be directly uploaded into the electronic docket and/or are not in formats accepted by that docket. These air quality modeling files have been placed on a data drive in the docket office. Electronic copies of the non-emissions air quality modeling input files and the air quality modeling output files can also be obtained prior to the end of the comment period by contacting Norm Possiel at *possiel.norm@epa.gov.* A detailed description of the 2011 and 2017 emissions data and procedures for accessing and commenting on these data are provided below.

III. Emissions Data and Methodologies

The EPA is requesting comment on the updated 2011 and 2017 emission inventories; supporting ancillary files used to allocate emissions temporally, spatially, and by emissions species; and on the emissions modeling methods used to develop the emission inventories, including but not restricted to, the activity data, model input databases, and the projection, control, and closure data used to develop projected 2017 emissions. Summaries of the emission inventories are provided to aid in the review of the data, but comments are sought on the actual inventories, model inputs, data, and methods used to develop the projected emissions.

A. Instructions for Submitting Emissions Comments and Alternative Emissions Data

The EPA can most effectively use comments on emissions data that provide specific alternative values to those in the EPA data sets, and for which accompanying documentation supports the alternative values. Commenters should provide the alternative data at a level of detail appropriate to the data set into which it will be incorporated, thereby including all key fields needed to substitute the old data with the new. For example, any data provided as an alternative to the EPA's point source emissions data should include all key fields used to identify point source data such as facility, unit, release point, process, and pollutant, along with alternative emissions values. If a commenter were to provide a new set of county total emissions as an alternative to detailed point source emissions data, the EPA would not be able to use that new data. Commenters should also include documentation that describes methods for development of any alternative values and relevant references supporting the alternative approach.

Any alternative emission inventory or ancillary data provided should be compatible with the formats used by the Sparse Matrix Operator Kernel Emissions (SMOKE) modeling system version 3.6.5, which is used by the EPA to process emission inventories into a format that can be used for air quality modeling. Formats are defined in the SMOKE Version 3.6.5 User's Manual available from *http://www.cmascenter.org/smoke/.* Only the rows of data that have changed from those provided by the EPA should be included in the alternative data sets. Alternative data that are not an input to SMOKE, such as model input databases for mobile source models, should be provided in a format in which it could be directly input to the model.

Commenters wishing to comment on inventory projection methods should submit to the docket comments that describe an alternative approach to the existing methods, along with documentation describing why that method is an improvement over the existing method.

B. Emissions Information Available for Public Comment

The released data include emission inventories that represent projected emissions into the atmosphere of criteria and some hazardous air pollutants in the years 2011 and 2017, additional ancillary data files that are used to convert the NEI emissions into a form that can be used for air quality modeling, and methods used to prepare the air quality model inputs and to develop projections of emissions for the year 2017. The platform includes emission inventories for sources at specific locations called point sources; emissions from fire events; and county-level emissions of onroad mobile sources, nonroad mobile sources, and nonpoint stationary sources.

The provided emission inventories are split into categories called modeling sectors. For example, facility-specific point emission sources are split into electric generating units (EGUs), oil and gas point sources, and other point sources. Nonpoint emission sources are split into agricultural ammonia sources, area fugitive dust sources, non-Category 3 commercial marine and locomotive sources, residential wood sources, oil and gas nonpoint sources, agricultural burning sources, and other nonpoint sources. Additional modeling sectors are onroad and nonroad mobile sources, Category 3 commercial marine sources, and emissions from wild and prescribed fires.

The emission inventories for the future year of 2017 have been developed using projection methods that are specific to the type of emission source. Future emissions are projected from the 2011 base case either by running models to estimate future year emissions from specific types of emission sources (*i.e.,* EGUs, and onroad and nonroad mobile sources), or for other types of sources by adjusting the base year emissions according to the best estimate of changes expected to occur in the intervening years (*i.e.,* non-EGU point and nonpoint sources).

For some sectors, the same emissions are used in the base and future years, such as biogenic emissions, wild and prescribed fire emissions, and Canadian emissions. For all other sectors, rules and specific legal obligations that go into effect in the intervening years, along with changes in activity for the sector, are considered when possible. Documentation of the methods used for each sector is provided in the TSD *Preparation of Emissions Inventories for the Version 6.2, 2011 Emissions Modeling Platform,* which can be found in the docket for this notice.

Emission projections for EGUs for 2017 were developed using the Integrated Planning Model (IPM). The National Electric Energy Data System (NEEDS) database contains the generation unit records used for the model plants that represent existing and planned/committed units in EPA modeling applications of IPM. The NEEDS database includes basic geographic, operating, air emissions, and other data on these generating units and is updated for the EPA's version 5.14 power sector modeling platform. The EGU emission projections included in this data release are reported in an air quality modeling-ready flat file taken from the EPA Base Case v.5.14, developed using IPM. The 2017 EGU emission projections in the flat file format, the corresponding NEEDS database, and user guides and documentation are available in the docket for this notice, and at *http://www.epa.gov/powersectormodeling.*

To project future emissions from onroad and nonroad mobile sources, the EPA uses the Motor Vehicle Emissions Simulator (MOVES) and the National Mobile Inventory Model (NMIM), respectively. Development of the future year onroad and nonroad emissions requires a substantial amount of lead time and resources. The EPA had already prepared the emissions projections for 2018 when the attainment deadline for Moderate nonattainment areas was revised to July 2018 in the 2008 Ozone SIP Requirements Rule, as discussed above, effectively requiring the agency to adjust its projection year to 2017. Thus, for purposes of this NODA, the EPA calculated the 2017 emissions from mobile sources using post-modeling adjustments to 2018 emissions, but the agency anticipates that it will directly generate the mobile source emissions for 2017 that will be used in the air quality modeling for the final rule to address interstate transport for the 2008 ozone standard. The EPA obtained 2018 projections by running the MOVES and NMIM models using year-specific information about fuel mixtures, activity data, and the impacts of national and state-level rules and control programs. The input databases and future year activity data for onroad mobile sources are provided with the 2011v6.2 platform available at *http://www.epa.gov/ttn/*

chief/emch/index.html#2011. The 2018 onroad and nonroad mobile source emissions were adjusted for 2017 using factors derived from national scale runs of MOVES and NMIM, respectively.

For non-EGU point and nonpoint sources, projections of 2017 emissions were developed by starting with the 2011 emissions inventories and applying adjustments that represent the impact of national, state, and local rules coming into effect in the years 2012 through 2017, along with the impacts of planned shutdowns, the construction of new plants, specific information provided by states, and specific legal obligations resolving alleged environmental violations, such as consent decrees. Changes in activity are considered for sectors such as oil and gas, residential wood combustion, cement kilns, livestock, aircraft, commercial marine vessels and locomotives. Data files that include factors that represent the changes are provided, along with summaries that quantify the emission changes resulting from the projections at a state and national level.

The provided data include relevant emissions inventories for neighboring countries used in our modeling, specifically the 2010 emissions inventories for Canada and the 2008 and 2018 emissions inventories for Mexico. Canadian emissions for a future year were not available.

Ancillary data files used to allocate annual emissions to the hourly, gridded emissions of chemical species used by the air quality model are also provided. The types of ancillary data files include temporal profiles that allocate annual and monthly emissions down to days and hours, spatial surrogates that allocate county-level emissions onto the grid cells used by the AQM, and speciation profiles that allocate the pollutants in the NEI to the chemical species used by the air quality model. In addition, there are temporal, spatial, and speciation cross-reference files that map the emission sources in the emission inventories to the appropriate profiles based on their location, emissions source classification code (SCC), and, in some cases, the specific facility or unit. With the exception of some speciation profiles and temporal profiles for EGUs and mobile sources, the same ancillary data files are used to prepare the 2011 and 2017 emissions inventories for air quality modeling.

Information related to this section is located in the docket. However, as mentioned above, some of the emissions data files are too large to be directly uploaded into the electronic docket and/or are not in formats accepted by that docket. Therefore, the information placed in the electronic docket, associated detailed data, and summaries to help with interpretation of the data are available for public review with the 2011v6.2 platform available on the Emissions Modeling Clearinghouse on the EPA's Web site at *http://www.epa.gov/ttn/chief/emch/index.html#2011.* Requests for electronic copies of pre-merged, intermediate and air quality model-ready emissions files for input to air quality modeling can be obtained by contacting Alison Eyth at *eyth.alison@epa.gov.*

The emissions inventories, along with many of the ancillary files, are provided in the form of flat files that can be input to SMOKE. Flat files are comma-separated values-style text files with columns and rows that can be loaded into spreadsheet or database software. The columns of interest in the emission inventory files are specified in each subsection below. The EPA specifically requests comment on the following components of the provided emissions modeling inventories and ancillary files:

- *Emissions values and supporting data for EGUs.* The EPA requests comment on the IPM version 5.14 input assumptions, NEEDS database, 2018 unit-level parsed files because 2017 parsed files are not available, 2017 flat file inputs and outputs (including modifications to the IPM 2018 Base Case to inform 2017 NO_X emissions), temporal profiles use to allocate seasonal emissions to hours, and cross references and matching between IPM and NEI.
- *Emission values for non-EGU sources.* The EPA requests comment on the criteria air pollutant projected 2017 emissions in the modeling inventories, such as NO_X, VOC, sulfur dioxide, particulate matter less than 2.5 micrometers, particulate matter less than 10 micrometers, and ammonia, with a focus on the ozone precursors NO_X and VOC. The EPA will also accept comments on 2017 projections of hazardous air pollutants (HAPs), as they are included in the outputs of models used to develop 2017 emission projections. However, HAPs are not the focus of this effort. The annual emissions values are located in the ANN_VALUE column of emission inventory files in the Flat File 2010 (FF10) format. Some emission inventories (*e.g.,* nonroad) may also have values filled in to the monthly value columns (*e.g.,* JAN_VALUE, FEB_VALUE, . . ., DEC_VALUE). The EPA requests comment on both the annual and monthly emissions values, where applicable. Summaries of emissions by state and county are provided to aid in the review of emissions values.
- *Model inputs and activity data used to develop mobile source emission inventories.* The EPA requests comment on the mobile source model input data used to develop the projected future mobile source emission inventories. These include both the databases used to create emission factors and the vehicle miles traveled and vehicle population activity data used to compute the emissions. Of particular interest are county total vehicle miles traveled, the mixture of vehicle types in 2017, hoteling hours of combination long-haul trucks, and changes to the inspection and maintenance programs. Alternative activity data should be provided in the SMOKE FF10 activity data format.
- *Projection data and methods.* The EPA seeks comment on the data used to project point and nonpoint source emissions from 2011 to 2017, and on the methods and assumptions used to implement the projections. In this context, nonpoint source emissions are inclusive of commercial marine vessel, railroad, oil and gas, and other nonpoint emissions. In particular, the EPA seeks comment on its assumptions regarding the manner in which specific consent decrees and state- or locality-specific control programs will be implemented.
- *Existing control techniques.* The emission inventories include information on emissions control techniques listed in terms of control codes submitted to the EIS. These are listed in the CONTROL_IDS and CONTROL_MEASURES columns in the emission inventory flat files, with levels of reduction in the ANN_PCT_RED column. Projection of non-EGU point source emissions to future years is dependent on this information. The EPA seeks comment on whether data on existing controls given in the inventory flat files are incomplete or erroneous. The flat files must be consulted for details of control techniques by pollutant.
- *Emissions modeling methods.* The EPA is using SMOKE version 3.6.5 to prepare data for air quality modeling. The EPA requests comment on the methods by which SMOKE is used to develop air quality model-ready emissions, as illustrated in the scripts provided with the modeling platform and as described in the TSD *Preparation of Emissions Inventories for the Version 6.2, 2011 Emissions Modeling Platform,* available with the 2011v6.2 platform at *http://www.epa.gov/ttn/chief/emch/index.html#2011.*
- *Temporal allocation.* Annual emission inventories must be allocated

to hourly values prior to air quality modeling. This may be done with temporal profiles in several steps, such as annual-to-month, month-to-day, and day-to-hour. The exact method used depends on the type of emissions being processed. The EPA seeks comment on the allocation of the emission inventories to month, day, and hour for all types of emission processes. In particular, the EPA seeks information that could help improve the temporal allocation in 2017 of emissions from EGUs, nonroad mobile sources, residential wood combustion sources, and the temporal allocation of vehicle miles traveled needed to model onroad mobile sources. The EPA seeks local- and region-specific data that can be used to improve the temporal allocation of emissions data.

- *Spatial surrogates.* Spatial surrogates are used to allocate county-level emissions to the grid cells used for air quality modeling. The EPA requests comment on the spatial surrogates used to spatially allocate the 2011 and 2017 emissions. The same spatial surrogates are used in the base and future years.
- *Chemical speciation.* Prior to air quality modeling, the pollutants in the emission inventories must be converted into the chemical species used by the air quality model using speciation profiles. The speciation profiles provided are consistent with version 4.4 of the SPECIATE database. The EPA requests comment on the provided speciation profiles, as well as any information that could help improve the speciation of oil and gas emissions in both the eastern and western U.S. in 2017. Oil and gas speciation information, along with VOC to TOG adjustment factors that are used to compute methane emissions, would be of the most use at the county or oil/gas basin level of detail and also for each distinct process at oil and gas drilling/production facilities (*e.g.,* glycol dehydrators).

To aid in the interpretation of the provided data files and how they relate to the aspects of the data on which the EPA is requesting comment, the EPA has provided a summary document in the docket that describes in more detail the provided data and summary files.

Dated: July 23, 2015.

Stephen D. Page,

Director, Office of Air Quality Planning and Standards.

[FR Doc. 2015–18878 Filed 8–3–15; 8:45 am]

BILLING CODE 6560–50–P

ENVIRONMENTAL PROTECTION AGENCY

[EPA–HQ–OW–2014–0170; FRL—9931–67–OW]

RIN 2040–ZA24

Final 2014 Effluent Guidelines Program Plan and 2014 Annual Effluent Guidelines Review Report

AGENCY: Environmental Protection Agency (EPA).

ACTION: Notice of availability.

SUMMARY: This notice announces the availability of the Environmental Protection Agency's (EPA) Final 2014 Effluent Guidelines Program Plan and EPA's 2014 Annual Effluent Guidelines Review Report. Section 304(m) of the Clean Water Act requires EPA to biennially publish a plan for new and revised effluent guidelines, after public notice and comment. The Plan identifies any new or existing industrial categories selected for effluent guidelines and provides a schedule. EPA typically publishes a preliminary plan upon which the public is invited to comment, and then publishes a final plan thereafter. EPA published the Preliminary 2014 Plan on September 16, 2014, and received public comment on it.

FOR FURTHER INFORMATION CONTACT: Mr. William F. Swietlik, Engineering and Analysis Division, Office of Water, 4303T, U.S. Environmental Protection Agency, 1200 Pennsylvania Avenue NW., Washington, DC., 20460; telephone number: (202) 566–1129; fax number: (202) 566–1053; email address: *swietlik.william@epa.gov*

SUPPLEMENTARY INFORMATION:

I. General Information

A. Supporting Documents—Key documents providing additional information about EPA's 2014 annual review and the Final 2014 Plan include the 2014 Effluent Guidelines Review Report and the Final 2014 Effluent Guidelines Program Plan.

B. *How can I get copies of these documents and other related information?*

1. *Docket.* EPA has established official public dockets for these actions under Docket ID No. EPA–HQ–OW–2014–0170. The official public docket is the collection of materials that is available for public viewing at the Water Docket in the EPA Docket Center, (EPA/DC) EPA West, Room 3334, 1301Constitution Ave. NW., Washington, DC 20460.

2. *Electronic Access.* You can access this **Federal Register** document electronically through the United States government online source for Federal regulations at *http://www.regulations.gov.*

3. *Internet access.* Copies of the supporting documents are available at *http://water.epa.gov/lawsregs/lawsguidance/cwa/304m/index.cfm*

II. How Is This Document Organized?

The outline of this notice follows.

A. Legal Authority
B. Summary of the Final 2014 Effluent Guidelines Program Plan

A. Legal Authority

This notice is published under the authority of the CWA, 33 U.S.C. 1251, *et seq.,* and in particular sections 301(d), 304(b), 304(g), 304(m), 306, 307(b) and 308 of the Act, 33 U.S.C. 1311(d), 1314(b), 1314(g), 1314(m), 1316, 1317(b), and 1318.

B. Summary of the Final 2014 Effluent Guidelines Program Plan

EPA prepared the *Final 2014 Effluent Guidelines Program Plan* (the Plan) pursuant to Clean Water Act section 304(m). The Plan provides a summary of EPA's review of effluent guidelines and pretreatment standards, consistent with CWA sections 301(d), 304(b), 304(g), 304(m), and 307(b). It includes EPA's evaluation of indirect discharge categories that do not have categorical pretreatment standards for the purpose of identifying potential new categories for which pretreatment standards under CWA section 307(b) might be warranted. From these reviews, the Plan identifies any new or existing industrial categories selected for effluent guidelines, and provides a schedule. In addition, the Plan presents any new or existing categories of industry selected for further review and analysis. The Final 2014 Plan and the 2014 Annual Review Report can be found at *http://water.epa.gov/lawsregs/lawsguidance/cwa/304m/index.cfm*

Dated: July 24, 2015.

Kenneth J. Kopocis,

Deputy Assistant Administrator for Water.

[FR Doc. 2015–18877 Filed 8–3–15; 8:45 am]

BILLING CODE 6560–50–P

Attachment B2

North Carolina Department of Environmental Quality Comments on EPA's "Notice of Availability of the Environmental Protection Agency's Updated Ozone Transport Modeling Data for the 2008 Ozone National Ambient Air Quality Standard (NAAQS)"

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Environmental Quality

PAT MCCRORY
Governor

DONALD R. VAN DER VAART
Secretary

October 23, 2015

Docket No. EPA–HQ–OAR–2015–0500
EPA Docket Center
WJC West (Air Docket)
U.S. Environmental Protection Agency
1200 Pennsylvania Ave. NW
Washington, DC 20460
Mail Code: 28221T

Subject: Notice of Availability of the Environmental Protection Agency's Updated Ozone Transport Modeling Data for the 2008 Ozone National Ambient Air Quality Standard (NAAQS)

Dear Sir/Madam:

The North Carolina Division of Air Quality (DAQ), within the Department of Environmental Quality, appreciates the opportunity to comment as requested in the "*Notice of Availability of the Environmental Protection Agency's Updated Ozone Transport Modeling Data for the 2008 Ozone National Ambient Air Quality Standard (NAAQS)*" (hereafter referred to as the NODA) published in the *Federal Register* on August 4, 2015 (80 *FR* 46271). I would like to offer the attached detailed comments for your consideration.

The EPA's 2017 revised modeling analysis suggests that North Carolina may have a significant contribution (i.e., at least 1 percent of the 75 parts per billion (ppb) 2008 8-hour zone NAAQS) to the ozone monitor in Baltimore, Maryland (hereafter referred to as the Essex monitor) that is a maintenance-only site now but projected by the modeling to exceed the 2008 ozone standard in 2017. The EPA reports that the 2017 maximum design value for the Essex, Maryland monitor will be 76.2 ppb, and North Carolina contributes 0.93 ppb, or 1.2% of the 2008 ozone NAAQS. These revised results are in contrast to the EPA preliminary ozone modeling results for 2018 released on January 22, 2015 that showed that North Carolina does not significantly contribute to any downwind state's ozone problems.

As a result, we have reviewed and prepared extensive comments that identify errors in the 2017 emissions inventory data (particularly for the power sector) and with how the EPA processed its 2017 air quality modeling results for the Essex monitor which had poor model performance for some of the time periods evaluated in the NODA. By addressing our comments and concerns with the 2017 emissions inventory and air quality modeling issues, the EPA will more accurately model ozone transport for North Carolina. By doing so, the DAQ believes that the revised modeling will show that North Carolina does not significantly contribute to ozone issues in any downwind state.

Attachment 1 to this letter provides data and comments for improving the 2017 and 2025 projection year inventories. Attachment 2 provides detailed comments and recommendations for improving the photochemical air quality modeling analysis for the Essex, Maryland monitor and North Carolina's contribution to this monitor. The following provides a brief summary of our major comments included in each of these attachments.

Attachment 1 - Comments on 2017 and 2025 Projection-Year Emissions Inventories

On-road Mobile Source Sector: The DAQ has provided MOVES2014 input databases to be used to project on-road mobile source emissions for the 2017 base case emissions inventory scenario (2017eh_cb6v2_v6). The MOVES2014 input databases were created using procedures consistent with development of on-road emissions inventories for state implementation plan (SIP) and transportation conformity purposes. The DAQ requests that the EPA use these inputs to replace the EPA's projected 2017 data described in the August 2015, Technical Support Document (TSD), *Preparation of Emissions Inventories for the Version 6.2, 2011 Emissions Modeling Platform*. Note that the MOVES2014 input databases reflect the recent relaxation of the summertime gasoline volatility standard for nine North Carolina counties (identified in Attachment 1).

In addition, the DAQ is preparing MOVES2014 input databases to be used to project on-road mobile source emissions for the 2025 base case emissions inventory scenario. The DAQ will submit these files to the EPA on a schedule to be determined through consultation with EPA personnel (most likely in early 2016).

Point Source Sector - Electricity Generating Units (EGUs): The EPA has released three versions of its power sector forecast modeling within the last year. For the first forecast generated by the EPA's Integrated Planning Model - National Electric Energy Data System, version 5.13 (IPM-NEEDS v5.13), the EPA estimated North Carolina's EGU NOx emissions at about 37,700 tons; this value was used in EPA's 2018 preliminary transport modeling that showed that North Carolina has no linkages to ozone problems in a downwind state. For the second forecast (IPM-NEEDS 5.14), the EPA estimated EGU NOx emissions at about 49,500 tons which was used in the EPA's 2017 transport modeling that showed that North Carolina had contributions to the Essex monitor (a maintenance-site) in Maryland. In August 2015, the EPA released a third forecast (IPM-NEEDS 5.15) for its Clean Power Plan rulemaking that estimated 2017 EGU NOx emissions to be 33,400 tons for North Carolina. The conflicting variations between the three EGU forecasts has the potential to significantly alter the EPA's determination of North Carolina linkages to ozone contributions for downwind states. The fact that the highest EGU forecast is causing transport related linkages brings into question the reliability of the EPA's EGU emissions estimates and ozone contributions. At a minimum, the DAQ estimates that North

Carolina's EGU NOx emissions for 2017 are over predicted by 2,860 tons by the EPA, with more pronounced differences at the plant level.

On June 9, 2015, the DAQ submitted written comments to the EPA on the IPM-NEEDS v5.14 results used in the 2017 NODA. In addition to these written comments, we have submitted comments on the NEEDS v5.14 database file to correct errors for the following three coal plants and to correct other issues: Roxboro (Units 1, 2, 3A, 3B, 4A, and 4B), GG Allen (Units 1, 2, 3, 4 and 5), and Marshall (Units 1 and 2). We have also submitted corrections to stack parameters and location coordinates. It is extremely critical that the EPA incorporate all of our comments as they are based on significant changes that have occurred within our EGU fleet since 2011. By incorporating all of the DAQ's comments, the EPA will improve the accuracy of the IPM forecast for North Carolina's EGUs.

Point Source Sector - Non-EGUs: The DAQ prepared two files containing 2017 and 2025 year projection factors for non-EGU point sources. These projection factors incorporate the following improvements to the NODA factors:

1. The NODA factors reflect projections for 2018, while the DAQ factors reflect 2017;
2. The NODA factors reflect data from the Annual Energy Outlook (AEO) 2014, while the DAQ factors use data from the latest AEO (2015); and
3. The NODA factors reflect North American Industry Classification System (NAICS) codes or source classification codes (SCCs), while the DAQ factors reflect our best judgment as to representative growth indicators based on SCC/NAICS combinations.

For facilities with emission units subject to the boiler Maximum Achievable Control Technology (MACT) standards, the DAQ submitted a control packet for EPA to use in preparing the 2017 projection year inventory. North Carolina is the only state that has state-specific emission limits for this rule established under Section 112(j) of the CAA; therefore, it is important that EPA apply this control packet to the 2011 NEI v6.2 to estimate 2017 year emissions and not apply any additional augmentation procedures based on control packet information developed by MARAMA or EPA. North Carolina boilers will transition to the federal Section 112(d) MACT limits beginning May 2019; therefore, the DAQ approves of EPA applying the "MARAMA/FCC Hybrid" approach control packet in lieu of the DAQ's 2017 control packet for estimating emissions for 2025.

Area (Nonpoint) Source Sector: To incorporate the same types of improvements as the NODA projection factors for non-EGU point sources, DAQ has developed two area (nonpoint) source sector projection factors for 2017 and 2025 for incorporation by EPA. While these files cover a large majority of area source categories, DAQ has identified a set of source categories for which we accept EPA's NODA projection factors (e.g., Livestock). With respect to wildfires, DAQ requests that the EPA remove the Pains Bay and Juniper Road wildfires from the 2017 and 2025 projection year inventories because these fires were exceptional events that occurred in 2011 and are not representative of a typical fire year for North Carolina.

Nonroad Source Sector: The DAQ has three major comments with regard to future EPA nonroad mobile source projections for North Carolina. First, we want to make certain that EPA's nonroad modeling accurately reflects the recent relaxation of the summertime gasoline volatility standard for nine North Carolina counties (identified in Attachment 1). Second, we request that EPA replace default national nonroad diesel equipment population growth rates over the 1996-2010 period for the Construction and Farm sectors in the model, which reflect national growth experienced during the 1990s, with actual North Carolina historical diesel fuel consumption data for each sector as reported in official government statistics by the Energy Information Administration. Finally, we ask that EPA use DAQ-developed locomotive projection factors that (1) more accurately reflect the effect of EPA's locomotive emission standards relative to EPA's 2011 locomotive emission estimates, and (2) incorporate North Carolina-specific projected passenger rail emissions activity growth.

Attachment 2 - Comments on Air Quality Transport Analysis for 2017

Although the EPA's revised 2017 v2 modeling indicates that North Carolina has linkages to the Essex maintenance monitor in Maryland, the DAQ's review questions the EPA's findings due to the following factors:

1. The use of recently observed air quality trends and most recent design values show that the Essex, Maryland monitor currently is and is expected to continue to attain the 2008 ozone standard in 2017.
2. Trajectory analysis for the top 4 daily 8-hour ozone concentrations at the Essex monitor in 2010, 2011, and 2012 (ozone data that are used to compute the maximum design value) show that the trajectory for only 1 of the 12 days touched the northern portion of North Carolina, questioning whether North Carolina truly had a contribution to the observed readings. Further analysis was made for the 63 days with ozone ≥70 ppb at Essex from 2009 through 2014. Only 9 of the 63 days had trajectories that crossed into North Carolina. An analysis of the meteorological conditions on these 9 days suggest it is highly unlikely that significant amounts of ozone or ozone precursors were transported from North Carolina to the Essex monitor.
3. The model resolution of 12 kilometers (km) is unable to accurately simulate the effects of the Chesapeake Bay Breeze on modeled concentrations, which has large impacts on the modeled meteorology and air quality conditions at coastal monitors such as Essex. Poor model performance leads to greater uncertainty of future design value and contribution predictions at the Essex monitor.
4. The projected design value at the Essex monitor is inflated by water grid cells in the model. These water grid cells are shown to have much lower mixing heights compared to adjacent land cells which will inflate pollutant concentrations. Also, ozone within these water cells are at least partially the result of local emissions (i.e., shipping traffic) that cannot be controlled by North Carolina. The model is unable to accurately characterize the air quality in these water grid cells and over-predicts ozone concentrations. In addition, in its air quality modeling technical support document, the EPA acknowledges regional differences in model

performance, where the model tends to over-predict ozone concentrations from the Southeast into the Northeast.[1]

5. The EPA's NODA reported model performance results based on statistics at the single monitor grid cell where the monitor is housed. While this method may be appropriate from solely a model performance evaluation standpoint, in this case there is a disconnect between the model performance evaluation and how the significant contribution assessment is conducted. Since the Relative Reduction Factors (RRFs) are calculated using the maximum grid cell in a 3x3 array surrounding the monitor location, and in the case of the Essex monitor, the 3x3 array contains water grid cells, the grid cell with the maximum concentration is rarely the cell containing the monitor. Instead, the maximum concentration actually occurs in a water cell. In situations where the 3x3 array spans a land-water interface, alternative model performance metrics may be appropriate, such as using the maximum value from the 3x3 array to compare to the observation. Alternatively, using the maximum value from the non-water cells in the array to compare to the observation may be appropriate. The model's ability to accurately predict maximum concentrations for use in the RRF calculation is not well characterized by solely looking at the performance at the grid cell containing the monitor. Nevertheless, the model performance of the single grid cell containing the Essex monitor was poor compared to other monitors throughout the domain, as reported in the NODA. The model bias was 6.79 ppb and the mean error was 10.48 ppb, among the highest for all monitors in the eastern US.

6. Due to the complexities associated with land-water interface and the over-predictions modeled for water grid cells, the EPA should determine future maximum design values using alternative approaches: (1) modified 3x3 grid cell array that eliminates grid cells over water and (2) a single cell array focused on the grid cell housing the monitor. Under both of these alternative approaches, the future design values are below the 76 ppb threshold and indicate that the Essex monitor will maintain compliance with the 2008 8-hour ozone NAAQS in 2017.

7. The 2017 ozone contribution from North Carolina to the Essex monitor is 0.45 ppb after removing three days with poor model performance as directed by the EPA's photochemical modeling guidance.[2] The contribution is much more statistically robust and defensible than the 0.93 ppb calculated by the EPA which includes days with poor model performance.

8. Of all the modeled ozone contributions to the Essex monitor, North Carolina had the 5th highest increase of any modeled contribution between 2018 v1 and 2017 v2, and the largest increase was due to boundary conditions. These spatial and inter-model version differences highlight volatility within the modeling platform at the Essex site.

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[1] Updated Air Quality Modeling Technical Support Document for the 2008 Ozone NAAQS Transport Assessment, August 2015, page A-6.
http://www3.epa.gov/airtransport/pdfs/Updated_2008_Ozone_NAAQS_Transport_AQModeling_TSD.pdf.

[2] EPA, 2014: *Draft Modeling Guidance for Demonstrating Attainment of Air Quality Goals for Ozone, $PM_{2.5}$, and Regional Haze*. Available from: http://www3.epa.gov/scram001/guidance/guide/Draft-O3-PM-RH-Modeling_Guidance-2014.pdf.

9. The EPA defines maintenance-only sites as those that have a projected 2017 average design value <76.0 ppb, but a projected 2017 maximum design value ≥76.0 ppb. Given all of the uncertainties associated with modeling the Essex ozone maintenance site and since the 2017 projected design value of the Essex monitor is 76.2 ppb (just 0.2 ppb above the threshold), the DAQ believes that the EPA should apply a more robust acceptance test that accounts for modeling uncertainties for determining a future design value for monitors with poor model performance. Alternatively, the EPA's bright-line test of 1 percent of the NAAQS should not be applied so rigidly for a poor performing monitor to determine significant contributions. The EPA's methodology overstates the 2017 future-year design value for the Essex maintenance site particularly since the Essex monitor has demonstrated attainment with the standard based on 2012-2014 EPA-certified monitoring data and preliminary monitoring data for 2013-2015. Given the uncertainties associated with the EPA's air quality modeling methodology for the Essex, Maryland monitor and its reliance on maximum concentrations for calculating future year design values, we believe that North Carolina's contribution of 1.2 percent (i.e., 0.2 percent above the threshold) should not be used solely to link North Carolina with the Essex ozone maintenance problem.

North Carolina recognizes the importance of getting the 2017 transport modeling "right" as it will form the foundation for interstate transport related rulemaking and other important actions taken in the coming years. We want to request the EPA to take its time to carefully and adequately address technical comments raised herein to ensure that future rulemaking is scientifically and legally defensible. We look forward to a continued dialogue with the EPA and all of our other partners as we work together to create accurate and representative emissions inventories and modeling platforms. Thank you for your consideration of these comments.

Sincerely,

Sheila C. Holman, Director
Division of Air Quality, NCDEQ

SSM/rps

Attachments

cc: Michael Abraczinskas, DAQ
Sushma Masemore, DAQ
Randy Strait, DAQ
William Barnette, Forsyth County Office of Environmental Assistance and Protection
Leslie Rhodes, Mecklenburg County Air Quality
David Brigman, Western Regional Air Quality Agency

Attachment 1

North Carolina Division of Air Quality's Comments on 2017 and 2025 Projection-Year Emissions Inventories

The North Carolina Division of Air Quality's (DAQ) comments on the U.S. Environmental Protection Agency's "*Notice of Availability of the Environmental Protection Agency's Updated Ozone Transport Modeling Data for the 2008 Ozone National Ambient Air Quality Standard (NAAQS)*" are organized by emissions source sector. For the on-road mobile sector, we have submitted MOVES2014 input files containing 2017 activity data directly to the EPA. For the remaining sectors, we have submitted North Carolina-specific data files containing corrections and supplemental data directly to the docket. Table 1 provides the name, format, and a brief description of each file submitted with our comments to the docket.

Table 1. Summary of North Carolina Division of Air Quality Data Files Submitted to EPA Docket No. EPA–HQ–OAR–2015–0500

Sector / File Name	File Format	File Description
Onroad Sector (all files submitted through EPA FTP Site)		
100 compressed archive files named 2017noda_c37###y2017_20151023_cdb.zip where c37### = county FIPS (c37001, c37003, etc. through c37199)	MySQL database, compressed as zip	MOVES2014 format input databases for all 100 North Carolina counties for modeling year 2017
Electricity Generating Units (EGUs)		
NCDAQ_Comments_NEEDS_v514_102315.xlsx; tab = NCDAQ Comments and Direction	Excel	Corrections to input data for several EGUs
NCDAQ_Comments_Parsed_514_2018_102315.xlsx; tab = NCDAQ Comments	Excel	Corrections to modeling assumptions for fuel type and retrofit SO2 and NOx Controls for GG Allen and Marshall that produced inaccurate results in the parsed output file. These comments are not included in the DAQ's comments on the NEEDS 5.14 database file.
NCDAQ_Comments_Update_NEEDS_to_2011NEIv2_CrossReference_102315.xlsx; Added column: Parameter updated	Excel	Corrections to stack parameters and location coordinates for future use.
NCDAQ_Comments_Flatfile_2017_20150319_19mar2015_v1_NC _Stack_102315.xlsx	Excel	Corrections to stack parameters and location coordinates for 2017 modeling file.
Non-EGU Point Source Inventory		
Plant/Emission Unit Closures		
NCDAQ_CLOSURES_2011v6_2_102315.xlsx	Excel	List of all facility and emission unit closures starting January 1, 2011 through September 30, 2015.
Projection Factors		
NCDAQ_PROJECTION_PtGFs_2011_2017_102315.xlsx	Excel	DAQ 2017 year projection factors for non-EGU stationary point source categories.

Sector / File Name	File Format	File Description
NCDAQ_PROJECTION_PtGFs_2011_2025_102315.xlsx	Excel	DAQ 2025 year projection factors for non-EGU stationary point source categories.
Control Factors		
NCDAQ_CONTROL_2011v6_2_2017_BoilerMACT_POINT_v2_102315.xlsx	Excel	DAQ 2017 year boiler MACT/GACT control factors for non-EGU stationary point source categories.
Area (Nonpoint) Source Inventory		
NCDAQ_PROJECTION_NonPtGFs_2011_2017_102315.xlsx	Excel	DAQ 2017 year projection factors for stationary nonpoint source categories.
NCDAQ_PROJECTION_NonPtGFs_2011_2025_102315.xlsx	Excel	DAQ 2025 year projection factors for stationary nonpoint source categories.
Nonroad Source Inventory		
NATION.GRW	Text (comma-separated values)	NONROAD model growth file, incorporating North Carolina-specific growth data for farm and construction sector diesel equipment.
NCDAQ_PROJECTION_Locomotives_2011_2017_102315.xlsx	Excel	DAQ 2017 year projection factors for locomotive source categories
NCDAQ_PROJECTION_Locomotives_2011_2025_102315.xlsx	Excel	DAQ 2025 year projection factors for locomotive source categories

I. On-road Mobile Sector

A. 2017 Model Inputs and Activity Data Used to Develop Mobile Source Emissions Inventories – Submitted through the EIS Gateway

The DAQ has provided MOVES2014 input databases to be used to model on-road mobile source emissions for the 2017 base case emissions inventory scenario (2017eh_cb6v2_v6). The MOVES2014 input databases were created using procedures consistent with development of on-road emissions inventories for state implementation plan (SIP) and transportation conformity purposes. The DAQ requests that the EPA use these inputs to replace the EPA's projected 2017 data described in the August 2015, Technical Support Document (TSD), *Preparation of Emissions Inventories for the Version 6.2, 2011 Emissions Modeling Platform*. Descriptions of the DAQ's data, including how it differs from the proposed EPA data, are given below.

1. Vehicle Miles Traveled (VMT) – The DAQ has provided projected 2017 VMT data for all 100 North Carolina counties. These data are based on the latest available annual Highway Performance Monitoring System (HPMS) data and Travel Demand Modeling (TDM) results, as opposed to the proposed EPA VMT data which are based on fuel use projections. The TDM modeling data also incorporate, at the county level, the effects of planned roadway construction projects which may not be represented in fuel-use-based VMT projections. The DAQ's 2017 VMT values were determined as follows:

a. TDM data for 20 counties (16 whole counties, 4 partial counties) – 2017 VMT values for each road type were taken directly from modeled 2017 TDM results or were interpolated from results for adjacent years.

b. HPMS data for 84 counties (80 whole counties, 4 partial counties) – 2017 VMT values were projected based on the HPMS VMT data for the latest three years available (2012, 2013, and 2014) using procedures recommended by the North Carolina Department of Transportation (NCDOT). Partial county VMT values were obtained by scaling whole county VMT values by the fraction of the total county population within the partial county area.

c. Combined HPMS and TDM VMT data for the 4 counties partially covered by TDM modeling – 2017 VMT values were obtained by adding the partial county TDM and HPMS results.

2. Vehicle Population Data – The DAQ has provided projected 2017 vehicle population data for all 100 North Carolina counties that were obtained using procedures consistent with SIP development and transportation conformity analysis. Unlike the proposed EPA vehicle population data, which are based on fuel use projections, these data are based on the latest available (2014) county-level vehicle registration data from the NCDOT and on the latest certified county human population estimates from the North Carolina Office of State Budget and Management. The county-level 2017 vehicle population projections were calculated by scaling the total 2014 county registered vehicle population by the ratio of the latest certified 2017 and 2014 county-level human population estimates. Each resulting 2017 county-level vehicle population estimate was then disaggregated by vehicle type using the 2014 vehicle type distribution for that county.

3. Updated Data - The revised 2017 MOVES input databases incorporate the following additional changes:

   a. Inspection and Maintenance (I/M) Programs – The following legislatively mandated changes to the I/M program, which were implemented in 2015, are included in the MOVES input databases for the 48 affected counties:
      i. Exemption of newer vehicles from I/M emissions test requirements – changed from the latest model year to the 3 latest model years
      ii. I/M compliance rate - changed from 95% to 96%

   b. Fuel Characteristics - Reid Vapor Pressure (RVP) –
      i. Effective May 30, 2014, the EPA relaxed the summer gasoline volatility standard for the Triangle and the Triad ozone maintenance areas (79 FR 29362). As a result, the following changes to the fuel supply parameters were made:
         - Summer (May – though September 15) fuel supply – change from 7.8 to 9.0 pounds per square inch (psi) RVP for the following North Carolina counties: Davidson, Davie, Forsyth, Guilford, Durham, Granville, and Wake.

ii. Effective October 16, 2015, the EPA relaxed the summer gasoline volatility standard for Gaston and Mecklenburg Counties included in the Charlotte maintenance area for the 2008 ozone standard (80 FR 49164). As a result, the summertime (May – though September 15) RVP was changed from 7.8 to 9.0 psi for Gaston and Mecklenburg Counties.

c. Source Type Age Distribution – The 2017 source type age distribution data for all counties was derived from the 2014 vehicle registration data provided by the NCDOT. First, county-level source type age distribution tables for 2014 were created. Then each source type age distribution was projected to a future year of 2017 using the Age Distribution Projection Tool for MOVES2014 provided by the EPA.

B. Comments Regarding 2017 Extended Idling Emissions from Long Haul Combination Trucks

On May 30, 2014, the DAQ submitted to the EPA detailed comments and recommendations regarding an alternative process for allocating extended idling emissions for the revised 2011NEIv1. Our comments (submitted to Docket No. EPA–HQ–OAR–2013–0809) included a revised county-level allocation of the estimated statewide extended idling hours provided by the EPA. In contrast to the allocation method proposed by the EPA, which distributed extended idling hours to counties solely based on rural interstate (RI) VMT, the DAQ developed a process that uses urban interstate (UI) VMT and available long haul combination truck parking resources as well as RI VMT. The DAQ process does a better job of allocating extended idling hours to counties with high UI VMT and a large number of parking spaces but without RI VMT.

The EPA did revise the method of allocating extended idling hours to the county level. The allocation process now includes both RI and UI VMT. However, the allocation process still does not take into account the availability of truck parking resources. The DAQ believes that this process assigns too many extended idling hours to urban counties like Guilford, Mecklenburg, and Wake that have high RI and UI VMT due to the confluence of interstate highways but also have relatively few truck parking resources. The DAQ finds that parking resources are often concentrated in the counties immediately surrounding these urban centers. The DAQ therefore recommends that the EPA review their extended idling allocation process to determine the effect of parking resource availability on the distribution of extended idling activity.

II. Point Source Sector – Electricity Generating Unit (EGU) Comments

The DAQ has prepared detailed comments on the following files to correct key data for North Carolina's EGUs:

- *NCDAQ_Comments_NEEDS_v514_102315.xlsx* – corrections to input data for several EGUs.
- *NCDAQ_Comments_Parsed_514_2018_102315* – corrections to modeling assumptions for fuel type and retrofit SO2 and NOx Controls for GG Allen and Marshall that produced

inaccurate results in the parsed output file. These comments are not included in the DAQ's comments on the NEEDS 5.14 database file.

- *NCDAQ_Comments_Update_NEEDS_to_2011NEIv2_CrossReference_102315.xlsx* and *NCDAQ_Comments_Flatfile_2017_20150319_19mar2015_v1_NC _Stack_102315.xlsx* – corrections to stack parameters and location coordinates.

These same comments also apply to the NEEDS v5.15 database and associated modeling files.

The following summarizes the DAQ's comments and concerns with the IPM-NEEDS v5.14 2017 forecast for North Carolina's EGUs. It is extremely critical that the EPA incorporate all of our comments because our comments are based on significant changes that have occurred within our EGU fleet since 2011. By incorporating all of the DAQ's comments, the EPA will improve the accuracy of the IPM forecast for North Carolina's EGUs.

A. Background

For EGU's, the EPA prepared the 2018 v6.1 emissions forecast using the Integrated Planning Model-National Electric Energy Data System version 5.13 (IPM-NEEDS v5.13).[1] The DAQ conducted an extensive review of the NEEDS v5.13 data base and submitted its revised data base for North Carolina's EGU fleet to the EPA. The EPA released the NEEDS v5.14 data base and documentation on March 25, 2015 for public review and comment.[2] The EPA incorporated many of the DAQ's comments on v5.13 into its revised data base (NEEDS v5.14) but missed some key revisions and changed some assumptions that resulted in a generation forecast that does not align with recent past and expected future trends in North Carolina's generation mix. The DAQ prepared and submitted additional comments to the EPA on June 9, 2015 for North Carolina's EGUs (provided in Appendix A to this attachment); however, the EPA did not incorporate the requested changes before releasing the 2017 transport modeling results. Consequently, the EPA's 2017 transport modeling is based on the NEEDs v5.14 EGU forecast that overstates NOx emissions for North Carolina.

Subsequently, on August 3, 2015 the EPA released IPM-NEEDS v5.15 that it used to support modeling for the Clean Power Plan.[3] This new forecast yields EGU NOx emissions estimates for 2016 and 2018 that are closer to what the DAQ expects based on forecast data provided by Duke Energy. However, for North Carolina, the EPA used the same NEEDS input data for the 2017 and 2018 power sector modeling forecasts for North Carolina. Thus, the DAQ's comments on the NEEDS v5.14 database also apply to the NEEDS v5.15 database. With these comments, the DAQ prepared revisions in the EPA's requested Excel file format for commenting on the NEEDS database and submitted the Excel file to the docket. In addition, the DAQ also submitted corrections to stack parameters and coordinates for some of its EGUs in a separate Excel file.

[1] EPA's Power Sector Modeling Platform v.5.13, http://www.epa.gov/airmarkets/programs/ipm/psmodel.html.
[2] EPA's Power Sector Modeling Platform v.5.14, http://www.epa.gov/powersectormodeling/psmodel514.html.
[3] EPA's Power Sector Modeling Platform v.5.15, http://www.epa.gov/airmarkets/programs/ipm/psmodel515.html.

As shown in the following discussion, the EPA has produced three conflicting EGU forecasts; two of which EPA used in its draft 2017 and 2018 transport modeling. The fact that the highest EGU forecast is causing transport related linkages brings into question the reliability of the EPA's EGU emissions estimates and ozone contributions.

B. Concerns with IPM-NEEDS v5.14 EGU Forecast used in 2017 Transport Modeling

Comparison of IPM-NEEDS Forecasts: Table 2 compares NOx emissions for North Carolina's EGU fleet for the EPA's three separate IPM-NEEDS forecasts. Based on this comparison, it is clear that the IPM-NEEDS v5.14 forecast that the EPA used in its 2017 transport modeling significantly overestimates NOx emissions as compared to the IPM-NEEDS v5.13 forecast that the EPA used in its initial 2018 transport modeling that demonstrated that North Carolina did not have any significant contributions to ozone problems in other states. In addition, the EPA's most recent IPM-NEEDS v5.15 forecast for the Clean Power Plan projects NOx emissions to be even lower than its IPM-NEEDS v5.13 forecast. The DAQ believes that the previous IPM-NEEDS v5.13 and the most recent IPM-NEEDS v5.15 forecasts more accurately reflect future year NOx emissions for North Carolina's EGU fleet.

At this time it is not clear why the IPM-NEEDS v5.14 NOx emissions forecast is significantly higher that the IPM-NEEDS v5.15 forecast. Since EPA has not released unit-level data for v5.15, the DAQ cannot trace the source(s) of the errors. The difference in emissions may be attributed, in part, to the difference between the Energy Information Administration's Annual Energy Outlook (AEO) national electricity demand forecast that is incorporated into the IPM-region-level demand forecast. The AEO 2014 national electricity demand forecast used for IPM-NEEDS v5.14 is slightly higher than the 2015 AEO national electricity demand forecast used for IPM-NEEDS v5.15. However, to understand the differences between the two IPM-NEEDS versions, the DAQ will need to compare emissions and other assumptions at the EGU level and the EPA has yet to release these results for IPM-NEEDS v5.15.

Table 2. Comparison of Three Recent IPM Forecasts of Annual NOx Emissions for North Carolina EGUs (thousand tons)

IPM-NEEDS Version	2016	2017	2018	2020	2025	2030	2040	2050
v5.13[a]	34.4	**36.1***	37.7	41.4	43.4	44.8	41.4	49.3
v5.14[b]	50.1	**49.5**	49.5	46.3	49.3	47.7	45.6	51.2
v5.15[c]	31.3	**33.4***	35.5	29.4	26.7	27.7	16.4	17.6
%Changes (v5.14 vs. v5.13)	46%	**37%**	31%	12%	14%	6%	10%	4%
%Changes (v5.14 vs. v5.15)	38%	**33%**	28%	37%	46%	42%	64%	66%

* Interpolated value using 2016 and 2018 modeled values because the EPA did not provide 2017 emissions in its data summary file.

a. Used in the EPA's draft 2018 transport modeling analysis, January 22, 2015.

b. Used in the EPA's revised draft 2017 transport modeling analysis, July 23, 2015.

c. Used in the EPA's Clean Power Plan modeling, August 3, 2015 see http://www.epa.gov/airmarkets/programs/ipm/cleanpowerplan.html.

Generation Mix: The IPM-NEEDS v5.14 forecast does not accurately reflect current and future trends in the generation mix for North Carolina. This incorrect modeling of some of Duke Energy's coal and natural gas plants results in significant increases in NOx emissions relative to the previous modeling forecast. The IPM-NEEDS v5.14 forecasts that coal will provide 84 percent of the fossil fuel base load electricity generation in 2017 or 2018, which is a significant shift from current day operations where coal only provides 64 percent of the fossil fuel base load generation (as of December 2014). Since 2011, Duke Energy has built 2,782 megawatts (MW) of new natural gas combined cycle units and these units are all operating at 60 to 70 percent of their annual capacity. In addition, in November 2014 Duke Energy provided the DAQ with its latest forecast up to 2030 and it does not indicate an increase in coal use, but rather a steady decline in coal generation. This trend is also reported in Duke Energy's latest Integrated Resource Plan to the North Carolina Utilities Commission.[4]

Coal-Plant-Specific Errors and Updates: The DAQ has identified the following errors in the EPA's assumptions and the NEEDS v5.14 input data for three coal-fired plants (GG Allen, Marshall, and Roxboro). The DAQ is also identifying an update for the forecast for the Ashville coal plant. Corrections to the errors and updates for Ashville are included in the NEEDs excel file provided by the DAQ.

1. Roxboro Units 1, 2, 3A, 3B, 4A, and 4B (ORIS ID 2712): The EPA accidentally revised the heat rates at these coal-fired units to 14,900 British thermal units per kilowatt hour (Btu/kWh) based on comments pertaining to a wood fired unit located in Roxboro (ORISID 10379), North Carolina. Actual heat rates for the Roxboro units range from 10,051 Btu/kWh and 10,352 Btu/kWh. With Roxboro being one of the largest power plants in North Carolina, which is located close to a neighbor state, it is vital that EPA assign correct heat rates to the Roxboro EGUs as specified in our comments.
2. GG Allen Units 1, 2, 3, 4 and 5 (ORIS ID 2718): Currently, all five coal units are operating 3% to 4% of the time during the ozone season and are equipped with selective non-catalytic reduction (SNCR) NOx controls. The EPA's IPM-NEEDS v5.14 modeling for 2017 shut down Units 1, 2, and 5. For Units 3 and 4, the EPA's IPM-NEEDS v5.14 modeling replaced SNCR with selective catalytic reduction (SCR), significantly increased coal generation for these two units, and applied an uncontrolled NOx rate of 0.36 pound per million British thermal unit (lb/MMBtu) to model post-SCR controlled NOx emissions. As a result, the IPM modeling caused many issues that significantly increased emissions for this plant. Duke Energy has not indicated that it plans to discontinue operation of any of the units by 2017. Under a recent consent decree agreement between the EPA and Duke Energy Corporation, by 2016 Duke must operate the existing SNCR controls for Units 1 and 2 continuously and comply with a 365-day rolling average NOx emission rate of 0.250 lb/MMBtu and a NOx tonnage cap of 600 tons per year per affected EGU. The consent decree also requires Duke

[4] Duke Energy Progress Integrated Resource Plan (Annual Report), September 1, 2014, http://starw1.ncuc.net/NCUC/ViewFile.aspx?Id=badec175-5e4f-4bea-a267-80e113db8c16.
Duke Energy Carolinas Integrated Resource Plan (Annual Report), September 1, 2014, http://starw1.ncuc.net/NCUC/ViewFile.aspx?Id=c3c5cbb5-51f2-423a-9dfc-a43ec559d307.

Energy to permanently shut down Unit 1, 2, and 3 by December 31, 2024.[5] The Duke Energy's forecast for all of Allen's units is 2,133 tons of NOx for 2017. The NEEDs v5.14 estimates GG Allen's emissions for all units at 6,120 tons of NOx, which is much greater than the amount projected by the utility.

3. Marshall Units 1 and 2 (ORIS ID 2727): The IPM forecast retires these units as a result of the SCR retrofit at GG Allen. According to Duke Energy's May 19, 2015 forecast, these coal units will not be retired.

4. Ashville Units 1 and 2 (ORIS ID 2706): Under a recent North Carolina session law, the Asheville coal-fired Units 1 and 2 owned by Duke Energy Progress are required to retire by January 31, 2020 and be replaced with new natural gas-fired units.[6] The retired units are expected to be replaced with a 625 MW natural gas combined cycle unit on site in November 2019. The DAQ has provided estimated emissions and operation data for this plant in the NEEDs v5.14.

Table 3 shows North Carolina coal-fired plant 2017 NOx emissions based on Duke Energy's May 18, 2015 forecast, EPA's 2017 projection based on v5.14, and their difference. The EPA's 2017 NOx emissions forecast for all of North Carolina's coal-fired EGUs is 2,860 tons more than the forecast that Duke Energy submitted to the DAQ (8 percent increase). At the plant level, the EPA projected much higher NOx emissions for Allen (3,987 tons) and Roxboro (2,691 tons) and much lower NOx emissions for Marshall (-5,104 tons) and Belews Creek (-1,817 tons) than the Duke Energy forecast. It is not clear how this shift will impact the modeling results for interstate transport contributions.

Table 3. North Carolina Coal-Fired Plants 2017 NOx Emissions Comparison (tons/year)

Plant	EPA EMP v2 2011	Duke Forecast 2017	2017 IPM-NEEDS v5.14	2017 Difference (EPA-Duke)
Allen	4,401	2,133	6,120	3,987
Roxboro	6,788	7,767	10,458	2,691
Mayo	1,510	2,285	4,088	1,803
Cliffside	710	1,800	2,908	1,108
Asheville	1,037	999	1,190	191
Belews Creek	4,002	7,357	5,540	-1,817
Marshall	9,086	12,850	7,746	-5,104
Retired since 2011	**11,751**			
Total	**39,285**	**35,191**	**38,051**	**2,860**

[5] Consent decree between the United States of America on behalf of the US EPA and Duke Energy Corporation, Civil Action No.: 1:00 cv 1262, September 10, 2015, see http://www2.epa.gov/enforcement/duke-energy-corporation-clean-air-act-caa-settlement.
[6] North Carolina Session Law 2015-110, Senate Bill 716, signed into law on June 24, 2015; See http://www.ncleg.net/Sessions/2015/Bills/Senate/PDF/S716v5.pdf.

III. Point Source Sector – Non-EGU Comments

A. Facility and Emission Unit Closures

The DAQ submitted a data file that lists all of the facility and emission unit closures starting January 1, 2011 through September 30, 2015. This list was developed by identifying the facilities and emissions units included in the 2011NEI v6.2 that have been end dated (i.e., no longer operational). The DAQ requests that EPA not apply any additional augmentation procedures to close facilities and emission units other than those identified in our file. The DAQ specifically excluded closures in the seven counties that are included in the Charlotte maintenance area for the 2008 ozone standard to make the forecast for this area consistent with the forecast developed for the maintenance plan. The seven Charlotte maintenance area counties are: Cabarrus (FIPS 37025), Gaston (FIPS 37071), Iredell (FIPS 37097), Lincoln (FIPS 37109), Mecklenburg (FIPS 37119), Rowan (FIPS 37159), and Union (FIPS 37179).

B. Corrections to Projection Factors

1. Projection Factors

The DAQ prepared two files containing 2017 and 2025 year projection factors for non-EGU point sources. There are three main reasons why the DAQ developed projections factors in response to the NODA:

1. The NODA factors reflect projections for 2018, while the DAQ factors reflect 2017;
2. The NODA factors reflect data from the Annual Energy Outlook (AEO) 2014, while the DAQ factors use data from the latest AEO (2015); and
3. The NODA factors reflect NAICS codes or SCCs, while the DAQ factors reflect our best judgment as to representative growth indicators based on SCC/NAICS combinations.

The DAQ's non-EGU point source growth factors for 2017 are located in the file "*NCDAQ_PROJECTION_PtGFs_2011_2017_102315.xlsx*" and the associated DAQ growth factors for 2025 are in the file "*NCDAQ_PROJECTION_PtGFs_2011_2025_102315.xlsx*." The DAQ specifically requests that EPA perform the following to compile North Carolina non-EGU point source projections for future emissions modeling:

1. Utilize the projection factors supplied by the DAQ in the files "*NCDAQ_PROJECTION_PtGFs_2011_2017_102315.xlsx*" and "*NCDAQ_PROJECTION_PtGFs_2011_2025_102315.xlsx*" into a relevant EPA projection file for the given year. To facilitate this process, the DAQ has prepared the projection factor files using the CoST model's Control Program Projection Packet format.
2. Incorporate EPA's current (2018EMPv1) modeling platform projection factors for the non-EGU point source sectors identified in Table 4.

3. Utilize EPA's current stand-alone future year inventory for biodiesel plants (*Biodiesel_Plants_2018_ff10_11apr2013_v0.csv*)
4. Utilize EPA's current 2018 and 2025 new cement plant inventory files (*cement_newkilns_year_2018_from_ISIS2013_NEI2011v1_17mar2015_v2.csv* and *cement_newkilns_year_2025_from_ISIS2013_NEI2011v1_30jan2015_v1.csv*), with the exception of removing Titan Cement records from EPA's 2018 file because this facility will not be operational by 2017.

Table 4. List of Current EPA Modeling Platform Sectors for which the DAQ Requests Use of Existing EPA Projection Factors

Platform Sector	Platform Abbreviation	TSD Pages	2017 Filename	2025 Filename
Livestock	Ag	101-102	*PROJECTION_2011_2017_ag_2011v6.2_no_RFS2_04feb2015.csv*	*PROJECTION_2011_2025_ag_2011v6.2_no_RFS2_23jan2015.csv*
Locomotives and Category 1&2 Marine Vessels[1]	c1c2rail and ptnonipm	102-104	*PROJECTION_2011v6.2_2017_c1c2rail_BASE_06feb2015.csv*	*PROJECTION_2011v6.2_2025_c1c2rail_BASE_06feb2015.csv*
Category 3 Marine Vessels	C3marine	104-105	*PROJECTION_2011_2017_C3_CMV_ECA_IMO_2011v6.2_10feb2015.csv*	*PROJECTION_2011_2025_C3_CMV_ECA_IMO_2011v6.2_10feb2015.csv*
Aircraft	ptnonipm	121-123	*PROJECTION_2011_2017_aircraft_ST_and_by_airport_22jan2015.txt*	*PROJECTION_2011_2025_aircraft_ST_and_by_airport_22jan2015.txt*
Residential Wood Combustion	rwc	126-128	*PROJECTION_2011_2017_RWC_2011v6.2_03mar2015.csv*	*PROJECTION_2011_2025_RWC_2011v6.2_03mar2015.csv*

[1] As discussed in the text of this section, EPA should only incorporate their Category 1&2 Commercial Marine Vessel projection factors (DAQ has developed/submitted projection factors for Locomotives).

Due to the improvements associated with the DAQ factors, we request that EPA replace the existing 2018EMPv1 platform growth factors with the data compiled as described above. The DAQ growth factors were developed from a combination of data sources including the latest AEO projections as well as state-specific information (e.g., county population and vehicle miles traveled projections).

1. Titan Cement

The DAQ specifically requests that the EPA remove Titan Cement (region_cd = 37129, facility_id = ISIS_CEMENT, unit_id = NCNEW1) from the 2018 new kilns file (*cement_newkilns_year_2018_from_ISIS2013_NEI2011v1_17mar2015_v2.csv*). This change is based on recent information that indicates that the plant will not begin operating until after 2020. This plant should be included in projection year inventories after 2020.

C. Corrections to Control Factors

1. Boiler MACT

Non-EGU Point Sources – 2017 Forecast

For non-EGU point sources, the DAQ submitted a new control packet and requests that the EPA apply this control packet to North Carolina's 2011NEIv2 base year inventory to forecast emissions for 2017. The DAQ requests that the EPA not apply any additional controls based on either EPA or the MARAMA/FCC Hybrid approaches noted in the technical support document. The control packet includes non-EGU point source controls by pollutant for emission units that either qualify as major (MACT) or area (GACT) sources. For the boiler MACT, North Carolina adopted state-specific rules under Section 112(j) of the Clean Air Act which are different from the federal rules. Except for one facility, owners and operators of boilers that qualify as major sources in North Carolina opted to incorporate Section 112(j) state-specific emission limits into their Title V permits effective in 2015, and will not be subject to the Section 112(d) emission limits until May 2019.

Table 5 shows the control factors that the DAQ developed to estimate emission reductions associated with Section 112(j) limits. These emission reduction estimates were developed based on a literature review and emissions reductions associated with boiler tune-ups and energy assessments which are the methods by which owners and operators are anticipated to comply with the Section 112(j) limits.

Table 5. DAQ Control Factors for Boiler MACT and GACT for 2017

Facility/Fuel Category	Fuel Category	Percent Emission Reduction from 2011 NEI					
		CO	VOC and HAP-VOC*	NOx	PM**	SO_2	HCl***
Major Sources – All boiler sizes	Average for all common fuels	22	22	4	4	4	4
	-Coal	34	34	4	4	4	4
	-Wood	27	27	4	4	4	4
	-Oil	6	6	4	4	4	4
	-Gas	4	4	4	4	4	4
Non-major source – All boiler sizes Common fuels	Common Fuel (coal, wood, fuel oil, or natural gas)	45	45	4	4	4	4

* HAP-VOC pollutants to which emission reduction should be applied include: 1,3-Butadiene (106990), Acrolein (107028), Formaldehyde (50000), Methanol (67561), Benzene (71432), and Acetaldehyde (75070).
** A 4% control efficiency was applied to emissions associated with all PM species (PM10-PRI, PM10-FIL, PM25-PRI, PM25-FIL, and PM-CON).
*** HCL=Hydrochloric acid (7647010).

The DAQ removed from the boiler MACT control packet file facilities and emission units that are included in the Facility and Emission Unit Closures file. In addition, the DAQ has removed from the boiler MACT control packet facilities and emission units that have closed in the seven counties that are included in the Charlotte maintenance area for the 2008 ozone standard to make the forecast for this area consistent with the forecast developed for the maintenance plan. The DAQ requests that the EPA apply the plant closure file prior to applying the boiler MACT control packet file when projecting emissions from the 2011 base year inventory.

The one facility that incorporated Section 112(d) requirements in its operating permit is:

- Kurz Transfer Products, LP (EIS Facility ID 7379311, FIPS 37057): The 2011NEIv2 emissions for this facility reflect compliance with the Section 112(d) emission limits; therefore, the DAQ requests that EPA not apply additional controls to this facility. Note that this facility is included in the 2017 control packet with the control efficiency set to zero for all pollutants.

Non-EGU Point Sources – 2025 Forecast

For the 2025 forecast year, the DAQ requests that the EPA apply the MARAMA/FCC Hybrid approach because by 2025 owners and operators of boilers in North Carolina will have been subject to the federal Section 112(d) emission limits for five to six years. As previously noted, the Kurz Transfer Products facility (EIS Facility ID 7379311) should be excluded from additional controls in 2025 because the 2011NEIv2 emissions for this facility reflect compliance with the Section 112(d) emission limits.

Nonpoint (Area) Sources – 2017 and 2025 Forecasts

For the nonpoint (area) source emissions inventory, the DAQ agrees with the EPA applying its control packet for both the 2017 and 2025 forecast.

IV. Area Source Sector

A. Corrections to Projection Factors

1. Projection Factors

In response to EPA's NODA, the DAQ prepared two new files containing 2017 and 2025 year North Carolina projection factors for nonpoint source categories. The 2017 factors are located in the file "*NCDAQ_PROJECTION_NonPtGFs_2011_2017_102315.xlsx*" and the associated growth factors for 2025 are in the file "*NCDAQ_PROJECTION_NonPtGFs_2011_2025_102315.xlsx*." The DAQ specifically requests that EPA perform the following to compile North Carolina nonpoint source projections for future emissions modeling:

1. Utilize the projection factors supplied by the DAQ in the files "*NCDAQ_PROJECTION_NonPtGFs_2011_2017_102315.xlsx*" and "*NCDAQ_PROJECTION_NonPtGFs_2011_2025_102315.xlsx*" into a relevant EPA projection file for the given year. To facilitate this process, the DAQ has prepared the projection factor files using the CoST model's Control Program Projection Packet format.

2. Incorporate EPA's current (2018EMPv1) modeling platform projection factors for the nonpoint source categories noted in Table 4.
3. Utilize EPA's stand-alone nonpoint source inventories for Portable Fuel Containers (*pfc_2018_2011v6.2_ff10_28jan2015_v0.csv*; and *pfc_2025_2011v6.2_ff10_28jan2015_v0.csv*)

2. Wildfires

The DAQ requests that the EPA remove the following two wildfires from the 2017 and 2025 projection year inventories. These fires are exceptional events that occurred in 2011 and are not representative of a typical fire year for North Carolina.

Pains Bay (Dare Bomb Range in Dare County) – NCST-802-20110025
Start Date: 05/05/2011
End Date: 07/08/2011
21,290 acres burned

Juniper Road (Pender County) – NCST-071-20110067
Start Date: 06/18/2011
End Date: 08/31/2011
31,140 acres burned

V. Non-Road Sector

A. Corrections to Reid Vapor Pressure Values

In the DAQ's comments on EPA's previous modeling platform (2018EMPv1), we requested that EPA incorporate revisions to NMIM county database fuel parameter entries for certain North Carolina counties. These revisions accounted for the EPA Administrator's approval of North Carolina's request to relax the summertime gasoline volatility standard for seven counties effective May 30, 2014. The DAQ specifically provided EPA with a "countyyearmonth" table in Excel format that displayed gasoline ID revisions (changing ID 17 to ID 2) for May through September for each of the seven affected counties (Davidson, Davie, Durham, Forsyth, Granville, Guilford, and Wake). On October 16, 2015, the DAQ received approval from EPA of a request for a similar relaxation for Gaston and Mecklenburg counties. Our review of the nonroad model inputs in the MOVES2014 model indicates that each of these nine counties are assigned the appropriate summertime RVP value. While working to prepare these comments, the DAQ asked EPA to confirm that EPA will be performing future year nonroad source emissions modeling using MOVES2014 rather than the National Mobile Inventory Model (NMIM). Because of uncertainty as to which model will be selected, EPA requested that the DAQ highlight in these comments that: (1) use of the MOVES2014 default RVP values is appropriate for North Carolina, but that (2) EPA should ensure that the DAQ has the opportunity to review NMIM's RVP inputs before any EPA use of that model. If EPA chooses to run NMIM, we therefore specifically request that EPA provide the DAQ with the version of the "countyyearmonth" table that EPA plans to use for this run. If appropriate, the DAQ will then submit updates to this table for use in EPA's NMIM run.

B. NONROAD Growth

The NONROAD model incorporates sector-specific equipment population growth rates that are used to project nonroad mobile source emissions activity. These growth rates generally reflect sector-level changes in national equipment populations during the 1990s. Because the 1990s represented a period of greater levels of economic prosperity than experienced more recently, and because of concerns with the representativeness of national growth rates for North Carolina, the DAQ prepared a comparison of NONROAD farm and construction diesel equipment growth indices with 1996-2010 North Carolina distillate fuel consumption data for the farm and construction sectors as reported by the U.S. Energy Information Administration (EIA). The DAQ determined that NONROAD is projecting 44.6 percent growth in 1996-2010 construction diesel equipment activity in the nation, while North Carolina's construction diesel consumption *decreased* 33.3 percent over this period. While NONROAD also overstated farm diesel equipment activity in North Carolina between 1996 and 2010, the magnitude was much less – NONROAD projected growth of 41.4 percent, while North Carolina farm diesel consumption grew by only 28.5 percent over this period.

Given the significant discrepancy between the national projected values and the actual historical North Carolina values, the DAQ requests that EPA incorporate North Carolina-specific growth data in future MOVES2014/NMIM runs for nonroad source categories. Table 6 displays a comparison of the EPA's NONROAD default growth indices for diesel farm and construction equipment, with analogous indices developed using actual diesel consumption data up through 2010, supplemented with the default NONROAD growth rates to estimate post-2010 emissions.

Table 6. NONROAD Default and EIA Fuel Consumption-Based Growth Indices

	Farm Diesel		Construction Diesel	
Year	**NONROAD**	**EIA-Based***	**NONROAD**	**EIA-Based***
1996	1000	1000	1000	1000
1998	1063	1059	1063	1423
2000	1126	1227	1125	810
2005	1271	992	1286	708
2010	1414	1285	1446	767
2015	1558	1416	1607	852
2025	1845	1677	1927	1022

* Represents DAQ-requested North Carolina inputs for future EPA nonroad modeling.

The DAQ has developed a revised NONROAD model growth input file (***NONROAD.GRW***) that includes NC-specific records reflecting the EIA-based indices in Table 6. We request that EPA use this file if NMIM is chosen for future nonroad source modeling runs. If EPA decides to run MOVES2014 to project nonroad mobile source emissions, then DAQ requests that EPA incorporate the Table 6 NC-specific growth index values into the model before performing the model run.

C. Locomotive Projection Factors

The EPA developed 2011 locomotive/rail yard emission estimates by projecting the 2008 ERTAC developed inventory. The DAQ understands that EPA did not make control adjustments to account for the effects of locomotive emission standards. The source category/year-specific effects of these emission standards are represented by the locomotive emission rates shown in *Emission Factors for Locomotives* (EPA-420-F-09-025). The EPA's locomotive sector modeling platform projections are based on EPA's 2011 inventory and forecast year emission estimates found in *Regulatory Impact Analysis: Control of Emissions of Air Pollution from Locomotive Engines and Marine Compression Ignition Engines Less than 30 Liters Per Cylinder* (EPA420-R-08-001). These emission estimates considered phase-in of cleaner locomotives after 2011 but used the *Annual Energy Outlook 2006* to project growth.

To improve the 2017 modeling inventory, the DAQ has prepared and submitted projection factors for locomotive source categories that generally base emissions activity growth from 2011 to each forecast year on energy consumption projections in AEO 2015, and reflect the emission rate improvements shown in EPA-420-F-09-025 between 2008 and each forecast year (for passenger rail, emissions activity growth is based on North Carolina-specific information). For rail yards and locomotives of Class I railroads, the projection factors incorporate emission rate adjustments from 2008 to account for EPA not incorporating 2011/2008 control adjustments into the 2011 inventory (the 2008 to 2011 adjustments only apply to these source categories because the emission rates don't change over that period for Class II/III railroads). For passenger railroad locomotives, the control adjustments are relative to 2011 because the DAQ-generated emission estimates incorporated into EPA's 2011 inventory reflect 2011 emission rates. It is important to emphasize that the locomotive factors that we've supplied only replace a portion of the projection factors in EPA's "c1c2rail" platform projection factor files—DAQ accepts the use of EPA's projection factors for Commercial Marine Vessel SCCs in these files.

Attachment 2

North Carolina Division of Air Quality's Comments on the Environmental Protection Agency's 2017 Air Quality Modeling Platform

The following sections present the U.S. Environmental Protection Agency's (EPA) findings related to North Carolina's future design values and interstate contributions in the "*Notice of Availability of the Environmental Protection Agency's Updated Ozone Transport Modeling Data for the 2008 Ozone National Ambient Air Quality Standard (NAAQS)"* (hereafter referred to as the NODA) published in the *Federal Register* on August 4, 2015 (80 *FR* 46271). A detailed discussion of the North Carolina Division of Air Quality's (DAQ) concerns with the performance of the air quality model is also provided.

North Carolina Contributions

Actual observed ambient and 2017 projected average and maximum ozone design values, and contributions from North Carolina, at each of the 2017 nonattainment and maintenance-only receptors in the Eastern U.S. are provided in Tables 1 and 2, respectively.[1] The maximum contribution by North Carolina to a nonattainment area in 2017 is 0.55 parts per billion (ppb), which is below the 1 percent significant contribution threshold.

Table 1. Ambient and 2017 Design Values (DVs) and North Carolina Contributions to Nonattainment Areas in the Eastern U.S.

Site ID	State	County	2009-2013 Average Design Value (ppb)	Projected 2017 Average Design Value (ppb)	2017 North Carolina Contribution (ppb)*
90013007	Connecticut	Fairfield	84.3	77.1	0.55
90019003	Connecticut	Fairfield	83.7	78.0	0.47
90099002	Connecticut	New Haven	85.7	77.2	0.38
240251001	Maryland	Harford	90.0	81.3	0.46
360850067	New York	Richmond	81.3	76.3	0.55
361030002	New York	Suffolk	83.3	79.2	0.38
390610006	Ohio	Hamilton	82.0	76.3	0.13
480391004	Texas	Brazoria	88.0	81.4	0.08
481210034	Texas	Denton	84.3	76.9	0.08
482011034	Texas	Harris	81.0	76.8	0.16
482011039	Texas	Harris	82.0	78.2	0.06
484392003	Texas	Tarrant	87.3	79.6	0.09
484393009	Texas	Tarrant	86.0	78.6	0.13
551170006	Wisconsin	Sheboygan	84.3	77.0	0.06
			Maximum Contribution		0.55

* North Carolina Contributions obtained from: http://www.epa.gov/airtransport/pdfs/2017 Ozone Contributions_Transport NODA.xlsx.

[1] Nonattainment receptors have a 2017 average design value of ≥76.0 ppb. Maintenance receptors have a 2017 average design values <76.0 ppb, but 2017 maximum design value of ≥76.0 ppb.

Table 2. Ambient and 2017 Design Values (DVs), and North Carolina Contributions, to Maintenance Areas in the Eastern U.S.

Site ID	State	County	2009 - 2013 Maximum Design Value (ppb)	Projected 2017 Maximum Design Value (ppb)	2017 North Carolina Contribution (ppb)*
90010017	Connecticut	Fairfield	83.0	78.4	0.33
211110067	Kentucky	Jefferson	85.0	78.6	0.01
211850004	Kentucky	Oldham	86.0	77.3	0.02
240053001	Maryland	Baltimore	84.0	76.2	0.93
260050003	Michigan	Allegan	86.0	78.5	0.05
261630019	Michigan	Wayne	81.0	76.2	0.32
340071001	New Jersey	Camden	87.0	78.1	0.07
340150002	New Jersey	Gloucester	87.0	77.5	0.33
340230011	New Jersey	Middlesex	85.0	76.3	0.50
340290006	New Jersey	Ocean	85.0	76.6	0.33
360810124	New York	Queens	80.0	77.6	0.39
420031005	Pennsylvania	Allegheny	82.0	76.5	0.07
421010024	Pennsylvania	Philadelphia	87.0	78.4	0.72
480850005	Texas	Collin	84.0	76.0	0.14
481130069	Texas	Dallas	84.0	78.0	0.22
481130075	Texas	Dallas	83.0	76.7	0.16
481211032	Texas	Denton	84.0	76.3	0.11
482010024	Texas	Harris	83.0	78.5	0.14
482010026	Texas	Harris	80.0	76.1	0.00
482010055	Texas	Harris	83.0	77.0	0.16
482011050	Texas	Harris	80.0	76.2	0.05
484390075	Texas	Tarrant	83.0	76.4	0.05
484393011	Texas	Tarrant	83.0	76.6	0.10
			Maximum Contribution		0.93

* North Carolina Contributions obtained from: http://www.epa.gov/airtransport/pdfs/2017 Ozone Contributions_Transport NODA.xlsx.

The maximum contribution by North Carolina to maintenance in 2017 is 0.93 ppb to the Essex monitor in Baltimore, Maryland, which is 1.2 percent of the standard. Given that the 2017 modeling shows a contribution slightly over the 1 percent threshold for the Essex monitor and that the EPA's 2018 modeling did not, the DAQ conducted further analyses, which are summarized in the following sections, to understand the factors that appear to be overestimating North Carolina's contribution to the Essex monitor.

Sensitivity of Future Design Value Calculations

The DAQ analyzed the future design values that the EPA estimated for the Essex monitor for a variety of different scenarios for computing the base design value (see Table 3). The Relative Reduction Factor (RRF) from the projected 2017 modeling was used for all calculations. This sensitivity analysis shows that the use of the maximum design value within the 2009-2013 base period (i.e., 84 ppb observed in 2010-2012) is the only scenario in which the Essex monitor would exceed the 2008 ozone standard in 2017. This is the same scenario used by the EPA in the 2017 modeling to link North Carolina with Maryland. However, when more recent observed design values are used, the Essex monitor will maintain compliance with the 2008 8-hour ozone NAAQS in 2017 under all scenarios (see Table 3). In fact, ozone values have decreased dramatically at the Essex monitor since 2012 and the monitor reached attainment with the standard in 2014. Based on current monitoring data, it is likely that Essex will continue to attain the 2008 ozone NAAQS in 2015 (see Table 4). In conclusion, we believe that the use of more recent design values does not show that the Essex maintenance monitor could exceed the ozone NAAQS in the future and thus, does not link North Carolina as contributing significantly to ozone maintenance problems in Maryland. **The EPA should consider recent ozone trends to understand whether or not a monitor will have nonattainment or maintenance issues in 2017.**

Table 3. Ozone Base and Future Design Value Calculations for a Variety of Base Design Value Scenarios at the Essex Ozone Monitor Site

Base Scenario*	Base Design Value (ppb)	2011-2017 Relative Reduction Factor (RRF)	Future Design Value (ppb)
5-year unweighted average, 2009-2013	78.2	0.907	70.9
5-year weighted average, 2009-2013**	80.7	0.907	73.2
5-year unweighted average, 2010-2014	77.4	0.907	70.2
5-year weighted average, 2010-2014	78.4	0.907	71.1
2010-2012 design value***	84.0	0.907	**76.2**
2011-2013 design value	78.6	0.907	71.2
2012-2014 design value	72.6	0.907	65.8
2013-2015 design value	68.3	0.907	62.5

* A weighted average is the average of the three design values within the 5-year period of study. An unweighted average gives equal weight to each year's 4th-highest ozone value within the 5-year period of study.
** This value is given as the "average 2009-2013 design value" for the Essex ozone monitor in the USEPA's 2017 modeling NODA.
*** This value is given as the "maximum 2009-2013 design value" for the Essex ozone monitor in the USEPA's 2017 modeling NODA.

Table 4. Fourth-Highest Ozone Values at the Essex Ozone Monitoring Site

4th-Highest Ozone Value		Design Value	
Year	PPB	Year	PPB
2009	71		
2010	84		
2011	85	2009-2011	80.0
2012	83	2010-2012	84.0
2013	68	2011-2013	78.6
2014	67	2012-2014	72.6
2015	70	2013-2015*	68.3

***** Represents 4th-highest value at Essex monitor as of October 10, 2015.

Comprehensive Air Quality Model with Extensions (CAMx) Model Performance Analysis

To demonstrate the model performance, the EPA provided the statistics for all monitors with mean observed ozone greater than 70 ppb and more than 10 days with observed ozone at or above 60 ppb in the NODA (see Table 5). This cutoff was applied to evaluate the model for a statistically significant number of days with elevated ozone which are more policy relevant (i.e., ozone sufficiently high to be used as days to compute the RRF). Note that in reporting model performance related to those monitors that were ultimately linked to nonattainment or maintenance, the EPA shows only the statistics for the single cell in the 3x3 array where the monitor is housed. The single cell model performance of the Essex monitor, while within the statistical parameters that the EPA deems acceptable, was poor compared to other monitors throughout the domain, having the third greatest bias of these monitors.

The true model performance for the Essex monitor should be based on the grid cell with the highest value in the base model run (i.e., water cell with elevated ozone values). As discussed later, this method shows a significantly higher mean bias and absolute error, and is the true representation of the EPA's method used to link North Carolina with the Essex monitor.

Table 5. May to September 2011 v2 Ozone Model Performance Statistics within the Single Monitor Grid Cell for Monitors with Mean Observed Ozone >70 ppb and >10 Days with Observed Ozone ≥60 ppb

Site_ID	State	County	Number of Obs ≥60 ppb	Obs Mean (ppb)	Model Mean (ppb)	Obs Median (ppb)	Model Median (ppb)	Mean Bias (ppb)	Mean Error (ppb)	Normalized Mean Bias (%)	Normalized Mean Error (%)
90110124	Connecticut	New London	25	70.92	80.15	68.38	78.30	9.23	14.80	13.02	20.86
371191005	North Carolina	Mecklenburg	40	70.08	78.81	69.31	77.48	8.73	13.32	12.45	19.00
240053001	Maryland	Baltimore	44	70.33	77.12	67.00	78.44	6.79	10.48	9.65	14.90
340290006	New Jersey	Ocean	27	73.32	79.64	73.00	82.02	6.33	8.84	8.63	12.05
420170012	Pennsylvania	Bucks	26	70.29	76.59	69.06	76.91	6.30	9.52	8.96	13.54
515100009	Virginia	Alexandria City	41	70.46	76.52	66.83	75.31	6.06	11.92	8.60	16.92
510360002	Virginia	Charles City	26	70.57	76.34	68.08	75.59	5.78	9.70	8.18	13.75
90090027	Connecticut	New Haven	16	73.58	78.80	71.38	72.37	5.22	11.16	7.09	15.17
132470001	Georgia	Rockdale	70	70.58	75.74	69.31	75.13	5.16	8.24	7.31	11.68
240030014	Maryland	Anne Arundel	41	71.26	76.15	68.63	72.45	4.89	10.05	6.87	14.10
340250005	New Jersey	Monmouth	27	70.79	74.92	66.88	74.96	4.13	8.51	5.83	12.03
240330030	Maryland	Prince Georges	31	70.56	74.31	67.38	72.19	3.75	8.43	5.31	11.95
291890014	Missouri	St Louis	36	70.27	73.93	69.04	71.77	3.66	8.48	5.20	12.07
371190041	North Carolina	Mecklenburg	57	70.90	74.54	69.75	73.38	3.63	9.29	5.12	13.10
90093002	Connecticut	New Haven	25	74.28	77.87	69.38	75.09	3.60	9.20	4.84	12.39
220770001	Louisiana	Pointe Coupee	21	70.21	73.58	69.63	73.14	3.37	4.30	4.80	6.12
250070001	Massachusetts	Dukes	17	72.73	75.96	69.57	78.39	3.22	9.04	4.43	12.42
550890009	Wisconsin	Ozaukee	13	70.44	73.65	69.75	75.95	3.21	11.73	4.55	16.65
482010047	Texas	Harris	30	70.00	73.10	67.69	72.12	3.10	8.90	4.43	12.71
90019003	Connecticut	Fairfield	29	71.95	75.00	69.63	71.39	3.05	8.82	4.23	12.25
240338003	Maryland	Prince Georges	38	73.68	76.71	72.06	73.13	3.03	9.48	4.11	12.87
131210055	Georgia	Fulton	69	70.05	72.89	68.63	71.66	2.84	10.73	4.05	15.32

Site_ID	State	County	Number of Obs ≥60 ppb	Obs Mean (ppb)	Model Mean (ppb)	Obs Median (ppb)	Model Median (ppb)	Mean Bias (ppb)	Mean Error (ppb)	Normalized Mean Bias (%)	Normalized Mean Error (%)
240290002	Maryland	Kent	42	70.91	73.62	68.38	71.87	2.70	6.87	3.81	9.69
100031013	Delaware	New Castle	34	70.79	73.45	66.37	72.18	2.66	7.57	3.76	10.70
510590030	Virginia	Fairfax	46	70.30	72.16	66.13	72.02	1.86	10.11	2.65	14.38
482010416	Texas	Harris	24	71.11	72.66	68.96	73.53	1.54	7.99	2.17	11.23
90013007	Connecticut	Fairfield	26	72.95	74.31	71.38	69.93	1.35	9.47	1.86	12.98
60659001	California	Riverside	80	73.92	75.13	71.38	74.78	1.21	8.61	1.64	11.65
90070007	Connecticut	Middlesex	20	70.60	71.72	67.06	70.82	1.11	7.43	1.58	10.52
360050133	New York	Bronx	19	70.48	71.41	69.63	71.64	0.93	7.02	1.32	9.96
482011050	Texas	Harris	26	71.28	72.18	69.88	73.26	0.89	8.25	1.25	11.58
290470005	Missouri	Clay	35	70.09	70.89	67.38	69.42	0.80	9.13	1.14	13.03
510130020	Virginia	Arlington	54	70.35	71.02	68.75	70.87	0.68	9.79	0.96	13.92
260210014	Michigan	Berrien	36	70.20	70.79	66.38	66.94	0.59	8.69	0.84	12.38
295100085	Missouri	St Louis City	41	70.06	70.63	69.63	71.12	0.56	9.02	0.80	12.87
340190001	New Jersey	Hunterdon	34	70.43	70.77	69.38	70.99	0.33	5.09	0.47	7.23
240150003	Maryland	Cecil	38	71.30	71.58	68.44	70.05	0.28	7.16	0.39	10.04
60370002	California	Los Angeles	36	72.04	72.17	70.44	70.67	0.13	8.08	0.18	11.22
240251001	Maryland	Harford	54	73.66	73.78	69.25	73.35	0.11	8.84	0.15	12.00
291831002	Missouri	St Charles	55	70.71	70.81	68.63	70.89	0.10	7.10	0.14	10.04
60610003	California	Placer	56	70.59	70.57	68.38	71.17	-0.02	7.53	-0.03	10.67
340230011	New Jersey	Middlesex	41	70.43	70.35	67.25	68.89	-0.07	5.77	-0.11	8.19
391650007	Ohio	Warren	39	71.46	71.04	69.75	73.29	-0.42	10.63	-0.59	14.87
90011123	Connecticut	Fairfield	26	70.04	69.61	66.75	68.93	-0.43	8.34	-0.61	11.90
550590019	Wisconsin	Kenosha	28	70.47	69.94	67.81	67.85	-0.53	7.61	-0.75	10.80
482010055	Texas	Harris	25	74.92	74.14	71.38	74.37	-0.78	6.61	-1.05	8.82
390271002	Ohio	Clinton	49	70.15	69.35	70.00	69.63	-0.79	7.01	-1.13	9.99
340130003	New Jersey	Essex	28	70.87	70.00	69.63	67.07	-0.86	5.74	-1.22	8.10
551010017	Wisconsin	Racine	20	70.74	69.79	68.19	66.46	-0.95	7.81	-1.34	11.04
482010046	Texas	Harris	26	73.17	72.16	73.63	73.82	-1.00	8.88	-1.37	12.14
421011002	Pennsylvania	Philadelphia	34	71.83	70.75	68.81	70.69	-1.07	6.49	-1.49	9.04
211850004	Kentucky	Oldham	53	71.00	69.91	68.88	68.52	-1.09	7.66	-1.53	10.78
220470012	Louisiana	Iberville	34	70.02	68.92	68.77	70.95	-1.10	8.52	-1.58	12.16
340150002	New Jersey	Gloucester	36	73.19	71.94	68.19	72.66	-1.25	7.91	-1.71	10.80
240259001	Maryland	Harford	45	72.24	70.92	69.75	69.73	-1.32	8.46	-1.83	11.71
482010024	Texas	Harris	40	70.83	69.49	69.81	70.95	-1.34	8.52	-1.90	12.03
220150008	Louisiana	Bossier	60	70.04	68.58	67.50	68.45	-1.46	7.38	-2.09	10.54
482010029	Texas	Harris	44	72.87	71.15	70.75	71.20	-1.72	7.50	-2.37	10.30
482011035	Texas	Harris	24	71.89	70.13	69.58	70.90	-1.76	9.52	-2.45	13.24
361030002	New York	Suffolk	34	73.00	71.04	68.48	68.11	-1.95	7.23	-2.67	9.90
261050007	Michigan	Mason	11	71.55	69.52	68.00	69.75	-2.02	8.40	-2.83	11.75
482010075	Texas	Harris	24	70.93	68.50	68.88	69.66	-2.43	7.54	-3.43	10.62
360850067	New York	Richmond	39	71.30	68.81	68.75	67.11	-2.49	7.98	-3.49	11.19
401430137	Oklahoma	Tulsa	64	70.99	68.31	69.00	68.61	-2.68	7.61	-3.78	10.71
482011039	Texas	Harris	29	73.17	70.40	72.63	69.80	-2.78	8.46	-3.79	11.56
482010051	Texas	Harris	26	75.40	72.51	73.56	72.08	-2.90	7.96	-3.84	10.55
401431127	Oklahoma	Tulsa	59	70.53	67.59	68.88	68.76	-2.94	8.58	-4.18	12.17
170317002	Illinois	Cook	19	70.25	67.21	67.25	73.11	-3.04	10.27	-4.33	14.62
481671034	Texas	Galveston	27	71.76	68.59	70.13	67.96	-3.17	8.32	-4.41	11.59
550710007	Wisconsin	Manitowoc	14	73.04	69.85	70.63	69.51	-3.18	8.83	-4.36	12.09
180910005	Indiana	La Porte	36	71.08	67.87	69.81	66.79	-3.21	8.40	-4.51	11.82
390610006	Ohio	Hamilton	58	71.78	68.17	69.44	68.39	-3.60	10.31	-5.02	14.36

Site_ID	State	County	Number of Obs ≥60 ppb	Obs Mean (ppb)	Model Mean (ppb)	Obs Median (ppb)	Model Median (ppb)	Mean Bias (ppb)	Mean Error (ppb)	Normalized Mean Bias (%)	Normalized Mean Error (%)
60170020	California	El Dorado	85	71.34	67.68	70.00	67.65	-3.66	7.42	-5.13	10.41
390610040	Ohio	Hamilton	61	70.08	66.28	67.75	66.81	-3.81	9.70	-5.43	13.84
421010024	Pennsylvania	Philadelphia	47	71.96	68.04	69.13	66.27	-3.92	6.78	-5.45	9.42
60656001	California	Riverside	100	77.15	73.14	76.56	73.49	-4.01	7.48	-5.20	9.69
260270003	Michigan	Cass	31	70.31	66.10	69.38	65.42	-4.21	7.31	-5.99	10.40
60371701	California	Los Angeles	44	72.86	68.54	71.31	69.48	-4.31	8.87	-5.92	12.17
360610135	New York	New York	19	71.72	67.37	71.88	66.19	-4.35	9.18	-6.06	12.79
261470005	Michigan	St Clair	22	70.26	65.49	68.25	65.17	-4.77	9.33	-6.79	13.28
482010026	Texas	Harris	28	71.62	66.81	69.06	68.09	-4.81	8.42	-6.71	11.75
60650012	California	Riverside	88	76.78	71.49	75.19	70.79	-5.29	9.85	-6.89	12.82
484393009	Texas	Tarrant	59	71.38	65.96	68.38	65.58	-5.42	9.22	-7.59	12.92
60610002	California	Placer	10	72.91	67.42	70.13	67.66	-5.49	6.62	-7.53	9.08
550790085	Wisconsin	Milwaukee	12	71.15	65.53	68.50	62.81	-5.62	10.72	-7.90	15.07
60371201	California	Los Angeles	84	70.99	65.20	67.27	65.25	-5.79	8.07	-8.16	11.37
360810124	New York	Queens	25	72.13	66.31	70.25	64.97	-5.82	8.88	-8.07	12.31
482011034	Texas	Harris	35	74.23	68.16	74.25	70.74	-6.07	9.40	-8.18	12.66
482450022	Texas	Jefferson	23	70.15	64.04	70.86	65.87	-6.11	7.16	-8.71	10.21
482450101	Texas	Jefferson	29	73.09	66.67	70.63	64.33	-6.42	8.40	-8.78	11.49
60610006	California	Placer	61	70.54	63.97	69.00	62.82	-6.57	9.40	-9.31	13.33
483550026	Texas	Nueces	16	71.29	64.65	69.56	64.28	-6.64	7.32	-9.32	10.27
60290232	California	Kern	105	71.88	65.09	71.25	64.05	-6.78	7.70	-9.44	10.71
484391002	Texas	Tarrant	34	71.34	64.43	69.44	64.96	-6.91	10.50	-9.68	14.72
60675003	California	Sacramento	67	71.06	64.00	69.25	61.38	-7.07	8.15	-9.94	11.48
551170006	Wisconsin	Sheboygan	26	72.94	65.79	67.19	63.45	-7.15	11.11	-9.80	15.23
482010070	Texas	Harris	26	75.14	67.72	73.94	68.52	-7.42	9.47	-9.87	12.60
60295002	California	Kern	83	74.34	66.83	73.00	66.19	-7.50	7.78	-10.09	10.47
480850005	Texas	Collin	66	72.91	65.38	70.19	65.95	-7.53	10.81	-10.33	14.83
60719004	California	San Bernardino	96	76.81	69.25	74.06	69.80	-7.56	10.14	-9.85	13.20
481211032	Texas	Denton	79	72.70	64.91	69.13	64.11	-7.80	9.42	-10.72	12.96
60670012	California	Sacramento	70	74.81	66.61	74.63	65.82	-8.20	10.86	-10.96	14.51
481210034	Texas	Denton	78	72.71	64.49	69.32	63.18	-8.22	9.65	-11.30	13.27
60990006	California	Stanislaus	76	70.88	62.56	69.38	62.52	-8.32	8.74	-11.73	12.34
60194001	California	Fresno	105	74.09	65.76	73.13	64.92	-8.33	9.00	-11.25	12.14
60290007	California	Kern	113	74.71	66.14	73.38	64.95	-8.58	9.14	-11.48	12.24
60290014	California	Kern	97	71.20	62.49	70.50	62.24	-8.71	9.07	-12.24	12.74
61072010	California	Tulare	115	74.82	65.67	73.88	65.52	-9.15	9.54	-12.23	12.75
60652002	California	Riverside	94	70.23	61.06	68.19	61.10	-9.18	10.18	-13.07	14.49
60710012	California	San Bernardino	117	73.66	64.33	72.38	64.01	-9.33	10.17	-12.66	13.81
480391004	Texas	Brazoria	32	78.43	69.07	77.56	67.74	-9.36	10.62	-11.93	13.54
481130069	Texas	Dallas	49	70.29	60.92	68.25	61.58	-9.38	11.40	-13.34	16.22
60655001	California	Riverside	121	73.17	63.73	71.43	63.85	-9.44	10.01	-12.90	13.68
400190297	Oklahoma	Carter	74	70.09	60.61	67.69	59.72	-9.48	10.40	-13.53	14.84
60658005	California	Riverside	107	73.84	64.23	71.63	64.32	-9.61	11.65	-13.02	15.78
60376012	California	Los Angeles	81	75.14	65.04	71.88	65.00	-10.11	11.56	-13.45	15.39
60190008	California	Fresno	92	73.11	62.88	71.75	61.72	-10.23	10.77	-13.99	14.72
60296001	California	Kern	88	70.44	60.10	70.06	59.60	-10.34	10.45	-14.67	14.84
61070006	California	Tulare	94	72.13	61.59	72.25	62.28	-10.54	10.80	-14.61	14.97
60470003	California	Merced	87	70.10	59.40	70.00	58.85	-10.71	11.11	-15.27	15.85
483670081	Texas	Parker	58	71.28	60.34	68.88	59.30	-10.93	11.11	-15.34	15.58

Site_ID	State	County	Number of Obs ≥60 ppb	Obs Mean (ppb)	Model Mean (ppb)	Obs Median (ppb)	Model Median (ppb)	Mean Bias (ppb)	Mean Error (ppb)	Normalized Mean Bias (%)	Normalized Mean Error (%)
60370016	California	Los Angeles	69	75.89	64.95	73.88	65.86	-10.94	12.67	-14.42	16.69
550790026	Wisconsin	Milwaukee	13	70.19	59.24	68.63	57.76	-10.95	11.79	-15.60	16.80
481130075	Texas	Dallas	58	72.64	61.64	69.94	62.00	-11.00	12.83	-15.14	17.67
60651016	California	Riverside	115	77.92	66.79	76.50	66.65	-11.14	12.31	-14.29	15.80
60379033	California	Los Angeles	120	74.75	63.16	74.50	62.99	-11.59	12.02	-15.51	16.08
484392003	Texas	Tarrant	76	74.37	62.48	70.44	61.99	-11.89	12.43	-15.99	16.72
60712002	California	San Bernardino	92	75.79	63.78	72.44	62.74	-12.02	13.39	-15.85	17.67
60195001	California	Fresno	101	75.78	63.75	74.33	62.55	-12.03	12.43	-15.87	16.41
60714001	California	San Bernardino	135	76.35	64.19	75.13	64.72	-12.16	13.06	-15.93	17.10
60290008	California	Kern	95	74.43	61.67	73.38	60.88	-12.76	12.76	-17.14	17.14
60719002	California	San Bernardino	122	75.09	62.06	74.25	61.89	-13.03	13.51	-17.35	17.99
60711004	California	San Bernardino	83	75.72	62.46	71.63	61.94	-13.26	14.56	-17.52	19.22
60311004	California	Kings	89	72.19	58.29	70.88	57.82	-13.90	13.95	-19.25	19.32
60390500	California	Madera	41	76.61	61.95	75.63	62.03	-14.66	14.69	-19.14	19.17
60710005	California	San Bernardino	125	81.70	66.31	82.00	65.63	-15.39	15.93	-18.84	19.50
60714003	California	San Bernardino	112	82.60	66.93	81.88	67.69	-15.67	16.29	-18.97	19.72
60658001	California	Riverside	120	79.04	63.29	76.25	63.29	-15.75	16.50	-19.92	20.87
60190242	California	Fresno	104	74.68	58.52	73.69	57.49	-16.15	16.15	-21.63	21.63
60190007	California	Fresno	106	76.21	59.75	74.63	59.09	-16.46	16.57	-21.60	21.74
61070009	California	Tulare	121	81.47	64.29	83.00	64.96	-17.18	17.18	-21.09	21.09

Source: http://www.epa.gov/airtransport/pdfs/Updated_2011_CAMx_Performance_Stats.xlsx). (Table is sorted on mean bias, highest to lowest).

Insufficient Model Resolution

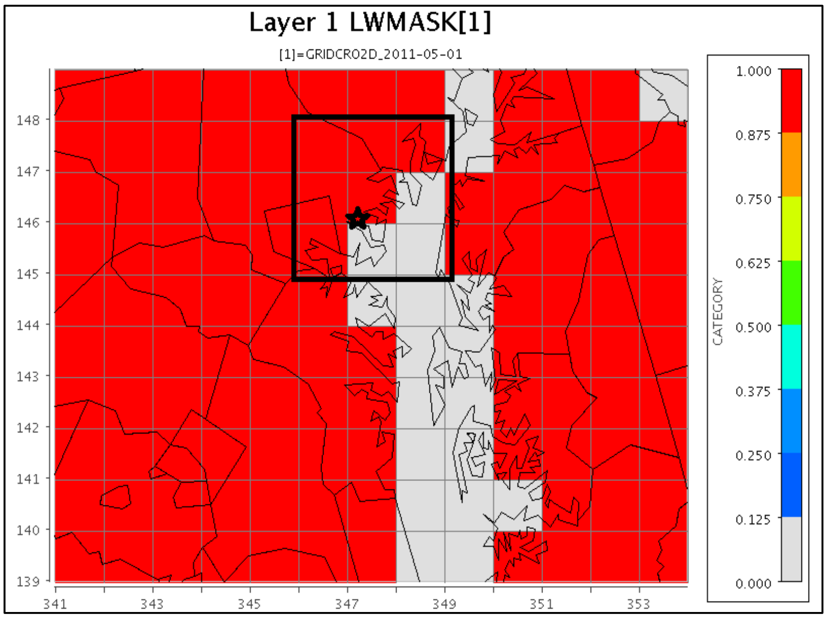
A model resolution of 12 kilometers (km) is unable to accurately resolve the Chesapeake Bay Breeze, which has large impacts on the modeled meteorological and air quality conditions at coastal monitors such as Essex. An examination of the Chesapeake Bay Breeze's effect on surface ozone for the Baltimore metropolitan area by He et al. determined that: "high-resolution (4 km or better) is necessary to predict accurately surface ozone for the Baltimore metropolitan area, and probably for other urban coastal areas where a bay breeze or sea breeze plays an important role in circulation and local air quality."[2] Based on C.P. Loughner et al., simulations at 4.5, 1.5, and 0.5 km resolutions produce more accurate 8 hour maximum ozone concentrations at locations near the Bay Breeze convergence zone compared to the 13.5 km resolution.[3] Studies from C.P. Loughner et al. found differences of 10 ppb between the 13.5 km and 0.5 km simulations over the Chesapeake Bay, which is supported by the fact that the mean error at the Essex monitor in the EPA's 2011 Ozone Model Performance statistics was 10.48 ppb. The EPA

[2] He et al., Atmospheric Environment 85 (2014) 18-30.
[3] C.P. Loughner et al., Atmospheric Environment 45 (2011) 4060-4072.

should consider 4 km or finer scale modeling to assess future ozone nonattainment and contributions at coastal monitor sites.

Coastal Sites and the 3x3 Grid Cell Array

The EPA's methodology to calculate RRFs, future design values, and contributions uses ozone data for a 3x3 grid cell array around a monitor.[4] For coastal sites like Essex, a portion of the 3x3 cell array will capture grid cells that are over water. As seen in Figure 1, two of the nine grid cells within the array are almost entirely water cells, while another is predominantly a water cell. However, meteorological and air quality conditions over the water are not consistent with those over land, including at the Essex monitor.



Note: The star denotes the location of the monitor. Red cells are land, gray cells are water.

Figure 1. Land-Water Mask for Grid Cells Near the Essex, Maryland Monitor.

Oftentimes, photochemical air quality models such as CAMx and the Community Multiscale Air Quality (CMAQ) model produce higher concentrations of ozone over interior bodies of water including the Chesapeake Bay than over adjacent land. In July 2011, Goldberg et al. did an analysis of surface ozone concentrations over the Chesapeake Bay and compared them to model predictions.[5] They found that surface ozone concentrations were 10 to 20 percent higher over the bay than the closest upwind surface ozone monitors (such as Essex). The marine environment over the Chesapeake Bay is characterized by lower boundary layer heights and less cloud cover

[4] USEPA 2007, Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, PM2.5, and Regional Haze, page 26. Available from http://www.epa.gov/scram001/guidance/guide/final-03-pm-rh-guidance.pdf.
[5] Daniel L. Goldberg et al. / Atmospheric Environment 84 (2014) 9-19.

compared to adjacent land locations, which will tend to concentrate ozone precursors and promote more rapid ozone formation. Additionally, Goldberg et al. concluded that one of the primary reasons for the higher ozone concentrations measured over the Chesapeake Bay was due to "shallower boundary layers trapping shipping emissions near the surface" (p. 18). They concluded that the CMAQ model was able to accurately depict this local maximum in ozone concentrations; however, the concern is that this marine maximum is part of the 3x3 grid cell array for the Essex monitor and is not representative of the local land characteristics near the monitor. Much of the ozone within these water cells is formed locally and neighboring states have no ability to control the precursor emissions that result in the ozone formation in this area.

The inclusion of these water cells in the design value calculation, in tandem with the insufficient model resolution of 12 km used, helps explain the 10.48 ppb mean error in ozone prediction by the CAMx model for the Essex monitor. The DAQ reviewed the EPA's modeling files and determined that the water cells are indeed inflating ozone design value projections at the Essex monitor and should not be considered for ozone transport-related decisions. The following section discusses the DAQ's alternative approach to characterizing this performance issue.

CAMx Model Performance Analysis & Evaluation of Design Values for Different Array Approaches

Following its guidance, the EPA computed RRFs and future design values for a 3x3 grid cell array from modeling with a 12 km horizontal resolution.[6] The 3x3 grid cell array consists of the grid cell containing the monitor and the 8 grid cells immediately surrounding the monitor. The highest value within any of these grid cells on a given day in the base model run, and that same grid cell for the same day in the future model run, are used to calculate the RRF and associated design values. In the modeling technical support document for the NODA, the EPA reports model performance statistics for the single grid cell containing the monitor rather than the statistics associated with the maximum modeled concentration within the 3x3 grid cell array that the EPA used to calculate the RRF and associated design values.[7] The purpose of this discussion is to compare the model performance statistics for the 3x3 grid cell array and two alternative approaches that show much improved model performance for the Essex ozone monitor site. The approaches evaluated include the following:

- EPA's 3x3 grid cell array that includes grid cells over water (which are known to have elevated values of ozone)
- Modified 3x3 grid cell array that eliminates grid cells over water
- Single cell array focused on the grid cell housing the monitor

[6] EPA, 2014: *Draft Modeling Guidance for Demonstrating Attainment of Air Quality Goals for Ozone, PM2s, and Regional Haze*. Available from: http://www3.epa.gov/scram001/guidance/guide/Draft-O3-PM-RH-Modeling_Guidance-2014.pdf

[7] Updated 8-Hour Ozone Model Performance Statistics by Monitoring Site for the 2011 Base Year CAMx Model Simulation, United States Environmental Protection Agency, July 2015, http://www3.epa.gov/airtransport/pdfs/Updated_2011_CAMx_Performance_Stats.xlsx

Figure 2 shows a time series comparing the daily maximum 8 hour ozone from the three approaches to observed ozone. Of the three approaches, the single cell approach tracked observations the best, followed closely by the modified 3x3 cell array. The EPA's 3x3 array clearly results in the poorest of the three approaches for predicting actual ozone concentrations for the Essex monitor.

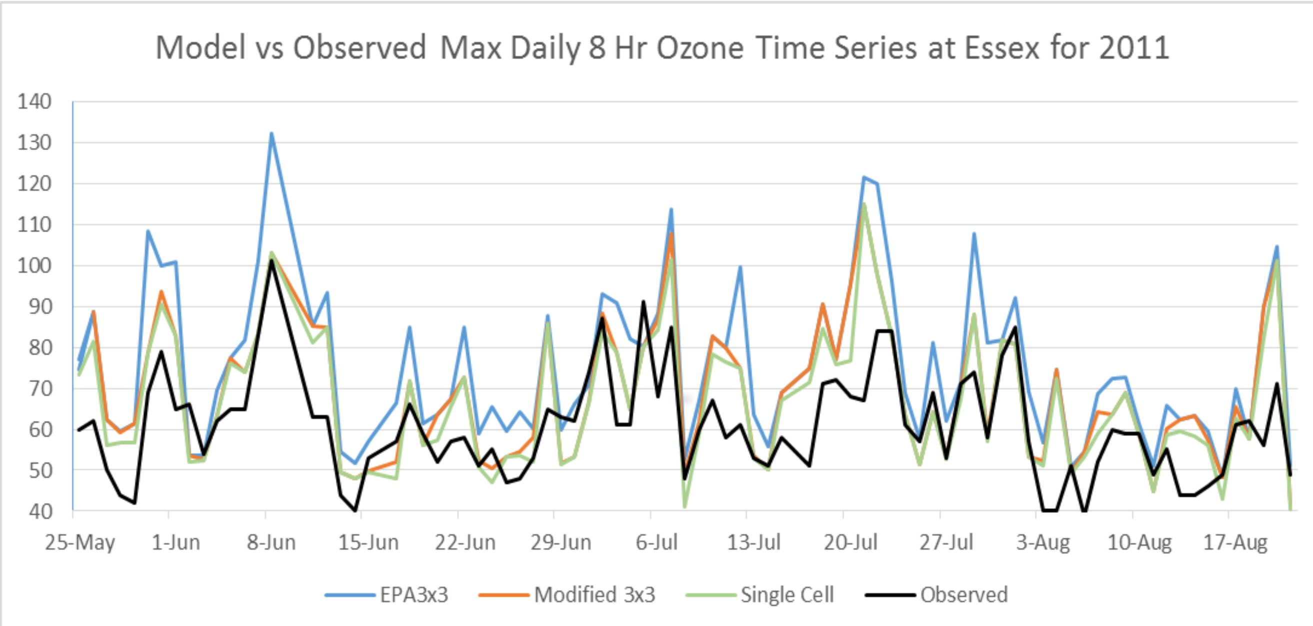


Figure 2. Time Series of Maximum Daily 8 Hour Ozone at the Essex Monitor for 2011

Table 6 presents the model performance statistics for the three approaches using the same criteria as the EPA for selecting the sample size to review (i.e., days at or above 60 ppb). The results of this analysis show that the mean bias and absolute error are much higher for the EPA's prescribed 3x3 array than for the modified 3x3 grid cell array that excludes the water cells or the single cell that contains the monitor. The single cell and the Modified 3x3 approaches have much lower bias and error compared to the recommended EPA 3x3 grid cell approach, and will provide more trustworthy RRF and future design values. Note that the statistical measures that the DAQ computed for the single cell containing the monitor (see Table 6) are slightly different than what the EPA computed (see Tables 5 and 6). The DAQ used the truncated integer observed ozone value at the Essex monitor posted on EPA's website to calculate the mean bias and absolute error. It appears that the EPA used a non-truncated integer value to calculate mean bias and absolute error because the EPA-calculated observed value is about 0.5 ppb higher than the value the DAQ calculated using the truncated value. This difference in the observed values carries over into the DAQ's calculation of the mean bias and absolute error making it difficult for the DAQ to duplicate the EPA's calculations.

Table 7 compares the design values at the Essex monitor using the EPA 3x3 methodology, the monitor grid cell (1x1) approach, and the modified 3x3 grid cell array which omits water grid cells. The future average and maximum design values using the two alternative approaches are statistically superior methods and show that the modeled contributions in 2017 to the Essex monitor are below the 76 ppb threshold.

Table 6. Comparison of Model Statistical Performance at the Essex Monitor for Alternative Approaches

	EPA 3x3	Modified 3x3	Single Cell
Mean Bias (ppb)	16.98	8.87	7.26
Mean Absolute Error (ppb)	18.51	11.85	10.67
Normalized Mean Bias	24.3%	12.7%	10.4%
Normalized Mean Absolute Error	26.5%	17.0%	15.3%

Table 7. Comparison of Design Values at the Essex Monitor for Alternative Approaches

	Average 2009-2013 DV	Max 2009-2013 DV	Base 2011	Future 2017	RRF	Future Average DV	Future Maximum DV
EPA 3x3	80.7	84.0	111.0	100.8	0.908	73.3	76.3*
Modified 3x3	80.7	84.0	96.7	85.5	0.884	71.3	74.2
Single Cell	80.7	84.0	95.2	85.2	0.895	72.2	75.2

* The DAQ independently computed design values using the EPA's methodology. There is a discrepancy of 0.1 ppb between the DAQ calculated design value and the EPA design value.

The DAQ urges EPA to present statistics for both the monitor grid cell and the maximum cell within the 3x3 grid cell array. If the statistics are poor at a monitor using EPA3x3, the DAQ urges EPA to use only the monitor grid cell for RRF and future design value calculations.

Impact of Model Performance on Ozone Contributions

The EPA performed nationwide, state-level ozone source apportionment modeling using the CAMx OSAT/APCA technique (ENVIRON, 2014)[8] to quantify the contribution of 2017 base case NOx and VOC emissions from all sources in each state to projected 2017 ozone concentrations at ozone monitoring sites. CAMx Ozone Source Apportionment Technology/ Anthropogenic Precursor Culpability Analysis (OSAT/APCA) model runs were performed for the period May 1 through September 30 using the projected 2017 base case emissions and 2011 meteorology for this time period. The hourly contributions from each state, contributions from Canada and Mexico, as well as initial and boundary contributions were tagged and processed to calculate an 8-hour average contribution metric (each entity is henceforth referred to as a "tag" in this document). The process for calculating the contribution metric uses the contribution modeling outputs in a "relative sense" to apportion the projected 2017 average design value at

[8] ENVIRON, 2014. User's Guide Comprehensive Air Quality Model with Extensions version 6.11, www.camx.com. ENVIRON International Corporation, Novato, CA

each monitoring location into contributions from each individual tag. This process is similar in concept to the approach for using model predictions to calculate 2017 ozone design values.

The approach used to calculate the contribution metric is outlined in the EPA's technical support document[9] and described by the following steps:

Step 1. Modeled hourly ozone concentrations are used to calculate the 8-hour daily maximum ozone (MDA8) concentration in the 3x3 grid cell array over and surrounding a given monitor on each day.

Step 2. The gridded hourly ozone contributions from each tag are subtracted from the corresponding gridded hourly total ozone concentrations to create a "pseudo" hourly ozone value for each tag for each hour in each grid cell.

Step 3. The hourly "pseudo" concentrations from Step 2 are used to calculate 8-hour average "pseudo" concentrations for each tag for the time period that corresponds to the MDA8 concentration from Step 1. Step 2 results in spatial fields of 8-hour average "pseudo" concentrations for each grid cell for each tag on each day.

Step 4. The 8-hour average "pseudo" concentrations for each tag and the MDA8 concentrations are extracted for those 3x3 grid cell arrays over ozone monitoring sites. The EPA used the data for all days with 2017 MDA8 concentrations ≥76 ppb (i.e., projected 2017 exceedance days) in the downstream calculations. If there were fewer than five 2017 exceedance days at a particular monitoring site, then the data from the top five 2017 MDA8 concentration days are extracted and used in the calculations.

Step 5. For each monitoring site and each tag, the 8-hour "pseudo" concentrations are then averaged across the days selected in Step 4 to create a multi-day average "pseudo" concentration for tag at each site. Similarly, the MDA8 concentrations were average across the days selected in Step 4.

Step 6. The multi-day average "pseudo" concentration and the corresponding multi-day average MDA8 concentration are used to create a Relative Contribution Factor (RCF) for each tag at each monitoring site. The RCF is the difference between the MDA8 concentration and the corresponding "pseudo" concentration, normalized by the MDA8 concentration.

Step 7. The RCF for each tag is multiplied by the 2017 average ozone design value to create the ozone contribution metrics for each tag at each site. Note that the sum of the contributions from each tag equals the 2017 average design value for that site.

Table 8 shows the calculation of contributions from North Carolina to the Essex monitor, starting with step 4, above. The table includes the daily "pseudo" concentrations for North Carolina and the corresponding MDA8 ozone concentrations on those days with 2017 model-predicted

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[9] Updated Air Quality Modeling Technical Support Document for the 2008 Ozone NAAQS Transport Assessment, August 2015.
http://www3.epa.gov/airtransport/pdfs/Updated_2008_Ozone_NAAQS_Transport_AQModeling_TSD.pdf.

exceedances at this site. The MDA8 ozone concentrations on these days are rank-ordered in the table. The 2017 average design value for the Essex monitor is 73.2 ppb. Using the data in Table 8, the RCF for North Carolina is calculated as:

(83.0261 – 81.9671) / 83.0261 = 0.01275 ppb

The contributions from North Carolina to the 2017 average design value at the Essex monitor are calculated as:

73.2 x 0.01275 = 0.9336 ppb, which is truncated to 0.93 ppb

Table 8. Calculation of 2017 Ozone Contributions from North Carolina to the Essex Monitor

Date	Predicted MDA8 Ozone for 2017 Modeled Exceedance Days	"Pseudo" 2017 8-Hr Ozone for North Carolina	Predicted 2011 MDA8 Ozone for 2017 Modeled Exceedance Days	2011 Observed (ppb)	Bias (ppb)	Normalized Bias (%)
7/21/2011	99.214	98.569	114.745	67	47.7	**71.3**
8/20/2011	94.810	92.603	101.266	71	30.3	**42.6**
6/8/2011	93.927	93.842	102.855	101	1.9	1.8
7/7/2011	89.274	89.087	101.532	85	16.5	19.4
7/22/2011	86.223	86.187	97.816	84	13.8	16.4
5/31/2011	80.742	80.735	90.549	79	11.5	14.6
7/29/2011	79.927	79.561	87.957	74	14.0	18.9
7/6/2011	79.285	79.209	84.329	68	16.3	24.0
6/9/2011	79.154	78.788	86.145	N/A*		
6/28/2011	77.981	77.246	85.916	65	20.9	32.2
6/1/2011	77.901	77.627	82.796	65	17.8	27.4
9/14/2011	77.215	76.682	75.322	58	17.3	29.9
6/7/2011	76.726	76.553	83.180	83	0.2	0.2
8/19/2011	76.696	69.700	82.057	56	26.1	**46.5**
7/18/2011	76.317	73.118	84.667	71	13.7	19.2
Multi-Day Average =>	83.0261	81.9671			15.3	23.7
2017 Average Design Value is 73.2 ppb (using EPA Guidance 3x3)	Relative Contribution Factor =>	0.01275				
	Contributions =>	0.9336				
	Truncated Contributions (ppb) =>	0.93				

* Observed ozone is unavailable for June 9.

Note that there are three days (July 21, August 19 and August 20, 2011) used in the contribution calculations that have particularly poor model performance (defined as a normalized bias of greater than 40 percent). The EPA notes in its photochemical modeling guidance[10] (page 102) that days with normalized bias greater than 20 percent should be examined for appropriateness, and also that days with bias greater than +/- 20 ppb may have a detrimental effect on design value calculations. Likewise, use of the days for which model performance is poor will significantly increase the uncertainty in the calculation of ozone contributions. For example, the observed ozone on August 19, 2011 was 56 ppb, while the 2011 model prediction was 82 ppb, an over-prediction of 46.5 percent. Incorporating these poor performing model days leads to the calculation of unrepresentative and unrealistic contributions. Table 9 shows the contributions to Essex if these three days are removed from the calculation of the RCF. The ozone contribution from North Carolina using the better performing model days is 0.45 ppb, which is less than the threshold established by the EPA as a significant contribution.

Table 9. Calculation of 2017 Ozone Contributions from North Carolina to the Essex Monitor Omitting Days with Normalized Bias <40 Percent

Date	Predicted MDA8 Ozone for 2017 Modeled Exceedance Days	"Pseudo" 2017 8-Hr Ozone for North Carolina	Predicted 2011 MDA8 Ozone for 2017 Modeled Exceedance Days	2011 Observed (ppb)	Bias (ppb)	Normalized Bias (%)
6/8/2011	93.927	93.842	102.855	101	1.9	1.8
7/7/2011	89.274	89.087	101.532	85	16.5	19.4
7/22/2011	86.223	86.187	97.816	84	13.8	16.4
5/31/2011	80.742	80.735	90.549	79	11.5	14.6
7/29/2011	79.927	79.561	87.957	74	14.0	18.9
7/6/2011	79.285	79.209	84.329	68	16.3	24.0
6/9/2011	79.154	78.788	86.145	N/A*		
6/28/2011	77.981	77.246	85.916	65	20.9	32.2
6/1/2011	77.901	77.627	82.796	65	17.8	27.4
9/14/2011	77.215	76.682	75.322	58	17.3	29.9
6/7/2011	76.726	76.553	83.180	83	0.2	0.2
7/18/2011	76.317	73.118	84.667	71	13.7	19.2
Multi-Day Average =>	81.223	80.720			14.0	20.8
2017 Average Design Value is 73.2 ppb (using EPA Guidance 3x3)	Relative Contribution Factor =>	0.00619				
	Contributions =>	0.4533				
	Truncated Contributions (ppb) =>	0.45				

* Observed ozone is unavailable for June 9.

[10] Draft Modeling Guidance for Demonstrating Attainment of Air Quality Goals for Ozone, PM2.5 and Regional Haze - http://www3.epa.gov/scram001/guidance/guide/Draft-O3-PM-RH-Modeling_Guidance-2014.pdf.

The DAQ also calculated 2017 contributions for days with observed ozone ≥76 ppb in 2011 (see Table 10) and for days projected to have ozone ≥76 ppb in 2017 (see Table 11). The model performance for these days is excellent. Using days with either actual ozone exceedances in 2011 or projected daily exceedances in 2017, North Carolina is estimated to contribute 0.04 ppb of ozone to the Essex monitor.

Table 10. Calculation of 2017 Ozone Contributions from North Carolina to the Essex Monitor Using Days with Observed Ozone ≥76 ppb in 2011

Date	Predicted 2017 MDA8 Ozone for 2011 Observed Exceedance Days	"Pseudo" 2017 8-Hr Ozone for North Carolina	Predicted 2011 MDA8 Ozone for 2011 Observed Exceedance Days	2011 Observed (ppb)	Bias (ppb)	Normalized Bias (%)
6/8/2011	93.927	93.842	102.855	101	1.9	1.8
7/5/2011	74.622	74.621	80.217	91	-10.8	-11.8
7/2/2011	75.353	75.353	83.802	87	-3.2	-3.7
7/7/2011	89.274	89.087	101.532	85	16.5	19.4
8/1/2011	73.200	73.193	80.687	85	-4.3	-5.1
7/22/2011	86.223	86.187	97.816	84	13.8	16.4
7/23/2011	73.189	73.153	82.766	84	-1.2	-1.5
6/7/2011	76.726	76.553	83.180	83	0.2	0.2
5/31/2011	80.742	80.735	90.549	79	11.5	14.6
7/31/2011	72.994	72.990	81.876	78	3.9	5.0
Multi-Day Average =>	79.625	79.571			5.8	7.0
2017 Average Design Value is 73.2 ppb (using EPA Guidance 3x3)	Relative Contribution Factor =>	0.00067				
	Contributions =>	0.0493				
	Truncated Contributions (ppb) =>	0.04				

Table 11. Calculation of 2017 Ozone Contributions from North Carolina to the Essex Monitor Using Days with Daily Predicted Ozone ≥76 ppb in 2017

Date	Predicted 2017 MDA8 Ozone for 2011 Observed Exceedance Days	"Pseudo" 2017 8-Hr Ozone for North Carolina	Predicted 2011 MDA8 Ozone for 2011 Observed Exceedance Days	2011 Observed (ppb)	Bias (ppb)	Normalized Bias (%)	2017 Daily Predicted Ozone
6/8/2011	93.927	93.842	102.855	101	1.85	1.84	92.2
7/5/2011	74.622	74.621	80.217	91	-10.78	-11.85	84.7
7/2/2011	75.353	75.353	83.802	87	-3.20	-3.68	78.2
8/1/2011	73.200	73.193	80.687	85	-4.31	-5.07	77.1
6/7/2011	76.726	76.553	83.180	83	0.18	0.22	76.6
Multi-Day Average =>	78.76546	78.71232			-3.25	-3.7	
2017 Average Design Value is 73.2 ppb (using EPA Guidance 3x3)	Relative Contribution Factor =>	0.00067					
	Contributions =>	0.0494					
	Truncated Contributions (ppb) =>	0.04					

In summary, the 2017 ozone contribution from North Carolina to the Essex monitor is 0.45 ppb after removing three days with poor model performance as directed by the EPA's photochemical modeling guidance. The contribution is much more statistically robust and defensible than the 0.93 ppb calculated by the EPA which includes days with poor model performance. For the set of days in 2011 for which the Essex monitor recorded actual ozone concentrations above 76 ppb, the projected ozone contribution from North Carolina to the Essex monitor is 0.04 ppb in 2017.

The DAQ urges EPA to consider the following alternative approaches to calculating contributions:

- Use the methodology outlined in the NODA, but remove days with normalized bias of +/- 30-40%.
- Use days with ozone exceedances in 2011, but remove days with normalized bias of +/- 30-40%.
- Use days with project future 2017 ozone exceedances computed from a daily RRF on days with ozone exceedances in 2011, but remove days with normalized bias of +/- 30-40%.

High Inter-Version Variability and Differences

The DAQ analyzed all modeled ozone contributors (i.e., states, biogenic, boundary, and tribal) to the Essex monitor, and found that North Carolina had the fifth highest increase of any modeled contributor from the 2018 v1 modeling to the 2017 v2 modeling results, going from 0.48 ppb to 0.93 ppb (see Table 12). The largest increase in contribution; however, was due to boundary conditions; this contribution increased by 2.38 ppb from the 2018 v1 modeling to the 2017 v2 modeling results. Additionally, the model boundary contribution at the nearby Padonia ozone monitoring site (located in the same county and 13.4 miles away from Essex) *decreased* by 1.73 ppb from the 2018 modeling to the 2017 modeling results. The DAQ believes these spatial and inter-version differences highlight the volatility within the modeling platform at the Essex monitoring site. Additionally, the modeled mean ozone for the 2011 base year increased from 76.16 ppb to 78.44 ppb from 2011 v1 to 2011 v2, respectively. Likewise the mean error – although significantly high in both runs – increased further from 9.66 ppb in the 2011 v1 modeling results to 10.48 ppb in the 2011 v2 modeling results (see Table 13).

We also reviewed the difference in contributions from North Carolina to all Maryland ozone monitors between the 2018 v1 modeling to the 2017 v2 modeling results (see Table 14). The 0.45 ppb increase at the Essex site was the largest increase in North Carolina's contribution to any Maryland ozone monitoring site from the 2018 v1 modeling to the 2017 v2 modeling results. By comparison, the contribution to the Padonia site only increased by 0.07 ppb, and the contribution to the nearby Edgewood ozone monitoring site decreased by 0.04 ppb.

Table 12. All CAMx-Modeled Source Contributions to Essex Monitor for 2017 v2 and 2018 v1

Contribution Source	2018 v1 Modeling	2017 v2 Modeling	Difference (2017 v2 – 2018 v1)*
Boundary	13.29	15.67	2.38
VA	3.31	4.70	1.39
KY	1.01	1.77	0.76
WV	1.99	2.65	0.66
NC	0.48	0.93	0.45
TN	0.37	0.67	0.30
MD	22.90	23.15	0.25
GA	0.10	0.27	0.17
DC	0.51	0.64	0.13
Biogenic	4.96	5.04	0.08

Note: The data, all in PPB, has been sorted by difference in contributions from 2018 version 1 to 2017 version 2.

Table 13. CAMx Model Performance Statistics for 2011 v2 and 2011 v1 modeling at the Essex monitor

CAMx Statistics	2011 v1 Modeling	2011 v2 Modeling	Difference (2011 v2 – 2011 v1)
Number of Observations ≥60 ppb	44	44	0
Observation Mean (ppb)	70.33	70.33	0
Model Mean (ppb)	75.15	77.12	1.967
Observation Median (ppb)	67.00	67.00	0
Model Median (ppb)	76.16	78.44	2.2795
Mean Bias (ppb)	**4.82**	**6.79**	**1.9675**
Mean Error (ppb)	**9.66**	**10.48**	**0.8215**

Table 14. EPA CAMx Modeling of North Carolina's Contribution to all Maryland Ozone Monitoring Sites for 2017 v2 and 2018 v1

Site ID	County	2018 v1 Modeling (ppb)	2017 v2 Modeling (ppb)	Difference (ppb, 2017 v2 – 2018 v1)
240053001	Baltimore	0.48	0.93	0.45
240290002	Kent	0.17	0.51	0.34
240030014	Anne Arundel	0.07	0.15	0.08
240051007	Baltimore	0.73	0.80	0.07
240430009	Washington	0.01	0.05	0.04
240330030	Prince George's	1.00	1.02	0.02
240130001	Carroll	0.29	0.30	0.01
240210037	Frederick	0.03	0.04	0.01
240259001	Harford	0.51	0.51	0.00
240170010	Charles	0.22	0.21	-0.01
240230002	Garrett	0.10	0.08	-0.02
240251001	Harford	0.50	0.46	-0.04
240338003	Prince George's	0.16	0.12	-0.04
240090011	Calvert	0.32	0.27	-0.05
240150003	Cecil	0.31	0.26	-0.05
240339991	Prince George's	0.98	0.81	-0.17
245100054	Baltimore (City)	1.60	1.21	-0.39
240313001	Montgomery	1.22	0.82	-0.40
240199991	Dorchester	3.06	2.06	-1.00

Note: The column at the right is the difference in contribution from version 1 to version 2, and the data is sorted by this column from largest increase to largest decrease.

Influence of Boundary Contributions on Design Value Uncertainty

As shown in Table 15, North Carolina's contribution represents only 1.2% of the total contribution to the 2017 projected design value for the Essex ozone monitor; thus, based on EPA's 1 percent threshold criterion, North Carolina's contribution would be considered significant. As previously discussed, the DAQ has identified several issues with the EPA's 2017 modeling analysis that suggest that North Carolina's actual contribution to the Essex monitor would be below the 1 percent threshold. In addition, North Carolina's contribution is dwarfed by the contribution from initial and boundary contributions that attempt to account for emissions from international sources and stratospheric ozone intrusion not included in the modeling domain. As shown in Table 15, initial and boundary contributions account for nearly 21 percent of the 2017 projected design value for the Essex ozone monitor. Unlike US emissions sources, the EPA held 2011 base year emissions constant for 2017 for international sources. This is contrary to the widely recognized expectation that emissions from international sources will continue to increase in future years. The EPA's approach introduces further uncertainty into the modeling analysis and understates future year emissions and contributions to ozone from international sources.

Table 15. Contribution of Emissions Sources to 2017 Projected Maximum Design Value (DV) for the Essex Ozone Monitor[11]

Essex Monitor 2017 Projected Maximum DV (ppb)	NC's Largest Contribution to Essex Monitor (ppb)	Initial and Boundary Contribution (ppb)*	All Other Contributions Inside Modeling Domain (ppb)**	NC Contribution (% of Max. DV)	Initial and Boundary Contribution (%of Max. DV)*	All Other Contributions (%of Max. DV)**
76.2	0.93	15.76	59.51	1.2%	20.7%	78.1%

* Contribution to design value from sources outside of the modeling domain (i.e., international sources and stratospheric intrusion of ozone).
** Contribution to design value from all sources within the modeling domain except for North Carolina's contribution (i.e., individual state and tribal, Canadian and Mexican, offshore, wild and prescribed fire, and biogenic emissions sources).

Essex, Maryland Trajectory Analysis

The DAQ reviewed the meteorology for four days with the highest ozone concentrations recorded by the Essex monitor in 2010, 2011 and 2012 (total of 12 days), and performed trajectory analyses on these days to determine if any air parcels moved across North Carolina (see Figure 3). The results showed that the trajectory for only one of the 12 days touched the northern portion of North Carolina, while the trajectories for the other 11 days were oriented to the north and west of the Essex monitor moving over the Ohio Valley and interior Northeast.

[11] Reference: Data File with 2017 Ozone Contributions (Excel format) posted on the EPA's website for Transport for the 2008 Ozone NAAQS, July 2015-Notice of Data Availability, http://www3.epa.gov/airtransport/ozonetransportNAAQS.html.

This finding (as well as others generated by other trajectory analyses discussed below) calls into question whether North Carolina truly had a contribution to these readings.

In addition to analyzing trajectories for the top-4 ozone days from the Essex ozone monitoring site, the DAQ performed an analysis of all days where there was an 8-hour reading of 70 ppb or greater at the Essex monitor for the years 2009 through 2014 (see Figure 4). Each trajectory ended at the Essex monitor at 4 PM Eastern; typically the hour during which the highest ozone concentrations occur. Six different trajectories were run for each day, each of these ending at different heights: 10 m, 100 m, 500 m, 1000 m, 1500 m, and 2000 m. All trajectories went back 60 hours, and used the 12 km North American Mesoscale (NAM) model for meteorology. There were 63 days where a 70+ ppb reading was observed at Essex and all of these were reviewed to see if the trajectory moved across any part of North Carolina, and nine of these days met this criterion. We reviewed meteorology for these nine days and conclude that it would have been extremely unlikely that air mass flows on these days could have transported ozone or related precursors from North Carolina to impact the Essex monitor. The specific analysis of each day and determination whether North Carolina appeared to contribute to Essex's ozone values on each day can be found in Appendix B (see slides 3 through 11). The remaining 54 days had no trajectories that even passed through North Carolina at all. For the Essex monitor, the percentage of back trajectories analyzed relative to the total number of exceedances studied, in combination with the analysis of the trajectories that crossed North Carolina and the corresponding analyses of ozone monitoring data near the back trajectory paths, collectively showed strong evidence that North Carolina did not contribute significantly to a deterioration of air quality downwind at the Essex, Maryland monitor.

The findings from this trajectory analysis also raises questions about how North Carolina could significantly contribute to nonattainment at the Essex monitor, as is projected in the 2017 CAMx modeling. The EPA should consider trajectory analyses in addition to photochemical modeling in determining upwind contributions.

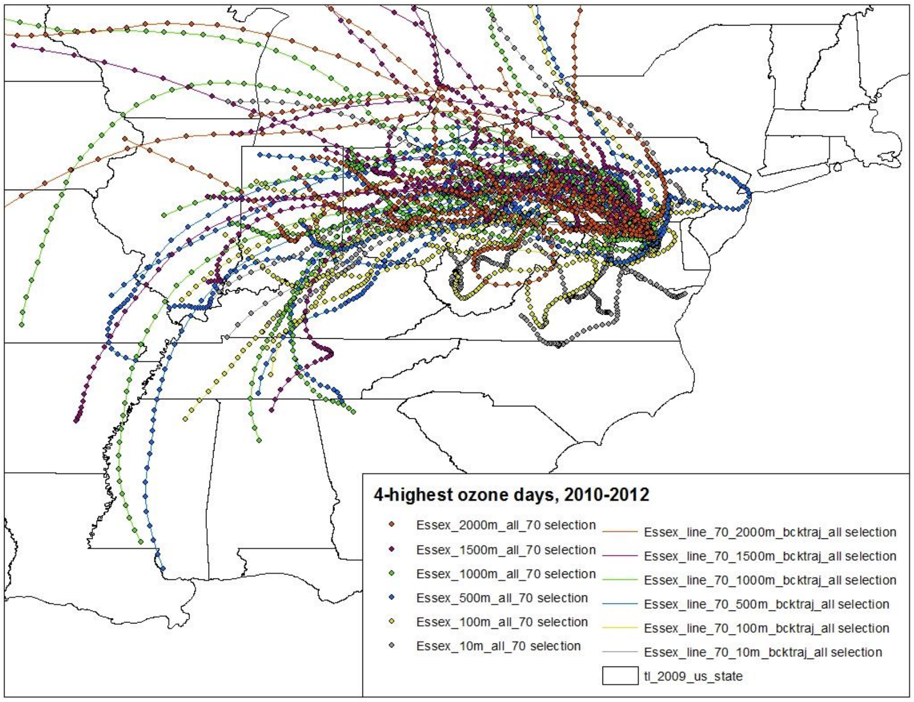

Figure 3. 60-hour Back Trajectory Analysis for the Top 4 Ozone Days, 2010-2012.

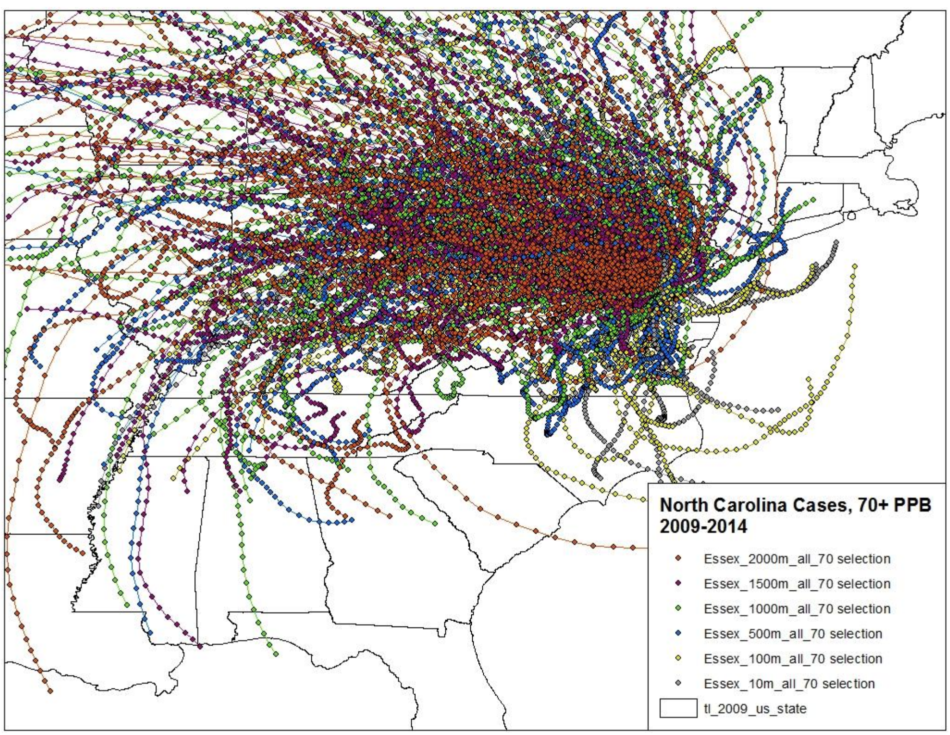

Figure 4. 60-Hour Back Trajectory Analysis for all 70+ ppb Ozone Days, 2009-2014.

Conclusions

Although the EPA's revised 2017 v2 modeling indicates that North Carolina has linkages to the Essex maintenance monitor in Maryland, the DAQ's review questions the EPA's findings due to the following factors:

1. The use of recently observed air quality trends and most recent design values show that the Essex, Maryland monitor currently is and is expected to continue to attain the 2008 ozone standard in 2017. **The EPA should consider recent ozone trends to understand whether or not a monitor will have nonattainment or maintenance issues in 2017.**
2. Trajectory analysis for the top 4 daily 8-hour ozone concentrations at the Essex monitor in 2010, 2011, and 2012 (ozone data that are used to compute the maximum design value) show that the trajectory for only 1 of the 12 days touched the northern portion of North Carolina, questioning whether North Carolina truly had a contribution to the observed readings. Further analysis was made for the 63 days with ozone ≥70 ppb at Essex from 2009 through 2014. Only 9 of the 63 days had trajectories that crossed into North Carolina. An analysis of the meteorological conditions on these 9 days suggest it is highly unlikely that significant amounts of ozone or ozone precursors were transported from North Carolina to the Essex monitor. **The EPA should consider trajectory analysis in addition to photochemical modeling in determining upwind contributions.**
3. The model resolution of 12 kilometers (km) is unable to accurately simulate the effects of the Chesapeake Bay Breeze on modeled concentrations, which has large impacts on the modeled meteorology and air quality conditions at coastal monitors such as Essex. Poor model performance leads to greater uncertainty of future design value and contribution predictions at the Essex monitor. **The EPA should consider 4 km or finer scale modeling to assess future nonattainment and contributions at coastal monitor sites.**
4. The projected design value at the Essex monitor is inflated by water grid cells in the model. These water grid cells are shown to have much lower mixing heights compared to adjacent land cells which will inflate pollutant concentrations. Also, ozone within these water cells are at least partially the result of local emissions (i.e., shipping traffic) that cannot be controlled by North Carolina. The model is unable to accurately characterize the air quality in these water grid cells and over-predicts ozone concentrations. In addition, in its air quality modeling technical support document, the EPA acknowledges regional differences in model performance, where the model tends to over-predict ozone concentrations from the Southeast into the Northeast.[12]
5. The EPA's NODA reported model performance results based on statistics at the single monitor grid cell where the monitor is housed. While this method may be appropriate from solely a model performance evaluation standpoint, in this case there is a disconnect between the model performance evaluation and how the significant contribution assessment is conducted. Since the RRFs are calculated using the maximum grid cell in a 3x3 array

[12] Updated Air Quality Modeling Technical Support Document for the 2008 Ozone NAAQS Transport Assessment, August 2015, page A-6.
http://www3.epa.gov/airtransport/pdfs/Updated_2008_Ozone_NAAQS_Transport_AQModeling_TSD.pdf.

surrounding the monitor location, and in the case of the Essex monitor, the 3x3 array contains water grid cells, the grid cell with the maximum concentration is rarely the cell containing the monitor. Instead, the maximum concentration actually occurs in a water cell. In situations where the 3x3 array spans a land-water interface, alternative model performance metrics may be appropriate, such as using the maximum value from the 3x3 array to compare to the observation. Alternatively, using the maximum value from the non-water cells in the array to compare to the observation may be appropriate. The model's ability to accurately predict maximum concentrations for use in the RRF calculation is not well characterized by solely looking at the performance at the grid cell containing the monitor. Nevertheless, the model performance of the single grid cell containing the Essex monitor was poor compared to other monitors throughout the domain, as reported in the NODA. The model bias was 6.79 ppb and the mean error was 10.48 ppb, among the highest for all monitors in the eastern US. **The DAQ urges the EPA to present statistics for both the monitor grid cell and the maximum grid cell within the 3x3 array. If the statistics are poor at the monitor using the 3x3 array, the DAQ urges EPA to use only the monitor grid cell for RRF and future design value calculations.**

6. Due to the complexities associated with land-water interface and the over-predictions modeled for water grid cells, **the EPA should determine future maximum design values using alternative approaches: (1) modified 3x3 grid cell array that eliminates grid cells over water and (2) a single cell array focused on the grid cell housing the monitor.** Under both of these alternative approaches, the future design values are below the 76 ppb threshold and indicate that the Essex monitor will maintain compliance with the 2008 8-hour ozone NAAQS in 2017.

7. The 2017 ozone contribution from North Carolina to the Essex monitor is 0.45 ppb after removing three days with poor model performance as directed by the EPA's photochemical modeling guidance.[13] The contribution is much more statistically robust and defensible than the 0.93 ppb calculated by the EPA which includes days with poor model performance. **The EPA should follow its guidance and remove days with poor model performance to make their contribution calculations more defensible.**

8. Of all the modeled ozone contributions to the Essex monitor, North Carolina had the 5th highest increase of any modeled contribution between 2018 v1 and 2017 v2, and the largest increase was due to boundary conditions. These spatial and inter-model version differences highlight volatility within the modeling platform at the Essex site. **The EPA should investigate further the causes of this volatility.**

9. The EPA defines maintenance-only sites as those that have a projected 2017 average design value <76.0 ppb, but a projected 2017 maximum design value ≥76.0 ppb. Given all of the uncertainties associated with modeling the Essex ozone maintenance site and since the 2017 projected design value of the Essex monitor is 76.2 ppb (just 0.2 ppb above the threshold), the DAQ believes that **the EPA should apply a more robust acceptance test that accounts for modeling uncertainties for determining a future design value for monitors with poor**

[13] EPA, 2014: *Draft Modeling Guidance for Demonstrating Attainment of Air Quality Goals for Ozone, $PM_{2.5}$, and Regional Haze*. Available from: http://www3.epa.gov/scram001/guidance/guide/Draft-O3-PM-RH-Modeling_Guidance-2014.pdf.

model performance. Alternatively, the EPA's bright-line test of 1 percent of the NAAQS should not be applied so rigidly for a poor performing monitor to determine significant contributions. The EPA's methodology overstates the 2017 future-year design value for the Essex maintenance site particularly since the Essex monitor has demonstrated attainment with the standard based on 2012-2014 EPA-certified monitoring data and preliminary monitoring data for 2013-2015. Given the uncertainties associated with the EPA's air quality modeling methodology for the Essex, Maryland monitor and its reliance on maximum concentrations for calculating future year design values, we believe that North Carolina's contribution of 1.2 percent (i.e., 0.2 percent above the threshold) should not be used solely to link North Carolina with the Essex ozone maintenance problem.