To: Aburano, Douglas[aburano.douglas@epa.gov]
Cc: joywiecks@fdlrez.com[joywiecks@fdlrez.com]; waynedupuis.fdlrez.com[waynedupuis@fdlrez.com]; Sean Copeland[SeanCopeland@FDLREZ.COM]
From: Philip J. DeFoe
Sent: Fri 9/30/2016 9:26:44 PM
Subject: Ozone designation letter
Final ozone designation letter.pdf
Copy of ozone_designvalues_20132015_final_07_29_16.xlsx

Aaniin Mr. Aburano,

The Fond Du Lac Band of Lake Superior Chippewa, would like to submit our ozone designation recommendation for the 2015 ozone National Ambient Air Quality Standard (NAAQS), published in the *Federal Register* on October 26, 2015 and effective December 28, 2015. Attached is our recommendation letter along with the EPA calculated design values for 2015 see table 5.

If you have any questions please contact Fond Du Lac Air Program Joy Wiecks joywiecks@fdlrez.com (218)878-7108 or Phil DeFoe philipdefoe@fdlrez.com (218)878-7112.

Miigwech.

Phil DeFoe

Fond Du Lac

Environmental

Air Program Technician

To: Aburano, Douglas[aburano.douglas@epa.gov]
Cc: Doty, Edward[Doty.Edward@epa.gov]
From: Bloomberg, David E.
Sent: Fri 9/30/2016 2:10:10 PM
Subject: Ozone Designation Recommendations
Ozone 2015 NAA Recommendation Letter.pdf
Ozone 2015 NAA Recommendation TSD.pdf

Doug,

We are mailing our designation recommendations for the 2015 ozone NAAQS today. Additionally, I wanted to send you an electronic copy of both the cover letter and TSD.

Please let me know if you have any questions.

- David

State of Illinois - CONFIDENTIALITY NOTICE: The information contained in this communication is confidential, may be attorney-client privileged or attorney work product, may constitute inside information or internal deliberative staff communication, and is intended only for the use of the addressee. Unauthorized use, disclosure or copying of this communication or any part thereof is strictly prohibited and may be unlawful. If you have received this communication in error, please notify the sender immediately by return e-mail and destroy this communication and all copies thereof, including all attachments. Receipt by an unintended recipient does not waive attorney-client privilege, attorney work product privilege, or any other exemption from disclosure.

To: Bizot, David A - DNR[David.Bizot@wisconsin.gov]; David Bloomberg (David.Bloomberg@illinois.gov)[David.Bloomberg@illinois.gov]; Jennifer.VanVlerah@epa.ohio.gov[Jennifer.VanVlerah@epa.ohio.gov]; Mary Maupin[maupinm@michigan.gov]; Scott Deloney[sdeloney@idem.in.gov]; Mary Jean Fenske[maryjean.fenske@state.mn.us]
Cc: Aburano, Douglas[aburano.douglas@epa.gov]; Doty, Edward[Doty.Edward@epa.gov]; Liljegren, Jennifer[Liljegren.Jennifer@epa.gov]; Svingen, Eric[Svingen.Eric@epa.gov]; Rosenthal, Steven[rosenthal.steven@epa.gov]
From: D'Agostino, Kathleen
Sent: Wed 11/16/2016 6:46:50 PM
Subject: WEBINAR ANNOUNCEMENT: Proposed Rule: Implementation of the 2015 O3 NAAQS

The proposed rule, "Implementation of the 2015 National Ambient Air Quality Standards for Ozone: Nonattainment Area Classifications and State Implementation Plan Requirements," is scheduled to publish in the Federal Register tomorrow.

EPA has scheduled a webinar to discuss the proposed rule.

Webinar: **PROPOSED RULE: IMPLEMENTATION OF THE 2015 NATIONAL AMBIENT AIR QUALITY STANDARDS FOR OZONE: NONATTAINMENT AREA CLASSIFICATIONS AND STATE IMPLEMENTATION PLAN REQUIREMENTS**
Date: Wednesday, December 7, 2016
Time: 2:00 – 3:30 PM Eastern Time
Intended Audience: Regions, State, Local, and Tribal Air Agencies, communities, industry, environmental groups, and the general public
Link to Join Webinar: https://epawebconferencing.acms.com/nonattainment-sip

Description: On November 2, 2016, the U.S. Environmental Protection Agency proposed requirements that would apply to state, local, and tribal air agencies for implementing the 2015 National Ambient Air Quality Standards (NAAQS) for ground-level ozone. The EPA revised both the health-based and welfare-based standards for ozone on October 1, 2015. This proposed action largely retains and updates the implementing regulations that apply for the 2008 ozone NAAQS, for purposes of the 2015 ozone standards, which creates stability in the planning process. This action also proposes two options for revoking the 2008 ozone NAAQS. The EPA is also seeking comment on a number of additional topics, including: (1) managing emissions from wildfires and wildland prescribed fires; (2) transportation conformity and general conformity; (3) contingency measures; (4) international transport and background ozone; and (5) additional policies for achieving emissions reductions. This webinar is intended to provide highlights of the proposed rule and address clarifying questions. To download a copy of the proposed rule or for more information go to https://www.epa.gov/ozone-pollution/implementation-2015-national-ambient-air-quality-standards-naaqs-ozone-state.

Logistics: You will listen to the audio via your computer. We highly recommend running a connect test on your system before logging into the webinar to ensure that the proper add-ins are enabled and the audio is working properly: http://admin.adobeconnect.com/common/help/en/support/meeting_test.htm.

To: Jeffrey Sprague[Jeff.Sprague@Illinois.gov]; Anna.Kelley@hamilton-co.org[Anna.Kelley@hamilton-co.org]; cassie.mcmahon@state.mn.us[cassie.mcmahon@state.mn.us]; christina.boss@hamilton-co.org[christina.boss@hamilton-co.org]; dave.brown@epa.state.oh.us[dave.brown@epa.state.oh.us]; Michael Depa[depam@michigan.gov]; Doreen Lehner[LehnerD@michigan.gov]; Dorian.Kvale@state.mn.us[Dorian.Kvale@state.mn.us]; gbaker@city.cleveland.oh.us[gbaker@city.cleveland.oh.us]; 'Gregory.Pratt@state.mn.us'[Gregory.Pratt@state.mn.us]; DHearne@city.cleveland.oh.us[DHearne@city.cleveland.oh.us]; Jeff.Myers@dnr.state.wi.us[Jeff.Myers@dnr.state.wi.us]; marseejs@rapca.org[marseejs@rapca.org]; Joy Taylor Morgan[TaylorJ1@michigan.gov]; Jeff Stoakes[jstoakes@idem.in.gov]; karen.granata@toledo.oh.gov[Karen.granata@toledo.oh.gov]; kari.palmer@state.mn.us[kari.palmer@state.mn.us]; WilliamsK29@michigan.gov[WilliamsK29@michigan.gov]; Kristie.ellickson@pca.state.mn.us[Kristie.ellickson@pca.state.mn.us]; Lisa.Herschberger@state.mn.us[Lisa.Herschberger@state.mn.us]; Mary.Williams@state.mn.us[Mary.Williams@state.mn.us]; mkrzywicki@city.cleveland.oh.us[mkrzywicki@city.cleveland.oh.us]; Monika.Vadali@state.mn.us[Monika.Vadali@state.mn.us]; mrogers@city.cleveland.oh.us[mrogers@city.cleveland.oh.us]; Paul Koval[paul.koval@epa.state.oh.us]; rothaj@rapca.org[rothaj@rapca.org]; Ruth.Roberson@state.mn.us[Ruth.Roberson@state.mn.us]; sbem@idem.in.gov[sbem@idem.in.gov]; sdeloney@idem.in.gov[sdeloney@idem.in.gov]; Sills, Robert (DNRE)[SILLSR@michigan.gov]; ljeter@rapca.org[ljeter@rapca.org]; Briana.Hilton@epa.ohio.gov[Briana.Hilton@epa.ohio.gov]
Cc: Cain, Alexis[cain.alexis@epa.gov]; Bollweg, George[bollweg.george@epa.gov]; Nguyen, Phuong[Nguyen.Phuong@epa.gov]; Newman, Erin[newman.erin@epa.gov]; Hulting, Melissa[hulting.melissa@epa.gov]; King, Suzanne[king.suzanne@epa.gov]; Sieffert, Margaret[Sieffert.Margaret@epa.gov]; Fuoco, Marta[fuoco.marta@epa.gov]; Aburano, Douglas[aburano.douglas@epa.gov]; Compher, Michael[compher.michael@epa.gov]
From: Trine, Rae
Sent: Mon 12/5/2016 5:18:57 PM
Subject: FW: December 7th EPA Webinar on the proposed rule to implement the 2015 NAAQS for ozone

FYI. Please forward if you know someone who would benefit from this Webinar. Thanks.

Rae

For distribution to Regions, State, Local and Tribal Air Agencies, communities, industry, environmental groups, and the general public:

Webinar: Proposed rule: Implementation of the 2015 National Ambient Air Quality Standards (NAAQS) for Ozone: Nonattainment Area Classifications and State Implementation Plan Requirements

Date: Wednesday, December 7, 2016
Time: 2:00 – 3:30 PM Eastern Time

Intended Audience: Regions, State, Local, and Tribal Air Agencies, communities, industry, environmental groups, and the general public

Link to Join Webinar: https://epawebconferencing.acms.com/nonattainment-sip

Description: On November 2, 2016, EPA proposed requirements that would apply to state, local, and tribal air agencies for implementing the 2015 NAAQS for ground-level ozone. The EPA revised both the health-based and welfare-based standards for ozone on October 1, 2015. This proposed action largely retains and updates the implementing regulations that apply for the 2008 ozone NAAQS, for purposes of the 2015 ozone standards, which creates stability in the planning process. This action also proposes two options for revoking the 2008 ozone NAAQS. The EPA is also seeking comment on a number of additional topics, including: (1) managing emissions from wildfires and wildland prescribed fires; (2) transportation conformity and general conformity; (3) contingency measures; (4) international transport and background ozone; and (5) additional policies for achieving emissions reductions. This webinar is intended to provide highlights of the proposed rule and address clarifying questions. To download a copy of the proposed rule or for more information go to https://www.epa.gov/ozone-pollution/implementation-2015-national-ambient-air-quality-standards-naaqs-ozone-state.

Logistics: You will listen to the audio via your computer. We highly recommend running a connect test on your system before logging into the webinar to ensure that the proper add-ins are enabled and the audio is working properly: http://admin.adobeconnect.com/common/help/en/support/meeting_test.htm.

To: Nam, Ed[nam.ed@epa.gov]; Mooney, John[Mooney.John@epa.gov]; Aburano, Douglas[aburano.douglas@epa.gov]
Cc: Bizot, David A - DNR[David.Bizot@wisconsin.gov]
From: Good, Gail - DNR
Sent: Thur 4/20/2017 7:36:26 PM
Subject: Supplemental information for 2015 Ozone Standard Designations
WI 2015 Ozone NAAQS Designations TSD 042017.pdf

Attached is your copy of a submittal sent to Acting Regional Administrator Kaplan today which contains supplemental technical information in support of the initial area designations for the 2015 ozone standard. As noted in the letter, EPA should consider this supporting information and ensure it is reflected in any modifications to Governor Walker's recommendation of September 21, 2016 that EPA elects to make in the "120 day" notifications that would occur prior to final designations.

Please let me know if you have any questions regarding this submittal, or if we can provide any clarification or additional information related to this issue.

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Gail Good
Director, Air Management
Wisconsin Department of Natural Resources
Phone: (608) 264-8537
Cell Phone: (608) 219-2690
gail.good@wisconsin.gov

dnr.wi.gov

To: Aguilar, Lauren[LAguilar@idem.IN.gov]; Baugues, Keith[KBaugues@idem.IN.gov]; Bem, Susan[SBEM@idem.IN.gov]; Blakley, Pamela[blakley.pamela@epa.gov]; Boling, Jean[JBoling@idem.IN.gov]; CALLAHAN, BRIAN[BCALLAHA@idem.IN.gov]; Comer, Carol[CComer@idem.IN.gov]; DELONEY, SCOTT[SDELONEY@idem.IN.gov]; DERF, MARK[MDERF@idem.IN.gov]; Aburano, Douglas[aburano.douglas@epa.gov]; Gross, Louise[gross.louise@epa.gov]; Harmon, Jack[JAHarmon@idem.IN.gov]; KING, NANCY[NKING@idem.IN.gov]; Panos, Christos[Panos.Christos@epa.gov]; PIGOTT, BRUNO[BPIGOTT@idem.IN.gov]; Reiss, Jessica[JReiss@idem.IN.gov]; Rosenthal, Steven[rosenthal.steven@epa.gov]; SEALS, SHAWN[SSEALS@idem.IN.gov]; Snemis, Donald (IDEM)[DSnemis@idem.IN.gov]; Tachtiris, Valerie[VTachtir@idem.IN.gov]; Wagner, Doug[DWAGNER@idem.IN.gov]; Walsh, Keelyn[KWalsh@idem.IN.gov]; ZLATOS, BETSY[BZLATOS@idem.IN.gov]; Pedersen, Christine[CPEDERSE@idem.IN.gov]
From: FERRIS, GALE
Sent: Thur 9/22/2016 12:54:26 PM
Subject: Indiana and U.S. EPA Region V Rule and SIP Call Notes: September 15, 2016
Indiana and EPA Rule and SIP Call Notes 09.15.16.doc

Attached are the call notes from the September 15, 2016 Indiana and U.S. EPA Region V Rule and SIP Call.

Please feel free to get back with me if you have any questions or concerns.

Thanks

To: Panos, Christos[Panos.Christos@epa.gov]; Aburano, Douglas[aburano.douglas@epa.gov]
From: Mitchell, Catherine
Sent: Fri 9/16/2016 8:24:46 PM
Subject: RE: Recommendations Concerning Air Quality Designations for the Revised 2015 8-Hour Ozone National Ambient Air Quality Standard (NAAQS)
Ozone_2015_Designation_Recommendations_FullDocForUSEPA.pdf

Dear Mr. Aburano and Mr. Panos,

Attached is a document titled **"Recommendations Concerning Air Quality Designations for the Revised 2015 8-Hour Ozone National Ambient Air Quality Standard (NAAQS)"**, for your information.

Hard copies of the attached will soon be put in the mail to Mr. Robert Kaplan and recipients as noted on the cover letter of the attached.

Have a great day!

Catherine Mitchell

Environmental Scientist 3 (ES3)

Office of Air Quality, IDEM

317-234-6530

cmitchel@idem.IN.gov

317-233-5967-fax

To: Aburano, Douglas[aburano.douglas@epa.gov]
From: Bloomberg, David E.
Sent: Thur 9/1/2016 6:44:26 PM
Subject: Ozone Designation Presentation Info
Ozone 2015 NAAQS Chicago Notice.docx
Ozone 2015 NAAQS M-E Notice.docx

Doug,

In case you're interested, attached is information about presentations the Illinois EPA, Air Quality Planning Section will be having in Chicago and Collinsville regarding upcoming area designation recommendations for the 2015 ozone NAAQS. These are information sessions, as opposed to hearings, and we will be providing some background and lead up to what we intend to recommend to USEPA by October 1. (The presentation in Chicago will be in Room #9034 within the Thomspon Center. We didn't have that detail when we originally put together the notice.)

Please let me know if you have any questions.

- David

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To: Aburano, Douglas[aburano.douglas@epa.gov]
From: Bizot, David A - DNR
Sent: Wed 3/1/2017 7:52:54 PM
Subject: RE: 2015 ozone NAAQS designations
Ozone 2017.JPG
094.JPG

Thanks Doug.

Also, happy first day of the (new) ozone season! Since you are at OAQPS, I thought you'd like to have available a few photos of our state weather conditions (attached). We are carefully monitoring ozone measurements today to see to see how far into double-digits they go.

David

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David Bizot

Phone: 608-267-7543

David.Bizot@wisconsin.gov

From: Aburano, Douglas [mailto:aburano.douglas@epa.gov]
Sent: Wednesday, March 01, 2017 6:54 AM
To: Bizot, David A - DNR
Subject: RE: 2015 ozone NAAQS designations

Hey David,

I'm on travel to OAQPS today and tomorrow. I can try and call you if I get a break in between sessions or maybe you can text me your questions if you're comfortable with that? Cell is 773-

612-6716.

Or email and I can try and answer as well.

Generally, we're shooting for 120-day letters to go out around June1 and finalize October 1.

Thanks,

Doug

From: Bizot, David A - DNR [mailto:David.Bizot@wisconsin.gov]
Sent: Tuesday, February 28, 2017 12:25 PM
To: Aburano, Douglas <aburano.douglas@epa.gov>
Subject: 2015 ozone NAAQS designations

Doug –

Hope you had a good time away. When you are back around, could you please contact me briefly to answer a few questions about 2015 ozone designations timelines? Thanks!

David

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Visit our survey at http://dnr.wi.gov/customersurvey to evaluate how I did.

David Bizot
Chief, Regional Pollutant and Mobile Sources Section

Bureau of Air Management
Wisconsin Department of Natural Resources

Phone: (608) 267-7543

Cell: (608) 286-8939
Fax: (608) 267-0560
David.Bizot@wisconsin.gov

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To: Aguilar, Lauren[LAguilar@idem.IN.gov]; Baugues, Keith[KBaugues@idem.IN.gov]; Bem, Susan[SBEM@idem.IN.gov]; Blakley, Pamela[blakley.pamela@epa.gov]; Boling, Jean[JBoling@idem.IN.gov]; CALLAHAN, BRIAN[BCALLAHA@idem.IN.gov]; DELONEY, SCOTT[SDELONEY@idem.IN.gov]; DERF, MARK[MDERF@idem.IN.gov]; Aburano, Douglas[aburano.douglas@epa.gov]; Gross, Louise C[gross.louise@epa.gov]; Harmon, Jack[JAHarmon@idem.IN.gov]; KING, NANCY[NKING@idem.IN.gov]; Panos, Christos[Panos.Christos@epa.gov]; PIGOTT, BRUNO[BPIGOTT@idem.IN.gov]; Reiss, Jessica[JReiss@idem.IN.gov]; Rosenthal, Steven[rosenthal.steven@epa.gov]; SEALS, SHAWN[SSEALS@idem.IN.gov]; Tachtiris, Valerie[VTachtir@idem.IN.gov]; Wagner, Doug[DWAGNER@idem.IN.gov]; Walsh, Keelyn[KWalsh@idem.IN.gov]; ZLATOS, BETSY[BZLATOS@idem.IN.gov]; Pedersen, Christine[CPEDERSE@idem.IN.gov]
From: FERRIS, GALE
Sent: Mon 3/20/2017 2:30:52 PM
Subject: Indiana and U.S. EPA Region V Rule and SIP Call Notes: March 16, 2017
Indiana and EPA Rule and SIP Call Notes 3.16.2017.doc

Attached are the call notes from the March 16, 2017 Indiana and U.S. EPA Region V Rule and SIP Call.

Please feel free to get back with me if you have any questions or concerns.

Thanks

To: Aguilar, Lauren[LAguilar@idem.IN.gov]; Baugues, Keith[KBaugues@idem.IN.gov]; Bem, Susan[SBEM@idem.IN.gov]; Blakley, Pamela[blakley.pamela@epa.gov]; Boling, Jean[JBoling@idem.IN.gov]; CALLAHAN, BRIAN[BCALLAHA@idem.IN.gov]; Comer, Carol[CComer@idem.IN.gov]; DELONEY, SCOTT[SDELONEY@idem.IN.gov]; DERF, MARK[MDERF@idem.IN.gov]; Aburano, Douglas[aburano.douglas@epa.gov]; Gross, Louise[gross.louise@epa.gov]; Harmon, Jack[JAHarmon@idem.IN.gov]; KING, NANCY[NKING@idem.IN.gov]; Panos, Christos[Panos.Christos@epa.gov]; PIGOTT, BRUNO[BPIGOTT@idem.IN.gov]; Reiss, Jessica[JReiss@idem.IN.gov]; Rosenthal, Steven[rosenthal.steven@epa.gov]; SEALS, SHAWN[SSEALS@idem.IN.gov]; Snemis, Donald (IDEM)[DSnemis@idem.IN.gov]; Tachtiris, Valerie[VTachtir@idem.IN.gov]; Wagner, Doug[DWAGNER@idem.IN.gov]; Walsh, Keelyn[KWalsh@idem.IN.gov]; ZLATOS, BETSY[BZLATOS@idem.IN.gov]; Pedersen, Christine[CPEDERSE@idem.IN.gov]
From: FERRIS, GALE
Sent: Wed 8/24/2016 12:47:40 PM
Subject: Indiana and U.S. EPA Region V Rule and SIP Call Notes: August 18, 2016
Indiana and EPA Rule and SIP Call Notes 08_18_2016 (2).doc

Attached are the call notes from the August 18, 2016 Indiana and U.S. EPA Region V Rule and SIP Call.

Please feel free to get back with me if you have any questions or concerns.

Thanks

Fond du Lac Band of Lake Superior Chippewa

Reservation Business Committee

1720 Big Lake Rd.
Cloquet, MN 55720
Phone (218) 879-4593
Fax (218) 879-4146

Chairman
Kevin R. Dupuis, Sr.

Secretary/Treasurer
Ferdinand Martineau, Jr.

Dist. I Representative
Vanessa L. Northrup

Dist. II Representative
Bruce M. Savage

Dist. III Representative
Roger M. Smith, Sr.

Executive Director,
Tribal Programs
Chuck Walt

Executive Director,
Enterprises
Michael Himango

September 30, 2016

Robert A. Kaplan, Acting Regional Administrator
U.S. Environmental Protection Agency
Region V
77 West Jackson Boulevard
Chicago, Illinois 60604

Dear Acting Regional Administrator Kaplan:

The Fond du Lac Reservation was established by the Treaty of LaPointe (1854) between the Fond du Lac Band of Lake Superior Chippewa ("the Band") and the United States Government, with established boundaries located in Northeastern Minnesota. The Band retains all rights in the Ceded Territories that were not specifically ceded by treaty. The Band is a sovereign nation and has Treatment as an Affected State status under the Clean Air act. The Band appreciates the opportunity to recommend the Ozone Designation within the reservation boundaries.

The Band's ozone monitoring site was established in 2001 at the Cloquet Forestry Center in cooperation with the Minnesota Pollution Control Agency. We operated our original monitor there from 2001-2013, when a new ozone analyzer was purchased and our site location was changed to the roof of the Fond du Lac-Resource Management Building. The location was changed partly for convenience of operation, partly to capture values resulting from traffic along Big Lake Road, and partly due to what was believed to be interference from terpenes at the Cloquet Forestry Center. Terpenes emitted from coniferous trees in the area appeared to be scrubbing ozone out of the air during the early morning hours, resulting in zero values that may not have been accurate. Because the Band changed the location of the monitoring site we do not have a valid 3 year design value at this time.

The Band will consider the area within the external boundaries of the reservation to be in attainment for the 2015 ozone National Ambient Air Quality Standard (NAAQS), published in the Federal Register on October 26, 2015 and effective December 28, 2015. This is based on the weight of evidence described below.

Based on the raw data for the two Fond du Lac sites our average mean for the 4th highest daily max value for the years 2013-2015 was 58 ppb for the 8-hr ozone design value, which is well below the ozone National Ambient Air Quality Standard value of 70 ppb. Further, the State of Minnesota is recommending the entire state be designated in attainment. In particular, the AQS site id 271377550 which is located in Duluth MN reported a design value of 52 ppb. Attached are the EPA calculated design values for 2015 see table 5, AQS-IDs, 270177416 and 270177417.

There is extensive scientific evidence that shows ozone exposure to sensitive groups can have adverse health effects. Human exposure from ozone must be considered, in order to protect public health for our community. The Band values our children and elders because they are the wealth of knowledge and our future. The Band appreciates EPA's ongoing efforts to regulate ozone with respect to public health and the environment.

If you have any questions, please contact Joy Wiecks (218-878-7108) or Phil DeFoe (218-878-7112) Fond Du Lac Environmental Air Program.

Respectfully,

Kevin R. DuPuis, Sr.
Chair, Fond du Lac Reservation Business Committee

c.c.

Sean Copeland, Fond du Lac Legal Counsel

Ben Giwojna, EPA Region 5

John Summerhays, EPA Region 5

ED_001361_00000111

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-3397
BRUCE RAUNER, GOVERNOR ALEC MESSINA, ACTING DIRECTOR

217-782-3397

September 30, 2016

Robert A. Kaplan, Acting Regional Administrator
Office of the Regional Administrator, R-19J
U.S. Environmental Protection Agency, Region 5
77 West Jackson Boulevard
Chicago, IL 60604-3507

Dear Mr. Kaplan,

On behalf of Governor Rauner, and pursuant to the U.S. Environmental Protection Agency's revision to the National Ambient Air Quality Standards (NAAQS) for ozone dated October 26, 2015, I am submitting our recommendations for attainment and nonattainment designations for the State of Illinois. Included with Illinois' recommendations is a supporting document prepared by the Illinois Environmental Protection Agency (Illinois EPA). The Illinois EPA will also provide this document to your staff in electronic format to facilitate your timely review.

Specifically, the following designations are recommended for Illinois:

County	Recommended Designation	Name of Area
Cook	Nonattainment	Chicago
DuPage	Nonattainment	Chicago
Kane	Nonattainment	Chicago
Lake	Nonattainment	Chicago
Will	Nonattainment	Chicago
McHenry	Nonattainment	Chicago
Kendall:		
Oswego Township	Nonattainment	Chicago
All Other Townships	Unclassifiable/ Attainment	
Grundy:		
Aux Sable Township	Nonattainment	Chicago
Goose Lake Township	Nonattainment	Chicago
All Other Townships	Unclassifiable/ Attainment	
Madison	Nonattainment	Metro-East
Monroe	Nonattainment	Metro-East
St. Clair	Nonattainment	Metro-East
All Other Counties	Unclassifiable/ Attainment	

4302 N. Main St., Rockford, IL 61103 (815)987-7760
595 S. State, Elgin, IL 60123 (847)608-3131
2125 S. First St., Champaign, IL 61820 (217)278-5800
2009 Mall St., Collinsville, IL 62234 (618)346-5120
9511 Harrison St., Des Plaines, IL 60016 (847)294-4000
412 SW Washington St., Suite D, Peoria, IL 61602 (309)671-3022
2309 W. Main St., Suite 116, Marion, IL 62959 (618)993-7200
100 W. Randolph, Suite 10-300, Chicago, IL 60601

PLEASE PRINT ON RECYCLED PAPER

We are recommending that the portions of the Chicago and Metro-East St. Louis metropolitan areas described above be designated as nonattainment for the 2015 ozone NAAQS, as violations of the revised ozone standard have been measured in these areas during 2013-2015. The remainder of Illinois is attaining the revised ozone standard and should, therefore, be designated as unclassifiable/attainment. The recommended nonattainment boundaries are the same as the boundaries established pursuant to the 2008 ozone NAAQS.

If there are any questions, please feel free to contact David Bloomberg at 217-524-4949 or via e-mail at David.Bloomberg@illinois.gov.

Cordially,

Alec Messina
Acting Director

Attachment

Technical Support Document
for
Recommended Nonattainment Boundaries in Illinois
for the
2015 Ozone National Ambient Air Quality Standard

AQPSTR 16-09

September 29, 2016

Illinois Environmental Protection Agency
Division of Air Pollution Control
1021 North Grand Avenue East
P.O. Box 19276
Springfield, IL 62794-9276

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Introduction

On October 26, 2015, the U.S. Environmental Protection Agency (U.S. EPA) revised the ozone National Ambient Air Quality Standard (NAAQS) in response to numerous studies which link the health effects associated with ozone exposure to increases in mortality, as well as cardiovascular and respiratory impairment. The primary ozone standard was strengthened from 0.075 parts per million (ppm), which was set in 2008, to a new level of 0.070 ppm (80 FR665291; October 26, 2015). U.S. EPA also strengthened the secondary ozone standard to provide increased protection against adverse public welfare effects including impacts on vegetation. This standard is identical to the primary standard (0.070 ppm).

Following the promulgation of a new or revised air quality standard, the Clean Air Act (CAA) requires the Governor to recommend initial designations of the attainment status for all areas of the State. Areas can be classified as ***nonattainment*** (does not meet, or contributes to a nearby area that does not meet the NAAQS), ***attainment*** (meets the NAAQS), or ***unclassifiable*** (cannot be classified based on available data). Starting with the 1997 ozone NAAQS, U.S. EPA has been using a designation category of ***unclassifiable/attainment*** for areas that are monitoring attainment and for areas that do not have monitors but for which they have reason to believe are likely attainment and are not contributing to nearby violations. Illinois is, therefore, required to provide recommendations for attainment/nonattainment area boundaries for the new ozone standard. The U.S. EPA will act on the State's recommendations by either affirming and promulgating the recommended designation boundaries, or by promulgating different designations. This report provides the basis for recommendations by the Illinois Environmental Protection Agency (Illinois EPA) for attainment/nonattainment designation boundaries for all areas in the State of Illinois for the 2015 ozone standard.

Based on the most recent three years of ambient monitoring data (2013-2015), only two counties in Illinois are currently violating the 2015 ozone NAAQS – Lake and Madison counties. Based

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on an analysis of the factors contained in federal guidance, the Illinois EPA is recommending that portions of the Chicago and Metro-East St. Louis metropolitan areas be designated as nonattainment for the 2015 ozone standard. The recommended boundaries also reflect U.S. EPA guidance "to show that: 1) violations are not occurring in the excluded portions of the recommended area and 2) the excluded portions do not contain emission sources that contribute to the observed violations." The remaining areas of Illinois should be classified as unclassifiable/attainment areas for the ozone standard.

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Federal Guidance

Illinois EPA initially relied on guidance memorandums issued by U.S. EPA on March 28, 2000, April 1, 2003, and December 4, 2008, for developing past recommendations that established the geographic boundaries of nonattainment areas (NAA) for the ozone standard. In these guidance documents, U.S. EPA recommended that areas with air quality data showing violations of the NAAQS, and nearby areas that cause or contribute to NAAQS violations, be designated nonattainment. Due to the pervasive nature of ground level ozone and transport of ozone and its precursors over large geographic areas, U.S. EPA also recommends that Combined Statistical Areas (CSAs), as defined by the Office of Management and Budget (OMB), associated with the violating monitor(s) serve as the starting point or "presumptive" boundary of ozone NAAQS. However, a case can be made for starting with Core Based Statistical Areas (CBSAs) or Metropolitan Statistical Areas (MSAs) if the CSAs are too expansive. U.S. EPA's most recent published updated guidance was issued on February 25, 2016. This guidance follows the same conceptual approach as the previous guidance in that it recommends presumptive boundaries based on CSA and, if appropriate, CBSA or MSA defined statistical areas.

The proposed ozone nonattainment area boundaries are shown in Figure 24 and are included within the boundaries of the Chicago-Naperville, IL-IN-WI Combined Statistical Area (Chicago CSA) and St. Louis-St.Charles-Farmington MO-IL Combined Statistical Area (St. Louis CSA). For the purpose of this analysis, only Illinois counties are assessed. Also, the CSAs in both areas are too large spatially for the outlying counties to contribute in any meaningful way to the violation in each urban area. Therefore, Illinois EPA believes that the CBSAs (which are the same as the MSAs in both areas) are more reasonable starting points for evaluating nonattainment boundaries. A listing of the Illinois counties comprising the Chicago-Naperville, IL-IN-WI CSA and the St. Louis, St. Charles-Farmington, MO-IL CSA are included in Table 1. The counties comprising the Chicago-Naperville-Elgin, IL-IN-WI MSA and the St. Louis, MO-IL MSA are shown in Table 2. The counties in Table 2 are the counties in Illinois that are evaluated as part of this analysis.

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Table 1. Counties Included in the Chicago CSA and St. Louis CSA

Chicago-Naperville, IL-IN-WI CSA	St. Louis-St. Charles-Farmington, MO-IL CSA
Bureau County, IL	Bond County, IL
Cook County, IL	Calhoun County, IL
DeKalb County, IL	Clinton County, IL
DuPage County, IL	Jersey County, IL
Grundy County, IL	Macoupin County, IL
Kane County, IL	Madison County, IL
Kankakee County, IL	Marion County, IL
Kendall County, IL	Monroe County, IL
Lake County, IL	St. Clair County, IL
LaSalle County, IL	Franklin County, MO
McHenry County, IL	Jefferson County, MO
Putnam County, IL	Lincoln County, MO
Will County, IL	St. Francois County, MO
Jasper County, IN	St. Charles County, MO
Lake County, IN	St. Louis City, MO
LaPorte County, IN	St. Louis County, MO
Newton County, IN	Warren County, MO
Porter County, IN	
Kenosha County, WI	

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Table 2. Counties Included in the Chicago MSA and St. Louis MSA

Chicago-Naperville-Elgin, IL-IN-WI MSA	St. Louis, MO-IL MSA
Cook County, IL	Bond County, IL
DeKalb County, IL	Calhoun County, IL
DuPage County, IL	Clinton County, IL
Grundy County, IL	Jersey County, IL
Kane County, IL	Macoupin County, IL
Kendall County, IL	Madison County, IL
Lake County, IL	Monroe County, IL
McHenry County, IL	St. Clair County, IL
Will County, IL	Franklin County, MO
Jasper County, IN	Jefferson County, MO
Lake County, IN	Lincoln County, MO
Newton County, IN	St. Charles County, MO
Porter County, IN	St. Louis City, MO
Kenosha County, WI	St. Louis County, MO
	Warren County, MO
	Warren County, MO

States may request nonattainment area boundaries that are smaller than the existing CSA or CBSA (MSA) boundaries where counties or portions of counties are rural and do not contribute to nonattainment based on five factors. The five factors are listed below. The emission and emissions-related data factor is intended to address a wide scope of analyses, including population, population growth, and vehicle miles travelled, as data that informs the analysis of emissions data.

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States may also request nonattainment area boundaries that are larger than the current CSA or CBSA/MSA to include adjacent counties when those counties contain emission sources, population, growth, commuting patterns, and other factors that may contribute to the nonattainment problem. The Illinois EPA's analysis of each of the five factors is provided in the following sections of this report.

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Five Factor Analysis

U.S. EPA recommends that States and Tribes consider the following five factors in assessing whether to include an area in the designated nonattainment area boundary:

- Air quality data
- Emission and emissions-related data
- Meteorology (weather/transport patterns)
- Geography/topography
- Jurisdictional Boundaries

Factor 1 – Air Quality Data

The ozone design values (i.e., the average of the fourth highest values from each of three consecutive years of data at a given ambient monitor) derived from ozone measurements collected from Illinois EPA's ambient air monitoring network from the most recent three-year period of record (2013-2015) are summarized in Table 3 and Figure 1. As shown in Table 3 and Figure 1, Illinois EPA's monitoring data indicate that violations of the 2015 ozone standard have been measured in both the Chicago and Metro-East metropolitan areas. The rest of Illinois currently meets the standard, although occasional exceedances have been recorded at almost all monitoring sites statewide due to the pervasiveness of ozone transport. In the Chicago area, measured design values from the 2013-2015 period exceed the NAAQS at only one monitoring station, located in Lake County. In the Metro-East area, design values exceeding the NAAQS have been measured in Madison County during this three-year period. Ozone air quality data collected in Illinois, therefore, indicate that it is appropriate to designate at least portions of the Chicago and Metro-East metropolitan areas as nonattainment areas for the ozone standard. However, Figures 2 and 3 show that the design values for both Chicago and the Metro-East have been decreasing steadily over the last 30 years. The ozone nonattainment boundaries have also

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been virtually the same over that same 30 years. Clearly, Federal and State control programs within the historical nonattainment areas have done an excellent job of improving ozone air quality over the period. In both areas, ozone design values in violation of the 2015 8-hour ozone standard occur in adjacent areas of neighboring states.

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Table 3. 2013-2015 8-Hour Ozone Design Values in Illinois (ppb)

AQCR	County	Site	4th High 8-Hour Values 2013	2014	2015	2013-2015 8-hr Average
	Chicago Metropolitan Area					
67	Cook	Alsip	64	66	66	65
67	Cook	Chicago-ComEd	62	67	65	64
67	Cook	Chicago-SWFP	71	67	66	68
67	Cook	Chicago-Taft	66	65	68	66
67	Cook	Cicero	63	63	61	62
67	Cook	Des Plaines	67	69	68	68
67	Cook	Evanston	69	72	70	70
67	Cook	Lemont	64	70	66	66
67	Cook	Northbrook	69	65	68	67
67	Cook	Schiller Park	62	63	58	61
67	DuPage	Lisle	63	64	67	64
67	Kane	Elgin	64	66	65	65
67	Lake	Zion	72	73	70	71
67	McHenry	Cary	65	67	64	65
67	Will	Braidwood	61	64	64	63
	Metro-East					
70	Madison	Alhambra *	71	68	67	68
70	Madison	Alton	72	72	69	71
70	Madison	Maryville	75	70	64	69
70	Madison	Wood River	69	70	69	69
70	Randolph	Houston	65	71	65	67
70	St. Clair	East St. Louis	66	67	66	66
75	Jersey	Jerseyville	68	65	67	66
	Rest of Illinois					
65	Peoria	Peoria	58	64	60	60
65	Peoria	Peoria Heights	66	64	64	64
66	McLean	Normal	69	66	63	66
66	Champaign	Thomasboro	63	62	62	62
69	Rock Island	Rock Island	60	62	60	60
73	Winnebago	Loves Park	63	70	66	66
74	Effingham	Effingham	64	63	64	63
74	Hamilton	Knight Prairie	64	63	64	63
75	Adams	Quincy	63	61	64	62
75	Macon	Decatur	64	67	66	65
75	Macoupin	Nilwood	65	63	64	64
75	Sangamon	Springfield	62	59	64	61
66	Champaign	Bondville *	66	68	65	66
68	Jo Daviess	Stockton *	65	67	62	64
66	Wabash	West Union +	61	63	64	62

+ - Monitor operated by the Indiana Department of Environmental Management

* - Monitor operated by U.S.EPA

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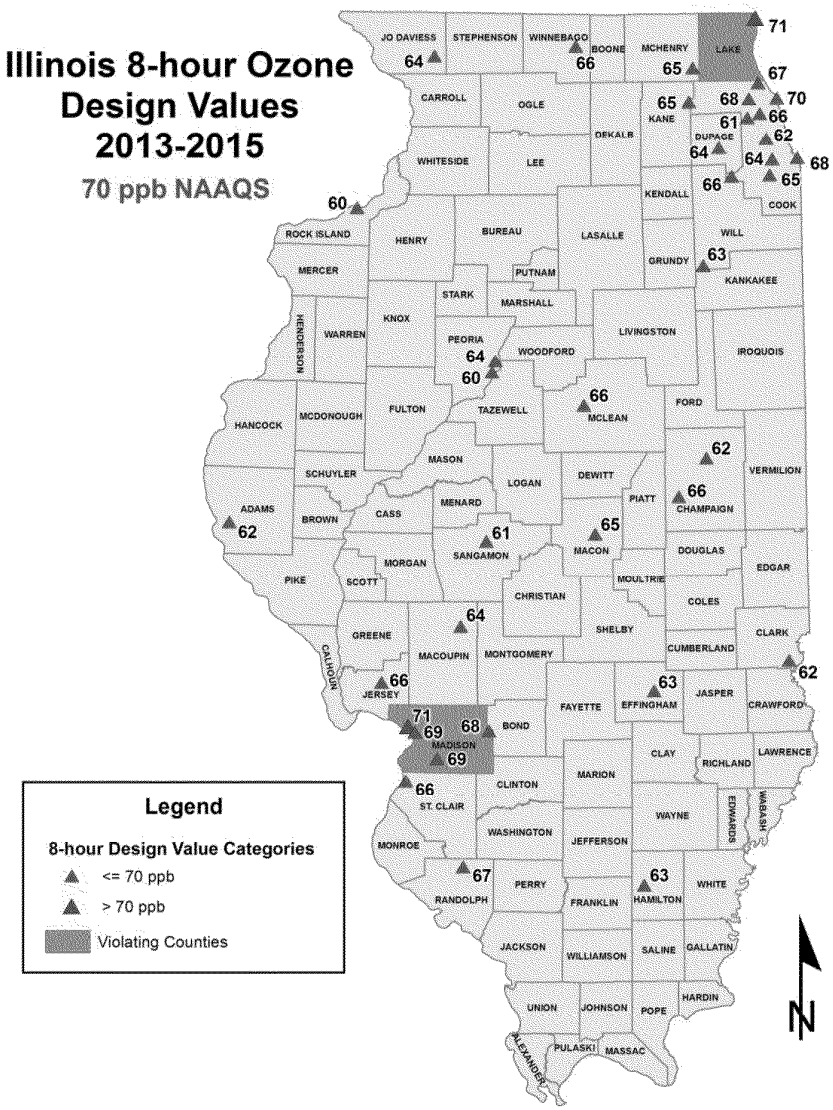
Figure 1. Illinois 8-Hour Ozone Design Values 2013-2015



Source: Illinois EPA - Final certified data.

Figure 2. Chicago Ozone Trend Compared to 1997, 2008, and 2015 Standards

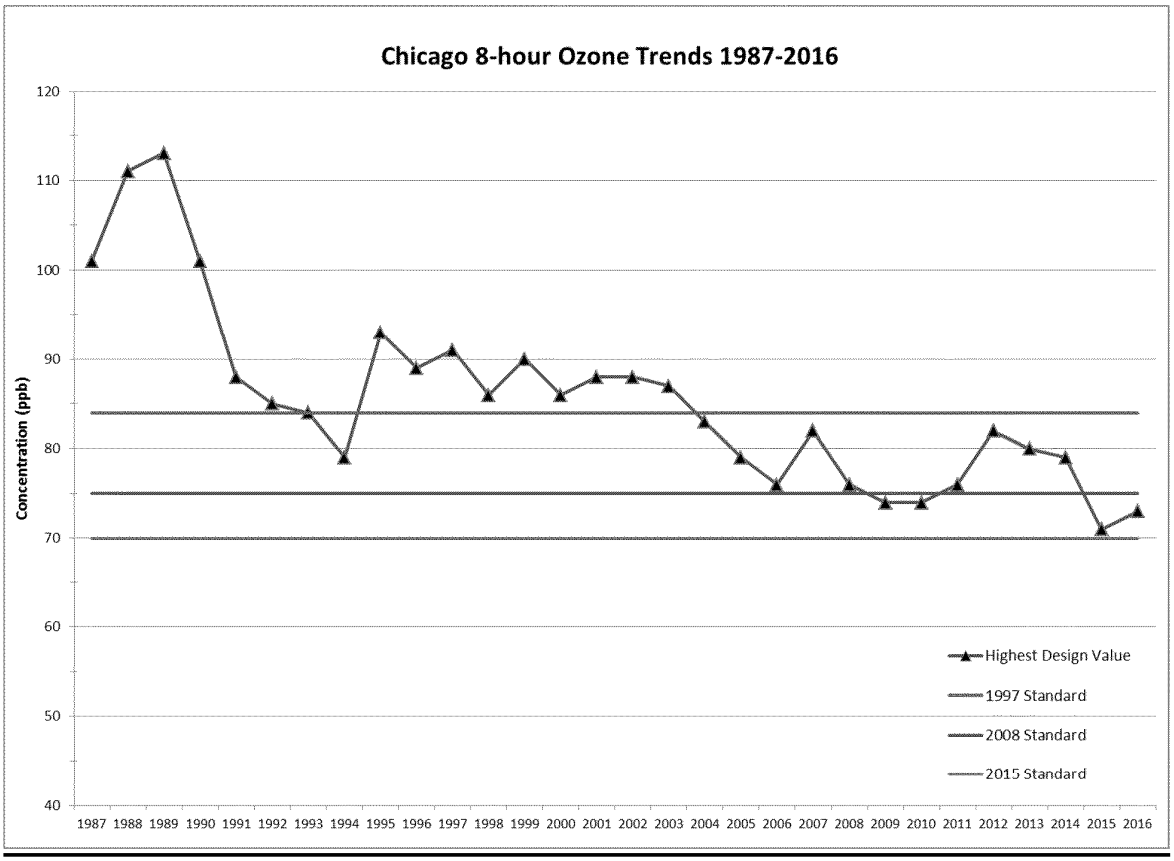
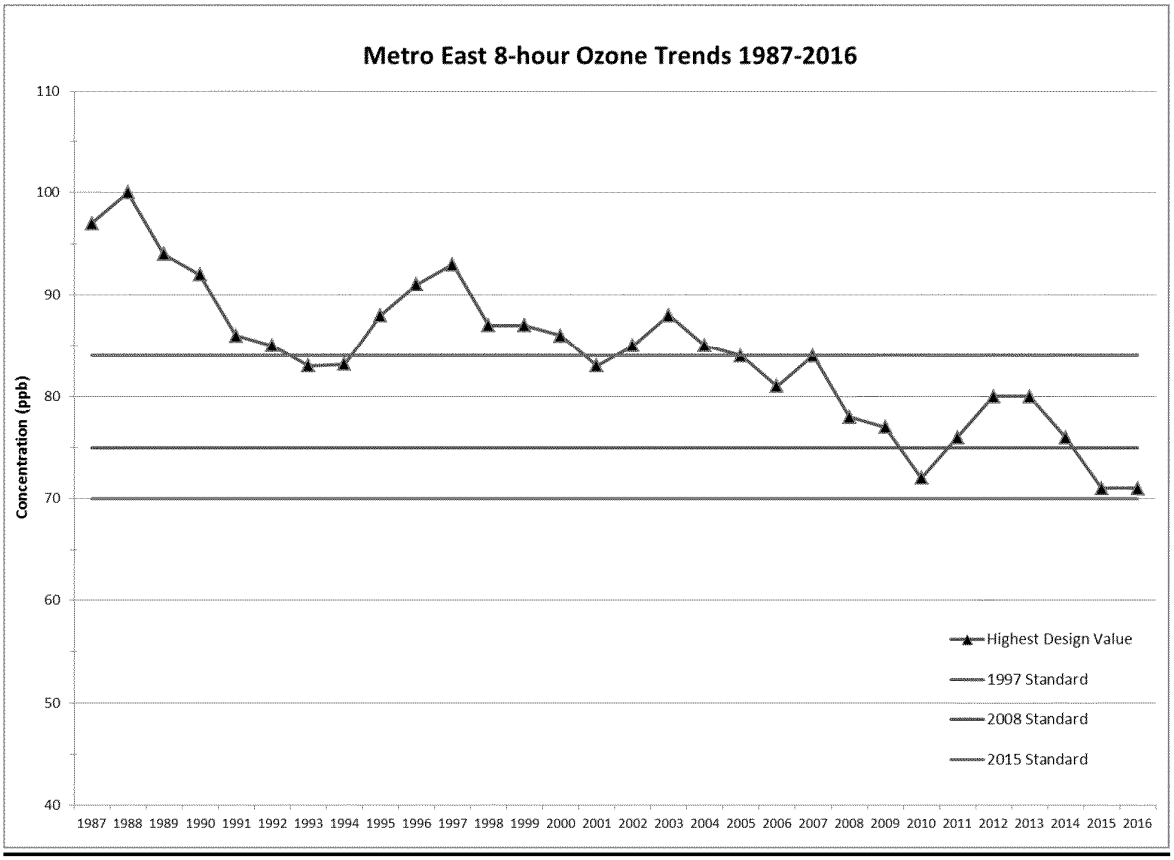


Figure 3. Metro-East Ozone Trend Compared to 1997, 2008, and 2015 Standards



Factor 2 – Emissions and Emissions-Related Data

U.S. EPA recommends that proposed nonattainment designations for the 2015 NAAQS reflect not only the areas of measured violations, but also the nearby areas that contribute to measured violations. Ozone is a secondary pollutant formed by chemical reactions from emissions of oxides of nitrogen (NOx) and volatile organic compounds (VOCs – also referred to as volatile organic materials, or VOMs, in Illinois regulations) that occur in the atmosphere in the presence of sunlight. These pollutants are referred to as precursors of ozone. U.S. EPA recommends using the 2011 National Emissions Inventory (NEI) version 2 emissions data for the initial nonattainment recommendations, but Illinois EPA has completed the 2014 NEI data compilation effort, so 2014 emissions will be used in this report. Illinois EPA emissions data for NOx and VOC for 2014 are summarized in descending order by county for point, area, non-road mobile, and on-road mobile source categories in Tables 4 through 7. A point source is defined as a source whose emissions are generally discharged through stacks. Area sources are defined as emissions that are spread over wide areas with no distinct discharge points (e.g., forest fires), or ones that are comprised of a large number of small point sources that are difficult to describe separately (e.g., residential fuel combustion). On-road mobile sources are classified as emissions from cars, trucks, buses, and motorcycles that are used for transportation of goods and passengers on streets and roads. Mobile non-road sources are characterized by emissions from other modes of powered transportation, such as airplanes, trains, ships, and off-highway motor vehicles.

Emissions and Emission-Related Data: Chicago

Emissions: Chicago

Tables 4 and 5 summarize Illinois EPA's 2014 estimated emissions from point, area, non-road mobile and on-road mobile sources in the Chicago MSA for NOx and VOCs. For the Chicago MSA Counties, NOx emissions are highest in Cook County with the greatest emissions from on-road sources. Cook County contributes about 50% of the total NOx emissions in the Chicago MSA counties. NOx emissions in Will, DuPage, and Lake Counties are also relatively high.

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Kendall, Grundy, and DeKalb counties have relatively low emissions, which combined amount to just over 5% of the total NOx emissions in the Chicago MSA.

Table 4. NOx Emissions by County in the Chicago MSA

NOx					
COUNTY	POINT	AREA	NONROAD	ONROAD	Total Tons/Yr
Cook	4,924.61	19,507.17	20,846.49	50,321.16	95,599.43
DuPage	684.59	4,517.19	3,702.57	12,658.17	21,562.51
Kane	503.93	1,989.45	2,659.81	6,179.09	11,332.28
Lake	2,291.70	3,255.34	3,314.74	8,981.73	17,843.52
Will	8,937.18	1,850.91	3,681.34	9,172.26	23,641.69
McHenry	216.58	1,183.48	1,440.20	3,789.81	6,630.08
Kendall	606.85	354.86	713.62	1,266.92	2,942.26
Grundy	1,034.69	168.17	1,295.64	1,078.91	3,577.41
Dekalb	123.72	296.41	1,285.97	1,546.83	3,252.94
Kankakee	733.52	354.42	1,150.88	1,719.27	3,958.08

Figure 4. NOx Emissions by County in the Chicago MSA

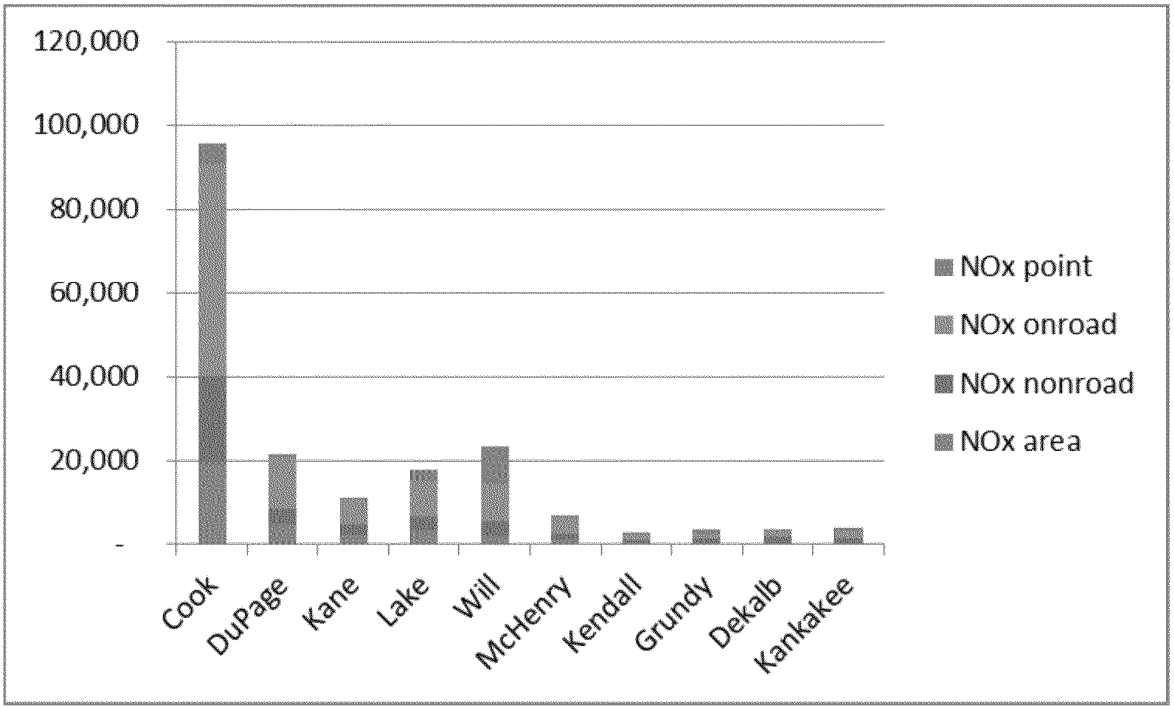

Table 5. VOC Emissions by County in the Chicago MSA

VOC					
COUNTY	POINT	AREA	NONROAD	ONROAD	Total Tons/Yr
Cook	6,961.51	42,123.09	11,741.98	22,587.95	83,414.53
DuPage	1,126.18	9,053.99	3,127.68	5,299.95	18,607.80
Kane	894.90	4,684.37	1,591.85	2,742.55	9,913.67
Lake	443.88	6,455.85	3,826.92	3,904.71	14,631.36
Will	2,390.18	6,018.82	2,006.46	3,712.42	14,127.89
McHenry	252.69	2,795.11	1,156.64	1,773.17	5,977.61
Kendall	215.07	1,131.42	1,389.78	622.23	3,358.50
Grundy	533.21	732.01	547.78	383.00	2,196.00
Dekalb	223.78	1,397.49	811.43	66.09	3,098.78
Kankakee	903.41	1,541.44	856.38	762.27	4,063.50

Figure 5. VOC Emissions by County in the Chicago MSA

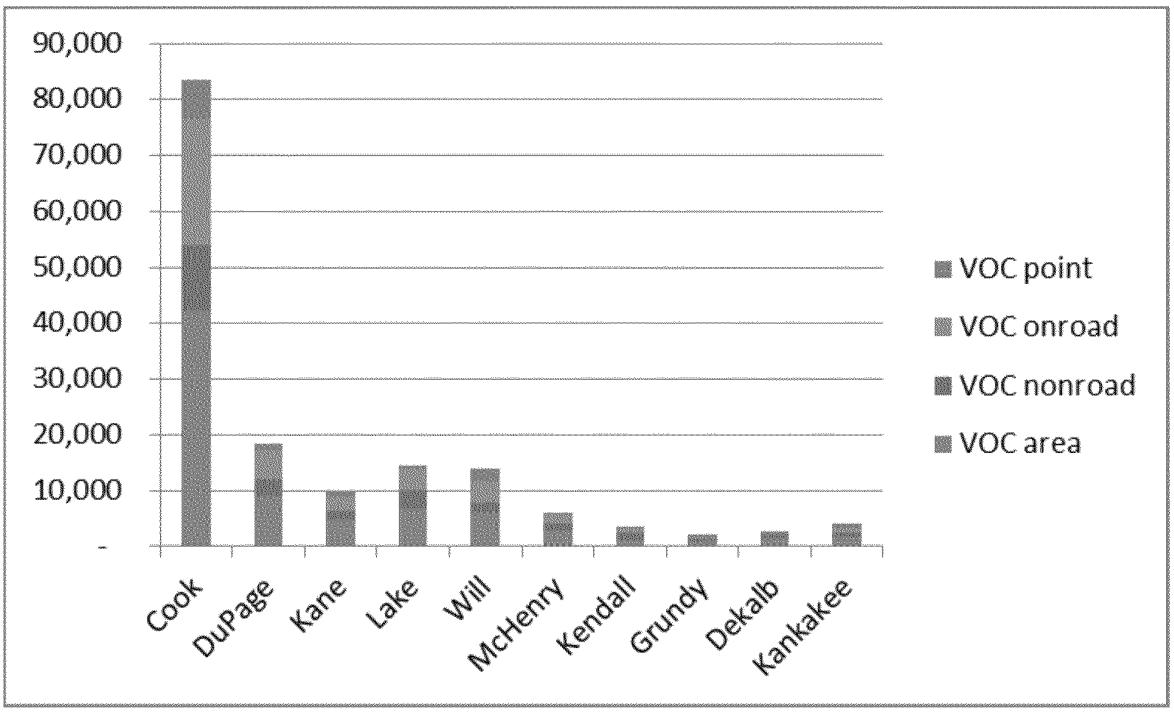

Table 5 summarizes the VOC emissions in the Chicago MSA. VOC emissions are highest in Cook County, with the greatest emissions coming from area sources. VOC emissions from Cook County are approximately 52% of the total VOC emissions in the area. DuPage, Lake, and Will counties also have relatively high VOC emissions. VOC emissions are lowest in DeKalb, Kendall, and Grundy counties; these counties combined contribute approximately 5% of the total VOC emissions in the area.

Figures 6 and 7 depict both the locations and emission rates of major point sources in the current Chicago MSA for NOx and VOCs, respectively. Emission totals are based on Illinois EPA reported emissions for 2014. The orange areas in the figures represent the areas being recommended as nonattainment for the 2015 ozone standard; counties bordered in bold black lines represent counties included in the MSA where emission sources are evaluated as to whether or not they contribute to nonattainment.

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Figure 6. NOx Point Sources in the Chicago MSA

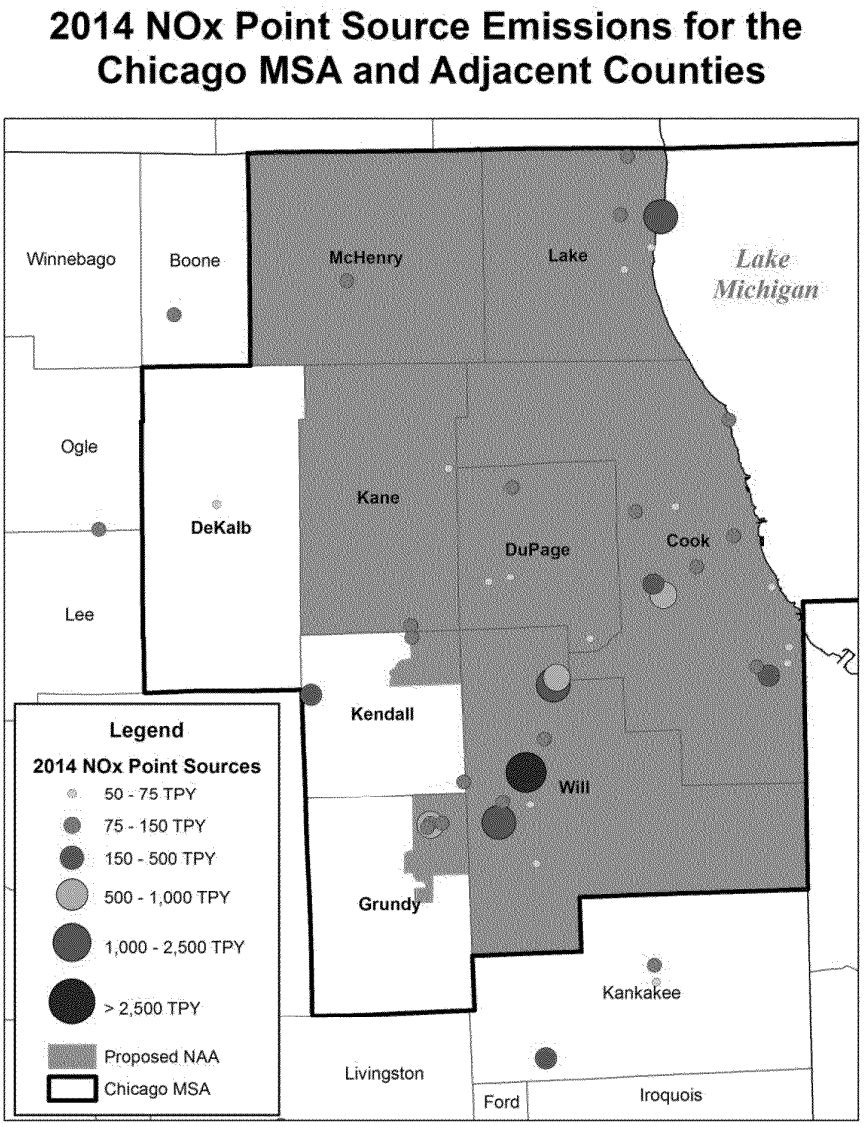
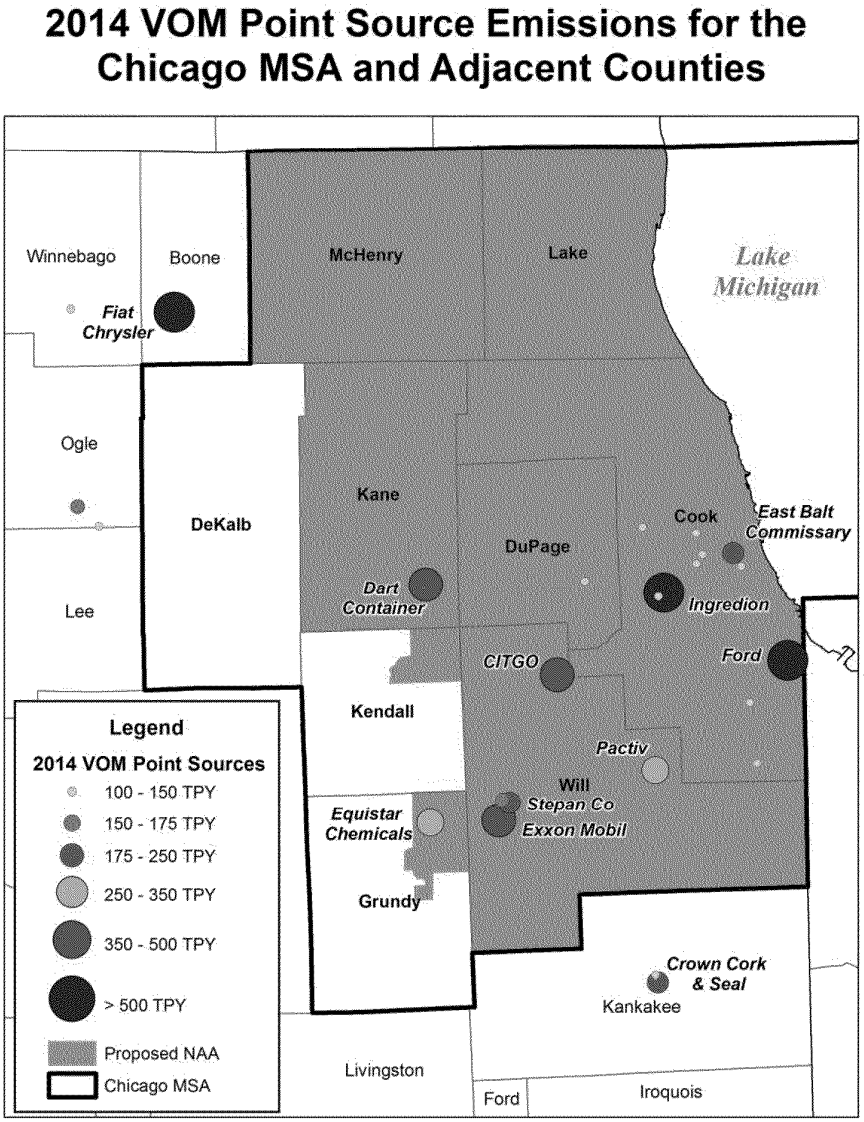


Figure 7. VOC (VOM) Point Sources in the Chicago MSA



For the Chicago MSA, the largest point sources for NOx are located in Will County. Cook and Lake Counties also contain major point sources contributing NOx emissions. In comparison, Kankakee, Kendall, DeKalb, and Grundy counties have relatively few point sources emitting NOx with contributions only representing approximately 8% of the total NOx emissions. Both the largest size and greatest number of VOC point sources occur in Cook, Will, and Grundy counties. In comparison, DeKalb, Kankakee, and Kendall counties have relatively few VOC point sources.

Emission-Related Data – Population and Urbanization: Chicago

Population and urbanization are factors that supplement and help to inform the analysis of emissions data. Table 6 lists the population of each of the counties contained in the Chicago MSA, as well as land areas and population densities based on U.S. Census Bureau estimates for 2014. Figure 8 graphically depicts population densities in the Chicago MSA. For the Chicago area, Cook, DuPage, Lake, and Will Counties have the largest populations and highest population densities, while DeKalb and Grundy Counties have the lowest.

Table 6. Population Data by County – Chicago MSA (Illinois Counties Only)

County	2014 Population	Land Area (Square Mile)	Population Density (Persons per Sq. Mile)
Cook	5,248,704	945.68	5,550
DuPage	933,769	333.61	2,799
Lake	704,149	447.56	1,573
Kane	527,501	520.44	1,014
Will	685,621	836.94	819
McHenry	306,975	603.51	509
Kendall	121,816	320.58	380
Kankakee	111,473	676.75	165
DeKalb	104,693	634.16	165
Grundy	50,433	419.90	120

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Figure 8. Population Density in the Chicago MSA

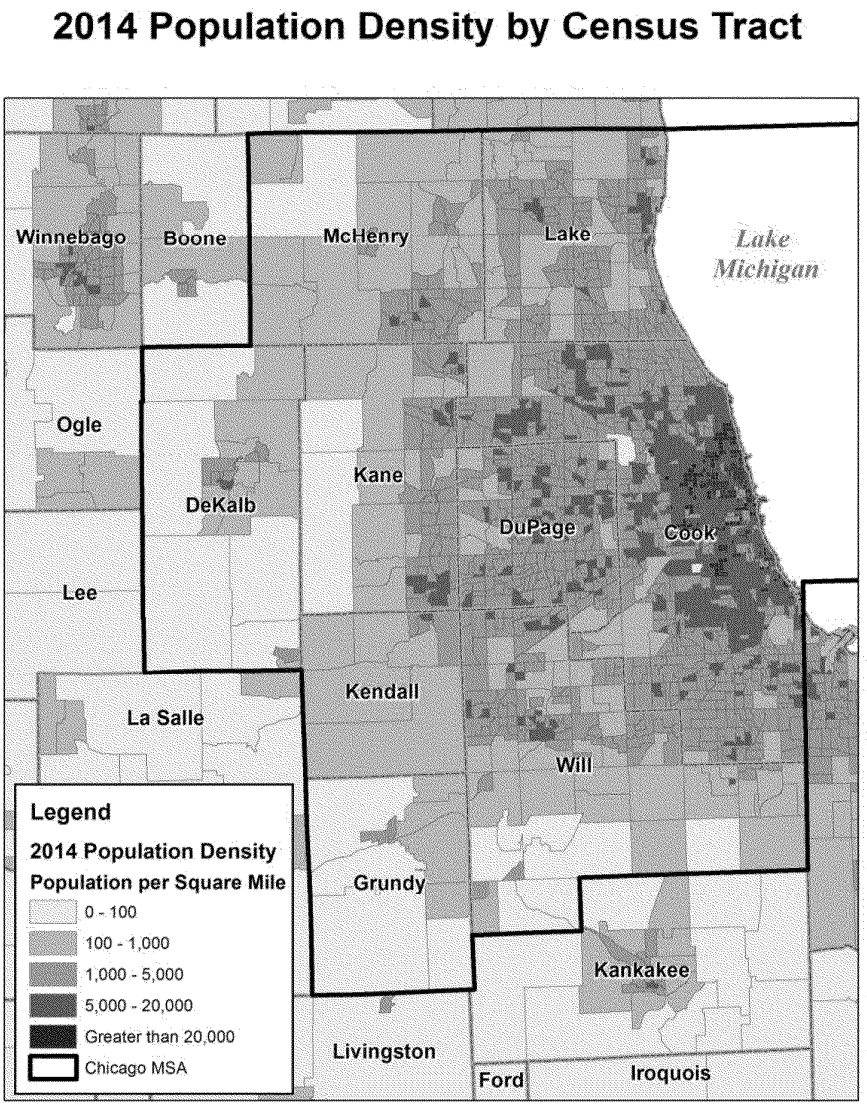

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Figure 9 illustrates the extent of the urbanized area within the Chicago MSA. According to the U.S. Census Bureau, MSA boundaries are dependent on a central urbanized area or contiguous area of relatively high population density. Outlying counties are included in MSAs if they exhibit strong social and economic ties to this core area, often measured by commuting and economic patterns. Therefore, it is logical to conclude that the urbanized areas in Winnebago, Boone, and Kankakee Counties are not directly influencing emissions in the Chicago MSA. A pattern of fragmented urban development and commuting is also apparent in DeKalb, Kankakee, and parts of Grundy counties. The urban extents in these counties are not contiguous with the core urbanized area of the Chicago MSA.

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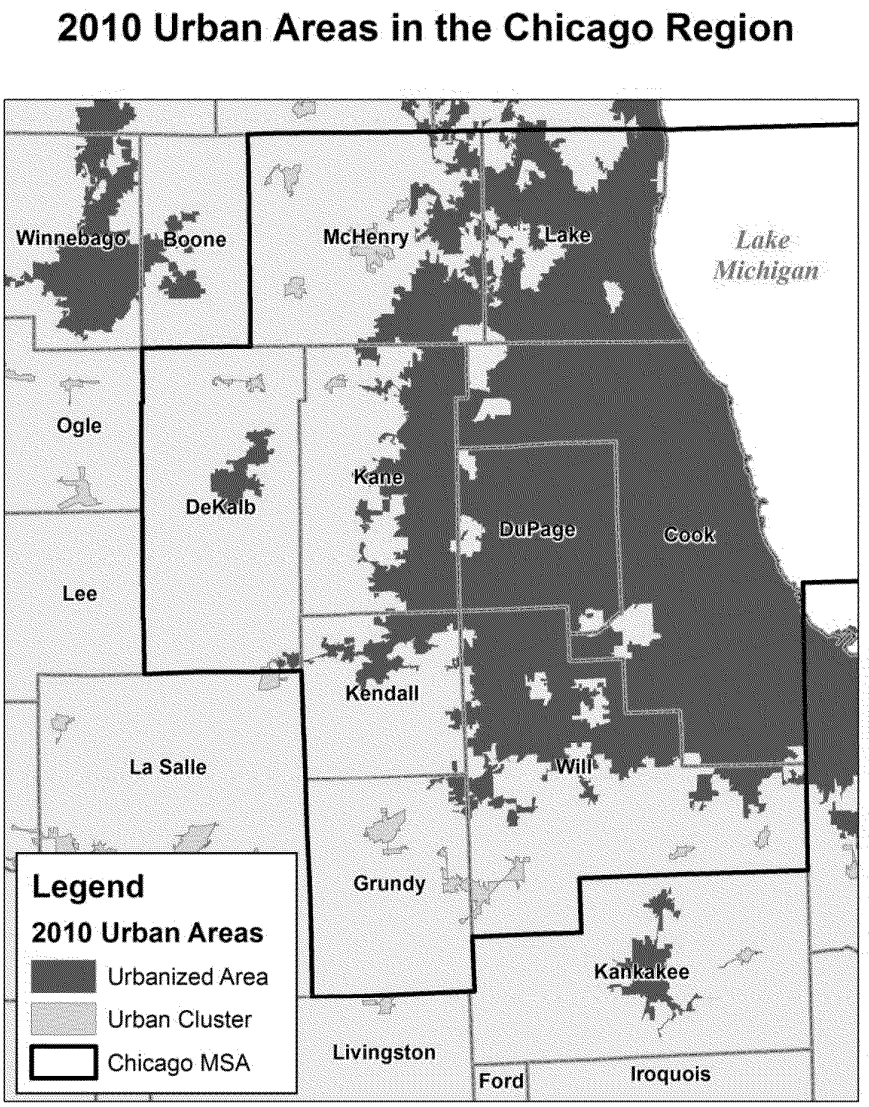
Figure 9. Urbanized Areas in the Chicago MSA



Population growth is an important indicator of potential emission increases in an area. Table 7 outlines percent change in population between 2010 and 2014 by county for the Chicago MSA. This data was provided by the U.S. Census Bureau and is based on estimates dated July 1, 2015. According to the data, Kendall County has experienced the greatest percent increase in

population at 6.2%; however, its total population is among the smaller counties at 1.4% of the overall study area. Cook County has experienced only an estimated 1.0% increase in population; however, its total population for 2014 represents just over 60% of the total population within the Chicago MSA.

Table 7. 2010-2014 Population Change by County for the Chicago MSA

County	2010 Population	2014 Population	Change (%)
Kendall	114,736	121,816	6.2%
Kane	515,269	527,501	2.4%
DuPage	916,924	933,769	1.8%
Will	677,560	685,621	1.2%
Cook	5,194,675	5,248,704	1.0%
Grundy	50,063	50,433	0.7%
Lake	703,462	704,149	0.1%
DeKalb	105,160	104,693	-0.4%
McHenry	308,760	306,975	-0.6%

Emission-Related Data – Traffic and Commuting Patterns: Chicago

Table 8 summarizes the Illinois Department of Transportation (IDOT) estimates of Annual Vehicle Miles Travelled (AVMT) for 2014, as calculated by IDOT's Highway Information System for the Chicago MSA counties. Figure 10 presents the same data in a pie chart format. According to IDOT traffic statistics for 2014, Cook County has by far the highest level of AVMT in the Chicago MSA, contributing over half in the MSA. DuPage, Kane, Lake, Will, and McHenry have moderate levels of AVMT in comparison. DeKalb, Grundy, and Kendall Counties have the lowest amounts of AVMT, with 1.5% or less of the total for the MSA per county.

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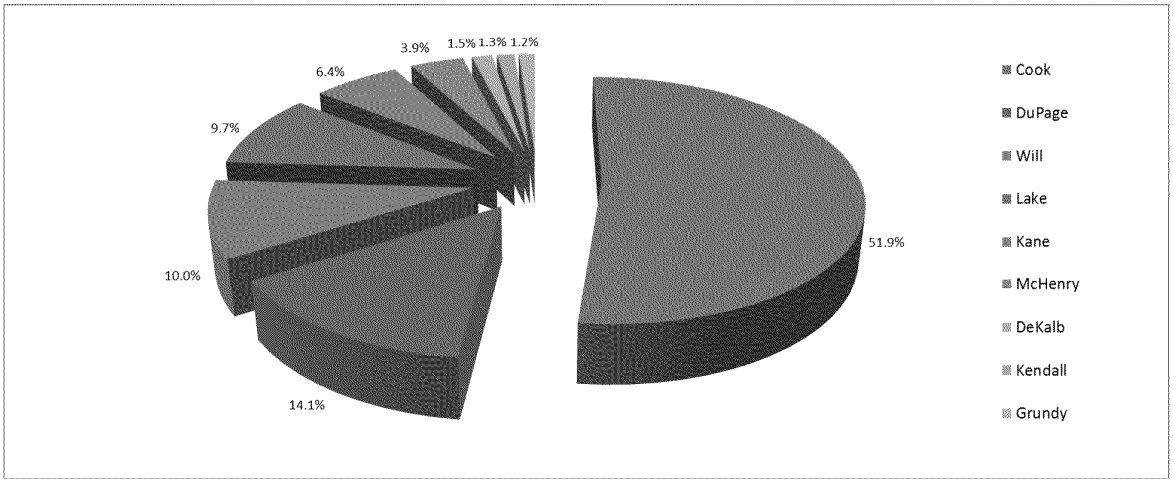
Table 8. 2014 IDOT Travel Statistics for the Chicago MSA

Chicago Metropolitan Statistical Area	Annual Vehicle Miles Traveled
Cook	30,968,482,692
DuPage	8,431,530,656
Will	5,990,879,258
Lake	5,773,254,658
Kane	3,825,411,032
McHenry	2,344,600,079
Dekalb	899,047,166
Kendall	776,942,781
Grundy	710,642,429

Figure 10. 2014 AVMT – Percent by County in the Chicago MSA



The U.S. Census Bureau has compiled statistics from 2009-2013 American Community Survey data that quantify commuting patterns both between counties and in and out of the state. Table 9 and Figure 11 show counties within the Chicago area and their respective commuting patterns. Within most of the Chicago MSA, a higher percentage of people stay in the counties in which they reside for work; however, commuting patterns within Kendall and Grundy Counties show a higher percentage of workers commuting to other counties within the area. However, the number of commuters in the Chicago MSA is overwhelmed by the number of Cook County commuters

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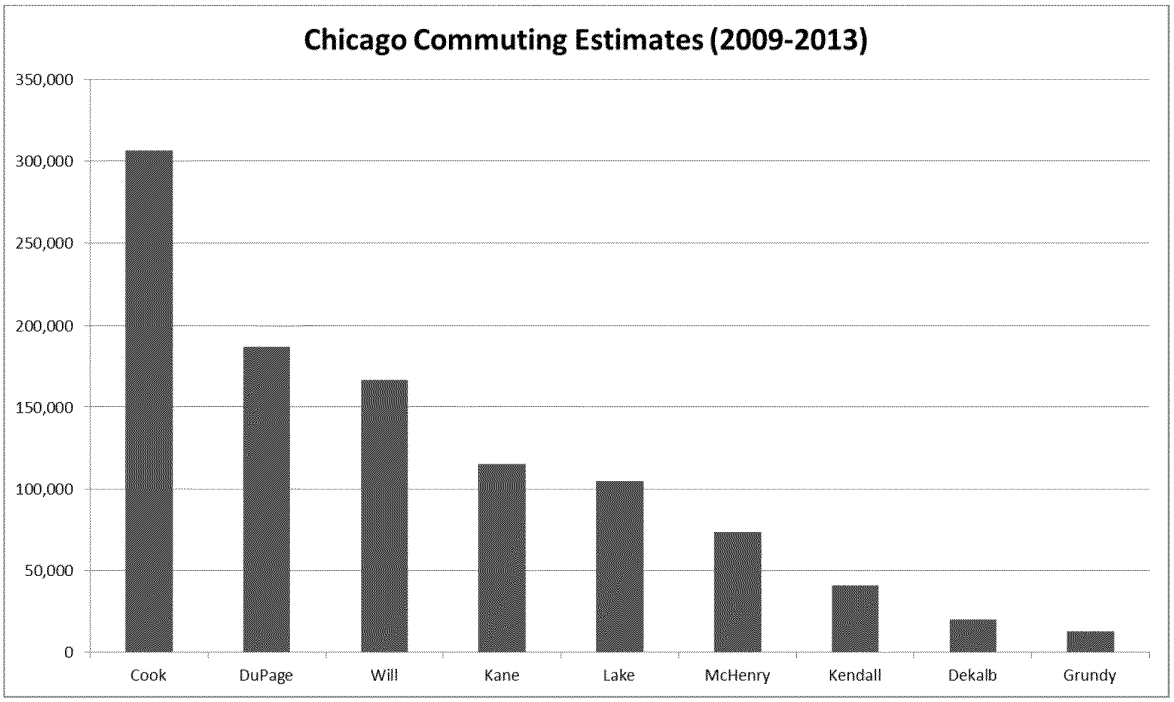
(about 60% of all of the commuters in the MSA). And 87% of the commuters in Cook County remain in Cook County for work.

Table 9. Commuting Patterns in the Chicago MSA

County of Residence	Workers	Staying in County	Commuting	Percent Staying	Percent Commuting
Cook	2,364,074	2,057,967	306,107	87.05%	12.95%
DuPage	461,643	274,956	186,687	59.56%	40.44%
Will	316,970	150,329	166,641	47.43%	52.57%
Kane	242,560	127,424	115,136	52.53%	47.47%
Lake	337,985	233,253	104,732	69.01%	30.99%
McHenry	150,887	77,111	73,776	51.11%	48.89%
Kendall	56,825	16,135	40,690	28.39%	71.61%
Dekalb	49,655	29,714	19,941	59.84%	40.16%
Grundy	22,556	9,785	12,771	43.38%	56.62%

Figure 11. Commuters by County in the Chicago MSA



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Emissions and Emission-Related Data: Metro-East

Emissions: Metro-East

Tables 10 and 11 and Figures 12 and 13 summarize Illinois EPA's 2014 estimated emissions from point, area, non-road mobile, and on-road mobile sources in the St. Louis MSA, including the adjacent counties of Randolph, Montgomery, and Washington.

For the St. Louis MSA and adjacent counties, NOx emissions are highest in Madison, St. Clair, and Randolph counties. Combined NOx emissions from Madison, St. Clair, and Randolph counties contribute about 58% of the total NOx emissions within the area. The greatest source contributors to the total NOx emissions for Madison and Randolph counties are point sources, whereas the greatest contributions in St. Clair County comes from on-road sources. Greene, Bond, Jersey, and Calhoun counties have relatively low emissions; combined they contribute to about 8% of the total NOx emissions.

VOC emissions are highest in Madison and St. Clair counties, and account for nearly 51% of the total VOC emissions. In contrast, Clinton, Macoupin, Randolph, Montgomery, and Monroe VOC emissions contribute to only 33% of the total VOC emissions for the area. Area sources are the major contributor towards total VOC emissions for 2014. VOC emissions are lowest in Jersey, Greene, Calhoun, and Bond counties, with combined emissions contributing around 13% of the total VOC emissions.

For the St. Louis MSA (Figure 14), the largest point sources for NOx are located in Madison, Montgomery, and Randolph counties. Madison and St. Clair counties have the largest number of NOx emitting point sources, most emitting less than 100 tons per year. Adjacent counties have relatively few point sources emitting NOx. The largest emitting and greatest number of point sources emitting VOC's (Figure 15) are located in Madison and St. Clair counties. Adjacent counties have relatively few point sources emitting VOCs.

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Table 10. NOx Emissions by County in the Metro-East MSA

NOx					
COUNTY	POINT	AREA	NONROAD	ONROAD	Total Tons/Yr
Madison	6,868.15	859.66	2,124.40	4,904.63	14,756.84
Randolph*	4,730.09	171.19	2,319.66	531.20	7,752.14
St. Clair	360.12	701.43	1,682.40	4,620.29	7,364.25
Clinton	3,196.28	272.53	776.54	695.82	4,941.17
Washington*	2,817.03	234.69	525.94	653.02	4,230.68
Montgomery*	1,888.98	115.84	810.25	889.34	3,704.41
Monroe	5.91	120.99	1,921.50	607.59	2,655.99
Macoupin	8.02	179.41	701.91	797.49	1,686.82
Calhoun	0.75	19.85	1,053.50	74.41	1,148.51
Bond	15.06	81.78	446.89	523.44	1,067.17
Jersey	0.00	76.13	561.68	374.12	1,011.93
Greene	0.00	48.91	579.98	229.84	858.74

Figure 12. NOx emissions by County in the Metro-East MSA

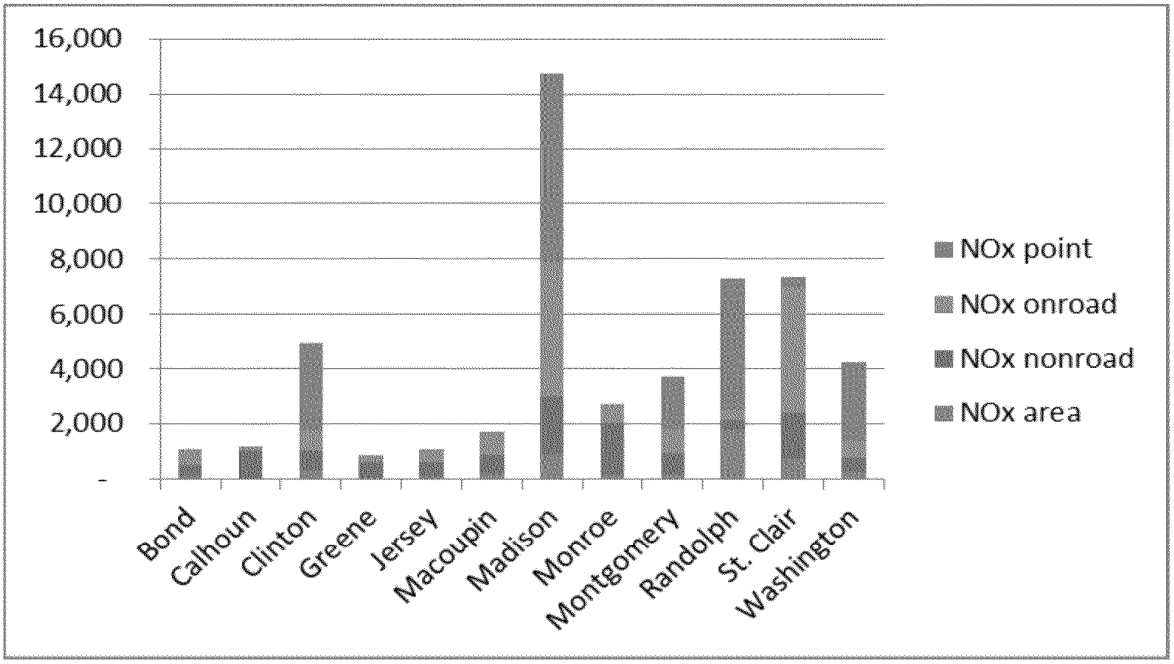

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Table 11. VOC emissions by County in the Metro-East MSA

VOC					
COUNTY	POINT	AREA	NONROAD	ONROAD	Total Tons/Yr
Madison	2,555.26	3,178.41	1,239.88	1,788.35	8,761.90
St. Clair	522.33	2,706.06	795.31	1,704.04	5,727.73
Clinton	185.97	1,079.45	929.19	274.79	2,469.41
Randolph*	327.90	671.05	703.40	255.10	1,957.46
Macoupin	5.29	958.78	295.86	381.98	1,641.91
Montgomery*	145.16	729.45	331.46	299.60	1,505.67
Washington*	88.17	1,000.82	124.71	196.49	1,410.19
Monroe	17.37	582.91	363.18	234.11	1,197.56
Calhoun	0.11	199.71	794.21	40.34	1,034.36
Jersey	10.34	418.46	333.43	168.82	931.05
Bond	24.13	456.51	195.81	173.29	849.74
Greene*	0.40	431.82	219.68	115.57	767.47

Figure 13. VOC emissions by County in the Metro-East MSA

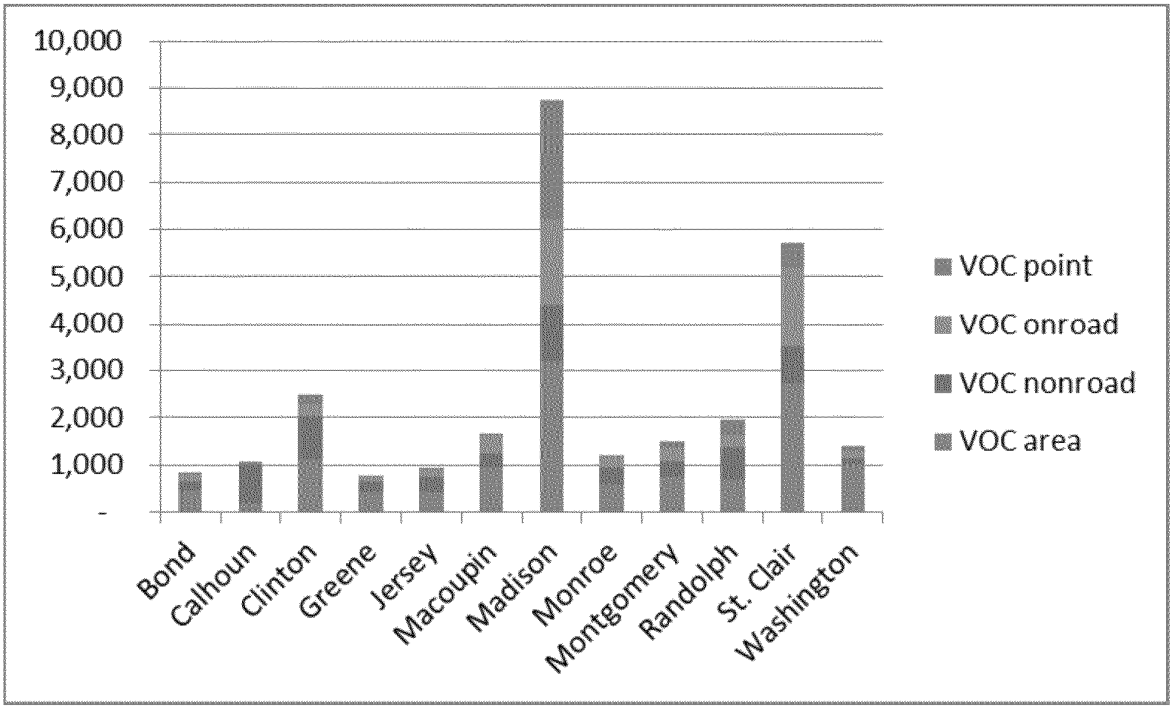

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Figure 14. NOx Point Sources in the Metro-East MSA

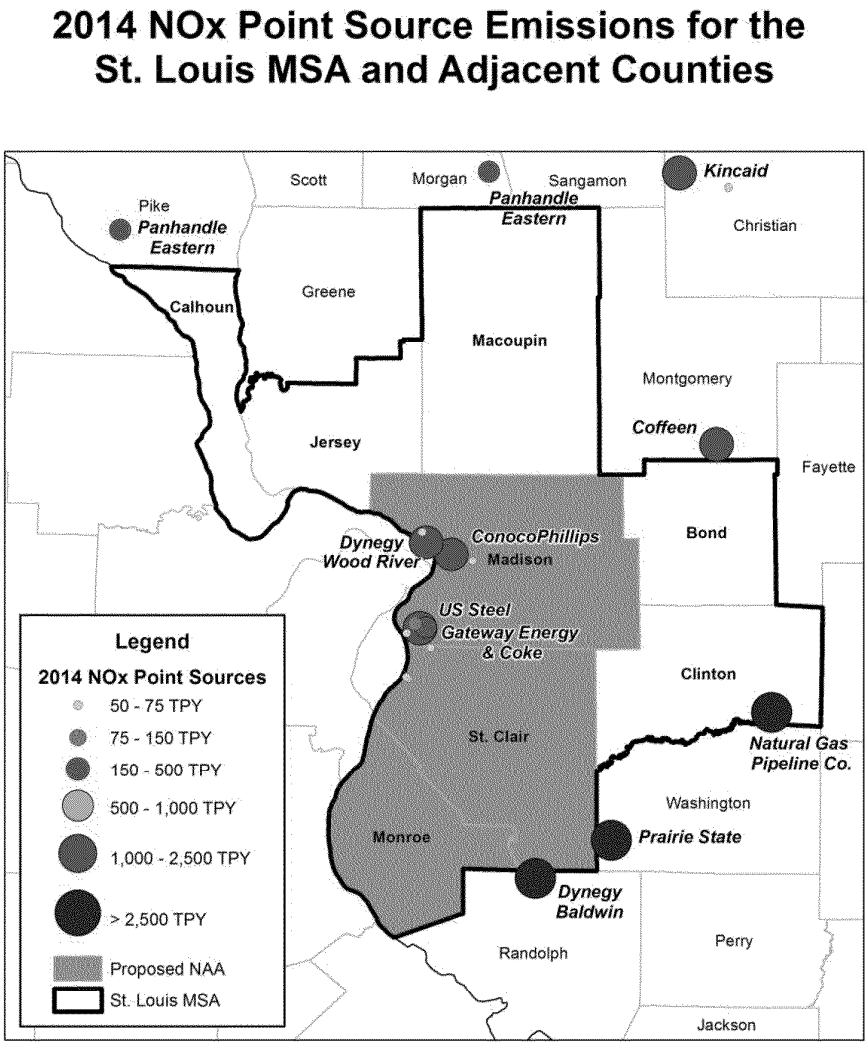
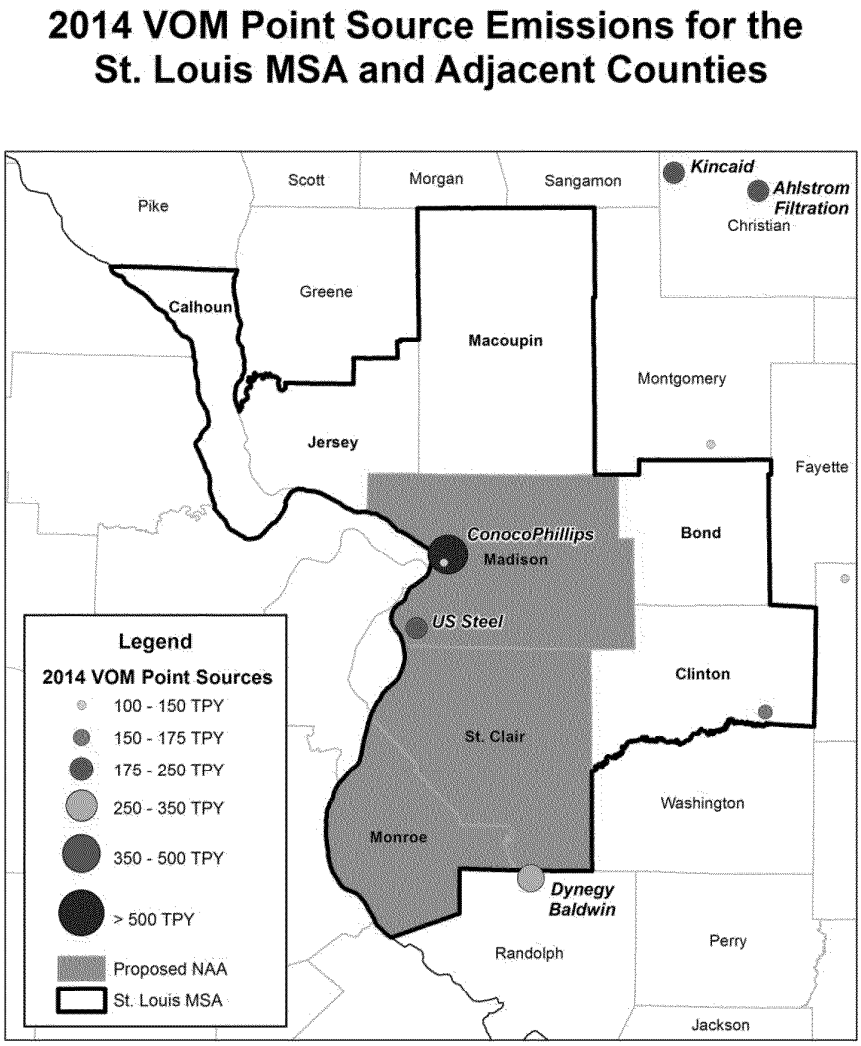


Figure 15. VOC (VOM) Point Sources in the Metro-East MSA



Emission-Related Data – Population and Urbanization: Metro-East

Population and urbanization are factors that supplement and help to inform the analysis of emissions data. Table 12 lists the population of each of the counties contained in the St. Louis MSA, as well as land areas and population densities based on U.S. Census Bureau estimates for 2014. Figure 16 graphically depict population densities in the St. Louis MSA. Madison and St. Clair counties contain the majority of the Metro-East population, while Bond, Washington, and Calhoun counties are considerably less populated.

Table 12. Population Data by County - Metro-East MSA and Adjacent Counties

County	2014 Population	Land Area (Square Mile)	Population Density (Persons per Sq. Mile)
St. Clair	265,552	663.81	400
Madison	266,635	725.02	368
Clinton	37,802	472.23	80
Monroe	33,695	388.29	87
Jersey	22,552	369.16	61
Randolph*	33,048	578.42	57
Macoupin	46,354	863.57	54
Bond	17,124	380.2	45
Montgomery*	29,058	703.8	41
Washington*	14,394	562.61	26
Calhoun	4,963	263.62	19

*Counties not included in St. Louis MO-IL MSA

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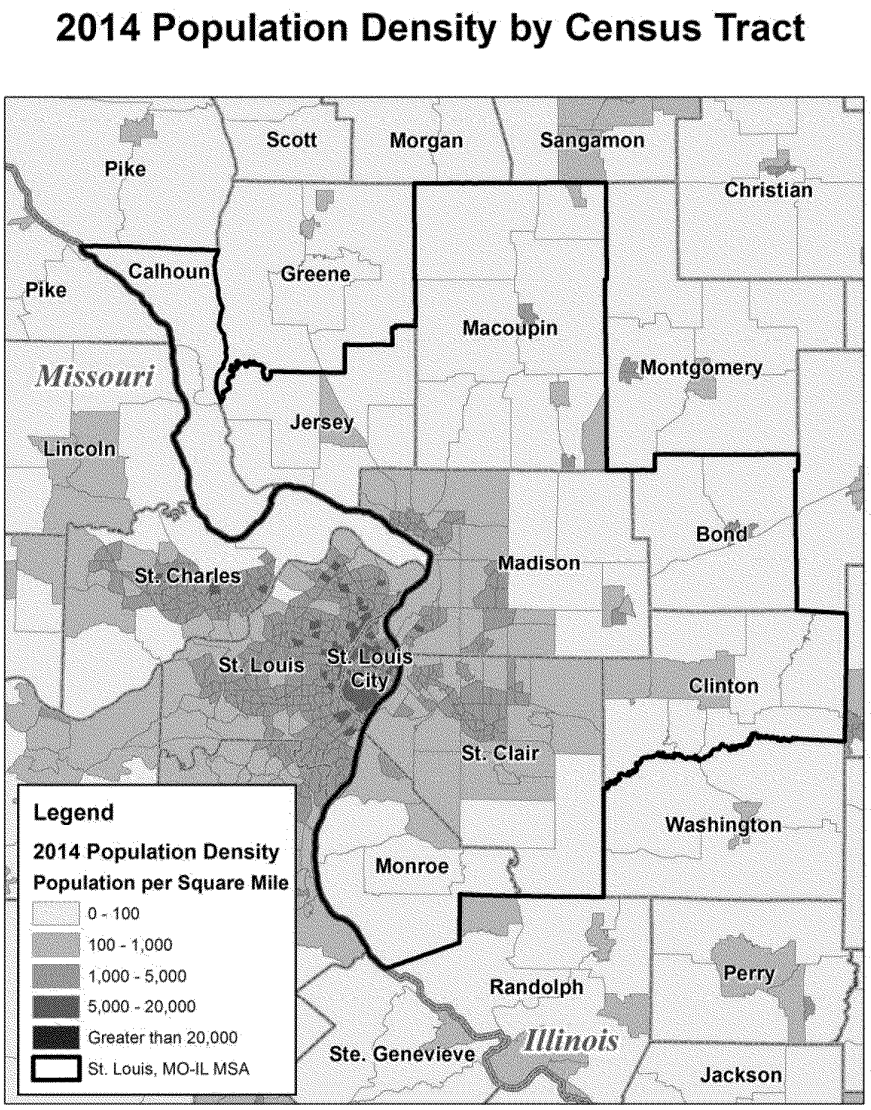
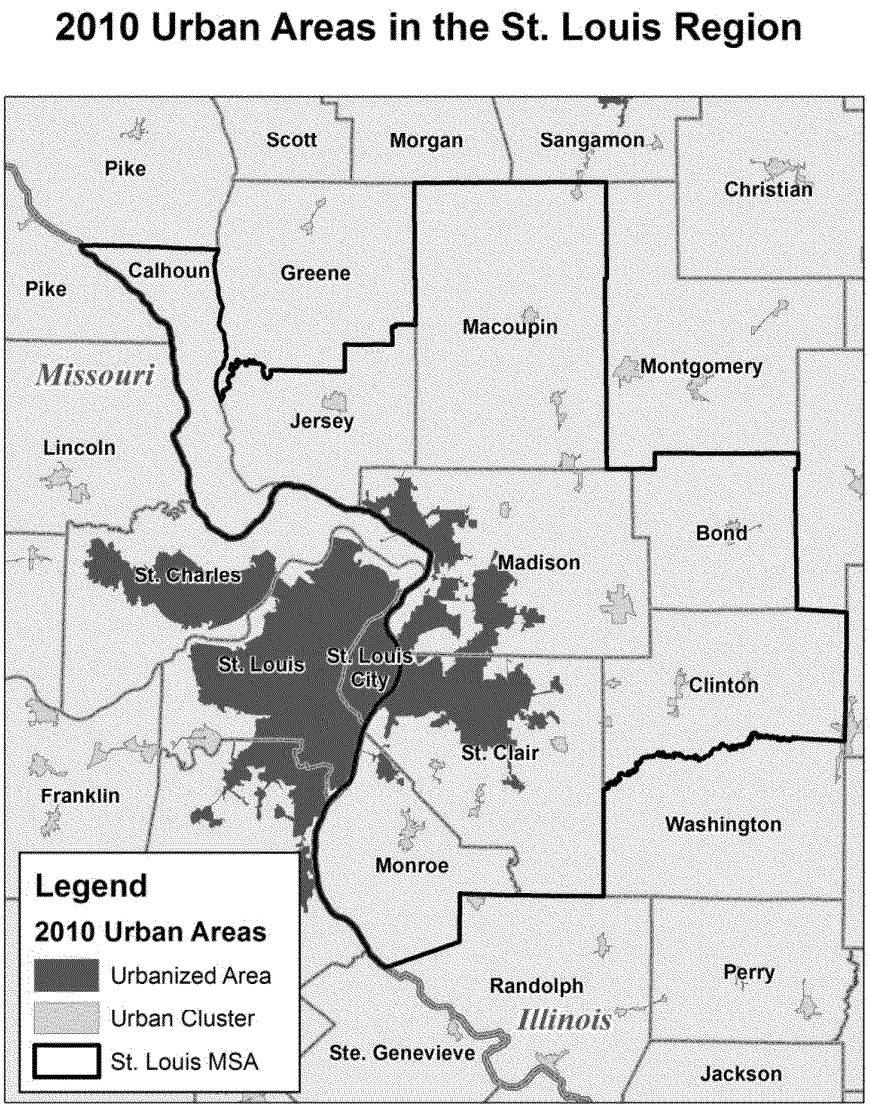
Figure 16. Population Density in the Metro-East MSA



In the St. Louis MSA and adjacent county areas, urbanization is not as pronounced as seen in the Chicago MSA (Figure 17). Madison and St. Clair counties are the most urbanized of the counties in the Metro-East portion of the St. Louis MSA. Adjacent counties such as Washington, Montgomery, and Randolph are not included in the St. Louis MSA and contain population centers disconnected from the Metro-East urban core. Based on the non-contiguous pattern of

urbanization, it is logical to conclude that Washington, Montgomery, and Randolph counties are not influencing emissions related to social, economic, and population growth in the Metro-East region.

Figure 17. Urbanized Areas in the Metro-East MSA



Population growth is an important indicator of potential emission increases in an area. Table13 outlines percent change in population between 2010 and 2014 by county for the Metro-East MSA. This data was provided by the U.S. Census Bureau and is based on estimates dated July 1, 2015. According to the data, only Monroe County has experienced modest population growth. Clinton County's population is essentially unchanged, while the other counties in the MSA have decreased by at least 1.0 % over the four years. The two most populated counties, Madison and St. Clair, have both experienced decreases in population.

Table 13. 2010-2014 Population Change by County for the Metro-East MSA

County	2010 Population	2014 Population	Change (%)
Monroe	32,957	33,695	2.2%
Clinton	37,762	37,802	0.1%
Madison	269,282	266,635	-1.0%
Randolph	33,476	33,048	-1.3%
St. Clair	270,056	265,552	-1.7%
Jersey	22,985	22,552	-1.9%
Calhoun	5,089	4,963	-2.5%
Macoupin	47,765	46,354	-3.0%
Bond	17,768	17,124	-3.6%

Emission-Related Data – Traffic and Commuting Patterns: Metro-East

Table 14 summarizes IDOT's estimates of AVMT for 2014, as calculated by IDOT's Highway Information System for the Metro-East Study Area. Figure 18 presents the same data in a pie chart format. According to IDOT traffic statistics for 2014, Madison and St. Clair Counties have the highest level of AVMT in the St. Louis Study Area. Both counties together account for almost three-fourths of the AVMT in the MSA. The other counties have relatively minor AVMT in comparison, with Calhoun County having less than 0.5 % of the total for the MSA.

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Table 14. 2014 IDOT Travel Statistics for the Metro-East MSA

St. Louis Metropolitan Statistical Area (MSA)	Annual Vehicle Miles Traveled (AVMT)
Madison	2,935,477,274
St. Clair	2,748,986,955
Macoupin	406,175,818
Clinton	391,161,309
Monroe	368,211,460
Bond	291,596,540
Randolph*	269,049,614
Jersey	196,211,404
Calhoun	35,735,522
* Randolph County is not part of the MSA	

Figure 18. 2014 AVMT - Percent by County in the Metro-East MSA

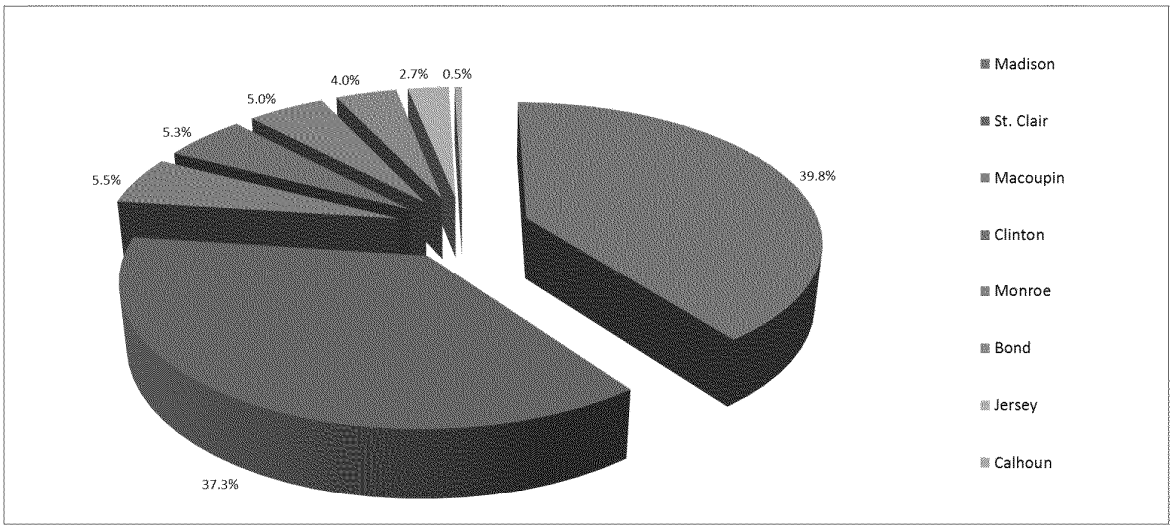

Table 15 and Figure 19 show counties within the Metro-East Study Area and their respective commuting patterns. Within the Metro-East Study Area, a higher percentage of people stay in the counties in which they reside for work, especially in Madison and St. Clair Counties, where the large majority of commuters live. Jersey, Calhoun, Clinton, and Monroe Counties show a greater percentage of workers commuting to other counties within the MSA, but the percentage of workers commuting from these counties to other counties is just over 10% of all workers in the MSA.

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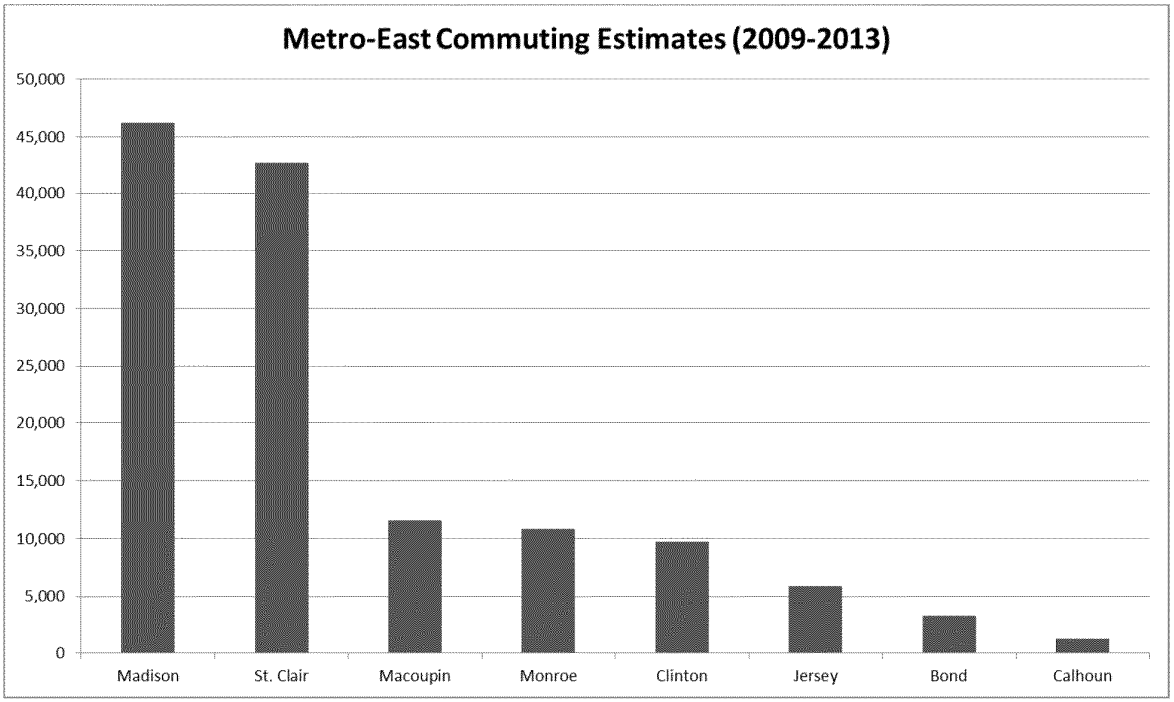
Table 15. Commuting Patterns in the Metro-East MSA

County of Residence	Workers	Staying in County	Commuting	Percent Staying	Percent Commuting
Madison	122,193	76,006	46,187	62.20%	37.80%
St. Clair	119,278	76,525	42,753	64.16%	35.84%
Macoupin	21,342	9,763	11,579	45.75%	54.25%
Monroe	16,184	5,317	10,867	32.85%	67.15%
Clinton	18,547	8,802	9,745	47.46%	52.54%
Jersey	10,062	4,138	5,924	41.13%	58.87%
Bond	7,508	4,239	3,269	56.46%	43.54%
Calhoun	2,154	904	1,250	41.97%	58.03%

Figure 19. Commuters by County in the Metro-East MSA



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Factor 3 – Meteorology

Meteorological data analysis provides additional insight into the transport of emissions. The most simplistic approach is to evaluate wind direction and speed from a fixed location, such as a National Weather Service meteorological data site. However, it is often difficult to assess where the air mass was, even an hour or two before the measurement was taken.

A more sophisticated analysis can be done by use of a back trajectory model. This type of model starts with a user-supplied location and time and tracks the air mass backwards using output from a meteorological model. This method produces a path that the air mass has taken to get to the desired final location and time, for as long of a period as 48 hours prior. Since nonattainment areas are relatively small and air mass residence time over the nonattainment area is short, a back trajectory model is an important tool in determining from where ozone and precursors are being transported.

The HYSPLIT (Hybrid Single-Particle Lagrangian Integrated Trajectory) modeling system produces trajectories that indicate the path air parcels travel over a given time. The modeling system uses meteorological data and topography to simulate atmospheric transport. In this analysis, days were chosen that had two or more monitors in the nonattainment areas that exceeded the 70 ppb standard. A total of ten days met this criteria in the Metro-East over the period 2013-2015, while 14 days met the criteria for the Chicago area. The endpoint of the HYSPLIT trajectories was in northwestern Madison County, which represents a central location for the highest design values in the Metro-East MSA. O'Hare Airport was the endpoint representing the areas of highest design values in the Chicago MSA.

These trajectories were generated following EPA's Designation Guidance Memorandum, including using the EDAS 40 km meteorological data, calculating trajectories at three different heights above the endpoint (100 m, 500 m, and 1000 m), and using an end time of 0000 Universal Coordinated Time (UTC), which is equivalent to 7 PM central daylight time. The end time of 7 PM almost always lies within the 8-hour period comprising the maximum ozone

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concentration on high ozone days. The trajectories go back 48 hours in time, accounting for the two previous days of loading ozone and precursors into the air mass.

Chicago Trajectories:

Individual trajectories for all 14 days are in Appendix A. In the Chicago area, there are generally two types of transport scenarios: a stronger wind scenario with transport across long distances (over 500 km; Figure 20), and shorter transport trajectories that have strong anticyclonic curvature (Figure 21).

The difference in the transport on high ozone days in Chicago is that stagnation conditions and the overall large size of the urban area can keep the air mass over the Chicago area for up to twelve hours. A caveat is that meteorological models struggle with simulating a land/lake breeze circulation; therefore, the trajectories derived from the models also likely won't accurately reflect lake-induced circulations. On days where lake breeze circulations are suspected, counties adjacent to Lake Michigan will have a more significant emissions contribution. However, using a photochemical modeling domain that covers much of North America, and the use of an entire ozone season worth of meteorology in ozone simulations, minimizes the risk that a dominant meteorological scenario for high ozone will not be represented in control strategy assessment.

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Figure 20. Long distance transport scenario into the Chicago MSA

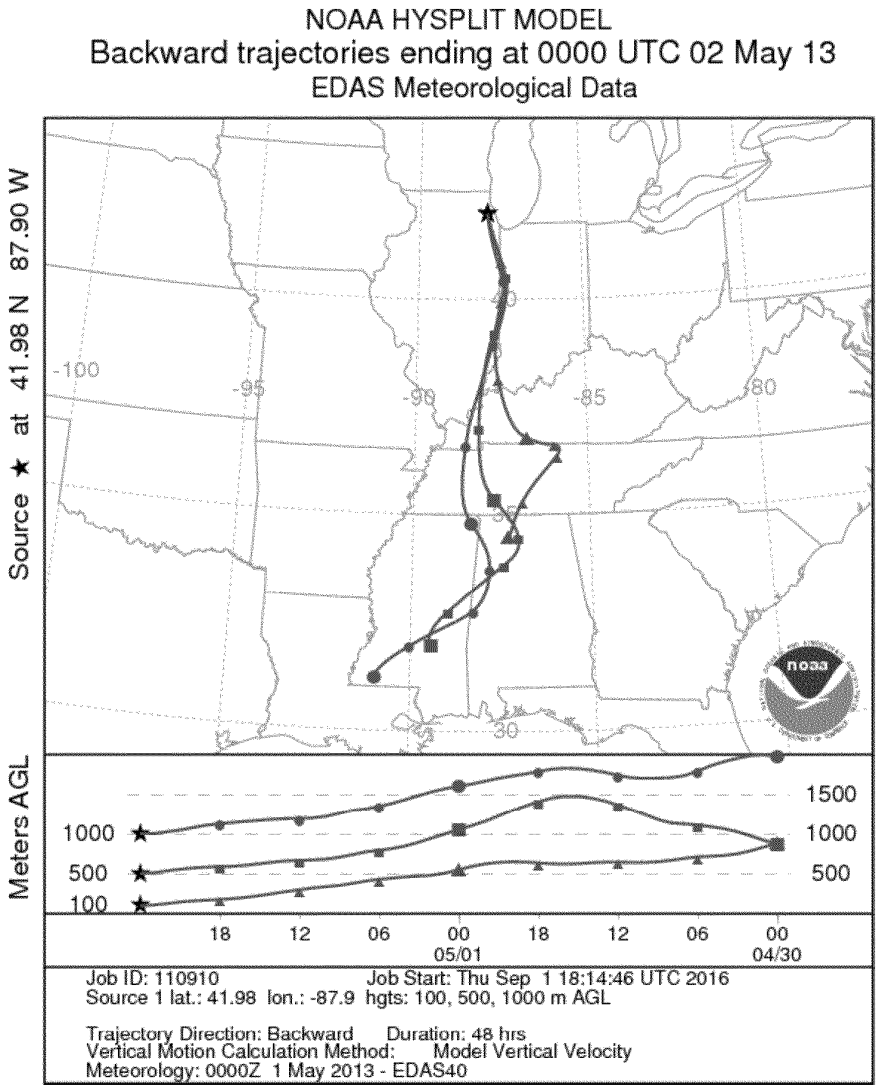
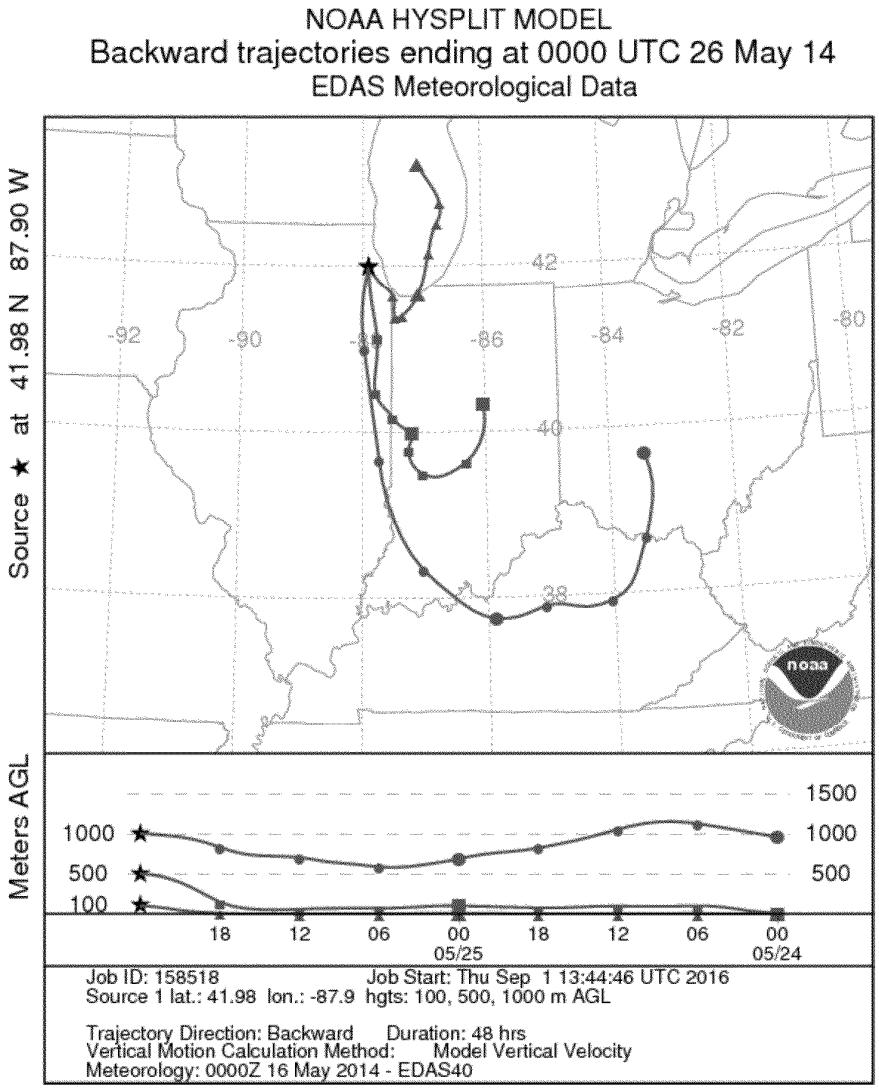


Figure 21. Anticyclonic curvature transport scenario into the Chicago MSA



Metro-East Trajectories

Individual trajectories for all ten days are in Appendix B. The trajectories generally represent two scenarios; the first is a stronger flow pattern, where transport over 48 hours can exceed 1,000 km (Figure 22), and the second is a relatively stagnant wind flow, where trajectories are much shorter and usually have a pronounced anticyclonic (clockwise) curvature, indicating circulation around a surface high pressure center (Figure 23). In both cases, residence time over the nonattainment area is short, though especially light winds can lead to 6-12 hours of residence time. However, using a photochemical modeling domain that covers much of North America, and the use of an entire ozone season worth of meteorology in ozone simulations, minimizes the risk that a dominant meteorological scenario for high ozone will not be represented in control strategy assessment.

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Figure 22. Long distance transport scenario into the Metro-East MSA

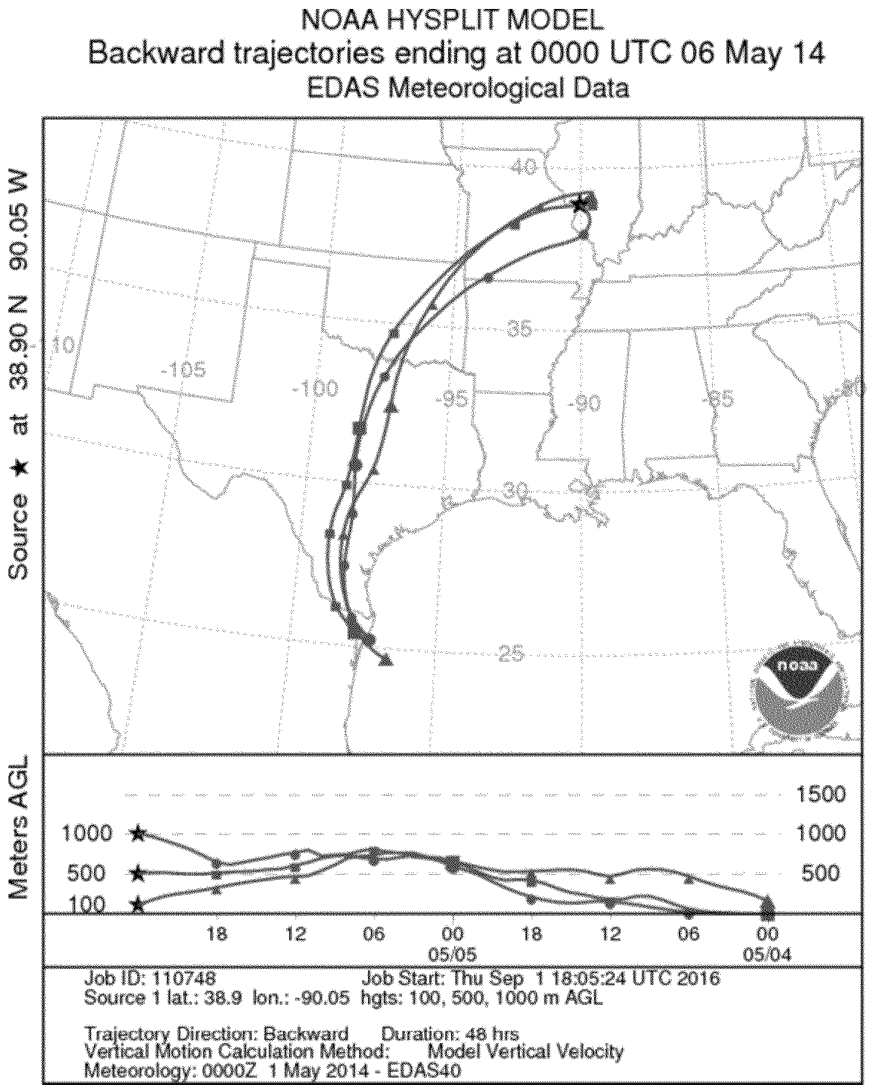
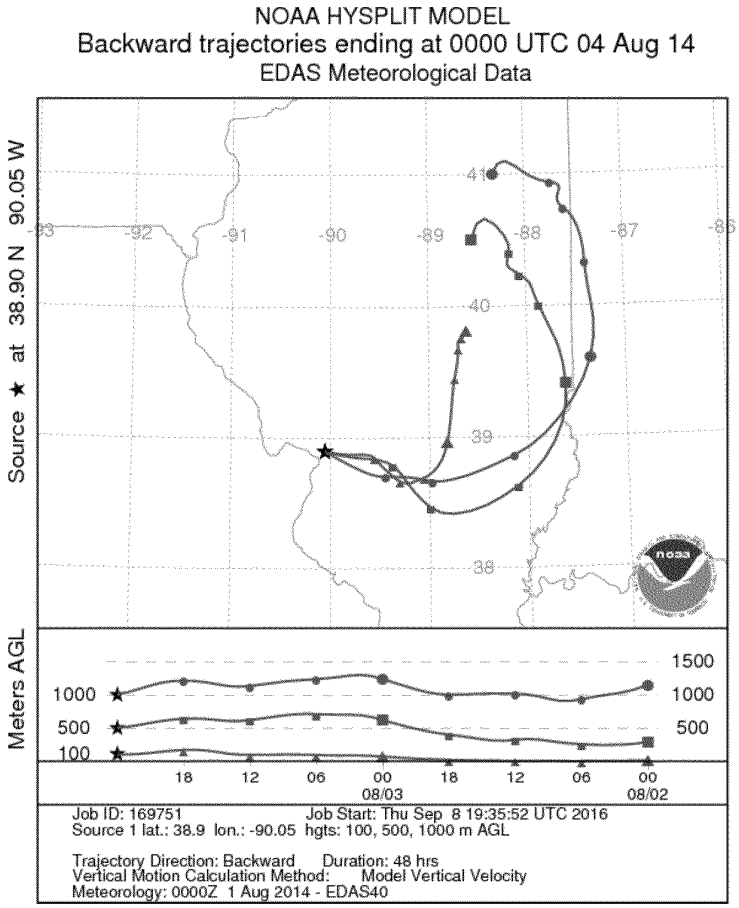


Figure 23. Anticyclonic curvature transport scenario into the Metro-East MSA



Factor 4 – Geography/Topography

Illinois is typified by flat to gently rolling terrain, with the exception of the Driftless Area in the northwest corner of the state and the Ozark Plateau in southern portion of the state. Illinois occupies a land mass of approximately 55,584 square miles. The average elevation of the state is approximately 600 feet (183 m) above sea level. Charles Mound, located in Jo Davies County, is the highest point in the state with an elevation of 1,235 feet (376 m) above sea level. The lowest point in the state is 279 feet (85 m) above sea level along the Mississippi River in Alexander County. Total topographic relief across the state is less than 1,000 feet, demonstrating the general flatness of the terrain. Therefore, topography is generally not a factor in affecting pollutant transport in Illinois, and is not considered a significant issue in defining the boundaries of the 8-hour ozone nonattainment areas.

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Factor 5 – Jurisdictional Boundaries

The Illinois EPA is responsible for air quality regulatory programs for every county in the state. Jurisdictional boundaries considered in this analysis are consistent with recommended geographic boundaries definitions, outlined in U.S. EPA's guidance documentation. Township Boundaries in this study reflect the 2009 political township boundaries provided by the Property Tax Division of the Illinois Department of Revenue. Based on the geographic location of the Chicago and Metro-East areas and the individual sources, it is expected that the coordination of planning activities required to address the nonattainment designation can be carried out in a cohesive manner.

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Five Factor Cumulative Evaluation and Recommendations

Chicago Area

Cook County. Cook County has high levels of precursor emissions, and generally has the highest emissions of any of the nine counties in the Chicago Study Area. Demographically, Cook County has the highest population, the highest population density, and the highest level of AVMT of all the counties in the Chicago Study Area. Therefore, Cook County should be included in the Chicago nonattainment area for the 2015 ozone standard.

DuPage and Will Counties. DuPage and Will Counties have high levels of precursor emissions. DuPage County is second only to Cook County in total population, population density, vehicular traffic, and total urban land cover. Similarly, Will County has a relatively high population, population density, population growth, and traffic level. The Illinois EPA therefore recommends that DuPage and Will Counties be included in the Chicago nonattainment area for the 2015 ozone standard.

Lake County. Lake County contains the one nonattainment monitor in the MSA, as well as high levels of precursor emissions, relatively high total population and population density, and moderately high levels of vehicular traffic. The Illinois EPA therefore recommends that Lake County be included in the Chicago nonattainment area for the 2015 ozone standard.

Kane and McHenry Counties. Kane and McHenry Counties are on the western fringe of the metropolitan area with the eastern portions of these counties having an urban/suburban character, while the western portions are basically rural. These counties have moderate levels of precursor emissions relative to Cook, DuPage, Lake, and Will Counties, and the total population and population density in these counties are also relatively moderate. McHenry and Kane counties are experiencing minor population growth. The Illinois EPA therefore recommends that McHenry and Kane counties be included in the Chicago nonattainment area for the 2015 ozone standard.

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Kendall and Grundy Counties. Due to their primarily rural character, most of Kendall and Grundy Counties were not included in the 1997 or the 2008 ozone nonattainment areas. Precursor emission levels in these counties are low, as is the total population, population density, and traffic volumes. However, due to the presence of emission sources located in parts of the counties, the Illinois EPA recommends that Oswego Township in Kendall County and Goose Lake and Aux Sable Townships in Grundy County be included in the Chicago nonattainment area for the 2015 ozone standard. The remainder of these two counties should retain their current designation as unclassifiable/attainment.

DeKalb County. The U.S. Census Bureau added DeKalb County to the Chicago MSA in 1998. DeKalb County has not been included in any ozone nonattainment area to date. This county is primarily rural, as shown by its low 2015 population totals and population densities, and is not contiguous with the Chicago urbanized area. Current precursor emission levels in this county are also low, compared to the other counties in the MSA. For these reasons, the Illinois EPA recommends that DeKalb County be designated unclassifiable/attainment for the 2015 ozone standard.

Metro-East St. Louis Area

Madison County. Madison County is designated as part of the nonattainment area for the 2008 ozone standard. Current air quality data (2013-2015) at one monitor in Madison County does not meet the 2015 ozone standard. In terms of precursor emissions, Madison County has the highest amounts of both NOx and VOCs in the Metro-East portion of the MSA. Demographically, Madison County has the highest population and the second highest population density. The Illinois EPA recommends that Madison County be included in the Metro-East nonattainment area for the 2015 ozone standard.

St. Clair County. St. Clair County is designated as part of the nonattainment area for the 2008 ozone standard. Current air quality data (2013-2015) at the monitor in St. Clair County shows that it is attaining the 2015 ozone standard. St. Clair County is one of the three highest emitting counties of both NOx and VOC in the Metro-East. St. Clair County has the highest population

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density and the second highest total population. St. Clair County also ranks second in AVMT within the study area. The Illinois EPA recommends that St. Clair County be included in the Metro-East nonattainment area for the 2015 ozone standard.

Monroe County. Monroe County is on the southern fringe of the Metro-East area with the northern portions of the county having an urban/suburban character, while the southern and eastern portions of the county are basically rural. It is currently designated as nonattainment for the 2008 ozone standard. Additionally, Monroe County has a relatively high commuting percentage. Due to these reasons, the Illinois EPA recommends that Monroe County be included in the Metro-East nonattainment area for the 2015 ozone standard.

Jersey County. Jersey County is a rural county located to the north of St. Louis, and is designated as unclassifiable/attainment for the 2008 ozone standard. Jersey County has low levels of precursor emissions, low population and population density, and low total population growth rates. For these reasons, the Illinois EPA recommends that Jersey County be designated as unclassifiable/attainment for the 2015 ozone standard.

Clinton County. Clinton County was first included in the St. Louis MO-IL MSA by the U.S. Census Bureau in 2003. This county is primarily rural, with low 2014 population totals and population densities compared to other counties in the Metro-East study area. Current NOx emissions in Clinton County are ranked fourth in the Metro-East, primarily due to a single source in the far southeastern portion of the county, well away from the current nonattainment counties of Madison and St. Clair. Clinton County is a distant third in VOC emissions in the Metro-East. Population growth is stagnant and total population is low. For these reasons, the Illinois EPA recommends that Clinton County be designated as unclassifiable/attainment for the 2015 ozone standard.

Randolph County. As defined by the U.S. Census Bureau, Randolph County is not part of the St. Louis MO-IL MSA. This rural county has low population, population density, and population growth rates. While Randolph County has higher NOx emissions, these are primarily due to a

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single power plant, which is well-controlled . For these reasons, the Illinois EPA recommends that Randolph County be designated unclassifiable/attainment for the 2015 ozone standard.

Macoupin, Bond, and Calhoun Counties. Bond, Calhoun, and Macoupin Counties were first added to the St. Louis MO-IL MSA by the U.S. Census Bureau in 2003. None of these three counties are included in the 2008 ozone nonattainment area. These counties are primarily rural, with low 2015 population totals and population densities. Current precursor emission levels in Macoupin, Bond, and Calhoun Counties are low, as are AVMT. For these reasons, the Illinois EPA recommends that Macoupin, Bond, and Calhoun Counties be designated unclassifiable/attainment for the 2015 ozone standard.

Montgomery County. Montgomery County is also not in the 2008 ozone nonattainment area, nor is it part of the St. Louis MO-IL MSA. The county is not contiguous with the Metro-East urbanized area and was therefore not evaluated based on emissions and emissions-related data or other factors for this study. Montgomery County does have a large EGU, but it is approximately 50 miles away from the violating monitor in Madison County, and is downwind from the Metro-East area. For these reasons, the Illinois EPA recommends that Montgomery County be designated as unclassifiable/attainment for the 2015 ozone standard.

Washington County. Washington County is not included in the 2008 ozone nonattainment area, nor is it part of the St. Louis MO-IL MSA. Washington County is considered adjacent to St. Clair County, however the county is not contiguous with the Metro-East urbanized area and was therefore not evaluated based on emission and emissions-related data influences or other factors for this study. For these reasons, the Illinois EPA recommends that Washington County be designated as unclassifiable/attainment for the 2015 ozone standard.

Remainder of Illinois

Areas of the state that are not part of the Chicago or Metro-East St. Louis metropolitan areas are in attainment with the 2015 ozone standard, and it is recommended that all remaining counties be designated as unclassifiable/attainment.

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Conclusions

Illinois EPA's recommendations for attainment/nonattainment boundary designations in Illinois for the 2015 ozone NAAQS are contained in Table 15. The location of Illinois EPA's recommended ozone nonattainment areas for the State of Illinois are shown in Figure 24.

The Clean Air Act does not specify the geographic boundaries, size, or the extent to which source contributions would require that an area be designated as nonattainment for the 2015 ozone standard, nor has U.S. EPA promulgated rules prescribing such. Illinois EPA's recommendations are consistent with the guidance memorandum provided by U.S. EPA and are based on an evaluation of current air quality, the location and magnitude of ozone precursor emission sources, and other factors. The Illinois EPA recognizes that each of the factors considered in this evaluation, when evaluated individually, are not necessarily conclusive. Rather, Illinois EPA's recommendations are based on consideration of all of the factors taken together. It is expected that the coordination of planning activities required to address the nonattainment designations can be carried out in a cohesive manner. The data sources utilized in the preparation of this report are summarized in Table 16.

However, this recommendation is being made at the start of October, according to U.S. EPA requirements. Current trends do not indicate a change in recommended nonattainment counties when 2016 data is included. However, Illinois EPA intends to review 2016 monitoring data when it becomes certified and, if warranted, will request that U.S. EPA consider 2014-2016 data at that time.

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Table 16. Recommended Attainment/Nonattainment Designations in Illinois for the 2015 Ozone National Ambient Air Quality Standard

County	Designation	Name of Area
Cook	Nonattainment	Chicago
DuPage	Nonattainment	Chicago
Kane	Nonattainment	Chicago
Lake	Nonattainment	Chicago
Will	Nonattainment	Chicago
McHenry	Nonattainment	Chicago
Kendall:		
Oswego Township	Nonattainment	Chicago
All Other Townships	Unclassifiable/Attainment	
Grundy:		
Aux Sable Township	Nonattainment	Chicago
Goose Lake Township	Nonattainment	
All Other Townships	Unclassifiable/Attainment	
Madison	Nonattainment	Metro-East
Monroe	Nonattainment	Metro-East
St. Clair	Nonattainment	Metro-East
All Other Counties	Unclassifiable/Attainment	

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Figure 24. Proposed 2015 8-Hour Ozone NAAQS Nonattainment Areas

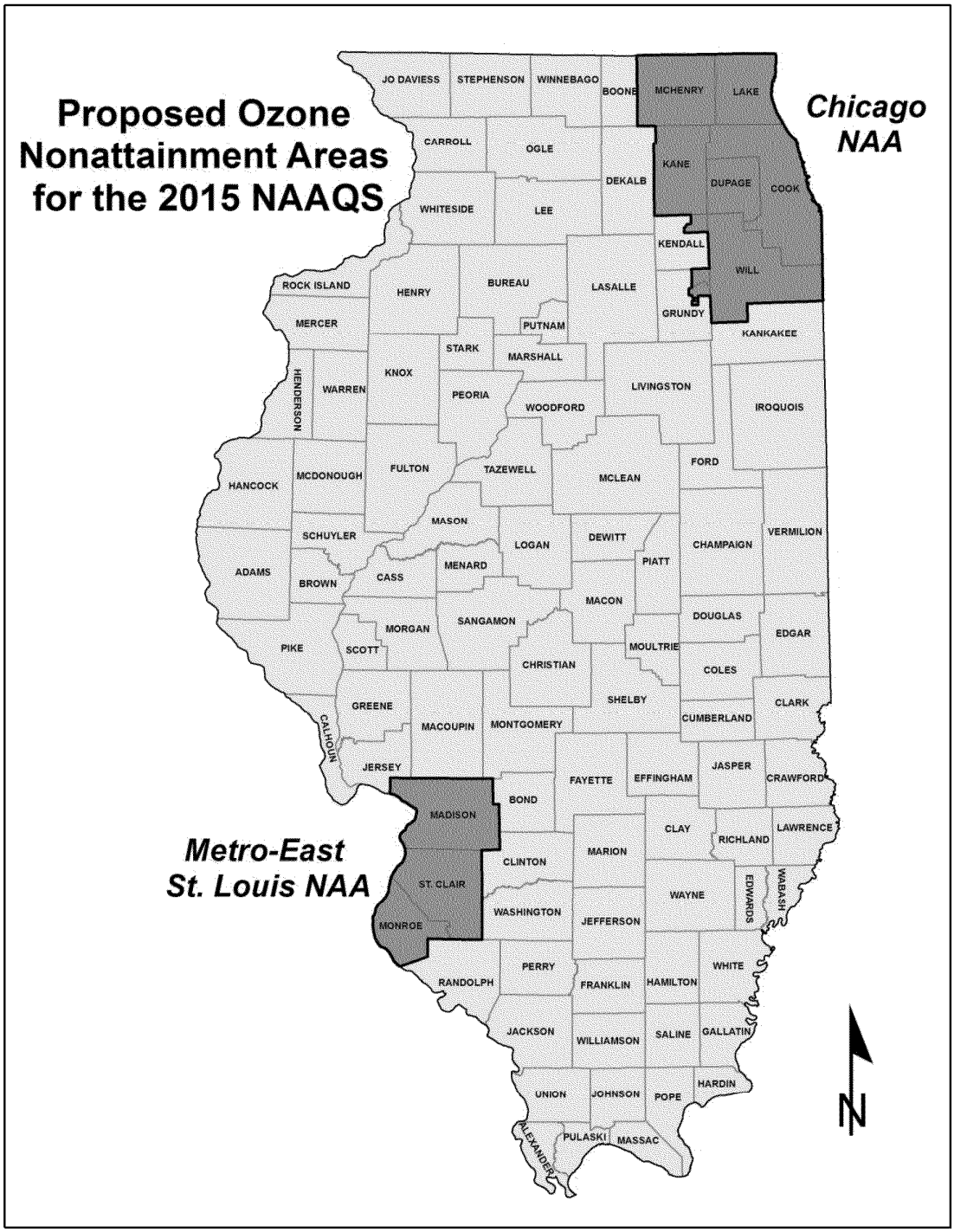

Table 17. Ozone NAA Boundary Recommendation Data Sources

Factor	Data Analysis	Data Source	Date of Study
1. Air Quality Data	8-hour ozone 2013-2015 Design Values	Illinois EPA	2013-2015
2. Emissions	Emission inventory information for pollutants: NO_x and VOC within the Chicago and St. Louis MSA's and adjacent counties. Emission totals (tons/year) are summarized by county for point, area, on-road/mobile, and non-road and animal sectors	Illinois EPA's 2014 submittal to the National Emissions Inventory (NEI)	2014
	Source locations and reported emissions in MSA's and adjacent counties	Illinois EPA	2014
2 Population Density and Urbanization	Annual Estimates of the Population in Illinois. Total population and population density estimates*	Table1:Annual Estimates of the Resident Population : April 1, 2010 to July1,2015, U.S. Census Bureau Population Division	2015
	Urbanized area boundaries and population density by census tract	ESRI Maps and Data	2010, 2014
2. Traffic and Commuting Patterns	Annual VMT tables for 2014	Illinois Department of Transportation, Travel Statistics 2014	2014
	Resident County to Workplace County Flows files table	American Community Survey - U.S. Census Bureau	2009-2013
3. Meteorology	Interactive HYSPLIT backward trajectories	Air Resources Laboratory/ NOAA	2013-2015
4. Geography/Topography	The National Elevation Dataset (NED) for Illinois	U.S. Geological Survey	2007
5. Jurisdictional Boundaries	MSA/CBSA/CSA Boundaries	Office of Management and Budget	February 2013
	2008 ozone NAA Boundaries	Illinois EPA	2012

Appendix A. Trajectories for the Chicago Area

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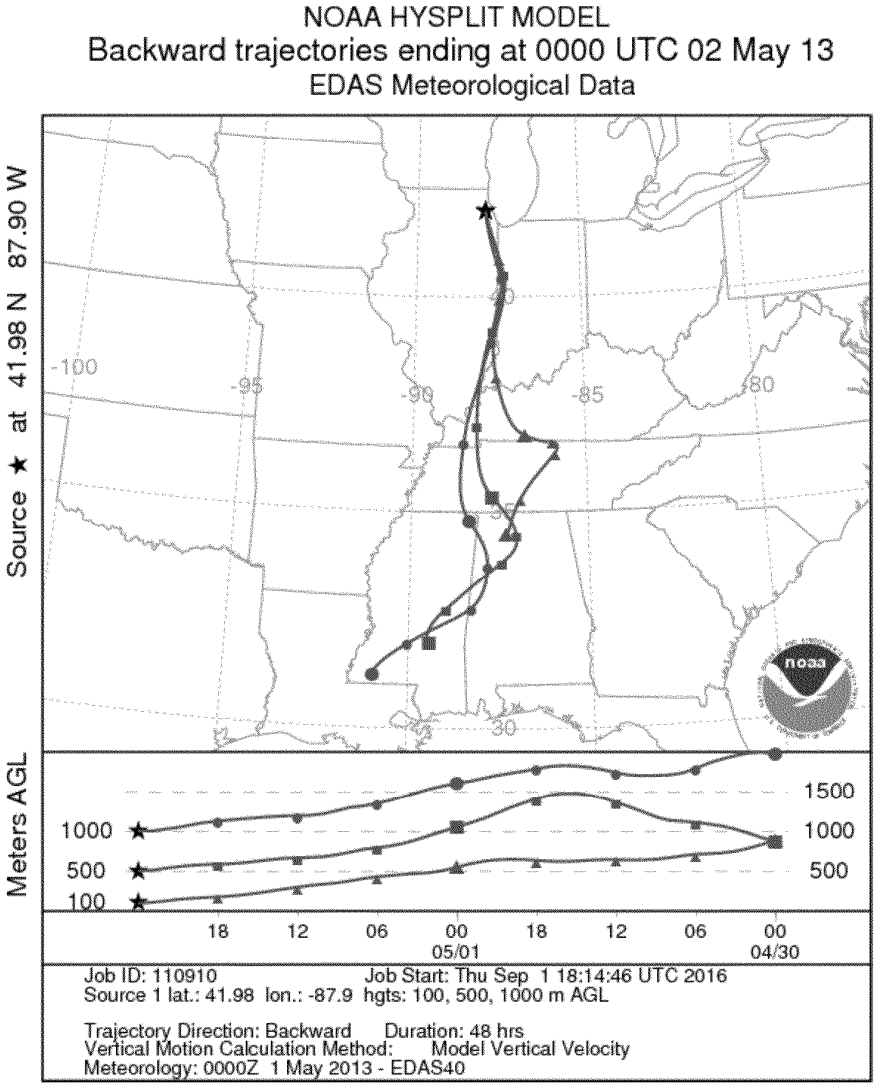
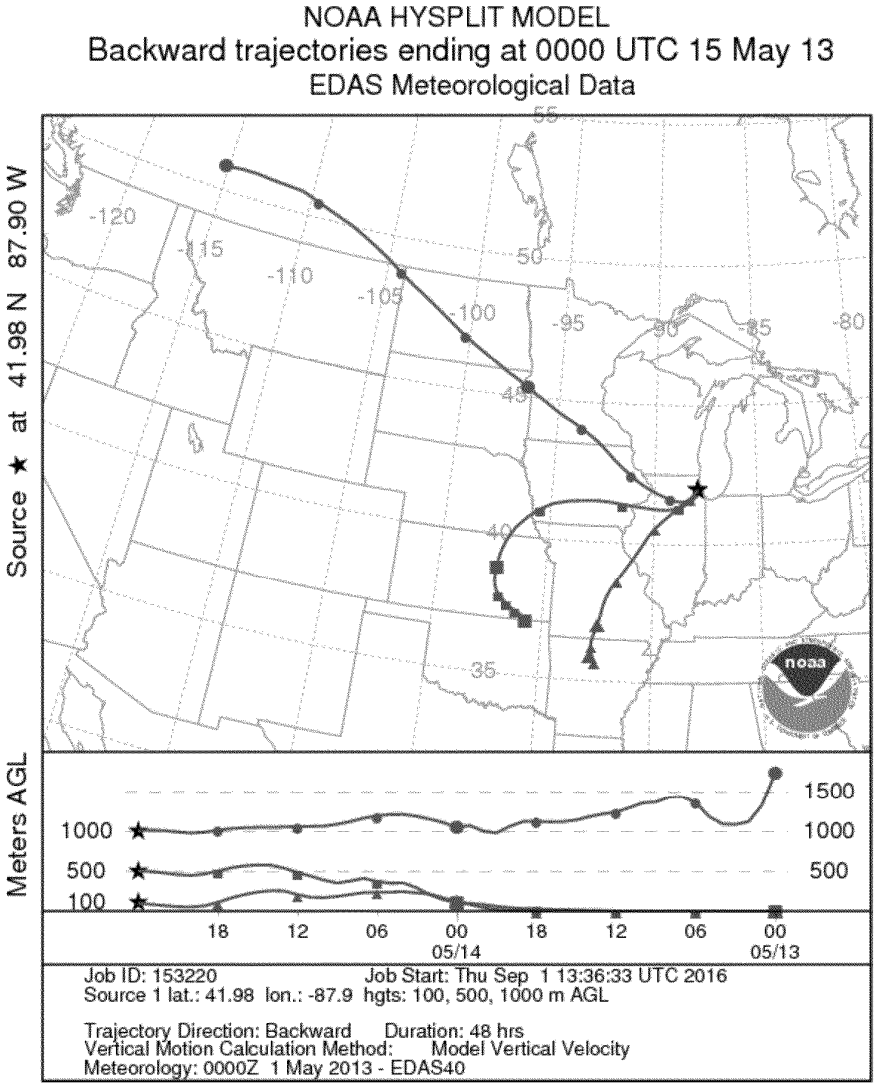
May 1, 2013, Trajectory



May 14, 2013, Trajectory



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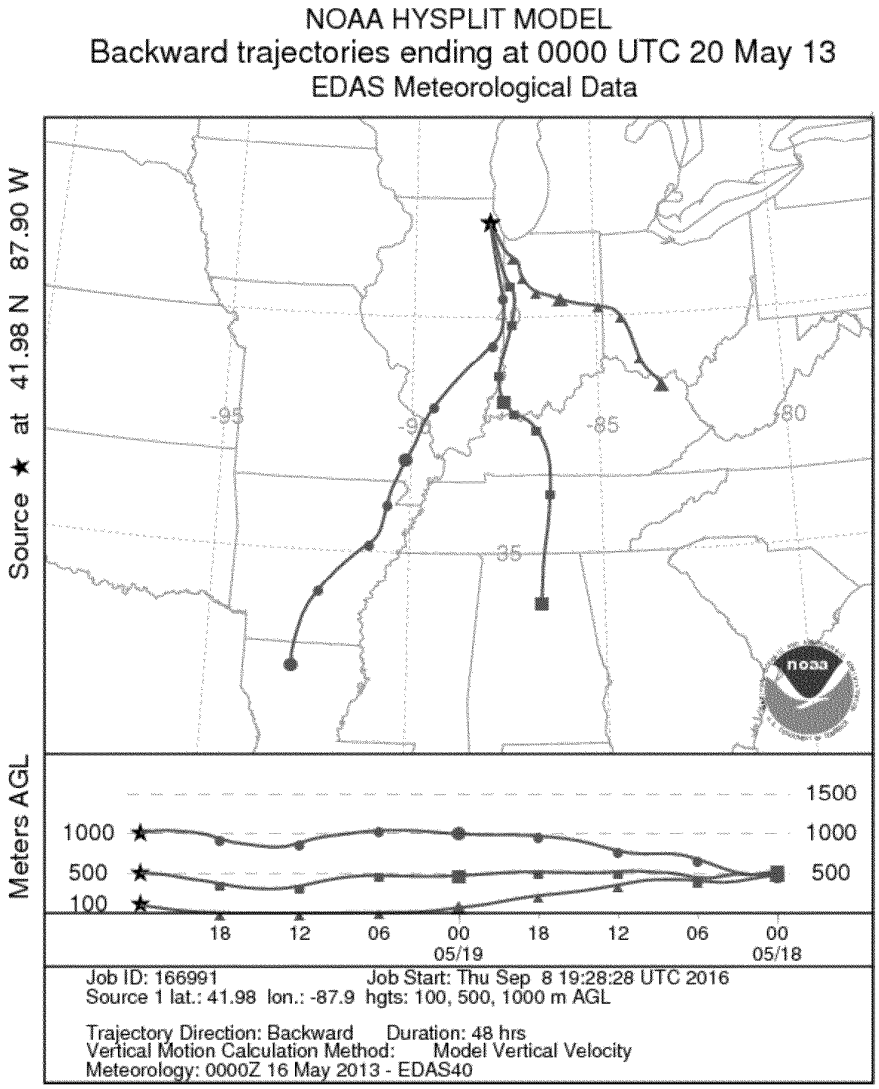
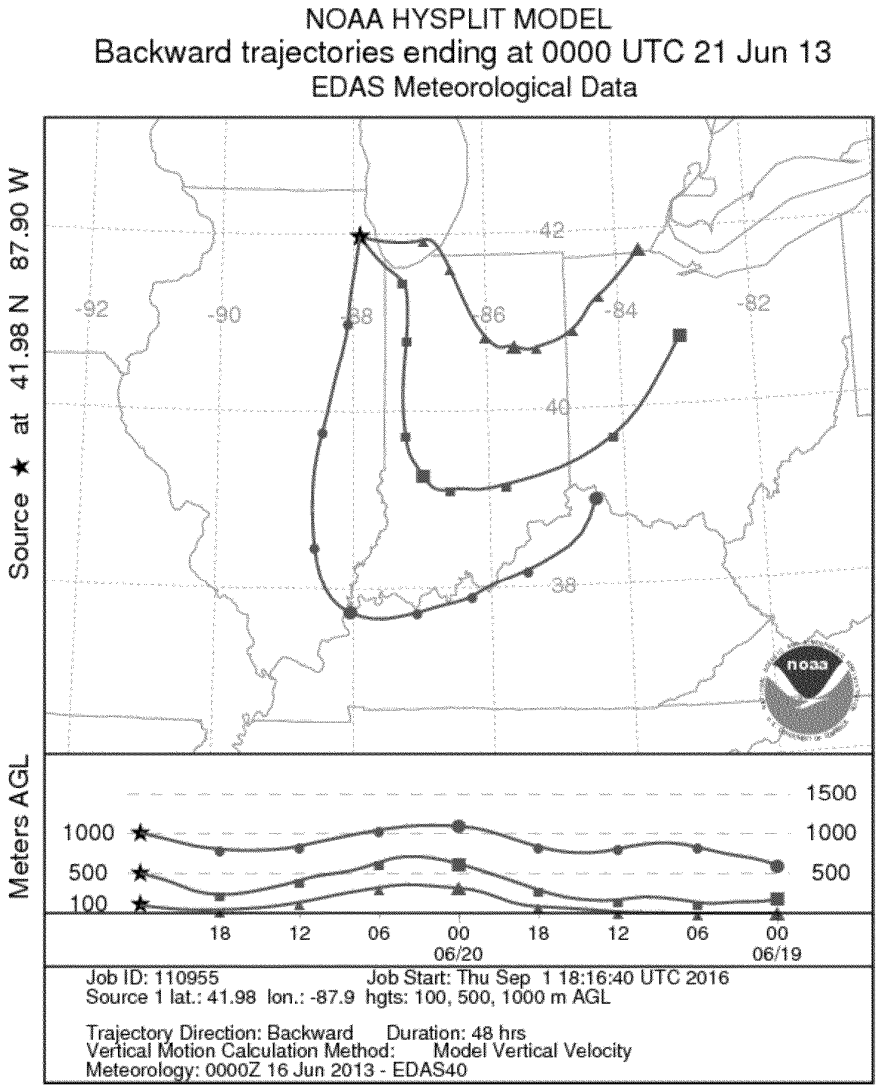
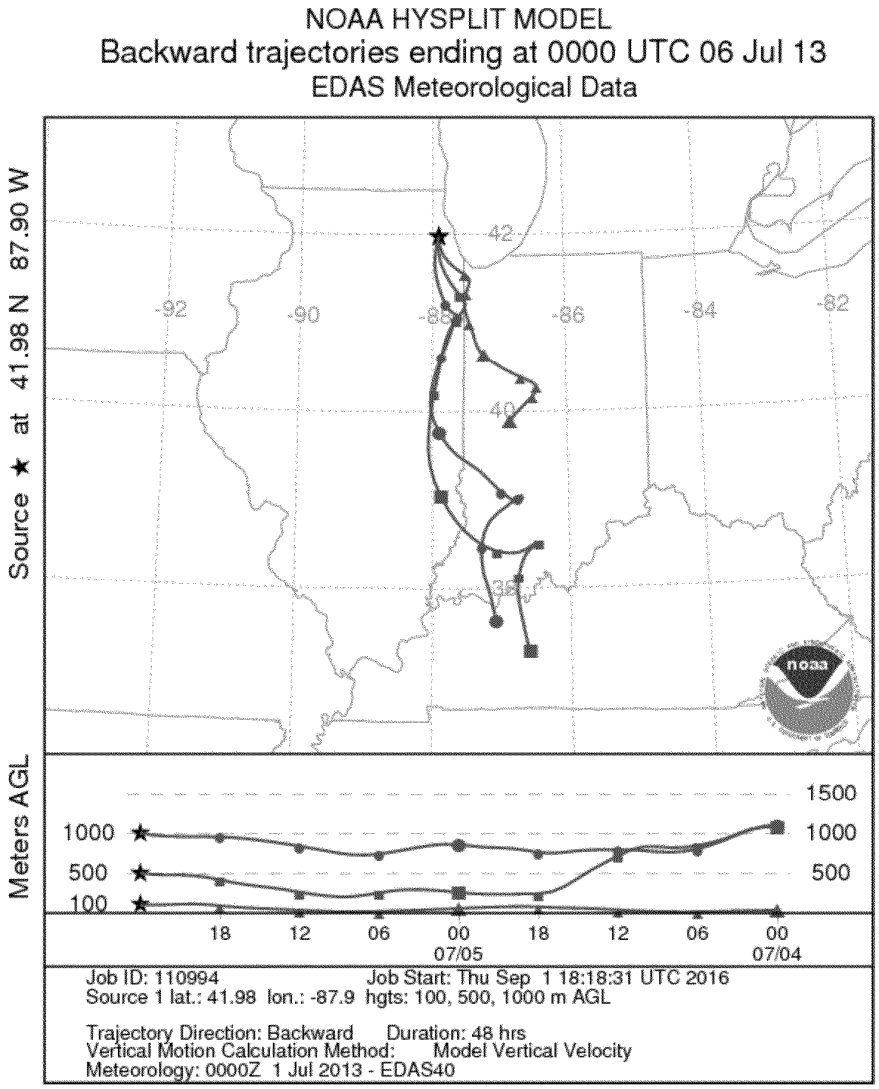


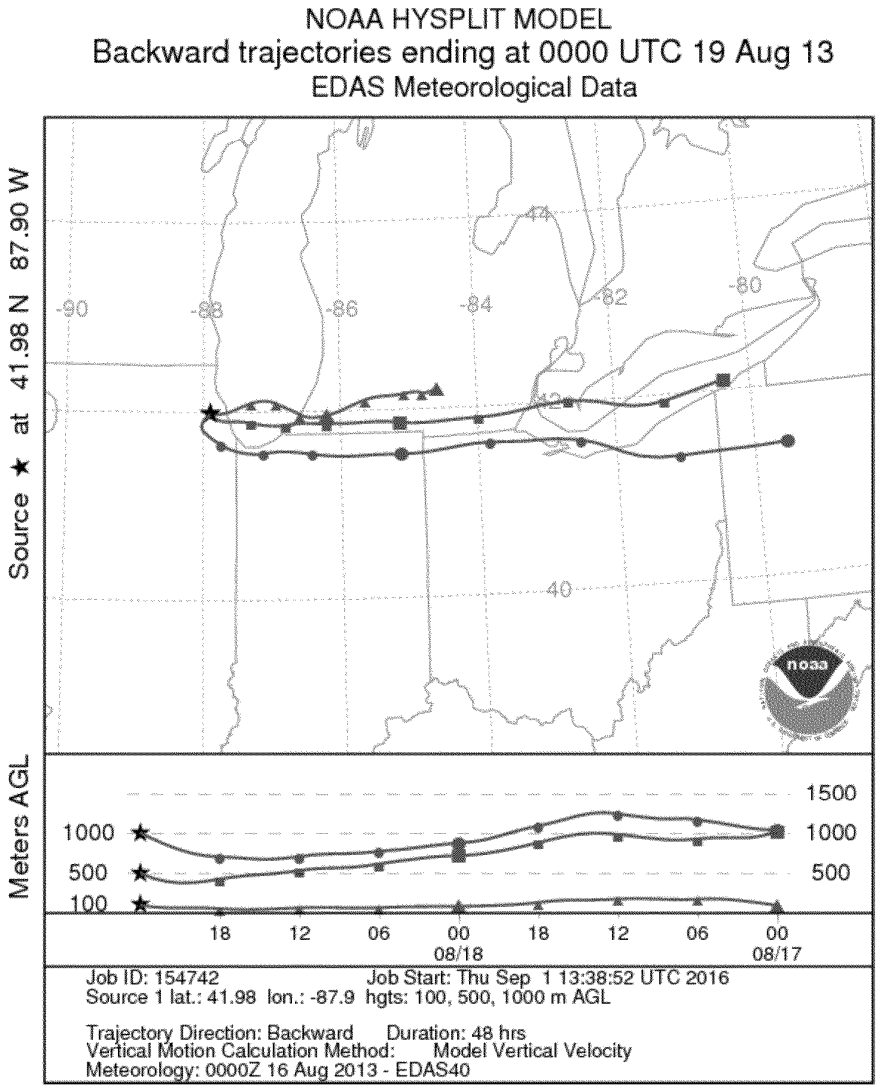
June 20, 2013, Trajectory



July 5, 2013, Trajectory



August 18, 2013, Trajectory



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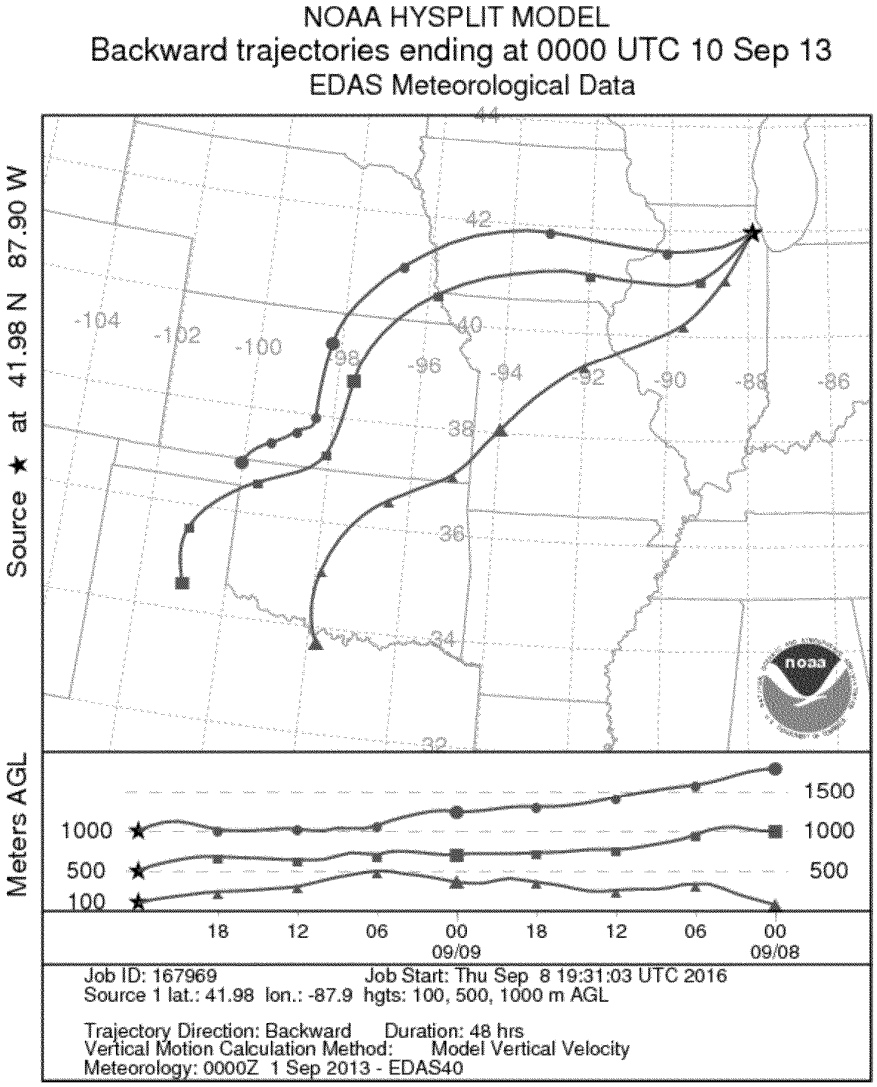

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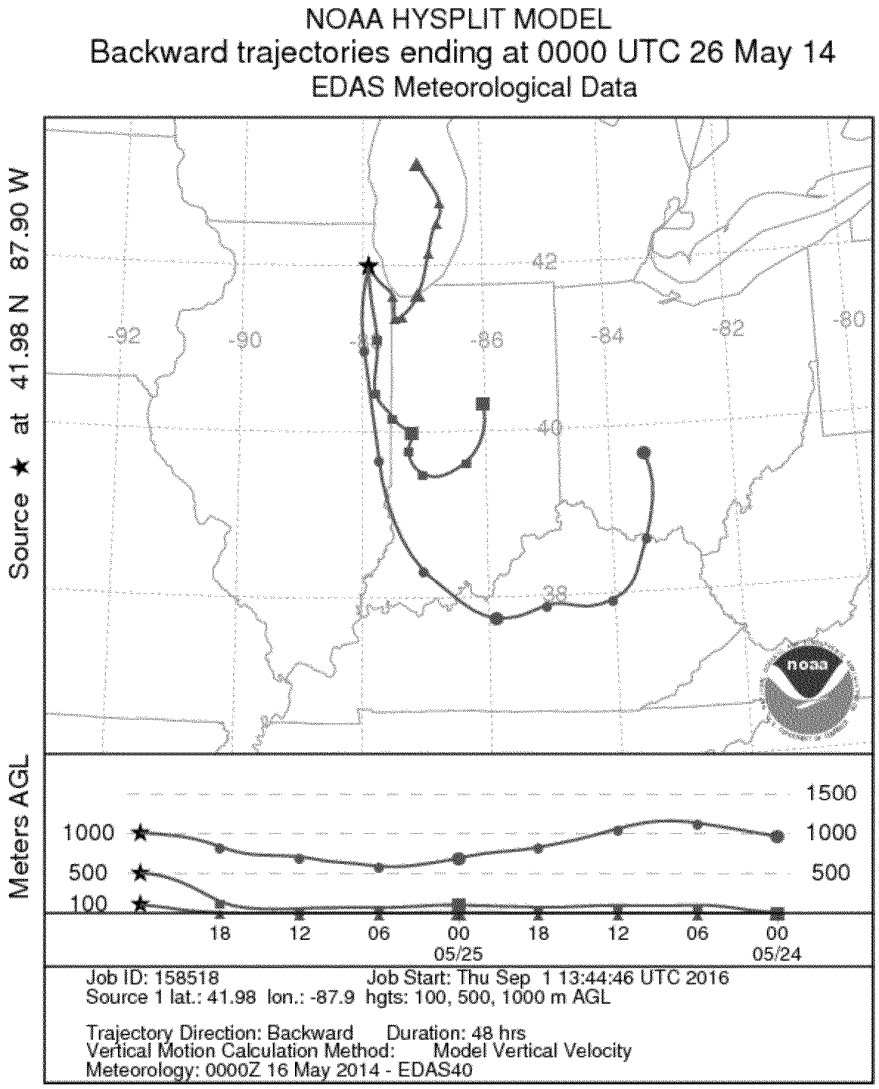

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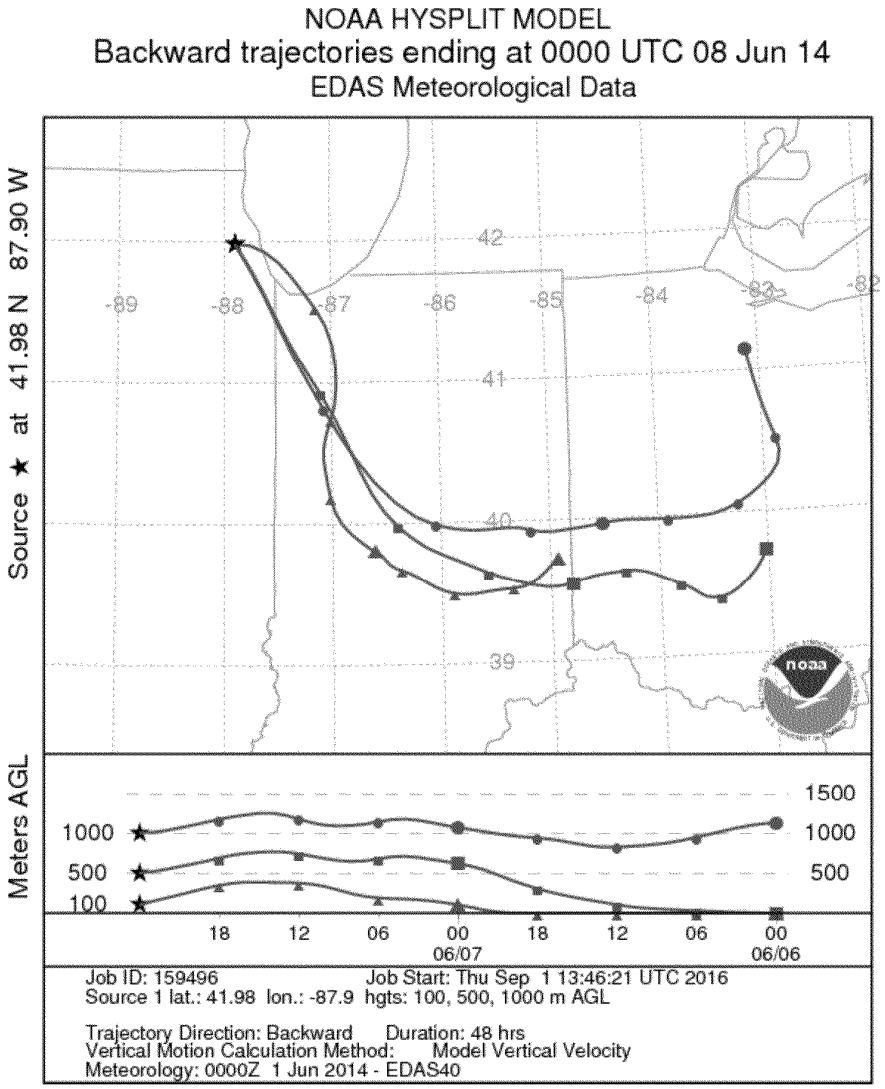

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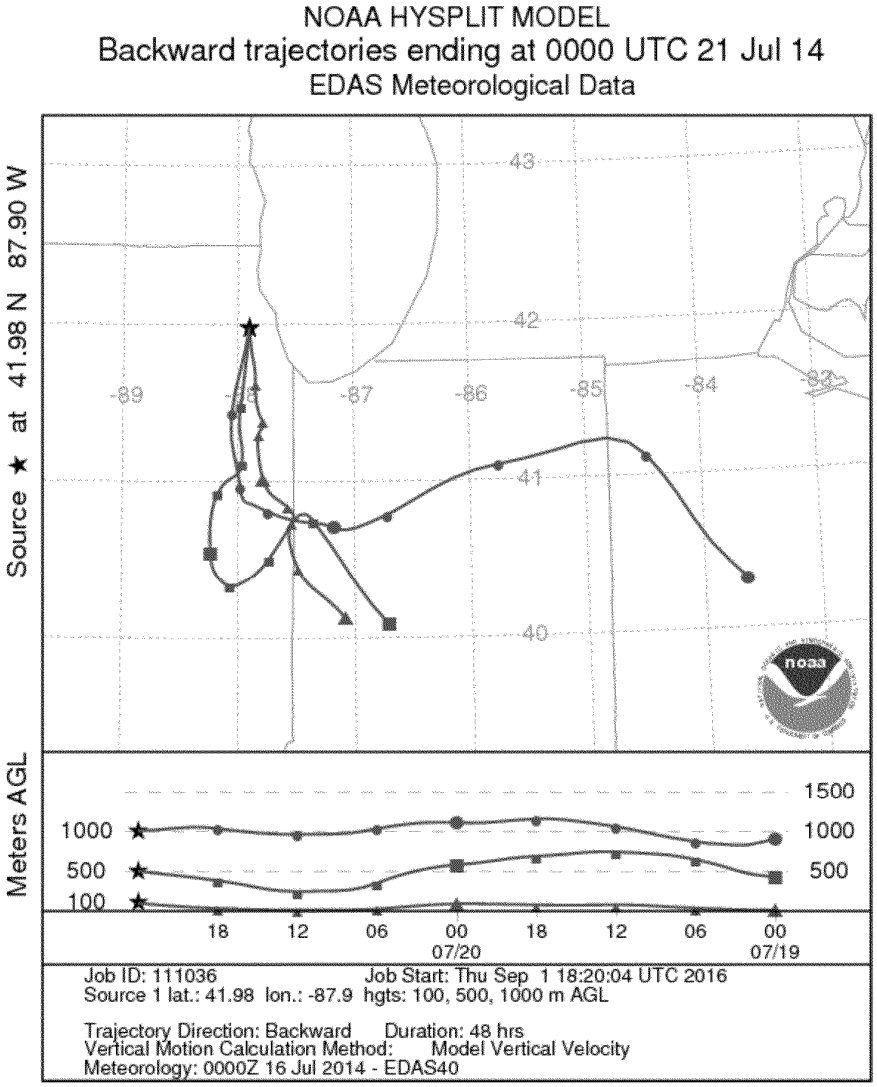

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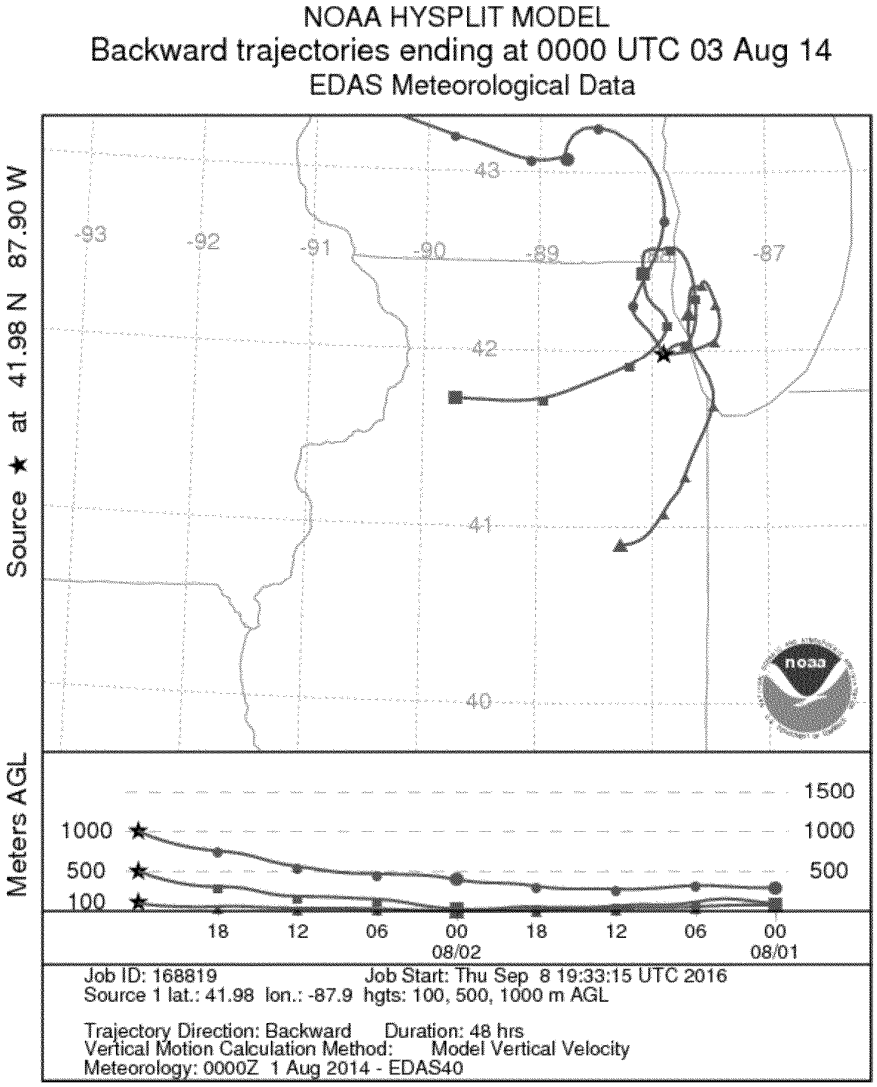

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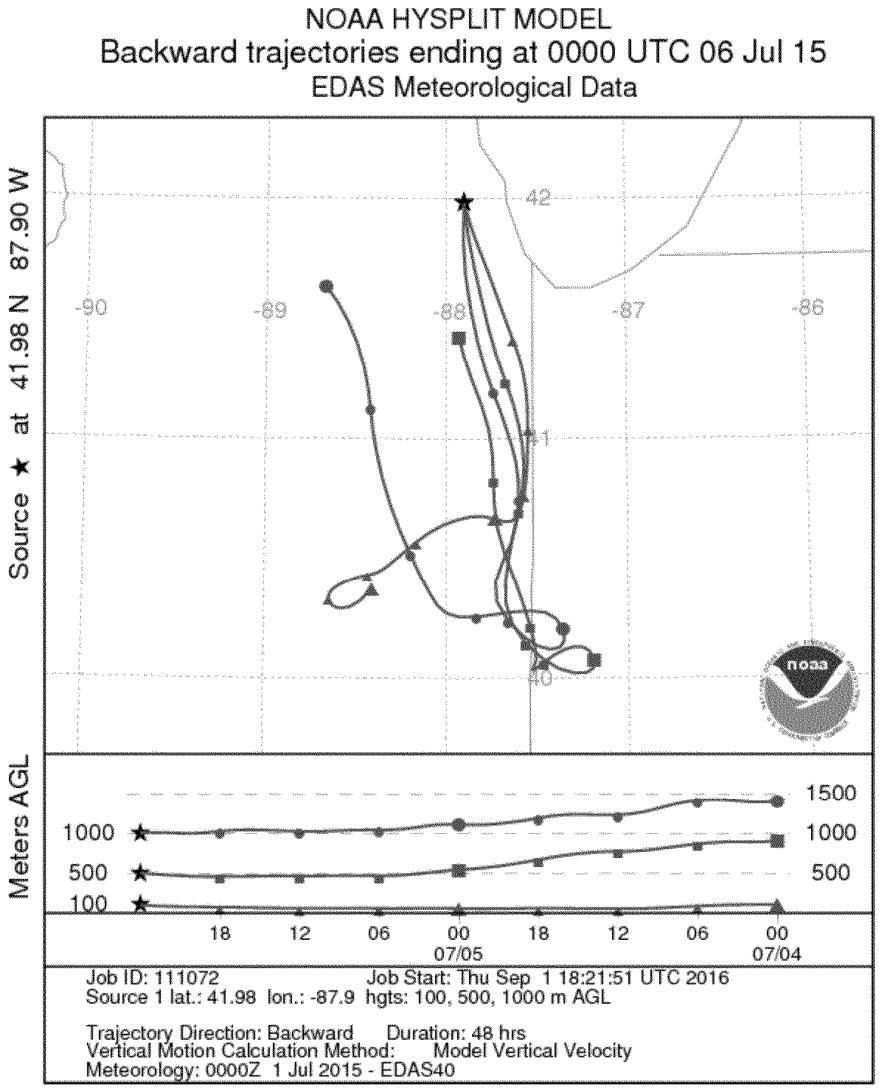

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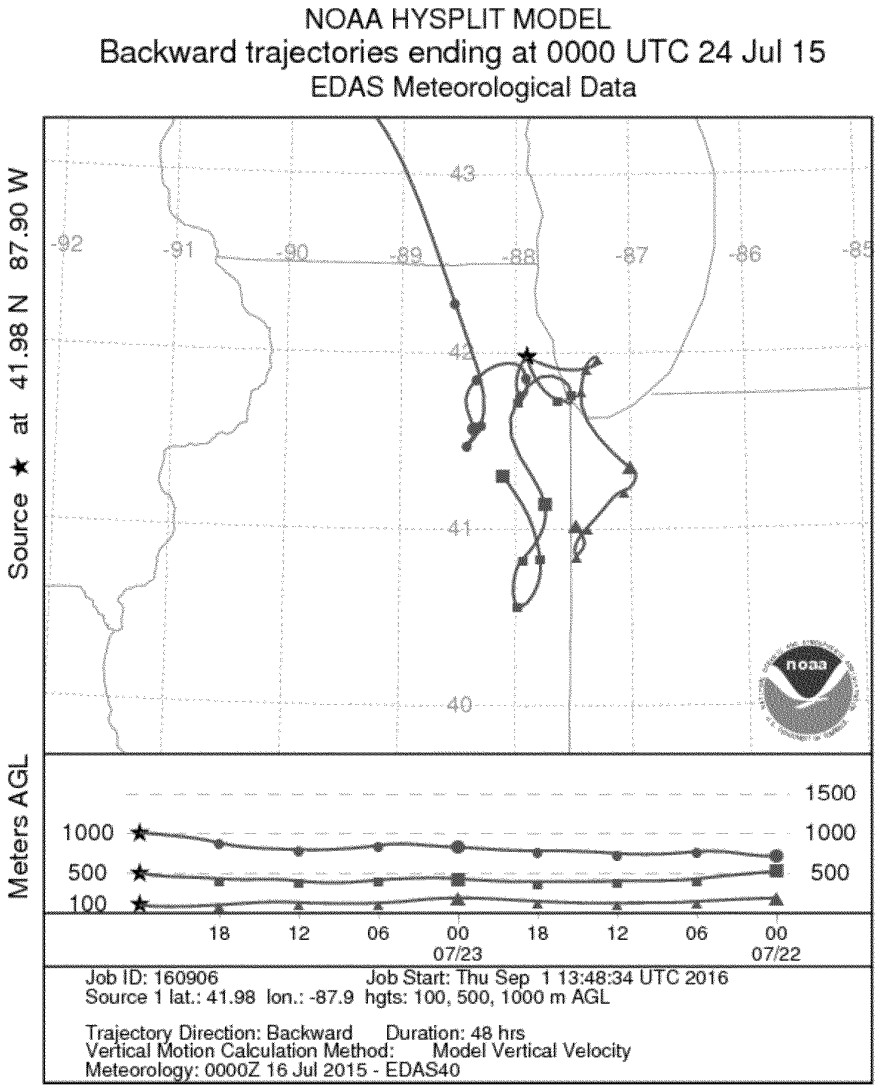

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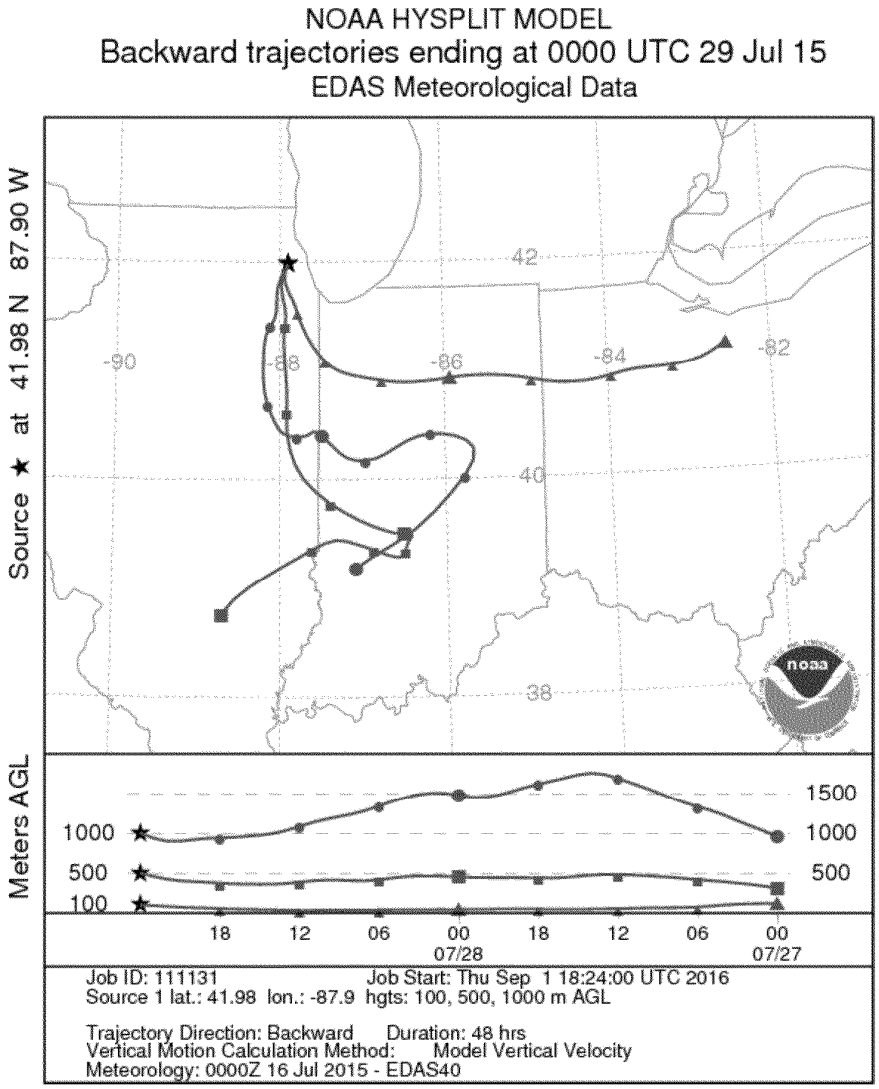

Appendix B. Trajectories for the Metro-East Area

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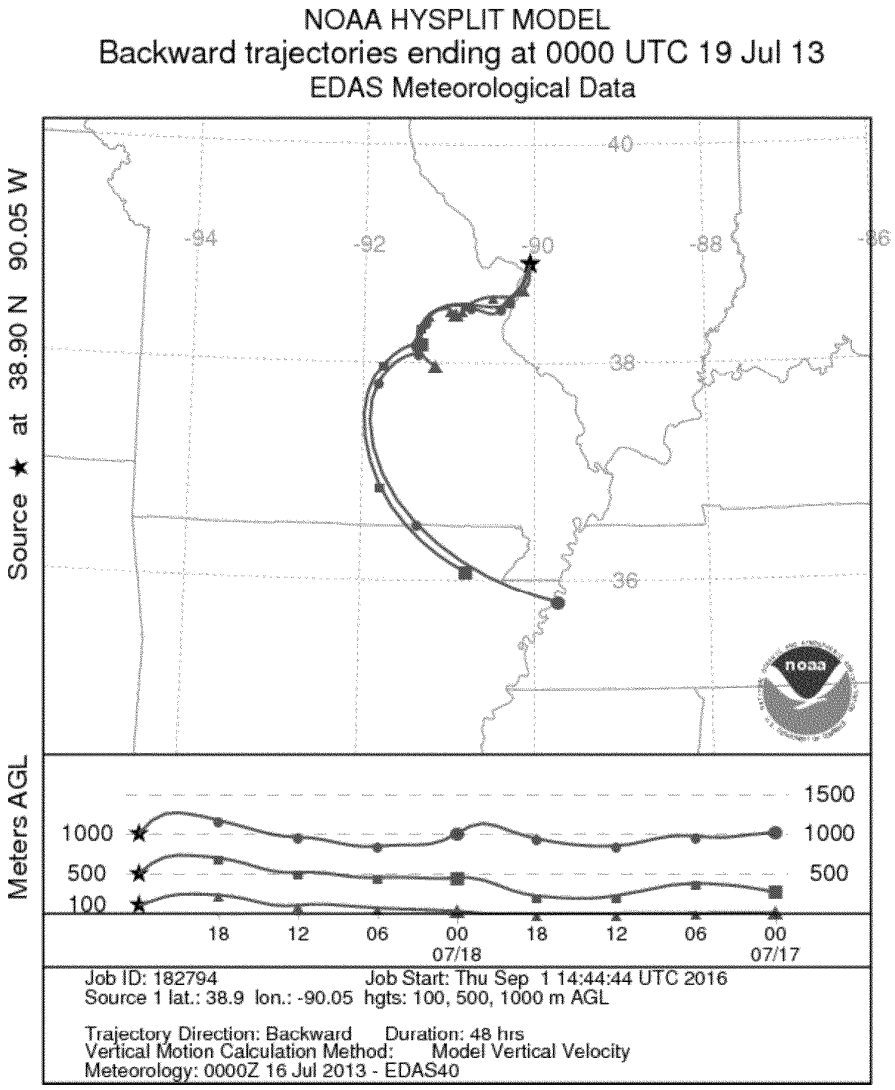
July 18, 2013, Trajectory



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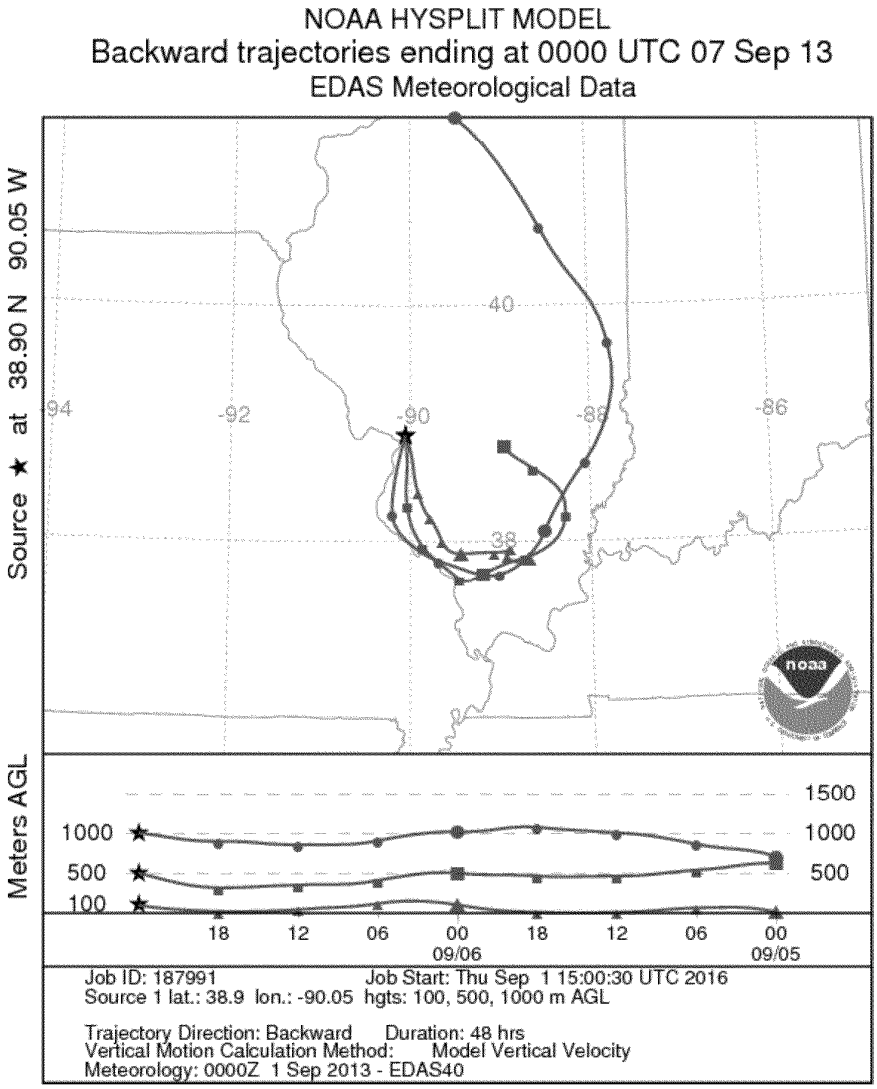

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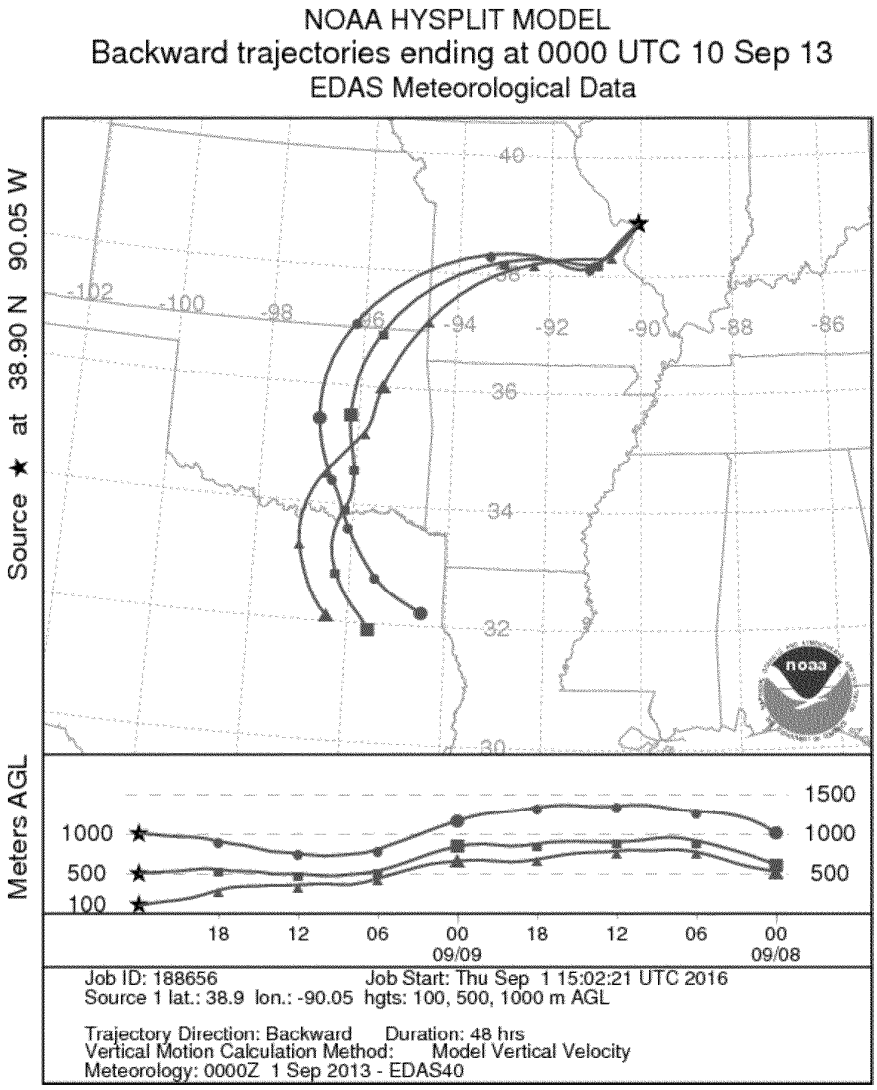

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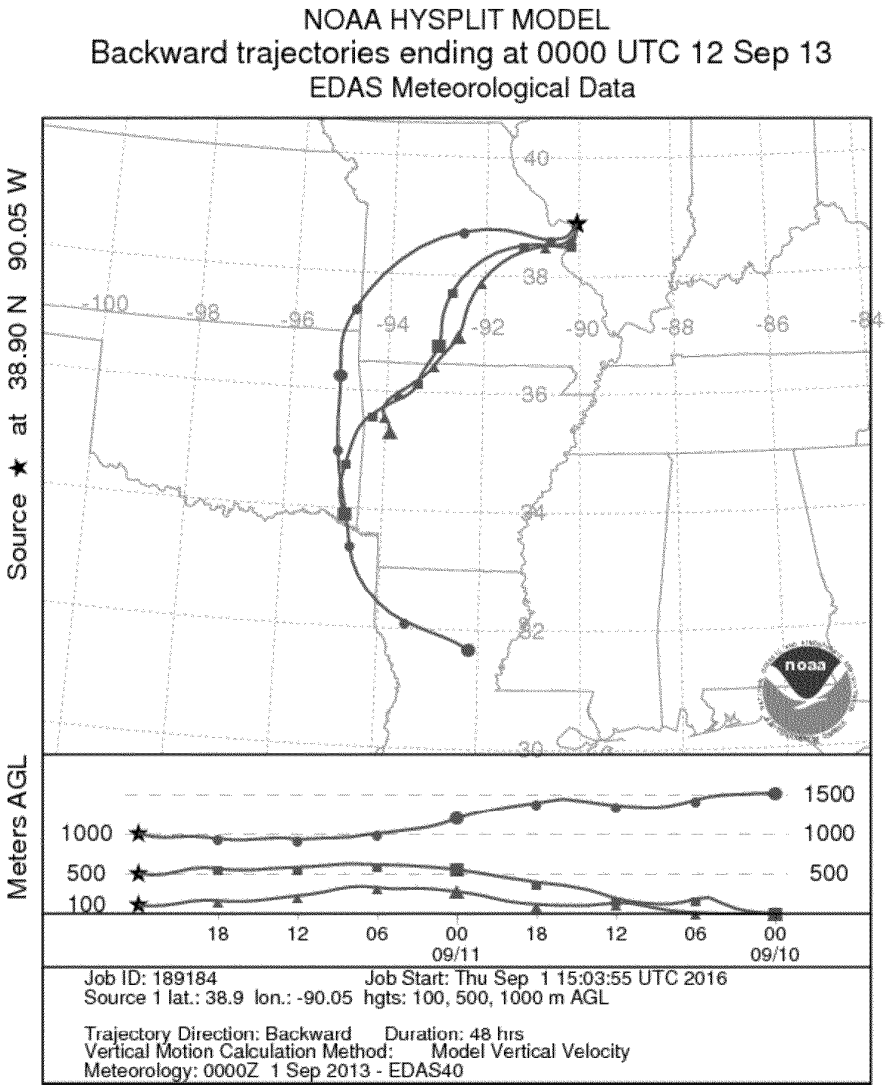

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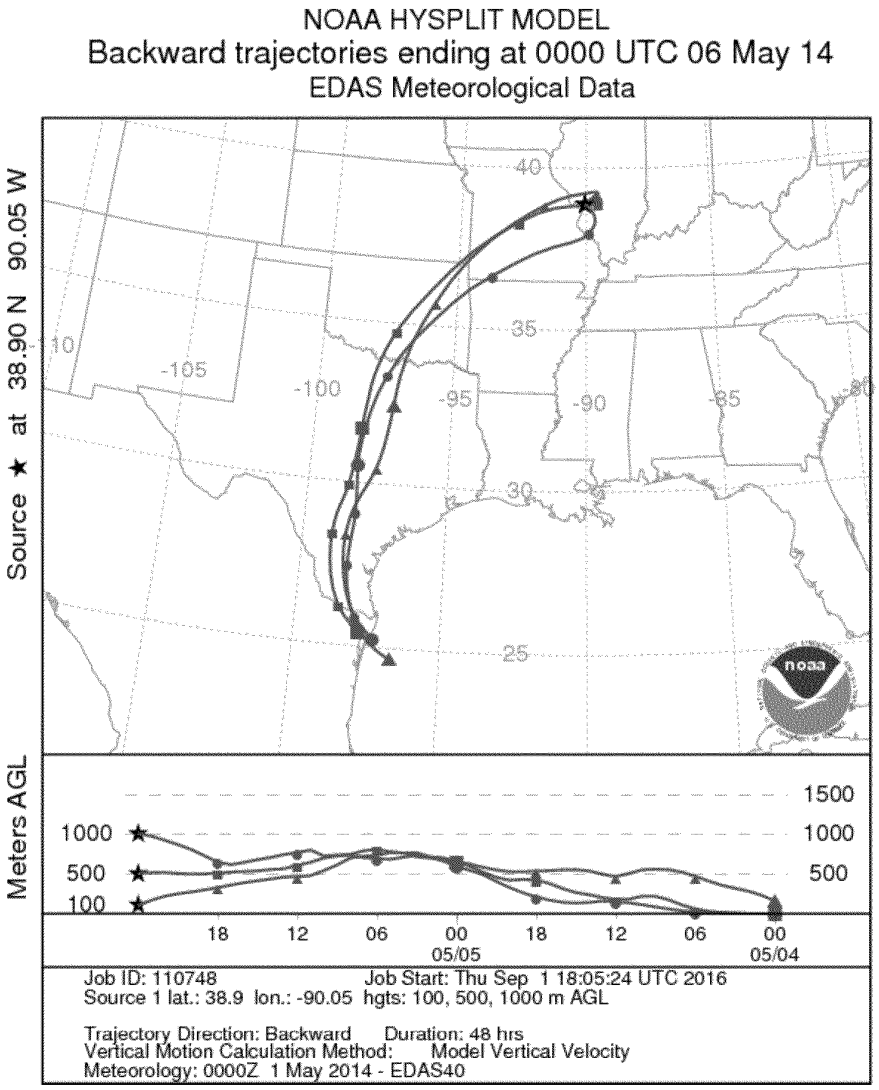

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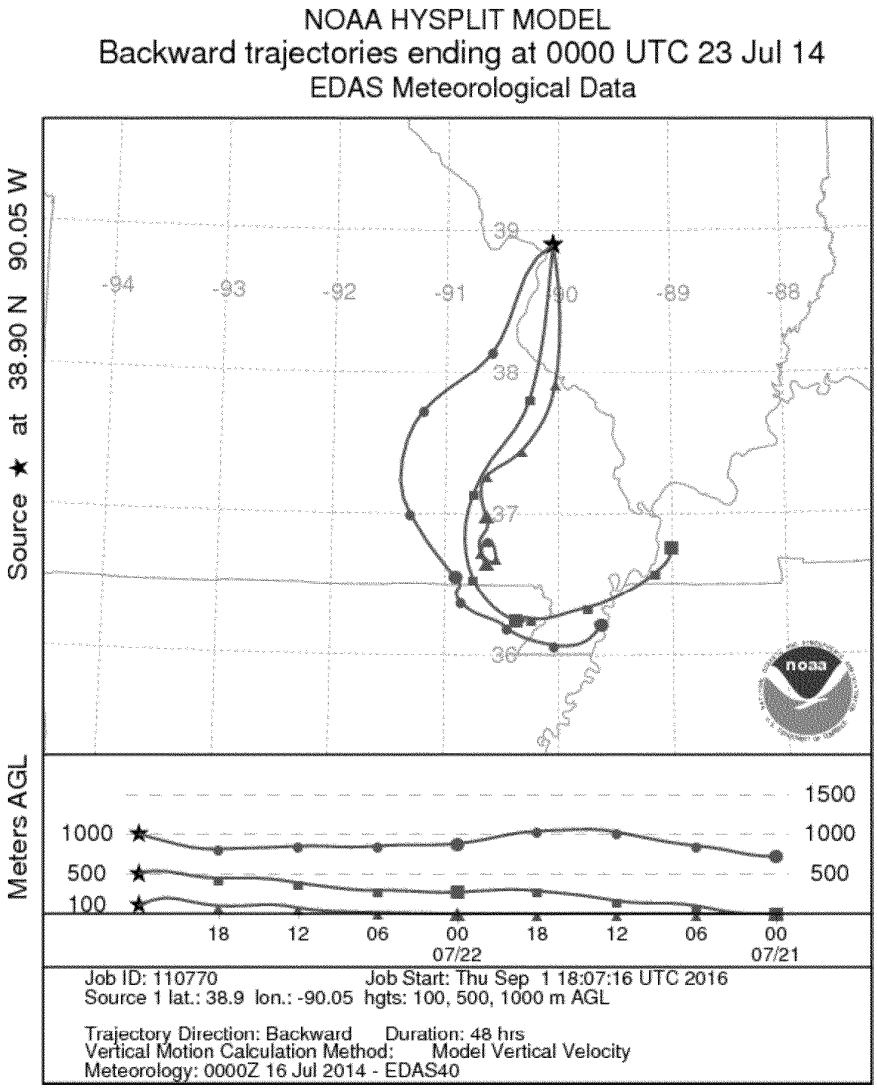

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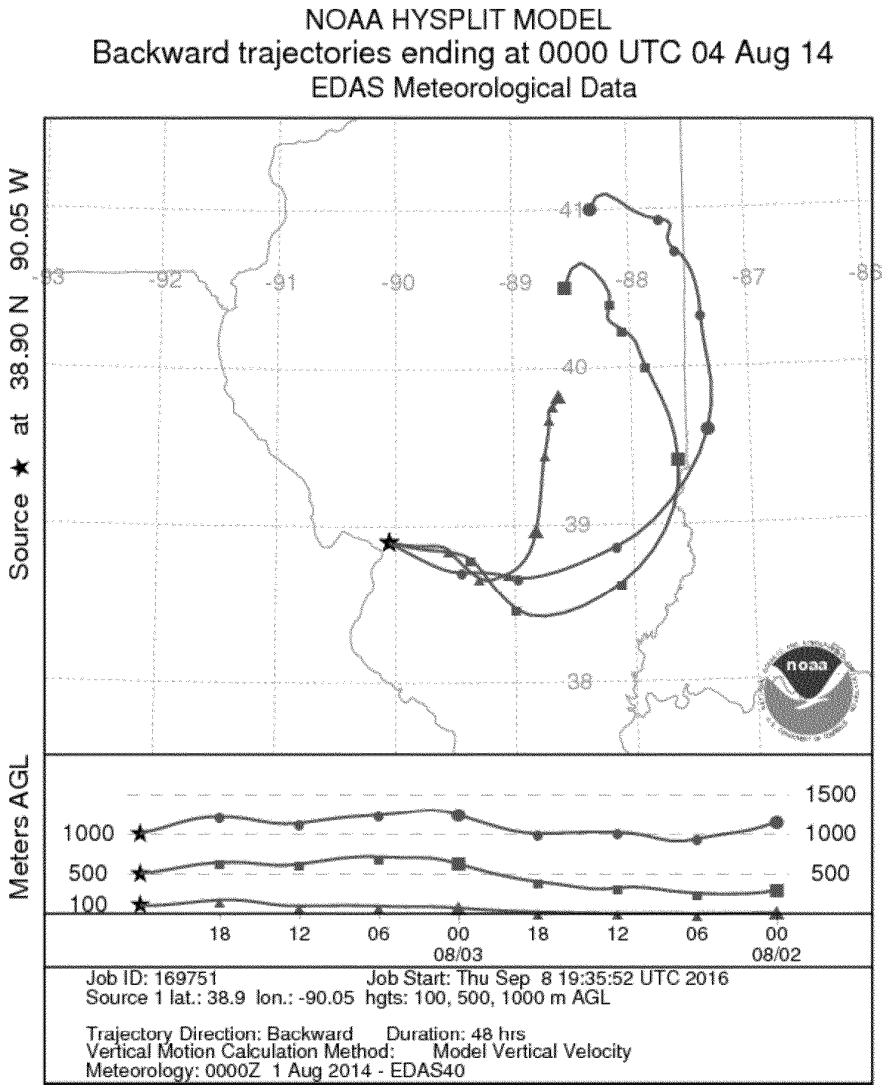

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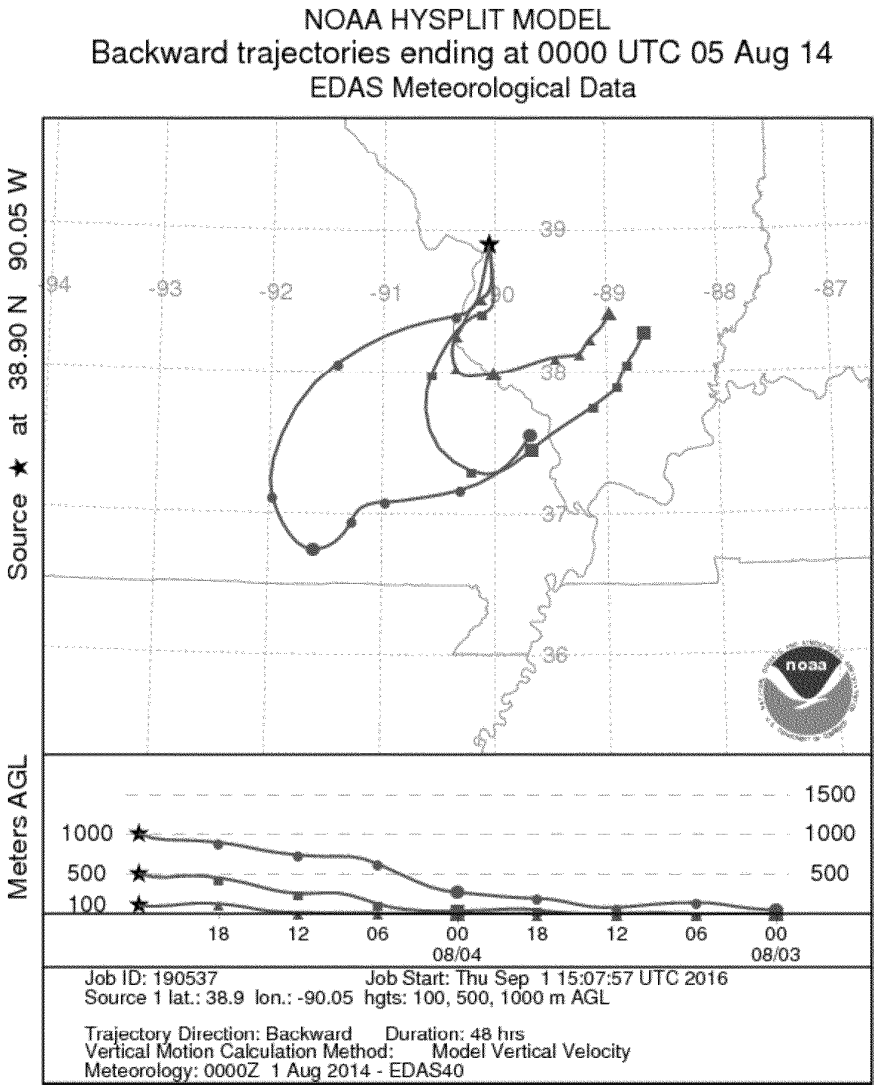

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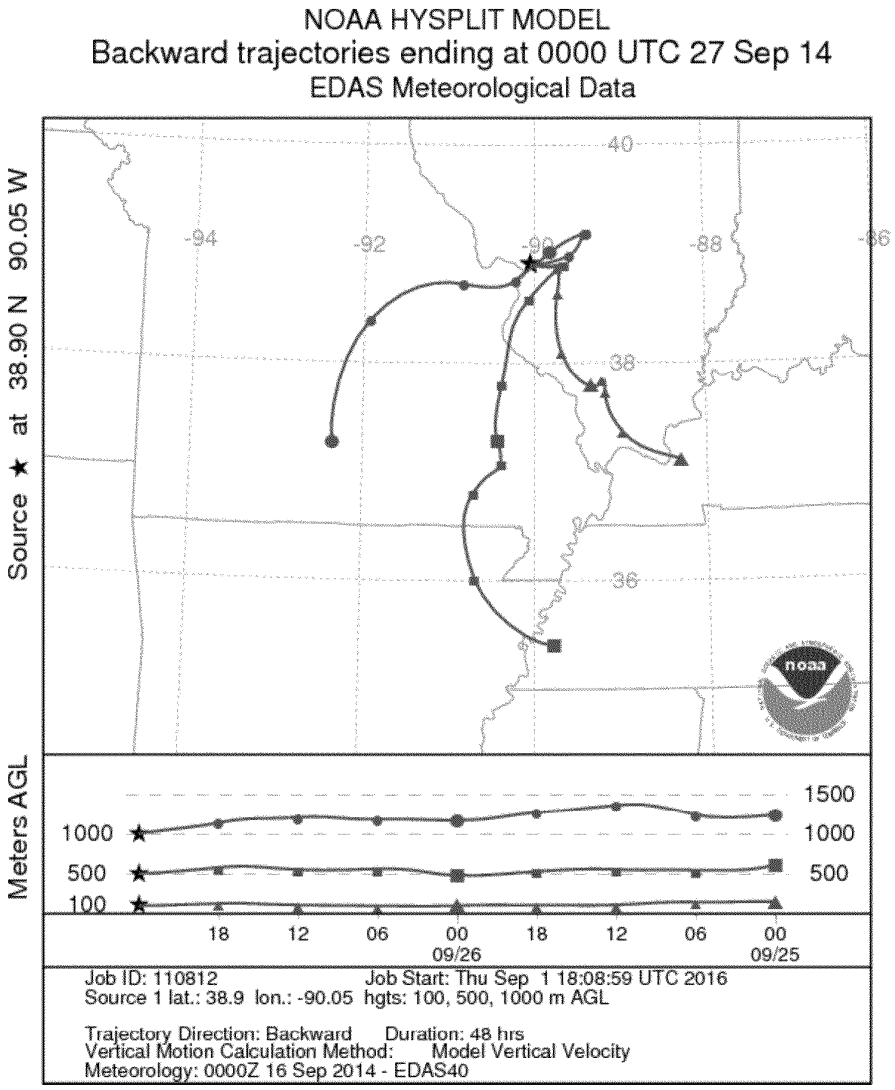

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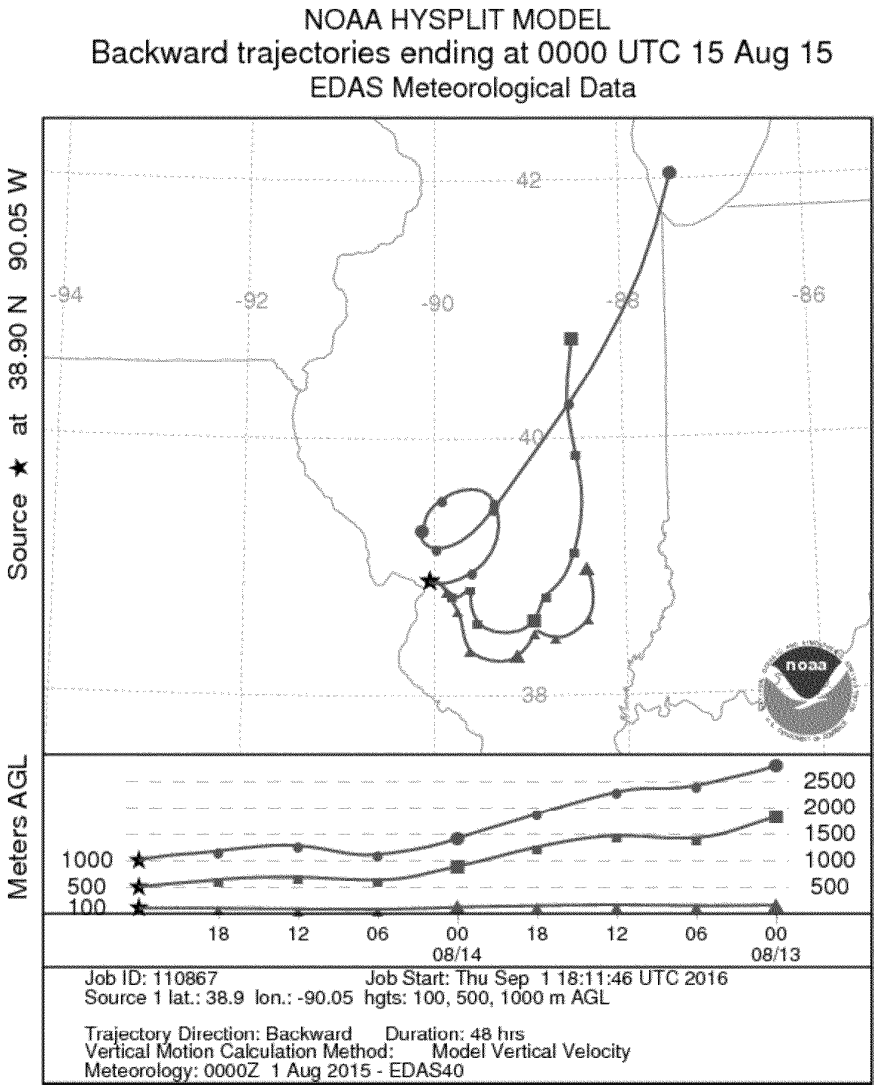

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DEPARTMENT OF NATURAL RESOURCES
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Scott Walker, Governor
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April 20, 2017

Robert Kaplan
Acting Regional Administrator
U.S. Environmental Protection Agency - Region 5
77 West Jackson Blvd.
Chicago, IL 60604-3507

Subject: Supplemental Information for 2015 Ozone National Ambient Air Quality Standard (NAAQS) Area Designations

Dear Mr. Kaplan:

On October 1, 2015, the U.S. Environmental Protection Agency (EPA) revised both the primary and secondary ozone NAAQS. On September 21, 2016, in accordance with section 107(d)(1)(A) of the Clean Air Act (CAA), Governor Walker recommended that all counties in Wisconsin be designated as attainment for this standard. In support of the governor's recommendation, the Wisconsin Department of Natural Resources (WDNR) is submitting the enclosed technical support document (TSD). EPA should consider this supporting information and ensure it is reflected in any modifications to the governor's recommendation EPA elects to make in the "120 day" notifications that would occur prior to final designations.

While the general concept of ozone formation and transport in the Lake Michigan basin has long been recognized, this TSD incorporates data from a variety of sources, some of which were unavailable until recently. This includes:

- Analysis of ozone data from the lakeshore and inland monitors operated by WDNR in both Sheboygan and Kenosha counties to help understand the lakeshore ozone gradient;
- Analysis of wind data when values above the 2015 ozone standard have been measured at shoreline monitors;
- Recent HYSPLIT and source apportionment modeling results;
- Photochemical modeling conducted by the Lake Michigan Air Directors Consortium (LADCO).

The result is a comprehensive, multifaceted analysis of the origins, transport, and impacts of ozone along Wisconsin's Lake Michigan shoreline. This technical document supports several important conclusions:

- Elevated ozone levels are confined to an extremely narrow band that follows Wisconsin's shoreline, with air quality improving dramatically just a few miles inland;
- Ozone concentrations measuring above the level of the 2015 ozone NAAQS at the state's lakeshore monitors occur almost exclusively when the wind is coming from over the lake, not from over Wisconsin;
- Ozone concentrations at Wisconsin's lakeshore monitors are primarily due to emissions originating from outside the state;

- Additional emissions reductions from the areas around Wisconsin's shoreline monitors, including the state's most populous areas, would not meaningfully change the design values at those monitors. In fact, in some cases such reductions would actually increase ozone concentrations.

This last point is of particular significance to the designation process. Historically, EPA has designated areas around violating monitors (typically, entire counties or metropolitan areas) based on the premise that nearby sources of VOC and NOx emissions contribute to locally monitored ozone concentrations. The TSD, however, provides incontrovertible evidence to the contrary. Specifically, photochemical modeling shows that hypothetical (and unrealistically large) additional cuts in VOC and NOx emissions in ten eastern counties – including the entire Milwaukee metro area – would only reduce ozone design values by an average of 0.1 ppb. This impact is insignificant, equating to about one tenth of one percent of the 2015 ozone NAAQS of 70 ppb.

This effect is even more pronounced in Sheboygan County. It is widely recognized that Sheboygan County's Kohler Andrae monitor, which regularly registers the highest ozone concentrations in the state, is greatly affected by ozone transport due to its location.[1] This TSD quantifies, for the first time, the county's own contributions to ozone levels at that monitor. New modeling shows that, even if it were possible to eliminate *all* manmade sources of VOC and NOx emissions in Sheboygan County – a clearly impossible scenario – ozone design values at the Kohler Andrae monitor *would not decrease at all*. In fact, the data indicates that ozone values might actually *increase*. The irrefutable conclusion – that Sheboygan County has no ability to reduce ozone values at the Kohler Andrae monitor – has obvious and significant implications on the designations process.

The governor noted in his September 21, 2016 letter that, if EPA elects to designate areas of the state as nonattainment, EPA should ensure that the geographic scope of these areas is minimized. Chapter 6 of the TSD describes the maximum geographic extent that could be considered by EPA, based on the latest available monitoring data and extensive analysis of the "lake breeze" effect that transports high ozone air to the Wisconsin lakeshore. Any nonattainment areas EPA elects to impose must adhere to this science-based, "distance from the shoreline" approach, rather than on arbitrary boundaries based on historical practice or outdated theories of how local emissions impact ozone levels in the state.

This submittal provides compelling, data-driven evidence for what has long been understood: Wisconsin's ozone problems are due to transported pollutants, exacerbated by the unique effects of Lake Michigan, and are not meaningfully affected by in-state emissions. EPA's repeated unwillingness to fully address the impacts of ozone transport on Wisconsin has left the state to address its nonattainment issues on its own. Wisconsin has met this challenge by implementing many measures to reduce pollutants and operating one of the best-controlled utility fleets in the nation. However, the science is clear: there are no demonstrable benefits to be gained by further controlling emissions in the state for the purpose of this standard. EPA must acknowledge this information, and use the discretion it has under the CAA to avoid imposing nonattainment areas on the state that would not improve air quality.

[1] EPA acknowledged this as recently as its January 2017 preliminary transport modeling for the 2015 ozone standard, in which ten upwind states were shown to contribute significantly to this monitor (this modeling also predicted a 2023 design value at this monitor of 71 ppb, which would exceed the standard).

I am available to discuss the information contained in this letter and TSD further if needed. Please contact me at Gail.Good@wisconsin.gov or 608-264-8537 if there are any questions regarding this submittal.

Sincerely,

Gail E. Good

Gail Good
Director
Air Management Program

cc: Kurt Thiede, AD/8
Ed Eberle, AD/8
Pat Stevens, EM/8
Bart Sponseller, EM/7
David Bizot, AM/7
Jennifer Rashel, LS/8
Ed Nam – EPA Region 5 (via email)
John Mooney – EPA Region 5 (via email)
Doug Aburano – EPA Region 5 (via email)

Enclosure

2015 Ozone National Ambient Air Quality Standards Area Designations

Technical Support Document

Wisconsin Department of Natural Resources

April 2017

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Figure 6.2: 2014-2016 design values plotted against the distance inland from Lake Michigan for all monitors in lakeshore counties and neighboring Waukesha and Walworth counties.

Figure 6.3: Locations and 2014-2016 ozone design values for monitors in Milwaukee County, with the north-south and concentration differences shown in red.

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List of Acronyms

CAA	Clean Air Act
CFR	Code of Federal Regulations
CBL	Convective boundary layer
CSAPR	Cross-State Air Pollution Rule
DV	Design value
EPA	U.S. Environmental Protection Agency
HYSPLIT	Hybrid Single-Particle Lagrangian Integrated Trajectory
LADCO	Lake Michigan Air Directors Consortium
LMOS 2017	Lake Michigan Ozone Study 2017
MDA8	Maximum daily 8-hour average ozone concentration
MSA	Metropolitan Statistical Area
NAAQS	National Ambient Air Quality Standards
NASA	National Aeronautics and Space Administration
NOAA	National Oceanic and Atmospheric Administration
NOx	Nitrogen oxides (NO and NO_2)
ppb	Parts per billion
ppm	Parts per million
RTA	Rural Transport Area
SIP	State Implementation Plan
TSD	Technical support document
VOC	Volatile organic compound
WDNR	Wisconsin Department of Natural Resources

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1. Introduction and Background

On October 1, 2015, the U.S. Environmental Protection Agency (EPA) promulgated revisions to the primary and secondary National Ambient Air Quality Standards (NAAQS) for ozone. The revisions became effective on December 28, 2015. The revised NAAQS increased the stringency of both the primary and secondary 8-hour ozone standards from 0.075 parts per million (ppm) to 0.070 ppm (70 parts per billion (ppb)). The standards are based on the annual 4th highest daily maximum 8-hour average (MDA8) ozone concentration, averaged over three consecutive years. This average is referred to as the "design value" for each 3-year period.

On September 21, 2016, in accordance with section 107(d)(1)(A) of the Clean Air Act (CAA), Governor Walker recommended that all counties in Wisconsin be designated as attainment for this standard. This recommendation was based on: (1) ozone levels in the state have improved, (2) the state has already significantly decreased emissions, and (3) elevated ozone measurements in Wisconsin are primarily due to emissions originating from outside the state. This technical support document (TSD) has been developed by the Wisconsin Department of Natural Resources (WDNR) to support this recommendation. The analyses contained within also define the maximum extent of potential 70 ppb ozone design values in the state.

This submittal provides compelling, data-driven evidence for what has long been understood: Wisconsin's ozone problems are due to transported pollutants, exacerbated by the unique effects of Lake Michigan, and are not meaningfully affected by in-state emissions. EPA should consider this supporting information and ensure it is reflected in any modifications to the governor's recommendation EPA elects to make in the "120 day" notifications that would occur prior to final designations.

1.1. Document Overview

This TSD presents a comprehensive analysis of the origins, transport and distribution of ozone impacting Wisconsin's Lake Michigan shoreline.

Following this introduction, Chapter 2 contains ozone monitoring data for the years 2014 to 2016. Chapter 3 presents a conceptual model for ozone formation in the Lake Michigan region, highlighting the significant role that meteorology plays in this region. Chapter 4 examines a number of analyses that demonstrate that ozone-rich air is confined to a narrow strip of land following the lakeshore, with ozone concentrations dropping dramatically just a few miles from the lake. Chapter 5 shows that ozone along the lakeshore is due to transport from other states located to the south. This conclusion is based on a number of analyses, including back-trajectory (HYSPLIT) and source apportionment modeling, as well as modeling of different emission reduction strategies. These conclusions are based on the findings that ozone-rich air rarely penetrates inland and is almost exclusively the result of out-of-state source emissions.

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Finally, should EPA elect to impose nonattainment areas in Wisconsin, Chapter 6 describes the maximum geographic extent that could be considered by EPA based on the evidence contained in this TSD.

1.2. Consideration of EPA's Designations Guidance

Information on the schedule and process for initially designating areas for the purposes of implementing the 2015 ozone NAAQS was provided by EPA in a February 25, 2016 memorandum, "Area Designations for the 2015 Ozone National Ambient Air Quality Standards." In this guidance, EPA states that "the boundaries for each nonattainment area should be evaluated and determined on a case-by-case basis considering the specific facts and circumstances unique to the area." The memorandum identified several factors that EPA intends to evaluate when making final nonattainment boundary decisions for this standard. These factors include:

- Air quality data,
- Emissions and emissions-related data,
- Meteorological data,
- Geography/topography, and
- Jurisdictional boundaries.

EPA's memorandum states that the agency will evaluate this and other information provided by a state when determining the appropriate nonattainment area designation. Wisconsin considered the above five factors in this TSD, as discussed below.

1.2.1. Air Quality Data

Ozone data from Wisconsin's air quality monitoring network is presented in Chapters 2, 4 and 5. In its guidance, EPA states that it intends to make final designation decisions for the 2015 ozone NAAQS using design values based on the 2014 to 2016 certified air quality data. The data presented in the TSD show that the only 2014 to 2016 ozone design values that exceed the 2015 ozone NAAQS in Wisconsin are located along the Lake Michigan shoreline. Chapter 4 demonstrates that ozone concentrations are highest along the lakeshore and decrease away from the shoreline along a sharply-defined gradient. The implications of this observed gradient for area designations are discussed in Chapter 6.

1.2.2. Emissions Data

EPA's guidance states that emissions of ozone precursor pollutants are important factors in the initial area designations process and that ambient ozone typically results due to a combination of regional and local emissions. A complete inventory of regional VOC and NOx emissions data for 2014, utilizing 2014 National Emissions Inventory and Clean Air Markets Division data, is included in Appendix A. A comprehensive list of permanent and enforceable control measures Wisconsin has implemented to reduce these precursor emissions can be found in Appendix B.

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This TSD considers local and regional emissions data throughout the document to assess the impacts of these emissions on monitored ozone concentrations in Wisconsin. Specifically, these emissions are considered throughout Chapters 4, 5 and 6, including through source apportionment modeling, in the photochemical modeling results, and the multiple analyses characterizing the lakeshore ozone effect and gradient. These analyses conclusively show that emissions originating from outside the state of Wisconsin are the predominant contributors to the elevated ozone concentrations measured at the state's lakeshore monitors. These analyses also demonstrate that local emissions within these counties do not significantly affect ozone concentrations along the lakeshore and therefore are irrelevant for the purposes of considering nonattainment area boundaries.

1.2.3. Meteorological Data

EPA states that evaluation of meteorological data helps to assess the fate and transport of emissions contributing to ozone concentrations and to identify areas potentially contributing to monitored violations. This data may also support determination of nonattainment area boundaries. The unique meteorology of the Lake Michigan region is an extraordinarily important factor contributing to the elevated ozone levels measured along Wisconsin's lakeshore. Chapter 3 provides an overview of how this meteorology affects ozone formation and transport in the region. Chapters 4 and 5 examine in more detail the roles of lake breeze events and meteorologically-driven transport on ozone distributions in Wisconsin's lakeshore counties. This work includes, among many other elements, HYSPLIT (Hybrid Single-Particle Lagrangian Integrated Trajectory) back trajectory analyses.

1.2.4. Geography and Topography

EPA notes that physical features may influence the fate and transport of emissions, as well as the formation and distribution of ozone concentrations, and therefore may be relevant to defining nonattainment area boundaries. The geography of the Lake Michigan region has an important impact on ozone distributions in Wisconsin, particularly when combined with local and regional meteorological patterns. Chapter 3 discusses how the geography of the Lake Michigan region combines with meteorological patterns to create localized high ozone concentrations along Wisconsin's lakeshore. Chapters 4 and 5 further discuss how ozone patterns are influenced by geographical features, such as the angle of the shoreline, and how this geography impacts monitored ozone concentrations.

The topography of the entire Lake Michigan lakeshore basin is relatively flat and is not believed to significantly impact regional ozone concentrations or distribution.

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1.2.5. Jurisdictional Boundaries

EPA's guidance says that existing jurisdictional boundaries may be considered for the purposes of providing a clearly defined legal boundary for potential nonattainment areas. However, where existing jurisdictional boundaries are not adequate to describe the area, EPA states "other clearly defined and permanent landmarks or geographic coordinates should be used."

The information contained in this TSD fully supports the governor's recommendation of September 21, 2016, which is that EPA should designate the entire state as attainment of the 2015 ozone standard. Should EPA elect to impose nonattainment areas on the state contrary to this recommendation, this analysis shows conclusively that using existing jurisdictional boundaries would not be appropriate for this purpose. Chapter 6 describes the maximum geographic extent that could be considered by EPA, based on the latest available monitoring data and extensive analysis of the meteorological patterns that transport high ozone air to the Wisconsin lakeshore.

This TSD also considers a number of tools and approaches that combine multiple factors into a comprehensive data analysis, presented in Chapters 4 and 5. Such approaches allow for a more complete understanding of how different factors work together to create the unique distribution of ozone observed in Wisconsin. This document presents ozone source apportionment modeling, as well as several other types of photochemical modeling, which combines the first four factors listed above to arrive at important conclusions relevant to the designations process.

A number of other types of analyses combine air quality data, meteorological data (in particular, wind direction analysis), and geography. Taken together, these analyses clearly describe how Wisconsin's Lake Michigan shoreline region is heavily impacted by transport of emissions from out-of-state sources to the south. In this environment, concentrated ozone formed over the lake is carried ashore by lake breezes, with ozone design values above 70 ppb being confined to a very narrow band along the shoreline.

1.3. Implications for EPA's Designations Process

The information contained in this TSD fully supports the governor's recommendation of September 21, 2016. Specifically, it is consistent with EPA's guidance, which notes that "for those portions of the area where an evaluation of the available information clearly establishes that emissions sources do not contribute to exceedances at the violating monitor(s), the EPA believes it would be appropriate to exclude that portion of the area from the nonattainment area." If EPA elects to act contrary to their own guidance and designate areas of the state as nonattainment, EPA should ensure that the geographic scope of these areas is minimized. Chapter 6 describes the maximum geographic extent that could be considered by EPA, based on conservative estimates of the extent of area with design values above 70 ppb. Any nonattainment areas EPA elects to impose must adhere to this science-based, "distance from the shoreline"

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approach, rather than on arbitrary boundaries based on historical practice or outdated theories of how local emissions impact ozone levels in the state.

2. Wisconsin Ozone Monitoring Data

Ozone levels in Wisconsin were monitored at 30 locations across the state from 2014 through 2016. The data was collected and fully quality-assured in accordance with the requirements of 40 CFR Part 50 and 40 CFR Part 58, Appendix A. Wisconsin's 2016 ozone data was certified by the state on February 9, 2017, and EPA concurred with the state's certification. EPA's guidance states that states and tribes can rely upon monitoring data for the purposes of area designations once it is certified in accordance with 40 CFR 58.15. Wisconsin's certified 2016 ozone data and the resulting design values are presented in this section and used throughout this document.

Table 2.1 lists the annual fourth-highest maximum daily 8-hour average (MDA8) ozone concentrations for the 30 monitoring locations and resulting design values. Design values are determined by averaging the annual fourth-highest MDA8 ozone concentrations for three consecutive years. A monitoring site meets the 2015 ozone NAAQS if the design value is less than or equal to 0.070 ppm (70 ppb). The only monitors with 2014-2016 design values measuring above the 2015 ozone standard are located along the Lake Michigan shoreline (see Table 2.1 and Figure 2.1). The Racine Payne and Dolan monitor in Racine County has only been operational for two years (2015 and 2016), so it does not have a 2014-2016 design value.

Ozone air quality data from Wisconsin's lakeshore monitors are analyzed in greater detail in Chapters 4 and 5.

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Table 2.1. Annual fourth-highest daily maximum 8-hour average (MDA8) ozone concentrations and certified 2014-2016 design values (ppb). Locations with design values exceeding the 2015 ozone standard are highlighted. Annual fourth-highest MDA8 values exceeding 70 ppb are listed in bold.

Monitor ID	Site Name	County	2014	2015	2016	Design Value
550030010	Bad River Tribal School	Ashland	56	57	62	58
550090026	UW - Green Bay	Brown	66	65	68	66
550210015	Columbus	Columbia	69	64	70	67
550250041	Madison East High School	Dane	66	64	66	65
550270001	Horicon Wildlife Area	Dodge	**71**	66	68	68
550290004	Newport State Park	Door	65	**74**	**77**	**72**
550350014	Eau Claire	Eau Claire	61	59	64	61
550390006	Fond du Lac	Fond du Lac	67	65	66	66
550410007	Potawatomi	Forest	61	63	65	63
550550009	Jefferson – Laatsch	Jefferson	**71**	65	**71**	69
550590019	Chiwaukee Prairie	Kenosha	**76**	**75**	**80**	**77**
550590025	Kenosha Water Tower	Kenosha	70	68	**76**	**71**
550610002	Kewaunee	Kewaunee	65	70	**72**	69
550630012	La Crosse	La Crosse	63	61	63	62
550710007	Manitowoc / Woodland Dunes	Manitowoc	66	**77**	**74**	**72**
550730012	Lake DuBay	Marathon	64	63	68	65
550790085	Bayside	Milwaukee	69	68	**77**	**71**
550790026	Milwaukee DNR SER Headquarters	Milwaukee	68	66	70	68
550790010	Milwaukee 16th St. Health Center	Milwaukee	62	63	68	64
550870009	Appleton	Outagamie	70	66	66	67
550890008	Grafton	Ozaukee	**74**	70	**71**	**71**
550890009	Harrington Beach State Park	Ozaukee	70	**71**	**79**	**73**
551010020	Racine – Payne & Dolan	Racine	NA	68	**76**	NA
551050030	Beloit - Converse	Rock	**72**	64	**72**	69
551110007	Devils Lake State Park	Sauk	64	63	66	64
551170006	Kohler-Andre State Park	Sheboygan	**72**	**81**	**85**	**79**
551170009	Sheboygan - Haven	Sheboygan	68	67	**74**	69
551250001	Trout Lake Nursery	Vilas	61	60	63	61
551270005	Lake Geneva NADP Site	Walworth	**73**	67	**72**	70
551330027	Waukesha – Cleveland Ave.	Waukesha	67	66	67	66

Source: U.S. EPA AirData, Air Quality System (AQS): (http://www.epa.gov/air/data/index.html)

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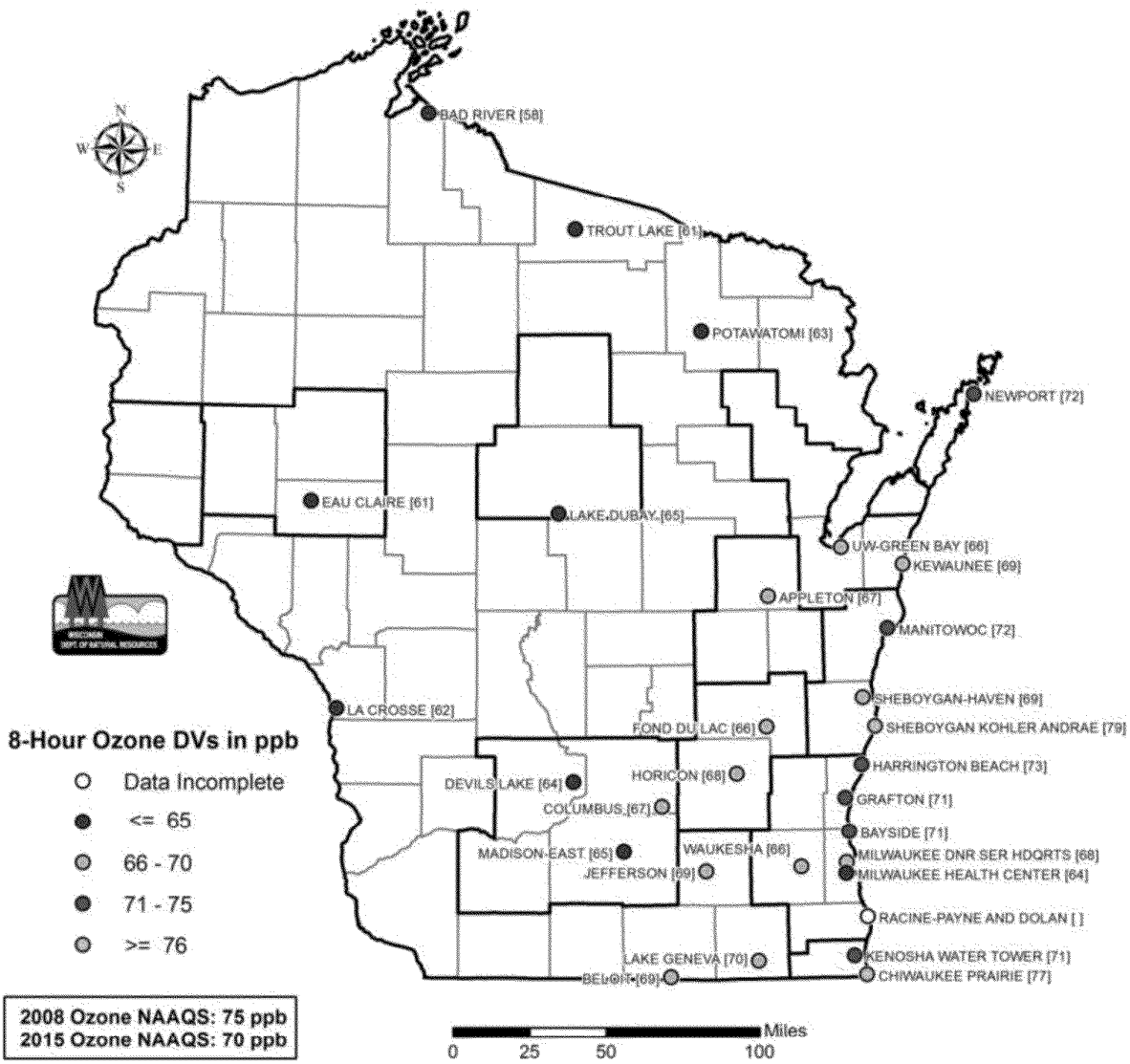
Figure 2.1: Certified 2014-2016 ozone design values (ppb).

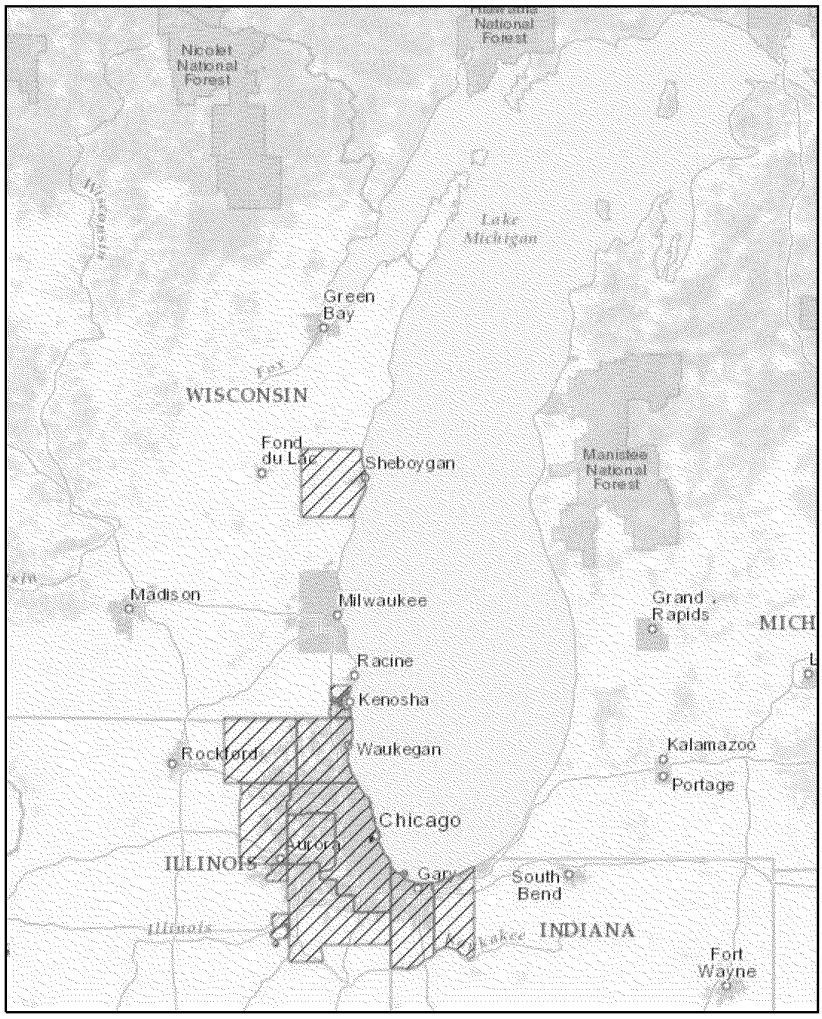


3. The Unique Ozone Dynamics of the Lake Michigan Region

3.1. Introduction

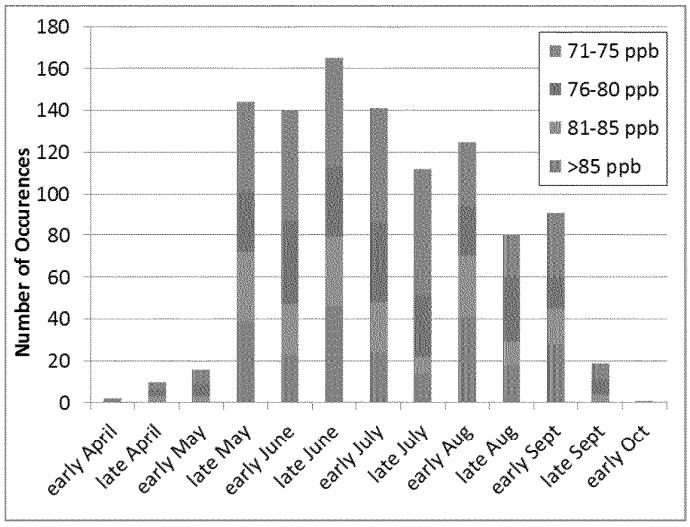
Monitors around Lake Michigan have a long history of ozone concentrations that exceed the level of the NAAQS. Since the promulgation of the original 1979 ozone NAAQS, lakeshore counties in Wisconsin, Illinois, Indiana and Michigan have been designated nonattainment with each subsequent standard. While ozone concentrations have decreased dramatically over time due to implementation of measures controlling ozone precursor emissions, there are still discrete areas with ozone concentrations above established NAAQS. For example, two Lake Michigan areas around Chicago, Illinois and Sheboygan County, Wisconsin (Figure 3.1) are currently designated nonattainment for the 2008 ozone NAAQS.

Figure 3.1. Map of the Lake Michigan region, with the Chicago and Sheboygan nonattainment areas for the 2008 ozone NAAQS indicated by hatching. (from LADCO)



Wisconsin's lakeshore monitors most frequently measure ozone concentrations exceeding the 2015 ozone NAAQS from late May through early August, with peak ozone exceedances in late June (Figure 3.2). A smaller number of exceedances occur in late August and early September with ozone concentrations rarely exceeding the 2015 ozone NAAQS before May 15 or after September 15. Ozone concentrations peak in the late spring and early summer because of the abundance of sunlight and heat, both of which contribute to ozone formation. In addition, strong land-lake temperature gradients in late spring and early summer cause lake breeze circulations that can contribute to high ozone concentrations, as discussed below.

Figure 3.2. Distribution of the number of occurrences of maximum daily 8-hour average ozone concentrations (MDA8) at monitors along Wisconsin's Lake Michigan lakeshore. Data are shown for the years 2005-2014.



The unique meteorology of the Lake Michigan area contributes strongly to the elevated ozone levels measured in this area. This meteorology causes transport of significant amounts of ozone from upwind sources to lakeshore counties in Wisconsin and neighboring states. Two types of meteorological patterns affect ozone concentrations in the region:

1) Synoptic scale meteorology[1] transports high concentrations of ozone and ozone precursors northward from source regions to the south and southeast, and
2) Mesoscale meteorology[1] (via land-lake breeze circulation patterns) carries precursors over the lake, where they react to form ozone. Winds then shift to pull the ozone onshore.

[1] Synoptic-scale meteorology refers to weather features of 24-48 hours' duration, whereas mesoscale meteorology refers to weather features of shorter duration.

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3.2. The Role of Synoptic-Scale Meteorology on High-Ozone Days

High pressure systems have been shown to generate meteorological conditions favorable to elevated ozone as they move through the eastern U.S. from west to east during late May to early September. These systems are typified by hazy, sunny skies with generally weak, clockwise-rotating winds and relatively shallow mixing such that near-surface pollution concentrations are not diluted by mixing. These meteorological conditions contribute to the buildup of ozone precursors and facilitate formation of ozone via photochemical reactions.

Ozone episodes are generally associated with high pressure systems over the eastern United States that transport pollutants and precursors from the south and east into the Lake Michigan region.[2,3] One study[4] estimated that 50 percent of Wisconsin's ozone exceedance days from 1980 to 1988 under the 1-hour ozone NAAQS occurred when the center of a high pressure system was situated southeast of the area (i.e., Ohio and east thereof). Under these circumstances, high ozone concentrations in the Lake Michigan region may result when polluted air from high emissions regions, such as the Ohio River Valley, is transported northward along the western side of a high pressure system.[5] In addition, while emissions from the heavily industrialized portions of the Lake Michigan region have decreased dramatically in recent decades, sources in large metropolitan areas along the lakeshore still generate ozone precursor emissions. Pollution from sources in these areas can add to the pool of pollution transported into the Lake Michigan region.[2]

Figure 3.3 shows the synoptic scale weather pattern for one such episode along with the resulting patterns in ozone concentrations. On this day a high pressure system was located to the southeast, centered over Virginia. Southeasterly to southerly winds on the western side of this system carried pollutants from the Ohio River Valley to Lake Michigan. This episode portrays a common pattern for ozone distributions on episode days: ozone concentrations were lowest in the regions with the highest emissions (in central Chicago and extending into northwestern Indiana) and the highest in rural coastal areas far downwind. During classic transport episodes such as this one, peak ozone concentrations move northward over the course of the day, carried by southerly winds. For example, on the day shown in Figure 3.3, ozone peaked at Wisconsin's southern Chiwaukee Prairie monitor between 11 a.m. and 1 p.m., at the Kohler Andrae monitor

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[2] Dye, T.S., P.T. Roberts, and M.E. Korc, 1995: Observations of transport processes for ozone and ozone precursors during the 1991 Lake Michigan Ozone Study. J. App. Meteor, 34: 1877-1889.

[3] Hanna, S.R., and J.C. Chang, 1995: Relations between meteorology and ozone in the Lake Michigan region. J. Applied Meteorology, 34: 670-678.

[4] Haney, J.L., S.G. Douglas, L.R. Chinkin, D.R. Souten, C.S.Burton, and P.T. Roberts, 1989: Ozone Air Quality Scoping Study for the Lower Lake Michigan Air Quality Region, SAI report #SYSAPP-89/101, prepared for US EPA, August, 197 pp.

[5] For example, Ragland, K. and P. Samson, 1977: Ozone and visibility reduction in the Midwest: evidence for large-scale transport. J. Applied Meteorology, 16: 1101–1106.

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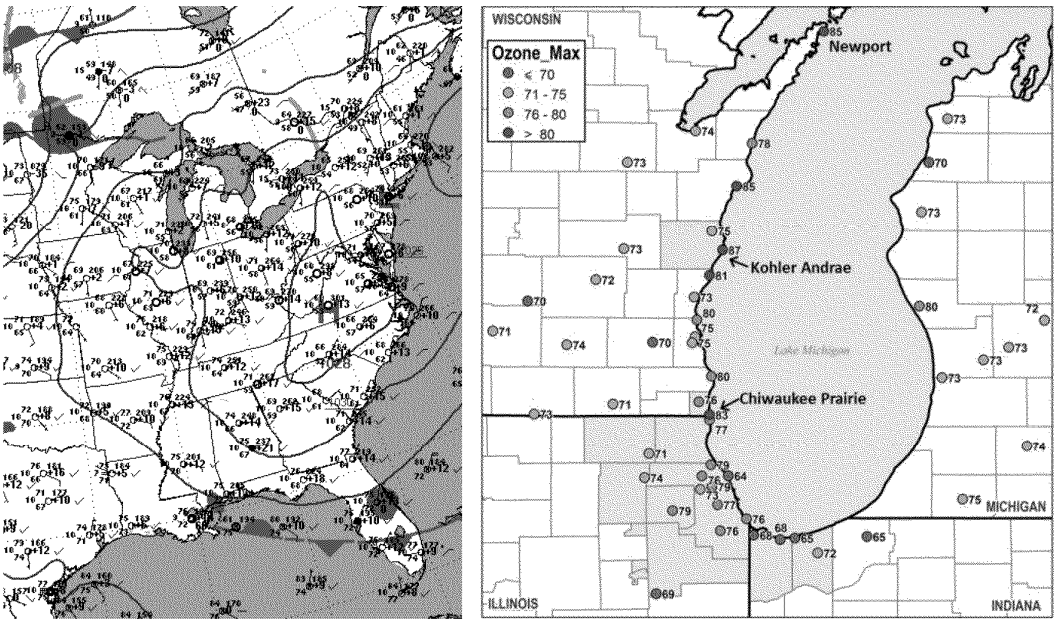
midway up the coast between 2 p.m. and 4 p.m., and at the northern Newport monitor between 4 p.m. and 6 p.m.

Figure 3.3. Surface synoptic weather map for 6 a.m. CST for the eastern U.S. (left), and the maximum daily 8-hour average (MDA8) ozone concentrations for the Lake Michigan region (right) for June 19, 2016. The Chicago and Sheboygan ozone nonattainment areas are shaded in gray.



3.3. The Role of Mesoscale Meteorology (Lake Breeze Circulation) on High-Ozone Days

Synoptic meteorological conditions often work in combination with unique lake-induced mesoscale meteorological features to produce the highest ozone concentrations in this region. Historically, Wisconsin's ozone nonattainment areas have been positioned along the state's Lake Michigan shoreline (Figure 3.1). With a surface area of approximately 22,400 square miles, Lake Michigan acts as a large heat sink during the warm months. Figure 3.4 highlights the considerable difference between the over-land air temperatures (measured at Racine, Wisconsin) and overwater air temperatures (measured at a buoy in southern Lake Michigan) during a 5-day ozone episode in June 2002. The strong daytime temperature contrast between the warm land and cold lake can lead to the formation of a thermally-driven circulation cell called the "lake breeze", which runs approximately perpendicular to the Lake Michigan shoreline (Figure 3.5).

As this figure shows, the lake breeze is generally preceded by an early morning land breeze, driven by relatively warm temperatures over the lake. The land breeze can carry ozone precursors emitted from urban areas, primarily Chicago, out over the lake, where they can react to form ozone. The onshore flow of the lake breeze circulation then transports elevated ozone from over the lake into eastern Wisconsin.

Figure 3.4. Hourly surface air temperatures at Racine, WI and at the South Lake Michigan Buoy during an ozone episode on June 20-25, 2002.

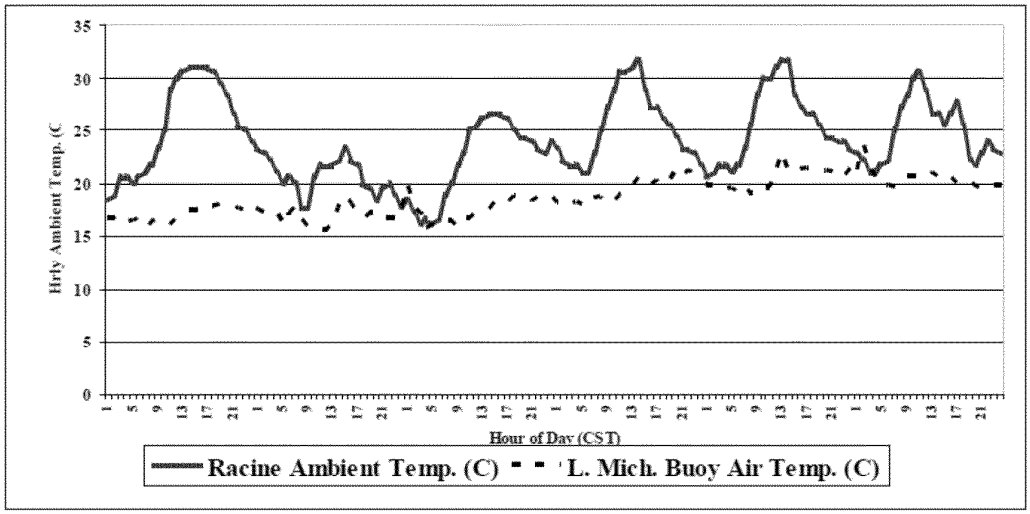
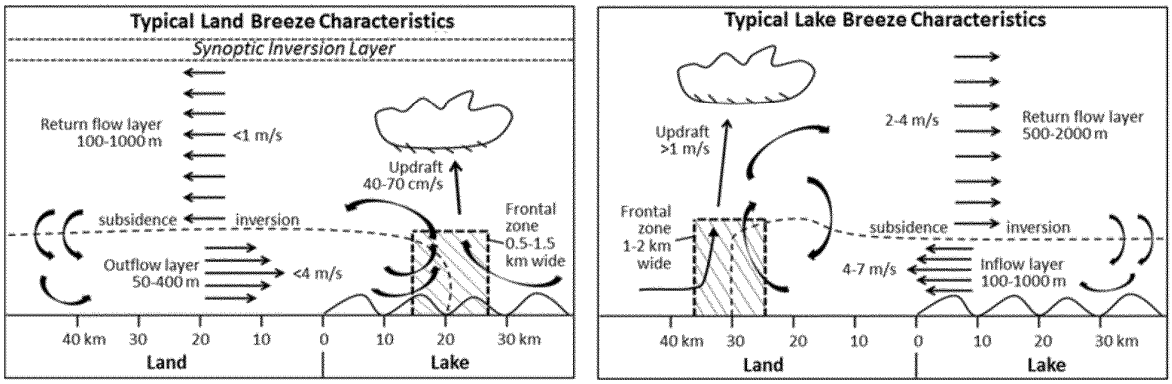


Figure 3.5. Schematic diagrams of the early morning land breeze (left) and late morning/afternoon lake breeze (right) circulations responsible for enhanced ozone production along the Lake Michigan shoreline. (modified from Foley et al., 2011[6])



3.4. Conceptual Model for Ozone Formation in the Lake Michigan Region

Synoptic and mesoscale meteorological patterns together drive ozone formation in the region, as described in a conceptual model in Dye et al. (1995).[2] Dye et al. (1995) described this model with a series of inter-related steps. These steps are described below, focusing on the conditions impacting Wisconsin's shoreline:

[6] Foley, T., E. A. Betterton, P.E. R. Jacko, and J. Hillery, 2011: Lake Michigan air quality: The 1994-2003 LADCO Aircraft Project (LAP), Atmos. Env., 45: 3192-3202.

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1) A shallow but intensely stable conduction inversion exists just above the relatively cold lake surface (Figure 3.5). During the early morning hours the land breeze and general offshore flow (i.e., southerly to west-southwesterly winds) transport ozone and fresh precursor emissions into the stable air in the conduction layer over Lake Michigan. A primary source region is the Chicago area, located at the southern edge of the lake.

2) By midmorning a sharp horizontal temperature gradient forms along the shoreline between the cold lake air and the increasingly warmer air over the land. This gradient effectively "cuts off" air in the conduction layer from additional injections of shore-emitted precursors. Strong stability in the conduction layer limits dispersion, creating high concentrations of ozone precursors, which can react in this layer.

3) By midmorning, the developing convective boundary layer (CBL) grows and the resulting convection mixes ozone vertically, where it combines with ozone transported from sources outside the region. Ozone concentrations in this air are lower due to the dilutive effects of convective mixing. As this air is transported towards the lake, it is forced to flow up and over the conduction layer (Figure 3.5).

4) The ozone-rich air in both layers is transported northward over Lake Michigan by the prevailing winds. When a lake breeze is present, it produces southerly to south-southeasterly winds along the western shore of Lake Michigan. This wind pattern transports the ozone originating from sources in the south to downwind receptor regions along the eastern Wisconsin lakeshore. On occasion, areas north of Ozaukee County experience elevated ozone levels as a southerly wind intercepts the shoreline where it juts into Lake Michigan.

5) When the ozone-laden air flows onshore in the downwind receptor regions, air with the highest ozone concentrations, located in the lowest 300 meters, mixes with the air at ground level along the shoreline. This causes the highest ozone concentrations to be found along the shoreline. Eventually, air from higher altitudes mixes with air at ground level further inland. This air mass is the remnant of the ozone-diluted CBL air that flowed up and over the conduction layer during the mid-morning hours, which is why ozone concentrations are lower further inland.

This complex meteorology leads to the high ozone concentrations and persistent nonattainment issues faced by the counties along the Lake Michigan shoreline.

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4. Evidence of Narrow Ozone Concentration Gradients Along the Wisconsin Lakeshore

The conceptual model presented in Chapter 3 indicates that ozone concentrations in Wisconsin should be highest near Lake Michigan and decrease away from the lakeshore. This chapter presents a number of analyses that confirm that narrow and steep gradients in ozone concentrations exist along Wisconsin's Lake Michigan shoreline during ozone episodes. These analyses also suggest that the origins of ozone measured inland differ from the ozone impacting the lakeshore.

To determine the extent and nature of this lakeshore ozone gradient, this chapter examines evidence from two primary sources: (1) photochemical modeling results, and (2) ozone data from monitors located in lakeshore counties. This analysis also highlights the central role of lake breeze events in creating the sharp concentration gradients observed along the lakeshore.

4.1. Photochemical Modeling Results

Recent photochemical modeling conducted by the Lake Michigan Air Directors Consortium (LADCO) indicates there is a steep, consistent ozone concentration gradient along the entire Lake Michigan lakeshore (Figure 4.1).[7] This modeling strongly suggests that high ozone design values are confined to a very narrow band that follows the shape of the lakeshore along most of the Wisconsin shoreline.

This modeling projects that the highest design values (≥76 ppb) remain almost exclusively over Lake Michigan. Concentrations of 71 to 75 ppb reach the shoreline in some places, but never penetrate deeply. Because this figure is based on model projections of ozone concentrations rather than actual measurements, the exact concentrations shown are illustrative only.[8] However, the gradients projected by the model are informative as they show how elevated ozone levels drop off dramatically in Wisconsin as distance from the lake increases. The remainder of this section examines monitoring data that lends support to this conclusion.

[7] This modeling is based on emissions estimates for 2017 and base year 2011 meteorology.
[8] These modeling results tend to underpredict ozone concentrations relative to the 2014-2016 design values.

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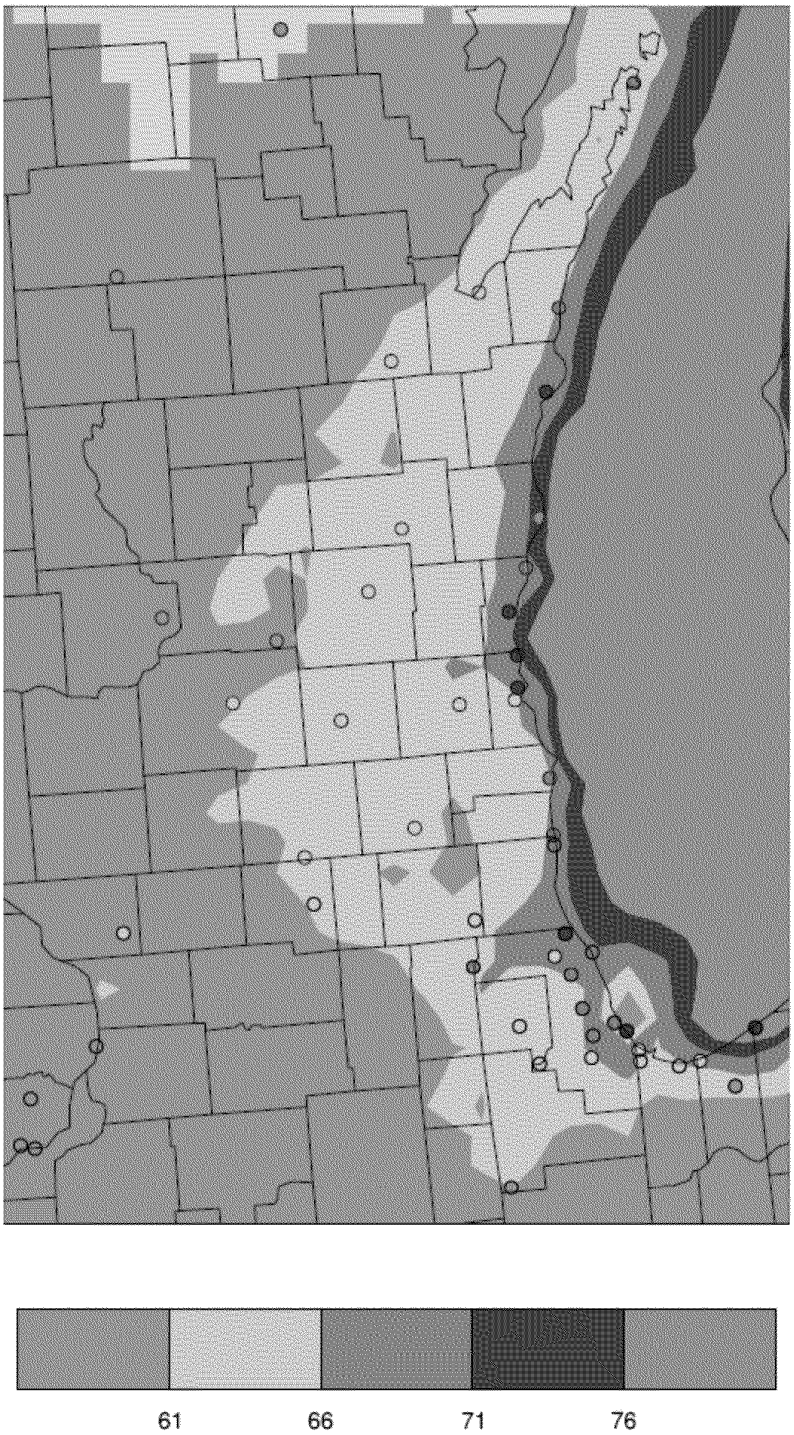
Figure 4.1. Photochemical model projections of 2017 design values along the western Lake Michigan shoreline. Design values are shown in ppb. Monitor values shown are projections from the model attainment test software for the grid cell containing the monitor. The modeling was completed by LADCO.



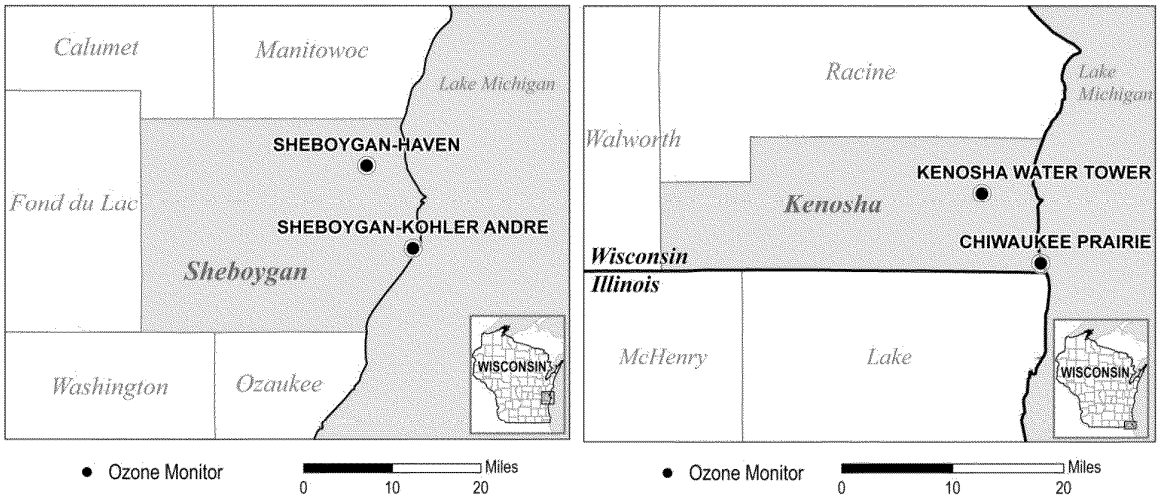
4.2. Comparing Data From Inland and Lakeshore Monitors

The photochemical modeling suggests that the air quality in the inland portions of the lakeshore counties contains lower levels of ozone than the areas nearest to Lake Michigan. Analysis of data from monitors operating inland and along the lakeshore provides new insight into the actual spatial distribution of ozone concentrations along Wisconsin's Lake Michigan shoreline.

The two monitors that usually measure the highest ozone concentrations in Wisconsin, Sheboygan County's Kohler Andrae monitor and Kenosha County's Chiwaukee Prairie monitor, are both located within several hundred feet of the Lake Michigan shoreline. For the last several years, WDNR has operated additional monitors located a few miles inland from these monitors (Figure 4.2):

- The Kenosha Water Tower monitor began operating in 2013. It is located 7.4 miles northwest of the Chiwaukee Prairie monitor and 3.6 miles inland from Lake Michigan.
- The Sheboygan Haven monitor began operating in 2014. It is located 10.9 miles north-northwest of the Kohler Andrae monitor and 3.2 miles from the lakeshore.

Figure 4.2. Location of the inland and lakeshore ozone monitors in Sheboygan (left) and Kenosha (right) counties.



4.2.1. Analysis of 8-Hour Average Data

Figure 4.3 shows that, for the years that data from both monitors are available, the fourth high MDA8 ozone concentrations at the inland monitors were substantially and consistently lower than those recorded at the lakeshore monitors:

- In Sheboygan County, the fourth high MDA8 values at the inland monitor were 4 to 14 ppb lower than those at the lakeshore monitor.
- In Kenosha County, these values were 4 to 7 ppb lower at the inland monitor when compared to the lakeshore monitor.

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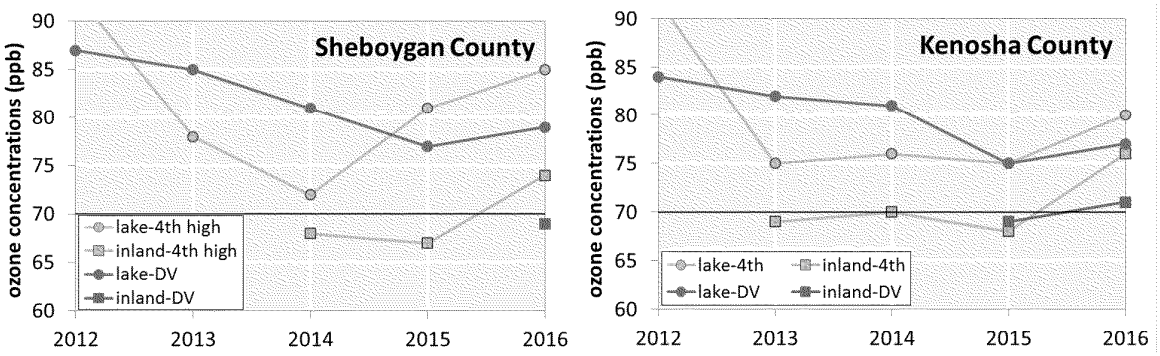
Note that a measurable and meaningful difference in measurements between the monitors was found each year, so this difference is not the result of an unusual year. This data confirms that measured ozone concentrations consistently and sharply decrease away from the lakeshore in these two counties. This is also consistent with the photochemical modeling results described in section 4.1.

These differences are likewise reflected in design values at these monitors. The 2014-2016 design value for the inland Sheboygan Haven monitor is 69 ppb – this is below the level of the 2015 ozone NAAQS and 10 ppb lower than the design value for the Kohler Andrae monitor. The 2014-2016 design value for the Kenosha Water Tower monitor was 71 ppb, which is 6 ppb lower than the design value for the Chiwaukee Prairie monitor. This confirms the steep drop-off of concentrations within the lakeshore ozone gradient.

Figure 4.3. Trends in annual fourth high maximum daily 8-hour average concentrations and design values for both monitors in Sheboygan (left) and Kenosha (right) counties.



4.2.2. Analysis of Hourly Data

Examination of the hourly ozone concentrations at these two locations provides additional insights into the patterns of ozone concentrations near the lakeshore. Figure 4.4 shows the 1-hour average ozone concentrations for the Kohler Andrae and Sheboygan Haven monitors over the course of a 5-day ozone episode in 2014. Three days in this episode resulted in MDA8 values over 70 ppb at the Kohler Andrae monitor and one day resulted in an MDA8 value over 70 ppb at the Sheboygan Haven monitor. This ozone episode is typical of the episodes that affect the lakeshore and offers an excellent example of how ozone concentrations compare at the two monitors located in Sheboygan County.

Figure 4.4. Hourly ozone concentrations at the Sheboygan County lakeshore (Kohler Andrae) and inland (Sheboygan Haven) monitors for an episode in July 2014. The maximum daily 8-hour average (MDA8) ozone concentrations for each site are listed at the bottom of the figure, color-coded by monitor.

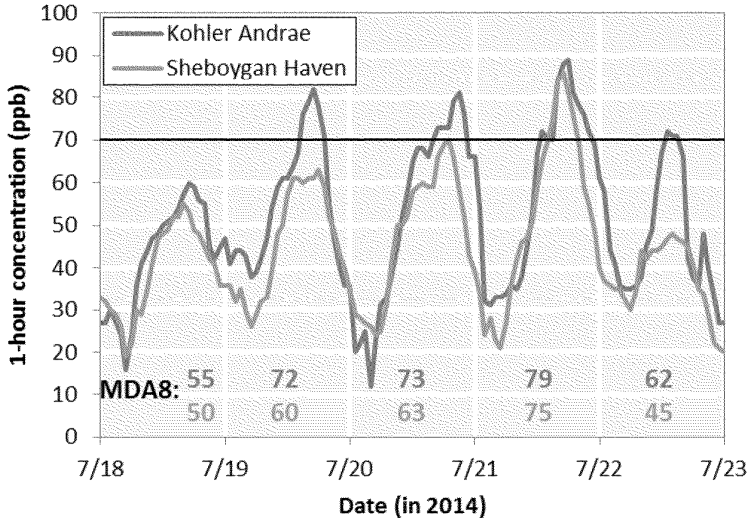
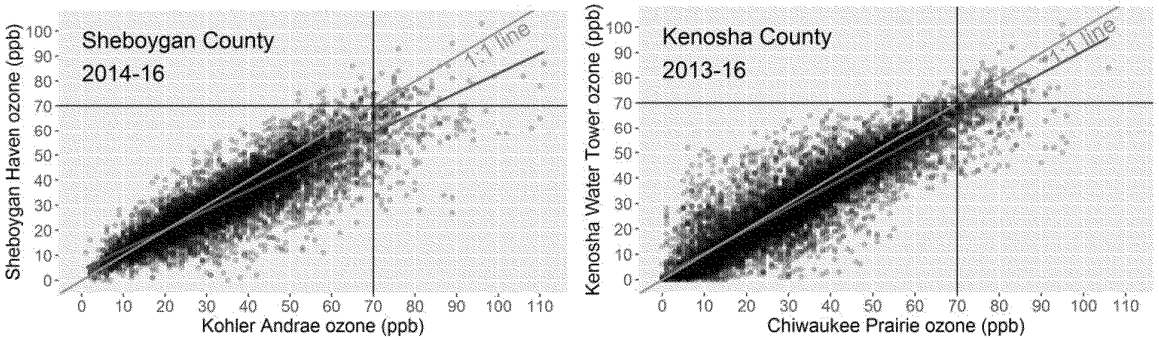


Figure 4.4 shows that hourly ozone concentrations generally changed at both sites in parallel. However, 1-hour concentrations at the lakeshore Kohler Andrae monitor were almost always higher than those at the inland Haven monitor. Peak differences were also consistently higher at the lakeshore monitor – as much as 20 ppb higher on July 19 and 22.[9] Overall, this episode shows systematic differences between inland and lakeshore ozone concentrations that are consistent with the differences observed in fourth high MDA8 and design values.

Figure 4.5 contains an analysis of all 1-hour ozone concentrations at these inland and lakeshore monitors. This data shows that the same trends observed during the 2014 episode were also present more generally; that is, 1-hour ozone concentrations at both inland monitors showed a consistent pattern of being lower than those monitored at the lakeshore. This is evident from the fact that most hourly concentrations are below the blue 1:1 line shown on the figures.[10] In addition, this data shows that these concentration differences were greatest when lakeshore ozone concentrations were at their highest. These inland-lakeshore concentration differences also tend to be greater in Sheboygan County relative to Kenosha County.[11]

[9] Section 4.2 discusses the differences in ozone transport inland under different meteorological conditions in some depth.
[10] The blue 1:1 line shows the relationship if the inland and lakeshore monitors had the same ozone concentration values.
[11] The same trends are found with MDA8 values (not shown).

Figure 4.5. Scatterplots of 1-hour ozone concentrations comparing inland monitors to lakeshore monitors in Sheboygan and Kenosha counties. The blue lines show the 1:1 line, and the red lines show the best-fit line to the data.



Appendix C contains additional analyses of this 1-hour ozone data. Most notably, these analyses find that during hours when lakeshore ozone was above 70 ppb, inland concentrations were consistently much lower. For example, during the 24 hours when lakeshore ozone concentrations were greater than 90 ppb in Sheboygan County, the median inland concentration was only 66 ppb. These findings conclusively demonstrate that the highest ozone concentrations are confined to the lakeshore monitors.

4.2.3. Conclusions

This data indicates that air with ozone concentrations above the level of the 2015 ozone NAAQS rarely reaches the inland monitors in Sheboygan and Kenosha Counties. Specifically, it shows that the highest-ozone air is confined to a band less than 3.6 miles wide along the lakeshore during most high-ozone episodes. The air located to the west (inland) of this lakeshore band has significantly lower average ozone concentrations during these episodes. The finding of similar results for both Sheboygan and Kenosha Counties, despite their different locations and geographies[12], indicates that this pattern is likely to hold for most of Wisconsin's Lake Michigan shoreline. Chapter 5 includes additional analyses of ozone concentrations under different meteorological conditions that further support this conclusion.

These results indicate that, if EPA elects to impose ozone nonattainment areas on Wisconsin, these areas should be no more than a few miles wide and should conform to the shape of the coastline. Further comparisons of the inland and lakeshore monitors are used in Chapter 6 to calculate the location of the 70 ppb contour along the lakeshore.

[12] These counties are located roughly 80 miles away from each other in different parts of the Wisconsin lakeshore and also have different coastline shapes, with Sheboygan County extending into the lake whereas Kenosha County has a relatively straight south-north configuration.

4.3. Analysis of the Lake Breeze Phenomenon

As described in Chapter 3, the lake breeze has been shown to play an important role in delivering high-ozone air to lakeshore monitors. This section examines the impact of lake breeze events on ozone concentrations at the inland and lakeshore monitors in Sheboygan and Kenosha Counties. This analysis confirms the steep concentration gradients observed in the previous section and helps explain their origin. It also helps define the unique ways in which the mesoscale meteorology of the Lake Michigan region drives ozone distribution along Wisconsin's Lake Michigan shoreline.[13]

This analysis used wind direction data and satellite images to classify days with peak 1-hour ozone concentrations above 70 ppb into one of three event types:[14]

- "Deep" lake breeze, meaning a day on which the lake breeze affected both the lakeshore and inland monitors.
- "Shallow" lake breeze, meaning a day on which the lake breeze affected the lakeshore but not the inland monitor.
- No lake breeze, meaning a day with no apparent lake breeze.

A small number of days were not able to be classified according to the event types above because of complex patterns. Classification of high-ozone days into these categories yielded the distribution of event types shown in Table 4.1. On most high-ozone days, the lake breeze reached the inland monitor.

Table 4.1. Distribution of the occurrence of different types of lake breeze events at the Sheboygan and Kenosha county monitors. The percentage of the classifiable events (which excludes "unclear" events) in each category is shown in parentheses.

	Deep lake breeze	Shallow lake breeze	No lake breeze	Unclear	Total days
Sheboygan	33 (67%)	5 (10%)	11 (22%)	8	57 (2014-16)
Kenosha	45 (62%)	13 (18%)	15 (20%)	8	81 (2013-16)

Peak 1-hour ozone concentration data for different lake breeze types are shown in Figure 4.6. This data shows that, while median peak ozone concentrations at the lakeshore were similar across all event types, median peak concentrations at inland monitors were considerably lower.

[13] Chapter 5 examines the ways in which interstate transport driven by synoptic-scale meteorology affects ozone in this region.

[14] Deep and shallow lake breezes were identified based on the occurrence of wind shifts to directions characteristic of lake breezes at the monitors. These classifications were confirmed by examination of MODIS satellite images that can show the presence of lake breeze fronts if the right type of clouds is present. See Appendix C for more information.

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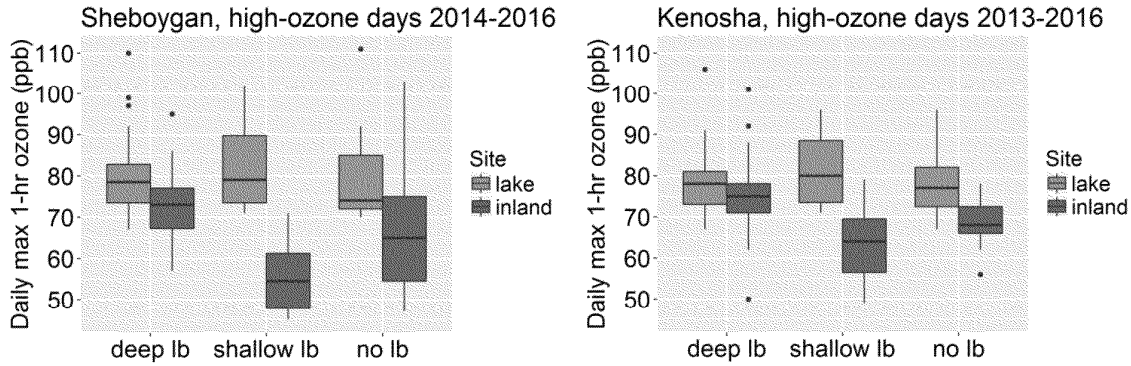
The inland-lakeshore concentration differences were especially large during shallow lake breeze events. Even during deep lake breeze events (when the lake breeze reached the inland monitor), peak concentrations at the inland monitor were on average 5 ppb lower than at the lakeshore monitor in Sheboygan and 3 ppb lower in Kenosha.[15] This result is consistent with the conceptual model for ozone formation in this region presented in Section 3.4.

Analysis of this data for individual days (see Appendix C) indicates that direct overland transport of ozone from the Chicago area also can affect concentrations measured at the inland Kenosha County monitor. This effect is most clearly evident on some days with deep[16] or shallow lake breezes. These days had hot temperatures (reaching 85-90°F at the Kenosha Water Tower monitor) and southerly to southwesterly winds that transported ozone-rich air from Chicago area sources into southeast Wisconsin. In 2016, direct overland transport of ozone was observed during the days with the highest and fourth highest MDA8 values, indicating that this mechanism can have an important impact on ozone design values at the inland Kenosha Water Tower monitor. There is no evidence from the data that any direct, overland transport occurred at the inland Sheboygan monitor.

Figure 4.6. Boxplots for Sheboygan and Kenosha counties showing the median and range[17] of daily maximum 1-hour average ozone concentrations for ozone episodes with deep, shallow, and no lake breeze ("lb"). Data are shown for the lakeshore and inland monitors in each county.



[15] Appendix C includes additional analyses of this data, including average profiles of ozone concentrations and wind direction for each type of high-ozone event.
[16] On days with a deep lake breeze, direct overland transport occurred in the hours before the lake breeze reached the inland monitor.
[17] Boxplots show the median and range of inland concentrations observed for a bin of lakeshore concentrations. The line in the middle of the box shows the median concentration, and the box encloses the middle half of the concentrations (e.g., the 25th to the 75th percentile values). The "whiskers" extend to the highest or lowest value within 1.5 times the interquartile mean (the difference between the 25th and 75th percentile values) beyond the box. The points are outliers that fall beyond the whiskers.

This data shows that, while lake breezes usually reach the inland monitors, the ozone concentrations carried by these lake breezes decrease sharply as they move inland. For example, during deep lake breeze events in Sheboygan, peak ozone concentrations decreased by roughly 5 ppb over 3.2 miles. In Kenosha, average peak ozone concentrations dropped by roughly 3 ppb in 3.45 miles.[18] This magnitude of difference helps explain the differences observed in the 8-hour ozone design values at these monitors.

In addition, this analysis shows that some lake breeze events don't reach the inland monitors at all. The concentration gradients during these shallow lake breeze events are even more pronounced, decreasing around 25 ppb in just 3.2 miles (in the case of the Sheboygan monitors) and 15 ppb in 3.45 miles (at the Kenosha monitors).

This analysis concludes that the steep ozone gradients found along the lakeshore result from the lake breeze phenomenon. The steepness of the ozone concentration gradient depends on the type of lake breeze event. This analysis also shows that, in addition to the lake breeze, direct overland transport of ozone influences concentrations measured at the inland Kenosha monitor, but does not appear to affect ozone concentrations at either Sheboygan monitor. This information will be used in Chapter 6 to define the 70 ppb ozone design value contour along the Wisconsin lakeshore.

4.4. Conclusions

The analyses in this chapter, which draw upon the latest data and modeling, demonstrate conclusively that ozone concentrations drop off dramatically and consistently within a few miles of Lake Michigan. This work also presents some insight into the characteristics of these gradients and the mechanisms that create them. In particular:

- Ozone design values were 6-10 ppb lower at the inland monitors compared with lakeshore monitors located in the same county.
- Average hourly ozone concentrations remained low at the inland monitors (located just 3.2 to 3.6 miles inland) during high-ozone hours, even when lakeshore concentrations exceeded 90 ppb.
- Meaningful ozone concentration differences between monitors were present even when the lake breeze reached the inland monitor.
- The gradients in measured ozone were especially steep during shallow lake breeze events, when the ozone-rich air from over the lake didn't reach the inland monitors.

These analyses demonstrate that the highest ozone concentrations are predominantly confined to a narrow strip of land that follows the Lake Michigan shoreline. Inland portions of the lakeshore

[18] The lakeshore Chiwaukee Prairie monitor is located 0.15 miles from the shoreline, so the inland distance between the two monitors is 3.45 miles.

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counties experience much lower ozone concentrations under all ozone episode types; these areas, as well as those areas further west, are highly unlikely to regularly measure ozone concentrations exceeding 70 ppb. This is critically important information when considering 2015 ozone NAAQS designations.

5. The Origins of High-Ozone Air Along the Wisconsin Lakeshore

This chapter examines the sources of the ozone-rich air impacting Wisconsin's Lake Michigan lakeshore using a number of types of analyses including the use of wind direction analysis and HYSPLIT back trajectories to examine the paths of transported ozone during ozone episodes; source apportionment modeling to estimate the contribution of ozone from different regions to monitors located both along the lakeshore and inland; and photochemical modeling of emissions reduction scenarios to examine how much control Wisconsin has on ozone concentrations along its lakeshore. These analyses demonstrate that interstate transport of ozone leaves the state with little ability to reduce ozone concentrations within its own borders. This chapter also shows that air at inland monitors may have different origins than air at lakeshore monitors, confirming earlier work showing differences between these monitors.

5.1. The Impact of Transport on Lakeshore Ozone Concentrations

This section uses several approaches to illustrate the impact of ozone transport on ozone concentrations measured along Wisconsin's lakeshore. The first approach examines the wind directions that deliver ozone-rich air to monitors in the region. The second approach analyzes the back trajectories of air parcels during ozone episodes to examine where these air parcels might have acquired their ozone. The final approach uses source apportionment modeling to describe the impact of transported ozone to concentrations measured at these monitors.

5.1.1. Analysis of Air Pollution Roses

The importance of transport in delivering ozone-rich air to monitors along Wisconsin's Lake Michigan lakeshore is evident from analysis of the wind directions from which this air originates. Figure 5.1 shows "air pollution roses" for all Lake Michigan monitors in Wisconsin that collect both wind direction and ozone concentration data.[19] This analysis shows that, in all cases, ozone concentrations measuring in excess of 70 ppb are being delivered to the monitors from over Lake Michigan. If local emissions were contributing to elevated ozone levels at these monitors, the pollution roses would instead show significant additional contributions from over land.

[19] The Kewaunee, Bayside, and Racine Payne and Dolan monitors do not collect wind data.

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Figure 5.1. Ozone pollution roses for hours with ozone above 70 ppb (left) and maps of monitor locations for lakeshore monitors (right). In the pollution roses, the length of the paddle shows the percentage of hours with winds from that direction, and the color corresponds to the average ozone concentration during those hours. The blue line in both figures shows an estimate of the shoreline angle, and the red arrow shows the angle of the dominant wind direction at that monitor. Map scales vary somewhat between maps.

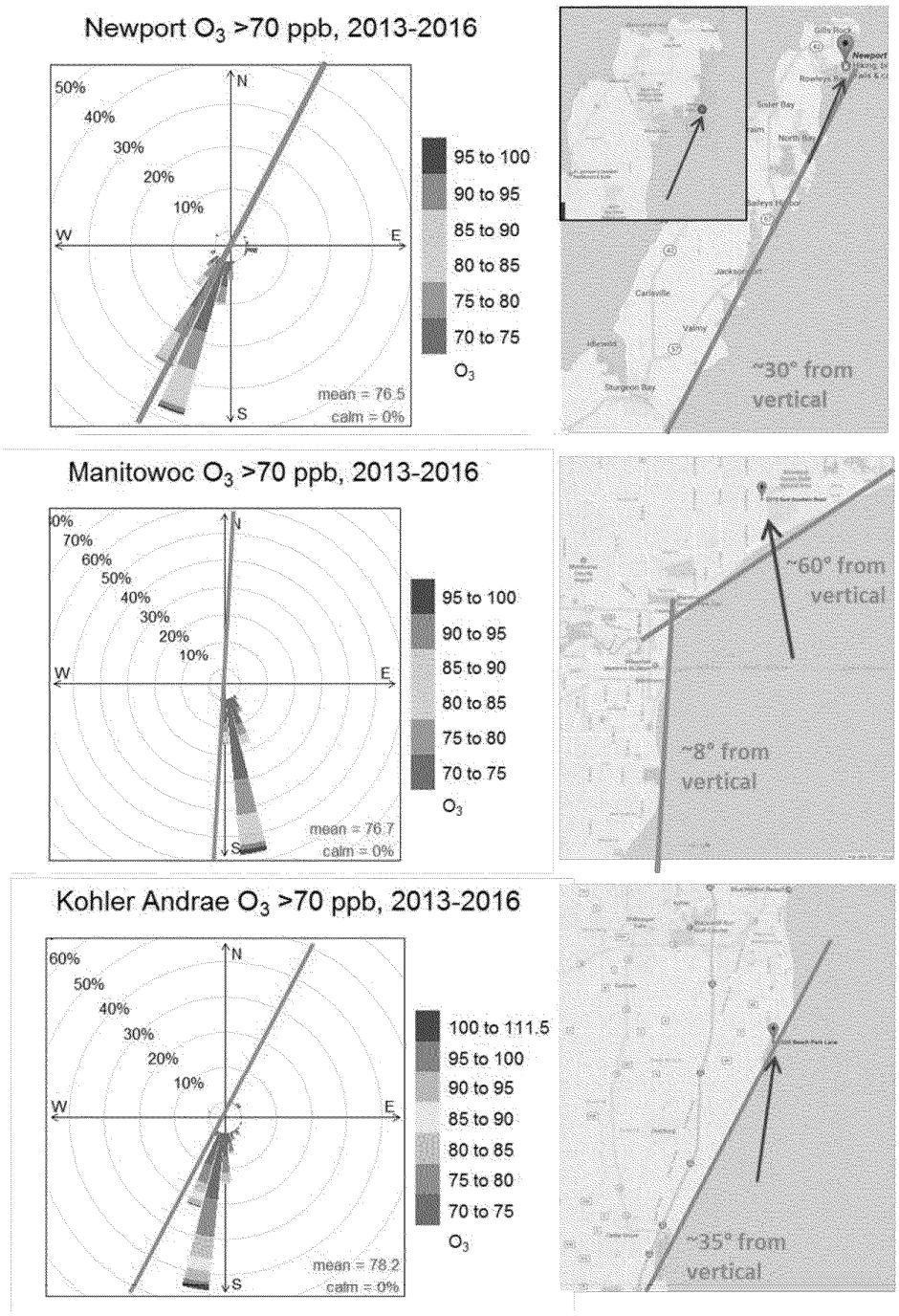


Figure 5.1. (continued)

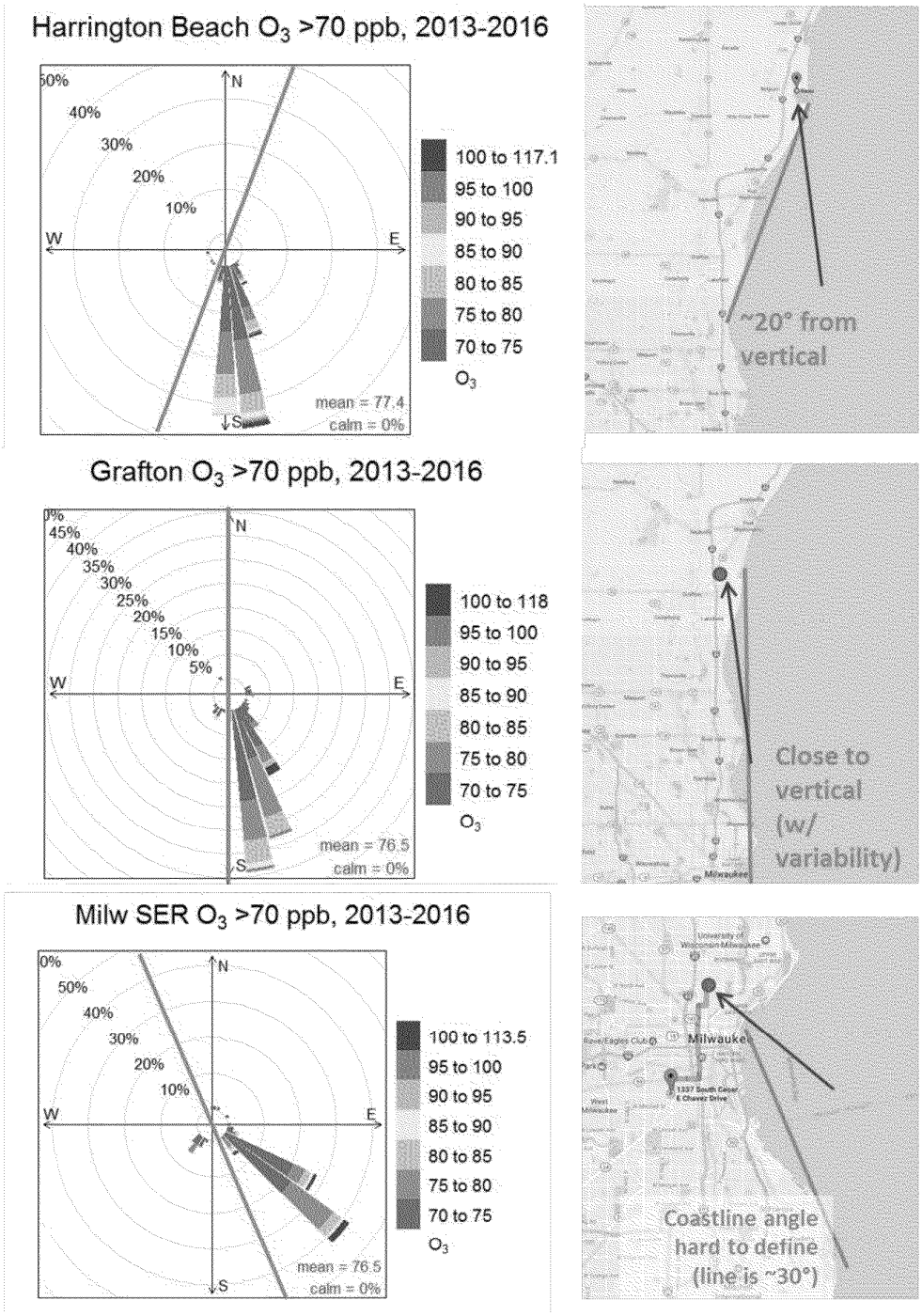
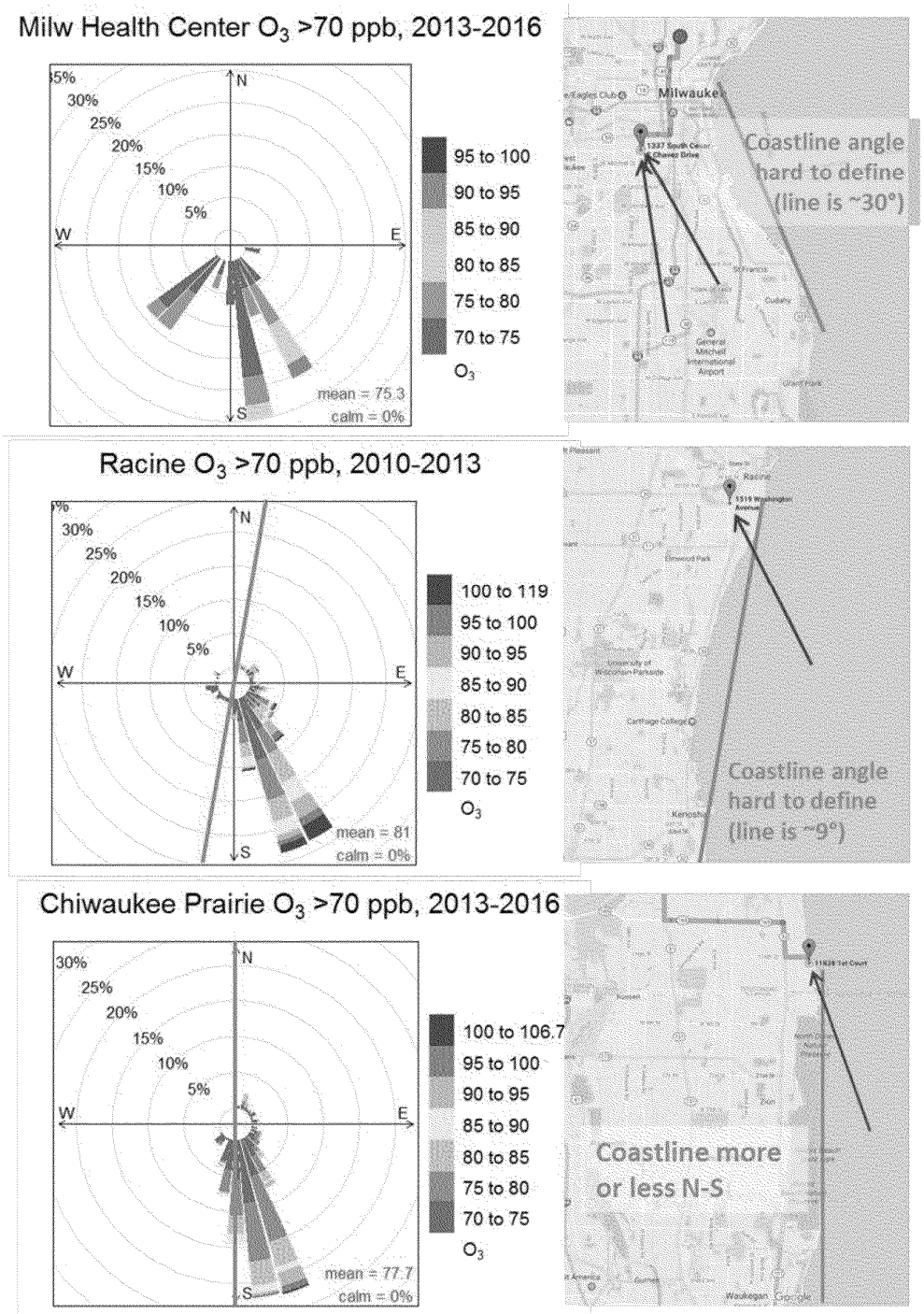


Figure 5.1. (continued)*



*Wind data is not collected at the currently operating Racine Payne and Dolan monitor, so the Racine pollution rose plots data from the old Racine monitor for the years 2010-2013.

For all Wisconsin lakeshore monitors, the dominant wind directions carrying ozone concentrations greater than 70 ppb come from the east (i.e., over the lake) relative to the shoreline.[20] The southernmost monitor, Chiwaukee Prairie, also receives some ozone-rich air from the south-southwest; this is most likely directly transported from the Chicago area. Such overland transport, however, is not apparent at the next most southerly monitor (in Racine), demonstrating the importance of winds that travel over Lake Michigan in delivering ozone to Wisconsin's lakeshore. It also underscores the importance of transport of ozone from the south to these monitors. The data from pollution roses are in line with the predictions of the conceptual model (outlined in Chapter 3).

Figure 5.2 shows air pollution roses for several inland monitors (Sheboygan Haven, Kenosha Water Tower, Waukesha, and Lake Geneva). Comparing this data with that for the lakeshore counties shows that the dominant ozone-laden winds come from a slightly more easterly direction at the inland monitors. The Kenosha Water Tower (WT) monitor also receives ozone-enriched air from the southwest. This air is likely transported directly over land from the Chicago area to the south and southwest. Such direct transport was found on a subset of lake breeze event days, as discussed in section 4.3, and is also evident at the Chiwaukee Prairie monitor.

The monitors in Waukesha and Walworth counties were also evaluated. These monitors receive most of their ozone-laden air from the southeast (for Waukesha) or east-southeast (for Lake Geneva). Ozone concentrations are low in Waukesha relative to the lakeshore monitors, most likely because of this site's distance from the shoreline and because major source regions do not lie directly upwind during high-ozone hours.[21] The air pollution rose suggests that winds reaching Lake Geneva on high ozone days passed through the northern Chicago suburbs. These winds likely carried significant ozone from the Chicago region over land to the Lake Geneva monitor. Overall, it is clear that transport from the south, both directly and via the lake breeze, is the major source of ozone to these inland monitors.

In summary, these air pollution roses show that high-ozone air almost always arrives at Wisconsin's lakeshore monitors from the south over Lake Michigan, indicating that transported ozone, rather than local or nearby emissions, is driving the high ozone values at these locations. Ozone delivered to inland monitors is also influenced by the direct transport of ozone overland from the greater Chicago area. This overland transport may carry ozone-rich air slightly farther inland in Kenosha County than the lakeshore counties more distant from Chicago.

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[20] Note that the coastline angle seems to be less important for the Milwaukee Health Center monitor, which has complex ozone-delivering wind patterns and generally very low ozone concentrations. The air travels many miles overland before reaching this monitor, so this monitor likely falls in a different category than the others.

[21] Racine County is upwind of the Waukesha monitor on high-ozone days. As discussed previously, ozone-rich air is diluted as it moves inland and mixes with cleaner air or reacts with surfaces, leading to lower concentrations inland relative to the lakeshore.

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Figure 5.2. **Ozone pollution roses for hours with ozone above 70 ppb (left) and maps of monitor locations for inland monitors (right).** Note that map scales are variable and the maps for the inland county monitors show a much larger area than do those for monitors in lakeshore counties. (See notes in Figure 5.1 caption.)

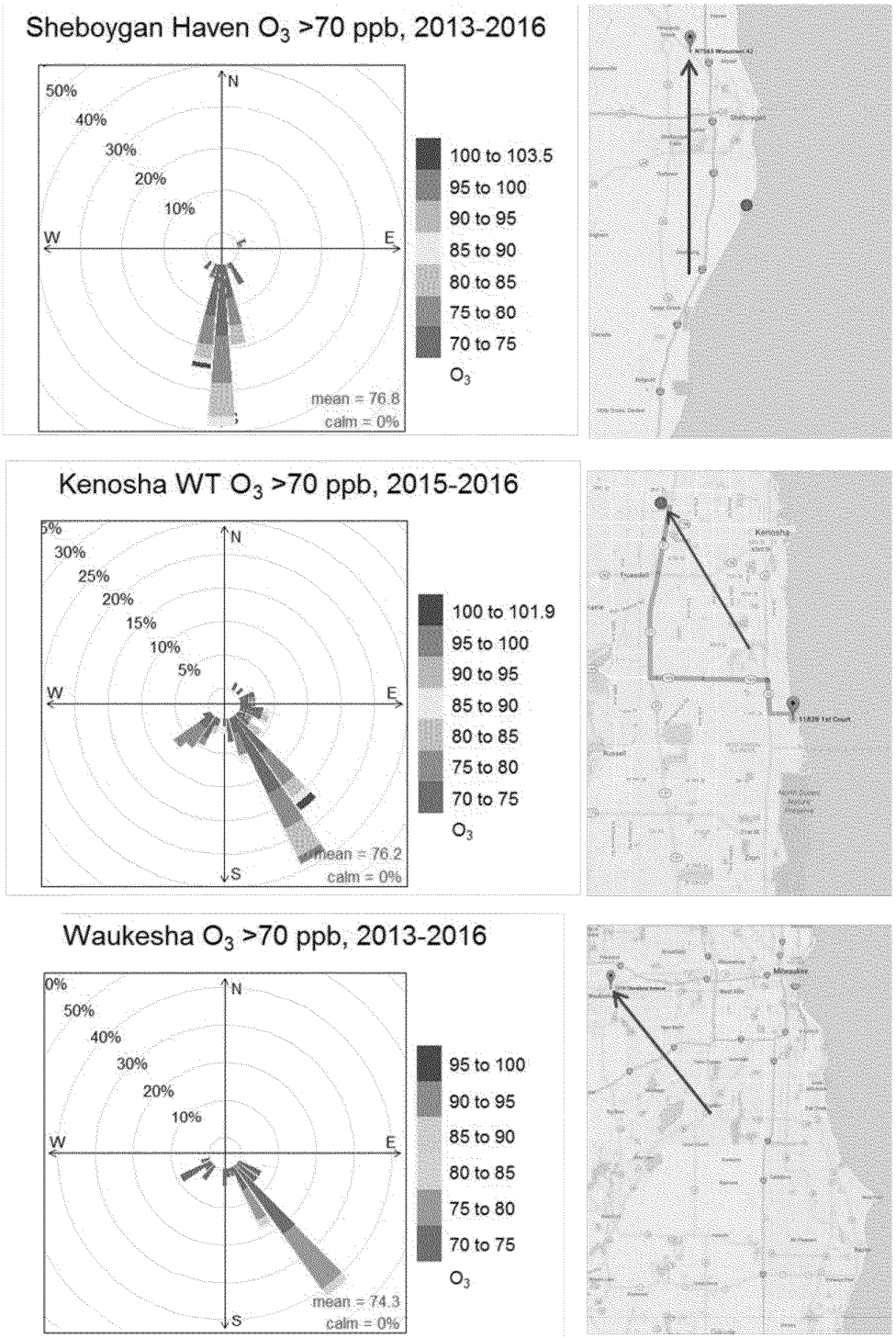
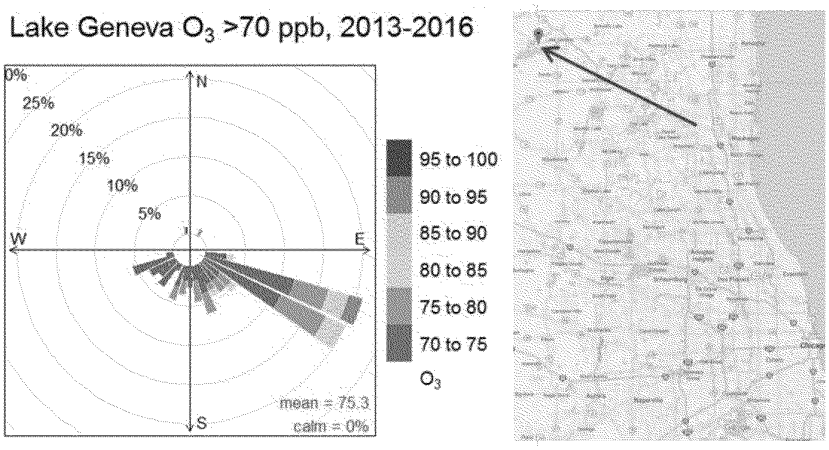


Figure 5.2. (continued)

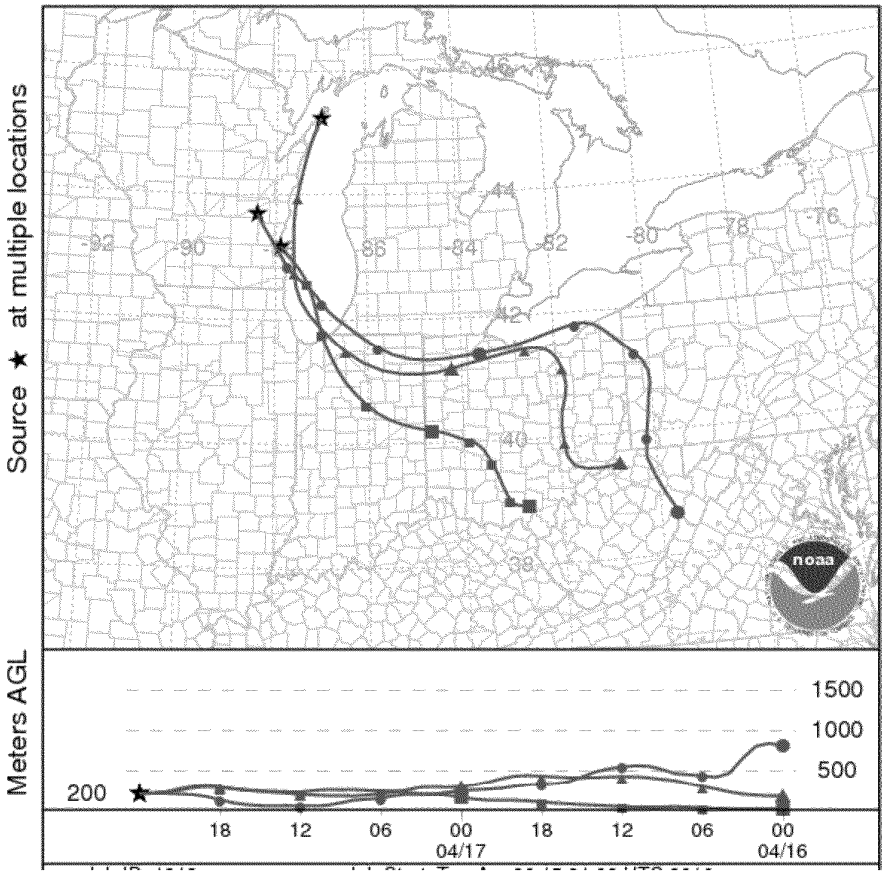


5.1.2. HYSPLIT Modeling Results

Back trajectories constructed using the HYSPLIT model help identify the source regions likely contributing to high ozone concentrations in Wisconsin. The HYSPLIT model uses meteorology for each day to outline the path an air parcel took to reach a given location, thus providing insight into the possible sources of ozone at that location.

As an example, Figure 5.3 shows back trajectories for a high ozone event on April 17, 2016 for three monitors, two on the lakeshore and one inland. These trajectories show the paths that air parcels took in the 48 hours prior to reaching their destination. These back trajectories show that the air reaching all three monitors travelled over Lake Michigan (and likely acquired some of its high ozone concentrations over the lake). Before reaching the lake, the air parcels traveled over northern Indiana and passed over parts of the Ohio River Valley, where they may have picked up additional ozone precursors.

Figure 5.3. HYSPLIT back trajectory analysis for monitors at Newport (red), Bayside (blue) and the inland Fond du Lac (green) monitors for 7 pm CDT on April 17, 2016. The bottom graph shows the elevation of each trajectory.



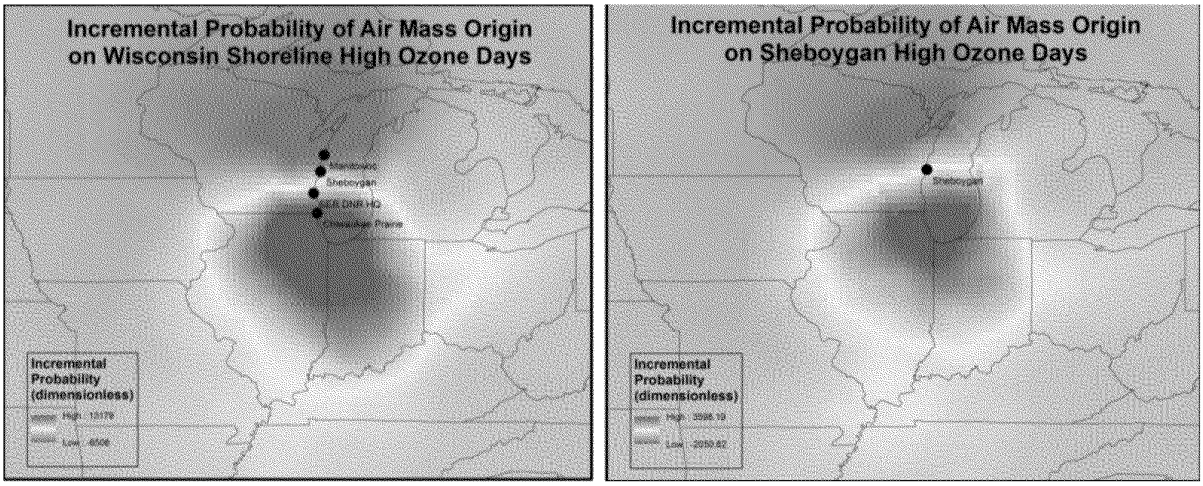
LADCO used the HYSPLIT model to construct back trajectories for each day during the years 2012 to 2015 at four different Wisconsin shoreline monitoring sites – Manitowoc, Sheboygan Kohler Andrae, Milwaukee SER ("SER DNR HQ") and Chiwaukee Prairie.[22] The LADCO HYSPLIT modeling results are shown in Figure 5.4 for all four shoreline monitors combined (left) as well as Sheboygan only (right). These results clearly indicate that, on high ozone days, ozone-rich air parcels are most likely to travel through northeast Illinois and northwest Indiana in the hours prior to reaching the Wisconsin monitoring sites. This is true for both analyses and strongly suggests that emissions from the greater Chicago area contribute significantly to ozone concentrations at these monitors. The results also show a high probability that, for the

[22] A full description of the methodology used can be found in the Modeling Demonstration for the 2008 Ozone National Ambient Air Quality Standard for the Lake Michigan Region – Technical Support Document, available at http://www.ladco.org/reports/ozone/index.php.

southernmost Wisconsin monitors, emissions from southern Indiana and the Ohio River Valley may also meaningfully contribute to ozone concentrations.

LADCO did not examine back trajectories for the ozone-rich air reaching Wisconsin's Newport monitor, located at the northeastern tip of Door County. This monitor is distant from the other monitors studied and is located northward of the monitor in Kewaunee County (which has a 2014-2016 design value below the 2015 ozone NAAQS).

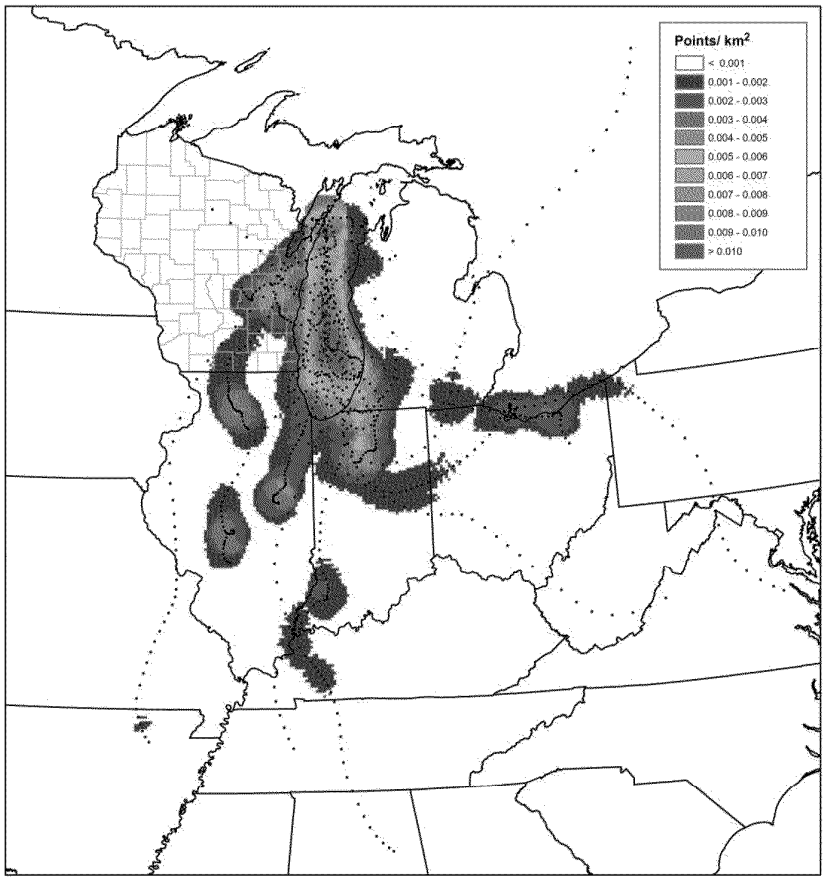
Figure 5.4. Incremental probability of air mass location in 72 hours prior to high ozone concentrations at Wisconsin shoreline monitors.



WDNR examined back trajectories for high-ozone days at the Newport monitor to determine whether the ozone-rich air reaching the monitor originated in the same manner as the ozone-rich air reaching lakeshore monitors to the south. Figure 5.5 shows that most of the trajectories traveled north up Lake Michigan to reach the remote Newport monitor. As is the case with the other Wisconsin lakeshore monitors, many of the trajectories traveled over the greater Chicago area, particularly over northern Indiana and southwestern Michigan. Other trajectories reaching the Newport monitor stretched farther west and/or farther south. Overall, the origins of ozone-rich air at the Newport monitor appear to originate from the south and from over the lake, which is consistent with results for other lakeshore monitors.

In summary, back trajectory analysis of HYSPLIT modeling confirms the crucial role played by transport of ozone and ozone precursors from source regions south of Wisconsin's lakeshore monitors. The next section examines the quantitative impacts of such transport.

Figure 5.5. 72-hour back trajectories for days with maximum daily 8-hour average ozone concentrations above 70 ppb during 2013-2016 at the Newport monitor. Points show hourly endpoints and the colors show the density of points in each area.



5.1.3. Source Apportionment Modeling Results

Source apportionment modeling quantifies the contributions of ozone from different regions and different source categories. The modeling is used here to examine the scale of interstate transport to the lakeshore monitors and the origins of that ozone.

Recent source apportionment modeling conducted by LADCO found that out-of-state emissions were responsible for 85 to 93 percent of the measured ozone concentrations at the lakeshore monitors (Figure 5.6). In addition, this modeling shows:

- The entire state of Wisconsin never contributed more than 15 percent of the ozone at any monitor and often contributed only 7 to 8 percent.
- At every monitor, Illinois contributed the greatest fraction of ozone, with the next greatest contribution coming from Indiana, Wisconsin or the "central" states (a region stretching from Texas and Louisiana north to Minnesota).

- Illinois's contribution was greatest near the Wisconsin-Illinois border and decreased to the north, contributing 16 percent at Door County's Newport monitor. Indiana's contribution followed an opposite pattern, with lower contributions to the southern sites and higher relative contributions to Kewaunee and Manitowoc in the north. This trend likely has to do with the wind direction required to deliver emissions from Indiana to Wisconsin's shoreline.
- Contributions from outside the U.S. ("boundary conditions") and from natural sources ("biogenics") contributed roughly a third of the ozone at Wisconsin's monitors.

The dominance of Illinois emissions to ozone measured at Wisconsin's lakeshore monitors is primarily due to two factors:

- Emissions from northeastern Illinois are much larger than those from all of Wisconsin's Lake Michigan lakeshore. Appendix A shows that both NO_x and VOC emissions from the nine counties in Illinois's portion of the Chicago area are more than three times larger than those from the ten counties that comprise Wisconsin's entire lakeshore region (including the Milwaukee metro area).
- Meteorology on high-ozone days carries these large amounts of emitted ozone precursors northward to Wisconsin, as was discussed in Chapter 3.

The source apportionment modeling result for the Newport monitor at the tip of Door County stands out in a number of different ways. Most notably, it had the lowest contribution from Illinois, receiving only 16 percent of its ozone from Illinois sources. The contribution from Wisconsin was also the lowest of any lakeshore monitor at around 7 percent. In contrast, this monitor received relatively large contributions from the central states, Kentucky and other distant states to the south, south-southeast and south-southwest. Finally, the Newport monitor received the largest contribution of any monitor from non-U.S. contributions, primarily from the western boundary. This unusual distribution underscores the distinctness of ozone transport to the Newport monitor.

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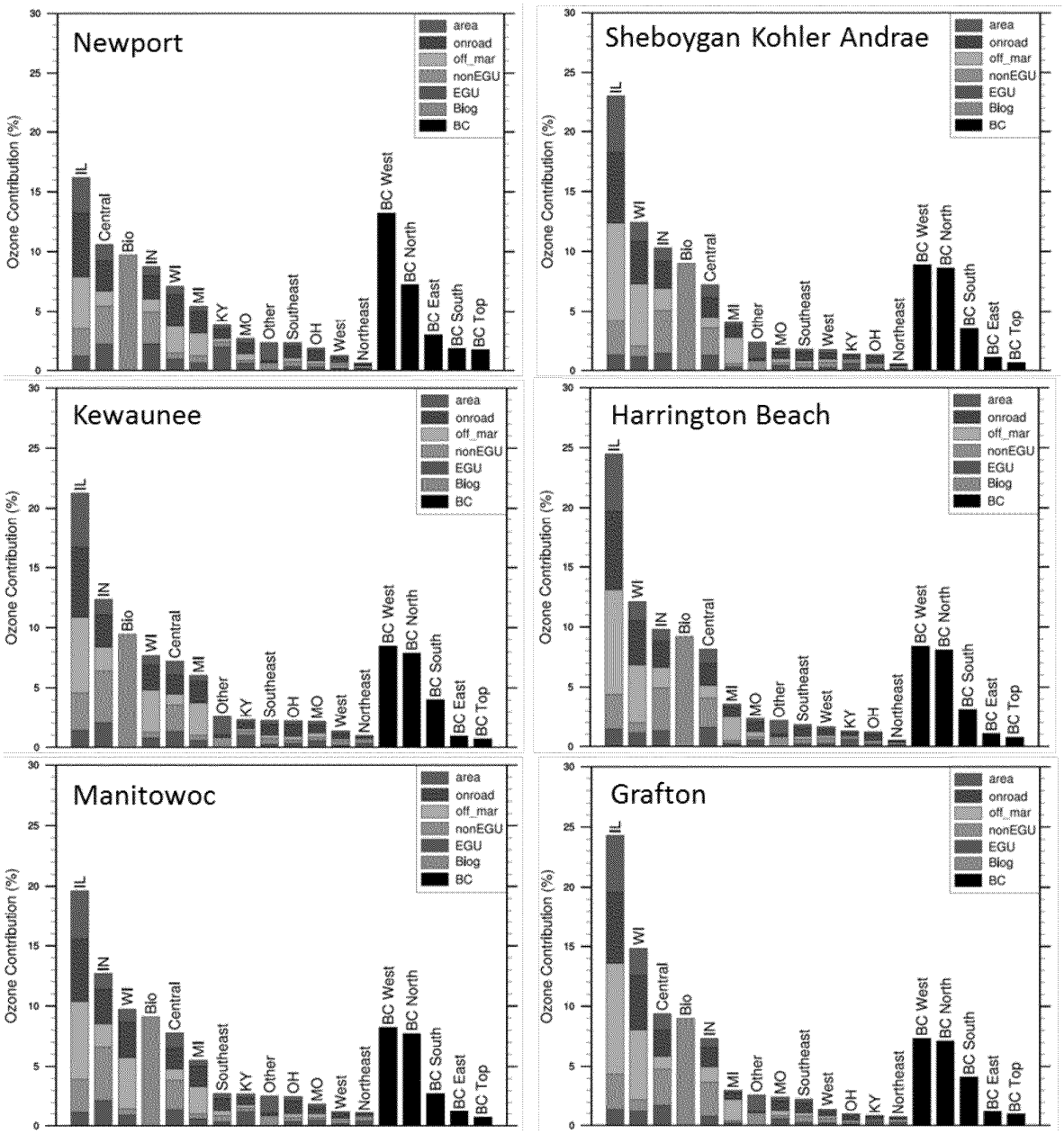
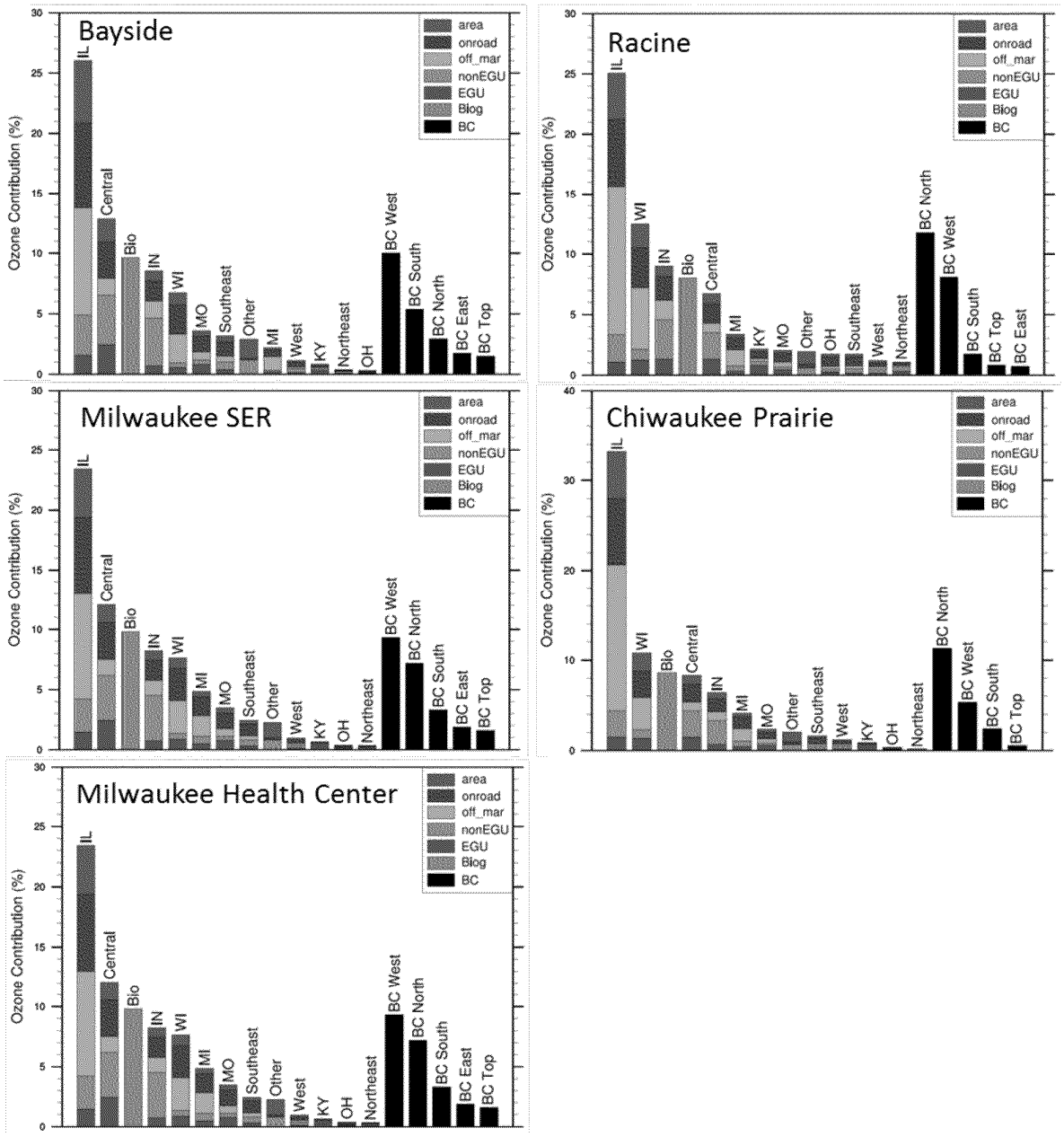
Figure 5.6. Ozone source apportionment modeling from LADCO for Wisconsin's lakeshore monitors.[23] Colors correspond to emission source categories. Monitors are arranged from north to south within each column.



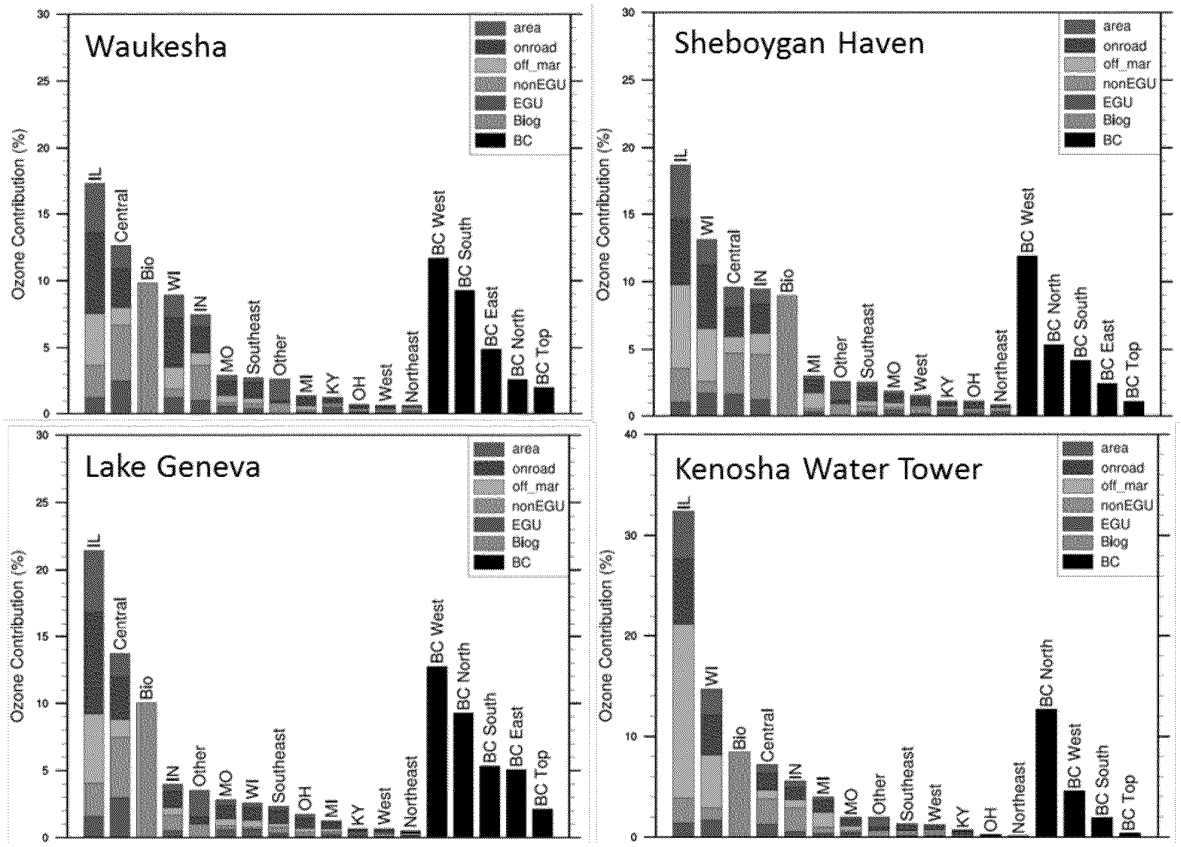
[23] The Central region includes MN, IA, NE, KS, OK, TX, AR and LA. The Southeast region includes MS, AL, GA, FL, TN, VA, NC and SC. The West region includes WA, OR, CA, NV, ID, MT, WY, UT, CO, AZ, NM, ND and SD. The Northeast region includes ME, NH, VT, MA, RI, CT, NY, NJ, PA, DE, MD, and WV. BC is boundary conditions, which are contributions from outside the U.S. "Bio" and "Biog" are biogenics.

Figure 5.6 (continued).



Ozone contributions at the inland monitors differed from those at nearby lakeshore monitors to varying degrees (Figure 5.7). While the distributions at the Kenosha Water Tower monitor were fairly similar to those at the nearby Chiwaukee Prairie monitor, the other three inland monitors (Sheboygan Haven, Waukesha, and Lake Geneva) varied more dramatically from their nearby lakeshore monitors.[24] All three of these inland monitors also received smaller contributions from states to the south than did the lakeshore monitors. These differences highlight the important role of the lake in transporting emissions from the south to the lakeshore and the smaller contribution of these sources to inland ozone concentrations.

Figure 5.7. Ozone source apportionment modeling from LADCO for Wisconsin's inland monitors.[23] Colors correspond to emission source categories. Monitors on the left are located in inland counties and on the right are located in lakeshore counties. Monitors are arranged from north to south within each column.



[24] The Waukesha monitor was compared with the Milwaukee SER and Milwaukee Health Center monitors, the Lake Geneva monitor to the Chiwaukee Prairie monitor, and the Sheboygan Haven monitor to the Sheboygan Kohler Andrae monitor.

In addition, the two monitors in the inland counties (Waukesha and Lake Geneva) also received much larger percent contributions from boundary conditions (sources outside the U.S.) compared with the nearest lakeshore monitors. Overall, the same four source regions (Illinois, Indiana, Wisconsin, and central states) were the most important at all inland and lakeshore sites.[25]

In summary, source apportionment modeling shows that Wisconsin's Lake Michigan monitors are overwhelmingly impacted by ozone transported from out-of-state sources of emissions. This modeling also supports previous analyses suggesting that lakeshore and inland areas receive ozone from a different mix of source regions, underlining the distinctions between ozone concentrations measured at inland and lakeshore locations.

5.2. The Impact of Hypothetical Additional Emissions Reductions in Wisconsin

Analyses indicate that Wisconsin sources contribute little to ozone concentrations measured along the state's Lake Michigan shoreline. To assess what impact further emissions reductions from Wisconsin sources could potentially have on ozone concentrations in this transport-dominated region, LADCO conducted refined photochemical modeling for WDNR. This modeling examined the impact of two hypothetical emission reduction scenarios on the 13 monitors located in a 10-county area along Wisconsin's lakeshore:[26]

- Scenario 1: A 10 percent reduction in NO_x emissions and a 10 percent reduction in VOC emissions from all sectors (except from onroad and biogenics) from the 10-county area.[27]
- Scenario 2: Completely eliminating ("zeroing out") <u>all</u> anthropogenic NOx and VOC emissions from Sheboygan County. This scenario eliminated emissions from all sectors except for biogenic emissions, which were held constant.

Neither Scenario 1 nor Scenario 2 is feasible. These "what if" modeling scenarios were conducted with the objective of determining whether Wisconsin's lakeshore counties, on their own, have any ability to further reduce ozone design values at lakeshore monitors. These modeling runs help further examine the role of transported emissions in driving ozone in this area by determining whether transported ozone effectively overwhelms the impact of any potential additional reductions in local emissions.

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[25] The exception is Lake Geneva, where Wisconsin's contribution ranked sixth among regions.

[26] The ten counties are Kenosha, Racine, Milwaukee, Waukesha, Ozaukee, Washington, Sheboygan, Manitowoc, Kewaunee, and Door.

[27] Reductions in onroad and biogenics sector emissions were not made since Wisconsin (like most other states) lacks any meaningful way to control emissions from these sectors. These reductions were made in the same ten counties as described in the previous footnote.

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5.2.1. Overview

The projected design values for 2017 for the lakeshore and nearby inland monitors were compared with those determined from a recent base case modeling scenario.[28] Design values were calculated based on projections for all grid cells bordering the cell containing the monitor (a "3x3" grid cell area) and also considering projections for just the grid cell containing the monitor (a "1x1" grid cell area).[29] The results of these modeling runs are shown in Table 5.1.

Table 5.1. Model projected 2017 design values (DVs, in ppb) and changes in design values (ppb) for the 2017 base case modeling run and for two hypothetical emission reduction scenarios (described in the text). Design values are calculated considering modeled concentrations in either a 3x3 grid cell area or just the grid cell containing the monitor (1x1). Modeling was conducted by LADCO.

	Base Case DVs		10% Cut Run*				Zero-Out Sheboygan Run*			
			3x3 DVs		1x1 DVs		3x3 DVs		1x1 DVs	
Monitor	3x3	1x1	DV	change	DV	change	DV	change	DV	change
Chiwaukee Prairie	66.4	69.5	66.4	0	69.6	+0.1	66.3	-0.1	69.5	0
Racine	64.9	68.4	64.8	-0.1	68.5	+0.1	64.8	-0.1	68.4	0
Milwaukee Health Ctr	61	65.6	60.9	-0.1	65.6	0	60.9	-0.1	65.5	-0.1
Milwaukee SER	65.7	71.9	65.6	-0.1	72.2	+0.3	65.6	-0.1	71.7	-0.2
Bayside	70.9	75.5	70.8	-0.1	75.7	+0.2	70.7	-0.2	75.5	0
Grafton	69.7	71.4	69.7	0	71.4	0	69.7	0	71.4	0
Harrington Beach	66.8	68	66.7	-0.1	67.9	-0.1	66.8	0	67.9	-0.1
Kohler Andrae	76.1	77	76	-0.1	76.9	-0.1	76.1	0	77.6	+0.6
Manitowoc	70.9	71.6	70.8	-0.1	71.4	-0.2	70.8	-0.1	71.5	-0.1
Kewaunee	68.1	68.4	68	-0.1	68.3	-0.1	68	-0.1	68.1	-0.3
Newport	68.3	68	68.2	-0.1	67.9	-0.1	68.1	-0.2	67.8	-0.2
Lake Geneva	63.7	63.4	63.6	-0.1	63.3	-0.1	63.6	-0.1	63.3	-0.1
Waukesha	61.8	63	61.8	0	63.1	+0.1	61.8	0	63	0

*The "10% cut run" reduced VOC and NOx emissions by 10% from all sectors except onroad and biogenics in the 8 lakeshore counties along with Waukesha and Washington Counties. The "zero-out Sheboygan run" completely eliminated emissions from all sectors in Sheboygan County except for biogenics.

[28] The base case scenario can be found in the Modeling Demonstration for the 2008 Ozone National Ambient Air Quality Standard for the Lake Michigan Region – Technical Support Document, available at http://www.ladco.org/reports/ozone/index.php.

[29] The 3x3 grid cell approach is used by EPA for its modeled attainment tests and is their suggested default for state/regional modeling applications. Each grid cell is 12 kilometers by 12 kilometers. In this approach, the highest projected value from a 3x3 set of grid cells (9 grid cells total) is used to represent the 2011 base year and projected 2017 concentrations. A relative reduction factor is determined based on both these values and applied to a weighted 5-year design value centered on 2011 and based on monitored values at each site.

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As shown in the table, under both scenarios most monitors show little to no change in their modeled 2017 design value (0.1 ppb or less) using either grid cell approach. The results of these two emission reduction scenarios are discussed in more detail below.

5.2.2. Scenario 1 Results

Projected design values showed almost no change in response to the 10 percent emissions cut across the 10-county area. Large, additional emissions reductions from the lakeshore area, which includes Wisconsin's most populous areas (including greater Milwaukee), would therefore have no meaningful impact on ozone design values at any of Wisconsin's lakeshore monitors. Design values are even projected to increase under this scenario at some monitors in the southern part of the lakeshore under the 1x1 grid cell approach, likely due to decreased titration effects in the urban center.

5.2.3. Scenario 2 Results

The results from the model run that eliminated all anthropogenic emissions from Sheboygan County were even more striking. Specifically, under the 3x3 grid cell approach, the design value at the Kohler Andrae monitor showed no decrease at all. Under the 1x1 approach, the design value at this monitor was actually predicted to *increase* by 0.6 ppb. Sheboygan County, therefore, has no ability to reduce ozone concentrations at the Kohler Andrae monitor. Some reductions in design values at monitors located north of the county were predicted under this scenario, but even these impacts were extremely small (generally, around 0.1 ppb).

5.2.4. Summary

LADCO modeling results clearly show that further reductions in nearby source emissions would have little, if any, impact on the monitored ozone concentrations in Wisconsin's lakeshore counties. Local emissions are essentially decoupled from the ozone concentrations registered in these counties. These results are also entirely consistent with what is understood about ozone transport and formation in this region as described earlier in this document.

This new information has significant impacts on the designations process. Specifically, these results show that designating nonattainment areas in the vicinity of any violating monitors would not offer any meaningful improvement on air quality; in fact, this may actually result in increasing ozone levels. These results also show that designating large nonattainment areas around lakeshore monitors, with the ostensible purpose of capturing the NOx and VOC emissions contributing to a violating monitor, simply is not supported when it comes to Wisconsin's lakeshore. Accordingly, given the limited influence of local emissions on lakeshore ozone concentrations, control of these nearby emissions should not be a factor considered by EPA when considering potential area designations in the state.

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5.3. Conclusions

This chapter demonstrates that emissions contributing to high ozone concentrations along Wisconsin's Lake Michigan lakeshore are dominated by emissions transported from outside the state. In particular, these analyses strongly conclude that:

- Transport of ozone-rich air over Lake Michigan from the south is the dominant source of ozone at all lakeshore monitors in Wisconsin.
- Inland and lakeshore monitors in Wisconsin's southeastern counties (Kenosha and Walworth) receive some ozone transported over land from the Chicago area in addition to ozone transported over the lake.
- Transported ozone is responsible for elevated ozone concentrations observed at Wisconsin's lakeshore monitors.
- Further reductions in emissions from Wisconsin lakeshore counties, including the Milwaukee area, would have little to no impact on ozone design values at these monitors.

In summary, this analysis conclusively demonstrates that ozone monitors in Wisconsin's lakeshore area are overwhelmingly affected by transport from upwind areas and that the transport of large amounts of out-of-state emissions to the Wisconsin lakeshore effectively overwhelms any impact of local emissions on monitored ozone concentrations. As a result, Wisconsin has no ability to address its lakeshore ozone issues on its own. These results indicate that there are no air quality benefits to be gained by further controlling Wisconsin emissions for the purposes of the 2015 ozone NAAQS.

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6. Implications for Area Designations for the 2015 Ozone NAAQS

6.1. The Need for a Flexible Designations Approach Given Wisconsin's Unique Circumstances

In this technical support document, WDNR demonstrates the unique situation of Wisconsin's lakeshore ozone monitors. These monitors are overwhelmingly affected by transport (Figure 5.6). Modeled reductions in ozone precursor emissions from Wisconsin's lakeshore counties had almost no impact on projected ozone design values within these counties (Table 5.1). This modeling confirms that the large amount of emissions transported to Wisconsin's lakeshore effectively overwhelms the impacts of local emissions within these counties. EPA itself stated its December 19, 2016 reclassification notice that Sheboygan's Kohler Andrae monitor "was not placed to monitor the maximum downwind impacts from the urbanized portion of the Sheboygan area, but to capture maximum downwind impacts from several urban areas along Lake Michigan, including Milwaukee, Wisconsin; Chicago, Illinois; and Gary, Indiana" (81 FR 91842).

The geography and meteorology of Wisconsin's Lake Michigan shoreline combine to maximize the amount of ozone delivered to its monitors. Such contributing factors include the location of major out-of-state emissions sources to the south, the presence of Lake Michigan to the east (which facilitates concentration and reaction of ozone precursors), and the frequent occurrences of lake breezes that pull the ozone onshore. This situation is of sufficient scientific interest that it is the target of a major research campaign during the 2017 ozone season, the Lake Michigan Ozone Study 2017 (LMOS 2017). During LMOS 2017, researchers from EPA, the National Aeronautics and Space Administration (NASA), the National Oceanic and Atmospheric Administration (NOAA), and a number of research universities will conduct an extensive field study along the Lake Michigan shoreline. The goal of this study is to better understand the underlying physical and chemical mechanisms affecting ozone formation and transport along Wisconsin's lakeshore.

As demonstrated repeatedly in this document, ozone design values exceeding the level of the 2015 ozone NAAQS are confined to a narrow strip of land near the lakeshore. This means that the majority of the area of the lakeshore counties is not regularly affected by high enough ozone concentrations to justify a nonattainment status. Because of these unique circumstances and the overwhelming role of transport in driving ozone concentrations in this region, EPA should exercise the flexibility available to it to take a different approach than it has traditionally taken to designate areas for Wisconsin's lakeshore counties.

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6.2. Support for the Governor's Recommendation for Attainment for all Wisconsin Counties

On September 21, 2016, Governor Walker recommended that EPA designate all counties in Wisconsin as attainment for the 2015 ozone NAAQS. This document provides extensive, data-driven support for the governor's recommendation.

This analysis demonstrates that any design values measuring above the level of the 2015 ozone NAAQS are confined to a narrow band that follows the lakeshore and are the result of out-of-state emissions. Modeling of additional hypothetical emissions reductions further indicates that Wisconsin has little to no ability to influence ozone concentrations at these monitors. Wisconsin counties should therefore not be designated nonattainment because of precursor emissions and resultant ozone that originates from beyond the state and over which Wisconsin has no control.

6.3. Maximum Extent of the 70 ppb Design Value Contour

If EPA disregards the governor's recommendation and elects to impose nonattainment area designations on Wisconsin counties, the scientific data and analysis presented in this document shows that such areas must not extend beyond the narrow strip of land near the lakeshore that is impacted by high ozone design values. This chapter provides additional technical analysis that defines the location of the 70 ppb design value contour along Wisconsin's Lake Michigan shoreline. This 70 ppb contour represents the maximum extent of the area EPA could consider in the state should it finalize any nonattainment areas.

The location of this contour is shown graphically in Figure 6.1 and is further explained in the remainder of this chapter. Appendix D contains a larger version of Figure 6.1.

6.3.1. Calculating the 70 ppb Ozone Design Value Contour

An ozone design value would attain the 2015 ozone NAAQS at a value of 70 ppb or lower. To determine the spatial extent of the area along the lakeshore that may exceed this value, it is crucial to estimate the location of the "contour" of air with a design value of 70 ppb. This section discusses two approaches to identifying the contour. The first examines the trends in ozone design values at monitors relative to distance inland from the lakeshore. The second examines the gradients in the two counties (Sheboygan and Kenosha) with both inland and lakeshore monitors.

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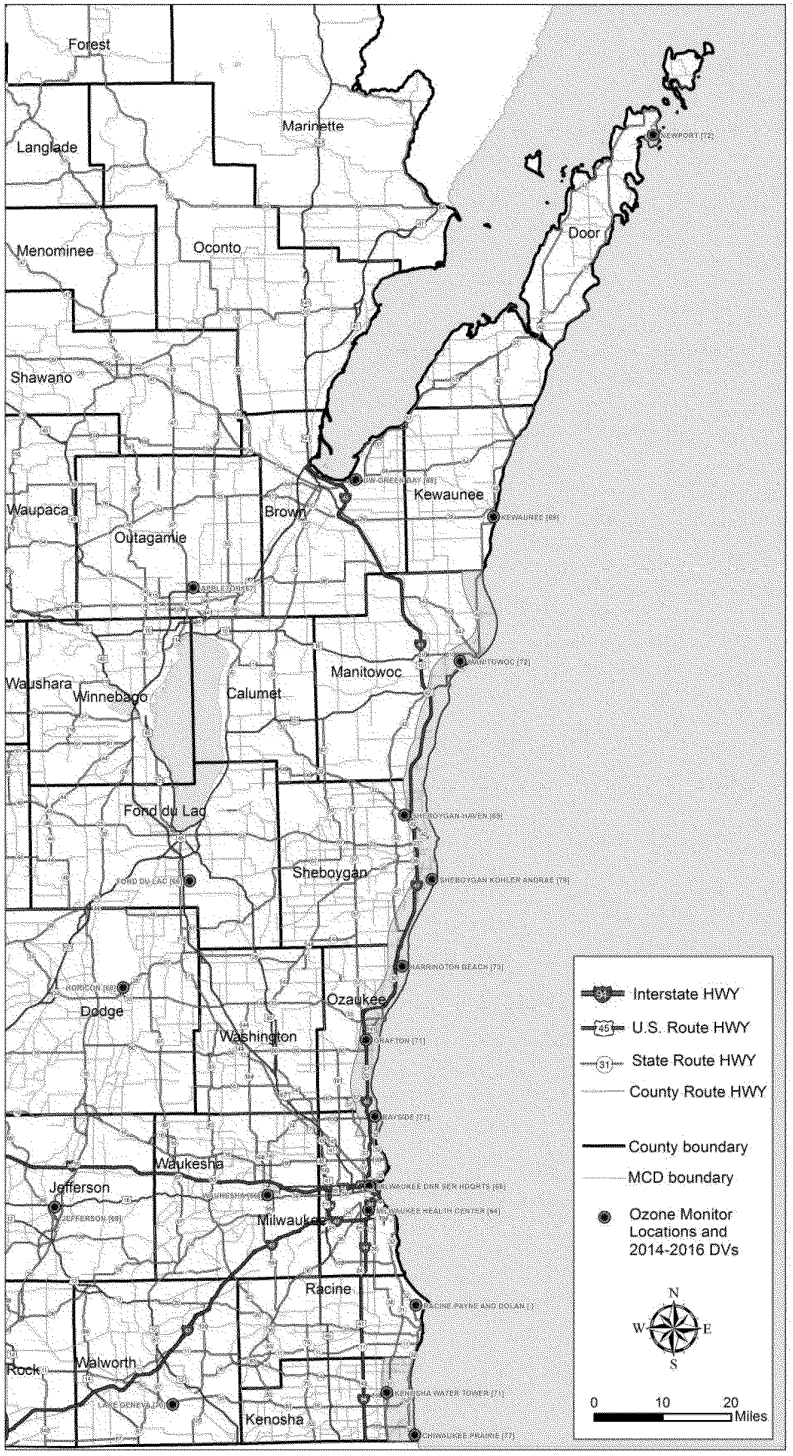
Figure 6.1. Map of the 70 ppb design value contour along Wisconsin's Lake Michigan shoreline. The 70 ppb design value contour as described in Chapter 6 is shaded. Appendix D contains a larger version of this figure.



Ozone design values relative to distance from the lakeshore

Evaluation of how ozone design values at the lakeshore monitors change with distance from the shoreline suggests that the 70 ppb contour lies just a few miles inland from Lake Michigan. Table 6.1 lists the inland distance for each monitor, and Figure 6.2 plots the design values versus these distances. The figure shows that most of the monitored design values fall very close to a line with a power fit (rather than a linear fit). This suggests that ozone design values drop off very sharply within the first half mile of the shoreline and then decrease more gradually with distance. The finding that the inland Waukesha monitor, located 16 miles inland from Lake Michigan, falls neatly along this line suggests that distance from the lakeshore is a primary driver of ozone concentrations even this far inland.[30] The best-fit line reaches 70 ppb at an inland distance of 2.3 miles, which suggests that the 70 ppb design value contour lies around 2.3 miles inland for much of the lakeshore.

Table 6.1. Distance inland and 2014-2016 design values for ozone monitors along Wisconsin's Lake Michigan lakeshore and nearby inland counties.

Monitor	Distance Inland (miles)	2014-2016 Design Value (ppb)
Chiwaukee	0.15	77
Kenosha Water Tower	3.6	71
Racine Payne & Dolan	1.2	--
Milwaukee Health Ctr	2	64
Milwaukee SER	1.5	68
Bayside	0.8	71
Grafton	1.9	71
Harrington Beach	0.8	73
Kohler Andrae	0	79
Sheboygan Haven	3.2	69
Manitowoc	0.8	72
Kewaunee	0.14	69
Newport	0.4	72
Lake Geneva	35	70
Waukesha	16	66

[30] Note that the equation calculated for the best fit line is almost identical without the Waukesha monitor, so the values for this monitor are not driving the equation for the line.

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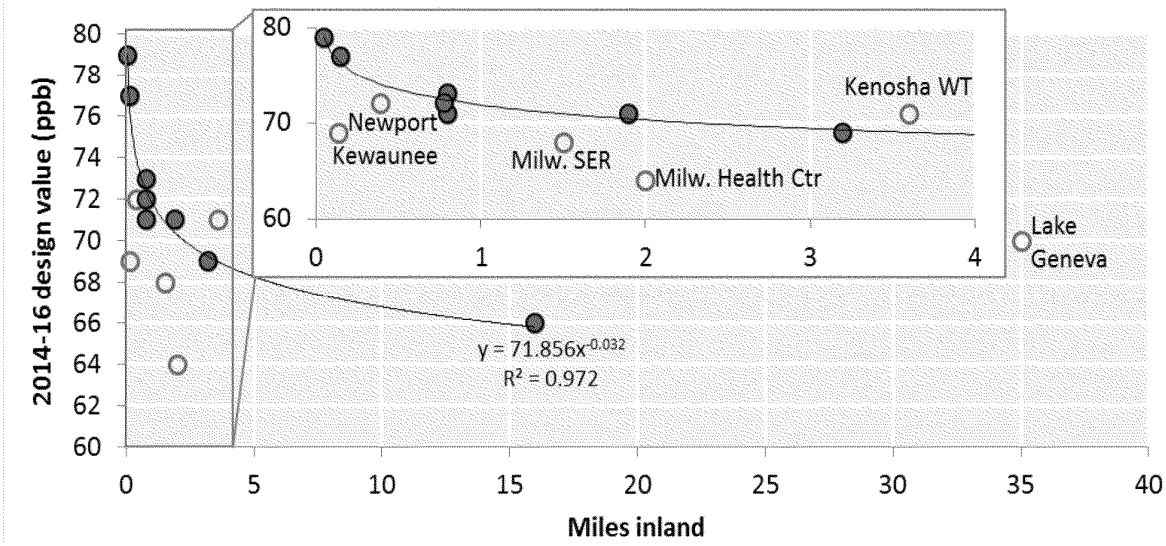
The finding that most of the monitors' design values fall on the same best-fit line suggests that a consistent relationship exists between design values and distance inland along most of the lakeshore. This suggests that this 70 ppb design value contour likely applies to most of the Wisconsin lakeshore.

There are straightforward explanations for the observed variations at the monitors whose design values do not fall along this line, as described below.

The design values at the Kenosha Water Tower and Lake Geneva monitors fall above the best-fit line for most of the monitors. These inland monitors are known to receive significant ozone during events that directly transport ozone from the Chicago area over land to these locations, as discussed in Chapter 5. Such transport does not depend directly on the distance from the lakeshore because ozone formed over the lake is not the only source of ozone. Thus, distance from the lakeshore is not the only factor driving ozone concentrations for these monitors.[31] This finding suggests the 70 ppb contour may be located slightly farther inland in Kenosha County than in most of the rest of the lakeshore.

Figure 6.2. 2014-2016 design values plotted against the distance inland from Lake Michigan for all monitors in lakeshore counties and neighboring Waukesha and Walworth counties. The best-fit line was plotted using the monitors with filled symbols using a power fit. Monitors that were not included in the best fit line are labeled.



[31] While the Chiwaukee Prairie monitor also receives some ozone via direct transport events, its design value still falls on the best-fit line. This likely occurs because this monitor receives its peak ozone concentrations from transport over the lake, not over land, so that the inland distance from the lakeshore is the primary factor affecting its ozone design values.

The design values for the two central Milwaukee monitors are located well below the best-fit line for most of the monitors. This is likely due to urban effects on ozone formation.[32] The lower-than-expected ozone design values at these monitors suggest that ozone design values throughout this urban area likely do not exceed the 2015 ozone NAAQS at all. Note that the 2014-2016 design value at the Bayside monitor in the northeastern corner of Milwaukee County was above the 2015 ozone NAAQS and lies on the best-fit line. This monitor is located outside the core urban area and therefore likely is not subject to the same urban effects as the two other monitors in the county.

Finally, the 2014-2016 design values at the northern monitors at Kewaunee and Newport are below the best-fit line. This indicates that ozone concentrations at these monitors are lower than would be anticipated in counties to the south. This deviation suggests that other factors are driving ozone concentrations at these monitors, likely due to their greater distance from emission sources to the south and the greater transport time needed for ozone to reach these monitors. The greater transport time allows pollutants in the transported air more time to undergo additional reactions, which could alter the composition of the pollutants. These differences suggest that the 70 ppb design value contour cannot be defined in the same way in Door County as it is farther south.

Comparison of inland and lakeshore monitor data in Sheboygan County

As previously discussed, Sheboygan County has two ozone monitors that have been operating since at least 2014 – one inland monitor (Sheboygan Haven) and one lakeshore monitor (Kohler Andrae). As shown in Table 6.1, the 2014-2016 design value at the lakeshore monitor was 10 ppb higher than that at the inland monitor. The inland monitor is 3.2 miles farther inland than the lakeshore monitor. The analysis in Figure 6.2 suggests that design values decrease with increasing distance from the lakeshore following a power function. However, in comparing the inland and lakeshore monitors a more conservative assumption is made that design values decrease in a linear fashion moving inland from the lake.

A linear decrease yields a presumptive concentration gradient of $\frac{10}{3.2}$. A design value of 70 ppb is 9 ppb lower than the design value at the Kohler Andrae monitor. Assuming a linear concentration gradient, we would expect 70 ppb design values to occur at a distance of:

$$9 \text{ ppb} * \left(\frac{3.2}{10}\right) = 2.9 \text{ miles inland}$$

[32] High NOx concentrations in urban centers have been shown to reduce ozone concentrations due to titration and reductions in ozone formation rates. See, for example, EPA (2013) Integrated Science Assessment for Ozone and Related Photochemical Oxidants. http://ofmpub.epa.gov/eims/eimscomm.getfile?p_download_id=511347 .

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This linear extrapolation for Sheboygan County yields a 70 ppb contour that is consistent with, but 0.6 miles farther inland than, the contour estimated using the best-fit line in the previous section (2.3 miles). This analysis suggests that the use of a linear interpolation to determine the 70 ppb contour allows for a margin of safety. As previously shown, there seems to be a consistent relationship between design values and distance inland for much of the lakeshore. A distance of 2.9 miles inland from the lakeshore is therefore a conservative calculation of the 70 ppb contour along much of Wisconsin's Lake Michigan lakeshore.

Comparison of inland and lakeshore monitor data in Kenosha County

Kenosha County also has two ozone monitors, one inland (Kenosha Water Tower) and one on the lakeshore (Chiwaukee Prairie) which have been operating since at least 2013 (Figure 4.2). As shown in Table 6.1, the 2014-2016 design value at the lakeshore monitor was 6 ppb higher than that at the inland monitor for the design value year. The inland monitor is 3.45 miles farther inland than the lakeshore monitor. Using the same method described above, this calculation conservatively assumes that concentrations decrease linearly between the lakeshore and inland monitors. This calculation yields a presumptive concentration gradient of $\frac{6}{3.45}$. A design value of 70 ppb is 7 ppb lower than the design value at the Chiwaukee Prairie monitor. Assuming a linear concentration gradient, the 70 ppb design value contour would occur at a distance of:

$$7 \text{ ppb} * \left(\frac{3.45}{6}\right) = 4.0 \text{ miles inland from the Chiwaukee Prairie monitor}$$
$$= 4.15 \text{ miles inland from the lakeshore} \approx 4.2 \text{ miles inland from the lakeshore}$$

A distance of 4.2 miles inland from the lakeshore is therefore a conservative calculation of the location of the 70 ppb design value contour in Kenosha County.

This calculation shows that the 70 ppb contour appears to be wider in Kenosha County than in Sheboygan County. This is consistent with the finding that the design value for the Kenosha Water Tower monitor is above the inland trend created by most of the lakeshore monitors (Figure 6.2), including those in Sheboygan County. These differences likely occur because of Kenosha's proximity to the Chicago area. This proximity allows winds to transport ozone-rich air over land from the Chicago area to inland parts of Kenosha County without transport over the lake. Evidence for such direct transport is presented in Chapter 5. Any such overland plumes are likely to be diluted significantly by turbulent mixing as they travel northward. Such mixing occurs at much greater rates over land than over the relatively cold and flat lake surface. Such direct transport of ozone-rich air from the Chicago area does not appear to play an important role at more distant northern monitors, as discussed for Racine County below.

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6.3.2. Application of the 70 ppb Design Value Contour to Individual Counties

The following applies the 70 ppb contour methodology described above to Wisconsin's lakeshore counties and those counties in the greater Milwaukee area that may have 2014-2016 design values at or near the level of the 2015 ozone NAAQS. This section only describes how that scientifically-derived contour could be applied. Nothing in these descriptions should be construed as a recommendation for a potential nonattainment area designation for the 2015 ozone NAAQS. The counties are listed starting from the south.

Kenosha County

Based on the monitor data analysis described above, WDNR estimates that the 70 ppb design value contour is located no greater than 4.2 miles inland from the lakeshore in Kenosha County.

Racine County

WDNR ceased operating a long-running ozone monitor in Racine County at the end of 2013 due to safety concerns at the site. In 2015, WDNR began operating a new monitor in the county at the "Payne and Dolan" site. The lack of ozone monitoring data for 2014 makes it impossible to calculate a 2014-2016 design value (see Table 6.2).

Given the lack of 2014 data, it is impossible to predict with certainty whether this monitor would have attained or violated the NAAQS over the 2014-2016 period. EPA states in its designation guidance that monitors with incomplete data may be designated "unclassifiable." If EPA does not designate Racine County as attainment for the 2015 ozone NAAQS, EPA should consider an unclassifiable designation in this county.

Table 6.2. Fourth high maximum daily 8-hour average ozone concentrations for the Racine Payne and Dolan monitor during the 2014-2016 design value period.

Monitor	Fourth High Maximum Daily 8-Hour Average Concentrations (ppb)		
	2014	2015	2016
Racine Payne & Dolan	-	68	76

However, if this monitor was somehow found by EPA to measure values above the 2015 ozone NAAQS in spite of the missing year of data, the location of the 70 ppb design value contour would be closer to the lakeshore than that in neighboring Kenosha County. Almost no ozone-rich air was observed arriving at the old Racine monitor from the south-southwest or southwest (Figure 5.1).[33] This is in contrast to the significant contributions from these directions at the

[33] Wind direction is not measured at the Racine Payne and Dolan monitor, so the pollution rose shown for Racine uses data from 2010-2013 for the original Racine monitor.

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Kenosha County monitors, as discussed previously. This suggests that Racine County is not subject to the same direct transport mechanism as is Kenosha County and thus does not receive elevated ozone concentrations inland from the lakeshore. It follows that the 70 ppb contour would be located closer to the lakeshore in Racine County than the 4.2-mile distance supported for Kenosha County.

Milwaukee County

Only one of the three monitors in Milwaukee County (the Bayside monitor) had a 2014-2016 design value above the level of the 2015 ozone NAAQS (Table 6.1). The Bayside monitor is located in the far northeastern corner of the county, significantly away from, and north of, the urban core. The design value for this monitor is part of the best-fit line comparing design values with distance inland from the lakeshore. This suggests that the 70 ppb design value contour in this area would be located at the same distance inland as in most other parts of the lakeshore. This distance is conservatively estimated at 2.9 miles inland based on comparison of the inland and lakeshore monitoring data in Sheboygan County.

The two monitors located in central Milwaukee County (Milwaukee SER and Milwaukee Health Center) have 2014-2016 design values that are below the 2015 ozone NAAQS (64 ppb and 68 ppb, respectfully) (Table 6.1). These lower design values likely result from urban effects on ozone formation (discussed in Section 6.3.1) and indicate that this portion of Milwaukee County is attaining the 2015 ozone NAAQS.

There is no additional information about the where the north/south boundary of the 70 ppb contour might be in Milwaukee County. In the absence of additional information, it is appropriate to assume that design values changed linearly in a north-south direction between the county's ozone monitors. The locations and design values for the relevant monitors are shown in Figure 6.3. Comparison of the Bayside monitor with the Milwaukee SER monitor suggests there is a concentration gradient of $\frac{3}{8.4}$ in the northern part of the county. The design value would only need to be 1 ppb lower than that at the Bayside monitor. Assuming a linear concentration gradient, we would expect 70 ppb concentrations to occur at a distance of:

$$1 \text{ ppb} * \left(\frac{8.4}{3}\right) = 2.8 \text{ miles south of the Bayside monitor}$$

Similarly, there is no monitoring data to inform whether the southern part of Milwaukee County may be experiencing design values that exceed the 2015 ozone NAAQS.

Taken together, the 70 ppb contour in Milwaukee County is estimated to be 2.9 miles from the lakeshore in the northeastern portion of the county. This contour would extend only 2.8 miles south of the Bayside monitor before cutting due east to the coastline, as shown in Figure 6.1.

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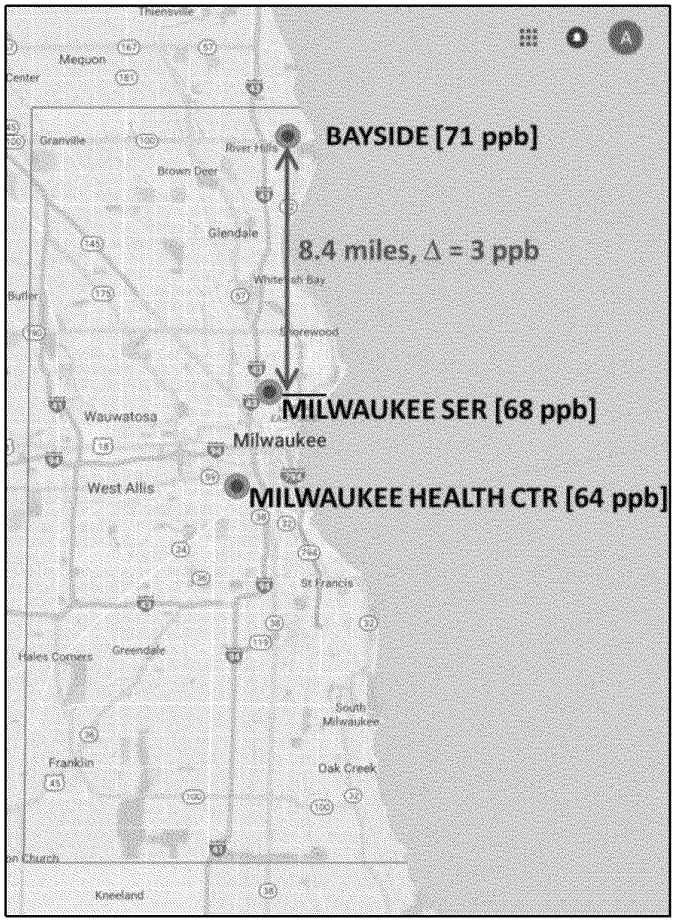
Figure 6.3. Locations and 2014-2016 ozone design values for monitors in Milwaukee County, with the north-south and concentration differences shown in red. The county boundary is shown in blue.



Waukesha and Washington Counties

Waukesha and Washington Counties are part of the Milwaukee-Waukesha-West Allis Metropolitan Statistical Area. In the past, these counties have been designated as part of the Milwaukee area, together with Milwaukee, Racine, Ozaukee and sometimes Kenosha counties.

This document clearly demonstrates that design values exceeding the level of the 2015 ozone NAAQS are confined to a narrow area along the Lake Michigan lakeshore. The high ozone air (and the 70 ppb design value contour) does not reach far enough inland to affect either Waukesha or Washington Counties. In fact, the only ozone monitor in these two counties, the Waukesha monitor, has a certified 2014-2016 design value of 66 ppb, well below the level of the 2015 ozone NAAQS.

Ozaukee, Sheboygan, and Manitowoc Counties

The design values for the monitors in Ozaukee, Sheboygan, and Manitowoc Counties all fell along the best-fit line comparing design values with distance inland from the lakeshore (Figure 6.1). This suggests that the location of the 70 ppb design value contour line would fall the same distance from the lakeshore in these counties, determined to be 2.9 miles inland as described earlier based on the data from the Sheboygan County monitors.

Kewaunee County

The monitor in Kewaunee County had a 2014-2016 design value of 69 ppb, which is below the level of the 2015 ozone NAAQS. This monitor is located very close to the shoreline (0.14 miles), a location equivalent to the Chiwaukee Prairie site in terms of proximity to the shoreline. Accordingly, no part of Kewaunee County is estimated to be in the 70 ppb contour.

Door County

The 2014-2016 design value for Door County's only monitor, at Newport State Park, is 72 ppb. A number of factors demonstrate that Door County is in a unique situation relative to ozone formation and transport compared with the other lakeshore counties:

- The design value at the Newport monitor is below the trend for design values versus distance inland for most lakeshore monitors (Figure 6.2), as did the Kewaunee monitor to the south. This suggests differences in the factors influencing ozone concentrations in this area, likely due to the remoteness of this monitor relative to the major out-of-state emissions source regions to the south.
- Door County is located to the north of Kewaunee County, whose ozone monitor had a design value (69 ppb) below the 2015 ozone NAAQS for the 2014-2016 period. It is probable that the area with design values attaining the standard extends northward from Kewaunee County into Door County.
- This monitor is located at the far northeastern tip of the Door peninsula, which juts northeastward into Lake Michigan. The monitor itself is located on high ground in Newport State Park and is surrounded on nearly three sides by water. This exposed location is the most likely spot in Door County to intercept ozone-rich air transported from the major metropolitan areas to the south.
- Door County is located east of the ozone monitor located in Green Bay. Despite being in an area with significantly more sources of emissions, the Green Bay monitor had a 2014-2016 design value of 66 ppb, further suggesting the ozone concentrations in Door County are not the result of local emissions.
- Source apportionment modeling for this monitor shows that the distribution of source regions at this monitor differs from that found at counties located to the south (Figure 5.6).
- This county is extremely rural, with very few sources of emissions.

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Ozone concentrations are therefore driven by different factors in Door County than in the other lakeshore counties. Given the lack of local emissions, the unusual geography, and the fact that the monitored ozone concentrations are the result of ozone transported from the south over the lake, there is no evidence that the 70 ppb contour extends beyond the boundary of Newport State Park.

As stated in EPA's guidance, section 182(h) of the CAA provides EPA with the discretion to designate an ozone nonattainment area as a rural transport area (RTA). In order for a nonattainment area to be classified as an RTA, the nonattainment area boundary may not include or be adjacent to any part of a Metropolitan Statistical Area (MSA). Should EPA designate a nonattainment area in Door County, any potential nonattainment area would therefore be eligible for classification as an RTA since Newport State Park does not include and is not adjacent to any part of an MSA.

EPA also requires that RTAs not contain VOC and NO_x emission sources that make a significant contribution to monitored ozone concentrations in the area or in other areas. As shown in Appendix A, all of Door County contributes only one percent of NOx and VOC emissions to the Lake Michigan region (excluding Michigan). There were only 11 point sources in Door County in 2014 that emitted a total of 8.6 tons of NOx and 79.8 tons of VOCs. In addition, there are no emission sources located within the boundaries of Newport State Park except for a very small amount of mobile source emissions. In contrast, the extensive analyses included in Chapter 5 demonstrate that emissions originating from outside of the state of Wisconsin contribute overwhelmingly to the elevated ozone levels measured at Door County's ozone monitor. Taken together, any potential ozone nonattainment area finalized by EPA in Door County, particularly one defined as the boundary of Newport State Park, would meet the second requirement to be eligible as a RTA.

6.4. Conclusions

This document supports the governor's recommendation that all areas of the state be designated attainment for the 2015 ozone NAAQS. If EPA does not follow this recommendation, this chapter has provided extensive, well-supported analysis to conclusively show that ozone design values above 70 ppb are limited to within 2.9 miles of Lake Michigan for most of the Wisconsin lakeshore and within 4.2 miles in areas impacted by direct overland transport. This finding is based on the latest available monitoring data and extensive analysis of the meteorological effects that transport high ozone air to the Wisconsin lakeshore. Any nonattainment areas EPA elects to impose must adhere to this science-based, "distance from the shoreline" approach, rather than on arbitrary boundaries based on historical practice or outdated theories of how local emissions impact ozone levels in the state.

This submittal provides compelling, data-driven evidence for what has long been understood: Wisconsin's ozone problems are due to transported pollutants, exacerbated by the unique effects

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of Lake Michigan, and are not meaningfully affected by in-state emissions. EPA's repeated unwillingness to fully address the impacts of ozone transport on Wisconsin has left the state to address its nonattainment issues on its own. Wisconsin has met this challenge by implementing many measures to reduce pollutants and operating one of the best-controlled utility fleets in the nation. However, the science is clear: there are no demonstrable benefits to be gained by further controlling emissions in the state for the purpose of this standard. EPA must acknowledge this information and use the discretion it has under the CAA to avoid imposing nonattainment areas on the state that would not improve air quality.

WDNR reserves the right to review the information contained in this document and supplement it at any time in order to provide EPA with the latest and most comprehensive information regarding the ozone concentrations in Wisconsin's lakeshore region.

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APPENDIX A

Regional Emissions Data

This appendix provides information about ozone precursor emissions of nitrogen oxides (NOx) and volatile organic compounds (VOC) from sources located along Wisconsin's lakeshore and the neighboring Lake Michigan region.

Methodology and Source Categories

Wisconsin utilized 2014 National Emission Inventory (NEI) data to characterize regional NOx and VOC emissions for 23 counties in and around the Wisconsin lakeshore region. This area includes the eastern Wisconsin Lake Michigan shoreline counties, all of the Milwaukee-area counties, and the counties in the Chicago-Naperville-Elgin, IL-IN-WI Core-Based Statistical Area (Table A.1). NOx emissions data for electric generating units from the 2014 from EPA's Clean Air Markets Division database were also incorporated into the emissions inventory.

Table A.1 Chicago-Naperville-Elgin, IL-IN-WI Core-Based Statistical Area counties. (U.S. Census Bureau, February 2013)

Illinois Counties	Indiana Counties	Wisconsin Counties
Cook	Jasper	Kenosha
DeKalb	Lake	
DuPage	Newton	
Grundy	Porter	
Kane		
Kendall		
Lake		
McHenry		
Will		

The NEI is a comprehensive and detailed estimate of air emissions of criteria pollutants, precursors to criteria pollutants, and hazardous air pollutants. The NEI is released every three years based primarily upon data provided by state, local, and tribal air agencies for sources in their jurisdictions and supplemented by data developed by EPA. The NEI groups sources into different categories, including point, area, non-road mobile, and on-road mobile source categories.

Point sources include emissions from fixed stationary sources such as electric utilities, industrial, commercial and institutional facilities, airports, and smaller industrial, non-industrial and commercial facilities. A small number of portable sources such as some asphalt or rock crushing operations are also included. For Wisconsin, point sources include those emitting five or more tons of NOx in a year and/or three tons of VOC in a year. Illinois and Indiana point source emissions were taken directly from the NEI database.

Nonpoint sources include emissions estimates for stationary sources which individually are too small in magnitude to report as point sources. These emissions sources are included in the NEI as

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a county total or tribal total (for participating tribes). Examples include residential heating, commercial combustion, asphalt paving, and commercial and consumer solvent use. Emissions attributable to biogenic sources (e.g., soil and vegetation) were removed from the dataset so that only anthropogenic emissions are included in the inventory. The NEI also includes certain mobile sources, including marine vessels and railroad equipment, in the nonpoint source category. Those emission sources were moved into the *Nonroad* category for the purposes of this emissions inventory.

Onroad sources include emissions from onroad vehicles that use gasoline, diesel, and other fuels. These sources include light duty and heavy duty vehicle emissions from operation on roads, highway ramps, and during idling. EPA uses the MOVES2014 model to compute onroad source emissions based on model inputs provided by state, local, and tribal air agencies.

Nonroad sources include off-road mobile sources that use gasoline, diesel, and other fuels. Source types include construction equipment, lawn and garden equipment, aircraft ground support equipment, locomotives, and commercial marine vessels. EPA uses the MOVES2014 model to compute nonroad source emissions.

Inventory Analysis

The complete NOx and VOC inventory for this 23-county area is shown in Tables A.2 and A.3. Illinois counties contributed about two thirds of regional ozone precursor emissions (61.5% for NOx, 68.1% for VOC), while Illinois and Indiana counties together accounted for about 80% of regional ozone precursor emissions (80.1% for NOx, 78.5% for VOC). The ten Wisconsin counties (including the greater Milwaukee area) contributed only about 20% of ozone precursor emissions (19.9% for NOx, 21.5% for VOC).

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Table A.2. Annual 2014 NOx emissions in tons for the Wisconsin Lake Michigan shoreline counties and the Chicago-Naperville-Elgin, IL-IN-WI Core-Based Statistical Area (CBSA).

County	Point Sources	NonPoint Sources	OnRoad Sources	NonRoad Sources	Total	Percent Contribution to 3-State Area
			Wisconsin			
Door	8.6	135.8	599.8	2,321.6	**3,065.8**	1.0%
Kenosha	2,587.5	469.5	1,765.0	1,195.0	**6,017.0**	2.0%
Kewaunee	50.6	75.7	318.1	694.9	**1,139.3**	0.4%
Manitowoc	814.0	353.4	1,371.5	694.5	**3,233.4**	1.1%
Milwaukee	6,716.2	3,180.7	8,979.6	3,157.3	**22,033.7**	7.2%
Ozaukee	313.1	303.3	1,312.6	1,169.7	**3,098.6**	1.0%
Racine	285.0	671.3	1,848.6	1,340.7	**4,145.6**	1.4%
Sheboygan	1,813.8	589.1	1,383.8	799.6	**4,586.3**	1.5%
Washington	219.3	523.3	1,968.7	888.7	**3,599.9**	1.2%
Waukesha	489.2	1,660.5	5,055.2	2,465.1	**9,669.9**	3.2%
Total	**13,297.2**	**7,962.5**	**24,602.8**	**14,727.0**	**60,589.6**	**19.9%**
			Illinois			
Cook	13,961.9	19,521.9	45,267.2	17,089.0	**95,839.9**	31.5%
DeKalb	127.4	298.0	1,513.8	1,433.5	**3,372.7**	1.1%
DuPage	839.9	4,531.7	12,168.4	4,448.2	**21,988.3**	7.2%
Grundy	1,036.4	167.3	1,029.8	1,347.6	**3,581.0**	1.2%
Kane	551.7	1,997.9	5,566.2	3,187.7	**11,303.5**	3.7%
Kendall	629.9	356.6	1,220.2	833.0	**3,039.8**	1.0%
Lake	2,294.7	3,252.8	8,382.7	3,646.1	**17,576.3**	5.8%
McHenry	220.0	1,181.1	3,479.3	1,771.9	**6,652.4**	2.2%
Will	9,061.8	1,858.9	8,515.3	4,294.9	**23,731.0**	7.8%
Total	**28,723.7**	**33,166.3**	**87,142.9**	**38,051.9**	**187,084.8**	**61.5%**
			Indiana			
Lake	7,191.5	94.4	2,452.2	455.1	**10,193.2**	3.3%
Jasper	15,374.1	1,063.6	8,654.5	3,809.3	**28,901.5**	9.5%
Newton	22.2	46.1	552.9	305.8	**926.9**	0.3%
Porter	10,389.4	362.1	3,307.4	2,579.0	**16,638.0**	5.5%
Total	**32,977.2**	**1,566.2**	**14,967.0**	**7,149.3**	**56,659.7**	**18.6%**
3-State TOTAL	**74,998.1**	**42,695.0**	**126,712.7**	**59,928.2**	**304,334.0**	**100.0%**
Source Type Contribution	**24.6%**	**14.0%**	**41.6%**	**19.7%**	**100.0%**	

Table A.3. Annual 2014 VOC emissions in tons for the Wisconsin Lake Michigan shoreline counties and the Chicago-Naperville-Elgin, IL-IN-WI Core-Based Statistical Area (CBSA).

County	Point Sources	NonPoint Sources	OnRoad Sources	NonRoad Sources	Total	Percent Contribution to 3-State Area
			Wisconsin			
Door	79.8	471.4	356.3	1,531.1	**2,438.6**	1.0%
Kenosha	178.7	1,556.5	908.7	560.8	**3,204.6**	1.4%
Kewaunee	56.5	279.4	188.3	754.7	**1,278.8**	0.5%
Manitowoc	463.5	1,088.9	699.1	556.4	**2,808.0**	1.2%
Milwaukee	1,851.7	8,864.7	4,432.6	1,867.1	**17,016.0**	7.3%
Ozaukee	122.7	876.0	635.6	356.1	**1,990.4**	0.9%
Racine	437.0	2,081.7	951.4	741.1	**4,211.2**	1.8%
Sheboygan	551.1	1,402.8	675.8	777.3	**3,407.0**	1.5%
Washington	281.8	1,613.0	941.6	721.9	**3,558.3**	1.5%
Waukesha	869.3	4,601.8	2,559.6	2,351.2	**10,381.9**	4.4%
Total	**4,891.9**	**22,836.2**	**12,349.0**	**10,217.6**	**50,294.7**	**21.5%**
			Illinois			
Cook	8,070.8	43,789.7	23,981.9	10,148.8	**85,991.2**	36.8%
DeKalb	231.7	1,361.8	839.7	667.3	**3,100.5**	1.3%
DuPage	1,145.3	8,985.9	6,196.5	3,281.8	**19,609.5**	8.4%
Grundy	536.8	737.1	433.5	399.5	**2,106.9**	0.9%
Kane	902.7	4,686.0	2,944.5	1,660.4	**10,193.5**	4.4%
Kendall	215.1	1,125.8	733.7	1,088.4	**3,163.0**	1.4%
Lake	450.1	6,368.2	4,372.4	3,445.7	**14,636.4**	6.3%
McHenry	260.3	2,756.2	1,971.5	1,085.3	**6,073.4**	2.6%
Will	2,415.6	5,984.1	4,094.8	1,866.8	**14,361.3**	6.1%
Total	**14,228.5**	**75,794.7**	**45,568.6**	**23,644.0**	**159,235.8**	**68.1%**
			Indiana			
Lake	209.9	653.2	551.1	389.0	1,803.1	0.8%
Jasper	3,997.2	5,454.0	3,538.1	2,041.2	15,030.5	6.4%
Newton	35.0	483.2	170.8	804.8	1,493.8	0.6%
Porter	743.8	2,189.7	1,209.2	1,823.9	5,966.7	2.6%
Total	**4,985.9**	**8,780.1**	**5,469.3**	**5,058.8**	**24,294.1**	**10.4%**
3-State TOTAL	**24,106.3**	**107,411.0**	**63,386.8**	**38,920.4**	**233,824.5**	**100.0%**
Source Type Contribution	**10.3%**	**45.9%**	**27.1%**	**16.6%**	**100.0%**	

APPENDIX B

Wisconsin Ozone Control Measures

This appendix documents the large number of permanent and enforceable control measures that have been implemented in Wisconsin to reduce NO_x and VOC ozone precursor emissions. These emission control measures have led to dramatic reductions in ozone precursor emissions from Wisconsin's lakeshore counties, as well as from the rest of the state.

1. Point Source Control Measures

1.1. NO_x Control Measures

Wisconsin NO_x Control Program – Wisconsin has implemented a NO_x control program to meet requirements for the 1997 ozone NAAQS. These control requirements are also applicable to the 2008 ozone NAAQS. The control requirements include: 1) Emission limitations to meet Rate-of-Progress (ROP); 2) Reasonable Available Control Technology (RACT) emission limitations for facilities with a current or future potential-to-emit (PTE) of 100 tons or more per year; and, 3) New source NOx performance standards that implement appropriate control technology for new or modified emission units regardless of ROP or RACT applicability. The ROP emission limitations are codified under s. NR 428.05, Wis. Adm. Code; the RACT emission limitations under s. NR 428.22, Wis. Adm. Code; and the new source emission limitations under s. NR 428.04, Wis. Adm. Code. The start date and applicability by county of each element of Wisconsin's NO_x control program is summarized in Table B.1.

Federal NO_x Transport Rules – Beginning January 1, 2009, electric generating units (EGUs) in 22 states east of the Mississippi (including Wisconsin) became subject to ozone season NO_x emission budgets under the Clean Air Interstate Rule (CAIR). CAIR reduces transport of NO_x emissions affecting attainment and maintenance of the 1997 ozone NAAQS as required under Section 110(a)(2)(D) of the Clean Air Act (CAA).[1] The Cross-State Air Pollution Rule (CSAPR) was implemented in 2011 to replace the CAIR requirements. The CSAPR emission reductions began with the 2015 ozone season. In 2016, EPA finalized the CSAPR Update (81 FR 74504) to address NO_x transport affecting the attainment and maintenance of the 2008 ozone NAAQS (79 FR 16436). The CSAPR Update establishes more stringent NO_x budgets starting with the 2017 ozone season. These rules implemented a system of allocating allowances by utility emission unit with provision for limited trading.

[1] The first transport rule promulgated by EPA was the NOx SIP Call in 2003. The EGU requirements are subsumed by the CAIR rule. However, NO_x emissions for some larger industrial sources in states contributing to Wisconsin continue to be regulated under the NO_x SIP Call.

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Table B.1. NO_x control program applicability.

County	Applicability and Effective Year		
	ROP - Existing Emission Units (NR 428.05)	RACT – Emission Units at Facilities > 100 TPY PTE (NR 420.22)	New Source Limits for Emission Units (NR 428.04)
Door	--	--	--
Kenosha	2001	2007	2001
Manitowoc	2001	--	--
Milwaukee	2001	2007	2001
Ozaukee	2001	2007	2001
Racine	2001	2007	2001
Sheboygan	2001	2007	--
Washington	2001	2007	2001
Waukesha	2001	2007	2001

Electric Utility NO_x Requirements – EGUs in the counties along Lake Michigan (as well as others in Wisconsin) are well controlled for NO_x emissions. These various EGUs are subject to the discussed Wisconsin NO_x control program, the federal transport rules, new source emission requirements, and limitations under consent decrees entered with EPA. The 2014 emissions and control requirements are listed for coal-fired and combustion turbine EGUs in Tables B.2 and B.3, respectively. The tables identify the EGUs along Lake Michigan, including those in the Milwaukee area.

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Table B.2. Control requirements for coal-fired EGU boilers in 2014 and thereafter. Numbers listed in the control requirements column refer to the programs listed in the footnotes. There are no coal-fired EGUs in Door, Washington or Waukesha Counties.

County	Plant	Unit	Emission Rate Limit (lbs/mmBtu)	Control Equipment	Control Requirements	2014 NOx (tons)
Kenosha	Pleasant Prairie	1	0.1	SCR	1,2,3,4	1,081
		2	0.1	SCR	1,2,3,4	1,338
Manitowoc	Manitowoc Public Util.	8	0.2	Fluidized Bed Combustion / Optimization	2,3,5	40
		9	0.155	Fluidized Bed Combustion, SNCR	2,3,5	34
Milwaukee	Valley	1	0.08	2015 Converted to NG	3,4,6	367[a]
		2	0.08	2015 Converted to NG	3,4,6	464[a]
		3	0.08	2015 Converted to NG	3,4,6	325[a]
		4	0.08	2015 Converted to NG	3,4,6	328[a]
	Elm Road	1	0.06	SCR	3,5	1,024
		2	0.06	SCR	3,5	964
	Oak Creek	5	0.1	SCR	1,2,3,4	492
		6	0.1	SCR	1,2,3,4	457
		7	0.1	SCR	1,2,3,4	410
		8	0.1	SCR	1,2,3,4	307
Ozaukee	--	--	--	--	--	--
Racine	--	--	--	--	--	--
Sheboygan	Edgewater	3	Retired	Retired	1,2,3,4	0
		4	0.1	LNB, SNCR	1,2,3,4	1,278[b]
		5	0.08 (30-day) 0.07 (12 month)	SCR	1,2,3,4	361

1) Wisconsin NO_x RACT program
2) Wisconsin NO_x ROP program
3) Federal CSAPR and CSAPR Update Transport programs
4) Federal Consent Decree
5) Best Available Control Technology (BACT)
6) Wisconsin NO_x New Source Performance Standards

a) The Valley Plant units 1,2,3, and 4 began firing natural gas in 2015. The 2016 NOx emissions are 64, 61, 92, and 91 tons for each unit, respectively.
b) Alliant Energy is required under federal consent decree to either retire Edgewater 4 or fire only natural gas beginning in 2019.
Definitions: NG – natural gas; LNB – low NOx burner; SCR – selective catalytic reduction; SNCR – selective non-catalytic reduction.

Table B.3. Control requirements for combustion turbine EGUs in 2014 and thereafter. There are no combustion turbines in Door or Waukesha Counties.

County	Plant	Unit	Emission Rate Limit (lbs/ mmBtu)	Control Equipment	Control Requirements	2014 NOx (tons)
Kenosha	Paris	1, 2, 3, 4	NG – 25 ppmdv	WI	3	12.5
Manitowoc	--	--	--	--	--	--
Milwaukee	--	--	--	--	--	--
Ozaukee	Port Washington	11,12, 21,22	NG - 3 ppmdv	DLN	1,2	127.9
Racine	--	--	--	--	--	--
Sheboygan	Sheboygan Falls	1, 2	NG - 25 ppmdv	DLN	3	2.3
Washington	Germantown	1, 2, 3, 4	Oil - 65 ppmdv	WI	3	103.5
		5	NG – 20 ppmdv	DLN	1	0.4

1) Best Available Control Technology (BACT)
2) New Source Performance Standards (NSPS)
3) Wisconsin NO_x RACT program

Definitions: ppmdv – parts per million dry volume; WI – water injection; and, DLN – Dry Low NOx burner.

1.2. Wisconsin VOC Control Measures

VOC RACT/CTG – Wisconsin has implemented VOC RACT to fulfill control technology guideline (CTG) requirements for the Wisconsin nonattainment areas under the 1997 and 2008 ozone NAAQS. These VOC RACT/CTG requirements are codified under chapters NR 419 through 424, Wis. Adm. Code. The list of the CTGs in place in Wisconsin is provided in Table B.4. All of these CTG requirements were implemented and effective prior to 2011.

1.3. Federal VOC Control Measures for Point Sources

A number of federal NESHAP rules have been implemented to control hazardous pollutants. These rules include requirements to control hazardous organic pollutants through ensuring complete combustion of fuels or implementing requirements for emissions of total hydrocarbons. Under either approach, the rules act to reduce total VOC emitted by the affected sources. These NESHAP rules apply to both major and area source facilities. Major sources are those facilities emitting more than 10 tons per year of a single hazardous air pollutant or more than 25 tons per year of all hazardous air pollutants in total. Area sources are those facilities that emit less than the major source thresholds for hazardous air pollutants.

These NESHAP measures apply nationally, thereby reducing the transport of VOC emissions. The NESHAP rules that will likely contribute to VOC emission reductions in the 2017 ozone season include the following:

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- *Mercury and Air Toxics (MATS) NESHAP* – On February 16, 2012, EPA promulgated the MATS rule under part 63 subpart UUUUU. Emission and other requirements were fully applicable by April 16, 2015.
- *Major Source Industrial, Commercial, and Institutional (ICI) Boiler and Process Heater NESHAP* – On March 21, 2011, EPA promulgated the "National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters" under part 63 subpart DDDDD. Emission and other requirements were fully applicable by January 31, 2016.
- *Area Source (non-major point sources) ICI Boiler and Process Heater NESHAP* – On March 21, 2011 EPA promulgated the "National Emission Standards for Hazardous Air Pollutants for Area Sources: Industrial, Commercial, and Institutional Boilers" under part 63 subpart JJJJJJ. This NESHAP requires solid fuel and oil fuel fired boilers operated by sources that are below the major source threshold to begin periodic combustion tuning by March 21, 2014.
- *Internal Combustion Engine Rules* – EPA has promulgated three rules that limit the total amount of hydrocarbon emissions from internal combustion engines:
    - National Emission Standards for Hazardous Pollutants for Reciprocating Internal Combustion Engines (RICE Maximum Achievable Control Technology, MACT) was promulgated on June 15, 2004 under Part 63, subpart ZZZZ and revised in January 2008 and March 2010, with the two revisions impacting additional RICE units;
    - Standards of Performance for Stationary Spark Ignition Internal Combustion Engines promulgated on January 18, 2008 under Part 60, subpart JJJJ; and
    - Standards of Performance for Stationary Compression Ignition Internal Combustion Engines promulgated on July 11, 2006 under Part 60, subpart IIII.

  These rules implement hydrocarbon emission limitations prior to and after 2011 based on compliance dates. These rules also act to continuously reduce emissions as existing stationary engines are replaced by new, cleaner-burning engines.

2. Area Source Control Measures

2.1. Area Source VOC Control Measures

As noted for point sources, Wisconsin has implemented a number of VOC RACT/CTG rules under chs. NR 419 through 424, Wis. Adm. Code. A number of these rules limit VOC emissions from area sources as well, as noted in Table B.4. In addition to Stage 1 fuel delivery vapor controls (the loading of underground storage tanks at gas stations), Wisconsin previously had a Stage 2 vehicle refueling vapor recovery program in place. However, the Stage 2 program was removed from Wisconsin's ozone SIP on November 4, 2013 (78 FR 65875) with EPA approval because the equipment was found to interface negatively with the onboard vapor recovery

systems required on gasoline fueled new vehicles after 1998. As stage 2 equipment was removed, refueling facility VOC emissions decreased slightly due to reduced fugitive underground storage tank VOC venting. This SIP revision was based on a technical showing of net benefit as required under CAA Sections 110(l) and 193 in order to prevent SIP backsliding.

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Table B.4. Volatile Organic Compounds (VOC) Control Technique Guidelines incorporated into Wisconsin Administrative Code.

Source	Title (Description)	EPA CTG Report No.	Wis. Adm. Code Incorporation	Emissions Inventory Classification
Petroleum and Gasoline Sources				
Bulk Gasoline Plants	Control of Volatile Organic Emissions from Bulk Gasoline Plants [bulk gasoline plant unloading, loading and storage]	EPA-450/2-77-035	NR 420.04(2)	Stationary Point Source
Refinery Equipment - Vacuum Producing Systems, Wastewater Separators, and Process Unit Turnarounds	Control of Refinery Vacuum Producing Systems, Wastewater Separators, and Process Unit Turnarounds	EPA-450/2-77-025	NR 420.05(1), (2) and (3)	Stationary Point Source
Refinery Equipment - Control of VOC Leaks	Control of Volatile Organic Compound Leaks from Petroleum Refinery Equipment	EPA-450/2-78-036	NR 420.05(4)	Stationary Point Source
Refinery Equipment - Control of VOC Leaks	Control of Volatile Organic Compound Equipment Leaks from Natural Gas/Gasoline Processing Plants	EPA-450/3-83-007	NR 420.05(4)	Stationary Point Source
Tanks - Fixed Roof	Control of Volatile Organic Emissions from Storage of Petroleum Liquids in Fixed-Roof Tanks	EPA-450/2-77-036	NR 420.03(5)	Stationary Point Source
Tanks - External Floating Roofs	Control of Volatile Organic Emissions from Petroleum Liquid Storage in External Floating Roof Tanks	EPA-450/2-78-047	NR 420.03(6) and (7)	Stationary Point Source
Gasoline Loading Terminals	Control of Hydrocarbons from Tank Truck Gasoline Loading Terminals	EPA-450/2-77-026	NR 420.04(1)	Stationary Point Source
Tank Trucks	Control of Volatile Organic Compound Leaks from Gasoline Tank Trucks and Vapor Collection Systems	EPA-450/2-78-051	NR 420.04(4)	Stationary Area Source
Gasoline Delivery - Stage I Vapor Control Systems	Design Criteria for Stage I Vapor Control Systems – Gasoline Service Stations	EPA-450/R-75-102	NR 420.04(3)	Stationary Area Source

Source	Title (Description)	EPA CTG Report No.	Wis. Adm. Code Incorporation	Emissions Inventory Classification
Surface Coating				
Automobile & Light-duty Truck	Control Techniques Guidelines for Automobile and Light-Duty Truck Assembly Coatings	EPA 453/R-08-006	NR 422.09	Stationary Point Source
Cans	Control of Volatile Organic Emissions from Existing Stationary Sources – Volume II: Surface Coating of Cans, Coils, Paper, Fabrics, Automobiles, and Light-Duty Trucks	EPA-450/2-77-008	NR 422.05	Stationary Point Source
Coils	Control of Volatile Organic Emissions from Existing Stationary Sources – Volume II: Surface Coating of Cans, Coils, Paper, Fabrics, Automobiles, and Light-Duty Trucks	EPA-450/2-77-008	NR 422.06	Stationary Point Source
Fabric & Vinyl	Control of Volatile Organic Emissions from Existing Stationary Sources – Volume II: Surface Coating of Cans, Coils, Paper, Fabrics, Automobiles, and Light-Duty Trucks	EPA-450/2-77-008	NR 422.08	Stationary Point Source
Flat Wood Paneling	Control of Volatile Organic Emissions from Existing Stationary Sources – Volume VII: Factory Surface Coating of Flat Wood Paneling	EPA-450/2-78-032	NR 422.13	Stationary Point Source
	Control Techniques Guidelines for Flat Wood Paneling Coatings	EPA-453/R-06-004	NR 422.131	Stationary Point Source
Large Appliances	Control of Volatile Organic Emissions from Existing Stationary Sources – Volume V: Surface Coating of Large Appliances	EPA-450/2-77-034	NR 422.11	Stationary Point Source
	Control Techniques Guidelines for Large Appliance Coatings	EPA 453/R-07-004	NR 422.115	Stationary Point Source
Magnet Wire	Control of Volatile Organic Emissions from Existing Stationary Sources – Volume IV: Surface Coating of Insulation of Magnet Wire	EPA-450/2-77-033	NR 422.12	Stationary Point Source
Metal Furniture	Control of Volatile Organic Emissions from Existing Stationary Sources – Volume III: Surface Coating of Metal Furniture	EPA-450/2-77-032	NR 422.1	Stationary Point Source

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Source	Title (Description)	EPA CTG Report No.	Wis. Adm. Code Incorporation	Emissions Inventory Classification
	Control Techniques Guidelines for Metal Furniture Coatings	EPA 453/R-07-005	NR 422.105	Stationary Point Source
Metal Parts, miscellaneous	Control Techniques Guidelines for Miscellaneous Metal and Plastic Parts Coatings	EPA 453/R-08-003	NR 422.15	Stationary Point Source
	Fire Truck and Emergency Response Vehicle Manufacturing - surface coating	(covered under Misc. Metal Parts CTG)	NR 422.151	Stationary Point Source
Paper, Film and Foil	Control of Volatile Organic Emissions from Existing Stationary Sources – Volume II: Surface Coating of Cans, Coils, Paper, Fabrics, Automobiles, and Light-Duty Trucks	EPA-450/2-77-008	NR 422.07	Stationary Point Source
	Control Techniques Guidelines for Paper, Film, and Foil Coatings	EPA 453/R-07-003	NR 422.075	Stationary Point Source
Plastic Parts - Coatings	Control Techniques Guidelines for Miscellaneous Metal and Plastic Parts Coatings	EPA 453/R-08-003	NR 422.083	Stationary Point Source
Traffic Markings	Reduction of Volatile Organic Compound Emissions from the Application of Traffic Markings	EPA-450/3-88-007	NR 422.17	Stationary Area Source
Wood Furniture	Control of Volatile Organic Compound Emissions from Wood Furniture Manufacturing Operations	EPA-453/R-96-007	NR 422.125	Stationary Point Source
Graphic Arts				
Rotogravure & Flexography	Control of Volatile Organic Emissions from Existing Stationary Sources – Volume VIII: Graphic Arts-Rotogravure and Flexography	EPA-450/2-78-033	NR 422.14	Stationary Point Source
Flexible Packaging	Control Techniques Guidelines for Flexible Package Printing	EPA-453/R-06-003	NR 422.141	Stationary Point Source
Letterpress	Control Techniques Guidelines for Offset Lithographic Printing and Letterpress Printing	EPA-453/R-06-002	NR 422.144	Stationary Point Source

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Source	Title (Description)	EPA CTG Report No.	Wis. Adm. Code Incorporation	Emissions Inventory Classification
Lithographic	Control Techniques Guidelines for Offset Lithographic Printing and Letterpress Printing	EPA-453/R-06-002	NR 422.142 and 422.143	Stationary Point Source
Solvents				
Dry Cleaning	Control of Volatile Organic Emissions from Perchloroethylene Dry Cleaning Systems	EPA-450/2-78-050	NR 423.05	Stationary Area Source
	Control of Volatile Organic Compound Emissions from Large Petroleum Dry Cleaners	EPA-450/3-82-009	NR 423.05	Stationary Area Source
Industrial Cleaning	Control Techniques Guidelines for Industrial Cleaning Solvents	EPA-453/R-06-001	NR 423.035 and 423.037	Stationary Area Source
Metal Cleaning	Control of Volatile Organic Emissions from Solvent Metal Cleaning	EPA-450/2-77-022	NR 423.03	Stationary Area Source
Chemical				
Pharmaceutical	Control of Volatile Organic Emissions from Manufacture of Synthesized Pharmaceutical Products	EPA-450/2-78-029	NR 421.03	Stationary Point Source
Polystyrene	Control of Volatile Organic Compound Emissions from Manufacture of High-Density Polyethylene, Polypropylene, and Polystyrene Resins	EPA-450/3-83-008	NR 421.05	Stationary Point Source
Rubber	Control of Volatile Organic Emissions from Manufacture of Pneumatic Rubber Tires	EPA-450/2-78-030	NR 421.04	Stationary Point Source
Synthetic Organic	Control of Volatile Organic Compound Emissions from Air Oxidation Processes in Synthetic Organic Chemical Manufacturing Industry	EPA-450/3-84-015	NR 421.07	Stationary Point Source
Synthetic Organic	Control of Volatile Organic Compound Emissions from Reactor Processes and Distillation Operations in Synthetic Organic Chemical Manufacturing Industry	EPA-450/4-91-031	NR 421.07	Stationary Point Source

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Source	Title (Description)	EPA CTG Report No.	Wis. Adm. Code Incorporation	Emissions Inventory Classification
Synthetic Resin	Control of Volatile Organic Compound Leaks from Synthetic Organic Chemical Polymer and Resin Manufacturing Equipment	EPA-450/3-83-006	NR 421.05	Stationary Point Source
Manufacturing				
Asphalt	Control of Volatile Organic Emissions from Use of Cutback Asphalt	EPA-450/2-77-037	NR 422.16	Stationary Area Source

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There are also a number of federal programs in place which reduce area source VOC emissions. VOC emission standards for consumer and commercial products were promulgated under 40 CFR Part 59. This program was implemented prior to 2011 and will continue to maintain reduced VOCs emitted from this source category. Future emission levels will vary depending on population and activity use factors. Another federal rule, the area source hazardous air pollutant control rule, also controls area VOC emissions associated with fuel storage and transfer activities (40 CFR 63, Subpart R, BBBBBB, and CCCCCC).

3. Onroad Source Control Measures

Both NO_x and VOC emissions from onroad mobile sources are substantially controlled through federal new vehicle emission standards programs and fuel standards that impact both tailpipe emissions and evaporative losses. Although initial compliance dates in many cases were prior to 2011, these regulations have continued to reduce area-wide emissions as fleets turn over to newer vehicles. All of these programs apply nationally and have reduced ozone precursor emissions contributing to ozone transport. The federal programs contributing to reductions in onroad ozone precursor emissions include those listed in Table B.5.

Table B.5. Federal onroad mobile source regulations contributing to attainment.

On-road Control Program	Pollutants	Model Year[a]	Regulation
Passenger vehicles, SUVs, and light duty trucks – emissions and fuel standards	VOC & NO_x	2004 – 2009+ (Tier 2) 2017+ (Tier 3)	40 CFR Part 85 & 86
Light-duty trucks and medium duty passenger vehicle – evaporative standards	VOC	2004 - 2010	40 CFR Part 86
Heavy-duty highway compression engines	VOC & NO_x	2007+	40 CFR Part 86
Heavy-duty spark ignition engines	VOC & NO_x	2005 – 2008+	40 CFR Part 86
Motorcycles	VOC & NO_x	2006 – 2010 (Tier 1 & 2)	40 CFR Part 86
Mobile Source Air Toxics – fuel formulation, passenger vehicle emissions, and portable container emissions	Organic Toxics & VOC	2009 – 2015[b]	40 CFR Part 59, 80, 85, & 86
Light duty vehicle corporate average fuel economy standards	Fuel efficiency (VOC and NO_x)	2012-2016 & 2017-2025	40 CFR Part 600

[a] The range in model years affected can reflect phasing of requirements based on engine size or initial years for replacing earlier tier requirements.
[b] The range in model years reflects phased implementation of fuel, passenger vehicle, and portable container emission requirements as well as the phasing by vehicle size and type.

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Two additional ongoing CAA-required programs limit onroad VOC and NO_x emissions. The first program, administered by EPA, has required the use of reformulated gasoline (RFG) in southeast Wisconsin (Kenosha, Milwaukee, Ozaukee, Racine, Washington and Waukesha counties) and the Chicago area since 1995. The second program is the Wisconsin-administered inspection/maintenance (I/M) program and is required for southeast Wisconsin (Kenosha, Milwaukee, Ozaukee, Racine, Washington and Waukesha counties) and Sheboygan County. The Wisconsin I/M program was first implemented in 1984 and has gone through several modifications and enhancements since that time. The I/M program requirements are codified in ch. NR 485, Wis. Adm. Code. Both the RFG and the I/M programs reduce average vehicle VOC and NO_x emissions and garner some level of continued incremental reduction as fleets turn over to new vehicles.

4. Nonroad Control Measures

Similar to on-road sources, VOC and NO_x emitted by nonroad mobile sources are significantly controlled via federal standards for new engines and therefore reduce ozone precursor emissions. Table B.6 lists the nonroad source categories and applicable federal regulations. The nonroad regulations continue to slowly lower average unit and total sector emissions as equipment fleets are replaced each year (it takes approximately 20 years for complete fleet turnover), pulling the highest emitting equipment out of circulation or substantially reducing its use. The new engine requirements are implemented in conjunction with fuel programs regulating fuel sulfur content. The fuel programs enable achievement of various new engine tier VOC and NO_x emission limits.

The RFG program noted in the onroad control measures also contributes to lower NOx and VOC emissions from the nonroad mobile sector.

Table B.6. Federal nonroad mobile source regulations contributing to attainment.

Nonroad Control Program	Pollutants	Model Year[a]	Regulation
Aircraft	HC & NO_x	2000 – 2005+	40 CFR Part 87
Compression Ignition[b]	NMHC & NO_x	2000 – 2015+ (Tier 4)	40 CFR Part 89 & 1039
Large Spark Ignition	HC & NO_x	2007+	40 CFR Part 1048
Locomotive Engines	HC & NO_x	2012 – 2014 (Tier 3) 2015+ (Tier 4)	40 CFR Part 1033
Marine Compression Ignition	HC & NO_x	2012 – 2018	40 CFR Part 1042
Marine Spark Ignition	HC & NO_x	2010+	40 CFR Part 1045
Recreational Vehicle[c]	HC & NO_x	2006 – 2012 (Tier 1 – 3) (phasing dependent on vehicle type)	40 CFR Part 1051
Small Spark Ignition Engine < 19[d] Kw – emission standards	HC & NO_x	2005 – 2012 (Tier 2 & 3) (phasing based on both Tier and engine size)	40 CFR Part 90 & 1054
Small Spark Ignition Engine < 19 Kw – evaporative standards	HC & NO_x	2008 – 2016 (phasing based on both engine size and category)	40 CFR Part 1045, 54, & 60

HC – Hydrocarbon (VOCs)

NMHC – Non-Methane Hydrocarbon (VOCs)

[a] The range in model years affected can reflect phasing of requirements based on engine size or initial years for replacing earlier tier requirements.

[b] Compression ignition applies to diesel non-road compression engines including engines operated in construction, agricultural, and mining equipment.

[c] Recreational vehicles include snowmobiles, off-road motorcycles, and all-terrain vehicles.

[d] Small spark ignition engines include engines operated in lawn and hand-held equipment.

APPENDIX C

Supplemental Analyses of Ozone Monitoring Data

This appendix presents additional analyses in support of the technical support document (TSD) submitted by the Wisconsin Department of Natural Resources related to 2015 ozone National Ambient Air Quality Standards (NAAQS) designations. These supplemental analyses include:

1. Additional comparison of hourly ozone data at the inland and lakeshore monitors.
2. Analysis of the lake breeze phenomenon. This section discusses in greater detail the methodology applied in the TSD to classify high-ozone events. It also presents and discusses the average ozone concentration and wind direction profiles for each event type.
3. Evidence for direct overland transport of ozone to the inland Kenosha County monitor. This section shows examples of days during which this transport occurred and discusses the patterns involved in such transport.

1. Comparison of hourly ozone data at the inland and lakeshore monitors

Section 4.2.2 of the TSD analyzes hourly ozone concentrations at the inland and lakeshore monitors in Sheboygan and Kenosha counties. This analysis found that 1-hour ozone concentrations at both inland monitors were generally lower than those monitored at the lakeshore, and these concentration differences were greatest when lakeshore ozone concentrations were at their highest. Figure 4.5 of the TSD uses a simple scatterplot to compare data at the inland and lakeshore monitors. This section uses boxplots to analyze the same hourly ozone concentration data in different ways.

Figure C.1 shows 1-hour average ozone concentrations at the inland monitors in Sheboygan and Kenosha counties plotted versus those at the lakeshore monitors for the same hours. The data are plotted three ways:

1) As a scatterplot.
2) As a boxplot, including all measurements available.
3) As a boxplot, showing only the hours with ozone concentrations above 70 ppb at the lakeshore monitor.

The two scatterplots at the top of Figure C.1 are also shown in Figure 4.5 of the TSD and discussed therein. The main conclusions from these graphs are that inland ozone concentrations increase as lakeshore concentrations increase, but are consistently lower than lakeshore concentrations. In particular:

- For Sheboygan County, a best-fit line through the data has a slope of 0.79 and a y-intercept close to zero, meaning that inland concentrations are roughly 79 percent of lakeshore concentrations.

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- For Kenosha County, the slope of the best-fit line is 0.89, and the intercept is very close to zero, meaning that the average inland concentrations are roughly 89 percent of lakeshore concentrations.

The largest differences were observed at the highest concentrations, and differences were greatest in Sheboygan County.

The remaining graphs of Figure C.1 plot this same 1-hour average concentration data as boxplots. In these plots, the observations are grouped together into bins according to the lakeshore ozone concentration. For example, one bin includes all of the observations for lakeshore ozone concentrations between 71 and 75 ppb. For all of the observations within each lakeshore concentration bin, the median inland concentration is shown as the line in the middle of each box. The box itself encloses the middle half of all inland ozone concentrations (from the 25th to the 75th percentile values). The lines and points above and below the box show the inland ozone concentrations values that are above or below the range in the box.[1]

Boxplots can be very useful for analyzing large amounts of data because they group and summarize that data in ways that make it easier to visualize trends in a statistically rigorous way. For example, in the scatterplots at the top of Figure C.1, it is impossible to see the most frequently observed inland concentrations at lakeshore concentrations below 60 ppb because of the large number of overlapping points. In contrast, the boxplots in the middle clearly show the midpoint, middle range of values and entire range of values for each lakeshore concentration bin.

The middle graphs in Figure C.1 show boxplots for all measurements available. These plots show that, particularly at lower concentrations, the middle half of the inland observed concentrations fall within a narrow range of values. For example, for Sheboygan County, during hours with lakeshore concentrations of 31 to 35 ppb, the middle half of inland concentrations ranged from 28 to 33 ppb. This demonstrates that inland and lakeshore concentrations are closely coupled when ozone concentrations are low. However, it is notable that even at these low concentrations, inland ozone concentrations tend to be 2-3 ppb lower than those at the lakeshore. These graphs show the mostly linear increase in inland concentrations compared with lakeshore concentration at lower concentrations. It is also clear from these graphs that, at higher ozone concentrations, the concentration differences between inland and lakeshore monitors become quite large. The differences between inland and lakeshore concentrations during hours with high ozone at the lakeshore are especially large in Sheboygan County.

[1] For example, when the lakeshore Kohler Andrae monitor in Sheboygan County measured between 71 and 75 ppb, the median concentration at the inland Sheboygan Haven monitor was 61 ppb. Half of the monitored inland concentrations in this lakeshore concentration bin fell between 54 ppb and 63 ppb. The lowest inland concentration observed when lakeshore concentrations were between 71 ppb and 75 ppb was 28 ppb, and the highest was 83 ppb.

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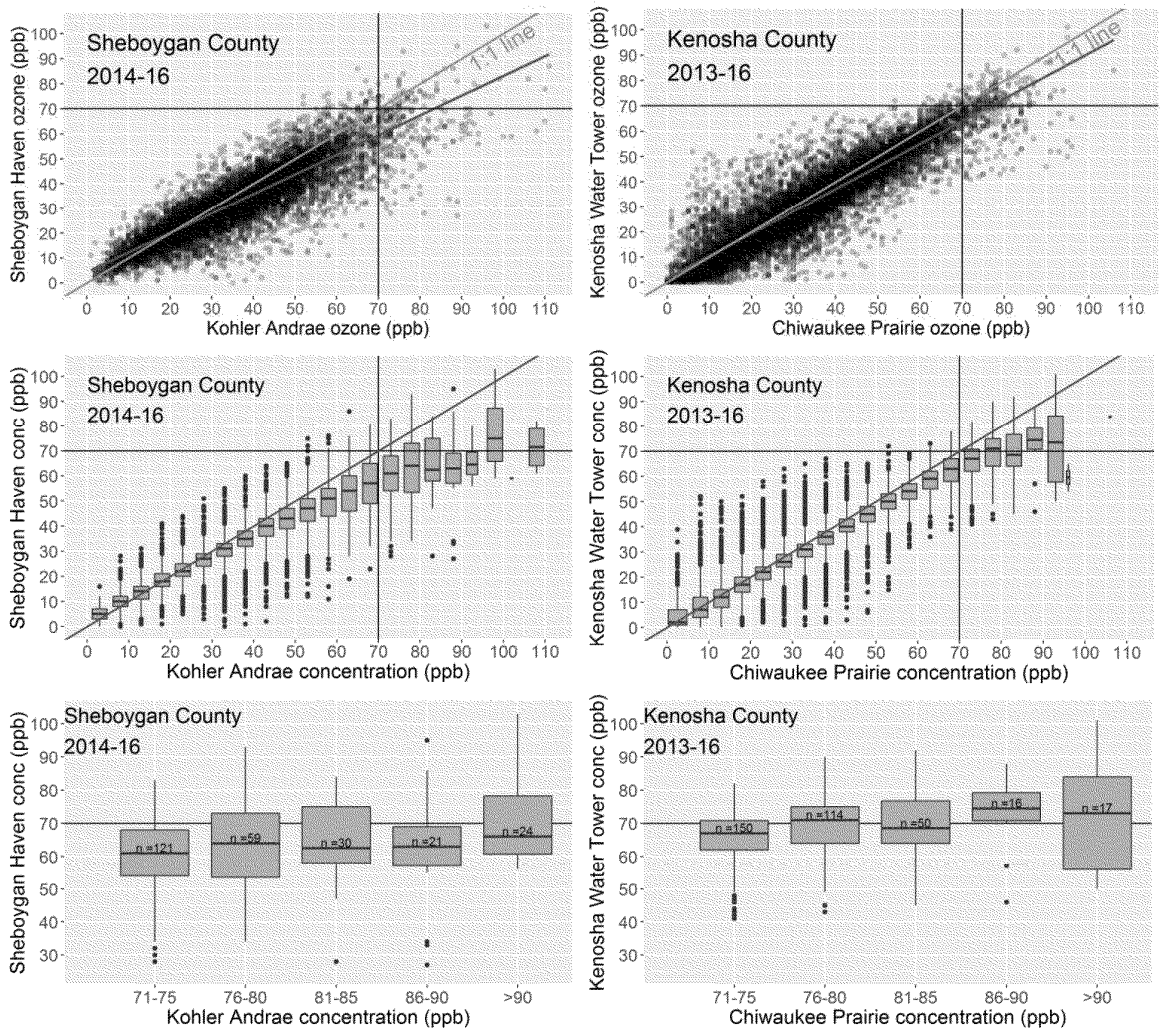
Figure C.1. Plots of 1-hour ozone concentrations comparing inland monitors to lakeshore monitors in Sheboygan and Kenosha counties. Plots are shown as scatterplots of concentrations for individual hours (top row), boxplots[2] of all hourly concentrations binned based on lakeshore concentrations (middle row), and boxplots of hourly concentrations for lakeshore concentrations above 70 ppb (bottom row). The blue lines in the top four plots show the 1:1 line. The red lines in the top two plots shows the best-fit line to the data. The values in the boxes in the bottom two plots list the number of observations in each lakeshore concentration bin.



[2] Boxplots show the median and range of inland concentrations observed for a bin of lakeshore concentrations. The line in the middle of the box shows the median concentration, and the box encloses the middle half of the concentrations (e.g., the 25th to the 75th percentile values). The "whiskers" extend to the highest or lowest value within 1.5 times the interquartile mean (the difference between the 25th and 75th percentile values) beyond the box. The points are outliers that fall beyond the whiskers.

The bottom graphs in Figure C.1 focus on the inland-lakeshore ozone concentration relationships during high ozone hours. These graphs show only the hours when lakeshore ozone concentrations were above 70 ppb. When lakeshore ozone concentrations were above 70 ppb in Sheboygan County, the median inland concentrations remained steady at around 61 to 66 ppb. This was true even for the highest lakeshore concentrations. For the 24 individual ozone episode hours when lakeshore ozone concentrations were greater than 90 ppb, the median inland concentration was only 66 ppb. A similar relationship is shown for the Kenosha County monitors. The extent of the "whiskers" and points that fall above the boxes indicate that high 1-hour ozone concentrations occasionally occurred at the inland monitors. However, inland ozone concentrations were most frequently decoupled from lakeshore concentrations when lakeshore ozone concentrations were at their highest.

2. Analysis of the Lake Breeze Phenomenon

Section 4.3 of the TSD discusses the impacts of different types of high-ozone events on peak ozone concentrations at inland and lakeshore monitors. This section describes the approach used to classify these events and provides more information about how ozone concentrations and wind direction change during each type of events.

High-ozone events were classified into one of three categories:

- "Deep" lake breeze, meaning a day on which the lake breeze affected both the lakeshore and inland monitors.
- "Shallow" lake breeze, meaning a day on which the lake breeze affected the lakeshore monitor but not the inland monitor.
- No lake breeze, meaning a day with no apparent lake breeze.

A small number of days could not be classified because of complex patterns.

2.1. Methodology

High-ozone events were identified as days with 1-hour ozone concentrations above 70 ppb. All days with ozone monitoring data at both the lakeshore and inland monitors in a county were considered for the analysis. This includes three ozone seasons for the Sheboygan County monitors (2014-2016) and four ozone seasons for the Kenosha County monitors (2013-2016).

Identification of patterns in wind direction at the inland and lakeshore monitors was the primary means of classification of high-ozone events. Days with a lake breeze typically begin with winds from the southwest during the early morning hours. These wind directions typically shift abruptly to come from a more southerly or southeasterly direction, as shown in Figure C.2. This shift typically occurs in the morning at the lakeshore monitors and later in the day at the inland

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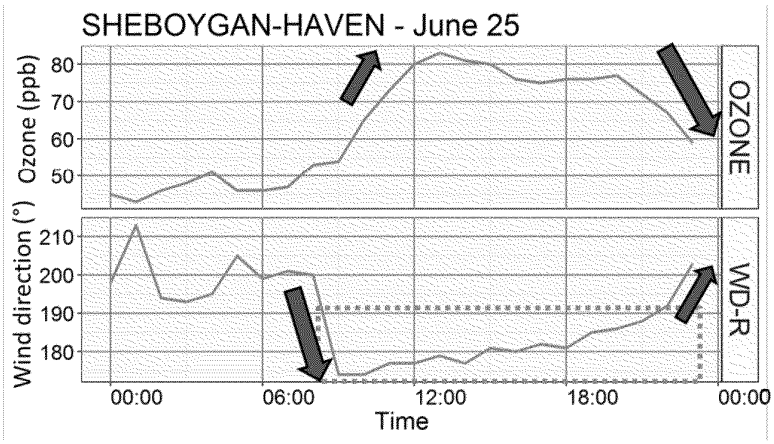
monitors. The lake breeze may occur for anywhere from a few minutes to 15 or more hours.[3] At the conclusion of a lake breeze event, winds usually revert to their original southwesterly direction unless the lake breeze event is ended by a synoptic wind shift such as a frontal passage. Monitored ozone concentrations tend to increase after the lake breeze reaches a monitor and typically drop sharply when the lake breeze ceases. The presence or absence of these wind shifts was the primary means of identifying the type of events that occurred. During "deep" lake breeze events, these shifts occurred at both inland and lakeshore monitors, whereas on "shallow" lake breeze days, they only occurred at the lakeshore monitor. Such shifts were absent on days without a lake breeze.

Figure C.2. Hourly ozone concentrations (top) and wind directions (bottom) for an example day (June 25, 2016) at the Sheboygan Haven monitor.[4] The red arrows show the onset and cessation of the lake breeze and when ozone concentrations rose and declined steeply. The blue box encloses the hours with a lake breeze.



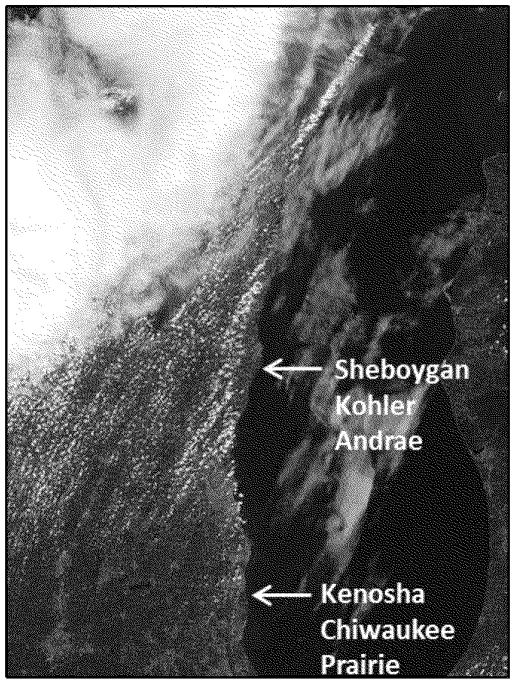
Moderate Resolution Imaging Spectroradiometer (MODIS) satellite images[5] were used to confirm lake breeze event types derived from the wind direction data. The MODIS satellite passes over the Lake Michigan region around 2:30 pm daily and collects visual images of the landscape. On days with a lake breeze and light cloud cover, lake breeze "fronts" can be seen as the interface between areas of clear skies towards the lake and light cloud cover to the west. The clear area is the area experiencing a lake breeze. On days with heavy cloud cover or no cloud cover, MODIS images cannot identify the presence or absence of a lake breeze front.

[3] This classification scheme only counted as "lake breeze" a wind pattern that held for at least 2-3 hours.
[4] Note that hours of the day are listed in Central Standard Time (CST), not in Central Daylight Time (CDT), and are listed under the time at the beginning of the collection period. For example, 1-hour average ozone listed for 1:00 pm CST includes ozone observations collected from 2:00 pm – 2:59 pm CDT.
[5] MODIS images were downloaded from http://ge.ssec.wisc.edu/modis-today/index.php.

The MODIS image in Figure C.3 shows a definite lake breeze in Sheboygan County and a probable narrow lake breeze in Kenosha County. It is notable that days with a shallow lake breeze did not show any obvious lake breeze in the MODIS images. If the lake breeze classification was not conclusive from the wind and MODIS data or if wind data was missing, additional confirmation was provided by examination of the synoptic meteorology of that day or from wind patterns at nearby airports or air quality monitors.

The distribution of high-ozone events determined by these classifications is shown in Table 4.1 of the TSD.

Figure C.3. MODIS satellite image for the afternoon of August 4, 2016 showing a definite lake breeze at Sheboygan and a likely lake breeze at Kenosha.



2.2. Ozone Concentration and Wind Direction Profiles for High-Ozone Event Types

Figure C.4 shows ozone concentration and wind direction profiles for each event type. These profiles show the averages (mean) values for all days in that event class. The average ozone concentration profiles were similar for all three classes of events at the lakeshore monitors. These profiles showed peak mean ozone concentrations of 69 ppb to 79 ppb in the afternoon. The highest mean peak lakeshore ozone concentrations were observed during shallow lake breeze events and the lowest during events without a lake breeze. However, the differences between these events were relatively small.

In contrast, ozone concentration profiles at the inland monitors varied dramatically between different types of events (Figure C.4). The greatest ozone concentrations at the inland monitors were observed during the deep lake breeze events. Shallow lake breeze events resulted in extremely low average peak mean inland ozone concentrations (52-60 ppb) when the peak lakeshore concentrations averaged 77 to 79 ppb – a concentration difference of 17 to 27 ppb. Inland concentrations were low for events without a lake breeze in Sheboygan County, but were relatively high for this type of event in Kenosha County. Overall, average inland concentrations tended to be higher at the inland Kenosha monitor relative to the Sheboygan monitor, as found in Section 4.2 of the TSD. These conclusions are consistent with those drawn based on Figure 4.6 in the TSD, which shows peak 1-hour ozone concentrations separated by ozone event type.

Figure C.4. Plots of mean hourly ozone concentrations (in ppb) and wind direction ("wd", in degrees) for Sheboygan County (left) and Kenosha County (right) monitors for high-ozone episodes with a deep lake breeze (top), a shallow lake breeze (middle), and no lake breeze (bottom).[4] Values for the lakeshore monitor are shown in blue and those for the inland monitor in green.

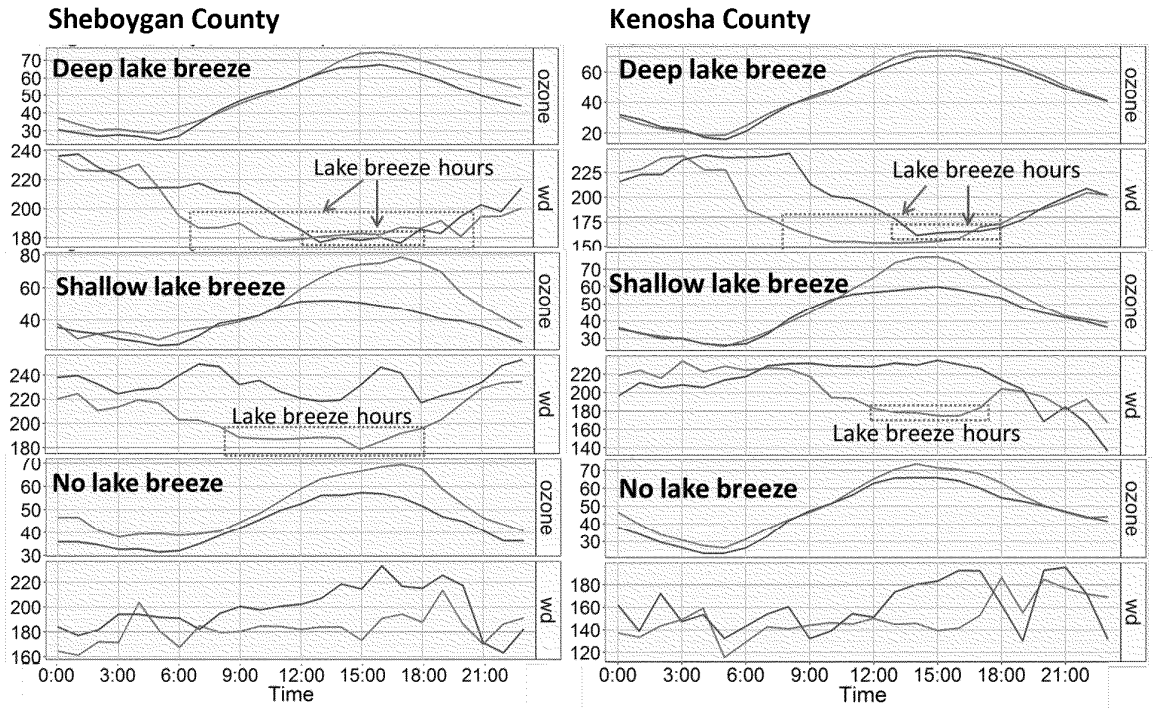


Figure C.4 also shows the wind shifts described earlier for lake breeze events. Events without a lake breeze typically had steady winds from the south (Sheboygan) or southeast (Kenosha) at the lakeshore monitor, although the wind patterns during events in this category were more variable than those in the other two.

During deep lake breeze events, the lower ozone concentrations at the inland monitors likely resulted from dilution of ozone-rich air via mixing with cleaner overlying air as the air moved inland from the lakeshore. Reaction of the ozone with surfaces on land also likely reduced ozone concentrations. On days with a shallow lake breeze, the ozone-enriched air from over the lake never even reached the inland monitor. Ozone concentrations at the inland monitors during most shallow lake breeze events may therefore reflect ozone concentrations in the absence of the influence of Lake Michigan.

3. Direct Overland Transport to the Inland Kenosha County Monitor

In addition to receiving ozone-enriched air via the lake breeze, the inland Kenosha Water Tower monitor also received some ozone via direct transport over land from the Chicago area. This transport was referred to in Section 4.3 of the TSD and is presented and discussed in greater detail here.

For the purposes of this analysis relative to the 2015 ozone NAAQS, days with direct overland transport were determined to be those days when ozone concentrations at the Kenosha Water Tower monitor were above 70 ppb during hours when the wind was coming from the south to southwest (e.g., from over the greater Chicago area), rather than from over the lake.[6] Over the four years that ozone was monitored at the Kenosha Water Tower monitor, five days met this criteria.[7] Of these five identified direct transport days, three were shallow lake breeze events and two were deep lake breeze events. On the days with a deep lake breeze, direct overland transport occurred prior to the onset of the lake breeze at the inland Kenosha Water Tower monitor.

HYSPLIT back trajectories for two of these direct transport days (June 19 and August 4, 2016) show that air parcels passed over much of the Chicago area prior to reaching the Kenosha Water Tower monitor (Figure C.5). Back trajectories for these days are shown as examples. During all five of the identified days, the air arrived at this monitor from the south-southwest to southwest (generally 210° to 230°) during the hours when direct transport was observed.

[6] The Chicago-Naperville-Joliet Metropolitan Statistical Area includes 9 counties in northeast Illinois, four counties in northwestern Indiana and Kenosha County in Wisconsin.
[7] However, wind data was not collected at this site during 2013 and half of 2015. It is possible additional direct transport days would have been identified had this data been available.

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Figure C.5. HYSPLIT back-trajectories for the inland Kenosha Water Tower monitor on two days with direct transport of ozone from the Chicago area. Back trajectories ended at two different elevations above ground level (in meters, m) at 1 PM and were projected backwards for 48 hours.

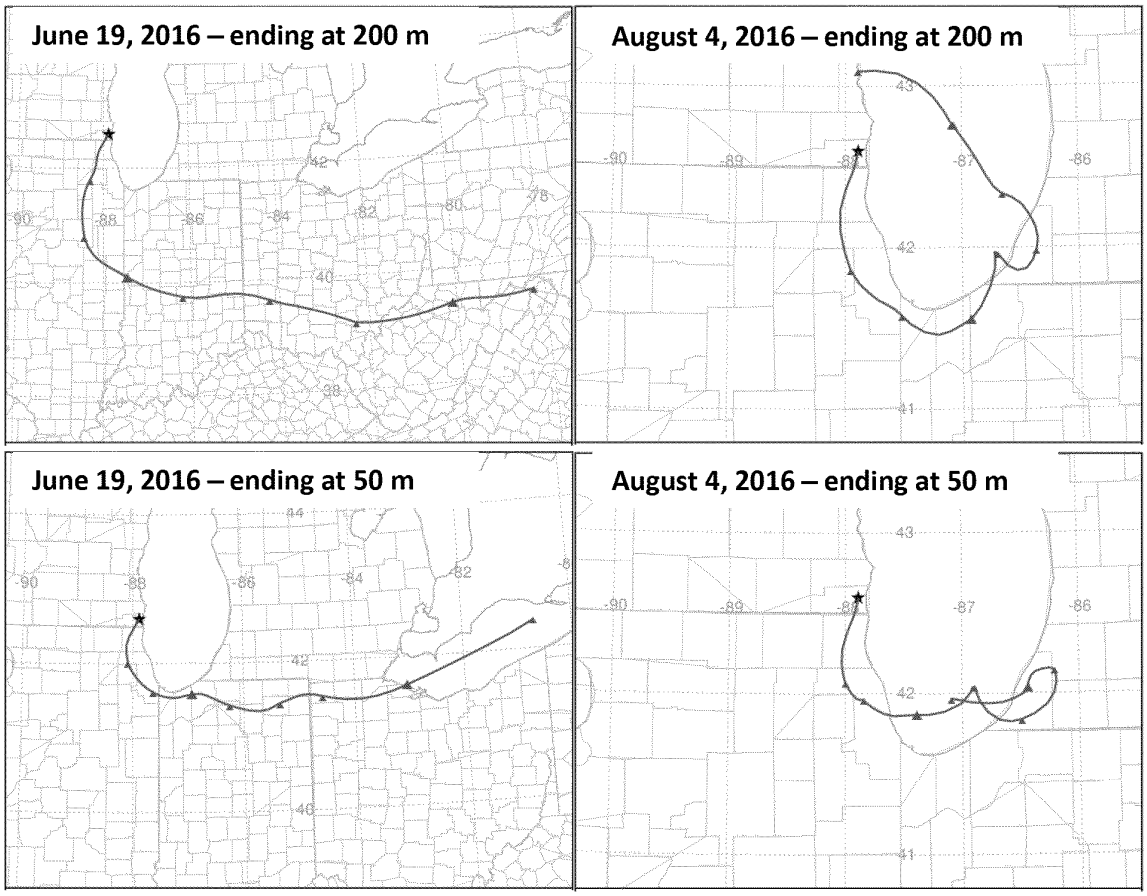
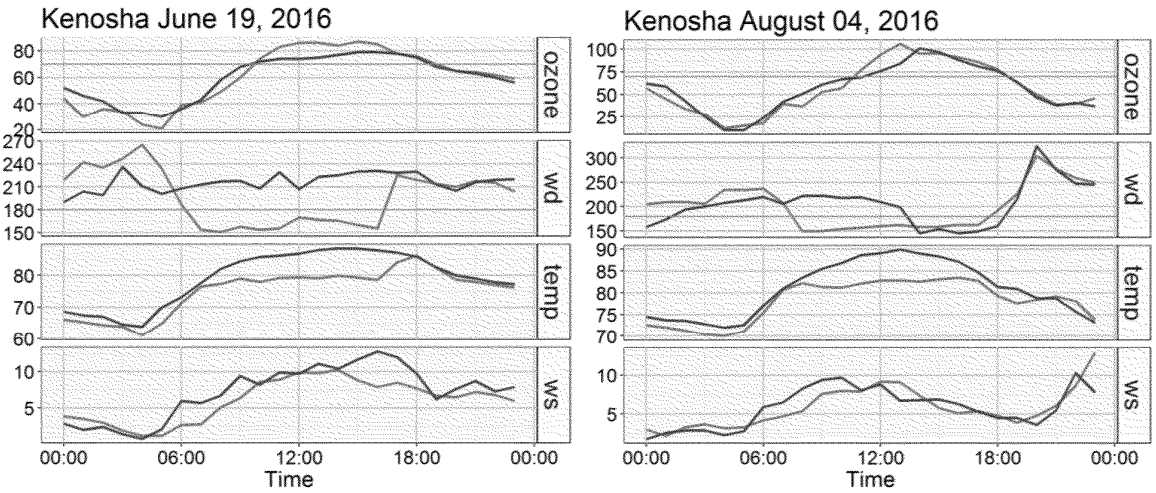


Figure C.6 shows how ozone concentrations, wind directions and other parameters changed at the two Kenosha County monitors during the two days shown in Figure C.5. Figure C.6 (left) shows an example shallow lake breeze day with direct overland transport of ozone to the inland Kenosha Water Tower monitor. On this day, the lake breeze reached the lakeshore Chiwaukee Prairie monitor in the morning and continued through most of the afternoon. In contrast, winds at the inland monitor remained steady from the south-southwest. Hourly ozone concentrations at the inland monitor reached 79 ppb, and hourly lakeshore concentrations reached 87 ppb.

Figure C.6 (right) shows a day with a deep lake breeze and direct transport of ozone from the Chicago area. On this day, the direct transport occurred during the morning and midday hours when winds at the Kenosha Water Tower monitor came from the south-southwest, before the lake breeze impacted this monitor. During the hours of direct transport, 1-hour ozone

concentrations at the inland monitor climbed to 84 ppb. Hourly ozone concentrations jumped even higher, to 101 ppb, when the lake breeze reached this monitor.

Figure C.6. Plots of hourly ozone concentrations (ppb), wind direction ("wd", in degrees), temperature ("temp", in °F), and wind speed ("ws", in miles/hour) at the two Kenosha monitors on two days with direct transport of ozone from the Chicago area to the inland Kenosha Water Tower monitor. June 19, 2016 had a shallow lake breeze, and August 4, 2016 had a deep lake breeze. Values for the lakeshore monitor are shown in blue and those for the inland monitor in green.



Temperatures on the days shown in Figure C.6 were very high, reaching 88 to 89 °F at the inland Kenosha Water Tower monitor. It appears that the south-southwesterly winds transported air containing ozone precursors from the Chicago area to Kenosha County, and the high temperatures facilitated the reaction of these precursors to form large amounts of ozone. Such transport occurred during both shallow and deep lake breeze events, with direct transport occurring before the lake breeze reached the inland monitor for the deep lake breeze events. The same patterns occurred on the other identified direct transport days, although both temperatures and ozone concentrations were lower on those days.

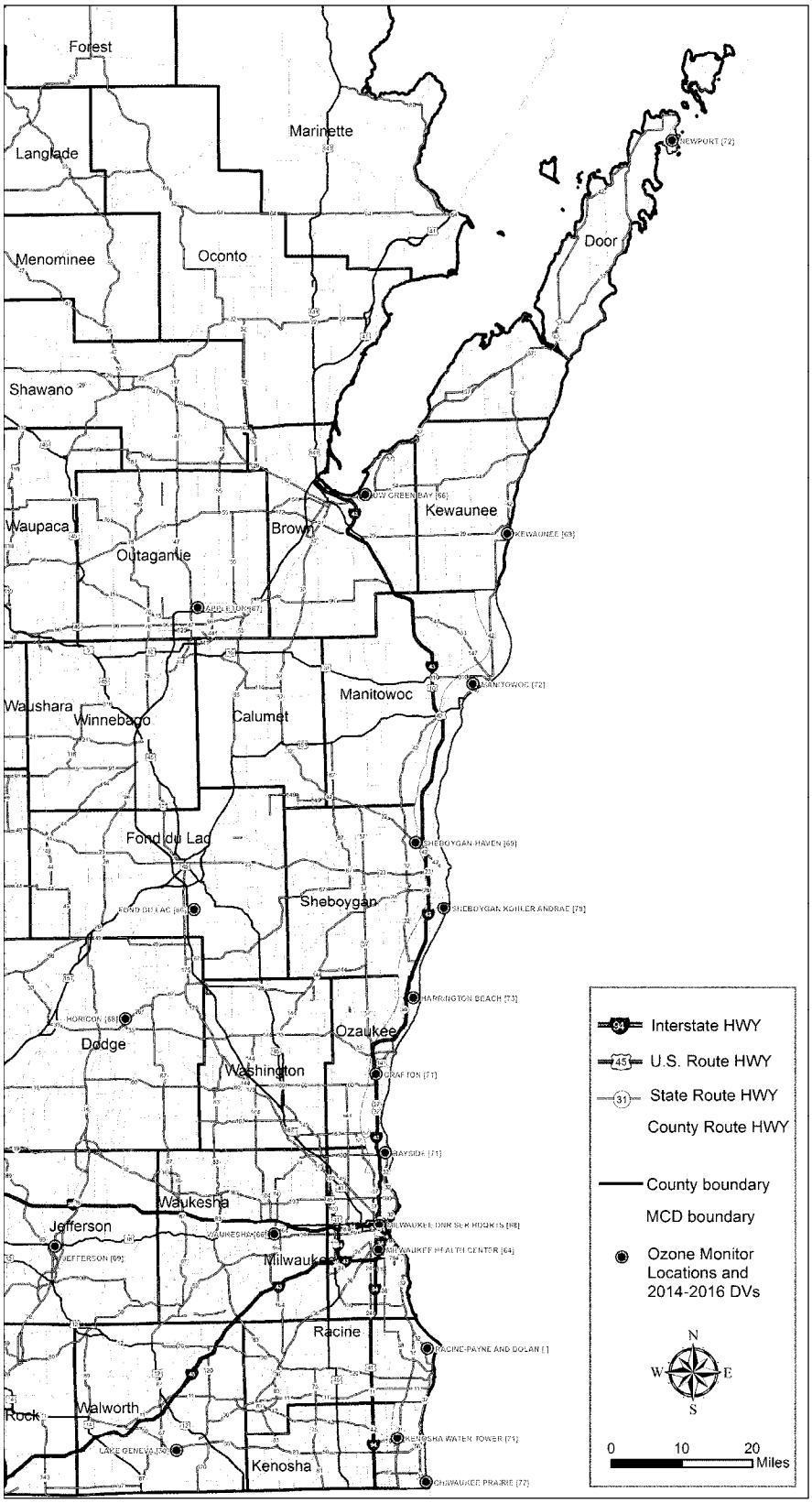
The two days shown in Figures C.5 and C.6 (August 4 and June 19) had the highest and fourth-highest maximum daily 8-hour average (MDA8) ozone concentrations of all days in 2016 at the Kenosha Water Tower monitor.[8] This shows that such direct transport events have an important impact on this monitor's design values, which are calculated from annual fourth-highest MDA8 values.

[8] The highest was on August 4, the fourth-highest was on June 19.

APPENDIX D

Map of the 70 ppb Ozone Design Value Contour

Figure D.1. Map of the 70 ppb design value contour along Wisconsin's Lake Michigan shoreline. The 70 ppb design value contour as described in Chapter 6 of the TSD is shaded. This graphic is identical to Figure 6.1 in the TSD. Page size is set to 11 x 17.



Indiana and EPA Rule and SIP Call Notes
September 15, 2016

Participants

EPA: Doug Aburano, Kathleen D'Agostino, Edward Doty, Charles Hatten, Joseph Ho, Michael Langman, Jennifer Liljegren, Chris Panos, Carolyn Persoon, Matt Rau, Steve Rosenthal, John Summerhays, Eric Svingen

IDEM: Lauren Aguilar, Susan Bem, Jean Boling, Brian Callahan, Scott Deloney, Mark Derf, Gale Ferris, Jack Harmon, Chris Pedersen, Jessica Reiss, Shawn Seals, Doug Wagner, Keelyn Walsh

Updates

SO_2 Implementation and Data Requirements Rule -
SABIC has requested a Commissioner's Order to establish permanent and enforceable SO_2 emission limits to ensure the facility-wide annual emissions are below the DRR emissions threshold of 2,000 tons of SO2 per year. SABIC's 2013-2015 hourly emissions data shows that the facility's COS vent oxidizer would exceed their proposed 415 pound per hour emission limit on the unit 0.3% of the time. Due to the nature of the operation of the COS vent oxidizer, EPA recommended the order establish an annual SO2 emissions cap based on a 12-month rolling average, rolled every 30 days to demonstrate annual SO2 emissions will remain below the DRR threshold and ensure continued attainment of the 1-hour SO_2 standard in the area surrounding the facility. Modeling will also be performed/provided as a technical supplement to the order to demonstrate that the cap is sufficient to ensure continued attainment of the standard. IDEM will provide a preliminary copy of the Commissioner's Order to EPA for review/comment.

Carmeuse has applied for a permit to modify their five kilns to burn natural gas and other fuels in order to demonstrate attainment of the 1-hour SO2 standard through modeling.

The ArcelorMittal - Burns Harbor SO2 monitoring site at the Port of Indiana should be up and running by the January 1, 2017 deadline.

Dearborn County (Lawrenceburg Township) $PM_{2.5}$ -
Redesignation petition and maintenance plan submitted to EPA for review/approval on August 19, 2016. EPA is in the process of reviewing the petition/preparing the proposed approval notice.

2012 $PM_{2.5}$ Transport Provision of ISIP -
IDEM is in the process of preparing an interstate transport analysis as a technical addendum to the SIP. The analysis should be completed and submitted to EPA by the end of the year.

Delaware County (Muncie, IN) Lead -
EPA is the process of preparing the proposed approval notice for the redesignation petition and maintenance plan. The approval notice will be sent to OGC for review/approval within the next couple of weeks. EPA asked about the occasional spikes in lead monitoring data that have occurred in 2016. IDEM mentioned that this is most likely attributable to fugitive lead dust being disturbed from road work taking place nearby. IDEM also mentioned that there was a power outage in January. Additional information will be provided to EPA to identify the spikes in lead concentration values in 2016 and identify what the spikes are attributable to, if possible.

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Dearborn County (Lawrenceburg Township) Ozone -
EPA is in the process of preparing the proposed approval notice for the redesignation petition and maintenance plan contingent upon revisions to Indiana's Emission Reporting Rule. The final rule was adopted at the August 10 Indiana Environmental Rules Board meeting and should be effective by no later than December.

Lake and Porter Counties Ozone (attainment demonstration, 15% plan, 3% contingency plan, NOx RACT) -
A call will be taking place with LADCO, Indiana, Illinois, and Wisconsin to discuss each states SIP submittal schedule. The NOx RACT will be an issue for Indiana. Based on the rulemaking process, Indiana would not be able to get a NOx RACT into place until early-2019. IDEM asked EPA if it would be feasible to request a NOx waiver contingent upon ozone monitoring data being below the standard after the SIP submittal deadline of January 1, 2017. EPA is looking into the applicability of the NOx RACT requirements if there were to be a violation of the standard after the SIP submittal deadline, but before the waiver approval is finalized.

2015 Ozone Designations -
IDEM is keeping track of 2016 monitoring data. No Indiana sites have violated the standard. The recommendations packet is in IDEM's internal review process and should be submitted to EPA by the end of next week. A Kentucky ozone monitor located in the Louisville area may exceed the 2015 8-hour ozone standard in 2016. If this is the case, Indiana will address the issue during the 120-day process.

Morgan County SO_2 Nonattainment Area -
A separate call will be scheduled to discuss the Morgan County attainment SIP and Indiana's efforts to redesignate the area.

Isolatek DRR Compliance Strategies -
No change.

Portside CSAPR Applicability Determination -
EPA will follow-up with the Clean Air Markets Division regarding the status of the CSAPR applicability determination.

Monitoring -
No change.

Next Call (date and time)
October 20, 2016, 9 am (Chicago), 10 am (Indianapolis)

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Status of Rule SIP Submittals

Ethanol Plant Clarification (11-99)
Submitted: 9/19/11
Staff: Pedersen
Status: 9/15/16: No change since 9/22/11.
9/22/11: Received, but on hold until EPA reconsiders the ethanol source definition policy.

AEP Rockport (12-392)
Submitted: 1/13/15
Staff: Bem, Rau
Status: 9/15/16: With Regional Administrator for signature.
8/18/16: Working on Sierra Club comments concerning modeling.
7/21/16: ORC approval is expected next week.
6/16/16: The draft final is with ORC.
5/19/16: Working on responses to comments from Louise Gross.
4/21/16: OGC is reviewing; should be done by mid-May.
3/17/16: Call scheduled to discuss comments.
2/18/16: No change.
1/28/16: Adverse comment received.
1/25/16: Comment period ends soon; no comments so far. Final is drafted.
12/28/15: Proposed rule published.
12/17/15: Signed and sent for publication.
11/23/15: With RA.
10/22/15: In signature chain.
9/17/15: No change since 7/16/15.
7/16/15 At ORC.
6/18/15: Notice drafted; to ORC in next few days.
5/21/15: No change.
4/16/15: Under review.
3/19/15: No change.
2/19/15: No update.

Shipbuilding and Ship Repair Antifoulant Coatings (14-441)
Submitted: 7/17/15
Staff: Bem, Svingen
Jeffboat Commissioners Order (2014-01)
Submitted: 10/23/14
Status: 9/15/16: No adverse comment received to date.
8/24/16: Withdrawal request for Jeffboat Commissioner's Order sent to EPA.
8/23/16: Direct final rule published; effective 10/24/16 unless adverse comment received by 9/22/16.
8/18/16: It is signed and sent for publication to the Federal Register. IDEM will finalize and send withdrawal letter for the Jeffboat Commissioners Order within a week.
7/21/16: ORC approval is expected next week.
6/16/16: With ORC.
5/19/16: It is in the signature chain. There are no issues, but IDEM to verify that Jeffboat is only source affected. Should publish in July. Commissioner's Order to be withdrawn.
4/21/16: Direct final approval being drafted. SIP submittal looks good. Commissioner's Order to be withdrawn when direct final rule publishes.
3/17/16: No change since 11/23/15.

11/23/15: Working on now.
10/22/15: No change since 8/27/15.
8/27/15: EPA to move forward with review of Shipbuilding and Ship Repair Antifoulant Coatings rule that will supersede Jeffboat Commissioners Order (CO). When rule is approved, Jeffboat CO will be withdrawn.
7/16/15: The Shipbuilding rulemaking should be sent this week.
6/18/15: Rule published 6/17/15. SIP submittal soon. TSD to be finished in next two weeks.
5/21/15: No change since 3/19/15.
3/19/15: EPA is holding off on approval, but will continue to review so that shipbuilding rule can be approved at same time.
2/19/15: EPA reviewing credits.
1/15/15: Only issue is question on credits. Susan forwarded question to Jay Koch for response.
12/18/14: No change.
11/24/14: Steve Rosenthal had question and will contact Jay Koch.

Abengoa Commissioner's Order (2015-01)
Submitted: 10/16/15
Staff: Bem, Liljegren
Status: 9/15/16: No adverse comments received. Rule effective 10/11/16.
8/18/16: No changes.
8/12/16: Direct final rule published; effective 10/11/16 unless adverse comment received by 9/12/16.
7/21/16: Should be signed next week. It will be a direct final rule.
6/16/16: Working on legal questions.
5/19/16: No change since 12/17/15.
12/17/15: At ORC.
11/23/15: Assigned to Jennifer Liljegren.
10/22/15: Submittal received.

SO_2 Emission Limits (11-356)
Submitted: 10/2/15
Staff: Bem, Summerhays
Status: 9/15/16: No change since 11/23/15.
11/23/15: Assigned to John Summerhays.
10/22/15: Submittal received. Rule is part of attainment demonstration.

Indiana Rules in Process

Asbestos (09-363)
Staff: Pedersen
Status: 9/15/16: No change since 10/22/15.
10/22/15: Jack Harmon working with program staff on draft rule language.
9/17/15: No change since 11/14/13.
11/14/13: Shadi Khoury resigned; rule will be reassigned.
9/19/13: No change.
8/22/13: Waiting on program staff input.
7/8/13: Rule reassigned to Shadi Khoury.
6/20/13: No change since 6/21/12.
6/21/12: IDEM working on draft.
5/17/12: No change since 9/22/11.

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9/22/11: Waiting on legal review.
8/11/11: Preparing for internal meetings.
6/23/11: On hold since 2/24/11, but will start again soon.
1/20/11: Second Notice in review.
11/18/10: Draft rule language in development since 2/17/10.
2/17/10: Drafting rule language.
1/20/10: No change since 11/18/09.
11/18/09: Manda is waiting on information from IDEM staff.
6/23/09: First Notice posted 6/3/09.

Stone Crushing SSOA (10-571)
Staff: Harmon
Status: 9/15/16: No change since 10/22/15.
10/22/15: Jack Harmon working with program staff. Draft will be submitted to EPA for comment.
9/17/15: No change since 5/21/15.
5/21/15: Jack Harmon is reviewing information to start rulemaking again.
4/16/15: No change since 6/19/14.
6/19/14: Working internally with program staff.
5/15/14: No change since 12/19/13.
12/19/13: Susan Bem reviewing.
11/14/13: Susann Brown resigned; Chris Pedersen is contact.
9/19/13: No change.
8/22/13: Draft rule language prepared based on calculations; being revised.
7/18/13: No change.
6/20/13: Susann Brown is starting to work on it.
5/16/13: No change since 3/24/11.
3/24/11: Working on language.
2/24/11: No change since 10/21/10.
10/21/10: Second Notice being drafted.
9/30/10: First Notice published on 9/15/10.
8/19/10: First Notice is in review.
7/22/10: First Notice is being drafted.

Source Specific Operating Agreements (11-315)
Staff: Pedersen
Status: 9/15/16: No change since 2/20/14.
2/20/14: Susann Brown resigned; Chris Pedersen is contact.
9/19/13: No change.
6/20/13: Susann Brown is starting to work on it.
5/16/13: No change since 6/23/11.
6/23/11: First Notice published 6/1/11.
5/26/11: First Notice scheduled for June 2011.

Permit By Rule (11-316)
Staff: Pedersen
Status: 9/15/16: No change since 2/20/14.
2/20/14: Susann Brown resigned; Chris Pedersen is contact.
9/19/13: No change.
6/20/13: Susann Brown is starting to work on it.
5/16/13: No change since 6/23/11.

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6/23/11: First Notice published 6/1/11.
5/26/11: First Notice scheduled for June 2011.

Startup, Shutdown, and Malfunctions (15-326)
Staff: Harmon
Status: 9/15/16: Preliminarily adopted 8/10/16; final adoption scheduled for 11/9/16. Will send parallel processing request after final adoption hearing.
7/21/16: Preliminary adoption scheduled for 8/10/16; final adoption likely to be 11/9/16. SIP Call deadline is 11/22/16, so parallel processing request may be needed. Discuss on next month's call.
6/16/16: No change.
5/19/16: Preliminary adoption scheduled for 8/10/16.
4/21/16: No change.
3/17/16: Second Notice publishes 3/30/16. EPA will respond on approval of language.
2/18/16: Jack Harmon provided clarifications to Mary Portanova. Mary said it is ok to proceed. Jack will let Mary know the anticipated status of the rulemaking for November as soon as it can be predicted.
1/25/16: Second Notice in review. Will send to Mary Portanova after internal review.
12/17/15: IDEM will send draft rule language to Mary Portanova for review when ready.
11/23/15: First Notice published on 9/30/15. Drafting Second Notice.

Non-Electric Generating Unit NOx Emissions (15-414)
Staff: Harmon
Status: 9/15/16: Clarifying draft language.
8/18/16: Will send draft rule language to Doug Aburano within 2 to 3 weeks for review.
7/21/16: Draft Second Notice being reviewed by program staff.
6/16/16: No change.
4/21/16: Internal meetings; Second Notice being drafted.
3/17/16: No change since 1/25/16.
1/25/16: Comments received, drafting Second Notice.
12/17/15: First Notice published 12/9/15. Copy will be sent to Doug Aburano.
11/23/15: Approved by OMB. First Notice should publish soon.

Volatile Organic Liquid Storage Tanks (15-427)
Staff: Harmon
Status: 9/15/16: In internal review.
8/18/16: Draft should be ready for Steve Rosenthal review in a few weeks.
7/21/16: Second Notice being drafted with help of Betsy Zlatos. Send copy of Second Notice to Steve Rosenthal after internal review.
6/16/16: No change since 2/18/16.
2/18/16: Second Notice still being drafted. The draft will be sent to EPA for review when ready.
1/25/16: No comments; Second Notice being drafted. Copy to Steve Rosenthal after internal review.
12/17/15: First Notice published 12/16/15.
11/23/15: Waiting for OMB approval to proceed with First Notice.

Emission Reporting for Lawrenceburg Township, Dearborn County (16-162)
Staff: Walsh
Status: 9/15/16: Final rule should be effective by December and will be submitted as soon as published.
8/18/16: Adopted 8/10/16. Final rule to be sent as soon as published (approximately 90 days).
7/21/16: No change since 5/19/16.
5/19/16: Adoption scheduled for 8/10/16.
4/21/16: Section 8 Notice will publish on 4/27/16.

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3/17/16: No change.
1/25/16: At OMB for review.
12/17/15: Notice in review.
11/23/15: Drafting Section 8 Notice for OMB submittal.

Cross State Air Pollution Rule (CSAPR) (16-209)
Staff: Aguilar
Status: 9/15/16: Second Notice tentatively to be ready in November.
8/18/16: No changes.
7/21/16: Second Notice should be drafted by October or November.
6/16/16: Meeting with affected sources in mid-July.
5/19/16: First Notice to publish 6/1/16.
5/16/16: OMB approval to proceed.

2016 CFR Update (16-208)
Staff: Walsh
Status: 9/15/16: Promulgation package sent to Attorney General on 9/13/16. Should be ready for submittal in December.
8/18/16: Adopted 8/10/16. SIP submittal to be sent after promulgation.
7/21/16: No change since 5/19/16.
5/19/16: Section 8 Notice to publish 5/25/16. Adoption scheduled for 8/10/16.
4/21/16: No change.
3/17/16: At OMB for review.
2/18/16: No change.
1/25/16: Draft notice in review.
12/17/15: No change.
11/23/15: Drafting Section 8 Notice for OMB submittal.

Short-Term Backup Units (16-309)
Staff: Harmon
Status: 9/15/16: Starting to draft rule language.
8/18/16: Comment period ends 8/19/16. One supporting comment received.
7/21/16: First Notice published on 7/20/16.
6/16/16: First Notice send to OMB today.
5/19/16: Internal discussions. Michael Langman will be contact.
4/21/16: Work beginning on First Notice draft.

Commercial and Industrial Solid Waste Incineration (CISWI) (xx-xxx)
Staff: Harmon
Status: 9/15/16: No change.
8/18/16: Making revisions.
7/21/16: No change since 5/19/16.
5/19/16: Incorporated EPA comments. Waiting on publication of new EPA rule.
4/21/16: Section 8 Notice drafted. Waiting to see if EPA makes additional changes by end of April.
3/17/16: With program staff for review.
2/18/16: No change.
1/25/16: Drafting notice and holding internal meeting.

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Outdoor Hydronic Heaters (16-332)
Staff: Walsh
Status: 9/15/16: No comments received to date.
8/18/16: First Notice published 8/17/16 for comment.
7/21/16: Submitted to OMB on 6/29/16.
6/16/16: No change.
5/19/16: First Notice being drafted.
4/21/16: Approved to start rule to address 3/16/15 NSPS and existing rule amendments.

NIPSCO Consent Decree Requirements (xx-xxx)
Staff: Reiss
Status: 9/15/16: Meeting with EPA and NIPSCO on force majeure language.
8/18/16: No change.
7/21/16: NIPSCO wants to meet with EPA and IDEM about issues, including force majeure language.
6/16/16: Three more issues to finalize before notice can be reviewed and go to OMB.
5/19/16: No change.
4/21/16: Revised draft sent back to NIPSCO attorney.
3/17/16: Reviewing comments from source attorney.
2/18/16: NIPSCO attorney to provide comments by end of February.
1/25/16: Comments from NIPSCO due by end of January.
12/17/15: No change.
11/23/15: Preparing OMB submittal.

2015 Ozone Standard (xx-xxx)
Staff: Walsh
Status: 9/15/16: No change.
8/18/16: At OMB for approval.
7/21/16: Draft Section 8 Notice in review.
6/16/16: Drafting Section 8 Notice.

State Plan Submittals

Lead NESHAP Delegation
Submitted: 1/8/14
Staff: Bem
Status:

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Non-Rule SIP Submittals

Pollutant	Activity		Status
CO	Nothing to report.		
Lead	Redesignation of Muncie-area, Delaware County, nonattainment area.		Redesignation petition and maintenance plan submitted April 14, 2016.
Nitrogen Dioxide	Nothing to report.		
Ozone	Redesignations		
		Lake/Porter Counties	Redesignation petition and maintenance plan submitted June 15, 2016. Based on partial/preliminary ozone monitoring data for 2016, the three year design value (2014-2016) for the Chiwaukee, WI monitor is above the 2008 standard. IDEM is in the initial stages of preparing an attainment demonstration and technical support document, including, 15% rate of progress plan, 3% contingency plan, and NOx RACT Analysis, for Lake and Porter counties.
		Lawrenceburg Township (Dearborn County)	Redesignation petition and maintenance plan submitted February 23, 2016. Supplement to recharacterize 2014 emissions inventory to include actual EGU and non-point emissions of point source category submitted May 4, 2016. Draft rulemaking for revision to Emissions Reporting Rule, LSA Document #16-162, published in the Indiana Register on April 27, 2016. Public comment period ended May 27, 2016. No public comments received. The rule was adopted at the August 10 Environmental Rules Board meeting and should be effective by December. Request to parallel process rule revisions to the Emissions Reporting Rule submitted June 1, 2016.
	2015 Standard Infrastructure SIP		Due to EPA on or before October 1, 2018.
	2015 Standard Designation Recommendations		Due to EPA on or before October 1, 2016.
Sulfur Dioxide	Round 1 Nonattainment Areas		Attainment demonstration submitted October 2, 2015; completeness letter received from EPA on February 25, 2016. Technical addendum for revisions to Indiana's State Implementation Plan for SO2 and attainment demonstration to incorporate changes to Rolls Royce within the Marion County nonattainment area was submitted May 2, 2016.
	Round 2 Designations (consent decree) Gibson, Rockport, Michigan City, Clifty Creek, and A.B. Brown generating stations		EPA designated Gibson, Jefferson (partial), LaPorte, Posey (partial), and Spencer (partial) counties as unclassifiable/attainment for the 2010 primary 1-hour SO2 standard as published in the *Federal Register (FR)* on July 12, 2016 (81 FR 45039).
	Redesignation of Clay and Washington Townships (Morgan County), nonattainment area.		EPA reviewed and provided comments on the preliminary draft of the redesignation petition and maintenance plan.
	Rounds 3 and 4 Designations (Data Requirements Rule)		Indiana's modeling and monitoring protocol submitted June 30, 2016. Modeling analyses or federally permanent/enforceable emission limits and compliance due by January 13, 2017.
Particulates	Lawrenceburg Township (part of Cincinnati NA area) Redesignations		EPA's proposed approval of the RACM/RACT analysis published in the Federal Register on August 25, 2016 (81 FR 58402). The rule will be effective on October 24, 2016, unless EPA receives adverse comments by September 26, 2016. Revised draft redesignation petition and maintenance plan completed. Public comment ended August 15, 2016. No public comments were received. Redesignation petition and maintenance plan submitted to EPA for review/approval on August 19, 2016.
	2012 Standard Infrastructure SIP		Infrastructure SIP submitted June 10, 2016. An interstate transport analysis that supports Indiana's fulfillment of Section 110(a)(2)(D)(i)(l) (Prong 1 and 2) and (ii) (Prong 4) requirements is being performed. This analysis is tentatively scheduled to be completed in late 2016.
Regional Haze	Five-Year Progress Report		Five-year progress report submitted March 30, 2016.

cc: Lauren Aguilar, Keith Baugues, Susan Bem, Jean Boling, Brian Callahan, Carol Comer, Scott Deloney, Mark Derf, Gale Ferris, Jack Harmon, Nancy King, Chris Pedersen, Bruno Pigott, Jessica Reiss, Shawn Seals, Don Snemis, Valerie Tachtiris, Doug Wagner, Keelyn Walsh, Betsy Zlatos, Doug Aburano (EPA Region V), Pam Blakley (EPA Region V), Louise Gross (EPA Region V), Chris Panos (EPA Region V), Steve Rosenthal (EPA Region V)

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Indiana Department of Environmental Management
We Protect Hoosiers and Our Environment.
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Michael R. Pence
Governor

Carol S. Comer
Commissioner

September 16, 2016

Mr. Robert A. Kaplan
Acting Regional Administrator
U.S. Environmental Protection Agency
Region 5
77 West Jackson Boulevard
Chicago, IL 60604-3608

Re: Recommendations Concerning Air Quality Designations for the Revised 2015 8-Hour Ozone National Ambient Air Quality Standard (NAAQS)

Dear Mr. Kaplan:

This letter is in response to U.S. Environmental Protection Agency's (U.S. EPA's) February 25, 2016 guidance memorandum concerning area designations for the 2015 8-hour ozone National Ambient Air Quality Standards. U.S. EPA's February 25, 2016, guidance memorandum states that air quality designations will be proposed in June of 2017 and final designations will be promulgated in October of 2017. The guidance indicates that states must submit their initial air quality designation recommendations to U.S. EPA by October 1, 2016.

The Indiana Department of Environmental Management (IDEM) is submitting Indiana's initial recommendations following a thorough analysis of the five factors identified by U.S. EPA in its guidance memorandum. Air quality data is among the five factors, and U.S. EPA has informed states that they should base recommendations on the most recent complete three consecutive years of quality-assured, certified air quality data available at the time initial recommendations must be submitted. Because quality-assured data from the 2016 ozone season is expected to be certified by May of 2017, U.S. EPA expects to base final air quality designation recommendations on 2014-2016 data. U.S. EPA has also informed states that they may update recommendations once 2016 data has met certification requirements.

Consistent with U.S. EPA guidance, IDEM has based its evaluations on quality-assured, certified ambient air quality data for 2013-2015 and quality-assured data for the 2014-2016 timeframe, both of which show that all monitors in Indiana are meeting the 2015 8-hour ozone NAAQS. Based on air quality data and a thorough examination of the additional factors, including emissions data, meteorology, geography/topography and jurisdictional boundaries, IDEM recommends all of the monitored counties in Indiana be designated attainment and all other counties within Indiana be designated as unclassifiable.

The following documents are enclosed to provide detailed data in support of Indiana's initial recommendations:

- Enclosure 1—List of Indiana counties with recommendations; map containing graphical representation of Indiana's recommendations
- Enclosure 2—Air quality data for all monitors in Indiana
- Enclosure 3—Indiana's assessment/technical support document

An electronic version of this letter in PDF format has been transmitted to Doug Aburano of U.S. EPA Region 5.

Consistent with U.S. EPA's February 2016 guidance, Indiana reserves the right to make necessary updates to its recommendations once 2016 monitoring data becomes certified. I would like to thank you for this opportunity to provide feedback to U.S. EPA regarding initial air quality designations under the 2015 8-hour ozone NAAQS. IDEM looks forward to continued coordination with Region 5 staff as the designation process moves forward. If you have any questions regarding Indiana's initial recommendations, please feel free to contact me at (317) 232-8611 or ccomer@idem.IN.gov, or Keith Baugues, Assistant Commissioner of IDEM's Office of Air Quality, at (317) 232-8222 or kbaugues@idem.IN.gov.

Sincerely,

Carol S. Comer
Commissioner

CSC/kb/sd/bc/gf/as
Enclosures

cc: Chris Panos, U.S. EPA Region 5 (no enclosures)
Steve Rosenthal, U.S. EPA Region 5 (no enclosures)
Doug Aburano, U.S. EPA Region 5 (no enclosures)
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File Copy (no enclosures)

Enclosure 1
List of Indiana Counties with Recommendations

As part of Indiana's initial recommendations for designations under the 2015 8-hour ozone NAAQS, IDEM is providing the alphabetical listing of counties and recommendations in Table 1-1 followed by a graphic representation in Figure 1-1.

Table 1-1: Alphabetical Listing of Indiana Counties with Initial Recommendations and Reason for Recommendations

County	Initial Recommendation for Designation under the 2015 8-Hour Ozone NAAQS	Reason for Initial Recommendation for Designation under the 2015 8-Hour Ozone NAAQS
Adams	Unclassifiable	No Monitor Data
Allen	Attainment	Monitor Value(s) Below Standard
Bartholomew	Attainment	Monitor Value(s) Below Standard
Benton	Unclassifiable	No Monitor Data
Blackford	Unclassifiable	No Monitor Data
Boone	Attainment	Monitor Value(s) Below Standard
Brown	Attainment	Monitor Value(s) Below Standard
Carroll	Attainment	Monitor Value(s) Below Standard
Cass	Unclassifiable	No Monitor Data
Clark	Attainment	Monitor Value(s) Below Standard
Clay	Unclassifiable	No Monitor Data
Clinton	Unclassifiable	No Monitor Data
Crawford	Unclassifiable	No Monitor Data
Daviess	Unclassifiable	No Monitor Data
Dearborn	Unclassifiable	No Monitor Data/Insignificant Contributor
Decatur	Unclassifiable	No Monitor Data
DeKalb	Unclassifiable	No Monitor Data
Delaware	Attainment	Monitor Value(s) Below Standard
Dubois	Unclassifiable	No Monitor Data
Elkhart	Attainment	Monitor Value(s) Below Standard
Fayette	Unclassifiable	No Monitor Data
Floyd	Attainment	Monitor Value(s) Below Standard
Fountain	Unclassifiable	No Monitor Data
Franklin	Unclassifiable	No Monitor Data
Fulton	Unclassifiable	No Monitor Data

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County	Initial Recommendation for Designation under the 2015 8-Hour Ozone NAAQS	Reason for Initial Recommendation for Designation under the 2015 8-Hour Ozone NAAQS
Gibson	Unclassifiable	No Monitor Data
Grant	Unclassifiable	No Monitor Data
Greene	Attainment	Monitor Value(s) Below Standard
Hamilton	Attainment	Monitor Value(s) Below Standard
Hancock	Attainment	Monitor Value(s) Below Standard
Harrison	Unclassifiable	No Monitor Data
Hendricks	Attainment	Monitor Value(s) Below Standard
Henry	Unclassifiable	No Monitor Data
Howard	Unclassifiable	No Monitor Data
Huntington	Attainment	Monitor Value(s) Below Standard
Jackson	Attainment	Monitor Value(s) Below Standard
Jasper	Unclassifiable	No Monitor Data/Insignificant Contributor
Jay	Unclassifiable	No Monitor Data
Jefferson	Unclassifiable	No Monitor Data
Jennings	Unclassifiable	No Monitor Data
Johnson	Attainment	Monitor Value(s) Below Standard
Knox	Attainment	Monitor Value(s) Below Standard
Kosciusko	Unclassifiable	No Monitor Data
LaGrange	Unclassifiable	No Monitor Data
Lake	Attainment	Monitor Value(s) Below Standard
LaPorte	Attainment	Monitor Value(s) Below Standard
Lawrence	Unclassifiable	No Monitor Data
Madison	Attainment	Monitor Value(s) Below Standard
Marion	Attainment	Monitor Value(s) Below Standard
Marshall	Unclassifiable	No Monitor Data
Martin	Unclassifiable	No Monitor Data
Miami	Unclassifiable	No Monitor Data
Monroe	Unclassifiable	No Monitor Data
Montgomery	Unclassifiable	No Monitor Data
Morgan	Attainment	Monitor Value(s) Below Standard
Newton	Unclassifiable	No Monitor Data/Insignificant Contributor
Noble	Unclassifiable	No Monitor Data
Ohio	Unclassifiable	No Monitor Data/Insignificant Contributor
Orange	Unclassifiable	No Monitor Data
Owen	Unclassifiable	No Monitor Data

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County	Initial Recommendation for Designation under the 2015 8-Hour Ozone NAAQS	Reason for Initial Recommendation for Designation under the 2015 8-Hour Ozone NAAQS
Parke	Unclassifiable	No Monitor Data
Perry	Attainment	Monitor Value(s) Below Standard
Pike	Unclassifiable	No Monitor Data
Porter	Attainment	Monitor Value(s) Below Standard
Posey	Attainment	Monitor Value(s) Below Standard
Pulaski	Unclassifiable	No Monitor Data
Putnam	Unclassifiable	No Monitor Data
Randolph	Unclassifiable	No Monitor Data
Ripley	Unclassifiable	No Monitor Data
Rush	Unclassifiable	No Monitor Data
St. Joseph	Attainment	Monitor Value(s) Below Standard
Scott	Unclassifiable	No Monitor Data
Shelby	Attainment	Monitor Value(s) Below Standard
Spencer	Unclassifiable	No Monitor Data
Starke	Unclassifiable	No Monitor Data
Steuben	Unclassifiable	No Monitor Data
Sullivan	Unclassifiable	No Monitor Data
Switzerland	Unclassifiable	No Monitor Data
Tippecanoe	Unclassifiable	No Monitor Data
Tipton	Unclassifiable	No Monitor Data
Union	Unclassifiable	No Monitor Data/Insignificant Contributor
Vanderburgh	Attainment	Monitor Value(s) Below Standard
Vermillion	Unclassifiable	No Monitor Data
Vigo	Attainment	Monitor Value(s) Below Standard
Wabash	Attainment	Monitor Value(s) Below Standard
Warren	Unclassifiable	No Monitor Data
Warrick	Attainment	Monitor Value(s) Below Standard
Washington	Unclassifiable	No Monitor Data
Wayne	Unclassifiable	No Monitor Data
Wells	Unclassifiable	No Monitor Data
White	Unclassifiable	No Monitor Data
Whitley	Unclassifiable	No Monitor Data

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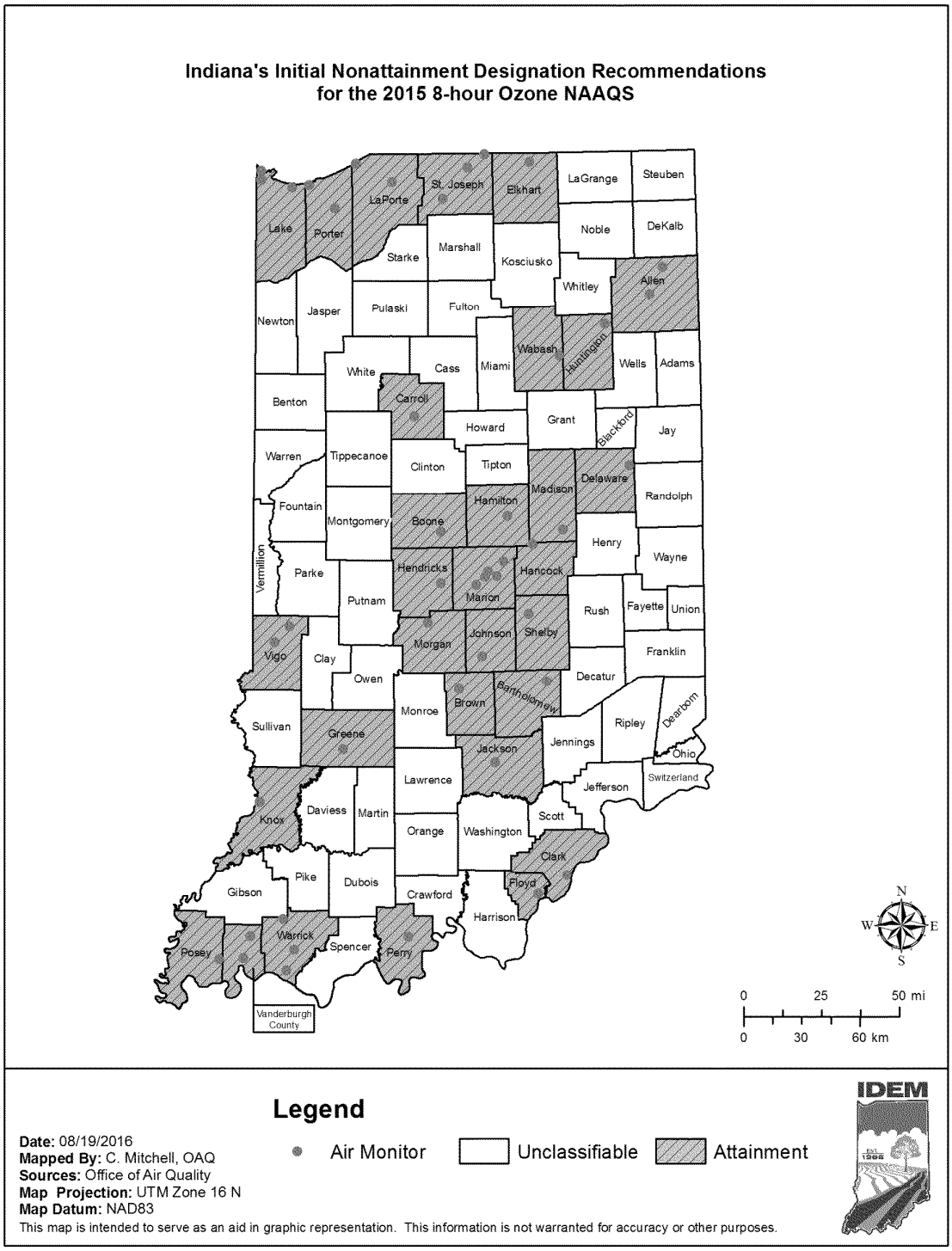
Figure 1-1: Map Showing Indiana Counties, Air Quality Monitors, and Initial Recommendations for Designations under the 2015 8-Hour Ozone NAAQS



Enclosure 2
Indiana Ozone Monitoring Data Summary
2005 - 2016 [a]

As part of Indiana's initial recommendations for designations under the 2015 8-hour ozone NAAQS, IDEM is providing air quality monitoring data for 2005 through 2016. Under the 2015 8-hour ozone NAAQS, attainment is determined by the average of the 4th highest daily maximum ozone value over a three-year period. This three-year average is called the Design Value. A monitor with a Design Value greater than 0.070 ppm is a violation of the 2015 8-hour ozone NAAQS.

Designations for the 2015 8-hour ozone NAAQS rely on a three-year average of ambient air monitoring data. States should base recommendations on the most recent complete three consecutive years of quality assured, certified air quality data available at the time initial recommendations must be submitted. Because data from the 2016 ozone season is expected to be certified and quality assured by May of 2017, U.S. EPA expects to base final decisions on 2014-2016 data. Indiana's evaluations are based on certified ambient air quality data for 2013-2015 and information for the 2014-2016 timeframe is included to the extent quality assured data for 2016 is available.

County	Site ID #	Site Name	4th Highest Ozone Value (ppm)												Three-Year Design Value (ppm)									
			2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016 [a]	05-07	06-08	07-09	08-10	09-11	10-12	11-13	12-14	13-15	14-16 [a]
Allen	180030002	Leo High School	0.086	0.073	0.077	0.066	0.065	0.065	0.070	0.077	0.062	0.063	0.062	0.066	0.078	0.072	0.069	0.065	0.066	0.070	0.069	0.067	0.062	0.063
Allen	180030004	Ft Wayne - Beacon Street	0.076	0.071	0.080	0.069	0.065	0.068	0.072	0.074	0.062	0.063	0.059	0.069	0.075	0.073	0.071	0.067	0.068	0.071	0.069	0.066	0.061	0.063
Bartholomew	180050007	Hope	Started operation June 1, 2013.								0.066 [b]	0.067	0.066	0.071	-----	-----	-----	-----	-----	-----	0.066 [b]	0.066 [b]	0.066 [b]	0.068
Boone	180110001	Whitestown	0.082	0.080	0.083	0.073	0.069	0.072	0.071	0.080	0.068	0.066	0.064	0.070	0.081	0.078	0.075	0.071	0.070	0.074	0.073	0.071	0.066	0.066
Brown	180130001	Helmsburg	Started operation May 14, 2014.									0.058 [b]	0.062	0.063	-----	-----	-----	-----	-----	-----	-----	0.058 [b]	0.060 [c]	0.061
Carroll	180150002	Flora	0.075	0.073	0.078	0.065	0.063	0.072	0.068	0.075	0.065	0.064	0.064	0.066	0.075	0.072	0.068	0.066	0.067	0.071	0.069	0.068	0.064	0.064
Clark	180190008	Charlestown State Park	0.080	0.079	0.090	0.075	0.067	0.077	0.082	0.085	0.067	0.066	0.074	0.072	0.083	0.081	0.077	0.073	0.075	0.081	0.078	0.072	0.069	0.070
Delaware	180350010	Albany	0.081	0.072	0.079	0.062	0.068	0.067	0.070	0.075	0.061	0.054	0.058	0.067	0.077	0.071	0.069	0.065	0.068	0.070	0.068	0.063	0.057	0.059
Elkhart	180390007	Bristol	0.086	0.067	0.082	0.068	0.061	0.065	0.072	0.075	0.055	0.055	0.058	0.072	0.078	0.072	0.070	0.064	0.066	0.070	0.067	0.061	0.056	0.061
Floyd	180431004	New Albany	0.080	0.076	0.082	0.075	0.063	0.072	0.080	0.087	0.068	0.066	0.065	0.073	0.079	0.077	0.073	0.070	0.071	0.079	0.078	0.073	0.066	0.068
Greene	180550001	Plummer	0.079	0.076	0.084	0.072	0.068	0.074	0.080	0.082	0.068	0.064	0.067	0.069	0.079	0.077	0.074	0.071	0.074	0.078	0.076	0.071	0.066	0.066
Hamilton	180570006	Noblesville - 191st Street	0.087	0.077	0.084	0.073	0.071	0.072	0.071	0.076	0.063	0.058	0.063	0.068	0.082	0.078	0.076	0.072	0.071	0.073	0.070	0.065	0.061	0.063
Hancock	180590003	Fortville	0.080	0.075	0.081	0.074	0.068	0.071	0.068	0.063	0.061	0.053	0.062	Disc.	0.078	0.076	0.074	0.071	0.069	0.067	0.064	0.059	0.058	Disc.
Hendricks	180630004	Avon	0.078	0.073	0.079	0.068	0.070	0.067	0.068	0.071	0.057	0.057	0.055	0.068	0.076	0.073	0.072	0.068	0.068	0.068	0.065	0.061	0.056	0.060
Huntington	180690002	Roanoke Elementary School	0.078	0.072	0.078	0.060	0.062	0.062	0.069	0.067	0.059	0.056	0.054	0.066	0.076	0.070	0.066	0.061	0.064	0.066	0.065	0.060	0.056	0.058
Jackson	180710001	Brownstown	0.077	0.075	0.078	0.070	0.063	0.069	0.067	0.065	0.063	0.064	0.064	0.070	0.076	0.074	0.070	0.067	0.066	0.067	0.065	0.064	0.063	0.066
Johnson	180810002	Trafalgar	0.077	0.078	0.080	0.069	0.071	0.070	0.068	0.074	0.062	0.056	0.063	0.062	0.078	0.075	0.073	0.070	0.069	0.070	0.068	0.064	0.060	0.060
Knox	180839991	Vincennes [e]	Started operation April 4, 2011.						0.077	0.079	0.064	0.062	0.063	0.071	-----	-----	-----	-----	0.077 [b]	0.078 [b]	0.073	0.068	0.063	0.065
Lake	180890022	Gary-IITRI	0.089	0.073	0.085	0.062	0.058	0.064	0.066	0.078	0.064	0.067	0.064	0.070	0.082	0.073	0.068	0.061	0.062	0.069	0.069	0.069	0.065	0.067
Lake	180890030	Whiting HS	0.088	0.081	0.088	0.062	0.062	0.069	0.069	0.081	0.062	0.065	0.070	Disc.	0.085	0.077	0.070	0.064	0.066	0.073	0.070	0.069	0.065	Disc.
Lake	180892008	Hammond - 141st St	0.087	0.075	0.077	0.068	0.065	0.069	0.072	0.077 [b]	0.063	0.067	0.060	0.068	0.079	0.073	0.070	0.067	0.068	0.072 [b]	0.070 [b]	0.069 [b]	0.063	0.065
LaPorte	180910005	Michigan City - W Michigan Blvd	0.084	0.075	0.073	0.059	0.066	0.070	0.080	0.100	0.069	0.070	0.067	0.039	0.077	0.069	0.066	0.065	0.072	0.083	0.083	0.079	0.068	0.058
LaPorte	180910010	LaPorte - E Lincolnway	0.089	0.069	0.078	0.065	0.063	0.067	0.070	0.079	0.064	0.061	0.061	0.068	0.078	0.070	0.068	0.065	0.066	0.072	0.071	0.068	0.062	0.063
Madison	180950010	Emporia	0.078	0.072	0.078	0.065	0.064	0.065	0.071	0.074	0.063	0.054	0.054	0.064	0.076	0.072	0.069	0.064	0.066	0.070	0.069	0.063	0.057	0.057

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Enclosure 2
Indiana Ozone Monitoring Data Summary
2005 - 2016 [a]

As part of Indiana's initial recommendations for designations under the 2015 8-hour ozone NAAQS, IDEM is providing air quality monitoring data for 2005 through 2016. Under the 2015 8-hour ozone NAAQS, attainment is determined by the average of the 4th highest daily maximum ozone value over a three-year period. This three-year average is called the Design Value. A monitor with a Design Value greater than 0.070 ppm is a violation of the 2015 8-hour ozone NAAQS.

Designations for the 2015 8-hour ozone NAAQS rely on a three-year average of ambient air monitoring data. States should base recommendations on the most recent complete three consecutive years of quality assured, certified air quality data available at the time initial recommendations must be submitted. Because data from the 2016 ozone season is expected to be certified and quality assured by May of 2017, U.S. EPA expects to base final decisions on 2014-2016 data. Indiana's evaluations are based on certified ambient air quality data for 2013-2015 and information for the 2014-2016 timeframe is included to the extent quality assured data for 2016 is available.

County	Site ID #	Site Name	4th Highest Ozone Value (ppm)												Three-Year Design Value (ppm)									
			2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016 [a]	05-07	06-08	07-09	08-10	09-11	10-12	11-13	12-14	13-15	14-16 [a]
Marion	180970042	Mann Road	0.076	0.074	0.080	Site discontinued.									0.077	Site discontinued.								
Marion	180970050	Indpls - Ft Harrison	0.080	0.076	0.083	0.075	0.073	0.072	0.077	0.075	0.059	0.066	0.069	0.073	0.079	0.078	0.077	0.073	0.074	0.074	0.070	0.066	0.064	0.069
Marion	180970057	Indpls - Harding St	0.081	0.076	0.076	0.067	0.067	0.068	0.068	0.077	0.062	0.066	0.061	0.069	0.077	0.073	0.070	0.067	0.067	0.071	0.069	0.068	0.063	0.065
Marion	180970073	Indpls - E 16th St	0.080	0.072	0.080	0.066	0.065	0.066	0.075	0.082	0.067	0.065	0.062	0.068	0.077	0.072	0.070	0.065	0.068	0.074	0.074	0.071	0.064	0.065
Marion	180970078	Indpls - Washington Park	Started operation April 1, 2009.				0.067	0.064	0.072	0.076	0.069	0.061 [b]	0.067	0.070	-----	-----	0.067 [b]	0.065 [b]	0.067	0.070	0.072	0.068 [b]	0.065 [b]	0.066
Marion	180970087	Indpls - I-70 E	Started operation May 4, 2014.									0.061	0.064	0.068	-----	-----	-----	-----	-----	-----	-----	0.061 [b]	0.062 [b]	0.064
Morgan	181090005	Monrovia	0.078	0.077	0.084	0.069	0.069	0.063	0.072	0.073	0.065	0.064	0.063	0.065	0.079	0.076	0.074	0.067	0.068	0.069	0.070	0.067	0.064	0.064
Perry	181230009	Leopold	0.086	0.079	0.080	0.073	0.065	0.072	0.074	0.081	0.064	0.067	0.067	0.069	0.081	0.077	0.072	0.070	0.070	0.075	0.073	0.070	0.066	0.067
Porter	181270024	Ogden Dunes	0.090	0.070	0.084	0.069	0.067	0.067	0.068	0.081	0.069	0.071	0.066	0.070	0.081	0.074	0.073	0.067	0.067	0.072	0.072	0.073	0.068	0.069
Porter	181270026	Valparaiso	0.078	0.071	0.080	0.061	0.064	0.061	0.063	0.067	0.063	0.067	0.060	0.071	0.076	0.070	0.068	0.062	0.062	0.063	0.064	0.065	0.063	0.066
Posey	181290003	St. Phillips	0.077	0.058	0.080	0.069	0.067	0.069	0.076	0.070	0.065	0.065	0.067	0.067	0.071	0.069	0.072	0.068	0.070	0.071	0.070	0.066	0.065	0.066
St. Joseph	181410010	Potato Creek State Park	0.078	0.069	0.075	0.063	0.060	0.060	0.064	0.070	0.057	0.059	0.058	0.069	0.074	0.069	0.066	0.061	0.061	0.064	0.063	0.062	0.058	0.062
St. Joseph	181410015	South Bend - Shields Dr	0.084	0.063	0.067	0.058	0.059	0.061	0.073	0.081	0.065	0.067	0.066	0.072	0.071	0.062	0.061	0.059	0.064	0.071	0.073	0.071	0.066	0.068
St. Joseph	181411007	Granger	0.086	0.070	0.082	0.069	0.062	0.060	0.071	0.077	Moved to Beckley St.				0.079	0.073	0.071	0.063	0.064	0.069	-----	-----	-----	-----
St. Joseph	181410016	Granger - Beckley St.	-----	-----	-----	-----	-----	-----	-----	-----	0.059	0.064	0.064	0.071	-----	-----	-----	-----	-----	-----	0.069	0.066	0.062	0.066
Shelby	181450001	Fairland	0.080	0.073	0.082	0.070	0.075	0.067	0.075	0.084	0.066	0.062	0.059	0.065	0.078	0.075	0.075	0.070	0.072	0.075	0.075	0.070	0.062	0.062
Vanderburgh	181630021	Evansville - Buena Vista	0.080	0.075	0.085	0.074	0.061	0.064	0.077	0.080	0.066	0.068	0.072	0.072	0.080	0.078	0.073	0.066	0.067	0.073	0.074	0.071	0.068	0.070
Vanderburgh	181630013	Inglefield	0.056	0.081	0.088	0.072	0.068	0.071	0.072	0.078	0.068	0.070	0.068	0.070	0.075	0.080	0.076	0.070	0.070	0.073	0.072	0.072	0.068	0.069
Vigo	181670018	Terre Haute - Lafayette Ave	0.064	0.060	0.077	0.059	0.058	0.063	0.067	0.075	0.061	0.062	0.064	0.069	0.067	0.065	0.064	0.060	0.062	0.068	0.067	0.066	0.062	0.065
Vigo	181670024	Sandcut	0.076	0.072	0.073	0.066	0.061	0.063	0.070	0.067	0.066	0.056	0.062	0.067	0.073	0.070	0.066	0.063	0.064	0.066	0.067	0.063	0.061	0.061
Wabash	181699991	Salamonie Reservoir [c]	Started operation June 1, 2011.						0.074 [b]	0.079	0.068	0.066	0.068	0.071	-----	-----	-----	-----	0.074 [b]	0.076 [b]	0.073 [b]	0.071	0.067	0.068
Warrick	181730008	Boonville	0.080	0.078	0.083	0.071	0.064	0.071	0.075	0.073	0.063	0.065	0.069	0.069	0.080	0.077	0.072	0.068	0.070	0.073	0.070	0.067	0.065	0.067
Warrick	181730009	Lynnville	0.076	0.070	0.080	0.064	0.064	0.070	0.072	0.075	0.061	0.064	0.062	0.072	0.075	0.071	0.069	0.066	0.068	0.072	0.069	0.066	0.062	0.066
Warrick	181730011	Dayville	0.077	0.078	0.076	0.060	0.057	0.070	0.072	0.081	0.066	0.066	0.065	0.071	0.077	0.071	0.064	0.062	0.066	0.074	0.073	0.071	0.065	0.067

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Enclosure 3

Technical Support Document

Indiana's Assessment of the 2015 8-Hour Ozone National Ambient Air Quality Standard (NAAQS)

October 1, 2016

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OVERVIEW

The purpose of this Technical Support Document is to support Indiana's initial recommendations for the designation of areas under the 2015 8-hour ozone National Ambient Air Quality Standard (NAAQS). Please note that because quality-assured, certified data for 2013-2015 show monitor violations in Core Based Statistical Areas (CBSAs) of neighboring states that include Indiana counties, assessments have been done for those areas.

Background

Ground level ozone is one of the six criteria air pollutants that scientists have identified as being particularly harmful to humans and the environment. Adverse health and environmental impacts associated with ground level ozone include respiratory impairment and damage to crops and forests. NAAQS have been developed for six criteria pollutants, including ground level ozone, and are used as measurements of air quality. The federal Clean Air Act (CAA) requires the United States Environmental Protection Agency (U.S. EPA) to set primary NAAQS at a level judged to be "requisite to protect the public health with an adequate margin of safety" and secondary NAAQS that are requisite to protect public welfare from "any known or anticipated effects associated with the pollutant in the ambient air," including effects on crops, vegetation, wildlife, buildings and national monuments, and visibility. U.S. EPA is responsible for conducting periodic reviews and may revise the NAAQS where updates are determined to be appropriate.

On October 1, 2015, U.S. EPA revised the primary and secondary 8-hour ozone NAAQS to 0.070 parts per million (ppm), retaining the annual fourth-highest daily maximum 8-hour concentration averaged over three years as the form of the standard[1]. The first step in implementing the 2015 8-hour ozone NAAQS is to designate which areas of the country do not meet the standard. By October 1, 2016, states must provide U.S. EPA with initial recommendations concerning nonattainment areas and boundaries. U.S. EPA intends to promulgate final designations under the 2015 8-hour ozone NAAQS by no later than October 1, 2017.

Ground-level ozone is not emitted directly into the air, but is created by chemical reactions with nitrogen oxides (NOx) and volatile organic compounds (VOCs) in the presence of sunlight. NOx is formed from the high-temperature reaction of nitrogen and oxygen during combustion processes in sources such as electric utility boilers, industrial fuel-burning sources and motor vehicles. VOCs include many industrial solvents and coatings as well as the hydrocarbons (HCs) that are emitted by motor vehicles as evaporative losses from gasoline and tailpipe emissions of unburned hydrocarbon. The formation of ozone is promoted by strong sunlight, warm temperatures and light winds. Elevated levels of the pollutant predominantly occur during the hot summer months.

[1] Federal Register, https://federalregister.gov/a/2015-26594e.

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Due to the fact that ozone is formed in the ambient air, control of ozone focuses upon reducing emissions of the precursors, NOx and VOCs. Areas where monitors record violations of the 2015 8-hour ozone NAAQS and areas determined to be contributing to recorded violations will both be designated as nonattainment areas. The use of already established air planning boundaries, where possible, will assure continued effective planning and implementation.

Technical Analysis

Indiana initiated its analysis with CBSA boundaries, consistent with historical nonattainment designations in Indiana (for example, the designation of the Michigan City-LaPorte, IN CBSA as a separate nonattainment area under the 1997 8-hour ozone NAAQS and the exclusion of the Michigan City-LaPorte, IN CBSA from the Chicago-Naperville, IL-IN-WI ozone nonattainment area for the 2008 8-hour ozone NAAQS). Analyses are based on the following five factors identified in U.S. EPA's February 25, 2016 memorandum *Area Designations for the 2015 Ozone National Ambient Air Quality Standards*:

1. Air quality monitoring data
2. Emissions and emissions-related data
3. Meteorological data and transport patterns
4. Geography and topography
5. Jurisdictional boundaries

Designations for the 2015 8-hour ozone NAAQS rely on a three-year average of ambient air monitoring data. States should base recommendations on the most recent complete three consecutive years of quality-assured, certified air quality data available at the time initial recommendations must be submitted. Because data from the 2016 ozone season is expected to be quality-assured and certified by May of 2017, U.S. EPA expects to base final decisions on 2014-2016 data. Therefore, the following evaluations are based on certified ambient air quality data for 2013-2015 as well as quality-assured data for the 2014-2016 timeframe. States may update recommendations once 2016 data has met certification requirements[2]. Indiana reserves the right to make necessary updates to its recommendations once 2016 monitoring data becomes certified.

Indiana's technical analysis follows in three sections:

- Northwestern Indiana (Jasper, Lake, Newton and Porter counties)
- Dearborn, Ohio and Union Counties
- All remaining Indiana counties

[2] U.S. EPA February 25, 2016, guidance memorandum, *Area Designations for the 2015 Ozone National Ambient Air Quality Standards*, https://www.epa.gov/sites/production/files/2016-02/documents/ozone-designations-guidance-2015.pdf.

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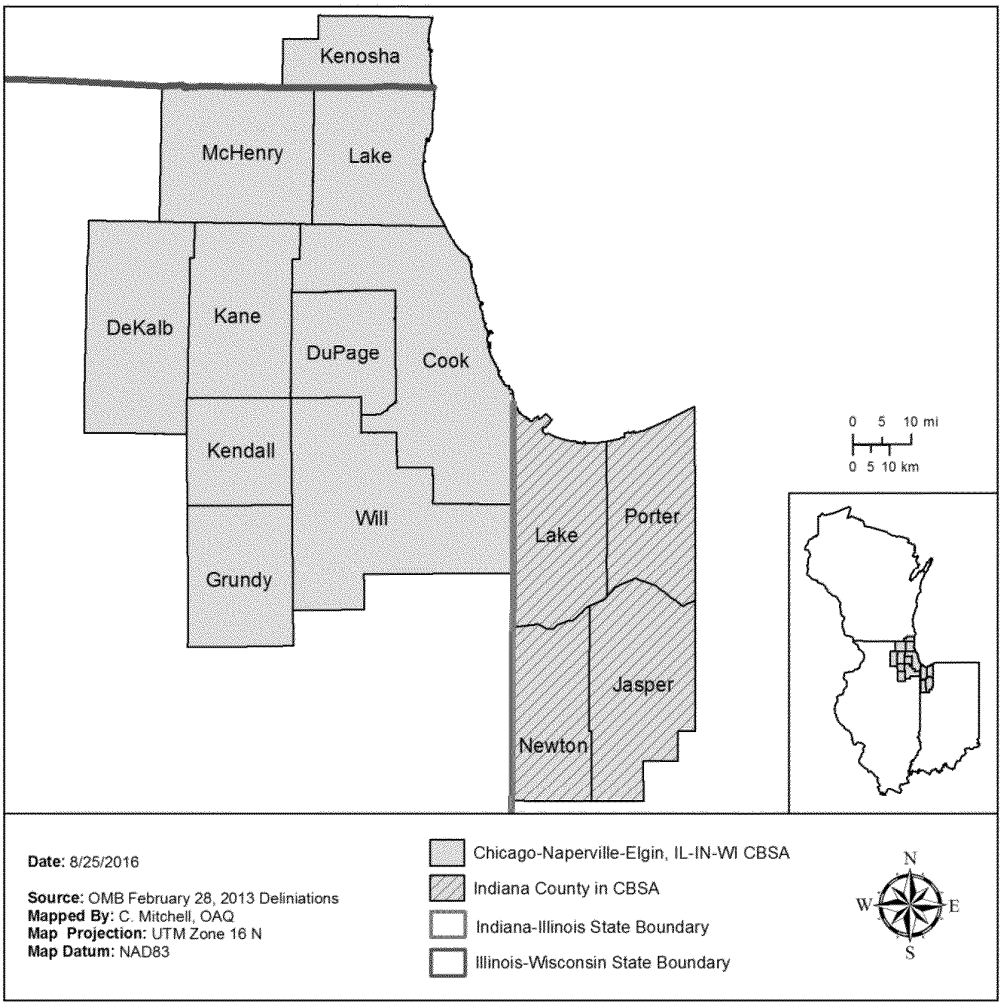
ANALYSIS FOR NORTHWESTERN INDIANA (JASPER, LAKE, NEWTON AND PORTER COUNTIES)

Introduction

Geographic Description

Northwestern Indiana includes Jasper, Lake, Newton and Porter counties. Lake and Porter counties are bordered by Lake Michigan on the north. Jasper and Newton counties are located to the south of Lake and Porter counties. The Chicago metropolitan area is located to the northwest. Jasper, Lake, Newton and Porter counties are part of the Chicago-Naperville-Elgin, IL-IN-WI CBSA along with several counties in Illinois and Wisconsin, as shown in *Figure A: Northwestern Indiana Area Map.*

Figure A: Northwestern Indiana Area Map



Designation History

Under the 1997 8-hour ozone NAAQS, U.S. EPA included Lake and Porter counties in the Chicago-Gary-Lake County, IL-IN nonattainment area due to measured violations throughout the region. Based on subsequent monitoring data showing the entire area's compliance with the NAAQS, U.S. EPA redesignated Lake and Porter counties to attainment on May 11, 2010. The 1997 8-hour ozone NAAQS was revoked, effective July 20, 2013.

U.S. EPA included Lake and Porter counties as part of the Chicago-Naperville, IL-IN-WI nonattainment area under the 2008 8-hour ozone NAAQS. Although three-year design values for monitoring sites in Lake and Porter counties have been meeting the 2008 8-hour NAAQS since the 2007-2009 timeframe, U.S. EPA included this portion of Indiana in the nonattainment area due to assumed contributions to violations in northeastern Illinois.

Summary of Analysis and Recommendation s

Indiana is recommending a designation of unclassifiable for both Jasper County and Newton County and attainment for both Lake County and Porter County under the 2015 8-hour ozone NAAQS. The five factor analysis follows.

Five Factor Analysis

1. Air Quality Monitoring Data

Indiana currently operates a total of four ozone monitors in Lake and Porter counties. (A fifth monitor, which was sited at Whiting High School from 2004 through 2015, was determined to be unnecessary and was discontinued beginning with the 2016 monitoring season.) There are no air quality monitors in Jasper or Newton counties. Seventeen ozone monitors are located within the greater Chicago-Naperville-Elgin, IL-IN-WI CBSA, making a total of 21 ozone monitoring sites in the three-state region.

The first step in assessing air quality data is to identify violating monitors. No monitors in the Indiana portion of the CBSA violated the 2015 8-hour ozone NAAQS for the 2013-2015 or, to date, for the 2014-2016 timeframes. Violations of the NAAQS occurred at two monitors near the Illinois/Wisconsin state border for the 2013-2015 timeframe. The violating monitors include the Illinois Beach State Park site (Zion Trailer) in Lake County, Illinois, which had a design value slightly over the standard at 0.071 ppm, and the Chiwaukee Prairie Stateline (Chiwaukee) site in Kenosha County, WI, which had a design value of 0.075 ppm. The 15 remaining monitors in the Illinois portion of the CBSA indicate attainment of the 2015 NAAQS.

Air quality data is provided in *Table 1: Northwestern Indiana Three-Year Design Values (2005-2016)*.

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Table 1: Northwestern Indiana Three-Year Design Values (2005-2016)

Site Name	County	Site #	Three Year Design Value				
			2005-2007	**2006-2008**	**2007-2009**	**2008-2010**	**2009-2011**
Gary – IITRI	Lake	180890022	0.082	0.073	0.068	0.061	0.062
Whiting HS	Lake	180890030	0.085	0.077	0.070	0.064	0.066
Hammond - 141st St.	Lake	180892008	0.079	0.073	0.070	0.067	0.068
Ogden Dunes	Porter	181270024	0.081	0.074	0.073	0.067	0.067
Valparaiso	Porter	181270026	0.076	0.070	0.068	0.062	0.062
Site Name	**County**	**Site #**	**Three Year Design Value**				
			2010-2012	**2011-2013**	**2012-2014**	**2013-2015**	**2014-2016***
Gary – IITRI	Lake	180890022	0.069	0.069	0.069	0.065	0.067
Whiting HS	Lake	180890030	0.073	0.070	0.069	0.065	Site Dis-continued
Hammond - 141st St.	Lake	180892008	0.072	0.070[a]	0.069[a]	0.063	0.065
Ogden Dunes	Porter	181270024	0.072	0.072	0.073	0.068	0.069
Valparaiso	Porter	181270026	0.063	0.064	0.065	0.063	0.066

** Based on preliminary 2016 quality-assured data.*
[a] Data considered incomplete.

2. Emissions and Emissions -Related Data

a. Emission Sources and Levels

2011 National Emissions Inventory (NEI) version 6.2 ozone precursor emissions data (NOx and VOCs) for northwestern Indiana counties is provided in *Table 2: Northwestern Indiana Emissions Inventories (Tons per Year)*. Data for the Illinois and Wisconsin portions of the CBSA are included in the table for comparison. Illinois sources contribute 74.3% of the area's NOx emissions and 81.2% of the area's VOC emissions. The magnitude of emissions from each area within the CBSA is illustrated in *Figure B: Northwestern Indiana Emissions Comparisons*.

In a comparison of northwestern Indiana counties, Lake County accounts for the largest percentages of precursor pollutants (NOx and VOCs). Jasper County emissions are generated primarily from the operation of the NIPSCO RM Schahfer Generating Station (NIPSCO-Schahfer) in Wheatfield, IN, which is the only major stationary source in the county. NIPSCO-Schahfer is regulated under the NOx SIP Call and Cross State Air Pollution Rule (CSAPR) and has been determined to not significantly impact monitors in Lake or Porter counties. Under a consent decree agreement with U.S. EPA, NIPSCO-Schahfer has been installing control technology on its four units that will result in an 80% reduction in NOx emissions and a 90% reduction in SO_2 emissions. Newton County does not have any major stationary sources and does not have a significant impact on air quality within northwestern Indiana.

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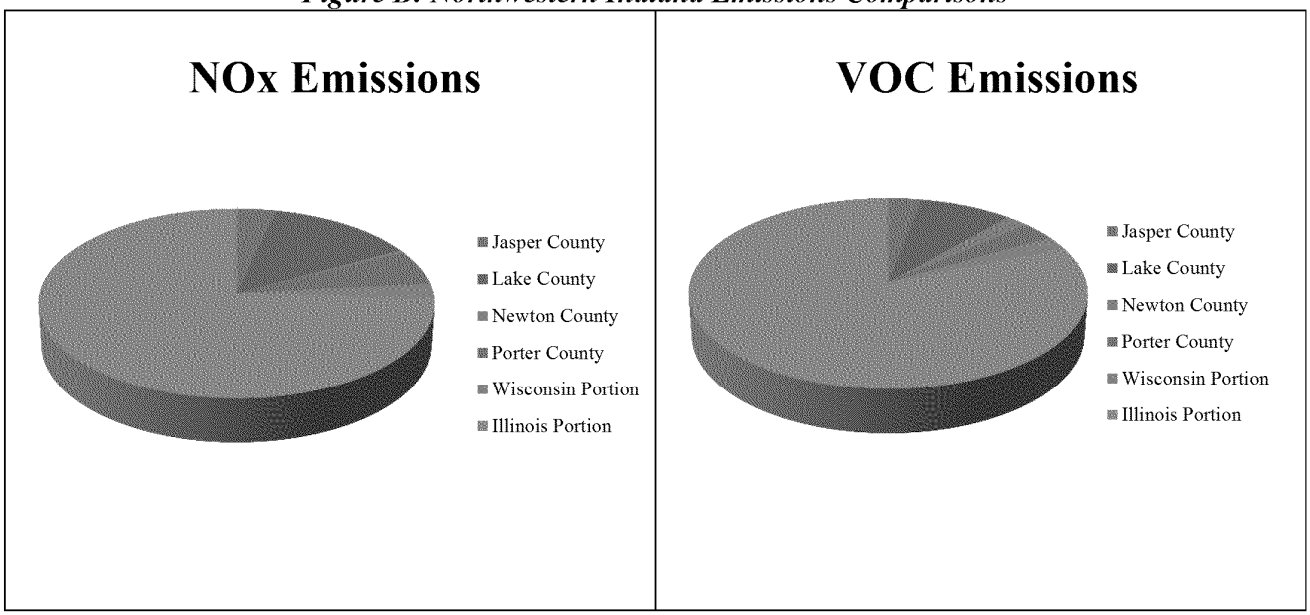
Table 2: Northwestern Indiana Emissions Inventories
(Tons per Year)

Source/Area	NO_x	Percent of CBSA	VOCs	Percent of CBSA
Jasper County	10,614	3.6%	6,125	3.0%
Lake County	38,823	13.3%	16,980	8.4%
Newton County	1,543	0.5%	4,381	2.2%
Porter County	17,531	6.0%	6,373	3.1%
Illinois Portion	216,761	74.3%	165,128	81.2%
Wisconsin Portion	6,608	2.3%	4,263	2.1%
Entire CBSA Totals	291,880	100%	203,250	100%

Figure B: Northwestern Indiana Emissions Comparisons



b. Control of Emission Sources

Effective programs and initiatives are in place to ensure the control of emissions from sources in northwestern Indiana. In fact, Lake and Porter counties are subject to the most stringent group of emission controls within the State of Indiana. Additionally, the permanent and enforceable controls in Lake and Porter counties are equally as stringent and, in some cases, even more stringent than elsewhere within the Chicago metropolitan area. As a result, northwestern Indiana has achieved significant and permanent air quality improvements, as air quality data shows.

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Indiana maintains a comprehensive, enhanced vehicle inspection and maintenance program in Lake and Porter counties that reduces on-road emissions from corporate, government, and privately-owned vehicles model years 1976 through 2012 (the four newest model years are exempted).

Northwestern Indiana will continue to see emission reductions from mobile and stationary sources as a result of rules including the NOx SIP Call, CSAPR, Tier 3 Motor Vehicle Emissions Standards and Gasoline Sulfur Control Requirements, the Highway Heavy-Duty Engine Rule, and the Non-Road Diesel Engine Rule. Most major stationary ozone precursor sources within northwestern Indiana are subject to reductions under the NOx SIP Call, CSAPR or RACT requirements. Additional significant regional NOx and VOC emission reductions following the implementation of Phase II NOx SIP Call and CSAPR and/or its replacement rule or program will ensure northwestern Indiana's compliance with the 2015 8-hour ozone NAAQS.

Indiana actively participates in regional air quality planning efforts sponsored by LADCO, with a shared goal of establishing a regional control strategy that provides for the attainment of the ozone and fine particle standards throughout the states of Illinois, Indiana, Michigan, Minnesota, Ohio and Wisconsin. Along with the other LADCO states, Indiana is developing local and statewide emission control measures where photochemical modeling and culpability analyses demonstrate a clear need. Cost effectiveness analyses justify the implementation of such measures. These actions will provide for an even greater margin of safety for northwestern Indiana and ensure continued maintenance with the standard well into the future. Furthermore, because this area is subject to transport, additional regional NOx and VOC reductions will ensure northwestern Indiana's compliance with the 2015 8-hour ozone NAAQS.

c. Population and Degree of Urbanization [3]

The vast majority of residents live in the Illinois portion of the CBSA. Within northwestern Indiana, Lake County has historically had the highest population and remains northwestern Indiana's most populated area; however, Lake County only comprised 5.2% of the entire CBSA population in 2010. Data indicates that a net growth of approximately 362,789 people occurred in the entire CBSA from 2000-2010. The Illinois portion of the CBSA accounted for a growth of 313,841 (87%) people compared with a growth of 32,099 (less than 9%) people in northwestern Indiana.

Population density is also a significant factor in determining degree of urbanization and magnitude of impacts on air quality. A comparison between northwestern Indiana's four counties shows Lake County to be the most concentrated but comparatively less so than other urbanized areas within the CBSA. For example, Cook County, Illinois had a population density more than five times greater than Lake County, Indiana in 2010.

Northwestern Indiana is projected to grow by 41,986 people between the years 2010 and 2025, compared with projected growth of 414,976 people in the Illinois portion of the

[3] Population and population density data obtained from U.S. Census Bureau, https://www.census.gov/.

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CBSA. Population figures for northwestern Indiana counties are provided in *Table 3: Northwestern Indiana Population Growth Rates, Patterns and Projections (2000-2025)*. Data for the Illinois and Wisconsin portions of the CBSA are included in the table for comparison. A complete breakdown of all counties in the CBSA is provided in *Table 4: Northwestern Indiana Population Density and Changes (2000-2010)*.

Table 3: Northwestern Indiana Population Growth Rates, Patterns and Projections (2000-2025)

Area	2000	2010	Percent of CBSA (2010)	2015	2020	2025	Overall Projected Change 2010- 2025
Jasper County	30,043	33,478	0.4%	35,008	36,323	37,536	12.1%
Lake County	484,564	496,005	5.2%	502,228	507,724	512,741	3.4%
Newton County	14,566	14,244	0.2%	14,080	13,854	13,567	-4.8%
Porter County	146,798	164,343	1.7%	172,563	179,751	186,212	13.3%
Illinois portion of the CBSA	8,272,768	8,586,609	90.7%	8,739,031	8,877,916	9,001,585	4.8%
Wisconsin portion of the CBSA	149,577	166,426	1.8%	170,700	181,975	191,635	15.1%
CBSA Total	9,098,316	9,461,105	100%	9,633,610	9,797,543	9,943,276	5.1%

Table 4: Northwestern Indiana Population Density and Changes (2000-2010)

Area	2000		2010		Change in Population Density 2000-2010
	Population	Density	Population	Density	
Indiana Counties					
Jasper	30,043	53.7	33,478	59.8	11.4%
Lake	484,564	975	496,005	994.1	2.0%
Newton	14,566	36.2	14,244	35. 5	-1.9%
Porter	146,798	351.1	164,343	393.0	11.9%
Illinois Counties					
Cook	5,376,741	5,685.6	5,194,675	5,495.1	-3.4%
DeKalb	88,969	140.3	105,160	166.6	18.7%
DuPage	904,161	2,710.3	916,924	2,799.8	3.3%
Grundy	37,535	89.4	50,063	119.8	34.0%
Kane	404,119	776.5	515,269	990.8	27.6%
Kendall	54,544	170.1	114,736	358.2	110.6%
Lake	644,356	1,439.7	703,462	1,585.6	10.1%
McHenry	260,077	430.9	308,760	511.9	18.8%
Will	502,266	600.1	677,560	809.6	34.9%
Wisconsin Counties					
Kenosha	149,577	548.2	166,426	611.9	11.6%

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d. Traffic, Commuting Patterns and Vehicle Miles Traveled

An examination of labor force data for Illinois[4], Indiana[5] and Wisconsin[6] indicates that northwestern Indiana contributes a small workforce in comparison with the entire CBSA. Illinois counties in the CBSA account for more than 4 million workers and 88.7% of the area's total workforce, as shown in *Table 5: Northwestern Indiana Commuting Patterns and Trends (2009-2013).*

Table 5: Northwestern Indiana Commuting Patterns and Trends (2009-2013)

Implied Resident Labor Force			Workers Who Live AND work in county		Workers Who Live in/Work Outside the County (Commuters)	
Area	**Actual Number**	**Percent of Entire CBSA**	**Actual Number**	**Percent of Implied Resident Labor Force**	**Actual Number**	**Percent of Implied Resident Labor Force**
Jasper County	21,528	0.5%	16,167	75.1%	5,362	24.9%
Lake County	295,378	6.5%	242,419	82.1%	52,959	17.9%
Newton County	9,344	0.2%	6,155	65.9%	3,189	34.1%
Porter County	107,638	2.4%	77,394	71.9%	30,243	28.1%
Illinois Portion of the CBSA	4,003,155	88.7%	2,976,674	74.4%	1,026,481	25.6%
Wisconsin Portion of the CBSA	78,252	1.7%	42,111	53.8%	36,141	46.2%
Entire CBSA	4,515,295	100%	3,360,920	74.4%	1,154,375	25.6%

Of the northwestern Indiana counties, Lake County has maintained the largest workforce and volume of traffic flow in and out of its borders. Commuter flow shown in *Figure C: Northwestern Indiana Commuting Flows (2014)* is typical of the flow in recent years.

[4] Illinois Department of Employment Security, http://www.ides.illinois.gov/LMI/Pages/Commuting_Patterns.aspx
[5] STATSIndiana, http://www.stats.indiana.edu/topic/commuting.asp
[6] Wisconsin Department of Workforce Development, http://worknet.wisconsin.gov/worknet_info/Publications/commuting.pdf

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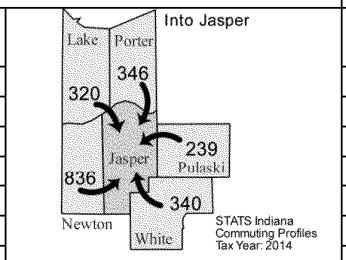
Figure C: Northwestern Indiana CommutingFlows (2014)

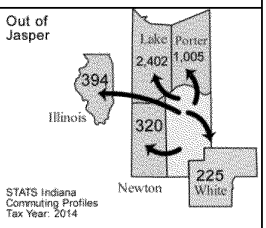
Top 5 counties sending workers into Jasper County

County Sending Workers	Workers
Newton County	836
Porter County	346
White County	340
Lake County	320
Pulaski County	239
Total of above	2,081
(10.6% of Jasper County workforce)	



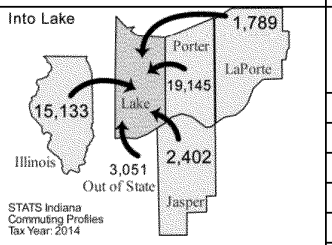
Top 5 counties receiving workers from Jasper County

County Receiving Workers	Workers
Lake County	2,402
Porter County	1,005
Illinois	394
Newton County	320
White County	225
Total of above	4,346
(20.1% of Jasper County labor force)	



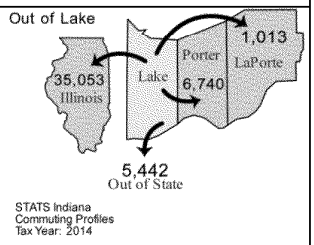
Top 5 counties sending workers into Lake County

County Sending Workers	Workers
Porter County	19,145
Illinois	15,133
Out of State	3,051
Jasper County	2,402
LaPorte County	1,789
Total of above	41,520
(14.5% of Lake County workforce)	



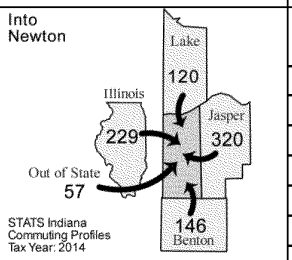
Top 5 counties receiving workers from Lake County

County Receiving Workers	Workers
Illinois	35,053
Porter County	6,740
Out of State	5,442
LaPorte County	1,013
Marion County	347
Total of above	48,595
(16.6% of Lake County labor force)	



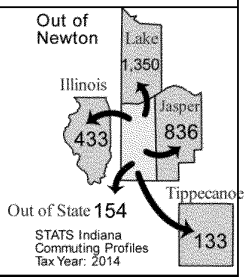
Top 5 counties sending workers into Newton County

County Sending Workers	Workers
Jasper County	320
Illinois	229
Benton County	146
Lake County	120
Out of State	57
Total of above	872
(12.1% of County workforce)	



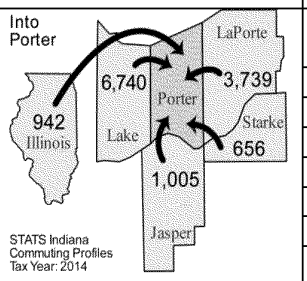
Top 5 counties receiving workers from Newton County

County Receiving Workers	Workers
Lake County	1,350
Jasper County	836
Illinois	433
Out of State	154
Tippecanoe County	133
Total of above	2,906
(31% of County labor force)	



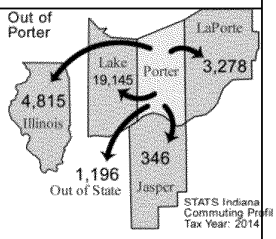
Top 5 counties sending workers into Porter County

County Sending Workers	Workers
Lake County	6,740
LaPorte County	3,739
Jasper County	1,005
Illinois	942
Starke County	656
Total of above	13,082
(13.6% of Porter County workforce)	



Top 5 counties receiving workers from Porter County

County Receiving Workers	Workers
Lake County	19,145
Illinois	4,815
LaPorte County	3,278
Out of State	1,196
Jasper County	346
Total of above	28,780
(25.8% of Porter County labor force)	



Source: STATSIndiana website, http://www.stats.indiana.edu/dms4/commuting.asp

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Lake County sent an average of 36,734 residents to work in Illinois from 2009-2013, as shown in *Table 6: Number of Commuters from Lake County into Illinois (2009-2013)*. That number amounts to less than 1% of the workforce in the Illinois portion of the CBSA. Based on northwestern Indiana commuting patterns and trends, it is safe to assume that cross-county mobile sources (for example, Porter County to Lake County) have very little to no impact on ozone concentrations in this area.

Table 6: Number of Commuters from Lake County into Illinois (2009-2013)

2009	2010	2011	2012	2013	Average
36,626	36,323	36,542	36,915	37,263	36,734

Vehicle miles traveled data for Illinois[7], Indiana[8] and Wisconsin[9] indicates that much of the area's vehicular traffic occurs in the Illinois portion of the CBSA. Figures are provided in *Table 7, Daily Vehicle Miles Traveled, Northwestern Indiana (2011, 2014)*. Lake County accounted for the largest daily vehicle miles traveled (DVMT) in northwestern Indiana and 8.2% of the entire CBSA in 2014. Porter County was shown to have the next highest DVMT in northwestern Indiana for 2014, totaling about half of the Lake County figure and making up 4.1% of entire CBSA.

Table 7: Daily Vehicle Miles Traveled, Northwestern Indiana (2011, 2014)

County	Year 2011	Percent of CBSA (2011)	Year 2014	Percent of CBSA (2014)	Percent Change 2011-2014
Indiana Portion of the CBSA					
Jasper	2,038,000	1.1%	2,351,900	1.2%	15.4%
Lake	16,226,000	8.5%	15,911,800	8.2%	-1.9%
Newton	662,000	0.3%	754,800	0.4%	14.0%
Porter	5,920,000	3.1%	7,892,800	4.1%	33.3%
Illinois Portion of the CBSA	160,913,472	84.8%	163,618,605	84.2%	1.7%
Wisconsin Portion of the CBSA	4,131,658	2.2%	3,720,750	1.9%	-9.9%
Entire CBSA	189,891,130	100%	194,250,655	100%	2.3%

[7] Illinois Department of Transportation, http://www.idot.illinois.gov/transportation-system/Network-Overview/highway-system/illinois-travel-statistics
[8] Indiana Department of Transportation, http://www.in.gov/indot/2469.htm
[9] Wisconsin Department of Transportation, http://wisconsindot.gov/Pages/projects/data-plan/veh-miles/default.aspx

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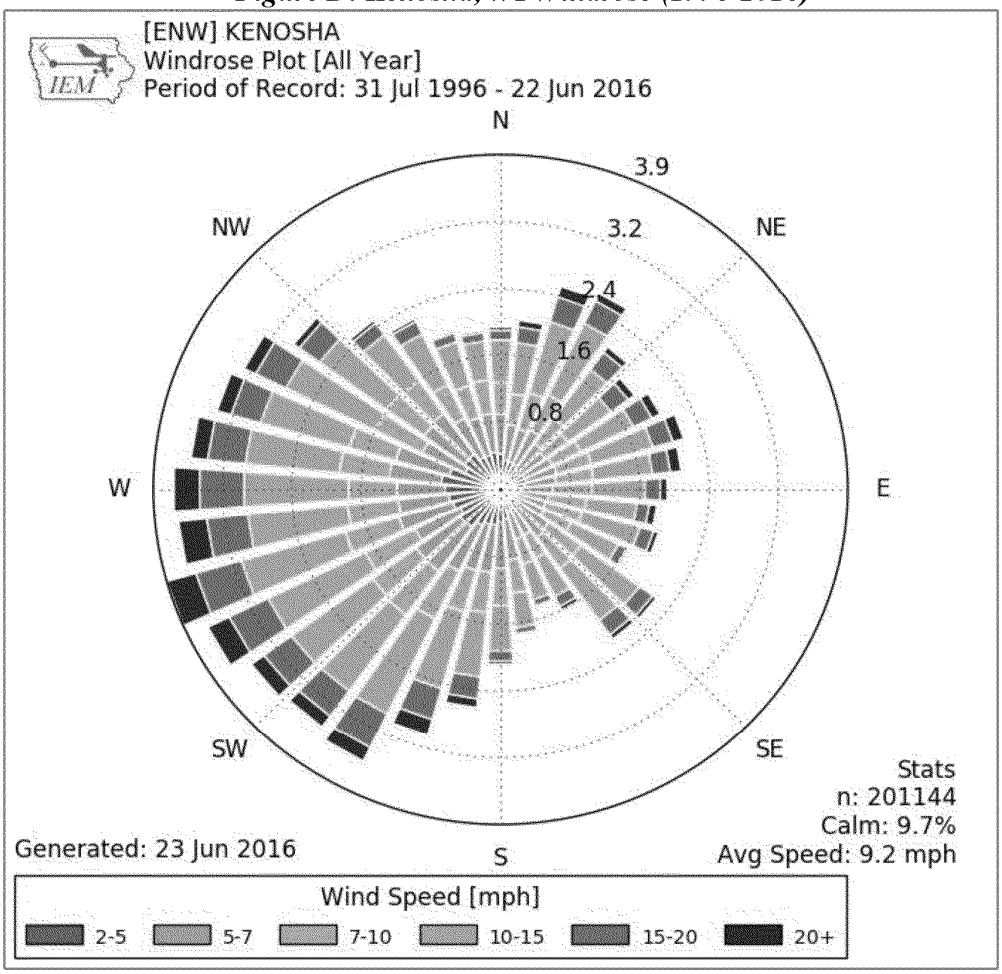
3. Meteorolog ical Data and T ransport Patterns

Based on quality-assured, certified data for 2013-2015 and preliminary quality-assured data for 2014-2016, monitors in northwestern Indiana attain the 2015 8-hour ozone standard. Ozone monitors located in northwestern Indiana's counties are typically impacted by emissions from Indiana and surrounding areas. Northwestern Indiana counties are prone to lake breezes and synoptic winds that bring Indiana emissions, as well as transported emissions, into the area. *Figure D: Kenosha, WI Windrose (1996-2016)* shows annual average wind directions and speeds recorded over the past 20 years at the Kenosha, WI surface weather observation station. Synoptic winds in this area are more likely to be from the west-southwest, while lake breezes tend to be easterly.

Figure D: Kenosha, WI Windrose (1996-2016)



Lake and Porter counties are located in a southeasterly direction, out of direction of the prevailing winds. Based on their proximity, Illinois and Wisconsin have overwhelming impacts on the Chiwaukee and Zion ozone monitors. Due to the distance Lake and Porter counties are from the Chiwaukee and Zion monitors, Indiana emissions mix with emissions

from other Midwest sources over Lake Michigan and would not likely have a major contribution to the Chiwaukee and Zion ozone monitors. Ozone precursor emissions over Lake Michigan are overwhelmingly dominated by Illinois' mobile sources. Lake and Porter counties in Indiana comprise only a minor fraction of the total emissions that lead to ozone formation over the lake that ultimately impacts shoreline monitors in the CBSA. Indiana does not have the jurisdiction to address the most significant causes of ozone formation within the Chicago CBSA. The largest contributors to the area's nonattainment fall outside of Indiana's jurisdictional boundaries within the states of Illinois and Wisconsin.

4. Geography/ Topography

There are no unique geographical or topographical features within the northwestern Indiana region that limit the transport of pollutants. However, meteorological patterns over a large body of water such as Lake Michigan may have unique impacts on the transport of pollutants and ozone formation at shoreline areas. Ozone that forms over Lake Michigan can be transported in all directions based on changes in temperatures, wind speed, and wind direction throughout the day, resulting in "lake effect" impacts at shoreline monitors. Because elevated ozone levels can be isolated and occur with no consistent pattern, violations at shoreline monitors pose a unique challenge from an air quality mitigation perspective. The two violating monitors in the northeastern portion of the CBSA are located on the shoreline and seem to be the only sites impacted severely by lake breezes and transport.

5. Jurisdictional Boundaries

Jasper, Newton, Lake and Porter counties are included in the Chicago-Naperville-Elgin, IL-IN-WI CBSA. However, transportation conformity and SIP planning for Lake and Porter counties are conducted independently due to limitations of jurisdictional authority. The Northwestern Indiana Regional Planning Commission serves as the area planning agency, which includes Lake and Porter counties.

Conclusion and Recommendations for Northwestern Indiana (Jasper, Lake, Newton and Porter Counties)

To provide a basis for Indiana's initial recommendations for northwestern Indiana under the 2015 8-hour ozone NAAQS, IDEM has evaluated the following factors: three complete years of quality-assured certified ambient air monitoring data for 2013-2015 and quality-assured data for 2014-2016; 2011 National Emissions Inventory data; data on population and population density; commuting trends and patterns; daily vehicle miles traveled; meteorology and transport patterns; geography and topography; and jurisdictional boundaries.

A total of 21 ozone air monitors are located in the Illinois, Indiana and Wisconsin portions of the CBSA. Data shows that 15 monitors in the Illinois portion of the CBSA are attaining the standard and two monitors near the Illinois/Wisconsin state border are in violation. No monitors in the Indiana portion of the CBSA violated the 2015 8-hour ozone NAAQS for the 2013-2015 timeframe or the 2014-2016 timeframe, to date.

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NEI data from 2011 shows northwestern Indiana counties contribute a small percentage of the total CBSA's emissions in comparison with the large overall impact from the Illinois portion of the CBSA. Newton County does not have any major stationary sources of ozone precursors, nor does it contribute to ozone impacts in northwestern Indiana. Jasper County accounts for only 3.6% of NOx and 3% of VOC emissions in the CBSA. New technology being installed at the NIPSCO-Schahfer power plant, Jasper County's only major source of ozone precursor emissions, will result in an 80% reduction in NOx emissions. Lake County, northwestern Indiana's most industrialized county, accounts for 13.3% of NOx and 8.4% of VOC emissions in the CBSA compared with Illinois' contribution of 74.3% of the area's NOx emissions and 81.2% of the area's VOC emission. Northwestern Indiana has achieved permanent and significant emissions reductions due to the implementation of regulations and control measures aimed at ensuring compliance under the 1997 and 2008 8-hour ozone NAAQS. Many of these regulations are more stringent than those in other areas of Indiana, other areas of the CBSA, and many areas of the United States. In addition to attaining the current standard, modeling shows that northwestern Indiana will make additional progress as a result of the implementation of CSAPR.

Northwest Indiana has a comparatively small population when compared to the CBSA as a whole; comprising just 7.5% of the population of the CBSA in 2010. Due to its comparatively small population, Northwest Indiana is a minor factor for air quality impacts within the CBSA. While Lake County is the most densely populated county within Indiana's portion of the CBSA, Lake County's population density was still only one-fifth that of Cook County, Illinois. Also, the Indiana portion of the CBSA accounts for a small percentage of the CBSA's workforce (an average of 9.6% from 2009-2013) and vehicular traffic (13.9% in 2014), thus contributing comparatively small impacts to the CBSA.

As mentioned above, violations of the NAAQS occurred at two monitors in the CBSA near the Illinois/Wisconsin state border for the 2013-2015 timeframe. The violating monitors are located at the Illinois Beach State Park site (Zion Trailer) in Lake County, Illinois, which had a design value slightly over the standard at 0.071 ppm, and the Chiwaukee Prairie Stateline (Chiwaukee) site in Kenosha County, WI, which had a design value of 0.075 ppm. While there are no geographical or topographical features in northwestern Indiana to affect the transport of pollutants, these shoreline monitors are subject to unique meteorological contributions attributable to Lake Michigan. Lake Michigan has a large impact on elevated ozone concentrations at the shoreline monitors in the area. The influence from Lake Michigan on ozone development and transport is profound: ozone and ozone precursors tend to collect over the lake as a result of synoptic or off-shore breezes. This can cause photochemical reactions which create ozone, which in turn can be transported onshore when meteorological conditions become conducive for a lake breeze to develop. An analysis of 20 years of data from the Kenosha, WI surface weather observation station indicates synoptic winds in the area are more likely to be west-southwesterly, while lake breezes tend to be easterly. Lake and Porter counties are located in a southeasterly direction from the violating monitors. The violations at the shoreline monitors in northeastern Illinois are generally related to the development of lake breezes. Northwest Indiana, being to the southeast of the violating monitors, has a minimal contribution.

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Due to limitations of jurisdictional authority, transportation conformity and the development of State Implementation Plans are addressed independently. The largest contributors of ozone precursors fall outside of Indiana's jurisdictional boundaries within the states of Illinois and Wisconsin. Indiana has and will continue to use its authority to address transportation conformity and SIP planning within state boundaries, ensuring effective coordination and communication between U.S. EPA, IDEM, northwestern Indiana communities, and appropriate officials in affected areas outside of Indiana's jurisdiction. IDEM believes that the Northwestern Indiana Regional Planning Commission, which operates at the local level, demonstrates a commitment to compliance, in coordination with state, federal and local officials. Additionally, IDEM's Office of Air Quality staff works closely with U.S. EPA Region 5 to ensure Indiana meets its commitments and complies with the requirements of the federal Clean Air Act.

The overall impact from the northwestern Indiana counties in the CBSA is dwarfed by the magnitude of impacts from the Illinois portion of the CBSA. Jasper and Newton counties are essentially rural in nature, do not have measured air quality above the 2015 8-hour ozone NAAQS, and are not contributing to ozone in Lake and Porter counties or the Chicago metropolitan area. Lake and Porter counties have achieved significant and permanent improvements in air quality, based on quality-assured certified 2013-2015 data and quality-assured 2014-2016 data showing the area's attainment of the 2015 8-hour ozone NAAQS. Indiana has been and will continue working with federal, state and local entities to ensure the protection of public health and the environment. Indiana believes that nonattainment boundaries should be limited to areas that actually have a three-year design value above the NAAQS. Section 107(d)(4)(A)(iv) of the federal Clean Air Act does not require nonattainment boundaries for areas classified as marginal or moderate to be based on metropolitan statistical boundaries. For these reasons, Indiana is recommending a designation of unclassifiable for Jasper County and Newton County and attainment for Lake County and Porter County under the 2015 8-hour ozone NAAQS as show in *Table 8: Initial Recommendations for Northwestern Indiana.*

Table 8: Initial Recommendations for Northwestern Indiana

Lake County*, Porter County*	Attainment
Jasper County, Newton County	Unclassifiable

**Indicates counties in which Indiana operates one or more ozone monitors.*

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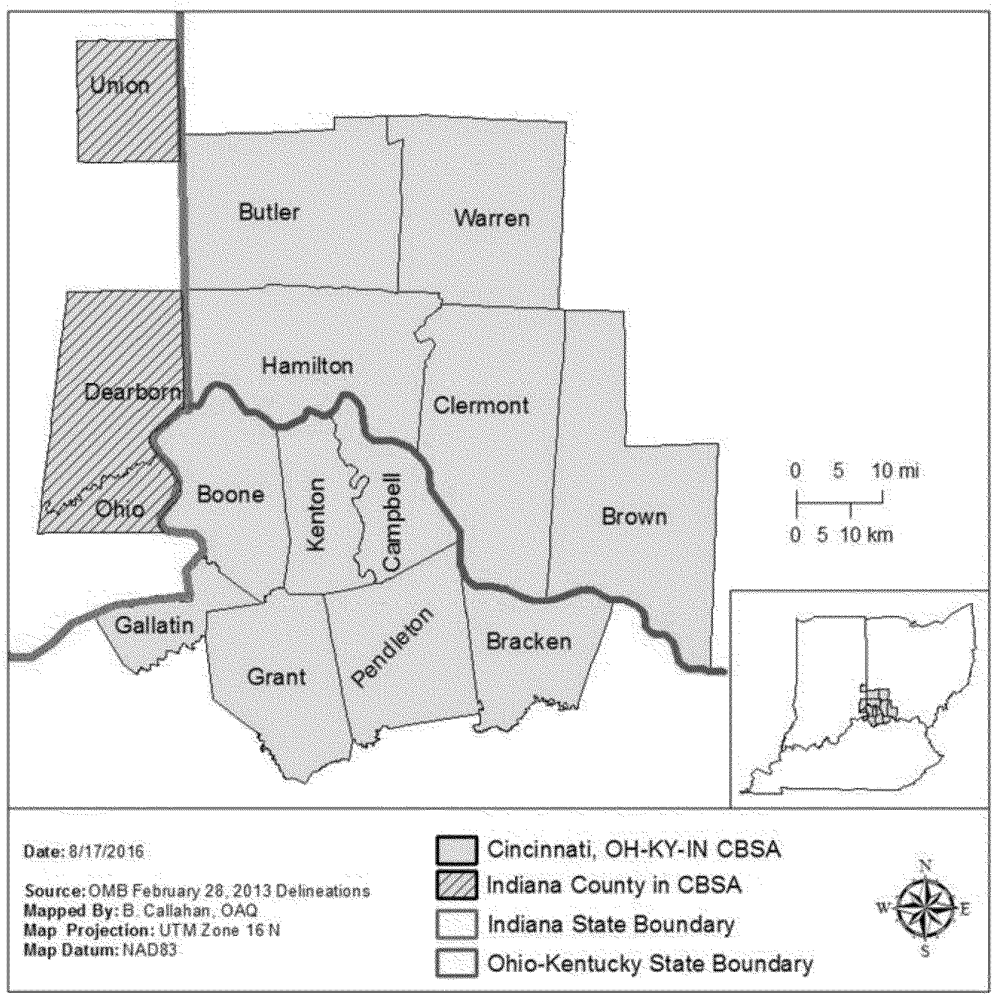
ANALYSIS FOR DEARBORN, OHIO AND UNION COUNTIES

Introduction

Geographic Description

Dearborn and Ohio counties are directly west of Cincinnati, Ohio. Union County is located northwest of Cincinnati, Ohio. Dearborn, Ohio and Union counties are part of the Cincinnati, OH-KY-IN CBSA along with several counties in Ohio and Kentucky, as shown in *Figure E: Dearborn, Ohio and Union Counties Area Map.*

Figure E: Dearborn, Ohio and Union Counties Area Map



Designation History

Under the 1997 8-hour ozone NAAQS, U.S. EPA included the Lawrenceburg Township portion of Dearborn County as part of the Cincinnati-Hamilton, OH-KY-IN nonattainment area based on measured violations in the Ohio portion of the CBSA and assumed contributions to those violations due to emissions of ozone precursors from American Electric Power's (AEP's) Tanners Creek Electric Generating Station (Tanners Creek) located in Lawrenceburg Township. Based on subsequent air quality data from the 2007-2009 ozone seasons that showed the entire area had achieved the standard, U.S. EPA redesignated Lawrenceburg Township to attainment on May 11, 2010.

U.S. EPA included the Lawrenceburg Township portion of Dearborn County as part of the Cincinnati, OH-KY-IN nonattainment area under the 2008 8-hour ozone NAAQS based on measured violations in the Ohio portion of the CBSA and assumed contributions to those violations due to emissions of ozone precursors from Tanners Creek located in Lawrenceburg Township. As a result of a settlement between U.S. EPA and AEP to resolve violations of CAA New Source Review requirements, AEP retired the Tanners Creek Generating Station and all four of the facility's coal-fired units effective June 1, 2015. Based on air quality data from 2012-2014 demonstrating attainment of the NAAQS, Indiana petitioned for the redesignation of Lawrenceburg Township to attainment in February of 2016. U.S. EPA action is pending on the request.

Summary of Analysis and Recommendations

Indiana is recommending a designation of unclassifiable for Dearborn County, Ohio County and Union County under the 2015 8-hour ozone NAAQS. The five factor analysis follows.

Five Factor Analysis

1. Air Quality Monitoring Data

Indiana does not have air quality monitors located within Dearborn, Ohio or Union counties. There are currently 10 air quality monitors measuring ozone concentrations in the Cincinnati, OH-KY-IN CBSA. Two monitors are located in Kentucky and eight monitors are located in Ohio.

The first step in assessing air quality data is to identify violating monitors. A violation of the NAAQS occurred at a monitor in the Kentucky portion of the CBSA for the 2013-2015 timeframe. The violating monitor is located at Northern Kentucky University in Campbell County and had a design value slightly over the standard at 0.071 ppm. The other monitor in Kentucky and all monitors in Ohio are in attainment.

In determining areas that might be contributing to elevated concentrations of ground-level ozone, IDEM notes the closure of the Tanners Creek power plant in Dearborn County effective June 1, 2015. The facility is no longer a source of ozone precursor emissions in

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Indiana's portion of the CBSA, and Dearborn, Ohio and Union counties do not contribute to monitored violations in the area.

Because air quality monitors are not located within Dearborn, Ohio and Union counties, a table of air quality data is not included here for Indiana's portion of the CBSA.

2. Emissions and Emissions -Related Data

a. Emission Sources and Levels

2011 National Emissions Inventory version 6.2 ozone precursor emissions data (NOx and VOCs) for Dearborn, Ohio and Union counties is provided in *Table 9: Dearborn, Ohio and Union Counties Emissions Inventories (Tons per Year)*. Data for the Kentucky and Ohio portions of the CBSA are included in the table for comparison. NOx and VOC emissions from Ohio and Kentucky sources account for approximately 96.3% and 91.8% respectively of the area's emissions. The magnitude of emissions from each area within the CBSA is illustrated in *Figure F: Dearborn, Ohio and Union County Emissions Comparisons*.

The Tanners Creek power plant in Lawrenceburg Township, Dearborn County was the primary source of ozone precursor emissions (NOx and VOCs) within Indiana's portion of the Cincinnati, OH-KY-IN CBSA and the basis for the township's inclusion in the nonattainment area under the previous NAAQS. Under a settlement between AEP and U.S. EPA resolving violations of the CAA's New Source Review (NSR) requirements, Tanners Creek and all four of the facility's coal-fired electric generating units were retired as of June 1, 2015. As a result, Tanners Creek is no longer a source of NOx and VOC ozone precursor emissions in the area.

Table 9: Dearborn, Ohio and Union Counties Emissions Inventories (Tons per Year)

Area	NO_x	Percent of CBSA	VOCs	Percent of CBSA
Dearborn County [a]	3,143	2.9%	2,943	3.7%
Ohio County	270	0.3%	1,713	2.2%
Union County	552	0.5%	1,846	2.3%
Kentucky Portion	21,658	20.4%	23,289	29.5%
Ohio Portion	80,785	75.9%	49,211	62.3%
Entire CBSA Totals	106,408	100%	79,002	100%

[a] *2011 NEI data adjusted to account for the permanent closure of Tanner's Creek Electric Generating Station in Dearborn County on June 1, 2015.*

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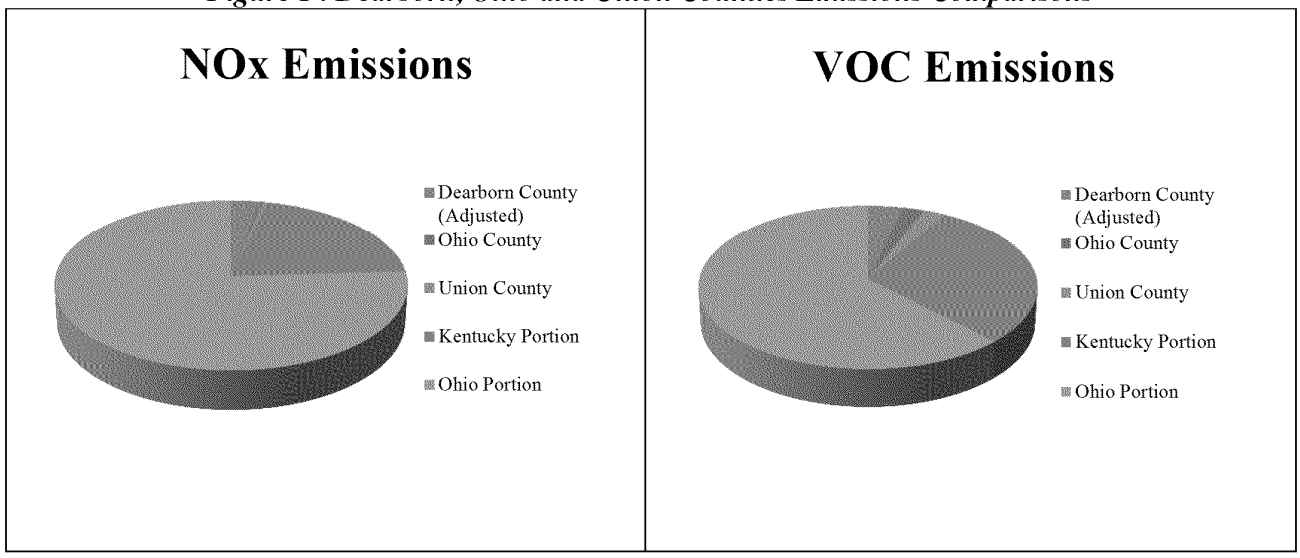
Figure F: Dearborn, Ohio and Union Counties Emissions Comparisons



b. Control of Emission Sources

The Lawrenceburg Township portion of Dearborn County was included in nonattainment areas under the 1997 and 2008 8-hour ozone NAAQS due to emissions from the Tanners Creek power plant located in Lawrenceburg Township in Dearborn County. As a result of the closure of Tanners Creek power plant effective June 1, 2015, Dearborn County does not contribute to monitored violations of the 2015 8-hour ozone NAAQS in the Cincinnati-Hamilton Area. Additional regional NOx and VOC emission reductions following the implementation of Phase II of the NOx SIP Call and CSAPR and/or its replacement rule or program will ensure compliance with the standard with an increasing margin of safety over time.

c. Population and Degree of Urbanization [10]

The vast majority of the CBSA's residents live in the Ohio and Kentucky portions of the CBSA. Dearborn, Ohio and Union counties comprised 3.1% of the population of the CBSA in 2010. Actual growth in the three Indiana counties was 4,610 people for the 2000-2010 timeframe. Projected growth for Dearborn, Ohio and Union counties for 2010-2025 is estimated at 5,376 people compared with 129,363 people for the entire CBSA.

Population density is also a significant factor in determining the degree of urbanization. Several counties within the Kentucky and Ohio portion of the CBSA have larger populations and comparatively dense concentrations in comparison with Dearborn, Ohio and Union counties, which are lightly populated and mostly rural in nature.

[10] Population and population density data obtained from U.S. Census Bureau, https://www.census.gov/.

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Population figures for Dearborn, Ohio and Union counties are provided in *Table 10: Dearborn, Ohio and Union Counties Population Growth Rates, Patterns and Projections (2000-2025).* Data for the Kentucky and Ohio portions of the CBSA are included in the table for comparison. A complete breakdown of all counties in the CBSA is provided in Table 11: *Dearborn, Ohio and Union Counties Population Density and Changes (2000-2010).*

Table 10: Dearborn, Ohio and Union Counties Population Growth Rates, Patterns and Projections (2000-2025)

Area	2000	2010	Percent of CBSA (2010)	2015	2020	2025	Overall Projected Change 2010- 2025
Dearborn County	46,109	50,047	2.4%	51,927	53,482	54,726	9.3%
Ohio County	5,623	6,128	0.3%	6,367	6,549	6,671	8.9%
Union County	7,349	7,516	0.4%	7,583	7,632	7,670	2.0%
Ohio portion of the CBSA	1,546,755	1,625,406	76.8%	1,641,910	1,660,660	1,677,570	3.2%
Kentucky portion of the CBSA	378,994	425,483	20.1%	449,677	474,345	497,306	16.9%
CBSA Total	1,984,830	2,114,580	100%	2,157,464	2,202,668	2,243,943	6.1%

Table 11: Dearborn, Ohio and Union Counties Population Density and Changes (2000-2010)

Area	2000		2010		Change in Population Density 2000-2010
	Population	Density	Population	Density	
Indiana Counties					
Dearborn	46,109	151.1	50,047	164.1	8.6%
Ohio	5,623	64.8	6,128	71.1	9.7%
Union	7,349	45.5	7,516	46.6	2.4%
Kentucky Counties					
Boone	85,991	349.2	118,811	482.3	38.1%
Bracken	8,279	40.7	8,488	41.3	1.5%
Campbell	88,616	584.7	90,336	597	2.1%
Gallatin	7,870	79.7	8,589	84.8	6.4%
Grant	22,384	86.1	24,662	95.6	11.0%
Kenton	151,464	935.2	159,720	996.7	6.6%
Pendleton	14,390	51.3	14,877	53.7	4.7%
Ohio Counties					
Brown	42,285	86.0	44,846	91.5	6.4%
Butler	322,807	712.2	368,130	788.2	10.7%
Clermont	177,977	393.8	197,363	436.5	10.8%
Hamilton	845,303	2075.1	802,374	1976.7	-4.7%
Warren	158,383	396.3	212,693	530.0	33.7%

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d. Traffic, Commuting Patterns and Vehicle Miles Traveled

An examination of labor force data for Indiana[11], Kentucky[12] and Ohio[13] indicates that Dearborn, Ohio and Union counties contribute 4.4% of the entire CBSA's workforce compared with Kentucky and Ohio's combined 95.6% share. Data is provided in *Table 12: Dearborn, Ohio and Union Counties Commuting Patterns and Trends (2009-2013).*

Although the percentage of out-of-county workers in all three Indiana counties may appear relatively high, the actual numbers are small with fewer than 1,800 out-of-county commuters in Ohio County, slightly more than 2,000 in Union County, and 13,194 in Dearborn County.

Table 12: Dearborn, Ohio and Union Counties Commuting Patterns and Trends (2009-2013)

Implied Resident Labor Force			Workers Who Live AND work in county		Workers Who Live in/Work Outside the County (Commuters)	
Area	**Actual Number**	**Percent of Entire CBSA**	**Actual Number**	**Percent of Implied Resident Labor Force**	**Actual Number**	**Percent of Implied Resident Labor Force**
Dearborn County	34,093	3.5%	20,899	61.3%	13,194	38.7%
Ohio County	4,173	0.4%	2,419	58.0%	1,754	42.0%
Union County	4,880	0.5%	2,799	57.4%	2,081	42.6%
Ohio portion of CBSA	753,469	75.9%	367,768	48.8%	385,701	51.2%
Kentucky portion of CBSA	195,512	19.7%	59,904	30.6%	135,608	69.4%
Entire CBSA	992,127	100%	453,789	45.7%	538,338	54.3%

Dearborn County has maintained the largest workforce and highest traffic flow in and out of its borders of the three Indiana counties. Commuter flow shown in *Figure G: Dearborn, Ohio and Union Counties Commuting Flows (2014)* is typical of the flow in recent years.

[11] STATSIndiana, STATSIndiana, http://www.stats.indiana.edu/topic/commuting.asp
[12] Kentucky Career Center, https://kylmi.ky.gov/vosnet/Default.aspx
[13] Ohio Department of Job and Family Services, http://ohiolmi.com/census/commuting.htm

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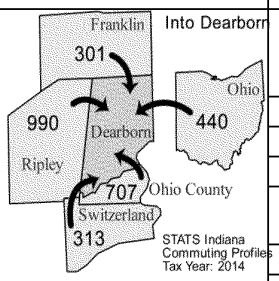
Figure G: Dearborn, Ohio and Union Counties Commuting Flows (2014)

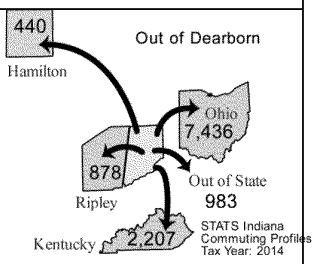
Top 5 counties sending workers into Dearborn County

County Sending Workers	Workers
Ripley County	990
Ohio County	707
Ohio (State)	440
Switzerland County	313
Franklin County	301
Total of above	2,751
(11.3 % of Dearborn County workforce)	



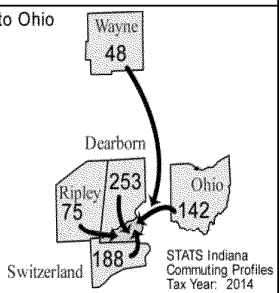
Top 5 counties receiving workers from Dearborn County

County Receiving Workers	Workers
Ohio (State)	7,436
Kentucky	2,207
Out of State	983
Ripley County	878
Hamilton County	440
Total of above	11,944
(34.9 % of Dearborn County labor force)	



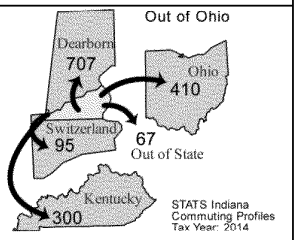
Top 5 counties sending workers into Ohio County

County Sending Workers	Workers
Dearborn County	253
Switzerland County	188
Ohio (State)	142
Ripley County	75
Wayne County	48
Total of above	706
(20.8 % of Ohio County workforce)	



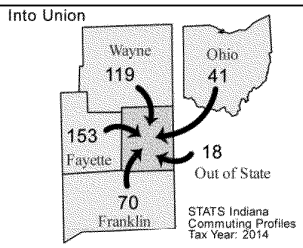
Top 5 counties receiving workers from Ohio County

County Receiving Workers	Workers
Dearborn County	707
Ohio (State)	410
Kentucky	300
Switzerland County	95
Out of State	67
Total of above	1,579
(38.1 % of Dearborn County labor force)	



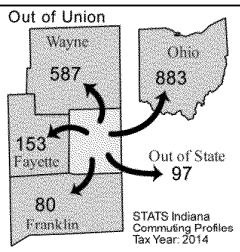
Top 5 counties sending workers into Union County

County Sending Workers	Workers
Fayette County	153
Wayne County	119
Franklin County	70
Ohio (State)	41
Out of State	18
Total of above	401
(12.1 % of Union County workforce)	



Top 5 counties receiving workers from Union County

County Receiving Workers	Workers
Ohio (State)	883
Wayne County	587
Fayette County	153
Out of State	97
Franklin County	80
Total of above	1,800
(37.6 % of Union County labor force)	



Source: STATSIndiana website, http://www.stats.indiana.edu/dms4/commuting.asp

Dearborn County sends an average of 7,515 residents to work in the State of Ohio, as shown in *Table 13: Number of Commuters from Dearborn County into Ohio (2009-2013)*. The number amounts to approximately 1% of the workforce in the Ohio portion of the CBSA. Based on Dearborn, Ohio and Union counties' commuting patterns and trends, it is safe to assume that cross-county mobile sources (for example, Dearborn County to neighboring areas) have very little to no impact on ozone concentrations in this area.

Table 13: Number of Commuters from Dearborn County into Ohio (2009-2013)

2009	2010	2011	2012	2013	Average
7,656	7,549	7,483	7,423	7,462	7,515

Data on vehicle miles traveled for Indiana[14], Kentucky[15] and Ohio[16] indicates that much of the area's vehicular traffic occurs in the Kentucky and Ohio portions of the CBSA. Figures are provided in *Table 14, Daily Vehicle Miles Traveled, Dearborn, Ohio and Union Counties (2011, 2014)*. Of the three Indiana counties, Dearborn County accounts for the largest DVMT but comprises only 3.1% of the entire CBSA in 2014.

Table 14: Daily Vehicle Miles Traveled, Dearborn, Ohio and Union Counties (2011, 2014)

County	Year 2011	Percent of CBSA (2011)	Year 2014	Percent of CBSA (2014)	Percent Change 2011-2014
Indiana Portion of the CBSA					
Dearborn	1,847,000	3.4%	1,778,900	3.1%	-3.7%
Ohio	121,000	0.2%	132,000	0.2%	9.1%
Union	205,000	0.4%	226,500	0.4%	10.5%
Ohio Portion of the CBSA	39,570,000	72.3%	42,600,000	73.8%	7.7%
Kentucky Portion of the CBSA	12,943,000	23.7%	13,021,000	22.5%	0.6%
Total(s)	54,686,000	100%	57,758,400	100%	5.6%

3. Meteorolog ical Data and Transport Patterns

The primary source of ozone precursor emissions (NOx and VOCs) within Indiana's portion of the Cincinnati, OH-KY-IN CBSA was the Tanners Creek power plant. As a result of a settlement with U.S. EPA to resolve violations of the CAA's new source review (NSR) requirements, AEP permanently retired the Tanners Creek facility and all four of the facility's coal-fired electric generating units on June 1, 2015. This will ensure that the facility does not restart without proper permitting under the CAA. As a result of Tanners Creek's closure, Dearborn, Ohio and Union counties do not contribute to monitored violations of the 2015 8-hour ozone NAAQS in the Cincinnati, OH-KY-IN CBSA. No further assessment of meteorological data and transport patterns was conducted.

[14] Indiana Department of Transportation, http://www.in.gov/indot/2469.htm
[15] Kentucky Transportation Cabinet, http://transportation.ky.gov/Planning/Pages/Roadway-Information-and-Data.aspx
[16] Ohio Department of Transportation, https://www.dot.state.oh.us/Divisions/Planning/TechServ/traffic/Pages/DVMT.aspx

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4. Geography/Topography

There are no geographical or topographical features within Dearborn, Ohio or Union County that would have an impact on air quality or potential transport. Therefore, this factor was not significant when making initial nonattainment recommendations.

5. Jurisdictional Boundaries

Dearborn, Ohio and Union counties are included in the Cincinnati, OH-KY-IN CBSA. The Ohio-Kentucky-Indiana Regional Council of Governments (OKI) serves as the planning agency for an area that includes Dearborn County in Indiana.

Conclusion and Recommendations for Dearborn, Ohio and Union Counties

To provide a basis for Indiana's initial recommendations for Dearborn, Ohio and Union counties under the 2015 8-hour ozone NAAQS, IDEM has evaluated the following factors: three complete years of quality-assured certified ambient air monitoring data for 2013-2015 and quality-assured data for 2014-2016 timeframes; 2011 National Emissions Inventory data; data on population and population density; commuting trends and patterns; daily vehicle miles traveled; meteorology and transport patterns; geography and topography; and jurisdictional boundaries.

A total of 10 ozone air monitors are located in the CBSA. Eight monitors are located in Ohio and two are located in Kentucky. Data shows that the eight Ohio monitors and one of the Kentucky monitors are attaining the standard. One monitor in the Kentucky portion of the CBSA is above the standard.

Although no air quality monitors are located within Indiana's portion of the CBSA, Lawrenceburg Township in Dearborn County was included in previously designated nonattainment areas based on emissions from the Tanners Creek power plant and the facility's assumed contribution to violations of the NAAQS. As a result of its permanent closure effective June 1, 2015, the Tanners Creek power plant is no longer a source of ozone precursor emissions in the CBSA.

NEI data from 2011, adjusted for the closure of the Tanners Creek power plant in Dearborn County, shows that Dearborn, Ohio and Union counties contribute a small percentage of emissions compared with the magnitude of impacts from the Kentucky and Ohio portions of the CBSA. Dearborn County accounts for 2.9% of the CBSA's total NOx emissions and 3.7% of the CBSA's total VOC emissions. Ohio County accounts for 0.3% of the CBSA's NOx emissions and 2.2% of the CBSA's VOC emissions. Union County contributes 0.5% of the CBSA's total NOx emissions and 2.3% of the CBSA's total VOC emissions.

The three Indiana counties of Dearborn, Ohio, and Union account for only 3.1% of the population of the Cincinnati CBSA and thus have a comparatively small effect on the CBSA. Also, the Indiana portions of the CBSA account for small percentages of the CBSA's total

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workforce (an average of 4.4% from 2009-2013) and vehicular traffic (3.7% in 2014), again having only small effects on the CBSA.

As mentioned above, a violation of the NAAQS occurred at a monitor in the Kentucky portion of the CBSA. The violating monitor is located at Northern Kentucky University in Campbell County and had a design value slightly over the standard at 0.071 ppm. As a result of the closure of Tanners Creek power plant in Dearborn County, Dearborn, Ohio and Union counties do not contribute to monitored violations of the 2015 8-hour ozone NAAQS in the CBSA. No further assessment of meteorological data or transport patterns was conducted. There are no geographical or topographical features within Dearborn, Ohio or Union counties that would have an impact on air quality or potential transport.

Due to limitations of jurisdictional authority, transportation conformity and the development of State Implementation Plans are addressed independently. The largest contributors of ozone precursors fall outside of Indiana's jurisdictional boundaries within the states of Kentucky and Ohio. Indiana has been and will continue to use its authority to address transportation conformity and SIP planning within state boundaries, ensuring effective coordination and communication between U.S. EPA, local and regional communities, and appropriate officials in affected areas outside of Indiana's jurisdiction. IDEM's Office of Air Quality staff works closely with U.S. EPA Region 5 to ensure Indiana meets its commitments and complies with the requirements of the federal Clean Air Act.

The overall impact from Dearborn, Ohio and Union counties in Indiana is very small compared with the magnitude of the Kentucky and Ohio portions of the CBSA. Dearborn, Ohio and Union counties are essentially rural in nature and ozone air monitors are not located in Indiana's portion of the CBSA. As a result of its permanent closure effective June 1, 2015, the Tanners Creek facility (Lawrenceburg Township in Dearborn County) is no longer a source of emissions in the CBSA and there is no indication that Dearborn, Ohio and Union counties contribute significantly to ozone in the CBSA. Indiana has been and will continue working with federal, state and local entities to ensure compliance with clean air regulations and the protection of public health and the environment. For these reasons, Indiana recommends that Dearborn, Ohio and Union counties be designated as unclassifiable under the 2015 8-hour ozone NAAQS, as shown in *Table 15: Initial Recommendations for Dearborn, Ohio and Union Counties*.

Table 15: Initial Recommendations for Dearborn, Ohio and Union Counties

Dearborn County	Unclassifiable
Ohio County	Unclassifiable
Union County	Unclassifiable

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ANALYSIS AND RECOMMENDATIONS FOR THE REMAINING COUNTIES IN INDIANA

The counties addressed in the earlier sections of this document (Jasper, Lake, Newton, and Porter counties in northwestern Indiana, and Dearborn, Ohio and Union counties near Cincinnati, OH) account for seven of Indiana's 92 counties. Among the remaining 85 counties within Indiana, 29 counties have ozone monitors and 56 counties do not have ozone monitors. Under the 2008 8-hour ozone NAAQS, all 85 counties were designated as unclassifiable/attainment.

Ozone design values based on quality-assured certified 2013-2015 ambient air quality data and preliminary, quality-assured 2014-2016 data show that air quality in the 29 monitored counties meets the 2015 8-hour ozone NAAQS. Indiana is recommending a designation of attainment for these 29 counties. Indiana is recommending a designation of unclassifiable for each of the remaining 56 counties without an air monitor.

Enclosure 1 of this submittal contains a complete list of Indiana's 92 counties and the initial recommendation for each. The ozone design values for monitors in the 29 counties are included in the complete table of air quality data provided in Enclosure 2 of this submittal.

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Illinois Environmental Protection Agency (Illinois EPA)
Notice of Public Presentation

Ozone Initial Area Designation Presentation
For the Chicago Area

Public Presentation
Tuesday September 6, 2016, at 2:00pm

James R. Thompson Center
100 W. Randolph St. Chicago, IL

On October 26, 2015, U.S.EPA revised the level of the primary and secondary National Ambient Air Quality Standard (NAAQS) for ozone to 0.070 ppm, averaged over an 8-hour period. This action provides increased protection for children, older adults, and people with asthma and other lung diseases against an array of adverse health effects.

After the U.S.EPA establishes a new or revised NAAQS, one of the first steps a state must take is to identify areas that are not meeting the new or revised NAAQS. This step, known as the initial area designations, is the subject of this presentation. The Illinois Environmental Protection Agency (Illinois EPA) will be presenting a recommendation for initial area designations, along with a summary of supporting data. This recommendation will be submitted to U.S. EPA for review.

Illinois Environmental Protection Agency (Illinois EPA)
Notice of Public Presentation

Ozone Initial Area Designation Presentation
For the Metro-East Area

Public Presentation
Wednesday, September 14, 2016, at 1:00pm

Illinois Department of Transportation Regional Office
1102 Eastport Plaza Drive, Collinsville, IL

On October 26, 2015, U.S.EPA revised the level of the primary and secondary National Ambient Air Quality Standard (NAAQS) for ozone to 0.070 ppm, averaged over an 8-hour period. This action provides increased protection for children, older adults, and people with asthma and other lung diseases against an array of adverse health effects.

After the U.S.EPA establishes a new or revised NAAQS, one of the first steps a state must take is to identify areas that are not meeting the new or revised NAAQS. This step, known as the initial area designations, is the subject of this presentation. The Illinois Environmental Protection Agency (Illinois EPA) will be presenting a recommendation for initial area designations, along with a summary of supporting data. This recommendation will be submitted to U.S. EPA for review.

Indiana and EPA Rule and SIP Call Notes
March 16, 2017

Participants
EPA: Douglas Aburano, Gilberto Alvarez, Sarah Arra, Kathleen D'Agostino, Paemla Blakely, Emily Crispell, Paymon Danesh, Joseph Ko, Michael Langman, Jennifer Liliegren, Anthony Maietta, Chris Panos, Carolyn Persoon, Randall Robinson, Steve Rosenthal, Eric Svingen,

IDEM: Lauren Aguilar, Jean Boling, Brian Callahan, Mark Derf, Gale Ferris, Jack Harmon, Chris Pedersen, Jessica Reiss, Doug Wagner, Keelyn Walsh

Updates

SO_2 Implementation and Data Requirements Rule -

IDEM is in the process of addressing EPA's comments/concerns regarding the modeling analyses used to characterize air quality around various Round 3 DRR SO_2 sources. A separate conference call was conducted March 15th to discuss EPA's comments/concerns. In response, IDEM performed updated modeling surrounding the DRR source SABIC using three years of SO_2 emissions data for CountryMark (instead of just 2015) in order to address EPA's comments/concerns regarding the previous modeling. The revised analysis showed a slight increase in maximum modeled SO_2 concentration surrounding SABIC, but remains well below the 1-hour SO_2 standard.

Dearborn County (Lawrenceburg Township) $PM_{2.5}$ -

The redesignation petition and maintenance plan is at EPA's Office of Regional Counsel and is moving through the signature process.

2012 $PM_{2.5}$ Transport SIP -

EPA is the process of reviewing the SIP.

Delaware County (Muncie, IN) Lead -

The redesignation petition and maintenance plan is moving through EPA's signature process and final approval should be published in the Federal Register soon.

Dearborn County (Lawrenceburg Township) Ozone -

The redesignation petition and maintenance plan is at EPA's Regional Administrator's Office and is moving through the signature process.

Lake and Porter Counties Ozone (Section 172 and 182 Submittal) -

The Section 172 and 182 submittal for Lake and Porter counties was submitted to EPA on February 28, 2017. EPA asked whether certification of Indiana's New Source Review permitting program was included as part of the public participation process of this submittal. IDEM stated that it was not included in the public process associated with this submittal but that all documents that the certification relied upon were subject to the public process. EPA stated that this certification needs to go through the public participation process.

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2015 Ozone Designations -

EPA is in the process of preparing the technical support documents for preliminary designation recommendations under the 2015 ozone standard and will be getting in touch with Region 5 states soon to discuss. EPA is anticipating that preliminary designation recommendation letters will be sent to Region 5 states in early-June.

Morgan County SO_2 Nonattainment Area -

EPA is planning on proceeding with review/approval of the revisions to Indiana's State Implementation Plan for SO_2 and Technical Support Document for the West Central, Southwest, and Marion County portion (i.e. Center, Perry, and Wayne Townships) of the Central Indiana Nonattainment Areas. The Morgan County SO_2 Nonattainment Area will be addressed separately at a later date.

Monitoring -

EPA received IDEM's supplemental information regarding the Belmont Advanced Wastewater Treatment Plant's reported lead emission levels. A separate call will be scheduled soon to address EPA's follow-up questions/concerns (e.g. what controls are in place, PTE, associated NSPS limits, etc.).

40 CFR 52.770 SIP Updates -

This item was addressed during last month's call and can be removed from the agenda.

Next Call (date and time)
April 20, 2017, 9 am (Chicago), 10 am (Indianapolis)

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Notes for the Rules Portion of the Rule and SIP Call
March 16, 2017

Status of Rule SIP Submittals

Ethanol Plant Clarification (11-99)
Submitted: 9/19/11
Staff: Pedersen
Status: 3/16/17: No change since 9/22/11.
9/22/11: Received, but on hold until EPA reconsiders the ethanol source definition policy.

SO_2 Emission Limits (11-356)
Submitted: 10/2/15
Staff: Bem, Summerhays
Status: 3/16/17: Assigned to Michelle Becker. Rule to be approved as part of attainment demonstration. Morgan Co. rule language should be approved with rest of rule even if remaining Morgan Co. approval is separate.
2/16/17: No change since 11/23/15.
11/23/15: Assigned to John Summerhays.
10/22/15: Submittal received. Rule is part of attainment demonstration.

Startup, Shutdown and Malfunctions (15-326)
Submitted: 1/31/17
Staff: Harmon, Persoon
Status: 3/16/17: At HQ. Should be back in a couple of weeks.
2/16/17: No change.
1/31/17: Final submittal sent.
1/19/17: The draft approval is going to OGC and OAQPS for review.
12/15/16: The approval is being drafted.
11/17/16: Submitted parallel processing request on 11/14/16.

Emission Reporting for Lawrenceburg Township, Dearborn County (16-162)
Submitted: 11/18/16
Staff: Walsh, Svingen
Status: 3/16/17: Waiting for Regional Administrator signature then should move through process. This type of approval should start moving at regular pace now. Expect publication in a few weeks.
2/16/17: Waiting in signature chain.
1/19/17: Final approval will be published at the same time as the redesignation request.
12/27/16: Proposed approval published.
12/15/16: Signed as a separate action from the redesignation request.
11/18/16: SIP submittal sent to EPA.
6/1/16: OAQ staff submitted Section 8 Notice and requested parallel processing.

2015 CFR Update (16-208)
Submitted: 12/13/16
Staff: Walsh, Hatten
Status: 3/16/17: At ORC for review.
2/16/17: Drafted and in signature chain.

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1/19/17: Review has been assigned to Charles Hatten.
12/15/16: Submittal received electronically.
12/13/16: SIP submittal sent to EPA.

Indiana Rules in Process

Asbestos (09-363)
Staff: Pedersen
Status: 3/16/17: Rule on hold.
6/23/09: First Notice posted 6/3/09.

Stone Crushing SSOA (10-571)
Staff: Harmon
Status: 3/16/17: No change.
2/16/17: Program staff discussions.
1/19/17: No change since 10/22/15.
10/22/15: Jack Harmon working with program staff. Draft will be submitted to EPA for comment.
9/30/10: First Notice published on 9/15/10.

Source Specific Operating Agreements (11-315)
Staff: Pedersen
Status: 3/16/17: Rule on hold.
6/23/11: First Notice published 6/1/11.

Permit By Rule (11-316)
Staff: Pedersen
Status: 3/16/17: Rule on hold.
6/23/11: First Notice published 6/1/11.

Cross State Air Pollution Rule (CSAPR) (16-209)
Staff: Aguilar
Status: 3/16/17: Preliminary adoption scheduled for 4/12/17. Waiting on CAMD for clarification on recording allocations and different ozone control periods.
2/16/17: Meeting today with affected sources. Waiting on CAMD input.
1/19/17: Second Notice was published and comment period will be over next week. Second Notice sent to Sarah Arra and Eric Svingen on 12/29/16.
12/15/16: Second Notice approved and submitted for publication. Lauren Aguilar will send copy of the draft notice to Sarah Arra and Eric Svingen.
11/17/16: CSAPR Update rule published 10/26/16. Draft Second Notice in review.
10/20/16: CSAPR Update rule released, but not published. Continuing work on Second Notice.
9/15/16: Second Notice tentatively to be ready in November.
8/18/16: No changes.
7/21/16: Second Notice should be drafted by October or November.
6/16/16: Meeting with affected sources in mid-July.
5/19/16: First Notice to publish 6/1/16.
5/16/16: OMB approval to proceed.

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NOx Emissions from Large Affected Units (15-414)
Staff: Harmon
Status: 3/16/17: Sarah Arra will set up a call with CAMD about suggestions to add Acid Rain Program references into rule. Still waiting on CAMD to comment on blast furnace gas exemption from fossil fuel defintion.
2/16/17: Steve Rosenthal will check with Sarah Arra for update. Waiting on CAMD input.
1/19/17: A revised draft was sent to Sarah Arra for review.
12/15/16: Finalizing response to comments.
11/17/16: No change since 9/15/16.
9/15/16: Clarifying draft language.
8/18/16: Will send draft rule language to Doug Aburano within 2 to 3 weeks for review.
7/21/16: Draft Second Notice being reviewed by program staff.
6/16/16: No change.
4/21/16: Internal meetings; Second Notice being drafted.
3/17/16: No change since 1/25/16.
1/25/16: Comments received, drafting Second Notice.
12/17/15: First Notice published 12/9/15. Copy will be sent to Doug Aburano.
11/23/15: Approved by OMB. First Notice should publish soon.

Volatile Organic Liquid Storage Tanks (15-427)
Staff: Harmon
Status: 3/16/17: Steve Rosenthal said the draft rule language looks fine and he will send comments soon.
2/16/17: Steve Rosenthal received draft Second Notice and will review next week.
1/19/17: The Second Notice will be sent to Steve Rosenthal when ready.
12/15/16: No change since 9/15/16.
9/15/16: In internal review.
8/18/16: Draft should be ready for Steve Rosenthal review in a few weeks.
7/21/16: Second Notice being drafted with help of Betsy Zlatos. Send copy of Second Notice to Steve Rosenthal after internal review.
6/16/16: No change since 2/18/16.
2/18/16: Second Notice still being drafted. The draft will be sent to EPA for review when ready.
1/25/16: No comments; Second Notice being drafted. Copy to Steve Rosenthal after internal review.
12/17/15: First Notice published 12/16/15.
11/23/15: Waiting for OMB approval to proceed with First Notice.

Short-Term Backup Units (16-309)
Staff: Harmon
Status: 3/16/17: No change since 9/15/16.
9/15/16: Starting to draft rule language.
8/18/16: Comment period ends 8/19/16. One supporting comment received.
7/21/16: First Notice published on 7/20/16.
6/16/16: First Notice send to OMB today.
5/19/16: Internal discussions. Michael Langman will be contact.
4/21/16: Work beginning on First Notice draft.

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Outdoor Hydronic Heaters (16-332)
Staff: Walsh
Status: 3/16/17: Second Notice published on 3/15/17.
2/16/17: Second Notice in review.
1/19/17: No change since 10/20/16.
10/20/16: Drafting Second Notice.
9/15/16: No comments received to date.
8/18/16: First Notice published 8/17/16 for comment.
7/21/16: Submitted to OMB on 6/29/16.
6/16/16: No change.
5/19/16: First Notice being drafted.
4/21/16: Approved to start rule to address 3/16/15 NSPS and existing rule amendments.

2015 Ozone Standard (16-529)
Staff: Walsh
Status: 3/16/17: Adoption is scheduled for 4/12/17.
2/16/17: No change.
1/19/17: Comment period ended and rule will be ready for next board meeting.
12/15/16: Section 8 Notice published and in comment period.
11/17/16: No change since 8/18/16.
8/18/16: At OMB for approval.
7/21/16: Draft Section 8 Notice in review.
6/16/16: Drafting Section 8 Notice.

Permit Legal Notices (xx-xxx)
Staff: Walsh
Status: 3/16/17: Staff reviewing notice.
2/16/17: No change.
1/19/17: Drafting First Notice.

U.S. Steel SO2 Revisions (xx-xxx)
Staff: Stevens
Status: 3/16/17: Submitted to OMB on 2/23/17.
2/16/17: Call with U.S. Steel tomorrow to discuss potential additional rule changes.
1/19/17: Drafting Section 8 Notice.

NIPSCO Consent Decree Requirements (xx-xxx)
Staff: Reiss
Status: 3/16/17: No change since 9/15/16.
9/15/16: Meeting with EPA and NIPSCO on force majeure language.
8/18/16: No change.
7/21/16: NIPSCO wants to meet with EPA and IDEM about issues, including force majeure language.
6/16/16: Three more issues to finalize before notice can be reviewed and go to OMB.
5/19/16: No change.
4/21/16: Revised draft sent back to NIPSCO attorney.
3/17/16: Reviewing comments from source attorney.
2/18/16: NIPSCO attorney to provide comments by end of February.
1/25/16: Comments from NIPSCO due by end of January.
12/17/15: No change.
11/23/15: Preparing OMB submittal.

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Lawrenceburg Township, Dearborn County Ozone Redesignation Emergency Rule
Staff: Walsh
Status: 3/16/17: Tentatively scheduled for adoption on 4/12/17. Waiting for federal rule to publish.

State Plan Submittals

Lead NESHAP Delegation
Submitted: 1/8/14
Staff: Bem
Status:

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Non-Rule SIP Submittals

Pollutant	Activity		Status
CO	Nothing to report.		
Lead	Redesignation of Muncie-area, Delaware County, nonattainment area.		Redesignation petition and maintenance plan submitted April 14, 2016.
Nitrogen Dioxide	Nothing to report.		
Ozone	Redesignations		
		Lake/Porter Counties	Redesignation petition and maintenance plan submitted June 15, 2016. Based on partial/preliminary ozone monitoring data for 2016, the three year design value (2014-2016) for the Chiwaukee, WI monitor is above the 2008 standard. Section 172 and 182 submittal sent to U.S. EPA for review and approval on February 28, 2016.
		Lawrenceburg Township (Dearborn County)	Redesignation petition and maintenance plan submitted February 23, 2016. Supplement to recharacterize 2014 emissions inventory to include actual EGU and non-point emissions of point source category submitted May 4, 2016. Final rulemaking for revision to Emissions Reporting Rule, LSA Document #16-162, published in the Indiana Register on November 17, 2016. Letter requesting approval of the revisions to the rule submitted to EPA November 18, 2016. EPA's proposed approval of the revisions to Emissions Reporting Rule and redesignation petition and maintenance plan published in the *Federal Register (FR)* on December 27, 2016 (81 FR 95080) and (81 FR 95081). Public comment periods for these rulemakings ended on January 26, 2017.
	2015 Standard Infrastructure SIP		Due to EPA on or before October 1, 2018.
	2015 Standard Designation Recommendations		Designation recommendations submitted September 16, 2016.
Sulfur Dioxide	Round 1 Nonattainment Areas		Attainment demonstration submitted October 2, 2015; completeness letter received from EPA on February 25, 2016. Technical addendum for revisions to Indiana's State Implementation Plan for SO2 and attainment demonstration to incorporate changes to Rolls Royce within the Marion County nonattainment area submitted May 2, 2016.
	Round 2 Designations (consent decree) Gibson, Rockport, Michigan City, Clifty Creek, and A.B. Brown generating stations		EPA designated Gibson, Jefferson (partial), LaPorte, Posey (partial), and Spencer (partial) counties as unclassifiable/attainment for the 2010 primary 1-hour SO2 standard as published in the *Federal Register (FR)* on July 12, 2016 (81 FR 45039).
	Redesignation of Clay and Washington Townships (Morgan County), nonattainment area.		Further discussions needed to address EPA's comments/concerns regarding the preliminary redesignation petition and maintenance plan.
	Rounds 3 and 4 Designations (Data Requirements Rule)		Indiana's modeling and monitoring protocol submitted June 30, 2016. Modeling analyses or federally permanent/enforceable emission limits and compliance due by January 13, 2017. Preliminary recommendations concerning Round 3 designations submitted January 13, 2017.
Particulates	Lawrenceburg Township (part of Cincinnati NA area) Redesignations		EPA approved the RACM/RACT analysis for Lawrenceburg Township as published in the *Federal Register (FR)* on October 24, 2016 (81 FR 58402). Revised draft redesignation petition and maintenance plan completed. Public comment ended August 15, 2016. No public comments were received. Redesignation petition and maintenance plan submitted August 19, 2016.
	2012 Standard Infrastructure SIP		Infrastructure SIP submitted June 10, 2016. Weight of evidence analysis supporting Indiana's fulfillment of Section 110(a)(2)(D)(i)(l) (Prong 1 and 2) and (ii) (Prong 4) requirements submitted December 28, 2016.
Regional Haze	Five-Year Progress Report		Five-year progress report submitted March 30, 2016.

cc: Lauren Aguilar, Keith Baugues, Susan Bem, Jean Boling, Brian Callahan, Scott Deloney, Mark Derf, Leslie Ferguson, Gale Ferris, Jack Harmon, Jay Koch, Nancy King, Bruno Pigott, Jessica Reiss, Shawn Seals, Valerie Tachtiris, Doug Wagner, Keelyn Walsh, Betsy Zlatos, Doug Aburano (EPA Region V), Pam Blakley (EPA Region V), Louise Gross (EPA Region V), Chris Panos (EPA Region V), Steve Rosenthal (EPA Region V)

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Indiana and EPA Rule and SIP Call Notes
August 18, 2016

Participants

EPA: Doug Aburano, Gilberto Alvarez, Michelle Becker, Kathleen D'Agostino, Edward Doty, Charles Hatten, Michael Langman, Jennifer Liljegren, Tony Maietta, Chris Panos, Carolyn Persoon, Mary Portanova, Matt Rau, Randall Robinson, Steve Rosenthal, John Summerhays, Eric Svingen

IDEM: Lauren Aguilar, Susan Bem, Jean Boling, Brian Callahan, Scott Deloney, Mark Derf, Gale Ferris, Jack Harmon, Chris Pedersen, Jessica Reiss, Shawn Seals, Doug Wagner, Keelyn Walsh

Updates

SO_2 Implementation and Data Requirements Rule - IDEM is continuing to work with SABIC, Carmeuse, and Isolatek to identify DRR compliance strategies. Control strategy options need to be identified by mid-September in order to get Commissioner Orders (1-to-3) in place, if necessary.

Dearborn County (Lawrenceburg Township) $PM_{2.5}$ - Public comment period ended August 15, 2016. No public comments were received. Redesignation petition and maintenance plan will be sent to EPA for review and approval soon.

Jefferson County (Madison Township) and Clark and Floyd Counties $PM_{2.5}$ - EPA proposed approval of the redesignation petition and maintenance plan as published in the Federal Register on June 23, 2016. Public comment period ended on July 25, 2016. No public comments were received. Final approval of the redesignation petition and maintenance plan should be published in the Federal Register in mid-September.

2012 $PM_{2.5}$ Transport SIP - An analysis is being performed on interstate transport of Indiana's emissions relative to the 2012 $PM_{2.5}$ NAAQS and U.S. EPA's March 2016 "Good Neighbor" Provision projected modeling of 2017 and 2025. This transport analysis is being coordinated via the Lake Michigan Air Director's Consortium (LADCO), with support from member states. The analysis will be a topic of discussion at the September 7 – 8 LADCO meeting in Chicago.

Lead Nonattainment Area - EPA is planning on completing its review of the redesignation petition and maintenance plan within the next few days. Final approval should be published in the Federal Register later this year.

Dearborn County (Lawrenceburg Township) Ozone - EPA is in the process of preparing the proposed approval notice for the redesignation petition and maintenance plan for Lawrenceburg Township (Dearborn County) submitted to EPA for review/approval on February 23, 2016 contingent upon revisions to Indiana's Emission Reporting Rule. The final rule was adopted at the August 10 Indiana Environmental Rules Board meeting and should be effective by December. IDEM will submit the rule amendments to EPA as a revision to Indiana's SIP soon thereafter.

Lake and Porter Counties Ozone (attainment demonstration, 15% plan, 3% contingency plan, NOx RACT) -

IDEM is in the initial stages of preparing an attainment demonstration and technical support document for Lake and Porter counties. IDEM is in the process of identifying source categories/facilities as part of the NOx RACT analysis. If a rulemaking is necessary in order to get RACT equivalent NOx control measures in place, it will be a time consuming process. A modeling analysis for the entire Chicago nonattainment area is being

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coordinated/conducted by LADCO, with support from each of the affected member states. The analysis will be a topic of discussion at the September 7 – 8 LADCO meeting in Chicago. EPA mentioned that the states of Ohio and Wisconsin have conducted NOx RACT analyses and these documents may be a good resource/example to take a look at.

2015 Ozone Designations - IDEM is keeping track of 2016 monitoring data. No sites have violated the standard. IDEM will meet the deadline for recommendations in October using as much quality-assured 2016 monitor data as possible.

Morgan County SO_2 Nonattainment Area - Preliminary draft of the redesignation petition and maintenance plan submitted to EPA for review/comment. IDEM asked EPA what the status of the review was/if staff had any questions or concerns. EPA stated that they are in the process of reviewing the draft and will provide any comments/suggested revisions they have soon.

Isolatek DRR Compliance Strategies - IDEM has been unable to identify compliance strategy options for Isolatek that would enable the facility to attain the 2010 primary 1-hour SO2 standard. IDEM asked EPA for continued assistance in identifying viable compliance strategies. IDEM and EPA will continue to look into this.

Portside CSAPR Applicability Determination - EPA provided additional information on allocation methodology used in the proposed CSAPR Update rule. Additional information on the status of the CSAPR applicability determination for Portside will be provided as it becomes available.

Monitoring – Based on recent discussions with ArcelorMittal, the Burns Harbor Port of Indiana SO2 monitoring site should be up and running by the January 1, 2017 deadline.

Next Call (date and time)

September 15, 2016, 9 am (Chicago), 10 am (Indianapolis)

Status of Rule SIP Submittals

Ethanol Plant Clarification (11-99)
Submitted: 9/19/11
Staff: Pedersen
Status: 8/18/16: No change since 9/22/11.
9/22/11: Received, but on hold until EPA reconsiders the ethanol source definition policy.

AEP Rockport (12-392)
Submitted: 1/13/15
Staff: Bem, Rau
Status: 8/18/16: Working on Sierra Club comments concerning modeling.
7/21/16: ORC approval is expected next week.
6/16/16: The draft final is with ORC.
5/19/16: Working on responses to comments from Louise Gross.
4/21/16: OGC is reviewing; should be done by mid-May.
3/17/16: Call scheduled to discuss comments.
2/18/16: No change.
1/28/16: Adverse comment received.
1/25/16: Comment period ends soon; no comments so far. Final is drafted.
12/28/15: Proposed rule published.
12/17/15: Signed and sent for publication.
11/23/15: With RA.
10/22/15: In signature chain.
9/17/15: No change since 7/16/15.
7/16/15 At ORC.
6/18/15: Notice drafted; to ORC in next few days.
5/21/15: No change.
4/16/15: Under review.
3/19/15: No change.
2/19/15: No update.

Shipbuilding and Ship Repair Antifoulant Coatings (14-441)
Submitted: 7/17/15
Staff: Bem, Svingen
Jeffboat Commissioners Order (2014-01)
Submitted: 10/23/14
Status: 8/18/16: It is signed and sent for publication to the Federal Register. IDEM will finalize and send withdrawal letter for the Jeffboat Commissioners Order within a week.
7/21/16: ORC approval is expected next week.
6/16/16: With ORC.
5/19/16: It is in the signature chain. There are no issues, but IDEM to verify that Jeffboat is only source affected. Should publish in July. Commissioner's Order to be withdrawn.
4/21/16: Direct final approval being drafted. SIP submittal looks good. Commissioner's Order to be withdrawn when direct final rule publishes.
3/17/16: No change since 11/23/15.
11/23/15: Working on now.
10/22/15: No change since 8/27/15.

8/27/15: EPA to move forward with review of Shipbuilding and Ship Repair Antifoulant Coatings rule that will supersede Jeffboat Commissioners Order (CO). When rule is approved, Jeffboat CO will be withdrawn.
7/16/15: The Shipbuilding rulemaking should be sent this week.
6/18/15: Rule published 6/17/15. SIP submittal soon. TSD to be finished in next two weeks.
5/21/15: No change since 3/19/15.
3/19/15: EPA is holding off on approval, but will continue to review so that shipbuilding rule can be approved at same time.
2/19/15: EPA reviewing credits.
1/15/15: Only issue is question on credits. Susan forwarded question to Jay Koch for response.
12/18/14: No change.
11/24/14: Steve Rosenthal had question and will contact Jay Koch.

Abengoa Commissioner's Order (2015-01)
Submitted: 10/16/15
Staff: Bem, Liljegren
Status: 8/18/16: No changes.
8/12/16: Direct final rule published; effective 10/11/16 unless adverse comment received by 9/12/16.
7/21/16: Should be signed next week. It will be a direct final rule.
6/16/16: Working on legal questions.
5/19/16: No change since 12/17/15.
12/17/15: At ORC.
11/23/15: Assigned to Jennifer Liljegren.
10/22/15: Submittal received.

SO_2 Emission Limits (11-356)
Submitted: 10/2/15
Staff: Bem, Summerhays
Status: 8/18/16: No change since 11/23/15.
11/23/15: Assigned to John Summerhays.
10/22/15: Submittal received. Rule is part of attainment demonstration.

Indiana Rules in Process

Asbestos (09-363)
Staff: Pedersen
Status: 8/18/16: No change since 10/22/15.
10/22/15: Jack Harmon working with program staff on draft rule language.
9/17/15: No change since 11/14/13.
11/14/13: Shadi Khoury resigned; rule will be reassigned.
9/19/13: No change.
8/22/13: Waiting on program staff input.
7/8/13: Rule reassigned to Shadi Khoury.
6/20/13: No change since 6/21/12.
6/21/12: IDEM working on draft.
5/17/12: No change since 9/22/11.
9/22/11: Waiting on legal review.
8/11/11: Preparing for internal meetings.

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6/23/11: On hold since 2/24/11, but will start again soon.
1/20/11: Second Notice in review.
11/18/10: Draft rule language in development since 2/17/10.
2/17/10: Drafting rule language.
1/20/10: No change since 11/18/09.
11/18/09: Manda is waiting on information from IDEM staff.
6/23/09: First Notice posted 6/3/09.

Stone Crushing SSOA (10-571)
Staff: Harmon
Status: 8/18/16: No change since 10/22/15.
10/22/15: Jack Harmon working with program staff. Draft will be submitted to EPA for comment.
9/17/15: No change since 5/21/15.
5/21/15: Jack Harmon is reviewing information to start rulemaking again.
4/16/15: No change since 6/19/14.
6/19/14: Working internally with program staff.
5/15/14: No change since 12/19/13.
12/19/13: Susan Bem reviewing.
11/14/13: Susann Brown resigned; Chris Pedersen is contact.
9/19/13: No change.
8/22/13: Draft rule language prepared based on calculations; being revised.
7/18/13: No change.
6/20/13: Susann Brown is starting to work on it.
5/16/13: No change since 3/24/11.
3/24/11: Working on language.
2/24/11: No change since 10/21/10.
10/21/10: Second Notice being drafted.
9/30/10: First Notice published on 9/15/10.
8/19/10: First Notice is in review.
7/22/10: First Notice is being drafted.

Source Specific Operating Agreements (11-315)
Staff: Pedersen
Status: 8/18/16: No change since 2/20/14.
2/20/14: Susann Brown resigned; Chris Pedersen is contact.
9/19/13: No change.
6/20/13: Susann Brown is starting to work on it.
5/16/13: No change since 6/23/11.
6/23/11: First Notice published 6/1/11.
5/26/11: First Notice scheduled for June 2011.

Permit By Rule (11-316)
Staff: Pedersen
Status: 8/18/16: No change since 2/20/14.
2/20/14: Susann Brown resigned; Chris Pedersen is contact.
9/19/13: No change.
6/20/13: Susann Brown is starting to work on it.
5/16/13: No change since 6/23/11.
6/23/11: First Notice published 6/1/11.

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5/26/11: First Notice scheduled for June 2011.

Startup, Shutdown, and Malfunctions (15-326)
Staff: Harmon
Status: 8/18/16: Preliminarily adopted 8/10/16; final adoption scheduled for 11/9/16. Will send parallel processing request after final adoption hearing.
7/21/16: Preliminary adoption scheduled for 8/10/16; final adoption likely to be 11/9/16. SIP Call deadline is 11/22/16, so parallel processing request may be needed. Discuss on next month's call.
6/16/16: No change.
5/19/16: Preliminary adoption scheduled for 8/10/16.
4/21/16: No change.
3/17/16: Second Notice publishes 3/30/16. EPA will respond on approval of language.
2/18/16: Jack Harmon provided clarifications to Mary Portanova. Mary said it is ok to proceed. Jack will let Mary know the anticipated status of the rulemaking for November as soon as it can be predicted.
1/25/16: Second Notice in review. Will send to Mary Portanova after internal review.
12/17/15: IDEM will send draft rule language to Mary Portanova for review when ready.
11/23/15: First Notice published on 9/30/15. Drafting Second Notice.

Non-Electric Generating Unit NOx Emissions (15-414)
Staff: Harmon
Status: 8/18/16: Will send draft rule language to Doug Aburano within 2 to 3 weeks for review.
7/21/16: Draft Second Notice being reviewed by program staff.
6/16/16: No change.
4/21/16: Internal meetings; Second Notice being drafted.
3/17/16: No change since 1/25/16.
1/25/16: Comments received, drafting Second Notice.
12/17/15: First Notice published 12/9/15. Copy will be sent to Doug Aburano.
11/23/15: Approved by OMB. First Notice should publish soon.

Volatile Organic Liquid Storage Tanks (15-427)
Staff: Harmon
Status: 8/18/16: Draft should be ready for Steve Rosenthal review in a few weeks.
7/21/16: Second Notice being drafted with help of Betsy Zlatos. Send copy of Second Notice to Steve Rosenthal after internal review.
6/16/16: No change since 2/18/16.
2/18/16: Second Notice still being drafted. The draft will be sent to EPA for review when ready.
1/25/16: No comments; Second Notice being drafted. Copy to Steve Rosenthal after internal review.
12/17/15: First Notice published 12/16/15.
11/23/15: Waiting for OMB approval to proceed with First Notice.

Emission Reporting for Lawrenceburg Township, Dearborn County (16-162)
Staff: Walsh
Status: 8/18/16: Adopted 8/10/16. Final rule to be sent as soon as published (approximately 90 days).
7/21/16: No change since 5/19/16.
5/19/16: Adoption scheduled for 8/10/16.
4/21/16: Section 8 Notice will publish on 4/27/16.
3/17/16: No change.
1/25/16: At OMB for review.
12/17/15: Notice in review.

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11/23/15: Drafting Section 8 Notice for OMB submittal.

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Cross State Air Pollution Rule (CSAPR) (16-209)
Staff: Aguilar
Status: 8/18/16: No changes.
7/21/16: Second Notice should be drafted by October or November.
6/16/16: Meeting with affected sources in mid-July.
5/19/16: First Notice to publish 6/1/16.
5/16/16: OMB approval to proceed.

2016 CFR Update (16-208)
Staff: Walsh
Status: 8/18/16: Adopted 8/10/16. SIP submittal to be sent after promulgation.
7/21/16: No change since 5/19/16.
5/19/16: Section 8 Notice to publish 5/25/16. Adoption scheduled for 8/10/16.
4/21/16: No change.
3/17/16: At OMB for review.
2/18/16: No change.
1/25/16: Draft notice in review.
12/17/15: No change.
11/23/15: Drafting Section 8 Notice for OMB submittal.

Short-Term Backup Units (16-309)
Staff: Harmon
Status: 8/18/16: Comment period ends 8/19/16. One supporting comment received.
7/21/16: First Notice published on 7/20/16.
6/16/16: First Notice send to OMB today.
5/19/16: Internal discussions. Michael Langman will be contact.
4/21/16: Work beginning on First Notice draft.

Commercial and Industrial Solid Waste Incineration (CISWI) (xx-xxx)
Staff: Harmon
Status: 8/18/16: Making revisions.
7/21/16: No change since 5/19/16.
5/19/16: Incorporated EPA comments. Waiting on publication of new EPA rule.
4/21/16: Section 8 Notice drafted. Waiting to see if EPA makes additional changes by end of April.
3/17/16: With program staff for review.
2/18/16: No change.
1/25/16: Drafting notice and holding internal meeting.

Outdoor Hydronic Heaters (16-332)
Staff: Walsh
Status: 8/18/16: First Notice published 8/17/16 for comment.
7/21/16: Submitted to OMB on 6/29/16.
6/16/16: No change.
5/19/16: First Notice being drafted.
4/21/16: Approved to start rule to address 3/16/15 NSPS and existing rule amendments.

NIPSCO Consent Decree Requirements (xx-xxx)
Staff: Reiss
Status: 8/18/16: No change.

7/21/16: NIPSCO wants to meet with EPA and IDEM about issues, including force majeure language.
6/16/16: Three more issues to finalize before notice can be reviewed and go to OMB.
5/19/16: No change.
4/21/16: Revised draft sent back to NIPSCO attorney.
3/17/16: Reviewing comments from source attorney.
2/18/16: NIPSCO attorney to provide comments by end of February.
1/25/16: Comments from NIPSCO due by end of January.
12/17/15: No change.
11/23/15: Preparing OMB submittal.

2015 Ozone Standard (xx-xxx)
Staff: Walsh
Status: 8/18/16: At OMB for approval.
7/21/16: Draft Section 8 Notice in review.
6/16/16: Drafting Section 8 Notice.

State Plan Submittals

Lead NESHAP Delegation
Submitted: 1/8/14
Staff: Bem
Status:

Non-Rule SIP Submittals

Pollutant	Activity		Status
CO	Nothing to report.		
Lead	Redesignation of Muncie-area, Delaware County, nonattainment area.		Final redesignation petition and maintenance plan submitted April 14, 2016.
Nitrogen Dioxide	Nothing to report.		
Ozone	Redesignations		
		Lake/Porter Counties	Final redesignation petition and maintenance plan submitted June 15, 2016. Based on partial preliminary ozone monitoring data for 2016, the three year design value (2014-2016) for multiple monitors in the Illinois/Wisconsin portion of the Chicago – Naperville, IL-IN-WI nonattainment area are above the 2008 standard. IDEM is in the initial stages of preparing an attainment demonstration and technical support document, including, 15% rate of progress plan, 3% contingency plan, and NOx RACT Analysis, for Lake and Porter counties.
		Lawrenceburg Township (Dearborn County)	Final redesignation petition and maintenance plan submitted February 23, 2016. Supplement to recharacterize 2014 emissions inventory to include actual EGU and non-point emissions of point source category submitted May 4, 2016. Draft rulemaking for revision to Emissions Reporting Rule, LSA Document #16-162, published in the Indiana Register on April 27, 2016. Public comment period ended May 27, 2016. No public comments received. The final rule was adopted at the August 10 Indiana Environmental Rules Board meeting and should be effective by December. Request to parallel process rule revisions to the Emissions Reporting Rule submitted June 1, 2016.
	2015 Standard Infrastructure SIP		Due to EPA on or before 10/1/2018.
	2015 Standard Designation Recommendations		Due to EPA on or before 10/1/2016.
Sulfur Dioxide	Round 1 Nonattainment Areas		Attainment demonstration submitted 10/2/2015; completeness letter received from EPA on 2/25/2016. Technical addendum for revisions to Indiana's State Implementation Plan for SO2 and attainment demonstration to incorporate changes to Rolls Royce within the Marion County nonattainment area was submitted May 2, 2016.

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	Round 2 Designations (consent decree) Gibson, Rockport, Michigan City, Clifty Creek, and A.B. Brown generating stations	EPA designated Gibson, Jefferson (partial), LaPorte, Posey (partial), and Spencer (partial) counties as unclassifiable/attainment for the 2010 primary 1-hour SO2 standard as published in the *Federal Register (FR)* on July 12, 2016 (81 FR 45039).
	Redesignation of Clay and Washington Townships (Morgan County), nonattainment area.	Preliminary draft of the redesignation petition and maintenance plan submitted to EPA for review/comment.
	Rounds 3 and 4 Designations (Data Requirements Rule)	Indiana's modeling and monitoring protocol submitted June 30, 2016.
Particulates	Redesignations	
	Lawrenceburg Township (part of Cincinnati NA area)	Submitted 2/11/2016 … a letter requesting EPA act on the RACM analysis provided in the attainment plan that shows that existing measures meet the RACM requirements. Revised draft redesignation petition and maintenance plan completed and is out for public comment. Deadline to request a hearing was 7/29/2016. A request for a public hearing was not received and the hearing was cancelled. Public comment period ended August 15, 2016. No public comments were received. Redesignation petition and maintenance plan will be sent to EPA for review/approval soon.
	Clark/Floyd Counties and Madison Township	EPA's proposed approval of the redesignation petition and maintenance plan published in the *Federal Register* (FR) on June 23, 2016 (81 FR 40834). Public comment period ended July 25, 2016. No public comments were received. Final approval of the redesignation petition and maintenance plan should be published in the Federal Register soon.
	2012 Standard Infrastructure SIP	Final infrastructure SIP submitted on June 10, 2016. To further show that Indiana has fulfilled the requirements of Prong 1 and Prong 2 of the interstate transport provisions, an analysis is being performed on interstate transport of Indiana's emissions relative to the 2012 $PM_{2.5}$ NAAQS and U.S. EPA's March 2016 "Good Neighbor" Provision projected modeling of 2017 and 2025. This transport analysis is being coordinated via the Lake Michigan Air Director's Consortium (LADCO), with support from each of the member states. It will be submitted separately as formal supporting documentation for 110(a)(2)(D)(i)(l) of this submittal. IDEM anticipates submission of the analysis to U.S. EPA in late-2016.
Regional Haze	Five-Year Progress Report	Final five-year progress report submitted March 30, 2016.

cc: Lauren Aguilar, Keith Baugues, Susan Bem, Jean Boling, Brian Callahan, Carol Comer, Scott Deloney, Mark Derf, Jack Harmon, Nancy King, Christine Pedersen, Bruno Pigott, Jessica Reiss, Shawn Seals, Don Snemis, Valerie Tachtiris, Doug Wagner, Keelyn Walsh, Betsy Zlatos, Doug Aburano (EPA Region V), Pam Blakley (EPA Region V), Louise Gross (EPA Region V), Chris Panos (EPA Region V), Steve Rosenthal (EPA Region V)

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To: Aguilar, Lauren[LAguilar@idem.IN.gov]; Baugues, Keith[KBaugues@idem.IN.gov]; Bem, Susan[SBEM@idem.IN.gov]; 'blakley.pamela@epamail.epa.gov'['blakley.pamela@epamail.epa.gov']; Boling, Jean[JBoling@idem.IN.gov]; CALLAHAN, BRIAN[BCALLAHA@idem.IN.gov]; Comer, Carol[CComer@idem.IN.gov]; DELONEY, SCOTT[SDELONEY@idem.IN.gov]; DERF, MARK[MDERF@idem.IN.gov]; Aburano, Douglas[aburano.douglas@epa.gov]; 'gross.louise@epa.gov'['gross.louise@epa.gov']; Harmon, Jack[JAHarmon@idem.IN.gov]; KING, NANCY[NKING@idem.IN.gov]; 'panos.christos@epamail.epa.gov'['panos.christos@epamail.epa.gov']; PIGOTT, BRUNO[BPIGOTT@idem.IN.gov]; Reiss, Jessica[JReiss@idem.IN.gov]; 'Rosenthal.Steven@epamail.epa.gov'['Rosenthal.Steven@epamail.epa.gov']; SEALS, SHAWN[SSEALS@idem.IN.gov]; Snemis, Donald (IDEM)[DSnemis@idem.IN.gov]; Tachtiris, Valerie[VTachtir@idem.IN.gov]; Wagner, Doug[DWAGNER@idem.IN.gov]; Walsh, Keelyn[KWalsh@idem.IN.gov]; ZLATOS, BETSY[BZLATOS@idem.IN.gov]; Pedersen, Christine[CPEDERSE@idem.IN.gov]
From: Ferguson, Leslie
Sent: Wed 10/26/2016 8:25:08 PM
Subject: Indiana and U.S. EPA Region V Rule and SIP Call Notes: October 20, 2016
EPA Rule and SIP Call Notes 10.20.16.doc

Attached are the call notes from the October 20, 2016, Indiana and U.S. EPA Region V Rule and SIP Call.

Please feel free to get back with me if you have any questions or concerns.

Thanks

Leslie J. Ferguson, MPH

Environmental Manager, Standards & Implementation

Indiana Department of Environmental Management

Office of Air Quality, N1003

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Indianapolis, IN 46204

Work: 317-233-1179

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To: Aguilar, Lauren[LAguilar@idem.IN.gov]; Baugues, Keith[KBaugues@idem.IN.gov]; Bem, Susan[SBEM@idem.IN.gov]; Blakley, Pamela[blakley.pamela@epa.gov]; Boling, Jean[JBoling@idem.IN.gov]; CALLAHAN, BRIAN[BCALLAHA@idem.IN.gov]; DELONEY, SCOTT[SDELONEY@idem.IN.gov]; DERF, MARK[MDERF@idem.IN.gov]; Aburano, Douglas[aburano.douglas@epa.gov]; Gross, Louise C[gross.louise@epa.gov]; Harmon, Jack[JAHarmon@idem.IN.gov]; KING, NANCY[NKING@idem.IN.gov]; Panos, Christos[Panos.Christos@epa.gov]; PIGOTT, BRUNO[BPIGOTT@idem.IN.gov]; Reiss, Jessica[JReiss@idem.IN.gov]; Rosenthal, Steven[rosenthal.steven@epa.gov]; SEALS, SHAWN[SSEALS@idem.IN.gov]; Tachtiris, Valerie[VTachtir@idem.IN.gov]; Wagner, Doug[DWAGNER@idem.IN.gov]; Walsh, Keelyn[KWalsh@idem.IN.gov]; ZLATOS, BETSY[BZLATOS@idem.IN.gov]; Pedersen, Christine[CPEDERSE@idem.IN.gov]
Cc: Ferguson, Leslie[LFerguso@idem.IN.gov]; KOCH, JAY[JKOCH@idem.IN.gov]
From: FERRIS, GALE
Sent: Thur 2/23/2017 2:02:59 PM
Subject: Indiana and U.S. EPA Region V Rule and SIP Call Notes: February 16, 2017
Indiana and EPA Rule and SIP Call Notes 2.16.17.doc

Attached are the call notes from the February 16, 2017 Indiana and U.S. EPA Region V Rule and SIP Call.

Please feel free to get back with me if you have any questions or concerns.

Thanks

To: Aguilar, Lauren[LAguilar@idem.IN.gov]; Baugues, Keith[KBaugues@idem.IN.gov]; Bem, Susan[SBEM@idem.IN.gov]; Blakley, Pamela[blakley.pamela@epa.gov]; Boling, Jean[JBoling@idem.IN.gov]; CALLAHAN, BRIAN[BCALLAHA@idem.IN.gov]; Comer, Carol[CComer@idem.IN.gov]; DELONEY, SCOTT[SDELONEY@idem.IN.gov]; DERF, MARK[MDERF@idem.IN.gov]; Aburano, Douglas[aburano.douglas@epa.gov]; Gross, Louise[gross.louise@epa.gov]; Harmon, Jack[JAHarmon@idem.IN.gov]; KING, NANCY[NKING@idem.IN.gov]; Panos, Christos[Panos.Christos@epa.gov]; PIGOTT, BRUNO[BPIGOTT@idem.IN.gov]; Reiss, Jessica[JReiss@idem.IN.gov]; Rosenthal, Steven[rosenthal.steven@epa.gov]; SEALS, SHAWN[SSEALS@idem.IN.gov]; Snemis, Donald (IDEM)[DSnemis@idem.IN.gov]; Tachtiris, Valerie[VTachtir@idem.IN.gov]; Wagner, Doug[DWAGNER@idem.IN.gov]; Walsh, Keelyn[KWalsh@idem.IN.gov]; ZLATOS, BETSY[BZLATOS@idem.IN.gov]; Pedersen, Christine[CPEDERSE@idem.IN.gov]
From: FERRIS, GALE
Sent: Tue 11/22/2016 8:43:03 PM
Subject: Indiana and U.S. EPA Region V Rule and SIP Call Notes: November 17, 2016
Indiana and EPA Rule and SIP Call Notes 11.17.16.doc

Attached are the call notes from the November 17, 2016 Indiana and U.S. EPA Region V Rule and SIP Call.

Please feel free to get back with me if you have any questions or concerns.

Thanks

To: FERRIS, GALE[GFERRIS@idem.IN.gov]
Cc: Aguilar, Lauren[LAguilar@idem.IN.gov]; Baugues, Keith[KBaugues@idem.IN.gov]; Bem, Susan[SBEM@idem.IN.gov]; Blakley, Pamela[blakley.pamela@epa.gov]; Boling, Jean[JBoling@idem.IN.gov]; CALLAHAN, BRIAN[BCALLAHA@idem.IN.gov]; DELONEY, SCOTT[SDELONEY@idem.IN.gov]; DERF, MARK[MDERF@idem.IN.gov]; Aburano, Douglas[aburano.douglas@epa.gov]; Gross, Louise[gross.louise@epa.gov]; Harmon, Jack[JAHarmon@idem.IN.gov]; KING, NANCY[NKING@idem.IN.gov]; Panos, Christos[Panos.Christos@epa.gov]; PIGOTT, BRUNO[BPIGOTT@idem.IN.gov]; Reiss, Jessica[JReiss@idem.IN.gov]; Rosenthal, Steven[rosenthal.steven@epa.gov]; SEALS, SHAWN[SSEALS@idem.IN.gov]; PIGOTT, BRUNO[BPIGOTT@idem.IN.gov]; Tachtiris, Valerie[VTachtir@idem.IN.gov]; Wagner, Doug[DWAGNER@idem.IN.gov]; Walsh, Keelyn[KWalsh@idem.IN.gov]; ZLATOS, BETSY[BZLATOS@idem.IN.gov]; Pedersen, Christine[CPEDERSE@idem.IN.gov]
From: FERRIS, GALE
Sent: Fri 1/27/2017 1:24:10 PM
Subject: Indiana and U.S. EPA Region V Rule and SIP Call Notes: January 19, 2017
Indiana and EPA Rule and SIP Call Notes 1.19.17.doc

Attached are the call notes from the January 19, 2017 Indiana and U.S. EPA Region V Rule and SIP Call.

Please feel free to get back with me if you have any questions or concerns.

Thanks

Indiana and EPA SIP/Rules Call Notes
October 20, 2016

Participants

EPA: Douglas Aburano, Pamela Blakley, Kathleen D'Agostino, Edward Doty, Jennifer Liljegren, Chris Panos, Matthew Rau, Steve Rosenthal, John Summerhays, Eric Svingen, Michael Langman, Charles Hatten, Carolyn Persoon, Paymon Danesh, Mary Portanova, Randall Robinson, Sarah Arra, Michele Becker and Joseph Ho.

IDEM: Lauren Aguilar, Jean Boling, Scott Deloney, Mark Derf, Leslie Ferguson, Brian Callahan, Jack Harmon, Chris Pedersen, Doug Wagner, Keelyn Walsh, Jessica Reiss

Updates

SO_2 Implementation and Data Requirements Rule –
There is no change from last month for Isolatek. A path to attainment does not appear possible.

Indiana is trying hard to meet the January 13, 2017, deadline regarding Carmeuse, but it is possible that it might be missed.

The ArcelorMittal - Burns Harbor SO_2 monitoring site in Porter County is on track to start operation by January 1, 2017.

For all other DRR sources a modeling TSD should be ready by January 13, 2017.

Dearborn County (Lawrenceburg Township) $PM_{2.5}$ –
EPA is reviewing Indiana's August 19, 2016, submittal for redesignation of the 1997 annual standard.

2012 $PM_{2.5}$ Transport SIP –
Indiana will have a draft to EPA in November. The document will not go through the public notice process. It is an addendum to the 2012 $PM_{2.5}$ Infrastructure State Implementation Plan that was submitted June 10, 2016.

Delaware County (Muncie, IN) Lead –
Monitoring data continues to show attainment. The redesignation is being reviewed by EPA's Office of Regional Counsel. They have not found any issues so far. EPA will let Indiana know if any issues arise.

Dearborn County (Lawrenceburg Township) Ozone –
Indiana is waiting for final promulgation of the Emission Reporting Rule. The redesignation should be submitted to EPA in December 2016.

Lake and Porter Counties Ozone (attainment demonstration, 15% plan, 3% contingency plan) –
A draft of LADCO's modeling was received. Indiana, Wisconsin, and Illinois are currently reviewing. It is a critical component of the attainment demonstration. The 15% Rate of Progress and 3% contingency plans are on track. Indiana's VOC RACT is up-to-date. A rule for NO_x RACT would not be complete by the attainment date and would not support reductions in the area that would advance the attainment date. Tentatively, a draft document may be ready for EPA review in November 2016. It will be put on public notice in December 2016,

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tentatively. The document may potentially be ready for submission ahead of schedule, in late January to early February.

2015 Ozone Designations –
EPA is in the process of sending out letters of receipt for receiving designation recommendations. EPA will formulate 120-day letters by June 2017. If EPA is considering changes to Indiana's recommendations, they plan to discuss these changes with Indiana prior to issuing the 120-day letter.

Morgan County SO_2 Nonattainment Area –
A separate call will was held October 19, 2016, to discuss the attainment SIP and potential redesignation of the area. EPA should begin drafting a response to the attainment plan in November. EPA is planning to consider approval of a partial redesignation of the nonattainment area.

SABIC/Carmeuse Commissioner's Orders for the Data Requirements Rule –
Commissioner's orders for SABIC were on track to be signed late last week. It will be on public notice the following week and Indiana will also submit a letter to request parallel processing of the orders. This should not draw any attention from the Sierra Club.

Monitoring –
There are not any monitoring changes.

Next Call (date and time)
November 17, 2016, 9 am (Chicago), 10 am (Indianapolis)

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Status of Rule SIP Submittals

Ethanol Plant Clarification (11-99)
Submitted: 9/19/11
Staff: Pedersen
Status: 10/20/16: No change since 9/22/11.
9/22/11: Received, but on hold until EPA reconsiders the ethanol source definition policy.

AEP Rockport (12-392)
Submitted: 1/13/15
Staff: Bem, Rau
Status: 10/20/16: Completed.
9/30/16: Final rule published; effective 10/31/16.
9/15/16: With Regional Administrator for signature.
8/18/16: Working on Sierra Club comments concerning modeling.
7/21/16: ORC approval is expected next week.
6/16/16: The draft final is with ORC.
5/19/16: Working on responses to comments from Louise Gross.
4/21/16: OGC is reviewing; should be done by mid-May.
3/17/16: Call scheduled to discuss comments.
2/18/16: No change.
1/28/16: Adverse comment received.
1/25/16: Comment period ends soon; no comments so far. Final is drafted.
12/28/15: Proposed rule published.
12/17/15: Signed and sent for publication.
11/23/15: With RA.
10/22/15: In signature chain.
9/17/15: No change since 7/16/15.
7/16/15: At ORC.
6/18/15: Notice drafted; to ORC in next few days.
5/21/15: No change.
4/16/15: Under review.
3/19/15: No change.
2/19/15: No update.

Shipbuilding and Ship Repair Antifoulant Coatings (14-441)
Submitted: 7/17/15
Staff: Bem, Svingen

Jeffboat Commissioners Order (2014-01)
Submitted: 10/23/14
Status: 10/20/16: Completed.
9/15/16: No adverse comment received to date.
8/24/16: Withdrawal request for Jeffboat Commissioner's Order sent to EPA.
8/23/16: Direct final rule published; effective 10/24/16 unless adverse comment received by 9/22/16.

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8/18/16: It is signed and sent for publication to the Federal Register. IDEM will finalize and send withdrawal letter for the Jeffboat Commissioners Order within a week.
7/21/16: ORC approval is expected next week.
6/16/16: With ORC.
5/19/16: It is in the signature chain. There are no issues, but IDEM to verify that Jeffboat is only source affected. Should publish in July. Commissioner's Order to be withdrawn.
4/21/16: Direct final approval being drafted. SIP submittal looks good. Commissioner's Order to be withdrawn when direct final rule publishes.
3/17/16: No change since 11/23/15.
11/23/15: Working on now.
10/22/15: No change since 8/27/15.
8/27/15: EPA to move forward with review of Shipbuilding and Ship Repair Antifoulant Coatings rule that will supersede Jeffboat Commissioners Order (CO). When rule is approved, Jeffboat CO will be withdrawn.
7/16/15: The Shipbuilding rulemaking should be sent this week.
6/18/15: Rule published 6/17/15. SIP submittal soon. TSD to be finished in next two weeks.
5/21/15: No change since 3/19/15.
3/19/15: EPA is holding off on approval, but will continue to review so that shipbuilding rule can be approved at same time.
2/19/15: EPA reviewing credits.
1/15/15: Only issue is question on credits. Susan forwarded question to Jay Koch for response.
12/18/14: No change.
11/24/14: Steve Rosenthal had question and will contact Jay Koch.

<u>SO_2 Emission Limits</u> (11-356)
Submitted: 10/2/15
Staff: Bem, Summerhays
Status: 10/20/16: No change since 11/23/15.
11/23/15: Assigned to John Summerhays.
10/22/15: Submittal received. Rule is part of attainment demonstration.

Indiana Rules in Process

<u>Asbestos</u> (09-363)
Staff: Pedersen
Status: 10/20/16: No change since 10/22/15.
10/22/15: Jack Harmon working with program staff on draft rule language.
9/17/15: No change since 11/14/13.
11/14/13: Shadi Khoury resigned; rule will be reassigned.
9/19/13: No change.
8/22/13: Waiting on program staff input.
7/8/13: Rule reassigned to Shadi Khoury.
6/20/13: No change since 6/21/12.
6/21/12: IDEM working on draft.
5/17/12: No change since 9/22/11.
9/22/11: Waiting on legal review.
8/11/11: Preparing for internal meetings.
6/23/11: On hold since 2/24/11, but will start again soon.
1/20/11: Second Notice in review.
11/18/10: Draft rule language in development since 2/17/10.

2/17/10: Drafting rule language.
1/20/10: No change since 11/18/09.
11/18/09: Manda is waiting on information from IDEM staff.
6/23/09: First Notice posted 6/3/09.

Stone Crushing SSOA (10-571)
Staff: Harmon
Status: 10/20/16: No change since 10/22/15.
10/22/15: Jack Harmon working with program staff. Draft will be submitted to EPA for comment.
9/17/15: No change since 5/21/15.
5/21/15: Jack Harmon is reviewing information to start rulemaking again.
4/16/15: No change since 6/19/14.
6/19/14: Working internally with program staff.
5/15/14: No change since 12/19/13.
12/19/13: Susan Bem reviewing.
11/14/13: Susann Brown resigned; Chris Pedersen is contact.
9/19/13: No change.
8/22/13: Draft rule language prepared based on calculations; being revised.
7/18/13: No change.
6/20/13: Susann Brown is starting to work on it.
5/16/13: No change since 3/24/11.
3/24/11: Working on language.
2/24/11: No change since 10/21/10.
10/21/10: Second Notice being drafted.
9/30/10: First Notice published on 9/15/10.
8/19/10: First Notice is in review.
7/22/10: First Notice is being drafted.

Source Specific Operating Agreements (11-315)
Staff: Pedersen
Status: 10/20/16: No change since 2/20/14.
2/20/14: Susann Brown resigned; Chris Pedersen is contact.
9/19/13: No change.
6/20/13: Susann Brown is starting to work on it.
5/16/13: No change since 6/23/11.
6/23/11: First Notice published 6/1/11.
5/26/11: First Notice scheduled for June 2011.

Permit By Rule (11-316)
Staff: Pedersen
Status: 10/20/16: No change since 2/20/14.
2/20/14: Susann Brown resigned; Chris Pedersen is contact.
9/19/13: No change.
6/20/13: Susann Brown is starting to work on it.
5/16/13: No change since 6/23/11.
6/23/11: First Notice published 6/1/11.
5/26/11: First Notice scheduled for June 2011.

Startup, Shutdown, and Malfunctions (15-326)

Staff: Harmon
Status: 10/20/16: No change.
9/15/16: Preliminarily adopted 8/10/16; final adoption scheduled for 11/9/16. Will send parallel processing request after final adoption hearing.
7/21/16: Preliminary adoption scheduled for 8/10/16; final adoption likely to be 11/9/16. SIP Call deadline is 11/22/16, so parallel processing request may be needed. Discuss on next month's call.
6/16/16: No change.
5/19/16: Preliminary adoption scheduled for 8/10/16.
4/21/16: No change.
3/17/16: Second Notice publishes 3/30/16. EPA will respond on approval of language.
2/18/16: Jack Harmon provided clarifications to Mary Portanova. Mary said it is ok to proceed. Jack will let Mary know the anticipated status of the rulemaking for November as soon as it can be predicted.
1/25/16: Second Notice in review. Will send to Mary Portanova after internal review.
12/17/15: IDEM will send draft rule language to Mary Portanova for review when ready.
11/23/15: First Notice published on 9/30/15. Drafting Second Notice.

Non-Electric Generating Unit NOx Emissions (15-414)
Staff: Harmon
Status: 10/20/16: No change.
9/15/16: Clarifying draft language.
8/18/16: Will send draft rule language to Doug Aburano within 2 to 3 weeks for review.
7/21/16: Draft Second Notice being reviewed by program staff.
6/16/16: No change.
4/21/16: Internal meetings; Second Notice being drafted.
3/17/16: No change since 1/25/16.
1/25/16: Comments received, drafting Second Notice.
12/17/15: First Notice published 12/9/15. Copy will be sent to Doug Aburano.
11/23/15: Approved by OMB. First Notice should publish soon.

Volatile Organic Liquid Storage Tanks (15-427)
Staff: Harmon
Status: 10/20/16: No change.
9/15/16: In internal review.
8/18/16: Draft should be ready for Steve Rosenthal review in a few weeks.
7/21/16: Second Notice being drafted with help of Betsy Zlatos. Send copy of Second Notice to Steve Rosenthal after internal review.
6/16/16: No change since 2/18/16.
2/18/16: Second Notice still being drafted. The draft will be sent to EPA for review when ready.
1/25/16: No comments; Second Notice being drafted. Copy to Steve Rosenthal after internal review.
12/17/15: First Notice published 12/16/15.
11/23/15: Waiting for OMB approval to proceed with First Notice.

Emission Reporting for Lawrenceburg Township, Dearborn County (16-162)
Staff: Walsh
Status: 10/20/16: Rule in promulgation process.
9/15/16: Final rule should be effective by December and will be submitted as soon as published.
8/18/16: Adopted 8/10/16. Final rule to be sent as soon as published (approximately 90 days).
7/21/16: No change since 5/19/16.
5/19/16: Adoption scheduled for 8/10/16.
4/21/16: Section 8 Notice will publish on 4/27/16.

3/17/16: No change.
1/25/16: At OMB for review.
12/17/15: Notice in review.
11/23/15: Drafting Section 8 Notice for OMB submittal.

Cross State Air Pollution Rule (CSAPR) (16-209)
Staff: Aguilar
Status: 10/20/16: CSAPR Update rule released, but not published. Continuing work on Second Notice.
9/15/16: Second Notice tentatively to be ready in November.
8/18/16: No changes.
7/21/16: Second Notice should be drafted by October or November.
6/16/16: Meeting with affected sources in mid-July.
5/19/16: First Notice to publish 6/1/16.
5/16/16: OMB approval to proceed.

2016 CFR Update (16-208)
Staff: Walsh
Status: 10/20/16: Rule in promulgation process.
9/15/16: Promulgation package sent to Attorney General on 9/13/16. Should be ready for submittal in December.
8/18/16: Adopted 8/10/16. SIP submittal to be sent after promulgation.
7/21/16: No change since 5/19/16.
5/19/16: Section 8 Notice to publish 5/25/16. Adoption scheduled for 8/10/16.
4/21/16: No change.
3/17/16: At OMB for review.
2/18/16: No change.
1/25/16: Draft notice in review.
12/17/15: No change.
11/23/15: Drafting Section 8 Notice for OMB submittal.

Short-Term Backup Units (16-309)
Staff: Harmon
Status: 10/20/16: No change.
9/15/16: Starting to draft rule language.
8/18/16: Comment period ends 8/19/16. One supporting comment received.
7/21/16: First Notice published on 7/20/16.
6/16/16: First Notice send to OMB today.
5/19/16: Internal discussions. Michael Langman will be contact.
4/21/16: Work beginning on First Notice draft.

Commercial and Industrial Solid Waste Incineration (CISWI) (xx-xxx)
Staff: Harmon
Status: 10/20/16: No change since 8/18/16.
8/18/16: Making revisions.
7/21/16: No change since 5/19/16.
5/19/16: Incorporated EPA comments. Waiting on publication of new EPA rule.
4/21/16: Section 8 Notice drafted. Waiting to see if EPA makes additional changes by end of April.
3/17/16: With program staff for review.
2/18/16: No change.
1/25/16: Drafting notice and holding internal meeting.

Outdoor Hydronic Heaters (16-332)
Staff: Walsh
Status: 10/20/16: Drafting Second Notice.
9/15/16: No comments received to date.
8/18/16: First Notice published 8/17/16 for comment.
7/21/16: Submitted to OMB on 6/29/16.
6/16/16: No change.
5/19/16: First Notice being drafted.
4/21/16: Approved to start rule to address 3/16/15 NSPS and existing rule amendments.

NIPSCO Consent Decree Requirements (xx-xxx)
Staff: Reiss
Status: 10/20/16: No change.
9/15/16: Meeting with EPA and NIPSCO on force majeure language.
8/18/16: No change.
7/21/16: NIPSCO wants to meet with EPA and IDEM about issues, including force majeure language.
6/16/16: Three more issues to finalize before notice can be reviewed and go to OMB.
5/19/16: No change.
4/21/16: Revised draft sent back to NIPSCO attorney.
3/17/16: Reviewing comments from source attorney.
2/18/16: NIPSCO attorney to provide comments by end of February.
1/25/16: Comments from NIPSCO due by end of January.
12/17/15: No change.
11/23/15: Preparing OMB submittal.

2015 Ozone Standard (xx-xxx)
Staff: Walsh
Status: 10/20/16: No change since 8/18/16.
8/18/16: At OMB for approval.
7/21/16: Draft Section 8 Notice in review.
6/16/16: Drafting Section 8 Notice.

State Plan Submittals

Lead NESHAP Delegation
Submitted: 1/8/14
Staff: Bem
Status:

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Non-Rule SIP Submittals

Pollutant	Activity	Status
CO	Nothing to report.	
Lead	Redesignation of Muncie-area, Delaware County, nonattainment area.	Redesignation petition and maintenance plan submitted April 14, 2016.
Nitrogen Dioxide	Nothing to report.	
Ozone	Redesignations	
	Lake/Porter Counties	Redesignation petition and maintenance plan submitted June 15, 2016. Based on partial/preliminary ozone monitoring data for 2016, the three year design value (2014-2016) for the Chiwaukee, WI monitor is above the 2008 standard. IDEM is in the initial stages of preparing an attainment demonstration and technical support document, including, 15% rate of progress plan, and 3% contingency plan for Lake and Porter counties.
	Lawrenceburg Township (Dearborn County)	Redesignation petition and maintenance plan submitted February 23, 2016. Supplement to recharacterize 2014 emissions inventory to include actual EGU and non-point emissions of point source category submitted May 4, 2016. Draft rulemaking for revision to Emissions Reporting Rule, LSA Document #16-162, published in the Indiana Register on April 27, 2016. Public comment period ended May 27, 2016. No public comments received. The rule was adopted at the August 10 Environmental Rules Board meeting and should be effective by December. Request to parallel process rule revisions to the Emissions Reporting Rule submitted June 1, 2016.
	2015 Standard Infrastructure SIP	Due to EPA on or before October 1, 2018.
	2015 Standard Designation Recommendations	Designation recommendations submitted September 16, 2016.
Sulfur Dioxide	Round 1 Nonattainment Areas	Attainment demonstration submitted October 2, 2015; completeness letter received from EPA on February 25, 2016. Technical addendum for revisions to Indiana's State Implementation Plan for SO2 and attainment demonstration to incorporate changes to Rolls Royce within the Marion County nonattainment area was submitted May 2, 2016.
	Round 2 Designations (consent decree) Gibson, Rockport, Michigan City, Clifty Creek, and A.B. Brown generating stations	EPA designated Gibson, Jefferson (partial), LaPorte, Posey (partial), and Spencer (partial) counties as unclassifiable/attainment for the 2010 primary 1-hour SO2 standard as published in the *Federal Register (FR)* on July 12, 2016 (81 FR 45039).
	Redesignation of Clay and Washington Townships (Morgan County), nonattainment area.	A separate call will be scheduled soon to discuss EPA's comments/concerns regarding the preliminary redesignation petition and maintenance plan.
	Rounds 3 and 4 Designations (Data Requirements Rule)	Indiana's modeling and monitoring protocol submitted June 30, 2016. Modeling analyses or federally permanent/enforceable emission limits and compliance due by January 13, 2017.
Particulates	Lawrenceburg Township (part of Cincinnati NA area) Redesignations	EPA's proposed approval of the RACM/RACT analysis published in the Federal Register on August 25, 2016 (81 FR 58402). The rule will be effective on October 24, 2016, unless EPA receives adverse comments by September 26, 2016. Revised draft redesignation petition and maintenance plan completed. Public comment ended August 15, 2016. No public comments were received. Redesignation petition and maintenance plan submitted to EPA for review/approval on August 19, 2016.
	2012 Standard Infrastructure SIP	Infrastructure SIP submitted June 10, 2016. An interstate transport analysis that supports Indiana's fulfillment of Section 110(a)(2)(D)(i)(l) (Prong 1 and 2) and (ii) (Prong 4) requirements is being performed. This analysis is tentatively scheduled to be completed in mid-to-late 2016.
Regional Haze	Five-Year Progress Report	Five-year progress report submitted March 30, 2016.

cc: Lauren Aguilar, Keith Baugues, Susan Bem, Jean Boling, Brian Callahan, Carol Comer, Scott Deloney, Mark Derf, Gale Ferris, Jack Harmon, Nancy King, Bruno Pigott, Jessica Reiss, Shawn Seals, Don Snemis, Valerie Tachtiris, Doug Wagner, Keelyn Walsh, Betsy Zlatos, Doug Aburano (EPA Region V), Pam Blakley (EPA Region V), Louise Gross (EPA Region V), Chris Panos (EPA Region V), Steve Rosenthal (EPA Region V)

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Indiana and EPA Rule and SIP Call Notes
February 16, 2017

Participants
EPA: Douglas Aburano, Gilberto Alvarez, Sarah Arra, Michelle Becker, Pamela Blakely, Emily Crispell, Kathleen D'Agostino, Paymon Danesh, Joseph Ko, Michael Langman, Avrohom Lapp, Jennifer Liljegren, John Mooney, Christos Panos, Mary Portanova, Matthew Rau, Randall Robinson, Steve Rosenthal, John Summerhays, Eric Svingen

IDEM: Lauren Aguilar, Susan Bem, Jean Boling, Brian Callahan, Scott Deloney, Mark Derf, Leslie Ferguson, Gale Ferris, Jack Harmon, Jay Koch, Chris Pedersen, Doug Wagner, Keelyn Walsh

Updates

SO_2 Implementation and Data Requirements Rule -

EPA indicated that its regional offices will be meeting on March 1st and 2nd to discuss the states Data Requirements Rule submittals. Region 5 plans to bring up Isolatek and Alcoa for discussion.

EPA is requesting that the modeling for Lake County be re-run with the newer version of AERMOD (v16216r) and the updated meteorological files using the latest version of AERMET.

Dearborn County (Lawrenceburg Township) $PM_{2.5}$ -

The redesignation petition and maintenance plan is at EPA's Office of Regional Counsel and is moving through EPA's signature process.

2012 $PM_{2.5}$ Transport SIP -

EPA is the process of reviewing the SIP.

Delaware County (Muncie, IN) Lead -

The template for approving lead redesignation petitions is moving through the signature process. The proposed rule approving the Cleveland, Ohio redesignation petition will be signed by the end of the week. The proposed rule approving the redesignation petition for Delaware County should follow soon thereafter.

Dearborn County (Lawrenceburg Township) Ozone -

The final rule approving revisions to the Emissions Reporting Rule and redesignation petition and maintenance plan is moving through EPA's signature process.

Lake and Porter Counties Ozone (Section 172 and 182 Submittal) -

IDEM is anticipating that the Section 172 and 182 submittal for Lake and Porter counties will be submitted for review/approval within the next couple of weeks.

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2015 Ozone Designations -

EPA is in the process of preparing the technical support documents for preliminary designation recommendations under the 2015 ozone standard and will be getting in touch with Region 5 states soon to discuss. EPA is anticipating that preliminary designation recommendation letters will be sent to Region 5 states in early-June.

Morgan County SO_2 Nonattainment Area -

No new updates.

Monitoring -

The Belmont Advanced Wastewater Treatment Plant reported lead emission levels that necessitated further evaluation. IDEM had proposed to put a lead monitor near Belmont to assess the lead impacts but have not begun construction on the monitoring site yet. The review of emissions and additional information that we are waiting on Belmont to provide will show the lead emission reductions are federally enforceable and permanent, therefore, a lead monitor will not need to be constructed at the facility.

40 CFR 52.770 SIP Updates -

IDEM e-mailed a number of corrections to the SIP. EPA will make the necessary revisions to fix the corrections, but will not be making significant revisions in this year's round of updates.

Next Call (date and time)
March 16, 2017, 9 am (Chicago), 10 am (Indianapolis)

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Agenda for the Rules Portion of the Rule and SIP Call
February 16, 2017

Status of Rule SIP Submittals

Ethanol Plant Clarification (11-99)
Submitted: 9/19/11
Staff: Pedersen
Status: 2/16/17: No change since 9/22/11.
9/22/11: Received, but on hold until EPA reconsiders the ethanol source definition policy.

SO_2 Emission Limits (11-356)
Submitted: 10/2/15
Staff: Bem, Summerhays
Status: 2/16/17: No change since 11/23/15.
11/23/15: Assigned to John Summerhays.
10/22/15: Submittal received. Rule is part of attainment demonstration.

Startup, Shutdown and Malfunctions (15-326)
Submitted: 1/31/17
Staff: Harmon, Persoon
Status: 2/16/17: No change.
1/31/17: Final submittal sent.
1/19/17: The draft approval is going to OGC and OAQPS for review.
12/15/16: The approval is being drafted.
11/17/16: Submitted parallel processing request on 11/14/16.

Emission Reporting for Lawrenceburg Township, Dearborn County (16-162)
Submitted: 11/18/16
Staff: Walsh, Svingen
Status: 2/16/17: Waiting in signature chain.
1/19/17: Final approval will be published at the same time as the redesignation request.
12/27/16: Proposed approval published.
12/15/16: Signed as a separate action from the redesignation request.
11/18/16: SIP submittal sent to EPA.
6/1/16: OAQ staff submitted Section 8 Notice and requested parallel processing.

2015 CFR Update (16-208)
Submitted: 12/13/16
Staff: Walsh, Hatten
Status: 2/16/17: Drafted and in signature chain.
1/19/17: Review has been assigned to Charles Hatten.
12/15/16: Submittal received electronically.
12/13/16: SIP submittal sent to EPA.

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Indiana Rules in Process

Asbestos (09-363)
Staff: Pedersen
Status: 2/16/17: Rule on hold.
6/23/09: First Notice posted 6/3/09.

Stone Crushing SSOA (10-571)
Staff: Harmon
Status: 2/16/17: Program staff discussions.
1/19/17: No change since 10/22/15.
10/22/15: Jack Harmon working with program staff. Draft will be submitted to EPA for comment.
9/30/10: First Notice published on 9/15/10.

Source Specific Operating Agreements (11-315)
Staff: Pedersen
Status: 2/16/17: Rule on hold.
6/23/11: First Notice published 6/1/11.

Permit By Rule (11-316)
Staff: Pedersen
Status: 2/16/17: Rule on hold.
6/23/11: First Notice published 6/1/11.

NOx Emissions from Large Affected Units (15-414)
Staff: Harmon
Status: 2/16/17: Steve Rosenthal will check with Sarah Arra for update. Waiting on CAMD input.
1/19/17: A revised draft was sent to Sarah Arra for review.
12/15/16: Finalizing response to comments.
11/17/16: No change since 9/15/16.
9/15/16: Clarifying draft language.
8/18/16: Will send draft rule language to Doug Aburano within 2 to 3 weeks for review.
7/21/16: Draft Second Notice being reviewed by program staff.
6/16/16: No change.
4/21/16: Internal meetings; Second Notice being drafted.
3/17/16: No change since 1/25/16.
1/25/16: Comments received, drafting Second Notice.
12/17/15: First Notice published 12/9/15. Copy will be sent to Doug Aburano.
11/23/15: Approved by OMB. First Notice should publish soon.

Volatile Organic Liquid Storage Tanks (15-427)
Staff: Harmon
Status: 2/16/17: Steve Rosenthal received draft Second Notice and will review next week.
1/19/17: The Second Notice will be sent to Steve Rosenthal when ready.
12/15/16: No change since 9/15/16.
9/15/16: In internal review.
8/18/16: Draft should be ready for Steve Rosenthal review in a few weeks.
7/21/16: Second Notice being drafted with help of Betsy Zlatos. Send copy of Second Notice to Steve Rosenthal after internal review.
6/16/16: No change since 2/18/16.

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2/18/16: Second Notice still being drafted. The draft will be sent to EPA for review when ready.
1/25/16: No comments; Second Notice being drafted. Copy to Steve Rosenthal after internal review.
12/17/15: First Notice published 12/16/15.
11/23/15: Waiting for OMB approval to proceed with First Notice.

Cross State Air Pollution Rule (CSAPR) (16-209)
Staff: Aguilar
Status: 2/16/17: Meeting today with affected sources. Waiting on CAMD input.
1/19/17: Second Notice was published and comment period will be over next week. Second Notice sent to Sarah Arra and Eric Svingen on 12/29/16.
12/15/16: Second Notice approved and submitted for publication. Lauren Aguilar will send copy of the draft notice to Sarah Arra and Eric Svingen.
11/17/16: CSAPR Update rule published 10/26/16. Draft Second Notice in review.
10/20/16: CSAPR Update rule released, but not published. Continuing work on Second Notice.
9/15/16: Second Notice tentatively to be ready in November.
8/18/16: No changes.
7/21/16: Second Notice should be drafted by October or November.
6/16/16: Meeting with affected sources in mid-July.
5/19/16: First Notice to publish 6/1/16.
5/16/16: OMB approval to proceed.

Short-Term Backup Units (16-309)
Staff: Harmon
Status: 2/16/17: No change since 9/15/16.
9/15/16: Starting to draft rule language.
8/18/16: Comment period ends 8/19/16. One supporting comment received.
7/21/16: First Notice published on 7/20/16.
6/16/16: First Notice send to OMB today.
5/19/16: Internal discussions. Michael Langman will be contact.
4/21/16: Work beginning on First Notice draft.

Outdoor Hydronic Heaters (16-332)
Staff: Walsh
Status: 2/16/17: Second Notice in review.
1/19/17: No change since 10/20/16.
10/20/16: Drafting Second Notice.
9/15/16: No comments received to date.
8/18/16: First Notice published 8/17/16 for comment.
7/21/16: Submitted to OMB on 6/29/16.
6/16/16: No change.
5/19/16: First Notice being drafted.
4/21/16: Approved to start rule to address 3/16/15 NSPS and existing rule amendments.

2015 Ozone Standard (16-529)
Staff: Walsh
Status: 2/16/17: No change.
1/19/17: Comment period ended and rule will be ready for next board meeting.
12/15/16: Section 8 Notice published and in comment period.
11/17/16: No change since 8/18/16.
8/18/16: At OMB for approval.

7/21/16: Draft Section 8 Notice in review.
6/16/16: Drafting Section 8 Notice.

Commercial and Industrial Solid Waste Incineration (CISWI) (xx-xxx)
Staff: Harmon
Status: 2/16/17: Rule will not go forward. Likely to repeal existing language with next CFR Update rule.
1/19/17: The proposed FIP was published which may impact how IDEM proceeds with rule.
12/15/16: No change since 8/18/16.
8/18/16: Making revisions.
7/21/16: No change since 5/19/16.
5/19/16: Incorporated EPA comments. Waiting on publication of new EPA rule.
4/21/16: Section 8 Notice drafted. Waiting to see if EPA makes additional changes by end of April.
3/17/16: With program staff for review.
2/18/16: No change.
1/25/16: Drafting notice and holding internal meeting.

NIPSCO Consent Decree Requirements (xx-xxx)
Staff: Reiss
Status: 2/16/17: No change since 9/15/16.
9/15/16: Meeting with EPA and NIPSCO on force majeure language.
8/18/16: No change.
7/21/16: NIPSCO wants to meet with EPA and IDEM about issues, including force majeure language.
6/16/16: Three more issues to finalize before notice can be reviewed and go to OMB.
5/19/16: No change.
4/21/16: Revised draft sent back to NIPSCO attorney.
3/17/16: Reviewing comments from source attorney.
2/18/16: NIPSCO attorney to provide comments by end of February.
1/25/16: Comments from NIPSCO due by end of January.
12/17/15: No change.
11/23/15: Preparing OMB submittal.

Permit Legal Notices (xx-xxx)
Staff: Walsh
Status: 2/16/17: No change.
1/19/17: Drafting First Notice.

U.S. Steel SO2 Revisions (xx-xxx)
Staff: Stevens
Status: 2/16/17: Call with U.S. Steel tomorrow to discuss potential additional rule changes.
1/19/17: Drafting Section 8 Notice.

State Plan Submittals

Lead NESHAP Delegation
Submitted: 1/8/14
Staff: Bem
Status:

Non-Rule SIP Submittals

Pollutant	Activity	Status
CO	Nothing to report.	
Lead	Redesignation of Muncie-area, Delaware County, nonattainment area.	Redesignation petition and maintenance plan submitted April 14, 2016.
Nitrogen Dioxide	Nothing to report.	
Ozone	Redesignations	
	Lake/Porter Counties	Redesignation petition and maintenance plan submitted June 15, 2016. Based on partial/preliminary ozone monitoring data for 2016, the three year design value (2014-2016) for the Chiwaukee, WI monitor is above the 2008 standard. Attainment demonstration and technical support document completed and is out for public comment. No public hearing request was received. The public hearing has been cancelled. Public comment period ends February 17, 2017. Section 182(f) NOx exemption request letter submitted to EPA for review on February 10, 2017.
	Lawrenceburg Township (Dearborn County)	Redesignation petition and maintenance plan submitted February 23, 2016. Supplement to recharacterize 2014 emissions inventory to include actual EGU and non-point emissions of point source category submitted May 4, 2016. Final rulemaking for revision to Emissions Reporting Rule, LSA Document #16-162, published in the Indiana Register on November 17, 2016. Letter requesting approval of the revisions to the rule submitted to EPA November 18, 2016. EPA's proposed approval of the revisions to Emissions Reporting Rule and redesignation petition and maintenance plan published in the *Federal Register (FR)* on December 27, 2016 (81 FR 95080) and (81 FR 95081). Public comment periods for these rulemakings ended on January 26, 2017.
	2015 Standard Infrastructure SIP	Due to EPA on or before October 1, 2018.
	2015 Standard Designation Recommendations	Designation recommendations submitted September 16, 2016.
Sulfur Dioxide	Round 1 Nonattainment Areas	Attainment demonstration submitted October 2, 2015; completeness letter received from EPA on February 25, 2016. Technical addendum for revisions to Indiana's State Implementation Plan for SO2 and attainment demonstration to incorporate changes to Rolls Royce within the Marion County nonattainment area submitted May 2, 2016.
	Round 2 Designations (consent decree) Gibson, Rockport, Michigan City, Clifty Creek, and A.B. Brown generating stations	EPA designated Gibson, Jefferson (partial), LaPorte, Posey (partial), and Spencer (partial) counties as unclassifiable/attainment for the 2010 primary 1-hour SO2 standard as published in the *Federal Register (FR)* on July 12, 2016 (81 FR 45039).
	Redesignation of Clay and Washington Townships (Morgan County), nonattainment area.	Further discussions needed to address EPA's comments/concerns regarding the preliminary redesignation petition and maintenance plan.
	Rounds 3 and 4 Designations (Data Requirements Rule) Carmeuse Lime, Inc. and SABIC Innovative Plastics	Indiana's modeling and monitoring protocol submitted June 30, 2016. Modeling analyses or federally permanent/enforceable emission limits and compliance due by January 13, 2017. Commissioner's Orders to establish permanent and enforceable SO2 emission limits for SABIC Innovative Plastic and Carmeuse Lime, Inc. in order to ensure continued attainment of the 1-hour SO2 standard submitted for review and approval on December 5, 2016 and December 27, 2016, respectively. Preliminary recommendations concerning Round 3 designations submitted January 13, 2017.
Particulates	Lawrenceburg Township (part of Cincinnati NA area) Redesignations	EPA approved the RACM/RACT analysis for Lawrenceburg Township as published in the *Federal Register (FR)* on October 24, 2016 (81 FR 58402). Revised draft redesignation petition and maintenance plan completed. Public comment ended August 15, 2016. No public comments were received. Redesignation petition and maintenance plan submitted August 19, 2016.
	2012 Standard Infrastructure SIP	Infrastructure SIP submitted June 10, 2016. Weight of evidence analysis supporting Indiana's fulfillment of Section 110(a)(2)(D)(i)(I) (Prong 1 and 2) and (ii) (Prong 4) requirements submitted December 28, 2016.
Regional Haze	Five-Year Progress Report	Five-year progress report submitted March 30, 2016.

cc: Lauren Aguilar, Keith Baugues, Susan Bem, Jean Boling, Brian Callahan, Scott Deloney, Mark Derf, Leslie Ferguson, Gale Ferris, Jack Harmon, Jay Koch, Nancy King, Bruno Pigott, Jessica Reiss, Shawn Seals, Valerie Tachtiris, Doug Wagner, Keelyn Walsh, Betsy Zlatos, Doug Aburano (EPA Region V), Pam Blakley (EPA Region V), Louise Gross (EPA Region V), Chris Panos (EPA Region V), Steve Rosenthal (EPA Region V)

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Indiana and EPA Rule and SIP Call Notes
November 17, 2016

Participants
EPA: Doug Aburano, Kathleen D'Agostino, Gilberto Alvarez, Sarah Arra, Michelle Becker, Paymon Danesh, Edward Doty, Charles Hatten, Michael Langman, Anthony Maietta, John Mooney, Carolyn Persoon, Matt Rau, Steve Rosenthal, John Summerhays

IDEM: Lauren Aguilar, Susan Bem, Jean Boling, Brian Callahan, Scott Deloney, Mark Derf, Gale Ferris, Jack Harmon, Chris Pedersen, Shawn Seals, Doug Wagner, Keelyn Walsh

Updates

SO_2 Implementation and Data Requirements Rule -
The parallel processing request for the Commissioner Order, to establish permanent and enforceable sulfur dioxide (SO_2) emission limits for Carmeuse Lime, Inc. should be submitted to EPA soon. (The Commissioner's Order was signed and e-mailed to Doug Aburano and Chris Panos on 11/18/2016.)

A request for use of adjusted friction velocity (ADJ_U*) Beta option for air dispersion modeling to comply with the Data Requirements Rule was submitted to EPA for review/approval on November 9th.

The public comment period for the SABIC Commissioner's Order ends December 2nd. Request for a public hearing must be submitted on or before November 20th. (No request for a hearing was received and the hearing was cancelled.)

EPA is in the process of addressing the lawsuit filed by the Sierra Club regarding Round 2 sulfur dioxide designation recommendations under the Data Requirements Rule. EPA anticipates that its responses to the lawsuit should be completed by the first week of December.

Dearborn County (Lawrenceburg Township) $PM_{2.5}$ -
EPA is in the process of drafting the approval notice for the redesignation petition and maintenance plan. EPA is anticipating that the notice will be signed in mid-December and published in mid-January in the Federal Register.

2012 $PM_{2.5}$ Transport Provision of ISIP -
An interstate transport analysis that supports Indiana's fulfillment of Section 110(a)(2)(D)(i)(l) (Prong 1 and 2) and (ii) (Prong 4) requirements will be sent to EPA for preliminary review/comment by the end of the week.

Delaware County (Muncie, IN) Lead -
EPA has completed its revisions to the approval notice for the redesignation petition and maintenance plan and submitted them to regional council for review/approval.

Dearborn County (Lawrenceburg Township) Ozone -
Indiana's final rule was published in the Indiana Register on November 16, 2016 and the letter will be sent. (The letter was signed and sent to EPA on 11/18/2016.)

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Lake and Porter Counties Ozone (attainment demonstration, 15% plan, 3% contingency plan, NOx RACT) -
A called is scheduled this afternoon with the Lake Michigan Air Directors Consortium and the states of Illinois, Indiana, and Wisconsin to discuss the states schedules to submit attainment demonstrations for their portions of the Chicago nonattainment area. Indiana plans to place the attainment demonstration for Lake and Porter counties on public notice in mid-December and send the demonstration to EPA for review/approval by no later than February 1, 2017. Indiana provided suggested/revisions comments to LADCO's technical support document (TSD) in October. The TSD includes updated photochemical modeling using 2018 emission inventories and model updates. Illinois and Wisconsin have not submitted their suggested revisions/comments to the TSD as of yet.

2015 Ozone Designations -
EPA will begin evaluating states preliminary air quality designation recommendations soon. EPA will begin dialogue with states in early-2017. The 120-day letters should be issued by EPA no later than June 2, 2017.

Morgan County SO_2 Nonattainment Area -
EPA is anticipating that it will propose approval of SO2 emission limits for the Morgan County nonattainment area in the first quarter of 2017.

SABIC/Carmeuse Commissioner's Orders for the Data Requirements Rule -
Previously discussed under Item #1

Monitoring -
IDEM reiterated to EPA that the Michigan City ozone monitor has been offline most of the 2016 monitoring season due to remediation to the property on which the monitor is located.

Early Drafts of Subsequent SIP Actions –
EPA recommends states provide SIP actions for preliminary review and comment. This should help eliminate additional work and shorten up the SIP approval process timeframe. A separate e-mail will be sent to states to continue the dialogue and seek ideas to help improve the process. States are welcome to provide examples of previous SIP actions. IDEM suggested it would helpful if EPA legal staff review preliminary SIP Actions, when deemed appropriate.

Next Call (date and time)
Thursday, December 15, 2016, 9 am (Chicago), 10 am (Indianapolis)

ED_001361_00000252

Status of Rule SIP Submittals

Ethanol Plant Clarification (11-99)
Submitted: 9/19/11
Staff: Pedersen
Status: 11/17/16: No change since 9/22/11.
9/22/11: Received, but on hold until EPA reconsiders the ethanol source definition policy.

SO_2 Emission Limits (11-356)
Submitted: 10/2/15
Staff: Bem, Summerhays
Status: 11/17/16: No change since 11/23/15.
11/23/15: Assigned to John Summerhays.
10/22/15: Submittal received. Rule is part of attainment demonstration.

Startup, Shutdown and Malfunctions
Submitted: 11/14/16 (parallel processing)
Staff: Harmon
Status: 11/17/16: Submitted parallel processing request on 11/14/16.

Indiana Rules in Process

Asbestos (09-363)
Staff: Pedersen
Status: 11/17/16: No change since 10/22/15.
10/22/15: Jack Harmon working with program staff on draft rule language.
9/17/15: No change since 11/14/13.
11/14/13: Shadi Khoury resigned; rule will be reassigned.
9/19/13: No change.
8/22/13: Waiting on program staff input.
7/8/13: Rule reassigned to Shadi Khoury.
6/20/13: No change since 6/21/12.
6/21/12: IDEM working on draft.
5/17/12: No change since 9/22/11.
9/22/11: Waiting on legal review.
8/11/11: Preparing for internal meetings.
6/23/11: On hold since 2/24/11, but will start again soon.
1/20/11: Second Notice in review.
11/18/10: Draft rule language in development since 2/17/10.
2/17/10: Drafting rule language.
1/20/10: No change since 11/18/09.
11/18/09: Manda is waiting on information from IDEM staff.
6/23/09: First Notice posted 6/3/09.

Stone Crushing SSOA (10-571)
Staff: Harmon
Status: 11/17/16: No change since 10/22/15.
10/22/15: Jack Harmon working with program staff. Draft will be submitted to EPA for comment.
9/17/15: No change since 5/21/15.

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5/21/15: Jack Harmon is reviewing information to start rulemaking again.
4/16/15: No change since 6/19/14.
6/19/14: Working internally with program staff.
5/15/14: No change since 12/19/13.
12/19/13: Susan Bem reviewing.
11/14/13: Susann Brown resigned; Chris Pedersen is contact.
9/19/13: No change.
8/22/13: Draft rule language prepared based on calculations; being revised.
7/18/13: No change.
6/20/13: Susann Brown is starting to work on it.
5/16/13: No change since 3/24/11.
3/24/11: Working on language.
2/24/11: No change since 10/21/10.
10/21/10: Second Notice being drafted.
9/30/10: First Notice published on 9/15/10.
8/19/10: First Notice is in review.
7/22/10: First Notice is being drafted.

Source Specific Operating Agreements (11-315)
Staff: Pedersen
Status: 11/17/16: No change since 2/20/14.
2/20/14: Susann Brown resigned; Chris Pedersen is contact.
9/19/13: No change.
6/20/13: Susann Brown is starting to work on it.
5/16/13: No change since 6/23/11.
6/23/11: First Notice published 6/1/11.
5/26/11: First Notice scheduled for June 2011.

Permit By Rule (11-316)
Staff: Pedersen
Status: 11/17/16: No change since 2/20/14.
2/20/14: Susann Brown resigned; Chris Pedersen is contact.
9/19/13: No change.
6/20/13: Susann Brown is starting to work on it.
5/16/13: No change since 6/23/11.
6/23/11: First Notice published 6/1/11.
5/26/11: First Notice scheduled for June 2011.

Startup, Shutdown, and Malfunctions (15-326)
Staff: Harmon
Status: 11/17/16: Final adopted 11/9/16; in promulgation process. Parallel processing request submitted 11/14/16.
10/20/16: No change.
9/15/16: Preliminarily adopted 8/10/16; final adoption scheduled for 11/9/16. Will send parallel processing request after final adoption hearing.
7/21/16: Preliminary adoption scheduled for 8/10/16; final adoption likely to be 11/9/16. SIP Call deadline is 11/22/16, so parallel processing request may be needed. Discuss on next month's call.
6/16/16: No change.
5/19/16: Preliminary adoption scheduled for 8/10/16.
4/21/16: No change.

3/17/16: Second Notice publishes 3/30/16. EPA will respond on approval of language.
2/18/16: Jack Harmon provided clarifications to Mary Portanova. Mary said it is ok to proceed. Jack will let Mary know the anticipated status of the rulemaking for November as soon as it can be predicted.
1/25/16: Second Notice in review. Will send to Mary Portanova after internal review.
12/17/15: IDEM will send draft rule language to Mary Portanova for review when ready.
11/23/15: First Notice published on 9/30/15. Drafting Second Notice.

Non-Electric Generating Unit NOx Emissions (15-414)
Staff: Harmon
Status: 11/17/16: No change since 9/15/16.
9/15/16: Clarifying draft language.
8/18/16: Will send draft rule language to Doug Aburano within 2 to 3 weeks for review.
7/21/16: Draft Second Notice being reviewed by program staff.
6/16/16: No change.
4/21/16: Internal meetings; Second Notice being drafted.
3/17/16: No change since 1/25/16.
1/25/16: Comments received, drafting Second Notice.
12/17/15: First Notice published 12/9/15. Copy will be sent to Doug Aburano.
11/23/15: Approved by OMB. First Notice should publish soon.

Volatile Organic Liquid Storage Tanks (15-427)
Staff: Harmon
Status: 11/17/16: No change since 9/15/16.
9/15/16: In internal review.
8/18/16: Draft should be ready for Steve Rosenthal review in a few weeks.
7/21/16: Second Notice being drafted with help of Betsy Zlatos. Send copy of Second Notice to Steve Rosenthal after internal review.
6/16/16: No change since 2/18/16.
2/18/16: Second Notice still being drafted. The draft will be sent to EPA for review when ready.
1/25/16: No comments; Second Notice being drafted. Copy to Steve Rosenthal after internal review.
12/17/15: First Notice published 12/16/15.
11/23/15: Waiting for OMB approval to proceed with First Notice.

Emission Reporting for Lawrenceburg Township, Dearborn County (16-162)
Staff: Walsh
Status: 11/17/16: Rule completed. SIP submittal to be sent 11/18/16.
10/20/16: Rule in promulgation process.
9/15/16: Final rule should be effective by December and will be submitted as soon as published.
8/18/16: Adopted 8/10/16. Final rule to be sent as soon as published (approximately 90 days).
7/21/16: No change since 5/19/16.
5/19/16: Adoption scheduled for 8/10/16.
4/21/16: Section 8 Notice will publish on 4/27/16.
3/17/16: No change.
1/25/16: At OMB for review.
12/17/15: Notice in review.
11/23/15: Drafting Section 8 Notice for OMB submittal.

Cross State Air Pollution Rule (CSAPR) (16-209)
Staff: Aguilar
Status: 11/17/16: CSAPR Update rule published 10/26/16. Draft Second Notice in review.

10/20/16: CSAPR Update rule released, but not published. Continuing work on Second Notice.
9/15/16: Second Notice tentatively to be ready in November.
8/18/16: No changes.
7/21/16: Second Notice should be drafted by October or November.
6/16/16: Meeting with affected sources in mid-July.
5/19/16: First Notice to publish 6/1/16.
5/16/16: OMB approval to proceed.

2016 CFR Update (16-208)
Staff: Walsh
Status: 11/17/16: No change.
10/20/16: Rule in promulgation process.
9/15/16: Promulgation package sent to Attorney General on 9/13/16. Should be ready for submittal in December.
8/18/16: Adopted 8/10/16. SIP submittal to be sent after promulgation.
7/21/16: No change since 5/19/16.
5/19/16: Section 8 Notice to publish 5/25/16. Adoption scheduled for 8/10/16.
4/21/16: No change.
3/17/16: At OMB for review.
2/18/16: No change.
1/25/16: Draft notice in review.
12/17/15: No change.
11/23/15: Drafting Section 8 Notice for OMB submittal.

Short-Term Backup Units (16-309)
Staff: Harmon
Status: 11/17/16: No change since 9/15/16.
9/15/16: Starting to draft rule language.
8/18/16: Comment period ends 8/19/16. One supporting comment received.
7/21/16: First Notice published on 7/20/16.
6/16/16: First Notice send to OMB today.
5/19/16: Internal discussions. Michael Langman will be contact.
4/21/16: Work beginning on First Notice draft.

Commercial and Industrial Solid Waste Incineration (CISWI) (xx-xxx)
Staff: Harmon
Status: 11/17/16: No change since 8/18/16.
8/18/16: Making revisions.
7/21/16: No change since 5/19/16.
5/19/16: Incorporated EPA comments. Waiting on publication of new EPA rule.
4/21/16: Section 8 Notice drafted. Waiting to see if EPA makes additional changes by end of April.
3/17/16: With program staff for review.
2/18/16: No change.
1/25/16: Drafting notice and holding internal meeting.

Outdoor Hydronic Heaters (16-332)
Staff: Walsh
Status: 11/17/16: No change.
10/20/16: Drafting Second Notice.
9/15/16: No comments received to date.

8/18/16: First Notice published 8/17/16 for comment.
7/21/16: Submitted to OMB on 6/29/16.
6/16/16: No change.
5/19/16: First Notice being drafted.
4/21/16: Approved to start rule to address 3/16/15 NSPS and existing rule amendments.

NIPSCO Consent Decree Requirements (xx-xxx)
Staff: Reiss
Status: 11/17/16: No change since 9/15/16.
9/15/16: Meeting with EPA and NIPSCO on force majeure language.
8/18/16: No change.
7/21/16: NIPSCO wants to meet with EPA and IDEM about issues, including force majeure language.
6/16/16: Three more issues to finalize before notice can be reviewed and go to OMB.
5/19/16: No change.
4/21/16: Revised draft sent back to NIPSCO attorney.
3/17/16: Reviewing comments from source attorney.
2/18/16: NIPSCO attorney to provide comments by end of February.
1/25/16: Comments from NIPSCO due by end of January.
12/17/15: No change.
11/23/15: Preparing OMB submittal.

2015 Ozone Standard (xx-xxx)
Staff: Walsh
Status: 11/17/16: No change since 8/18/16.
8/18/16: At OMB for approval.
7/21/16: Draft Section 8 Notice in review.
6/16/16: Drafting Section 8 Notice.

State Plan Submittals

Lead NESHAP Delegation
Submitted: 1/8/14
Staff: Bem
Status:

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Non-Rule SIP Submittals

Pollutant	Activity	Status
CO	Nothing to report.	
Lead	Redesignation of Muncie-area, Delaware County, nonattainment area.	Redesignation petition and maintenance plan submitted April 14, 2016.
Nitrogen Dioxide	Nothing to report.	
Ozone	Redesignations	
	Lake/Porter Counties	Redesignation petition and maintenance plan submitted June 15, 2016. Based on partial/preliminary ozone monitoring data for 2016, the three year design value (2014-2016) for the Chiwaukee, WI monitor is above the 2008 standard. IDEM is in the initial stages of preparing an attainment demonstration and technical support document, including, 15% rate of progress plan, and 3% contingency plan for Lake and Porter counties.
	Lawrenceburg Township (Dearborn County)	Redesignation petition and maintenance plan submitted February 23, 2016. Supplement to recharacterize 2014 emissions inventory to include actual EGU and non-point emissions of point source category submitted May 4, 2016. Draft rulemaking for revision to Emissions Reporting Rule, LSA Document #16-162, published in the Indiana Register on April 27, 2016. Public comment period ended May 27, 2016. No public comments received. The rule was adopted at the August 10 Environmental Rules Board meeting and should be effective by December. Request to parallel process rule revisions to the Emissions Reporting Rule submitted June 1, 2016.
	2015 Standard Infrastructure SIP	Due to EPA on or before October 1, 2018.
	2015 Standard Designation Recommendations	Designation recommendations submitted September 16, 2016.
Sulfur Dioxide	Round 1 Nonattainment Areas	Attainment demonstration submitted October 2, 2015; completeness letter received from EPA on February 25, 2016. Technical addendum for revisions to Indiana's State Implementation Plan for SO2 and attainment demonstration to incorporate changes to Rolls Royce within the Marion County nonattainment area was submitted May 2, 2016.
	Round 2 Designations (consent decree) Gibson, Rockport, Michigan City, Clifty Creek, and A.B. Brown generating stations	EPA designated Gibson, Jefferson (partial), LaPorte, Posey (partial), and Spencer (partial) counties as unclassifiable/attainment for the 2010 primary 1-hour SO2 standard as published in the *Federal Register (FR)* on July 12, 2016 (81 FR 45039).
	Redesignation of Clay and Washington Townships (Morgan County), nonattainment area.	A separate call will be scheduled soon to discuss EPA's comments/concerns regarding the preliminary redesignation petition and maintenance plan.
	Rounds 3 and 4 Designations (Data Requirements Rule) Carmeuse Lime, Inc. and SABIC Innovative Plastics	Indiana's modeling and monitoring protocol submitted June 30, 2016. Modeling analyses or federally permanent/enforceable emission limits and compliance due by January 13, 2017. Commissioner's Orders to establish permanent and enforceable SO2 emission limits for Carmeuse Lime, Inc. and SABIC Innovative Plastics in order to ensure continued attainment of the 1-hour SO2 standard submitted to EPA for parallel processing on November XX, 2016 and October 25, 2016, respectively.
Particulates	Lawrenceburg Township (part of Cincinnati NA area) Redesignations	EPA's proposed approval of the RACM/RACT analysis published in the Federal Register on August 25, 2016 (81 FR 58402). The rule will be effective on October 24, 2016, unless EPA receives adverse comments by September 26, 2016. Revised draft redesignation petition and maintenance plan completed. Public comment ended August 15, 2016. No public comments were received. Redesignation petition and maintenance plan submitted to EPA for review/approval on August 19, 2016.
	2012 Standard Infrastructure SIP	Infrastructure SIP submitted June 10, 2016. An interstate transport analysis that supports Indiana's fulfillment of Section 110(a)(2)(D)(i)(l) (Prong 1 and 2) and (ii) (Prong 4) requirements is being performed. This analysis is tentatively scheduled to be completed in mid-to-late 2016.
Regional Haze	Five-Year Progress Report	Five-year progress report submitted March 30, 2016.

cc: Lauren Aguilar, Keith Baugues, Susan Bem, Jean Boling, Brian Callahan, Carol Comer, Scott Deloney, Mark Derf, Gale Ferris, Jack Harmon, Nancy King, Chris Pedersen, Bruno Pigott, Jessica Reiss, Shawn Seals, Don Snemis, Valerie Tachtiris, Doug Wagner, Keelyn Walsh, Betsy Zlatos, Doug Aburano (EPA Region V), Pam Blakley (EPA Region V), Louise Gross (EPA Region V), Chris Panos (EPA Region V), Steve Rosenthal (EPA Region V)

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Indiana and EPA Rule and SIP Call Notes
January 19, 2017

Participants
EPA: Douglas Aburano, Gilberto Alvarez, Michelle Becker, Kathleen D'Agostino, Paymon Danesh, Joseph Ko, Michael Langman, Jennifer Liljegren, Anthony Maietta, Christos Panos, Mary Portanova, Matthew Rau, Randall Robinson, Steve Rosenthal, John Summerhays, Eric Svingen

IDEM: Lauren Aguilar, Susan Bem, Jean Boling, Brian Callahan, Scott Deloney, Mark Derf, Gale Ferris, Jack Harmon, Chris Pedersen, Jessica Reiss, Shawn Seals, Doug Wagner, Keelyn Walsh

Updates

SO_2 Implementation and Data Requirements Rule -

Preliminary recommendations concerning Round 3 designations submitted to EPA electronically on January 13, 2017. A hardcopy of the submittal package will be mailed to EPA soon.

The Commissioner's Orders for Carmeuse and SABIC will be approved by EPA soon through a direct final rulemaking in the Federal Register.

IDEM will be monitoring EPA's recent enhancements to the AERMOD dispersion modeling systems as published in the Federal Register on January 17, 2017 and how it may relate to the 1-hour SO_2 designations under the Data Requirements Rule. Several bug fixes and coding changes have occurred recently with AERMOD that have not allowed states to use the most current version.

Carmeuse is in the process of replacing/upgrading their existing baghouses. As a result, a rule revision will be necessary to allow Carmeuse to increase the facility's 1-hour SO_2 emission rates at higher stack height releases. How should this emission's rate increase be addressed to demonstrate that there are no adverse impacts in demonstrating continued attainment of the 2010 1-hour SO_2 standard (e.g. anti-backsliding, modeling SIP based limits, etc.)? EPA will need to look into this.

Dearborn County (Lawrenceburg Township) $PM_{2.5}$ -

The redesignation petition and maintenance plan is at EPA's Office of Regional Counsel and is moving through EPA's signature process.

2012 $PM_{2.5}$ Transport SIP -

Weight of evidence analysis supporting Indiana's fulfillment of Section 110(a)(2)(D)(i)(l) (Prong 1 and 2) and (ii) (Prong 4) requirements submitted December 28, 2016. EPA is the process of reviewing the SIP.

Delaware County (Muncie, IN) Lead -

The redesignation petition is at EPA's Office of Regional Counsel and will be sent to the Office of General Counsel for review/signature in the near future. EPA is anticipating that the petition will be approved in the Federal Register in the first quarter of 2017.

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Dearborn County (Lawrenceburg Township) Ozone -

EPA's proposed approval of the revisions to the Emissions Reporting Rule and redesignation petition and maintenance plan were published in the Federal Register on December 27, 2016. The public comment periods for these rulemakings end on January 26, 2017. The final rule approving these rulemakings is in EPA's signature process based on the assumption that no adverse comments will be received.

Lake and Porter Counties Ozone (attainment demonstration, 15% plan, 3% contingency plan) -

Attainment demonstration and technical support document, including, 15% rate of progress plan, 3% contingency plan, and NO_x RACT exemption request letter for Lake and Porter counties completed and is out for public comment. The public comment period ends February 17, 2017. IDEM is anticipating that an attainment demonstration will submitted to EPA for review/approval in mid-to-late February. EPA mentioned that the NO_x exemption request letter should focus on the fact that additional NO_x emission reductions would be excessive and are not necessary to achieve attainment of the 2008 standard. The lack of time to implement additional NO_x RACT level controls is not a valid reason to request an exemption from these requirements. EPA suggested that a checklist be developed documenting NO_x RACT level controls currently in place in Lake and Porter counties and providing a brief description of each of these controls, including negative declarations and proof of certification.

2015 Ozone Designations -

IDEM is anticipating that 2016 ambient air quality monitoring data for all pollutants will be quality assured by the end of March. EPA is in the early stages of establishing area boundaries for the technical support documents and will be getting in touch with Region 5 states soon to discuss.

The notice of data availability of EPA's preliminary interstate ozone transport modeling data for the 2015 standard was published in the Federal Register on January 6, 2017 for public comment.

Morgan County SO_2 Nonattainment Area -

No new updates.

NNSR Certification SIP -

IDEM is anticipating that a SIP will be submitted for review/approval in the first quarter of 2017. The SIP should address Lake and Porter counties as a moderate nonattainment area. Lawrenceburg Township will not need to be addressed if the area is redesignated to attainment before the certification SIP is submitted for review/approval.

NNSR certification requirements for the 2015 standard could be addressed as part of the upcoming infrastructure SIP.

Monitoring -

Previously addressed under 2015 Ozone Designations

Next Call (date and time)
February 16, 2017, 9 am (Chicago), 10 am (Indianapolis)

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Agenda for the Rules Portion of the Rule and SIP Call
January 19, 2017

Status of Rule SIP Submittals

Ethanol Plant Clarification (11-99)
Submitted: 9/19/11
Staff: Pedersen
Status: 1/19/17: No change since 9/22/11.
9/22/11: Received, but on hold until EPA reconsiders the ethanol source definition policy.

SO_2 Emission Limits (11-356)
Submitted: 10/2/15
Staff: Bem, Summerhays
Status: 1/19/17: No change since 11/23/15.
11/23/15: Assigned to John Summerhays.
10/22/15: Submittal received. Rule is part of attainment demonstration.

Startup, Shutdown and Malfunctions (15-326)
Submitted: 11/14/16 (parallel processing)
Staff: Harmon, Persoon
Status: 1/19/17: The draft approval is going to OGC and OAQPS for review.
12/15/16: The approval is being drafted.
11/17/16: Submitted parallel processing request on 11/14/16.

Emission Reporting for Lawrenceburg Township, Dearborn County (16-162)
Submitted: 11/18/16
Staff: Walsh, Svingen
Status: 1/19/17: Final approval will be published at the same time as the redesignation request.
12/27/16: Proposed approval published.
12/15/16: Signed as a separate action from the redesignation request.
11/18/16: SIP submittal sent to EPA.
6/1/16: OAQ staff submitted Section 8 Notice and requested parallel processing.

2015 CFR Update (16-208)
Submitted: 12/13/16
Staff: Walsh, Hatten
Status: 1/19/17: Review has been assigned to Charles Hatten.
12/15/16: Submittal received electronically.
12/13/16: SIP submittal sent to EPA.

Indiana Rules in Process

Asbestos (09-363)
Staff: Pedersen
Status: 1/19/17: No change since 10/22/15.
10/22/15: Jack Harmon working with program staff on draft rule language.

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9/17/15: No change since 11/14/13.
11/14/13: Shadi Khoury resigned; rule will be reassigned.
9/19/13: No change.
8/22/13: Waiting on program staff input.
7/8/13: Rule reassigned to Shadi Khoury.
6/20/13: No change since 6/21/12.
6/21/12: IDEM working on draft.
5/17/12: No change since 9/22/11.
9/22/11: Waiting on legal review.
8/11/11: Preparing for internal meetings.
6/23/11: On hold since 2/24/11, but will start again soon.
1/20/11: Second Notice in review.
11/18/10: Draft rule language in development since 2/17/10.
2/17/10: Drafting rule language.
1/20/10: No change since 11/18/09.
11/18/09: Manda is waiting on information from IDEM staff.
6/23/09: First Notice posted 6/3/09.

Stone Crushing SSOA (10-571)
Staff: Harmon
Status: 1/19/17: No change since 10/22/15.
10/22/15: Jack Harmon working with program staff. Draft will be submitted to EPA for comment.
9/17/15: No change since 5/21/15.
5/21/15: Jack Harmon is reviewing information to start rulemaking again.
4/16/15: No change since 6/19/14.
6/19/14: Working internally with program staff.
5/15/14: No change since 12/19/13.
12/19/13: Susan Bem reviewing.
11/14/13: Susann Brown resigned; Chris Pedersen is contact.
9/19/13: No change.
8/22/13: Draft rule language prepared based on calculations; being revised.
7/18/13: No change.
6/20/13: Susann Brown is starting to work on it.
5/16/13: No change since 3/24/11.
3/24/11: Working on language.
2/24/11: No change since 10/21/10.
10/21/10: Second Notice being drafted.
9/30/10: First Notice published on 9/15/10.
8/19/10: First Notice is in review.
7/22/10: First Notice is being drafted.

Source Specific Operating Agreements (11-315)
Staff: Pedersen
Status: 1/19/17: No change since 2/20/14.
2/20/14: Susann Brown resigned; Chris Pedersen is contact.
9/19/13: No change.
6/20/13: Susann Brown is starting to work on it.
5/16/13: No change since 6/23/11.
6/23/11: First Notice published 6/1/11.
5/26/11: First Notice scheduled for June 2011.

Permit By Rule (11-316)
Staff: Pedersen
Status: 1/19/17: No change since 2/20/14.
2/20/14: Susann Brown resigned; Chris Pedersen is contact.
9/19/13: No change.
6/20/13: Susann Brown is starting to work on it.
5/16/13: No change since 6/23/11.
6/23/11: First Notice published 6/1/11.
5/26/11: First Notice scheduled for June 2011.

Startup, Shutdown, and Malfunctions (15-326)
Staff: Harmon
Status: 1/19/17: Final submittal should be ready at the end of next week.
12/30/16: Final rule filed; effective 1/29/17.
12/15/16: No change.
11/17/16: Final adopted 11/9/16; in promulgation process. Parallel processing request submitted 11/14/16.
10/20/16: No change.
9/15/16: Preliminarily adopted 8/10/16; final adoption scheduled for 11/9/16. Will send parallel processing request after final adoption hearing.
7/21/16: Preliminary adoption scheduled for 8/10/16; final adoption likely to be 11/9/16. SIP Call deadline is 11/22/16, so parallel processing request may be needed. Discuss on next month's call.
6/16/16: No change.
5/19/16: Preliminary adoption scheduled for 8/10/16.
4/21/16: No change.
3/17/16: Second Notice publishes 3/30/16. EPA will respond on approval of language.
2/18/16: Jack Harmon provided clarifications to Mary Portanova. Mary said it is ok to proceed. Jack will let Mary know the anticipated status of the rulemaking for November as soon as it can be predicted.
1/25/16: Second Notice in review. Will send to Mary Portanova after internal review.
12/17/15: IDEM will send draft rule language to Mary Portanova for review when ready.
11/23/15: First Notice published on 9/30/15. Drafting Second Notice.

NOx Emissions from Large Affected Units (15-414)
Staff: Harmon
Status: 1/19/17: A revised draft was sent to Sarah Arra for review.
12/15/16: Finalizing response to comments.
11/17/16: No change since 9/15/16.
9/15/16: Clarifying draft language.
8/18/16: Will send draft rule language to Doug Aburano within 2 to 3 weeks for review.
7/21/16: Draft Second Notice being reviewed by program staff.
6/16/16: No change.
4/21/16: Internal meetings; Second Notice being drafted.
3/17/16: No change since 1/25/16.
1/25/16: Comments received, drafting Second Notice.
12/17/15: First Notice published 12/9/15. Copy will be sent to Doug Aburano.
11/23/15: Approved by OMB. First Notice should publish soon.

Volatile Organic Liquid Storage Tanks (15-427)
Staff: Harmon

Status: 1/19/17: The Second Notice will be sent to Steve Rosenthal when ready.
12/15/16: No change since 9/15/16.
9/15/16: In internal review.
8/18/16: Draft should be ready for Steve Rosenthal review in a few weeks.
7/21/16: Second Notice being drafted with help of Betsy Zlatos. Send copy of Second Notice to Steve Rosenthal after internal review.
6/16/16: No change since 2/18/16.
2/18/16: Second Notice still being drafted. The draft will be sent to EPA for review when ready.
1/25/16: No comments; Second Notice being drafted. Copy to Steve Rosenthal after internal review.
12/17/15: First Notice published 12/16/15.
11/23/15: Waiting for OMB approval to proceed with First Notice.

Cross State Air Pollution Rule (CSAPR) (16-209)
Staff: Aguilar
Status: 1/19/17: Second Notice was published and comment period will be over next week. Second Notice sent to Sarah Arra and Eric Svingen on 12/29/16.
12/15/16: Second Notice approved and submitted for publication. Lauren Aguilar will send copy of the draft notice to Sarah Arra and Eric Svingen.
11/17/16: CSAPR Update rule published 10/26/16. Draft Second Notice in review.
10/20/16: CSAPR Update rule released, but not published. Continuing work on Second Notice.
9/15/16: Second Notice tentatively to be ready in November.
8/18/16: No changes.
7/21/16: Second Notice should be drafted by October or November.
6/16/16: Meeting with affected sources in mid-July.
5/19/16: First Notice to publish 6/1/16.
5/16/16: OMB approval to proceed.

Short-Term Backup Units (16-309)
Staff: Harmon
Status: 1/19/17: No change since 9/15/16.
9/15/16: Starting to draft rule language.
8/18/16: Comment period ends 8/19/16. One supporting comment received.
7/21/16: First Notice published on 7/20/16.
6/16/16: First Notice send to OMB today.
5/19/16: Internal discussions. Michael Langman will be contact.
4/21/16: Work beginning on First Notice draft.

Outdoor Hydronic Heaters (16-332)
Staff: Walsh
Status: 1/19/17: No change since 10/20/16.
10/20/16: Drafting Second Notice.
9/15/16: No comments received to date.
8/18/16: First Notice published 8/17/16 for comment.
7/21/16: Submitted to OMB on 6/29/16.
6/16/16: No change.
5/19/16: First Notice being drafted.
4/21/16: Approved to start rule to address 3/16/15 NSPS and existing rule amendments.

2015 Ozone Standard (16-529)
Staff: Walsh

Status: 1/19/17: Comment period ended and rule will be ready for next board meeting.
12/15/16: Section 8 Notice published and in comment period.
11/17/16: No change since 8/18/16.
8/18/16: At OMB for approval.
7/21/16: Draft Section 8 Notice in review.
6/16/16: Drafting Section 8 Notice.

Commercial and Industrial Solid Waste Incineration (CISWI) (xx-xxx)
Staff: Harmon
Status: 1/19/17: The proposed FIP was published which may impact how IDEM proceeds with rule.
12/15/16: No change since 8/18/16.
8/18/16: Making revisions.
7/21/16: No change since 5/19/16.
5/19/16: Incorporated EPA comments. Waiting on publication of new EPA rule.
4/21/16: Section 8 Notice drafted. Waiting to see if EPA makes additional changes by end of April.
3/17/16: With program staff for review.
2/18/16: No change.
1/25/16: Drafting notice and holding internal meeting.

NIPSCO Consent Decree Requirements (xx-xxx)
Staff: Reiss
Status: 1/19/17: No change since 9/15/16.
9/15/16: Meeting with EPA and NIPSCO on force majeure language.
8/18/16: No change.
7/21/16: NIPSCO wants to meet with EPA and IDEM about issues, including force majeure language.
6/16/16: Three more issues to finalize before notice can be reviewed and go to OMB.
5/19/16: No change.
4/21/16: Revised draft sent back to NIPSCO attorney.
3/17/16: Reviewing comments from source attorney.
2/18/16: NIPSCO attorney to provide comments by end of February.
1/25/16: Comments from NIPSCO due by end of January.
12/17/15: No change.
11/23/15: Preparing OMB submittal.

Permit Legal Notices (xx-xxx)
Staff: Walsh
Status: 1/19/17: Drafting First Notice.

U.S. Steel SO2 Revisions (xx-xxx)
Staff: Stevens
Status: 1/19/17: Drafting Section 8 Notice.

State Plan Submittals

Lead NESHAP Delegation
Submitted: 1/8/14
Staff: Bem
Status:

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Non-Rule SIP Submittals

Pollutant	Activity	Status
CO	Nothing to report.	
Lead	Redesignation of Muncie-area, Delaware County, nonattainment area.	Redesignation petition and maintenance plan submitted April 14, 2016.
Nitrogen Dioxide	Nothing to report.	
Ozone	Redesignations	
	Lake/Porter Counties	Redesignation petition and maintenance plan submitted June 15, 2016. Based on partial/preliminary ozone monitoring data for 2016, the three year design value (2014-2016) for the Chiwaukee, WI monitor is above the 2008 standard. Attainment demonstration and technical support document, including, 15% rate of progress plan and 3% contingency plan for Lake and Porter counties completed and is out for public comment. Deadline to request a hearing is February 10, 2017. Public comment period ends February 17, 2017.
	Lawrenceburg Township (Dearborn County)	Redesignation petition and maintenance plan submitted February 23, 2016. Supplement to recharacterize 2014 emissions inventory to include actual EGU and non-point emissions of point source category submitted May 4, 2016. Final rulemaking for revision to Emissions Reporting Rule, LSA Document #16-162, published in the Indiana Register on November 17, 2016. Letter requesting approval of the revisions to the rule submitted to EPA November 18, 2016. EPA's proposed approval of the revisions to Emissions Reporting Rule and redesignation petition and maintenance plan published in the *Federal Register (FR)* on December 27, 2016 (81 FR 95080) and (81 FR 95081). Public comment periods for these rulemakings end on January 26, 2017.
	2015 Standard Infrastructure SIP	Due to EPA on or before October 1, 2018.
	2015 Standard Designation Recommendations	Designation recommendations submitted September 16, 2016.
Sulfur Dioxide	Round 1 Nonattainment Areas	Attainment demonstration submitted October 2, 2015; completeness letter received from EPA on February 25, 2016. Technical addendum for revisions to Indiana's State Implementation Plan for SO2 and attainment demonstration to incorporate changes to Rolls Royce within the Marion County nonattainment area submitted May 2, 2016.
	Round 2 Designations (consent decree) Gibson, Rockport, Michigan City, Clifty Creek, and A.B. Brown generating stations	EPA designated Gibson, Jefferson (partial), LaPorte, Posey (partial), and Spencer (partial) counties as unclassifiable/attainment for the 2010 primary 1-hour SO2 standard as published in the *Federal Register (FR)* on July 12, 2016 (81 FR 45039).
	Redesignation of Clay and Washington Townships (Morgan County), nonattainment area.	Further discussions needed to address EPA's comments/concerns regarding the preliminary redesignation petition and maintenance plan.
	Rounds 3 and 4 Designations (Data Requirements Rule) Carmeuse Lime, Inc. and SABIC Innovative Plastics	Indiana's modeling and monitoring protocol submitted June 30, 2016. Modeling analyses or federally permanent/enforceable emission limits and compliance due by January 13, 2017. Commissioner's Orders to establish permanent and enforceable SO2 emission limits for SABIC Innovative Plastic and Carmeuse Lime, Inc. in order to ensure continued attainment of the 1-hour SO2 standard submitted for review and approval on December 5, 2016 and December 27, 2016, respectively. Preliminary recommendations concerning Round 3 designations submitted January 13, 2017.
Particulates	Lawrenceburg Township (part of Cincinnati NA area) Redesignations	EPA approved the RACM/RACT analysis for Lawrenceburg Township as published in the *Federal Register (FR)* on October 24, 2016 (81 FR 58402). Revised draft redesignation petition and maintenance plan completed. Public comment ended August 15, 2016. No public comments were received. Redesignation petition and maintenance plan submitted August 19, 2016.
	2012 Standard Infrastructure SIP	Infrastructure SIP submitted June 10, 2016. Weight of evidence analysis supporting Indiana's fulfillment of Section 110(a)(2)(D)(i)(l) (Prong 1 and 2) and (ii) (Prong 4) requirements submitted December 28, 2016.
Regional Haze	Five-Year Progress Report	Five-year progress report submitted March 30, 2016.

cc: Lauren Aguilar, Keith Baugues, Susan Bem, Jean Boling, Brian Callahan, Scott Deloney, Mark Derf, Gale Ferris, Jack Harmon, Nancy King, Bruno Pigott, Jessica Reiss, Shawn Seals, Don Snemis, Valerie Tachtiris, Doug Wagner, Keelyn Walsh, Betsy Zlatos, Doug Aburano (EPA Region V), Pam Blakley (EPA Region V), Louise Gross (EPA Region V), Chris Panos (EPA Region V), Steve Rosenthal (EPA Region V)

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To: Bloomberg, David E.[David.Bloomberg@Illinois.gov]; Bizot, David A - DNR[David.Bizot@wisconsin.gov]; MaryJean Fenske[MaryJean.Fenske@state.mn.us]; Mary Maupin[maupinm@michigan.gov]; SCOTT DELONEY[SDELONEY@idem.IN.gov]; Jennifer.VanVlerah@epa.ohio.gov[Jennifer.VanVlerah@epa.ohio.gov]
Cc: 'Edward Doty'[Doty.Edward@epa.gov]; D'Agostino, Kathleen[dagostino.kathleen@epa.gov]; Liljegren, Jennifer[Liljegren.Jennifer@epa.gov]; Svingen, Eric[Svingen.Eric@epa.gov]
From: Aburano, Douglas
Sent: Wed 11/2/2016 7:56:17 PM
Subject: RE: Proposed Implementation Rule for 2015 O3 Standard Signed
FACT SHEET 2015 ozone Implementation proposal.pdf

Looks like I jumped the gun in my rush to get you the news and didn't use the language HQ wanted me to use. So, here it is:

I wanted to let you know that EPA Administrator Gina McCarthy signed the proposed Classifications & SIP Requirements Rule for the 2015 ozone NAAQS on Wednesday, November 2, 2016. The rule is posted on the EPA web site at https://www.epa.gov/ozone-pollution/implementation-2015-national-ambient-air-quality-standards-naaqs-ozone-state. We anticipate publication of this rule in the *Federal Register* in approximately two weeks.

A webinar covering the contents of the final SIP Requirements Rule will be scheduled for early December 2016, with details forthcoming. Materials will not be distributed prior to the webinar. Participants will have the opportunity to ask questions during the webinar.

If you have any questions, please contact:

Me, Kathleen D'Agostino or Ed Doty in the Region or

Bob Lingard at (919) 541-5272 or at lingard.robert@epa.gov at OAQPS.

Thanks,

Doug

Douglas Aburano

Chief, Attainment Planning and Maintenance Section
U.S. EPA - Region 5
Phone: (312) 353-6960
Fax: (312) 408-2279
e-mail: aburano.douglas@epa.gov

From: Aburano, Douglas
Sent: Wednesday, November 02, 2016 1:21 PM
To: Bloomberg, David E. <David.Bloomberg@Illinois.gov>; 'Bizot, David A - DNR' <David.Bizot@wisconsin.gov>; MaryJean Fenske <MaryJean.Fenske@state.mn.us>; Mary Maupin <maupinm@michigan.gov>; SCOTT DELONEY <SDELONEY@idem.IN.gov>; 'Jennifer.VanVlerah@epa.ohio.gov' <Jennifer.VanVlerah@epa.ohio.gov>
Cc: Edward Doty <Doty.Edward@epa.gov>; D'Agostino, Kathleen <dagostino.kathleen@epa.gov>; Liljegren, Jennifer <Liljegren.Jennifer@epa.gov>; Svingen, Eric <Svingen.Eric@epa.gov>
Subject: Proposed Implementation Rule for 2015 O3 Standard Signed

The Administrator signed the proposal for implementing the 2015 ozone standards. This proposed action largely retains and updates the implementing regulations that apply for the 2008 ozone standards, for purposes of the 2015 ozone standards. We are taking comment, for 60-days, on a number of specific issues including nonattainment area classification thresholds and deadlines for planning, implementation of emission controls, and attainment.

https://www.epa.gov/ozone-pollution/implementation-2015-national-ambient-air-quality-standards-naaqs-ozone-state

Doug

Douglas Aburano
Chief, Attainment Planning and Maintenance Section
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e-mail: aburano.douglas@epa.gov

FACT SHEET

PROPOSED RULE: IMPLEMENTATION OF THE 2015 NATIONAL AMBIENT AIR QUALITY STANDARDS FOR OZONE: NONATTAINMENT AREA CLASSIFICATIONS AND STATE IMPLEMENTATION PLAN REQUIREMENTS

ACTION

- On November 2, 2016, the U.S. Environmental Protection Agency proposed requirements that would apply to state, local, and tribal air agencies for implementing the 2015 National Ambient Air Quality Standards (NAAQS) for ground-level ozone. The EPA revised both the health-based and welfare-based standards for ozone on October 1, 2015.

- Implementation of the NAAQS is a shared responsibility of the EPA, states and tribes. This proposed rule interprets the requirements of the Clean Air Act (CAA) and seeks public comment on proposed requirements that ensure public health protection is achieved by meeting the 2015 ozone standards, while giving the EPA's partners flexibility to reduce administrative burdens, where possible.
    - These requirements would apply to states with nonattainment areas, and states in an ozone transport region (OTR).
    - The EPA will work closely with states, tribes and communities to provide assistance in achieving the 2015 ozone standards.

- This proposed action largely retains and updates the implementing regulations that apply for the 2008 ozone NAAQS, for purposes of the 2015 ozone standards, which creates stability in the planning process. This action is seeking public comment on a number of issues, including:
    - nonattainment area classification thresholds and deadlines for areas to attain the 2015 ozone standards;
    - milestone compliance demonstrations to address reasonable further progress requirements;
    - planning and implementation deadlines for reasonably available control technology;
    - consideration of pollution sources within a state but outside of a nonattainment area for purposes of attainment planning;
    - reconsideration of the optional ozone NAAQS trading provisions for pollutants that react to form ozone, which would allow either volatile organic compounds (VOC) or oxides of nitrogen (NOx) emissions reductions to satisfy nonattainment New Source Review permitting emissions offset requirements for VOC or NO_x emissions increases; and
    - requirements for emissions inventories and emissions statements.

- This action also proposes two options for revoking the 2008 ozone NAAQS.
    - Consistent with the EPA's approach for revoking the 1997 ozone standards, Option 1 would revoke the 2008 NAAQS in all areas effective 1 year after the effective date of designations for the 2015 ozone NAAQS. This option would establish a set of protective anti-backsliding requirements for all nonattainment areas that have not yet attained the 2008 NAAQS at the time of its revocation.
    - Option 2 proposes to revoke the 2008 ozone NAAQS in areas designated attainment for that NAAQS 1 year after the effective date of the designations for each area for the 2015 ozone NAAQS. Under Option 2, the 2008 ozone NAAQS would continue to apply in any

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area designated nonattainment for the 2008 standards until that area is redesignated to attainment. Option 2 would follow the approach established most recently for the $PM_{2.5}$ NAAQS.

- The EPA is also seeking comment on a number of additional topics, including: (1) managing emissions from wildfires and wildland prescribed fires; (2) transportation conformity and general conformity; (3) contingency measures; (4) international transport and background ozone; and (5) additional policies for achieving emissions reductions.

BACKGROUND

- Ozone is formed from NO_X and VOC in the presence of sunlight. Cars, trucks, buses, engines, industries, power plants and products, such as solvents and paints are among the major manmade sources of ozone-forming emissions. Exposure to ground-level ozone pollution is linked to a variety of significant health problems.

- Ozone levels are most commonly elevated in the warm summer months, when hot sunny days make it more likely that ozone will form. But this isn't always the case. In parts of the western United States with high levels of local VOC and NO_X emissions and unique meteorological conditions, ozone levels have been high when snow is on the ground.

- The CAA directs the EPA to set and review air quality standards for common pollutants known as "criteria pollutants," which the agency has identified based on their likelihood of harming public health and welfare. The EPA established air quality standards for ozone in 1979. The EPA subsequently revised the ozone standards in 1997, 2008 and 2015 based on the most recently available scientific studies at the time.
    - In October 2015, the EPA strengthened the ozone NAAQS from 75 parts per billion (ppb) to 70 ppb to ensure the protection of public health and welfare

- After the EPA establishes or revises an air quality standard, the agency follows a process by which states recommend area designations (*i.e.*, as nonattainment, attainment, or unclassifiable) to the EPA. The EPA then evaluates their recommendations and air quality data and other factors prior to making its proposed and final determinations regarding area designations. Ozone nonattainment areas are classified by the severity of their air quality problem based on air quality monitoring data, with classifications ranging from "Marginal" to "Extreme." The EPA anticipates finalizing area designations and classifications for the 2015 ozone NAAQS in late 2017.

- States, and in some cases local agencies or tribes, are the primary implementers of the NAAQS. They are responsible for developing and submitting to the EPA, implementation plans that meet the nonattainment planning requirements of the CAA. The EPA promulgates implementation rules to clarify its interpretation of applicable statutory provisions.

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HOW TO COMMENT

- The EPA will accept comments for 60 days beginning when this proposal is published in the *Federal Register*. All comments should be identified by Docket ID No. EPA-HQ-OAR-2016-0202 and submitted to the Federal e-rulemaking portal (www.regulations.gov). Follow the online instructions for submitting comments. If anyone requests a public hearing within 15 days of the proposal publication date, we will publish a subsequent *Federal Register* document announcing details of the hearing.

- For additional information about other ways to submit comments, please visit https://www.epa.gov/dockets/commenting-epa-dockets.

FOR MORE INFORMATION

- To download a copy of the proposed rule from the EPA website, go to "Regulatory Actions" at the following address: https://www.epa.gov/ozone-pollution/implementation-2015-national-ambient-air-quality-standards-naaqs-ozone-state

- This proposed rule and other background information are also available either electronically at http://www.regulations.gov, the EPA's electronic public docket and comment system, or in hardcopy at the EPA Docket Center's Public Reading Room.
    - The Public Reading Room is located in the EPA Headquarters, Room Number 3334 in the EPA William Jefferson Clinton West Building, located at 1301 Constitution Ave., NW, Washington, D.C. Hours of operation are 8:30 a.m. to 4:30 p.m. eastern standard time, Monday through Friday, excluding federal holidays.
    - Visitors are required to show photographic identification, pass through a metal detector and sign the EPA visitor log. All visitor materials will be processed through an X-ray machine as well. Visitors will be provided a badge that must be visible at all times.
    - Materials for this action can be accessed using Docket ID EPA-HQ-OAR-2016-0202.

- Additional information on the ozone nonattainment areas is available on the EPA Green Book at https://www.epa.gov/green-book/green-book-8-hour-ozone-2008-area-information.

- For more information on the proposed rule, contact Robert Lingard at (919) 541-5272 or *lingard.robert@epa.gov*.

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To: Aburano, Douglas[aburano.douglas@epa.gov]
From: D'Agostino, Kathleen
Sent: Wed 3/22/2017 5:28:38 PM
Subject: Briefing documents for March 29 RA general
State recommendations-EPA intended table.docx
2015 Ozone designations.docx
Intended Nonattainment Boundaries.png

Any comments/suggestions?

Kathleen D'Agostino

Environmental Engineer

U.S. EPA Region 5

312-886-1767

dagostino.kathleen@epa.gov

To: Aburano, Douglas[aburano.douglas@epa.gov]
From: D'Agostino, Kathleen
Sent: Wed 3/22/2017 4:17:59 PM
Subject: Briefing documenst for March 29 RA general
Intended Nonattainment Boundaries.png
Region 5-2015 ozone nonattainment areas.docx
2015 Ozone designations.docx

Let me know if you have any suggestions. Note my comment/question in the briefing document.

Kathleen D'Agostino

Environmental Engineer

U.S. EPA Region 5

312-886-1767

dagostino.kathleen@epa.gov

Briefing Paper

Air and Radiation Division/March 29, 2017

Subject: Designation of Areas under the 2015 Ozone Standard.

Summary: EPA is on a schedule to send letters to states by June 2, indicating areas that EPA intends to designate as nonattainment under the 2015 ozone national ambient air quality standards (NAAQS). These letters will be prepared for signature by the Regional Administrators. EPA is required to promulgate final designations by October 1, 2017.

Background:

- On **October 1, 2015**, EPA promulgated a revised ozone NAAQS of 0.070 parts per million.
- States (and tribes) were required to submit area designation by **October 1, 2016**.
- EPA will inform states of any intended modifications to a its recommendations by **June 2, 2017** (120 days prior to finalizing the designation).
- EPA finalizes designations **October 1, 2017**.

Section 107(d)(1) of the CAA directs EPA to designate an area as "nonattainment" if it is violating the NAAQS or if it is contributing to a violation of the NAAQS in a nearby area. EPA received designation recommendations from all 6 states and from two tribes. The recommendations and EPA's intended designations are summarized in the attached table.

Issue:

Ex. 5 - Deliberative Process

Next Steps:

- The Region is drafting technical support documents (TSDs) to accompany the 120-day letters. Regions need to provide these draft TSDs to headquarters for review by April 4.
- The Administrator will be briefed and make final decisions on the 120-day letters on or around May 2.
- Regions will begin preparing 120-day letters around May 5.
- 120-day letters are to be sent on June 2.

Ex. 5 - Deliberative Process

EPA's Intended Area Designations for the 2015 Ozone Standard

Ex. 5 - Deliberative Process

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State	State Recommended Nonattainment Areas
Illinois	Chicago Cook County DuPage County Kane County Will County McHenry County Kendall County (p) Grundy County (p) St. Louis Madison County Monroe County St. Clair County
Indiana	None
Michigan	Allegan County Berrien County Muskegon County Detroit Livingston County Macomb County Monroe County Oakland County St. Clair County Washtenaw County Wayne County
Minnesota	None

Ex. 5 - Deliberative Process

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Ohio	Cincinnati Butler County Clermont County Hamilton County Warren County Cleveland Cuyahoga County Geauga County Lake County Lorain County Medina County Portage County Summit County Columbus Delaware County Fairfield County Franklin County Licking County	Ex. 5 - Deliberative Process
Wisconsin	None	

***Note:** The Fond du Lac Band of Lake Superior Chippewa (MN) recommended that the area within the reservation boundaries to be designated as attainment, separately from adjacent lands and that the Forest County Potawatomi Community (WI) recommended that trust lands located within Forest County be designated as attainment, separately from adjacent lands. Ex. 5 - Deliberative Process

Ex. 5 - Deliberative Process

ED_001361_00000400

Briefing Paper

Air and Radiation Division/March 29, 2017

Subject: Designation of Areas under the 2015 Ozone Standard.

Summary: EPA is on a schedule to send letters to states by June 2, indicating areas that EPA intends to designate as nonattainment under the 2015 ozone national ambient air quality standards (NAAQS). These letters will be prepared for signature by the Regional Administrators. EPA is required to promulgate final designations by October 1, 2017.

Background: On October 1, 2015, EPA promulgated a revised ozone NAAQS of 0.070 parts per million. The Clean Air Act (CAA) governs the process for initial area designations after EPA establishes a new or revised standard. Under the CAA, states (and tribes) are required to submit area designation recommendations to the EPA no later than 1 year following promulgation, in this case, by October 1, 2016. EPA is then obligated to inform states if EPA intends to make any modifications to a state's or tribe's recommendations no later than 120 days prior to finalizing the designation. Because the CAA requires EPA to complete the initial designation process within 2 years of promulgation,[1] the 120-day letter must be sent out by June 2, 2017, to promulgate final designations by October 1, 2017. If a state has additional information that it wants EPA to consider, such information should be submitted no later than 60 days from the date of the 120-day letter.

Section 107(d)(1) of the CAA directs EPA to designate an area as "nonattainment" if it is violating the NAAQS or if it is contributing to a violation of the NAAQS in a nearby area. EPA received designation recommendations from all 6 states and from two tribes. The recommendations can be summarized as follows:

Illinois & Michigan – Recommended all areas with violating monitors as nonattainment, with boundaries remaining consistent with previous nonattainment boundaries.

Indiana – Recommend entire state as attainment or unclassifiable, regardless of monitored violations in areas in which Indiana counties had been previously included. For example, the Chicago area has monitored violations of the standard in Illinois and Wisconsin but Indiana recommended Lake and Porter Counties be designated as attainment, even though those counties have been included as part of the Chicago noattainment area under the 1-hour, 1997 and 2008 ozone standards.

Minnesota – Recommended all counties be designated as attainment.

Ohio – Recommended all areas with violating monitors as nonattainment but decreased size of each area by 1 or 2 counties.

Wisconsin – Recommended the entire state be designated as attainment despite monitored violations of the standard. WI argued that ozone levels in the state have improved and that the monitored violations are due to transport.

Fond du Lac Band of Lake Superior Chippewa (MN) – Recommended that the area within the

[1] If the Administrator has insufficient information to make initial designation decisions in the 2-year time frame, EPA may take up to 1 additional year, i.e., no later than 3 years after promulgation of the standard.

reservation boundaries to be designated as attainment.

Forest County Potawatomi Community (WI) – Recommended that trust lands located within Forest County be designated as attainment, separately from adjacent lands.

Issue:

Ex. 5 - Deliberative Process

Next Steps and Recommendations:

- The Region is drafting technical support documents (TSDs) to accompany the 120-day letters. Regions need to provide these draft TSDs to headquarters for review by April 4.
- The Administrator will be briefed and make final decisions on the 120-day letters on or around May 2.
- Regions will begin preparing 120-day letters around May 5.
- 120-day letters are to be sent on June 2.

Nonattainment Areas in Region 5

Multistate

- Ex. 5 - Deliberative Process

Michigan

- Ex. 5 - Deliberative Process

Ohio

- Ex. 5 - Deliberative Process

Wisconsin

- Ex. 5 - Deliberative Process

From: Joseph Jakuta
Location: https://global.gotomeeting.com/join/856314685
Importance: Normal
Subject: OTC Modeling Committee
Start Date/Time: Tue 9/13/2016 7:00:00 PM
End Date/Time: Tue 9/13/2016 8:30:00 PM
VADEQ_CMAQ-ISAM_policy_OTCcall_09132016.pdf
OTC_Modeling_Committee_Fall_2016_09062016 [Recovered].pptx

;;;
Agenda

1. VA CMAQ/ISAM Work
2. Modeling Presentation [forthcoming]
3. Other Platform Updates

a. EI
b. Modeling Runs
c. TSD - https://www.dropbox.com/s/ys21htf90s75955/2011%20OTC%20MANE-VU%20Modeling%20TSD.docx?dl=0

4. Air Quality Data Update

---GoToMeeting invitation begins---
Please join my meeting from your computer, tablet or smartphone.
https://global.gotomeeting.com/join/856314685
You can also dial in using your phone.
United States +1 (571) 317-3122
Access Code: 856-314-685
---GoToMeeting invitation ends---

To: michele.chaffee@ct.gov[michele.chaffee@ct.gov]; Sherry M. Godlewski[Sherry.Godlewski@des.nh.gov]; Arnold, Anne[Arnold.Anne@epa.gov]; Bean, Clayton[bean.clayton@epa.gov]; Burkhart, Richard[burkhart.richard@epa.gov]; bxgaza@gw.dec.state.ny.us[bxgaza@gw.dec.state.ny.us]; Christopher, Lakiesha[Lakiesha.Christopher@ct.gov]; Coughlin, Steven (DEP)[steven.coughlin@state.ma.us]; Darren Austin[darren.austin@dem.ri.gov]; Dave Healy[David.healy@des.nh.gov]; erica.snyder@dep.state.nj.us[erica.snyder@dep.state.nj.us]; Faranca, Victoria[Victoria.Faranca@dep.nj.gov]; gallen@nescaum.org[gallen@nescaum.org]; Greg.John@dep.state.nj.us[Greg.John@dep.state.nj.us]; Jessica Dunbar - NHDES (jessica.dunbar@des.nh.gov)[jessica.dunbar@des.nh.gov]; Joe Carola (joe.carola@DEM.RI.GOV)[joe.carola@DEM.RI.GOV]; John Kent[jwkent@gw.dec.state.ny.us]; jude.catalano@po.state.ct.us[jude.catalano@po.state.ct.us]; Julie Ross[julie.ross@state.ma.us]; kathleen.knight@ct.gov[kathleen.knight@ct.gov]; kurt.kebschull@ct.gov[kurt.kebschull@ct.gov]; lenny.giuliano@dem.ri.gov[lenny.giuliano@dem.ri.gov]; Leon, Bennet (Bennet.Leon@vermont.gov)[Bennet.Leon@vermont.gov]; llandry@des.state.nh.us[llandry@des.state.nh.us]; Marc Bennett[Marc.Bennett@state.ma.us]; mark.wert@state.ma.us[mark.wert@state.ma.us]; martha.e.webster@maine.gov[martha.e.webster@maine.gov]; michael.geigert@ct.gov[Michael.Geigert@ct.gov]; glenn.pacheco@state.ma.us[glenn.pacheco@state.ma.us]; paul.bodner@ct.gov[paul.bodner@ct.gov]; Peter Mayes[Peter.Mayes@dep.state.nj.us]; Riley, Dan[Dan.Riley@vermont.gov]; Robert.Huizer@dep.state.nj.us[Robert.Huizer@dep.state.nj.us]; Samuel Sampieri[Samuel.Sampieri@ct.gov]; Stuart, Julia A (DEC)[julia.stuart@dec.ny.gov]; Tom Downs[Tom.Downs@maine.gov]
Cc: White, Johne[White.Johne@epa.gov]; Dickerson, Phil[Dickerson.Phil@epa.gov]; Kelly, Bob[Kelly.Bob@epa.gov]
From: McWilliams, Anne K.
Sent: Fri 4/14/2017 4:45:45 PM
Subject: Save the Date - R1 Air Quality Outreach and Forecasting Workshop - June 1, 2017
2017 workshop agenda.docx

Hello,

Please save June 1, 2017 for the EPA Region 1 Air Quality Outreach and Forecasting Workshop. We will host the workshop at our Chelmsford Lab. We will also provide remote access for those unable to attend in person.

Attached is a very draft agenda for planning purposes. Please let me know if you are interesting in filling in for TBD or have additional agenda items. Also, please forward to anyone else in your organization who may be interested.

Best regards,

Anne McWilliams

****Draft****

Air Quality Forecasting & Outreach Workshop

EPA Region 1 Laboratory
Chelmsford, MA
June 1, 2017

9:00 – 9:15	Introductions	Anne McWilliams, EPA
9:15 – 10:00	EPA Updates	
	- New Ozone NAAQS	Rich Burkhart, EPA
	- Status of ozone Designations	Rich Burkhart, EPA
10:00– 11:30	Forecasting Trends and Challenges	
	- Ozone and PM2.5 Trends	Anne McWilliams, EPA
	- How did we do forecasting to the new NAAQS	Anne McWilliams, EPA
	- Welcome to new forecasters/words of advice	All
	- Air Quality Case Study/round table	TBD
11:30 – 12:30	Lunch (on your own)	
12:30 – 2:15	Air Quality Projects	
	- Long Island Study – when to trigger	Anne McWilliams, EPA
	- 2016 Ft McMurray Exceptional Event	CT DEEP (invited)
	- 2017 Stratospheric Intrusion	Lisa Landry, NH DES
	- Lessons Learned from Village Green	CT DEEP (invited)
2:15 – 3:30	AQI Outreach and Discussion	
	- Outreach Activities	All
	- Current/upcoming Woodstove Changeouts	TBD
	- Social Media	TBD
	- Citizen Science Discussion	All
	- Airnow Webpage Redesign	EPA OAQPS (invited)
3:30 – 4:00	Wrap Up/Next Steps	All

To: Pirolli, Ric (Ric.Pirolli@ct.gov)[Ric.Pirolli@ct.gov]; paul.bodner@ct.gov[paul.bodner@ct.gov]; Anne Gobin (Anne.Gobin@ct.gov) (Anne.Gobin@ct.gov)[Anne.Gobin@ct.gov]; Sliwinski, Rob (DEC) <rob.sliwinski@dec.ny.gov> (rob.sliwinski@dec.ny.gov)[rob.sliwinski@dec.ny.gov]; 'robert.bielawa@dec.ny.gov'[robert.bielawa@dec.ny.gov]; 'scott.griffin@dec.ny.gov'[scott.griffin@dec.ny.gov]; Steitz, Francis[Francis.Steitz@dep.nj.gov]; Ratzman, Kenneth[Kenneth.Ratzman@dep.nj.gov]; Davis, Sharon[Sharon.Davis@dep.nj.gov]; Arnold, Anne[Arnold.Anne@epa.gov]; Wieber, Kirk[Wieber.Kirk@epa.gov]; Ruvo, Richard[Ruvo.Richard@epa.gov]; Conroy, David[Conroy.Dave@epa.gov]; McConnell, Robert[mcconnell.robert@epa.gov]; Wholean, Kiernan[Kiernan.Wholean@ct.gov]
From: Wong, Danny
Sent: Fri 12/9/2016 8:48:18 PM
Subject: RE: Call with EPA on AD SIP for 75 ppb Ozone NAAQS
AD SIP 12122016 v1.pptx

Attached is the PPT for Monday's call. Remember, call has been moved to 3:30 pm.

From: Wong, Danny
Sent: Friday, December 09, 2016 8:35 AM
To: Pirolli, Ric (Ric.Pirolli@ct.gov) <Ric.Pirolli@ct.gov>; 'Bodner, Paul' <Paul.Bodner@ct.gov>; Anne Gobin (Anne.Gobin@ct.gov) (Anne.Gobin@ct.gov) <Anne.Gobin@ct.gov>; 'Sliwinski, Rob (DEC) <rob.sliwinski@dec.ny.gov> (rob.sliwinski@dec.ny.gov)' <rob.sliwinski@dec.ny.gov>; 'robert.bielawa@dec.ny.gov' <robert.bielawa@dec.ny.gov>; 'scott.griffin@dec.ny.gov' <scott.griffin@dec.ny.gov>; Steitz, Francis <Francis.Steitz@dep.nj.gov>; Ratzman, Kenneth <Kenneth.Ratzman@dep.nj.gov>; Davis, Sharon <Sharon.Davis@dep.nj.gov>; 'Arnold.anne@Epa.gov' <Arnold.anne@Epa.gov>; 'Wieber, Kirk' <Wieber.Kirk@epa.gov>; 'Ruvo, Richard' <Ruvo.Richard@epa.gov>; 'Conroy.dave@Epa.gov' <Conroy.dave@Epa.gov>; 'mcconnell.robert@epa.gov' <mcconnell.robert@epa.gov>; 'Wholean, Kiernan' <Kiernan.Wholean@ct.gov>
Subject: RE: Call with EPA on AD SIP for 75 ppb Ozone NAAQS

I've been asked to see if we can move the start time of this call to 3:30 instead of 3:00 on next Monday. Please let me know if you CANNOT stay past 4:00 for this call (would be rescheduled to 3:30 to 4:30) so we may make alternative plan.

Please let me know ASAP. Thank you.

From: Wong, Danny
Sent: Wednesday, December 07, 2016 4:02 PM
To: Pirolli, Ric (Ric.Pirolli@ct.gov) <Ric.Pirolli@ct.gov>; 'Bodner, Paul'

<Paul.Bodner@ct.gov>; Anne Gobin (Anne.Gobin@ct.gov) (Anne.Gobin@ct.gov) <Anne.Gobin@ct.gov>; 'Sliwinski, Rob (DEC) <rob.sliwinski@dec.ny.gov> (rob.sliwinski@dec.ny.gov)' <rob.sliwinski@dec.ny.gov>; 'robert.bielawa@dec.ny.gov' <robert.bielawa@dec.ny.gov>; 'scott.griffin@dec.ny.gov' <scott.griffin@dec.ny.gov>; Steitz, Francis <Francis.Steitz@dep.nj.gov>; Ratzman, Kenneth <Kenneth.Ratzman@dep.nj.gov>; Davis, Sharon <Sharon.Davis@dep.nj.gov>; 'Arnold.anne@Epa.gov' <Arnold.anne@Epa.gov>; 'Wieber, Kirk' <Wieber.Kirk@epa.gov>; 'Ruvo, Richard' <Ruvo.Richard@epa.gov>; 'Conroy.dave@Epa.gov' <Conroy.dave@Epa.gov>; 'mcconnell.robert@epa.gov' <mcconnell.robert@epa.gov>; 'Wholean, Kiernan' <Kiernan.Wholean@ct.gov>
Subject: RE: Call with EPA on AD SIP for 75 ppb Ozone NAAQS

Attached is the agenda for next week's call.

From: Wong, Danny
Sent: Monday, December 05, 2016 9:22 AM
To: Pirolli, Ric (Ric.Pirolli@ct.gov) <Ric.Pirolli@ct.gov>; 'Bodner, Paul' <Paul.Bodner@ct.gov>; Anne Gobin (Anne.Gobin@ct.gov) (Anne.Gobin@ct.gov) <Anne.Gobin@ct.gov>; 'Sliwinski, Rob (DEC) <rob.sliwinski@dec.ny.gov> (rob.sliwinski@dec.ny.gov)' <rob.sliwinski@dec.ny.gov>; 'robert.bielawa@dec.ny.gov' <robert.bielawa@dec.ny.gov>; 'scott.griffin@dec.ny.gov' <scott.griffin@dec.ny.gov>; Steitz, Francis <Francis.Steitz@dep.nj.gov>; Ratzman, Kenneth <Kenneth.Ratzman@dep.nj.gov>; Davis, Sharon <Sharon.Davis@dep.nj.gov>; Arnold, Ann <Ann.Arnold@dep.nj.gov>; 'Wieber, Kirk' <Wieber.Kirk@epa.gov>; 'Ruvo, Richard' <Ruvo.Richard@epa.gov>; 'Conroy.dave@Epa.gov' <Conroy.dave@Epa.gov>; mcconnell.robert@epa.gov; Wholean, Kiernan <Kiernan.Wholean@ct.gov>
Subject: RE: Call with EPA on AD SIP for 75 ppb Ozone NAAQS

Looks like 3-4pm on Dec 12 (next Monday) works for most. Please block this time out on your calendar. I will be sending out call info and agenda shortly.

From: Wong, Danny
Sent: Thursday, December 01, 2016 10:50 AM
To: Pirolli, Ric (Ric.Pirolli@ct.gov) <Ric.Pirolli@ct.gov>; 'Bodner, Paul' <Paul.Bodner@ct.gov>; Anne Gobin (Anne.Gobin@ct.gov) (Anne.Gobin@ct.gov) <Anne.Gobin@ct.gov>; 'Sliwinski, Rob (DEC) <rob.sliwinski@dec.ny.gov> (rob.sliwinski@dec.ny.gov)' <rob.sliwinski@dec.ny.gov>; 'robert.bielawa@dec.ny.gov' <robert.bielawa@dec.ny.gov>; 'scott.griffin@dec.ny.gov' <scott.griffin@dec.ny.gov>; Steitz, Francis <Francis.Steitz@dep.nj.gov>; Ratzman, Kenneth <Kenneth.Ratzman@dep.nj.gov>;

Davis, Sharon <Sharon.Davis@dep.nj.gov>; Arnold, Ann <Ann.Arnold@dep.nj.gov>; 'Wieber, Kirk' <Wieber.Kirk@epa.gov>; Ruvo, Richard <Ruvo.Richard@epa.gov>; 'Conroy.dave@Epa.gov' <Conroy.dave@Epa.gov>
Subject: Call with EPA on AD SIP for 75 ppb Ozone NAAQS

All,

NJ, NY, and CT have completed the shared technical work for the tri-state area's attainment demonstration (AD) for the 75 ppb ozone NAAQS. We would like to have a conference call with EPA Regions 1 and 2 to discuss the status of our AD SIP planning progress, including the SIP modeling results. Please fill out the doodle poll for your availability for this call (http://doodle.com/poll/hpnvnk5rqqrtym99).

An agenda and a PPT will be sent out before the call. If you have any questions, feel free to contact me or the other states.

Danny Wong

Bureau Chief

NJDEP Division of Air Quality – Bureau of Evaluation and Planning
401 East State Street, 2nd Floor
Mail Code 401-02
P.O. Box 420
Trenton, NJ 08625-0420

Telephone (609) 984-2608
Fax (609) 633-1112

http://www.nj.gov/dep/aqes/index.html

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Attainment SIP Effort for NJ-NY-CT Nonattainment Area

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Purpose of Call

- Information sharing
- Path forward to address SIP requirement
  - 2008 (75 ppb) ozone NAAQS
  - 1997 (84 ppb) ozone NAAQS
  - Impact on/from 2015 (70 ppb) ozone NAAQS

Air Quality Data			4th Max				Design Values	
As of Nov 13, 2016			AQS Data			AirNow	AQS Data	Prelim.
AQS Code	State	Site Name	2013	2014	2015	2016	2015	2016
090010017	CT	Greenwich	82	78	84	85	81	82
090011123	CT	Danbury	76	74	79	81	76	78
090013007	CT	Stratford	90	74	86	83	83	81
090019003	CT	Westport	86	81	87	87	84	85
090070007	CT	Middletown	82	80	78	80	80	79
090090027	CT	Criscuolo Park	75	72	81	75	76	76
090099002	CT	Madison-Beach Rd	85	69	81	80	78	76
360050110	NY	IS52	71	71	63	69	68	67
360050133	NY	Pfizer Lab	68	70	72	70	70	70
360610135	NY	Convent Av	62	65	71	71	66	69
360810124	NY	Queens	71	63	73	71	69	69
360850067	NY	Susan Wagner	71	72	79	77	74	76
360870005	NY	South Mountain Rd	69	68	77	73	71	72
361030002	NY	Babylon	72	66	78	73	72	72
361030004	NY	Riverhead	78	64	76	78	72	72
361030009	NY	Holtsville	74	62	63	73	66	66
361192004	NY	White Plains	72	74	73	75	73	74
340030006	NJ	Leonia	74	73	76	75	74	74
340130003	NJ	Newark Firehouse	69	70	72	70	70	70
340170006	NJ	Bayonne	66	72	77	69	71	72
340190001	NJ	Flemington	73	65	73	78	70	72
340230011	NJ	Rutgers University	70	71	77	76	72	74
340250005	NJ	Monmouth University	71	64	77	70	70	70
340273001	NJ	Chester	73	68	70	69	70	69
340315001	NJ	Ramapo	69	65	71	72	68	69
340410007	NJ	Columbia	61	60	66	66	62	64

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Modeled 8-hour Ozone Design Values						
Site Name	AQS Code	County	State	Modeling		
				2011 DVB	2017 BETA2	2017 BETA2 LW
Greenwich Point Park	90010017	Fairfield	CT	80.3	77	73
Danbury (Western Conn State Univ)	90011123	Fairfield	CT	81.3	74	74
Stratford	90013007	Fairfield	CT	84.3	77	76
Westport (Sherwood Island Connector)	90019003	Fairfield	CT	83.7	83	76
Middletown	90070007	Middlesex	CT	79.3	70	70
Criscuolo Park-New Haven	90090027	New Haven	CT	74.3	67	67
Madison-Beach Rd (Hammonasset State Park)	90099002	New Haven	CT	85.7	77	76
Pfizer Lab	360050133	Bronx	NY	74	71	68
Convent Av (CCNY)	360610135	New York	NY	73.3	70	67
Queens	360810124	Queens	NY	78	74	72
Susan Wagner HS	360850067	Richmond	NY	81.3	78	72
South Mountain Rd (Rockland County)	360870005	Rockland	NY	75	67	67
Babylon	361030002	Suffolk	NY	83.3	77	77
Riverhead	361030004	Suffolk	NY	78	71	71
Holtsville	361030009	Suffolk	NY	78.7	73	72
White Plains	361192004	Westchester	NY	75.3	73	68
Leonia	340030006	Bergen	NJ	77	68	68
Newark Firehouse	340130003	Essex	NJ	78	69	69
Bayonne	340170006	Hudson	NJ	77	69	69
Flemington	340190001	Hunterdon	NJ	78	68	68
Rutgers University	340230011	Middlesex	NJ	81.3	71	71
Monmouth University	340250005	Monmouth	NJ	80	71	69
Chester	340273001	Morris	NJ	76.3	67	67
Ramapo	340315001	Passaic	NJ	73.3	65	65
Columbia	340410007	Warren	NJ	66	57	57

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Modeling

- Two runs
  - Base year 2011
  - “On the books” 2017
    - Additional analysis for land/water interface
- Did not include CSAPR Update
  - Only provides 0.3 ppb improvement at Westport
- Other factors for consideration
  - Weight of evidence (WOE)
  - Exceptional event

8-hour Ozone Design Values							
Site Name	AQS Code	County	State	Modeling			Monitoring
				2011 DVB	2017 BETA2	2017 BETA2 LW	2016 Prelim. DV
Greenwich Point Park	90010017	Fairfield	CT	80.3	77	73	82
Danbury (Western Conn State Univ)	90011123	Fairfield	CT	81.3	74	74	78
Stratford	90013007	Fairfield	CT	84.3	77	76	81
Westport (Sherwood Island Connector)	90019003	Fairfield	CT	83.7	83	76	85
Middletown	90070007	Middlesex	CT	79.3	70	70	79
Criscuolo Park-New Haven	90090027	New Haven	CT	74.3	67	67	76
Madison-Beach Rd (Hammonasset State Park)	90099002	New Haven	CT	85.7	77	76	76
Pfizer Lab	360050133	Bronx	NY	74	71	68	70
Convent Av (CCNY)	360610135	New York	NY	73.3	70	67	69
Queens	360810124	Queens	NY	78	74	72	69
Susan Wagner HS	360850067	Richmond	NY	81.3	78	72	76
South Mountain Rd (Rockland County)	360870005	Rockland	NY	75	67	67	72
Babylon	361030002	Suffolk	NY	83.3	77	77	72
Riverhead	361030004	Suffolk	NY	78	71	71	72
Holtsville	361030009	Suffolk	NY	78.7	73	72	66
White Plains	361192004	Westchester	NY	75.3	73	68	74
Leonia	340030006	Bergen	NJ	77	68	68	74
Newark Firehouse	340130003	Essex	NJ	78	69	69	70
Bayonne	340170006	Hudson	NJ	77	69	69	72
Flemington	340190001	Hunterdon	NJ	78	68	68	72
Rutgers University	340230011	Middlesex	NJ	81.3	71	71	74
Monmouth University	340250005	Monmouth	NJ	80	71	69	70
Chester	340273001	Morris	NJ	76.3	67	67	69
Ramapo	340315001	Passaic	NJ	73.3	65	65	69
Columbia	340410007	Warren	NJ	66	57	57	64

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Weight of Evidence

- When can WOE be used – based on EPA guidance:
  - Guidance for 85 ppb standard – future DV in range of 82~87 ppb
  - Guidance for 75 ppb standard – "Air agencies are encouraged to consult with their EPA Regional office … to determine which additional analyses may be most appropriate for their particular area."

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Exceptional Event – May/June 2016

- Flag data
  - Does not commit state to anything
- Some states working with NESCAUM on developing exceptional event document for EPA submission
- Why is this important?
  - Westport goes from 85 ppb to 82 ppb (attaining 84 ppb ozone NAAQS)
  - Susan Wagner goes from 76 ppb to 74 ppb (attaining 75 ppb ozone NAAQS)

As of Oct 24, 2016		Design Value		Δ ppb (EE DV - 2016 DV)
State	Site Name	Prelim. 2016	EE Adj. 2016	
CT	Criscuolo Park	76	76	0
CT	Danbury	78	77	-1
CT	Greenwich	82	80	-2
CT	Madison-Beach Rd	76	76	0
CT	Middletown	79	78	-1
CT	Stratford	81	80	-1
CT	Westport	85	82	-3
NY	Susan Wagner	76	74	-2

Exceptional Event 2016 (May 25 – 28)

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Land/Water Interface Model Analysis

- Way of determining future design value with/without considering uncertainty of modeling over water grid
  - States should be allowed to show a range for attainment demonstration
- Real “interference” from the land/water interface for ozone formation at the coastal monitors
- Further study needed (in progress with NESCAUM)

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State Options

- Submit a complete SIP
  - Would at least show attainment for the 85 ppb ozone NAAQS
  - WOE
  - Include discussions on:
    - Exceptional event
    - Land/water analysis
    - Transport from upwind states
  - Wait to see what the air quality will be like for 2017 ozone season

- Bump up

ED_001361_00001132

Tentative SIP Schedule

- Propose Q1 2017
- Final Q1/Q2 2017 (assuming little to no comments)

To: Darren Austin[darren.austin@dem.ri.gov]
Cc: doug.mcvay@dem.ri.gov[doug.mcvay@dem.ri.gov]; laurie.grandchamp@dem.ri.gov[laurie.grandchamp@dem.ri.gov]; gina.friedman@dem.ri.gov[gina.friedman@dem.ri.gov]; Judge, Robert[Judge.Robert@epa.gov]; Taylor, Catherine[taylor.catherine@epa.gov]; Kahn, Peter R.[kahn.peter@epa.gov]; McWilliams, Anne K.[mcwilliams.anne@epa.gov]; Arnold, Anne[Arnold.Anne@epa.gov]; Conroy, David[Conroy.Dave@epa.gov]
From: Wortman, Eric
Sent: Tue 5/9/2017 2:50:56 PM
Subject: Exceptional Event Demonstration Submittal Process - RI DEM

Darren,

Thank you for notifying us of the public comment period for your proposed exceptional events demonstration for the 2016 Ft. McMurray wildfire. The public comment period for the demonstration ends on May 26, 2017. Given this timeframe, we understand that it may be challenging to provide your final submittal to the EPA by the May 31, 2017 deadline. The exceptional events rule provides flexibility for the EPA to begin its review concurrent with the public comment period, provided that any received public comments and your response to those comments are sent to the EPA by a specified date (see 81 FR 68266/68267). Please note that if RI DEM receives public comments disputing the technical elements of a demonstration during a comment period that runs concurrent with the EPA's review and these comments result in the need to reanalyze or reassess the validity of a claimed event, a second public comment period may be necessary.

In accordance with §50.14(c)(3), RI DEM should submit a copy of the proposed demonstration and documentation of the public comment process to the EPA by May 31, 2017. RI DEM should provide the EPA with a final submittal, including any public comments received and your response to those comments, no later than June 30, 2017. Your submittals may be sent to the following address:

Art Johnson, Acting Director
Office of Ecosystem Protection
U.S. EPA Region 1
5 Post Office Square (Mail Code: OEP-06-5)

Boston, MA 02109-3912

Please let me know if you have any questions,

Eric

Eric Wortman | Environmental Scientist

U.S. Environmental Protection Agency

Telephone: (617) 918-1624 | Email: wortman.eric@epa.gov

To: Darren Austin[darren.austin@dem.ri.gov]
Cc: doug.mcvay@dem.ri.gov[doug.mcvay@dem.ri.gov]; laurie.grandchamp@dem.ri.gov[laurie.grandchamp@dem.ri.gov]; gina.friedman@dem.ri.gov[gina.friedman@dem.ri.gov]; Judge, Robert[Judge.Robert@epa.gov]; Conroy, David[Conroy.Dave@epa.gov]; Arnold, Anne[Arnold.Anne@epa.gov]; McWilliams, Anne K.[mcwilliams.anne@epa.gov]; Burkhart, Richard[burkhart.richard@epa.gov]; Van Arsdale, Alan[vanarsdale.alan@epa.gov]; Taylor, Catherine[taylor.catherine@epa.gov]; Kahn, Peter R.[kahn.peter@epa.gov]
From: Wortman, Eric
Sent: Mon 3/27/2017 2:15:02 PM
Subject: EPA Comment Letter on RI Draft Exceptional Event Demonstration
EPA Comment Letter on Draft RI EE Demo 3-27-17.pdf
EPA RLSO_RIDEM DRAFT Ex Ev Demo_3-27-17.docx

Good morning Darren,

I've attached a copy of our comment letter on RI DEM's draft exceptional event demonstration for the 2016 Ft. McMurray wildfire. I've also attached a red-line/strike-out version of the draft demonstration with other clarifying suggestions and minor editorial revisions. Please let me know if you have any questions or would like to set up a call to discuss our comments in more detail.

Thank you.

Eric

Eric Wortman | Environmental Scientist

U.S. Environmental Protection Agency

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To: Darren Austin[darren.austin@dem.ri.gov]; Grandchamp, Laurie (DEM)[laurie.grandchamp@dem.ri.gov]; Friedman, Gina (DEM)[gina.friedman@dem.ri.gov]; michael.geigert@ct.gov[Michael.Geigert@ct.gov]; Kiernan Wholean[Kiernan.Wholean@ct.gov]; randall.semagin@ct.gov[randall.semagin@ct.gov]
Cc: mark.wert@state.ma.us[mark.wert@state.ma.us]; Steven Coughlin[steven.coughlin@state.ma.us]; Judge, Robert[Judge.Robert@epa.gov]; Arnold, Anne[Arnold.Anne@epa.gov]; Conroy, David[Conroy.Dave@epa.gov]; McWilliams, Anne K.[mcwilliams.anne@epa.gov]; Taylor, Catherine[taylor.catherine@epa.gov]; Van Arsdale, Alan[vanarsdale.alan@epa.gov]; Burkhart, Richard[burkhart.richard@epa.gov]
From: Wortman, Eric
Sent: Fri 3/3/2017 9:39:39 PM
Subject: FW: EPA Response on MA Draft Exceptional Events Demo for Ft. McMurray Fire
EPA Comment Letter on Draft Mass EE Demo_final 3-3-17.pdf

Hi everyone,

Attached are the comments that we sent to Massachusetts DEP on their draft exceptional events demonstration. As discussed in the past, we want to share this information with you in case it helps you with your own demonstrations. Due to the large file size of the draft submittals, all three states have been utilizing our NE Air Monitoring SharePoint site to exchange the files (Click here for link to site). You should be able to access each other's draft demonstrations by navigating to the "Exceptional Events" folder under the "Public Folder" for the respective state on the left side of the home page.

Thanks and have a great weekend,

Eric

From: Wortman, Eric
Sent: Friday, March 03, 2017 4:27 PM
To: mark.wert@state.ma.us
Cc: Steven Coughlin <steven.coughlin@state.ma.us>; glenn.pacheco@state.ma.us; 'Keith, Glenn (DEP)' <Glenn.Keith@MassMail.State.MA.US>; Robert Judge <Judge.Robert@epa.gov>; Arnold, Anne <Arnold.Anne@epa.gov>; Conroy, David <Conroy.Dave@epa.gov>; McWilliams, Anne K. <mcwilliams.anne@epa.gov>; Burkhart, Richard <burkhart.richard@epa.gov>; Taylor, Catherine <taylor.catherine@epa.gov>; Van Arsdale, Alan <vanarsdale.alan@epa.gov>; Kipp, Katrina <kipp.katrina@epa.gov>
Subject: EPA Response on MA Draft Exceptional Events Demo for Ft. McMurray Fire

Mark,

Please find the attached comment letter regarding your draft exceptional events demonstration for the 2016 Ft. McMurray fire. We are happy to meet with you next week to explain our comments in more detail. If you would like me to set up a call to discuss this further, we are available Monday at 1:00 or Wednesday at 9:00 and 12:00. Please let me know.

I will also share a copy of our response and your draft submittal with Connecticut and Rhode Island.

Have a good weekend,

Eric

Eric Wortman | Environmental Scientist

U.S. Environmental Protection Agency

Telephone: (617) 918-1624 Email: wortman.eric@epa.gov

To: Exceptional Event call list[gallen2@nescaum.org]
Cc: Anne.Gobin@ct.gov[Anne.Gobin@ct.gov]; Francis.Steitz@dep.nj.gov[Francis.Steitz@dep.nj.gov]; peg.hanna@dep.state.nj.us[peg.hanna@dep.state.nj.us]; laurie.grandchamp@dem.ri.gov[laurie.grandchamp@dem.ri.gov]; Palma, Elizabeth[Palma.Elizabeth@epa.gov]; pmiller@nescaum.org[pmiller@nescaum.org]
From: George Allen
Sent: Mon 2/13/2017 6:28:48 PM
Subject: O3 Exceptional Event Call Follow-up from Bob Judge/EPA R1 [WARNING: DKIM validation failed]

Hi everyone -- The info below is from Bob Judge to follow up on last week's ExEv call.
-- George

Bob Judge EPA R1 wrote:
First, here?s the regulatory text regarding public comment from the EE rule:

(A) Document that the State followed the public comment process and that the comment period was open for a minimum of 30 days, which could be concurrent with the beginning of the Administrator?s initial review period of the associated demonstration provided the State can meet all requirements in this paragraph;
(B) Submit the public comments it received along with its demonstration to the Administrator; and
(C) Address in the submission to the Administrator those comments disputing or contradicting factual evidence provided in the demonstration.

As a matter of practice, it?s very similar to the way States provide the opportunity for public comment on Air Monitoring Network Plans (at least in Region 1). Typically, it gets posted to the Agency?s web site, and an email notice gets sent around to known interested parties. In light of the regional nature of these potential EE requests, it would seem that sharing with neighboring/ nearby States might also be important. And I think you shared with me that some enviros had concerns about the EE policy overall, so it might be in a State?s interest to be proactive regarding making available. Section 6 of the Wildfire Guidance also discusses the requirements for the public comment period and includes examples of supporting documentation and a conclusion statement for the demo submittal. The full text of the rule and guidance can be found at the link below:
https://www.epa.gov/air-quality-analysis/exceptional-events-rule-and-guidance

Second, on Washoe County, I spoke to my Region 9 counterpart- and I?m told that the package has been submitted to EPA. At this time, the Region has not acted on the request. (FYI- supposedly the EE request for Washoe will be expanded to include additional days for the same event. I guess it initially only covered 1 day). The link below provides other examples of submitted requests:
https://www.epa.gov/air-quality-analysis/exceptional-events-submissions-table

We are working with OAQPS on the request for STN data from other States, as requested by

Region 1 States.

Let me know if you have questions.

Thanks- Bob

==========

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To: Conroy, David[Conroy.Dave@epa.gov]; kathleen.knight@ct.gov[kathleen.knight@ct.gov]; paul.farrell@ct.gov[paul.farrell@ct.gov]; paul.bodner@ct.gov[paul.bodner@ct.gov]; wendy.jacobs@ct.gov[wendy.jacobs@ct.gov]; kurt.kebschull@ct.gov[kurt.kebschull@ct.gov]; pete.babich@ct.gov[pete.babich@ct.gov]; Jaimeson.Sinclair@ct.gov[Jaimeson.Sinclair@ct.gov]; michael.geigert@ct.gov[michael.geigert@ct.gov]; Kiernan.Wholean@ct.gov[Kiernan.Wholean@ct.gov]; mark.wert@state.ma.us[mark.wert@state.ma.us]; Azin Kavian[azin.kavian@state.ma.us]; Glenn.Keith@state.ma.us[Glenn.Keith@state.ma.us]; Tom Downs[Tom.Downs@maine.gov]; jeff.s.crawford@maine.gov[jeff.s.crawford@maine.gov]; Tom.Graham@maine.gov[Tom.Graham@maine.gov]; Michele.Roberge@des.nh.gov[Michele.Roberge@des.nh.gov]; jeffrey.underhill@des.nh.gov[Jeffrey.Underhill@des.nh.gov]; Michael.Fitzgerald@des.nh.gov[Michael.Fitzgerald@des.nh.gov]; Sharon.Davis@dep.nj.gov[Sharon.Davis@dep.nj.gov]; Judy.Rand@dep.nj.gov[Judy.Rand@dep.nj.gov]; robert.bielawa@dec.ny.gov[robert.bielawa@dec.ny.gov]; scott.griffin@dec.ny.gov[scott.griffin@dec.ny.gov]; Diana.Rivenburgh@dec.ny.gov[Diana.Rivenburgh@dec.ny.gov]; michael.sheehan@dec.ny.gov[michael.sheehan@dec.ny.gov]; karen slattery[karen.slattery@dem.ri.gov]; Barbara.H.Morin@health.ri.gov[Barbara.H.Morin@health.ri.gov]; Bennet.Leon@vermont.gov[Bennet.Leon@vermont.gov]; Jeff.Merrell@vermont.gov[Jeff.Merrell@vermont.gov]; McWilliams, Anne K.[mcwilliams.anne@epa.gov]; Arnold, Anne[Arnold.Anne@epa.gov]; Burkhart, Richard[burkhart.richard@epa.gov]; Biton, Leiran[biton.leiran@epa.gov]; McConnell, Robert[mcconnell.robert@epa.gov]; Ruvo, Richard[Ruvo.Richard@epa.gov]; Kelly, Bob[Kelly.Bob@epa.gov]; Cuzzupe, Mary Jane[Cuzzupe.MaryJane@epa.gov]; Kahn, Peter R.[kahn.peter@epa.gov]; Kipp, Katrina[kipp.katrina@epa.gov]; St. Germain, Chris[Stgermain.Chris@epa.gov]; Taylor, Catherine[taylor.catherine@epa.gov]; Thompson, Alysha[Thompson.Alysha@epa.gov]; Van Arsdale, Alan[vanarsdale.alan@epa.gov]; gallen@nescaum.org[gallen@nescaum.org]; swierman@marama.org[swierman@marama.org]; dfoerter@otc.org[dfoerter@otc.org]; Weinstock, Lewis[Weinstock.Lewis@epa.gov]; Cavender, Kevin[Cavender.Kevin@epa.gov]; Papp, Michael[Papp.Michael@epa.gov]; Pleim, Jon[Pleim.Jon@epa.gov]; margaret.valis@dec.ny.gov[margaret.valis@dec.ny.gov]; richard.marriner@maine.gov[richard.marriner@maine.gov]; Andy.Johnson@maine.gov[Andy.Johnson@maine.gov]; Becky' 'Ohler (Rebecca.Ohler@des.nh.gov)[Rebecca.Ohler@des.nh.gov]; Kendall Perkins[kendall.perkins@des.nh.gov]; Lacaillade, Robert[Robert.Lacaillade@vermont.gov]; Tom McGrath[Thomas.Mcgrath@state.ma.us]; Pikul, Anthony (DEP)[anthony.pikul@state.ma.us]; laurie.grandchamp@dem.ri.gov[laurie.grandchamp@dem.ri.gov]; Friedman, Gina (DEM)[gina.friedman@dem.ri.gov]; melinda.viera@health.ri.gov[melinda.viera@health.ri.gov]; randall.semagin@ct.gov[randall.semagin@ct.gov]; Timin, Brian[Timin.Brian@epa.gov]; Khan, Mazeeda[Khan.Mazeeda@epa.gov]; Luis Lim[luis.lim@dep.nj.gov]; dirk.felton@dec.ny.gov[dirk.felton@dec.ny.gov]; brian.lay@dec.ny.gov[brian.lay@dec.ny.gov]; ellsworth, todd[ellsworth.todd@epa.gov]; Hence, Kia[hence.kia@epa.gov]; schmidt, howard[schmidt.howard@epa.gov]; Hyden, Loretta[Hyden.Loretta@epa.gov]; cripps, christopher[cripps.christopher@epa.gov]; Pino, Maria[Pino.Maria@epa.gov]; dtrostle@pa.gov[dtrostle@pa.gov]; kdalal@pa.gov[kdalal@pa.gov]; betsy.frey@state.de.us[betsy.frey@state.de.us]; Charles Sarnoski[Charles.Sarnoski@state.de.us]; Charles.Turner@deq.virginia.gov[Charles.Turner@deq.virginia.gov]; david.krask@maryland.gov[david.krask@maryland.gov]; Jennifer.hains@maryland.gov[Jennifer.hains@maryland.gov]; Ryan.auvil@maryland.gov[Ryan.auvil@maryland.gov]; Henry.Kim@phila.gov[Henry.Kim@phila.gov]; dennis.sosna@phila.gov[Dennis.Sosna@phila.gov]; Hallie.weiss@phila.gov[Hallie.weiss@phila.gov]; Paresh.mehta@phila.gov[Paresh.mehta@phila.gov]; dstern@achd.net[dstern@achd.net]; dnadzam@achd.net[dnadzam@achd.net]; Don Torsello,[dtorsello@state.pa.us]; Nick Lazor,[nlazor@state.pa.us]; Sean Nolan,[senolan@pa.gov]; Khin Sann Thaung,[KhinSann.Thaung@dc.gov]; Ram Tangirala,[rama.tangirala@dc.gov]; Brandon Miller[brandon.miller@dc.gov]; Alexandra Catena,[Alexandra.catena@dc.gov]; Nielson,

Irene[Nielson.Irene@epa.gov]; Wieber, Kirk[Wieber.Kirk@epa.gov]
From: Judge, Robert
Sent: Thur 2/2/2017 9:05:06 PM
Subject: EMPs in OTR- Wednesday, Feb 15; 11 am-12 noon
MonitoringJudgePAMSO3 FRM.ppt.pdf
PAMS_Northeast_R1_R2_R3 (00000002).pdf

Hi everyone-

I've been given your name as a key person to reach out to who may have insights and ideas to consider as we begin planning to develop Enhanced Monitoring Plans (EMPs) in the Ozone Transport Region (OTR).

As you may know, in addition to certain minimally "required" PAMs sites tied to NCORE sites in the larger CBSAs, the 2015 ozone NAAQS suggested that in the OTR, these sites should be supplemented by these EMPs. With your help, these plans will result in collecting more information that would be helpful to better understand, and solve, the ozone problem in the Northeast. I've attached a couple of presentations that might be of interest to you in this regard. Note that this distribution list includes air monitoring contacts, air modelers, and planners. Participation of experts such as you in each of these areas will help ensure that the development of these EMPs are as beneficial as possible. I am hopeful that I have included folks knowledgeable in each of these areas from each State/District that is part of the Ozone Transport Region and each relevant EPA Office. If I missed someone, please pass this along.

The call will be:

Wednesday, February 15; from 11 am-12 noon

Dial (866) 299-3188

Conference Code: 919-541-5651#

See the image below (and attachments) as we begin to frame the concept of Enhanced Monitoring Plans (EMP) in the Ozone Transport Region (OTR).

Note that as of summer 2015, there were 19 current "PAMS" sites in the northeast vs 11

“required” NCORE based PAMS CBSAs greater that 1,000,000 (blue represents existing PAMS sites.)

In consideration of ozone design values, my observation of the old/ current vs new is that there are 2 “required” monitors outside the “traditional” Transport Corridor, and that “required” measurements are significantly lacking in CT and western MA. In addition- under the “new,” coverage has been reduced in NJ, and coverage eliminated in Maine.

(Note that there is also a NCORE required PAMs site in Richmond, VA; and there is an existing PAMS site (elsewhere?) in Richmond.

Also, as I understand it the “required” NCORE PAMS site in Rochester, NY is being considered to be moved downstate. Boston’s NCORE

based required site “may” request to be “moved” so it remains at a nearby existing PAMS site.)

Based on the current network, vs the future NCORE based PAMS sites, and the obligation for all States in the OTR to submit EMPs;

1) where should any additional measurements be made?

2) And because EMPs don’t necessarily need to measure the same parameters, what should be measured at these other locations?

(From guidance: Require all O_3 moderate (or worse) NA areas and States in the OTR to also develop and implement an “enhanced ozone monitoring plan which could include additional O_3 sites; additional NO2, NOx and/or NOy sites; additional VOC measurements (different time periods or different locations); enhanced upper air measurements; etc.)

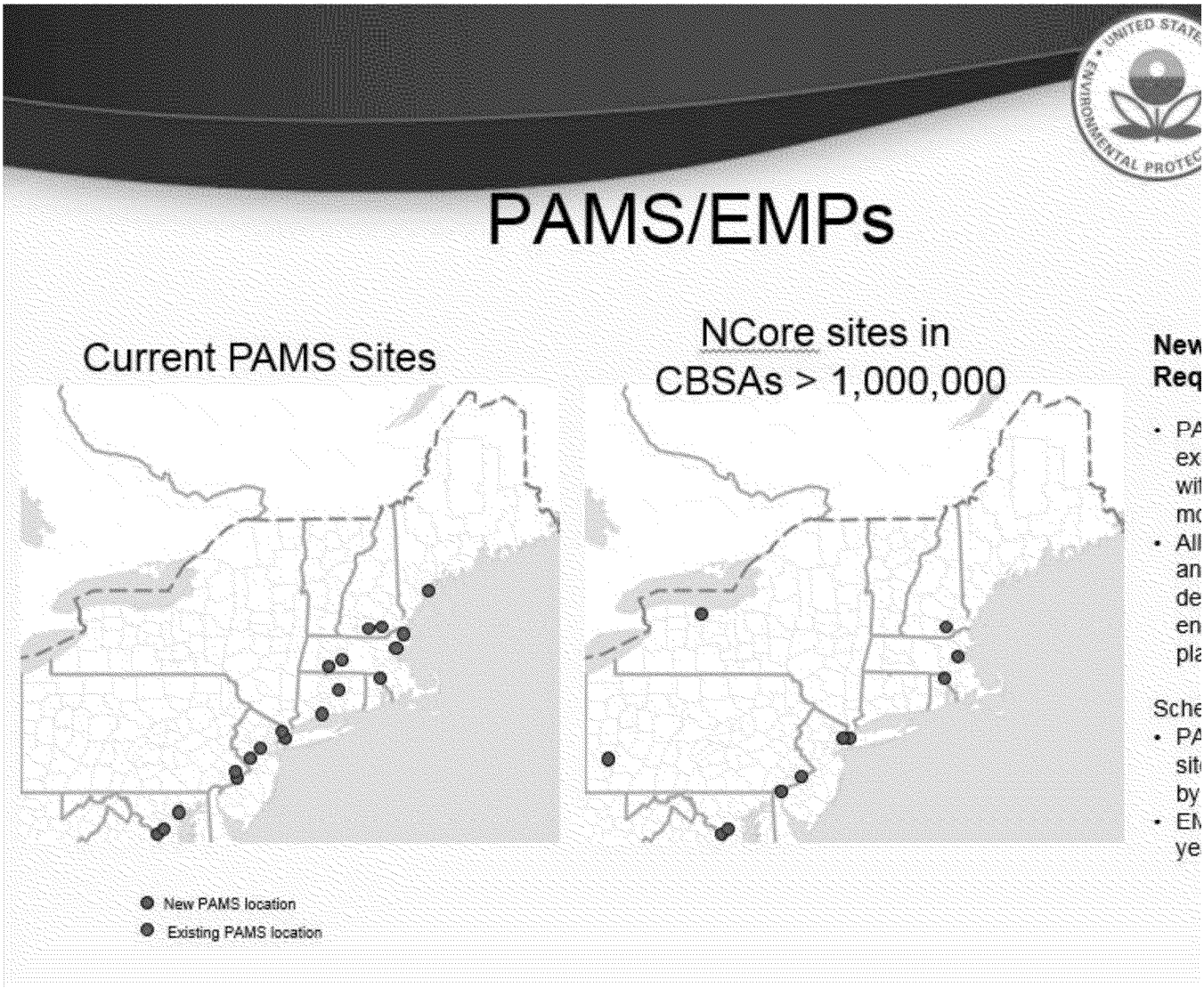
3) For all monitoring locations “approved” as part of EMPs in the OTR, should they all measure the same parameters/ same averaging time?

4) If yes to 3) are there any exceptions? (ie, ozone and/ or NO2 monitors on ferries?)

As an additional piece of background information, Dave Krask of MDE presented on some of their efforts at "Enhanced Monitoring" that might be of interest. His presentation can be accessed on AMTIC here:
https://www.epa.gov/amtic/photochemical-assessment-monitoring-station-pams-meteorology-2016-naamc

Thanks,

Bob



Robert Judge

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From: Wortman, Eric
Sent: Thur 2/2/2017 3:18:32 PM
Subject: Draft Q/D for CT Exceptional Event Demo
Q over D.DOCX

Hi Darren,

Attached is the draft Q/D analysis provided by Connecticut, and our initial feedback is also included below. Although this is not the final version and is only a small piece of the demonstration, we wanted to share it with you early to assist with the preparation of Rhode Island's EE demonstration. We'll continue to share information as it becomes available and look forward to discussing things in more detail with you tomorrow.

Please let me know if you have any questions.

Eric

Eric Wortman | Environmental Scientist

U.S. Environmental Protection Agency

Telephone: (617) 918-1624 Email: wortman.eric@epa.gov

From: Wholean, Kiernan [mailto:Kiernan.Wholean@ct.gov]
Sent: Thursday, February 02, 2017 9:15 AM
To: Judge, Robert <Judge.Robert@epa.gov>; Taylor, Catherine <taylor.catherine@epa.gov>; McWilliams, Anne K. <mcwilliams.anne@epa.gov>; Mackintosh, David <Mackintosh.David@epa.gov>
Cc: Geigert, Michael <Michael.Geigert@ct.gov>; Pirolli, Ric <Ric.Pirolli@ct.gov>; Arnold, Anne <Arnold.Anne@epa.gov>
Subject: RE: Q over D for CT

Thanks for the comments.

Please do share with the other states anything that you think might help them.

From: Judge, Robert [mailto:Judge.Robert@epa.gov]
Sent: Thursday, February 02, 2017 8:45 AM
To: Wholean, Kiernan <Kiernan.Wholean@ct.gov>; Taylor, Catherine <taylor.catherine@epa.gov>; McWilliams, Anne K. <mcwilliams.anne@epa.gov>; Mackintosh, David <Mackintosh.David@epa.gov>
Cc: Geigert, Michael <Michael.Geigert@ct.gov>; Pirolli, Ric <Ric.Pirolli@ct.gov>; Arnold, Anne <Arnold.Anne@epa.gov>
Subject: RE: Q over D for CT

Kiernan- thanks for this. A few of us looked at this here. In general, this looks fine.

There's a minor math error, probably a transcription error, in the THC calculations. On page 2 it states "17,791 tons of HC emitted during the period from May 19 to May 24" but then on page 3 the number used is not 17,791 but "17,991." And then the numbers from that point forward are also off, but not by much since we still end up with the same 0.69 tpd/km result.

Also, the document states:

The fuel loading is given in AP-42 for different regions of the United States and ranges from 9 to 60 tons per acre. Conservatively, we will estimate a low end emission rate using ***10 tons per acre which is associated with North Central US conifer forests. Note that our results could increase by a factor of 6 were we to expect the high end of emissions.***

The forest fire was in a Boreal Conifer forest in Canada, so the most similar AP-42 classification would be "Region 9: Conifers" at 10 tons per acre. You could probably use 11 tons per acre based on the values for R10 interior, Eastern, or North Central, however stating that the it could

be 6 times would be extremely conservative- as you point out. The factors at 60 tons per acre tend to be coastal areas (wet, grassy) and Fort McMurray is definitely not near the coast—it's the central part of Canada. There might be more research to support a more accurate value, which EPA Canada might even have a more accurate factor for boreal areas, but we don't see it changing the numbers that much. Map identifying the different forest areas: http://www.cec.org/tools-and-resources/map-files/north-american-forests-2011

So bottom line is, as expected, the Q/D is very low, and even multiplying by 6 would still be very small. That said, we've also heard discussion of other fires in the area (ie, NY, midwest) in this timeframe that might be/ should be considered. That said, the conclusion likely remains that even with this Q/D analyses, more detailed analyses are appropriate, and that is exactly what CT is doing…

As a final general point, please let us know if you are comfortable with us sharing these drafts broadly with MA and RI as they are being developed. As you know, both MA and RI are intending to submit EE requests for this fire event. We feel this broad sharing, even in draft form, would be of benefit to all of us, but only want to share what you feel comfortable with.

Thanks! Feel free to give me a call if you have more questions, and we look forward to reviewing your full demo including the narrative description/ conceptual model, soon.

,Bob

From: Wholean, Kiernan [mailto:Kiernan.Wholean@ct.gov]
Sent: Friday, January 27, 2017 12:01 PM
To: Judge, Robert <Judge.Robert@epa.gov>; Taylor, Catherine <taylor.catherine@epa.gov>; McWilliams, Anne K. <mcwilliams.anne@epa.gov>
Cc: Geigert, Michael <Michael.Geigert@ct.gov>; Pirolli, Ric <Ric.Pirolli@ct.gov>
Subject: Q over D for CT

Bob, Catie and Anne:

Attached is a draft of the Q/d analysis for Connecticut's Fort McMurray Exceptional Event Analysis.

I could not find any information on actual or modeled VOC or NOx emissions from the Fort McMurray fire, so I used AP-42 with varying levels of conservatism. I also attempted to estimate emissions based on reported emissions from one of the wildfires used to develop the Q/d guidance. Based on the results of these estimates, it does not seem worth the effort to run some of the emissions models such as SMARTFIRE or CONSUME, especially as I do not know that we have the expertise or data to obtain more meaningful results. Therefore, we will rely, as we expected, on the analyses that Michael is conducting related to ozone concentrations observed on similar days with respect to meteorology and emissions.

Please let us know your thoughts on the draft and procedures in this portion of the draft.

Thank you,

Kiernan Wholean

860-424-3425

To: Exceptional Event call list[gallen2@nescaum.org]
Cc: Anne.Gobin@ct.gov[Anne.Gobin@ct.gov];
Francis.Steitz@dep.nj.gov[Francis.Steitz@dep.nj.gov];
peg.hanna@dep.state.nj.us[peg.hanna@dep.state.nj.us];
laurie.grandchamp@dem.ri.gov[laurie.grandchamp@dem.ri.gov];
pmiller@nescaum.org[pmiller@nescaum.org]
From: George Allen
Sent: Wed 12/21/2016 2:02:14 PM
Subject: Additional material for May O3 exceptional event follow-up call: Today, Dec 21, 11am to 12 noon
Exceptional-Event-Process-Only 2016.v2.pptx
Exceptional-Event-Process-Only 2016.v2.pptx

Sorry for a 2nd email. A few slides from Sharon Davis that summarize the process and essential elements of the analysis are attached [pptx]. This might be useful in discussing the first few bullets on the agenda. This os also posted on the google drive link below.
-- George

Hi everyone; here's info for today's 11am to 12 noon EE call. A calendar invite went out [to most of you] last week.

Call-in info: 877-594-8353, code 805-552-87#

CT-DEEP Presentation [an update on Michael Geigert's EE analysis]:
ftp://ftp.state.ct.us/dep/air/public/2016_Exceedance_days/Canadian_Wildfires/CT%20Exceptional%20Event%2

If you have problems with FTP downloads, CT's presentations are on my google drive:
https://drive.google.com/open?id=0B4duMFtoHVUEZm4tWUw5ZnhYb2s
-- both the one from early November and the one for this call (download them, don't try to open in google drive).

Sharon Davis, NJ-DEP, will be leading the call.

Agenda.
Purpose of Meeting: To discuss process and content in the preparation of an Exceptional Event Demonstration for the May 2016 Canadian (Mexican?) wildfires that influenced ozone air quality in New Jersey and Connecticut.
- Overview of Process now that States have submitted Letters of Intent to Submit.
- Role of EPA (Feedback on Scope of Analysis, assistance with data analysis, available tools, etc.)
- Expectations of States (public process, signature (Air Director?), etc.)
- Overview of Schedule
- Process Moving Forward/Next Steps

--- George

Distribution:
Kathleen.Knight@ct.gov, paul.farrell@ct.gov, paul.bodner@ct.gov, wendy.jacobs@ct.gov, kurt.kebschull@ct.gov, Pete.Babich@ct.gov, Jaimeson.Sinclair@ct.gov, michael.geigert@ct.gov, Kiernan.Wholean@ct.gov, mark.wert@state.ma.us, Azin.Kavian@state.ma.us, Glenn.Keith@state.ma.us, tom.downs@maine.gov, jeff.s.crawford@maine.gov, Tom.Graham@maine.gov, Michele.Roberge@des.nh.gov, Jeffrey.Underhill@des.nh.gov, Michael.Fitzgerald@des.nh.gov, Sharon.Davis@dep.nj.gov, Ray.Papalski@dep.nj.gov, robert.bielawa@dec.ny.gov, scott.griffin@dec.ny.gov, Diana.Rivenburgh@dec.ny.gov, rob.sliwinski@dec.ny.gov, karen.slattery@dem.ri.gov, Barbara.H.Morin@health.ri.gov, Bennet.Leon@vermont.gov, Jeff.Merrell@vermont.gov, Simcox.Alison@epa.gov, McWilliams.Anne@epa.gov, arnold.anne@epa.gov, burkhart.richard@epa.gov, conroy.dave@epa.gov, biton.leiran@epa.gov, judge.robert@epa.gov, McConnell.Robert@epa.gov, ruvo.richard@epa.gov, greene.cynthia@epa.gov, Wong.Shutsu@epa.gov, kelly.bob@epa.gov, jude.catalano@ct.gov, samuel.sampieri@ct.gov, Martha.E.Webster@maine.gov, Tom.Downs@maine.gov, Steven.Coughlin@State.MA.US, julie.ross@state.ma.us, marc.bennett@state.ma.us, glenn.pacheco@state.ma.us, lisa.landry@des.nh.gov, Jessica.Dunbar@des.nh.gov, David.healy@des.nh.gov, erica.snyder@dep.nj.gov, Robert.Huizer@dep.nj.gov, Greg.John@dep.nj.gov, Peter.Mayes@dep.nj.gov, Victoria.Faranca@dep.nj.gov, julia.stuart@dec.ny.gov, bob.gaza@dec.ny.gov, john.kent@dec.ny.gov, lenny.giuliano@DEM.RI.GOV, Darren.Austin@dem.ri.gov, Dan.Riley@state.vt.us, Bennet.Leon@vermont.gov, mcwilliams.anne@epa.gov, burkhart.richard@epa.gov, simcox.alison@epa.gov, arnold.anne@epa.gov, gibson.benjamin@epa.gov, bean.clayton@epa.gov, kelly.bob@epa.gov, Richard.Marriner@maine.gov, Andy.Johnson@maine.gov, Tom.Downs@maine.gov, Michael.Fitzgerald@des.nh.gov, Rebecca.Ohler@des.nh.gov, Heidi.Hales@vermont.gov, Robert.Lacaillade@vermont.gov, Thomas.Mcgrath@state.ma.us, Randall.Semagin@ct.gov, Michele.Chaffee@ct.gov, Paul.Sierzenga@dec.ny.gov, Dirk.Felton@dec.ny.gov, Brian.Lay@dec.ny.gov, luis.lim@dep.nj.gov, james.Oxley@dep.nj.gov, Olga.Boyko@dep.nj.gov, Melinda.Viera@health.ri.gov, gina.friedman@dem.ri.gov, Kendall.Perkins@des.nh.gov, Timothy.Verville@des.nh.gov, judge.robert@epa.gov, simcox.alison@epa.gov, conroy.dave@epa.gov, mcwilliams.anne@epa.gov, vanarsdale.alan@epa.gov, khan.mazeeda@epa.gov, glenn.keith@state.ma.us, Mark.Wert@state.ma.us, lenny.giuliano@dem.ri.gov, patricia.north@des.state.nh.us, Barbara.H.Morin@health.ri.gov, Jeffrey.Underhill@des.nh.gov, senolan@pa.gov, michael.woodman@maryland.gov, dfoerter@otcair.org

To: kathleen.knight@ct.gov[kathleen.knight@ct.gov]; paul.farrell@ct.gov[paul.farrell@ct.gov]; paul.bodner@ct.gov[paul.bodner@ct.gov]; wendy.jacobs@ct.gov[wendy.jacobs@ct.gov]; kurt.kebschull@ct.gov[kurt.kebschull@ct.gov]; pete.babich@ct.gov[pete.babich@ct.gov]; Jaimeson.Sinclair@ct.gov[Jaimeson.Sinclair@ct.gov]; michael.geigert@ct.gov[michael.geigert@ct.gov]; Kiernan.Wholean@ct.gov[Kiernan.Wholean@ct.gov]; mark.wert@state.ma.us[mark.wert@state.ma.us]; Azin.Kavian@state.ma.us[Azin.Kavian@state.ma.us]; Glenn.Keith@state.ma.us[Glenn.Keith@state.ma.us]; Tom Downs[Tom.Downs@maine.gov]; jeff.s.crawford@maine.gov[jeff.s.crawford@maine.gov]; Tom.Graham@maine.gov[Tom.Graham@maine.gov]; Michele.Roberge@des.nh.gov[Michele.Roberge@des.nh.gov]; jeffrey.underhill@des.nh.gov[Jeffrey.Underhill@des.nh.gov]; Michael.Fitzgerald@des.nh.gov[Michael.Fitzgerald@des.nh.gov]; Sharon.Davis@dep.nj.gov[Sharon.Davis@dep.nj.gov]; Judy.Rand@dep.nj.gov[Judy.Rand@dep.nj.gov]; robert.bielawa@dec.ny.gov[robert.bielawa@dec.ny.gov]; scott.griffin@dec.ny.gov[scott.griffin@dec.ny.gov]; Diana.Rivenburgh@dec.ny.gov[Diana.Rivenburgh@dec.ny.gov]; rob.sliwinski@dec.ny.gov[rob.sliwinski@dec.ny.gov]; karen.slattery@dem.ri.gov[karen.slattery@dem.ri.gov]; Barbara.H.Morin@health.ri.gov[Barbara.H.Morin@health.ri.gov]; Bennet.Leon@vermont.gov[Bennet.Leon@vermont.gov]; Jeff.Merrell@vermont.gov[Jeff.Merrell@vermont.gov]; Simcox, Alison[simcox.alison@epa.gov]; McWilliams, Anne K.[mcwilliams.anne@epa.gov]; Arnold, Anne[Arnold.Anne@epa.gov]; Burkhart, Richard[burkhart.richard@epa.gov]; Conroy, David[Conroy.Dave@epa.gov]; Biton, Leiran[biton.leiran@epa.gov]; Judge, Robert[Judge.Robert@epa.gov]; McConnell, Robert[mcconnell.robert@epa.gov]; Ruvo, Richard[Ruvo.Richard@epa.gov]; Greene, Cynthia[Greene.Cynthia@epa.gov]; Wong, Shutsu[Wong.Shutsu@epa.gov]; Kelly, Bob[Kelly.Bob@epa.gov]; Michael Woodman -MDE-[michael.woodman@maryland.gov]; Nolan, Sean[senolan@pa.gov]; Steven.Coughlin@State.MA.US[Steven.Coughlin@State.MA.US]; Hence, Kia[hence.kia@epa.gov]; martha.e.webster@maine.gov[martha.e.webster@maine.gov]
Cc: Anne.Gobin@ct.gov[Anne.Gobin@ct.gov]; Steitz, Francis[Francis.Steitz@dep.nj.gov]; Peg Hanna (peg.hanna@dep.state.nj.us)[peg.hanna@dep.state.nj.us]; Laurie Grandchamp[laurie.grandchamp@dem.ri.gov]; Ric Pirolli (ric.pirolli@ct.gov)[ric.pirolli@ct.gov]; darren.austin@dem.ri.gov[darren.austin@dem.ri.gov]; pmiller@nescaum.org[pmiller@nescaum.org]
From: George Allen
Sent: Wed 10/26/2016 6:15:31 PM
Subject: EPA webinar from September on exceptional events [call on Thursday, Oct. 27, 1-2pm]

Hi everyone - Bob Judge @ R1 reminded me of the EPA webinar from last month on this - it might be a good refresher for tomorrow's call:
https://www.epa.gov/sites/production/files/2016-09/documents/exceptional_events_frn_and_guidance_webinar_20160921_finalv2.pdf
George

Here's an agenda for tomorrow's NESCAUM call on regional coordination for state exceptional event demonstrations.

Call details are:

Date & Time: Thursday, Oct. 27, 1-2pm

Dial: 877-594-8353

Code: 170-427-22#

Call Agenda:

1. NESCAUM: Call purpose - explore areas of potential regional coordination among states interested in doing exceptional events demonstration during the ~May 25, 2016 high ozone period
2. EPA R1: Recap of exceptional events rule and where regional approach could help support state-specific demonstration
3. All: Poll of states that are pursuing exceptional events demo and areas where regional collaboration can be useful. For interested states, are there specific regional analyses a state can do that can be used across all states? Some examples are:
a. HY-SPLIT trajectories using common starting parameters for all affected monitor locations
b. Regional meteorological description of the ~May 25 period and how it compares to common weather patterns associated with high ozone episodes in the region
c. Ambient air monitoring profiles in the region of CO, black carbon, other pollutants as indicators of the influence of woodsmoke, and comparison to profiles during other high ozone periods
d. Summary analysis of satellite information during ~May 25 period
e. Summary of media reports on wildfires during ~May 25 period
f. Photochemical modeling on a regional scale
g. Others?
4. NESCAUM: Recap of work assignments that may come from call and next steps.

To: gallen@nescaum.org[gallen@nescaum.org]; kathleen.knight@ct.gov[kathleen.knight@ct.gov]; paul.farrell@ct.gov[paul.farrell@ct.gov]; paul.bodner@ct.gov[paul.bodner@ct.gov]; wendy.jacobs@ct.gov[wendy.jacobs@ct.gov]; kurt.kebschull@ct.gov[kurt.kebschull@ct.gov]; pete.babich@ct.gov[pete.babich@ct.gov]; Jaimeson.Sinclair@ct.gov[Jaimeson.Sinclair@ct.gov]; michael.geigert@ct.gov[michael.geigert@ct.gov]; Kiernan.Wholean@ct.gov[Kiernan.Wholean@ct.gov]; mark.wert@state.ma.us[mark.wert@state.ma.us]; Azin.Kavian@state.ma.us[Azin.Kavian@state.ma.us]; Glenn.Keith@state.ma.us[Glenn.Keith@state.ma.us]; Tom Downs[Tom.Downs@maine.gov]; jeff.s.crawford@maine.gov[jeff.s.crawford@maine.gov]; Tom.Graham@maine.gov[Tom.Graham@maine.gov]; Michele.Roberge@des.nh.gov[Michele.Roberge@des.nh.gov]; jeffrey.underhill@des.nh.gov[Jeffrey.Underhill@des.nh.gov]; Michael.Fitzgerald@des.nh.gov[Michael.Fitzgerald@des.nh.gov]; Sharon.Davis@dep.nj.gov[Sharon.Davis@dep.nj.gov]; Judy.Rand@dep.nj.gov[Judy.Rand@dep.nj.gov]; robert.bielawa@dec.ny.gov[robert.bielawa@dec.ny.gov]; scott.griffin@dec.ny.gov[scott.griffin@dec.ny.gov]; Diana.Rivenburgh@dec.ny.gov[Diana.Rivenburgh@dec.ny.gov]; rob.sliwinski@dec.ny.gov[rob.sliwinski@dec.ny.gov]; karen.slattery@dem.ri.gov[karen.slattery@dem.ri.gov]; Barbara.H.Morin@health.ri.gov[Barbara.H.Morin@health.ri.gov]; Bennet.Leon@vermont.gov[Bennet.Leon@vermont.gov]; Jeff.Merrell@vermont.gov[Jeff.Merrell@vermont.gov]; Simcox, Alison[simcox.alison@epa.gov]; McWilliams, Anne K.[mcwilliams.anne@epa.gov]; Arnold, Anne[Arnold.Anne@epa.gov]; Burkhart, Richard[burkhart.richard@epa.gov]; Conroy, David[Conroy.Dave@epa.gov]; Biton, Leiran[biton.leiran@epa.gov]; Judge, Robert[Judge.Robert@epa.gov]; McConnell, Robert[mcconnell.robert@epa.gov]; Ruvo, Richard[Ruvo.Richard@epa.gov]; Greene, Cynthia[Greene.Cynthia@epa.gov]; Wong, Shutsu[Wong.Shutsu@epa.gov]; Kelly, Bob[Kelly.Bob@epa.gov]; Michael Woodman -MDE-[michael.woodman@maryland.gov]; Nolan, Sean[senolan@pa.gov]
Cc: Anne.Gobin@ct.gov[Anne.Gobin@ct.gov]; Steitz, Francis[Francis.Steitz@dep.nj.gov]; Peg Hanna (peg.hanna@dep.state.nj.us)[peg.hanna@dep.state.nj.us]; Laurie Grandchamp[laurie.grandchamp@dem.ri.gov]; Ric Pirolli (ric.pirolli@ct.gov)[ric.pirolli@ct.gov]; darren.austin@dem.ri.gov[darren.austin@dem.ri.gov]
From: Paul Miller
Sent: Wed 10/26/2016 4:45:10 PM
Subject: Agenda for NESCAUM exceptional events call on Thursday, Oct. 27, 1-2pm
EPA Exceptional Events Guidance wildfires-O3 with Cvr Memo Signed 9_16_16.pdf

Here's an agenda for tomorrow's NESCAUM call on regional coordination for state exceptional event demonstrations. I'm also attaching the September 16, 2016 EPA memo on exceptional events guidance for wildfires in case you do not have it. The 3 "tier" levels in the memo are an initial starting point for framing an exceptional events demonstration relevant to the ~May 25, 2016 high ozone period.

Call details are:

Date & Time: Thursday, Oct. 27, 1-2pm

Dial: 877-594-8353

Code: 170-427-22#

Call Agenda:

1. NESCAUM: Call purpose - explore areas of potential regional coordination among states interested in doing exceptional events demonstration during the ~May 25, 2016 high ozone period

2. EPA R1: Recap of exceptional events rule and where regional approach could help support state-specific demonstration

3. All: Poll of states that are pursuing exceptional events demo and areas where regional collaboration can be useful. For interested states, are there specific regional analyses a state can do that can be used across all states? Some examples are:

a. HY-SPLIT trajectories using common starting parameters for all affected monitor locations

b. Regional meteorological description of the ~May 25 period and how it compares to common weather patterns associated with high ozone episodes in the region

c. Ambient air monitoring profiles in the region of CO, black carbon, other pollutants as indicators of the influence of woodsmoke, and comparison to profiles during other high ozone periods

d. Summary analysis of satellite information during ~May 25 period

e. Summary of media reports on wildfires during ~May 25 period

f. Photochemical modeling on a regional scale

g. Others?

4. NESCAUM: Recap of work assignments that may come from call and next steps.

Paul J. Miller, Deputy Director & Chief Scientist

Northeast States for Coordinated Air Use Management
89 South Street, Suite 602

Boston, MA 02111

Ph: 617-259-2016

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-----Original Message-----
From: George Allen
Sent: Thursday, October 20, 2016 1:19 PM
To: Paul Miller; Kathleen.Knight@ct.gov; paul.farrell@ct.gov; paul.bodner@ct.gov; wendy.jacobs@ct.gov; kurt.kebschull@ct.gov; Pete.Babich@ct.gov; Jaimeson.Sinclair@ct.gov; michael.geigert@ct.gov; Kiernan.Wholean@ct.gov; mark.wert@state.ma.us; Azin.Kavian@state.ma.us; Glenn.Keith@state.ma.us; tom.downs@maine.gov; jeff.s.crawford@maine.gov; Tom.Graham@maine.gov; Michele.Roberge@des.nh.gov; Jeffrey.Underhill@des.nh.gov; Michael.Fitzgerald@des.nh.gov; Sharon.Davis@dep.nj.gov; Judy.Rand@dep.nj.gov; robert.bielawa@dec.ny.gov; scott.griffin@dec.ny.gov; Diana.Rivenburgh@dec.ny.gov; rob.sliwinski@dec.ny.gov; karen.slattery@dem.ri.gov; Barbara.H.Morin@health.ri.gov; Bennet.Leon@vermont.gov; Jeff.Merrell@vermont.gov; Simcox.Alison@epa.gov; McWilliams.Anne@epa.gov; arnold.anne@epa.gov; burkhart.richard@epa.gov; conroy.dave@epa.gov; biton.leiran@epa.gov; judge.robert@epa.gov; McConnell.Robert@epa.gov; ruvo.richard@epa.gov; greene.cynthia@epa.gov; Wong.Shutsu@epa.gov; kelly.bob@epa.gov
Cc: Anne.Gobin@ct.gov; Steitz, Francis; Peg Hanna (peg.hanna@dep.state.nj.us); Laurie Grandchamp; Ric Pirolli (ric.pirolli@ct.gov); darren.austin@dem.ri.gov
Subject: next Thurs. October 27, 1-2 pm: exceptional event rule call with EPA R1 and R2

Hi Everyone; based on the doodle poll, the best time for this call is Thursday Oct 27, 1 to 2 pm.
877-594-8353, code: 170-427-22#

A calendar invite will follow. My apologies to those that can't make this time. We will take notes.

George

At 05:40 PM 10/17/2016, Paul Miller wrote:

Following up on George's email to many of you earlier today (and adding a few more email addresses to this email), I wanted to provide a little more context for the call we're trying to schedule. NESCAUM is following up on a request from the NESCAUM directors on the possibility of NESCAUM providing regional support for interested states that may be planning on developing exceptional event demonstrations to be submitted to EPA. Specifically, this would be looking at ozone exceedances in the region on or about May 25-28, 2016 that are thought to have been heavily influenced by upwind wildfires. Not all states may be interested in this, so no need to respond to the poll if not relevant to your state.

One key area the NESCAUM directors would like us to discuss on the call with EPA is if there are regional elements for an exceptional event demonstration that could be coordinated through NESCAUM. The goal would be to minimize duplicative work by individual states. States would still be the ones making the submissions, but NESCAUM could help coordinate and perhaps develop some elements that would be common to all submittals. One example might be identifying a consistent approach for HY-SPLIT back trajectories (assuming this

would be one element of a demonstration). A second possibility would be a common regional analysis of the meteorological pattern during this period, and how it may, or may not, differ from historically "normal" high ozone meteorological patterns. For those who have an interest in pursuing this further, please respond to the poll when you can (if you haven't already), and feel free to suggest other areas that might be amenable to a regional approach. Thanks, Paul

Paul J. Miller, Deputy Director & Chief Scientist

Northeast States for Coordinated Air Use Management

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To: gallen@nescaum.org[gallen@nescaum.org]; kathleen.knight@ct.gov[kathleen.knight@ct.gov]; paul.farrell@ct.gov[paul.farrell@ct.gov]; paul.bodner@ct.gov[paul.bodner@ct.gov]; wendy.jacobs@ct.gov[wendy.jacobs@ct.gov]; kurt.kebschull@ct.gov[kurt.kebschull@ct.gov]; pete.babich@ct.gov[pete.babich@ct.gov]; Jaimeson.Sinclair@ct.gov[Jaimeson.Sinclair@ct.gov]; michael.geigert@ct.gov[michael.geigert@ct.gov]; Kiernan.Wholean@ct.gov[Kiernan.Wholean@ct.gov]; mark.wert@state.ma.us[mark.wert@state.ma.us]; Azin.Kavian@state.ma.us[Azin.Kavian@state.ma.us]; Glenn.Keith@state.ma.us[Glenn.Keith@state.ma.us]; Tom Downs[Tom.Downs@maine.gov]; jeff.s.crawford@maine.gov[jeff.s.crawford@maine.gov]; Tom.Graham@maine.gov[Tom.Graham@maine.gov]; Michele.Roberge@des.nh.gov[Michele.Roberge@des.nh.gov]; jeffrey.underhill@des.nh.gov[Jeffrey.Underhill@des.nh.gov]; Michael.Fitzgerald@des.nh.gov[Michael.Fitzgerald@des.nh.gov]; Sharon.Davis@dep.nj.gov[Sharon.Davis@dep.nj.gov]; Judy.Rand@dep.nj.gov[Judy.Rand@dep.nj.gov]; robert.bielawa@dec.ny.gov[robert.bielawa@dec.ny.gov]; scott.griffin@dec.ny.gov[scott.griffin@dec.ny.gov]; Diana.Rivenburgh@dec.ny.gov[Diana.Rivenburgh@dec.ny.gov]; rob.sliwinski@dec.ny.gov[rob.sliwinski@dec.ny.gov]; karen.slattery@dem.ri.gov[karen.slattery@dem.ri.gov]; Barbara.H.Morin@health.ri.gov[Barbara.H.Morin@health.ri.gov]; Bennet.Leon@vermont.gov[Bennet.Leon@vermont.gov]; Jeff.Merrell@vermont.gov[Jeff.Merrell@vermont.gov]; Simcox, Alison[simcox.alison@epa.gov]; McWilliams, Anne K.[mcwilliams.anne@epa.gov]; Arnold, Anne[Arnold.Anne@epa.gov]; Burkhart, Richard[burkhart.richard@epa.gov]; Conroy, David[Conroy.Dave@epa.gov]; Biton, Leiran[biton.leiran@epa.gov]; Judge, Robert[Judge.Robert@epa.gov]; McConnell, Robert[mcconnell.robert@epa.gov]; Ruvo, Richard[Ruvo.Richard@epa.gov]; Greene, Cynthia[Greene.Cynthia@epa.gov]; Wong, Shutsu[Wong.Shutsu@epa.gov]; Kelly, Bob[Kelly.Bob@epa.gov]
Cc: Anne.Gobin@ct.gov[Anne.Gobin@ct.gov]; Steitz, Francis[Francis.Steitz@dep.nj.gov]; Peg Hanna (peg.hanna@dep.state.nj.us)[peg.hanna@dep.state.nj.us]; Laurie Grandchamp[laurie.grandchamp@dem.ri.gov]; Ric Pirolli (ric.pirolli@ct.gov)[ric.pirolli@ct.gov]
From: Paul Miller
Sent: Mon 10/17/2016 9:40:51 PM
Subject: Additional context for the poll to talk about the exceptional event rule call with EPA R1 and R2

Following up on George's email to many of you earlier today (and adding a few more email addresses to this email), I wanted to provide a little more context for the call we're trying to schedule. NESCAUM is following up on a request from the NESCAUM directors on the possibility of NESCAUM providing regional support for interested states that may be planning on developing exceptional event demonstrations to be submitted to EPA. Specifically, this would be looking at ozone exceedances in the region on or about May 25-28, 2016 that are thought to have been heavily influenced by upwind wildfires. Not all states may be interested in this, so no need to respond to the poll if not relevant to your state.

One key area the NESCAUM directors would like us to discuss on the call with EPA is if there are regional elements for an exceptional event demonstration that could be coordinated through NESCAUM. The goal would be to minimize duplicative work by individual states. States would still be the ones making the submissions, but NESCAUM could help coordinate and perhaps develop some elements that would be common to all submittals. One example might be identifying a consistent approach for HY-SPLIT back trajectories (assuming this would be one element of a demonstration). A second possibility would be a common regional analysis of the meteorological pattern during this period, and how it may, or may not, differ from historically

"normal" high ozone meteorological patterns. For those who have an interest in pursuing this further, please respond to the poll when you can (if you haven't already), and feel free to suggest other areas that might be amenable to a regional approach. Thanks, Paul

Paul J. Miller, Deputy Director & Chief Scientist

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Follow us:

From: George Allen
Sent: Monday, October 17, 2016 10:45 AM
To: Kathleen.Knight@ct.gov; paul.farrell@ct.gov; paul.bodner@ct.gov; wendy.jacobs@ct.gov; kurt.kebschull@ct.gov; Pete.Babich@ct.gov; Jaimeson.Sinclair@ct.gov; michael.geigert@ct.gov; Kiernan.Wholean@ct.gov; mark.wert@state.ma.us; Azin.Kavian@state.ma.us; Glenn.Keith@state.ma.us; tom.downs@maine.gov; jeff.s.crawford@maine.gov; Tom.Graham@maine.gov; Michele.Roberge@des.nh.gov; Jeffrey.Underhill@des.nh.gov; Michael.Fitzgerald@des.nh.gov; Sharon.Davis@dep.nj.gov; Judy.Rand@dep.nj.gov; robert.bielawa@dec.ny.gov; scott.griffin@dec.ny.gov; Diana.Rivenburgh@dec.ny.gov; rob.sliwinski@dec.ny.gov; karen.slattery@dem.ri.gov; Barbara.H.Morin@health.ri.gov; Bennet.Leon@vermont.gov; Jeff.Merrell@vermont.gov; Simcox.Alison@epa.gov; McWilliams.Anne@epa.gov; arnold.anne@epa.gov; burkhart.richard@epa.gov; conroy.dave@epa.gov; biton.leiran@epa.gov; judge.robert@epa.gov; McConnell.Robert@epa.gov; ruvo.richard@epa.gov; greene.cynthia@epa.gov; Wong.Shutsu@epa.gov; kelly.bob@epa.gov
Cc: Anne.Gobin@ct.gov; Paul Miller
Subject: poll for times for exceptional event rule call with EPA R1 and R2

Hi APC members; we're scheduling a call with EPA R1 and R2 to discuss Revisions to the 2007 Exceptional Events Rule, finalized September 16. If you are interested in participating, please fill out this poll for a time by this Wednesday if possible:
http://doodle.com/poll/6ctq7qmmqppxe3gw

More information on the rule is below. Please pass this along to others in your agency who might be interested.
Thanks - George

Guidance and additional information on the rule is at:
https://www.epa.gov/air-quality-analysis/treatment-data-influenced-exceptional-events and
https://www.epa.gov/sites/production/files/2016-09/documents/exceptional_events_guidance_9-16-16_final.pdf

The Federal Register notice published Oct. 3: Treatment of Data Influenced by Exceptional Events, 68216-68282
https://www.gpo.gov/fdsys/pkg/FR-2016-10-03/pdf/2016-22983.pdf
https://www.gpo.gov/fdsys/pkg/FR-2016-10-03/html/2016-22983.htm

To: Anne Gobin (Anne.Gobin@ct.gov)[Anne.Gobin@ct.gov]; Beth Thornton[beth.thornton@dec.ny.gov]; Bill O'Sullivan[Bill.O'Sullivan@dep.nj.gov]; Chris Salmi[Chris.Salmi@dep.nj.gov]; Christine Kirby (Christine.Kirby@state.ma.us)[Christine.Kirby@state.ma.us]; Craig Wright (craig.wright@des.nh.gov)[craig.wright@des.nh.gov]; Doug Elliott (doug.elliott@vermont.gov)[doug.elliott@vermont.gov]; Doug McVay[doug.mcvay@dem.ri.gov]; Glenn Keith[Glenn.Keith@state.ma.us]; heidi.hales@state.vt.us[heidi.hales@state.vt.us]; Jeff Crawford[jeff.s.crawford@maine.gov]; jeffrey.underhill@des.nh.gov[Jeffrey.Underhill@des.nh.gov]; Kenneth Ratzman (Kenneth.ratzman@dep.nj.gov)[Kenneth.ratzman@dep.nj.gov]; Laurie Grandchamp[laurie.grandchamp@dem.ri.gov]; Linda Miller (Linda.Miller@dep.nj.gov)[Linda.Miller@dep.nj.gov]; Marc Cone (Marc.A.Cone@maine.gov)[Marc.A.Cone@maine.gov]; Mike Fitzgerald[Michael.Fitzgerald@des.nh.gov]; Nancy Seidman[nancy.seidman@state.ma.us]; Peg Hanna (peg.hanna@dep.state.nj.us)[peg.hanna@dep.state.nj.us]; Rebecca Ohler (rebecca.ohler@des.nh.gov)[rebecca.ohler@des.nh.gov]; Ric Pirolli (ric.pirolli@ct.gov)[ric.pirolli@ct.gov]; Richelle Wormley[Richelle.Wormley@dep.nj.gov]; Rob Sliwinski (rob.sliwinski@dec.ny.gov)[rob.sliwinski@dec.ny.gov]; Steitz, Francis[Francis.Steitz@dep.nj.gov]; 'Steve Flint'[steven.flint@dec.ny.gov]; Conroy, David[Conroy.Dave@epa.gov]; Filippelli, John[Filippelli.John@epa.gov]; Ruvo, Richard[Ruvo.Richard@epa.gov]
Cc: All_Staff[All_Staff@nescaum.org]; David Foerter (dfoerter@otcair.org)[dfoerter@otcair.org]; Arnold, Anne[Arnold.Anne@epa.gov]; McWilliams, Anne K.[mcwilliams.anne@epa.gov]; Judge, Robert[Judge.Robert@epa.gov]
From: Paul Miller
Sent: Fri 9/23/2016 2:20:41 PM
Subject: Corrected call notes and action items from the September 21 monthly NESCAUM directors' call

Here are my corrected notes and action items from the September 21st NESCAUM director's call. Under Item 3 below, I've corrected the exceptional events demonstration public comment requirement – it's a minimum 30-day state public comment process, but EPA is not requiring a public hearing (as I originally wrote) as part of the state process. – Paul

NESCAUM monthly directors' call, Sept. 21, 2016

On call:

ME – Marc Cone

NH –Craig Wright

VT – Heidi Hales

MA –Glenn Keith

RI – Doug McVay, Laurie Grandchamp

CT – Anne Gobin, Ric Pirolli

NJ – Frank Steitz, Ken Ratzmann, Peg Hanna

EPA – R1: Anne Arnold, Anne McWilliams, Bob Judge

EPA – R2: Rick Ruvo

OTC – Dave Foerter

NESCAUM – Paul Miller, Matt Solomon, Mahdi Ahmadi, Kathy Kinsey, Dick Valentinetti

1. Follow-up Directors' meeting

a. Working on action items

b. SILs draft comments (thanks to Dave Healy-NH DES, Joel Leon-NJ DEP, for developing initial draft). NESCAUM directors should expect to receive draft comments by Permit Modeling Committee on Tuesday, September 27. Submittal deadline to EPA is Friday, Sept. 30. Comments are brief and technical in nature.

c. MassDEP request on HAP data reporting. States reminded to please send responses to MassDEP questions. CT has responded, NH is sending a response today.

d. Reminder of request for *ad hoc* wood use survey state participants from the inventory side (so far have names from NH, ME – some states already indicated not a priority, so no names to be sent)

2. VW concept paper sent by Arthur Marin on Tuesday, request comments by 9/27. Questions should be sent to Elaine O'Grady.

3. Exceptional events final action by EPA. EPA webinar today at 2pm. EPA R1 gave overview of EPA final action, e.g., due dates for exceptional events demonstrations, including advanced notice requirement of intent to submit exceptional events demonstration. EPA R2 invites NJ & NY to contact it if additional questions.

Submittals would be approved by EPA regional administrator, so state submittal level should be air director or higher, according to who in state has authority for submittals to EPA. Submissions will need to go through a minimum 30-day state public comment process, similar to SIP submittals.

States need to flag in advance all possible 1-hour data as potential exceptional event.

There was a May 25-28, 2016 potential exceptional event that affects ozone DVs in the region. EPA suggests might need more robust Tier 3 demonstration level. Submittals would request exclusion of 1-hr data for the period affected to be removed from 8-hr average calculation. Could exclude all hours across multiple days, or something less.

CT asks if joint effort could be coordinated through NESCAUM? NESCAUM can facilitate effort amongst interested states in follow-up conversation with EPA on scope of regional effort, and what may follow from that. States indicating interest are MA (Glenn), CT (Ric), NJ (to cc: Frank, Peg), RI (contact to be sent by Doug). NESCAUM will coordinate with EPA R1 on follow-up call.

Additional item:

Technical Assessment Review (TAR) draft: Comments on NESCAUM TAR draft requested by Matt Solomon. Please notify him asap if your staff plans on commenting on the NESCAUM draft. Submittal deadline to EPA/NHTSA is Monday, Sept. 26.

Paul J. Miller, Deputy Director & Chief Scientist

Northeast States for Coordinated Air Use Management
89 South Street, Suite 602

Boston, MA 02111

Ph: 617-259-2016

Fax: 617-742-9162
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To: Anne Gobin (Anne.Gobin@ct.gov)[Anne.Gobin@ct.gov]; Beth Thornton[beth.thornton@dec.ny.gov]; Bill O'Sullivan[Bill.O'Sullivan@dep.nj.gov]; Chris Salmi[Chris.Salmi@dep.nj.gov]; Christine Kirby (Christine.Kirby@state.ma.us)[Christine.Kirby@state.ma.us]; Craig Wright (craig.wright@des.nh.gov)[craig.wright@des.nh.gov]; Doug Elliott (doug.elliott@vermont.gov)[doug.elliott@vermont.gov]; Doug McVay[doug.mcvay@dem.ri.gov]; Glenn Keith[Glenn.Keith@state.ma.us]; heidi.hales@state.vt.us[heidi.hales@state.vt.us]; Jeff Crawford[jeff.s.crawford@maine.gov]; jeffrey.underhill@des.nh.gov[Jeffrey.Underhill@des.nh.gov]; Kenneth Ratzman (Kenneth.ratzman@dep.nj.gov)[Kenneth.ratzman@dep.nj.gov]; Laurie Grandchamp[laurie.grandchamp@dem.ri.gov]; Linda Miller (Linda.Miller@dep.nj.gov)[Linda.Miller@dep.nj.gov]; Marc Cone (Marc.A.Cone@maine.gov)[Marc.A.Cone@maine.gov]; Mike Fitzgerald[Michael.Fitzgerald@des.nh.gov]; Nancy Seidman[nancy.seidman@state.ma.us]; Peg Hanna (peg.hanna@dep.state.nj.us)[peg.hanna@dep.state.nj.us]; Rebecca Ohler (rebecca.ohler@des.nh.gov)[rebecca.ohler@des.nh.gov]; Ric Pirolli (ric.pirolli@ct.gov)[ric.pirolli@ct.gov]; Richelle Wormley[Richelle.Wormley@dep.nj.gov]; Rob Sliwinski (rob.sliwinski@dec.ny.gov)[rob.sliwinski@dec.ny.gov]; Steitz, Francis[Francis.Steitz@dep.nj.gov]; 'Steve Flint'[steven.flint@dec.ny.gov]; Conroy, David[Conroy.Dave@epa.gov]; Filippelli, John[Filippelli.John@epa.gov]; Ruvo, Richard[Ruvo.Richard@epa.gov]
Cc: All_Staff[All_Staff@nescaum.org]; David Foerter (dfoerter@otcair.org)[dfoerter@otcair.org]; Arnold, Anne[Arnold.Anne@epa.gov]; McWilliams, Anne K.[mcwilliams.anne@epa.gov]; Judge, Robert[Judge.Robert@epa.gov]
From: Paul Miller
Sent: Wed 9/21/2016 4:20:55 PM
Subject: Call notes and action items from the September 21 monthly NESCAUM directors' call

Here are my notes and action items from today's call. Let me know if you have questions or corrections. –Paul

NESCAUM monthly directors' call, Sept. 21, 2016

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Paul J. Miller, Deputy Director & Chief Scientist

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Region 1
5 Post Office Square
Boston, MA 02109-3912

March 27, 2017

Darren Austin
Office of Air Resources
Department of Environmental Management
235 Promenade Street, Room 230
Providence, RI 02908

Dear Mr. Austin:

Thank you for the opportunity to review and comment on your draft exceptional event demonstration, shared with us on March 3, 2017, for the Ft. McMurray wildfire. The Rhode Island Department of Environmental Management (RI DEM) is proposing the demonstration under the exceptional events rule at 40 CFR 50.14 to show that the elevated ozone concentrations recorded at the East Providence, West Greenwich, and Narragansett monitoring locations on May 25 and 26, 2016 were the result of high levels of ozone and ozone precursors being transported within the smoke plume to Rhode Island.

EPA Region 1 has reviewed RI DEM's draft demonstration and is providing comments to strengthen the discussion. You will find the Agency's comments in the enclosure. In addition to the comments in the enclosure, we are also providing an electronic markup of the draft demonstration with recommendations for additional clarifying and editorial revisions.

If you have any questions regarding this matter, please contact Eric Wortman at 617-918-1624, or Catie Taylor at 617-918-8607.

Sincerely,

David B. Conroy, Chief
Air Programs Branch

Enclosure

cc: Douglas McVay, RI DEM
Laurie Grandchamp, RI DEM
Gina Friedman, RI DEM

Enclosure

EPA Comments on Rhode Island's Draft Exceptional Events Demonstration for the Ft. McMurray Wildfire Event in May 2016

The Rhode Island Department of Environmental Management (RI DEM) provided EPA a draft exceptional events demonstration on March 3, 2017 for air quality impacts from the 2016 Ft. McMurray wildfire. The draft submittal requests the exclusion of 8-hr ozone (O_3) monitoring data on May 25 and 26, 2016 for the East Providence, West Greenwich, and Narragansett monitoring locations. The comments below are based on EPA's review of the draft submittal.

1. RI DEM should format the narrative document to include page numbers, table of contents, table and figure numbers, and appendices. This will make the overall organizational structure of the demonstration easier to follow for the reader and will allow for easier references within the narrative itself.

2. RI DEM should clearly indicate in Section 1 of the document the exceptional events demonstration is being requested for the East Providence, West Greenwich, and Narragansett monitoring locations for the period of May 25 and 26, 2016. A map of the three monitoring locations should also be provided.

3. Many of the figures in the demonstration do not contain a thorough description in the narrative text. RI DEM should describe each figure in enough detail to provide the public with an understanding of the data being illustrated. This will help reviewers navigate through all the information that is provided in the demonstration. The figures should only contain information necessary to convey the message and be large enough to distinguish the data being presented. RI DEM should clearly indicate which slides include time-lapse animation to help the reader navigate illustrations in the referenced slide deck. It's important that the use of animated technology be easily viewed by the public as part of the public comment period.

4. RI DEM should summarize all the findings discussed throughout the document that formulates a clear causal relationship of the Ft. McMurray smoke and the proposed O_3 concentrations being excluded. RI DEM needs to clearly demonstrate that wildfire emissions were transported from Ft. McMurray to each monitor and how those wildfire emissions impacted O_3 concentrations. RI DEM should include satellite photos or time-lapse animations of smoke or other parameters which show movement of the plume from Ft. McMurray to Rhode Island through May 28 as part of the discussions in the Conceptual Model section of the document. Satellite evidence of smoke over Rhode Island or eastern Massachusetts during May 25 and May 26 should also be included. This will illustrate the location of the smoke plume during the duration of the event.

5. RI DEM should provide webcam pictures from any cameras in or nearby Rhode Island to help show that smoke was present in Rhode Island during May 25 and 26. Connecticut Department of Energy and Environment (CT DEEP) provided webcam pictures from

Cornwall and Talcott Mountain in its demonstration, and it may be useful to include these in your demonstration. Additionally, there are also high resolution cameras in the Boston area available at www.hazecam.net/. An archive of pictures taken during May 2016 should be available from Northeast States for Coordinated Air Use Management. This may provide information to support that smoke was at ground level in southeastern New England.

6. RI DEM should provide additional HYSPLIT trajectories to help illustrate the movement of the smoke plume from Ft. McMurray to Rhode Island. It may be beneficial to show forward trajectories from Ft. McMurray, as well as back trajectories from other areas in New England, New York and the upper Midwest where smoke was evident. In addition to the back trajectories in slides 19 and 22, RI DEM should include back trajectories for the West Greenwich and East Providence monitors for different times during the day on both May 25 and 26, 2016.

7. RI DEM should evaluate the Chemical Speciation Network (CSN) data at both the East Providence site and at additional upwind CSN sites. This could show evidence of smoke at ground level at upwind locations prior to May 25, and at the East Providence site during May 25 and 26. Alternatively, RI DEM can include the analysis of CSN data already completed by the CT DEEP and include this analysis as an appendix.

8. RI DEM should provide further discussions about the Black Carbon (BC) measurements during the event and plot delta C data for the East Providence, Urban League and Hayes Street sites. This may provide information to support that smoke was at ground level in Rhode Island.

9. RI DEM uses the term "non-event" day to describe a typical O_3 exceedance day. However, three of the four typical O_3 exceedance days included graphics of Hazard Mapping System (HMS) smoke analysis and narrative discussion about smoke in the area. RI DEM should select other days that are representative of a more typical O_3 exceedance day, without any influence from smoke. Moreover, instead of including slides 55-58 which present duplicate data already contained in slides 50-54, we would suggest adding hourly plots of O_3, carbon monoxide (CO), fine particulate matter ($PM_{2.5}$,) and BC for typical O_3 exceedance days at the East Providence site. This should assist the reader with understanding what CO, $PM_{2.5}$ and BC look like during typical O_3 exceedance days.

10. RI DEM should provide a comparison of O_3 concentrations on meteorologically similar days for each of the three monitors, i.e., a "similar day or matching day analysis." Showing other days with similar back trajectories and similar meteorology to May 25 and 26, 2016 (e.g. high temperatures and sunny skies) with low O_3 concentrations measured at these monitors could help demonstrate the uniqueness of O_3 concentrations on May 25 and 26. EPA

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provides guidance on conducting a "matching day analysis" in Section 3.6.4 of the September 16, 2016 wildfire guidance document.[1]

11. On Slide 1 and the table on page 13 in the narrative, RI DEM should consider adding two columns to indicate the critical 4th high value for 2017 to help demonstrate the regulatory significance of the exceptional event for the three monitoring sites. For example, the table provided below shows that with the May 25 and 26 data excluded, the 4th high 8-hour O_3 average in 2016 at Narragansett drops from 71 ppb to 66 ppb. The resulting difference in the 2017 critical value is significant (i.e., 70 ppb versus 65 ppb) and helps demonstrate the regulatory significance of this exceptional event demonstration.

	Current Values					Without May 25 - 26, 2016		
Site Name	**4th High 2014**	**4th High 2015**	**4th High 2016**	**2014-2016 DV**	**2017 Critical Value**	**4th High 2016**	**2014-2016 DV**	**2017 Critical Value**
East Providence	64	71	71	68	71	64	66	78
Narragansett	63	77	71	70	65	66	68	70
West Greenwich	67	70	75	70	68	70	69	73

12. An analysis of daily nitrogen oxide (NOx) emissions from upwind electric generating units during the 2016 O_3 season is a useful way to show that the May 25-26 time period was not a period of peak electricity demand in the Northeast with associated higher NOx emissions. RI DEM should include CT DEEP's analysis of NOx sources from EPA's Air Markets Program Data (AMPD) website as an appendix to its exceptional events demonstration.

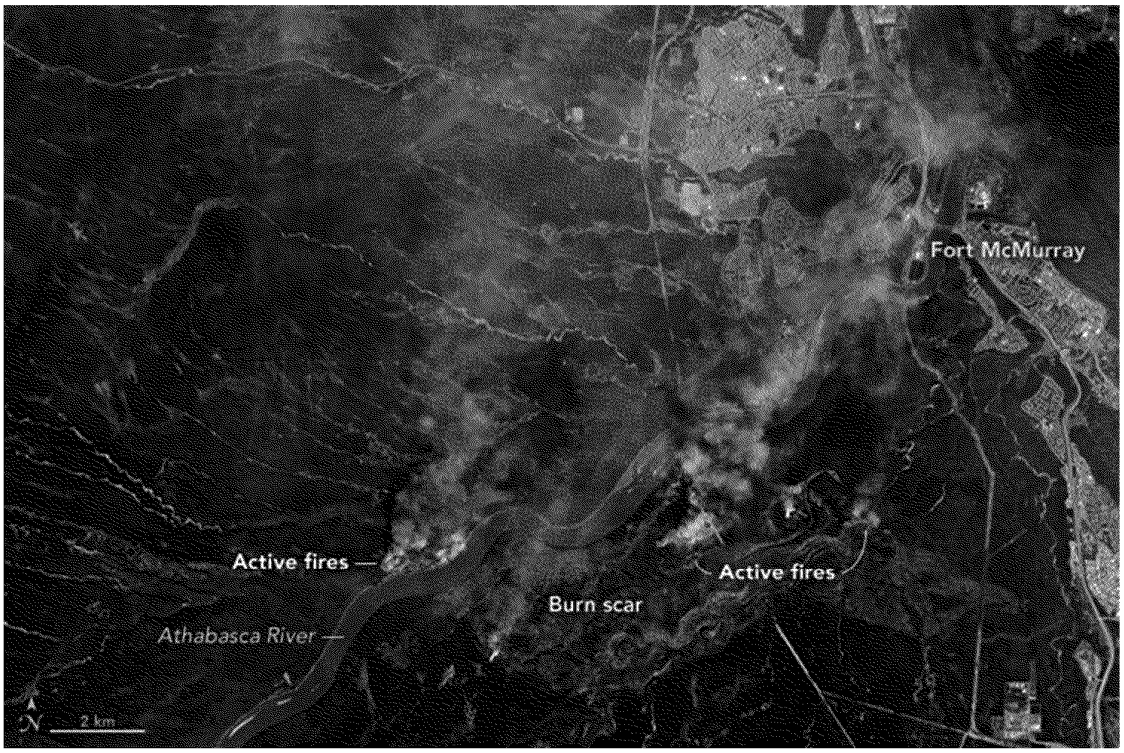
13. If smoke from fires (Mexico/Yucatan) other than the Ft. McMurray fire are considered important in the narrative, then additional discussion related to fire-related smoke from these fires, their transport, and their potential effects on O_3 concentrations needs to be built into the narrative. As written, the contribution and significance of these additional fires is not described in this exceptional event request. It should either be better clarified that the demonstration focuses solely on the Ft. McMurray wildfire plume or the reference to other fires should be dropped from the demonstration narrative entirely.

[1] Guidance on the Preparation of Exceptional Events Demonstrations for Wildfire Events that May Influence Ozone Concentrations, September 16, 2016. Available at https://www.epa.gov/air-quality-analysis/exceptional-events-rule-and-guidance.

Rhode Island DEM

Exceptional Event Demonstration

Fort McMurray Wildfire May 2016



Preface: This document is intended to be used side by side with the accompanying PowerPoint presentation. References to content in the PowerPoint presentation will be frequently made, indicated by "**SLIDE#X**". Due to the graphically heavy content of the exceptional event demonstration, PowerPoint was deemed a much better tool to display in detail graphical images, animations, and graphs with higher resolution and detail, than strictly in a Word document.

I. Introduction

The Rhode Island Department of Environmental Management, in conjunction with the Rhode Island Department of Health Air Pollution Laboratory, operate an air monitoring network throughout the state for a variety of pollutants. Of particular importance is ozone, which is measured during the ozone season (officially March 1 – September 30) for three locations (East Providence, West Greenwich and Narragansett), with data used to gauge public health impacts real time and also submitted to the EPA via the AQS (Air Quality System) database.

This documentation is being submitted to EPA Region I to demonstrate that the ozone data in the state of Rhode Island at all three ozone monitors on May 25th and May 26th, 2016 should be excluded from use in determinations of exceedances or violations of the National Ambient Air Quality Standards (NAAQS) as an exceptional event caused by extreme wildfire activity in a variety of locations, but prominently featured emissions from Fort McMurray, Alberta, Canada, as per the Revised Exceptional Events Rule (40 CFR 50.14(c)(3).

DRAFT

As required by the rule, this document will serve to provide the following evidence.

- A narrative conceptual model of how fire activity led to the exceedances at East Providence, West Greenwich, and Narragansett ozone monitors.
- A demonstration that the wildfires affected readings at the monitors in such a way that there exists a clear causal relationship of the elevated ozone readings.
- Comparison of the event concentrations to those of non-event.
- Evidence that the events was not reasonably controllable or preventable.
- Evidence that the event was caused by human activity and is not likely to recur.
- Documentation that RIDEM completed the public comment process.

The "Initial Notification of Potential Exceptional Event" was provided by the Rhode Island Department of Environmental Management Office of Air Resources to EPA Region I in a letter dated January 9th, 2017. See below.

ED_001361_00001142

RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF AIR RESOURCES
235 Promenade Street, Room 230
Providence, Rhode Island 02908

9 January 2017

Mr. David Conroy
United States Environmental Protection Agency Region I
EPA New England
5 Post Office Square, Suite 100
Boston, MA 02109-3912

Re: Formal Initial Notification for a Potential Exceptional Event for Ozone from May 25-28, 2016

Dear Mr. Conroy:

This letter serves to notify the USEPA that the State of Rhode Island, Department of Environmental Management will be examining the aforementioned period as an exceptional event, per the Clean Air Act (CAA) section 319(b).

Preliminary data analysis indicates that significant fires in Fort McMurray, Canada and possibly elsewhere in the eastern United States may have significantly influenced an ozone episode from May 25th to May 28th.

In accordance with 40 CFR 50.14(c)(2) of the "Exceptional Events Rule", all ozone data for that period has been flagged in EPA's Air Quality System with an IF "Informational" Flag.

Feel free to call or e-mail me with any questions concerning this notification.

Sincerely,

Douglas McVay
Chief
Office of Air Resources

Cc: Robert Judge, EPA R1

The following documentation serves to meet the requirements of Clean Air Act Section 319(b), Air quality monitoring data influenced by exceptional events; 40 CFR Section 50.14, Treatment of air quality monitoring data influenced by exceptional events; and EPA's "Guidance on the Preparation of Exceptional Events Demonstrations for Wildfire Events that May Influence Ozone Concentrations" from the updated guidance rule promulgated on September 16, 2016.

This documentation is intended to demonstrate that on May 25 and May 26, 2016 the three ozone monitors operated jointly by the Rhode Island Department of Health and the Rhode Island Department of Environmental Management experienced elevated ozone concentrations caused by transported smoke emissions, including ozone and ozone precursors such as nitrogen oxides (NOx) and volatile organic carbons (VOCs). The daily maximum 8-hr. average concentrations from this event are listed below.

Monitor	County	Monitor ID	Date	Daily Max. 8-hr Average Concentration (parts per million)
Narragansett	Washington	440090007	5/25/2016	0.086 ppm
West Greenwich	Kent	440030002	5/25/2016	0.078 ppm
East Providence	Providence	40071010	5/25/2016	0.071 ppm
West Greenwich	Kent	440030002	5/26/2016	0.084 ppm
Narragansett	Washington	440090007	5/26/2016	0.081 ppm
East Providence	Providence	40071010	5/26/2016	0.078 ppm

The EPA Guidance document outlines a 3-tiered approach in preparing exceptional event demonstrations. A Tier 1 demonstration is one in which a wildfire clearly influenced monitored values, either outside of the ozone season, with concentrations higher than typical that were deemed as event related, or the wildfire was in very close proximity to the monitor. These demonstrations require the least amount of evidence and documentation. The 5/25/16 and 5/26/16 events are within the Rhode Island ozone season, and although statically above normal, they are not unprecedented, and therefore a Tier 1 approach is not applicable.

A Tier 2 analysis is necessary when the wildfire impacts are less clear, and more evidence is required in a weight of evidence approach to demonstrate a causal relationship. Due to the great distance traveled with this smoke event, a minimum Tier 2 analysis is required. Tier 3 demonstrations are used when the relationship between the wildfire and ozone concentrations are the most complex, requiring the highest level of documentation. We are making this more complex demonstration.

As part of a Tier 2 analysis, the guidance document lists 2 factors for providing a clear causal relationship, with (Q) being the quantity of wildfire emissions over (d), the distance of the

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impacted monitors. A Q/d ratio that is over 100 tons/day/km is the threshold listed as providing a clear causal relationship. The 2nd factor is providing analysis that the ozone concentrations when compared to non-event concentrations are in the 99th percentile for the year and past 5 years (RIDEM evaluated the past 6 years), which was the case for the 5/25/16 and 5/26/16 exceptional event.

Connecticut Department of Energy and Environmental Protection provided an in depth Q/d analysis to determine if there was a causal relationship from fire activities on the monitors. Much of this initial work has been utilized as part of a Rhode Island-specific Q/d analysis, accounting for the difference in distance to the RIDEM impacted monitors.

Rhode Island Q/d Analysis

Q is the total daily emission rate in tons per day of reactive hydrocarbons (rHC) and nitrogen oxides (NOx). EPA recommends, in the exceptional events guidance, that only 60% of the hydrocarbons should be considered reactive. Therefore the reactive hydrocarbon emissions (Ehc) become rHC = 0.6 * Ehc or 0.6 * 17,791 = 10,675 tons of reactive HC emitted during the period of interest. No adjustments are suggested for the NOx emissions. Therefore the total rHC and NOx emissions over the period are 10675 + 2965, or 13,640 tons over the six days. On average this results in a daily emission rate, or Q, of 2293 tons per day.

Estimate of d

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Based on the large distance, we will not present individual analyses for each monitor, but estimate the distance from the Fort McMurray fire to the most distant point in Rhode Island. We will therefore use a value of d of 3316 kilometers, the flight distance from Fort McMurray to Little Compton, Rhode Island.

Q/d Estimate

Using the values determined above, Q/d then becomes 2,273 tpd divided by 3316 kilometer (km) or 0.69 tons per day per kilometer (tpd/km). This value is well below the EPA recommended level of 100 tpd/km indicating clear causality.

Acres	Ehc	ENOx	Q	d (km)	Q/d	Q/d per day
148,263	17,791.56	2965.26	13,640.2	3316	4.1134	0.6915
1,457,909	174,949.1	29,158.18	134,127.6	3316	40.8179	

Taking a less conservative approach and using the maximum extent of the burn area over the life of the fire, the result would be a Q/d of 40.4 tpd/km. Still sufficiently below the EPA recommended threshold for establishing clear causality. Recalling that a worst case fuel loading would increase our results by a factor of six, Q/d would in this case result in 240 tpd/km and would indicate clear causality. While this approach might be justified by the ongoing

smoldering of the peat, the intensity of the Fort McMurray fire, variability in the burn rate and other factors, it is difficult to justify without further details that may only be obtained through estimates which introduce their own error.

Taking a slightly different approach we consider the basis for the EPA guidance and look at emissions from one of the four fires EPA relied on in developing their guidance. Appendix A2 of the EPA guidance indicates that EPA based their conclusions on 12 km grid Community Multiscale Air Quality (CMAQ) modeling of four 2011 multiday fires: Wallow, Waterhole, Big Hill and Flint Hills. Emissions from the fires were based on a program called SMARTFIRE. The SMARTFIRE fire information system is a framework maintained by the US Forest Service for aggregating, associating, and reconciling wildland fire information from disparate sources. Using information available on the Wallow Fire, we approximate the emissions that might be calculated for the Fort McMurray fire.

The Wallow Fire burned in eastern Arizona and western New Mexico from May 29, 2011 through July 8, 2011 and burned 841 square miles (538,240 acres) by June 26th. The maximum daily emissions from that fire were reported as approximately 15,000 tons of reactive volatile organic compound (rVOC) and 1,000 tons of NOx. [Simulating Fire Event Impacts on Regional ozone (O3) and particulate matter less than 2.5 microns (PM2.5) and Looking Forward Toward Evaluation, Kirk Baker, EPA October 5, 2015 and Using SOAS and related field study data for scientific and regulatory modeling, Kirk Baker, EPA, undated; both are slide presentations] If we scale this fire up by a factor of three to approximate the acreage burned in the Fort McMurray fire, then we have daily emissions as high as 45,000 tons for rVOC and 3,000 tons for NOx. These emissions produce a Q of 48,000 tpd and Q/d becomes 14.6 – still well below EPA expectation for causality.

Noting the wide variability in emissions estimates from different approaches, and as the Q/d method does not generally satisfy the expectation of a clear causal impact, we present other evidence demonstrating that the plume from the Fort McMurray fire caused elevated ozone levels in Rhode Island in Tier 2 and Tier 3 approaches. Therefore, this document will attempt to show a clear causal relationship that (1) the wildfire emissions were transported to the monitor and (2) that the wildfire emissions impacted ozone concentrations.

Statistical Examination of Exceptional Event with Non Events

With the arrival of the plume on 5/25/16, all three of the ozone monitors in Rhode Island experienced exceedances of the 2015 ozone standard on both days. Additionally, widespread exceedances were recorded in New Jersey (16/17 monitors), New York (29/30 monitors), and Connecticut (11/12) monitors. Massachusetts experienced exceedances with 9/15 monitors, with three additional monitors reaching the standard.

Section 3.5.1 of EPA's September 16, 2016 wildfire guidance document entitled "Guidance on the Preparation of Exceptional Events Demonstrations for Wildfire Events that May Influence Ozone Concentrations" states that one of the factors for a Tier 2 analysis involves showing that the exceedance due to the exceptional event "is in the 99th or higher percentile of the 5-year

distribution of O3 monitoring data." That can be shown for some of the exceedances May 25 and 26 but not all as described below.

The table below, examines the historical context for the 3 monitors in question for the previous 6 years, 2011-2016, for the months of May and June only. For May 25th, Narragansett (0.086 parts per million(ppm)) exceeded 99th percentile for the period. West Greenwich was below 99th percentile but tied 98th percentile (0.078 ppm), while East Providence (0.071 ppm) was below 99th and 98th percentile. For May 26th, West Greenwich (0.084 ppm) and East Providence (0.078 ppm) both exceeded 99th percentile. Narragansett (0.081 ppm) was below 99th percentile, but tied 98th percentile.

Monitor	Date	Daily Max. 8-hr Average Concentration	May-June 2011-2016 99th Percentile	May-June 2011-2016 98th Percentile
Narragansett	5/25/2016	0.086 ppm	0.084 ppm	0.081 ppm
West Greenwich	5/25/2016	0.078 ppm	0.082 ppm	0.078 ppm
East Providence	5/25/2016	0.071 ppm	0.076 ppm	0.076 ppm
West Greenwich	5/26/2016	0.084 ppm	0.082 ppm	0.078 ppm
Narragansett	5/26/2016	0.081 ppm	0.084 ppm	0.081 ppm
East Providence	5/26/2016	0.078 ppm	0.076 ppm	0.076 ppm

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Table X below examines the historical context for the 3 monitors in question for the entire ozone season, April to September, for the years 2011-2016. On May 25th, Narragansett (0.086 ppm) exceeded 99th percentile for the period, while West Greenwich tied the 99th percentile (0.078 ppm). East Providence (0.071 ppm) was lower than the 99th percentile, but exceeded 98th percentile. For May 26th, West Greenwich (0.084 ppm) eclipsed 99th percentile, while East Providence (0.078 ppm) tied 99th percentile. Narragansett (0.081 ppm) also tied 99th percentile.

Monitor	Date	Daily Max. 8-hr Average Concentration	Ozone Season 2011-2016 99th Percentile	Ozone Season 2011-2016 98th Percentile
Narragansett	5/25/2016	0.086 ppm	0.081 ppm	0.075 ppm
West Greenwich	5/25/2016	0.078 ppm	0.078 ppm	0.072 ppm
East Providence	5/25/2016	0.071 ppm	0.078 ppm	0.070 ppm
West Greenwich	5/26/2016	0.084 ppm	0.078 ppm	0.072 ppm
Narragansett	5/26/2016	0.081 ppm	0.081 ppm	0.075 ppm
East Providence	5/26/2016	0.078 ppm	0.078 ppm	0.070 ppm

West Greenwich

5/25/16 8-hr ozone is tied for 2nd highest for entire ozone season (2011-2016)

8-hr ozone tied for 7th highest for May/June (2011-2016)

5/26/16 8-hr ozone is tied for 8th highest for entire ozone season (2011-2016)

8-hr ozone is 2nd highest for May/June (2011-2016)

Narragansett

5/25/16 8-hr ozone is tied for 3rd highest for entire ozone season (2011-2016)

8-hr ozone is tied for 2nd highest for May/June (2011-2016)

5/26/16 8-hr ozone is tied for 7th highest for entire ozone season (2011-2016)

8-hr ozone is tied for 6th highest for May/June 2011-2016

East Providence

5/25/16 8-hr ozone is 14th highest for entire ozone season (2011-2016)

8-hr ozone is 6th highest for May/June (2011-2016)

5/26/16 8-hr ozone is tied for 8th highest for entire ozone season (2011-2016)

8-hr ozone is tied for 3rd highest for May/June (2011-2016)

See a graphical representation of the 2011-2016 April to September ranges, and 2011-2016 May June ranges for all three locations below.

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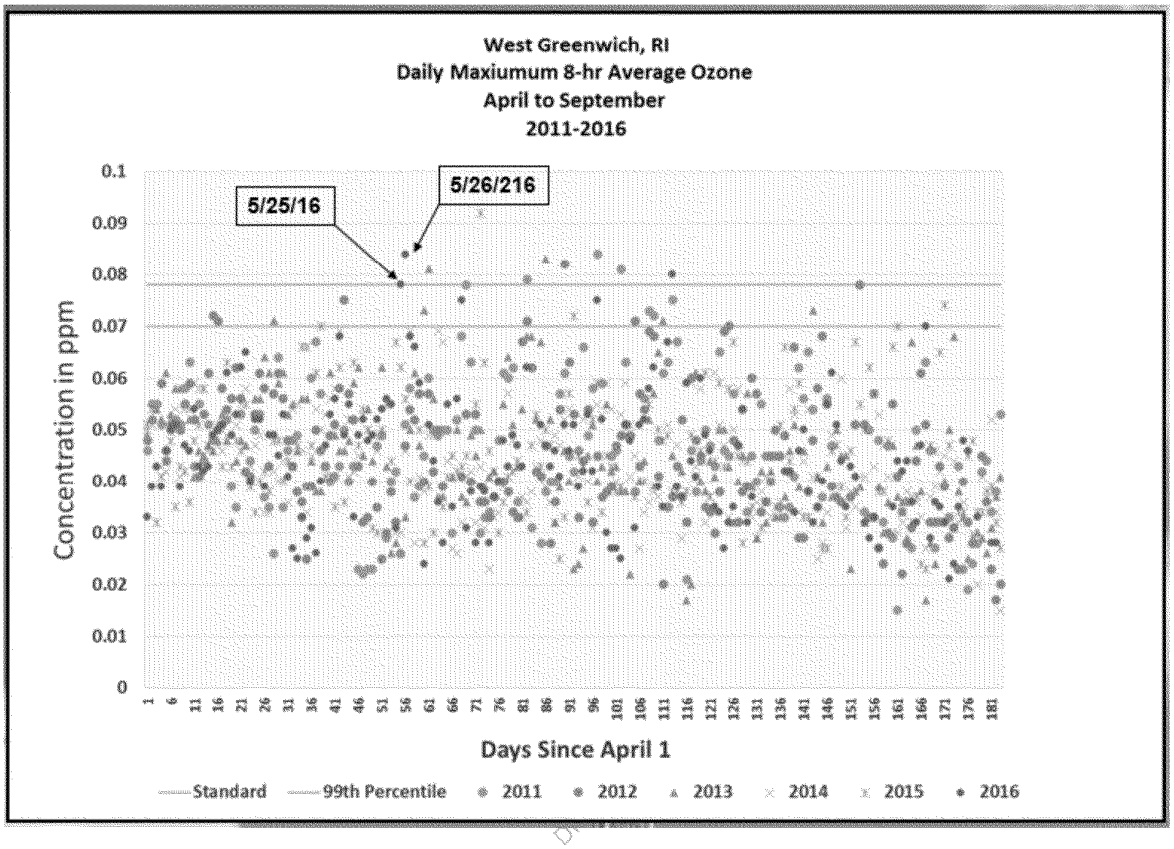
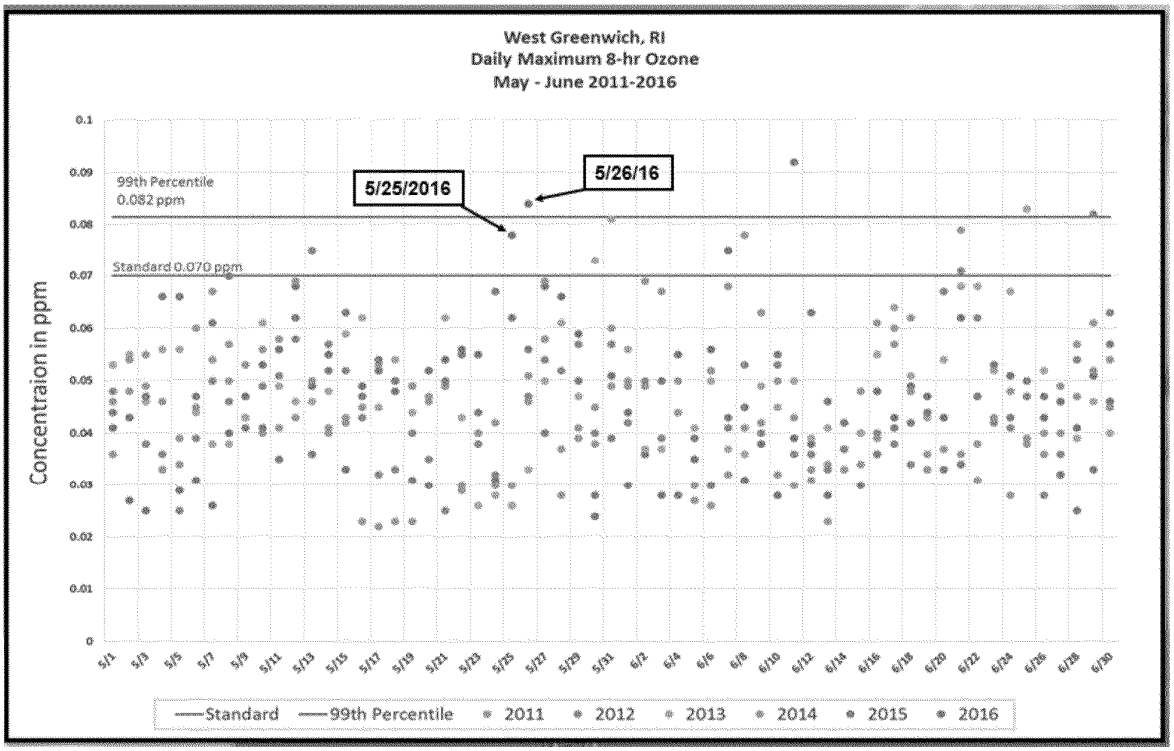

West Greenwich, RI
Daily Maxiumum 8-hr Average Ozone
April to September
2011-2016
5/25/16
5/26/216
Concentration in ppm
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
Days Since April 1
Standard
99th Percentile
2011
2012
2013
2014
2015
2016


West Greenwich, RI
Daily Maximum 8-hr Ozone
May - June 2011-2016
99th Percentile
0.082 ppm
Standard 0.070 ppm
5/25/2016
5/26/16
Concentraion in ppm
Standard
99th Percentile
2011
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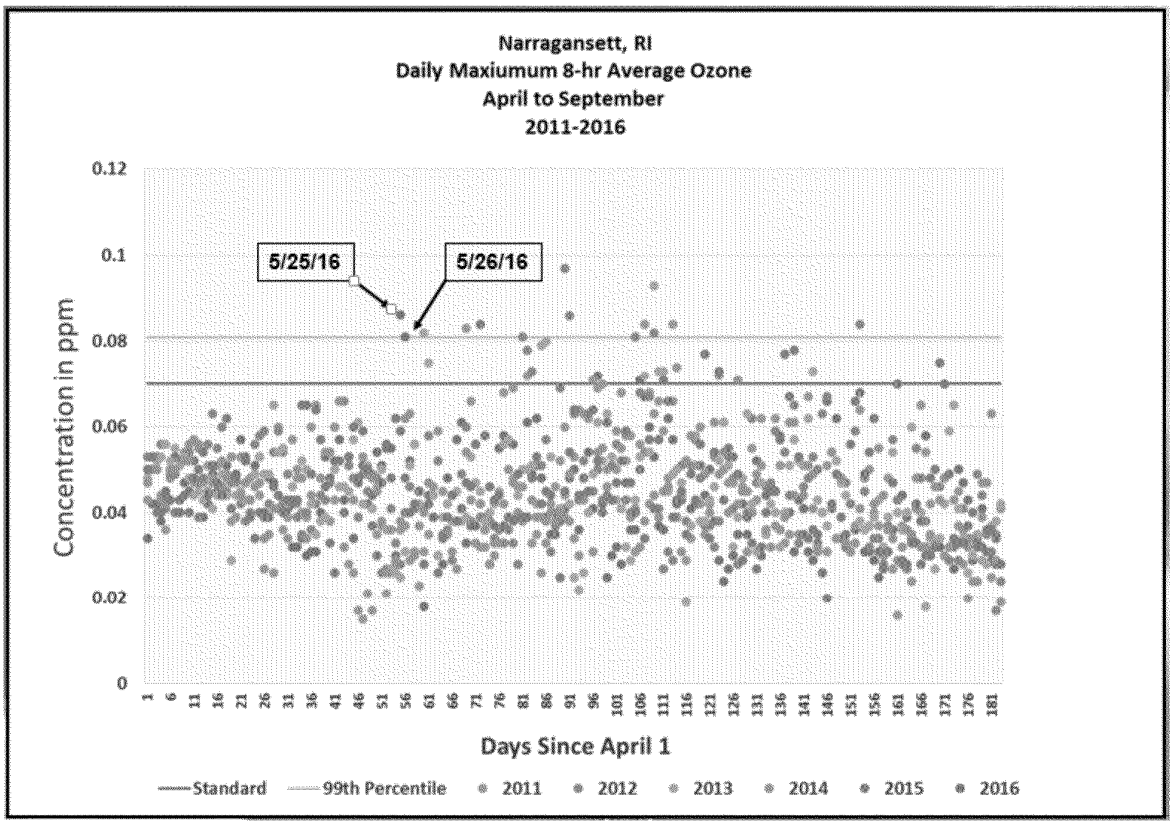
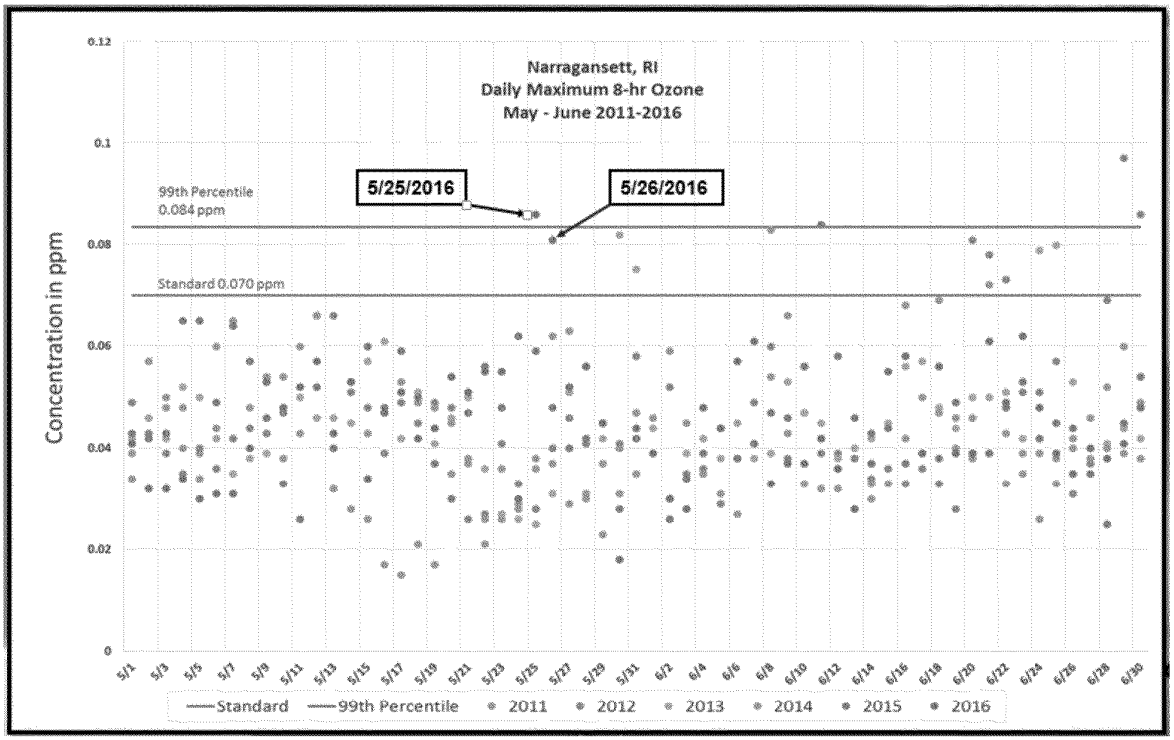
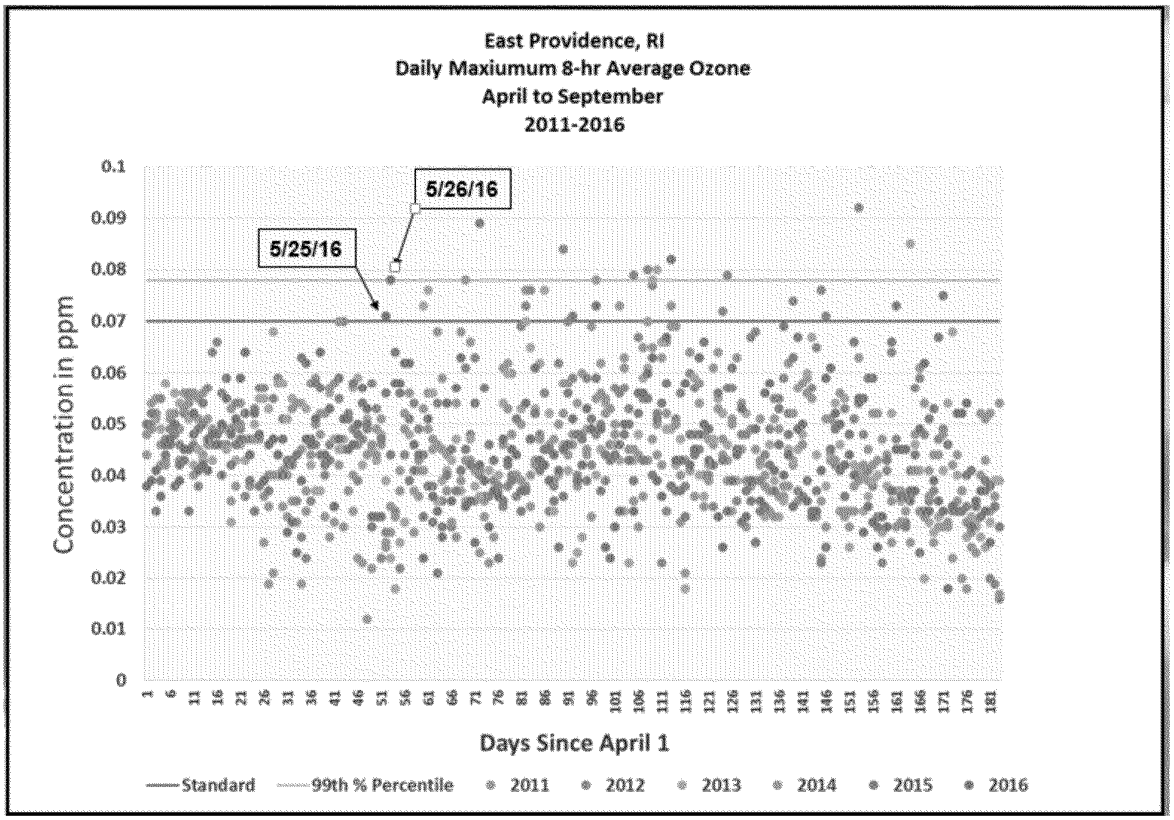
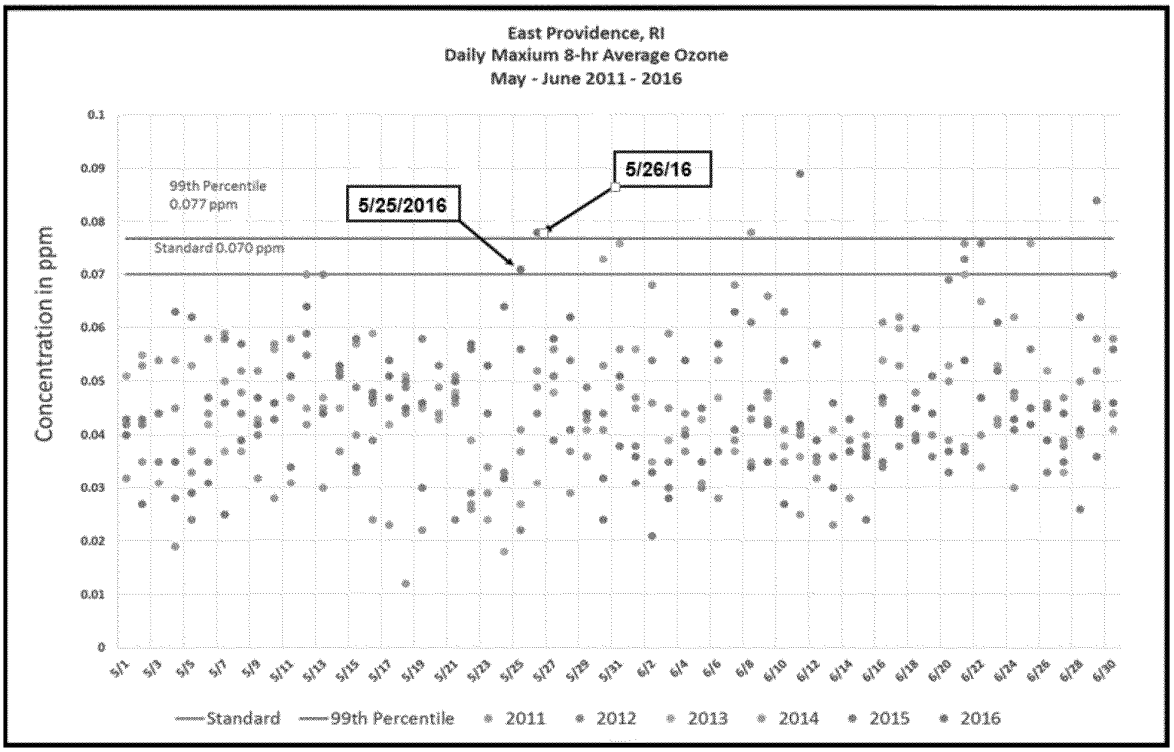

Narragansett, RI
Daily Maxiumum 8-hr Average Ozone
April to September
2011-2016
5/25/16
5/26/16
Concentration in ppm
Days Since April 1
Standard
99th Percentile
2011
2012
2013
2014
2015
2016


Narragansett, RI
Daily Maximum 8-hr Ozone
May - June 2011-2016
5/25/2016
5/26/2016
99th Percentile
0.084 ppm
Standard 0.070 ppm
Concentration in ppm
Standard
99th Percentile
2011
2012
2013
2014
2015
2016


East Providence, RI
Daily Maxiumum 8-hr Average Ozone
April to September
2011-2016
5/26/16
5/25/16
Concentration in ppm
Days Since April 1
Standard
99th % Percentile
2011
2012
2013
2014
2015
2016



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Rhode Island Design Value and Regulatory Significance

A site is in violation for the NAAQS eight-hour standard if the monitored design value for that site is in exceedance of 70 parts per billion (ppb). The design value is calculated by averaging the fourth highest maximum daily eight-hour ozone concentrations measured at each site in three consecutive years. For the most recent certified data, 2013-2015, the design value for the Narragansett monitor is 73 ppb, while West Greenwich and East Providence both have design values of 70 ppb. Refer to the Rhode Island attainment designation letter sent to EPA on 9/27/16. **Slide #1** (also below) reveals the design value for the 2014-2016 seasons, and how those values are impacted when exceptional event values for 5/25/16 and 5/26/16 are excluded from the design value for that period, which drops the design value 2 ppb for all three ozone monitors. Note that the design values are in attainment of the standard even when *including* the exceptional event values.

Design Values 2014-2016							
East Providence Top 8-hr			Year	4th Highest	Design Value 2014-2016 (ppb)		
7/22/2016	0.082		2014	64			
5/26/2016	0.078		2015	71	68	includes exceptional	
7/6/2016	0.073		2016	71	66	dropping exceptional	
5/25/2016	0.071	4th Highest	2016 (EE)	64			
7/21/2016	0.067						
4/22/2016	0.064	4th Highest excluding					
		exceptional event					
West Greenwich Top 8-hr			Year	4th Highest	Design Value 2014-2016 (ppb)		
5/26/2016	0.084		2014	67			
7/22/2016	0.08		2015	70	70	includes exceptional	
5/25/2016	0.078		2016	75	68	dropping exceptional	
6/7/2016	0.075	4th Highest	2016 (EE)	68			
7/6/2016	0.075						
5/12/2016	0.068	4th Highest excluding					
		exceptional event					
Narragansett Top 8-hr			Year	4th Highest	Design Value 2014-2016 (ppb)		
5/25/2016	0.086		2014	63			
5/26/2016	0.081		2015	77	70	includes exceptional	
7/6/2016	0.072		2016	71	68	dropping exceptional	
7/15/2016	0.071	4th Highest	2016 (EE)	66			
7/16/2016	0.067						
8/24/2016	0.066	4th Highest excluding					
		exceptional event					

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Conceptual Model

Wildfire Event and Smoke Transport to Rhode Island

On May 1, 2016 a fire began in a remote portion of forest southwest of Fort McMurray, Alberta, Canada. Only two days later, the fire forced the largest wildfire evacuation in Alberta history and eventually spanned approximately 589,995 hectares (1,500,000 acres) before being declared under control on July 5, 2016. Three days after the fire began, it was already deemed extreme by Alberta Agriculture and Forestry.

Date	Hectares	Acres
5/4/16	10,000	25,000
5/5/16	85,000	210,000
5/6/16	100,000	250,000
5/7/16	156,000	390,000
5/16/16	285,000	700,000
5/21/16	504,443	1,246,510

By mid-June, rain and cooler temperatures aided in the firefighting effort. June 13 marks the first date the fire was held in check since becoming out of control. No official cause has been determined to date, though it is suspected to be human caused. However, the conditions

leading up to the outbreak were a bit unusual. A hot air mass (temps 90 degrees or higher) with very low humidity (less than 20%) combined with intense winds of 45 mph on 5/4/16 contributed significantly to the fire's growth. The conditions prior to the outbreak were unusually dry, with a low snowpack due to an El Nino cycle, followed by an abnormally warm and dry spring which resulted in a fire season start some four weeks sooner than usual, creating the dry tinder and soil conditions.

SLIDE #2 (https://www.giss.nasa.gov/research/features/201605_fires/) reveals land surface temperature anomalies nearly 10 degrees centigrade above average for the period of 4/26/16 to 5/3/16. Although specific fires cannot be attributed to climate change, some have theorized a possible correlation between climate change, longer dry seasons, and fuel aridity. It's unclear if extreme fire events such as the Fort McMurray fire may be more frequent in the future, but it is known that forest fire smoke is part of a normal summertime atmosphere.

SLIDE #3 is an animation from 5/18/16 – 5/25/16 of the daily Hazards Mapping System (HMS) website (http://www.ospo.noaa.gov/Products/land/hms.html), which generates a daily fire smoke analysis using sensors, environmental, and satellite data. This animation shows the migration of the plume from the Fort McMurray (and other Canadian fires), along with a southern plume associated with the Yucatan Peninsula fires in Mexico. At various times during this period, smoke was also clearly visible in satellite images as seen on 5/20/16, 5/22/16, and 5/24/16 on **SLIDE#4** (https://worldview.earthdata.nasa.gov/). **SLIDE #5** is a loop of 72 hr trajectories for Providence along with the daily HMS smoke analysis overlay (http://airnowtech.org/).

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SLIDE #6 is an animation from 5/20/16 – 5/28/16 of AOD (aerosol optical depth), with warm colors indicating higher AOD (higher aerosol concentrations). This satellite product is only available in relatively cloud free areas, as the sensor is not able to detect AOD in significant cloud cover. A lobe of the plume grazes Rhode Island on 5/20/16 with some ground evidence, while the brunt of the plume arrives early on 5/25/16 and reaches surface level with significant ground level smoke at the monitors as shown later on **SLIDES #50-54**.

Similar satellite and aerosol index composites track the plume well as it migrated southward to the Upper Midwest/Great Lakes Region on 5/18/16 (**SLIDE #7**), as it moved aloft over the Upper Midwest in northwest flow (**SLIDE #8**), and arrived in the Northeast on 5/20/16, with the brunt of the smoke remaining aloft (**SLIDE #9**). All satellite aerosol composite slides courtesy of CTDEEP.

As mentioned, there are indications of additional smoke influence from Mexican wildfires impacting RI. Satellite data indicated significant fires in early May over much of the Yucatan Peninsula. There is little specific information on the cause of these fires, but typically February to May is the dry season in this region, with fires caused both intentionally for agricultural purposes or from lightning strikes. These fires will not be examined as in depth as Fort McMurray, and it's believed the Fort McMurray provided the greatest impact on the

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exceptional event, with the Yucatan fires acting to exacerbate.

The Navy smoke model (https://www.nrlmry.navy.mil/aerosol_web/) picked up on significant smoke surface concentrations over Mexico and the Gulf of Mexico on 5/23/16 (**SLIDE #10**). The HMS analysis also showed a significant plume over the Gulf of Mexico on 5/22/16 and 5/23/16 (**SLIDE #11**). 850 mb analysis on 5/22/16 and 5/23/16 shows transport flows from the south southwest originating from the plume, delivering smoke to the north (**SLIDE #12**) with the Mexican and Fort McMurray plumes appearing to link on 5/24/16 and 5/25/16 (**SLIDE #13**) and becoming entrained in the northwest flow (**SLIDE #14**) and eventually into the Northeast (images from http://www2.mmm.ucar.edu/imagearchive/ by way of the NWS Storm Prediction Center). The entrainment of the Yucatan smoke and increase in precursors, along with very warm temperatures aloft allowed for enhanced ozone production.

The Fish and Wildlife Service's Branch of Air Quality administers the air monitoring program IMPROVE, as part of a Regional Haze network to establish air quality trends affecting refuge resources. Sampling of Potassium (k), a useful indicator of smoke, occurs every three days at Seney National Wildlife Refuge (**SLIDE #15**) on the Upper Peninsula of Michigan, a Federal Class I area. **SLIDE #16** (courtesy of CTDEEP) indicates elevated K and aerosol spikes on 5/24/16 that coincided with and ozone exceedance on a normalized scale. Trajectories reveal that this is the same air mass and plume responsible for the exceptional event in Rhode Island.

Exceptional Event Meteorology and Trajectories

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A smoke plume has already been established and tracked into Rhode Island under favorable transport conditions. **SLIDE #17** is an animation that shows the daily air quality index from 5/20/16 to 5/28/16. An area of elevated ozone develops under stagnation in the Upper Midwest, then traverses into the Great Lakes Region, before arriving and peaking in the Northeast on 5/25/16 and 5/26/16.

The National Oceanic and Atmospheric Administration (NOAA) HYSPLIT model was run using the AirNOW Tech Navigator tool (http://airnowtech.org/navigator/) to produce 36 hour back trajectories of air parcel movement at 100, 500, and 1500 meters. Wildfire Guidance recommends heights no lower than 100m to avoid terrain interference, and no higher than 1500m to confine the parcel in the mixing layer. Narragansett is the farthest monitor from the smoke source and the other monitoring locations are located in close proximity to each other (Narragansett to East Providence is 24 miles, Narragansett to West Greenwich is 20 miles). The trajectories are serving two purposes. One is to show that the flows on 5/25/16 that produced the ozone exceedances are atypical of high ozone events. Secondly, the trajectories show that flows were originating along a course with which the plume was traveling.

On 5/24/16, there was an area of low pressure just offshore of Southern New England with an occluded front extending from Cape Cod to off the coast of Nova Scotia. A closed upper level low was situated just off the coast of Southern New England (see **SLIDE #18** for 5/24 NOAA

surface and 850 mb analysis, and ETA 500 mb analysis). The surface wind component is from the northeast (fresh marine air) up to 500 meters or more, as shown by the HYSPLIT trajectory run for 5/24 (**SLIDE #19**). At a height of 1500 meters, flows ranged from the south and southeast. Early on 5/25/16, the trajectories began to back to the north and eventually northwest at 500 and 1500 meters by 10 AM, while surface flows had back rotated to the southwest (again see **SLIDE #19**, click to animate/advance). The surface, 500 mb, and 850 mb low pressure troughs have both begun to shift east and northeast (see **SLIDE #20**). By this time, the directional change in winds at the surface up to 500 mb or more (again refer to **SLIDE #19** animation) had tapped into the well-established smoke plume that had been lingering west and northwest of the area, and the plume was transported into Rhode Island's air shed.

The synoptic pattern at the surface and aloft and HYSPLIT trajectories or atypical of a typical ozone event in this area, which will be evaluated more in depth.

By 5/26, the exceptional event did begin to take on some characteristics of a traditional non-event day of ozone exceedances. At the surface (**SLIDE #21**), a stationary boundary was situated just northwest of the state, 850 mb flows had shifted more west and southwest, and 500 mb flows exhibited a more westerly regime. See (**SLIDE #22**, for trajectories on 5/26. All are favorable regimes for ozone transport. However, by that time, the smoke and ozone plume had been already well entrenched and continued to exacerbate and enhance the high ozone in the air shed. Although there is indication of precursors and smoke impacting Rhode Island on 5/27 and 5/28, we are focusing this demonstration on May 25-26 because there is clearer indication of the influence of smoke on these days. However, trajectories (**SLIDE #23**) and 850 mb flows (**SLIDE #24)** had shifted to a more south southwesterly component with substantial fetch over the ocean, mixing in cleaner marine air, and reducing impacts of the plume. There were western areas of the Northeast that continued to be impacted by the plume on these dates that were not as affected by the mixing of cleaner marine air.

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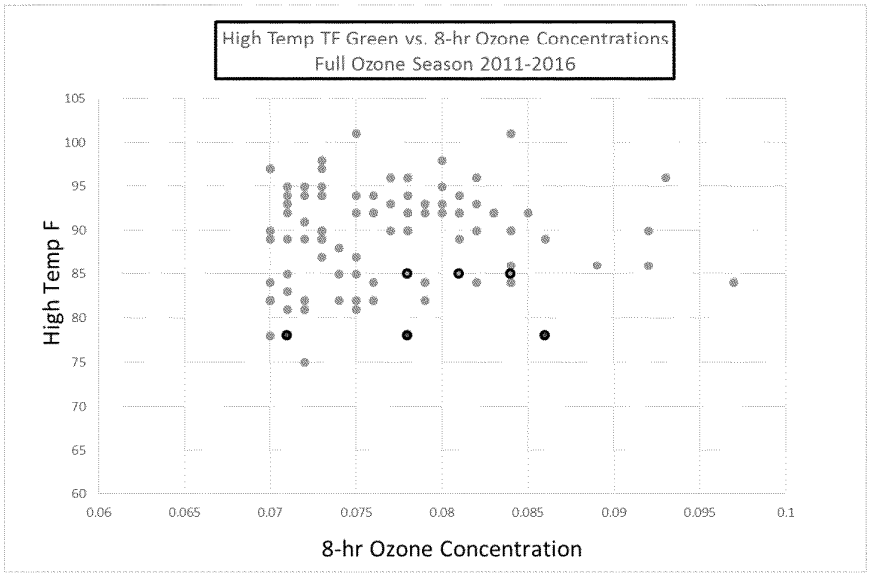
There are several meteorological predictor variables (temperature, wind speed, wind direction, cloud cover, relative humidity, and mixing heights) for forecasting high ozone. It is well known that days with high ozone correlate strongly with high maximum temperatures. When examining a plot of ozone exceedances for the full ozone seasons for 2011-2016, May 25th especially appears as an outlier. NWS observed high temperatures were plotted along with 8-hr ozone values on exceedance days. The red dots indicate 5/25/16, with yellow as 5/26/16.



The high temperature at TF Green on 5/25/16 only reached 78F. The average daily maximum temperature for ANY exceedance of 0.070 ppm standard for that period was 89F. On 5/26/16, as mentioned, was still heavily influenced by the persistence of the plume, but more closely resembled a non-event ozone exceedance, as high temperatures reached 85F at TF Green on that date. As was the case in the upper Midwest on 5/19/16 and 5/20/16, meteorological conditions on 5/25/16 and 5/26/16 were not favorable for such elevated ozone readings.

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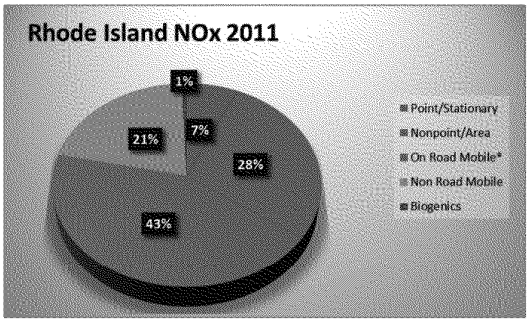
Examination of Typical Non-Event Ozone Exceedances

It is hoped that in establishing the typical non-event synoptic weather, ozone precursor conditions, trajectories, and the discrepancies between non-events and the exceptional event of May 25th and 26th will expose the uniqueness of conditions on those days.

Rhode Island's geography is characterized by coastal lowlands around Narragansett Bay and rolling hills central and north, with the highest point only 812 feet above sea level. The state experiences a humid continental climate which is strongly influenced by its proximity to the Atlantic Ocean with Narragansett Bay intersecting the state, with a tidal shoreline of 384 miles. The state experiences all four seasons, prevailing westerly flow, with summer heat and humidity along with deep continental polar air masses in winter. Interior portions well away from the coast tend to have more extreme temperatures fluctuations as opposed to the immediate coast which is moderating by ocean temperatures.

Rhode Island's weather is highly changeable, therefore its air quality is also highly changeable and is substantially affected by transport. Based on the most recent processed emissions inventory for 2011, nearly 43% of NOx emissions (an ozone precursor) originated from on road mobile sources. The West Greenwich Regional PAMS Type I location ozone monitor was

established to measure upwind background measurements, as it situated in a heavily wooded, unpopulated region, far from and even upwind of any potential mobile source impacts of precursor pollutants. Concentrations at West Greenwich are typically assumed to be nearly all transport. This is important, as this location was significantly impacted by the exceptional event, especially on 5/26/16.



It should be noted that since ozone monitoring began in the state, there has been a measurable decrease in high ozone days. Ozone concentrations during the summer season in Rhode Island are influenced by several factors and weather scenarios that result in the highest 8-hr concentrations each season.

The "classic" conceptual event involves surface flow along the 95 corridor from more densely populated and industrialized precursor pollution source regions of Connecticut, New York, New Jersey, eastern Pennsylvania via a generally southwest or west southwest low level component. Mid-level transport is also from the southwest or west southwest, with a more westerly component in the upper levels. Ozone plumes may pool in Long Island sound and migrate along coastal Rhode Island before being brought inland with light and localized sea breezes. Other surface flow regimes from the west can transport ozone plumes within relatively stable marine air along Long Island sound (and again from more precursor rich locations) before also with localized coastal sea breezes bringing the plume inland. The sea breezes typically become more vigorous during afternoon peak heating times. These scenarios are most often associated with Bermuda high anticyclone in the Atlantic and localized ridging (high pressure/high temperature heights) aloft, which provide the surface flows from the southwest and west southwest, all within a relatively stable air mass, with limited clouds to allow for the significant UV light necessary for the chemical formation of ozone.

Ozone transport and formation can also be exacerbated by an approaching cold front (with no associated precipitation) situated west of the state during peak daylight heating. The front acts as a sort of squeegee, resulting in a substantial buildup of precursors in the prefrontal warm sector. Stagnation events as a result of days of high pressure, upper level subsidence, and light mixing may also compound ozone readings over the course of several days. But in Rhode Island, local emissions are not substantial enough for significant local ozone formation, or immediately problematic upwind formation in Massachusetts, with our highest days only resulting from transport from more emissions rich locations.

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Stronger sea breezes or surface southerly wind gradients typically result in the mixing in of cleaner, precursor deprived maritime air masses, which will limit ozone exceedances. Narragansett and East Providence, due to their proximity to the ocean, are especially susceptible southerly gradients ushering in clean marine air. The passage of a surface cold front, a wind switch to the west, northwest, and north results in increased mixing of air sourced from "cleaner" less populated, less polluted source regions. Lastly, other flows not consistent with high ozone concentrations are southeast, east, and northeast, as those directions bring in typically cleaner air from over the ocean.

For purposes of this demonstration, several non-event days with the highest 8-hr ozone exceedances for the six year period 2011-2016 will be examined.

6/11/2015

This date experienced 8-hr averages of 92 ppb (West Greenwich, tied for 3rd highest), 89 ppb (East Providence, 4th highest), and 84 ppb (Narragansett, tied 7th highest).

Per **SLIDE #25** the synoptic pattern for this event involved an offshore Atlantic ridge of high pressure (Bermuda High), a 500 mb trough dipping down from southeast Canada, with a slow moving cold front approaching from the northwest with no associated precipitation. Cold fronts in the Northeast during the summer typically move slowly with little momentum, often stalling near the coast or just offshore, and feature more a density difference (dry denser air behind with humid buoyant air prefrontal). As mentioned precursors tend to accumulate ahead of the front. High temperature this day at TF Green Airport reached 86F.

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Trajectories in **SLIDE #26** reveal a very favorable southwest low level flows from the southwest with a direction that limits cleaner marine air influence. Directions veer with height to 500m, originating emissions rich Ohio, Pennsylvania, Northern New Jersey, New York, and the I-95 corridor through Connecticut. Upper flows at 1500m are westerly, as influenced by the weak 500 mb trough to the north. Note, the HMS smoke overlay indicates that this date may have been influenced by fire smoke.

8/31/2012

This date experienced 8-hr averages of 92 ppb (East Providence, tied 3rd highest), 84 ppb (Narragansett, tied 7th highest), and 78 ppb (West Greenwich, tied 13th highest).

SLIDE #27 shows high pressure was located offshore and south of RI, with a cold front well off to the northwest, and a pre frontal trough draped northeast to southwest along the northeast. A ridge of high pressure is evident over the East Coast at 500 mb, with a trough located well north of RI into Canada, with flows a bit west northwest ahead of the approaching trough. Flows at 850 mb are generally straight west. High temperature at TF Green Airport reached 90F.

Trajectories on **SLIDE #28** show very favorable flows at both 100 and 500m from a west

southwest component from favorable transport areas, with an evident plume in New Jersey, Long Island, Coastal Connecticut, and into Rhode Island. Flows originate from the west northwest at 1500m.

6/29/2012 – 6/30/12

6/29/12 experienced the highest 8-hr ozone reading of the past six years, 97 ppb (Narragansett), with 84 ppb (East Providence, tied 7th highest), and an 82 ppb (West Greenwich, tied 9th highest). Only Narragansett experienced an exceedance on 6/30/12, although it was the 5th highest reading of the period at 86 ppb and was a coastal only event.

Synoptically (**SLIDE #29**), this event was very much prefrontal influenced, with an approaching cold front oriented north northeast to southwest, with a tropical system well offshore. At 850 mb, winds were southwest, with west northwest flows at 500 mb, with a weak trough over Rhode Island. This event may also have been smoke influenced, as the HMS analysis shows widespread smoke over the entire Northeast. This event lasted into 6/30/12 as the front stalled just offshore of New England, with only Narragansett experiencing an exceedance on that day, as the frontal boundary had appeared to shift and stall at the coast, with any smoke lingering in Southern New England. High temperature at TF Airport reached 84F on 6/29/12 and 89F on 6/30/12.

Trajectories once again are southwest at 100 and 500m, with a northwest flow at 1500m on 6/29/12 (**SLIDE #30**) shifting more westerly at 100 and 500 m, and continued northwest at 1500m on 6/30/12 (**SLIDE #31**).

DRAFT

9/11/2013

This date experienced an 8-hr reading of 85 ppb (East Providence, 6th highest event) with no exceedances at the other monitors.

Surface high pressure was located offshore (**SLIDE #32**), with a broad ridge over much of the Eastern US at 500mb, 850 mb flows from the west, and a trough again located to our northwest, with a frontal boundary approaching the eastern Great Lakes. The high temperatures at TF Green Airport was 92F.

Trajectories (**SLIDE #33**) at 100 m were from the southwest, and again at 500 and 1500 m up into Rhode Island, with a dip from the west to northwest in the flow around Eastern Pennsylvania and New Jersey. Again, the HMS product is alluding to smoke for Southern New England for the 9/11/2013 analysis.

<u>Pollution Wind Roses</u>

RIDEM utilizes Agilaire, LLC software to manage our air quality monitoring data activities. Using this software pollution roses were generated for the months of May and June for 2014-2016 using ozone concentrations and wind data from the three ozone monitoring locations to

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compare wind directional frequency as compared to ozone readings. Each of the following 3 slides has wind roses for 2014, 2015 and 2016.

West Greenwich – **SLIDE #34** The 2014-2015 pollution roses revealed a more typical wind regime from the west southwest, southwest, and even some south, which resulted in exceedances of the 8-hr standard. When advancing to the 2016 rose, the exceedance under a northwest and west northwest flow associated with the May 2016 event is evident.

Narragansett – **SLIDE #35** Per the 2014 and 2015 pollution roses, high ozone surface winds are statistically from favorable transport directions of west, west southwest, and southwest. The 2016 rose again shows the unusual elevated ozone from the west northwest component.

East Providence – **SLIDE #36** The East providence location is a more susceptible to spring time bay breezes, when the water land temperature differences are the greatest, which can shift prevailing winds southwest to more of southeast direction. Additionally, due to the frictional change of air flow going from the land over the West Bay to the East Bay and a Meteorological phenomenon known as the Ekman spiral, this location in particular may see higher ozone concentrations under a variety of flows, including southeast (transport brought in on bay breeze), south, southwest, west southwest, and west, as indicated by the pollution roses for 2014 and 2015. However, the May 2016 signal is still evident, with a rare high ozone resulting from a west northwest surface flow.

When examining East Providence more closely on the May 2016 exceptional event, it appeared the ozone on 5/26/16 did not climb as high if not having been impacted by a bay breeze. At 11AM the winds shifted from the southwest (213 degrees) to south southeast (171 degrees) and eventually to southeast (157 degrees), with a 6 ppb drop in the hourly ozone value from 85 ppb to 79 ppb (**SLIDE #37**). Narragansett (**SLIDE #38**) and West Greenwich (**SLIDE #39**) did not experience a sea breeze and winds retained a westerly component, while ozone values remained high.

Air Quality Model Performance during Exceptional Event

Throughout the exceptional event, both the CMAQ and NOAA models vastly underperformed in tracking the plume, when compared to observations. On 5/24/15 (**SLIDE #40**) the NOAA model did not capture any of the exceedances around Lake Ontario and Lake Erie to our northwest, the day prior to the exceptional event in RI. As the plume impacted RI and the Northeast on 5/25/16, the under prediction continued by an entire health impact category on the Air Quality index, with models only predicting MODERATE along the immediate coast of Southern New England. Observed ozone concentrations reached UNHEALTHY at monitors in CT and RI.

Refer to the images on **SLIDE #41** and **SLIDE #42**, provided to RIDEM by Joel Dreesen of The Maryland Department of the Environment. The plotted maps of interpolated NOAA/CMAQ predicted concentrations versus observed 8-hour concentrations tracks the substantial negative

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bias in the models with the plume as it tracks into Rhode Island from the northwest. The negative bias reaches approximately 15-25 ppb on 5/25/16, continuing on to 5/26/16 (**SLIDE #42**). By 5/27/16, as the plume exits the region, the modeled prediction goes from a negative bias to a more neutral bias as the smoke impact lessened. By that time, the weather pattern and trajectories indicate a more southerly, cleaner flow off the Atlantic for Rhode Island, which displaced some of the plume out of the region and mixed in cleaner marine air. Both models do not assimilate gaseous smoke emissions in predicting ozone concentrations, which resulted in the negative bias.

Monitoring Data and Smoke Evidence at RI Monitors

Smoke is a complex mixture of carbon dioxide, water vapor, carbon monoxide, particulate matter, hydrocarbons and other organic chemicals, nitrogen oxides, and trace minerals. The individual compounds present in smoke number in the thousands. Smoke composition depends on multiple factors, including how efficiently a fuel burns, the fuel type and moisture content, the fire temperature, wind conditions and other weather-related influences, whether the smoke is fresh or "aged," and other variables (https://www3.epa.gov/airnow/wildfire_may2016.pdf).

In addition to the many ingredients that comprise of fire smoke, ozone precursor emissions of NOx and VOCs can generate ozone within the plume or combine with emissions from other sources to generate ozone (*Jaffe, D.A., Wigder, N.L., 2012. Ozone production from wildfires: A critical review. Atmospheric Environment 51, 1-10*). There are many variables that impact the magnitude and ratios of fire emissions, including the acreage burned, the characteristics of the fuel burned, and the meteorological conditions (*Akagi, S., Craven, J., Taylor, J., McMeeking, G., Yokelson, R., Burling, I., Urbanski, S., Wold, C., Seinfeld, J., Coe, H., 2012. Evolution of trace gases and particles emitted by a chaparral fire in California.Atmospheric Chemistry and Physics, 12, 1397-1421*). In an analysis conducted by (*Pfister, G., Wiedinmyer, C., Emmons, L., 2008. Impacts of the fall 2007 California wildfires on surface ozone: Integrating local observations with global model simulations. Geophysical Research Letters, 35*), smoke impacts were modeled for the busy 2007 California wildfire season. An increase in observed ozone was found when the model predicts a strong impact of pollution from the fires, where measured afternoon 8-hour concentrations increased, on average, by about 10 ppb. The findings demonstrate that intense wildfire periods can significantly increase the frequency of ozone concentrations exceeding current U.S. health standards.

The resultant rapid increase in smoke parameters (i.e., PM2.5, black carbon and carbon monoxide) and ozone that all three monitors in Rhode Island experienced under the aforementioned meteorological conditions and trajectories is quite remarkable. The response for these pollutants atthe monitors is revealed in the upcoming plots.

Note that scales for all non-ozone parameters have been normalized as indicated on the slides to provide for better scaling between different parameters.

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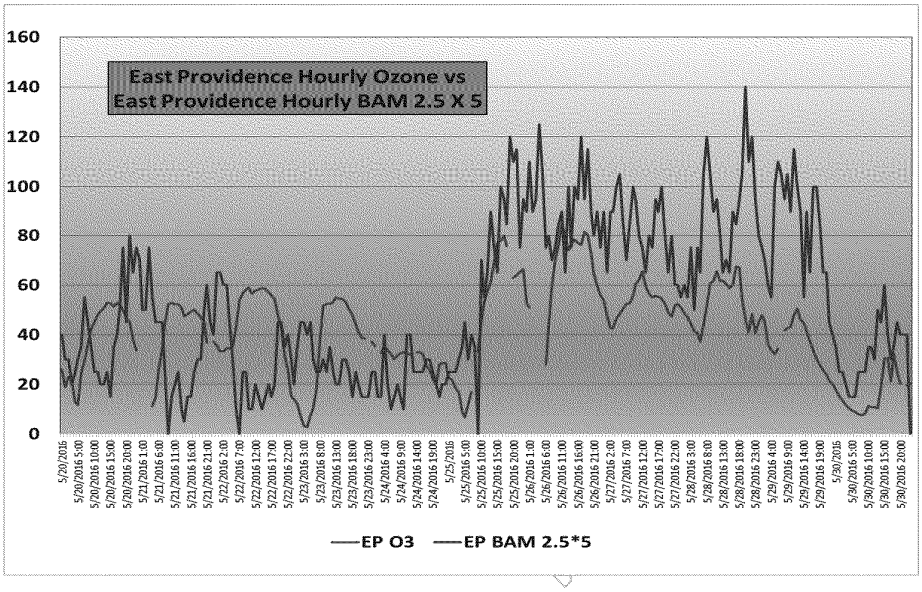
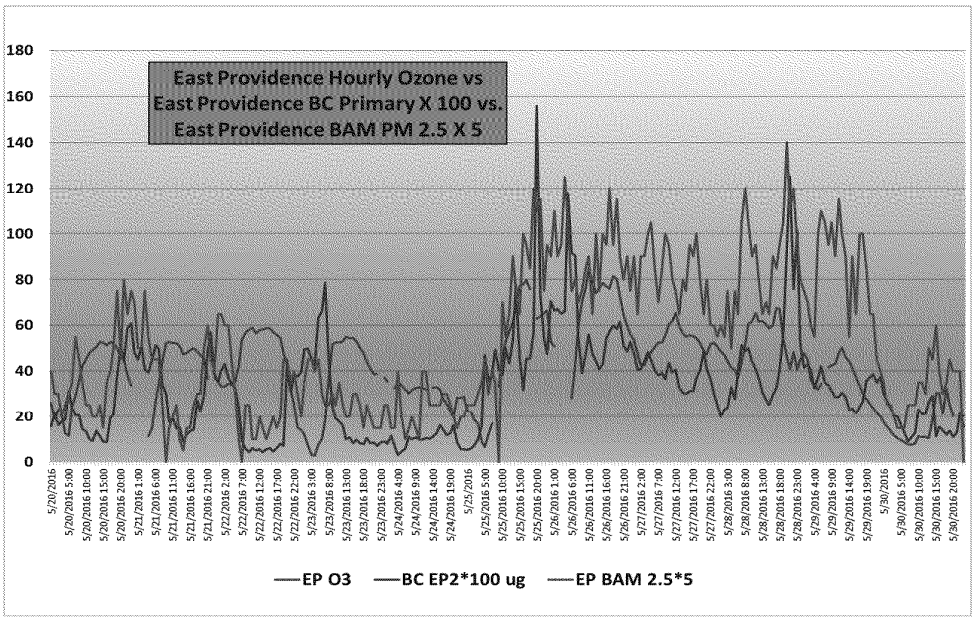
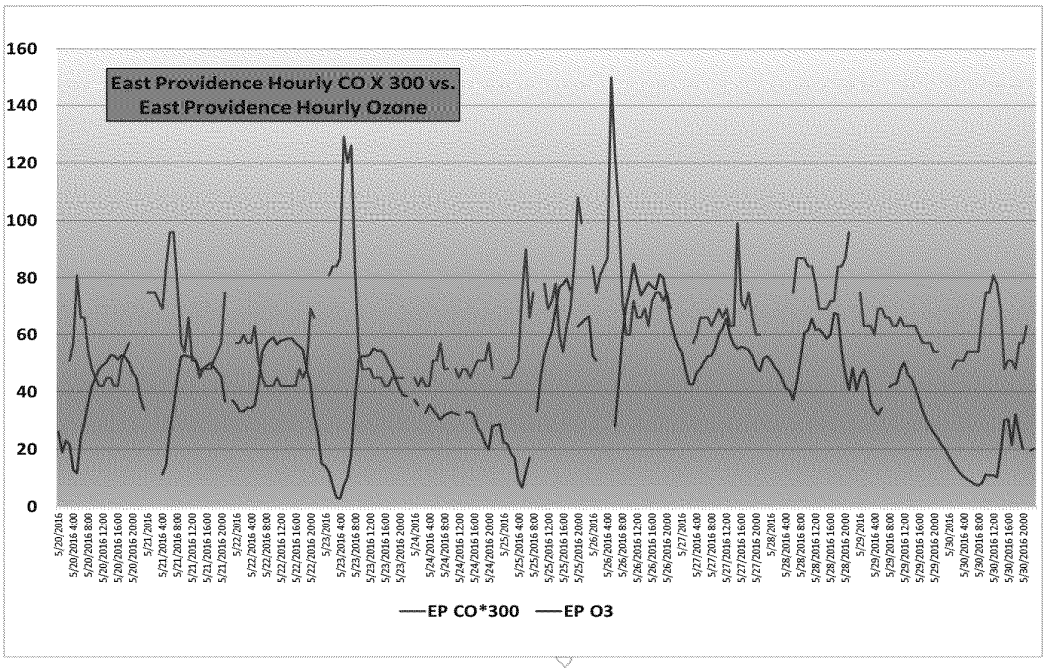
All PM 2.5 was measured by Met One BAMs with ozone by measured by Thermo Fisher Scientific 49i analyzers. At East Providence, PM 2.5 curves climbed together as the plume arrived early on the morning of 5/25/16 at East Providence.



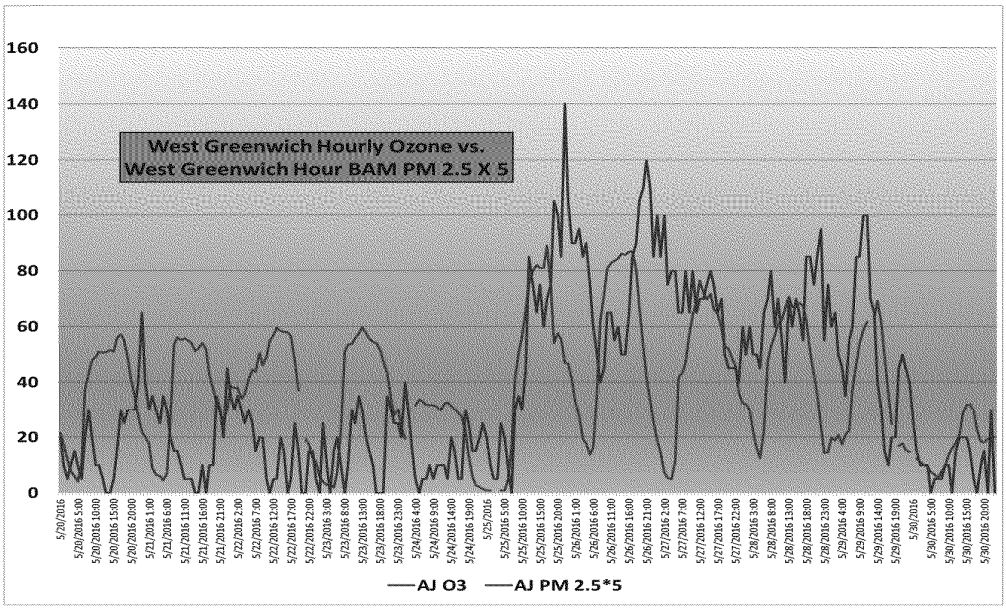
Black Carbon also compared favorably with ozone and PM 2.5. Black carbon primary was measured by Magee Scientific AE 33 Aethalometer.



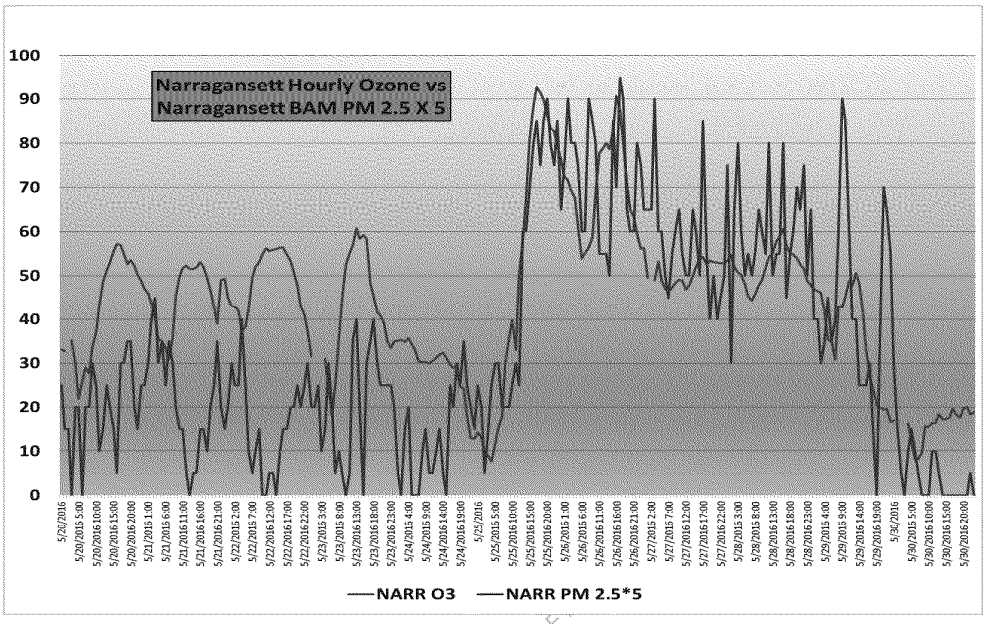
Hourly carbon monoxide versus hourly ozone at East Providence.



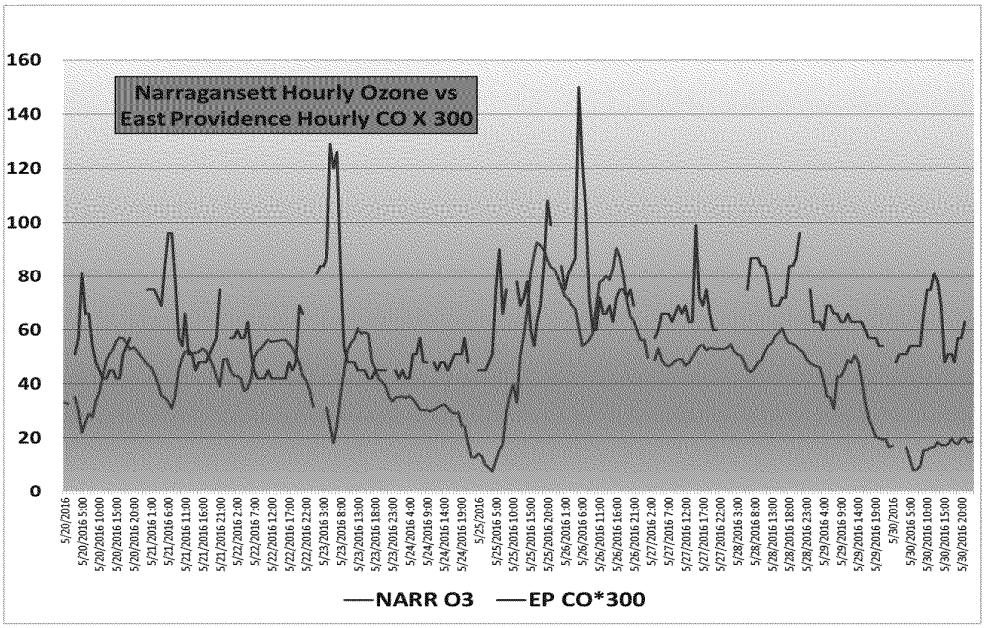
West Greenwich experienced a similar climb for both hourly ozone and hourly PM 2.5 as the plume impacted the monitor early on 5/25/16.



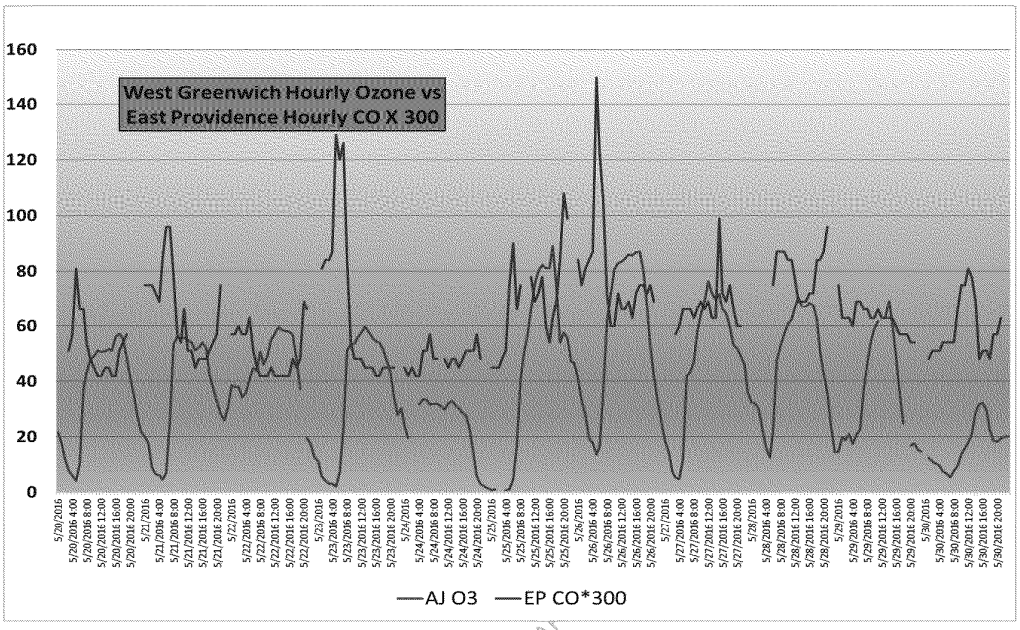
Narragansett hourly ozone and hourly PM 2.5 curves responding to the plume arrival.



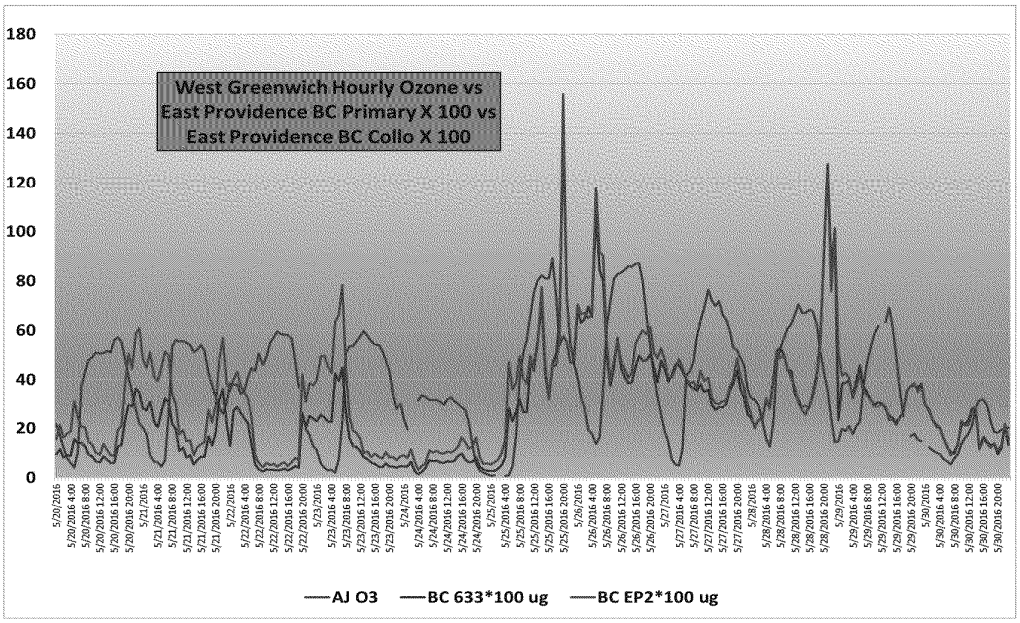
Narragansett hourly ozone and East Providence CO.



West Greenwich hourly ozone and East Providence hourly carbon monoxide.



West Greenwich hourly ozone versus East Providence hourly black carbon and a co-located hourly black carbon, measured by a Magee Scientific AE21 Aethalometer. The co-located black carbon measurements are typically in very good agreement.



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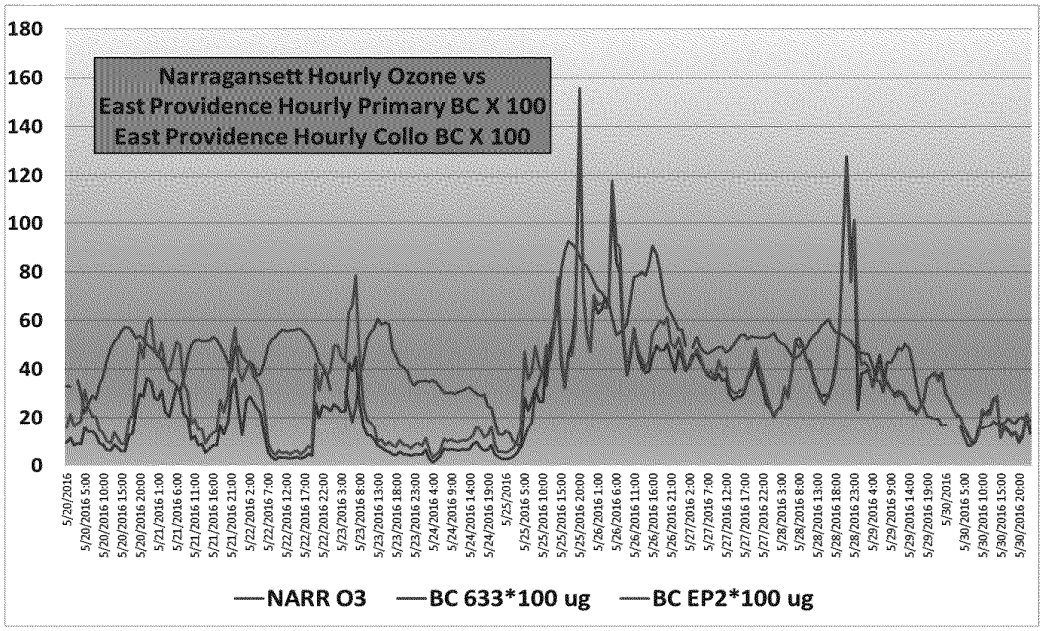
Narragansett hourly ozone versus East Providence hourly black carbon primary and co-located.



Event Caused by Human Activity that is Unlikely to Recur at a Particular Location

Clean Air Act Section 319(b)(1)(A)(iii) defines an exceptional event as "an event caused by human activity that is unlikely to recur at a particular location or a natural event". The current exceptional events rule at 40 CFR Section 50.14(c)(3)(iv)(A) requires that evidence be provided in an exceptional event demonstration that this definition has been met.

There has been no official cause determined for the Fort McMurray fire. However, several Canadian officials have strongly suggested that at the time, there was no ongoing weather pattern that would be able to produce lightning, which according to the Canadian National Fire Database accounts for 47% of fires, with human activity the number one cause. In these instances with a lack of lightning, it is inferred that the cause if human activity, especially in springtime when there is more outdoor human activity.

Below are excerpts of press releases from Canadian news organizations regarding the event with links to the article online.

"*Mike Flannigan, a professor of wildland fires at the University of Alberta, says the fire's proximity to the city, as well as data that shows there were no lightning strikes in the area, lead him to believe the cause of the fire was likely human."*

Flannigan said weather conditions in Western Canada have been perfect for wildfires as the warm, dry winter has led to an abundance of dead, dry leaves and wood ready to light up. "It's really extreme conditions," he said, adding that the low humidity and lack of green vegetation combined with windy conditions contributed to the incredibly intense fire in the northern Alberta city.

http://globalnews.ca/news/2684741/fort-mcmurray-wildfire-likely-caused-by-humans/

From Alberta Senior Wildfire Manager, Chad Morrison....

While the investigation continues into the inferno known informally as 'The Beast,' Chad Morrison told the Globe and Mail on Saturday that the fire was probably the result of human action–a broad category that includes everything from careless ATV drivers to issues with power lines. "Human-caused really means anything other than lightning. It's most likely human caused, but we're continuing to investigate," Mr. Morrison said.

He continues.....

"It wasn't natural," said Mr. Spring of the fire that ignited on May 1. "There was no probability of a fire starting naturally that day. There was no lightning in the forecast, nothing that we look for."

http://www.theglobeandmail.com/news/national/fort-mcmurray-wildfire-most-likely-human-caused-alberta-senior-wildfire-manager-says/article30279836/

The Royal Canadian Mounted Police (RCMP) have been investigating the cause of the fire, which may never be officially determined.

Cpl. Hal Turnbull said this area is popular with hikers and ATV riders.

"It's not an area that's remote and isolated, it's an area that's frequently accessed by the individuals who reside in and around the Fort McMurray area," Turnbull said. Because of the unique scope and magnitude of the fire, Turnbull said, it's only natural that police would investigate the cause.

http://www.cbc.ca/news/canada/edmonton/fort-mcmurray-wildfire-cause-investigation-rcmp-1.3635241

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In a news release, the RCMP said that investigators ruled out lightning as the "probable cause" of the wildfire, which began in early May and prompted a massive evacuation in several Fort McMurray communities. Officials have dubbed the wildfire MWF-009.

As a result, the RCMP is asking for the public's help in the investigation into the cause of the wildfire, which an airborne forestry crew first spotted 15 kilometres southwest of Fort McMurray on May 1.

http://www.ctvnews.ca/canada/fort-mcmurray-wildfire-likely-result-of-human-activity-rcmp-1.2946737

Cpl. Hal Turnbull with the Alberta RCMP K Division said as they rule out natural causes such as lightning, they're left with human activity-related causes.

http://www.metronews.ca/news/calgary/2016/06/14/rcmp-want-publics-help-in-fort-mcmurray-fire-investigation.html

The Exceptional Events Rule (40 CFR 50.1(n)) defines a wildfire as "...any fire started by an unplanned ignition caused by lightning; volcanoes; other acts of nature; unauthorized activity; or accidental, human-caused actions, or a prescribed fire that has developed into a wildfire. A wildfire that predominantly occurs on wildland is a natural event." The 2016 Exceptional Events Rule revisions also codified the following definition of wildland: "Wildland means an area in which human activity and development are essentially non-existent, except for roads, railroads, power lines, and similar transportation facilities. Structures, if any, are widely scattered" (40 CFR 50.1(o)).

Based on the evidence above, the Fort McMurray event qualifies as a wildfire because unplanned human activity or arson is assumed to have caused the unplanned event. EPA generally considers the emissions of smoke and ozone precursors from wildfires on wildland to meet the regulatory definition of a natural event at 40 CFR 50.1(k). This wildfire event occurred predominantly on wildland as noted. Rhode Island DEM has shown that the Fort McMurray wildfire is a natural event and may be considered for treatment as an exceptional event.

Not Reasonably Controllable or Preventable

Clean Air Act Section 319(b)(1)(A)(ii) requires that an exceptional event be "not reasonably controllable or preventable". The current exceptional events rule at 40 CFR Section 50.14(c)(3)(iv)(A) also requires that evidence be provided in an exceptional event demonstration that the event was not reasonably controllable or preventable. This criterion applies to both natural events and events caused by human activity unlikely to recur.

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Below are excerpts of press releases from Canadian news organizations regarding the event with links to the article online.

Few on the front lines had ever seen anything like it. "It's an unprecedented fire with respect to the rate it spread, how it involved the community," said regional fire chief Darby Allen earlier this week, after cooler temperatures and higher humidity allowed crews to get a handle on the fire.

"The way this thing happened, the way it travelled, the way it behaved – they're rewriting their formulas on how fires behave, based on this fire," he said.

"No amount of tankers or resources, or no size of firebreak, could have prevented it from hitting the community that day," Morrison said. "Sometimes Mother Nature is going to do what it wants to do and bad things happen."

https://www.theguardian.com/world/2016/may/15/alberta-wildfire-the-beast-fort-murray-canada

On the first day of May near-record temperatures and bone dry forests created the perfect conditions for a fire to start.

A wildfire crew landed almost immediately after the fire was discovered and began to tackle the two-hectare fire, which is larger than two Canadian football fields. As the crew approached, MWF-009 was already sending sparks into the sky and leaping to the crowns of tall trees.

"When a fire starts at that time it moves to a full crown within minutes. It was in the crowns and rolling by the time the helicopters showed up," Mr. Morrison said. "When these fires occur, Mother Nature is going to do what it's going to do. It's going to challenge us."

http://www.theglobeandmail.com/news/national/fort-mcmurray-wildfire-most-likely-human-caused-alberta-senior-wildfire-manager-says/article30279836/

Based on the information from this demonstration, the Fort McMurray fire started in a wildland ("wilderness area known as the Horse River Trail System") due likely to human activities that authorities have not been able to officially determine. RIDEM is not aware of any evidence clearly demonstrating that prevention or control efforts beyond those actually made would have been reasonable. Therefore, emissions from this wildfire were not reasonably controllable or preventable.

Public Comment

Exceptional Events Rule (40 CFR 50.14(c)(1)(i)) determines that air agencies must "notify the public promptly whenever an event occurs or is reasonably anticipated to occur which may result in the exceedance of an applicable air quality standard." Additionally, according to 40 CFR 50.14(c)(3)(v), air agencies must "document [in their exceptional events demonstration] that the [air agency] followed the public comment process and that the comment period was open for a minimum of 30 days…." Further, air agencies must submit any received public comments to the EPA and address in their submission those comments disputing or contradicting the factual evidence in the demonstration.

RIDEM posts a daily air quality forecast available on the following websites.

http://www.dem.ri.gov/programs/air/air-quality-forecast.php

http://airnow.gov/

Additionally, on days of forecasted exceedances, RIDEM issues a formal press release sent via an email list to stakeholders, notifies all local television stations, the National Weather Service, and posts to social media.

RIDEM posted this exceptional events demonstration and notice of public comment from X to X, which was available at the following URL for a period of 30 days. XXXXXXXX

Public comments to be added later…… DRAFT

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DRAFT

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State of Rhode Island and Providence Plantations
State House
Providence, Rhode Island 02903-1196
401-222-2080

Gina M. Raimondo
Governor

September 27, 2016

Curt Spalding
Regional Administrator
US Environmental Protection Agency Region I
5 Post Office Square, Suite 100
Mail Code: ORA01-4
Boston, MA 02109-3912

Dear Mr. Spalding:

Pursuant to the requirements of Section 107(d)(1) of the Clean Air Act Amendments of 1990, Rhode Island is hereby submitting its recommendation for the State's attainment status designation for the 2015 revised National Ambient Air Quality Standard (NAAQS) for ozone. Section 107(d)(1) defines nonattainment areas as areas that do not meet, or that contribute to ambient air quality in a nearby area that does not meet, the NAAQS for a pollutant.

A site is in violation of the eight-hour NAAQS if the monitored design value for that site is greater than 70 parts per billion (ppb). The design value is calculated by averaging the fourth highest maximum daily eight-hour ozone concentration measured at a site each year in three consecutive years. The eight-hour ozone design values for the three Rhode Island ozone monitoring sites for the most recent three-year period with certified data, 2013 – 2015, are included in the table below.

Site	County	Design Value (ppb)
W. Greenwich	Kent	70
Narragansett	Washington	73
E. Providence	Providence	70

The design value for the Narragansett monitoring site exceeds 70 ppb. On the basis of the most recent certified data (2013 – 2015), our designation recommendation should be nonattainment. However, we ask that the EPA consider 2014 – 2016 data when making the designation decision. The 2014 – 2016

data set is preliminary and not yet certified, however it will be certified by the time EPA is required to make its designation for the 2015 ozone NAAQS. The eight-hour ozone design values for the three Rhode Island ozone monitoring sites for the 2014 – 2016 three-year period were calculated as follows:

Site	County	Design Value (ppb)
W. Greenwich	Kent	70
Narragansett	Washington	70
E. Providence	Providence	68

No monitoring site in Rhode Island would exceed the 70 ppb standard based on this data set. Therefore, we ask that you consider a designation recommendation of attainment per the 2014 – 2016 data set.

The EPA's guidance for designating areas for the 2015 revised ozone NAAQS[1] states that the EPA intends to consider information relevant to designations associated with counties in the Combined Statistical Area (CSA) or the Core Based Statistical Area (CBSA) associated with the violating monitor for determining the boundaries of a nonattainment area. The Rhode Island monitors are located in the Providence–Warwick, RI-MA CBSA, which includes all five of the Rhode Island counties as well as Bristol County in Massachusetts.

For ease of administration, I am recommending that, as with previous ozone NAAQS, the Rhode Island 2015 ozone nonattainment (or attainment) area be defined by the boundaries of the State of Rhode Island, rather than the boundaries of the CBSA.

Rhode Island is keenly aware that the State's ozone levels are strongly influenced by upwind states' emissions. Therefore, for Rhode Island's ozone air quality to continue to improve, it is essential for the EPA to fully address significant contribution responsibilities of upwind states under section 110(a)(2)(D) of the Clean Air Act.

If you have any questions about this issue, I encourage you to contact Douglas McVay or Laurie Grandchamp at the Rhode Island Department of Environmental Management's Office of Air Resources at (401) 222-4700.

Sincerely,

Gina M. Raimondo
Governor

1 Memo from Janet G. McCabe, Acting Assistant Administrator, US EPA, to Regional Administrators, "Area Designations for the 2015 Ozone National Ambient Air Quality Standards," February 25, 2016.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Region 1
5 Post Office Square
Boston, MA 02109-3912

March 3, 2017

Mark Wert
Massachusetts Department of Environmental Protection
One Winter Street, 7th floor
Boston, Massachusetts 02108

Dear Mr. Wert:

Thank you for the opportunity to review and comment on your draft exceptional event demonstration, shared with us on February 17, 2017, for the Ft. McMurray wildfire. The Massachusetts Department of Environmental Protection (MassDEP) is proposing the demonstration under the exceptional events rule at 40 CFR 50.14 to show that the elevated ozone concentrations recorded at Chicopee and Ware monitoring locations on May 25 and 26, 2016 were the result of high levels of ozone and ozone precursors being transported within the smoke plume to Massachusetts.

EPA Region 1 has reviewed MassDEP's draft demonstration and is providing comments to strengthen the discussion. You will find the Agency's comments in the enclosure.

If you have any questions regarding this matter, please contact Eric Wortman at 617-918-1624, or Catie Taylor at 617-918-8607.

Sincerely,

David B. Conroy, Chief
Air Programs Branch

Enclosure

cc: Steven Coughlin, MassDEP
Glenn Keith, MassDEP
Glenn Pacheco, MassDEP

Enclosure

EPA Comments on the Draft Exceptional Events Demonstration for the Ft. McMurray Wildfire Event in May 2016 Massachusetts Department of Environmental Protection

The Massachusetts Department of Environmental Protection (MassDEP) provided EPA a draft exceptional events demonstration on February 17, 2017 for air quality impacts from the 2016 Ft. McMurray wildfire. The draft submittal requests the exclusion of 8-hr ozone (O_3) monitoring data on May 25-26, 2016 for the Chicopee and Ware monitoring locations in western Massachusetts. The comments below are based on EPA's review of the draft submittal.

1. On Page 1, it is mentioned that "…ozone was monitored and recorded at 15 monitoring locations." We think it would be useful to mention that there is also an additional site operated by the Wampanoag Tribe on Martha's Vineyard, as shown on the map on page 7.

2. On Page 3, 4th paragraph, the term "AP-42" should be defined for the public.

3. On Page 5, MassDEP should consider adding two columns to Table 1 in Section 2 to indicate the critical 4th high value for 2017 to help demonstrate the regulatory significance of the exceptional event. For example, the calculations provided in the revised Table 1 below show that with the May 25-26 data excluded, the 4th high 8-hour ozone average in 2017 must stay below 72 parts per billion (ppb) at Chicopee compared with 67 ppb to stay in attainment of the 70 ppb NAAQS. This is a significant difference and part of the rationale for pursuing this exceptional events demonstration.

	Current Values					**If May 25-26 Removed**		
	2014	2015	2016	**2014-2016**	2017	2016	**2014-2016**	2017
	4th High	4th High	4th High	**Design Value**	Critical Value	4th High	**Design Value**	Critical Value
Chicopee	65	70	76	**70**	67 71		**68**	72
Ware	68	71	72	**70**	70 70		**69**	72

4. MassDEP should note the references for wildfire data in Section 6 of the document.

5. MassDEP should consider using time-lapse animation links to help illustrate the time sequence of smoke moving across the central / northeastern U.S. in Figure 2 in Section 6. Note that any use of animated technology should be able to be easily viewed by the public as

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part of the public comment period and used to supplement the figures provided in the demonstration.

Additional satellite imagery during the transport event for the Great Lakes and Upper Midwest and subsequent movement to the east coast would also help provide the public and interested reviewers with a more complete picture of the movement of smoke from Fort McMurray to the affected monitors. Currently, the satellite still imagery cuts off in the western Great Lakes region. Satellite images of New England may show smoke was in the area on May 25-26.

Local webcams in the area may also provide supplemental information about whether or not smoke was found locally at ground level at either Chicopee, Ware, or other nearby locations on the dates considered for this exceptional events request. Ideally, this could provide corroborating information both during smoke filled, and clean days.

6. In Section 7, the conceptual model for ozone formation from the Fort McMurray wildfire should include a more robust discussion related to ozone production due to fire-related ozone precursors. The discussion should include the potential mechanisms for ozone production near and far from the fire (fresh emissions versus aged emissions) and information highlighting potential ozone production aloft and at ground level. The conceptual model should speak to areas of uncertainty as well as areas of scientific consensus. This discussion should help the public and other interested reviewers understand subsequent information presented further on in the demonstration's depiction of ground-level measurements typically associated with smoke.

7. In Section 7, it may be beneficial to include a discussion related to elevated ozone concentrations, meteorological conditions, and smoke conditions in the Upper Midwest/ Great Lakes Region and/or Upstate New York on the days preceding May 25-26, 2016.

8. In Section 7 on Page 12, the third paragraph reads, "The model forecasts under-predicted the observed levels by up to 10 ppb. This negative bias in the model is evidence of the influence of the smoke plume on ozone concentrations." It is important to note that Figures 4 and 5 seem to show the exact opposite effect in the southeast United States, particularly on May 19, 2016. The National Oceanic and Atmospheric Administration (NOAA) Community Multiscale Air Quality (CMAQ) model has over-predicted and under-predicted ambient ozone concentrations. Several potential explanations for this lack of predictability may be possible. MassDEP should consider providing data to support model performance from NOAA. MassDEP is encouraged to consider more broadly CMAQ model results in bolstering its argument that smoke alone was the cause of the model's under prediction of ozone.

9. If smoke from fires (Mexico/Yucatan, Georgia/South Carolina and/or Texas) other than the Fort McMurray fire (Figure 6, Page 17) are considered important in the narrative, then some

additional discussion related to fire-related smoke from these fires, their transport, and potential effects needs to be built into the narrative. As written, the contribution and significance of these additional fires is not described in this exceptional event request. It should either be better described or dropped from the demonstration narrative entirely.

10. MassDEP should provide additional information explaining Figure 10. Also, Figure 10 should be defined as Figure 10a, 10b, 10c, and 10d.

11. Pages 27 and 28. MassDEP should include additional figures similar to Figures 13 and 14 that include the data for entire ozone seasons for 2011-2016. Similar to Figures 13 and 14, MassDEP should provide the 99th percentile statistics on the additional figures. This will show if the concentrations recorded during May 25- 26, 2016 are unusual compared to the full ozone season over the last six years.

12. MassDEP should provide wind rose vs ozone concentrations plots for the Chicopee and Ware monitors for multiple years with explanation(s) regarding what the data means. This will illustrate the prominent wind direction during times of elevated ozone. The first two figures below (Figures 1 and 2) are wind roses from AirNow-Tech for calendar years 2012 through 2016. Figures 3 through 7 show the wind roses for the May through September time periods for 2012 through 2016, and allow the reader to better see the wind directions associated with moderate and higher air quality.

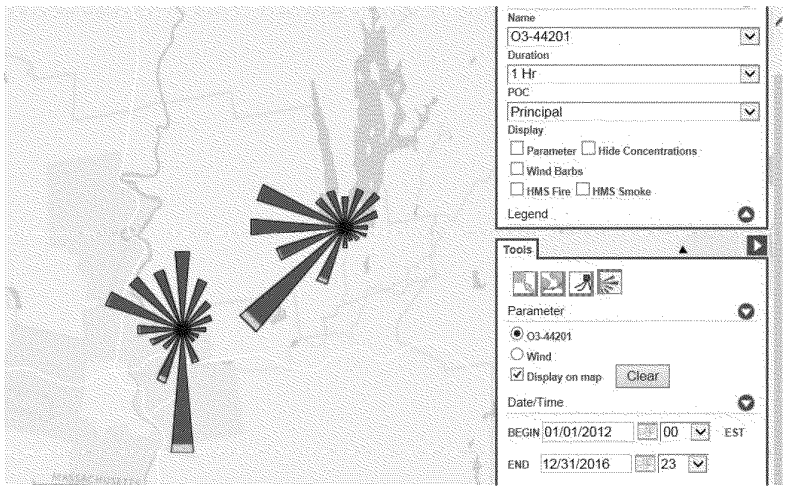


Figure 1: Example Ozone Rose (2012 - 2016) from AirNow-Tech

Figure 2: Same Ozone Rose as Figure 1 with back trajectories from May 25

Figure 3: Ozone Rose May 1 - Sept 30, 2012

Figure 4: Ozone Rose May 1 - Sept 30, 2013

Figure 5: Ozone Rose May 1 - Sept 30, 2014

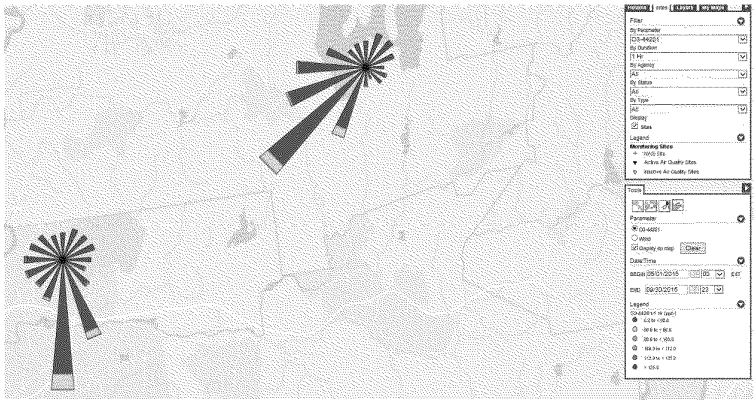
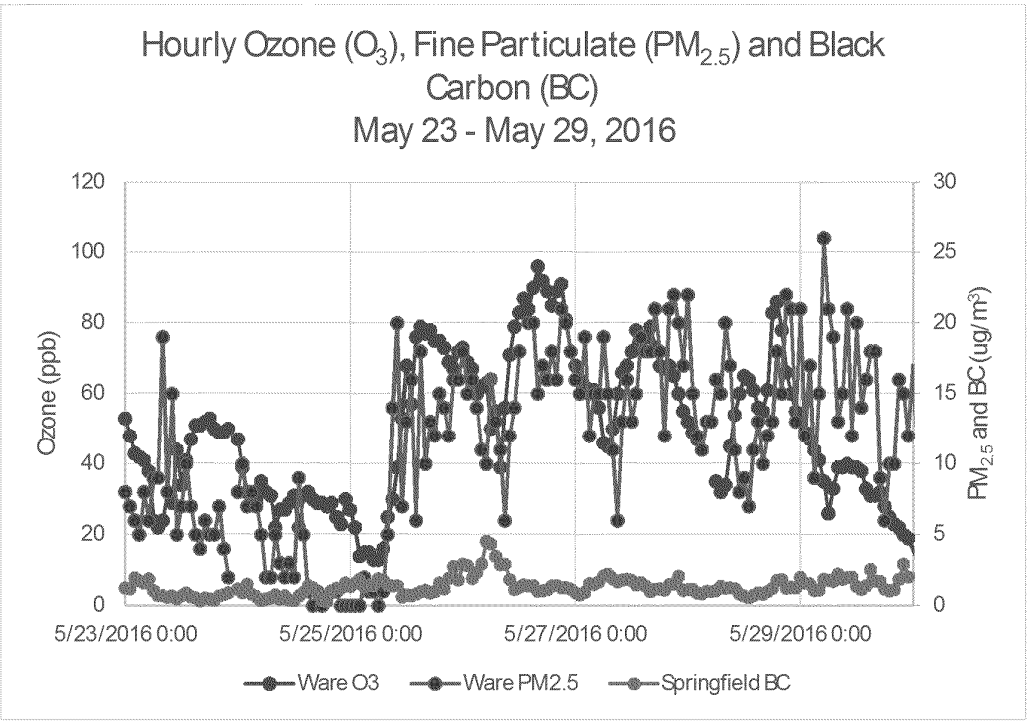


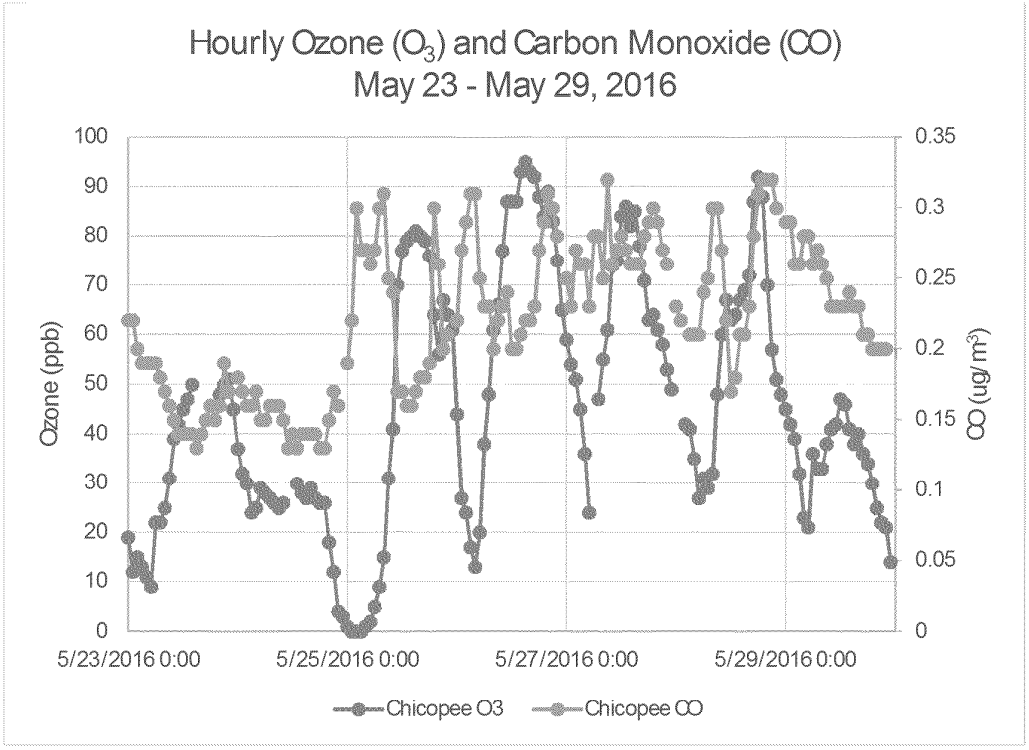
Figure 6: Ozone Rose May 1 - Sept 30, 2015

Figure 7: Ozone Rose May 1 - Sept 30, 2016

13. Page 31-33 (Figures 17-19). MassDEP should provide hourly concentrations of O_3, CO, continuous $PM_{2.5}$, BC and other related ambient air measurements such as delta C (calculated from aethalometers) for the period beginning May 23rd and ending May 29th. While all these measurements are not available at Chicopee or Ware, we believe including this information from nearby Springfield or even Greenfield may provide useful information. Additional information such as Chemical Speciation Network (CSN) data from Chicopee, or upwind areas may also be beneficial. MassDEP could also provide plots of O_3, CO, $PM_{2.5}$, and BC (and delta C) for non-event days to assist with comparisons in Section 10, beginning on page 38.

See the examples below of data analysis that may be useful.





14. Page 33, section 9. The second paragraph suggests that these back trajectories were done for ***500***m, 1000m and 1500m. Figures 20-33 (figure 29 is missing) all seem to indicate that the trajectories were done at ***100*** meters, 1000 meters and 1500 meters. Please correct that narrative. The graphics should be expanded as much as possible to make them as legible as possible. In addition, we believe that the spaces between "dots" on the back trajectory represent 6 hours of time. MassDEP would serve the public well by better explaining exactly what this graphic means to the lay person, including the different elevation trajectories, and the concept that longer "spaces" between "dots" implies faster wind speeds and other relevant material.

15. MassDEP should consider providing an analysis of daily NOx emissions from upwind electric generating units during the 2016 ozone season. This data is available from EPA's Air Markets Program Data (AMPD) website and will likely show that the May 25-26 time period was not a period of peak electricity demand in the Northeast with associated higher NOx emissions. Alternatively, MassDEP can point to the analysis of NOx sources already completed by the Connecticut Department of Energy and Environmental Protection (CT DEEP) and include this analysis as an appendix.

16. Regarding the public notice, EPA has no comments on the language of the notice but we do recommend broad distribution of the notice to the lists routinely used by MassDEP for notification of air quality regulations, permits, and air monitoring network plans.

Final Ozone NAAQS
- PAMS and Enhanced Monitoring Plans-
Ambient Air Monitoring in NESCAUM

Robert Judge
Air Monitoring Coordinator
EPA- Region 1

Providence, RI – December 7, 2016

ED_001361_00001147

ED_001361_00001147

Overview

The Photochemical Assessment Monitoring Station (PAMS) program (required by CAA) requires areas to collect enhanced ambient air measurements related to ozone. The rulemaking for the final 2015 ozone NAAQS included significant revisions to the PAMS requirements (80 FR 65292; October 26, 2015).

The first significant change was to only require PAMS sites at NCore sites in CBSAs of 1 million population or more, regardless of attainment status.

The second significant change required that States with Moderate and above 8-hour O_3 nonattainment areas and all states in the Ozone Transport Region to develop and implement an Enhanced Monitoring Plan (EMP) detailing enhanced O_3 and O_3 precursor monitoring activities to be performed.

PAMS Monitoring Requirements

-Require PAMS monitoring at existing NCore monitoring site(s) in large urban areas with a population of 1,000,000 or more. (NCore is a multi-pollutant monitoring network for particles, gases and meteorology.) This change reduces the required number of PAMS sites while improving national geographic distribution and reduces "redundancy" in the PAMS network. At a minimum, PAMS measurements must be performed in June, July, and August (not linked to the "season" where ozone must be measured*).

-Required NCore/PAMS sites are to measure ozone, nitrogen dioxide, NOx, NOy, hourlyspeciated VOCs, three 8-hour averaged carbonyls on every third day, and hourly averaged mixing height, in addition to a number of other meteorological parameters (e.g. wind speed and direction). EPA has included a waiver option that would allow the use of less frequent, longer-averaged VOC measurements in limited situations, and the possibility of meteorological measurements at nearby locations. EPA has also provided waiver provisions to substitute near-by PAMS sites to meet "PAMS at NCore" requirements. ("Waivers" require EPA approval.)

-Enhanced Monitoring Plans (EMPs) are required to be developed and implemented by monitoring agencies with moderate (and above) ozone nonattainment areas and *by states in the Ozone Transport Region (OTR).* These EMPs provide agencies with some flexibility to collect additional data that are needed to better understand and control their ozone pollution problems.

-According to the CFR, states will need to comply with the new PAMS monitoring requirements (begin operation) at NCore sites by June 1, 2019. Enhanced Monitoring Plans will be due within two years after EPA designates nonattainment areas or by Oct. 1, 2019*, whichever is later.

*Details/ clarification follow on later slides.

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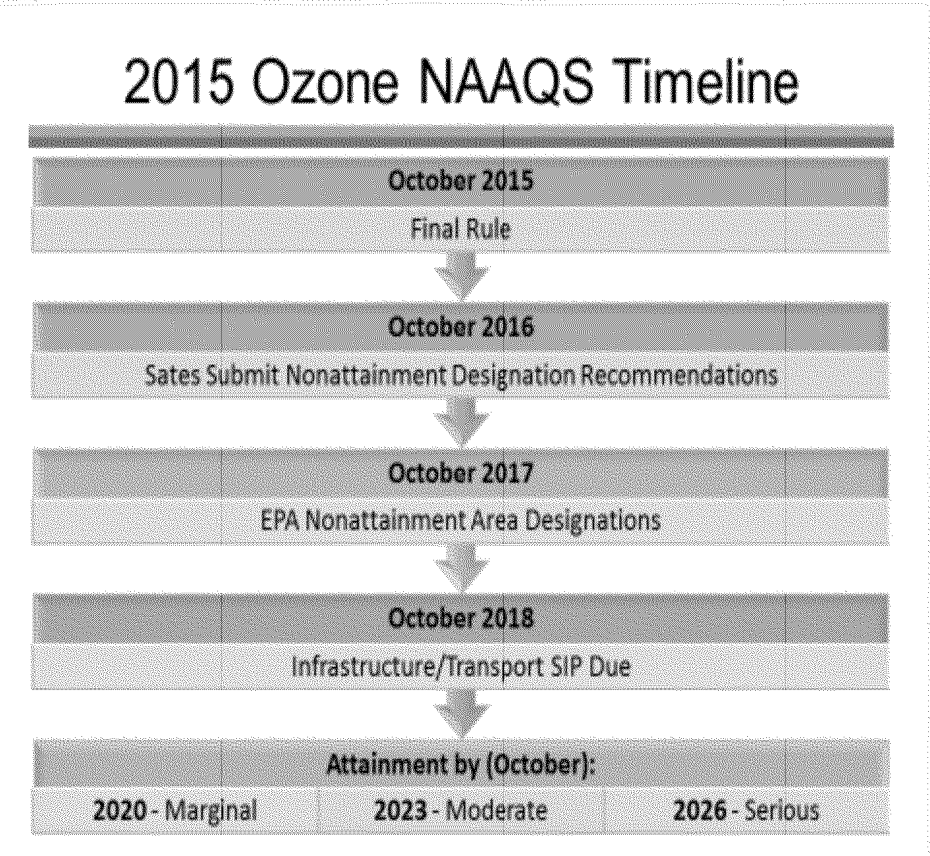
Timeline for designations and implementation

- This process is laid out in the Clean Air Act and some of the key milestones for ozone and PAMS are shown here.



NCORE/PAMS Timeline

Draft PAMS Implementation Plans for **required** NCORE/PAMS sites including any waivers by May 1, 2017 for 30 day Notice to Public.

Final Implementation Plans (and waivers) submitted (with the Annual Monitoring Network Plan (AMNP)) by July 1, 2017.

Based 120 day EPA review of Implementation Plans/ waivers… expect formal response/ approval by EPA on October 31, 2017.

*Schedule set to help meet the "operational" requirement by June 1, 2019.

EMP Timeline

Enhanced Monitoring Plans (EMPs) for the OTR

Although the regulation requires that these EMPs be submitted by October 1, 2019 (or two years after the effective date of a designation to a classification ≥Moderate for O3 nonattainment area whichever is later)…

But PAMS Implementation Guideline suggests the following schedule…

Draft EMPs (for ≥Moderate NA areas and State in the OTR) should be submitted to EPA Regional Offices by May 1, 2018 (as with any AMNP for 30 day public notice)

Final EMPS should be submitted to the Regions along with the final AMNP by July 1, 2018.

Based on EPA 120 day review, formal response by Regions by October 31, 2018.

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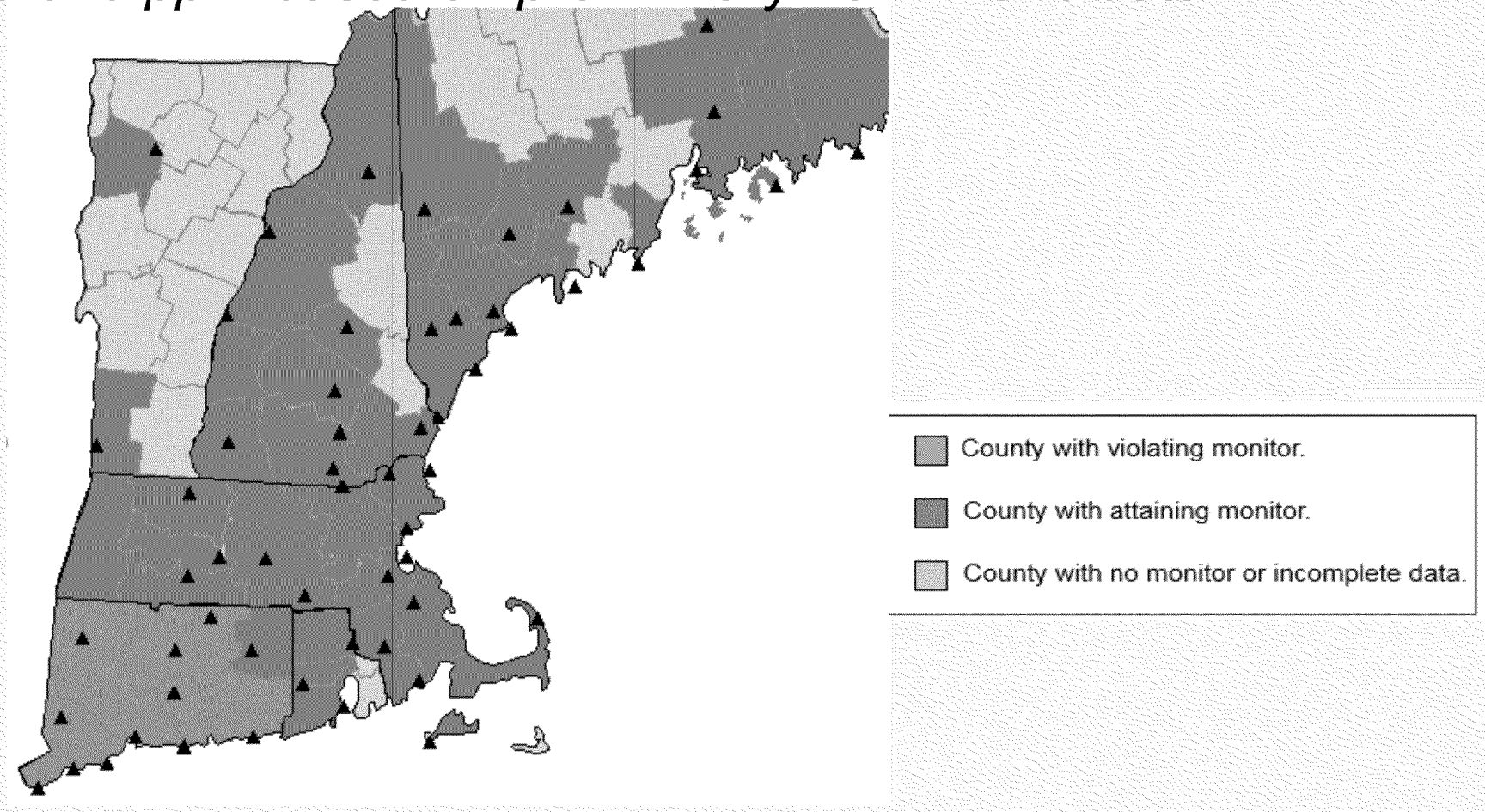
Status of Counties under 8-hour ozone NAAQS of 0.070 ppm based on preliminary 2014-2016 data.



Also see:
http://ozoneairqualitystandards.epa.gov/OAR_OAQPS/OzoneSliderApp/index.html#

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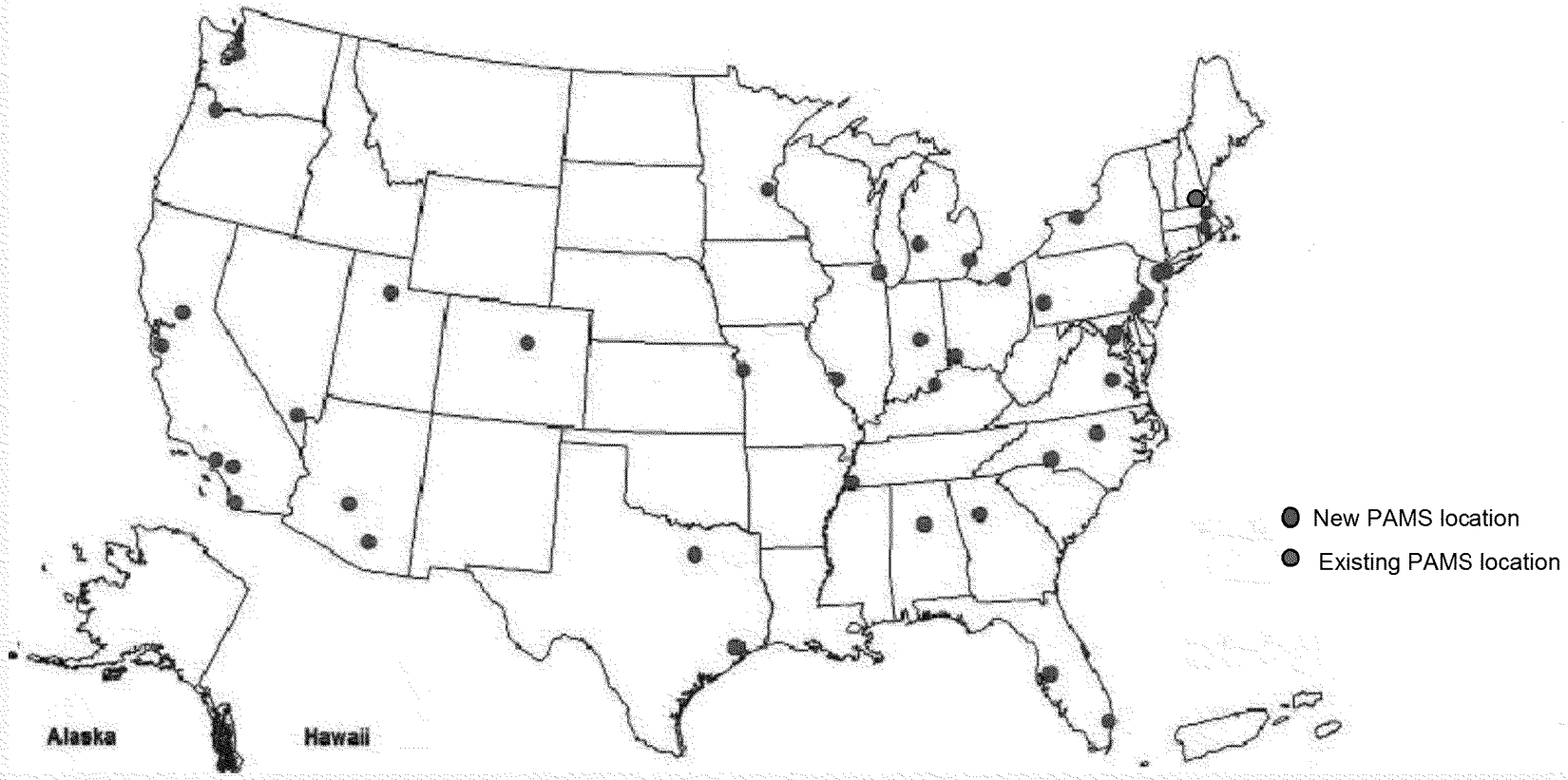
Estimated location of required PAMS locations based on final network design requirements

(ie, NCore sites in CBSAs with greater than 1,000,000 population)



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Regulatory Revisions Finalized for PAMS

- Require PAMS at all NCore sites in CBSAs with a population greater than 1,000,000.
- In Region 1, this includes NCore sites at **East Providence, RI; Roxbury, MA; and Londonderry, NH.**
- In Region 2, this includes NCore sites at **Rochester, NY; Queens College, NY; and Newark Firehouse, NJ.**
- Require PAMS during PAMS season (June, July, August) at the above NCore sites but allow for Regional approval of alternative PAMS site.
  - Require sites to collect hourly VOC data*
  - Require sites to collect carbonyls (3 8-hour samples daily) on a 1 in 3 schedule (or hourly formaldehyde)
  - Require sites to measure "true NO_2" in addition to current NOy
  - Change requirement for upper air meteorology to requirement for measuring mixing height*

**EPA included a waiver option that will allow the use of less frequent, longer-averaged VOC measurements in limited situations, and the possibility of meteorological measurements at nearby measurements.*

- Require all O_3 moderate (or worse) NA areas and States in the OTR (i.e. all of NESCAUM and more) to also develop and implement an "enhanced ozone monitoring plan"
  - Could include additional O_3 sites; additional NO2, NOx and/or NOy sites; additional VOC measurements (different time periods or different locations); enhanced upper air measurements; etc.

EPA intends to redistribute available PAMS funding to support the new requirements.

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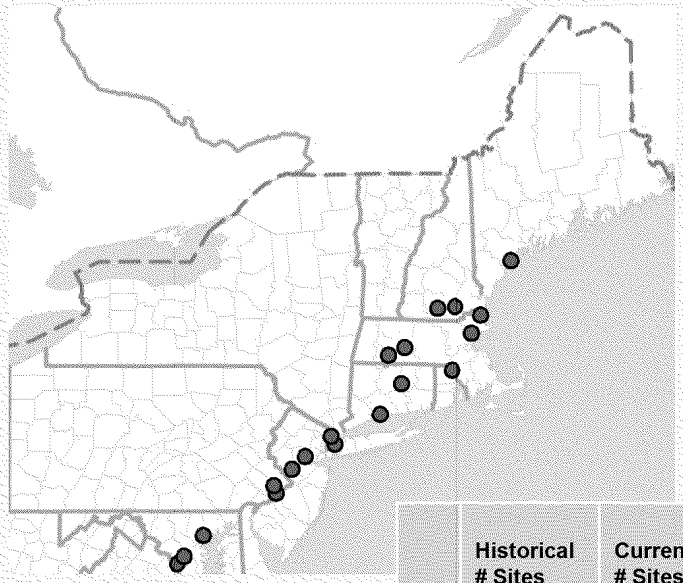
PAMS/EMPs

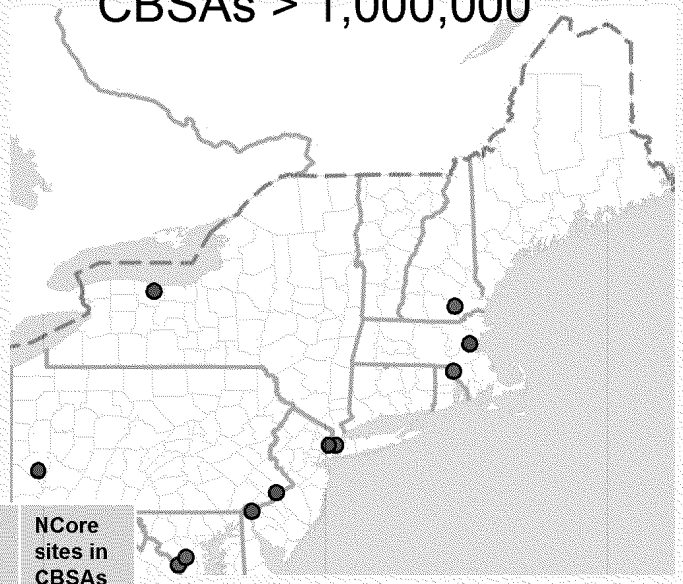
Current PAMS Sites



New PAMS location

Existing PAMS location

NCore sites in CBSAs > 1,000,000



	Historical # Sites	Current # Sites	NCore sites in CBSAs >1M
CT	4	0	
MA	8	4	1
ME	2	1	
NH	2	2	1
RI	2	1	1

New PAMS Requirements

- PAMS collocated with all existing NCore sites in areas with pop. of 1 million or more.
- All moderate and above NAs and **all OTR states** to develop and implement an enhanced ozone monitoring plan.

Schedule:

- PAMS monitoring at NCore sites will become effective by June 1, 2019.
- EMPs submitted within two years of designations.

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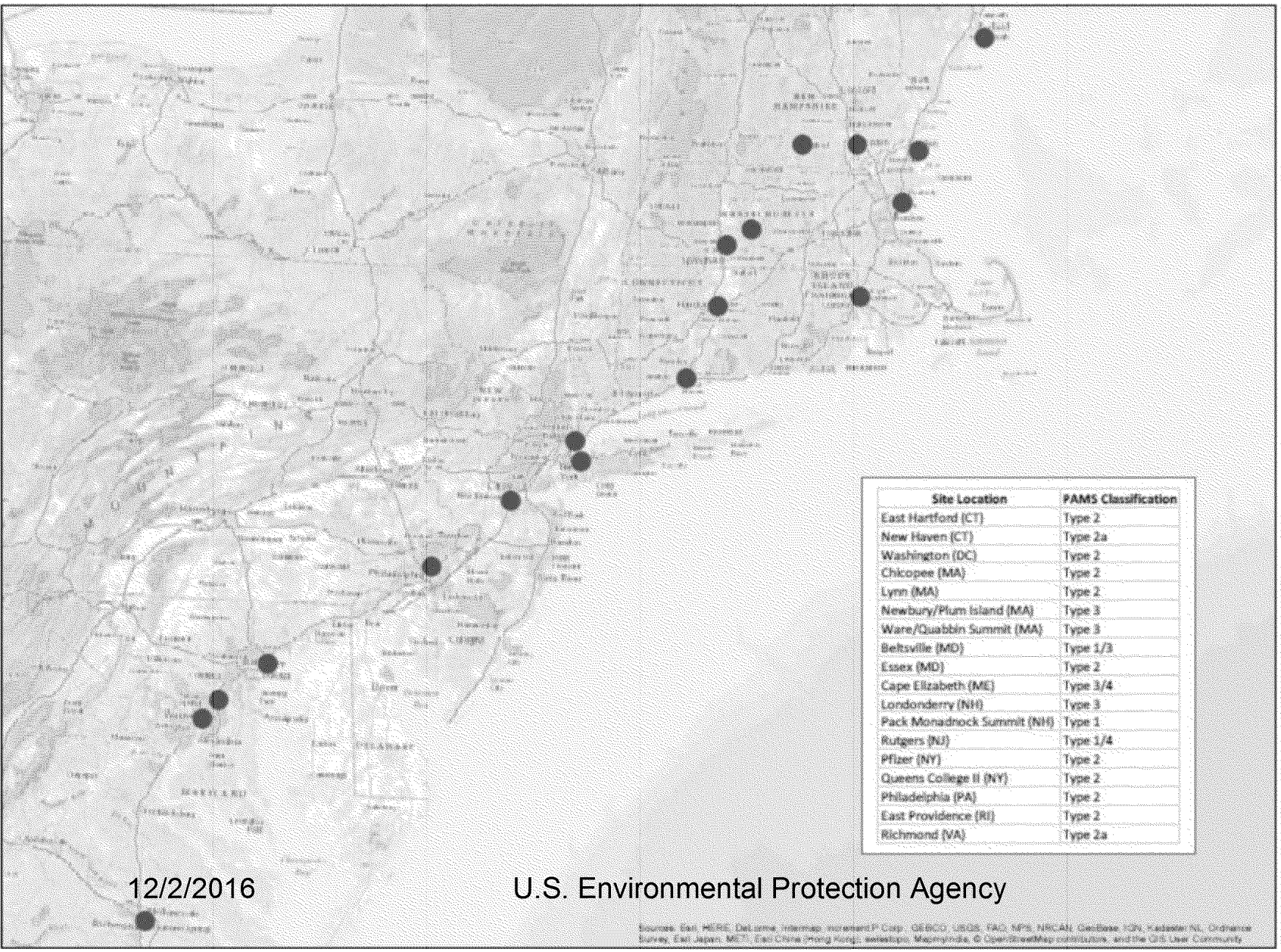
Active PAMS Sites in the Northeast



Site Location	PAMS Classification
East Hartford (CT)	Type 2
New Haven (CT)	Type 2a
Washington (DC)	Type 2
Chicopee (MA)	Type 2
Lynn (MA)	Type 2
Newbury/Plum Island (MA)	Type 3
Ware/Quabbin Summit (MA)	Type 3
Beltsville (MD)	Type 1/3
Essex (MD)	Type 2
Cape Elizabeth (ME)	Type 3/4
Londonderry (NH)	Type 3
Pack Monadnock Summit (NH)	Type 1
Rutgers (NJ)	Type 1/4
Pfizer (NY)	Type 2
Queens College II (NY)	Type 2
Philadelphia (PA)	Type 2
East Providence (RI)	Type 2
Richmond (VA)	Type 2a

PAMS Site Locations:

● Active

Date: December 14, 2015

Map Projection: GCS NAD83

Data Sources:
PAMS Site Locations - U.S. EPA Air Data (2015);
Base Map - ESRI (2015).

0 30 60 mi
0 40 80 km

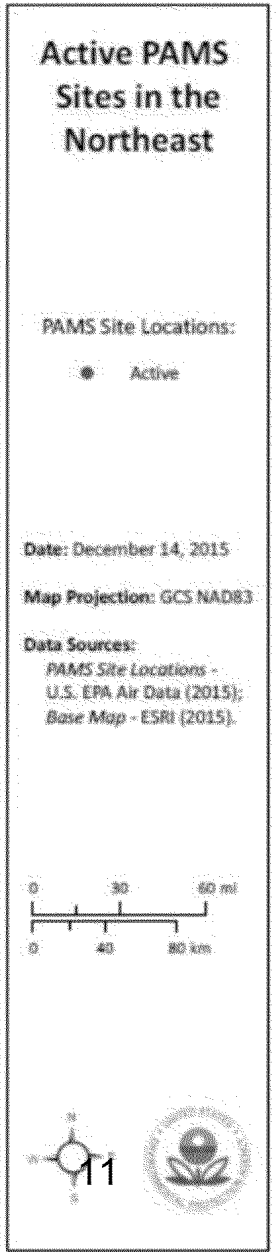
Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

What should the PAMS/ Enhanced Monitoring Program look like going forward?

What are your ideas?

How can EPA help, particularly for EMPs?

Site Location	PAMS Classification
East Hartford (CT)	Type 2
New Haven (CT)	Type 2a
Washington (DC)	Type 2
Chicopee (MA)	Type 2
Lynn (MA)	Type 2
Newbury/Plum Island (MA)	Type 3
Ware/Quabbin Summit (MA)	Type 3
Beltsville (MD)	Type 1/3
Essex (MD)	Type 2
Cape Elizabeth (ME)	Type 3/4
Londonderry (NH)	Type 3
Pack Monadnock Summit (NH)	Type 1
Rutgers (NJ)	Type 1/4
Pfizer (NY)	Type 2
Queens College II (NY)	Type 2
Philadelphia (PA)	Type 2
East Providence (RI)	Type 2
Richmond (VA)	Type 2a



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Final Ozone Monitoring Season in Region 1 and 2 (NESCAUM)

- **Connecticut (March 1- Sept. 30)**
- **Maine (April 1- Sept. 30) *(unchanged)***
- **Massachusetts (March 1- Sept. 30)**
- **New Hampshire (March 1- Sept. 30)**
- **Rhode Island (March 1- Sept. 30)**
- **Vermont (April 1- Sept. 30) *(unchanged)***
- **New Jersey (March 1 – Oct. 31)**
- **New York (March 1 – Oct. 31)**

- Ozone monitoring at NCore stations to be January – December (year round) regardless of location

- Implementation Deadline – revised season requirements to be effective on first day of ozone monitoring season in **2017** for existing stations.

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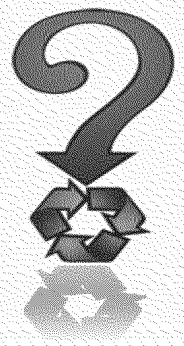
Questions?

- **Bob Judge**
- **Judge.robert@EPA.GOV**

617-918-8387



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Q/d Analysis

EPA guidance [Guidance on the Preparation of Exceptional Events Demonstrations for Wildfire Events that May Influence Ozone Concentrations, Final, EPA, September 2016] recommends conducting a Q/d analysis as a rough assessment of the ability of a wildfire to cause increased ozone concentrations. The Q/d analysis is simply a comparison of the ration of Q, the daily tons of VOC and NOx emitted from the fire, to d, the distance in kilometers from the fire to the point of concern. If the Q/d value compares favorably to analytical data from other fires, then the fire can be presumed to have had a causal effect on ozone concentrations at the point of concern.

EPA guidance indicates that a fire should have a Q/d in excess of 100 tons per day per kilometer (tpd/km) in order to be considered to have a clear causal impact on ozone. EPA developed this value based on analyses of four fires which occurred in 2011.

Estimate of Q

The emissions from the fire can be estimated using information from EPA's AP-42 Compilation of Air Emission Factors Section 13.1 Wildfires and Prescribed Burning. The equations given are as follows:

$F_i = P_i * L$ (Equation 1)
$E_i = F_i * A$ (Equation 2)

F_i = emission factor (mass of pollutant/unit area of forest consumed)
P_i = yield for pollutant "i" (mass of pollutant/unit mass of forest fuel consumed)
= 12 kg/Mg (24 lb/ton) for total hydrocarbon (as CH_4)
= 2 kg/Mg (4 lb/ton) for nitrogen oxides (NO_x)
L = fuel loading consumed (mass of forest fuel/unit land area burned)
A = land area burned
E_i = total emissions of pollutant "i" (mass pollutant)

Combining equations 1 and 2, we have:

$E_i = P_i * L * A$

Pi is given above for total hydrocarbons and for nitrogen oxides. The fuel loading is given in AP-42 for different regions of the United States and ranges from 9 to 60 tons per acre. Conservatively, we will estimate a low end emission rate using 10 tons per acre which is associated with North Central US conifer forests. Note that our results could increase by a factor of 6 were we to expect the high end of emissions.

The Alberta government reported that by June 10, 2016 the fire ultimately covered 589,995 hectares (1,457,909 acres) with a perimeter of 996 kilometers (618 miles). For reference, the total land area of Rhode Island is approximately 270,000 hectares.[1] The chart below indicates

[1] Any large area estimate can only be considered comprehensible if compared to the State of Rhode Island.

the total area covered by the fire as reported by the Alberta government[2]. During the week prior to the exceptional event in Connecticut the fire grew by approximately 60,000 hectares (148,263 acres).

Therefore, ignoring the smoldering of approximately 500,000 hectares we estimate the total hydrocarbon emissions from the week to be:

Ehc = 24 lbs of HC / ton of forest fuel consumed * 10 tons fuel / acre * 148,263 acres

Ehc = 35,583,120 pounds of HC

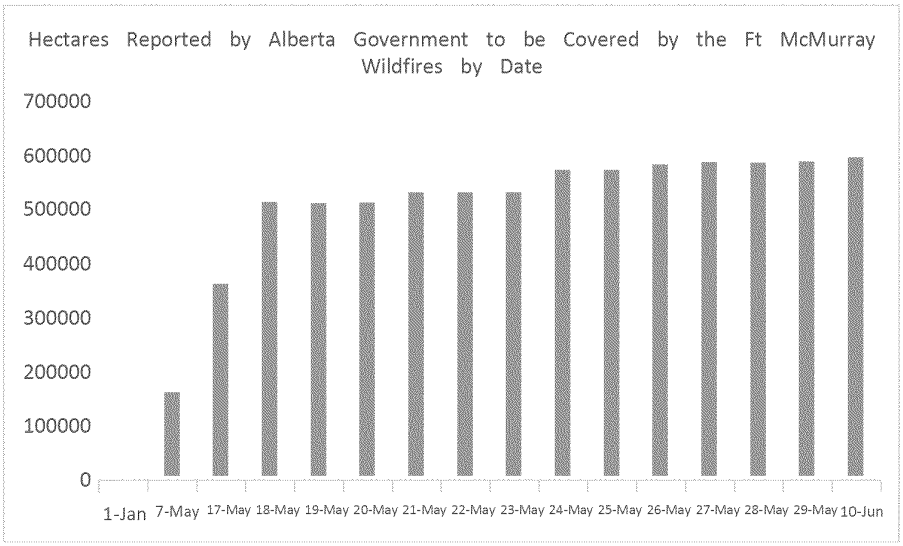
Ehc = 17,791 tons of HC emitted during the period from May 19 to May 24

Similarly for NOx:

Enox = 4 lbs of NOx / ton of forest fuel consumed * 10 tons fuel / acre * 148,263 acres

Enox = 5,930,520 pounds of NOx

Enox = 2,965 tons of NOx emitted during the period from May 19 to May 24



[2] https://www.alberta.ca/release.cfm?xID=41701E7ECBE35-AD48-5793-1642C499FF0DE4CF [Final Update 39: 2016 Wildfires (June 10 at 4:30 p.m.), Alberta Government]

Q is the total daily emission rate in tons per day of reactive hydrocarbons and nitrogen oxides. EPA recommends, in the exceptional events guidance, that only 60% of the hydrocarbons should be considered reactive. Therefore the reactive hydrocarbon emissions become rHC = 0.6 * Ehc or 0.6 * 17,991 = 10,794 tons of reactive HC emitted during the period of interest. No adjustments are suggested for the NOx emissions. Therefore the total rHC and NOx emissions over the period are 10794 + 2965, or 13,759 tons over the six days. On average this results in a daily emission rate, or Q, of 2293 tons per day.

Estimate of d

Based on the large distance, we will not present individual analyses for each monitor in Connecticut but estimate the distance from the Fort McMurray fire to the most distant point in Connecticut. We will therefore use a value of d of 3286 kilometers, the flight distance from Fort McMurray to Stonington, CT.

Q/d Estimate

Using the values determined above, Q/d then becomes 2293 tpd divided by 3286 km or 0.69 tpd/km. This value is well below the EPA recommended level of 100 tpd/km indicating clear causality.

{this table may be used to calculate Q/d – and will not appear in this form in the final}

acres	Ehc	Enox	Q	d	q/d	q/d per day	
148263	17791.56	2965.26	13640.2	3286	4.151003	0.691834	as explained above
1457909	174949.1	29158.18	134127.6	3286	40.8179		if the entire area burned in
	0	0	0	3286	0		
	0	0	0	3286	0		
	0	0	0	3286	0		
	0	0	0	3286	0		
	0	0	0	3286	0		

Taking a less conservative approach and using the maximum extent of the burn area over the life of the fire, the result would be a Q/d of 40.8 tpd/km. Still sufficiently below the EPA recommended threshold for establishing clear causality. Recalling that a worst case fuel loading would increase our results by a factor of six, Q/d would in this case result in 240 tpd/km and would indicate clear causality. While this approach might be justified by the ongoing smoldering of the peat, the intensity of the Fort McMurray fire, variability in the burn rate and

other factors, it is difficult to justify without further details that may only be obtained through estimates which introduce their own error.

Taking a slightly different approach we consider the basis for the EPA guidance and look at emissions from one of the four fires EPA relied on in developing their guidance. Appendix A2 of the EPA guidance indicates that EPA based their conclusions on 12 km grid CMAQ modeling of four 2011 multiday fires: Wallow, Waterhole, Big Hill and Flint Hills. Emissions from the fires were based on a program called SMARTFIRE. Using information available on the Wallow Fire, we approximate the emissions that might be calculated for the Fort McMurray fire.

The Wallow Fire burned in eastern Arizona and western New Mexico from May 29, 2011 through July 8, 2011 and burned 841 square miles (538,240 acres) by June 26th. The maximum daily emissions from that fire were reported as approximately 15,000 tons of rVOC and 1,000 tons of NOx. [Simulating Fire Event Impacts on Regional O3 and PM2.5 and Looking Forward Toward Evaluation, Kirk Baker, EPA October 5, 2015 and Using SOAS and related field study data for scientific and regulatory modeling, Kirk Baker, EPA, undated; both are slide presentations] If we scale this fire up by a factor of three to approximate the acreage burned in the Fort McMurray fire, then we have daily emissions as high as 45,000 tons for rVOC and 3,000 tons for NOx. These emissions produce a Q of 48,000 tpd and Q/d becomes 14.6 – still well below EPA expectation for causality.

Noting the wide variability in emissions estimates from different approaches, and as the Q/d method does not generally satisfy the expectation of a clear causal impact, we present other evidence demonstrating that the plume from the Fort McMurray fire caused elevated ozone levels in Connecticut.

ED_001361_00001152

Process to Exclude Air Quality Data Affected by Exceptional Events

Reflects Final Rule, 81 FR 191,
October 3, 2016, 68216-68282

ED_001361_00001152

STEPS

A. Notify EPA R2 with Intent to Request Exclusion
   - Transmit 1-page letter to EPA R2
   - Flag data in EPA's AQS database
   - Initiate communication with EPA R2 staff
B. EPA will respond with due date and level of effort to Demonstrate Exceptional Event
   - Tier 1, 2 or 3 (3=highest level of effort)
   - May 31, 2017 due date for 2016 data

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STEPS (cont.)

C. States will Prepare Demonstration documents
   - Requires 30-day public comment period
   - Document requires 6 elements

D. States will submit documents by May 31, 2017
   - EPA Regions have 120 days to conduct initial review
   - Document is complete or needs additional info
   - States have 12 months to submit additional info
   - EPA Regions may require public comment again
   - Final decision 12 months after submittal of complete document

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Required 6 Elements

1. Conceptual Model of Demonstration
2. Clear Causal Relationship between Event and Air Quality Concentration
3. Comparison of Air Quality Data during Event and during Non-Event Periods
4. Event is a Human Activity not to Recur, or a Natural Event
5. Event is not Reasonably Controllable or Preventable
6. 30-Day Public Comment Period

To: gallen@nescaum.org[gallen@nescaum.org]; kathleen.knight@ct.gov[kathleen.knight@ct.gov]; paul.farrell@ct.gov[paul.farrell@ct.gov]; paul.bodner@ct.gov[paul.bodner@ct.gov]; wendy.jacobs@ct.gov[wendy.jacobs@ct.gov]; kurt.kebschull@ct.gov[kurt.kebschull@ct.gov]; pete.babich@ct.gov[pete.babich@ct.gov]; Jaimeson.Sinclair@ct.gov[Jaimeson.Sinclair@ct.gov]; michael.geigert@ct.gov[Michael.Geigert@ct.gov]; Kiernan Wholean[Kiernan.Wholean@ct.gov]; mark.wert@state.ma.us[mark.wert@state.ma.us]; Azin Kavian[azin.kavian@state.ma.us]; Glenn.Keith@state.ma.us[Glenn.Keith@state.ma.us]; Tom Downs[Tom.Downs@maine.gov]; jeff.s.crawford@maine.gov[jeff.s.crawford@maine.gov]; Tom.Graham@maine.gov[Tom.Graham@maine.gov]; Michele.Roberge@des.nh.gov[Michele.Roberge@des.nh.gov]; jeffrey.underhill@des.nh.gov[Jeffrey.Underhill@des.nh.gov]; michael.fitzgerald@des.nh.gov[michael.fitzgerald@des.nh.gov]; Sharon.Davis@dep.nj.gov[Sharon.Davis@dep.nj.gov]; Judy.Rand@dep.nj.gov[Judy.Rand@dep.nj.gov]; robert.bielawa@dec.ny.gov[robert.bielawa@dec.ny.gov]; scott.griffin@dec.ny.gov[scott.griffin@dec.ny.gov]; Diana.Rivenburgh@dec.ny.gov[Diana.Rivenburgh@dec.ny.gov]; michael.sheehan@dec.ny.gov[michael.sheehan@dec.ny.gov]; karen slattery[karen.slattery@dem.ri.gov]; Barbara.H.Morin@health.ri.gov[Barbara.H.Morin@health.ri.gov]; Bennet.Leon@vermont.gov[Bennet.Leon@vermont.gov]; Jeff.Merrell@vermont.gov[Jeff.Merrell@vermont.gov]; Simcox, Alison[simcox.alison@epa.gov]; McWilliams, Anne K.[mcwilliams.anne@epa.gov]; Arnold, Anne[Arnold.Anne@epa.gov]; Burkhart, Richard[burkhart.richard@epa.gov]; Conroy, David[Conroy.Dave@epa.gov]; Biton, Leiran[biton.leiran@epa.gov]; Judge, Robert[Judge.Robert@epa.gov]; McConnell, Robert[mcconnell.robert@epa.gov]; Ruvo, Richard[Ruvo.Richard@epa.gov]; Greene, Cynthia[Greene.Cynthia@epa.gov]; Wong, Shutsu[Wong.Shutsu@epa.gov]; Kelly, Bob[Kelly.Bob@epa.gov]
Cc: Paul.Kritzler@ct.gov[Paul.Kritzler@ct.gov]; Judge, Robert[Judge.Robert@epa.gov]
From: Charla Rudisill
Sent: Mon 4/24/2017 6:05:01 PM
Subject: RE: APC Meeting April 11-12, 2017 - Handouts - email #2 again
NJDEP - EE Presentation 2017_Final.pdf

Or just pdf it. That seems to have worked.

From: Charla Rudisill
Sent: Monday, April 24, 2017 2:03 PM
To: George Allen <gallen@nescaum.org>; 'Kathleen.Knight@ct.gov' <Kathleen.Knight@ct.gov>; 'paul.farrell@ct.gov' <paul.farrell@ct.gov>; 'paul.bodner@ct.gov' <paul.bodner@ct.gov>; 'wendy.jacobs@ct.gov' <wendy.jacobs@ct.gov>; 'kurt.kebschull@ct.gov' <kurt.kebschull@ct.gov>; 'Pete.Babich@ct.gov' <Pete.Babich@ct.gov>; 'Jaimeson.Sinclair@ct.gov' <Jaimeson.Sinclair@ct.gov>; 'michael.geigert@ct.gov' <michael.geigert@ct.gov>; 'Kiernan.Wholean@ct.gov' <Kiernan.Wholean@ct.gov>; 'mark.wert@state.ma.us' <mark.wert@state.ma.us>; 'Azin.Kavian@state.ma.us' <Azin.Kavian@state.ma.us>; 'Glenn.Keith@state.ma.us' <Glenn.Keith@state.ma.us>; 'tom.downs@maine.gov' <tom.downs@maine.gov>; 'jeff.s.crawford@maine.gov' <jeff.s.crawford@maine.gov>; 'Tom.Graham@maine.gov' <Tom.Graham@maine.gov>; 'Michele.Roberge@des.nh.gov' <Michele.Roberge@des.nh.gov>; 'Jeffrey.Underhill@des.nh.gov' <Jeffrey.Underhill@des.nh.gov>; 'Michael.Fitzgerald@des.nh.gov' <Michael.Fitzgerald@des.nh.gov>; 'Sharon.Davis@dep.nj.gov'

<Sharon.Davis@dep.nj.gov>; 'Judy.Rand@dep.nj.gov' <Judy.Rand@dep.nj.gov>; 'robert.bielawa@dec.ny.gov' <robert.bielawa@dec.ny.gov>; 'scott.griffin@dec.ny.gov' <scott.griffin@dec.ny.gov>; 'Diana.Rivenburgh@dec.ny.gov' <Diana.Rivenburgh@dec.ny.gov>; 'michael.sheehan@dec.ny.gov' <michael.sheehan@dec.ny.gov>; 'karen.slattery@dem.ri.gov' <karen.slattery@dem.ri.gov>; 'Barbara.H.Morin@health.ri.gov' <Barbara.H.Morin@health.ri.gov>; 'Bennet.Leon@vermont.gov' <Bennet.Leon@vermont.gov>; 'Jeff.Merrell@vermont.gov' <Jeff.Merrell@vermont.gov>; 'Simcox.Alison@epa.gov' <Simcox.Alison@epa.gov>; 'McWilliams.Anne@epa.gov' <McWilliams.Anne@epa.gov>; 'arnold.anne@epa.gov' <arnold.anne@epa.gov>; 'burkhart.richard@epa.gov' <burkhart.richard@epa.gov>; 'conroy.dave@epa.gov' <conroy.dave@epa.gov>; 'biton.leiran@epa.gov' <biton.leiran@epa.gov>; 'judge.robert@epa.gov' <judge.robert@epa.gov>; 'McConnell.Robert@epa.gov' <McConnell.Robert@epa.gov>; 'ruvo.richard@epa.gov' <ruvo.richard@epa.gov>; 'greene.cynthia@epa.gov' <greene.cynthia@epa.gov>; 'Wong.Shutsu@epa.gov' <Wong.Shutsu@epa.gov>; 'kelly.bob@epa.gov' <kelly.bob@epa.gov>
Cc: 'Paul.Kritzler@ct.gov' <Paul.Kritzler@ct.gov>; 'judge.robert@epa.gov' <judge.robert@epa.gov>
Subject: RE: APC Meeting April 11-12, 2017 - Handouts - email #7

Everyone should have received all the handouts EXCEPT NJ's exceptional event one (too big) which was email #2.

I will condense it (with IT's help!).

From: Charla Rudisill
Sent: Monday, April 24, 2017 1:57 PM
To: George Allen <gallen@nescaum.org>; 'Kathleen.Knight@ct.gov' <Kathleen.Knight@ct.gov>; 'paul.farrell@ct.gov' <paul.farrell@ct.gov>; 'paul.bodner@ct.gov' <paul.bodner@ct.gov>; 'wendy.jacobs@ct.gov' <wendy.jacobs@ct.gov>; 'kurt.kebschull@ct.gov' <kurt.kebschull@ct.gov>; 'Pete.Babich@ct.gov' <Pete.Babich@ct.gov>; 'Jaimeson.Sinclair@ct.gov' <Jaimeson.Sinclair@ct.gov>; 'michael.geigert@ct.gov' <michael.geigert@ct.gov>; 'Kiernan.Wholean@ct.gov' <Kiernan.Wholean@ct.gov>; 'mark.wert@state.ma.us' <mark.wert@state.ma.us>; 'Azin.Kavian@state.ma.us' <Azin.Kavian@state.ma.us>; 'Glenn.Keith@state.ma.us' <Glenn.Keith@state.ma.us>; 'tom.downs@maine.gov' <tom.downs@maine.gov>; 'jeff.s.crawford@maine.gov' <jeff.s.crawford@maine.gov>; 'Tom.Graham@maine.gov' <Tom.Graham@maine.gov>; 'Michele.Roberge@des.nh.gov' <Michele.Roberge@des.nh.gov>; 'Jeffrey.Underhill@des.nh.gov' <Jeffrey.Underhill@des.nh.gov>; 'Michael.Fitzgerald@des.nh.gov' <Michael.Fitzgerald@des.nh.gov>; 'Sharon.Davis@dep.nj.gov' <Sharon.Davis@dep.nj.gov>; 'Judy.Rand@dep.nj.gov' <Judy.Rand@dep.nj.gov>;

'robert.bielawa@dec.ny.gov' <robert.bielawa@dec.ny.gov>; 'scott.griffin@dec.ny.gov' <scott.griffin@dec.ny.gov>; 'Diana.Rivenburgh@dec.ny.gov' <Diana.Rivenburgh@dec.ny.gov>; 'michael.sheehan@dec.ny.gov' <michael.sheehan@dec.ny.gov>; 'karen.slattery@dem.ri.gov' <karen.slattery@dem.ri.gov>; 'Barbara.H.Morin@health.ri.gov' <Barbara.H.Morin@health.ri.gov>; 'Bennet.Leon@vermont.gov' <Bennet.Leon@vermont.gov>; 'Jeff.Merrell@vermont.gov' <Jeff.Merrell@vermont.gov>; 'Simcox.Alison@epa.gov' <Simcox.Alison@epa.gov>; 'McWilliams.Anne@epa.gov' <McWilliams.Anne@epa.gov>; 'arnold.anne@epa.gov' <arnold.anne@epa.gov>; 'burkhart.richard@epa.gov' <burkhart.richard@epa.gov>; 'conroy.dave@epa.gov' <conroy.dave@epa.gov>; 'biton.leiran@epa.gov' <biton.leiran@epa.gov>; 'judge.robert@epa.gov' <judge.robert@epa.gov>; 'McConnell.Robert@epa.gov' <McConnell.Robert@epa.gov>; 'ruvo.richard@epa.gov' <ruvo.richard@epa.gov>; 'greene.cynthia@epa.gov' <greene.cynthia@epa.gov>; 'Wong.Shutsu@epa.gov' <Wong.Shutsu@epa.gov>; 'kelly.bob@epa.gov' <kelly.bob@epa.gov>
Cc: 'Paul.Kritzler@ct.gov' <Paul.Kritzler@ct.gov>; 'judge.robert@epa.gov' <judge.robert@epa.gov>
Subject: RE: APC Meeting April 11-12, 2017 - Handouts - email #7

To: gallen@nescaum.org[gallen@nescaum.org]; kathleen.knight@ct.gov[kathleen.knight@ct.gov]; paul.farrell@ct.gov[paul.farrell@ct.gov]; paul.bodner@ct.gov[paul.bodner@ct.gov]; wendy.jacobs@ct.gov[wendy.jacobs@ct.gov]; kurt.kebschull@ct.gov[kurt.kebschull@ct.gov]; pete.babich@ct.gov[pete.babich@ct.gov]; Jaimeson.Sinclair@ct.gov[Jaimeson.Sinclair@ct.gov]; michael.geigert@ct.gov[Michael.Geigert@ct.gov]; Kiernan Wholean[Kiernan.Wholean@ct.gov]; mark.wert@state.ma.us[mark.wert@state.ma.us]; Azin Kavian[azin.kavian@state.ma.us]; Glenn.Keith@state.ma.us[Glenn.Keith@state.ma.us]; Tom Downs[Tom.Downs@maine.gov]; jeff.s.crawford@maine.gov[jeff.s.crawford@maine.gov]; Tom.Graham@maine.gov[Tom.Graham@maine.gov]; Michele.Roberge@des.nh.gov[Michele.Roberge@des.nh.gov]; jeffrey.underhill@des.nh.gov[Jeffrey.Underhill@des.nh.gov]; michael.fitzgerald@des.nh.gov[michael.fitzgerald@des.nh.gov]; Sharon.Davis@dep.nj.gov[Sharon.Davis@dep.nj.gov]; Judy.Rand@dep.nj.gov[Judy.Rand@dep.nj.gov]; robert.bielawa@dec.ny.gov[robert.bielawa@dec.ny.gov]; scott.griffin@dec.ny.gov[scott.griffin@dec.ny.gov]; Diana.Rivenburgh@dec.ny.gov[Diana.Rivenburgh@dec.ny.gov]; michael.sheehan@dec.ny.gov[michael.sheehan@dec.ny.gov]; karen slattery[karen.slattery@dem.ri.gov]; Barbara.H.Morin@health.ri.gov[Barbara.H.Morin@health.ri.gov]; Bennet.Leon@vermont.gov[Bennet.Leon@vermont.gov]; Jeff.Merrell@vermont.gov[Jeff.Merrell@vermont.gov]; Simcox, Alison[simcox.alison@epa.gov]; McWilliams, Anne K.[mcwilliams.anne@epa.gov]; Arnold, Anne[Arnold.Anne@epa.gov]; Burkhart, Richard[burkhart.richard@epa.gov]; Conroy, David[Conroy.Dave@epa.gov]; Biton, Leiran[biton.leiran@epa.gov]; Judge, Robert[Judge.Robert@epa.gov]; McConnell, Robert[mcconnell.robert@epa.gov]; Ruvo, Richard[Ruvo.Richard@epa.gov]; Greene, Cynthia[Greene.Cynthia@epa.gov]; Wong, Shutsu[Wong.Shutsu@epa.gov]; Kelly, Bob[Kelly.Bob@epa.gov]
Cc: Paul.Kritzler@ct.gov[Paul.Kritzler@ct.gov]; Judge, Robert[Judge.Robert@epa.gov]
From: Charla Rudisill
Sent: Mon 4/24/2017 5:57:20 PM
Subject: RE: APC Meeting April 11-12, 2017 - Handouts - email #7
APC_EPA Prop Imp Rule 2015 NAAQS.pptx

To: gallen@nescaum.org[gallen@nescaum.org]; kathleen.knight@ct.gov[kathleen.knight@ct.gov]; paul.farrell@ct.gov[paul.farrell@ct.gov]; paul.bodner@ct.gov[paul.bodner@ct.gov]; wendy.jacobs@ct.gov[wendy.jacobs@ct.gov]; kurt.kebschull@ct.gov[kurt.kebschull@ct.gov]; pete.babich@ct.gov[pete.babich@ct.gov]; Jaimeson.Sinclair@ct.gov[Jaimeson.Sinclair@ct.gov]; michael.geigert@ct.gov[Michael.Geigert@ct.gov]; Kiernan Wholean[Kiernan.Wholean@ct.gov]; mark.wert@state.ma.us[mark.wert@state.ma.us]; Azin Kavian[azin.kavian@state.ma.us]; Glenn.Keith@state.ma.us[Glenn.Keith@state.ma.us]; Tom Downs[Tom.Downs@maine.gov]; jeff.s.crawford@maine.gov[jeff.s.crawford@maine.gov]; Tom.Graham@maine.gov[Tom.Graham@maine.gov]; Michele.Roberge@des.nh.gov[Michele.Roberge@des.nh.gov]; jeffrey.underhill@des.nh.gov[Jeffrey.Underhill@des.nh.gov]; michael.fitzgerald@des.nh.gov[michael.fitzgerald@des.nh.gov]; Sharon.Davis@dep.nj.gov[Sharon.Davis@dep.nj.gov]; Judy.Rand@dep.nj.gov[Judy.Rand@dep.nj.gov]; robert.bielawa@dec.ny.gov[robert.bielawa@dec.ny.gov]; scott.griffin@dec.ny.gov[scott.griffin@dec.ny.gov]; Diana.Rivenburgh@dec.ny.gov[Diana.Rivenburgh@dec.ny.gov]; michael.sheehan@dec.ny.gov[michael.sheehan@dec.ny.gov]; karen slattery[karen.slattery@dem.ri.gov]; Barbara.H.Morin@health.ri.gov[Barbara.H.Morin@health.ri.gov]; Bennet.Leon@vermont.gov[Bennet.Leon@vermont.gov]; Jeff.Merrell@vermont.gov[Jeff.Merrell@vermont.gov]; Simcox, Alison[simcox.alison@epa.gov]; McWilliams, Anne K.[mcwilliams.anne@epa.gov]; Arnold, Anne[Arnold.Anne@epa.gov]; Burkhart, Richard[burkhart.richard@epa.gov]; Conroy, David[Conroy.Dave@epa.gov]; Biton, Leiran[biton.leiran@epa.gov]; Judge, Robert[Judge.Robert@epa.gov]; McConnell, Robert[mcconnell.robert@epa.gov]; Ruvo, Richard[Ruvo.Richard@epa.gov]; Greene, Cynthia[Greene.Cynthia@epa.gov]; Wong, Shutsu[Wong.Shutsu@epa.gov]; Kelly, Bob[Kelly.Bob@epa.gov]
Cc: Paul.Kritzler@ct.gov[Paul.Kritzler@ct.gov]; Judge, Robert[Judge.Robert@epa.gov]
From: Charla Rudisill
Sent: Mon 4/24/2017 5:50:46 PM
Subject: RE: APC Meeting April 11-12, 2017 - Handouts - email #3
Maine 176A Petition.pptx

-----Original Message-----
From: Charla Rudisill
Sent: Monday, April 24, 2017 1:48 PM
To: George Allen <gallen@nescaum.org>; 'Kathleen.Knight@ct.gov' <Kathleen.Knight@ct.gov>; 'paul.farrell@ct.gov' <paul.farrell@ct.gov>; 'paul.bodner@ct.gov' <paul.bodner@ct.gov>; 'wendy.jacobs@ct.gov' <wendy.jacobs@ct.gov>; 'kurt.kebschull@ct.gov' <kurt.kebschull@ct.gov>; 'Pete.Babich@ct.gov' <Pete.Babich@ct.gov>; 'Jaimeson.Sinclair@ct.gov' <Jaimeson.Sinclair@ct.gov>; 'michael.geigert@ct.gov' <michael.geigert@ct.gov>; 'Kiernan.Wholean@ct.gov' <Kiernan.Wholean@ct.gov>; 'mark.wert@state.ma.us' <mark.wert@state.ma.us>; 'Azin.Kavian@state.ma.us' <Azin.Kavian@state.ma.us>; 'Glenn.Keith@state.ma.us' <Glenn.Keith@state.ma.us>; 'tom.downs@maine.gov' <tom.downs@maine.gov>; 'jeff.s.crawford@maine.gov' <jeff.s.crawford@maine.gov>; 'Tom.Graham@maine.gov' <Tom.Graham@maine.gov>; 'Michele.Roberge@des.nh.gov' <Michele.Roberge@des.nh.gov>; 'Jeffrey.Underhill@des.nh.gov' <Jeffrey.Underhill@des.nh.gov>; 'Michael.Fitzgerald@des.nh.gov' <Michael.Fitzgerald@des.nh.gov>; 'Sharon.Davis@dep.nj.gov' <Sharon.Davis@dep.nj.gov>; 'Judy.Rand@dep.nj.gov' <Judy.Rand@dep.nj.gov>; 'robert.bielawa@dec.ny.gov' <robert.bielawa@dec.ny.gov>; 'scott.griffin@dec.ny.gov' <scott.griffin@dec.ny.gov>; 'Diana.Rivenburgh@dec.ny.gov' <Diana.Rivenburgh@dec.ny.gov>; 'michael.sheehan@dec.ny.gov' <michael.sheehan@dec.ny.gov>; 'karen.slattery@dem.ri.gov' <karen.slattery@dem.ri.gov>; 'Barbara.H.Morin@health.ri.gov' <Barbara.H.Morin@health.ri.gov>; 'Bennet.Leon@vermont.gov' <Bennet.Leon@vermont.gov>; 'Jeff.Merrell@vermont.gov' <Jeff.Merrell@vermont.gov>; 'Simcox.Alison@epa.gov' <Simcox.Alison@epa.gov>; 'McWilliams.Anne@epa.gov'

<McWilliams.Anne@epa.gov>; 'arnold.anne@epa.gov' <arnold.anne@epa.gov>; 'burkhart.richard@epa.gov' <burkhart.richard@epa.gov>; 'conroy.dave@epa.gov' <conroy.dave@epa.gov>; 'biton.leiran@epa.gov' <biton.leiran@epa.gov>; 'judge.robert@epa.gov' <judge.robert@epa.gov>; 'McConnell.Robert@epa.gov' <McConnell.Robert@epa.gov>; 'ruvo.richard@epa.gov' <ruvo.richard@epa.gov>; 'greene.cynthia@epa.gov' <greene.cynthia@epa.gov>; 'Wong.Shutsu@epa.gov' <Wong.Shutsu@epa.gov>; 'kelly.bob@epa.gov' <kelly.bob@epa.gov>
Cc: 'Paul.Kritzler@ct.gov' <Paul.Kritzler@ct.gov>; 'judge.robert@epa.gov' <judge.robert@epa.gov>
Subject: APC Meeting April 11-12, 2017 - Handouts - email #1

Hi all -

I am just going to email the handouts to you. Drop Box is not an option for many of you. I will email in several rounds.

Charla

New Jersey Draft Exceptional Event Update for May 25 - 26, 2017

Sharon Davis, NJDEP

NESCAUM Attainment Planning Committee Meeting, Training and Workshop

April 11, 2017

ED_001361_00001163

Overview

* Background
* Impact to NJ Ozone Air Quality
* EPA Exceptional Event Rule
* Steps and Elements of Analysis
* **NJ's Exceptional Event Analysis**
* Technical Evidence
* More Event Impact
* Conclusion

ED_001361_00001163

Background

* A wildfire in Fort McMurray, Alberta, Canada, from [illegible] July 5, 2016 burned over 1,500,000 acres, over 5,900 square kilom[illegible] forced over 80,000 residents our of their homes and destroyed [illegible] 400 buildings.
* This wildfire has been termed the greatest natural disa[illegible] Canadian history.
* Event impacted New Jersey air quality
  - Uncommonly high ozone air quality exceedance[illegible] sured from May 25 – 26, 2016.
* Other monitors in Ozone Transport Region and NJ's [illegible] nonattainment areas were also impacted.
* Thank you to CT DEEP and MDE for sharing resource[illegible] knowledge. Thanks to NESCAUM for coordination efforts and EPA [illegible] 1 and 2 for timely input.

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4

Holy Smoke Batman!

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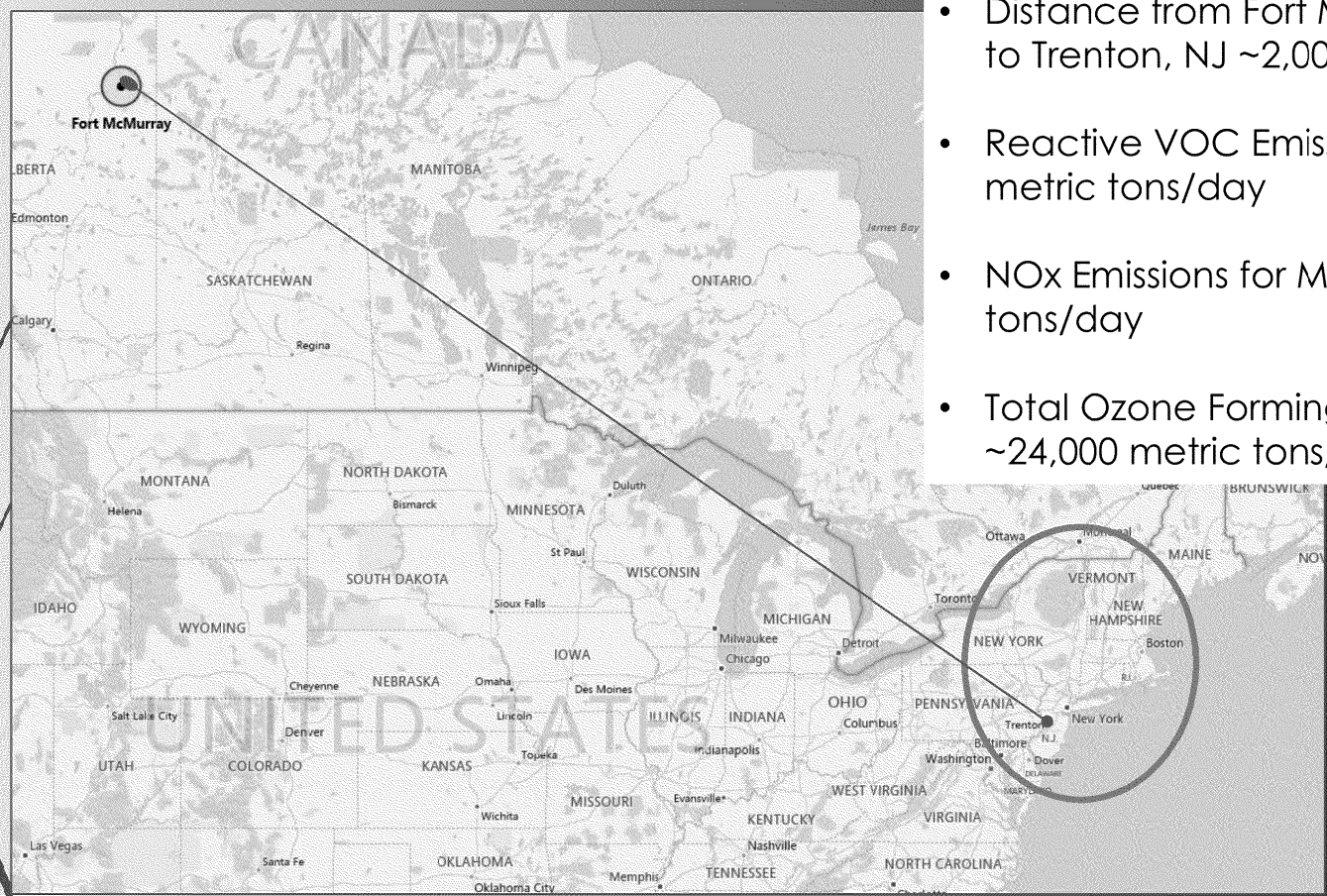
Holy Transport Robin!!



- Distance from Fort McMurray, Canada to Trenton, NJ ~2,000 Miles (3,200 km)
- Reactive VOC Emissions for May ~ 19,000 metric tons/day
- NOx Emissions for May ~ 5,300 metric tons/day
- Total Ozone Forming Compounds ~24,000 metric tons/day

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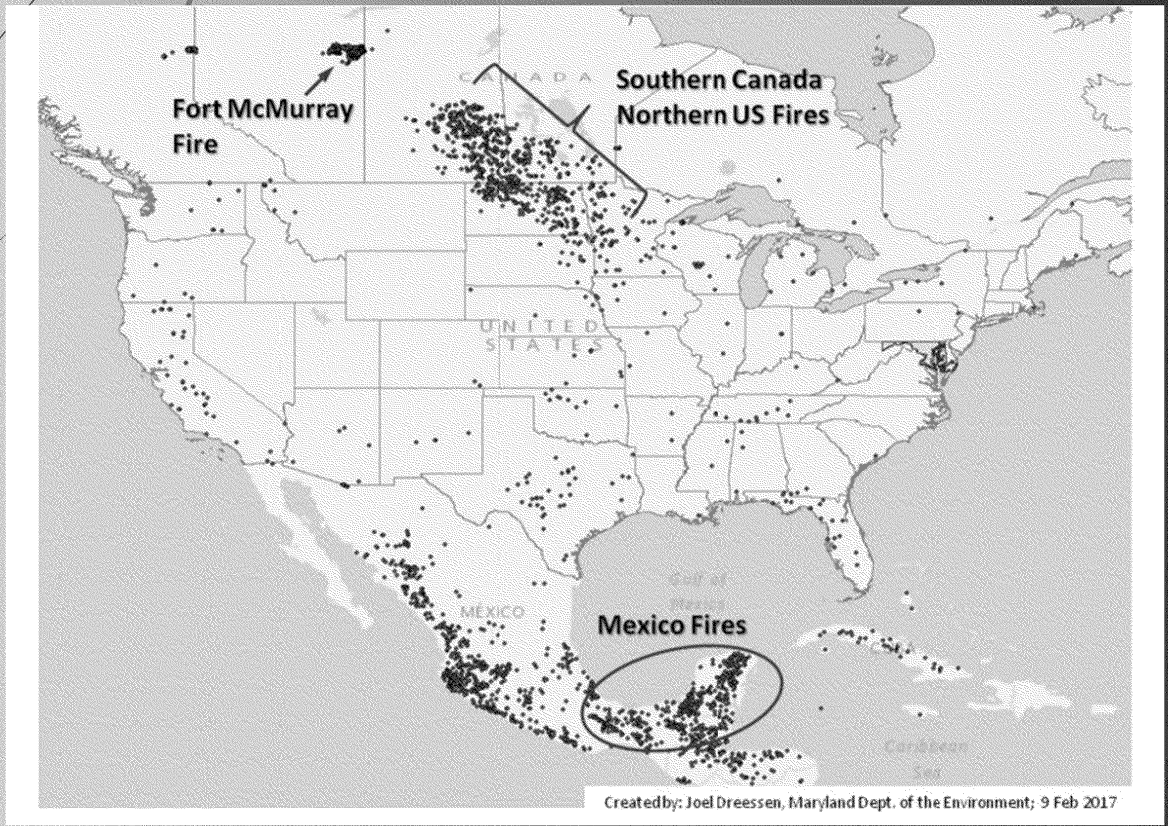
Fire Locations In North America May 17 – 20, 2017



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Impact to New Jersey Air Quality

* May 25, 2016: 16 out of 17 New Jersey monitors exceeded the 70 ppb ozone standard
* May 26, 2016: 10 out of 17 monitors exceeded the 70 ppb ozone standard
* Impact on states within shared nonattainment areas: PA, MD, CT, NY
* Exclusion of days will affect New Jersey's shared nonattainment areas
  - Northern NJ nonattainment area design values meet the 85 ppb standard, get closer to 75 ppb
  - Southern NJ nonattainment design values are closer to the 70 ppb ozone standard.
  - Lowers 4th high 8-hour average for future DV calculations

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NJ Daily Maximum Ozone Levels Before, During and After Exceptional Event

Site Name	5/21	5/22	5/23	5/24	5/25	5/26	5/27	5/28	5/29
Ancora State Hospital	39	42	49	47	76	64	61	54	33
Bayonne	38	47	51	36	69	76	54	68	47
Brigantine	53	49	53	49	79	62	52	45	21
Camden Spruce St	41	45	54	48	78	68	59	61	40
Chester	43	48	46	46	83	86	64	56	61
Clarksboro	37	44	56	55	83	70	59	58	36
Colliers Mills	43	52	59	57	90	70	66	62	40
Columbia	39	37	40	46	76	73	63	50	57
Flemington	41	46	49	53	83	88	69	69	61
Leonia	44	49	52	40	86	85	62	77	58
Millville	44	42	49	53	81	69	58	52	29
Monmouth University	46	51	53	45	81	65	49	50	37
Newark Firehouse	36	45	38	38	81	77	49	65	50
Ramapo	45	47	46	48	79	81	71	55	57
Rider University	41	41	48	54	82	82	67	70	55
Rutgers University	42	47	55	46	84	86	75	73	53
Washington Crossing*	33	44	51	55	83	86	74	74	57

*operated by EPA

exceeds 70 ppb NAAQS of 2015
exceeds 75 ppb NAAQS of 2008
exceeds 84 ppb NAAQS of 1997

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Comparison with Non-Event Day

	May 25 – 26, 2016	July 21 – 22, 2016
# Ozone Exceedances at NJ Monitors (out of 17 total monitors)	16/10	3/7
Highest measured ozone concentration	90/88	74/81
Peak PJM Mid-Atlantic Maximum Hourly Loads	44,462 MWh	53,351 MWh (20% increase)
Average Daily EGU NOx Emissions (PJM Mid-Atlantic Region)	576 tons	776 tons (35% increase)
Maximum Hourly NOx Emissions	31 tons	43 tons (39% increase)
Temperature	50 degree F until May 23rd	Averaged 70 – 80 degree F

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Northern NJ Nonattainment Area (NNJ-NY-CT)

State	Site Name	Prelim 2016	EE DV	Δ ppb
CT	Criscuolo Park	76	76	0
CT	Danbury	78	77	1
CT	Greenwich	81	80	1
CT	Madison-Beach Rd	76	76	0
CT	Middletown	79	79	0
CT	Stratford	81	80	1
CT	Westport	85	83	2
NJ	Bayonne	72	72	0
NJ	Chester	69	68	1
NJ	Columbia	64	63	1
NJ	Flemington	72	70	2
NJ	Leonia	74	74	0
NJ	Monmouth University	70	69	1
NJ	Newark Firehouse	70	70	0
NJ	Ramapo	69	68	1
NJ	Rutgers University	74	74	0
NY	Babylon	72	71	1
NY	Convent Av	69	68	1
NY	Holtsville	66	65	1
NY	IS52	67	67	0
NY	Pfizer Lab	70	70	0
NY	Queens	69	69	0
NY	Riverhead	72	70	2
NY	South Mountain Rd	72	71	1
NY	Susan Wagner	76	75	1
NY	White Plains	74	72	2

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Southern NJ Nonattainment Area (SNJ-DE-MD)

State	Site Name	Prelim. 2016	EE DV	Δ ppb
DE	Kent (KILLENS)	66	66	0
DE	New Castle (BCSP)	74	72	2
DE	New Castle (BELLFNT2)	70	70	0
DE	New Castle (LUMS 2)	68	68	0
DE	New Castle (MLK)	71	70	1
DE	Sussex (LEWES)	69	68	1
DE	Sussex (SEAFORD)	65	63	2
MD	Cecil (Fair Hill)	76	74	2
NJ	Ancora State Hospital	69	68	1
NJ	Brigantine	62	62	0
NJ	Camden Spruce St	75	74	1
NJ	Clarksboro	74	73	1
NJ	Colliers Mills	73	72	1
NJ	Millville	68	67	1
NJ	Rider University	72	71	1
NJ	Washington Crossing	73	73	0
PA	Bucks (BRIS)	77	76	1
PA	Chester (NEWG)	73	71	2
PA	Delaware (CHES)	72	72	0
PA	Montgomery (NORR)	72	70	2
PA	Philadelphia (LAB)	61	60	1
PA	Philadelphia (NEA)	77	76	1
PA	Philadelphia (NEW)	74	73	1

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NJ 2016 4th Highest Daily Maximum

	Daily Max 8-Hr O_3 (ppb)		2016 Daily Maximum 8-Hr O_3 Concentrations (ppb)			
	5/25/2016	5/26/2016	1st Max	2nd Max	3rd Max	4th Max
Ancora State Hospital	76	64	76	76	69	69
Bayonne	69	76	76	74	69	69
Brigantine	79	62	79	68	67	63
Camden Spruce St	78	68	81	78	78	78
Chester	83	86	86	83	72	69
Clarksboro	83	70	83	79	77	76
Colliers Mills	90	70	90	77	73	72
Columbia WMA	76	73	76	73	72	66
Flemington	83	88	88	83	78	78
Leonia	86	85	86	85	77	75
Millville	81	69	81	70	69	69
Monmouth Univ	81	65	81	73	72	70
Newark Firehouse	81	77	81	77	71	70
Ramapo	79	81	81	79	79	72
Rider Univ	82	82	82	82	76	74
Rutgers Univ	84	86	86	84	78	76
Washington Crossing*	83	86	86	83	75	74

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2016 4th Max: With and Without Event Data

SNJ-PA-DE-MD NAA

		W/EE	W/O EE	Δ ppb
DE	Kent (KILLENS)	68	67	1
DE	New Castle (BCSP)	78	73	5
DE	New Castle (BELLFNT2)	74	72	2
DE	New Castle (LUMS 2)	69	68	1
DE	New Castle (MLK)	73	72	1
DE	Sussex (LEWES)	70	68	2
DE	Sussex (SEAFORD)	68	63	5
MD	Cecil (Fair Hill)	80	76	4
NJ	Ancora State Hospital	69	64	5
NJ	Brigantine	63	63	0
NJ	Camden Spruce St	78	76	2
NJ	Clarksboro	76	74	2
NJ	Colliers Mills	72	71	1
NJ	Millville	69	68	1
NJ	Rider University	74	71	3
NJ	Washington Crossing	74	74	0
PA	Bucks (BRIS)	80	75	5
PA	Chester (NEWG)	80	75	5
PA	Delaware (CHES)	71	70	1
PA	Montgomery (NORR)	73	67	6
PA	Philadelphia (LAB)	69	67	2
PA	Philadelphia (NEA)	80	78	2
PA	Philadelphia (NEW)	76	75	1

NNJ-NY-CT NAA

		W/EE	W/O EE	Δ ppb
CT	Criscuolo Park	75	75	0
CT	Danbury	81	80	1
CT	Greenwich	83	79	4
CT	Madison-Beach Rd	80	78	2
CT	Middletown	80	79	1
CT	Stratford	83	82	1
CT	Westport	87	81	6
NJ	Bayonne	69	68	1
NJ	Chester	69	67	2
NJ	Columbia	66	65	1
NJ	Flemington	78	73	5
NJ	Leonia	75	73	2
NJ	Monmouth University	70	68	2
NJ	Newark Firehouse	70	68	2
NJ	Ramapo	72	68	4
NJ	Rutgers University	76	75	1
NY	Babylon	73	70	3
NY	Convent Av	71	69	2
NY	Holtsville	73	70	3
NY	IS52	69	69	0
NY	Pfizer Lab	70	68	2
NY	Queens	71	71	0
NY	Riverhead	78	72	6
NY	South Mountain Rd	73	70	3
NY	Susan Wagner	77	74	3
NY	White Plains	75	71	4

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EPA Exceptional Event Rule

* September 2016: EPA finalized revisions to Exceptional Event Rule and Guidance on the Preparation of Exceptional Events Demonstrations for Wildfire Events that May Influence Ozone Concentrations
  https://www.epa.gov/air-quality-analysis/exceptional-events-rule-and-guidance
  - Allows for exclusion of monitoring data in determination of exceedances or violations of the NAAQS.
* EPA Exceptional Event Definition:
  - Unusual or naturally occurring events that can affect air quality but are not reasonably controllable by states to affect attainment of the National Ambient Air Quality Standards.
  - Include wildfires, stratospheric ozone intrusions and volcanic and seismic activities.
* Final rule for 2015 Ozone NAAQS (80 FR 65292; October 26, 2015)
  - 2016 EE demonstrations submitted to EPA by May 31, 2017 for consideration in designations for 70 ppb ozone NAAQS (80 FR 65413)

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STEPS

A. Notify EPA with Intent to Request Exclusion
   * Flag data in EPA's AQS database
   * Provide Initial Notification of Potential EE to EPA Regional Office
B. EPA reviews and communicates within 60-days on level of pri
C. EPA and states collaborate on scope of demonstration
   * Regulatory significance
   * Level of clear causal analysis (Tier 1, Tier 2, or Tier 3)
C. State Prepares Demonstration to Submit to EPA
   * Requires 30-day public comment period
   * Document requires 6 elements
D. Provide 30-day Public Review and Comment Period Prior to S to EPA (NJ EE Analysis Posted on April 3, 2017at http://www.nj.gov/dep/baqp/ee.html
   * NJ comment period ends May 3, 2017
   * Submit to EPA Region 2 by May 31, 2017
E. EPA reviews and acts has 120 days to conduct initial review
   * Document is complete or needs additional info
   * NJ has 12 months to submit additional info; EPA R2 may require ment again
   * Final decision 12 months after submittal of complete docume

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Required 6 Elements and Content of Analysis

1. Conceptual Model of Demonstration
2. Clear Causal Relationship between Event and Air Quality Concentration
3. Comparison of Air Quality Data during Event and during Non-Event Periods
4. Event is a Human Activity not to Recur, or a Natural Event
5. Event is not Reasonably Controllable or Preventable
6. 30-Day Public Comment Period

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Tiered Approach to Develop "Clear Causal Relationship"

* **Tier 1**: Wildfires that clearly influence monitored ozone exceedances or violations
  - Areas or during times of year characterized by low ozone concentrations
  - Simple and less resource intensive analysis.
* **Tier 2**: Wildfire events impact on ozone are less c
  - Require additional supportive documentation.
* **Tier 3**: Wildfire does not fall into the specific scenarios that qualify for Tier 1 or Tier 2
  - Clear causal relationship satisfied by a weight of evidence showing.

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New Jersey EE Analysis

* Conceptual model of ozone formation in New Jersey
* Historical ozone data comparison with event
* Comparison of similar days (meteorology, temperature, wind direction, ozone air quality
* Emissions over distance (Q/d) analysis
* Demonstration that fire emissions transported to ozone monitors
* Wind trajectories
* Satellite Imagery of Smoke Plume progression over U.S.
* Progression of air quality (AQI) leading up to NJ EE
* Meteorological conditions
* CO and Black Carbon animations
* Progression of smoke, temperature and aerosol optical depth leading up to NJ EE
* **Regulatory significance: Ozone Design Values in NJ's nonattainment**
    * Up to 3 ppb in NNJ NAA; moves 1 NJ monitor into 70 ppb ozone attainment
    * Up to 2 ppb in SNJ NAA; all but one NJ monitor see a 1 ppb benefit
    * Significant reduction in 4th high value for use in future DV calculations
* 99th percentile daily ozone concentration plots for each monitor for 2016
* Fine particulate matter from upwind monitors

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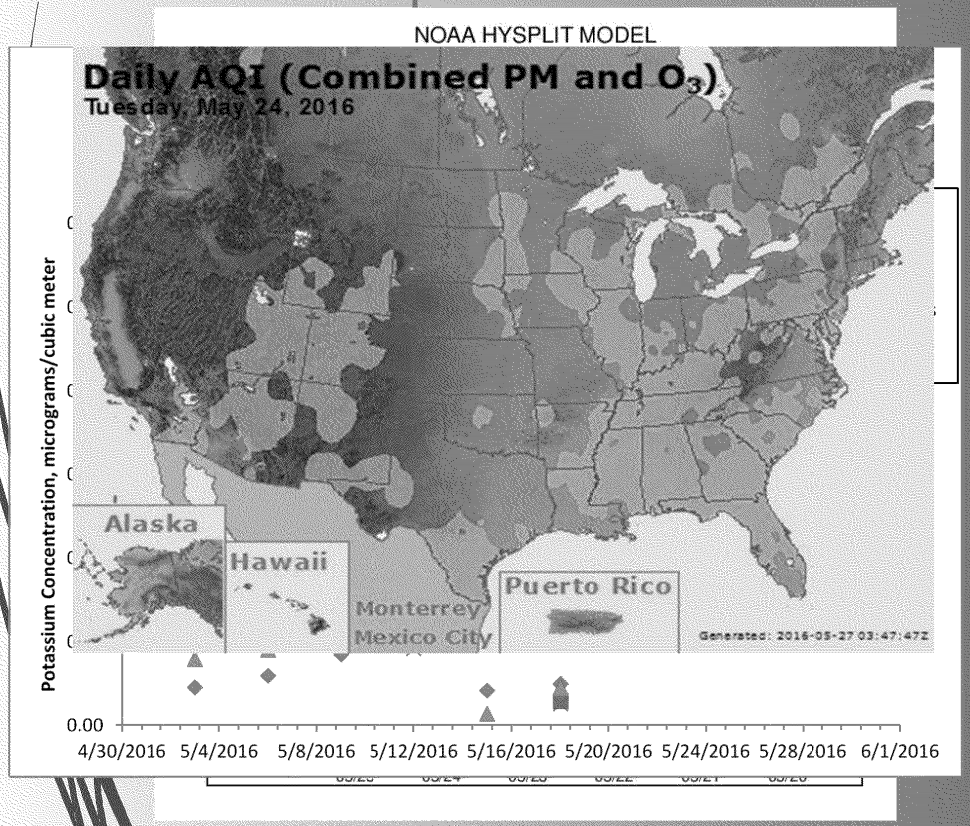
Sample of Technical Evidence



* HYSPLIT back trajectories: Wind carried emissions from Fort McMurray, Canada to New Jersey on May 24 and 26, 2016
* NJ ozone monitoring levels > 98th percentile of high ozone levels typically monitored in the summer during the last 5 years
* Progressions of ozone monitoring data from Fort McMurray to NJ show elevated ozone in the days leading up to NJ's high ozone exceptional event
* Ambient air monitoring levels of potassium, a known tracer compound for wood smoke, were greater than air of the states upwind from the long trajectory path) on the days up to the event

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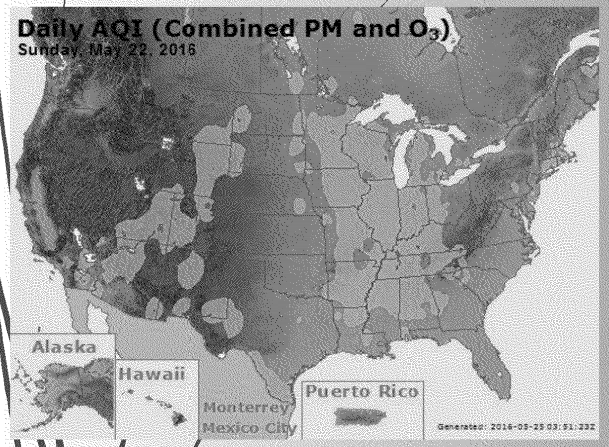
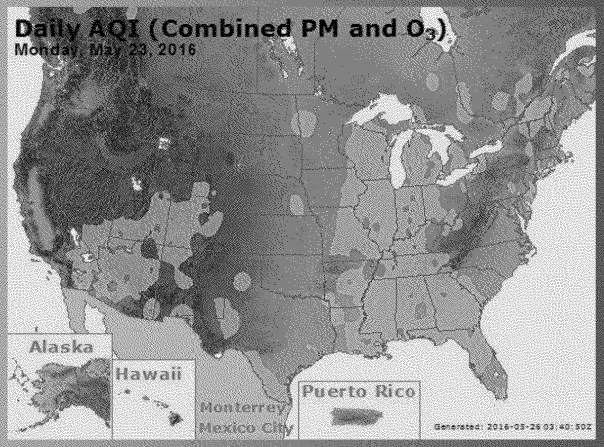
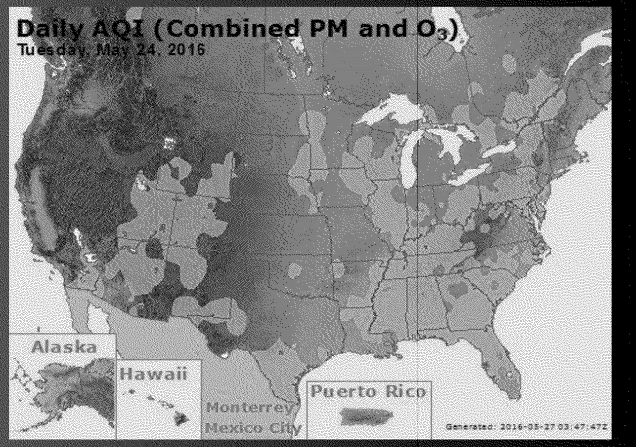
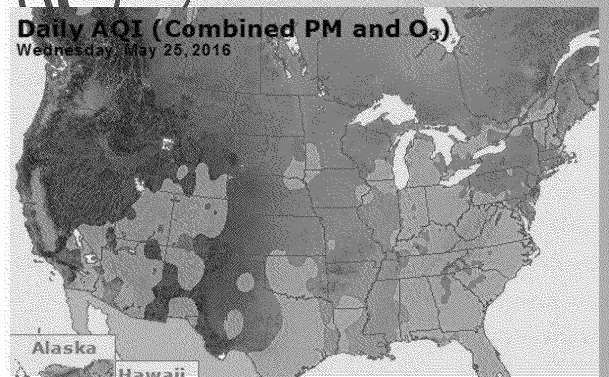
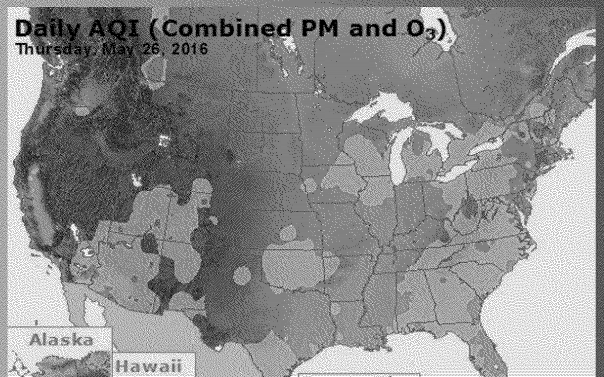
Movement of PM and Ozone Across the Country from May 22 – May 27, 2016

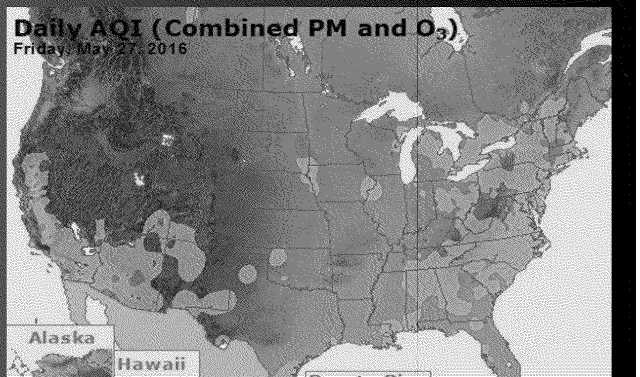












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Additional Technical Evidence

* Aerosol Optical Depth and Carbon Monoxide levels [illegible] NOAA satellite data indicate emissions from Fort McMurray wildfire [illegible] to NJ
* Satellite image overlays of wood smoke with ground [illegible] ozone monitor data show the smoke plume moving from the wildfire [illegible] tion to New Jersey along with elevated ozone levels on the ground
* NOAA's Hazard Mapping system (HMS) satellite data [illegible] the daily progression of the wildfire smoke plume from Alberta [illegible] (Fort McMurray), through the mid-western United States [illegible] NJ
* Elevated 24-hr fine particulate (PM2.5) monitor levels [illegible] about the state were recorded on May 25 and 26, 2016, similar to the [illegible] found in New Jersey during a past wildfire episode in NJ

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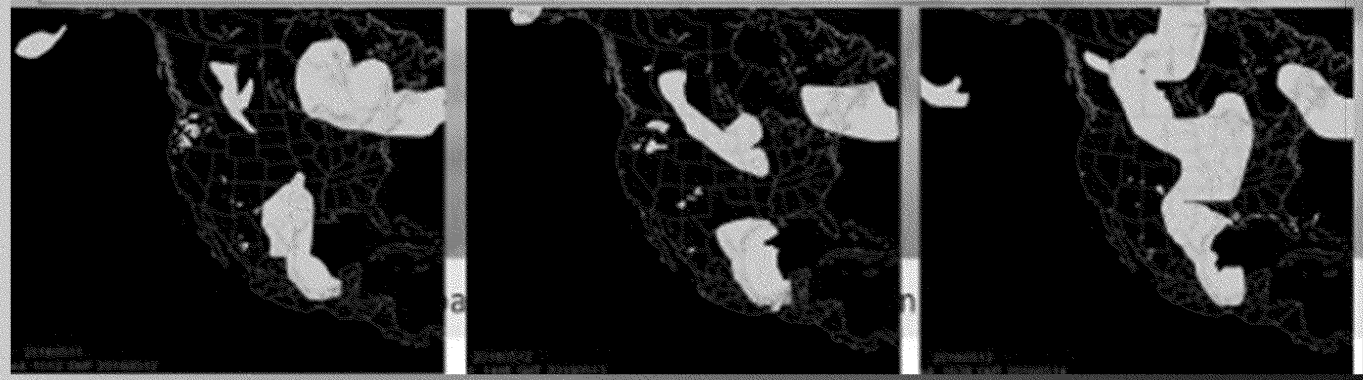
Satellite Imagery – The Smoke Plume

May 5-7, 2016: Southeastern US wildfires interacting with Fort McMurray plume

May 11-13, 2016: Mexican wildfires interacting with Fort McMurray plume



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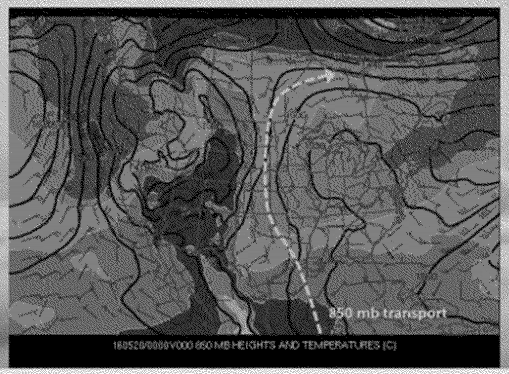
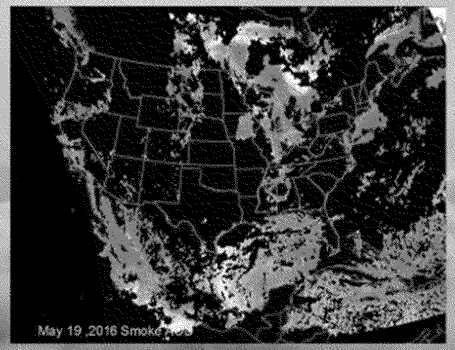
Earth, Wind and Fire (and Aerosol Optical Depth)

May 19, 2016 Winds and Temp 850mb



Connecticut Department of Energy and Environmental Protection

May 19, 2016 Aerosol Optical Depth



Connecticut Department of Energy and Environmental Protection

May 19, 2016 HMS Smoke and Fires

Connecticut Department of Energy and Environmental Protection

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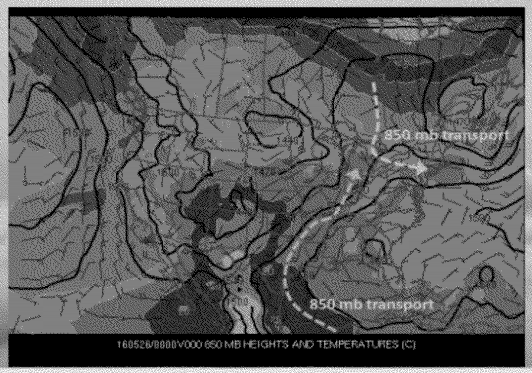
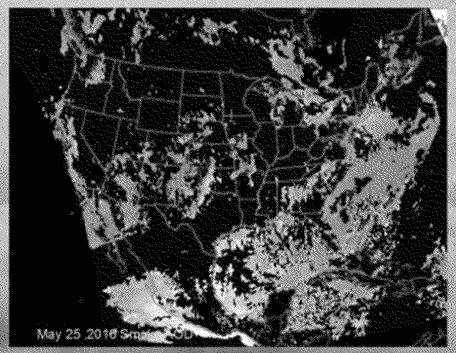
Earth, Wind and Fire (and Aerosol Optical Depth)

May 25, 2016 Winds and Temp 850mb



Connecticut Department of Energy and Environmental Protection

May 25, 2016 Aerosol Optical Depth



Connecticut Department of Energy and Environmental Protection

May 25, 2016 HMS Smoke and Fires

Connecticut Department of Energy and Environmental Protection

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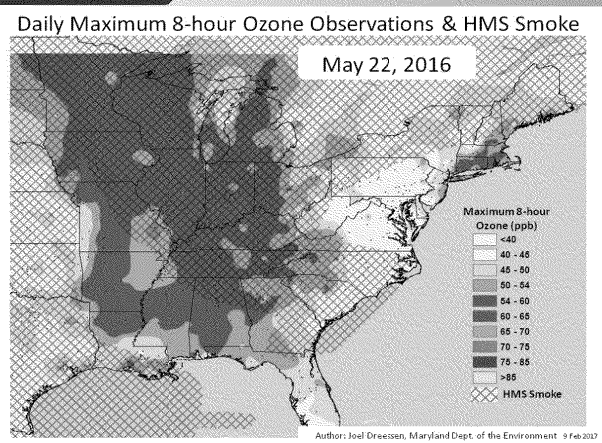
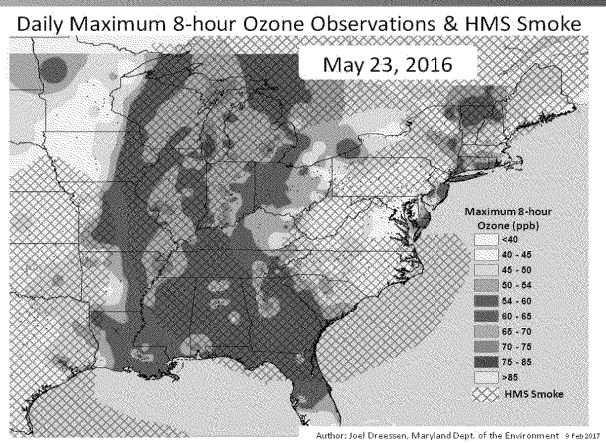
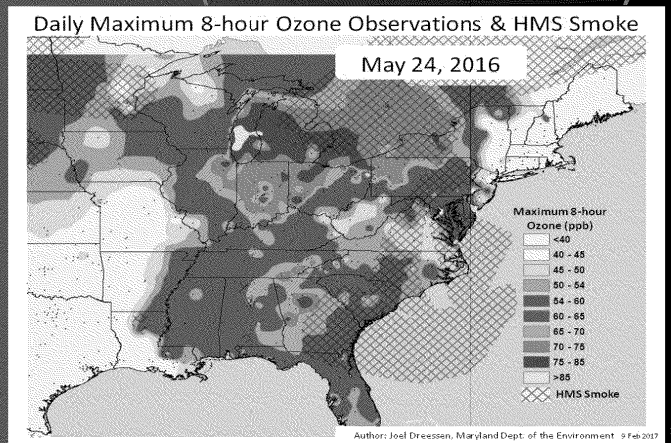
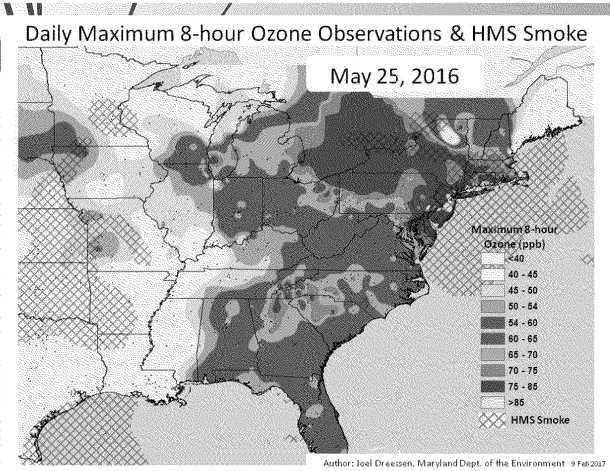
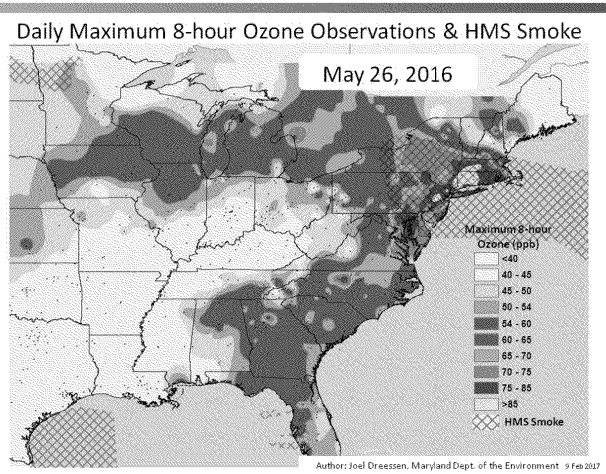
Ozone Levels Measured on the Ground Compared to Satellite Observations of the Same Location (Cross-Hatched)

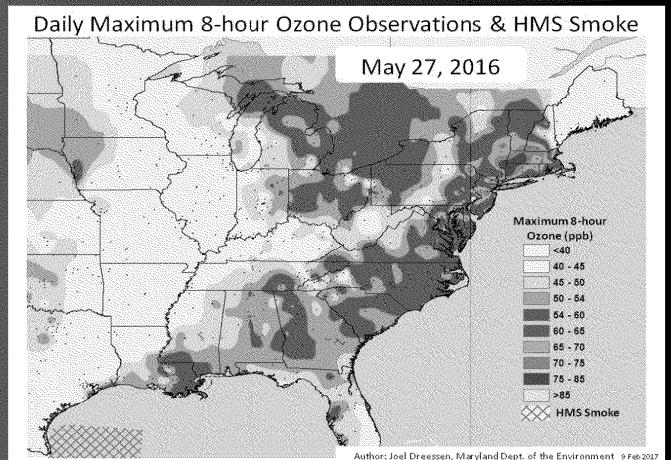












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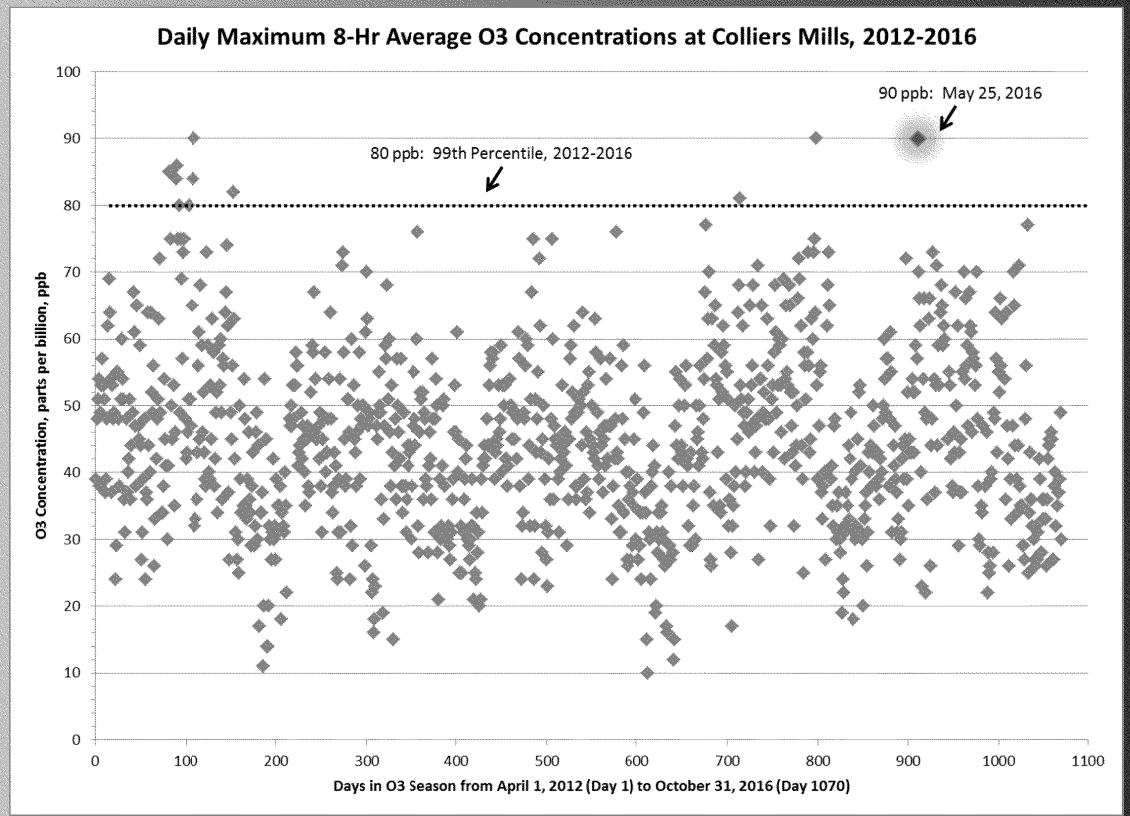
99th Percentile Charts: Daily Max 8-hr O3 Concentrations 2012 - 2016



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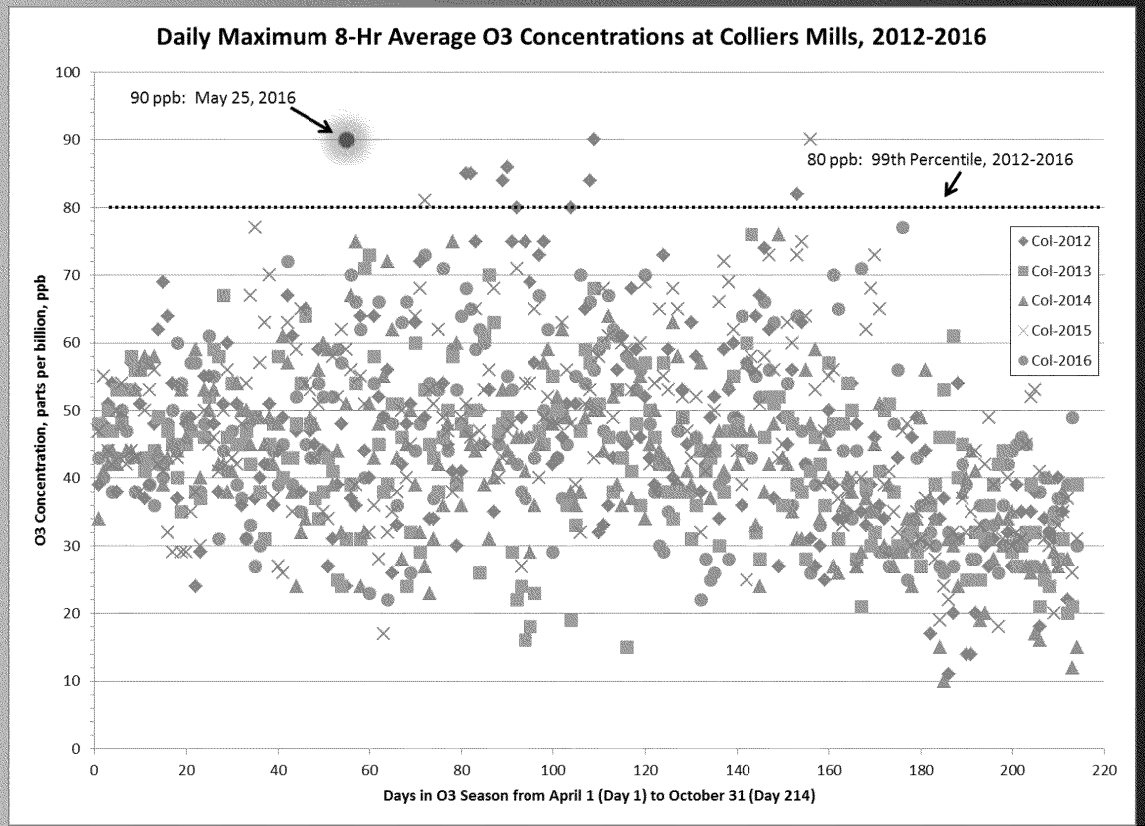
99th Percentile Charts: Daily Max 8-hr O3 Concentrations 2012 - 2016



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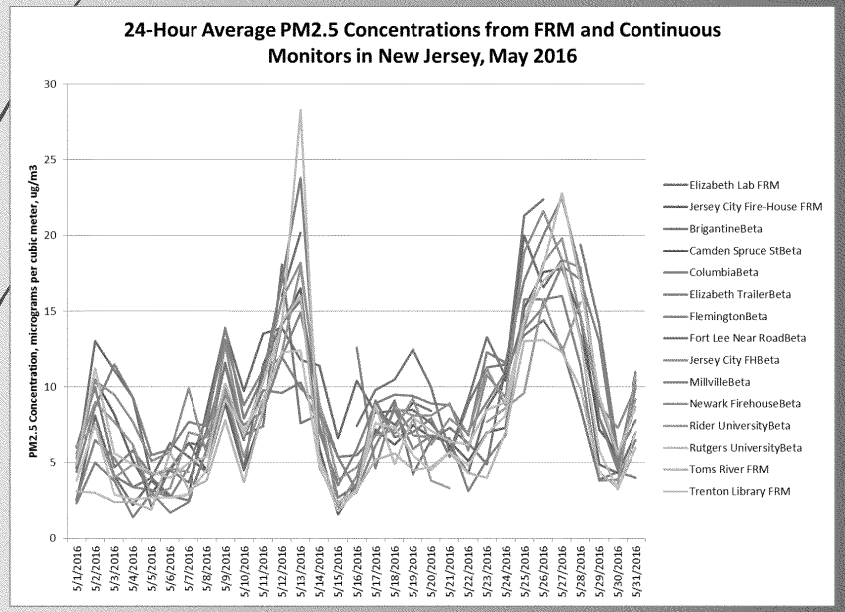
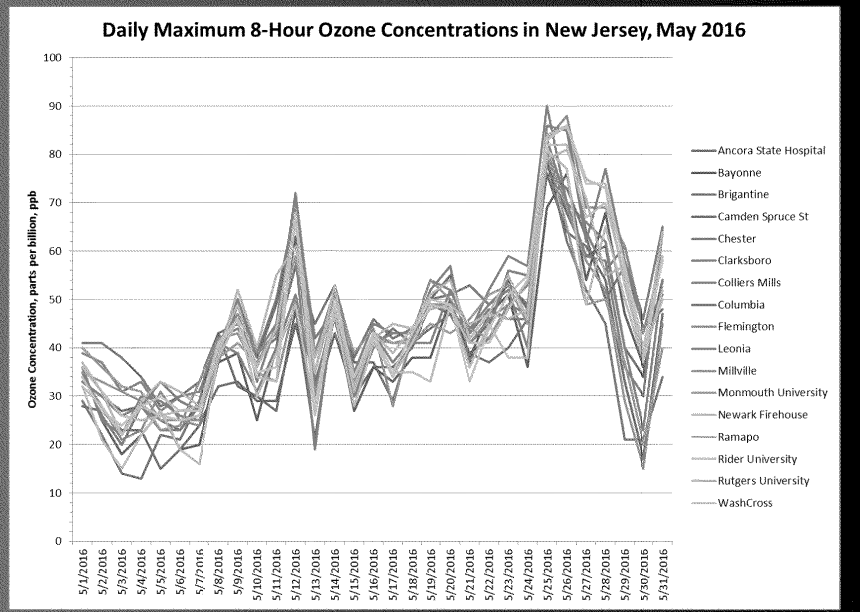
Peaks in PM2.5 & Ozone for May 2016

24-hr Avg PM2.5 Concentrations



Daily Max 8-hr Ozone Concentrations



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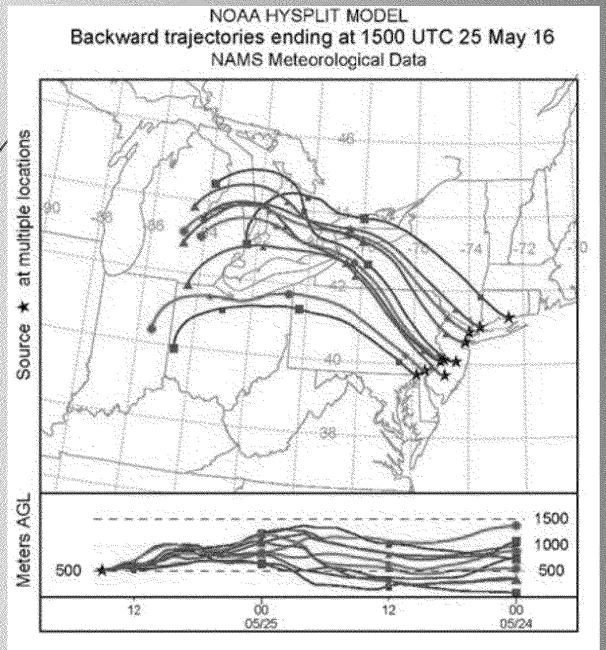
West to East Progressing Daily Max 8-hour O_3 (May 22-25, 2016)



STATE	STATION	5/22/2016	5/23/2016	5/24/2016	5/25/2016
Wisconsin	Chiwaukee	55*	75	86	73
Wisconsin	Eau Claire	64	60	57	49
Wisconsin	Lake DuBay	59	68	51	46
Wisconsin	Newport	50	73	72	44
Michigan	Ann Arbor	56	76	77	66
Michigan	Grand Rapids	57	71	81	65
Michigan	Houghton Lake	62	64	74	64
Michigan	Lansing	51	67	76	65
Illinois	Braidwood	64	64	72	53
Illinois	Northbrook	58	71	79	64
Illinois	Jerseyville	65	78	62	51
Indiana	Albany	56	63	75	61
Indiana	Flora	57	69	71	58
Indiana	Indianapolis	62	72	74	61
Indiana	South Bend	54	69	74	64
Ohio	East Lake	49	49	76	82
Ohio	Kinsman	51	46	75	80
Ohio	Lebanon	61	58	79	63
Ohio	Lima	58	57	77	65
Pennsylvania	Erie	56	56	70	79
Pennsylvania	Lancaster	41	45	59	81
Pennsylvania	Moshamon	43	46	63	76
Pennsylvania	Peckville	32	44	63	79
New York	Pinnacle	46	49	73	77
New York	White Plains	52	56	38	82
New York	Whiteface	51	60	69	74
New York	Williamson	41	44	78	81
New Jersey	Brigantine	49	53	49	79
New Jersey	Colliers Mills	52	59	57	90
New Jersey	Leonia	49	52	40	86

*data from Harrington station

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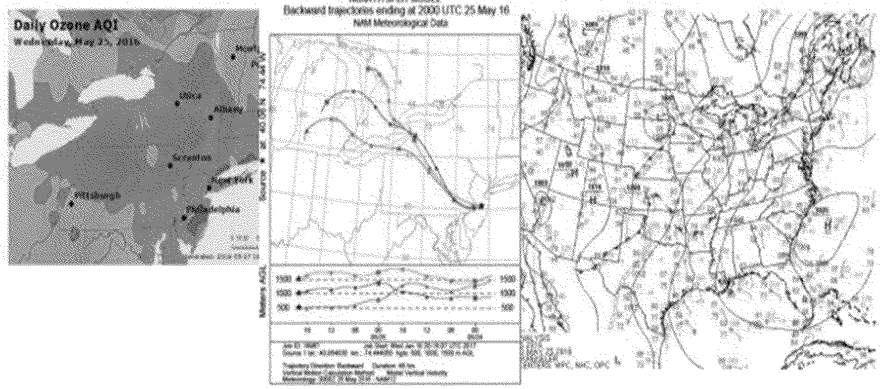
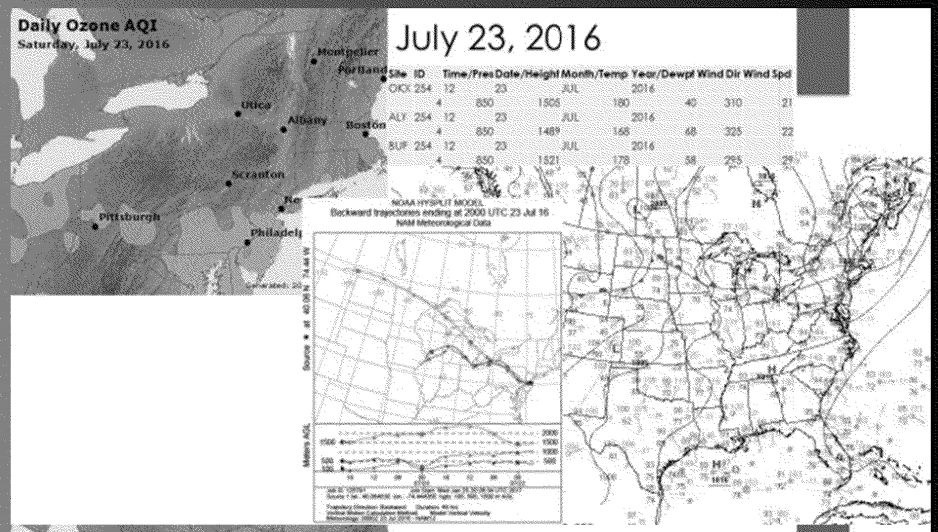
Similar Day Analysis

Reference Day: May 25, 2016

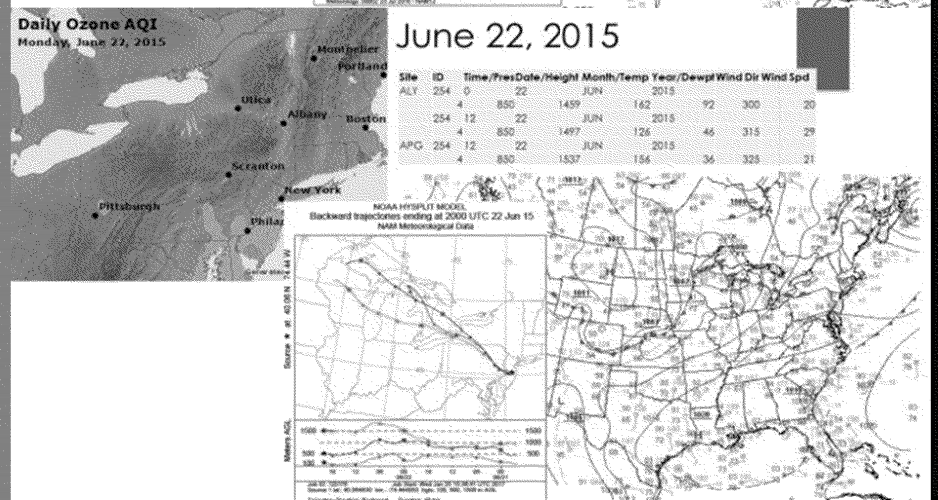


July 23, 2016



Site	ID	Time/Pres	Date/Height	Month/Temp	Year/Dewpt	Wind Dir	Wind Spd
OKX	254	12	23	JUL	2016		
		4	850	1505	180	40	310	21
ALY	254	12	23	JUL	2016		
		4	850	1489	168	48	325	22
BUF	254	12	23	JUL	2016		
		4	850	1521	178	58	255	29

June 22, 2015



Site	ID	Time/Pres	Date/Height	Month/Temp	Year/Dewpt	Wind Dir	Wind Spd
ALY	254	0	22	JUN	2015		
		4	850	1459	162	92	300	20
	254	12	22	JUN	2015		
		4	850	1497	126	46	315	29
APG	254	12	22	JUN	2015		
		4	850	1537	156	36	325	21

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Photographic Evidence that Plume Impacted Ground (Webcam: Newark, NJ)

May 25, 2016, 3:00 PM

May 29, 2016, 5:00 PM

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Photographic Evidence that Plume Impacted Ground (Hazecam, Brigantine, NJ)

May 25, 2016, 3:00 PM

May 28, 2016, 5:00 PM

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Event Impact

* Exclusion of the ozone levels occurring on May 25 & 26, 2016:
  * Drop NJ's design value from 1 to 2 ppb depending on the side
  * Place the Flemington monitor in attainment of the 70ppb NAAQS
  * Lower the design value into attainment of the 75 ppb standard for the Northern NJ-NY-CT nonattainment area
* Use of the lower design value may result in earlier attainment of the 70 and 75 ppb ozone NAAQS in the future

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Conclusion

* A May 2016 wildfire event in Fort McMurray, Alberta [illegible] generated volatile organic compounds, black carbon, fine par[illegible] matter, carbon monoxide, nitrogen oxides, potassium, haze and oth[illegible] products of combustion.
* Wildfire emissions resulted in elevated concentratio[illegible] one in New Jersey's air on May 25-26, 2016.
* The monitored ozone concentrations were greater [illegible] 98th to 99th percentile highest concentrations for ozone recorde[illegible] New Jersey over the past five years.
* Meteorological conditions were not consistent with [illegible] ally high ozone concentrations.
* Technical analysis demonstrates that there exists a [illegible] usal relationship between the specific event and the monitored exce[illegible] es of the ozone NAAQS in NJ on May 25 and 26, 2016
* The ozone data measured at New Jersey monitors o[illegible] 25-26, 2016 are due to an exceptional event and should be exclud[illegible] n the calculation of the 2016 ozone design value.

ED_001361_00001163

Questions?

Contact Information
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Bureau of Evaluation and Planning
Sharon.Davis[illegible]nj.gov
(609) 984-3009

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2015 Ozone NAAQS Proposed Implementation Rule

April 11, 2017
NESCAUM APC Meeting
Paul Bodner

Connecticut Department of Energy and Environmental Protection

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Overview of Proposed Rule

- Background
- Key Topics & State Comments
  1. Classification thresholds and attainment dates
  2. Revoking the 2008 ozone NAAQS
  3. Submitting nonattainment area and OTR SIP elements
  4. RFP – baseline year & milestone compliance demonstrations
  5. RACM – consideration of sources of intrastate transport
  6. NNSR – interprecursor trading
  7. Policy on international emissions (CAA section 179B)
- Potential Congressional or Court Actions?

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Background

- Ozone NAAQS established in 1979, then revised in 1997, 2008 and 2015
- Revised 8-hour ozone NAAQS promulgated October 1, 2015: 0.070 ppm (70 ppb)
- CAA Section 182 requires states to submit plans (SIPs) to implement the revised ozone NAAQS
- Proposed implementation rule published November 17, 2016 (81 FR 81276) describes a framework for nonattainment area classifications and SIP requirements
- Proposed rule largely follows approach used for the 2008 ozone NAAQS.

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Classification Thresholds & Attainment Dates

- Proposes to retain the "percent-above-the-standard" classification method for ozone NA severity
- Proposes to retain current approach to establishing attainment dates for each classification.

Area class		Percent above 1-hr ozone NAAQS	8-hour ozone design values (ppm)		Proposed attainment date (years after designation)
			2008 NAAQS (0.075 ppm)	2015 NAAQS (0.070 ppm) *(proposed)*	
Marginal	From up to [1]	0.833 15	0.076 0.086	0.071 0.081	3
Moderate	From up to [1]	15 33.333	0.086 0.100	0.081 0.093	6
Serious	From up to [1]	33.333 50	0.100 0.113	0.093 0.105	9
Severe-15	From up to [1]	50 58.333	0.113 0.119	0.105 0.111	15
Severe-17	From up to [1]	58.333 133.333	0.119 0.175	0.111 0.163	17
Extreme	Equal to or above	133.333	0.175	0.163	20

Note 1: But not including.

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Revoking the 2008 Ozone NAAQS

- Option 1: Revoke one year after 2015 NAAQS designations are effective
  - consistent with 1997 ozone NAAQS revocation
  - triggers protective "anti-backsliding" requirements for areas designated NA for the 2015 NAAQS that have not been redesignated for the 2008 NAAQS prior to revocation effective date
- Option 2: Revoke only in areas designated attainment for the 2008 NAAQS by its revocation date, and upon redesignation to attainment for the 2008 or 2015 NAAQS for all other areas
  - parallels approach used for 2012 PM2.5 NAAQS, and is consistent with approach used previously for Pb and SO2 NAAQS
  - anti-backsliding requirements not needed

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NA Area and OTR SIP Deadlines

- Proposes to retain the existing approach
- Per CAA section 182, submission due dates for each SIP element measured from effective date of NA designations
  - Emissions inventory, RACT & Emissions statement regs (2 years)
  - NNSR SIPs, 15% RFP, Moderate attainment demo (3 years)
  - 3%/yr RFP & Attainment demos for Serious and higher (4 years)
- Per CAA section 184, OTR states must also submit statewide RACT SIPs within 2 years of designations
- Implement RACT by Jan 1 of 5th year after desig effective date
- Proposal requires states to address <u>each</u> SIP element, even if no revisions are needed
  - Certifications for existing regs must undergo public review

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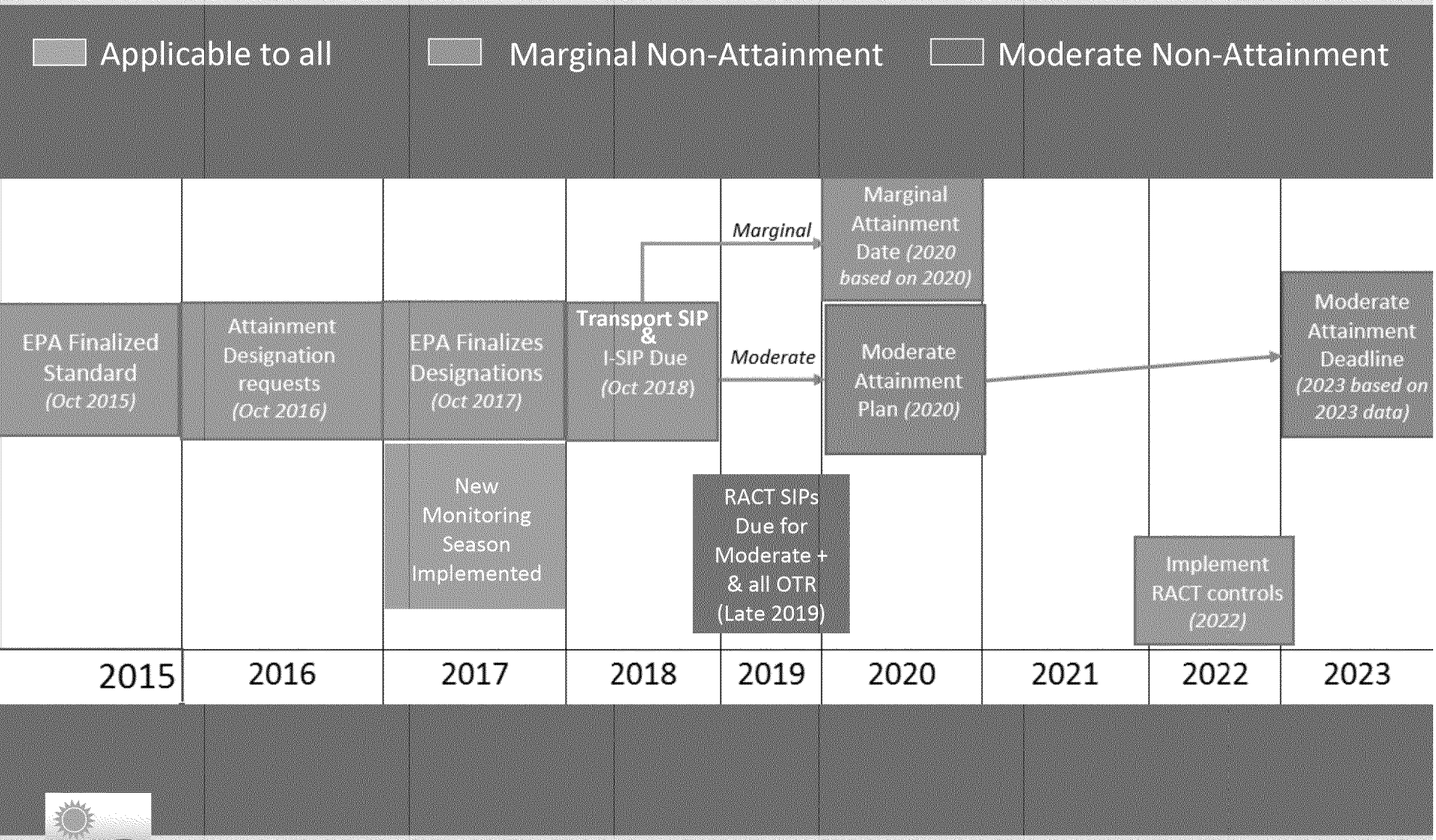
Proposed 2015 NAAQS Implementation Timeline



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RFP Baseline Year & Milestone Compliance Demonstration

- EPA requested comment on 2 options for RFP baseline year
  - Require baseline be same year that designations become effective
  - Flexible, states select any year, 2015 thru designations year
- CAA section 182(g) requires Serious and higher areas to submit MCD within 90 days after a RFP milestone date showing the area achieved the required reductions
  - EPA has not previously codified MCD requirements for ozone NAAQS
  - EPA recognizes the 90 day submittal requirement makes use of actual emissions likely infeasible, so proposes state can choose either:
  - Option 1: If available, use of actual PEI emissions reductions
  - Option 2: Satisfy MCD in terms of compliance with control measures in the approved RFP plan (*e.g., percent implementation*)

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RACM: Intrastate Transport

- CAA section 172(c)(6) requires that SIPs include enforceable emission limitations and "other control measures", means or techniques as may be necessary to attain a standard by the applicable attainment date.
- The EPA interprets "other control measures" as those measures and technologies that can be applied to any emission source within a state, including outside of a nonattainment area.
- Proposes to clarify that RACM analyses must also consider the impacts of emissions from sources outside an ozone nonattainment area (but within a state's boundaries) as necessary to attain the ozone NAAQS.

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NNSR: Interprecursor Trading (IPT)

- Responds to petition for reconsideration challenging the IPT provision in the 2008 ozone SIP requirements rule
  - Claimed inadequate public comment opportunity
  - Also claimed CAA prohibits IPT for ozone NNSR
- Proposal reaffirms EPA's previous IPT policy allowing use of either NOx or VOC reductions to satisfy NNSR NA offset requirements
- Interested states must gain EPA SIP approval of IPT program
  - IPT ratios must be approved by EPA & be supported with modeling demonstrating ratio provides an equivalent or greater ozone benefit
  - IPT ratios can be area-specific (default) ratios for a specific NA area or permit-specific ratios, at the state's discretion
  - If state's NNSR program not approved by EPA, case-by-case required
- Draft technical guidance is available in the rule docket

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CAA section 179B: International Emissions

- Section 179B allows EPA to:
  - approve attainment SIPs that show an area would attain "but for emissions emanating from outside the U.S.", and
  - not bump-up areas that would have attained by the attainment date "but for emissions emanating from outside the U.S."
- EPA requested comment on whether 179B demonstrations should be limited to NA areas adjoining international borders
  - historical 179B actions have all been along the Mexican border
- Proposes that 179B(b) demos claiming an area would have attained but for international emissions must include adoption of all RACM (including RACT) for the area, regardless of classification.

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New Jersey Comments Include:

- Require states to update Reasonably Available Control Technology (RACT) to have regional consistency;
- Allow for use of inter precursor ratios in an efficient manner;
- Expand the geographical boundary for securing offsets;
- Revoke the 75 ppb standard consistent with the process used for the 2008 ozone NAAQS;
- Provide clarification regarding the transition obligation for states delegated for the Federal PSD program;
- Provide flexibility to states for selecting Reasonable Further Progress baseline year and milestone demonstration;
- Treat wildfire and prescribe burning consistent with base year;
- Require control measures outside of the nonattainment area; and,

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New York Comments Include:

- Revise classification method to better represent the time and emission reductions needed to attain.
- Revoke 2008 NAAQS everywhere 1 year after new designations due to simplicity, nationwide uniformity, focus on the more protective NAAQS and associated anti-backsliding requirements.
- Provide flexibility for RFP baseline year to enable matching RFP year to ozone conducive meteorology year for modeling.
- Redesignation substitute option should <u>not</u> be allowed.
- If RACM reductions will be needed from nearby areas to attain on time, then EPA's initial designations should include those areas in the NA area.

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Connecticut Comments Include:

- Revise classification method to more realistically reflect the time needed to attain.
- Revoke 2008 NAAQS everywhere 1 year after new designations are final and retain strong anti-backsliding.
- Provide flexibility for RFP baseline year and milestone compliance demonstrations.
- States with NA areas should adopt RACM statewide if necessary to achieve timely attainment.
- Newly reclassified areas should adopt RACT within 2 years, and implemented prior to the start of the ozone season of the required attainment year or the 3rd year after adoption (whichever is earlier).
- Firm deadlines for new CTGs are also warranted.

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Other Comments by OTC:

- Revocation of the 2008 NAAQS should not allow relaxation of controls in areas without approved GN SIPs.
- For areas eligible for 2008 redesignation, EPA should allow more time to submit such requests & maintenance plans.
- States with shared NA areas should be allowed to select different RFP baseline years to recognize early controls.
- EPA should <u>not</u> mandate recertification of previously approved SIP elements, unless states have made changes or there are new federal requirements.
- CAA Sec 179B demonstrations should be restricted to NA areas along international borders

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Noteworthy Comments from Other States:

- PA & NC: agree with EPA's proposed classification method.
- PA: comments extensively on MOVES & NONROAD issues.
- NC:
  - provides detailed comments on EPA's IPT guidance,
  - thinks RACM outside the NA area should be a state decision
  - favors not restricting 179B to international border areas
  - urges EPA to provide better info on BG and BC contributions.

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Noteworthy Comments from Other States:

- DE:
  - favors retaining 2008 NAAQS until an area redesignates with a maintenance plan
  - urges EPA to update the NOx waiver guidance to consider if the requesting state significantly impacts attainment elsewhere.
- OH:
  - opposes both revocation options
  - urges EPA to limit anti-backsliding requirements
  - thinks 15% RFP should gauged versus a 1990 baseline and should allow credit for reductions from outside the NA area.

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Noteworthy Comments from Other Stakeholders:

- MOG:
  - EPA must consider post-2018 federal and NA area controls when judging GN SIPs (due in 2018) to avoid illegal over control in upwind states.
  - EPA must investigate international emissions to develop guidance that will allow states to account for those emissions in GN SIPs.
- ALA and other Health Advocates:
  - The 2008 NAAQS should be retained to continue progress. If revoked, retain bump-up, attainment deadlines & maintenance requirements .
  - RACT should apply at source level, with no averaging.

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Next Steps

- EPA plans to finalize the rule in same timeframe as final designations (~ Oct 2017)
- Effective dates ~ end of 2017 or early 2018
- Potential roadblocks
  - Delays under new administration
  - Pending court cases on 2015 NAAQS
  - Congressional action. For example, HR 806 would:
    - Delay designations until 2025
    - Extend NAAQS review periods to 10 year intervals
    - Allow technical feasibility as "secondary consideration" for NAAQS revisions
    - Hearing was held on 3/22/2017 by the House Energy and Commerce Subcommittee on the Environment

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Clean Air Act § 176A(a)(2) Consideration: Maine's Success Story

Tom Downs, CCM
Chief Meteorologist

Because Maine is in the Ozone Transport Region (OTR) …

- Existing Sources: Reasonably Available Control Technology (RACT)

- Major Modifications or Major New Sources:
  - Lowest Achievable Emission Rate (LAER) for NO_x and VOC
  - NO_x/VOC Offsets ($$$, if available at all)

- Additional regulatory burden: mandated CTGs additional recordkeeping, EPA interpretations

- Unfair disadvantage compared to competitors in other ozone attainment states outside the OTR

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Additional Maine Ozone/OTR Facts

- Maine is in compliance with all NAAQS – and has been since 2004!
- Maine sources have neither caused nor contributed to ozone standard exceedances anywhere in the OTR.
- Maine industries have already *not* acted on certain expansion opportunities because of prohibitive costs of additional OTR requirements

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Basis of Maine's Petition

- Demonstration that Maine NO_x and VOC emissions are not impacting nonattainment areas in the OTR
- Maine is in attainment for all NAAQS.
- Supporting Analyses
  - Trajectory analyses of days when ozone exceedances were recorded in the OTR demonstrate that emissions from Maine sources not transported toward the OTR on those days.
  - EPA's apportionment modeling for the 2008 and 2015 Ozone NAAQS further demonstrates that Maine's contribution to every monitor site in the other states within the OTR is less than one percent of both the 2008 and the 2015 8-hour Ozone NAAQS.
  - Maine's emissions are trending downward even with NO_x waivers in place. Maine's point source VOC emissions are 0.7% of Maine's natural biogenic emissions.
- The only areas of the state proposed to remain in the OTR are municipalities along the coast in York County. Maine is requesting the State's OTR inclusion be similar to that of Virginia, where only a portion of that state is part of the OTR.

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And Furthermore, …

- Impacts from Maine's emissions on the OTR area less than the states cited in the CAA § 176A petition for which EPA has proposed denial.
- A key feature of the CAA is the flexibility it provides to states.

In contrast, OTR requirements are
rigid and **uniform** across the region;
unnecessarily **burdensome** and
not effective or **appropriate** considering that Maine's emissions have no impact on nonattainment sites in the OTR.

Consequences of Maine's Consideration of Withdrawal from the OTR

- Improved ability of Maine businesses to compete in national and international markets, creates business certainty
- Expanded options for businesses with startup or expansion opportunities
- Allows Maine sources more appropriate regulatory structure while making possible a more holistic approach to environmental stewardship
- Reduced use of State resources – no CTGs; no need to apply for NO_x Waiver after each new ozone NAAQS

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Regulatory Authority for Removal from the OTR

CAA § 176A. Interstate transport commissions

(a) Authority to establish interstate transport regions

Whenever, on the Administrator's own motion or by petition from the Governor of any State, the Administrator has reason to believe that the interstate transport of air pollutants from one or more States contributes significantly to a violation of a national ambient air quality standard in one or more other States, the Administrator may establish, by rule, a transport region for such pollutant that includes such States. The Administrator, on the Administrator's own motion or upon petition from the Governor of any State, or upon the recommendation of a transport commission established under subsection (b) of this section, may—

(1) add any State or portion of a State to any region established under this subsection whenever the Administrator has reason to believe that the interstate transport of air pollutants from such State significantly contributes to a violation of the standard in the transport region, or

(2) remove any State or portion of a State from the region whenever the Administrator has reason to believe that the control of emissions in that State or portion of the State pursuant to this section will not significantly contribute to the attainment of the standard in any area in the region.

The Administrator shall approve or disapprove any such petition or recommendation within 18 months of its receipt. The Administrator shall establish appropriate proceedings for public participation regarding such petitions and motions, including notice and comment.

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2014 NEI NO_x and VOC Emissions Inventory by State

OTR State	Annual NO_x Emissions (TPY)		Annual VOC Emissions (TPY)	
	Anthropogenic	Biogenic	Anthropogenic	Biogenic
Connecticut	58,289.98	576.08	80,078.14	60,645.85
Delaware	28,515.54	719.97	20,073.33	21,962.85
District of Columbia	7,790.91	12.26	7,729.25	1,350.28
Maine	53,119.30	2,413.13	59,850.67	436,878.39
Maryland	141,323.89	2,992.36	122,216.51	142,009.23
Massachusetts	120,845.35	868.61	137,644.35	97,680.93
New Hampshire	35,356.17	657.61	40,244.56	104,256.71
New Jersey	161,609.35	1,255.00	178,945.31	102,877.17
New York	335,086.53	8,620.89	303,268.13	381,551.21
Pennsylvania	520,683.63	9,343.22	481,467.64	439,423.85
Rhode Island	27,873.62	159.57	23,985.08	16,899.26
Vermont	14,228.48	1,205.02	26,324.49	79,524.71
Virginia	283,750.44	8,806.88	273,380.52	801,123.63
OTR Total	1,788,473.19	37,630.60	1,755,207.98	2,686,184.07
Maine Contribution	**2.97%**	6.41%	**3.41%**	16.26%

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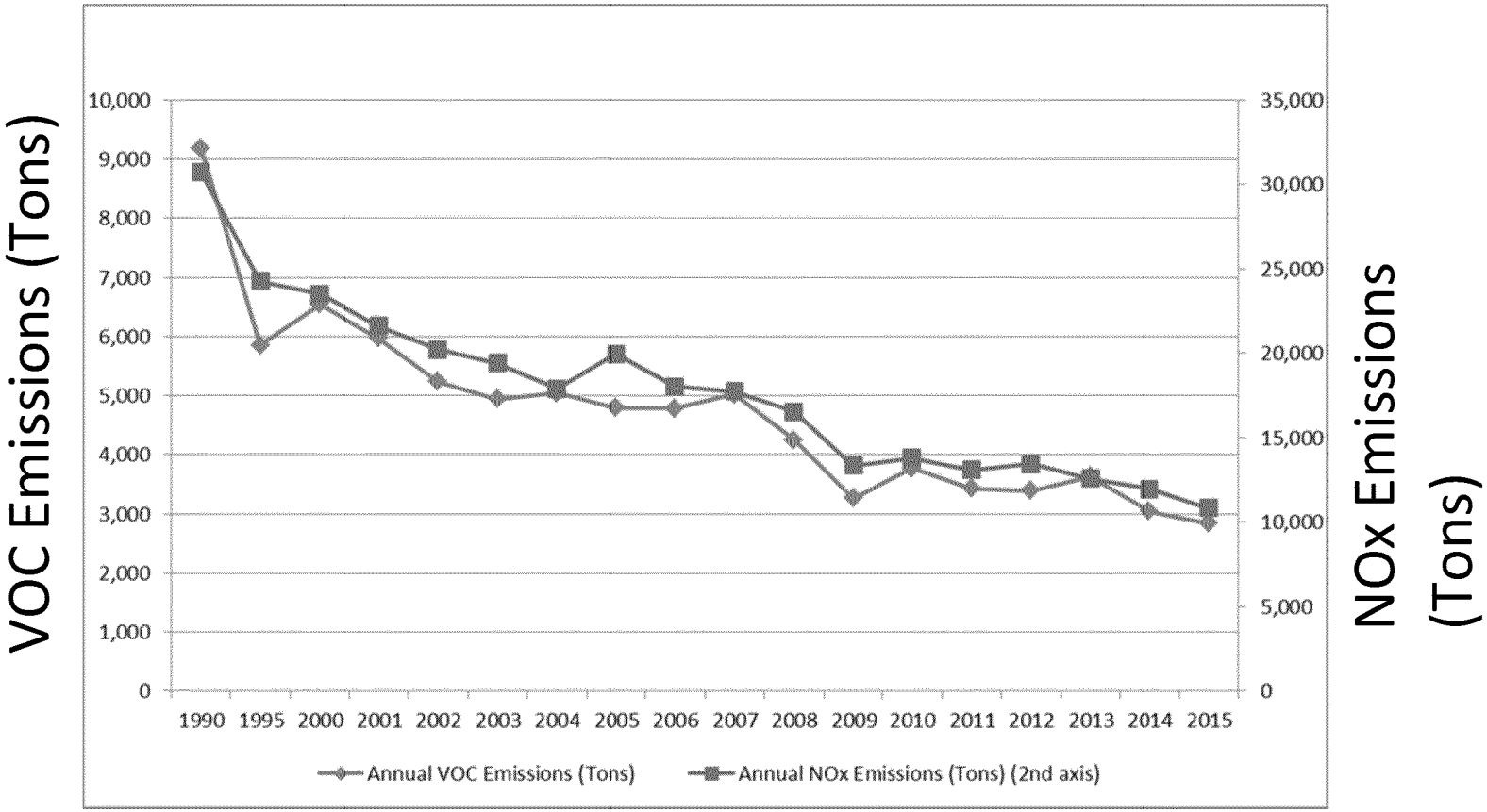
Maine's Point Source Emissions Trends



Note: Maine's annual VOC point source emissions for 2014 in were 3,042 tons which is 0.7% of Maine's 2014 biogenic (natural) VOC emissions which were 436,878 tons.

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Nonattainment and Maintenance Sites Modeling Results

Final CSAPR Update Model Determined Nonattainment and Maintenance Sites in the OTR							
Monitor ID	State	County	2009-2013 Base Period Average Design Value (ppb)	2009-2013 Base Period Maximum Design Value (ppb)	2017 Base Case Average Design Value (ppb)	2017 Base Case Maximum Design Value (ppb)	ME Contribution (ppb)
90010017	Connecticut	Fairfield	80.3	83	74.1	76.6	0.01
90013007	Connecticut	Fairfield	84.3	89	75.5	79.7	0.00
90019003	Connecticut	Fairfield	83.7	87	76.5	79.5	0.00
90099002	Connecticut	New Haven	85.7	89	76.2	79.2	0.00
240251001	Maryland	Harford	90.0	93	78.8	81.4	0.00
360850067	New York	Richmond	81.3	83	75.8	77.4	0.00
361030002	New York	Suffolk	83.3	85	76.8	78.4	0.00
421010024	Pennsylvania	Philadelphia	83.3	87	73.6	76.9	0.00

Preliminary Interstate Ozone Transport Model Determined Nonattainment and Maintenance Sites in the OTR							
Monitor ID	State	County	2023 Base Case Average Design Value (ppb)	2023 Base Case Maximum Design Value (ppb)	2013-2015 Design Value (ppb)	2014-2016 Design Value (ppb)	ME Contribution
361030002	New York	Suffolk	71.3	72.7	72	72	0.01
90013007	Connecticut	Fairfield	69.4	73.2	83	81	0.00
90019003	Connecticut	Fairfield	70.5	73.3	84	85	0.00
90099002	Connecticut	New Haven	69.8	72.5	78	76	0.00
240251001	Maryland	Harford	71.3	73.7	71	73	0.00
360810124	New York	Queens	69.9	71.7	69	69	0.00
360850067	New York	Richmond	71.2	72.7	74	76	0.00

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Ozone Trends and Nearby Nonattainment Area Exceedance Days Trajectory Analysis

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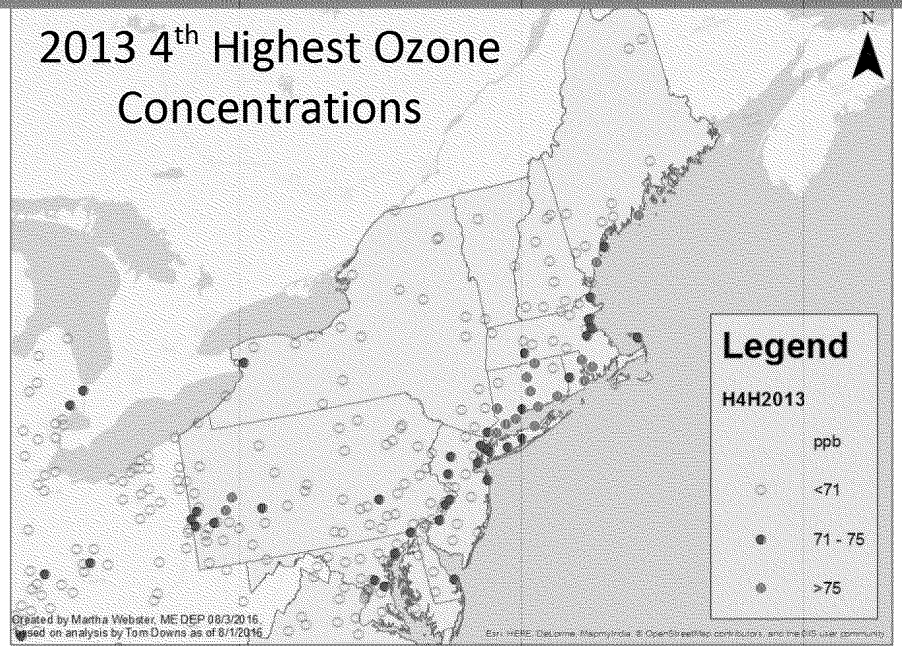
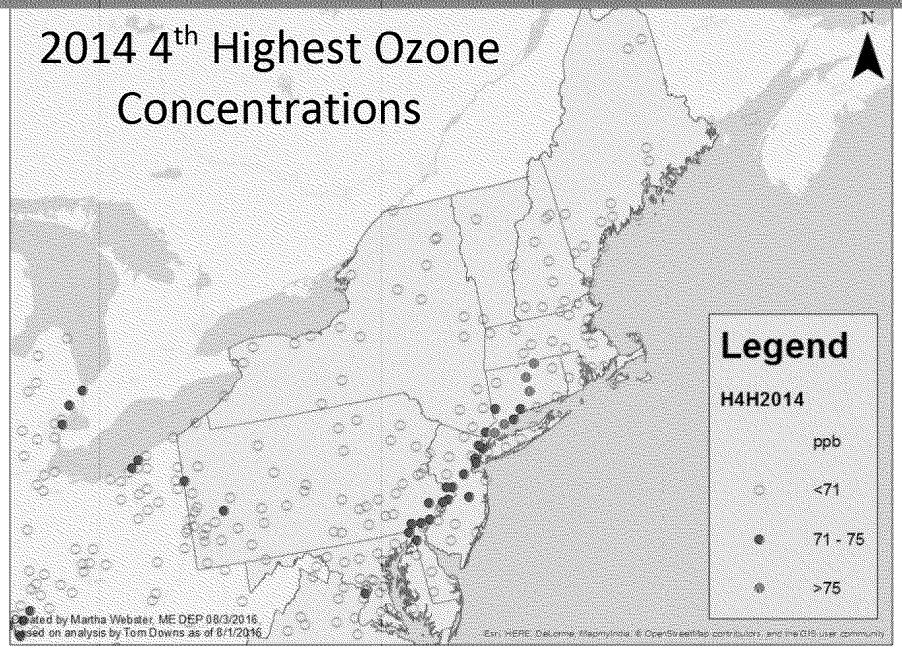
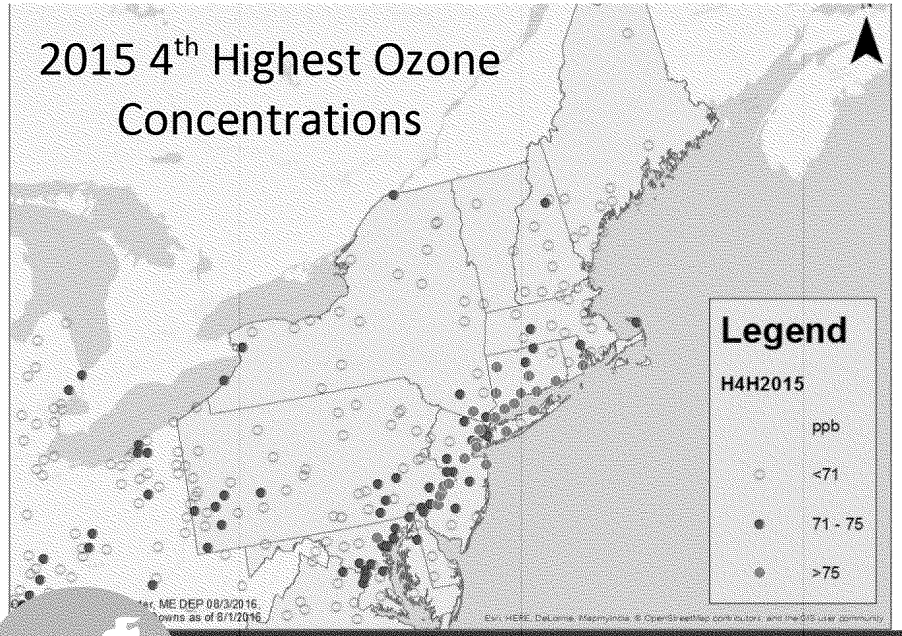
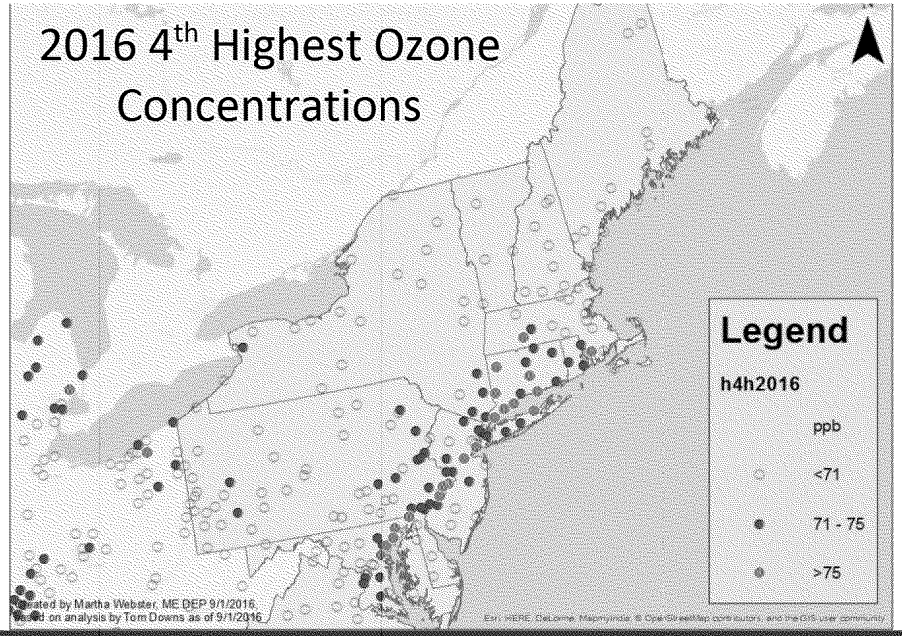
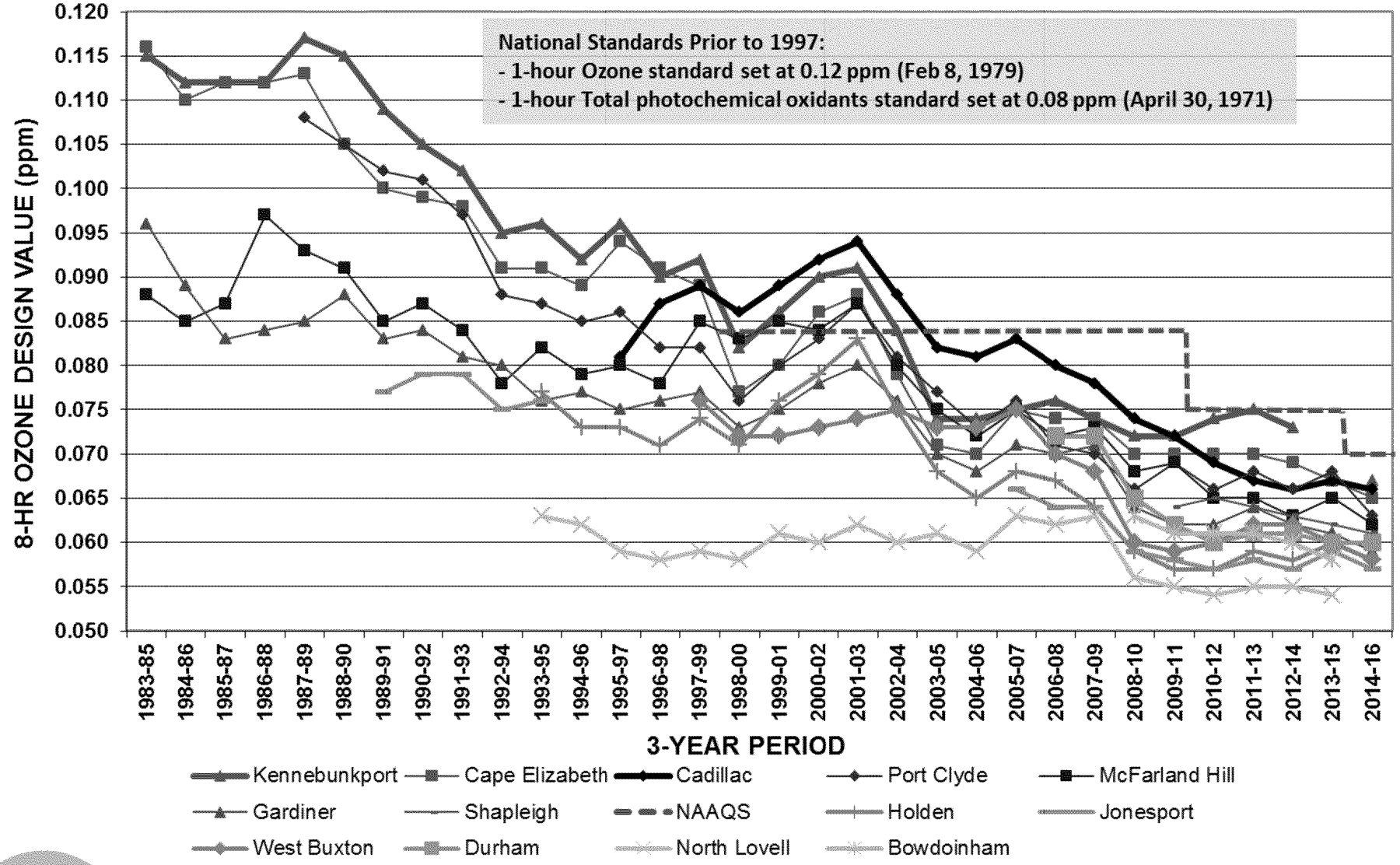








MAINE 8-HOUR OZONE DESIGN VALUE (DV) TRENDS



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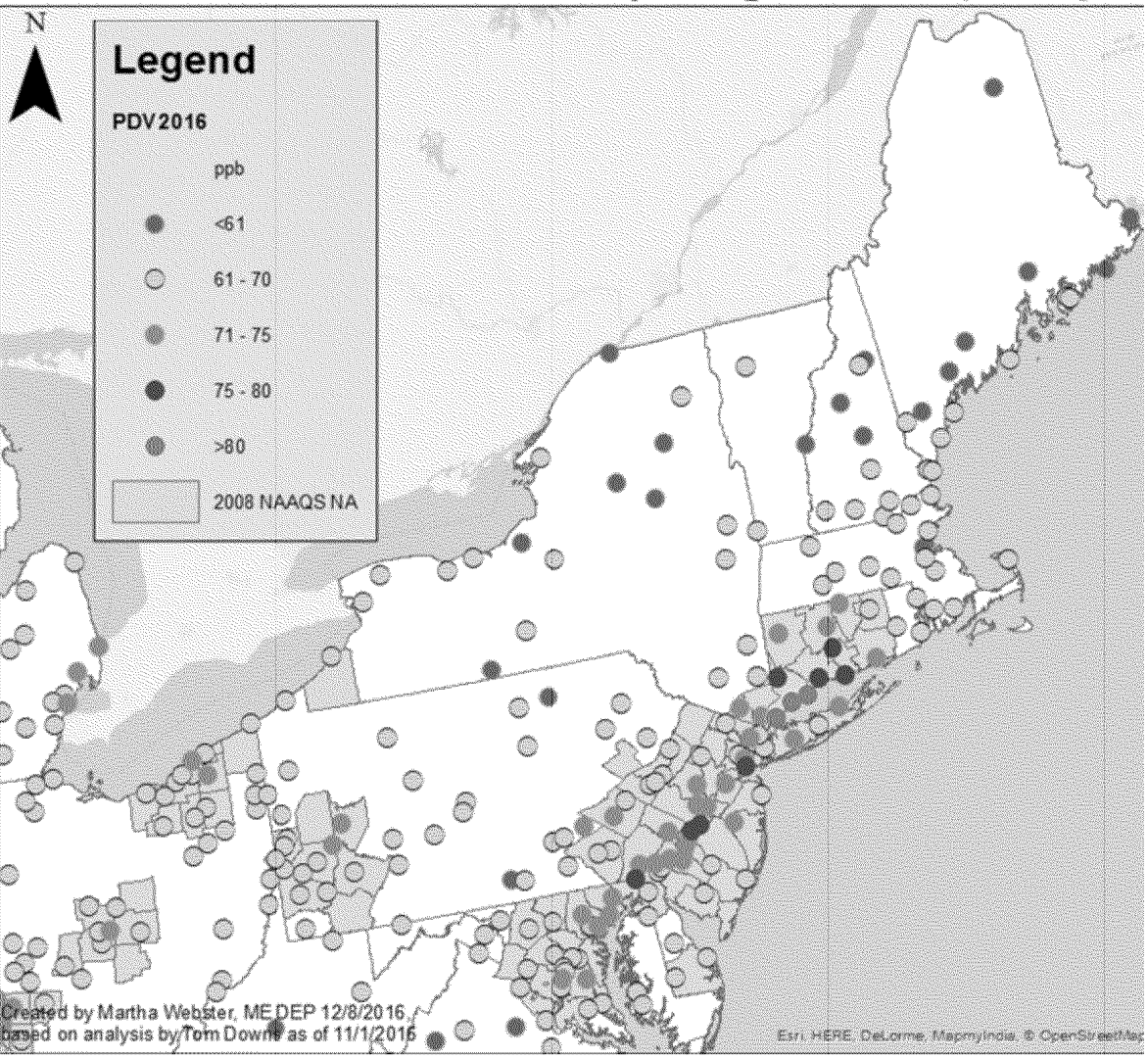
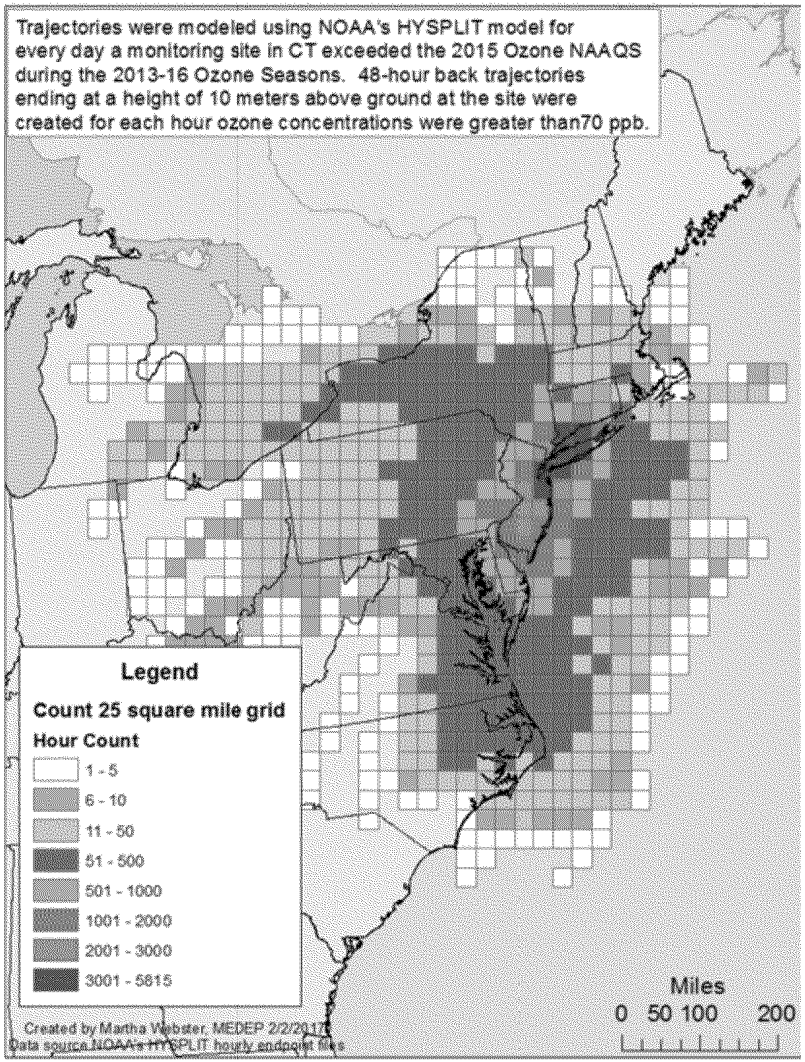
2014-16 8-hr Ozone Preliminary Design Values



Back Trajectory Hourly Endpoint Counts for Connecticut Nonattainment Areas



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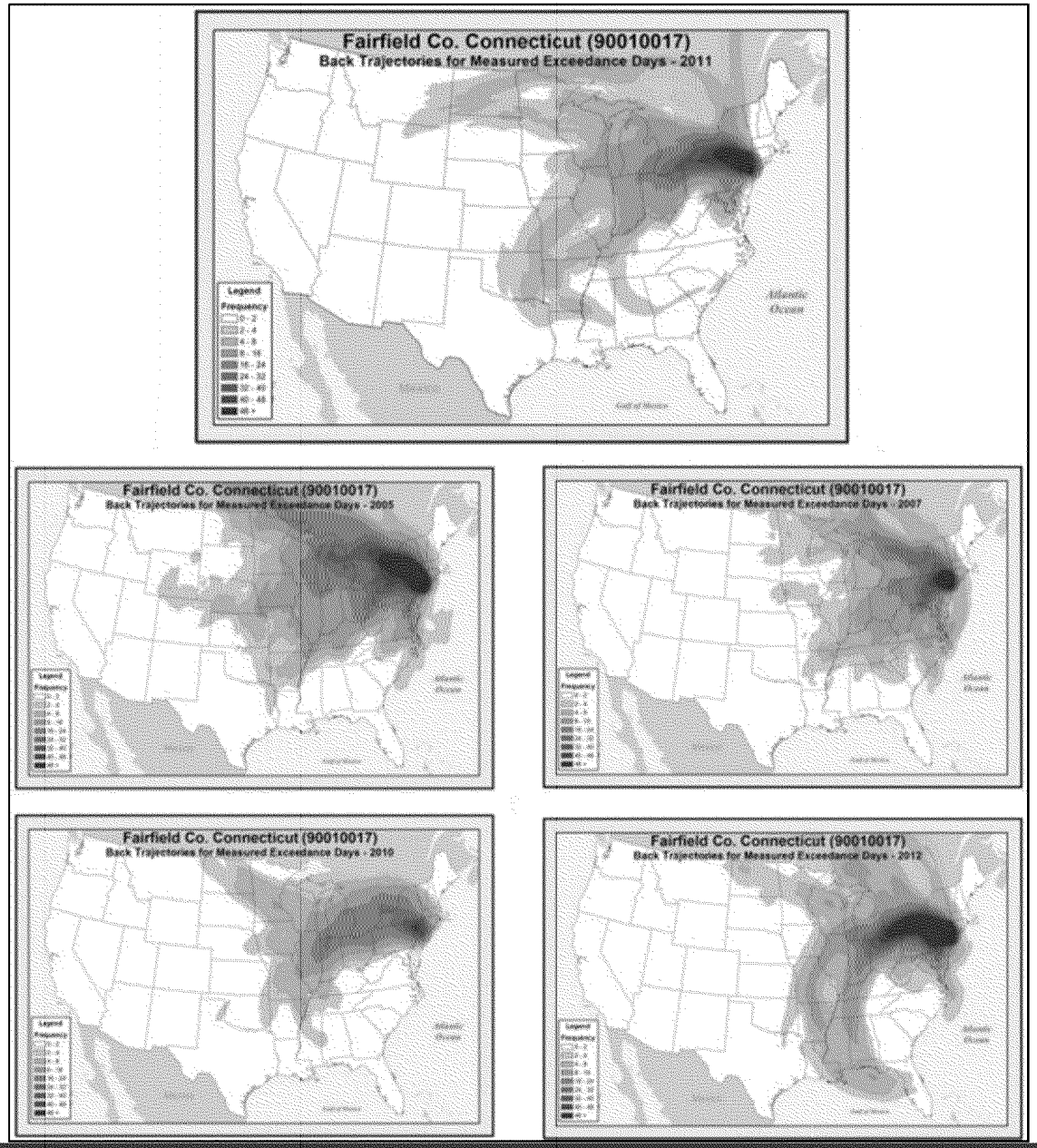
EPA's Trajectory Analysis results also show that Maine's emissions do not impact Nonattainment and Maintenance sites.

[Source: Appendix E of the Air Quality Modeling Technical Support Document for the Final Cross-State Air Pollution Update Rule, August 2016.]



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