Air Quality Modeling
Final Rule Technical Support Document

U.S. Environmental Protection Agency
Office of Air Quality Planning and Standards
Air Quality Assessment Division
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I. Introduction

In this technical support document (TSD) we describe the air quality modeling performed to support the Final Transport Rule (TR)[1]. For this rule the Environmental Protection Agency (EPA) used air quality modeling to:

(1) identify locations expected to be nonattainment or have maintenance problems for annual (average) $PM_{2.5}$, 24-hour $PM_{2.5}$, and/or 8-hour ozone for the analytic years chosen for the TR,

(2) quantify the impacts (i.e., air quality contributions) of SO_2 and NO_X emissions from upwind states on downwind annual and 24-hour $PM_{2.5}$ concentrations at monitoring sites projected to be nonattainment or have maintenance problems in 2012 for the 1997 annual and 2006 24-hour $PM_{2.5}$ NAAQS[2], respectively,

(3) quantify the contributions of NO_X emissions on downwind 8-hour ozone concentrations at monitoring sites projected to be nonattainment or have maintenance problems in 2012 for the 1997 ozone NAAQS from upwind states,

(4) "calibrate" the Air Quality Assessment Tool (AQAT) for use in the process of determining the amount of significant contribution,

(5) examine issues related to the need for NOx emissions reductions from upwind states, and

(6) assess the health and welfare benefits of the emissions reductions expected to result from this rule.

This TSD includes information on the following analytical aspects of the TR air quality modeling:

- a description of the modeling platform,
- an evaluation of model predictions compared to measured concentrations,
- the procedures and results of projecting ozone and $PM_{2.5}$ concentrations for future year scenarios,
- the procedures used to quantify interstate contributions for annual and 24-hour $PM_{2.5}$, and 8-hour ozone,
- the results of evaluating the interstate contributions using concentration thresholds, and

[1] See docket item (placeholder) for the input files and output files from the Final Transport Rule air quality modeling.
[2] National Ambient Air Quality Standards (NAAQS).

- the air quality impacts from the SO_2 and NO_X emissions reductions expected from the "Air Quality-Assured Trading" scenario (i.e., remedy scenario), as described in the rule preamble.

Air quality modeling was performed for several emissions cases: a 2005 base year, a 2012 "no CAIR" base case, a 2014 "no CAIR" base case, the 2014 remedy scenario, a 2014 "AQAT" calibration scenario, and two emissions sensitivity scenarios. There were two separate annual model simulations for 2005. One of the 2005 simulations was used as the base year for projecting air quality and the second 2005 simulation, which included additional year-specific emissions for 2005, was used in the analysis of model performance. The year 2005 was selected for the Transport Rule base year because this is the most recent year for which EPA has a complete national emissions inventory. The 2012 base case modeling was used to identify future nonattainment and maintenance locations and to quantify the contributions of emissions in upwind states to annual and 24-hour $PM_{2.5}$, and 8-hour ozone at downwind receptors. The 2014 base case and 2014 remedy case modeling were used to quantify the benefits of the emissions reductions from the rule. The rationale for selecting 2012 and 2014 as the analytic years for the TR is provided in the preamble.

As indicated above, we used the air quality modeling platform described in this TSD to simulate a 2014 emissions scenario developed to calibrate AQAT. This scenario is referred to as the AQAT calibration scenario and the modeling results from this scenario were used both as direct inputs to EPA's evaluation of downwind air quality under multiple EGU emission reduction scenarios and as data points valuable to calibrating AQAT[3]. For more information on AQAT and how the AQAT calibration was

[3] The 2014 AQAT calibration scenario was designed to be similar to the 2014 preferred remedy case modeled for the proposed rule. In the calibration scenario EGU SO2 emissions for states included in Group 1 at proposal were modeled using IPM under a cost threshold of $2000/ton. Emissions of SO2 from EGUs in the proposed Group 2 states were modeled using IPM under a cost threshold of $500/ton. Annual and ozone season EGU NOx emissions for states included in the proposed Transport Rule for contributions to $PM_{2.5}$ and ozone respectively were modeled for a cost threshold of $500/ton. Note that the geography of states participating in each program and the geography of states defined as Group 1 and Group 2 for SO_2 in the final Transport Rule differs from the proposed Transport Rule. The emissions from EGUs for the AQAT calibration scenario were merged with the 2014 base case emissions from other source sectors for input to CAMx. The annual CAMx simulation for this scenario was performed for the modeling domain covering the Eastern U.S with 12 km horizontal resolution. Initial and boundary concentrations for modeling this scenario were obtained from outputs of the 2014 base case simulation performed at 36 km resolution for the Continental U.S. domain. The CAMx

used as part of the approach for identifying emissions that constitute a state's significant contribution to nonattainment and interference with maintenance, please refer to preamble section VI.C and the Significant Contribution and State Emissions Budgets Final Rule TSD. We also performed two sensitivity model simulations to further examine the impacts of NOx and SO_2 emissions on concentrations of $PM_{2.5}$. The sensitivity scenarios included (1) a simulation for 2014 which was identical to the 2014 base case, except that we included the SO2 emissions reductions from the AQAT calibration scenario (without any NOx reductions) and (2) a simulation for 2012 in which "removed" (i.e., zero-out) NOx emissions from all anthropogenic emissions in Georgia. The scenario with SO2-only emissions reductions was performed to quantify the nitrate increase that occurs when SO_2 emissions are reduced ("nitrate replacement"). The NOx zero-out simulation was performed to quantify the role of NOx emissions in the formation of sulfate. The results of these two sensitivity scenarios are provided in separate technical report in the docket[4].

The remaining sections of the Air Quality Modeling Final Rule TSD are as follows. Section II describes the air quality modeling platform and the evaluation of model predictions of $PM_{2.5}$ and ozone using corresponding ambient measurements. Section III defines the procedures for projecting future case $PM_{2.5}$ and ozone concentrations and the approach for determining locations with projected nonattainment and/or maintenance problems. Section IV describes (1) the source apportionment (i.e., contribution) modeling, (2) the procedures for quantifying contributions to nonattainment and/or maintenance, (3) the evaluation of contributions to determine which states are covered by this rule, and (4) an analysis of contributions relative to various air quality thresholds. In section V we present the results of modeling performed for 2014 to assess

model predictions from the AQAT calibration scenario were used to characterize the season-specific response of sulfate to the SO_2 and NO_x emissions reductions modeled. The seasonal response in sulfate, as predicted for individual sites by CAMx, was used along with the CAMx predictions from the 2012 base case to develop calibration factors that were applied when running AQAT in order to align the sulfate estimates from AQAT with what would be expected from simulations with CAMx. The CAMx model predictions of the other $PM_{2.5}$ component species (e.g., nitrate) from the AQAT calibration scenario were used directly along with the calibrated sulfate estimates from AQAT to estimate total $PM_{2.5}$ concentrations at the cost threshold levels analyzed for the final rule. Details on AQAT, the calibration scenario, the approach for using air quality modeling results to calibrate AQAT, and the AQAT $PM_{2.5}$ concentration estimates are provided in the Significant Contribution and State Emissions Budgets Final Rule TSD.

[4] "Technical Analyses in Support of the Need for Annual NOx Controls in the Final Transport Rule".

the impacts on air quality of the emissions reductions expected from this rule. Information on the development of emissions inventories for the TR and the steps and data used in creating emissions inputs for air quality modeling can be found in the Emissions Inventory Final Rule TSD (EITSD). The EITSD also contains state/sector/pollutant emissions summaries for each of the emissions scenarios modeled.

II. Air Quality Modeling Platform

A. Air Quality Model

We used the Comprehensive Air Quality Model with Extension[5] (CAMx) version 5.3 to simulate ozone and $PM_{2.5}$ concentrations for the 2005 base year and the 2012 and 2014 future year scenarios modeled for the TR. CAMx was also used for the 2012 source apportionment modeling to quantify interstate transport of ozone and $PM_{2.5}$. CAMx is a three-dimensional Eulerian grid-based photochemical model designed to simulate the formation, chemical transformation, transport, and removal of ozone, secondary and directly emitted $PM_{2.5}$, and their precursor species on national, regional, and local scales for short-term episodes up to annual time periods. Using this model, EPA simulated the emissions from many different sources of pollution (e.g., EGUs, mobile sources). The emission inputs represent the outputs of other sector-specific models, reported measurements, or other sources. Meteorological model outputs of parameters such as wind speed, wind direction, temperature, pressure, and precipitation are important inputs to CAMx. The emission, transport, diffusion, chemical transformation, and concentrations of pollution were simulated at 1-hour intervals across the modeling domains.

B. Modeling Domains

The CAMx model applications for the TR focus on states in the Eastern U.S. using a horizontal grid resolution of 12 x 12 km (Table II-1). The Eastern modeling region (i.e., Eastern modeling domain) extends from Texas northward to North Dakota and eastward to the East Coast. Thirty seven states and the District of Columbia are wholly contained with this modeling domain. The Eastern modeling domain lies within a coarse grid, 36 x 36 km modeling domain which covers the lower 48 states and adjacent portions of Canada and Mexico. The 36 km and 12 km modeling domains extend vertically from the surface to 100 millibars (approximately 15 km) using a sigma-pressure coordinate system. Predictions from the 36 km Continental U.S. (CONUS) domain were used to provide initial and boundary concentrations for simulations in the 12 km domain. The 2005 base year scenarios, and the 2012 base case, 2014 base case, and 2014 remedy emissions scenarios were modeled for the 36 km and 12 km domains.

[5] Comprehensive Air Quality Model with Extensions Version 5.3 User's Guide. Environ International Corporation. Novato, CA. December 2010 (www.camx.com).

However, as described below, the source apportionment modeling was performed for the 37 states wholly within the 12 km Eastern domain only using boundary concentrations from the 2012 base case 36 km CAMx simulation. The 36 km and 12 km modeling domains are shown in Figure II-1. Table II-1 provides geographic specifications for these domains.

In addition to the CAMx model, the TR modeling platform includes (1) emissions for the 2005 base year, 2012 base case, 2014 base case, and 2014 remedy scenario, (2) meteorology for the year 2005, and (3) estimates of intercontinental transport (i.e., boundary concentrations) from a global photochemical model. Using these input data, CAMx was run to generate hourly predictions of ozone and $PM_{2.5}$ component species concentrations for each grid cell in the modeling domains. The development of 2005 meteorological inputs and initial and boundary concentrations for the CONUS domain are described below. The emissions inventories used in the TR air quality modeling are described in the EITSD.

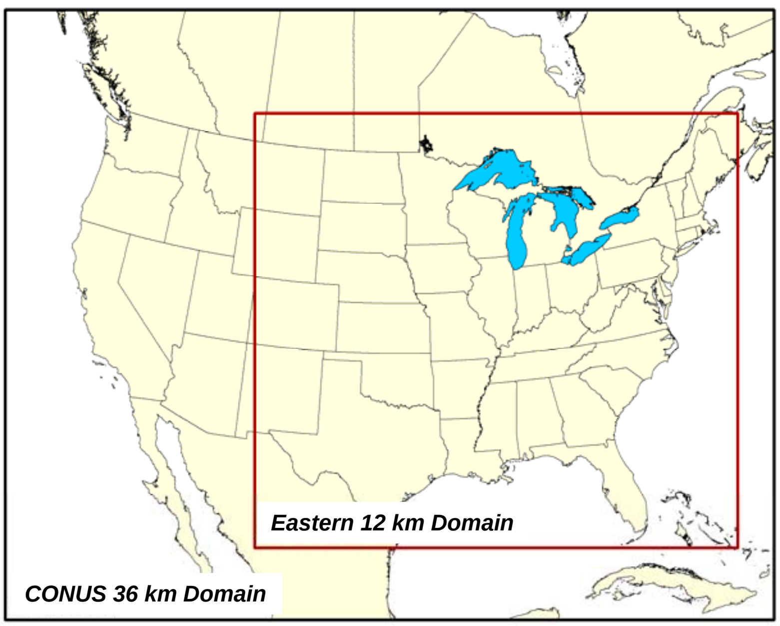

Figure II-1. Transport Rule air quality modeling domains.

Table II-1. Specifications of the air quality modeling domains.

	36 x 36 km Domain	12 x 12 km Domain
Map Projection	Lambert Conformal Projection	
Grid Resolution	36 km	12 km
Coordinate Center	97 deg W, 40 deg N	
True Latitudes	33 deg N and 45 deg N	
Dimensions	148 x 112 x 14	279 x 240 x 14
Vertical extent	14 Layers: Surface to 100 millibar level (see Table II-2)	

C. Model Simulation Periods

Annual simulations of CAMx were performed in quarterly segments (i.e., January through March, April through June, July through September, and October through December) for each emissions scenario. With this approach to segmenting an annual simulation we were able to model several quarters at the same time and, thus, reduce the overall throughput time for an annual simulation. The CONUS domain simulations included a "ramp-up" period, comprised of 10 days before the beginning of each quarter, to mitigate the effects of initial concentrations. For the 12 km Eastern domain simulations we used a 3-day ramp-up period for each quarter. Fewer ramp-up days were used for the 12 km simulations because the initial concentrations were derived from the parent 36 km simulations.

D. Meteorological Input Data

All of the TR CAMx simulations used meteorology for 2005. The gridded meteorological input data for 2005 were derived from simulations of the Pennsylvania State University / National Center for Atmospheric Research Mesoscale Model. This model, commonly referred to as MM5, is a limited-area, non-hydrostatic, terrain-following system that solves for the full set of physical and thermodynamic equations which govern atmospheric motions.[6] Meteorological model input fields for CAMx were prepared separately for each of the domains shown in Figure II-1 using MM5 version 3.7.4. The MM5 simulations were run on the same map projection and with the same horizontal resolution as CAMx.

The CONUS and Eastern meteorological model runs were configured similarly. The selections for key MM5 physics options are as follows:

- Pleim-Xiu PBL and land surface schemes
- Kain-Fritsh 2 cumulus parameterization
- Reisner 2 mixed phase moisture scheme
- RRTM longwave radiation scheme
- Dudhia shortwave radiation scheme

Three dimensional analysis nudging[7] for temperature and moisture was applied above the boundary layer only. Analysis nudging for the wind field was applied above and below the boundary layer. The 36 km domain nudging weighting factors were 3.0 x 10^4 for wind fields and temperatures and 1.0 x 10^5 for moisture fields. The 12 km domain nudging weighting factors were 1.0 x 10^4 for wind fields and temperatures and 1.0 x 10^5 for moisture fields.

The meteorological model runs were conducted in 5.5 day segments with 12 hours of overlap for spin-up purposes. The meteorological modeling domains contain 34 vertical layers with an approximately 38 m deep surface layer and a 100 millibar top. The MM5 and CAMx vertical structures are shown in Table II-2 and do not vary by horizontal grid resolution. The meteorological outputs from the MM5 simulations were processed to create model-ready inputs for CAMx using the mm5camx meteorological processor.

[6] Grell, G., J. Dudhia, and D. Stauffer, 1994: A Description of the Fifth-Generation Penn State/NCAR Mesoscale Model (MM5), NCAR/TN-398+STR., 138 pp, National Center for Atmospheric Research, Boulder CO.

[7] "nudging" is a common practice in meteorological modeling in which measured values for certain meteorological parameters are input to the model simulation with weighting factors to more closely align or "nudge" the predictions to the observations.

Table II-2. Vertical layer structure for MM5 and CAMx (heights are layer top).

CAMx Layers	MM5 Layers	Sigma P	Approximate Height (m)	Approximate Pressure (mb)
0	0	1.000	0	1000
1	1	0.995	38	995
2	2	0.990	77	991
3	3	0.985	115	987
	4	0.980	154	982
4	5	0.970	232	973
	6	0.960	310	964
5	7	0.950	389	955
	8	0.940	469	946
6	9	0.930	550	937
	10	0.920	631	928
	11	0.910	712	919
7	12	0.900	794	910
	13	0.880	961	892
	14	0.860	1,130	874
8	15	0.840	1,303	856
	16	0.820	1,478	838
	17	0.800	1,657	820
9	18	0.770	1,930	793
	19	0.740	2,212	766
10	20	0.700	2,600	730
	21	0.650	3,108	685
11	22	0.600	3,644	640
	23	0.550	4,212	595
12	24	0.500	4,816	550
	25	0.450	5,461	505
	26	0.400	6,153	460
13	27	0.350	6,903	415
	28	0.300	7,720	370
	29	0.250	8,621	325
	30	0.200	9,625	280
14	31	0.150	10,764	235
	32	0.100	12,085	190
	33	0.050	13,670	145
	34	0.000	15,674	100

The 2005 MM5 meteorological predictions were compared to the corresponding observations as part of a model performance evaluation to assess the adequacy of the MM5 simulated fields. The qualitative aspects of this evaluation included the comparison of the model-estimated synoptic patterns against observed patterns from historical weather chart archives for 2005. Additionally, the evaluation compared spatial patterns of monthly average rainfall and monthly maximum planetary boundary layer (PBL) heights. Qualitatively, the model fields closely matched the observed synoptic patterns, which is not unexpected given the use of nudging. An operational evaluation for 2005 was performed using statistical comparisons of model/observed pairs (e.g., mean normalized bias, mean normalized error, index of agreement, root mean square errors, etc.) for multiple meteorological parameters. For this portion of the evaluation, five meteorological parameters were investigated: temperature, humidity, shortwave downward radiation, wind speed, and wind direction. The three individual MM5 evaluations are described elsewhere.[8,9,10] The results of these analyses indicate that the bias and error values associated with the 2005 meteorological data were generally within the range of past meteorological modeling results that have been used for air quality applications[11].

E. Initial and Boundary Concentrations

The lateral boundary and initial species concentrations are provided by a three-dimensional global atmospheric chemistry model, the GEOS-CHEM model[12] (standard version 7-04-11[13]). The global GEOS-CHEM model simulates atmospheric chemical and physical processes driven by assimilated meteorological observations from the NASA's Goddard Earth Observing System (GEOS). The GEOS-CHEM model was run for 2005 with a grid resolution of 2.0 degree x 2.5 degree (latitude-longitude) and 30 vertical layers up to 100 mb. The predictions were used to provide one-way dynamic boundary conditions at three-hour intervals and an initial concentration field for the 36 km CAMx simulations. The concentrations from the 36 km CONUS domain model simulations were used to develop the initial/boundary concentrations for the corresponding 12 km Eastern domain model simulations.

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[8] Baker, K. and P. Dolwick. Meteorological Modeling Performance Evaluation for the Annual 2005 Eastern U.S. 12-km Domain Simulation, USEPA/OAQPS, February 2, 2009. http://www.epa.gov/scram001/meteorology/metgridmodeling/met.2005.12EUS1.pdf

[9] Baker, K. and P. Dolwick. Meteorological Modeling Performance Evaluation for the Annual 2005 Western U.S. 12-km Domain Simulation, USEPA/OAQPS, February 2, 2009. http://www.epa.gov/scram001/meteorology/metgridmodeling/met.2005.12WUS1.pdf

[10] Baker, K. and P. Dolwick. Meteorological Modeling Performance Evaluation for the Annual 2005 Continental U.S. 36-km Domain Simulation, USEPA/OAQPS, February 2, 2009. http://www.epa.gov/scram001/meteorology/metgridmodeling/met.2005.36US1.pdf

[11] Dolwick, P, R. Gilliam, L. Reynolds, and A. Huffman. Regional and Local-Scale Evaluation of 2002 MM5 Meteorological Fields for Various Air Quality Modeling Applications, 6th Annual CMAS Conference, Chapel Hill, NC, October 1-3, 2007. http://www.cmascenter.org/conference/2007/abstracts/dolwick_session3_2007.pdf

[12] Yantosca, B., 2006. GEOS-CHEMv7-04112 User's Guide, Atmospheric Chemistry Modeling Group, Harvard University, Cambridge, MA, March 05, 2006.

[13] Henze, D.K., J.H. Seinfeld, N.L. Ng, J.H. Kroll, T-M. Fu, D.J. Jacob, C.L. Heald, 2008. Global modeling of secondary organic aerosol formation from aromatic hydrocarbons: high-vs.low-yield pathways. *Atmos. Chem. Phys*., 8, 2405-2420.

F. Model Performance Evaluation for Ozone and $PM_{2.5}$

The predictions from CAMx for ozone and fine particulate sulfate, nitrate, ammonium, organic carbon, elemental carbon, and crustal material from the 2005 base year evaluation case were compared to measured concentrations in order to evaluate the performance of the modeling platform for replicating observed concentrations. This evaluation was comprised of statistical and graphical comparisons of paired modeled and observed data. Details on the model performance evaluation including a description of the methodology, the model performance statistics, and results are provided in the Appendix A.

III. Projection of Future Nonattainment and Maintenance for Annual $PM_{2.5}$, 24-Hour $PM_{2.5}$, and 8-Hour Ozone

In this section we describe the approach for projecting future concentrations of ozone and $PM_{2.5}$ to identify locations that are expected to be nonattainment or have a maintenance problem in the 2012 and 2014 future year scenarios modeled for the TR. The nonattainment and maintenance locations are based on projections of future air quality at existing ozone and $PM_{2.5}$ monitoring sites. The nonattainment and maintenance sites for the 2012 base case are used as the "receptors" for quantifying the contributions of emissions in upwind states to nonattainment and maintenance in downwind locations. Future year concentrations for the 2014 base case and 2014 remedy scenario were used to assess the impacts of the emissions reductions from the TR on ozone and $PM_{2.5}$ air quality.

For this analysis we are using air quality modeling results in a "relative" sense to project future concentrations of ozone and $PM_{2.5}$. Rather than use the absolute model-predicted future year ozone and $PM_{2.5}$ concentrations, the base year and future year predictions are used to calculate a (relative) percent change in ozone and $PM_{2.5}$ concentrations. In this approach, the ratio of future year model predictions (i.e., 2012 or 2014) to 2005 base year model predictions are used to adjust (2003-2007) ambient measured data up or down depending on the relative (percent) change in model predictions for each location. The use of ambient data as part of the calculation helps to constrain the future year design value predictions, even if the absolute model concentrations are over-predicted or under-predicted. For example, assume that a monitoring site has a measured sulfate concentration of 6.0 $\mu g/m^3$ in the 2003-2007 base period and a modeled concentration (in 2005) of 4.0 $\mu g/m^3$. In the 2012 base case, the modeled concentration is 3.2 $\mu g/m^3$. Therefore the relative response factor is 0.80 or a 20% reduction [100*(1-(3.2/4.0))]. Consequently, the estimated 2012 base case sulfate value would be 6 $\mu g/m^3$ multiplied by the relative response factor of 0.80, or 4.8 $\mu g/m^3$. In this way, the predicted future year pollutant concentration is always anchored by the observed data. As described below, the procedures for projecting annual and 24-hour $PM_{2.5}$ and 8-hour ozone conform to the methodologies contained in the final guidance for attainment demonstration modeling[14] (referred to below as the "modeling guidance").

[14] U.S. EPA, 2007: Guidance on the Use of Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, $PM_{2.5}$, and Regional Haze; Office of Air Quality

A. Procedures for Processing Ambient Ozone and $PM_{2.5}$ Data

In this analysis we use measurements of ambient ozone and $PM_{2.5}$ data from several state and federal monitoring networks. This includes data from over 500 ozone monitoring sites as well as over 500 Federal Reference Method (FRM) $PM_{2.5}$ sites in the Eastern U.S.. In addition, speciated $PM_{2.5}$ data from the Chemical Speciation Network (CSN) and IMPROVE network are used to estimate $PM_{2.5}$ species concentrations at each FRM site. The ambient data used in this analysis were obtained from EPA's Air Quality System (AQS)[15] for the time-period between 2003 and 2007.

In order to utilize the ambient data, the raw measurements must be processed into a form pertinent for useful interpretations. The ozone data were processed consistent with the formats associated with the 1997 8-hour NAAQS for ozone. The level of the 1997 8-hour O_3 NAAQS is 0.08 ppm. The 8-hour ozone standard is not met if the 3-year average of the annual 4th highest daily maximum 8-hour O_3 concentration is greater than 0.08 ppm (0.085 ppm or greater when rounded up). This 3-year average is referred to as the design value.

The $PM_{2.5}$ ambient data were processed consistent with the formats associated with the NAAQS for $PM_{2.5}$. For $PM_{2.5}$, we evaluated concentrations of both the annual $PM_{2.5}$ NAAQS and the 24-hour $PM_{2.5}$ NAAQS. The annual $PM_{2.5}$ standard is not met if the 3-year average of the annual mean concentration is greater than 15.0 $\mu g/m^3$ (15.05 $\mu g/m^3$ or greater when rounded up). The 3-year average annual mean concentration is computed at each site by averaging the daily Federal Reference Method (FRM) samples by quarter, averaging these quarterly averages to obtain an annual average, and then averaging the three annual averages. The 3-year average annual mean concentration is referred to as the annual design value.

The 24-hour standard is not met when the 3-year average of the annual 98th percentile $PM_{2.5}$ concentration is greater than 35 $\mu g/m^3$ (35.5 $\mu g/m^3$ or greater when rounded up). The 3-year average mean 98th percentile concentration is computed at each site by averaging the 3 individual annual 98th percentile values at each site. The 3-year average 98th percentile concentration is referred to as the 24-hour design value.

Planning and Standards, Research Triangle Park, NC.
http://www.epa.gov/ttn/scram/guidance/guide/final-03-pm-rh-guidance.pdf

[15] See **http://www.epa.gov/ttn/airs/airsaqs/** for access to raw data.

When projecting ambient monitoring data to future time periods using relative response factors, the modeling guidance recommends using the average of the three design value periods centered on the year of the base year emissions. Since 2005 was the base emissions year for the TR modeling, we used the design value for 2003-2005, 2004-2006, and 2005-2007 to represent the base period ozone and $PM_{2.5}$ concentrations. Specifically, we used ambient ozone and annual and 24-hour $PM_{2.5}$ design values for the periods 2003-2005, 2004-2006, and 2005-2007 as the starting point for our projections of design values for each of the future year scenarios modeled. The 2003–2005, 2004-2006, and 2005-2007 design values are accessible at www.epa.gov/airtrends/values.html.

Ambient design values from monitoring sites were included in our analysis if the site had at least one complete[16] design value in the 2003-2007 five-year period.[17] There were 723 monitoring sites in the 12 km Eastern modeling domain which had at least one complete design value period for the annual $PM_{2.5}$ NAAQS, and 722 sites which met this criteria for the 24-hour NAAQS[18] and 744 sites which met the criteria for the 8-hour ozone NAAQS.

B. Projection of Future Design Values and Determination of Nonattainment and Maintenance for Annual and 24-Hour $PM_{2.5}$

As noted above, the projection methodology for $PM_{2.5}$ involves using the model predictions in a relative sense to estimate the change in $PM_{2.5}$ between 2005 and each future year scenario. For a particular location, the percent change in modeled concentration (relative response factor) is multiplied by the corresponding observed base period ambient concentration to estimate the future year design value for that location. The procedure for calculating future year annual and 24-hour $PM_{2.5}$ design values is called the Speciated Modeled Attainment Test (SMAT). The SMAT approach is codified in a software tool available from EPA called Modeled Attainment Test Software, or

[16] Design value completeness was determined according to the monitoring rules in CFR 40 Part 50 Appendix I (8-hour ozone) and Appendix N (annual and 24-hr PM2.5).
[17] If there is only one complete design value, then the nonattainment and maintenance design values are the same.
[18] Design values were only used if they were deemed to be officially complete based on CFR 40 Part 50 Appendix N. The completeness criteria for the annual and 24-hour $PM_{2.5}$ NAAQS are different. Therefore, there are fewer complete sites for the annual NAAQS.

MATS[19]. The software (including documentation) is available at: http://www.epa.gov/scram001/modelingapps_mats.htm.

As described below, design values of $PM_{2.5}$ in 2012 and 2014 were estimated by applying the 2005 to 2012 or 2005 to 2014 relative change in model-predicted $PM_{2.5}$ species concentrations to the measured (2003-2007) $PM_{2.5}$ species concentrations. The $PM_{2.5}$ species include sulfate, nitrate, ammonium, particle bound water, elemental carbon, salt, other primary $PM_{2.5}$, and organic aerosol mass (by difference). Organic aerosol mass by difference is defined as the difference between FRM $PM_{2.5}$ and the sum of the other components.

For each FRM $PM_{2.5}$ monitoring site, all valid design values (up to 3) from this period were averaged together, resulting in the "average" design value. Averaging the three values together has the effect of creating a 5-year weighted average. The middle year (2005) is weighted 3 times, the 2nd and 4th years (2004 and 2006) are weighted twice, and the 1st and 5th years (2003 and 2007) are weighted once. We refer to this as the 5-year weighted average design value concentration. For sites that did not have three valid design values, the "average" of all valid design values from the time-period were used.

The average design values were used to project concentrations for the 2012 and 2014 scenarios in order to determine which monitoring sites are expected to be nonattainment for these future year scenarios. We also projected design values for each of the individual valid 3-year design value periods (i.e., 2003-2005, 2004-2006, and 2003-2007). The projection of design values for these individual periods was used in the interstate contribution analysis to determine sites expected to have maintenance problems, as described below.

1. Methodology for Projecting Future Annual $PM_{2.5}$ Nonattainment and Maintenance

The following is a summary of the method used to project future year annual $PM_{2.5}$ design values. Additional details are provided in the modeling guidance and MATS documentation.

[19] U.S. EPA, 2009: Modeled Attainment Test Software; User's Manual http://www.epa.gov/ttn/scram/guidance/guide/MATS%20manual-1-5-1.pdf

As described above, base period (i.e., 2003 – 2007) FRM data are the starting point for projecting future design values since these quality assured measurements are used to determine attainment status. In order to apply SMAT to the FRM data, information on $PM_{2.5}$ speciation is needed for the location of each FRM monitoring site. Since co-located $PM_{2.5}$ speciation data are only available at ~15 percent of FRM monitoring sites, spatial interpolation techniques are used to calculate species concentrations for each FRM monitoring site. Speciation data from the IMPROVE and CSN were interpolated on a quarterly basis to each FRM monitor location by applying the Voronoi Neighbor Averaging (VNA) technique (using MATS). Additional information on the VNA interpolation techniques and data handling procedures can be found in the MATS User's Guide[20]. After the species fractions are calculated for each FRM site, the following procedures were used to estimate future year design values:

Step 1**:** Calculate quarterly mean concentrations for each of the major species components of $PM_{2.5}$ (i.e., sulfate, nitrate, ammonium, elemental carbon, organic carbon mass, particle bound water, salt, and blank mass). This is done by multiplying the monitored quarterly mean concentration of FRM-derived total $PM_{2.5}$ by the monitored fractional composition of $PM_{2.5}$ species for each quarter averaged over 3 years[21] (e.g., 20 percent sulfate fraction multiplied by 15 $\mu g/m^3$ $PM_{2.5}$ equals 3 $\mu g/m^3$ sulfate).

Step 2**:** For each quarter, calculate the ratio of future year to base year model predictions for sulfate, nitrate, elemental carbon, organic carbon, and other primary PM2.5. The result is a set of species-specific quarterly average relative response factors (RRF) (e.g., assume that the model-predicted 2005 base year sulfate for a particular location is 10.0 $\mu g/m^3$ and the 2012 future concentration is 8.0 $\mu g/m^3$, then the RRF for sulfate is 0.8). The RRFs are calculated based on the modeled concentrations averaged over the nine grid cells[22] centered at the location of the monitor.

Step 3**:** For each quarter and each of the species, multiply the base year quarterly mean component concentration (Step 1) by the species-specific quarterly RRF obtained in Step 2. This results in an estimated future year quarterly mean concentration for each

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[20] Available at http://www.epa.gov/ttn/scram/guidance/guide/MATS-2-3-1_manual.pdf

[21] For this analysis, species fractions were calculated using FRM and speciation data for the 2004-2006 time period. This was deemed to be representative of the 2005 base year period.

[22] The modeling guidance recommends calculating annual $PM_{2.5}$ RRFs using a 3 X 3 grid cell array (9 grid cells) when using a model resolution of 12km.

species (e.g., 3 μg/m^3 sulfate multiplied by the 0.8 RRF equals a future sulfate concentration of 2.4 μg/m^3).

Step 4: The future year concentrations for the remaining species are then calculated[23]. The future year ammonium is calculated based on the calculated future year sulfate and nitrate concentrations, using a constant value for the degree of neutralization of sulfate[24] (from the ambient data). The future year particle bound water concentration is calculated from an empirical formula derived from the Aerosol Inorganic Model (AIM)[25]. The inputs to the formula are the future year concentrations of sulfate, nitrate, and ammonium (from step 3).

Step 5**:** Average the four quarterly mean future concentrations to obtain the future year annual design value concentration for each of the component species. Sum the species concentrations to obtain the future year annual design value for $PM_{2.5}$.

Step 6**:** Calculate the **maximum** future design value by processing each of the three base design value periods (2003-2005, 2004-2006, and 2005-2007) separately. The highest of the three future values is the maximum design value. The maximum design values are used to determine future year maintenance sites.

The preceding procedures for determining future year $PM_{2.5}$ concentrations were applied for each FRM site. The calculated annual $PM_{2.5}$ design values are truncated after the second decimal place[26]. This is consistent with the truncation and rounding procedures for the annual $PM_{2.5}$ NAAQS. Any value that is greater than or equal to 15.05 μg/m^3 is rounded to 15.1 μg/m^3 and is considered to be violating the NAAQS. Thus, sites with future year annual $PM_{2.5}$ design values of 15.05 μg/m^3 or greater, based on the projection of 5-year weighted average concentrations, are predicted to be nonattainment sites. Sites with future year maximum design values of 15.05 μg/m^3 or greater are predicted to be maintenance sites. Note that nonattainment sites are also maintenance sites because the maximum design value at a site is always greater than or equal to the 5-year weighted average at that site. For ease of reference we use the term "nonattainment

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[23] All of the calculations and assumptions are consistent with the default MATS settings (as described in the MATS user's guide and the photochemical modeling guidance). Additionally, we did not explicitly model salt and therefore the salt concentration was held constant from the base to future. Blank mass was assumed to be a constant mass of 0.5 μg/m3 in both the base and future year.

[24] See section 5.1.2.2 of the MATS User's guide for details on the ammonium calculation.

[25] See section 5.1.2.2 of the MATS User's guide for details on the particle bound water formula.

[26] For example, a calculated annual average concentration of 14.94753 becomes 14.94 when digits beyond two places to the right are truncated.

sites" to refer to those sites that are projected to exceed the NAAQS based on both the average and maximum design values. Those sites that are projected to be in attainment based on the average design value but are projected to exceed the NAAQS based on the maximum design value are referred to as maintenance sites. The monitoring sites that we project to be nonattainment and/or maintenance for the annual $PM_{2.5}$ NAAQS in the 2012 base case are used as the nonattainment/maintenance receptors for assessing the contribution of emissions in upwind states to downwind nonattainment and maintenance of the annual $PM_{2.5}$ NAAQS (see section IV, below). The 2003-2007 base period and projected annual $PM_{2.5}$ design values for each site for the 2012 and 2014 scenarios are provided in Appendix B.

2. Methodology for Projecting Future 24-Hour $PM_{2.5}$ Nonattainment and Maintenance

The following is a summary of the procedures used for calculating future year 24-hour $PM_{2.5}$ design values. Additional details are provided in the modeling guidance and MATS documentation. The procedures for calculating the future year 24-hour $PM_{2.5}$ design values have been updated for the final rule[27]. The updates are intended to make the projection methodology more consistent with the procedures for calculating ambient design values. In the 24-hr attainment test used for the proposed TR, for each $PM_{2.5}$ monitor, we projected the measured 98th percentile concentrations from the 2003-2007 period to the future. As an additional check, we also projected the next highest concentrations from the other calendar quarters for each year (the three quarters when the 98th percentile did not occur) to ensure that the future year 98th percentile did not switch seasons in the future year compared to the base year. A basic assumption in this methodology is that the overall distribution of high measured days in the base period will be the same as in the future. Examination of several future year modeling scenarios showed that many of the highest PM2.5 days switched from the summer in the base period to the winter in the future period. As a result, the distribution of days shifted between the base and future periods. This is especially true in areas such as the upper Midwest which experience both high summer and winter $PM_{2.5}$ episodes.

[27] See "Update to the 24-hour $PM_{2.5}$ NAAQS Modeled Attainment Test", memorandum from Tyler Fox. Docket item EPA-HQ-OAR-2009-0491-4360. There were no methodological updates to either the ozone or annual $PM_{2.5}$ attainment test methodology.

In the revised methodology, used for the final TR, we do not assume that the temporal distribution of high days in the base and future periods will remain the same. We project a larger set of ambient days from the base period to the future and then re-rank the entire set of days to find the new future 98th percentile value (for each year).

Similar to the annual $PM_{2.5}$ calculations, we are using the 2003-2007 base period FRM data for projecting future year design values. The 24-hour $PM_{2.5}$ calculations are computationally similar to the annual average calculations. The main difference is that the base period "high day" 24-hour $PM_{2.5}$ concentrations are projected to the future year, instead of the annual average concentrations. Also, the $PM_{2.5}$ species fractions and relative response factors are calculated from observed and modeled **high** concentration days, instead of quarterly **average** data.

Both the annual $PM_{2.5}$ and 24-hour $PM_{2.5}$ calculations are performed on a calendar quarter basis. Since all years and quarters are averaged together in the annual $PM_{2.5}$ calculations, the individual years can be averaged together early in the calculations. However, in the 24-hour $PM_{2.5}$ calculations, the 98th percentile value from each year is used in the final calculations. Since the 98th percentile value can come from any day in the year, all potential 98th percentile days in the four quarters must be carried through to near the end of the calculations. To calculate final future year design values, the 98th percentile for each year is identified and then, three yearly values from consecutive years were averaged resulting in a design value. Three design values were calculated for the 2003-2007 time period, as was done for the annual $PM_{2.5}$ standard. The average of the valid design values was used to calculate the "average" design value. When all five years of data were valid, resulting in three design values, the average of the three design values is a five year weighted average of the 98th percentile values for each site.

In the revised 24-hour attainment test methodology, the 8 highest ambient $PM_{2.5}$ days in each quarter at each site are projected to the future (32 days per year) using species specific quarterly relative response factors. After all 32 days are projected to the future, the days are re-ranked to determine the future year 98th percentile day. The 98th percentile is selected based on the rank of the 98th percentile day in the base year ambient data. For example, at site A, if the observed 98th percentile value in year 1 was the 3rd high day for the year, then the future year 98th percentile is selected as the 3rd high future day for the year.

This update to the methodology ensures that the 98th percentile day is not over-estimated or under-estimated due to changes in the temporal distribution of high days between the base and future days. In practice, we have found that in almost all cases, the revised methodology leads to lower future 98th percentile values and therefore lower projected future 24-hour $PM_{2.5}$ design values.

Table III-1 and Table III-2 show an example design value calculation for a single site in Baldwin County Alabama. Table III-1 lists the projected high future year days at the site for 2003 (32 days) as well as base year values. The values in Table III-1 are ranked in decreasing order based on the Future Year $PM_{2.5}$ concentration. At this site for 2003, the 98th percentile day is the 3rd high for the year (based on the number of samples collected in 2003). Therefore the 3rd high day is flagged (future year concentration of 20.5718 $\mu g/m^3$) and carried through to the final design value calculation. Note that the 3rd high day in the base year is on a different day (20030524), which had a concentration of 29.1 $\mu g/m^3$

Table III-1. Example high base and future year days for 2003 at a single monitoring site.

AIRS ID	State	County	Date	Year	Quarter	Base Year PM2.5 (ug/m3)	Future Year PM2.5 (ug/m3)
10030010	Alabama	Baldwin	20030415	2003	2	32.2	22.8255
10030010	Alabama	Baldwin	20030524	2003	2	29.1	20.6422
10030010	**Alabama**	**Baldwin**	**20030530**	**2003**	**2**	**29**	**20.5718**
10030010	Alabama	Baldwin	20031006	2003	4	28.4	19.6670
10030010	Alabama	Baldwin	20030810	2003	3	30.5	18.8999
10030010	Alabama	Baldwin	20030310	2003	1	19.7	14.8373
10030010	Alabama	Baldwin	20030506	2003	2	20.5	14.5855
10030010	Alabama	Baldwin	20030605	2003	2	20.5	14.5855
10030010	Alabama	Baldwin	20030626	2003	2	20	14.2333
10030010	Alabama	Baldwin	20030909	2003	3	22.7	14.1159
10030010	Alabama	Baldwin	20031003	2003	4	20	13.8963
10030010	Alabama	Baldwin	20030115	2003	1	18.1	13.6426
10030010	Alabama	Baldwin	20030918	2003	3	21.9	13.6252
10030010	Alabama	Baldwin	20030427	2003	2	19	13.5291
10030010	Alabama	Baldwin	20030430	2003	2	18.9	13.4586
10030010	Alabama	Baldwin	20031009	2003	4	18.2	12.6597
10030010	Alabama	Baldwin	20031018	2003	4	17.5	12.1788
10030010	Alabama	Baldwin	20031021	2003	4	17.4	12.1101
10030010	Alabama	Baldwin	20030912	2003	3	19.3	12.0306
10030010	Alabama	Baldwin	20030127	2003	1	15.5	11.7010

AIRS ID	State	County	Date	Year	Quarter	Base Year PM2.5 (ug/m3)	Future Year PM2.5 (ug/m3)
10030010	Alabama	Baldwin	20030325	2003	1	15.3	11.5517
10030010	Alabama	Baldwin	20031024	2003	4	16.5	11.4918
10030010	Alabama	Baldwin	20030214	2003	1	15	11.3277
10030010	Alabama	Baldwin	20030316	2003	1	14.8	11.1783
10030010	Alabama	Baldwin	20031208	2003	4	15.6	10.8735
10030010	Alabama	Baldwin	20030301	2003	1	14.3	10.8050
10030010	Alabama	Baldwin	20030322	2003	1	13.9	10.5063
10030010	Alabama	Baldwin	20030924	2003	3	16.4	10.2519
10030010	Alabama	Baldwin	20030720	2003	3	14.6	9.1479
10030010	Alabama	Baldwin	20030729	2003	3	14.6	9.1479
10030010	Alabama	Baldwin	20030819	2003	3	14.3	8.9639
10030010	Alabama	Baldwin	20031108	2003	4	12.5	8.7439

Table III-2 shows the 98th percentile values for each of the five years (2003-2007). The future year 98th percentile values from all five years of the 2003-2007 period (the 3rd high future year day in each year) are used to calculate the final five year weighted design value.

Table III-2. Example design value calculation for site 010030010

AIRS ID	State	County	98th Percentile Day Rank	Year	Date Base Year	Base High Quarter	Base Year PM2.5 (ug/m3)	Date Future Year	Future High Quarter	Future Year PM2.5 (ug/m3)
10030010	AL	Baldwin	3	2003	20030524	2	29.1	20030530	2	20.5718
10030010	AL	Baldwin	3	2004	20040720	3	27.5	20040313	1	19.1684
10030010	AL	Baldwin	3	2005	20050624	2	26	20050128	1	17.6003
10030010	AL	Baldwin	3	2006	20060701	3	25.7	20060601	2	18.1773
10030010	AL	Baldwin	3	2007	20070503	2	22.4	20070503	2	15.9236
				5 year weighted average =			**26.2**			**18.2**

The following are the individual steps for calculating the future year 24-hour $PM_{2.5}$ design values:

<u>Step 1</u>**:** At each FRM monitoring site, identify the 8 highest observed 24-hour $PM_{2.5}$ concentration days in each quarter for each year (2003-2007) and identify the day rank of the official 98th percentile value based on the number of collected ambient samples (e.g., the 3rd highest day of the year). This results in a data set for each year (for up to 5 years) for each site containing 32 days of data.

Step 2: In this step we calculate quarterly ambient species fractions on "high"[28] days for each of the major component species of $PM_{2.5}$ (sulfate, nitrate, ammonium, elemental carbon, organic carbon mass, particle bound water, salt and blank mass). This calculation is performed by multiplying the monitored concentrations of FRM-derived total $PM_{2.5}$ mass on the 10 percent of highest $PM_{2.5}$ days at each site for each quarter, by the average monitored species composition[29] on the 10 percent highest $PM_{2.5}$ days for each quarter, averaged over 3 years[30]. The end result is a set of quarterly species fractions for each FRM site.

Step 3: Multiply the quarterly "high day" species fractions from step 2 by the PM2.5 mass concentration for the 8 high days per quarter identified in step 1. This results in a set of species concentrations for each of the 32 days per year identified in step 1.

Step 4: For each quarter, calculate the ratio of future year (e.g., 2012) to base year (e.g., 2005) modeled predictions for sulfate, nitrate, elemental carbon, organic carbon, and other primary $PM_{2.5}$ for the average of the top 10 percent of modeled days[31] based on predicted concentrations of 24-hour $PM_{2.5}$. The result is a single set of species-specific "high day" relative response factors (RRF), one for each quarter (e.g., assume that 2005 predicted sulfate on the 10 percent highest $PM_{2.5}$ days for a quarter for a particular location is 20 µg/m^3 and the 2012 base case concentration is 16 µg/m^3, then the RRF for sulfate is 0.8). The RRFs are calculated based on the modeled concentrations at the single[32] grid cell where the monitor is located.

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[28] High ambient data and model days were defined as the top 10 percent days in each quarter based on 24-hour average concentrations of $PM_{2.5}$ mass.

[29] Similar to the annual average calculations, the quarterly species fractions are calculated at each FRM site using interpolated species data (using VNA). For the 24-hour species interpolations, the highest 10% of monitor days in each quarter are interpolated.

[30] For this analysis, species fractions were calculated using an average of FRM and speciation data for the 2004-2006 time period. This was deemed to be most representative of the 2005 modeling year.

[31] The calculation of the top 10% of modeled PM2.5 days in each quarter did not include "other primary PM2.5" (crustal) concentrations. As indicated in Appendix A, the crustal component of PM2.5 was severely over predicted. Therefore, we did not allow the selection of the "high" modeled days (which are used for the RRF calculations) to be unduly influenced by the over-predicted crustal concentrations. However, the modeled crustal concentrations were used to calculate the "crustal" component RRF.

[32] The modeling guidance recommends using a single grid cell to calculate RRFs for the 24-hr PM2.5 NAAQS.

Step 5**:** For each of the 8 days in each quarter, multiply the species concentrations (step 3) by the quarterly[33] species-specific RRF obtained in step 4. This leads to an estimated future concentration for each component for each day. (e.g., 21.0 µg/m^3 of nitrate for day 2 in quarter 1 of 2003 x 0.75 (the quarter 1 nitrate RRF) = future nitrate for that day of 15.75 µg/m^3).

Step 6: The future year concentrations for the remaining species are then calculated[34] for each of the days. The future year ammonium is determined based on the calculated future year sulfate and nitrate concentrations, using a constant value for the degree of neutralization of sulfate (from the ambient data). The future year particle-bound water concentration is calculated from an empirical formula derived from the AIM model[35]. The inputs to the formula are the calculated future year concentrations of sulfate, nitrate, and ammonium (from step 5).

Step 7**:** Sum the species concentrations to obtain total $PM_{2.5}$ concentration values for each of the 32 days per year.

Step 8: For each monitoring site, rank the 32 days per year for each site for each year by total $PM_{2.5}$ concentration. For each year, the previously identified 98th percentile rank (for each year) is used to identify the 98th percentile concentration for each year. For example, if the base year 98th percentile value for year 1 was the 3rd high concentration, then the future year 98th percentile concentration is the future year 3rd high $PM_{2.5}$ concentration (out of 32 days). For each monitoring site, a single 98th percentile concentration is identified for each year (2003-2007) that has been projected to the future year.

Step 9**:** The estimated 98th percentile values for each of the 5 years (identified in step 8) are averaged over 3 year consecutive intervals to create the 3 year average design values (e.g., the 98th percentile values from 2003, 2004, and 2005 are averaged. Then the 98th percentile values from 2004, 2005, and 2006 are averaged, etc.). The (up to 3) valid

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[33] Since there is only one modeled base year (2005), there are four quarterly RRFs at each monitor. The modeled quarterly RRF for quarter 1 is multiplied by the ambient data for quarter 1 (8 days in each year) for each of the 5 years of ambient data. The same procedure is applied for the 8 high days per quarter in the other 3 quarters.

[34] We did not explicitly model salt and therefore the salt concentration was held constant from the base to future. Blank mass was assumed to be a constant mass of 0.5 µg/m3 in both the base and future year.

[35] Similar to the annual PM2.5 calculations, the ammonium and particle bound water formulas can be found in section 5.1.2.2 of the MATS user's guide: http://www.epa.gov/ttn/scram/guidance/guide/MATS-2-3-1_manual.pdf

design values are then averaged to create the "average" future design value that is used for assessing nonattainment. For sites that have valid measurements across the entire 2003-2007 time period, the result is 3 valid design values. When these design values are averaged, the result is a 5 year weighted average for that monitoring site.

Step 10**:** Calculate the **maximum** future design value by processing each of the three projected base design value periods (2003-2005, 2004-2006, and 2005-2007) separately. The highest of the three future values is the maximum design value. The maximum design values are used to determine future year 24-hour $PM_{2.5}$ maintenance receptors.

The preceding procedures for determining future year 24-hour $PM_{2.5}$ concentrations were applied for each FRM site. The 24-hour $PM_{2.5}$ design values are truncated after the first decimal place. This approach is consistent with the truncation and rounding procedures for the 24-hour $PM_{2.5}$ NAAQS. Any value that is greater than or equal to 35.5 $\mu g/m^3$ is rounded to 36 $\mu g/m^3$ and is violating the NAAQS. Sites with future year 5 year weighted average design values of 35.5 $\mu g/m^3$ or greater, based on the projection of **5-year weighted average** concentrations, are predicted to be nonattainment. Sites with future year **maximum** design values of 35.5 $\mu g/m^3$ or greater, based on a single design value period, are predicted to be "maintenance" sites. Note that nonattainment sites for the 24-hour NAAQS are also maintenance sites because the maximum design value is at a site is always greater than or equal to the 5-year weighted average for that site. For ease of reference we use the term "nonattainment sites" to refer to those sites that are projected to exceed the NAAQS based on both the average and maximum design values. Those sites that are projected to be attainment based on the average design value but exceed the NAAQS based on the maximum design value are referred to as maintenance sites. The monitoring sites that we project to be nonattainment and/or maintenance for the 24-hour $PM_{2.5}$ NAAQS in the 2012 base case are used as the nonattainment/maintenance receptors for assessing the contribution of emissions in upwind states to downwind nonattainment and maintenance of 24-hour $PM_{2.5}$ NAAQS (see section IV, below). The 2003-2007 base period and projected 24-hour $PM_{2.5}$ design values for each site for the 2012 and 2014 scenarios are provided in Appendix B.

C. Projection of Future Design Values and Determination of Nonattainment and Maintenance for 8-Hour Ozone

The following is a summary of the future year 8-hour ozone calculations. Additional details are provided in the modeling guidance and MATS documentation. Base period 2003-2007 ambient ozone design value data taken from AQS are the starting point for projecting future year design values. Since ozone is a single species, the ozone projection procedure is relatively simple (compared to the $PM_{2.5}$ projection methodologies). It is not necessary to interpolate ambient ozone data, since ambient ozone design values and gridded, modeled ozone data are all that are needed for the projections.

To project 8-hour ozone design values we used the 2005 base year, the 2012 future base case, and 2014 future base and control case model-predicted ozone concentrations to calculate relative response factors. The methodology we followed is consistent with the attainment demonstration modeling guidance. The RRFs were applied to the 2003-2007 ozone design values through the following steps:

Step 1**:** The first step in the procedure is to calculate a RRF based on the change in modeled ozone concentration from the 2005 base case simulation to the future year simulation. For each monitoring site we calculate the mean of the modeled 8-hour average daily maximum predictions across all days with 8-hour average daily maximum predictions greater than or equal to 85 ppb[36]. The mean concentrations are calculated using the predictions in the nine grid cells (3 by 3) that include or surround the location of the monitoring site. The RRF for a site is the ratio of the mean prediction in the future year to the mean prediction in the 2005 base year. The RRFs were calculated on a site-by-site basis.

Step 2**:** The RRF for each site is then multiplied by the 2003-2007 5-year weighted average ambient design value for that site, yielding an estimate of the future year (2012) design value at that particular monitoring location.

Step 3**:** We calculate the **maximum** future design value by projecting design values for each of the three base periods (2003-2005, 2004-2006, and 2005-2007)

[36] As specified in the attainment demonstration modeling guidance, if there are less than 10 modeled days > 85 ppb, then the threshold is lowered in 1 ppb increments (to as low as 70 ppb) until there 10 days. If there are less than 5 days > 70 ppb, then an RRF calculation is not completed for that site.

separately. The highest of the three future values is the maximum design value. This **maximum** value is used to identify the 8-hour ozone maintenance receptors.

The preceding procedures for determining future year 8-hour ozone design values were applied for each ozone monitoring site for each future year scenario that was modeled (i.e., the 2012 base case, 2014 base case, and 2014 control). Each future year design value was truncated to integers in units of ppb. This approach is consistent with the rounding and truncation procedures for the 8-hour ozone NAAQS. Future year design values that are greater than or equal to 85 ppb are considered to be violating the NAAQS. Sites with future year 5 year weighted average design values (the average of all valid design values from the projected 2003-2007 time-period) of 85 ppb or greater are predicted to be nonattainment. Sites with future year maximum design values of 85 ppb or greater are predicted to be future year maintenance sites. Note that, as described previously for the annual and 24-hour $PM_{2.5}$ NAAQS, nonattainment sites for the ozone NAAQS are also maintenance sites because the maximum design value is always greater than or equal to the 5-year weighted average. For ease of reference we use the term "nonattainment sites" to refer to those sites that are projected to exceed the NAAQS based on both the average and maximum design values. Those sites that are projected to be attainment based on the average design value but exceed the NAAQS based on the maximum design value are referred to as maintenance sites. The monitoring sites that we project to be nonattainment and/or maintenance for the ozone NAAQS in the 2012 base case are the nonattainment/maintenance receptors used for assessing the contribution of emissions in upwind states to downwind nonattainment and maintenance of the 8-hour ozone NAAQS. The 2003-2007 base period and projected 8-hour ozone design values for all sites for the 2012 and 2014 scenarios are provided in Appendix B[37].

[37] Note that there are a number of ozone monitoring sites for which we did not calculate projected design values because there were less than 5 days with predicted ozone concentrations > 70 ppb.

IV. State-by-State Source Contribution Modeling and Results

This section documents the procedures used to quantify the air quality impacts (i.e., the contributions) of emissions in individual states on annual $PM_{2.5}$, 24-hour $PM_{2.5}$, and 8-hour ozone concentrations at projected 2012 nonattainment and maintenance receptors in the East. The purpose of this assessment is to determine which states contribute to ozone, and/or annual $PM_{2.5}$, and/or 24-hour $PM_{2.5}$ nonattainment and/or maintenance problems in other states[38] in amounts at or above thresholds based on 1 percent of the corresponding NAAQS (see section V of the preamble for more details). The air quality contributions were quantified using source apportionment techniques in CAMx. In general, these techniques track the formation and transport of ozone and particulate matter from specific emissions sources and calculate the contribution of sources and precursors to ozone and $PM_{2.5}$ at individual receptor locations. The strength of the photochemical model source apportionment technique is that all modeled ozone and/or $PM_{2.5}$ mass at a given receptor location in the modeling domain can be tracked back to specific sources of emissions and boundary conditions in order to fully characterize culpable sources. Furthermore, in contrast to other techniques, such as "zero-out" modeling (such as was used in development of CAIR), the tracking of emissions and resulting pollution in source apportionment modeling does not affect the transport, chemical transformation, or atmospheric chemical relationships within the modeling. This type of source apportionment is useful for understanding the downwind air quality impacts of both the types of sources or regions, and the magnitude of the contributions that are associated with ozone and $PM_{2.5}$, as estimated by the model. More details on the implementation of source apportionment in CAMx can be found in the CAMx user's guide[39].

[38] In this assessment we refer to source states as "upwind" States and nonattainment and/or maintenance sites in other states as "downwind" nonattainment and/or maintenance receptors.
[39] Comprehensive Air Quality Model with Extensions Version 5 User's Guide. Environ International Corporation. Novato, CA. March 2009.

A. Nonattainment and Maintenance Receptors for the Assessment of $PM_{2.5}$ and Ozone Contributions

As described above in section III, we identified monitoring sites in the East that are expected to be nonattainment and/or have maintenance problems for the 2012 base case for the 1997 annual and 2006 24-hour $PM_{2.5}$ standards and the 1997 8-hour standard[40]. These 2012 nonattainment and/or maintenance sites are used as the receptors in the analysis of interstate contributions. For each of the NAAQS, the projected nonattainment and maintenance sites are listed, respectively, in the preamble in Tables V.C-1 and V.C-2 for Annual PM2.5, Tables V.C-3 and V.C-4 for 24-hour PM2.5, and Tables V.C-5 and V.C-6 for 8-hour ozone. These data are repeated, below, for the convenience of the reader. Note that counties with multiple monitoring sites can have both nonattainment sites and maintenance only sites.

Table IV-1 contains the 2003-2007 base period average and maximum annual $PM_{2.5}$ design values and the corresponding 2012 base case average and maximum design values for sites projected to be nonattainment of the annual $PM_{2.5}$ NAAQS in 2012. Table IV-2 contains this same information for projected 2012 base case maintenance-only sites. There are 12 sites in 7 counties projected to be nonattainment for the annual $PM_{2.5}$ NAAQS in 2012. There are 4 sites in 3 counties projected to have maintenance only problems for the annual $PM_{2.5}$ NAAQS in 2012. The 2012 base case annual $PM_{2.5}$ nonattainment and/or maintenance sites in the East are shown in Figure IV-1.

Table IV-1. Average and maximum 2003-2007 and 2012 base case annual $PM_{2.5}$ design values ($\mu g/m^3$) at projected nonattainment sites.

Monitor ID	State	County	Average Design Value 2003-2007	Maximum Design Value 2003-2007	Final Rule Average Design Value 2012	Final Rule Maximum Design Value 2012
010730023	Alabama	Jefferson	18.57	18.94	16.15	16.46
010732003	Alabama	Jefferson	17.15	17.69	15.16	15.64
131210039	Georgia	Fulton	17.43	17.47	15.07	15.10
171191007	Illinois	Madison	16.72	17.01	15.46	15.73
261630033	Michigan	Wayne	17.50	18.16	15.73	16.32
390350038	Ohio	Cuyahoga	17.37	18.10	15.99	16.66
390350045	Ohio	Cuyahoga	16.47	16.98	15.14	15.61

[40] As indicated previously, average design values are used to indentify sites that are nonattainment and maximum design values are used to identify sites that have a maintenance problem.

Monitor ID	State	County	Average Design Value 2003-2007	Maximum Design Value 2003-2007	Final Rule Average Design Value 2012	Final Rule Maximum Design Value 2012
390350060	Ohio	Cuyahoga	17.11	17.66	15.67	16.18
390610014	Ohio	Hamilton	17.29	17.53	15.76	15.98
390610042	Ohio	Hamilton	16.85	17.25	15.40	15.77
390618001	Ohio	Hamilton	17.54	17.90	16.01	16.33
420030064	Pennsylvania	Allegheny	20.31	20.75	17.94	18.33

Table IV-2. Average and maximum 2003-2007 and 2012 base case annual $PM_{2.5}$ design values ($\mu g/m^3$) at projected maintenance-only sites.

Monitor ID	State	County	Average Design Value 2003-2007	Maximum Design Value 2003-2007	Final Rule Average Design Value 2012	Final Rule Maximum Design Value 2012
180970081	Indiana	Marion	16.05	16.36	14.86	15.16
180970083	Indiana	Marion	15.90	16.27	14.71	15.06
390350065	Ohio	Cuyahoga	15.97	16.44	14.67	15.10
390617001	Ohio	Hamilton	16.17	16.56	14.74	15.10

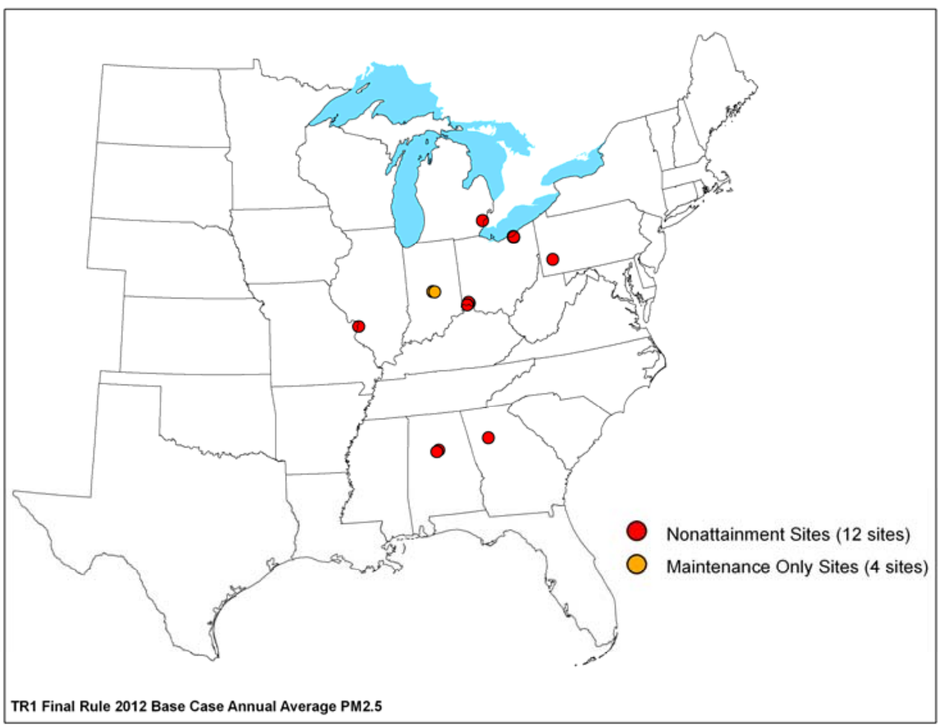

Figure IV-1. Projected 2012 base case annual $PM_{2.5}$ nonattainment and/or maintenance sites in the East.

Table IV-3 contains the 2003-2007 base period average and maximum 24-hour $PM_{2.5}$ design values and the 2012 base case average and maximum design values for sites projected to be 2012 nonattainment of the 24-hour $PM_{2.5}$ NAAQS in 2012. Table IV-4 contains this same information for projected 2012 24-hour maintenance-only sites. There are 20 sites in 12 counties projected to be nonattainment for the 24-hour $PM_{2.5}$ NAAQS in 2012. There are 21 sites in 13 counties projected to have maintenance only problems for the 24-hour $PM_{2.5}$ NAAQS in 2012. The 2012 base case 24-hour $PM_{2.5}$ nonattainment and/or maintenance site in the East are shown in Figure IV-2.

Table IV-3. Average and maximum 2003-2007 and 2012 base case 24-hour $PM_{2.5}$ design values ($\mu g/m^3$) at projected nonattainment sites.

Monitor ID	State	County	Average Design Value 2003-2007	Maximum Design Value 2003-2007	Final Rule Average Design Value 2012	Final Rule Maximum Design Value 2012
010730023	Alabama	Jefferson	44.0	44.2	36.9	37.3
170311016	Illinois	Cook	43.0	46.3	37.5	40.4
171191007	Illinois	Madison	39.1	40.1	36.5	36.8
180970043	Indiana	Marion	38.4	39.9	35.7	37.1
180970066	Indiana	Marion	38.3	39.6	35.7	36.9
180970081	Indiana	Marion	38.2	39.2	35.8	36.9
261470005	Michigan	St Clair	39.6	40.6	36.2	37.1
261630015	Michigan	Wayne	40.1	40.6	35.5	36.0
261630016	Michigan	Wayne	42.9	45.4	38.9	41.2
261630019	Michigan	Wayne	40.9	41.4	37.3	37.8
261630033	Michigan	Wayne	43.8	44.2	39.4	39.8
390350038	Ohio	Cuyahoga	44.2	47.0	39.4	41.8
390350060	Ohio	Cuyahoga	42.1	45.7	37.7	40.8
420030064	Pennsylvania	Allegheny	64.2	68.2	56.7	59.9
420030093	Pennsylvania	Allegheny	45.6	51.5	39.1	44.3
420030116	Pennsylvania	Allegheny	42.5	42.5	35.5	35.5
420070014	Pennsylvania	Beaver	43.4	44.6	36.2	37.4
420710007	Pennsylvania	Lancaster	40.8	44.0	35.9	38.3
540090011	West Virginia	Brooke	43.9	44.9	37.5	38.3
550790043	Wisconsin	Milwaukee	39.9	40.8	36.2	37.1

Table IV-4. Average and maximum 2003-2007 and 2012 base case 24-hour $PM_{2.5}$ design values ($\mu g/m^3$) at projected maintenance-only sites.

Monitor ID	State	County	Average Design Value 2003-2007	Maximum Design Value 2003-2007	Final Rule Average Design Value 2012	Final Rule Maximum Design Value 2012
010732003	Alabama	Jefferson	40.3	40.8	35.3	35.9
170310052	Illinois	Cook	40.2	41.4	34.9	36.0
170312001	Illinois	Cook	37.7	40.6	33.6	36.1
170313301	Illinois	Cook	40.2	43.3	34.9	37.6
170316005	Illinois	Cook	39.1	41.8	34.1	36.4
171190023	Illinois	Madison	37.3	38.1	35.1	35.8
180890022	Indiana	Lake	38.9	44.0	34.9	39.5
180890026	Indiana	Lake	38.4	41.3	34.0	37.0
261610008	Michigan	Washtenaw	39.4	40.8	35.0	36.3
390170003	Ohio	Butler	39.2	41.1	34.4	36.5
390350045	Ohio	Cuyahoga	38.5	41.5	34.7	38.1
390350065	Ohio	Cuyahoga	38.6	41.0	34.9	37.6
390618001	Ohio	Hamilton	40.6	40.9	35.2	35.8
390811001	Ohio	Jefferson	41.9	45.5	34.5	37.8
391130032	Ohio	Montgomery	37.8	40.0	33.6	35.6
420031008	Pennsylvania	Allegheny	41.3	42.8	35.0	36.3
420031301	Pennsylvania	Allegheny	40.3	42.4	33.9	35.6
420033007	Pennsylvania	Allegheny	37.5	43.1	32.3	37.3
421330008	Pennsylvania	York	38.2	40.7	33.3	36.0
550790010	Wisconsin	Milwaukee	38.6	40.0	35.4	36.7
550790026	Wisconsin	Milwaukee	37.3	41.3	33.6	37.2

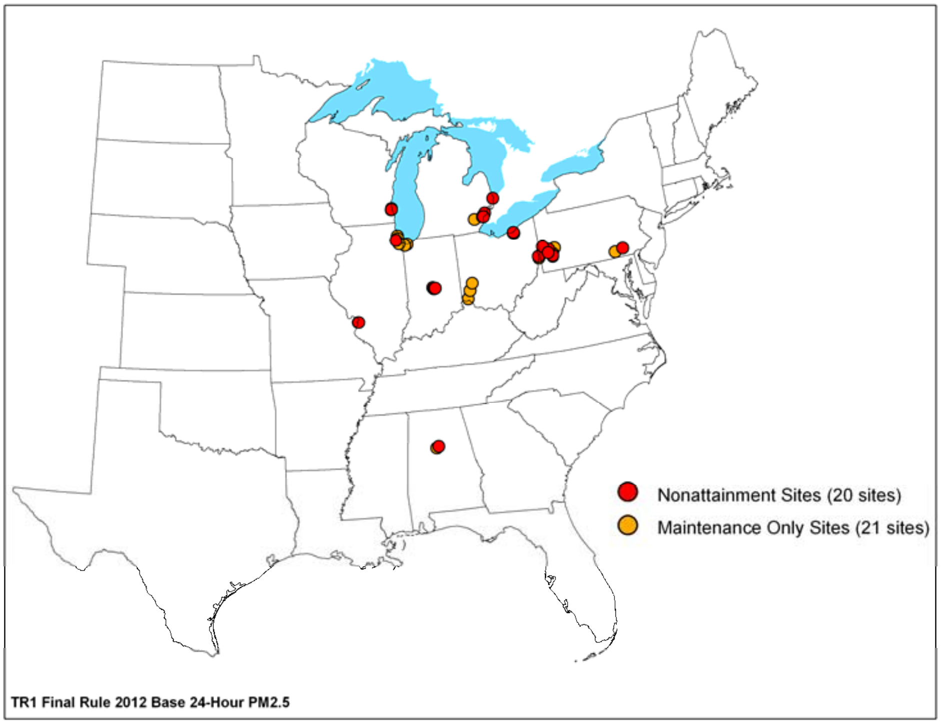

Figure IV-2. Projected 2012 base case 24-hour $PM_{2.5}$ nonattainment and/or maintenance sites in the East.

Table IV-5 contains the 2003-2007 base period average and maximum 8-hour ozone design values and the 2012 base case average and maximum design values for sites projected to be 2012 nonattainment of the 8-hour ozone NAAQS in 2012. Table IV-6 contains this same information for projected 2012 8-hour ozone maintenance-only sites. There are 7 sites in 3 counties projected to be nonattainment for the 1997 8-hour ozone NAAQS in 2012. There are 9 sites in 5 counties projected to have maintenance only problems for the 1997 8-hour ozone NAAQS in 2012. The 2012 base case 8-hour ozone nonattainment and/or maintenance sites in the East are shown in Figure IV-3.

Table IV-5. Average and maximum 2003-2007 and 2012 base case 8-hour ozone design values (ppb) at projected nonattainment sites.

Monitor ID	State	County	Average Design Value 2003-2007	Maximum Design Value 2003-2007	Final Rule Average Design Value 2012	Final Rule Maximum Design Value 2012
220330003	Louisiana	East Baton Rouge	92.0	96	85.6	89.3
480391004	Texas	Brazoria	94.7	97	86.7	88.8
482010051	Texas	Harris	93.0	98	86.1	90.8
482010055	Texas	Harris	100.7	103	93.3	95.4
482010062	Texas	Harris	95.7	99	88.8	91.8
482010066	Texas	Harris	92.3	96	87.1	90.6
482011039	Texas	Harris	96.3	100	88.8	92.2

Table IV-6. Average and maximum 2003-2007 and 2012 base case 8-hour ozone design values (ppb) at projected maintenance-only sites.

Monitor ID	State	County	Average Design Value 2003-2007	Maximum Design Value 2003-2007	Final Rule Average Design Value 2012	Final Rule Maximum Design Value 2012
090011123	Connecticut	Fairfield	92.3	94	83.9	85.5
090093002	Connecticut	New Haven	90.3	93	82.7	85.1
240251001	Maryland	Harford	92.7	94	84.4	85.6
260050003	Michigan	Allegan	90.0	93	82.4	85.1
482010024	Texas	Harris	88.0	92	83.4	87.2
482010029	Texas	Harris	91.7	93	84.2	85.4
482011015	Texas	Harris	89.0	96	82.4	88.9
482011035	Texas	Harris	86.3	95	79.9	88.0
482011050	Texas	Harris	89.3	92	82.8	85.4

Figure IV-3. Projected 2012 base case 8-hour ozone nonattainment and/or maintenance sites in the East.

B. Overview of Approach for Source Apportionment Modeling

Source apportionment modeling for both ozone and $PM_{2.5}$ was performed using the 2012 base case emissions. In this modeling we tracked ozone and $PM_{2.5}$ formed from anthropogenic emissions in each state that is wholly within the 12 km modeling domain. The modeling results were used to calculate the contributions of the emissions in these states to pollution concentrations at each of the projected nonattainment and maintenance receptors. The states included in the source apportionment modeling for ozone and $PM_{2.5}$ are: Alabama, Arkansas, Connecticut, Delaware, the District of Columbia[41], Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Nebraska, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Vermont, Virginia, West Virginia, and Wisconsin.

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[41] As in the proposal, EPA has combined the contributions from Maryland and the District of Columbia as a single entity in our contribution analysis for the final rule. EPA believes that this is a fair representation of emissions for transport analysis because of the small size of the District of Columbia and its close proximity to Maryland. However, the District of Columbia is not included in the Transport Rule due to the significant contribution analysis findings in section VI.D of the preamble.

There are several other states that are only partially contained within the 12 km modeling domain (i.e., Colorado, Montana, New Mexico, and Wyoming). We did not track the emissions or assess the contribution from emissions in these states individually. Rather, the emissions from these states were tracked as a combined set of emissions together with emissions from sources in Canada and Mexico in a category named "other". Emissions from wildfires in all states were also included in the "other" category. In the CAMx source apportionment techniques we also tracked the contributions from biogenic emissions (regionally) and initial and boundary concentrations (IC/BCs). The contributions from these three categories (i.e., other, biogenic, and IC/BCs) were not used in the analysis to determine upwind state contributions to downwind areas.

C. Approach to Calculating Contributions for Annual and 24-Hour $PM_{2.5}$

We used the CAMx Particulate Source Apportionment Technique (PSAT) to calculate contributions to annual and 24-hour $PM_{2.5}$ nonattainment and maintenance. The CAMx PSAT is capable of "tagging" (i.e., tracking) source category emissions for certain PM species and precursor emissions. For the Transport Rule, we ran PSAT to tag emissions of NO_X, SO_2, and primary $PM_{2.5}$ from the relevant sources within the individual states listed above. Each state was a separate tag, and the tagged emissions followed state boundaries (not grid cells). Information on the creation of tagged emissions can be found in the Transport Rule EITSD. Due to the relatively small modeled concentrations of secondary organic aerosols (SOA), and the relatively large runtime penalty of the SOA PSAT mechanism, we chose not to track SOA.

In the PSAT simulation, NO_X emissions are tracked to contributions to particulate nitrate concentrations, SO_2 emissions are tracked to contributions to particulate sulfate concentrations, and primary particulates (organic carbon, elemental carbon, and other, unspeciated $PM_{2.5}$) are tracked as contributions to primary particulates. We combined the contributions of nitrate and sulfate in calculating the net contributions to $PM_{2.5}$ for the purpose of evaluating the interstate contributions against specific threshold criteria, as described in section IV.E, below. The rationale for including mass associated with nitrate plus sulfate and excluding primary $PM_{2.5}$ and SOA in the contributions for the TR is articulated in the section V of the TR preamble.

We developed and applied several post-processing steps to transform the PSAT modeling outputs to $PM_{2.5}$ contributions. The approach involved processing the PSAT model outputs using MATS along with other post-processing software to calculate the contribution of each upwind state to each nonattainment and/or maintenance site (i.e., receptor).

The following is a description of the procedures for calculating contributions for annual $PM_{2.5}$. These procedures were applied separately for each source state.

1. The analysis identified the air quality contributions from each state modeled using source apportionment to calculate contributions to each monitoring site. Particularly important monitoring sites included the receptor sites identified in the 2012 base case modeling as being nonattainment and/or maintenance receptors.

2. Contributions for each of the $PM_{2.5}$ species from each state, as predicted by PSAT, are subtracted from the standard 2012 base case CAMx model output to generate a new set of model output files for each source region (state).

3. Daily, 24-hr average $PM_{2.5}$ species are calculated for the "standard" model output files and newly generated source contribution output files.

4. The relative response factors (RRFs) for each of the $PM_{2.5}$ species is calculated for each source region at all receptors using the MATS model attainment software. In this approach, the MATS "baseline" model file is defined as the standard 2012 base case CAMx model output file and the "future case" model file is defined as the 2012 state contribution model output file (from step 3).

5. The species-specific annual average RRFs (generated by MATS in step 4) for each source state are multiplied by the annual average future year (2012) species concentrations generated for the 2012 base case to estimate $PM_{2.5}$ species contributions in $\mu g/m^3$ from each species for each source-tagged state[42]. [The actual calculation is (species concentration – (RRF*species concentration))]

6. The annual average contributions of sulfate ion, nitrate ion, ammonium, and water for each source state are combined to calculate the nitrate plus sulfate $PM_{2.5}$ contribution used in the TR analysis[43].

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[42] The calculations in step 5 use MATS outputs and additional post-processing software developed for this rule. More details on the post-processing steps and software can be found in Appendix C.

[43] Particulate ammonium and particle bound water are attached to the nitrate and sulfate. Therefore, they are counted as part of the downwind contribution of total sulfate and total nitrate. As in the design value calculations in section III, the ammonium contribution is calculated based on the calculated sulfate and nitrate concentrations, using a constant value for the degree of neutralization of sulfate (from the ambient data). The particle bound water contribution concentration is calculated from the empirical formula contained in MATS. .

7. Annual $PM_{2.5}$ (i.e., nitrate plus sulfate) contributions are expressed in units of $\mu g/m^3$. Values of annual $PM_{2.5}$ contribution are truncated after two places to the right of the decimal (e.g., a contribution of 0.149 $\mu g/m^3$ is truncated to 0.14 $\mu g/m^3$).

The 24-hour $PM_{2.5}$ contributions were calculated in a manner similar to the procedures for annual $PM_{2.5}$. However, there are several more steps in the 24-hour calculations which are designed to retain the contributions in each quarter through most of the post-processing. For 24-hour $PM_{2.5}$, the contributions are calculated as the five year average contributions to the 98th percentile concentrations at each site.

The following is a description of the procedures for calculating contributions for 24-hour $PM_{2.5}$. These procedures were applied separately for each source-tagged state.

1. The analysis identified the air quality contributions from each state modeled using source apportionment to calculate contributions to each monitoring site. Particularly important monitoring sites included the receptor sites identified in the 2012 base case modeling as being nonattainment and/or maintenance for 24-hour $PM_{2.5}$.

2. Contributions for each of the $PM_{2.5}$ species from each state, as predicted by PSAT, are subtracted from the standard 2012 CAMx model output to generate a new set of model output files for each source region.

3. Daily, 24-hr average $PM_{2.5}$ species model output files are generated for the "standard" 2012 base case model output files and newly generated source contribution output files.

4. Relative response factors (RRFs) are calculated for each of the $PM_{2.5}$ species[44] for each source state at all receptors using the MATS model attainment software. Quarterly RRFs are calculated using the average of the "high" concentration model days in each quarter. Here, the "high" concentration days are based on the highest 10% of modeled $PM_{2.5}$ days[45] (in each grid cell) in the 2012 base case. The MATS "baseline" model file is defined as the standard 2012 base case CAMx model output file and the "future case" model file is defined as the 2012 state contribution region model output file (from step 3).

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[44] As in the design value calculations in section III, the ammonium contribution is calculated based on the calculated sulfate and nitrate contribution concentrations, using a constant value for the degree of neutralization of sulfate (from the ambient data). The particle bound water contribution concentration is calculated from the empirical formula contained in MATS.

[45] Due to large over-predictions of crustal PM (other primary PM2.5), the modeled PM2.5 concentrations used to determine the high modeled days in each quarter do not include crustal PM2.5. We did not want the crustal PM2.5 to unduly influence the selection of the high modeled days. The model performance for crustal PM2.5 and all other PM2.5 components is documented in Appendix A.

5. The species "high days" quarterly average RRFs (generated by MATS in step 4) for each source region are multiplied[46] by the previously identified 2012 98th percentile day species concentrations for each site for each year (2003-2007) projected to the 2012 base case. [The actual calculation is (species concentration – (RRF*species concentration))]. This calculation is done for all valid years of data (up to 5 years). The quarterly species RRFs are applied based on the quarter in which the 98th percentile value (in 2012) occurred. For example, if the projected 98th percentile value for 2003 occurs in January, then the modeled RRFs for quarter 1 will be applied to the species concentrations for that particular day. The result of these calculations are the contribution of each of the species from the upwind source to each of the 98th percentile days, for up to 5 years.

6. For each receptor, the contributions of each species for the 98th percentile days (2003-2007 projected to the 2012 base case) are averaged[47] together. This represents the species contributions to 24-hour $PM_{2.5}$ concentrations.

7. The 24-hour contributions of sulfate ion, nitrate ion, ammonium, and water[48] for each source state are combined to calculate the total $PM_{2.5}$ contribution used in the TR analysis, as in the calculations for annual $PM_{2.5}$, described above..

8. 24-hour $PM_{2.5}$ contributions are expressed in units of µg/m^3. For the contribution assessment, values of 24-hour $PM_{2.5}$ contribution are truncated after two places to the right of the decimal (e.g., a contribution of 0.349 µg/m^3 is truncated to 0.34 µg/m^3).

D. Approach to Calculating Contributions for 8-Hour Ozone

We used the CAMx Anthropogenic Precursor Culpability Assessment (APCA) source apportionment technique to calculate the contributions to 8-hour ozone nonattainment and maintenance in the 2012 base case. APCA tracks the formation of ozone from NO_X and VOC emissions. Through emissions pre-processing procedures, we tagged all of the anthropogenic NO_X and VOC emissions in each state wholly within the

[46] The calculations in steps 5 and 6 use MATS outputs and post-processing software written for this rule. More details on the post-processing steps and software can be found in Appendix C.

[47] For the 24-hr PM2.5 NAAQs contribution calculations, the five year average contributions are **not weighted** towards the middle year of the period. Since the 98th percentile day for each year can be in a different season, EPA did not want to weight the upwind contribution to a particular season. Upwind states should not be penalized for having a large contribution in the high season for 2005, compared to other years. Likewise, upwind states should not be rewarded for having a small contribution to 2005 compared to other years

[48] Particulate ammonium and particle bound water are attached to the nitrate and sulfate. Therefore, they are counted as part of the downwind contribution of total sulfate and total nitrate.

Eastern modeling domain. A separate tag was created for each state, and the tagged emissions followed state boundaries. The list of tagged states can be found in section B.

The emissions from all anthropogenic sources of NO_X and VOC were tracked in the APCA simulation. Several post-processing steps were developed to transform the raw model outputs to ozone contributions. The approach for calculating ozone contributions was similar to the approach used for $PM_{2.5}$, except that the APCA model outputs were processed using MATS instead of the PSAT outputs used for $PM_{2.5.}$

The following is a description of the procedures for calculating contributions for 8-hour ozone. These procedures were applied separately for each source state.

1. The analysis identified the air quality contributions from each state modeled using source apportionment to calculate contributions to each monitoring site. Particularly important monitoring sites included the receptor sites identified in the 2012 base case modeling as being nonattainment and/or maintenance for 8-hour ozone.

2. The "raw" contributions from each source state are subtracted from the "raw" standard 2012 CAMx model output to generate a new set of model output files for each state.

3. Daily 8-hr maximum ozone model output files are generated from hourly ozone predictions in the "standard" model output files and newly generated source contribution output files.

4. Relative response factors (RRFs) are calculated for each source state for all receptors using MATS. The "baseline" ozone values in this calculation are the 2012 base case 8-hour daily maximum concentrations and the "future case" ozone values are the 8-hour daily maximum concentrations in the 2012 source state file created in step 3.

5. A "modified"[49] model attainment test is applied with MATS using an initial ozone criterion of 85 ppb and a minimum allowable criterion of 70 ppb. A minimum number of 5 days at or above the 85 ppb criterion or 5 days of modeled ozone greater than the minimum allowable criterion (70 ppb) are required[50] for a relative response factor to be estimated at a receptor site. For sites at which there are not 5 modeled days with

[49] We refer to this as a "modified" attainment test because the contribution analysis uses a different set of concentration thresholds compared to the attainment test used to calculate future year design values.

[50] The contribution analysis uses a minimum number of days above the threshold of 5 days. This differs from the default attainment test minimum number of 10 days > 85 ppb. It was reasoned that the contribution should be averaged over multiple days, but requiring a minimum of 10 days was not necessary. Since the attainment test uses an absolute minimum of 5 days in order to perform an RRF calculation, we chose to use 5 days as the default minimum number of days needed for each contribution calculation.

predicted 8-hour daily maximum concentrations above the initial ozone criterion, the criterion is decreased by 1 ppb until 5 days are included in the RRF calculation until the minimum threshold (70 ppb) is reached. If there are less than 5 modeled days above 70 ppb, then a contribution to the receptor is not calculated and the receptor is not used in the contribution analysis.

6. The relative response factor (from step 4) is multiplied by the 2012 base case design value to estimate ozone contribution in ppb from the source state[51] [The actual calculation is (ozone concentration – (RRF*ozone concentration))]

7. Ozone contributions are expressed in units of ppb. Ozone contribution values are truncated after 1 place to the right of the decimal (e.g. a contribution of 0.79 ppb is truncated to 0.7 ppb).

E. Evaluation of Interstate Contributions

The previous section describes the procedures for calculating 8-hour ozone and annual and 24-hour $PM_{2.5}$ contributions to the nonattainment and maintenance receptor sites[52]. The contributions to each 2012 nonattainment receptor and each maintenance receptor are provided in Appendix D[53]. For annual $PM_{2.5}$ we calculated each state's contribution to each of the 12 monitoring sites that are projected to be nonattainment and each of the 4 sites that are projected to have maintenance problems for the annual $PM_{2.5}$ NAAQS in the 2012 base case. For 24-hour $PM_{2.5}$, we calculated each state's contribution to each of the 20 monitoring sites that are projected to be nonattainment and each of the 21 sites that are projected to have maintenance problems for the 24-hour $PM_{2.5}$ NAAQS in the 2012 base case. Similarly, for ozone we calculated each state's contribution to each of the 4 monitoring sites that are projected to be nonattainment and

[51] The calculation in step 6 uses MATS outputs and post-processing software written for this rule. More details on the post-processing steps and software can be found in Appendix C.

[52] As noted previously, the nonattainment receptors are those monitoring sites which are projected to exceed the NAAQS in the 2012 base case, based on the 5-year weighted average design values. The maintenance receptors are those monitoring sites which are projected to exceed the NAAQS in the 2012 base case based on projections of the maximum design value in the 5-year period. Monitoring sites with average design values at or below the level of the NAAQS, but with maximum design values exceeding the NAAQS are referred to as maintenance only receptors.

[53] The contributions to all monitoring sites in the 12 km Eastern modeling domain are provided in the TR docket.

each of 6[54] sites that are projected to have maintenance problems for the 8-hour ozone NAAQS in the 2012 Base Case.

The upwind state-to-downwind receptor combinations (i.e., linkages) were evaluated to determine if the contributions to downwind nonattainment and/or maintenance are at or above specific contribution thresholds. As described in the TR preamble, EPA is using 1 percent of the NAAQS as the threshold for determining which states to include in this rule. The thresholds for the 1997 annual $PM_{2.5}$ NAAQS, 2006 24-hour $PM_{2.5}$ NAAQS, and 1997 8-hour ozone NAAQS are shown in Table IV-7.

Table IV-7. Threshold concentrations used for evaluating interstate contributions to annual and 24-hour $PM_{2.5}$ and 8-hour ozone.

Pollutant	Level of the NAAQS	1 Percent Threshold
Annual $PM_{2.5}$	15.0 µg/m^3	0.15 µg/m^3
24-Hour $PM_{2.5}$	35 µg/m^3	0.35 µg/m^3
8-Hour Ozone	0.08 ppm	0.0008 ppm (0.8 ppb)

To determine which states contribute amounts at or above these thresholds to nonattainment and/or maintenance, we examined the amount of contribution from each state to each downwind nonattainment receptor and each maintenance only receptor for the three NAAQS and noted the magnitude of the contribution relative to the threshold. States that contribute amounts at or above the threshold to at least one downwind nonattainment receptor or one maintenance receptor for the annual $PM_{2.5}$ NAAQS or the 24-hour $PM_{2.5}$ NAAQS are included in the TR for annual SO_2 and NO_X emissions budgets. States that contribute amounts that are at or above the threshold to at least one 8-hour ozone downwind nonattainment or maintenance receptor are included in the TR for ozone season (i.e., May through September) NO_X emissions budgets.

[54] There are 6 additional sites with projected 2012 nonattainment or maintenance (Harris Co., Texas sites 482010024, 482010062, 482010066, 482011015, 482011035, and 482011039) for which there are less than 5 days with 8-hour ozone predictions of at least 70 ppb. Thus, we did not calculate contributions for these 6 sites.

1. Contributions to Annual $PM_{2.5}$ Nonattainment and Maintenance

The largest contribution from each state to annual $PM_{2.5}$ across all downwind nonattainment receptors is provided in Table IV-8. The largest contribution from each State to annual $PM_{2.5}$ across all downwind maintenance-only receptors is also provided in Table IV-8.

Table IV-8. Largest contribution to downwind annual $PM_{2.5}$ ($\mu g/m^3$) nonattainment and maintenance for each of 37 states.

Upwind State	Largest Downwind Contribution to Nonattainment for Annual $PM_{2.5}$ ($\mu g/m^3$)	Largest Downwind Contribution to Maintenance for Annual $PM_{2.5}$ ($\mu g/m^3$)
Alabama	0.51	0.19
Arkansas	0.10	0.04
Connecticut	0.00	0.00
Delaware	0.00	0.00
Florida	0.08	0.01
Georgia	0.46	0.13
Illinois	0.50	0.65
Indiana	1.34	1.27
Iowa	0.26	0.14
Kansas	0.09	0.04
Kentucky	0.94	0.81
Louisiana	0.09	0.03
Maine	0.00	0.00
Maryland	0.15	0.06
Massachusetts	0.00	0.00
Michigan	0.64	0.64
Minnesota	0.14	0.09
Mississippi	0.05	0.01
Missouri	1.22	0.27
Nebraska	0.06	0.03
New Hampshire	0.00	0.00
New Jersey	0.02	0.01
New York	0.21	0.21
North Carolina	0.20	0.06
North Dakota	0.06	0.04
Ohio	1.34	0.94
Oklahoma	0.08	0.03

Upwind State	Largest Downwind Contribution to Nonattainment for Annual $PM_{2.5}$ ($\mu g/m^3$)	Largest Downwind Contribution to Maintenance for Annual $PM_{2.5}$ ($\mu g/m^3$)
Pennsylvania	0.54	0.54
Rhode Island	0.00	0.00
South Carolina	0.24	0.04
South Dakota	0.03	0.01
Tennessee	0.32	0.32
Texas	0.18	0.07
Vermont	0.00	0.00
Virginia	0.12	0.06
West Virginia	0.95	0.40
Wisconsin	0.22	0.19

Based on the state-by-state contribution analysis, there are 18 states which contribute 0.15 $\mu g/m^3$ or more to downwind annual $PM_{2.5}$ nonattainment. These states are: Alabama, Georgia, Illinois, Indiana, Iowa, Kentucky, Maryland, Michigan, Missouri, New York, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, Texas, West Virginia, and Wisconsin. A list of the downwind nonattainment sites to which each upwind state contributes 0.15 $\mu g/m^3$ or more (i.e., the upwind state-to-downwind nonattainment "linkages") are provided in Appendix E.

There are 12 states which contribute 0.15 µg/m3 or more to downwind annual $PM_{2.5}$ maintenance. These states are: Alabama, Illinois, Indiana, Kentucky, Michigan, Missouri, New York, Ohio, Pennsylvania, Tennessee, West Virginia, and Wisconsin. A list of the downwind maintenance sites to which each upwind state contributes 0.15 µg/m3 or more (i.e., the upwind state-to-downwind maintenance "linkages") are provided in Appendix E.

2. Contributions to 24-Hour $PM_{2.5}$ Nonattainment and Maintenance

The largest contribution from each state to 24-hour $PM_{2.5}$ across all downwind nonattainment receptors is provided in Table IV-9. The largest contribution from each state to 24-hour $PM_{2.5}$ across all downwind maintenance-only receptors is also provided in Table IV-9.

Table IV-9. Largest contribution to downwind 24-hour $PM_{2.5}$ ($\mu g/m^3$) nonattainment and maintenance for each of 37 states.

Upwind State	Largest Downwind Contribution to Nonattainment for 24-hour $PM_{2.5}$ ($\mu g/m^3$)	Largest Downwind Contribution to Maintenance for 24-hour $PM_{2.5}$ ($\mu g/m^3$)
Alabama	0.51	0.42
Arkansas	0.24	0.23
Connecticut	0.10	0.18
Delaware	0.22	0.20
Florida	0.07	0.03
Georgia	1.10	0.92
Illinois	3.72	5.70
Indiana	3.56	5.15
Iowa	0.82	1.55
Kansas	0.37	0.81
Kentucky	4.38	3.58
Louisiana	0.11	0.13
Maine	0.06	0.10
Maryland	2.83	2.11
Massachusetts	0.19	0.30
Michigan	1.86	2.03
Minnesota	0.61	1.01
Mississippi	0.06	0.07
Missouri	3.73	3.71
Nebraska	0.24	0.52
New Hampshire	0.05	0.10
New Jersey	0.68	0.75
New York	0.83	1.34
North Carolina	0.40	0.38
North Dakota	0.21	0.33
Ohio	5.85	4.74
Oklahoma	0.17	0.20
Pennsylvania	2.85	2.29
Rhode Island	0.02	0.03
South Carolina	0.29	0.25
South Dakota	0.10	0.17
Tennessee	1.38	1.30
Texas	0.37	0.33

Upwind State	Largest Downwind Contribution to Nonattainment for 24-hour $PM_{2.5}$ ($\mu g/m^3$)	Largest Downwind Contribution to Maintenance for 24-hour $PM_{2.5}$ ($\mu g/m^3$)
Vermont	0.03	0.05
Virginia	1.21	1.01
West Virginia	4.02	3.33
Wisconsin	0.69	0.97

Based on the state-by-state contribution analysis, there are 21 states which contribute 0.35 µg/m3 or more to downwind 24-hour $PM_{2.5}$ nonattainment. These states are: Alabama, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Maryland, Michigan, Minnesota, Missouri, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Tennessee, Texas, Virginia, West Virginia, and Wisconsin. A list of the downwind nonattainment counties to which each upwind state contributes 0.35 µg/m3 or more (i.e., the upwind state-to-downwind nonattainment “linkages”) are provided in Appendix E.

There are 21 states which contribute (individually) 0.35 µg/m3 or more to downwind 24-hour $PM_{2.5}$ maintenance. These states are: Alabama, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Maryland, Michigan, Minnesota, Missouri, Nebraska, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia, and Wisconsin. A list of the downwind maintenance sites to which each upwind state contributes 0.35 µg/m3 or more (i.e., the upwind state-to-downwind maintenance “linkages”) are provided in Appendix E.

3. Contributions to 8-Hour Ozone Nonattainment and Maintenance

The largest contribution from each state to 8-hour ozone across all downwind nonattainment receptors is provided in Table IV-10. The largest contribution from each state to 8-hour ozone across all downwind maintenance-only receptors is also provided in Table IV-10.

Table IV-10. Largest contribution to downwind 8-hour ozone nonattainment and maintenance for each of 37 states.

Upwind State	Largest Downwind Contribution to Nonattainment for Ozone (ppb)	Largest Downwind Contribution to Maintenance for Ozone (ppb)
Alabama	4.0	2.8
Arkansas	2.1	2.0
Connecticut	0.0	0.2
Delaware	0.0	0.6
Florida	0.5	3.6
Georgia	1.6	2.8
Illinois	1.9	26.8
Indiana	1.3	9.4
Iowa	0.6	0.9
Kansas	0.5	1.0
Kentucky	1.6	1.6
Louisiana	8.0	11.1
Maine	0.0	0.0
Maryland	0.0	2.7
Massachusetts	0.0	0.6
Michigan	0.0	0.9
Minnesota	0.3	0.2
Mississippi	4.0	3.3
Missouri	1.1	4.8
Nebraska	0.2	0.2
New Hampshire	0.0	0.1
New Jersey	0.0	11.5
New York	0.0	18.8
North Carolina	0.5	1.3
North Dakota	0.2	0.1
Ohio	0.1	3.2
Oklahoma	0.3	2.8
Pennsylvania	0.1	8.2
Rhode Island	0.0	0.0
South Carolina	0.4	0.9
South Dakota	0.1	0.1
Tennessee	2.2	1.1
Texas	3.9	1.9

Upwind State	Largest Downwind Contribution to Nonattainment for Ozone (ppb)	Largest Downwind Contribution to Maintenance for Ozone (ppb)
Vermont	0.0	0.0
Virginia	0.2	8.2
West Virginia	0.0	2.8
Wisconsin	0.2	2.2

Based on the state-by-state contribution analysis, there are 11 states (which contribute 0.8 ppb or more to downwind 8-hour ozone nonattainment. These states are: Alabama, Arkansas, Georgia, Illinois, Indiana, Kentucky, Louisiana, Mississippi, Missouri, Tennessee, and Texas. A list of the downwind nonattainment counties to which each upwind state contributes 0.8 ppb or more (i.e., the upwind state-to-downwind nonattainment "linkages") is provided in Appendix E.

There are 26 states which contribute 0.8 ppb or more to downwind 8-hour ozone maintenance. These states are: Alabama, Arkansas, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maryland, Michigan, Mississippi, Missouri, New Jersey, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, South Carolina, Tennessee, Texas, Virginia, West Virginia, and Wisconsin. A list of the downwind nonattainment counties to which each upwind state contributes 0.8 ppb or more (i.e., the upwind state-to-downwind nonattainment "linkages") is provided in Appendix E.

F. Analysis of Contributions Captured by Various Thresholds

In this section we present a summary of the amount of upwind contribution to each receptor based on the 1 percent threshold in comparison to the amount of contribution based on two other thresholds: 0.5 percent of the NAAQS and 5 percent of the NAAQS. This analysis was performed to support the development of responses to comments on the choice of thresholds in the proposed rule. The concentration associated with each of these thresholds, as used in this analysis, is given in Table IV-11.

Table IV-11. Concentrations associated with thresholds of 0.5 percent, 1 percent, and 5 percent.

	0.5 Percent	1 Percent	5 Percent
8-hour Ozone (ppb)	0.4	0.8	4
Annual PM2.5 (µg/m^3)	0.075	0.15	0.75
24-Hour PM2.5 (µg/m^3)	0.175	0.35	1.75

For the analysis of thresholds we calculate several "metrics" (i.e., measures of contribution) for each downwind receptor for the 8-hour ozone, annual $PM_{2.5}$, and 24-hour $PM_{2.5}$ NAAQS, individually. These metrics are listed in Table IV-12. In this table "x" refers to one the thresholds included in this analysis, namely, 0.5 percent, 1 percent, and 5 percent.

Table IV-12. Contribution metrics used for the analysis of thresholds.

Contribution Metrics
In-State Contribution
Total Contribution from All Upwind States
Upwind Contribution as a Percent of Receptor Concentration
Number of Upwind States that Contribute At or Above "x" Percent Threshold
Total Contribution from Upwind States using a "x" Percent Threshold
Percent of Upwind Contribution Captured with "x" Percent Threshold

The method for calculating each metric of the metrics in Table 1 is as follows:

1. In-State Contribution
- Amount of contribution from emissions from the state in which the receptor is located. These data are available from the contribution calculations described previously in this document.

2. Total Contribution from All Upwind States
- Sum of contributions from all upwind states, without consideration of any contribution threshold.

3. Upwind Contribution as a Percent of Receptor Concentration
- Ratio of total contribution from all upwind states (metric 2) divided by the sum of the in-state contribution (metric 1) and the total upwind contribution (metric 2), expressed as a percent.

4. Number of Upwind States that Contribute At or Above “x” Percent Threshold
- Count of the number of upwind states that contribute amounts at or above the given threshold.

5. Total Contribution from Upwind States using a “x” Percent Threshold
- Sum of contributions from all upwind states the individually contribute at or above the given threshold.

6. Percent of Upwind Contribution Captured with “x” Percent Threshold
- Total contribution using an “x” percent threshold (metric 5) divided by the total contribution from all upwind states (metric 2), expressed as a percent.

The data for each of the above contribution metrics for each 2012 nonattainment and maintenance receptor are provided in Appendix F Tables F-1, F-2, and F-3 for 8-hour ozone, annual $PM_{2.5}$ and 24-hour $PM_{2.5}$, respectively.

The contribution data in Tables F-1 through F-3 indicate that the amount of transport from upwind states comprises a very large portion of the concentration at the 8-hour ozone, annual $PM_{2.5}$ and 24-hour $PM_{2.5}$ nonattainment and maintenance sites. For ozone, more than 90 percent of the concentration at the Allegan, MI, Fairfield County, CT and New Haven County, CT receptors is due to transport from upwind states. For Harford County, MD, Baton Rouge Parish, LA, and Harris County, TX, transport is 35 to 50 percent of the concentration. For annual $PM_{2.5}$, 60 to 70 percent of the concentration is due to upwind transport at all receptors, except for Jefferson County, AL where transport is somewhat less, but still substantial at 45 to 50 percent. The amount of $PM_{2.5}$ due to transport is 60 to 80 percent of the concentration at a majority of the 24-hour $PM_{2.5}$ receptors. The interpretation of the contribution summaries presented in Tables F-1 through F-3 with respect to decisions on the selection of thresholds for the final rule can be found in section V.D.1 of the final rule preamble.

V. Air Quality Impacts of the Transport Rule SO_2 and NO_X Emissions Reductions

In this section we present the air quality impacts of the SO_2 and NO_X emissions reductions in the 2014 remedy scenario in comparison to air quality predicted for the 2012 base case and 2014 base case scenarios[55]. We first describe the magnitude and spatial patterns in emissions reductions (and increases) in the East. Then we quantify the impacts of these emissions changes on projected design value concentrations for annual $PM_{2.5}$, 24-hour $PM_{2.5}$, and 8-hour ozone at monitoring sites in the Eastern modeling domain[56]. We also provide the impacts on visibility for the 20 percent worst days in Class I Areas in the East.

A. Characterization of Emissions in 2014 for the Transport Rule Remedy Scenario

The approach for developing the 2014 remedy scenario is described in the TR preamble. The methods for projecting emissions for the 2012 and 2014 base case scenarios, including the baseline control programs, are presented in the EITSD[57]. The 23 states that are included in the TR for annual SO_2 and NO_X emissions controls to reduce interstate contributions of $PM_{2.5}$ are shown on the map in Figure V-1. These states are divided into two groups with different levels of SO_2 emissions reductions. The states in Group 1 have deeper reductions than those in Group 2[58]. The 20 states subject to ozone season NO_X controls to reduce interstate transport of ozone are shown on the map in Figure V-2. Also shown on the map are the 6 additional states (Iowa, Kansas, Michigan, Missouri, Oklahoma, and Wisconsin)[59] that EPA is proposing to include in the Transport Rule ozone season NO_X trading program. The aggregate emissions of annual SO_2, annual

[55] Note that the comparisons between the 2012 base case and the 2014 remedy scenario include the impacts of emissions reductions from other rules and control programs that are projected to come into effect between 2012 and 2014, in addition to the impacts of the emissions reductions in the TR. The comparison between the 2014 base case and the 2014 remedy reflects the SO2 and NOx emissions reductions in the TR, only.
[56] This analysis does not include projections for monitoring sites that do not meet certain completeness criteria or other projection criteria, as described in section III of this TSD.
[57] State/sector/pollutant emissions summaries for all of the scenarios simulated with CAMx can be found in the EITSD.
[58] See section IV.D of the TR preamble for details on the SO_2 emissions reduction requirements for Group 1 and Group 2 States.
[59] These 6 states were included in the remedy scenario modeled for assessing the air quality impacts of the Transport Rule.

NO_X, and ozone season NO_X for these states are provided in Appendix G for the 2014 base case and remedy scenarios.

Figure V-1. States modeled for annual SO_2 and NO_X emission reductions.

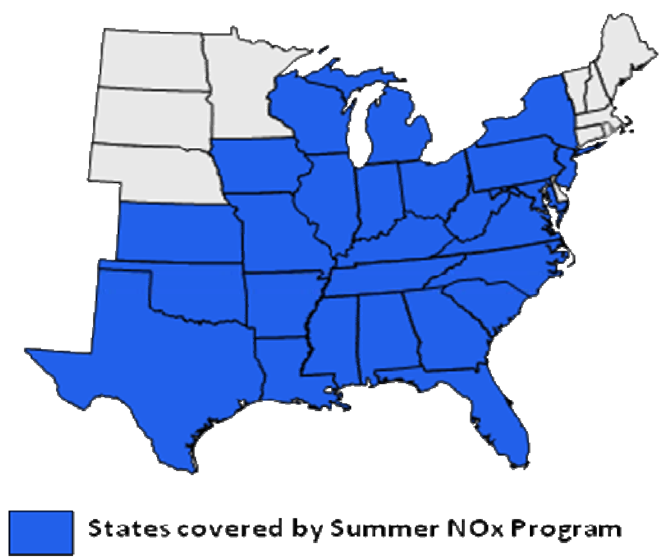

Figure V-2. States modeled for ozone season NO_X emission reductions.

For the Group 1 states as a whole, annual SO_2 emissions from electric generating units (EGUs) are projected to be 67 percent lower in 2014 with the TR controls compared to those in the 2014 base case. The reduction in EGU emissions yields a net 52 percent reduction in total SO_2 for the Group 1 states. Overall, for both Group 1 and Group 2 states, total SO_2 emissions across all source categories are 47 percent lower in the 2014 remedy scenario, compared to the 2014 base case.

The difference in annual total county-level SO_2 emissions between the 2014 base and remedy scenarios is shown in Figure V-3. This figure reveals that substantial SO_2 emissions reductions will occur in the states modeled as part of the TR with the largest reductions in Alabama northward across Tennessee into the Ohio Valley extending eastward across Pennsylvania. Some increases in SO_2 emissions are noted in a few states not included in the TR for annual SO_2 reductions, most notably in several counties in Arkansas, Colorado, Florida, Louisiana, Montana, and Wyoming.

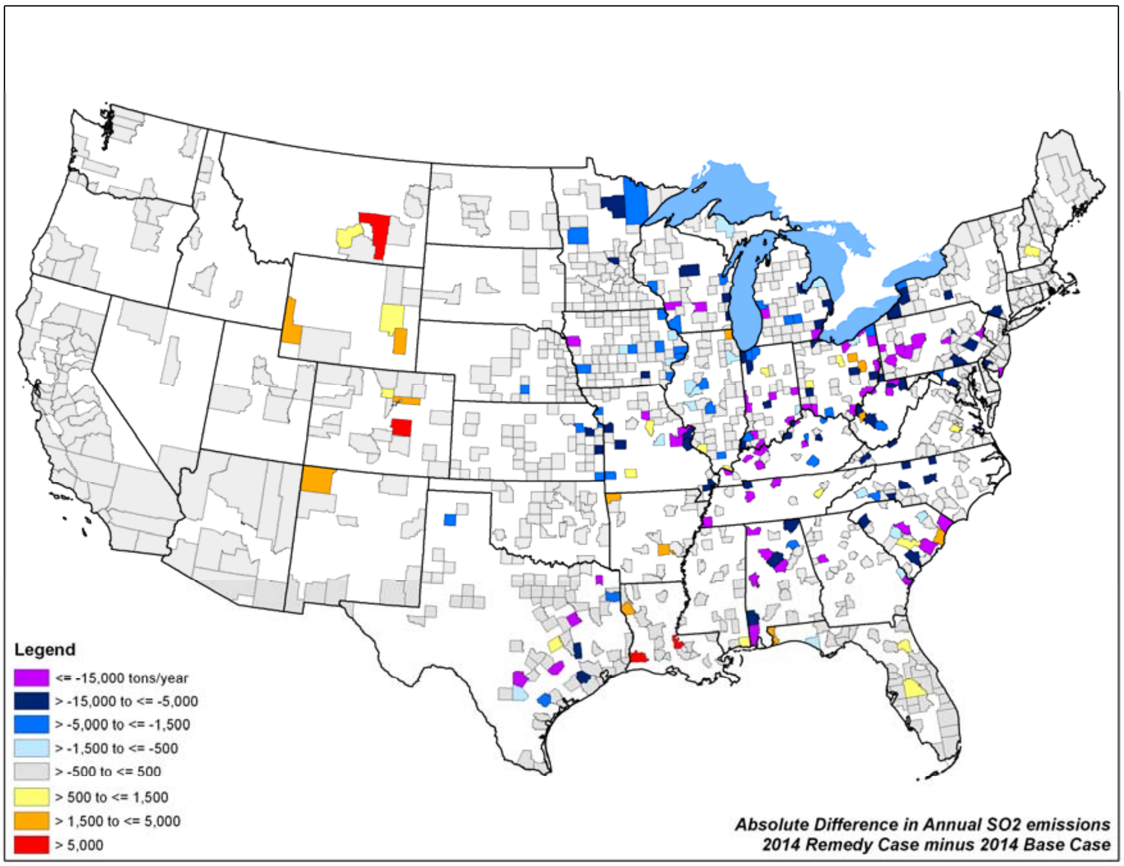

Figure V-3. Change in county total annual EGU SO_2 emissions between the 2014 base and control scenarios.

Annual emissions of NO_X from EGUs are lower by 11 percent in the remedy scenario compared to the 2014 base case for the states that were modeled as part of the TR for annual NO_X emissions reductions. The reduction in EGU NO_X produces a 2 percent net reduction in total NO_X for these states. For the states included in the air quality modeling of ozone season NO_X controls, ozone season EGU NO_X emission are 11 percent lower in the 2014 remedy scenario, compared to the 2014 base case.

The changes in winter and ozone season NO_X emissions between the 2014 remedy and 2014 base case at individual EGU facilities are presented in Figures V-4 and V-5, respectively. As is evident from Figure V-4, the largest reductions in winter NO_X are at facilities located in the area extending from Texas, Oklahoma, Kansas, and Nebraska eastward across the Midwest and Ohio Valley into Pennsylvania. Increases in EGU NO_X emissions are seen in locations scattered across the East. Comparing Figures V-4 and V-5 indicates that the spatial pattern in NO_X emissions reductions in the ozone season is similar to that in the winter.

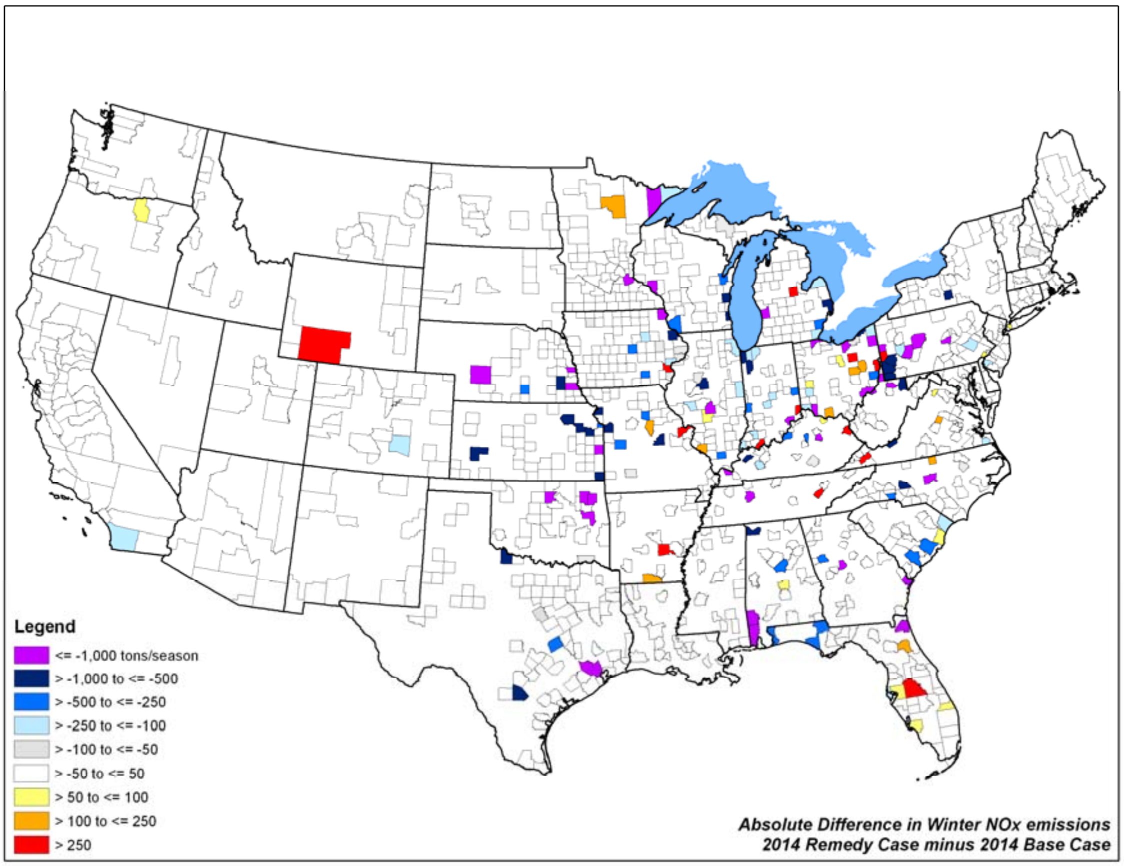

Figure V-4. Change in winter season county total EGU NO_X emissions between the 2014 base and control scenarios at individual facilities.

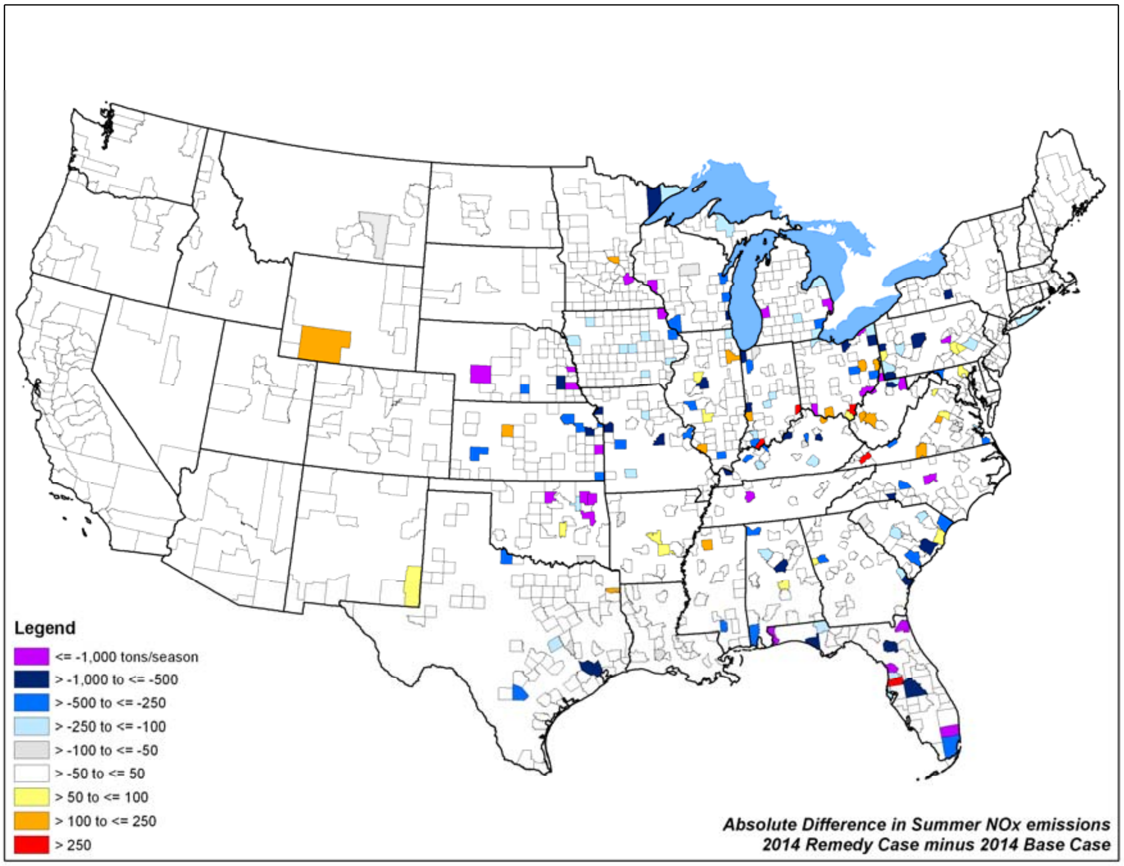

Figure V-5. Change in ozone season county total EGU NO_X emissions between the 2014 base and control scenarios at individual facilities.

B. Impacts on Projected $PM_{2.5}$ Design Value Concentrations

The projected annual and 24-hour $PM_{2.5}$ design values for the 2014 base case and 2014 remedy scenario at individual monitoring sites are provided in Appendix B. The impacts of the annual SO_2 and NO_X emissions reductions on annual and 24-hour $PM_{2.5}$ design values are also provided in Appendix B. The impacts in 2014 on annual and 24-hour $PM_{2.5}$ design values for each monitored county are shown in Figures V-6 and V-7, respectively[60,61]. The results, as shown in these figures indicate that the emissions reductions from the TR will substantially lower annual and 24-hour $PM_{2.5}$ concentrations at most locations in the Eastern U.S, compared to the 2014 base case. Annual $PM_{2.5}$ is

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[60] These maps, which show the difference between the 2014 remedy scenario and the 2014 base case, are based upon 5-year weighted average design values. Additional maps showing average design value concentrations for 2003-2007, the 2012 and 2014 base cases, and the 2014 remedy scenario for annual and 24-hour $PM_{2.5}$ are provided in Appendix H. Maps showing the predicted change in annual and 24-hour $PM_{2.5}$ between the 2014 remedy and the 2012 base case are also provided in Appendix H.

[61] For counties with multiple monitoring sites, the maps show the largest difference from among the sites in a county.

lower by more than 2 $\mu g/m^3$ in areas of the East extending from Tennessee northward to Indiana and Ohio, and eastward across Pennsylvania. Along the highly populated Northeast Corridor, across the Southeast and in the upper Midwest, including the cities of Atlanta, Birmingham, St. Louis, Chicago, and Detroit annual $PM_{2.5}$ concentrations are lower by 1 to 2 $\mu g/m^3$.

As shown in Figure V-7, the predicted reductions in 24-hour $PM_{2.5}$ are greater than those for annual $PM_{2.5}$ concentrations. Daily $PM_{2.5}$ concentrations in the remedy scenario are lower than in the 2014 base case by 2 to 6 $\mu g/m^3$ across much of the Southeast and along portions of the Northeast Corridor. In the multi-state area from Tennessee to western Pennsylvania, our modeling predicts 24-hour $PM_{2.5}$ concentrations that are 6 to 10 $\mu g/m^3$ lower than those in the 2014 base case.

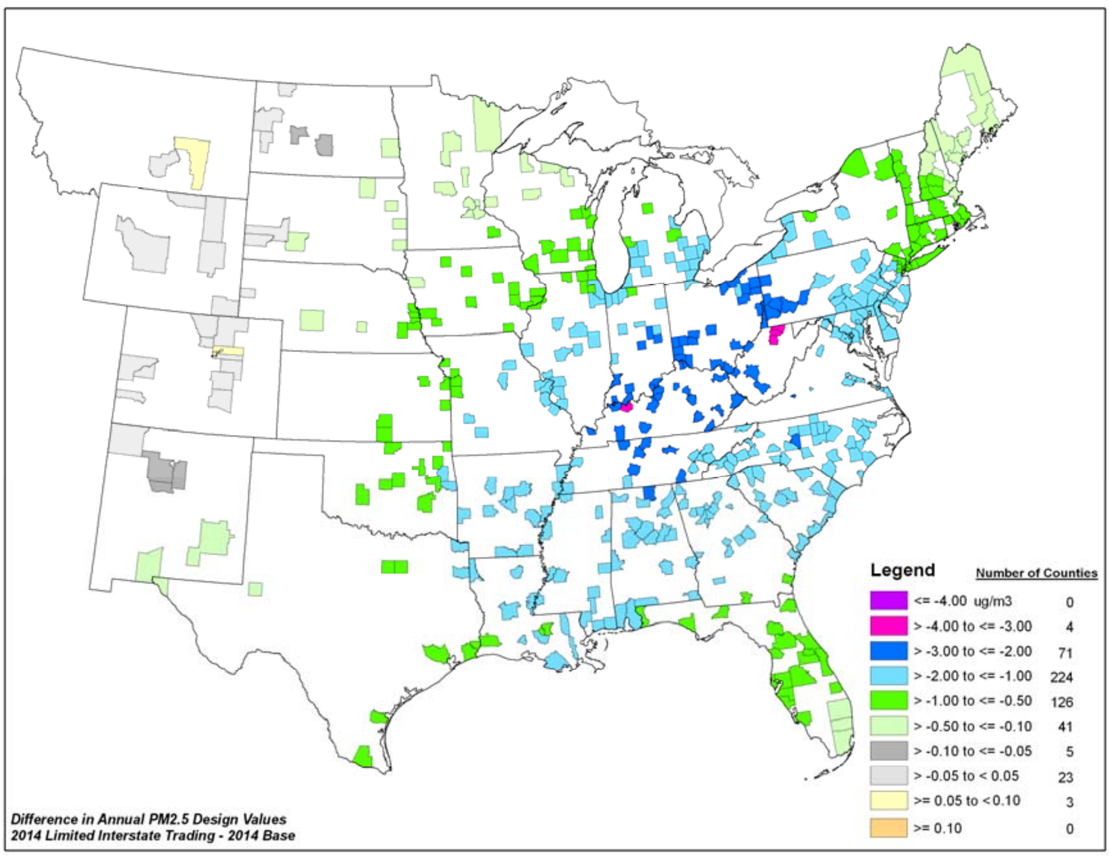

Figure V-6. Impacts on annual average $PM_{2.5}$ concentrations ($\mu g/m^3$) resulting from the emissions reductions in the 2014 remedy scenario compared to the 2014 base case scenario.

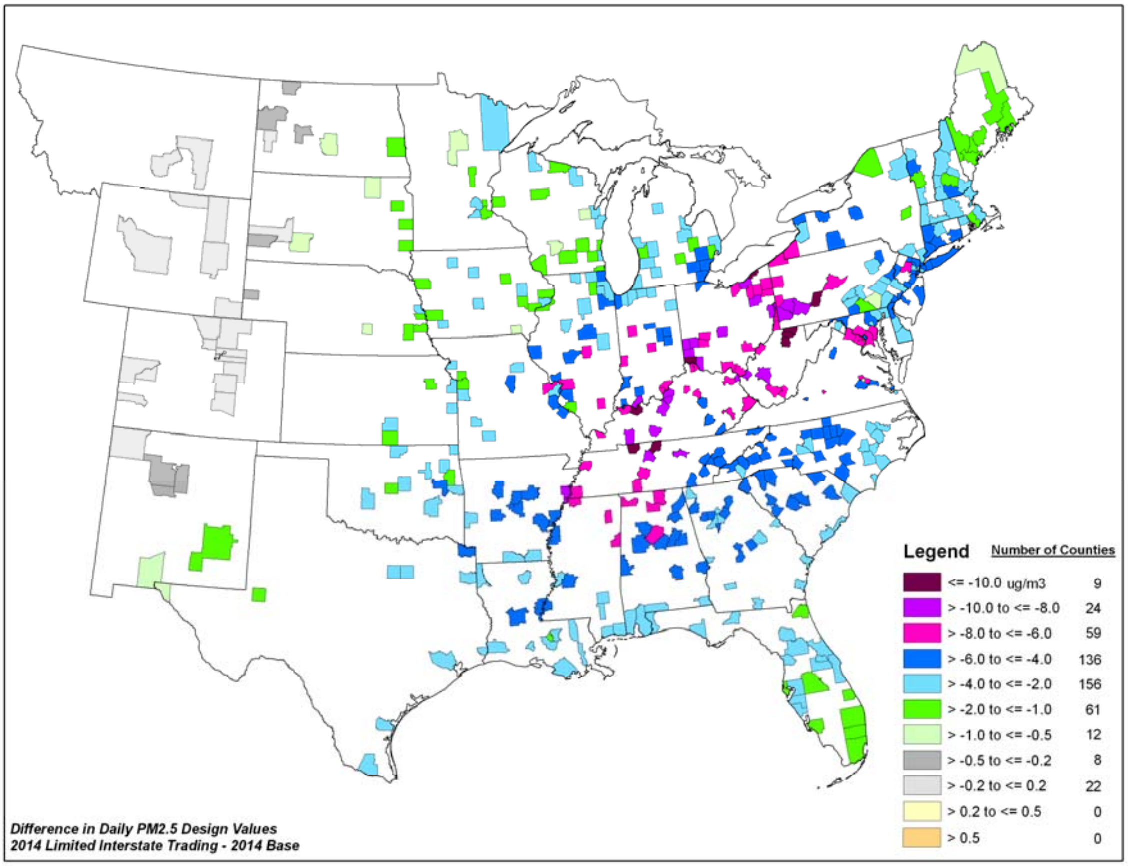

Figure V-7. Impacts on 24-hour $PM_{2.5}$ concentrations ($\mu g/m^3$) resulting from the emissions reductions in the 2014 remedy scenario compared to the 2014 base case scenario.

The spatial patterns of the magnitude of reduction in annual and 24-hour $PM_{2.5}$ across the East are generally consistent with the patterns in annual SO_2 and winter NO_X emissions reductions from EGUs, as evident by comparing Figures V-6 and V-7 to Figures V-3 and V-4, respectively. These figures also indicate that $PM_{2.5}$ concentrations are lower in the remedy scenario in those states in the East not included in the TR for annual SO_2 and NO_X reductions, like Arkansas, Louisiana, Mississippi, Oklahoma, and several northern New England. In Arkansas, Florida, and Louisiana, the reductions in transported $PM_{2.5}$ are large enough to more than offset the forecasted increases in local emissions of SO_2 in these states.

There are a few locations mainly in the West where SO_2 emissions and, therefore, $PM_{2.5}$ is predicted to be higher in the 2014 remedy scenario compared to the 2014 base case. Locations where annual $PM_{2.5}$ levels are higher in the remedy scenario are evident in Colorado and Wyoming.

C. Impacts on Annual and 24-Hour $PM_{2.5}$ Nonattainment and Maintenance

The number of projected nonattainment and/or maintenance sites in the East for the 2003-2007 base period, 2012 base case, 2014 base case, and 2014 remedy scenario for annual $PM_{2.5}$ and 24-hour $PM_{2.5}$ are provided in Table V-1. The percent difference in the number of nonattainment and maintenance sites between the 2014 remedy scenario and both the 2012 and 2014 base case scenarios are also provided in this table. The average and peak reductions in annual $PM_{2.5}$ and 24-hour $PM_{2.5}$ concentrations for those sites with 2012 nonattainment and/or maintenance problems are provided in Table V-2[62]. The annual $PM_{2.5}$ nonattainment and/or maintenance sites in the East for the 2014 base case are shown in Figure V-8. There are no annual $PM_{2.5}$ nonattainment and/or maintenance sites projected for the 2014 remedy scenario. Maps showing the location of 24-hour $PM_{2.5}$ nonattainment and/or maintenance sites for the 2014 base case and 2014 remedy scenario are provided in Figures V-9 and V-10, respectively.

Table V-1. Percent reduction in annual and 24-hour $PM_{2.5}$ nonattainment and/or maintenance in the Eastern U.S.

	Number of Nonattainment and Maintenance Sites				**Percent Reduction in Nonattainment/Maintenance Sites**	
	Ambient (2003-2007)	**2012 Base Case**	**2014 Base Case**	**2014 Remedy**	**2012 Base vs 2014 Remedy**	**2014 Base vs 2014 Remedy**
Annual $PM_{2.5}$ Nonattainment Sites[a]	103	12	7	0	100 percent	100 percent
Annual $PM_{2.5}$ Maintenance-Only Sites	22	4	3	0	100 percent	100 percent
Daily $PM_{2.5}$ Nonattainment Sites	151	20	10	1	95 percent	90 percent
Daily $PM_{2.5}$ Maintenance-Only Sites	48	21	12	4	81 percent	67 percent

[a] As indicated in section III, the term “nonattainment” is used to denote sites that are projected to have both nonattainment and maintenance problems.

[62] The average and peak reductions in concentrations are calculated using the projected average design values.

Table V-2. Average and peak reductions in annual $PM_{2.5}$ and 24-hour $PM_{2.5}$ for the 2012 base case nonattainment and/or maintenance sites for the 2014 remedy compared to the 2012 base case and the 2014 base case.

	2014 Remedy vs 2012 Base Case		**2014 Remedy vs 2014 Base Case**	
	Average Reduction	**Peak Reduction**	**Average Reduction**	**Peak Reduction**
Annual $PM_{2.5}$ Nonattainment Sites	2.73 $\mu g/m^3$	3.32 $\mu g/m^3$	2.18 $\mu g/m^3$	2.69 $\mu g/m^3$
Annual $PM_{2.5}$ Maintenance-Only Sites	2.99 $\mu g/m^3$	3.26 $\mu g/m^3$	2.49 µg/m3	2.69 µg/m3
24-Hour $PM_{2.5}$ Nonattainment Sites	6.8 $\mu g/m^3$	11.7 $\mu g/m^3$	5.3 $\mu g/m^3$	9.1 $\mu g/m^3$
24-Hour $PM_{2.5}$ Maintenance-Only Sites	6.5 $\mu g/m^3$	11.0 $\mu g/m^3$	5.1 $\mu g/m^3$	9.3 $\mu g/m^3$

The information in Table V-1 shows that the extent of nonattainment and maintenance problems for annual $PM_{2.5}$ and 24-hour $PM_{2.5}$ is significantly lower in the 2014 remedy scenario compared to both the 2012 base case and the 2014 base case. All annual $PM_{2.5}$ nonattainment and maintenance problems are projected to be resolved by 2014 with the remedy coupled with other existing control programs. Annual $PM_{2.5}$ concentrations are, on average, more than 2 $\mu g/m^3$ lower across the 12 sites that were nonattainment in the 2012 base case. The impacts on annual $PM_{2.5}$ at maintenance-only sites are comparable to those at the nonattainment sites.

For 24-hour $PM_{2.5}$, there are significantly fewer nonattainment and/or maintenance sites in the 2014 remedy scenario compared to both the 2012 and 2014 base cases. There is only one remaining nonattainment site[63] and 4 remaining maintenance sites[64] for 24-hour $PM_{2.5}$ with the 2014 remedy scenario.. The average reduction in 24-hour $PM_{2.5}$ across the 20 2012 nonattainment sites is 6.8 $\mu g/m^3$ and the peak reduction at an individual nonattainment site is 11.7 $\mu g/m^3$. Comparable reductions are projected at 24-hour $PM_{2.5}$ maintenance-only sites.

[63] Allegheny Co, PA site 420030064
[64] Cook Co, IL site 170311016, Lake Co, IN site 180890022, Wayne Co, MI site 261630019, and Lancaster Co, PA site 420710007

Figure V-8. Projected annual $PM_{2.5}$ nonattainment and/or maintenance sites in the East for the 2014 base case.

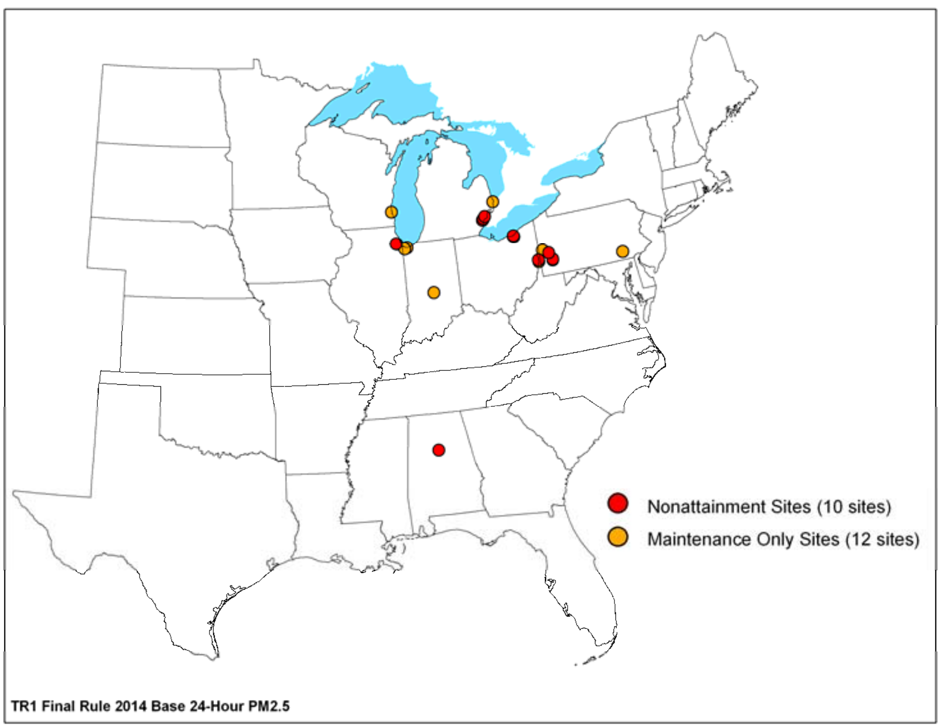

Figure V-9. Projected 24-hour $PM_{2.5}$ nonattainment and/or maintenance sites in the East for the 2014 base case.

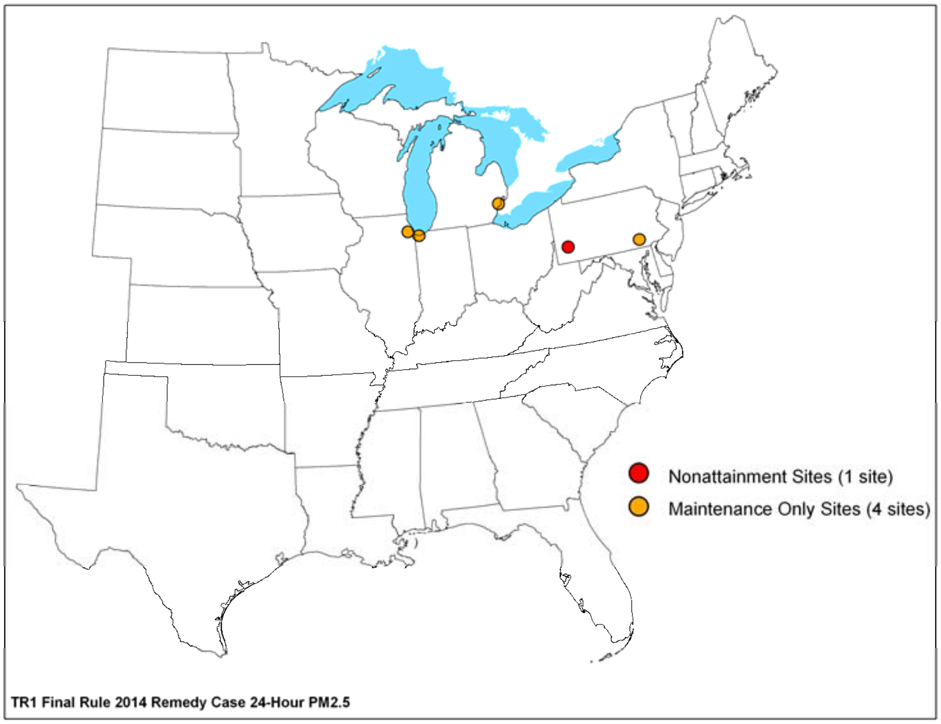

Figure V-10. Projected 24-hour $PM_{2.5}$ nonattainment and/or maintenance sites in the East for the 2014 remedy scenario.

D. Impacts on Projected 8-Hour Ozone Design Value Concentrations

The projected 8-hour ozone design values for the 2014 base case and 2014 remedy scenario at individual monitoring sites are provided in Appendix B. The impacts of the ozone season NO_X emissions reductions on 8-hour ozone design values for monitored counties in the Eastern 12 km modeling domain are also provided in Appendix B. The impacts are shown in Figure V-11[65]. This figure indicates that the emissions reductions modeled will result in lower ozone concentrations in most counties in the Eastern U.S., compared to the 2014 base case. Concentrations of 8-hour ozone are projected to be lower by 0.2 ppb or more for the 2014 remedy scenario in portions of the Southeast, Midwest, and Northeast. Reductions in ozone of 1 ppb or more are predicted at sites in 23 counties in portions Florida, Georgia, Iowa, Kansas, Oklahoma, Ohio, West Virginia, and Pennsylvania.

[65] These maps, which show the difference between the 2014 remedy scenario and the 2014 base case, are based upon 5-year weighted average design values. Additional maps showing average design value concentrations for 2003-2007, the 2012 and 2014 base cases, and the 2014 remedy scenario for 8-hour are provided in Appendix H. Maps showing the predicted change in 8-hour between the 2014 remedy and the 2012 base case are also provided in Appendix H.

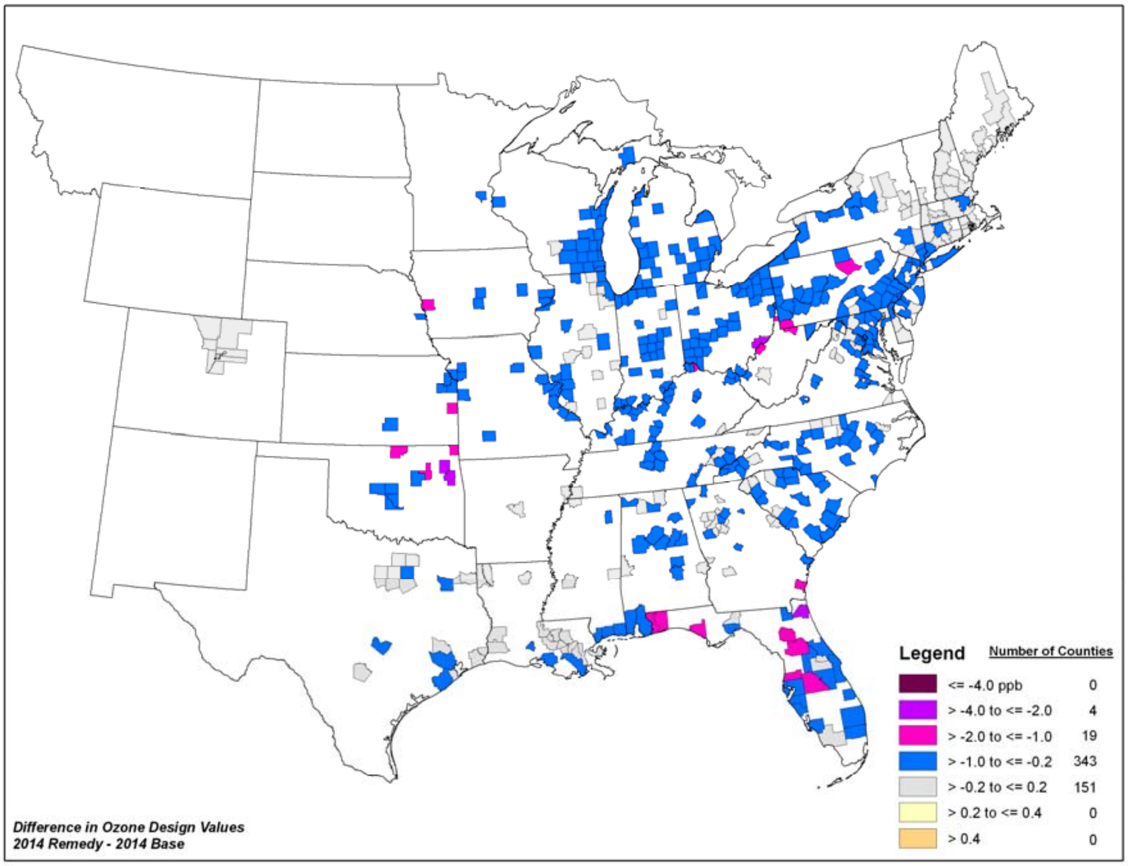

Figure V-11. Impacts on 8-hour ozone concentrations in 2014 resulting from the emissions reductions in the 2014 remedy scenario.

E. Impacts on 8-Hour Ozone Nonattainment and Maintenance

The number of projected 8-hour ozone nonattainment and/or maintenance sites in the East for the 2012 base case, 2014 base case, and 2014 remedy for 8-hour ozone are provided in Table V-3. The percent difference in the number of nonattainment and maintenance sites between the 2014 remedy scenario and both the 2012 and 2014 base case scenarios are also provided in this table. The average and peak reductions in 8-hour ozone concentrations for those sites with 2012 nonattainment and/or maintenance problems are provided in Table V-4. The location of 8-hour ozone nonattainment and/or maintenance sites in the East for the 2014 base case is shown in Figure V-12 and V-13, respectively.

Table V-3. Percent reduction in 8-hour ozone nonattainment and/or maintenance in the Eastern U.S.

	Number of Nonattainment and Maintenance Sites				Percent Reduction in Nonattainment/ Maintenance Sites	
8-Hour Ozone	**Ambient (2003-2007)**	**2012 Base Case**	**2014 Base Case**	**2014 Remedy**	**2012 Base vs 2014 Remedy**	**2014 Base vs 2014 Remedy**
Nonattainment Sites	104	7	4	4	43 percent	No Change
Maintenance-Only Sites	65	9	6	6	33 percent	No Change

Table V-4. Average and peak reductions in 8-hour ozone for the 2012 base case nonattainment and/or maintenance sites for the 2014 remedy compared to the 2012 base case and the 2014 base case.

8- Hour Ozone	2014 Remedy vs 2012 Base Case		2014 Remedy vs 2014 Base Case	
	Average Reduction	**Greatest Reduction**	**Average Reduction**	**Greatest Reduction**
Nonattainment Sites	1.9 ppb	2.3 ppb	0.1 ppb	0.3 ppb
Maintenance-Only Sites	1.8 ppb	2.1 ppb	0.1 ppb	0.5 ppb

The information in Table V-4 shows that the extent of nonattainment for 8-hour ozone is predicted to be lower by 43 percent and the number maintenance-only sites by 33 percent in the 2014 remedy scenario compared to the 2012 base case. For the 10 sites with residual nonattainment and/or maintenance problems in the 2014 remedy scenario, the predicted ozone reductions provide 5 percent of the amount needed for these sites to attain and/or maintain the ozone standard. Of these 12 sites, 4 are predicted to be nonattainment and 6 are predicted to have maintenance problems. The 4 nonattainment sites and 5 of the maintenance sites are located in Houston. One maintenance site is in Baton Rouge.

Figure V-12. Projected 8-hour ozone nonattainment and/or maintenance sites in the East for the 2014 base case.

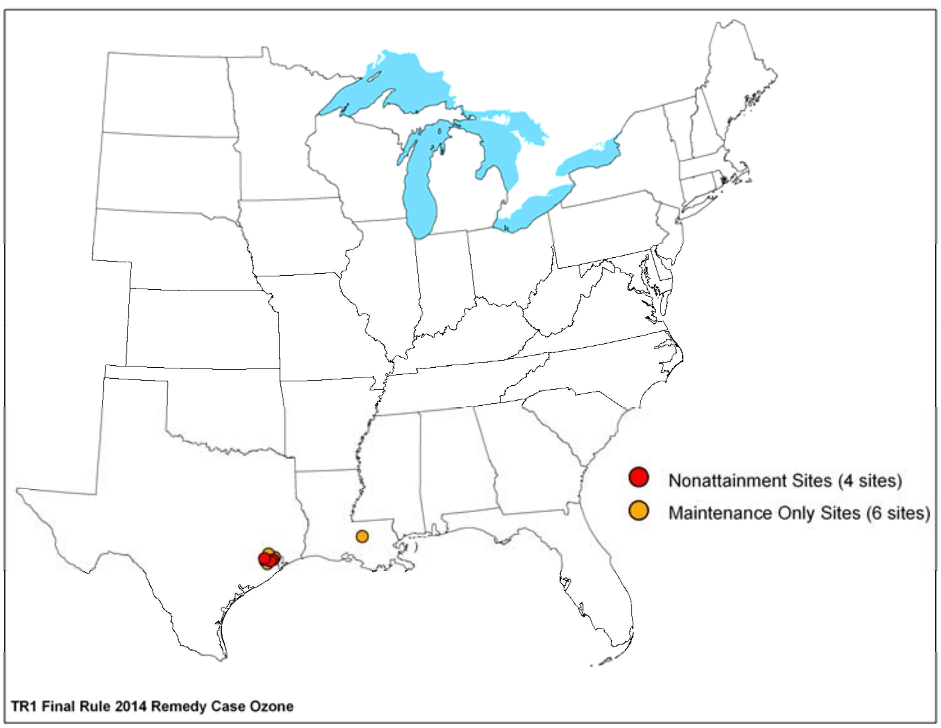

Figure V-13. Projected 8-hour ozone nonattainment and/or maintenance sites in the East for the 2014 remedy scenario.

F. Impacts on Visibility in Class 1 Areas

The impacts of the TR regional SO_2 and NO_X emissions reductions were examined in terms of the projected improvements in visibility on the 20 percent best and worst visibility days at Class I areas[66]. We quantified visibility impacts at the 60 Class I areas in the Eastern 12km modeling domain which have complete IMPROVE ambient data for 2005 or are represented by IMPROVE monitors with complete data. Sites were used in this analysis if they had at least 3 years of complete data for the 2003-2007 period[67].

Visibility for the 2012 base case, 2014 base case and 2014 remedy scenario were calculated using the regional haze methodology outlined in section 6 of the photochemical modeling guidance, which applies modeling results in a relative sense, using base year ambient data. The $PM_{2.5}$ and regional haze modeling guidance recommends the calculation of future year changes in visibility in a similar manner to the calculation of changes in $PM_{2.5}$ design values. The regional haze methodology for calculating future year visibility impairment is included in MATS (http://www.epa.gov/scram001/modelingapps_mats.htm)

In calculating visibility impairment, the extinction coefficient values[68] are made up of individual component species (sulfate, nitrate, organics, etc). The predicted change in visibility (on the 20 percent best and worst days) is calculated as the modeled percent change in the mass for each of the $PM_{2.5}$ species (on the 20% best and worst observed days) multiplied by the observed concentrations. The future mass is converted to extinction and then daily species extinction coefficients are summed to get a daily total extinction value (including Rayleigh scattering). The daily extinction coefficients are converted to deciviews and averaged across all 20 percent best or worst days. In this way, we calculate an average change in deciviews from the base case to a future case at each IMPROVE site. Subtracting the 2014 Transport rule remedy scenario deciview values

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[66] The focus of this analysis is on visibility impacts at Class I areas within our 12 km Eastern modeling domain. We have also calculated visibility impacts for Class I areas farther to the west using results of the modeling for the 36 km modeling domain. These results can be found in Appendix I.

[67] Since the base case modeling used meteorology for 2005, one of the complete years must be 2005.

[68] Extinction coefficient is in units of inverse megameters (Mm^{-1}). It is a measure of how much light is absorbed or scattered as it passes through a medium. Light extinction is commonly used as a measure of visibility impairment in the regional haze program.

from the corresponding 2014 base case deciview values gives an estimate of the visibility benefits in Class I areas that are expected to occur from the TR.

The following options were chosen in MATS for calculating the future year visibility values for the rule:

New IMPROVE algorithm
Use model grid cells at (IMPROVE) monitor
Temporal adjustment at monitor- 3x3 for 12km grid, (1x1 for 36km grid)
Start monitor year- 2003
End monitor year- 2007
Base model year 2005
Minimum years required for a valid monitor- 3

The "base model year" was chosen as 2005 because it is the base case meteorological year for the final Transport Rule modeling. The start and end years were chosen as 2003 and 2007 because that is the 5 year period which is centered on the base model year of 2005. These choices are consistent with using a 5 year base period for regional haze calculations. The predicted visibility and change in visibility on the 20 percent worst days is provided in Table V-5 for each Class I area in the Eastern modeling domain. The predicted visibility and change in visibility on the 20 percent best days is provided in Table V-6 for each Class I area in the Eastern modeling domain.

Visibility on the 20 percent worst days is predicted to improve in the 2014 remedy scenario compared to the 2014 base case at 55 of the 60 locations included in this analysis. Similarly, visibility on the 20 percent best days is predicted to improve or not change in 2014 at 48 of these 60 locations. A very small degradation in visibility is predicted for a few locations in five states not covered by the Transport Rule including Colorado, Maine, New Mexico, North Dakota, South Dakota. Note that the modeling did not include Best Available Retrofit Technology (BART) controls[69].

[69] All known enforceable controls are included in the modeling. EPA does not know of any specific state BART rules that are currently in place. We did not attempt to apply generic BART emissions reductions for any sources.

Table V-5. Visibility (in deciviews) on the 20 percent worst days at Class I areas in the Eastern 12km modeling domain.

Class I Area (IMPROVE Site)	Site Code	State	2003-2007 Baseline Visibility 20% Worst Days (dv)	2012 Base Case Visibility 20% Worst Days (dv)	2014 Base Case Visibility 20% Worst Days(dv)	2014 Remedy Case Visibility 20% Worst Days(dv)	2014 Visibility Change from 2014 Base Case (dv)
Acadia NP	ACAD	ME	22.75	20.26	20.08	19.12	-0.96
Badlands NP	BADL	SD	16.82	16.11	15.98	15.66	-0.32
Bandelier NM	BAND	NM	11.97	11.28	11.09	10.87	-0.22
Big Bend NP	BIBE	TX	17.21	16.49	16.26	15.35	-0.91
Black Canyon of the Gunnison NM	BLCA	CO	10.00	9.54	9.49	9.46	-0.03
Bosque del Apache	BOAP	NM	13.81	13.20	13.01	12.74	-0.27
Boundary Waters Canoe Area	BOWA	MN	20.20	19.15	18.84	17.78	-1.06
Brigantine	BRIG	NJ	28.68	25.75	25.35	22.88	-2.47
Caney Creek Wilderness	CACR	AR	26.69	25.20	24.38	21.55	-2.83
Carlsbad Caverns NP	CAVE	TX	16.51	15.76	15.54	14.80	-0.74
Cohutta Wilderness	COHU	GA	30.45	27.68	26.62	22.85	-3.77
Dolly Sods Wilderness	DOSO	WV	29.94	27.84	27.11	21.39	-5.72
Eagles Nest Wilderness	EANE	CO	8.82	8.32	8.28	8.30	0.02
Everglades NP	EVER	FL	22.48	20.6	20.36	19.47	-0.89
Flat Tops Wilderness	FLTO	CO	8.82	8.32	8.28	8.3	0.02
Great Gulf Wilderness	GRGU	NH	21.43	19.56	19.22	17.48	-1.74
Great Sand Dunes NM	GRSA	CO	11.82	11.30	11.28	11.25	-0.03
Great Smoky Mountains NP	GRSM	TN	30.56	27.93	27.02	23.34	-3.68
Guadalupe Mountains NP	GUMO	TX	16.51	15.76	15.54	14.8	-0.74
Hercules-Glades Wilderness	HEGL	MO	26.95	25.82	25.19	22.87	-2.32
Isle Royale NP	ISLE	MI	21.31	20.22	19.92	18.95	-0.97
James River Face Wilderness	JARI	VA	28.93	26.56	25.80	21.61	-4.19
Joyce-Kilmer-Slickrock Wilderness	JOYC	TN	30.56	27.93	27.02	23.34	-3.68
La Garita Wilderness	LAGA	CO	10.00	9.54	9.49	9.46	-0.03
Linville Gorge Wilderness	LIGO	NC	29.66	26.83	26.01	21.73	-4.28
Lostwood	LOST	ND	19.61	18.89	18.79	18.63	-0.16
Lye Brook Wilderness	LYBR	VT	24.11	21.17	20.74	18.22	-2.52
Maroon Bells-Snowmass Wilderness	MABE	CO	8.82	8.32	8.28	8.3	0.02
Mammoth Cave NP	MACA	KY	32.00	30.42	29.54	24.37	-5.17
Medicine Lake	MELA	MT	18.21	17.75	17.68	17.58	-0.10
Mesa Verde NP	MEVE	CO	12.14	11.39	11.40	11.34	-0.06
Moosehorn	MOOS	ME	21.19	19.17	19.01	18.11	-0.90
Mount Zirkel Wilderness	MOZI	CO	9.72	9.29	9.23	9.22	-0.01
North Absaroka Wilderness	NOAB	WY	11.30	11.08	11.05	11.04	-0.01
Okefenokee	OKEF	GA	27.21	24.58	24.05	21.82	-2.23

Class I Area (IMPROVE Site)	Site Code	State	2003-2007 Baseline Visibility 20% Worst Days (dv)	2012 Base Case Visibility 20% Worst Days (dv)	2014 Base Case Visibility 20% Worst Days(dv)	2014 Remedy Case Visibility 20% Worst Days(dv)	2014 Visibility Change from 2014 Base Case (dv)
Otter Creek Wilderness	OTCR	WV	29.94	27.84	27.11	21.39	-5.72
Pecos Wilderness	PECO	NM	9.60	9.14	9.04	8.94	-0.10
Presidential Range-Dry River Wilderness	PRRA	NH	21.43	19.56	19.22	17.48	-1.74
Rawah Wilderness	RAWA	CO	9.72	9.29	9.23	9.22	-0.01
Roosevelt Campobello International Park	ROCA	ME	21.19	19.17	19.01	18.11	-0.90
Cape Romain	ROMA	SC	27.43	24.59	24.02	21.27	-2.75
Rocky Mountain NP	ROMO	CO	12.85	12.33	12.22	12.24	0.02
Salt Creek	SACR	NM	18.27	17.40	17.14	16.52	-0.62
San Pedro Parks Wilderness	SAPE	NM	10.42	9.99	9.90	9.76	-0.14
Seney	SENE	MI	25.05	23.97	23.34	21.78	-1.56
Shenandoah NP	SHEN	VA	29.42	26.97	26.21	21.15	-5.06
Shining Rock Wilderness	SHRO	NC	28.54	25.71	24.84	21.08	-3.76
Sipsey Wilderness	SIPS	AL	29.88	27.49	26.51	22.88	-3.63
Theodore Roosevelt NP	THRO	ND	17.88	17.16	17.04	16.92	-0.12
UL Bend	ULBE	MT	15.49	15.25	15.21	15.20	-0.01
Upper Buffalo Wilderness	UPBU	AR	26.97	25.50	24.73	22.05	-2.68
Voyageurs NP	VOYA	MN	19.62	18.70	18.41	17.48	-0.93
Washakie Wilderness	WASH	WY	11.30	11.08	11.05	11.04	-0.01
West Elk Wilderness	WEEL	CO	8.82	8.32	8.28	8.30	0.02
Weminuche Wilderness	WEMI	CO	10.00	9.54	9.49	9.46	-0.03
White Mountain Wilderness	WHIT	NM	13.01	12.46	12.29	11.71	-0.58
Wheeler Peak Wilderness	WHPE	NM	9.60	9.14	9.04	8.94	-0.10
Wind Cave NP	WICA	SD	15.95	15.26	15.14	15.03	-0.11
Wichita Mountains	WIMO	OK	23.63	22.20	21.72	20.34	-1.38
Wolf Island	WOLF	GA	27.21	24.58	24.05	21.82	-2.23

Table V-6. Visibility (in deciviews) on the 20 percent best days at Class I areas in the Eastern 12km modeling domain.

Class I Area (IMPROVE Site)	Site Code	State	2003-2007 Baseline Visibility 20% Best Days (dv)	2012 Base Case Visibility 20% Best Days(dv)	2014 Base Case Visibility 20% Best Days(dv)	2014 Remedy Case Visibility 20% Best Days(dv)	2014 Visibility Change from 2014 Base Case (dv)
Acadia NP	ACAD	ME	8.26	8.00	7.95	7.91	-0.04
Badlands NP	BADL	SD	6.65	6.38	6.34	6.34	0.00
Bandelier NM	BAND	NM	4.62	4.22	4.15	4.15	0.00
Big Bend NP	BIBE	TX	5.73	5.42	5.39	5.31	-0.08
Black Canyon of the Gunnison NM	BLCA	CO	2.76	2.36	2.32	2.33	0.01
Bosque del Apache	BOAP	NM	6.07	5.61	5.56	5.54	-0.02
Boundary Waters Canoe Area	BOWA	MN	5.90	5.79	5.77	5.69	-0.08
Brigantine	BRIG	NJ	14.29	13.38	13.24	12.87	-0.37
Caney Creek Wilderness	CACR	AR	11.82	11.40	11.33	11.09	-0.24
Carlsbad Caverns NP	CAVE	TX	5.60	5.28	5.24	5.18	-0.06
Cohutta Wilderness	COHU	GA	13.84	13.13	12.88	12.21	-0.67
Dolly Sods Wilderness	DOSO	WV	11.23	10.58	10.33	9.25	-1.08
Eagles Nest Wilderness	EANE	CO	0.92	0.46	0.42	0.41	-0.01
Everglades NP	EVER	FL	12.29	11.52	11.45	11.21	-0.24
Flat Tops Wilderness	FLTO	CO	0.92	0.46	0.42	0.41	-0.01
Great Gulf Wilderness	GRGU	NH	6.96	6.75	6.71	6.62	-0.09
Great Sand Dunes NM	GRSA	CO	3.86	3.59	3.53	3.51	-0.02
Great Smoky Mountains NP	GRSM	TN	13.17	12.58	12.24	11.53	-0.71
Guadalupe Mountains NP	GUMO	TX	5.60	5.28	5.24	5.18	-0.06
Hercules-Glades Wilderness	HEGL	MO	12.97	12.40	12.23	11.76	-0.47
Isle Royale NP	ISLE	MI	6.59	6.40	6.37	6.27	-0.10
James River Face Wilderness	JARI	VA	14.02	13.23	12.92	12.10	-0.82
Joyce-Kilmer-Slickrock Wilderness	JOYC	TN	13.17	12.58	12.24	11.53	-0.71
La Garita Wilderness	LAGA	CO	2.76	2.36	2.32	2.33	0.01
Linville Gorge Wilderness	LIGO	NC	11.33	10.52	10.32	9.63	-0.69
Lostwood	LOST	ND	8.01	7.88	7.86	7.84	-0.02
Lye Brook Wilderness	LYBR	VT	5.82	5.57	5.51	5.39	-0.12
Maroon Bells-Snowmass Wilderness	MABE	CO	0.92	0.46	0.42	0.41	-0.01
Mammoth Cave NP	MACA	KY	16.50	15.57	15.27	14.15	-1.12
Medicine Lake	MELA	MT	6.64	6.54	6.52	6.52	0.00
Mesa Verde NP	MEVE	CO	3.70	3.23	3.20	3.21	0.01
Moosehorn	MOOS	ME	8.56	8.42	8.39	8.41	0.02
Mount Zirkel Wilderness	MOZI	CO	1.19	1.02	0.97	0.98	0.01
North Absaroka Wilderness	NOAB	WY	1.67	1.56	1.54	1.54	0.00
Okefenokee	OKEF	GA	14.90	14.09	13.91	13.12	-0.79

Class I Area (IMPROVE Site)	Site Code	State	2003-2007 Baseline Visibility 20% Best Days (dv)	2012 Base Case Visibility 20% Best Days(dv)	2014 Base Case Visibility 20% Best Days(dv)	2014 Remedy Case Visibility 20% Best Days(dv)	2014 Visibility Change from 2014 Base Case (dv)
Otter Creek Wilderness	OTCR	WV	11.23	10.58	10.33	9.25	-1.08
Pecos Wilderness	PECO	NM	1.37	1.04	1.00	1.02	0.02
Presidential Range-Dry River Wilderness	PRRA	NH	6.96	6.75	6.71	6.62	-0.09
Rawah Wilderness	RAWA	CO	1.19	1.02	0.97	0.98	0.01
Roosevelt Campobello International Park	ROCA	ME	8.56	8.42	8.39	8.41	0.02
Cape Romain	ROMA	SC	15.05	13.77	13.58	12.97	-0.61
Rocky Mountain NP	ROMO	CO	2.27	1.99	1.96	1.96	0.00
Salt Creek	SACR	NM	7.88	7.42	7.32	7.24	-0.08
San Pedro Parks Wilderness	SAPE	NM	1.46	1.24	1.18	1.13	-0.05
Seney	SENE	MI	7.13	6.93	6.89	6.83	-0.06
Shenandoah NP	SHEN	VA	10.21	9.17	8.98	8.21	-0.77
Shining Rock Wilderness	SHRO	NC	7.28	6.53	6.33	5.71	-0.62
Sipsey Wilderness	SIPS	AL	15.33	14.71	14.52	13.85	-0.67
Theodore Roosevelt NP	THRO	ND	7.07	6.86	6.82	6.83	0.01
UL Bend	ULBE	MT	4.40	4.24	4.21	4.21	0.00
Upper Buffalo Wilderness	UPBU	AR	12.03	11.47	11.33	11.05	-0.28
Voyageurs NP	VOYA	MN	6.79	6.64	6.62	6.56	-0.06
Washakie Wilderness	WASH	WY	1.67	1.56	1.54	1.54	0.00
West Elk Wilderness	WEEL	CO	0.92	0.46	0.42	0.41	-0.01
Weminuche Wilderness	WEMI	CO	2.76	2.36	2.32	2.33	0.01
White Mountain Wilderness	WHIT	NM	3.35	3.11	3.07	3.00	-0.07
Wheeler Peak Wilderness	WHPE	NM	1.37	1.04	1.00	1.02	0.02
Wind Cave NP	WICA	SD	4.91	4.65	4.62	4.64	0.02
Wichita Mountains	WIMO	OK	9.85	9.21	9.11	9.00	-0.11
Wolf Island	WOLF	GA	14.9	14.09	13.91	13.12	-0.79

Air Quality Modeling Final Rule
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Appendix A

Model Performance Evaluation for the 2005-Based
Final Transport Rule Air Quality Modeling Platform

A.1. Introduction

An operational model evaluation was conducted for the 2005 base year CAMx annual model simulation performed for the 12 km Eastern U.S. modeling domain.[1,2] The purpose of this evaluation was to examine the ability of the Transport Rule air quality modeling platform to replicate the magnitude and spatial and temporal variability of measured (i.e., observed) ozone and PM2.5 component species concentrations within the modeling domain. Included in the evaluation are statistical measures of model performance based upon model-predicted versus observed concentrations that were paired in space and time on a daily or weekly basis, depending on the sampling frequency of the particular monitoring network, as described below.

Model performance statistics were calculated for several spatial scales and temporal periods. Statistics were calculated for individual monitoring sites and for each of four subregions of the Eastern modeling domain. The subregions include the Northeast, Midwest, Southeast, and Central states which are defined based upon the states contained within the Regional Planning Organizations (RPOs)[3] in the East. The statistics for each site and subregion were calculated by season (e.g., "winter" is defined as January through March). For 8-hour daily maximum ozone, we also calculated performance statistics by subregion for the May through September ozone season[4]. In addition to the performance statistics, we prepared several graphical presentations of model performance for 8-hour daily maximum ozone, sulfate, and nitrate which are the three key pollutants for the Transport Rule. These graphical presentations include:

(1) regional maps which show the normalized mean bias and error calculated for each season at individual monitoring sites,
(2) bar and whisker plots which show the distribution of the predicted and observed data by month by subregion, and
(3) time series plots of observed and predicted concentrations for those monitoring sites predicted to be nonattainment or have maintenance problems for ozone or PM2.5 in the Transport Rule 2012 base case.

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[1] See section II.B of the main document for a description of the Eastern modeling domain.
[2] As noted in section II of the main document, II.F. of the main document, the 2005 base year simulation used Continuous Emissions Monitoring (CEM) data for specifying emissions from electric generating units as well as year-specific wild and prescribed fires. These data were used for the 2005 evaluation case in order to provide more resolved year-specific emissions data for these two sectors than was included in the 2005 base year emissions used as the baseline for projecting future air quality. See the Emissions Inventory Technical Support Document for the Final Transport Rule for additional details on these emissions.
[3] The subregions are defined by States where: Midwest is IL, IN, MI, OH, and WI; Northeast is CT, DE, MA, MD, ME, NH, NJ, NY, PA, RI, and VT; Southeast is AL, FL, GA, KY, MS, NC, SC, TN, VA, and WV; Central is AR, IA, KS, LA, MN, MO, NE, OK, and TX; West is AK, CA, OR, WA, AZ, NM, CO, UT, WY, SD, ND, MT, ID, and NV.
[4] In calculating the ozone season statistics we limited the data to those observed and predicted pairs with observations that exceeded 60 ppb in order to focus on concentrations at the upper portion of the distribution of values.

A.1.1 Monitoring Networks

The model evaluation for ozone was based upon comparisons of model predicted 8-hour daily maximum concentrations to the corresponding observed data at monitoring sites in the EPA Air Quality System (AQS). The $PM_{2.5}$ evaluation focused on $PM_{2.5}$ component species including sulfate (SO_4), nitrate (NO_3), total nitrate ($TNO_3=NO_3+HNO_3$), ammonium (NH_4), elemental carbon (EC), organic carbon (OC), and crustal material (CR). $PM_{2.5}$ observed data for 2005 were obtained from the following networks: Chemical Speciation Network (CSN), Interagency Monitoring of PROtected Visual Environments (IMPROVE) network, and the Clean Air Status and Trends Network (CASTNet). The pollutant species included in the evaluation for each network are listed in Table A-1. For $PM_{2.5}$ species that are measured by more than one network, we calculated separate sets of statistics for each network. The CSN and IMPROVE networks provide 24-hour average concentrations on a 1 in every 3 day, or 1 in every 6 day sampling cycle. The $PM_{2.5}$ species data at CASTNet sites are weekly integrated samples. In this analysis we use the term “urban sites” to refer to CSN sites; “suburban/rural sites” to refer to CASTNet sites; and “rural sites” to refer to IMPROVE sites.

Table A-1. $PM_{2.5}$ monitoring networks and pollutants species included in the evaluation of the 2005-based modeling platform.

Ambient Monitoring Networks	Particulate Species					
	SO_4	NO_3	TNO_3[a]	EC	NH_4	OC
IMPROVE	X	X		X		X
CASTNet	X		X		X	
CSN	X	X		X	X	X

[a] $TNO_3 = (NO_3 + HNO_3)$

A.1.2 Model Performance Statistics

The Atmospheric Model Evaluation Tool (AMET) was used to calculate the model performance statistics used in this document[5]. Some of the statistics calculated for the 2005 CAMx model simulation are identified in Table A-2. For this analysis we have selected the normalized mean bias, normalized error, fractional bias, and fractional error to characterize model performance. All of the statistics listed in Table A-2 are provided in csv or xls files in the Transport Rule docket. As noted above, we calculated the performance statistics by season. In

[5] Gilliam, R. C., W. Appel, and S. Phillips. The Atmospheric Model Evaluation Tool (AMET): Meteorology Module. Presented at 4th Annual CMAS Models-3 Users Conference, Chapel Hill, NC, September 26 - 28, 2005. (http://www.cmascenter.org/)

this analysis "winter" includes the months of January through March; "spring" includes the months of April through June; "summer" includes the months of July through September; and "fall" includes the months of October through December.

Table A-2. AMET model performance statistics calculated for this analysis.

Mean Observed	Percent Normalized Bias
Mean Predicted	Percent Normalized Error
Median Observed	Percent Normalized Mean Bias
Median Predicted	Percent Normalized Mean Error
Standard Deviation of Observed	Normalized Median Bias
Standard Deviation of Predictions	Normalized Median Error
Correlation Coefficient	Fractional Bias
R Squared	Fractional Error
Mean Bias	Index of Agreement
Mean Error	Root Mean Square Error
Median Bias	
Median Error	

Normalized mean bias (NMB) is used as a normalization to facilitate a range of concentration magnitudes. This statistic averages the difference (model - observed) over the sum of observed values. NMB is a useful model performance indicator because it avoids over inflating the observed range of values, especially at low concentrations.

Normalized mean bias is defined as:

$$\text{NMB} = \frac{\sum_{1}^{n}(P-O)}{\sum_{1}^{n}(O)} * 100$$

Normalized mean error (NME) is also similar to NMB, where the performance statistic is used as a normalization of the mean error. NME calculates the absolute value of the difference (model - observed) over the sum of observed values.

Normalized mean error is defined as:

$$\text{NME} = \frac{\sum_{1}^{n}|P-O|}{\sum_{1}^{n}(O)} * 100$$

Fractional bias is defined as:

$$FB = \frac{1}{n}\left(\frac{\sum_{1}^{n}(P-O)}{\sum_{1}^{n}\left(\frac{(P+O)}{2}\right)}\right)$$ *100, where P = predicted and O = observed concentrations.

FB is a useful model performance indicator because it has the advantage of equally weighting positive and negative bias estimates. The single largest disadvantage in this estimate of model performance is that the estimated concentration (i.e., prediction, P) is found in both the numerator and denominator. Fractional error (FE) is similar to fractional bias except the absolute value of the difference is used so that the error is always positive.
Fractional error is defined as:

$$FE = \frac{1}{n}\left(\frac{\sum_{1}^{n}|P-O|}{\sum_{1}^{n}\left(\frac{(P+O)}{2}\right)}\right)*100$$

A.1.3 Highlights of the Model Evaluation Results

In this section we present a summary of the model performance results for 8-hour daily maximum ozone and each of the $PM_{2.5}$ component species included in this evaluation. Details on the performance of the 2005 modeling platform for each of these pollutants are provided in subsequent sections of this Appendix.

Ozone

● In general, the model performance statistics indicate that the 8-hour daily maximum ozone concentrations predicted by the 2005 CAMx modeling platform closely reflect the corresponding 8-hour observed ozone concentrations in space and time in each subregion of the Eastern modeling domain.

● The day to day fluctuations in observed 8-hour daily maximum concentrations appear to be captured well, based on a time series analysis for monitoring sites projected to be nonattainment or have maintenance problems for the 8-hour ozone NAAQS in the Transport Rule 2012 base case.

Sulfate and Nitrate

● Model predictions of sulfate correspond closest to observations during the late spring and summer when observed sulfate concentrations are highest. Average positive bias across the subregions during the spring and summer is less than 10 percent for both urban and rural locations. During the fall and winter, when sulfate is generally low, the modeling platform shows more moderate over prediction of nearly 60 percent, on average across the subregions at both urban and rural locations.

● Nitrate predictions best match the observations during the fall and winter when observations are at their highest levels. The average low bias across the subregions during the fall and winter is smaller than 17 percent for urban locations and 5 percent for rural locations. There is an tendency for more moderate under prediction in the spring and summer, when nitrate concentrations are very low, as indicated by the 30 percent average low bias at both urban and rural locations for the spring and summer seasons.

● The modeling platform closely replicates the short-term variability, the general magnitude, and site-to-site differences in both sulfate and nitrate, as measured in counties with sites projected to be nonattainment or have maintenance problems for $PM_{2.5}$ in the Transport Rule 2012 base case.

● The modeling platform shows considerable skill at distinguishing between days with high and low concentrations for both sulfate and nitrate at different times of the year. The time series analysis shows that the model consistently captures the correct timing of the observed peak episode days for sulfate and for nitrate.

Ammonium, Elemental Carbon, Organic Carbon, and Crustal Material

● The model performance statistics indicate that predictions of ammonium are close to the observations. During the summer, there is slight under prediction with a low bias of smaller than 10 percent, on average across the subregions for urban locations. In other times of the year ammonium tends to be somewhat over predicted with a positive bias of 19 percent, on average across the subregions for urban locations.

● For elemental carbon, the model performance statistics show clear over prediction throughout the year at urban locations where the average positive bias across the subregions is 100 percent. The degree of over prediction is less at rural locations, particularly in the summer. The performance issues with elemental carbon may be related to problems with the total mass or speciation of directly emitted $PM_{2.5}$ emissions from sources located mainly in urban areas. However, model performance for elemental carbon, as well as for organic carbon, must be viewed in light of measurement procedures which may affect the comparability of observations to model predictions[6].

[6] Ambient measurements of EC and OC are based on speciation of observed total carbon by one of several techniques and protocols. Since the relative contributions of EC and OC to total carbon depend on the measurement technique and protocol used, measured EC and OC concentrations are considered to be "operationally defined" and may not correspond exactly to modeled EC and OC. Thus, a high bias in modeled EC in combination with low bias in modeled OC could be caused in part by the different definitions of EC and OC inherent in the model and observations.

● Observations of organic carbon are somewhat under predicted during the spring and summer when the low bias is 15 percent, on average at urban locations across the four subregions. In contrast, during the winter organic carbon is somewhat over predicted with an average positive bias of 27 percent at urban locations.

● Crustal material is over predicted by a considerable amount at both urban and rural locations in all seasons and subregions with an average positive bias well in excess of 100 percent. Performance issues for crustal material found in the 2005 CAMx simulations have also been reported in other applications[13] and may be associated with problems in properly characterizing the magnitude of emissions inventories for directly emitted $PM_{2.5}$ from fugitive sources.

The "acceptability" of model performance was judged by considering the 2005 CAMx performance results in light of the range of performance found in recent regional ozone and $PM_{2.5}$ model applications.[7,8,9,10,11,12,13,14,15,16,17] These other modeling studies represent a wide range of modeling analyses which cover various models, model configurations, domains, years and/or episodes, chemical mechanisms, and aerosol modules. Overall, the ozone and $PM_{2.5}$ model performance results for the 2005 CAMx simulations performed for the Transport Rule are within the range, or close to that found in other recent applications. The model performance results, as described in this report, demonstrate that the predictions from the Transport Rule modeling platform closely replicate the corresponding observed concentrations in terms of the magnitude,

[7] Appel, K.W., Bhave, P.V., Gilliland, A.B., Sarwar, G., and Roselle, S.J.: evaluation of the community multiscale air quality (CMAQ) model version 4.5: sensitivities impacting model performance: Part II – particulate matter. Atmospheric Environment 42, 6057-6066, 2008.
[8] Appel, K.W., Gilliland, A.B., Sarwar, G., Gilliam, R.C., 2007. Evaluation of the community multiscale air quality (CMAQ) model version 4.5: sensitivities impacting model performance: Part I – ozone. Atmospheric Environment 41, 9603-9615.
[9] Appel, K.W., Roselle, S.J., Gilliam, R.C., and Pleim, J.E.,: Sensitivity of the Community Multiscale Air Quality (CMAQ) model v4.7 results for the eastern United States to MM5 and WRF meteorological drivers. Geoscientific Model Development, 3, 169-188, 2010.
[10] Foley, K.M., Roselle, S.J., Appel, K.W., Bhave, P.V., Pleim, J.E., Otte, T.L., Mathur, R., Sarwar, G., Young, J.O., Gilliam, R.C., Nolte, C.G., Kelly, J.T., Gilliland, A.B., and Bash, J.O.,: Incremental testing of the Community multiscale air quality (CMAQ) modeling system version 4.7. Geoscientific Model Development, 3, 205-226, 2010.
[11] Hogrefe, G., Civeroio, K.L., Hao, W., Ku, J-Y., Zalewsky, E.E., and Sistla, G., Rethinking the Assessment of Photochemical Modeling Systems in Air Quality Planning Applications. Air & Waste Management Assoc., 58:1086-1099, 2008.
[12] Phillips, S., K. Wang, C. Jang, N. Possiel, M. Strum, T. Fox, 2007: Evaluation of 2002 Multi-pollutant Platform: Air Toxics, Ozone, and Particulate Matter, 7th Annual CMAS Conference, Chapel Hill, NC, October 6-8, 2008.
[13] Strum, M., Wesson, K., Phillips, S.,Pollack, A., Shepard, S., Jimenez, M., et.al.. Link Based vs NEI Onroad Emissions Impact on Air Quality Model Predictions. 17th Annual International Emission Inventory Conference, Portland, Oregon , June 2-5, 2008.
[14] Tesche, T.W., Morris, R., Tonnesen, G., McNally, D., Boylan, J., Brewer, P., 2006. CMAQ/CAMx annual 2002 performance evaluation over the eastern United States. Atmospheric Environment 40, 4906-4919.
[15] U.S. Environmental Protection Agency; Technical Support Document for the Final Clean Air Interstate Rule: Air Quality Modeling; Office of Air Quality Planning and Standards; RTP, NC; March 2005 (CAIR Docket OAR-2005-0053-2149).
[16] U.S. Environmental Protection Agency; Technical Support Document for the Proposal to Designate an Emissions Control Area for Nitrogen Oxides, Sulfur Oxides, and Particulate Matter: EPA-420-R-007, 329pp., 2009. (http://www.epa.gov/otaq/regs/nonroad/marine/ci/420r09007.pdf)
[17] U.S. Environmental Protection Agency; Renewable Fuel Standard Program (RFS2) Regulatory Impact Analysis. EPA-420-R-10-006. February 2010. Sections 3.4.2.1.2 and 3.4.3.3. Docket EPA-HQ-OAR-2009-0472-11332.

temporal fluctuations, and spatial differences for 8-hour daily maximum ozone, sulfate, and nitrate, which are the key pollutants for the Transport Rule. In addition, the modeling platform captures the general magnitude and seasonal variations in ammonium and organic carbon, two other components of $PM_{2.5}$. As noted above, model predictions of elemental carbon and crustal material are over predicted, most likely due to problems in the emissions for these pollutants.

Consistent with EPA's guidance for attainment demonstration modeling, we have applied the model predictions performed as part of the Transport Rule in a relative manner for projecting future concentrations and for calculating interstate contributions of ozone and $PM_{2.5}$. The National Research Council[18] states that using air quality modeling in a relative manner "may help reduce the bias introduced by modeling errors and, therefore, may be more accurate than using model results directly (absolute values) to estimate future pollutant levels". Thus, the results of this evaluation together with the manner in which we are applying model predictions gives us confidence that our air quality model applications using the CAMx 2005 modeling platform provides a scientifically credible approach for assessing ozone and $PM_{2.5}$ concentrations for the Final Transport Rule.

[18] National Research Council, 2002. Estimating the Public Health Benefits of Proposed Air Pollution Regulations, Washington, DC: National Academies Press.

A.2. Evaluation for 8-Hour Daily Maximum Ozone

The 8-hour ozone model performance bias and error statistics for each subregion and each season are provided in Table A-3. The distributions of observed and predicted 8-hour ozone by month in the 5-month ozone season for each subregion are shown in Figures A-1 through A-4. Spatial plots of the normalized mean bias and error for individual monitors are shown in Figures A-5 and A-6, respectively. The statistics shown in these two figures were calculated over the ozone season using data pairs on days with observed 8-hour ozone of $\geq$ 60 ppb. Time series plots of observed and predicted 8-hour ozone during the ozone season at monitoring sites identified as nonattainment or maintenance in the Transport Rule 2012 base case[19] are provided in Figure A-7a-h[20]. These sites are listed in Table A-4.

Table A-4. Monitoring sites used for the ozone time series analysis.

County	State	Monitoring Site ID
Fairfield	Connecticut	90011123
New Haven	Connecticut	90093002
East Baton Rouge	Louisiana	220330003
Harford	Maryland	240251001
Allegan	Michigan	260050003
Brazoria	Texas	480391004
Harris	Texas	482010029*
Harris	Texas	482010051*
Harris	Texas	482010055
Harris	Texas	482011050

*Data for 2005 were not available in AMET for this site, thus no time series plot was created for this site.

In general, the model performance statistics indicate that the 8-hour daily maximum ozone concentrations predicted by the 2005 CAMx modeling platform closely reflect the corresponding 8-hour observed ozone concentrations in space and time in each subregion of the Eastern modeling domain. As indicated by the statistics in Table A-3, bias and error for 8-hour daily maximum ozone are relatively low in each subregion, not only in the summer when concentrations are highest, but also during other times of the year. Specifically, 8-hour ozone in the summer is slightly over predicted with the greatest over prediction in the Southeast (NMB is 14.6 percent). In the spring ozone is slightly over predicted in the Northeast and Southeast and slightly under predicted in the Midwest and Central, with NMBs less than $\pm$ 10 percent in each

[19] The procedures for identifying projected nonattainment and maintenance sites are described in section IV of the main body of this document.
[20] Ozone data are not available for 2005 for two of the projected 2012 base case nonattainment sites in Harris county, TX (sites: 482010029 and 482010051)

region during this season. In the fall and winter, when concentrations are generally low, the bias is less than ± 25 percent in each subregion.

The monthly distribution of 8-hour daily maximum ozone during the ozone season corresponds well with that of the observed concentrations, as indicated by the graphics in Figures A-1 through A-4. Specifically, the predicted concentrations tend to be close to, or somewhat greater than, the observed median and 75th percentile values for each subregion. Model estimates in the Midwest and Central states capture the entire 25th to 75th percentile range of the observed concentrations.

Model bias at individual sites during the ozone season is similar to that seen on a subregional basis for the summer. The information in Figure A-5 indicates that the bias for days with observed 8-hour daily maximum ozone greater than 60 ppb is within ± 20 percent at the vast majority of monitoring sites across the East. The exceptions are sites in and/or near Miami, Minneapolis, Baton Rouge, and Houston, as well as at several sites in the extreme western most part of the modeling domain. At these sites observed concentrations greater than 60 ppb are under predicted generally in the range of 20 to 40 percent. Looking at the map of bias in Figure A-5 indicates that the low bias at these sites is not evident at other sites in these same areas. This suggests that the under prediction at these sites is likely due to very local features (e.g., meteorology and/or emissions) and not indicative of a systematic problem in the modeling platform.

Model error, as seen from Figure A-6, is 14 percent or less at most of the sites across the Eastern modeling domain. Somewhat greater error is evident at sites in several areas most notably along portions of the Northeast Corridor and in portions of Florida, Louisiana, Texas, and the western most part of the modeling domain.

In addition to the above analysis of overall model performance, we also examine how well the modeling platform replicates day to day fluctuations in observed 8-hour daily maximum concentrations at those monitoring sites predicted to be nonattainment or have maintenance problems for the 8-hour ozone NAAQS in the Transport Rule 2012 base case. For this site-specific analysis we present the time series of observed and predicted 8-hour daily maximum concentrations by site over the ozone season, May through September. The results, as shown in Figures A-7a through h, indicate that the modeling platform replicates the day-to-day variability in ozone during this time period. This is particularly true for the three sites in the Northeast (i.e., Harford County, MD, New Haven County, CT, and Fairfield County, CT) and for Allegan County, MI. Looking across all the sites indicates that the modeling platform is able to capture the site to site differences in the short-term variability of ozone concentrations. Still, some observed episode days are over predicted and some under predicted. Under prediction of peak episodes is evident at the site in Baton Rouge and the sites near Houston.

Table A-3. Daily maximum 8-hour ozone performance statistics by subregion, by season.

Subregion		No. of Obs	NMB (%)	NME (%)	FB (%)	FE (%)
Central States	Winter	9455	-2.1	19.1	-1.1	22.8
	Spring	14103	-5.8	14.6	-4.4	15.7
	Summer	12776	1.5	19.4	3.8	21.3
	Fall	8361	3.3	18.1	4.1	19.7
Midwest	Winter	2738	-11.7	19.6	-15.6	25.2
	Spring	15153	-3.0	14.8	-1.6	15.5
	Summer	15727	3.6	15.5	4.7	16.2
	Fall	4056	17.6	24.5	18.1	25.5
Southeast	Winter	9107	4.6	15.1	5.8	16.1
	Spring	19753	0.9	13.9	3.2	15.4
	Summer	19423	14.6	22.6	16.1	23.8
	Fall	6193	22.3	26.7	23.9	28.6
Northeast	Winter	4667	-5.4	19.1	-5.3	22.9
	Spring	15063	3.4	16.6	4.7	17.4
	Summer	15527	8.7	18.9	9.8	19.5
	Fall	5284	11.3	24.3	13.0	28.3

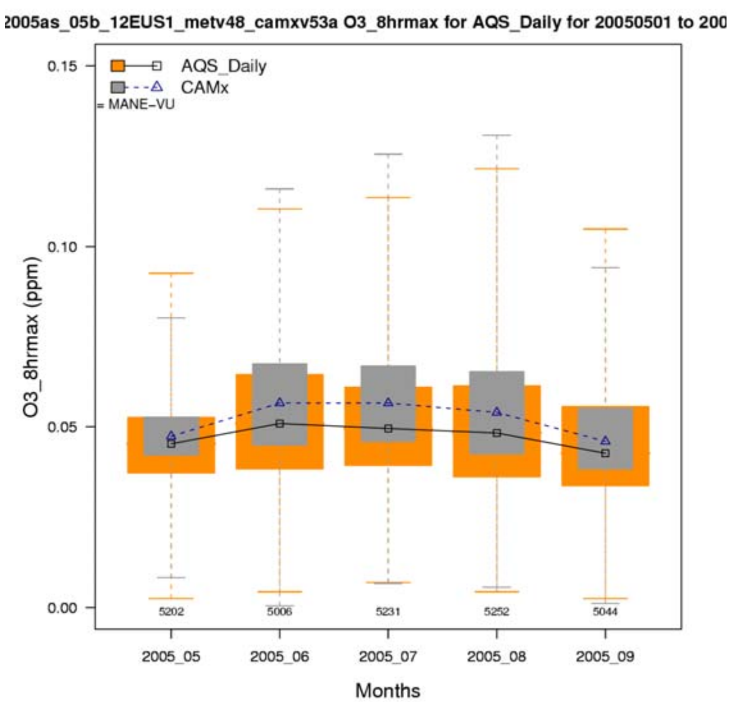

Figure A-1. Distribution of observed and predicted 8-hour daily maximum ozone by month for the period May through September for the Northeast subregion. [symbol = median; top/bottom of box = 75th/25th percentiles; top/bottom line = max/min values]

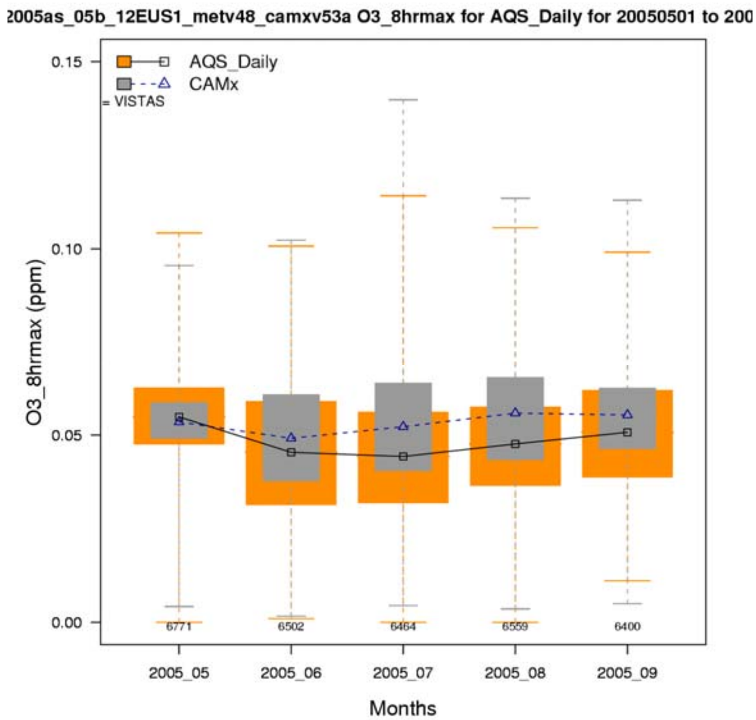

Figure A-2. Distribution of observed and predicted 8-hour daily maximum ozone by month for the period May through September 2005 for the Southeast subregion.

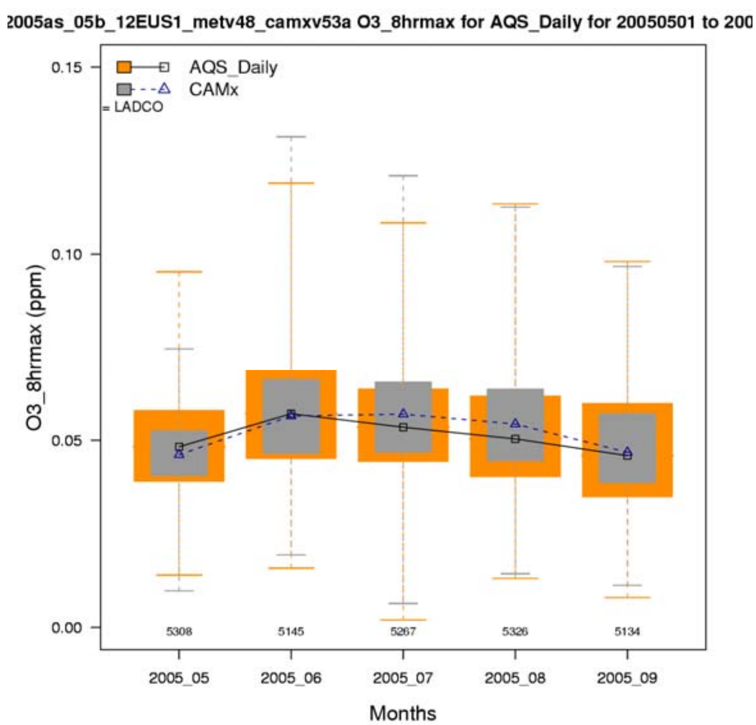

Figure A-3. Distribution of observed and predicted 8-hour daily maximum ozone by month for the period May through September for the Midwest subregion.

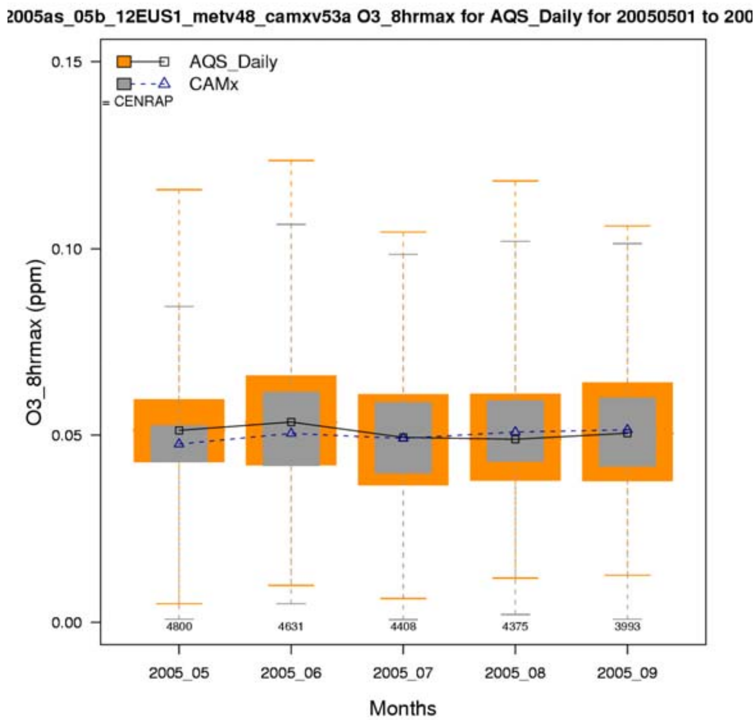

Figure A-4. Distribution of observed and predicted 8-hour daily maximum ozone by month for the period May through September for the Central states subregion.

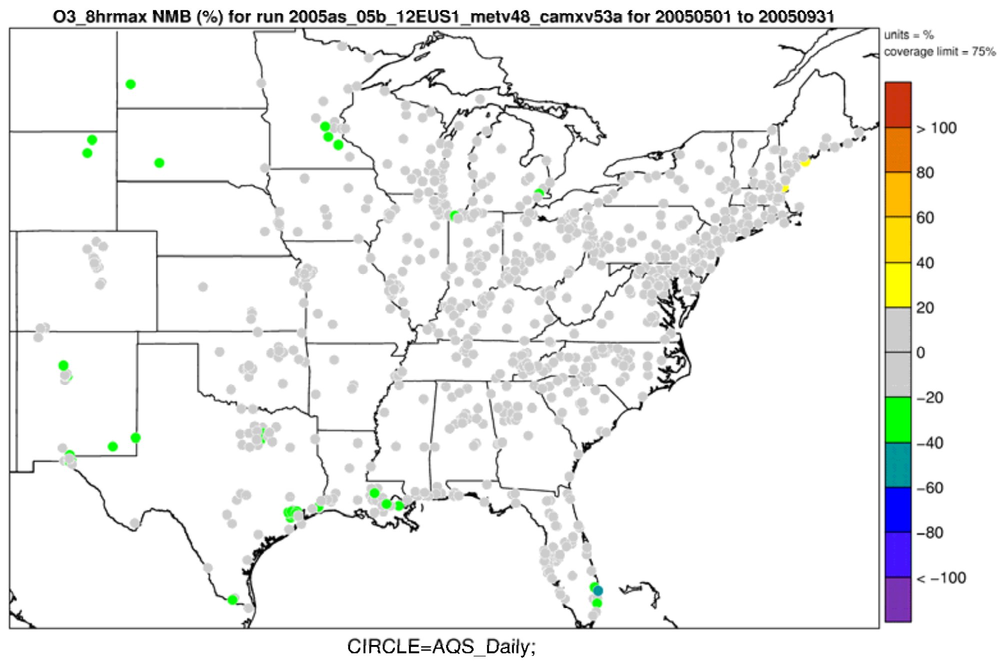

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Figure A-5. Normalized Mean Bias (%) of 8 hour daily maximum ozone greater than 60 ppb over the period May-September 2005 at monitoring sites in Eastern modeling domain.

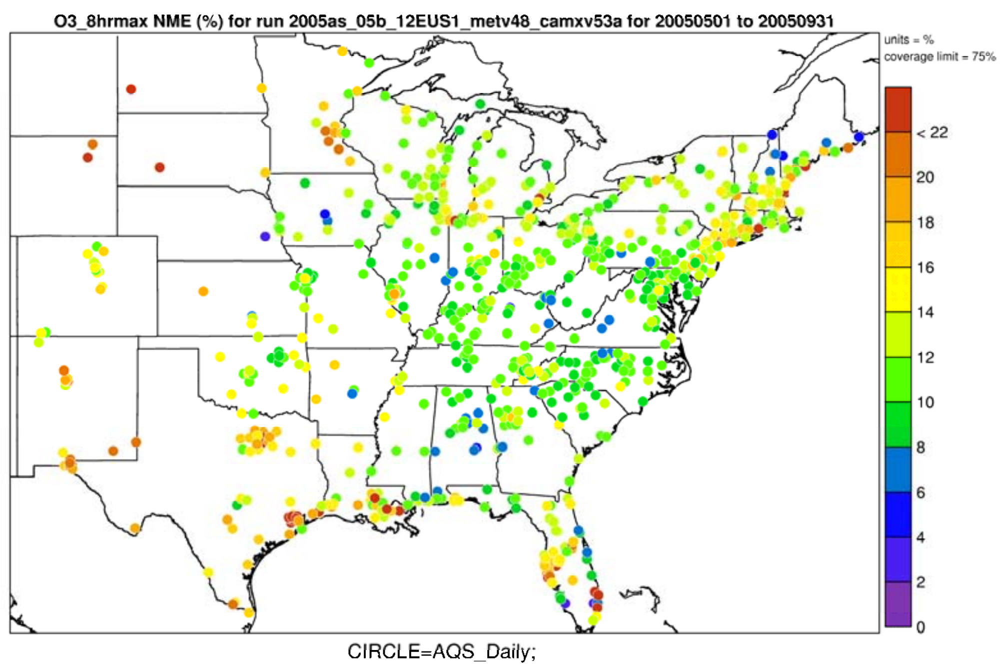

Figure A-6. Normalized Mean Error (%) of 8 hour daily maximum ozone greater than 60 ppb over the period May-September 2005 at monitoring sites in Eastern modeling domain.

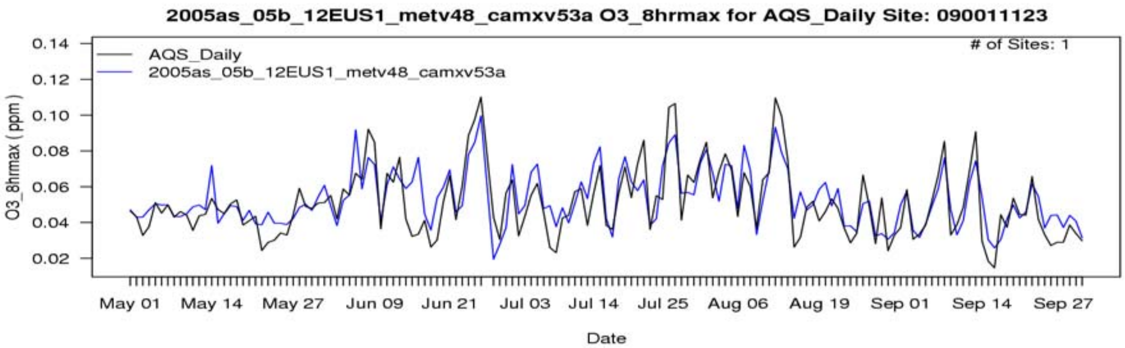

Figure A-7a. Time series of observed (black) and predicted (blue) 8-hour daily maximum ozone for the period May through September 2005 at site 090011123 in Fairfield County, CT.

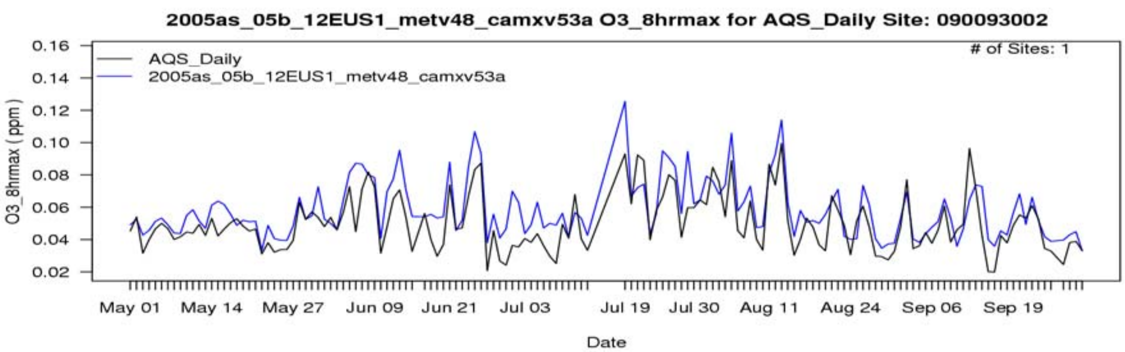

Figure A-7b. Time series of observed (black) and predicted (blue) 8-hour daily maximum ozone for the period May through September 2005 at site 090093002 in New Haven County, CT.

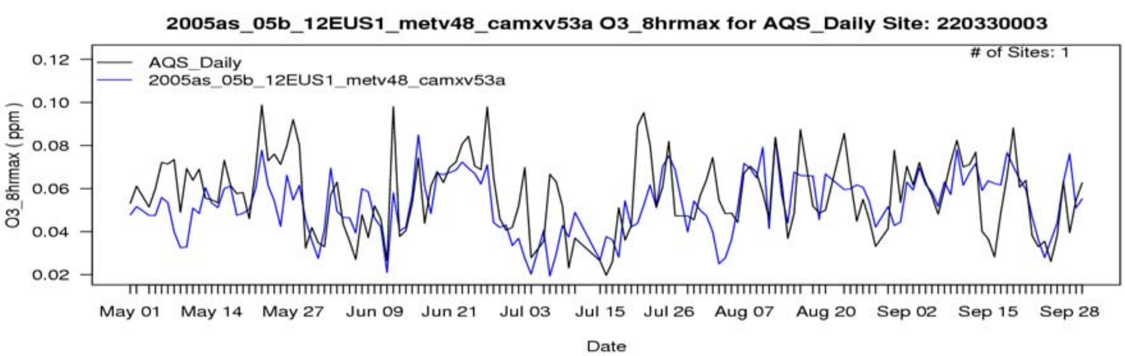

Figure A-7c. Time series of observed (black) and predicted (blue) 8-hour daily maximum ozone for the period May through September 2005 at site 220330003 in East Baton Rouge Parish, LA.

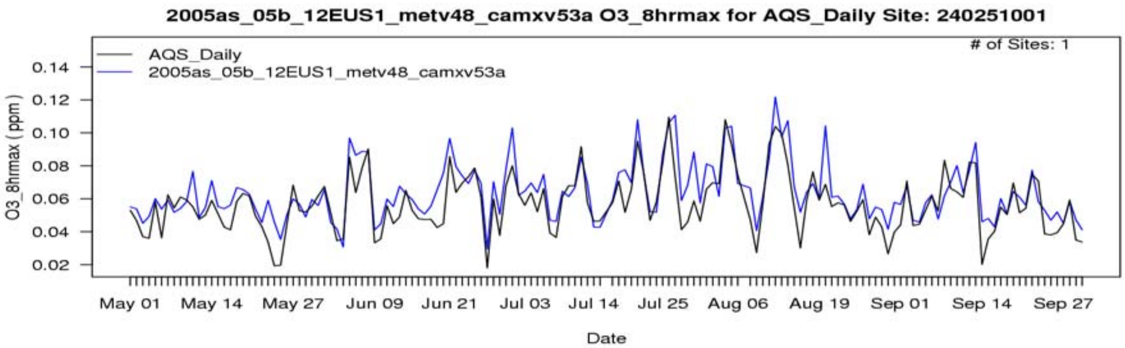

Figure A-7d. Time series of observed (black) and predicted (blue) 8-hour daily maximum ozone for the period May through September 2005 at site 240251001 in Harford County, MD.

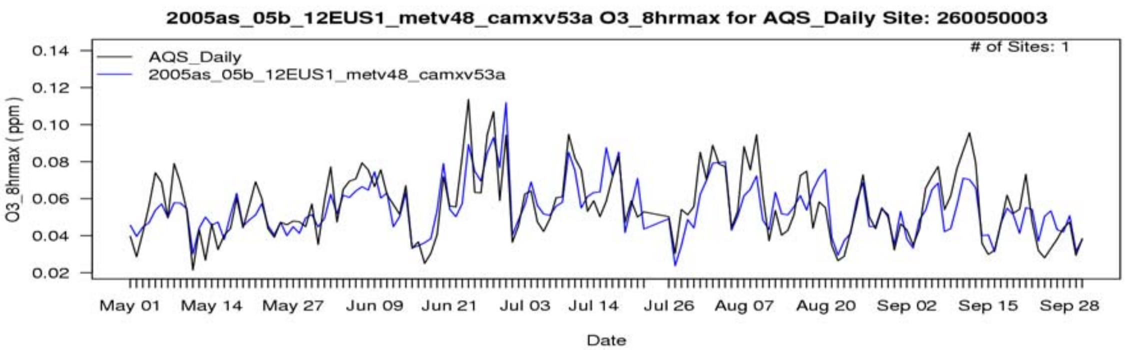

Figure A-7e. Time series of observed (black) and predicted (blue) 8-hour daily maximum ozone for the period May through September 2005 at site 2600050003 in Allegan County, MI.

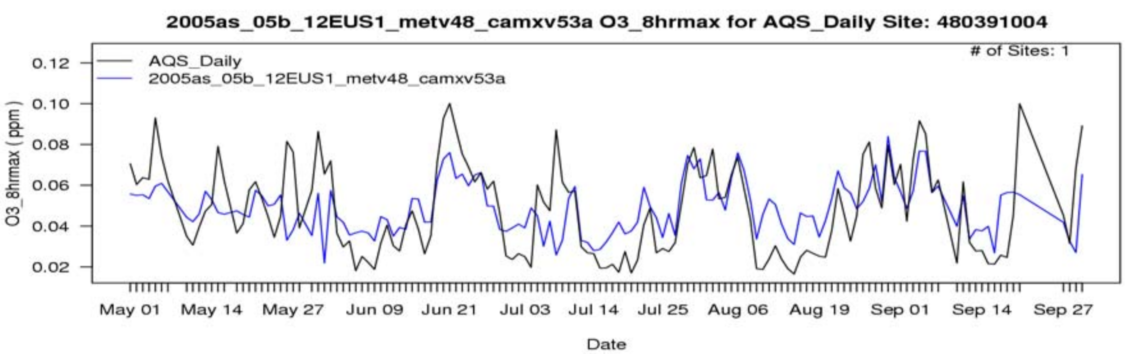

Figure A-7f. Time series of observed (black) and predicted (blue) 8-hour daily maximum ozone for the period May through September 2005 at site 480391004 in Brazoria County, TX.

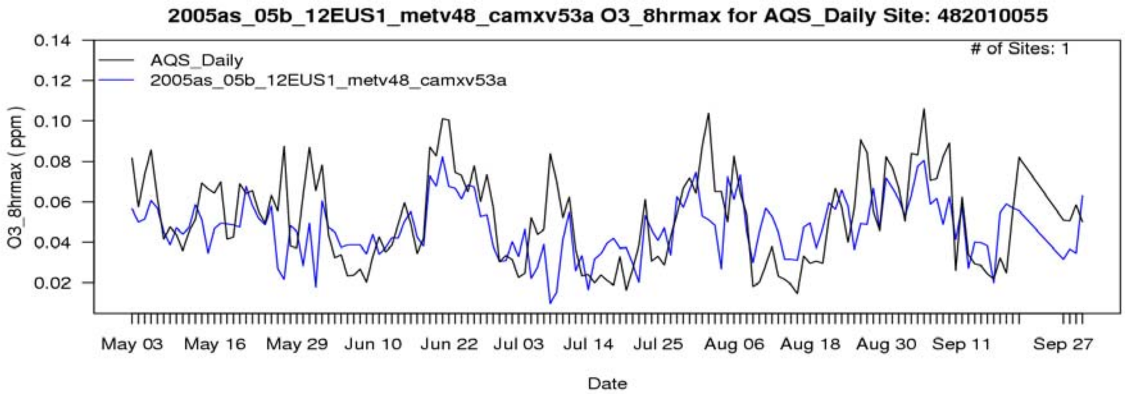

Figure A-7g. Time series of observed (black) and predicted (blue) 8-hour daily maximum ozone for the period May through September 2005 at site 482010055 in Harris County, TX.

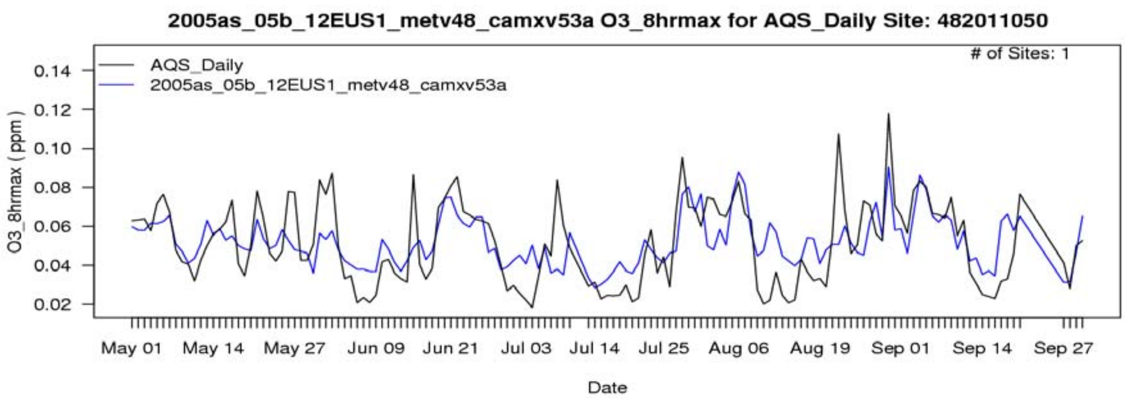

Figure A-7h. Time series of observed (black) and predicted (blue) 8-hour daily maximum ozone for the period May through September 2005 at site 482011050 in Harris County, TX.

A.3. Evaluation of $PM_{2.5}$ Component Species

The evaluation of 2005 model predictions for PM2.5 covers the performance for the individual PM2.5 component species (i.e., sulfate, nitrate, organic carbon, elemental carbon, and crustal material). Performance results are provided for each species with a focus on sulfate and nitrate, which are the key PM2.5 species for the Transport Rule. As indicated above, for each species we present tabular summaries of bias and error statistics by subregion for each season. These statistics are based on the set of observed-predicted pairs of data for the particular quarter at monitoring sites within the subregion. Separate statistics are provided for each monitoring network, as applicable for the particular species measured. For sulfate and nitrate we also provide a more refined temporal and spatial analysis of model performance that includes (1) graphics of the distribution of 24-hour average concentrations and predictions by month for each subregion, (2) spatial maps which show the normalized mean bias and error by site, aggregated by quarter, and (3) time series plots of observed and predicted concentrations for CSN sites in counties with predicted Transport Rule 2012 base case nonattainment and/or maintenance for the annual and/or 24-hour PM2.5 NAAQS[21,22]. The 2012 base case nonattainment or maintenance counties and the CSN sites in these counties used for the time series analysis are listed in Table A-4.

Table A-4. CSN sites used for the sulfate and nitrate time series analysis.

County	State	CSN Sites Used for Time Series Analysis
Jefferson	Alabama	10730023 10732003
Fulton	Georgia	No CSN data for in AMET for this county; used CSN site 130890002 in DeKalb County which is adjacent to Fulton County
Cook	Illinois	170310057 170310076 170314201
Madison	Illinois	171192009
Lake	Indiana	180890022 180892004
Marion	Indiana	180970078
St Clair	Michigan	No CSN data in AMET for this county nor in adjacent counties in Michigan
Washtenaw	Michigan	261610008
Wayne	Michigan	261630001 261630033
Butler	Ohio	390171004

[21] The procedures for identifying projected nonattainment and maintenance sites are described in section IV of the main body of this document.
[22] We have included time series for all CSN sites (with data available in AMET for 2005) in the projected nonattainment/maintenance counties because some of the nonattainment/maintenance sites do not have co-located $PM_{2.5}$ speciation monitors.

County	State	CSN Sites Used for Time Series Analysis
Cuyahoga	Ohio	390350038 390350060
Hamilton	Ohio	390610040
Jefferson	Ohio	390810017
Montgomery	Ohio	391130031
Allegheny	Pennsylvania	420030008 420030064
Beaver	Pennsylvania	No CSN data in AMET for this county; see results for CSN sites in Allegheny County which is adjacent to Beaver County
Lancaster	Pennsylvania	420710007
York	Pennsylvania	421330008
Brooke	West Virginia	No CSN data in AMET for this county nor in adjacent counties in West Virginia
Milwaukee	Wisconsin	550790026

A.3.1. Evaluation for Sulfate

The model performance bias and error statistics for sulfate for each subregion and each season are provided in Table A-5. The distributions of observed and predicted suflate by month for each subregion are shown in Figures A-8 through A-11. Spatial plots of the normalized mean bias and error by season for individual monitors are shown in Figures A-12 through A-15. Time series plots of observed and predicted 24-hour average sulfate during the ozone season at CSN monitoring sites in counties identified as nonattainment or maintenance for the annual and/or 24-hour PM2.5 NAAQS are provided in Figure A-16a-x[23].

The results of this analysis indicate that sulfate predictions from our modeling platform correspond closest to observations during the late spring and summer when observed sulfate concentrations are highest. During the fall and winter, when sulfate is generally low, the modeling platform tends to over predict observed concentrations. The bias and error statistics in Table A-5 indicate that model performance for sulfate is best during the spring and summer seasons at both urban and rural sites in the Midwest, Southeast, and Central subregions. In these subregions NMB is generally $\pm$ 15 percent or less. In the Northeast subregion the bias is in this same range during the summer, but there is a somewhat stronger signal of over prediction in the spring when NMB and FB are in the range of 30 to 50 percent. Average bias across the subregions during the spring and summer is less than 10 percent for both urban and rural locations.

In the fall and winter observed sulfate is over predicted, particularly in the Midwest and Southeast. During the cool seasons NMBs are generally in the range of 60 to 70% and FBs are

[23] There is one county, Fulton County, GA, that is projected to be nonattainment for the annual PM2.5 NAAQS in 2012 for which there is no site with 2005 $PM_{2.5}$ speciation data available in AMET. Instead, we provide time series plots based on speciation measurements at the CSN site in neighboring DeKalb County, GA.

generally 30 to 45 percent at urban and rural sites in these two subregions. The tendency for over prediction during the cool seasons is less evident in the Northeast and Central subregions where NMBs are generally less than 40 percent. On average across the subregions for both urban and rural locations, the over prediction bias nearly 60 percent.

The close relationship between observations and predictions during portions of the spring and summer is further revealed in Figures A8 through A-11 which show the distribution of observed 24-hour average (CSN and IMPROVE) and weekly average (CASTNet) sulfate concentrations and the corresponding model predictions by month for January through December 2005. These figures indicate that the distribution of predictions is most consistent with that of the observations for the months of June through September. Over prediction is evident during the months of Jan through April and October through December.

Model bias and error at individual sites for each season, as displayed in Figures A-12 through A-15, suggest spatial patterns in model performance that vary by season. In the winter (Figure A-12a) and fall (Figure A-15a) over prediction is fairly consistent at sites across the Eastern modeling domain. However, Figures 12 b and 15b indicate that there is no clear regional trend in error for these two seasons. During the spring (Figure A-13a) and summer (Figure A-14a) bias appears to be much less than in fall and winter at most sites. The few sites in extreme northern New England that have biases much greater than 20 percent have relatively low measured spring and summer average sulfate concentrations (e.g., 2 $\mu g/m^3$ or less). Normalized mean bias is only $\pm$ 20 percent across much of the southern two-thirds of the modeling domain during these seasons. In portions of the northern third of the modeling domain, NMBs at most sites are somewhat greater, but are still in the range of only 20 to 40 percent. Model error is also much less in spring and summer compared to fall and winter at most sites in the domain.

In addition to the above analysis of overall model performance, we also examine how well the modeling platform replicates the magnitude and short-term fluctuations in observed 24-hour average sulfate concentrations at CSN monitoring sites in counties with predicted nonattainment and/or maintenance problems for the annual and/or 24-hour PM2.5 NAAQS in the Transport Rule 2012 base case. The annual time series plots of observed and predicted 24-hour average concentrations for the 24 CSN sites in these counties are provided in Figures A-16a through x. These figures indicate that the modeling platform closely replicates the short-term variability, the general magnitude, and site-to-site differences in sulfate concentrations throughout much of the year in counties predicted by our modeling to have future nonattainment and/or maintenance problems for PM2.5. The modeling platform shows considerable skill at distinguishing between high and low days at each site. The over prediction during winter and fall, as seen in the performance statistics, is evident on some days at these sites. For example, the time series for site 26263001 in Wayne County, MI (Figure A-16a) shows that the observations at this site exhibit considerable short-term variability, particularly during the summer. As evident from this figure, the model predictions closely track these temporal fluctuations and the magnitude of the observations in each season. Notable over predictions are limited to a few days in January, April, and October. Time series for all of the sites examined indicates that the model consistently captures the correct timing of the observed peak episode days.

Table A-5. Sulfate performance statistics by subregion, by season for the 2005 CAMx model simulation.

Subregion	Network	Season	No. of Obs.	NMB (%)	NME (%)	FB (%)	FE (%)
CENRAP	CSN	Winter	862	57.7	67.3	40.6	49.7
		Spring	884	3.0	38.3	3.4	41.0
		Summer	758	-12.4	43.4	-20.7	55.5
		Fall	580	46.7	62.6	36.9	48.4
	IMPROVE	Winter	657	64.6	73.7	43.0	52.3
		Spring	722	5.7	38.3	13.6	41.1
		Summer	654	1.6	41.5	6.9	48.4
		Fall	607	43.5	56.6	39.8	49.7
	CASTNet	Winter	72	47.7	49.1	35.4	37.9
		Spring	76	-1.5	27.0	2.5	31.0
		Summer	72	-8.3	27.6	-8.1	38.5
		Fall	76	28.3	34.6	25.6	31.9
MWRPO	CSN	Winter	618	73.9	86.4	37.7	54.0
		Spring	633	15.5	39.1	28.6	40.0
		Summer	616	11.3	34.3	22.9	39.8
		Fall	628	51.8	59.6	39.1	45.9
	IMPROVE	Winter	164	63.7	71.0	31.7	45.2
		Spring	177	14.2	40.2	31.3	45.0
		Summer	153	1.1	33.2	18.4	42.5
		Fall	128	44.7	51.4	42.7	48.3
	CASTNet	Winter	140	38.3	41.9	28.3	33.9
		Spring	156	13.3	28.1	22.1	30.6
		Summer	162	1.6	23.2	6.9	23.9
		Fall	157	35.3	36.5	29.9	31.1
VISTAS	CSN	Winter	963	60.3	66.4	42.0	47.7
		Spring	969	10.1	30.6	9.1	30.6
		Summer	914	-4.0	31.5	-9.2	36.9
		Fall	977	57.2	61.5	40.1	45.4

Subregion	Network	Season	No. of Obs.	NMB (%)	NME (%)	FB (%)	FE (%)
	IMPROVE	Winter	493	70.5	74.5	47.8	52.3
		Spring	527	5.4	35.3	6.5	39.0
		Summer	502	-6.1	35.5	-16.7	45.0
		Fall	468	60.9	68.5	44.7	54.3
	CASTNet	Winter	270	42.8	45.6	33.7	37.1
		Spring	288	4.4	20.2	4.2	22.1
		Summer	263	-7.9	20.9	-14.4	27.5
		Fall	276	40.4	43.8	32.4	36.7
MANEVU	CSN	Winter	872	33.0	56.0	14.8	43.1
		Spring	881	30.9	46.4	34.9	44.5
		Summer	884	4.0	30.7	18.2	37.0
		Fall	861	44.0	52.2	35.6	43.7
	IMPROVE	Winter	596	46.7	61.4	21.4	44.6
		Spring	687	38.5	55.7	45.9	55.1
		Summer	626	11.7	39.5	31.0	46.9
		Fall	581	63.3	67.2	50.3	56.2
	CASTNet	Winter	195	24.3	33.3	16.7	30.7
		Spring	199	27.2	37.1	35.7	40.4
		Summer	197	5.9	23.4	15.7	26.6
		Fall	195	49.7	50.8	42.8	43.3

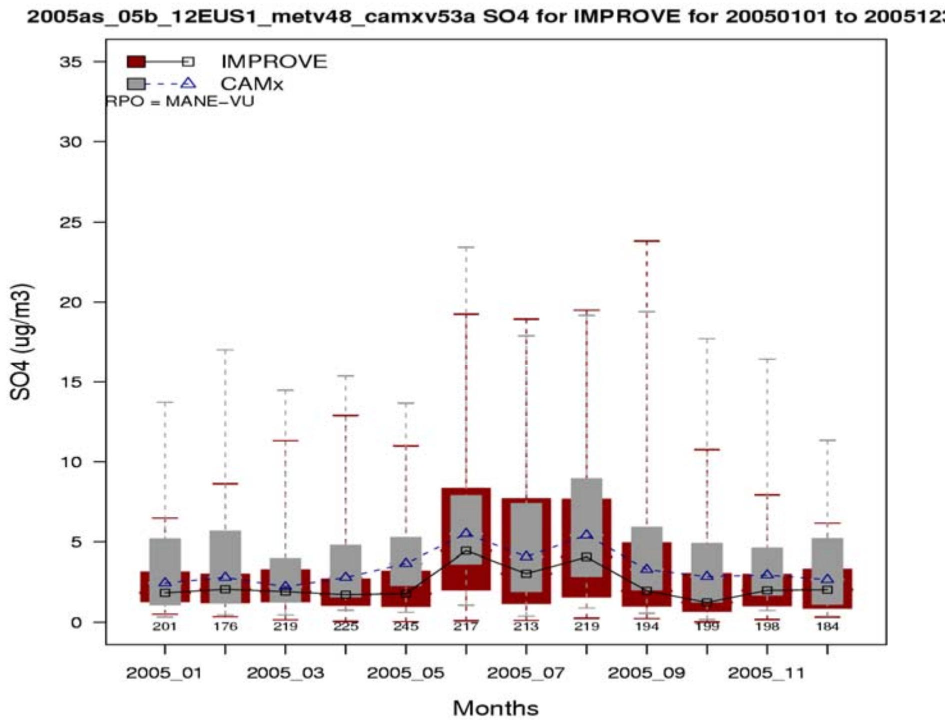

Figure A-8a. Distribution of observed and predicted 24-hour average sulfate by month for 2005 at IMPROVE sites in the Northeast subregion. [symbol = median; top/bottom of box = $75^{th}/25^{th}$ percentiles; top/bottom line = max/min values]

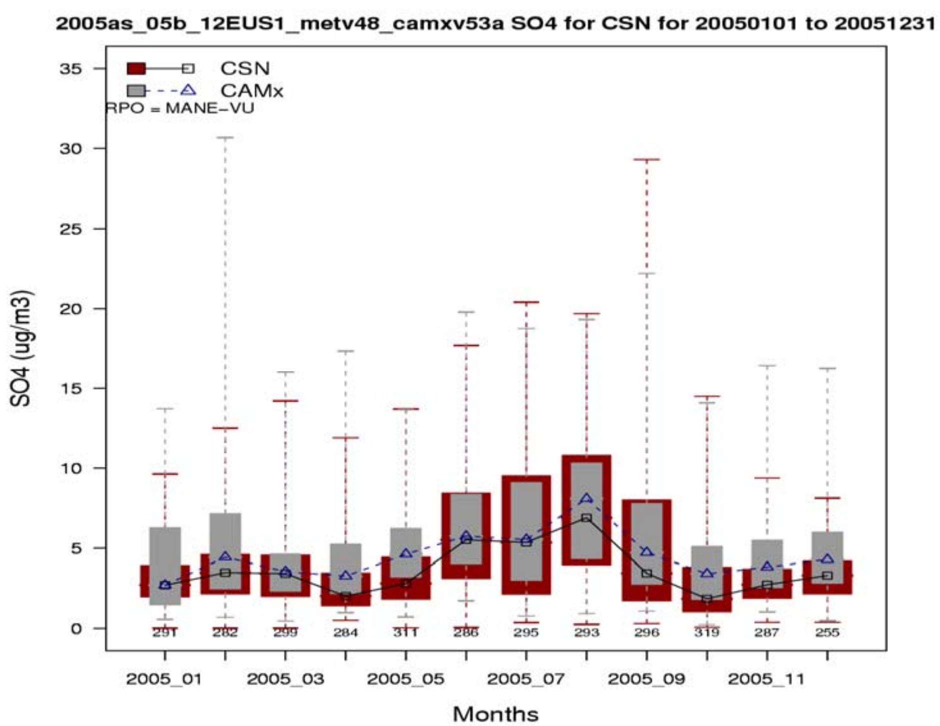

Figure A-8b. Distribution of observed and predicted 24-hour average sulfate by month for 2005 at CSN sites in the Northeast subregion.

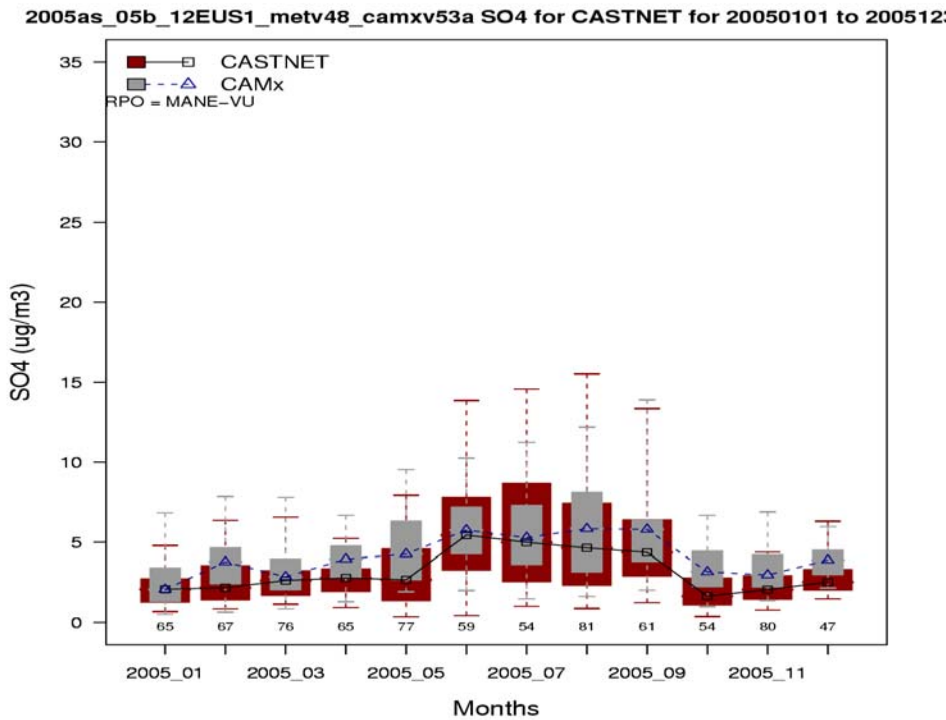

Figure A-8c. Distribution of observed and predicted weekly average sulfate by month for 2005 at CASTNet sites in the Northeast subregion.

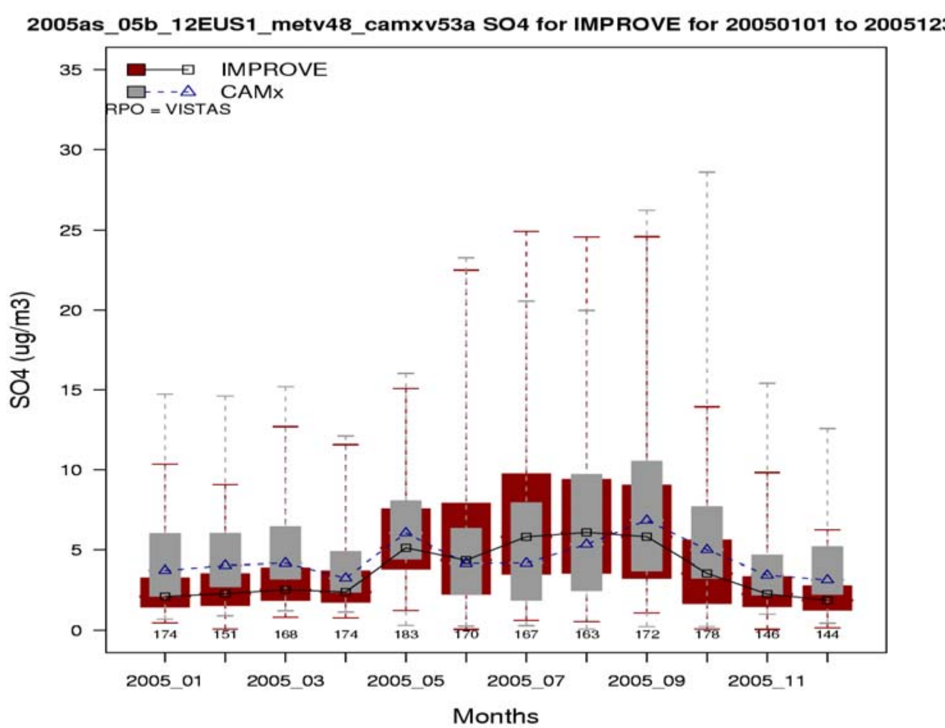

Figure A-9a. Distribution of observed and predicted 24-hour average sulfate by month for 2005 at IMPROVE sites in the Southeast subregion.

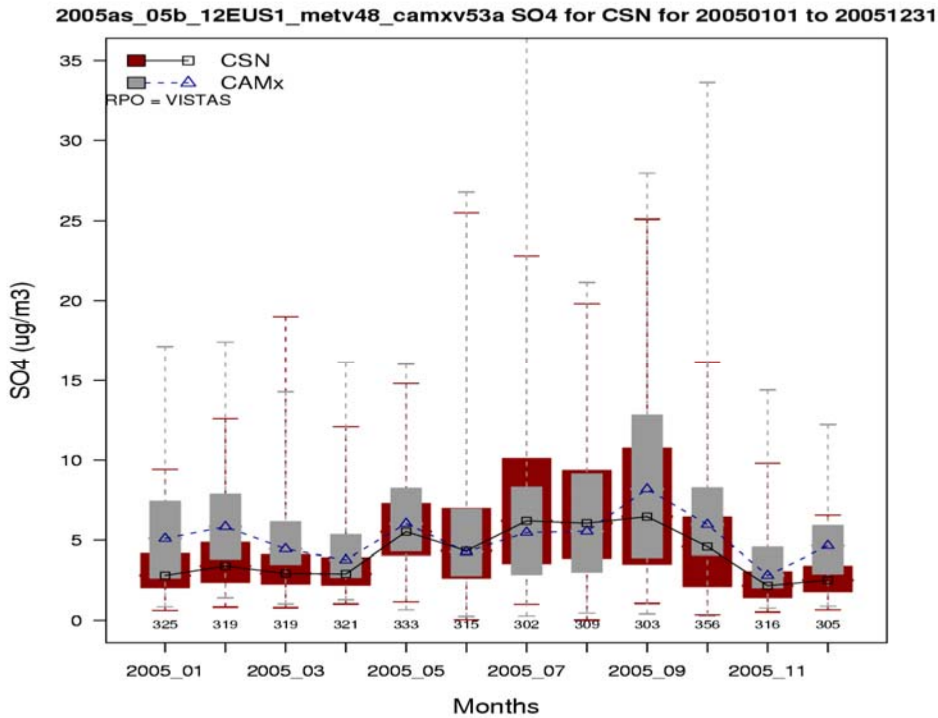

Figure A-9b. Distribution of observed and predicted 24-hour average sulfate by month for 2005 at CSN sites in the Southeast subregion.

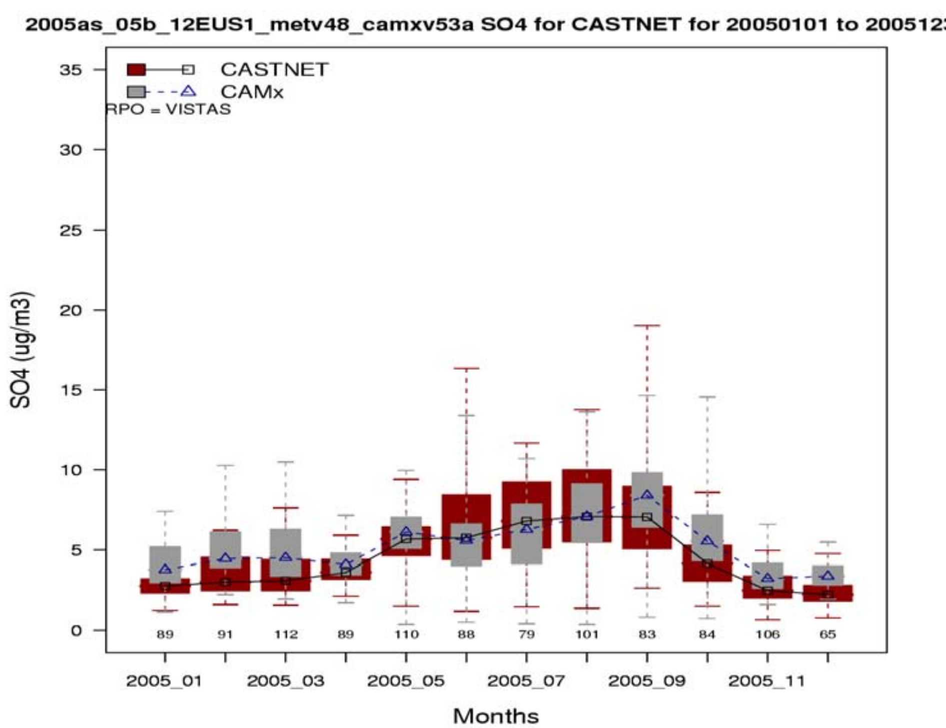

Figure A-9c. Distribution of observed and predicted weekly average sulfate by month for 2005 at CASTNet sites in the Southeast subregion.

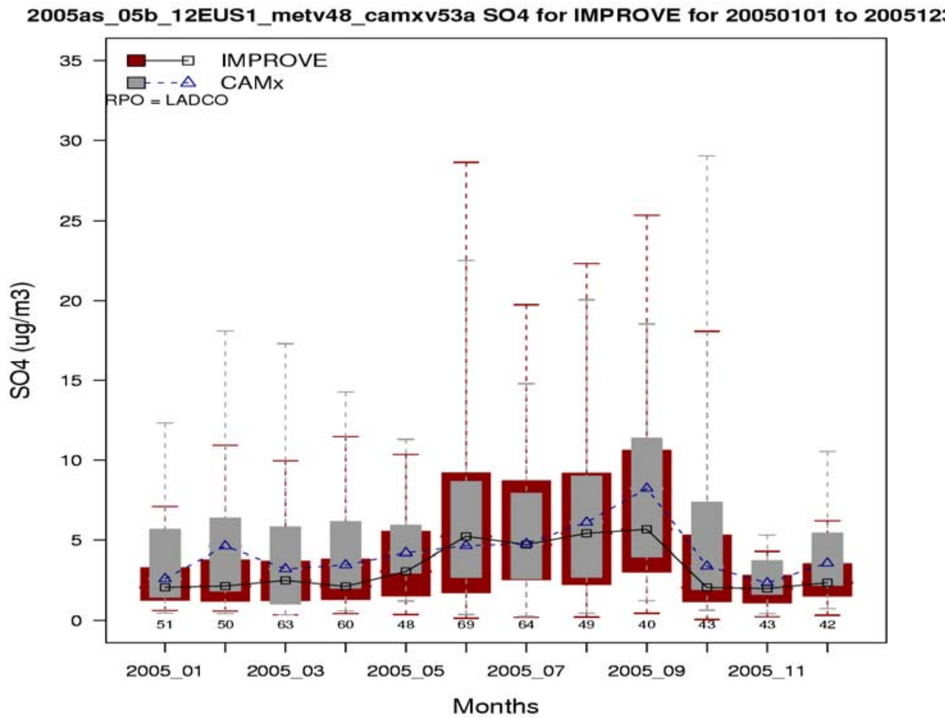

Figure A-10a. Distribution of observed and predicted 24-hour average sulfate by month for 2005 at IMPROVE sites in the Midwest subregion.

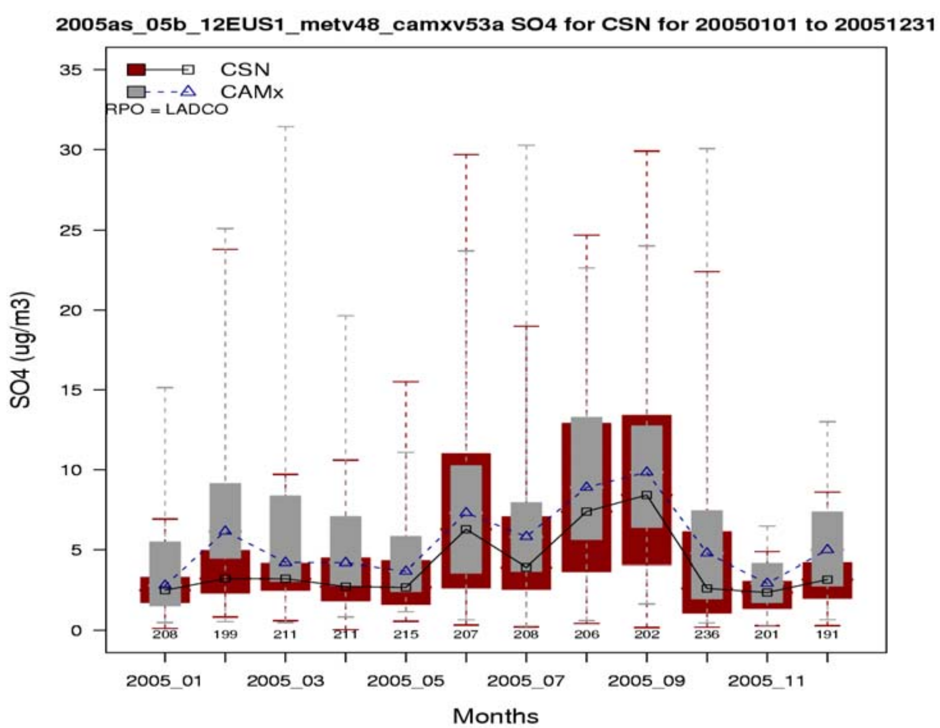

Figure A-10b. Distribution of observed and predicted 24-hour average sulfate by month for 2005 at CSN sites in the Midwest subregion.

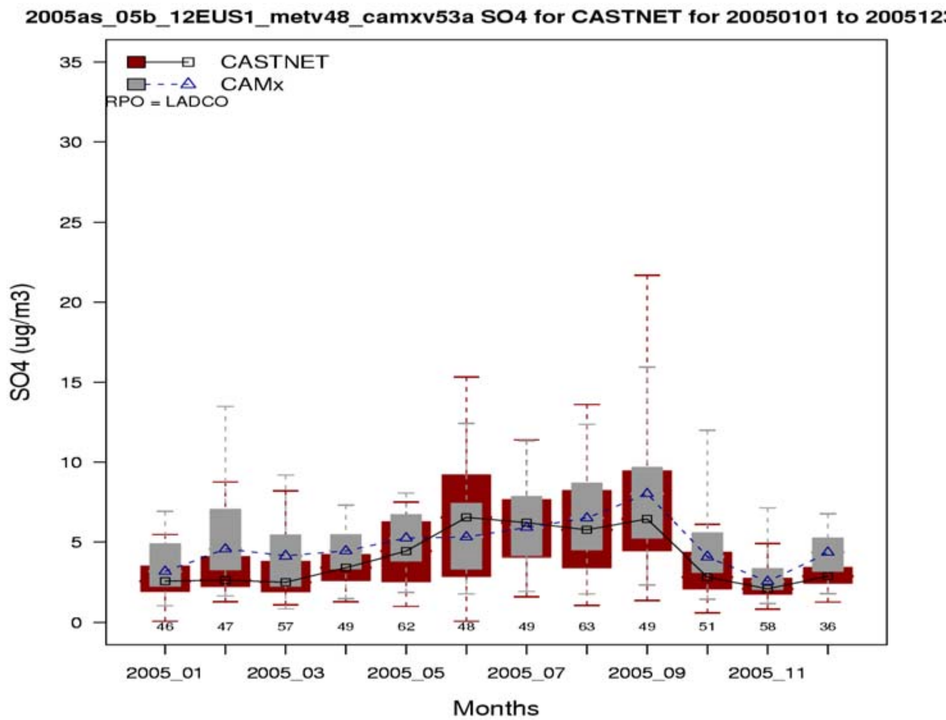

Figure A-10c. Distribution of observed and predicted weekly average sulfate by month for 2005 at CASTNet sites in the Midwest subregion.

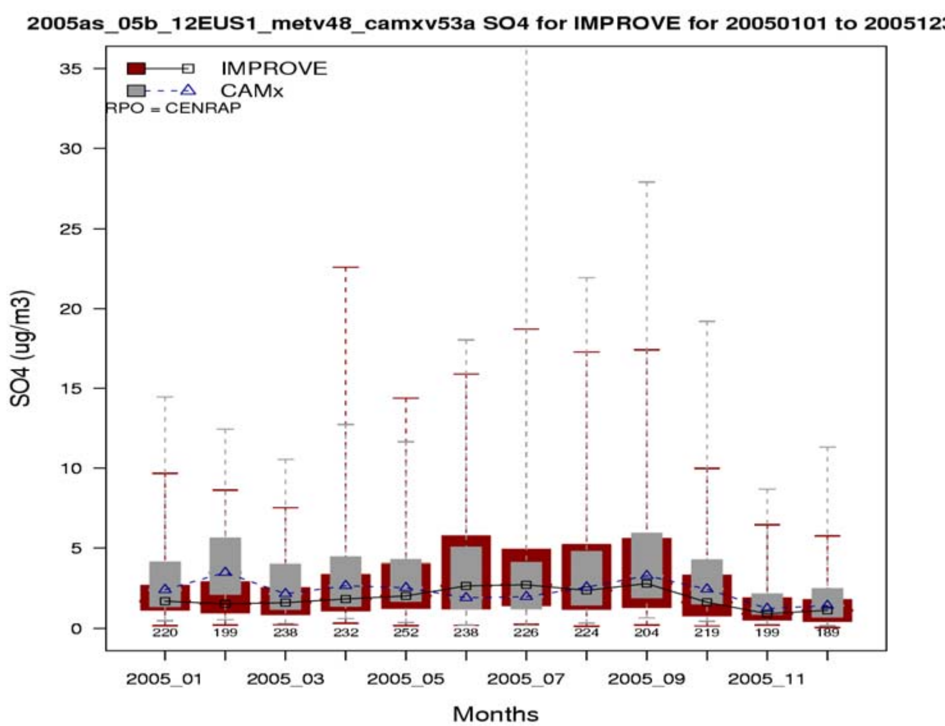

Figure A-11a. Distribution of observed and predicted 24-hour average sulfate by month for 2005 at IMPROVE sites in the Central states subregion.

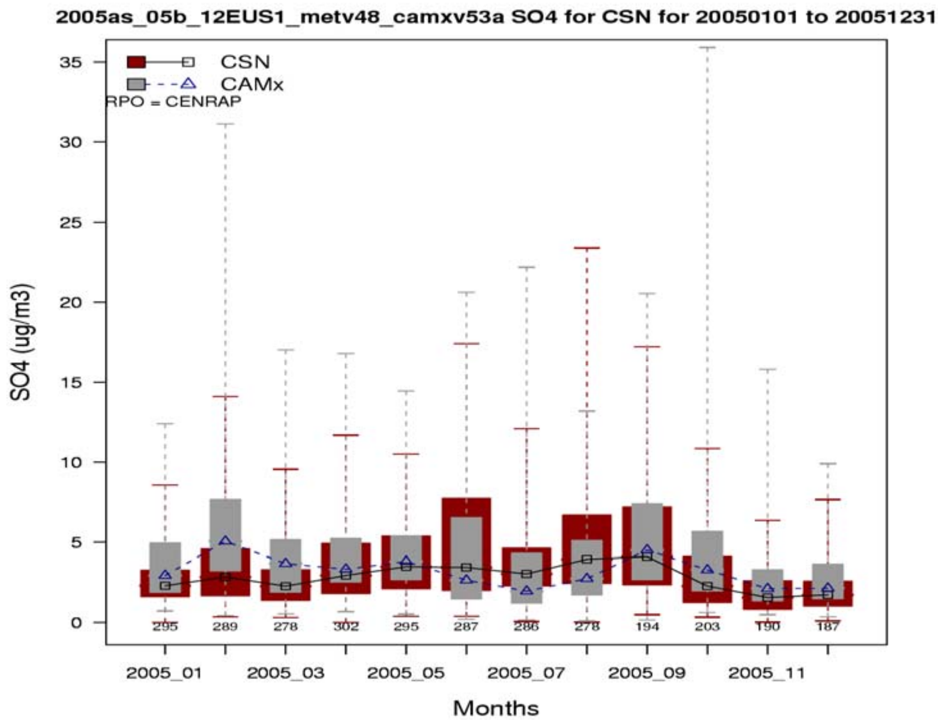

Figure A-11b. Distribution of observed and predicted 24-hour average sulfate by month for 2005 at CSN sites in the Central states subregion.

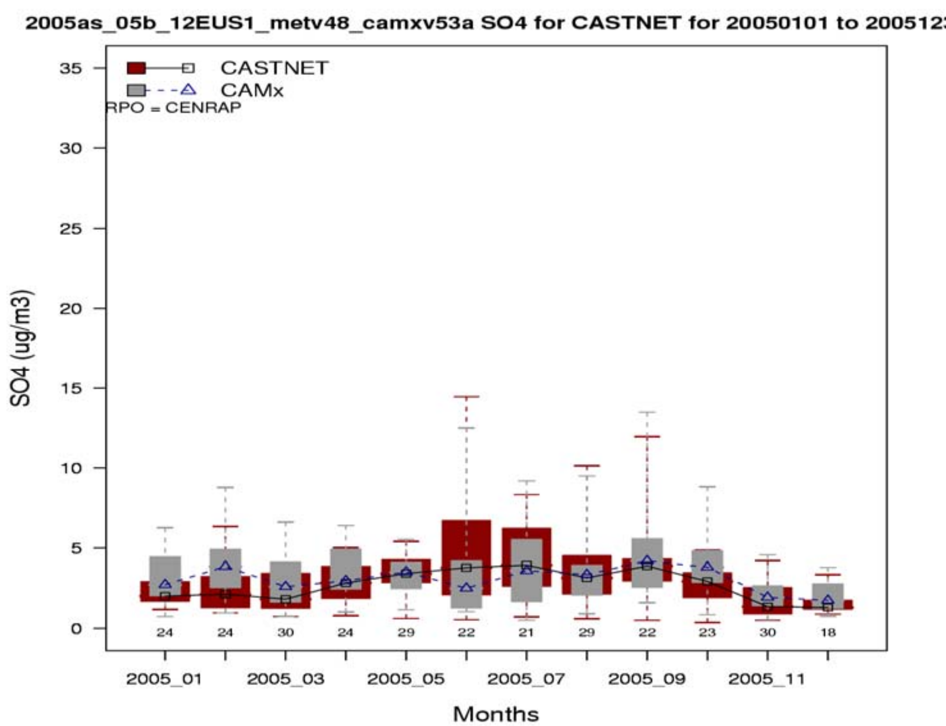

Figure A-11c. Distribution of observed and predicted weekly average sulfate by month for 2005 at CASTNet sites in the Central states subregion.

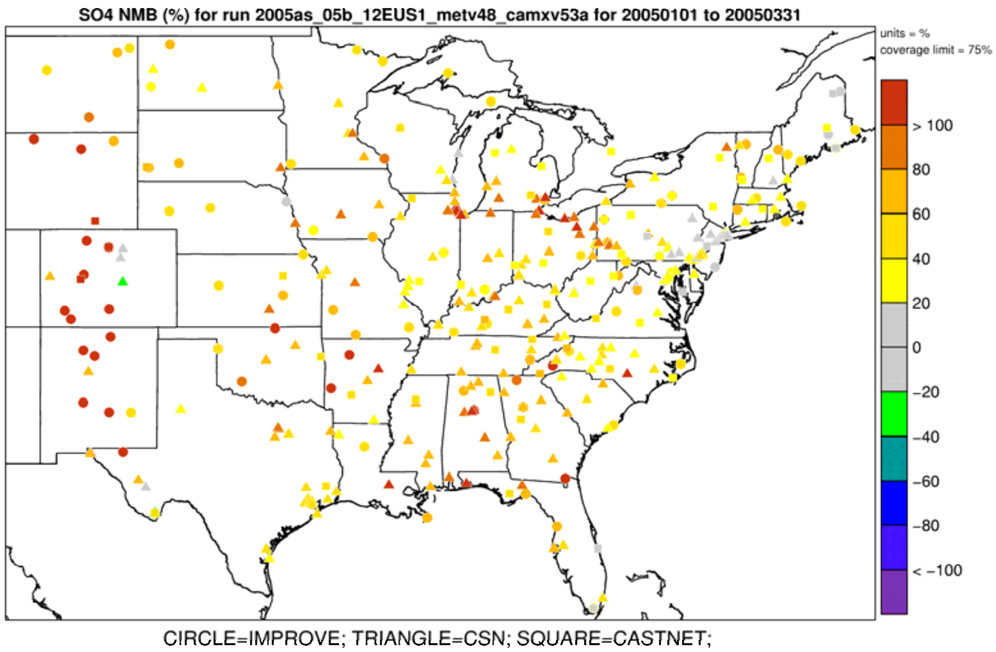

Figure A-12a. Normalized Mean Bias (%) of sulfate during January through March 2005 at monitoring sites in Eastern modeling domain.

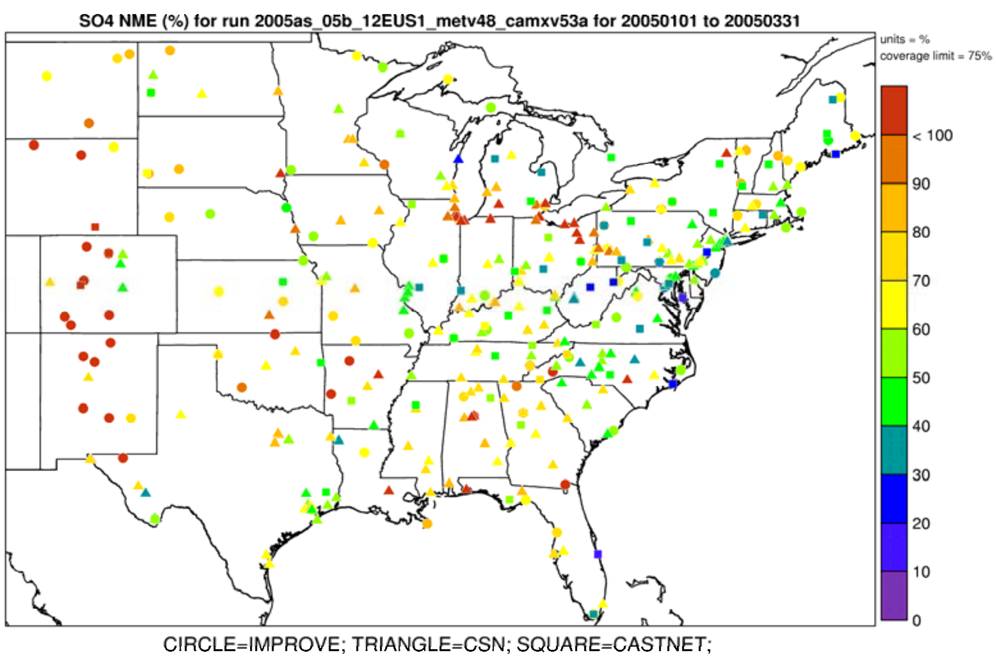

Figure A-12b. Normalized Mean Error (%) of sulfate during January through March 2005 at monitoring sites in Eastern modeling domain.

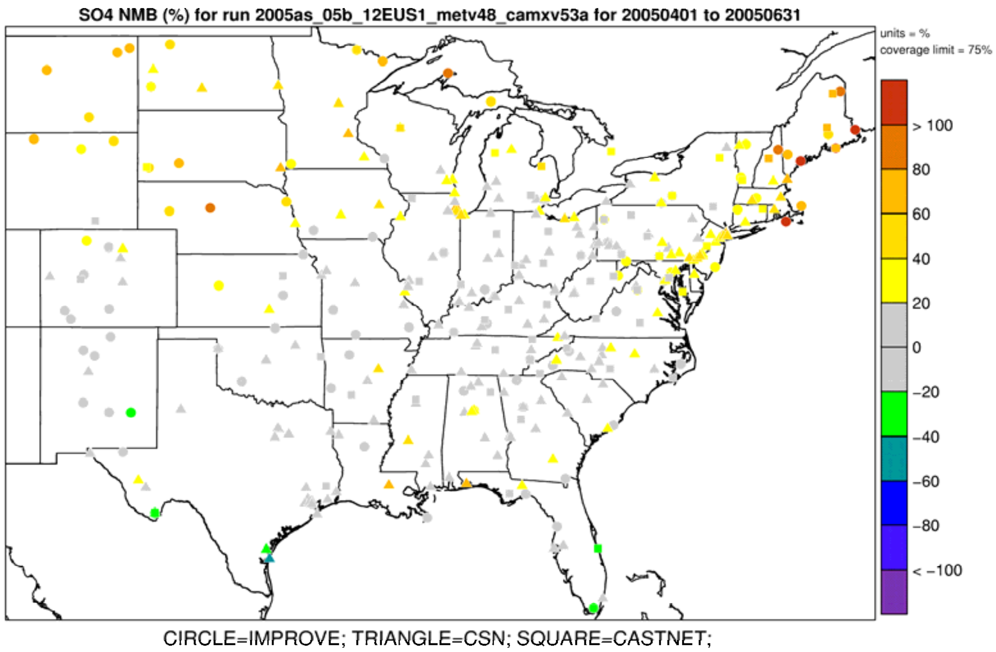

Figure A-13a. Normalized Mean Bias (%) of sulfate during April through June 2005 at monitoring sites in Eastern modeling domain.

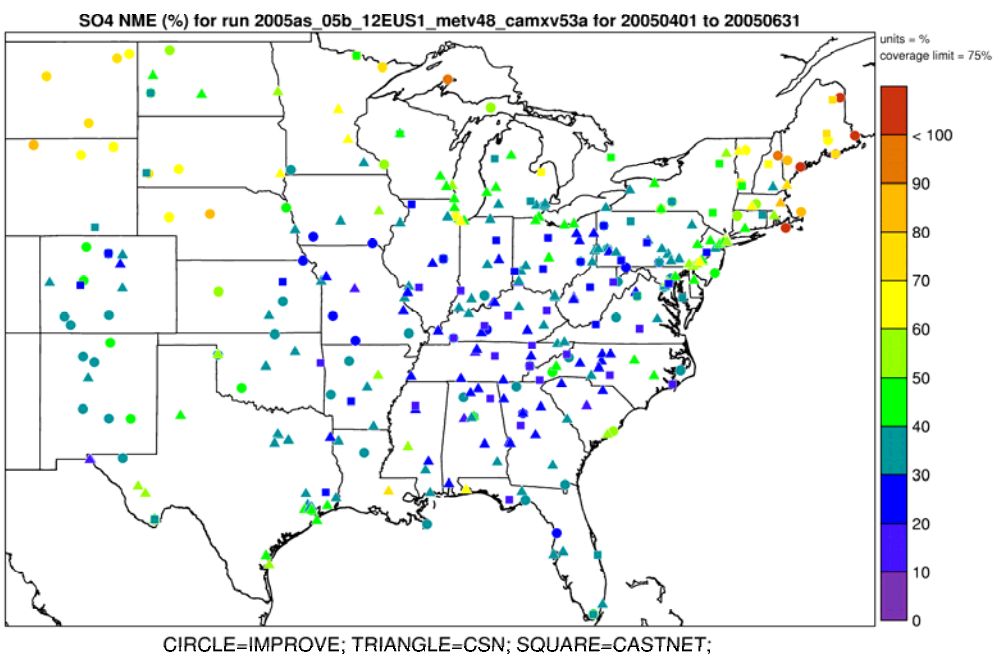

Figure A-13b. Normalized Mean Error (%) of sulfate during April through June 2005 at monitoring sites in Eastern modeling domain.

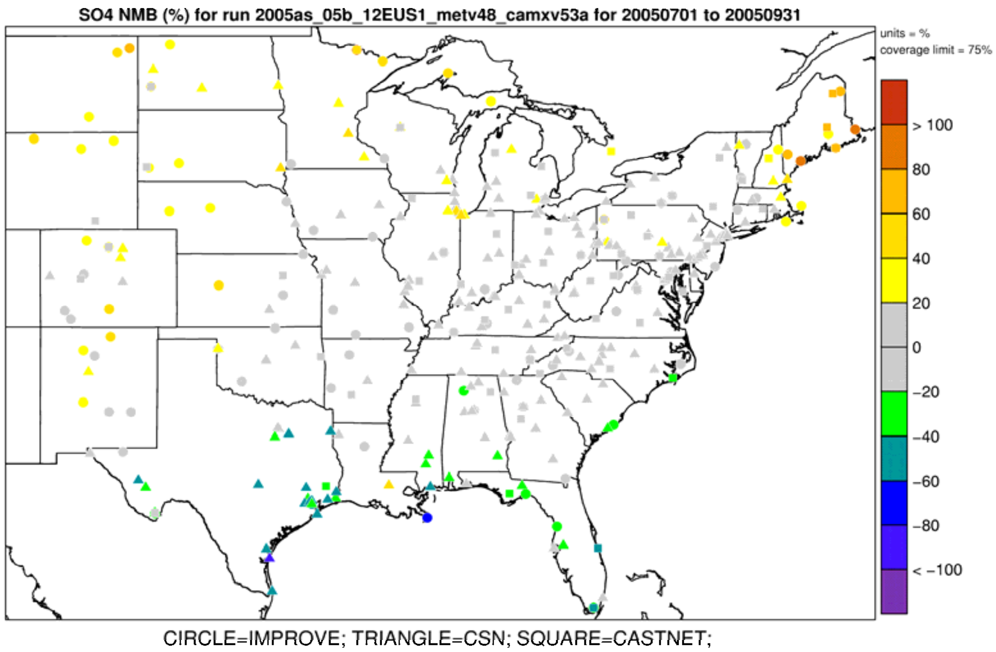

Figure A-14a. Normalized Mean Bias (%) of sulfate during July through September 2005 at monitoring sites in Eastern modeling domain.

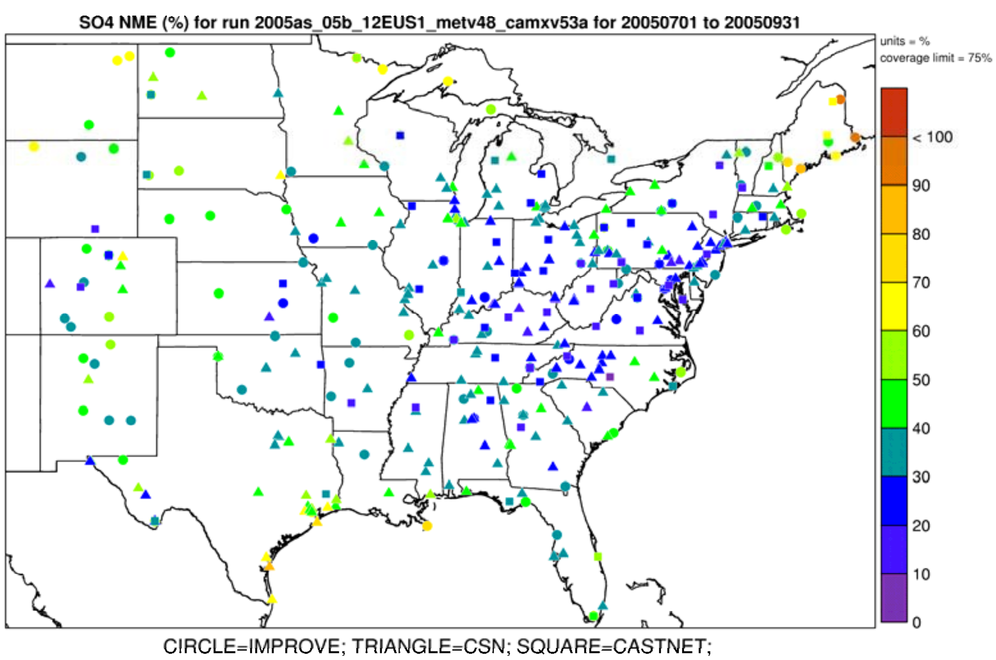

Figure A-14b. Normalized Mean Error (%) of sulfate during July through September 2005 at monitoring sites in Eastern modeling domain.

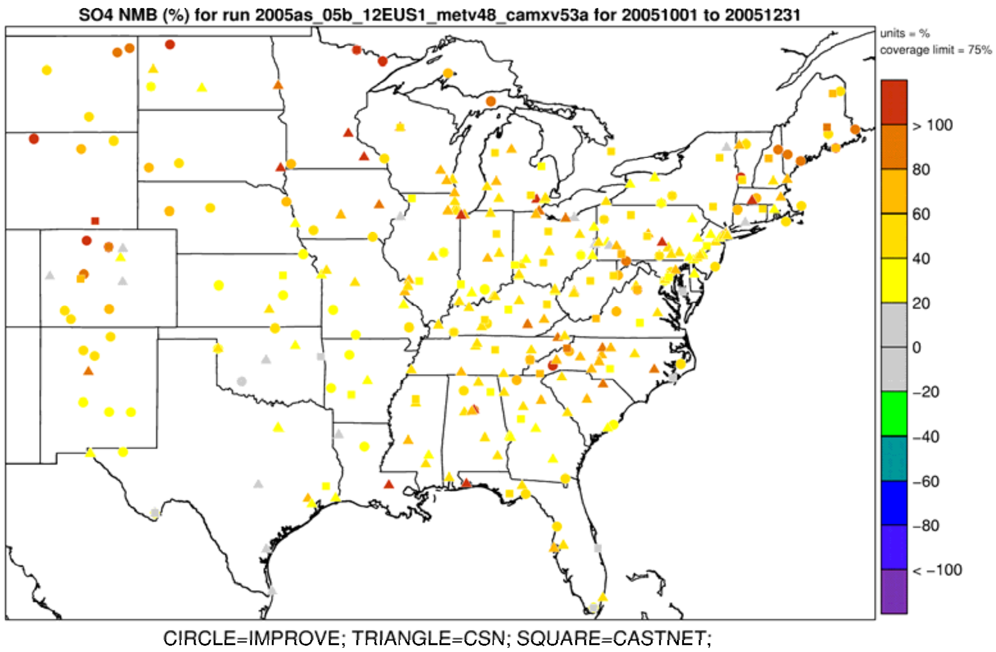

Figure A-15a. Normalized Mean Bias (%) of sulfate during October through December 2005 at monitoring sites in Eastern modeling domain.

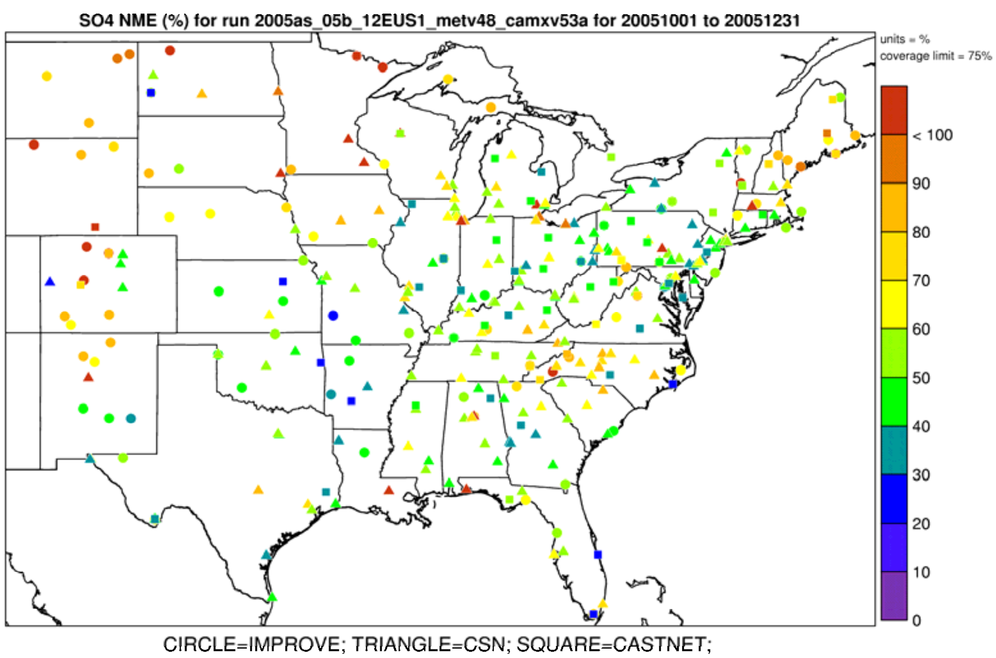

Figure A-15b. Normalized Mean Error (%) of sulfate during October through December 2005 at monitoring sites in Eastern modeling domain.

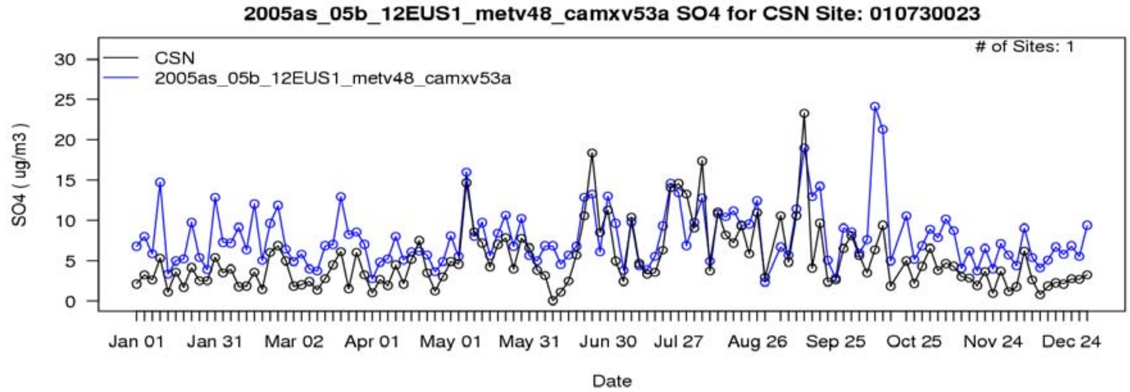

Figure A-16a. Time series of observed (black) and predicted (blue) 24-hour average sulfate for 2005 at site 010730023 in Jefferson County, AL.

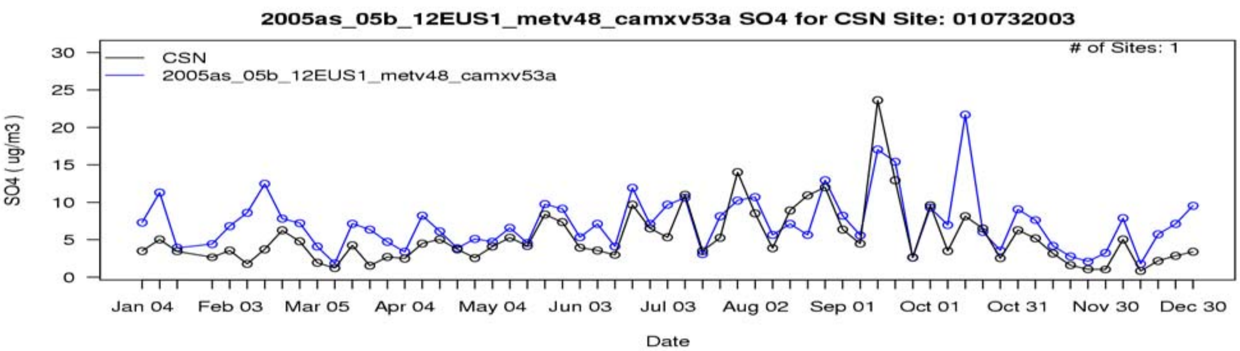

Figure A-16b. Time series of observed (black) and predicted (blue) 24-hour average sulfate for 2005 at site 010732003 in Jefferson County, AL.

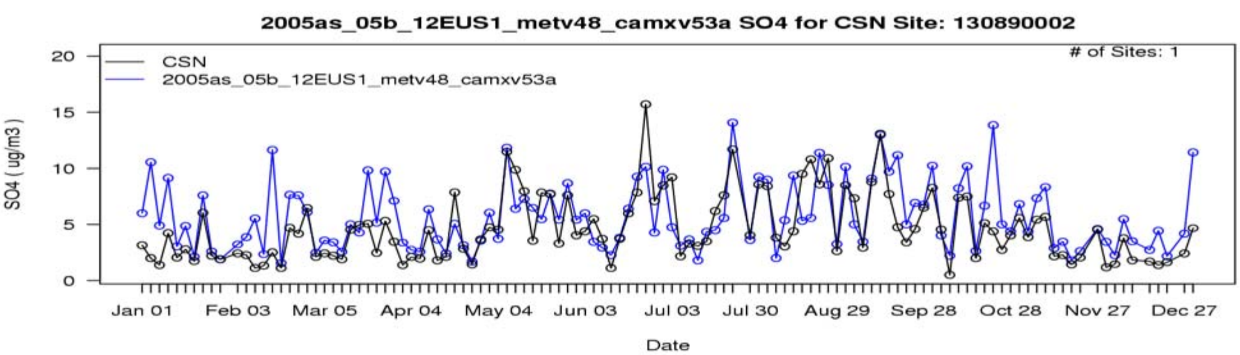

Figure A-16c. Time series of observed (black) and predicted (blue) 24-hour average sulfate for 2005 at site 130890002 in DeKalb County, GA (this site in DeKalb County is used since there were no CSN data available for Fulton County).

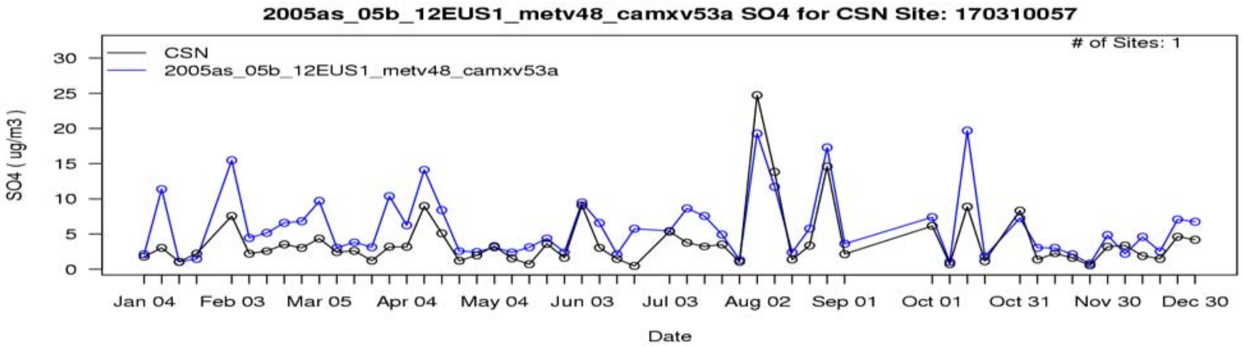

Figure A-16d. Time series of observed (black) and predicted (blue) 24-hour average sulfate for 2005 at site 170310057 in Cook County, IL.

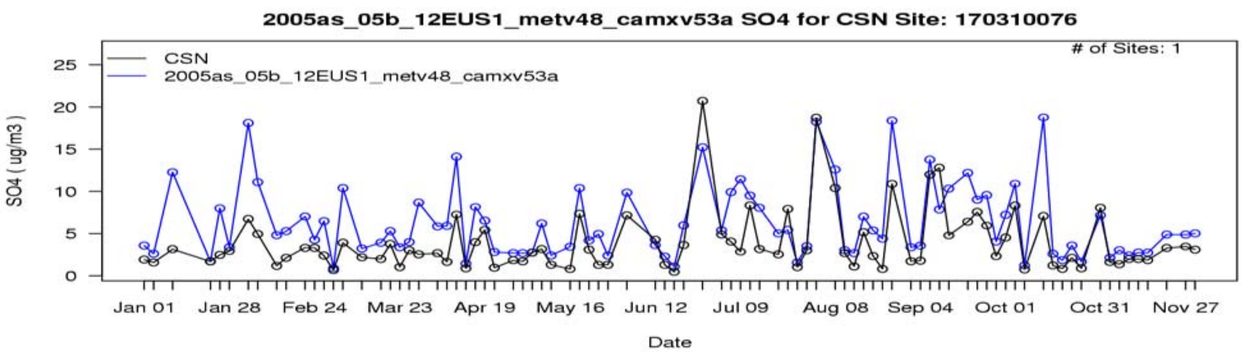

Figure A-16e. Time series of observed (black) and predicted (blue) 24-hour average sulfate for 2005 at site 170310076 in Cook County, IL.

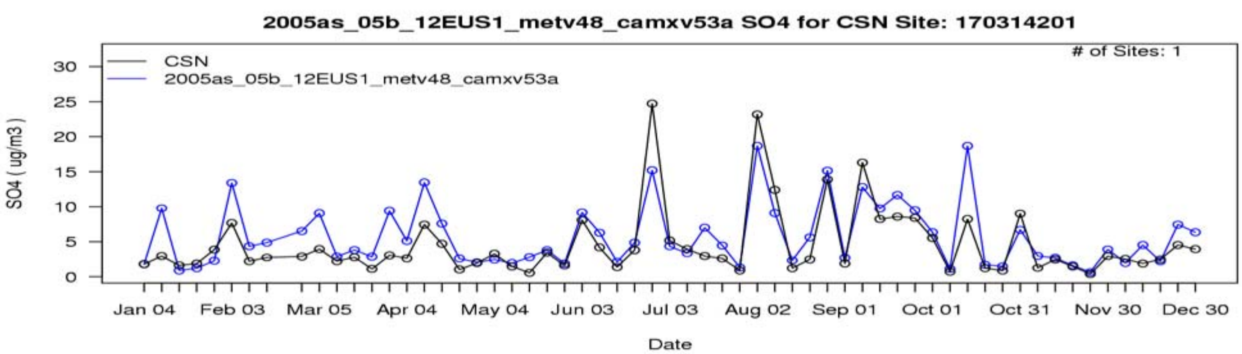

Figure A-16f. Time series of observed (black) and predicted (blue) 24-hour average sulfate for 2005 at site 170314201 in Cook County, IL.

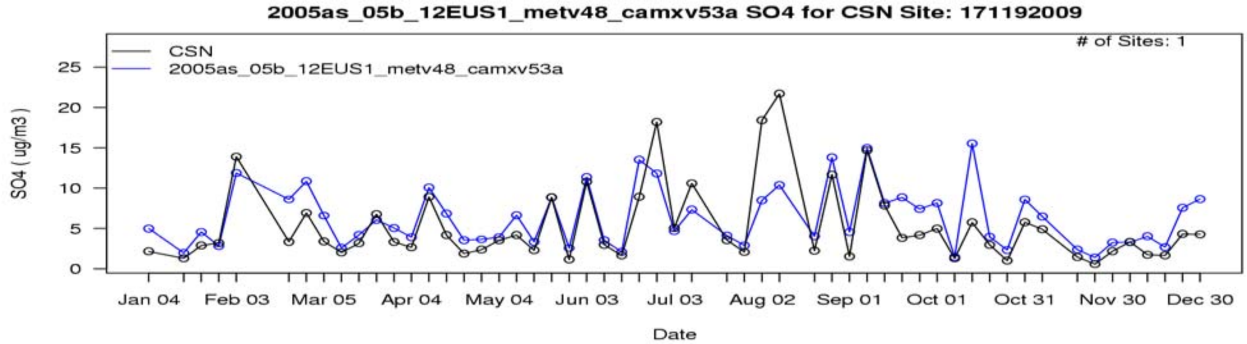

Figure A-16g. Time series of observed (black) and predicted (blue) 24-hour average sulfate for 2005 at site 1711192009 in Madison County, IL.

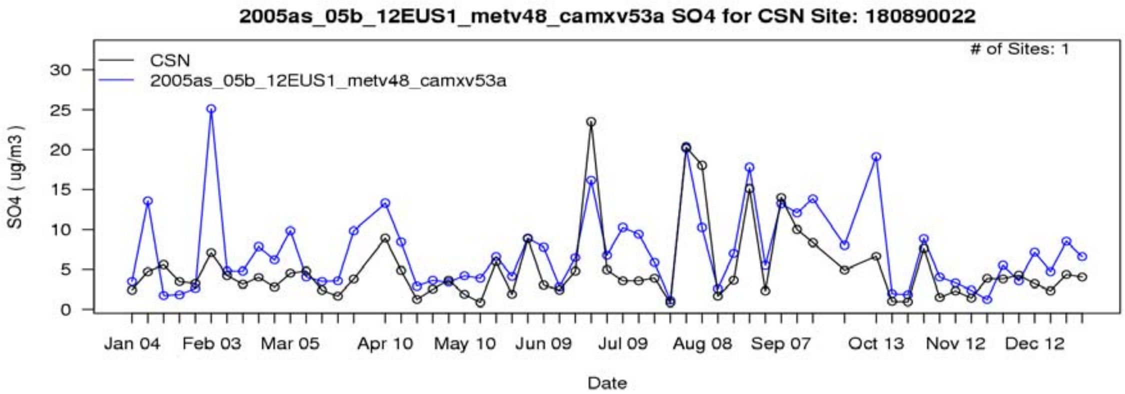

Figure A-16h. Time series of observed (black) and predicted (blue) 24-hour average sulfate for 2005 at site 180890022 in Lake County, IN.

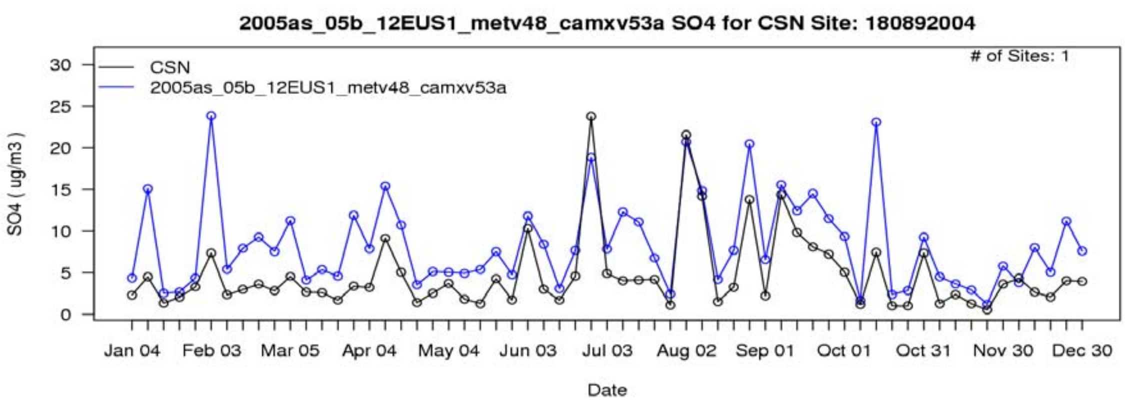

Figure A-16i. Time series of observed (black) and predicted (blue) 24-hour average sulfate for 2005 at site 180892004 in Lake County, IN.

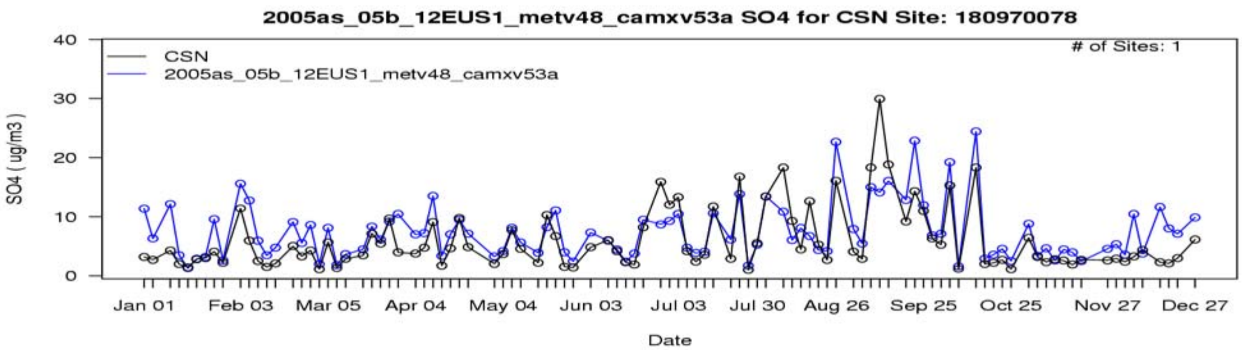

Figure A-16j. Time series of observed (black) and predicted (blue) 24-hour average sulfate for 2005 at site 180970078 in Marion County, IN.

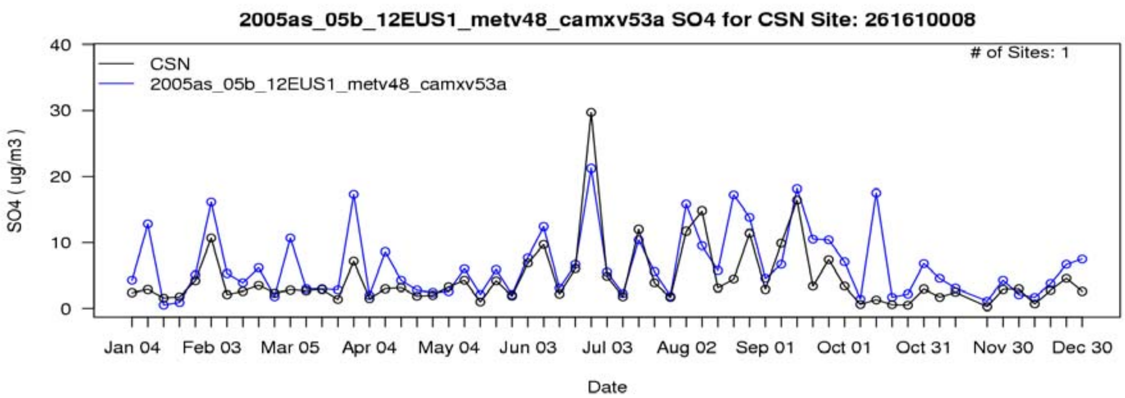

Figure A-16k. Time series of observed (black) and predicted (blue) 24-hour average sulfate for 2005 at site 261610008 in Washtenaw County, MI.

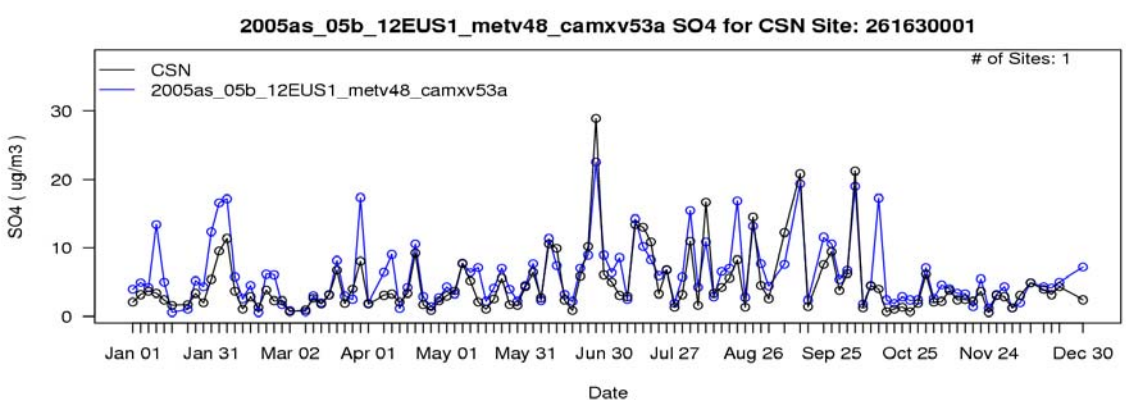

Figure A-16l. Time series of observed (black) and predicted (blue) 24-hour average sulfate for 2005 at site 261630001 in Wayne County, MI.

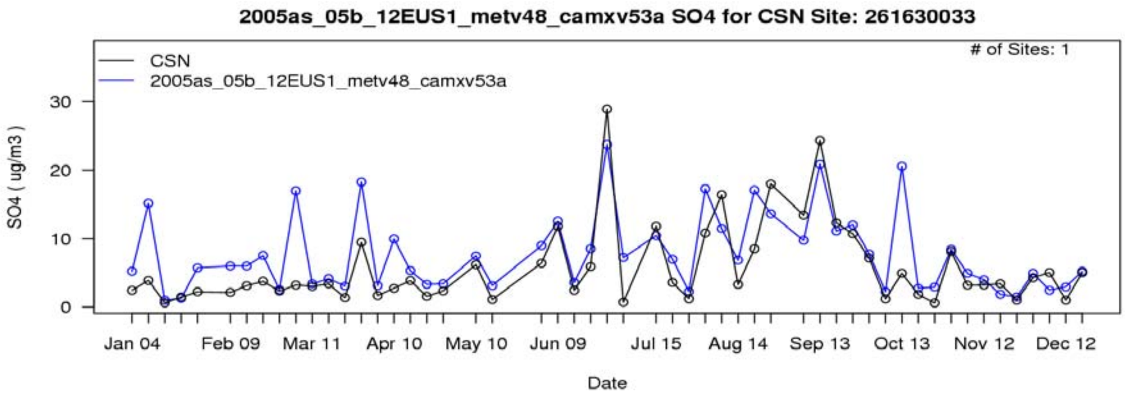

Figure A-16m. Time series of observed (black) and predicted (blue) 24-hour average sulfate for 2005 at site 261630033 in Wayne County, MI.

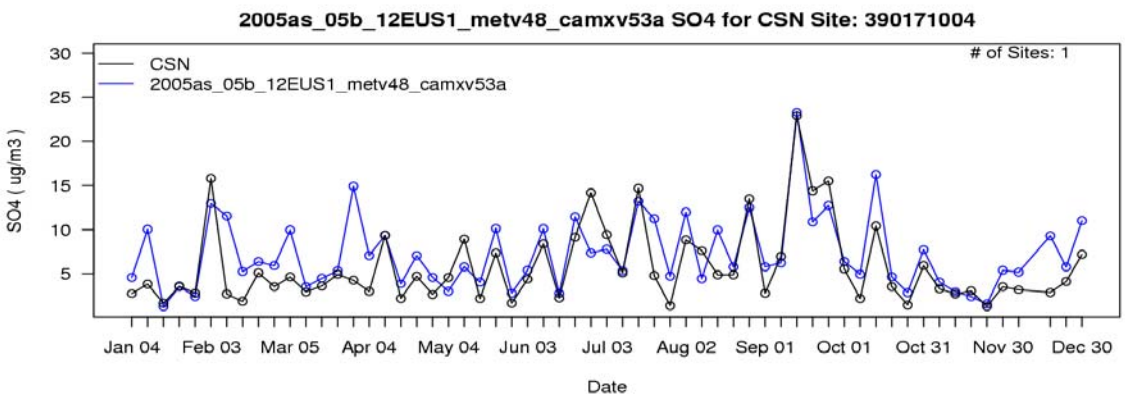

Figure A-16n. Time series of observed (black) and predicted (blue) 24-hour average sulfate for 2005 at site 390171004 in Butler County, OH.

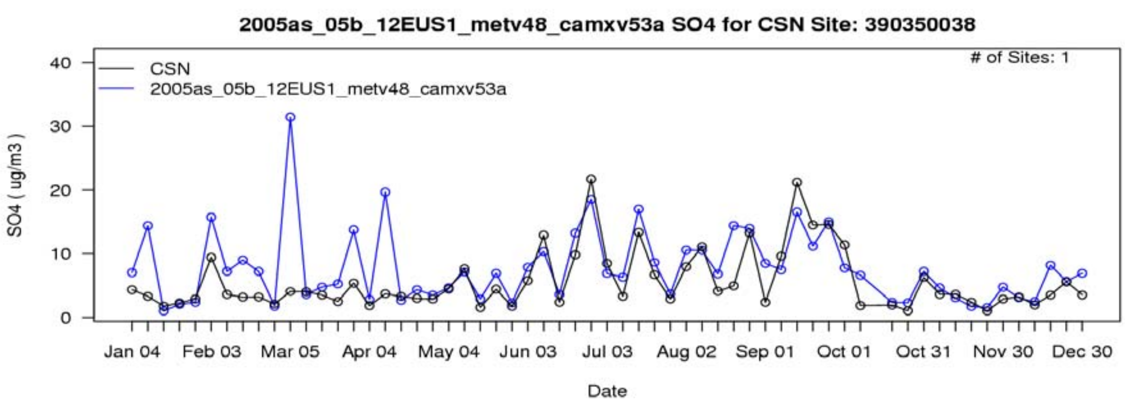

Figure A-16o. Time series of observed (black) and predicted (blue) 24-hour average sulfate for 2005 at site 390350038 in Cuyahoga County, OH.

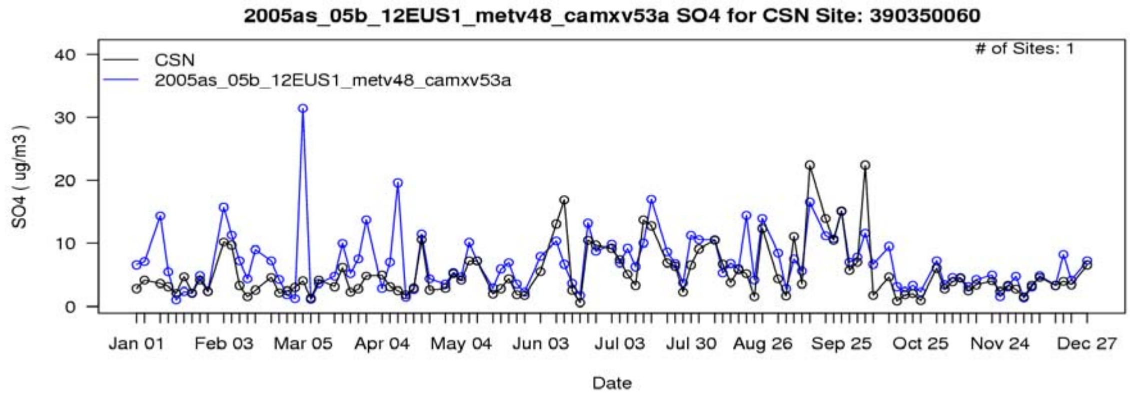

Figure A-16p. Time series of observed (black) and predicted (blue) 24-hour average sulfate for 2005 at site 390350060 in Cuyahoga County, OH.

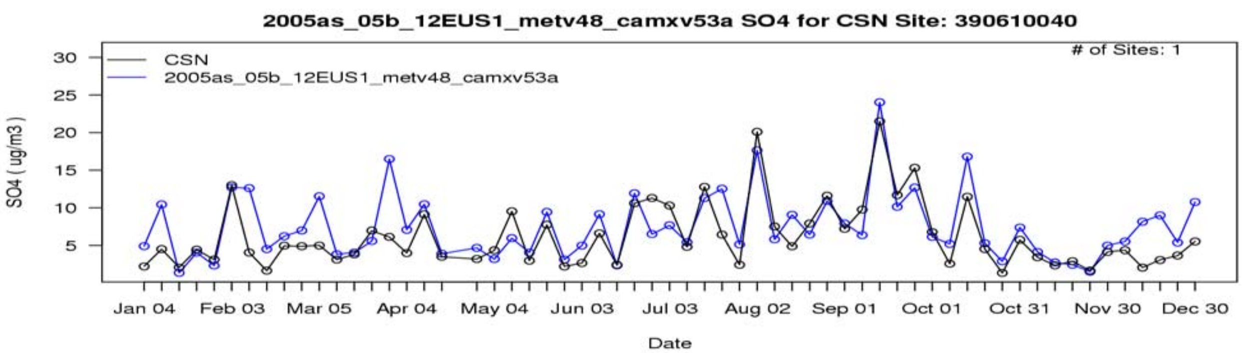

Figure A-16q. Time series of observed (black) and predicted (blue) 24-hour average sulfate for 2005 at site 390610040 in Hamilton County, OH.

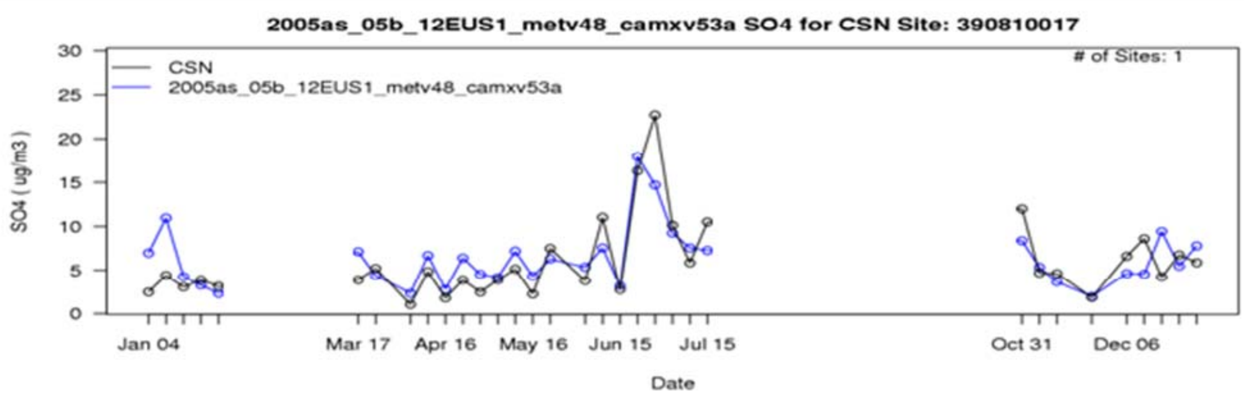

Figure A-16r. Time series of observed (black) and predicted (blue) 24-hour average sulfate for 2005 at site 390810017 in Jefferson County, OH (blank sections indicate extended periods with missing data).

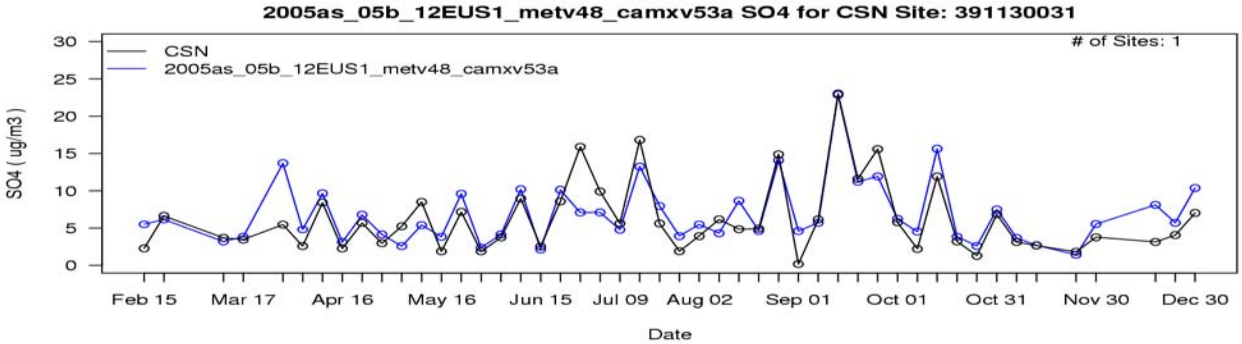

Figure A-16s. Time series of observed (black) and predicted (blue) 24-hour average sulfate for 2005 at site 391130031 in Montgomery County, OH.

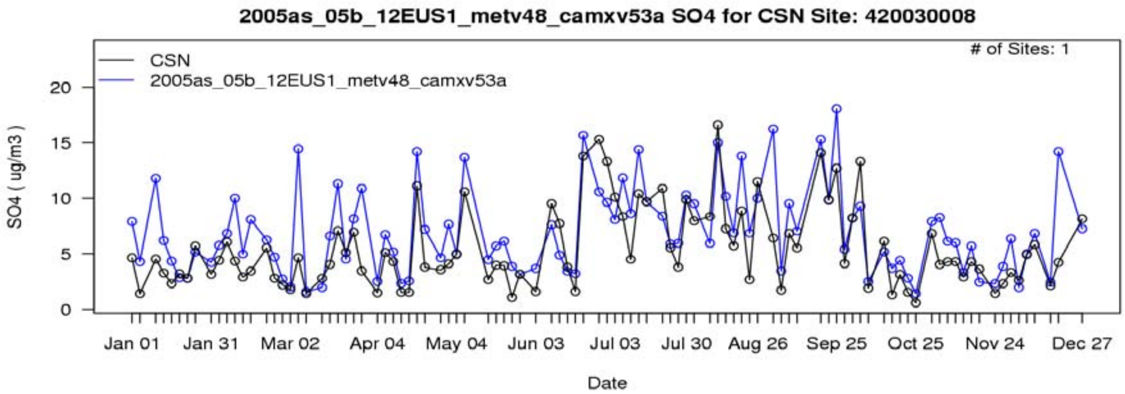

Figure A-16t. Time series of observed (black) and predicted (blue) 24-hour average sulfate for 2005 at site 420030008 in Allegheny County, PA.

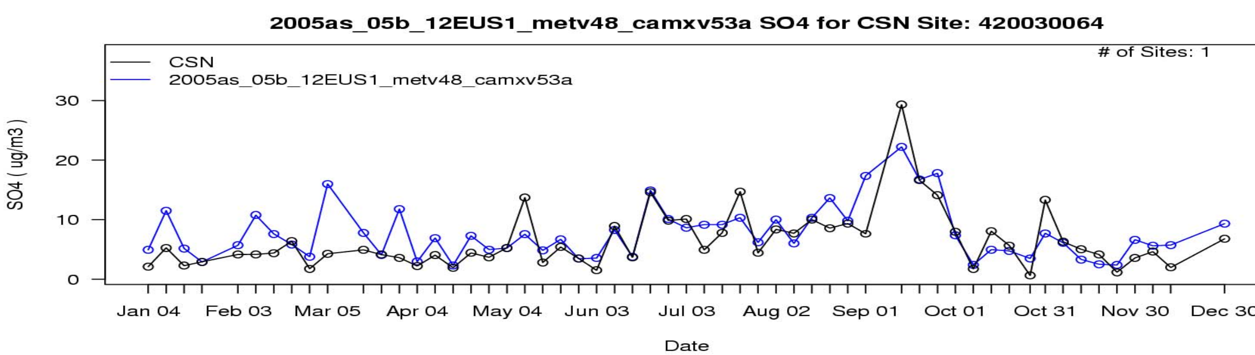

Figure A-16u. Time series of observed (black) and predicted (blue) 24-hour average sulfate for 2005 at site 420030064 in Allegheny County, PA.

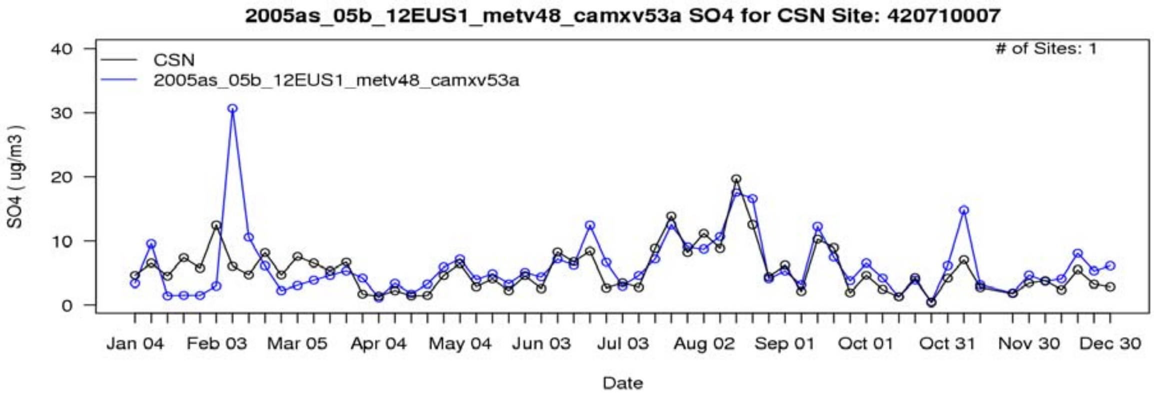

Figure A-16v. Time series of observed (black) and predicted (blue) 24-hour average sulfate for 2005 at site 420710007 in Lancaster County, PA.

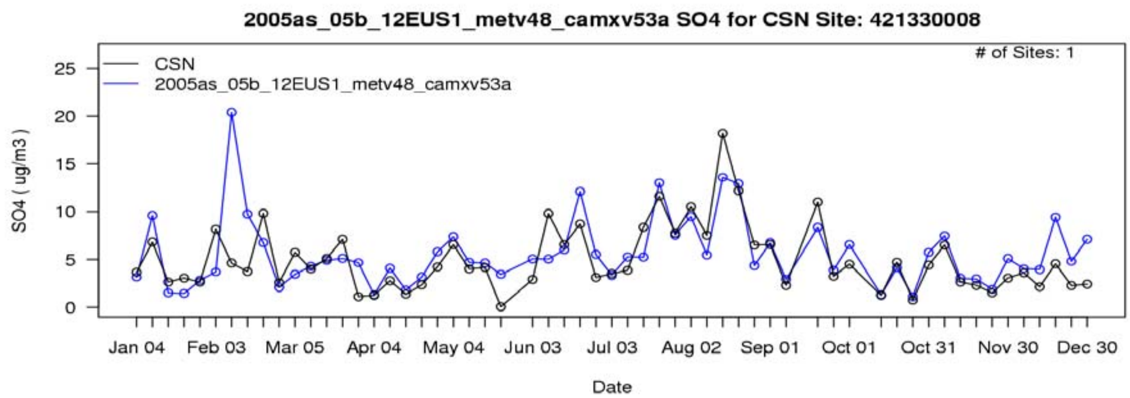

Figure A-16w. Time series of observed (black) and predicted (blue) 24-hour average sulfate for 2005 at site 421330008 in York County, PA.

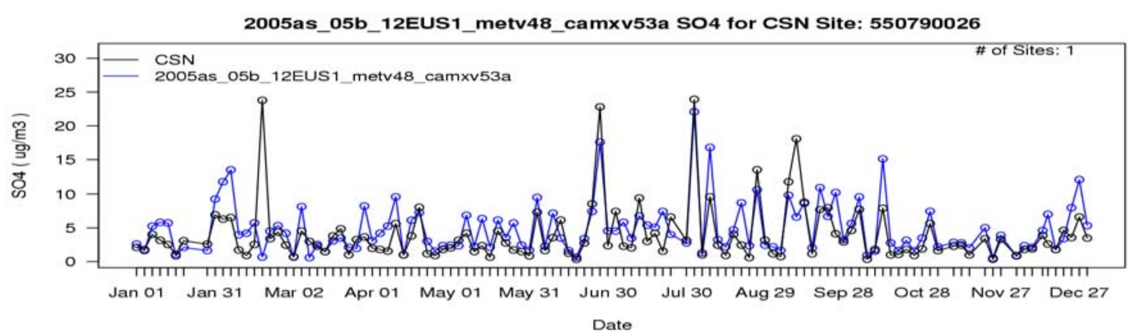

Figure A-16x. Time series of observed (black) and predicted (blue) 24-hour average sulfate for 2005 at site 550790026 in Milwaukee County, WI.

3.2 Evaluation for Nitrate

The model performance bias and error statistics for nitrate for each subregion and each season are provided in Table A-6. This table includes statistics for particulate nitrate, as measured at CSN and IMPROVE sites, and statistics for total nitrate, as measured at CASTNet sites. The distributions of observed and predicted nitrate by month for each subregion are shown in Figures A-17 through A-20. Spatial plots of the normalized mean bias and error by season for individual monitors are shown in Figures A-21 through A-24. Time series plots of observed and predicted 24-hour average nitrate at CSN monitoring sites in counties identified as nonattainment or maintenance for the annual and/or 24-hour $PM_{2.5}$ NAAQS in the 2012 Transport Rule base case are provided in Figure A-25a-x[24].

The nitrate predictions from our modeling platform correspond well with the observations, particularly during the fall and winter when observations are at their highest levels. The bias and error statistics in Table A-6 indicate that model performance for nitrate is generally best during the winter and fall seasons at both urban and rural sites in each of the four subregions. The bias statistics indicate that the predictions are generally within $\pm$ 20 percent of the observations at urban, suburban, and rural locations in most subregions during this season. Average bias across the subregions during the fall and winter is smaller than 17 percent for urban locations and 5 percent for rural locations. Somewhat greater under prediction is indicated by the FBs, especially in the Southeast where winter nitrate concentrations are lower than in the other subregions. In the spring and summer, when nitrate concentrations are low in all subregions, the under prediction bias is larger than in fall and winter, as indicated by the 30 percent average bias at both urban and rural locations for the spring and summer seasons. Model error for nitrate is somewhat greater in all seasons for each subregions compared to sulfate, particularly with the FE statistic.

Examining the distribution of observations and predictions for each subregion and network, as shown in Figures A-17 through A-20 provides perhaps a clearer understanding of model performance for nitrate than the performance statistics in Table A-6. These figures are based on observed 24-hour average (CSN and IMPROVE) particle nitrate and weekly average (CASTNet) total nitrate concentrations and the corresponding model predictions by month for January through December 2005. The figures indicate that the modeling platform closely replicates the observations in terms of the seasonal variability in nitrate concentrations and the large differences between the subregions and between urban, suburban, and rural sites in terms of the magnitude of nitrate concentrations. Median predicted concentrations are very similar in magnitude to the median of the measurements in nearly all months for each subregion for urban, suburban, and rural sites. However, a tendency for under prediction is evident in the 75th percentile concentrations during the winter months.

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[24] There is one county, Fulton County, GA, that is projected to be nonattainment for the annual PM2.5 NAAQS in 2012 for which there is no site with 2005 $PM_{2.5}$ speciation data available in AMET. Instead, we provide time series plots based on speciation measurements at the CSN site in neighboring DeKalb County, GA.

Model bias and error at individual sites indicates mainly under prediction biases of less than 40 percent at most sites during the winter and fall, as indicated in Figures A-21a and A-24a. The exception to this is the Southeast and extreme western portion of the modeling domain where there appears to be a greater number of sites with under prediction in the range of 40 to 60 percent. During the spring and summer, when particle nitrate concentrations are very low, most sites across the modeling domain show under prediction of nitrate of 40 to 80 percent. Model error during the fall and winter, as shown in Figures A-21b and A-24b, is least at sites located in portions of the northern Plains states eastward to the mid-Altlantic states. Nitrate concentrations are typically higher in these areas than in other portions of the modeling domain.

Like sulfate, the modeling platform closely matches the magnitude and short-term fluctuations in observed 24-hour average nitrate concentrations at CSN monitoring sites in counties with predicted nonattainment and/or maintenance problems for the annual or 24-hour PM2.5 NAAQS in the Transport Rule 2012 base case. The annual time series plots of observed and predicted 24-hour average nitrate concentrations for the 24 CSN sites in these counties are provided in Figures A-25a through x. These figures indicate that the short-term variability, general magnitude, and site-to-site differences in nitrate observations are captured by the model predictions in counties predicted to have future nonattainment and/or maintenance problems. In addition, the modeling platform shows excellent skill at replicating the timing of the transition between high nitrate episodes in the fall and winter and the very low concentrations during the spring and summer. For example, the time series for site 262610008 in Washtenaw County, MI (Figure A-25k) shows that the model predictions not only closely track the periods with high observed nitrate during cool season months (i.e., January, February, March and November and December), but also the more moderate concentrations in the transition months of April, May, and October, as well as the very low concentrations during July and August. At most sites there are a few peak days that are under predicted and others that are over predicted by the model. For example, at site 170310057 in Cook County, IL (Figure A-25d), the model under predicted the observed peak on February 3, closely replicated the peak on March 5, and over predicted the peak on March 29. Even at this site, however, the timing of observed high nitrate episodes is accurately captured by the model. Overall, the model predictions of nitrate track the temporal variability in the observations throughout the year at the monitoring sites examined in this analysis.

Table A-6. Nitrate performance statistics by subregion, by season for the 2005 CAMx model simulation.

Region	Network	Season	No. of Obs.	NMB (%)	NME (%)	FB (%)	FE (%)
CENRAP	CSN	Winter	514	-21.8	46.2	-32.6	64.3
		Spring	493	-36.9	62.4	-92.3	111.0
		Summer	478	-39.1	86.3	-112.0	131.0
		Fall	442	-3.9	58.3	-40.6	84.7

Region	Network	Season	No. of Obs.	NMB (%)	NME (%)	FB (%)	FE (%)
	IMPROVE	Winter	657	-10.4	49.1	-39.1	78.0
		Spring	722	-39.6	63.5	-112.0	128.0
		Summer	654	-31.8	93.1	-126.0	146.0
		Fall	607	2.2	73.2	-40.3	104.0
	CASTNet	Winter	72	9.6	29.4	10.6	31.0
		Spring	76	-28.7	31.8	-37.9	40.2
		Summer	72	-12.4	27.7	-20.8	32.4
		Fall	76	13.8	38.7	18.3	37.8
MWRPO	CSN	Winter	618	-13.9	45.6	-33.2	56.3
		Spring	633	1.0	68.6	-36.9	81.6
		Summer	616	-35.0	75.4	-85.1	112.0
		Fall	628	-17.7	49.1	-46.1	76.2
	IMPROVE	Winter	164	-19.2	46.7	-46.7	77.3
		Spring	177	-8.6	71.1	-86.5	113.0
		Summer	153	-51.4	79.4	-124.0	143.0
		Fall	128	-14.6	59.4	-69.0	100.0
	CASTNet	Winter	140	-12.3	25.2	-10.6	25.9
		Spring	156	-9.1	25.4	-11.9	28.6
		Summer	162	22.0	35.5	11.2	30.3
		Fall	157	8.9	37.7	6.6	32.0
VISTAS	CSN	Winter	963	-29.3	67.5	-72.1	101.0
		Spring	969	-43.4	73.3	-104.0	121.0
		Summer	914	-56.5	82.7	-125.0	140.0
		Fall	977	-40.6	76.7	-96.2	120.0
	IMPROVE	Winter	493	-20.9	79.5	-70.3	112.0
		Spring	527	-43.0	85.5	-122.0	142.0
		Summer	502	-43.6	108.0	-134.0	157.0
		Fall	468	-31.9	95.0	-105.0	142.0
	CASTNet	Winter	270	3.9	24.8	4.2	25.2

Region	Network	Season	No. of Obs.	NMB (%)	NME (%)	FB (%)	FE (%)
		Spring	288	-14.6	25.4	-14.2	27.6
		Summer	263	9.6	30.1	8.2	30.1
		Fall	276	30.5	44.4	27.6	40.1
MANEVU	CSN	Winter	872	-14.8	43.7	-18.9	53.5
		Spring	881	-2.1	67.0	-47.8	90.5
		Summer	884	-39.1	81.0	-111.0	132.0
		Fall	862	6.9	65.4	-29.8	78.7
	IMPROVE	Winter	596	18.2	68.7	13.6	75.5
		Spring	687	3.0	79.2	-52.9	105.0
		Summer	626	-21.3	98.1	-112.0	136.0
		Fall	576	40.3	86.9	-22.4	98.5
	CASTNet	Winter	195	11.6	26.1	16.7	29.6
		Spring	199	16.7	30.3	13.2	30.2
		Summer	197	32.3	40.7	20.4	36.9
		Fall	195	40.4	52.1	41.1	49.1

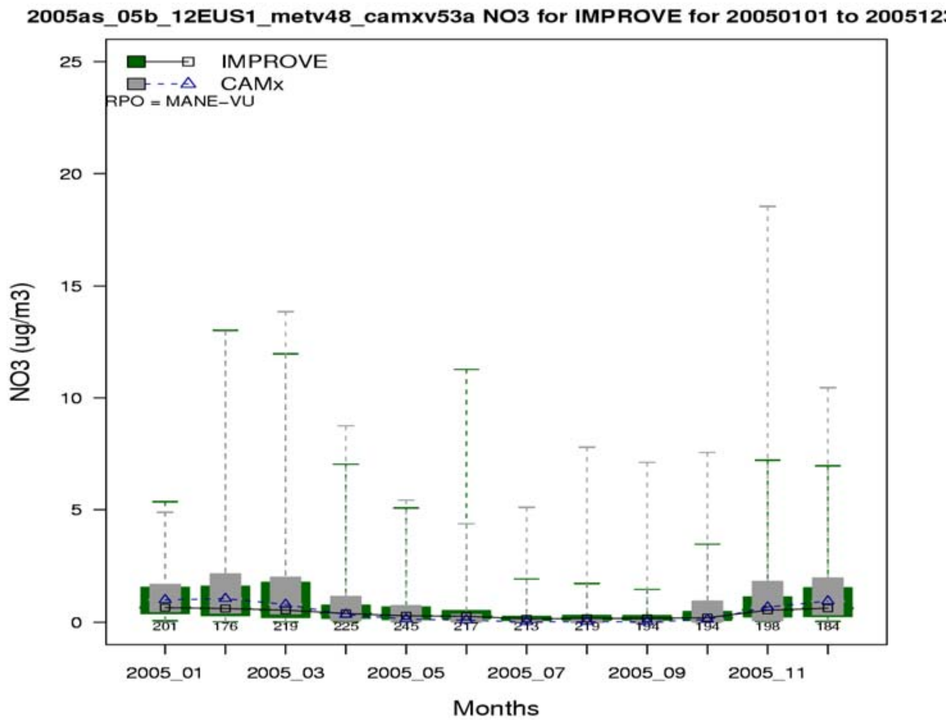

Figure A-17a. Distribution of observed and predicted 24-hour average nitrate by month for 2005 at IMPROVE sites in the Northeast subregion. [symbol = median; top/bottom of box = 75th/25th percentiles; top/bottom line = max/min values]

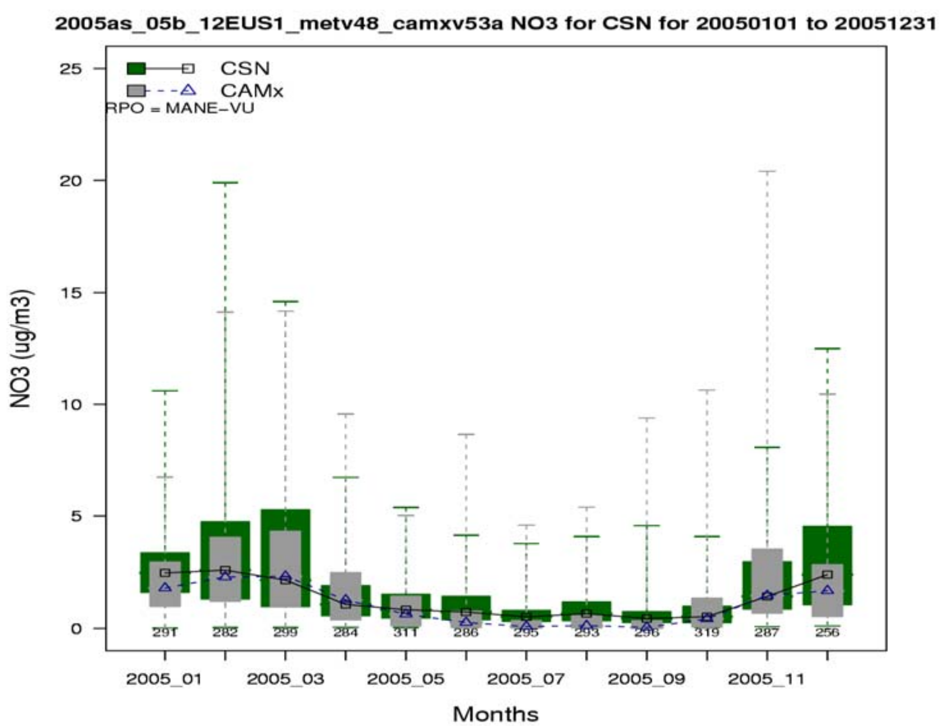

Figure A-17b. Distribution of observed and predicted 24-hour average nitrate by month for 2005 at CSN sites in the Northeast subregion.

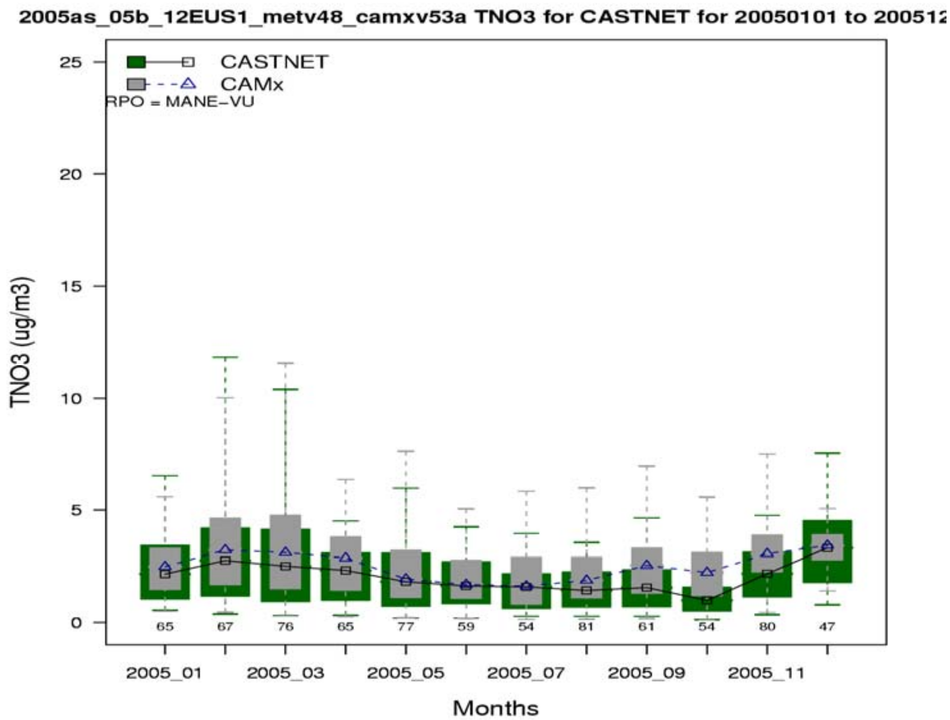

Figure A-17c. Distribution of observed and predicted weekly average total nitrate by month for 2005 at CASTNet sites in the Northeast subregion.

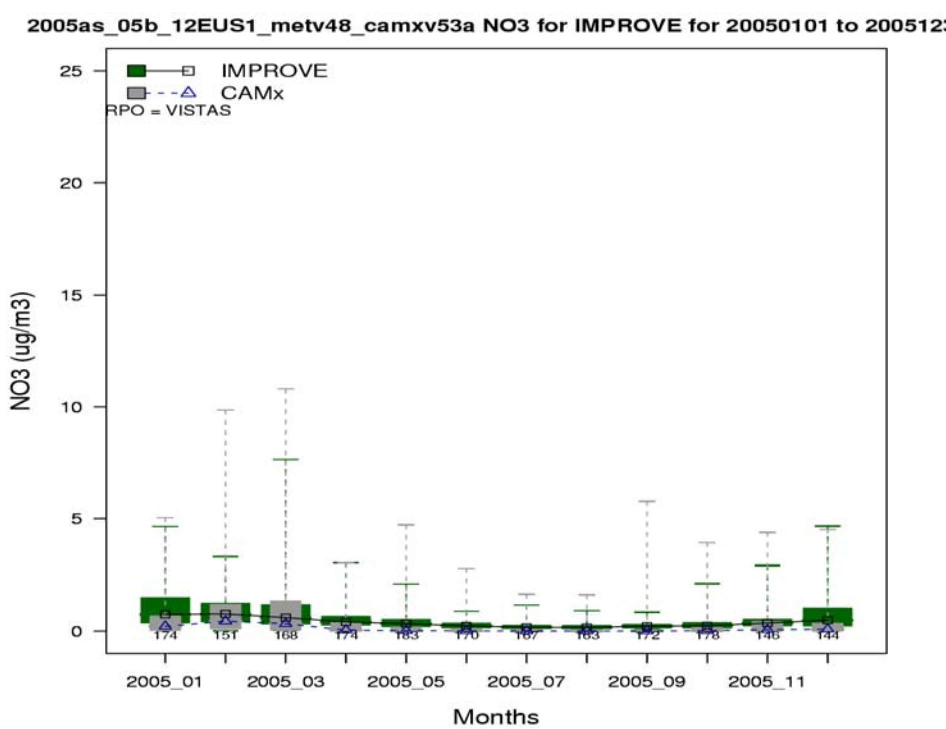

Figure A-18a. Distribution of observed and predicted 24-hour average nitrate by month for 2005 at IMPROVE sites in the Southeast subregion.

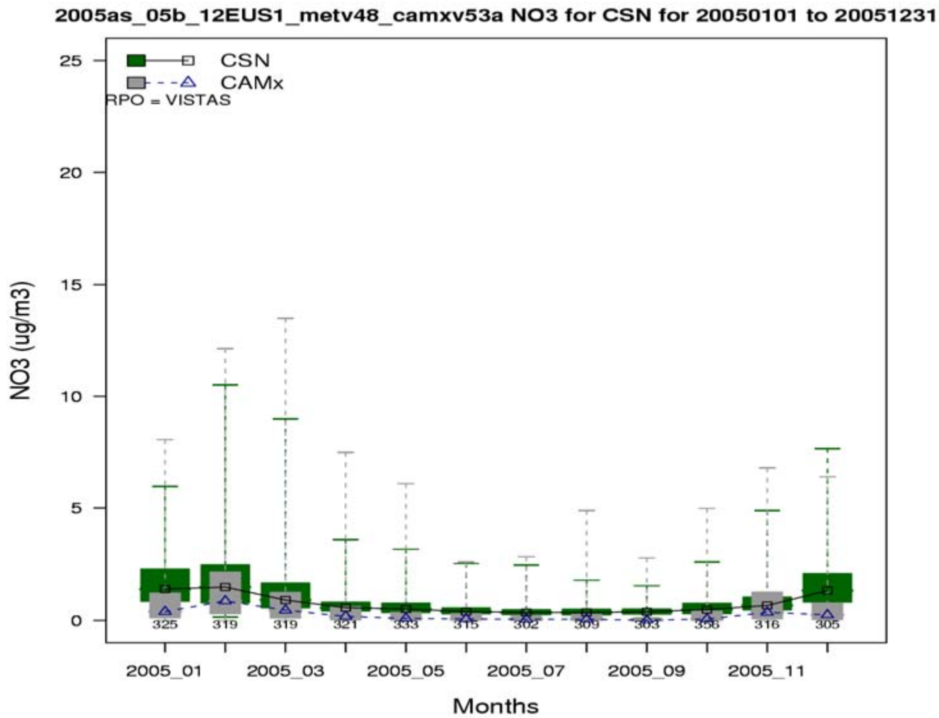

Figure A-18b. Distribution of observed and predicted 24-hour average nitrate by month for 2005 at CSN sites in the Southeast subregion.

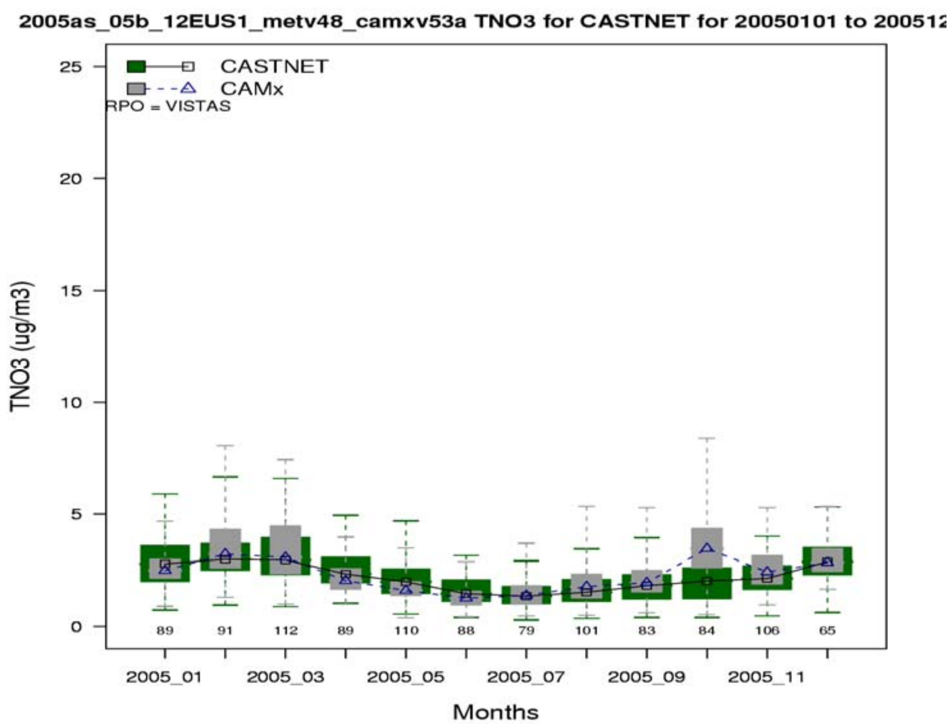

Figure A-18c. Distribution of observed and predicted weekly average total nitrate by month for 2005 at CASTNet sites in the Southeast subregion.

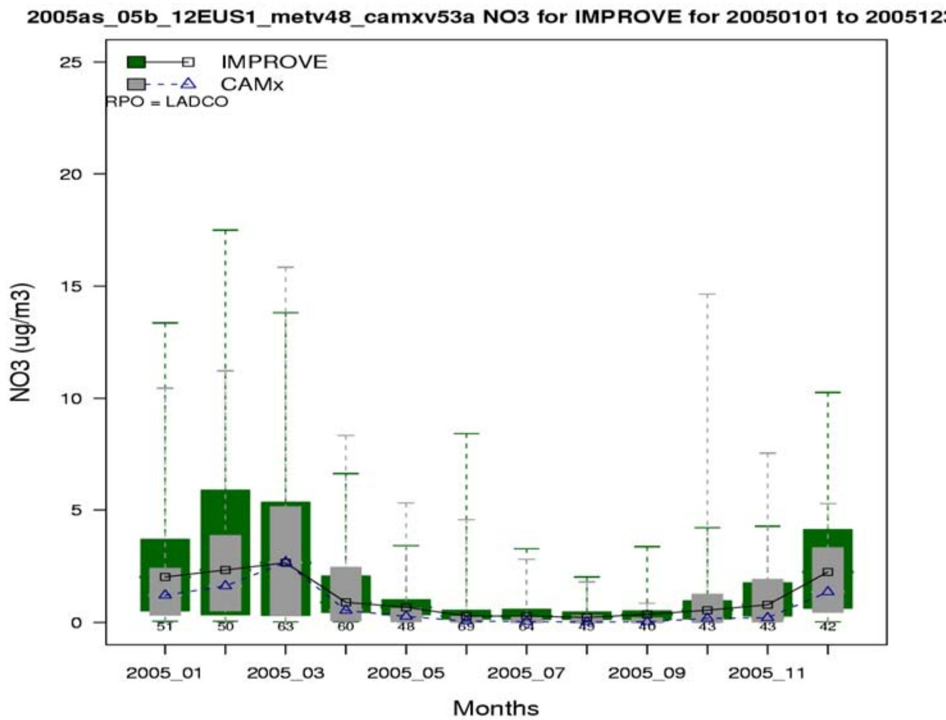

Figure A-19a. Distribution of observed and predicted 24-hour average nitrate by month for 2005 at IMPROVE sites in the Midwest subregion.

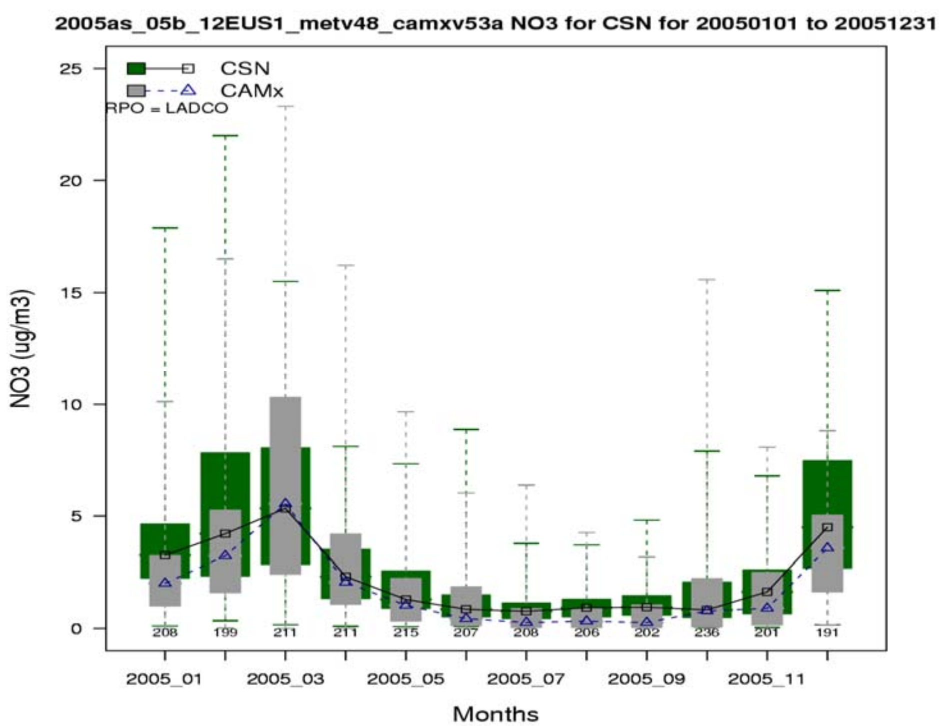

Figure A-19b. Distribution of observed and predicted 24-hour average nitrate by month for 2005 at CSN sites in the Midwest subregion.

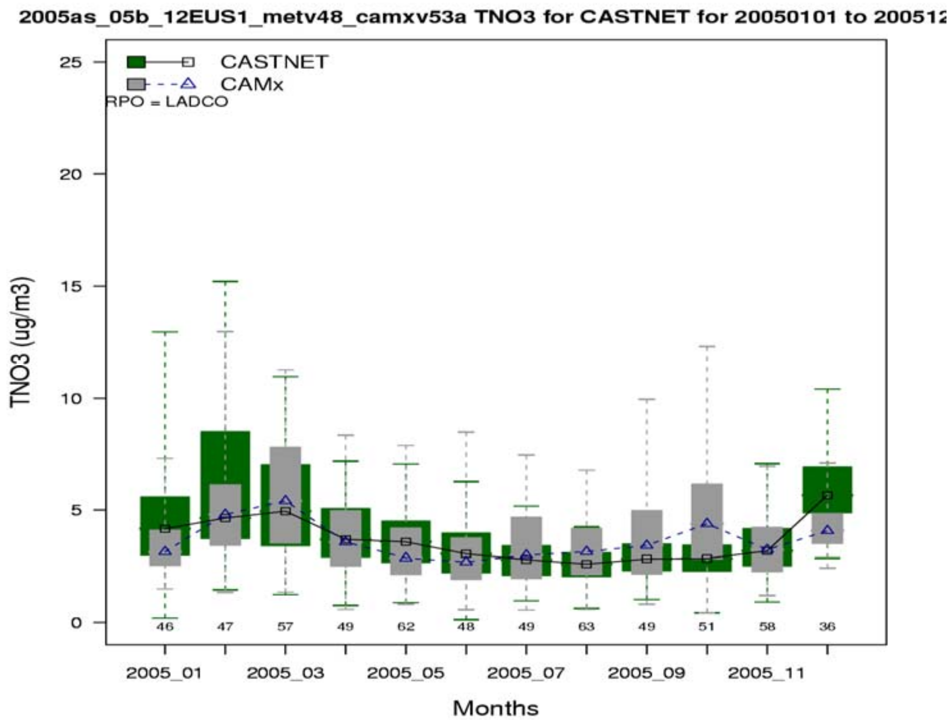

Figure A-19c. Distribution of observed and predicted weekly average total nitrate by month for 2005 at CASTNet sites in the Midwest subregion.

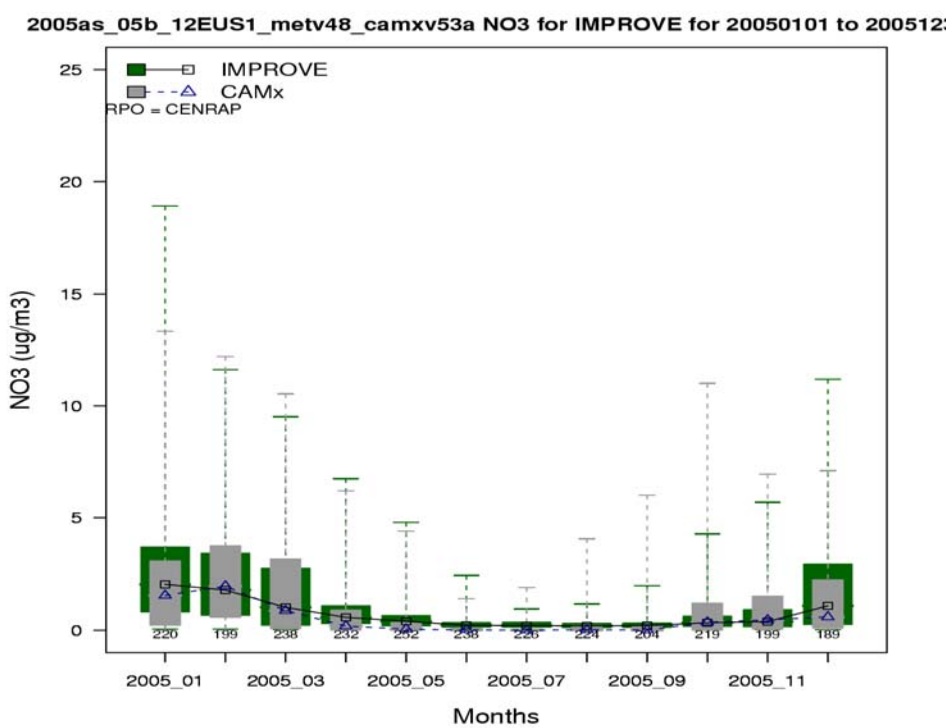

Figure A-20a. Distribution of observed and predicted 24-hour average nitrate by month for 2005 at IMPROVE sites in the Central states subregion.

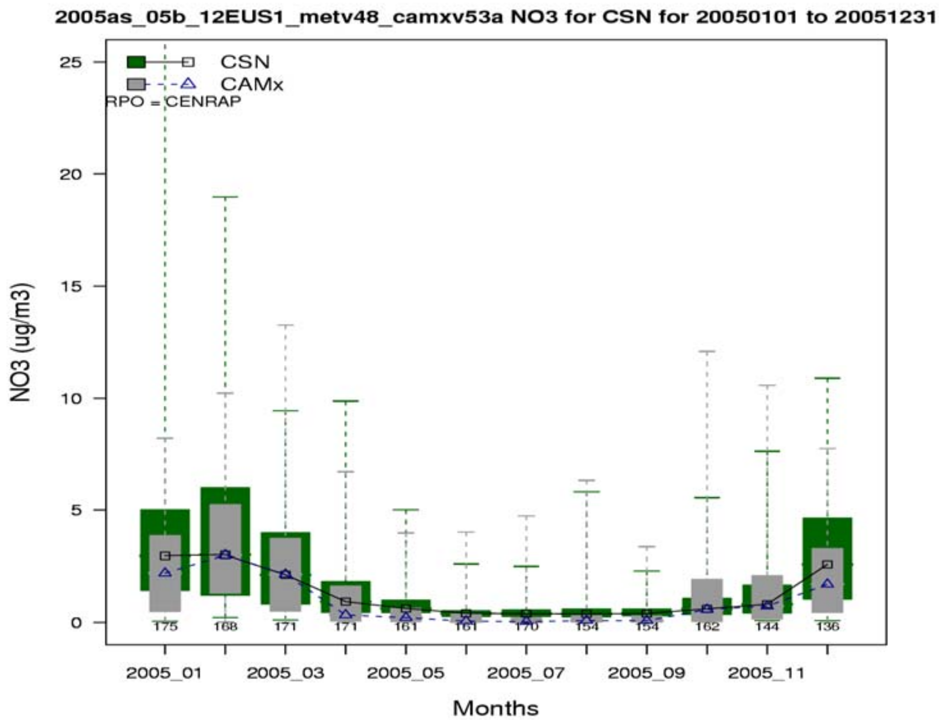

Figure A-20b. Distribution of observed and predicted 24-hour average nitrate by month for 2005 at CSN sites in the Central states subregion.

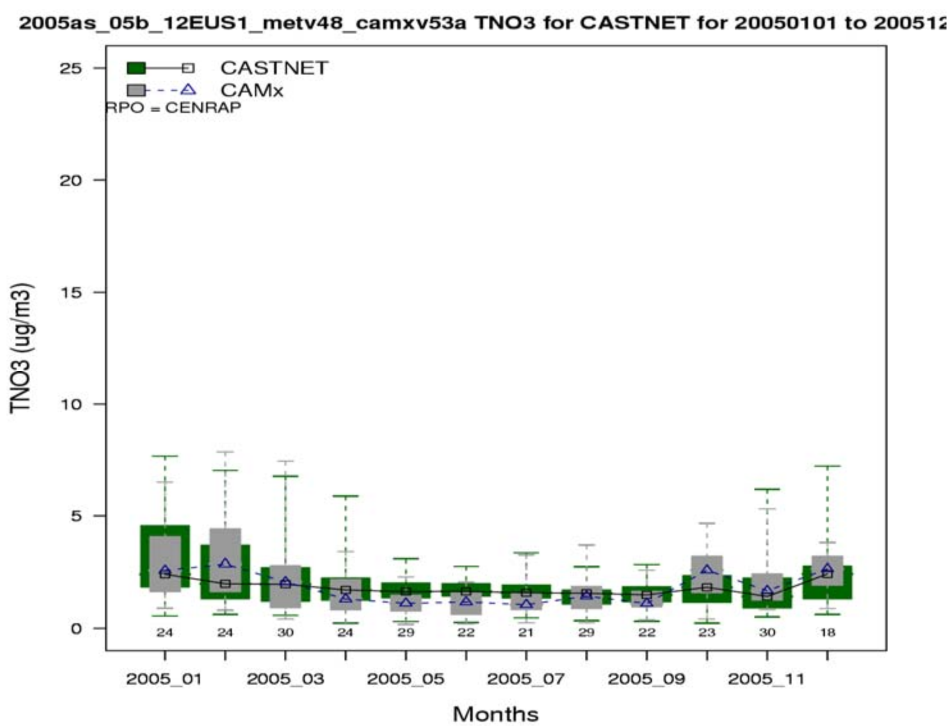

Figure A-20c. Distribution of observed and predicted weekly average total nitrate by month for 2005 at CASTNet sites in the Central states subregion.

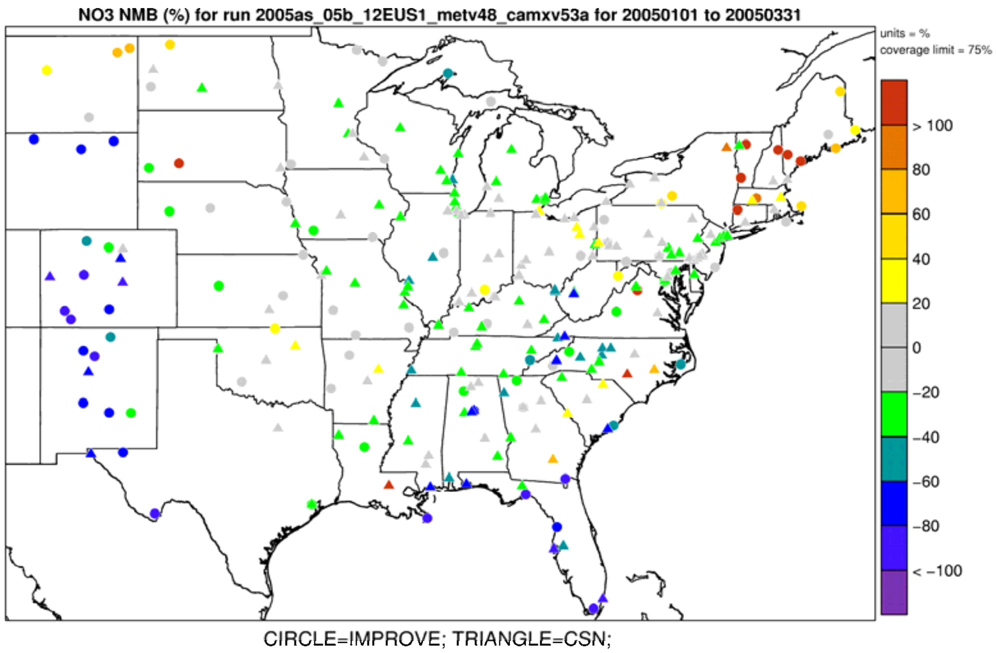

Figure A-21a. Normalized Mean Bias (%) for nitrate during January through March 2005 at monitoring sites in Eastern modeling domain.

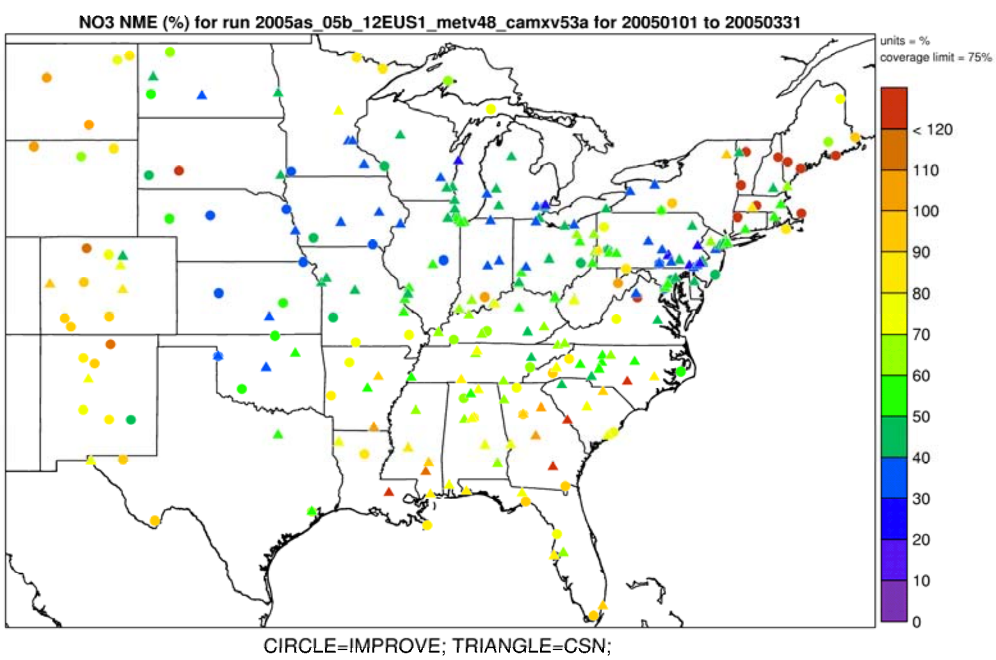

Figure A-21b. Normalized Mean Error (%) for nitrate during January through March 2005 at monitoring sites in Eastern modeling domain.

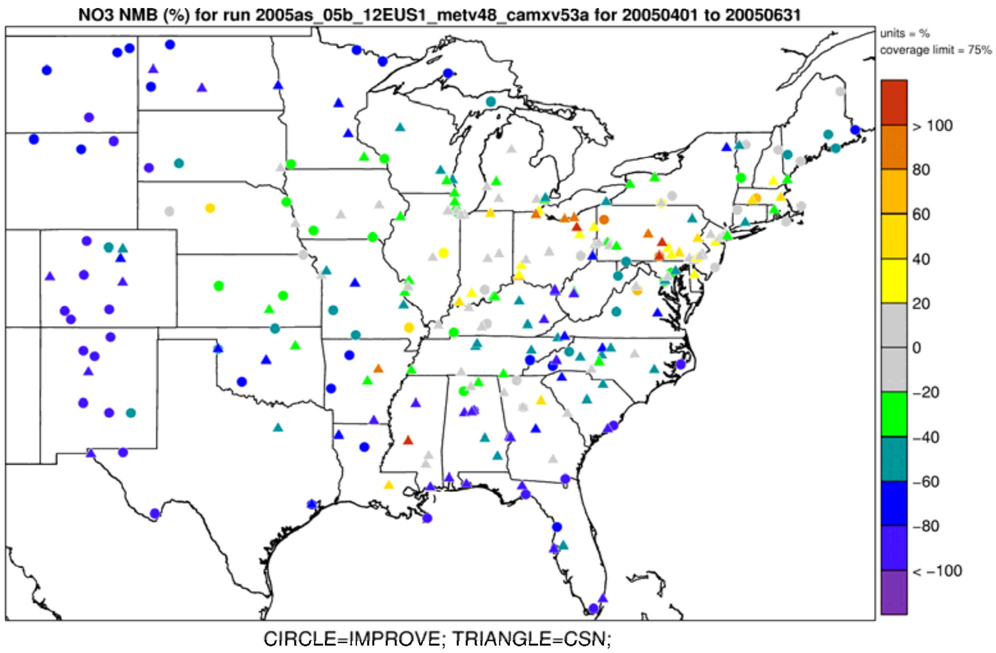

Figure A-22a. Normalized Mean Bias (%) for nitrate during April through June 2005 at monitoring sites in Eastern modeling domain.

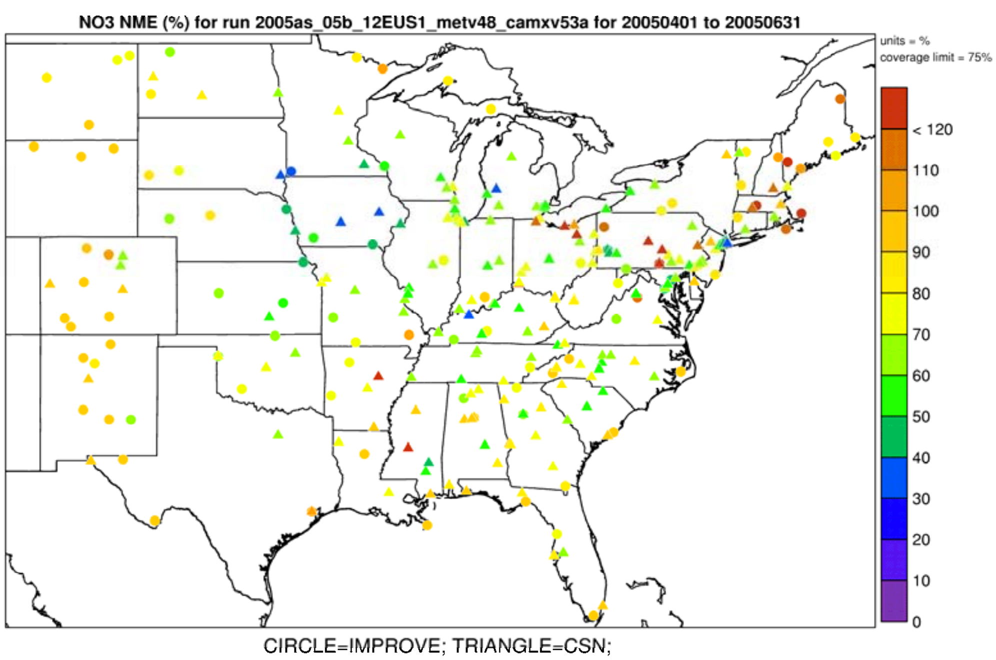

Figure A-22b. Normalized Mean Error (%) for nitrate during April through June 2005 at monitoring sites in Eastern modeling domain.

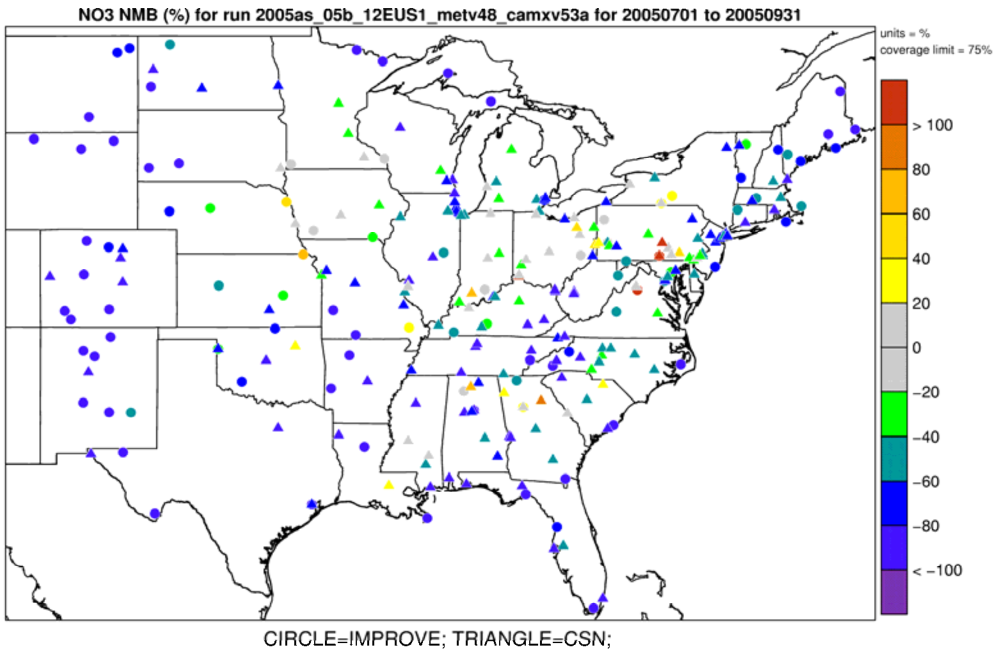

Figure A-23a. Normalized Mean Bias (%) for nitrate during July through September 2005 at monitoring sites in Eastern modeling domain.

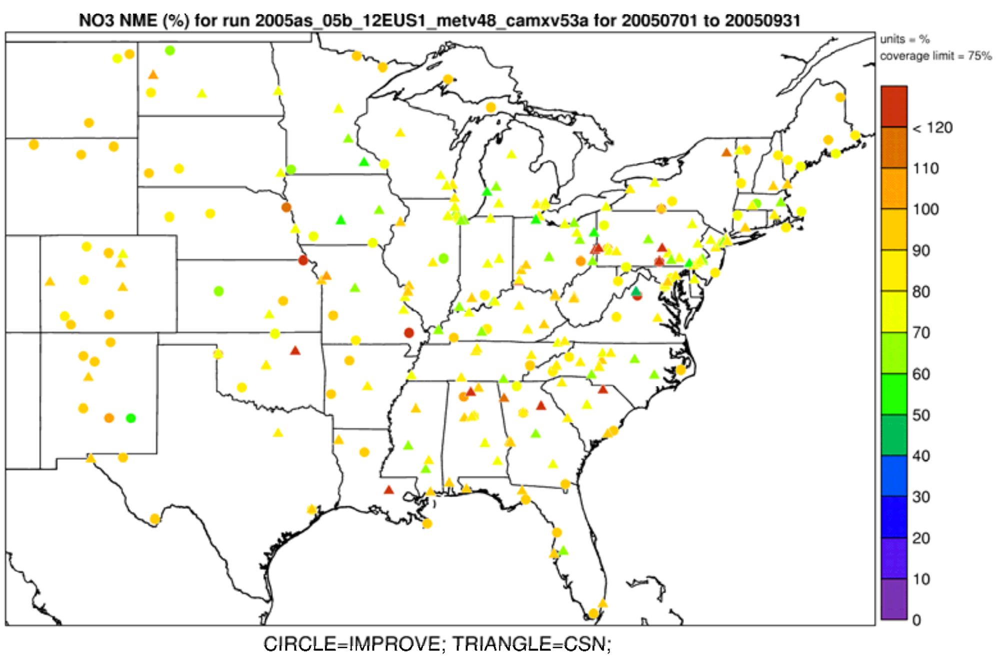

Figure A-23b. Normalized Mean Error (%) for nitrate during July through September 2005 at monitoring sites in Eastern modeling domain.

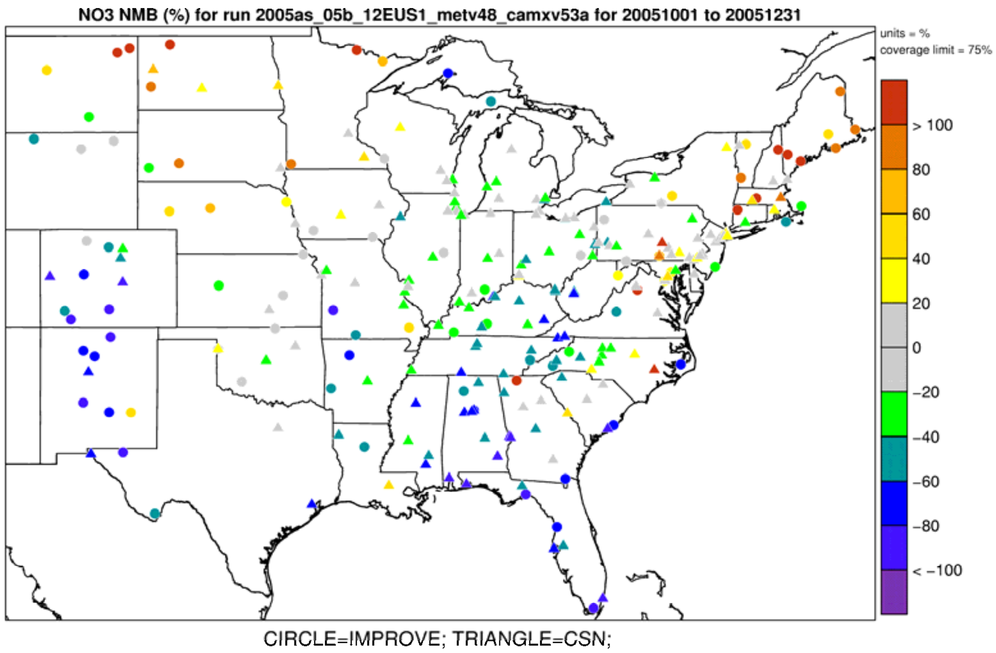

Figure A-24a. Normalized Mean Bias (%) for nitrate during October through December 2005 at monitoring sites in Eastern modeling domain.

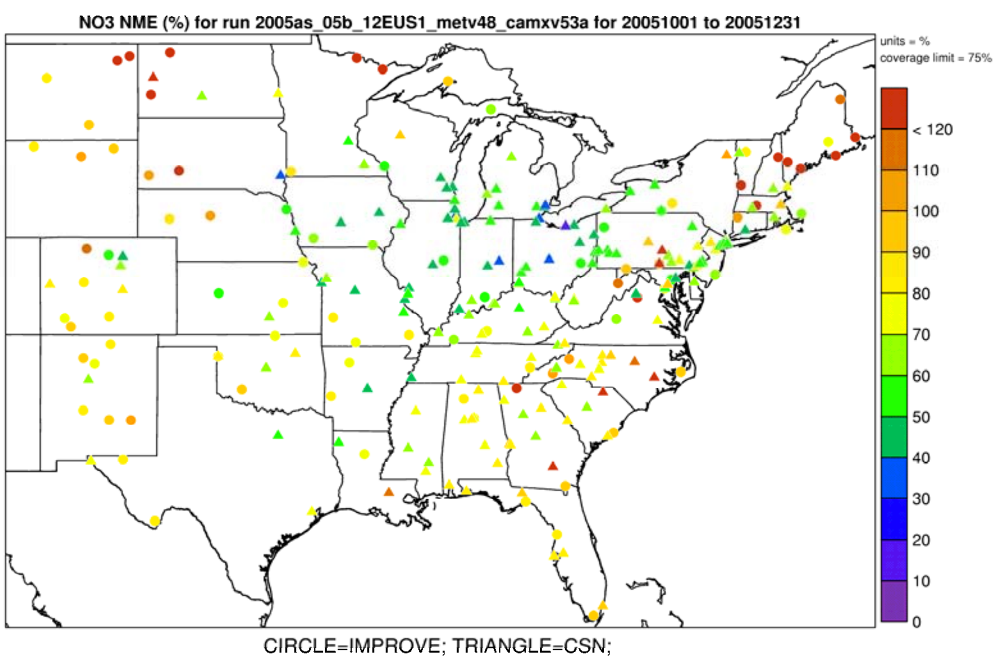

Figure A-24b. Normalized Mean Error (%) for nitrate during October through December 2005 at monitoring sites in Eastern modeling domain.

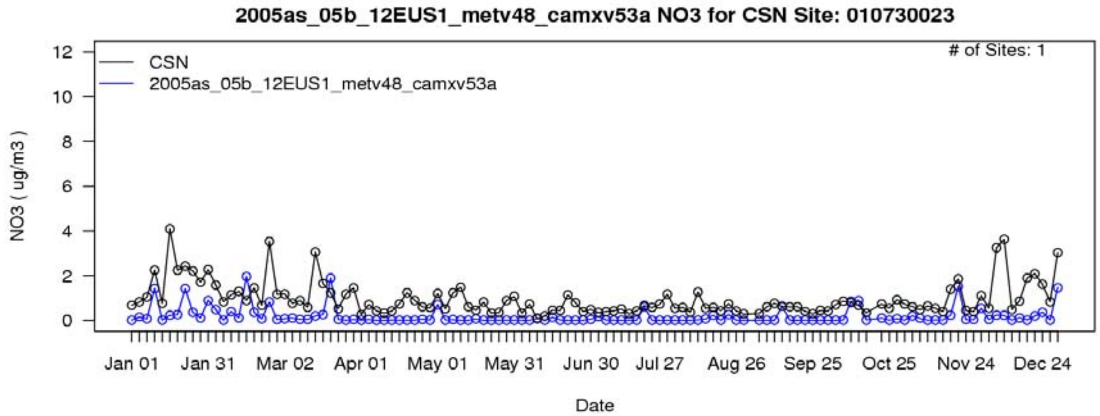

Figure A-25a. Time series of observed (black) and predicted (blue) 24-hour average nitrate for 2005 at site 010730023 in Jefferson County, AL.

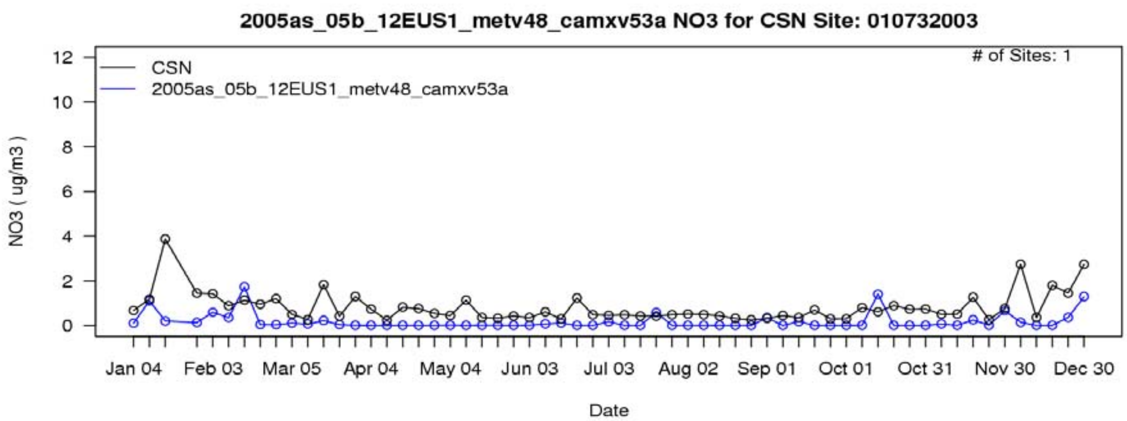

Figure A-25b. Time series of observed (black) and predicted (blue) 24-hour average nitrate for 2005 at site 010732003 in Jefferson County, AL.

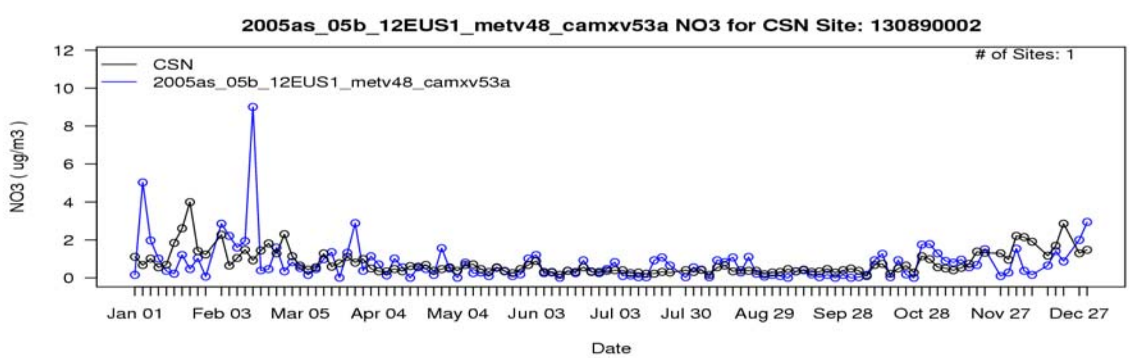

Figure A-25c. Time series of observed (black) and predicted (blue) 24-hour average nitrate for 2005 at site 130890002 in DeKalb County, GA (this site in DeKalb County is used since there were no CSN data available for Fulton County).

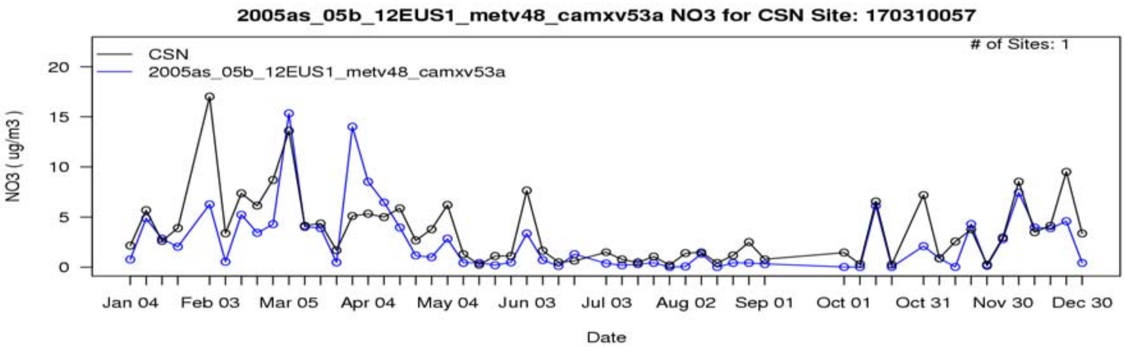

Figure A-25d. Time series of observed (black) and predicted (blue) 24-hour average nitrate for 2005 at site 170310057 in Cook County, IL.

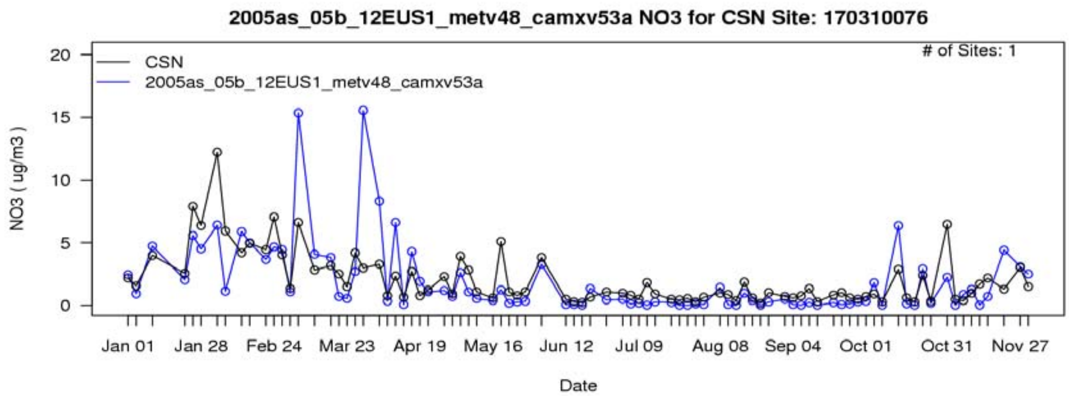

Figure A-25e. Time series of observed (black) and predicted (blue) 24-hour average nitrate for 2005 at site 170310076 in Cook County, IL.

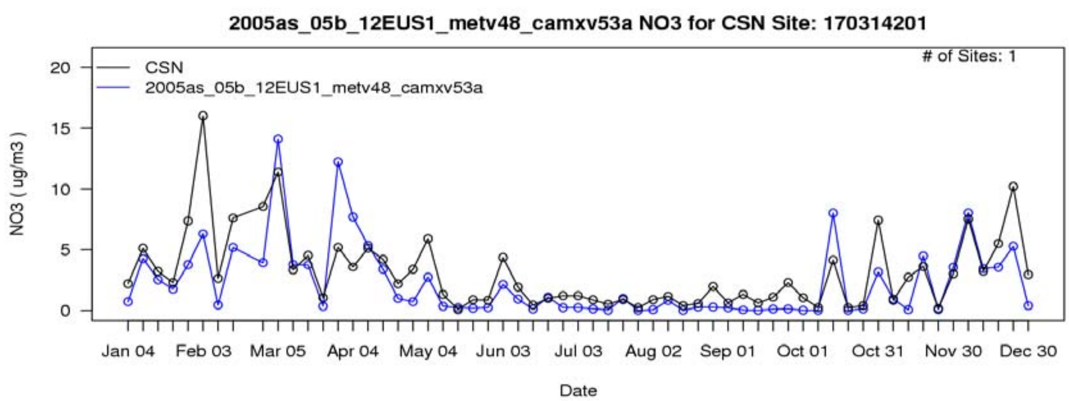

Figure A-25f. Time series of observed (black) and predicted (blue) 24-hour average nitrate for 2005 at site 170314201 in Cook County, IL.

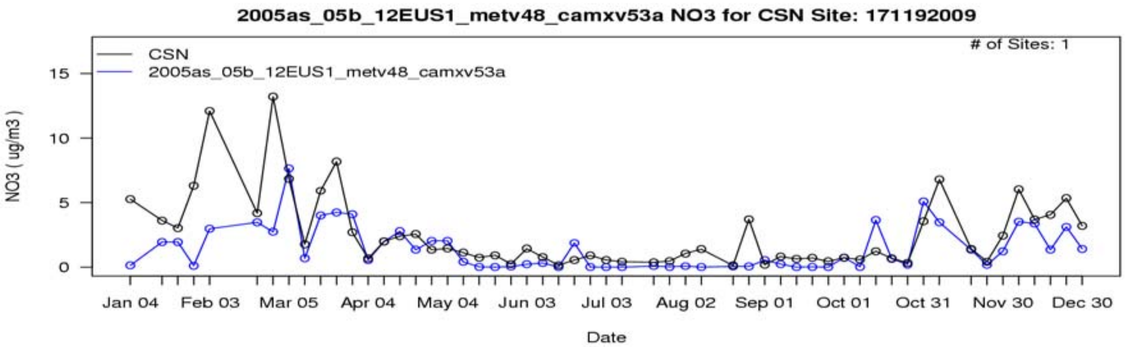

Figure A-25g. Time series of observed (black) and predicted (blue) 24-hour average nitrate for 2005 at site 1711192009 in Madison County, IL.

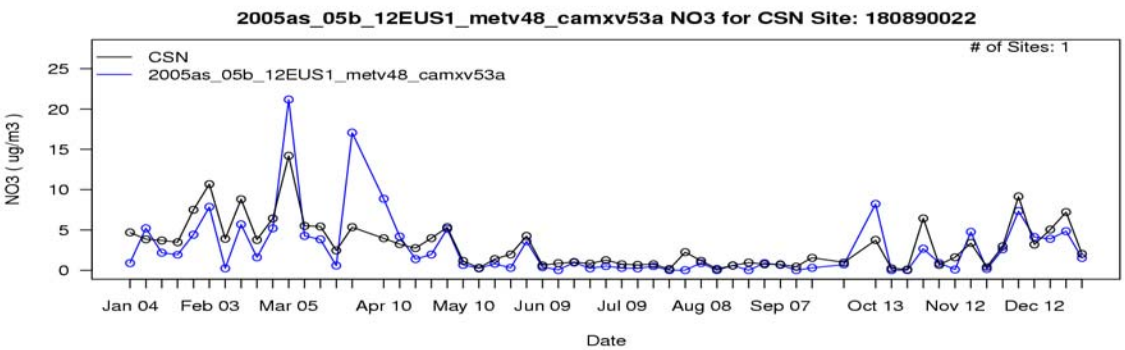

Figure A-25h. Time series of observed (black) and predicted (blue) 24-hour average nitrate for 2005 at site 180890022 in Lake County, IN.

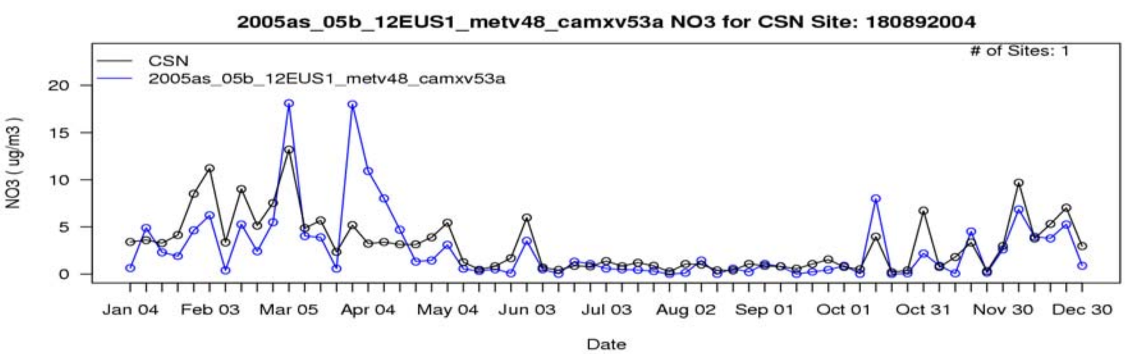

Figure A-25i. Time series of observed (black) and predicted (blue) 24-hour average nitrate for 2005 at site 180892004 in Lake County, IN.

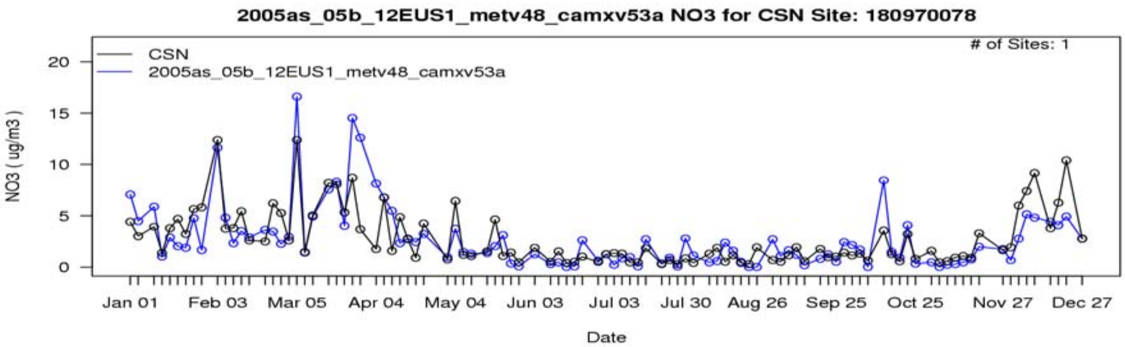

Figure A-25j. Time series of observed (black) and predicted (blue) 24-hour average nitrate for 2005 at site 180970078 in Marion County, IN.

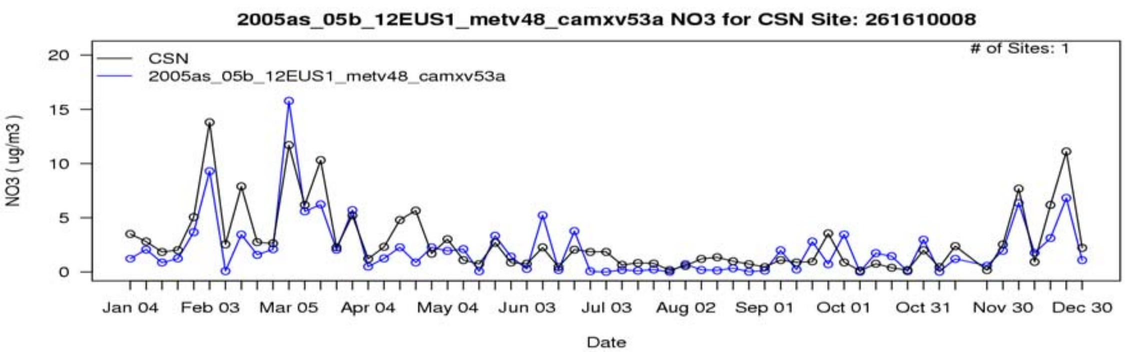

Figure A-25k. Time series of observed (black) and predicted (blue) 24-hour average nitrate for 2005 at site 261610008 in Washtenaw County, MI.

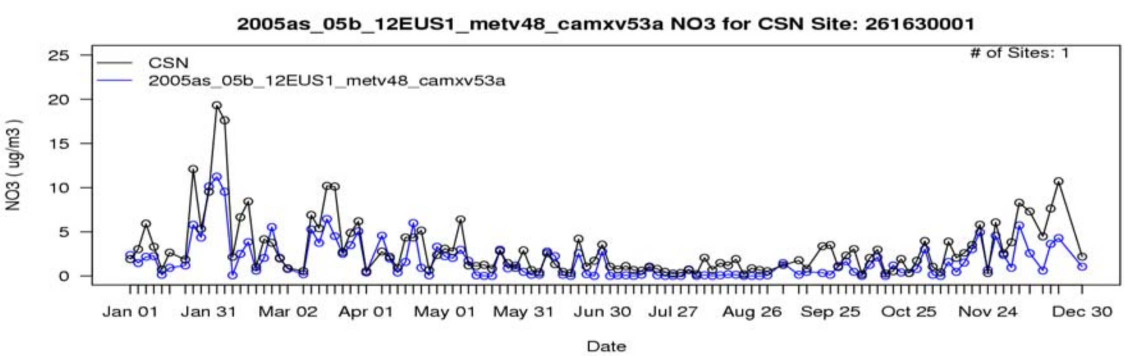

Figure A-25l. Time series of observed (black) and predicted (blue) 24-hour average nitrate for 2005 at site 261630001 in Wayne County, MI.

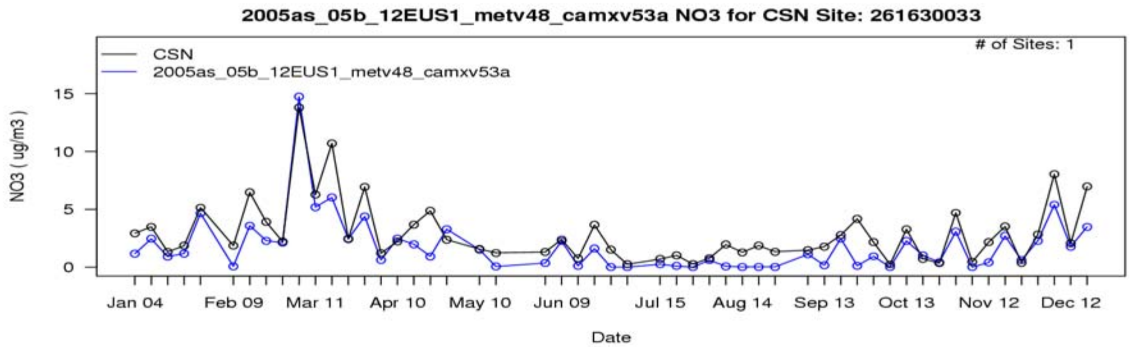

Figure A-25m. Time series of observed (black) and predicted (blue) 24-hour average nitrate for 2005 at site 261630033 in Wayne County, MI.

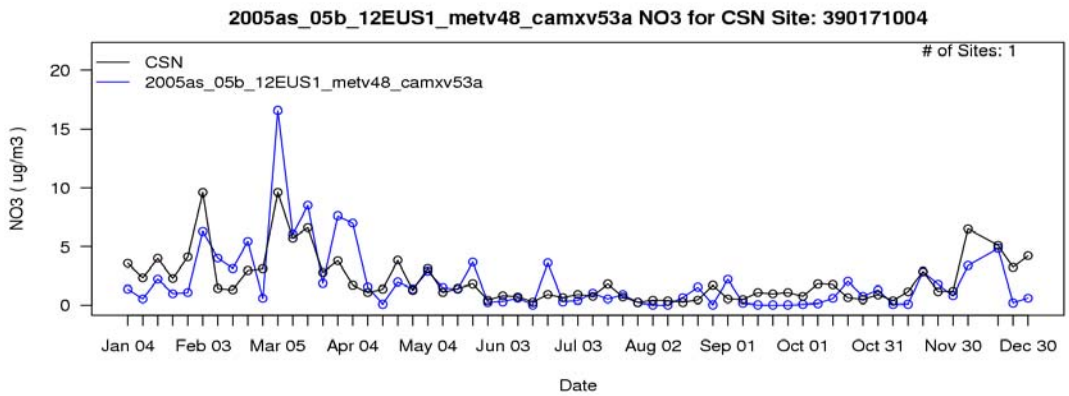

Figure A-25n. Time series of observed (black) and predicted (blue) 24-hour average nitrate for 2005 at site 390171004 in Butler County, OH.

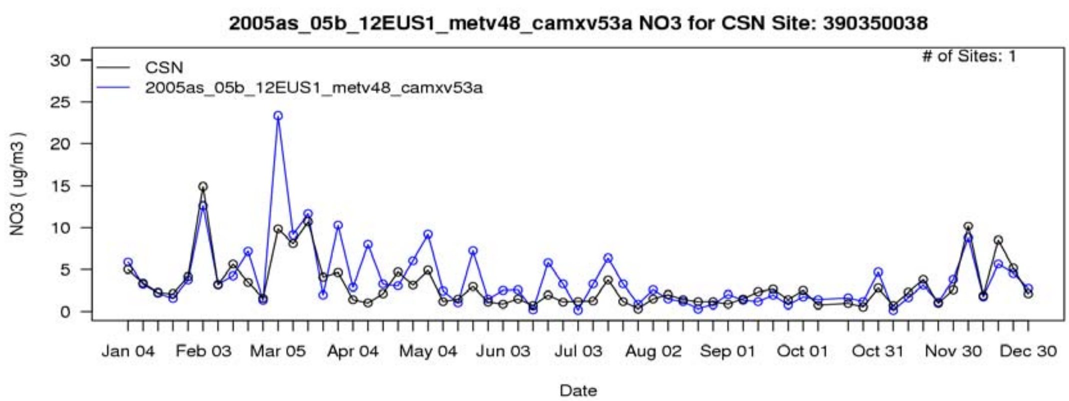

Figure A-25o. Time series of observed (black) and predicted (blue) 24-hour average nitrate for 2005 at site 390350038 in Cuyahoga County, OH.

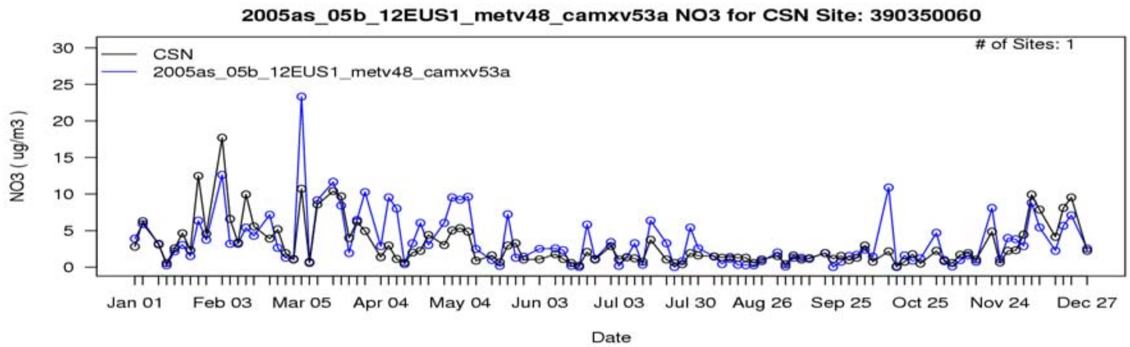

Figure A-25p. Time series of observed (black) and predicted (blue) 24-hour average nitrate for 2005 at site 390350060 in Cuyahoga County, OH.

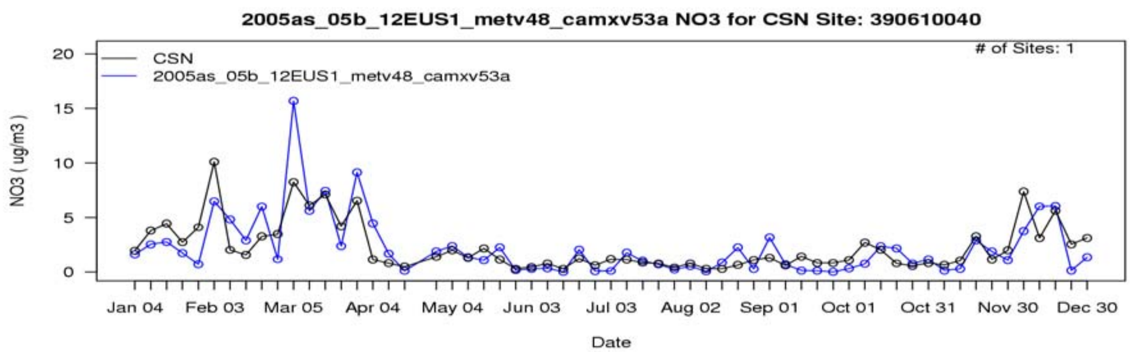

Figure A-25q. Time series of observed (black) and predicted (blue) 24-hour average nitrate for 2005 at site 390610040 in Hamilton County, OH.

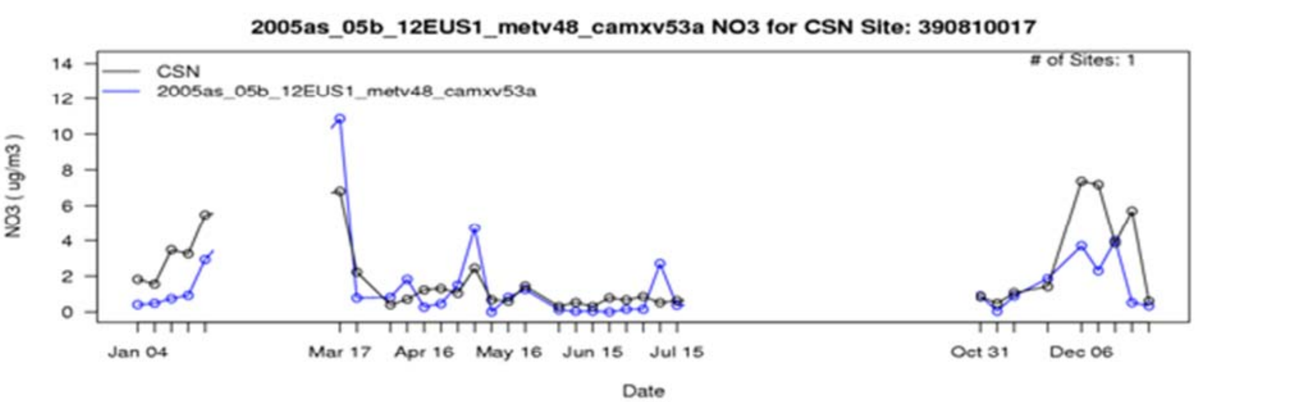

Figure A-25r. Time series of observed (black) and predicted (blue) 24-hour average nitrate for 2005 at site 390810017 in Jefferson County, OH. (blank sections indicate extensive periods with missing data).

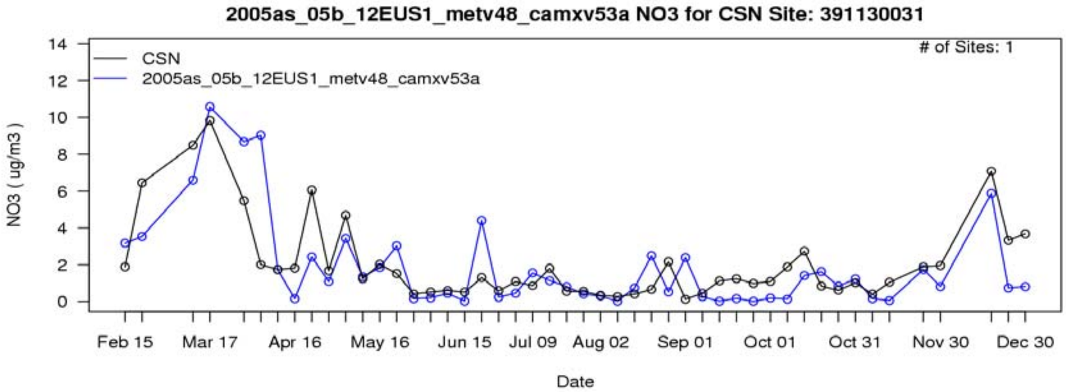

Figure A-25s. Time series of observed (black) and predicted (blue) 24-hour average nitrate for 2005 at site 391130031 in Montgomery County, OH.

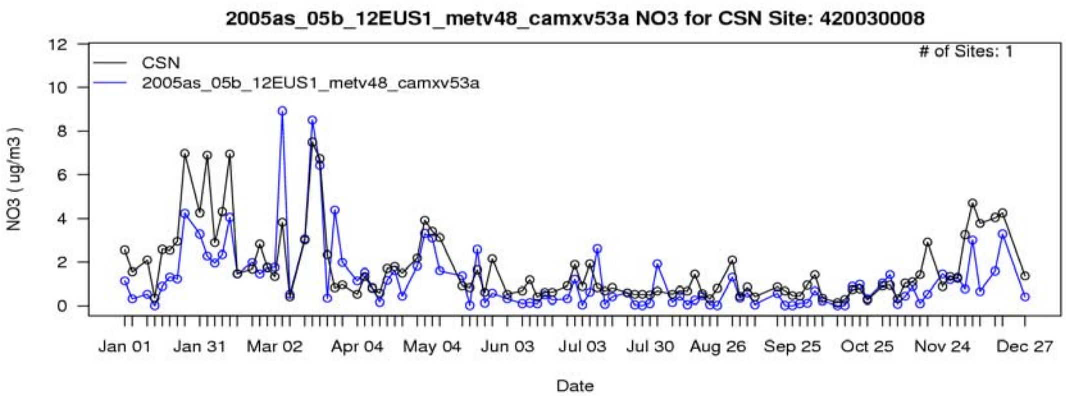

Figure A-25t. Time series of observed (black) and predicted (blue) 24-hour average nitrate for 2005 at site 420030008 in Allegheny County, PA.

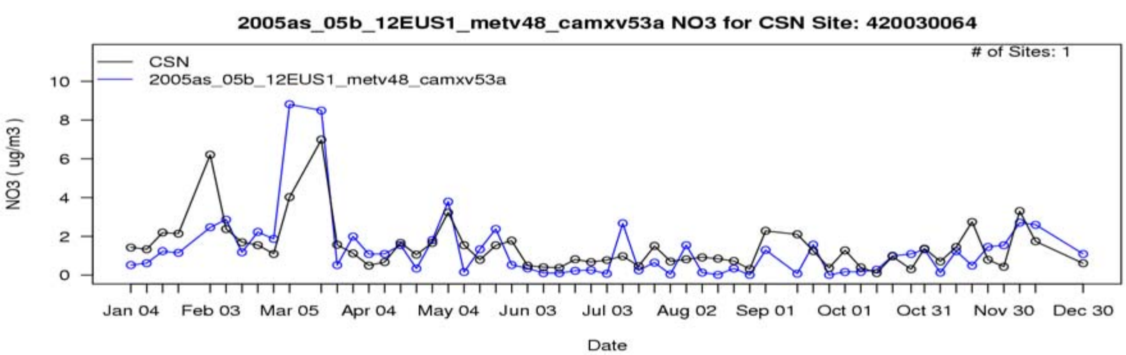

Figure A-25u. Time series of observed (black) and predicted (blue) 24-hour average nitrate for 2005 at site 420030064 in Allegheny County, PA.

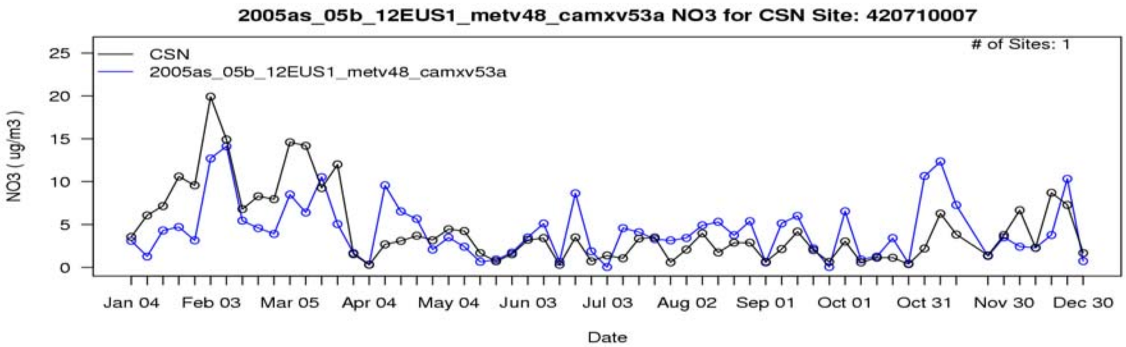

Figure A-25v. Time series of observed (black) and predicted (blue) 24-hour average nitrate for 2005 at site 420710007 in Lancaster County, PA.

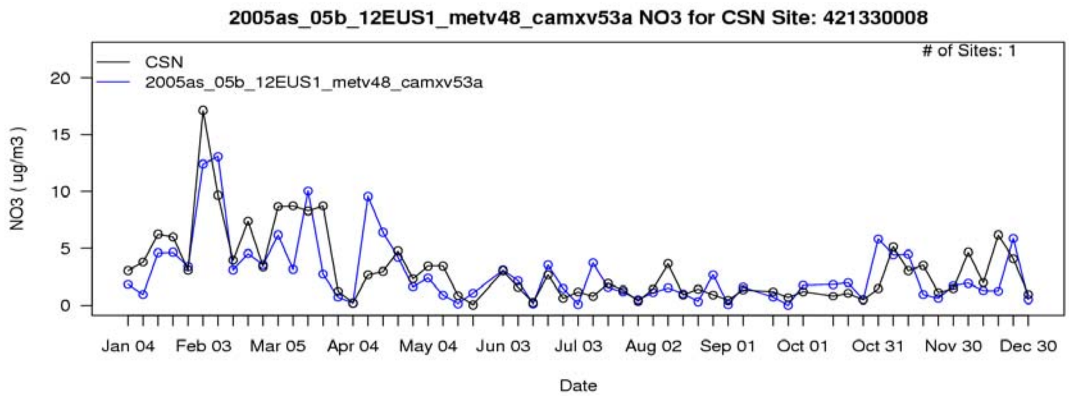

Figure A-25w. Time series of observed (black) and predicted (blue) 24-hour average nitrate for 2005 at site 421330008 in York County, PA.

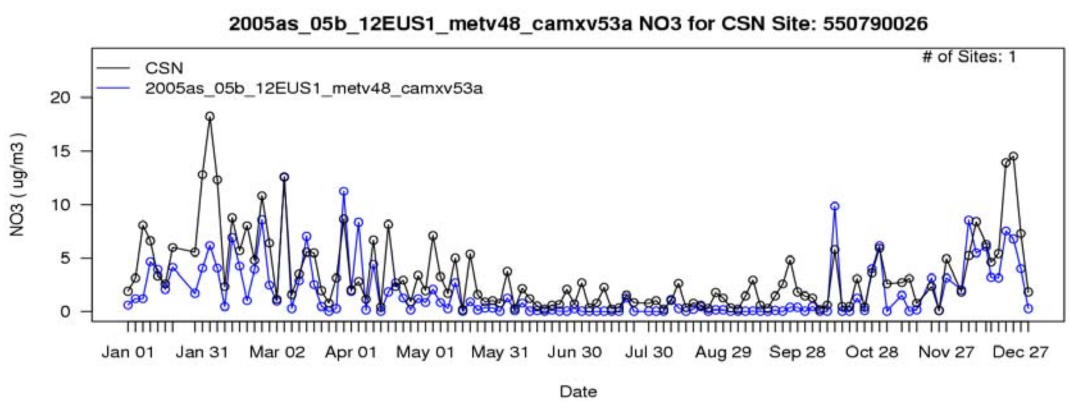

Figure A-25x. Time series of observed (black) and predicted (blue) 24-hour average nitrate for 2005 at site 550790026 in Milwaukee County, WI.

A.3.3. Evaluation for Ammonium

The model performance bias and error statistics for ammonium for each subregion and each season are provided in Table A-7. These statistics indicate model bias for ammonium is generally ± 40 percent or less for all seasons in each subregion. During the summer, there is slight under prediction with a low bias smaller than 10 percent, on average across the subregions for urban locations. In other times of the year ammonium tends to be somewhat over predicted with a bias of 19 percent, on average across the subregions for urban locations. There is not a large variation from subregion to subregion or at urban versus rural sites in the error statistics for ammonium.

Table A-7. Ammonium performance statistics by subregion, by season for the 2005 CAMx model simulation.

Region	Network	Season	No. of Obs.	NMB (%)	NME (%)	FB (%)	FE (%)
CENRAP	CSN	Winter	862	26.7	51.0	25.9	47.1
		Spring	884	-2.1	41.7	1.4	48.0
		Summer	758	-11.1	44.0	-15.0	58.4
		Fall	580	33.8	59.5	31.8	52.9
	CASTNet	Winter	72	37.7	44.1	32.4	37.6
		Spring	76	14.4	35.6	14.0	35.2
		Summer	72	-1.8	32.0	0.6	39.5
		Fall	76	39.0	56.6	37.9	50.9
MWRPO	CSN	Winter	618	15.5	40.8	9.7	35.1
		Spring	633	17.3	42.6	26.4	42.8
		Summer	616	0.3	37.0	19.2	44.8
		Fall	628	17.7	38.7	25.1	40.0
	CASTNet	Winter	140	7.8	22.6	10.0	22.5
		Spring	156	30.2	38.7	30.5	36.1
		Summer	162	-3.7	26.8	2.1	26.8
		Fall	157	31.1	39.9	30.2	36.2
VISTAS	CSN	Winter	963	21.4	46.1	17.9	42.0
		Spring	969	5.0	33.8	9.4	36.0
		Summer	914	-10.8	35.9	-5.8	42.0
		Fall	977	22.9	40.1	24.1	39.0
	CASTNet	Winter	380	21.1	29.6	16.7	26.3

Region	Network	Season	No. of Obs.	NMB (%)	NME (%)	FB (%)	FE (%)
		Spring	375	-6.0	26.8	-6.2	29.8
		Summer	364	-29.0	33.7	-42.4	47.0
		Fall	351	18.3	31.1	18.0	31.6
MANEVU	CSN	Winter	872	6.7	35.7	10.9	35.4
		Spring	881	26.0	45.8	35.8	49.3
		Summer	884	-7.6	36.9	17.0	47.2
		Fall	861	32.0	51.5	39.0	52.6
	CASTNet	Winter	195	34.8	42.6	35.7	40.4
		Spring	199	23.9	38.4	29.7	38.6
		Summer	197	-15.8	27.0	-9.1	27.9
		Fall	195	50.2	53.7	46.3	48.1

A.3.4. Evaluation for Elemental Carbon

The model performance bias and error statistics for elemental carbon for each subregion and each season are provided in Table A-8. The statistics show clear over prediction at urban sites in all subregions. For example, NMBs are greater than 100 percent at urban sites in the Midwest, Northeast, and Central subregions with only slightly less over prediction at urban sites in the Southeast. Rural sites show much less over prediction than at urban sites with under prediction in the spring and summer at rural sites in the Southeast and Central subregions. In addition, the predictions for urban sites have greater error than the predictions for rural locations.

Table A-8. Elemental Carbon performance statistics by subregion, by season for the 2005 CAMx model simulation.

Subregion	Network	Season	No. of Obs.	NMB (%)	NME (%)	FB (%)	FE (%)
CENRAP	CSN	Winter	939	163.0	179.0	76.4	87.3
		Spring	913	105.0	127.0	50.5	76.2
		Summer	780	162.0	173.0	63.9	86.5
		Fall	615	112.0	139.0	69.0	79.9
	IMPROVE	Winter	624	54.0	80.9	38.4	55.7
		Spring	735	-20.3	45.8	-16.3	47.6
		Summer	653	-9.6	39.2	-11.0	41.9
		Fall	614	2.9	34.8	10.3	38.0
MWRPO	CSN	Winter	621	152.0	167.0	81.3	85.4

Subregion	Network	Season	No. of Obs.	NMB (%)	NME (%)	FB (%)	FE (%)
		Spring	634	76.6	92.2	58.0	66.8
		Summer	618	73.7	83.1	52.2	60.6
		Fall	629	111.0	125.0	66.4	73.8
	IMPROVE	Winter	202	108.0	114.0	47.3	59.5
		Spring	188	15.4	44.2	-1.2	37.5
		Summer	163	1.1	37.1	-12.7	34.9
		Fall	143	26.5	38.5	28.2	42.3
VISTAS	CSN	Winter	959	84.5	95.3	57.1	64.1
		Spring	968	49.2	74.3	43.7	60.2
		Summer	910	66.5	84.4	54.0	67.0
		Fall	981	33.6	61.2	33.4	52.9
	IMPROVE	Winter	515	17.7	55.0	19.3	50.2
		Spring	526	-25.5	45.0	-25.3	46.4
		Summer	495	-19.8	39.6	-29.7	51.3
		Fall	459	-4.0	38.5	8.2	41.3
MANEVU	CSN	Winter	870	132.0	139.0	71.8	75.5
		Spring	868	124.0	139.0	73.3	80.1
		Summer	879	95.6	114.0	62.2	70.0
		Fall	862	98.4	117.0	60.2	68.7
	IMPROVE	Winter	622	77.6	95.9	46.0	63.4
		Spring	650	32.0	61.5	19.7	50.2
		Summer	565	14.5	46.9	0.6	39.7
		Fall	611	75.4	88.4	43.9	58.7

A.3.5. Evaluation for Organic Carbon

The model performance bias and error statistics for organic carbon for each subregion and each season are provided in Table A-9. The statistics in this table indicate a tendency for the modeling platform to somewhat under predict observed organic carbon concentrations during the spring and summer at urban locations with an NMB of -15 percent, on average at urban locations across the four subregions. In contrast, during the winter organic carbon is somewhat over predicted with an average NMB of 27 percent at urban locations. Organic carbon at rural locations in the spring and summer tends to be slightly under predicted in some subregions and over predicted in others with NMBs generally within ± 30 percent. At rural locations in the winter organic carbon is generally under predicted with NMBs generally smaller than -20 percent.

Table A-9. Organic Carbon performance statistics by subregion, by season for the 2005 CAMx model simulation.

Region	Network	Season	No. of Obs.	NMB (%)	NME (%)	FB (%)	FE (%)
CENRAP	CSN	Winter	607	23.9	68.8	32.9	64.4
		Spring	620	-27.8	39.3	-27.6	47.9
		Summer	557	-4.1	34.7	-4.3	41.3
		Fall	476	-7.8	47.4	2.3	51.9
	IMPROVE	Winter	624	18.8	65.0	18.0	50.0
		Spring	734	-21.8	35.8	-17.0	39.2
		Summer	651	16.3	34.4	14.1	34.5
		Fall	613	-20.8	39.3	-13.1	40.8
MWRPO	CSN	Winter	574	33.3	61.1	45.0	61.0
		Spring	618	-27.9	39.0	-17.7	44.1
		Summer	616	-13.8	33.3	-11.8	38.6
		Fall	577	8.4	53.7	24.2	58.4
	IMPROVE	Winter	202	37.1	53.4	26.2	45.1
		Spring	188	-8.7	27.4	-7.6	27.8
		Summer	163	8.1	40.7	10.8	34.2
		Fall	142	1.9	37.4	14.6	41.9
VISTAS	CSN	Winter	931	0.1	48.7	14.3	51.2
		Spring	963	-33.2	40.1	-32.0	47.4
		Summer	902	-8.2	31.0	-7.2	35.8
		Fall	951	-26.2	45.2	-16.0	52.4
	IMPROVE	Winter	514	-5.8	43.2	-1.1	44.3
		Spring	525	-27.3	39.4	-24.4	38.9
		Summer	495	15.4	39.6	3.4	38.9
		Fall	459	-17.4	35.8	-12.6	40.6
MANEVU	CSN	Winter	831	52.0	76.5	46.2	62.9
		Spring	833	-0.6	49.3	8.5	51.4
		Summer	877	-8.0	34.2	-5.8	37.8
		Fall	786	36.1	66.6	43.0	63.9
	IMPROVE	Winter	621	69.9	85.3	45.0	58.0
		Spring	649	0.2	40.9	8.2	39.1

Region	Network	Season	No. of Obs.	NMB (%)	NME (%)	FB (%)	FE (%)
		Summer	565	15.3	37.0	13.9	33.4
		Fall	608	73.6	83.9	48.2	57.3

A.3.6. Evaluation for Crustal Material

The model performance bias and error statistics for crustal material for each subregion and each season are provided in Table A-10. As indicated by the performance statistics in this table, the modeling platform over predicts observed concentrations at urban and rural sites in each season for all four subregions. The magnitude of the over prediction is quite large with NMBs that exceed 100 percent.

Table A-10. Crustal Material performance statistics by subregion, by season for the 2005 CAMx model simulation

Region	Network	Season	No. of Obs.	NMB (%)	NME (%)	FB (%)	FE (%)
CENRAP	CSN	Winter	861	735.0	761.0	153.0	157.0
		Spring	874	212.0	261.0	98.4	119.0
		Summer	758	196.0	256.0	99.9	127.0
		Fall	578	394.0	426.0	136.0	142.0
	IMPROVE	Winter	683	554.0	582.0	129.0	139.0
		Spring	742	66.0	109.0	43.1	76.1
		Summer	673	53.0	116.0	51.8	85.9
		Fall	672	204.0	229.0	100.0	110.0
MWRPO	CSN	Winter	619	935.0	937.0	161.0	162.0
		Spring	634	439.0	442.0	134.0	135.0
		Summer	612	466.0	477.0	138.0	140.0
		Fall	625	632.0	643.0	150.0	151.0
	IMPROVE	Winter	174	957.0	958.0	151.0	153.0
		Spring	183	280.0	280.0	105.0	108.0
		Summer	159	343.0	351.0	110.0	117.0
		Fall	152	662.0	662.0	141.0	143.0
VISTAS	CSN	Winter	963	897.0	906.0	159.0	160.0
		Spring	964	378.0	398.0	120.0	126.0

Region	Network	Season	No. of Obs.	NMB (%)	NME (%)	FB (%)	FE (%)
		Summer	923	339.0	372.0	116.0	127.0
		Fall	979	641.0	642.0	145.0	145.0
	IMPROVE	Winter	471	772.0	779.0	148.0	152.0
		Spring	519	176.0	216.0	76.8	101.0
		Summer	503	129.0	208.0	70.0	112.0
		Fall	471	539.0	542.0	138.0	141.0
MANEVU	CSN	Winter	863	1030.0	1030.0	165.0	165.0
		Spring	877	496.0	499.0	139.0	140.0
		Summer	880	517.0	519.0	142.0	143.0
		Fall	859	841.0	841.0	157.0	157.0
	IMPROVE	Winter	661	886.0	890.0	155.0	156.0
		Spring	686	349.0	355.0	116.0	121.0
		Summer	613	365.0	369.0	122.0	123.0
		Fall	623	843.0	844.0	155.0	156.0

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Appendix B

2003-2007 Base Period and Projected 2012 and 2014 Design Values for Monitoring Sites in the Eastern Modeling Domain

The tables in this appendix provide the 5-year weighted average and maximum design values for 8-hour ozone, annual PM2.5, and 24-hour PM2.5 for monitoring sites in the 12 km Eastern U.S. modeling domain[1]. Design values are provided for the 2003-2007 base period, 2012 base case, 2014 base case, and 2014 remedy scenario.

Also included in this appendix are tables of the differences (i.e., increases and decreases) by site in average design values between the 2014 remedy scenario and both the 2012 base case and 2014 base case. Note that increases and decreases reported as ± 0.1 ppb for ozone, ± 0.01 µg/m^3 for annual PM2.5, and ± 0.1 µg/m^3 for 24-hour PM2.5 may overstate the actual difference in concentrations because the design value concentrations are truncated before the differences are calculated.

[1] Design values are provided for those sites which meet the data completeness and projection criteria described in Section III of the TSD.

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			8-Hour Ozone (ppb)							
Monitor ID	**State**	**County**	**2003-2007 Average Ambient Values**	**2003-2007 Maximum Ambient Values**	**2012 Base Case Average Values**	**2012 Base Case Maximum Values**	**2014 Base Case Average Values**	**2014 Base Case Maximum Values**	**2014 Remedy Average Values**	**2014 Remedy Maximum Values**
010030010	Alabama	Baldwin	77.3	78.0	69.6	70.2	67.6	68.2	67.4	68.0
010270001	Alabama	Clay	74.0	76.0	63.8	65.5	61.2	62.8	60.9	62.5
010331002	Alabama	Colbert	72.0	74.0	64.0	65.8	62.3	64.0	61.5	63.2
010510001	Alabama	Elmore	70.7	71.0	62.2	62.5	60.1	60.4	59.9	60.1
010550011	Alabama	Etowah	71.7	73.0	61.8	63.0	59.8	60.8	59.5	60.5
010730023	Alabama	Jefferson	78.7	86.0	68.7	75.0	66.4	72.5	66.1	72.3
010731003	Alabama	Jefferson	79.0	84.0	68.2	72.5	65.9	70.1	65.7	69.9
010731005	Alabama	Jefferson	81.0	86.0	70.0	74.3	67.3	71.5	67.1	71.2
010731009	Alabama	Jefferson	77.0	82.0	66.2	70.5	64.1	68.2	63.7	67.8
010731010	Alabama	Jefferson	73.0	75.0	62.5	64.2	60.2	61.8	60.0	61.6
010732006	Alabama	Jefferson	83.7	89.0	72.9	77.5	70.3	74.7	70.1	74.5
010735002	Alabama	Jefferson	74.0	77.0	64.9	67.5	63.1	65.6	62.8	65.4
010735003	Alabama	Jefferson	77.0	82.0	66.9	71.2	64.9	69.1	64.6	68.8
010736002	Alabama	Jefferson	81.3	89.0	71.7	78.4	69.6	76.1	69.3	75.9
010790002	Alabama	Lawrence	72.0	74.0	63.7	65.4	61.6	63.4	61.5	63.2
010890014	Alabama	Madison	77.3	78.0	68.0	68.7	65.5	66.1	65.4	66.0
010970003	Alabama	Mobile	76.7	78.0	69.2	70.4	67.5	68.6	67.1	68.2
010972005	Alabama	Mobile	76.7	77.0	69.1	69.4	67.2	67.5	67.0	67.2
011011002	Alabama	Montgomery	69.3	74.0	60.4	64.5	58.3	62.2	58.0	62.0
011030011	Alabama	Morgan	77.3	79.0	69.3	70.8	67.4	68.9	67.2	68.7
011130002	Alabama	Russell	71.3	75.0	64.6	68.0	62.2	65.5	62.1	65.4
011170004	Alabama	Shelby	85.7	88.0	74.1	76.1	71.3	73.2	71.1	73.0
011190002	Alabama	Sumter	64.0	66.0	57.5	59.3	58.0	59.8	57.9	59.7
011210003	Alabama	Talladega	72.0	72.0	62.4	62.4	60.5	60.5	60.0	60.0
011250010	Alabama	Tuscaloosa	73.3	77.0	63.6	66.8	61.3	64.4	61.0	64.1

			8-Hour Ozone (ppb)							
Monitor ID	**State**	**County**	**2003-2007 Average Ambient Values**	**2003-2007 Maximum Ambient Values**	**2012 Base Case Average Values**	**2012 Base Case Maximum Values**	**2014 Base Case Average Values**	**2014 Base Case Maximum Values**	**2014 Remedy Average Values**	**2014 Remedy Maximum Values**
050350005	Arkansas	Crittenden	87.3	89.0	77.1	78.6	74.4	75.9	74.4	75.8
051190007	Arkansas	Pulaski	78.3	80.0	67.9	69.4	65.5	66.9	65.5	66.9
051191002	Arkansas	Pulaski	79.7	83.0	69.5	72.4	67.2	69.9	67.1	69.9
051191005	Arkansas	Pulaski	74.0	75.0	64.4	65.2	62.1	62.9	62.0	62.9
080013001	Colorado	Adams	69.0	70.0	65.1	66.1	64.1	65.1	64.1	65.1
080050002	Colorado	Arapahoe	78.7	81.0	73.8	75.9	72.5	74.6	72.5	74.6
080130011	Colorado	Boulder	77.0	81.0	71.8	75.5	70.4	74.0	70.4	74.0
080310014	Colorado	Denver	73.0	75.0	68.9	70.8	67.8	69.7	67.9	69.7
080350004	Colorado	Douglas	83.7	85.0	78.8	80.0	77.5	78.7	77.5	78.7
080590002	Colorado	Jefferson	76.3	79.0	72.5	75.1	71.5	74.0	71.5	74.0
080590005	Colorado	Jefferson	70.3	75.0	66.4	70.8	65.4	69.8	65.4	69.8
080590006	Colorado	Jefferson	81.7	85.0	76.7	79.8	75.4	78.4	75.4	78.4
080590011	Colorado	Jefferson	80.7	82.0	76.7	77.9	75.6	76.8	75.6	76.8
080690007	Colorado	Larimer	76.0	78.0	70.5	72.3	68.7	70.5	68.7	70.5
080691004	Colorado	Larimer	72.3	74.0	66.7	68.3	65.2	66.7	65.2	66.7
081230009	Colorado	Weld	76.7	78.0	71.5	72.7	70.1	71.3	70.1	71.3
090010017	Connecticut	Fairfield	88.0	90.0	81.1	82.9	79.5	81.3	79.4	81.2
090011123	Connecticut	Fairfield	92.3	94.0	83.9	85.5	82.0	83.5	81.8	83.3
090013007	Connecticut	Fairfield	90.0	92.0	82.9	84.7	81.4	83.2	81.3	83.1
090019003	Connecticut	Fairfield	87.7	89.0	80.9	82.1	79.4	80.6	79.3	80.5
090031003	Connecticut	Hartford	84.3	90.0	74.3	79.3	72.3	77.2	72.1	77.0
090050005	Connecticut	Litchfield	87.7	89.0	78.2	79.4	76.1	77.2	76.0	77.1
090070007	Connecticut	Middlesex	90.3	92.0	80.9	82.4	78.9	80.4	78.8	80.3
090090027	Connecticut	New Haven	79.3	81.0	72.8	74.4	71.5	73.0	71.4	72.9
090093002	Connecticut	New Haven	90.3	93.0	82.7	85.1	81.0	83.4	80.9	83.3
090110008	Connecticut	New London	85.3	88.0	76.7	79.2	74.9	77.3	74.8	77.2

			8-Hour Ozone (ppb)							
Monitor ID	State	County	2003-2007 Average Ambient Values	2003-2007 Maximum Ambient Values	2012 Base Case Average Values	2012 Base Case Maximum Values	2014 Base Case Average Values	2014 Base Case Maximum Values	2014 Remedy Average Values	2014 Remedy Maximum Values
090131001	Connecticut	Tolland	88.7	91.0	78.4	80.5	76.3	78.3	76.2	78.1
100010002	Delaware	Kent	80.3	81.0	71.2	71.8	69.0	69.6	68.9	69.5
100031007	Delaware	New Castle	80.0	82.0	70.3	72.0	68.1	69.8	68.0	69.7
100031010	Delaware	New Castle	82.3	83.0	73.6	74.2	71.6	72.2	71.5	72.1
100031013	Delaware	New Castle	81.3	82.0	72.1	72.7	69.9	70.5	69.7	70.3
100051002	Delaware	Sussex	81.3	82.0	71.2	71.8	69.0	69.6	68.9	69.5
100051003	Delaware	Sussex	82.7	84.0	74.1	75.2	72.2	73.4	72.1	73.3
110010025	D.C.	Washington	79.7	81.0	72.7	73.9	70.9	72.1	70.8	71.9
110010041	D.C.	Washington	80.3	85.0	72.9	77.2	71.1	75.3	70.9	75.0
110010043	D.C.	Washington	84.7	87.0	76.9	79.0	75.0	77.0	74.8	76.8
120010025	Florida	Alachua	72.0	72.0	62.3	62.3	60.5	60.5	59.3	59.3
120030002	Florida	Baker	68.7	70.0	59.7	60.8	57.7	58.8	57.1	58.2
120050006	Florida	Bay	78.7	81.0	69.6	71.6	67.9	69.9	66.7	68.6
120090007	Florida	Brevard	69.0	69.0	61.9	61.9	60.5	60.5	60.3	60.3
120094001	Florida	Brevard	71.3	72.0	63.7	64.4	62.3	63.0	62.1	62.7
120112003	Florida	Broward	61.3	63.0	56.9	58.5	55.9	57.5	55.7	57.2
120118002	Florida	Broward	65.0	67.0	60.8	62.7	59.8	61.7	59.6	61.4
120210004	Florida	Collier	68.3	69.0	59.2	59.8	57.2	57.8	57.1	57.7
120310077	Florida	Duval	77.0	77.0	69.1	69.1	67.9	67.9	64.3	64.3
120310100	Florida	Duval	77.7	79.0	69.7	70.8	68.2	69.3	65.3	66.4
120330004	Florida	Escambia	79.7	81.0	72.4	73.6	71.0	72.2	69.6	70.7
120330018	Florida	Escambia	82.7	83.0	73.8	74.0	71.9	72.2	70.3	70.6
120330024	Florida	Escambia	80.7	81.0	72.0	72.3	70.2	70.4	68.6	68.9
120570081	Florida	Hillsborough	78.7	80.0	73.6	74.9	72.1	73.3	72.0	73.2
120570110	Florida	Hillsborough	76.0	76.0	67.4	67.4	65.8	65.8	65.7	65.7
120571035	Florida	Hillsborough	74.0	76.0	69.3	71.2	67.9	69.8	67.7	69.6

			8-Hour Ozone (ppb)							
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120571065	Florida	Hillsborough	80.7	81.0	76.6	76.9	75.1	75.4	74.9	75.1
120573002	Florida	Hillsborough	77.5	78.0	70.0	70.4	68.4	68.8	68.2	68.6
120574004	Florida	Hillsborough	74.0	74.0	66.4	66.4	64.7	64.7	64.4	64.4
120690002	Florida	Lake	76.7	77.0	68.8	69.1	66.9	67.1	66.7	67.0
120712002	Florida	Lee	70.3	72.0	62.0	63.5	60.1	61.6	60.0	61.5
120713002	Florida	Lee	70.3	71.0	61.5	62.1	59.5	60.1	59.3	59.9
120730012	Florida	Leon	70.0	70.0	60.8	60.8	58.3	58.3	58.2	58.2
120730013	Florida	Leon	71.0	72.0	61.6	62.5	58.9	59.8	58.8	59.7
120813002	Florida	Manatee	77.3	79.0	69.9	71.5	68.3	69.8	68.1	69.6
120814012	Florida	Manatee	76.3	77.0	67.4	68.0	65.6	66.2	65.5	66.1
120814013	Florida	Manatee	72.7	73.0	64.4	64.6	62.7	63.0	62.6	62.8
120830003	Florida	Marion	71.7	72.0	62.6	62.8	60.7	60.9	59.7	59.9
120830004	Florida	Marion	73.0	73.0	63.2	63.2	61.3	61.3	60.3	60.3
120950008	Florida	Orange	79.3	81.0	72.0	73.6	70.5	72.0	70.4	71.9
120952002	Florida	Orange	79.3	80.0	72.3	72.9	70.5	71.1	70.4	71.0
120972002	Florida	Osceola	72.0	73.0	64.4	65.3	62.7	63.5	62.4	63.2
120990020	Florida	Palm Beach	65.0	65.0	59.7	59.7	58.6	58.6	58.4	58.4
121010005	Florida	Pasco	76.3	77.0	67.0	67.6	66.0	66.6	64.9	65.5
121012001	Florida	Pasco	73.3	75.0	64.7	66.2	63.4	64.8	62.1	63.6
121030004	Florida	Pinellas	72.3	73.0	64.7	65.3	63.2	63.8	62.8	63.4
121030018	Florida	Pinellas	69.7	71.0	61.7	62.9	60.2	61.3	60.0	61.1
121035002	Florida	Pinellas	72.7	74.0	65.1	66.3	63.8	64.9	63.2	64.4
121056005	Florida	Polk	73.3	75.0	65.6	67.1	64.1	65.6	62.9	64.4
121056006	Florida	Polk	74.7	75.0	66.4	66.7	65.0	65.2	63.6	63.9
121111002	Florida	St Lucie	66.5	68.0	59.7	61.1	58.3	59.7	58.0	59.3
121130015	Florida	Santa Rosa	80.0	80.0	71.9	71.9	70.1	70.1	68.9	68.9

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121151005	Florida	Sarasota	77.3	78.0	67.3	68.0	65.4	66.0	65.3	65.9
121151006	Florida	Sarasota	73.3	74.0	64.4	65.0	62.5	63.1	62.5	63.1
121152002	Florida	Sarasota	73.5	74.0	64.0	64.5	62.2	62.6	62.0	62.4
121171002	Florida	Seminole	76.0	77.0	68.8	69.7	66.9	67.8	66.8	67.7
121272001	Florida	Volusia	68.3	69.0	59.6	60.2	57.6	58.2	57.3	57.9
121275002	Florida	Volusia	68.3	69.0	59.3	59.9	57.3	57.9	57.1	57.7
121290001	Florida	Wakulla	71.3	74.0	63.1	65.4	61.1	63.4	60.9	63.2
130210012	Georgia	Bibb	81.0	83.0	71.2	73.0	66.5	68.2	66.4	68.0
130210013	Georgia	Bibb	81.0	81.0	71.5	71.5	67.0	67.0	66.8	66.8
130510021	Georgia	Chatham	68.3	69.0	61.7	62.4	59.8	60.5	59.0	59.7
130550001	Georgia	Chattooga	75.0	76.0	64.9	65.7	62.5	63.3	62.3	63.2
130590002	Georgia	Clarke	80.7	83.0	68.9	70.8	65.8	67.6	65.6	67.5
130670003	Georgia	Cobb	82.7	87.0	72.5	76.2	69.7	73.3	69.6	73.2
130730001	Georgia	Columbia	73.0	73.0	64.0	64.0	61.3	61.3	61.2	61.2
130770002	Georgia	Coweta	82.0	85.0	71.9	74.6	68.4	70.9	68.2	70.7
130850001	Georgia	Dawson	76.3	79.0	66.3	68.6	63.5	65.8	63.5	65.7
130890002	Georgia	De Kalb	88.7	93.0	79.9	83.7	77.5	81.2	77.3	81.1
130893001	Georgia	De Kalb	87.5	88.0	79.5	80.0	77.7	78.2	77.6	78.0
130970004	Georgia	Douglas	87.3	90.0	76.8	79.2	73.8	76.1	73.7	76.0
131130001	Georgia	Fayette	85.7	89.0	76.2	79.1	73.5	76.3	73.4	76.2
131210055	Georgia	Fulton	91.7	94.0	82.6	84.6	80.1	82.1	80.0	82.0
131270006	Georgia	Glynn	67.0	68.0	59.4	60.3	58.0	58.9	56.4	57.2
131350002	Georgia	Gwinnett	88.7	90.0	78.0	79.2	74.8	75.9	74.6	75.7
131510002	Georgia	Henry	89.7	95.0	78.9	83.6	75.8	80.3	75.7	80.1
132130003	Georgia	Murray	78.0	79.0	68.2	69.1	65.6	66.4	65.4	66.3
132150008	Georgia	Muscogee	75.7	80.0	66.6	70.4	63.8	67.4	63.7	67.3

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132151003	Georgia	Muscogee	70.7	73.0	62.1	64.1	59.5	61.4	59.4	61.3
132230003	Georgia	Paulding	80.3	83.0	68.1	70.4	65.4	67.6	65.3	67.5
132450091	Georgia	Richmond	80.3	81.0	70.2	70.8	67.4	68.0	67.3	67.9
132470001	Georgia	Rockdale	90.0	95.0	78.3	82.7	74.7	78.9	74.6	78.8
132611001	Georgia	Sumter	72.3	74.0	64.1	65.6	61.4	62.8	61.3	62.8
170010006	Illinois	Adams	70.0	70.0	63.8	63.8	62.7	62.7	62.3	62.3
170190004	Illinois	Champaign	68.3	70.0	61.7	63.3	60.5	62.0	60.3	61.8
170230001	Illinois	Clark	66.0	66.0	59.2	59.2	57.8	57.8	57.7	57.7
170310001	Illinois	Cook	77.3	82.0	72.2	76.6	71.1	75.4	71.0	75.3
170310032	Illinois	Cook	74.3	77.0	68.9	71.4	67.8	70.3	67.6	70.1
170310064	Illinois	Cook	71.3	77.0	66.1	71.4	65.1	70.3	64.9	70.1
170310072	Illinois	Cook	71.0	73.0	66.3	68.2	65.5	67.4	65.4	67.2
170310076	Illinois	Cook	77.0	79.0	72.3	74.2	71.3	73.2	71.2	73.1
170311003	Illinois	Cook	76.3	79.0	72.2	74.7	71.3	73.8	71.1	73.7
170311601	Illinois	Cook	76.7	80.0	71.7	74.8	70.6	73.6	70.6	73.6
170314002	Illinois	Cook	66.3	68.0	63.4	65.0	62.9	64.5	62.8	64.4
170314007	Illinois	Cook	71.7	74.0	66.9	69.0	65.8	67.9	65.7	67.8
170314201	Illinois	Cook	74.3	76.0	69.3	70.9	68.2	69.8	68.1	69.6
170317002	Illinois	Cook	77.7	79.0	72.9	74.1	71.9	73.2	71.8	73.0
170436001	Illinois	Du Page	69.0	70.0	65.1	66.1	64.3	65.3	64.3	65.2
170491001	Illinois	Effingham	70.0	72.0	63.4	65.2	61.7	63.5	61.6	63.3
170650002	Illinois	Hamilton	73.0	73.0	66.3	66.3	64.7	64.7	64.7	64.7
170831001	Illinois	Jersey	78.7	80.0	70.5	71.7	68.3	69.5	68.1	69.2
170890005	Illinois	Kane	74.3	77.0	68.0	70.5	66.5	68.9	66.4	68.8
170971002	Illinois	Lake	76.7	79.0	71.9	74.1	70.9	73.0	70.7	72.8
170971007	Illinois	Lake	78.0	79.0	73.1	74.1	72.1	73.0	71.9	72.8

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171110001	Illinois	McHenry	73.3	78.0	66.8	71.0	65.2	69.4	65.1	69.2
171132003	Illinois	McLean	73.0	74.0	65.3	66.2	63.9	64.8	63.8	64.6
171150013	Illinois	Macon	71.3	74.0	64.7	67.2	63.5	65.9	63.4	65.8
171170002	Illinois	Macoupin	73.0	74.0	64.4	65.3	62.4	63.3	62.2	63.0
171190008	Illinois	Madison	82.7	84.0	74.7	75.9	72.6	73.7	72.3	73.5
171191009	Illinois	Madison	83.0	84.0	75.7	76.6	73.8	74.7	73.5	74.4
171193007	Illinois	Madison	81.0	83.0	73.2	75.0	71.1	72.9	70.8	72.6
171430024	Illinois	Peoria	68.3	71.0	61.4	63.9	60.3	62.7	60.0	62.3
171431001	Illinois	Peoria	72.7	76.0	65.4	68.4	64.2	67.1	63.8	66.7
171570001	Illinois	Randolph	72.0	75.0	65.8	68.5	64.6	67.3	64.6	67.3
171613002	Illinois	Rock Island	65.3	68.0	59.5	62.0	58.2	60.6	57.9	60.3
171630010	Illinois	St Clair	81.7	82.0	75.5	75.8	73.7	74.0	73.4	73.7
171670010	Illinois	Sangamon	70.0	71.0	61.6	62.5	60.5	61.3	60.4	61.2
171971011	Illinois	Will	71.7	72.0	66.0	66.2	64.7	65.0	64.6	64.9
172010009	Illinois	Winnebago	69.0	71.0	61.9	63.7	60.4	62.2	60.2	62.0
172012001	Illinois	Winnebago	68.3	70.0	61.3	62.8	59.8	61.3	59.6	61.1
180030002	Indiana	Allen	79.3	83.0	71.4	74.7	69.8	73.0	69.6	72.9
180030004	Indiana	Allen	74.3	76.0	66.8	68.4	65.3	66.8	65.2	66.7
180110001	Indiana	Boone	79.7	81.0	72.2	73.4	70.5	71.7	70.1	71.2
180150002	Indiana	Carroll	74.0	75.0	66.4	67.3	64.9	65.7	64.7	65.5
180190008	Indiana	Clark	80.3	83.0	72.1	74.5	70.0	72.4	69.6	72.0
180350010	Indiana	Delaware	76.3	78.0	67.9	69.5	66.2	67.7	65.9	67.4
180390007	Indiana	Elkhart	79.0	83.0	70.8	74.4	69.2	72.7	69.0	72.5
180431004	Indiana	Floyd	77.7	79.0	71.0	72.2	69.3	70.5	68.9	70.0
180550001	Indiana	Greene	78.3	80.0	70.1	71.6	68.4	69.9	68.1	69.6
180570005	Indiana	Hamilton	82.7	87.0	75.0	78.9	73.3	77.1	72.8	76.6

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180590003	Indiana	Hancock	78.0	81.0	70.6	73.4	69.0	71.6	68.5	71.1
180630004	Indiana	Hendricks	75.3	76.0	68.2	68.9	66.8	67.4	66.3	66.9
180690002	Indiana	Huntington	75.0	76.0	67.6	68.5	66.0	66.9	65.9	66.8
180710001	Indiana	Jackson	74.7	76.0	66.6	67.7	65.0	66.2	64.7	65.8
180810002	Indiana	Johnson	76.7	78.0	69.6	70.7	68.2	69.3	67.8	68.9
180890022	Indiana	Lake	77.7	82.0	72.1	76.1	71.2	75.1	70.9	74.8
180890030	Indiana	Lake	81.0	85.0	75.8	79.5	74.9	78.5	74.7	78.4
180892008	Indiana	Lake	77.7	79.0	72.7	73.9	71.8	73.0	71.7	72.9
180910005	Indiana	La Porte	77.0	78.0	71.2	72.1	70.1	71.0	69.9	70.8
180910010	Indiana	La Porte	78.5	79.0	71.5	71.9	70.2	70.7	69.9	70.3
180950010	Indiana	Madison	76.7	80.0	68.8	71.8	67.1	70.0	66.8	69.6
180970042	Indiana	Marion	72.7	76.0	66.7	69.7	65.4	68.4	64.9	67.9
180970050	Indiana	Marion	78.7	81.0	72.2	74.3	70.7	72.8	70.3	72.3
180970057	Indiana	Marion	75.0	77.0	69.1	70.9	67.8	69.6	67.4	69.2
180970073	Indiana	Marion	75.7	77.0	69.3	70.5	67.9	69.1	67.5	68.7
181090005	Indiana	Morgan	77.0	79.0	69.9	71.7	68.4	70.2	67.8	69.6
181230009	Indiana	Perry	81.0	81.0	75.1	75.1	73.1	73.1	72.6	72.6
181270024	Indiana	Porter	78.3	81.0	71.9	74.4	70.9	73.3	70.6	73.1
181270026	Indiana	Porter	75.3	77.0	68.4	69.9	67.1	68.6	66.9	68.4
181290003	Indiana	Posey	71.7	75.0	64.9	67.9	63.2	66.1	62.9	65.8
181410010	Indiana	St Joseph	74.7	77.0	67.8	69.9	66.5	68.5	66.3	68.3
181410015	Indiana	St Joseph	75.0	79.0	67.1	70.7	65.7	69.2	65.5	69.0
181411007	Indiana	St Joseph	79.3	82.0	71.0	73.4	69.5	71.9	69.3	71.6
181450001	Indiana	Shelby	77.3	80.0	70.9	73.4	69.6	72.0	69.1	71.5
181630013	Indiana	Vanderburgh	67.7	75.0	61.1	67.7	59.5	65.9	59.3	65.7
181630021	Indiana	Vanderburgh	77.3	80.0	70.4	72.8	68.5	70.9	68.3	70.6

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181670018	Indiana	Vigo	63.0	67.0	56.0	59.5	55.1	58.6	54.6	58.0
181670024	Indiana	Vigo	74.0	76.0	65.5	67.2	64.6	66.4	63.9	65.6
181730008	Indiana	Warrick	77.7	80.0	71.3	73.4	69.6	71.6	69.2	71.3
181730009	Indiana	Warrick	72.7	75.0	65.3	67.4	63.6	65.7	63.3	65.3
181730011	Indiana	Warrick	76.7	77.0	70.6	70.8	68.7	69.0	68.5	68.7
190450021	Iowa	Clinton	71.3	73.0	64.1	65.6	62.6	64.1	62.2	63.7
190851101	Iowa	Harrison	74.7	75.0	67.6	67.8	65.9	66.1	64.5	64.8
191130028	Iowa	Linn	67.7	71.0	60.9	63.9	59.5	62.5	59.2	62.0
191530058	Iowa	Polk	63.0	66.0	56.9	59.6	55.6	58.2	55.3	57.9
191630014	Iowa	Scott	70.3	74.0	63.4	66.8	61.8	65.0	61.5	64.8
191632011	Iowa	Scott	72.0	72.0	65.0	65.0	63.4	63.4	63.1	63.1
191690011	Iowa	Story	61.0	66.0	54.9	59.4	53.7	58.1	53.5	57.9
200450004	Kansas	Douglas	73.0	73.0	65.3	65.3	63.8	63.8	62.9	62.9
200910010	Kansas	Johnson	75.3	76.0	67.9	68.5	66.2	66.8	65.6	66.2
201030003	Kansas	Leavenworth	75.0	77.0	67.4	69.1	65.8	67.5	65.1	66.9
201070002	Kansas	Linn	73.3	74.0	64.8	65.4	63.3	63.9	62.2	62.8
201730001	Kansas	Sedgwick	64.3	66.0	57.2	58.7	55.5	57.0	55.2	56.7
202090021	Kansas	Wyandotte	75.3	77.0	68.7	70.3	67.2	68.7	66.7	68.2
210130002	Kentucky	Bell	71.7	74.0	62.0	64.0	60.0	61.9	59.9	61.8
210150003	Kentucky	Boone	75.7	77.0	68.1	69.3	66.1	67.3	65.8	66.9
210190017	Kentucky	Boyd	77.3	79.0	69.7	71.3	68.2	69.7	68.0	69.5
210290006	Kentucky	Bullitt	74.0	76.0	67.7	69.5	66.0	67.8	65.4	67.2
210370003	Kentucky	Campbell	83.0	83.0	76.5	76.5	74.8	74.8	73.8	73.8
210430500	Kentucky	Carter	71.0	72.0	62.9	63.8	61.3	62.2	61.1	62.0
210470006	Kentucky	Christian	78.0	81.0	68.6	71.2	66.5	69.0	66.1	68.6
210590005	Kentucky	Daviess	75.7	81.0	69.9	74.8	68.0	72.8	67.8	72.6

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210610501	Kentucky	Edmonson	73.7	76.0	65.2	67.3	63.3	65.3	63.1	65.0
210670001	Kentucky	Fayette	62.7	65.0	56.6	58.7	55.1	57.1	54.6	56.6
210670012	Kentucky	Fayette	70.3	73.0	63.5	65.9	61.8	64.1	61.3	63.6
210890007	Kentucky	Greenup	76.7	78.0	69.0	70.2	67.5	68.6	67.2	68.4
210910012	Kentucky	Hancock	74.0	76.0	68.7	70.5	66.7	68.5	66.5	68.3
210930006	Kentucky	Hardin	74.7	78.0	68.0	71.0	66.2	69.2	65.7	68.6
211010014	Kentucky	Henderson	75.3	78.0	69.1	71.6	67.4	69.9	67.0	69.5
211110027	Kentucky	Jefferson	75.3	79.0	68.6	72.0	66.9	70.1	66.4	69.7
211110051	Kentucky	Jefferson	78.3	82.0	72.1	75.5	70.4	73.8	69.9	73.2
211111021	Kentucky	Jefferson	71.0	73.0	64.6	66.4	62.8	64.6	62.5	64.2
211130001	Kentucky	Jessamine	73.3	77.0	67.0	70.4	64.9	68.2	64.4	67.7
211170007	Kentucky	Kenton	78.7	81.0	72.2	74.3	70.5	72.6	69.8	71.8
211390003	Kentucky	Livingston	73.7	75.0	66.9	68.1	65.1	66.3	64.3	65.5
211451024	Kentucky	McCracken	73.3	76.0	67.4	69.9	66.0	68.4	65.3	67.8
211490001	Kentucky	McLean	73.0	73.0	65.9	65.9	64.2	64.2	63.9	63.9
211850004	Kentucky	Oldham	83.0	85.0	74.1	75.8	71.9	73.6	71.4	73.1
211990003	Kentucky	Pulaski	70.3	72.0	65.1	66.7	61.9	63.4	61.5	63.0
212130004	Kentucky	Simpson	75.7	78.0	66.7	68.8	64.6	66.6	64.4	66.3
212210013	Kentucky	Trigg	70.0	70.0	62.6	62.6	60.6	60.6	60.4	60.4
212270008	Kentucky	Warren	72.0	73.0	63.6	64.4	61.6	62.5	61.4	62.3
220050004	Louisiana	Ascension	82.0	84.0	75.9	77.8	74.5	76.3	74.4	76.3
220110002	Louisiana	Beauregard	75.0	75.0	70.4	70.4	69.4	69.4	69.4	69.4
220150008	Louisiana	Bossier	78.0	79.0	69.8	70.7	67.3	68.2	67.3	68.2
220170001	Louisiana	Caddo	79.0	80.0	70.4	71.3	68.0	68.9	67.9	68.8
220190002	Louisiana	Calcasieu	82.0	83.0	76.6	77.5	75.4	76.3	75.3	76.2
220190008	Louisiana	Calcasieu	70.0	71.0	65.2	66.1	64.1	65.0	64.1	65.0

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220190009	Louisiana	Calcasieu	78.7	80.0	72.4	73.6	71.0	72.2	70.9	72.1
220330003	Louisiana	East Baton Rouge	92.0	96.0	85.6	89.3	84.1	87.7	84.0	87.7
220330009	Louisiana	East Baton Rouge	80.3	81.0	74.8	75.4	73.4	74.0	73.3	74.0
220330013	Louisiana	East Baton Rouge	81.3	82.0	75.4	76.0	73.8	74.5	73.8	74.4
220331001	Louisiana	East Baton Rouge	86.0	87.0	80.5	81.4	79.0	79.9	79.0	79.9
220470007	Louisiana	Iberville	84.0	86.0	77.2	79.1	75.6	77.4	75.5	77.3
220470009	Louisiana	Iberville	80.0	81.0	73.5	74.4	72.0	72.9	71.9	72.8
220470012	Louisiana	Iberville	85.0	86.0	78.9	79.9	77.5	78.4	77.4	78.3
220511001	Louisiana	Jefferson	83.0	84.0	76.6	77.5	74.9	75.8	74.9	75.8
220550005	Louisiana	Lafayette	82.0	82.0	74.6	74.6	72.9	72.9	72.7	72.7
220570004	Louisiana	Lafourche	79.3	80.0	72.9	73.6	71.6	72.2	71.4	72.0
220630002	Louisiana	Livingston	78.3	80.0	72.3	73.8	70.8	72.4	70.8	72.3
220730004	Louisiana	Ouachita	75.3	77.0	67.2	68.7	65.0	66.5	65.0	66.5
220770001	Louisiana	Pointe Coupee	83.7	86.0	77.8	80.0	76.4	78.5	76.4	78.5
220870002	Louisiana	St Bernard	78.0	78.0	71.3	71.3	69.8	69.8	69.7	69.7
220890003	Louisiana	St Charles	77.3	78.0	71.4	72.0	69.8	70.4	69.8	70.4
220930002	Louisiana	St James	76.3	77.0	70.7	71.3	69.3	70.0	69.3	69.9
220950002	Louisiana	St John The Baptis	79.0	80.0	73.1	74.0	71.8	72.7	71.7	72.6
221010003	Louisiana	St Mary	76.0	76.0	69.5	69.5	68.2	68.2	68.0	68.0
221210001	Louisiana	West Baton Rouge	84.3	85.0	78.5	79.1	77.0	77.6	77.0	77.6
230050027	Maine	Cumberland	59.0	59.0	52.2	52.2	50.8	50.8	50.8	50.8
230052003	Maine	Cumberland	72.0	75.0	63.7	66.3	62.1	64.6	62.0	64.6

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230090102	Maine	Hancock	82.0	83.0	72.5	73.4	70.8	71.7	70.8	71.6
230090103	Maine	Hancock	73.0	74.0	64.6	65.5	63.0	63.9	63.0	63.8
230090301	Maine	Hancock	68.7	70.0	60.6	61.8	59.1	60.2	59.1	60.2
230112005	Maine	Kennebec	69.7	71.0	61.0	62.2	59.5	60.6	59.4	60.6
230130004	Maine	Knox	75.3	77.0	66.3	67.8	64.7	66.2	64.6	66.1
230194008	Maine	Penobscot	67.0	68.0	59.6	60.5	58.3	59.2	58.3	59.1
230230004	Maine	Sagadahoc	68.5	70.0	60.3	61.6	58.7	60.0	58.7	60.0
230310038	Maine	York	73.7	75.0	65.1	66.2	63.4	64.5	63.4	64.5
230312002	Maine	York	74.0	74.0	66.0	66.0	64.3	64.3	64.3	64.3
230313002	Maine	York	74.0	77.0	66.3	68.9	64.6	67.2	64.6	67.2
240030014	Maryland	Anne Arundel	89.7	90.0	80.0	80.2	77.6	77.9	77.3	77.6
240051007	Maryland	Baltimore	77.3	78.0	70.0	70.6	68.3	68.9	68.2	68.8
240053001	Maryland	Baltimore	85.3	87.0	78.7	80.3	77.3	78.8	77.1	78.7
240090011	Maryland	Calvert	81.0	81.0	71.3	71.3	69.4	69.4	69.1	69.1
240130001	Maryland	Carroll	83.3	86.0	74.2	76.6	72.2	74.5	72.0	74.3
240150003	Maryland	Cecil	90.7	93.0	79.4	81.4	77.0	79.0	76.9	78.8
240170010	Maryland	Charles	86.0	88.0	75.1	76.8	73.0	74.7	72.6	74.3
240210037	Maryland	Frederick	80.3	83.0	71.3	73.7	69.3	71.6	69.2	71.5
240230002	Maryland	Garrett	75.5	76.0	69.4	69.9	68.1	68.5	67.6	68.0
240251001	Maryland	Harford	92.7	94.0	84.4	85.6	82.5	83.7	82.3	83.5
240259001	Maryland	Harford	88.3	91.0	78.6	81.0	76.4	78.7	76.2	78.6
240290002	Maryland	Kent	82.0	83.0	72.0	72.9	69.9	70.7	69.7	70.5
240313001	Maryland	Montgomery	83.0	86.0	75.3	78.0	73.4	76.1	73.2	75.9
240330030	Maryland	Prince Georges	85.0	85.0	77.0	77.0	75.0	75.0	74.8	74.8
240338003	Maryland	Prince Georges	91.0	91.0	80.9	80.9	78.6	78.6	78.3	78.3
240430009	Maryland	Washington	78.3	79.0	69.9	70.5	68.2	68.8	67.9	68.5

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250010002	Massachusetts	Barnstable	84.7	86.0	75.6	76.7	73.9	75.0	73.8	75.0
250034002	Massachusetts	Berkshire	79.7	81.0	71.2	72.3	69.3	70.5	69.2	70.3
250051002	Massachusetts	Bristol	82.7	86.0	73.5	76.4	71.9	74.8	71.9	74.8
250070001	Massachusetts	Dukes	83.0	84.0	75.0	75.9	73.4	74.3	73.4	74.3
250092006	Massachusetts	Essex	83.3	84.0	75.6	76.3	73.9	74.6	73.9	74.5
250094004	Massachusetts	Essex	77.7	79.0	69.9	71.1	68.3	69.4	68.2	69.3
250095005	Massachusetts	Essex	80.0	80.0	71.0	71.0	69.0	69.0	69.0	69.0
250130008	Massachusetts	Hampden	87.3	92.0	76.8	80.9	74.5	78.6	74.5	78.5
250150103	Massachusetts	Hampshire	71.7	77.0	63.3	67.9	61.4	66.0	61.3	65.9
250154002	Massachusetts	Hampshire	85.0	87.0	75.1	76.9	73.1	74.8	73.0	74.7
250170009	Massachusetts	Middlesex	79.0	79.0	70.5	70.5	68.6	68.6	68.5	68.5
250171102	Massachusetts	Middlesex	77.3	81.0	69.5	72.8	67.8	71.0	67.6	70.9
250213003	Massachusetts	Norfolk	84.7	86.0	75.3	76.5	73.5	74.7	73.4	74.5
250250041	Massachusetts	Suffolk	80.3	81.0	72.6	73.2	71.2	71.8	71.1	71.7
250250042	Massachusetts	Suffolk	67.3	68.0	61.3	61.9	60.1	60.7	60.0	60.7
250270015	Massachusetts	Worcester	80.0	83.0	71.0	73.7	69.2	71.8	69.1	71.7
260050003	Michigan	Allegan	90.0	93.0	82.4	85.1	80.9	83.6	80.4	83.1
260190003	Michigan	Benzie	81.7	83.0	74.1	75.3	72.6	73.8	72.4	73.5
260210014	Michigan	Berrien	82.3	84.0	75.4	76.9	73.9	75.4	73.6	75.2
260270003	Michigan	Cass	80.7	84.0	72.0	74.9	70.2	73.1	69.9	72.7
260370001	Michigan	Clinton	75.7	78.0	67.0	69.1	65.2	67.2	64.9	66.9
260490021	Michigan	Genesee	77.3	80.0	69.1	71.5	67.3	69.7	67.0	69.4
260492001	Michigan	Genesee	79.3	82.0	71.1	73.5	69.4	71.8	69.1	71.5
260630007	Michigan	Huron	75.7	78.0	68.6	70.7	67.3	69.4	67.1	69.1
260650012	Michigan	Ingham	76.0	78.0	67.6	69.3	65.8	67.6	65.5	67.2
260770008	Michigan	Kalamazoo	75.3	78.0	67.8	70.2	66.2	68.6	65.9	68.3

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260810020	Michigan	Kent	79.3	83.0	70.7	74.0	69.0	72.2	68.5	71.7
260810022	Michigan	Kent	81.0	83.0	71.9	73.7	70.0	71.8	69.6	71.3
260890001	Michigan	Leelanau	75.7	77.0	69.2	70.4	67.8	68.9	67.5	68.7
260910007	Michigan	Lenawee	78.7	81.0	70.6	72.7	69.2	71.2	68.6	70.6
260990009	Michigan	Macomb	86.0	90.0	78.0	81.6	76.7	80.3	76.4	80.0
260991003	Michigan	Macomb	84.0	87.0	76.8	79.6	75.6	78.3	75.3	78.0
261050007	Michigan	Mason	79.7	81.0	71.7	72.9	70.2	71.3	69.8	70.9
261130001	Michigan	Missaukee	73.7	75.0	66.1	67.3	64.8	65.9	64.4	65.6
261210039	Michigan	Muskegon	85.0	88.0	77.0	79.7	75.5	78.1	75.0	77.6
261250001	Michigan	Oakland	78.0	81.0	71.7	74.5	70.6	73.4	70.4	73.1
261390005	Michigan	Ottawa	81.7	85.0	73.2	76.1	71.5	74.4	70.9	73.8
261470005	Michigan	St Clair	82.3	85.0	73.9	76.3	72.3	74.7	72.0	74.4
261530001	Michigan	Schoolcraft	79.3	82.0	71.4	73.8	69.8	72.2	69.6	72.0
261610008	Michigan	Washtenaw	78.3	81.0	70.8	73.3	69.4	71.8	69.1	71.5
261630001	Michigan	Wayne	73.0	75.0	66.2	68.0	65.0	66.8	64.7	66.5
261630016	Michigan	Wayne	73.5	76.0	66.2	68.5	64.9	67.1	64.6	66.8
261630019	Michigan	Wayne	82.0	83.0	75.5	76.4	74.2	75.1	73.9	74.8
270031002	Minnesota	Anoka	67.7	69.0	65.4	66.7	64.8	66.1	64.3	65.6
280330002	Mississippi	De Soto	82.7	85.0	73.3	75.3	70.8	72.8	70.7	72.7
280450001	Mississippi	Hancock	79.0	79.0	71.3	71.3	69.7	69.7	69.5	69.5
280470008	Mississippi	Harrison	83.0	83.0	74.0	74.0	72.0	72.0	71.8	71.8
280470009	Mississippi	Harrison	77.0	77.0	68.5	68.5	67.0	67.0	66.8	66.8
280490010	Mississippi	Hinds	71.3	73.0	62.6	64.1	59.9	61.4	59.9	61.3
280590006	Mississippi	Jackson	80.3	81.0	72.4	73.1	70.8	71.4	70.6	71.2
280590007	Mississippi	Jackson	74.0	74.0	66.4	66.4	65.2	65.2	65.0	65.0
280750003	Mississippi	Lauderdale	74.3	76.0	66.5	68.0	65.6	67.1	65.5	67.0

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280810005	Mississippi	Lee	73.7	75.0	64.6	65.8	62.2	63.3	62.0	63.1
290370003	Missouri	Cass	74.7	77.0	66.4	68.4	64.8	66.8	64.0	66.0
290470003	Missouri	Clay	79.0	81.0	70.4	72.2	68.6	70.3	67.9	69.7
290470005	Missouri	Clay	84.7	87.0	76.2	78.2	74.3	76.3	73.7	75.8
290470006	Missouri	Clay	83.0	87.0	74.2	77.8	72.3	75.8	71.7	75.2
290490001	Missouri	Clinton	83.0	85.0	74.3	76.1	72.4	74.1	71.8	73.5
290770036	Missouri	Greene	73.0	77.0	64.9	68.4	63.4	66.9	63.0	66.4
290990012	Missouri	Jefferson	82.3	86.0	76.0	79.4	74.9	78.2	74.5	77.9
291130003	Missouri	Lincoln	87.0	87.0	78.9	78.9	76.8	76.8	76.5	76.5
291370001	Missouri	Monroe	71.7	75.0	64.4	67.4	63.0	66.0	62.6	65.4
291570001	Missouri	Perry	77.5	80.0	69.8	72.0	68.4	70.6	68.2	70.4
291650023	Missouri	Platte	77.0	77.0	69.3	69.3	67.5	67.5	67.0	67.0
291831002	Missouri	St Charles	86.3	89.0	78.3	80.8	76.3	78.7	76.0	78.4
291831004	Missouri	St Charles	87.0	89.0	79.2	81.0	77.1	78.9	76.9	78.6
291860005	Missouri	Ste Genevieve	79.7	83.0	72.3	75.3	71.8	74.8	71.6	74.5
291890004	Missouri	St Louis	82.3	86.0	76.6	80.1	75.3	78.7	75.0	78.4
291890005	Missouri	St Louis	83.0	83.0	76.1	76.1	74.4	74.4	74.1	74.1
291890006	Missouri	St Louis	78.0	78.0	72.1	72.1	70.5	70.5	70.2	70.2
291890014	Missouri	St Louis	88.0	88.0	81.4	81.4	79.6	79.6	79.3	79.3
295100085	Missouri	St Louis City	84.0	84.0	77.8	77.8	76.1	76.1	75.9	75.9
295100086	Missouri	St Louis City	83.0	86.0	76.9	79.7	75.2	77.9	75.0	77.7
310550028	Nebraska	Douglas	68.7	70.0	63.3	64.5	62.1	63.2	61.3	62.4
310550032	Nebraska	Douglas	64.7	66.0	59.3	60.5	58.2	59.4	57.4	58.6
310550035	Nebraska	Douglas	66.3	68.0	61.1	62.6	59.8	61.4	59.0	60.5
330012004	New Hampshire	Belknap	71.3	73.0	63.3	64.9	61.5	62.9	61.4	62.9
330050007	New	Cheshire	70.7	71.0	63.1	63.4	61.5	61.8	61.4	61.7

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	Hampshire									
330074001	New Hampshire	Coos	77.0	77.0	69.0	69.0	67.3	67.3	67.3	67.3
330074002	New Hampshire	Coos	65.0	67.0	58.3	60.0	56.8	58.5	56.8	58.5
330090010	New Hampshire	Grafton	67.0	67.0	59.1	59.1	57.5	57.5	57.4	57.4
330110020	New Hampshire	Hillsborough	70.3	71.0	61.9	62.5	60.1	60.7	60.0	60.6
330111011	New Hampshire	Hillsborough	78.7	80.0	69.8	71.0	67.8	68.9	67.7	68.8
330115001	New Hampshire	Hillsborough	78.3	80.0	69.8	71.3	68.0	69.4	67.9	69.4
330131007	New Hampshire	Merrimack	71.7	72.0	63.1	63.3	61.3	61.6	61.2	61.5
330150014	New Hampshire	Rockingham	75.3	77.0	67.4	68.9	65.8	67.2	65.7	67.2
330150016	New Hampshire	Rockingham	77.0	79.0	68.9	70.7	67.2	69.0	67.2	69.0
330190003	New Hampshire	Sullivan	70.0	72.0	61.7	63.5	60.0	61.7	59.9	61.6
340010005	New Jersey	Atlantic	79.3	82.0	71.1	73.5	69.3	71.6	69.2	71.5
340030005	New Jersey	Bergen	86.0	86.0	79.4	79.4	77.8	77.8	77.5	77.5
340070003	New Jersey	Camden	85.7	88.0	76.7	78.8	74.8	76.8	74.6	76.6
340071001	New Jersey	Camden	89.3	91.0	79.9	81.4	77.8	79.3	77.6	79.0
340110007	New Jersey	Cumberland	83.3	84.0	73.4	74.0	71.2	71.8	71.0	71.6
340150002	New Jersey	Gloucester	87.0	88.0	77.5	78.4	75.4	76.3	75.2	76.1
340170006	New Jersey	Hudson	85.7	89.0	79.8	82.9	78.9	81.9	78.8	81.8
340190001	New Jersey	Hunterdon	89.0	90.0	79.7	80.6	77.4	78.2	77.2	78.1
340210005	New Jersey	Mercer	88.0	91.0	79.7	82.4	77.7	80.3	77.5	80.1

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340230011	New Jersey	Middlesex	88.3	91.0	79.2	81.6	77.1	79.4	76.8	79.2
340250005	New Jersey	Monmouth	87.3	89.0	79.7	81.2	78.1	79.6	78.0	79.5
340273001	New Jersey	Morris	83.3	86.0	74.7	77.1	72.7	75.1	72.5	74.8
340290006	New Jersey	Ocean	93.0	94.0	83.1	84.0	80.9	81.8	80.7	81.6
340315001	New Jersey	Passaic	81.0	83.0	73.4	75.2	71.6	73.4	71.4	73.2
360010012	New York	Albany	73.7	76.0	66.0	68.1	64.4	66.5	64.3	66.3
360050110	New York	Bronx	74.0	76.0	68.1	69.9	67.1	68.9	66.9	68.8
360050133	New York	Bronx	74.7	75.0	70.0	70.3	69.1	69.4	69.0	69.3
360130006	New York	Chautauqua	86.7	89.0	79.2	81.3	77.7	79.7	77.1	79.2
360130011	New York	Chautauqua	77.3	79.0	71.0	72.5	69.6	71.1	69.1	70.6
360270007	New York	Dutchess	75.7	79.0	67.6	70.5	65.9	68.8	65.8	68.7
360290002	New York	Erie	85.0	86.0	77.4	78.3	76.1	77.0	75.7	76.6
360410005	New York	Hamilton	71.7	73.0	64.9	66.1	63.7	64.8	63.6	64.8
360430005	New York	Herkimer	68.3	70.0	62.4	64.0	61.2	62.8	61.2	62.7
360450002	New York	Jefferson	78.0	80.0	71.2	73.0	69.8	71.6	69.7	71.5
360551007	New York	Monroe	76.3	80.0	69.6	73.0	68.2	71.5	68.0	71.3
360631006	New York	Niagara	82.7	86.0	77.3	80.4	76.2	79.2	76.1	79.1
360650004	New York	Oneida	68.3	72.0	62.0	65.4	60.7	64.0	60.5	63.8
360671015	New York	Onondaga	73.7	76.0	66.0	68.1	64.5	66.5	64.3	66.3
360715001	New York	Orange	82.0	84.0	74.4	76.2	72.7	74.5	72.7	74.4
360750003	New York	Oswego	78.0	82.0	71.1	74.7	69.7	73.3	69.5	73.1
360790005	New York	Putnam	84.3	86.0	76.2	77.8	74.4	75.9	74.2	75.7
360810098	New York	Queens	69.0	69.0	63.5	63.5	62.6	62.6	62.4	62.4
360810124	New York	Queens	80.0	82.0	73.7	75.5	72.4	74.2	72.2	74.0
360830004	New York	Rensselaer	77.3	80.0	69.2	71.6	67.6	69.9	67.5	69.8
360850067	New York	Richmond	88.3	89.0	82.5	83.2	81.4	82.0	81.2	81.9

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360910004	New York	Saratoga	79.7	82.0	71.2	73.2	69.4	71.5	69.3	71.3
360930003	New York	Schenectady	70.0	74.0	62.9	66.5	61.5	65.0	61.4	64.9
361030002	New York	Suffolk	90.0	91.0	83.0	83.9	81.8	82.7	81.6	82.5
361030004	New York	Suffolk	84.7	90.0	77.9	82.7	76.3	81.1	76.2	81.0
361030009	New York	Suffolk	90.3	91.0	83.2	83.8	81.7	82.4	81.6	82.3
361111005	New York	Ulster	77.3	79.0	69.0	70.5	67.2	68.7	67.0	68.5
361173001	New York	Wayne	68.0	71.0	61.7	64.5	60.5	63.1	60.3	63.0
361192004	New York	Westchester	87.7	90.0	81.1	83.2	79.7	81.8	79.5	81.6
370030004	North Carolina	Alexander	77.0	79.0	66.9	68.6	64.9	66.6	64.6	66.3
370110002	North Carolina	Avery	70.0	72.0	61.1	62.9	58.6	60.3	58.4	60.1
370210030	North Carolina	Buncombe	74.0	74.0	62.7	62.7	60.8	60.8	60.7	60.7
370270003	North Carolina	Caldwell	74.3	76.0	64.4	65.9	62.3	63.7	62.1	63.5
370330001	North Carolina	Caswell	76.3	77.0	66.5	67.2	64.2	64.8	64.1	64.7
370370004	North Carolina	Chatham	73.3	74.0	63.7	64.3	61.8	62.3	61.3	61.9
370510008	North Carolina	Cumberland	78.0	80.0	67.7	69.4	65.4	67.1	65.0	66.7
370511003	North Carolina	Cumberland	81.7	83.0	70.7	71.8	68.4	69.5	68.1	69.2
370590002	North Carolina	Davie	81.3	83.0	70.9	72.4	68.8	70.2	68.0	69.4
370630013	North Carolina	Durham	77.0	78.0	67.4	68.3	65.3	66.2	65.2	66.0
370650099	North Carolina	Edgecombe	77.0	79.0	67.6	69.4	65.5	67.2	65.2	66.9

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370670022	North Carolina	Forsyth	78.0	79.0	68.4	69.2	66.3	67.2	66.1	67.0
370670028	North Carolina	Forsyth	73.0	74.0	62.6	63.5	60.9	61.8	60.7	61.6
370670030	North Carolina	Forsyth	76.0	76.0	66.6	66.6	64.4	64.4	64.2	64.2
370671008	North Carolina	Forsyth	80.0	81.0	69.6	70.5	67.5	68.3	67.3	68.1
370690001	North Carolina	Franklin	78.7	81.0	69.0	71.0	66.7	68.7	66.5	68.4
370750001	North Carolina	Graham	78.3	79.0	67.2	67.8	64.8	65.4	64.6	65.2
370770001	North Carolina	Granville	82.0	85.0	70.9	73.5	68.8	71.3	68.6	71.1
370810011	North Carolina	Guilford	77.0	77.0	67.4	67.4	64.9	64.9	64.8	64.8
370810013	North Carolina	Guilford	82.0	82.0	71.4	71.4	68.9	68.9	68.7	68.7
370870036	North Carolina	Haywood	77.3	78.0	67.7	68.4	65.4	66.0	65.2	65.8
370990005	North Carolina	Jackson	76.0	76.0	66.1	66.1	63.7	63.7	63.4	63.4
371010002	North Carolina	Johnston	77.3	79.0	67.5	69.0	65.2	66.7	64.9	66.3
371070004	North Carolina	Lenoir	75.3	77.0	66.0	67.5	63.3	64.8	63.1	64.6
371090004	North Carolina	Lincoln	81.0	83.0	70.7	72.4	68.6	70.3	68.2	69.9
371170001	North Carolina	Martin	75.0	77.0	67.2	69.0	65.5	67.2	65.4	67.1
371190041	North Carolina	Mecklenburg	88.0	90.0	77.7	79.4	76.0	77.8	75.3	77.0

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371191005	North Carolina	Mecklenburg	80.3	83.0	70.8	73.2	69.3	71.6	68.6	70.9
371191009	North Carolina	Mecklenburg	89.3	93.0	78.0	81.3	75.8	78.9	75.2	78.3
371290002	North Carolina	New Hanover	72.3	73.0	65.4	66.0	63.0	63.6	62.8	63.4
371450003	North Carolina	Person	77.3	79.0	64.8	66.2	64.2	65.7	64.1	65.5
371470099	North Carolina	Pitt	76.3	77.0	66.5	67.1	63.8	64.4	63.5	64.1
371570099	North Carolina	Rockingham	77.0	78.0	65.6	66.4	63.5	64.4	63.4	64.2
371590021	North Carolina	Rowan	86.7	89.0	75.3	77.3	72.9	74.8	72.3	74.3
371590022	North Carolina	Rowan	86.7	90.0	75.6	78.4	73.2	76.0	72.7	75.5
371730002	North Carolina	Swain	66.3	68.0	57.4	58.9	55.3	56.8	55.1	56.6
371790003	North Carolina	Union	79.3	81.0	68.2	69.7	65.8	67.2	65.4	66.8
371830014	North Carolina	Wake	80.3	82.0	71.0	72.5	68.8	70.2	68.5	69.9
371830016	North Carolina	Wake	80.0	83.0	70.1	72.7	67.7	70.3	67.4	69.9
390030009	Ohio	Allen	78.7	81.0	70.2	72.3	68.4	70.4	68.2	70.2
390071001	Ohio	Ashtabula	89.0	91.0	81.4	83.2	79.7	81.5	79.0	80.7
390170004	Ohio	Butler	83.3	85.0	75.3	76.9	73.2	74.6	72.8	74.3
390171004	Ohio	Butler	82.3	85.0	74.2	76.7	72.1	74.5	71.7	74.1
390230001	Ohio	Clark	81.0	83.0	71.9	73.7	69.7	71.5	69.4	71.1
390230003	Ohio	Clark	77.0	78.0	69.1	70.0	67.2	68.1	66.9	67.7

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390250022	Ohio	Clermont	81.0	83.0	74.4	76.3	72.7	74.5	71.8	73.6
390271002	Ohio	Clinton	82.3	85.0	73.2	75.7	70.8	73.1	70.3	72.6
390350034	Ohio	Cuyahoga	71.0	76.0	64.7	69.3	63.4	67.9	62.9	67.3
390350064	Ohio	Cuyahoga	73.0	76.0	67.8	70.6	66.8	69.5	66.3	69.0
390355002	Ohio	Cuyahoga	79.7	81.0	72.9	74.1	71.5	72.7	70.9	72.1
390410002	Ohio	Delaware	78.3	81.0	69.7	72.1	67.8	70.1	67.5	69.8
390490028	Ohio	Franklin	80.3	82.0	71.9	73.4	70.0	71.5	69.6	71.1
390490029	Ohio	Franklin	86.3	88.0	77.2	78.7	75.1	76.6	74.8	76.2
390490037	Ohio	Franklin	80.3	81.0	72.6	73.3	70.9	71.5	70.6	71.2
390490081	Ohio	Franklin	79.7	80.0	71.4	71.7	69.6	69.8	69.2	69.5
390550004	Ohio	Geauga	79.3	86.0	71.0	77.0	69.4	75.3	68.8	74.6
390570006	Ohio	Greene	80.3	83.0	71.5	73.9	69.3	71.7	69.1	71.4
390610006	Ohio	Hamilton	84.7	86.0	77.4	78.6	75.5	76.6	74.9	76.1
390610010	Ohio	Hamilton	82.0	84.0	75.1	76.9	73.2	75.0	72.5	74.3
390610040	Ohio	Hamilton	81.7	83.0	75.9	77.1	74.3	75.5	73.4	74.6
390810017	Ohio	Jefferson	78.0	80.0	69.1	70.9	67.6	69.4	66.9	68.6
390830002	Ohio	Knox	77.7	79.0	68.9	70.1	67.0	68.1	66.7	67.8
390850003	Ohio	Lake	86.3	89.0	78.7	81.1	77.1	79.5	76.5	78.9
390850007	Ohio	Lake	80.7	81.0	73.5	73.8	71.9	72.2	71.2	71.5
390870006	Ohio	Lawrence	70.7	73.0	63.6	65.7	62.2	64.2	62.0	64.0
390870011	Ohio	Lawrence	63.3	69.0	55.2	60.2	53.8	58.7	53.5	58.3
390890005	Ohio	Licking	78.0	81.0	69.2	71.8	67.2	69.8	66.9	69.5
390930018	Ohio	Lorain	76.7	80.0	69.4	72.4	67.9	70.8	67.5	70.4
390950024	Ohio	Lucas	76.3	78.0	69.9	71.5	68.5	70.0	67.9	69.4
390950027	Ohio	Lucas	77.7	82.0	71.0	75.0	69.5	73.4	69.0	72.9
390950034	Ohio	Lucas	81.3	86.0	73.8	78.1	72.2	76.4	71.7	75.9

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390950081	Ohio	Lucas	80.7	84.0	73.9	77.0	72.4	75.4	71.8	74.8
390970007	Ohio	Madison	79.7	82.0	70.5	72.5	68.4	70.4	68.1	70.1
390990013	Ohio	Mahoning	78.7	80.0	70.2	71.4	68.6	69.7	67.9	69.0
391030003	Ohio	Medina	80.3	84.0	71.9	75.2	70.2	73.4	69.6	72.9
391090005	Ohio	Miami	76.7	80.0	68.0	70.9	65.8	68.7	65.5	68.3
391130037	Ohio	Montgomery	74.0	75.0	65.6	66.5	63.6	64.5	63.2	64.1
391331001	Ohio	Portage	83.7	88.0	74.7	78.5	72.9	76.6	72.3	76.0
391351001	Ohio	Preble	73.0	75.0	64.9	66.7	63.1	64.8	62.8	64.5
391510016	Ohio	Stark	78.0	79.0	70.0	70.9	68.3	69.2	68.0	68.9
391510022	Ohio	Stark	77.3	80.0	69.3	71.7	67.7	70.0	67.3	69.7
391514005	Ohio	Stark	81.0	82.0	72.0	72.9	70.3	71.1	69.9	70.8
391530020	Ohio	Summit	83.7	85.0	75.2	76.4	73.5	74.6	73.1	74.2
391550009	Ohio	Trumbull	80.0	83.0	71.3	73.9	69.5	72.1	68.8	71.4
391550011	Ohio	Trumbull	84.3	86.0	75.1	76.6	73.3	74.8	72.5	74.0
391650007	Ohio	Warren	88.3	91.0	79.3	81.7	76.9	79.3	76.5	78.9
391670004	Ohio	Washington	82.7	85.0	75.3	77.4	73.2	75.3	69.3	71.2
391730003	Ohio	Wood	80.0	83.0	72.2	74.9	70.5	73.2	70.1	72.7
400170101	Oklahoma	Canadian	76.0	76.0	68.7	68.7	66.8	66.8	66.5	66.5
400219002	Oklahoma	Cherokee	75.7	76.0	69.0	69.2	67.9	68.2	64.5	64.7
400270049	Oklahoma	Cleveland	74.7	75.0	67.0	67.2	65.1	65.3	64.5	64.8
400370144	Oklahoma	Creek	76.7	77.0	68.1	68.4	66.5	66.7	65.7	65.9
400719010	Oklahoma	Kay	78.0	79.0	70.0	70.9	68.1	68.9	66.6	67.5
400871073	Oklahoma	Mc Clain	72.0	72.0	64.5	64.5	62.6	62.6	62.2	62.2
400979014	Oklahoma	Mayes	78.5	79.0	71.6	72.1	70.6	71.1	67.8	68.2
401090033	Oklahoma	Oklahoma	77.0	77.0	69.8	69.8	68.0	68.0	67.6	67.6
401090096	Oklahoma	Oklahoma	76.3	78.0	69.1	70.6	67.4	68.9	66.9	68.4

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401091037	Oklahoma	Oklahoma	80.0	81.0	71.5	72.4	69.4	70.2	69.2	70.0
401159004	Oklahoma	Ottawa	78.0	79.0	69.4	70.3	67.9	68.7	66.2	67.1
401430137	Oklahoma	Tulsa	79.3	80.0	70.9	71.6	69.1	69.7	68.2	68.8
401430174	Oklahoma	Tulsa	74.0	76.0	66.6	68.4	65.1	66.9	64.1	65.8
401430178	Oklahoma	Tulsa	79.3	80.0	71.9	72.5	70.3	70.9	69.0	69.7
401431127	Oklahoma	Tulsa	77.0	78.0	69.0	69.9	67.2	68.1	66.7	67.6
420010002	Pennsylvania	Adams	76.3	78.0	67.8	69.4	65.9	67.4	65.8	67.3
420030008	Pennsylvania	Allegheny	79.3	81.0	72.5	74.1	71.2	72.7	70.6	72.1
420030010	Pennsylvania	Allegheny	82.3	84.0	75.3	76.8	73.9	75.4	73.2	74.8
420030067	Pennsylvania	Allegheny	80.3	82.0	72.7	74.2	71.2	72.7	70.7	72.2
420031005	Pennsylvania	Allegheny	83.7	87.0	76.2	79.2	74.5	77.4	73.9	76.8
420050001	Pennsylvania	Armstrong	83.0	84.0	74.5	75.4	72.7	73.6	72.2	73.1
420070002	Pennsylvania	Beaver	83.0	84.0	74.3	75.2	72.7	73.6	72.2	73.1
420070005	Pennsylvania	Beaver	79.3	81.0	71.7	73.3	70.2	71.7	69.6	71.1
420070014	Pennsylvania	Beaver	74.0	75.0	67.0	67.9	65.5	66.4	65.0	65.9
420110009	Pennsylvania	Berks	80.0	80.0	71.9	71.9	69.8	69.8	69.6	69.6
420130801	Pennsylvania	Blair	74.3	77.0	68.0	70.4	66.6	69.1	66.1	68.5
420170012	Pennsylvania	Bucks	88.0	92.0	80.2	83.9	78.2	81.8	78.0	81.6
420210011	Pennsylvania	Cambria	74.7	77.0	68.1	70.2	66.8	68.8	66.2	68.3
420270100	Pennsylvania	Centre	78.3	79.0	70.9	71.6	69.3	69.9	69.0	69.6
420290100	Pennsylvania	Chester	86.0	87.0	75.6	76.5	73.4	74.2	73.2	74.1
420334000	Pennsylvania	Clearfield	78.3	82.0	69.9	73.2	68.3	71.6	67.7	70.9
420430401	Pennsylvania	Dauphin	79.3	81.0	71.9	73.4	70.2	71.7	70.0	71.5
420431100	Pennsylvania	Dauphin	79.3	81.0	72.3	73.8	70.6	72.1	70.4	71.9
420450002	Pennsylvania	Delaware	83.3	85.0	74.5	76.0	72.5	73.9	72.3	73.7
420490003	Pennsylvania	Erie	81.3	83.0	74.3	75.9	72.8	74.3	72.2	73.7

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420550001	Pennsylvania	Franklin	72.3	75.0	64.4	66.8	62.6	64.9	62.4	64.7
420590002	Pennsylvania	Greene	80.0	81.0	73.9	74.8	72.5	73.4	71.0	71.9
420630004	Pennsylvania	Indiana	80.0	80.0	72.8	72.8	71.3	71.3	70.7	70.7
420690101	Pennsylvania	Lackawanna	74.3	75.0	66.2	66.9	64.5	65.1	64.3	64.9
420692006	Pennsylvania	Lackawanna	75.3	76.0	67.1	67.8	65.5	66.1	65.2	65.8
420710007	Pennsylvania	Lancaster	83.3	84.0	74.8	75.5	72.9	73.5	72.7	73.3
420730015	Pennsylvania	Lawrence	72.3	73.0	64.7	65.3	63.2	63.8	62.7	63.3
420770004	Pennsylvania	Lehigh	83.3	85.0	75.0	76.5	73.0	74.5	72.8	74.3
420791100	Pennsylvania	Luzerne	69.3	73.0	61.8	65.1	60.3	63.6	59.9	63.1
420791101	Pennsylvania	Luzerne	76.3	77.0	67.9	68.5	66.1	66.7	65.9	66.5
420810100	Pennsylvania	Lycoming	77.3	79.0	69.7	71.3	68.3	69.8	67.2	68.7
420850100	Pennsylvania	Mercer	82.0	83.0	73.1	74.0	71.4	72.3	70.5	71.4
420910013	Pennsylvania	Montgomery	85.7	86.0	77.4	77.6	75.4	75.6	75.2	75.4
420950025	Pennsylvania	Northampton	84.3	87.0	75.9	78.4	73.9	76.3	73.8	76.1
420958000	Pennsylvania	Northampton	80.0	82.0	71.7	73.5	69.8	71.5	69.6	71.3
420990301	Pennsylvania	Perry	77.0	78.0	69.2	70.1	67.4	68.2	67.2	68.1
421010004	Pennsylvania	Philadelphia	64.3	68.0	58.8	62.1	57.4	60.8	57.3	60.6
421010014	Pennsylvania	Philadelphia	79.7	81.0	72.6	73.7	70.9	72.1	70.8	71.9
421010024	Pennsylvania	Philadelphia	90.3	91.0	81.8	82.4	79.8	80.4	79.6	80.2
421010136	Pennsylvania	Philadelphia	77.0	77.0	69.4	69.4	67.6	67.6	67.5	67.5
421174000	Pennsylvania	Tioga	77.7	81.0	69.9	72.9	68.4	71.3	68.0	70.8
421250005	Pennsylvania	Washington	78.3	80.0	71.9	73.5	70.6	72.2	69.9	71.4
421250200	Pennsylvania	Washington	77.3	81.0	70.5	73.9	69.1	72.4	68.2	71.4
421255001	Pennsylvania	Washington	78.0	78.0	69.7	69.7	68.2	68.2	67.5	67.5
421290006	Pennsylvania	Westmoreland	78.3	80.0	71.3	72.9	69.9	71.4	69.4	70.9
421290008	Pennsylvania	Westmoreland	79.0	82.0	71.9	74.6	70.4	73.0	69.8	72.4

			8-Hour Ozone (ppb)							
Monitor ID	**State**	**County**	**2003-2007 Average Ambient Values**	**2003-2007 Maximum Ambient Values**	**2012 Base Case Average Values**	**2012 Base Case Maximum Values**	**2014 Base Case Average Values**	**2014 Base Case Maximum Values**	**2014 Remedy Average Values**	**2014 Remedy Maximum Values**
421330008	Pennsylvania	York	82.0	83.0	73.8	74.7	72.1	73.0	71.9	72.8
440030002	Rhode Island	Kent	84.3	86.0	74.9	76.4	73.1	74.5	73.0	74.4
440071010	Rhode Island	Providence	82.3	84.0	73.5	75.0	71.7	73.2	71.6	73.1
440090007	Rhode Island	Washington	86.0	89.0	77.2	79.9	75.4	78.0	75.3	78.0
450010001	South Carolina	Abbeville	79.0	81.0	68.5	70.2	66.2	67.8	66.0	67.6
450030003	South Carolina	Aiken	76.0	77.0	66.1	67.0	63.4	64.2	63.2	64.0
450070003	South Carolina	Anderson	76.5	78.0	65.7	67.0	63.2	64.4	63.0	64.2
450110001	South Carolina	Barnwell	73.0	73.0	64.0	64.0	61.7	61.7	61.5	61.5
450150002	South Carolina	Berkeley	67.3	70.0	60.0	62.4	58.5	60.8	58.1	60.4
450190046	South Carolina	Charleston	74.0	75.0	67.2	68.1	65.4	66.3	64.9	65.8
450210002	South Carolina	Cherokee	74.0	75.0	64.1	64.9	61.8	62.6	61.6	62.4
450230002	South Carolina	Chester	75.7	76.0	66.3	66.5	64.4	64.7	64.0	64.2
450250001	South Carolina	Chesterfield	75.0	75.0	65.7	65.7	63.8	63.8	63.4	63.4
450290002	South Carolina	Colleton	72.3	74.0	63.5	65.0	61.1	62.5	60.8	62.3
450310003	South Carolina	Darlington	76.3	77.0	66.4	67.0	64.3	64.9	64.1	64.6
450370001	South Carolina	Edgefield	70.0	70.0	61.0	61.0	58.4	58.4	58.3	58.3
450730001	South Carolina	Oconee	73.0	76.0	62.9	65.5	60.6	63.1	60.5	63.0
450770002	South	Pickens	78.7	81.0	66.9	68.9	64.2	66.1	64.2	66.0

			8-Hour Ozone (ppb)							
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	Carolina									
450790007	South Carolina	Richland	80.3	82.0	68.9	70.4	65.8	67.2	65.5	66.9
450790021	South Carolina	Richland	72.7	73.0	62.2	62.4	59.4	59.7	59.2	59.5
450791001	South Carolina	Richland	82.3	83.0	70.6	71.2	67.4	68.0	67.1	67.7
450830009	South Carolina	Spartanburg	82.3	83.0	71.2	71.8	68.3	68.9	68.2	68.8
450870001	South Carolina	Union	76.0	77.0	66.7	67.6	64.6	65.5	64.3	65.1
450890001	South Carolina	Williamsburg	69.3	70.0	61.3	61.9	59.6	60.2	59.2	59.8
450910006	South Carolina	York	76.7	79.0	66.9	68.9	64.9	66.8	64.3	66.3
470010101	Tennessee	Anderson	77.3	80.0	65.8	68.1	63.6	65.8	63.4	65.6
470090101	Tennessee	Blount	85.3	86.0	74.2	74.8	71.5	72.1	71.3	71.9
470090102	Tennessee	Blount	68.5	70.0	59.8	61.1	57.6	58.9	57.5	58.7
470370011	Tennessee	Davidson	68.7	72.0	60.4	63.3	58.0	60.8	57.6	60.4
470370026	Tennessee	Davidson	77.7	79.0	67.6	68.8	64.8	65.9	64.4	65.4
470651011	Tennessee	Hamilton	80.0	83.0	71.1	73.7	68.3	70.8	68.1	70.7
470654003	Tennessee	Hamilton	81.0	84.0	71.7	74.4	68.8	71.4	68.7	71.2
470890002	Tennessee	Jefferson	82.3	84.0	72.3	73.8	68.6	70.0	68.3	69.8
470930021	Tennessee	Knox	78.7	81.0	68.9	70.9	66.2	68.2	66.1	68.0
470931020	Tennessee	Knox	85.0	88.0	74.4	77.0	71.6	74.1	71.5	74.0
471050109	Tennessee	Loudon	85.0	87.0	71.3	73.0	69.0	70.7	68.9	70.5
471210104	Tennessee	Meigs	80.0	81.0	70.3	71.2	67.5	68.3	67.3	68.1
471490101	Tennessee	Rutherford	76.3	80.0	66.4	69.6	63.6	66.7	63.2	66.2
471550101	Tennessee	Sevier	79.0	82.0	68.6	71.2	65.9	68.4	65.6	68.1

			8-Hour Ozone (ppb)							
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471550102	Tennessee	Sevier	80.7	83.0	70.5	72.5	67.9	69.8	67.6	69.6
471570021	Tennessee	Shelby	80.0	82.0	70.9	72.6	68.4	70.1	68.3	70.0
471571004	Tennessee	Shelby	80.7	81.0	71.2	71.4	68.6	68.9	68.6	68.8
471632002	Tennessee	Sullivan	80.3	83.0	73.5	76.0	71.5	73.9	71.4	73.8
471632003	Tennessee	Sullivan	80.0	83.0	73.4	76.2	71.5	74.2	71.4	74.1
471650007	Tennessee	Sumner	83.0	84.0	72.7	73.5	69.8	70.6	69.3	70.2
471650101	Tennessee	Sumner	79.0	82.0	69.4	72.0	66.7	69.3	66.2	68.7
471870106	Tennessee	Williamson	75.3	77.0	65.2	66.7	62.6	64.0	62.4	63.8
471890103	Tennessee	Wilson	78.7	82.0	68.7	71.6	65.9	68.7	65.4	68.2
480290032	Texas	Bexar	82.0	85.0	74.8	77.5	72.8	75.5	72.7	75.4
480391004	Texas	Brazoria	94.7	97.0	86.7	88.8	84.7	86.7	84.4	86.5
480391016	Texas	Brazoria	78.0	79.0	71.9	72.8	70.3	71.2	70.2	71.1
480850005	Texas	Collin	90.3	92.0	79.9	81.4	76.6	78.0	76.5	77.9
481130069	Texas	Dallas	87.0	90.0	80.7	83.4	78.0	80.7	77.9	80.6
481130075	Texas	Dallas	88.3	90.0	80.4	81.9	77.4	78.9	77.3	78.8
481130087	Texas	Dallas	87.0	88.0	81.3	82.3	78.8	79.7	78.7	79.6
481133003	Texas	Dallas	84.0	84.0	76.7	76.7	74.1	74.1	73.9	73.9
481210034	Texas	Denton	94.0	95.0	81.7	82.5	77.9	78.7	77.9	78.7
481390015	Texas	Ellis	81.7	84.0	71.7	73.7	68.2	70.1	68.1	70.0
481670014	Texas	Galveston	85.0	87.0	79.0	80.8	77.5	79.3	77.4	79.2
481830001	Texas	Gregg	84.3	85.0	78.0	78.6	75.9	76.5	75.8	76.4
482010024	Texas	Harris	88.0	92.0	83.4	87.2	82.2	86.0	82.1	85.9
482010026	Texas	Harris	85.7	89.0	79.4	82.4	77.8	80.8	77.7	80.7
482010029	Texas	Harris	91.7	93.0	84.2	85.4	82.4	83.6	82.3	83.5
482010046	Texas	Harris	78.7	82.0	74.5	77.7	73.5	76.6	73.4	76.5
482010047	Texas	Harris	78.7	80.0	74.1	75.4	72.9	74.1	72.9	74.1

			8-Hour Ozone (ppb)							
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482010051	Texas	Harris	93.0	98.0	86.1	90.8	84.3	88.8	84.1	88.6
482010055	Texas	Harris	100.7	103.0	93.3	95.4	91.3	93.4	91.1	93.2
482010062	Texas	Harris	95.7	99.0	88.8	91.8	87.0	90.0	86.9	89.9
482010066	Texas	Harris	92.3	96.0	87.1	90.6	85.5	88.9	85.4	88.8
482010070	Texas	Harris	84.3	88.0	78.8	82.2	77.3	80.7	77.2	80.5
482010075	Texas	Harris	83.3	88.0	77.8	82.2	76.4	80.7	76.2	80.5
482011015	Texas	Harris	89.0	96.0	82.4	88.9	80.8	87.2	80.7	87.1
482011034	Texas	Harris	82.7	87.0	76.6	80.6	75.1	79.0	74.9	78.8
482011035	Texas	Harris	86.3	95.0	79.9	88.0	78.4	86.3	78.2	86.1
482011039	Texas	Harris	96.3	100.0	88.8	92.2	86.8	90.2	86.8	90.1
482011050	Texas	Harris	89.3	92.0	82.8	85.4	81.2	83.7	81.1	83.6
482030002	Texas	Harrison	79.0	80.0	71.6	72.5	69.3	70.2	69.2	70.1
482210001	Texas	Hood	83.0	84.0	71.0	71.8	67.6	68.4	67.5	68.3
482450009	Texas	Jefferson	81.7	82.0	74.7	75.0	73.2	73.5	73.1	73.4
482450011	Texas	Jefferson	80.0	81.0	73.8	74.7	72.3	73.2	72.2	73.1
482450018	Texas	Jefferson	83.3	84.0	76.8	77.5	75.4	76.0	75.3	75.9
482450022	Texas	Jefferson	79.7	81.0	72.7	73.8	71.0	72.2	70.9	72.1
482450101	Texas	Jefferson	84.7	88.0	78.4	81.4	76.8	79.8	76.7	79.7
482450628	Texas	Jefferson	78.0	78.0	71.9	71.9	70.5	70.5	70.4	70.4
482510003	Texas	Johnson	87.0	89.0	75.2	76.9	71.4	73.1	71.3	72.9
483390078	Texas	Montgomery	85.0	86.0	78.0	78.9	76.0	76.9	75.9	76.8
483611001	Texas	Orange	78.0	80.0	71.4	73.2	69.8	71.6	69.7	71.5
483611100	Texas	Orange	73.0	74.0	67.0	67.9	65.7	66.6	65.6	66.5
483670081	Texas	Parker	88.7	91.0	76.1	78.1	72.5	74.3	72.4	74.3
484230007	Texas	Smith	81.0	82.0	74.0	74.9	71.9	72.7	71.7	72.6
484390075	Texas	Tarrant	95.3	96.0	82.4	83.0	78.5	79.0	78.4	79.0

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484391002	Texas	Tarrant	93.3	95.0	82.2	83.7	78.5	79.9	78.4	79.8
484392003	Texas	Tarrant	93.7	95.0	81.8	83.0	78.1	79.2	78.0	79.1
484393009	Texas	Tarrant	92.7	93.0	81.3	81.6	77.8	78.1	77.7	78.0
484393011	Texas	Tarrant	86.0	87.0	77.1	78.0	73.9	74.7	73.8	74.6
484530014	Texas	Travis	81.3	82.0	72.6	73.2	70.5	71.1	70.3	70.9
484530020	Texas	Travis	79.3	81.0	71.2	72.8	69.4	70.8	69.3	70.7
484530613	Texas	Travis	76.0	76.0	68.7	68.7	66.8	66.8	66.6	66.6
500030004	Vermont	Bennington	72.0	73.0	64.3	65.2	62.7	63.6	62.6	63.4
510130020	Virginia	Arlington	86.7	87.0	79.1	79.3	77.1	77.4	76.9	77.2
510330001	Virginia	Caroline	80.0	81.0	71.0	71.9	68.9	69.8	68.7	69.6
510360002	Virginia	Charles City	80.3	82.0	72.3	73.9	70.5	71.9	70.2	71.7
510410004	Virginia	Chesterfield	76.7	77.0	68.6	68.9	66.9	67.2	66.6	66.9
510590005	Virginia	Fairfax	78.3	79.0	70.5	71.2	68.5	69.1	68.3	68.9
510590018	Virginia	Fairfax	90.0	91.0	82.4	83.3	80.4	81.3	80.1	81.0
510590030	Virginia	Fairfax	88.0	89.0	80.2	81.1	78.2	79.0	78.0	78.8
510591005	Virginia	Fairfax	85.7	87.0	78.1	79.3	76.1	77.3	75.9	77.1
510595001	Virginia	Fairfax	82.0	84.0	74.3	76.1	72.2	74.0	72.1	73.8
510610002	Virginia	Fauquier	72.7	73.0	64.8	65.1	63.2	63.4	63.0	63.3
510690010	Virginia	Frederick	72.3	73.0	63.8	64.4	62.4	63.0	62.3	62.9
510850003	Virginia	Hanover	81.3	82.0	72.6	73.3	70.5	71.2	70.3	70.9
510870014	Virginia	Henrico	82.0	85.0	73.4	76.1	71.3	73.9	71.1	73.7
511071005	Virginia	Loudoun	80.7	82.0	72.1	73.3	69.9	71.0	69.8	70.9
511130003	Virginia	Madison	77.7	80.0	69.7	71.7	68.0	70.1	67.9	69.9
511390004	Virginia	Page	74.0	76.0	66.3	68.1	64.7	66.5	64.6	66.4
511530009	Virginia	Prince William	78.7	79.0	70.2	70.4	68.2	68.5	68.1	68.4
511611004	Virginia	Roanoke	74.7	76.0	67.8	68.9	65.9	67.1	65.7	66.9

			8-Hour Ozone (ppb)							
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511630003	Virginia	Rockbridge	69.7	71.0	62.2	63.4	60.5	61.6	60.3	61.4
511790001	Virginia	Stafford	81.7	85.0	74.0	77.0	72.0	74.9	71.8	74.7
515100009	Virginia	Alexandria City	81.7	83.0	74.8	76.0	73.0	74.1	72.7	73.9
516500004	Virginia	Hampton City	76.7	78.0	70.7	71.9	69.6	70.8	69.5	70.7
518000004	Virginia	Suffolk City	76.7	78.0	71.4	72.6	70.6	71.8	70.5	71.7
518000005	Virginia	Suffolk City	75.3	77.0	66.9	68.4	65.1	66.6	65.0	66.4
540030003	West Virginia	Berkeley	75.0	76.0	66.9	67.8	65.3	66.2	65.0	65.9
540110006	West Virginia	Cabell	78.7	84.0	70.9	75.7	69.3	74.0	69.1	73.8
540291004	West Virginia	Hancock	75.7	77.0	67.5	68.6	66.1	67.2	65.4	66.6
540390010	West Virginia	Kanawha	77.3	79.0	68.1	69.6	66.4	67.9	66.3	67.8
540610003	West Virginia	Monongalia	75.3	78.0	72.0	74.6	70.8	73.3	69.3	71.8
540690010	West Virginia	Ohio	78.3	82.0	69.1	72.4	67.6	70.8	66.5	69.6
541071002	West Virginia	Wood	79.0	82.0	71.1	73.8	68.4	71.0	67.2	69.7
550090026	Wisconsin	Brown	73.7	75.0	66.9	68.0	65.5	66.6	65.2	66.4
550210015	Wisconsin	Columbia	72.7	74.0	65.1	66.3	63.5	64.7	63.3	64.5
550250041	Wisconsin	Dane	72.0	74.0	64.8	66.6	63.4	65.1	63.2	64.9
550270007	Wisconsin	Dodge	74.7	77.0	67.6	69.7	66.0	68.1	65.8	67.8
550290004	Wisconsin	Door	88.7	90.0	80.3	81.4	78.5	79.6	78.2	79.4
550390006	Wisconsin	Fond Du Lac	73.7	75.0	68.1	69.3	66.8	68.0	66.6	67.7
550550002	Wisconsin	Jefferson	74.3	76.0	66.7	68.2	65.0	66.5	64.8	66.2
550590019	Wisconsin	Kenosha	84.7	86.0	79.8	81.1	78.8	80.0	78.6	79.8
550610002	Wisconsin	Kewaunee	82.7	86.0	75.3	78.3	73.7	76.6	73.4	76.4
550710007	Wisconsin	Manitowoc	85.0	87.0	78.0	79.8	76.4	78.2	76.2	78.0
550790010	Wisconsin	Milwaukee	69.0	70.0	65.0	65.9	64.1	65.1	64.0	64.9
550790026	Wisconsin	Milwaukee	76.0	77.0	71.6	72.5	70.6	71.6	70.4	71.4
550790041	Wisconsin	Milwaukee	81.3	83.0	76.6	78.2	75.6	77.1	75.4	76.9

			8-Hour Ozone (ppb)							
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550790044	Wisconsin	Milwaukee	71.0	71.0	66.6	66.6	65.8	65.8	65.5	65.5
550790085	Wisconsin	Milwaukee	82.7	86.0	77.7	80.8	76.6	79.7	76.4	79.4
550870009	Wisconsin	Outagamie	74.0	75.0	67.1	68.0	65.8	66.6	65.5	66.4
550890008	Wisconsin	Ozaukee	81.3	85.0	76.1	79.6	75.1	78.5	74.9	78.3
550890009	Wisconsin	Ozaukee	83.3	88.0	77.9	82.3	76.7	81.0	76.4	80.8
551010017	Wisconsin	Racine	80.3	82.0	75.6	77.2	74.7	76.3	74.5	76.1
551050024	Wisconsin	Rock	74.0	76.0	66.4	68.2	64.8	66.6	64.6	66.4
551091002	Wisconsin	St Croix	69.0	71.0	61.4	63.2	60.2	62.0	59.6	61.4
551110007	Wisconsin	Sauk	69.7	71.0	62.5	63.6	61.0	62.2	60.9	62.0
551170006	Wisconsin	Sheboygan	88.0	89.0	81.6	82.5	80.1	81.0	79.8	80.8
551270005	Wisconsin	Walworth	75.7	77.0	68.8	70.0	67.1	68.2	66.8	68.0
551310009	Wisconsin	Washington	72.3	75.0	65.7	68.1	64.3	66.7	64.0	66.4
551330017	Wisconsin	Waukesha	75.0	75.0	68.7	68.7	67.3	67.3	67.2	67.2
551330027	Wisconsin	Waukesha	71.5	72.0	65.5	65.9	64.2	64.6	64.0	64.5

			Annual $PM_{2.5}$ Design Values ($\mu g/m^3$)							
Site ID	**State**	**County**	**2003-2007 Average Ambient Values**	**2003-2007 Maximum Ambient Values**	**2012 Base Case Average Values**	**2012 Base Case Maximum Values**	**2014 Base Case Average Values**	**2014 Base Case Maximum Values**	**2014 Remedy Average Values**	**2014 Remedy Maximum Values**
010030010	Alabama	Baldwin	11.44	11.75	9.87	10.15	9.58	9.85	8.40	8.63
010270001	Alabama	Clay	13.27	13.32	11.77	11.82	11.25	11.31	9.68	9.73
010331002	Alabama	Colbert	12.75	13.11	11.65	11.97	11.19	11.50	9.37	9.62
010491003	Alabama	DeKalb	14.13	14.42	12.44	12.70	11.93	12.19	10.06	10.28
010530002	Alabama	Escambia	13.19	13.37	11.71	11.88	11.42	11.59	10.24	10.40
010550010	Alabama	Etowah	14.87	15.22	13.10	13.40	12.59	12.88	10.82	11.07
010690003	Alabama	Houston	13.22	13.22	11.69	11.69	11.44	11.44	10.27	10.27
010730023	Alabama	Jefferson	18.57	18.94	16.15	16.46	15.58	15.89	13.94	14.21
010731005	Alabama	Jefferson	15.46	15.89	13.81	14.20	13.33	13.71	11.67	12.00
010731009	Alabama	Jefferson	13.52	14.05	12.21	12.70	11.78	12.25	10.03	10.44
010731010	Alabama	Jefferson	15.89	16.19	13.83	14.10	13.29	13.55	11.56	11.79
010732003	Alabama	Jefferson	17.15	17.69	15.16	15.64	14.69	15.16	13.11	13.53
010732006	Alabama	Jefferson	15.10	15.42	13.21	13.49	12.75	13.01	11.23	11.46
010735002	Alabama	Jefferson	14.42	14.85	12.48	12.85	11.98	12.34	10.36	10.67
010735003	Alabama	Jefferson	14.53	14.88	12.86	13.17	12.37	12.68	10.64	10.90
010890014	Alabama	Madison	13.83	13.97	12.34	12.46	11.80	11.91	9.70	9.78
010970002	Alabama	Mobile	12.90	12.90	11.41	11.41	11.03	11.03	9.85	9.85
010970003	Alabama	Mobile	12.36	12.49	10.88	10.99	10.51	10.61	9.34	9.43
010972005	Alabama	Mobile	11.51	11.92	9.96	10.31	9.63	9.97	8.47	8.77
011010007	Alabama	Montgomery	14.24	14.41	12.79	12.95	12.35	12.51	10.92	11.06
011030011	Alabama	Morgan	13.32	13.74	11.95	12.31	11.46	11.81	9.56	9.85
011130001	Alabama	Russell	15.73	15.83	13.91	13.99	13.36	13.44	11.85	11.92
011170006	Alabama	Shelby	14.43	14.61	12.75	12.91	12.26	12.42	10.57	10.71
011190002	Alabama	Sumter	11.92	11.92	10.71	10.71	10.31	10.31	8.77	8.77

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011210002	Alabama	Talladega	14.51	14.51	12.97	12.97	12.45	12.45	10.54	10.54
011250004	Alabama	Tuscaloosa	13.56	13.79	12.19	12.39	11.73	11.93	9.99	10.17
011270002	Alabama	Walker	13.86	14.30	12.46	12.86	11.97	12.36	10.16	10.49
050010011	Arkansas	Arkansas	12.45	12.54	11.54	11.62	11.11	11.19	9.75	9.82
050030005	Arkansas	Ashley	12.83	13.30	11.92	12.35	11.56	11.98	10.39	10.76
050350005	Arkansas	Crittenden	13.36	13.36	12.15	12.15	11.58	11.58	9.86	9.86
050450002	Arkansas	Faulkner	12.79	13.10	11.87	12.16	11.44	11.72	10.18	10.43
050510003	Arkansas	Garland	12.40	12.67	11.50	11.74	11.07	11.31	9.84	10.06
050930007	Arkansas	Mississippi	12.61	12.61	11.60	11.60	11.08	11.08	9.40	9.40
051070001	Arkansas	Phillips	12.10	12.40	11.13	11.40	10.67	10.92	9.17	9.38
051130002	Arkansas	Polk	11.65	12.04	10.79	11.16	10.45	10.81	9.37	9.70
051150003	Arkansas	Pope	12.79	13.14	11.94	12.26	11.55	11.86	10.40	10.68
051190007	Arkansas	Pulaski	13.17	13.27	12.07	12.15	11.59	11.67	10.25	10.32
051191004	Arkansas	Pulaski	14.05	14.23	12.94	13.11	12.46	12.62	11.12	11.26
051191005	Arkansas	Pulaski	13.59	13.62	12.49	12.52	12.02	12.05	10.70	10.73
051390006	Arkansas	Union	12.86	13.09	11.88	12.09	11.51	11.71	10.32	10.51
051450001	Arkansas	White	12.57	12.74	11.72	11.88	11.33	11.48	10.15	10.27
080010006	Colorado	Adams	10.06	10.16	9.10	9.19	8.89	8.97	8.94	9.03
080050005	Colorado	Arapahoe	7.96	8.10	7.19	7.32	7.03	7.16	7.07	7.19
080130003	Colorado	Boulder	8.32	8.54	7.74	7.95	7.62	7.83	7.65	7.86
080130012	Colorado	Boulder	6.96	7.06	6.42	6.51	6.32	6.41	6.36	6.45
080290004	Colorado	Delta	7.44	7.62	6.82	6.99	6.71	6.88	6.70	6.87
080310002	Colorado	Denver	9.37	9.74	8.45	8.78	8.25	8.57	8.30	8.63
080310023	Colorado	Denver	9.76	9.76	8.81	8.81	8.60	8.60	8.66	8.66
080390001	Colorado	Elbert	4.40	4.54	4.13	4.26	4.08	4.22	4.09	4.23
080410008	Colorado	El Paso	6.73	6.73	6.13	6.13	6.01	6.02	6.03	6.04

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080410011	Colorado	El Paso	7.94	8.11	7.27	7.42	7.15	7.30	7.18	7.33
080690009	Colorado	Larimer	7.33	7.40	6.88	6.94	6.81	6.88	6.83	6.89
080770017	Colorado	Mesa	9.28	9.48	8.47	8.65	8.31	8.48	8.30	8.47
081010012	Colorado	Pueblo	7.45	7.65	6.90	7.09	6.80	6.99	6.79	6.98
081130004	Colorado	San Miguel	4.65	4.81	4.41	4.56	4.39	4.54	4.38	4.53
081230006	Colorado	Weld	8.19	8.35	7.54	7.70	7.45	7.61	7.46	7.62
081230008	Colorado	Weld	8.78	9.28	8.14	8.59	8.03	8.48	8.06	8.51
090010010	Connecticut	Fairfield	13.21	13.27	11.30	11.34	10.96	11.00	10.13	10.16
090011123	Connecticut	Fairfield	12.49	12.59	10.71	10.78	10.39	10.46	9.55	9.63
090013005	Connecticut	Fairfield	12.43	12.72	10.50	10.74	10.16	10.38	9.28	9.48
090019003	Connecticut	Fairfield	11.48	11.73	9.66	9.85	9.34	9.52	8.49	8.64
090031003	Connecticut	Hartford	11.03	11.36	9.54	9.82	9.30	9.57	8.64	8.89
090050005	Connecticut	Litchfield	8.01	8.01	6.72	6.72	6.52	6.52	5.72	5.72
090090026	Connecticut	New Haven	12.12	12.13	10.30	10.31	9.99	10.01	9.17	9.19
090090027	Connecticut	New Haven	12.45	12.57	10.61	10.71	10.30	10.40	9.47	9.56
090091123	Connecticut	New Haven	13.12	13.54	11.22	11.57	10.90	11.24	10.10	10.41
090092008	Connecticut	New Haven	11.17	11.22	9.45	9.48	9.16	9.19	8.38	8.40
090092123	Connecticut	New Haven	12.74	12.91	10.98	11.12	10.69	10.82	9.92	10.03
090113002	Connecticut	New London	10.96	11.33	9.46	9.77	9.25	9.55	8.58	8.86
100010002	Delaware	Kent	12.61	12.84	10.50	10.70	10.21	10.41	8.85	9.03
100010003	Delaware	Kent	12.52	12.66	10.45	10.59	10.17	10.30	8.88	9.01
100031003	Delaware	New Castle	13.73	14.33	11.48	11.97	11.16	11.64	9.81	10.22
100031007	Delaware	New Castle	12.92	13.41	10.74	11.16	10.45	10.86	9.11	9.48
100031012	Delaware	New Castle	13.69	13.88	11.46	11.62	11.15	11.30	9.83	9.95
100032004	Delaware	New Castle	14.87	15.11	12.51	12.72	12.17	12.37	10.79	10.97
100051002	Delaware	Sussex	13.39	13.45	11.14	11.18	10.82	10.86	9.44	9.47

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110010041	District Of Columbia		14.16	14.38	11.96	12.15	11.57	11.75	10.10	10.26
110010042	District Of Columbia		14.41	14.52	12.01	12.10	11.59	11.68	9.93	10.01
110010043	District Of Columbia		13.99	14.44	11.69	12.08	11.29	11.66	9.64	9.96
120010023	Florida	Alachua	9.32	9.51	7.83	7.98	7.67	7.82	6.84	6.97
120010024	Florida	Alachua	9.59	9.64	8.08	8.13	7.92	7.97	7.11	7.15
120051004	Florida	Bay	11.46	11.69	9.97	10.15	9.92	10.10	8.98	9.14
120090007	Florida	Brevard	8.32	8.64	6.95	7.22	6.79	7.05	6.13	6.36
120111002	Florida	Broward	8.22	8.30	6.99	7.06	6.87	6.94	6.49	6.56
120112004	Florida	Broward	8.18	8.28	6.90	6.98	6.77	6.85	6.38	6.45
120113002	Florida	Broward	8.21	8.21	6.91	6.91	6.79	6.79	6.40	6.40
120170005	Florida	Citrus	9.00	9.14	7.31	7.42	7.17	7.27	6.49	6.59
120310098	Florida	Duval	9.90	9.99	8.47	8.57	8.28	8.38	7.45	7.55
120310099	Florida	Duval	10.44	10.53	9.05	9.12	8.85	8.92	8.06	8.11
120330004	Florida	Escambia	11.72	11.91	10.29	10.44	10.06	10.21	9.12	9.24
120570030	Florida	Hillsborough	10.74	10.95	8.82	8.99	8.63	8.80	8.07	8.23
120573002	Florida	Hillsborough	10.52	10.75	8.70	8.90	8.51	8.71	7.93	8.11
120710005	Florida	Lee	8.36	8.41	6.96	7.00	6.82	6.86	6.26	6.30
120730012	Florida	Leon	12.56	12.71	10.93	11.05	10.74	10.86	9.80	9.90
120814012	Florida	Manatee	8.81	8.91	6.98	7.06	6.82	6.90	6.22	6.29
120830003	Florida	Marion	10.11	10.20	8.53	8.60	8.36	8.43	7.62	7.69
120861016	Florida	Miami-Dade	9.45	9.54	7.95	8.02	7.76	7.83	7.37	7.44
120866001	Florida	Miami-Dade	8.14	8.28	7.13	7.25	7.04	7.16	6.65	6.77
120951004	Florida	Orange	9.61	9.76	7.99	8.12	7.80	7.92	7.06	7.18
120952002	Florida	Orange	9.50	9.60	7.87	7.95	7.67	7.75	6.94	7.02
120990009	Florida	Palm Beach	7.84	7.84	6.75	6.75	6.63	6.63	6.20	6.20
120992005	Florida	Palm Beach	7.70	7.81	6.59	6.68	6.47	6.56	6.05	6.13

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121030018	Florida	Pinellas	9.82	9.85	7.95	7.96	7.78	7.80	7.23	7.24
121031009	Florida	Pinellas	9.52	9.69	7.70	7.84	7.54	7.68	6.99	7.12
121056006	Florida	Polk	9.53	9.62	7.86	7.94	7.71	7.78	7.10	7.17
121111002	Florida	St. Lucie	8.34	8.47	7.03	7.13	6.87	6.97	6.27	6.35
121150013	Florida	Sarasota	8.77	8.86	7.07	7.16	6.92	7.00	6.32	6.39
121171002	Florida	Seminole	9.51	9.64	7.90	8.00	7.71	7.80	6.96	7.05
121275002	Florida	Volusia	9.27	9.34	7.73	7.78	7.54	7.59	6.71	6.75
130210007	Georgia	Bibb	16.54	16.78	14.58	14.79	13.95	14.15	12.52	12.70
130210012	Georgia	Bibb	13.94	14.17	12.20	12.40	11.57	11.75	10.19	10.35
130510017	Georgia	Chatham	13.74	13.87	12.00	12.10	11.65	11.75	10.40	10.49
130510091	Georgia	Chatham	13.93	14.11	12.23	12.39	11.87	12.03	10.62	10.75
130590002	Georgia	Clarke	14.90	14.90	13.15	13.15	12.48	12.48	10.96	10.96
130630091	Georgia	Clayton	16.50	16.71	14.30	14.48	13.66	13.83	12.21	12.36
130670003	Georgia	Cobb	16.15	16.21	14.05	14.10	13.50	13.54	12.03	12.07
130670004	Georgia	Cobb	15.42	15.50	13.30	13.37	12.75	12.81	11.31	11.36
130890002	Georgia	DeKalb	15.48	15.66	13.25	13.40	12.59	12.74	11.15	11.28
130892001	Georgia	DeKalb	15.37	15.56	13.20	13.36	12.56	12.73	11.11	11.26
130950007	Georgia	Dougherty	14.46	14.83	12.73	13.07	12.41	12.75	11.24	11.55
131150005	Georgia	Floyd	16.13	16.18	14.21	14.25	13.70	13.75	12.01	12.05
131210032	Georgia	Fulton	15.84	16.02	13.56	13.72	12.93	13.08	11.50	11.63
131210039	Georgia	Fulton	17.43	17.47	15.07	15.10	14.42	14.45	12.99	13.02
131270006	Georgia	Glynn	12.25	12.30	10.73	10.78	10.49	10.54	9.51	9.56
131350002	Georgia	Gwinnett	16.07	16.36	14.01	14.26	13.38	13.63	11.93	12.15
131390003	Georgia	Hall	14.16	14.37	12.43	12.62	11.85	12.03	10.30	10.47
131530001	Georgia	Houston	14.19	14.58	12.35	12.69	11.82	12.14	10.42	10.69
131850003	Georgia	Lowndes	12.58	12.83	11.14	11.36	10.91	11.13	9.97	10.17

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132150001	Georgia	Muscogee	14.94	15.14	13.16	13.33	12.63	12.80	11.12	11.26
132150008	Georgia	Muscogee	15.39	15.39	13.65	13.65	13.11	13.11	11.62	11.62
132150011	Georgia	Muscogee	14.16	14.48	12.52	12.81	12.04	12.32	10.66	10.92
132230003	Georgia	Paulding	14.12	14.43	12.13	12.39	11.64	11.89	10.07	10.28
132450005	Georgia	Richmond	15.61	15.82	13.96	14.15	13.43	13.61	11.99	12.15
132450091	Georgia	Richmond	15.68	15.88	14.04	14.21	13.50	13.67	12.05	12.20
132950002	Georgia	Walker	15.49	15.75	13.77	14.00	13.19	13.40	11.22	11.40
133030001	Georgia	Washington	15.14	15.54	13.64	13.99	12.93	13.26	11.55	11.83
133190001	Georgia	Wilkinson	15.27	15.50	13.59	13.79	12.86	13.05	11.47	11.63
170010006	Illinois	Adams	12.50	12.87	11.48	11.81	11.08	11.40	10.08	10.35
170190004	Illinois	Champaign	12.50	12.89	11.41	11.77	10.94	11.29	9.48	9.82
170191001	Illinois	Champaign	12.53	12.92	11.46	11.83	10.98	11.34	9.50	9.89
170310022	Illinois	Cook	15.21	15.55	13.73	14.05	13.25	13.55	12.24	12.52
170310050	Illinois	Cook	14.81	15.22	13.29	13.66	12.77	13.13	11.85	12.19
170310052	Illinois	Cook	15.75	16.02	14.09	14.33	13.50	13.74	12.59	12.83
170310057	Illinois	Cook	15.03	15.34	13.38	13.66	12.80	13.07	11.90	12.16
170310076	Illinois	Cook	14.89	15.18	13.30	13.56	12.74	12.98	11.83	12.07
170312001	Illinois	Cook	14.77	15.14	13.30	13.63	12.82	13.14	11.95	12.26
170313301	Illinois	Cook	15.24	15.59	13.62	13.93	13.05	13.35	12.17	12.46
170314007	Illinois	Cook	12.78	13.15	11.47	11.80	10.95	11.26	10.00	10.29
170314201	Illinois	Cook	12.76	13.18	11.46	11.84	10.93	11.29	9.98	10.29
170316005	Illinois	Cook	15.48	16.07	13.80	14.32	13.21	13.71	12.31	12.78
170434002	Illinois	DuPage	13.82	14.01	12.52	12.69	11.96	12.13	11.01	11.16
170831001	Illinois	Jersey	12.89	13.20	12.02	12.32	11.49	11.77	10.01	10.26
170890003	Illinois	Kane	13.32	13.54	12.06	12.26	11.55	11.74	10.56	10.74
170890007	Illinois	Kane	14.34	14.34	13.03	13.03	12.50	12.50	11.54	11.54

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170971007	Illinois	Lake	11.81	12.10	10.75	11.01	10.29	10.54	9.36	9.60
171110001	Illinois	McHenry	12.40	12.47	11.26	11.33	10.80	10.86	9.86	9.93
171132003	Illinois	McLean	12.39	12.39	11.37	11.37	10.87	10.87	9.65	9.65
171150013	Illinois	Macon	13.24	13.57	12.21	12.51	11.69	11.98	10.33	10.60
171191007	Illinois	Madison	16.72	17.01	15.46	15.73	14.76	15.02	13.28	13.51
171192009	Illinois	Madison	14.01	14.66	13.16	13.77	12.57	13.15	11.07	11.58
171193007	Illinois	Madison	14.32	14.45	13.45	13.58	12.86	12.98	11.39	11.49
171430037	Illinois	Peoria	13.34	13.66	12.24	12.54	11.75	12.03	10.69	10.95
171570001	Illinois	Randolph	13.11	13.64	12.16	12.64	11.57	12.03	10.04	10.43
171613002	Illinois	Rock Island	12.01	12.31	10.97	11.25	10.59	10.85	9.70	9.92
171630010	Illinois	Saint Clair	15.58	15.74	14.40	14.54	13.71	13.85	12.21	12.35
171634001	Illinois	Saint Clair	14.29	14.49	13.23	13.41	12.58	12.75	11.14	11.28
171670012	Illinois	Sangamon	13.13	13.29	12.23	12.38	11.71	11.85	10.43	10.53
171971002	Illinois	Will	13.63	14.05	12.34	12.72	11.77	12.12	10.73	11.06
171971011	Illinois	Will	11.52	11.78	10.47	10.70	10.00	10.21	8.86	9.02
172010013	Illinois	Winnebago	13.57	13.57	12.38	12.38	11.96	11.96	11.12	11.12
180030004	Indiana	Allen	13.67	14.08	12.51	12.89	12.16	12.53	10.90	11.25
180030014	Indiana	Allen	13.55	13.91	12.41	12.74	12.06	12.38	10.81	11.11
180190006	Indiana	Clark	16.44	16.67	14.83	15.03	14.20	14.39	11.69	11.83
180350006	Indiana	Delaware	13.69	13.86	12.62	12.78	12.16	12.31	10.21	10.33
180372001	Indiana	Dubois	15.19	15.68	13.90	14.35	13.29	13.72	10.66	11.04
180431004	Indiana	Floyd	14.85	14.99	13.43	13.56	12.84	12.96	10.30	10.42
180650003	Indiana	Henry	13.64	13.64	12.59	12.59	12.17	12.17	10.10	10.10
180670003	Indiana	Howard	13.93	14.29	12.82	13.15	12.40	12.73	10.65	10.95
180830004	Indiana	Knox	14.03	14.21	12.77	12.92	12.18	12.32	10.02	10.11
180890006	Indiana	Lake	14.33	14.51	12.95	13.11	12.47	12.63	11.42	11.57

			Annual $PM_{2.5}$ Design Values ($\mu g/m^3$)							
Site ID	State	County	2003-2007 Average Ambient Values	2003-2007 Maximum Ambient Values	2012 Base Case Average Values	2012 Base Case Maximum Values	2014 Base Case Average Values	2014 Base Case Maximum Values	2014 Remedy Average Values	2014 Remedy Maximum Values
180890027	Indiana	Lake	13.83	14.13	12.53	12.80	12.07	12.33	10.97	11.22
180891003	Indiana	Lake	14.02	14.25	12.73	12.94	12.29	12.49	11.23	11.42
180892004	Indiana	Lake	14.05	14.41	12.71	13.04	12.25	12.57	11.21	11.52
180892010	Indiana	Lake	13.89	14.10	12.54	12.73	12.07	12.26	11.06	11.25
180910011	Indiana	LaPorte	12.49	12.84	11.29	11.60	10.91	11.21	9.81	10.10
180910012	Indiana	LaPorte	12.69	13.07	11.50	11.84	11.12	11.45	9.97	10.29
180950009	Indiana	Madison	13.97	14.37	12.90	13.27	12.47	12.83	10.44	10.75
180970042	Indiana	Marion	14.24	14.51	13.20	13.45	12.73	12.97	10.34	10.56
180970078	Indiana	Marion	15.26	15.43	14.12	14.28	13.64	13.79	11.29	11.42
180970079	Indiana	Marion	14.71	14.99	13.56	13.81	13.08	13.33	10.81	11.04
180970081	Indiana	Marion	16.05	16.36	14.86	15.16	14.36	14.65	12.01	12.27
180970083	Indiana	Marion	15.90	16.27	14.71	15.06	14.21	14.55	11.86	12.16
181270020	Indiana	Porter	12.66	13.01	11.42	11.74	11.01	11.32	9.90	10.19
181270024	Indiana	Porter	13.21	13.39	11.92	12.09	11.49	11.65	10.36	10.48
181410014	Indiana	St. Joseph	13.29	13.65	12.21	12.54	11.89	12.21	10.99	11.29
181411008	Indiana	St. Joseph	13.69	13.69	12.57	12.57	12.23	12.23	11.37	11.37
181412004	Indiana	St. Joseph	12.82	13.22	11.77	12.14	11.45	11.81	10.57	10.90
181470009	Indiana	Spencer	14.32	14.55	13.06	13.27	12.47	12.66	9.82	9.95
181570008	Indiana	Tippecanoe	13.70	14.06	12.54	12.87	12.10	12.42	10.41	10.70
181630006	Indiana	Vanderburgh	14.69	14.89	13.53	13.71	13.01	13.19	10.96	11.13
181630012	Indiana	Vanderburgh	14.82	15.00	13.61	13.78	13.08	13.25	11.08	11.23
181630016	Indiana	Vanderburgh	14.99	15.14	13.81	13.95	13.29	13.43	11.23	11.36
181670018	Indiana	Vigo	13.99	14.17	12.65	12.82	12.12	12.27	10.17	10.29
181670023	Indiana	Vigo	13.46	13.69	12.16	12.37	11.63	11.83	9.66	9.82
190130008	Iowa	Black Hawk	11.16	11.52	10.20	10.54	9.91	10.23	9.22	9.51
190450021	Iowa	Clinton	12.52	12.63	11.44	11.54	11.07	11.16	10.20	10.28

			Annual $PM_{2.5}$ Design Values ($\mu g/m^3$)							
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191032001	Iowa	Johnson	12.08	12.26	11.04	11.20	10.73	10.88	9.97	10.11
191130037	Iowa	Linn	10.79	10.95	9.78	9.92	9.48	9.63	8.75	8.88
191370002	Iowa	Montgomery	10.02	10.33	9.09	9.37	8.84	9.11	8.13	8.37
191390015	Iowa	Muscatine	12.92	13.29	11.85	12.20	11.50	11.83	10.66	10.96
191471002	Iowa	Palo Alto	9.53	9.53	8.72	8.72	8.51	8.51	7.99	7.99
191530030	Iowa	Polk	10.41	10.54	9.44	9.55	9.17	9.29	8.52	8.63
191532510	Iowa	Polk	9.95	10.14	9.01	9.19	8.76	8.93	8.13	8.31
191532520	Iowa	Polk	10.64	10.64	9.65	9.65	9.38	9.38	8.75	8.75
191550009	Iowa	Pottawattamie	11.13	11.52	10.08	10.44	9.82	10.17	9.25	9.57
191630015	Iowa	Scott	11.86	12.06	10.84	11.03	10.47	10.64	9.59	9.75
191630018	Iowa	Scott	11.64	11.89	10.64	10.87	10.27	10.48	9.38	9.58
191630019	Iowa	Scott	14.42	14.42	13.27	13.27	12.86	12.86	12.01	12.01
191770006	Iowa	Van Buren	10.84	10.84	9.94	9.94	9.65	9.65	8.92	8.92
191930017	Iowa	Woodbury	10.32	10.53	9.47	9.66	9.27	9.46	8.80	8.98
191970004	Iowa	Wright	10.37	10.51	9.47	9.59	9.22	9.34	8.59	8.70
200910007	Kansas	Johnson	10.59	10.86	9.60	9.84	9.33	9.56	8.59	8.81
200910009	Kansas	Johnson	11.10	11.10	10.08	10.08	9.79	9.79	8.97	8.97
200910010	Kansas	Johnson	9.68	9.74	8.81	8.86	8.56	8.61	7.82	7.86
201070002	Kansas	Linn	10.47	10.62	9.66	9.79	9.41	9.53	8.55	8.65
201730008	Kansas	Sedgwick	10.26	10.85	9.28	9.81	9.05	9.57	8.39	8.89
201730009	Kansas	Sedgwick	10.29	10.95	9.31	9.89	9.07	9.64	8.42	8.95
201730010	Kansas	Sedgwick	10.36	10.96	9.37	9.92	9.14	9.67	8.49	8.99
201770010	Kansas	Shawnee	10.79	10.79	9.86	9.86	9.61	9.61	8.87	8.87
201770011	Kansas	Shawnee	10.93	10.93	10.00	10.00	9.76	9.76	9.06	9.06
201910002	Kansas	Sumner	9.89	10.31	9.01	9.39	8.80	9.17	8.13	8.47
202090021	Kansas	Wyandotte	12.73	13.37	11.54	12.12	11.23	11.80	10.44	10.97

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202090022	Kansas	Wyandotte	10.93	11.25	9.90	10.18	9.61	9.90	8.86	9.14
210130002	Kentucky	Bell	14.10	14.18	12.52	12.58	11.93	11.99	9.84	9.88
210190017	Kentucky	Boyd	14.49	14.70	12.99	13.17	12.36	12.54	9.85	9.98
210290006	Kentucky	Bullitt	14.92	15.27	13.57	13.89	12.96	13.26	10.41	10.64
210370003	Kentucky	Campbell	13.67	13.67	12.46	12.46	11.94	11.94	9.33	9.33
210430500	Kentucky	Carter	12.22	12.61	10.85	11.19	10.29	10.62	8.09	8.33
210470006	Kentucky	Christian	13.20	13.55	12.16	12.47	11.59	11.88	9.13	9.35
210590005	Kentucky	Daviess	14.10	14.10	13.03	13.03	12.42	12.42	9.40	9.40
210670012	Kentucky	Fayette	14.36	14.60	12.87	13.08	12.30	12.51	9.82	9.97
210670014	Kentucky	Fayette	14.87	15.13	13.36	13.59	12.79	13.01	10.30	10.52
210730006	Kentucky	Franklin	13.37	13.52	12.04	12.17	11.49	11.62	9.04	9.12
210930006	Kentucky	Hardin	13.58	14.04	12.37	12.78	11.78	12.17	9.18	9.47
211010014	Kentucky	Henderson	13.93	14.28	12.69	13.00	12.18	12.47	9.99	10.22
211110043	Kentucky	Jefferson	15.55	15.77	14.04	14.24	13.42	13.62	10.88	11.05
211110044	Kentucky	Jefferson	15.35	15.52	13.79	13.94	13.18	13.32	10.70	10.79
211110048	Kentucky	Jefferson	15.31	15.33	13.74	13.76	13.12	13.14	10.63	10.65
211110051	Kentucky	Jefferson	14.74	15.28	13.30	13.79	12.69	13.15	10.13	10.50
211170007	Kentucky	Kenton	14.39	14.52	13.12	13.24	12.57	12.70	9.94	10.06
211250004	Kentucky	Laurel	12.55	12.55	11.19	11.19	10.67	10.67	8.58	8.58
211451004	Kentucky	McCracken	13.41	13.91	12.33	12.78	11.73	12.16	9.63	9.95
211510003	Kentucky	Madison	13.61	13.70	12.17	12.26	11.62	11.71	9.16	9.25
211930003	Kentucky	Perry	13.21	13.88	11.76	12.36	11.21	11.78	9.12	9.58
211950002	Kentucky	Pike	13.49	13.98	11.94	12.37	11.37	11.77	9.05	9.37
212270007	Kentucky	Warren	13.83	13.92	12.71	12.78	12.11	12.19	9.44	9.49
220171002	Louisiana	Caddo	12.53	12.53	11.49	11.49	11.03	11.03	9.90	9.90
220190009	Louisiana	Calcasieu	10.58	10.78	9.55	9.74	9.31	9.49	8.47	8.64

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220190010	Louisiana	Calcasieu	11.07	11.24	10.00	10.15	9.75	9.90	8.89	9.03
220290003	Louisiana	Concordia	11.42	11.42	10.32	10.32	9.98	9.98	8.79	8.79
220330009	Louisiana	East Baton Rouge	13.38	13.57	12.07	12.24	11.75	11.91	10.87	11.03
220331001	Louisiana	East Baton Rouge	12.08	12.18	10.87	10.95	10.59	10.66	9.72	9.78
220470005	Louisiana	Iberville	12.90	12.98	11.47	11.54	11.15	11.22	10.28	10.34
220470009	Louisiana	Iberville	11.02	11.16	9.77	9.89	9.47	9.59	8.45	8.55
220511001	Louisiana	Jefferson	11.52	11.68	9.92	10.05	9.59	9.71	8.55	8.66
220550006	Louisiana	Lafayette	11.08	11.18	9.85	9.95	9.56	9.65	8.45	8.54
220730004	Louisiana	Ouachita	11.97	12.21	11.02	11.23	10.68	10.89	9.57	9.75
220790002	Louisiana	Rapides	11.03	11.04	9.92	9.94	9.62	9.64	8.55	8.57
221050001	Louisiana	Tangipahoa	12.03	12.39	10.61	10.92	10.27	10.58	9.12	9.39
221090001	Louisiana	Terrebonne	10.74	10.83	9.40	9.47	9.11	9.18	8.06	8.12
221210001	Louisiana	West Baton Rouge	13.51	13.68	12.19	12.35	11.87	12.03	10.99	11.13
230010011	Maine	Androscoggin	9.90	10.62	8.92	9.58	8.75	9.39	8.43	9.05
230030013	Maine	Aroostook	9.74	10.27	9.35	9.87	9.28	9.78	9.03	9.52
230031011	Maine	Aroostook	8.27	8.92	7.80	8.41	7.71	8.32	7.49	8.07
230050015	Maine	Cumberland	11.06	11.68	9.88	10.44	9.70	10.24	9.37	9.90
230050027	Maine	Cumberland	11.13	11.53	9.95	10.32	9.77	10.12	9.44	9.78
230090103	Maine	Hancock	5.76	6.17	5.02	5.38	4.95	5.31	4.65	4.98
230110016	Maine	Kennebec	9.99	10.70	9.02	9.67	8.86	9.49	8.55	9.16
230172011	Maine	Oxford	10.13	10.38	9.34	9.57	9.21	9.43	8.88	9.09
230190002	Maine	Penobscot	9.12	9.65	8.20	8.67	8.05	8.52	7.72	8.17
240030014	Maryland	Anne Arundel	11.91	11.91	9.91	9.91	9.59	9.59	8.28	8.28

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240031003	Maryland	Anne Arundel	14.82	15.26	12.59	12.96	12.23	12.59	10.95	11.27
240032002	Maryland	Anne Arundel	14.57	14.57	12.32	12.32	11.98	11.98	10.72	10.72
240051007	Maryland	Baltimore	13.77	14.04	11.58	11.80	11.24	11.45	9.73	9.91
240053001	Maryland	Baltimore	14.76	15.05	12.42	12.67	12.08	12.33	10.69	10.92
240150003	Maryland	Cecil	12.68	12.82	10.58	10.69	10.29	10.40	8.98	9.06
240251001	Maryland	Harford	12.51	12.62	10.36	10.45	10.07	10.16	8.73	8.81
240313001	Maryland	Montgomery	12.47	12.70	10.57	10.76	10.23	10.41	8.75	8.91
240330030	Maryland	Prince George's	12.24	12.24	10.34	10.34	10.02	10.02	8.61	8.61
240338003	Maryland	Prince George's	13.03	13.23	10.88	11.06	10.54	10.72	9.17	9.33
240430009	Maryland	Washington	13.70	14.14	12.00	12.38	11.64	12.01	9.81	10.12
245100006	Maryland	Baltimore City	14.12	14.37	11.86	12.07	11.52	11.72	10.13	10.31
245100007	Maryland	Baltimore City	14.38	15.01	12.15	12.67	11.80	12.29	10.33	10.74
245100008	Maryland	Baltimore City	15.76	15.87	13.34	13.43	12.96	13.05	11.58	11.66
245100049	Maryland	Baltimore City	15.63	15.63	13.27	13.27	12.90	12.90	11.57	11.57
250035001	Massachusetts	Berkshire	10.65	11.15	9.44	9.90	9.24	9.68	8.55	8.97
250051004	Massachusetts	Bristol	9.58	10.16	8.06	8.56	7.99	8.48	7.47	7.92
250092006	Massachusetts	Essex	9.03	9.09	7.71	7.76	7.58	7.63	7.09	7.14
250095005	Massachusetts	Essex	9.10	9.32	7.89	8.07	7.76	7.94	7.29	7.46
250096001	Massachusetts	Essex	9.58	9.74	8.32	8.46	8.18	8.31	7.69	7.82
250130008	Massachusetts	Hampden	9.85	10.14	8.56	8.82	8.37	8.62	7.74	7.97

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250130016	Massachusetts	Hampden	12.17	12.52	10.70	11.00	10.47	10.76	9.84	10.12
250132009	Massachusetts	Hampden	11.85	11.90	10.41	10.45	10.19	10.23	9.57	9.60
250230004	Massachusetts	Plymouth	9.87	10.14	8.39	8.63	8.30	8.53	7.78	7.99
250250002	Massachusetts	Suffolk	12.34	13.00	10.68	11.24	10.50	11.05	9.98	10.51
250250027	Massachusetts	Suffolk	11.86	12.27	10.21	10.57	10.03	10.39	9.51	9.86
250250042	Massachusetts	Suffolk	10.88	11.36	9.32	9.74	9.17	9.57	8.65	9.03
250250043	Massachusetts	Suffolk	13.07	13.88	11.34	12.05	11.15	11.84	10.63	11.30
250270016	Massachusetts	Worcester	10.55	10.70	9.17	9.30	8.98	9.10	8.37	8.48
250270023	Massachusetts	Worcester	11.29	11.32	9.86	9.87	9.66	9.67	9.06	9.07
260050003	Michigan	Allegan	11.84	11.99	10.76	10.89	10.41	10.53	9.19	9.27
260170014	Michigan	Bay	10.93	11.05	9.89	10.01	9.61	9.72	8.60	8.69
260210014	Michigan	Berrien	11.72	11.91	10.63	10.81	10.27	10.44	9.18	9.30
260490021	Michigan	Genesee	11.61	11.79	10.47	10.63	10.14	10.29	8.93	9.06
260650012	Michigan	Ingham	12.23	12.51	11.07	11.32	10.73	10.98	9.49	9.71
260770008	Michigan	Kalamazoo	12.84	13.06	11.68	11.88	11.32	11.51	10.13	10.30
260810020	Michigan	Kent	12.89	13.09	11.56	11.74	11.18	11.35	10.14	10.30
260990009	Michigan	Macomb	12.70	13.04	11.53	11.83	11.19	11.48	9.85	10.07
261130001	Michigan	Missaukee	8.26	8.36	7.68	7.77	7.46	7.55	6.86	6.94
261150005	Michigan	Monroe	13.92	14.13	12.55	12.74	12.17	12.36	10.53	10.68
261210040	Michigan	Muskegon	11.61	11.70	10.48	10.56	10.13	10.20	9.16	9.20
261250001	Michigan	Oakland	13.78	14.26	12.29	12.73	11.89	12.31	10.56	10.93
261390005	Michigan	Ottawa	12.55	12.67	11.28	11.38	10.91	11.01	9.82	9.89
261450018	Michigan	Saginaw	10.61	10.61	9.61	9.61	9.33	9.33	8.34	8.34
261470005	Michigan	St. Clair	13.34	13.75	12.27	12.64	11.95	12.32	10.58	10.88
261610005	Michigan	Washtenaw	12.30	12.30	11.04	11.04	10.69	10.69	9.35	9.35
261610008	Michigan	Washtenaw	13.88	14.29	12.41	12.78	12.02	12.37	10.70	11.01

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261630001	Michigan	Wayne	14.52	15.11	12.94	13.47	12.52	13.03	11.31	11.77
261630015	Michigan	Wayne	15.88	16.40	14.26	14.72	13.81	14.27	12.24	12.62
261630016	Michigan	Wayne	14.57	15.17	13.09	13.63	12.69	13.21	11.29	11.76
261630019	Michigan	Wayne	14.32	14.77	12.96	13.37	12.59	12.98	11.20	11.53
261630025	Michigan	Wayne	13.39	13.88	11.93	12.36	11.52	11.94	10.14	10.47
261630033	Michigan	Wayne	17.50	18.16	15.73	16.32	15.25	15.82	13.59	14.08
261630036	Michigan	Wayne	14.67	15.44	13.17	13.86	12.78	13.44	11.44	12.00
270210001	Minnesota	Cass	5.70	5.80	5.37	5.47	5.29	5.38	5.06	5.15
270370470	Minnesota	Dakota	9.30	9.55	8.49	8.72	8.27	8.49	7.86	8.07
270530050	Minnesota	Hennepin	9.76	9.82	8.87	8.92	8.62	8.67	8.24	8.29
270530961	Minnesota	Hennepin	9.14	9.27	8.30	8.42	8.07	8.18	7.68	7.78
270530963	Minnesota	Hennepin	9.59	9.81	8.69	8.89	8.44	8.63	8.05	8.23
270530965	Minnesota	Hennepin	9.54	9.58	8.67	8.71	8.42	8.46	8.05	8.09
270531007	Minnesota	Hennepin	9.56	9.75	8.68	8.86	8.44	8.61	8.05	8.21
270532006	Minnesota	Hennepin	9.33	9.39	8.48	8.52	8.24	8.28	7.85	7.89
270953051	Minnesota	Mille Lacs	6.54	6.67	6.09	6.22	5.98	6.11	5.72	5.84
271095008	Minnesota	Olmsted	10.13	10.13	9.26	9.26	9.04	9.04	8.48	8.48
271230866	Minnesota	Ramsey	11.32	11.61	10.41	10.67	10.16	10.42	9.78	10.03
271230868	Minnesota	Ramsey	11.02	11.31	10.06	10.32	9.79	10.04	9.43	9.68
271230871	Minnesota	Ramsey	9.63	9.80	8.77	8.93	8.54	8.69	8.18	8.32
271377001	Minnesota	Saint Louis	6.10	6.15	5.73	5.78	5.65	5.70	5.45	5.49
271377550	Minnesota	Saint Louis	6.19	6.25	5.78	5.84	5.67	5.73	5.44	5.49
271377551	Minnesota	Saint Louis	7.51	7.62	7.02	7.12	6.90	7.00	6.66	6.75
271390505	Minnesota	Scott	9.00	9.16	8.24	8.39	8.04	8.17	7.62	7.74
271453052	Minnesota	Stearns	8.58	8.80	7.96	8.17	7.81	8.01	7.46	7.66
280010004	Mississippi	Adams	11.29	11.46	10.17	10.33	9.84	9.99	8.63	8.77

			Annual $PM_{2.5}$ Design Values ($\mu g/m^3$)							
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280110001	Mississippi	Bolivar	12.36	12.58	11.39	11.60	10.97	11.16	9.55	9.72
280330002	Mississippi	DeSoto	12.43	12.51	11.24	11.31	10.70	10.76	9.08	9.14
280350004	Mississippi	Forrest	13.62	13.99	12.08	12.41	11.69	12.00	10.28	10.55
280470008	Mississippi	Harrison	12.20	12.34	10.69	10.81	10.38	10.50	9.26	9.37
280490010	Mississippi	Hinds	12.56	12.66	11.29	11.38	10.87	10.95	9.58	9.66
280590006	Mississippi	Jackson	12.04	12.16	10.42	10.54	10.10	10.21	8.99	9.09
280670002	Mississippi	Jones	14.39	14.59	12.79	12.96	12.35	12.52	10.85	11.00
280750003	Mississippi	Lauderdale	13.07	13.09	11.76	11.78	11.32	11.34	9.76	9.78
280810005	Mississippi	Lee	12.57	12.83	11.42	11.65	10.89	11.11	9.19	9.37
280870001	Mississippi	Lowndes	12.79	13.11	11.66	11.94	11.17	11.44	9.52	9.75
281090001	Mississippi	Pearl River	12.14	12.14	10.72	10.72	10.40	10.40	9.24	9.24
281490004	Mississippi	Warren	12.32	12.32	11.22	11.22	10.83	10.83	9.56	9.56
290190004	Missouri	Boone	11.84	11.84	10.91	10.91	10.55	10.55	9.52	9.52
290210005	Missouri	Buchanan	12.80	12.80	11.78	11.78	11.52	11.52	10.79	10.79
290370003	Missouri	Cass	10.67	10.83	9.74	9.89	9.46	9.60	8.62	8.73
290390001	Missouri	Cedar	11.12	11.12	10.24	10.24	9.94	9.94	8.85	8.85
290470005	Missouri	Clay	11.03	11.25	10.03	10.24	9.76	9.96	8.94	9.10
290770032	Missouri	Greene	11.75	11.87	10.92	11.03	10.57	10.68	9.49	9.60
290950034	Missouri	Jackson	12.78	13.19	11.56	11.93	11.24	11.60	10.44	10.78
290990012	Missouri	Jefferson	13.79	13.97	12.81	12.98	12.27	12.43	10.96	11.12
291370001	Missouri	Monroe	10.87	10.87	9.99	9.99	9.62	9.62	8.57	8.57
291831002	Missouri	Saint Charles	13.29	13.70	12.44	12.83	11.88	12.25	10.38	10.71
291860006	Missouri	Sainte Genevieve	13.34	13.66	12.38	12.67	11.86	12.13	10.44	10.68
291890004	Missouri	Saint Louis	13.04	13.04	12.06	12.06	11.51	11.51	10.16	10.16
291892003	Missouri	Saint Louis	13.46	13.79	12.39	12.69	11.79	12.08	10.32	10.58

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295100007	Missouri	St. Louis City	14.27	14.45	13.17	13.34	12.56	12.72	11.15	11.30
295100085	Missouri	St. Louis City	14.36	14.45	13.21	13.29	12.56	12.64	11.07	11.14
295100086	Missouri	St. Louis City	13.44	13.60	12.37	12.52	11.74	11.89	10.27	10.40
295100087	Missouri	St. Louis City	14.56	14.70	13.44	13.57	12.77	12.90	11.26	11.38
300870307	Montana	Rosebud	6.58	6.58	6.34	6.34	6.32	6.32	6.39	6.39
301111065	Montana	Yellowstone	8.14	8.18	7.76	7.79	7.69	7.72	7.70	7.73
310250002	Nebraska	Cass	9.99	9.99	9.03	9.03	8.80	8.80	8.23	8.23
310550019	Nebraska	Douglas	9.88	10.06	8.91	9.08	8.67	8.84	8.10	8.25
310550052	Nebraska	Douglas	9.85	10.18	8.88	9.17	8.64	8.92	8.08	8.36
310790004	Nebraska	Hall	7.95	7.95	7.22	7.22	7.06	7.06	6.66	6.66
311090022	Nebraska	Lancaster	8.90	9.28	7.99	8.33	7.77	8.10	7.25	7.57
311111002	Nebraska	Lincoln	7.57	7.57	7.04	7.04	6.95	6.95	6.77	6.77
311530007	Nebraska	Sarpy	9.79	9.86	8.83	8.89	8.59	8.65	8.01	8.08
311570003	Nebraska	Scotts Bluff	6.04	6.04	5.64	5.64	5.60	5.60	5.57	5.57
311770002	Nebraska	Washington	9.29	9.35	8.42	8.47	8.21	8.26	7.67	7.73
330012004	New Hampshire	Belknap	7.28	7.33	6.39	6.43	6.27	6.31	5.82	5.86
330050007	New Hampshire	Cheshire	11.53	11.61	10.29	10.36	10.11	10.17	9.55	9.60
330070014	New Hampshire	Coos	10.24	10.39	9.49	9.63	9.36	9.50	8.97	9.09
330090010	New Hampshire	Grafton	8.43	8.43	7.59	7.59	7.45	7.45	6.99	6.99
330110020	New Hampshire	Hillsborough	10.18	10.18	8.86	8.86	8.71	8.71	8.19	8.19
330111015	New Hampshire	Hillsborough	10.01	10.01	8.75	8.75	8.59	8.59	8.07	8.07
330115001	New Hampshire	Hillsborough	6.27	6.27	5.44	5.44	5.34	5.34	4.94	4.94

			Annual $PM_{2.5}$ Design Values ($\mu g/m^3$)							
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330131006	New Hampshire	Merrimack	9.72	9.73	8.46	8.47	8.31	8.32	7.80	7.81
330150014	New Hampshire	Rockingham	9.00	9.20	7.84	8.02	7.74	7.91	7.32	7.48
330190003	New Hampshire	Sullivan	9.86	10.17	8.86	9.12	8.70	8.96	8.18	8.41
340011006	New Jersey	Atlantic	11.47	11.47	9.61	9.61	9.39	9.39	8.28	8.28
340030003	New Jersey	Bergen	13.09	13.29	11.05	11.21	10.58	10.73	9.72	9.84
340070003	New Jersey	Camden	13.31	13.40	11.20	11.28	10.89	10.96	9.72	9.79
340071007	New Jersey	Camden	13.51	13.78	11.31	11.52	10.96	11.17	9.75	9.93
340130015	New Jersey	Essex	13.27	13.29	11.09	11.11	10.66	10.68	9.71	9.73
340155001	New Jersey	Gloucester	13.46	13.46	11.28	11.28	10.97	10.97	9.71	9.71
340171003	New Jersey	Hudson	14.24	14.66	12.04	12.39	11.55	11.88	10.63	10.92
340210008	New Jersey	Mercer	12.71	12.97	10.80	10.99	10.48	10.67	9.32	9.46
340218001	New Jersey	Mercer	11.14	11.66	9.37	9.80	9.09	9.50	7.99	8.34
340230006	New Jersey	Middlesex	12.15	12.52	10.32	10.63	10.01	10.30	8.93	9.19
340270004	New Jersey	Morris	11.50	11.92	9.73	10.07	9.41	9.74	8.36	8.64
340273001	New Jersey	Morris	10.21	10.59	8.73	9.04	8.47	8.78	7.45	7.71
340292002	New Jersey	Ocean	10.92	11.27	9.17	9.45	8.90	9.17	7.87	8.11
340310005	New Jersey	Passaic	12.88	13.09	10.78	10.94	10.37	10.51	9.41	9.52
340390004	New Jersey	Union	14.94	15.53	12.57	13.08	12.10	12.59	11.11	11.56
340390006	New Jersey	Union	13.32	13.64	11.10	11.35	10.66	10.91	9.72	9.93
340392003	New Jersey	Union	13.06	13.32	10.90	11.10	10.48	10.68	9.51	9.68
340410006	New Jersey	Warren	12.72	13.11	10.87	11.19	10.56	10.86	9.34	9.60
350010023	New Mexico	Bernalillo	7.03	7.13	6.41	6.49	6.28	6.37	6.21	6.30
350010024	New Mexico	Bernalillo	6.64	6.81	6.03	6.20	5.92	6.08	5.84	6.01
350050005	New Mexico	Chaves	6.54	6.58	6.13	6.17	6.06	6.11	5.84	5.88

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350130017	New Mexico	Dona Ana	9.95	10.40	9.42	9.84	9.34	9.76	9.18	9.59
350130025	New Mexico	Dona Ana	6.31	6.35	5.89	5.93	5.81	5.85	5.66	5.70
350431003	New Mexico	Sandoval	5.00	5.02	4.55	4.58	4.47	4.49	4.41	4.43
350439011	New Mexico	Sandoval	7.99	8.34	7.61	7.94	7.55	7.88	7.49	7.81
350450006	New Mexico	San Juan	5.92	6.08	5.61	5.76	5.59	5.74	5.58	5.73
350490020	New Mexico	Santa Fe	4.76	4.81	4.49	4.54	4.45	4.50	4.40	4.44
360010005	New York	Albany	11.83	11.83	10.71	10.71	10.48	10.48	9.78	9.78
360050080	New York	Bronx	15.43	15.72	13.30	13.54	12.79	13.02	12.01	12.22
360050083	New York	Bronx	13.09	13.35	10.98	11.18	10.47	10.67	9.54	9.71
360050110	New York	Bronx	13.45	14.06	11.51	12.04	11.04	11.54	10.32	10.79
360130011	New York	Chautauqua	9.80	10.09	8.73	8.98	8.47	8.71	6.97	7.16
360290005	New York	Erie	12.62	12.79	11.30	11.45	10.98	11.13	9.53	9.66
360291007	New York	Erie	12.64	13.00	11.29	11.62	10.97	11.29	9.47	9.77
360310003	New York	Essex	5.94	5.98	5.44	5.48	5.33	5.36	4.77	4.80
360470122	New York	Kings	14.20	14.64	12.04	12.42	11.54	11.90	10.64	10.97
360551007	New York	Monroe	10.64	10.64	9.52	9.52	9.28	9.28	8.33	8.33
360590008	New York	Nassau	11.66	12.07	9.79	10.13	9.43	9.75	8.56	8.85
360610056	New York	New York	16.18	17.02	13.80	14.49	13.23	13.89	12.30	12.89
360610062	New York	New York	14.80	15.31	12.53	12.96	12.02	12.43	11.07	11.44
360610079	New York	New York	13.61	14.00	11.62	11.95	11.14	11.45	10.39	10.67
360610128	New York	New York	15.41	15.80	13.14	13.46	12.61	12.91	11.69	11.97
360632008	New York	Niagara	11.96	12.29	10.84	11.13	10.56	10.85	9.17	9.41
360671015	New York	Onondaga	10.08	10.46	8.98	9.32	8.71	9.03	7.64	7.90
360710002	New York	Orange	10.99	11.43	9.38	9.74	9.07	9.42	8.15	8.45
360810124	New York	Queens	12.18	12.69	10.30	10.74	9.85	10.27	8.96	9.34
360850055	New York	Richmond	13.31	13.37	11.13	11.18	10.68	10.73	9.76	9.81

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360850067	New York	Richmond	11.59	11.82	9.70	9.90	9.32	9.51	8.51	8.69
360893001	New York	St. Lawrence	7.29	7.71	6.76	7.14	6.64	7.01	6.02	6.35
361010003	New York	Steuben	9.00	9.38	7.96	8.29	7.76	8.08	6.55	6.81
361030001	New York	Suffolk	11.52	11.52	9.63	9.63	9.26	9.26	8.38	8.38
361191002	New York	Westchester	11.73	11.94	9.83	9.99	9.42	9.57	8.55	8.68
370010002	North Carolina	Alamance	13.94	14.07	11.90	12.01	11.42	11.54	9.55	9.65
370210034	North Carolina	Buncombe	12.60	12.65	10.91	10.95	10.44	10.48	8.76	8.79
370330001	North Carolina	Caswell	13.19	13.33	11.18	11.30	10.70	10.81	8.84	8.93
370350004	North Carolina	Catawba	15.31	15.37	12.92	12.97	12.38	12.43	10.46	10.51
370370004	North Carolina	Chatham	11.99	12.15	10.23	10.37	9.83	9.97	8.06	8.18
370510009	North Carolina	Cumberland	13.73	13.85	12.01	12.12	11.53	11.63	9.94	10.03
370570002	North Carolina	Davidson	15.17	15.24	12.86	12.92	12.39	12.45	10.32	10.37
370610002	North Carolina	Duplin	11.30	11.54	9.73	9.94	9.32	9.53	7.89	8.06
370630001	North Carolina	Durham	13.57	13.67	11.67	11.75	11.23	11.32	9.46	9.54
370650004	North Carolina	Edgecombe	12.37	12.38	10.69	10.69	10.24	10.24	8.66	8.66
370670022	North Carolina	Forsyth	14.28	14.45	12.02	12.16	11.50	11.63	9.51	9.63
370710016	North Carolina	Gaston	14.26	14.40	12.01	12.12	11.53	11.64	9.71	9.80
370810013	North Carolina	Guilford	13.79	13.79	11.73	11.73	11.22	11.22	9.40	9.40
370870010	North Carolina	Haywood	12.98	13.00	11.44	11.46	11.00	11.02	9.56	9.57
370990006	North Carolina	Jackson	12.09	12.43	10.54	10.85	10.06	10.35	8.45	8.70
371070004	North Carolina	Lenoir	11.12	11.29	9.57	9.73	9.17	9.32	7.76	7.90
371110004	North Carolina	McDowell	14.24	14.35	12.34	12.43	11.86	11.95	10.11	10.18
371170001	North Carolina	Martin	10.86	11.12	9.27	9.50	8.91	9.14	7.52	7.71
371190010	North Carolina	Mecklenburg	15.31	15.31	12.96	12.96	12.50	12.50	10.70	10.70
371190041	North Carolina	Mecklenburg	14.74	14.94	12.43	12.60	11.97	12.14	10.14	10.29
371190042	North Carolina	Mecklenburg	14.80	14.93	12.49	12.59	12.03	12.13	10.20	10.29

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371210001	North Carolina	Mitchell	12.75	13.00	10.95	11.17	10.48	10.68	8.67	8.84
371230001	North Carolina	Montgomery	12.35	12.52	10.58	10.72	10.16	10.30	8.40	8.51
371290002	North Carolina	New Hanover	9.96	10.18	8.54	8.72	8.17	8.34	6.94	7.08
371330005	North Carolina	Onslow	10.98	11.26	9.40	9.66	9.03	9.28	7.66	7.88
371350007	North Carolina	Orange	13.12	13.25	11.21	11.32	10.78	10.88	8.96	9.05
371470005	North Carolina	Pitt	11.59	11.90	9.99	10.26	9.57	9.84	8.13	8.36
371550005	North Carolina	Robeson	12.78	12.79	11.18	11.21	10.65	10.68	9.09	9.12
371590021	North Carolina	Rowan	14.02	14.02	11.93	11.93	11.52	11.52	9.61	9.61
371730002	North Carolina	Swain	12.65	12.82	11.06	11.21	10.54	10.68	8.84	8.96
371830014	North Carolina	Wake	13.54	13.57	11.64	11.67	11.19	11.22	9.46	9.49
371890003	North Carolina	Watauga	12.05	12.06	10.24	10.25	9.75	9.76	7.82	7.83
371910005	North Carolina	Wayne	12.96	13.14	11.33	11.49	10.78	10.93	9.31	9.44
380070002	North Dakota	Billings	4.61	4.68	4.42	4.49	4.40	4.46	4.37	4.44
380130002	North Dakota	Burke	5.90	5.90	5.74	5.74	5.72	5.72	5.69	5.69
380130003	North Dakota	Burke	5.78	5.78	5.61	5.61	5.58	5.58	5.55	5.55
380150003	North Dakota	Burleigh	6.61	6.71	6.24	6.33	6.18	6.27	6.11	6.19
380171004	North Dakota	Cass	7.72	7.75	7.22	7.25	7.10	7.13	6.91	6.94
380530002	North Dakota	McKenzie	5.01	5.09	4.85	4.93	4.82	4.91	4.80	4.88
380570004	North Dakota	Mercer	6.04	6.15	5.80	5.90	5.76	5.87	5.71	5.82
390090003	Ohio	Athens	12.39	12.67	10.88	11.13	10.39	10.63	8.14	8.33
390170016	Ohio	Butler	15.74	16.11	14.34	14.68	13.78	14.11	11.28	11.55
390170017	Ohio	Butler	15.36	15.36	14.11	14.11	13.63	13.63	11.38	11.38
390171004	Ohio	Butler	14.90	15.14	13.67	13.89	13.19	13.40	10.85	11.03
390230005	Ohio	Clark	14.64	14.77	13.35	13.47	12.90	13.02	10.74	10.84
390250022	Ohio	Clermont	14.15	14.15	12.94	12.94	12.43	12.43	9.82	9.82
390350027	Ohio	Cuyahoga	15.46	16.13	14.22	14.83	13.80	14.40	11.28	11.76

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390350034	Ohio	Cuyahoga	13.76	14.07	12.75	13.04	12.37	12.65	9.98	10.21
390350038	Ohio	Cuyahoga	17.37	18.10	15.99	16.66	15.54	16.20	12.99	13.54
390350045	Ohio	Cuyahoga	16.47	16.98	15.14	15.61	14.70	15.16	12.15	12.53
390350060	Ohio	Cuyahoga	17.11	17.66	15.67	16.18	15.21	15.71	12.70	13.14
390350065	Ohio	Cuyahoga	15.97	16.44	14.67	15.10	14.25	14.67	11.69	12.03
390351002	Ohio	Cuyahoga	14.14	14.64	12.95	13.41	12.58	13.03	10.38	10.75
390490024	Ohio	Franklin	15.27	15.95	13.62	14.23	13.12	13.71	11.12	11.63
390490025	Ohio	Franklin	15.08	15.45	13.45	13.78	12.95	13.27	10.95	11.23
390490081	Ohio	Franklin	14.33	14.33	12.80	12.80	12.33	12.33	10.35	10.35
390570005	Ohio	Greene	13.36	13.55	12.07	12.24	11.61	11.78	9.43	9.57
390610006	Ohio	Hamilton	14.84	14.84	13.50	13.50	12.97	12.97	10.47	10.47
390610014	Ohio	Hamilton	17.29	17.53	15.76	15.98	15.16	15.37	12.47	12.63
390610040	Ohio	Hamilton	15.50	15.88	14.12	14.46	13.55	13.89	10.86	11.14
390610042	Ohio	Hamilton	16.85	17.25	15.40	15.77	14.81	15.17	12.16	12.47
390610043	Ohio	Hamilton	15.55	15.82	14.16	14.41	13.61	13.86	11.13	11.35
390617001	Ohio	Hamilton	16.17	16.56	14.74	15.10	14.17	14.52	11.48	11.80
390618001	Ohio	Hamilton	17.54	17.90	16.01	16.33	15.41	15.72	12.73	12.99
390810017	Ohio	Jefferson	15.41	15.46	13.37	13.41	12.91	12.95	10.57	10.60
390811001	Ohio	Jefferson	16.51	17.17	14.31	14.88	13.82	14.37	11.28	11.71
390851001	Ohio	Lake	13.02	13.02	12.15	12.15	11.81	11.81	9.53	9.53
390870010	Ohio	Lawrence	15.14	15.44	13.66	13.92	13.07	13.32	10.71	10.91
390930016	Ohio	Lorain	13.87	14.13	12.80	13.04	12.43	12.67	10.15	10.33
390933002	Ohio	Lorain	12.78	12.98	11.88	12.06	11.57	11.75	9.72	9.88
390950024	Ohio	Lucas	14.38	14.68	13.01	13.28	12.62	12.88	10.98	11.22
390950025	Ohio	Lucas	13.95	14.37	12.62	13.00	12.24	12.61	10.57	10.90
390950026	Ohio	Lucas	14.08	14.30	12.78	12.97	12.38	12.58	10.75	10.93

			Annual $PM_{2.5}$ Design Values ($\mu g/m^3$)							
Site ID	State	County	2003-2007 Average Ambient Values	2003-2007 Maximum Ambient Values	2012 Base Case Average Values	2012 Base Case Maximum Values	2014 Base Case Average Values	2014 Base Case Maximum Values	2014 Remedy Average Values	2014 Remedy Maximum Values
390990005	Ohio	Mahoning	14.68	14.99	13.13	13.41	12.74	13.02	10.60	10.82
390990014	Ohio	Mahoning	15.12	15.53	13.61	13.99	13.22	13.58	11.07	11.39
391130031	Ohio	Montgomery	14.58	14.58	13.22	13.22	12.76	12.76	10.58	10.58
391130032	Ohio	Montgomery	15.54	15.92	14.10	14.44	13.62	13.95	11.38	11.66
391330002	Ohio	Portage	13.37	13.56	12.06	12.22	11.69	11.84	9.66	9.79
391351001	Ohio	Preble	13.70	13.88	12.68	12.84	12.25	12.41	9.92	10.05
391450013	Ohio	Scioto	14.65	14.84	13.10	13.26	12.55	12.71	10.12	10.25
391510017	Ohio	Stark	16.26	16.69	14.47	14.87	14.02	14.41	11.70	12.02
391510020	Ohio	Stark	15.23	15.23	13.61	13.61	13.21	13.21	11.31	11.31
391530017	Ohio	Summit	15.17	15.61	13.70	14.10	13.31	13.70	11.33	11.67
391530023	Ohio	Summit	14.26	14.58	12.88	13.18	12.52	12.81	10.59	10.85
391550007	Ohio	Trumbull	14.53	14.73	13.16	13.35	12.78	12.96	10.66	10.82
400159008	Oklahoma	Caddo	9.22	9.77	8.37	8.87	8.19	8.67	7.56	8.00
400219002	Oklahoma	Cherokee	11.79	12.28	10.92	11.37	10.63	11.06	9.62	10.02
400719010	Oklahoma	Kay	10.26	10.62	9.47	9.81	9.26	9.59	8.53	8.84
400819005	Oklahoma	Lincoln	10.28	10.28	9.40	9.40	9.17	9.17	8.35	8.35
400970186	Oklahoma	Mayes	11.70	11.83	10.87	11.00	10.61	10.73	9.69	9.81
400979014	Oklahoma	Mayes	11.44	11.62	10.62	10.79	10.35	10.51	9.41	9.56
401010169	Oklahoma	Muskogee	11.89	12.10	11.08	11.28	10.80	11.00	9.85	10.04
401090035	Oklahoma	Oklahoma	10.07	10.23	9.04	9.19	8.79	8.94	8.05	8.18
401091037	Oklahoma	Oklahoma	9.86	10.07	8.86	9.04	8.61	8.79	7.87	8.03
401159004	Oklahoma	Ottawa	11.69	11.95	10.84	11.07	10.57	10.79	9.63	9.81
401210415	Oklahoma	Pittsburg	11.09	11.36	10.23	10.48	9.97	10.21	9.01	9.22
401359015	Oklahoma	Sequoyah	12.99	12.99	12.09	12.09	11.78	11.78	10.78	10.78
401430110	Oklahoma	Tulsa	11.52	11.52	10.61	10.61	10.30	10.30	9.43	9.43
401431127	Oklahoma	Tulsa	11.37	11.56	10.47	10.64	10.18	10.34	9.32	9.46

			Annual $PM_{2.5}$ Design Values ($\mu g/m^3$)							
Site ID	State	County	2003-2007 Average Ambient Values	2003-2007 Maximum Ambient Values	2012 Base Case Average Values	2012 Base Case Maximum Values	2014 Base Case Average Values	2014 Base Case Maximum Values	2014 Remedy Average Values	2014 Remedy Maximum Values
420010001	Pennsylvania	Adams	13.05	13.59	11.25	11.72	10.92	11.38	9.22	9.63
420030008	Pennsylvania	Allegheny	15.24	15.48	13.51	13.73	13.05	13.27	10.97	11.17
420030021	Pennsylvania	Allegheny	14.66	14.66	12.99	12.99	12.54	12.54	10.38	10.38
420030064	Pennsylvania	Allegheny	20.31	20.75	17.94	18.33	17.30	17.68	14.62	14.95
420030067	Pennsylvania	Allegheny	13.07	13.48	11.38	11.74	10.97	11.31	8.80	9.08
420030095	Pennsylvania	Allegheny	13.84	14.54	12.12	12.73	11.70	12.29	9.52	9.99
420030116	Pennsylvania	Allegheny	15.36	15.36	13.54	13.54	13.09	13.09	10.97	10.97
420031008	Pennsylvania	Allegheny	15.25	15.49	13.48	13.70	13.03	13.24	10.53	10.70
420031301	Pennsylvania	Allegheny	16.26	16.57	14.32	14.59	13.79	14.05	11.33	11.54
420033007	Pennsylvania	Allegheny	15.30	15.72	13.44	13.81	12.94	13.30	10.65	10.95
420039002	Pennsylvania	Allegheny	14.44	14.44	12.72	12.72	12.26	12.26	9.94	9.94
420070014	Pennsylvania	Beaver	16.38	16.45	14.44	14.51	14.03	14.09	11.85	11.93
420110011	Pennsylvania	Berks	15.82	16.19	13.74	14.06	13.42	13.74	12.01	12.30
420170012	Pennsylvania	Bucks	13.42	13.93	11.32	11.74	10.98	11.38	9.77	10.12
420210011	Pennsylvania	Cambria	15.40	15.55	13.61	13.74	13.22	13.34	10.75	10.82
420270100	Pennsylvania	Centre	12.78	13.42	11.17	11.73	10.85	11.41	9.01	9.49
420290100	Pennsylvania	Chester	15.22	15.22	12.88	12.88	12.54	12.54	11.12	11.12
420410101	Pennsylvania	Cumberland	14.45	15.12	12.52	13.11	12.20	12.77	10.62	11.12
420430401	Pennsylvania	Dauphin	15.13	15.78	12.79	13.35	12.44	12.98	10.83	11.31
420450002	Pennsylvania	Delaware	15.23	15.69	12.85	13.23	12.51	12.88	11.17	11.49
420490003	Pennsylvania	Erie	12.54	12.57	11.33	11.36	11.01	11.04	9.27	9.30
420692006	Pennsylvania	Lackawanna	11.73	12.17	10.05	10.43	9.76	10.12	8.53	8.85
420710007	Pennsylvania	Lancaster	16.55	17.46	14.06	14.83	13.70	14.45	12.21	12.86
420770004	Pennsylvania	Lehigh	14.50	14.50	12.48	12.48	12.13	12.13	10.89	10.89
420791101	Pennsylvania	Luzerne	12.76	12.76	10.99	10.99	10.69	10.69	9.48	9.48
420850100	Pennsylvania	Mercer	13.28	13.74	11.91	12.32	11.55	11.95	9.47	9.80

			Annual $PM_{2.5}$ Design Values ($\mu g/m^3$)							
Site ID	**State**	**County**	**2003-2007 Average Ambient Values**	**2003-2007 Maximum Ambient Values**	**2012 Base Case Average Values**	**2012 Base Case Maximum Values**	**2014 Base Case Average Values**	**2014 Base Case Maximum Values**	**2014 Remedy Average Values**	**2014 Remedy Maximum Values**
420950025	Pennsylvania	Northampton	13.68	14.07	11.72	12.06	11.38	11.72	10.16	10.47
420990301	Pennsylvania	Perry	12.81	12.81	11.13	11.13	10.86	10.86	9.41	9.41
421010047	Pennsylvania	Philadelphia	15.19	15.19	12.90	12.90	12.52	12.52	11.36	11.36
421250005	Pennsylvania	Washington	15.17	15.48	13.26	13.53	12.76	13.02	10.16	10.38
421250200	Pennsylvania	Washington	14.92	14.92	13.00	13.00	12.52	12.52	9.94	9.94
421255001	Pennsylvania	Washington	13.37	13.61	11.67	11.89	11.30	11.51	9.24	9.41
421290008	Pennsylvania	Westmoreland	15.49	15.68	13.65	13.82	13.20	13.36	10.54	10.68
421330008	Pennsylvania	York	16.52	17.25	14.01	14.63	13.64	14.24	12.05	12.58
440070022	Rhode Island	Providence	10.07	10.07	8.68	8.68	8.54	8.54	8.00	8.00
440070026	Rhode Island	Providence	12.14	12.41	10.55	10.79	10.37	10.61	9.80	10.02
440070028	Rhode Island	Providence	10.82	11.10	9.37	9.61	9.21	9.45	8.65	8.88
440071010	Rhode Island	Providence	9.93	10.23	8.53	8.78	8.38	8.63	7.81	8.04
450130007	South Carolina	Beaufort	11.52	11.71	9.89	10.05	9.57	9.73	8.23	8.37
450190048	South Carolina	Charleston	12.21	12.48	10.63	10.87	10.31	10.55	8.95	9.15
450190049	South Carolina	Charleston	11.60	11.83	9.89	10.08	9.56	9.74	8.22	8.38
450250001	South Carolina	Chesterfield	12.56	12.75	11.03	11.19	10.63	10.79	9.04	9.17
450370001	South Carolina	Edgefield	13.17	13.38	11.64	11.83	11.14	11.32	9.69	9.84
450410002	South Carolina	Florence	12.65	12.73	11.08	11.15	10.70	10.76	9.14	9.20
450430009	South Carolina	Georgetown	12.85	12.90	11.10	11.13	10.78	10.81	9.45	9.47
450450008	South Carolina	Greenville	15.65	15.92	13.54	13.78	13.01	13.24	11.33	11.53
450450009	South Carolina	Greenville	14.66	14.82	12.61	12.75	12.09	12.22	10.39	10.51
450470003	South Carolina	Greenwood	13.53	13.70	11.81	11.96	11.25	11.38	9.65	9.77
450510002	South Carolina	Horry	12.04	12.16	10.44	10.53	10.12	10.21	8.74	8.81
450630008	South Carolina	Lexington	14.64	15.07	12.91	13.28	12.38	12.75	10.78	11.10
450730001	South Carolina	Oconee	10.95	11.24	9.37	9.62	8.93	9.17	7.41	7.60
450790007	South Carolina	Richland	13.59	13.79	11.90	12.08	11.39	11.57	9.73	9.88

			Annual $PM_{2.5}$ Design Values ($\mu g/m^3$)							
Site ID	State	County	2003-2007 Average Ambient Values	2003-2007 Maximum Ambient Values	2012 Base Case Average Values	2012 Base Case Maximum Values	2014 Base Case Average Values	2014 Base Case Maximum Values	2014 Remedy Average Values	2014 Remedy Maximum Values
450790019	South Carolina	Richland	14.24	14.45	12.51	12.70	11.99	12.17	10.36	10.51
450830010	South Carolina	Spartanburg	14.17	14.33	12.12	12.25	11.63	11.76	9.93	10.04
460110002	South Dakota	Brookings	9.37	9.77	8.68	9.04	8.52	8.87	8.17	8.51
460130003	South Dakota	Brown	8.42	8.48	7.88	7.94	7.77	7.83	7.57	7.63
460290002	South Dakota	Codington	10.14	10.34	9.48	9.66	9.33	9.52	9.07	9.25
460330132	South Dakota	Custer	5.64	5.64	5.33	5.33	5.31	5.31	5.28	5.28
460710001	South Dakota	Jackson	5.39	5.45	5.08	5.14	5.06	5.11	4.95	5.01
460990006	South Dakota	Minnehaha	10.18	10.39	9.34	9.53	9.14	9.32	8.75	8.93
460990007	South Dakota	Minnehaha	9.58	9.82	8.79	9.00	8.60	8.80	8.20	8.41
461030016	South Dakota	Pennington	7.48	7.59	7.06	7.16	7.01	7.10	6.99	7.09
461030020	South Dakota	Pennington	8.77	8.83	8.31	8.36	8.24	8.29	8.23	8.28
461031001	South Dakota	Pennington	7.32	7.35	6.92	6.95	6.87	6.90	6.85	6.88
470090011	Tennessee	Blount	14.30	14.71	12.61	12.96	12.03	12.37	10.27	10.55
470370023	Tennessee	Davidson	14.21	14.32	13.07	13.18	12.49	12.59	10.17	10.24
470370025	Tennessee	Davidson	13.99	14.19	12.82	13.00	12.24	12.40	9.90	10.03
470370036	Tennessee	Davidson	12.97	12.98	11.84	11.85	11.27	11.27	8.98	9.00
470450004	Tennessee	Dyer	12.28	12.57	11.23	11.49	10.69	10.93	8.81	8.98
470650031	Tennessee	Hamilton	15.67	16.05	13.91	14.25	13.31	13.64	11.29	11.57
470651011	Tennessee	Hamilton	13.73	13.89	12.09	12.23	11.50	11.64	9.40	9.51
470654002	Tennessee	Hamilton	15.16	15.43	13.42	13.65	12.81	13.03	10.75	10.92
470930028	Tennessee	Knox	15.47	15.74	13.53	13.76	12.90	13.12	11.00	11.18
470931017	Tennessee	Knox	15.64	15.71	13.71	13.76	13.04	13.09	11.15	11.19
470931020	Tennessee	Knox	15.18	15.26	13.25	13.32	12.58	12.64	10.64	10.69
470990002	Tennessee	Lawrence	11.69	12.13	10.69	11.09	10.26	10.64	8.44	8.75
471050108	Tennessee	Loudon	15.49	15.72	13.67	13.87	13.11	13.30	11.28	11.44
471071002	Tennessee	McMinn	14.29	14.70	12.63	13.00	12.08	12.43	10.20	10.50

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471192007	Tennessee	Maury	13.21	13.51	12.14	12.40	11.61	11.87	9.50	9.71
471251009	Tennessee	Montgomery	13.80	13.91	12.72	12.82	12.14	12.23	9.79	9.86
471410001	Tennessee	Putnam	13.37	13.37	12.06	12.06	11.51	11.51	9.26	9.26
471450004	Tennessee	Roane	14.49	14.77	12.73	12.99	12.18	12.42	10.24	10.44
471570014	Tennessee	Shelby	13.71	13.79	12.36	12.43	11.76	11.83	10.03	10.11
471570038	Tennessee	Shelby	13.43	13.57	12.09	12.21	11.49	11.60	9.75	9.83
471570047	Tennessee	Shelby	13.68	13.79	12.36	12.46	11.74	11.85	9.91	10.02
471571004	Tennessee	Shelby	12.04	12.08	10.88	10.92	10.32	10.36	8.60	8.66
471631007	Tennessee	Sullivan	14.16	14.46	12.51	12.78	11.96	12.22	10.01	10.22
471650007	Tennessee	Sumner	13.68	13.83	12.64	12.77	12.02	12.14	9.22	9.30
480370004	Texas	Bowie	12.85	12.95	11.80	11.88	11.39	11.46	10.25	10.32
481130050	Texas	Dallas	12.77	12.89	11.22	11.33	10.92	11.02	9.97	10.07
481130069	Texas	Dallas	11.80	12.26	10.32	10.72	10.03	10.42	9.06	9.42
481130087	Texas	Dallas	11.15	11.61	9.73	10.13	9.43	9.82	8.44	8.78
481350003	Texas	Ector	7.78	7.99	7.26	7.45	7.15	7.34	6.82	7.00
481410037	Texas	El Paso	9.09	9.09	8.60	8.60	8.53	8.53	8.38	8.38
482010058	Texas	Harris	11.77	12.39	10.54	11.08	10.26	10.79	9.55	10.04
482011035	Texas	Harris	15.42	15.84	13.93	14.31	13.57	13.94	12.89	13.24
482030002	Texas	Harrison	11.69	11.79	10.67	10.75	10.18	10.26	9.02	9.09
482150043	Texas	Hidalgo	10.98	11.16	10.23	10.40	10.05	10.22	9.48	9.64
482450021	Texas	Jefferson	11.56	11.66	10.38	10.48	10.09	10.18	9.23	9.32
483550032	Texas	Nueces	10.42	10.87	9.31	9.71	9.04	9.43	8.31	8.67
483550034	Texas	Nueces	9.63	10.24	8.58	9.12	8.33	8.85	7.61	8.08
483611001	Texas	Orange	11.51	11.72	10.38	10.58	10.12	10.31	9.24	9.41
484391002	Texas	Tarrant	11.41	11.79	9.92	10.25	9.63	9.95	8.70	8.99
484391006	Texas	Tarrant	12.23	12.81	10.66	11.16	10.36	10.85	9.43	9.87

			Annual $PM_{2.5}$ Design Values ($\mu g/m^3$)							
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500010002	Vermont	Addison	8.94	8.94	8.22	8.22	8.08	8.08	7.55	7.55
500010003	Vermont	Addison	8.91	8.91	8.20	8.20	8.05	8.05	7.52	7.52
500030004	Vermont	Bennington	8.52	9.00	7.66	8.08	7.50	7.92	6.91	7.29
500070012	Vermont	Chittenden	9.27	9.56	8.53	8.79	8.38	8.64	7.85	8.10
500070014	Vermont	Chittenden	10.02	10.02	9.23	9.23	9.08	9.08	8.54	8.54
500210002	Vermont	Rutland	11.08	11.13	10.18	10.22	10.02	10.06	9.48	9.52
510130020	Virginia	Arlington	14.27	14.62	12.07	12.37	11.65	11.94	10.07	10.33
510360002	Virginia	Charles	12.37	12.48	10.32	10.42	9.96	10.06	8.43	8.52
510410003	Virginia	Chesterfield	13.44	13.59	11.25	11.39	10.85	10.98	9.20	9.31
510590030	Virginia	Fairfax	13.33	13.59	11.30	11.54	10.92	11.14	9.46	9.67
510591005	Virginia	Fairfax	13.62	13.77	11.56	11.70	11.16	11.30	9.68	9.81
510595001	Virginia	Fairfax	13.88	14.12	11.95	12.16	11.55	11.75	10.02	10.20
510870014	Virginia	Henrico	13.51	13.83	11.31	11.58	10.90	11.16	9.24	9.47
510870015	Virginia	Henrico	12.93	12.99	10.96	11.02	10.51	10.57	8.80	8.84
511071005	Virginia	Loudoun	13.57	13.90	11.82	12.10	11.43	11.71	9.83	10.06
511390004	Virginia	Page	12.79	12.85	11.07	11.11	10.65	10.69	8.67	8.69
515200006	Virginia	Bristol City	13.93	14.00	12.02	12.08	11.43	11.48	9.32	9.36
516500004	Virginia	Hampton City	12.17	12.35	10.11	10.28	9.77	9.92	8.42	8.56
516800015	Virginia	Lynchburg City	12.84	13.00	10.96	11.10	10.48	10.61	8.60	8.71
517100024	Virginia	Norfolk City	12.78	13.01	10.69	10.88	10.33	10.51	9.02	9.18
517700014	Virginia	Roanoke City	14.27	14.48	12.48	12.67	11.88	12.07	9.81	9.98
517750010	Virginia	Salem City	14.69	14.69	12.94	12.94	12.35	12.35	10.35	10.35
518100008	Virginia	Virginia Beach City	12.40	12.57	10.30	10.45	9.95	10.09	8.61	8.74
540030003	West Virginia	Berkeley	15.93	16.19	14.09	14.32	13.70	13.92	11.81	11.99

			Annual $PM_{2.5}$ Design Values ($\mu g/m^3$)							
Site ID	**State**	**County**	**2003-2007 Average Ambient Values**	**2003-2007 Maximum Ambient Values**	**2012 Base Case Average Values**	**2012 Base Case Maximum Values**	**2014 Base Case Average Values**	**2014 Base Case Maximum Values**	**2014 Remedy Average Values**	**2014 Remedy Maximum Values**
540090005	West Virginia	Brooke	16.52	16.80	14.33	14.58	13.84	14.09	11.34	11.55
540090011	West Virginia	Brooke	16.04	16.37	13.87	14.15	13.39	13.66	10.89	11.13
540110006	West Virginia	Cabell	16.30	16.57	14.71	14.94	14.05	14.28	11.57	11.75
540291004	West Virginia	Hancock	15.76	16.64	13.73	14.51	13.28	14.03	10.81	11.44
540330003	West Virginia	Harrison	13.99	14.19	13.17	13.36	12.71	12.90	9.36	9.49
540390010	West Virginia	Kanawha	15.15	15.38	13.40	13.60	12.78	12.97	10.13	10.28
540390011	West Virginia	Kanawha	13.17	13.17	11.67	11.67	11.13	11.13	8.67	8.67
540391005	West Virginia	Kanawha	16.52	16.59	14.65	14.71	14.01	14.06	11.30	11.35
540490006	West Virginia	Marion	15.03	15.25	14.22	14.43	13.76	13.95	10.16	10.30
540511002	West Virginia	Marshall	15.19	15.33	13.25	13.38	12.75	12.87	10.07	10.17
540610003	West Virginia	Monongalia	14.35	14.47	12.89	13.01	12.41	12.53	9.28	9.40
540690010	West Virginia	Ohio	14.58	14.58	12.53	12.53	12.05	12.05	9.51	9.51
540810002	West Virginia	Raleigh	12.90	13.03	11.22	11.33	10.70	10.80	8.39	8.47
541071002	West Virginia	Wood	15.40	15.44	13.74	13.77	13.16	13.20	10.84	10.87
550030010	Wisconsin	Ashland	6.07	6.21	5.66	5.79	5.57	5.69	5.29	5.41
550090005	Wisconsin	Brown	11.39	11.86	10.60	11.03	10.36	10.78	9.85	10.27
550250047	Wisconsin	Dane	12.20	12.65	11.13	11.54	10.80	11.20	10.05	10.42
550270007	Wisconsin	Dodge	11.04	11.26	10.13	10.34	9.82	10.02	9.11	9.29
550410007	Wisconsin	Forest	7.41	7.41	6.90	6.90	6.75	6.75	6.36	6.36
550430009	Wisconsin	Grant	11.79	12.24	10.75	11.16	10.45	10.85	9.70	10.07
550590019	Wisconsin	Kenosha	11.98	12.93	10.94	11.80	10.49	11.32	9.58	10.35
550710007	Wisconsin	Manitowoc	10.20	10.89	9.50	10.13	9.24	9.85	8.71	9.30
550790010	Wisconsin	Milwaukee	13.32	13.94	12.16	12.72	11.72	12.26	10.89	11.41
550790026	Wisconsin	Milwaukee	12.88	13.83	11.73	12.59	11.30	12.12	10.47	11.24
550790043	Wisconsin	Milwaukee	14.08	14.62	12.87	13.36	12.41	12.89	11.57	12.02
550790059	Wisconsin	Milwaukee	13.68	14.87	12.51	13.58	12.06	13.10	11.24	12.22

			Annual $PM_{2.5}$ Design Values ($\mu g/m^3$)							
Site ID	**State**	**County**	**2003-2007 Average Ambient Values**	**2003-2007 Maximum Ambient Values**	**2012 Base Case Average Values**	**2012 Base Case Maximum Values**	**2014 Base Case Average Values**	**2014 Base Case Maximum Values**	**2014 Remedy Average Values**	**2014 Remedy Maximum Values**
550790099	Wisconsin	Milwaukee	13.54	14.40	12.36	13.14	11.92	12.68	11.10	11.81
550870009	Wisconsin	Outagamie	10.96	11.45	10.19	10.63	9.95	10.39	9.41	9.83
550890009	Wisconsin	Ozaukee	11.60	12.22	10.66	11.23	10.30	10.85	9.53	10.05
551091002	Wisconsin	St. Croix	10.09	10.09	9.31	9.31	9.11	9.11	8.70	8.70
551110007	Wisconsin	Sauk	10.22	10.57	9.35	9.67	9.06	9.37	8.32	8.61
551198001	Wisconsin	Taylor	8.24	8.43	7.67	7.85	7.51	7.69	7.07	7.24
551250001	Wisconsin	Vilas	6.78	6.87	6.33	6.42	6.21	6.30	5.85	5.92
551330027	Wisconsin	Waukesha	13.91	14.34	12.77	13.17	12.36	12.75	11.61	11.98
560050877	Wyoming	Campbell	6.29	6.29	6.12	6.12	6.10	6.10	6.11	6.11
560050892	Wyoming	Campbell	5.11	5.33	4.96	5.17	4.95	5.16	4.96	5.17
560050899	Wyoming	Campbell	5.26	5.49	5.07	5.30	5.06	5.28	5.07	5.29
560090819	Wyoming	Converse	3.58	3.68	3.43	3.53	3.42	3.52	3.43	3.53
560131003	Wyoming	Fremont	8.17	8.50	7.81	8.12	7.74	8.05	7.75	8.05
560210001	Wyoming	Laramie	4.48	4.69	4.15	4.34	4.11	4.31	4.12	4.31
560330002	Wyoming	Sheridan	9.70	9.84	9.32	9.45	9.25	9.38	9.26	9.39

			24-Hour $PM_{2.5}$ Design Values ($\mu g/m^3$)							
Site ID	State	County	2003-2007 Average Ambient Values	2003-2007 Maximum Ambient Values	2012 Base Case Average Values	2012 Base Case Maximum Values	2014 Base Case Average Values	2014 Base Case Maximum Values	2014 Remedy Average Values	2014 Remedy Maximum Values
010030010	Alabama	Baldwin	26.2	27.5	22.7	23.8	21.7	22.8	18.2	19.1
010270001	Alabama	Clay	31.8	32.4	26.4	27.1	24.9	25.6	19.7	20.2
010331002	Alabama	Colbert	30.4	30.4	26.2	26.3	24.9	25.0	18.1	18.2
010491003	Alabama	De Kalb	32.0	32.6	26.0	26.9	24.7	25.6	19.6	20.3
010530002	Alabama	Escambia	29.0	29.7	24.8	25.4	24.0	24.6	21.0	21.5
010550010	Alabama	Etowah	35.1	35.7	29.3	29.5	28.1	28.4	22.4	22.5
010690003	Alabama	Houston	28.6	28.6	24.6	24.6	23.7	23.7	20.3	20.3
010730023	Alabama	Jefferson	44.0	44.2	36.9	37.3	35.6	36.0	31.1	31.6
010731005	Alabama	Jefferson	34.8	35.5	30.1	30.6	28.8	29.3	24.2	24.6
010731009	Alabama	Jefferson	34.5	34.9	28.8	29.0	27.6	27.8	20.6	21.2
010731010	Alabama	Jefferson	34.1	34.3	28.1	28.3	26.6	26.8	20.8	21.0
010732003	Alabama	Jefferson	40.3	40.8	35.3	35.9	34.2	34.9	30.5	31.3
010732006	Alabama	Jefferson	33.1	34.1	27.9	28.6	26.9	27.5	21.4	21.7
010735002	Alabama	Jefferson	33.0	34.8	27.9	29.3	26.5	27.9	20.7	21.7
010735003	Alabama	Jefferson	35.8	36.5	29.2	29.7	27.9	28.4	22.3	22.9
010890014	Alabama	Madison	33.5	34.1	27.9	28.0	26.5	26.6	19.0	19.3
010970002	Alabama	Mobile	30.0	30.0	26.2	26.2	24.9	24.9	21.6	21.6
010970003	Alabama	Mobile	28.5	29.4	24.8	25.5	23.6	24.3	20.2	20.8
011010007	Alabama	Montgomery	32.0	33.5	27.1	28.5	26.0	27.3	21.2	21.6
011030011	Alabama	Morgan	31.5	31.9	25.1	25.4	23.8	24.0	17.3	18.0
011130001	Alabama	Russell	35.5	36.9	31.0	32.1	29.6	30.5	25.2	25.5
011170006	Alabama	Shelby	32.0	32.8	27.4	27.6	26.3	26.4	20.7	21.1
011190002	Alabama	Sumter	28.9	28.9	24.8	24.8	23.8	23.8	18.9	18.9
011210002	Alabama	Talladega	33.4	33.4	28.9	28.9	27.8	27.8	22.1	22.1
011250004	Alabama	Tuscaloosa	29.8	30.1	25.5	25.5	24.4	24.4	19.5	19.6

			24-Hour $PM_{2.5}$ Design Values ($\mu g/m^3$)							
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011270002	Alabama	Walker	32.8	33.3	26.5	27.6	25.2	26.3	19.7	20.6
050010011	Arkansas	Arkansas	29.1	29.6	27.0	27.4	25.8	26.2	20.4	20.7
050030005	Arkansas	Ashley	28.9	29.9	26.6	27.1	25.6	26.1	22.5	23.1
050350005	Arkansas	Crittenden	35.0	35.0	30.9	30.9	29.0	29.0	20.9	20.9
050450002	Arkansas	Faulkner	29.8	30.6	27.2	27.8	26.0	26.6	21.1	21.6
050510003	Arkansas	Garland	29.2	29.3	26.3	26.4	25.0	25.1	20.4	20.5
051070001	Arkansas	Phillips	29.1	30.2	26.6	27.6	25.2	26.2	20.1	21.4
051130002	Arkansas	Polk	26.1	27.7	22.9	24.0	21.6	22.6	17.8	18.4
051150003	Arkansas	Pope	28.3	29.1	25.9	26.2	25.0	25.2	19.9	20.7
051190007	Arkansas	Pulaski	31.1	31.4	28.4	28.7	27.0	27.3	22.4	22.9
051191004	Arkansas	Pulaski	31.9	32.4	29.4	29.9	28.5	28.9	24.5	24.8
051191005	Arkansas	Pulaski	31.9	32.3	29.5	29.9	28.2	28.7	24.0	24.4
051390006	Arkansas	Union	28.7	29.6	26.1	26.7	25.2	25.7	21.8	22.4
051450001	Arkansas	White	29.9	31.1	27.4	28.5	26.2	27.3	21.7	22.3
080010006	Colorado	Adams	25.3	29.2	21.9	25.4	21.0	24.4	21.1	24.5
080050005	Colorado	Arapahoe	21.2	22.2	18.3	19.1	17.6	18.3	17.5	18.2
080130003	Colorado	Boulder	21.1	22.3	19.3	20.4	19.0	20.1	19.1	20.2
080130012	Colorado	Boulder	18.7	19.7	16.6	17.5	16.2	17.0	16.2	17.0
080290004	Colorado	Delta	20.7	22.3	18.4	19.8	17.9	19.2	17.8	19.1
080310002	Colorado	Denver	26.4	27.6	23.3	24.3	22.5	23.5	22.6	23.6
080310023	Colorado	Denver	26.3	26.3	23.5	23.5	22.9	22.9	23.1	23.1
080390001	Colorado	Elbert	13.1	15.1	11.7	13.4	11.3	13.1	11.2	13.0
080410008	Colorado	El Paso	16.4	16.7	14.8	15.0	14.4	14.6	14.4	14.5
080410011	Colorado	El Paso	16.5	17.4	14.8	15.6	14.4	15.2	14.4	15.2
080690009	Colorado	Larimer	18.3	18.8	16.8	17.3	16.5	17.0	16.6	17.1
080770017	Colorado	Mesa	23.5	24.6	21.6	22.5	20.8	21.6	20.7	21.5

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081010012	Colorado	Pueblo	15.4	15.8	14.0	14.3	13.7	14.1	13.7	14.1
081130004	Colorado	San Miguel	10.1	11.3	9.7	10.9	9.6	10.8	9.6	10.8
081230006	Colorado	Weld	22.9	23.9	20.8	21.9	20.6	21.6	20.8	21.8
081230008	Colorado	Weld	18.3	18.9	16.7	17.1	16.4	16.7	16.4	16.8
090010010	Connecticut	Fairfield	36.2	37.3	29.9	30.6	28.6	29.3	25.7	26.7
090011123	Connecticut	Fairfield	32.2	32.7	28.2	28.6	27.2	27.6	24.3	24.7
090013005	Connecticut	Fairfield	34.9	35.6	28.8	29.2	27.5	28.0	22.3	22.9
090019003	Connecticut	Fairfield	33.6	36.7	27.0	28.3	25.7	26.9	20.6	20.9
090031003	Connecticut	Hartford	31.8	32.6	26.0	26.4	24.9	25.2	21.9	22.1
090050005	Connecticut	Litchfield	27.1	27.1	20.2	20.2	19.2	19.2	15.0	15.0
090090026	Connecticut	New Haven	35.6	37.9	28.3	29.4	27.1	28.0	23.4	23.8
090090027	Connecticut	New Haven	35.5	36.0	28.9	29.3	27.8	28.1	23.7	23.7
090091123	Connecticut	New Haven	38.3	40.3	30.8	31.5	29.4	29.9	25.8	26.4
090092008	Connecticut	New Haven	33.6	36.4	27.1	28.2	26.0	26.9	21.6	21.6
090092123	Connecticut	New Haven	34.4	34.7	28.3	28.6	27.3	27.5	23.9	24.0
090113002	Connecticut	New London	32.0	34.4	25.4	26.4	24.5	25.4	20.1	20.2
100010002	Delaware	Kent	32.1	32.2	24.8	26.0	24.0	25.2	21.0	22.1
100010003	Delaware	Kent	31.5	32.4	24.7	26.4	24.0	25.8	20.2	22.2
100031003	Delaware	New Castle	34.3	34.3	28.0	28.0	27.1	27.1	24.5	24.5
100031007	Delaware	New Castle	32.6	34.5	24.6	25.6	23.5	24.3	19.3	20.1
100031012	Delaware	New Castle	33.5	33.5	27.7	27.7	26.8	26.8	25.5	25.5
100032004	Delaware	New Castle	36.6	36.7	29.5	29.7	28.4	28.6	25.7	26.5
100051002	Delaware	Sussex	33.7	34.3	25.6	26.5	24.9	25.8	22.5	23.4
110010041	District Of Columbia		36.3	37.8	30.3	31.5	29.1	30.3	23.4	24.9
110010042	District Of Columbia		34.9	37.0	29.2	31.4	27.9	30.2	22.6	25.8
110010043	District Of Columbia		34.1	34.8	28.7	29.4	27.5	28.2	22.1	23.1

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120010023	Florida	Alachua	21.3	21.5	17.1	17.4	16.4	16.7	13.5	13.8
120010024	Florida	Alachua	20.9	22.2	17.4	18.8	17.1	18.5	14.7	15.9
120051004	Florida	Bay	28.0	29.2	24.1	24.9	23.5	24.3	20.8	21.6
120090007	Florida	Brevard	20.7	22.0	17.2	18.3	16.5	17.5	14.3	15.4
120111002	Florida	Broward	18.3	18.9	15.7	16.2	15.3	15.7	14.1	14.5
120112004	Florida	Broward	18.6	19.0	16.2	16.5	15.7	16.0	14.4	14.6
120113002	Florida	Broward	15.9	15.9	13.6	13.6	13.1	13.1	12.0	12.0
120170005	Florida	Citrus	21.2	21.9	17.1	18.0	16.6	17.4	13.4	14.1
120310098	Florida	Duval	23.7	24.1	19.6	20.3	19.2	20.1	17.6	18.3
120310099	Florida	Duval	24.3	24.5	21.1	21.5	20.7	21.2	19.1	19.6
120330004	Florida	Escambia	28.8	30.6	25.2	26.4	24.5	25.5	21.8	22.3
120570030	Florida	Hillsborough	23.4	24.0	19.2	19.8	18.7	19.2	16.9	17.3
120573002	Florida	Hillsborough	22.2	22.5	17.6	18.0	17.0	17.4	14.9	15.4
120710005	Florida	Lee	17.7	17.9	14.5	14.8	14.0	14.3	12.7	13.1
120730012	Florida	Leon	27.0	28.2	23.5	24.7	22.7	23.8	20.1	20.8
120814012	Florida	Manatee	19.5	20.2	15.5	15.9	14.9	15.3	12.9	13.2
120830003	Florida	Marion	22.5	22.5	18.3	18.3	17.7	17.7	15.0	15.0
120861016	Florida	Miami-Dade	19.1	19.1	15.2	15.2	14.8	14.8	13.5	13.5
120866001	Florida	Miami-Dade	18.6	19.1	15.8	16.3	15.3	15.7	13.9	14.3
120952002	Florida	Orange	21.8	21.8	17.1	17.1	16.5	16.5	14.5	14.5
120990009	Florida	Palm Beach	17.7	17.7	15.8	15.8	15.5	15.5	14.6	14.6
120992005	Florida	Palm Beach	18.2	18.4	15.2	15.4	14.7	15.0	13.6	14.0
121030018	Florida	Pinellas	21.7	22.4	18.1	18.2	17.6	17.8	16.3	16.6
121031009	Florida	Pinellas	20.8	21.1	16.7	17.0	16.2	16.6	15.1	15.2
121056006	Florida	Polk	19.3	19.9	15.9	16.4	15.6	16.1	14.2	14.8
121111002	Florida	St Lucie	18.1	18.3	15.1	15.3	14.6	14.9	12.7	13.2

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121150013	Florida	Sarasota	19.2	19.9	16.0	16.6	15.4	16.0	13.4	13.9
121171002	Florida	Seminole	22.0	23.0	17.3	17.9	16.5	17.1	13.9	14.4
121275002	Florida	Volusia	22.0	23.9	17.2	18.9	16.5	18.1	14.0	15.2
130210007	Georgia	Bibb	33.5	33.6	28.6	29.0	27.1	27.7	24.3	25.1
130210012	Georgia	Bibb	30.7	31.4	25.9	26.4	24.3	24.7	20.0	20.4
130510017	Georgia	Chatham	28.4	28.9	24.4	24.7	23.5	23.9	21.1	21.6
130510091	Georgia	Chatham	27.9	28.6	24.5	25.3	23.7	24.5	20.9	21.2
130630091	Georgia	Clayton	35.8	37.7	30.0	31.4	28.7	29.8	24.7	25.1
130670003	Georgia	Cobb	35.0	36.3	29.0	29.6	27.7	28.1	23.2	23.4
130670004	Georgia	Cobb	34.1	35.7	28.0	29.1	26.3	27.2	22.7	23.3
130890002	Georgia	De Kalb	33.4	33.7	27.5	27.8	25.9	26.2	22.3	22.8
130892001	Georgia	De Kalb	33.9	35.4	28.0	29.2	26.5	27.6	22.8	23.7
130950007	Georgia	Dougherty	34.1	35.2	29.8	30.8	28.9	29.9	25.7	27.5
131150005	Georgia	Floyd	35.1	36.4	29.8	31.0	28.6	29.7	24.3	25.0
131210032	Georgia	Fulton	34.1	35.0	28.2	29.6	27.0	28.6	23.4	24.9
131210039	Georgia	Fulton	37.6	37.6	31.8	31.8	30.2	30.2	27.2	27.2
131270006	Georgia	Glynn	26.1	26.7	23.3	23.5	22.6	22.8	20.5	20.6
131350002	Georgia	Gwinnett	32.8	35.0	27.1	27.7	25.4	26.0	21.2	21.5
131390003	Georgia	Hall	30.1	30.3	25.5	25.9	24.1	24.6	19.9	20.8
131530001	Georgia	Houston	29.6	30.6	25.4	27.1	23.9	25.6	19.4	21.5
131850003	Georgia	Lowndes	25.6	26.2	21.6	22.2	20.7	21.3	18.2	18.5
132150001	Georgia	Muscogee	31.3	32.9	27.6	28.6	26.4	27.3	23.5	23.9
132150008	Georgia	Muscogee	34.5	37.6	29.2	31.4	27.9	29.9	24.6	25.0
132150011	Georgia	Muscogee	30.2	30.9	26.2	26.2	25.0	25.3	22.1	23.7
132230003	Georgia	Paulding	33.0	33.3	26.6	26.9	25.4	25.7	21.2	21.3
132450005	Georgia	Richmond	32.7	33.4	30.0	30.6	28.9	29.3	26.2	26.4

			24-Hour $PM_{2.5}$ Design Values ($\mu g/m^3$)							
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132450091	Georgia	Richmond	31.9	32.6	28.4	28.8	27.5	28.2	24.2	24.5
132950002	Georgia	Walker	30.9	32.5	26.0	27.4	24.8	26.1	21.3	22.6
133030001	Georgia	Washington	30.8	31.4	26.5	26.9	24.8	25.3	21.0	21.3
133190001	Georgia	Wilkinson	33.1	33.7	29.4	29.9	27.7	28.1	23.2	24.2
170010006	Illinois	Adams	31.4	32.3	28.0	28.8	26.3	26.8	21.3	21.5
170190004	Illinois	Champaign	31.3	32.5	28.2	29.9	26.6	28.4	22.9	24.8
170191001	Illinois	Champaign	30.0	31.7	27.2	28.5	26.1	27.2	22.4	23.7
170310022	Illinois	Cook	36.6	38.6	33.2	34.9	32.4	34.1	30.2	31.9
170310050	Illinois	Cook	36.1	38.0	31.5	33.1	30.0	31.4	27.9	29.6
170310052	Illinois	Cook	40.2	41.4	34.9	36.0	33.2	34.1	29.5	30.0
170310057	Illinois	Cook	37.3	38.6	32.6	33.7	30.9	32.0	27.4	28.4
170310076	Illinois	Cook	38.0	39.1	33.0	34.0	31.5	32.3	28.9	29.5
170311016	Illinois	Cook	43.0	46.3	37.5	40.4	35.8	38.7	32.6	36.1
170312001	Illinois	Cook	37.7	40.6	33.6	36.1	32.4	34.9	29.4	32.0
170313103	Illinois	Cook	39.6	40.3	35.0	35.4	33.5	33.9	30.3	30.7
170313301	Illinois	Cook	40.2	43.3	34.9	37.6	33.4	36.1	30.2	32.5
170314007	Illinois	Cook	34.3	36.4	30.5	32.3	28.8	30.5	25.0	27.3
170314201	Illinois	Cook	32.0	33.8	27.7	29.6	26.0	27.8	24.2	25.5
170316005	Illinois	Cook	39.1	41.8	34.1	36.4	32.7	34.9	31.9	34.3
170434002	Illinois	Du Page	34.6	35.9	31.0	32.3	29.7	31.1	27.7	28.3
170650002	Illinois	Hamilton	31.6	31.6	29.6	29.6	27.8	27.8	21.2	21.2
170831001	Illinois	Jersey	32.1	33.2	29.6	30.5	27.8	28.6	23.3	23.7
170890003	Illinois	Kane	33.8	35.4	29.9	31.2	28.2	29.4	26.7	27.3
170890007	Illinois	Kane	34.8	34.8	31.2	31.2	29.5	29.5	28.5	28.5
170971007	Illinois	Lake	33.0	35.0	29.9	31.5	27.8	29.6	23.5	25.0
170990007	Illinois	La Salle	28.9	29.9	25.8	26.6	24.6	25.3	22.3	23.0

			24-Hour $PM_{2.5}$ Design Values ($\mu g/m^3$)							
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171110001	Illinois	McHenry	31.5	32.6	28.3	29.3	26.9	27.9	23.8	25.4
171132003	Illinois	McLean	33.4	33.4	30.2	30.2	28.8	28.8	24.3	24.3
171150013	Illinois	Macon	33.2	34.4	30.3	31.5	28.3	29.2	22.2	23.7
171190023	Illinois	Madison	37.3	38.1	35.1	35.8	32.8	33.6	28.3	29.3
171191007	Illinois	Madison	39.1	40.1	36.5	36.8	34.6	35.3	29.2	30.5
171192009	Illinois	Madison	34.9	35.9	33.3	34.3	31.5	32.5	26.0	27.4
171193007	Illinois	Madison	34.0	34.6	32.0	32.7	30.6	31.2	23.3	23.6
171430037	Illinois	Peoria	32.7	34.1	29.3	30.6	27.5	28.6	24.5	25.1
171570001	Illinois	Randolph	28.9	29.9	27.3	28.3	25.6	26.6	23.7	25.9
171613002	Illinois	Rock Island	30.9	31.4	28.2	28.9	27.4	28.1	26.0	26.7
171630010	Illinois	St Clair	33.7	34.1	31.7	32.3	29.7	30.0	25.5	26.4
171634001	Illinois	St Clair	31.9	32.9	30.1	31.2	28.2	29.2	26.7	26.9
171670012	Illinois	Sangamon	33.4	34.1	30.4	30.9	29.2	29.7	24.8	25.2
171971002	Illinois	Will	36.4	37.1	32.3	32.9	30.6	31.4	26.9	28.2
171971011	Illinois	Will	30.7	31.7	27.1	27.9	25.4	26.2	19.9	20.4
172010013	Illinois	Winnebago	34.7	34.7	31.3	31.3	29.9	29.9	27.9	27.9
180030004	Indiana	Allen	33.1	34.6	30.7	32.0	30.0	31.4	26.7	29.2
180030014	Indiana	Allen	30.5	31.1	28.2	28.8	27.6	28.2	23.7	23.8
180190006	Indiana	Clark	37.5	39.4	33.1	34.5	31.4	32.6	24.3	24.8
180350006	Indiana	Delaware	32.0	33.6	29.0	30.3	27.6	28.7	22.8	23.6
180372001	Indiana	Dubois	35.3	36.9	33.2	34.8	31.8	33.4	26.4	29.1
180390003	Indiana	Elkhart	34.4	36.3	31.1	32.8	29.9	31.4	27.5	29.0
180431004	Indiana	Floyd	33.2	34.5	30.2	31.2	28.5	29.3	20.7	21.2
180650003	Indiana	Henry	31.8	31.8	28.5	28.5	27.2	27.2	21.7	21.7
180670003	Indiana	Howard	32.2	32.9	28.9	29.7	27.4	28.1	23.2	24.5
180830004	Indiana	Knox	35.9	36.3	33.0	33.2	31.6	31.8	25.9	26.9

			24-Hour $PM_{2.5}$ Design Values ($\mu g/m^3$)							
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180890006	Indiana	Lake	34.9	35.5	31.3	31.8	30.3	30.8	27.2	28.2
180890022	Indiana	Lake	38.9	44.0	34.9	39.5	33.7	38.3	32.1	36.1
180890026	Indiana	Lake	38.4	41.3	34.0	37.0	32.8	35.8	30.3	33.2
180890027	Indiana	Lake	32.6	34.2	29.1	30.8	28.1	29.7	25.6	26.8
180890031	Indiana	Lake	34.0	34.0	30.6	30.6	29.2	29.2	24.4	24.4
180891003	Indiana	Lake	32.7	33.5	29.5	30.3	28.6	29.5	26.9	28.3
180892004	Indiana	Lake	32.9	33.9	29.6	30.6	28.6	29.7	27.4	28.9
180892010	Indiana	Lake	34.2	35.6	30.7	31.9	29.6	31.0	26.8	28.7
180910011	Indiana	La Porte	33.0	33.6	28.5	29.1	27.2	27.9	23.7	24.6
180910012	Indiana	La Porte	30.6	31.8	27.2	28.1	26.3	27.3	24.0	26.3
180950009	Indiana	Madison	32.8	34.0	29.8	30.8	28.5	29.3	22.6	23.2
180970042	Indiana	Marion	34.2	35.3	32.2	33.5	30.8	32.1	23.6	23.8
180970043	Indiana	Marion	38.4	39.9	35.7	37.1	34.3	35.7	26.6	27.4
180970066	Indiana	Marion	38.3	39.6	35.7	36.9	34.2	35.3	27.6	28.6
180970078	Indiana	Marion	36.6	37.6	34.1	34.9	32.4	33.2	25.2	25.9
180970079	Indiana	Marion	35.6	36.7	32.5	33.4	30.7	31.7	24.1	24.3
180970081	Indiana	Marion	38.2	39.2	35.8	36.9	34.1	35.1	26.9	27.0
180970083	Indiana	Marion	36.6	37.0	34.0	34.5	32.4	32.7	25.8	25.9
181270020	Indiana	Porter	32.9	34.6	28.7	30.6	27.4	29.2	24.2	25.5
181270024	Indiana	Porter	31.8	32.4	28.1	28.8	26.9	27.7	24.7	25.8
181410014	Indiana	St Joseph	32.4	33.9	29.8	31.4	29.0	30.4	26.2	28.3
181411008	Indiana	St Joseph	33.1	33.1	29.5	29.5	28.8	28.8	28.3	28.3
181412004	Indiana	St Joseph	30.0	31.4	27.2	28.4	26.5	27.8	25.9	27.9
181470009	Indiana	Spencer	32.3	33.1	30.4	31.3	28.9	29.5	19.9	20.3
181570008	Indiana	Tippecanoe	35.6	36.7	32.8	33.9	31.3	32.1	23.8	24.6
181630006	Indiana	Vanderburgh	34.8	35.5	31.9	32.5	30.8	31.4	26.3	26.9

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181630012	Indiana	Vanderburgh	33.2	34.4	31.0	32.2	30.0	31.0	25.8	26.5
181630016	Indiana	Vanderburgh	32.6	33.7	30.3	31.3	29.4	30.3	26.4	26.9
181670018	Indiana	Vigo	34.6	35.1	32.1	32.6	30.8	31.7	23.7	24.0
181670023	Indiana	Vigo	34.8	36.1	32.2	33.5	30.4	31.5	22.5	22.7
190130008	Iowa	Black Hawk	30.7	32.0	27.9	29.3	27.0	28.4	26.0	26.9
190450021	Iowa	Clinton	33.9	35.9	30.3	31.9	29.3	30.7	27.4	28.2
191032001	Iowa	Johnson	34.6	35.2	30.9	31.6	29.4	30.1	28.3	29.1
191130037	Iowa	Linn	30.6	33.3	27.5	30.0	26.6	29.0	23.2	24.8
191370002	Iowa	Montgomery	27.5	27.7	24.4	24.8	23.3	23.9	19.7	20.6
191390015	Iowa	Muscatine	36.0	37.7	33.2	34.5	32.2	33.3	31.0	32.7
191471002	Iowa	Palo Alto	25.7	25.7	23.5	23.5	22.6	22.6	20.2	20.2
191530030	Iowa	Polk	28.4	29.0	25.7	26.2	24.7	25.2	22.8	23.3
191532510	Iowa	Polk	27.2	29.5	24.3	26.0	23.3	25.1	21.1	24.0
191532520	Iowa	Polk	31.4	31.4	27.9	27.9	27.1	27.1	25.4	25.4
191550009	Iowa	Pottawattamie	28.6	28.9	25.6	25.8	24.8	25.0	23.3	23.8
191630015	Iowa	Scott	31.0	32.1	27.7	28.6	26.7	27.7	24.7	25.6
191630018	Iowa	Scott	32.3	33.3	29.7	31.0	28.8	30.0	26.8	27.4
191630019	Iowa	Scott	37.1	37.1	33.2	33.2	31.5	31.5	29.4	29.4
191770006	Iowa	Van Buren	28.3	28.3	25.5	25.5	24.7	24.7	24.2	24.2
191930017	Iowa	Woodbury	26.4	28.4	23.6	25.4	23.0	24.8	21.6	23.1
191970004	Iowa	Wright	28.6	28.8	25.6	25.8	24.9	25.0	22.1	22.3
200910007	Kansas	Johnson	25.3	26.5	23.0	24.1	22.1	23.1	19.4	21.0
200910009	Kansas	Johnson	29.3	29.3	26.3	26.3	25.5	25.5	23.8	23.8
200910010	Kansas	Johnson	23.5	23.6	20.9	21.0	20.0	20.2	16.4	17.0
201070002	Kansas	Linn	25.3	26.2	23.0	23.7	21.9	22.5	19.1	20.1
201730008	Kansas	Sedgwick	23.7	25.3	20.8	22.3	20.0	21.4	17.6	19.2

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201730009	Kansas	Sedgwick	25.0	26.4	22.2	23.5	21.5	22.6	18.9	20.3
201730010	Kansas	Sedgwick	25.3	27.0	22.5	23.9	21.9	23.3	20.0	21.2
201770010	Kansas	Shawnee	29.1	29.1	26.1	26.1	25.2	25.2	23.7	23.7
201910002	Kansas	Sumner	22.8	23.7	20.1	20.9	19.3	20.1	17.8	18.8
202090021	Kansas	Wyandotte	29.5	32.1	26.3	28.9	25.1	27.6	23.3	25.7
202090022	Kansas	Wyandotte	26.6	28.6	24.2	26.0	23.5	25.3	20.6	22.8
210130002	Kentucky	Bell	29.9	31.0	25.4	26.1	24.2	24.7	19.6	19.7
210190017	Kentucky	Boyd	33.1	34.4	28.7	29.8	26.9	28.0	18.7	19.4
210290006	Kentucky	Bullitt	34.6	35.8	30.9	32.0	29.1	30.1	20.4	20.8
210370003	Kentucky	Campbell	31.2	31.2	27.3	27.3	26.1	26.1	18.6	18.6
210430500	Kentucky	Carter	29.9	31.2	25.4	26.6	23.7	24.8	15.8	16.9
210470006	Kentucky	Christian	33.6	33.6	29.6	29.6	27.8	27.8	18.7	18.7
210590005	Kentucky	Daviess	33.8	33.8	32.0	32.0	30.1	30.1	19.7	19.7
210670012	Kentucky	Fayette	31.9	33.2	27.9	28.9	25.8	26.8	19.0	19.4
210670014	Kentucky	Fayette	32.2	33.2	28.4	29.2	26.5	27.4	20.5	22.2
210730006	Kentucky	Franklin	32.1	33.8	27.7	29.0	25.8	27.0	19.4	20.0
210930006	Kentucky	Hardin	32.8	35.1	29.0	31.1	27.1	29.0	18.3	19.1
211010014	Kentucky	Henderson	31.8	32.7	28.5	29.4	27.4	28.2	20.8	21.2
211110043	Kentucky	Jefferson	35.4	36.1	31.4	32.2	29.8	30.7	22.1	22.6
211110044	Kentucky	Jefferson	36.1	36.6	31.8	32.2	30.0	30.4	22.2	22.4
211110048	Kentucky	Jefferson	36.4	37.2	31.5	32.3	29.8	30.5	24.2	24.5
211110051	Kentucky	Jefferson	32.4	33.8	28.4	29.7	26.6	27.8	18.0	18.3
211170007	Kentucky	Kenton	34.7	35.4	30.2	31.3	28.8	29.7	22.5	23.0
211250004	Kentucky	Laurel	25.1	25.1	21.5	21.5	20.4	20.4	15.9	15.9
211451004	Kentucky	McCracken	33.6	35.9	30.5	32.5	28.5	30.4	20.6	21.7
211510003	Kentucky	Madison	30.1	30.9	24.5	25.4	23.1	24.2	17.2	17.6

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211930003	Kentucky	Perry	28.5	29.8	24.4	25.5	22.8	23.9	16.1	16.9
211950002	Kentucky	Pike	30.5	31.4	26.0	26.8	24.6	25.3	18.1	19.1
212270007	Kentucky	Warren	33.1	35.1	29.2	31.0	27.3	29.1	18.5	19.8
220171002	Louisiana	Caddo	27.5	27.5	24.5	24.5	23.3	23.3	20.8	20.8
220190009	Louisiana	Calcasieu	24.2	25.8	22.0	23.6	21.4	22.9	18.5	19.4
220190010	Louisiana	Calcasieu	26.3	27.2	23.7	24.8	22.9	23.9	19.1	19.8
220290003	Louisiana	Concordia	26.1	26.1	23.8	23.8	22.6	22.6	17.9	17.9
220330009	Louisiana	East Baton Rouge	29.3	30.5	25.9	27.0	25.0	26.2	22.9	23.9
220331001	Louisiana	East Baton Rouge	25.4	26.1	21.9	22.6	21.2	21.8	19.4	19.9
220470005	Louisiana	Iberville	28.6	29.3	25.2	25.9	24.4	25.2	23.1	23.9
220470009	Louisiana	Iberville	26.1	27.8	22.8	23.9	21.9	23.0	18.3	19.2
220511001	Louisiana	Jefferson	27.0	27.9	22.3	22.9	21.6	22.3	18.8	19.3
220550006	Louisiana	Lafayette	24.2	24.4	21.7	22.0	20.9	21.1	17.3	17.6
220730004	Louisiana	Ouachita	28.9	30.6	26.1	27.5	25.0	26.2	21.7	22.6
220790002	Louisiana	Rapides	30.2	34.3	26.3	30.3	25.1	28.9	20.6	23.8
221050001	Louisiana	Tangipahoa	29.6	30.3	25.1	25.7	24.0	24.7	20.9	21.4
221090001	Louisiana	Terrebonne	26.2	26.4	22.6	22.7	21.7	21.8	18.2	18.8
221210001	Louisiana	West Baton Rouge	29.0	29.8	25.6	26.5	24.8	25.6	22.9	23.8
230010011	Maine	Androscoggin	26.5	29.0	23.6	25.2	22.9	24.5	21.2	22.6
230030013	Maine	Aroostook	24.2	25.4	22.5	23.6	22.2	23.3	21.3	22.3
230031011	Maine	Aroostook	22.9	24.3	20.8	22.2	20.4	21.8	19.5	20.9
230050015	Maine	Cumberland	27.7	30.1	23.8	26.5	23.2	25.8	22.3	24.8
230050027	Maine	Cumberland	29.2	31.1	24.5	26.0	23.8	25.4	22.3	23.5
230090103	Maine	Hancock	19.4	19.7	13.5	13.7	13.4	13.5	11.9	12.1

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230110016	Maine	Kennebec	26.2	28.1	23.1	25.1	22.4	24.4	20.8	22.5
230172011	Maine	Oxford	28.3	30.4	25.6	26.6	25.0	26.0	23.8	25.0
230190002	Maine	Penobscot	22.0	24.3	18.7	20.6	18.1	20.0	17.0	18.8
240030014	Maryland	Anne Arundel	33.2	33.2	27.5	27.5	26.6	26.6	20.4	20.4
240031003	Maryland	Anne Arundel	35.5	37.4	29.5	30.9	28.3	29.7	24.0	25.6
240032002	Maryland	Anne Arundel	36.1	36.1	31.4	31.4	30.4	30.4	26.8	26.8
240051007	Maryland	Baltimore	33.3	34.1	27.6	28.2	26.2	26.8	22.0	22.7
240053001	Maryland	Baltimore	35.8	37.0	29.8	30.7	28.9	29.8	24.8	25.8
240150003	Maryland	Cecil	30.8	32.5	25.3	26.6	24.4	25.6	21.9	23.4
240251001	Maryland	Harford	31.2	31.4	24.0	24.3	23.1	23.4	19.6	19.6
240313001	Maryland	Montgomery	30.9	31.8	25.8	26.3	24.7	25.1	18.6	19.7
240330030	Maryland	Prince Georges	31.7	31.7	26.2	26.2	25.1	25.1	19.4	19.4
240338003	Maryland	Prince Georges	33.4	34.6	27.7	28.6	26.7	27.6	20.2	20.8
240430009	Maryland	Washington	33.4	35.5	29.1	30.6	28.2	29.6	22.8	24.5
245100006	Maryland	Baltimore City	33.3	33.8	27.9	28.1	26.8	26.9	24.3	25.1
245100007	Maryland	Baltimore City	34.7	36.1	28.7	29.5	27.5	28.1	24.7	25.2
245100008	Maryland	Baltimore City	37.2	37.3	31.3	32.0	30.0	30.7	27.6	28.8
245100035	Maryland	Baltimore City	37.7	39.2	32.2	33.0	31.1	31.8	27.6	29.7
245100040	Maryland	Baltimore City	39.0	40.9	33.0	34.4	31.8	33.1	28.6	30.2

			24-Hour $PM_{2.5}$ Design Values ($\mu g/m^3$)							
Site ID	**State**	**County**	**2003-2007 Average Ambient Values**	**2003-2007 Maximum Ambient Values**	**2012 Base Case Average Values**	**2012 Base Case Maximum Values**	**2014 Base Case Average Values**	**2014 Base Case Maximum Values**	**2014 Remedy Average Values**	**2014 Remedy Maximum Values**
245100049	Maryland	Baltimore City	38.1	38.1	33.2	33.2	32.1	32.1	29.8	29.8
250035001	Massachusetts	Berkshire	31.0	33.5	27.1	28.8	26.2	27.8	23.1	23.7
250051004	Massachusetts	Bristol	25.0	26.8	19.3	20.2	19.3	20.2	17.8	18.6
250092006	Massachusetts	Essex	28.7	33.4	23.2	27.0	22.7	26.5	20.7	24.5
250095005	Massachusetts	Essex	26.8	27.1	20.7	20.8	20.3	20.3	17.7	17.7
250096001	Massachusetts	Essex	27.8	27.9	23.3	23.7	22.8	23.1	21.1	21.6
250130008	Massachusetts	Hampden	27.2	27.9	22.8	23.3	22.1	22.6	20.2	20.7
250130016	Massachusetts	Hampden	32.3	33.5	28.1	29.3	27.4	28.4	25.2	25.3
250132009	Massachusetts	Hampden	33.1	33.3	28.6	28.7	27.9	27.9	26.1	26.2
250230004	Massachusetts	Plymouth	28.4	28.8	21.7	22.2	21.4	21.8	19.1	19.7
250250002	Massachusetts	Suffolk	29.4	29.7	24.3	24.4	23.7	23.8	22.8	22.8
250250027	Massachusetts	Suffolk	29.2	29.5	23.6	23.6	23.0	23.1	22.1	22.2
250250042	Massachusetts	Suffolk	28.6	29.1	23.7	23.7	23.1	23.1	21.6	21.9
250250043	Massachusetts	Suffolk	32.1	33.9	26.1	27.8	25.6	27.3	23.1	24.8
250270016	Massachusetts	Worcester	30.0	30.0	23.9	24.0	23.2	23.3	21.2	21.5
250270023	Massachusetts	Worcester	30.6	30.6	25.2	25.2	24.6	24.6	22.6	22.6
260050003	Michigan	Allegan	33.8	34.0	30.1	30.3	29.1	29.3	27.1	27.7
260170014	Michigan	Bay	31.6	32.1	28.3	28.8	27.4	28.0	25.2	25.9
260210014	Michigan	Berrien	31.3	32.3	27.8	28.5	26.5	27.3	24.1	25.3
260490021	Michigan	Genesee	30.4	32.0	27.4	28.8	26.5	27.8	24.8	25.6
260650012	Michigan	Ingham	31.9	32.1	29.3	29.6	28.4	28.8	26.5	27.4
260770008	Michigan	Kalamazoo	31.1	32.8	28.3	29.9	27.4	28.9	24.3	25.3
260810020	Michigan	Kent	36.5	37.1	32.2	32.7	30.9	31.3	28.3	28.7
260990009	Michigan	Macomb	35.3	35.9	32.0	32.7	31.0	31.7	29.6	30.6
261130001	Michigan	Missaukee	24.8	25.2	22.0	22.2	20.9	21.0	17.4	17.4

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261150005	Michigan	Monroe	38.8	39.6	34.4	34.8	32.6	33.1	26.9	27.0
261210040	Michigan	Muskegon	34.7	36.6	30.5	32.1	29.0	30.4	26.7	27.9
261250001	Michigan	Oakland	39.9	40.4	35.0	35.4	33.4	33.9	27.8	29.0
261390005	Michigan	Ottawa	34.2	34.7	31.0	31.4	30.2	30.6	28.6	29.3
261450018	Michigan	Saginaw	30.6	30.6	27.2	27.2	26.1	26.1	24.0	24.0
261470005	Michigan	St Clair	39.6	40.6	36.2	37.1	35.0	36.0	32.2	32.9
261610005	Michigan	Washtenaw	33.6	33.6	29.8	29.8	28.7	28.7	26.6	26.6
261610008	Michigan	Washtenaw	39.4	40.8	35.0	36.3	33.9	35.0	28.4	29.2
261630001	Michigan	Wayne	37.8	40.1	32.9	35.1	31.3	33.5	28.9	30.0
261630015	Michigan	Wayne	40.1	40.6	35.5	36.0	34.1	34.6	30.8	31.6
261630016	Michigan	Wayne	42.9	45.4	38.9	41.2	37.9	40.1	33.7	35.4
261630019	Michigan	Wayne	40.9	41.4	37.3	37.8	36.3	36.6	34.7	35.5
261630025	Michigan	Wayne	35.1	36.8	30.8	31.9	29.3	30.2	26.4	26.8
261630033	Michigan	Wayne	43.8	44.2	39.4	39.8	38.2	38.5	34.3	34.5
261630036	Michigan	Wayne	37.1	37.9	34.0	34.9	33.0	33.7	29.1	29.7
261630039	Michigan	Wayne	37.0	37.0	32.9	32.9	31.8	31.8	29.4	29.4
270210001	Minnesota	Cass	18.0	19.1	16.4	17.4	15.9	16.9	15.1	16.1
270370470	Minnesota	Dakota	25.4	25.6	23.0	23.2	22.0	22.1	20.7	21.0
270530050	Minnesota	Hennepin	27.2	28.0	24.0	24.7	23.0	23.7	21.5	22.2
270530961	Minnesota	Hennepin	25.5	26.2	22.9	23.5	22.2	22.8	20.5	21.3
270530963	Minnesota	Hennepin	26.0	27.8	23.0	24.6	22.1	23.5	20.8	21.9
270530965	Minnesota	Hennepin	24.7	25.5	21.8	22.5	21.1	21.7	20.1	20.7
270531007	Minnesota	Hennepin	25.4	25.7	22.4	22.7	21.5	21.8	20.4	20.7
270532006	Minnesota	Hennepin	26.7	27.5	24.0	24.7	23.0	23.6	20.9	21.5
270953051	Minnesota	Mille Lacs	22.0	22.2	20.5	20.8	19.9	20.2	18.5	18.9
271230866	Minnesota	Ramsey	28.0	29.4	25.5	26.8	24.7	25.9	22.8	23.1

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271230868	Minnesota	Ramsey	28.3	30.5	25.4	27.1	24.4	26.0	22.9	24.5
271230871	Minnesota	Ramsey	26.3	26.8	23.4	24.0	22.3	22.7	21.2	21.3
271377001	Minnesota	St Louis	20.3	21.2	18.5	19.4	18.1	18.9	17.2	18.2
271377550	Minnesota	St Louis	19.5	20.1	17.9	18.2	17.2	17.5	15.7	16.0
271377551	Minnesota	St Louis	23.5	23.8	21.2	21.4	20.7	20.8	18.5	18.6
271390505	Minnesota	Scott	24.9	25.8	22.7	23.4	22.1	22.8	20.1	21.2
280010004	Mississippi	Adams	27.4	27.8	24.3	24.8	23.2	23.7	18.7	19.1
280110001	Mississippi	Bolivar	28.9	29.9	26.4	27.2	25.1	26.1	20.9	21.8
280330002	Mississippi	De Soto	30.8	31.3	27.1	27.3	25.4	25.7	18.4	19.5
280350004	Mississippi	Forrest	30.4	31.1	27.0	27.6	26.0	26.5	23.5	24.3
280470008	Mississippi	Harrison	29.0	29.0	25.6	25.6	24.6	24.6	21.2	21.2
280490010	Mississippi	Hinds	28.8	29.1	25.4	25.5	24.2	24.3	20.2	20.3
280590006	Mississippi	Jackson	26.9	26.9	23.4	23.4	22.4	22.4	19.2	19.2
280670002	Mississippi	Jones	31.2	31.6	27.8	28.3	26.7	27.2	23.5	23.8
280810005	Mississippi	Lee	32.1	33.4	27.7	28.5	26.2	26.8	19.4	20.0
280870001	Mississippi	Lowndes	32.4	33.0	27.5	28.0	26.0	26.6	19.9	21.3
281490004	Mississippi	Warren	30.2	30.2	26.7	26.7	25.6	25.6	21.8	21.8
290190004	Missouri	Boone	30.2	30.2	27.0	27.0	25.8	25.8	21.6	21.6
290210005	Missouri	Buchanan	30.1	30.1	26.9	26.9	26.2	26.2	23.6	23.6
290370003	Missouri	Cass	25.6	26.1	23.0	23.3	21.7	21.9	18.1	18.2
290390001	Missouri	Cedar	28.7	28.7	25.7	25.7	24.1	24.1	20.7	20.7
290470005	Missouri	Clay	28.0	28.6	24.9	25.6	24.1	24.8	22.3	23.7
290770032	Missouri	Greene	28.2	29.4	25.9	26.9	24.3	25.1	21.0	21.4
290950034	Missouri	Jackson	27.8	27.9	25.2	25.2	24.0	24.1	22.4	22.4
290990012	Missouri	Jefferson	33.4	34.2	31.2	31.9	29.4	29.9	24.2	24.8
291370001	Missouri	Monroe	27.8	27.8	24.9	24.9	23.6	23.6	21.0	21.0

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291831002	Missouri	St Charles	33.1	34.7	31.6	33.0	30.0	31.3	23.5	24.4
291860006	Missouri	Ste Genevieve	31.4	32.0	28.6	29.3	27.1	27.6	22.2	23.2
291890004	Missouri	St Louis	32.0	32.0	29.5	29.5	27.5	27.5	24.1	24.1
291892003	Missouri	St Louis	33.2	33.8	30.1	30.9	29.0	29.5	27.5	28.6
295100007	Missouri	St Louis City	33.1	33.5	31.2	31.7	28.8	29.3	23.6	24.4
295100085	Missouri	St Louis City	33.2	33.8	30.7	31.4	28.9	29.4	24.5	25.0
295100086	Missouri	St Louis City	32.5	32.6	30.1	30.3	28.2	28.3	25.9	26.9
295100087	Missouri	St Louis City	34.3	34.7	32.2	32.7	30.0	30.4	25.5	26.0
300870307	Montana	Rosebud	19.7	19.7	18.9	18.9	18.7	18.7	18.9	18.9
301111065	Montana	Yellowstone	19.3	19.4	18.2	18.5	18.1	18.4	18.1	18.4
310250002	Nebraska	Cass	28.3	28.3	25.0	25.0	24.3	24.3	22.9	22.9
310550019	Nebraska	Douglas	25.7	25.7	22.7	22.7	22.1	22.1	20.9	20.9
310550052	Nebraska	Douglas	25.7	26.8	23.1	24.0	22.3	23.3	20.5	21.7
310790004	Nebraska	Hall	19.1	19.1	16.7	16.7	16.3	16.3	15.6	15.6
311090022	Nebraska	Lancaster	24.7	26.6	22.2	23.8	21.5	23.2	20.1	22.3
311570003	Nebraska	Scotts Bluff	16.6	16.6	15.4	15.4	15.2	15.2	15.0	15.0
311770002	Nebraska	Washington	24.0	24.8	21.8	22.7	21.3	22.1	19.1	19.7
330012004	New Hampshire	Belknap	20.5	21.4	15.6	16.2	15.1	15.7	12.9	13.3
330050007	New Hampshire	Cheshire	30.2	31.0	26.2	26.4	25.5	25.6	23.3	23.4
330070014	New Hampshire	Coos	26.5	26.9	22.7	22.8	22.0	22.0	19.5	20.0
330090010	New Hampshire	Grafton	23.0	23.0	18.8	18.8	18.2	18.2	16.1	16.1
330110020	New Hampshire	Hillsborough	28.6	28.6	24.9	24.9	24.2	24.2	22.4	22.4
330111015	New Hampshire	Hillsborough	27.3	27.3	24.6	24.6	23.9	23.9	22.6	22.6
330115001	New Hampshire	Hillsborough	25.9	25.9	20.0	20.0	19.4	19.4	15.4	15.4
330131006	New Hampshire	Merrimack	25.6	26.1	20.7	21.0	20.1	20.4	18.2	18.3
330150014	New Hampshire	Rockingham	26.3	27.8	21.5	22.6	21.1	22.2	18.8	19.3

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330190003	New Hampshire	Sullivan	28.9	30.8	22.7	24.1	21.8	23.1	19.6	20.6
340030003	New Jersey	Bergen	37.0	37.7	30.5	31.0	28.9	29.4	24.4	24.8
340070003	New Jersey	Camden	36.5	38.6	29.3	31.2	28.1	30.1	23.5	25.5
340071007	New Jersey	Camden	37.3	38.8	29.7	30.8	28.3	29.3	23.7	24.7
340130015	New Jersey	Essex	38.3	38.4	30.2	30.7	28.7	29.2	25.4	26.0
340171003	New Jersey	Hudson	39.0	40.5	32.2	32.7	30.7	31.2	28.1	28.6
340172002	New Jersey	Hudson	41.4	41.4	35.4	35.4	33.7	33.7	32.7	32.7
340210008	New Jersey	Mercer	34.7	35.8	28.2	28.4	26.9	27.0	21.4	21.7
340230006	New Jersey	Middlesex	34.8	38.1	27.6	30.0	26.5	28.9	22.2	23.8
340270004	New Jersey	Morris	32.3	33.6	26.5	27.4	25.3	26.1	20.4	20.8
340273001	New Jersey	Morris	31.5	32.9	25.6	26.8	24.4	25.6	18.4	18.9
340292002	New Jersey	Ocean	31.5	33.9	24.5	26.1	23.4	24.9	18.3	19.5
340310005	New Jersey	Passaic	36.3	37.1	29.6	30.5	28.1	29.1	23.1	24.9
340390004	New Jersey	Union	40.4	41.4	32.3	33.4	30.8	31.9	27.5	28.8
340390006	New Jersey	Union	37.3	37.7	30.7	31.5	29.1	29.8	23.8	24.4
340392003	New Jersey	Union	36.8	37.4	29.4	29.9	28.0	28.5	24.3	25.0
340410006	New Jersey	Warren	34.0	34.7	29.1	29.9	28.2	29.0	23.3	24.2
350010023	New Mexico	Bernalillo	18.6	18.8	16.9	17.2	16.3	16.7	16.1	16.4
350010024	New Mexico	Bernalillo	16.4	17.1	14.8	15.4	14.4	14.9	14.1	14.7
350050005	New Mexico	Chaves	15.6	16.5	14.3	15.0	14.0	14.6	12.9	13.3
350130017	New Mexico	Dona Ana	32.9	35.5	31.1	33.5	30.8	33.2	30.4	32.8
350130025	New Mexico	Dona Ana	13.8	14.1	12.7	13.1	12.5	12.9	11.8	12.2
350431003	New Mexico	Sandoval	10.3	10.9	9.3	9.9	9.1	9.6	8.7	9.3
350439011	New Mexico	Sandoval	15.6	16.2	14.9	15.6	14.7	15.4	14.5	15.2
350450006	New Mexico	San Juan	12.4	12.6	11.7	12.0	11.7	11.9	11.6	11.8
350490020	New Mexico	Santa Fe	9.7	10.2	9.1	9.6	9.0	9.4	8.8	9.2

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360010005	New York	Albany	34.2	34.2	30.3	30.3	29.5	29.5	27.6	27.6
360050080	New York	Bronx	38.8	40.2	33.0	33.4	31.2	31.6	28.4	29.1
360050083	New York	Bronx	34.7	35.3	29.4	30.2	27.4	28.2	22.9	23.4
360050110	New York	Bronx	36.1	36.6	31.3	32.4	29.5	30.5	26.9	27.7
360130011	New York	Chautauqua	29.1	30.1	24.4	25.1	23.4	24.0	17.2	18.1
360290005	New York	Erie	35.3	37.0	31.6	33.2	30.8	32.3	27.7	29.4
360291007	New York	Erie	33.6	35.2	30.1	32.2	29.3	31.4	25.7	28.3
360310003	New York	Essex	22.4	22.8	19.7	19.9	18.8	19.0	15.1	15.2
360470122	New York	Kings	36.9	38.0	30.4	31.0	28.7	29.3	25.0	25.7
360551007	New York	Monroe	32.2	33.0	27.2	27.8	26.2	26.6	22.2	22.7
360590008	New York	Nassau	34.0	35.0	26.9	27.6	25.5	26.1	21.2	22.2
360610056	New York	New York	39.7	40.6	33.3	34.0	31.3	31.9	27.8	28.0
360610062	New York	New York	38.8	41.6	31.2	32.1	29.8	30.5	25.7	26.4
360610079	New York	New York	37.9	40.2	31.6	33.5	29.8	31.6	26.9	28.3
360610128	New York	New York	39.4	41.8	32.4	33.8	30.8	32.0	27.8	28.7
360632008	New York	Niagara	33.8	34.3	29.8	30.7	29.0	30.0	24.5	25.5
360671015	New York	Onondaga	27.3	28.5	23.6	24.1	22.7	23.0	18.3	19.4
360710002	New York	Orange	28.9	29.4	23.9	24.4	23.0	23.4	20.9	21.3
360810124	New York	Queens	35.5	35.5	29.6	29.6	28.0	28.0	24.0	24.0
360850055	New York	Richmond	34.9	37.0	29.1	30.8	27.7	29.3	23.2	24.7
360850067	New York	Richmond	32.4	33.0	25.4	26.0	24.0	24.5	19.7	20.9
360893001	New York	St Lawrence	22.0	22.5	19.5	20.1	19.0	19.6	17.1	18.4
361010003	New York	Steuben	27.8	28.2	23.3	23.6	22.4	22.7	17.4	17.8
361030001	New York	Suffolk	34.6	34.6	26.7	26.7	25.3	25.3	19.9	19.9
361191002	New York	Westchester	33.5	34.3	25.8	26.5	24.3	25.0	21.1	21.3
370010002	North Carolina	Alamance	31.7	32.1	26.6	26.8	25.2	25.5	20.6	21.0

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370210034	North Carolina	Buncombe	30.0	30.2	24.5	24.7	23.5	23.6	18.2	18.3
370330001	North Carolina	Caswell	29.4	29.5	24.0	24.2	22.9	23.1	18.7	18.8
370350004	North Carolina	Catawba	34.5	35.5	27.1	27.9	26.1	26.8	21.7	22.0
370370004	North Carolina	Chatham	26.9	27.4	22.2	23.0	21.3	22.0	16.2	16.5
370510009	North Carolina	Cumberland	30.7	31.2	25.8	26.6	24.7	25.5	20.6	21.0
370570002	North Carolina	Davidson	31.3	32.1	25.7	26.4	24.8	25.5	21.5	21.8
370610002	North Carolina	Duplin	28.3	29.6	22.8	23.5	21.7	22.4	17.9	18.6
370630001	North Carolina	Durham	31.0	32.0	24.8	25.4	23.7	24.3	18.7	19.0
370650004	North Carolina	Edgecombe	26.7	26.9	23.8	24.0	22.6	22.8	18.7	19.0
370670022	North Carolina	Forsyth	31.9	32.2	26.1	26.3	25.1	25.4	21.0	21.4
370710016	North Carolina	Gaston	30.8	30.9	24.1	24.3	23.1	23.3	18.5	18.7
370810013	North Carolina	Guilford	30.6	30.6	26.1	26.1	24.9	24.9	20.4	20.4
370870010	North Carolina	Haywood	27.7	28.5	23.6	24.0	22.6	22.8	18.5	18.9
370990006	North Carolina	Jackson	24.9	25.4	20.6	20.7	19.4	19.5	15.6	16.0
371070004	North Carolina	Lenoir	25.2	25.5	21.2	21.4	20.1	20.3	17.5	17.9
371110004	North Carolina	McDowell	31.5	32.0	25.3	25.8	24.4	24.9	19.8	20.2
371170001	North Carolina	Martin	24.8	26.2	21.3	22.3	20.2	21.2	17.0	17.3
371190010	North Carolina	Mecklenburg	32.3	32.3	26.2	26.2	25.2	25.2	21.4	21.4
371190041	North Carolina	Mecklenburg	31.7	32.1	24.6	24.9	23.6	23.9	19.6	19.8
371190042	North Carolina	Mecklenburg	30.7	31.4	23.5	23.8	22.5	22.9	18.7	19.0
371210001	North Carolina	Mitchell	30.2	31.6	24.1	26.0	22.9	24.8	17.4	19.4
371230001	North Carolina	Montgomery	28.2	29.0	23.1	23.9	22.3	23.0	17.2	17.6
371290002	North Carolina	New Hanover	25.4	25.4	20.6	20.6	19.3	19.3	15.7	15.7
371330005	North Carolina	Onslow	24.6	25.1	21.4	21.9	20.4	20.9	16.9	17.1
371350007	North Carolina	Orange	29.3	29.8	23.5	24.0	22.3	22.8	17.8	18.2
371470005	North Carolina	Pitt	26.2	26.9	22.5	22.7	21.3	21.5	18.1	18.4

			24-Hour $PM_{2.5}$ Design Values ($\mu g/m^3$)							
Site ID	**State**	**County**	**2003-2007 Average Ambient Values**	**2003-2007 Maximum Ambient Values**	**2012 Base Case Average Values**	**2012 Base Case Maximum Values**	**2014 Base Case Average Values**	**2014 Base Case Maximum Values**	**2014 Remedy Average Values**	**2014 Remedy Maximum Values**
371550005	North Carolina	Robeson	29.9	30.4	24.7	24.9	23.1	23.3	18.8	19.1
371590021	North Carolina	Rowan	30.2	30.2	24.4	24.4	23.6	23.6	19.8	19.8
371730002	North Carolina	Swain	27.3	28.3	22.0	22.7	20.9	21.6	16.7	17.8
371830014	North Carolina	Wake	31.6	32.2	25.9	26.5	24.8	25.4	19.1	19.6
371890003	North Carolina	Watauga	30.4	30.5	24.6	24.8	23.4	23.5	17.9	18.1
371910005	North Carolina	Wayne	29.7	30.4	24.5	25.4	22.6	23.4	19.6	20.1
380070002	North Dakota	Billings	13.0	13.6	12.4	12.9	12.3	12.8	12.2	12.7
380130003	North Dakota	Burke	16.7	16.7	16.1	16.1	16.0	16.0	15.8	15.8
380150003	North Dakota	Burleigh	17.6	18.7	16.7	17.6	16.4	17.4	15.9	16.9
380171004	North Dakota	Cass	21.2	22.5	19.5	20.6	18.9	20.0	17.7	19.1
380530002	North Dakota	McKenzie	11.9	13.0	11.4	12.4	11.3	12.3	11.1	12.0
380570004	North Dakota	Mercer	16.9	17.9	16.1	17.0	16.0	16.9	15.6	16.5
390090003	Ohio	Athens	32.3	33.2	26.8	27.3	25.1	25.5	17.7	18.1
390170003	Ohio	Butler	39.2	41.1	34.4	36.5	33.0	35.4	26.1	26.9
390170016	Ohio	Butler	37.1	37.7	32.3	33.2	30.4	31.3	22.8	23.0
390170017	Ohio	Butler	37.9	37.9	33.4	33.4	32.0	32.0	22.8	22.8
390171004	Ohio	Butler	37.1	38.1	32.6	33.8	30.9	32.0	21.9	22.7
390230005	Ohio	Clark	35.3	36.4	31.7	32.6	30.2	31.0	22.5	23.2
390250022	Ohio	Clermont	34.4	34.4	29.9	29.9	28.5	28.5	19.5	19.5
390350027	Ohio	Cuyahoga	36.6	38.8	33.4	35.3	32.4	34.3	27.1	28.7
390350034	Ohio	Cuyahoga	36.5	37.9	32.3	34.0	31.4	33.2	23.4	24.3
390350038	Ohio	Cuyahoga	44.2	47.0	39.4	41.8	38.2	40.5	32.6	34.5
390350045	Ohio	Cuyahoga	38.5	41.5	34.7	38.1	33.7	37.0	25.5	26.6
390350060	Ohio	Cuyahoga	42.1	45.7	37.7	40.8	36.7	39.7	29.8	32.2
390350065	Ohio	Cuyahoga	38.6	41.0	34.9	37.6	33.7	36.5	25.1	25.9
390351002	Ohio	Cuyahoga	34.2	34.8	30.6	31.5	29.8	30.9	23.7	25.4

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390490024	Ohio	Franklin	38.5	39.7	33.1	34.3	31.2	32.8	24.5	25.5
390490025	Ohio	Franklin	38.4	39.1	33.1	33.7	31.2	31.8	22.9	23.5
390490081	Ohio	Franklin	34.1	34.1	28.4	28.4	26.6	26.6	21.3	21.3
390570005	Ohio	Greene	32.2	33.0	29.0	29.8	27.0	27.9	19.7	19.8
390610006	Ohio	Hamilton	37.6	37.6	33.1	33.1	31.6	31.6	21.2	21.2
390610014	Ohio	Hamilton	38.2	39.4	33.2	34.1	31.3	32.2	22.5	23.0
390610040	Ohio	Hamilton	36.7	37.7	31.5	32.6	29.7	30.7	21.5	22.4
390610042	Ohio	Hamilton	37.3	38.2	32.6	33.3	31.2	31.7	24.8	26.4
390610043	Ohio	Hamilton	35.9	36.2	32.2	32.8	31.1	31.5	21.9	22.3
390617001	Ohio	Hamilton	38.8	39.6	33.6	34.2	32.2	32.9	23.2	23.9
390618001	Ohio	Hamilton	40.6	40.9	35.2	35.8	33.5	33.9	25.6	26.2
390810017	Ohio	Jefferson	40.7	42.4	33.4	34.9	31.9	33.4	26.1	28.2
390811001	Ohio	Jefferson	41.9	45.5	34.5	37.8	33.1	36.4	25.1	27.3
390851001	Ohio	Lake	37.1	37.1	34.3	34.3	32.9	32.9	22.9	22.9
390870010	Ohio	Lawrence	33.7	34.8	28.4	29.4	26.7	27.6	20.1	20.9
390933002	Ohio	Lorain	31.5	32.1	29.0	29.5	28.1	28.6	21.9	22.3
390950024	Ohio	Lucas	36.3	38.6	32.8	35.1	31.9	33.9	26.4	28.4
390950025	Ohio	Lucas	35.1	36.8	31.7	33.2	30.8	32.3	28.8	30.8
390950026	Ohio	Lucas	34.9	36.7	31.4	33.1	30.3	31.9	25.8	27.5
390990005	Ohio	Mahoning	35.1	35.7	29.8	30.4	28.8	29.5	22.6	23.6
390990014	Ohio	Mahoning	36.8	38.2	31.8	32.9	30.7	31.6	24.0	25.2
391130031	Ohio	Montgomery	35.7	37.1	32.2	33.2	31.0	32.0	26.9	27.3
391130032	Ohio	Montgomery	37.8	40.0	33.6	35.6	32.1	33.9	22.8	24.2
391330002	Ohio	Portage	34.3	34.5	29.8	30.0	28.9	29.1	21.1	21.4
391351001	Ohio	Preble	32.8	33.9	30.4	31.6	28.9	30.1	20.0	20.4
391450013	Ohio	Scioto	34.5	36.1	29.4	30.9	27.8	29.2	20.6	22.2

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391510017	Ohio	Stark	36.9	37.6	32.3	33.0	31.2	32.0	22.9	24.2
391530017	Ohio	Summit	38.0	39.6	33.1	34.7	31.9	33.5	24.6	26.1
391530023	Ohio	Summit	35.8	37.5	32.1	33.8	30.8	32.5	23.6	25.1
391550007	Ohio	Trumbull	36.2	37.8	32.1	33.4	31.1	32.2	24.1	25.1
400159008	Oklahoma	Caddo	23.9	26.0	21.3	22.9	20.6	22.1	18.2	19.3
400219002	Oklahoma	Cherokee	27.5	28.0	24.6	25.2	23.6	24.6	22.3	23.4
400710602	Oklahoma	Kay	31.8	31.8	28.9	28.9	28.2	28.2	27.0	27.0
400719010	Oklahoma	Kay	27.9	32.2	25.3	29.3	24.6	28.5	22.6	26.3
400819005	Oklahoma	Lincoln	27.8	27.8	25.0	25.0	24.1	24.1	21.4	21.4
400970186	Oklahoma	Mayes	28.7	29.1	26.2	26.8	25.4	26.1	23.9	25.0
400979014	Oklahoma	Mayes	26.1	26.3	23.3	23.3	22.3	22.4	19.7	20.5
401010169	Oklahoma	Muskogee	29.5	30.5	27.4	28.0	26.7	27.2	22.7	23.8
401090035	Oklahoma	Oklahoma	23.4	24.0	20.6	21.1	19.7	20.3	18.5	19.2
401091037	Oklahoma	Oklahoma	27.1	28.2	23.7	24.9	22.8	23.9	21.1	22.4
401159004	Oklahoma	Ottawa	29.1	29.6	26.0	27.1	25.2	26.3	22.4	23.8
401210415	Oklahoma	Pittsburg	26.3	27.2	23.9	25.0	22.9	24.2	20.1	21.4
401359015	Oklahoma	Sequoyah	31.4	31.4	29.1	29.1	28.2	28.2	25.0	25.0
401430110	Oklahoma	Tulsa	28.4	28.4	25.8	25.8	24.7	24.7	22.8	22.8
401431127	Oklahoma	Tulsa	30.3	31.0	27.7	28.6	26.6	27.7	23.6	24.9
420010001	Pennsylvania	Adams	34.9	36.2	28.8	30.1	27.9	29.3	22.8	24.5
420030008	Pennsylvania	Allegheny	39.4	39.9	33.8	34.2	32.6	32.9	25.9	26.6
420030021	Pennsylvania	Allegheny	35.1	35.1	30.1	30.1	28.9	28.9	22.6	22.6
420030064	Pennsylvania	Allegheny	64.2	68.2	56.7	59.9	54.1	57.5	45.0	48.0
420030067	Pennsylvania	Allegheny	36.4	39.4	29.7	32.2	28.2	30.4	19.3	21.6
420030093	Pennsylvania	Allegheny	45.6	51.5	39.1	44.3	37.5	42.5	29.4	33.7
420030095	Pennsylvania	Allegheny	38.7	40.7	32.8	35.1	31.3	33.7	24.3	27.2

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420030116	Pennsylvania	Allegheny	42.5	42.5	35.5	35.5	33.8	33.8	25.6	25.6
420030133	Pennsylvania	Allegheny	39.2	39.2	34.3	34.3	32.8	32.8	27.5	27.5
420031008	Pennsylvania	Allegheny	41.3	42.8	35.0	36.3	33.2	34.4	24.0	24.8
420031301	Pennsylvania	Allegheny	40.3	42.4	33.9	35.6	32.3	33.8	24.5	25.4
420033007	Pennsylvania	Allegheny	37.5	43.1	32.3	37.3	30.9	35.7	24.5	28.3
420039002	Pennsylvania	Allegheny	37.8	37.8	32.2	32.2	30.6	30.6	22.8	22.8
420070014	Pennsylvania	Beaver	43.4	44.6	36.2	37.4	34.5	35.7	27.0	28.0
420110011	Pennsylvania	Berks	37.7	39.1	33.7	35.3	32.9	34.5	30.3	32.7
420170012	Pennsylvania	Bucks	34.0	34.8	28.5	29.0	27.0	27.4	24.5	24.7
420210011	Pennsylvania	Cambria	39.0	39.4	34.3	34.7	32.8	33.3	22.8	23.1
420270100	Pennsylvania	Centre	36.2	37.6	30.1	31.2	29.3	30.3	22.7	24.2
420290100	Pennsylvania	Chester	36.7	36.7	31.0	31.0	30.0	30.0	26.3	26.3
420410101	Pennsylvania	Cumberland	38.0	40.2	31.4	32.7	30.9	32.2	28.8	30.1
420430401	Pennsylvania	Dauphin	38.0	39.0	32.9	34.1	32.2	33.4	29.8	31.4
420450002	Pennsylvania	Delaware	35.2	35.9	29.3	30.0	28.3	29.1	23.6	25.6
420490003	Pennsylvania	Erie	34.4	34.4	30.1	30.1	28.8	28.8	21.9	21.9
420692006	Pennsylvania	Lackawanna	31.5	32.6	26.5	27.2	25.4	26.0	20.0	20.1
420710007	Pennsylvania	Lancaster	40.8	44.0	35.9	38.3	35.3	37.6	34.7	36.9
420770004	Pennsylvania	Lehigh	36.4	36.4	31.4	31.4	30.4	30.4	27.0	27.0
420791101	Pennsylvania	Luzerne	32.4	32.4	27.1	27.1	25.8	25.8	22.3	22.3
420850100	Pennsylvania	Mercer	36.3	36.3	30.5	30.5	29.6	29.6	23.1	23.1
420950025	Pennsylvania	Northampton	36.7	37.4	30.6	31.1	29.6	30.3	25.6	26.2
420990301	Pennsylvania	Perry	30.4	30.4	27.1	27.1	26.4	26.4	22.8	22.8
421010004	Pennsylvania	Philadelphia	36.5	36.7	29.7	30.0	28.5	28.9	24.9	26.1
421010024	Pennsylvania	Philadelphia	35.9	35.9	28.9	28.9	27.3	27.3	22.1	22.1
421010047	Pennsylvania	Philadelphia	37.3	37.7	30.2	30.6	29.2	29.5	24.7	25.2

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421250005	Pennsylvania	Washington	35.5	36.3	29.5	30.3	28.0	28.8	21.5	21.6
421250200	Pennsylvania	Washington	33.5	33.5	27.1	27.1	25.9	25.9	20.1	20.1
421255001	Pennsylvania	Washington	38.1	39.9	31.0	32.4	29.6	31.0	20.3	20.6
421290008	Pennsylvania	Westmoreland	37.1	37.5	32.1	32.2	30.7	30.9	21.9	22.7
421330008	Pennsylvania	York	38.2	40.7	33.3	36.0	32.6	35.3	30.8	33.6
440070022	Rhode Island	Providence	29.4	29.4	23.1	23.1	22.6	22.6	20.0	20.0
440070026	Rhode Island	Providence	30.6	32.2	25.5	26.1	24.8	25.4	21.8	22.1
440070028	Rhode Island	Providence	28.1	28.1	23.3	23.3	22.6	22.6	20.4	20.4
440071010	Rhode Island	Providence	28.8	29.7	22.9	23.1	22.3	22.5	20.0	20.2
450190049	South Carolina	Charleston	27.9	27.9	22.6	22.6	21.8	21.8	18.5	18.6
450250001	South Carolina	Chesterfield	28.7	29.9	23.9	24.7	22.9	23.6	18.3	18.7
450370001	South Carolina	Edgefield	32.2	33.7	26.8	27.9	25.2	26.2	20.4	21.2
450410002	South Carolina	Florence	28.8	28.9	24.3	24.6	23.2	23.5	19.0	19.3
450450008	South Carolina	Greenville	31.8	31.8	27.0	27.0	25.8	25.8	22.0	22.0
450450009	South Carolina	Greenville	32.5	33.5	26.7	27.3	25.4	26.1	21.3	21.6
450470003	South Carolina	Greenwood	30.0	31.0	24.9	25.5	23.4	24.0	18.8	19.2
450510002	South Carolina	Horry	28.3	29.0	24.0	24.7	22.9	23.7	19.1	19.5
450630008	South Carolina	Lexington	32.8	33.4	28.0	28.8	26.6	27.5	22.4	23.1
450730001	South Carolina	Oconee	27.9	28.2	23.4	23.4	22.1	22.1	17.1	17.4
450790007	South Carolina	Richland	31.3	32.0	26.0	26.4	24.6	24.9	20.0	20.3
450790019	South Carolina	Richland	33.2	33.8	27.8	28.2	26.3	26.7	21.5	21.9
450830010	South Carolina	Spartanburg	32.4	32.4	26.3	26.3	25.1	25.1	20.4	20.4
460110002	South Dakota	Brookings	23.5	24.9	20.9	22.0	20.3	21.4	18.9	20.1
460130003	South Dakota	Brown	18.7	19.2	17.0	17.3	16.6	16.9	15.9	16.3
460290002	South Dakota	Codington	23.6	24.0	21.9	22.4	21.3	21.7	19.4	19.6
460330132	South Dakota	Custer	14.3	14.3	13.5	13.5	13.3	13.3	13.0	13.0

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460710001	South Dakota	Jackson	12.7	13.4	11.8	12.4	11.6	12.2	10.9	11.4
460990006	South Dakota	Minnehaha	24.1	25.5	21.7	23.0	21.0	22.2	19.7	20.7
460990007	South Dakota	Minnehaha	23.9	25.1	21.3	22.1	20.6	21.4	18.9	20.0
461030016	South Dakota	Pennington	17.2	17.2	15.9	16.0	15.7	15.7	15.6	15.7
461030020	South Dakota	Pennington	18.5	19.2	17.5	18.1	17.3	17.8	17.3	17.8
461031001	South Dakota	Pennington	15.9	16.6	14.8	15.6	14.5	15.4	14.4	15.3
470090011	Tennessee	Blount	32.5	34.2	28.1	29.5	26.7	28.0	21.1	22.2
470370023	Tennessee	Davidson	33.5	34.3	30.7	31.4	29.3	30.0	21.3	21.8
470370025	Tennessee	Davidson	30.9	31.5	28.1	28.6	26.8	27.4	20.0	20.6
470370036	Tennessee	Davidson	32.7	33.5	29.6	30.4	28.0	28.7	19.1	19.4
470450004	Tennessee	Dyer	31.9	33.3	28.8	29.8	27.0	28.0	19.6	19.9
470650031	Tennessee	Hamilton	33.2	35.2	28.1	29.0	26.8	27.5	23.8	24.1
470651011	Tennessee	Hamilton	29.7	31.3	24.2	25.1	22.9	23.6	17.2	17.6
470654002	Tennessee	Hamilton	33.5	34.3	27.5	28.0	26.1	26.6	20.9	21.2
470930028	Tennessee	Knox	36.6	36.6	30.8	30.8	29.3	29.3	23.6	23.6
470931017	Tennessee	Knox	33.4	33.9	28.9	29.2	27.6	27.9	22.4	22.6
470990002	Tennessee	Lawrence	28.4	31.7	25.2	28.2	23.9	26.7	17.4	19.3
471050108	Tennessee	Loudon	32.2	33.3	27.8	28.6	26.5	27.3	21.3	21.9
471071002	Tennessee	Mc Minn	32.7	33.9	27.2	28.0	25.7	26.5	20.2	21.0
471192007	Tennessee	Maury	30.9	31.7	28.4	29.1	27.1	27.9	19.8	20.7
471251009	Tennessee	Montgomery	36.3	37.5	33.0	34.2	31.2	32.3	21.0	21.7
471410001	Tennessee	Putnam	32.6	32.6	28.5	28.5	26.8	26.8	18.2	18.2
471450004	Tennessee	Roane	30.2	31.4	25.0	26.1	23.6	24.6	18.2	19.0
471570014	Tennessee	Shelby	32.2	33.5	28.0	28.9	26.2	27.2	19.8	20.4
471570038	Tennessee	Shelby	32.5	33.5	28.2	28.8	26.2	26.7	19.2	19.7
471570047	Tennessee	Shelby	33.5	33.8	28.8	29.4	26.8	27.2	19.4	20.1

			24-Hour $PM_{2.5}$ Design Values ($\mu g/m^3$)							
Site ID	**State**	**County**	**2003-2007 Average Ambient Values**	**2003-2007 Maximum Ambient Values**	**2012 Base Case Average Values**	**2012 Base Case Maximum Values**	**2014 Base Case Average Values**	**2014 Base Case Maximum Values**	**2014 Remedy Average Values**	**2014 Remedy Maximum Values**
471571004	Tennessee	Shelby	29.8	30.4	26.9	27.1	25.3	25.5	18.0	19.1
471631007	Tennessee	Sullivan	31.1	32.0	25.9	26.7	24.8	25.5	20.4	20.5
471650007	Tennessee	Sumner	33.6	34.5	31.0	31.9	29.3	30.3	18.4	18.9
480370004	Texas	Bowie	29.4	30.0	26.2	26.9	25.3	26.0	21.1	21.9
481130050	Texas	Dallas	27.4	29.9	23.3	25.9	22.1	24.7	19.6	21.5
481130069	Texas	Dallas	25.7	27.7	22.2	23.8	21.2	22.7	18.5	19.8
481130087	Texas	Dallas	24.2	27.0	20.4	22.7	19.5	21.8	16.8	18.8
481350003	Texas	Ector	17.8	18.2	16.5	16.9	16.1	16.5	14.7	15.2
481410037	Texas	El Paso	22.9	22.9	21.6	21.6	21.5	21.5	21.0	21.0
482011035	Texas	Harris	30.8	31.4	27.5	27.9	26.4	26.8	23.9	24.1
482030002	Texas	Harrison	25.9	26.2	23.6	23.9	22.6	23.0	19.5	20.0
482150043	Texas	Hidalgo	26.4	27.9	24.8	26.2	24.1	25.6	22.0	23.4
483550032	Texas	Nueces	27.5	30.2	24.1	26.8	23.1	25.7	20.1	22.5
483550034	Texas	Nueces	20.7	22.2	17.7	18.7	16.7	17.7	13.8	14.5
483611001	Texas	Orange	27.7	28.7	25.1	25.8	24.1	24.7	20.4	21.0
484391002	Texas	Tarrant	25.3	26.8	21.6	23.3	20.8	22.5	18.3	20.0
484391006	Texas	Tarrant	25.7	27.9	22.3	24.3	21.6	23.5	18.9	20.3
500010002	Vermont	Addison	28.2	28.2	23.8	23.8	22.8	22.8	19.2	19.2
500010003	Vermont	Addison	31.7	31.7	26.9	26.9	25.8	25.8	21.1	21.1
500030004	Vermont	Bennington	26.4	28.5	22.3	24.4	21.7	23.9	18.4	20.2
500070012	Vermont	Chittenden	29.8	30.3	25.3	25.8	24.4	25.0	20.6	22.7
500070014	Vermont	Chittenden	30.1	30.1	26.4	26.4	25.8	25.8	23.3	23.3
500210002	Vermont	Rutland	30.6	31.3	28.0	28.1	27.5	27.6	26.3	27.0
510130020	Virginia	Arlington	34.1	36.3	28.6	30.6	27.2	29.1	20.4	21.7
510360002	Virginia	Charles City	31.7	32.1	25.6	26.0	24.7	25.0	18.9	19.4
510410003	Virginia	Chesterfield	31.2	32.6	23.7	24.6	22.7	23.6	18.0	18.5

			24-Hour $PM_{2.5}$ Design Values ($\mu g/m^3$)							
Site ID	**State**	**County**	**2003-2007 Average Ambient Values**	**2003-2007 Maximum Ambient Values**	**2012 Base Case Average Values**	**2012 Base Case Maximum Values**	**2014 Base Case Average Values**	**2014 Base Case Maximum Values**	**2014 Remedy Average Values**	**2014 Remedy Maximum Values**
510590030	Virginia	Fairfax	34.4	35.0	28.7	29.1	27.6	27.9	21.1	21.3
510591005	Virginia	Fairfax	33.7	35.2	28.2	29.9	26.9	28.5	20.2	21.5
510595001	Virginia	Fairfax	33.3	33.7	28.7	29.0	27.4	27.7	21.2	21.9
510870014	Virginia	Henrico	31.9	32.9	25.5	26.5	24.6	25.5	19.0	19.8
510870015	Virginia	Henrico	29.1	29.6	23.5	23.8	22.4	22.7	16.4	16.9
511071005	Virginia	Loudoun	34.4	35.7	29.6	30.8	28.5	29.7	21.7	22.4
511390004	Virginia	Page	30.0	30.9	26.2	27.2	25.1	26.2	19.6	21.7
515200006	Virginia	Bristol City	30.2	30.5	24.7	24.9	23.3	23.4	18.2	18.3
516500004	Virginia	Hampton City	29.0	29.2	23.8	24.6	22.8	23.6	18.3	19.2
516800015	Virginia	Lynchburg City	30.7	31.1	25.9	26.2	24.6	24.9	18.1	18.3
517100024	Virginia	Norfolk City	29.6	29.9	24.0	24.3	22.9	23.3	19.2	19.7
517700014	Virginia	Roanoke City	32.7	33.2	27.2	27.5	25.8	26.0	20.0	20.3
517750010	Virginia	Salem City	34.0	34.0	28.7	28.7	27.3	27.3	22.0	22.0
540030003	West Virginia	Berkeley	34.5	35.8	30.6	31.1	29.8	30.3	25.9	27.2
540090005	West Virginia	Brooke	39.4	41.5	31.9	33.4	30.4	31.6	24.5	25.5
540090011	West Virginia	Brooke	43.9	44.9	37.5	38.3	36.1	37.0	28.3	29.1
540110006	West Virginia	Cabell	35.1	36.6	30.9	32.2	29.3	30.7	21.0	22.2
540291004	West Virginia	Hancock	40.6	41.2	32.5	32.7	30.7	31.1	22.5	23.3
540330003	West Virginia	Harrison	33.5	34.6	31.3	32.2	30.1	31.0	18.5	18.8
540390010	West Virginia	Kanawha	34.7	35.5	29.8	30.4	28.4	29.0	19.9	20.9
540390011	West Virginia	Kanawha	33.1	33.1	28.4	28.4	27.1	27.1	19.8	19.8
540391005	West Virginia	Kanawha	36.9	37.7	32.0	32.6	30.5	31.0	22.4	23.2
540490006	West Virginia	Marion	33.6	33.7	30.9	31.0	29.7	29.7	18.4	18.5
540511002	West Virginia	Marshall	33.9	34.8	28.1	28.3	27.0	27.2	19.3	19.6
540610003	West Virginia	Monongalia	35.6	36.2	30.3	31.0	28.3	28.9	17.2	17.9

			24-Hour $PM_{2.5}$ Design Values ($\mu g/m^3$)							
Site ID	**State**	**County**	**2003-2007 Average Ambient Values**	**2003-2007 Maximum Ambient Values**	**2012 Base Case Average Values**	**2012 Base Case Maximum Values**	**2014 Base Case Average Values**	**2014 Base Case Maximum Values**	**2014 Remedy Average Values**	**2014 Remedy Maximum Values**
540690010	West Virginia	Ohio	32.0	32.0	26.3	26.3	25.1	25.1	18.1	18.1
540810002	West Virginia	Raleigh	30.6	31.3	25.7	26.3	24.5	25.0	17.2	17.4
540890001	West Virginia	Summers	31.2	31.2	26.4	26.4	25.1	25.1	17.4	17.4
541071002	West Virginia	Wood	35.4	36.7	30.1	31.2	27.5	28.5	20.2	21.2
550030010	Wisconsin	Ashland	18.6	20.5	16.8	18.5	16.2	17.9	13.8	14.6
550090005	Wisconsin	Brown	36.5	37.0	33.7	34.1	32.8	33.3	30.8	31.7
550090009	Wisconsin	Brown	35.8	35.8	33.1	33.1	32.6	32.6	31.9	31.9
550250047	Wisconsin	Dane	35.5	36.9	32.5	33.8	31.3	32.5	29.7	30.3
550270007	Wisconsin	Dodge	31.8	33.1	29.2	30.4	28.2	29.3	26.7	27.5
550410007	Wisconsin	Forest	25.2	25.2	22.8	22.8	22.2	22.2	19.8	19.8
550430009	Wisconsin	Grant	34.3	35.0	31.2	31.7	30.4	30.8	28.8	29.3
550590019	Wisconsin	Kenosha	32.7	34.0	29.3	30.3	27.8	28.9	26.3	27.2
550710007	Wisconsin	Manitowoc	29.7	31.6	27.5	29.3	26.7	28.7	24.5	26.4
550790010	Wisconsin	Milwaukee	38.6	40.0	35.4	36.7	34.0	35.4	30.7	33.0
550790026	Wisconsin	Milwaukee	37.3	41.3	33.6	37.2	32.3	35.9	29.9	32.9
550790043	Wisconsin	Milwaukee	39.9	40.8	36.2	37.1	34.5	35.4	31.6	33.8
550790059	Wisconsin	Milwaukee	35.5	37.0	32.3	33.6	30.4	31.7	28.2	29.8
550790099	Wisconsin	Milwaukee	37.7	38.7	34.0	35.0	32.5	33.8	30.6	32.0
550870009	Wisconsin	Outagamie	32.8	34.4	30.2	31.7	29.7	31.2	29.2	31.0
550890009	Wisconsin	Ozaukee	32.5	34.0	30.0	31.5	29.0	30.5	27.1	28.6
551091002	Wisconsin	St Croix	26.6	26.6	24.2	24.2	23.4	23.4	22.2	22.2
551110007	Wisconsin	Sauk	28.6	28.8	26.2	26.4	25.5	25.8	24.9	25.5
551198001	Wisconsin	Taylor	25.3	26.0	23.0	23.7	22.4	22.9	21.4	21.7
551250001	Wisconsin	Vilas	22.6	23.8	20.4	21.4	19.8	20.7	18.3	19.0
551330027	Wisconsin	Waukesha	35.4	36.2	32.4	33.1	31.0	31.7	29.7	29.9
560050877	Wyoming	Campbell	18.6	18.6	17.8	17.8	17.7	17.7	17.7	17.7

			24-Hour $PM_{2.5}$ Design Values ($\mu g/m^3$)							
Site ID	**State**	**County**	**2003-2007 Average Ambient Values**	**2003-2007 Maximum Ambient Values**	**2012 Base Case Average Values**	**2012 Base Case Maximum Values**	**2014 Base Case Average Values**	**2014 Base Case Maximum Values**	**2014 Remedy Average Values**	**2014 Remedy Maximum Values**
560050892	Wyoming	Campbell	12.5	13.3	12.2	13.0	12.2	13.0	12.2	13.0
560050899	Wyoming	Campbell	12.6	13.5	12.4	13.2	12.3	13.2	12.4	13.2
560090819	Wyoming	Converse	9.9	10.5	9.6	10.1	9.6	10.1	9.6	10.1
560131003	Wyoming	Fremont	29.8	31.9	28.0	30.0	27.7	29.6	27.7	29.6
560210001	Wyoming	Laramie	11.9	12.7	11.1	11.8	11.0	11.7	11.0	11.7
560330002	Wyoming	Sheridan	30.8	32.5	29.6	31.1	29.4	30.8	29.4	30.8

8-Hour Ozone (ppb)				
Monitor ID	**State**	**County**	**Difference: 2014 Remedy - 2012 Base Case**	**Difference: 2014 Remedy - 2014 Base Case**
10030010	Alabama	Baldwin	-2.2	-0.2
10270001	Alabama	Clay	-2.9	-0.3
10331002	Alabama	Colbert	-2.5	-0.8
10510001	Alabama	Elmore	-2.3	-0.2
10550011	Alabama	Etowah	-2.3	-0.3
10730023	Alabama	Jefferson	-2.6	-0.3
10731003	Alabama	Jefferson	-2.5	-0.2
10731005	Alabama	Jefferson	-2.9	-0.2
10731009	Alabama	Jefferson	-2.5	-0.4
10731010	Alabama	Jefferson	-2.5	-0.2
10732006	Alabama	Jefferson	-2.8	-0.2
10735002	Alabama	Jefferson	-2.1	-0.3
10735003	Alabama	Jefferson	-2.3	-0.3
10736002	Alabama	Jefferson	-2.4	-0.3
10790002	Alabama	Lawrence	-2.2	-0.1
10890014	Alabama	Madison	-2.6	-0.1
10970003	Alabama	Mobile	-2.1	-0.4
10972005	Alabama	Mobile	-2.1	-0.2
11011002	Alabama	Montgomery	-2.4	-0.3
11030011	Alabama	Morgan	-2.1	-0.2
11130002	Alabama	Russell	-2.5	-0.1
11170004	Alabama	Shelby	-3.0	-0.2
11190002	Alabama	Sumter	0.4	-0.1
11210003	Alabama	Talladega	-2.4	-0.5
11250010	Alabama	Tuscaloosa	-2.6	-0.3
50350005	Arkansas	Crittenden	-2.7	0.0
51190007	Arkansas	Pulaski	-2.4	0.0
51191002	Arkansas	Pulaski	-2.4	-0.1
51191005	Arkansas	Pulaski	-2.4	-0.1
80013001	Colorado	Adams	-1.0	0.0
80050002	Colorado	Arapahoe	-1.3	0.0
80130011	Colorado	Boulder	-1.4	0.0
80310014	Colorado	Denver	-1.0	0.1
80350004	Colorado	Douglas	-1.3	0.0
80590002	Colorado	Jefferson	-1.0	0.0

8-Hour Ozone (ppb)				
Monitor ID	State	County	Difference: 2014 Remedy - 2012 Base Case	Difference: 2014 Remedy - 2014 Base Case
80590005	Colorado	Jefferson	-1.0	0.0
80590006	Colorado	Jefferson	-1.3	0.0
80590011	Colorado	Jefferson	-1.1	0.0
80690007	Colorado	Larimer	-1.8	0.0
80691004	Colorado	Larimer	-1.5	0.0
81230009	Colorado	Weld	-1.4	0.0
90010017	Connecticut	Fairfield	-1.7	-0.1
90011123	Connecticut	Fairfield	-2.1	-0.2
90013007	Connecticut	Fairfield	-1.6	-0.1
90019003	Connecticut	Fairfield	-1.6	-0.1
90031003	Connecticut	Hartford	-2.2	-0.2
90050005	Connecticut	Litchfield	-2.2	-0.1
90070007	Connecticut	Middlesex	-2.1	-0.1
90090027	Connecticut	New Haven	-1.4	-0.1
90093002	Connecticut	New Haven	-1.8	-0.1
90110008	Connecticut	New London	-1.9	-0.1
90131001	Connecticut	Tolland	-2.2	-0.1
100010002	Delaware	Kent	-2.3	-0.1
100031007	Delaware	New Castle	-2.3	-0.1
100031010	Delaware	New Castle	-2.1	-0.1
100031013	Delaware	New Castle	-2.4	-0.2
100051002	Delaware	Sussex	-2.3	-0.1
100051003	Delaware	Sussex	-2.0	-0.1
110010025	District of Columbia		-1.9	-0.1
110010041	District of Columbia		-2.0	-0.2
110010043	District of Columbia		-2.1	-0.2
120010025	Florida	Alachua	-3.0	-1.2
120030002	Florida	Baker	-2.6	-0.6
120050006	Florida	Bay	-2.9	-1.2
120090007	Florida	Brevard	-1.6	-0.2
120094001	Florida	Brevard	-1.6	-0.2
120112003	Florida	Broward	-1.2	-0.2
120118002	Florida	Broward	-1.2	-0.2
120210004	Florida	Collier	-2.1	-0.1
120310077	Florida	Duval	-4.8	-3.6

8-Hour Ozone (ppb)				
Monitor ID	State	County	Difference: 2014 Remedy - 2012 Base Case	Difference: 2014 Remedy - 2014 Base Case
120310100	Florida	Duval	-4.4	-2.9
120330004	Florida	Escambia	-2.8	-1.4
120330018	Florida	Escambia	-3.5	-1.6
120330024	Florida	Escambia	-3.4	-1.6
120570081	Florida	Hillsborough	-1.6	-0.1
120570110	Florida	Hillsborough	-1.7	-0.1
120571035	Florida	Hillsborough	-1.6	-0.2
120571065	Florida	Hillsborough	-1.7	-0.2
120573002	Florida	Hillsborough	-1.8	-0.2
120574004	Florida	Hillsborough	-2.0	-0.3
120690002	Florida	Lake	-2.1	-0.2
120712002	Florida	Lee	-2.0	-0.1
120713002	Florida	Lee	-2.2	-0.2
120730012	Florida	Leon	-2.6	-0.1
120730013	Florida	Leon	-2.8	-0.1
120813002	Florida	Manatee	-1.8	-0.2
120814012	Florida	Manatee	-1.9	-0.1
120814013	Florida	Manatee	-1.8	-0.1
120830003	Florida	Marion	-2.9	-1.0
120830004	Florida	Marion	-2.9	-1.0
120950008	Florida	Orange	-1.6	-0.1
120952002	Florida	Orange	-1.9	-0.1
120972002	Florida	Osceola	-2.0	-0.3
120990020	Florida	Palm Beach	-1.3	-0.2
121010005	Florida	Pasco	-2.1	-1.1
121012001	Florida	Pasco	-2.6	-1.3
121030004	Florida	Pinellas	-1.9	-0.4
121030018	Florida	Pinellas	-1.7	-0.2
121035002	Florida	Pinellas	-1.9	-0.6
121056005	Florida	Polk	-2.7	-1.2
121056006	Florida	Polk	-2.8	-1.4
121111002	Florida	St Lucie	-1.7	-0.3
121130015	Florida	Santa Rosa	-3.0	-1.2
121151005	Florida	Sarasota	-2.0	-0.1
121151006	Florida	Sarasota	-1.9	0.0

8-Hour Ozone (ppb)				
Monitor ID	State	County	Difference: 2014 Remedy - 2012 Base Case	Difference: 2014 Remedy - 2014 Base Case
121152002	Florida	Sarasota	-2.0	-0.2
121171002	Florida	Seminole	-2.0	-0.1
121272001	Florida	Volusia	-2.3	-0.3
121275002	Florida	Volusia	-2.2	-0.2
121290001	Florida	Wakulla	-2.2	-0.2
130210012	Georgia	Bibb	-4.8	-0.1
130210013	Georgia	Bibb	-4.7	-0.2
130510021	Georgia	Chatham	-2.7	-0.8
130550001	Georgia	Chattooga	-2.6	-0.2
130590002	Georgia	Clarke	-3.3	-0.2
130670003	Georgia	Cobb	-2.9	-0.1
130730001	Georgia	Columbia	-2.8	-0.1
130770002	Georgia	Coweta	-3.7	-0.2
130850001	Georgia	Dawson	-2.8	0.0
130890002	Georgia	De Kalb	-2.6	-0.2
130893001	Georgia	De Kalb	-1.9	-0.1
130970004	Georgia	Douglas	-3.1	-0.1
131130001	Georgia	Fayette	-2.8	-0.1
131210055	Georgia	Fulton	-2.6	-0.1
131270006	Georgia	Glynn	-3.0	-1.6
131350002	Georgia	Gwinnett	-3.4	-0.2
131510002	Georgia	Henry	-3.2	-0.1
132130003	Georgia	Murray	-2.8	-0.2
132150008	Georgia	Muscogee	-2.9	-0.1
132151003	Georgia	Muscogee	-2.7	-0.1
132230003	Georgia	Paulding	-2.8	-0.1
132450091	Georgia	Richmond	-2.9	-0.1
132470001	Georgia	Rockdale	-3.7	-0.1
132611001	Georgia	Sumter	-2.8	-0.1
170010006	Illinois	Adams	-1.5	-0.4
170190004	Illinois	Champaign	-1.4	-0.2
170230001	Illinois	Clark	-1.5	-0.1
170310001	Illinois	Cook	-1.2	-0.1
170310032	Illinois	Cook	-1.3	-0.2
170310064	Illinois	Cook	-1.2	-0.2

8-Hour Ozone (ppb)				
Monitor ID	**State**	**County**	**Difference: 2014 Remedy - 2012 Base Case**	**Difference: 2014 Remedy - 2014 Base Case**
170310072	Illinois	Cook	-0.9	-0.1
170310076	Illinois	Cook	-1.1	-0.1
170311003	Illinois	Cook	-1.1	-0.2
170311601	Illinois	Cook	-1.1	0.0
170314002	Illinois	Cook	-0.6	-0.1
170314007	Illinois	Cook	-1.2	-0.1
170314201	Illinois	Cook	-1.2	-0.1
170317002	Illinois	Cook	-1.1	-0.1
170436001	Illinois	Du Page	-0.8	0.0
170491001	Illinois	Effingham	-1.8	-0.1
170650002	Illinois	Hamilton	-1.6	0.0
170831001	Illinois	Jersey	-2.4	-0.2
170890005	Illinois	Kane	-1.6	-0.1
170971002	Illinois	Lake	-1.2	-0.2
170971007	Illinois	Lake	-1.2	-0.2
171110001	Illinois	McHenry	-1.7	-0.1
171132003	Illinois	McLean	-1.5	-0.1
171150013	Illinois	Macon	-1.3	-0.1
171170002	Illinois	Macoupin	-2.2	-0.2
171190008	Illinois	Madison	-2.4	-0.3
171191009	Illinois	Madison	-2.2	-0.3
171193007	Illinois	Madison	-2.4	-0.3
171430024	Illinois	Peoria	-1.4	-0.3
171431001	Illinois	Peoria	-1.6	-0.4
171570001	Illinois	Randolph	-1.2	0.0
171613002	Illinois	Rock Island	-1.6	-0.3
171630010	Illinois	St Clair	-2.1	-0.3
171670010	Illinois	Sangamon	-1.2	-0.1
171971011	Illinois	Will	-1.4	-0.1
172010009	Illinois	Winnebago	-1.7	-0.2
172012001	Illinois	Winnebago	-1.7	-0.2
180030002	Indiana	Allen	-1.8	-0.2
180030004	Indiana	Allen	-1.6	-0.1
180110001	Indiana	Boone	-2.1	-0.4
180150002	Indiana	Carroll	-1.7	-0.2

8-Hour Ozone (ppb)				
Monitor ID	**State**	**County**	**Difference: 2014 Remedy - 2012 Base Case**	**Difference: 2014 Remedy - 2014 Base Case**
180190008	Indiana	Clark	-2.5	-0.4
180350010	Indiana	Delaware	-2.0	-0.3
180390007	Indiana	Elkhart	-1.8	-0.2
180431004	Indiana	Floyd	-2.1	-0.4
180550001	Indiana	Greene	-2.0	-0.3
180570005	Indiana	Hamilton	-2.2	-0.5
180590003	Indiana	Hancock	-2.1	-0.5
180630004	Indiana	Hendricks	-1.9	-0.5
180690002	Indiana	Huntington	-1.7	-0.1
180710001	Indiana	Jackson	-1.9	-0.3
180810002	Indiana	Johnson	-1.8	-0.4
180890022	Indiana	Lake	-1.2	-0.3
180890030	Indiana	Lake	-1.1	-0.2
180892008	Indiana	Lake	-1.0	-0.1
180910005	Indiana	La Porte	-1.3	-0.2
180910010	Indiana	La Porte	-1.6	-0.3
180950010	Indiana	Madison	-2.0	-0.3
180970042	Indiana	Marion	-1.8	-0.5
180970050	Indiana	Marion	-1.9	-0.4
180970057	Indiana	Marion	-1.7	-0.4
180970073	Indiana	Marion	-1.8	-0.4
181090005	Indiana	Morgan	-2.1	-0.6
181230009	Indiana	Perry	-2.5	-0.5
181270024	Indiana	Porter	-1.3	-0.3
181270026	Indiana	Porter	-1.5	-0.2
181290003	Indiana	Posey	-2.0	-0.3
181410010	Indiana	St Joseph	-1.5	-0.2
181410015	Indiana	St Joseph	-1.6	-0.2
181411007	Indiana	St Joseph	-1.7	-0.2
181450001	Indiana	Shelby	-1.8	-0.5
181630013	Indiana	Vanderburgh	-1.8	-0.2
181630021	Indiana	Vanderburgh	-2.1	-0.2
181670018	Indiana	Vigo	-1.4	-0.5
181670024	Indiana	Vigo	-1.6	-0.7
181730008	Indiana	Warrick	-2.1	-0.4

8-Hour Ozone (ppb)				
Monitor ID	State	County	Difference: 2014 Remedy - 2012 Base Case	Difference: 2014 Remedy - 2014 Base Case
181730009	Indiana	Warrick	-2.0	-0.3
181730011	Indiana	Warrick	-2.1	-0.2
190450021	Iowa	Clinton	-1.9	-0.4
190851101	Iowa	Harrison	-3.1	-1.4
191130028	Iowa	Linn	-1.7	-0.3
191530058	Iowa	Polk	-1.6	-0.3
191630014	Iowa	Scott	-1.9	-0.3
191632011	Iowa	Scott	-1.9	-0.3
191690011	Iowa	Story	-1.4	-0.2
200450004	Kansas	Douglas	-2.4	-0.9
200910010	Kansas	Johnson	-2.3	-0.6
201030003	Kansas	Leavenworth	-2.3	-0.7
201070002	Kansas	Linn	-2.6	-1.1
201730001	Kansas	Sedgwick	-2.0	-0.3
202090021	Kansas	Wyandotte	-2.0	-0.5
210130002	Kentucky	Bell	-2.1	-0.1
210150003	Kentucky	Boone	-2.3	-0.3
210190017	Kentucky	Boyd	-1.7	-0.2
210290006	Kentucky	Bullitt	-2.3	-0.6
210370003	Kentucky	Campbell	-2.7	-1.0
210430500	Kentucky	Carter	-1.8	-0.2
210470006	Kentucky	Christian	-2.5	-0.4
210590005	Kentucky	Daviess	-2.1	-0.2
210610501	Kentucky	Edmonson	-2.1	-0.2
210670001	Kentucky	Fayette	-2.0	-0.5
210670012	Kentucky	Fayette	-2.2	-0.5
210890007	Kentucky	Greenup	-1.8	-0.3
210910012	Kentucky	Hancock	-2.2	-0.2
210930006	Kentucky	Hardin	-2.3	-0.5
211010014	Kentucky	Henderson	-2.1	-0.4
211110027	Kentucky	Jefferson	-2.2	-0.5
211110051	Kentucky	Jefferson	-2.2	-0.5
211111021	Kentucky	Jefferson	-2.1	-0.3
211130001	Kentucky	Jessamine	-2.6	-0.5
211170007	Kentucky	Kenton	-2.4	-0.7

8-Hour Ozone (ppb)				
Monitor ID	**State**	**County**	**Difference: 2014 Remedy - 2012 Base Case**	**Difference: 2014 Remedy - 2014 Base Case**
211390003	Kentucky	Livingston	-2.6	-0.8
211451024	Kentucky	McCracken	-2.1	-0.7
211490001	Kentucky	McLean	-2.0	-0.3
211850004	Kentucky	Oldham	-2.7	-0.5
211990003	Kentucky	Pulaski	-3.6	-0.4
212130004	Kentucky	Simpson	-2.3	-0.2
212210013	Kentucky	Trigg	-2.2	-0.2
212270008	Kentucky	Warren	-2.2	-0.2
220050004	Louisiana	Ascension	-1.5	-0.1
220110002	Louisiana	Beauregard	-1.0	0.0
220150008	Louisiana	Bossier	-2.5	0.0
220170001	Louisiana	Caddo	-2.5	-0.1
220190002	Louisiana	Calcasieu	-1.3	-0.1
220190008	Louisiana	Calcasieu	-1.1	0.0
220190009	Louisiana	Calcasieu	-1.5	-0.1
220330003	Louisiana	East Baton Rouge	-1.6	-0.1
220330009	Louisiana	East Baton Rouge	-1.5	-0.1
220330013	Louisiana	East Baton Rouge	-1.6	0.0
220331001	Louisiana	East Baton Rouge	-1.5	0.0
220470007	Louisiana	Iberville	-1.7	-0.1
220470009	Louisiana	Iberville	-1.6	-0.1
220470012	Louisiana	Iberville	-1.5	-0.1
220511001	Louisiana	Jefferson	-1.7	0.0
220550005	Louisiana	Lafayette	-1.9	-0.2
220570004	Louisiana	Lafourche	-1.5	-0.2
220630002	Louisiana	Livingston	-1.5	0.0
220730004	Louisiana	Ouachita	-2.2	0.0
220770001	Louisiana	Pointe Coupee	-1.4	0.0
220870002	Louisiana	St Bernard	-1.6	-0.1
220890003	Louisiana	St Charles	-1.6	0.0
220930002	Louisiana	St James	-1.4	0.0
220950002	Louisiana	St John The Baptis	-1.4	-0.1
221010003	Louisiana	St Mary	-1.5	-0.2
221210001	Louisiana	West Baton Rouge	-1.5	0.0

8-Hour Ozone (ppb)				
Monitor ID	State	County	Difference: 2014 Remedy - 2012 Base Case	Difference: 2014 Remedy - 2014 Base Case
230050027	Maine	Cumberland	-1.4	0.0
230052003	Maine	Cumberland	-1.7	-0.1
230090102	Maine	Hancock	-1.7	0.0
230090103	Maine	Hancock	-1.6	0.0
230090301	Maine	Hancock	-1.5	0.0
230112005	Maine	Kennebec	-1.6	-0.1
230130004	Maine	Knox	-1.7	-0.1
230194008	Maine	Penobscot	-1.3	0.0
230230004	Maine	Sagadahoc	-1.6	0.0
230310038	Maine	York	-1.7	0.0
230312002	Maine	York	-1.7	0.0
230313002	Maine	York	-1.7	0.0
240030014	Maryland	Anne Arundel	-2.7	-0.3
240051007	Maryland	Baltimore	-1.8	-0.1
240053001	Maryland	Baltimore	-1.6	-0.2
240090011	Maryland	Calvert	-2.2	-0.3
240130001	Maryland	Carroll	-2.2	-0.2
240150003	Maryland	Cecil	-2.5	-0.1
240170010	Maryland	Charles	-2.5	-0.4
240210037	Maryland	Frederick	-2.1	-0.1
240230002	Maryland	Garrett	-1.8	-0.5
240251001	Maryland	Harford	-2.1	-0.2
240259001	Maryland	Harford	-2.4	-0.2
240290002	Maryland	Kent	-2.3	-0.2
240313001	Maryland	Montgomery	-2.1	-0.2
240330030	Maryland	Prince Georges	-2.2	-0.2
240338003	Maryland	Prince Georges	-2.6	-0.3
240430009	Maryland	Washington	-2.0	-0.3
250010002	Massachusetts	Barnstable	-1.8	-0.1
250034002	Massachusetts	Berkshire	-2.0	-0.1
250051002	Massachusetts	Bristol	-1.6	0.0
250070001	Massachusetts	Dukes	-1.6	0.0
250092006	Massachusetts	Essex	-1.7	0.0
250094004	Massachusetts	Essex	-1.7	-0.1
250095005	Massachusetts	Essex	-2.0	0.0

8-Hour Ozone (ppb)				
Monitor ID	State	County	Difference: 2014 Remedy - 2012 Base Case	Difference: 2014 Remedy - 2014 Base Case
250130008	Massachusetts	Hampden	-2.3	0.0
250150103	Massachusetts	Hampshire	-2.0	-0.1
250154002	Massachusetts	Hampshire	-2.1	-0.1
250170009	Massachusetts	Middlesex	-2.0	-0.1
250171102	Massachusetts	Middlesex	-1.9	-0.2
250213003	Massachusetts	Norfolk	-1.9	-0.1
250250041	Massachusetts	Suffolk	-1.5	-0.1
250250042	Massachusetts	Suffolk	-1.3	-0.1
250270015	Massachusetts	Worcester	-1.9	-0.1
260050003	Michigan	Allegan	-2.0	-0.5
260190003	Michigan	Benzie	-1.7	-0.2
260210014	Michigan	Berrien	-1.8	-0.3
260270003	Michigan	Cass	-2.1	-0.3
260370001	Michigan	Clinton	-2.1	-0.3
260490021	Michigan	Genesee	-2.1	-0.3
260492001	Michigan	Genesee	-2.0	-0.3
260630007	Michigan	Huron	-1.5	-0.2
260650012	Michigan	Ingham	-2.1	-0.3
260770008	Michigan	Kalamazoo	-1.9	-0.3
260810020	Michigan	Kent	-2.2	-0.5
260810022	Michigan	Kent	-2.3	-0.4
260890001	Michigan	Leelanau	-1.7	-0.3
260910007	Michigan	Lenawee	-2.0	-0.6
260990009	Michigan	Macomb	-1.6	-0.3
260991003	Michigan	Macomb	-1.5	-0.3
261050007	Michigan	Mason	-1.9	-0.4
261130001	Michigan	Missaukee	-1.7	-0.4
261210039	Michigan	Muskegon	-2.0	-0.5
261250001	Michigan	Oakland	-1.3	-0.2
261390005	Michigan	Ottawa	-2.3	-0.6
261470005	Michigan	St Clair	-1.9	-0.3
261530001	Michigan	Schoolcraft	-1.8	-0.2
261610008	Michigan	Washtenaw	-1.7	-0.3
261630001	Michigan	Wayne	-1.5	-0.3
261630016	Michigan	Wayne	-1.6	-0.3

8-Hour Ozone (ppb)				
Monitor ID	State	County	Difference: 2014 Remedy - 2012 Base Case	Difference: 2014 Remedy - 2014 Base Case
261630019	Michigan	Wayne	-1.6	-0.3
270031002	Minnesota	Anoka	-1.1	-0.5
280330002	Mississippi	De Soto	-2.6	-0.1
280450001	Mississippi	Hancock	-1.8	-0.2
280470008	Mississippi	Harrison	-2.2	-0.2
280470009	Mississippi	Harrison	-1.7	-0.2
280490010	Mississippi	Hinds	-2.7	0.0
280590006	Mississippi	Jackson	-1.8	-0.2
280590007	Mississippi	Jackson	-1.4	-0.2
280750003	Mississippi	Lauderdale	-1.0	-0.1
280810005	Mississippi	Lee	-2.6	-0.2
290370003	Missouri	Cass	-2.4	-0.8
290470003	Missouri	Clay	-2.5	-0.7
290470005	Missouri	Clay	-2.5	-0.6
290470006	Missouri	Clay	-2.5	-0.6
290490001	Missouri	Clinton	-2.5	-0.6
290770036	Missouri	Greene	-1.9	-0.4
290990012	Missouri	Jefferson	-1.5	-0.4
291130003	Missouri	Lincoln	-2.4	-0.3
291370001	Missouri	Monroe	-1.8	-0.4
291570001	Missouri	Perry	-1.6	-0.2
291650023	Missouri	Platte	-2.3	-0.5
291831002	Missouri	St Charles	-2.3	-0.3
291831004	Missouri	St Charles	-2.3	-0.2
291860005	Missouri	Ste Genevieve	-0.7	-0.2
291890004	Missouri	St Louis	-1.6	-0.3
291890005	Missouri	St Louis	-2.0	-0.3
291890006	Missouri	St Louis	-1.9	-0.3
291890014	Missouri	St Louis	-2.1	-0.3
295100085	Missouri	St Louis City	-1.9	-0.2
295100086	Missouri	St Louis City	-1.9	-0.2
310550028	Nebraska	Douglas	-2.0	-0.8
310550032	Nebraska	Douglas	-1.9	-0.8
310550035	Nebraska	Douglas	-2.1	-0.8
330012004	New Hampshire	Belknap	-1.9	-0.1

8-Hour Ozone (ppb)				
Monitor ID	State	County	Difference: 2014 Remedy - 2012 Base Case	Difference: 2014 Remedy - 2014 Base Case
330050007	New Hampshire	Cheshire	-1.7	-0.1
330074001	New Hampshire	Coos	-1.7	0.0
330074002	New Hampshire	Coos	-1.5	0.0
330090010	New Hampshire	Grafton	-1.7	-0.1
330110020	New Hampshire	Hillsborough	-1.9	-0.1
330111011	New Hampshire	Hillsborough	-2.1	-0.1
330115001	New Hampshire	Hillsborough	-1.9	-0.1
330131007	New Hampshire	Merrimack	-1.9	-0.1
330150014	New Hampshire	Rockingham	-1.7	-0.1
330150016	New Hampshire	Rockingham	-1.7	0.0
330190003	New Hampshire	Sullivan	-1.8	-0.1
340010005	New Jersey	Atlantic	-1.9	-0.1
340030005	New Jersey	Bergen	-1.9	-0.3
340070003	New Jersey	Camden	-2.1	-0.2
340071001	New Jersey	Camden	-2.3	-0.2
340110007	New Jersey	Cumberland	-2.4	-0.2
340150002	New Jersey	Gloucester	-2.3	-0.2
340170006	New Jersey	Hudson	-1.0	-0.1
340190001	New Jersey	Hunterdon	-2.5	-0.2
340210005	New Jersey	Mercer	-2.2	-0.2
340230011	New Jersey	Middlesex	-2.4	-0.3
340250005	New Jersey	Monmouth	-1.7	-0.1
340273001	New Jersey	Morris	-2.2	-0.2
340290006	New Jersey	Ocean	-2.4	-0.2
340315001	New Jersey	Passaic	-2.0	-0.2
360010012	New York	Albany	-1.7	-0.1
360050110	New York	Bronx	-1.2	-0.2
360050133	New York	Bronx	-1.0	-0.1
360130006	New York	Chautauqua	-2.1	-0.6
360130011	New York	Chautauqua	-1.9	-0.5
360270007	New York	Dutchess	-1.8	-0.1
360290002	New York	Erie	-1.7	-0.4
360410005	New York	Hamilton	-1.3	-0.1
360430005	New York	Herkimer	-1.2	0.0
360450002	New York	Jefferson	-1.5	-0.1

8-Hour Ozone (ppb)				
Monitor ID	State	County	Difference: 2014 Remedy - 2012 Base Case	Difference: 2014 Remedy - 2014 Base Case
360551007	New York	Monroe	-1.6	-0.2
360631006	New York	Niagara	-1.2	-0.1
360650004	New York	Oneida	-1.5	-0.2
360671015	New York	Onondaga	-1.7	-0.2
360715001	New York	Orange	-1.7	0.0
360750003	New York	Oswego	-1.6	-0.2
360790005	New York	Putnam	-2.0	-0.2
360810098	New York	Queens	-1.1	-0.2
360810124	New York	Queens	-1.5	-0.2
360830004	New York	Rensselaer	-1.7	-0.1
360850067	New York	Richmond	-1.3	-0.2
360910004	New York	Saratoga	-1.9	-0.1
360930003	New York	Schenectady	-1.5	-0.1
361030002	New York	Suffolk	-1.4	-0.2
361030004	New York	Suffolk	-1.7	-0.1
361030009	New York	Suffolk	-1.6	-0.1
361111005	New York	Ulster	-2.0	-0.2
361173001	New York	Wayne	-1.4	-0.2
361192004	New York	Westchester	-1.6	-0.2
370030004	North Carolina	Alexander	-2.3	-0.3
370110002	North Carolina	Avery	-2.7	-0.2
370210030	North Carolina	Buncombe	-2.0	-0.1
370270003	North Carolina	Caldwell	-2.3	-0.2
370330001	North Carolina	Caswell	-2.4	-0.1
370370004	North Carolina	Chatham	-2.4	-0.5
370510008	North Carolina	Cumberland	-2.7	-0.4
370511003	North Carolina	Cumberland	-2.6	-0.3
370590002	North Carolina	Davie	-2.9	-0.8
370630013	North Carolina	Durham	-2.2	-0.1
370650099	North Carolina	Edgecombe	-2.4	-0.3
370670022	North Carolina	Forsyth	-2.3	-0.2
370670028	North Carolina	Forsyth	-1.9	-0.2
370670030	North Carolina	Forsyth	-2.4	-0.2
370671008	North Carolina	Forsyth	-2.3	-0.2
370690001	North Carolina	Franklin	-2.5	-0.2

8-Hour Ozone (ppb)				
Monitor ID	State	County	Difference: 2014 Remedy - 2012 Base Case	Difference: 2014 Remedy - 2014 Base Case
370750001	North Carolina	Graham	-2.6	-0.2
370770001	North Carolina	Granville	-2.3	-0.2
370810011	North Carolina	Guilford	-2.6	-0.1
370810013	North Carolina	Guilford	-2.7	-0.2
370870036	North Carolina	Haywood	-2.5	-0.2
370990005	North Carolina	Jackson	-2.7	-0.3
371010002	North Carolina	Johnston	-2.6	-0.3
371070004	North Carolina	Lenoir	-2.9	-0.2
371090004	North Carolina	Lincoln	-2.5	-0.4
371170001	North Carolina	Martin	-1.8	-0.1
371190041	North Carolina	Mecklenburg	-2.4	-0.7
371191005	North Carolina	Mecklenburg	-2.2	-0.7
371191009	North Carolina	Mecklenburg	-2.8	-0.6
371290002	North Carolina	New Hanover	-2.6	-0.2
371450003	North Carolina	Person	-0.7	-0.1
371470099	North Carolina	Pitt	-3.0	-0.3
371570099	North Carolina	Rockingham	-2.2	-0.1
371590021	North Carolina	Rowan	-3.0	-0.6
371590022	North Carolina	Rowan	-2.9	-0.5
371730002	North Carolina	Swain	-2.3	-0.2
371790003	North Carolina	Union	-2.8	-0.4
371830014	North Carolina	Wake	-2.5	-0.3
371830016	North Carolina	Wake	-2.7	-0.3
390030009	Ohio	Allen	-2.0	-0.2
390071001	Ohio	Ashtabula	-2.4	-0.7
390170004	Ohio	Butler	-2.5	-0.4
390171004	Ohio	Butler	-2.5	-0.4
390230001	Ohio	Clark	-2.5	-0.3
390230003	Ohio	Clark	-2.2	-0.3
390250022	Ohio	Clermont	-2.6	-0.9
390271002	Ohio	Clinton	-2.9	-0.5
390350034	Ohio	Cuyahoga	-1.8	-0.5
390350064	Ohio	Cuyahoga	-1.5	-0.5
390355002	Ohio	Cuyahoga	-2.0	-0.6
390410002	Ohio	Delaware	-2.2	-0.3

8-Hour Ozone (ppb)				
Monitor ID	State	County	Difference: 2014 Remedy - 2012 Base Case	Difference: 2014 Remedy - 2014 Base Case
390490028	Ohio	Franklin	-2.3	-0.4
390490029	Ohio	Franklin	-2.4	-0.3
390490037	Ohio	Franklin	-2.0	-0.3
390490081	Ohio	Franklin	-2.2	-0.4
390550004	Ohio	Geauga	-2.2	-0.6
390570006	Ohio	Greene	-2.4	-0.2
390610006	Ohio	Hamilton	-2.5	-0.6
390610010	Ohio	Hamilton	-2.6	-0.7
390610040	Ohio	Hamilton	-2.5	-0.9
390810017	Ohio	Jefferson	-2.2	-0.7
390830002	Ohio	Knox	-2.2	-0.3
390850003	Ohio	Lake	-2.2	-0.6
390850007	Ohio	Lake	-2.3	-0.7
390870006	Ohio	Lawrence	-1.6	-0.2
390870011	Ohio	Lawrence	-1.7	-0.3
390890005	Ohio	Licking	-2.3	-0.3
390930018	Ohio	Lorain	-1.9	-0.4
390950024	Ohio	Lucas	-2.0	-0.6
390950027	Ohio	Lucas	-2.0	-0.5
390950034	Ohio	Lucas	-2.1	-0.5
390950081	Ohio	Lucas	-2.1	-0.6
390970007	Ohio	Madison	-2.4	-0.3
390990013	Ohio	Mahoning	-2.3	-0.7
391030003	Ohio	Medina	-2.3	-0.6
391090005	Ohio	Miami	-2.5	-0.3
391130037	Ohio	Montgomery	-2.4	-0.4
391331001	Ohio	Portage	-2.4	-0.6
391351001	Ohio	Preble	-2.1	-0.3
391510016	Ohio	Stark	-2.0	-0.3
391510022	Ohio	Stark	-2.0	-0.4
391514005	Ohio	Stark	-2.1	-0.4
391530020	Ohio	Summit	-2.1	-0.4
391550009	Ohio	Trumbull	-2.5	-0.7
391550011	Ohio	Trumbull	-2.6	-0.8
391650007	Ohio	Warren	-2.8	-0.4

8-Hour Ozone (ppb)				
Monitor ID	State	County	Difference: 2014 Remedy - 2012 Base Case	Difference: 2014 Remedy - 2014 Base Case
391670004	Ohio	Washington	-6.0	-3.9
391730003	Ohio	Wood	-2.1	-0.4
400170101	Oklahoma	Canadian	-2.2	-0.3
400219002	Oklahoma	Cherokee	-4.5	-3.4
400270049	Oklahoma	Cleveland	-2.5	-0.6
400370144	Oklahoma	Creek	-2.4	-0.8
400719010	Oklahoma	Kay	-3.4	-1.5
400871073	Oklahoma	Mc Clain	-2.3	-0.4
400979014	Oklahoma	Mayes	-3.8	-2.8
401090033	Oklahoma	Oklahoma	-2.2	-0.4
401090096	Oklahoma	Oklahoma	-2.2	-0.5
401091037	Oklahoma	Oklahoma	-2.3	-0.2
401159004	Oklahoma	Ottawa	-3.2	-1.7
401430137	Oklahoma	Tulsa	-2.7	-0.9
401430174	Oklahoma	Tulsa	-2.5	-1.0
401430178	Oklahoma	Tulsa	-2.9	-1.3
401431127	Oklahoma	Tulsa	-2.3	-0.5
420010002	Pennsylvania	Adams	-2.0	-0.1
420030008	Pennsylvania	Allegheny	-1.9	-0.6
420030010	Pennsylvania	Allegheny	-2.1	-0.7
420030067	Pennsylvania	Allegheny	-2.0	-0.5
420031005	Pennsylvania	Allegheny	-2.3	-0.6
420050001	Pennsylvania	Armstrong	-2.3	-0.5
420070002	Pennsylvania	Beaver	-2.1	-0.5
420070005	Pennsylvania	Beaver	-2.1	-0.6
420070014	Pennsylvania	Beaver	-2.0	-0.5
420110009	Pennsylvania	Berks	-2.3	-0.2
420130801	Pennsylvania	Blair	-1.9	-0.5
420170012	Pennsylvania	Bucks	-2.2	-0.2
420210011	Pennsylvania	Cambria	-1.9	-0.6
420270100	Pennsylvania	Centre	-1.9	-0.3
420290100	Pennsylvania	Chester	-2.4	-0.2
420334000	Pennsylvania	Clearfield	-2.2	-0.6
420430401	Pennsylvania	Dauphin	-1.9	-0.2
420431100	Pennsylvania	Dauphin	-1.9	-0.2

8-Hour Ozone (ppb)				
Monitor ID	State	County	Difference: 2014 Remedy - 2012 Base Case	Difference: 2014 Remedy - 2014 Base Case
420450002	Pennsylvania	Delaware	-2.2	-0.2
420490003	Pennsylvania	Erie	-2.1	-0.6
420550001	Pennsylvania	Franklin	-2.0	-0.2
420590002	Pennsylvania	Greene	-2.9	-1.5
420630004	Pennsylvania	Indiana	-2.1	-0.6
420690101	Pennsylvania	Lackawanna	-1.9	-0.2
420692006	Pennsylvania	Lackawanna	-1.9	-0.3
420710007	Pennsylvania	Lancaster	-2.1	-0.2
420730015	Pennsylvania	Lawrence	-2.0	-0.5
420770004	Pennsylvania	Lehigh	-2.2	-0.2
420791100	Pennsylvania	Luzerne	-1.9	-0.4
420791101	Pennsylvania	Luzerne	-2.0	-0.2
420810100	Pennsylvania	Lycoming	-2.5	-1.1
420850100	Pennsylvania	Mercer	-2.6	-0.9
420910013	Pennsylvania	Montgomery	-2.2	-0.2
420950025	Pennsylvania	Northampton	-2.1	-0.1
420958000	Pennsylvania	Northampton	-2.1	-0.2
420990301	Pennsylvania	Perry	-2.0	-0.2
421010004	Pennsylvania	Philadelphia	-1.5	-0.1
421010014	Pennsylvania	Philadelphia	-1.8	-0.1
421010024	Pennsylvania	Philadelphia	-2.2	-0.2
421010136	Pennsylvania	Philadelphia	-1.9	-0.1
421174000	Pennsylvania	Tioga	-1.9	-0.4
421250005	Pennsylvania	Washington	-2.0	-0.7
421250200	Pennsylvania	Washington	-2.3	-0.9
421255001	Pennsylvania	Washington	-2.2	-0.7
421290006	Pennsylvania	Westmoreland	-1.9	-0.5
421290008	Pennsylvania	Westmoreland	-2.1	-0.6
421330008	Pennsylvania	York	-1.9	-0.2
440030002	Rhode Island	Kent	-1.9	-0.1
440071010	Rhode Island	Providence	-1.9	-0.1
440090007	Rhode Island	Washington	-1.9	-0.1
450010001	South Carolina	Abbeville	-2.5	-0.2
450030003	South Carolina	Aiken	-2.9	-0.2
450070003	South Carolina	Anderson	-2.7	-0.2

8-Hour Ozone (ppb)				
Monitor ID	State	County	Difference: 2014 Remedy - 2012 Base Case	Difference: 2014 Remedy - 2014 Base Case
450110001	South Carolina	Barnwell	-2.5	-0.2
450150002	South Carolina	Berkeley	-1.9	-0.4
450190046	South Carolina	Charleston	-2.3	-0.5
450210002	South Carolina	Cherokee	-2.5	-0.2
450230002	South Carolina	Chester	-2.3	-0.4
450250001	South Carolina	Chesterfield	-2.3	-0.4
450290002	South Carolina	Colleton	-2.7	-0.3
450310003	South Carolina	Darlington	-2.3	-0.2
450370001	South Carolina	Edgefield	-2.7	-0.1
450730001	South Carolina	Oconee	-2.4	-0.1
450770002	South Carolina	Pickens	-2.7	0.0
450790007	South Carolina	Richland	-3.4	-0.3
450790021	South Carolina	Richland	-3.0	-0.2
450791001	South Carolina	Richland	-3.5	-0.3
450830009	South Carolina	Spartanburg	-3.0	-0.1
450870001	South Carolina	Union	-2.4	-0.3
450890001	South Carolina	Williamsburg	-2.1	-0.4
450910006	South Carolina	York	-2.6	-0.6
470010101	Tennessee	Anderson	-2.4	-0.2
470090101	Tennessee	Blount	-2.9	-0.2
470090102	Tennessee	Blount	-2.3	-0.1
470370011	Tennessee	Davidson	-2.8	-0.4
470370026	Tennessee	Davidson	-3.2	-0.4
470651011	Tennessee	Hamilton	-3.0	-0.2
470654003	Tennessee	Hamilton	-3.0	-0.1
470890002	Tennessee	Jefferson	-4.0	-0.3
470930021	Tennessee	Knox	-2.8	-0.1
470931020	Tennessee	Knox	-2.9	-0.1
471050109	Tennessee	Loudon	-2.4	-0.1
471210104	Tennessee	Meigs	-3.0	-0.2
471490101	Tennessee	Rutherford	-3.2	-0.4
471550101	Tennessee	Sevier	-3.0	-0.3
471550102	Tennessee	Sevier	-2.9	-0.3
471570021	Tennessee	Shelby	-2.6	-0.1
471571004	Tennessee	Shelby	-2.6	0.0

8-Hour Ozone (ppb)				
Monitor ID	State	County	Difference: 2014 Remedy - 2012 Base Case	Difference: 2014 Remedy - 2014 Base Case
471632002	Tennessee	Sullivan	-2.1	-0.1
471632003	Tennessee	Sullivan	-2.0	-0.1
471650007	Tennessee	Sumner	-3.4	-0.5
471650101	Tennessee	Sumner	-3.2	-0.5
471870106	Tennessee	Williamson	-2.8	-0.2
471890103	Tennessee	Wilson	-3.3	-0.5
480290032	Texas	Bexar	-2.1	-0.1
480391004	Texas	Brazoria	-2.3	-0.3
480391016	Texas	Brazoria	-1.7	-0.1
480850005	Texas	Collin	-3.4	-0.1
481130069	Texas	Dallas	-2.8	-0.1
481130075	Texas	Dallas	-3.1	-0.1
481130087	Texas	Dallas	-2.6	-0.1
481133003	Texas	Dallas	-2.8	-0.2
481210034	Texas	Denton	-3.8	0.0
481390015	Texas	Ellis	-3.6	-0.1
481670014	Texas	Galveston	-1.6	-0.1
481830001	Texas	Gregg	-2.2	-0.1
482010024	Texas	Harris	-1.3	-0.1
482010026	Texas	Harris	-1.7	-0.1
482010029	Texas	Harris	-1.9	-0.1
482010046	Texas	Harris	-1.1	-0.1
482010047	Texas	Harris	-1.2	0.0
482010051	Texas	Harris	-2.0	-0.2
482010055	Texas	Harris	-2.2	-0.2
482010062	Texas	Harris	-1.9	-0.1
482010066	Texas	Harris	-1.7	-0.1
482010070	Texas	Harris	-1.6	-0.1
482010075	Texas	Harris	-1.6	-0.2
482011015	Texas	Harris	-1.7	-0.1
482011034	Texas	Harris	-1.7	-0.2
482011035	Texas	Harris	-1.7	-0.2
482011039	Texas	Harris	-2.0	0.0
482011050	Texas	Harris	-1.7	-0.1
482030002	Texas	Harrison	-2.4	-0.1

8-Hour Ozone (ppb)				
Monitor ID	State	County	Difference: 2014 Remedy - 2012 Base Case	Difference: 2014 Remedy - 2014 Base Case
482210001	Texas	Hood	-3.5	-0.1
482450009	Texas	Jefferson	-1.6	-0.1
482450011	Texas	Jefferson	-1.6	-0.1
482450018	Texas	Jefferson	-1.5	-0.1
482450022	Texas	Jefferson	-1.8	-0.1
482450101	Texas	Jefferson	-1.7	-0.1
482450628	Texas	Jefferson	-1.5	-0.1
482510003	Texas	Johnson	-3.9	-0.1
483390078	Texas	Montgomery	-2.1	-0.1
483611001	Texas	Orange	-1.7	-0.1
483611100	Texas	Orange	-1.4	-0.1
483670081	Texas	Parker	-3.7	-0.1
484230007	Texas	Smith	-2.3	-0.2
484390075	Texas	Tarrant	-4.0	-0.1
484391002	Texas	Tarrant	-3.8	-0.1
484392003	Texas	Tarrant	-3.8	-0.1
484393009	Texas	Tarrant	-3.6	-0.1
484393011	Texas	Tarrant	-3.3	-0.1
484530014	Texas	Travis	-2.3	-0.2
484530020	Texas	Travis	-1.9	-0.1
484530613	Texas	Travis	-2.1	-0.2
500030004	Vermont	Bennington	-1.7	-0.1
510130020	Virginia	Arlington	-2.2	-0.2
510330001	Virginia	Caroline	-2.3	-0.2
510360002	Virginia	Charles City	-2.1	-0.3
510410004	Virginia	Chesterfield	-2.0	-0.3
510590005	Virginia	Fairfax	-2.2	-0.2
510590018	Virginia	Fairfax	-2.3	-0.3
510590030	Virginia	Fairfax	-2.2	-0.2
510591005	Virginia	Fairfax	-2.2	-0.2
510595001	Virginia	Fairfax	-2.2	-0.1
510610002	Virginia	Fauquier	-1.8	-0.2
510690010	Virginia	Frederick	-1.5	-0.1
510850003	Virginia	Hanover	-2.3	-0.2
510870014	Virginia	Henrico	-2.3	-0.2

8-Hour Ozone (ppb)				
Monitor ID	State	County	Difference: 2014 Remedy - 2012 Base Case	Difference: 2014 Remedy - 2014 Base Case
511071005	Virginia	Loudoun	-2.3	-0.1
511130003	Virginia	Madison	-1.8	-0.1
511390004	Virginia	Page	-1.7	-0.1
511530009	Virginia	Prince William	-2.1	-0.1
511611004	Virginia	Roanoke	-2.1	-0.2
511630003	Virginia	Rockbridge	-1.9	-0.2
511790001	Virginia	Stafford	-2.2	-0.2
515100009	Virginia	Alexandria City	-2.1	-0.3
516500004	Virginia	Hampton City	-1.2	-0.1
518000004	Virginia	Suffolk City	-0.9	-0.1
518000005	Virginia	Suffolk City	-1.9	-0.1
540030003	West Virginia	Berkeley	-1.9	-0.3
540110006	West Virginia	Cabell	-1.8	-0.2
540291004	West Virginia	Hancock	-2.1	-0.7
540390010	West Virginia	Kanawha	-1.8	-0.1
540610003	West Virginia	Monongalia	-2.7	-1.5
540690010	West Virginia	Ohio	-2.6	-1.1
541071002	West Virginia	Wood	-3.9	-1.2
550090026	Wisconsin	Brown	-1.7	-0.3
550210015	Wisconsin	Columbia	-1.8	-0.2
550250041	Wisconsin	Dane	-1.6	-0.2
550270007	Wisconsin	Dodge	-1.8	-0.2
550290004	Wisconsin	Door	-2.1	-0.3
550390006	Wisconsin	Fond Du Lac	-1.5	-0.2
550550002	Wisconsin	Jefferson	-1.9	-0.2
550590019	Wisconsin	Kenosha	-1.2	-0.2
550610002	Wisconsin	Kewaunee	-1.9	-0.3
550710007	Wisconsin	Manitowoc	-1.8	-0.2
550790010	Wisconsin	Milwaukee	-1.0	-0.1
550790026	Wisconsin	Milwaukee	-1.2	-0.2
550790041	Wisconsin	Milwaukee	-1.2	-0.2
550790044	Wisconsin	Milwaukee	-1.1	-0.3
550790085	Wisconsin	Milwaukee	-1.3	-0.2
550870009	Wisconsin	Outagamie	-1.6	-0.3
550890008	Wisconsin	Ozaukee	-1.2	-0.2

8-Hour Ozone (ppb)				
Monitor ID	State	County	Difference: 2014 Remedy - 2012 Base Case	Difference: 2014 Remedy - 2014 Base Case
550890009	Wisconsin	Ozaukee	-1.5	-0.3
551010017	Wisconsin	Racine	-1.1	-0.2
551050024	Wisconsin	Rock	-1.8	-0.2
551091002	Wisconsin	St Croix	-1.8	-0.6
551110007	Wisconsin	Sauk	-1.6	-0.1
551170006	Wisconsin	Sheboygan	-1.8	-0.3
551270005	Wisconsin	Walworth	-2.0	-0.3
551310009	Wisconsin	Washington	-1.7	-0.3
551330017	Wisconsin	Waukesha	-1.5	-0.1
551330027	Wisconsin	Waukesha	-1.5	-0.2

Annual $PM_{2.5}$ ($\mu g/m^3$)				
Monitor ID	State	County	Difference: 2014 Remedy - 2012 Base Case	Difference: 2014 Remedy - 2014 Base Case
010030010	Alabama	Baldwin	-1.47	-1.18
010270001	Alabama	Clay	-2.09	-1.57
010331002	Alabama	Colbert	-2.28	-1.82
010491003	Alabama	DeKalb	-2.38	-1.87
010530002	Alabama	Escambia	-1.47	-1.18
010550010	Alabama	Etowah	-2.28	-1.77
010690003	Alabama	Houston	-1.42	-1.17
010730023	Alabama	Jefferson	-2.21	-1.64
010731005	Alabama	Jefferson	-2.14	-1.66
010731009	Alabama	Jefferson	-2.18	-1.75
010731010	Alabama	Jefferson	-2.27	-1.73
010732003	Alabama	Jefferson	-2.05	-1.58
010732006	Alabama	Jefferson	-1.98	-1.52
010735002	Alabama	Jefferson	-2.12	-1.62
010735003	Alabama	Jefferson	-2.22	-1.73
010890014	Alabama	Madison	-2.64	-2.10
010970002	Alabama	Mobile	-1.56	-1.18
010970003	Alabama	Mobile	-1.54	-1.17
010972005	Alabama	Mobile	-1.49	-1.16
011010007	Alabama	Montgomery	-1.87	-1.43
011030011	Alabama	Morgan	-2.39	-1.90
011130001	Alabama	Russell	-2.06	-1.51
011170006	Alabama	Shelby	-2.18	-1.69
011190002	Alabama	Sumter	-1.94	-1.54
011210002	Alabama	Talladega	-2.43	-1.91
011250004	Alabama	Tuscaloosa	-2.20	-1.74
011270002	Alabama	Walker	-2.30	-1.81
050010011	Arkansas	Arkansas	-1.79	-1.36
050030005	Arkansas	Ashley	-1.53	-1.17
050350005	Arkansas	Crittenden	-2.29	-1.72
050450002	Arkansas	Faulkner	-1.69	-1.26
050510003	Arkansas	Garland	-1.66	-1.23
050930007	Arkansas	Mississippi	-2.20	-1.68
051070001	Arkansas	Phillips	-1.96	-1.50
051130002	Arkansas	Polk	-1.42	-1.08
051150003	Arkansas	Pope	-1.54	-1.15
051190007	Arkansas	Pulaski	-1.82	-1.34

Annual $PM_{2.5}$ ($\mu g/m^3$)				
Monitor ID	State	County	Difference: 2014 Remedy - 2012 Base Case	Difference: 2014 Remedy - 2014 Base Case
051191004	Arkansas	Pulaski	-1.82	-1.34
051191005	Arkansas	Pulaski	-1.79	-1.32
051390006	Arkansas	Union	-1.56	-1.19
051450001	Arkansas	White	-1.57	-1.18
080010006	Colorado	Adams	-0.16	0.05
080050005	Colorado	Arapahoe	-0.12	0.04
080130003	Colorado	Boulder	-0.09	0.03
080130012	Colorado	Boulder	-0.06	0.04
080290004	Colorado	Delta	-0.12	-0.01
080310002	Colorado	Denver	-0.15	0.05
080310023	Colorado	Denver	-0.15	0.06
080390001	Colorado	Elbert	-0.04	0.01
080410008	Colorado	El Paso	-0.10	0.02
080410011	Colorado	El Paso	-0.09	0.03
080690009	Colorado	Larimer	-0.05	0.02
080770017	Colorado	Mesa	-0.17	-0.01
081010012	Colorado	Pueblo	-0.11	-0.01
081130004	Colorado	San Miguel	-0.03	-0.01
081230006	Colorado	Weld	-0.08	0.01
081230008	Colorado	Weld	-0.08	0.03
090010010	Connecticut	Fairfield	-1.17	-0.83
090011123	Connecticut	Fairfield	-1.16	-0.84
090013005	Connecticut	Fairfield	-1.22	-0.88
090019003	Connecticut	Fairfield	-1.17	-0.85
090031003	Connecticut	Hartford	-0.90	-0.66
090050005	Connecticut	Litchfield	-1.00	-0.80
090090026	Connecticut	New Haven	-1.13	-0.82
090090027	Connecticut	New Haven	-1.14	-0.83
090091123	Connecticut	New Haven	-1.12	-0.80
090092008	Connecticut	New Haven	-1.07	-0.78
090092123	Connecticut	New Haven	-1.06	-0.77
090113002	Connecticut	New London	-0.88	-0.67
100010002	Delaware	Kent	-1.65	-1.36
100010003	Delaware	Kent	-1.57	-1.29
100031003	Delaware	New Castle	-1.67	-1.35
100031007	Delaware	New Castle	-1.63	-1.34
100031012	Delaware	New Castle	-1.63	-1.32

Annual $PM_{2.5}$ ($\mu g/m^3$)				
Monitor ID	**State**	**County**	**Difference: 2014 Remedy - 2012 Base Case**	**Difference: 2014 Remedy - 2014 Base Case**
100032004	Delaware	New Castle	-1.72	-1.38
100051002	Delaware	Sussex	-1.70	-1.38
110010041	District Of Columbia		-1.86	-1.47
110010042	District Of Columbia		-2.08	-1.66
110010043	District Of Columbia		-2.05	-1.65
120010023	Florida	Alachua	-0.99	-0.83
120010024	Florida	Alachua	-0.97	-0.81
120051004	Florida	Bay	-0.99	-0.94
120090007	Florida	Brevard	-0.82	-0.66
120111002	Florida	Broward	-0.50	-0.38
120112004	Florida	Broward	-0.52	-0.39
120113002	Florida	Broward	-0.51	-0.39
120170005	Florida	Citrus	-0.82	-0.68
120310098	Florida	Duval	-1.02	-0.83
120310099	Florida	Duval	-0.99	-0.79
120330004	Florida	Escambia	-1.17	-0.94
120570030	Florida	Hillsborough	-0.75	-0.56
120573002	Florida	Hillsborough	-0.77	-0.58
120710005	Florida	Lee	-0.70	-0.56
120730012	Florida	Leon	-1.13	-0.94
120814012	Florida	Manatee	-0.76	-0.60
120830003	Florida	Marion	-0.91	-0.74
120861016	Florida	Miami-Dade	-0.58	-0.39
120866001	Florida	Miami-Dade	-0.48	-0.39
120951004	Florida	Orange	-0.93	-0.74
120952002	Florida	Orange	-0.93	-0.73
120990009	Florida	Palm Beach	-0.55	-0.43
120992005	Florida	Palm Beach	-0.54	-0.42
121030018	Florida	Pinellas	-0.72	-0.55
121031009	Florida	Pinellas	-0.71	-0.55
121056006	Florida	Polk	-0.76	-0.61
121111002	Florida	St. Lucie	-0.76	-0.60
121150013	Florida	Sarasota	-0.75	-0.60
121171002	Florida	Seminole	-0.94	-0.75
121275002	Florida	Volusia	-1.02	-0.83
130210007	Georgia	Bibb	-2.06	-1.43
130210012	Georgia	Bibb	-2.01	-1.38

Annual $PM_{2.5}$ ($\mu g/m^3$)				
Monitor ID	State	County	Difference: 2014 Remedy - 2012 Base Case	Difference: 2014 Remedy - 2014 Base Case
130510017	Georgia	Chatham	-1.60	-1.25
130510091	Georgia	Chatham	-1.61	-1.25
130590002	Georgia	Clarke	-2.19	-1.52
130630091	Georgia	Clayton	-2.09	-1.45
130670003	Georgia	Cobb	-2.02	-1.47
130670004	Georgia	Cobb	-1.99	-1.44
130890002	Georgia	DeKalb	-2.10	-1.44
130892001	Georgia	DeKalb	-2.09	-1.45
130950007	Georgia	Dougherty	-1.49	-1.17
131150005	Georgia	Floyd	-2.20	-1.69
131210032	Georgia	Fulton	-2.06	-1.43
131210039	Georgia	Fulton	-2.08	-1.43
131270006	Georgia	Glynn	-1.22	-0.98
131350002	Georgia	Gwinnett	-2.08	-1.45
131390003	Georgia	Hall	-2.13	-1.55
131530001	Georgia	Houston	-1.93	-1.40
131850003	Georgia	Lowndes	-1.17	-0.94
132150001	Georgia	Muscogee	-2.04	-1.51
132150008	Georgia	Muscogee	-2.03	-1.49
132150011	Georgia	Muscogee	-1.86	-1.38
132230003	Georgia	Paulding	-2.06	-1.57
132450005	Georgia	Richmond	-1.97	-1.44
132450091	Georgia	Richmond	-1.99	-1.45
132950002	Georgia	Walker	-2.55	-1.97
133030001	Georgia	Washington	-2.09	-1.38
133190001	Georgia	Wilkinson	-2.12	-1.39
170010006	Illinois	Adams	-1.40	-1.00
170190004	Illinois	Champaign	-1.93	-1.46
170191001	Illinois	Champaign	-1.96	-1.48
170310022	Illinois	Cook	-1.49	-1.01
170310050	Illinois	Cook	-1.44	-0.92
170310052	Illinois	Cook	-1.50	-0.91
170310057	Illinois	Cook	-1.48	-0.90
170310076	Illinois	Cook	-1.47	-0.91
170312001	Illinois	Cook	-1.35	-0.87
170313301	Illinois	Cook	-1.45	-0.88
170314007	Illinois	Cook	-1.47	-0.95

Annual $PM_{2.5}$ ($\mu g/m^3$)				
Monitor ID	State	County	Difference: 2014 Remedy - 2012 Base Case	Difference: 2014 Remedy - 2014 Base Case
170314201	Illinois	Cook	-1.48	-0.95
170316005	Illinois	Cook	-1.49	-0.90
170434002	Illinois	DuPage	-1.51	-0.95
170831001	Illinois	Jersey	-2.01	-1.48
170890003	Illinois	Kane	-1.50	-0.99
170890007	Illinois	Kane	-1.49	-0.96
170971007	Illinois	Lake	-1.39	-0.93
171110001	Illinois	McHenry	-1.40	-0.94
171132003	Illinois	McLean	-1.72	-1.22
171150013	Illinois	Macon	-1.88	-1.36
171191007	Illinois	Madison	-2.18	-1.48
171192009	Illinois	Madison	-2.09	-1.50
171193007	Illinois	Madison	-2.06	-1.47
171430037	Illinois	Peoria	-1.55	-1.06
171570001	Illinois	Randolph	-2.12	-1.53
171613002	Illinois	Rock Island	-1.27	-0.89
171630010	Illinois	Saint Clair	-2.19	-1.50
171634001	Illinois	Saint Clair	-2.09	-1.44
171670012	Illinois	Sangamon	-1.80	-1.28
171971002	Illinois	Will	-1.61	-1.04
171971011	Illinois	Will	-1.61	-1.14
172010013	Illinois	Winnebago	-1.26	-0.84
180030004	Indiana	Allen	-1.61	-1.26
180030014	Indiana	Allen	-1.60	-1.25
180190006	Indiana	Clark	-3.14	-2.51
180350006	Indiana	Delaware	-2.41	-1.95
180372001	Indiana	Dubois	-3.24	-2.63
180431004	Indiana	Floyd	-3.13	-2.54
180650003	Indiana	Henry	-2.49	-2.07
180670003	Indiana	Howard	-2.17	-1.75
180830004	Indiana	Knox	-2.75	-2.16
180890006	Indiana	Lake	-1.53	-1.05
180890027	Indiana	Lake	-1.56	-1.10
180891003	Indiana	Lake	-1.50	-1.06
180892004	Indiana	Lake	-1.50	-1.04
180892010	Indiana	Lake	-1.48	-1.01
180910011	Indiana	LaPorte	-1.48	-1.10

Annual $PM_{2.5}$ ($\mu g/m^3$)				
Monitor ID	State	County	Difference: 2014 Remedy - 2012 Base Case	Difference: 2014 Remedy - 2014 Base Case
180910012	Indiana	LaPorte	-1.53	-1.15
180950009	Indiana	Madison	-2.46	-2.03
180970042	Indiana	Marion	-2.86	-2.39
180970078	Indiana	Marion	-2.83	-2.35
180970079	Indiana	Marion	-2.75	-2.27
180970081	Indiana	Marion	-2.85	-2.35
180970083	Indiana	Marion	-2.85	-2.35
181270020	Indiana	Porter	-1.52	-1.11
181270024	Indiana	Porter	-1.56	-1.13
181410014	Indiana	St. Joseph	-1.22	-0.90
181411008	Indiana	St. Joseph	-1.20	-0.86
181412004	Indiana	St. Joseph	-1.20	-0.88
181470009	Indiana	Spencer	-3.24	-2.65
181570008	Indiana	Tippecanoe	-2.13	-1.69
181630006	Indiana	Vanderburgh	-2.57	-2.05
181630012	Indiana	Vanderburgh	-2.53	-2.00
181630016	Indiana	Vanderburgh	-2.58	-2.06
181670018	Indiana	Vigo	-2.48	-1.95
181670023	Indiana	Vigo	-2.50	-1.97
190130008	Iowa	Black Hawk	-0.98	-0.69
190450021	Iowa	Clinton	-1.24	-0.87
191032001	Iowa	Johnson	-1.07	-0.76
191130037	Iowa	Linn	-1.03	-0.73
191370002	Iowa	Montgomery	-0.96	-0.71
191390015	Iowa	Muscatine	-1.19	-0.84
191471002	Iowa	Palo Alto	-0.73	-0.52
191530030	Iowa	Polk	-0.92	-0.65
191532510	Iowa	Polk	-0.88	-0.63
191532520	Iowa	Polk	-0.90	-0.63
191550009	Iowa	Pottawattamie	-0.83	-0.57
191630015	Iowa	Scott	-1.25	-0.88
191630018	Iowa	Scott	-1.26	-0.89
191630019	Iowa	Scott	-1.26	-0.85
191770006	Iowa	Van Buren	-1.02	-0.73
191930017	Iowa	Woodbury	-0.67	-0.47
191970004	Iowa	Wright	-0.88	-0.63
200910007	Kansas	Johnson	-1.01	-0.74

Annual $PM_{2.5}$ ($\mu g/m^3$)				
Monitor ID	State	County	Difference: 2014 Remedy - 2012 Base Case	Difference: 2014 Remedy - 2014 Base Case
200910009	Kansas	Johnson	-1.11	-0.82
200910010	Kansas	Johnson	-0.99	-0.74
201070002	Kansas	Linn	-1.11	-0.86
201730008	Kansas	Sedgwick	-0.89	-0.66
201730009	Kansas	Sedgwick	-0.89	-0.65
201730010	Kansas	Sedgwick	-0.88	-0.65
201770010	Kansas	Shawnee	-0.99	-0.74
201770011	Kansas	Shawnee	-0.94	-0.70
201910002	Kansas	Sumner	-0.88	-0.67
202090021	Kansas	Wyandotte	-1.10	-0.79
202090022	Kansas	Wyandotte	-1.04	-0.75
210130002	Kentucky	Bell	-2.68	-2.09
210190017	Kentucky	Boyd	-3.14	-2.51
210290006	Kentucky	Bullitt	-3.16	-2.55
210370003	Kentucky	Campbell	-3.13	-2.61
210430500	Kentucky	Carter	-2.76	-2.20
210470006	Kentucky	Christian	-3.03	-2.46
210590005	Kentucky	Daviess	-3.63	-3.02
210670012	Kentucky	Fayette	-3.05	-2.48
210670014	Kentucky	Fayette	-3.06	-2.49
210730006	Kentucky	Franklin	-3.00	-2.45
210930006	Kentucky	Hardin	-3.19	-2.60
211010014	Kentucky	Henderson	-2.70	-2.19
211110043	Kentucky	Jefferson	-3.16	-2.54
211110044	Kentucky	Jefferson	-3.09	-2.48
211110048	Kentucky	Jefferson	-3.11	-2.49
211110051	Kentucky	Jefferson	-3.17	-2.56
211170007	Kentucky	Kenton	-3.18	-2.63
211250004	Kentucky	Laurel	-2.61	-2.09
211451004	Kentucky	McCracken	-2.70	-2.10
211510003	Kentucky	Madison	-3.01	-2.46
211930003	Kentucky	Perry	-2.64	-2.09
211950002	Kentucky	Pike	-2.89	-2.32
212270007	Kentucky	Warren	-3.27	-2.67
220171002	Louisiana	Caddo	-1.59	-1.13
220190009	Louisiana	Calcasieu	-1.08	-0.84
220190010	Louisiana	Calcasieu	-1.11	-0.86

Annual $PM_{2.5}$ ($\mu g/m^3$)				
Monitor ID	State	County	Difference: 2014 Remedy - 2012 Base Case	Difference: 2014 Remedy - 2014 Base Case
220290003	Louisiana	Concordia	-1.53	-1.19
220330009	Louisiana	East Baton Rouge	-1.20	-0.88
220331001	Louisiana	East Baton Rouge	-1.15	-0.87
220470005	Louisiana	Iberville	-1.19	-0.87
220470009	Louisiana	Iberville	-1.32	-1.02
220511001	Louisiana	Jefferson	-1.37	-1.04
220550006	Louisiana	Lafayette	-1.40	-1.11
220730004	Louisiana	Ouachita	-1.45	-1.11
220790002	Louisiana	Rapides	-1.37	-1.07
221050001	Louisiana	Tangipahoa	-1.49	-1.15
221090001	Louisiana	Terrebonne	-1.34	-1.05
221210001	Louisiana	West Baton Rouge	-1.20	-0.88
230010011	Maine	Androscoggin	-0.49	-0.32
230030013	Maine	Aroostook	-0.32	-0.25
230031011	Maine	Aroostook	-0.31	-0.22
230050015	Maine	Cumberland	-0.51	-0.33
230050027	Maine	Cumberland	-0.51	-0.33
230090103	Maine	Hancock	-0.37	-0.30
230110016	Maine	Kennebec	-0.47	-0.31
230172011	Maine	Oxford	-0.46	-0.33
230190002	Maine	Penobscot	-0.48	-0.33
240030014	Maryland	Anne Arundel	-1.63	-1.31
240031003	Maryland	Anne Arundel	-1.64	-1.28
240032002	Maryland	Anne Arundel	-1.60	-1.26
240051007	Maryland	Baltimore	-1.85	-1.51
240053001	Maryland	Baltimore	-1.73	-1.39
240150003	Maryland	Cecil	-1.60	-1.31
240251001	Maryland	Harford	-1.63	-1.34
240313001	Maryland	Montgomery	-1.82	-1.48
240330030	Maryland	Prince George's	-1.73	-1.41
240338003	Maryland	Prince George's	-1.71	-1.37
240430009	Maryland	Washington	-2.19	-1.83
245100006	Maryland	Baltimore City	-1.73	-1.39
245100007	Maryland	Baltimore City	-1.82	-1.47
245100008	Maryland	Baltimore City	-1.76	-1.38
245100049	Maryland	Baltimore City	-1.70	-1.33

Annual $PM_{2.5}$ ($\mu g/m^3$)				
Monitor ID	State	County	Difference: 2014 Remedy - 2012 Base Case	Difference: 2014 Remedy - 2014 Base Case
250035001	Massachusetts	Berkshire	-0.89	-0.69
250051004	Massachusetts	Bristol	-0.59	-0.52
250092006	Massachusetts	Essex	-0.62	-0.49
250095005	Massachusetts	Essex	-0.60	-0.47
250096001	Massachusetts	Essex	-0.63	-0.49
250130008	Massachusetts	Hampden	-0.82	-0.63
250130016	Massachusetts	Hampden	-0.86	-0.63
250132009	Massachusetts	Hampden	-0.84	-0.62
250230004	Massachusetts	Plymouth	-0.61	-0.52
250250002	Massachusetts	Suffolk	-0.70	-0.52
250250027	Massachusetts	Suffolk	-0.70	-0.52
250250042	Massachusetts	Suffolk	-0.67	-0.52
250250043	Massachusetts	Suffolk	-0.71	-0.52
250270016	Massachusetts	Worcester	-0.80	-0.61
250270023	Massachusetts	Worcester	-0.80	-0.60
260050003	Michigan	Allegan	-1.57	-1.22
260170014	Michigan	Bay	-1.29	-1.01
260210014	Michigan	Berrien	-1.45	-1.09
260490021	Michigan	Genesee	-1.54	-1.21
260650012	Michigan	Ingham	-1.58	-1.24
260770008	Michigan	Kalamazoo	-1.55	-1.19
260810020	Michigan	Kent	-1.42	-1.04
260990009	Michigan	Macomb	-1.68	-1.34
261130001	Michigan	Missaukee	-0.82	-0.60
261150005	Michigan	Monroe	-2.02	-1.64
261210040	Michigan	Muskegon	-1.32	-0.97
261250001	Michigan	Oakland	-1.73	-1.33
261390005	Michigan	Ottawa	-1.46	-1.09
261450018	Michigan	Saginaw	-1.27	-0.99
261470005	Michigan	St. Clair	-1.69	-1.37
261610005	Michigan	Washtenaw	-1.69	-1.34
261610008	Michigan	Washtenaw	-1.71	-1.32
261630001	Michigan	Wayne	-1.63	-1.21
261630015	Michigan	Wayne	-2.02	-1.57
261630016	Michigan	Wayne	-1.80	-1.40
261630019	Michigan	Wayne	-1.76	-1.39
261630025	Michigan	Wayne	-1.79	-1.38

Annual $PM_{2.5}$ ($\mu g/m^3$)				
Monitor ID	State	County	Difference: 2014 Remedy - 2012 Base Case	Difference: 2014 Remedy - 2014 Base Case
261630033	Michigan	Wayne	-2.14	-1.66
261630036	Michigan	Wayne	-1.73	-1.34
270210001	Minnesota	Cass	-0.31	-0.23
270370470	Minnesota	Dakota	-0.63	-0.41
270530050	Minnesota	Hennepin	-0.63	-0.38
270530961	Minnesota	Hennepin	-0.62	-0.39
270530963	Minnesota	Hennepin	-0.64	-0.39
270530965	Minnesota	Hennepin	-0.62	-0.37
270531007	Minnesota	Hennepin	-0.63	-0.39
270532006	Minnesota	Hennepin	-0.63	-0.39
270953051	Minnesota	Mille Lacs	-0.37	-0.26
271095008	Minnesota	Olmsted	-0.78	-0.56
271230866	Minnesota	Ramsey	-0.63	-0.38
271230868	Minnesota	Ramsey	-0.63	-0.36
271230871	Minnesota	Ramsey	-0.59	-0.36
271377001	Minnesota	Saint Louis	-0.28	-0.20
271377550	Minnesota	Saint Louis	-0.34	-0.23
271377551	Minnesota	Saint Louis	-0.36	-0.24
271390505	Minnesota	Scott	-0.62	-0.42
271453052	Minnesota	Stearns	-0.50	-0.35
280010004	Mississippi	Adams	-1.54	-1.21
280110001	Mississippi	Bolivar	-1.84	-1.42
280330002	Mississippi	DeSoto	-2.16	-1.62
280350004	Mississippi	Forrest	-1.80	-1.41
280470008	Mississippi	Harrison	-1.43	-1.12
280490010	Mississippi	Hinds	-1.71	-1.29
280590006	Mississippi	Jackson	-1.43	-1.11
280670002	Mississippi	Jones	-1.94	-1.50
280750003	Mississippi	Lauderdale	-2.00	-1.56
280810005	Mississippi	Lee	-2.23	-1.70
280870001	Mississippi	Lowndes	-2.14	-1.65
281090001	Mississippi	Pearl River	-1.48	-1.16
281490004	Mississippi	Warren	-1.66	-1.27
290190004	Missouri	Boone	-1.39	-1.03
290210005	Missouri	Buchanan	-0.99	-0.73
290370003	Missouri	Cass	-1.12	-0.84
290390001	Missouri	Cedar	-1.39	-1.09

Annual $PM_{2.5}$ ($\mu g/m^3$)				
Monitor ID	State	County	Difference: 2014 Remedy - 2012 Base Case	Difference: 2014 Remedy - 2014 Base Case
290470005	Missouri	Clay	-1.09	-0.82
290770032	Missouri	Greene	-1.43	-1.08
290950034	Missouri	Jackson	-1.12	-0.80
290990012	Missouri	Jefferson	-1.85	-1.31
291370001	Missouri	Monroe	-1.42	-1.05
291831002	Missouri	Saint Charles	-2.06	-1.50
291860006	Missouri	Sainte Genevieve	-1.94	-1.42
291890004	Missouri	Saint Louis	-1.90	-1.35
291892003	Missouri	Saint Louis	-2.07	-1.47
295100007	Missouri	St. Louis City	-2.02	-1.41
295100085	Missouri	St. Louis City	-2.14	-1.49
295100086	Missouri	St. Louis City	-2.10	-1.47
295100087	Missouri	St. Louis City	-2.18	-1.51
300870307	Montana	Rosebud	0.05	0.07
301111065	Montana	Yellowstone	-0.06	0.01
310250002	Nebraska	Cass	-0.80	-0.57
310550019	Nebraska	Douglas	-0.81	-0.57
310550052	Nebraska	Douglas	-0.80	-0.56
310790004	Nebraska	Hall	-0.56	-0.40
311090022	Nebraska	Lancaster	-0.74	-0.52
311111002	Nebraska	Lincoln	-0.27	-0.18
311530007	Nebraska	Sarpy	-0.82	-0.58
311570003	Nebraska	Scotts Bluff	-0.07	-0.03
311770002	Nebraska	Washington	-0.75	-0.54
330012004	New Hampshire	Belknap	-0.57	-0.45
330050007	New Hampshire	Cheshire	-0.74	-0.56
330070014	New Hampshire	Coos	-0.52	-0.39
330090010	New Hampshire	Grafton	-0.60	-0.46
330110020	New Hampshire	Hillsborough	-0.67	-0.52
330111015	New Hampshire	Hillsborough	-0.68	-0.52
330115001	New Hampshire	Hillsborough	-0.50	-0.40

Annual $PM_{2.5}$ ($\mu g/m^3$)				
Monitor ID	**State**	**County**	**Difference: 2014 Remedy - 2012 Base Case**	**Difference: 2014 Remedy - 2014 Base Case**
330131006	New Hampshire	Merrimack	-0.66	-0.51
330150014	New Hampshire	Rockingham	-0.52	-0.42
330190003	New Hampshire	Sullivan	-0.68	-0.52
340011006	New Jersey	Atlantic	-1.33	-1.11
340030003	New Jersey	Bergen	-1.33	-0.86
340070003	New Jersey	Camden	-1.48	-1.17
340071007	New Jersey	Camden	-1.56	-1.21
340130015	New Jersey	Essex	-1.38	-0.95
340155001	New Jersey	Gloucester	-1.57	-1.26
340171003	New Jersey	Hudson	-1.41	-0.92
340210008	New Jersey	Mercer	-1.48	-1.16
340218001	New Jersey	Mercer	-1.38	-1.10
340230006	New Jersey	Middlesex	-1.39	-1.08
340270004	New Jersey	Morris	-1.37	-1.05
340273001	New Jersey	Morris	-1.28	-1.02
340292002	New Jersey	Ocean	-1.30	-1.03
340310005	New Jersey	Passaic	-1.37	-0.96
340390004	New Jersey	Union	-1.46	-0.99
340390006	New Jersey	Union	-1.38	-0.94
340392003	New Jersey	Union	-1.39	-0.97
340410006	New Jersey	Warren	-1.53	-1.22
350010023	New Mexico	Bernalillo	-0.20	-0.07
350010024	New Mexico	Bernalillo	-0.19	-0.08
350050005	New Mexico	Chaves	-0.29	-0.22
350130017	New Mexico	Dona Ana	-0.24	-0.16
350130025	New Mexico	Dona Ana	-0.23	-0.15
350431003	New Mexico	Sandoval	-0.14	-0.06
350439011	New Mexico	Sandoval	-0.12	-0.06
350450006	New Mexico	San Juan	-0.03	-0.01
350490020	New Mexico	Santa Fe	-0.09	-0.05
360010005	New York	Albany	-0.93	-0.70
360050080	New York	Bronx	-1.29	-0.78
360050083	New York	Bronx	-1.44	-0.93
360050110	New York	Bronx	-1.19	-0.72

Annual $PM_{2.5}$ ($\mu g/m^3$)				
Monitor ID	State	County	Difference: 2014 Remedy - 2012 Base Case	Difference: 2014 Remedy - 2014 Base Case
360130011	New York	Chautauqua	-1.76	-1.50
360290005	New York	Erie	-1.77	-1.45
360291007	New York	Erie	-1.82	-1.50
360310003	New York	Essex	-0.67	-0.56
360470122	New York	Kings	-1.40	-0.90
360551007	New York	Monroe	-1.19	-0.95
360590008	New York	Nassau	-1.23	-0.87
360610056	New York	New York	-1.50	-0.93
360610062	New York	New York	-1.46	-0.95
360610079	New York	New York	-1.23	-0.75
360610128	New York	New York	-1.45	-0.92
360632008	New York	Niagara	-1.67	-1.39
360671015	New York	Onondaga	-1.34	-1.07
360710002	New York	Orange	-1.23	-0.92
360810124	New York	Queens	-1.34	-0.89
360850055	New York	Richmond	-1.37	-0.92
360850067	New York	Richmond	-1.19	-0.81
360893001	New York	St. Lawrence	-0.74	-0.62
361010003	New York	Steuben	-1.41	-1.21
361030001	New York	Suffolk	-1.25	-0.88
361191002	New York	Westchester	-1.28	-0.87
370010002	North Carolina	Alamance	-2.35	-1.87
370210034	North Carolina	Buncombe	-2.15	-1.68
370330001	North Carolina	Caswell	-2.34	-1.86
370350004	North Carolina	Catawba	-2.46	-1.92
370370004	North Carolina	Chatham	-2.17	-1.77
370510009	North Carolina	Cumberland	-2.07	-1.59
370570002	North Carolina	Davidson	-2.54	-2.07
370610002	North Carolina	Duplin	-1.84	-1.43
370630001	North Carolina	Durham	-2.21	-1.77
370650004	North Carolina	Edgecombe	-2.03	-1.58
370670022	North Carolina	Forsyth	-2.51	-1.99
370710016	North Carolina	Gaston	-2.30	-1.82
370810013	North Carolina	Guilford	-2.33	-1.82
370870010	North Carolina	Haywood	-1.88	-1.44
370990006	North Carolina	Jackson	-2.09	-1.61
371070004	North Carolina	Lenoir	-1.81	-1.41

Annual $PM_{2.5}$ ($\mu g/m^3$)				
Monitor ID	**State**	**County**	**Difference: 2014 Remedy - 2012 Base Case**	**Difference: 2014 Remedy - 2014 Base Case**
371110004	North Carolina	McDowell	-2.23	-1.75
371170001	North Carolina	Martin	-1.75	-1.39
371190010	North Carolina	Mecklenburg	-2.26	-1.80
371190041	North Carolina	Mecklenburg	-2.29	-1.83
371190042	North Carolina	Mecklenburg	-2.29	-1.83
371210001	North Carolina	Mitchell	-2.28	-1.81
371230001	North Carolina	Montgomery	-2.18	-1.76
371290002	North Carolina	New Hanover	-1.60	-1.23
371330005	North Carolina	Onslow	-1.74	-1.37
371350007	North Carolina	Orange	-2.25	-1.82
371470005	North Carolina	Pitt	-1.86	-1.44
371550005	North Carolina	Robeson	-2.09	-1.56
371590021	North Carolina	Rowan	-2.32	-1.91
371730002	North Carolina	Swain	-2.22	-1.70
371830014	North Carolina	Wake	-2.18	-1.73
371890003	North Carolina	Watauga	-2.42	-1.93
371910005	North Carolina	Wayne	-2.02	-1.47
380070002	North Dakota	Billings	-0.05	-0.03
380130002	North Dakota	Burke	-0.05	-0.03
380130003	North Dakota	Burke	-0.06	-0.03
380150003	North Dakota	Burleigh	-0.13	-0.07
380171004	North Dakota	Cass	-0.31	-0.19
380530002	North Dakota	McKenzie	-0.05	-0.02
380570004	North Dakota	Mercer	-0.09	-0.05
390090003	Ohio	Athens	-2.74	-2.25
390170016	Ohio	Butler	-3.06	-2.50
390170017	Ohio	Butler	-2.73	-2.25
390171004	Ohio	Butler	-2.82	-2.34
390230005	Ohio	Clark	-2.61	-2.16
390250022	Ohio	Clermont	-3.12	-2.61
390350027	Ohio	Cuyahoga	-2.94	-2.52
390350034	Ohio	Cuyahoga	-2.77	-2.39
390350038	Ohio	Cuyahoga	-3.00	-2.55
390350045	Ohio	Cuyahoga	-2.99	-2.55
390350060	Ohio	Cuyahoga	-2.97	-2.51
390350065	Ohio	Cuyahoga	-2.98	-2.56
390351002	Ohio	Cuyahoga	-2.57	-2.20

Annual $PM_{2.5}$ (µg/m^3)				
Monitor ID	State	County	Difference: 2014 Remedy - 2012 Base Case	Difference: 2014 Remedy - 2014 Base Case
390490024	Ohio	Franklin	-2.50	-2.00
390490025	Ohio	Franklin	-2.50	-2.00
390490081	Ohio	Franklin	-2.45	-1.98
390570005	Ohio	Greene	-2.64	-2.18
390610006	Ohio	Hamilton	-3.03	-2.50
390610014	Ohio	Hamilton	-3.29	-2.69
390610040	Ohio	Hamilton	-3.26	-2.69
390610042	Ohio	Hamilton	-3.24	-2.65
390610043	Ohio	Hamilton	-3.03	-2.48
390617001	Ohio	Hamilton	-3.26	-2.69
390618001	Ohio	Hamilton	-3.28	-2.68
390810017	Ohio	Jefferson	-2.80	-2.34
390811001	Ohio	Jefferson	-3.03	-2.54
390851001	Ohio	Lake	-2.62	-2.28
390870010	Ohio	Lawrence	-2.95	-2.36
390930016	Ohio	Lorain	-2.65	-2.28
390933002	Ohio	Lorain	-2.16	-1.85
390950024	Ohio	Lucas	-2.03	-1.64
390950025	Ohio	Lucas	-2.05	-1.67
390950026	Ohio	Lucas	-2.03	-1.63
390990005	Ohio	Mahoning	-2.53	-2.14
390990014	Ohio	Mahoning	-2.54	-2.15
391130031	Ohio	Montgomery	-2.64	-2.18
391130032	Ohio	Montgomery	-2.72	-2.24
391330002	Ohio	Portage	-2.40	-2.03
391351001	Ohio	Preble	-2.76	-2.33
391450013	Ohio	Scioto	-2.98	-2.43
391510017	Ohio	Stark	-2.77	-2.32
391510020	Ohio	Stark	-2.30	-1.90
391530017	Ohio	Summit	-2.37	-1.98
391530023	Ohio	Summit	-2.29	-1.93
391550007	Ohio	Trumbull	-2.50	-2.12
400159008	Oklahoma	Caddo	-0.81	-0.63
400219002	Oklahoma	Cherokee	-1.30	-1.01
400719010	Oklahoma	Kay	-0.94	-0.73
400819005	Oklahoma	Lincoln	-1.05	-0.82
400970186	Oklahoma	Mayes	-1.18	-0.92

Annual $PM_{2.5}$ ($\mu g/m^3$)				
Monitor ID	State	County	Difference: 2014 Remedy - 2012 Base Case	Difference: 2014 Remedy - 2014 Base Case
400979014	Oklahoma	Mayes	-1.21	-0.94
401010169	Oklahoma	Muskogee	-1.23	-0.95
401090035	Oklahoma	Oklahoma	-0.99	-0.74
401091037	Oklahoma	Oklahoma	-0.99	-0.74
401159004	Oklahoma	Ottawa	-1.21	-0.94
401210415	Oklahoma	Pittsburg	-1.22	-0.96
401359015	Oklahoma	Sequoyah	-1.31	-1.00
401430110	Oklahoma	Tulsa	-1.18	-0.87
401431127	Oklahoma	Tulsa	-1.15	-0.86
420010001	Pennsylvania	Adams	-2.03	-1.70
420030008	Pennsylvania	Allegheny	-2.54	-2.08
420030021	Pennsylvania	Allegheny	-2.61	-2.16
420030064	Pennsylvania	Allegheny	-3.32	-2.68
420030067	Pennsylvania	Allegheny	-2.58	-2.17
420030095	Pennsylvania	Allegheny	-2.60	-2.18
420030116	Pennsylvania	Allegheny	-2.57	-2.12
420031008	Pennsylvania	Allegheny	-2.95	-2.50
420031301	Pennsylvania	Allegheny	-2.99	-2.46
420033007	Pennsylvania	Allegheny	-2.79	-2.29
420039002	Pennsylvania	Allegheny	-2.78	-2.32
420070014	Pennsylvania	Beaver	-2.59	-2.18
420110011	Pennsylvania	Berks	-1.73	-1.41
420170012	Pennsylvania	Bucks	-1.55	-1.21
420210011	Pennsylvania	Cambria	-2.86	-2.47
420270100	Pennsylvania	Centre	-2.16	-1.84
420290100	Pennsylvania	Chester	-1.76	-1.42
420410101	Pennsylvania	Cumberland	-1.90	-1.58
420430401	Pennsylvania	Dauphin	-1.96	-1.61
420450002	Pennsylvania	Delaware	-1.68	-1.34
420490003	Pennsylvania	Erie	-2.06	-1.74
420692006	Pennsylvania	Lackawanna	-1.52	-1.23
420710007	Pennsylvania	Lancaster	-1.85	-1.49
420770004	Pennsylvania	Lehigh	-1.59	-1.24
420791101	Pennsylvania	Luzerne	-1.51	-1.21
420850100	Pennsylvania	Mercer	-2.44	-2.08
420950025	Pennsylvania	Northampton	-1.56	-1.22
420990301	Pennsylvania	Perry	-1.72	-1.45

Annual $PM_{2.5}$ ($\mu g/m^3$)				
Monitor ID	State	County	Difference: 2014 Remedy - 2012 Base Case	Difference: 2014 Remedy - 2014 Base Case
421010047	Pennsylvania	Philadelphia	-1.54	-1.16
421250005	Pennsylvania	Washington	-3.10	-2.60
421250200	Pennsylvania	Washington	-3.06	-2.58
421255001	Pennsylvania	Washington	-2.43	-2.06
421290008	Pennsylvania	Westmoreland	-3.11	-2.66
421330008	Pennsylvania	York	-1.96	-1.59
440070022	Rhode Island	Providence	-0.68	-0.54
440070026	Rhode Island	Providence	-0.75	-0.57
440070028	Rhode Island	Providence	-0.72	-0.56
440071010	Rhode Island	Providence	-0.72	-0.57
450130007	South Carolina	Beaufort	-1.66	-1.34
450190048	South Carolina	Charleston	-1.68	-1.36
450190049	South Carolina	Charleston	-1.67	-1.34
450250001	South Carolina	Chesterfield	-1.99	-1.59
450370001	South Carolina	Edgefield	-1.95	-1.45
450410002	South Carolina	Florence	-1.94	-1.56
450430009	South Carolina	Georgetown	-1.65	-1.33
450450008	South Carolina	Greenville	-2.21	-1.68
450450009	South Carolina	Greenville	-2.22	-1.70
450470003	South Carolina	Greenwood	-2.16	-1.60
450510002	South Carolina	Horry	-1.70	-1.38
450630008	South Carolina	Lexington	-2.13	-1.60
450730001	South Carolina	Oconee	-1.96	-1.52
450790007	South Carolina	Richland	-2.17	-1.66
450790019	South Carolina	Richland	-2.15	-1.63
450830010	South Carolina	Spartanburg	-2.19	-1.70
460110002	South Dakota	Brookings	-0.51	-0.35
460130003	South Dakota	Brown	-0.31	-0.20
460290002	South Dakota	Codington	-0.41	-0.26
460330132	South Dakota	Custer	-0.05	-0.03
460710001	South Dakota	Jackson	-0.13	-0.11
460990006	South Dakota	Minnehaha	-0.59	-0.39
460990007	South Dakota	Minnehaha	-0.59	-0.40
461030016	South Dakota	Pennington	-0.07	-0.02
461030020	South Dakota	Pennington	-0.08	-0.01
461031001	South Dakota	Pennington	-0.07	-0.02
470090011	Tennessee	Blount	-2.34	-1.76

Annual $PM_{2.5}$ ($\mu g/m^3$)				
Monitor ID	State	County	Difference: 2014 Remedy - 2012 Base Case	Difference: 2014 Remedy - 2014 Base Case
470370023	Tennessee	Davidson	-2.90	-2.32
470370025	Tennessee	Davidson	-2.92	-2.34
470370036	Tennessee	Davidson	-2.86	-2.29
470450004	Tennessee	Dyer	-2.42	-1.88
470650031	Tennessee	Hamilton	-2.62	-2.02
470651011	Tennessee	Hamilton	-2.69	-2.10
470654002	Tennessee	Hamilton	-2.67	-2.06
470930028	Tennessee	Knox	-2.53	-1.90
470931017	Tennessee	Knox	-2.56	-1.89
470931020	Tennessee	Knox	-2.61	-1.94
470990002	Tennessee	Lawrence	-2.25	-1.82
471050108	Tennessee	Loudon	-2.39	-1.83
471071002	Tennessee	McMinn	-2.43	-1.88
471192007	Tennessee	Maury	-2.64	-2.11
471251009	Tennessee	Montgomery	-2.93	-2.35
471410001	Tennessee	Putnam	-2.80	-2.25
471450004	Tennessee	Roane	-2.49	-1.94
471570014	Tennessee	Shelby	-2.33	-1.73
471570038	Tennessee	Shelby	-2.34	-1.74
471570047	Tennessee	Shelby	-2.45	-1.83
471571004	Tennessee	Shelby	-2.28	-1.72
471631007	Tennessee	Sullivan	-2.50	-1.95
471650007	Tennessee	Sumner	-3.42	-2.80
480370004	Texas	Bowie	-1.55	-1.14
481130050	Texas	Dallas	-1.25	-0.95
481130069	Texas	Dallas	-1.26	-0.97
481130087	Texas	Dallas	-1.29	-0.99
481350003	Texas	Ector	-0.44	-0.33
481410037	Texas	El Paso	-0.22	-0.15
482010058	Texas	Harris	-0.99	-0.71
482011035	Texas	Harris	-1.04	-0.68
482030002	Texas	Harrison	-1.65	-1.16
482150043	Texas	Hidalgo	-0.75	-0.57
482450021	Texas	Jefferson	-1.15	-0.86
483550032	Texas	Nueces	-1.00	-0.73
483550034	Texas	Nueces	-0.97	-0.72
483611001	Texas	Orange	-1.14	-0.88

Annual $PM_{2.5}$ ($\mu g/m^3$)				
Monitor ID	State	County	Difference: 2014 Remedy - 2012 Base Case	Difference: 2014 Remedy - 2014 Base Case
484391002	Texas	Tarrant	-1.22	-0.93
484391006	Texas	Tarrant	-1.23	-0.93
500010002	Vermont	Addison	-0.67	-0.53
500010003	Vermont	Addison	-0.68	-0.53
500030004	Vermont	Bennington	-0.75	-0.59
500070012	Vermont	Chittenden	-0.68	-0.53
500070014	Vermont	Chittenden	-0.69	-0.54
500210002	Vermont	Rutland	-0.70	-0.54
510130020	Virginia	Arlington	-2.00	-1.58
510360002	Virginia	Charles	-1.89	-1.53
510410003	Virginia	Chesterfield	-2.05	-1.65
510590030	Virginia	Fairfax	-1.84	-1.46
510591005	Virginia	Fairfax	-1.88	-1.48
510595001	Virginia	Fairfax	-1.93	-1.53
510870014	Virginia	Henrico	-2.07	-1.66
510870015	Virginia	Henrico	-2.16	-1.71
511071005	Virginia	Loudoun	-1.99	-1.60
511390004	Virginia	Page	-2.40	-1.98
515200006	Virginia	Bristol City	-2.70	-2.11
516500004	Virginia	Hampton City	-1.69	-1.35
516800015	Virginia	Lynchburg City	-2.36	-1.88
517100024	Virginia	Norfolk City	-1.67	-1.31
517700014	Virginia	Roanoke City	-2.67	-2.07
517750010	Virginia	Salem City	-2.59	-2.00
518100008	Virginia	Virginia Beach City	-1.69	-1.34
540030003	West Virginia	Berkeley	-2.28	-1.89
540090005	West Virginia	Brooke	-2.99	-2.50
540090011	West Virginia	Brooke	-2.98	-2.50
540110006	West Virginia	Cabell	-3.14	-2.48
540291004	West Virginia	Hancock	-2.92	-2.47
540330003	West Virginia	Harrison	-3.81	-3.35
540390010	West Virginia	Kanawha	-3.27	-2.65
540390011	West Virginia	Kanawha	-3.00	-2.46
540391005	West Virginia	Kanawha	-3.35	-2.71
540490006	West Virginia	Marion	-4.06	-3.60
540511002	West Virginia	Marshall	-3.18	-2.68

Annual $PM_{2.5}$ ($\mu g/m^3$)				
Monitor ID	State	County	Difference: 2014 Remedy - 2012 Base Case	Difference: 2014 Remedy - 2014 Base Case
540610003	West Virginia	Monongalia	-3.61	-3.13
540690010	West Virginia	Ohio	-3.02	-2.54
540810002	West Virginia	Raleigh	-2.83	-2.31
541071002	West Virginia	Wood	-2.90	-2.32
550030010	Wisconsin	Ashland	-0.37	-0.28
550090005	Wisconsin	Brown	-0.75	-0.51
550250047	Wisconsin	Dane	-1.08	-0.75
550270007	Wisconsin	Dodge	-1.02	-0.71
550410007	Wisconsin	Forest	-0.54	-0.39
550430009	Wisconsin	Grant	-1.05	-0.75
550590019	Wisconsin	Kenosha	-1.36	-0.91
550710007	Wisconsin	Manitowoc	-0.79	-0.53
550790010	Wisconsin	Milwaukee	-1.27	-0.83
550790026	Wisconsin	Milwaukee	-1.26	-0.83
550790043	Wisconsin	Milwaukee	-1.30	-0.84
550790059	Wisconsin	Milwaukee	-1.27	-0.82
550790099	Wisconsin	Milwaukee	-1.26	-0.82
550870009	Wisconsin	Outagamie	-0.78	-0.54
550890009	Wisconsin	Ozaukee	-1.13	-0.77
551091002	Wisconsin	St. Croix	-0.61	-0.41
551110007	Wisconsin	Sauk	-1.03	-0.74
551198001	Wisconsin	Taylor	-0.60	-0.44
551250001	Wisconsin	Vilas	-0.48	-0.36
551330027	Wisconsin	Waukesha	-1.16	-0.75
560050877	Wyoming	Campbell	-0.01	0.01
560050892	Wyoming	Campbell	0.00	0.01
560050899	Wyoming	Campbell	0.00	0.01
560090819	Wyoming	Converse	0.00	0.01
560131003	Wyoming	Fremont	-0.06	0.01
560210001	Wyoming	Laramie	-0.03	0.01
560330002	Wyoming	Sheridan	-0.06	0.01

24-Hour $PM_{2.5}$ ($\mu g/m^3$)				
Monitor ID	State	County	Difference: 2014 Remedy - 2012 Base Case	Difference: 2014 Remedy - 2014 Base Case
010030010	Alabama	Baldwin	-4.5	-3.5
010270001	Alabama	Clay	-6.7	-5.2
010331002	Alabama	Colbert	-8.1	-6.8
010491003	Alabama	De Kalb	-6.4	-5.1
010530002	Alabama	Escambia	-3.8	-3.0
010550010	Alabama	Etowah	-6.9	-5.7
010690003	Alabama	Houston	-4.3	-3.4
010730023	Alabama	Jefferson	-5.8	-4.5
010731005	Alabama	Jefferson	-5.9	-4.6
010731009	Alabama	Jefferson	-8.2	-7.0
010731010	Alabama	Jefferson	-7.3	-5.8
010732003	Alabama	Jefferson	-4.8	-3.7
010732006	Alabama	Jefferson	-6.5	-5.5
010735002	Alabama	Jefferson	-7.2	-5.8
010735003	Alabama	Jefferson	-6.9	-5.6
010890014	Alabama	Madison	-8.9	-7.5
010970002	Alabama	Mobile	-4.6	-3.3
010970003	Alabama	Mobile	-4.6	-3.4
011010007	Alabama	Montgomery	-5.9	-4.8
011030011	Alabama	Morgan	-7.8	-6.5
011130001	Alabama	Russell	-5.8	-4.4
011170006	Alabama	Shelby	-6.7	-5.6
011190002	Alabama	Sumter	-5.9	-4.9
011210002	Alabama	Talladega	-6.8	-5.7
011250004	Alabama	Tuscaloosa	-6.0	-4.9
011270002	Alabama	Walker	-6.8	-5.5
050010011	Arkansas	Arkansas	-6.6	-5.4
050030005	Arkansas	Ashley	-4.1	-3.1
050350005	Arkansas	Crittenden	-10.0	-8.1
050450002	Arkansas	Faulkner	-6.1	-4.9
050510003	Arkansas	Garland	-5.9	-4.6
051070001	Arkansas	Phillips	-6.5	-5.1
051130002	Arkansas	Polk	-5.1	-3.8
051150003	Arkansas	Pope	-6.0	-5.1
051190007	Arkansas	Pulaski	-6.0	-4.6
051191004	Arkansas	Pulaski	-4.9	-4.0

24-Hour $PM_{2.5}$ ($\mu g/m^3$)				
Monitor ID	**State**	**County**	**Difference: 2014 Remedy - 2012 Base Case**	**Difference: 2014 Remedy - 2014 Base Case**
051191005	Arkansas	Pulaski	-5.5	-4.2
051390006	Arkansas	Union	-4.3	-3.4
051450001	Arkansas	White	-5.7	-4.5
080010006	Colorado	Adams	-0.8	0.1
080050005	Colorado	Arapahoe	-0.8	-0.1
080130003	Colorado	Boulder	-0.2	0.1
080130012	Colorado	Boulder	-0.4	0.0
080290004	Colorado	Delta	-0.6	-0.1
080310002	Colorado	Denver	-0.7	0.1
080310023	Colorado	Denver	-0.4	0.2
080390001	Colorado	Elbert	-0.5	-0.1
080410008	Colorado	El Paso	-0.4	0.0
080410011	Colorado	El Paso	-0.4	0.0
080690009	Colorado	Larimer	-0.2	0.1
080770017	Colorado	Mesa	-0.9	-0.1
081010012	Colorado	Pueblo	-0.3	0.0
081130004	Colorado	San Miguel	-0.1	0.0
081230006	Colorado	Weld	0.0	0.2
081230008	Colorado	Weld	-0.3	0.0
090010010	Connecticut	Fairfield	-4.2	-2.9
090011123	Connecticut	Fairfield	-3.9	-2.9
090013005	Connecticut	Fairfield	-6.5	-5.2
090019003	Connecticut	Fairfield	-6.4	-5.1
090031003	Connecticut	Hartford	-4.1	-3.0
090050005	Connecticut	Litchfield	-5.2	-4.2
090090026	Connecticut	New Haven	-4.9	-3.7
090090027	Connecticut	New Haven	-5.2	-4.1
090091123	Connecticut	New Haven	-5.0	-3.6
090092008	Connecticut	New Haven	-5.5	-4.4
090092123	Connecticut	New Haven	-4.4	-3.4
090113002	Connecticut	New London	-5.3	-4.4
100010002	Delaware	Kent	-3.8	-3.0
100010003	Delaware	Kent	-4.5	-3.8
100031003	Delaware	New Castle	-3.5	-2.6
100031007	Delaware	New Castle	-5.3	-4.2
100031012	Delaware	New Castle	-2.2	-1.3
100032004	Delaware	New Castle	-3.8	-2.7

24-Hour $PM_{2.5}$ (µg/m^3)				
Monitor ID	State	County	Difference: 2014 Remedy - 2012 Base Case	Difference: 2014 Remedy - 2014 Base Case
100051002	Delaware	Sussex	-3.1	-2.4
110010041	District Of Columbia		-6.9	-5.7
110010042	District Of Columbia		-6.6	-5.3
110010043	District Of Columbia		-6.6	-5.4
120010023	Florida	Alachua	-3.6	-2.9
120010024	Florida	Alachua	-2.7	-2.4
120051004	Florida	Bay	-3.3	-2.7
120090007	Florida	Brevard	-2.9	-2.2
120111002	Florida	Broward	-1.6	-1.2
120112004	Florida	Broward	-1.8	-1.3
120113002	Florida	Broward	-1.6	-1.1
120170005	Florida	Citrus	-3.7	-3.2
120310098	Florida	Duval	-2.0	-1.6
120310099	Florida	Duval	-2.0	-1.6
120330004	Florida	Escambia	-3.4	-2.7
120570030	Florida	Hillsborough	-2.3	-1.8
120573002	Florida	Hillsborough	-2.7	-2.1
120710005	Florida	Lee	-1.8	-1.3
120730012	Florida	Leon	-3.4	-2.6
120814012	Florida	Manatee	-2.6	-2.0
120830003	Florida	Marion	-3.3	-2.7
120861016	Florida	Miami-Dade	-1.7	-1.3
120866001	Florida	Miami-Dade	-1.9	-1.4
120952002	Florida	Orange	-2.6	-2.0
120990009	Florida	Palm Beach	-1.2	-0.9
120992005	Florida	Palm Beach	-1.6	-1.1
121030018	Florida	Pinellas	-1.8	-1.3
121031009	Florida	Pinellas	-1.6	-1.1
121056006	Florida	Polk	-1.7	-1.4
121111002	Florida	St Lucie	-2.4	-1.9
121150013	Florida	Sarasota	-2.6	-2.0
121171002	Florida	Seminole	-3.4	-2.6
121275002	Florida	Volusia	-3.2	-2.5
130210007	Georgia	Bibb	-4.3	-2.8
130210012	Georgia	Bibb	-5.9	-4.3
130510017	Georgia	Chatham	-3.3	-2.4
130510091	Georgia	Chatham	-3.6	-2.8

24-Hour $PM_{2.5}$ ($\mu g/m^3$)				
Monitor ID	State	County	Difference: 2014 Remedy - 2012 Base Case	Difference: 2014 Remedy - 2014 Base Case
130630091	Georgia	Clayton	-5.3	-4.0
130670003	Georgia	Cobb	-5.8	-4.5
130670004	Georgia	Cobb	-5.3	-3.6
130890002	Georgia	De Kalb	-5.2	-3.6
130892001	Georgia	De Kalb	-5.2	-3.7
130950007	Georgia	Dougherty	-4.1	-3.2
131150005	Georgia	Floyd	-5.5	-4.3
131210032	Georgia	Fulton	-4.8	-3.6
131210039	Georgia	Fulton	-4.6	-3.0
131270006	Georgia	Glynn	-2.8	-2.1
131350002	Georgia	Gwinnett	-5.9	-4.2
131390003	Georgia	Hall	-5.6	-4.2
131530001	Georgia	Houston	-6.0	-4.5
131850003	Georgia	Lowndes	-3.4	-2.5
132150001	Georgia	Muscogee	-4.1	-2.9
132150008	Georgia	Muscogee	-4.6	-3.3
132150011	Georgia	Muscogee	-4.1	-2.9
132230003	Georgia	Paulding	-5.4	-4.2
132450005	Georgia	Richmond	-3.8	-2.7
132450091	Georgia	Richmond	-4.2	-3.3
132950002	Georgia	Walker	-4.7	-3.5
133030001	Georgia	Washington	-5.5	-3.8
133190001	Georgia	Wilkinson	-6.2	-4.5
170010006	Illinois	Adams	-6.7	-5.0
170190004	Illinois	Champaign	-5.3	-3.7
170191001	Illinois	Champaign	-4.8	-3.7
170310022	Illinois	Cook	-3.0	-2.2
170310050	Illinois	Cook	-3.6	-2.1
170310052	Illinois	Cook	-5.4	-3.7
170310057	Illinois	Cook	-5.2	-3.5
170310076	Illinois	Cook	-4.1	-2.6
170311016	Illinois	Cook	-4.9	-3.2
170312001	Illinois	Cook	-4.2	-3.0
170313103	Illinois	Cook	-4.7	-3.2
170313301	Illinois	Cook	-4.7	-3.2
170314007	Illinois	Cook	-5.5	-3.8
170314201	Illinois	Cook	-3.5	-1.8

24-Hour $PM_{2.5}$ ($\mu g/m^3$)				
Monitor ID	State	County	Difference: 2014 Remedy - 2012 Base Case	Difference: 2014 Remedy - 2014 Base Case
170316005	Illinois	Cook	-2.2	-0.8
170434002	Illinois	Du Page	-3.3	-2.0
170650002	Illinois	Hamilton	-8.4	-6.6
170831001	Illinois	Jersey	-6.3	-4.5
170890003	Illinois	Kane	-3.2	-1.5
170890007	Illinois	Kane	-2.7	-1.0
170971007	Illinois	Lake	-6.4	-4.3
170990007	Illinois	La Salle	-3.5	-2.3
171110001	Illinois	McHenry	-4.5	-3.1
171132003	Illinois	McLean	-5.9	-4.5
171150013	Illinois	Macon	-8.1	-6.1
171190023	Illinois	Madison	-6.8	-4.5
171191007	Illinois	Madison	-7.3	-5.4
171192009	Illinois	Madison	-7.3	-5.5
171193007	Illinois	Madison	-8.7	-7.3
171430037	Illinois	Peoria	-4.8	-3.0
171570001	Illinois	Randolph	-3.6	-1.9
171613002	Illinois	Rock Island	-2.2	-1.4
171630010	Illinois	St Clair	-6.2	-4.2
171634001	Illinois	St Clair	-3.4	-1.5
171670012	Illinois	Sangamon	-5.6	-4.4
171971002	Illinois	Will	-5.4	-3.7
171971011	Illinois	Will	-7.2	-5.5
172010013	Illinois	Winnebago	-3.4	-2.0
180030004	Indiana	Allen	-4.0	-3.3
180030014	Indiana	Allen	-4.5	-3.9
180190006	Indiana	Clark	-8.8	-7.1
180350006	Indiana	Delaware	-6.2	-4.8
180372001	Indiana	Dubois	-6.8	-5.4
180390003	Indiana	Elkhart	-3.6	-2.4
180431004	Indiana	Floyd	-9.5	-7.8
180650003	Indiana	Henry	-6.8	-5.5
180670003	Indiana	Howard	-5.7	-4.2
180830004	Indiana	Knox	-7.1	-5.7
180890006	Indiana	Lake	-4.1	-3.1
180890022	Indiana	Lake	-2.8	-1.6
180890026	Indiana	Lake	-3.7	-2.5

24-Hour $PM_{2.5}$ ($\mu g/m^3$)				
Monitor ID	State	County	Difference: 2014 Remedy - 2012 Base Case	Difference: 2014 Remedy - 2014 Base Case
180890027	Indiana	Lake	-3.5	-2.5
180890031	Indiana	Lake	-6.2	-4.8
180891003	Indiana	Lake	-2.6	-1.7
180892004	Indiana	Lake	-2.2	-1.2
180892010	Indiana	Lake	-3.9	-2.8
180910011	Indiana	La Porte	-4.8	-3.5
180910012	Indiana	La Porte	-3.2	-2.3
180950009	Indiana	Madison	-7.2	-5.9
180970042	Indiana	Marion	-8.6	-7.2
180970043	Indiana	Marion	-9.1	-7.7
180970066	Indiana	Marion	-8.1	-6.6
180970078	Indiana	Marion	-8.9	-7.2
180970079	Indiana	Marion	-8.4	-6.6
180970081	Indiana	Marion	-8.9	-7.2
180970083	Indiana	Marion	-8.2	-6.6
181270020	Indiana	Porter	-4.5	-3.2
181270024	Indiana	Porter	-3.4	-2.2
181410014	Indiana	St Joseph	-3.6	-2.8
181411008	Indiana	St Joseph	-1.2	-0.5
181412004	Indiana	St Joseph	-1.3	-0.6
181470009	Indiana	Spencer	-10.5	-9.0
181570008	Indiana	Tippecanoe	-9.0	-7.5
181630006	Indiana	Vanderburgh	-5.6	-4.5
181630012	Indiana	Vanderburgh	-5.2	-4.2
181630016	Indiana	Vanderburgh	-3.9	-3.0
181670018	Indiana	Vigo	-8.4	-7.1
181670023	Indiana	Vigo	-9.7	-7.9
190130008	Iowa	Black Hawk	-1.9	-1.0
190450021	Iowa	Clinton	-2.9	-1.9
191032001	Iowa	Johnson	-2.6	-1.1
191130037	Iowa	Linn	-4.3	-3.4
191370002	Iowa	Montgomery	-4.7	-3.6
191390015	Iowa	Muscatine	-2.2	-1.2
191471002	Iowa	Palo Alto	-3.3	-2.4
191530030	Iowa	Polk	-2.9	-1.9
191532510	Iowa	Polk	-3.2	-2.2
191532520	Iowa	Polk	-2.5	-1.7

24-Hour $PM_{2.5}$ ($\mu g/m^3$)				
Monitor ID	State	County	Difference: 2014 Remedy - 2012 Base Case	Difference: 2014 Remedy - 2014 Base Case
191550009	Iowa	Pottawattamie	-2.3	-1.5
191630015	Iowa	Scott	-3.0	-2.0
191630018	Iowa	Scott	-2.9	-2.0
191630019	Iowa	Scott	-3.8	-2.1
191770006	Iowa	Van Buren	-1.3	-0.5
191930017	Iowa	Woodbury	-2.0	-1.4
191970004	Iowa	Wright	-3.5	-2.8
200910007	Kansas	Johnson	-3.6	-2.7
200910009	Kansas	Johnson	-2.5	-1.7
200910010	Kansas	Johnson	-4.5	-3.6
201070002	Kansas	Linn	-3.9	-2.8
201730008	Kansas	Sedgwick	-3.2	-2.4
201730009	Kansas	Sedgwick	-3.3	-2.6
201730010	Kansas	Sedgwick	-2.5	-1.9
201770010	Kansas	Shawnee	-2.4	-1.5
201910002	Kansas	Sumner	-2.3	-1.5
202090021	Kansas	Wyandotte	-3.0	-1.8
202090022	Kansas	Wyandotte	-3.6	-2.9
210130002	Kentucky	Bell	-5.8	-4.6
210190017	Kentucky	Boyd	-10.0	-8.2
210290006	Kentucky	Bullitt	-10.5	-8.7
210370003	Kentucky	Campbell	-8.7	-7.5
210430500	Kentucky	Carter	-9.6	-7.9
210470006	Kentucky	Christian	-10.9	-9.1
210590005	Kentucky	Daviess	-12.3	-10.4
210670012	Kentucky	Fayette	-8.9	-6.8
210670014	Kentucky	Fayette	-7.9	-6.0
210730006	Kentucky	Franklin	-8.3	-6.4
210930006	Kentucky	Hardin	-10.7	-8.8
211010014	Kentucky	Henderson	-7.7	-6.6
211110043	Kentucky	Jefferson	-9.3	-7.7
211110044	Kentucky	Jefferson	-9.6	-7.8
211110048	Kentucky	Jefferson	-7.3	-5.6
211110051	Kentucky	Jefferson	-10.4	-8.6
211170007	Kentucky	Kenton	-7.7	-6.3
211250004	Kentucky	Laurel	-5.6	-4.5
211451004	Kentucky	McCracken	-9.9	-7.9

24-Hour $PM_{2.5}$ ($\mu g/m^3$)				
Monitor ID	State	County	Difference: 2014 Remedy - 2012 Base Case	Difference: 2014 Remedy - 2014 Base Case
211510003	Kentucky	Madison	-7.3	-5.9
211930003	Kentucky	Perry	-8.3	-6.7
211950002	Kentucky	Pike	-7.9	-6.5
212270007	Kentucky	Warren	-10.7	-8.8
220171002	Louisiana	Caddo	-3.7	-2.5
220190009	Louisiana	Calcasieu	-3.5	-2.9
220190010	Louisiana	Calcasieu	-4.6	-3.8
220290003	Louisiana	Concordia	-5.9	-4.7
220330009	Louisiana	East Baton Rouge	-3.0	-2.1
220331001	Louisiana	East Baton Rouge	-2.5	-1.8
220470005	Louisiana	Iberville	-2.1	-1.3
220470009	Louisiana	Iberville	-4.5	-3.6
220511001	Louisiana	Jefferson	-3.5	-2.8
220550006	Louisiana	Lafayette	-4.4	-3.6
220730004	Louisiana	Ouachita	-4.4	-3.3
220790002	Louisiana	Rapides	-5.7	-4.5
221050001	Louisiana	Tangipahoa	-4.2	-3.1
221090001	Louisiana	Terrebonne	-4.4	-3.5
221210001	Louisiana	West Baton Rouge	-2.7	-1.9
230010011	Maine	Androscoggin	-2.4	-1.7
230030013	Maine	Aroostook	-1.2	-0.9
230031011	Maine	Aroostook	-1.3	-0.9
230050015	Maine	Cumberland	-1.5	-0.9
230050027	Maine	Cumberland	-2.2	-1.5
230090103	Maine	Hancock	-1.6	-1.5
230110016	Maine	Kennebec	-2.3	-1.6
230172011	Maine	Oxford	-1.8	-1.2
230190002	Maine	Penobscot	-1.7	-1.1
240030014	Maryland	Anne Arundel	-7.1	-6.2
240031003	Maryland	Anne Arundel	-5.5	-4.3
240032002	Maryland	Anne Arundel	-4.6	-3.6
240051007	Maryland	Baltimore	-5.6	-4.2
240053001	Maryland	Baltimore	-5.0	-4.1
240150003	Maryland	Cecil	-3.4	-2.5
240251001	Maryland	Harford	-4.4	-3.5
240313001	Maryland	Montgomery	-7.2	-6.1
240330030	Maryland	Prince Georges	-6.8	-5.7

24-Hour $PM_{2.5}$ ($\mu g/m^3$)				
Monitor ID	State	County	Difference: 2014 Remedy - 2012 Base Case	Difference: 2014 Remedy - 2014 Base Case
240338003	Maryland	Prince Georges	-7.5	-6.5
240430009	Maryland	Washington	-6.3	-5.4
245100006	Maryland	Baltimore City	-3.6	-2.5
245100007	Maryland	Baltimore City	-4.0	-2.8
245100008	Maryland	Baltimore City	-3.7	-2.4
245100035	Maryland	Baltimore City	-4.6	-3.5
245100040	Maryland	Baltimore City	-4.4	-3.2
245100049	Maryland	Baltimore City	-3.4	-2.3
250035001	Massachusetts	Berkshire	-4.0	-3.1
250051004	Massachusetts	Bristol	-1.5	-1.5
250092006	Massachusetts	Essex	-2.5	-2.0
250095005	Massachusetts	Essex	-3.0	-2.6
250096001	Massachusetts	Essex	-2.2	-1.7
250130008	Massachusetts	Hampden	-2.6	-1.9
250130016	Massachusetts	Hampden	-2.9	-2.2
250132009	Massachusetts	Hampden	-2.5	-1.8
250230004	Massachusetts	Plymouth	-2.6	-2.3
250250002	Massachusetts	Suffolk	-1.5	-0.9
250250027	Massachusetts	Suffolk	-1.5	-0.9
250250042	Massachusetts	Suffolk	-2.1	-1.5
250250043	Massachusetts	Suffolk	-3.0	-2.5
250270016	Massachusetts	Worcester	-2.7	-2.0
250270023	Massachusetts	Worcester	-2.6	-2.0
260050003	Michigan	Allegan	-3.0	-2.0
260170014	Michigan	Bay	-3.1	-2.2
260210014	Michigan	Berrien	-3.7	-2.4
260490021	Michigan	Genesee	-2.6	-1.7
260650012	Michigan	Ingham	-2.8	-1.9
260770008	Michigan	Kalamazoo	-4.0	-3.1
260810020	Michigan	Kent	-3.9	-2.6
260990009	Michigan	Macomb	-2.4	-1.4
261130001	Michigan	Missaukee	-4.6	-3.5
261150005	Michigan	Monroe	-7.5	-5.7
261210040	Michigan	Muskegon	-3.8	-2.3
261250001	Michigan	Oakland	-7.2	-5.6
261390005	Michigan	Ottawa	-2.4	-1.6
261450018	Michigan	Saginaw	-3.2	-2.1

24-Hour $PM_{2.5}$ ($\mu g/m^3$)				
Monitor ID	**State**	**County**	**Difference: 2014 Remedy - 2012 Base Case**	**Difference: 2014 Remedy - 2014 Base Case**
261470005	Michigan	St Clair	-4.0	-2.8
261610005	Michigan	Washtenaw	-3.2	-2.1
261610008	Michigan	Washtenaw	-6.6	-5.5
261630001	Michigan	Wayne	-4.0	-2.4
261630015	Michigan	Wayne	-4.7	-3.3
261630016	Michigan	Wayne	-5.2	-4.2
261630019	Michigan	Wayne	-2.6	-1.6
261630025	Michigan	Wayne	-4.4	-2.9
261630033	Michigan	Wayne	-5.1	-3.9
261630036	Michigan	Wayne	-4.9	-3.9
261630039	Michigan	Wayne	-3.5	-2.4
270210001	Minnesota	Cass	-1.3	-0.8
270370470	Minnesota	Dakota	-2.3	-1.3
270530050	Minnesota	Hennepin	-2.5	-1.5
270530961	Minnesota	Hennepin	-2.4	-1.7
270530963	Minnesota	Hennepin	-2.2	-1.3
270530965	Minnesota	Hennepin	-1.7	-1.0
270531007	Minnesota	Hennepin	-2.0	-1.1
270532006	Minnesota	Hennepin	-3.1	-2.1
270953051	Minnesota	Mille Lacs	-2.0	-1.4
271230866	Minnesota	Ramsey	-2.7	-1.9
271230868	Minnesota	Ramsey	-2.5	-1.5
271230871	Minnesota	Ramsey	-2.2	-1.1
271377001	Minnesota	St Louis	-1.3	-0.9
271377550	Minnesota	St Louis	-2.2	-1.5
271377551	Minnesota	St Louis	-2.7	-2.2
271390505	Minnesota	Scott	-2.6	-2.0
280010004	Mississippi	Adams	-5.6	-4.5
280110001	Mississippi	Bolivar	-5.5	-4.2
280330002	Mississippi	De Soto	-8.7	-7.0
280350004	Mississippi	Forrest	-3.5	-2.5
280470008	Mississippi	Harrison	-4.4	-3.4
280490010	Mississippi	Hinds	-5.2	-4.0
280590006	Mississippi	Jackson	-4.2	-3.2
280670002	Mississippi	Jones	-4.3	-3.2
280810005	Mississippi	Lee	-8.3	-6.8
280870001	Mississippi	Lowndes	-7.6	-6.1

24-Hour $PM_{2.5}$ ($\mu g/m^3$)				
Monitor ID	**State**	**County**	**Difference: 2014 Remedy - 2012 Base Case**	**Difference: 2014 Remedy - 2014 Base Case**
281490004	Mississippi	Warren	-4.9	-3.8
290190004	Missouri	Boone	-5.4	-4.2
290210005	Missouri	Buchanan	-3.3	-2.6
290370003	Missouri	Cass	-4.9	-3.6
290390001	Missouri	Cedar	-5.0	-3.4
290470005	Missouri	Clay	-2.6	-1.8
290770032	Missouri	Greene	-4.9	-3.3
290950034	Missouri	Jackson	-2.8	-1.6
290990012	Missouri	Jefferson	-7.0	-5.2
291370001	Missouri	Monroe	-3.9	-2.6
291831002	Missouri	St Charles	-8.1	-6.5
291860006	Missouri	Ste Genevieve	-6.4	-4.9
291890004	Missouri	St Louis	-5.4	-3.4
291892003	Missouri	St Louis	-2.6	-1.5
295100007	Missouri	St Louis City	-7.6	-5.2
295100085	Missouri	St Louis City	-6.2	-4.4
295100086	Missouri	St Louis City	-4.2	-2.3
295100087	Missouri	St Louis City	-6.7	-4.5
300870307	Montana	Rosebud	0.0	0.2
301111065	Montana	Yellowstone	-0.1	0.0
310250002	Nebraska	Cass	-2.1	-1.4
310550019	Nebraska	Douglas	-1.8	-1.2
310550052	Nebraska	Douglas	-2.6	-1.8
310790004	Nebraska	Hall	-1.1	-0.7
311090022	Nebraska	Lancaster	-2.1	-1.4
311570003	Nebraska	Scotts Bluff	-0.4	-0.2
311770002	Nebraska	Washington	-2.7	-2.2
330012004	New Hampshire	Belknap	-2.7	-2.2
330050007	New Hampshire	Cheshire	-2.9	-2.2
330070014	New Hampshire	Coos	-3.2	-2.5
330090010	New Hampshire	Grafton	-2.7	-2.1
330110020	New Hampshire	Hillsborough	-2.5	-1.8
330111015	New Hampshire	Hillsborough	-2.0	-1.3
330115001	New Hampshire	Hillsborough	-4.6	-4.0
330131006	New Hampshire	Merrimack	-2.5	-1.9
330150014	New Hampshire	Rockingham	-2.7	-2.3
330190003	New Hampshire	Sullivan	-3.1	-2.2

24-Hour $PM_{2.5}$ ($\mu g/m^3$)				
Monitor ID	**State**	**County**	**Difference: 2014 Remedy - 2012 Base Case**	**Difference: 2014 Remedy - 2014 Base Case**
340030003	New Jersey	Bergen	-6.1	-4.5
340070003	New Jersey	Camden	-5.8	-4.6
340071007	New Jersey	Camden	-6.0	-4.6
340130015	New Jersey	Essex	-4.8	-3.3
340171003	New Jersey	Hudson	-4.1	-2.6
340172002	New Jersey	Hudson	-2.7	-1.0
340210008	New Jersey	Mercer	-6.8	-5.5
340230006	New Jersey	Middlesex	-5.4	-4.3
340270004	New Jersey	Morris	-6.1	-4.9
340273001	New Jersey	Morris	-7.2	-6.0
340292002	New Jersey	Ocean	-6.2	-5.1
340310005	New Jersey	Passaic	-6.5	-5.0
340390004	New Jersey	Union	-4.8	-3.3
340390006	New Jersey	Union	-6.9	-5.3
340392003	New Jersey	Union	-5.1	-3.7
340410006	New Jersey	Warren	-5.8	-4.9
350010023	New Mexico	Bernalillo	-0.8	-0.2
350010024	New Mexico	Bernalillo	-0.7	-0.3
350050005	New Mexico	Chaves	-1.4	-1.1
350130017	New Mexico	Dona Ana	-0.7	-0.4
350130025	New Mexico	Dona Ana	-0.9	-0.7
350431003	New Mexico	Sandoval	-0.6	-0.4
350439011	New Mexico	Sandoval	-0.4	-0.2
350450006	New Mexico	San Juan	-0.1	-0.1
350490020	New Mexico	Santa Fe	-0.3	-0.2
360010005	New York	Albany	-2.7	-1.9
360050080	New York	Bronx	-4.6	-2.8
360050083	New York	Bronx	-6.5	-4.5
360050110	New York	Bronx	-4.4	-2.6
360130011	New York	Chautauqua	-7.2	-6.2
360290005	New York	Erie	-3.9	-3.1
360291007	New York	Erie	-4.4	-3.6
360310003	New York	Essex	-4.6	-3.7
360470122	New York	Kings	-5.4	-3.7
360551007	New York	Monroe	-5.0	-4.0
360590008	New York	Nassau	-5.7	-4.3
360610056	New York	New York	-5.5	-3.5

24-Hour $PM_{2.5}$ ($\mu g/m^3$)				
Monitor ID	State	County	Difference: 2014 Remedy - 2012 Base Case	Difference: 2014 Remedy - 2014 Base Case
360610062	New York	New York	-5.5	-4.1
360610079	New York	New York	-4.7	-2.9
360610128	New York	New York	-4.6	-3.0
360632008	New York	Niagara	-5.3	-4.5
360671015	New York	Onondaga	-5.3	-4.4
360710002	New York	Orange	-3.0	-2.1
360810124	New York	Queens	-5.6	-4.0
360850055	New York	Richmond	-5.9	-4.5
360850067	New York	Richmond	-5.7	-4.3
360893001	New York	St Lawrence	-2.4	-1.9
361010003	New York	Steuben	-5.9	-5.0
361030001	New York	Suffolk	-6.8	-5.4
361191002	New York	Westchester	-4.7	-3.2
370010002	North Carolina	Alamance	-6.0	-4.6
370210034	North Carolina	Buncombe	-6.3	-5.3
370330001	North Carolina	Caswell	-5.3	-4.2
370350004	North Carolina	Catawba	-5.4	-4.4
370370004	North Carolina	Chatham	-6.0	-5.1
370510009	North Carolina	Cumberland	-5.2	-4.1
370570002	North Carolina	Davidson	-4.2	-3.3
370610002	North Carolina	Duplin	-4.9	-3.8
370630001	North Carolina	Durham	-6.1	-5.0
370650004	North Carolina	Edgecombe	-5.1	-3.9
370670022	North Carolina	Forsyth	-5.1	-4.1
370710016	North Carolina	Gaston	-5.6	-4.6
370810013	North Carolina	Guilford	-5.7	-4.5
370870010	North Carolina	Haywood	-5.1	-4.1
370990006	North Carolina	Jackson	-5.0	-3.8
371070004	North Carolina	Lenoir	-3.7	-2.6
371110004	North Carolina	McDowell	-5.5	-4.6
371170001	North Carolina	Martin	-4.3	-3.2
371190010	North Carolina	Mecklenburg	-4.8	-3.8
371190041	North Carolina	Mecklenburg	-5.0	-4.0
371190042	North Carolina	Mecklenburg	-4.8	-3.8
371210001	North Carolina	Mitchell	-6.7	-5.5
371230001	North Carolina	Montgomery	-5.9	-5.1
371290002	North Carolina	New Hanover	-4.9	-3.6

24-Hour $PM_{2.5}$ ($\mu g/m^3$)				
Monitor ID	**State**	**County**	**Difference: 2014 Remedy - 2012 Base Case**	**Difference: 2014 Remedy - 2014 Base Case**
371330005	North Carolina	Onslow	-4.5	-3.5
371350007	North Carolina	Orange	-5.7	-4.5
371470005	North Carolina	Pitt	-4.4	-3.2
371550005	North Carolina	Robeson	-5.9	-4.3
371590021	North Carolina	Rowan	-4.6	-3.8
371730002	North Carolina	Swain	-5.3	-4.2
371830014	North Carolina	Wake	-6.8	-5.7
371890003	North Carolina	Watauga	-6.7	-5.5
371910005	North Carolina	Wayne	-4.9	-3.0
380070002	North Dakota	Billings	-0.2	-0.1
380130003	North Dakota	Burke	-0.3	-0.2
380150003	North Dakota	Burleigh	-0.8	-0.5
380171004	North Dakota	Cass	-1.8	-1.2
380530002	North Dakota	McKenzie	-0.3	-0.2
380570004	North Dakota	Mercer	-0.5	-0.4
390090003	Ohio	Athens	-9.1	-7.4
390170003	Ohio	Butler	-8.3	-6.9
390170016	Ohio	Butler	-9.5	-7.6
390170017	Ohio	Butler	-10.6	-9.2
390171004	Ohio	Butler	-10.7	-9.0
390230005	Ohio	Clark	-9.2	-7.7
390250022	Ohio	Clermont	-10.4	-9.0
390350027	Ohio	Cuyahoga	-6.3	-5.3
390350034	Ohio	Cuyahoga	-8.9	-8.0
390350038	Ohio	Cuyahoga	-6.8	-5.6
390350045	Ohio	Cuyahoga	-9.2	-8.2
390350060	Ohio	Cuyahoga	-7.9	-6.9
390350065	Ohio	Cuyahoga	-9.8	-8.6
390351002	Ohio	Cuyahoga	-6.9	-6.1
390490024	Ohio	Franklin	-8.6	-6.7
390490025	Ohio	Franklin	-10.2	-8.3
390490081	Ohio	Franklin	-7.1	-5.3
390570005	Ohio	Greene	-9.3	-7.3
390610006	Ohio	Hamilton	-11.9	-10.4
390610014	Ohio	Hamilton	-10.7	-8.8
390610040	Ohio	Hamilton	-10.0	-8.2
390610042	Ohio	Hamilton	-7.8	-6.4

24-Hour $PM_{2.5}$ ($\mu g/m^3$)				
Monitor ID	State	County	Difference: 2014 Remedy - 2012 Base Case	Difference: 2014 Remedy - 2014 Base Case
390610043	Ohio	Hamilton	-10.3	-9.2
390617001	Ohio	Hamilton	-10.4	-9.0
390618001	Ohio	Hamilton	-9.6	-7.9
390810017	Ohio	Jefferson	-7.3	-5.8
390811001	Ohio	Jefferson	-9.4	-8.0
390851001	Ohio	Lake	-11.4	-10.0
390870010	Ohio	Lawrence	-8.3	-6.6
390933002	Ohio	Lorain	-7.1	-6.2
390950024	Ohio	Lucas	-6.4	-5.5
390950025	Ohio	Lucas	-2.9	-2.0
390950026	Ohio	Lucas	-5.6	-4.5
390990005	Ohio	Mahoning	-7.2	-6.2
390990014	Ohio	Mahoning	-7.8	-6.7
391130031	Ohio	Montgomery	-5.3	-4.1
391130032	Ohio	Montgomery	-10.8	-9.3
391330002	Ohio	Portage	-8.7	-7.8
391351001	Ohio	Preble	-10.4	-8.9
391450013	Ohio	Scioto	-8.8	-7.2
391510017	Ohio	Stark	-9.4	-8.3
391530017	Ohio	Summit	-8.5	-7.3
391530023	Ohio	Summit	-8.5	-7.2
391550007	Ohio	Trumbull	-8.0	-7.0
400159008	Oklahoma	Caddo	-3.1	-2.4
400219002	Oklahoma	Cherokee	-2.3	-1.3
400710602	Oklahoma	Kay	-1.9	-1.2
400719010	Oklahoma	Kay	-2.7	-2.0
400819005	Oklahoma	Lincoln	-3.6	-2.7
400970186	Oklahoma	Mayes	-2.3	-1.5
400979014	Oklahoma	Mayes	-3.6	-2.6
401010169	Oklahoma	Muskogee	-4.7	-4.0
401090035	Oklahoma	Oklahoma	-2.1	-1.2
401091037	Oklahoma	Oklahoma	-2.6	-1.7
401159004	Oklahoma	Ottawa	-3.6	-2.8
401210415	Oklahoma	Pittsburg	-3.8	-2.8
401359015	Oklahoma	Sequoyah	-4.1	-3.2
401430110	Oklahoma	Tulsa	-3.0	-1.9
401431127	Oklahoma	Tulsa	-4.1	-3.0

24-Hour $PM_{2.5}$ ($\mu g/m^3$)				
Monitor ID	State	County	Difference: 2014 Remedy - 2012 Base Case	Difference: 2014 Remedy - 2014 Base Case
420010001	Pennsylvania	Adams	-6.0	-5.1
420030008	Pennsylvania	Allegheny	-7.9	-6.7
420030021	Pennsylvania	Allegheny	-7.5	-6.3
420030064	Pennsylvania	Allegheny	-11.7	-9.1
420030067	Pennsylvania	Allegheny	-10.4	-8.9
420030093	Pennsylvania	Allegheny	-9.7	-8.1
420030095	Pennsylvania	Allegheny	-8.5	-7.0
420030116	Pennsylvania	Allegheny	-9.9	-8.2
420030133	Pennsylvania	Allegheny	-6.8	-5.3
420031008	Pennsylvania	Allegheny	-11.0	-9.2
420031301	Pennsylvania	Allegheny	-9.4	-7.8
420033007	Pennsylvania	Allegheny	-7.8	-6.4
420039002	Pennsylvania	Allegheny	-9.4	-7.8
420070014	Pennsylvania	Beaver	-9.2	-7.5
420110011	Pennsylvania	Berks	-3.4	-2.6
420170012	Pennsylvania	Bucks	-4.0	-2.5
420210011	Pennsylvania	Cambria	-11.5	-10.0
420270100	Pennsylvania	Centre	-7.4	-6.6
420290100	Pennsylvania	Chester	-4.7	-3.7
420410101	Pennsylvania	Cumberland	-2.6	-2.1
420430401	Pennsylvania	Dauphin	-3.1	-2.4
420450002	Pennsylvania	Delaware	-5.7	-4.7
420490003	Pennsylvania	Erie	-8.2	-6.9
420692006	Pennsylvania	Lackawanna	-6.5	-5.4
420710007	Pennsylvania	Lancaster	-1.2	-0.6
420770004	Pennsylvania	Lehigh	-4.4	-3.4
420791101	Pennsylvania	Luzerne	-4.8	-3.5
420850100	Pennsylvania	Mercer	-7.4	-6.5
420950025	Pennsylvania	Northampton	-5.0	-4.0
420990301	Pennsylvania	Perry	-4.3	-3.6
421010004	Pennsylvania	Philadelphia	-4.8	-3.6
421010024	Pennsylvania	Philadelphia	-6.8	-5.2
421010047	Pennsylvania	Philadelphia	-5.5	-4.5
421250005	Pennsylvania	Washington	-8.0	-6.5
421250200	Pennsylvania	Washington	-7.0	-5.8
421255001	Pennsylvania	Washington	-10.7	-9.3
421290008	Pennsylvania	Westmoreland	-10.2	-8.8

24-Hour $PM_{2.5}$ ($\mu g/m^3$)				
Monitor ID	State	County	Difference: 2014 Remedy - 2012 Base Case	Difference: 2014 Remedy - 2014 Base Case
421330008	Pennsylvania	York	-2.5	-1.8
440070022	Rhode Island	Providence	-3.1	-2.6
440070026	Rhode Island	Providence	-3.7	-3.0
440070028	Rhode Island	Providence	-2.9	-2.2
440071010	Rhode Island	Providence	-2.9	-2.3
450190049	South Carolina	Charleston	-4.1	-3.3
450250001	South Carolina	Chesterfield	-5.6	-4.6
450370001	South Carolina	Edgefield	-6.4	-4.8
450410002	South Carolina	Florence	-5.3	-4.2
450450008	South Carolina	Greenville	-5.0	-3.8
450450009	South Carolina	Greenville	-5.4	-4.1
450470003	South Carolina	Greenwood	-6.1	-4.6
450510002	South Carolina	Horry	-4.9	-3.8
450630008	South Carolina	Lexington	-5.6	-4.2
450730001	South Carolina	Oconee	-6.3	-5.0
450790007	South Carolina	Richland	-6.0	-4.6
450790019	South Carolina	Richland	-6.3	-4.8
450830010	South Carolina	Spartanburg	-5.9	-4.7
460110002	South Dakota	Brookings	-2.0	-1.4
460130003	South Dakota	Brown	-1.1	-0.7
460290002	South Dakota	Codington	-2.5	-1.9
460330132	South Dakota	Custer	-0.5	-0.3
460710001	South Dakota	Jackson	-0.9	-0.7
460990006	South Dakota	Minnehaha	-2.0	-1.3
460990007	South Dakota	Minnehaha	-2.4	-1.7
461030016	South Dakota	Pennington	-0.3	-0.1
461030020	South Dakota	Pennington	-0.2	0.0
461031001	South Dakota	Pennington	-0.4	-0.1
470090011	Tennessee	Blount	-7.0	-5.6
470370023	Tennessee	Davidson	-9.4	-8.0
470370025	Tennessee	Davidson	-8.1	-6.8
470370036	Tennessee	Davidson	-10.5	-8.9
470450004	Tennessee	Dyer	-9.2	-7.4
470650031	Tennessee	Hamilton	-4.3	-3.0
470651011	Tennessee	Hamilton	-7.0	-5.7
470654002	Tennessee	Hamilton	-6.6	-5.2
470930028	Tennessee	Knox	-7.2	-5.7

24-Hour $PM_{2.5}$ ($\mu g/m^3$)				
Monitor ID	**State**	**County**	**Difference: 2014 Remedy - 2012 Base Case**	**Difference: 2014 Remedy - 2014 Base Case**
470931017	Tennessee	Knox	-6.5	-5.2
470990002	Tennessee	Lawrence	-7.8	-6.5
471050108	Tennessee	Loudon	-6.5	-5.2
471071002	Tennessee	Mc Minn	-7.0	-5.5
471192007	Tennessee	Maury	-8.6	-7.3
471251009	Tennessee	Montgomery	-12.0	-10.2
471410001	Tennessee	Putnam	-10.3	-8.6
471450004	Tennessee	Roane	-6.8	-5.4
471570014	Tennessee	Shelby	-8.2	-6.4
471570038	Tennessee	Shelby	-9.0	-7.0
471570047	Tennessee	Shelby	-9.4	-7.4
471571004	Tennessee	Shelby	-8.9	-7.3
471631007	Tennessee	Sullivan	-5.5	-4.4
471650007	Tennessee	Sumner	-12.6	-10.9
480370004	Texas	Bowie	-5.1	-4.2
481130050	Texas	Dallas	-3.7	-2.5
481130069	Texas	Dallas	-3.7	-2.7
481130087	Texas	Dallas	-3.6	-2.7
481350003	Texas	Ector	-1.8	-1.4
481410037	Texas	El Paso	-0.6	-0.5
482011035	Texas	Harris	-3.6	-2.5
482030002	Texas	Harrison	-4.1	-3.1
482150043	Texas	Hidalgo	-2.8	-2.1
483550032	Texas	Nueces	-4.0	-3.0
483550034	Texas	Nueces	-3.9	-2.9
483611001	Texas	Orange	-4.7	-3.7
484391002	Texas	Tarrant	-3.3	-2.5
484391006	Texas	Tarrant	-3.4	-2.7
500010002	Vermont	Addison	-4.6	-3.6
500010003	Vermont	Addison	-5.8	-4.7
500030004	Vermont	Bennington	-3.9	-3.3
500070012	Vermont	Chittenden	-4.7	-3.8
500070014	Vermont	Chittenden	-3.1	-2.5
500210002	Vermont	Rutland	-1.7	-1.2
510130020	Virginia	Arlington	-8.2	-6.8
510360002	Virginia	Charles City	-6.7	-5.8
510410003	Virginia	Chesterfield	-5.7	-4.7

24-Hour $PM_{2.5}$ ($\mu g/m^3$)				
Monitor ID	**State**	**County**	**Difference: 2014 Remedy - 2012 Base Case**	**Difference: 2014 Remedy - 2014 Base Case**
510590030	Virginia	Fairfax	-7.6	-6.5
510591005	Virginia	Fairfax	-8.0	-6.7
510595001	Virginia	Fairfax	-7.5	-6.2
510870014	Virginia	Henrico	-6.5	-5.6
510870015	Virginia	Henrico	-7.1	-6.0
511071005	Virginia	Loudoun	-7.9	-6.8
511390004	Virginia	Page	-6.6	-5.5
515200006	Virginia	Bristol City	-6.5	-5.1
516500004	Virginia	Hampton City	-5.5	-4.5
516800015	Virginia	Lynchburg City	-7.8	-6.5
517100024	Virginia	Norfolk City	-4.8	-3.7
517700014	Virginia	Roanoke City	-7.2	-5.8
517750010	Virginia	Salem City	-6.7	-5.3
540030003	West Virginia	Berkeley	-4.7	-3.9
540090005	West Virginia	Brooke	-7.4	-5.9
540090011	West Virginia	Brooke	-9.2	-7.8
540110006	West Virginia	Cabell	-9.9	-8.3
540291004	West Virginia	Hancock	-10.0	-8.2
540330003	West Virginia	Harrison	-12.8	-11.6
540390010	West Virginia	Kanawha	-9.9	-8.5
540390011	West Virginia	Kanawha	-8.6	-7.3
540391005	West Virginia	Kanawha	-9.6	-8.1
540490006	West Virginia	Marion	-12.5	-11.3
540511002	West Virginia	Marshall	-8.8	-7.7
540610003	West Virginia	Monongalia	-13.1	-11.1
540690010	West Virginia	Ohio	-8.2	-7.0
540810002	West Virginia	Raleigh	-8.5	-7.3
540890001	West Virginia	Summers	-9.0	-7.7
541071002	West Virginia	Wood	-9.9	-7.3
550030010	Wisconsin	Ashland	-3.0	-2.4
550090005	Wisconsin	Brown	-2.9	-2.0
550090009	Wisconsin	Brown	-1.2	-0.7
550250047	Wisconsin	Dane	-2.8	-1.6
550270007	Wisconsin	Dodge	-2.5	-1.5
550410007	Wisconsin	Forest	-3.0	-2.4
550430009	Wisconsin	Grant	-2.4	-1.6
550590019	Wisconsin	Kenosha	-3.0	-1.5

24-Hour $PM_{2.5}$ ($\mu g/m^3$)				
Monitor ID	**State**	**County**	**Difference: 2014 Remedy - 2012 Base Case**	**Difference: 2014 Remedy - 2014 Base Case**
550710007	Wisconsin	Manitowoc	-3.0	-2.2
550790010	Wisconsin	Milwaukee	-4.7	-3.3
550790026	Wisconsin	Milwaukee	-3.7	-2.4
550790043	Wisconsin	Milwaukee	-4.6	-2.9
550790059	Wisconsin	Milwaukee	-4.1	-2.2
550790099	Wisconsin	Milwaukee	-3.4	-1.9
550870009	Wisconsin	Outagamie	-1.0	-0.5
550890009	Wisconsin	Ozaukee	-2.9	-1.9
551091002	Wisconsin	St Croix	-2.0	-1.2
551110007	Wisconsin	Sauk	-1.3	-0.6
551198001	Wisconsin	Taylor	-1.6	-1.0
551250001	Wisconsin	Vilas	-2.1	-1.5
551330027	Wisconsin	Waukesha	-2.7	-1.3
560050877	Wyoming	Campbell	-0.1	0.0
560050892	Wyoming	Campbell	0.0	0.0
560050899	Wyoming	Campbell	0.0	0.1
560090819	Wyoming	Converse	0.0	0.0
560131003	Wyoming	Fremont	-0.3	0.0
560210001	Wyoming	Laramie	-0.1	0.0
560330002	Wyoming	Sheridan	-0.2	0.0

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Appendix C

Ozone and PM2.5 Contribution Calculation Examples

As described in Section IV, the contribution of ozone and PM2.5 from upwind states to downwind nonattainment and maintenance receptors was calculated using a combination of MATS and other post-processing software. This appendix describes the calculations in more detail.

8-Hour Ozone **[All example concentrations are in ppb]**

The 2012 future year base case ozone design value calculations are described in Section III.C. The 2012 design values were calculated by running MATS using the CAMx 2005 base year and 2012 future base case model outputs. The contribution metrics were calculated as described in Section IV.D. There are several pieces of information needed to calculate the upwind ozone contributions to downwind ozone receptor sites.

1) The 2012 base case 8-hr design values at each receptor.
2) The relative response factors (RRFs) from each "source apportionment" MATS run. The source apportionment MATS run is described in Section IV.B steps 4 and 5. The source apportionment MATS runs specify the "base" year model file as the 2012 CAMx base case and the "future" year model file as the 2012 CAMx source apportionment case. A separate source apportionment MATS case is run for each upwind state.

The 2012 future year design values are shown in the example below as the variable "f_o3_DV" (from the MATS output file "*scenario_name* - Ozone Monitors -- monitor data, temporally adjusted 2012.csv")

_id	lat	Long	referencecell	f_o3_DV	_state_name	_county_name
10331002	34.76056	-87.6506	155091	**64.5**	Alabama	Colbert
10731003	33.48556	-86.915	162080	**69.7**	Alabama	Jefferson
10731005	33.33111	-87.0036	162078	**71**	Alabama	Jefferson
10731009	33.45972	-87.3056	159079	**66.4**	Alabama	Jefferson

These values are multiplied by the RRFs calculated from each source apportionment MATS run (for each upwind state). The values in the orange column (below) represent the relative ozone contribution from an upwind state to each downwind receptor. For example, an RRF value of 0.9569 for Colbert County means that the upwind state contributes 4.31% [(1 – 0.9569)* 100)] of the ozone in Colbert County (averaged across all high[1] ozone days)

[1] The high ozone day threshold for the MATS ozone contribution runs are defined in Section IV.D. step 5.

_id	lat	long	referencecell	f_o3_DV	_state_name	_county_name	SA_rrf
10331002	34.76056	-87.6506	155091	64.5	Alabama	Colbert	**0.9569**
10731003	33.48556	-86.915	162080	69.7	Alabama	Jefferson	0.9944
10731005	33.33111	-87.0036	162078	71	Alabama	Jefferson	0.9979
10731009	33.45972	-87.3056	159079	66.4	Alabama	Jefferson	0.9986

The 2012 future year design value (f_o3_DV) is multiplied by the RRF and then subtracted from the 2012 design value to get the total upwind contribution in ppb (the values in blue below). Here is the formula:

Ozone Contribution = f_o3_dv – (f_o3_dv * RRF)

The future design values and RRFs were derived from MATS. The calculation of the contribution was accomplished with additional post-processing software (using the formula above). The final 8-hr ozone contributions (in ppb) are truncated to the tenths digit.

_id	lat	Long	referencecell	f_o3_DV	_state_name	_county_name	SA_rrf	Contribution
10331002	34.76056	-87.6506	155091	64.5	Alabama	Colbert	0.9569	**2.7**
10731003	33.48556	-86.915	162080	69.7	Alabama	Jefferson	0.9944	**0.3**
10731005	33.33111	-87.0036	162078	71	Alabama	Jefferson	0.9979	**0.1**
10731009	33.45972	-87.3056	159079	66.4	Alabama	Jefferson	0.9986	**0.0**

Annual Average PM2.5 **[All example concentrations are in ug/m3]**

The 2012 future year base case annual average PM2.5 design value calculations are described in Section III.B. The 2012 design values were calculated by running MATS using the CAMx 2005 base year and 2012 future base case model outputs. The annual PM2.5 contribution metrics were calculated as described in Section IV.C. The information needed to calculate the upwind annual PM2.5 contributions to downwind annual PM2.5 receptor sites is as follows:

1) The 2012 future base case annual average PM2.5 design values **and** component species concentrations at each receptor.
2) The relative response factors (RRFs) from each "source apportionment" MATS run. The source apportionment MATS run is described in Section IV.A step 4. The source apportionment MATS runs specify the "base" year model file as the 2012 CAMx base case and the "future" year model file as the 2012 CAMx source apportionment case. A separate source apportionment MATS case is run for each upwind state.

The 2012 future year annual average PM2.5 design values are shown in the example below as the variable "f_pm25_ann_DV" (from the MATS output file "*scenario_name* Annual PM25 Point.csv").

_id	_STATE_NAME	_COUNTY_NAME	monitor_lat	monitor_long	monitor_gridcell	b_pm25_ann_DV	**f_pm25_ann_DV**
10030010	Alabama	Baldwin	30.498	-87.8814	158051	11.44	**10.81**
10270001	Alabama	Clay	33.28126	-85.8022	171079	13.21	**12**
10331002	Alabama	Colbert	34.76056	-87.6506	155091	12.67	**12.13**
10491003	Alabama	DeKalb	34.28763	-85.9683	169088	14.09	**12.75**

The 2012 future design value is comprised of a number of component PM2.5 species. The following table shows the 2012 species concentrations.

_id	_STATE_NAME	_COUNTY_NAME	f_blank_mass	f_crustal_mass	f_EC_mass	f_NH4_mass	f_Ocmb_mass	f_SO4_mass	f_NO3_mass	f_water_mass	f_salt_mass
10030010	Alabama	Baldwin	0.5	0.4838	0.4564	1.0612	3.2319	4.0003	0.0042	1.0489	0.0315
10270001	Alabama	Clay	0.5	0.7034	0.5973	1.1121	4.3653	3.5529	0.0675	1.0888	0.02
10331002	Alabama	Colbert	0.5	0.3902	0.3137	1.2683	4.2728	4.0396	0.1537	1.1984	0.0024
10491003	Alabama	DeKalb	0.5	0.6574	0.4713	1.3423	4.2096	4.0967	0.1444	1.314	0.0163

The source apportionment RRFs (in orange below) are derived from the source apportionment MATS runs. They represent the relative PM2.5 species contribution from an upwind state to each downwind receptor. For example, an RRF value of 0.9656 for Baldwin County for sulfate means that the upwind state contributes 3.44% [(1 – 0.9656)* 100)] of the sulfate ion in Baldwin County (averaged across all days).

_id	_STATE_NAME	_COUNTY_NAME	SA_rrf_crustal	SA_rrf_ec	SA_rrf_nh4	SA_rrf_oc	SA_rrf_so4	SA_rrf_no3	SA_rrf_water
10030010	Alabama	Baldwin	0.9949	0.9947	0.964	0.9985	**0.9656**	0.9996	0.9634
10270001	Alabama	Clay	0.9895	0.9897	0.9535	0.9972	0.9529	0.9929	0.9514
10331002	Alabama	Colbert	0.9863	0.9871	0.9322	0.9954	0.928	0.9899	0.9292
10491003	Alabama	DeKalb	0.9862	0.9859	0.9371	0.9961	0.9364	0.9913	0.9357

The annual RRFs from the source apportionment MATS run are multiplied by the 2012 species concentrations and then subtracted from the 2012 species concentrations to get species contributions. Here is the formula:

Annual PM2.5 Contribution (SO4) = f_SO4_mass – (f_SO4_mass * SA_rrf_SO4)

The calculation is completed for each of the 7 species[2] which have an RRF. The yellow and orange columns are taken directly from MATS output files.

The species contributions from upwind state "A" to the example downwind receptors are shown in blue below. The blue columns are the final species contributions which are calculated using additional post-processing software (using the formula above).

_id	_STATE_NAME	_COUNTY _NAME	crustal_mass_ SA	EC_mass_ SA	NH4_mass _SA	Ocmb_mass_ SA	SO4_mass _SA	NO3_mass _SA	water_mass _SA
10030010	Alabama	Baldwin	0.0025	0.0024	0.0382	0.0048	0.1376	0.0000	0.0384
10270001	Alabama	Clay	0.0074	0.0062	0.0517	0.0122	0.1673	0.0005	0.0529
10331002	Alabama	Colbert	0.0053	0.0040	0.0860	0.0197	0.2909	0.0016	0.0848
10491003	Alabama	DeKalb	0.0091	0.0066	0.0844	0.0164	0.2606	0.0013	0.0845

[2] The RRF for salt is not used because it is always equal to 1.

For the final transport rule contributions, the sulfate and nitrate and related species (ammonium and water) contributions were summed to get the total PM2.5 contribution used in the proposed rule. These are the values in the blue column below. The final annual average PM2.5 contributions (in ug/m3) are truncated to the hundredths digit.

_id	_STATE_NAME	_COUNTY_NAME	Total Annual PM2.5 Mass Contribution
10030010	Alabama	Baldwin	0.20
10270001	Alabama	Clay	0.26
10331002	Alabama	Colbert	0.43
10491003	Alabama	DeKalb	0.40

24-Hour Average $PM_{2.5}$ **[All example concentrations are in ug/m3]**

The 2012 future year base case 24 hr. average $PM_{2.5}$ design value calculations are described in Section III.B. The 2012 design values were calculated by running MATS using the CAMx 2005 base year and 2012 future base case model outputs. The 24-hr. $PM_{2.5}$ contribution metrics were calculated as described in Section IV.C. The 24-hr. $PM_{2.5}$ contribution calculations are considerably more complicated than the annual average calculations. High 24-hr values can occur at different times of the year at each receptor. Therefore, we must calculate the contributions to the downwind receptor for each of the quarters and years. The final contribution is a 5 year average of the contribution to the 98^{th} percentile day for each year[3]. The 98^{th} percentile future days vary by receptor and are identified in the "New Daily All Years High Quarters PM25 *scenario_name* .csv" file[4].

The information needed to calculate the upwind 24-hr. $PM_{2.5}$ contributions to downwind 24-hr. $PM_{2.5}$ receptor sites is as follows:

1) The 2012 future base case 24-hour average $PM_{2.5}$ and component species concentrations for each 98^{th} percentile day for (up to) five years at each receptor.
3) The relative response factors (RRFs) from each "source apportionment" MATS run. The source apportionment MATS run is described in Section IV.A step 4. The source apportionment MATS runs specify the "base" year model file as the 2012 CAMx future base case and the "future" year model file as the 2012 CAMx source apportionment case. A separate source apportionment MATS case is run for each upwind state.

The 2012 future year 24-hr. 98^{th} percentile $PM_{2.5}$ values are shown in the example below as the variable "f_pm25__d_q_conc" (from the file "New Daily All Years High Quarters PM25 *scenario_name* .csv"). For the design value calculations, the future year 98^{th} percentile values (in bold) are averaged together to create a 5 year weighted average (year 1 is weighted once, year 2 twice, year 3 three times, year 4 twice, and year 5 once).

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[3] The contribution on the 98^{th} percentile day represents the contribution to the particular quarter of the year when the future year 98^{th} percentile day occurred. The quarter in which the future year 98^{th} percentile day occurs varies across the 5 years.

[4] This is a file that was created in the post-processing of standard MATS outputs. It is not a file directly output from MATS.

_id	_state_name	_county_name	monitor_lat	monitor_lon	year	b_high_quarter	b_pm25_d_q_conc	f_high_quarter	f_pm25_d_q_conc
10030010	Alabama	Baldwin	30.498001	-87.881412	2003	2	29.1	2	**25.362821**
10030010	Alabama	Baldwin	30.498001	-87.881412	2004	3	25.5	1	**23.900602**
10030010	Alabama	Baldwin	30.498001	-87.881412	2005	2	23.7	3	**22.30151**
10030010	Alabama	Baldwin	30.498001	-87.881412	2006	3	25.6	2	**22.39673**
10030010	Alabama	Baldwin	30.498001	-87.881412	2007	2	22.4	2	**19.605115**

The 2012 future 24-hr $PM_{2.5}$ design value is comprised of a number of component $PM_{2.5}$ species. The following table shows the 2012 species concentrations for each of the 98th percentile value days in Baldwin County.

_id	_state_name	_county_name	year	f_high_quarter	f_blank_mass_q	f_crustal_mass_q	f_EC_mass_q	f_NH4_mass_q	f_Ocmb_mass_q	f_SO4_mass_q	f_NO3_mass_q	f_water_mass_q	f_salt_mass_q
10030010	Alabama	Baldwin	2003	2	0.5	0.65643	0.56179	2.26291	11.08756	8.303571	0	1.981797	0.008758
10030010	Alabama	Baldwin	2004	1	0.5	0.54168	0.952419	2.28928	10.365396	6.766255	0	2.477496	0.008073
10030010	Alabama	Baldwin	2005	3	0.5	0.84954	0.588702	1.95904	8.5855297	8.269267	0	1.543505	0.005927
10030010	Alabama	Baldwin	2006	2	0.5	0.57812	0.494769	1.99295	9.7648339	7.31297	0	1.745372	0.007713
10030010	Alabama	Baldwin	2007	2	0.5	0.50442	0.431691	1.73887	8.5199149	6.380639	0	1.522855	0.00673

The source apportionment RRFs[5] (in orange below) are derived from the source apportionment MATS runs. They represent the relative $PM_{2.5}$ species contribution from an upwind state to each downwind receptor in each quarter[6]. For example, an RRF value of 0.9656 for Baldwin County for quarter 2 sulfate means that the upwind state contributes 3.44% [(1 – 0.9656)* 100)] of the sulfate ion

[5] One additional step is needed to calculate the water RRF. Since the MATS output file does not contain the quarterly water RRF, it must be back-calculated from the base and future year water concentrations (f_water_mass_q / b_water_mass_q)

[6] There is a single species RRF for each of the 4 quarters.

in Baldwin County in quarter 2 (averaged across all high[7] days in each quarter). The Source apportionment MATS run produces species specific RRFs for each of the four quarters. The quarters that contain the 98th percentile values for the receptor site were previously identified in the first step. The future year 98th percentile quarters for the 5 years at the example receptor site (Baldwin) are:

Year 1 (2003) quarter 2
Year 2 (2004) quarter 1
Year 3 (2005) quarter 3
Year 4 (2006) quarter 2
Year 5 (2007) quarter 2

The table below shows the source apportionment RRFs for each year and quarter. The rows which contain the RRFs for the 98th percentile quarters are in bold below:

_id	_state_name	_county_name	year	quarter	SA_rrf_crustal_q	SA_rrf_ec_q	SA_rrf_nh4_q	SA_rrf_oc_q	SA_rrf_so4_q	SA_rrf_no3_q	SA_rrf_water_q
10030010	Alabama	Baldwin	2003	1	0.9663	0.9772	0.9965	0.9852	0.8881	0.9958	0.8882
10030010	**Alabama**	**Baldwin**	**2003**	**2**	**0.9912**	**0.9934**	**0.9996**	**0.9978**	**0.9656**	**0.9985**	**0.9655**
10030010	Alabama	Baldwin	2003	3	0.9897	0.9914	0.9993	0.9985	0.942	1	0.9419
10030010	Alabama	Baldwin	2003	4	0.9715	0.971	0.9981	0.9918	0.9082	0.9981	0.9082
10030010	**Alabama**	**Baldwin**	**2004**	**1**	**0.9663**	**0.9772**	**0.9965**	**0.9852**	**0.8881**	**0.9958**	**0.8882**
10030010	Alabama	Baldwin	2004	2	0.9912	0.9934	0.9996	0.9978	0.9656	0.9985	0.9655
10030010	Alabama	Baldwin	2004	3	0.9897	0.9914	0.9993	0.9985	0.942	1	0.9419
10030010	Alabama	Baldwin	2004	4	0.9715	0.971	0.9981	0.9918	0.9082	0.9981	0.9082
10030010	Alabama	Baldwin	2005	1	0.9663	0.9772	0.9965	0.9852	0.8881	0.9958	0.8882
10030010	Alabama	Baldwin	2005	2	0.9912	0.9934	0.9996	0.9978	0.9656	0.9985	0.9655
10030010	**Alabama**	**Baldwin**	**2005**	**3**	**0.9897**	**0.9914**	**0.9993**	**0.9985**	**0.942**	**1**	**0.9419**
10030010	Alabama	Baldwin	2005	4	0.9715	0.971	0.9981	0.9918	0.9082	0.9981	0.9083
10030010	Alabama	Baldwin	2006	1	0.9663	0.9772	0.9965	0.9852	0.8881	0.9958	0.8882
10030010	**Alabama**	**Baldwin**	**2006**	**2**	**0.9912**	**0.9934**	**0.9996**	**0.9978**	**0.9656**	**0.9985**	**0.9655**
10030010	Alabama	Baldwin	2006	3	0.9897	0.9914	0.9993	0.9985	0.942	1	0.9419

[7] Consistent with the 24-hr $PM_{2.5}$ design value calculations, the "high" days are defined as the 10% highest modeled $PM_{2.5}$ concentration days for each quarter at each receptor.

10030010	Alabama	Baldwin	2006	4	0.9715	0.971	0.9981	0.9918	0.9082	0.9981	0.9083
10030010	Alabama	Baldwin	2007	1	0.9663	0.9772	0.9965	0.9852	0.8881	0.9958	0.8882
10030010	**Alabama**	**Baldwin**	**2007**	**2**	**0.9912**	**0.9934**	**0.9996**	**0.9978**	**0.9656**	**0.9985**	**0.9655**
10030010	Alabama	Baldwin	2007	3	0.9897	0.9914	0.9993	0.9985	0.942	1	0.9419
10030010	Alabama	Baldwin	2007	4	0.9715	0.971	0.9981	0.9918	0.9082	0.9981	0.9082

The quarterly RRFs from the source apportionment MATS run which correspond to the quarter when the 98^{th} percentile value occurs are multiplied by the 2012 species concentrations for the 98^{th} percentile days in each year. The result is then subtracted from the 2012 species concentrations to get species contributions for each year. Here is the formula:

98^{th} percentile PM2.5 Contribution (SO4) = f_SO4_mass_q – (f_SO4_mass_q * SA_rrf_SO4_q)

The calculation is completed for each year for each of the 7 species[8] which have an RRF.

The species contributions from upwind state "A" to the example downwind receptor is shown in blue below. The blue columns are the species contributions which are calculated using additional post-processing software (using the contribution formula above).

_id	_state_name	_county_name	year	quarter	crustal_mass_SA	EC_mass_SA	NH4_mass_SA	Ocmb_mass_SA	SO4_mass_SA	NO3_mass_SA	water_mass_SA
10030010	Alabama	Baldwin	2003	2	0.0058	0.0037	0.0009	0.0244	0.2856	0	0.0684
10030010	Alabama	Baldwin	2004	1	0.0183	0.0217	0.0080	0.1534	0.7571	0	0.2770
10030010	Alabama	Baldwin	2005	3	0.0088	0.0051	0.0014	0.0129	0.4796	0	0.0897
10030010	Alabama	Baldwin	2006	2	0.0051	0.0033	0.0008	0.0215	0.2516	0	0.0602
10030010	Alabama	Baldwin	2007	2	0.0044	0.0028	0.0007	0.0187	0.2195	0	0.0525

The next step is to average the contributions for the each of the 5 years.

The contributions (from the blue columns in the table above) are averaged[9] across the five 98^{th} percentile days with the following result:

[8] The RRF for salt is ignored because it is always equal to 1.

			crustal_mass_SA	EC_mass_SA	NH4_mass_SA	Ocmb_mass_SA	SO4_mass_SA	NO3_mass_SA	water_mass_SA
10030010	Alabama	Baldwin	0.0080	0.0075	**0.0025**	0.0481	**0.3835**	**0.0000**	**0.1114**

For the final transport rule contributions, the sulfate and nitrate and related species (ammonium and water) contributions were summed to get the total $PM_{2.5}$ contribution used in the final rule. The sum of these values is shown as the 24-hr $PM_{2.5}$ contribution in the blue column below. The final 24 hr. $PM_{2.5}$ contributions (in ug/m3) are truncated to the hundredths digit.

_id	_STATE_NAME	_COUNTY_NAME	Total 24 Hr. PM2.5 Mass Contribution
10030010	Alabama	Baldwin	0.51

[9] The 5 year average for the **contribution** calculations is a "straight" 5 year average, not a weighted average.

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Appendix D

2012 Base Case State-by-State Contributions to Nonattainment and Maintenance for 8-Hour Ozone, Annual $PM_{2.5}$, and 24-Hour $PM_{2.5}$

This Appendix provides tabular summaries of the state-by-state contributions to 8-hour ozone, annual $PM_{2.5,}$ and 24-hour $PM_{2.5}$ at projected 2012 base case nonattainment and maintenance receptors.

The contributions from a state to nonattainment and/or maintenance in another (i.e., "downwind") state were used to identify states to be covered by the Transport Rule.

The largest contribution from each state to nonattainment and/or maintenance in a downwind state is provided at the bottom of the table.

Contributions that are at or above the following thresholds are shown in red.

Ozone Threshold: 0.8 ppb
Annual $PM_{2.5}$ Threshold: 0.15 $\mu g/m^3$
24-Hour $PM_{2.5}$ Threshold: 0.35 $\mu g/m^3$

In-state contributions (i.e., the contribution from a state to nonattainment or maintenance within the State itself) are provided in the tables in this Appendix for completeness. The in-state contributions were not used to identify states to be covered by the Transport Rule.

The tabular summaries are provided by pollutant starting with 8-hour ozone, then annual PM2.5, and finally 24-hour PM2.5. For each pollutant the contributions to nonattainment sites are provided in "Part 1" and the contributions to maintenance sites are provided in "Part 2". Note that some counties have multiple sites that are projected to be nonattainment as well as other sites that are projected to have a maintenance problem.

State-by-State Contributions to 8-Hour Ozone (ppb) *Nonattainment* Receptors
Part 1a.
Source States: Alabama through Missouri

Receptor Monitor ID	Receptor State	Receptor County	Source State =>	AL	AR	CT	DE	FL	GA	IL	IN	IA	KS	KY	LA	ME	MD	MA	MI	MN	MS	MO
220330003	Louisiana	East Baton Rouge		**2.8**	**2.1**	0.0	0.0	0.3	**1.6**	0.2	0.2	0.1	0.5	0.3	39.7	0.0	0.0	0.0	0.0	0.0	**4.0**	0.5
480391004	Texas	Brazoria		**3.1**	**1.1**	0.0	0.0	0.5	**1.2**	**1.4**	**1.0**	0.6	0.2	**1.3**	**7.9**	0.0	0.0	0.0	0.0	0.3	**3.2**	**1.1**
482010051	Texas	Harris		**3.7**	0.3	0.0	0.0	0.4	**1.2**	**1.8**	**1.2**	0.5	0.1	**1.5**	**7.3**	0.0	0.0	0.0	0.0	0.1	**3.1**	**0.9**
482010055	Texas	Harris		**4.0**	0.4	0.0	0.0	0.4	**1.3**	**1.9**	**1.3**	0.6	0.1	**1.6**	**8.0**	0.0	0.0	0.0	0.0	0.1	**3.4**	**1.0**
			Largest Contribution to Downwind Nonattainment	**4.0**	**2.1**	0.0	0.0	0.5	**1.6**	**1.9**	**1.3**	0.6	0.5	**1.6**	**8.0**	0.0	0.0	0.0	0.0	0.3	**4.0**	**1.1**

State-by-State Contributions to 8-Hour Ozone (ppb) *Nonattainment* Receptors
Part 1b.
Source States: Nebraska through Wisconsin

Receptor Monitor ID	Receptor State	Receptor County	Source State =>	NE	NH	NJ	NY	NC	ND	OH	OK	PA	RI	SC	SD	TN	TX	VT	VA	WV	WI
220330003	Louisiana	East Baton Rouge		0.1	0.0	0.0	0.0	0.5	0.2	0.1	0.3	0.1	0.0	0.4	0.1	**1.0**	**3.9**	0.0	0.2	0.0	0.0
480391004	Texas	Brazoria		0.2	0.0	0.0	0.0	0.2	0.1	0.1	0.3	0.0	0.0	0.3	0.1	**1.6**	35.2	0.0	0.1	0.0	0.2
482010051	Texas	Harris		0.2	0.0	0.0	0.0	0.2	0.1	0.1	0.1	0.0	0.0	0.3	0.1	**2.0**	27.2	0.0	0.0	0.0	0.2
482010055	Texas	Harris		0.2	0.0	0.0	0.0	0.2	0.1	0.1	0.1	0.0	0.0	0.3	0.1	**2.2**	29.5	0.0	0.1	0.0	0.2
			Largest Contribution to Downwind Nonattainment	0.2	0.0	0.0	0.0	0.5	0.2	0.1	0.3	0.1	0.0	0.4	0.1	**2.2**	**3.9**	0.0	0.2	0.0	0.2

State-by-State Contributions to 8-Hour Ozone (ppb) *Maintenance* Receptors
Part 2a.
Source States: Alabama through Missouri

Receptor Monitor ID	Receptor State	Receptor County	Source State =>	AL	AR	CT	DE	FL	GA	IL	IN	IA	KS	KY	LA	ME	MD	MA	MI	MN	MS	MO
90011123	Connecticut	Fairfield		0.4	0.5	5.7	0.4	0.0	0.3	**0.8**	**0.9**	0.2	0.2	**1.6**	0.1	0.0	**2.3**	0.6	0.7	0.2	0.5	0.6
90093002	Connecticut	New Haven		0.1	0.1	4.4	0.6	0.1	0.0	0.7	**1.1**	0.1	0.1	**1.4**	0.1	0.0	**2.7**	0.1	0.7	0.1	0.1	0.4
240251001	Maryland	Harford		0.3	0.1	0.2	0.1	0.0	0.1	0.7	**1.0**	0.1	0.1	**1.4**	0.0	0.0	34.5	0.3	**0.9**	0.2	0.2	0.4
260050003	Michigan	Allegan		0.3	**2.0**	0.0	0.0	0.0	0.3	**26.8**	**9.4**	**0.9**	**1.0**	0.6	0.3	0.0	0.0	0.0	4.3	0.1	0.3	**4.8**
482010029	Texas	Harris		**2.7**	0.2	0.0	0.0	**3.6**	**2.8**	0.2	0.2	0.0	0.0	0.3	**5.8**	0.0	0.0	0.0	0.1	0.0	**2.0**	0.0
482011050	Texas	Harris		**2.8**	0.5	0.0	0.0	**0.9**	**1.9**	**0.8**	0.6	0.3	0.1	**0.8**	**11.1**	0.0	0.2	0.0	0.1	0.1	**3.3**	0.5
			Largest Contribution to Downwind Maintenance	**2.8**	**2.0**	0.2	0.6	**3.6**	**2.8**	**26.8**	**9.4**	**0.9**	**1.0**	**1.6**	**11.1**	0.0	**2.7**	0.6	**0.9**	0.2	**3.3**	**4.8**

State-by-State Contributions to 8-Hour Ozone (ppb) *Maintenance* Receptors
Part 2b.
Source States: Nebraska through Wisconsin

Receptor Monitor ID	Receptor State	Receptor County	Source State =>	NE	NH	NJ	NY	NC	ND	OH	OK	PA	RI	SC	SD	TN	TX	VT	VA	WV	WI
90011123	Connecticut	Fairfield		0.1	0.1	**11.5**	**18.0**	0.6	0.0	**2.2**	0.2	**6.4**	0.0	0.1	0.0	**0.9**	0.3	0.0	**2.6**	**1.6**	0.2
90093002	Connecticut	New Haven		0.0	0.0	**10.4**	**18.8**	**1.3**	0.0	**3.2**	0.1	**8.2**	0.0	0.1	0.0	0.4	0.1	0.0	**4.5**	**2.1**	0.2
240251001	Maryland	Harford		0.1	0.0	0.6	**1.0**	**1.0**	0.0	**3.1**	0.1	**5.6**	0.0	0.1	0.0	**1.0**	0.2	0.0	**8.2**	**2.8**	0.3
260050003	Michigan	Allegan		0.2	0.0	0.0	0.0	0.3	0.0	0.2	**2.8**	0.0	0.0	0.1	0.0	0.6	**1.9**	0.0	0.1	0.0	**2.2**
482010029	Texas	Harris		0.0	0.0	0.0	0.0	0.7	0.0	0.2	0.0	0.1	0.0	**0.9**	0.0	0.6	35.0	0.0	0.3	0.1	0.0
482011050	Texas	Harris		0.1	0.0	0.1	0.2	0.6	0.1	0.1	0.1	0.5	0.0	0.7	0.1	**1.1**	33.1	0.0	0.4	0.0	0.1
			Largest Contribution to Downwind Maintenance	0.2	0.1	**11.5**	**18.8**	**1.3**	0.1	**3.2**	**2.8**	**8.2**	0.0	**0.9**	0.1	**1.1**	**1.9**	0.0	**8.2**	**2.8**	**2.2**

State-by-State Contributions to Annual $PM_{2.5}$ ($\mu g/m^3$) *Nonattainment* Receptors
Part 1a.
Source States: Alabama through Missouri

Receptor Monitor ID	Receptor State	Receptor County	Source State =>	AL	AR	CT	DE	FL	GA	IL	IN	IA	KS	KY	LA	ME	MD	MA	MI	MN	MS	MO
10730023	Alabama	Jefferson		3.11	0.03	0.00	0.00	0.07	**0.46**	0.14	**0.28**	0.03	0.02	**0.22**	0.09	0.00	0.02	0.00	0.05	0.01	0.05	0.12
10732003	Alabama	Jefferson		2.58	0.03	0.00	0.00	0.08	**0.46**	**0.15**	**0.30**	0.04	0.02	**0.24**	0.09	0.00	0.02	0.00	0.05	0.01	0.05	0.12
131210039	Georgia	Fulton		**0.51**	0.03	0.00	0.00	0.08	1.36	**0.16**	**0.31**	0.04	0.02	**0.25**	0.06	0.00	0.04	0.00	0.07	0.02	0.02	0.13
171191007	Illinois	Madison		0.12	0.10	0.00	0.00	0.01	0.08	1.51	**0.70**	**0.26**	0.09	**0.33**	0.07	0.00	0.01	0.00	**0.26**	0.14	0.01	**1.22**
261630033	Michigan	Wayne		0.08	0.02	0.00	0.00	0.00	0.06	**0.42**	**0.69**	0.10	0.02	**0.25**	0.02	0.00	0.03	0.00	2.27	0.09	0.00	0.14
390350038	Ohio	Cuyahoga		0.09	0.02	0.00	0.00	0.01	0.07	**0.37**	**0.65**	0.09	0.02	**0.28**	0.02	0.00	0.06	0.00	**0.63**	0.07	0.00	**0.15**
390350045	Ohio	Cuyahoga		0.09	0.02	0.00	0.00	0.01	0.08	**0.37**	**0.65**	0.09	0.02	**0.29**	0.02	0.00	0.06	0.00	**0.64**	0.07	0.00	**0.15**
390350060	Ohio	Cuyahoga		0.10	0.02	0.00	0.00	0.01	0.08	**0.37**	**0.65**	0.09	0.02	**0.29**	0.02	0.00	0.06	0.00	**0.64**	0.07	0.00	**0.15**
390610014	Ohio	Hamilton		**0.19**	0.03	0.00	0.00	0.01	0.13	**0.50**	**1.28**	0.10	0.03	**0.81**	0.03	0.00	0.04	0.00	**0.35**	0.07	0.01	**0.22**
390610042	Ohio	Hamilton		**0.20**	0.04	0.00	0.00	0.01	0.13	**0.49**	**1.34**	0.10	0.02	**0.94**	0.03	0.00	0.04	0.00	**0.33**	0.06	0.01	**0.22**
390618001	Ohio	Hamilton		**0.19**	0.03	0.00	0.00	0.01	0.13	**0.50**	**1.27**	0.10	0.02	**0.80**	0.03	0.00	0.04	0.00	**0.35**	0.06	0.01	**0.22**
420030064	Pennsylvania	Allegheny		0.08	0.02	0.00	0.00	0.01	0.07	**0.26**	**0.51**	0.06	0.01	**0.27**	0.01	0.00	**0.15**	0.00	**0.33**	0.04	0.00	0.12
			Largest Contribution to Downwind Nonattainment	**0.51**	0.10	0.00	0.00	0.08	**0.46**	**0.50**	**1.34**	**0.26**	0.09	**0.94**	0.09	0.00	**0.15**	0.00	**0.64**	0.14	0.05	**1.22**

State-by-State Contributions to Annual $PM_{2.5}$ ($\mu g/m^3$) *Nonattainment* Receptors
Part 1b.
Source States: Nebraska through Wisconsin

Receptor Monitor ID	Receptor State	Receptor County	Source State =>	NE	NH	NJ	NY	NC	ND	OH	OK	PA	RI	SC	SD	TN	TX	VT	VA	WV	WI
10730023	Alabama	Jefferson		0.01	0.00	0.00	0.01	0.09	0.01	**0.24**	0.02	0.10	0.00	0.11	0.00	**0.25**	0.07	0.00	0.05	0.14	0.03
10732003	Alabama	Jefferson		0.01	0.00	0.00	0.02	0.09	0.01	**0.26**	0.02	0.11	0.00	0.11	0.00	**0.26**	0.08	0.00	0.05	0.14	0.03
131210039	Georgia	Fulton		0.01	0.00	0.01	0.03	**0.20**	0.01	**0.32**	0.02	**0.17**	0.00	**0.24**	0.00	**0.29**	0.07	0.00	0.09	**0.19**	0.04
171191007	Illinois	Madison		0.06	0.00	0.00	0.02	0.03	0.06	**0.42**	0.08	0.11	0.00	0.03	0.03	**0.19**	**0.18**	0.00	0.02	0.13	**0.16**
261630033	Michigan	Wayne		0.02	0.00	0.00	0.13	0.03	0.04	**0.99**	0.03	**0.29**	0.00	0.01	0.01	0.11	0.04	0.00	0.04	**0.24**	**0.22**
390350038	Ohio	Cuyahoga		0.02	0.00	0.01	**0.21**	0.04	0.04	2.62	0.02	**0.53**	0.00	0.02	0.01	0.13	0.04	0.00	0.06	**0.40**	**0.18**
390350045	Ohio	Cuyahoga		0.02	0.00	0.01	**0.21**	0.04	0.04	2.64	0.02	**0.54**	0.00	0.02	0.01	0.13	0.04	0.00	0.06	**0.40**	**0.18**
390350060	Ohio	Cuyahoga		0.02	0.00	0.01	**0.21**	0.04	0.04	2.63	0.02	**0.54**	0.00	0.02	0.01	0.13	0.04	0.00	0.06	**0.40**	**0.18**
390610014	Ohio	Hamilton		0.02	0.00	0.00	0.09	0.06	0.03	2.12	0.03	**0.38**	0.00	0.04	0.01	**0.32**	0.07	0.00	0.06	**0.37**	**0.15**
390610042	Ohio	Hamilton		0.02	0.00	0.00	0.08	0.06	0.03	2.03	0.03	**0.37**	0.00	0.04	0.01	**0.32**	0.07	0.00	0.06	**0.36**	0.14
390618001	Ohio	Hamilton		0.02	0.00	0.00	0.09	0.06	0.03	2.11	0.03	**0.38**	0.00	0.04	0.01	**0.32**	0.07	0.00	0.06	**0.37**	**0.15**
420030064	Pennsylvania	Allegheny		0.01	0.00	0.02	**0.17**	0.08	0.03	**1.34**	0.01	2.14	0.00	0.04	0.01	0.13	0.04	0.00	0.12	**0.95**	0.10
			Largest Contribution to Downwind Nonattainment	0.06	0.00	0.02	**0.21**	**0.20**	0.06	**1.34**	0.08	**0.54**	0.00	**0.24**	0.03	**0.32**	**0.18**	0.00	0.12	**0.95**	**0.22**

State-by-State Contributions to Annual $PM_{2.5}$ ($\mu g/m^3$) *Maintenance* Receptors
Part 2a.
Source States: Alabama through Missouri

Receptor Monitor ID	Receptor State	Receptor County	Source State =>	AL	AR	CT	DE	FL	GA	IL	IN	IA	KS	KY	LA	ME	MD	MA	MI	MN	MS	MO
180970081	Indiana	Marion		**0.15**	0.04	0.00	0.00	0.01	0.09	**0.65**	2.94	0.14	0.04	**0.63**	0.03	0.00	0.03	0.00	**0.41**	0.09	0.01	**0.26**
180970083	Indiana	Marion		**0.15**	0.04	0.00	0.00	0.01	0.09	**0.65**	2.94	0.14	0.04	**0.63**	0.03	0.00	0.03	0.00	**0.41**	0.09	0.01	**0.27**
390350065	Ohio	Cuyahoga		0.09	0.02	0.00	0.00	0.01	0.08	**0.37**	**0.65**	0.09	0.02	**0.29**	0.02	0.00	0.06	0.00	**0.64**	0.07	0.00	**0.15**
390617001	Ohio	Hamilton		**0.19**	0.03	0.00	0.00	0.01	0.13	**0.50**	**1.27**	0.10	0.03	**0.81**	0.03	0.00	0.04	0.00	**0.35**	0.07	0.01	**0.22**
			Largest Contribution to Downwind Maintenance	**0.19**	0.04	0.00	0.00	0.01	0.13	**0.65**	**1.27**	0.14	0.04	**0.81**	0.03	0.00	0.06	0.00	**0.64**	0.09	0.01	**0.27**

State-by-State Contributions to Annual $PM_{2.5}$ ($\mu g/m^3$) *Maintenance* Receptors
Part 2b.
Source States: Nebraska through Wisconsin

Receptor Monitor ID	Receptor State	Receptor County	Source State =>	NE	NH	NJ	NY	NC	ND	OH	OK	PA	RI	SC	SD	TN	TX	VT	VA	WV	WI
180970081	Indiana	Marion		0.03	0.00	0.00	0.07	0.05	0.04	**0.94**	0.03	**0.23**	0.00	0.04	0.01	**0.25**	0.07	0.00	0.04	**0.21**	**0.19**
180970083	Indiana	Marion		0.03	0.00	0.00	0.07	0.05	0.04	**0.94**	0.03	**0.23**	0.00	0.04	0.01	**0.25**	0.07	0.00	0.04	**0.21**	**0.19**
390350065	Ohio	Cuyahoga		0.02	0.00	0.01	**0.21**	0.04	0.04	2.63	0.02	**0.54**	0.00	0.02	0.01	0.13	0.04	0.00	0.06	**0.40**	**0.18**
390617001	Ohio	Hamilton		0.02	0.00	0.00	0.09	0.06	0.03	2.12	0.03	**0.38**	0.00	0.04	0.01	**0.32**	0.07	0.00	0.06	**0.37**	**0.15**
			Largest Contribution to Downwind Maintenance	0.03	0.00	0.01	**0.21**	0.06	0.04	**0.94**	0.03	**0.54**	0.00	0.04	0.01	**0.32**	0.07	0.00	0.06	**0.40**	**0.19**

State-by-State Contributions to 24-Hour $PM_{2.5}$ ($\mu g/m^3$) *Nonattainment* Receptors
Part 1a.
Source States: Alabama through Missouri

Receptor Monitor ID	Receptor State	Receptor County	Source State =>	AL	AR	CT	DE	FL	GA	IL	IN	IA	KS	KY	LA	ME	MD	MA	MI	MN	MS	MO
10730023	Alabama	Jefferson		6.81	0.02	0.00	0.00	0.07	**1.10**	0.29	**0.65**	0.04	0.01	**0.60**	0.09	0.00	0.12	0.00	0.13	0.00	0.06	0.18
170311016	Illinois	Cook		0.08	0.16	0.00	0.00	0.00	0.08	4.75	**3.29**	**0.70**	0.11	**0.72**	0.07	0.00	0.06	0.00	**1.37**	0.21	0.03	**0.75**
171191007	Illinois	Madison		0.28	0.24	0.00	0.00	0.00	0.17	4.03	**3.02**	**0.45**	**0.37**	**1.71**	0.07	0.00	0.05	0.00	**0.99**	0.25	0.02	**3.73**
180970043	Indiana	Marion		**0.38**	0.07	0.00	0.00	0.00	0.16	**1.67**	9.15	0.16	0.02	**4.38**	0.02	0.00	0.11	0.00	0.25	0.02	0.01	**0.88**
180970066	Indiana	Marion		**0.48**	0.09	0.00	0.00	0.00	0.27	**1.40**	8.39	0.12	0.03	**3.93**	0.03	0.00	0.12	0.00	0.22	0.02	0.02	**0.86**
180970081	Indiana	Marion		**0.51**	0.09	0.00	0.00	0.01	0.30	**1.35**	8.29	0.11	0.03	**3.86**	0.03	0.00	0.12	0.00	0.21	0.02	0.02	**0.86**
261470005	Michigan	St Clair		0.31	0.05	0.00	0.01	0.00	0.20	**1.07**	**2.44**	0.08	0.02	**1.25**	0.06	0.00	0.20	0.00	1.97	0.03	0.03	**0.38**
261630015	Michigan	Wayne		0.34	0.07	0.00	0.00	0.02	0.19	**1.06**	**2.74**	0.11	0.04	**1.28**	0.11	0.00	0.13	0.00	4.35	0.06	0.04	**0.46**
261630016	Michigan	Wayne		0.12	0.01	0.00	0.01	0.00	0.08	**1.50**	**2.75**	0.17	0.06	**0.67**	0.00	0.00	0.17	0.00	5.22	0.03	0.00	0.23
261630019	Michigan	Wayne		0.11	0.01	0.00	0.01	0.00	0.07	**1.47**	**2.79**	0.15	0.05	**0.64**	0.00	0.00	0.16	0.00	3.58	0.03	0.00	0.21
261630033	Michigan	Wayne		0.33	0.05	0.00	0.00	0.02	0.21	**1.02**	**2.59**	0.11	0.04	**1.03**	0.10	0.00	0.12	0.00	5.03	0.10	0.04	0.32
390350038	Ohio	Cuyahoga		0.29	0.03	0.00	0.00	0.00	0.20	**0.70**	**1.84**	0.11	0.01	**0.89**	0.01	0.00	**0.36**	0.01	**1.76**	0.03	0.01	0.22
390350060	Ohio	Cuyahoga		0.17	0.02	0.00	0.00	0.00	0.13	**0.76**	**1.67**	0.14	0.02	**0.57**	0.01	0.00	0.27	0.01	**1.86**	0.06	0.00	0.17
420030064	Pennsylvania	Allegheny		0.06	0.04	0.00	0.00	0.00	0.07	**0.67**	**1.71**	0.09	0.03	**0.86**	0.01	0.00	0.17	0.00	**0.88**	0.06	0.00	**0.36**
420030093	Pennsylvania	Allegheny		0.20	0.07	0.00	0.01	0.01	0.14	**0.55**	**1.58**	0.06	0.02	**1.09**	0.06	0.00	0.26	0.00	**0.40**	0.02	0.02	0.34
420030116	Pennsylvania	Allegheny		0.16	0.07	0.00	0.01	0.00	0.14	**0.63**	**1.72**	0.07	0.03	**1.19**	0.06	0.00	0.26	0.00	0.32	0.01	0.02	**0.41**
420070014	Pennsylvania	Beaver		0.24	0.08	0.01	0.01	0.01	0.13	**0.70**	**1.73**	0.12	0.04	**1.02**	0.07	0.00	0.30	0.01	**0.63**	0.06	0.03	**0.40**
420710007	Pennsylvania	Lancaster		0.23	0.04	0.10	0.22	0.04	0.29	0.16	0.31	0.05	0.02	0.26	0.04	0.06	**2.84**	0.19	0.20	0.02	0.02	0.11
540090011	West Virginia	Brooke		0.06	0.03	0.01	0.01	0.00	0.06	**0.75**	**1.71**	0.15	0.03	**0.85**	0.01	0.00	0.33	0.01	**0.90**	0.10	0.00	0.32
550790043	Wisconsin	Milwaukee		0.16	0.04	0.00	0.00	0.00	0.15	**3.72**	**3.56**	**0.82**	0.30	**1.15**	0.02	0.00	0.06	0.00	**1.06**	**0.61**	0.01	**0.88**
			Largest Contribution to Downwind Nonattainment	**0.51**	0.24	0.10	0.22	0.07	**1.10**	**3.72**	**3.56**	**0.82**	**0.37**	**4.38**	0.11	0.06	**2.84**	0.19	**1.86**	**0.61**	0.06	**3.73**

State-by-State Contributions to 24-Hour $PM_{2.5}$ ($\mu g/m^3$) *Nonattainment* Receptors
Part 1b.
Source States: Nebraska through Wisconsin

Receptor Monitor ID	Receptor State	Receptor County	Source State =>	NE	NH	NJ	NY	NC	ND	OH	OK	PA	RI	SC	SD	TN	TX	VT	VA	WV	WI
10730023	Alabama	Jefferson		0.01	0.00	0.02	0.06	0.28	0.01	**1.18**	0.01	**0.65**	0.00	0.29	0.00	**0.70**	0.04	0.00	0.20	**1.04**	0.02
170311016	Illinois	Cook		0.11	0.00	0.00	0.23	0.04	0.07	**1.73**	0.09	**0.65**	0.00	0.02	0.05	0.24	0.27	0.00	0.07	**0.66**	**0.69**
171191007	Illinois	Madison		0.10	0.00	0.00	0.12	0.05	0.10	**2.40**	0.17	**0.69**	0.00	0.03	0.06	**0.75**	**0.37**	0.00	0.06	**0.66**	0.15
180970043	Indiana	Marion		0.01	0.00	0.01	0.09	0.09	0.01	**2.66**	0.03	**0.62**	0.00	0.05	0.00	**1.16**	0.04	0.00	0.12	**1.10**	0.07
180970066	Indiana	Marion		0.01	0.00	0.01	0.10	0.11	0.02	**2.54**	0.02	**0.67**	0.00	0.07	0.00	**1.33**	0.05	0.00	0.12	**1.05**	0.06
180970081	Indiana	Marion		0.01	0.00	0.01	0.10	0.11	0.02	**2.53**	0.02	**0.69**	0.00	0.07	0.00	**1.38**	0.05	0.00	0.12	**1.04**	0.06
261470005	Michigan	St Clair		0.02	0.00	0.03	**0.41**	0.10	0.01	**4.51**	0.02	**1.41**	0.00	0.05	0.00	**0.62**	0.11	0.00	0.16	**1.56**	0.15
261630015	Michigan	Wayne		0.02	0.00	0.02	0.34	0.09	0.03	**3.67**	0.04	**1.00**	0.00	0.03	0.01	**0.51**	0.09	0.00	0.13	**1.08**	0.26
261630016	Michigan	Wayne		0.06	0.00	0.03	**0.83**	0.04	0.01	**3.42**	0.01	**1.36**	0.00	0.01	0.00	0.24	0.02	0.00	0.10	**0.97**	0.30
261630019	Michigan	Wayne		0.05	0.00	0.03	**0.73**	0.04	0.01	**3.32**	0.01	**1.32**	0.00	0.01	0.00	0.23	0.01	0.00	0.10	**0.95**	**0.38**
261630033	Michigan	Wayne		0.03	0.00	0.02	**0.46**	0.08	0.05	**3.83**	0.03	**0.96**	0.00	0.04	0.01	**0.45**	0.09	0.00	0.13	**0.98**	**0.35**
390350038	Ohio	Cuyahoga		0.01	0.00	0.02	0.25	0.23	0.03	8.49	0.00	**1.91**	0.00	0.07	0.01	**0.44**	0.01	0.00	0.31	**2.94**	0.17
390350060	Ohio	Cuyahoga		0.04	0.00	0.02	**0.82**	0.13	0.04	8.96	0.01	**2.16**	0.00	0.04	0.01	0.26	0.01	0.00	0.20	**1.76**	0.23
420030064	Pennsylvania	Allegheny		0.03	0.00	0.02	0.13	0.13	0.07	**4.81**	0.03	5.53	0.00	0.05	0.01	0.20	0.04	0.00	0.22	**4.02**	0.16
420030093	Pennsylvania	Allegheny		0.01	0.00	0.04	0.12	0.15	0.02	**3.07**	0.03	3.21	0.00	0.06	0.00	0.34	0.06	0.00	0.30	**2.96**	0.06
420030116	Pennsylvania	Allegheny		0.01	0.00	0.04	0.12	0.17	0.02	**3.48**	0.03	2.96	0.00	0.07	0.00	**0.35**	0.06	0.00	0.32	**3.36**	0.06
420070014	Pennsylvania	Beaver		0.03	0.00	0.04	0.21	0.12	0.04	**4.00**	0.04	2.61	0.00	0.04	0.01	0.34	0.08	0.00	0.24	**2.57**	0.16
420710007	Pennsylvania	Lancaster		0.01	0.05	**0.68**	**0.66**	**0.40**	0.01	**0.76**	0.03	6.69	0.02	0.14	0.00	0.26	0.09	0.03	**1.21**	**0.84**	0.07
540090011	West Virginia	Brooke		0.02	0.00	0.04	0.31	0.08	0.06	**5.85**	0.02	**2.85**	0.00	0.03	0.02	0.19	0.03	0.00	0.22	3.28	0.28
550790043	Wisconsin	Milwaukee		0.24	0.00	0.00	0.11	0.07	0.21	**2.41**	0.11	**0.69**	0.00	0.06	0.10	0.26	0.11	0.00	0.08	**0.75**	3.00
			Largest Contribution to Downwind Nonattainment	0.24	0.05	**0.68**	**0.83**	**0.40**	0.21	**5.85**	0.17	**2.85**	0.02	0.29	0.10	**1.38**	**0.37**	0.03	**1.21**	**4.02**	**0.69**

State-by-State Contributions to 24-Hour $PM_{2.5}$ ($\mu g/m^3$) *Maintenance* Receptors
Part 2a.
Source States: Alabama through Missouri

Receptor Monitor ID	Receptor State	Receptor County	Source State =>	AL	AR	CT	DE	FL	GA	IL	IN	IA	KS	KY	LA	ME	MD	MA	MI	MN	MS	MO
10732003	Alabama	Jefferson		4.61	0.02	0.00	0.00	0.02	**0.92**	0.31	**0.72**	0.03	0.01	**0.64**	0.06	0.00	0.10	0.00	0.14	0.00	0.03	0.18
170310052	Illinois	Cook		0.09	0.06	0.00	0.00	0.00	0.12	6.13	**2.84**	**0.98**	**0.36**	**0.66**	0.01	0.00	0.07	0.00	**1.49**	0.31	0.00	**1.07**
170312001	Illinois	Cook		0.08	0.11	0.00	0.00	0.00	0.07	3.96	**4.87**	**0.41**	0.23	**0.67**	0.01	0.00	0.07	0.00	**1.83**	0.09	0.00	**0.82**
170313301	Illinois	Cook		0.03	0.09	0.00	0.00	0.00	0.02	5.10	**3.39**	**0.67**	0.26	**0.55**	0.03	0.00	0.06	0.00	**1.78**	0.18	0.01	**0.86**
170316005	Illinois	Cook		0.11	0.16	0.00	0.00	0.00	0.15	6.15	**2.49**	**1.03**	**0.36**	**0.40**	0.06	0.00	0.02	0.00	**1.36**	0.19	0.01	**1.10**
171190023	Illinois	Madison		0.32	0.23	0.00	0.00	0.00	0.19	3.87	**3.05**	**0.40**	0.28	**1.76**	0.05	0.00	0.06	0.00	**0.85**	0.19	0.02	**3.71**
180890022	Indiana	Lake		0.07	0.02	0.00	0.00	0.00	0.06	**3.09**	5.77	**0.52**	0.20	**0.54**	0.00	0.00	0.04	0.00	**1.41**	0.14	0.00	**0.62**
180890026	Indiana	Lake		0.12	0.03	0.00	0.00	0.00	0.10	**2.85**	4.52	**0.42**	0.18	**0.73**	0.02	0.00	0.09	0.00	**1.83**	0.14	0.01	**0.60**
261610008	Michigan	Washtenaw		**0.40**	0.09	0.00	0.01	0.01	0.25	**1.09**	**2.96**	0.14	0.06	**1.18**	0.13	0.00	0.14	0.00	2.67	0.03	0.07	**0.39**
390170003	Ohio	Butler		**0.42**	0.06	0.00	0.01	0.00	0.28	**1.37**	**5.15**	0.14	0.03	**3.58**	0.04	0.00	0.26	0.00	**0.82**	0.04	0.02	**0.55**
390350045	Ohio	Cuyahoga		0.18	0.02	0.00	0.00	0.00	0.12	**0.70**	**1.66**	0.11	0.01	**0.68**	0.01	0.00	0.31	0.00	**2.03**	0.05	0.00	0.17
390350065	Ohio	Cuyahoga		0.20	0.06	0.00	0.00	0.00	0.14	**0.81**	**1.82**	0.11	0.02	**0.87**	0.02	0.00	0.32	0.00	**1.64**	0.04	0.01	0.33
390618001	Ohio	Hamilton		0.24	0.04	0.00	0.01	0.01	0.14	**1.04**	**3.59**	0.17	0.03	**2.23**	0.02	0.00	0.32	0.00	**0.51**	0.03	0.01	**0.35**
390811001	Ohio	Jefferson		0.07	0.04	0.00	0.01	0.00	0.07	**0.55**	**1.62**	0.08	0.02	**1.20**	0.00	0.00	0.20	0.00	**0.68**	0.05	0.00	0.28
391130032	Ohio	Montgomery		**0.40**	0.08	0.00	0.01	0.00	0.25	**1.02**	**3.95**	0.09	0.03	**3.10**	0.04	0.00	0.21	0.00	**0.60**	0.04	0.02	**0.52**
420031008	Pennsylvania	Allegheny		0.13	0.08	0.00	0.01	0.00	0.09	**0.71**	**2.14**	0.09	0.03	**1.23**	0.05	0.00	0.20	0.00	**0.77**	0.03	0.02	**0.37**
420031301	Pennsylvania	Allegheny		0.07	0.02	0.00	0.00	0.00	0.06	**0.54**	**1.61**	0.07	0.02	**0.69**	0.01	0.00	0.19	0.00	**0.85**	0.03	0.00	0.23
420033007	Pennsylvania	Allegheny		0.04	0.02	0.00	0.01	0.00	0.04	**0.49**	**1.40**	0.05	0.01	**0.67**	0.00	0.00	0.19	0.00	**0.59**	0.01	0.00	0.23
421330008	Pennsylvania	York		0.17	0.02	0.18	0.20	0.03	0.27	**0.37**	**0.73**	0.11	0.02	**0.42**	0.05	0.10	**2.12**	0.30	**0.52**	0.06	0.01	0.17
550790010	Wisconsin	Milwaukee		0.07	0.02	0.00	0.00	0.00	0.07	**5.70**	**2.90**	**1.55**	**0.81**	**0.85**	0.01	0.00	0.03	0.00	**1.47**	**0.66**	0.00	**1.20**
550790026	Wisconsin	Milwaukee		0.06	0.04	0.00	0.00	0.00	0.06	**4.14**	**1.96**	**1.47**	**0.48**	**0.58**	0.01	0.00	0.02	0.00	**1.10**	**1.01**	0.00	**1.01**
			Largest Contribution to Downwind Maintenance	**0.42**	0.23	0.18	0.20	0.03	**0.92**	**5.70**	**5.15**	**1.55**	**0.81**	**3.58**	0.13	0.10	**2.12**	0.30	**2.03**	**1.01**	0.07	**3.71**

State-by-State Contributions to 24-Hour $PM_{2.5}$ ($\mu g/m^3$) *Maintenance* Receptors
Part 2b.
Source States: Nebraska through Wisconsin

Receptor Monitor ID	Receptor State	Receptor County	Source State =>	NE	NH	NJ	NY	NC	ND	OH	OK	PA	RI	SC	SD	TN	TX	VT	VA	WV	WI
10732003	Alabama	Jefferson		0.00	0.00	0.02	0.05	0.22	0.01	**0.99**	0.00	**0.50**	0.00	0.25	0.00	**0.68**	0.03	0.00	0.15	**0.78**	0.02
170310052	Illinois	Cook		0.22	0.00	0.00	0.10	0.06	0.09	**1.45**	0.15	**0.56**	0.00	0.05	0.06	0.18	0.08	0.00	0.06	**0.58**	**0.97**
170312001	Illinois	Cook		0.12	0.00	0.00	0.14	0.04	0.02	**1.71**	0.08	**0.67**	0.00	0.02	0.02	0.20	0.08	0.00	0.06	**0.70**	**0.45**
170313301	Illinois	Cook		0.15	0.00	0.00	0.16	0.02	0.05	**1.53**	0.11	**0.64**	0.00	0.00	0.04	0.12	0.16	0.00	0.05	**0.61**	**0.66**
170316005	Illinois	Cook		0.23	0.00	0.00	0.20	0.06	0.06	**0.85**	0.20	0.31	0.00	0.04	0.06	0.24	0.33	0.00	0.05	0.25	**0.83**
171190023	Illinois	Madison		0.07	0.00	0.00	0.09	0.06	0.08	**2.38**	0.14	**0.67**	0.00	0.03	0.05	**0.81**	0.29	0.00	0.06	**0.68**	0.14
180890022	Indiana	Lake		0.11	0.00	0.00	0.13	0.03	0.05	**1.12**	0.07	**0.39**	0.00	0.01	0.03	0.12	0.04	0.00	0.04	**0.41**	**0.58**
180890026	Indiana	Lake		0.10	0.00	0.00	0.18	0.05	0.05	**1.71**	0.03	**0.74**	0.00	0.02	0.03	0.18	0.05	0.00	0.08	**0.77**	**0.54**
261610008	Michigan	Washtenaw		0.03	0.00	0.03	**0.41**	0.08	0.01	**4.41**	0.05	**1.01**	0.00	0.05	0.00	**0.59**	0.22	0.00	0.13	**1.02**	0.19
390170003	Ohio	Butler		0.02	0.00	0.03	0.30	0.10	0.02	5.90	0.03	**1.58**	0.00	0.05	0.01	**1.22**	0.05	0.00	0.18	**1.56**	0.11
390350045	Ohio	Cuyahoga		0.02	0.00	0.02	**0.89**	0.15	0.02	9.04	0.00	**1.87**	0.00	0.04	0.01	0.29	0.01	0.00	0.23	**2.04**	0.18
390350065	Ohio	Cuyahoga		0.02	0.00	0.02	**0.62**	0.16	0.02	8.51	0.02	**2.20**	0.00	0.04	0.00	**0.35**	0.04	0.00	0.24	**2.26**	0.15
390618001	Ohio	Hamilton		0.02	0.00	0.04	0.21	0.11	0.03	5.88	0.04	**1.65**	0.00	0.03	0.00	**0.78**	0.05	0.00	0.22	**2.15**	0.13
390811001	Ohio	Jefferson		0.01	0.00	0.03	0.18	0.09	0.03	5.09	0.02	**2.29**	0.00	0.05	0.01	0.29	0.03	0.00	0.18	**3.16**	0.12
391130032	Ohio	Montgomery		0.01	0.00	0.04	0.30	0.12	0.02	4.93	0.04	**1.14**	0.00	0.05	0.01	**1.30**	0.07	0.00	0.23	**1.39**	0.11
420031008	Pennsylvania	Allegheny		0.02	0.00	0.03	0.22	0.07	0.04	**4.74**	0.03	4.23	0.00	0.03	0.00	0.34	0.07	0.00	0.18	**2.96**	0.12
420031301	Pennsylvania	Allegheny		0.01	0.00	0.03	0.19	0.07	0.02	**4.22**	0.02	4.31	0.00	0.03	0.00	0.16	0.03	0.00	0.15	**2.87**	0.10
420033007	Pennsylvania	Allegheny		0.01	0.00	0.03	0.13	0.10	0.02	**3.64**	0.01	4.26	0.00	0.04	0.00	0.14	0.02	0.00	0.18	**3.33**	0.07
421330008	Pennsylvania	York		0.02	0.10	**0.75**	**1.34**	**0.38**	0.03	**1.55**	0.02	8.98	0.03	0.17	0.01	0.19	0.06	0.05	**1.01**	**1.47**	0.23
550790010	Wisconsin	Milwaukee		**0.52**	0.00	0.00	0.06	0.03	0.19	**1.19**	0.17	**0.39**	0.00	0.02	0.09	0.16	0.06	0.00	0.03	**0.37**	4.26
550790026	Wisconsin	Milwaukee		**0.43**	0.00	0.00	0.10	0.02	0.33	**1.03**	0.17	**0.35**	0.00	0.02	0.17	0.13	0.13	0.00	0.03	0.32	4.03
			Largest Contribution to Downwind Maintenance	**0.52**	0.10	**0.75**	**1.34**	**0.38**	0.33	**4.74**	0.20	**2.29**	0.03	0.25	0.17	**1.30**	0.33	0.05	**1.01**	**3.33**	**0.97**

Air Quality Modeling Final Rule
Technical Support Document

Appendix E

Upwind States to Downwind Nonattainment and Maintenance Linkages

Table E-1. Upwind State to Downwind Nonattainment Site "Linkages" for Annual $PM_{2.5}$

Upwind State	Annual $PM_{2.5}$ Downwind Nonattainment Receptor Sites			
Alabama	Fulton, GA (131210039)	Hamilton, OH (390610014)	Hamilton, OH (390610042)	Hamilton, OH (390618001)
Georgia	Jefferson, AL (10730023)	Jefferson, AL (10732003)		
Illinois	Jefferson, AL (10732003)	Fulton, GA (131210039)	Wayne, MI (261630033)	Cuyahoga, OH (390350038)
	Cuyahoga, OH (390350045)	Cuyahoga, OH (390350060)	Hamilton, OH (390610014)	Hamilton, OH (390610042)
	Hamilton, OH (390618001)	Allegheny, PA (420030064)		
Indiana	Jefferson, AL (10730023)	Jefferson, AL (10732003)	Fulton, GA (131210039)	Madison, IL (171191007)
	Wayne, MI (261630033)	Cuyahoga, OH (390350038)	Cuyahoga, OH (390350045)	Cuyahoga, OH (390350060)
	Hamilton, OH (390610014)	Hamilton, OH (390610042)	Hamilton, OH (390618001)	Allegheny, PA (420030064)
Iowa	Madison, IL (171191007)			
Kentucky	Jefferson, AL (10730023)	Jefferson, AL (10732003)	Fulton, GA (131210039)	Madison, IL (171191007)
	Wayne, MI (261630033)	Cuyahoga, OH (390350038)	Cuyahoga, OH (390350045)	Cuyahoga, OH (390350060)
	Hamilton, OH (390610014)	Hamilton, OH (390610042)	Hamilton, OH (390618001)	Allegheny, PA (420030064)
Maryland	Allegheny, PA (420030064)			
Michigan	Madison, IL (171191007)	Cuyahoga, OH (390350038)	Cuyahoga, OH (390350045)	Cuyahoga, OH (390350060)
	Hamilton, OH (390610014)	Hamilton, OH (390610042)	Hamilton, OH (390618001)	Allegheny, PA (420030064)
Missouri	Madison, IL (171191007)	Cuyahoga, OH (390350038)	Cuyahoga, OH (390350045)	Cuyahoga, OH (390350060)

Upwind State	Annual $PM_{2.5}$ Downwind Nonattainment Receptor Sites			
	Hamilton, OH (390610014)	Hamilton, OH (390610042)	Hamilton, OH (390618001)	
New York	Cuyahoga, OH (390350038)	Cuyahoga, OH (390350045)	Cuyahoga, OH (390350060)	Allegheny, PA (420030064)
North Carolina	Fulton, GA (131210039)			
Ohio	Jefferson, AL (10730023)	Jefferson, AL (10732003)	Fulton, GA (131210039)	Madison, IL (171191007)
	Wayne, MI (261630033)	Allegheny, PA (420030064)		
Pennsylvania	Fulton, GA (131210039)	Wayne, MI (261630033)	Cuyahoga, OH (390350038)	Cuyahoga, OH (390350045)
	Cuyahoga, OH (390350060)	Hamilton, OH (390610014)	Hamilton, OH (390610042)	Hamilton, OH (390618001)
South Carolina	Fulton, GA (131210039)			
Tennessee	Jefferson, AL (10730023)	Jefferson, AL (10732003)	Fulton, GA (131210039)	Madison, IL (171191007)
	Hamilton, OH (390610014)	Hamilton, OH (390610042)	Hamilton, OH (390618001)	
Texas	Madison, IL (171191007)			
West Virginia	Fulton, GA (131210039)	Wayne, MI (261630033)	Cuyahoga, OH (390350038)	Cuyahoga, OH (390350045)
	Cuyahoga, OH (390350060)	Hamilton, OH (390610014)	Hamilton, OH (390610042)	Hamilton, OH (390618001)
	Allegheny, PA (420030064)			
Wisconsin	Madison, IL (171191007)	Wayne, MI (261630033)	Cuyahoga, OH (390350038)	Cuyahoga, OH (390350045)
	Cuyahoga, OH (390350060)	Hamilton, OH (390610014)	Hamilton, OH (390618001)	

Table E-2. Upwind State to Downwind Maintenance Site "Linkages" for Annual $PM_{2.5}$

Upwind State	Annual $PM_{2.5}$ Downwind Maintenance Receptor Sites			
Alabama	Marion, IN (180970081)	Marion, IN (180970083)	Hamilton, OH (390617001)	
Illinois	Marion, IN (180970081)	Marion, IN (180970083)	Cuyahoga, OH (390350065)	Hamilton, OH (390617001)
Indiana	Cuyahoga, OH (390350065)	Hamilton, OH (390617001)		
Kentucky	Marion, IN (180970081)	Marion, IN (180970083)	Cuyahoga, OH (390350065)	Hamilton, OH (390617001)
Michigan	Marion, IN (180970081)	Marion, IN (180970083)	Cuyahoga, OH (390350065)	Hamilton, OH (390617001)
Missouri	Marion, IN (180970081)	Marion, IN (180970083)	Cuyahoga, OH (390350065)	Hamilton, OH (390617001)
New York	Cuyahoga, OH (390350065)			
Ohio	Marion, IN (180970081)	Marion, IN (180970083)		
Pennsylvania	Marion, IN (180970081)	Marion, IN (180970083)	Cuyahoga, OH (390350065)	Hamilton, OH (390617001)
Tennessee	Marion, IN (180970081)	Marion, IN (180970083)	Hamilton, OH (390617001)	
West Virginia	Marion, IN (180970081)	Marion, IN (180970083)	Cuyahoga, OH (390350065)	Hamilton, OH (390617001)
Wisconsin	Marion, IN (180970081)	Marion, IN (180970083)	Cuyahoga, OH (390350065)	Hamilton, OH (390617001)

Table E-3. Upwind State to Downwind Nonattainment Site "Linkages" for 24-hour $PM_{2.5}$

Upwind State	24-Hour $PM_{2.5}$ Downwind Nonattainment Receptor Sites			
Alabama	Marion, IN (180970043)	Marion, IN (180970066)	Marion, IN (180970081)	
Georgia	Jefferson, AL (10730023)			
Illinois	Marion, IN (180970043)	Marion, IN (180970066)	Marion, IN (180970081)	St Clair, MI (261470005)
	Wayne, MI (261630015)	Wayne, MI (261630016)	Wayne, MI (261630019)	Wayne, MI (261630033)
	Cuyahoga, OH (390350038)	Cuyahoga, OH (390350060)	Allegheny, PA (420030064)	Allegheny, PA (420030093)
	Allegheny, PA (420030116)	Beaver, PA (420070014)	Brooke, WV (540090011)	Milwaukee, WI (550790043)
Indiana	Jefferson, AL (10730023)	Cook, IL (170311016)	Madison, IL (171191007)	St Clair, MI (261470005)
	Wayne, MI (261630015)	Wayne, MI (261630016)	Wayne, MI (261630019)	Wayne, MI (261630033)
	Cuyahoga, OH (390350038)	Cuyahoga, OH (390350060)	Allegheny, PA (420030064)	Allegheny, PA (420030093)
	Allegheny, PA (420030116)	Beaver, PA (420070014)	Brooke, WV (540090011)	Milwaukee, WI (550790043)
Iowa	Cook, IL (170311016)	Madison, IL (171191007)	Milwaukee, WI (550790043)	
Kansas	Madison, IL (171191007)			
Kentucky	Jefferson, AL (10730023)	Cook, IL (170311016)	Madison, IL (171191007)	Marion, IN (180970043)
	Marion, IN (180970066)	Marion, IN (180970081)	St Clair, MI (261470005)	Wayne, MI (261630015)
	Wayne, MI (261630016)	Wayne, MI (261630019)	Wayne, MI (261630033)	Cuyahoga, OH (390350038)
	Cuyahoga, OH (390350060)	Allegheny, PA (420030064)	Allegheny, PA (420030093)	Allegheny, PA (420030116)

Upwind State	24-Hour $PM_{2.5}$ Downwind Nonattainment Receptor Sites			
	Beaver, PA (420070014)	Brooke, WV (540090011)	Milwaukee, WI (550790043)	
Maryland	Cuyahoga, OH (390350038)	Lancaster, PA (420710007)		
Michigan	Cook, IL (170311016)	Madison, IL (171191007)	Cuyahoga, OH (390350038)	Cuyahoga, OH (390350060)
	Allegheny, PA (420030064)	Allegheny, PA (420030093)	Beaver, PA (420070014)	Brooke, WV (540090011)
	Milwaukee, WI (550790043)			
Minnesota	Milwaukee, WI (550790043)			
Missouri	Cook, IL (170311016)	Madison, IL (171191007)	Marion, IN (180970043)	Marion, IN (180970066)
	Marion, IN (180970081)	St Clair, MI (261470005)	Wayne, MI (261630015)	Allegheny, PA (420030064)
	Allegheny, PA (420030116)	Beaver, PA (420070014)	Milwaukee, WI (550790043)	
New Jersey	Lancaster, PA (420710007)			
New York	St Clair, MI (261470005)	Wayne, MI (261630016)	Wayne, MI (261630019)	Wayne, MI (261630033)
	Cuyahoga, OH (390350060)	Lancaster, PA (420710007)		
North Carolina	Lancaster, PA (420710007)			
Ohio	Jefferson, AL (10730023)	Cook, IL (170311016)	Madison, IL (171191007)	Marion, IN (180970043)
	Marion, IN (180970066)	Marion, IN (180970081)	St Clair, MI (261470005)	Wayne, MI (261630015)
	Wayne, MI (261630016)	Wayne, MI (261630019)	Wayne, MI (261630033)	Allegheny, PA (420030064)
	Allegheny, PA (420030093)	Allegheny, PA (420030116)	Beaver, PA (420070014)	Lancaster, PA (420710007)

Upwind State	24-Hour $PM_{2.5}$ Downwind Nonattainment Receptor Sites			
	Brooke, WV (540090011)	Milwaukee, WI (550790043)		
Pennsylvania	Jefferson, AL (10730023)	Cook, IL (170311016)	Madison, IL (171191007)	Marion, IN (180970043)
	Marion, IN (180970066)	Marion, IN (180970081)	St Clair, MI (261470005)	Wayne, MI (261630015)
	Wayne, MI (261630016)	Wayne, MI (261630019)	Wayne, MI (261630033)	Cuyahoga, OH (390350038)
	Cuyahoga, OH (390350060)	Brooke, WV (540090011)	Milwaukee, WI (550790043)	
Tennessee	Jefferson, AL (10730023)	Madison, IL (171191007)	Marion, IN (180970043)	Marion, IN (180970066)
	Marion, IN (180970081)	St Clair, MI (261470005)	Wayne, MI (261630015)	Wayne, MI (261630033)
	Cuyahoga, OH (390350038)	Allegheny, PA (420030116)		
Texas	Madison, IL (171191007)			
Virginia	Lancaster, PA (420710007)			
West Virginia	Jefferson, AL (10730023)	Cook, IL (170311016)	Madison, IL (171191007)	Marion, IN (180970043)
	Marion, IN (180970066)	Marion, IN (180970081)	St Clair, MI (261470005)	Wayne, MI (261630015)
	Wayne, MI (261630016)	Wayne, MI (261630019)	Wayne, MI (261630033)	Cuyahoga, OH (390350038)
	Cuyahoga, OH (390350060)	Allegheny, PA (420030064)	Allegheny, PA (420030093)	Allegheny, PA (420030116)
	Beaver, PA (420070014)	Lancaster, PA (420710007)	Milwaukee, WI (550790043)	
Wisconsin	Cook, IL (170311016)	Wayne, MI (261630019)	Wayne, MI (261630033)	

Table E-4. Upwind State to Downwind Maintenance Site "Linkages" for 24-hour $PM_{2.5}$

Upwind State	24-Hour $PM_{2.5}$ Downwind Maintenance Receptor Sites			
Alabama	Washtenaw, MI (261610008)	Butler, OH (390170003)	Montgomery, OH (391130032)	
Georgia	Jefferson, AL (10732003)			
Illinois	Lake, IN (180890022)	Lake, IN (180890026)	Washtenaw, MI (261610008)	Butler, OH (390170003)
	Cuyahoga, OH (390350045)	Cuyahoga, OH (390350065)	Hamilton, OH (390618001)	Jefferson, OH (390811001)
	Montgomery, OH (391130032)	Allegheny, PA (420031008)	Allegheny, PA (420031301)	Allegheny, PA (420033007)
	York, PA (421330008)	Milwaukee, WI (550790010)	Milwaukee, WI (550790026)	
Indiana	Jefferson, AL (10732003)	Cook, IL (170310052)	Cook, IL (170312001)	Cook, IL (170313301)
	Cook, IL (170316005)	Madison, IL (171190023)	Washtenaw, MI (261610008)	Butler, OH (390170003)
	Cuyahoga, OH (390350045)	Cuyahoga, OH (390350065)	Hamilton, OH (390618001)	Jefferson, OH (390811001)
	Montgomery, OH (391130032)	Allegheny, PA (420031008)	Allegheny, PA (420031301)	Allegheny, PA (420033007)
	York, PA (421330008)	Milwaukee, WI (550790010)	Milwaukee, WI (550790026)	
Iowa	Cook, IL (170310052)	Cook, IL (170312001)	Cook, IL (170313301)	Cook, IL (170316005)
	Madison, IL (171190023)	Lake, IN (180890022)	Lake, IN (180890026)	Milwaukee, WI (550790010)
	Milwaukee, WI (550790026)			
Kansas	Cook, IL (170310052)	Cook, IL (170316005)	Milwaukee, WI (550790010)	Milwaukee, WI (550790026)
Kentucky	Jefferson, AL (10732003)	Cook, IL (170310052)	Cook, IL (170312001)	Cook, IL (170313301)

Upwind State	24-Hour $PM_{2.5}$ Downwind Maintenance Receptor Sites			
	Cook, IL (170316005)	Madison, IL (171190023)	Lake, IN (180890022)	Lake, IN (180890026)
	Washtenaw, MI (261610008)	Butler, OH (390170003)	Cuyahoga, OH (390350045)	Cuyahoga, OH (390350065)
	Hamilton, OH (390618001)	Jefferson, OH (390811001)	Montgomery, OH (391130032)	Allegheny, PA (420031008)
	Allegheny, PA (420031301)	Allegheny, PA (420033007)	York, PA (421330008)	Milwaukee, WI (550790010)
	Milwaukee, WI (550790026)			
Maryland	York, PA (421330008)			
Michigan	Cook, IL (170310052)	Cook, IL (170312001)	Cook, IL (170313301)	Cook, IL (170316005)
	Madison, IL (171190023)	Lake, IN (180890022)	Lake, IN (180890026)	Butler, OH (390170003)
	Cuyahoga, OH (390350045)	Cuyahoga, OH (390350065)	Hamilton, OH (390618001)	Jefferson, OH (390811001)
	Montgomery, OH (391130032)	Allegheny, PA (420031008)	Allegheny, PA (420031301)	Allegheny, PA (420033007)
	York, PA (421330008)	Milwaukee, WI (550790010)	Milwaukee, WI (550790026)	
Minnesota	Milwaukee, WI (550790010)	Milwaukee, WI (550790026)		
Missouri	Cook, IL (170310052)	Cook, IL (170312001)	Cook, IL (170313301)	Cook, IL (170316005)
	Madison, IL (171190023)	Lake, IN (180890022)	Lake, IN (180890026)	Washtenaw, MI (261610008)
	Butler, OH (390170003)	Hamilton, OH (390618001)	Montgomery, OH (391130032)	Allegheny, PA (420031008)
	Milwaukee, WI (550790010)	Milwaukee, WI (550790026)		
Nebraska	Milwaukee, WI (550790010)	Milwaukee, WI (550790026)		

Upwind State	24-Hour $PM_{2.5}$ Downwind Maintenance Receptor Sites			
New Jersey	York, PA (421330008)			
New York	Washtenaw, MI (261610008)	Cuyahoga, OH (390350045)	Cuyahoga, OH (390350065)	York, PA (421330008)
North Carolina	York, PA (421330008)			
Ohio	Jefferson, AL (10732003)	Cook, IL (170310052)	Cook, IL (170312001)	Cook, IL (170313301)
	Cook, IL (170316005)	Madison, IL (171190023)	Lake, IN (180890022)	Lake, IN (180890026)
	Washtenaw, MI (261610008)	Allegheny, PA (420031008)	Allegheny, PA (420031301)	Allegheny, PA (420033007)
	York, PA (421330008)	Milwaukee, WI (550790010)	Milwaukee, WI (550790026)	
Pennsylvania	Jefferson, AL (10732003)	Cook, IL (170310052)	Cook, IL (170312001)	Cook, IL (170313301)
	Madison, IL (171190023)	Lake, IN (180890022)	Lake, IN (180890026)	Washtenaw, MI (261610008)
	Butler, OH (390170003)	Cuyahoga, OH (390350045)	Cuyahoga, OH (390350065)	Hamilton, OH (390618001)
	Jefferson, OH (390811001)	Montgomery, OH (391130032)	Milwaukee, WI (550790010)	Milwaukee, WI (550790026)
Tennessee	Jefferson, AL (10732003)	Madison, IL (171190023)	Washtenaw, MI (261610008)	Butler, OH (390170003)
	Cuyahoga, OH (390350065)	Hamilton, OH (390618001)	Montgomery, OH (391130032)	
Virginia	York, PA (421330008)			
West Virginia	Jefferson, AL (10732003)	Cook, IL (170310052)	Cook, IL (170312001)	Cook, IL (170313301)
	Madison, IL (171190023)	Lake, IN (180890022)	Lake, IN (180890026)	Washtenaw, MI (261610008)
	Butler, OH (390170003)	Cuyahoga, OH (390350045)	Cuyahoga, OH (390350065)	Hamilton, OH (390618001)

Upwind State	24-Hour $PM_{2.5}$ Downwind Maintenance Receptor Sites			
	Jefferson, OH (390811001)	Montgomery, OH (391130032)	Allegheny, PA (420031008)	Allegheny, PA (420031301)
	Allegheny, PA (420033007)	York, PA (421330008)	Milwaukee, WI (550790010)	
Wisconsin	Cook, IL (170310052)	Cook, IL (170312001)	Cook, IL (170313301)	Cook, IL (170316005)
	Lake, IN (180890022)	Lake, IN (180890026)		

Table E-5. Upwind State to Downwind Nonattainment "Linkages" for 8-hour Ozone

Upwind State	8-Hour Ozone Downwind Nonattainment Receptor Sites			
Alabama	East Baton Rouge, LA (220330003)	Brazoria, TX (480391004)	Harris, TX (482010051)	Harris, TX (482010055)
Arkansas	East Baton Rouge, LA (220330003)	Brazoria, TX (480391004)		
Georgia	East Baton Rouge, LA (220330003)	Brazoria, TX (480391004)	Harris, TX (482010051)	Harris, TX (482010055)
Illinois	Brazoria, TX (480391004)	Harris, TX (482010051)	Harris, TX (482010055)	
Indiana	Brazoria, TX (480391004)	Harris, TX (482010051)	Harris, TX (482010055)	
Kentucky	Brazoria, TX (480391004)	Harris, TX (482010051)	Harris, TX (482010055)	
Louisiana	Brazoria, TX (480391004)	Harris, TX (482010051)	Harris, TX (482010055)	
Mississippi	East Baton Rouge, LA (220330003)	Brazoria, TX (480391004)	Harris, TX (482010051)	Harris, TX (482010055)
Missouri	Brazoria, TX (480391004)	Harris, TX (482010051)	Harris, TX (482010055)	
Tennessee	East Baton Rouge, LA (220330003)	Brazoria, TX (480391004)	Harris, TX (482010051)	Harris, TX (482010055)
Texas	East Baton Rouge, LA (220330003)			

Table E-6. Upwind State to Downwind Maintenance "Linkages" for 8-Hour Ozone

Upwind State	8-Hour Ozone Downwind Maintenance Receptor Sites			
Alabama	Harris, TX (482010029)	Harris, TX (482011050)		
Arkansas	Allegan, MI (260050003)			
Florida	Harris, TX (482010029)	Harris, TX (482011050)		
Georgia	Harris, TX (482010029)	Harris, TX (482011050)		
Illinois	Fairfield, CT (90011123)	Allegan, MI (260050003)	Harris, TX (482011050)	
Indiana	Fairfield, CT (90011123)	New Haven, CT (90093002)	Harford, MD (240251001)	Allegan, MI (260050003)
Iowa	Allegan, MI (260050003)			
Kansas	Allegan, MI (260050003)			
Kentucky	Fairfield, CT (90011123)	New Haven, CT (90093002)	Harford, MD (240251001)	Harris, TX (482011050)
Louisiana	Harris, TX (482010029)	Harris, TX (482011050)		
Maryland	Fairfield, CT (90011123)	New Haven, CT (90093002)		
Michigan	Harford, MD (240251001)			
Mississippi	Harris, TX (482010029)	Harris, TX (482011050)		
Missouri	Allegan, MI (260050003)			
New Jersey	Fairfield, CT (90011123)	New Haven, CT (90093002)		
New York	Fairfield, CT (90011123)	New Haven, CT (90093002)	Harford, MD (240251001)	
North Carolina	New Haven, CT (90093002)	Harford, MD (240251001)		
Ohio	Fairfield, CT (90011123)	New Haven, CT (90093002)	Harford, MD (240251001)	

Upwind State	8-Hour Ozone Downwind Maintenance Receptor Sites			
Oklahoma	Allegan, MI (260050003)			
Pennsylvania	Fairfield, CT (90011123)	New Haven, CT (90093002)	Harford, MD (240251001)	
South Carolina	Harris, TX (482010029)			
Tennessee	Fairfield, CT (90011123)	Harford, MD (240251001)	Harris, TX (482011050)	
Texas	Allegan, MI (260050003)			
Virginia	Fairfield, CT (90011123)	New Haven, CT (90093002)	Harford, MD (240251001)	
West Virginia	Fairfield, CT (90011123)	New Haven, CT (90093002)	Harford, MD (240251001)	
Wisconsin	Allegan, MI (260050003)			

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Appendix F

Analysis of Contribution Thresholds

Table F-1a. Contribution metrics for 8-hour ozone 2012 nonattainment receptors – part 1.

Monitoring Site	State	County	2012 Base Case In-State Contribution (ppb)	2012 Total Contribution from All Upwind States (ppb)	Upwind Contribution as a Percent of Receptor Concentration	# States Contributing At or Above 0.5% Threshold	# States Contributing At or Above 1% Threshold	# States Contributing At or Above 5% Threshold
220330003	LA	East Baton Rouge	39.8	21.0	35%	10	6	1
480391004	TX	Brazoria	35.3	27.6	44%	12	10	1
482010051	TX	Harris	27.3	26.9	50%	11	9	1
482010055	TX	Harris	29.6	29.1	50%	12	9	2

Table F-1b. Contribution metrics for 8-hour ozone 2012 nonattainment receptors – part 2.

Monitoring Site	State	County	Transport (ppb) Using 0.5% Threshold	Transport (ppb) Using 1% Threshold	Transport (ppb) Using 5% Threshold	% of Total Transport Captured with 0.5% Threshold	% of Total Transport Captured with 1% Threshold	% of Total Transport Captured with 5% Threshold
220330003	LA	East Baton Rouge	17.8	15.7	4.0	85%	75%	19%
480391004	TX	Brazoria	24.5	23.3	7.9	89%	84%	29%
482010051	TX	Harris	24.2	23.2	7.3	90%	86%	27%
482010055	TX	Harris	26.6	25.1	12.1	91%	86%	42%

Table F-1c. Contribution metrics for 8-hour ozone 2012 maintenance receptors – part 1.

Monitoring Site	**State**	**County**	**2012 Base Case In-State Contribution (ppb)**	**2012 Total Contribution from All Upwind States (ppb)**	**Upwind Contribution as a Percent of Receptor Concentration**	**# States Contributing At or Above 0.5% Threshold**	**# States Contributing At or Above 1% Threshold**	**# States Contributing At or Above 5% Threshold**
90011123	CT	Fairfield	5.7	56.9	91%	19	11	3
90093002	CT	New Haven	4.4	59.6	93%	15	10	4
240251001	MD	Harford	33.7	32.7	49%	13	10	2
260050003	MI	Allegan	4.3	56.9	93%	11	9	3
482010029	TX	Harris	35.0	21.9	38%	8	6	1
482011050	TX	Harris	33.1	29.7	47%	15	8	1

Table F-1d. Contribution metrics for 8-hour ozone 2012 maintenance receptors – part 2.

Monitoring Site	**State**	**County**	**Transport (ppb) Using 0.5% Threshold**	**Transport (ppb) Using 1% Threshold**	**Transport (ppb) Using 5% Threshold**	**% of Total Transport Captured with 0.5% Threshold**	**% of Total Transport Captured with 1% Threshold**	**% of Total Transport Captured with 5% Threshold**
90011123	CT	Fairfield	53.9	49.3	36.0	95%	87%	63%
90093002	CT	New Haven	57.3	54.2	42.0	96%	91%	71%
240251001	MD	Harford	28.2	26.4	13.8	86%	81%	42%
260050003	MI	Allegan	53.7	52.3	41.1	94%	92%	72%
482010029	TX	Harris	19.4	18.0	5.8	89%	82%	27%
482011050	TX	Harris	27.1	22.9	11.1	91%	77%	37%

Table F-2a. Contribution metrics for annual PM2.5 2012 nonattainment receptors – part 1.

Monitoring Site	State	County	2012 Base Case In-State Contribution (μg/m^3)	2012 Total Contribution from All Upwind States (μg/m^3)	Upwind Contribution as a Percent of Receptor Concentration	# States Contributing At or Above 0.5% Threshold	# States Contributing At or Above 1% Threshold	# States Contributing At or Above 5% Threshold
10730023	AL	Jefferson	3.12	2.72	47%	12	5	0
10732003	AL	Jefferson	2.58	2.85	52%	14	6	0
131210039	GA	Fulton	1.37	3.43	72%	13	10	0
171191007	IL	Madison	1.51	4.92	77%	17	9	1
261630033	MI	Wayne	2.27	4.12	64%	13	7	1
390350038	OH	Cuyahoga	2.62	4.24	62%	12	9	0
390350045	OH	Cuyahoga	2.64	4.28	62%	13	9	0
390350060	OH	Cuyahoga	2.64	4.29	62%	13	9	0
390610014	OH	Hamilton	2.13	5.43	72%	13	10	2
390610042	OH	Hamilton	2.04	5.55	73%	13	9	2
390618001	OH	Hamilton	2.11	5.39	72%	13	10	2
420030064	PA	Allegheny	2.14	4.99	70%	14	8	2

Table F-2b. Contribution metrics for annual PM2.5 2012 nonattainment receptors – part 2.

Monitoring Site	State	County	Transport (μg/m^3) Using 0.5% Threshold	Transport (μg/m^3) Using 1% Threshold	Transport (μg/m^3) Using 5% Threshold	% of Total Transport Captured with 0.5% Threshold	% of Total Transport Captured with 1% Threshold	% of Total Transport Captured with 5% Threshold
10730023	AL	Jefferson	2.24	1.45	0.00	82%	53%	0%
10732003	AL	Jefferson	2.49	1.67	0.00	87%	59%	0%
131210039	GA	Fulton	2.94	2.64	0.00	86%	77%	0%
171191007	IL	Madison	4.57	3.72	1.22	93%	76%	25%
261630033	MI	Wayne	3.75	3.10	0.99	91%	75%	24%
390350038	OH	Cuyahoga	3.71	3.40	0.00	88%	80%	0%
390350045	OH	Cuyahoga	3.82	3.43	0.00	89%	80%	0%
390350060	OH	Cuyahoga	3.83	3.43	0.00	89%	80%	0%
390610014	OH	Hamilton	4.89	4.57	2.09	90%	84%	39%
390610042	OH	Hamilton	5.02	4.57	2.28	91%	82%	41%
390618001	OH	Hamilton	4.87	4.55	2.07	90%	84%	38%
420030064	PA	Allegheny	4.61	3.98	2.29	92%	80%	46%

Table F-2c. Contribution metrics for annual PM2.5 2012 maintenance receptors – part 1.

Monitoring Site	State	County	2012 Base Case In-State Contribution (μg/m^3)	2012 Total Contribution from All Upwind States (μg/m^3)	Upwind Contribution as a Percent of Receptor Concentration	# States Contributing At or Above 0.5% Threshold	# States Contributing At or Above 1% Threshold	# States Contributing At or Above 5% Threshold
180970081	IN	Marion	2.94	4.78	62%	13	10	1
180970083	IN	Marion	2.94	4.79	62%	13	10	1
390350065	OH	Cuyahoga	2.64	4.28	62%	13	9	0
390617001	OH	Hamilton	2.12	5.42	72%	13	10	2

Table F-2d. Contribution metrics for annual PM2.5 2012 maintenance receptors – part 2.

Monitoring Site	**State**	**County**	**Transport (μg/m³) Using 0.5% Threshold**	**Transport (μg/m³) Using 1% Threshold**	**Transport (μg/m³) Using 5% Threshold**	**% of Total Transport Captured with 0.5% Threshold**	**% of Total Transport Captured with 1% Threshold**	**% of Total Transport Captured with 5% Threshold**
180970081	IN	Marion	4.24	3.92	0.94	89%	82%	20%
180970083	IN	Marion	4.25	3.93	0.94	89%	82%	20%
390350065	OH	Cuyahoga	3.82	3.43	0.00	89%	80%	0%
390617001	OH	Hamilton	4.88	4.56	2.08	90%	84%	38%

Table F-3a. Contribution metrics for 24-hour PM2.5 2012 nonattainment receptors – part 1.

Monitoring Site	State	County	2012 Base Case In-State Contribution ($\mu g/m^3$)	2012 Total Contribution from All Upwind States ($\mu g/m^3$)	Upwind Contribution as a Percent of Receptor Concentration	# States Contributing At or Above 0.5% Threshold	# States Contributing At or Above 1% Threshold	# States Contributing At or Above 5% Threshold
10730023	AL	Jefferson	6.81	7.87	54%	12	7	0
170311016	IL	Cook	4.75	12.55	73%	13	9	1
171191007	IL	Madison	4.03	17.06	81%	14	11	3
180970043	IN	Marion	9.15	14.19	61%	9	8	2
180970066	IN	Marion	8.39	13.75	62%	10	8	2
180970081	IN	Marion	8.29	13.73	62%	10	8	2
261470005	MI	St Clair	1.97	15.28	89%	12	9	2
261630015	MI	Wayne	4.35	13.97	76%	12	8	2
261630016	MI	Wayne	5.22	13.20	72%	10	7	2
261630019	MI	Wayne	3.58	12.89	78%	10	8	2
261630033	MI	Wayne	5.03	13.59	73%	12	9	2
390350038	OH	Cuyahoga	8.49	12.86	60%	14	8	4
390350060	OH	Cuyahoga	8.96	11.58	56%	11	7	3
420030064	PA	Allegheny	5.53	14.93	73%	9	7	2
420030093	PA	Allegheny	3.21	12.05	79%	11	6	2
420030116	PA	Allegheny	2.96	13.19	82%	10	7	2
420070014	PA	Beaver	2.61	13.51	84%	12	7	2
420710007	PA	Lancaster	6.69	10.45	61%	15	7	1
540090011	WV	Brooke	3.28	15.33	82%	12	6	2
550790043	WI	Milwaukee	3.00	17.74	86%	14	10	3

Table F-3b. Contribution metrics for 24-hour PM2.5 2012 nonattainment receptors – part 2.

Monitoring Site	State	County	Transport (µg/m^3) Using 0.5% Threshold	Transport (µg/m^3) Using 1% Threshold	Transport (µg/m^3) Using 5% Threshold	% of Total Transport Captured with 0.5% Threshold	% of Total Transport Captured with 1% Threshold	% of Total Transport Captured with 5% Threshold
10730023	AL	Jefferson	7.16	5.92	0.00	91%	75%	0%
170311016	IL	Cook	11.51	10.56	3.29	92%	84%	26%
171191007	IL	Madison	15.91	15.14	9.15	93%	89%	54%
180970043	IN	Marion	13.10	12.85	7.04	92%	91%	50%
180970066	IN	Marion	12.75	12.26	6.47	93%	89%	47%
180970081	IN	Marion	12.73	12.22	6.39	93%	89%	47%
261470005	MI	St Clair	14.35	13.65	6.95	94%	89%	46%
261630015	MI	Wayne	12.93	11.80	6.41	93%	85%	46%
261630016	MI	Wayne	12.27	11.50	6.17	93%	87%	47%
261630019	MI	Wayne	12.04	11.60	6.11	93%	90%	47%
261630033	MI	Wayne	12.53	11.67	6.42	92%	86%	47%
390350038	OH	Cuyahoga	12.33	10.83	8.45	96%	84%	66%
390350060	OH	Cuyahoga	10.55	9.60	5.78	91%	83%	50%
420030064	PA	Allegheny	13.73	13.31	8.83	92%	89%	59%
420030093	PA	Allegheny	11.09	9.65	6.03	92%	80%	50%
420030116	PA	Allegheny	12.04	11.14	6.84	91%	85%	52%
420070014	PA	Beaver	12.38	11.05	6.57	92%	82%	49%
420710007	PA	Lancaster	9.34	7.38	2.83	89%	71%	27%
540090011	WV	Brooke	14.56	12.91	8.70	95%	84%	57%
550790043	WI	Milwaukee	16.66	15.65	9.69	94%	88%	55%

Table F-3c. Contribution metrics for 24-hour PM2.5 2012 maintenance receptors – part 1.

Monitoring Site	State	County	2012 Base Case In-State Contribution (µg/m3)	2012 Total Contribution from All Upwind States (µg/m3)	Upwind Contribution as a Percent of Receptor Concentration	# States Contributing At or Above 0.5% Threshold	# States Contributing At or Above 1% Threshold	# States Contributing At or Above 5% Threshold
10732003	AL	Jefferson	4.61	6.88	60%	11	7	0
170310052	IL	Cook	6.13	12.66	67%	13	10	1
170312001	IL	Cook	3.96	13.57	77%	11	9	2
170313301	IL	Cook	5.10	12.23	71%	11	9	2
170316005	IL	Cook	6.15	11.15	65%	16	8	1
171190023	IL	Madison	3.87	16.65	81%	15	9	4
180890022	IN	Lake	5.77	9.84	63%	10	9	1
180890026	IN	Lake	4.52	11.65	72%	12	9	2
261610008	MI	Washtenaw	2.67	15.18	85%	13	10	2
390170003	OH	Butler	5.90	18.03	75%	13	9	2
390350045	OH	Cuyahoga	9.04	11.81	57%	12	7	3
390350065	OH	Cuyahoga	8.51	12.53	60%	12	8	3
390618001	OH	Hamilton	5.88	14.19	71%	12	8	3
390811001	OH	Jefferson	5.09	11.36	69%	11	6	2
391130032	OH	Montgomery	4.93	15.19	76%	13	9	2
420031008	PA	Allegheny	4.23	14.80	78%	11	7	3
420031301	PA	Allegheny	4.31	12.29	74%	9	6	2
420033007	PA	Allegheny	4.26	11.46	73%	9	6	2
421330008	PA	York	8.98	13.25	60%	17	11	1
550790010	WI	Milwaukee	4.26	18.62	81%	13	12	2
550790026	WI	Milwaukee	4.03	15.17	79%	13	11	2

Table F-3d. Contribution metrics for 24-hour PM2.5 2012 maintenance receptors – part 2.

Monitoring Site	**State**	**County**	**Transport ($\mu g/m^3$) Using 0.5% Threshold**	**Transport ($\mu g/m^3$) Using 1% Threshold**	**Transport ($\mu g/m^3$) Using 5% Threshold**	**% of Total Transport Captured with 0.5% Threshold**	**% of Total Transport Captured with 1% Threshold**	**% of Total Transport Captured with 5% Threshold**
10732003	AL	Jefferson	6.19	5.23	0.00	90%	76%	0%
170310052	IL	Cook	11.67	10.96	2.84	92%	87%	22%
170312001	IL	Cook	12.56	12.13	6.70	93%	89%	49%
170313301	IL	Cook	11.13	10.69	5.17	91%	87%	42%
170316005	IL	Cook	10.37	8.42	2.49	93%	76%	22%
171190023	IL	Madison	15.81	14.31	10.90	95%	86%	66%
180890022	IN	Lake	8.88	8.68	3.09	90%	88%	31%
180890026	IN	Lake	10.73	10.19	4.68	92%	88%	40%
261610008	MI	Washtenaw	14.12	13.46	7.37	93%	89%	49%
390170003	OH	Butler	17.27	16.25	8.73	96%	90%	48%
390350045	OH	Cuyahoga	11.05	9.87	5.94	94%	84%	50%
390350065	OH	Cuyahoga	11.66	10.57	6.28	93%	84%	50%
390618001	OH	Hamilton	13.28	12.30	7.97	94%	87%	56%
390811001	OH	Jefferson	10.63	9.50	5.45	94%	84%	48%
391130032	OH	Montgomery	14.41	13.42	7.05	95%	88%	46%
420031008	PA	Allegheny	13.86	12.92	9.84	94%	87%	67%
420031301	PA	Allegheny	11.39	10.78	7.09	93%	88%	58%
420033007	PA	Allegheny	10.71	10.12	6.97	94%	88%	61%
421330008	PA	York	12.02	10.65	2.11	91%	80%	16%
550790010	WI	Milwaukee	17.80	17.61	8.60	96%	95%	46%
550790026	WI	Milwaukee	14.21	13.56	6.10	94%	89%	40%

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Appendix G

Summary of Aggregated Emissions of SO_2 and NO_x For States Included in the Transport Rule

Table G-1. Group1 and Group 2 States NO_X Total Emissions for each Transport Rule Modeling Case.

	2005 Base Year	**2012 Base Case**	**2014 Base Case**	**2014 Remedy**	**2014 Remedy - 2012 Base Case**	**Percent Change: 2014 Remedy vs 2012 Base Case**	**2014 Remedy - 2014 Base Case**	**Percent Change: 2014 Remedy vs 2014 Base Case**
Annual Total NO_X Emissions for States in Group 1	8,942,956	5,998,929	5,592,557	5,490,517	-508,412	-8.5%	-102,039	-1.8%
Annual Total NO_X Emissions for States in Group 2	4,626,321	3,351,169	3,083,373	3,030,042	-321,127	-9.6%	-53,331	-1.7%
Annual Total NO_X for all States included for PM	13,569,277	9,350,098	8,675,929	8,520,559	-829,539	-8.9%	-155,370	-1.8%
Annual Total NO_X Emissions for All States Fully within the Eastern Modeling Domain	17,265,033	12,013,803	11,173,286	10,974,018	-1,039,784	-8.7%	-199,268	-1.8%
Annual Total NO_X Emissions for All Western States	3,887,276	2,959,396	2,751,224	2,751,659	-207,737	-7.0%	435	0.0%
Total NO_X	21,152,309	14,973,199	13,924,510	13,725,678	-1,247,521	-8.3%	-198,832	-1.4%

Table G-2. Group1 and Group 2 States SO_2 Total Emissions for each Transport Rule Case.

	2005 Base Year	2012 Base Case	2014 Base Case	2014 Remedy	2014 Remedy - 2012 Base Case	Percent Change: 2014 Remedy vs 2012 Base Case	2014 Remedy - 2014 Base Case	Percent Change: 2014 Remedy vs 2014 Base Case
Annual Total SO2 Emissions for States in Group 1	8,695,431	6,841,869	6,198,185	2,999,641	-3,842,228	-56.2%	-3,198,544	-51.6%
Annual Total SO2 Emissions for States in Group 2	2,989,533	2,343,536	2,086,522	1,419,361	-924,175	-39.4%	-667,161	-32.0%
Annual Total SO2 for all States included for PM	11,684,964	9,185,405	8,284,707	4,419,002	-4,766,403	-51.9%	-3,865,705	-46.7%
Annual Total SO2 Emissions for All States Fully within the Eastern Modeling Domain	13,545,837	10,361,804	9,512,351	5,680,977	-4,680,826	-45.2%	-3,831,374	-40.3%
Annual Total SO2 Emissions for All Western States	808,533	567,085	566,435	594,818	27,733	4.9%	28,383	5.0%
Total SO2	14,354,370	10,928,889	10,078,786	6,275,795	-4,653,094	-42.6%	-3,802,991	-37.7%

Table G-3. Group1 and Group 2 States NO_X EGU Sector Emissions for each Transport Rule Case.

	2005 Base Year	**2012 Base Case**	**2014 Base Case**	**2014 Remedy**	**2014 Remedy - 2012 Base Case**	**Percent Change: 2014 Remedy vs 2012 Base Case**	**2014 Remedy - 2014 Base Case**	**Percent Change: 2014 Remedy vs 2014 Base Case**
Annual EGU NO_X Emissions for States in Group 1	1,927,858	938,824	940,211	838,171	-100,653	-10.7%	-102,039	-10.9%
Annual EGU NO_X Emissions for States in Group 2	700,110	444,377	425,686	372,355	-72,022	-16.2%	-53,331	-12.5%
Annual EGU NO_X for all States included for PM	2,627,967	1,383,201	1,365,897	1,210,527	-172,674	-12.5%	-155,370	-11.4%
Annual EGU NO_X Emissions for All States Fully within the Eastern Modeling Domain	3,224,300	1,715,510	1,718,178	1,518,910	-196,600	-11.5%	-199,268	-11.6%
Annual EGU NO_X Emissions for All Western States	504,861	369,180	371,244	371,680	2,500	0.7%	435	0.1%
Total EGU NO_X	3,729,161	2,084,689	2,089,422	1,890,590	-194,099	-9.3%	-198,832	-9.5%

Table G-4. Group1 and Group 2 States SO_2 EGU Sector Emissions for each Transport Rule Modeling Case.

	2005 Base Year	**2012 Base Case**	**2014 Base Case**	**2014 Remedy**	**2014 Remedy - 2012 Base Case**	**Percent Change: 2014 Remedy vs 2012 Base Case**	**2014 Remedy - 2014 Base Case**	**Percent Change: 2014 Remedy vs 2014 Base Case**
Annual EGU SO2 Emissions for States in Group 1	6,764,335	5,313,000	4,752,537	1,553,993	-3,759,007	-70.8%	-3,198,544	-67.3%
Annual EGU SO2 Emissions for States in Group 2	2,143,069	1,702,727	1,468,071	800,910	-901,816	-53.0%	-667,161	-45.4%
Annual EGU SO2 for all States included for PM	8,907,403	7,015,726	6,220,608	2,354,903	-4,660,823	-66.4%	-3,865,705	-62.1%
Annual EGU SO2 Emissions for All States Fully within the Eastern Modeling Domain	10,019,270	7,635,785	6,912,529	3,081,155	-4,554,630	-59.6%	-3,831,374	-55.4%
Annual EGU SO2 Emissions for All Western States	361,613	224,026	247,039	275,422	51,397	22.9%	28,383	11.5%
EGU SO2	10,380,883	7,859,810	7,159,569	3,356,577	-4,503,233	-57.3%	-3,802,991	-53.1%

Table G-5. 26-State[1] Total and EGU Sector Ozone Season NO_X Emissions for each Modeling Scenario.

	2005 Base Year	2012 Base Case	2014 Base Case	2014 Remedy	2014 Remedy - 2012 Base Case	Percent Change: 2014 Remedy vs 2012 Base Case	2014 Remedy - 2014 Base Case	Percent Change: 2014 Remedy vs 2014 Base Case
Ozone Season EGU NO_x Emissions for States Included for Ozone	1,001,600	671,939	668,513	593,833	-78,106	-11.6%	-74,680	-11.2%
Ozone Season Total NO_x Emissions for States Included for Ozone	6,153,473	4,455,600	4,128,792	4,054,111	-401,489	-9.0%	-74,680	-1.8%

[1] Includes the 20 states covered by the final Transport Rule for ozone season NOx budgets and the 6 states covered for ozone season NOx budgets in the Supplemental Notice.

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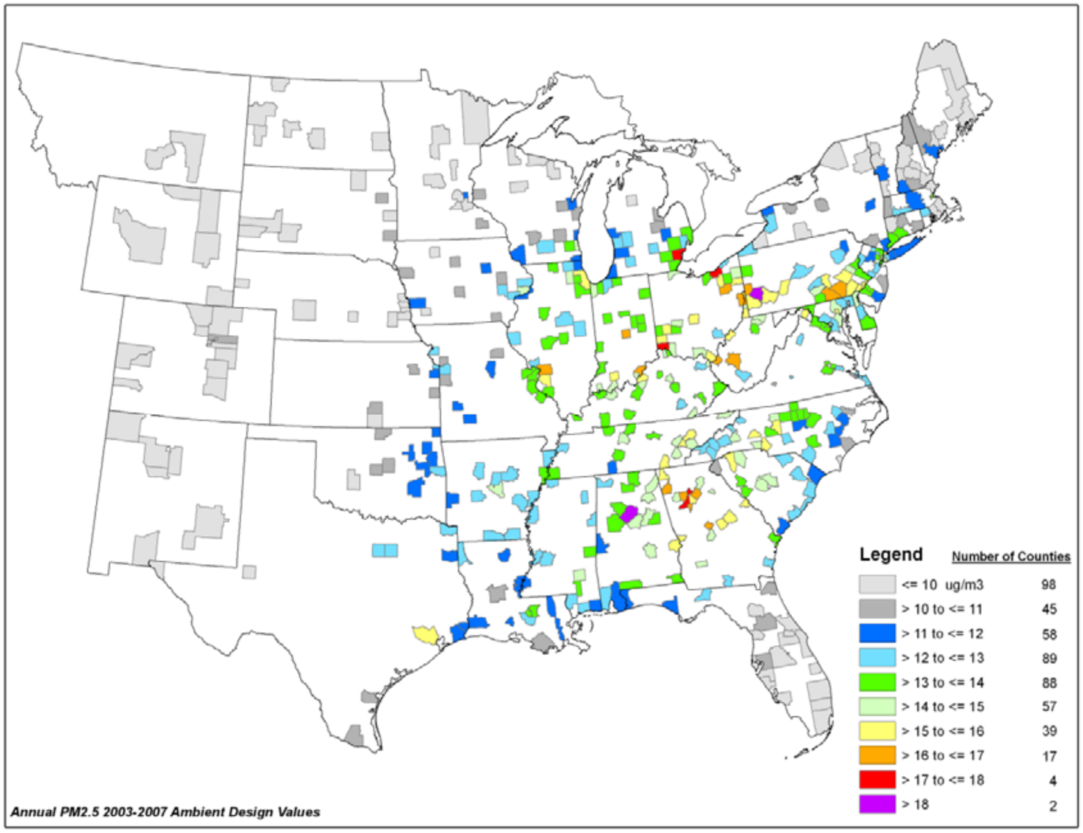
Appendix H

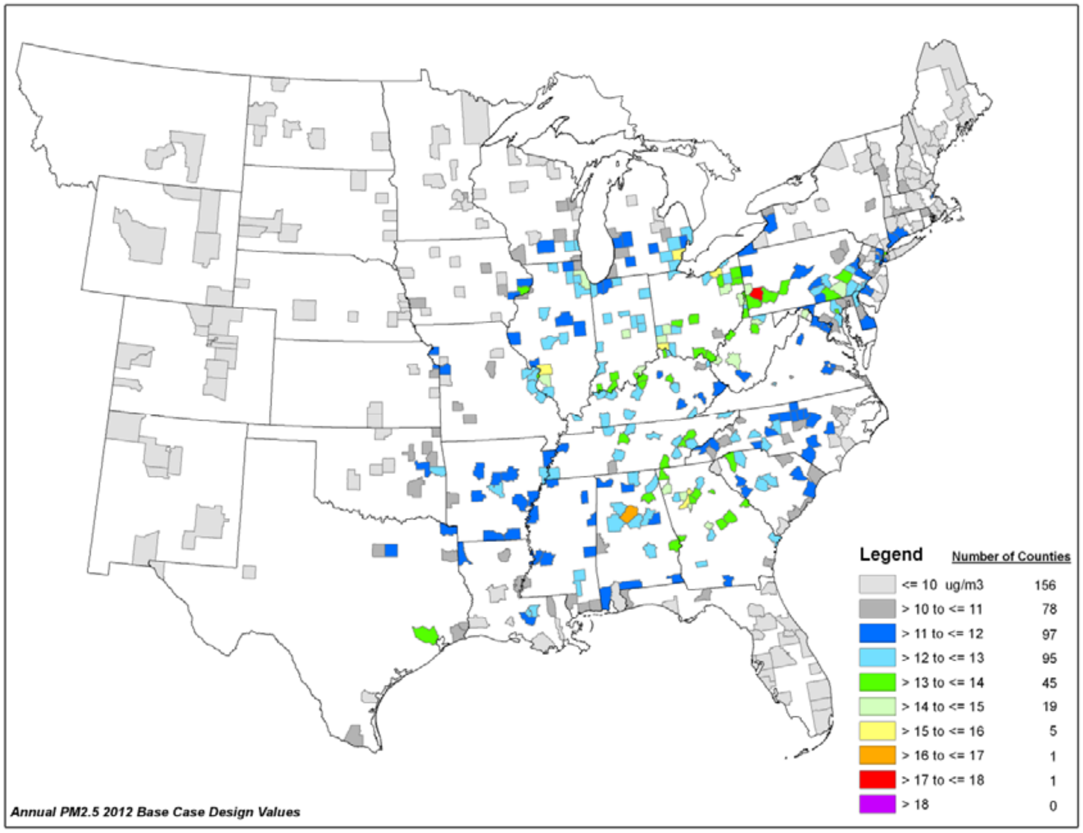
Concentration and Difference Maps for
Annual $PM_{2.5}$, 24-Hour $PM_{2.5}$, and 8-Hour Ozone

Annual $PM_{2.5}$ Maps

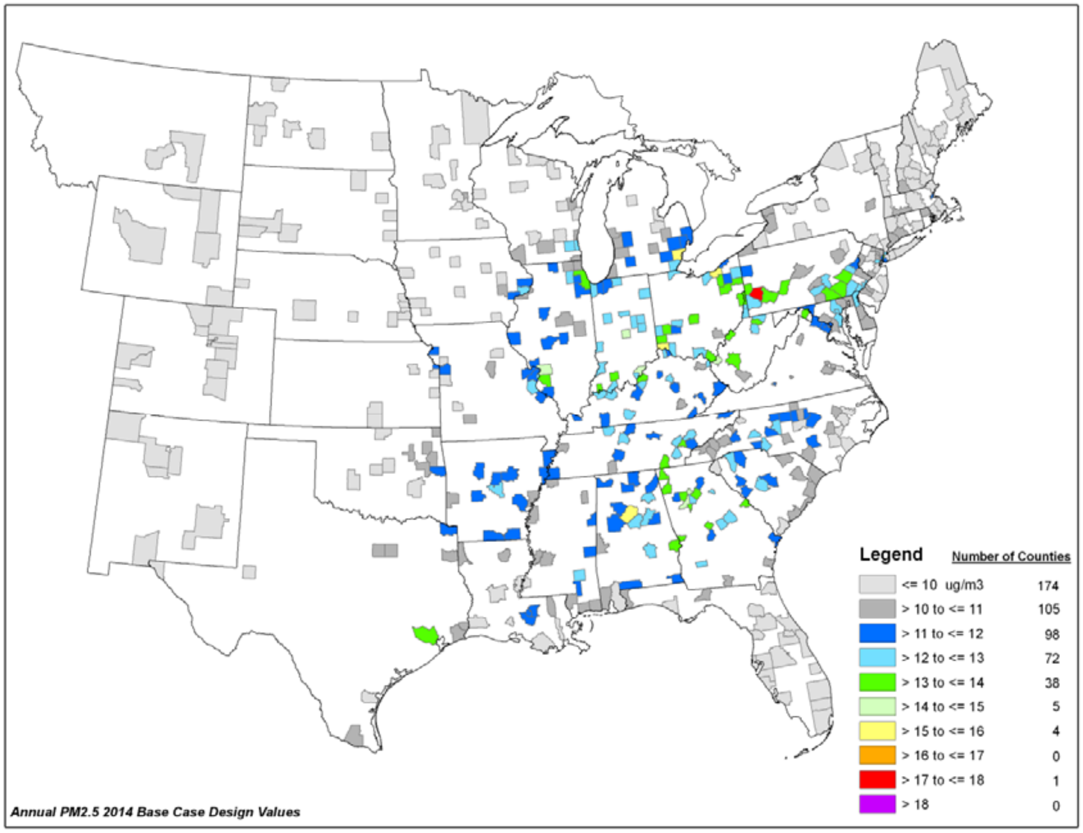
2003-2007 Average Ambient Annual $PM_{2.5}$ Concentrations



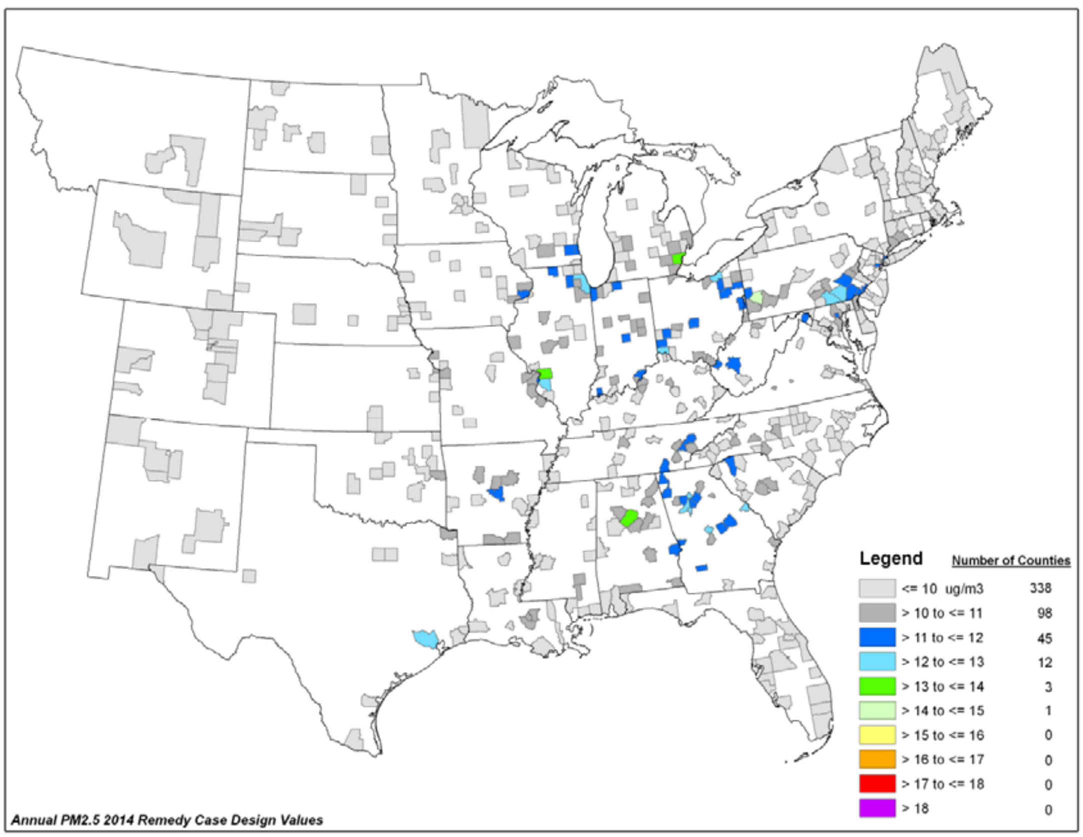
2012 Base Case Annual $PM_{2.5}$ Concentrations



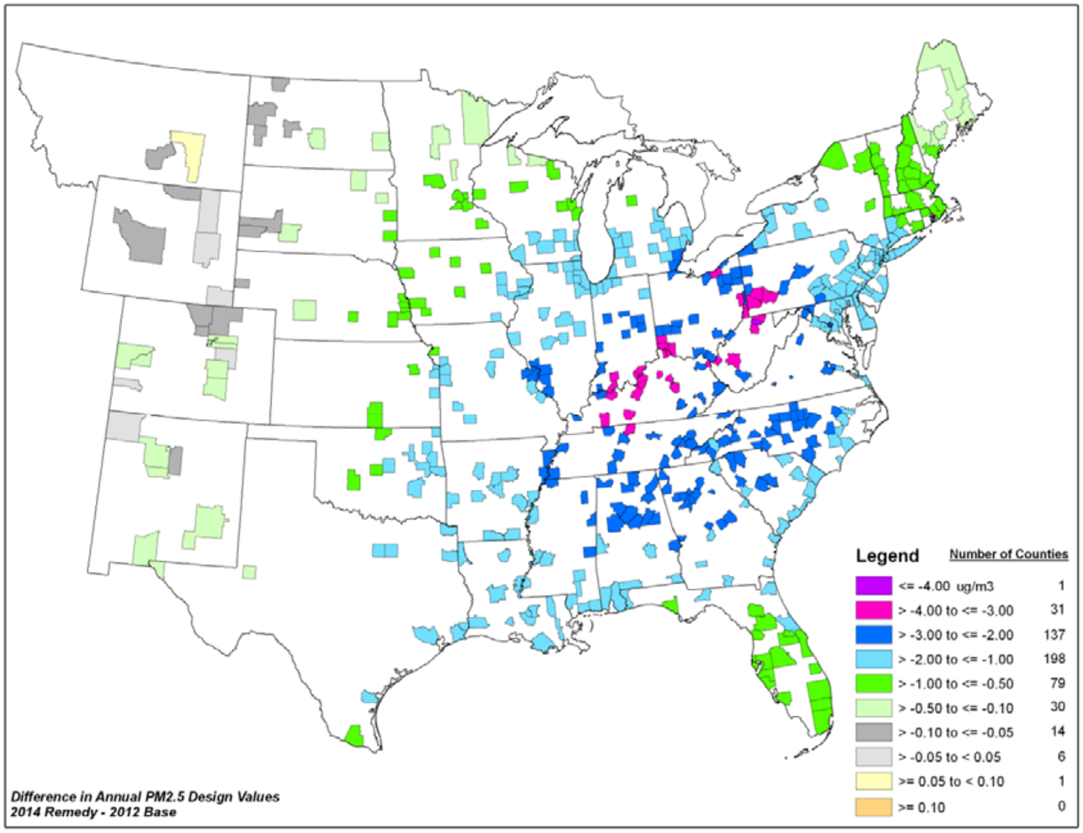
2014 Base Case Annual $PM_{2.5}$ Concentrations



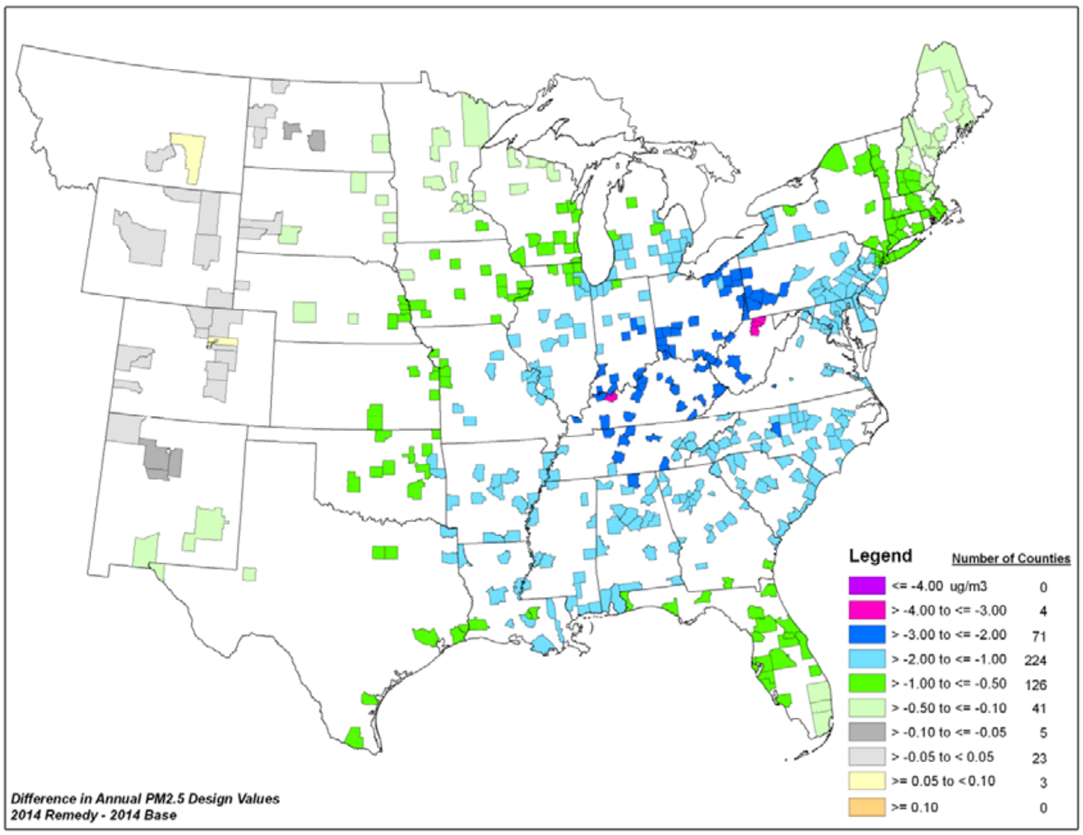
2014 Remedy Annual $PM_{2.5}$ Concentrations



2014 Remedy – 2012 Base Case Difference in Annual $PM_{2.5}$ Concentrations

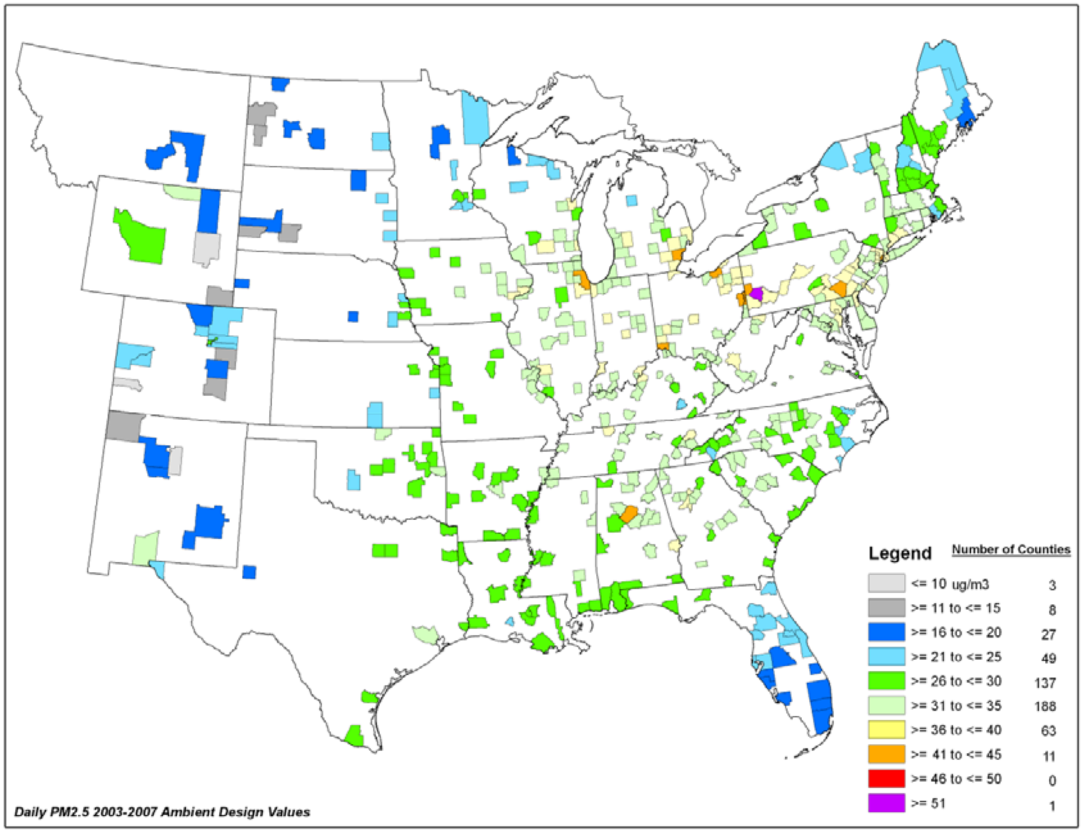


2014 Remedy – 2014 Base Case Difference in Annual $PM_{2.5}$ Concentrations

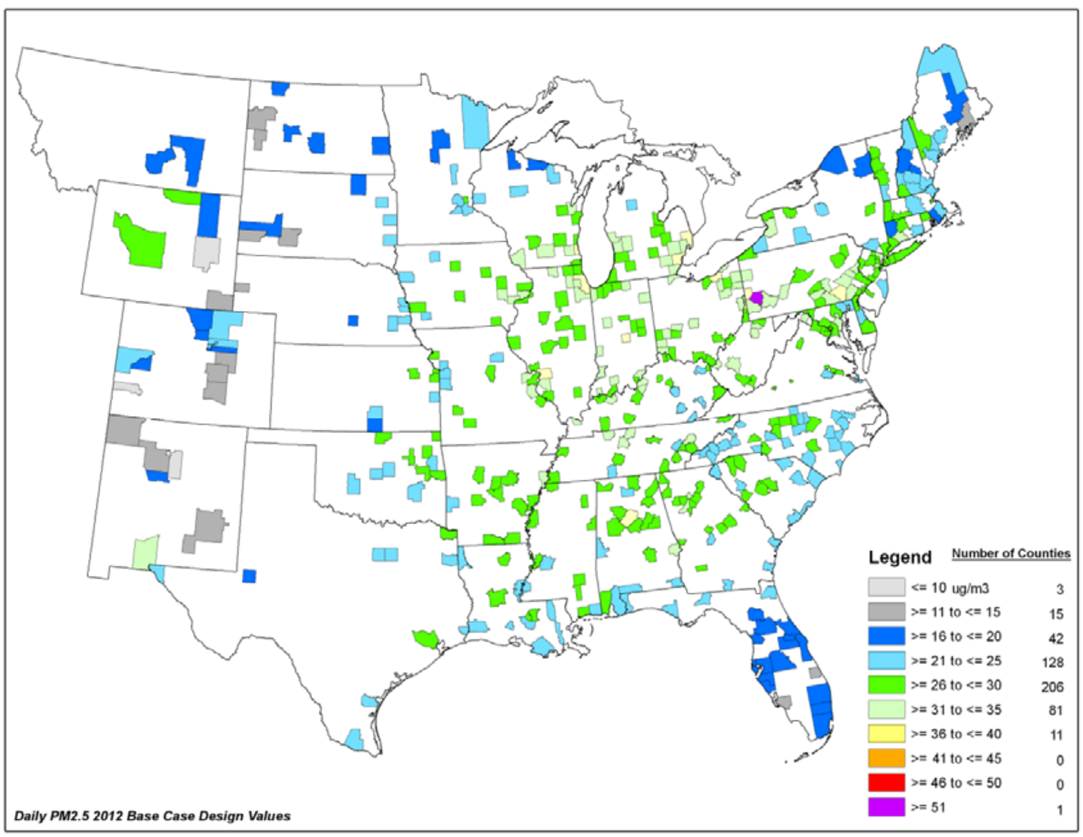


24-Hour $PM_{2.5}$ Maps

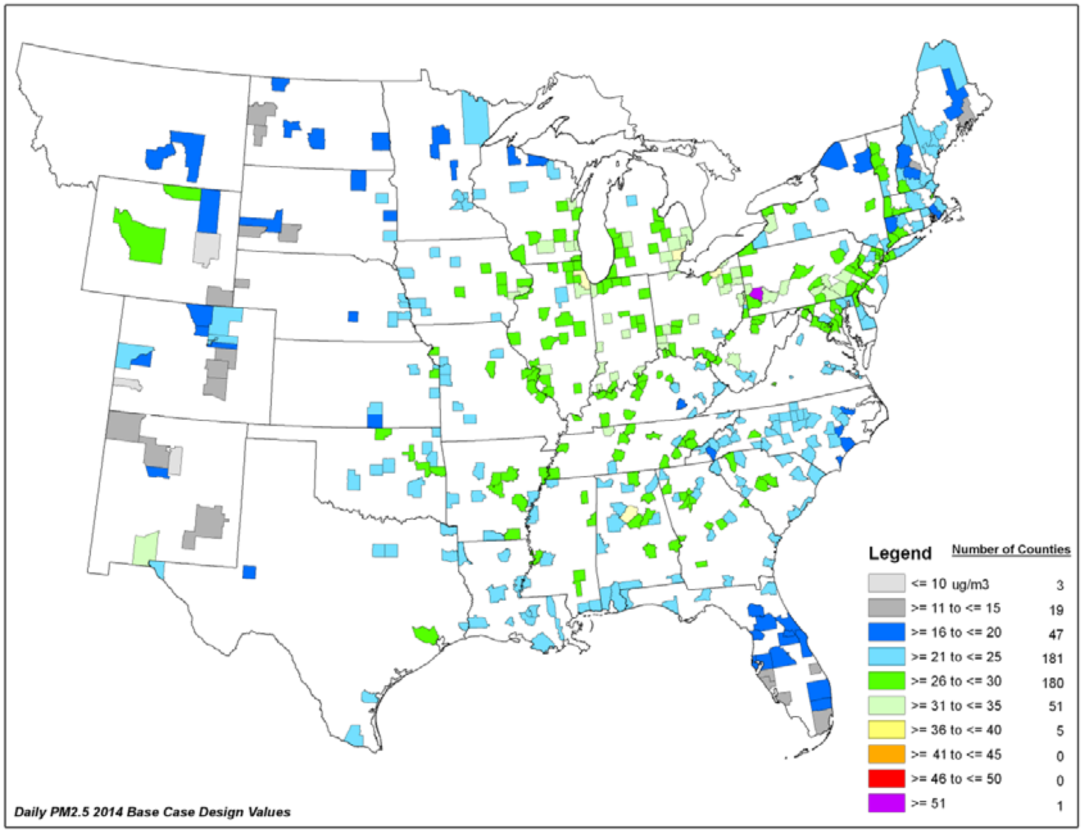
2003-2007 Average Ambient 24-Hour $PM_{2.5}$ Concentrations



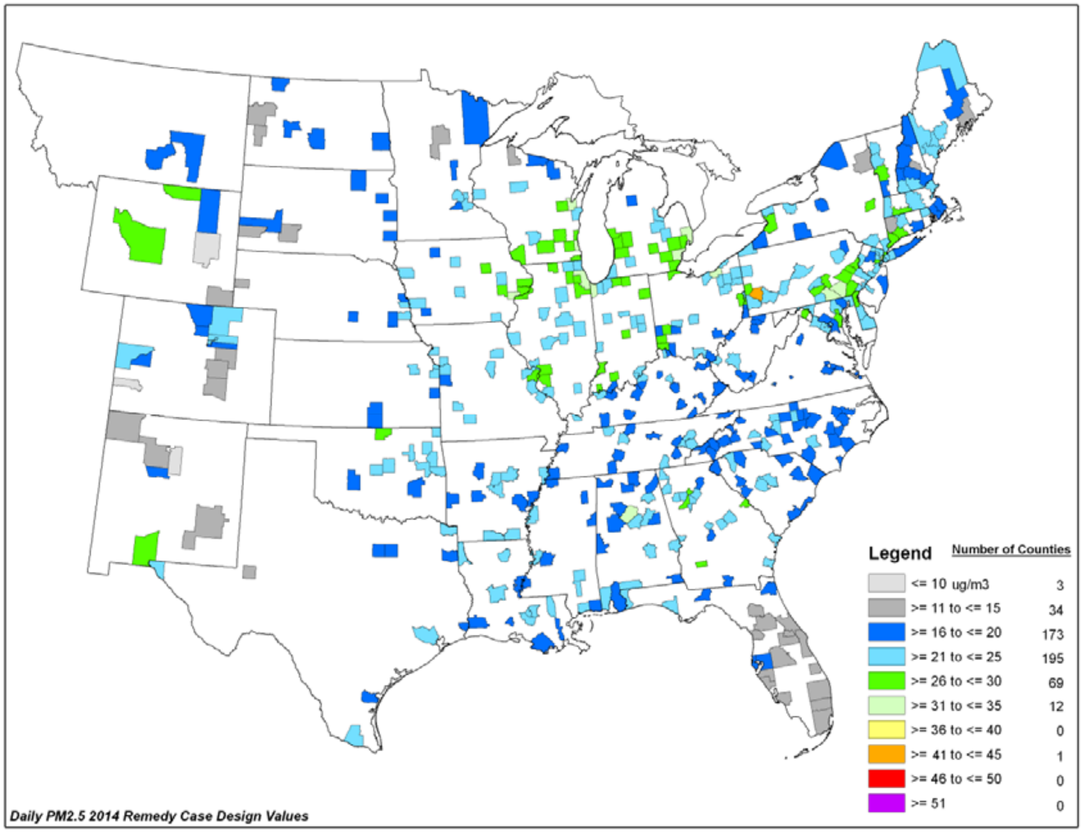
2012 Base Case 24-Hour $PM_{2.5}$ Concentrations



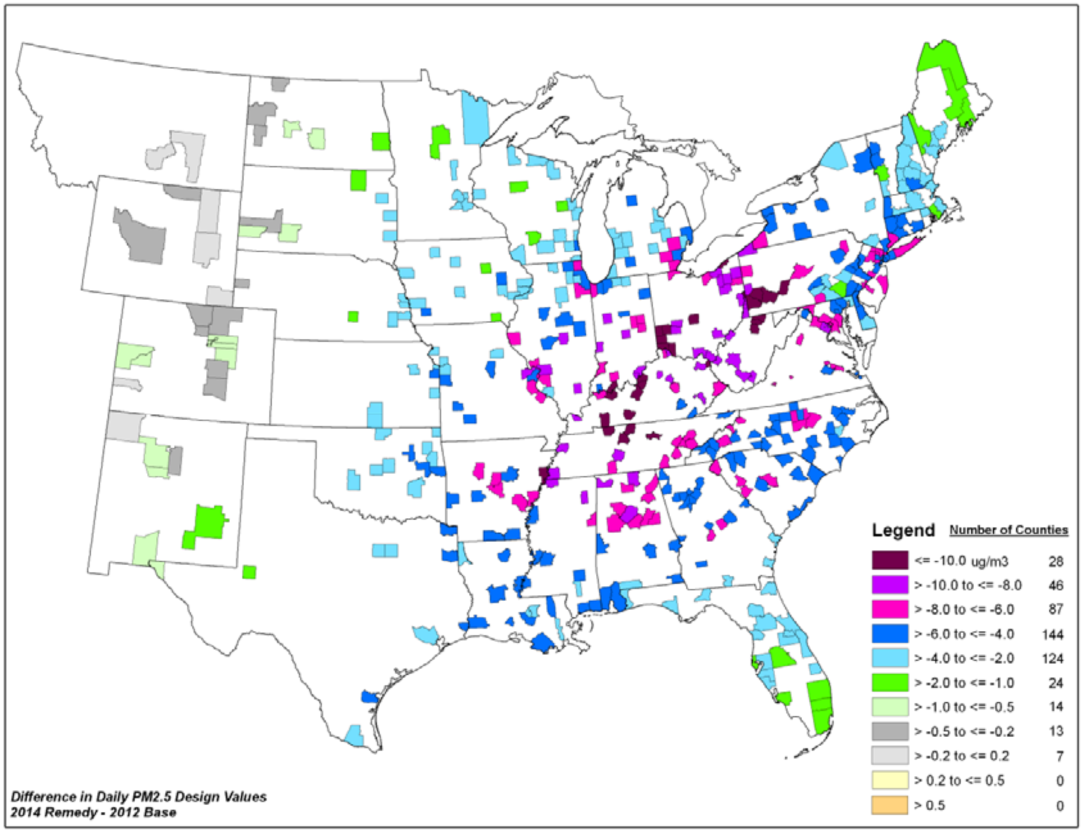
2014 Base Case 24-Hour $PM_{2.5}$ Concentrations



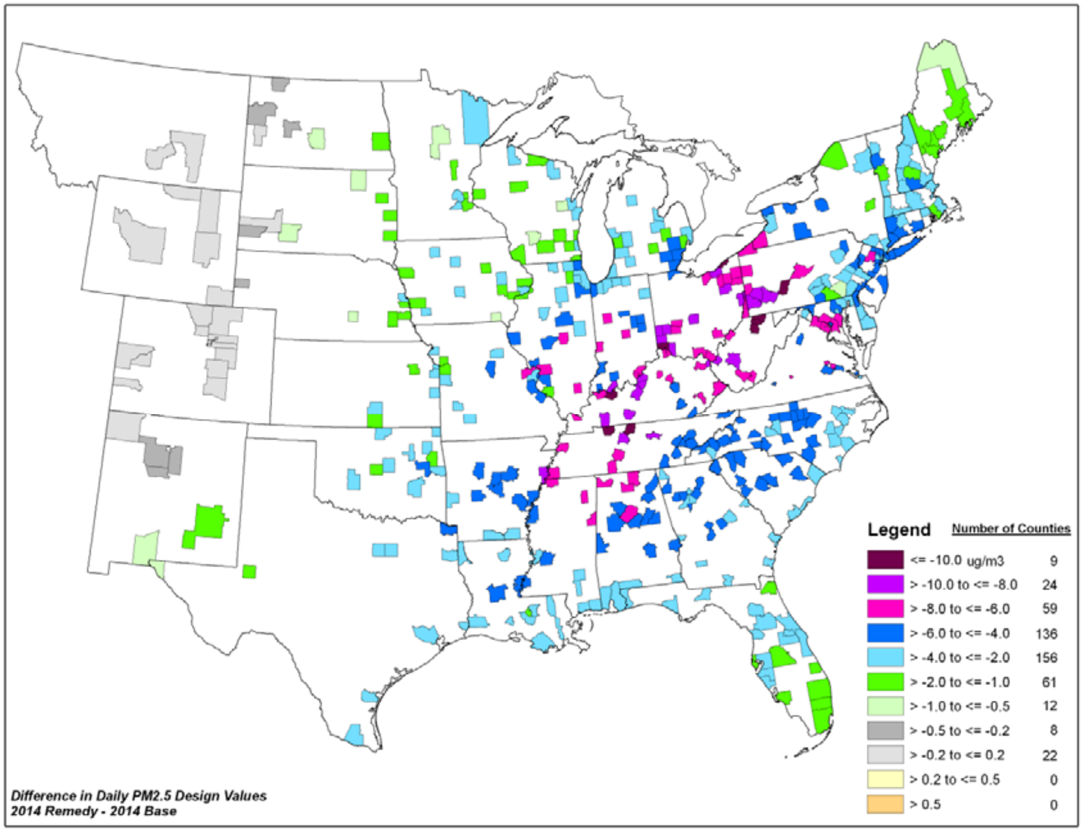
2014 Remedy 24-Hour $PM_{2.5}$ Concentrations



2014 Remedy – 2012 Base Case Difference in 24-Hour $PM_{2.5}$ Concentrations

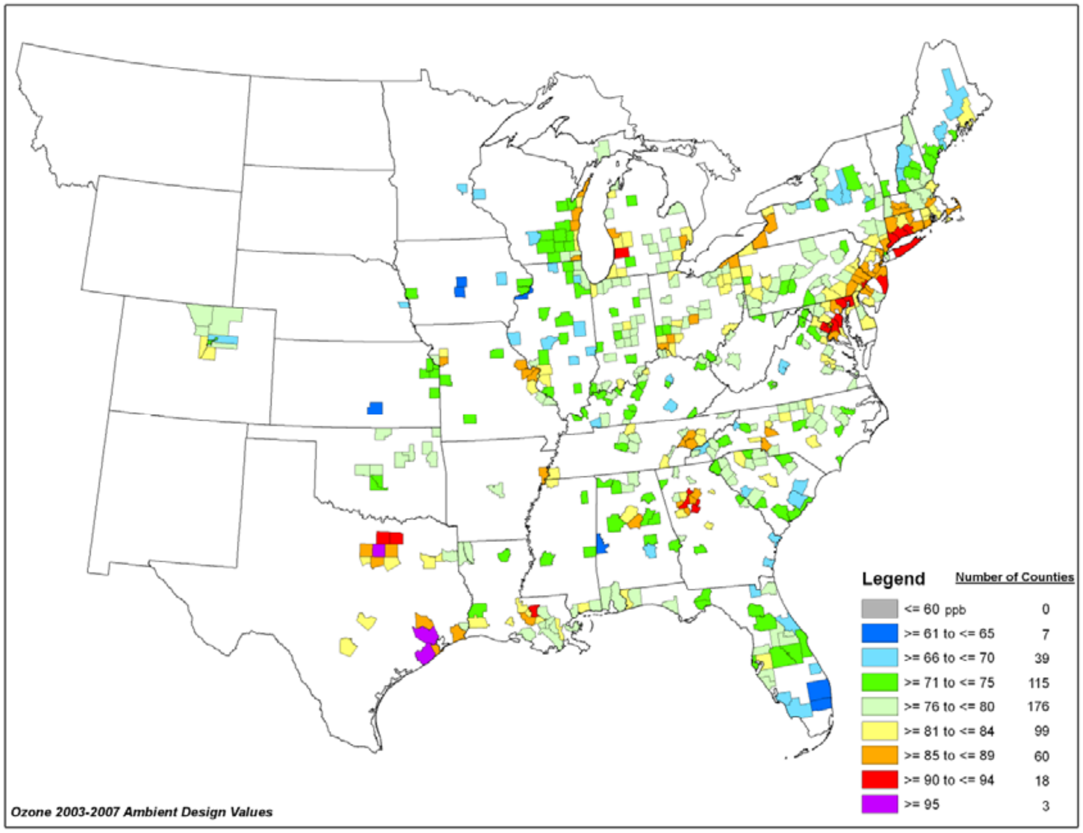


2014 Remedy – 2014 Base Case Difference in 24-Hour $PM_{2.5}$ Concentrations

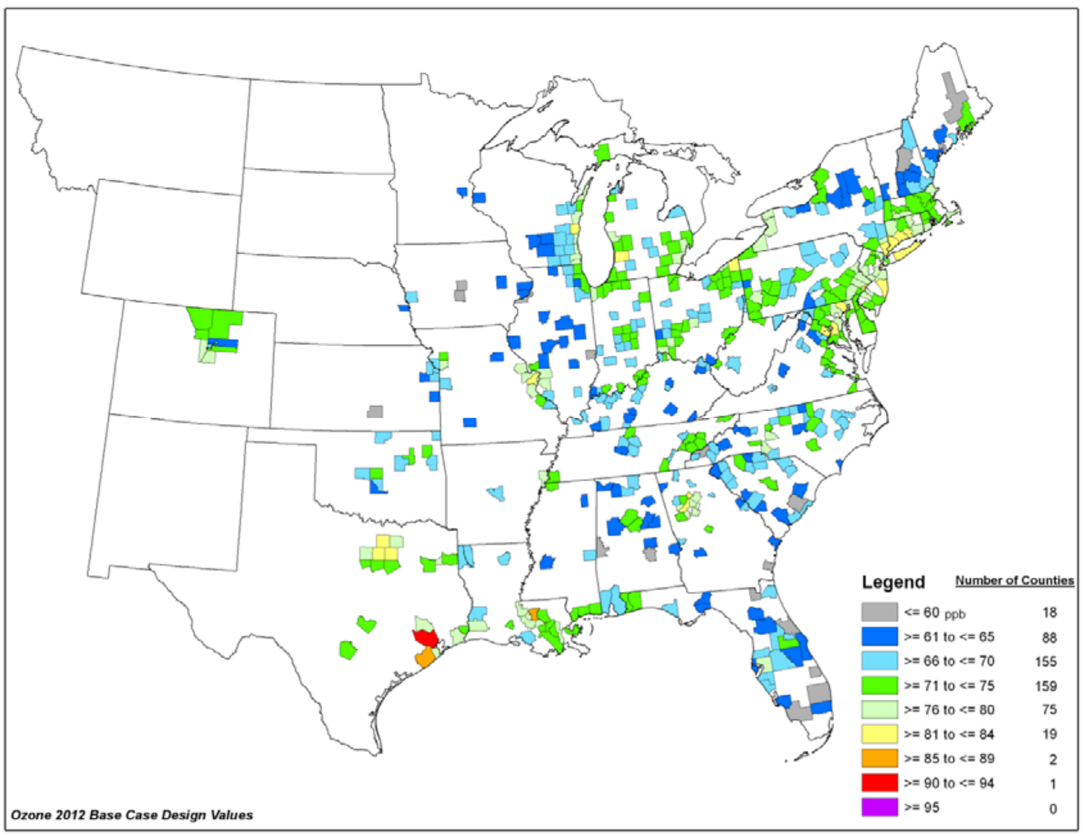


8-Hour Ozone Maps

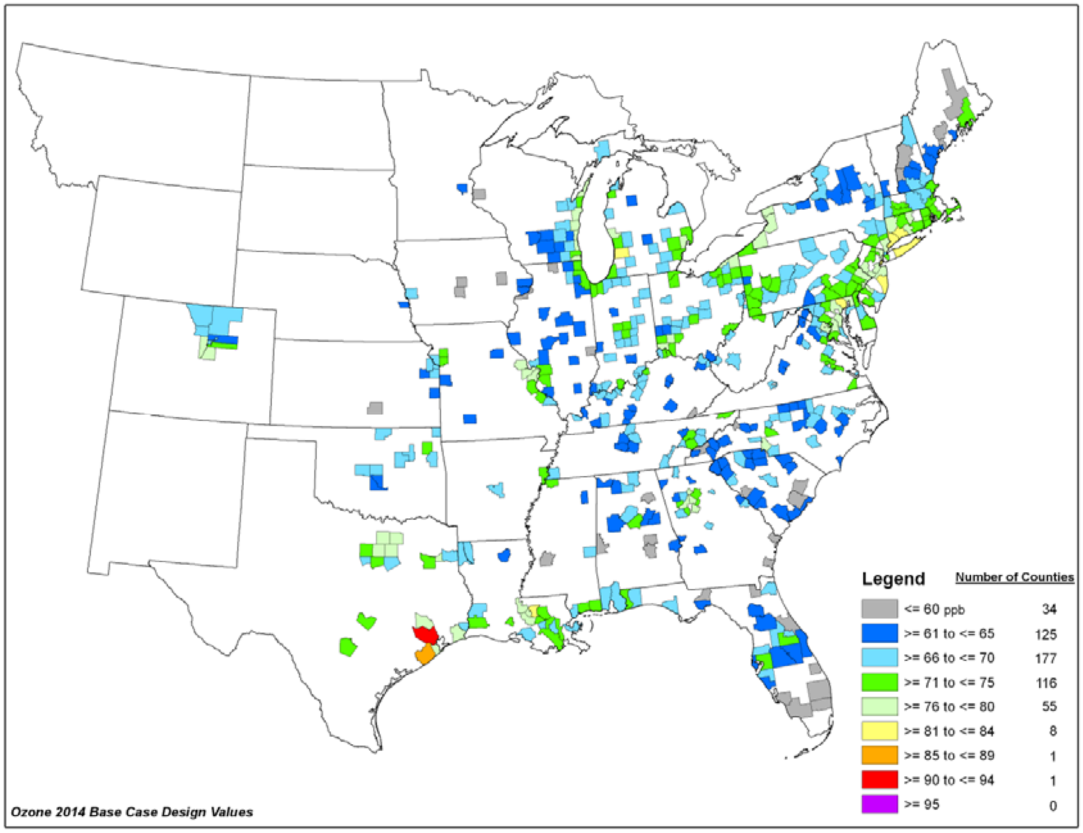
2003-2007 Average Ambient 8-Hour Ozone Concentrations



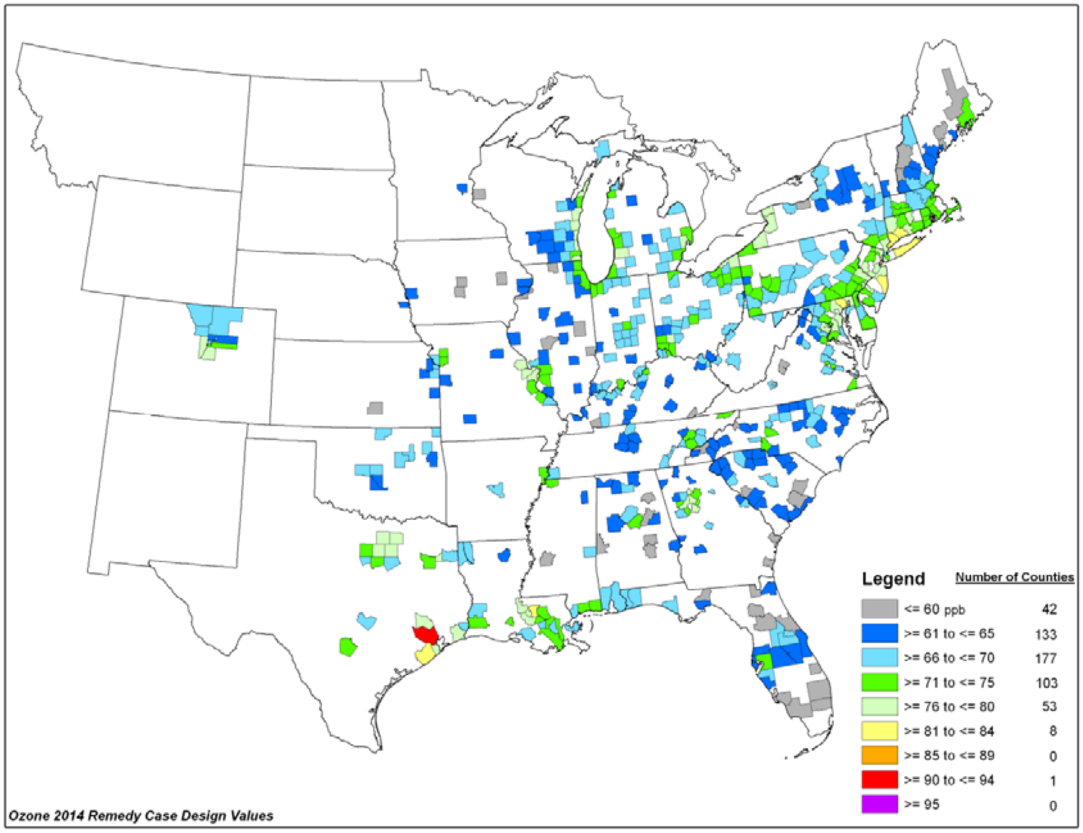
2012 Base Case 8-Hour Ozone Concentrations



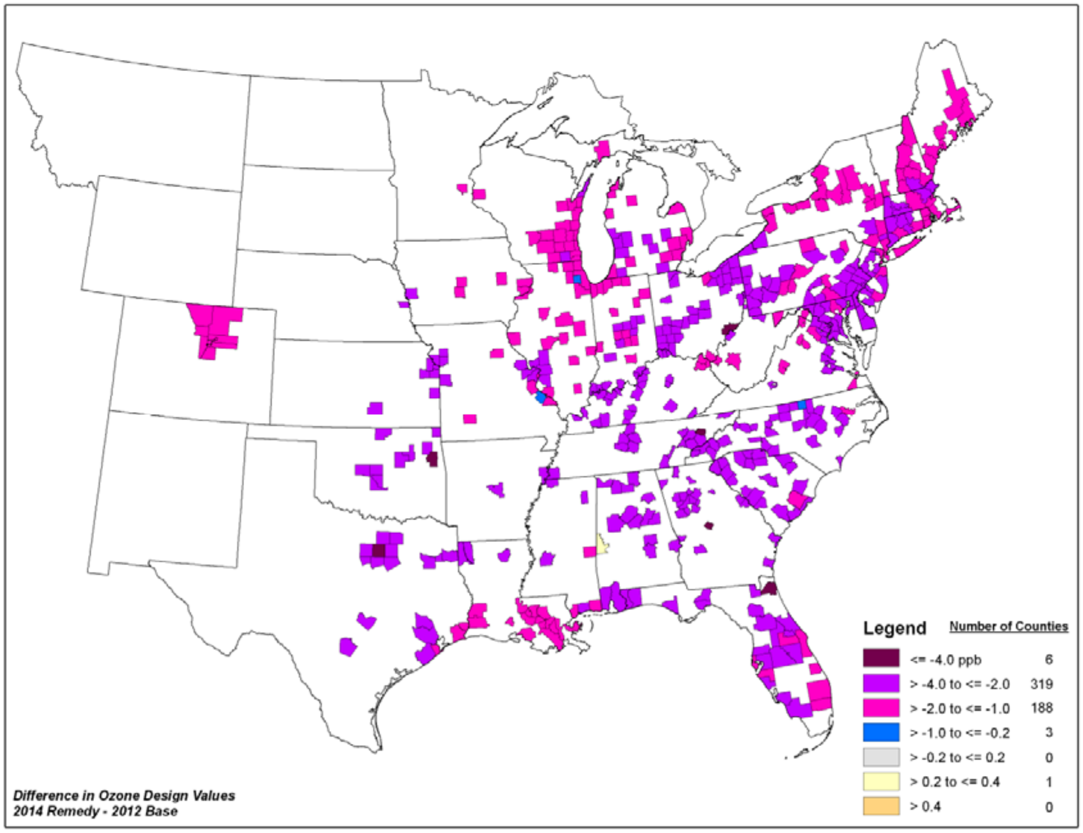
2014 Base Case 8-Hour Ozone Concentrations



2014 Remedy 8-Hour Ozone Concentrations



2014 Remedy – 2012 Base Case Difference in 8-Hour Ozone Concentrations



2014 Remedy – 2014 Base Case Difference in 8-Hour Ozone Concentrations