Photochemical Modeling of Ozone, PM2.5 and Visibility Impacts in Arkansas from Texas Existing and Planned Coal-Fired Power Plants

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I. INTRODUCTION

In recent years, several coal-fired power plants have been proposed and permitted in the State of Texas. Cumulative impacts of these plants on ozone air quality in neighboring states have not been analyzed. In early 2010, Sierra Club has sponsored photochemical modeling studies of cumulative ozone impacts from both Texas existing and new coal-fired power plants in neighboring states, namely Arkansas, Louisiana and Oklahoma (AMI, 2010a,b,c). Their ozone impacts have been quantified through detailed modeling of specific ozone episodes using the photochemical grid model CAMx (Comprehensive Air quality Model with Extensions). CAMx is a state of the science model and has been used by several states within the Central Regional Air Planning Association (CENRAP) for the ozone State Implementation Plans. The CAMx model has also been used in regional haze modeling (CENRAP, 2007). In this study, the modeling inputs developed by CENRAP for the year 2002 have been used by the CAMx model to analyze cumulative impacts from the Texas existing and new coal-fired power plants on ozone air quality as well as fine particles (PM2.5) and visibility in neighboring states. Methodologies, assumptions and results of the CAMx modeling analysis are presented in the following sections.

II. MODELING METHODOLOGIES

This section documents the methodologies and assumptions used in the generation of modeling inputs such as emissions and stack parameters of Texas existing and planned coal-fired power plants. Other modeling inputs, including modeling domain and baseline emissions, have been taken from the regional haze modeling by CENRAP (CENRAP, 2007).

A. **Model Version**

The latest version 5.10 of the CAMx model has been used in the current modeling study. To be consistent with the CENRAP modeling, the Mechanism 4 with the Carbon Bond IV photochemistry and aerosol chemistry has also been used.

B. Modeling Domain

Figure 1 shows the horizontal grid that has been used in the CAMx modeling. With a resolution of 36 km, it covers the continental US and parts of Canada and Mexico. This same grid has been used in regional haze modeling by CENRAP and other regional planning organizations (RPO). The CAMx modeling grid also contains 19 vertical layers.

C. Modeling Runs

The CAMx model has been applied to predict ozone and PM2.5 over the entire year of 2002. The model simulation has been divided into four quarterly runs with about 10 spin-up days to minimize the effects of initial conditions.

D. Emissions and Stack Parameters of Texas Coal-Fired Power Plants

For ozone modeling, emissions of nitrogen oxides (NOx), volatile organic compounds (VOC) and carbon monoxide (CO) from the Texas existing and planned coal-fired power plants are modeled as elevated point sources in the CAMx model. For PM2.5 modeling, their emissions of sulfur dioxide (SO2), acid sulfuric (H2SO4), ammonia (NH3) and particulates (PM2.5 and PM10) are also required. The locations of these plants are shown in Figure 2. For use by CAMx, NOx emissions are speciated into nitric oxide (NO) and nitrogen dioxide (NO2). VOC emissions are speciated into various chemical species required by the Carbon Bond 4 mechanism. The speciation of NOx and VOC emissions as well as other necessary modeling inputs (location, emissions, and stack parameters) is described further below.

D.1 Removal of Existing Texas Coal-Fired Power Plants

To determine the ozone impacts attributable solely to the existing Texas coal-fired power plants, the 2002 baseline case was re-run, removing the emissions of all existing coal-fired plants in Texas. This procedure of running an ozone model with and without specified sources, typically known as “zero-out” of emission sources, is the best way to determine the incremental ozone impact of the specified sources.

The existing coal-fired power plants in Texas in 2007 were determined from the U.S. Energy Information Administration (EIA) Form EIA-860 database[1], which lists all electrical generating units in the United States during a specific year. For 2007, there were 36 operational coal-fired power plant units listed in the EIA database for the state of Texas. These power plant units are presented in Table 1 with associated locations and stack parameters as listed in the CAMx model emission files. The emissions from these coal-fired units in Texas were removed from the CAMx model inputs.

D.2 Addition of Planned Texas Coal-Fired Power Plants

To determine the ozone impacts attributable solely to new or planned Texas coal-fired power plants, the 2002 baseline case was re-run, including the existing Texas coal-fired plants, and adding the emissions of 14 planned coal-fired power plant units in Texas. The necessary modeling inputs (locations, emissions, and stack parameters) for the planned power plant units were derived from the Texas Commission on Environmental Quality (TCEQ) permit applications for each new facility.

The location, stack parameters, and maximum permitted emissions of NO_x, SO_2, CO, and VOCs for the 14 planned Texas units, as listed in the TCEQ permit applications, are presented in Table 2. For the CAMx model inputs, the stack locations were converted to Lambert Conformal Conic (LCC) coordinates, and all stack parameters were converted to metric units, as presented in Table 3.

For input into the CAMx model, the NO_x emissions in Table 2 have to be split into NO and NO_2 emissions, and the VOC emissions in Table 2 need to be split into various reactive classes for the Carbon Bond 4 chemical mechanism used in the ozone modeling. To be consistent with the CAMx emission treatment for the existing coal-fired

1 Available at *http://www.eia.doe.gov/cneaf/electricity/page/eia860.html*.

power plants, the NO_x emissions were split into 90% NO and 10% NO_2, and the VOC emissions were split into the same percentage of reactive classes used for the existing coal-fired units. The emissions for all components that were input into the CAMx model (in moles per hour) for the planned power plant units are presented in Table 4.

Table 5 shows their emissions of particulates (PM2.5 and PM10), acid sulfuric (H2SO4) and ammonia (NH3). These emissions were compiled from the TCEQ permit applications. The PM2.5 emissions are speciated into various components using the NCOAL profile (0.1600 sulfates; 0.0050 nitrates; 0.1000 organic mass carbon, 0.0100 elemental carbon and 0.7250 fine soil) that was used in the CENRAP regional haze modeling (CENRAP, 2007).

E. Other Modeling Inputs

Other modeling inputs required by CAMx, such as initial and boundary conditions, land use, photolysis rates, winds and other meteorological data, have been obtained from the CENRAP database. Emissions for ground-level sources and elevated point sources have been taken for the baseline year 2002.

F. Calculation of Visibility Impacts

For calculating visibility impacts at Federal Class I areas such as Breton Island in Louisiana, Caney Creek and Upper Buffalo in Arkansas, and Wichita Mountains in Oklahoma, methodologies recommended by the US EPA and Federal Land Managers (FLM) in their regulatory guidance documents have been adopted (EPA, 2003; FLAG, 2008; FLAG, 2000). Specifically, the old and new IMPROVE equations have been used to relate the predicted PM concentrations to light extinction. PM components predicted by the CAMx model include sulfates, nitrates, elemental carbon (EC), organic mass carbon (OMC), fine soil and coarse mass (PM10-PM2.5).

Recommended in the FLAG 2000 manual, the old IMPROVE equation is given by:

$b_{ext} = b_{Ray} + b_{Sulfate} + b_{Nitrate} + b_{EC} + b_{OMC} + b_{Soil} + b_{CM}$

where

$b_{Sulfate} = 3 \times f(RH) \times [Sulfate]$

$b_{Nitrate} = 3 \times f(RH) \times [Nitrate]$

$b_{EC} = 10 \times [EC]$

$b_{OMC} = 4 \times [OMC]$

$b_{Soil} = 1 \times [Soil]$

$b_{CM} = 0.6 \times [CM]$

Monthly averages of relative humidity adjustment factor f(RH) are given in the EPA regional haze guidance (2003).

Recommended in the draft FLAG 2008 manual, the new IMPROVE equation adds light extinction from sea salt and NO2. It is defined as follows:

$b_{ext} = b_{Ray} + b_{Sulfate} + b_{Nitrate} + b_{EC} + b_{OMC} + b_{Soil} + b_{CM} + b_{NaCl} + b_{NO2}$

where

$b_{Sulfate} = 2.2 \times f_S(RH) \times [Small\ Sulfate] + 4.8\ f_L(RH) \times [Large\ Sulfate]$

$b_{Nitrate} = 2.4 \times f_S(RH) \times [Small\ Nitrate] + 5.1\ f_L(RH) \times [Large\ Nitrate]$

$b_{EC} = 10 \times [Elemental\ Carbon]$

$b_{OMC} = 2.8 \times [Small\ Organic\ Mass] + 6.1 \times [Large\ Organic\ Mass]$

$b_{Soil} = 1 \times [Fine\ Soil]$

$b_{CM} = 0.6 \times [Coarse\ Mass]$

$b_{NaCl} = 1.7 \times f_{SS}(RH) \times [Sea\ Salt]$

$b_{NO2} = 0.33 \times [NO2\ (ppb)]$

In the above equations, the relative humidity adjustment factors $f_S(RH)$, $f_L(RH)$ and $f_{SS}(RH)$ are given in the draft FLAG 2008 manual.

The apportionment of the Small and Large components of Sulfate, Nitrate and Organic Mass is done as follows:

[Large Sulfate] = [Total Sulfate] / 20 x [Total Sulfate], for [Total Sulfate] < 20 $\mu g/m^3$
[Large Sulfate] = [Total Sulfate], for [Total Sulfate] > 20 $\mu g/m^3$
[Small Sulfate] = [Total Sulfate] – [Large Sulfate]

The same equations are used to apportion Total Nitrate and Total OMC among their Large and Small components.

The haze index (HI) for the source is calculated in deciviews (dv) from the source's extinction plus natural background using the following formula:

$$HI_{source} = 10 \ln[(b_{source} + b_{natural})/10]$$

where $b_{natural}$ is the Class I area specific clean natural visibility background, and default values arre given in (EPA, 2003).

The visibility significance metric for evaluating visibility impact is the change in deciview (del-dv) from the source's and natural conditions haze indices:

$$\begin{aligned} \text{del-dv} &= HI_{source} - HI_{natural} \\ &= 10 \ln[(b_{source} + b_{natural})/10] - 10 \ln[b_{natural}/10] \\ &= 10\ln[(b_{source} + b_{natural})/b_{natural}] \end{aligned}$$

A threshold of 0.5 deciview is used to assess potential contribution to visibility impairment. This is the same threshold established in the Regional Haze Rule. This del-dv threshold is equivalent to the 5% change in light extinction recommended by the FLMs in their FLAG manuals (FLAG, 2008 and FLAG, 2000).

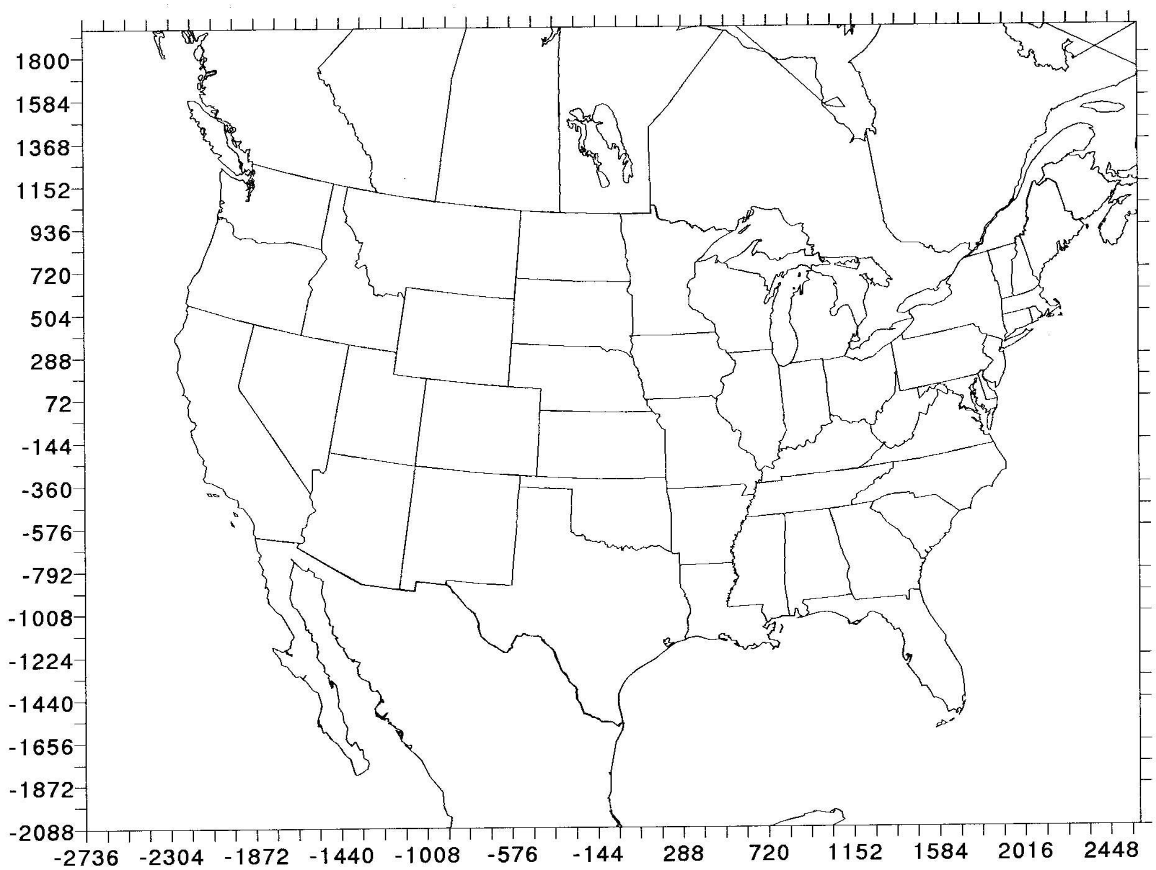

Figure 1 - The National RPO 36-km Grid used by the CAMx Model

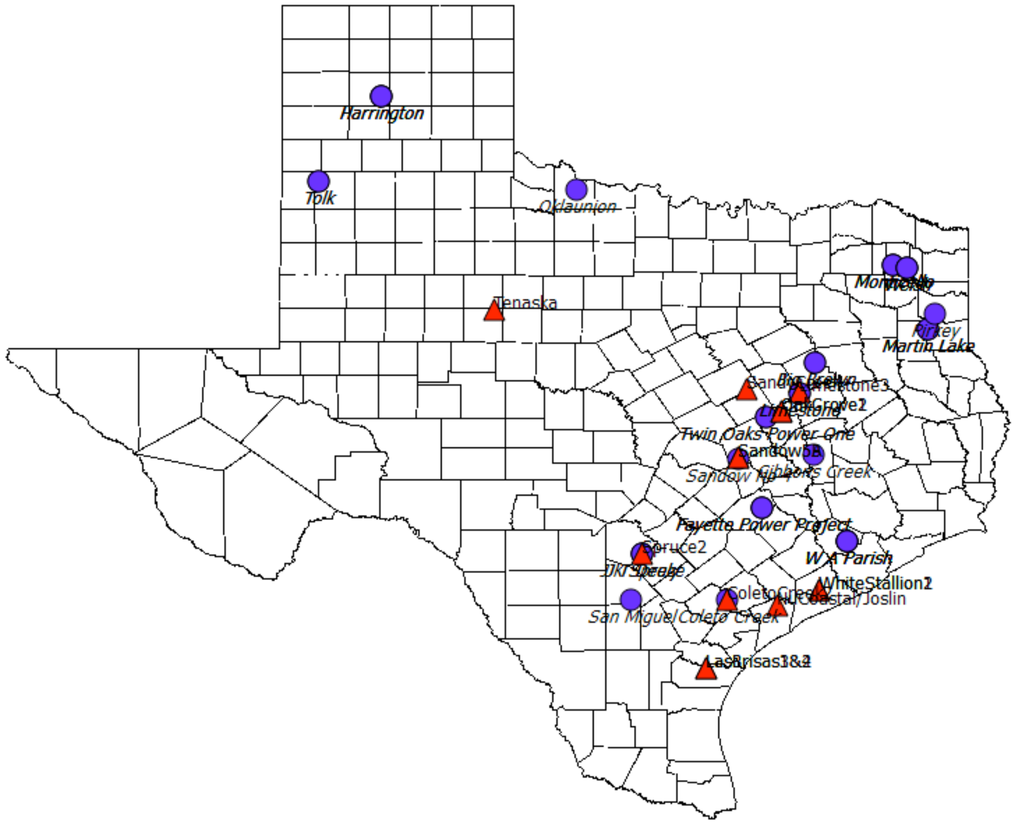

Figure 2 – Location of Texas Existing (●) and New (▲) Coal Plants

Table 1. Existing Texas Coal-Fired Power Plant Units (RPO 36 km Grid)

Facility	Lambert Coord. X(km)	Lambert Coord. Y(km)	Stack Height (m)	Stack Diam. (m)	Stack Temp. (K)	Stack Velocity (m/hr)
Big Brown 1	88.759	-905.844	122.0	6.77	459	85320
Big Brown 2	88.717	-905.766	122.0	6.77	459	85320
Coleto Creek	*-21.114*	-1251.291	124.7	6.10	450	128415
Fayette Power 1	23.149	-1118.055	182.9	7.01	426	104400
Fayette Power 2	23.501	-1118.925	182.9	7.01	431	98280
Fayette Power 3	23.501	-1118.925	162.5	7.85	327	96480
Gibbons Creek	87.977	-1040.286	141.8	6.10	366	79200
Harrington 1	-430.220	-507.977	76.2	5.78	436	96585
Harrington 2	-430.135	-507.926	91.5	5.80	429	106463
Harrington 3	*-430.071*	-507.919	91.5	5.80	422	106463
JK Spruce	-129.768	-1186.301	160.1	7.93	341	65880
JT Deely 1	-130.050	-1186.359	213.4	7.93	427	109080
JT Deely 2	-130.050	-1186.359	213.4	7.93	405	109080
Limestone 1	70.235	-950.846	171.6	8.20	344	98640
Limestone 2	70.336	-950.406	171.6	8.20	344	98640
Martin Lake 1	227.908	-854.160	137.8	7.01	373	97920
Martin Lake 2	227.954	-854.249	137.8	7.01	370	114120
Martin Lake 3	228.001	-854.339	137.8	7.01	377	118440
Monticello 1	182.041	-762.826	121.9	6.55	453	117000
Monticello 2	181.997	-762.826	121.9	6.55	453	117000
Monticello 3	182.003	-762.722	140.2	7.77	354	95400
Oklaunion	-201.072	-652.449	137.8	-6.40	364	86760
Pirkey	237.052	-833.501	160.0	6.71	343	93240
San Miguel	-145.721	-1253.272	137.2	6.10	366	90000
Sandow 4	-6.772	-1046.209	122.0	6.55	355	107640
Tolk 1	-512.146	-626.752	122.0	6.86	405	115244
Tolk 2	-512.054	-626.758	122.0	6.86	405	115244
Twin Oaks 1	28.396	-987.489	103.7	3.81	422	87840
Twin Oaks 2	28.342	-987.522	103.7	3.81	422	87840
WA Parish 1	132.405	-1167.095	182.9	7.32	405	81000
WA Parish 2	132.461	-1167.184	182.9	7.32	405	81000
WA Parish 3	132.560	-1167.438	152.4	6.71	347	78480
WA Parish 4	132.566	-1167.340	152.4	6.71	409	77400
Welsh 1	199.968	-766.281	91.5	4.39	408	148320
Welsh 2	199.968	-766.281	91.5	4.39	408	148320
Welsh 3	199.968	-766.281	91.5	4.39	408	131760

Table 2. TCEQ Permit Information for Planned Texas Coal-Fired Power Plant Units

Facility	Emission Point (EPN)	UTM Zone	UTM East (m)	UTM North (m)	Stack Height (ft)	Stack Diam. (ft)	Stack Velocity (ft/sec)	Stack Temp. (F)	NO_x (lb/hr)	SO_2 (lb/hr)	CO (lb/hr)	VOC (lb/hr)
Limestone 3	LMS3	14	761108	3479785	535	28.5	57.6	132	1600	2400	4480	36
Sandy Creek	S01	14	694268	3483795	360	27.8	65	165	1637	2456	2456	29
Tenaska	54	14	382162	3597378	514	30	64.62	104	581	498.42	1246.1	29.9
Las Brisas 1&2	CFB1&2	14	650089	3078160	500	16	66.9	160	616	1428	678	30.8
Las Brisas 3&4	CFB3&4	14	649950	3078195	500	16	66.9	160	616	1428	678	30.8
Coleto Creek 2	B2	14	674681	3177476	400	23.63	22.56	180	400	667	1001	23
White Stallion 1	1A-1B	15	206868	3194028	487	15	64.6	140	660	754	1452	33
White Stallion 2	2A-2B	15	206996	3194028	487	15	64.6	140	660	754	1452	33
Spruce 2		14	566121	3242102	600	29	62.5	133	1600	2880	4480	29
Nu Coastal/Joslin	ESJ-1A	14	740009	3171238	300	17.25	60	291	186	473	398	13.3
Sandow 5A	SA-S5A	14	686039	3383055	335	16	75	162	296	592	296	15.1
Sandow 5B	SA-S5B	14	685992	3383036	335	16	75	162	296	592	296	15.1
Oak Grove 1	E-OGU1	14	739345	3452385	450	32.6	56	138	1800	5382	6100	47
Oak Grove 2	E-OGU2	14	739286	3452470	450	32.6	56	138	1800	5382	6100	47

Table 3. Locations and Stack Parameters of Planned Texas Coal-Fired Power Plant Units (RPO 36 km Grid)

Facility	Lambert Coord. X(km)	Lambert Coord. Y(km)	Stack Height (m)	Stack Diam. (m)	Stack Temp. (K)	Stack Velocity (m/sec)	Stack Velocity (m/hr)
Limestone 3	71.202	-948.381	163.1	8.69	329	17.56	63220
Sandy Creek	4.252	-943.190	109.8	8.48	347	19.82	71341
Tenaska	-306.061	-822.739	156.7	9.15	313	19.70	70924
Las Brisas 1&2	-47.552	-1351.114	152.4	4.88	344	20.40	73427
Las Brisas 3&4	-47.692	-1351.076	152.4	4.88	344	20.40	73427
Coleto Creek 2	-20.919	-1251.086	122.0	7.20	355	6.88	24761
White Stallion 1	98.106	-1236.272	148.5	4.57	333	19.70	70902
White Stallion 2	98.235	-1236.267	148.5	4.57	333	19.70	70902
Spruce 2	-129.269	-1183.786	182.9	8.84	329	19.05	68598
Nu Coastal/Joslin	44.963	-1258.472	91.5	5.26	417	18.29	65854
Sandow 5A	-5.831	-1044.172	102.1	4.88	345	22.87	82317
Sandow 5B	-5.879	-1044.190	102.1	4.88	345	22.87	82317
Oak Grove 1	48.911	-975.492	137.2	9.94	332	17.07	61463
Oak Grove 2	48.853	-975.405	137.2	9.94	332	17.07	61463

Table 4. CAMx NOx/VOC/CO/SO2 Emissions for Planned Texas Coal-Fired Power Plant Units

Facility	NO (mol/hr)	NO_2 (mol/hr)	OLE (mol/hr)	PAR (mol/hr)	TOL (mol/hr)	XYL (mol/hr)	FORM (mol/hr)	ALD2 (mol/hr)	ETH (mol/hr)	MEOH (mol/hr)	ETOH (mol/hr)	ISOP (mol/hr)	CO (mol/hr)	SO_2 (mol/hr)
Limestone 3	14200	1578	11.746	291.493	23.746	64.129	0	13.182	0	0	0	0	72576	17010
Sandy Creek	14528	1614	9.462	234.814	19.129	51.659	0	10.619	0	0	0	0	39787	17407
Tenaska	5161	573	9.759	242.182	19.729	53.280	0	10.952	0	0	0	0	20186	3533
Las Brisas 1&2	5467	607	10.049	249.389	20.316	54.866	0	11.278	0	0	0	0	10984	10121
Las Brisas 3&4	5467	607	10.049	249.389	20.316	54.866	0	11.278	0	0	0	0	10984	10121
Coleto Creek 2	3550	394	7.504	186.232	15.171	40.971	0	8.422	0	0	0	0	16216	4727
White Stallion 1	5857	651	10.767	267.202	21.767	58.785	0	12.083	0	0	0	0	23522	5344
White Stallion 2	5857	651	10.767	267.202	21.767	58.785	0	12.083	0	0	0	0	23522	5344
Spruce 2	14200	1578	9.462	234.814	19.129	51.659	0	10.619	0	0	0	0	72576	20412
Nu Coastal/Joslin	1647	183	4.323	107.286	8.740	23.603	0	4.852	0	0	0	0	6441	3351
Sandow 5A	2627	292	4.927	122.265	9.960	26.898	0	5.529	0	0	0	0	4795	4196
Sandow 5B	2627	292	4.927	122.265	9.960	26.898	0	5.529	0	0	0	0	4795	4196
Oak Grove 1	15975	1775	15.334	380.561	31.002	83.724	0	17.209	0	0	0	0	98820	38145
Oak Grove 2	15975	1775	15.334	380.561	31.002	83.724	0	17.209	0	0	0	0	98820	38145

Table 5. CAMx Emissions of Particulates, Acid Sulfuric and Ammonia of Planned Texas Coal-Fired Power Plant Units (RPO 36 km Grid)

Facility	Lambert Coord. X(km)	Lambert Coord. Y(km)	PM2.5 (g/hr)	PM10 (g/hr)	H2SO4 (mol/hr)	Ammonia (mol/hr)
Limestone 3	71.202	-948.381	73665	127008	277.7	1232.7
Sandy Creek	4.252	-943.190	86030	148327	587.8	1094.0
Tenaska	-306.061	-822.739	65564	113042	0	0
Las Brisas 1&2	-47.552	-1351.114	53670	92534	629.5	853.8
Las Brisas 3&4	-47.692	-1351.076	53670	92534	629.5	853.8
Coleto Creek 2	-20.919	-1251.086	56038	96617	0	0
White Stallion 1	98.106	-1236.272	78019	98885	490.6	901.9
White Stallion 2	98.235	-1236.267	78019	98885	490.6	901.9
Spruce 2	-129.269	-1183.786	69455	119750	203.7	1334.1
Nu Coastal/Joslin	44.963	-1258.472	35856	61821	446.8	439.5
Sandow 5A	-5.831	-1044.172	11681	20140	28.7	424.2
Sandow 5B	-5.879	-1044.190	11681	20140	28.7	424.2
Oak Grove 1	48.911	-975.492	116548	203666	763.7	1467.5
Oak Grove 2	48.853	-975.405	116548	203666	763.7	1467.5

III. MODELING RESULTS

The CAMx model has been used to predict ozone and PM2.5 concentrations during the entire year 2002 for three emission scenarios:

1. In the first scenario, emissions from the 2002 full baseline as developed by CENRAP have been used. This full baseline includes emissions from the existing Texas coal-fired power plants (2002 full baseline).
2. In the second scenario, emissions from these existing plants as shown in Section II.D.1 are removed from the elevated point source file of the first scenario. This second scenario is denoted as 2002 baseline without the Texas existing plants.
3. In the third scenario, emissions from the new Texas coal-fired plants shown in Section II.D.2 are added to the elevated point source file of the first scenario. This third scenario is denoted as 2002 full baseline with the Texas new plants.

Differences in ozone/PM2.5 concentrations between the first scenario (2002 full baseline) and the second scenario (2002 baseline without the Texas existing plants) can then be attributed to the Texas existing plants. Similarly, ozone/PM2.5 differences between the third scenario (2002 full baseline with the Texas new plants) and the first scenario (2002 full baseline) are attributable to the Texas new coal-fired plants.

A photochemical grid model such as CAMx can generate lots of output. This study focuses on ground-level impacts of 8-hour ozone and 24-hour PM2.5 predicted by CAMx over the portion of the 36 km grid that covers Arkansas. Impacts of the Texas coal-fired plants are assessed by examining: (1) their contributions to daily domain-wide peaks, (2) maximum increases anywhere in the Arkansas grid; and (3) new exceedances of applicable ambient air quality standards (AAQS). For ozone, both the 2008 8-hour ambient ozone standard of 0.075 ppm and the expected lower standard of 0.07 ppm are considered. This lower ozone AAQS is expected to be recommended by the US EPA in

October 2010 (EPA, 2009). For the days when the maximum impacts from the Texas coal plants have been predicted to occur, tile plots of O3/PM2.5 concentrations (baseline, baseline without the Texas existing plants, baseline with the Texas new plants, and ozone difference) are provided in the applicable appendices. In addition to the gridded impacts, impacts at monitoring sites that are located throughout the state are also considered for both ozone and PM2.5.

A. Ozone Impacts of Texas Existing Plants

Appendix A presents the ozone impacts predicted at nine monitoring sites and over the Arkansas portion of the 36 km grid. North Little Rock (NLR1) has been predicted to have the highest increase of 0.57 ppb on the maximum 8-hour ozone. At other sites, existing exceedances of both the 2008 AAQS of 0.075 ppm and the expected lower AAQS of 0.07 ppm are exacerbated by ozone increases by the Texas existing plants. Maximum increases of 8-hour ozone at monitoring sites range from 2.6 to 7.7 ppb. At these sites, the CAMx model has also predicted several new exceedances of both the 2008 AAQS of 0.075 ppm and the expected lower AAQS of 0.07 ppm.

Over the Arkansas grid, the CAMx model has predicted a maximum increase of 9.884 ppb in southwest Arkansas. The model has also predicted 92 new exceedances of the 2008 AAQS of 0.075 ppm, and 160 new exceedances of the expected lower AAQS of 0.07 ppm. The locations of these new exceedances are tabulated in Appendix A.

B. PM2.5 Impacts of Texas Existing Plants

Appendix B presents the 24-hour and annual PM2.5 impacts predicted at 17 monitoring sites and over the Arkansas portion of the 36 km grid. The Springdale monitor has been predicted to have the highest increase of 0.928 ug/m3 on the maximum 24-hour PM2.5. At all other sites, existing exceedances of 24-hour AAQS of 35 ug/m3 are exacerbated by PM2.5 increases up to 0.883 ug/m3. Maximum increases of 24-hour PM2.5 at monitoring sites range from 2 to 9 ug/m3. For annual-averaged PM2.5, a maximum increase of 0.621 ug/m3 has been predicted for the Mena monitor. At other sites, increases range from 0.17 to 0.6 ug/m3. All PM2.5 annual averages are below the annual AAQS of 15 ug/m3.

Over the Arkansas grid, the CAMx model has predicted a maximum increase of 10.794 ug/m3 in southwest Arkansas. The model has also predicted 13 new exceedances of the 24-hour AAQS of 35 ug/m3. The locations of these new exceedances are tabulated in Appendix B.

C. Visibility Impacts of Texas Existing Plants at Class I Areas

In Arkansas, there are two Class I areas: Caney Creek and Upper Buffalo. As shown in Appendix C, no significant visibility impact is predicted for Caney Creek. For Upper Buffalo, one day with del-dv larger than 0.5 deciview (0.816) has been predicted with the old IMPROVE equation. The new IMPROVE equation has also predicted 6 days with del-dv larger than 0.5 deciview and with a maximum change of 1.291 deciview. Sulfates (SO4) are the main contributors to these significant visibility impacts.

D. Ozone Impacts of Texas New Plants

Appendix D presents the ozone impacts predicted at nine monitoring sites and over the Arkansas portion of the 36 km grid. The ozone monitor in North Little Rock has been predicted to have the highest increase of 0.04 ppb on the maximum 8-hour ozone. At other sites, existing exceedances of both the 2008 AAQS of 0.075 ppm and the expected lower AAQS of 0.07 ppm are exacerbated by ozone increases by the Texas new plants. Maximum increases of 8-hour ozone at monitoring sites are about 1 ppb. The CAMx model has also predicted new exceedances of the 2008 AAQS of 0.075 ppm at North Little Rock, and new exceedances of the expected lower AAQS of 0.07 ppm at two sites (Springdale and Upper Buffalo).

Over the Arkansas grid, the CAMx model has predicted a maximum increase of 1.446 ppb in southwest Arkansas. The model has also predicted 14 new exceedances of the 2008 AAQS of 0.075 ppm, and 17 new exceedances of the expected lower AAQS of 0.07 ppm. The locations of these new exceedances are tabulated in Appendix D.

E. PM2.5 Impacts of Texas New Plants

Appendix E presents the 24-hour and annual PM2.5 impacts predicted at 17 monitoring sites and over the Arkansas portion of the 36 km grid. The Hot Springs monitor has been predicted to have the highest increase of 2.674 ug/m3 on the maximum 24-hour PM2.5. At other sites, existing exceedances of 24-hour AAQS of 35 ug/m3 are exacerbated by PM2.5 increases up to 0.632 ug/m3. Maximum increases of 24-hour PM2.5 at monitoring sites range from 2 to 5 ug/m3. At the Fort Smith monitor, the CAMx model has predicted three new exceedances of the 24-hour AAQS of 35 ug/m3. For annual-averaged PM2.5, a maximum increase of 0.24 ug/m3 has been predicted for the Fort Smith monitor. At other sites, increases range from 0.1 to 0.2 ug/m3. All PM2.5 annual averages are below the annual AAQS of 15 ug/m3.

Over the Arkansas grid, the CAMx model has predicted a maximum increase of 6.07 ug/m3 in southwest Arkansas. The model has also predicted 7 new exceedances of the 24-hour AAQS of 35 ug/m3. The locations of these new exceedances are tabulated in Appendix E.

F. Visibility Impacts of Texas New Plants at Class I Areas

As shown in Appendix F, no significant impact is predicted for Caney Creek. For Upper Buffalo, one day with del-dv larger than 0.5 deciview (0.552) has been predicted with the old IMPROVE equation. The new IMPROVE equation has also predicted three days with del-dv larger than 0.5 deciview and with a maximum change of 1.034 deciview. Sulfates (SO4) are the main contributors to these significant visibility impacts.

IV. CONCLUSIONS

Results of the above photochemical modeling for the entire year 2002 with the CAMx model have shown that Texas existing and new coal-fired power plants cause significantly adverse ozone, PM2.5 and visibility impacts in Arkansas. Not only they exacerbate existing violations of the 2008 ozone AAQS of 0.075 ppm and the expected lower AAQS of 0.07 ppm, they also cause several new exceedances of these standards. Over the Arkansas grid, the CAMx model has predicted a maximum increase of 9.884 ppb in southwest Arkansas. The model has also predicted 92 new exceedances of the 2008 AAQS of 0.075 ppm, and 160 new exceedances of the expected lower AAQS of 0.07 ppm For PM2.5, existing exceedances of 24-hour AAQS of 35 ug/m3 at monitoring sites are exacerbated by PM2.5 increases due to the Texas plants. Maximum increases of 24-hour PM2.5 at monitoring sites range from 3 to 9 ug/m3. Over the Arkansas grid, the CAMx model has predicted a maximum increase of 10.794 ug/m3 in southwest Arkansas The CAMx model has also predicted 13 new exceedances of the 24-hour AAQS of 35 ug/m3. No significant visibility impact has been predicted for Caney Creek. Significant visibility impacts have been predicted for Upper Buffalo, with one day above 0.5 deciview calculated with the old IMPROVE equation and six days with the new IMPROVE equation. A maximum change of 1.291 deciview has also been predicted.

The Texas new coal plants have been predicted to exacerbate existing exceedances at several monitoring sites of both the 2008 AAQS of 0.075 ppm and the expected lower AAQS of 0.07 ppm. The CAMx model has predicted a maximum increase of 1.446 ppb in southwest Arkansas, 14 new exceedances of the 2008 AAQS and 17 new exceedances of the expected lower AAQS of 0.07 ppm. For PM2.5, existing exceedances at several sites of the 24-hour AAQS of 35 ug/m3 are exacerbated. Maximum increases of 24-hour PM2.5 at monitoring sites range from 2 to 5 ug/m3. Over the Arkansas grid, the CAMx model has predicted a maximum increase of 6.07 ug/m3 in southwest Arkansas and 7 new exceedances of the 24-hour AAQS of 35 ug/m3. No significant visibility impact has been predicted for Caney Creek. Significant visibility impacts have been predicted for Upper Buffalo with one day above 0.5 deciview calculated with the old IMPROVE equation and three days with the new IMPROVE equation. A maximum change of 1.034 deciview has also been predicted. Thus, the Texas existing and new coal-fired plants severely interfere with the maintenance and/or attainment of ozone and PM2.5 AAQS in Arkansas. They also cause significant visibility impacts at Upper Buffalo.

V. REFERENCES

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Appendix A

2002 CAMx Modeling
Ozone Impacts of Texas Existing Coal Plants in Arkansas

2002 zeroTX Case (36km grid - AR Sites)

****
*** IMPACTS AT MONITORING SITES ***
****

Number of monitoring sites : 9

Site	**Site Address**	**LCCx(km)**	**LCCy(km)**
CACR	Caney Creek	263.634	-617.795
UPBU	Upper Buffalo	348.029	-448.296
MARI	Marion	616.027	-508.336
NEWT	Newton Co Hwy 16	339.358	-453.926
MENA	Mena	261.241	-609.612
NLR1	NLittleRock Pike Av	430.159	-569.076
NLR2	NLittleRock Remount	431.219	-560.756
ROCK	Little Rock	425.807	-577.567
SPRI	Springdale	257.611	-418.455

***** Predicted Impacts on Maximum 8-Hr O3 (ppm)*****

Site	**JDay**	**Base O3**	**Proj O3**	**Impact**
CACR	2002242	0.08083	0.08083	0.00001
UPBU	2002242	0.07833	0.07833	0.00000
MARI	2002206	0.11891	0.11891	0.00000
NEWT	2002242	0.07808	0.07808	0.00000
MENA	2002194	0.08138	0.08143	0.00005
NLR1	2002196	0.10346	0.10404	0.00057
NLR2	2002196	0.10641	0.10685	0.00044
ROCK	2002186	0.10351	0.10351	0.00001
SPRI	2002193	0.08541	0.08550	0.00009

***** Predicted Maximum 8-Hr O3 Impacts (ppm)*****

Site	**JDay**	**Base O3**	**Proj O3**	**Impact**
CACR	2002201	0.05304	0.06078	0.00773
UPBU	2002207	0.06503	0.06988	0.00485
MARI	2002203	0.08036	0.08292	0.00257
NEWT	2002207	0.06563	0.07066	0.00503
MENA	2002201	0.05149	0.05890	0.00741
NLR1	2002202	0.06825	0.07239	0.00414
NLR2	2002202	0.06969	0.07388	0.00419
ROCK	2002202	0.06694	0.07105	0.00410
SPRI	2002208	0.06054	0.06513	0.00459

New Exceedances of 8-Hr AAQS of 0.075 ppm

Site	**JDay**	**Base O3**	**Proj O3**	**Impact**
MENA	2002192	0.07469	0.07525	0.00056
NLR1	2002232	0.07496	0.07557	0.00061
NLR2	2002163	0.07457	0.07504	0.00047
NLR2	2002178	0.07446	0.07546	0.00100

ROCK	2002212	0.07229	0.07532	0.00303
ROCK	2002235	0.07405	0.07633	0.00228
SPRI	2002222	0.07499	0.07610	0.00111

New Exceedances of 8-Hr AAQS of 0.070 ppm

Site	JDay	Base O3	Proj O3	Impact
CACR	2002191	0.06699	0.07184	0.00485
CACR	2002196	0.06978	0.07139	0.00161
CACR	2002207	0.06705	0.07304	0.00599
UPBU	2002197	0.06964	0.07125	0.00161
MARI	2002202	0.06914	0.07073	0.00159
MARI	2002231	0.06984	0.07049	0.00065
MARI	2002235	0.06974	0.07002	0.00027
NEWT	2002197	0.06923	0.07110	0.00187
NEWT	2002207	0.06563	0.07066	0.00503
MENA	2002191	0.06626	0.07082	0.00456
MENA	2002207	0.06549	0.07130	0.00581
NLR1	2002202	0.06825	0.07239	0.00414
NLR1	2002211	0.06865	0.07165	0.00300
NLR2	2002179	0.06988	0.07011	0.00023
NLR2	2002202	0.06969	0.07388	0.00419
NLR2	2002211	0.06982	0.07260	0.00278
ROCK	2002202	0.06694	0.07105	0.00410
ROCK	2002211	0.06744	0.07069	0.00325
SPRI	2002252	0.06999	0.07000	0.00001
SPRI	2002274	0.06898	0.07012	0.00113

****
*** IMPACTS OVER MODELING GRID ***
****

	JDay	I	J	LCCx(km)	LCCy(km)	Base O3	Proj O3	Impact
Grid Peak	2002206	92	44	558.000	-522.000	0.120227	0.120193	-0.000034
Max Impact	2002201	84	39	270.000	-702.000	0.068857	0.078741	0.009884

Number of New Exceedances of AAQS=0.075 ppm = 92
Number of New Exceedances of AAQS=0.070 ppm = 160

***** New Exceedances of AAQS = 0.075 PPM *****

JDay	I	J	LCCx(km)	LCCy(km)	Base	Proj	Impact
2002143	88	38	414.000	-738.000	0.07497	0.07500	0.00004
2002159	92	45	558.000	-486.000	0.07499	0.07502	0.00003
2002164	88	42	414.000	-594.000	0.07396	0.07557	0.00160
2002164	91	43	522.000	-558.000	0.07389	0.07538	0.00149
2002178	83	45	234.000	-486.000	0.07316	0.07566	0.00250
2002178	83	46	234.000	-450.000	0.07409	0.07642	0.00233
2002179	83	44	234.000	-522.000	0.07375	0.07504	0.00129
2002179	87	48	378.000	-378.000	0.07486	0.07537	0.00051

2002190	84	40	270.000	-666.000	0.07484	0.07521	0.00038
2002191	83	41	234.000	-630.000	0.06986	0.07560	0.00574
2002193	85	39	306.000	-702.000	0.07471	0.07502	0.00031
2002193	87	39	378.000	-702.000	0.07477	0.07504	0.00028
2002194	90	41	486.000	-630.000	0.07498	0.07504	0.00006
2002195	86	38	342.000	-738.000	0.06987	0.07663	0.00676
2002195	84	39	270.000	-702.000	0.07283	0.07612	0.00329
2002195	91	40	522.000	-666.000	0.07401	0.07562	0.00161
2002196	91	38	522.000	-738.000	0.07422	0.07689	0.00267
2002196	84	39	270.000	-702.000	0.07323	0.07917	0.00594
2002196	90	39	486.000	-702.000	0.07299	0.07647	0.00348
2002196	91	39	522.000	-702.000	0.07331	0.07674	0.00343
2002196	86	40	342.000	-666.000	0.07339	0.07640	0.00300
2002196	87	40	378.000	-666.000	0.07278	0.07568	0.00289
2002197	92	41	558.000	-630.000	0.07410	0.07618	0.00208
2002197	83	47	234.000	-414.000	0.07272	0.07637	0.00364
2002199	84	39	270.000	-702.000	0.07376	0.08021	0.00645
2002199	89	43	450.000	-558.000	0.07484	0.07562	0.00078
2002200	88	42	414.000	-594.000	0.07288	0.07552	0.00264
2002200	89	42	450.000	-594.000	0.07327	0.07567	0.00240
2002201	85	38	306.000	-738.000	0.06953	0.07686	0.00733
2002201	84	39	270.000	-702.000	0.06886	0.07874	0.00988
2002201	85	39	306.000	-702.000	0.06842	0.07652	0.00810
2002202	89	43	450.000	-558.000	0.07296	0.07690	0.00394
2002203	85	38	306.000	-738.000	0.07028	0.07569	0.00541
2002203	86	38	342.000	-738.000	0.07439	0.07992	0.00553
2002203	88	42	414.000	-594.000	0.07293	0.07568	0.00276
2002203	91	43	522.000	-558.000	0.07233	0.07551	0.00317
2002203	92	44	558.000	-522.000	0.07322	0.07628	0.00306
2002203	93	44	594.000	-522.000	0.07405	0.07711	0.00305
2002203	94	46	630.000	-450.000	0.07451	0.07653	0.00202
2002204	85	38	306.000	-738.000	0.06960	0.07538	0.00578
2002207	85	39	306.000	-702.000	0.07242	0.07609	0.00367
2002207	86	40	342.000	-666.000	0.07358	0.07780	0.00422
2002207	84	41	270.000	-630.000	0.07026	0.07650	0.00624
2002207	85	41	306.000	-630.000	0.07247	0.07820	0.00574
2002207	86	41	342.000	-630.000	0.07468	0.07995	0.00527
2002207	87	41	378.000	-630.000	0.07263	0.07637	0.00373
2002207	86	42	342.000	-594.000	0.07474	0.08058	0.00584
2002207	88	42	414.000	-594.000	0.07480	0.07794	0.00314
2002207	87	43	378.000	-558.000	0.07374	0.07861	0.00486
2002207	92	43	558.000	-558.000	0.07436	0.07573	0.00136
2002207	87	44	378.000	-522.000	0.07230	0.07727	0.00497
2002212	91	44	522.000	-522.000	0.07264	0.07523	0.00259
2002212	83	45	234.000	-486.000	0.07344	0.07581	0.00237
2002212	92	47	558.000	-414.000	0.07412	0.07522	0.00110
2002212	93	48	594.000	-378.000	0.07451	0.07537	0.00087
2002213	91	38	522.000	-738.000	0.07473	0.07753	0.00280
2002213	91	40	522.000	-666.000	0.07499	0.07767	0.00267
2002213	90	41	486.000	-630.000	0.07318	0.07688	0.00370
2002213	91	41	522.000	-630.000	0.07404	0.07648	0.00244
2002213	92	41	558.000	-630.000	0.07452	0.07590	0.00138
2002213	89	42	450.000	-594.000	0.07330	0.07687	0.00357
2002213	90	42	486.000	-594.000	0.07399	0.07743	0.00343
2002213	86	44	342.000	-522.000	0.07176	0.07516	0.00339
2002213	90	46	486.000	-450.000	0.07442	0.07647	0.00204

2002213	91	46	522.000	-450.000	0.07491	0.07649	0.00158
2002213	93	46	594.000	-450.000	0.07475	0.07557	0.00081
2002214	90	39	486.000	-702.000	0.07447	0.07580	0.00132
2002214	87	41	378.000	-630.000	0.07416	0.07546	0.00130
2002214	87	42	378.000	-594.000	0.07398	0.07520	0.00122
2002214	91	45	522.000	-486.000	0.07487	0.07520	0.00033
2002222	83	46	234.000	-450.000	0.07382	0.07516	0.00134
2002226	88	44	414.000	-522.000	0.07477	0.07539	0.00062
2002233	92	47	558.000	-414.000	0.07494	0.07504	0.00010
2002233	93	47	594.000	-414.000	0.07496	0.07516	0.00021
2002234	86	38	342.000	-738.000	0.07355	0.07581	0.00227
2002234	85	39	306.000	-702.000	0.07281	0.07571	0.00291
2002234	84	40	270.000	-666.000	0.07215	0.07542	0.00327
2002234	85	40	306.000	-666.000	0.07253	0.07513	0.00259
2002235	88	43	414.000	-558.000	0.07479	0.07735	0.00256
2002235	91	44	522.000	-522.000	0.07494	0.07596	0.00102
2002235	93	46	594.000	-450.000	0.07485	0.07524	0.00039
2002277	85	38	306.000	-738.000	0.07354	0.07676	0.00322
2002277	86	38	342.000	-738.000	0.07341	0.07719	0.00378
2002277	87	38	378.000	-738.000	0.07125	0.07511	0.00386
2002277	89	38	450.000	-738.000	0.07265	0.07552	0.00288
2002277	91	38	522.000	-738.000	0.07464	0.07660	0.00196
2002277	86	39	342.000	-702.000	0.07194	0.07545	0.00351
2002277	87	39	378.000	-702.000	0.07061	0.07502	0.00441
2002277	90	39	486.000	-702.000	0.07216	0.07520	0.00304
2002279	92	42	558.000	-594.000	0.07499	0.07507	0.00007
2002279	93	43	594.000	-558.000	0.07498	0.07505	0.00007
2002291	83	46	234.000	-450.000	0.07367	0.07557	0.00190

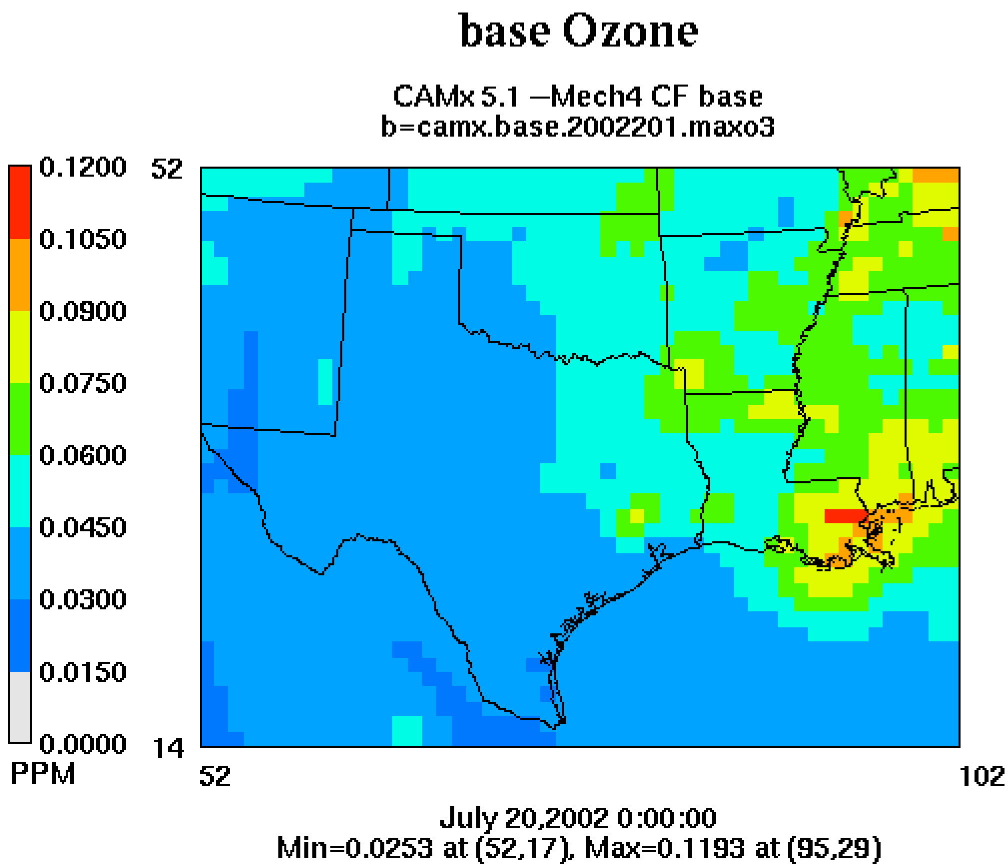
***** New Exceedances of AAQS = 0.070 PPM *****

JDay	I	J	LCCx(km)	LCCy(km)	Base	Proj	Impact
2002102	86	48	342.000	-378.000	0.06968	0.07068	0.00100
2002120	87	43	378.000	-558.000	0.06912	0.07052	0.00140
2002149	84	39	270.000	-702.000	0.06696	0.07095	0.00398
2002164	85	38	306.000	-738.000	0.06841	0.07172	0.00331
2002164	86	38	342.000	-738.000	0.06964	0.07210	0.00247
2002164	84	39	270.000	-702.000	0.06797	0.07178	0.00381
2002164	85	39	306.000	-702.000	0.06953	0.07305	0.00352
2002164	86	39	342.000	-702.000	0.06851	0.07162	0.00311
2002164	89	42	450.000	-594.000	0.06869	0.07023	0.00155
2002164	90	42	486.000	-594.000	0.06865	0.07005	0.00140
2002164	90	44	486.000	-522.000	0.06880	0.07057	0.00177
2002164	91	44	522.000	-522.000	0.06849	0.07007	0.00158
2002178	83	43	234.000	-558.000	0.06937	0.07330	0.00392
2002178	85	44	306.000	-522.000	0.06770	0.07049	0.00279
2002178	84	45	270.000	-486.000	0.06808	0.07042	0.00234
2002178	93	45	594.000	-486.000	0.06987	0.07027	0.00040
2002178	90	46	486.000	-450.000	0.06970	0.07025	0.00054
2002179	85	45	306.000	-486.000	0.06927	0.07016	0.00089
2002191	88	40	414.000	-666.000	0.06911	0.07044	0.00133
2002191	91	40	522.000	-666.000	0.06973	0.07000	0.00027
2002191	83	41	234.000	-630.000	0.06986	0.07560	0.00574
2002191	84	41	270.000	-630.000	0.06801	0.07329	0.00529
2002191	83	42	234.000	-594.000	0.06691	0.07159	0.00469
2002191	83	43	234.000	-558.000	0.06780	0.07088	0.00309

2002191	83	45	234.000	−486.000	0.06923	0.07002	0.00079
2002192	85	38	306.000	−738.000	0.06939	0.07449	0.00510
2002192	84	39	270.000	−702.000	0.06864	0.07386	0.00522
2002193	87	38	378.000	−738.000	0.06985	0.07009	0.00024
2002195	85	38	306.000	−738.000	0.06641	0.07328	0.00687
2002195	86	38	342.000	−738.000	0.06987	0.07663	0.00676
2002195	87	38	378.000	−738.000	0.06731	0.07324	0.00593
2002195	88	38	414.000	−738.000	0.06777	0.07299	0.00522
2002195	90	38	486.000	−738.000	0.06970	0.07255	0.00285
2002195	91	38	522.000	−738.000	0.06940	0.07169	0.00229
2002195	86	39	342.000	−702.000	0.06724	0.07025	0.00301
2002195	90	39	486.000	−702.000	0.06887	0.07166	0.00279
2002196	85	38	306.000	−738.000	0.06707	0.07306	0.00598
2002196	86	38	342.000	−738.000	0.06880	0.07372	0.00493
2002196	87	38	378.000	−738.000	0.06534	0.07008	0.00474
2002196	88	38	414.000	−738.000	0.06788	0.07223	0.00434
2002196	89	38	450.000	−738.000	0.06769	0.07156	0.00387
2002196	85	39	306.000	−702.000	0.06964	0.07481	0.00517
2002196	86	39	342.000	−702.000	0.06733	0.07185	0.00452
2002196	87	39	378.000	−702.000	0.06893	0.07334	0.00441
2002196	88	39	414.000	−702.000	0.06989	0.07414	0.00425
2002196	84	40	270.000	−666.000	0.06929	0.07321	0.00392
2002196	84	41	270.000	−630.000	0.06977	0.07175	0.00198
2002196	85	41	306.000	−630.000	0.06964	0.07143	0.00179
2002197	87	44	378.000	−522.000	0.06670	0.07017	0.00347
2002197	85	45	306.000	−486.000	0.06825	0.07187	0.00361
2002197	83	46	234.000	−450.000	0.06659	0.07078	0.00419
2002197	84	46	270.000	−450.000	0.06904	0.07242	0.00338
2002197	85	46	306.000	−450.000	0.06926	0.07161	0.00235
2002197	86	46	342.000	−450.000	0.06910	0.07075	0.00166
2002197	86	47	342.000	−414.000	0.06995	0.07098	0.00103
2002199	84	40	270.000	−666.000	0.06697	0.07306	0.00610
2002200	85	38	306.000	−738.000	0.06548	0.07051	0.00504
2002200	86	38	342.000	−738.000	0.06676	0.07055	0.00379
2002200	84	39	270.000	−702.000	0.06520	0.07189	0.00669
2002200	85	39	306.000	−702.000	0.06611	0.07123	0.00513
2002200	86	39	342.000	−702.000	0.06742	0.07160	0.00418
2002200	87	39	378.000	−702.000	0.06879	0.07217	0.00338
2002200	88	39	414.000	−702.000	0.06940	0.07250	0.00310
2002200	87	40	378.000	−666.000	0.06744	0.07129	0.00384
2002200	88	40	414.000	−666.000	0.06805	0.07161	0.00356
2002200	91	44	522.000	−522.000	0.06761	0.07027	0.00267
2002201	85	38	306.000	−738.000	0.06953	0.07686	0.00733
2002201	86	38	342.000	−738.000	0.06946	0.07470	0.00524
2002201	84	39	270.000	−702.000	0.06886	0.07874	0.00988
2002201	85	39	306.000	−702.000	0.06842	0.07652	0.00810
2002201	86	39	342.000	−702.000	0.06438	0.07086	0.00648
2002201	84	40	270.000	−666.000	0.06250	0.07207	0.00957
2002201	85	40	306.000	−666.000	0.06488	0.07287	0.00799
2002201	89	42	450.000	−594.000	0.06675	0.07002	0.00327
2002202	92	41	558.000	−630.000	0.06901	0.07063	0.00162
2002202	88	42	414.000	−594.000	0.06648	0.07048	0.00400
2002202	88	43	414.000	−558.000	0.06755	0.07203	0.00447
2002203	87	38	378.000	−738.000	0.06797	0.07254	0.00457
2002203	84	39	270.000	−702.000	0.06562	0.07053	0.00491
2002203	85	39	306.000	−702.000	0.06957	0.07366	0.00410
2002203	86	39	342.000	−702.000	0.06832	0.07223	0.00390

2002203	93	43	594.000	-558.000	0.06697	0.07017	0.00320
2002203	89	44	450.000	-522.000	0.06899	0.07199	0.00300
2002203	92	45	558.000	-486.000	0.06970	0.07240	0.00270
2002203	92	46	558.000	-450.000	0.06802	0.07063	0.00261
2002203	93	46	594.000	-450.000	0.06800	0.07064	0.00264
2002204	85	38	306.000	-738.000	0.06960	0.07538	0.00578
2002204	86	38	342.000	-738.000	0.06609	0.07258	0.00649
2002207	86	39	342.000	-702.000	0.06773	0.07034	0.00261
2002207	88	41	414.000	-630.000	0.06859	0.07093	0.00234
2002207	85	42	306.000	-594.000	0.06679	0.07270	0.00592
2002207	89	42	450.000	-594.000	0.06970	0.07187	0.00217
2002207	90	42	486.000	-594.000	0.06851	0.07015	0.00164
2002207	91	42	522.000	-594.000	0.06920	0.07052	0.00132
2002207	86	43	342.000	-558.000	0.06697	0.07240	0.00543
2002207	85	44	306.000	-522.000	0.06433	0.07004	0.00572
2002207	86	44	342.000	-522.000	0.06921	0.07477	0.00556
2002207	84	45	270.000	-486.000	0.06877	0.07326	0.00449
2002207	85	45	306.000	-486.000	0.06733	0.07250	0.00517
2002207	86	45	342.000	-486.000	0.06915	0.07459	0.00544
2002207	87	45	378.000	-486.000	0.06984	0.07455	0.00471
2002207	85	46	306.000	-450.000	0.06634	0.07125	0.00491
2002207	86	46	342.000	-450.000	0.06512	0.07011	0.00499
2002207	88	46	414.000	-450.000	0.06934	0.07299	0.00365
2002207	85	47	306.000	-414.000	0.06814	0.07281	0.00467
2002207	86	47	342.000	-414.000	0.06557	0.07027	0.00469
2002207	89	47	450.000	-414.000	0.06840	0.07042	0.00202
2002207	86	48	342.000	-378.000	0.06711	0.07119	0.00408
2002208	89	47	450.000	-414.000	0.06927	0.07148	0.00220
2002208	91	48	522.000	-378.000	0.06986	0.07151	0.00164
2002211	88	43	414.000	-558.000	0.06837	0.07107	0.00271
2002211	92	44	558.000	-522.000	0.06836	0.07019	0.00184
2002211	94	46	630.000	-450.000	0.06956	0.07057	0.00101
2002212	85	39	306.000	-702.000	0.06727	0.07295	0.00568
2002212	87	43	378.000	-558.000	0.06698	0.07040	0.00342
2002212	91	43	522.000	-558.000	0.06833	0.07106	0.00272
2002212	83	44	234.000	-522.000	0.06875	0.07114	0.00239
2002212	86	44	342.000	-522.000	0.06997	0.07320	0.00324
2002212	87	44	378.000	-522.000	0.06944	0.07258	0.00314
2002212	92	44	558.000	-522.000	0.06930	0.07151	0.00221
2002212	93	44	594.000	-522.000	0.06928	0.07087	0.00158
2002212	90	45	486.000	-486.000	0.06786	0.07007	0.00221
2002212	91	45	522.000	-486.000	0.06796	0.07009	0.00212
2002212	83	46	234.000	-450.000	0.06772	0.07006	0.00235
2002213	86	38	342.000	-738.000	0.06648	0.07160	0.00512
2002213	90	38	486.000	-738.000	0.06806	0.07247	0.00441
2002213	85	39	306.000	-702.000	0.06586	0.07084	0.00497
2002213	90	40	486.000	-666.000	0.06756	0.07156	0.00401
2002213	89	41	450.000	-630.000	0.06883	0.07247	0.00365
2002213	89	44	450.000	-522.000	0.06889	0.07197	0.00309
2002213	93	45	594.000	-486.000	0.06960	0.07052	0.00092
2002213	91	47	522.000	-414.000	0.06944	0.07102	0.00158
2002213	92	48	558.000	-378.000	0.06953	0.07024	0.00072
2002231	92	46	558.000	-450.000	0.06956	0.07046	0.00090
2002231	94	46	630.000	-450.000	0.06976	0.07064	0.00088
2002233	87	39	378.000	-702.000	0.06999	0.07008	0.00009
2002234	87	38	378.000	-738.000	0.06962	0.07079	0.00117
2002234	84	41	270.000	-630.000	0.06872	0.07126	0.00255

2002257	87	44	378.000	−522.000	0.06973	0.07014	0.00041
2002257	83	46	234.000	−450.000	0.06944	0.07084	0.00140
2002257	84	47	270.000	−414.000	0.06948	0.07058	0.00111
2002258	88	38	414.000	−738.000	0.06913	0.07028	0.00115
2002258	90	42	486.000	−594.000	0.06958	0.07014	0.00056
2002260	88	44	414.000	−522.000	0.06918	0.07149	0.00231
2002260	90	44	486.000	−522.000	0.06798	0.07040	0.00242
2002260	89	45	450.000	−486.000	0.06914	0.07104	0.00191
2002274	83	45	234.000	−486.000	0.06945	0.07119	0.00174
2002274	83	46	234.000	−450.000	0.06985	0.07141	0.00157
2002277	88	39	414.000	−702.000	0.06871	0.07324	0.00453
2002277	89	39	450.000	−702.000	0.06839	0.07236	0.00397
2002277	86	40	342.000	−666.000	0.06749	0.07008	0.00259
2002277	87	40	378.000	−666.000	0.06711	0.07111	0.00400
2002277	88	40	414.000	−666.000	0.06664	0.07130	0.00466
2002277	89	41	450.000	−630.000	0.06594	0.07018	0.00424
2002277	92	44	558.000	−522.000	0.06947	0.07018	0.00071
2002279	83	47	234.000	−414.000	0.06972	0.07141	0.00169
2002285	84	40	270.000	−666.000	0.06927	0.07218	0.00290
2002291	83	44	234.000	−522.000	0.06871	0.07068	0.00196
2002291	87	47	378.000	−414.000	0.06946	0.07050	0.00103
2002291	86	48	342.000	−378.000	0.06914	0.07029	0.00115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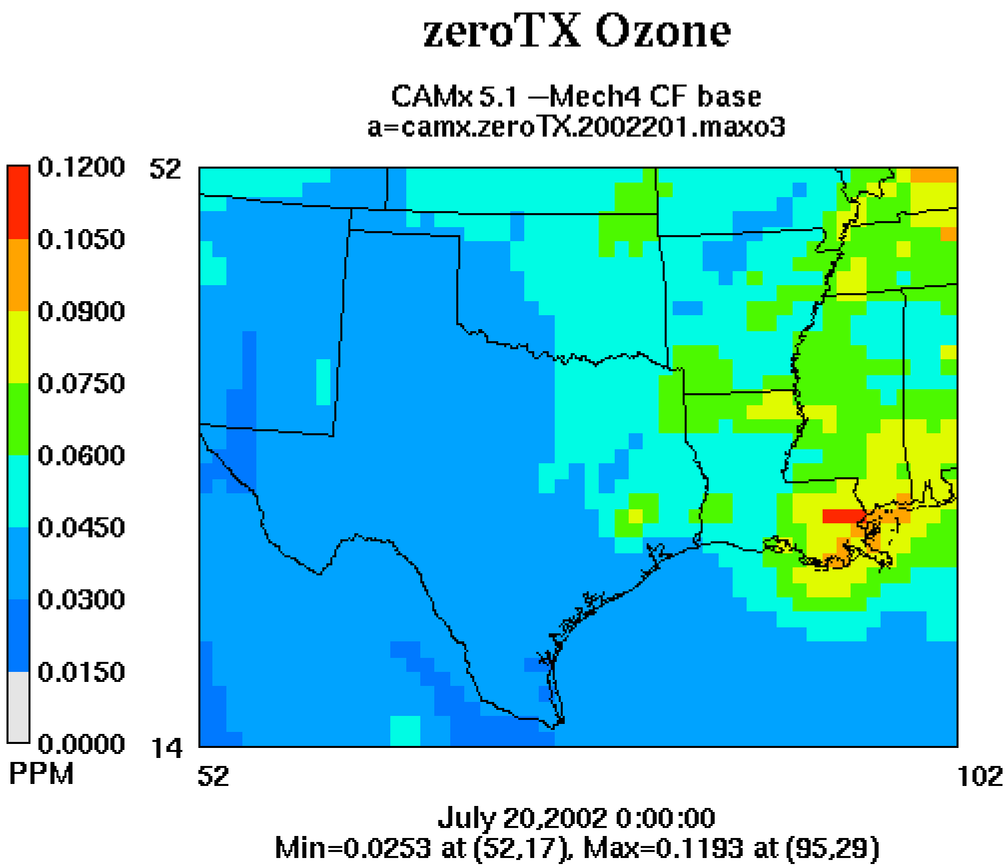
0.0900
0.0750
0.0600
0.0450
0.0300
0.0150
0.0000
PPM
52
14
52
102
July 20,2002 0:00:00
Min=0.0253 at (52,17), Max=0.1193 at (95,29)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CAMx 5.1 –Mech4 CF base
a=camx.zeroTX.2002201.maxo3
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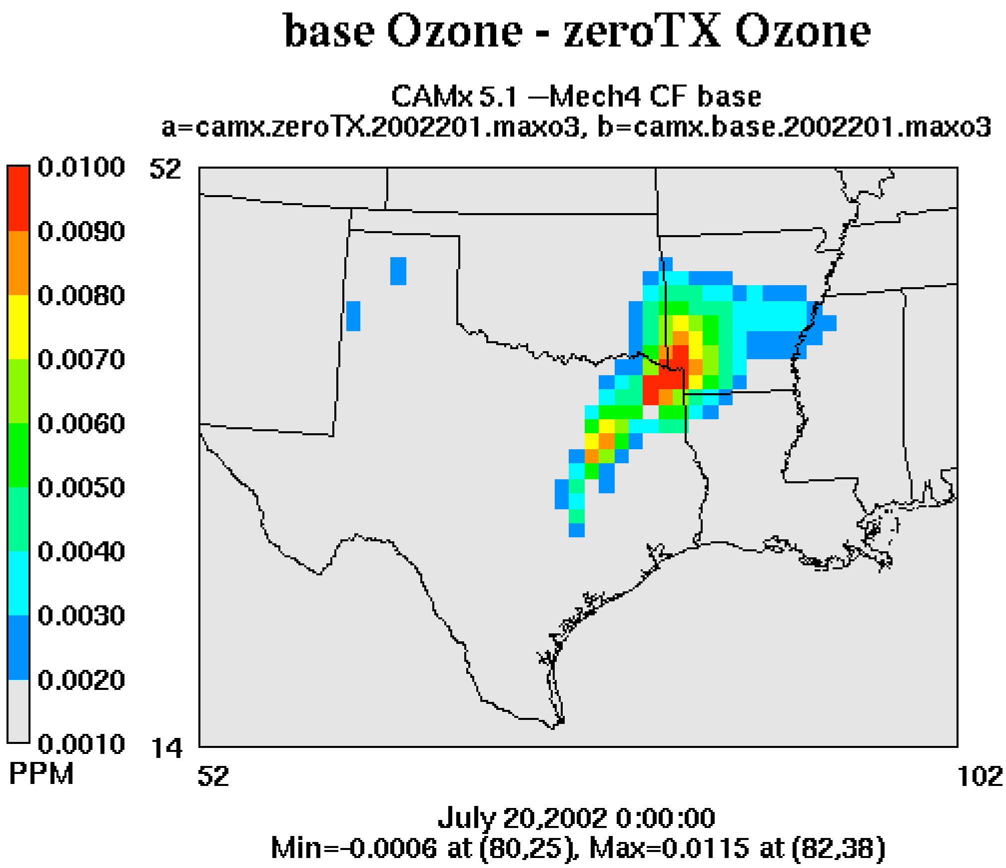
0.1050
0.0900
0.0750
0.0600
0.0450
0.0300
0.0150
0.0000
PPM
52
14
52
102
July 20,2002 0:00:00
Min=0.0253 at (52,17), Max=0.1193 at (95,29)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0.0080
0.0070
0.0060
0.0050
0.0040
0.0030
0.0020
0.0010
PPM
52
14
52
102
July 20,2002 0:00:00
Min=-0.0006 at (80,25), Max=0.0115 at (82,38)

Appendix B

2002 CAMx Modeling of PM2.5 Impacts of Texas Existing Coal Plants in Arkansas

2002 zeroTX Case (36km grid – AR sites)

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**********************************
*** IMPACTS AT MONITORING SITES ***
**********************************
```

Number of monitoring sites : 17

Site	**Site Address**	**LCCx(km)**	**LCCy(km)**
CACR	Caney Creek	263.634	-617.795
UPBU	Upper Buffalo	348.029	-448.296
STUT	Stuttgart	496.950	-591.741
CROS	Crossett	469.765	-746.665
MARI	Marion	616.027	-508.336
CONW	Conway	416.834	-532.606
HOTS	Hot Springs NP	359.759	-604.118
NEWP	Newport	531.485	-493.708
HELE	Helena	585.622	-584.782
MENA	Mena	253.229	-595.339
RUSS	Russellville	349.076	-513.420
NLRC	N. Little Rock	430.159	-569.077
LRKB	Little Rock Bond St	433.272	-571.907
FSMI	Fort Smith	233.734	-506.859
ElDO	El Dorado	402.547	-741.730
SPRD	Springdale	257.611	-418.456
SEAR	Searcy	477.972	-511.767

***** Predicted Impacts on Maximum 24-Hr PM2.5 (ug/m3) *****

Site	**Jday**	**Base PM2.5**	**Proj PM2.5**	**Impact**
CACR	2002303	40.72100	40.73100	0.01000
UPBU	2002065	37.79100	38.28800	0.49700
STUT	2002302	38.22100	38.24700	0.02600
CROS	2002343	29.24900	29.38500	0.13600
MARI	2002285	45.78600	45.80500	0.01900
CONW	2002348	41.11900	41.57700	0.45800
HOTS	2002064	44.80700	45.69000	0.88300
NEWP	2002285	41.98200	42.00500	0.02300
HELE	2002348	35.71800	36.05800	0.34000
MENA	2002303	43.44700	43.45500	0.00800
RUSS	2002065	60.47100	60.78100	0.31000
NLRC	2002348	37.78400	38.24000	0.45600
LRKB	2002348	37.79100	38.05800	0.26700
FSMI	2002345	52.95900	53.71000	0.75100
ElDO	2002348	29.44900	29.84800	0.39900
SPRD	2002345	56.64000	57.56800	0.92800
SEAR	2002348	39.61400	39.97000	0.35600

***** Predicted Maximum 24-Hr PM2.5 Impacts (ug/m3) *****

Site	Jday	Base PM2.5	Proj PM2.5	Impact
CACR	2002197	3.49800	12.95100	9.45300
UPBU	2002200	3.38100	9.00200	5.62100
STUT	2002214	6.61900	10.12100	3.50200
CROS	2002195	9.97800	13.62100	3.64300
MARI	2002201	7.57200	11.56000	3.98800
CONW	2002200	8.91900	13.81500	4.89600
HOTS	2002197	5.48500	9.89200	4.40700
NEWP	2002201	6.08300	10.84600	4.76300
HELE	2002201	5.29300	8.12100	2.82800
MENA	2002197	3.42700	12.17700	8.75000
RUSS	2002200	6.55500	12.62900	6.07400
NLRC	2002214	5.90200	9.29700	3.39500
LRKB	2002214	5.87700	9.29700	3.42000
FSMI	2002105	6.94200	13.21700	6.27500
ElDO	2002195	7.33500	12.88800	5.55300
SPRD	2002105	6.34600	12.03000	5.68400
SEAR	2002200	10.14400	15.16300	5.01900

***** Predicted Annual-Averaged PM2.5 Impacts (ug/m3)*****

Site	Base PM2.5	Proj PM2.5	Impact
CACR	9.25911	9.86408	0.60497
UPBU	9.27466	9.61235	0.33769
STUT	10.79324	10.95876	0.16551
CROS	9.59471	9.75484	0.16013
MARI	13.24478	13.38023	0.13545
CONW	11.22252	11.48120	0.25868
HOTS	10.11610	10.42115	0.30505
NEWP	11.92019	12.09421	0.17402
HELE	11.48164	11.61217	0.13053
MENA	9.41264	10.03349	0.62085
RUSS	11.27454	11.66627	0.39173
NLRC	11.26745	11.49202	0.22457
LRKB	11.24102	11.46107	0.22006
FSMI	11.23694	11.82074	0.58380
ElDO	9.52172	9.74678	0.22506
SPRD	11.33105	11.81492	0.48387
SEAR	10.86670	11.07160	0.20491

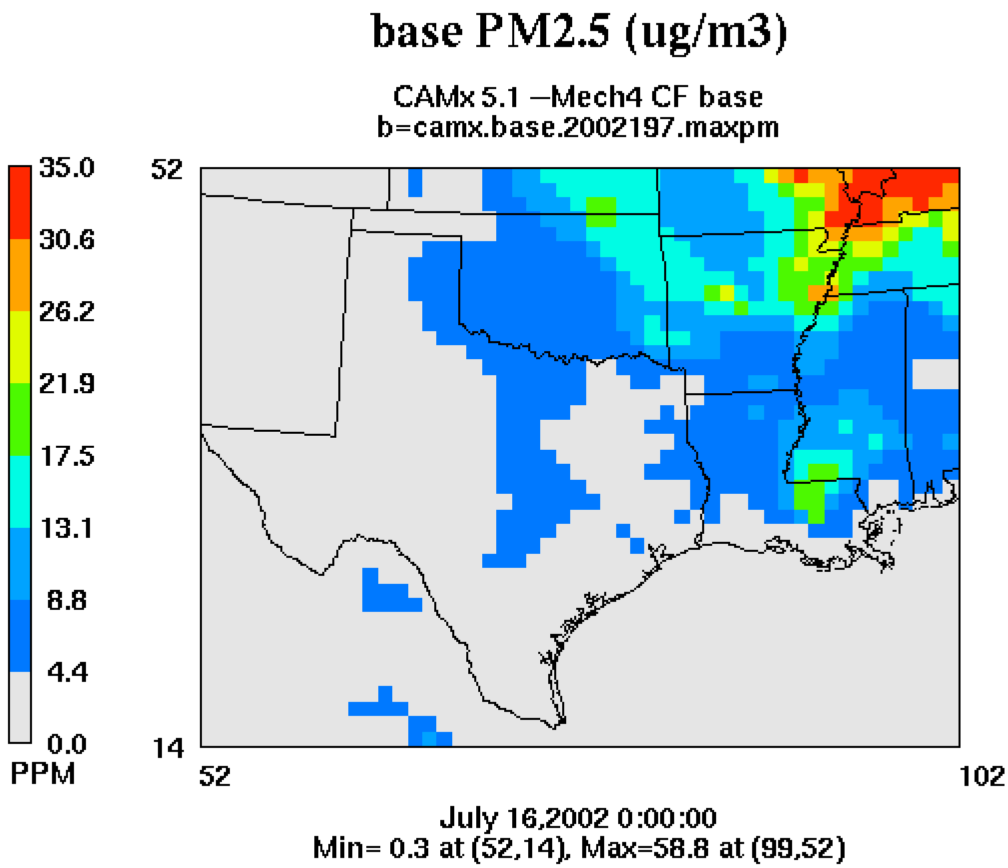
****
*** IMPACTS OVER MODELING GRID ***
****

	JDay	I	J	LCCx(km)	LCCy(km)	Base PM	Proj PM	Impact
Grid Peak	2002088	85	45	306.000	-486.000	117.662	119.718	2.055
Max Impact	2002197	83	41	234.000	-630.000	3.348	14.142	10.794

Number of New Exceedances of 24-hr AAQS of 35 ug/m3 = 13

***** New Exceedances of 24-Hr AAQS of 35 ug/m3 *****

JDay	I	J	LCCx(km)	LCCy(km)	Base	Proj	Impact
2002023	83	45	234.000	-486.000	33.9543	35.3143	1.3600
2002023	87	45	378.000	-486.000	34.2507	35.2871	1.0364
2002030	84	44	270.000	-522.000	32.6097	35.6553	3.0456
2002064	87	42	378.000	-594.000	34.1401	35.0612	0.9211
2002087	85	43	306.000	-558.000	34.6338	35.1312	0.4975
2002088	86	48	342.000	-378.000	34.8710	36.8603	1.9893
2002103	84	43	270.000	-558.000	33.4328	35.5566	2.1237
2002342	86	48	342.000	-378.000	32.1535	38.4611	6.3076
2002342	87	48	378.000	-378.000	31.4789	35.4939	4.0150
2002345	85	45	306.000	-486.000	34.6309	35.0336	0.4027
2002348	87	43	378.000	-558.000	34.8856	35.2497	0.3641
2002348	93	43	594.000	-558.000	34.9218	35.1778	0.2559
2002348	85	44	306.000	-522.000	34.7770	35.0243	0.2473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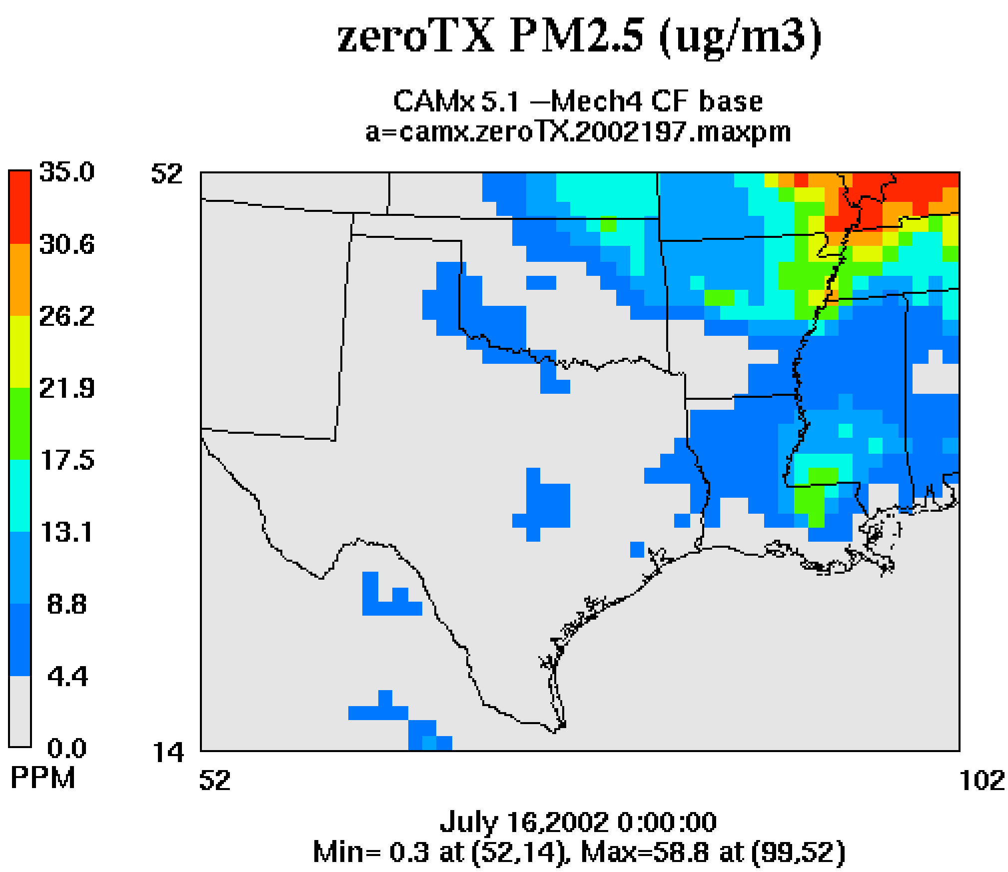
30.6
26.2
21.9
17.5
13.1
8.8
4.4
0.0
PPM
52
14
52
102
July 16,2002 0:00:00
Min= 0.3 at (52,14), Max=58.8 at (99,52)


zeroTX PM2.5 (ug/m3)
CAMx 5.1 –Mech4 CF base
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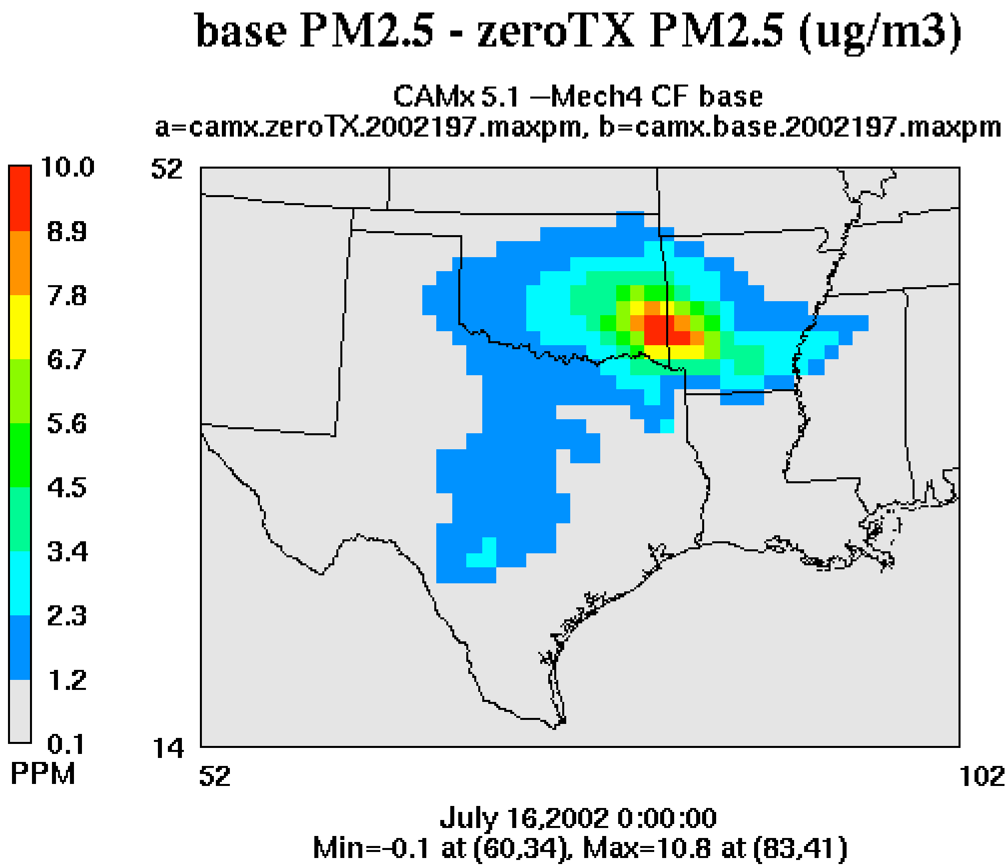
30.6
26.2
21.9
17.5
13.1
8.8
4.4
0.0
PPM
52
14
52
102
July 16,2002 0:00:00
Min= 0.3 at (52,14), Max=58.8 at (99,52)


base PM2.5 - zeroTX PM2.5 (ug/m3)
CAMx 5.1 –Mech4 CF base
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10.0
8.9
7.8
6.7
5.6
4.5
3.4
2.3
1.2
0.1
PPM
52
14
52
102
July 16,2002 0:00:00
Min=-0.1 at (60,34), Max=10.8 at (83,41)

Appendix C

2002 CAMx Modeling
Visibility Impacts of Texas Existing Coal Plants at Class I Areas (Caney Creek and Upper Buffalo)

2002 zeroTX Case (36km grid)

Number of monitoring sites : 1

Site	**Site Address**	**LCCx(km)**	**LCCy (km)**
CACR	Caney Creek	263.634	-617.795

***** Predicted Visibility Impacts (Old IMPROVE Equation) *****

```
Maximum delDV (deciview)       =     0.017
Max delDV occurred on JDay     =   2002338
Project bsource (Mm-1)         =     0.037
Natural bnat (Mm-1)            =    21.140
Number of days with delDV >0.5 =     0
```

***** Predicted Visibility Impacts (New IMPROVE Equation) *****

```
Maximum delDV (deciview)       =     0.016
Max delDV occurred on JDay     =   2002338
Project bsource (Mm-1)         =     0.033
Natural bnat (Mm-1)            =    21.140
Number of days with delDV >0.5 =     0
```

2002 zeroTX Case (36km grid)

Number of monitoring sites : 1

Site	**Site Address**	**LCCx(km)**	**LCCy (km)**
UPBU	Upper Buffalo	348.029	-448.296

***** Predicted Visibility Impacts (Old IMPROVE Equation) *****

Maximum delDV (deciview) = 0.816
Max delDV occurred on JDay = 2002008
Project bsource (Mm-1) = 1.789
Natural bnat (Mm-1) = 21.040
Number of days with delDV >0.5 = 1

JDay	bSO4	bNO3	bsource	delDV
2002008	1.784	0.000	1.789	0.816

***** Predicted Visibility Impacts (New IMPROVE Equation) *****

Maximum delDV (deciview) = 1.291
Max delDV occurred on JDay = 2002349
Project bsource (Mm-1) = 2.900
Natural bnat (Mm-1) = 21.040
Number of days with delDV >0.5 = 6

JDay	**bSO4**	**bNO3**	**bsource**	**delDV**
2002008	1.833	0.000	1.838	0.838
2002305	1.379	0.000	1.380	0.635
2002349	2.894	0.000	2.900	1.291
2002351	1.848	0.000	1.852	0.844
2002352	1.143	0.000	1.146	0.530
2002364	2.050	0.000	2.055	0.932

Appendix D

2002 CAMx Modeling of Ozone Impacts of Texas New Coal Plants in Arkansas

2002 newTX Case (36km grid - AR Sites)

****
*** IMPACTS AT MONITORING SITES ***
****

Number of monitoring sites : 9

Site	**Site Address**	**LCCx(km)**	**LCCy(km)**
CACR	Caney Creek	263.634	-617.795
UPBU	Upper Buffalo	348.029	-448.296
MARI	Marion	616.027	-508.336
NEWT	Newton Co Hwy 16	339.358	-453.926
MENA	Mena	261.241	-609.612
NLR1	NLittleRock Pike Av	430.159	-569.076
NLR2	NLittleRock Remount	431.219	-560.756
ROCK	Little Rock	425.807	-577.567
SPRI	Springdale	257.611	-418.455

***** Predicted Impacts on Maximum 8-Hr O3 (ppm)*****

Site	**JDay**	**Base O3**	**Proj O3**	**Impact**
CACR	2002242	0.08083	0.08083	0.00000
UPBU	2002242	0.07833	0.07833	0.00000
MARI	2002206	0.11891	0.11890	-0.00001
NEWT	2002242	0.07808	0.07808	0.00000
MENA	2002194	0.08143	0.08142	0.00000
NLR1	2002196	0.10404	0.10407	0.00004
NLR2	2002196	0.10685	0.10688	0.00003
ROCK	2002186	0.10351	0.10351	0.00000
SPRI	2002193	0.08550	0.08551	0.00000

*** Predicted Maximum 8-Hr O3 Impacts (ppm)***

Site	JDay	Base O3	Proj O3	Impact
CACR	2002236	0.05526	0.05627	0.00101
UPBU	2002213	0.04944	0.05062	0.00118
MARI	2002203	0.08292	0.08323	0.00031
NEWT	2002213	0.05031	0.05150	0.00119
MENA	2002236	0.05524	0.05624	0.00100
NLR1	2002213	0.08225	0.08302	0.00077
NLR2	2002213	0.08319	0.08395	0.00076
ROCK	2002213	0.08149	0.08230	0.00080
SPRI	2002202	0.05255	0.05365	0.00110

New Exceedances of 8-Hr AAQS of 0.075 ppm

Site	**JDay**	**Base O3**	**Proj O3**	**Impact**
NLR2	2002199	0.07499	0.07504	0.00005

New Exceedances of 8-Hr AAQS of 0.070 ppm

Site	JDay	Base O3	Proj O3	Impact
UPBU	2002207	0.06988	0.07063	0.00075
SPRI	2002257	0.06985	0.07014	0.00029
SPRI	2002279	0.06996	0.07025	0.00029

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*********************************
*** IMPACTS OVER MODELING GRID ***
*********************************
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	JDay	I	J	LCCx(km)	LCCy(km)	Base O3	Proj O3	Impact
Grid Peak	2002206	92	44	558.000	-522.000	0.120193	0.120173	-0.000020
Max Impact	2002237	84	39	270.000	-702.000	0.056599	0.058045	0.001446

Number of New Exceedances of AAQS=0.075 ppm = 14
Number of New Exceedances of AAQS=0.070 ppm = 17

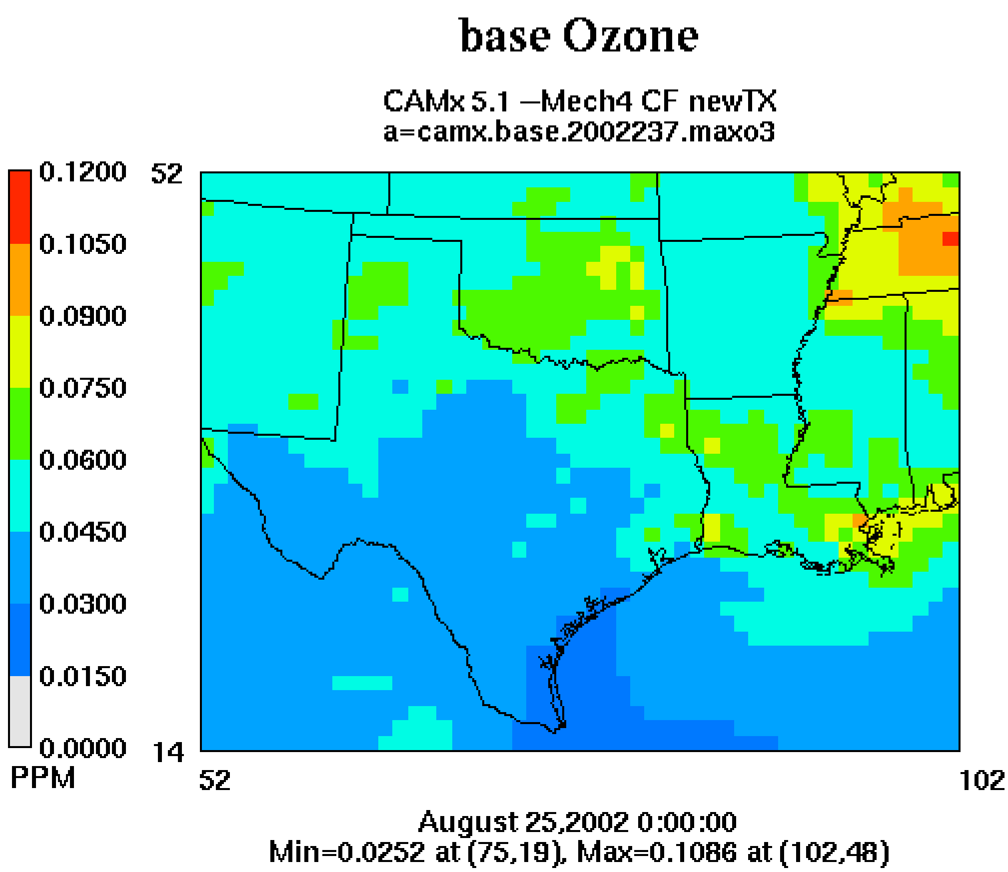
***** New Exceedances of AAQS = 0.075 PPM *****

JDay	I	J	LCCx(km)	LCCy(km)	Base	Proj	Impact
2002120	88	45	414.000	-486.000	0.07496	0.07501	0.00004
2002196	85	39	306.000	-702.000	0.07481	0.07537	0.00056
2002197	87	45	378.000	-486.000	0.07484	0.07502	0.00018
2002201	86	38	342.000	-738.000	0.07470	0.07507	0.00037
2002203	90	44	486.000	-522.000	0.07486	0.07527	0.00041
2002207	91	43	522.000	-558.000	0.07481	0.07537	0.00056
2002207	86	44	342.000	-522.000	0.07477	0.07593	0.00116
2002207	86	45	342.000	-486.000	0.07459	0.07564	0.00105
2002207	87	45	378.000	-486.000	0.07455	0.07536	0.00081
2002207	84	46	270.000	-450.000	0.07414	0.07511	0.00097
2002211	89	43	450.000	-558.000	0.07487	0.07505	0.00018
2002214	90	46	486.000	-450.000	0.07488	0.07501	0.00013
2002277	88	38	414.000	-738.000	0.07464	0.07555	0.00091
2002277	91	39	522.000	-702.000	0.07498	0.07539	0.00041

***** New Exceedances of AAQS = 0.070 PPM *****

JDay	I	J	LCCx(km)	LCCy(km)	Base	Proj	Impact
2002197	89	43	450.000	-558.000	0.06993	0.07005	0.00012
2002200	89	40	450.000	-666.000	0.06997	0.07011	0.00014
2002200	87	41	378.000	-630.000	0.06990	0.07051	0.00062
2002200	88	44	414.000	-522.000	0.06981	0.07032	0.00051
2002202	89	44	450.000	-522.000	0.06970	0.07007	0.00037
2002207	83	41	234.000	-630.000	0.06910	0.07003	0.00092
2002207	84	42	270.000	-594.000	0.06921	0.07018	0.00097
2002207	84	44	270.000	-522.000	0.06955	0.07074	0.00119
2002208	88	47	414.000	-414.000	0.06994	0.07034	0.00040
2002208	90	47	486.000	-414.000	0.06993	0.07024	0.00031
2002211	88	42	414.000	-594.000	0.06989	0.07016	0.00026

2002213	87	44	378.000	−522.000	0.06959	0.07058	0.00099
2002214	89	39	450.000	−702.000	0.06986	0.07017	0.00031
2002277	89	40	450.000	−666.000	0.06950	0.07025	0.00075
2002277	90	40	486.000	−666.000	0.06971	0.07036	0.00065
2002277	91	40	522.000	−666.000	0.06964	0.07017	0.00053
2002279	84	47	270.000	−414.000	0.06984	0.07013	0.00030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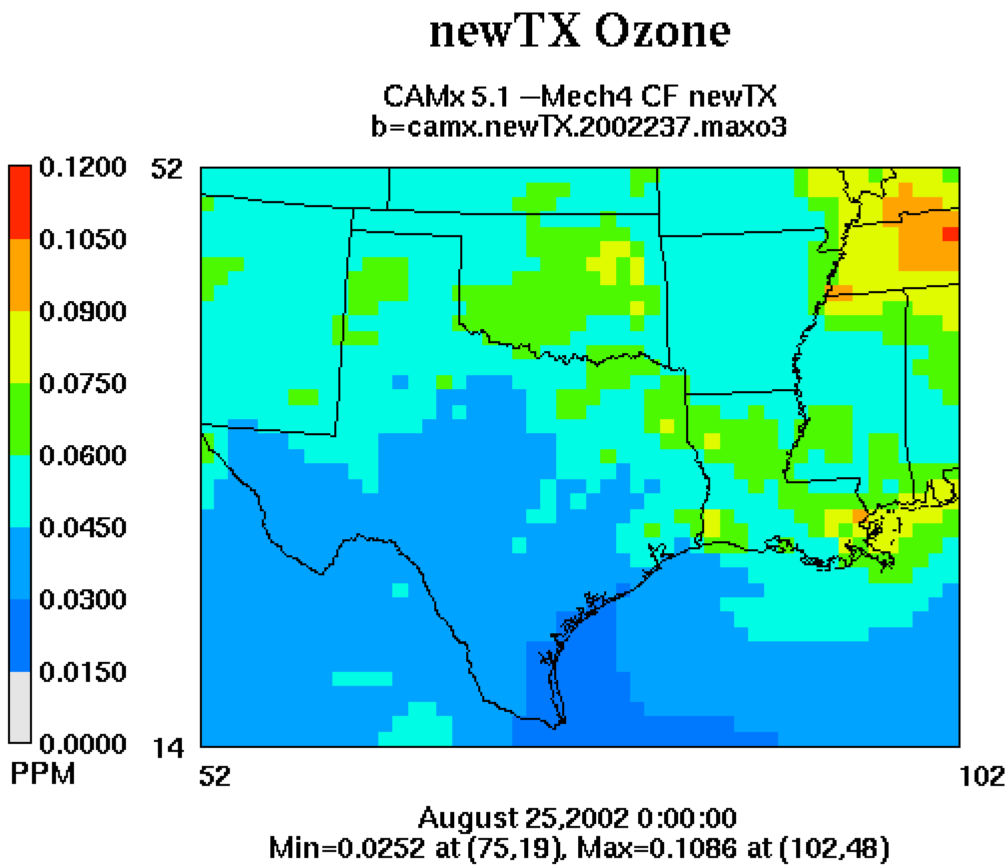
0.1050
0.0900
0.0750
0.0600
0.0450
0.0300
0.0150
0.0000
PPM
52
14
52
102
August 25,2002 0:00:00
Min=0.0252 at (75,19), Max=0.1086 at (102,48)


newTX Ozone
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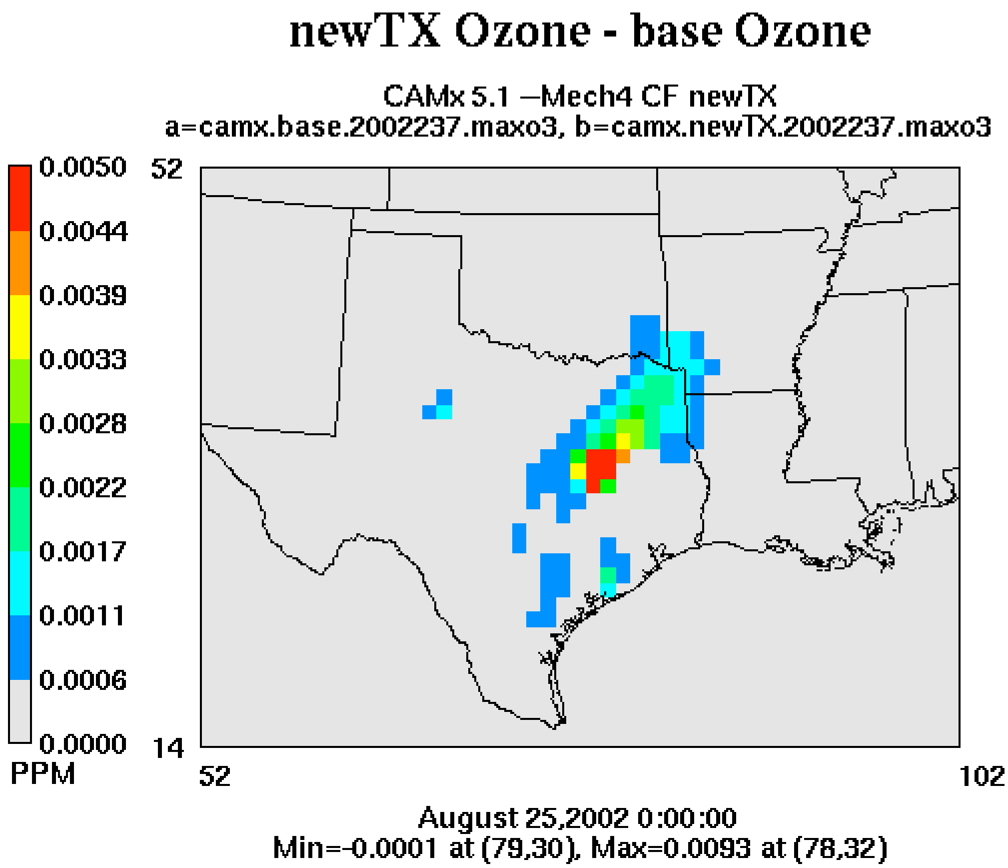
0.0900
0.0750
0.0600
0.0450
0.0300
0.0150
0.0000
PPM
52
14
52
102
August 25,2002 0:00:00
Min=0.0252 at (75,19), Max=0.1086 at (102,48)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0.0044
0.0039
0.0033
0.0028
0.0022
0.0017
0.0011
0.0006
0.0000
PPM
52
14
52
102
August 25,2002 0:00:00
Min=-0.0001 at (79,30), Max=0.0093 at (78,32)

Appendix E

2002 CAMx Modeling of PM2.5 Impacts of Texas New Coal Plants in Arkansas

2002 newTX Case (36km grid - AR sites)

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**********************************
*** IMPACTS AT MONITORING SITES ***
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Number of monitoring sites : 17

Site	Site Address	LCCx(km)	LCCy(km)
CACR	Caney Creek	263.634	-617.795
UPBU	Upper Buffalo	348.029	-448.296
STUT	Stuttgart	496.950	-591.741
CROS	Crossett	469.765	-746.665
MARI	Marion	616.027	-508.336
CONW	Conway	416.834	-532.606
HOTS	Hot Springs NP	359.759	-604.118
NEWP	Newport	531.485	-493.708
HELE	Helena	585.622	-584.782
MENA	Mena	253.229	-595.339
RUSS	Russellville	349.076	-513.420
NLRC	N. Little Rock	430.159	-569.077
LRKB	Little Rock Bond St	433.272	-571.907
FSMI	Fort Smith	233.734	-506.859
ElDO	El Dorado	402.547	-741.730
SPRD	Springdale	257.611	-418.456
SEAR	Searcy	477.972	-511.767

***** Predicted Impacts on Maximum 24-Hr PM2.5 (ug/m3) *****

Site	Jday	Base PM2.5	Proj PM2.5	Impact
CACR	2002303	40.73100	40.73600	0.00500
UPBU	2002088	38.28800	38.92000	0.63200
STUT	2002302	38.24700	38.25200	0.00500
CROS	2002343	29.38500	29.44900	0.06400
MARI	2002285	45.80500	45.81200	0.00700
CONW	2002348	41.57700	41.67000	0.09300
HOTS	2002064	45.69000	48.36400	2.67400
NEWP	2002285	42.00500	42.01200	0.00700
HELE	2002348	36.05800	36.15200	0.09400
MENA	2002303	43.45500	43.46000	0.00500
RUSS	2002065	60.78100	61.25800	0.47700
NLRC	2002348	38.24000	38.33700	0.09700
LRKB	2002348	38.05800	38.15700	0.09900
FSMI	2002345	53.71000	54.17500	0.46500
ElDO	2002348	29.84800	30.04300	0.19500
SPRD	2002345	57.56800	58.03800	0.47000
SEAR	2002348	39.97000	40.04700	0.07700

***** Predicted Maximum 24-Hr PM2.5 Impacts (ug/m3) *****

Site	Jday	Base PM2.5	Proj PM2.5	Impact
CACR	2002363	24.25500	29.44900	5.19400
UPBU	2002363	15.26700	18.27500	3.00800
STUT	2002334	5.56200	8.11000	2.54800
CROS	2002362	20.43600	22.67500	2.23900
MARI	2002334	6.00600	8.52200	2.51600
CONW	2002363	17.51600	20.71200	3.19600
HOTS	2002363	17.98200	22.00900	4.02700
NEWP	2002362	22.19500	24.17900	1.98400
HELE	2002334	6.44100	8.16200	1.72100
MENA	2002363	21.24500	25.99300	4.74800
RUSS	2002363	23.27600	27.53100	4.25500
NLRC	2002363	16.52100	19.05100	2.53000
LRKB	2002363	16.55600	18.96600	2.41000
FSMI	2002363	17.99700	22.93700	4.94000
ElDO	2002362	19.27800	22.67600	3.39800
SPRD	2002363	16.47800	20.69800	4.22000
SEAR	2002363	17.11700	19.00800	1.89100

***** New Exceedances of 24-Hr AAQS of 35 ug/m3 *****

Site	Jday	Base PM2.5	Proj PM2.5	Impact
FSMI	2002023	34.55000	35.96300	1.41300
FSMI	2002088	34.24300	35.76000	1.51700
FSMI	2002344	34.71300	35.26000	0.54700

***** Predicted Annual-Averaged PM2.5 Impacts (ug/m3)*****

Site	Base PM2.5	Proj PM2.5	Impact
CACR	9.86408	10.05661	0.19253
UPBU	9.61235	9.74343	0.13108
STUT	10.95876	11.02423	0.06548
CROS	9.75484	9.81067	0.05583
MARI	13.38023	13.43142	0.05119
CONW	11.48120	11.58154	0.10034
HOTS	10.42115	10.53710	0.11595
NEWP	12.09421	12.15852	0.06431
HELE	11.61217	11.65956	0.04740
MENA	10.03348	10.23056	0.19707
RUSS	11.66627	11.80545	0.13918
NLRC	11.49202	11.58101	0.08898
LRKB	11.46107	11.54851	0.08744
FSMI	11.82074	12.06182	0.24108
ElDO	9.74678	9.83372	0.08694
SPRD	11.81492	12.02308	0.20816
SEAR	11.07160	11.14803	0.07642

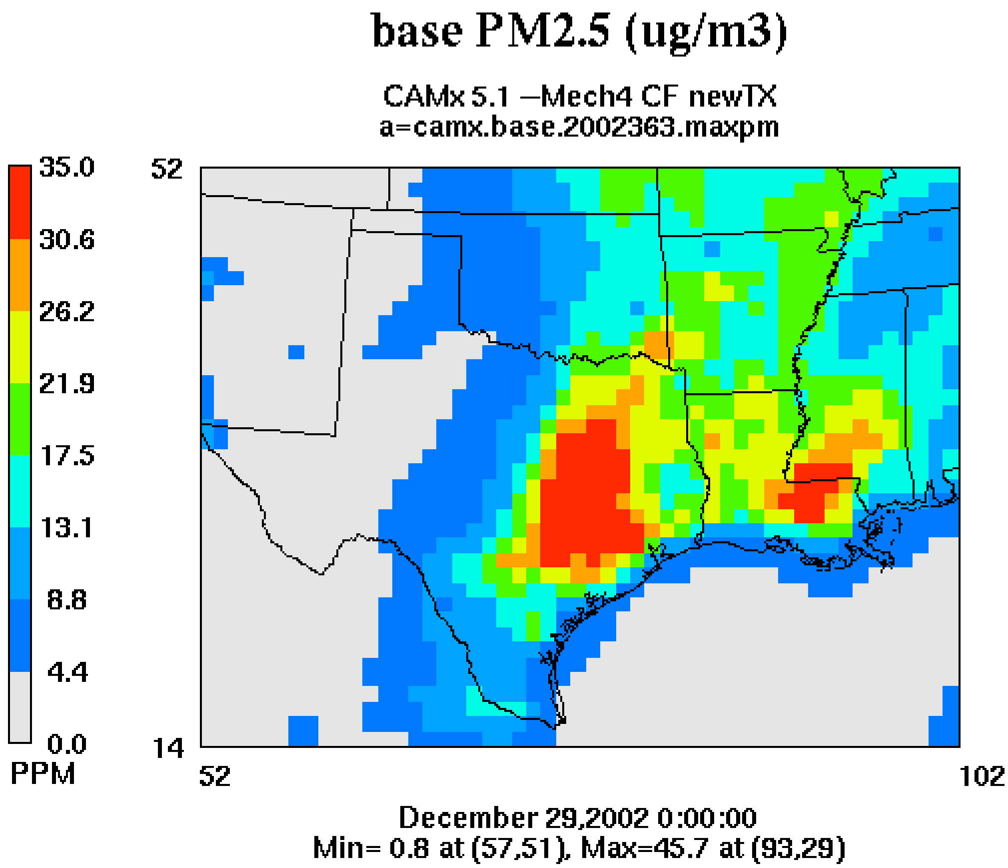
****
*** IMPACTS OVER MODELING GRID ***
****

	JDay	I	J	LCCx(km)	LCCy(km)	Base PM	Proj PM	Impact
Grid Peak	2002088	85	45	306.000	-486.000	119.718	120.491	0.773
Max Impact	2002363	83	41	234.000	-630.000	28.146	34.215	6.070

Number of New Exceedances of 24-hr AAQS of 35 ug/m3 = 7

***** New Exceedances of 24-Hr AAQS of 35 ug/m3 *****

JDay	I	J	LCCx(km)	LCCy(km)	Base	Proj	Impact
2002023	83	44	234.000	-522.000	34.0549	35.5836	1.5287
2002064	87	44	378.000	-522.000	34.4829	36.1961	1.7132
2002074	86	47	342.000	-414.000	34.8657	35.1219	0.2562
2002088	86	42	342.000	-594.000	34.9003	35.6062	0.7060
2002088	86	44	342.000	-522.000	34.3442	35.0665	0.7223
2002348	84	45	270.000	-486.000	34.9968	35.0419	0.0451
2002351	83	47	234.000	-414.000	34.5072	36.6428	2.1355



base PM2.5 (ug/m3)
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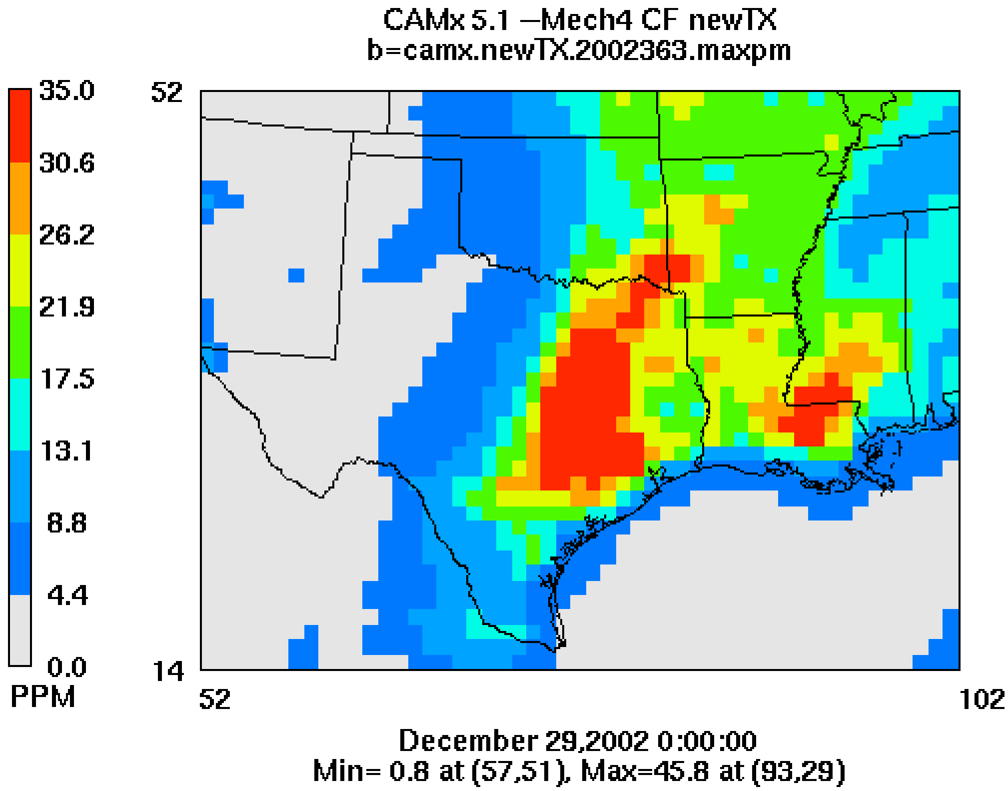
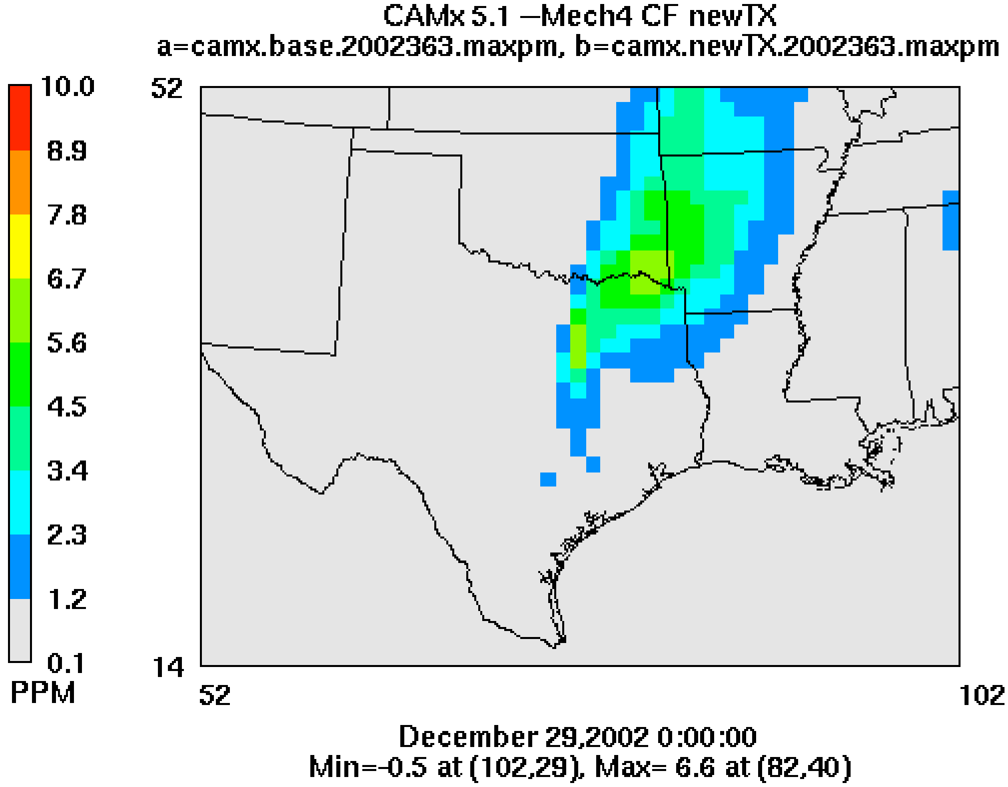
30.6
26.2
21.9
17.5
13.1
8.8
4.4
0.0
PPM
52
14
52
102
December 29,2002 0:00:00
Min= 0.8 at (57,51), Max=45.7 at (93,29)

newTX PM2.5 (ug/m3)



newTX PM2.5 - base PM2.5 (ug/m3)



Appendix F

2002 CAMx Modeling
Visibility Impacts of Texas New Coal Plants at Class I Areas (Caney Creek and Upper Buffalo)

2002 newTX Case (36km grid)

Number of monitoring sites : 1

Site	Site Address	LCCx(km)	LCCy (km)
CACR	Caney Creek	263.634	-617.795

***** Predicted Visibility Impacts (Old IMPROVE Equation) *****

```
Maximum delDV (deciview)       =     0.010
Max delDV occurred on JDay     =   2002035
Project bsource (Mm-1)         =     0.022
Natural bnat (Mm-1)            =    21.140
Number of days with delDV >0.5 =     0
```

***** Predicted Visibility Impacts (New IMPROVE Equation) *****

```
Maximum delDV (deciview)       =     0.010
Max delDV occurred on JDay     =   2002035
Project bsource (Mm-1)         =     0.021
Natural bnat (Mm-1)            =    21.140
Number of days with delDV >0.5 =     0
```

2002 newTX Case (36km grid)

Number of monitoring sites : 1

Site	Site Address	LCCx(km)	LCCy (km)
UPBU	Upper Buffalo	348.029	-448.296

***** Predicted Visibility Impacts (Old IMPROVE Equation) *****

Maximum delDV (deciview) = 0.552
Max delDV occurred on JDay = 2002009
Project bsource (Mm-1) = 1.195
Natural bnat (Mm-1) = 21.040
Number of days with delDV >0.5 = 1

JDay	bSO4	bNO3	bsource	delDV
2002009	1.192	0.000	1.195	0.552

***** Predicted Visibility Impacts (New IMPROVE Equation) *****

Maximum delDV (deciview) = 1.034
Max delDV occurred on JDay = 2002349
Project bsource (Mm-1) = 2.292
Natural bnat (Mm-1) = 21.040
Number of days with delDV >0.5 = 3

JDay	bSO4	bNO3	bsource	delDV
2002009	1.244	0.000	1.247	0.576
2002349	2.287	0.000	2.292	1.034
2002364	1.297	0.000	1.300	0.599