

APPENDIX H

TNRCC MEMO, REGIONAL MODELING RESULTS FOR POINT SOURCES 11/12/99

REGIONAL STRATEGY

APRIL 2000 REVISION

Texas Natural Resource Conservation Commission

INTEROFFICE MEMORANDUM

To: Jim Thomas, Director
Technical Analysis Division

Date: November 12, 1999

Thru: Candy Garrett, Manager
Air Modeling and Data Analysis Section
Technical Analysis Division

From: Cyril Durrenberger
Air Modeling and Data Analysis Section
Technical Analysis Division

Subject: Results for Regional Modeling with 1993, 1995, and 1996 Episodes

The University of Texas has performed regional scale photochemical modeling with the 1993, 1995, and 1996 episodes. The 1993 episode was used for the Houston/Galveston nonattainment area State Implementation Plan (SIP), and the 1995 and 1996 episodes were used for modeling in the Dallas/Fort Worth nonattainment area SIP. All results are based on a future base 2007 emissions inventory. For the 1993 episode, the emissions were projected to 2007 directly from the base 1993 emissions inventory. For the 1995 and 1996 episodes, the future base 2007 emissions inventory was projected to 2007, using emissions from the projections to 2007 used with the 1993 episode and day specific temperatures and day of the week information.

This modeling was designed to evaluate the impact of various levels of reductions on areas for which detailed urban scale modeling has not been performed. Due to the large area covered, the grid size has been larger than used for detailed urban scale modeling used for SIP development in the nonattainment areas (Houston/Galveston, Dallas/Fort Worth, and Beaumont/Port Arthur). For nonattainment areas, evaluation of emissions reductions from sources outside of nonattainment areas has been covered in the modeling for those SIPs. The results from this modeling will be limited to the areas that are not covered by SIPs.

A series of model sensitivity evaluations was made with elevated nitrogen oxides (NO_x) emissions reduced across-the-board by 20 percent, 30 percent, 40 percent, and 50 percent applied to the sources located in the area of Texas, generally east of Interstate Highway 35. This was the area formally identified as the Texas Clean Air Strategy. These reductions were applied to all nonattainment areas. This is a revision of the information reported earlier that included only the results for the 50 percent reductions based on a review of ozone maps. This report includes specific values for reductions of 20 percent, 30 percent, 40 percent, and 50 percent over each near nonattainment area. The maximum 1-hour ozone reductions range from 13.7 parts per billion (ppb) to 26.7 ppb. In general, these maximum reductions are located in northeast Texas. Depending on the day simulated, reductions in excess of 12 ppb are found over from 10 to 37 counties. The reductions occur where high ozone is predicted.

Maximum 8-hour ozone reductions range from 11.8 ppb to 22.3 ppb. In general, these maximum reductions are located in northeast Texas, range over a number of counties, and are located where high 8-hour ozone concentrations are predicted.

Details for 1-hour and 8-hour averages for each area are included in the attached tables. In each case, the base case values are those modeled after clean gasoline controls have been applied over the state. In a number of cases, the modeled base case concentration was near monitored background levels. In these cases, the model is rather “stiff” and ozone concentrations do not show much response to reductions of NO_x. In a few cases when the base case concentrations are low, there are small increases in ozone concentrations.

CD/aeb

Attachments

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Files INT-06

1-hour concentrations for the Austin Area

Day	Base Case Value	Percent reduction of elevated point sources			
		20%	30%	40%	50%
	ppb	Maximum difference in ppb			
9/7/93	104	4	6	7	8
9/8/93	131	<1	1	2	3
9/9/93	104	1	1	2	2
9/10/93	108	3	3	4	4
9/11/93	103	3	5	7	10
6/20/95	62	1	1	2	3
6/21/95	77	3	4	5	6
6/22/95	93	1	1	2	3
7/2/96	77	1	1	2	2
7/3/96	92	1	2	3	3
7/4/96	80	1	1	2	2

1-hour concentrations for the San Antonio Area

Day	Base Case Value	Percent reduction of elevated point sources			
		20%	30%	40%	50%
	ppb	Maximum difference in ppb			
9/7/93	118	2	3	4	5
9/8/93	131	1	2	2	3
9/9/93	115	1	1	2	2
9/10/93	119	2	2	3	4
9/11/93	79	<1	1	1	2
6/20/95	57	1	1	1	2
6/21/95	64	1	1	1	2
6/22/95	81	1	1	1	2
7/2/96	79	<1	1	1	2
7/3/96	82	<1	<1	<1	1
7/4/96	65	<1	1	1	1

1-hour concentrations for the Corpus Christi Area

Day	Base Case Value	Percent reduction of elevated point sources			
		20%	30%	40%	50%
	ppb	Maximum difference in ppb			
9/7/93	71	1	2	3	4
9/8/93	85	1	1	2	3
9/9/93	79	1	2	3	4
9/10/93	64	<1	<1	1	1
9/11/93	53	<1	<1	1	1
6/20/95	45	<1	<1	<1	<1
6/21/95	51	<1	<1	<+1*	<+1*
6/22/95	59	<1	<1	<1	<1
7/2/96	56	<1	<1	1	1
7/3/96	61	<+1*	<+1*	<+1*	<+1*
7/4/96	50	<1	<1	<1	<1

1-hour concentrations for the Tyler-Longview Area

Day	Base Case Value	Percent reduction of elevated point sources			
		20%	30%	40%	50%
	ppb	Maximum difference in ppb			
9/7/93	104	2	4	7	10
9/8/93	136	6	9	12	14
9/9/93	119	3	5	6	8
9/10/93	102	3	5	8	10
9/11/93	108	4	6	8	11
6/20/95	105	5	8	11	13
6/21/95	98	3	5	7	10
6/22/95	142	4	6	8	12
7/2/96	133	6	10	14	18
7/3/96	145	9	14	19	20
7/4/96	112	5	7	10	13

1-hour concentrations for the Victoria Area

Day	Base Case Value	Percent reduction of elevated point sources			
		20%	30%	40%	50%
	ppb	Maximum difference in ppb			
9/7/93	98	3	5	7	9
9/8/93	121	5	7	10	14
9/9/93	109	5	8	11	14
9/10/93	83	4	6	8	10
9/11/93	56	<1	1	1	3
6/20/95	48	1	2	2	3
6/21/95	57	1	2	3	3
6/22/95	66	2	3	4	5
7/2/96	62	2	3	4	5
7/3/96	71	2	3	4	5
7/4/96	57	1	2	3	4

8-hour concentrations for the Austin Area

Day	Base Case Value	Percent reduction of elevated point sources			
		20%	30%	40%	50%
	ppb	Maximum difference in ppb			
9/7/93	96	2	3	4	6
9/8/93	115	2	3	4	4
9/9/93	98	<1	1	1	1
9/10/93	99	1	2	2	3
9/11/93	83	2	3	5	7
6/20/95	60	1	2	2	3
6/21/95	73	2	3	4	5
6/22/95	83	1	2	3	3
7/2/96	70	<1	1	1	2
7/3/96	83	1	1	2	2
7/4/96	72	1	1	2	3

8-hour concentrations for the San Antonio Area

Day	Base Case Value	Percent reduction of elevated point sources			
		20%	30%	40%	50%
	ppb	Maximum difference in ppb			
9/7/93	106	2	3	4	5
9/8/93	118	1	2	3	4
9/9/93	108	1	1	1	2
9/10/93	104	2	2	3	4
9/11/93	68	1	1	2	2
6/20/95	52	<1	<1	1	1
6/21/95	59	1	1	1	2
6/22/95	73	1	1	1	2
7/2/96	71	1	1	1	2
7/3/96	69	<1	<1	1	1
7/4/96	60	1	1	1	1

8-hour concentrations for the Corpus Christi Area

Day	Base Case Value	Percent reduction of elevated point sources			
		20%	30%	40%	50%
	ppb	Maximum difference in ppb			
9/7/93	63	2	2	2	3
9/8/93	74	1	1	1	2
9/9/93	71	2	2	3	3
9/10/93	55	<1	<1	1	1
9/11/93	45	<1	<1	<1	<1
6/20/95	42	<1	<1	<1	<1
6/21/95	46	1	1	1	1
6/22/95	49	<1	<1	<1	<1
7/2/96	49	1	1	1	1
7/3/96	51	<1	<1	<1	<1
7/4/96	44	<1	<1	<1	<1

8-hour concentrations for the Tyler-Longview Area

Day	Base Case Value	Percent reduction of elevated point sources			
		20%	30%	40%	50%
	ppb	Maximum difference in ppb			
9/7/93	99	4	6	9	11
9/8/93	124	3	4	6	8
9/9/93	110	2	3	4	6
9/10/93	94	3	4	6	8
9/11/93	96	2	4	5	7
6/20/95	96	4	6	8	9
6/21/95	97	5	8	11	14
6/22/95	124	4	7	11	15
7/2/96	117	5	8	11	12
7/3/96	131	8	12	15	16
7/4/96	106	4	6	8	11

8-hour concentrations for the Victoria Area

Day	Base Case Value	Percent reduction of elevated point sources			
		20%	30%	40%	50%
	ppb	Maximum difference in ppb			
9/7/93	94	3	4	6	8
9/8/93	113	3	5	8	10
9/9/93	104	4	6	8	10
9/10/93	74	1	2	3	4
9/11/93	51	1	2	3	3
6/20/95	46	1	2	2	3
6/21/95	53	2	3	3	4
6/22/95	60	2	3	3	4
7/2/96	58	2	3	4	5
7/3/96	64	1	2	3	3
7/4/96	52	1	1	2	3