

Revised Denver 2010 8-Hour Ozone Design Value Projections and Results of 2010 Sensitivity Tests

Ralph Morris, Ed Tai and Tanarit
Sakulyanontvittaya
ENVIRON International Corporation
Novato, California

Dennis McNally and Cyndi Loomis
Alpine Geophysics, LLC
Arvada, Colorado

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Emissions Summary 2010 Sensitivity Tests

Test	Description	Emissions (TPD)			% Anthro (%)		
		CO	VOC	NOx	CO	VOC	NOx
b1	2010 Base Case	-386.0	-42.2	-50.1	-10.2%	-5.3%	-5.6%
b1-sns01	20% VOC On-Road in NAA	0.0	-22.8	0.0	0.0%	-3.0%	0.0%
b1-sns02	Evap VOC On-Road in NAA (7 psi RVP)	-46.9	-9.8	-0.3	-1.4%	-1.3%	0.0%
b1-sns03	0% Ethanol in NAA	323.3	-3.8	-2.0	9.5%	-0.5%	-0.2%
b1-sns04	20% VOC O&G in NAA	0.0	-48.2	0.0	0.0%	-6.4%	0.0%
b1-sns04b	20% VOC & NOx Area, Point, Non-Road and O&G in NAA	0.0	-72.5	-41.3	0.0%	-9.6%	-4.9%
b1-sns04c	20% VOC & 30% NOx Area, Point, Non-Road and O&G in NAA	0.0	-72.5	-62.0	0.0%	-9.6%	-7.4%
b1-sns04d	40% VOC O&G in NAA	0.0	-96.3	0.0	0.0%	-12.7%	0.0%
b1-sns05	20% NOx Point & O&G in NAA	0.0	0.0	-20.6	0.0%	0.0%	-2.5%
b1-sns06	20% VOC Non-Road in NAA	0.0	-12.7	0.0	0.0%	-1.7%	0.0%
b1-sns07	20% VOC Area in NAA	0.0	-7.5	0.0	0.0%	-1.0%	0.0%
b1-sns08	20% NOx Point & O&G in Colorado	0.0	0.0	-78.0	0.0%	0.0%	-9.3%
b1-sns09	20% VOC O&G in Colorado	0.0	-67.2	0.0	0.0%	-8.9%	0.0%
b1-sns10	20% VOC & NOx Point & O&G in CO	0.0	-77.5	-78.0	0.0%	-10.2%	-9.3%
b1-sns11	20% NOx Point & O&G in NAA + 20% NOx Pawnee	0.0	0.0	-23.0	0.0%	0.0%	-2.7%
b1-sns12a	Effects of increase in Bark Beetle infestation 2006 to 2010	-8.4	-87.8	-0.3	-0.2%	-11.6%	0.0%
b1-sns12b	Effects of 2010 Bark Beetle infestation	-21.1	-233.5	-0.8	-0.6%	-30.8%	-0.1%

2010 Base Case emission reductions from 2006 levels, all other emission reductions from 2010 Base Case.

Air Quality Summary 2010 Sensitivity Tests

Test	Description	DV Ozone (PPB)		Grid DV Ozone(ppb)*		Grid Diff. Ozone (ppb)**	
		RFNO	FTCW	Max.	Min.	Max.	Min.
2006.a3	Current Year 8-Hour Ozone Design Value	85	86				
b1	2010 Base Case	84.9	84.9				
b1-sns01	20% VOC On-Road in NAA	-0.2	-0.1	0.1	-0.2	0.1	-0.6
b1-sns02	Evap VOC On-Road in NAA (7 psi RVP)	-0.1	-0.1	0.1	-0.1	-0.2	-0.3
b1-sns03	0% Ethanol in NAA	0.1	0.0	0.4	0.0	1.3	-0.2
b1-sns04	20% VOC O&G in NAA	0.0	-0.1	0.0	-0.4	0.0	-0.8
b1-sns04b	20% VOC & NOx Area, Point, Non-Road and O&G in NAA	-0.5	-1.1	1.8	-1.4	3.2	-3.3
b1-sns04c	20% VOC & 30% NOx Area, Point, Non-Road and O&G in NAA	-0.7	-1.6	2.8	-2.0	5.1	-4.7
b1-sns04d	40% VOC O&G in NAA	-0.1	-0.2	0.1	-0.7	0.1	-1.7
b1-sns05	20% NOx Point & O&G in NAA	-0.2	-0.5	0.3	-0.8	1.7	-2.0
b1-sns06	20% VOC Non-Road in NAA	-0.2	-0.1	0.0	-0.2	0.0	-0.8
b1-sns07	20% VOC Area in NAA	-0.1	-0.1	0.0	-0.1	0.0	-0.2
b1-sns08	20% NOx Point & O&G in Colorado	-0.2	-0.6	1.1	-1.0	2.2	-2.2
b1-sns09	20% VOC O&G in Colorado	0.0	-0.1	0.1	-0.3	0.1	-0.8
b1-sns10	20% VOC & NOx Point & O&G in CO	-0.3	-0.6	0.9	-1.2	2.1	-2.7
b1-sns11	20% NOx Point & O&G in NAA + 20% NOx Pawnee	-0.2	-0.5	0.3	-0.8	1.7	-2.0
b1-sns12a	Effects of increase in Bark Beetle infestation 2006 to 2010	0.0	-0.1	0.1	-0.1	0.1	-0.1
b1-sns12b	Effects of 2010 Bark Beetle infestation	-0.1	-0.1	0.1	-0.1	0.3	-0.3

* Maximum difference in 2010 design value anywhere on the 4km grid.

**Maximum difference in daily maximum 8-hour ozone concentration anywhere on the 4km grid.

Impact of Statewide vs NAA Controls

- Two sets of simulations compared
Statewide vs NAA controls
 - 20% Point and O&G NO_x (sns05 and sns08)
 - Additional 58.2 tons of NO_x control yields 0.1 ppb additional reduction in design value at RFNO and FTCW
 - 20% O&G VOC (sns04 and sns09)
 - Additional 19 tons of VOC control yields no additional ozone benefit on design value at RFNO and FTCW

Preliminary Conclusions

- Local NO_x controls can be effective in reducing ozone, but can also produce local ozone increases in metropolitan Denver and at locations of point sources
- Local VOC controls also reduce ozone and do not exhibit adverse effects
- State-wide regional controls have marginal additional impact over NAA controls
- Bark Beetle infestation emission changes show minimal impact
- Modeling results should be interpreted accounting for their uncertainties and should be just one of many components in determining an ozone control plan

Next Steps

- Draft Final 2006 Base Case and Model Performance Evaluation report (end of July)
- 2010 Ozone Source Apportionment Modeling (OSAT) (mid August)
 - 11 Source Regions
 - 7 Source Categories
 - On-Road Mobile; Non-Road Mobile; O&G Area+Point; Other Area; EGU Point; Non-EGU Point and Biogenics+Wildfires
- 2010 Control Packages Modeling (Late August)
- 2020 Modeling (Fall)