

Status of Development of Emission Control Strategies for Ozone

DRAFT July 24, 2008

Strategies Under Development for 2008 Proposed Ozone Action Plan <i>(All strategies apply to the entire Denver/North Front Range nonattainment area (NAA) unless otherwise noted)</i>				Potential Strategies Requiring Additional Evaluation for Near-Term Plan/SIP Amendment		Strategies Deferred for Future Consideration in Ozone Planning Process
Recommended Measures for Federally-Enforceable State Implementation Plan (SIP)	<i>Potential Emission Reduction</i>	Recommend Measures Adopted and Enforced as State-only Measures	<i>Potential Emission Reduction</i>		<i>Potential Emission Reduction</i>	
Mobile Sources						
➤ More stringent Reg. 11 I/M cutpoints (Denver area) – adopted, effective May 1, 2008	~ 1 tpd VOC, ~3 tpd NOx, ~13 tpd CO	➤ Inspection/maintenance program in North Front Range (structure to be determined)	~ 1 tpd VOC, ~1 tpd NOx, ~17 tpd CO	Ozone Fuels Strategies:		➤ Mandatory high-emitter program ➤ CA Clean Car Standards (statewide) ➤ Employer-based travel reduction pilot programs ➤ Promote anti-idling ordinances among local governments
➤ 7.8 RVP gasoline regulatory requirement in North Front Range (consistent with Denver area)	~ 3 tpd VOC	➤ Mandatory high-emitter <u>pilot</u> program (Denver area) – began January 1, 2008	<i>unknown at this time</i>	➤ 7.0 RVP gasoline	~ 10 tpd VOC	
		➤ Tighten up collector plate requirements for older vehicles (statewide)	< 1 tpd VOC ~ 7 tpd CO	➤ Federal Reformulated Gasoline	~ 18 tpd VOC	
				➤ Eliminate ethanol waiver	~ 10 tpd VOC + 360 tpd CO	Strategies Removed from Future Consideration
						➤ Stage II vapor recovery at gasoline service stations
Oil and Gas Sources						
➤ Increase condensate tank control (95%) ▪ for all new/modified tanks >2 tpy (2009) ▪ for all existing tanks >10 tpy (2010)	VOC ~ 6-9 tpd ~19-30 tpd	➤ Increase condensate tank control (95%) ▪ for all existing tanks >5 tpy (2011) ▪ for all existing tanks >2 tpy (2012)	VOC ~ 30-35 tpd ~9-12 tpd	➤ Statewide Oil & Gas regulations – control requirements for new condensate tanks and pneumatic valves	~ 30-45 tpd NOx	➤ Leak detection and maintenance at exploration/production sites and compressor stations ➤ Well completions ➤ Drill rigs (NOx) ➤ Miscellaneous oil & gas equipment
➤ Pneumatic valves controls - require low/no bleed valves on all new and existing valves by 2009	~ 23 tpd VOC	➤ Statewide Oil & Gas regulations -- Controls on existing reciprocating internal combustion engines	<i>unknown at this time</i>			
Stationary Source Controls						
➤ Expand Reg. 7 (VOC control requirements) to entire NAA	<i>unknown at this time</i>			➤ Emission controls on large NOx sources ▪ power plants ▪ boilers ▪ cement kilns	~ 30-45 tpd NOx	➤ Additional control requirements for major/minor VOC/NOx sources
➤ Remove current exemptions in Reg. 3 for selected small sources required to file air pollution emission notices and obtain permits	<i>unknown at this time</i>					Strategies Still Under Discussion for Proposed Ozone Plan and/or SIP
➤ Require Reasonably Available Control Technology (RACT) for minor sources in NAA (Reg. 3)	<i>unknown at this time</i>					➤ Minor source BACT for VOC sources in Reg. 3
Area Sources						
				➤ California Paints/Solvents/Consumer Products Rule	~ 8 tpd VOC	➤ Promote municipal ozone-beneficial tree planting guidelines
TOTAL EMISSION REDUCTIONS	VOC NOx CO	~52-66 tpd ~ 3 tpd ~13 tpd		VOC NOx CO	~41-49 tpd NA >24 tpd	

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Recommended Measures for Federally-Enforceable State Implementation Plan (SIP)					
	Potential Emission Reduction	Cost (\$ million)	Cost Effectiveness (\$/ton)**	Other Air Quality Impacts	Comments
Mobile Sources					
➤ More stringent Reg. 11 I/M cutpoints (Denver area) – adopted, effective May 1, 2008	~ 1 tpd VOC, ~3 tpd NOx, ~13 tpd CO	\$1.21	\$780/ton		New cutpoints are already in place effective May 1, 2008
➤ 7.8 RVP gasoline regulatory requirement in North Front Range (consistent with Denver area)	~ 3 tpd VOC	not estimated at this time			80% of gasoline supplied in NFR already meets 7.8 RVP (8.8 for ethanol blends)
Oil and Gas Sources					
➤ Increase condensate tank control (95%) ▪ for all new/modified tanks >2 tpy (2009) ▪ for all existing tanks >10 tpy (2010)	VOC ~ 6-9 tpd ~ 19-30 tpd	cost analysis in progress			
➤ Pneumatic valves controls - require low/no bleed valves on all new and existing valves by 2009	~ 23 tpd VOC	~(4.5)	~(500)		Replacement/retrofit of valves reduces product loss and results in net cost savings
Stationary Source Controls					
➤ Expand Reg. 7 (VOC control requirements) to entire NAA	unknown at this time	cost analysis in progress			
➤ Remove current exemptions in Reg. 3 for selected small sources required to file air pollution emission notices and obtain permits	unknown at this time	cost analysis in progress			
➤ Require Reasonably Available Control Technology (RACT) for minor sources in NAA (Reg. 3)	unknown at this time	cost analysis in progress			
TOTAL EMISSION REDUCTIONS	VOC NOx CO	~52-66 tpd ~ 3 tpd ~13 tpd		**VOC +NOx +1/60 CO	

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Recommend Measures Adopted and Enforced as State-only Measures					
	<i>Potential Emission Reduction</i>	<i>Cost</i>	<i>Cost Effectiveness (\$/ton)</i>	<i>Other Air Quality Impacts</i>	<i>Comments</i>
Mobile Sources					
➤ Inspection/maintenance program in North Front Range (structure to be determined)	~ 1 tpd VOC, ~1 tpd NOx, ~17 tpd CO	<i>not available</i>			<i>Cost and effectiveness cannot be estimated until program structure is determined</i>
➤ Mandatory high-emitter <u>pilot</u> program (Denver area) – began January 1, 2008	<i>unknown at this time</i>				<i>Results of pilot program will be evaluated to determined if a full-scale HE program should be implemented</i>
➤ Tighten up collector plate requirements for older vehicles (statewide)	< 1 tpd VOC ~ 7 tpd CO	<i>not available</i>			<i>Statutory changes are need. Working with stakeholders to develop a legislative package for 2009 session.</i>
Oil and Gas Sources					
➤ Increase condensate tank control (95%) <ul style="list-style-type: none"> ▪ for all existing tanks >5 tpy (2011) ▪ for all existing tanks >2 tpy (2012) 	VOC ~ 30-35 tpd ~ 9-12 tpd	<i>cost analysis in progress</i>			
➤ Statewide Oil & Gas regulations -- Controls on existing reciprocating internal combustion engines	<i>unknown at this time</i>	<i>not available</i>			
TOTAL EMISSION REDUCTIONS	VOC NOx CO	~41-49 tpd NA >24 tpd			

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Potential Strategies Requiring Additional Evaluation for Near-Term Plan/SIP Amendment					
	<i>Potential Emission Reduction</i>	<i>Cost</i>	<i>Cost Effectiveness (\$/ton)</i>	<i>Other Air Quality Impacts</i>	<i>Comments</i>
Mobile Sources					
<u>Ozone Fuels Strategies:</u>					
➤ 7.0 RVP gasoline	~ 10 tpd VOC	<i>To be determined</i>		<i>Air toxics benefits</i>	
➤ Federal Reformulated Gasoline	~ 18 tpd VOC	<i>To be determined</i>		<i>Air toxics and NOx benefits</i>	
➤ Eliminate ethanol waiver	~ 10 tpd VOC + 360 tpd CO	<i>To be determined</i>		<i>Potential to increase CO, mixed impact on air toxics</i>	<i>Emission impact analysis assumes refiners meet RVP standard by not blending ethanol</i>
Oil and Gas Sources					
➤ Statewide Oil & Gas regulations – control requirements for new condensate tanks and pneumatic valves	<i>unknown at this time</i>	<i>To be determined</i>		<i>Prevents ozone problems in other parts of the state</i>	
Stationary Source Controls					
➤ Emission controls on large NOx sources <ul style="list-style-type: none"> ▪ power plants ▪ boilers ▪ cement kilns 	~ 30-45 tpd NOx	<i>To be determined</i>		<i>Regional haze, nitrogen deposition, PM2.5 benefits</i>	
Area Sources					
➤ California Paints/Solvents/ Consumer Products Rule	~ 8 tpd VOC	<i>To be determined</i>			
TOTAL EMISSION REDUCTIONS	VOC NOx CO				

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Strategies Deferred for Future Consideration in Ozone Planning Process	<i>Comments</i>
Mobile Sources	
<ul style="list-style-type: none"> ➤ Mandatory high-emitter program ➤ CA Clean Car Standards (statewide) ➤ Employer-based travel reduction pilot programs ➤ Promote anti-idling ordinances among local governments 	
Oil and Gas Sources	
<ul style="list-style-type: none"> ➤ Leak detection and maintenance at exploration/production sites and compressor stations ➤ Well completions ➤ Drill rigs (NOx) ➤ Miscellaneous oil & gas equipment 	
Stationary Source Controls	
<ul style="list-style-type: none"> ➤ Additional control requirements for major/minor VOC/NOx sources 	
Area Sources	
<ul style="list-style-type: none"> ➤ Promote municipal ozone-beneficial tree planting guidelines 	
Strategies Still Under Discussion for Proposed Ozone Plan and/or SIP	
<ul style="list-style-type: none"> ➤ Minor source BACT for VOC sources in Reg. 3 	
Strategies Removed from Future Consideration	
<ul style="list-style-type: none"> ➤ Stage II vapor recovery at gasoline service stations 	