



Ozone Reduction Measures Recommendations for Short-Term Actions

Prepared by:
RAQC Subcommittees for consideration by the RAQC Board
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Preliminary Draft for Discussion Only

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INTRODUCTION

Recent Evolution of Federal Ozone Standards

In March 2008 the U.S. Environmental Protection Agency (EPA) established a more stringent ambient air quality standard for ozone of 0.075 parts per million (or 75 parts per billion) in order to protect public health. During the summer of 2009 the EPA Administrator announced her intention to reconsider the 2008 standard and in January 2010 proposed adopting a new standard in the range of 0.060-0.070 ppm.

In anticipation of this new, more stringent standard, the Regional Air Quality Council (RAQC), in coordination with the Colorado Department of Public Health and Environment (CDPHE) and its other planning partners, embarked in 2010 upon an exhaustive identification and evaluation of potential control strategies that potentially would be needed to meet the proposed EPA standard. The RAQC's efforts focused on evaluation of potential mobile source and transportation-related strategies, which culminated in a report to the Governor in early 2011.

During 2011, again in anticipation of a tighter federal ozone standard, the RAQC and CDPHE turned their attention to evaluating potential stationary and area source strategies. This evaluation included strategies pertaining to oil and gas development and the energy sector. RAQC and CDPHE also continued their work to develop an improved photochemical modeling platform that could be used to perform sensitivity analyses, evaluate packages of strategies in the future, and provide the necessary attainment demonstration for a future State Implementation Plan (SIP) revision.

Before EPA finalized promulgation of a new ozone standard, however, President Obama intervened in September 2011 and directed EPA to defer reconsideration of the 2008 ozone standard at this time. Instead he directed EPA to re-evaluate the standard during the normal five-year review that could result in a new proposal in 2013 and a final decision in mid-2014. In the meantime, EPA indicated its intent to fully implement the 2008 standard as required under the federal Clean Air Act.

Clean Air Act Requirements

EPA is still developing the rule that will guide the designation and classification of nonattainment areas, as well as rule that will outline the specific implementation requirements for the 2008 standard. EPA intends to proceed with initial area designations by the end of 2011 and finalize these designations by mid-2012. EPA expects that 52 metropolitan areas around the country may be designated nonattainment for the 2008 standard and 43 of these areas are likely to fall into the Marginal classification category under the Clean Air Act. Based on monitored ozone values in the region, the Denver/North Front Range area will be designated nonattainment for the 2008 standard and will be classified as a Marginal area.

While EPA's implementation rule will spell out specific requirements for Marginal and other areas, the expected attainment deadline for Marginal areas is expected to be the end of 2015. EPA expects many of the Marginal areas around the country will attain the standard by this time as a result of emission-reducing rules already in place. It is not known at this time the likelihood whether the Denver/North Front Range nonattainment area will attain the standard by 2015, but it will be close.

There are few additional requirements for Marginal areas under the Clean Act since they are expected to achieve attainment within 3 years. No additional mandatory measures are required at this time and a formal SIP attainment demonstration using photochemical modeling is not required. Transportation conformity for ozone-precursor emissions remains in effect, but new emission budgets are not required at this time.

In the event the Denver/North Front Range area fails to attain the standard by 2015 (with two one-year extensions possible), the region would be “bumped up” to a Moderate area classification, which would require mandatory emission reductions, a modeled attainment demonstration, and attainment within 3 additional years.

RAQC Short-Term Efforts

Even though additional mandatory measures as part of a federally-enforceable SIP are not required at this time in the Denver/North Front Range nonattainment area, the region still faces a challenge to achieve the 2008 standard by 2015. Additional short-term actions will be prudent to ensure attainment. In addition, additional measures will likely be needed beyond the 2015-2020 timeframe in order to maintain attainment with the current standard and address a possible more stringent standard in the future.

In light of the need to continue ozone reduction measures in the short-term, the RAQC asked its various strategy subcommittees to reconvene, review the list strategies already developed, and identify recommended short-term activities and actions. The subcommittees assembled the strategies into three categories:

1. Strategies where short-term actions are possible that could result in appreciable, measurable emission reductions by 2015;
2. Strategies that will not likely result in appreciable emissions reductions by 2015, but hold promise for additional reductions in the longer-term and which deserve continued short-term evaluation, refinement and promotion;
3. Strategies that will not result in appreciable emissions reductions in the 2015-2020 timeframe and which do not warrant additional effort at this time.

The following tables summarize the subcommittees’ assessment of strategies and categorization for short-term efforts.

RAQC Area Sources Strategies

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Potential Short-Term Strategies (Implementation within 2015 timeframe)			
Measure	Description of Categorization	RAQC Effort	Other Efforts
Zero Emissions Lawn and Garden Equipment (Commercial) - Incentives for replacement of spark ignition gas mower equipment	Not feasible as a mandatory measure but with funding a pilot program can be explored on a voluntary basis.	Seek out funding opportunities for a pilot project and work with local governments who are interested in obtaining alternative-fueled equipment.	
Zero Emissions Lawn and Garden Equipment (Residential) - Incentives for replacement of hand-held equipment	Not feasible as a mandatory measure but can continue to be implemented as a voluntary strategy with proper funding.	Seek out funding opportunities to continue the existing voluntary mower trade-in program.	
VOC Content Limits for Architectural & Industrial Maintenance and Consumer Products	Conduct an outreach and education program to encourage the use of lower VOC content products.	The RAQC and APCD will continue to pursue this on a voluntary basis in outreach and education efforts. Based on current estimated emissions reduction benefit, voluntarily continue to assess potential air quality benefit through air quality modeling and analysis.	APCD will continue to review benefits and implementation issues associated with adoption of this as a regulatory strategy. APCD will provide technical support to the RAQC in connection with any voluntary strategy.

Potential Long-Term Strategies which Need Additional Short-Term Action (Implementation beyond 2015)			
Measure	Description of Categorization	RAQC Effort	Other Efforts
Tree planting Guidelines/Urban Forest Management	Not feasible as a mandatory measure but could be utilized as part of an outreach and education program on a voluntary basis in the short term.	Incorporate into existing outreach and education program as outreach to local governments, residential and commercial development managers, landscape companies and citizens.	Many local governments have tree planting programs, such as Golden and Broomfield. The RAQC and others will continue to pursue these programs and encourage program administrators to incorporate air quality benefits as a component of the efforts.

Other Potential Long-Term Strategies (Not currently under active consideration)			
Measure	Description of Categorization	RAQC Effort	Other Efforts
Indirect Source Rule - Construction mitigation to reduce emissions from new development for large projects	This measure would be resource intensive and would require legislative action to implement which would make it difficult to implement without a SIP.	The RAQC has a small amount of funding to continue to reach out to off-road equipment operators on a voluntary basis to retrofit any eligible equipment, including reducing vehicle idling. With more funding, more can be done.	
Operational Indirect Source Rule - reduce mobile emissions associated with new development of large commercial and residential projects after project completion through land use planning.	This measure is being considered under the implementation of land use measures previously developed.		

RAQC Stationary Sources & Energy Strategies

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Possible Short-Term Strategies (Implementation within 2015 timeframe)			
Measure	Description of Categorization	RAQC Effort	Other Efforts
NA	NA	NA	NA

Potential Long-Term Strategies which Need Additional Short-Term Action (Implementation beyond 2015)			
Measure	Description of Categorization	RAQC Effort	Other Efforts
Stationary Sources: Demand Response (DR) Participant Control Measures for Compression Ignition (CI) Reciprocating Internal Combustion Engines (RICE)	Information to date indicates that the potential increased emissions possible under a Demand Response Program could be significant and negate any benefits from EE/RE programs during peak ozone episodes	Follow development of DR programs in NAA/state. Participate in PUC docket issues that consider Demand Response in their demand reduction goal setting proceedings going forward.	APCD: Continue to investigate DR programs and number of participants and quantify potential emissions disbenefit and report back to RAQC Board. Potential control measures will then be identified and evaluated for necessity, viability and costs. The PUC is investigating Demand Response and other demand side management programs in its demand reduction goal setting proceedings with PSCo for 2011, 2012 & 2013.
Energy Efficiency / Renewable Energy (EE/RE) Policies & Programs	Colorado has a requirement of 30% of electricity supply to be provided by renewable energy sources (RES) by 2020 through recent state legislation. However, due to incentive credits allowed for some RES, the actual renewable energy to be supplied in 2020 is estimated at around 17%. The governor has announced a goal of Balanced Energy Portfolio of 1/3 renewables, 1/3 gas and 1/3 coal.	Continue to work with EPA in their EE/RE modeling support program to determine emissions reduction impact from current EE/RE programs planned for 2018/20 timeframe. Work with PUC/GEO/APCD staff to investigate additional EE/RE programs, assess methodology and costs (currently estimated at \$250k) of evaluating benefit of additional EE/RE programs, participate in GEO process planned through mid 2012 to evaluate a Balanced Energy Portfolio and participate in PUC informational docket proceedings dealing with authorizing/approving renewable energy plan/projects within the state's goals.	CDPHE: assist RAQC/PUC/GEO with EGU data and analysis as required for EE/RE planning. The GEO is structuring a process over the next several months to evaluate the cost/benefit of a Balanced Energy Portfolio and the current planned EE/RE policies and programs. The PUC is responsible for authorizing/approving renewable energy plan/projects within the state's goals. Currently the PUC is reviewing the recently filed PSCo Long Range Resource Plan, which addresses a reduced demand for electricity over previous estimates, planned purchased power and meeting the state's renewable energy goal of 30% of the utilities power generation to come from renewables.
NOx and VOC controls on large stationary sources in NAA	Relatively small benefit for considerable outlay of effort for Division and specified sources to establish technical and economic feasibility of potential control options through case-by-case analysis. Sources can not be compelled to participate in technical and economic analysis unless there is a proposed Rulemaking.	Based on current estimated emissions reduction benefit, continue to assess potential air quality benefit through air quality modeling and analysis.	CDPHE: If required for a proposed Rulemaking, pursue further case-by-case exploration to determine the technical and economic feasibility of potential control options for the 15 facilities identified during subcommittee review. Pursue further analysis on voluntary basis through outreach to specified sources where possible.

RAQC Stationary Sources & Energy Strategies

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Potential Long-Term Strategies which Need Additional Short-Term Action (Implementation beyond 2015) [continued]			
Measure	Description of Categorization	RAQC Effort	Other Efforts
RACT and BACT for Minor Sources in NAA	Relatively small benefit for considerable outlay of effort for Division and minor sources within identified source subcategories to analyze control options. Sources can not be compelled to participate in technical and economic analysis unless there is a proposed Rulemaking.	Based on current estimated emissions reduction benefit, continue to assess potential air quality benefit through air quality modeling and analysis.	CDPHE: If required for a proposed Rulemaking, pursue further investigation of 15 identified source subcategories with control potential identified during subcommittee review Pursue further analysis on voluntary basis, through outreach where possible.
Tightening NOx limits on Boilers and Steam Generators in 9-County Non-Attainment Area	Small benefit (<1 tpd NOx) for considerable outlay of effort for Division and specified sources to establish technical and economic feasibility of potential control options through case-by-case analysis. Sources can not be compelled to participate in technical and economic analysis unless there is a proposed Rulemaking.	Based on current estimated emissions reduction benefit, continue to assess potential air quality benefit through air quality modeling and analysis.	CDPHE: If required for a proposed Rulemaking, pursue further case-by-case exploration to determine the technical and economic feasibility of potential control options for the 17 boilers identified during subcommittee review .

Other Potential Long-Term Strategies (Not currently under active consideration)			
Measure	Description of Categorization	RAQC Effort	Other Efforts
Stage II Vapor Recovery for Gasoline Dispensing Facilities (GDFs) in Denver Metro Area/North Front Range (DMA/NFR)	Board recommended this measure not be considered any further due to costs and diminishing benefit over time.	NA	An EPA proposal established June 30, 2013 as the date that ORVR systems are expected to be in widespread use, in essence proposing repeal of the Stage II federal requirements for systems used at gas stations to capture gasoline vapors while refueling.

RAQC Fuels and Motor Vehicles Strategies

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Possible Short-Term Strategies (Implementation within 2015 timeframe)			
Measure	Description of Categorization	RAQC Effort	Other Efforts
Diesel Retrofits	Emissions benefits can be achieved through this effort by 2015. Efforts are currently underway to implement this strategy with area public fleets including school buses, public works fleets and over-the-road trucks.	The RAQC currently has EPA DERA and FHWA CMAQ grants to assist public and private fleets to retrofit diesel vehicles with tailpipe retrofits, aerodynamic retrofits and other equipment to reduce their emissions.	CDPHE operates their Colorado Clean Diesel Program retrofitting school buses around the state with tailpipe and idle reduction equipment.
Fleet Fuel Use Reduction	This program can provide emissions benefits prior to 2015. Efforts are underway with multiple fleet partners.	The RAQC has worked with area fleets since 2002 to reduce fuel use through idle reduction efforts. The RAQC has developed model idle reduction policies, installed equipment and has performed outreach to fleets to educate them on the costs and benefits of idle reduction. The RAQC has EPA DERA and FHWA CMAQ funds to assist fleets with their efforts.	CDPHE operates their Colorado Clean Diesel Program to retrofit school buses around the state to reduce their idling. The City and County of Denver operates their "Engines Off!" campaign which seeks to educate public and private fleets to reduce idling. They have signage around the City to reinforce the message. HB1275 was passed to reduce heavy-duty diesel idling.
Expand Use of Alternative Fuels in Governmental and Private Fleets	Efforts are currently underway to expand electric and natural gas vehicle purchases and infrastructure in Colorado. This effort could have emissions benefits within the short-term timeframe.	The RAQC currently has EPA DERA and FHWA CMAQ grants to assist public and private fleets to purchase alternatively fueled medium and heavy-duty vehicles. The RAQC has funding to assist with approximately 5 - 10 vehicle purchases depending on vehicle costs. In addition, the RAQC has a pending CMAQ grant with DRCOG to begin purchasing electric and other alternatively fueled vehicles and infrastructure.	The Colorado Natural Gas Vehicle Coalition (CNGVC) has developed a plan with industry and interested stakeholders to develop Colorado fueling infrastructure and is working with the automobile industry to deliver vehicles to the Colorado market. In addition, the Colorado Public Utilities Commission has an investigatory docket open to seek input into the deployment of electric and natural gas vehicles. The RAQC is a party to this process.
Eco-Driving Education to Encourage Driving Practices that Reduce Fuel Use and Reduce Emissions	A small voluntary pilot program is underway internally at CDOT. If the results are positive, more eco-driving programs could be developed and expanded to provide benefits prior to 2015/2018.	Seek funding for this project and implement eco-driving programs with fleet partners.	CDOT is investigating a voluntary pilot program to determine the feasibility of this strategy for safety and fuel saving benefits. Private companies have also implemented these types of programs in their fleets. Private insurance companies (i.e., Progressive) provide drivers incentives to reduce driving by offering lower rates. Assess if other insurance companies are going to adopt this model.

RAQC Fuels and Motor Vehicles Strategies

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Possible Short-Term Strategies (Implementation within 2015 timeframe) [continued]			
Measure	Description of Categorization	RAQC Effort	Other Efforts
In Use Vehicle Fleet Strategies: High-Emitter Repair and Cash for Clunkers	The in-use vehicle fleet is a significant contributor to the region's emissions. These strategies focus on addressing this issue. High-emitter repair focuses on repairing high-emitters identified through various strategies. Cash for clunkers is a vehicle retirement strategy focused on salvaging high-emitting vehicles that cannot be repaired. No funding is currently available for this strategy.	Continue to seek funding for this project.	No other agencies are pursuing this type of program in Colorado.

Potential Long-Term Strategies Which Need Additional Short-Term Action (Implementation beyond 2015)			
Measure	Description of Categorization	RAQC Effort	Other Efforts
Reformulated Gasoline (RFG)	Not available in the 2015 timeframe. Refiners will require 60 months for implementation of this strategy after strategy is approved. Could be considered in the 2018/20 timeframe. The governor can petition the EPA to opt into the federal RFG program for attainment purposes.	Continue to evaluate potential benefit through MOVES emissions modeling and photochemical air quality modeling and analysis.	CDPHE: Continue to provide technical assistance to assess potential benefit through MOVES emissions modeling and photochemical air quality sensitivity modeling and analysis. If this strategy is to be considered further, the administrative cost to Colorado to enforce this strategy will need to be determined.
7.0 Reid Vapor Pressure (RVP) Gasoline	Not available in the 2015 timeframe. Refiners will require 48 months for implementation of this strategy after strategy is approved in a SIP. Could be considered in the 2018/20 timeframe as a demonstrated, necessary strategy for attainment as part of a moderate area SIP.	Continue to evaluate potential benefit through MOVES emissions modeling and photochemical air quality modeling and analysis.	CDPHE: Continue to provide technical assistance to assess potential benefit through MOVES emissions modeling and photochemical air quality sensitivity modeling and analysis. The administrative cost to Colorado to enforce this strategy will need to be determined if this strategy is to be considered further in a SIP. EPA is currently developing the Tier 3 Motor Vehicle and Fuels proposed rule for 2012 anticipated to be effective in 2018 timeframe that may include consideration of RVP.
Eliminate Ethanol Waiver	Not available in the 2015 timeframe. Refiners will require 48 months for implementation of this strategy after strategy is approved. Could be considered in the 2018/20 timeframe. Governor must petition EPA requesting elimination of waiver and support request with documentation that this strategy decreases air pollution.	Continue to evaluate potential benefit through MOVES emissions modeling and photochemical air quality modeling and analysis.	CDPHE: Continue to provide technical assistance to assess potential benefit through MOVES emissions modeling and photochemical air quality sensitivity modeling and analysis. If this strategy is to be considered further, the administrative cost to Colorado to enforce this strategy will need to be determined and an investigation is required to determine if any other areas have successfully eliminated the ethanol waiver.

RAQC Fuels and Motor Vehicles Strategies

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Potential Long-Term Strategies Which Need Additional Short-Term Action (Implementation beyond 2015) [continued]			
Measure	Description of Categorization	RAQC Effort	Other Efforts
Electrification of Vehicle Fleet	Vehicle delivery to the general public will limit the emissions benefits prior to 2015 but benefits should expand prior to 2018. Efforts are currently in progress to assess and implement this strategy.	Assist other agencies with electric vehicle planning and promote the use of current incentives to increase electric vehicle penetration. Assess the California Advanced Clean Cars Program Zero Emission Vehicle (ZEV) and Low Emission Vehicle (LEV) requirements options for Colorado.	The Denver Metro Clean Cities Coalition was awarded a \$500,000 grant for their Funding Electric Vehicle Expansion in the Rockies (FEVER) project. This project will develop an action plan to determine how to best deploy infrastructure and vehicles in Colorado. In addition, the Colorado Public Utilities Commission has an investigatory docket open to seek input into the deployment of electric vehicles. The RAQC is a party to this process.
I/M Program Enhancements - OBD Testing	CDPHE is evaluating this as a potential mandatory I/M program improvement.	Assist CDPHE with grant funding to provide repair assistance to motorists to increase participation in the effort to determine emissions benefits.	AQCC will be evaluating options to improve the I/M Program. RAQC could provide input into this process.
I/M Program Enhancements - Evaporative Emission Testing via High Emitter Remote Sensing	CDPHE is evaluating this as a potential mandatory I/M program improvement.	Assist CDPHE with grant funding to provide repair assistance to motorists to increase participation in the effort to determine emissions benefits.	CDPHE will continue to evaluate this option as part of its ongoing work with USEPA. RAQC could be a part of this process.
I/M Program Enhancements - More Stringent Pass/Fail Standards	CDPHE has evaluated this as a potential mandatory I/M program improvement. This evaluation has shown limited emissions benefits.	None	CDPHE could re-evaluate this option as part of its efforts to improve the I/M Program if needed for future attainment purposes. RAQC could be a part of this process.

RAQC Fuels and Motor Vehicles Strategies

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Other Potential Long-Term Strategies (Not currently under active consideration)			
Measure	Description of Categorization	RAQC Effort	Other Efforts
Remote Sensing Based High-Emitter Program	CDPHE has evaluated this as a potential mandatory I/M program improvement. This evaluation has shown limited emissions benefits.	Assist CDPHE with grant funding to provide repair assistance to motorists to increase participation in the effort to determine emissions benefits.	CDPHE has evaluated this as a mandatory stand-alone option but could re-evaluate this as a supplemental improvement to the I/M Program if needed for future attainment purposes. RAQC could be a part of this process.
Signal Timing and Coordination	Updated MOVES emissions factors indicate that emissions benefit is negligible.	None	DRCOG will continue to include Signal Timing & Coordination in development of transportation plans for congestion management.
Eliminate Ethanol Blending During the Summer Ozone Season	EPA has rejected a waiver from the Renewable Fuel Standard (RFS) filed by Texas. Absent an RFS waiver or a significant increase in the use of E-85 or mid-level ethanol blends, eliminating ethanol in the summer is not a legally viable option for refiners.	None	CDPHE: Continue to monitor RFS waiver situation and market penetration of higher ethanol blended fuels.

RAQC Oil & Gas Strategies

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Possible Short-Term <u>Regulatory</u> Strategies (Implementation within 2015 timeframe)				
Measure	Option	Description of Categorization	RAQC Effort	Other Efforts
Condensate Tanks	c	Lower Statewide condensate tank VOC threshold requiring control: Accomplish through changes to Regulation No. 7.	Provide input on moving forward	APCD would analyze potential reduction benefits using different thresholds. Because there are existing inventories for these units, analysis would be less complex. APCD would work with stakeholders and propose regulatory changes to AQCC.
Glycol Dehydrators: Modify Applicability Threshold	a	Reduce dehydrator VOC applicability threshold: Accomplish through changes to Regulation No. 7.	Provide input on moving forward	APCD would analyze potential reduction benefits using different thresholds. Because there are existing inventories for these units, analysis would be less complex. APCD would work with stakeholders and propose regulatory changes to AQCC.
Pneumatic Devices: Expand Low/No-Bleed Requirement Statewide		Expand current DMA/NFR Ozone NAA pneumatic VOC control requirements to Statewide. Accomplish through changes to Regulation No. 7.	Provide input on moving forward	APCD would analyze reductions benefits. Because of the lack of existing inventories, significant additional analysis is required. APCD would work with stakeholders and propose regulatory changes to AQCC.
Pneumatic Injection Pumps: Replace or Control		Evaluate replacing or controlling pneumatic methanol and chemical injection pumps in the NAA and Statewide to reduce VOC: Accomplish through changes to Regulation No. 7.	Provide input on moving forward	APCD would analyze reductions benefits. Because of the lack of existing inventories, significant additional analysis is required. APCD would work with stakeholders and propose regulatory changes to AQCC.

Possible Short-Term <u>Voluntary</u> Strategies (Implementation within 2015 timeframe)				
Measure	Option	Description of Categorization	RAQC Effort	Other Efforts
Fugitive Leaks: Require Directed Inspection and Maintenance Program		Encourage Directed Inspection and Maintenance (DI&M) Programs to minimize fugitive VOC leaks in the NAA.	Work with Stakeholders on possible voluntary program	APCD to assist RAQC in encouraging a voluntary program
Drill Rigs	b	Implement a voluntary program to add selective catalytic reduction control on diesel fired drill rigs	Work with stakeholders on possible voluntary program	APCD to assist RAQC in coordinating activity

RAQC Oil & Gas Strategies

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Potential Long-Term Strategies which Need Additional Short-Term Action (Implementation beyond 2015)				
Measure	Option	Description of Categorization	RAQC Effort	Other Efforts
Well Completions: Require Green Completions When Feasible		Evaluate requiring green completions to reduce VOC emissions in the NAA at well completions and workovers, when technically and economically feasible.	Coordinate with COGCC on effectiveness of current requirements	COGCC rules already require green completions under certain conditions.

Other Potential Long-Term Strategies (Not currently under active consideration)				
Measure	Option	Description of Categorization	RAQC Effort	Other Efforts
Condensate Tanks	a	Increase condensate tank system-wide VOC control efficiency requirement: Accomplish through changes to Regulation No. 7.	none	none
	b	Enhance condensate tank capture and VOC control of flash gas routed to flare device: Accomplish through industry participation in equipment upgrades.	none	APCD would work with industry to study issue and identify possible solutions
	d	Incorporate crude oil tanks into system-wide regulations: Accomplish through changes to Regulation No. 7.	none	none
Glycol Dehydrators: Increase Control	b	Increase dehydrator VOC control requirement: Accomplish through changes to Regulation No. 7.	none	none
Submerged fill on Condensate Loadout Operations at E&P Sites		Evaluate requiring E&P condensate loadout operations in the NAA to control VOC emissions by using submerged filling	none	none
Condensate Tank: Electronic Surveillance System		This VOC control measure uses ESS to alert the operator when the condensate tank flare is not operational, thereby prompting repairs which results in less downtime of the flare control device. Further long-term evaluation of ESS is necessary to refine the technology and standardize requirements.	none	APCD will continue to work with producers to determine benefits and optimize ESS systems for future consideration.

RAQC Oil & Gas Strategies

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Other Potential Long-Term Strategies (Not currently under active consideration) [continued]				
Measure	Option	Description of Categorization	RAQC Effort	Other Efforts
Compressor Stations in Non-Attainment Area (NAA): Potential NOx Reductions from Natural Gas-Fired Reciprocating Internal Combustion Engines (RICE)	a	Conversion of engines to electric to reduce NOx emissions: A detailed case-by-case engineering analysis would be required to determine the feasibility and cost of conversion.	none	none
	b	Replace older compressor engines with cleaner engines to reduce NOx emissions. A detailed case-by-case engineering analysis would be required to determine the feasibility and cost of replacement.	none	none
	c	Require the addition of post combustion controls on compressor engines to reduce NOx emissions. A detailed case-by-case engineering analysis would be required to determine the feasibility and cost of post combustion controls.	none	none
RICE under 500 HP and Portable RICE: Evaluate Potential NOx Emission Controls	a	Evaluate post combustion controls on all horsepower (HP) Diesel/Gasoline RICE. A detailed case-by-case engineering analysis would be required to determine the feasibility and cost of post combustion controls	none	The O&G Subcommittee recommended parking this strategy. Consequently, further analysis of these measures would be a low priority in the medium to long-term.
	b	Evaluate post combustion controls on Portable RICE; A detailed case-by-case engineering analysis would be required to determine the feasibility and cost of post combustion controls	none	
	c	Evaluate post combustion controls on other natural gas-fired RICE ≥500 HP. A detailed case-by-case engineering analysis would be required to determine the feasibility and cost of post combustion controls.	none	
	d	Evaluate post combustion controls on NG RICE <500 HP. A detailed case-by-case engineering analysis would be required to determine the feasibility and cost of post combustion controls.	none	
Drill Rigs	a	Adopt California drill rig requirements	none	none

RAQC Oil & Gas Strategies

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Other Potential Long-Term Strategies (Not currently under active consideration) [continued]				
Measure	Option	Description of Categorization	RAQC Effort	Other Efforts
Miscellaneous O&G Sources	a	Expand Regulation No. 7 applicability for small engines.	none	The O&G Subcommittee recommended parking this strategy. Consequently, further analysis of these measures would be a low priority in the medium to long-term.
	b	Require insulation on heated separators	none	
	c	Require the installation of BASO valves (or an equivalent)	none	
Produced Water Tanks		Evaluate requiring VOC controls on produced water tanks at condensate tank batteries that are already controlled in the NAA.	none	The O&G Subcommittee recommended parking this strategy. Consequently, further analysis of this measure would be a low priority in the medium to long-term.
Amine Units		Evaluate requiring VOC controls on amine units in the NAA and statewide: Accomplish through	none	The O&G Subcommittee recommended parking this strategy. Consequently, further analysis of this measure would be a low priority in the medium to long-term.

RAQC Alternative Transportation and Land Use Strategies

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Possible Short-Term Strategies (Implementation within 2015 timeframe)			
Measure	Description of Categorization	RAQC Effort	Other Efforts
Expand TDM Efforts	As a voluntary strategy, the region has extensive experience with this strategy. TDM efforts are currently being implemented by major employers, cities, DRCOG RideArrangers, transportation management associations, and the RAQC.	The RAQC has implemented a successful TDM program entitled Every Trip Counts. In fiscal years 2012 and 2013, the RAQC will receive \$226,000 to expand this program to include the cities of Arvada, Wheat Ridge, and Lakewood and the Denver Federal Center. Continue to implement and expand TDM efforts consistent with air quality goals. Continue to work with DRCOG, TMAs and local governments in the development and implementation of TDM programs.	Currently, DRCOG, TMAs, local governments, business groups, and business owners implement TDM programs. In Fiscal Years 2012/2013, \$2.7 million will be allocated for TDM projects throughout the region. In Fiscal Years 2014/2015, there is \$2.8 million to allocate for TDM projects. In 2011, DRCOG and established TMAs formed the Regional TDM Program as means of building upon TDM successes and to create a regional branding, marketing, and expanded advertising campaign for TDM in the Denver metro area and to implement Metro Vision goals.
Combined Land Use Strategies to Increase Development Densities, Mixed Use and Connectivity to Transportation Choices STRATEGIES INCLUDE: Urban Growth Boundaries, Regional Transportation Plan Selection Criteria, Corridor Planning, Local Land Use Tools/Policies to Improve Air Quality, TOD, Financial/Economic Tools/Policies to Improve Air Quality, Revenue Sharing, Community Land Trusts, Purchase of Development Rights/Transfer of Development Rights	As voluntary strategies, many of these efforts are currently underway in the Denver region and have been adopted through local comprehensive plans, area plans, and light rail station area plans.	Work closely with local governments to include air quality planning, specifically ozone air quality, in the local development process. Seek funding to update the 1997 version of the RAQC's Local Air Quality Tools Handbook. Continue to provide staff support to local and regional grant application processes by providing air quality and transportation planning expertise.	DRCOG, through its 2035 Steering Committee, and local governments are currently undertaking projects related to: corridor planning, station area planning, TOD, land banking, urban growth boundaries, activity center plans, and connectivity and urban design studies.
Bike and Pedestrian Facilities	As a voluntary strategies, many bicycle and pedestrian projects have been identified through the local and regional planning process.	Continue the RAQC's partnerships with BikeDenver and the Denver B-cycle program. Continue with work with local governments, DRCOG, and CDOT on project identification, support, and implementation.	Local governments, DRCOG, and CDOT fund bike and pedestrian projects through the regional Transportation Improvement Program.
Car-Sharing	As a voluntary strategy, there are several successful models of this program in place in the Denver metro area.	Work with car-sharing companies to obtain data on program usage and effectiveness. Work with companies to expand program throughout region.	Private car-sharing companies, businesses, universities, DRCOG, and local governments. There are currently three car sharing companies in the Denver metro area. DRCOG recently funded a TDM project with eGo CarShare.

RAQC Alternative Transportation and Land Use Strategies

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Possible Short-Term Strategies (Implementation within 2015 timeframe) [continued]			
Measure	Description of Categorization	RAQC Effort	Other Efforts
Parking Supply Management - Priced Parking	Local jurisdictions have adopted parking ordinances. There is extensive regional experience with priced parking with increasing experience in the suburban communities.	Work with local governments on identification of parking supply needs and identification of areas where supply can be reduced as a means of encouraging mode shift. Work with parking providers to determine current use and pricing structure. Work with DRCOG to inventory priced parking for future modeling efforts.	Local Governments, Private Parking Companies, DRCOG
Reduce Speed Limit	Potential benefit warrants continued analysis in terms of emissions reduction and air quality improvement in future baseline modeling. In addition, consideration of safety issues should also be addressed.	Continue to assess potential benefit through MOVES emissions modeling and photochemical air quality sensitivity modeling.	CDOT, CDPHE, DRCOG. Continue to provide technical assistance to assess potential benefit through transportation modeling, MOVES emission modeling and photochemical air quality sensitivity modeling. CDOT input relative to safety issues related to any proposed speed limit reduction strategies.

Potential Long-Term Strategies which Need Additional Short-Term Action (Implementation beyond 2015)			
Measure	Description of Categorization	RAQC Effort	Other Efforts
Full Build Out of FasTracks	Current economic conditions and cost increases have impacted the timeline for the full build out of the FasTracks system. RTD is anticipating a 2012 election to address funding.	Continue to work as a partner to the full build out of FasTracks.	RTD, Metro Mayors Caucus, and private sector.
RTD Fare Structure	Current economic conditions have resulted in a RTD decision to keep fares at their 2011 levels.	Work with RTD regarding level of service and potential impacts on ridership, vehicle miles traveled and associated air quality impacts.	RTD

RAQC Alternative Transportation and Land Use Strategies

Draft Strategies Assessment for November RAQC Meeting

Potential Long-Term Strategies which Need Additional Short-Term Action (Implementation beyond 2015) [continued]			
Measure	Description of Categorization	RAQC Effort	Other Efforts
RTD Increased Transit Service Levels	Current economic conditions have resulted in an RTD decision to decrease and cut service starting in January 2012.	Work with RTD regarding fare structure and potential impacts on ridership, vehicle miles traveled and associated air quality impacts.	RTD
Changes to the State Land Board Mission/Policies	The State Land Board has parcels of land in and around the Denver urban growth boundary that have the potential for development and redevelopment.	Work with the State Land Board as appropriate on projects related to air quality.	State Land Board continues to evaluate the Board's parcels for the potential for alternative power generation and oil and gas production.

Other Potential Long-Term Strategies (Not currently under active consideration)			
Measure	Description of Categorization	RAQC Effort	Other Efforts
Neighborhood Electric Vehicles	As a voluntary strategy, this is an innovative idea that has not been implemented in the Denver metro area.	Research current programs and other jurisdictions. Work with local governments regarding feasibility of implementation.	

RAQC Transportation Pricing Strategies

Draft Strategies Assessment for November RAQC Meeting

Possible Short-Term Strategies (Implementation within 2015 timeframe)			
Measure	Description of Categorization	RAQC Effort	Other Efforts
Pay as You Drive Insurance	As a voluntary measure, this strategy is currently being implemented in Colorado by Progressive, Allstate, and GMAC/Onstar insurance companies.	Companies have been resistant to sharing specific usage data regarding decrease in vehicle miles traveled. However, with more education, they should be able to understand the regional significance of analyzing the trip reduction impacts of this strategy. Work with State, CDOT and DRCOG regarding monitoring of this program.	State Insurance Office (DORA), Private Insurance Companies
Transportation Facility Pricing	Region has experience with HOT lanes and tolled facilities. Increases in tolls and facility charges would require substantial political effort to implement.	Continue to monitor state of the practice. Work with CDOT regarding programs.	CDOT and public tolling authorities continue to analyze and explore revenue options.

Potential Long-Term Strategies which Need Additional Short-Term Action (Implementation beyond 2015)			
Measure	Description of Categorization	RAQC Effort	Other Efforts
Fuel Tax Pricing Strategies	Current economic conditions would require substantial political effort to increase the price of gas.	Continue to monitor state of the practice. Work with CDOT regarding programs.	CDOT continues to analyze and explore revenue options.
Mileage Based User Fee	Current economic conditions would require substantial political effort to implement a mileage based user fee. To date, no states have implemented mileage based user fees. Oregon, Washington, and Minnesota have completed pilot studies. These studies have analyzed the effects of a MBUF on vehicle miles traveled and have also studied this strategy as a revenue replacement/addition to the gas tax.	Continue to monitor state of the practice. Work with CDOT regarding current scope of work for pilot program.	CDOT has developed a scope of work to develop a pilot project and obtain federal grant funding to conduct a MBUF pilot project. Move Colorado is a private organization Colorado community, business and political leaders that formed to address transportation funding issues including mileage based user fees.