

Oil and Gas Ozone Reduction Strategies not being Further Developed at this Time

Ten strategies to reduce ozone emissions by reducing volatile organic compounds (VOCs) in the non-attainment area (NAA) from oil and gas sources were presented at the February 26, 2008 Regional Air Quality Council (RAQC) stakeholder meeting. Between that meeting and the April 10, 2008 RAQC stakeholder meeting, two of the ten strategies were developed further. Eight have not been further developed, as discussed in this paper.

The decision to determine which strategies would be developed was based primarily on VOC emission inventories for each source category. The two strategies that are being developed are “Condensate Tanks” and “High-Bleed Pneumatic Devices.” In the 2006 baseline, NAA VOC emissions from these two source categories were 126 and 25 tons per day (tpd), or 71 and 14 percent of total VOC emissions from oil and gas sources, respectively. VOC emissions from the remaining source categories collectively were 27 tpd, or 15 percent. “Fugitive emissions at oil and gas well heads” is the third largest source category of VOC emissions, at 4.6 percent. Most of the remaining source categories are less than 1 percent of the total VOC emissions from oil and gas sources. The following table shows a break out of NAA VOC emissions from oil and gas source categories.

Strategy	Source Category	2006 NAA VOC Emissions (tpd)	Percent of 2006 NAA VOC Emissions
Unregulated Source Categories ¹	Drilling Rigs ²	0.58	0.3
	Exempt Engines	0.44	0.2
	Heaters for Oil and Gas Wells	0.07	0.0
	Pneumatic Devices	24.83	14.0
	Fugitive Emissions at Oil & Gas Wells	8.21	4.6
	Well Completions	0.82	0.5
	Well Recompletions	1.10	0.6
	Well Blowdowns	3.90	2.2
	Pneumatic Pumps	1.79	1.0
	Workover Rigs	0.12	0.1
	Exempt Atmospheric Storage Tanks ³	15.12	8.5
	Exempt Truck Loading Activities	1.99	1.1
	Compressor Engines	4.84	2.7
Other ⁴	0.60	0.3	
High-Bleed Pneumatic Devices	See “Unregulated Source Categories”	See “Unregulated Source Categories”	See “Unregulated Source Categories”
Engines	Specific Engines ⁵	Not Available	Not Available
Well Completions	See “Unregulated Source Categories”	See “Unregulated Source Categories”	See “Unregulated Source Categories”
Leak Detection	Fugitive Emissions ⁶	1.22	0.7
Heated Separator Insulation	Heated Separators ⁵	Not Available	Not Available
Condensate Tanks	APEN Tanks ⁷	111.33	62.6
Glycol Dehydrators	Glycol Dehydrators ⁸	0.85	0.5
BASO [®] Valves	BASO [®] Valves ⁵	Not Available	Not Available
Condensate Loadout Operations	See “Unregulated Source Categories”	See “Unregulated Source Categories”	See “Unregulated Source Categories”

1 Emissions from unregulated source categories were provided in the Independent Petroleum Association of Mountain States (IPAMS) Phase III Western Regional Air Partnership (WRAP) emission inventory report “Development of Baseline 2006

Emissions from Oil and Gas Activity in the Denver-Julesburg Basin”, originally published February 7, 2008 and updated in March 2008. Because these source categories are not regulated, the Colorado Air Pollution Control Division (APCD) does not collect emission data for them.

- 2 Note that this table reports source category VOC emissions. Although VOC emissions are low from drill rigs, APCD may consider regulation changes for drill rigs and other sources due to nitrogen oxides (NOx) emissions as part of the Regional Haze process.
- 3 Emissions from exempt tanks represent tanks that do not require Air Pollution Emission Notices (APENs), which mean that they emit less than approximately 5 tons per year VOCs
- 4 Source category “Other” in strategy “Unregulated Source Categories” includes produced water tanks, exempt flaring, soil land farming (spills), natural gas production flares, natural gas production “other, not classified”, oil production processing operations “not classified”, natural gas processing facilities relief valves, natural gas processing facilities process valves, natural gas processing facilities and production gas sweetening by amine process, natural gas production flares combusting gases less than 1000 BTU/scf, natural gas production flanges and connections, process heaters, and tank losses.
- 5 Emissions from this source category are not available. However, based on emissions from similar sources, emissions from this source category are likely to be insignificant.
- 6 “Fugitive Emissions” represent VOC emissions reported by natural gas facilities and compressor stations based on APENs.
- 7 “APEN Tanks” represents regulated tanks for which APCD receives APENs. However, emissions provided in this table are based on Regulation 7 reports, not APENS, as they are considered a more up-to-date source of information.
- 8 Emissions for glycol dehydrators are based on Air Pollution Emission Notices (APENs).

One of the ten strategies, “Leak Detection,” was originally going to be developed further because as a combined source category, fugitive emissions represent the third highest source category at 9.4 tpd and 5.3 percent of total oil and gas emission sources. The majority of those emissions are from oil and gas wellheads, rather than from natural gas facilities or compressor stations. Options within the strategy involved changes related to the leak detection and repair (LDAR) program described in 40 CFR Part 60, Subpart KKK (KKK) and Directed Implementation and Maintenance (DI&M) programs. KKK applies to all gas processing facilities within the NAA. DI&M is a voluntary program encouraged by the EPA Gas STAR program. APCD prefers not to implement either of these programs at wellheads. Therefore, implementing this strategy would not yield significant emission reductions, so it was not developed further.