WRAP Oil & Gas Phase II Proposal: 2002 and 2018 Area Source Inventory Improvements and Area Source Control Evaluation

WRAP Stationary Sources Forum Meeting

Salt Lake City, UT

August 16, 2006

Phase I Recap

- First regional, uniform assessment of O&G emissions in western states
  - Essentially no area source emission inventory prior to Phase I report
- Emphasis on area source NOx emissions
- Emission estimates also provided for SO2 from drill rigs and VOCs from some wellhead processes

Phase I Recap

Table 2-2. Change in oil and gas NOx emissions in the 2002 area source inventory as a result of this inventory effort.

	WRAP Oil and Gas Inventory			Oil and Gas in Previous Inventory		
State/Tribe	Area	Point	Total	Area	Point	Total
Alaska	886	45,822	46,708		45,822	45,822
Arizona		2,735	2,735		2,735	2,735
California*	8,070	16,707	24,777	8,070	16,707	24,777
Colorado	23,147	25,955	49,102		25,955	25,955
Idaho		2,590	2,590		2,590	2,590
Montana	7,792	4,275	12,067		4,275	4,275
Nevada	62	83	145		83	83
New Mexico	60,446	57,173	117,619		57,173	57,173
North Dakota	4,631	4,739	9,369		4,739	4,739
Oregon	85	1,182	1,267		1,182	1,182
South Dakota	367	323	690		323	323
Utah	5,190	3,311	8,500		3,311	3,311
Washington		1,281	1,281		1,281	1,281
Wyoming	19,699	15,015	34,715	6,409	15,015	21,424
Total	**130,376**	**181,191**	**311,566**	**14,479**	**181,191**	**195,670**

Phase I Recap

Table 2-1a. 2002 State total NOx emissions (tons) from oil and gas sources.

State	Compressor Engines	Drill Rigs	Wellhead	CBM Pump Engines	Area Source Total
Alaska		877	9		886
Arizona					
California					8,070
Colorado		5,734	15,924	1,489	23,147
Idaho					
Montana	2,027	1,044	4,721		7,792
Nevada	33	24	5		62
New Mexico	40,095	6,645	13,482	225	60,446
North Dakota	2,920	1,536	176		4,631
Oregon	73	-	12		85
South Dakota	284	36	47		367
Utah	2,371	676	2,143		5,190
Washington					
Wyoming	7,025	4,964	6,283	1,428	19,699
Total	**54,828**	**21,536**	**42,800**	**3,141**	**130,376**

Phase II – Task 1:
2002 Inventory Improvements

- Reduce uncertainties and improve our understand of significant sources
- Provide basis for a better 2018 projection
  - No plans to redo 2002 baseline modeling
- Develop a workplan first
  - Identify data sources, potential improvements
  - Prioritize source categories, subregions, and pollutants to be improved
  - Will address projection sensitivities too

Table 1. Equipment and pollutants addressed by WRAP, New Mexico work, and the proposed effort.

Equipment	NOx	PM	SO_2	VOCs
Drill Rigs	X		X	
	X		X	X
	X	X	X	
Compressor Engines	X			
	X		X	X
	X	X	X	
CBM Engines	X			
	X			
Artificial Lift Engines	X		X	X
Salt Water Disposal Engines	X		X	X
Tanks				X
				X
Fugitives-Oil and Gas				X
				X
Glycol Dehydration Units				X
				X
Heaters	X			
	X		X	
Pneumatic Devices	X			X
				X
Completions	X			X
			X	
Venting				X
				X

WRAP | NW NM | Proposed Effort

Phase II – Task 1:
2002 Inventory Improvements

- VOCs
  - VOC is a concern for both haze and ozone
  - Current data for 2018 shows O&G to be a significant component of state-wide, total VOC emissions in some states:
    - UT (8%), NM (17%), WY (31%)
  - Venting and fugitive emissions *[for some areas]*
    - Build off recent work in northwest NM
  - Glycol dehydrators *[for some areas]*
    - Closer examination of emission potential

Phase II – Task 1: 2002 Inventory Improvements

- Drill Rigs
  - NOx: Closer examination of actual drill durations, use of “air packages” for drilling, and extent of rotary vs workover rigs *[for some areas]*
  - SO2: Revise based on any changes in estimated engine use *[for some areas]*
  - PM: Review basis for predictions in NONROAD model and contact manufacturers for emission factor information *[for all areas]*

Phase II – Task 1:
2002 Inventory Improvements

- Wellhead compression
  - NOx: Phase I assumed wellhead compression used as opposed to larger centralized stations *[for some areas]*
  - SO2: Look at sour gas fields *[for some areas]*
  - PM: Review basis for predictions in NONROAD model and contact manufacturers for emission factor information *[for all areas]*
- Coal bed methane development
  - Closer examination of NOx emissions given relatively low estimates in previous inventories

Phase II – Task 1: 2002 Inventory Improvements

- Fugitive dust
  - Workplan will examine feasibility of evaluating unpaved road and well construction emissions
  - Resources not likely to be sufficient to evaluate dust emissions in addition to the other emissions of interest

Phase II – Task 2: Control Strategy Evaluation

Table 2. Control technology evaluations to be conducted.

Equipment	NOx	PM	SO_2	VOC
Drill Rigs	x	x	X	
Compressor Engines	x	x	X	
CBM Engines	x	x	X	
Tanks				x
Glycol Dehydration Units				x
Heaters	x			
Pneumatic Devices				x
Completion-Flaring and Venting	x			x

Phase II – Task 2: Control Strategy Evaluation

- For each control measure, a one-page summary of:
  - Control measure description
  - Current and future feasibility
  - Control efficiency range
  - Cost and cost-effectiveness range
  - Potential for application to existing/new equipment

Phase II – Task 2: Control Strategy Evaluation

- For each state:
  - Examine current baseline of controls (both on the books and in the works)
  - Evaluate potential for additional controls
  - Develop a range of control options
  - Estimate potential emission reductions for each control option

Phase II – Task 3:
2018 Emissions

- 2018 emissions are based on growth factors applied to the 2002 inventory
- Examine sensitivity of switching several source categories from well-based to production-based growth factors
- Examine older RMPs, EISs to determine accuracy of previous predictions

Phase II – Task 3:
2018 Emissions

- Examine full range (not just midpoint) of development projections, in addition to recent leasing and permitting trends
- Develop a 2018 regional control scenario that is a combination of the most promising controls based on feasibility and cost-effectiveness.
  - Will include state-specific emission reductions

Cost, Schedule, Deliverables

Task	Description	Cost
1	2002 EI Improvements	30,500
2	Control Strategy Evaluation	45,000
3	2018 EI Improvements	24,500
Total		100,000

Table 3. Proposed schedule of deliverables.

Task	Milestone	Deliverable	Due Date
1-3	Recommended Work Plan	Technical Memorandum	October 13, 2006
1	2002 EI Improvements	Memorandum to WRAP on preliminary Findings	December 20, 2006
2	Control Technology Evaluation	Memorandum on Control Options Evaluated	January 20, 2007
3	2018 EI Improvements	Technical memorandum on revised 2018 emissions, control strategy emissions reductions	March 3, 2007
	Draft Final Report		March 24
	Final Report		Two weeks after receipt of comments on draft report