NEW MEXICO OZONE ATTAINMENT INITIATIVE 2014 and 2028 Emissions Development

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NM OAI Study Webinar

February 1, 2021

RAMBOLL Bright ideas. Sustainable change.

DEVELOPMENT OF 2028 MODELING EMISSIONS

Natural Emissions

02

Anthropogenic Emission Data Sources

03

SMOKE Emissions Modeling

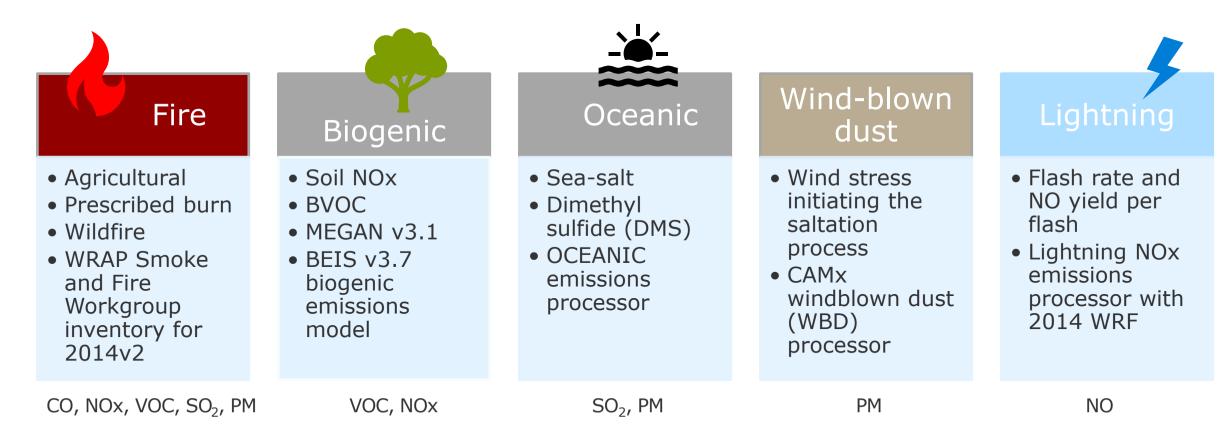
04

Summary of 2014 and 2028 Emissions



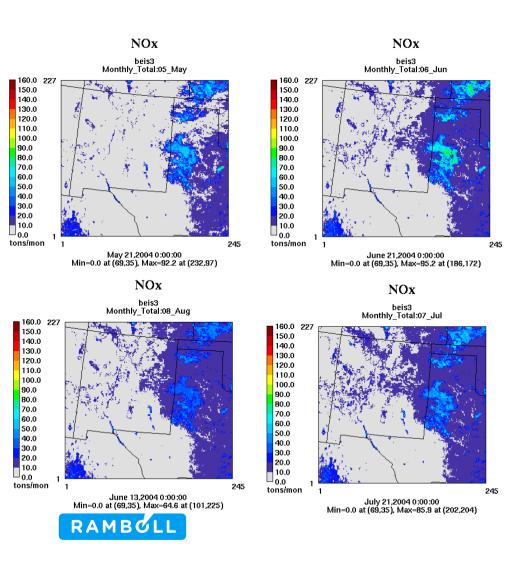
NATURAL EMISSIONS

Remained the same between 2014 and 2028





BEIS V3.7 EMISSIONS



		MEGAN	BEIS3	Abs Diff	Ratio	
Ton	Tons/month			(BEIS3-MEGAN)	(BEIS3/MEGAN)	
	NOX	35,050	10,602	-24,448	0.30	
May	VOC	128,323	159,809	31,486	1.25	
	NOX	42,445	13,134	-29,311	0.31	
Jun	VOC	267,055	256,379	-10,676	0.96	
	NOX	51,639	12,838	-38,801	0.25	
Jul	VOC	317,697	251,562	-66,135	0.79	
	NOX	41,002	11,923	-29,079	0.29	
Aug	VOC	354,570	216,032	-138,538	0.61	
		voc		VOC		

VOC beis3 Monthly_Total:05_May 16.0 227

15.0

14.0

13.0

12.0

11.0

10.0

9.0

8.0

7.0

6.0

5.0

4.0

3.0

2.0

1.0

tons/mon

16.0 227

15.0

14.0

13.0

12.0

11.0

10.0

9.0

8.0

7.0

6.0

5.0

4.0

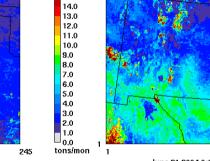
3.0

2.0

1.0

□0.0 tons/mon 1

0.0



16.0 227

15.0

May 21,2004 0:00:00 Min=0.3 at (113,223), Max=21.2 at (9,2)

VOC

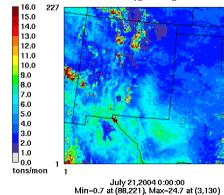
beis3 Monthly_Total:08_Aug

June 21,2004 0:00:00 Min=0.5 at (88,221), Max=26.4 at (9,2)

beis3 Monthly_Total:06_Jun

VOC

beis3 Monthly_Total:07_Jul



June 13,2004 0:00:00 Min=0.5 at (88,221), Max=19.9 at (234,72)

245

245

245

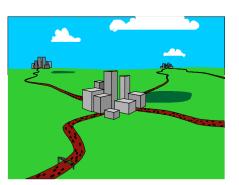
ANTHRO EMISSION DATA SOURCES 🛛 🖚 🛣 🗮 🔛

- 2014 anthropogenic emissions from 2014v2 scenario of the WRAP/WAQS RH modeling
 - Onroad emissions generated using SMOKE-MOVES processing for the 4-km domain
 - O&G emissions based on state-of-the-science WRAP OGWG emission estimates
 - NMED found a generator engine missing in 2014v2 inventory (94 tpy NOx)
 - Consistent emissions data between the Regional Haze and OAI studies
- 2028 anthropogenic emissions based on the WRAP/WAQS 2028 on-the-books scenario (2028OTBa2 only with actual 2014 fires)
 - O&G emissions based on inventory developed by Ramboll (presented in Jan 11th meeting)
 - $_{\odot}~$ Onroad emissions created using SMOKE-MOVES
 - Fixed double counting of NM sources
 - Updated San Juan Generating Station (NOx 7,391 TPY) and added Lordsburg Generating Station
 - Updated three O&G sources: Chaco Gas Plant (NOx 2,053 tpy), Carlsbad CS, and Mountainair CS (NOx 645 tpy)



EMISSION PROCESSING FOR AQM

Start With



Annual Estimates (tons/year)

County Totals

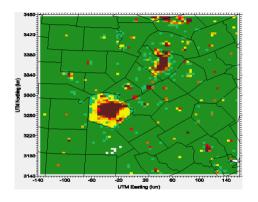
Hourly

Gridded

Speciated

Criteria Pollutants (NOx, CO, VOC)

Model Ready



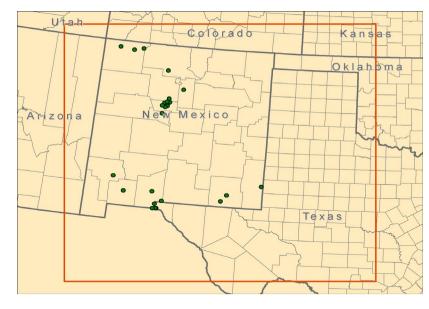
Total Inventory Points Motor Area Biogenics Vehicles EMISSION PROCESSING STEPS Merge Components Model Inputs

Inventory Components

SMOKE PROCESSING SECTORS

US-Anthro 🖚 🕋 💂 🔛								
Sector	Description							
afdust_adj	- Area fugitive dust							
ag	- Agricultural ammonia sources							
nonpt	- Other nonpoint sources							
	- Non-point Oil and Gas for 7 WRAP							
np_oilgas_wrap	States (CO, MT, NM, ND, SD, UT,							
	WY)							
np_oilgas	- Non-point Oil and Gas							
nonroad	- Non-road mobile							
rail	- Locomotive							
onroad	- On-road mobile							
ptegu	- EGU point sources							
ptnonipm	- Non-EGU point sources							
	- Point Oil and Gas for 7 WRAP							
pt_oilgas_wrap	States (CO, MT, NM, ND, SD, UT,							
	WY)							
pt_oilgas_wrap	- Point Oil and Gas							
rwc	- Residential Wood Combustion							

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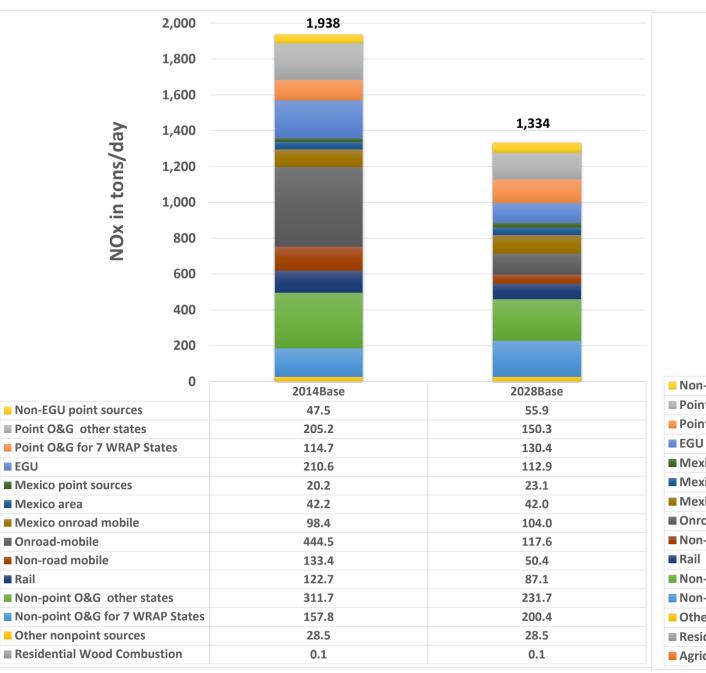
New Mexico 4-km Domain

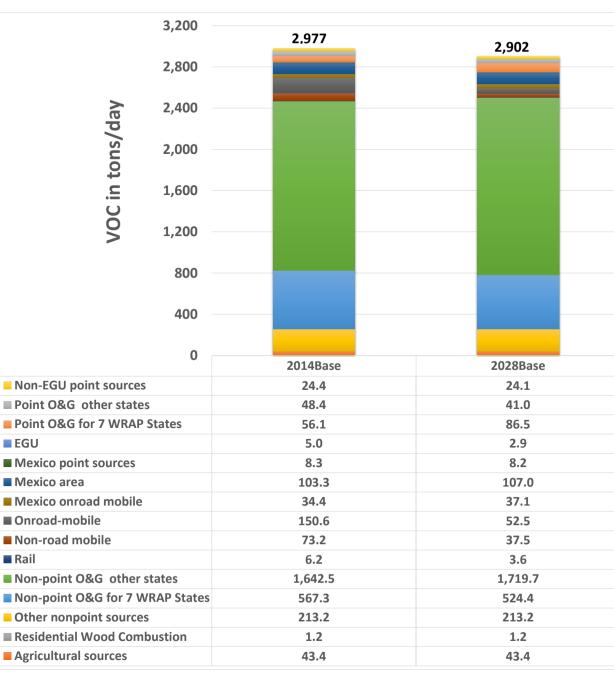
Non-US Anthro & Natural

Sector	Description	
onroad_mex	- Mexico onroad mobile	
othar	- Mexico area	
othpt	- Mexico point sources	
MEGAN/BEIS	- Biogenic	
LtNOx	- Lightning Nox	
AG fire	- Ag Fire	
RX fire	- Prescribed Fire	
WF fire	- Wild Fire	
Ptfire_othna	- Mexico fire	
WBD	- Windblown Dust	



NEW MEXICO 4-KM EMISSIONS COMPARISON:

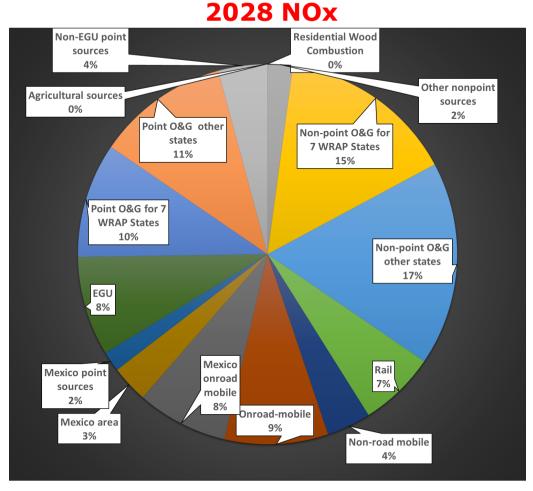




NEW MEXICO 4-KM NOX COMPARISON

Non-EGU point **Residential Wood Combustion** Other nonpoint sources sources 2% 2% Agricultural sources 0% Non-point O&G for Point O&G other 7 WRAP States states 8% Point O&G for 7 11% WRAP States 6% Non-point O&G other states 16% EGU 11% Rail Mexico point 6% sources 1% Non-road mobile Mexico area 7% 2% Mexico onroad mobile 5% Onroad-mobile 23%

2014 NOx



1,938 TPD

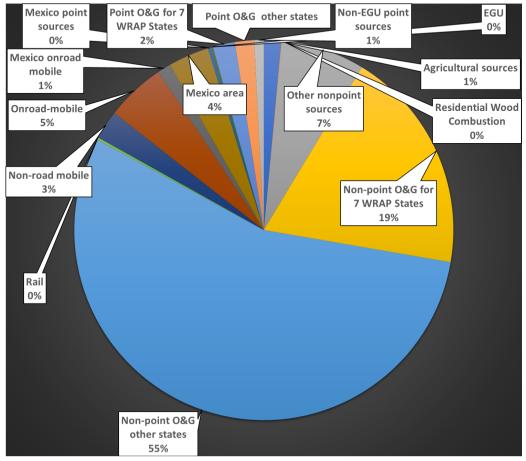
1,334 TPD

-604 TPD (31.1%) Reduction

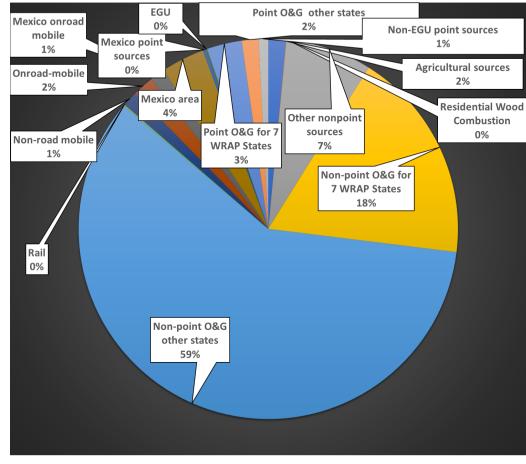


NEW MEXICO 4-KM VOC COMPARISON

2014 VOC



2028 VOC



2,977 TPD

2,902TPD



-75 TPD (2.5%) Reduction

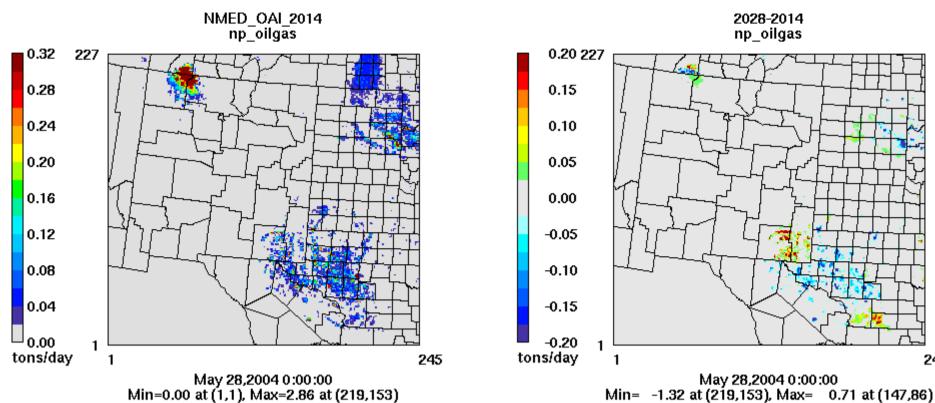
NON-POINT O&G EMISSIONS: NOX

2014

NOx

Difference plot (2028 – 2014)

Delta_NOx



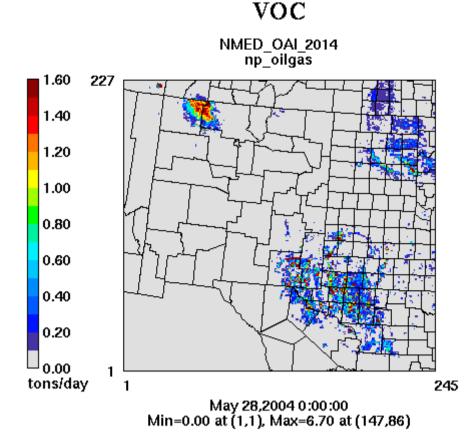


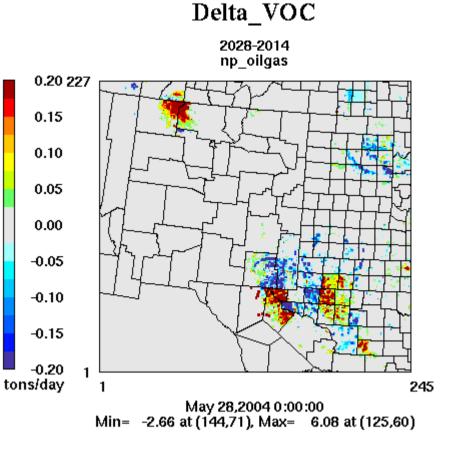
245

NON-POINT O&G EMISSIONS: VOC

2014

Difference plot (2028 – 2014)



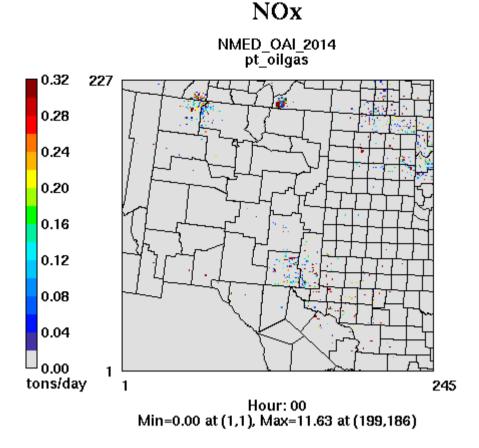


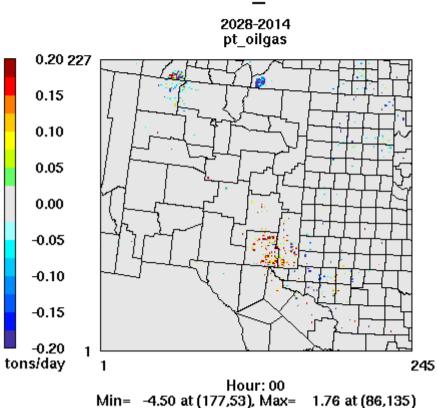


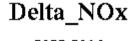
POINT O&G EMISSIONS: NOX

2014

Difference plot (2028 – 2014)





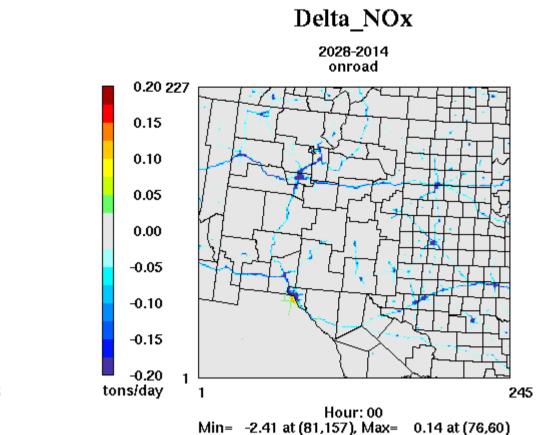


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Difference plot (2028 – 2014)





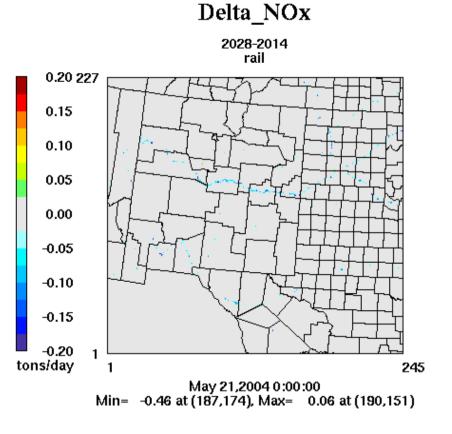
ONROAD EMISSIONS: NOX

0.32 227 0.28 0.24 0.20 0.16 0.12 0.08 0.04 0.00 tons/day 245 Hour: 00 Min=0.00 at (219,7), Max=3.27 at (81,157)

RAIL EMISSIONS: NOX

2014 NOx NMED_OAI_2014 rail 0.20 227 0.18 0.15 0.13 0.10 0.08 0.05 0.03 0.00 1 tons/day 245 May 21,2004 0:00:00 Min=0.00 at (1,1), Max=1.19 at (38,173)

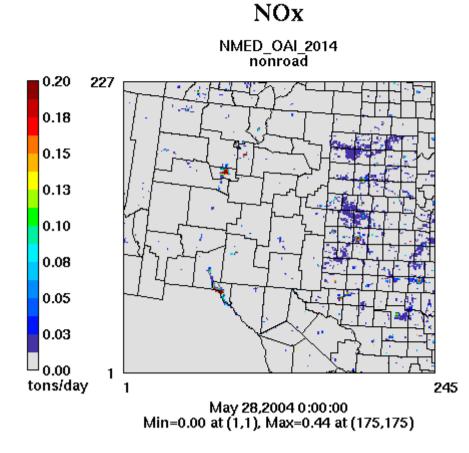
Difference plot (2028 – 2014)



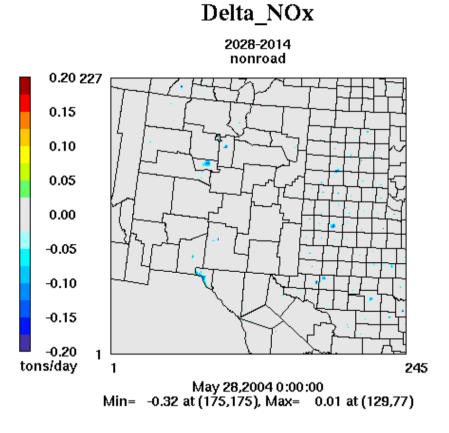


NONROAD EMISSIONS: NOX

2014



Difference plot (2028 – 2014)





CURRENT STATUS AND NEXT STEPS

- Completed 36/12/4-km 2028 emissions with updated 2028 O&G emissions for New Mexico and started CAMx runs
- Process 2028 O&G emissions for NM O&G Control Scenario
- Conduct CAMx 2028 36/12/4-km NM O&G control strategy simulation and provide ozone results to NMED



2028 O&G CONTROL SCENARIO **EMISSIONS** – PRELIMINARY ANALYSIS



2028 O&G CONTROL SCENARIO EMISSIONS

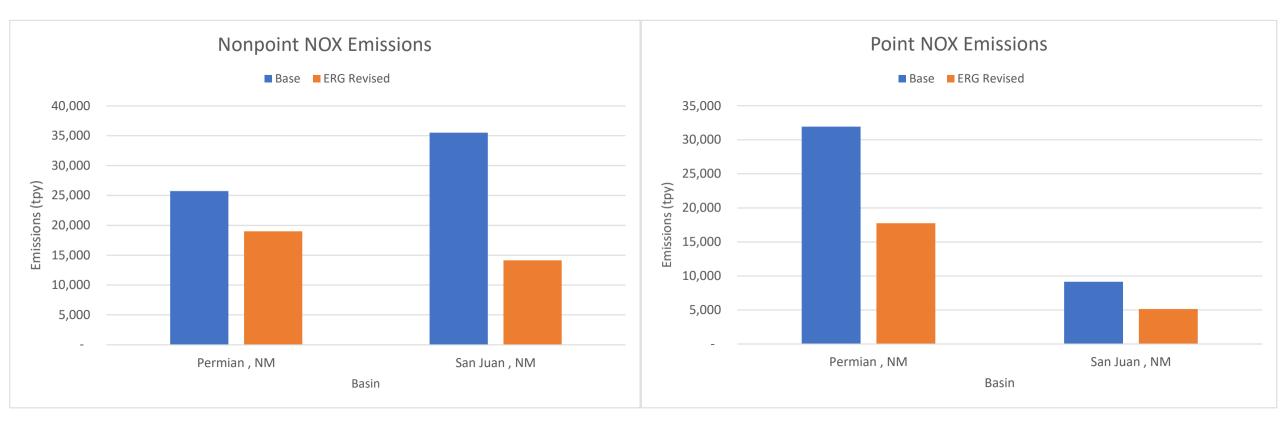
- ERG provided revised point and nonpoint NM emissions for affected counties/SCCs/pollutants.
- 7 NM counties included in ERG's inventory
 - San Juan Basin (4 counties)
 - Permian Basin (3 counties)

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• Bar chart displays by Pollutant, Basin and Source Categories (in tons/year)

		Source	Base	ERG Revised	Change	Percent Change	
	NOv	Nonpoint	61,245	33,144	(28,101)	-46%	
	NOx	Point	41,066	22,872	(18,195)	-44%	
		Total	102,311	56,015	(46,296)	-45%	
		Source	Base	ERG Revised	Change	Percent Change	
	NOC	Nonpoint	181,252	85,564	(95 <i>,</i> 688)	-53%	
	VOC	Point	30,340	19,608	(10,732)	-35%	
		Total	211,592	105,173	(106,420)	-50%	

2028 O&G CONTROL SCENARIO NOX EMISSIONS

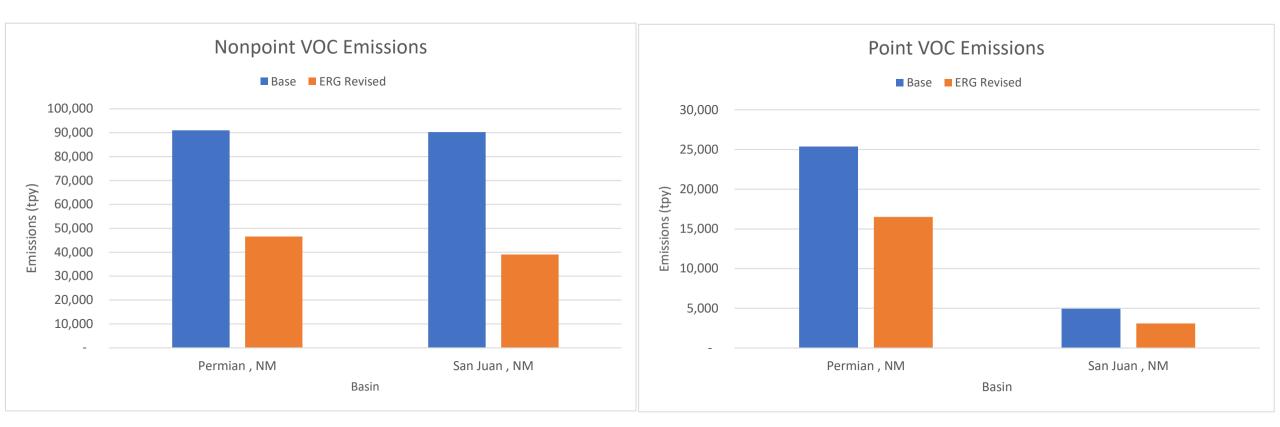


- 26% NOx reduction for Permian
- 60% NOx reduction for San Juan

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- 44% NOx reduction for Permian
- 44% NOx reduction for San Juan

2028 O&G CONTROL SCENARIO VOC EMISSIONS

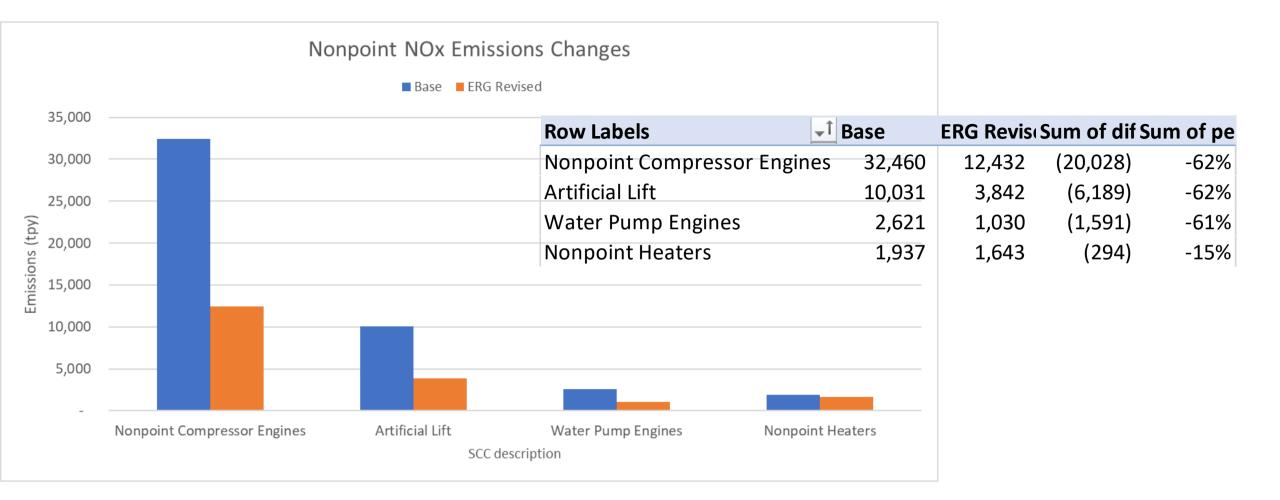


- 49% VOC reduction in Permian
- 57% VOC reduction in San Juan

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- 35% VOC reduction for Permian
- 38% VOC reduction for San Juan

NONPOINT O&G NOX CHANGE





NONPOINT O&G VOC CHANGE

								Row Label	Row Labels		ase	ERG Revise	Sum of dif S	um of pe
								Oil Well Tr	uck Loading		10,353	1,273	(9,080)	-88%
						Gas Well T	ruck Loading		292	36	(256)	-88%		
								Pneumatio	c Devices		38,240	9 <i>,</i> 598	(28,641)	-75%
				Nor	npoint VO	C Emissic	ons Changes	Pneumatio	c Pumps		11,404	2,862	(8,541)	-75%
							Nonpoint	Fugitives		18,894	5 <i>,</i> 668	(13,225)	-70%	
45.000		Base ERG Revised				Dehydrato	or		11,870	5,964	(5,905)	-50%		
45,000								Condensa	te tank		7,289	3,809	(3 <i>,</i> 480)	-48%
40,000								Blowdowr	n Flaring		15,110	8,135	(6 <i>,</i> 975)	-46%
35,000	_						Oil Tank			35 <i>,</i> 889	21,747	(14,141)	-39%	
30,000							Water Pur	np Engines		6,962	4,252	(2,710)	-39%	
Emissions (tpy) 225,000 20,000	_						Artificial Li	ft		3,232	2,776	(455)	-14%	
								Nonpoint	Compressor En	igines	16,162	13,885	(2,277)	-14%
10,000														
ш 15,000														
10,000		_												
5,000				_										
-	Pneumatic	Oil Tank	Nonpoint	Oil Well	Pneumatic	Blowdown	Dehydrator Cond	ensate Water Pum	p Nonpoint Artificia	al Lift Gas Well				
	Devices		Fugitives	Truck Loading	Pumps	Flaring	-	ank Engines	Compressor Engines	Truck Loading				

SCC description

