Implementation of the Minor Source Permitting Program in Colorado from 2010 - 2021

01/05/22

Colorado's Obligations per the CAA

"Each [state implementation] plan must set forth legally enforceable procedures that enable the State or local agency to determine whether the construction or modification of a facility, building, structure or installation, or combination of these will result in… interference with attainment or maintenance of a national standard in the State in which the proposed source (or modification) is located or in a neighboring State." *

* 40 C.F.R. § 51.160(a)(2)

Colorado's Obligations per the CAA

"Such procedures [in the SIP] must include means by which the State or local agency responsible for final decision making on an application for approval to construct or modify will prevent such construction or modification if… [i]t will interfere with the attainment or maintenance of a national standard." *

* 40 C.F.R. § 51.160(b)(2)

Colorado's Obligations per its EPA-Approved SIP

CDPHE must:

- Prepare a Preliminary Analysis to determine what impact a project will have on ambient air.[1]
- Grant the permit if the project will not cause an exceedance any NAAQS.[2]
- Deny the permit if the project cannot comply with the NAAQS.[3]

[1] 5CCR1001-5 Part B § III.B.5
[2] 5CCR1001-5 Part B § III.D.1
[3] 5CCR1001-5 Part B § III.F.1

In practice…

Colorado has failed to meet its CAA and SIP obligations, allowing emission sources to **circumvent the 1-hr NO_2, 1-hr SO_2, 24-hr PM2.5 and annual PM2.5 NAAQS**.

This has been happening from 2010 to present date, **far beyond the reasonable use of regulatory enforcement discretion**.

HOW?

- PS Memo 10-01. 1-hr NO_2, 1-hr SO_2 NAAQS compliance verification only for sources emitting with less than 40 tpy.
- Breaking up projects. Issuing separate permits to sources in the same facility. The NAAQS compliance requirement is then assessed for each permit individually thus breaking up the total emissions.
- Arbitrary decisions. Mostly to exempt facilities from the PM2.5 NAAQS.
- Failing to ensure the scientific integrity of the NAAQS compliance analyses.

PS Memo 10-01

It has been the law of the land at CDPHE for the past 11 years in what pertains to assessing 1-hr NO_2 and 1-hr SO_2 NAAQS compliance, superseding state and federal regulations.

From: [redacted]
Sent: Monday, April 18, 2011 3:38 PM
To: [redacted]
Cc: [redacted]
Subject: RE: UCD - permit 96AD234

[redacted]

Does not matter - PS memo 10-01 over-rides.

[redacted]

From: [redacted]
Sent: Monday, April 18, 2011 3:22 PM
To: [redacted]
Cc: [redacted]
Subject: RE: UCD - permit 96AD234

[redacted]

I think you missed it. Impacts of 1-hr NO2 and SO2 exceed the NAAQS.

[redacted]

From: [redacted]
Sent: Monday, April 18, 2011 3:49 PM
To: [redacted]
Cc: [redacted]
Subject: RE: UCD - permit 96AD234

Per [redacted] and [redacted] it does.

[redacted]

From: [redacted]
Sent: Monday, April 18, 2011 3:43 PM
To: [redacted]
Cc: [redacted]
Subject: RE: UCD - permit 96AD234

PS memo 10-01 is only a guidance document. It does not supersede statutory/regulatory requirements.

PS Memo 10-01

The Troutman report concluded that:

- PS Memo 10-01 had no basis in law.
- Its assumption that sources emitting fewer than 40 tpy of NOx or SO_2 would not cause violations of the corresponding NAAQS was unfounded.
- Its justifications do not withstand scrutiny.

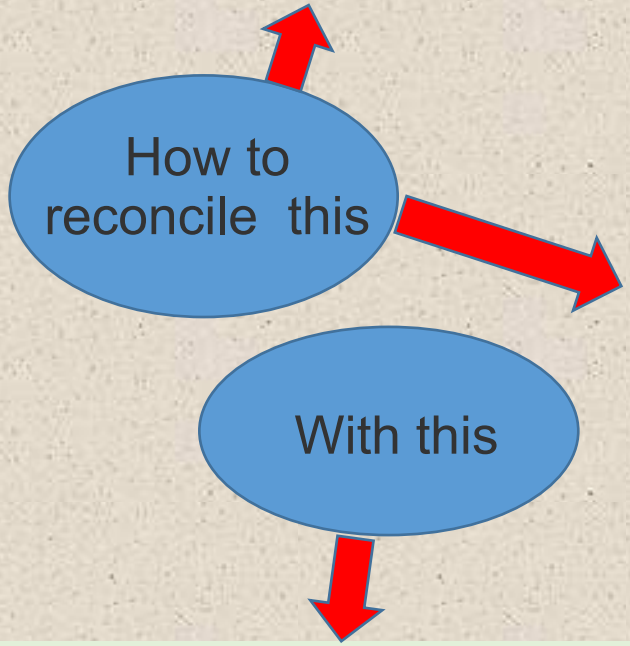
… but these have been known and obvious facts since the moment the memo was promulgated.

PS Memo 10-01

Examples of how it has been used.

*"However, PS memo 10-01 makes it very clear that we [**cannot**] require [Company] to do modeling to the 1 hour NOx standard since emissions of NOx will be less than 40 tons per year."*

Sep 6, 2016 email from a CDPHE manager to a permit modeler.



From: [redacted]
Date: Mon, Jan 7, 2013 at 2:50 PM
Subject: Re: Updated: [redacted] Plant Permitting Effort Kick off Meeting
To: [redacted]
Cc: [redacted]

[redacted]

I hear what you are saying. However, per PS memo 10-02 the Division **does not** require impact modeling to the 1 hour standard for sources of SO2 or NOx with a net change in emissions of less than 40 ton per year. Per the last paragraph (emphasis added): "…, the Division **will apply** EPA's SERs for NOx and SO_2 to the 1-hour NO_2 and 1-hour SO_2 standards **for all** stationary source permitting activities, including determining when ambient air quality impact analyses are necessary for permitting,…".

As for the reasoning, it is explained better in the memo than I can.

[redacted]

5CCR1001-5 Part B § III.D.1 and 5CCR1001-5 Part B § III.F.1 respectively:

Grant the permit if the project will not cause an exceedance any NAAQS.

Deny the permit if the project cannot comply with the NAAQS.

PS Memo 10-01

Was officially rescinded in early 2021 shortly after the complaint was filed with EPA's OIG, but in practice the 40 tpy threshold continues to be used to circumvent the 1-hr NO_2 NAAQS.

PRELIMINARY ANALYSIS - PROJECT SUMMARY

Project Details	For Division Use Only
Review Engineer:	[redacted]
Package #:	422886
Received Date:	12/10/2019
Review Start Date:	12/31/2020

Section 01 - Facility Information

Company Name:	[redacted] Exploration & Production, LLC
County AIRS ID:	123
Plant AIRS ID:	A0B8
Facility Name:	[redacted] Tank Battery
Physical Address/Location:	NWNW quadrant of Section 35, Township 7N, Range 66W
County:	Weld County
Type of Facility:	Well Production Facility
What industry segment?	Oil & Natural Gas Production & Processing
Is this facility located in a NAAQS non-attainment area?	Yes
If yes, for what pollutant?	Ozone (NOx & VOC)

Section 04 - Public Comment Requirements

Is Public Comment Required?	Yes
If yes, why?	Requesting Synthetic Minor Permit

Section 05 - Ambient Air Impact Analysis Requirement

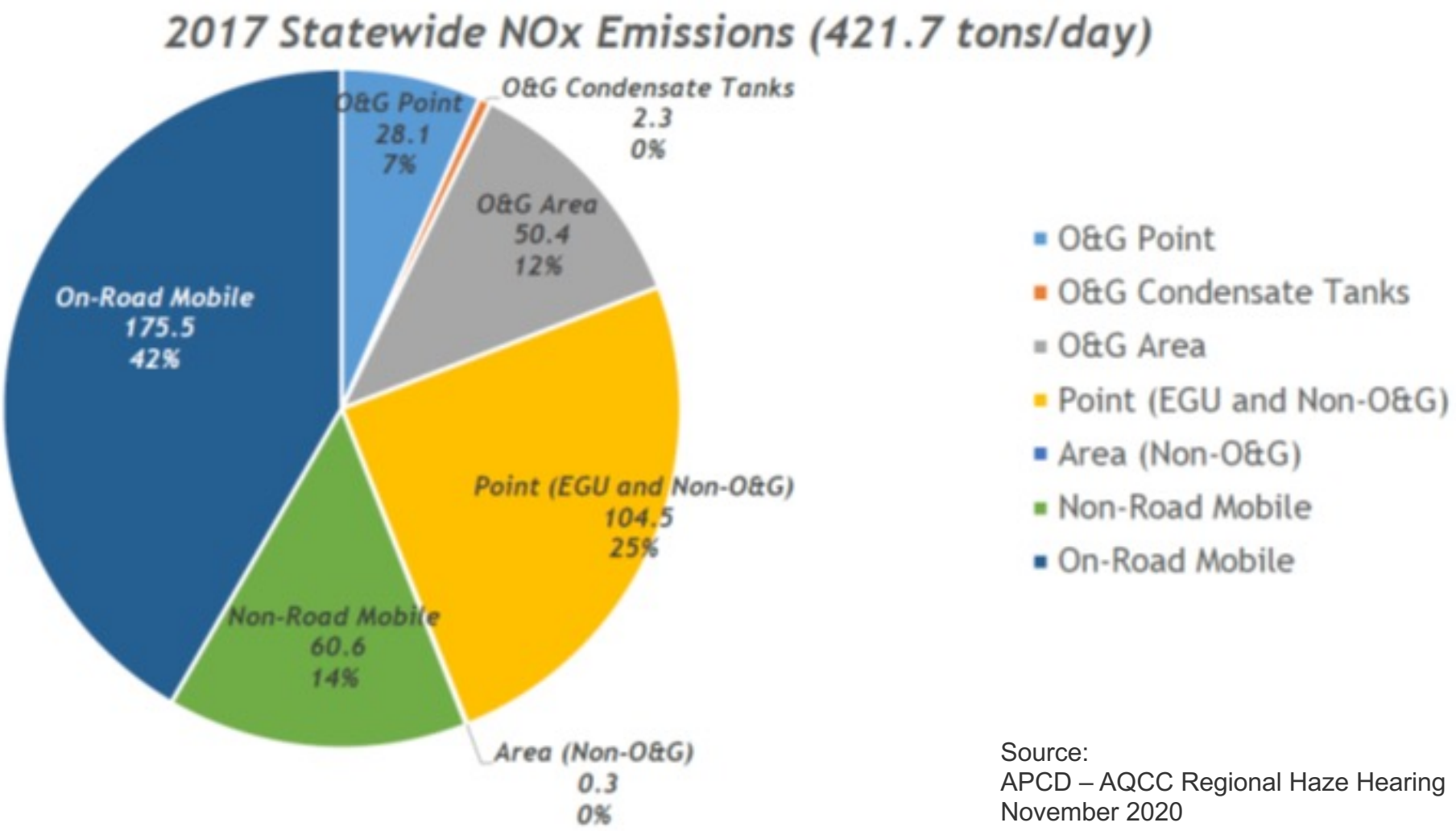
Was a quantitative modeling analysis required?	No
If yes, for what pollutants?	
If yes, attach a copy of Technical Services Unit modeling results summary.	

Status	Complete
History File Edit Date	8/25/2021
Ozone Status	Non-Attainment
Modified By:	[redacted]

EMISSIONS With Controls (tons per year)

.5	H2S	SO2	NOx	VOC	Fug	CO
0.8	0.0	0.0	10.7	26.5	0.8	22.

NOx Sources in Colorado



Source:
APCD – AQCC Regional Haze Hearing
November 2020

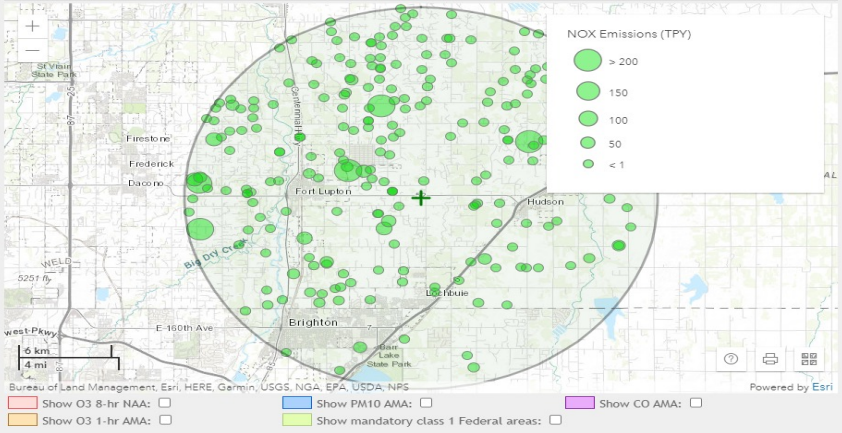
44% of all NOx emissions sources in the state are covered by PS Memo 10-01

Breaking up Projects

Projects with NOx emissions >40 tpy have also been able to circumvent the 1-hr NO_2 and 1-hr SO_2 NAAQS.

COUNTY_FIPS	SITE_ID	CONSTRUCTION_PERMIT_NUMBER	CONST_PERMIT_LAST_ISSUE_DATE	EMISSION_UNIT_ID	POLLUTANT_CODE	EMISSION_PROCESS_DESCRIPTION	PROC_EMIS_ESTIM	PROC_EMIS_ESTIM_UNITS
123	0185	18WE0133.XP	2/21/2018	016	NOX	CUMMINS GTA38 NG RICE	0.225	TY
123	0185	GP02	7/27/2017	014	NOX	NATURAL GAS RICE	12.077937	TY
123	0185	GP02	7/27/2017	008	NOX	NATURAL GAS RICE	11.350004	TY
123	0185	GP02	7/27/2017	015	NOX	NATURAL GAS RICE	12.077937	TY
123	0185	GP02	7/27/2017	009	NOX	NATURAL GAS RICE	10.254647	TY
123	0185	GP02	7/27/2017	010	NOX	NATURAL GAS RICE	11.350009	TY
123	0185	GP02	7/27/2017	013	NOX	NATURAL GAS RICE	12.077937	TY
						TOTAL NOX EMISSIONS	**69.413471**	

* There might be more permits than the ones in this list.



NEARBY FACILITIES IN 15 KM RADIUS	**237**
NOX EMISSIONS FROM NEARBY FACILITIES (TPY)	**2796**

Last modeling submitted in 2011

6 General Permits issued on the same date for 6 separate stationary engines, each with NOx emissions <40 tpy but all engines combined emit a total of 69 tpy.

Breaking up Projects

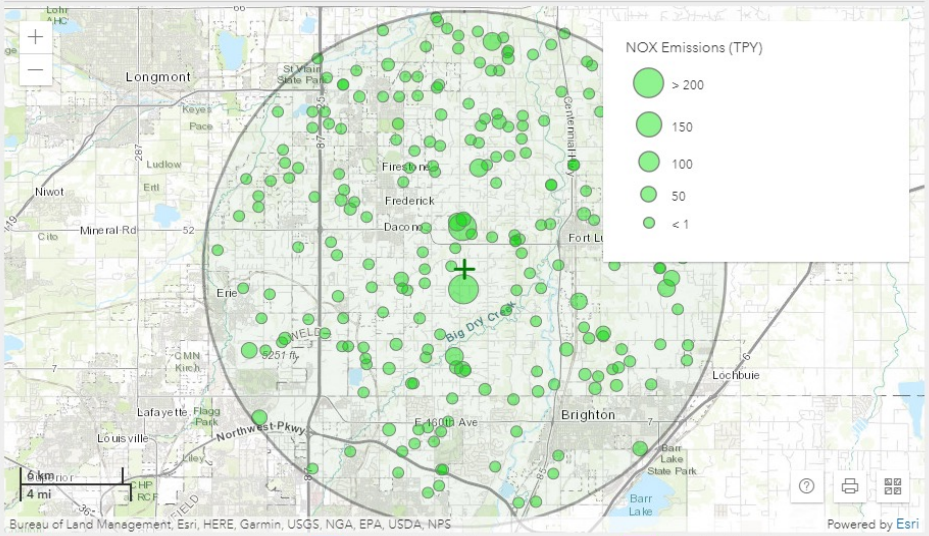
COUNTY_ FIPS	SITE_ID	CONSTRUCTION_PERMIT_ NUMBER	CONST_PERMIT_LAST_ ISSUE_DATE	EMISSION_ UNIT_ID	POLLUTANT _CODE	EMISSION_PROCESS_DESCRIPTION	PROC_EMIS_ ESTIM	PROC_EMIS_ ESTIM_UNITS
123	0184	01WE0349	7/3/2001 0:00	006	NOX	TEG GLYCOL DEHYDRATOR	0.18	TY
123	0184	03WE1153	10/20/2017 6:04	009	NOX	CATERPILLAR G3608 LE NG RICE	16.02	TY
123	0184	10WE1049	5/20/2013 11:38	011	NOX	CAT NAT GAS ENG RATED AT 1,775 HP	13.13	TY
123	0184	10WE1050	5/20/2013 11:31	012	NOX	CAT NAT GAS ENG RATED AT 1,775 HP	13.16	TY
123	0184	11WE1961	7/1/2013 14:31	013	NOX	CATERPILLAR NAT GAS ENG RATED AT 1,775 HP	12.14	TY
123	0184	11WE1962	7/1/2013 14:30	014	NOX	CATERPILLAR NAT GAS ENG RATED AT 1,775 HP	12.18	TY
123	0184	11WE1963	7/10/2013 11:45	015	NOX	CATERPILLAR NAT GAS ENG RATED AT 1,775 HP	11.00	TY
123	0184	11WE1964	7/10/2013 11:52	016	NOX	CATERPILLAR NAT GAS ENG RATED AT 1,775 HP	11.53	TY
123	0184	11WE1965	10/26/2017 6:10	017	NOX	GLYCOL DEHYDRATOR RATED AT 0.75 MMBTU/HR	0.39	TY
123	0184	12WE804	7/3/2012 0:00	004	NOX	COOPER BESSEMER NAT GAS FIRED ICE	54.02	TY
123	0184	98WE0452	3/10/2009 0:00	019	NOX	NAT GAS FIRED WAUKESHA ICE	6.50	TY
123	0184	98WE0453	2/17/2005 0:00	018	NOX	NAT GAS FIRED WAUKESHA ICE	42.70	TY
						TOTAL NOX EMISSIONS	**192.95**	

* There might be more permits than the ones in this list.

Last modeling submitted in 2010

NEARBY FACILITIES IN 15 KM RADIUS	**244**
NOX EMISSIONS FROM NEARBY FACILITIES (TPY)	**2492**

Queried Sources of Air Pollution



Show O3 8-hr NAA: ☐ Show PM10 AMA: ☐ Show CO AMA: ☐

Show O3 1-hr AMA: ☐ Show mandatory class 1 Federal areas: ☐

This map returns an inventory of stationary sources of air pollution based on origin coordinates, radius, and pollutant. To learn more about using this product, and other features of this product, click the help [?] icon on the lower right corner of the map.

Query at Longitude -104.8831 and Latitude 40.0669 for NOX sources within a 15(km) radius with emissions >0(TPY) returned 245 sources.

6 different permits issued in 2013 in less than 2 months for 6 separate stationary engines, each with NOx emissions <40 tpy but all engines combined emit a total of 73 tpy.

Breaking up Projects

With each emission unit being permitted individually, the determination of whether a NAAQS compliance demonstration is necessary or not, is biased, based only on a small fraction of the project's emissions.

From Title V Permit 95OPWE013, Major PSD source since at least 2002.

This facility is categorized as a PSD major stationary source (Potential to Emit ≥ 250 Tons/year for NO_X, CO, VOC). Future modifications at this facility resulting in a significant net emissions increase (see Reg. 3, Part D, Sections II.A.27 and 44) or a modification which is major by itself (Potential to Emit ≥ 250 TPY) for any pollutant listed in Regulation No. 3, Part D, Section II.A.44 for which the area is in attainment or attainment/maintenance may result in the application of the PSD review requirements.

YEAR OF PERMIT ISSUANCE	NOX EMISSIONS PERMITTED
1993	35.779899
1998	64.052197
2001	70.999933
2005	47.9996
2007	22.249982
2011	20.690539
2014	6.5
2015	36.269833
2016	8.5
2017	74.80001
2018	34.179337
2020	80.629179

It's even possible that major modifications at existing PSD facilities may have been avoided by breaking up projects.

PS Memo 10-01 + Breaking up Projects =

In the 5-year period from June 2016 to June 2021

12,959 air permits issued involving criteria pollutants

11,627 new permits

1,332 permit modifications

Only 42 have gone through a NAAQS compliance assessment in the same period – **Only 2 in the first half of 2021!**

There has been 1 major PSD permit in the last decade

How was NAAQS compliance verified for 12,917 permits issued in the last 5 years?

Per 5CCR1001-5 Part B § III.B.5

CDPHE must Prepare a Preliminary Analysis to determine what impact a project will have on ambient air.

Suggestion for EPA: Randomly check the Preliminary Analysis documents for a large sample of facilities/permits and look for the Ambient Air Impact Analysis Requirement section.

How was NAAQS compliance verified for 12,917 permits issued in the last 5 years?

O&G production facility

Section 05 - Ambient Air Impact Analysis Requirements	
Was a quantitative modeling analysis required?	Yes
If yes, for what pollutants?	CO
If yes, attach a copy of Technical Services Unit modeling results summary.	

Nat. gas processing plant

Section 05 - Ambient Air Impact Analysis Requirements	
Was a quantitative modeling analysis required?	No
If yes, for what pollutants?	
If yes, attach a copy of Technical Services Unit modeling results summary.	

O&G production facility

Section 11 – Modeling				
Is modeling required to demonstrate compliance with National Ambient Air Quality Standards (NAAQS)?		Yes	X	No
If "yes", for which pollutants? Why?				

Nat. gas compressor station

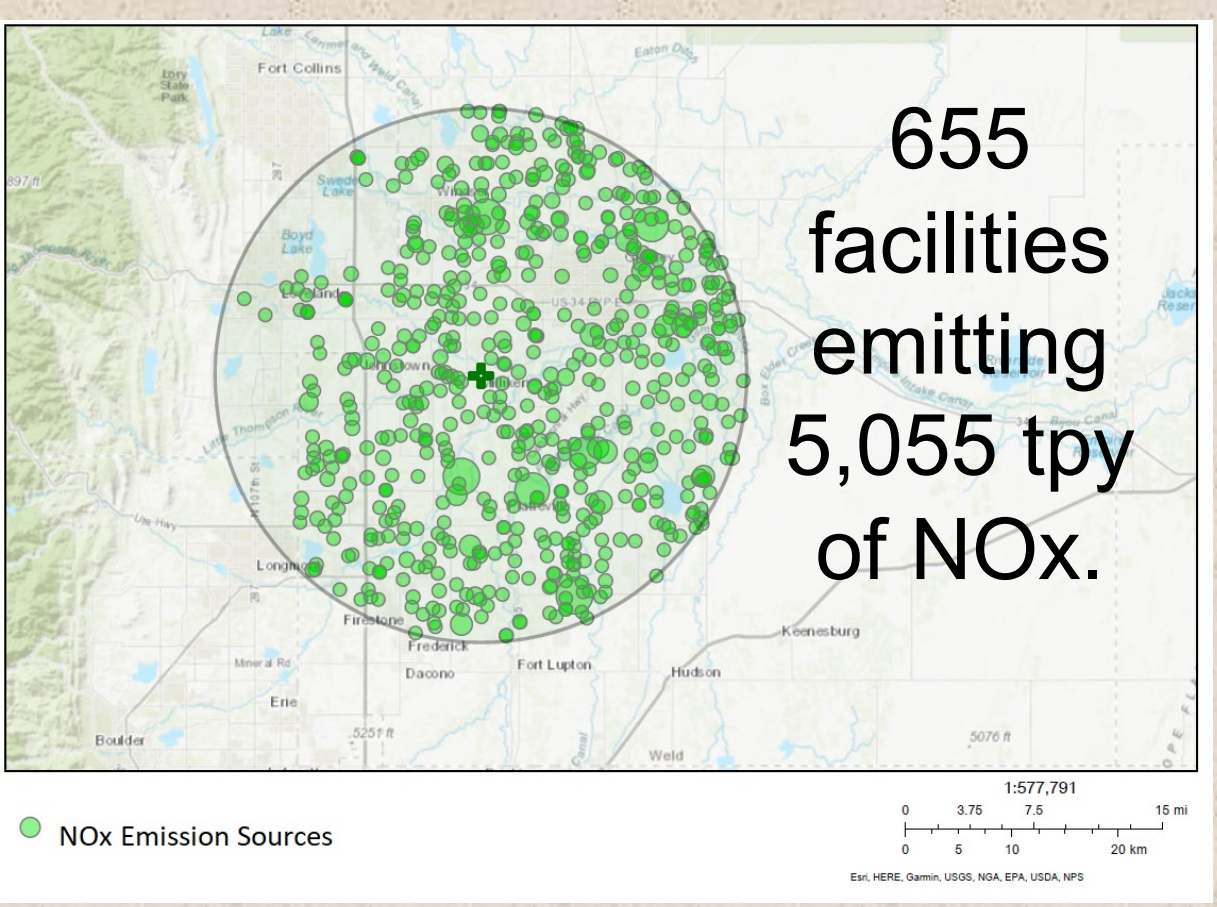
Section 05 - Ambient Air Impact Analysis Requirement	
Was a quantitative modeling analysis required?	No
If yes, for what pollutants?	
If yes, attach a copy of Technical Services Unit modeling results summary.	

Gravel pit

While the controlled PPD for PM10 is above the modelling threshold, since the controlled TPY of PM10 is significantly below 15, no modelling will be required per [redacted] guidance.

The Consequence of PS Memo 10-01 and Breaking up Projects

Unfettered growth of emissions, especially NOx in the Ozone NAA.

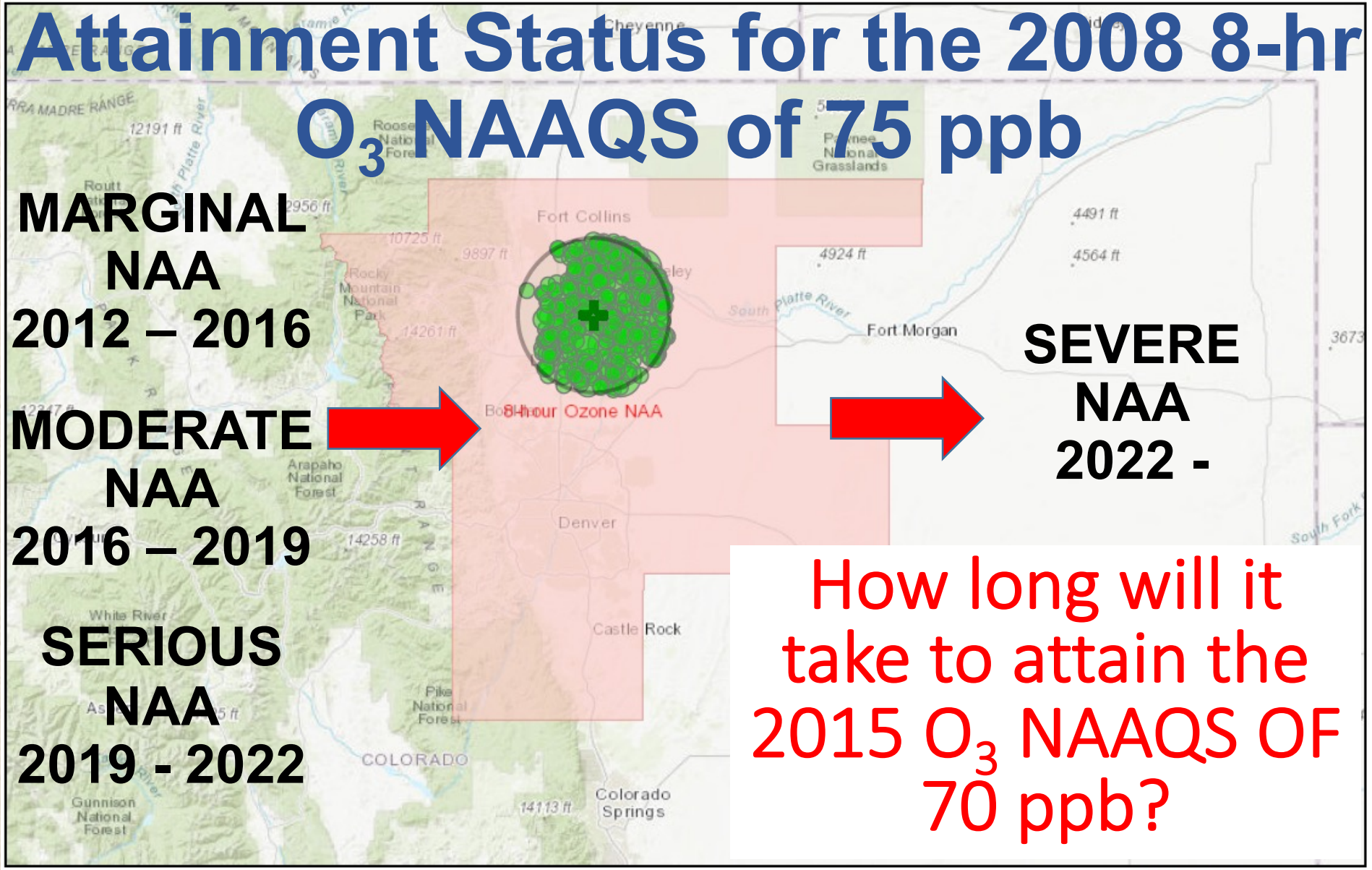


655 facilities emitting 5,055 tpy of NOx.

46% of those emissions are from sources with < 40 tpy.

Only 6 facilities emit >100 tpy of NOx.

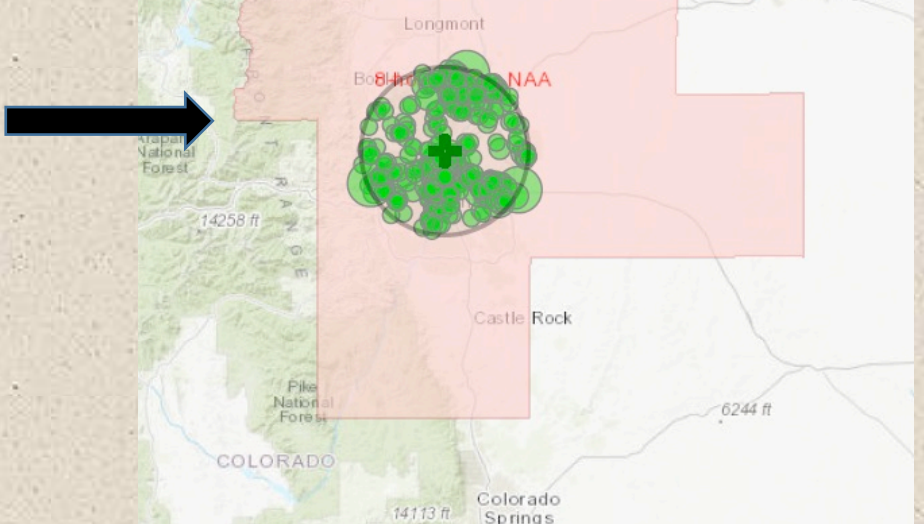
Attainment Status for the 2008 8-hr O_3 NAAQS of 75 ppb



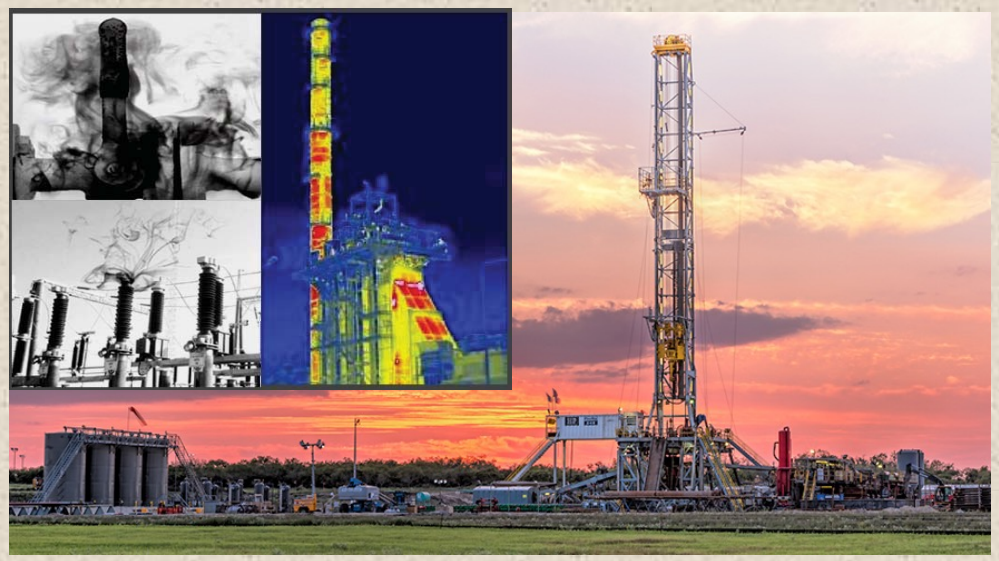
How much of the O_3 problem is caused by NOx emissions from minor sources?

Is there a strategy to control NOx emissions from minor sources?

VOCs + NOx +



Current Control Strategies



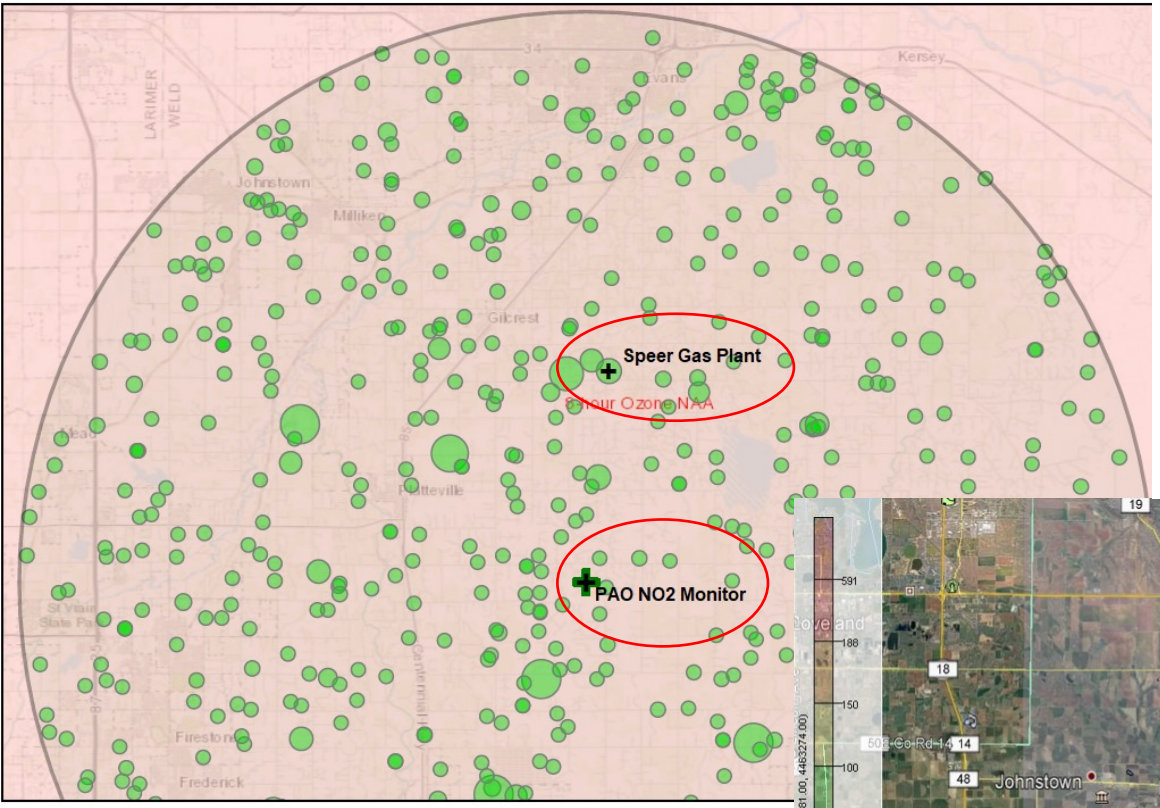
VOC leaks from O&G

NOx / VOC from vehicles

Current control strategies are important, but 10 years of deteriorating NAA status shows that they simply are not enough to solve the ozone problem

Enforcing the 1-hr NO_2 NAAQS prior to issuing air permits should be part of the solution

Platteville Atmospheric Observatory (PAO) NO2 Monitor and Nearby Sources



NOx Sources

8-hr Ozone NAA

Is there a 1-hr NO_2 NAAQS NAA?

Monitored at PAO 2021

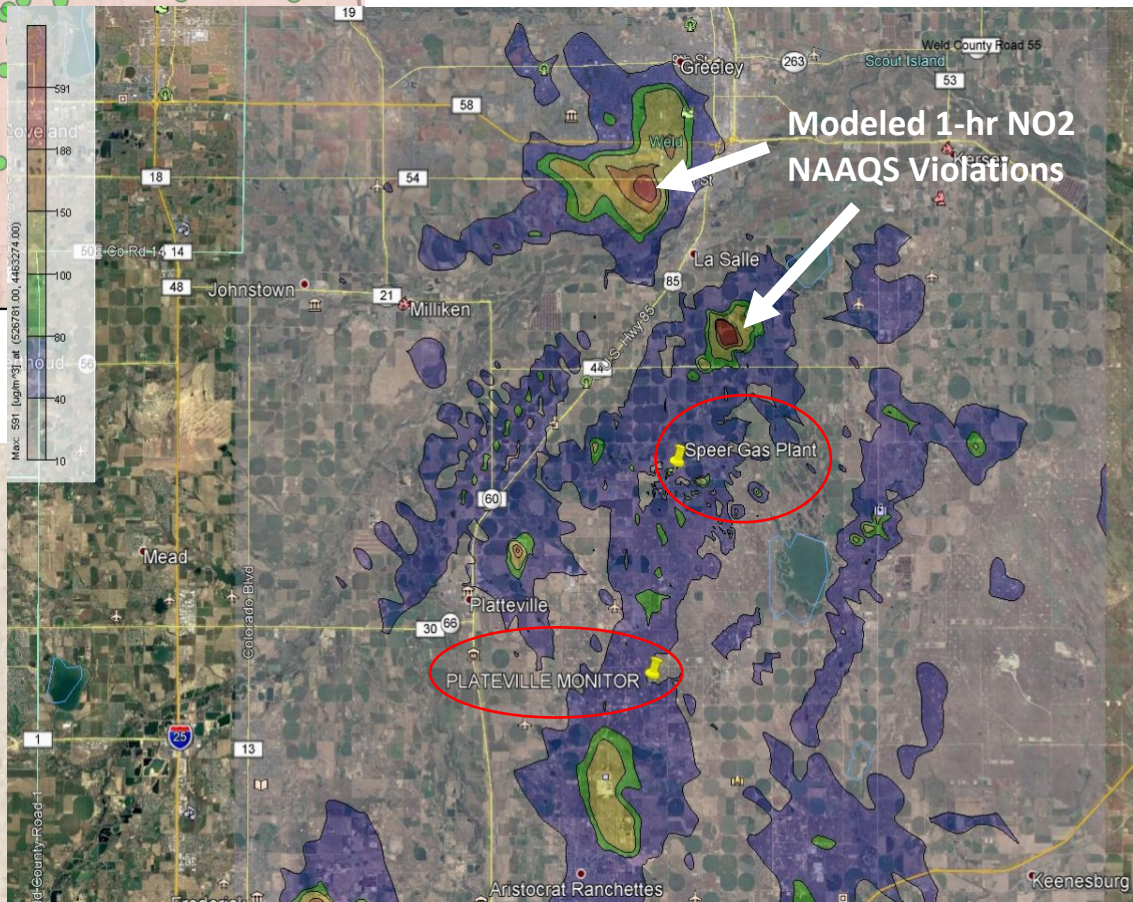
H8H = 41 ppb

H1H = 44 PPB

Modeled at PAO 2020

H8H = 14 ppb

H1H = 23 ppb



Arbitrary Decisions to Circumvent the NAAQS

"After consulting with some higher-ups, I agree that modeling for the 24-hour PM2.5 standard will not be required in this case.

Unfortunately, we don't have a specific written policy I can point to that says "you can always ignore the daily PM2.5 modeling threshold", but we do it on more of a case-by-case basis."

03/11/2020 email from a CDPHE permit engineer to an applicant.

"Yes, the decision to allow Bowie, and three other sources, to not be required to model the PM2.5 was made by upper management. I haven't been told it has been rescinded. I think they get a pass until this permit action is completed."

02/19/2013 email from a CDPHE permit engineer to a permit modeler.

03/29/2011 email from permit engineer to supervisor:
"They are increasing SO_2 from 0.2 tpy to 60.7 tpy"

04/01/2011 response from supervisor:
"If we are to pursue modeling, I would suggest it be limited to compliance with the annual/24-hr SO2 standards…"

Failing to ensure the Scientific Integrity of the NAAQS Compliance Analyses

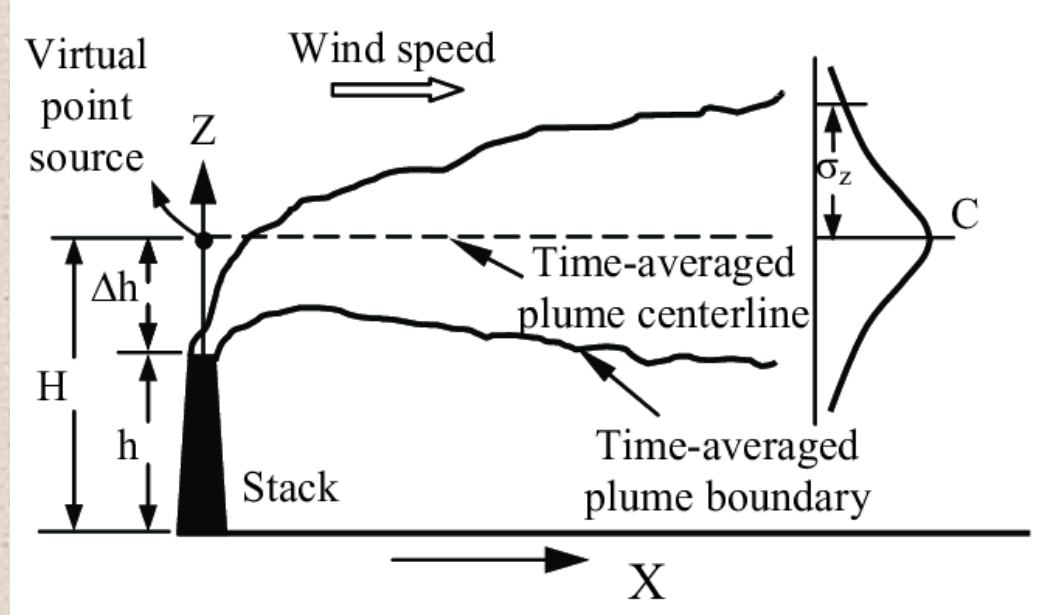
- Authorizing the use of only 3 months of monitored data to create an annual seasonal-hourly background concentration profile for modeling 1-hr NO_2.
- Authorizing to monitor background concentrations for modeling without any QA/QC procedures in place and with non FRM or FEM monitors.

Failing to ensure the Scientific Integrity of the NAAQS Compliance Analyses

- Authorizing the use of NO_2/NOx ISR that are impossible to achieve.
- Authorizing the dilution of the ozone background concentration when modeling NO_2 with the OLM option.
- Authorizing the use of incomplete meteorological data for permit modeling.

"…for minor NSR issues, EPA has minimal requirements and typically defers to the states to implement their SIPs."

04/07/2017 email from EPA R8 to Colorado



The science behind modeling the dispersion of pollutants in the atmosphere is exactly the same regardless of the major or minor source status of the modeled facility.

For practical purposes there are no NAAQS in Colorado.

NAAQS are very rarely enforced within Colorado's NSR program

Some areas designated as "Unclassifiable / Attainment" for the 1-hr SO_2 NAAQS might really be NAA if the modeling is done correctly.

There is modeling data supported by monitored concentrations showing a potential 1-hr NO_2 NAAQS NAA.

There are also signs that PSD Increment levels may have already been exceeded in many parts of the ozone NAA.

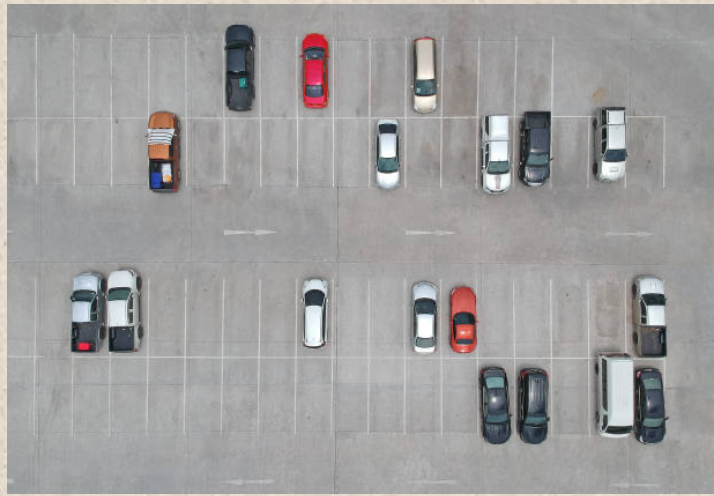
Colorado's NSR Permitting Program

About 40 permit engineers to issue permits

2 permit modelers to verify NAAQS

This structure needs to change if we want to improve air quality in Colorado

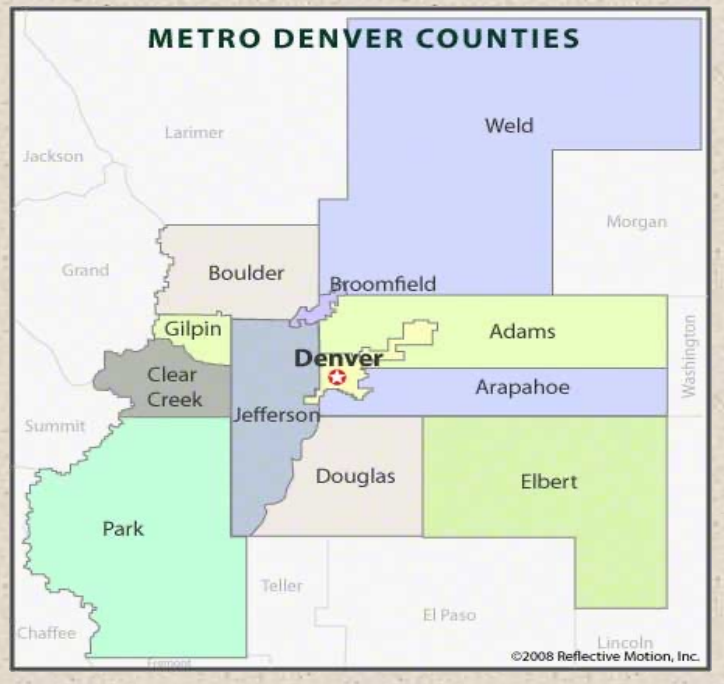
Permits alone don't ensure good air quality



Other Possible Solutions?

Involve local governments in the NAAQS compliance process.

Contracting air quality modeling reviews with local governments to supplement the State's resources while at the same time strengthening local governments' ability to deal with air quality problems



CO SB11-235 already allows this process to occur with private consulting companies at the expense of the regulated industry.

Oversight from EPA is necessary to ensure that Colorado's SIP is implemented correctly and that NAAQS are enforced as part of the NSR permitting process

Lest we forget…

THE CURRENT O_3 NAAQS PROMULGATED IN 2015 IS 70 PPB!

Colorado has NOT been able to attain the 2008 O_3 NAAQS of 75 PPB for a full decade

Brace yourself for another decade of poor air quality with uncontrolled O_3 precursor emissions.

Questions?