

Drill Rig Permitting: The Issues

Global Policy Working Group Meeting

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Issues Overview

- Regulating drill rigs within a stationary source permitting program has created three fundamental, and substantial, issues:
 1. Permitting requires modeling to show compliance with the National Ambient Air Quality Standards (NAAQS) – this is an obstacle for rigs now and will only become more difficult later.
 2. Aggregating well sites with processing facilities and permitting the drill rigs that visit them has brought into play the issue of increment protection and the attending proposal to prohibit pad revisitation for two years after a rig has left it.
 3. Regulating drilling activities in a stationary source permitting program results in Lessee permits containing requirements that apply to contractor owned and operated equipment. Because of how rigs are deployed, this creates impractical and potentially insurmountable administrative problems.

Issue #1

- Permitting of drill rigs requires modeling for compliance with the national ambient air quality standards (NAAQS)
- Modeling for compliance was not a problem until 2010
 - In 2010, EPA lowered the NAAQS for NO₂
 - Drill rigs must now, or eventually, model for compliance with this new standard
 - Nationwide, modeling existing drill rigs under the 1-hour NO₂ NAAQS has been unsuccessful
 - Study of the issue reveals this is a modeling problem, there is no violation of any NAAQS

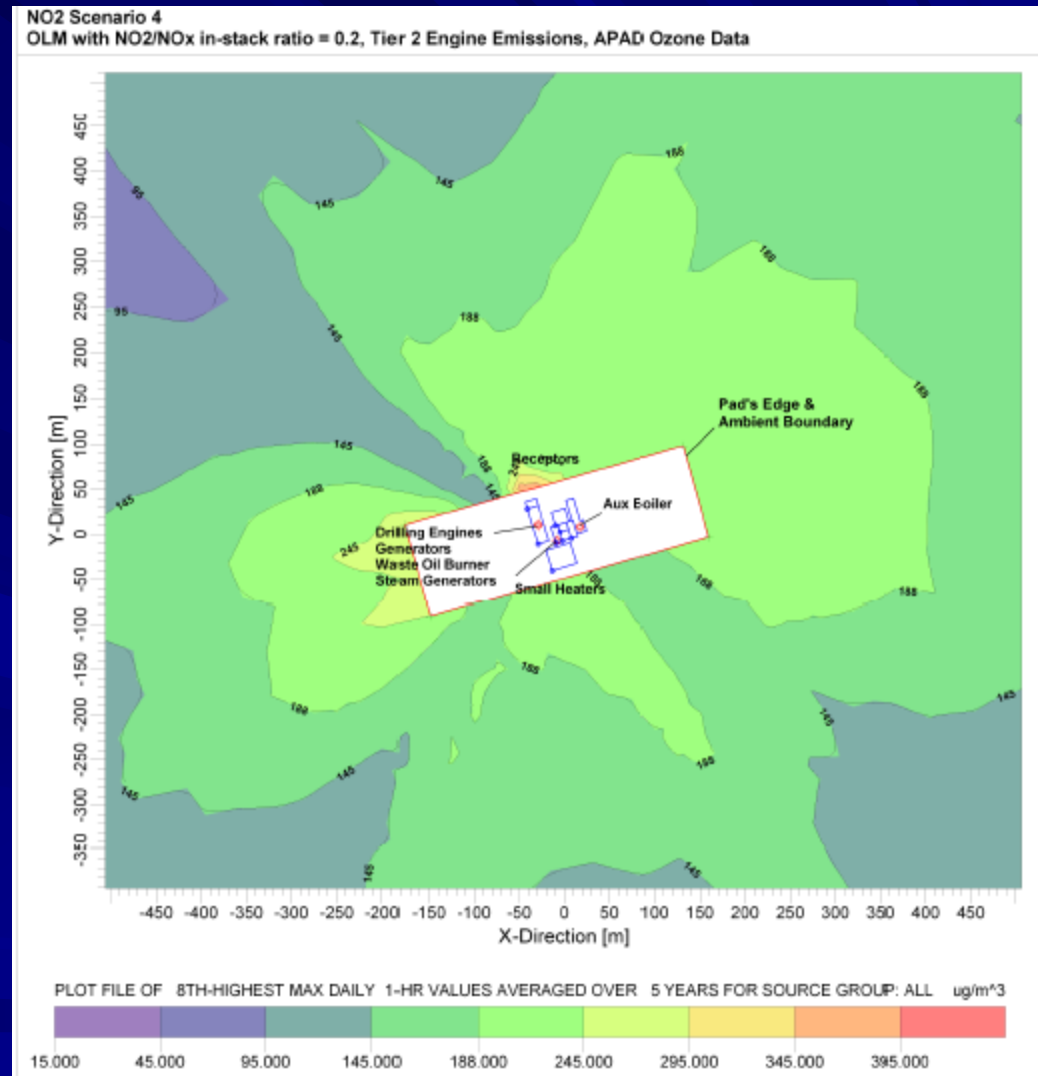
Modeling

- When obtaining a permit, drill rigs have to show they meet the NAAQS via modeling
- The modeling requirements are very prescriptive
 - 18 AAC 50.215(b)(1) requires use of 40 CFR 51, Appendix W
 - 40 CFR 51, Appendix W prescribes:
 - Types of models than can be used;
 - How to incorporate meteorological information;
 - How to incorporate background (i.e., existing) concentrations into the modeled concentrations; and most important here:
 - How the source should operate within the model
- 40 CFR 51, Appendix W directs the modeler to model the source at design capacity or at an operating level that is translated to an enforceable permit limitation

Modeling at Design Capacity

Model Inputs & Results

- Generic rig, generic pad
- All Tier 2 engines on rig
- Single rig only
- No rig camp
- No well-servicing equipment
- No other pad sources (heaters, processing equipment)
- This other equipment often exists and will only increase the modeled impacts
- **Max impact = 210 ppb**
- **Standard = 100 ppb**
- **Note: values on plot at right are in $\mu\text{g}/\text{m}^3$**



Most current drilling activities, when modeled, will show higher impacts

Modeling at a Restricted Capacity

- A permittee may model the equipment at less than design capacity or with realistic operating scenarios.
- As shown on the following slides, the resulting permit conditions can be challenging and often quite onerous.

Restricted Capacity Permit Conditions

F. Operate the drilling rig sources listed in Exhibit A, Section B as follows:

1. The Permittee may operate CP1 and CP2 sources for no greater than 500 hours per unit per twelve-month period.
2. Drill rig sources DR11 through DR15 may be operated no greater than 8,322 hours per unit per twelve-month period.
3. Limit concurrent operation of Drill Rig Sources DR1, DR3, DR5, and DR6 to no more than one unit, except when moving the drill rig between wells. Limit concurrent operation of Drill Rig Sources DR1, DR3, DR5, and DR6 to no more than two units when moving the Drill Rig between wells;
4. Do not operate DR2 & DR4 (Cat 399TA) during drilling operations at CD-1 or CD-2. Drill Rig Source DR2 is authorized to operate during rig movement activities;

These are older restrictions imposed to protect the increments. They effectively require operation on highline power only – a challenge.

NAAQS-Related Permit Conditions on the OCS: an Extreme but Real Example

- A 500 meter safety zone published in the Federal Register was required for the 1-hour NO₂ standard
- Icebreakers could not come within 5 miles of drill rig
- Oil spill response vessels had to stay at least 10 miles away from drill rig
- In resupplying the rig, the number of days and the amount of time alongside was strictly limited
- Only one tug could be near the rig as it was jacking up
- No vessels within 25 miles of the rig could be refueled

**The above were draft permit conditions deemed unworkable by the permittee.
This permitting effort had to be restarted.**

Modeling Issues Summary

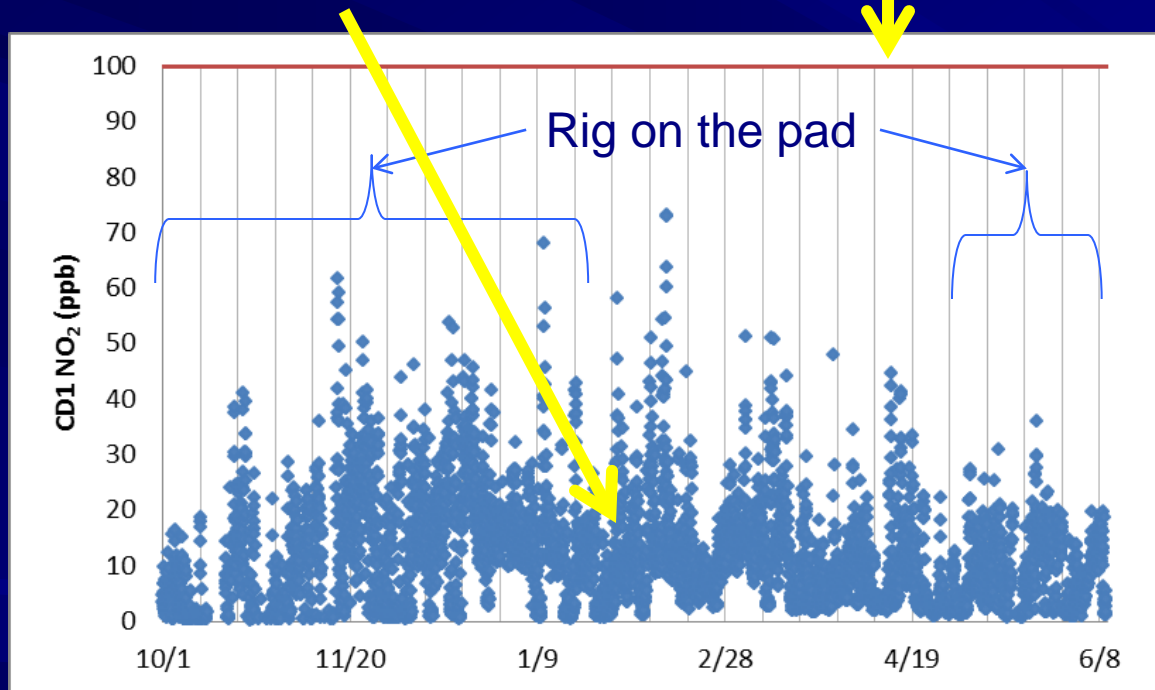
- **Drilling, particularly exploration drilling, requires flexibility within air permits**
 - The locations can be very remote
 - The conditions both above and below the surface can require the need for rapid adaptation
- **Permit restrictions on engine use or engine capacity decreases the ability to adapt and can cause safety issues**
- **Permit restrictions on rig power generation are not likely to work at remote locations**
- **For the newest NAAQS, no workable restricted capacity operations have been identified for rigs**

Monitoring data shows the restrictions are unnecessary.

Reality: Monitoring Information (CD1)

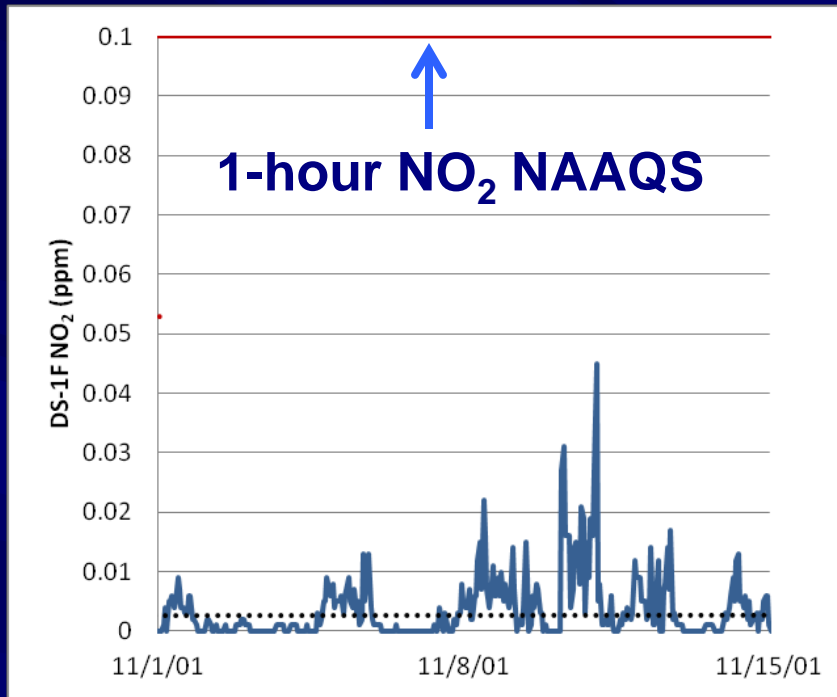
1-hour NO_2 NAAQS

1-hour NO_2 Measurements



Even with a major processing facility nearby, monitoring shows drill rig compliance

Monitoring Information (DS-1F)



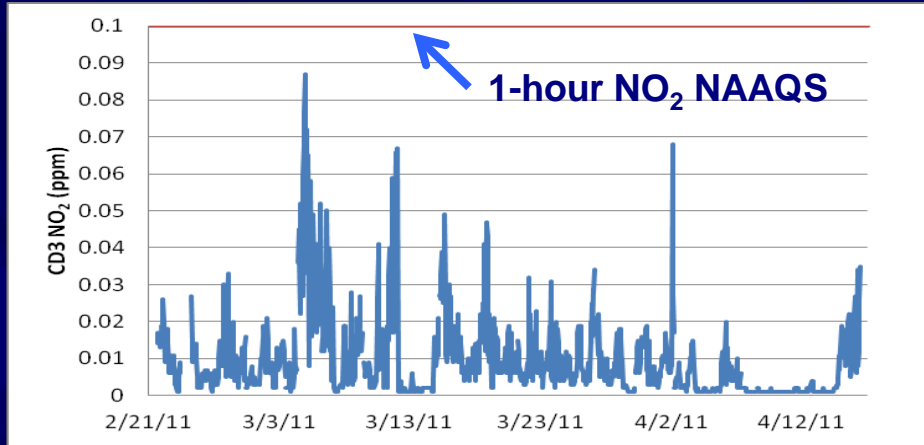
***Rig present the entire time**



Date	NO ₂ (ppm)	Wind Direction (°)	Wind Speed (m/s)
11/11/2001 1:00	0.045	110 (ESE)	3.3

Monitoring Information (CD3)

Monitoring Station



*Rigs and servicing equipment present entire time

Date	NO ₂ (ppm)	Wind Direction (°)	Wind Speed (m/s)
3/4/2011 23:00	0.087	267 (W)	1.5
3/12/2011 1:00	0.067	296 (WNW)	1.5
4/2/2011 2:00	0.068	267 (W)	1.0

Even a dual rig drilling program, with simultaneous well-servicing occurring, does not threaten the ambient standards

Year Range	3-year average of 1-hour NO ₂ (ppm)*
1992-94	0.056
1993-95	0.061
1994-96	0.050
1995-97	0.048
1996-98	0.038
1997-99	0.033
1998-00	0.036
1999-01	0.036
2000-02	0.037
2001-03	0.040
2002-04	0.041
2003-05	0.041
2004-06	0.048
2005-07	0.051
2006-08	0.054
2007-09	0.035
2008-10	0.032
2009-11	0.031

* Consistent with the NAAQS, each year's eighth highest measurement is averaged with each of the preceding two years' eighth highest measurements to determine compliance

Monitoring Information (A-Pad)



Issue #1 Summary

- Models are not well-designed to handle the new NAAQS.
- No measured information exists that shows drill rigs are any threat to any of the NAAQS.
- ADEC requires reasonable assurance that the NAAQS are met and protected.
- The summaries above show that the reasonable assurance is there for all the drilling activity configurations that have occurred over the past several years.
 - Aggressive dual rig/well-servicing operations
 - Numerous and diverse well-servicing operations
 - Rigs deployed without grid power
 - Rigs located on pads with major air pollutant sources
 - No configurations are known that would change this conclusion

Issue #2

- Regulating drill rigs in a stationary source permitting program combined with the decision to aggregate well sites with processing facilities has brought into play standards and requirements unachievable, using existing tools, for drill rigs and drilling programs
 - At major facilities, increment must be protected
 - This is $\sim 1/4^{\text{th}}$ the NAAQS
 - Since drill rigs already have major difficulty modeling for compliance with the NAAQS, modeling compliance with the increments is at least four times more challenging
- The solution proposed by ADEC to avoid this - staying away from a pad for at least 24 months after leaving – is not realistic under any drilling program.

Pad Visitation Restrictions

- Robust and steady oil production, and well integrity, requires rigs to visit a pad often more frequently than once each two years.
- Efforts to minimize footprint and extend reach require more wells per pad so pad activity is obviously going to increase
- This issue might be 90% solved if we avail ourselves of the recent 6th Circuit Federal Court decision that opens up the possibility of safely disaggregating well sites from processing facilities
- The restriction may still be applied at locations like CD1, DS-1B, or on a platform, however

Issue #3

- Lessee permits contain obligations to ensure that contractor-owned and operated equipment complies with emission and work practice standards.
- This has become a recently heightened concern with EPA's promulgation of the "Boiler MACT".
- But Lessees have no direct oversight or control regarding the routine operation of or maintenance on contractor-owned equipment such as heaters, engines, or boilers.
- Contractors have ensured the emission and work practice standards are met but many practical issues are raised when the standards are included in Lessee permits.

Issue #3: The Practical Problems

- Standards such as those in the Boiler MACT apply at all times and are attended by recordkeeping and reporting provisions.
- Rigs & camps move from Lessee to Lessee and may be absent from one's field for years.
- How can the Lessee continuously assure compliance in this case?
- Should the requirements be listed in all the Lessee's permits?
- If something goes wrong, who is responsible? All parties?
- It is administratively impractical for Lessees to assure compliance with standards that apply even while the rigs and camps are operated away from the Lessee's facilities.

Concluding Points

- All data collected to date shows that the NAAQS are being met. Furthermore, EPA's Title 2 program (engine Tier regulations) is going to result in the air quality becoming only better over time.
- Permitting drill rigs is not a common practice in the US. We are aware of no states that require air permits for drill rigs and two that regulate rigs within a "registration" program (CA, WY).
- The fact that the NAAQS are protected, that the ambient air quality impacts from drill rigs will only lessen with time, and because of the major issues highlighted here, we believe that Alaska can and should seek a less administratively burdensome approach to drill rig regulation.