Public Health and the Proposed Pit Rule

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BEFORE THE OIL CONSERVATION COMMISSION
CASE NO. 14784 NMOGA EXHIBIT 11-1
HEARING DATE: MAY 14, 2012

Objective

- Evaluate whether the proposed revisions to the Pit Rule are reasonable, and protective of public health.

BEFORE THE OIL CONSERVATION COMMISSION
CASE NO. 14784 NMOGA EXHIBIT 11-2
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Hazard vs. Risk

"Hazard" is the ability to cause an adverse effect.

"Risk" is the probability of the adverse effect occurring.

"Hazard" without "Risk" has no public health or environmental consequence.

BEFORE THE OIL CONSERVATION COMMISSION
CASE NO. 14784 NMOGA EXHIBIT 11-3
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What is in Oil & Gas Pits?

- **The Industry Sampling Program (2006)** – sampled solids from three drilling/reserve pits in NW New Mexico (gas production); and three pits in SE New Mexico (oil production).

The OCD Sampling Program (2007) – sampled solids and residual liquids from 21 drilling/reserve pits, 2 production pits, and 2 closed-loop tanks – 12 samples from NW New Mexico (gas production); and 25 samples from SE New Mexico (oil production).

BEFORE THE OIL CONSERVATION COMMISSION
CASE NO. 14784 NMOGA EXHIBIT 11-4
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Findings of Industry Program

Total Petroleum Hydrocarbon (GRO + DRO)

NW (Gas) Average	1800 mg/kg
SE (Oil) Average	7700 mg/kg
OCD Criterion	2500 mg/kg

BEFORE THE OIL CONSERVATION COMMISSION
CASE NO. 14784 NMOGA EXHIBIT 11-5
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Findings of Industry Program

Chloride Anion

NW (Gas) Average	3,900 mg/kg
SE (Oil) Average	125,000 mg/kg

BEFORE THE OIL CONSERVATION COMMISSION
CASE NO. 14784 NMOGA EXHIBIT 11-6
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Findings of Industry Program

Arsenic

NW (Gas) Average	4.1 mg/kg
SE (Oil) Average	2.3 mg/kg
NMED Tier 1 Residential SSL	3.9 mg/kg

Not TCLP Hazardous – Not bioavailable; not environmentally mobile

BEFORE THE OIL CONSERVATION COMMISSION
CASE NO. 14784 NMOGA EXHIBIT 11-7
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Findings of Industry Program

Barium

NW (Gas) Average	10,000 mg/kg
SE (Oil) Average	1,763 mg/kg
NMED Tier 1 Residential SSL	5,450 mg/kg

Not TCLP Hazardous – Not bioavailable; not environmentally mobile

BEFORE THE OIL CONSERVATION COMMISSION
CASE NO. 14784 NMOGA EXHIBIT 11-8
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Findings of Industry Program

Benzene

NW (Gas) Average 0.12 mg/kg

SE (Oil) Average 8.17 mg/kg

NMED Tier 1 Residential SSL 10.3 mg/kg

High concentrations in SE solids from Pit LC-1 may be analytical artifact (not real).

Benzene in TCLP leachate tests of solids from Pit LC-1 all exceed WQCC 3103 criterion (0.01 mg/L).

BEFORE THE OIL CONSERVATION COMMISSION
CASE NO. 14784 NMOGA EXHIBIT 11-9
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Findings of OCD Program

OCD's analytical results are generally consistent with those of the Industry, and will not be detailed here.

BEFORE THE OIL CONSERVATION COMMISSION
CASE NO. 14784 NMOGA EXHIBIT 11-10
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Constituents of Concern

Several hundred chemicals are present in oil & gas pits.

Vast majority are present at concentrations so low that they present no risk to health or environment.

Most of the remainder are present at the point where public contact would occur at concentrations so low that they present no risk, or are well within acceptable risk tolerances (e.g., adverse effect not expected or no significant increased risk of cancer).

These chemicals pose no risk to public health, environment, or natural resources, if pits are managed and closed as required by the Pit Rule, even with the revisions proposed by Industry.

BEFORE THE OIL CONSERVATION COMMISSION
CASE NO. 14784 NMOGA EXHIBIT 11-11
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Constituents of Concern

Only a few compounds are present in a form or at a concentration that are (in my opinion) of potential regulatory concern:

Total Petroleum Hydrocarbon (GRO + DRO)

Chloride Anion

Benzene

BEFORE THE OIL CONSERVATION COMMISSION
CASE NO. 14784 NMOGA EXHIBIT 11-12
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Constituents of Concern

Total Petroleum Hydrocarbon (GRO+DRO)

GRO fraction (120-400°F) contains compounds that are slightly water-soluble (especially the single-ring aromatics). Could become environmentally mobile if a release from a pit occurs.

DRO fraction (350-760°F) also contains compounds that are slightly water-soluble, and potentially environmentally mobile.

GRO+DRO's primary concern is potential to adversely affect the taste and usability of fresh water sources.

BEFORE THE OIL CONSERVATION COMMISSION
CASE NO. 14784 NMOGA EXHIBIT 11-13
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Constituents of Concern

Chloride Anion

Chloride salts are water-soluble, and environmentally mobile.

Chloride anion is not considered to be toxic to man or animals.

Chloride anion can adversely affect the growth of many plants.

Chloride salts can adversely affects the taste and usability of freshwater sources.

BEFORE THE OIL CONSERVATION COMMISSION
CASE NO. 14784 NMOGA EXHIBIT 11-14
HEARING DATE: MAY 14, 2012

Constituents of Concern

Benzene

Benzene is a component of the GRO fraction, and is one of the more soluble and environmentally mobile constituents (saturation = 1850 mg/L in fresh water).

Is a human bone marrow poison and a human carcinogen.

Although present in the pits at low concentration, many regulatory agencies consider any exposure to a carcinogen to be unacceptable.

BEFORE THE OIL CONSERVATION COMMISSION
CASE NO. 14784 NMOGA EXHIBIT 11-15
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Rule Addresses Constituent Risks

- Direct exposure risks are addressed by the siting, fencing, removal and/or closure requirements.
- Water risks are addressed by the siting, design, operational and closure criteria.

BEFORE THE OIL CONSERVATION COMMISSION
CASE NO. 14784 NMOGA EXHIBIT 11-16
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Conclusions

The proposed Industry approach to pit closure provides a number of benefits compared to OCD's current policies:

- If liners are intact, onsite pit closure and landfills are equally protective.
- Small onsite pit closures (small mass of toxicant) presents less risk to water than large landfills (large mass of toxicant).
- Direct exposure risks are *de minimis* for onsite pit closure.

BEFORE THE OIL CONSERVATION COMMISSION
CASE NO. 14784 NMOGA EXHIBIT 11-17
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Conclusion

- Revisions to the Pit Rule as proposed by Industry, provides for appropriate protection of public health and the environment.

BEFORE THE OIL CONSERVATION COMMISSION
CASE NO. 14784 NMOGA EXHIBIT 11-18
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