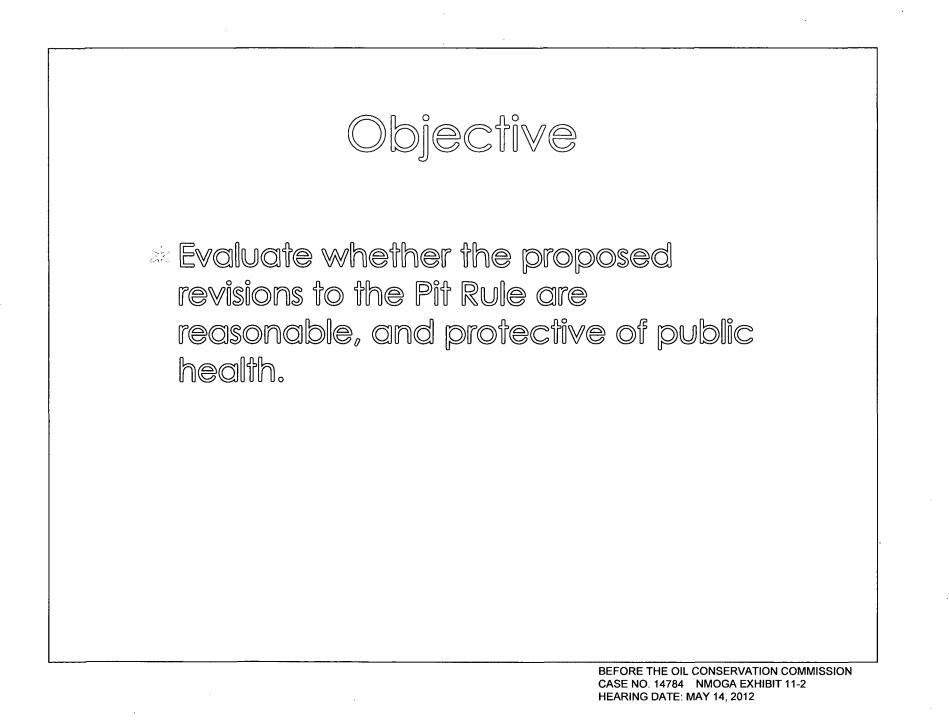
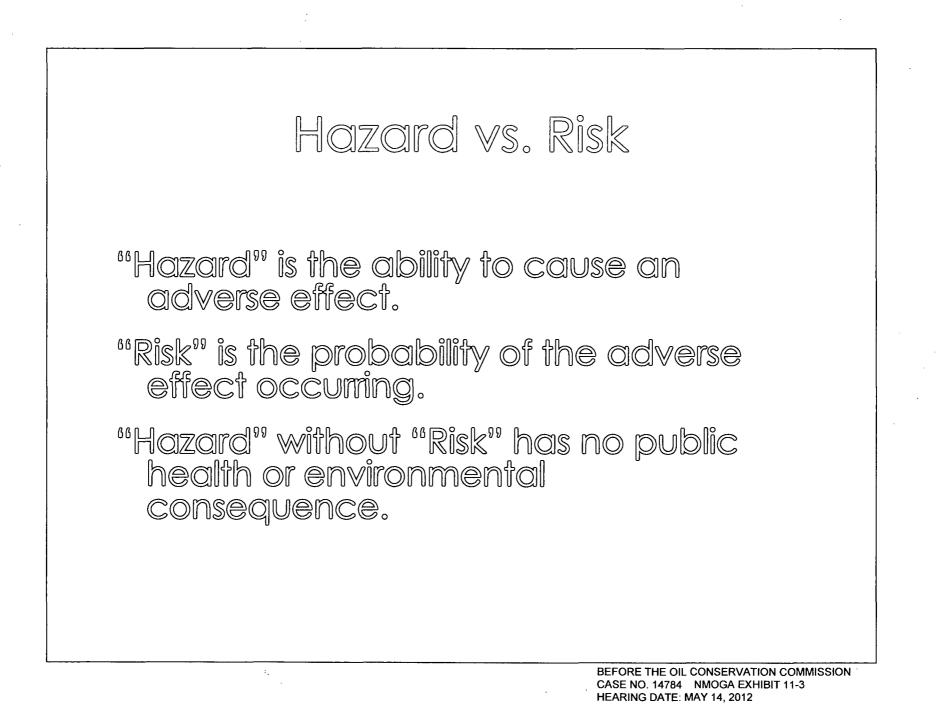
Public Health and the Proposed Pit Rule

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





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).

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Total Petroleum Hydrocarbon (GRO + DRO)

NW (Gas) Average

1800 mg/kg

7700 mg/kg

SE (Oil) Average

OCD Criterion

2500 mg/kg

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<u>Chloride Anion</u>

NW (Gas) Average

SE (Oil) Average

3,900 mg/kg

125,000 mg/kg

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Arsenic

NW (Gas) Average 4.1 mg/kg

SE (OII) Average 2.3 mg/kg

NMED Tier 1 Residential SSL 3.9 mg/kg

Not TCLP Hazardous – Not bioavailable; not environmentally mobile

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Banium

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

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<u>Benzene</u>

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).

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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.

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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.

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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

<u>Benzene</u>

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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.

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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.

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<u>Benzene</u>

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.

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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.

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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.

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