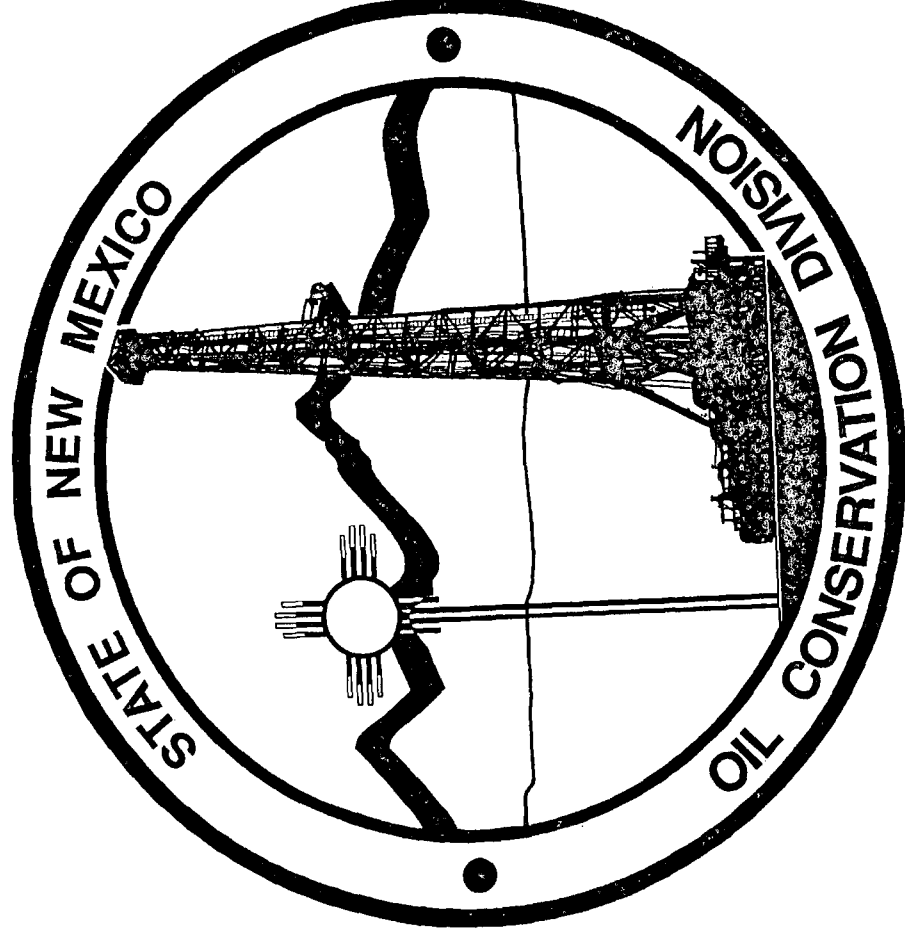
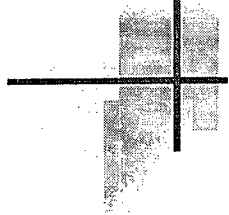


CASE NO. 14015
OCD EXHIBIT 6



Final Appeal to the
Oil Conservation Commission
For
Statewide Ban on Unlined
Permanent Pits



Evolution of NM Pit Regulations

- 1931 State Engineer declares Lea County Water Basin.
- 1953 State Engineer declares all water <10,000 mg/l is protectable.
- **1956 OCC Order R-1224**
 - +State Engineer Requests OCC to enact rules governing brine water disposal in parts of Lea Co. NM-
 - +OCC orders operators to perform a due diligence study.

Evolution of NM Pit Regulations

- 1958 OCC Order R-1224-A

+State Engineer request that portions of Lea Co. NM underground water basin be protected from oilfield brine discharges into unlined pits.

+OCC ordered such protection with small quantity exemption allowed and rescinded protection studies for other parts of Lea County (southern).

- 1963 OCC Order R-2526

+OCC show cause hearing to several operators who were discharging brine water into unlined pits in the Lea County Underground Water Basin.

+OCC orders operators to cease discharging into unlined pits.

Evolution of NM Pit Regulations

■ 1964 OCC R-2788

- +OCC heard a request by Dr. Sam Dunn to review a previous directive by the OCC on a moratorium on discharging salt water into unlined pits near the Pecos River in Ts 6-7 R 26 E.
- +OCC ordered discharging within 2 miles of the Pecos River was prohibited in these areas, but allowed limited quantities when operations were further than 2 miles.

■ 1966 OCC R-3164

- +OCC held a show cause hearing for operators that had been notified of discharging produced salt waters into the Vacuum Field located west of Hobbs, NM which was part of the declared water basin designated for protection by the State Engineers office.
- +OCC orders all operators to cease by certain deadlines.

Evolution of NM Pit Regulations

■ 1967 OCC Order R-3221

- +OCC files motion to prohibit discharge of produced salt waters in Lea, Eddy, Chavez and Roosevelt counties of NM. The State Engineer had declared these areas to be protected. Order noted issue of high chlorides.
- +OCC orders prohibition of use of unlined pits in the four counties with exceptions:
 - +16 bbl per day allowed
 - +District Supervisor could allow 30 day usage without liners
 - +use of Mud (drilling) and burn pits

■ 1967 OCC Order R-3221-A

- +Files motion to start the R-3221 prohibition at an earlier date for certain area in Lea Co.
- +OCC ordered such.

Evolution of NM Pit Regulations

■ 1968 OCC Order R-3221-B, B1 & C

- +Application to amend R-3221 B to allow unlined pits in a large area between Hobbs and Carlsbad know as Nash Draw and Clayton Basin.
- +R-3221 C Application to require permits for lined pits.
- +OCC amends R-3221 to allow unlined pits due to sparse groundwater and close proximately to Potash Mining areas and Salt Playa lakes.
- +OCC Requires permits for lined pits.

Evolution of NM Pit Regulations

- 1978 EPA reports on "Surface Impoundments and effects on ground-water quality in US
Ref: EPA 570/9-78-005.
- Report Summary:
 - NM had 16,000 pits the highest reported in US
 - Majority 98 % was from oil and gas operations
 - Drilling and workover pits were not included in the study which would have added approximately 60,000 to 80,000 additional pits.
 - Confirms that pits present a high risk to ground water.



Evolution of NM Pit Regulations

■ **1985 OCC Order 7940**

- +OCC files application to determine a vulnerable area for McKinley, Rio Arriba, San Juan and Sandoval counties of NW NM.
- +OCC creates a vulnerable area in NW San Juan Basin:
 - primarily protects the River Valleys of San Juan, La Plata and Animas
 - 29 sections where ground water <50 feet
 - defined "vulnerable aquifer" as <50 feet
 - 5 bbl/day exemption allowed with conditions
 - created a short term and long term study group
 - Required pit registration and approval for commercial facilities



Evolution of NM Pit Regulations

- 1968-1985 Numerous applications are filed for R-3221 exceptions
 - 1986 OCC Order 7940-A
- +Requires permits for Commercial/Centralized facilities.
- exempts facilities with <16 bbl/day.

Evolution of NM Pit Regulations

■ **1988 OCC Order R-3221-D**

+OCC Application to set guidelines for filing exceptions to R-3221

+OCC approves guidelines for filing exceptions to R-3221

Evolution of NM Pit Regulations

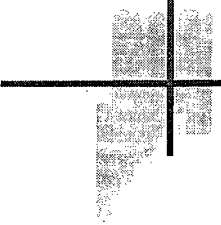
■ 1992 OCC Order 7940-B

- + Application to expand San Juan Basin vulnerable area and prohibit discharges into unlined pits and create special rules.
- + OCC orders the following:
 - Creates special rules for discharging into unlined pits.
 - Established wellhead protection areas, unless pit precedes well.
 - Requires approval for lined pits and below grade tanks located in vulnerable area.
 - Requires registration for pits which receive >5 bbls/day outside the vulnerable area and outside of a wellhead protection area.
 - Expanded the vulnerable area to include "specifically San Juan, Animas and LaPlata" alluvial areas which lie within 50 vertical feet, measured perpendicularly to the drainage channel, of all major perennial and ephemeral creeks, canyons, washes, arroyos and draws located within the oil and gas producing areas of the San Juan Basin in northwestern New Mexico,.
 - Variances allowed

Evolution of NM Pit Regulations

■ 1992 OCC Order 7940-C

- +OCC proposed amendment to Order 7940 and rescind Order 7940-B(1)
- +OCC orders the following:
 - Rescinded all small quantity exemptions within the vulnerable area
 - Reduce the radius for domestic wellhead protection areas
 - Maintained the vulnerable area expansion of 7940-B
 - Vulnerable area lined pits and below-grade tanks require Approval.
 - Non-vulnerable areas registration of unlined pits >5 bbls/day.
 - Pit closures required.
 - Variances allowed



Evolution of NM Pit Regulations

- 1997 Pit survey reported **11,614 pits...**
- +55% were **Unlined** Production Pits...
- +90% were **Not Permitted...**
- +95% were located in San Juan & Rio Arriba Co.

Evolution of NM Pit Regulations

2003 OCC Order R-12011-B Current Pit Rule 50

- +Repeal several orders and rules to combine in one comprehensive rule.
- +So ordered: With Performance based standards and guidelines.

-Grandfathered Unlined Pits.

-Siting requirements are limited.

-Allows new unlined pits in areas of known protectable groundwater.
-Does not require technical sound science or guidance for permitting new unlined pits.

-Monitoring Wells or Testing is not required.

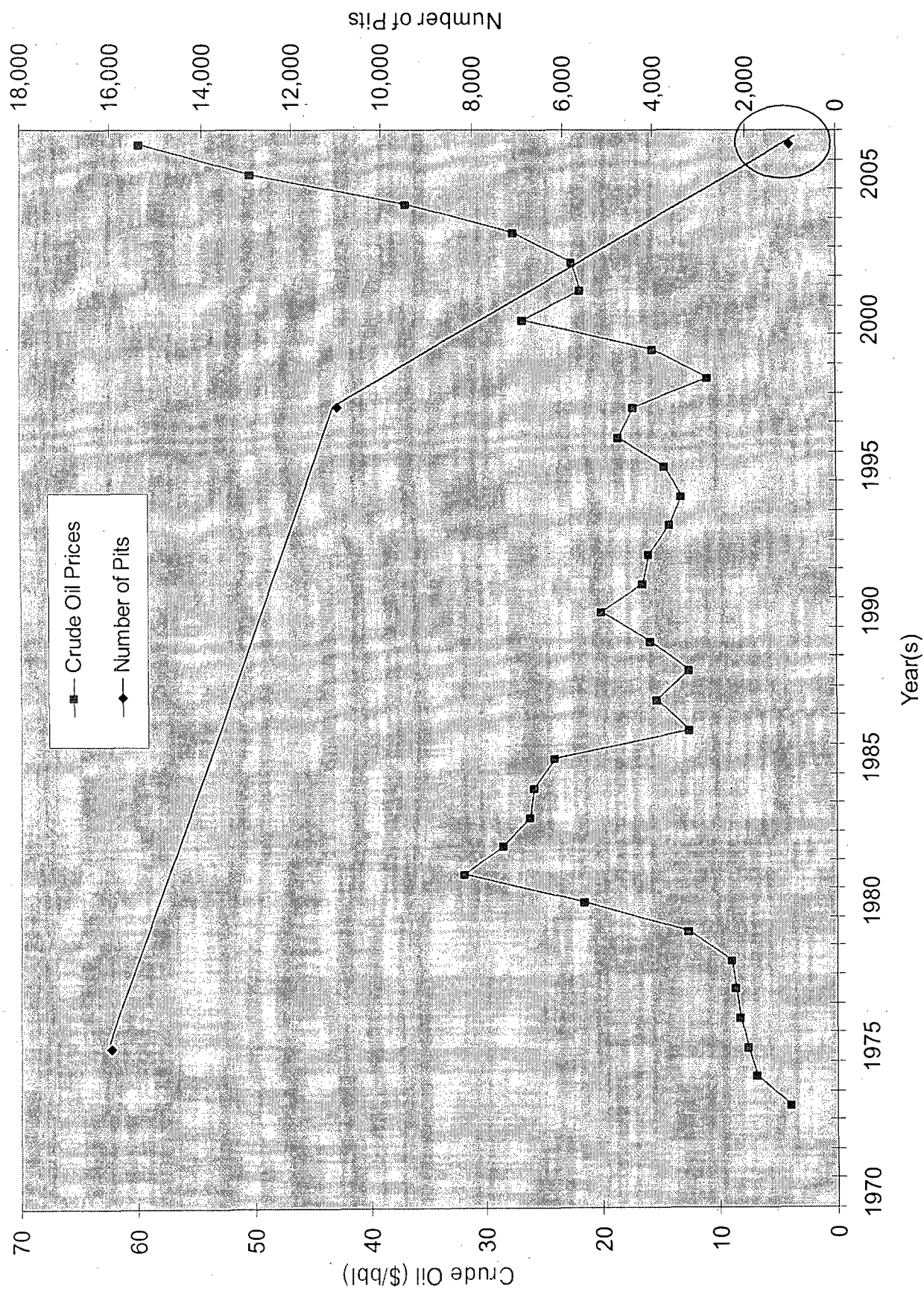
-Closure standard does not include protection of public health and environment for unlined pits.

-No Bonding Required.

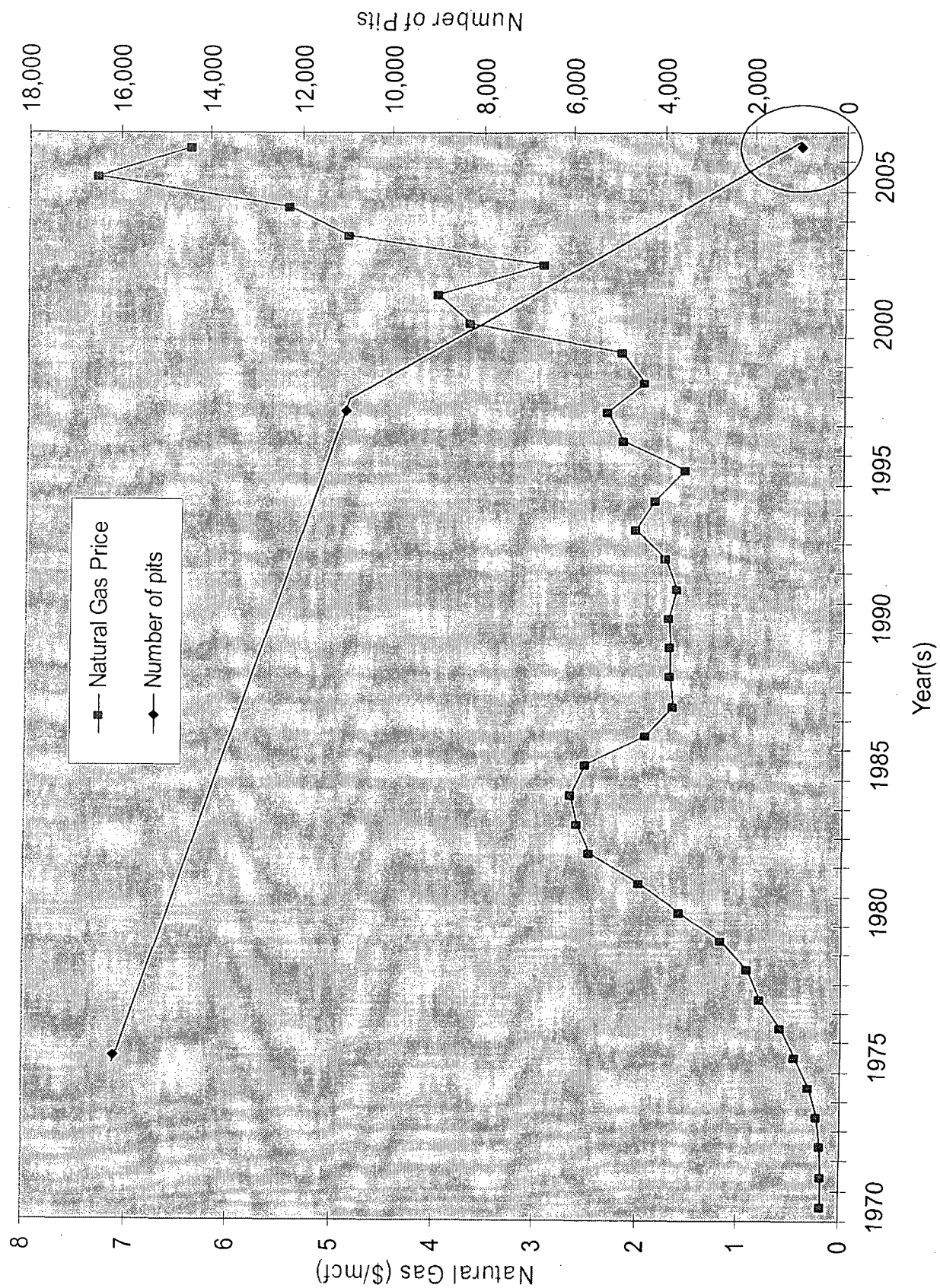
Pit Ground Water Contamination Cases

- 2005 400 confirmed pit groundwater cases
? Unknown other pit cases
- 2007 150 abatement cases *higher priority*
154 pending cases *lower priority*
200 estimated pit cases *pending*

Well Head Price of Crude Oil -VS- Number of Pits



Well Head Price of Natural Gas -VS- Number of Pits

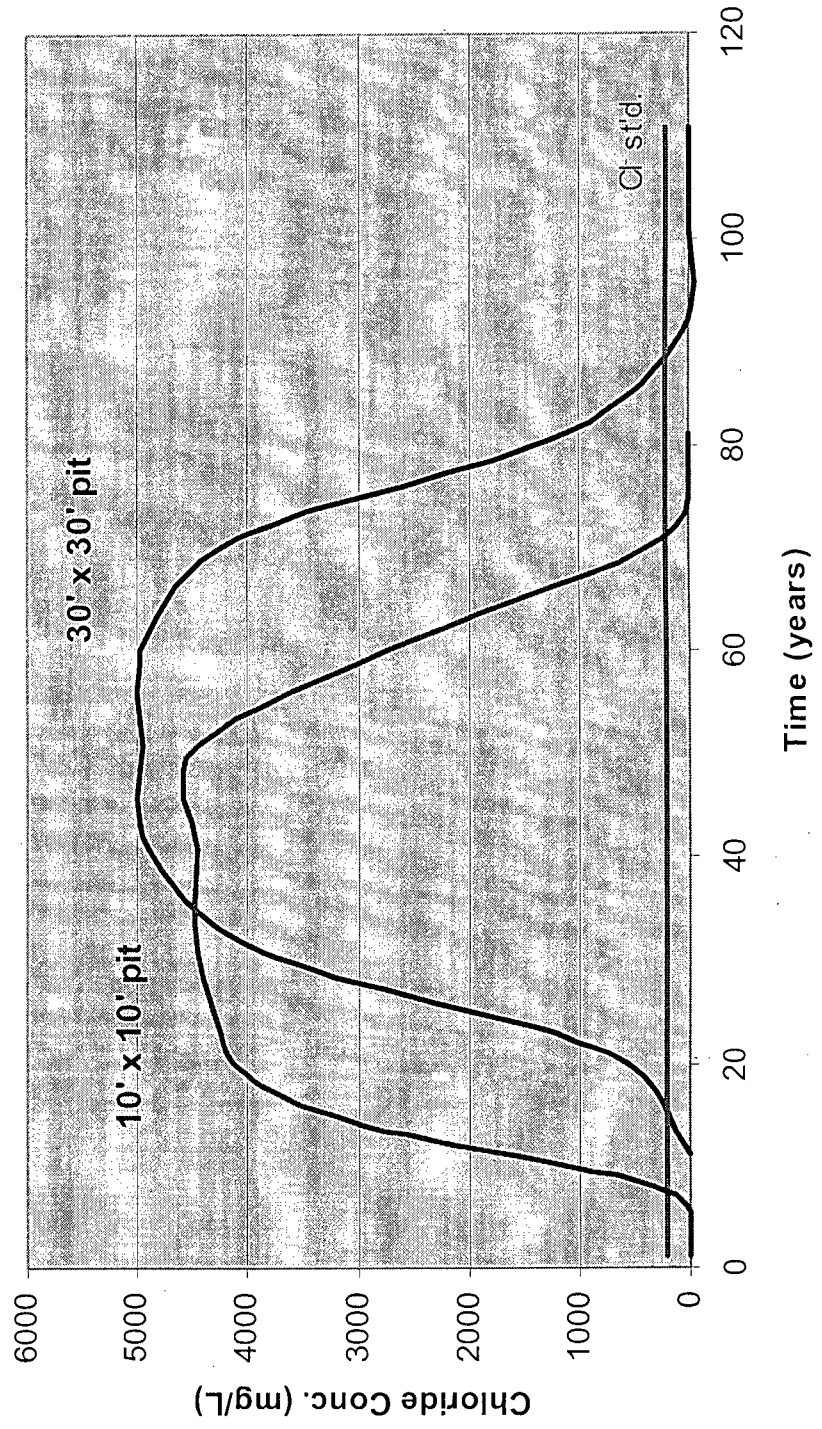


Modeling of Small Unlined Pits

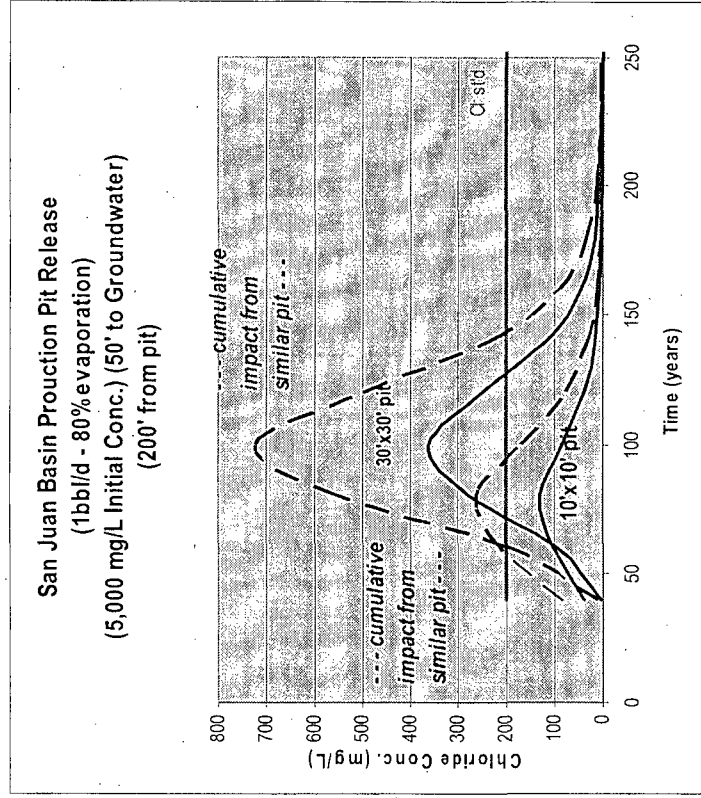
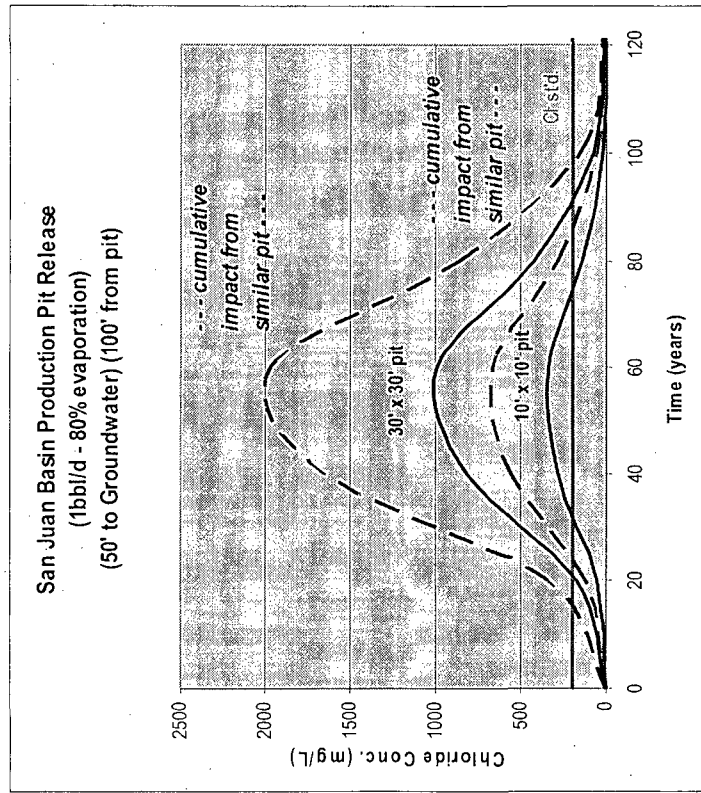
- Selected San Juan Basin Area
- Used 5000 mg/l Chloride as a tracer
- Small quantities discharges <1 bbl/day
- Used typical input parameters
- Varied distance from pit and pit size.
- Distance to groundwater set at 50 feet
- Looked at cumulative effects

Modeling Results

San Juan Basin Production Pit Release
(1 bbl/d with 80% evaporation) (5,000 mg/L Initial Conc.)
(50' to Groundwater) (1m from pit)

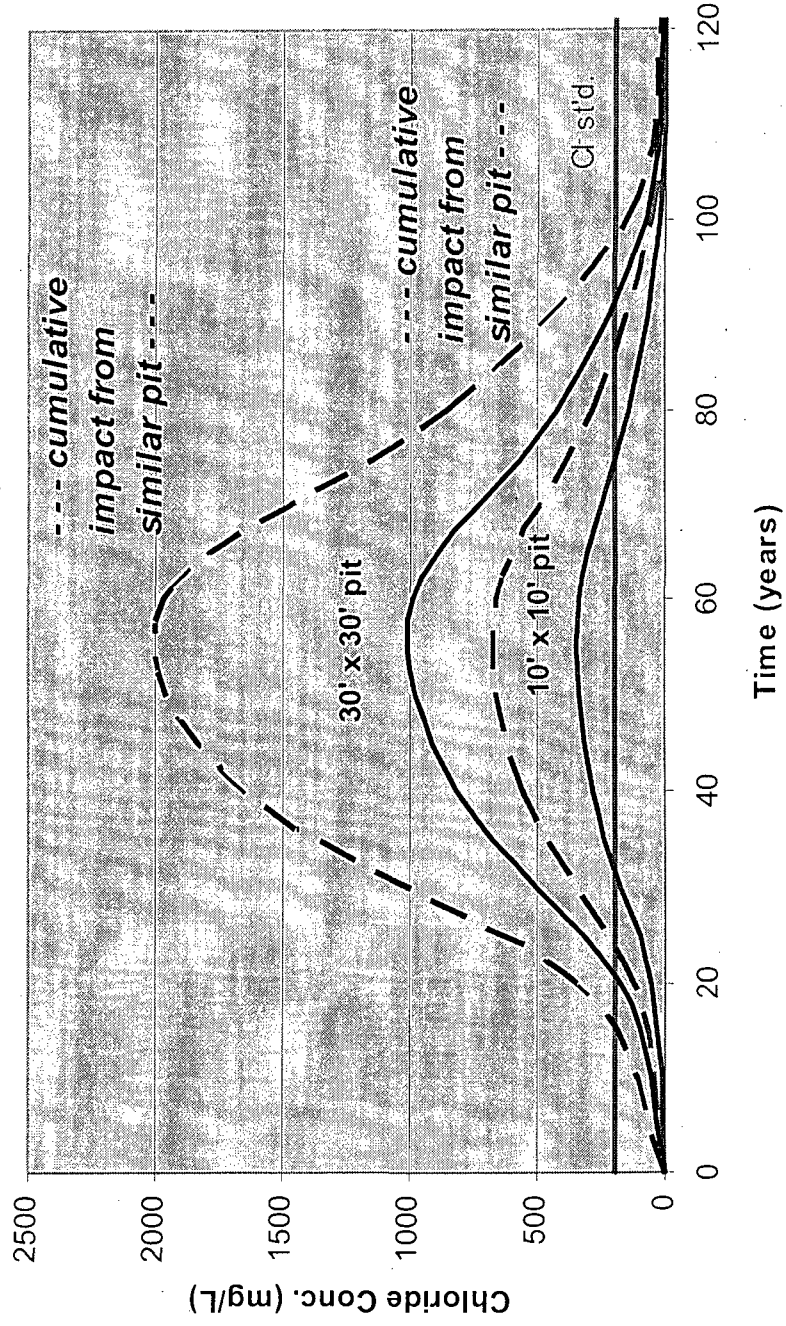


Modeling Results



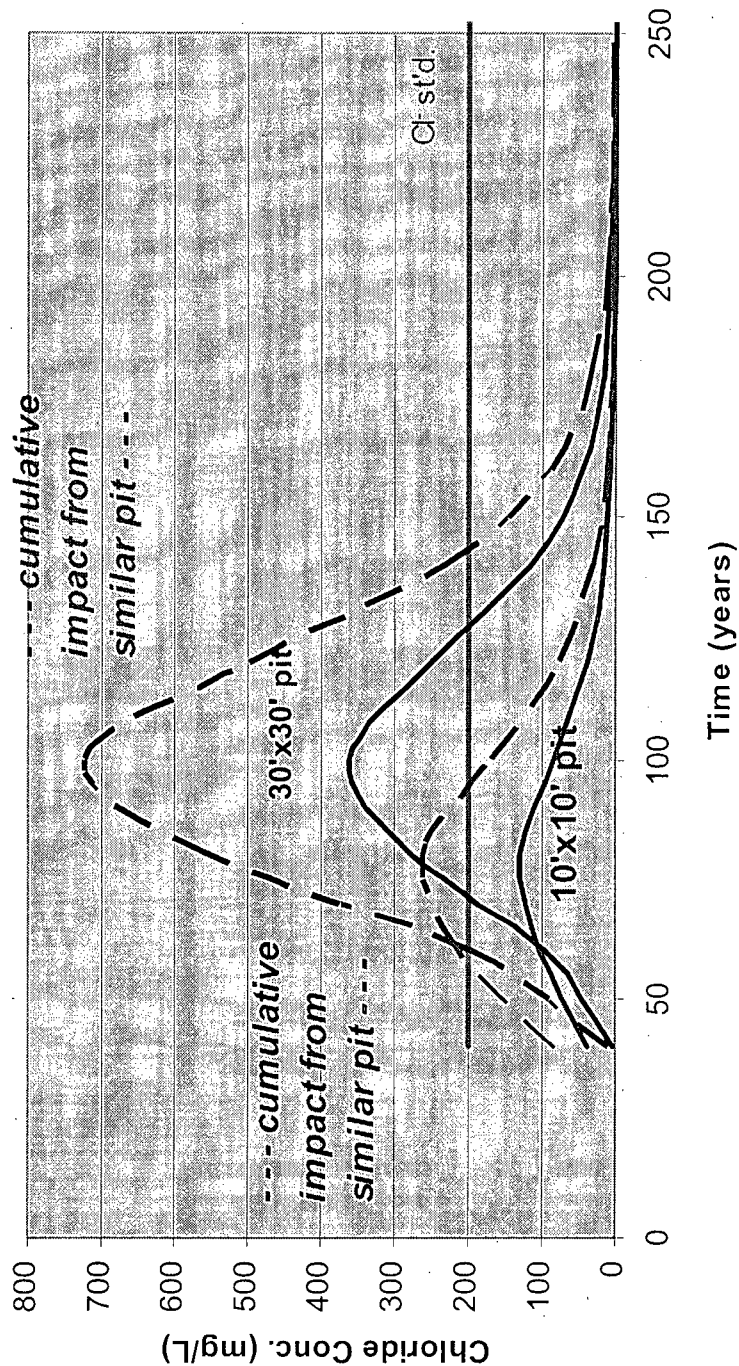
Modeling Results

San Juan Basin Production Pit Release
(1 bbl/d - 80% evaporation)
(50' to Groundwater) (100' from pit)



Modeling Results

San Juan Basin Production Pit Release
(1 bbl/d - 80% evaporation)
(5,000 mg/L Initial Conc.) (50' to Groundwater)
(200' from pit)



Modeling Conclusions

- Very small quantities may cause groundwater contamination over time.
- 50 foot separation does not protect groundwater when a source is available.
- Cumulative effects compound the problem



Evolution of NM Pit Regulations

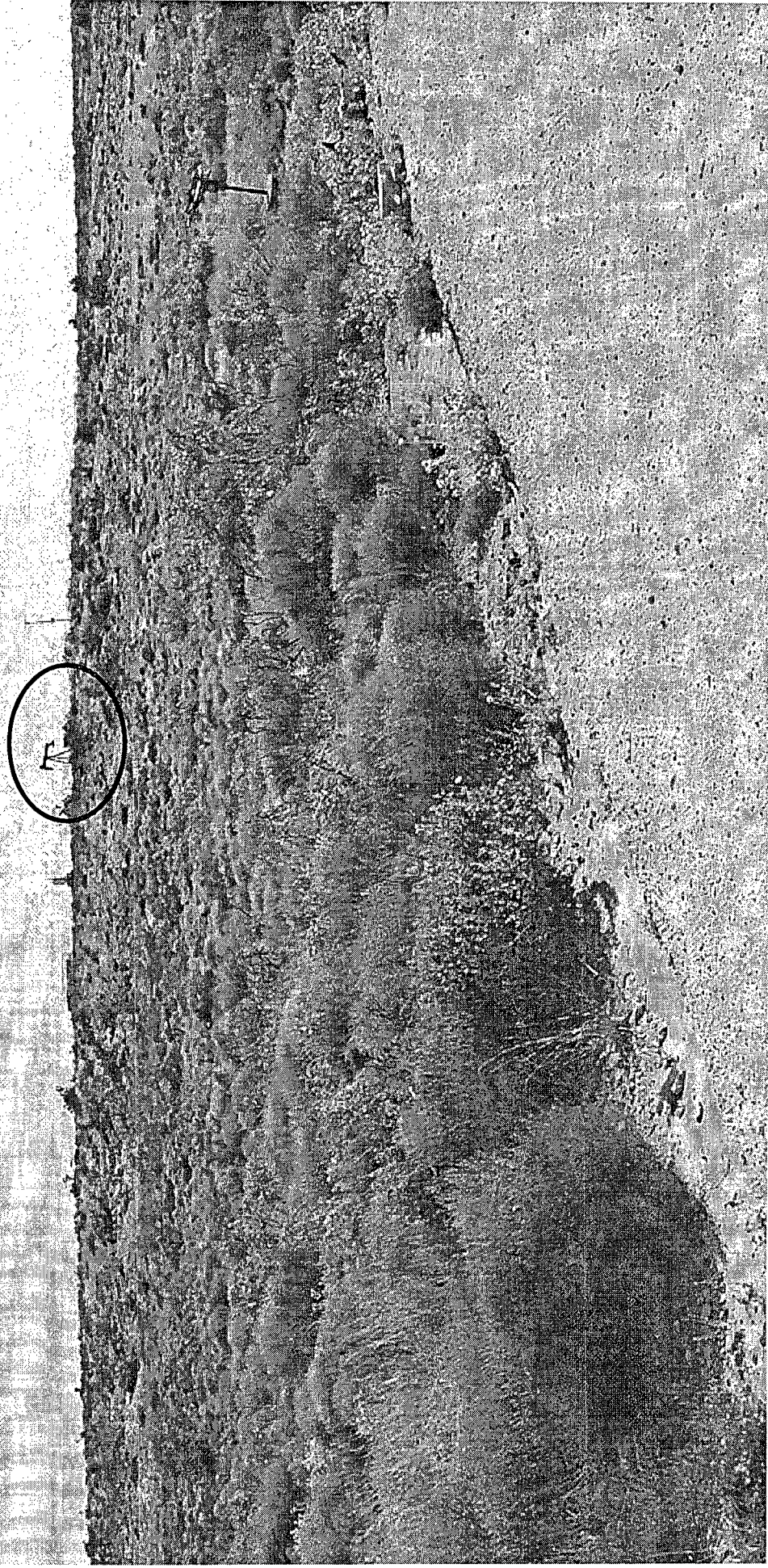
- So How Many Unlined Pits are Remaining?
- Best Estimate 2000 pits!
- Long term impact is unknown at this time!

Unlined pit located in exempted
area between Carlsbad and Hobbs

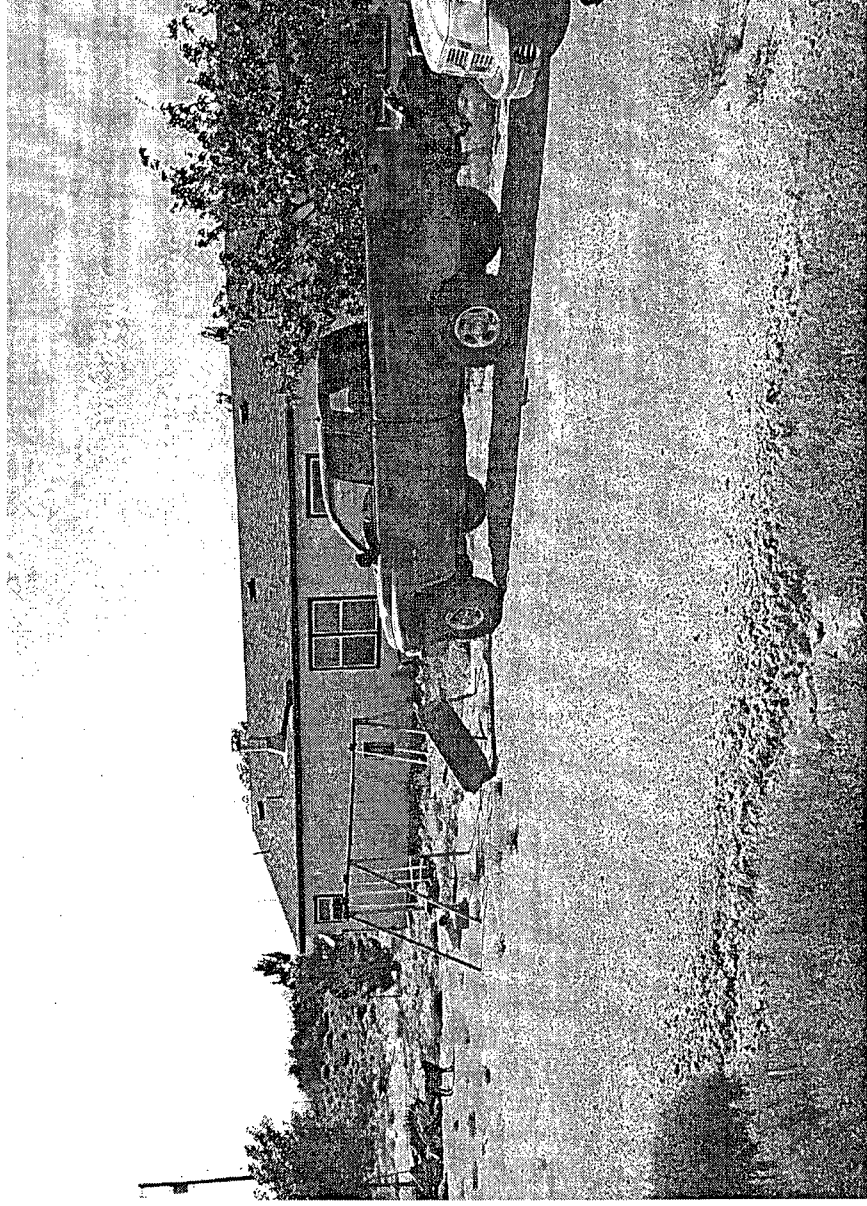


Unlined production pit located in very close proximity to ranch fresh water well

R-3221-D exempt area grandfathered in rule 50



Ranch house water well located
in proximity to unlined production
pit





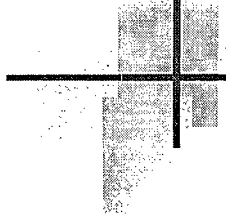
Ground Water Evidence

By Glenn von Gonten-OCD Senior Hydrologist

Please

Close the Book on Unlined Pits in New Mexico

- Over 50 years of documented vadose zone and ground water contamination cases.
- Concerns from Environmental and Wildlife Groups, General Public and Landowners.
- Task Force Consensus.



Thank You