Case 8224

Water Study Committee

Exhibits

1, 2, 3

20 Feb. 1985

RECOMMENDATIONS OF THE WATER STUDY COMMITTEE

Before the Oil Conservation Division (OCD) of the Energy and Minerals Department of the State of New Mexico.

The following is presented in the matter of the hearing called on June 7, 1984 by the OCD to consider case No. 8224, the Prohibition of Disposal of Produced Water on the Surface of the Ground, in Any Water Course, or in Any Body of Water in McKinley, Rio Arriba, Sandoval, and San Juan Counties, New Mexico; which hearing was continued to an indefinite date.

Background

A meeting was held in Santa Fe, New Mexico on July 18, 1984 by OCD to allow all parties interested in case No. 8224 to discuss the case and provide a forum for directing any studies which would be conducted. A committee was subsequently appointed by R. L. Stamets to evaluate the impact of oil and gas operations on the ground and surface waters in the northwest New Mexico area. The committee was divided into short-term and long-term groups.

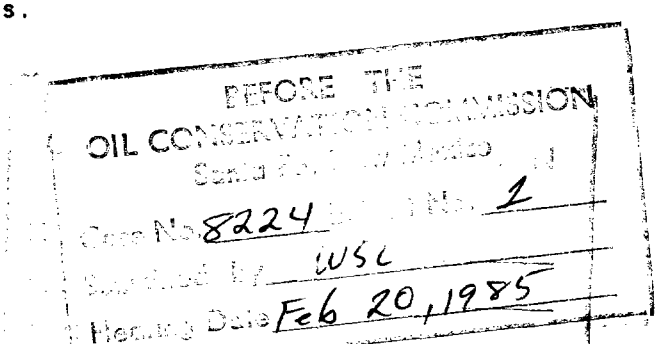
The short-term committee goals were specified as:

1. Determine what constitutes a vulnerable aquifer;
2. map the vulnerable aquifer;
3. attempt to determine the probability unlined pits may have in contaminating the vulnerable aquifers; and
4 prepare a recommendation to the OCD for an order which will address the problems identified by the committee.

Meetings were held on August 2, October 17, November 29, and January 9 of the short-term committee with other task group mapping sessions and field tours held as needed. The meetings provided discussion of the goals, preparation of a definition of the problem and the preparation of a map and various recommendations to the OCD.

Report of Short-Term Water Study Committee

It has been determined that in San Juan, Rio Arriba, McKinley and Sandoval Counties in the State of New Mexico, there are areas where ground or surface water may be vulnerable to contamination by oil and gas production operations. Those vulnerable areas include areas where the depth to ground water is less than 50 feet, the aquifer containing the ground water consists of unconsolidated alluvial fill, and the water is presently used for or could reasonably be presumed to be used for municipal, domestic, industrial, agricultural or stock watering purposes.



Areas were excluded from the short-term committee's concern because of one or more of the following factors:

1. There are few if any oil or gas operations in the area;
2. there are few if any water wells in the area; and/or
3. water is non-existent or deeper than 400 feet.

The vulnerable area as defined below was delineated using available water well data, 100 yr. flood hazard maps, topographic maps. The vulnerable area was defined as that area which lies over or adjacent to a vulnerable aquifer and includes those portions of the San Juan, Animas, and La Plata River valleys which are bounded by the topographic line on either side of the river that is 100 vertical feet above the river channel measured perpendicularly to the river channel. Special areas were also identified which fell outside of the "vulnerable area". These areas were listed because water well records indicated water production from less than 50'.

RECOMMENDATIONS

It is hereby recommended that the NMOCD consider the following in promulgating an order for the regulation of the use of pits in the vulnerable areas of northwestern New Mexico.

A. DEFINITIONS:

1. Aquifer: An aquifer is a saturated permeable geologic unit (a geological formation, group of formations, or part of a formation) that can transmit significant quantitites of water under ordinary hydraulic gradients.

   For purposes of this definition, the word significant means that the water from the aquifer is used for or may reasonably be presumed to be usable for municipal, industrial, domestic, agricultural, or stock watering purposes.

2. Vulnerable Aquifer: For the purpose of this order the following are defined as vulnerable aquifers:

   a) Unconfined aquifers that are less than 50 feet from the surface, or

   b) Unconfined aquifers in floodplain areas, or

   c) Aquifers in unconsolidated materials.

3. Vulnerable Area: An area which lies over or adjacent to a vulnerable aquifer and is defined as an area within the river valleys of the San Juan, Animas, and La Plata Rivers which is bounded by the topographic line on either side of the river that is 100 vertical feet above the river channel measured perpendicularly to the river channel.

4. Special Areas: Areas outside of the vulnerable area in which ground water is subsequently found to be within 50' of the ground surface. Special areas presently identified are listed below:

   a) Sections

T28N–R 8W, Section 17	T30N–R12W, Section 13
T28N–R11W, Section 18	T30N–R12W, Section 15
T28N–R15W, Section 26	T30N–R12W, Section 27
T29N–R10W, Section 16	T30N–R12W, Section 33
T29N–R12W, Section 24	T30N–R13W, Section 1
T29N–R18W, Section 17	T30N–R15W, Section 6
T29N–R19W, Section 23	T30N–R15W, Section 16
T29N–R19W, Section 30	T30N–R15W, Section 21
T30N–R10W, Section 5	T30N–R16W, Section 29
T30N–R11W, Section 3	T30N–R19W, Section 34
T30N–R11W, Section 7	T31N–R10W, Section 13
T30N–R11W, Section 8	T31N–R11W, Section 35
T30N–R11W, Section 10	T32N–R10W, Section 10
T30N–R11W, Section 19	T32N–R11W, Section 23
	T32N–R12W, Section 25

   b) Areas that lie between the rivers and the ditches mentioned below are also special areas:

      Highland Park Ditch
      Hillside Thomas Ditch
      Cunningham Ditch
      Farmers Ditch
      Halford Independent Ditch
      Citizens Ditch
      Hammond Ditch

5. Produced Water Pit: That pit which receives water produced from primary separation in conjunction with the production of crude oil and/or natural gas whether or not such pit is located at the site of production.

6 Ancillary Pit: Those pits not receiving fluids from primary separation including but not limited to dehydrator pits, tank drain pits, pipeline drip collector pits, blowdown pits, and compressor scrubber pits. Examples are listed below:

   a) Dehydrator Pit: Those pits which normally receive produced water only from the dehydration unit.

   b) Blowdown Pit: Those pits which receive liquid only when a well is blown down.

   (c) Tank Drain Pit: Those pits which receive water that is drained from a production storage tank.

d) Pipeline Drip Collector Pit: Those pits which receive liquids which accumulate in gas pipelines.

e) Compressor Scrubber Pit: Those pits which receive liquids at the compressor suction in event of primary separator failure.

B. PROHIBITIONS AND EXEMPTIONS

Disposal of produced water or fluids produced in connection with the production of oil and natural gas, or both, in unlined pits is prohibited, except for disposal of produced water as described herein:

1. Pits lying outside vulnerable or special areas are exempt from this order.

2. Ancillary pits within vulnerable or special areas to which the volume of water discharged is no greater than ___*___ barrel per day are exempted from this order except where the depth to ground water is less than ___*___ feet in which case all unlined pits are prohibited.

3. Any pits, ponds, lagoons, or impoundments resulting from activities regulated by a discharge plan approved and permit issued by NMOCD or NMEID under Water Quality Control Commission Regulations authorized under the New Mexico Water Quality Act.

4. Any pits, ponds, lagoons or impoundments resulting from activities regulated by a RCRA or NPDES permit issued by NMEID or EPA under RCRA or NPDES regulations authorized under the Resource Conservation and Recovery Act, New Mexico Hazardous Waste Act, Clean Water Act or Safe Drinking Water Act.

5. Any pits, ponds, lagoons or impoundments resulting from activities regulated by a mining plan approved and permit issued by the New Mexico Coal Surface Mining Commission under the authority of the Surface Mined Lands Reclamation Act.

C. PERMITS

The purpose of this subsection is to allow for the disposal of ___*___ barrel per day or less of produced water into unlined pits, based on the depth to ground water beneath such pits and provided that such pits meet the quality and soil characteristics criteria as set forth below.

Upon application to and approval by the NMOCD, unlined produced water pits and those ancillary pits which receive greater than ___*___ bbl./day that are within the vulnerable area may be permitted under this order based on the following criteria and after satisfying either a. or b. below.

Depth to Groundwater	Maximum Volume For an Unlined Pit
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* The committee could not reach an agreement on allowing the continued use of unlined pits (in the vulnerable area) for small volumes of produced water. All references to water volume or depth to groundwater have intentionally been left blank.

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a) Quality Permit: If the operator can demonstrate that the quality of either existing uncontaminated ground water, or produced water is such that the introduction of produced water will not cause degradation of the ground water, the unlined pit may be permitted upon application to the NMOCD. The demonstration must include analysis for organic and inorganic parameters as required by the Division.

b) Soil and Geologic Characteristics Permit: If the operator can demonstrate through the use of standard soil analysis parameters (e.g. percolation tests, infiltration rates, particle size/distribution, etc.) that the existing soil and/or underlying geologic stratum exhibit low permeabilities such that the produced water will not cause degradation of the ground water, the unlined pit may be permitted upon application to the NMOCD. This can be accomplished on an areal or site specific basis.

D. COMPLIANCE SCHEDULE

After 18 months of the date of this order, the use of unlined pits for the treatment, storage or disposal of produced water within vulnerable or special areas defined herein is prohibited except by permit as defined above. Partially or fully buried tanks and lined pits installed shall be to NMOCD specifications.

CONCLUSION:

The committee feels that these recommendations will provide the basic structure for an order from the OCD which will provide some immediate protection to vulnerable ground and surface waters in northwest New Mexico. It should be understood that the committee worked essentially with limited data available in the records of various agencies, and that to date only limited evidence of contamination of these waters was found. Hydrologic mechanisms exist for transporting contaminants into the ground water. These mechanisms also provide some attenuation of such contaminants before reaching the ground water. The ultimate disposition of various liquids deposited into unlined pits and a determination of the probability an unlined pit may have in contaminating vulnerable aquifers depend on the hydrological, geological, soil and geochemical conditions at the individual pit sites. Shallow ground water conditions and permeable surface materials present in these vulnerable areas provide a contamination risk from discharges of produced water. Until and

unless quantification of such risks becomes possible, protection of ground water for uses defined herein must be based on a rational but conservative methodology, keeping in mind the need to apply limited resources to address the potential serious problems first.

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