Exhibits 1 through 6
Complete Set

Proposed Special Rules and Regulations governing the disposal of produced water, drilling fluids, drill cuttings, and completion fluids at commercial or centralized facilities utilizing ponds, pits or below grade tanks within McKinley, Rio Arriba, Sandoval and San Juan Counties, New Mexico:

RULE 1. Applicability:

These rules shall apply to all commercial or centralized facilities that dispose of or store produced water, drilling fluids, drill cuttings or completion fluids within the aforementioned counties. These rules shall not apply to those facilities which are subject to regulation under the rules and regulations of the New Mexico Water Quality Control Commission.

RULE 2. Prohibitions:

Effective June 1, 1986, at commercial surface disposal facilities, disposal or storage of completion fluids, produced water, drilling fluids, drill cuttings, or other fluids or materials produced in connection with the production of oil and/or natural gas, in unauthorized pits, on the surface of the ground, in any watercourse, in any other place or in any manner which may constitute a hazard to any fresh water supplies is hereby prohibited in that area encompassed by McKinley, Rio Arriba, Sandoval, or San Juan Counties, New Mexico.

RULE 3. Definitions:

(a) Fresh water (to be protected) includes all surface waters and includes all underground waters containing 10,000 milligrams per liter or less of total dissolved solids except for which, after notice and hearing, it is found there is no reasonably foreseeable beneficial use which would be impaired by contamination of such waters.

(b) Produced water shall mean those waters produced in conjunction with the production of crude oil and/or natural gas and commonly collected at field storage, processing or disposal facilities including but not limited to: lease tanks, commingled tank batteries, burn pits, LACT units, dehydrators, and community or lease salt water disposal systems and which may be collected at gas processing plants, pipeline drips and other processing or transporation facilities.

(c) Completion fluids shall mean those fluids which are intended or actually introduced into and recovered from a well after the well is drilled including but not limited to salt solutions, fracturing fluids, acidizing fluids and packer fluids.

(d) Drill Cuttings: Particles of formation obtained from a well during drilling operations and brought to the surface by drilling fluid or air in rotary drilling or bailed out in cable tool drilling.

(e) Drilling Fluids: A mixture of water or other fluids and one or more of the various mud-making materials such as clay, weighting materials, chemicals, additives, etc.

(f) Commercial surface disposal or collection facilities: Those facilities that receive compensation for collection, disposal, evaporation or storage of produced water, drilling fluids, drill cuttings, and/or completion fluids in surface pits, ponds, or below grade tanks.

(g) Centralized surface disposal or collection facilities: Those facilities other than commercial surface disposal or collection facilities that receive produced water, drilling fluids, drill cuttings, or completion fluids from any off-well site location for collection, disposal, evaporation, or storage in surface pits, ponds, or below grade tanks. Examples include facilities such as field compressor stations, facilities operated by a producer, or those operated by any governmental entity including landfills.

RULE 4. Commercial Surface Disposal Facilities To Be Approved

(a) Effective June 1, 1986, no produced water, drilling fluids, drill cuttings or completion fluids may be received at commercial surface disposal facilities except at such facilities as may be approved by the Division.

(b) The Director of the Division is hereby authorized to approve administratively the use of lined or unlined pits or below grade tanks at commercial facilities for collection, disposal, or storage of produced water, drilling fluids, drill cuttings, or completion fluids upon a proper showing that the tank or pit is, or will be, constructed and operated in such a manner as to ensure structural integrity, and to protect fresh waters.

(c) Notification to the Division of any existing commercial collection or disposal facilities will be submitted by May 1, 1986, so that inspection and a schedule of compliance can be arranged.

RULE 5. Commercial Surface Disposal Facility Records

Each operator of a commercial surface disposal facility shall keep and make available for inspection, records for each calendar month on the source, location, volume and type of waste (produced water, acids, completion fluids, drilling mud, etc.), date of disposal, and hauling company that disposes of fluids or material in their ~~pit~~ facilities. Such records ~~are to~~ shall be maintained for a

period of two years from the date of ~~fluid~~ disposal.

RULE 6. Registration of Centralized Surface Disposal or Collection Facilities

(a) Except as provided by Rule 6(c) below, the owner/operator of any existing centralized surface disposal or collection facility seeking the continued use of such pit(s) for disposal purposes, must file a Pit Registration Form with the Division in the form attached as "Exhibit A" hereto by August 1, 1986.

(b) Except as provided by Rule 6(c) below, the owner/operator of any proposed centralized surface disposal or collection facility to be constructed after August 1, 1986, must file a Pit Registration Form with the Division at least ninety days prior to the date of initiation of construction of the facility. Within 30 days of receipt of a registration form, the Division will notify the applicant in writing if there is a need to provide additional information pursuant to Rule 7.

OPTION 1: (Industry Proposal)

RULE 6(c) The requirement for filing a Pit Registration Form shall not apply to those pits or facilities ~~receiving only produced water that~~ receive a numerical index of 10 or less pursuant to Rule 6(e) or to pipeline drip pits; provided, however, that upon written notice by the Division ~~to~~ Director, the owner/operator of any such ~~a~~ pit(s) that the location, discharge, or other factor(s) relating to the pit may provide for inadequate protection of fresh water supplies, such form shall be filed within thirty days.

(d) These rules shall not apply to any pit that is utilized during emergency drilling conditions for a period of up to ten days, provided that such pit is not located within a water course or within ten feet to ground water as measured from the base of the pit, and further provided ~~that should such emergency conditions persist for a period in excess of ten days~~, permission to ~~continue~~ dispose into such pit shall be sought from the Aztec district office.

(e) For purposes of this section, Centralized Surface Disposal or Collection Facilities that receive only produced water may be classified by volume, water quality and depth to groundwater according to the following scales, with the lower numbers representing the least hazardous conditions. Any pit that receives a sum score of ten or less pursuant to this section, is not required to file a pit registration form unless the operator is notified to do so by the Division pursuant to the provisions of Rule 6(c).

Volume Score	Bbl
1	0-20

2	21-50
3	51-80
4	81-100
5	101+

Quality -
Score TDS (ppm) - of fluid in pit, or if not available highest TDS of all sources of produced water.

1	0-500
2	500-2000
3	2001-5000
4	5001-10,000
5	10,000+

Depth to Groundwater
Score Feet

1	101+
2	81-100
3	51-80
4	11-50
5	0-10

Centralized facilities receiving any fluids other than, or in addition to, produced water, such as completion fluids, drilling mud, etc., shall ~~automatically~~ file a Pit Registration Form with the Division, ~~clearly indicating the types and volumes of fluids.~~

OPTION 2: (Industry proposal modified by OCD; different numerical rating values)

RULE 6(c) The requirement for filing a Pit Registration Form shall not apply to those pits or facilities receiving only produced water that receive a numerical index of 10 or less pursuant to Rule 6(e) or to pipeline drip pits; provided, however, that upon written notice by the Division to the owner/operator of such a pit(s) that the location, discharge, or other factor(s) relating to the pit may provide for inadequate protection of fresh water supplies, such form shall be filed within thirty days.

(d) These rules shall not apply to any pit that is utilized during emergency drilling conditions for a period of up to ten days, provided that such pit is not located within a water course or within ten feet to ground water as measured from the base of the pit, and further provided that should such emergency conditions persist for a period in excess of ten days, permission to continue disposal into such pit shall be sought from the Aztec district office.

(e) For purposes of this section, Centralized Surface Disposal or Collection Facilities that receive only produced water may be classified by volume, water quality and depth to ground water according to the following scales, with the lower numbers representing the

least hazardous conditions. Any pit that receives a sum score of ten or less pursuant to this section, is not required to file a pit registration form unless the operator is notified to do so by the Division pursuant to the provisions of Rule 6(c).

Volume Score	Bbl.
1	0-20
2	21-50
4	51-80
6	81-100
10	101+

Quality Score	TDS (ppm)
1	0-500
2	500-2000
3	2001-5000
4	5001-10,000
5	10,000+

- of fluid in pit, or if not available highest TDS of all sources of produced water.

Depth to Groundwater Score	Feet
1	101+
2	81-100
4	51-80
6	11-50
10	0-10

Centralized facilities receiving any fluids other than, or in addition to, produced water, such as completion fluids, drilling mud, etc., shall automatically file a Pit Registration Form with the Division, clearly indicating the types and volumes of fluids.

OPTION 3: (OCD Proposal)

RULE 6(c) The requirement for filing a Pit Registration Form shall not apply to centralized facilities receiving a maximum of 16 barrels per day, daily, or to pipeline drip pits; provided that such pit is not located within a watercourse or within ten feet to ground water as measured from the base of the pit; and provided, further, that upon written notice by the Division to the owner/operator of any such pit(s) that the location, discharge, or other factor(s) relating to the pit may provide for inadequate protection of fresh water supplies, such form shall be filed within thirty days.

(d) These rules shall not apply to any pit that is utilized during emergency drilling conditions for a period of up to ten days provided that such pit is not located within a water course or within ten feet to ground water as measured from the base of the pit, and

further provided that should such conditions persist for a period in excess of ten days, permission to continue disposal into such pit shall be sought from the Aztec district office.

(e) Centralized facilities receiving any fluids other than, or in addition to, produced water, such as completion fluids, drilling mud, etc., shall automatically file a Pit Registration Form with the Division, clearly indicating the type and volumes of fluids.

RULE 7. Additional Information, Permits, Appeals

(a) If, upon review of a Pit Registration Form, the Division determines that utilization of any existing or proposed pit may present a threat of contamination to fresh water supplies, the Division shall request and the owner/operator shall provide such additional information as the Division believes is necessary.

(b) The criteria to be utilized by the Division in determining whether facilities covered by this rule present a threat of fresh water contamination are:

1) Volume of Discharge
2) Type of Pit (lined, unlined, tank)
3) Source of Fluid
4) Total Dissolved Solids
5) Depth to Groundwater
6) Presence and Concentration of Constituents in Pit Fluids
7) Nature and Permeability of Vadose Zone
8) Aquifer Water Quality
9) Surface Location and Proximity to Water Courses
10) Nature and Areal Extent of Aquifer Potentially Affected
11) Such other relevant factors as the Division may determine

(c) If, upon review of all information regarding a Pit Registration Form, the Division continues to believe that the facility utilization may present a threat of contamination to fresh water supplies, the Division shall notify the owner/operator in writing of this fact and specify the reasons that the Division believes the facility presents a threat of contamination to fresh water supplies. This notice shall invite the owner/operator to consult with the Division to initiate such design, operation, or site changes as the Division believes are necessary to ensure structural integrity and allow the facility to comply with water protection requirements.

(d) Upon showing that operation of a facility will not present a hazard to fresh water resources, the Director of the Division is hereby authorized to approve administratively the use of lined or unlined pits or below grade tanks at centralized facilities for collection, disposal, or storage of produced water or completion fluids.

(e) If the Division and the owner/operator of a facility are unable to agree on such changes as the Division believes are necessary, the Division shall issue a second notice to such owner/operator specifying the potential threat(s) to fresh water supplies posed by the facility. The owner/operator of the facility shall then have thirty days from receipt of such notice in which to request a hearing to show that construction or operation of the facility will not result in contamination of fresh water supplies for the reasons set forth by the Division. Failure of the owner/operator to request a hearing shall result in a finding by the Division that the facility as designed or operated poses a threat of contamination to fresh water supplies and such facility, if proposed, shall not be constructed or, if existing, shall immediately cease operations.

STATE OF NEW MEXICO
Energy and Minerals Department

OIL CONSERVATION DIVISION
P. O. Box 2088
Santa Fe, New Mexico 87501
(505) 827-5800

CENTRALIZED DISPOSAL OR COLLECTION
PIT REGISTRATION FORM
(Instructions on Back)

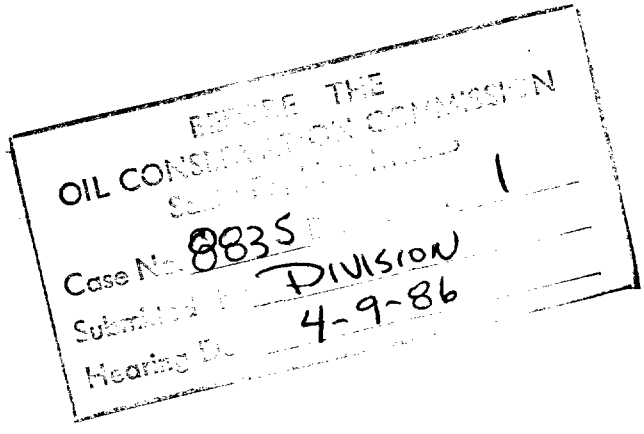
Owner/Operator: _____
(List information only for pits operated by you at a lease or at other locations)

Well and Lease, or Facility Name: _____

Location: _____

(A) Pit Fluid Sources	(B) Maximum Daily Discharge to Each Pit	(C) Pit Type: 1. Unlined 2. Lined 3. Tank
List All Wells and Locations That Contribute Fluid to Pit		

EXHIBIT "A"


BEFORE THE
OIL CONSERVATION COMMISSION
Case No. 8835
Submitted by DIVISION
Hearing Date 4-9-86

* 1984 CUMULATIVE WATER SUMMARIES - NORTHERN NEW MEXICO

WATER PRODUCTION SUMMARY

		Wells
Bbls Water Produced with Oil	46,298,758	3,032
Bbls Water Produced with Gas	793,900	13,937
Total Northern New Mexico Produced Water	47,092,658 Bbls.	16,969 Wells

PRODUCED WATER DISPOSAL SUMMARY

Secondary Recovery Injection Bbls Water Reinjected	26,204,595	502
Salt Water Disposal Injection Bbls Water Injected	17,400,443	22
Total Northern New Mexico Injection Disposal	43,605,038 Bbls	524

Difference Between Total Produced Water and Total Injected Water 3,487,620 Bbls

(Difference disposed of in permitted ponds, make up for secondary recovery, unlined pits.)

* Sources: N. M. OCC Monthly Statistical Reports, Underground Injection Waterflood & Pressure Maintenance Annual Report

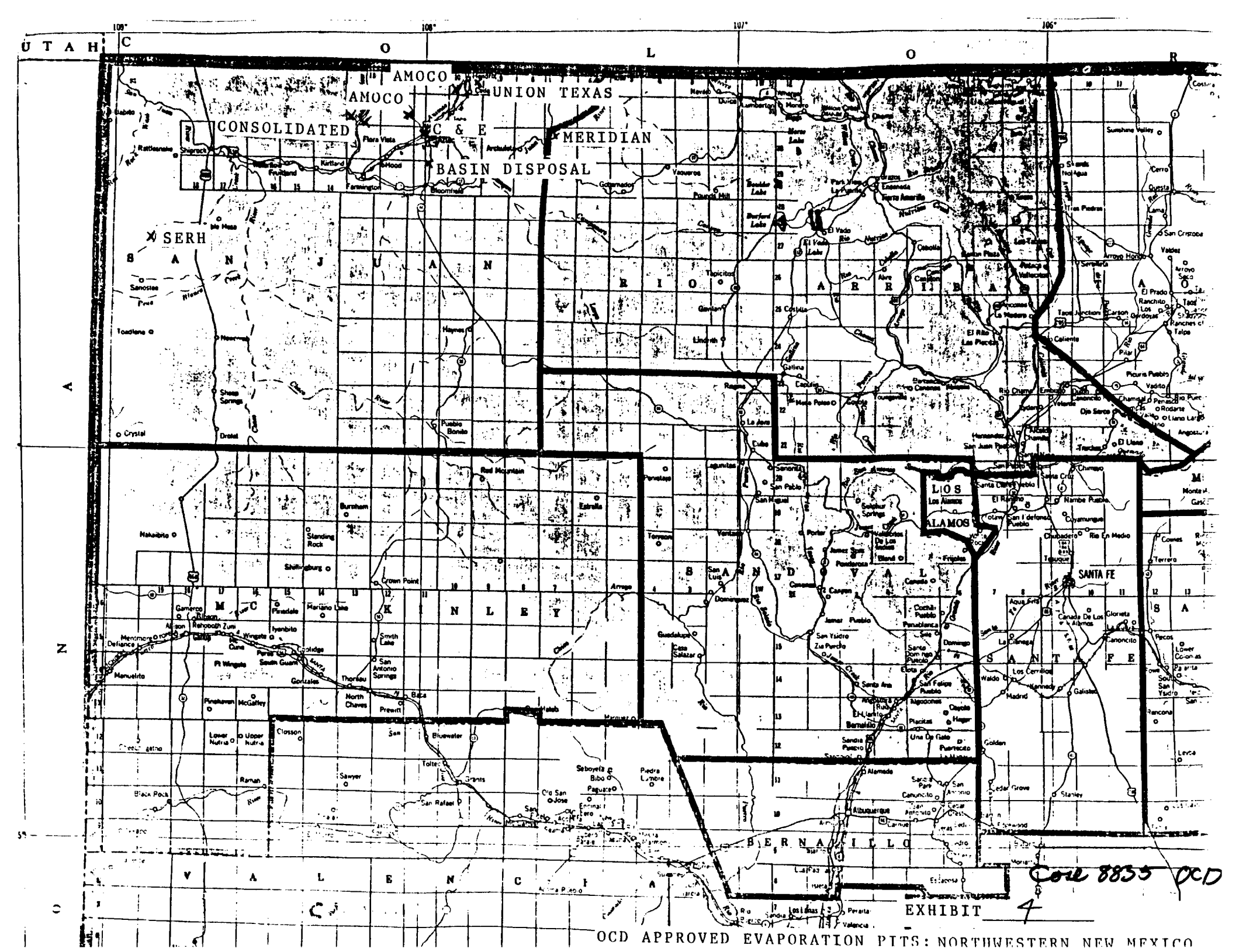
Case 8835
OCD
EXHIBIT 3

1984 CUMULATIVE WATER SUMMARY - VULNERABLE AREA

Water Production Summary

Total Wells in Vulnerable Area	-	1,378
Number of Wells Reporting Water	-	595
Total Water Reported	-	2,342,406 Bbls.
Number of Wells Reporting More than 150 Barrels Water for any Month	-	41
Volume of Water from Wells Reporting More than 150 Barrels Water for any Month	-	2,296,551 Bbls.

Case 8835
OCD
Exhibit 3



OCD APPROVED EVAPORATION PITS: NORTHWESTERN NEW MEXICO

GUIDELINES FOR THE DESIGN AND CONSTRUCTION OF LINED EVAPORATION PITS

(Revised 5/85)

NEW MEXICO OIL CONSERVATION DIVISION
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO

Case 8835
OCD
EXHIBIT 5

PREFACE

The following specifications shall be used as a guide to the preparation of plans and specifications for lined evaporation ponds to be used to contain those liquid discharges regulated by the Oil Conservation Division. All plans and specifications shall be submitted to the Oil Conservation Division for approval prior to construction. Designs may deviate from the following specifications if it can be shown that the design integrity is such that the construction of that pit will not affect any present or future sources of usable ground water. Please note that this guide does not take precedence over any specifications outlined in the Oil Conservation Commission's Order No. R-3221-C.

1. LOCATION

(A.) Evaporation pits shall not be located in any watercourse, lakebed, sink-hole, or other depression. Pits adjacent to any such watercourse or depression shall be located safely above the high-water level of such watercourse or depression.

2. DESIGN AND CONSTRUCTION

(A.) Evaporation pits shall be so designed and constructed to provide the minimum evaporative surface area needed for the maximum yearly volume of liquid to be discharged to the pit. This design parameter shall be based upon local climatological data. Such data and calculations used for the pit design shall be submitted with any proposed plans and specifications. Special care should be taken when calculating the pit volume to account for the decrease in the evaporation rate during the winter months.

(B.) Pits shall be located on level ground and shall be rectangular. Excavated material may be used to form levees around the pit. The levees shall rise a minimum of 18 inches above ground level.

(C.) The design freeboard allowance shall take wave action into account to prevent overtopping due to wave action. A determination of the wave type (breaking or non-breaking) shall be made to determine the forces acting upon the levee. Such calculations shall be submitted with the details for pit construction.

(D.) The pit is to be constructed so that the inside grade of the levee is no steeper than 2:1. Levees shall have an outside grade no steeper than 3:1 (See Figure 1).

(E.) The top of the levees shall be level and shall be at least 18 inches wide.

(F.) The pit shall incorporate a double liner system with a leak detection system installed between the primary (top) and secondary (bottom) liner.

3. MATERIALS

(A.) Materials used for lining evaporation pits shall be impermeable and may be rigid, semi-rigid, or flexible.

(B.) If rigid or semi-rigid materials are used, leak-proof expansion joints shall be provided, or the material shall be of sufficient thickness and strength to withstand (without cracking) expansion, contraction, and

settling movements in the underlying earth.

(C.) If flexible membrane materials are used, they shall be of at least 30 mil thickness and shall have good resistance to tears or punctures.

(D.) All materials used for lining evaporation pits shall be resistant to hydrocarbons, salts, and acidic and alkaline solutions. The liners shall also be resistant to fungus and rot. The primary liner shall be resistant to ultra-violet light or provision made to protect the material from the sun as specified in Section 6 (F).

4. LEAK DETECTION SYSTEM

(A.) A leak detection system of an approved design shall be installed between the primary and secondary liner, and shall be inspected and approved by the OCD prior to installation of the primary liner.

(B.) Leak detection systems may consist of, but are not necessarily limited to, approved fail-safe electric detection systems or drainage and sump systems.

(C.) If an electric grid detection system is used, provision must be made for adequately testing all components to ensure the system remains functional.

(D.) If the drainage and sump system is to be used, a network of slotted or perforated drainage pipes shall be installed between the primary and secondary liners. The network shall be of sufficient density so that no point in the pit-bed is more than 20 feet from such drainage pipe or lateral thereof. The material placed between the pipes and laterals shall be sufficiently permeable to allow transport of the fluids to the drainage pipe. The slope for all drainage lines and laterals shall be at least 6 inches per 50 feet. The slope of the pit-bed shall also conform to these values to assure fluid flow towards the leak detection system. The drainage pipe shall convey any fluids to a concrete or corrosion-proof sump located outside the perimeter of the pond (See Figure 2).

5. PREPARATION OF PIT-BED FOR INSTALLATION OF LINERS

(A.) The bed of the pit and inside grade of the levee shall be smooth and compacted, free of holes, rocks, stumps, clods, or any other debris which may rupture the liner. In extremely rocky areas, it will probably be necessary to cover the pit-bed with a compacted layer of sand or other suitable material.

(B.) A trench shall be excavated on the top of the levee the entire perimeter of the pit for the purpose of anchoring

flexible liners. This trench shall be located a minimum of 9 inches from the slope break and shall be a minimum of 12 inches deep. (See Fig. 3).

6. INSTALLATION OF FLEXIBLE MEMBRANE LINERS

(A.) Prior to installation of the secondary liner, the appropriate OCD district office should be notified at least 24 hours in advance of the scheduled installation to afford the opportunity for a Division representative to inspect the pit-bed and levee walls.

(B.) The pit liner shall be installed and joints sealed according to manufacturer's specifications and with approval of the Division representative.

(C.) The liner shall rest smoothly on the pit-bed and the inner face of the levees, and shall be of sufficient size to extend down to the bottom of the anchor trench and come back out a minimum of two inches from the trench on the side furthest from the pond. (See Fig. 3). In locations where temperature variations are significant, wrinkles or folds shall be placed at each corner of the pit to allow for the contraction and expansion of the membrane due to temperature variations. The membrane manufacturer should be consulted on this matter.

(D.) Certain conditions require the venting of gas that may accumulate beneath a liner. If organic matter exists in the soils under the liner, or if natural gas is present in the region, gas production is likely. When a fluctuating water table is present immediately below the pond bottom, pockets of air may also accumulate below the liner. The net result of gas or air accumulation below the liner may be the "floating" of the liner to the pond surface. Two possible vent designs are illustrated in Fig. 4. The need to vent this accumulated gas can be accomplished by providing a uniform layer of sand (which less than 5% will pass the 200 sieve) or a geotextile beneath the liners. To achieve the best results from either of these media, the slope from the lowest point of the pond to the toe of the dike must be at least 2%. The venting medium is carried across the entire bottom and up the side slopes. Vents should be located approximately one foot down from the crown of the dike. (See Figure 3).

(E.) An anchor of used pipe or other similar material shall be placed over the liner in the anchor trench and said trench back-filled. The anchor trench shall extend the entire perimeter of the pond.

(F.) If the lining material used for the primary liner is not sun-resistant, at least one inch of sand or other suitable material shall be spread uniformly to cover the liner over the floor of the pit. Gravel or other wave-resistant

material with sufficient angle of repose to remain in place shall be used to cover the sloping inner wall of the levee. A geotextile liner shall be placed beneath any gravel layer to provide protection for the membrane liner. Any gravel or sand layers used to protect the membrane liner from the sun shall extend to the anchor trench.

(G.) Any sand or gravel layers placed on top of a membrane liner shall be done so in such a manner that the risk of tearing the liner is minimized.

7. SKIMMER PONDS/TANKS

(A.) A skimmer pond or tank shall be used to separate any oil from the water prior to allowing the water to discharge to the evaporation pond, except for the following cases:

1) It can be shown that the water being discharged to the pond contains no oil or grease.

2) The discharge to the pond is from an oil or natural gas processing facility where the discharge has already passed through a skimmer basin, skimmer tank, decanter, or API Separator.

(B.) The skimmer pond/tank shall be designed to allow for a one-hour fluid residence time prior to discharge to the pond. The flow rate basis for the design volume shall be the maximum discharge to the pond in a one-hour period.

(C.) If a skimmer pond is to be used, the pond shall conform to the same specifications as the evaporation pond.

(D.) If a skimmer tank is to be used, the materials of construction and/or design shall provide for corrosion resistance.

(E.) If a skimmer pond is to be used, syphons or other suitable means shall be employed to draw water from the oil water interface for transfer to the evaporation pond. The siphon shall be located as far as possible from the inlet to the skimmer pond.

(F.) The skimmer pond/tank shall at all times be kept free of appreciable oil build-up to prevent oil flow to the evaporation pond.

(G.) Figures 5- a & b illustrate general design criteria for skimmer ponds and tanks, respectively.

8. FENCES AND SIGNS

(A.) A fence shall be constructed and maintained in good condition around the evaporation pit installation. The fences shall be

constructed so as to prevent livestock from entering the pit area. Fences shall not be constructed on the levees.

(B.) A sign not less than 12" x 24" with lettering of not less than two inches shall be posted in a conspicuous place on the fence surrounding the evaporation pit installation. The sign shall be maintained in legible condition and shall identify the operator of the evaporation system, the location of the system by quarter-quarter section, township, and range.

9. MAINTENANCE

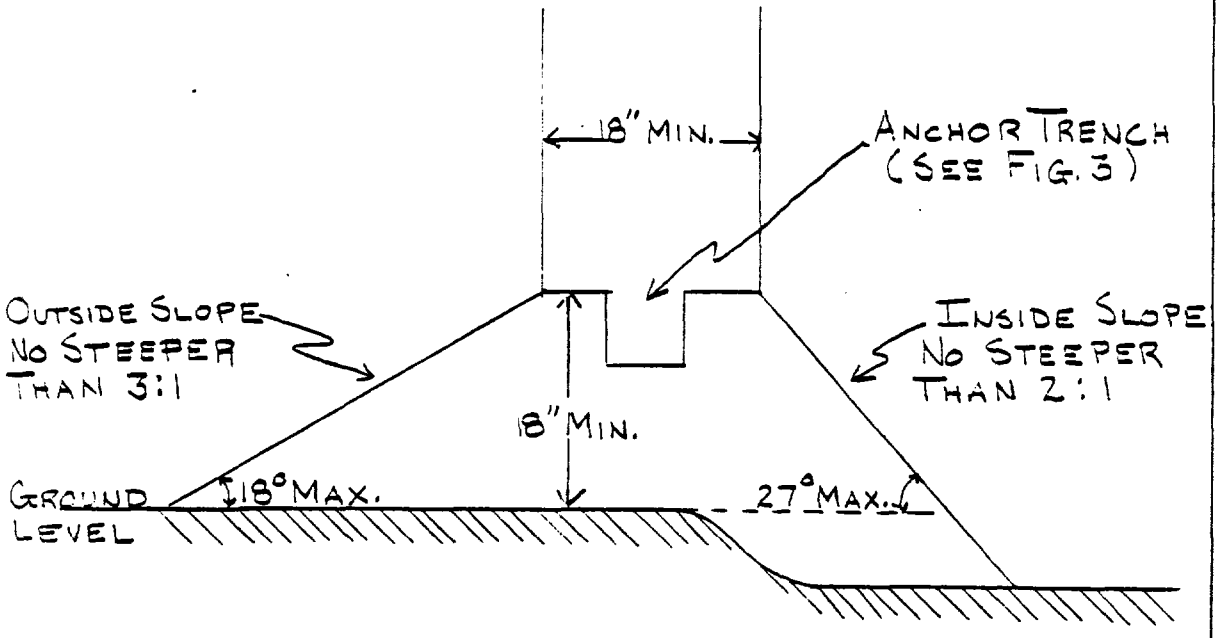
(A.) The leak detection sump shall be inspected at least weekly.

(B.) The outside walls of the levee shall be maintained in such a manner to prevent erosion. Inspections of the outside wall of the levee shall be made after any rainfall of consequence.

10. CONTINGENCY PLAN

(A.) A contingency plan in the event of a leak shall be submitted for approval along with the details for pit construction. The contingency plan will outline a procedure for making repairs to the pit in the most expeditious manner possible.

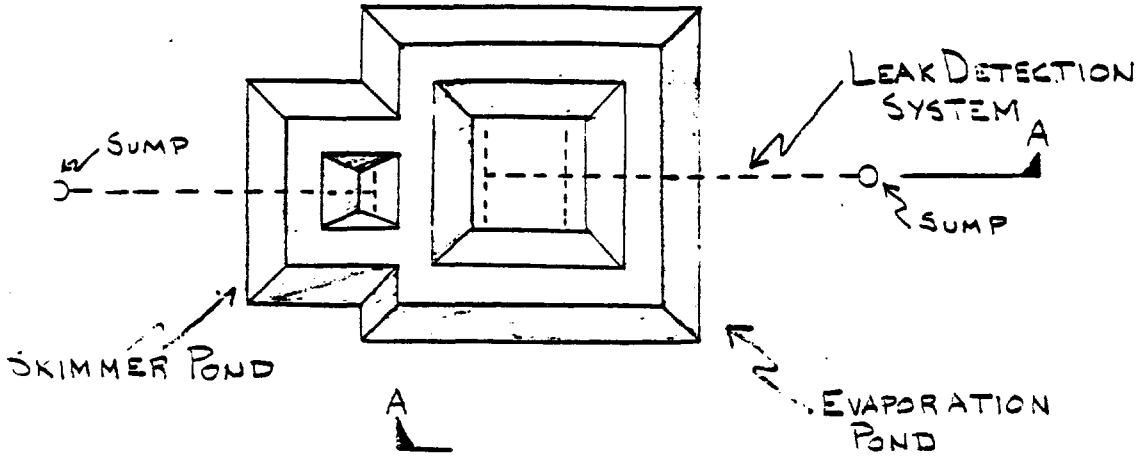
FIGURE 1- PIT CONSTRUCTION



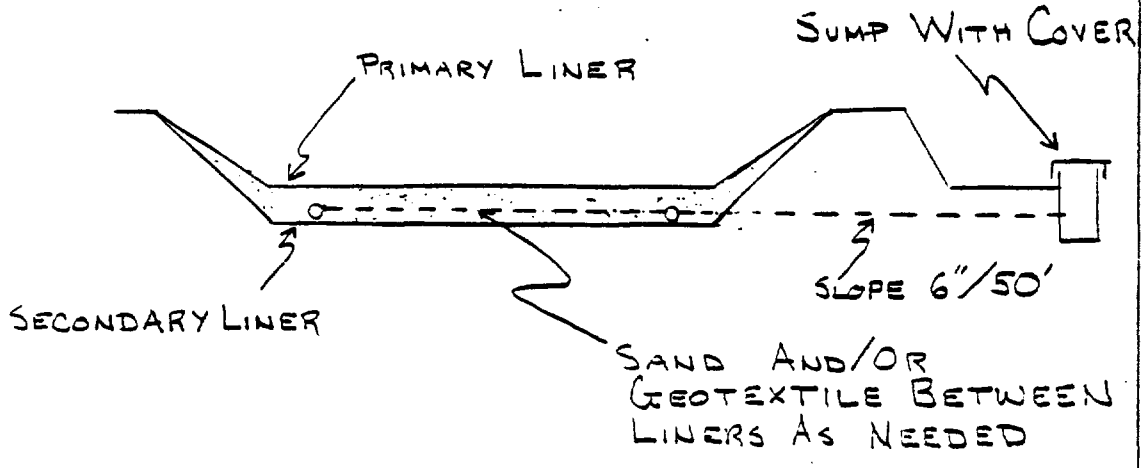
NOTE: LEVEE TO BE CONSTRUCTED IN A MANNER SUCH THAT DESIGN COMPACTION AND DIMENSIONS PROVIDE FOR A MINIMUM SAFETY FACTOR OF TWO FOR FORCES ACTING AGAINST THE LEVEE.

FIGURE 2 - LEAK DETECTION SYSTEM

PLAN



SECTION A-A



NOTE: SKIMMER POND TO HAVE SEPARATE LEAK DETECTION SYSTEM AND SUMP.

FIGURE 3 - ANCHOR TRENCH

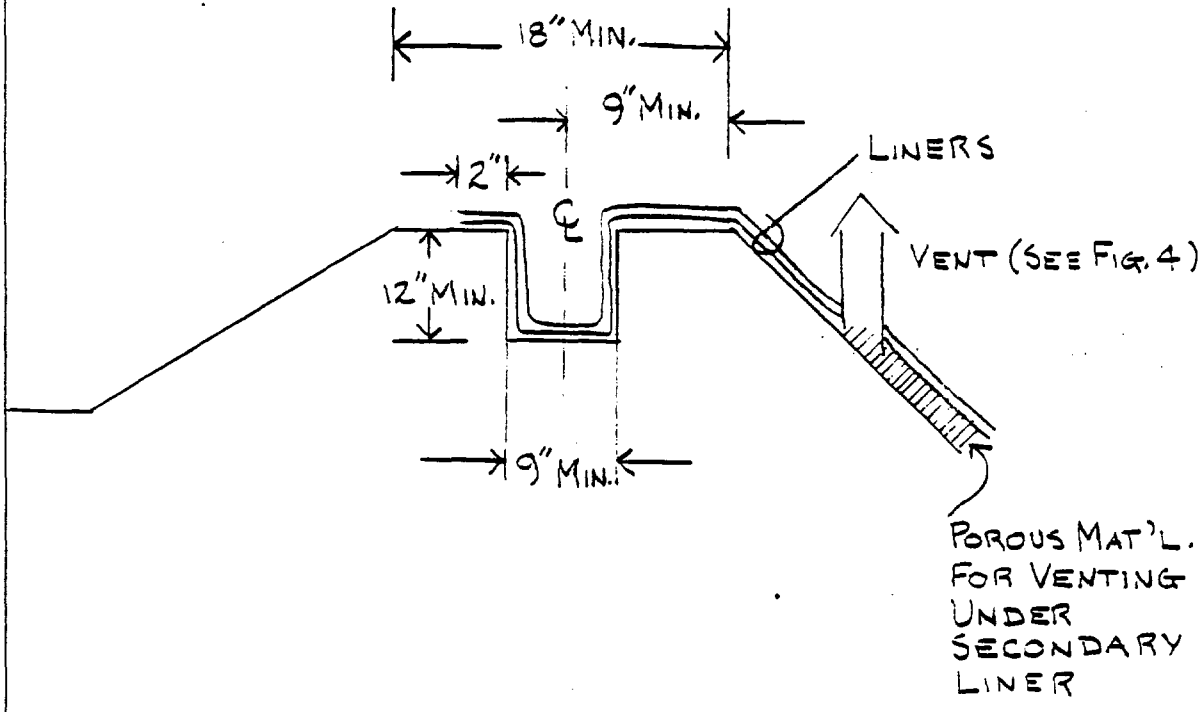
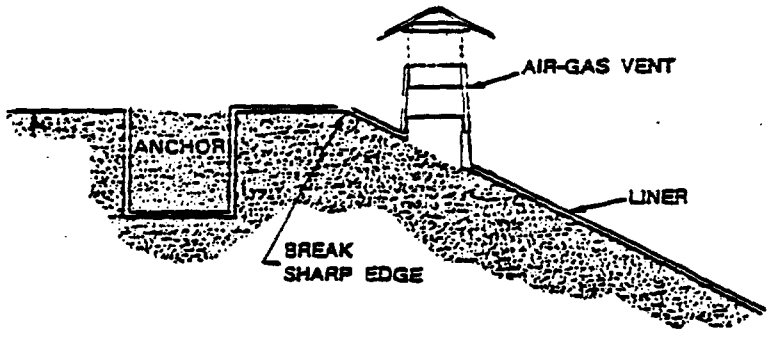


FIGURE 4 - TWO EXAMPLES OF VENT DESIGNS

SOURCE: EPA REPORT #SW-870, "LINING OF WASTE IMPOUNDMENT FACILITIES", PG. 260



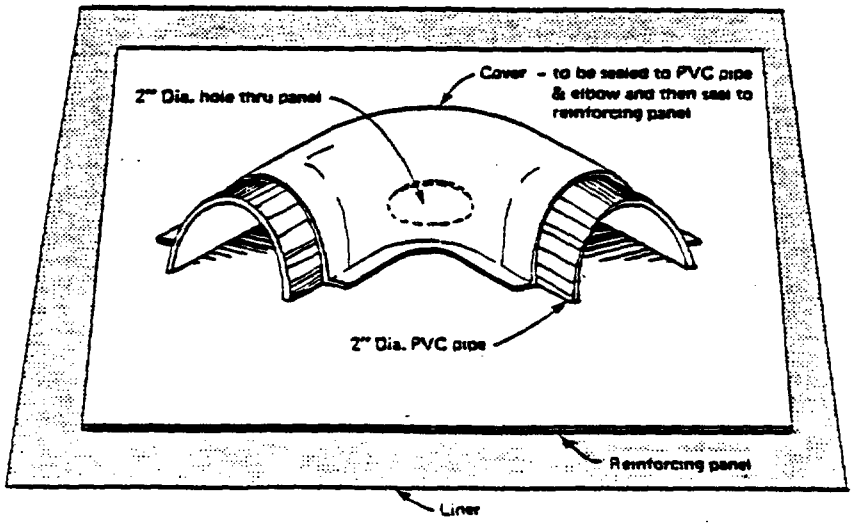
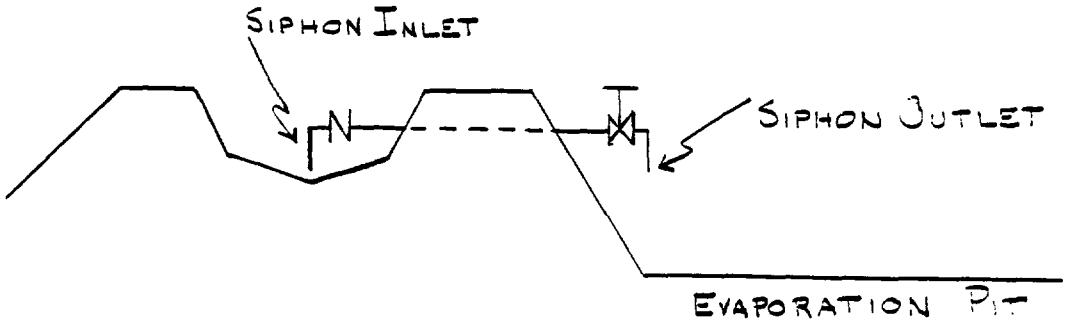
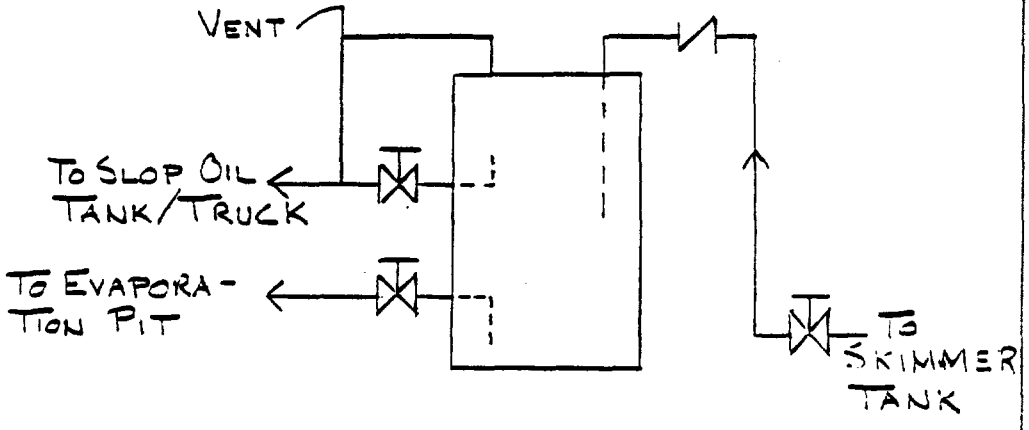


FIGURE 5: SKIMMER POND/TANK

(A.) SKIMMER POND



(B.) SKIMMER TANK



NOTE: BEFORE BEGINNING DISCHARGES TO SKIMMER POND/TANK, FILL WITH FRESH-WATER TO SIPHON INLET.

PARTIAL LISTING OF PRODUCED WATER CONTAMINANTS -
NORTHERN NEW MEXICO
(All values are in mg/l except for pH, L = Less than)

PIT SAMPLES

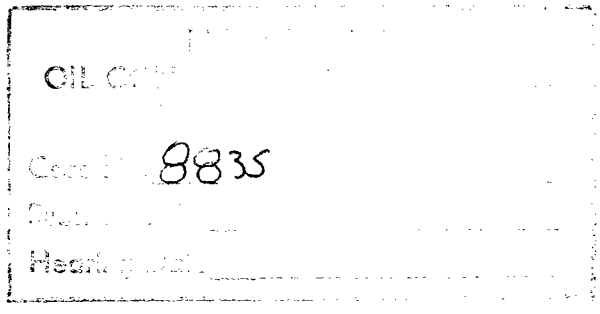
NAME	RANGE	MEAN°	MEDIAN°	# VALUES
Chloride	70-12,351	2955	1618	16
Sulfate	0-1548	740	111	13
Total Dissolved Solids	798-22,583	8130	4476	16
pH	5.8-9.3	7.6	7.8	16
Arsenic	0.014-0.31	0.085	0.041	11
Barium	L 0.10-41		0.56	17
Boron	L 0.10-6.6		0.85	17
Cadmium	L 0.10-0.20		L 0.10	17
Chromium	L 0.10-0.36		L 0.10	17
Iron*	L 0.10-40		3.2	17
Manganese*	L 0.05-2.8		0.66	17
Selenium	L 0.005-0.24		0.030	11
Benzene	0-10.2	2.2	1.35	18
Toluene	0-13	1.82	0.74	18
Ethylbenzene	0-0.16		0	18
Xylenes	0-4.0		0.60	18

°Mean figures do not include L values.
Median figures include L values.

Sampled by OCD thru 5/85
Analysis by SLD

* Some samples not filtered; figures represent total samples.

Case No 8835
OCD
EXHIBIT 6


OIL
8835