May 22, 1990

P.O. BOX 633 MIDLAND, TEXAS 79702

MIDLAND DIVISION

Oil Conservation Division ·P. 0. Box 2088 Sante Fe, New Mexico, 87501

9968

WATER DISPOSAL WELL STATE SEC. 27 LEASE WELL NO. 1 VACUUM DEVONIAN, SOUTH FIELD LEA COUNTY, NEW MEXICO

#### Gentlemen:

MobilExploration & Producing U.S. Inc., as agent for Mobil Producing Texas & New Mexico, Inc. MPTM), respectfully requests authority to dispose of produced water into the Devonian formation in the subject well.

Conversion of this well to a water disposal well is necessary to economically dispose of lease and off lease water. The same water as permitted for disposal in the State Sec. 27 #2 will be disposed into the #1. The purpose for converting #1 is as back-up capacity to #2. Presently #1 is still P&A'd and we wish to permit the well before Mobil spends money to re-enter it.

The supporting information for this application is organized in accordance with Form C-108.

If any further information is needed concerning this application, please call J. W. Dixon at (915) 688-2452.

Environmental, Regulatory, & Loss Prevention Supervisor

Mobil Exploration & Producing U.S. Inc. as agent for Mobil Producing Texas & New Mexico, Inc.

.JWD/spb attachments

cc: w/attachments Offset Operators Surface Owner New Mexico State Land Office District Director OCD - Hobbs Page 2 May 22, 1990 Oil Conservation Division WATER DISPOSAL WELL STATE SEC. 27 LEASE WELL NO. 1

٠.

bcc: w/attachments Central Files Production Eng. Supv.-K. Walters
Reservoir Engr. supv.
Geoscience Supv.
Operations Supv. - R. P. Pratt

## STATE OF NEW MEXICO ENERGY AND MINERALS DEPARTMENT

## **OIL CONSERVATION DIVISION** POST OFFICE BOX 2088 STATE LAND OFFICE BUILDING SANTA FE, NEW MEXICO 6/501

FURM C-100 Revised 7-1-81

I.	Purpose: Secondary Recovery Pressure Maintenance Disposal Storage Application qualifies for administrative approval? yes Mno
ı.	Operator: Mobil Producing Texas & New Mexico, Inc.  c/o Mobil Exploration & Producing U.S. Inc., P.O. Box 633, Midland, TX
	Contact party: J. W. Dixon Phone: (915) 688-2452
1.	Well data: Complete the data required on the reverse side of this form for each well proposed for injection. Additional sheets may be attached if necessary.
٧.	Is this an expansion of an existing project?  yes  no If yes, give the Division order number authorizing the project
٧.	Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review.
I.	Attach a tabulation of data on all wells of public record within the area of review whice penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail.
ı.	Attach data on the proposed operation, including:
	<ol> <li>Proposed average and maximum daily rate and volume of fluids to be injected;</li> <li>Whether the system is open or closed;</li> <li>Proposed average and maximum injection pressure;</li> <li>Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and</li> <li>If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.).</li> </ol>
Ι.	Attach appropriate geological data on the injection zone including appropriate lithologed detail, geological name, thickness, and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such source known to be immediately underlying the injection interval.
χ.	Describe the proposed stimulation program, if any.
х.	Attach appropriate logging and test data on the well. (If well logs have been filed with the Division they need not be resubmitted.)
Ι.	Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.
1.	Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground source of drinking water.
ı.	Applicants must complete the "Proof of Notice" section on the reverse side of this form.
٧.	Certification
	I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.
	Name: J. W. Dixon, Title Env., Reg., Technician
	Signature:

#### 111. WELL DATA

- A. The following well data must be submitted for each injection well covered by this application. The data must be both in tabular and schematic form and shall include:
  - (1) Lense name; Well No.; location by Section, Township, and Range; and footage location within the section.
  - (2) Each casing string used with its size, setting depth, sacks of cement used, hole size, top of cement, and how such top was determined.
  - (3) A description of the tubing to be used including its size, lining material, and setting depth.
  - (4) The name, model, and setting depth of the packer used or a description of any other seal system or assembly used.

Division District offices have supplies of Well Data Sheets which may be used or which may be used as models for this purpose. Applicants for several identical wells may submit a "typical data sheet" rather than submitting the data for each well.

- B. The following must be submitted for each injection well covered by this application. All items must be addressed for the initial well. Responses for additional wells need be shown only when different. Information shown on schematics need not be repeated.
  - (1) The name of the injection formation and, if applicable, the field or pool name.
  - (2) The injection interval and whether it is perforated or open-hole.
  - (3) State if the well was drilled for injection or, if not, the original purpose of the well.
  - (4) Give the depths of any other perforated intervals and detail on the sacks of cement or bridge plugs used to seal off such perforations.
  - (5) Give the depth to and name of the next higher and next lower oil or gas zone in the area of the well, if any.

#### XIV. PROOF OF NOTICE

All applicants must furnish proof that a copy of the application has been furnished, by certified or registered mail, to the owner of the surface of the land on which the well is to be located and to each leasehold operator within one-half mile of the well location.

Where an application is subject to administrative approval, a proof of publication must be submitted. Such proof shall consist of a copy of the legal advertisement which was published in the county in which the well is located. The contents of such advertisement must include:

- (1) The name, address, phone number, and contact party for the applicant;
- (2) the intended purpose of the injection well; with the exact location of single wells or the section, township, and range location of multiple wells;
- (3) the formation name and depth with expected maximum injection rates and pressures; and
- (4) a notation that interested parties must file objections or requests for hearing with the Oil Conservation Division, P. O. Box 2088, Santa Fe, New Mexico 87501 within 15 days.

NO ACTION WILL BE TAKEN ON THE APPLICATION UNTIL PROPER PROOF OF NOTICE HAS BEEN SUBMITTED.

NOTICE: Surface owners or offset operators must file any objections or requests for hearing of administrative applications within 15 days from the date this application was mailed to them.

#### STATE SEC. 27 #1 SWD PERMIT APPLICATION

#### C-108

- I. Disposal
- II. Mobil
- III. A. 1. State Sec. 27 #1, 660' FNL & 1983' FEL, Sec. 27, T185, R35E
  - 2. 13 3/8" csg @ 360' cmt w/350 sks of cmt, circ to surface
    9 5/8" csg @ 3800' cmt w/3500 sks of cmt, circ to surface
    7 5/8" csg @ 11,800' cmt w/1165 sks of cmt, TOC by temp
    survey @ 1715'
    7 5/8" csg cmt @ 1689'
  - 3. 3 1/2 or 4 1/2" Duolined tubing (fiberglass lining) set  $0 \pm 11,750'$
  - 4. 7 5/8" permanent pkr + seal assembly set @ + 11,750'
  - B. 1. Devonian, South Vacuum

    - 3. Originally drilled as Devonian producer
    - 4. Devonian perfs @ 11,650-668' squeezed w/150 sks
    - 5. Bone Springs, ± 8850'
  - IV. Yes, Division order # R-8645 dated 5-5-88
  - V. See attached map, Exhibit "A"
  - VI. Application filed March 2, 1988 for disposal permit for State Sec. 27 #2
- VII. 1. Average rate = 10,000 BWPD Maximum rate = 20,000 BWPD
  - Closed system
  - 3. Average injection pressure = 0 (operate on gravity feed) Maximum injection pressure = 2390 psi
  - 4. See attached Exhibit "B", plus chemical analysis of source water, statement from previous Reservoir Engineer
  - 5. See attached Exhibit "C"

#### VIII. 1. Lithologic detail

- a) Composition Devonian, white to tan, medium to course crystalline with vuggy to cavernous porosity
- b) Type structure faulted anticline
- c) Average porosity 13%
- d) Average permeability 5 to 30 md
- 2. Geologic name Devonian
- 3. Thickness average, 500'
- 4. Average top of pay 12,000'
- 5. Overlying fresh water zones, 10,000 ppm or less TDS:
  - a) Ogalalla @ 300'
  - b) Santa Rosa @ 1400'
- 6. There are no fresh water zones immediately underlying the injection zone.
- IX. Acidize Devonian w/2,000 gal 15% HCL acid + 10,000 gal gelled 15% HCL acid + 6000 lbs graded rock salt. Maximum treating rate = 5 BPM, maximum treating pressure = 5000 psi. Flush treatment with 50 bbls biocide-treated fresh water.
  - X. Well will need to be deepened from present PBTD of 11,752' to proposed new TD of 13,970'.
    At that time, open-hole logs will be run and filed with the OCD.
- XI. See attached Exhibit "D"
- XII. MPTM has examined the available geologic and engineering data and finds no evidence of open faults or other hydrological connection between the Devonian Formation and any underground source of drinking water.
- XII. See attached Exhibits "E" and "F" for Proof of Notice

#### Also attached:

- Proposed sketch
- Map (Exhibit A) with 1/2 mile radius drawn

$\cdot$ , $\cdot$	
DATE 4-23-90 WELL NO. / LEASE State Section 27	
FIELD Vacuum Devonian South LOCATION 660' FNL \$ 1983 FEL Unit B Sec 27,	T185, R350
Lea County, New Mexico	
SIGNED DE Elwood GL 3887	
DF <u>3895'</u> KB <u>3896'</u> ZERO <i>KB</i> (9'AGL)	
PRESENT WELLBORE DIAGRAM	° \$A
20 sk surface cont plug, cz cut 3' below surface, marker welded on	,,,
133/8" 48 16/ft H-40 cy set to 360' w/350 sks, cmt circ (17")	(ole)
75/8" csg cut @ 1689', spot 30 sk cmt plug 1740 - 163	8'
Primary Toc (95/8-75/8) @ 1715' (temp survey)	
95/8" 36/6/4 J-55 csy set to 3800' w/3500 sks, cmt circ (124" hole	)
	r
Wellbore loaded w/ mud	
Cont retainer set @ ± 11,260', squeezed perts, left 2 bb	Is cont
Devonian Perts	@ ± 11, 216.
	72 holes
11,650 - 11,668 , 54 weeted W/150 5PS	72 110 103
PBTD=11,752' 1 152' 1 26.4, 29.7, \$ 33.7 bft N-80 Buttress + X-line	Csg
set to 11,800' w/ 1165 sks	

TD: 11,800', PBTD: 11,152'

•	LOCATION 660' FNL \$ 1983' FEL Unit B Sec 27, TISS, R3
SIGNED DE Elwood	Lea Gunty, New Mexico  GL 3887'  DF 3895'  KB 3896'  ZERO KB (9'AGL)
PROPOS	ED WELLBORE DIAGRAM
	- 31/2" or 41/2" N-80/K-55 Duolined thy, plus fluid an annulus  - 133/8" 48 16/4 H-40 cy set to 360' w/350 sks, cmt circ (17° hole)  75/8" csg cut @ 1689'  Primary Toc (95/8-75/8) @ 1715' (temp survey)  - 95/8" 3616/4 J-55 cy set to 3800' w/3500 sks, cmt circ (124" hole)  - 160-11,668', squeezed w/150 sks cmt 4 spf 72 holes  Permanent plus set @ ± 11,750'  75/8" 26.4, 29.7, \$ 33.7 16/4 N-80 Buttress + X-line csg set to 11,800' w/1165 sks  Proposed Devonian Disposed Zone  OH 11,800-13,970')

Proposed TD: 13,970'

## State of New Mexico





# Commissioner of Public Lands

P.O. BOX 1148 SANTA FE, NEW MEXICO 87504-1148

Mobil Exploration & Producing U.S., Inc. P. O. Box 633 Midland, Texas 79702

Re: Water Disposal Well State Section 27 Lease

Well No. 2

Vacuum Devonian, South Field Lea County, New Mexico

Attn: Mr. C. A. Moore

Gentlemen:

In connection with the above application submitted to the Oil Conservation Division by Mobil's letter dated March 2, 1988, the Land Commissioner has no objections at this time as to the above application, but reserves the right to refuse to grant an easement if it would be detrimental to the Trust Lands.

Because an oil and gas lessee is entitled to dispose of the Salt Water produced exclusively from wells located on the leased premises, no salt water disposal easement will be needed; however, if any of the salt water to be injected is produced from wells outside of the leased lands, you must apply for a Salt Water Disposal Easement.

Copies to.

TL Hill

w. Perry Barre

RC Pyer

AT Alast

L. Farrar

L. Marzzynski

WRH: FOP: cw

cc: Oil Conservation Division

Very truly yours,

W. R. Humphries

Commissioner of Public Lands

By: Floyd O. Prando, Director Oil and Gas Division

A/C 505~827-5744

RECEIVED

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ENV. & REG.

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Mobil Producing Texas & New Mexico, Inc. c/o Producing U.S. Inc.  7. Address SI Constant P.O. Box 633, Midland, Tx. 79702  7. Location of Well Unit Tettes H. Locate 1980 Feb. 1	MELL GAS WELL	OTHER	Disposal	SINGLE X	MULTIPLE ZONE	S+=	te Sec 27
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ALCORION of Well Walf LETTER H LOCATED 1980 FEET FROM THE MONTH LINE 12. COUNTY 12. COUN	3. Address of Operator					10. Field on	nd Pool, or Wildcat
Size of Hole   Size of Casing   Weight Per Foot   Setting Depth   Sacks Of Cement   Start Plus Bond   Size of Hole   Size of Casing   Size of Casing   Size of Hole   Size of Casing   Size of Hole   Size of Casing   Size of Casing   Size of Hole   Size of Casing   Size of Casing   Size of Hole   Size of Casing   Size of Cas		dland,Tx.79702	····		· · · · · · · · · · · · · · · · · · ·	Vacuum	Devonian South
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This space for State Use)  ORIGINAL SIGNED BY USERY MEXION  ORIGINAL SIGNED BY USERY MEXICON  ORIGINA	(J) JUDALL TOLI	war arshosar ab	brroacton II we	****** T2 20	arcante.		CT
ABOVE SPACE DESCRIBE PROPOSED PROGRAM: IF PROPOSAL IS TO DEEPEN ON PLUG BACK, GIVE BATA ON PRESENT  INVECTIONE. GIVE SLOWOUT PREVENTER PROGRAM, IF ANY.  hereby centry that the information above is true and complete to the best of my knowledge and belief.  Environmental & Regulatory  Title Manager    Date   12/15/87	to grade of section is a section of the section of			· .		PROD. GE RES. ENC FLD. ENC CENTRAL DRLG. SU DRLG. EN LAND MGR	CO. MGR.  GR. MGR.  FILES MIDLAND  JPT. SEC.  JOHN SEC.  JOHN SEC.  JOHN SEC.  JOHN SEC.  JOHN SEC.
Hereby centry that the information above is true and complete to the best of my knowledge and belief.  Environmental & Regulatory  Title Manager    Date   12/15/87	N ABOVE SPACE DESCRIBE PR IVE ZONE, GIVE BLOWOUT PREVENT	IOPOSED PROGRAM: IF	PROPOSAL IS TO DEEPEN OF	PLUG BACK, GIVE DA	TA ON PRESENT 1	DJ/ST. OP	MGR. HOULE
Title Manager  ORIGINAL SIGNED BY ASSET SEXTON  ORIGINAL SIGNED BY ASSET SEXTON  ORIGINAL SIGNED BY ASSET SEXTON  OPPROVED BY DISTRICT I SERVEN SEXTON  OPPROVED BY DISTRICT I SEXTON SEXTO	hereby ceptify that the informati	on above is true and com				REGULATO	RY
ORIGINAL SIGNED BY JEGRY SIXTON Mobil Exploration & Producing U.S.Inc.as Agent for Mobil Producing Texas & New Mexico, Inc.  APPROVED BY DISTRICT I SUPCEMBER  OATE DEC 1 7 1007	(M-5	1		tal & Regula		~	
ORIGINAL SIGNED BY ASSET SEXTON Mobil Producing Texas & New Mexico, Inc.  APPROVED BY DISTRICT I SUPCEMBER  AITLE DEC 1 7 1007	Signed Harry	mune,	Tule Manager			Date12	/15/87
APPROVED BY DISTRICT I SUPERVISOR FITTE DEC 17 1087	(This space for	State Use)	Mobil Expl	oration & Pr	oducing U.S	.Inc.as	Agent for
APPROVED BY DISTRICT I SUPERVISOR FITTE DEC 17 1087	ORIGINAL SIGN	OTXIR VARREL YE CEL	Mobil Prod	ucing Texas	& New Mexic	co, Inc.	
CONDITIONS OF APPROVAL, IF ANY:	PPROVED BY DISTRIC	t i subtayisür	#ITLE			DATE	FC 1 7 1997
	CONDITIONS OF APPROVAL. IF	FANY:	<del></del>	:		_	

t Date Unless Drilling Underway.

#### STATE OF NEW MEXICO ENERGY AND MINERALS DEPARTMENT

## OIL CONSERVATION DIVISION P. O. BOX 2088

## P. O. BOX 2088 SANTA FE, NEW MEXICO 87501

Form C-102 Revised 10-1-78

	All dis	itances must be fro	om the outer	sounderles of	the Section	•			
Operator Mobil Pro	ducing Texas &		L-080 '				Well No.		
New Mexic		1	State Se	c. 27	16	<del></del>	#2		
H Sec	tion Townshi		Range	•	County		•		
Actual Footoge Location		-18-S	R-35	E	Lea				
10001	et from the North	line and	660 <b>'</b>	· Ice	t from the	East	· line		
Cround Level Elev.	Producing Formation	<del></del>	Pool			2000	Dedicated Acreoge:		
3887'	Devonian		South V	acuum			NA Acres		
2. If more than	<ol> <li>Outline the acreage dedicated to the subject well by colored pencil or hachure marks on the plat below.</li> <li>If more than one lease is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty).</li> </ol>								
dated by comm	3. If more than one lense of different ownership is dedicated to the well, have the interests of all owners been consolidated by communitization, unitization, force-pooling.ete?								
this form if nec		no tract descri	ptions was	on nave ac	tually be	en Consolida	ated. (Use reverse side of		
forced-pooling,		non-standard	unit, elimi	nating sucl	n interest	s, has been	nunitization, unitization, approved by the Division.		
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	               		.			shown on t notes of a under my, s	certify that the well location his plat was platted from field ctual surveys made by me or upervision, and that the same d correct to the best of my and belief.		
	T-18-5	R -35-1				Date Surveye  Hegistered P and/or Land:	rolessional Engineer Surveyor		

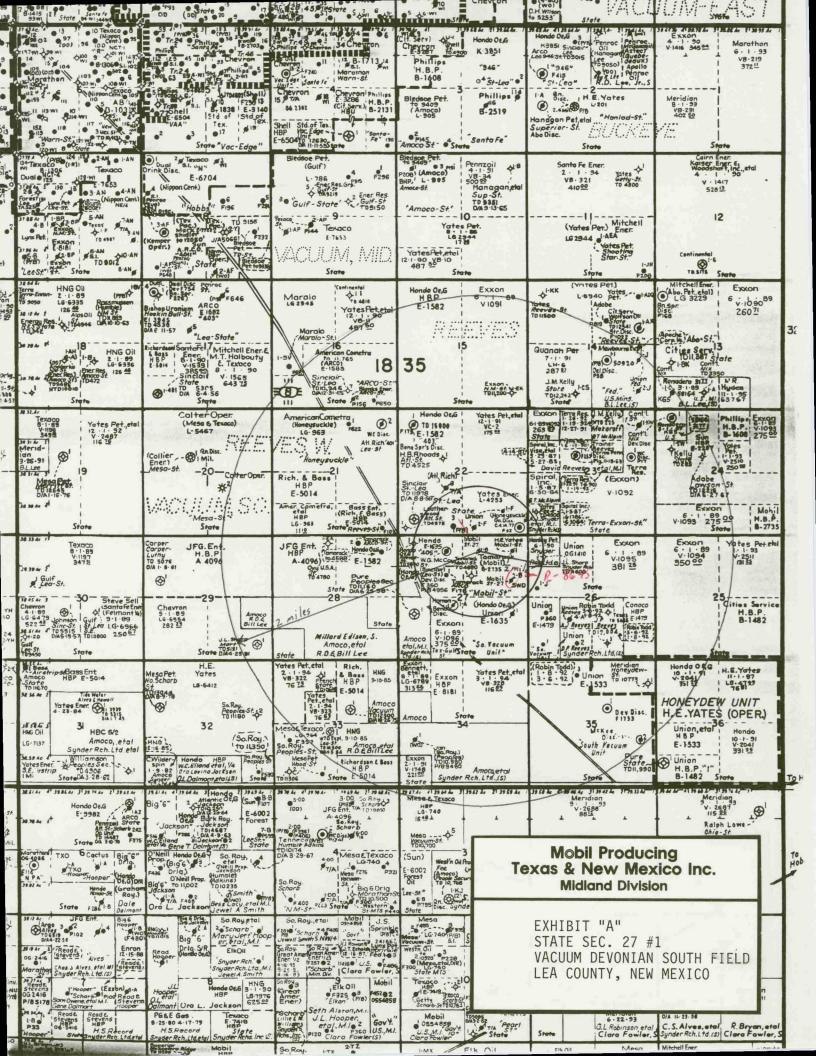


Exhibit "B"

#### INTEROFFICE CORRESPONDENCE

DATE: Feb. 15, 1988

TO: Ann Moore

CC:

With regards to the water capatability test conducted on fluids to be injected into the State 27 well #2 SWDW, the following statement can be made:

A composite of produced water which represents the typical injection fluid consists of Abo (46%), San Andres (48%), Glorieta (2%), Pennsylvania (3%), and Blinebry (1%). This water was combined with Devonian produced water in varying amounts. In summary, the Devonian water alone, and mixtures of Devonian from 0 to 50% with the proposed injection fluid formed carbonate scale. Calcium sulfate becomes evident in the high percent composite range of 80 - 100%. Thus a scale prevention program is needed and chemical treatment of the well will be done as required to control both types of scale.

Ann, attached is a copy of the analysis performed by NL Treating Chemicals If you have any questions, please give me a call at ext. 2076.

Thanks

Jack Hamner RM - 240 Project Reservoir Engineer Treating
Chemicals

NL Treating Chemicals/NL incustries, inc. P.O. Box 60020, Houston, Texas 77205 Tel. (713) 987-5400 Telex: 4620243 NLOS UI

## Water Analysis Repc.

						SHEET NUMBER
COMPANY Mobil Produci	ng Texa	es & New Mexico				DATE
PIELD Vacuum				COUNTY OR FARISH Lea		STATE New Mexico
EASE OR UNIT North Bridges State	Vacuul <del>Leases</del>	m Alo Samplesourd - Unit #235	CE		Abo	(FORMATION)
DEPTH. FT. B	(T, °F	SAMPLE SOURCE	64		DIL, EBL/DAY	GAS, MMCF/DAY
12-16-87		TYPE OF WATER: D PRI TYPE OF PRODUCTION:	ODUCED D SUPPLY D D PRIMARY D WATERF	WATERFLOOD D SA	LT WATER DISPOSAL  D POLYMER FLOOD	STEAMFLOOD
Na + 20	15	(NUMBER)	WATER ANALYSIS BESIDE ION SYMBOL IND  5 0			15 20 CI -
Ca++	+++				+ + + + +	HCO <sub>3</sub> =
DISSOLVED SOLIDS				DISSOLVED G	BASES	
CATIONS  Total Hardness  Calcium, Ca + +  Magnesium, Mg + +  ron (Total) Fe + + +  Barium, Ba + +  Lodium, Na + (Calc.)		128 50 78 75.1	1,000 952 1,727	Hydrogen Sulfid Carbon Dioxide, Oxygen, O2 PHYSICAL PRO pH (Field En (Redox Poten Specific Gravity	CO <sub>2</sub> PERTIES	mg/l mg/l mg/l MV
NIONS Chloride, CI cultate, SO <sub>4</sub> = carbonate, CO <sub>3</sub> = cucarbonate, HCO <sub>3</sub> cydroxyl, OH cultide, S =	- - -	169.0 30.7 3.4	6,000 1,475 207	Turbidity, FTU U Total Dissolved: Stability Index  CaSO <sub>4</sub> Solubility  Max. CaSO <sub>4</sub> Pos Max. BaSO <sub>4</sub> Pos Residual Hydroc	Solids (Calc.)  @ 80 °F  @ 100 °F  @ 120 °F  / @ °F  Essible (Calc.)  ssible (Calc.)	11,361 mg/l +0.81 +0,30 +0,45 mg/l mg/l mg/l ppm(Vo!/Vol)

#### **USPENDED SOLIDS (QUALITATIVE)**

on Sulfide 🖸 Iron Oxide 🖸 Calcium Carbonate 🗘 Calcium Sulfate 🗘 Acid Insoluble 🗎

EMARKS AND RECOMMENDATIONS:

TO ENGINEER	DIST. NO.	ADDRESS		OFFICE PHONE	HOME PHONE
Dickerson/Slyker	821	l			
ALYZED BY	DATE	PCITUBIETZIC	I CUSTOMER	T EEGION T	لدانتېت، اد

Treating Chemicals

NL Treating Chemicals/NL Industries, Inc. P.O. Box 60020, Houston, Texas 77205 Tel. (713) 987-5400 Teiex: 4620243 NLOS UI

## Water Analysis Repc

				SHEET NUMBER
				11
COMPANY				DATE
Mobil Producing	Texas & New Mexico			1
FIELD			COUNTY OR PARISH	STATE
Vacuum			lea	New Mexico
LEASE OR UNIT	SAMPLE SOUR	Œ.	WATER	SOURCE (FORMATION)
Bridges-State L	_eases  #193		San	Andres
DEPTH. FT. BHT.	*F SAMPLE SOURCE	TEMP. *F	WATER, BBUDAY OIL BBUDAY	GAS, MMCF/DAY
DATE SAMPLED	TYPE OF WATER: D PE		WATERFLOOD   SALT WATER DI	SPOSAL
12-16-87			LOCD CO2 FLOOD C POLYM	
12-16-07				
	(NUMBER	WATER ANALYSIS BESIDE ION SYMBOL INC	S PATTERN DICATES me/I SCALE UNIT)	
Na + 20	15 10 -	5 0	5 10	15 20 CI -
				——————————————————————————————————————
Ca++	<del></del>	<del></del>	<del>                                     </del>	HCO3
1 1 1 1	11111111			
Mg <sup>+</sup> +	<del></del>		+++++++	!
Fe <sup>++</sup> +			<u> </u>	<u>'                                    </u>
DISSOLVED SOLIDS			DISSOLVED GASES	
CATIONS	me/I <b>2</b> 82	mg/l	Hydrogen Sulfide, H <sub>2</sub> S	mg/l
fotal Hardness			Carbon Dioxide, CO <sub>2</sub>	mg/l
Calcium, Ca + +	<u> 156</u>	3,120	Oxygen, O <sub>2</sub>	mg/l
Aagnesium, Mg <sup>+ +</sup>	126	1.537		
ron (Total) Fe + + +			PHYSICAL PROPERTIES	
Barium, Ba + +			_ pн (Field)	<u>6.63</u>
odium, Na + (Calc.)	974.7	22,418	Eh (Redox Potential)	MV
			Specific Gravity	Charles and the same of the sa
NIONS	_		Turbidity, FTU Units	
intoride, CI	<u> 1,183.1</u>	42.000	Total Dissolved Solids (Calc.)	
ulfate, SO <sub>4</sub> =	57.3	2,750	Stability Index @ 80 •1	
arbonate, CO <sub>2</sub> =			<u>@100</u> •	
icarbonate, HCO3	12.2	744	<u>6120 •</u>	+0.52
ydroxyl, OH	-		CaSO <sub>4</sub> Solubility @*F	mg/l
Jiffide, S =	4.1	65	•F	
			Max. CaSO <sub>4</sub> Possible (Calc.)	
	<del></del>		Max. BaSO <sub>4</sub> Possible (Calc.)	
		-	Residual Hydrocarbons	ppm(Vol/Vol)

UBPENDED SOLIDS (QUALITATIVE)

an Sulfide ☐ Iron Oxide ☐ Calcium Carbonate ☐ Calcium Sulfate ☐ Acid Insoluble ☐ EMARKS AND RECOMMENDATIONS:

C ENGINEER	DIST. NO.	ADDRESS	ICFFICE PHONE	HOME PHONE
Dickerson/Slyker	821	İ		

Treating Chemicals
Chemicals

NL Treating Chemicals/NL Industries, Inc. P.O. Box 60020, Houston, Texas 77205 Tel. (713) 987-5400 Telex: 4620243 NLOS UI

### Water Analysis Repo

							SHEET NUMBER
					<del></del>		3
COMPANY			•				DATE
	oducing Texa	s & New Me	KICO			<del></del>	
FIELD				j	COUNTY OR PARISH		STATE
Vacuum					Lea		New Mexico
LEASE OR LNIT	_		LE SOURCE			WATER SOURCE (FO	RMATION)
·	-State Lease					Glorieta	
DEPTH. FT.	БНТ, °F	SAMPLE SOURCE		1	WATER, EBUDAY O	L SSUDAY	GAS, MMCF/DAY
		1		53			
DATE SAMPLED	\ <b></b>				WATERFLOOD D SAL		·
12-16-8	<u> </u>	TTPE OF PHODE	CHON: U PHIM	ART LI WATERF	1000 D C02 FL00D	S POLYMER FLOOD	C STEAMFLOOD
			WAT	ER ANALYSIS	S PATTERN		
		(1)			DICATES me/I SCALE UI	NIT)	
+ 20	) 15	10	5	0	5	10 15	20 cı
Na + 20		1111	1111	11111	111111		<del></del>
	Ì				Ì	1	
ca++	╌╬╌╬╌╂╌╂╌╂╌╂	<del></del>	<del></del>	<del>!                                    </del>	<del>                                     </del>	<del>! ! ! ! ! ! !</del>	
j			'''		!	'   ' ' ' '	1 1 1 1
Mg++		1 .		! .	, , , , , , , ,	, , , , , , ,	1 1 1 1 20 =
Mg	<del></del>	<del>-1-1-1-1</del>	<del></del>	<del>         </del>	<del>                                     </del>	<del>11:11:11</del>	SO <sub>4</sub> =-
	1				}	}	
Fe + + +			<u> </u>		<u> </u>	<u> </u>	<u> </u>
DISSOLVEDS	SOLIDS				DISSOLVED G	ASES	
CATIONS		п	e/l	mg/I	Hydrogen Sulfide	HaS	mg/l
Total Hardness			76	••••	Carbon Dioxide,	_	mg/l
Calcium, Ca +		18	38	3,760	Охусел, О2		mg/l
Magnesium, Mg		1	38	107			
ron (Total) Fe	+ + + +				PHYSICAL PROF	PERTIES	
Barium, Ba + +	•				pH (Field)		6.45
Socium, Na <sup>+</sup> (0		3.69	8.9	85.075	Eh (Redox Potent		MV
30Cidiii, i4a (	<i>J</i> 8.0. <i>)</i>				Specific Gravity	,	
ANIONS					Turbidity, FTU Ur	nits	
Chloride, CI		3.9	5.5	139,000	Total Dissolved S		231_712 mg/l
			7.4	2,275		@_80°F	+0.77
Sulfate, SO <sub>4</sub> =	. =			<del></del>	ordoniry index	@_100 • F	+0.96
Carbonate, CO		<del></del>	7.5	458		@ 120 ·F	+1.21
Bicarbonate, Ho	w	<del></del>	<del></del>		CaSO <sub>4</sub> Solubility	-	
iyoroxyl, OH			4.5	72	CesO4 solubility		mg/l
Sulfide, S ==			<u> </u>		May Caso Des	©*F	mg/l
				<del></del>	Max. CaSO <sub>4</sub> Pos		mg/l
		<del></del>		<del></del>	Max. BaSO <sub>4</sub> Pos		mg/l
					Residual Hydroca	BIDOUZ	ppm(Vol/Vol)

#### JUSPENDED SOLIDS (QUALITATIVE)

ron Sultide 🗆 Iron Oxide 🗅 Calcium Carbonate 🗅 Calcium Sulfate 🗇 Acid Insoluble 🗇

REMARKS AND RECOMMENDATIONS:

TO ENGINEER	DIST. NO.	ADDRESS	OFFICE PHONE	HOME PHONE
Dickerson/Slyker	821			
VTET BV	DATE	היינים ביינים ביינים ווחודות ביינים		

NL Treating Chemicals/NL Industries, Inc. P.O. Box 60020, Houston, Texas 77205 Tel. (713) 987-5400 Telex: 4620243 NLOS UI

## Water Analysis Repor

				SHEET NUMBER
	<del></del>	. <del> </del>		5
OMPANY	e C Novi Movins			DATE
Mobil Producing Texa	S & NEW MEXICO	:001	JNTY OR PARISH	
Vacuum		1.	*	STATE
EASE OR UNIT	SAMPLE SOURCE	<u> </u>	<del></del>	New Mexico
Bridges-State Leases	l l		ì	CE (FORMATION)
EPTH. FT.   EHT, "F	SAMPLE SOURCE	TEMP. *F WAT	ER. BBUDAY JOIL, BBUDAY	Penn IGAS, MMCF/DAY
CF III. 1		72	OIC BEDDAT	(S.), MAIST 15A1
ATE SAMPLED	TYPE OF WATER: EL PRODUCE		TERFLOOD C SALT WATER DISPOSA	
12-16-87	TYPE OF PRODUCTION: C PRI	MARY D WATERFLOO	D C CC2 FLOOD C POLYMER FLO	OD C STEAMFLOOD
<u></u>			<del></del>	
		TER ANALYSIS PA		
		E ION STMEOL INDICA	TES mell SCALE UNIT)	
Na + 20 15	10 5	0	5 10	15 20 CI -
			' '   ' ' ' '   ' ' ' ' ' ' ' '	
Ca++	. , , † , , , , † ,	11111	<u>, , , , , , , , , , , , , , , , , , , </u>	HCO3-
— · · · · · · · · · · · · · · · · · · ·			1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	11111103
Mg <sup>+ +</sup>	<del>111111</del>	<del></del>	<del></del>	50 <sub>4</sub> =
_Fe <sup>+++</sup>		11111		1 1 1 1 0 0 3 =
ISSOLVED SOLIDS			DISSOLVED GASES	
ATIONS	me/l	mg/l	Hydrogen Sulfide, H <sub>2</sub> S	mg/l
atal Hardness	246	••••	Carbon Dioxide, CO <sub>2</sub>	mg/l
alcium, Ca + +	132	2,640	Oxygen, O <sub>2</sub>	mg/l
agnesium, Mg + +	114	1,391	5., y 5, <b>5</b> 2	
on (Total) Fe + + +			PHYSICAL PROPERTIES	
arium, Ba + +			рн (Field)	6.16
dium, Na + (Calc.)	2,197	50,531	Eh (Redox Potential)	MV
			Specific Gravity	
IIONS			Turbidity, FTU Units	
Horide, CI	2.366.2	84,000	Total Dissolved Solics (Calc.)	141,813 mg/l
.liate, SO <sub>4</sub> =	46.4	.1 3,225	Stability Index @80°F	<u>+C_13</u>
irbonate, CO3 =			<b>€_100°</b> F	_+0_03
carbonate, HCO3	12	732	@_120°F	<u>+0.22</u>
droxyl, OH	• C 1:	001	CaSO <sub>4</sub> Solubility @*F	mg/l
ifide, S =	18.4	204	@•F	mg/l
	<del></del>		Max. CaSO <sub>4</sub> Possible (Calc.)	mg/l
	<del></del>		Max. BaSO <sub>4</sub> Possible (Calc.)	mg/l
			Residual Hydrocarbons	ppm(Vol/Vol)

#### SPENDED SOLIDS (QUALITATIVE)

- MARKS AND RECOMMENDATIONS:

ENGINEER	DIST. NO.	ADDRESS	<del></del>	CFFICE PHONE	HOME PHONE
ickerson/Slyker	821				
LYZED BY	DATE	DISTRIBUTION	C CUSTOMER	I REGION	C DISTRICT
• •	12/17/87		E NUTO SALES EN RHIFER		-

Treating Chemicals
Chemicals

NL Treating Chemicals/NL Industries, Inc. P.O. Box 60020, Houston, Texas 77205 Tel. (713) 987-5400 Telex: 4620243 NLOS UI

## Water Analysis Repo

				SHEET NUMBER
COMPANY				DATE
Mobil Producina Te	exas & New Mexico			
FIELD		100	UNTY OR PARISH	STATE
Vacuum		L	ea	New Mexico
LEASE OR UNIT	SAMPLE SOURCE		WATER SOURCE	
Bridges-State Leas	ses #165		Middle Pe	enn
SEPTH. PT. BHT, "F	SAMPLE SOURCE	TEMP, *F WA	TER, BBL/DAY   CIL. BSL/DAY	GAS, MMCF/DAY
JATE SAMPLED	TYPE OF WATER: C PROD	UCED [ SUPPLY   W	ATERFLOOD C SALT WATER DISPOSAL	
12-16-87			OD CO2 FLOOD C POLYMER FLOOD	C STEAMFLOOD
+ 20 15	(NUMBER BE	WATER ANALYSIS F SIDE ION SYMBOL INDIC		15 20
Na + 20 15	<del></del>	<del>, , , , , , , , , , , , , , , , , , , </del>	<del></del>	15 20 CI -
Ca+ ÷	  - <del> - - - - - - - - - - - - - - - - - </del>	 <del> </del>	<del>                                     </del>	HCO <sub>3</sub>
Mg++	_			
Fe+++				
DISSOLVED SOLIDS			DISSOLVED GASES	
CATIONS	me/l	mg/l	Hydrogen Sulfide, H <sub>2</sub> S	mg/l
otal Hardness	172	<del></del>	Carbon Dioxide, CO <sub>2</sub>	mg/l
Calcium, Ca + +	100	2,000	Oxygen, O <sub>2</sub>	mg/l
Aagnesium, Mg + +		878		
on (Total) Fe + + +		·	PHYSICAL PROPERTIES	
Barium, Ba + +		<del></del>	рн (Lab)	7.7
odium, Na + (Calc.)		<del></del>	Eh (Redox Potential)	MV
		<del></del>	Specific Gravity	
NIONS	•		Turbidity, FTU Units	
inloride, CI	647.9	23,000	Total Dissolved Solids (Calc.)	mg/l
ulfate, SO <sub>4</sub> =	33.9	1,625	Stability Index @*F	******
arbonate, CO3 =			<b>@</b> •F	<del></del>
icarbonate, HCO3			<b>@</b> •F	
ydroxyl, OH			CaSO4 Solubility @*F	mg/l
ulfide, S=			<b>6</b> •F	mg/l
			Max. CaSO <sub>4</sub> Possible (Calc.)	mg/l
			Max. BaSO <sub>4</sub> Possible (Calc.)	mg/l
			Residual Hydrocarbons	ppm(Vol/Vol)

#### USPENDED SOLIDS (QUALITATIVE)

Mote: Small sample of water obtained.

TC ENGINEER	DIST. NO.	[ADDRESS .	OFFICE PHONE	HOME PHONE
)ickerson/Slyker	821	·	1	
1, V7CD BV	10475	IDISTRIBUTION T CUSTOMES		

Treating Chemicals

NL Treating Chemicals/NL Industries, Inc. P.O. Box 60020, Houston, Texas 77205 Tei. (713) 987-5400 Telex: 4620243 NLOS UI

## Water Analysis Repo

				SHEET NUMBER
COMPANY Mobil Producing Texa	s & New Mexico			DATE
FIELD		COUNTY OF	PARISH	STATE
Vacuum		Lea		New Mexico
LEASEORUNIT Bridges-State Leases			WATER SOURCE Blinebry	(FORMATION)
ЭЕРТН, РТ. ВНТ. °F	SAMPLE SOURCE	TEMP, *F   WATER, BOI		GAS, MMCF/DAY
DATE SAMPLED 12-16-87	TYPE OF PRODUCTION: G PRI	D C SUPPLY G WATERFLO	DOD D SALT WATER DISPOSAL CO2 FLOOD D POLYMER FLOOD	D [] STEAMFLOOD
+ 20 15		TER ANALYSIS PATTER E ION SYMBOL INDICATES M		15 20 CI -
Na + 20 15Ca + + 1 1 1 1	<del></del>			HCO <sub>3</sub>
Mg++	· · ·   · · · ·   · ·   · ·   · ·   · ·   · ·   · ·   · ·   · ·   · · ·   · ·   · ·   · ·   · · ·   · ·   · ·   · ·   · · ·   · · ·   · · ·   · · ·   · · · · · · · · · · · · · · · · · · · ·			SO <sub>4</sub> =
Fe+++				·
DISSOLVED SOLIDS		DIS	SOLVED GASES	
CATIONS  Total Hardness  Calcium, Ca + +  chesium, Mg + +	me/l 734 546 188	Cart	rogen Sulfide, H <sub>2</sub> S oon Dioxide, CO <sub>2</sub> sen, O <sub>2</sub>	mg/l mg/l mg/l
c <sub>e</sub> +++ ·+ 	2,665.7	61,311 PH	SICAL PROPERTIES (Field) Redox Potential) cilic Gravity	MV
NIONS Chloride, CI cultate, SO <sub>4</sub> = Carbonate, CO <sub>3</sub> = Sicarbonate, HCO <sub>3</sub>	3.352.1 41.7 5.9		idity, FTU Units I Dissolved Solids (Calc.) ility Index @80°F @_100°F @_120°F	195,885 mg/l ±1.55 ±1.74 ±1.97
nydroxyl, OH ullide, S =		CaSo	O4 Solubility @*F  @*F  CaSO <sub>4</sub> Possible (Calc.)  BaSO <sub>4</sub> Possible (Calc.)  dual Hydrocarbons	mg/l mg/l mg/l ppm(Vol/Vol)

#### USPENDED SOLIDS (QUALITATIVE)

nn Sulfide 🖸 Iron Cxide 🖟 Calcium Carbonate 🖟 Calcium Sulfate 🗀 Acid Insoluble 🖨 EMARKS AND RECOMMENDATIONS:

TC ENGINEER	DIST, NO.	ADDRESS	OFFICE PHONE	HOME PHONE .
Dickerson/Slyker	821			
ALYZED BY	DATE	DISTRIBUTION C CUSTOMER	I REGION	☐ DISTRICT

#### Exhibit "C"



January 20, 1988

Mr. David Howell Mobil Producing Texas & New Mexico P. O. Box 1800 Hobbs, New Mexico 88240

Subject: Vacuum Area Waters - Compatibility Study with Devonian Brine

Dear Mr. Howell:

Appended are individual produced water analyses pertaining to those Mr. Dickerson and I took with you on December 16, 1987. Also included is the Union's Devonian water analysis.

A mixture of your produced water was made as follows:

Abo	46%
San Andres	48%
Glorieta	2%
Pennsylvania	3%
Blinebry	1 %

That mixture was blended with Devonian water in 10% increments. Samples were placed in an oven for 5 days at 100°.

The "Compatibility" appendage describes how samples reacted. Brief general summary comments are these:

- 1. No major initial incompatibility was seen at the time of mixing.
- 2. Moderate calcium carbonate deposition was found in the Devonian by itself (100%).
- 3. Mixtures were stable and stayed clear in the 90%-60% Devonian range.
- 4. Calcium carbonate deposition was seen in all samples from 50% Devonian to 0% (or 100% composite produced water mixture).
- 5. Calcium sulfate deposition was observed in the 80%-100% composite produced water ratios.

Mobil Producing Texas & New Mexico Page Two

In summary, the Devonian alone, and mixtures of Devonian from 50% to 0% formed carbonate scale. Calcium sulfate becomes a known in the high percent composite mixture range.

In other words, scale prevention treatment is advisable throughout most of the mixing range. One treatment can handle both kinds of scale.

We would be pleased to discuss this report with you at a mutually agreeable time.

Very truly yours,

Wayne Dickerson John U. Shyke Wayne Dickerson John V. Slyker

Sales Engineer Sales Representative

/cg

cc: W. Reeves

D. Seale

# N

NL Treating Chemicals/NL Industries, Inc. P. O. Box 4305 Houston. Texas 77210

#### REPORT OF TEST

			SHEET NUMBER
COMPANY			CATE
Mobil Producina Tex	cas & New Mexico		12-16-87
FIELD OR PLANT		COUNTY OR PARISH	STATE
Vacuum Area Leases		lea	New Mexico
LEASE OR UNIT	WELLIS) NAME & NO.	SAMPLE SOURCE	
		See Below	
TYPE SAMPLE		TYPE TEST	
		Compatibility of	Devonian with Mix

reason for test

Possible Salt Water Disposal

#### RESULTS:

Compati	bility Mixture %	Observations (100	0°F)
Devonian	Composite Produced Waters	Initial <u>Appearance</u>	5 days
100	0	Clear	Moderate calcium carbonate Deposition
	10	Clear	No deposition
90 80	20	Clear	No deposition
70	30	Clear	No deposition
60	40	Slightly hazy	No deposition
50	50	Slightly hazy	Moderate calcium carbonate deposition
40	60	Slightly hazy; slight gray cast	Slight calcium carbonate deposition
30	70		Slight calcium carbonate deposition
20	80	- · ·	Moderate calcium sulfate \$ slight calcium carbonate depositions; slight iron compounds precipitated.
10	90	Slightly hazy; slight gray cast	
0	100	Slightly hazy, slight gray cast	

#### REMARKS & RECOMMENDATIONS:

Composite Produced Water Ratios

Source	Mixture %
Abo	46
San Andres	48
Clorieta	2
Pennsylvania	3
Blinebry	1

ALES ENGINEER DIST NO. ADDRESS TOFFICE PHONE TOFFICE PHONE

Exhibit "D"



#### EXHIBIT \*\*E\*\*

NEWSPAPER ADVERTISEMENT WILL BE FORTHCOMING

# MOBIL PRODUCING TEXAS & NEW MEXICO, INC. STATE SEC. 27, WELL #1 SOUTH VACUUM (DEVONIAN) FIELD LEA COUNTY, TEXAS

#### EXHIBIT "F"

#### OFFSET OPERATORS

Arco Oil & Gas Co. P. O. Box 1710 1515 Caller Service Hobbs, New Mexico 88240

Hanley Petroleum 1500 Wilco Bldg. Midland, Tx. 79702

UNOCAL Corporation P. O. Box 671 Midland, Texas 79702 Exxon Company, USA P. O. Box 1600 Midland, Texas 79702

Hondo Oil & Gas P. O. Box 2819 Dallas, Tx.

Yates Energy Southwest Centre Suite 1010 Roswell, N.M. 88201

#### SURFACE OWNER

Snyder Ranches, Inc. P. O. Box 726 Lovington, New Mexico 88260

May 22, 1990

P.O. BOX 633 MIDLAND, TEXAS 79702

MIDLAND DIVISION

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Arco Oil & Gas Co. P. O. Box 1710 1515 Caller Service Hobbs, New Mexico 88240

> NOTICE OF APPLICATION FOR WATER DISPOSAL WELL STATE SEC. 27 LEASE, WELL NO. 1 VACUUM DEVONIAN, SOUTH FIELD LEA COUNTY, NEW MEXICO

#### Gentlemen:

Mobil Exploration & Producing U.S. Inc., as agent for Mobil Producing Texas & New Mexico, Inc., (MPTM), has made application to the Oil Conservation Division of New Mexico for authority to dispose of produced water into a reservoir not productive of oil or gas in the above captioned well.

A copy of this application is furnished to you for your information.

Yours very truly,

G. N. Miller

Environmental, Regulatory & Loss Prevention Supervisor

Mobil Exploration & Producing U.S. Inc. as agent for Mobil Producing Texas & New Mexico, Inc.

JWD:spb attachments

May 22, 1990

P.O. BOX 633 MIDLAND, TEXAS 79702

MIDLAND DIVISION

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Hanley Petroleum 1500 Wilco Bldg. Midland, Texas 79701

> NOTICE OF APPLICATION FOR WATER DISPOSAL WELL STATE SEC. 27 LEASE, WELL NO. 1 VACUUM DEVONIAN, SOUTH FIELD LEA COUNTY, NEW MEXICO

#### Gentlemen:

Mobil Exploration & Producing U.S. Inc., as agent for Mobil Producing Texas & New Mexico, Inc., (MPTM), has made application to the Oil Conservation Division of New Mexico for authority to dispose of produced water into a reservoir not productive of oil or gas in the above captioned well.

A copy of this application is furnished to you for your information.

Yours very truly,

G. N. Miller

Environmental, Regulatory & Loss Prevention Supervisor

Mobil Exploration & Producing U.S. Inc. as agent for Mobil Producing Texas & New Mexico, Inc.

JWD:spb attachments

May 22, 1990

P.O. BOX 633 MIDLAND, TEXAS 79702

MIDLAND DIVISION

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

UNOCAL Corporation P. O. Box 671 Midland, Texas 79702

NOTICE OF APPLICATION FOR WATER DISPOSAL WELL STATE SEC. 27 LEASE, WELL NO. 1 VACUUM DEVONIAN, SOUTH FIELD LEA COUNTY, NEW MEXICO

#### Gentlemen:

Mobil Exploration & Producing U.S. Inc., as agent for Mobil Producing Texas & New Mexico, Inc., (MPTM), has made application to the Oil Conservation Division of New Mexico for authority to dispose of produced water into a reservoir not productive of oil or gas in the above captioned well.

A copy of this application is furnished to you for your information.

Yours very truly,

G. N. Miller

Environmental, Regulatory & Loss Prevention Supervisor

Mobil Exploration & Producing U.S. Inc. as agent for Mobil Producing Texas & New Mexico, Inc.

JWD:spb attachments

May 22, 1990

P.O. BOX 633 MIDLAND, TEXAS 79702

MIDLAND DIVISION

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Exxon Company, USA P. O. Box 1600 Midland, Texas 79702

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JWD:spb
attachments

May 22, 1990

P.O. BOX 633 MIDLAND, TEXAS 79702

MIDLAND DIVISION

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Hondo Oil & Gas P. O. Box 2819 Dallas, Texas 75205

> NOTICE OF APPLICATION FOR WATER DISPOSAL WELL STATE SEC. 27 LEASE, WELL NO. 1 VACUUM DEVONIAN, SOUTH FIELD LEA COUNTY, NEW MEXICO

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JWD:spb attachments

May 22, 1990

P.O. BOX 633 MIDLAND, TEXAS 79702

MIDLAND DIVISION

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Snyder Ranches, Inc. P. O. Box 726 Lovington, New Mexico 88260

NOTICE OF APPLICATION FOR WATER DISPOSAL WELL STATE SEC. 27 LEASE, WELL NO. 1 VACUUM DEVONIAN, SOUTH FIELD LEA COUNTY, NEW MEXICO

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Mobil Producing Texas & New Mexico, Inc.

JWD:spb attachments

May 22, 1990

P.O. BOX 633 MIDLAND, TEXAS 79702

MIDLAND DIVISION

CERTIFIED MAIL RETURN RECEIPT REQUESTED

Yates Energy Southwest Centre Suite 1010 Midland, Texas 79701

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