Royalty Owner Brochure

Proposed
Northeast Drinkard
Secondary Recovery Unit

Lea County, New Mexico

Northeast Drinkard Unit
Exhibit Five
Cases 9230
9231
9232

Overview

- Approximately 50% More Oil.

  The Working Interest Owners recommend implementation of a Waterflood Secondary Oil Recovery program for certain oil accumulations in the Eunice area (Figure 1). It is anticipated that this program will increase recovery by approximately 15 million barrels of oil that would otherwise remain in the ground.

- Formation of Unit Required.

  This recovery program requires that the various leases be operated as a single production unit. The proposed 5000 acre Northeast Drinkard Unit, located south of Hobbs in Lea County, New Mexico will make this possible.

- Royalty Owners to Share in Extra Oil Without Costs.

  Each Royalty Owner will equitably share in unit production on the basis set forth in the Unit Agreement. There will be no cost to the Royalty Owners, since the entire investment to implement the waterflood, as well as future expenditures and operating costs, will be paid by the Working Interest Owners.

- Review of the Unit Agreement and Waterflood by the New Mexico Oil Conservation Division.

  The Unit Agreement and waterflood program will be reviewed for approval by the New Mexico Oil Conservation Division before it can be made effective. The responsibility of the Division is to verify the soundness of the project with respect to conservation of oil and gas, waste prevention, and the protection of the rights of all interested parties.

- Potential Future Enhanced Oil Recovery.

  Unitization will also enable the Working Interest Owners to consider enhanced recovery procedures such as carbon dioxide flooding to produce additional oil not obtainable by waterflooding. Shell Western E&P Inc., proposed unit operator, is among the industry leaders in enhanced oil recovery.

- Cooperation of all Parties Imperative.

  To make the proposed waterflood secondary recovery program possible, you are urged to commit your interest to the unit by signing and returning the attached ratification forms.

Location Map

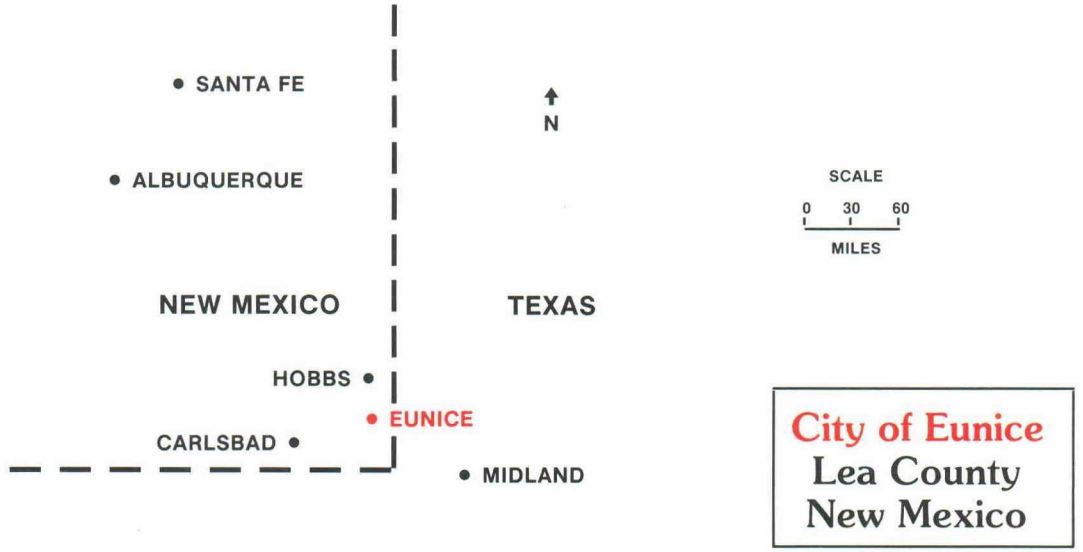


FIGURE 1

Proposed Unit Outline

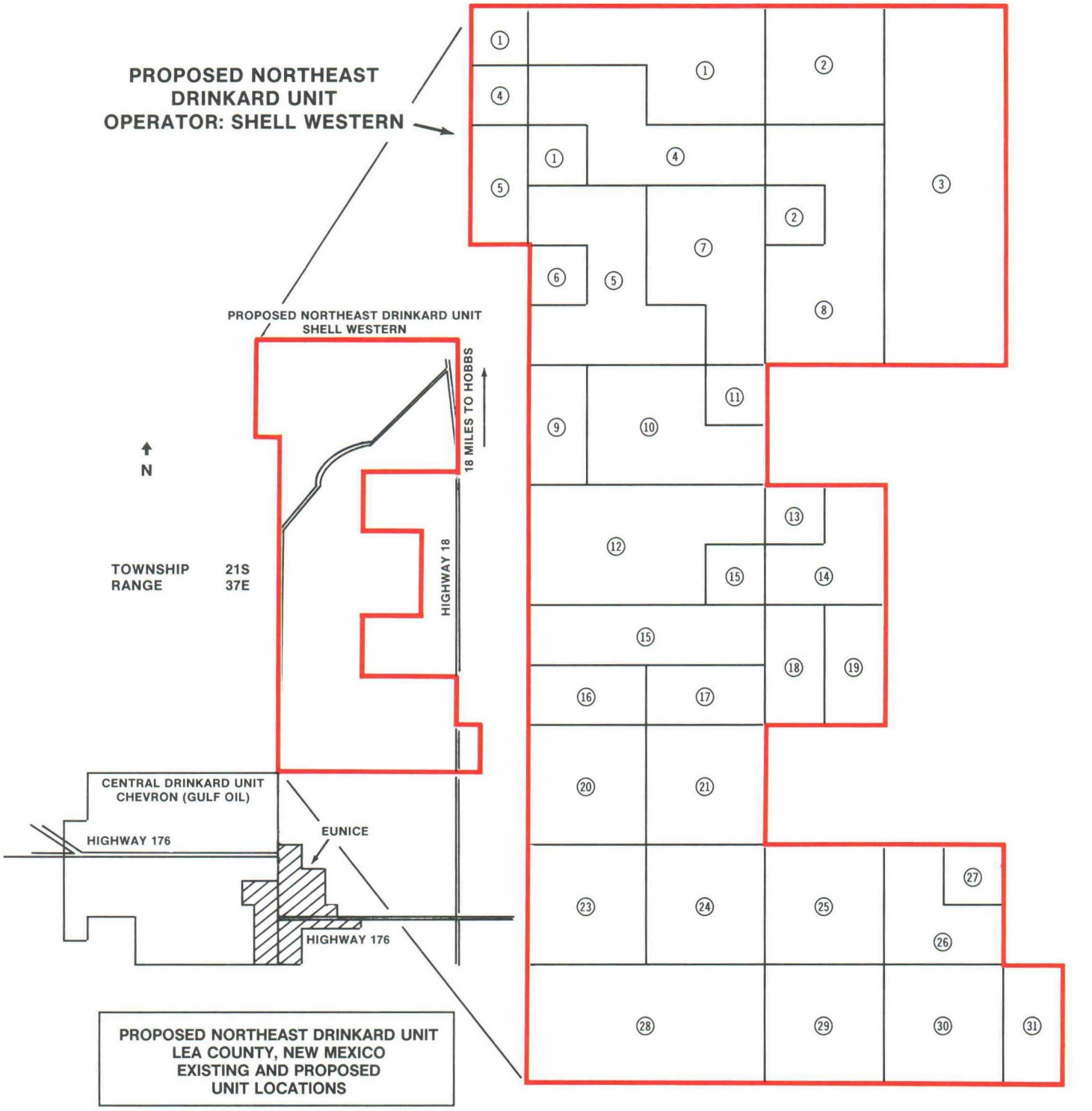


FIGURE 2

LEGEND
③ UNIT TRACT NUMBER

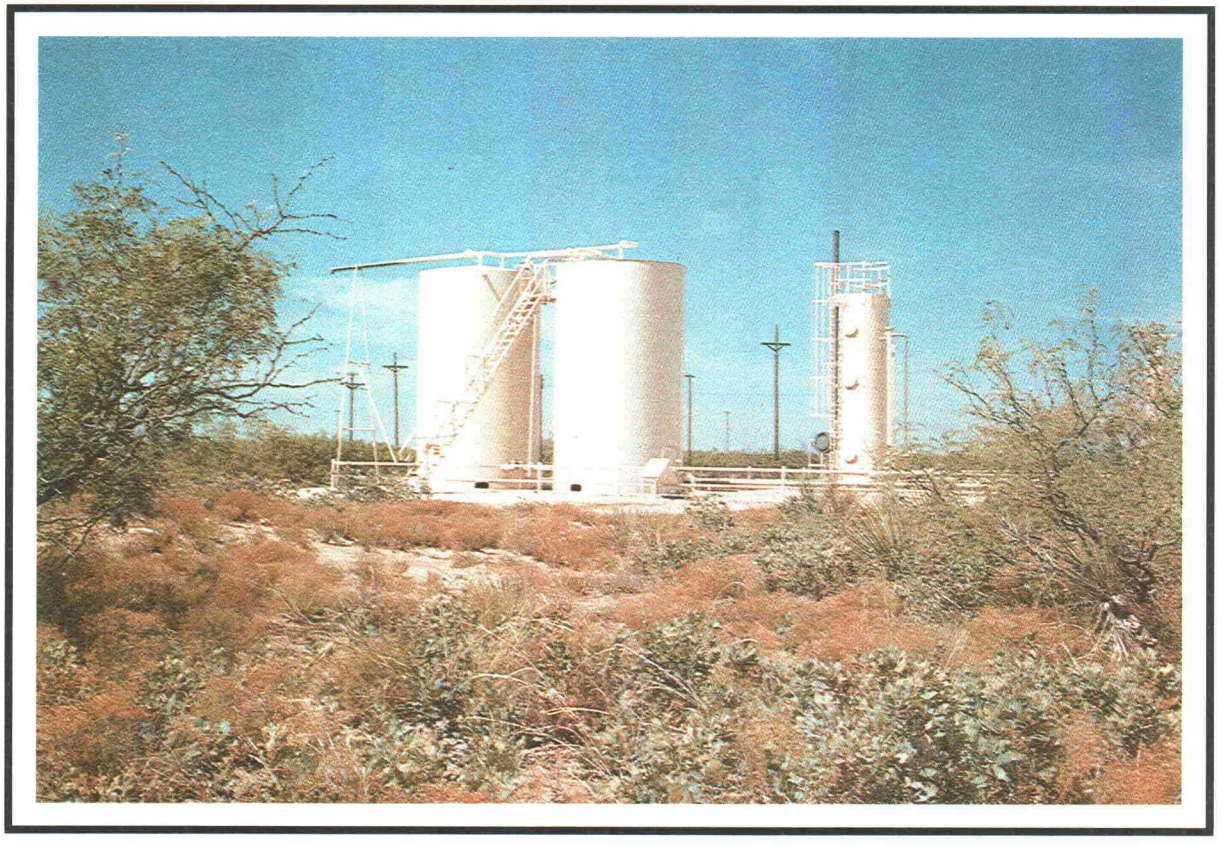
1 MILE
½ MILE
SCALE

Introduction

Shell Western E&P Inc. on behalf of all the Working Interest Owners has prepared this brochure to provide a convenient method of explaining to you a Waterflood Secondary Oil Recovery program for certain oil accumulations in the Eunice area. The Working Interest Owners have recently completed a technical study which concluded that the oil accumulations within the vertical interval to be unitized beneath the thirty tracts of land shown on Figure 2 should respond favorably to water injection. The proposed unit operating plan is designed to recover not only the remaining primary oil and secondary waterflood oil but also the significant gas reserves contained in the interval to be unitized.

Also shown on Figure 2 is the existing adjacent Central Drinkard Unit operated by Chevron (formerly Gulf) which was unitized in 1967 to initiate secondary recovery efforts. This successful water injection project has provided an excellent basis for designing a waterflood plan and predicting additional secondary oil recovery for the proposed Northeast Drinkard Unit. Of course, this secondary oil recovery will not only result in additional royalty payments to you, but will also increase the supply of energy for New Mexico and the nation.

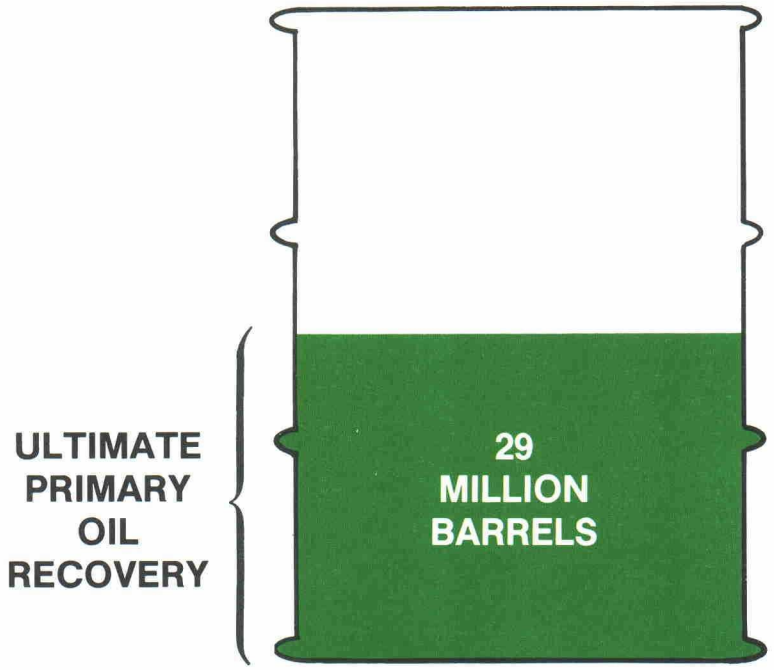
The proposed unit is located in Lea County, New Mexico, and as shown on Figure 2 is approximately two miles north of Eunice and eighteen miles south of Hobbs. Descriptions of the thirty tracts included in the proposed 5000 acre unit area are listed in Table 1 of the Appendix.



History and Forecast Without Waterflooding

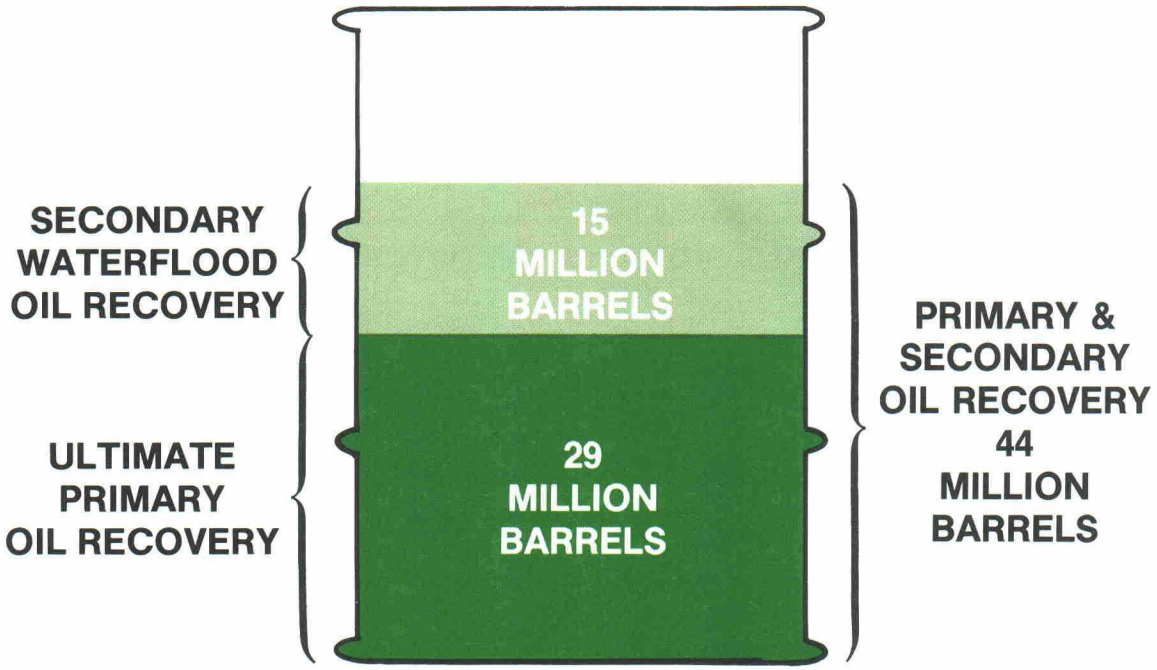
These oil and gas accumulations in the Eunice area were discovered over 40 years ago during the early 1940s. Development on 40-acre spacing of the numerous productive oil and gas zones has continued until present, with the major activity occurring between 1948 and 1958. Since discovery, approximately 27 million barrels of oil have been produced from the proposed unitized interval within the leases in the proposed unit.

The oil accumulations are currently in the later stages of primary depletion, with only an estimated 2 million barrels of primary oil remaining to be produced. However, under a water injection program, substantial oil recovery in addition to this 29 million barrels of ultimate primary oil is possible, and oil production will be maintained well beyond the remaining primary life.



Waterflood Oil Recovery Program

The natural mechanism of solution gas expansion has provided energy to produce oil in the proposed unit area since discovery. These energy sources are now substantially depleted, so they must be replaced by artificial means if additional oil is to be recovered. One such means is the injection of water into the energy-depleted oil reservoir. Results of a technical study indicated that, with the implementation of a secondary recovery water injection program commonly known as waterflooding, oil recovery from the proposed unit can be increased by approximately 15 million barrels. Therefore, under this waterflood program, expected ultimate oil recovery would increase from 29 million to 44 million barrels and remaining oil to be produced would increase from 2 million barrels to 17 million barrels.

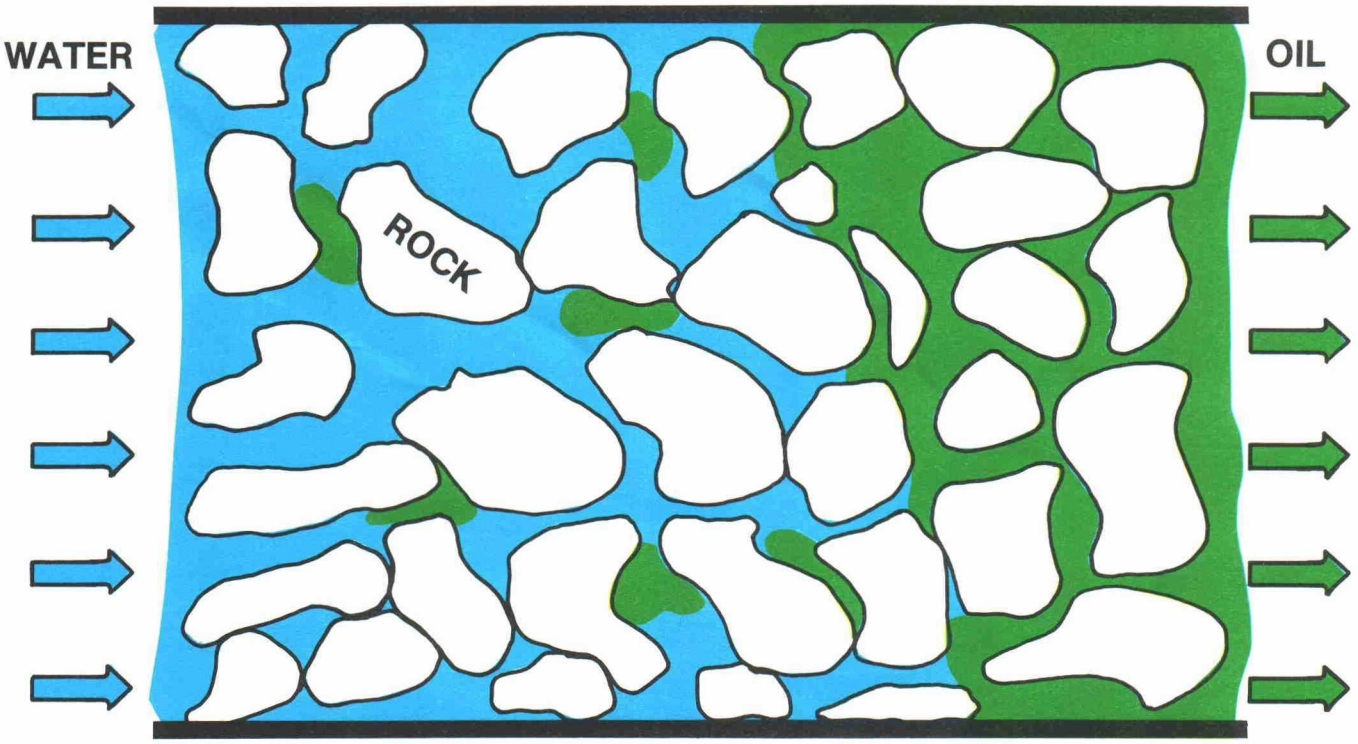


What Is Waterflooding?

Waterflooding is the industry-wide recognized secondary recovery technique used to increase oil recovery from reservoirs which have produced under the natural solution gas expansion drive mechanism. When it is determined that a reservoir is primarily producing by gas expansion, consideration is given to supplementing the solution gas drive with the injection of water to recover additional oil.

In the proposed unit area, the natural force of compressed solution gas is rapidly decreasing in strength. Under this condition an artificial driving force can be provided by injecting water into the producing formation. The injected water travels through the oil-bearing rock, pushing oil ahead of it and into producing wells (see facing page). This process of injecting water is referred to as waterflooding. In order for this to occur, however, the water injection wells must be located at optimum positions in the field without regard to lease boundaries.

SCHEMATIC
MAGNIFIED PORTION
OIL RESERVOIR

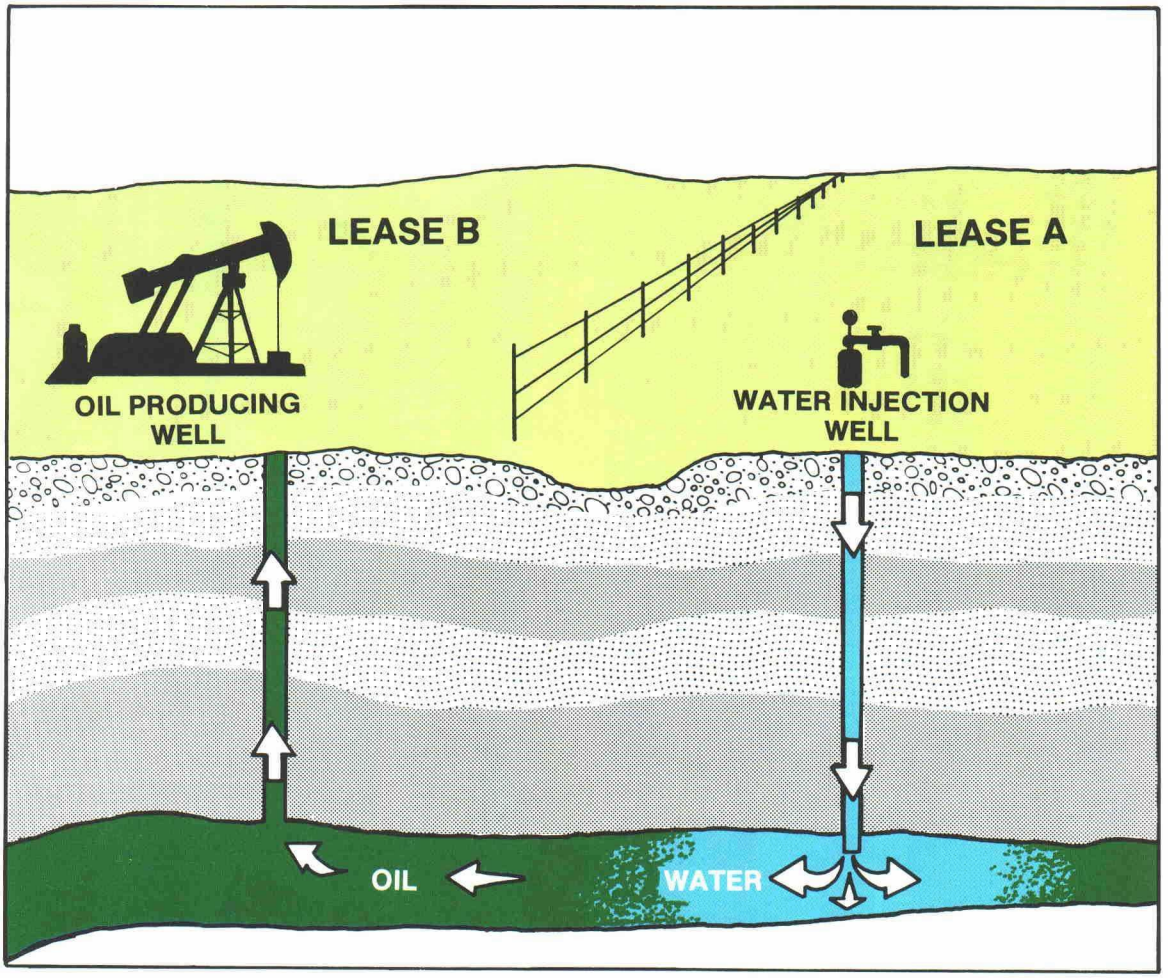


WATER PUSHING OIL
THROUGH FORMATION

Why Unitization?

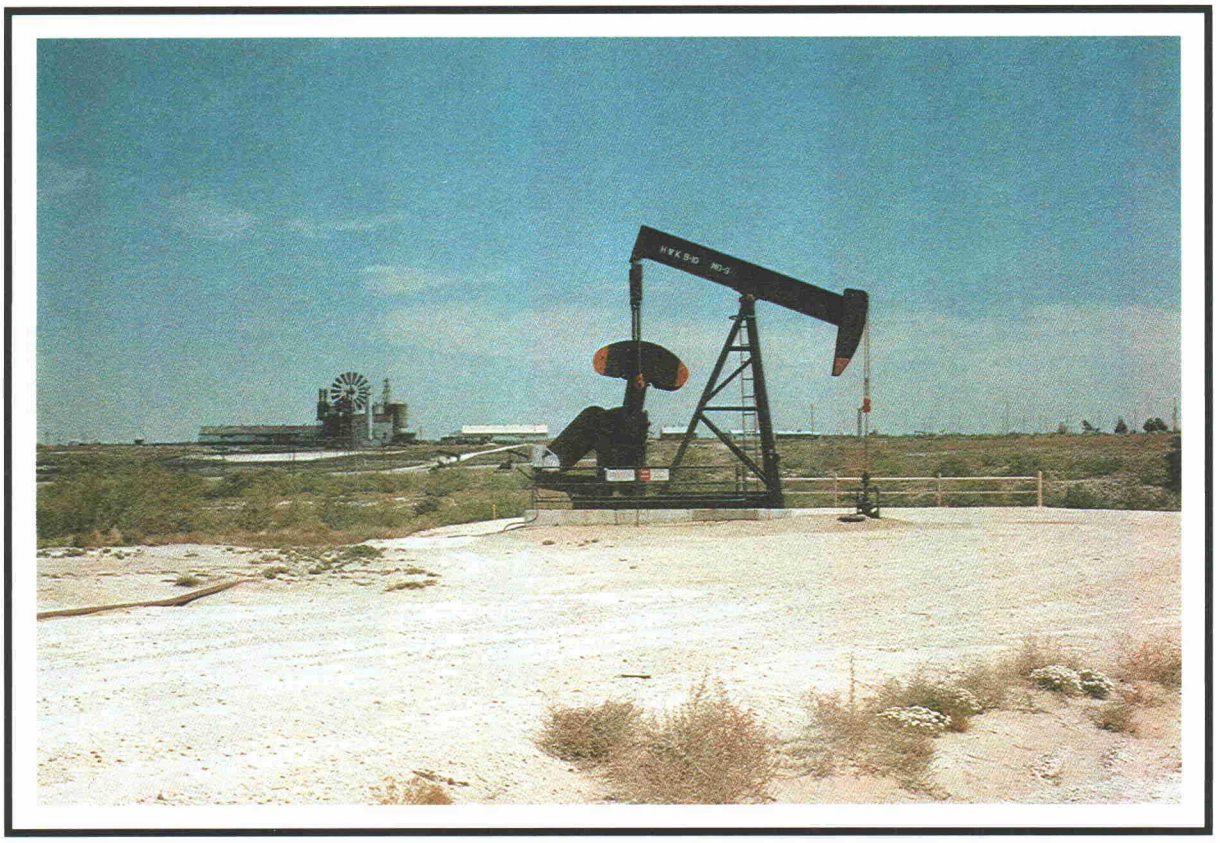
Under primary or non-unitized operations, each royalty owner shares in the oil produced from wells located on properties in which he owns interest.

Under the waterflood oil recovery program proposed, the entire 5000 acre unit rather than each single property or lease, is the basic development and production property. This must be; since the oil reservoir underlies the numerous leases that make up the unit, and the injection of water on one parcel of land affects the oil and gas underlying a neighbors land. Because oil is displaced across property lines and some of the wells on a property may be used for injection of water instead of production of oil, it is therefore necessary to combine all leases in a way that they can be treated and operated as a single property. Unitization is a means of accomplishing this arrangement, as it consolidates the numerous Working Interest Owners and Royalty Interest Owners in such a way that they can be operated as a single property or unit, and all parties share in the production on a fair and equitable basis.



What Is Unitization?

Unitization is a cooperative arrangement, in the form of a written agreement, by which smaller properties with various individual ownerships are combined into one larger property. Unitization, therefore, makes it possible to implement a waterflood secondary oil recovery program in the most efficient manner to increase the amount of oil production. After unitization, each individual owner shares in every barrel of oil produced from the entire project through its remaining life. The property formed by this pooling of ownerships and sharing of production is called a "unit". All unitization plans must be reviewed and approved by the New Mexico Oil Conservation Division before a supplemental recovery program can be undertaken. The effect of this consolidation is that the owners of interest in an individual property or tract trade their "exclusive" rights to develop and receive production from that tract for a percentage participation in the development and production from all tracts in the unit.



Allocation of Unit Production

Significant volumes of gas will be produced from the unit in addition to the remaining primary and secondary oil. For this reason a separate participation formula for oil and gas will be used to ensure that each tract receives its equitable share of produced oil and gas from the total unit.

The tract participation formulas for the unit oil and gas production are summarized below. Key tract parameters were used in the formulas which reflect each tract's remaining primary oil and gas reserves, as well as secondary oil potential. These formulas result in equitable sharing of unit production even though each tract's oil and gas production may be more or less based on placement of production and injection wells as shown in Figure 3.

Tract Participation Formulas

Oil Production

Phase I Each tract's share of unit oil production will be based on

$$25\% \text{ of } \frac{\text{Tract oil production from 6/1/84-5/31/85}}{\text{Total unit oil production from 6/1/84-5/31/85}}$$

$$\text{Plus } 75\% \text{ of } \frac{\text{Tract remaining primary oil reserves}}{\text{Total unit remaining primary oil reserves}}$$

The initial oil participation formula will remain in effect until 2,285,476 barrels of oil are produced from the unit area after 5/31/85.

Phase II After Phase I ends, each tract's share of unit oil production will be based on

$$100\% \text{ of } \frac{\text{Tract ultimate primary oil recovery}}{\text{Total unit ultimate primary oil recovery}}$$

The Phase II oil participation formula will become effective when 2,285,476 barrels of oil have been produced from the unit area after 5/31/85.

Gas Production

Phase I Each tract's share of unit gas production will be based on

$$100\% \text{ of } \frac{\text{Tract remaining primary gas reserves}}{\text{Total unit remaining primary gas reserves}}$$

The initial gas participation formula will remain in effect until 71,911,442 MCF of gas are produced from the unit area after 5/31/85.

Phase II After Phase I ends, each tract's share of unit gas production will be based on

$$100\% \text{ of } \frac{\text{Tract ultimate primary gas recovery}}{\text{Total unit ultimate primary gas recovery}}$$

The Phase II gas participation formula will become effective when 71,911,442 MCF of gas has been produced from the unit area after 5/31/85.

Proposed Flood Plan

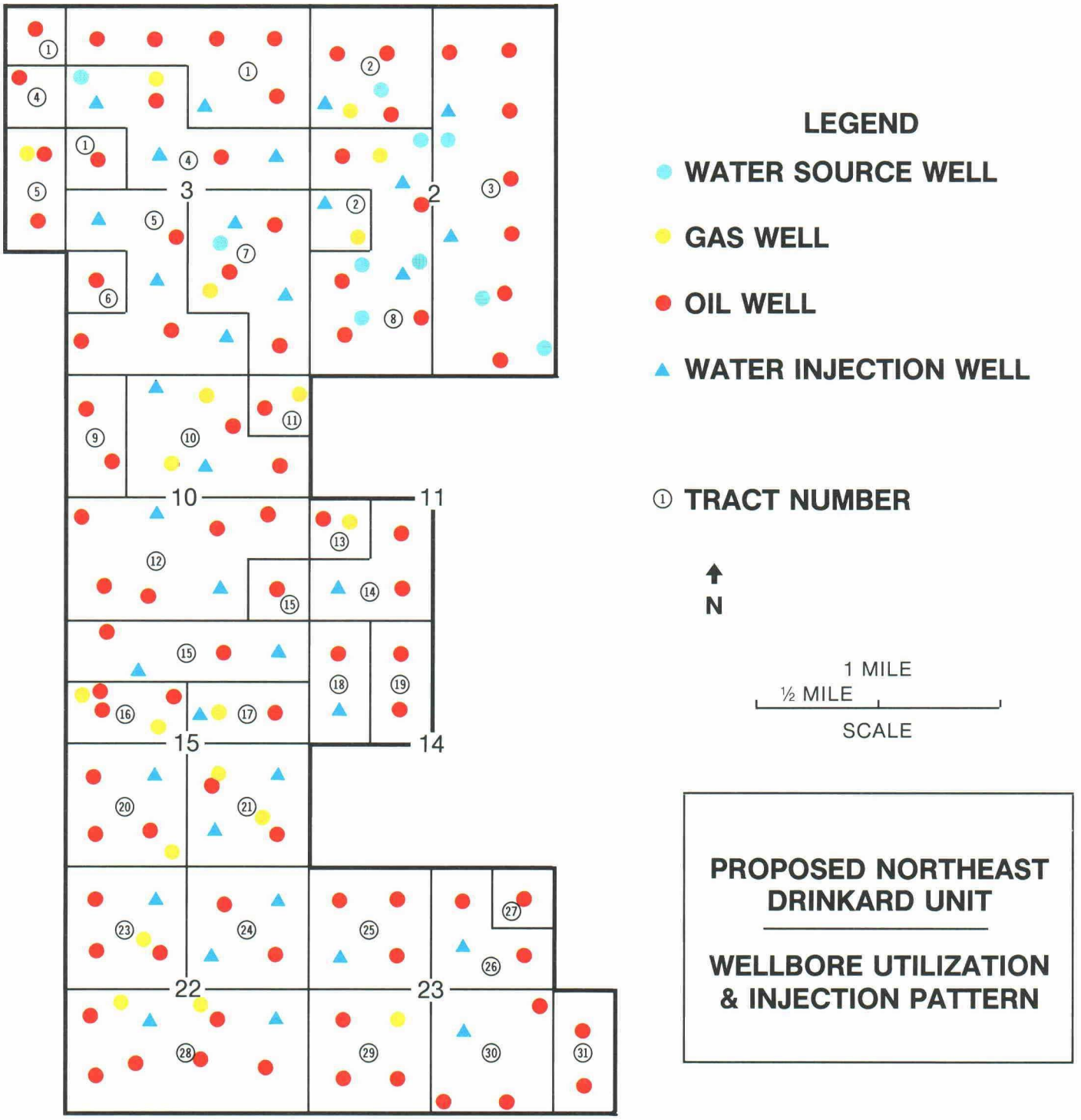
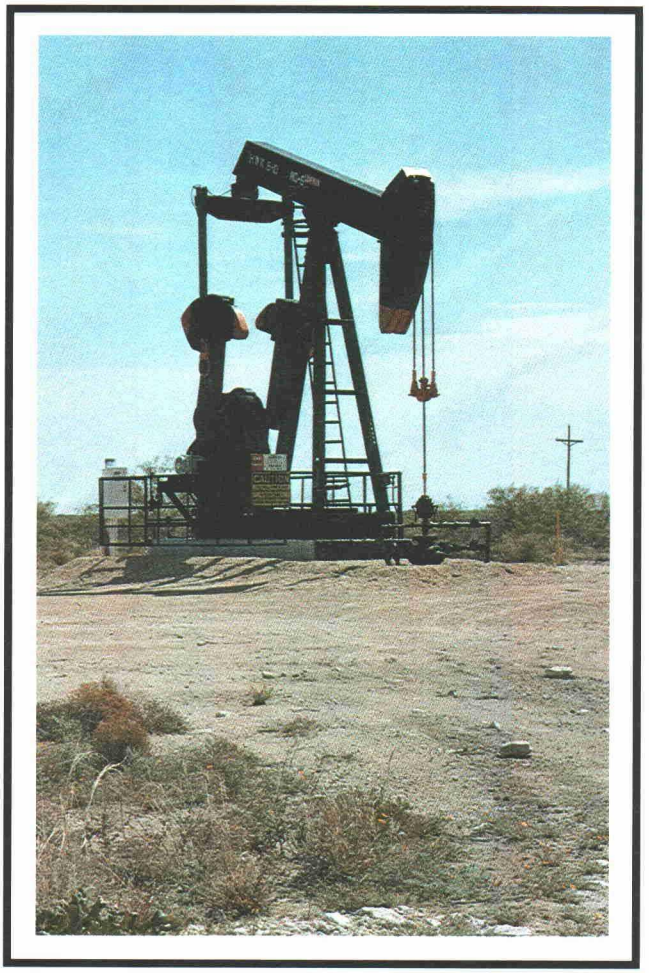


FIGURE 3

Successful Unitization Requires Cooperation

Formation of the proposed Northeast Drinkard Unit requires cooperation of the various Working Interest and Royalty Interest Owners. To form the unit, it is necessary that the Royalty and Working Interest Owners join together in signing a written agreement which establishes the method of arriving at each tract's participation. By ratifying the agreement, a Royalty Owner signifies acceptance of the unitization and water injection concept, the tract participation formula, and his or her interest in the unit. Since the purpose of the unitization and water injection program is to increase oil recovery, each Royalty Owner will receive over the life of the unit more income without paying any of the costs associated with implementing and conducting the waterflood program. As mentioned earlier, the proposed water injection plans will result in over eight times the amount of oil to be recovered over the remaining life of the leases within the unit. Recovery of this additional oil will not be achieved unless the proposed unit is formed. We urge you, therefore, to commit your interest to the unit by signing, before a Notary Public, the attached ratification forms in the enclosed self-addressed, postage paid envelope as soon as possible.



If you have any questions, please address correspondence to:

Shell Western E&P Inc.
Land Dept.-Rocky Mountain Division
P. O. Box 831
Houston, TX 77001

Appendix

Table 1
Proposed Northeast Drinkard Unit
Lea County, New Mexico
Tract Descriptions

Tract No.	Lease Name	Description	Operator
1	W. C. Hawk B-3	Lots 1,2,3,4,7,8,12 Sec. 3 & Lot 1 Sec. 4, T21S, R37E	Conoco, Inc.
2	State Sec. 2	Lots 3,4,5,6,13 Sec. 2, T21S, R37E	Meridian Oil
3	Harry Leonard	Lots 1,2,7,8,9,10,15,16, SE/4 Sec. 2 T21S, R37E	Chevron USA, Inc. (Gulf Oil Corp.)
4	Taylor-Glenn	Lots 5,6,9,10,11 Sec. 3 & Lot 8 Sec. 4, T21S, R37E	Shell Western E&P Inc.
5	C. H. Livingston	Lots 9,16 Sec. 4 & Lots 13,14 SW/4 SE/4, NE/4 SW/4, S/2 SW/4 Sec. 3, T21S, R37E	Shell Western E&P Inc.
6	J. C. Estlack	NW/4 SW/4 Sec. 3, T21S, R37E	Texaco, Inc.
7	W. C. Hawk B-3	Lots 15,16, N/2 SE/4, SE/4 SE/4 Sec. 3, T21S, R37E	Conoco, Inc.
8	State Sec. 2	Lots 11,12,14, SW/4 Sec. 2, T21S, R37E	Shell Western E&P Inc.
9	State Sec. 10	W/2 NW/4 Sec. 10, T21S, R37E	Conoco, Inc.
10	W. C. Hawk B-10	E/2 NW/4, S/2 NE/4, NW/4 NE/4 Sec. 10, T21S, R37E	Conoco, Inc.
11	Dauron	NE/4 NE/4 Sec. 10, T21S, R37E	Meridian Oil
12	NM V State	SW/4, W/2 SE/4, NE/4 SE/4 Sec. 10, T21S, R37E	Exxon Co., USA
13	Gutman	NW/4 SW/4 Sec. 11, T21S, R37E	Meridian Oil
14	J. H. Nolan	NE/4 SW/4 & S/2 SW/4 Sec. 11, T21S, R37E	Conoco, Inc.
15	State S	SE/4 SE/4 Sec. 10 & N/2 N/2 Sec. 15, T21S, R37E	Texaco, Inc. (Getty Oil)
16	State S	S/2 NW/4 Sec. 15, T21S, R37E	Cities Service
17	State Sec. 15	S/2 NE/4 Sec. 15, T21S, R37E	Shell Western E&P Inc.
18	Eva Owen	W/2 NW/4 Sec. 14, T21S, R37E	Bravo Energy
19	Andrews	E/2 NW/4 Sec. 14, T21S, R37E	Shell Western E&P Inc.
20	Argo	SW/4 Sec. 15, T21S, R37E	Shell Western E&P Inc.
21	L. G. Warlick	SE/4 Sec. 15, T21S, R37E	Marathon
23	Argo A	NW/4 Sec. 22, T21S, R37E	Shell Western E&P Inc.
24	O. R. Eubank	NE/4 Sec. 33, T21S, R37E	Chevron USA, Inc. (Gulf Oil Corp.)
25	D. A. Williamson	NW/4 Sec. 23, T21S, R37E	Texaco, Inc. (Getty Oil)
26	Roy Barton	S/2 NE/4 & NW/4 NE/4 Sec. 23, T21S, R37E	Arco Oil & Gas Co.
27	D. A. Williamson	NE/4 NE/4 Sec. 23, T21S, R37E	Mobil Prod. TX & NM
28	A. J. Turner	S/2 Sec. 22, T21S, R37E	Shell Western E&P Inc.
29	S. J. Sarkeys	SW/4 Sec. 23, T21S, R37E	Shell Western E&P Inc.
30	S. J. Sarkeys	SE/4 Sec. 23, T21S, R37E	Arco Oil & Gas Co.
31	Stephens Estate	W/2 SW/4 Sec. 24, T21S, R37E	Mobil Prod. TX & NM

Appendix

Table 2
Proposed Northeast Drinkard Unit
Working Interest Ownership by Tracts

Tract 1:	Conoco	25.00000%
	ARCO	25.00000%
	Chevron	25.00000%
	Amoco	25.00000%
Tract 2:	Meridian Oil	100.00000%
Tract 3:	Chevron	100.00000%
Tract 4:	Shell Western	100.00000%
Tract 5:	Shell Western	100.00000%
Tract 6:	Texaco	90.00000%
	Phillips	10.00000%
Tract 7:	Conoco	25.00000%
	ARCO	25.00000%
	Chevron	25.00000%
	Amoco	25.00000%
Tract 8:	Shell Western	100.00000%
Tract 9:	Conoco	25.00000%
	ARCO	25.00000%
	Chevron	25.00000%
	Amoco	25.00000%
Tract 10:	Conoco	25.00000%
	ARCO	25.00000%
	Chevron	25.00000%
	Amoco	25.00000%
Tract 11:	Meridian Oil	100.00000%
Tract 12:	Exxon	100.00000%
Tract 13:	Meridian Oil	100.00000%
Tract 14:	Conoco	24.21875%
	ARCO	24.21875%
	Chevron	24.21875%
	Amoco	24.21875%
	J. H. Hendrix Corp.	1.04166%
	Ann W. Morris	.52084%
	Irma Spear	1.56250%

Appendix (Cont.)

Tract 15:	Texaco	100.00000%
Tract 16:	Cities Service	100.00000%
Tract 17:	Shell Western	100.00000%
Tract 18: (Blinebry-Drinkard)	Shell Western	25.00000%
	ARCO	25.00000%
	B. M. Jerigan	14.46667%
	J. E. Moran Trust	14.46667%
	Parrish Trust	6.60001%
	AJM Co.	2.06665%
	CEM Co.	2.06665%
	EMM Co.	2.06667%
	KAM Co.	2.06667%
	KPM Co.	2.06667%
	PGM Co.	2.06667%
	TMM Co.	2.06667%
Tract 19: (Blinebry-Drinkard)	Shell Western	62.50000%
	ARCO	25.00000%
	B. M. Jerigan	3.61666%
	J. E. Moran Trust	3.61667%
	Moran Partnership	3.61667%
	Parrish Trust	1.65000%
Tract 18 and 19: (Tubb Formation)	Shell Western	43.75000%
	ARCO	25.00000%
	B. M. Jerigan	9.04167%
	J. E. Moran Trust	9.04166%
	Parrish Trust	4.12503%
	AJM Co.	1.29167%
	CEM Co.	1.29167%
	EMM Co.	1.29166%
	KAM Co.	1.29166%
	KPM Co.	1.29166%
	PGM Co.	1.29166%
	TMM Co.	1.29166%
Tract 20:	Shell Western	100.00000%

Appendix (Cont.)

Tract 21:	Marathon	70.50780%
	K.A.C. Keck	9.16666%
	A. Z. Cone	6.00000%
	S. E. Cone, Jr.	4.54167%
	Felmont Oil Corp.	4.49220%
	M. C. Kastman	4.16667%
	P. Shelton	.37500%
	O. W. McWhorter	.25000%
	Charles L. Cobb	.25000%
	L. Howard	.12500%
	J. Garrison	.06250%
	M. Riwinsky	.06250%
Tract 23:	Shell Western	100.00000%
Tract 24:	Chevron	81.25000%
	Duer Wagner, Jr.	17.43750%
	Duer Wagner, III	1.31250%
Tract 25: (Blinebry)	Texaco	43.75000%
	Devon Corporation	30.65625%
	Devon-Smedvig	25.59375%
Tract 25: (Tubb-Drinkard)	Texaco	100.00000%
Tract 26:	ARCO	100.00000%
Tract 27:	Mobil	100.00000%
Tract 28:	Shell Western	100.00000%
Tract 29:	Shell Western	100.00000%
Tract 30:	ARCO	100.00000%
Tract 31:	Mobil	100.00000%