STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION DIVISION FOR THE PURPOSE OF CONSIDERING:

CASE NO. 11826
Order No. R-4629-A

APPLICATION OF QUAY VALLEY, INC. FOR AMENDMENT OF DIVISION ORDER NO. R-4629 TO AUTHORIZE A TERTIARY RECOVERY PROJECT BY THE INJECTION OF CARBON DIOXIDE IN ITS NORTH EL MAR UNIT WATERFLOOD PROJECT AREA, AND TO QUALIFY THIS PROJECT FOR THE RECOVERED TAX RATE PURSUANT TO THE ENHANCED OIL RECOVERY ACT, LEA COUNTY, NEW MEXICO.

ORDER OF THE DIVISION

BY THE DIVISION:

This cause came on for hearing at 8:15 a.m. on August 7 and September 4, 1997, at Santa Fe, New Mexico, before Examiner David R. Catanach.

NOW, on this 5th day of November, 1997, the Division Director, having considered the testimony, the record and the recommendations of the Examiner, and being fully advised in the premises,

FINDS THAT:

(1) Due public notice having been given as required by law, the Division has jurisdiction of this cause and the subject matter thereof.

(2) The applicant, Quay Valley, Inc., seeks authority to institute a tertiary recovery project in its North El Mar Unit Waterflood Project Area by the injection of combined water, carbon dioxide (CO_2), and produced gas into the Delaware formation, El Mar-Delaware Pool, through the gross interval from approximately 4,450 feet to 4,765 feet through thirty-one (31) injection wells located within Sections 24, 25, 26, 34, 35 and 36, Township 26 South, Range 32 East, and Sections 30 and 31, Township 26 South, Range 33 East, NMPM, Lea County, New Mexico, all as shown on Exhibit "A" attached hereto.

(3) Applicant further seeks to re-authorize the injection authority for those previously approved injection wells whose authority to inject has terminated pursuant to Division Rule No. 705.C.

(4) Applicant further seeks to qualify the proposed North El Mar Unit Tertiary Recovery Project for the recovered oil tax rate pursuant to the "New Mexico Enhanced Oil Recovery Act", (Laws 1992, Chapter 38, Sections 1 through 5).

(5) By Order No. R-3486 dated September 9, 1968, the Division authorized Continental Oil Company to institute a waterflood project in the El Mar-Delaware Pool by the injection of water into the Delaware formation through two initial injection wells located in Section 26, Township 26 South, Range 32 East. This project was designated the Continental El Mar Wilder Waterflood Project.

(6) By Order No. R-3540 dated October 31, 1968, the Division authorized Continental Oil Company to institute a waterflood project in the El Mar-Delaware Pool by the injection of water into the Delaware formation through two initial injection wells located in Sections 30 and 31, Township 26 South, Range 33 East. This project was designated the Continental El Mar Payne Waterflood Project.

(7) By Order No. R-4629 dated September 13, 1973, the Division, upon application of Continental Oil Company, approved the North El Mar Unit comprising some 2,361.16 acres, of State and Federal lands described as follows:

NORTH EL MAR UNIT AREA
TOWNSHIP 26 SOUTH, RANGE 32 EAST, NMPM
Section 24: S/2 SE/4
Section 25: All
Section 26: NE/4 NE/4, S/2 NE/4, SE/4 NW/4, S/2
Section 27: SE/4 SE/4
Section 34: N/2 NE/4, Lots 1 and 2
Section 35: N/2 N/2, Lots 1 through 4
Section 36: N/2 N/2, Lots 1 through 4

TOWNSHIP 26 SOUTH, RANGE 33 EAST, NMPM
Section 19: SW/4 SW/4
Section 30: NW/4 NW/4, S/2 NW/4, SW/4
Section 31: E/2 NW/4, Lots 1 and 2

(8) Order No. R-4629 further authorized Continental Oil Company to expand its two previously approved waterflood projects in the El Mar-Delaware Pool, as described in Finding Paragraph Nos. (5) and (6) above, by the injection of water into the Delaware formation through an additional twenty-seven wells located within the Unit Area.

(9) Evidence and testimony presented indicates that Quay Valley, Inc. assumed operations of the North El Mar Unit Waterflood Project from Conoco Inc. in June, 1996.

(10) Geologic evidence and testimony presented by the applicant indicates that:

a) the unitized interval within the North El Mar Unit comprises that portion of the Bell Canyon member of the Delaware formation which occurs from a depth of approximately 4,672 feet to 4,782 feet in the Continental Oil Company Payne Well No. 11 located in Unit N of Section 30, Township 26 South, Range 33 East, as shown on the gamma ray/sonic log run on the well on July 21, 1960;

b) the unitized interval consists of three separate members, all of which are correlatable and continuous throughout the North El Mar Unit Area;

c) the upper and lower members of the unitized interval are sand members which are known to be productive of oil and gas. The middle member is a shale member which is not hydrocarbon productive;

d) the proposed tertiary recovery operations will occur primarily within the upper and lower sand members of the unitized interval; and,

e) the unitized interval is currently subject to CO_2 injection within the Burlington Resources Oil & Gas Company El Mar Unit which is located directly offset to the south in Loving County, Texas.

(11) The applicant presented engineering evidence and testimony which indicates that:

a) injection of water for secondary recovery operations commenced in January, 1975 within the North El Mar Unit. Injected water volume peaked in approximately 1978 and has declined since that time;

b) cumulative production (primary and secondary) within the North El Mar Unit is approximately 6.1 million barrels of oil;

c) cumulative production since the initiation of secondary recovery operations within the North El Mar Unit is approximately 1.2 million barrels of oil;

d) current oil production within the North El Mar Unit is approximately 100 barrels of oil per day. Current water injection is approximately 700 barrels of water per day;

e) applicant proposes to utilize a five-spot injection pattern within the Unit Area and proposes to implement a change in the process used for the displacement of crude oil by initiating water-alternating-gas (WAG) injection (injecting water and carbon dioxide (CO_2) in alternating slugs of produced gas and CO_2 with slugs of water;

f) applicant proposes to initially utilize twenty-seven producing wells and twenty-four injection wells within the tertiary recovery project area;

g) a total of 27.1 BCF of CO_2 will be purchased for injection within the tertiary recovery project area. Ultimately, the applicant anticipates injecting approximately 41 BCF of CO_2 and produced gas over the life of the project, which is expected to be twenty-one years;

h) the tertiary recovery project costs are estimated to be approximately $23.25 million dollars; and,

i) as a result of implementing the proposed tertiary recovery project, the applicant anticipates the recovery of an additional 3.7 million barrels of oil from the Unit Area at a value of approximately $67.25 million dollars.

(12) The evidence and testimony presented in this case indicates that it is prudent to implement the proposed tertiary recovery project within the North El Mar Unit at this time, and that such implementation will result in the recovery of additional oil and gas from the project area which may otherwise not be recovered, thereby preventing waste.

(13) The proposed tertiary recovery project should be approved.

(14) The injection authority for the wells shown on Exhibit "A" should be reinstated.

(15) All injection wells or the pressurization system should be initially equipped with a pressure control device or acceptable substitute which will limit the surface injection pressure to no more than 530 psi for water injection and 1160 psi for CO_2 and produced gas injection.

(16) The applicant testified that there are no "problem wells" within the one-half mile "area of review" and further testified that all plugged and abandoned wells and all producing wells are cemented in a manner adequate to confine the injected fluid to the proposed injection interval.

(17) The applicant proposes utilizing unlined tubing in its injection wells within the tertiary recovery project.

(18) Current Division policy dictates that injection should be accomplished through plastic or fiberglass lined tubing.

(19) Each of the injection wells shown on Exhibit "A" should be equipped with 2 3/8-inch internally coated tubing installed in a packer set within 100 feet of the uppermost injection perforation or casing shoe; the casing-tubing annulus should be filled with an inert fluid; and a gauge or approved leak-detection device should be attached to the annulus in order to determine leakage in the casing, tubing or packer.

(20) Prior to commencing injection operations into any of the wells shown on Exhibit "A", the casing in each well should be pressure tested throughout the interval from the surface to the proposed packer setting depth to assure the integrity of such casing.

(21) Each of the wells within the tertiary recovery project area, including active producing or injection wells, and temporarily abandoned producing or injection wells should be equipped so as to confine the injected fluid to the proposed injection interval.

(22) The operator should give advance notification to the supervisor of the Hobbs District Office of the Division of the date and time of the installation of any new injection equipment and of the mechanical integrity pressure tests in order that the same may be witnessed.

(23) The application should be approved and the project should be governed by the provisions of Rule Nos. 701 through 708 of the Oil Conservation Division Rules and Regulations.

(24) The evidence presented by the applicant indicates that the proposed tertiary recovery project meets all the criteria for certification by the Division as a qualified "Enhanced Oil Recovery Project" pursuant to the "Enhanced Oil Recovery Act" (Laws 1992, Chapter 38, Sections 1 through 5).

(25) The certified "EOR Project Area" should initially comprise the area described in Finding Paragraph No. (7) above, provided however, the "EOR Project Area" eligible for the recovered oil tax rate may be contracted and reduced dependent upon the evidence presented by the applicant in its demonstration of the occurrence of a positive production response.

(26) To be eligible for the EOR tax credit, the applicant should advise the Division when CO_2 (WAG) injection commences within the "EOR Project Area" and request the Division certify the subject tertiary recovery project to the New Mexico Taxation and Revenue Department.

(27) At such time as a positive production response occurs from CO_2 (WAG) injection operations and within seven years from the date of the Certificate of Qualification, the applicant must apply to the Division for certification of positive production response, which application shall identify the area actually benefitting from tertiary recovery operations. The Division may review the application administratively or set it for hearing. Based upon evidence presented, the Division will certify to the New Mexico Taxation and Revenue Department those lands and wells which are eligible for the tax credit.

(28) The injection authority granted herein for the thirty-one WAG injection wells should terminate one year after the effective date of this order if the operator has not commenced WAG injection operations into these wells, provided however, the Division, upon written request by the operator, may grant an extension thereof for good cause shown.

IT IS THEREFORE ORDERED THAT:

(1) Division Order No. R-4629 is hereby amended to authorize Quay Valley, Inc., to institute an EOR tertiary recovery project by means of combined water, carbon dioxide (CO_2), and produced gas injection (WAG) in its El Mar Unit Area, described as follows, by the injection of water, CO_2 and produced gases into the Delaware formation, El Mar-Delaware Pool, through the gross interval from approximately 4,450 feet to 4,765 feet through thirty-one (31) injection wells located within Sections 24, 25, 26, 34, 35 and 36, Township 26 South, Range 32 East, and Sections 30 and 31, Township 26 South, Range 33 East, NMPM, Lea County, New Mexico, all as shown on Exhibit "A" attached hereto:

NORTH EL MAR UNIT AREA
TOWNSHIP 26 SOUTH, RANGE 32 EAST, NMPM
Section 24: S/2 SE/4
Section 25: All
Section 26: NE/4 NE/4, S/2 NE/4, SE/4 NW/4, S/2
Section 27: SE/4 SE/4
Section 34: N/2 NE/4, Lots 1 and 2
Section 35: N/2 N/2, Lots 1 through 4
Section 36: N/2 N/2, Lots 1 through 4

TOWNSHIP 26 SOUTH, RANGE 33 EAST, NMPM
Section 19: SW/4 SW/4
Section 30: NW/4 NW/4, S/2 NW/4, SW/4
Section 31: E/2 NW/4, Lots 1 and 2

(2) Injection authority is hereby reinstated for each of the injection wells shown on Exhibit "A".

(3) WAG injection operations shall be accomplished through 2 3/8 inch internally coated tubing installed in a packer set within approximately 100 feet of the uppermost injection perforations or casing shoe; the casing-tubing annulus shall be filled with an inert fluid and a gauge or approved leak-detection device shall be attached to the annulus in order to determine leakage in the casing, tubing or packer.

(4) All injection wells or the pressurization system should be initially equipped with a pressure control device or acceptable substitute which will limit the surface injection pressure to no more than 530 psi for water injection and 1160 psi for CO_2 and produced gas injection.

(5) The Division Director shall have the authority to administratively authorize a pressure limitation in excess of the above pressure limits upon a showing by the operator that such higher pressure will not result in the fracturing of the injection formation or confining strata.

(6) Prior to commencing injection operations into any of the wells shown on Exhibit "A", the casing in each well shall be pressure tested throughout the interval from the surface to the proposed packer setting depth to assure the integrity of such casing.

(7) Each of the wells within the tertiary recovery project area, including active producing or injection wells, and temporarily abandoned producing or injection wells shall be equipped so as to confine the injected fluid to the proposed injection interval.

(8) The operator shall give advance notification to the supervisor of the Hobbs District Office of the Division of the date and time of the installation of any new injection equipment and of the mechanical integrity pressure tests in order that the same may be witnessed.

(9) The operator shall immediately notify the supervisor of the Hobbs District Office of the Division of the failure of the casing in any of the injection wells, the leakage of water, natural gas, CO_2, or oil from or around any producing well, or the leakage of water, natural gas, CO_2, or oil from any plugged and abandoned well within the "EOR Project Area", and shall take such steps as may be necessary to correct such failure of leakage.

(10) The subject tertiary recovery project is hereby certified as a qualified "Enhanced Oil Recovery Project" pursuant to the"Enhanced Oil Recovery Act" (Laws 1992, Chapter 38, Sections 1 through 5).

(11) The certified and approved "EOR Project Area" shall include those lands described in Ordering Paragraph No. (1) above, provided however, the "EOR Project Area" eligible for the recovered oil tax rate may be reduced dependent upon the evidence presented by the applicant in its demonstration of the occurrence of a positive production response.

(12) To be eligible for the EOR credit, prior to commencing WAG injection operations, the operator must request from the Division a Certificate of Qualification, which certificate will specify the proposed project area as described above.

(13) At such time as a positive production response occurs and within seven years from the date of the Certificate of Qualification, the operator must apply to the Division for certification of positive production response, which application shall identify the area actually benefitting from enhanced recovery operations. The Division may review the application administratively or set it for hearing. Based upon evidence presented, the Division will certify to the New Mexico Taxation and Revenue Department those lands and wells which are eligible for the credit.

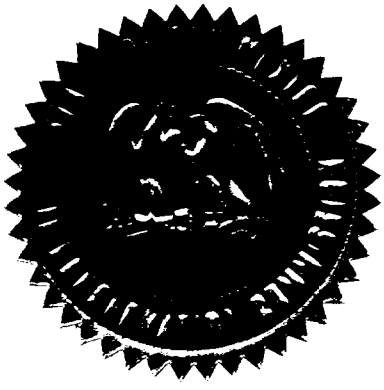
(14) The injection authority granted herein for the thirty-one WAG injection wells shall terminate one year after the effective date of this order if the operator has not commenced WAG injection operations into these wells, provided however, the Division, upon written request by the operator, may grant an extension thereof for good cause shown.

(15) The subject tertiary recovery project is hereby designated the North El Mar Unit Tertiary Recovery Project and shall be governed by the provisions of Rules Nos. 701 through 708 of the Oil Conservation Division Rules and Regulations.

(16) Monthly progress reports of the tertiary recovery project herein authorized shall be submitted to the Division in accordance with Rules 706 and 1115 of the Division Rules and Regulations.

(17) Jurisdiction is hereby retained for the entry of such further orders as the Division may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.



STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

WILLIAM J. LeMAY
Director

EXHIBIT "A"
CASE NO. 11826
ORDER NO. R-4629-A
NORTH EL MAR UNIT TERTIARY RECOVERY PROJECT
APPROVED INJECTION WELLS

WELL NAME & NUMBER	API NUMBER	WELL LOCATION	PERFORATED INTERVAL	TUBING SIZE	PACKER DEPTH	MAXIMUM PRESSURE
NEMU No. 2	30-025-08269	660' FSL & 660' FEL (P) 24-26S-32E	4,697'-4,728'	2 3/8"	4,597'	1160 PSIG
NEMU No. 4	30-025-08436	990' FNL & 330' FWL (D) 30-26S-33E	4,682'-4,692'	2 3/8"	4,582'	1160 PSIG
NEMU No. 6	30-025-08280	660' FNL & 2005' FEL (B) 25-26S-32E	4,651'-4,690'	2 3/8"	4,551'	1160 PSIG
NEMU No. 8	30-025-08287	990' FNL & 990' FWL (D) 25-26S-32E	4,639'-4,654'	2 3/8"	4,539'	1160 PSIG
NEMU No. 10	30-025-08299	1980' FNL & 1980' FWL (F) 26-26S-32E	4,529'-4,535'	2 3/8"	4,429'	1160 PSIG
NEMU No. 12	30-025-08294	1980' FNL & 660' FEL (H) 26-26S-32E	4,603'-4,622'	2 3/8"	4,503'	1160 PSIG
NEMU No. 14	30-025-08277	1980' FNL & 1980' FWL (F) 25-26S-32E	4,623'-4,653'	2 3/8"	4,523'	1160 PSIG
NEMU No. 16	30-025-08281	1980' FNL & 660' FEL (H) 25-26S-32E	4,654'-4,677'	2 3/8"	4,554'	1160 PSIG
NEMU No. 18	30-025-08434	1880' FNL & 1650' FWL (F) 30-26S-33E	4,723'-4,732'	2 3/8"	4,623'	1160 PSIG
NEMU No. 20	30-025-08431	1980' FSL & 660' FWL (L) 30-26S-33E	4,672'-4,684'	2 3/8"	4,572'	1160 PSIG

WELL NAME & NUMBER	API NUMBER	WELL LOCATION	PERFORATED INTERVAL	TUBING SIZE	PACKER DEPTH	MAXIMUM PRESSURE
NEMU No. 22	30-025-08278	1980' FSL & 1980' FEL (J) 25-26S-32E	4,625'-4,649'	2 3/8"	4,525'	1160 PSIG
NEMU No. 24	30-025-08275	1980' FSL & 660' FWL (L) 25-26S-32E	4,603'-4,632'	2 3/8"	4,503'	1160 PSIG
NEMU No. 26	30-025-08293	1980' FSL & 1980' FEL (J) 26-26S-32E	4,544'-4,571'	2 3/8"	4,444'	1160 PSIG
NEMU No. 28	30-025-08296	1980' FSL & 660' FWL (L) 26-26S-32E	4,497'-4,536'	2 3/8"	4,397'	1160 PSIG
NEMU No. 29	30-025-08300	330' FSL & 330' FEL (P) 27-26S-32E	4,456'-4,474'	2 3/8"	4,356'	1160 PSIG
NEMU No. 31	30-025-08292	660' FSL & 1980' FWL (N) 26-26S-32E	4,495'-4,527'	2 3/8"	4,395'	1160 PSIG
NEMU No. 33	30-025-08288	660' FSL & 660' FEL (P) 26-26S-32E	4,595'-4,626'	2 3/8"	4,495'	1160 PSIG
NEMU No. 35	30-025-08274	660' FSL & 1980' FWL (N) 25-26S-32E	4,609'-4,643'	2 3/8"	4,509'	1160 PSIG
NEMU No. 37	30-025-08283	660' FSL & 660' FEL (P) 25-26S-32E	4,638'-4,680'	2 3/8"	4,538'	1160 PSIG
NEMU No. 39	30-025-08435	660' FSL & 1650' FWL (N) 30-26S-33E	4,675'-4,765'	2 3/8"	4,575'	1160 PSIG
NEMU No. 41	30-025-08437	660' FNL & 660' FWL (D) 31-26S-33E	4,646'-4,689'	2 3/8"	4,546'	1160 PSIG
NEMU No. 42	30-025-08316	544' FNL & 1448' FEL (B) 36-26S-32E	4,617'-4,638'	2 3/8"	4,517'	1160 PSIG
NEMU No. 46	30-025-08311	660' FNL & 1650' FEL (B) 35-26S-32E	4,566'-4,585'	2 3/8"	4,466'	1160 PSIG
NEMU No. 48	30-025-08309	660' FNL & 660' FWL (D) 35-26S-32E	4,485'-4,516'	2 3/8"	4,385'	1160 PSIG
NEMU No. 50	30-025-08305	330' FSL & 330' FEL (H) 34-26S-32E	4,450'-4,466'	2 3/8"	4,350'	1160 PSIG
NEMU No. 51	30-025-08312	1650' FNL & 2310' FWL (F) 35-26S-32E	4,515'-4,536'	2 3/8"	4,415'	1160 PSIG

WELL NAME & NUMBER	API NUMBER	WELL LOCATION	PERFORATED INTERVAL	TUBING SIZE	PACKER DEPTH	MAXIMUM PRESSURE
NEMU No. 52	30-025-08313	490' FSL & 330' FEL (H) 35-26S-32E	4,569'-4,606'	2 3/8"	4,469'	1160 PSIG
NEMU No. 54	30-025-08318	543' FSL & 2108' FWL (F) 36-26S-32E	4,590'-4,636'	2 3/8"	4,490'	1160 PSIG
NEMU No. 57	30-025-08440	1935' FNL & 2090' FWL (F) 31-26S-33E	4,666'-4,740'	2 3/8"	4,566'	1160 PSIG
NEMU No. 58	30-025-24908	770' FNL & 990' FWL (D) 36-26S-32E	4,598'-4,632'	2 3/8"	4,498'	1160 PSIG
NEMU No. 62	30-025-25422	1829' FNL & 330' FEL (H) 36-26S-32E	4,618'-4,660'	2 3/8"	4,518'	1160 PSIG

CAMPBELL, CARR, BERGE
& SHERIDAN, P.A.
LAWYERS

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WILLIAM F. CARR
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October 9, 1997

HAND DELIVERED

Mr David R. Catanach, Examiner
Oil Conservation Division
New Mexico Department of Energy,
Minerals and Natural Resources
2040 south Pacheco Street
Santa Fe, New Mexico 87505

Re: ***Oil Conservation Division Case No. 11826:***
Application of Quay Valley, Inc. for Amendment of Division Order No. R-4629 to authorize a tertiary recovery project by the injection of carbon dioxide in its North El Mar-Delaware Unit Waterflood Project Area, for reapproval of injection wells and to qualify this project for the recovered tax rate pursuant to the Enhanced Oil Recovery Act, Lea County, New Mexico

Dear Mr. Catanach:

Pursuant to your request, I am enclosing copies of revised well data sheets for the Form C-108 previously filed for the North El Mar Unit.

If you need additional information from QuayValley, Inc. please advise.

Very truly yours,

WILLIAM F. CARR
WFC:mlh
Enclosures
cc: Ms. Stella Swanson
Quay Valley, Inc.
Post Office Box 10280
Midland, Texas 79702

Wells Located within NEMU boundaries
other than Injection wells.

QUAY VALLEY, INC

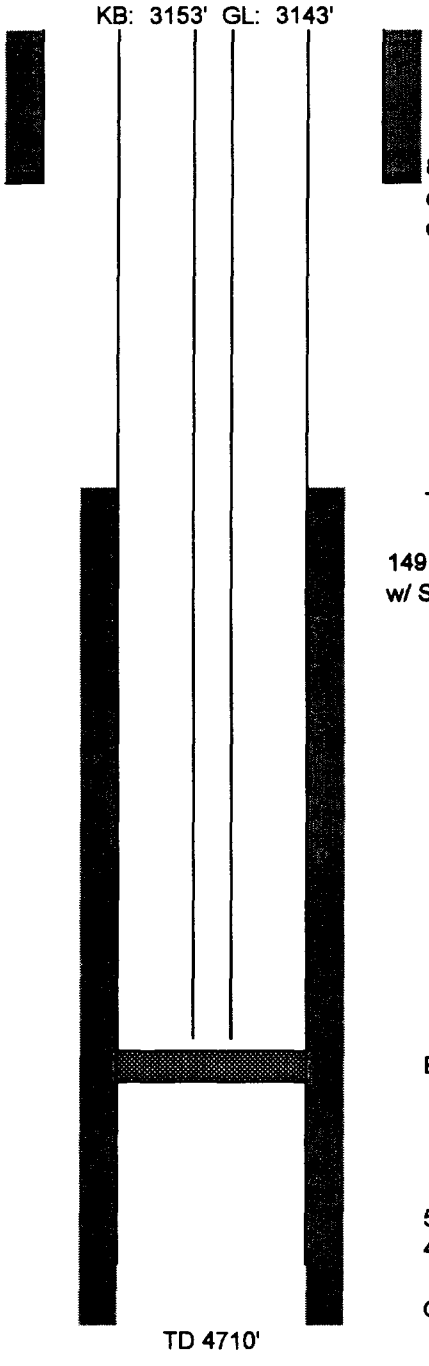
North Elmar Unit #3

FORMERLY ANTWEIL MORRIS R FEDERAL LITTLEFIELD DQ 1-X

(API# 30-025-084200)

330' FSL & 330' FWL
Section 19, T-26-S, R-33-E
Lea County, New Mexico

SPUD DATE: 6/30/61 COMPLETION DATE: 7/17/61



8 5/8" 32# casing @ 377'
cemented w/ 225 sx
cmt. Circ

TOC @ ? by well record

149 jts 2 3/8' tubing & OPSMA
w/ SN @ 4645'

Elder CIBP @ 4650'

5 1/2" ,14#,15.5#,& 17# @
4702' w/ 100 sx

OPEN HOLE @ 4702' - 10'

TD 4710'

QUAY VALLEY, INC.
JULY, 1996

Bobby Gray/Gray Pumping
915/943-4397

NEMU #3

Status	(TA) Formerly: Federal Littlefield "DQ" 1-X
County & State	Lea County, New Mexico
Spud Date:	06/30/61
Completion	07/17/61
Total Depth	4,710'
Surface Casing	8 5/8" @ 377' 225 sx TOC: surface Hole Size:
Production Casing	5 1/2" @ 4,702' 100 sx TOC: Hole Size:
Tubing Size	149 jts of 2 3/8" @ 4,645'
Perforations	Open hole.
Packer Size & Type	
Bridge Plug, If one	Elder CIBP @ 4,650'

QUAY VALLEY, INC

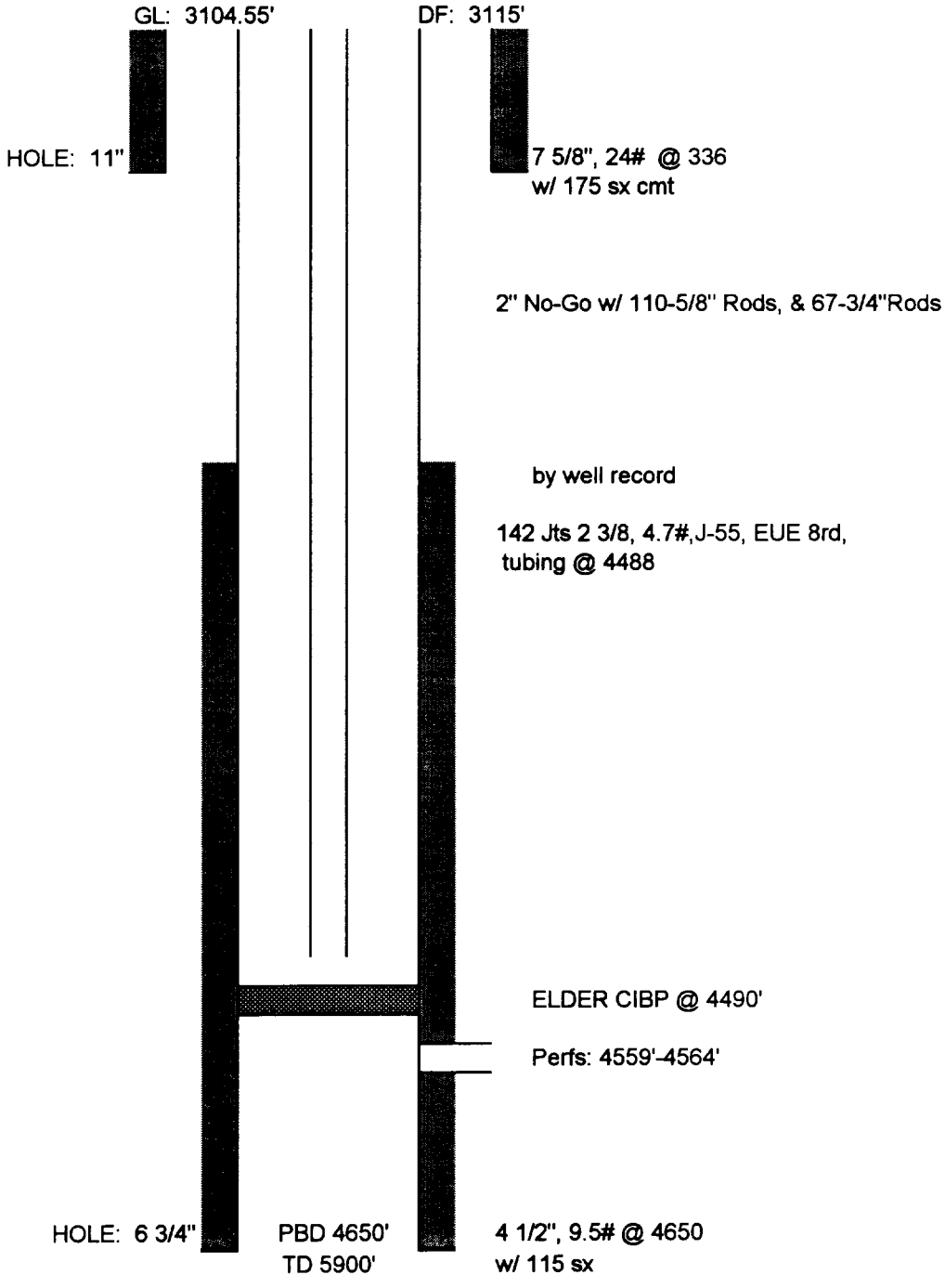
North El Mar Unit #11

FORMERLY CONTINENTAL OIL WILDER #25

(API# 30-025-082970)

1980' FNL & 1980' FEL
Section 26, T-26-S, R-32-E
Lea County, New Mexico

SPUD DATE: 6/24/60 COMPLETION DATE: 7/17/60



QUAY VALLEY, INC.
JULY, 1996

Bobby Gray/Gray Pumping
915/943-4397

NEMU #11

Status	(TA) Formerly: Wilder #25
County & State	Lea County, New Mexico
Spud Date:	06/24/60
Completion	07/17/60
Total Depth	5,900' PBTD @ 4,650'
Surface Casing	7 5/8" @ 336' 175 sx TOC: Surface Hole Size: 11"
Production Casing	4 1/2" @ 4,650' 1,15 sx TOC: Hole Size: 6 3/4"
Tubing Size	2 3/8" @ 4,488'
Perforations	4,559'-64'
Packer Size & Type	
Bridge Plug, If one	Elder CIBP @ 4,490'

Quay Valley, INC

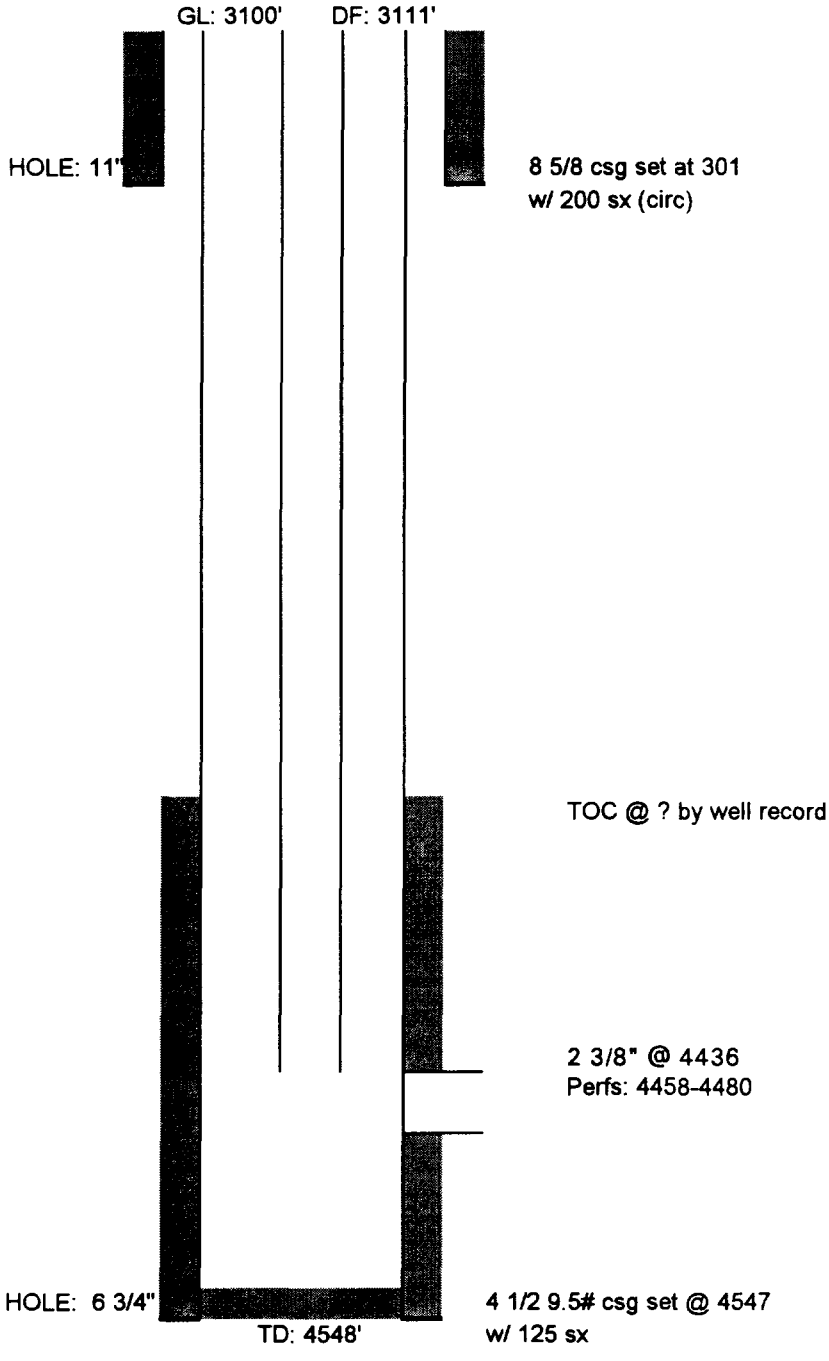
North El Mar Unit #49

FORMERLY TEXACO INC ELLIOT FEDERAL #2

(API# 30-025-083060)

1016' FNL & 330' FEL
Section 34, Township 26 South, Range 32 East
Lea County, NM

Spud Date: 10/06/59 Completion: 10/18/59



QUAY VALLEY, INC.
JULY, 1996

Bobby Gray/Gray Pumping
915/943-4397

NEMU #49

Status	(POW) Formerly: Elliot Federal #2
County & State	Lea County, New Mexico
Spud Date:	10/06/59
Completion	10/18/59
Total Depth	4,548'
Surface Casing	8 5/8" @ 301' 200 sx TOC: Surface Hole Size: 11"
Production Casing	4 1/2" @ 4,547' 125 sx TOC: ? Hole Size: 6 ¾"
Tubing Size	2 3/8" @ 4,436'
Perforations	4,458'-4,480'
Packer Size & Type	
Bridge Plug, If one	

Quay Valley, INC

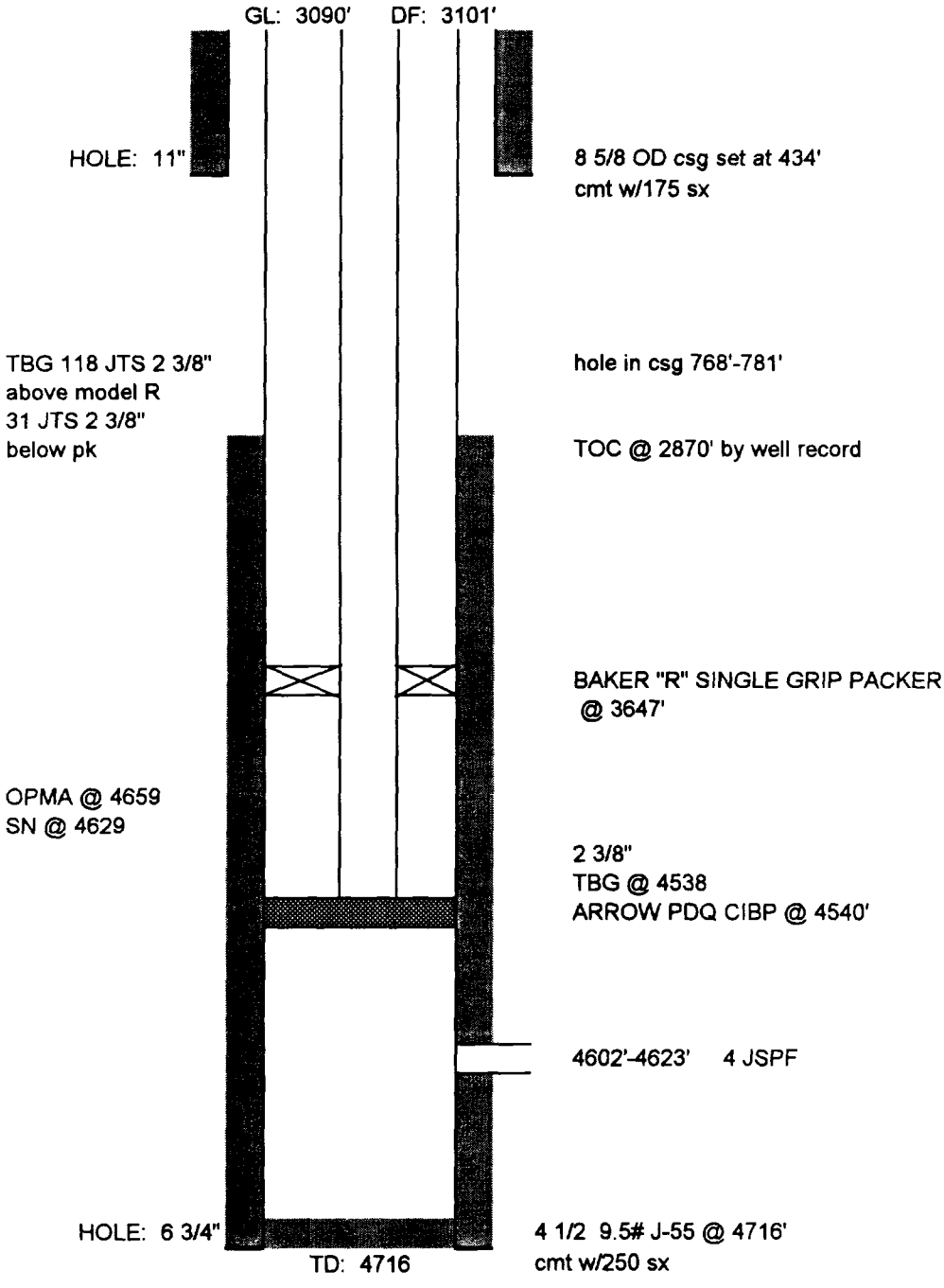
North El Mar Unit #55

FORMERLY KERN COUNTY LAND STATE 36 #6

(API# 30-025-083190)

544' FSL & 1448' FEL
Section 36, Township 26 South, Range 32 East
Lea County, NM

Spud Date: 12/05/59 Completion: 12/13/59



QUAY VALLEY, INC.
JULY, 1996

Bobby Gray/Gray Pumping
915/943-4397

NEMU #55

Status	(TA) Formerly: State 36 #6
County & State	Lea County, New Mexico
Spud Date:	12/05/59
Completion	12/13/59
Total Depth	4,716'
Surface Casing	8 5/8" @ 434' 175 sx TOC: Surface (?) Hole Size: 11"
Production Casing	4 1/2" @ 4,716' 250 sx TOC: ? Hole Size: 6 3/4"
Tubing Size	2 3/8" @ 4,538'
Perforations	4,602'-23'
Packer Size & Type	Baker "R" Single grip @ 3,647'
Bridge Plug, If one	Arrow "PDQ" CIBP @ 4,540'

QUAY VALLEY, INC

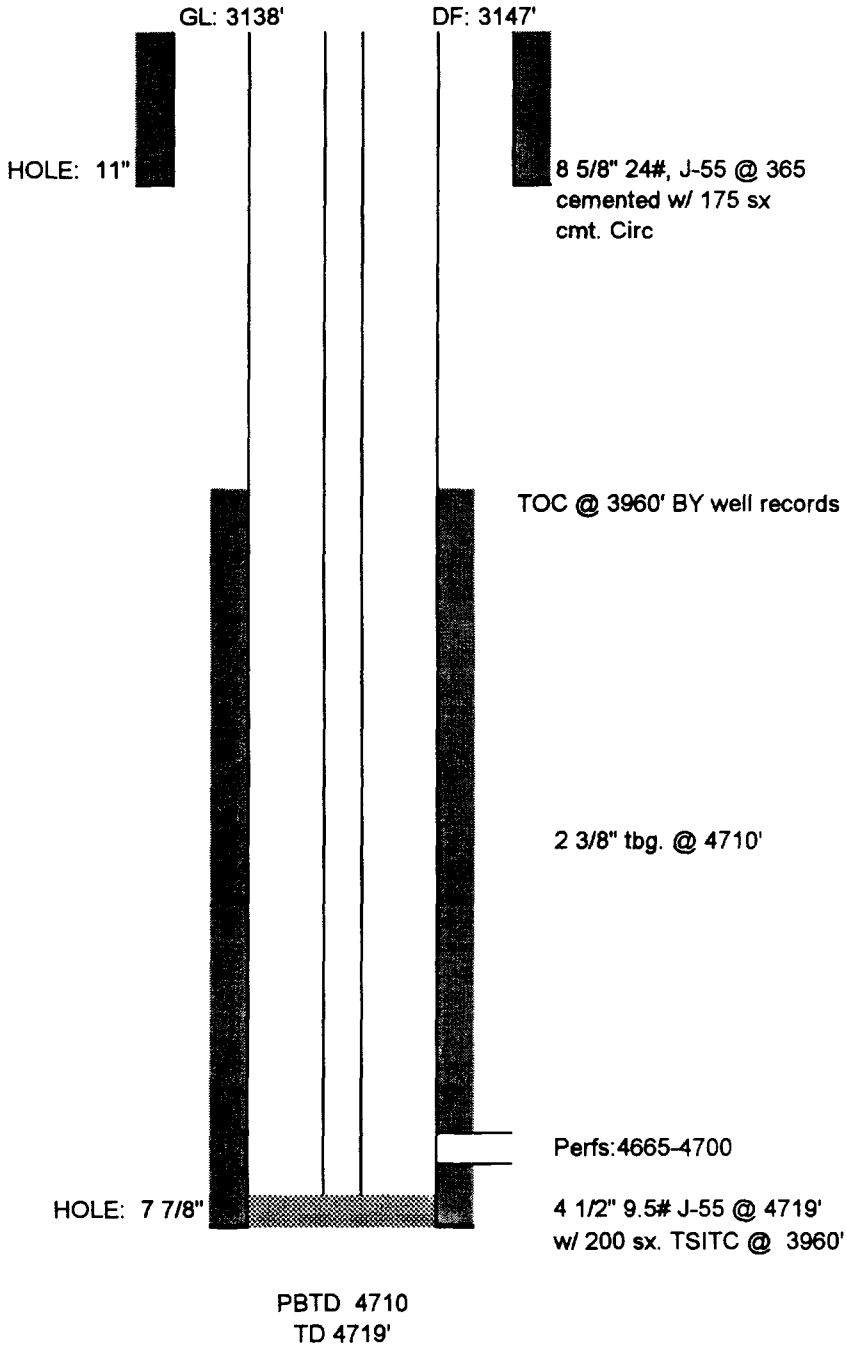
North Elmar Unit #1

FORMERLY CONTINENTAL FEDERAL LITTLEFIELD "DR" #1

(API# 30-025-082680)

330' FSL & 1650' FEL
Section 24, T-26-S, R-32-E
Lea County, New Mexico

SPUD DATE: 3/11/60 COMPLETION DATE: 3/31/60



QUAY VALLEY, INC.
JULY, 1996

Bobby Gray/Gray Pumping
915/943-4397

NEMU #1

STATUS	(POW) Formerly: Federal Littlefield "DR" #1
County & State	Lea County, New Mexico
Spud Date:	03/11/60
Completion	03/31/60
Total Depth	4,719' (Plug back to 4,710')
Surface Casing	8 5/8" @ 365' 175 sx TOC: Surface Hole Size: 11"
Production Casing	4 1/2" @ 4,719' 200 sx TOC: 3,960' Hole Size: 7 7/8"
Tubing Size	4,710' OF 2 3/8"
Perforations	4,665'-4,700'
Packer Size & Type	
Bridge Plug, If one	

QUAY VALLEY, INC

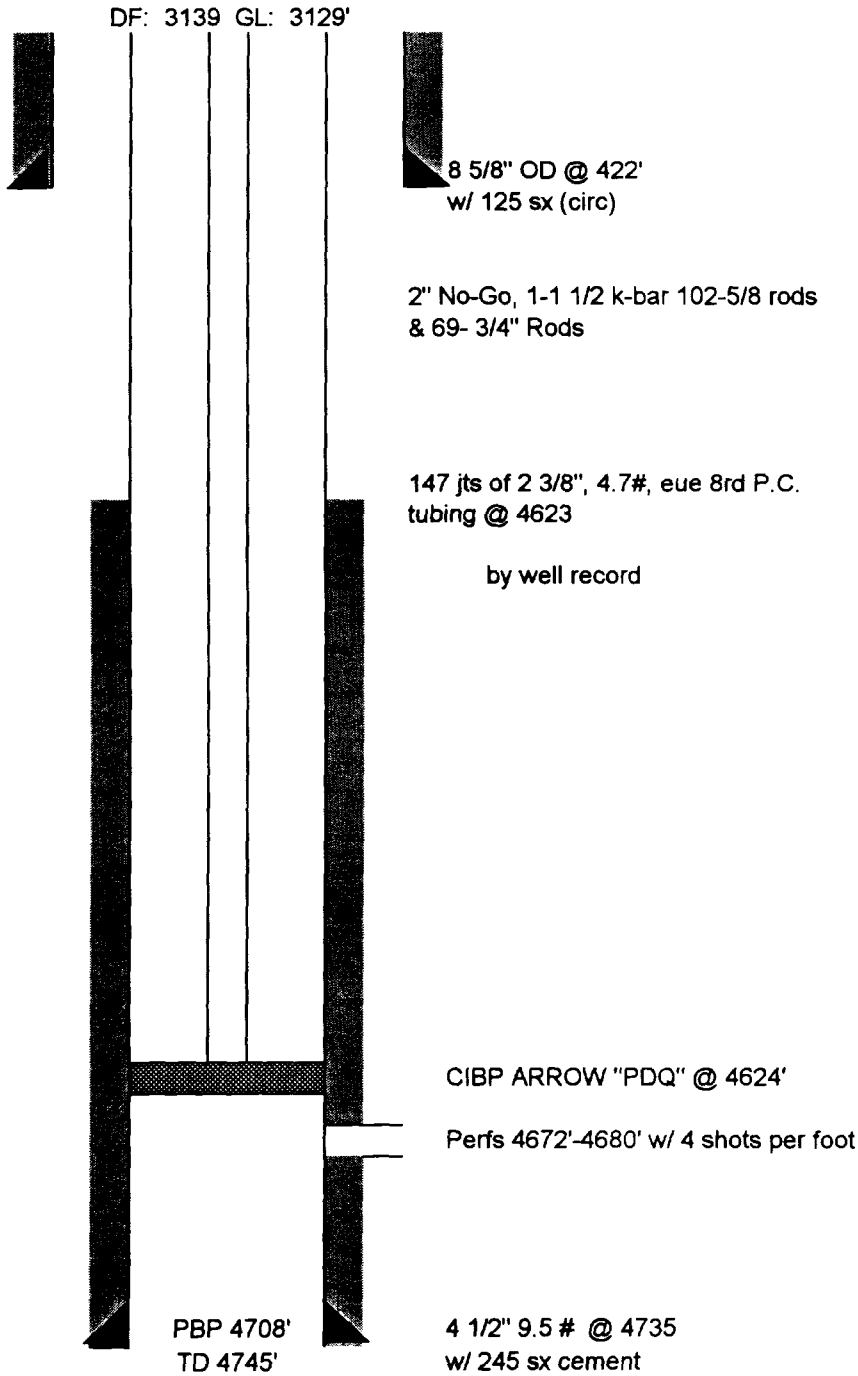
North El Mar Unit #5

FORMERLY WORLDWIDE PETROLEUM MELISSA FEDERAL #1

(API# 30-025-082720)

660' FNL & 660' FEL
Section 25, T-26-S, R-32-E
Lea County, New Mexico

SPUD DATE: 7/20/59 COMPLETION DATE: 7/27/59



QUAY VALLEY, INC.
JULY, 1996

Bobby Gray/Gray Pumping
915/943-4397

NEMU #5

Status	(TA) Formerly: Melissa Federal #1
County & State	Lea County, New Mexico
Spud Date:	07/20/59
Completion	07/27/59
Total Depth	4,745'
Surface Casing	8 5/8" @ 422' 125 sx TOC: Surface Hole Size:
Production Casing	4 1/2" @ 4,735' 245 sx TOC: Hole Size:
Tubing Size	147 jts of 2 3/8" @ 4,623'
Perforations	4,672'-80'
Packer Size & Type	
Bridge Plug, If one	Arrow "PDQ" CIBP @ 4,624'

QUAY VALLEY, INC

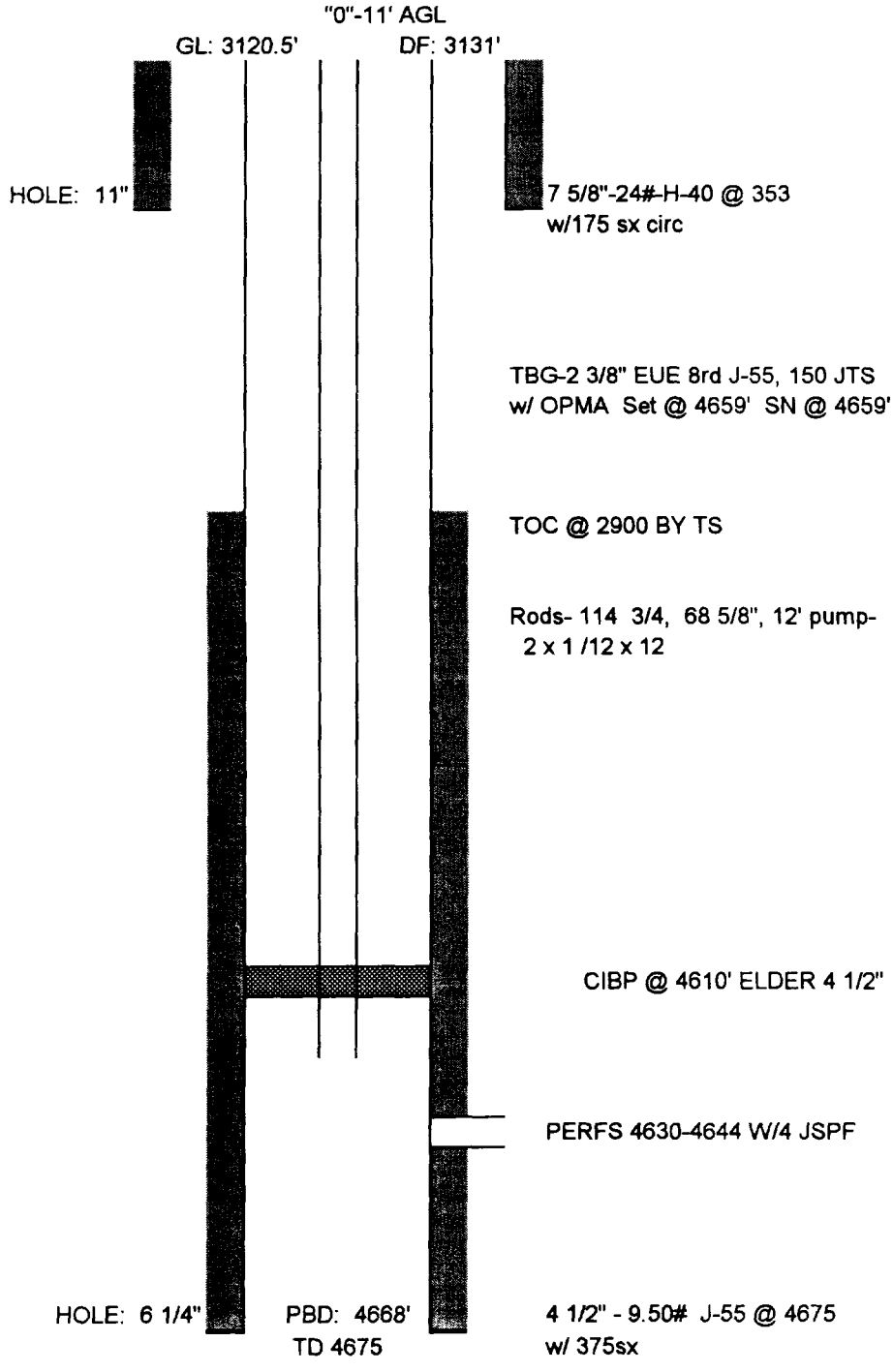
North El Mar Unit #7

FORMERLY CONTINENTAL OIL WILDER #15

(API# 30-025-082860)

660' FNL & 1980' FWL
Section 25, T-26-S, R-32-E
Lea County, New Mexico

SPUD DATE: 11/29/59 COMPLETION DATE: 12/13/59



QUAY VALLEY, INC.
JULY, 1996

Bobby Gray/Gray Pumping
915/943-4397

NEMU #7

Status	(TA)	Formerly: Wilder #15
County & State	Lea County, New Mexico	
Spud Date:	11/29/59	
Completion	12/13/59	
Total Depth	4,675'	
Surface Casing	7 5/8" @ 353' 175 sx Hole Size: 11"	TOC: Circ. to Surface
Production Casing	4 1/2" @ 4,675 375 sx Hole Size: 6 1/4"'	TOC: 2,900'
Tubing Size	2 3/8" @ 4,659'	
Perforations	4,630'-44'	
Packer Size & Type		
Bridge Plug, If one	Elder 4 1/2" cement retension @ 4,610'	

QUAY VALLEY, INC

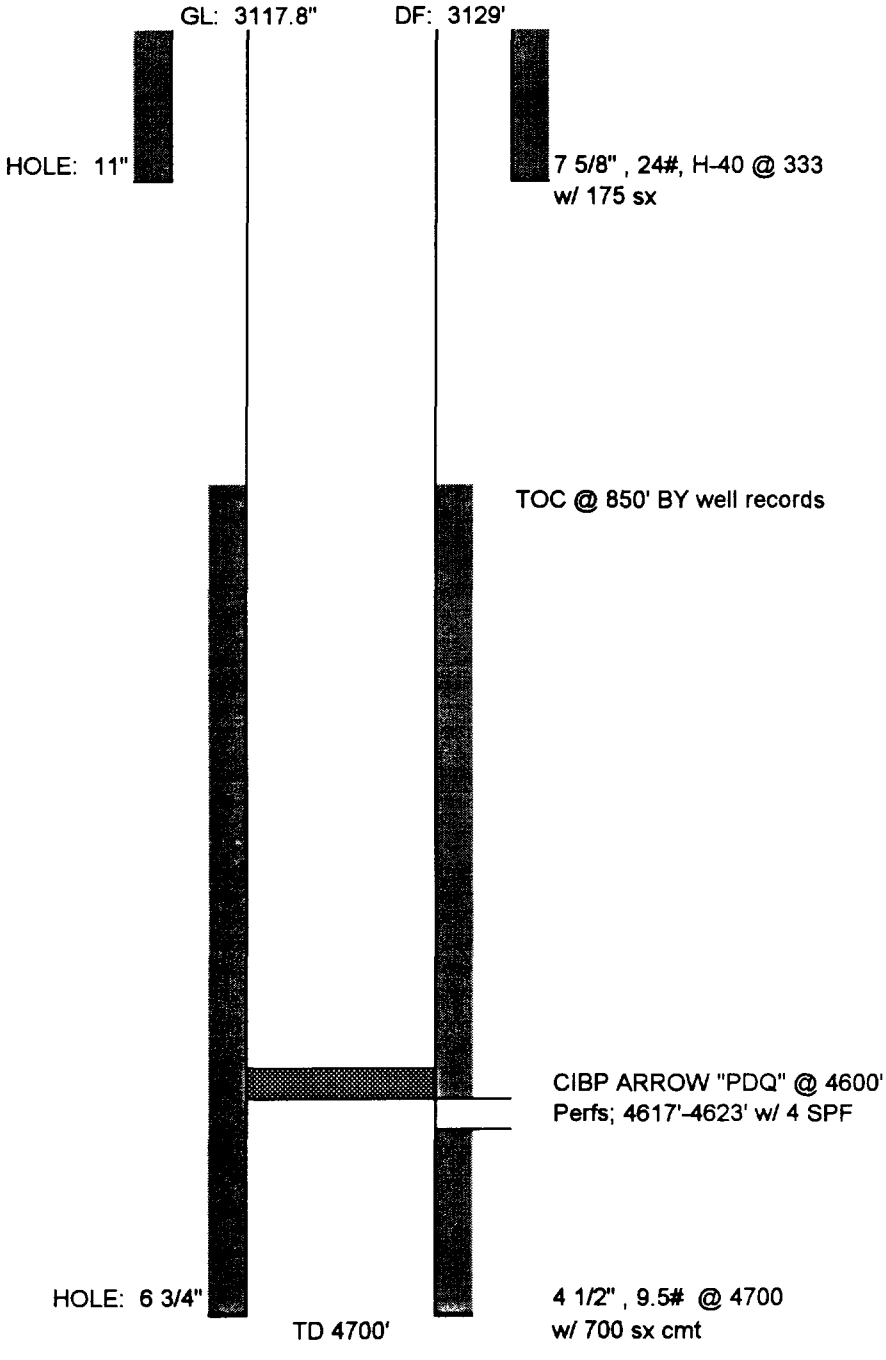
North El Mar Unit #9

FORMERLY CONTINENTAL OIL WILDER #26

(API# 30-025-082980)

990' FNL & 660' FEL
Section 26, T-26-S, R-32-E
Lea County, New Mexico

SPUD DATE: 7/22/60 COMPLETION DATE: 8/13/60



QUAY VALLEY, INC.
JULY, 1996

Bobby Gray/Gray Pumping
915/943-4397

NEMU #9

Status	(TA) Formerly: Wilder #26
County & State	Lea County, New Mexico
Spud Date:	07/22/60
Completion	08/13/60
Total Depth	4,700'
Surface Casing	7 5/8" @ 333' 175 sx TOC: Surface Hole Size: 11"
Production Casing	4 1/2" @ 4,700' 700 sx TOC: 850' Hole Size: 6 3/4"
Tubing Size	2 3/8" (nothing in wellbore)
Perforations	4,617'-23'
Packer Size & Type	
Bridge Plug, If one	Arrow "PDQ" CIBP @ 4,600'

QUAY VALLEY, INC

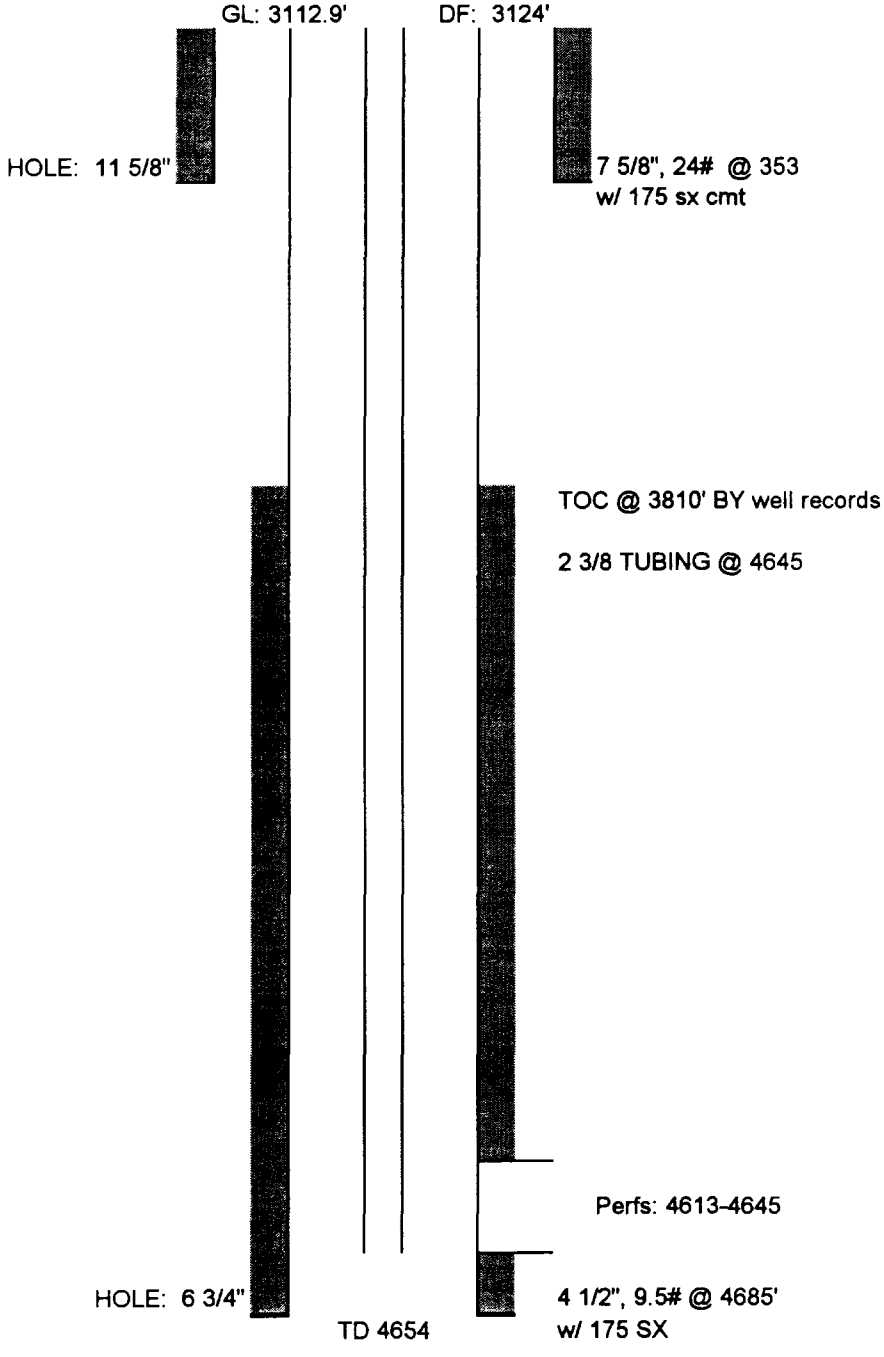
North El Mar Unit #13

FORMERLY CONTINENTAL OIL WILDER #14

(API# 30-025-082850)

1980' FNL & 660 FWL
Section 25, T-26-S, R-32-E
Lea County, New Mexico

SPUD DATE: 11/01/59 COMPLETION DATE: 11/16/59



QUAY VALLEY, INC.
JULY, 1996

Bobby Gray/Gray Pumping
915/943-4397

NEMU #13

Status	(POW) Formerly: Wilder #14
County & State	Lea County, New Mexico
Spud Date:	11/01/59
Completion	11/16/59
Total Depth	4,654'
Surface Casing	7 5/8" @ 353' 175 sx TOC: Surface Hole Size: 11 5/8"
Production Casing	4 1/2" @ 4,654' 175 sx TOC: 3,810' Hole Size: 6 3/4"
Tubing Size	2 3/8" @ 4,645'
Perforations	4,613'-45'
Packer Size & Type	
Bridge Plug, If one	

QUAY VALLEY, INC

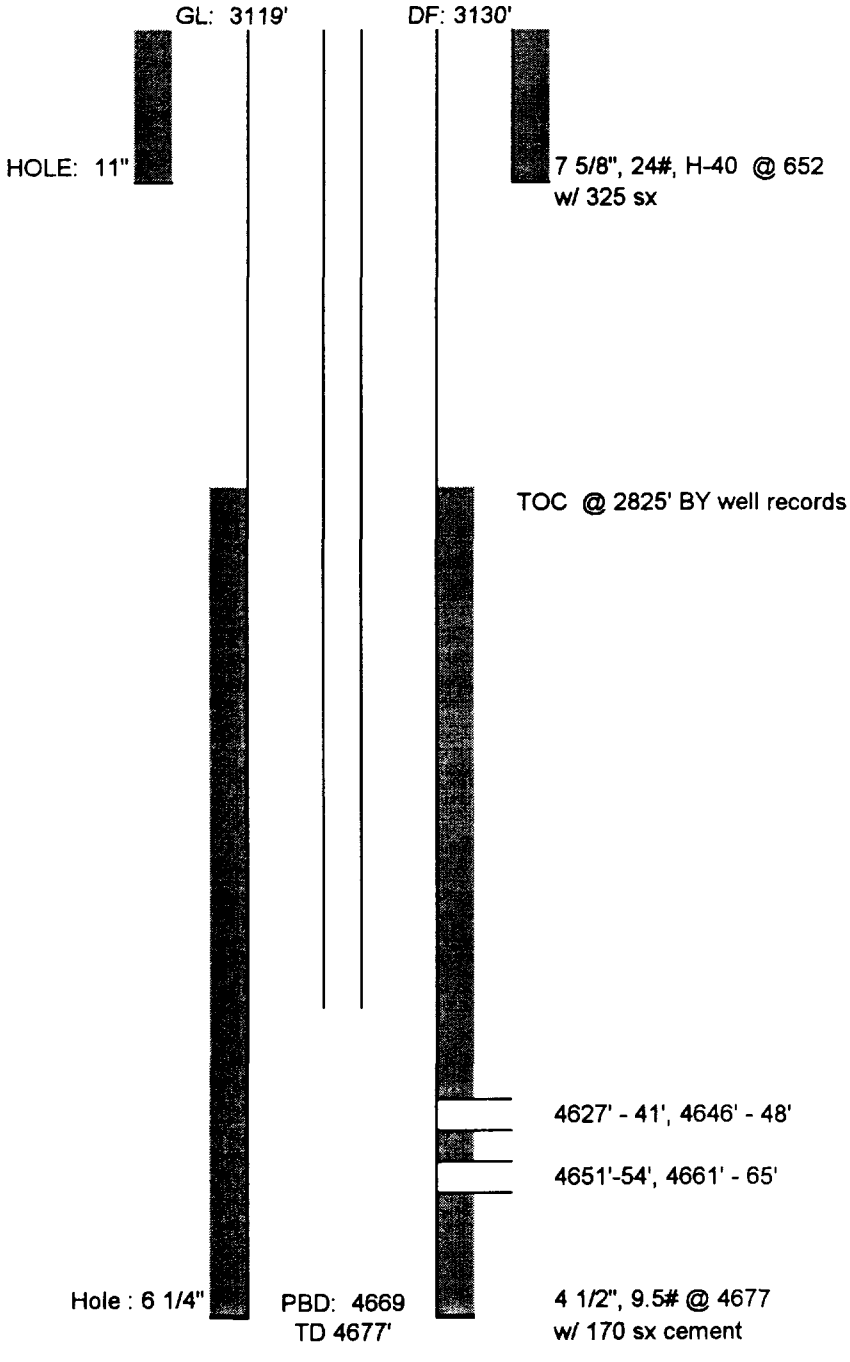
North El Mar Unit #15

FORMERLY CONTINENTAL OIL WILDER #8

(API# 30-025-082790)

1980' FNL & 1980' FEL
Section 25, T-26-S, R-32-E
Lea County, New Mexico

SPUD DATE: 7/23/59 COMPLETION DATE: 8/2/59



QUAY VALLEY, INC.
JULY, 1996

Bobby Gray/Gray Pumping
915/943-4397

NEMU #15

Status	(POW) Formerly: Wilder #8
County & State	Lea County, New Mexico
Spud Date:	07/23/59
Completion	08/02/59
Total Depth	4,677' PBTD 4,669' +/-
Surface Casing	7 5/8" @ 652' 325 sx TOC: Surface Hole Size: 11"
Production Casing	4 1/2" @ 4,677' 170 sx TOC: 2,825' Hole Size: 6 1/4"
Tubing Size	2 3/8"
Perforations	4,627'-41', 4,646'-48', 4651'-54', 4,661'-65'
Packer Size & Type	
Bridge Plug, If one	Arrow "PDQ" CIBP @ 4,580' Cement plug top - 669' bottom - 861' 9/25/95 drilled hard cement from 665' to 860'. Drilled out CIBP.

Quay Valley, INC

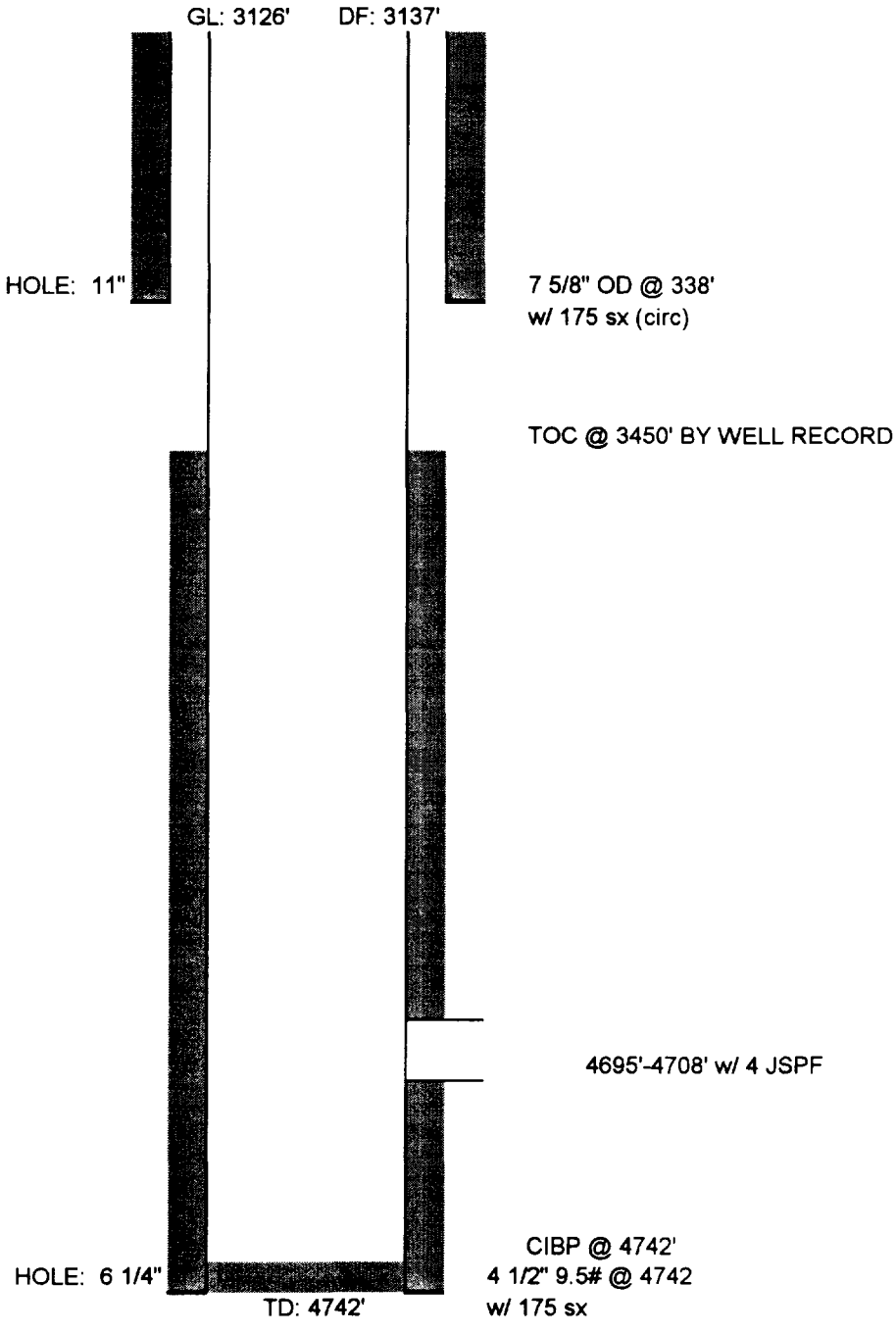
North El Mar Unit #17

FORMERLY CONTINENTAL OIL PAYNE #2

(API# 30-025-084300)

1880' FNL & 660' FWL **Spud Date: 9/7/59** **Completion: 9/18/59**

Section 30, Township 26 South, Range 33 East
Lea County, NM



QUAY VALLEY, INC.
JULY, 1996

Bobby Gray/Gray Pumping
915/943-4397

NEMU #17

Status	(TA) Formerly: Payne #2
County & State	Lea County, New Mexico
Spud Date:	09/07/59
Completion	09/18/59
Total Depth	4,742'
Surface Casing	7 5/8" @ 338' 175 sx TOC: Surface Hole Size: 11"
Production Casing	4 1/2" @ 4,742' 175 sx TOC: 3,450' Hole Size: 6 1/4"
Tubing Size	1/27/95 took out 2 3/8"
Perforations	4,695'-4,708'
Packer Size & Type	
Bridge Plug, If one	Arrow "PDQ" CIBP @ 4,672. Knocked down to 4,742'.

Quay Valley, INC

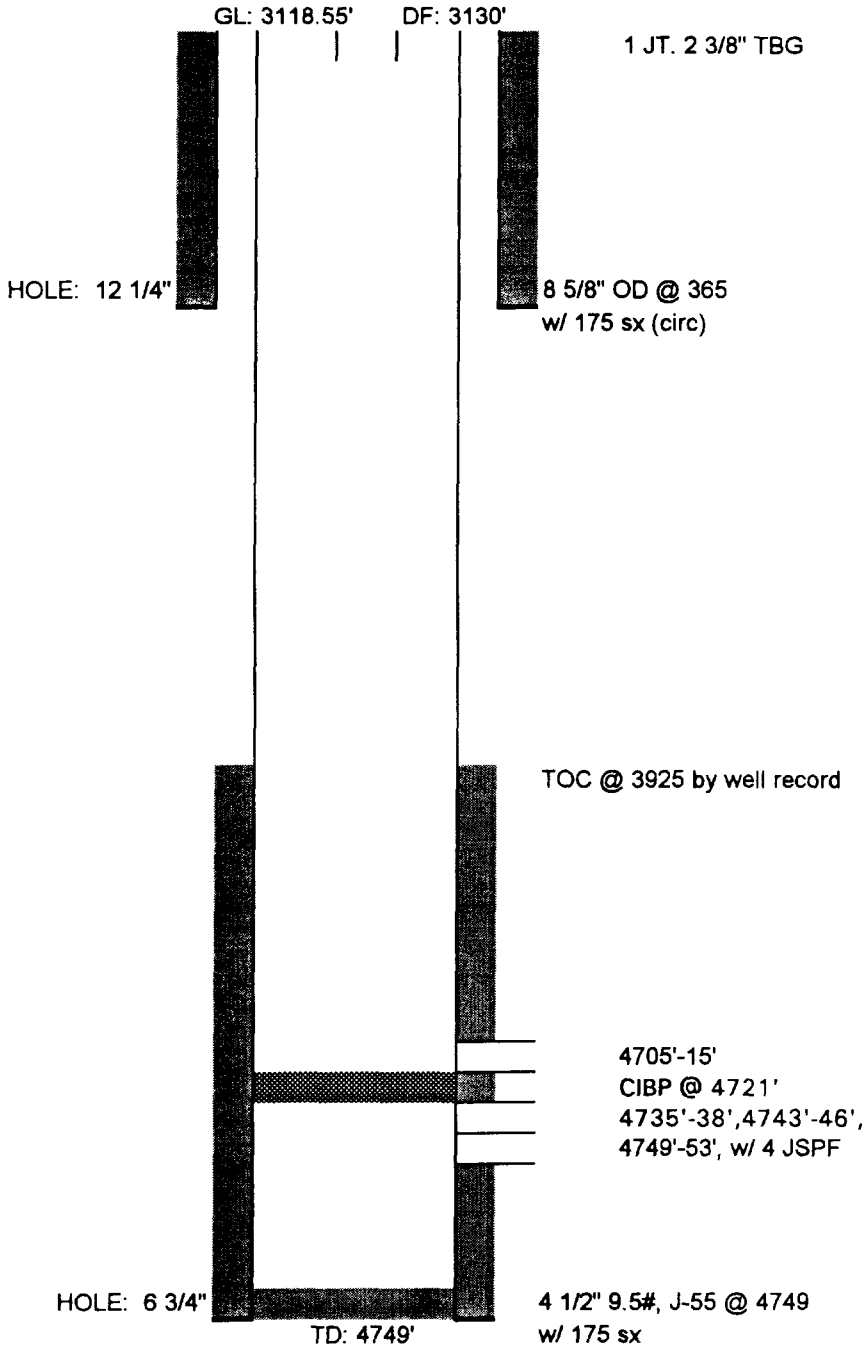
North El Mar Unit #19

FORMERLY CONTINENTAL OIL PAYNE #4

(API# 30-025-084320)

1980' FSL & 1980' FWL
Section 30, Township 26 South, Range 33 East
Lea County, NM

Spud Date: 10/21/59 Completion: 10/31/59



QUAY VALLEY, INC.
JULY, 1996

Bobby Gray/Gray Pumping
915/943-4397

NEMU #19

Status	(TA) Formerly: Payne #4
County & State	Lea County, New Mexico
Spud Date:	10/21/59
Completion	10/31/59
Total Depth	4,749'
Surface Casing	8 5/8" @ 365' 175 sx TOC: Surface Hole Size: 12 1/4"
Production Casing	4 1/2" @ 4,749' 175 sx TOC: 3,925' Hole Size: 6 3/4"
Tubing Size	2 3/8" @ 4,666'
Perforations	4,705'-15', 4735 -38', 4743' - 46', 4749'- 53' W/ 4 JSPF
Packer Size & Type	
Bridge Plug, If one	Elder CIBP @ 4,667' Knocked down to 4,721"

Quay Valley,INC

North El Mar Unit #21

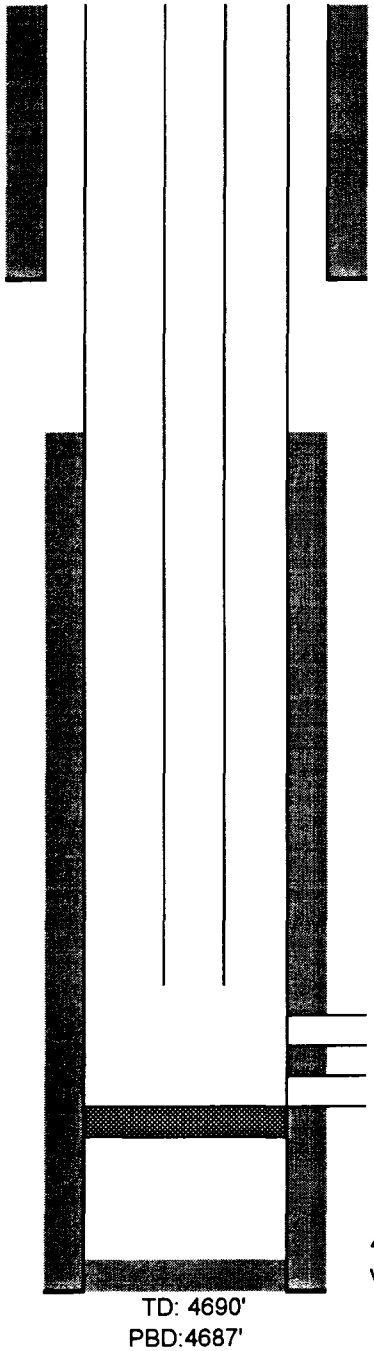
FORMERLY CONTINENTAL OIL WILDER #13

(API# 30-025-082840)

Spud Date: 10/11/59 Completion: 10/29/59

1980' FSL & 660' FEL
Section 25, Township 26 South, Range 32 East
Lea County, NM

GL: 3111' KB:3122'



7 5/8" 24# H-40 @ 356
w/ 175 sx (circ)

TOC @ 3600' by well record

148 JTS 2 3/8" OD, 4.7#
J-55, EUE TBG @ 4613'

4638'-48', 4655'-57'

4659'-61' w/ 4 JSPF
CIBP @ 4670'

4 1/2" 9.5#, J-55 @ 4690
w/ 175 sx

TD: 4690'
PBD:4687'

QUAY VALLEY, INC.
JULY, 1996

Bobby Gray/Gray Pumping
915/943-4397

NEMU #21

Status	(POW) Formerly: Wilder #13
County & State	Lea County, New Mexico
Spud Date:	10/11/59
Completion	10/29/59
Total Depth	4,690' PBTD @ 4,687'
Surface Casing	7 5/8" @ 356' 175 sx TOC: Surface Hole Size:
Production Casing	4 1/2" @ 4,690' 175 sx TOC: 3,600' Hole Size:
Tubing Size	2 3/8" @ 4,613'
Perforations	4,638'-48', 4,655'-57', 4659'-61'
Packer Size & Type	????
Bridge Plug, If one	Arrow "PDQ" CIBP @ 4,615' (10/95 drilled out BP & put back on production. Pushed to 4,670'.)

Quay Valley, INC

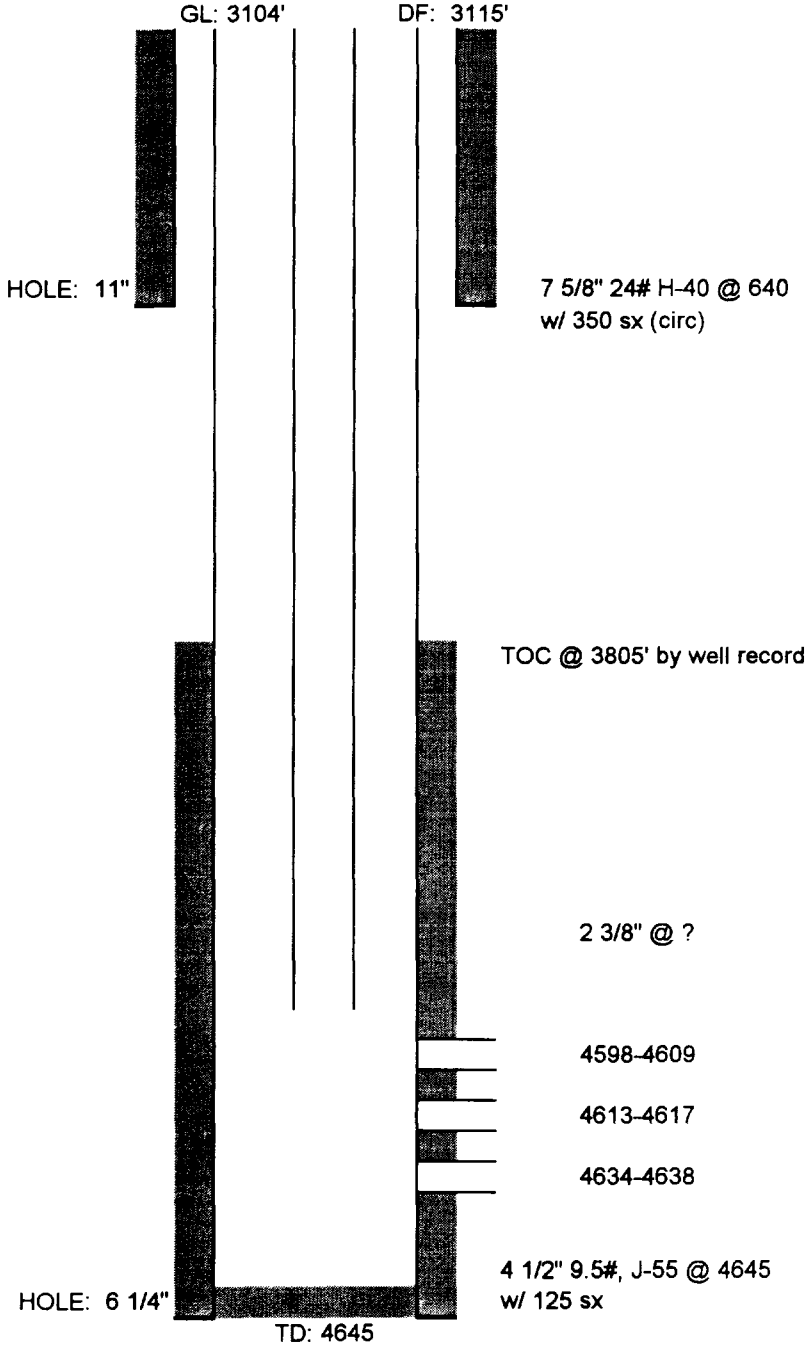
North El Mar Unit #23

FORMERLY CONTINENTAL OIL WILDER #4

(API# 30-025-082760)

1980' FSL & 1980' FWL
Section 25, Township 26 South, Range 32 East
Lea County, NM

Spud Date: 6/19/59 Completion: 6/30/59



QUAY VALLEY, INC.
JULY, 1996

Bobby Gray/Gray Pumping
915/943-4397

NEMU #23

Status	(POW) Formerly: Wilder #4
County & State	Lea County, New Mexico
Spud Date:	06/19/59
Completion	06/30/59
Total Depth	4,645'
Surface Casing	7 5/8" @ 640' 350 sx TOC: Surface Hole Size: 11"
Production Casing	4 1/2" @ 4,645' 125 sx TOC: 3,805' Hole Size: 6 1/4"
Tubing Size	2 3/8"
Perforations	4,598'-4,609', 4,613'-17', 4,634'-38'
Packer Size & Type	-------
Bridge Plug, If one	-------

Quay Valley, INC

North El Mar Unit #25

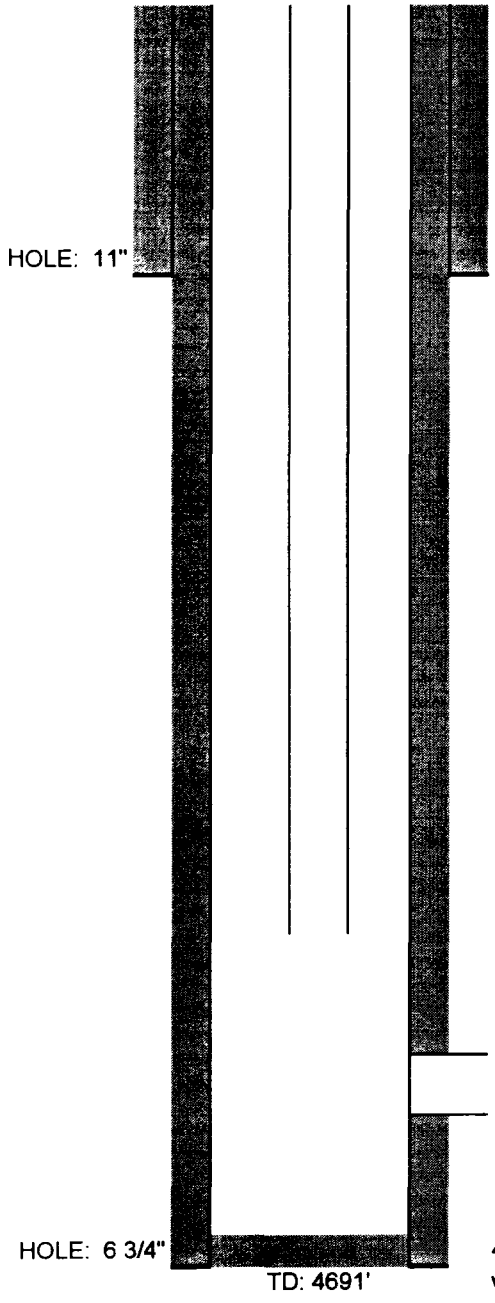
FORMERLY CONTINENTAL OIL WILDER #17

(API# 30-025-082900)

1980' FSL & 660 FEL
Section 26, Township 26 South, Range 32 East
Lea County, NM

Spud Date: 2/10/60 Completion: 2/22/60

GL: 3103' KB:3113'



TOC @ SURF BY CIRC in well record

HOLE: 11"

7 5/8" , 24# H-40 @ 349
w/ 175 sxs

148 JTS 2 3/8"
tbg @ 4516

4594-4602, 4607-4616
1 SPF

HOLE: 6 3/4"

TD: 4691'

4 1/2" 9.5# @ 4691
w/ 810 sx cement

QUAY VALLEY, INC.
JULY, 1996

Bobby Gray/Gray Pumping
915/943-4397

NEMU #25

Status	(POW) Formerly: Wilder #17
County & State	Lea County, New Mexico
Spud Date:	02/10/60 (Respuded 11/10/84)
Completion	02/22/60
Total Depth	4,691'
Surface Casing	7 5/8" @ 349' 175 sx TOC: Surface Hole Size: 11"
Production Casing	4 1/2" @ 4,691' 810 sx TOC: Surface (?) Hole Size: 6 3/4"
Tubing Size	2 3/8" @ 4,516'
Perforations	4,594'-4,602', 4,607-4,616'
Packer Size & Type	
Bridge Plug, If one	Elder 4 1/2" CIBP @ 4,670' - drilled out BP @4,570' - Put back on production.

Quay Valley, INC

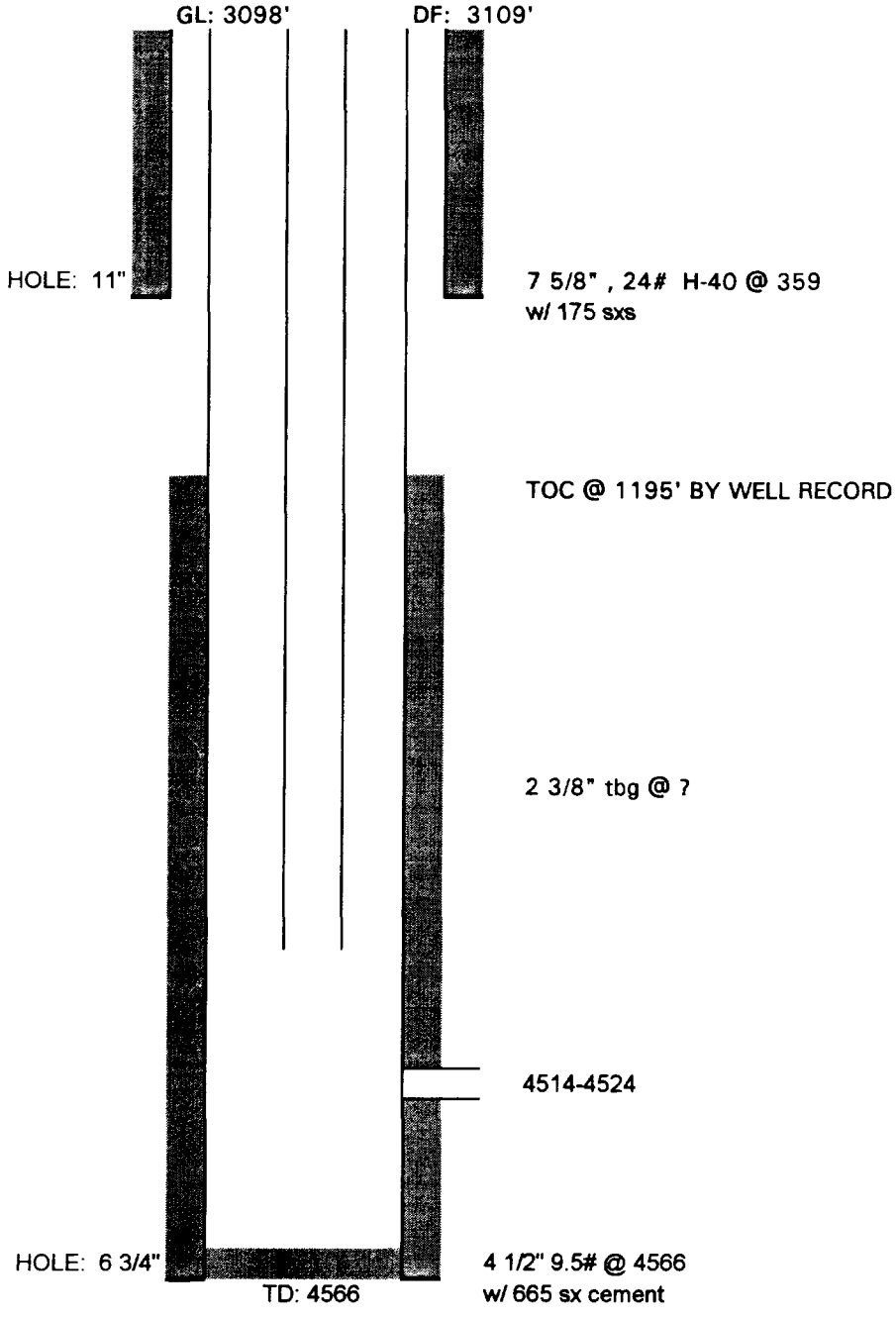
North El Mar Unit #27

FORMERLY CONTINENTAL OIL WILDER #22

(API# 30-025-082950)

1980' FSL & 1980' FWL
Section 26, Township 26 South, Range 32 East
Lea County, NM

Spud Date: 5/10/60 Completion: 5/21/60



QUAY VALLEY, INC.
JULY, 1996

Bobby Gray/Gray Pumping
915/943-4397

NEMU #27

Status	(POW) Formerly: Wilder #22
County & State	Lea County, New Mexico
Spud Date:	05/10/60
Completion	05/21/60
Total Depth	4,566'
Surface Casing	7 5/8" @ 359' 175 sx TOC: Surface Hole Size: 11"
Production Casing	4 1/2" @ 4,566' 665 sx TOC: 1,195' Hole Size: 6 3/4"
Tubing Size	2 3/8"
Perforations	4,514'-24'
Packer Size & Type	
Bridge Plug, If one	

Quay Valley, INC

North El Mar Unit #30

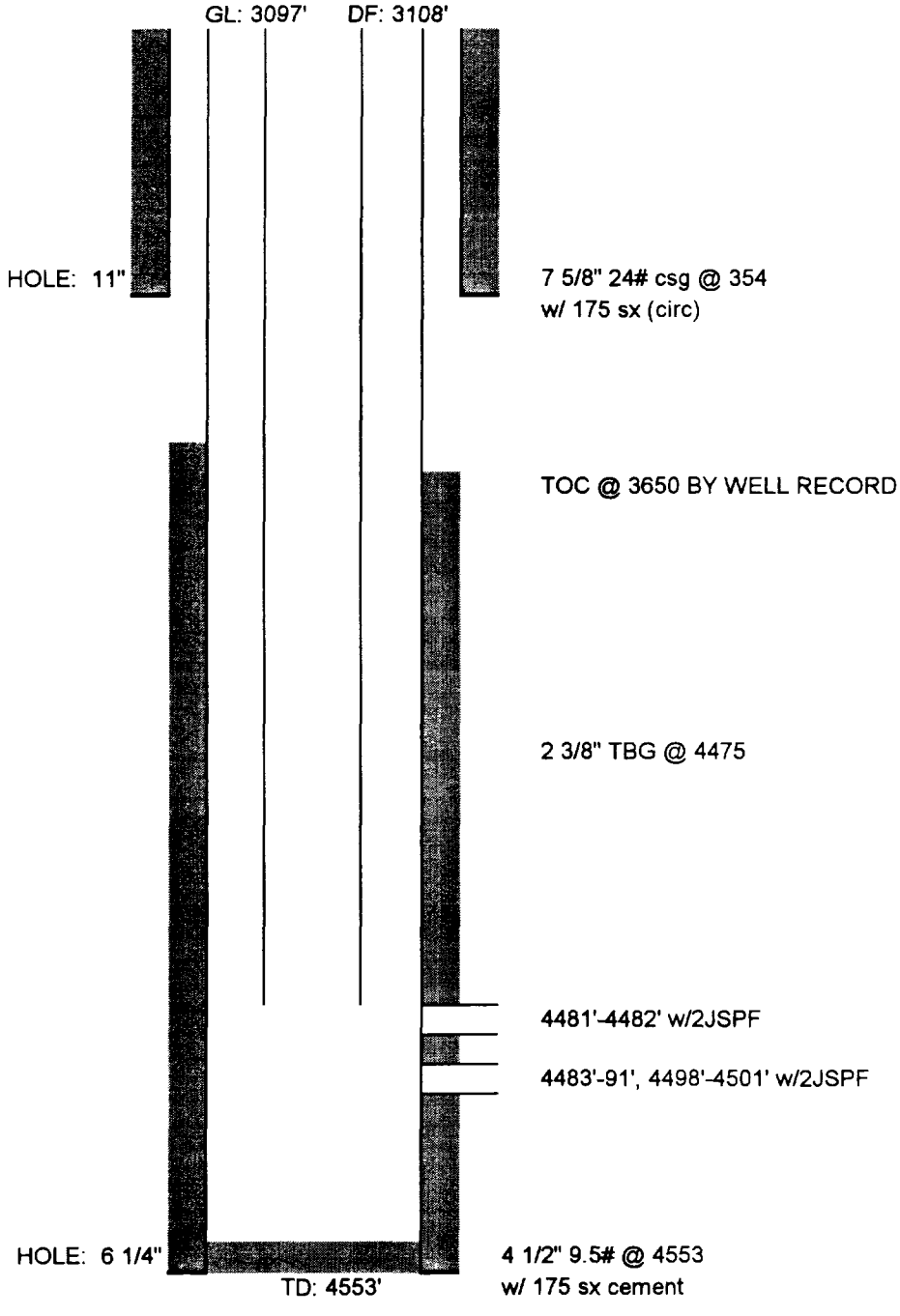
FORMERLY CONTINENTAL OIL WILDER #16

(API# 30-025-082890)

660' FSL & 660' FWL

Spud Date: 1/30/60 **Completion: 2/10/60**

Section 26, Township 26 South, Range 32 East
Lea County, NM



QUAY VALLEY, INC.
JULY, 1996

Bobby Gray/Gray Pumping
915/943-4397

NEMU #30

Status	(POW) Formerly: Wilder #16
County & State	Lea County, New Mexico
Spud Date:	01/30/60 (Respud 10/30/80)
Completion	02/10/60
Total Depth	4,553'
Surface Casing	7 5/8' @ 354' 175 sx TOC: Surface Hole Size: 11"
Production Casing	4 1/2" @ 4,553' 175 sx TOC: 3,650' Hole Size: 6 1/4"
Tubing Size	2 3/8" @ 4,475'
Perforations	4481'-4482', 4483'-91', 4498'-4501'
Packer Size & Type	
Bridge Plug, If one	Knocked out CIBP @ 4,400' 9/21/95

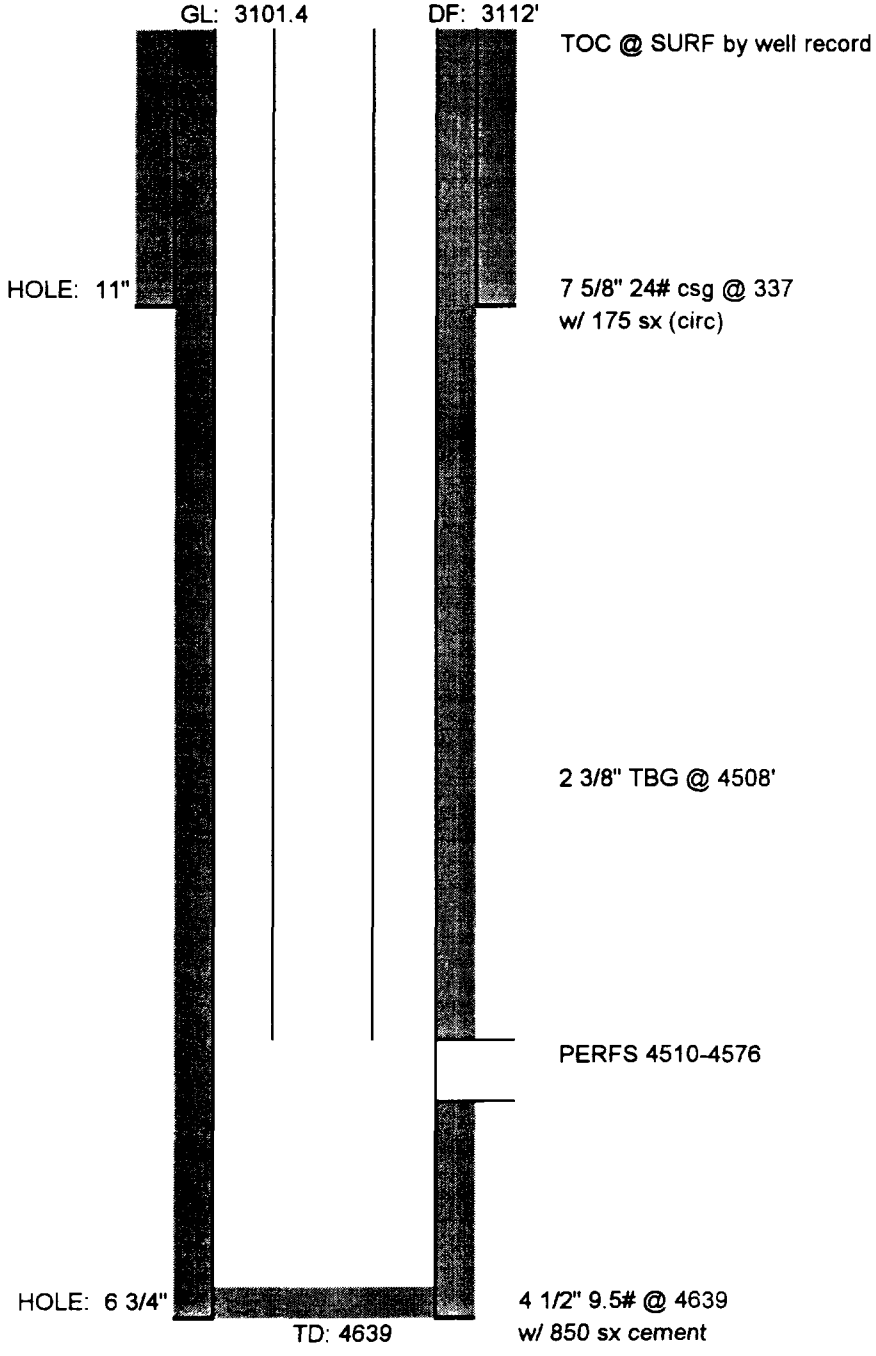
Quay Valley, INC

North El Mar Unit #32

FORMERLY CONTINENTAL OIL WILDER #18

(API# 30-025-082910)

660' FSL & 660' FEL Spud Date: 3/3/60 Completion: 3/17/60
Section 26, Township 26 South, Range 32 East
Lea County, NM



QUAY VALLEY, INC.
JULY, 1996

Bobby Gray/Gray Pumping
915/943-4397

NEMU #32

Status	(POW) Formerly: Wilder #18
County & State	Lea County, New Mexico
Spud Date:	03/03/60
Completion	03/17/60
Total Depth	4,639'
Surface Casing	7 5/8" @ 337' 175 sx TOC: Surface Hole Size: 11"
Production Casing	4 1/2" @ 4,639' 850 sx TOC: Surface Hole Size: 6 3/4"
Tubing Size	2 3/8" TBG @ 4502'
Perforations	4,510'-76'
Packer Size & Type	
Bridge Plug, If one	

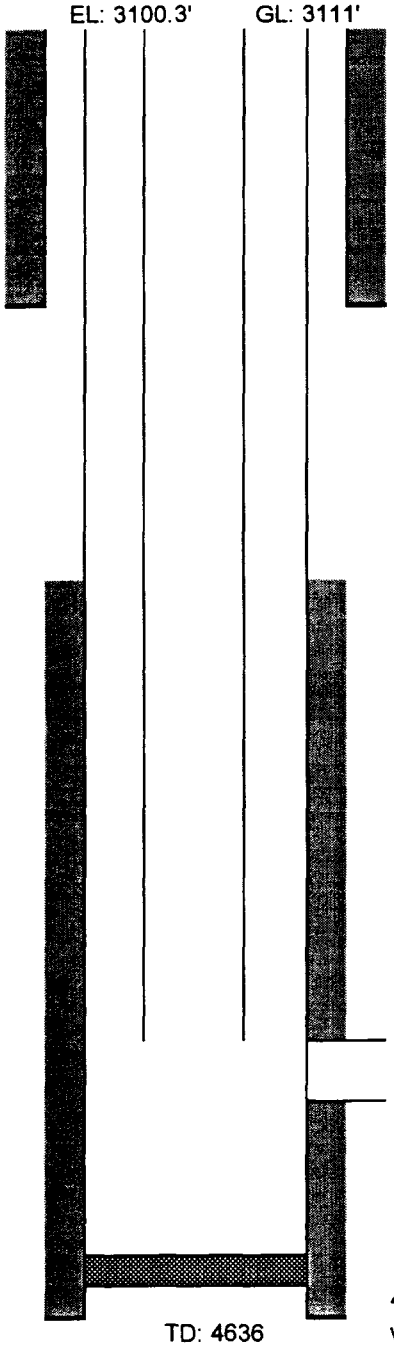
Quay Valley

North El Mar Unit #34

FORMERLY CONTINENTAL OIL WILDER #1

(API# 30-025-082730)

330' FSL & 330' FWL Spud Date: 4/16/59 Completion: 5/3/59
Section 25, Township 26 South, Range 32 East
Lea County, NM



QUAY VALLEY, INC.
JULY, 1996

Bobby Gray/Gray Pumping
915/943-4397

NEMU #34

Status	(POW) Formerly: Wilder #1
County & State	Lea County, New Mexico
Spud Date:	04/16/59
Completion	05/03/59
Total Depth	4,636'
Surface Casing	8 5/8" @ 707' 350 sx TOC: Surface Hole Size:
Production Casing	4 1/2" @ 4,636' 150 sx TOC: Hole Size:
Tubing Size	2 3/8" TBG @ 4536'
Perforations	4,580'-83', 4,589'-94', 4,604'-10', 4,617'-20'
Packer Size & Type	
Bridge Plug, If one	Knocked out CIBP (02/01/95) - pushed to 4,625'

Quay Valley, INC

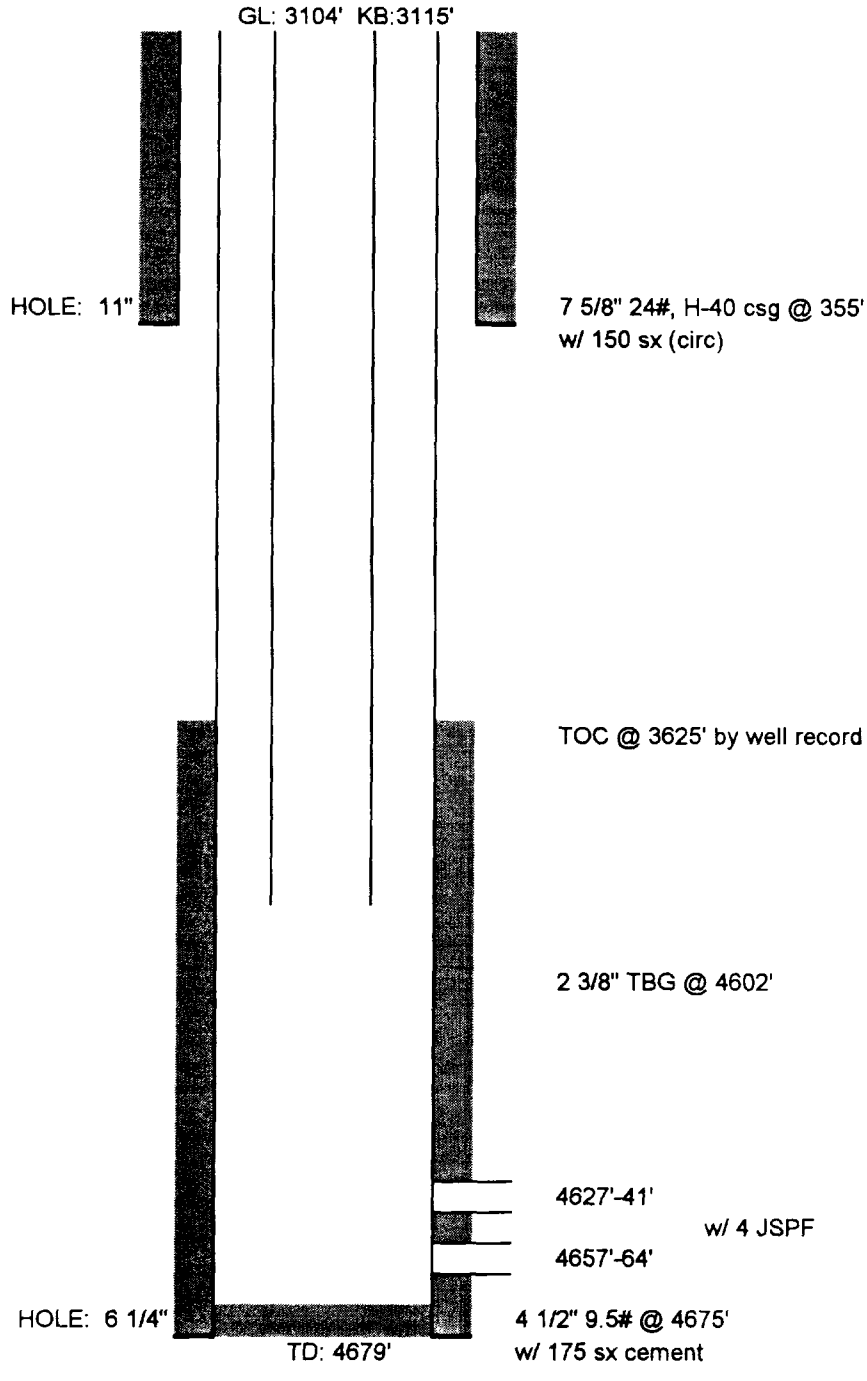
North El Mar Unit #36

FORMERLY CONTINENTAL OIL WILDER #11

(API# 30-025-082820)

Spud Date: 9/30/59 Completion: 10/11/59

660' FSL & 1980' FEL
Section 25, Township 26 South, Range 32 East
Lea County, NM



QUAY VALLEY, INC.
JULY, 1996

Bobby Gray/Gray Pumping
915/943-4397

NEMU #36

Status	(POW) Formerly: Wilder #11
County & State	Lea County, New Mexico
Spud Date:	09/30/59
Completion	10/11/59
Total Depth	4,679'
Surface Casing	7 5/8" @ 355' 150 sx TOC: Surface Hole Size: 11"
Production Casing	4 1/2" @ 4,675' 175 sx TOC: 3,625' Hole Size: 6 1/4"
Tubing Size	2 3/8" TBG @ 4602'
Perforations	4,627'-41', 4,657'-64'
Packer Size & Type	
Bridge Plug, If one	Arrow "PDQ" CIBP @ 4,575' 2/95 removed CIBP and returned to production.

Quay Valley, INC

North El Mar Unit #38

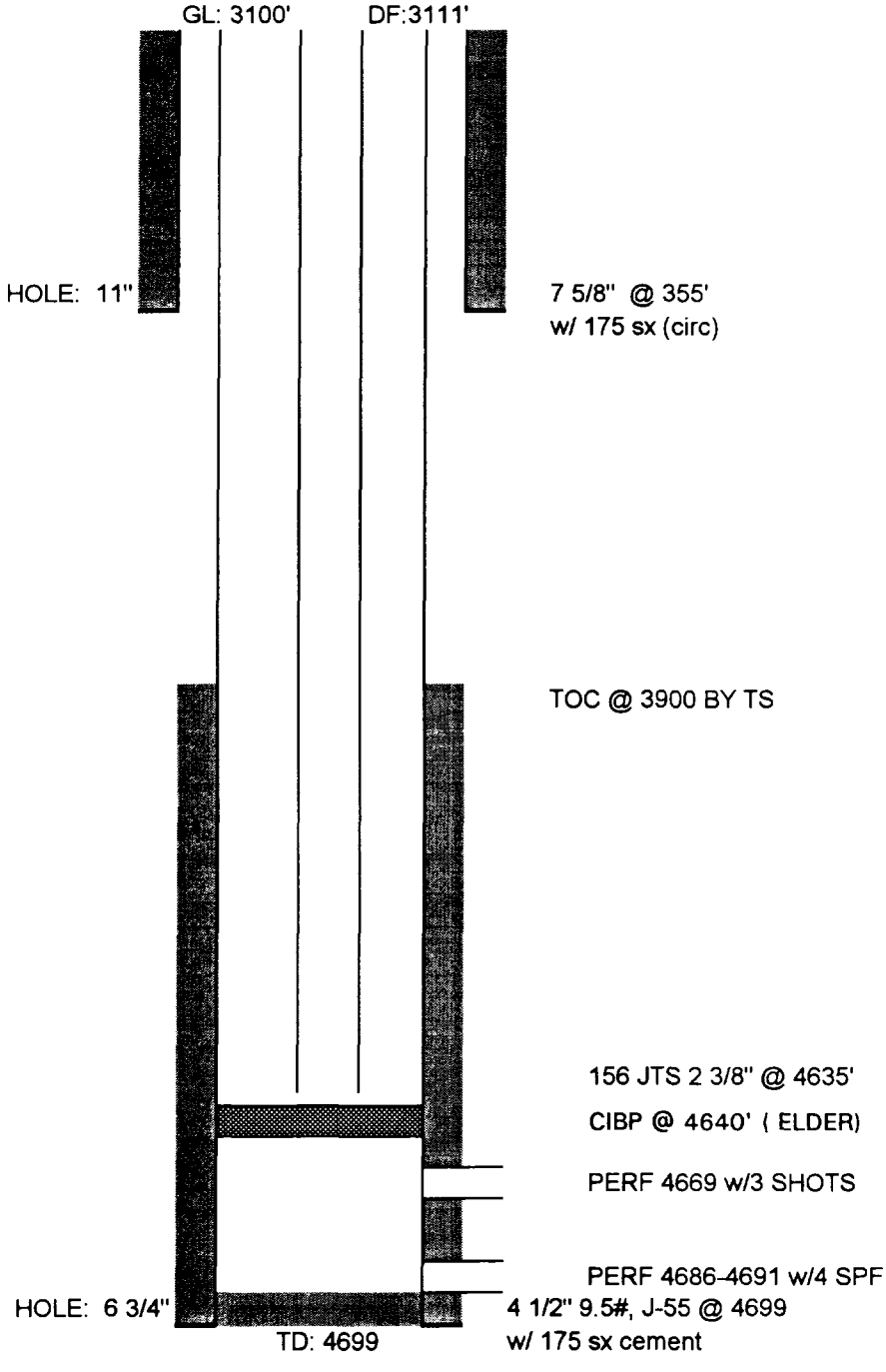
FORMERLY CONTINENTAL PAYNE #5

(API# 30-025-084330)

660' FSL & 660' FWL Spud Date: 1/20/60 Completion: 1/30/60

Section 30, Township 26 South, Range 33 East

Lea County, NM



QUAY VALLEY, INC.
JULY, 1996

Bobby Gray/Gray Pumping
915/943-4397

NEMU #38

Status	(TA) Formerly: Payne #5
County & State	Lea County, New Mexico
Spud Date:	01/20/60
Completion	01/30/60
Total Depth	4,699'
Surface Casing	7 5/8" @ 355" 175 sx TOC: Surface Hole Size: 11"
Production Casing	4 1/2" @ 4,699' 175 sx TOC: 3,900' Hole Size: 6 3/4"
Tubing Size	2 3/8" @ 4,635'
Perforations	4,669'W/ 3 SHOTS, 4686' - 4691' W/ 4 SPF
Packer Size & Type	
Bridge Plug, If one	Elder 4 1/2" CIBP @ 4,640'

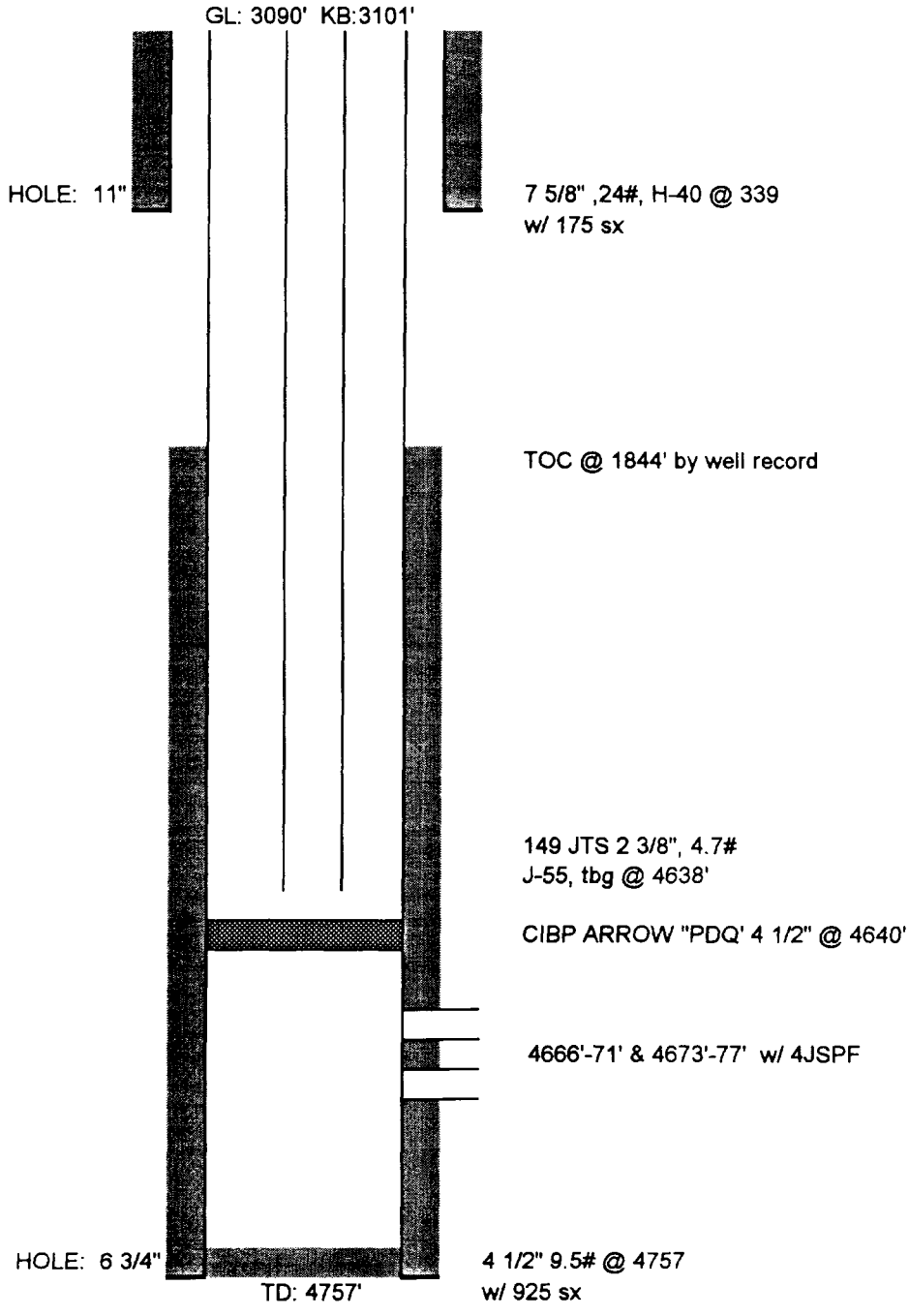
Quay Valley, INC

North El Mar Unit #40

FORMERLY CONTINENTAL OIL PAYNE #10

(API# 30-025-084390)

660' FNL & 1650' FWL Spud Date: 5/31/60 Completion: 6/13/60
Section 31, Township 26 South, Range 33 East
Lea County, NM



QUAY VALLEY, INC.
JULY, 1996

Bobby Gray/Gray Pumping
915/943-4397

NEMU #40

Status	(TA) Formerly: Payne #10
County & State	Lea County, New Mexico
Spud Date:	05/31/60
Completion	06/13/60
Total Depth	4,757'
Surface Casing	7 5/8" @ 339' 175 sx TOC: Surface (?) Hole Size: 11"
Production Casing	4 1/2" @ 4,757' 925 sx TOC: 1,844' Hole Size: 6 3/4"
Tubing Size	2 3/8" @ 4,638'
Perforations	4,666'-71', 4,673'-77'
Packer Size & Type	
Bridge Plug, If one	Arrow "PDQ" 4 1/2" CIBP @ 4,640'

Quay Valley, INC

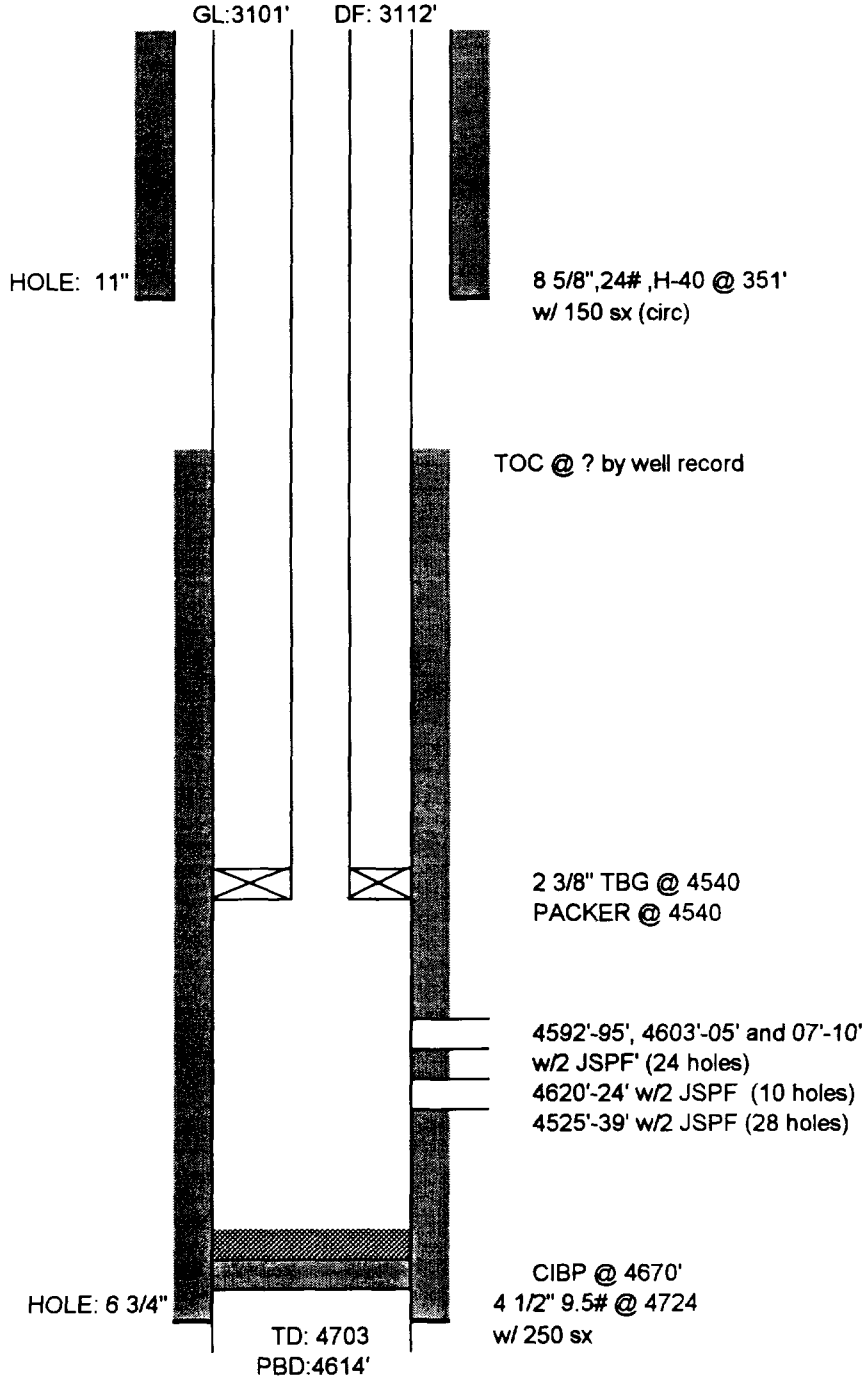
North El Mar Unit #43

FORMERLY KERN COUNTY LAND STATE 36 #2

(API# 30-025-083150)

543' FNL & 2108' FWL
Section 36, Township 26 South, Range 32 East
Lea County, NM

Spud Date: 6/02/59 Completion: 6/23/59



QUAY VALLEY, INC.
JULY, 1996

Bobby Gray/Gray Pumping
915/943-4397

NEMU #43

Status	(POW) Formerly: State 36 #2
County & State	Lea County, New Mexico
Spud Date:	06/02/59
Completion	06/23/59
Total Depth	4,724' PBTD @ 4,614'
Surface Casing	8 5/8" @ 351' 150 sx TOC: Surface Hole Size: 11"
Production Casing	4 1/2" @ 4,724' 250 sx TOC: ? Hole Size: 6 3/4"
Tubing Size	2 3/8" @ 4,540'
Perforations	4,592'-95', 4,603-05', 07'-10', 4,620'-24', 4625'-4639'
Packer Size & Type	@ 4,540'
Bridge Plug, If one	Drilled out CIBP @ 4,554'; pushed to 4,670' (01/95)

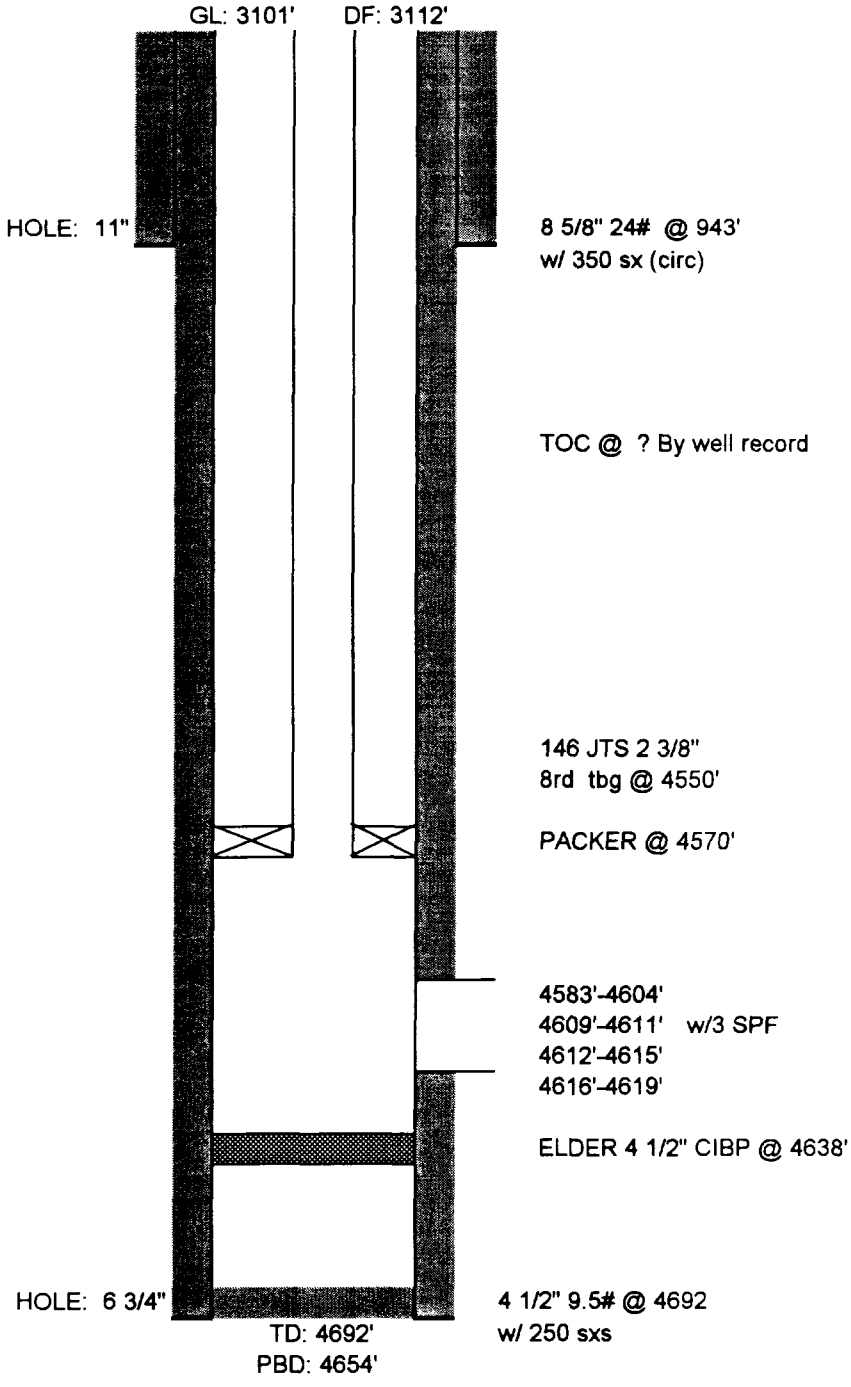
Quay Valley, INC

North El Mar Unit #44

FORMERLY KERN COUNTY LAND STATE 36 #1

(API# 30-025-083140)

330' FNL & 330' FWL Spud Date: 2/19/59 Completion: 3/1/59
Section 36, Township 26 South, Range 32 East
Lea County, NM



QUAY VALLEY, INC.
JULY, 1996

Bobby Gray/Gray Pumping
915/943-4397

NEMU #44

Status	(POW) Formerly: State 36 #1
County & State	Lea County, New Mexico
Spud Date:	02/19/59
Completion	03/01/59
Total Depth	4,692' PBTD @ 4,654'
Surface Casing	8 5/8" @ 943' 350 sx TOC: Surface Hole Size: 11"
Production Casing	4 1/2" @ 4,692' 250 sx TOC: Surface (?) Hole Size: 6 3/4"
Tubing Size	2 3/8" @ 4,550'
Perforations	4,583'-4,604', 4,609'-11', 4,612'-15', 4,616'-19'
Packer Size & Type	@ 4,570'
Bridge Plug, If one	Elder 4 1/2" @ 4,555'. Knocked out & pushed to 4,638'.

Quay Valley, INC

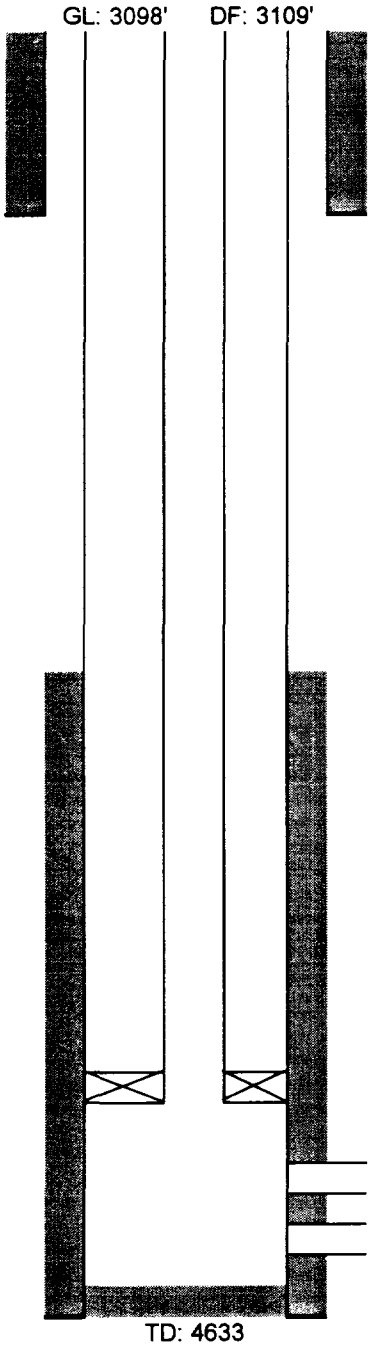
North El Mar Unit #45

FORMERLY CONTINTENTAL OIL BRADLEY 35 #1

(API# 30-025-083080)

660' FNL & 330' FEL
Section 35, Township 26 South, Range 32 East
Lea County, NM

Spud Date: 5/12/59 Completion: 5/23/59



QUAY VALLEY, INC.
JULY, 1996

Bobby Gray/Gray Pumping
915/943-4397

NEMU #45

Status	(TA) Formerly: Bradley 35 #1
County & State	Lea County, New Mexico
Spud Date:	05/12/59
Completion	05/23/59
Total Depth	4,633'
Surface Casing	8 5/8" @ 716' 350 sx TOC: Surface Hole Size: ?
Production Casing	4 1/2" @ 4,633' 175 sx TOC: 3,533' Hole Size: ?
Tubing Size	2 3/8" @ 4,549'
Perforations	4,587'-97', 4,605'-12', 4,617'-30'
Packer Size & Type	@ 4,540'
Bridge Plug, If one	Arrow "PDQ" @ 4,551' (Knock out - Run BHPT)

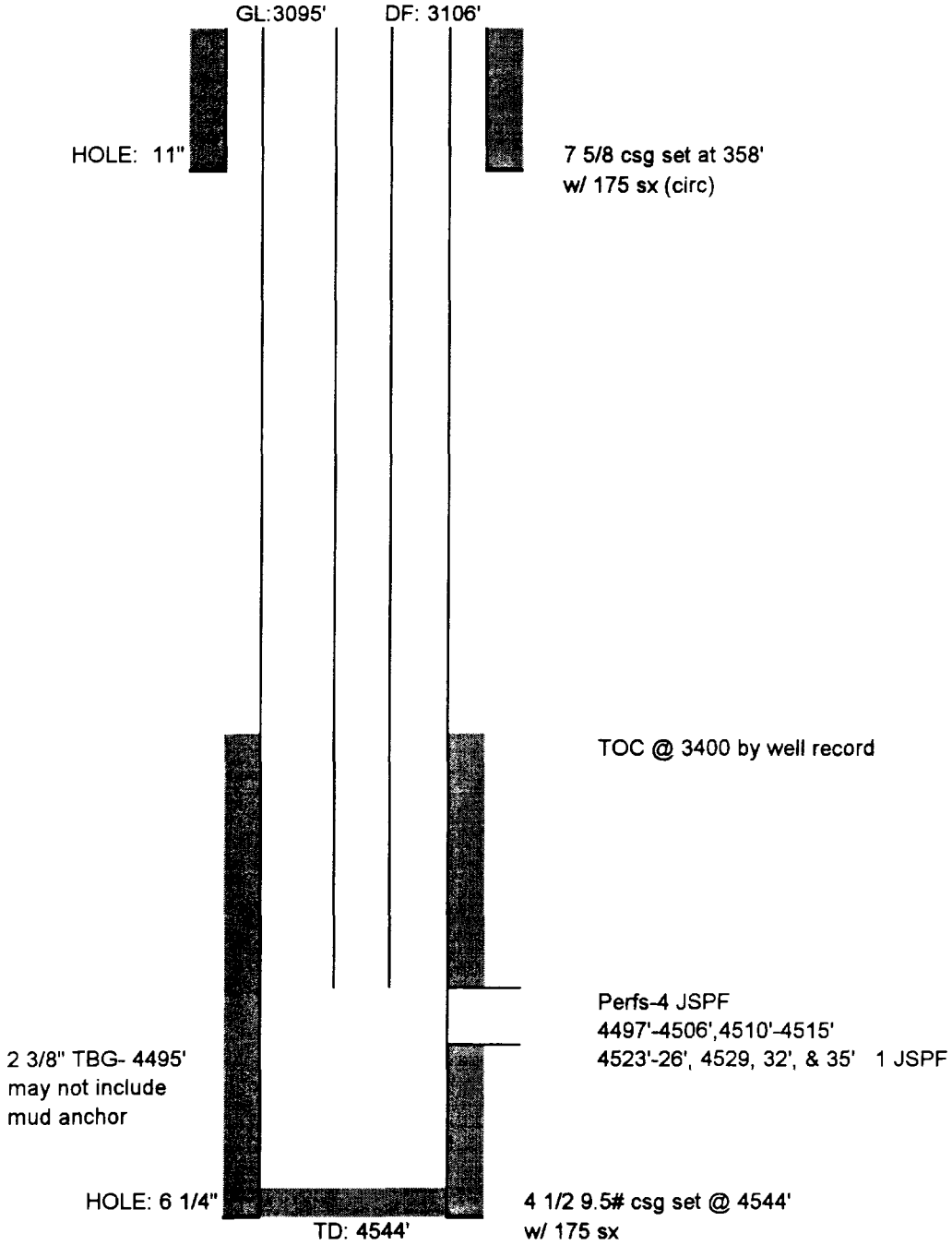
Quay Valley, INC

North El Mar Unit #47

FORMERLY CONTINENTAL OIL BRADLEY 35 #3

(API# 30-025-083100)

660' FNL & 1980' FWL Spud Date: 12/20/59 Completion: 12/29/59
Section 35, Township 26 South, Range 32 East
Lea County, NM



QUAY VALLEY, INC.
JULY, 1996

Bobby Gray/Gray Pumping
915/943-4397

NEMU #47

Status	(POW) Formerly: Bradley 35 #3
County & State	Lea County, New Mexico
Spud Date:	12/20/59
Completion	12/29/59
Total Depth	4,544'
Surface Casing	7 5/8" @ 358' 175 sx TOC: Surface Hole Size: 11"
Production Casing	4 1/2" @ 4,544' 175 sx TOC: 3,400' Hole Size: 6 1/4"
Tubing Size	2 3/8" @ 4,495'
Perforations	4,497'-4,506', 4,510'-4,515', 4,523'-26'-29', 32', 35'
Packer Size & Type	
Bridge Plug, If one	

Quay Valley, INC

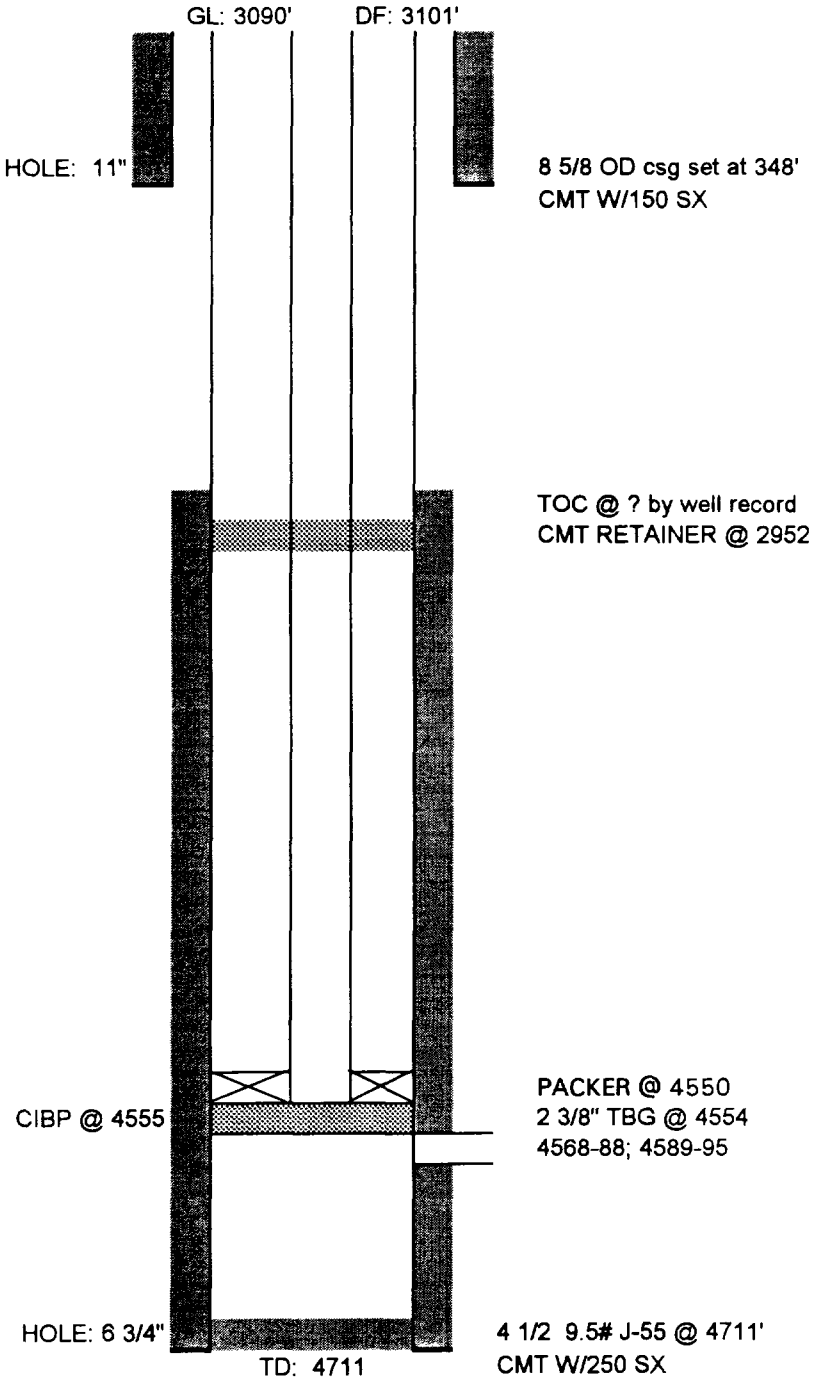
North El Mar Unit #53

FORMERLY KERN COUNTY LAND STATE 36 #4

(API# 30-025-083170)

542' FSL & 330' FNL
Section 36, Township 26 South, Range 32 East
Lea County, NM

Spud Date: 7/11/59 **Completion:** 7/19/59



QUAY VALLEY, INC.
JULY, 1996

Bobby Gray/Gray Pumping
915/943-4397

NEMU #53

Status	(TA) Formerly: State 36 #4
County & State	Lea County, New Mexico
Spud Date:	07/11/59
Completion	07/19/59
Total Depth	4,711'
Surface Casing	8 5/8" @ 348' 150 sx TOC: ? Hole Size: 11"
Production Casing	4 1/2" @ 4,711' 250 sx TOC: ? Hole Size: 6 3/4"
Tubing Size	2 3/8" @ 4,554'
Perforations	4,568'-88', 4,589'-95'
Packer Size & Type	@ 4,550'
Bridge Plug, If one	Elder 4 12/" CIBP @ 4,555' Elder 4 1/2" Cement Retainer @ 2,952'

Quay Valley, INC

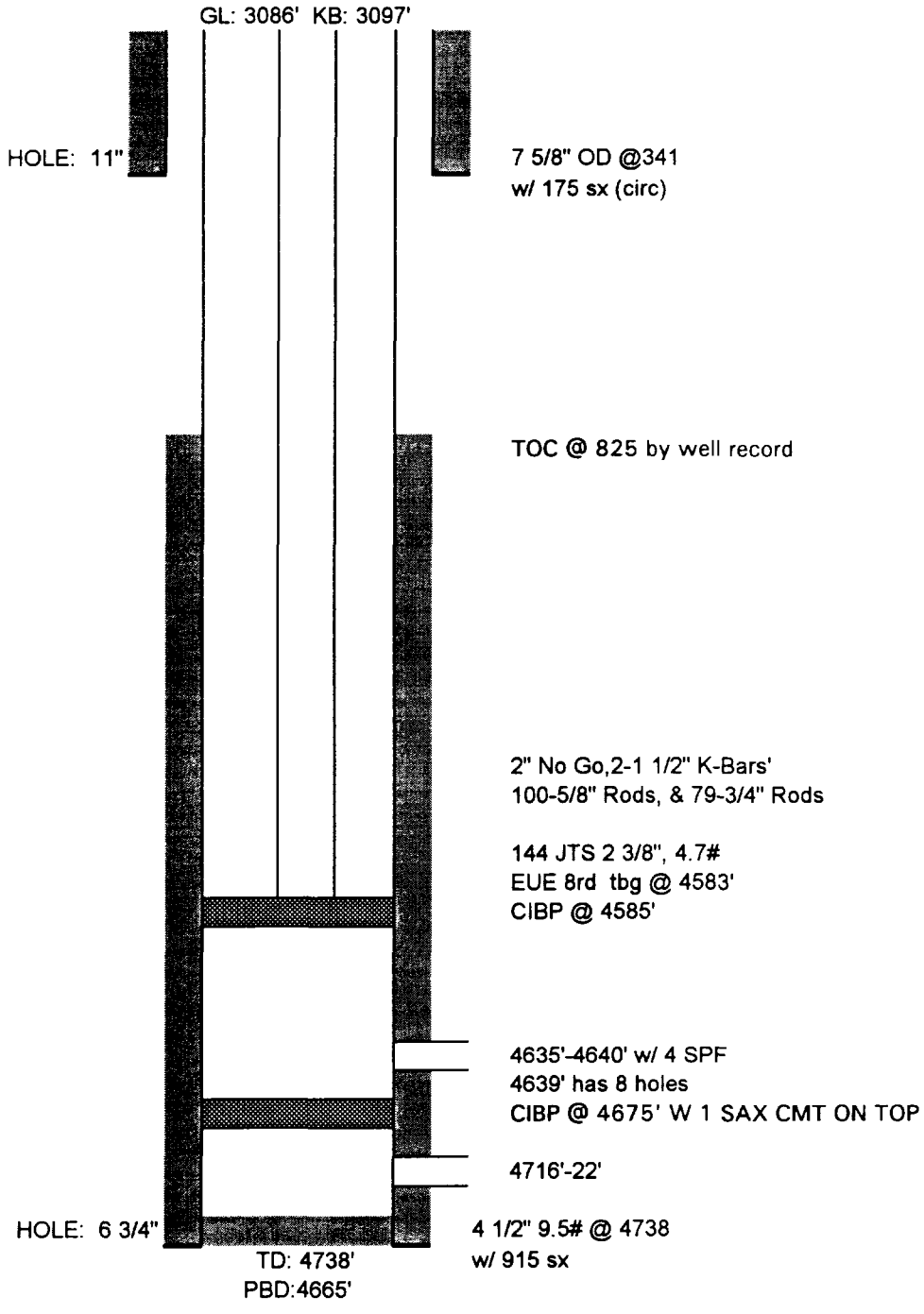
North El Mar Unit #56

FORMERLY CONTINENTAL OIL PAYNE #9

(API# 30-025-084380)

1935' FNL & 330' FWL
Section 31, Township 26 South, Range 33 East
Lea County, NM

Spud Date: 4/20/60 Completion: 4/29/60



QUAY VALLEY, INC.
JULY, 1996

Bobby Gray/Gray Pumping
915/943-4397

NEMU #56

Status	(TA) Formerly: Payne #9
County & State	Lea County, New Mexico
Spud Date:	04/20/60
Completion	04/29/60
Total Depth	4,738' PBTD @ 4,665'
Surface Casing	7 5/8" @ 341' 175 sx TOC: Surface Hole Size: 11"
Production Casing	4 1/2" @ 4,738' 915 sx TOC: 825' Hole Size: 6 3/4"
Tubing Size	2 3/8" @ 4,583'
Perforations	4,635'-40', 4,716'-22'
Packer Size & Type	
Bridge Plug, If one	Arrow "PDQ" CIBP @ 4,585' Also CIBP @ 4,675'

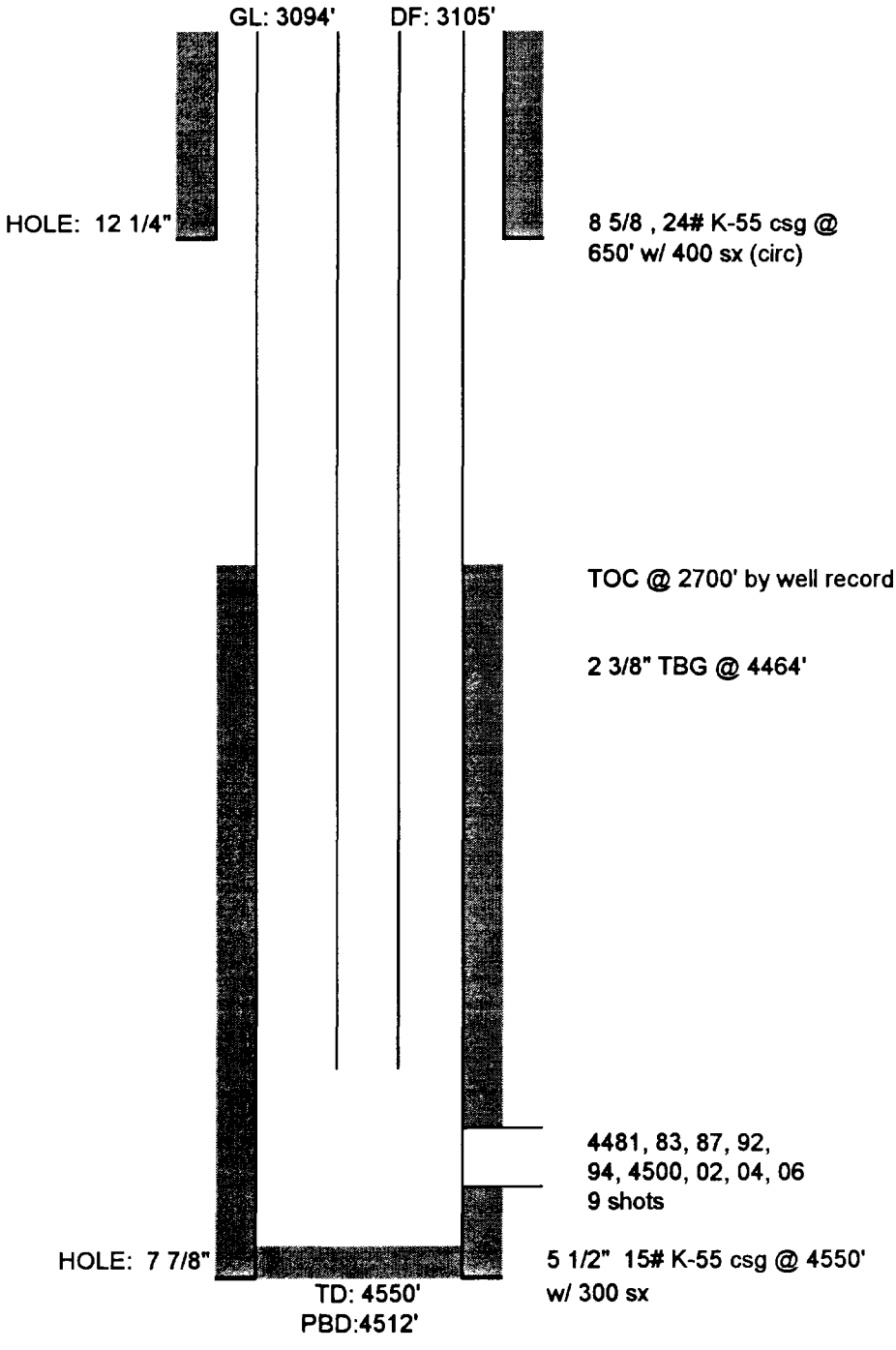
Quay Valley, INC

North El Mar Unit #59

(API# 30-025-253890)

600' FSL & 900' FWL
Section 35, Township 26 South, Range 32 East
Lea County, NM

Spud Date: 12/13/76 Completion: 1/22/77



QUAY VALLEY, INC.
JULY, 1996

Bobby Gray/Gray Pumping
915/943-4397

NEMU #59

Status	(POW)
County & State	Lea County, New Mexico
Spud Date:	12/13/76
Completion	01/22/77
Total Depth	4,550' PBTD @ 4,512'
Surface Casing	8 5/8" @ 650' 400 sx TOC: Surface Hole Size: 12 1/4"
Production Casing	5 1/2" @ 4,550' 300 sx TOC: 2,700' Hole Size: 7 7/8"
Tubing Size	2 3/8" @ 4,464'
Perforations	4,481'-4,506'
Packer Size & Type	
Bridge Plug, If one	

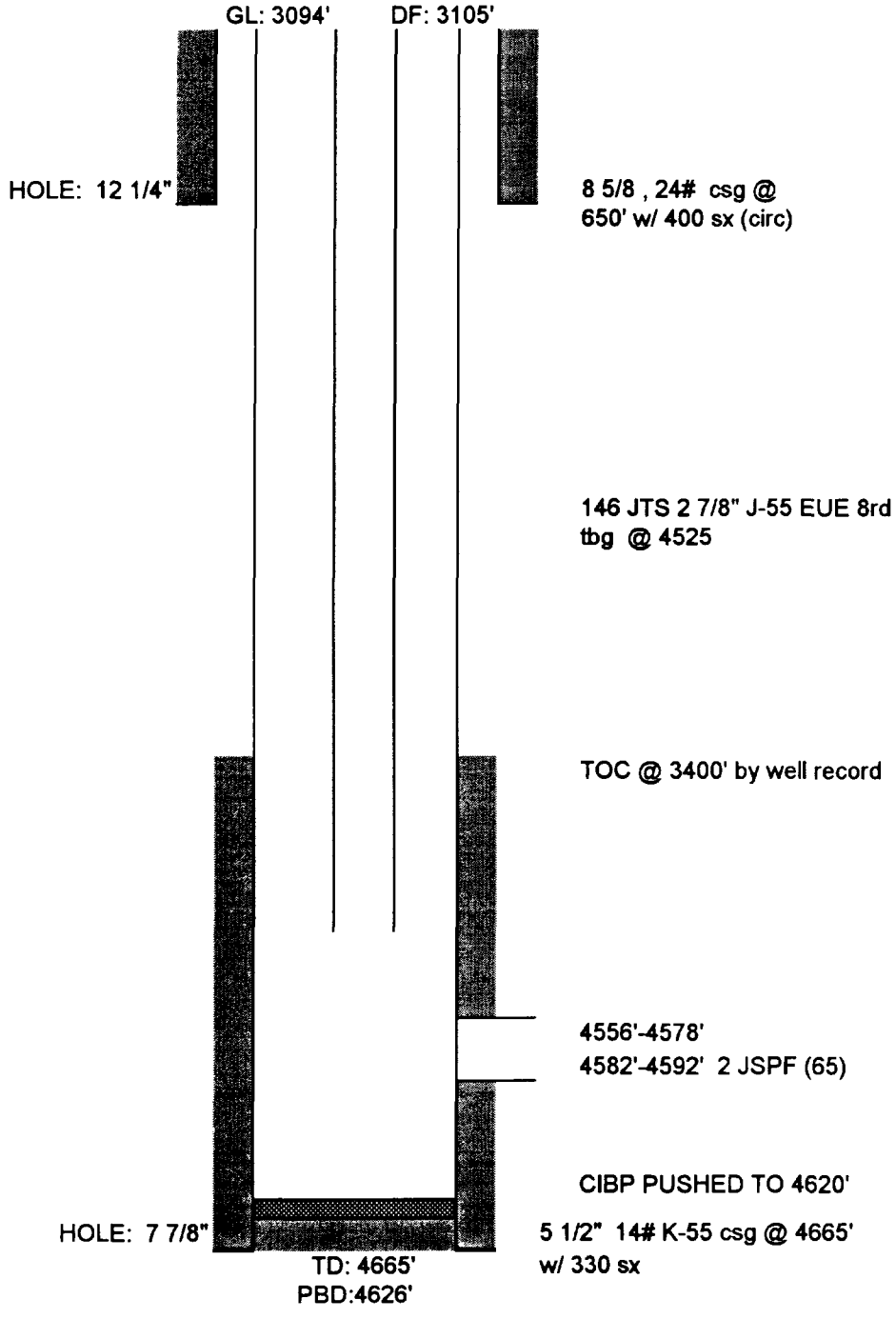
Quay Valley, INC

North El Mar Unit #60

(API# 30-025-253900)

500' FSL & 1650' FEL
Section 35, Township 26 South, Range 32 East
Lea County, NM

Spud Date: 12/23/76 Completion: 1/27/77



QUAY VALLEY, INC.
JULY, 1996

Bobby Gray/Gray Pumping
915/943-4397

NEMU #60

Status	(POW)
County & State	Lea County, New Mexico
Spud Date:	12/23/76
Completion	01/27/77
Total Depth	4,665' PBTD @ 4,626'
Surface Casing	8 5/8" @ 650' 400 sx TOC: Surface Hole Size: 12 1/4"
Production Casing	5 1/2" @ 4,665' 330 sx TOC: 3,400' Hole Size: 7 7/8"
Tubing Size	2 3/8" @ 4,525'
Perforations	4,556'-78', 4,582'-92'
Packer Size & Type	
Bridge Plug, If one	CIBP @ 4,620' (Drilled out 10/95)

Quay Valley, INC

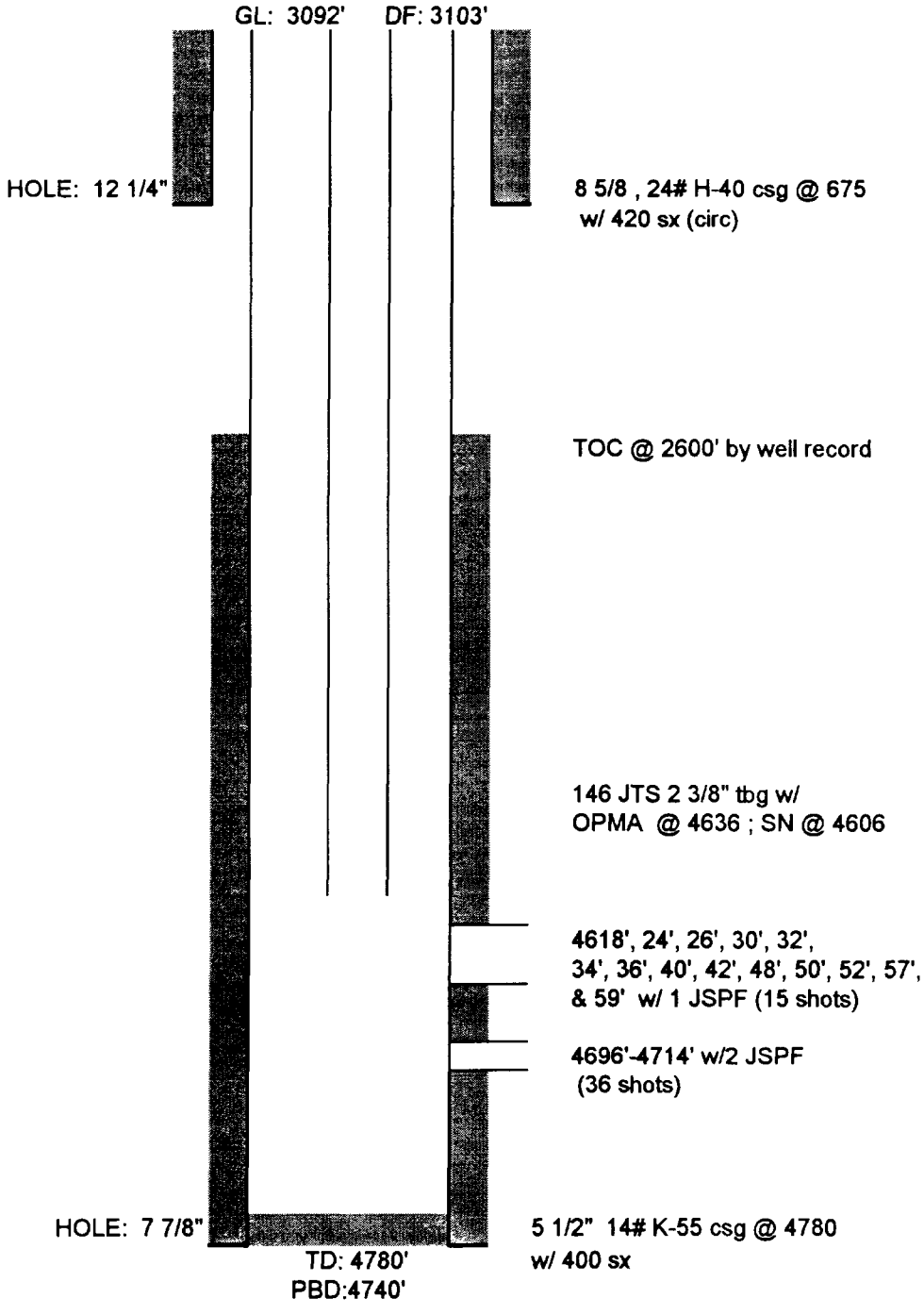
North El Mar Unit #61

(API# 30-025-253820)

660' FNL & 330' FEL Spud Date: 1/4/77 Completion: 2/14/77

Section 36, Township 26 South, Range 32 East

Lea County, NM



QUAY VALLEY, INC.
JULY, 1996

Bobby Gray/ray Pumping
915/943-4397

NEMU #61

Status	(POW)
County & State	Lea County, New Mexico
Spud Date:	01/04/77
Completion	02/14/77
Total Depth	4,780' PBTD @ 4,740'
Surface Casing	8 5/8" @ 675' 420 sx TOC: Surface Hole Size: 12 1/4"
Production Casing	5 1/2" @ 4,780' 400 sx TOC: 2,600' Hole Size: 7 7/8"
Tubing Size	2 3/8" @ 4,636'
Perforations	4,696'-4,714' (Old perfs) 4,618', 4,622'-42', 4,647'-59',
Packer Size & Type	
Bridge Plug, If one	

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION DIVISION FOR THE PURPOSE OF CONSIDERING:	)	CASE NO. 11,826
APPLICATION OF QUAY VALLEY, INC., FOR AMENDMENT OF DIVISION ORDER NO. R-4269 TO AUTHORIZE A TERTIARY RECOVERY PROJECT BY THE INJECTION OF CARBON DIOXIDE IN THE NORTH EL MAR-DELAWARE UNIT WATERFLOOD PROJECT AREA, AND TO QUALIFY THIS PROJECT FOR THE RECOVERED OIL TAX RATE PURSUANT TO THE ENHANCED OIL RECOVERY ACT, LEA COUNTY, NEW MEXICO	)	ORIGINAL

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: DAVID R. CATANACH, Hearing Examiner

September 4th, 1997

Santa Fe, New Mexico

This matter came on for hearing before the New Mexico Oil Conservation Division, DAVID R. CATANACH, Hearing Examiner, on Thursday, September 4th, 1997, at the New Mexico Energy, Minerals and Natural Resources Department, Porter Hall, 2040 South Pacheco, Santa Fe, New Mexico, Steven T. Brenner, Certified Court Reporter No. 7 for the State of New Mexico.

* * *

I N D E X

September 4th, 1997
Examiner Hearing
CASE NO. 11,826

* * *

A P P E A R A N C E S

FOR THE DIVISION:

RAND L. CARROLL
Attorney at Law
Legal Counsel to the Division
2040 South Pacheco
Santa Fe, New Mexico 87505

* * *

WHEREUPON, the following proceedings were had at 9:52 a.m.:

EXAMINER CATANACH: Call the hearing back to order and go back to page 1. We forgot to call Case 11,826.

MR. CARROLL: Application of Quay Valley, Inc., for amendment of Division Order Number R-4269 to authorize a tertiary recovery project by the injection of carbon dioxide in the North El Mar-Delaware unit Waterflood Project area, and to quality this project for the recovered oil tax rate pursuant to the Enhanced Oil Recovery Act, Lea County, New Mexico.

EXAMINER CATANACH: This case was heard originally on August 7th this year, and it's my recollection that we readvertised the case to provide for reauthorization of some injection wells that may have had their injection authority terminated. I believe that's all it was readvertised for.

I will call for appearances in this case at this time.

And there being no appearances, we will take Case 11,826 under advisement.

(Thereupon, these proceedings were concluded at 9:53 a.m.)

* * *

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 11826 heard by me on September 4 1997

David H. Catanach, Examiner
Oil Conservation Division

CERTIFICATE OF REPORTER

STATE OF NEW MEXICO)
) ss.
COUNTY OF SANTA FE)

I, Steven T. Brenner, Certified Court Reporter and Notary Public, HEREBY CERTIFY that the foregoing transcript of proceedings before the Oil Conservation Division was reported by me; that I transcribed my notes; and that the foregoing is a true and accurate record of the proceedings.

I FURTHER CERTIFY that I am not a relative or employee of any of the parties or attorneys involved in this matter and that I have no personal interest in the final disposition of this matter.

WITNESS MY HAND AND SEAL September 5th, 1997.

STEVEN T. BRENNER
CCR No. 7

My commission expires: October 14, 1998

STATE OF NEW MEXICO

ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION DIVISION FOR THE PURPOSE OF CONSIDERING:	)	CASE NO. 11,826
APPLICATION OF QUAY VALLEY, INC., FOR AMENDMENT OF DIVISION ORDER NO. R-4629 TO AUTHORIZE A TERTIARY RECOVERY PROJECT BY THE INJECTION OF CARBON DIOXIDE IN THE NORTH EL MAR-DELAWARE UNIT WATERFLOOD PROJECT AREA, AND TO QUALIFY THIS PROJECT FOR THE RECOVERED OIL TAX RATE PURSUANT TO THE ENHANCED OIL RECOVERY ACT, LEA COUNTY, NEW MEXICO	)	

REPORTER'S TRANSCRIPT OF PROCEEDINGS

EXAMINER HEARING

BEFORE: DAVID R. CATANACH, Hearing Examiner

August 7th, 1997

Santa Fe, New Mexico

This matter came on for hearing before the New Mexico Oil Conservation Division, DAVID R. CATANACH, Hearing Examiner, on Thursday, August 7th, 1997, at the New Mexico Energy, Minerals and Natural Resources Department, Porter Hall, 2040 South Pacheco, Santa Fe, New Mexico, Steven T. Brenner, Certified Court Reporter No. 7 for the State of New Mexico.

* * *

I N D E X

August 7th, 1997
Examiner Hearing
CASE NO. 11,826

* * *

E X H I B I T S

Applicant's	Identified	Admitted
Exhibit 1A	8	12
Exhibit 1B	9	12
Exhibit 2	10	12
Exhibit 3	10	12
Exhibit 4	19	27
Exhibit 5	22	27
Exhibit 6	23	27
Exhibit 7	23	27
Exhibit 8	25	27
Exhibit 9	36	47
Exhibit 10	37	47
Exhibit 11	41	47
Exhibit 12	44	47

* * *

A P P E A R A N C E S

FOR THE DIVISION:

RAND L. CARROLL
Attorney at Law
Legal Counsel to the Division
2040 South Pacheco
Santa Fe, New Mexico 87505

FOR THE APPLICANT:

CAMPBELL, CARR, BERGE and SHERIDAN, P.A.
Suite 1 - 110 N. Guadalupe
P.O. Box 2208
Santa Fe, New Mexico 87504-2208
By: WILLIAM F. CARR

FOR BURLINGTON RESOURCES OIL AND GAS COMPANY:

KELLAHIN & KELLAHIN
117 N. Guadalupe
P.O. Box 2265
Santa Fe, New Mexico 87504-2265
By: W. THOMAS KELLAHIN

* * *

WHEREUPON, the following proceedings were had at 10:16 a.m.:

EXAMINER CATANACH: At this time we'll call Case 11,826.

MR. CARROLL: Application of Quay Valley, Inc., for amendment of Division Order Number R-4629 to authorize a tertiary recovery project by the injection of carbon dioxide in its north El Mar-Delaware Unit Waterflood Project area, and to qualify this project for the recovered oil tax rate pursuant to the Enhanced Oil Recovery Act, Lea County, New Mexico.

EXAMINER CATANACH: Call for appearances in this case.

MR. CARR: May it please the Examiner, my name is William F. Carr with the Santa Fe law firm Campbell, Carr, Berge and Sheridan. We represent Quay Valley, Inc., in this matter, and I have three witnesses.

EXAMINER CATANACH: Additional appearances?

MR. KELLAHIN: Mr. Examiner, I'm Tom Kellahin of the Santa Fe law firm of Kellahin and Kellahin, appearing on behalf of Burlington Resources Oil and Gas Company. I do not have any witnesses to be sworn.

EXAMINER CATANACH: Will the witnesses please stand to be sworn in?

(Thereupon, the witnesses were sworn.)

MR. CARR: Mr. Examiner, at this time we'd call Stella M. Swanson.

STELLA M. SWANSON,

the witness herein, after having been first duly sworn upon her oath, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. CARR:

Q. Would you state your name for the record, please?

A. Stella M. Swanson.

Q. Where do you reside?

A. Midland, Texas.

Q. By whom are you employed?

A. Quay Valley, Inc.

Q. And what position do you hold with Quay Valley?

A. Landman.

Q. Does the geographic area of your responsibility at Quay Valley include the portion of southeastern New Mexico which is the subject of this case?

A. Yes, it does.

Q. Have you previously testified before the New Mexico Oil Conservation Division?

A. No, I have not.

Q. Could you summarize your educational background and your work experience for Mr. Catanach?

A. I'm a certified professional landman. I received

my certification in July, 1992, received recertification earlier this year. I have 18 years of land experience. I've worked on this project since June of 1994.

Q. Are you familiar with the Application filed in this case on behalf of Quay Valley?

A. Yes, I am.

Q. Are you familiar with the status of the lands i the area of the north El Mar Unit?

A. Yes.

Q. And have you prepared exhibits for presentation at this hearing?

A. Yes, I have.

MR. CARR: Mr. Catanach, we tender Stella M. Swanson as an expert witness in petroleum land matters.

EXAMINER CATANACH: Ms. Swanson is so qualified.

Q. (By Mr. Carr) Could you briefly summarize what Quay Valley seeks with this Application?

A. Quay seeks an amendment of Division Order Number R-4629, dated September 13th, 1973, which approved the north El Mar Unit agreement and a water injection project for the El Mar-Delaware Pool, and to authorize the implementation of tertiary recovery operations in this project area by including the injection of carbon dioxide and produced gases with water into the Delaware formation, and to provide for the differences in density of the CO_2

and water by permitting CO_2 injection to be conducted at a maximum of 1160 pounds and surface water injection pressure not to exceed 530 pounds.

Q. Do you also seek to qualify this project for the recovered oil tax rate, pursuant to the New Mexico Enhanced Oil Recovery Act?

A. Yes, we do.

Q. When was the North El Mar Unit formed?

A. The North El Mar Unit was formed in 1973 by Order Number R-4629, dated September 13th, 1973. It's currently operated by Quay Valley, Inc., successor to Continental Oil Company. CO_2 may be conducted under this agreement. We currently have 95.3267 percent of the working interests committed to the unit plan.

Q. When did waterflood operations commence in the unit area?

A. Waterflood operations commenced in 1973 pursuant to Division Order Number R-4629. Actual water injection into the formation started January, 1975.

Q. Let's go to the exhibit book. Mr. Catanach, the book contains tabs. At the beginning we have a table of contents and then a copy of our Application, and we'll start by going to what has been marked for identification as Exhibit 1A.

Ms. Swanson, would you refer to this exhibit,

identify it, and explain what it shows?

A. This is a general land map, obtained from Midland Map Company in Midland Texas. It's their most current updated map. The North El Mar Unit is outlined in yellow. This map also shows offsetting tracts and units. The southernmost boundary of the North El Mar Unit is the New Mexico-Texas state line, which is offset by the Burlington El Mar-Delaware Unit.

Q. At this time are you in negotiations with Burlington for a lease line agreement between your unit and the unit they operate to the south in Texas?

A. Yes, sir, we are.

Q. And has Burlington cooperated with you in your efforts not only to collect data for the subject Application, but is working with you, and you're not having trouble as you go forward at this time with --

A. No, sir. No, sir, not at all.

Q. Let's go to Exhibit 1B. Would you just identify that, please?

A. 1B shows all the wells in the North El Mar Unit. The status as of June, 1997, of all the wells in the unit, which consist of 19 producing wells, two water injection wells, 29 shut-in water injection wells, and 12 shut-in production wells.

This map also shows the planned status of the

wells during the CO_2 EOR project operations.

Q. If we go to Exhibit Number 2 in the exhibit book, this is another map of the project area which will be reviewed by a later witness; is that correct?

A. Yes, sir, that's correct.

Q. What is the character of the lands in the North El Mar Unit?

A. There are 2101.4 acres of federal land and 259.76 acres of state land.

Q. Have you reviewed your plans to implement this CO_2 injection project with representatives of the Bureau of Land Management?

A. Yes, sir, I spoke with Tony Ferguson, and he indicated that there was no objections to this Application.

Q. And this Application and the C-108 has been provided to the BLM, has it not?

A. Yes, sir.

Q. Have your plans to implement this project been reviewed by representatives of the New Mexico Commissioner of Public Lands?

A. I spoke with Pete Martinez of the Roswell office.

Q. Of the Santa Fe --

A. I'm sorry, of the Santa Fe office. And he said that he had no problems with our Applications.

Q. Is Exhibit Number 3 in this exhibit book a copy

of an affidavit confirming that notice of this hearing has been provided to all affected parties as required by the rules of the Oil Conservation Division?

A. Yes, sir, it is.

Q. And to whom was notice of this Application provided?

A. To all offsetting leasehold operators within a half mile of any proposed injection well in the El Mar-Delaware Pool, and the owners of surface of the land.

Q. The surface owners are the BLM and the State?

A. Yes, sir.

Q. At the request of the Oil Conservation Division, was a courtesy copy of the C-108 provided to the Texas Railroad Commission?

A. Yes, sir, it was.

Q. What is the current status of Quay Valley's efforts to implement this project?

A. The reservoir studies are completed, facility designs are being completed and should be completed by September of 1997, corporate approvals have been obtained, ballots have been presented to partners, and related contracts are being negotiated.

Q. How soon does Quay Valley hope to commence operations in this CO_2 flood?

A. We anticipate initial CO_2 injection February,

1998.

Q. Ms. Swanson, will Quay Valley call technical witnesses to review the geological and engineering portions of this case?

A. Yes, sir.

Q. Were Quay Valley Exhibits 1 through 3 either prepared by you or compiled at your direction?

A. Yes, sir.

MR. CARR: Mr. Catanach, at this time we would move the admission into evidence of Quay Valley Exhibits 1 through 3.

EXAMINER CATANACH: Exhibits 1 through 3 will be admitted as evidence.

MR. CARR: That concludes my direct examination of Ms. Swanson.

EXAMINATION

BY EXAMINER CATANACH:

Q. Ms. Swanson, what's the total acreage in this unit?

A. 2361.16.

Q. And it's state and federal lands?

A. Yes, sir.

Q. No fee lands?

A. No, sir.

Q. And this unit was originally put together by

Conoco?

A. Yes, sir, Continental Oil Company.

Q. And you're a successor to Conoco?

A. Yes, sir.

Q. You testified that 95 percent of the working interest owners were committed to the unit?

A. Yes, sir.

Q. What's the status of the other --

A. We've been talking to Burlington, which has less than a half a percent, which we just received a few weeks -- a couple weeks ago, that they had acquired that interest. And I don't foresee any problem with them. We just need to get the appropriate information to them.

Q. Was this unit originally statutorily unitized, forced unitization, or was it a voluntary unit?

A. I believe it was a voluntary unit.

Q. I guess I don't understand how come only 95 percent is committed at this point. I don't understand what --

A. When we originally sent out AFEs, over a year ago, they were -- we had probably about 98 percent approved. We just never -- No one would ever send an AFE back in on a smaller interest. We have several interests in there that own maybe less than a quarter percent.

MR. CARR: Mr. Examiner, if I could clarify,

perhaps. We have a hundred percent of the interest in the unit area, but we have had a positive response to the AFE for the CO_2 project from in excess of 95 percent.

EXAMINER CATANACH: I see, okay.

Q. (By Examiner Catanach) Give me the numbers again on the wells' status. Nineteen producing wells?

A. Yes, sir, 19 producing wells, two water injection wells --

Q. And --

A. -- 29 shut-in water injection wells, and 12 shut-in production wells.

Q. How long has Quay Valley operated this unit?

A. Since June of last year, of 1996.

Q. The shut-in water injection wells, do you know how long those wells have been shut in, Ms. Swanson?

A. No, sir, I don't have specific dates, but several years.

EXAMINER CATANACH: I have nothing further of this witness.

MR. KELLAHIN: Mr. Examiner --

EXAMINER CATANACH: Hold on a second, I'm sorry.

Mr. Kellahin?

EXAMINATION

BY MR. KELLAHIN:

Q. Ms. Swanson, I was looking at some of the

displays, Exhibits 2 and 3 that you sponsored.

Are you the right person to ask about the operational sequence of these various wells, or do you have an engineering witness that can describe the historic chronology of operations?

A. We have an engineering witness to testify to that.

Q. When I look at Exhibit Tab 1B, there is a plat of the unit that has well symbols on it.

A. Yes, sir.

Q. Are you able to describe the status of these wells, or did you prepare -- Did you prepare this display?

A. I assisted in preparing it.

Q. Am I correct in understanding that waterflood operations are not currently taking place in the unit?

A. We are injecting water in Well 50 and 29.

Q. Those are the only two injection wells being utilized?

A. Yes, sir.

Q. And that's why they are shaded black?

A. Yes, sir.

Q. Any of the injection wells that are not shaded in that fashion with the shut-in symbol through them are former water-injection wells that are currently shut in?

A. Yes, sir, that's correct.

Q. If it is to be a new injection well, how do I read and find the code for that type of well, for a new injection?

A. I don't believe that there are any new injection wells.

Q. Okay, so you're not going to drill any new injection wells?

A. No, sir.

Q. You're going to utilize old shut-in water injection wells which would be converted to CO_2 and water injection?

A. That's correct.

Q. I've got you.

Do you currently have a leaseline injection agreement with Burlington on the southern boundary for those old shut-in injection wells?

A. There is an agreement in place from -- between Texaco and Conoco, and I have spoke with Burlington a couple of weeks ago about amending that.

Q. Okay. Is it your position that you need new leaseline injection agreements with Burlington in order to utilize these wells for the purpose of this project?

A. Yes, sir.

Q. When I go to Exhibit Number 2, there's a color code on that display. It describes four phases.

Can you generally describe for me what you mean by these various phases? Is there a timing sequence to these?

MR. CARR: That is actually going to be reviewed by the engineering witness.

Q. (By Mr. Kellahin) Okay, all right. But this is a phase operation of some type?

A. Yes, sir.

MR. KELLAHIN: Okay. Thank you, Mr. Examiner.

EXAMINATION

BY MR. CARROLL:

Q. Ms. Swanson, is Quay Valley actually the name of an actual valley?

And if so, where is that valley located?

A. In Quay County, New Mexico.

It's actually where the president of Quay Valley was raised.

Q. So there's a Quay River? Or is it just called Quay Valley?

MR. KELLAHIN: There are no rivers in New Mexico.

MR. CARROLL: Not in Quay County.

MR. CARR: Only when it rains.

EXAMINER CATANACH: This witness may be excused.

MR. CARR: Mr. Catanach, at this time we would call William G. Watson.

WILLIAM G. WATSON,

the witness herein, after having been first duly sworn upon his oath, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. CARR:

Q. Will you state your name for the record, please?

A. Yes, it's William G. Watson.

Q. Where do you reside?

A. I reside in Midland, Texas.

Q. By whom are you employed?

A. I am self-employed.

Q. What is your current position with or relationship to Quay Valley?

A. I'm a consulting geologist.

Q. Mr. Watson, have you previously testified before the New Mexico Oil Conservation Division?

A. No, I have not.

Q. Could you summarize your educational background for Mr. Catanach?

A. Yes, I have a bachelor of arts degree in geology from Texas Tech University and a master of science degree in geology from the University of Texas at Arlington.

Q. Could you review your work experience since graduation?

A. Yes, I worked five and a half years for Union Oil

Company of California, two of those years in their New Mexico district, and I've worked seventeen and a half years as a consulting geologist working southeast New Mexico and west Texas.

Q. Are you familiar with the Application filed in this case on behalf of Quay Valley?

A. Yes, I am.

Q. Are you familiar with the North El Mar Unit and Quay Valley's plans to implement a CO_2 flood therein?

A. Yes, I am.

Q. Have you made a geological study of the unit and the surrounding area?

A. Yes, I have.

Q. Are you prepared to share the results of that study with Mr. Catanach?

A. Yes, I am.

MR. CARR: Mr. Catanach, we tender William G. Watson as an expert witness in petroleum geology.

EXAMINER CATANACH: Mr. Watson is so qualified.

Q. (By Mr. Carr) Mr. Watson, if you would turn to what has been marked as Quay Valley Exhibit Number 4, would you identify that and review it for Mr. Catanach?

A. Yes, Exhibit 4 is the type log which was originally used to define the unitized interval in the unit agreement. It is a portion of the expanded scale gamma-ray

sonic well log of the Quay Valley Number 39 North El Mar Unit well. It was originally drilled as the Continental Oil Company Number 11 Payne Federal well, located in Section 30, Township 26 South, Range 33 East.

Looking at the type log, the gamma-ray curve is on the left side and the sonic curve is on the right side. The top, heavy horizontal line is at a depth of 4672 feet, which is the top of the unitized Delaware sand. As noted on the right-hand side of that line, this is also the horizon on which the structure map was made.

The bottom horizontal line is at a depth of 4782 feet, which is the base of the unitized sand.

On page 5 of the unit agreement, the unitized formation is defined as the Delaware sand formation found between the depths of 4672 feet and 4782 feet in the Continental Oil Company Payne Number 11 well, located 1650 feet from the west line and 660 feet from the south line, Section 30, Township 26 South, Range 33 East, on the gamma ray sonic log of said well, run on July 21st, 1960. That's what's shown here on Exhibit 4.

Q. So what you've shown is the type log for the unit?

A. That is correct.

Q. Is this the same injection interval in which CO_2 is being injected in the offsetting Burlington unit to the

south?

A. Yes, it is.

Q. Could you describe the general characteristics of the unitized Delaware formation?

A. The unitized Delaware sand interval is generally made up of three members.

The top member, known as the Ramsey member, is a clean, well-sorted calcareous quartz sand.

The middle member, known as the Ford member, is black and very calcareous. It varies from a shaly hard sand to a silty shale. It's most widely known as a black shale.

The lower member, known as the Olds member, is a well-sorted calcareous quartz sand with limy and shaly intervals sometimes present.

Q. In what portion of this formation are you proposing to inject CO_2?

A. We propose to inject CO_2 into the entire unitized zone.

Q. So you're seeking authority to inject into all three members?

A. That's correct.

Q. Okay. Let's go to what has been marked as Quay Valley Exhibit Number 5. Would you identify and review this, please?

A. Okay. Exhibit 5 is a structure map. The area shown is the North El Mar Unit, operated by Quay Valley in Lea County, New Mexico, and the top two miles of the El Mar Unit, operated by Burlington Resources, in Loving County, Texas.

The scale on this map is one inch equals 2000 feet, and the contour interval is 25 feet.

The map was constructed on the top of the unitized Delaware sand, as noted on Exhibit 4, the type log.

The structure shows dip to the east, with a perpendicular strike being north-south. In the North El Mar Unit, the steepest dip is on the west side of the field at approximately 150 feet per mile, dipping to the east. In the center of the field is the flattest area, with less than 75 feet per mile dip to the east. And on the east side of the field the dip is approximately 100 feet per mile to the east.

The Quay Valley Number 18 well, located in Section 30, position F, in Township 26 South, Range 33 East, is the structurally lowest well in the unitized Delaware sand. The well's initial potential was pumping 16 barrels of oil and 108 barrels of water per day for an 87-percent water cut.

Q. Let's now go to Quay Valley Exhibit Number 6,

your isopach, and I would ask you to review that.

A. All right. Exhibit 6 is an isopach of the same area as was shown on the structure map. Again, the scale of this map is one inch equals 2000 feet. Here the contour interval is ten feet.

The map shows the amount of the net sand in the unitized Delaware sand interval. On the type log, that was the interval between the two heavy horizontal lines.

The isopach map shows that the sand trends northeast-southwest and that the thickest portion of the sand is in the middle of the field. To the northeast, the sand thickens and opens to the main channel. To the west and the northwest, the sand is not present, which sets up the updip boundary and trapping mechanism for the field. To the northeast the main channel becomes wet, as indicated by high water cuts, as seen in the Quay Valley Number 18 well.

Q. Mr. Watson, if we'd now go to the cross-sections, start with Quay Valley Exhibit Number 7, your B-B' cross-section. If you could take that out now and then review it for Mr. Catanach.

A. All right. Exhibit 7 is a north-south stratigraphic cross-section. It's noted as cross-section B-B'. It is a north-south-trending cross-section, as shown on the index map. North is on the left side of the cross-

section.

The cross-section begins on the north in Section 24, going south through Section 25, into Section 36, and then it crosses into Texas and picks up two wells operated by Burlington Resources.

The vertical scale is one inch equals 40 feet, and there is no horizontal scale.

This is a stratigraphic cross-section, and it's hung on the top of the unitized Delaware sand. This is the top, heavy line shown.

A thinner line has been added at the top of the Ford member. This is to help show correlative intervals within the unitized sand, because many of the wells in the North El Mar Unit were not drilled deep enough to see the bottom of the unitized interval.

The first well on the left has a thin but unitized Delaware sand interval.

Going south through the North El Mar Unit, the sand interval thickens. In Texas the interval in the last two wells remains thick. In these two wells, they were drilled deep enough to see the lower boundary of the unitized Delaware sand interval.

The cross-section shows that the unitized Delaware sand interval is well defined, and that where the sand is productive the porosity is fairly uniform.

Q. All right, let's now go to the east-west cross-section, A-A', and I'd ask you to review that.

A. All right. Exhibit 8 is the east-west stratigraphic cross-section noted as A-A'. It is an east-west-trending cross-section, as shown on the index map. The west is to the left side of the cross-section.

The cross-section begins on the west in Section 26, moving east through Section 25, and ends in Section 30. All of the east-west cross-section is in the El Mar Unit, in the North El Mar Unit.

The vertical scale is one inch equals 40 feet, and there is no horizontal scale.

This is a stratigraphic cross-section. It's hung on the top of the unitized Delaware sand, as shown by the top, heavy line. Again, a thinner line has been added on the top of the Ford member. This line is to help show the correlative intervals within the unitized sand.

On the west side the unitized Delaware sand interval is the thinnest, and the entire interval is seen on the well log.

Going across the field from west to east the sand interval thickens, and most of the wells were not drilled deep enough to see the bottom of the unitized sand interval.

This cross-section shows that the unitized

Delaware sand interval is well defined and that where the sand is productive the porosity is fairly uniform.

Q. Basically what you've shown is that you have a good reservoir section here for a CO_2 flood; isn't that right?

A. Yes.

Q. What geological conclusions have you reached from your study of the reservoir?

A. Based on my geologic study of the North El Mar Unit, the unitized Delaware sand interval is a good geologic section for a CO_2 flood. The unitized interval is correlative across the field and has uniformity of pay.

Q. When we get to the C-108 in this case, we're going to be looking at potential contamination of drinking water.

Have you examined geological data about wells in the area and the potential for harm to drinking water?

A. Yes, I've examined the available geologic data in the North El Mar field. There are no water wells within one mile of the field, and I've found no evidence of open faults or any other hydrologic connection between the injection zone and any underground source of drinking water.

Q. Mr. Watson, were Quay Valley Exhibits 4 through 8 prepared by you or compiled under your direction?

A. Yes, they were.

MR. CARR: At this time, Mr. Catanach, we would move the admission into evidence of Quay Valley Exhibits 4 through 8.

EXAMINER CATANACH: I'm sorry, what numbers, Mr. Carr?

MR. CARR: Four through 8.

EXAMINER CATANACH: Exhibits 4 through 8 will be admitted as evidence.

MR. CARR: That concludes my direct examination of Mr. Watson.

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Watson, what interval of the Delaware formation are we talking about here? Is this Brushy Canyon or --

A. No, this is Bell Canyon.

Q. Bell Canyon.

A. Yes, sir.

Q. Okay. And it appears that this entire field is located in portions of New Mexico and Texas; is that correct?

A. Yes, the area is all productive, yes, sir.

Q. It's in communication in both states?

A. Yes, sir.

Q. And Burlington is currently conducting CO_2 injection operations in Texas; is that correct?

A. That is my understanding, yes.

Q. Now, do all three of these members in this sand interval contribute to production?

A. The middle member is the Ford shale, and I do not believe that it contributes to the production in the field.

Q. So mostly we're talking about the Ramsey and the Olds?

A. Yes, sir.

Q. Okay. Do you expect any of the injected fluid to enter the Ford member?

A. I don't believe that it will. It's tighter. It's primarily a shale, versus the other two that are known to be productive, and they are sands.

Q. Okay. The proposed CO_2 project area as outlined on Applicant's Exhibit Number 2 doesn't encompass the entire unit area. Is that due to some geologic considerations, Mr. Watson?

A. I think our engineer will talk about that. But no, it's not.

Q. So the entire unit is geologically capable of --

A. Yes, sir.

Q. Okay. It just -- You've got some high water cuts to the north?

A. That would be to the northeast.

Q. To the northeast.

A. Yes, sir, as you enter the main depositional channel through there.

Q. Have you actually -- You testified that there aren't any water wells within a mile of --

A. That's correct. The closest water well we found was in Section 28 to the east. That's in Township 26 South, Range 33 East. I believe that was about two miles away, two to two and a half.

Q. Okay. Do you know, in fact, if there is fresh water present in the unit?

A. I don't know that there is, but -- I'm not aware that it's been tested to see.

Q. The well in Section 28 that you found, do you know what depth that may have occurred?

A. I believe that was producing between -- a little over a hundred feet.

EXAMINER CATANACH: Okay. I have no further questions.

Mr. Kellahin, did you have any questions?

MR. KELLAHIN: No, sir, not of this witness.

EXAMINER CATANACH: Okay.

MR. CARR: Mr. Catanach, at this time we would call Mr. Orr, O-r-r.

ROBERT M. ORR,

the witness herein, after having been first duly sworn upon his oath, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. CARR:

Q. Would you state your name for the record, please?

A. Robert M. Orr.

Q. And where do you reside?

A. Monahans, Texas.

Q. By whom are you employed?

A. I'm employed by Transpetco Engineering, Inc., out of Shreveport, Louisiana, and Midland, Texas. We're a consulting firm involved in CO_2 floods.

Q. And you are the consulting engineering support for this Application of Quay Valley; is that right?

A. Yes, I am.

Q. Mr. Orr, have you previously testified before this Division?

A. Yes, I have, but it's been many years ago.

Q. Could you summarize your educational background for Mr. Catanach?

A. Yes, sir, I have a BS, bachelor of science, in petroleum engineering from the University of Texas. I'm a registered petroleum engineer in the State of Texas, number 15512. I have attended numerous schools on waterflooding

and other technical-type schooling.

Q. Could you review briefly your work experience?

A. Yes, sir. After leaving college I worked for Gulf Oil Corporation. I left Gulf Oil Corporation and went to work for a consulting firm, the George L. Buckles Company, worked for them until 1971, at which time I formed my own oil and gas and consulting company, and I've done that to date, plus my work with Transpetco Engineering.

Q. Are you familiar with the Application filed in this case on behalf of Quay Valley?

A. Yes, I am.

Q. Are you familiar with the wells in the area of the proposed CO_2 injection project?

A. Yes, I am.

Q. Have you reviewed the status of each well in the area of review for injection -- for each injection well in the proposed CO_2 project?

A. Yes, I have.

Q. And are you prepared to share the results of your work with Mr. Catanach?

A. I am.

MR. CARR: Mr. Catanach, we tender Robert M. Orr as an expert witness in petroleum engineering.

EXAMINER CATANACH: Mr. Orr is so qualified.

Q. (By Mr. Carr) Mr. Orr, let's go back first to

Exhibit 1B, the base map, and I'd ask you to review the current status of the unit operations.

A. The unit that's reviewed in 1B and also in Exhibit 2 are the -- showing the current status of the North El Mar Unit. This area is in the final stages or the stripper stages of waterflood operation, which was approved by the Commission in 1973, under Order Number R-4629. Currently, there are two active injection wells and 29 shut-in injection wells.

The cumulative water injection to date has been 16.1 MM barrels, and current injection rates are about approximately 680 barrels of water per day.

There were a total of 31 producing wells in the original unit. There are currently 19 active producers, producing approximately 100 barrels of oil per day. The cumulative production to date is 6.1 MM barrels, and the total cumulative oil production since the commencement of waterflood is 1.2 MM barrels.

Q. Let's go to Exhibit Number 2. Could you first explain how the yellow-shaded acreage on this exhibit was determined?

A. Well, actually, this is a plat of the entire unit area, but the yellow area is what we consider the prime part of the unit, and this is the -- what we based our economics on for the development of the CO_2 flood.

The -- Actually, the entire unit will be -- could be used, but the determination will be after we have completed the area enclosed or colored in yellow.

Q. When we look at the area shaded in yellow, is it appropriate to refer to just that as the project area, or should the entire unit area be included as the project?

A. The entire unit is the project area, and you can see that we have a number of circles shown on the plat that could possibly be future drilled wells, but we do not anticipate at this time that these wells would be drilled unless the economics dictates that we would do that.

Q. And when we're talking about, say, like the Well Number 9 in the northern part of the unit, that is a shut-in producing well at this time, is it not?

A. No, that's a well that has not been drilled. No, excuse me, excuse me. Let me re-refer back to -- Okay, it's a well that's shut in.

Q. And the same would apply to the Number 11 --

A. Number 11, yes.

Q. -- and also to the Number 3 up in the extreme northeast corner of the unit?

A. Yes, I'm looking at Exhibit 1B now.

Q. And so, in fact, if we are injecting, say, in the Number 12 due south of the Number 9, we would anticipate the potential for the response to the CO_2 under various

circumstances in the Number 9 as well?

A. Yes.

Q. And the yellow-shaded area is really the area that you've defined for the basis of your economic work on the unit area?

A. Yes.

Q. So in essence what we're saying is that the project area really should be the unit, not just the area that you've defined, to base your economic work on?

A. That is true.

Q. Now, across the bottom of this exhibit we talk about Phase I, II, III and IV. Are Quay Valley's plans to go out and to develop this unit with separate phases, or does this -- the way you've defined this in various phases across the bottom, just indicate the chronological order in which you anticipate to focus your effort?

A. Well, again, this is our proposed plan of how we will inject the CO_2 and where we will inject water, and also how we will expand the operation of the unit.

And if you'll notice, there are five blue triangles on the south side of the unit, which we've entitled Phase IV, and this -- these wells were put in that way to show how we would do that, whatever the -- in our cooperation with Burlington along the south lease line.

Q. So basically what you've done is broken this into

various components, and it doesn't necessarily mean you're going to go Phase I, then Phase II, then Phase III and so forth?

A. No, and here again, the volumes of water that we produce, the amount of CO_2 that we are injecting, the recovery that we get will determine how we balance the flood, and I'll testify further on that we will be using a WAG-type injection program in this unit.

Q. Okay, well, let's -- Using this exhibit, why don't you review for Mr. Catanach the initial proposed CO_2 project, how you plan to implement it.

A. The initial proposed program will be that we will use a fivespot pattern, and we think that the recovery due to the CO_2 is going to be significant, and we will inject -- reinject the produced gas along with the CO_2, and we'll continue to inject water in this -- what we're calling, I guess, would be more appropriate, a target area, with alternating slugs of CO_2 and water injection.

We propose to use 27 -- initially 27 producing wells and 24 injection wells. We do not plan, as I said, at this time to drill any additional injection wells. And the well type and completion data is shown on schematics that we'll present in a few minutes.

We anticipate that we'll inject a total of 27.1 BCF of CO_2, which we will purchase for the project, and

then produced gases will be recycled back to the reservoir, resulting in what we're estimating to be an ultimate injection of 40.8 BCF of gas during approximately a 21-year period. And the recycled gas would consist of CO_2 and certain hydrocarbon gases that we would produce with the oil from the reservoir.

Q. If this Application is granted, what would be the range of bottomhole pressures in the North El Mar Unit?

A. The range of pressures would be for the -- Well, excuse me. The estimated bottomhole pressure at this time is 2840 p.s.i., and that's what we would expect in the area of the injection wells, and 150 p.s.i. around the producing wells, and an average reservoir pressure would be in the range of 2200 p.s.i.

Q. Why does Quay Valley propose to institute a carbon dioxide tertiary recovery project at this time? And you may want to refer to Exhibit Number 9 at this time as well?

A. Right. If you look at Exhibit Number 9, you'll see that it's a history, production history, of the North El Mar Unit, and also a forecast of what we estimate for the future. And you can see that it starts at 1970, even though the field was developed ten or more years prior to that. And after approval to waterflood, you can see by this plat that water injection began in January of 1975.

The plat shows the water injection as it was injected into the reservoir. It shows the water production, the oil production and the gas production through -- to June of 1997.

Then on the graph also is our forecast for gas injection, the gas production, the water production, and the oil production that we anticipate for the North El Mar Unit. It's our opinion that this is an excellent candidate for a CO_2 injection program.

Q. Is this the time to institute a CO_2 flood in the unit?

A. Yes, it's our opinion that it should be done as soon as possible. At the present time, CO_2 is available for injection. The earlier that the CO_2 can be injected is the less time that the operator would have to operate it in a strictly stripper-type of operation.

And also any delay in the implementation of this project could lead to plugging of wells or a permanent loss of the ability to economically conduct a CO_2 flood in this area.

Q. Let's go to what has been marked Quay Valley Exhibit Number 10. Can you identify and review that for Mr. Catanach?

A. Yes, Exhibit Number 10 is a generalized MMP plot of the -- of our estimate of what we think will take place

in the North El Mar Unit, and you can see that this is a plot of recovery versus pressure and is the reason we're requesting the bottomhole pressure that we've asked for. And you can see on the left side of the graph is when we start a CO_2 injection, and we would have an immiscible gas displacement recovery program at that time.

Then as the reservoir pressured up, you can see that we'll have partial miscibility, and we anticipate that at that time we would begin to get an increase in oil recovery. And then as the pressures continue to increase, we would reach miscible displacement, and you can see that there would be a slight increase or additional increase at that time.

So you can see that actually this is the basis of a recovery curve as a function of pressure.

Q. Now, our pressure requirements -- a minimum miscibility would be at current reservoir conditions, and that is at 1100 p.s.i.g.?

A. Yes, we estimate the minimum miscibility at current reservoir conditions to be 1100 p.s.i.g.

Q. And then the average reservoir pressure currently --

A. -- is -- yes, is 1835 p.s.i. And it ranges from 1580 p.s.i. to 2040 p.s.i.

Q. In fact, if we can keep the pressures up what

we're achieving is that we're going to have greater CO_2 contact with more of the reservoir --

A. Yes.

Q. -- isn't that what the goal is?

A. And sufficient reservoir pressure is needed to maintain an average reservoir pressure greater than a minimum miscibility pressure, and closer to the optimum displacement pressure of 2200 pounds, approximately. And the higher the displacement pressure, the more efficient the CO_2 flood is because of the increase in viscosity of the CO_2.

Q. What is the source of the carbon dioxide you propose to inject?

A. There is a pipeline in the field or that goes through this unit, operated by Kinder Morgan Energy Partners, Limited Partnership, and it's delivered to them from the Denver city hub.

Q. Will there be adequate CO_2 to carry out this CO_2 flood?

A. Yes, a CO_2 delivery pressure in the range of 1800 to 2000 pounds is available, and we are in the final stages or the stages of negotiation for a supply of CO_2.

Q. What volumes does Quay Valley plan to inject into the unit?

A. We plan to inject 14.8 billion cubic feet of CO_2

and other gases ultimately in the reservoir, and we anticipate we'll inject 16.9 million barrels of water.

Q. What rates will be the maximum average daily injection rates of the unit?

A. The -- For CO_2 we anticipate that the maximum rate would be 15 MMCF per day, which calculates to roughly .75 MMCF per day per well, and an average of 12 MMCF per day for the field. Excuse me, the maximum for the well would be .75 and the average would be .5 MMCF per day.

For water, we anticipate that the maximum injection rate would be 4700 barrels per day for the field, 200 barrels per day per well at maximum, and average for the field would be about 2400 barrels per day, with an average per well of 100 barrels per day.

Q. What injection pressure are you requesting for water and for CO_2?

A. For water we're requesting a maximum surface injection pressure of 530 p.s.i., and for CO_2 a maximum surface injection pressure of 1160 p.s.i.

Q. And what you're attempting to do, is it not, is to maintain sufficient pressure to maintain injection bottomhole pressures below the fracture pressure? Isn't that the objective?

A. That is correct.

Q. Why is there a pressure difference between water

and CO_2?

A. It's a difference in the density of the water and the CO_2.

Q. And how have you determined whether injection pressures can be set at the requested levels without damaging the formation?

A. We made a study of the fracture treatments in the area, and the instantaneous shut-in pressures in that area from the frac jobs were 2826 p.s.i. from actual fracture treatments. And based on the difference in the density of the CO_2 and the water, this would equate to a surface pressure of 537 p.s.i. for water, 1168 p.s.i. for CO_2. And we're requesting a pressure slightly less than that of 530 pounds for water and 1160 pounds for CO_2, both of which are below the reservoir frac pressure.

Q. Could you identify the exhibit behind the tab marked Exhibit 11?

A. Exhibit 11 is the C-108 form for the North Mason Unit [*sic*].

Q. And if we go to page 53 of this exhibit, the C-108 for the North El Mar Unit, could you identify that for me, please?

A. Yes, this is a plat showing a circle around each injection well, and --

Q. It shows the area of review --

A. Yes.

Q. -- for each of the wells in the project?

A. Yes.

Q. Does it show all wells within two miles of each of these injection wells?

A. Yes, it does.

Q. And if we go back to the preceding page, page 52, does this plat show the ownership in the area?

A. Yes, these are -- These two plats tie together to show this ownership.

Q. Let's explain to the Examiner how this exhibit is organized. Could you just summarize for him how the well data sheets are organized in the exhibit?

A. Yes, this plat shows the exact location of the wells, but then the wells that are located within the unit are shown on pages -- Excuse me, I should say the injection wells that are in the unit are shown on pages 3 through 51.

This is a schematic of the well showing the well type, the construction, the date drilled, location, depth of completion, the record of completion and so forth.

Then on all other wells in the unit area, including producing wells, shut-in wells and temporarily abandoned wells are shown on pages 54 through 130.

Q. Now, if we --

A. Then -- Excuse me. Then all New Mexico offset

wells to the unit are shown on pages 131 through 141. And then the Texas offset wells are shown on pages 149 to 197.

Q. And the data for the preparation of the Texas offset well data sheet was obtained from OCD records, and also some of the information has been supplied by Burlington; is that correct?

A. Yes, it has, and some came from scout ticket records.

Q. And so the well data sheets contain all data required by Form C-108 for all wells in the areas of review which penetrate the injection zone; is that correct?

A. Yes.

Q. Have you reviewed the data available on wells within the areas of review for each of these proposed CO_2 injection wells and satisfied yourself that there is no remedial work required on any of these wells to make them safe to operate --

A. Yes.

Q. -- in close proximity to the CO_2 flood?

A. Yes, I have. Excuse me.

Q. And what is the present status of the wells Quay Valley proposes to utilize for injection?

A. Well, they propose to use all of the wells that are in the area, including the active wells, the shut-in wells, and the temporarily abandoned wells.

Q. And the wells that will be used are shown on Exhibit 2; is that correct?

A. Yes.

Q. Will the injection of carbon dioxide in these wells pose threat to any underground source of drinking water?

A. No, it's my opinion these wells are all completed properly.

MR. CARR: Let's go to Exhibit Number 12.

Mr. Catanach, I would request permission to replace this exhibit, substituting, and I will do that in the next couple of days. There are several typos in this which I did not catch. Lea County is not in Texas, for starters.

THE WITNESS: They wish.

MR. CARR: And although I was supposed to have caught all of these things, I failed at four different places, and at the suggestion of Quay Valley and if you will be kind to me, I'd like to change it, and I will submit a revised one to include in the exhibit package early next week. It won't affect the testimony, and I would like to go through it, but I would like to correct the exhibit, with your permission.

Q. (By Mr. Carr) Mr. Orr, let's look at this exhibit. Can you identify what it is?

A. Yes, this is the Application of Quay Valley, Inc., for an enhanced oil recovery project qualification for the recovered oil tax rate at the North El Mar Unit in Lea County, New Mexico.

Q. And other than the typographical errors I failed to catch, does this Application meet the requirements of OCD rules for the EOR tax credit?

A. Yes, it does.

Q. And it is complete and provides the required data?

A. Yes, it does.

Q. What are the estimated additional capital costs to be incurred in the project?

A. We estimate that it will cost $2.89 million for facility and well work for the project.

Q. And what are the total project costs?

A. The operating cost and the cost of CO_2 and the cost to recycle the gas and the total operation for the duration of the unit we estimate to be $23.25 million.

Q. And how much additional production does Quay Valley expect to obtain from the project?

A. It is our estimate that we will recovery 3.7 million stock tank barrels of oil.

Q. And what is the total estimated value of this additional production?

A. We estimate that it will be $67.25 million, based on a price currently received, or received in June, by the North El Mar Unit of eighteen dollars and seventy-five and a half cents a barrel.

Q. Does Quay Valley Exhibit Number 12 set out the production history and production forecast for oil, gas and water from the project area as required by Division rules for application for certification for tax incentive?

A. Yes, it does.

Q. And this is the same exhibit, the production forecast that you previously have reviewed?

A. Yes.

Q. In your opinion, will approval of this Application and the implementation of a CO_2 flood in the North El Mar Unit be in the best interest of conservation, the prevention of waste and the protection of correlative rights?

A. Yes, sir.

Q. Were Quay Valley Exhibit Numbers 9 through 12 prepared by you or compiled under your direction and supervision?

A. Yes, it was.

MR. CARR: At this time, Mr. Catanach, I move the admission into evidence of Quay Valley Exhibits 9 through 12.

EXAMINER CATANACH: Exhibits 9 through 12 will be admitted as evidence.

MR. CARR: That concludes my direct examination of Mr. Orr.

EXAMINATION

BY EXAMINER CATANACH:

Q. Mr. Orr, I believe you testified that you -- it's your opinion that CO_2 injection will not pose a threat to groundwater sources in the area?

A. Yes, sir.

Q. What groundwater sources are you basing that on? Or what are you basing that on?

A. Well, I was fortunate to be involved in the development of this part of the El Mar field both in Texas and New Mexico and was with the company that drilled some of the wells in there, and so I feel like I also have a personal knowledge of the area. And we did not find any water in there that we could use for any of our operations.

To my knowledge, there are no windmills or anything right in that area. There are some scattered throughout the general area, but by and large, they're very, very poor wells that don't produce a very high quality water.

All of the wells, to my knowledge, were completed with sufficient surface casing and cementing to protect any

surface water, if there would be any in there.

Q. At what depth do you think some of this groundwater occurs? Is it relatively shallow?

A. I think it's very shallow, and I think it's probably due -- I'm not a hydrologist, but I think it's probably due to local accumulation in surface sands or surface type of porosity that would be very near the surface.

Q. You're not aware of any formations deeper than that, that might contain fresh water in this area?

A. No, sir.

Q. Okay. Just to make sure I have the figures right, total project costs of $23.25 million?

A. Yes.

Q. Additional recovery, 3.7 million barrels of stock tank oil?

A. Yes.

Q. And additional value of $67.25 million?

A. Yes, sir.

Q. Okay. Mr. Orr, do you know -- There are currently two active injection wills within the project; is that correct?

A. Yes.

Q. The remainder have been shut in. Do you know for how long they've been shut in?

A. I don't have it right here in front of me, but the -- a number of these wells had bridge plugs in them, and Quay Valley has gone in and removed a number of those in the field, and the integrity of the wells in all of them that they've been tested have been good.

Q. Has Quay Valley tested all of the proposed injection wells, do you know?

A. I can't answer that; I don't know whether they've tested them. But in the implementation of the project, if they haven't been, they will be.

MR. CARR: I've been advised that all have recently been tested.

THE WITNESS: Okay.

Q. (By Examiner Catanach) To your knowledge, have these wells been used in the past six months for injection?

A. No.

Q. They've been abandoned -- or not been used for injection for several years, I believe the previous testimony was?

A. That's right.

EXAMINER CATANACH: Okay. Mr. Carr, we may have to face this in writing the order. The injection authority on these 29 wells may have expired, and we may have to repermit them for injection, which probably would fall within the scope of the case, so I don't think we have to

do anything different, but we'll address that when we get to it.

MR. CARR: Do you want it readvertised for that purpose?

EXAMINER CATANACH: Yeah, Mr. Carr, it might be a good idea to --

MR. CARR: And we would -- You know, I believe the C-108 contains the data that you would need to do that. And if they readvertise them to have the injection authority for these wells as needed, we'd like to do that immediately, because we are planning to go forward fairly quickly with this project. So if we could readvertise for the 4th of September.

If you desire a proposed order in the meantime, we can do that to keep it moving and then we have everything in place on that date.

EXAMINER CATANACH: Yeah, I think it would probably be a good idea. I mean, the sheer number of them, the 29 is -- It's a bunch of wells.

MR. CARR: And if I can work with you on that, we'd need to be ready by next Tuesday.

EXAMINER CATANACH: And we'd have to talk some more about maybe notification, additional notice. I'm not sure if additional notice is necessary, but we might need to talk about that too.

MR. CARR: We can check that.

Q. (By Examiner Catanach) Okay. Mr. Orr, with respect to the injection pressure, you're requesting 1160 for the CO_2 and 530 p.s.i. for the water?

A. Yes.

Q. And that is based on some fracture pressure data that you've obtained from -- Is it several wells within the unit, or is it --

A. A number, yes, sir, that's an average.

Q. That is an average of the fracture pressure when you initially completed the wells?

A. The initial -- After a frac job, we took the instantaneous shut-in pressure at that time.

Q. Okay, and that's for -- Were the wells frac'd in all three of the members at the same time?

A. Yes, most of them were.

Q. So that would correspond to what you've testified -- You testified that you believe the fracture pressure would relate to the 530 p.s.i. for water?

A. Yes, sir, that's our -- It would actually be a little bit higher than that. We're requesting slightly lower than what we measured.

Q. Okay. Can we go over the rates again? I'm not sure I got the rates right. On a per-well basis, CO_2 -- I believe the number I caught was maximum .7 MMCF per day?

A. Yes, per well.

Q. Per well, okay. And average was .5 --

A. Yes, sir.

Q. -- MMCF per day?

Water, max per well, 200?

A. Yes, sir.

Q. And average, 100?

A. Yes, sir.

Q. Okay. I did get them right.

Now, I'm not clear, I guess, on the phasing of the project. It's not a phased project within an area?

A. Well, at the time this exhibit was made -- and as you've heard testimony that we're not -- we do not have a final cross-line agreement or state line agreement, whatever you want to call it, with Burlington. So the south side is pending our cooperation with Burlington. And so we've put that in as Phase 4. They are currently injecting CO_2 about a half a mile south of this unit.

So as they -- As we work out an agreement with them, that Phase IV could come in early on, maybe even shortly after Phase I. So really the phases are our thinking of talking about how we would develop the CO_2 and the water injection in that area.

Q. Okay. Within the wells operated in New Mexico, have you seen any evidence of water or CO_2 out of zone as a

result of injection in Texas?

A. No.

Q. Now, the data that you've submitted, the area-of-review data, does that -- that does include the wells in Texas; is that correct?

A. Yes, sir.

Q. Okay.

A. And they're shown in that exhibit, 149 to 197.

Q. Okay.

Q. Pages 149 to 197.

Q. And you've also examined those wells to see if they were completed properly, have you not?

A. From my knowledge of the field and the review of these, it's my opinion they are completed properly.

Q. So as to confine the injected fluid to the injection zone?

A. Yes, sir.

Q. And not to pose any threat to any groundwater?

A. It's my opinion that it would not.

EXAMINER CATANACH: Okay. I have nothing further, Mr. Carr.

MR. CARR: Mr. Catanach, that concludes our presentation in this case.

I will provide a revised Exhibit 12, and we'll contact you to confirm, following the hearing, what

additional notice, if any, is required of the...

EXAMINER CATANACH: Okay, so you'll supply an additional Exhibit 12, a new --

MR. CARR: Just a corrected --

EXAMINER CATANACH: Corrected. And in the meantime we'll continue the case to September 4th; is that my understanding?

MR. CARR: Yes, sir, and readvertise --

EXAMINER CATANACH: Readvertise for --

MR. CARR: -- for reapproval of the injection authority.

EXAMINER CATANACH: Okay. There being nothing further, this case, Case 11,826, will be continued to September 4th.

(Thereupon, these proceedings were concluded at 11:34 a.m.)

* * *

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 11826, heard by me on September 7 1997.

David K. Catanach, Examiner
Oil Conservation Division

CERTIFICATE OF REPORTER

STATE OF NEW MEXICO)
) ss.
COUNTY OF SANTA FE)

I, Steven T. Brenner, Certified Court Reporter and Notary Public, HEREBY CERTIFY that the foregoing transcript of proceedings before the Oil Conservation Division was reported by me; that I transcribed my notes; and that the foregoing is a true and accurate record of the proceedings.

I FURTHER CERTIFY that I am not a relative or employee of any of the parties or attorneys involved in this matter and that I have no personal interest in the final disposition of this matter.

WITNESS MY HAND AND SEAL August 9th, 1997.

STEVEN T. BRENNER
CCR No. 7

My commission expires: October 14, 1998