STATE OF NEW MEXICO
ENERGY, MINERALS and NATURAL
RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
P.O. BOX 2088
SANTA FE, NM. 87504-2088

BEFORE THE
OIL CONSERVATION DIVISION
Case No.11113,11114 Exhibit No.18
Submitted By:
GREAT WESTERN DRILLING CO.
Hearing Date: October 13, 1994

APPLICATION FOR AUTHORIZATION TO INJECT

I. Purpose: X Secondary Recovery ____ Pressure Maintenance ____ Disposal ____ Storage
Application qualifies for administrative approval? __ Yes X No

II. Operator: Great Western Drilling Company

Address: P.O. Box 1659 Midland, Texas 79702

Contact party: Dennis L. Hendrix Phone: (915) 682-5241

III. Well data: A. Well data for each injection well covered by this application has been provided in the attached table (**Attachment A**) and attached wellbore schematics (**Attachments B.1 thru B.5**).
B. Additional required information for each injection well covered by this application is provided in **Attachment C**.

IV. Is this an expansion of an existing project? ___ Yes X No

V. Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review.
> > A map has been attached as **Attachment D** that identifies the area of review for all proposed injection wells.

VI. Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail.
> > A table of data has been provided on the wells in the "area of review" as **Attachments E1 & E2**. Also, wellbore schematics have been provided of all plugged wells in this "area of review" and are **Attachments F.1 thru F.11**.

VII. Attach data on the proposed operation. The appropriate data has been included as **Attachments G1 & G2**.

VIII. Attach appropriate geological data on the injection zone including appropriate lithologic detail, geological name, thickness, and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such source known to be immediately underlying the injection interval.
> > The required geological data is included as **Attachment H**.

IX. Describe the proposed stimulation program, if any.
> > The proposed stimulation program is described in **Attachment H**.

X. Attach appropriate logging and test data on the well, if not on file with the Division. **All logs are on file.**

XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.
> > The analyses are included as **Attachments I**, with the location map included as **Attachment J**.

XII. Not applicable to this project.

XIII. Applicants must complete "Proof of Notice" section. Proof is provided by certified receipt stubs included.

XIV. Certification

I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.

Name: Dennis L. Hendrix Title: Operations Engineer

Signature: Dennis L. Hendrix Date: 08/30/94

If the information required under Section VI, VIII, X, and XI above has been previously submitted, it need not be duplicated and resubmitted. Please show the date and circumstance of the earlier submittal. _____

GREAT WESTERN DRILLING COMPANY
C-108 APPLICATION TO INJECT
SOUTH CARTER SAN ANDRES UNIT WF PROJECT

LIST OF ATTACHMENTS

Attachment A: Table of well data for each proposed injection well.
(III. A.)

Attachment B.1-B.5: Wellbore schematics of each proposed injection well.
(III. A.)

Attachment C: Additional information for each proposed injection well.
(III. B.)

Attachment D: Two-mile map that identifies "area of review" w/ 1/2 mi.
(V.) radius'.

Attachment E.1-E.2: Table of well data for each well in the "area of review".
(VI.)

Attachment F.1-F.11: Schematics of all plugged wells in the "area of review".
(VI.)

Attachment G.1-G.2: Data on the proposed operation.
(VII.)

Attachment H: Geologic data on injection zone.
(VIII. & IX.) Description of the proposed stimulation program.

Attachment I: Chemical analyses of two or more fresh water wells within
one mile (XI.) one mile of any proposed injection well.

Attachment J: Map showing location of fresh water wells sampled.
(XI.)

NMINJ.XLS

PROPOSED SOUTH CARTER (S/A) UNIT

Wells Proposed For Conversion To Injectors

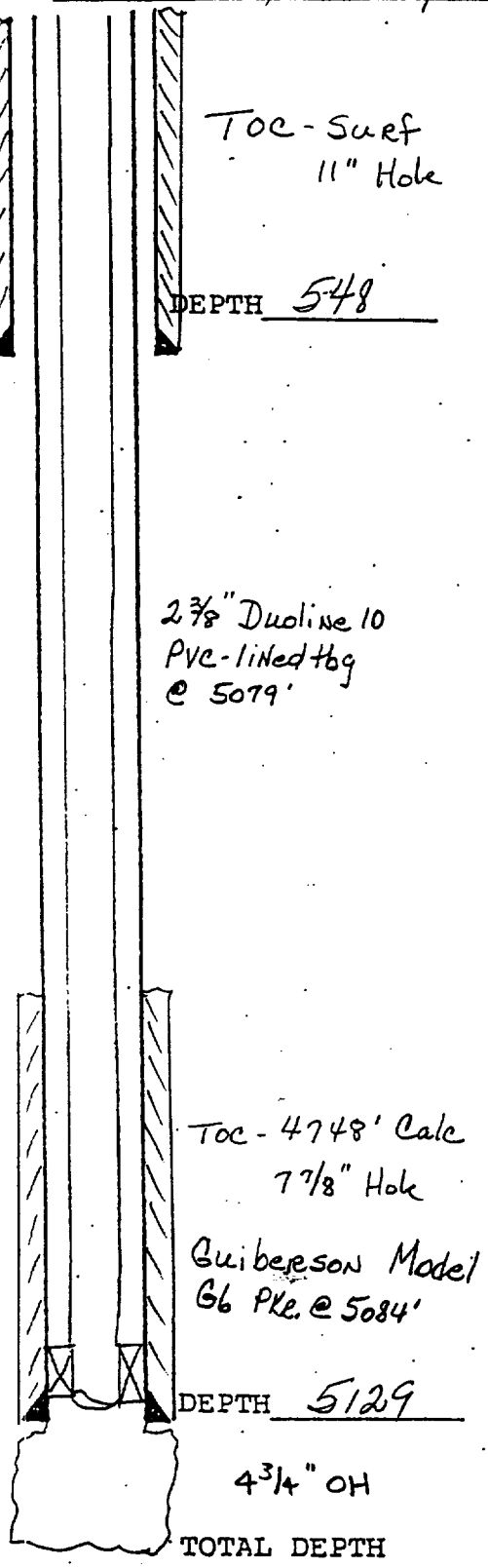
Lease Name	Well No.	Type	Location	Casing Size (Inches)	Casing Depth (Feet)	Cement Used (Sacks)	TOC	Total Depth (Feet)	Hole Size (Inches)	Tubing & Depth	Packer & Depth	Perfs/OH	Completn Date
Effie Carter	#2	Inj	330 FSL & 2310 FWL	8 5/8	548	500	Circ		11	2 3/8" Duoline 10	Guiberson Model G6		
		Conv.	Sec 5, 18S, 39E	5 1/2	5129	100	4748' Calc	5210	7 7/8	PVC-lined tbg. @ 5079'	Pkr. @ 5084'	5129-5210' OH	9/1/57
			Lea County, NM										
Effie Carter	#3	Inj	1980 FWL & 1650 FSL	8 5/8	478	500	Circ		11	2 3/8" Duoline 10	Guiberson Model G6		
		Conv.	Sec 5, 18S, 39E	5 1/2	5094	100	4713' Calc	5235	7 7/8	PVC-lined tbg. @ 5044'	Pkr. @ 5049'	5094-5235' OH	10/27/57
			Lea County, NM										
Dune-Johnson	#2	Inj	990 FSL & 990 FWL	8 5/8	344	200	Circ		11	2 3/8" Duoline 10	Guiberson Model G6		
		Conv.	Sec 5, 18S, 39E	5 1/2	5097	200	4335' Calc	5246	7 7/8	PVC-lined tbg. @ 5047'	Pkr. @ 5052'	5097-5246' OH	4/2/58
			Lea County, NM										
McQuein	#2	Inj	1650 FNL & 2310 FWL	8 5/8	571	500	Circ		11 1/4	2 3/8" Duoline 10	Guiberson Model G6	5095-5270' OH	10/10/57
		Conv	Sec 8, 18S, 39E	5 1/2	5095	100	4714' Calc	5270	7 7/8	PVC-lined tbg. @ 4962'	Pkr. @ 4967'	5012-5026'	12/2/58
			Lea County, NM									5040-5046'	3/11/71
Sylvester Johnson	#3	Inj	330 FNL & 990 FWL	8 5/8	336	225	Circ.		11	2 3/8" Duoline 10	Guiberson Model G6		
		Conv	Sec 8, 18S, 39E	5 1/2	5108	100	4727' Calc	5233	7 7/8	PVC-lined tbg. @ 5058'	Pkr. @ 5063'	5108-5233' OH	8/31/53
			Lea County, NM										

Attachment B.1

LEASE Effie Carter WELL # 2 FIELD Carter South

LOCATION 330 FSL + 2310 FWL COUNTY Lea STATE N.M.

Sec 5, T-18-S, R 39E Completed 9-1-57



ELEVATION: GL 3632 KDB 3652

CASING: SURFACE 8 5/8 CSG GR 24 WT @ 548 W/ 500 SX. TOC Surf

PRODUCTION 5 1/2 CSG GR 14 WT @ 5139 W/ 100 SX. TOC 4748 Calc.

INITIAL COMPLETION: FORMATION: Appears to be Natural OH Completion w/22,000 gals acid (5129-5182). 9-1-57.

SUBSEQUENT WORKOVERS AND RECONDITIONING:

PRODUCING EQUIPMENT DATA:

PUMPING UNIT SIZE _____ MAX. SL _____

PUMP DATA _____ SN @ _____

RODS _____

TUBING 2 3/8 Duoline 10 PVC-lined tbg @ 5160

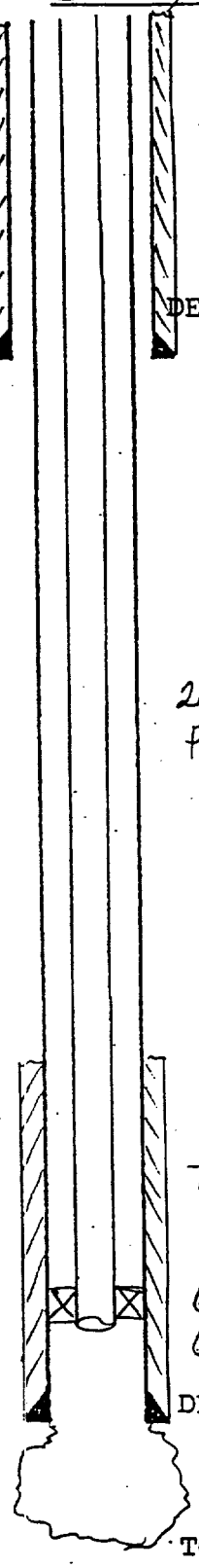
REMARKS: Guiberson Model G6 Pkr @ 5084

7/24/93 DLB

LEASE Effie Carter WELL #3 FIELD Carter South

LOCATION 1980 FWL + 1650 FSL COUNTY Lea STATE N.M.

Sec 5, T-18S, R39E Unit K Completed 10-27-57



ELEVATION: GL 3626 KDB

CASING: SURFACE 8 5/8 CSG GR 24 WT
@ 478 W/ 500 SX. TOC Surf
PRODUCTION 5 1/2 CSG GR 14 WT
@ 5094 W/ 100 SX. TOC 4713

INITIAL COMPLETION: FORMATION: Appears to be Natural OH completion w/ 15,000 gals 15% acid. 10-27-57

SUBSEQUENT WORKOVERS AND RECONDITIONING:

PRODUCING EQUIPMENT DATA:

PUMPING UNIT SIZE MAX. SL

PUMP DATA SN @

RODS

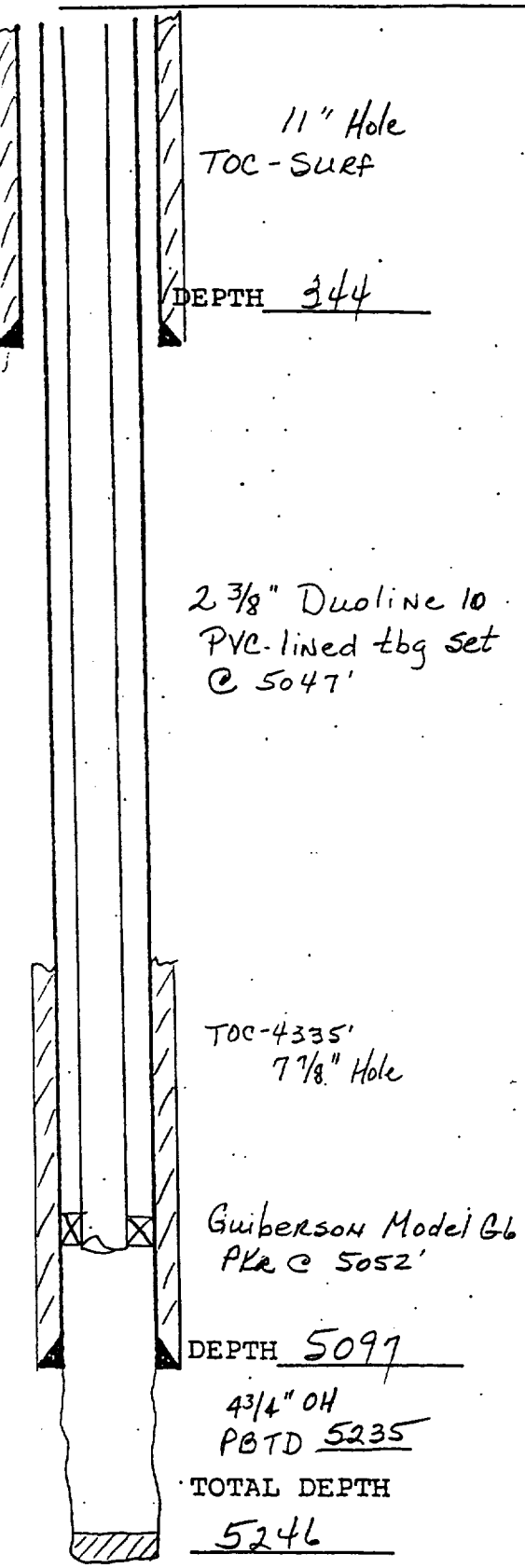
TUBING 2 3/8 Duoline 10 PVC-lined tbg @ 5044'

REMARKS: Guiberson Model G6 PKR @ 5049'

LEASE S.P. Johnson WELL # 2 FIELD South Carter (San Andres)

LOCATION 990FSL - 990FWL COUNTY Lea STATE N.Mex
Sec 5 - 18S - 39E

Completed 4-11-58



ELEVATION: GL 3636 KDB

CASING: SURFACE 8 5/8 CSG GR 24 WT
@ 344 W/ 200 SX. TOC Circ
PRODUCTION 5 1/2 CSG GR 15 1/2 WT
@ 5097 W/ 200 SX. TOC 4335

INITIAL COMPLETION: FORMATION: OH Completion
Acidize w/ 4000 gals acid.

SUBSEQUENT WORKOVERS AND RECONDITIONING:

PRODUCING EQUIPMENT DATA:

PUMPING UNIT SIZE MAX. SL

PUMP DATA SN @

RODS

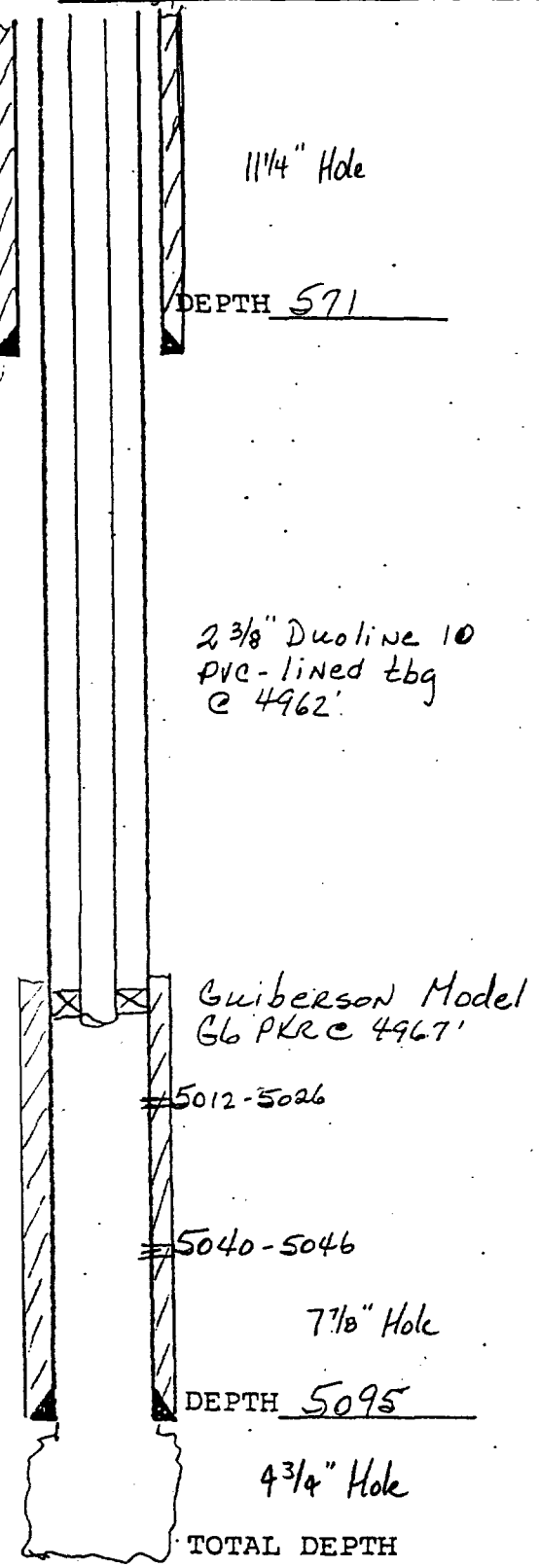
TUBING 2 3/8 Duoline 10 PVC-lined tbg @ 5047'

REMARKS: Guiberson Model G6 PKr @ 5052'

LEASE McQuein WELL #2 FIELD Carter South

LOCATION 1650 FNL + 2310 FWL COUNTY Lea STATE N.M.

Sec 8, T18S-R39E Unit F Completed 10-10-57



ELEVATION: GL 3628 KDB

CASING: SURFACE 8 5/8 CSG GR 24 WT
@ 571 W/ 500 SX. TOC Surf

PRODUCTION 5 1/2 CSG GR 14 WT
@ 5095 W/ 100 SX. TOC 4714

INITIAL COMPLETION: FORMATION: San Andres
10-10-57. Natural OH completion. Acidize w/6000 gals acid 5266-5250. Frac w/4,000 gals lse oil w/4000 # sd.

SUBSEQUENT WORKOVERS AND RECONDITIONING:
12-2-58 Perf 5040-5046 w/4 SPF. Acidize w/5000 gals 28% acid.
3-11-71 Perf 5012-5026 w/1 SPF acidize w/ 5000 gals 28% acid.

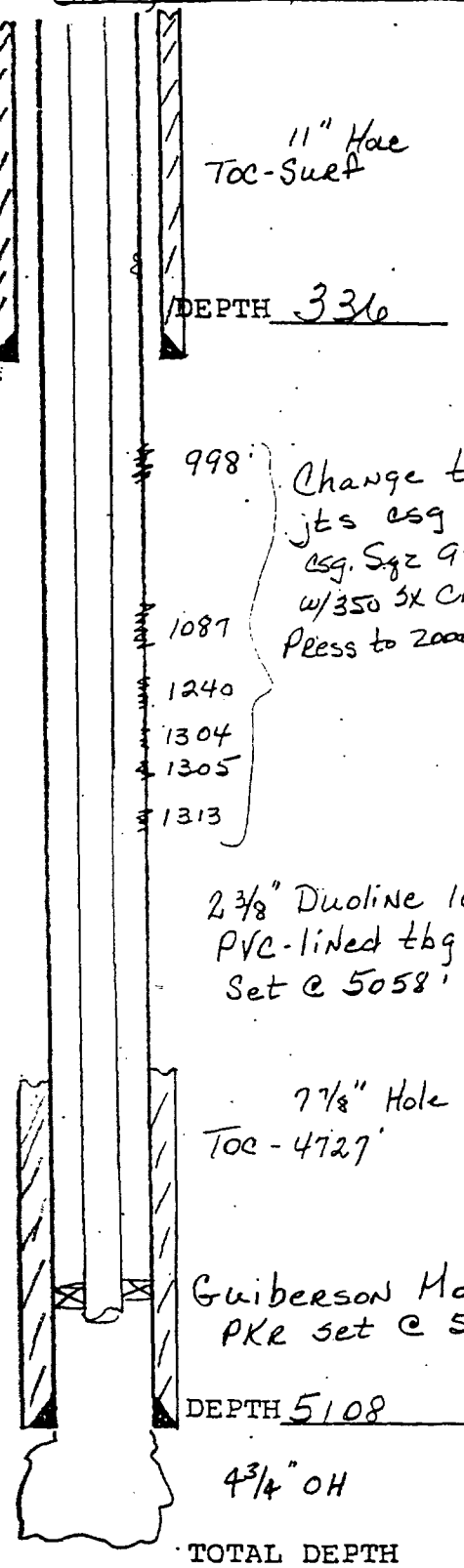
PRODUCING EQUIPMENT DATA:
PUMPING UNIT SIZE MAX. SL
PUMP DATA SN @
RODS
TUBING 2 3/8 Duoline 10 PVC-lined tbg @ 4962'
REMARKS: Guiberson Model G6 PKR @ 4967'

7/24/03 DLB

LEASE Sylvester Johnson WELL #3 FIELD Carter South

LOCATION 330 FNL & 990 FWL COUNTY Lea STATE New Mexico

Sec 8, T-18-S, R 39E Unit D Completed 9-16-58



ELEVATION: GL 3631 KDB

CASING: SURFACE 8 5/8 CSG GR 24 WT @ 336 W/ 225 SX. TOC Circ

PRODUCTION 5 1/2 CSG GR 14 WT @ 5108 W/ 100 SX. TOC 4727

INITIAL COMPLETION: FORMATION: San Andres

9-16-58. Natural OH completion. No acid was used.

SUBSEQUENT WORKOVERS AND RECONDITIONING:

11-3-60. Acid Sqz w/3000 gals 15% XLST + 500 gals acid gel 5213-5233, Sqz 3000 gals 15% XLST + 500 gals acid gel @ 5171-5213, Sqz 3000 gals 15% XLST + 500 gals gel 5129-5171, Sqz 3000 gals 15% XLST + 500 gals acid gel 5129-5233.

5-21-68 Acidize w/15,000 gals 15% NH

6-14-88. 8 Holes in csg 1313-Surf. Chng out top 2 jts csg w/15.5# csg. Sqz'd csg 998-1313 w/ 350 sxs "Class "C". Max press 2000 #. DOC 710-1365.

PRODUCING EQUIPMENT DATA:

PUMPING UNIT SIZE MAX. SL

PUMP DATA SN @

RODS

TUBING 2 3/8 Duoline 10 PVC-lined tbg @ 5058'

REMARKS: Guiberson Model G6 Pkr @ 5063'

7/24/93 LB

FORM C-108 APPLICATION
GREAT WESTERN DRILLING COMPANY
SOUTH CARTER SAN ANDRES WATERFLOOD PROJECT

III. WELL DATA

B. (1) The name of the injection formation and, if applicable, the field or pool name.
(2) The injection interval and whether it is perforated or open-hole.
(3) State if the well was drilled for injection or, if not, the original purpose of the well.
(4) Give the depths of any other perforated intervals and detail on the sacks of cement or bridge plugs used to seal off such perforations.
(5) Give the depth to and name of the next higher and next lower oil or gas zone in the area of the well, if any.

Since the information in item (2) is on the wellbore schematic, it will be omitted. Other items that are common to all the proposed injection wells will be grouped.

Effie Carter #2, Sylvester Johnson #3, & McQuein #2:

(1) San Andres formation, Carter, South (San Andres) Field.
(2) On Schematic(s).
(3) Originally drilled as an oil producer in the San Andres.
(4) No other perforated or open-hole intervals, other than those listed on the schematic(s).
(5) There are no productive oil or gas zones above or below the proposed injection interval.

Effie Carter #3 & S.P. Johnson #2:

(1) San Andres formation, Carter, South (San Andres) Field.
(2) On Schematic(s).
(3) Originally drilled as an oil producer in the San Andres.
(4) No other perforated or open-hole intervals, other than those listed on the schematic(s).
(5) Within the 1/2 mile area of these wellbores is the Blackwood & Nichols Carter #1, which was perforated in the interval 5822'-5837' (Glorieta). This is the next lowest producing zone in the area of these proposed injectors. The B&N Carter #1 never established commercial production and was subsequently plugged and abandoned. There are no known producing zones above the injection interval within the area of this proposed injector.

SCARTER.XLS

PROPOSED SOUTH CARTER (S/A) UNIT

Texas Wells Within Area of Review

Lease Name	Well No.	Type	Location	Casing Size (Inches)	Casing Depth (Feet)	Cement Used (Sacks)	TOC	Total Depth (Feet)	Hole Size (Inches)	OH/ Perfs	Compl Date
Granberry	2	Oil	330 FSL, 660' FWL , Sec. 6	8 5/8	325	300	Circ.		12 1/4		7/12/77
			Blk. A-9 PSL Survey								
			Gaines Co., Tx.	4 1/2	5245	1300	Circ	5273	7 7/8	5150-78'	
										5210-31'	
C.A. Taylor	1	Oil	660 FNL, 660 FWL, Sec. 15	8 5/8	329	300	Circ		12 1/4		8/28/57
			Blk. A-9 PSL Survey								
			Gaines Co., Tx.	5 1/2	5127	125	4651' Calc	5210	7 7/8	5124-27'	
										5127-5210' OH	
Taylor	2	Oil	1650 FNL, 330 FWL, Sec. 15	8 5/8	2072	1100	Circ		12 1/4		8/3/77
			Blk. A-9 PSL Survey								
			Gaines Co., Tx	4 1/2	5569	165	4500' Calc	5585	7 7/8	5050-5107' Sqz'd	
										5087-5104'	
Taylor	3	Oil	770 FNL, 660 FWL, Sec. 15	8 5/8	308	2575	Circ.		12 1/4		10/18/77
			Blk. A-9 PSL Survey								
			Gaines Co., Tx	4 1/2	5109	1400	Circ.	5212	7 7/8	5109-5212' OH	
Francis S. Granberry	1	Oil	660 FSL, 660 FWL, Sec. 6	13 3/8	343	300	58' Calc.		17 1/2		2/4/57
		P&A	Blk. A-9 PSL Survey								
			Gaines Co., Tx.	9 5/8	4636	850	2845' Calc		12 1/4		
				Left in Well	3942			PB 5270			
				7	5358	90	4963' Calc	11912	8 3/4	5180-90'	
				Left in Well	1606					5284-92'	
Francis S. Granberry	1-A	Oil	2310 FSL, 330 FWL, Sec. 6	8 5/8	548	500	Circ		12 1/4		10/31/51
		P&A	Blk. A-9 PSL Survey								
			Gaines Co., Tx.	5 1/2	5197	100	4816' Calc	5276	7 7/8	5197-5276'	

PROPOSED SOUTH CARTER (S/A) UNIT

Texas Wells Within Area of Review

Lease Name	Well No.	Type	Location	Casing Size (Inches)	Casing Depth (Feet)	Cement Used (Sacks)	TOC	Total Depth (Feet)	Hole Size (Inches)	OH/ Perfs	Compl Date
Taylor	2-A	Oil	2310 FEL, 330 FWL, Sec. 8	8 5/8	547	500	Circ.		12 1/4		10/16/57
		P&A	Blk. A-9 PSL Survey	Left in well	547						
			Gaines Co., Tx.	5 1/2	5098	100	4100' Calc		7 7/8	5032-52'	
				Left in well	763					5089-5375' OH	
				4 1/2	4616		992' Calc.	5375	7 7/8		1979
				Left in well	3626						Reentry
Taylor	4-A	Oil	1981 FSL, 630 FWL, Sec. 15	8 5/8	350	225	Circ.		12 1/4		4/26/85
			Blk. A-9 PSL Survey								
			Gaines Co., Tx.	5 1/2	5006	1200	Circ.	5142	7 7/8	5006-5142' OH	
Taylor	1W	Inj.	1320 FNL, 1320 FWL, Sec 15	8 5/8	438	250	Circ.		12 1/4		8/8/84
			Blk. A-9 PSL Survey								
			Gaines Co., Tx.	5 1/2	5050	1300	Circ.	5221	7 7/8	5056-5221' OH	
Taylor	2W	Inj	2640 FNL, 1260 FWL, Sec 15	8 5/8	310	225	Circ.		12 1/4		10/31/84
			Blk. A-9 PSL Survey								
			Gaines Co., Tx.	5 1/2	5042	1100	Circ.	5210	7 7/8	5042-5210' OH	
Taylor	4W	Inj	80 FNL, 1260 FWL, Sec 15	8 5/8	359	225	Circ.		12 1/4		5/7/85
			Blk. A-9 PSL Survey								
			Gaines Co., Tx.	5 1/2	5039	1200	Circ.	5244	7 7/8	5039-5244' OH	
Taylor	#4	D&A	1980 FNL & 540 FWL Sec 15	8 5/8	2150	1050	Circ		12 1/4	---	2/13/93
			Blk A-9, PSL Survey								D&A
			Gaines Co., Tx	---	---	---	---	7425	7 7/8	---	

PROPOSED SOUTH CARTER (S/A) UNIT

New Mexico Wells Within Area of Review

Lease Name	Well No.	Type	Location	Casing Size (Inches)	Casing Depth (Feet)	Cement Used (Sacks)	TOC	Total Depth (Feet)	Hole Size (Inches)	Perfs/OH	Compl Date
S.P. Johnson	#1	SWD	990 FWL & 1650 FSL	9 5/8	335	225	Circ		12 1/4		
		SI	Sec 5, 18S, 39E	7	5142	250	4044' Calc	5854	8 3/4	4772-4880'	1/3/58
			Lea County, NM							5142-5854' OH	4/14/61
McQuein	#1	Oil	1980 FNL & 435 FEL	13 3/8	300	300	Circ		17 1/4		
		P&A	Sec 8, 18S, 39E	8 5/8	3600	500	2440' Calc		11 1/4		
			Lea County, NM	5 1/2	5411	850	2173' Calc	6500	7 7/8	5025-5035'	1/31/55
										5058-5066'	2/23/59
Blackwood & Nichols		Oil	1972 FNL & 660 FWL	10 3/4	297	200	Circ		13 3/4		
Carter	#1	P&A	Sec 5, 18S, 39E	7 5/8	3367	1450	Circ		9 7/8		
			Lea County, NM	5 1/2	5940	650	930' Calc.	6628	6 3/4	5822-5837'	8/31/53
Steve Taylor	#1-B	Oil	660 FNL & 660 FEL	8 5/8	306	150	Circ		12 1/4		
		P&A	Sec. 7, 18S, 39E	5 1/2	5221	150	4030' Calc	5257	7 7/8	4900-5184'	3/2/57
			Lea County, NM							5221-5263' OH	
Carter	#1-B	Oil	1650 FNL & 330 FEL	8 5/8	331	331	Circ		11		
		P&A	Sec 7, 18S, 39E	5 1/2	5076	150	4505' Calc	5155	7 7/8	5090-5155' OH	6/14/59
			Lea County, NM								
Fee	#1	Oil	1650 FEL & 330 FSL	8 5/8	340	225	Circ		11		
		P&A	Sec 6, 18S, 39E	5 1/2	5124	100	4743' Calc	5199	7 7/8	5124-5200' OH	1/16/59
			Lea County, NM								
S.P. Johnson "A"	#3	Oil	330 FEL & 1650 FSL	8 5/8	287	200	Circ		11		
		P&A	Sec 6, 18S, 39E	5 1/2	5124	100	4553' Calc	5201	7 7/8	5124-5201' OH	11/22/58
			Lea County, NM								
Johnson	#1-A	Oil	330 FEL & 330 FSL	8 5/8	331	250	Circ		11		
		P&A	Sec 6, 18S, 39E	5 1/2	5115	100	4734' Calc	5228	7 7/8	5115-5228' OH	11/22/58
			Lea County, NM								
Sylvester Johnson	#2	Oil	1650 FWL & 330 FNL	8 5/8	530	480	Circ		11		
		Active	Sec 8, 18S, 39E	5 1/2	5122	100	4741' Calc	5232	7 7/8	5122-5232' OH	4/22/58
			Lea County, NM								

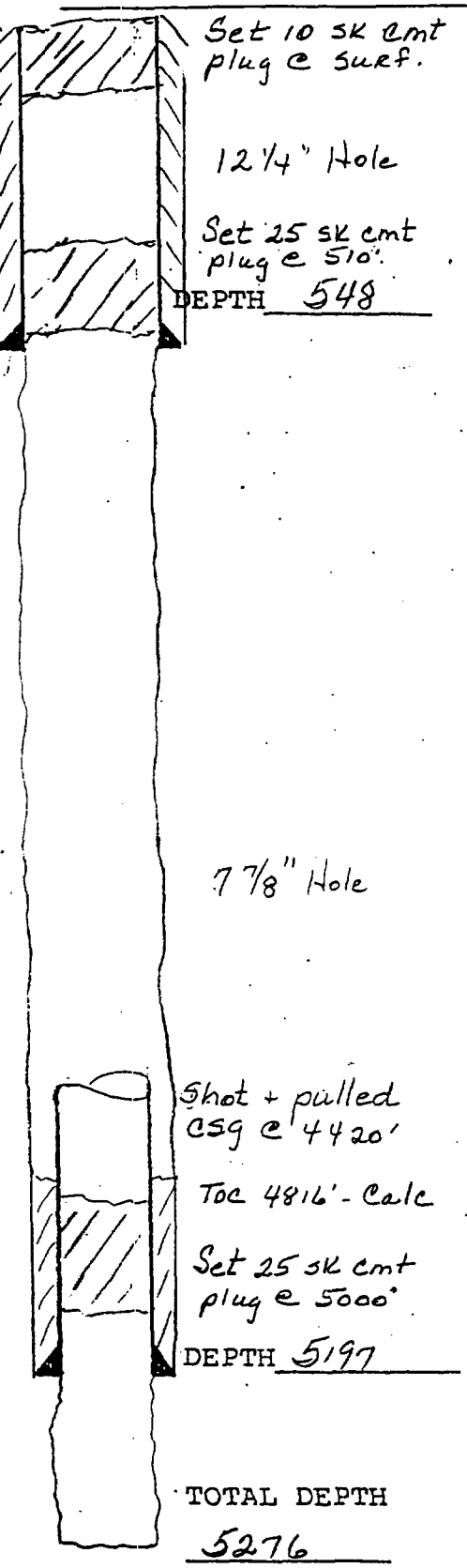
PROPOSED SOUTH CARTER (S/A) UNIT
New Mexico Wells Within Area of Review

Lease Name	Well No.	Type	Location	Casing Size (Inches)	Casing Depth (Feet)	Cement Used (Sacks)	TOC	Total Depth (Feet)	Hole Size (Inches)	Perfs/OH	Compl Date
Burton Federal	**#1**	Oil	**660 FSL & 330 FEL**	8 5/8	265	275	Circ.		11		
		Active	**Sec 5, 18S, 39E**	5 1/2	5105	100	4724' Calc	5220	7 7/8	5105-5220' OH	8/7/57
			Lea County, NM								
Effie Carter	**#1**	Oil	**330 FEL & 1650 FSL**	8 5/8	367	350	Circ		11		
		Active	**Sec 5, 18S, 39E**	5 1/2	5168	100	4787' Calc	5185	7 7/8	5168-5185' OH	4/19/57
			Lea County, NM								
Sylvester Johnson	**#1**	Oil	**660 FNL & 330 FEL**	8 5/8	369	350	Circ		11		
		Active	**Sec 8, 18S, 39E**	5 1/2	5176	100	4795' Calc	5184	7 7/8	5176-5184' OH	3/27/57
			Lea County, NM							5059-5158'	6/29/67
Carter	**#1A**	Oil	**330 FNL & 330 FEL**	8 5/8	340	300	Circ		11		
		Active	**Sec 7, 18S, 39E**	5 1/2	5075	100	4694' Calc	5230	7 7/8	5075-5230' OH	2/27/69
			Lea County, NM								

LEASE Francis S. Granberry WELL # 1-A FIELD Carter-New Mexico (San Andres)

LOCATION 2310 FNL & 330 FWL COUNTY Gaines STATE Tx
Sec 6, Blk A-9, PSL Survey

Completed 10-13-51



ELEVATION: GL 3630 KDB

CASING: SURFACE 8 5/8" CSG GR WT
@ 548 W/ 500 SX. TOC Circ

PRODUCTION 5½ CSG GR WT
@ 5197 W/ 100 SX. TOC 4816 Calc

INITIAL COMPLETION: FORMATION:
Acidize w/ 7000 gals.
P+A'd 11-7-57 Shot + pulled csg @ 4420'
Set 25 sk cmt plug @ 5000' and 510'.
Set 10 sk cmt plug @ surface.

SUBSEQUENT WORKOVERS AND RECONDITIONING:

PRODUCING EQUIPMENT DATA:
PUMPING UNIT SIZE MAX. SL
PUMP DATA SN @
RODS
TUBING

REMARKS:

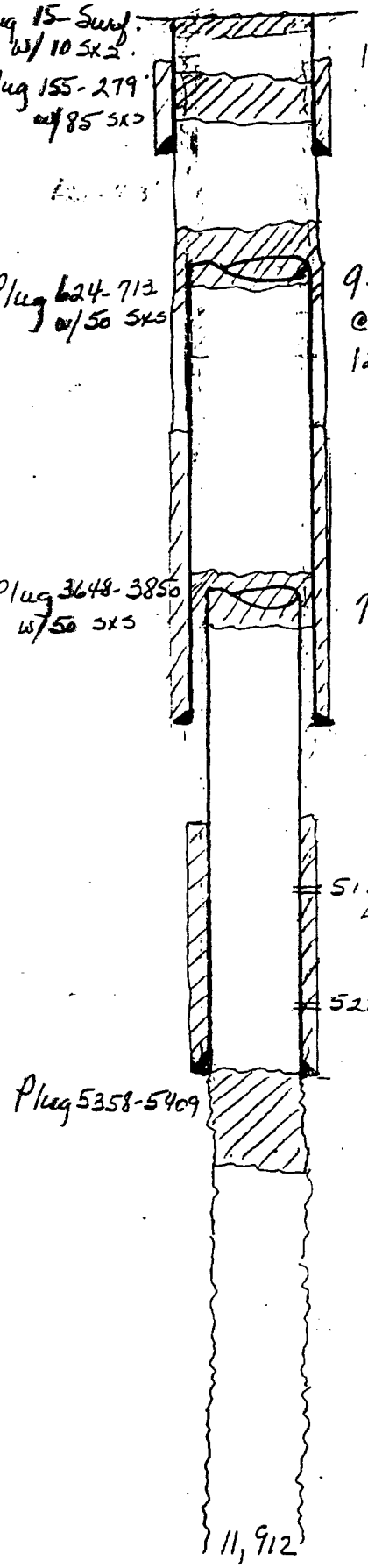
Attachment F.2

WELL DATA SHEET Date 4-20-94

Lease FRANCIS S. Granberry Well NO. #1 Field S. Carter (SonAndres)

Location 660 FSL + 660 FWL Sec 6, BLK A-9 County Gaines State Tx

PSL Survey



13 3/8 OD Surface Pipe
Set @ 343 w/ 300 sx
wt. _____ #ft.
Circ to 58'

9⅝ csg Stub @ 694'

9⅝ OD Intermediate Casing Set @ 4636
w/ 850 sx _____ #ft.
TOC 2845'. Calc

7" csg stub @ 3752'

7" OD _____ # _____ ft.
_____ OD _____ # _____ ft.
_____ OD _____ # _____ ft.
_____ Thd _____ Gr.,
_____ Casing
Set @ 5358 w/ 90 sx
TOC 4963 By Calc

P. BTD 5358'

T. D. 11,912'

Date Completed: 2-4-57
Well Elevation: 3612' GR KB
Producing Formation: _____
From _____' to _____'
_____' to _____'
Initial Production _____ BOPD _____ BWPD
Initial Treatment: Total acid 4500 gals.

Subsequest Workover or Reconditioning:
P+A well and pull casing
13 3/8 343' left in well
9 5/8 3942 left in well
7" 1606 left in well

Present Production: _____ BOPD _____ BWPD
Gas: _____ MCF/D

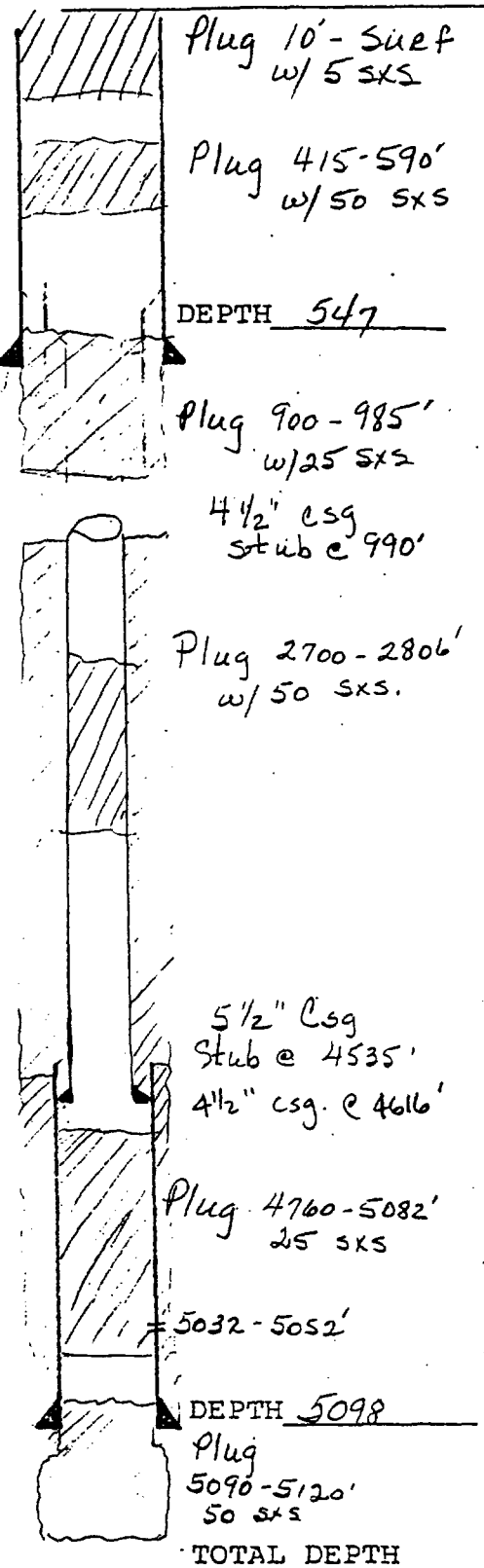
Static F.L. @ _____' Date _____
Pumping F.L. @ _____' Date _____
Well Depth by SLM _____' Date _____
Static BHP _____ psi @ Ga. Depth _____
Date _____

Tubular Data: _____

Remarks: _____

LEASE Taylor WELL #2-A FIELD Carter-New Mexico (San Andres

LOCATION 2310 FSL + 330 FWL COUNTY Gaines STATE Tx
Sec 15, BIK A-9, PSL Survey



ELEVATION: GL _____ KDB 3649
CASING: SURFACE 8 5/8 CSG _____ GR _____ WT
@ 547 W/ 500 SX. TOC Surf
PRODUCTION 5 1/2 CSG _____ GR _____ WT
@ 5098 W/ _____ SX. TOC 4100'
INITIAL COMPLETION: FORMATION: _____
Pulled out 4535' 5 1/2" csg. Re-enter well and set 4 1/2" csg. 3626 - 4616. TOC @ 1010' by T.S.

SUBSEQUENT WORKOVERS AND RECONDITIONING:

10-16-57 P+A'd well. Set plug in O.H. Set plug across perfs in 5 1/2" csg. Cut-off 5 1/2" @ 4535'. Set plugs @ 8 5/8" shoe & surface.

2-6-79 Re-entered wellbore. Drilled out plugs to TD. RAN 4 1/2" 11.6# csg. & landed at 4616' (inside 5 1/2" stub @ 4535'). Cemented in-place w/ 100 sks. cmt. TOC @ 1010'. Tested S/A All water.

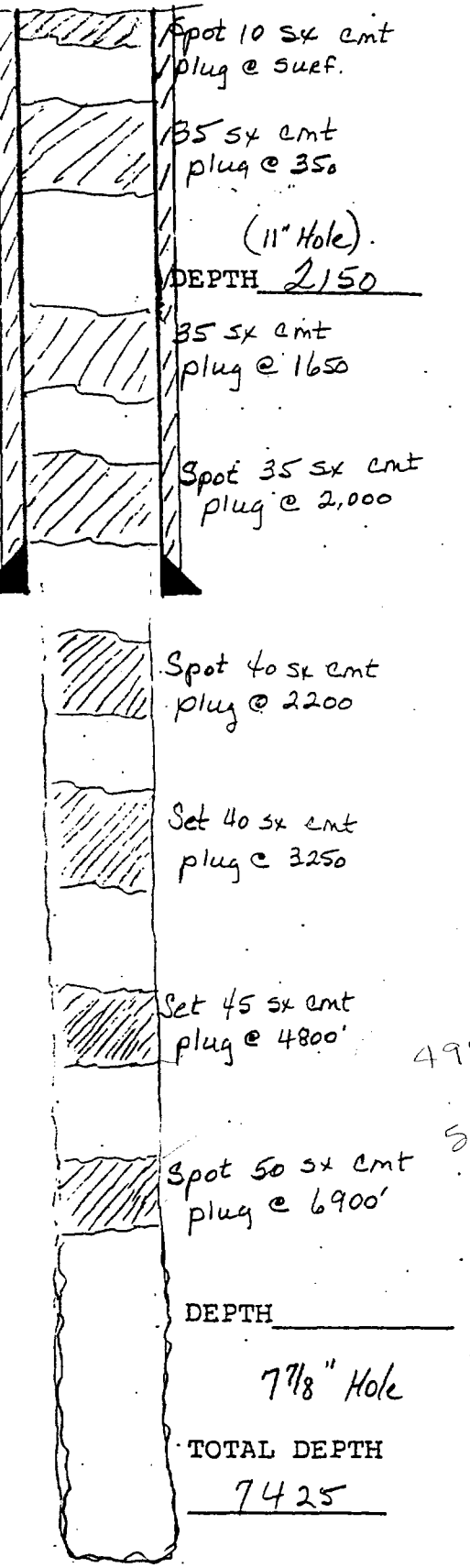
4-27-79 P+A'd well. Set 50sk plug in O.H. 5090-5120'. Set 25 sk plug fr. 4760'-5082'. Set 50 sk. plug from 2700-2806'. Pulled 4 1/2" csg. @ 990'. Set 25 sk plug across 8 5/8" shoe @ 900-985'. Set 50 sk plug @ 415-590'. Set 10' surface plug w/ 5 sx.

PRODUCING EQUIPMENT DATA:
PUMPING UNIT SIZE _____ MAX. SL _____
PUMP DATA _____ SN @ _____
RODS _____
TUBING _____
REMARKS:

LEASE Amer. Explor.-Taylor WELL # 4 FIELD South Carter (San Andres)

LOCATION 1980 FNL + 540 FWL COUNTY Gaines STATE Tx

Sec 15, BIK A-9, PSL Survey (Completed) D&A 2-13-93



ELEVATION: GL 3641 KDB

CASING: SURFACE 8 5/8 CSG GR 24# WT

@ 2150 W/ 1050 SX. TOC Circ

PRODUCTION CSG GR WT

@ W/ SX. TOC

INITIAL COMPLETION: FORMATION: Set 8 5/8 csg @ 2150 cmt w/1050 sx. Circ to surf. Do to TD @ 7425' Test for prod. Dry hole. Spot 50 sx cmt plug @ 6900'. WO cmt. RIH - No plug. Spot 50 sx cmt @ 6900'. Set plugs as follows: 45 sx cmt @ 4800', 40 sx @ 3250', 40 sx @ 2200, 35 sx @ 2000, 35 sx @ 1650, 35 sx @ 350, Spot 10 sx cmt plug @ surface.

SUBSEQUENT WORKOVERS AND RECONDITIONING:

PRODUCING EQUIPMENT DATA:

PUMPING UNIT SIZE MAX. SL

PUMP DATA SN @

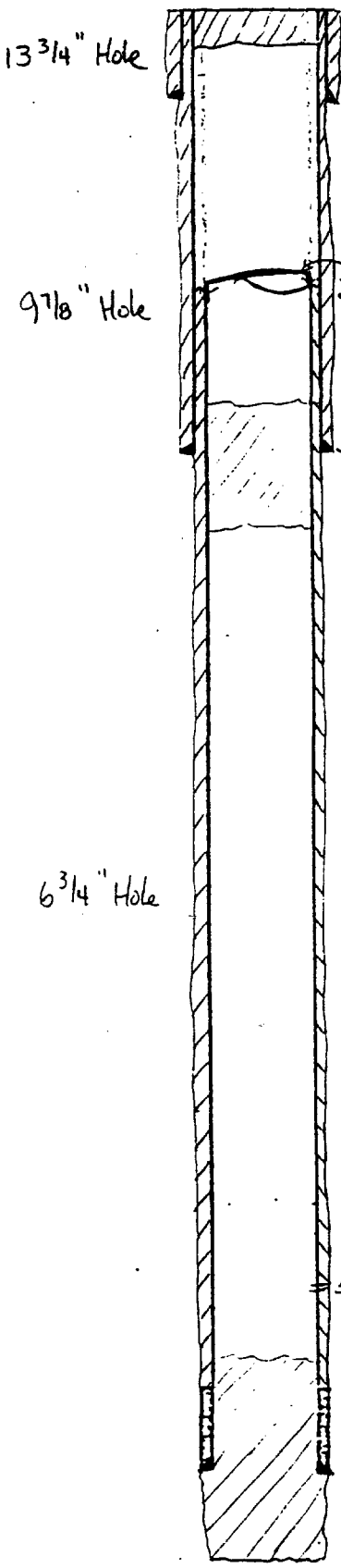
RODS

TUBING

REMARKS:

WELL DATA SHEET Date 8-11-94

Lease Blackwood Nichols Carter Well NO. #1 Field South Carter (San Andres)
Location 660 FWL & 1972 FNL - Sec 5-18S-39E County Lea State N.M.



10 3/4 OD Surface Pipe
Set @ 297 w/ 200 sx
wt. 32.75 #ft.
Circ to surf

7 5/8 OD Intermediate Casing Set @ 3367
w/ 1450 sx 24 #ft.
TOC surf.

5 1/2 OD 15.5 # ____ ft.
____ OD ____ # ____ ft.
____ OD ____ # ____ ft.
____ Thd ____ Gr.,
____ Casing
Set @ 5940 w/ 650 sx
TOC 930 By calc.

P. BTD 5890 '

T. D. 6628 '

Date Completed: 8-31-53
Well Elevation: GR 3629 KB
Producing Formation: San Andres
From ____ ' to ____ '
____ ' to ____ '

Initial Production 12.42 BOPD 100 BWPD
Initial Treatment: Perf 5822-5837 Acidize w/1000 gal 15% HCL + Reacidize w/5000 gal 15% HCL.

Subsequest Workover or Reconditioning:
(5-31-55) Set 25 sx cmt plug @ 3300-3500, Shot + pulled csg @ 931' Placed 5 sx cmt plug in top of 7 5/8" csg.

* Note: NMOCD records indicated "additional" plugging detail on Form C-103 filed 6-15-54, but could find no record in District office.

Present Production: ____ BOPD ____ BWPD
Gas: ____ MCF/D

Static F.L. @ ____ ' Date ____
Pumping F.L. @ ____ ' Date ____
Well Depth by SLM ____ ' Date ____
Static BHP ____ psi @ Ga. Depth ____
Date ____

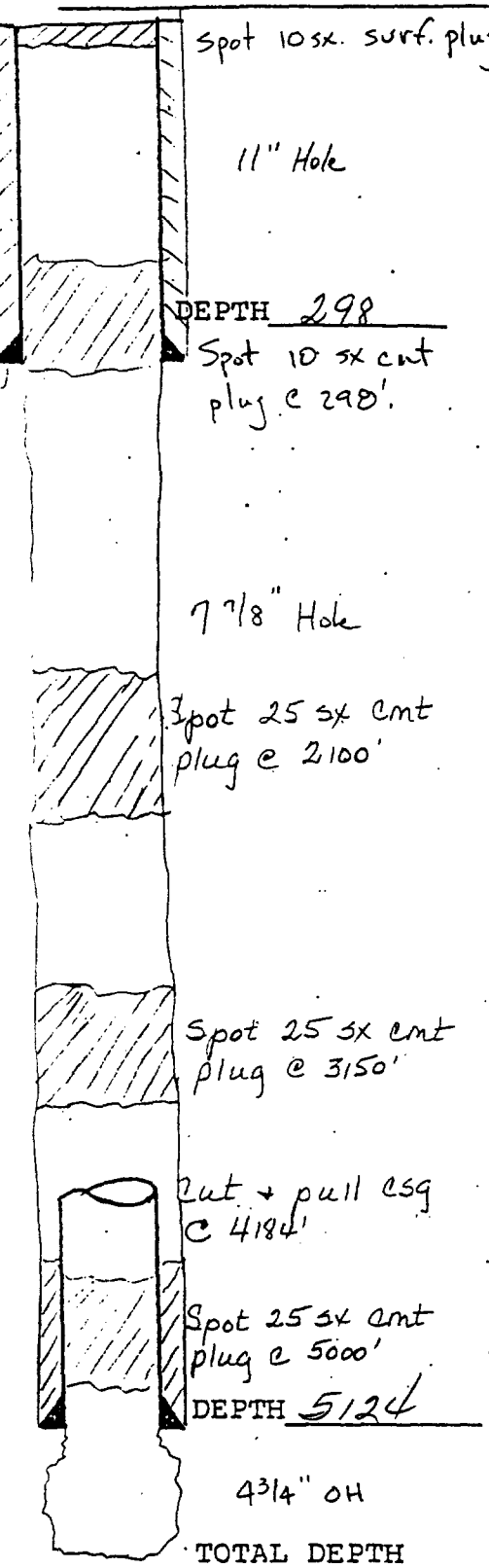
Tubular Data: ____

Remarks: ____

LEASE S.P. Johnson WELL #3 FIELD South Carter (San Andres)

LOCATION 330 FEL & 1650 FSL Sec 6, 18S, 39E COUNTY Lea STATE New Mexico

Completed 11-25-58



ELEVATION: GL _____ KDB 3658

CASING: SURFACE 8 5/8 CSG _____ GR _____ WT _____
@ 298 W/ 225 SX. TOC Surf

PRODUCTION 5 1/2 CSG _____ GR _____ WT _____
@ 5124 W/ 150 SX. TOC 4553

INITIAL COMPLETION: FORMATION: _____
Acidize OH 5124-5201' w/8000 gal

SUBSEQUENT WORKOVERS AND RECONDITIONING:
(7-25-59) Spot 25 sx cmt plug @ 5000'. A 25 sx cmt plug was set @ top and base of salt @ 2100' & 3150'. Cut & pulled 4184' csg, set 10 sx cmt plug @ 298'. Base of 8 5/8" csg. A 10 sx cmt plug was set @ surf.

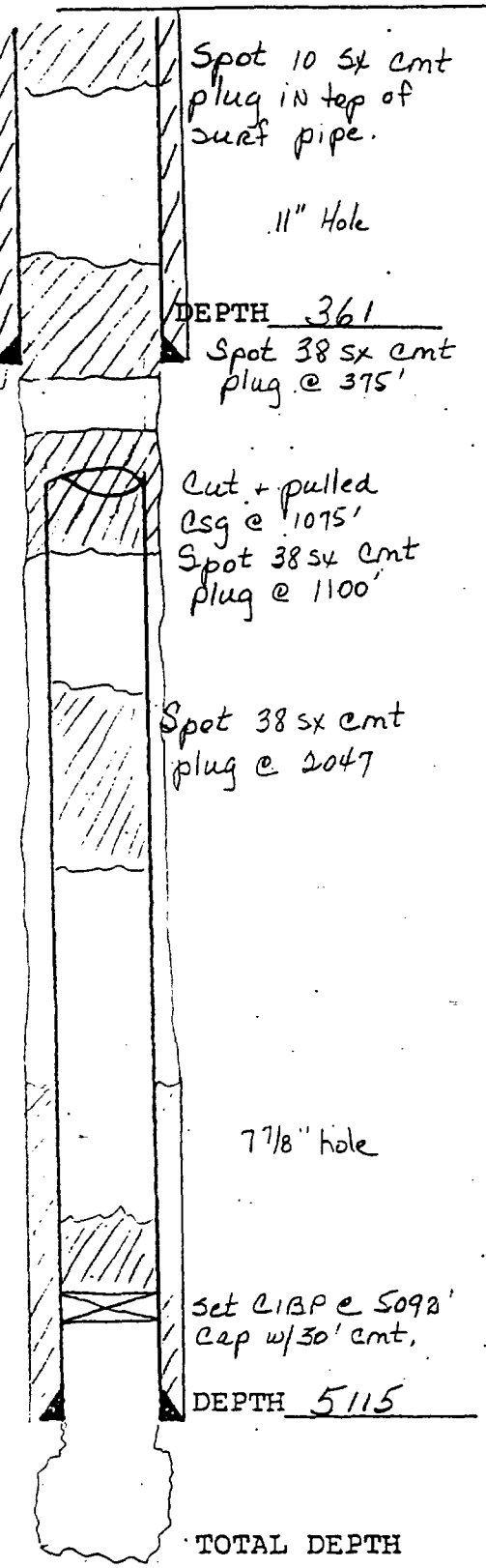
PRODUCING EQUIPMENT DATA:
PUMPING UNIT SIZE _____ MAX. SL _____
PUMP DATA _____ SN @ _____
RODS _____
TUBING _____

REMARKS:

LEASE Johnson WELL #1-A FIELD South Carter (San Andres)

LOCATION 330 FEL + 330 FSL COUNTY Lea STATE New Mexico
Sec 6, 18S, 39E

Completed (7-23-58)



ELEVATION: GL _____ KDB 3657

CASING: SURFACE 8 5/8 CSG _____ GR _____ WT _____
@ 361 W/ 200 SX. TOC Surf

PRODUCTION 5 1/2 CSG _____ GR _____ WT _____
@ 5115 W/ 100 SX. TOC 4734 Calc

INITIAL COMPLETION: FORMATION: Natural OH Completion. Acidize w/14,000 gals in stages from 5155-5228.

SUBSEQUENT WORKOVERS AND RECONDITIONING:
(8-24-73) Set CIBP @ 5092' cap w/30' cmt. Spot 38 sx cmt plug @ 2047. Cut + pulled csg @ 1075' Spot 38 sx cmt plug @ 1100'. Spot 38 sx cmt plug @ 375'. Spot 10 sx cmt plug in top of surface pipe.

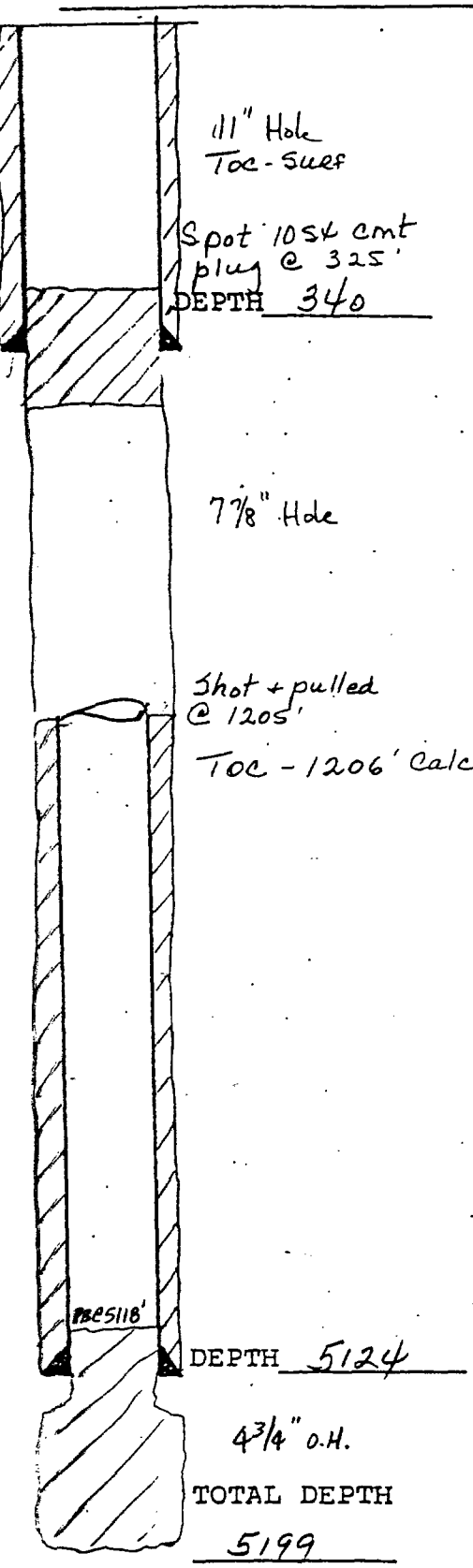
PRODUCING EQUIPMENT DATA:
PUMPING UNIT SIZE _____ MAX. SL _____
PUMP DATA _____ SN @ _____
RODS _____
TUBING _____

REMARKS:

LEASE F.J. Danglade Fee WELL #1 FIELD South Caprock (San Andres)

LOCATION 330 FSL + 1650 FEL COUNTY Lea STATE N.M.
Sec 6, 18S-39E

Completed (2-1-59)



ELEVATION: GL _____ KDB 3642

CASING: SURFACE 8 5/8 CSG _____ GR 24# WT
@ 340 W/ 225 SX. TOC Surf

PRODUCTION 5 1/2 CSG _____ GR 14# WT
@ 5124 W/ 100 SX. TOC 1206

INITIAL COMPLETION: FORMATION: Natural OH
Completion. Acidice w/7000 gals acid.

SUBSEQUENT WORKOVERS AND RECONDITIONING:
(2-6-60) Spot 15 sx cmt @ btm of well. Shot + pulled csg @ 1205'. Spot 10 sx cmt @ 325'.

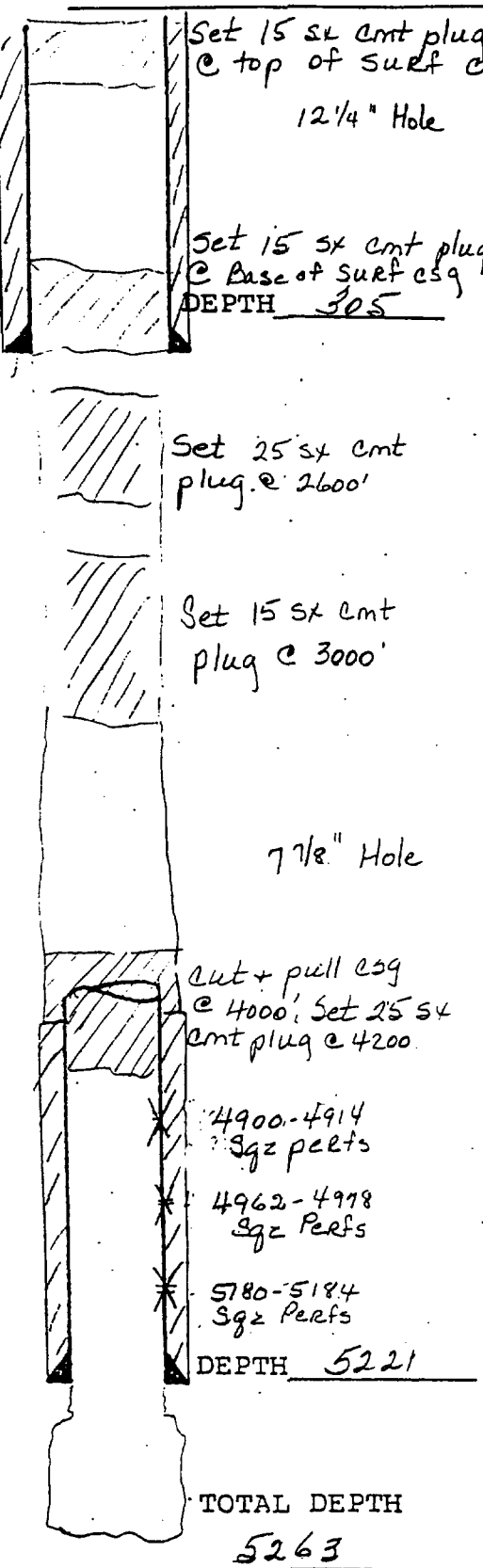
PRODUCING EQUIPMENT DATA:
PUMPING UNIT SIZE _____ MAX. SL _____
PUMP DATA _____ SN @ _____
RODS _____
TUBING _____

REMARKS:

LEASE Steve Taylor "B" WELL #1 FIELD South Caster (San Andres)

LOCATION 660 FNL & 660 FEL COUNTY Lea STATE New Mexico
Sec 7, 18S, 39E

Completed - 4-12-57



ELEVATION: GL _____ KDB 3649

CASING: SURFACE 8 5/8 CSG _____ GR 24# WT
@ 305 W/ 150 SX. TOC Surf
PRODUCTION 5½ CSG _____ GR 15½ WT
@ 5219 W/ 150 SX. TOC 4030

INITIAL COMPLETION: FORMATION: Perf @ 5180-5184, 4962-4978 acidize w/250 gals mud acid, 8000 gals .15% ACL. Perf 4900-4914 acidize w/250 gals Mud acid, 6,000 gals W-19.

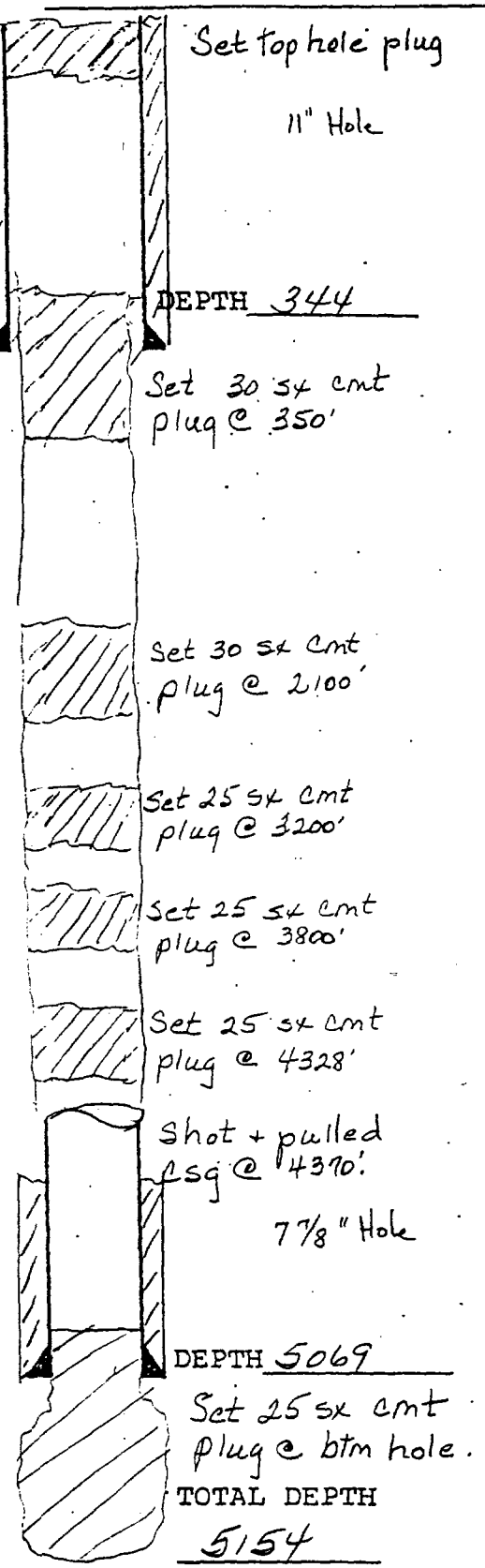
SUBSEQUENT WORKOVERS AND RECONDITIONING:
(4-12-57) Squeeze perfs 4900-4914, 4962-4978, 5180-5184 CO + deepen to 5257. Acidize w/500 gals Mud acid. Frac w/10,000 gals oil-10,000# Sand.
(7-12-57) Set 25 sx cmt plug @ 4200. Cut + pull csg @ 4000'. Set 15 sx cmt plug @ 3000'. Set 25 sx cmt plug @ 2600'. Set 15 sx cmt plugs @ top + btm of surface csg.

PRODUCING EQUIPMENT DATA:
PUMPING UNIT SIZE _____ MAX. SL _____
PUMP DATA _____ SN @ _____
RODS _____
TUBING _____
REMARKS:

LEASE Carter "B" WELL # 1 FIELD South Carter (San Andres)

LOCATION 1650 FNL & 330 FEL COUNTY Lea STATE New Mexico
Sec 7, 18S, 39E

Completed 2-10-60



ELEVATION: GL 3642 KDB

CASING: SURFACE 8 5/8 CSG GR 24# WT
@ 344 W/ 331 SX. TOC CIRC
PRODUCTION 5 1/2 CSG GR 14# WT
@ 5076 W/ 150 SX. TOC 4505 Calc.

INITIAL COMPLETION: FORMATION: Natural OH Completion. Acidize OH w/2000 gal non-emulsion acid.

SUBSEQUENT WORKOVERS AND RECONDITIONING:
(5-28-60) Set 25 sx cmt btm hole plug, w/hole loaded. Shot + pulled csg @ 4370'. Set cmt plugs as follows: 25 sx @ 4328, 25 sx @ 3800, 25 sx @ 3200, 30 sx @ 2100, 30 sx @ 350. Set top hole plug + marker.

PRODUCING EQUIPMENT DATA:
PUMPING UNIT SIZE MAX. SL
PUMP DATA SN @
RODS
TUBING

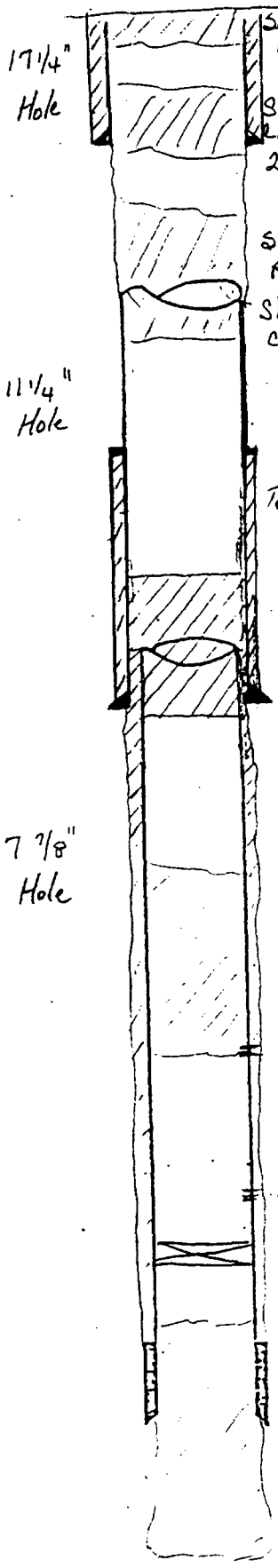
REMARKS:

Attachment F.11

WELL DATA SHEET Date 8-12-94

Lease McQUEIN Well NO. #1 Field South Carter (San Andres)

Location 1980 FNL - 435 FEL Sec 8-18S-39E County Lea State N.M.



P. BTD 5381'

T. D. 6500'

Date Completed: 2-1-55

Well Elevation: 3642 GR KB

Producing Formation:

From ' to '

' to '

Initial Production BOPD BWPD

Initial Treatment: Perf @ 5025-35 w/6 SPF. Trt w/14,000 gals acid + 14,000 gals Sd. oil.

Subsequest Workover or Reconditioning: (2-24-59) Set CIBP @ 5076. Perf 5058-5066 w/4 SPF. Acidize w/5000 gals.

(5-4-70) Load Hole w/10.5 ppg Mud. Set 25 sx cmt plug 4835-5035. Shot + pull csg @ 3375. Set 35 sx cmt plug @ 3280-3410. Shot + pull 8 5/8 csg @ 1200. Set 35 sx cmt

Present Production: BOPD BWPD

Gas: MCF/D

Static F.L. @ ' Date

Pumping F.L. @ ' Date

Well Depth by SLM ' Date

Static BHP psi @ Ga. Depth

Date

~~Tubular Data:~~ Cont'd plug 1160-1218, 25 sx cmt plug 280-310 + @ 10 sx cmt plug @ surface.

Remarks:

FORM C-108 APPLICATION
GREAT WESTERN DRILLING COMPANY
SOUTH CARTER SAN ANDRES WATERFLOOD PROJECT

VII. Attach data on the proposed operation, including:

1. Proposed average and maximum daily rate and volume of fluids to be injected;

Proposed Average Rate:	**2000 BWIPD (400 BWIPD/well)**
Proposed Maximum Rate:	**3000 BWIPD (600 BWIPD/well)**
Proposed Volume to be Injected:	**15,000,000 BW (~1 HCPV)**

2. Whether system is open or closed;

   The waterflood operation will be a closed system.

3. Proposed average and maximum injection pressure;

Proposed Average Inj. Pressure:	**800 psi**
Proposed Maximum Inj. Pressure:	**1025 psi**

4. Sources and appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water;

   Sources: **San Andres produced water & Ogallala makeup water. Analysis and the compatibility results of Ogallala with the San Andres are attached (Attachment G.2).**

5. If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.).

   Not applicable to this project.

Martin Water Laboratories, Inc.
WATER CONSULTANTS SINCE 1953
BACTERIAL AND CHEMICAL ANALYSES

P. O. BOX 1468
MONAHANS, TEXAS 79756
(915) 943-3234 or 563-1040

709 W. INDIANA
MIDLAND, TEXAS 79701
(915) 683-4521

August 26, 1994

Mr. Joe Clements
Great Western Drilling Company
P. O. Box 515
Lovington, NM 88260

Subject: Recommendations relative to laboratory #894174 (8-25-94), American Exploration water supply well.

Dear Mr. Clements:

The objective herein is to evaluate compatibility between the supply water and each of the produced waters recorded on laboratory #894133 (8-23-94). We have carefully compared all of these waters and have encountered a single condition of concern regarding this compatibility. This supply water contains a significant amount of oxygen and all of the produced waters contain a significant amount of hydrogen sulfide. Therefore, any resulting combination would cause precipitation of elemental sulfur and serious aggravation of an already severe corrosiveness from the individual waters. The only means to resolve this would be through the elimination of the oxygen from the supply water prior to mixing with the produced waters.

We would not consider this incompatibility to be of sufficient magnitude to cause any need for concern if there are any plans to inject this supply well alone into the producing intervals represented by the produced waters. This incompatibility would be so extensively distributed throughout the reservoir that we feel the minor precipitation of sulfur that would occur would clearly have no detectable influence on the mobility of the fluid back in the reservoir.

Yours very truly,

Wayfan C. Martin

WCM/plm

P. O. BOX 1468
MONAHANS, TEXAS 79756
PH. 943-3234 OR 563-1040

Martin Water Laboratories, Inc.

709 W. INDIANA
MIDLAND, TEXAS 79701
PHONE 683-4521

RESULT OF WATER ANALYSES

TO: Mr. Joe Clements
P. O. Box 515, Lovington, NM 88260

LABORATORY NO. 894174
SAMPLE RECEIVED 8-25-94
RESULTS REPORTED 8-26-94

COMPANY Great Western Drilling Company LEASE American Exploration
FIELD OR POOL
SECTION BLOCK SURVEY COUNTY Gaines STATE TX
SOURCE OF SAMPLE AND DATE TAKEN:
NO. 1 Raw water - taken from water supply well. 8-25-94 (OGALLALA)
NO. 2
NO. 3
NO. 4
REMARKS:

CHEMICAL AND PHYSICAL PROPERTIES	NO. 1	NO. 2	NO. 3	NO. 4
Specific Gravity at 60° F.	1.0016			
pH When Sampled	7.8			
pH When Received	7.52			
Bicarbonate as HCO_3	156			
Supersaturation as $CaCO_3$	0			
Undersaturation as $CaCO_3$	--			
Total Hardness as $CaCO_3$	152			
Calcium as Ca	41			
Magnesium as Mg	12			
Sodium and/or Potassium	55			
Sulfate as SO_4	81			
Chloride as Cl	43			
Iron as Fe	0.65			
Barium as Ba	0			
Turbidity, Electric	12			
Color as Pt	35			
Total Solids, Calculated	388			
Temperature °F.	70			
Carbon Dioxide, Calculated	4			
Dissolved Oxygen,	3.3			
Hydrogen Sulfide	0.0			
Resistivity, ohms/m at 77° F.	20.70			
Suspended Oil				
Filtrable Solids as mg/l	2.5			
Volume Filtered, ml	2,000			

Results Reported As Milligrams Per Liter

Additional Determinations And Remarks: Letter of recommendation attached.

Form No. 3

By Waylan G. Martin, M.A.

FORM C-108 APPLICATION
GREAT WESTERN DRILLING COMPANY
SOUTH CARTER SAN ANDRES WATERFLOOD PROJECT

VIII. Attach appropriate geologic data on the injection zone including appropriate lithologic detail, geological name, thickness and depth.

The Carter, South (San Andres) field produces from porous dolomite in the San Andres formation at depths ranging from 5000' to 5250'. The San Andres dolomite in the the field varies in thickness from 600' to 770'. The productive interval occurs approximately 250' from the top of the San Andres (refer to type log) where the dolomite is cleaner with less interruptions from deeper water mudstones or shelfal anhydrite.

Give the geologic name, and depth to bottom of all underground sources of drinking water (acquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such source known to be immediately underlying the injection interval.

The only known drinking water source overlying the proposed injection interval is the Ogallala, which occurs at an approximate depth of 125'-140'. There are no such drinking water sources underlying the injection interval.

IX. Describe the proposed stimulation program, if any.

Any stimulation performed will involve either a cleanup acid job or acid-stimulating new perfs or open-hole pay. In either case, the acid jobs would include using 15% NEFEHCL at 50-75 gallons per net foot of pay, utilizing ball sealers and/or rock salt for diversion. The jobs will be pumped at relatively low rates of 2-3 BPM.

Attachment 1

P. O. BOX 1468
MONAHANS, TEXAS 79756
PH. 943-3234 OR 563-1040

Martin Water Laboratories, Inc.

709 W. INDIANA
MIDLAND, TEXAS 79701
PHONE 683-4521

RESULT OF WATER ANALYSES

TO: Mr. Joe Clements
P.O. Box 515, Lovington, NM 88260

LABORATORY NO. 894146
SAMPLE RECEIVED 8-16-94
RESULTS REPORTED 8-23-94

COMPANY Great Western Drilling Company LEASE As listed
FIELD OR POOL
SECTION ____ BLOCK ____ SURVEY ____ COUNTY Lea STATE NM
SOURCE OF SAMPLE AND DATE TAKEN:
NO. 1 Raw water - taken @ Bar 4 Dairy (8/10 mile west of carter battery).
NO. 2 Raw water - taken @ John Offutt home (8/10 mile north of carter battery).
NO. 3 Raw water - taken from ranch windmill (8/10 mile south of McQuien battery).
NO. 4

REMARKS: Samples taken 8-16-94 by Tom Elrod, Martin Water Laboratories, Inc.

CHEMICAL AND PHYSICAL PROPERTIES

	NO. 1	NO. 2	NO. 3	NO. 4
Specific Gravity at 60° F.	1.0018	1.0020	1.0018	
pH When Sampled				
pH When Received	7.24	7.28	7.27	
Bicarbonate as HCO_3	205	205	176	
Supersaturation as $CaCO_3$				
Undersaturation as $CaCO_3$				
Total Hardness as $CaCO_3$	256	312	212	
Calcium as Ca	70	85	58	
Magnesium as Mg	19	24	17	
Sodium and/or Potassium	50	45	99	
Sulfate as SO_4	105	102	104	
Chloride as Cl	62	97	125	
Iron as Fe	0.04	0.04	0.04	
Barium as Ba				
Turbidity, Electric				
Color as Pt				
Total Solids, Calculated	513	558	578	
Temperature °F.				
Carbon Dioxide, Calculated				
Dissolved Oxygen,				
Hydrogen Sulfide	0.0	0.0	0.0	
Resistivity, ohms/m at 77° F.	15.46	13.10	12.32	
Suspended Oil				
Filtrable Solids as mg/l				
Volume Filtered, ml				
Nitrate, as N	1.8	2.1	1.1	

Results Reported As Milligrams Per Liter

Additional Determinations And Remarks The undersigned certifies the above to be true and correct to the best of his knowledge and belief.

Form No. 3

By _____
Waylan C. Martin, M.A.

GREAT WESTERN DRILLING CO.

Carter, S. (San Andres)
Lea Co., N.M.

Fresh Water Wells

DATE: SCALE:
GEOLOGIST: CONTOUR INTERVAL: