

DISTRIBUTION: Original and one copy to Santa Fe with one copy to the appropriate District Office

ISN'T AN INDEX IN THE TABLE
LOOK IN THE INDEXES COLLECTION TABLE DEF-OBJ.
TO DETERMINE THE VALID INDEX. (ERROR 3015)

OS 01025-
01026

CAPRAK QUEEN PDC

Northland Operating Co.
Drickey Queen Sand Unit
Pilot Redevelopment Project
Section 15, T14S, R31E
Chaves County, NM

Attachment A

III. Well Data

Section A

1. Lease/Well Name: Drickey Queen Sand Unit No. 54
140' FSL & 330' FEL, Section 15, T14S, R31E
Chaves County, NM

2. Casing and Cement:

PROPOSED:

Casing Size	Setting Depth	Sacks Cement	Hole Size	Top of Cement
9-5/8"	350'	165	12-1/4"	Surface
7"	3052' TVD	480 (estimated)	8-3/4"	Surface
Open Hole	5640' MD	0	6-1/4"	N/A

NOTE: It is proposed to drill a vertical hole to 2,808' TVD, then kick off at 23.5 degrees per 100 ft, reaching horizontal at 3,052' TVD. The 7" casing will be run and cemented to surface, then an additional 2490' of horizontal lateral will be drilled and completed open hole.

3. Tubing: 3-1/2", 9.3 #/ft, J-55, R-2, EUE, T&C, Internally and Externally Plastic-coated w/ Baker Epoxy 3M 134
4. Packer: 7" x 3-1/2" IPC Compression Packer, set @ 2800' +/- in vertical section of hole.

Section B

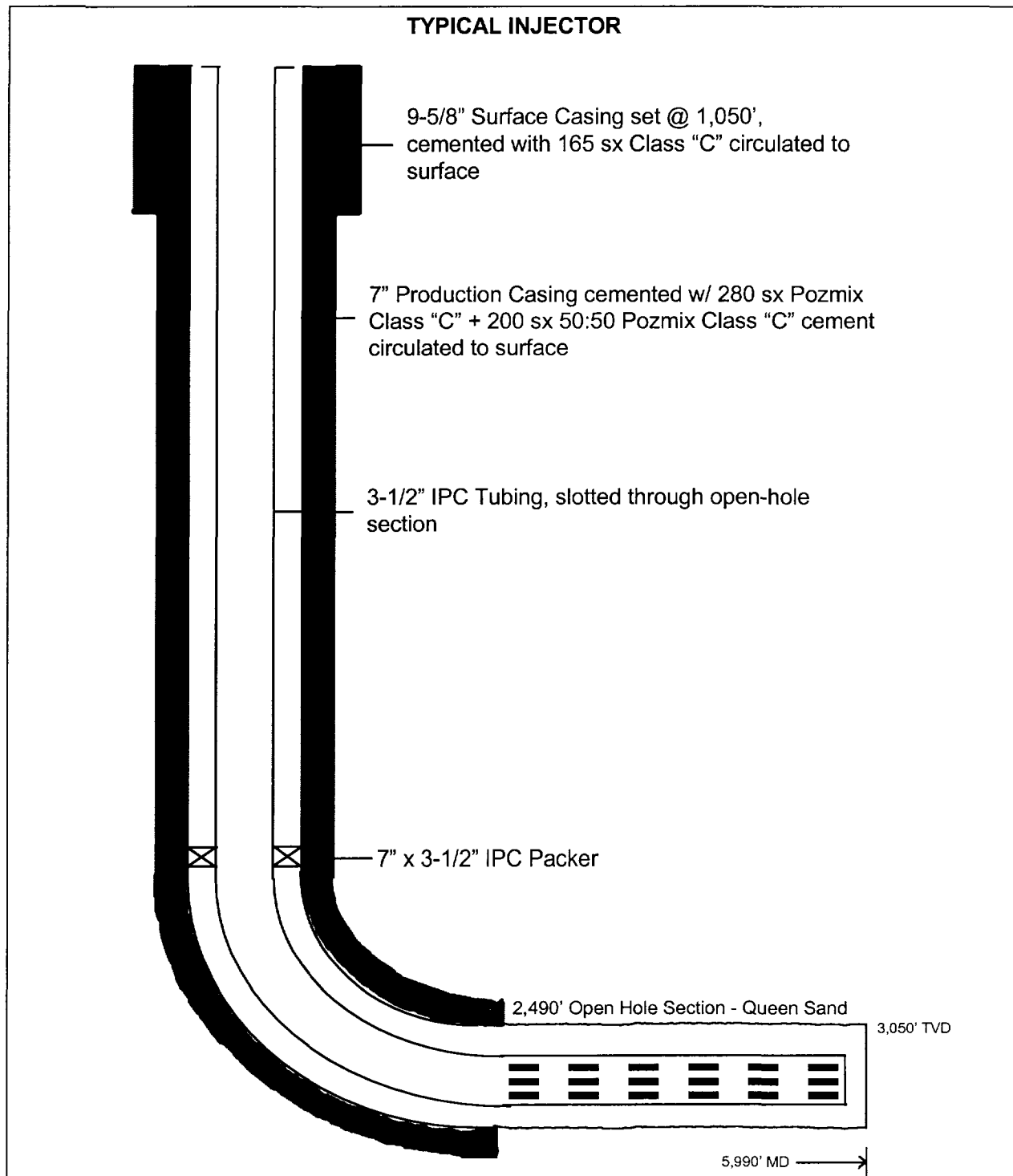
1. Injection Formation: Queen Sand
Field or Pool Name: Drickey (Queen) Field
2. Injection Interval: 3,052' (2,490' of horizontal lateral)
3. Original Purpose of Well: New Well
4. Other Perforated Intervals: None
5. Next Higher Oil/Gas Zone: Seven Rivers
6. Next Lower Oil/Gas Zone: Grayburg

See proposed wellbore schematic (Attachment B)

Northland Operating Co.
Drickey Queen Sand Unit No. 54
140' FSL & 330' FEL
Section 15, T14S, R31E
Chaves County, New Mexico

III. Continued

Attachment B



Northland Operating Co.
Drickey Queen Sand Unit
Pilot Redevelopment Project
Section 15, T14S, R31E
Chaves County, NM

Attachment A

III. Well Data

Section A

1. Lease Name: Drickey Queen Sand Unit No. 55
140' FSL & 330' FWL, Section 15, T14S, R31E
Chaves County, NM
2. Casing and Cement:

PROPOSED:

Casing Size	Setting Depth	Sacks Cement	Hole Size	Top of Cement
9-5/8"	350'	165	12-1/4"	Surface
7"	3052' TVD	480 (estimated)	8-3/4"	Surface
Open Hole	5640' MD	0	6-1/4"	N/A

NOTE: It is proposed to drill a vertical hole to 2,808' TVD, then kick off at 23.5 degrees per 100 ft, reaching horizontal at 3,052' TVD. The 7" casing will be run and cemented to surface, then an additional 2490' of horizontal lateral will be drilled and completed open hole.

3. Tubing: 3-1/2", 9.3 #/ft, J-55, R-2, EUE, T&C, Internally and Externally Plastic-coated w/ Baker Epoxy 3M 134
4. Packer: 7" x 3-1/2" IPC Compression Packer, set @ 2800' +/- in vertical section of hole.

Section B

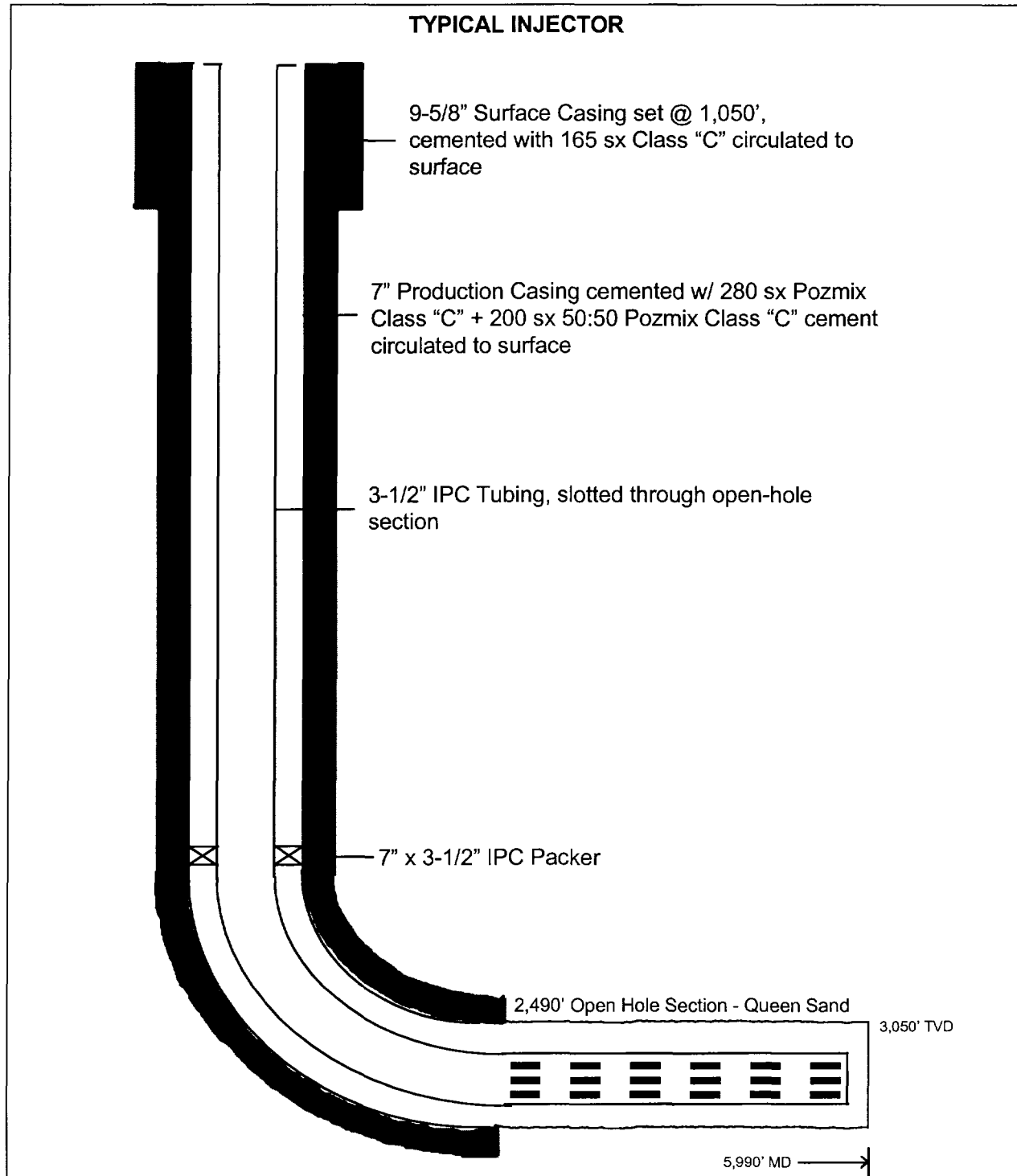
1. Injection Formation: Queen Sand
Field or Pool Name: Drickey (Queen) Field
2. Injection Interval: 3052' (2490' of horizontal lateral)
3. Original Purpose of Well: New Well
4. Other Perforated Intervals: None
5. Next Higher Oil/Gas Zone: Seven Rivers
6. Next Lower Oil/Gas Zone: Grayburg

See proposed wellbore schematic for Typical Injector (Attachment B)

Northland Operating Co.
Drickey Queen Sand Unit No. 55
140' FSL & 330' FWL
Section 15, T14S, R31E
Chaves County, New Mexico

III. Continued

Attachment B



Northland Operating Co.
Drickey Queen Sand Unit
Pilot Redevelopment Project
Section 15, T14S, R31E
Chaves County, NM

Attachment A

III. Well Data

Section A

1. Lease Name: Drickey Queen Sand Unit No. 56
140' FNL & 380' FWL, Section 15, T14S, R31E
Chaves County, NM
2. Casing and Cement:

PROPOSED:

Casing Size	Setting Depth	Sacks Cement	Hole Size	Top of Cement
9-5/8"	350'	165	12-1/4"	Surface
7"	3052' TVD	480 (estimated)	8-3/4"	Surface
Open Hole	5640' MD	0	6-1/4"	N/A

NOTE: It is proposed to drill a vertical hole to 2,808' TVD, then kick off at 23.5 degrees per 100 ft, reaching horizontal at 3,052' TVD. The 7" casing will be run and cemented to surface, then an additional 2490' of horizontal lateral will be drilled and completed open hole.

3. Tubing: 3-1/2", 9.3 #/ft, J-55, R-2, EUE, T&C, Internally and Externally Plastic-coated w/ Baker Epoxy 3M 134
4. Packer: 7" x 3-1/2" IPC Compression Packer, set @ 2800' +/- in vertical section of hole.

Section B

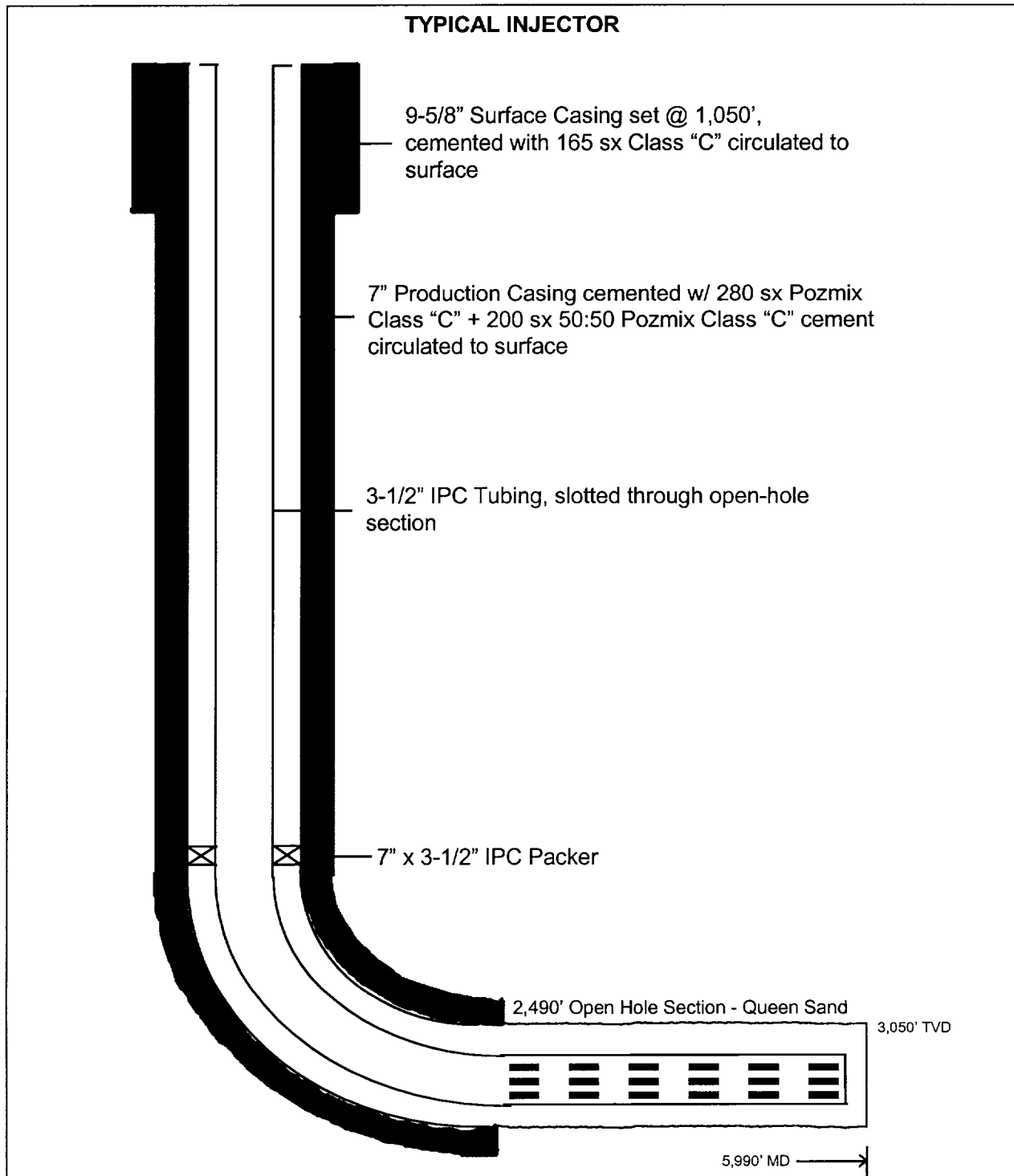
1. Injection Formation: Queen Sand
Field or Pool Name: Drickey (Queen) Field
2. Injection Interval: 3052' (2490' of horizontal lateral)
3. Original Purpose of Well: New Well
4. Other Perforated Intervals: None
5. Next Higher Oil/Gas Zone: Seven Rivers
6. Next Lower Oil/Gas Zone: Grayburg

See proposed wellbore schematic for Typical Injector (Attachment B)

Northland Operating Co.
Drickey Queen Sand Unit No. 56
140' FNL & 380' FWL
Section 15, T14S, R31E
Chaves County, New Mexico

III Continued

Attachment B



Northland Operating Co.
Drickey Queen Sand Unit
Pilot Redevelopment Project
Section 15, T14S, R31E
Chaves County, NM

Attachment A

III. Well Data

Section A

1. Lease Name: Drickey Queen Sand Unit No. 57
140' FNL & 330' FEL, Section 15, T14S, R31E
Chaves County, NM
2. Casing and Cement:

PROPOSED:

Casing Size	Setting Depth	Sacks Cement	Hole Size	Top of Cement
9-5/8"	350'	165	12-1/4"	Surface
7"	3052' TVD	480 (estimated)	8-3/4"	Surface
Open Hole	5640' MD	0	6-1/4"	N/A

NOTE: It is proposed to drill a vertical hole to 2,808' TVD, then kick off at 23.5 degrees per 100 ft, reaching horizontal at 3,052' TVD. The 7" casing will be run and cemented to surface, then an additional 2490' of horizontal lateral will be drilled and completed open hole.

3. Tubing: 3-1/2", 9.3 #/ft, J-55, R-2, EUE, T&C, Internally and Externally Plastic-coated w/ Baker Epoxy 3M 134
4. Packer: 7" x 3-1/2" IPC Compression Packer, set @ 2800' +/- in vertical section of hole.

Section B

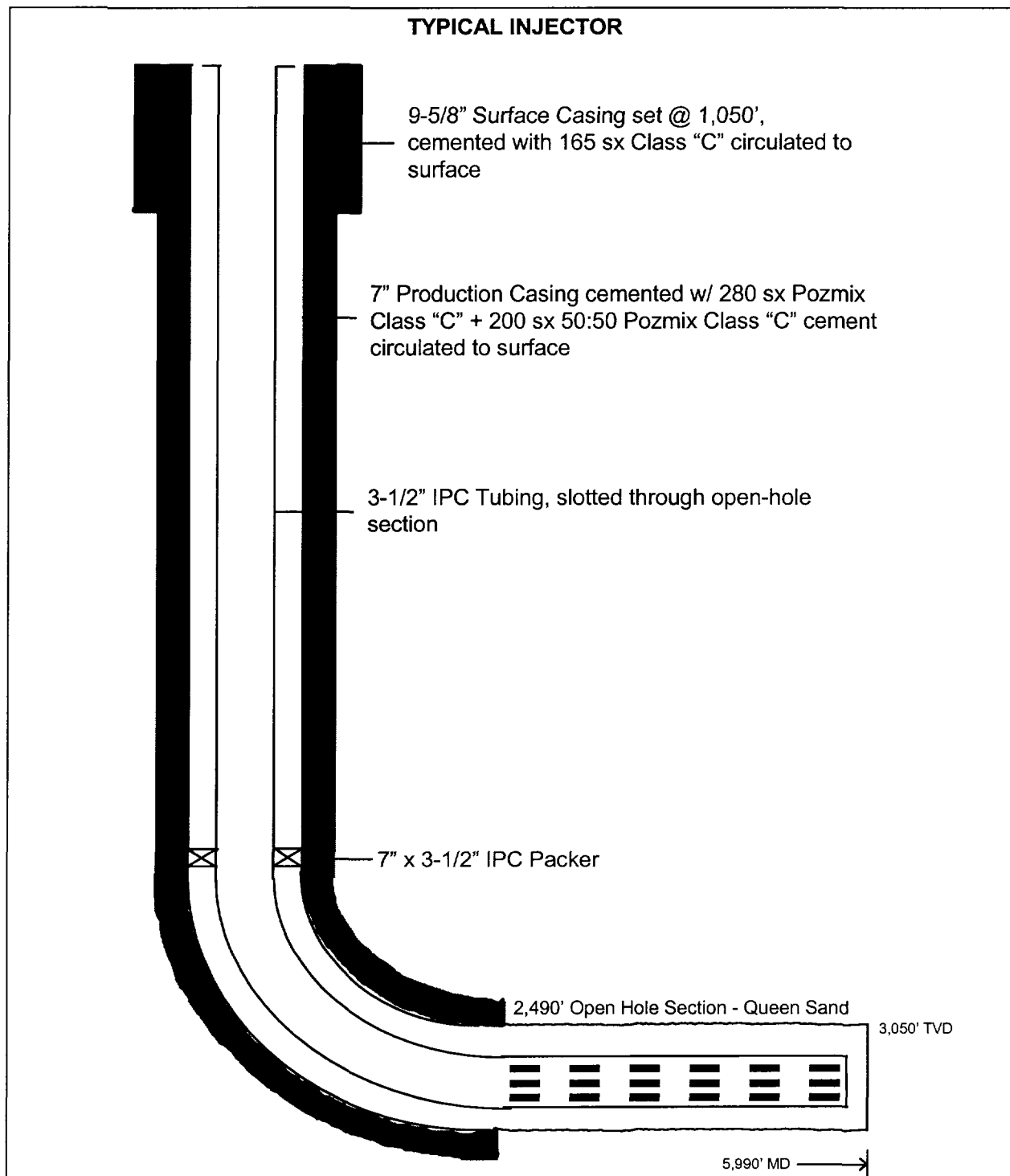
1. Injection Formation: Queen Sand
Field or Pool Name: Drickey (Queen) Field
2. Injection Interval: 3052' (2490' of horizontal lateral)
3. Original Purpose of Well: New Well
4. Other Perforated Intervals: None
5. Next Higher Oil/Gas Zone: Seven Rivers
6. Next Lower Oil/Gas Zone: Grayburg

See proposed wellbore schematic for Typical Injector (Attachment B)

Northland Operating Co.
Drickey Queen Sand Unit No. 57
140' FNL & 330' FEL
Section 15, T14S, R31E
Chaves County, New Mexico

III Continued

Attachment B



Northland Operating Co.
Drickey Queen Sand Unit
Pilot Redevelopment Project
Section 15, T14S, R31E
Chaves County, NM

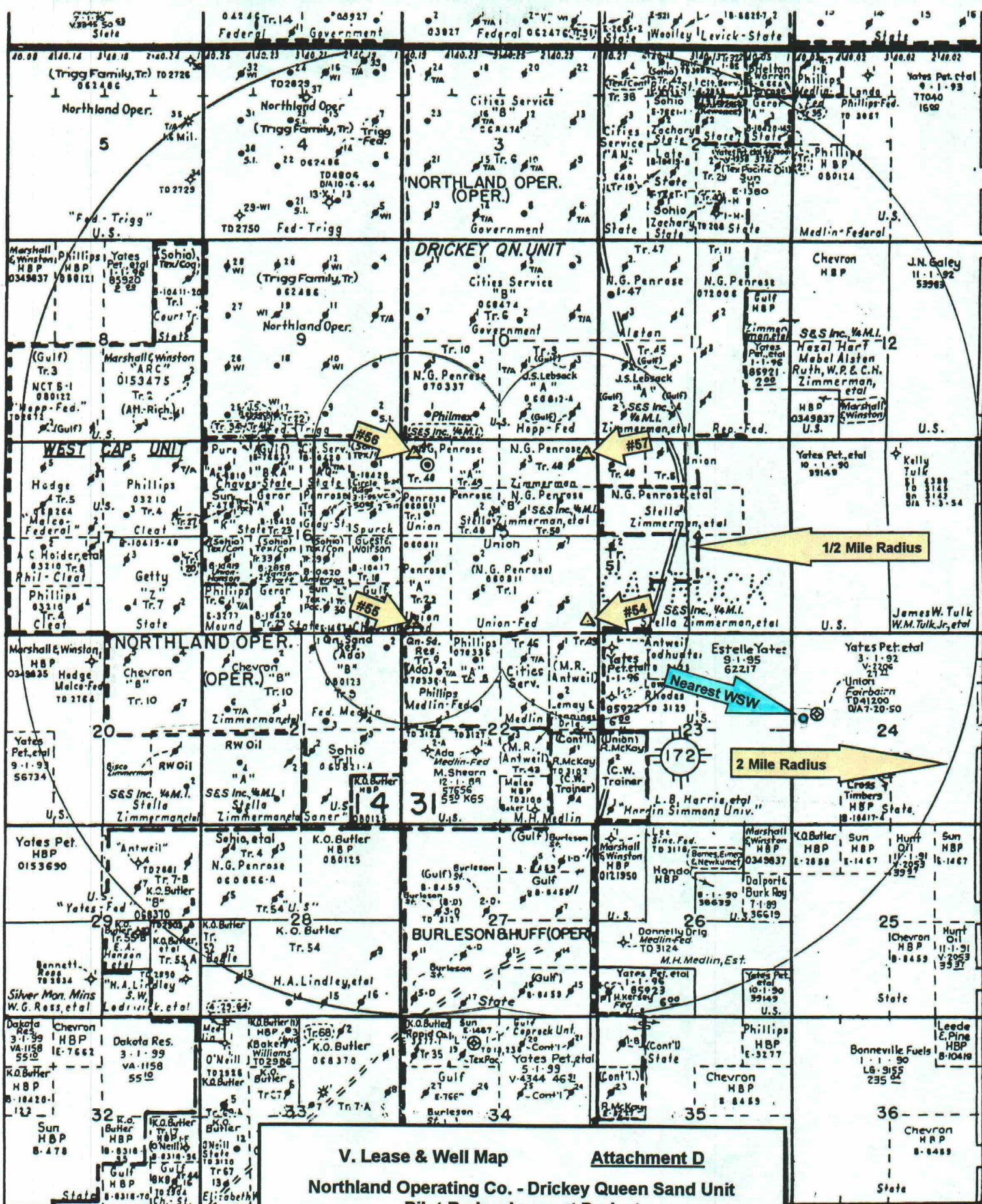
IV. Project Description

The proposed project is a pilot redevelopment project designed to improve the sweep efficiency and overall waterflood recoveries associated with the Drickey Queen Sand Unit located in the Caprock (Queen) Field in Chaves County, New Mexico. It is, therefore, an expansion of an existing project

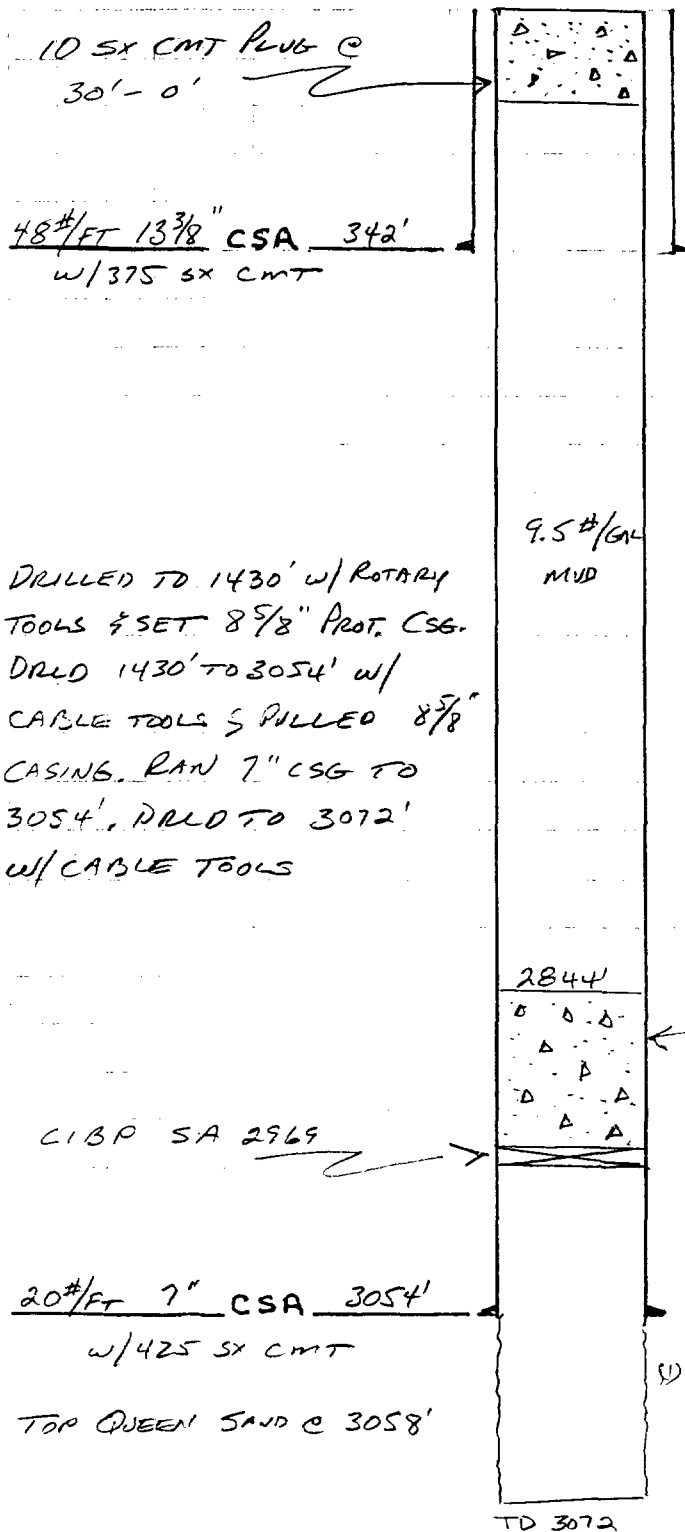
As you are aware, this field was discovered in 1948 and developed during the time period from 1954-1956. The field was developed into twelve (12) contiguous waterflood units from 1960-64. Active waterflood operations on the Drickey Queen Sand Unit continued until the late 1960's and early 1970's when the low oil prices caused the unit to become uneconomical. The unit was sold to independents, who cut back on water injection and began salvage operations. With the increase in oil prices in the late 1970's, plugging operations were discontinued and the unit was operated as a stripper property.

A recent reservoir study was conducted on the field that resulted in the conclusion that waterflood recoveries as a percentage of original oil in place were low in this unit as a result of poor injectivity related to high oil viscosity. The high oil viscosity was a result of the early blowdown of gas from the reservoir during cable-tool drilling operations.

The proposed pilot project will test the theory that horizontal lateral injection isolated in the main Queen Sand zone will overcome the injectivity problem and better enable reservoir repressurization and volumetric sweep.



Subject UNIT DRICKEY QUEEN FIELD CAPROCK Date _____
WELL 10 I (T-3-3) LOCATION 14S 31E 10I Sheet _____ of _____
CURRENT STATUS PxA PRODUCER (PxA 10/27/70) Project No. _____
 By _____

MEAS. DATUM: 4415 DFKB ELEV: DF GR. ELEV: _____

PxA 10/27/70 By CITIES SERVICE

CIBP SET @ 2969' w/25 SX CMT PLUG
ON TOP OF B.P. @ 2969-2844'. LOADED
HOLE w/MUD, SET 10 SX CMT PLUG
@ SURF. 30'-0' w/PxA MARKER.
NO PIPE PULLED

(1) 7-10-54 ORIG. COMP. IN OPEN
HOLE SECTION 3058-3072'

IPP: 183 BOPD, 38° API, NATURAL

LAST PROD: 6/69 @ 3 BOPD

PxA 10/27/70

Subject	UNIT DRICKEY QUEEN FIELD CAPROCK	Date
WELL 100 (T-3-2)	LOCATION 145 31E 100	Sheet of
CURRENT STATUS	PXA PRODUCER (PXA 10/27/70)	Project No.
		By

10 SX CMT PLUG @
SURFACE 30'-0' →

MEAS. DATUM: 4281 DF
KB ELEV: DF GR. ELEV:

48#/FT 13³/₈" CSA 332
w/ 400 SX CMT.

PXA 10/27/70 BY CITIES SERVICE
CIBP SET @ 2858' w/ 25 SX CMT PLUG
ON TOP OF B.P. @ 2858-2733'. LOADED
HOLE w/ MUD. SET 10 SX CMT PLUG
@ SURFACE 30'-0' w/ PXA MARKER
NO PIPE PULLED

NOTE:

DRLD TO 1290' w/ ROTARY
TOOLS. RAN 8⁵/₈" CSG &
SET w/ MUD. DRLD FROM
1250 TO 2915' w/ CABLE
TOOLS. RECOVERED 8⁵/₈"
CSG & RAN 2915' OF 7"
PRODUCTION CSG. CMTD &
D.O. w/ CABLE TOOLS TO
2930'.

9.5# GAL
MUD

2733

← 25 SX CMT PLUG 2858'-2733'

CIBP SET @ 2858' →

20#/FT 7" CSA 2915'
w/ 400 SX CMT.

TOP QUEEN SN @ 2920

TD 2930

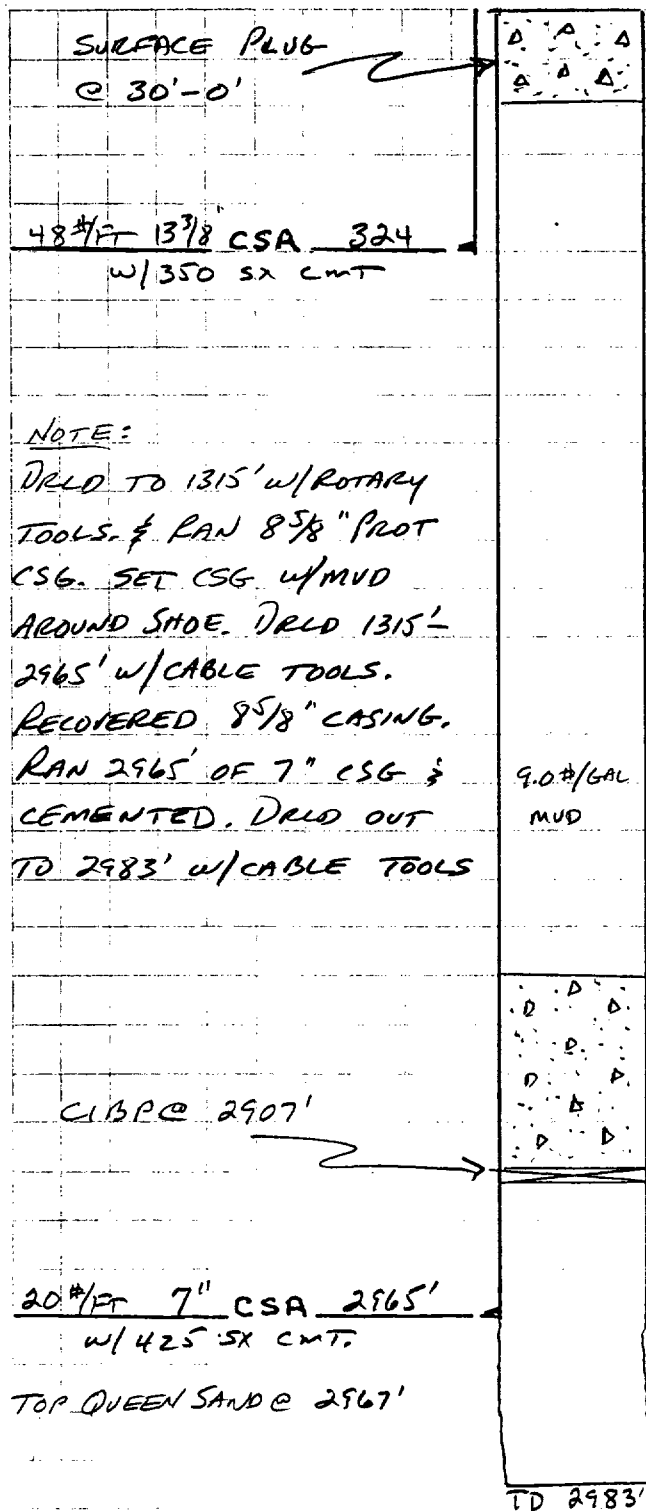
(1)
CA

(1) 7-24-54 ORIG COMP IN OPEN HOLE
SECTION 2900'-2930'.

IPP: 300 BPLOPD, 35.0° API, NATURAL
LAST PROD 6/68 @ 4 BOPD

(2) PXA 10/27/70

Subject	UNIT <u>DRICKEY QUEEN</u> FIELD <u>CAPROCK</u>	Date
	WELL <u>10P (T-3-4)</u> LOCATION <u>145 31E 10P</u>	Sheet of
	CURRENT STATUS <u>PXA INJECTOR</u> (PXA 11/12/70)	Project No.
		By



MEAS. DATUM: 4315 DF
KB ELEV: DF GR. ELEV: 4304

PXA 11/12/70 BY CITIES SERVICE
CIBP SET @ 2907' w/25 SX CMT PLUG
ON TOP OF B.P. @ 2907'-2782'. LOADED
HOLD w/MUD. SET 10 SX CMT PLUG @
SURF 30'-0' w/PXA MARKER. NO
PIPE PULLED.

← 25 SX CMT PLUG 2907'-2782'

(1) 9-12-54 ORIG. COMP. IN OPEN HOLE
SECTION 2967'-2983'.

IPP: 160 BPLOPD, NATURAL, 37° API
LAST PROD: 11/9/61 @ 11 BOPD

(2) 11-21-61 CONVERTED TO WATER
INJECTION THRU 2 3/8\" TBG &
UDELL PKR SET @ 2941'.

(3) PXA 11/12/70

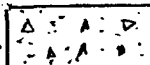
Subject UNIT DRICKEY QUEEN FIELD CAPROCK Date _____
WELL 11L (T-45-1) LOCATION 14S 31E 11L Sheet _____ of _____
 CURRENT STATUS PXA INJECTOR (PXA 10/23/70) Project No. _____
 By _____

SURFACE PLUG @ 30'-0'

32#/FT 9 5/8" CSA 329
 w/300 SX cmt.

CIBP @ 2960 w/25 SX
 CMT PLUG @ 2960-2835'

20#/FT 7" CSA 3049
 w/1390 SX cmt.



TD 3071

MEAS. DATUM: 4419 TOP TBG HD

KB ELEV: 4426' GR. ELEV: 4417'

10-23-70 PXA BY CITIES SERVICE

CIBP SA 2960' w/25 SX CMT PLUG
 ON TOP @ 2960-2835'. LOADED HOLE
 w/MUD. SET 10 SX CMT PLUG @
 SURF 30'-0'.

NO RECORD OF PIPE PULLED FROM
 THIS WELL.

TOP QUEEN SAND @ 3060' (11' BELOW CSG SHOE)

(1) 10/18/54 ORIG. COMP. IN OPEN
 HOLE SECTION 3060-3071'. TREATED
 w/8000 GALS FRAC OIL & 8000#
 SAND

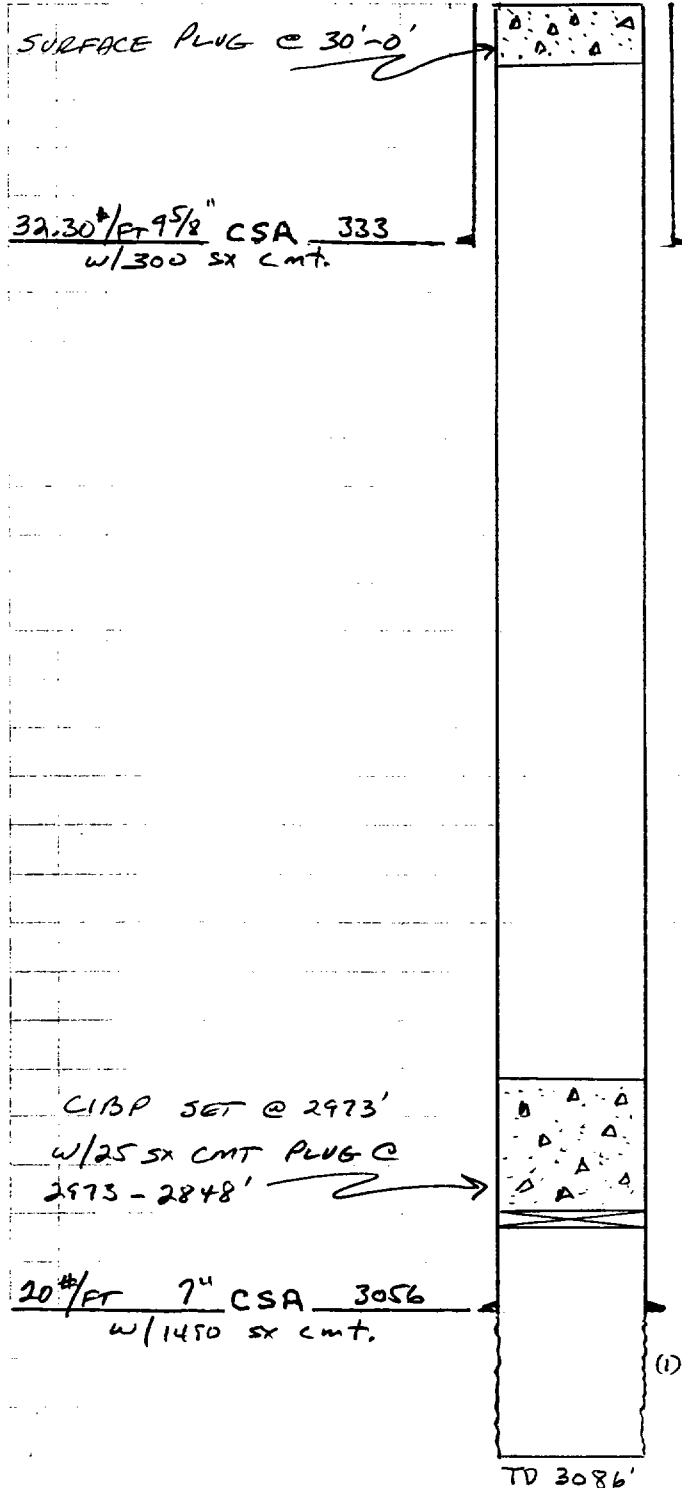
IAP: 89 BOPD,
 LAST PROD: 8/61

(2) 8/29/61 - CONVERTED TO WATER
 INJECTION. INJECTED INTO O.H.
 THRU 2 3/8" TBG & PKR. SA 3014'.

PXA: 10/23/70

LAST INJECTION:

Subject UNIT DRICKEY QUEEN FIELD CAPROCK Date _____
WELL 11M (T-45-2) LOCATION _____ Sheet _____ of _____
 CURRENT STATUS _____ PXA PRODUCER (PXA 5/26/70) Project No. _____
 By _____



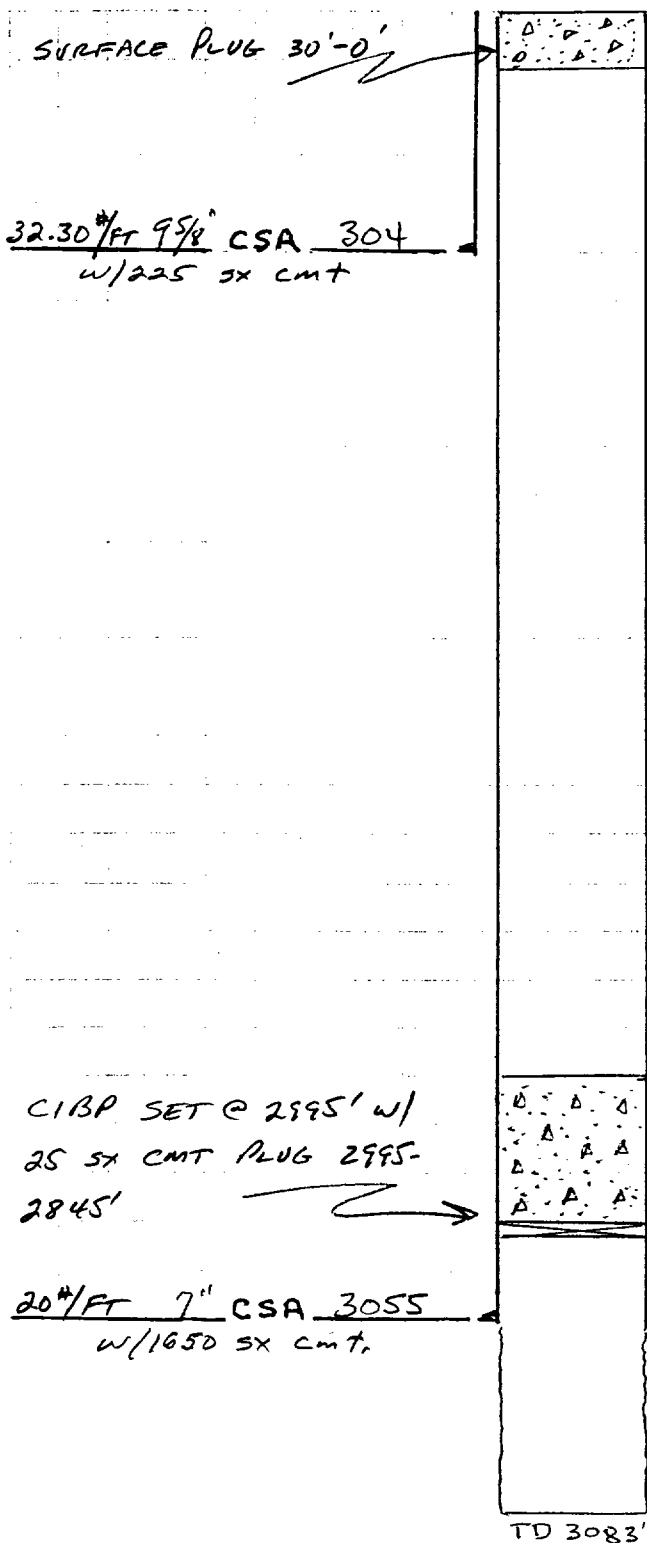
MEAS. DATUM: 4413 DF
 KB ELEV: DF GR. ELEV: 4402'

5-26-70 PXA BY CITIES SERVICE
 CIBP SET @ 2973' w/ 25 CMT PLUG ON
 TOP B.P. @ 2973-2848'. LOADED HOLE
 w/ MUD. SET 10 SX CMT PLUG @
 SURF. 30'-0'.
 NO PIPE PULLED

TOP QUEEN SAND @ 3064' (8' BELOW CSG SHOE)

- (1) 11/14/54 ORIG. COMP. IN OPEN HOLE
 SECTION 3064-3086'. SAND FRAC
 3064-86' w/ 8000 GALS LSE OIL
 & 4000 # SAND. IPP 103 BOPD, 36'
 LAST PROD: 6/69 @ 7 BOPD.

Subject UNIT DRICKEY QUEEN FIELD CAPROCK Date _____
WELL 11N (T-45-4) LOCATION 14S 31E 11N Sheet _____ of _____
 CURRENT STATUS PXA INJECTOR (PXA 5/19/70) Project No. _____
 By _____



MEAS. DATUM: 4406' TOP TBG HD.

KB ELEV: 4414' GR. ELEV: 4404'

5-19-70 PXA BY CITIES SERVICE

CIBP SET @ 2995' W/ 25 SX CMT PLUG
 ON TOP OF B.P. @ 2995'-2845'. LOADED
 HOLE W/MUD. SET 10 SX CMT PLUG
 @ SURF 30'-0'.

NO PIPE PULLED

TOP QUEEN SAND @ 3068' (13' BELOW CSG SHOE)

(1) 1/25/55 ORIG COMP IN OPEN HOLE

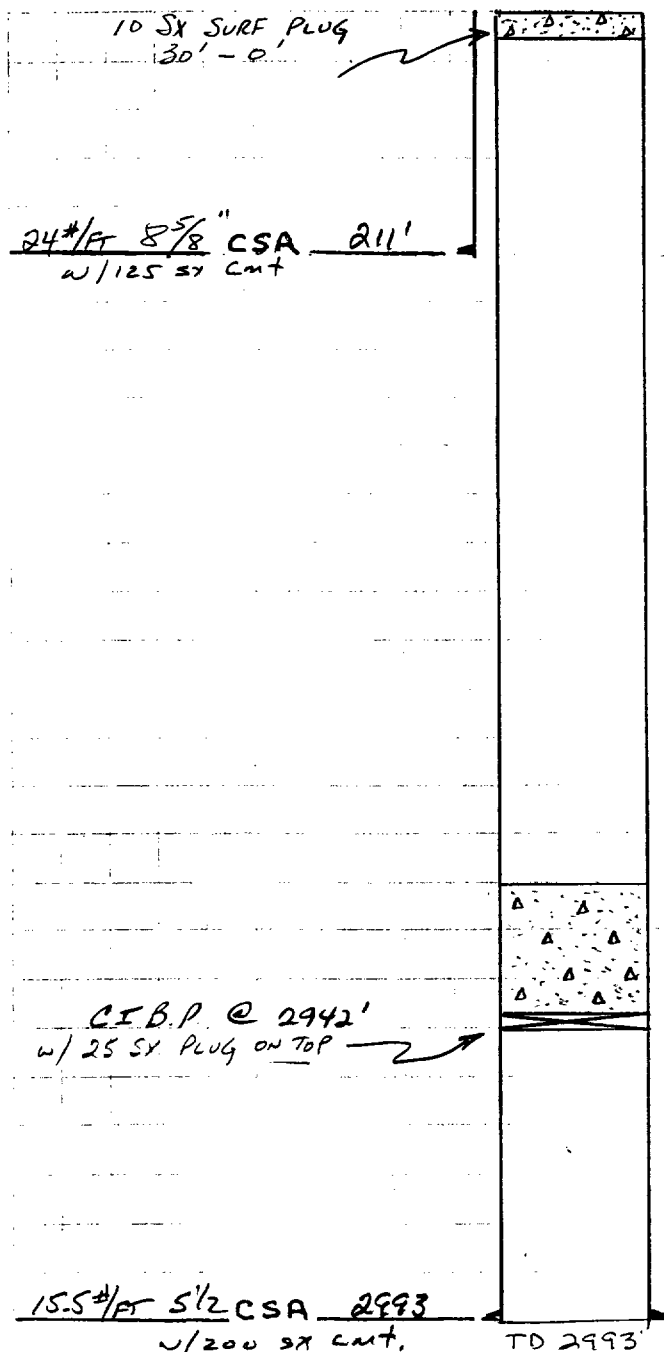
SECTION 3068'-3083'. FRACED W/
 8000 GALS OIL + 8000 # SAND

IPP: 75 BORD, 360 API

LAST PROD: 5/62 PXA 5/19/70

(2) 6/4/62' CONVERTED TO WATER
 INJECTION WELL. INJECTED INTO
 OIL THRU 2 3/8" TBG & PER SET
 @ 3025'.

Subject UNIT DRICKEY QUEEN FIELD CAPROCK Date _____
WELL 14L (T-51-2) LOCATION 14S 31E 14L Sheet _____ of _____
 CURRENT STATUS PXA INJECTOR (PXA 11/12/70) Project No. _____
 By _____



MEAS. DATUM: 4295 DF

KB ELEV: _____ GR. ELEV: _____

11/12/70 P&A Well BY CITIES SERVICE

CIBP SET @ 2942' w/ 25 SX CMT PLUG
 ON TOP OF BP @ 2942-2922'
 LOADED HOLE w/ MUD. SET 10 SX CMT
 PLUG @ SURF. (30'-0') w/ MARKER

CIBP @ 2942'
w/ 25 SX PLUG ON TOP →

TOP QUEEN SAND @ 2968'

(1) (12)

(1) 11/10/55 ORIG COMP. THRU PERFS
 2970'-2973'. TREATED PERFS
 w/ 8000 GALS FRAC-OIL & 10000#
 SAND. IP: 44 BOPD
 LAST PROD: 2/61 PXA: 11/12/70

(2) 2/1/61 CONVERTED TO WATER
 INJECTION

UNIT DRICKEY QUEEN FIELD CAPROCK Date _____
 WELL 14D (T-48-5) LOCATION 14S 31E 14D Sheet _____
 CURRENT STATUS PXA INJECTOR Project No. _____
 By _____

10 SX SURF PLUG
30'-0'

45.45#/FT 12^{3/4}" CSA 171'
W/200 SX CMT

MEAS. DATUM: 4294 DF

KB ELEV: DF GR. ELEV: _____

11-12-70 PXA WELL BY CITIES SERVICE
 CIBP SET @ 2900' W/25 SX CMT PLUG
 ON TOP OF B.P. @ 2900-2975'. LOADED
 HOLE W/MUD, SET 10 SX CMT PLUG @
 SURF 30'-0 W/PXA MARKER

NOTE: 8^{5/8}" CSG SET @
 1257'. CABLE TOOLS WERE
 USED TO DRILL TO 2963'.
 8^{5/8}" CSG WAS RECOVERED
 BEFORE SETTING 7" OIL
 STRING @ 2948'

20#/FT 7" CSA 2948'
W/125 SX CMT

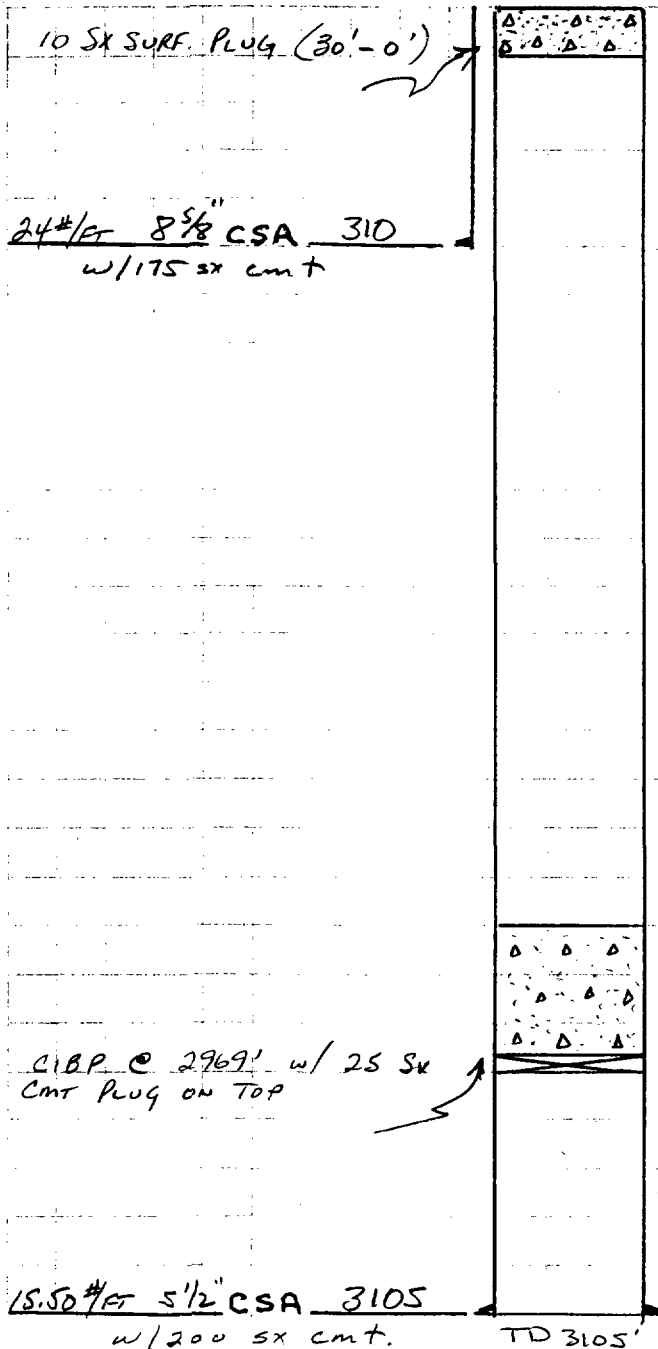
TOP QUEEN SH @ 2951'

TD 2963'

(1) 5-27-55 ORIG COMP IN OPEN HOLE
 SECTION 2951-2963'. FRACED O.H.
 2951-63' W/6000 GALS LSE OIL & 6000#
 SAND. IPP: 25 BPLOPD, 36°API
 LAST PROD 5/2/62 @ 430PD.

(2) 5-28-62 CONVERTED TO WIW. INJECTED
 INTO O.H. THRU 2^{3/8}" IPC TSG &
 PER SA

Subject UNIT DRICKEY QUEEN FIELD CAPROCK Date _____
WELL 14C (T-51-1) LOCATION 145 31E 14C Sheet _____ of _____
 CURRENT STATUS PXA PRODUCER (10/23/70 PXA) Project No. _____
 By _____

MEAS. DATUM: 4417 DFKB ELEV: DF GR. ELEV: _____PXA 10/23/70 BY CITIES SERVICESET CIBP @ 2969' IN 5 1/2" CSG. w/
25 SX CMT PLUG ON TOP 2969-2749'.SET 10 SX SURF PLUG @ 30'-0' w/
MARKERCIBP @ 2969' w/ 25 SX
CMT PLUG ON TOPTOP QUEEN SAND @ 3081'

(U)

(1) 10/30/55 ORIG COMP THRU PERFS
3083 - 3091'. TREATED PERFS
w/ 8000 GALS FRAC OIL & 10000 #
SAND.

IPP: 65 BOPD, 34° API

LAST PROD: 2/60 PXA: 10/23/70

Subject

UNIT DRICKEY QUEENFIELD CAPROCK

Date

WELL ISA (T-48-4)LOCATION 145 31E 15A

Sheet

CURRENT STATUS

PXA PRODUCER(PXA 6/8/70)

Drawn By

Inch

SURFACE PLUG 30'-0"

MEAS. DATUM: 4264 DFKB ELEV: DF GR. ELEV: 4254'45#/FT 12³/₄" CSA 199'
W/ 250 SX CMT

6-8-70 PXA BY CITIES SERVICE

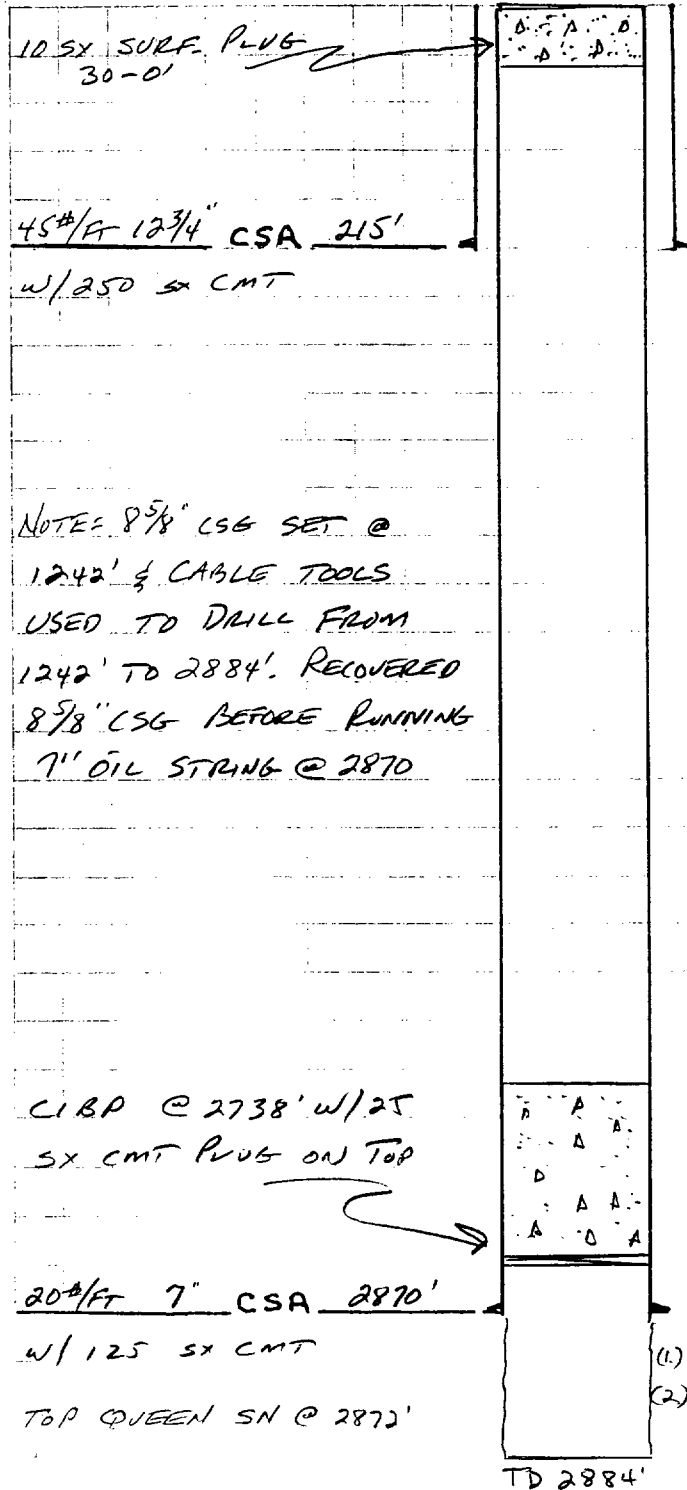
CIBP SET @ 2872' W/ 25 SX CMT PLUG ON
TOP OF B.P. @ 2972'-2747'. LOADED HOLE
W/ MUD, SET 10 SX SURFACE PLUG 30'-0'
W/ PXA MARKERNOTE: 8⁵/₈" CSG WAS SET
@ 1211' & CABLE TOOLS
WERE USED TO DRILL
TO 2931'. THE 8⁵/₈" CSG
WAS RECOVERED PRIOR TO
RUNNING THE 7" OIL
STRING @ 2912'.CIBP @ 2872' W/ 25 SX
CMT PLUG ON TOP20#/FT 7" CSA 2912'
W/ 125 SX CMT

TOP QUEEN SN @ 2915

TD 2931'

- (1) 10-18-54 ORIG. COMP. IN OPEN HOLE
SECTION 2915-2931'. FRACED W/ 8000 GALS
LSE OIL & 4000 # SAND, IPP: 60 BPOPD
LAST PROD 6/69 @ 1 BOPD

Subject	UNIT <u>DRICKEY QUEEN</u> FIELD <u>CAPROCK</u>	Date
	<u>WELL 15B (T-48-3)</u> LOCATION <u>14S 31E 15B</u>	Sheet <u> </u> of <u> </u>
	CURRENT STATUS <u>PXA INJECTOR (PXA 11/12/70)</u>	Project No. <u> </u>
		By <u> </u>



MEAS. DATUM: 4231 G.L
KB ELEV: GR. ELEV: 4231

11-12-70 PXA WELL BY CITIES SERVICE
CIBP SA 2738' W/25 SX CMT PLUG ON
TOP OF B.P. @ 2738'-2613. LOADED HOLE
W/MVD. SET 10 SX CMT PLUG @ SURFACE
30'-0 W/ PXA MARKER.
NO PIPE PULLED

(1) 9-18-54 ORIGINAL COMP. IN OPEN
HOLE SECTION 2872'-2884'. FRACED
W/8000 GALS LSE OIL & 4000 #/SAND.
1 PP: 89 BPLOPD
LAST PROD: 5/62 @ 4 BOPD

(2) 5-28-62 CONVERTED TO WIW. INJECT
INTO O.H. THRU 2 3/8" TBG &
PKR SA 2850'.

Subject	UNIT <u>DRICKEY QUEEN</u> FIELD <u>CAPROCK</u>	Date	
	<u>WELL 15G (T-50-1)</u> LOCATION <u>14S 31E 15G</u>	Sheet	of
	<u>CURRENT STATUS PXA PRODUCER (PXA 6/10/70)</u>	Project No.	
		By	

10 SX CMT SURF PLUG
30'-0'

MEAS. DATUM: 4255

KB ELEV: 4266 GR. ELEV: 4255 GL

45#/FT 1 3/4" CSA 185'
W/ 200 SX CMT

6-10-70 PXA BY CITIES SERVICE
CIBP SET @ 2865' W/ 25 SX CMT PLUG
ON TOP OF B.P. @ 2865'-2740'. LOADED
HOLE W/ MVD. SET 10 SX CMT PLUG @
SURF. 30'-0' W/ PXA MARKER

NOTE: 8 5/8" CSG WAS SET
@ 1241' & CABLE TOOLS
WERE USED TO DRILL TO
2913'. THE 8 5/8" WAS
PULLED BEFORE RUNNING
THE 7" OIL STRING

CIBP SET @ 2865' W/ 25
SX CMT PLUG ON TOP

20#/FT 7" CSA 2897'
W/ 125 SX CMT.

TOP QUEEN SN @ 2899'

TD 2913'

- (1) 10-18-54 ORIG COMP IN OPEN HOLE
SECTION 2899'-2913'. FRACED O.H.
2899-13' W/ 8000 GALS OIL & 4000# SN.
1 PP: 75 BPLOPD
LAST PROD 6/69 @ 1 BOPD

Subject	UNIT <u>DRICKEY QUEEN</u> FIELD <u>CAPROCK</u>	Date
	<u>WELL 15H (T-50-2)</u> LOCATION <u>14S 31E 15N</u>	Sheet of
	CURRENT STATUS <u>PXA INJECTOR</u> (PXA 11/12/70)	Project No.
		By

MEAS. DATUM: 4248 DFKB ELEV: DF GR. ELEV:

10-SACK PLUG 30' TO SURF.

45#/FT 12³/₄" CSA 163'
W/125 SX CMT

NOTE: 8⁵/₈" PROT. CSG WAS
SET @ 1190' & CABLE TOOLS
WERE USED TO DRILL TO
2914'. THE 8⁵/₈" CSG WAS
PULLED BEFORE RUNNING
7" OIL STRING

LBP @ 2842'

20#/FT 7" CSA 2905'
W/125 SX CMT.

TOP QUEEN/ SN @ 2910'

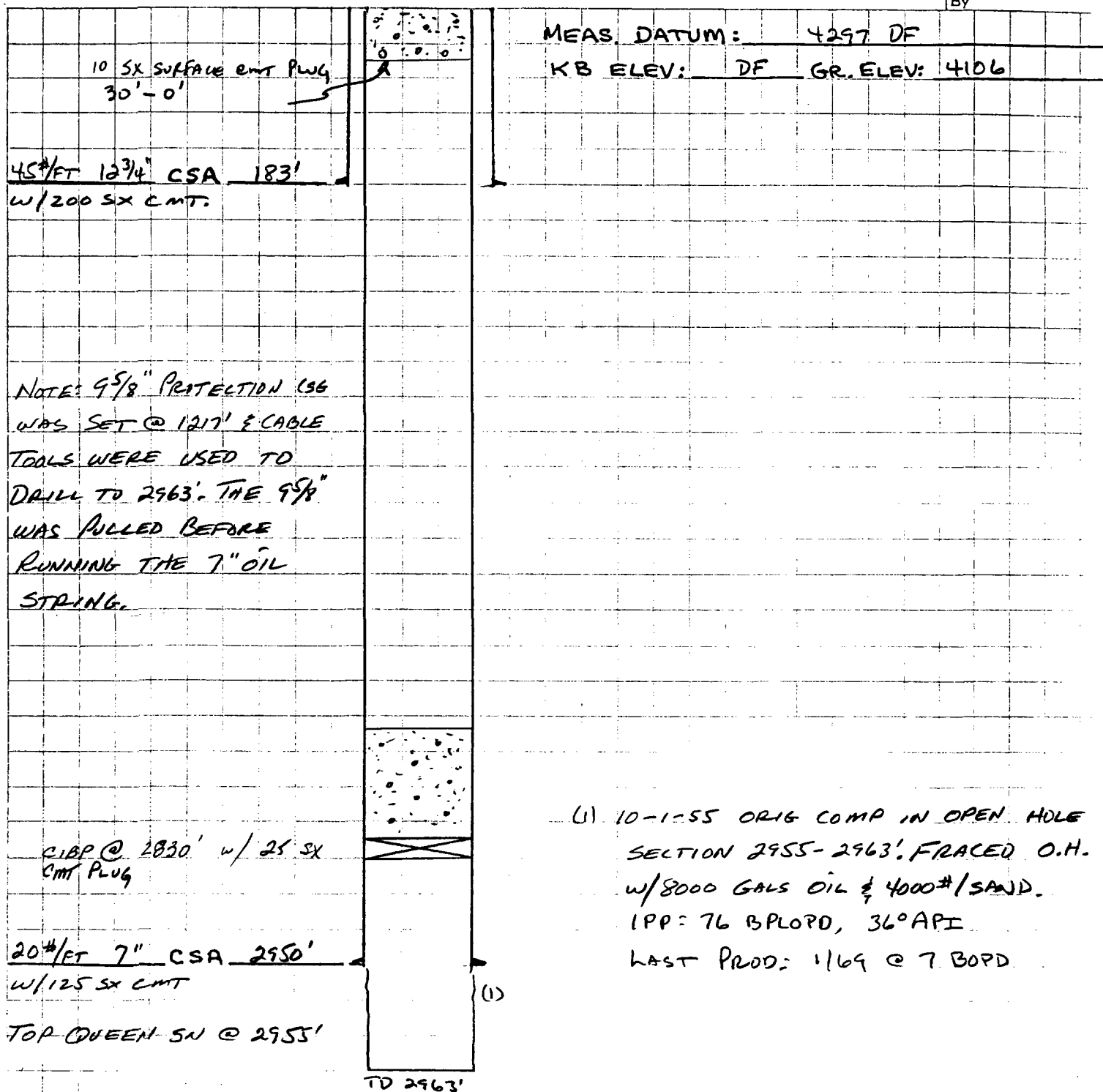
TO 2914'

25-SACK PLUG 2717-2844'

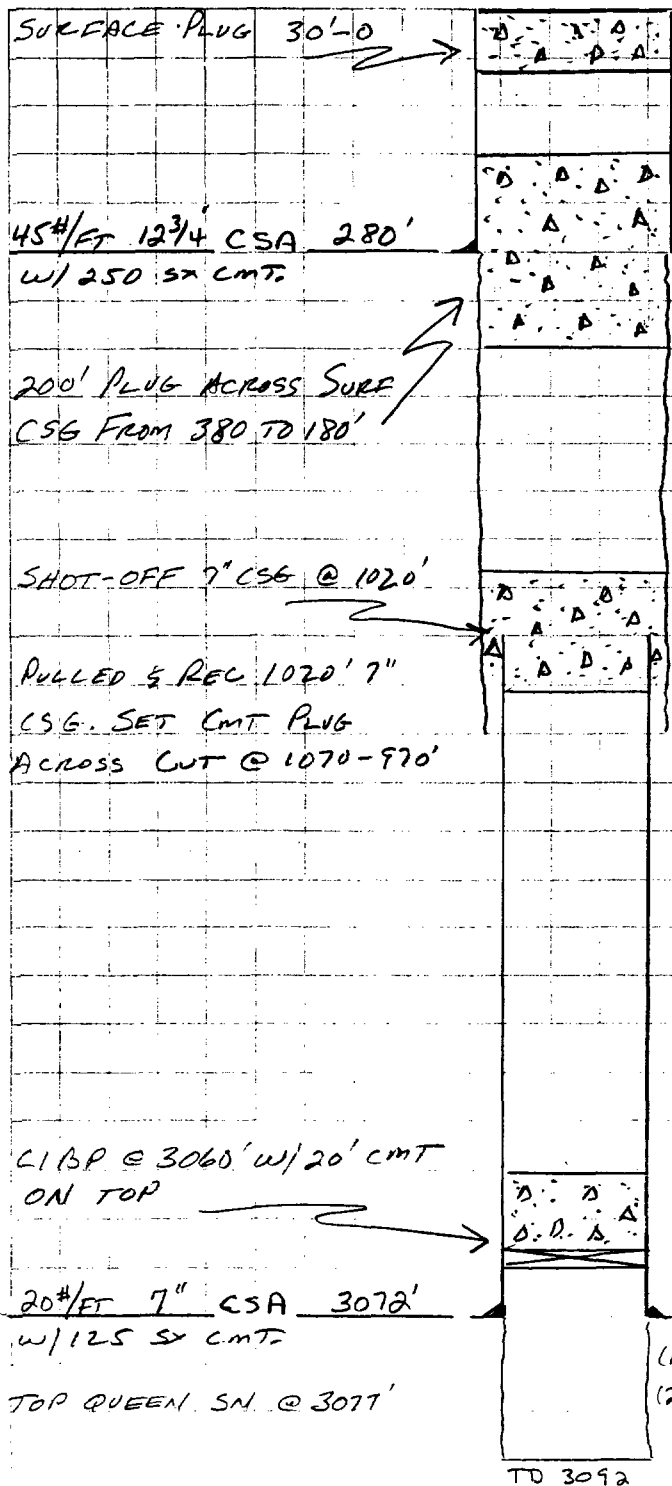
- (1) 10-1-55 OR16 COMP IN OPEN HOLE
SECTION 2910'-2914'. FRACED W/ 8000
GALS OIL & 4000# SAND,
IPP: 52 BPL/D, 320 API
LAST PROD: 5/63 @ 3 BOPD

- (2) 5- -63 CONVERTED TO WATER INJECTION
WELL. INJECTED INTO QH. TARD
2³/₈" TBG 3 PER SA ± 2860'.

Subject	UNIT DRICKEY QUEEN	FIELD CAPROCK	Date
	WELL 15I (T-1-7)	LOCATION 14S 31E 15I	Sheet of
	CURRENT STATUS	PXA PRODUCER (PXA 6/24/70)	Project No.
			By



Subject	UNIT DRILLEY QUEEN FIELD CAPROCK	Date	
	WELL 15J (T-1-3) LOCATION 14S 31E 15J	Sheet	of
	CURRENT STATUS PXA INJECTOR (PXA 5/2/74)	Project No.	
		By	



MEAS. DATUM: 4422 DF
KB ELEV: DF GR ELEV: 4411

5-2-74 PXA BY GUEST & WOLFSON
CIBP SET @ 3060' W/ 20' CMT ON TOP
OF B.P @ 3060 - 3040'. SHOT OFF &
RECOVERED 7" PRODUCTION CSG FROM
1020'. SET 100' CMT PLUG 1070-970'.
SET CMT PLUG 380-180'. SET 10 SX
CMT PLUG W/ PXA MARKER AT SURFACE

(1) 9-27-54 ORIG COMP IN OPEN HOLE
SECTION 3077-3092'. FRACED O.H.
W/ 175 BBIS LSE OIL & 4000# SAND
IPP: 120 BLPD,
LAST PROD: 2165 @ 1 BOPD

(2) 2-21-65 CONVERTED TO WIW.
INJECTED INTO O.H. THRU 2 3/8"
TBG & TENSION PKR SA 3070.
INIT. INJ. 350 BWPD ON VACUUM-

NOTE: 9 5/8" CSG WAS SET @ 1353'
& CABLE TOOLS WERE USED TO
DRILL TO 3092'. PULLED & REC
9 5/8" CSG BEFORE RUNNING 7"
OIL STRING

Subject	UNIT DRICKEY QUEEN FIELD CAPROCK	Date	
	WELL 15K (T-1-2)	Sheet	of
	CURRENT STATUS T.A. PRODUCER (T.A. 8/74)	Project No.	
		By	

MEAS. DATUM: 4323 DF

KB ELEV: DF GR. ELEV:

45#/FT 12³/₄" CSA 245'
W/245 SX CMT

T.A. BY CITIES SERVICE 8/74

VISUAL INSPECTION FROM CAPROCK
INDICATED WELL MAYBE AXA.
DID NOT FIND ROAD TO WELL

20#/FT 7" CSA 2965'
W/125 SX CMT

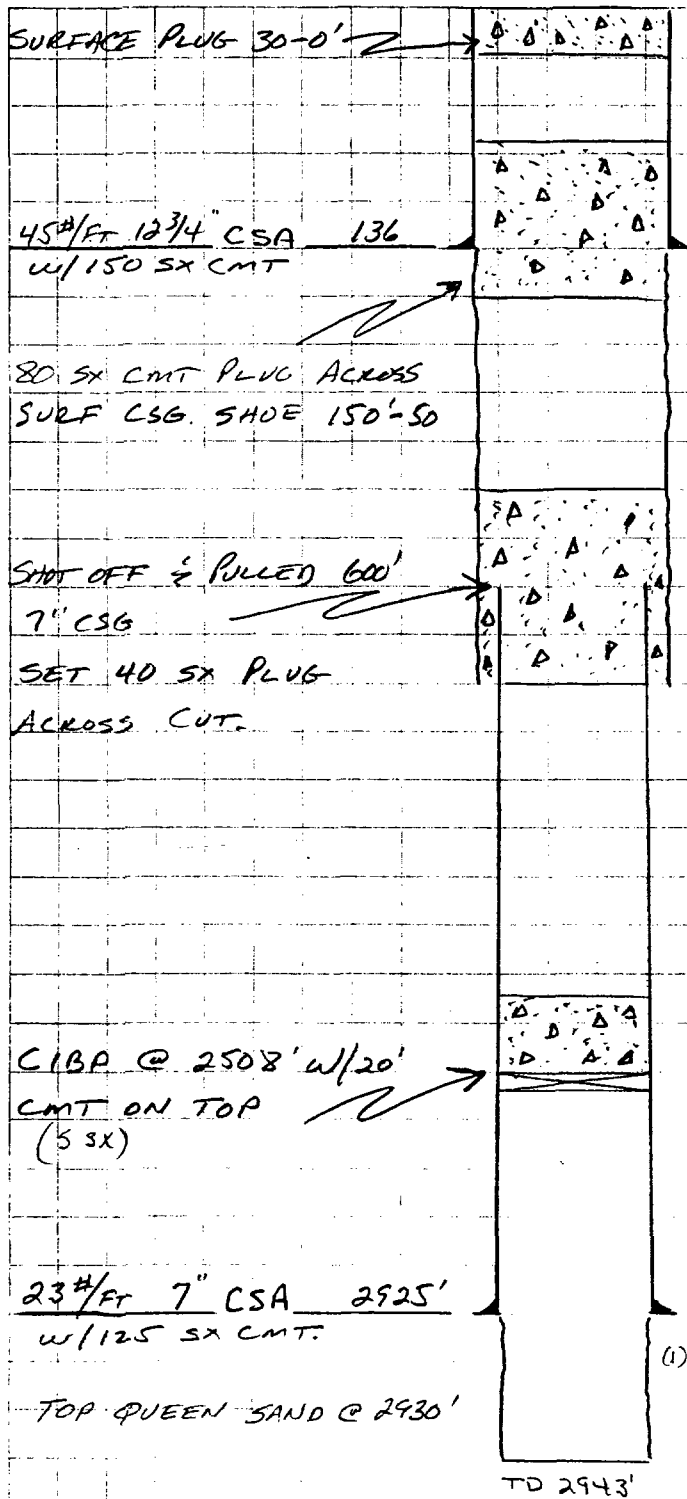
- (1) 7-28-54 ORIG COMP IN OPEN HOLE
SECTION 2968-2979'. FRACED OH
W/8000 GALS OIL & 4000 # SAND.
IPP 112 BORD, 36° API
LAST PROD 8/74 @ 3BORD

TOP QUEEN SAND @ 2968'

TO 2979'

NOTE: 9⁵/₈" PROT. CSG WAS SET @ 1295
& CABLE TOOLS WERE USED TO DRILL
FROM 1295 TO T.D. 9⁵/₈" CSG WAS
PULLED BEFORE RUNNING 7" OIL
STRING @ 2965'.

Subject	UNIT DRICKEY QUEEN FIELD CARPOCK	Date	
	WELL 15M (T-2-2) LOCATION 145 31E 15M	Sheet	of
	CURRENT STATUS PXA PRODUCER (PXA 3/26/74)	Project No.	
		By	



MEAS. DATUM: 4275 D.F.

KB ELEV: D.F. GR ELEV:

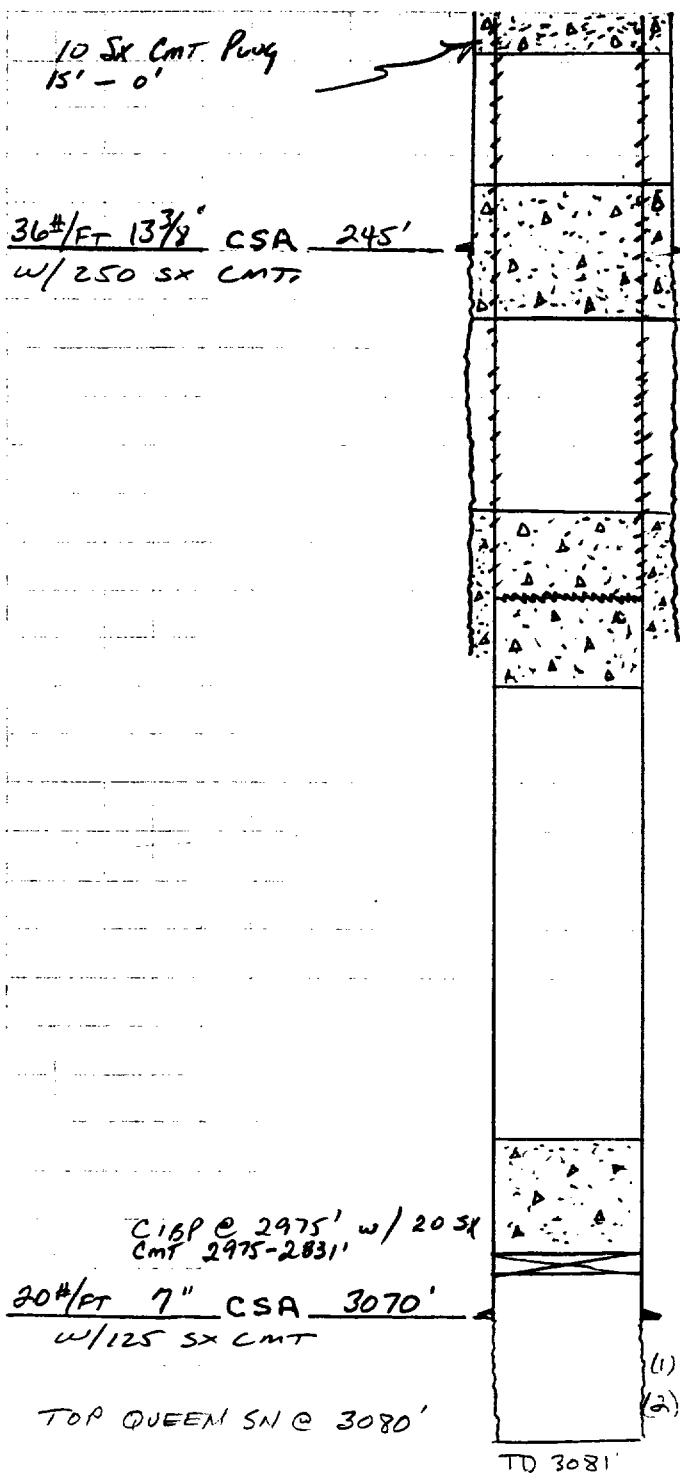
3-26-74 PXA BY GUEST & WOLFSON
CIBP SET @ 2508' w/20' CMT PLUG ON
TOP OF B.P. @ 2508-2488'. SHOT &
RECOVERED 600' OF 7" CSG. SET 40 SX
PLUG @ 700-500'. SET 80 SX CMT PLUG
150'-50'. SET 10 SX SURFACE PLUG
30-0'.

(1) 6-14-55 ORIG COMP IN OPEN HOLE
SECTION 2930-2943'.

IPP: 80 BPLOPD, 36°API, NATURAL
LAST PROD: 5/70 @ 12 BOPD

NOTE: 8 5/8" CSG WAS SET @ 1235'
& CABLE TOOLS WERE USED TO DRILL
FROM 1235 TO T.D. THE 8 5/8" CSG WAS
PULLED BEFORE RUNNING THE 7"
OIL STRING.

Subject	UNIT <u>DRICKEY QUEEN</u> FIELD <u>CAPROCK</u>	Date
	WELL <u>15N (T-1-6)</u> LOCATION <u>14S 31E 15N</u>	Sheet <u> </u> of <u> </u>
	CURRENT STATUS <u>PXA INJECTOR</u> (<u>PXA 11/17/70</u>)	Project No. <u> </u>
		By <u> </u>



MEAS. DATUM: 4426 DF
KB ELEV: DF GR. ELEV:

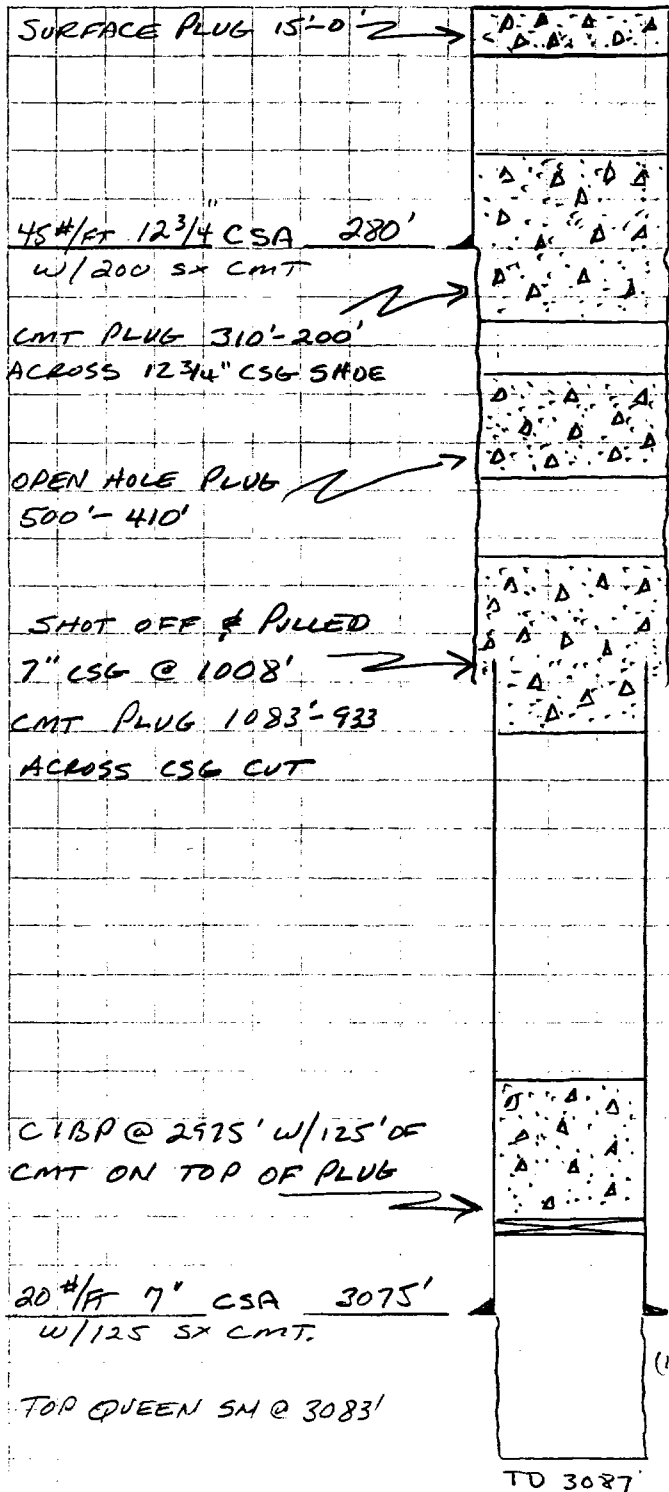
30 SX CMT PLUG ACROSS BASE
SURFACE CSG- 314-179'

SHOT OFF & PULLED 1000' OF 7"
SET 30 SX CMT PLUG @ 1082-930

- (1) 8-15-55' ORIG COMP IN OPEN HOLE
SECTION 3080-3081'
IPF: 648 BOPD, 36.3° API, NATURAL
LAST PROD: 10/64 @ 1 BOPD
- (2) 12- -64 CONVERTED TO WIW, INS.
INTO O.H. TARD 2 3/8" TBG 1/2
PKR SA 3050'.

NOTE: 8 5/8" PROT. CSG WAS SET @
1410' & CABLE TOOLS WERE USED
TO DRILL FROM 1410' TO T.D. THE
8 5/8" CSG WAS PULLED BEFORE
RUNNING THE 7" OIL STRING.

Subject	UNIT DRICKEY QUEEN FIELD CAPROCK	Date
	WELL 150 (T-1-4) LOCATION 145 31E 150	Sheet of
	CURRENT STATUS PXA PRODUCER (PXA 4/16/70)	Project No.
		By



MEAS. DATUM: 4424 DF

KB ELEV: DF GR ELEV: 4413

4-16-70 PXA BY CITIES SERVICE

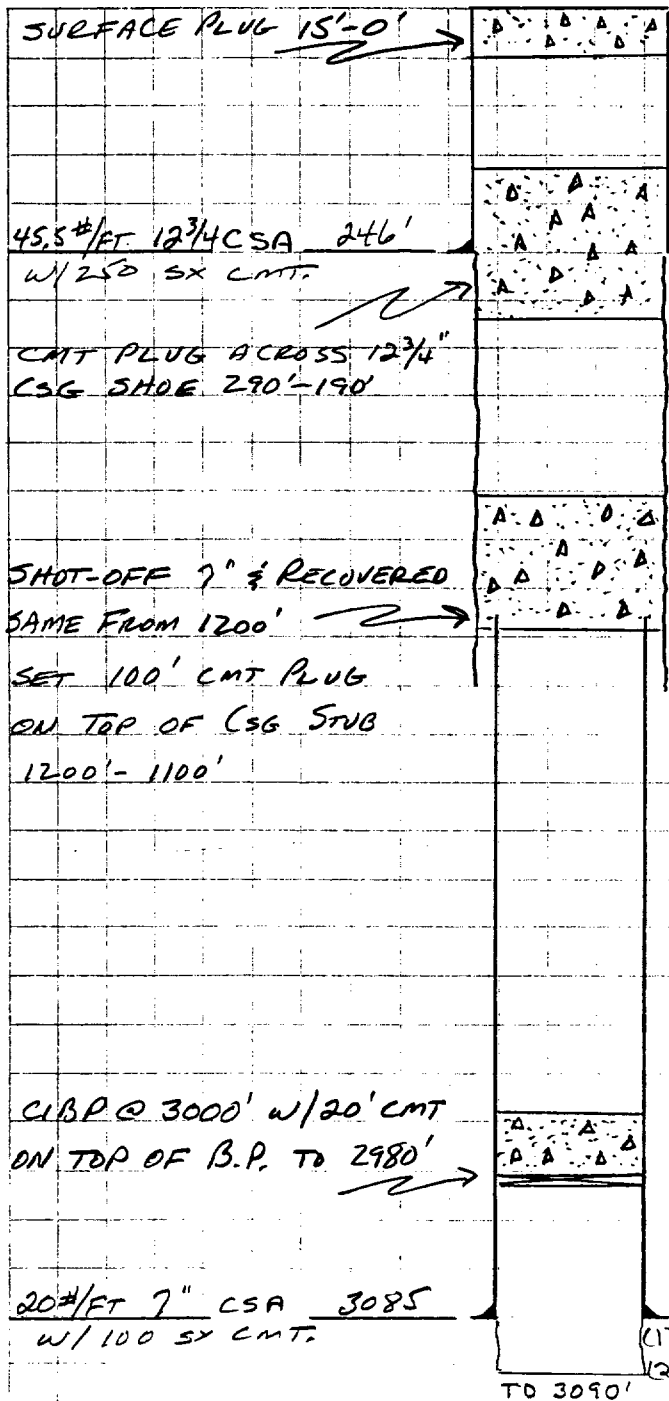
CIBP SET @ 2975' W/30 SX CMT PLUG ON TOP OF B.P. @ 2975-2850'.

SHOT AND PULLED 1008' OF 7" CSG. SET CMT PLUGS, 1083-933', 500-410', 310'-200', 10 SX CMT PLUG @ SURF 15'-0'.

- (1) 11-7-54 ORIG. COMP. IN OPEN HOLE SECTION 3083-3087'. FRACED W/ 8000 GALS OIL & 4000# SAND. FLUSHED W/ 500 GALS KEROSENE. IPP: 63 BPLOPD, 36°API

NOTE: 8 5/8" CSG WAS SET @ 1241' & CABLE TOOLS WERE USED FROM 1241' TO T.D. RECOVERED 8 5/8" CSG BEFORE RUNNING 7" OIL STRING @ 3075'

Subject	UNIT DRICKEY QUEEN FIELD CAPROCK	Date
	WELL 15P (T-1-S) LOCATION 14S 31E 15P	Sheet of
	CURRENT STATUS PXA INJECTOR (PXA 4/29/74)	Project No.
		By



MEAS. DATUM: G.L.

KB ELEV: 4426' GR ELEV: 4417 G.L.

4-29-74 PXA By GUEST & WOLFSON

CIBP SET @ 3000' W/ 20' OF CEMENT ON TOP B.P. TO 2980'.

SHOT OFF AND RECOVERED 7" CASING FROM 1200'. SET 100' PLUG @ CSG

STUB. SET 100' CMT PLUG ACROSS

12 3/4" CSG SHOE 290'-190'. SET

10 SX CMT PLUG @ SURFACE, 15'-0'

CIBP @ 3000' W/ 20' CMT ON TOP OF B.P. TO 2980'

20#/FT 7" CSA 3085 W/ 100 SX CMT.

(1) 1-17-55 ORIG COMP IN O.H. SECTION 3086-3090'.

IPP: 80 BPLOPD, 36° API, NATURAL
LAST PROD: 10/60 @ 1 BOPD

(2) 3-20-65 CONVERTED TO WIW. INJECT INTO O.H. THRU 2 3/8" TBG & PKR SET @ 3003'.

FIRST WATER ON VACUUM @ 400 B/L

NOTE: 8 5/8" CSG WAS SET @ 1399' AND CABLE TOOLS WERE USED TO DRILL TO T.D. RECOVERED 8 5/8" CSG BEFORE RUNNING 7" OIL STRING @ 3085'

Subject	UNIT <u>DRICKEY QUEEN</u> FIELD <u>CAPROCK</u>	Date
	WELL <u>16J (T-25-1)</u> LOCATION <u>145 31E 16J</u>	Sheet of
	CURRENT STATUS <u>PXA INJECTOR (PXA 6/19/70)</u>	Project No.
		By

SURF CMT PLUG 30'-0'

MEAS. DATUM: 4208' TOP T&G HD.

KB ELEV: _____ GR. ELEV: 4206

45#/FT 12³/₄" CSA 129'
W/ 150 SX CMT

6-19-70 PXA BY CITIES SERVICE
CIBP SET @ 2800' W/ 25 SX CMT PLUG
ON TOP OF B.P. @ 2800'-2675'.
LOADED HOLE W/ MUD. SET 10 SX CMT
PLUG @ SURF. 30'-0.

NOTE: 8⁵/₈" CSG WAS SET
@ 1152'. CABLE TOOLS
WERE USED TO DRILL
FROM 1152 - T.D. THE 8⁵/₈"
CSG WAS RECOVERED
BEFORE RUNNING THE
7" OIL STRING @ 2855'

CIBP @ 2800' W/ 125'
CMT ON TOP OF B.P.

20#/FT 7" CSA 2855'
W/ 125 SX CMT.

TOP QUEEN SN @ 2859'

TD 2868'

- (1) 5-17-55 ORIG COMP IN OPEN HOLE
SECTION 2859'-2868'. SAND FRAC W/
8000 GALS OIL & 8000 # SAND.
IPP: 96 BPLOPD, 36° API
LAST PROD: 2164 @ 1 B/D

- (2) 3-3-64 CONVERTED TO W.I.M.
INJECTED INTO O.H. THRU 2³/₈"
T&G & PKR SA 2831. INJECTED
281 BWD @ 1100 PSL

Subject	UNIT <u>DRICKEN QUEEN</u> FIELD <u>CAPROCK</u>	Date
	WELL <u>16 0 (T-30-1)</u> LOCATION <u>14S 3E 11 0</u>	Sheet <u> </u> of <u> </u>
	CURRENT STATUS <u>PXA PRODUCER (PXA 6/6/70)</u>	Project No. <u> </u>
		By <u> </u>

MEAS. DATUM: 4210 DFKB ELEV: 4210 GR. ELEV: 4201'

28#/FT 8⁵/₈" CSA 175
w/100 SY CMT

6-6-70 By CITIES SERVICE

CIBP SET @ 2858' w/25 SY CMT PLUG
ON TOP OF B.P. @ 2858-2638'. LOADED
HOLE w/ MUD. SET 10 SY CMT PLUG
@ SURFACE, 30'-0'.

CIBP @ 2858' w/25 SY
CMT PLUG ON TOP
TO 2638'

TOP QUEEN SAND @ 2888' (AT CSG SHOE)

14#/FT 5¹/₂" CSA 2888
w/100 SY CMT.

(1) 5-28-55' ORIG COMP IN OPEN HOLE
SECTION 2888'-2907'. SAND FRACED
w/ 8000 GA'S LSC OIL: 8000 # S.M.S.
IPP: 56 BOPD, 35° API

TD 2907

LAST PROD: 4.2 @ 1 B/D
PXA: 6/6/70

Subject	UNIT DRUCKY QUEEN	FIELD CAPROCK	Date
	WELL 16P (T-36-1)	LOCATION 14S 31E 16P	Sheet of
	CURRENT STATUS	PXA INJECTOR (PXA 3/26/74)	Project No.
			By

10 SX CMT PLUG @ SURF

MEAS. DATUM: 4249 DF

KB ELEV: DF GR. ELEV:

8 5/8" CSA 203
w/150 SX CMT

40 SX CMT PLUG SPOTTED ACROSS SURF. CSG.

SHOT & PULLED 900' OF 5-1/2"
w/ 30 SX CMT PLUG ACROSS CSG STUB

CIBP @ 2504' w/ 5 SX CMT PLUG

TOP QUEEN SAND @ 2910' (11' BELOW CSG SHOE)

5-1/2" 14# CSA 2899'
CMTD w/ 75 SX

- (1) 12/15/55 ORIG. COMP IN OPEN
HOLE SECTION 2910-2928'.
SAND FRACED O.H. 2910-28' w/
8000 GALS LSE CRUDE & 8000 #
SAND. IPP: 86 BOPD, 33.9° API
172/1 GOR

(1)
(2)

TO 2928'

- (2) 6/63 CONVERTED TO WATER INJECT.
WELL

- (3) PXA 3/26/74

Subject	UNIT DRACKEY QUEEN FIELD CAPROCK	Date
	WELL 22A (T-43-1)	Sheet
	LOCATION 14S 31E 22A	Project No.
	CURRENT STATUS PXA PRODUCER (PXA 6/27/70)	By

SURFACE PLUG @ 30'-0'

24 1/4" FT 8 5/8" CSA 263
w/170 SX CMT

MEAS. DATUM: 4427 DF

KB ELEV: DF GR. ELEV: 4418

6-27-70 PXA By CITIES SERVICE
CIBP SET @ 3050' w/25 SX CMT PLUG
ON TOP OF B.P. @ 3050-2850'. LOADED
HOLE w/MUD. SET 10 SX CMT PLUG
@ SURFACE, 30'-0'.

CIBP SET @ 3050' w/25 SX
CMT ON TOP OF B.P. 3050'
TO 2850'

TOP QUEEN SAND @ 3092' (4' BELOW CSG SHOE)

(1) 11-1-54 ORIG COMP IN OPEN HOLE

SECTION 3092-3099'

IPP: 49 BOPD, 38° API, NATURAL

15.5 1/4" FT 5 1/2" CSA 3088
w/150 SX CMT

TD 3099

Subject

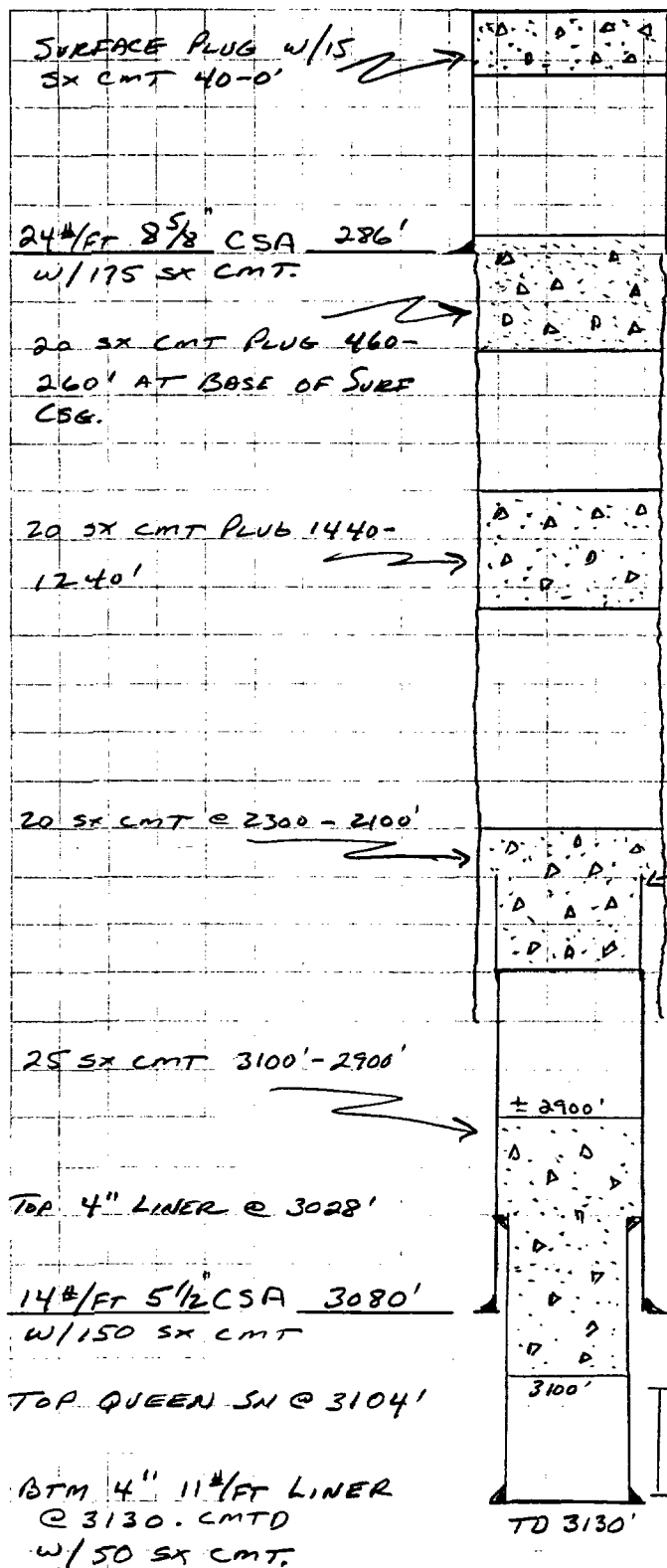
UNIT DRICKEY QUEEN FIELD CAPROCK
WELL 22E (T-9-3) LOCATION 145 31E 22E
CURRENT STATUS PxA PRODUCER (PxA 1-10-64)

Date

Sheet of

Project No.

By



MEAS. DATUM: 4426 DF

KB ELEV: DF GR ELEV: 4417

1-10-64 PxA BY ADA OIL CO.

SHOT-OFF AND RECOVERED 5 1/2" CSG
FROM 2133'.

(1) 6-16-55 ORIG COMP THRU PERFS
3104' - 3130'.

IPP: 49 BOPD + 23 BSWPD, 60R 600/1

(2) PxA 1-10-64

Subject

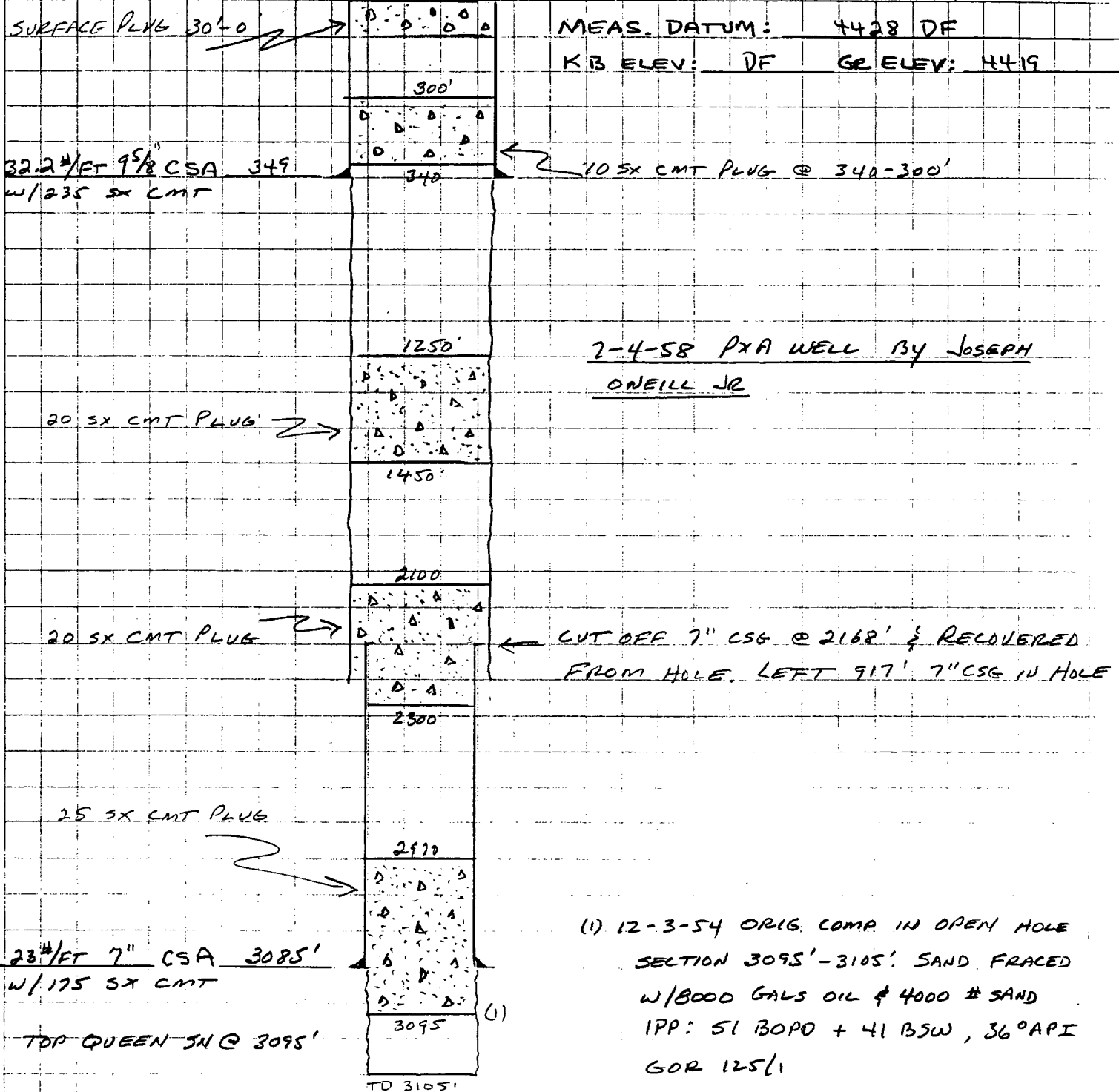
UNIT DRICKEY QUEEN FIELD CAPROCK
 WELL 22G (T-46-2) LOCATION 145 31E 22G
 CURRENT STATUS PXA PRODUCER

Date

Sheet of

Project No.

By



VI. Area of Review Well Data

Well Name	Well No.	Operator	Location	Class Date P&A	Spud Date	Comp. Date	TD O/H TD	Comp. Interval	Casing Program
Drickey Queen Unit	T-3-3	Northland Operating Co.	660' FEL & 1980' FSL Sec. 10, T14S R31E	P&A 11/12/70	7/14/54	8/7/54	3054' 3072'	3052-74' O/H	13-3/8" Surf. Csg. @ 342', Cmtd. w/ 375 sx, TOC @ Surf. 7" Prod. Csg. @ 3054', Cmtd. w/ 425 sx, TOC @ 306'
Drickey Queen Unit	T-3-1	Northland Operating Co.	1980' FEL & 1980' FSL Sec. 10, T14S R31E	TA Inj.	5/15/54	6/11/54	2898' 2925'	2898-2925' O/H	13-3/8" Surf. Csg. @ 324', Cmtd. w/ 360 sx, TOC @ Surf. 7" Prod. Csg. @ 2898', Cmtd. w/ 400 sx, TOC @ 312'
Drickey Queen Unit	T-10-2	Northland Operating Co.	1980' FWL & 1980' FSL Sec. 10, T14S R31E	Oil	11/12/53	11/30/53	2875' 2893'	2875-2893' O/H	No Surface Casing Reported 7" Prod. Csg. @ 2875', Cmtd. w/ 100 sx, TOC @ 2228'
Drickey Queen Unit	T-10-3	Northland Operating Co.	660' FWL & 1980' FSL Sec. 10, T14S R31E	Injector	5/14/54	6/26/54	2838' 2858'	2838-58' O/H	No Surface Casing Reported 7" Prod. Csg. @ 2838', Cmtd. w/ 275 sx, TOC @ 1060'
Drickey Queen Unit	T-10-1	Northland Operating Co.	660' FWL & 660' FSL Sec. 10, T14S R31E	Oil	10/11/53	11/24/53	2824' 2831'	2824-31' O/H	No Surface Casing Reported 5-1/2" Prod. Csg. @ 2824', Cmtd. w/ 125 sx, TOC @ 2147'
Drickey Queen Unit	T-10-4	Northland Operating Co.	1980' FWL & 660' FSL Sec. 10, T14S R31E	S/I Injector	1/7/54	1/8/54	2846' 2867'	2846-67' O/H	No Surface Casing Reported 7" Prod. Csg. @ 2846', Cmtd. w/ 125 sx, TOC @ 2038'
Drickey Queen Unit	T-3-2	Northland Operating Co.	1980' FEL & 660' FSL Sec. 10, T14S R31E	P&A 10/27/70	6/29/54	7/10/54	2915' 2930'	2915-30' O/H	13-3/8" Surf. Csg. @ 332', Cmtd. w/ 400 sx, TOC @ Surf. 7" Prod. Csg. @ 2915', Cmtd. w/ 400 sx, TOC @ 329'
Drickey Queen Unit	T-3-4	Northland Operating Co.	660' FEL & 660' FSL Sec. 10, T14S R31E	P&A 11/12/70	10/2/54	10/23/54	2965' 2983'	2965-83' O/H	13-3/8" Surf. Csg. @ 324', Cmtd. w/ 350 sx, TOC @ Surf. 7" Prod. Csg. @ 2965', Cmtd. w/ 425 sx, TOC @ 217'
Drickey Queen Unit	T-45-1	Northland Operating Co.	660' FWL & 1980' FSL Sec. 11, T14S R31E	P&A 10/23/70	9/9/54	10/18/54	3049' 3071'	3049-71' O/H	9-5/8" Surf. Csg. @ 329', Cmtd. w/ 300 sx, TOC @ Surf. 7" Prod. Csg. @ 3049', Cmtd. w/ 1390 sx, TOC @ Surf.
Drickey Queen Unit	T-45-2	Northland Operating Co.	660' FWL & 660' FSL Sec. 11, T14S R31E	P&A 5/26/70	9/26/54	10/12/54	3056' 3086'	3056-86' O/H	9-5/8" Surf. Csg. @ 333', Cmtd. w/ 300 sx, TOC @ Surf. 7" Prod. Csg. @ 3056', Cmtd. w/ 1490 sx, TOC @ Surf.
Drickey Queen Unit	T-45-4	Northland Operating Co.	1980' FWL & 660' FSL Sec. 11, T14S R31E	P&A 5/19/70	12/14/54	12/31/54	3055' 3083'	3055-83' O/H	9-5/8" Surf. Csg. @ 304', Cmtd. w/ 225 sx, TOC @ Surf. 7" Prod. Csg. @ 3055', Cmtd. w/ 1650 sx, TOC @ Surf.
Drickey Queen Unit	T-51-2	Northland Operating Co.	2310' FSL & 330' FWL Sec. 14, T14S R31E	P&A 11/12/70	10/22/55	11/10/55	2993' N/A	2970-73' O/H	8-5/8" Surf. Csg. @ 211', Cmtd. w/ 125 sx, TOC @ Surf. 5-1/2" Prod. Csg. @ 2993', Cmtd. w/ 200 sx, TOC @ 1910'
Drickey Queen Unit	T-48-5	Northland Operating Co.	660' FNL & 580' FWL Sec. 14, T14S R31E	P&A 11/12/70	4/4/55	5/27/55	2948' 2963'	2948-63' O/H	12-3/4" Surf. Csg. @ 171', Cmtd. w/ 200 sx, TOC @ Surf. 7" Prod. Csg. @ 2948', Cmtd. w/ 125 sx, TOC @ 2140'
Drickey Queen Unit	T-51-1	Northland Operating Co.	330' FNL & 1650' FWL Sec. 14, T14S R31E	P&A 10/23/70	11/16/55	11/30/55	3105' N/A	3083-91' O/H	8-5/8" Surf. Csg. @ 310', Cmtd. w/ 175 sx, TOC @ Surf. 5-1/2" Prod. Csg. @ 3105', Cmtd. w/ 200 sx, TOC @ 2022'
Drickey Queen Unit	T-48-4	Northland Operating Co.	660' FNL & 660' FEL Sec. 15, T14S R31E	P&A 6/8/70	9/6/54	9/31/54	2912' 2931'	2912-31' O/H	12-3/4" Surf. Csg. @ 199', Cmtd. w/ 250 sx, TOC @ Surf. 7" Prod. Csg. @ 2912', Cmtd. w/ 125 sx, TOC @ 2104'

VI. Area of Review Well Data

Well Name	Well No.	Operator	Location	Class Date P&A	Spud Date	Comp. Date	TD O/H TD	Comp. Interval	Casing Program
Drickey Queen Unit	T-48-3	Northland Operating Co.	660' FNL & 1980' FEL Sec. 15, T14S R31E	P&A 11/12/70	8/13/54	9/3/54	2870' 2884'	2872-2884' O/H	12-3/4" Surf. Csg. @ 215', Cmt'd. w/ 250 sx, TOC @ Surf. 7" Prod. Csg. @ 2870', Cmt'd. w/ 125 sx, TOC @ 2062'
Drickey Queen Unit	T-48-1	Northland Operating Co.	660' FNL & 1980' FWL Sec. 15, T14S R31E	S/I Injector 11/12/70	12/27/53	1/11/54	2857' 2870'	2855-70' O/H	No Surface Casing Reported 5-1/2" Prod. Csg. @ 2857', Cmt'd. w/ 125 sx, TOC @ 2180'
Drickey Queen Unit	T-18-1	Northland Operating Co.	660' FNL & 660' FWL Sec. 15, T14S R31E	Oil	4/25/53	6/3/53	4139' 2900' PB	2868-2900' O/H	No Surface Casing Reported 5-1/2" Prod. Csg. @ 2868', Cmt'd. w/ 100 sx, TOC @ 2326'
Drickey Queen Unit	T-1-1	Northland Operating Co.	1980' FNL & 660' FWL Sec. 15, T14S R31E	Oil	3/26/54	4/10/54	2939' 2956'	2942-56' O/H	No Surface Casing Reported 7" Prod. Csg. @ 2939', Cmt'd. w/ 150 sx, TOC @ 1969'
Drickey Queen Unit	T-48-2	Northland Operating Co.	1980' FNL & 1980' FWL Sec. 15, T14S R31E	S/I Injector	5/18/54	6/4/54	2893' 2914'	2897-2913' O/H	No Surface Casing Reported 7" Prod. Csg. @ 2893', Cmt'd. w/ 125 sx, TOC @ 2085'
Drickey Queen Unit	T-50-1	Northland Operating Co.	1980' FNL & 1980' FEL Sec. 15, T14S R31E	P&A 6/10/70	7/29/54	10/1/54	2897' 2913'	2899-2913' O/H	12-3/4" Surf. Csg. @ 185', Cmt'd. w/ 200 sx, TOC @ Surf. 7" Prod. Csg. @ 2897', Cmt'd. w/ 125 sx, TOC @ 2089'
Drickey Queen Unit	T-50-2	Northland Operating Co.	1650' FNL & 990' FEL Sec. 15, T14S R31E	P&A 11/12/70	8/24/55	9/30/55	2905' 2914'	2910-2914' O/H	12-3/4" Surf. Csg. @ 163', Cmt'd. w/ 125 sx, TOC @ Surf. 7" Prod. Csg. @ 2905', Cmt'd. w/ 125 sx, TOC @ 2097'
Drickey Queen Unit	T-1-7	Northland Operating Co.	2310' FSL & 990' FEL Sec. 15, T14S R31E	P&A 6/24/70	8/25/55	9/25/55	2950' 2963'	2955-63' O/H	12-3/4" Surf. Csg. @ 183', Cmt'd. w/ 200 sx, TOC @ Surf. 7" Prod. Csg. @ 2950', Cmt'd. w/ 125 sx, TOC @ 2142'
Drickey Queen Unit	T-1-3	Northland Operating Co.	1980' FSL & 1980' FEL Sec. 15, T14S R31E	P&A 5/27/4	8/19/54	9/6/54	3072' 3092'	3077-92' O/H	12-3/4" Surf. Csg. @ 280', Cmt'd. w/ 250 sx, TOC @ Surf. 7" Prod. Csg. @ 3072', Cmt'd. w/ 125 sx, TOC @ 2264'
Drickey Queen Unit	T-1-2	Northland Operating Co.	2080' FSL & 1980' FWL Sec. 15, T14S R31E	Poss. P&A	6/13/54	7/8/54	2965' 2979'	2967-2979' O/H	12-3/4" Surf. Csg. @ 245', Cmt'd. w/ 265 sx, TOC @ Surf. 7" Prod. Csg. @ 2965', Cmt'd. w/ 125 sx, TOC @ 2157'
Drickey Queen Unit	T-2-1	Northland Operating Co.	660' FWL & 1980' FSL Sec. 15, T14S R31E	Injector	4/30/55	5/23/55	2924' 2945'	2929-45' O/H	12-3/4" Surf. Csg. @ 148', Cmt'd. w/ 150 sx, TOC @ Surf. 7" Prod. Csg. @ 2924', Cmt'd. w/ 125 sx, TOC 2116'
Drickey Queen Unit	T-2-2	Northland Operating Co.	660' FWL & 660' FSL Sec. 15, T14S R31E	P&A 3/26/74	5/26/55	6/14/55	2925' 2942'	2930-42' O/H	12-3/4" Surf. Csg. @ 136', Cmt'd. w/ 150 sx, TOC @ Surf. 7" Prod. Csg. @ 2925', Cmt'd. w/ 125 sx, TOC @ 2117'
Drickey Queen Unit	T-1-6	Northland Operating Co.	1980' FWL & 660' FSL Sec. 15, T14S R31E	P&A 11/17/70	6/21/55	8/12/55	3070' 3081'	3080-81' O/H	12-3/4" Surf. Csg. @ 249', Cmt'd. w/ 250 sx, TOC @ 22' 7" Prod. Csg. @ 3072', Cmt'd. w/ 125 sx, TOC @ 2264'
Drickey Queen Unit	T-1-4	Northland Operating Co.	1980' FEL & 660' FSL Sec. 15, T14S R31E	P&A 04/16/70	10/3/54	10/27/54	3075' 3087'	3083-87' O/H	12-3/4" Surf. Csg. @ 280', Cmt'd. w/ 200 sx, TOC @ 44' 7" Prod. Csg. @ 3075', Cmt'd. w/ 125 sx, TOC @ 2267'
Drickey Queen Unit	T-1-5	Northland Operating Co.	990' FEL & 660' FSL Sec. 15, T14S R31E	P&A 4/29/74	3/7/55	3/31/55	3085' 3090'	3086-90' O/H	12-3/4" Surf. Csg. @ 246', Cmt'd. w/ 250 sx, TOC @ Surf. 7" Prod. Csg. @ 3085', Cmt'd. w/ 100 sx, TOC @ 2438'

VI. Area of Review Well Data

Well Name	Well No.	Operator	Location	Class Date P&A	Spud Date	Comp. Date	TD O/H TD	Comp. Interval	Casing Program
Drickey Queen Unit	T-24-1	Northland Operating Co.	660' FNL & 660' FEL Sec. 16, T14S R31E	Injector	2/7/55	3/3/55	2860' 2881'	2865'-2881' O/H	12-3/4" Surf. Csg. @ 120', Cmt'd. w/ 125 sx, TOC @ Surf. 7" Prod. Csg. @ 2860', Cmt'd. w/ 125 sx, TOC @ 2052'
Drickey Queen Unit	T-22-1	Northland Operating Co.	660' FNL & 1980' FEL Sec. 16, T14S R31E	TA Inj. 2/1/90	2/22/55	3/6/55	2823' 2857'	2839'-57' O/H	8-5/8" Surf. Csg. @ 173', Cmt'd. w/ 100 sx, TOC @ Surf. 5-1/2" Prod. Csg. @ 2823', Cmt'd. w/ 300 sx, TOC @ 1198'
Drickey Queen Unit	T-17-1	Northland Operating Co.	1980' FNL & 1980' FEL Sec. 16, T14S R31E	TA Oil 6/1/73	10/30/54	11/15/54	2854' 2868'	2857'-68' O/H	12-3/4" Surf. Csg. @ 118', Cmt'd. w/ 125 sx, TOC @ Surf. 7" Prod. Csg. @ 2854', Cmt'd. w/ 125 sx, TOC @ 2046'
Drickey Queen Unit	T-24-2	Northland Operating Co.	1980' FNL & 660' FEL Sec. 16, T14S R31E	S/I Injector	7/16/54	8/8/54	2848' 2896'	2883'-96' O/H	No Surface Casing Reported 7" Prod. Csg. @ 2848', Cmt'd. w/ 125 sx, TOC @ 2040'
Drickey Queen Unit	T-18-1	Northland Operating Co.	1980' FSL & 660' FEL Sec. 16, T14S R31E	Oil	4/4/55	4/11/55	2879' 2899'	2879'-2899' O/H	8-5/8" Surf. Csg. @ 152', Cmt'd. w/ 125 sx, TOC @ Surf. 5-1/2" Prod. Csg. @ 2879', Cmt'd. w/ 100 sx, TOC @ 2337'
Drickey Queen Unit	T-25-1	Northland Operating Co.	1980' FSL & 1980' FEL Sec. 16, T14S R31E	P&A 6/29/70	3/14/55	4/3/55	2856' 2868'	2858'-68' O/H	12-3/4" Surf. Csg. @ 122', Cmt'd. w/ 125 sx, TOC @ Surf. 7" Prod. Csg. @ 2856', Cmt'd. w/ 125 sx, TOC @ 2048'
Drickey Queen Unit	T-30-1	Northland Operating Co.	660' FSL & 1980' FEL Sec. 16, T14S R31E	P&A 6/6/70	5/3/55	5/16/55	2868' 2907'	2888'-2906' O/H	8-5/8" Surf. Csg. @ 175', Cmt'd. w/ 100 sx, TOC @ Surf. 5-1/2" Prod. Csg. @ 2888', Cmt'd. w/ 100 sx, TOC @ 2346'
Drickey Queen Unit	T-36-1	Northland Operating Co.	660' FSL & 660' FEL Sec. 16, T14S R31E	P&A 3/26/74	11/19/55	12/1/55	2899' 2928'	2899'-2928' O/H	8-5/8" Surf. Csg. @ 203', Cmt'd. w/ 150 sx, TOC @ Surf. 5-1/2" Prod. Csg. @ 2899', Cmt'd. w/ 75 sx, TOC 2493'
Drickey Queen Unit	T-43-1	Northland Operating Co.	330' FNL & 990' FEL Sec. 22 T14S R31E	P&A 6/27/70	10/19/54	10/28/54	3088' 3099'	3092'-99' O/H	8-5/8" Surf. Csg. @ 263', Cmt'd. w/ 170 sx, TOC @ Surf. 5-1/2" Prod. Csg. @ 3088', Cmt'd. w/ 150 sx, TOC @ 2276'
Drickey Queen Unit	T-46-1	Northland Operating Co.	660' FNL & 1980' FEL Sec. 22, T14S R31E	TA Oil	8/22/54	9/15/54	3085' 3087'	3085'-87' O/H	9-5/8" Surf. Csg. @ 310', Cmt'd. w/ 225 sx, TOC @ Surf. 7" Prod. Csg. @ 3085', Cmt'd. w/ 125 sx, TOC @ 2277'
Drickey Queen Unit	T-8-1	Northland Operating Co.	660' FNL & 1980' FWL Sec. 22, T14S R31E	TA Oil	11/20/54	11/29/54	3084' 3101'	3094'-3101' O/H	8-5/8" Surf. Csg. @ 327', Cmt'd. w/ 250 sx, TOC @ Surf. 5-1/2" Prod. Csg. @ 3084', Cmt'd. w/ 550 sx, TOC @ Surf.
Drickey Queen Unit	T-9-2	Northland Operating Co.	990' FNL & 990' FWL Sec. 22, T14S R31E	TA Injector	4/28/55	5/6/55	3077' 3124'	3076'-3124' O/H	8-5/8" Surf. Csg. @ 270', Cmt'd. w/ 200 sx, TOC @ Surf. 5-1/2" Prod. Csg. @ 3077', Cmt'd. w/ 150 sx, TOC @ 2265'
Drickey Queen Unit	T-9-3	Northland Operating Co.	2310' FNL & 990' FWL Sec. 22, T14S R31E	P&A 01/10/64	5/9/55	5/17/55	3130'	3104'-30' O/H	8-5/8" Surf. Csg. @ 286', Cmt'd. w/ 175 sx, TOC @ Surf. 5-1/2" Prod. Csg. @ 3080', Cmt'd. w/ 150 sx, TOC @ 2268'
Drickey Queen Unit	T-9-1	Northland Operating Co.	1980' FNL & 1980' FWL Sec. 22, T14S R31E	Injector	4/10/55	4/24/55	3065' 3125'	3088'-3125' O/H	8-5/8" Surf. Csg. @ 274', Cmt'd. w/ 175 sx, TOC @ Surf. 5-1/2" Prod. Csg. @ 3065', Cmt'd. w/ 150 sx, TOC @ 2253'

VI. Area of Review Well Data

Well Name	Well No.	Operator	Location	Class Date P&A	Spud Date	Comp. Date	TD O/H TD	Comp. Interval	Casing Program
Drickey Queen Unit	T-46-2	Northland Operating Co.	1980' FNL & 1980' FEL Sec. 22, T14S R31E	P&A	10/21/54	11/3/54	3085' 3105'	3095-3105' O/H	9-5/8" Surf. Csg. @ 349', Cmt'd. w/ 235 sx, TOC @ Surf. 7" Prod. Csg. @ 3085', Cmt'd. w/ 175 sx, TOC @ 1954'
Drickey Queen Unit	T-43-2	Northland Operating Co.	1660' FNL & 990' FEL Sec. 22, T14S R31E	Injector	11/25/54	12/12/54	3090' 3101'	3095-3101' O/H	9-5/8" Surf. Csg. @ 262', Cmt'd. w/ 150 sx, TOC @ Surf. 7" Prod. Csg. @ 3088', Cmt'd. v/ 100 sx, TOC @ 2441'
West Cap Unit	T-9-2	Northland Operating Co.	330' FNL & 330' FEL Sec. 21, T14S R31E	Oil	6/29/55	7/7/55	2937' 2952'	2937-52' O/H	8-5/8" Surf. Csg. @ 177', Cmt'd. w/ 60 sx, TOC @ Surf. 5-1/2" Prod. Csg. @ 2937', Cmt'd. w/ 125 sx, TOC @ 2260'
West Cap Unit	T-9-1	Northland Operating Co.	330' FNL & 2310' FEL Sec. 21, T14S R31E	Injector	6/20/55	7/6/55	2906' 2925'	2906-25' O/H	8-5/8" Surf. Csg. @ 168', Cmt'd. w/ 75 sx, TOC @ Surf. 5-1/2" Prod. Csg. @ 2906', Cmt'd. w/ 125 sx, TOC @ Surf.
West Cap Unit	T-9-4	Northland Operating Co.	2150' FNL & 974' FEL Sec. 21, T14S R31E	TA Injector	10/28/63	11/2/63	3049'	2979-84'	8-5/8" Surf. Csg. @ 122', Cmt'd. w/ 125 sx, TOC @ Surf. 4-1/2" Prod. Csg. @ 3049', Cmt'd. w/ 300 sx, TOC @ 1206'
Trigg Federal	1	Northland Operating Co.	1980 FSL & 660 FEL Sec. 9, T14S, R31E	Oil	8/14/54	9/23/54	2794' 2814'	2800-2814'	13-3/8" Surf. Csg. @ 130', Cmt'd. w/ 50 sx, TOC @ 53' 5-1/2" Prod. Csg. @ 2794', Cmt'd. w/ 100 sx, TOC @ 2252'
Trigg Federal	2	Northland Operating Co.	660 FSL & 660 FEL Sec. 9, T14S, R31E	?	10/2/54	10/22/54	2788' 2810'	2790-2810'	13-3/8" Surf. Csg. @ 120', Cmt'd. w/ 50 sx, TOC @ 43' 5-1/2" Prod. Csg. @ 2788', Cmt'd. w/ 100 sx, TOC @ 2246'
Trigg Federal	9	Northland Operating Co.	660 FSL & 1980 FEL Sec. 9, T14S, R31E	Oil	5/5/55	5/28/55	2786' 2805'	2786-2805'	13-3/8" Surf. Csg. @ 90', Cmt'd. w/ 50 sx, TOC @ Surf. 5-1/2" Prod. Csg. @ 2786', Cmt'd. w/ 100 sx, TOC @ 2244'

Note: In those cases where cement tops were not reported on completion records, TOC was calculated assuming a yield of 1.5 cubic feet per sack (Class C cement with 2% bentonite).
Additionally, a 35% washout factor was utilized.

VII. Project Information

1. Proposed average daily injection volume: 1680 BWPD per injector
Proposed maximum daily injection volume: 2000 BWPD per injector
2. Both the fresh water gathering system and the injection system will be closed to the atmosphere.
3. Proposed average daily injection pressure: 500 psig at each injector
Proposed maximum daily injection pressure: 600 psig at each injector

Note: A step rate test will be run on the first horizontal injector and forwarded to the NMOCD. Depending on the results of the test, a higher injection wellhead pressure may be requested

4. The injection water will be obtained from area Ogallala wells that have been drilled and that are scheduled to be drilled (see Attachment G showing list and location of source wells). An analysis of water taken from a rancher's fresh water supply well located in the SW/4 of the NW/4 of Section 24, T14S, R31E is also attached (see Attachment H), as is an analysis of produced Queen Sand water from DQSU No. 6-2 (Attachment H(a)). This is the nearest fresh water well to the proposed injectors, and is in fact the only fresh water well within a two (2) mile radius of any of the proposed injectors. Attached as Attachment H(b) is a comparison between the fresh water sample and produced Queen Sand water. This comparison shows a moderate to severe scaling tendency at 140 degrees F when the concentration of fresh water reaches 85%. Measures will be taken with chemical additives to combat this problem.
5. Chlorides in all of the source wells is expected to be similar to that observed in the water analyzed in Attachment H.

Attachment G

VII. Item 4

List of Fresh Water Source Wells:

L-3776	SW/4,SW/4	Sec. 16, T13S, R32E
L-3776-S	SW/4,SW/4,SE/4	Sec. 33, T13S, R32E
L-3776-S-2	NE/4,SW/4	Sec. 28, T13S, R32E
L-3776-S-3	NW/4,SW/4,SW/4	Sec. 09, T13S, R32E
L-3776-S-4	SE/4	Sec. 16, T13S, R32E
L-3776-S-5	SW/4,NE/4	Sec. 21, T13S, R32E
L-3776-S-6	SW/4,SW/4	Sec. 21, T13S, R32E
L-3776-S-7	NE/4,NE/4	Sec. 28, T13S, R32E
Rancher's well	SW/4, NW/4	Sec. 24, T14S, R31E

At least one (1) additional water supply well is planned to be drilled in the immediate vicinity of the proposed pilot project. A request to expand the existing license to 1) allow for shipment of water from the wells listed above to the Drickey Queen Sand Unit, and 2) expand the amount of permissible withdrawals has been filed with the appropriate State of New Mexico agencies.

The only water supply well located within two (2) miles of any of the proposed injectors is a rancher's well in Section 24, T14S, R31E. This well is approximately 6500' east-southeast of the proposed DQSU No. 54 (see map).

Permian Treating Chemicals WATER ANALYSIS REPORT

SAMPLE

Oil Co. : Northland Operating
Lease : Drickey Queen
Well No. : Fresh Water
Lab No. : 112398.001

Sample Loc. :
Date Analyzed: 24-November-1998
Date Sampled : 23-November-1998

ANALYSIS

1. pH 7.930
2. Specific Gravity 60/60 F. 1.003
3. CaCO₃ Saturation Index @ 80 F. +0.883
@ 140 F. +1.483

Dissolved Gases

	MG/L	EQ. WT.	*MEQ/L
4. Hydrogen Sulfide	Not Present		
5. Carbon Dioxide	Not Determined		
6. Dissolved Oxygen	Not Determined		

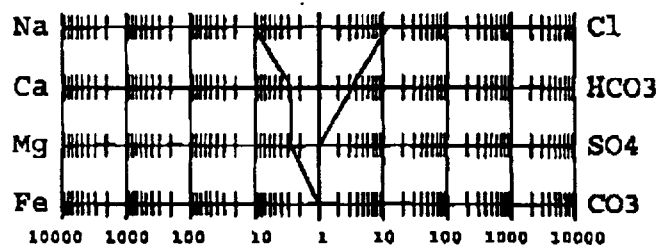
Cations

7. Calcium (Ca++)	52	/ 20.1 =	2.59
8. Magnesium (Mg++)	32	/ 12.2 =	2.62
9. Sodium (Na+) (Calculated)	231	/ 23.0 =	10.04
10. Barium (Ba++)	Below 10		

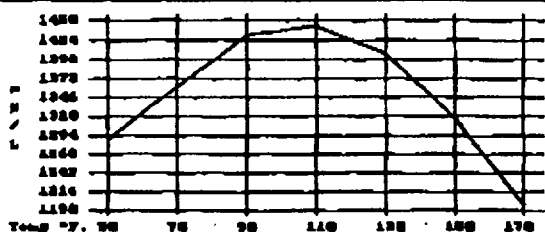
Anions

11. Hydroxyl (OH-)	0	/ 17.0 =	0.00
12. Carbonate (CO ₃ --)	0	/ 30.0 =	0.00
13. Bicarbonate (HCO ₃ -)	195	/ 61.1 =	3.19
14. Sulfate (SO ₄ --)	38	/ 48.8 =	0.78
15. Chloride (Cl-)	400	/ 35.5 =	11.27
16. Total Dissolved Solids	948		
17. Total Iron (Fe)	2	/ 18.2 =	0.08
18. Total Hardness As CaCO ₃	260		
19. Resistivity @ 75 F. (Calculated)	2.912 /cm.		

LOGARITHMIC WATER PATTERN *meq/L.



Calcium Sulfate Solubility Profile



PROBABLE MINERAL COMPOSITION COMPOUND EQ. WT. X *meq/L = mg/L.

Ca(HCO ₃) ₂	81.04	2.59	210
CaSO ₄	68.07	0.00	0
CaCl ₂	55.50	0.00	0
Mg(HCO ₃) ₂	73.17	0.60	44
MgSO ₄	60.19	0.78	47
MgCl ₂	47.62	1.24	59
NaHCO ₃	84.00	0.00	0
NaSO ₄	71.03	0.00	0
NaCl	58.46	10.03	586

*Milli Equivalents per Liter

This water is mildly corrosive due to the pH observed on analysis.
The corrosivity is increased by the content of mineral salts in solution.

Attachment H

Analysis of Water From Nearest Fresh
Water Well in Section 24, T14S, R31E

Permian Treating Chemicals WATER ANALYSIS REPORT

SAMPLE

Oil Co. : Northland Operating
Lease : Drickey Queen
Well No.: # 6-2
Lab No. : 112396.001

Sample Loc. :
Date Analyzed: 24-November-1998
Date Sampled : 23-November-1998

ANALYSIS

1. pH 5.260
2. Specific Gravity 60/60 F. 1.213
3. CaCO₃ Saturation Index @ 80 F. +1.114
@ 140 F. +1.554

Dissolved Gasses

4. Hydrogen Sulfide
5. Carbon Dioxide
6. Dissolved Oxygen

Not Present
Not Determined
Not Determined

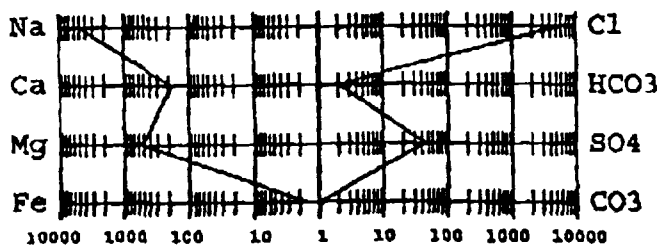
Cations

7. Calcium	(Ca ⁺⁺)	3,647	/ 20.1 =	181.44
8. Magnesium	(Mg ⁺⁺)	5,879	/ 12.2 =	481.89
9. Sodium	(Na ⁺)	(Calculated) 112,192	/ 23.0 =	4,877.91
10. Barium	(Ba ⁺⁺)	Not Determined		

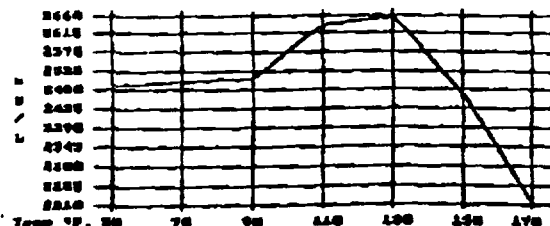
Anions

11. Hydroxyl	(OH ⁻)	0	/ 17.0 =	0.00
12. Carbonate	(CO ₃ ⁼)	0	/ 30.0 =	0.00
13. Bicarbonate	(HCO ₃ ⁻)	117	/ 61.1 =	1.91
14. Sulfate	(SO ₄ ⁼)	2,150	/ 48.8 =	44.06
15. Chloride	(Cl ⁻)	194,956	/ 35.5 =	5,491.72
16. Total Dissolved Solids		318,941		
17. Total Iron (Fe)		26	/ 18.2 =	1.43
18. Total Hardness As CaCO ₃		33,310		
19. Resistivity @ 75 F. (Calculated)		0.001 /cm.		

LOGARITHMIC WATER PATTERN *meq/L.



Calcium Sulfate Solubility Profile



PROBABLE MINERAL COMPOSITION			
COMPOUND	EQ. WT. X	*meq/L =	mg/L.
Ca(HCO ₃) ₂	81.04	1.91	155
CaSO ₄	68.07	44.06	2,999
CaCl ₂	55.50	135.47	7,519
Mg(HCO ₃) ₂	73.17	0.00	0
MgSO ₄	60.19	0.00	0
MgCl ₂	47.62	481.89	22,947
NaHCO ₃	84.00	0.00	0
NaSO ₄	71.03	0.00	0
NaCl	58.46	4,874.36	284,955

*Milli Equivalents per Liter

This water is somewhat corrosive due to the pH observed on analysis.
The corrosivity is increased by the content of mineral salts in solution.

Attachment H(a)

Analysis of Produced Queen Sand
Water From DQSU No. 6-2

Comparison Between Two Waters

24-November-1998

TO: Permian Treating Chemicals

Company : Northland Operating

Sample # 1
Drickey Queen # 6-2

Sample # 2
Drickey Queen - Fresh Water

Percent of #1 & #2	pH	TDS mg/L	SpGr	Saturation Index @80°F. @140°F.		Calcium Sulfate Scaling Potential
100 - 0	5.260	318941	1.213	-0.581	+0.472	Nil
95 - 5	5.394	303041	1.203	-0.539	+0.494	Nil
90 - 10	5.527	287142	1.192	-0.498	+0.515	Nil
85 - 15	5.661	271242	1.182	-0.459	+0.535	Nil
80 - 20	5.794	255342	1.171	-0.422	+0.552	Nil
75 - 25	5.928	239443	1.161	-0.387	+0.567	Nil
70 - 30	6.061	223543	1.150	-0.354	+0.581	Nil
65 - 35	6.195	207643	1.140	-0.323	+0.591	Nil
60 - 40	6.328	191744	1.129	-0.296	+0.599	Nil
55 - 45	6.462	175844	1.119	-0.271	+0.604	Nil
50 - 50	6.595	159945	1.108	-0.250	+0.605	Nil
45 - 55	6.729	144045	1.098	-0.234	+0.602	Nil
40 - 60	6.862	128145	1.087	-0.223	+0.593	Nil
35 - 65	6.996	112246	1.077	-0.218	+0.578	Nil
30 - 70	7.129	96,346	1.066	-0.222	+0.555	Nil
25 - 75	7.263	80,446	1.056	-0.237	+0.520	Nil
20 - 80	7.396	64,547	1.045	-0.240	+0.517	Nil
15 - 85	7.530	48,647	1.035	-0.124	+0.710	Nil
10 - 90	7.663	32,747	1.024	+0.124	+0.914	Nil
5 - 95	7.797	16,848	1.014	+0.454	+1.207	Nil
0 - 100	7.930	948	1.003	+0.883	+1.483	Nil

Attachment H(b)

Comparison Between Waters

Northland Operating Co.
Drickey Queen Sand Unit
Pilot Redevelopment Project
Section 15, T14S, R31E
Chaves County, NM

VIII. Geological Data

A. Injection Zone:

The Queen Sand occurs at a depth of approximately 3050 feet (+1300 feet), and dips southeasterly to 3110 feet on the eastern boundary of the Drickey Queen Sand Unit. The field is considered a common reservoir limited by a gas-oil contact and an oil-water contact. The gas-oil contact is at +1415 feet and the oil-water contact is at +1312 feet. Although an aquifer exists on the eastern edge of the field, no effective water-drive has been observed.

The oil production comes from an upper sand member averaging 11 feet in net pay thickness that is found just below a hard limestone interval. This sand is composed of fine-grained sand with a high uranium content which gives a "hot" gamma ray log response, and averages 23% porosity and 320 mds permeability.

B. Fresh Water Sources:

Fresh water for injection will be pumped from the Ogallala Aquifer, which occurs at a depth of 200 to 300 feet from the surface. No other fresh water-bearing zones have been identified in the area.

Northland Operating Co.
Drickey Queen Sand Unit
Pilot Redevelopment Project
Section 15, T14S, R31E
Chaves County, NM

IX. Proposed Stimulation Program

The proposed injectors will be stimulated using mud-removal enzymes.

Northland Operating Co.
Drickey Queen Sand Unit
Pilot Redevelopment Project
Section 15, T14S, R31E
Chaves County, NM

X. Logging and Test Data

The proposed wells will be logged at the time of drilling, with copies submitted to the appropriate Division District Office in conformance with General Rule No. 117.

In addition, a step-rate test will be run on at least one of the four wells in order to determine the need for upward adjustment in the permitted wellhead injection pressure.

Northland Operating Co.
Drickey Queen Sand Unit
Pilot Redevelopment Project
Section 15, T14S, R31E
Chaves County, NM

XI. Fresh Water Analysis

The nearest fresh water well to any of the proposed injectors is a rancher's well located approximately 6500' east-southeast of the proposed Drickey Queen Unit No. 54. The name of this fresh water well is unknown, but is located in the SW/4 of the NW/4 of Section 24, T14S, R31E (as shown on the map included with this application). The surface area around and near the Drickey Queen Sand Unit is utilized as open range land for cattle grazing. An analysis of the water from the well in Section 24 is attached as Attachment H in Section VII of this application.

Northland Operating Co.
Drickey Queen Sand Unit
Pilot Redevelopment Project
Section 15, T14S, R31E
Chaves County, NM

XII. Affirmative Statement

Attached is a statement by Ron Wilson, Certified Petroleum Geologist, regarding geological evidence of faulting or other hydrologic connection between the Queen Sand injection zone and the Ogallala fresh water zone.

Northland Operating Co.
Drickey Queen Sand Unit
Pilot Redevelopment Project
Section 15, T14S, R31E
Chaves County, NM

Attachment J

XIII. Item A

Proof of Notice

Surface Owners of property on which injectors will be located:

G.P. and Aline Sims
P.O. Box 1046
Eunice, NM 88231

Lease Operators within 1/2-mile of proposed injectors:

Northland Operating Co.
3500 Oak Lawn, Suite 380, LB #31, Dallas, TX 75219

STATE OF TEXAS

COUNTY OF DALLAS

BEFORE ME, the undersigned authority on this day personally appeared James Hull, Jr., Manager of Regulatory Compliance with Northland Operating Co., who being by me duly sworn, deposes and states that the persons listed on the foregoing attached list have been sent a copy, of the New Mexico Oil Conservation Division Form C-108, entitled "Application for Authorization to Inject" on November 24, 1998. This application pertains to Northland's desire to obtain authority to inject fresh water into four (4) new injectors to be drilled on the Drickey Queen Sand Unit in Section 15, T14S, R22S, Chaves County, New Mexico.

Northland Operating Co.

James Hull, Jr.

SUBSCRIBED AND SWORN TO before me on November 24, 1998, to certify which witness my hand and seal of office.

NOTARY PUBLIC, STATE OF TEXAS

Northland Operating Co.
Drickey Queen Sand Unit
Pilot Redevelopment Project
Section 15, T14S, R31E
Chaves County, NM

Attachment K

XIII. Item B

LEGAL NOTICE

Northland Operating Co., 3500 Oak Lawn Ave., Suite 380, LB #31, Dallas, TX 75219, has filed Form C-108 (Application for Authority to Inject) with the New Mexico Oil Conservation Division seeking administrative approval for four (4) new water injection wells in the Drickey Queen Sand Unit. The surface locations of the proposed wells will be as follows:

140' FSL & 330' FEL, Section 15, T14S, R31E, Chaves County, New Mexico
140' FNL & 380' FWL, Section 15, T14S, R31E, Chaves County, New Mexico
200' FSL & 330' FEL, Section 15, T14S, R31E, Chaves County, New Mexico
140' FNL & 330' FEL, Section 15, T14S, R31E, Chaves County, New Mexico

Injection water will be sourced from area water supply wells producing from the Ogallalla formation plus water produced from the Queen Sand along with oil. The water will be injected into the Queen Sand reservoir at a depth of approximately 3,050', at a maximum surface pressure of 600 psig at each injection well, and a maximum rate of 2000 barrels per day per injection well.

All interested parties opposing this action must file objections or requests for hearing with the New Mexico Oil Conservation Division, 2040 S. Pacheco Street, Santa Fe, New Mexico 87505, within fifteen (15) days.

Additional information can be obtained by contacting Jim Hull, Manager of Regulatory Compliance, at 3500 Oak Lawn, Suite 380, LB #31, Dallas, Texas 75219, or (214) 521-9959.

NOTE: A copy of the affidavit of publication of the above notice in the Roswell Daily Record will be forwarded upon its receipt by Northland Operating Co. on Monday, November 30, 1998. Also note the attached facsimile copy of a note from the Roswell Daily Record stating that the notice will be published on November 29, 1998.

Roswell Daily Record

Post Office Box 1897

Roswell, New Mexico

11/25/98

Steve,
your legal notice will
run on November 29, 1998.

An Affidavit will be sent
as soon as legal has run.

Thanks,
From

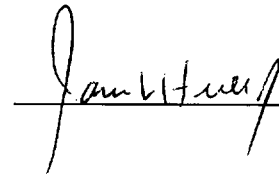
Happy Thanksgiving!

STATE OF TEXAS

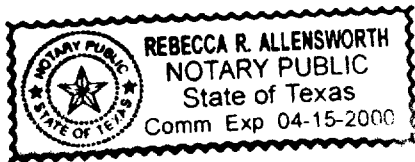
COUNTY OF DALLAS

BEFORE ME, the undersigned authority on this day personally appeared James Hull, Jr., Manager of Regulatory Compliance with Northland Operating Co., who being by me duly sworn, deposes and states that the persons listed on the foregoing attached list have been sent a copy, of the New Mexico Oil Conservation Division Form C-108, entitled "Application for Authorization to Inject" on November 24, 1998. This application pertains to Northland's desire to obtain authority to inject fresh water into four (4) new injectors to be drilled on the Drickey Queen Sand Unit in Section 15, T14S, R22S, Chaves County, New Mexico.

Northland Operating Co.


James Hull, Jr.

SUBSCRIBED AND SWORN TO before me on November 24, 1998, to certify which witness my hand and seal of office.




NOTARY PUBLIC, STATE OF TEXAS

HARPER & ASSOCIATES, INC.
CONSULTANTS AT OIL AND GAS TECHNOLOGY

SUITE 300
307 WEST SEVENTH STREET
FORT WORTH, TEXAS 76102

G. MICHAEL HARPER
PRESIDENT

November 25, 1998

(817) 332-4552
(FAX) (817) 332-4550

Queen Sand Resources, Inc.
Attn: Mr. Ken Flournoy, VP Operations
3500 Oak Lawn, Suite 380, LB #31
Dallas, Texas 75219

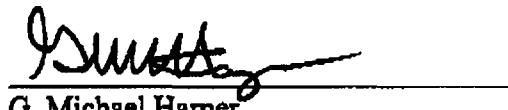
Re: Pilot Horizontal Project
Section 15-T4S-R31E
Chaves County, New Mexico

Dear Mr. Flournoy:

A review has been made at the geology immediately within and surrounding Section 15 of 4S-31E. The wireline logs that were available for review showed no loss or gain of rock section between any of the wells other than very minor variations of a few feet which are attributable to normal thickening and thinning consistent with the depositional environment. There is no evidence of faulting within Section 15 that would indicate a pathway exists for movement of injection water to the shallower aquifers in the area. However, it must be understood that with well spacings of approximately 1300 feet, there exists the possibility that faults could be present in Section 15 that do not manifest their presence in the available wireline logs.



Ronald J. Wilson
Certified Petroleum Geologist #4575



G. Michael Harper
Registered Professional Engineer

GMH:saz
quencert.doc

Northland Operating Co.

December 2, 1998

New Mexico Oil Conservation Division
2040 South Pacheco
Santa Fe, NM 87505

RE: Form C-108, Section XIII
Filed by Northland Operating Co.
Dated November 24, 1998
Pertaining to Drickey Queen Sand Unit

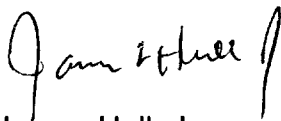
Dear Sirs,

As promised in Section XIII of the application, we have attached a facsimile copy of the Affidavit of Publication provided by the Roswell Daily Record on December 1, 1998, which certifies that the Legal Notice required as part of the C-108, Application for Authorization to Inject, was published on November 29, 1998, in the county where the project is located. Please advise if the original Affidavit is required for your records.

Also attached is a copy of a plat showing the proposed layout of the injectors and their associated laterals, and the dual-lateral producer that will be drilled in the center of Section 15. This information is for your information and files.

Thank you very much in advance for your timely review of the referenced application.

Yours very truly,



James Hull, Jr.
Manager of Regulatory Compliance

Ben, I will fax this to you & follow up with a call to make sure we are in compliance on everything, Thanks again.

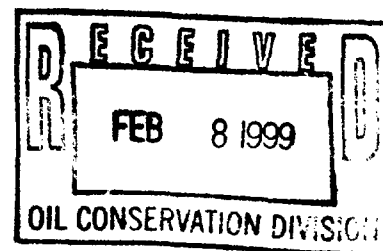
Sincerely ,

A handwritten signature in black ink, appearing to read 'Jim', with a stylized flourish at the end.

James L, Hull, Jr.
Production Clerk

Northland Operating Co.

February 5, 1999



Mr Ben Stone
State of New Mexico
Oil Conservation Division
2040 South Pacheco Street
Santa Fe, NM 87505

Re: Northland Operating Co.,
Administrative Order No. WFX-746

Dear Ben:

This is to confirm our conversation last week regarding our pilot project in New Mexico. Thank you for your assistance in granting us authorization to inject in the wells covered by the above mentioned Administrative Order.

Ben, all of these wells are in Chaves Co. New Mexico. API #'s are as follows:

Well #54 30-005-21156
Well #55 30-005-21157
Well #56 30-005-21153
Well #57 30-005-21154

The location discrepancies you asked about are as follows:

Well #54 should be 200 FSL. The drilling permit & newspaper article both have 200' FSL. Your approval was written 140' FSL.

Well #55 should be 140' FSL. The drilling permit, plat & newspaper article have 140' FSL. This was probably a typing error.

Well #56 should be 140' FNL. The drilling permit was typed incorrectly. The plat has 140' FNL.

Well #57 is OK.

13760 Noel Rd., Suite 1030, L.B. #44, Dallas, Texas 75240-7336
Tel (972) 233-9906 Fax (972)-233-9575

Ben, I will fax this to you & follow up with a call to make sure we are in compliance on everything, Thanks again.

Sincerely ,

A handwritten signature in cursive script, appearing to read "Jim", written in black ink.

James L, Hull, Jr.
Production Clerk