Case No.

1728

Application, Transcript,
Small Exhibits, Etc.

Application of Hixon,

NEW MEXICO OIL CONSERVATION COMMISSION

APPLICATION OF HANSON, WATERS & WILLIAMSON

FOR A

PILOT WATER FLOOD PROJECT

AND CERTAIN PROPOSED LOCATIONS FOR WELLS

IN THE

COYOTE QUEEN POOL

CHAVES COUNTY, NEW MEXICO

PRODUCTION SUMMARY

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
EXHIBIT No. R-1
CASE 1728

ERNEST A. HANSON
Petroleum Building
Roswell, New Mexico

HANSON, WATERS AND WILLIAMSON
PROPOSED PILOT FLOOD
COYOTE QUEEN FIELD
CHAVES COUNTY, NEW MEXICO

PRODUCTION SUMMARY

Total Number of Wells:	11
Total Field Production Aug. 1, to Oct. 31:	5,251.34 barrels
Daily Field Average for 92 Producing Days:	57.08 barrels
Daily Well Average for 92 Producing Days:	5.19 BOPD
Total Field Production Oct. 1, to Oct. 31:	2,106.52 barrels
Daily Field Average for 31 Producing Days:	67.95 barrels
Daily Well Average for 31 Producing Days:	6.18 BOPD

Wells to be Effected by the Proposed Pilot Flood:

Hanson, Waters & Williamson - #1 Hanson State "A"	10.95 BOPD
Hanson, Waters & Williamson - #2 Hanson State "A"	1.16 BOPD
Hanson, Waters & Williamson - #1 Levick State "C"	5.32 BOPD
Hanson, Waters & Williamson - #2 Levick State "C"	3.01 BOPD
Total daily oil produced by effected wells:	20.44 BOPD
Daily average of effected wells:	5.09 BOPD

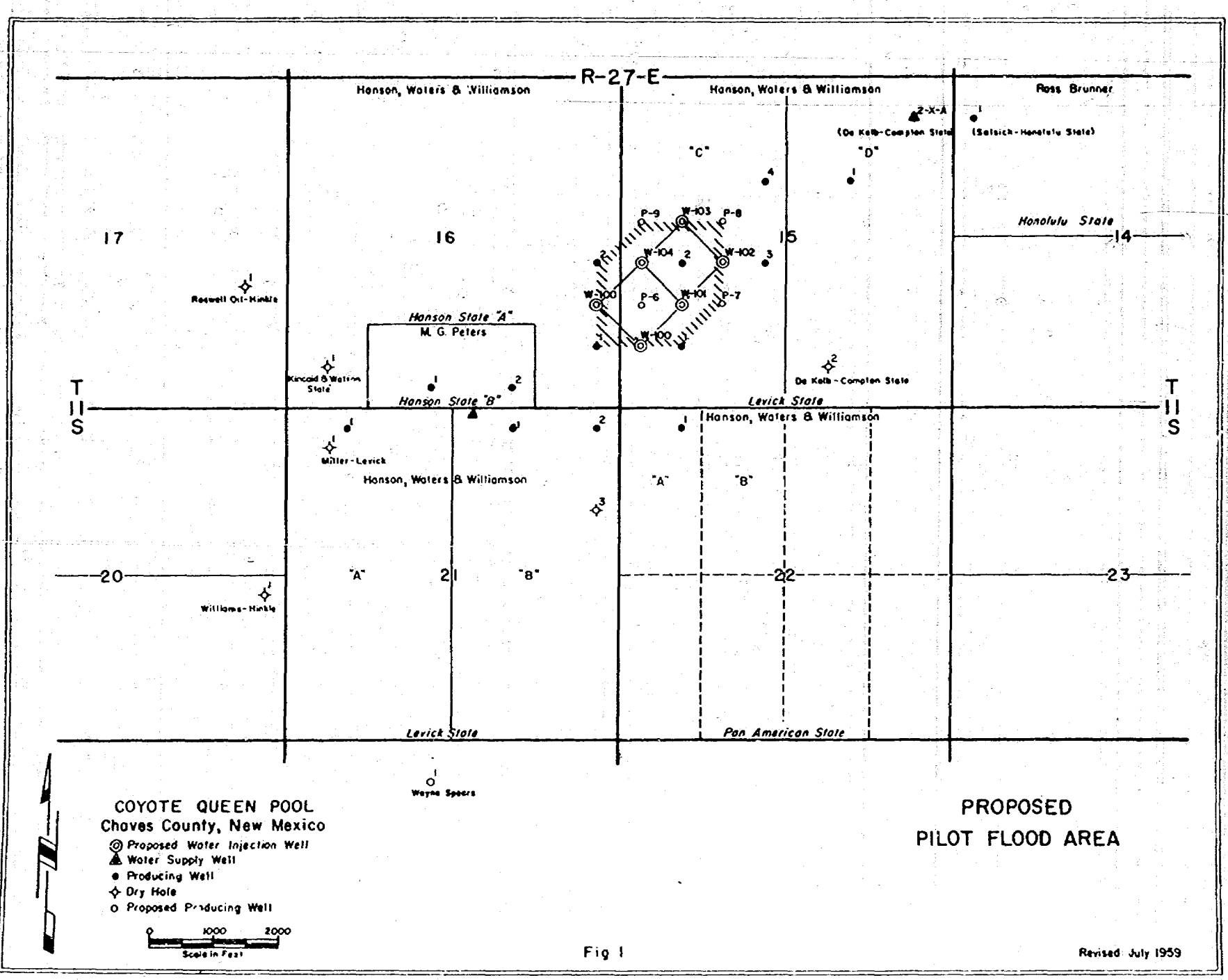

Fig 1

Revised July 1959

Levick State "A"

HANSON, WATERS AND WILLIAMSON
Levick State "A"
W½, Sec. 21, T. 11 S., R. 27 E., N.M.P.M.
Coyote-Queen Field
Chaves County, New Mexico

Producing wells on lease:
Hanson, Waters & Williamson - #1 Levick State "A"

Lease Production Summary:

Total amt. oil produced from Aug. 1, to Oct. 31:	284.33 barrels
Daily average for 92 producing days:	3.09 barrels
Daily average for period Oct. 1, to Oct. 31:	2.57 barrels

Individual well Production Record:

Hanson, Waters & Williamson - #1 Levick State "A"

Same as Lease Production Summary

31 day potential test; Oct. 1, to Oct. 31:	2.57 BOPD

LEASE PRODUCTION RECORD

LEVICK STATE "A"
W½, Section 21, Township 11 South, Range 27 East, N.M.P.M.
Coyote-Queen Field, Chaves County, New Mexico

Date	August	September	October
1			
2	14.00		
3	9.86	4.62	
4	0.00	4.62	3.48
5	9.28	2.31	1.16
6	0.00	3.47	1.15
7	6.96	0.00	1.74
8	0.00	2.31	1.16
9	3.48	6.93	0.00
10	0.00	6.93	2.32
11	1.74	2.31	2.32
12	0.00	0.00	5.80
13	4.64	3.47	2.89
14	7.00	2.31	3.48
15	0.00	1.73	4.04
16	5.22	2.31	0.00
17	0.00	2.89	1.16
18	4.06	4.04	1.15
19	0.00	4.05	1.74
20	4.06	2.31	2.31
21	4.64	2.88	3.46
22	0.00	4.05	2.88
23	0.00	6.93	2.89
24	4.64	3.46	2.31
25	4.64	4.05	1.16
26	9.86	1.15	4.62
27	4.64	2.31	5.20
28	3.48	1.16	3.46
29	7.58	8.66	3.47
30	0.00	5.78	4.62
31	4.64	2.89	2.89
	0.00	2.32	1.73
			5.78
			0.00
Total	114.42	89.54	80.37

HANSON, WATERS AND WILLIAMSON
Levick State "B"
E½, Sec. 21, T. 11 S., R. 27 E., N.M.P.M.
Coyote-Queen Field
Chaves County, New Mexico

Levick State "B"

Producing wells on lease:
Hanson, Waters & Williamson - #1 Levick State "B"
Hanson, Waters & Williamson - #2 Levick State "B"

Lease Production Summary:

Total amt. Oil produced from Aug. 1, to Oct. 31: 2155.58 barrels
Daily average for 92 producing days: 23.43 barrels
Daily average for period Oct. 1, to Oct. 31: 22.97 barrels

Individual Well Production Record:

Hanson, Waters & Williamson - #1 Levick State "B"

Date	November
1	23.73
2	19.19
3	18.51
4	19.68
5	20.83
6	15.04
7	20.96
8	17.36
9	18.51
10	17.36
Total	191.17

10 day potential test; Nov. 1, to Nov. 10: 19.12 BOPD

Individual Well Production Record: (Continued)

Hanson, Waters & Williamson - #2 Leviak State "B"

Date	November
1	3.47
2	2.32
3	5.78
4	0.00
5	19.68
6	9.25
7	12.73
8	6.93
9	15.04
10	10.41
Total	85.63

10 day potential test; Nov. 1, to Nov. 10:

8.56 BOPD

LEASE PRODUCTION RECORD

LEVICK STATE "8"
E½, Section 21, Township 11 South, Range 27 East, N.M.P.M.
Coyote-Queen Field, Chaves County, New Mexico

Date	August	September	October
1	39.60	0.00	21.52
2	61.80	0.00	13.89
3	33.80	0.00	15.04
4	15.32	15.05	20.83
5	30.64	34.71	7.52
6	23.28	14.89	3.47
7	20.09	31.32	17.35
8	18.60	0.00	23.73
9	11.02	48.75	40.50
10	14.00	38.76	24.88
11	34.38	26.04	20.83
12	25.02	6.99	59.17
13	26.18	32.50	20.83
14	11.60	26.62	32.40
15	14.58	34.71	23.14
16	28.00	55.55	23.15
17	28.00	21.98	11.57
18	53.60	22.68	15.04
19	21.58	20.83	28.93
20	27.42	12.73	14.56
21	19.80	39.35	13.95
22	32.64	0.00	28.93
23	26.18	6.79	24.30
24	24.45	29.55	24.30
25	0.00	27.42	34.72
26	15.74	13.30	26.61
27	17.48	42.23	30.09
28	22.70	9.84	24.30
29	35.58	32.98	22.00
30	31.40	2.98	22.02
31	0.00		21.98
Total	764.48	649.55	711.55

HANSON, WATERS AND WILLIAMSON
Levick State "C"
W½, Section 15, Township 11 South, Range 27 East, N.M.P.M.
Coyote-Queen Field
Chaves County, New Mexico

Levick State "C"

Producing wells on lease:
Hanson, Waters & Williamson - #1 Levick State "C"
Hanson, Waters & Williamson - #2 Levick State "C"
Hanson, Waters & Williamson - #3 Levick State "C"
Hanson, Watets & Williamson - #4 Levick State "C"

Lease Production Summary:

Total amt. oil produced from Aug. 1, to Oct. 31:	1292.72 barrels
Daily average for 92 producing days:	14.05 barrels
Daily average for period Oct. 1, to Oct. 31:	16.57 barrels

Individual Well Production Record:

Hanson, Waters & Williamson - #1 Levick State "C"

Date	November
1	4.62
2	4.63
3	5.78
4	10.41
5	1.16
Total	26.60

5 day potential test; Nov. 1, to Nov. 5: 5.32 BOPD

Hanson, Waters & Williamson - #2 Levick State "C"

Date	November
1	2.31
2	2.31
3	3.47
4	3.47
5	3.47
Total	15.03

5 day potential test; Nov. 1, to Nov. 5: 3.01 BOPD

Individual Well Production Record: (Continued)

Hanson, Waters & Williamson - #3 Levick State "C"

Date	November
8	4.63
9	4.62
10	4.63
Total	13.88

3 day potential test; Nov. 1, to Nov. 3: 4.63 BOPD

Hanson, Waters & Williamson - #4 Levick State "C"

Date	November
1	6.93
2	13.88
3	10.41
Total	31.22

3 day potential test; Nov. 1, to Nov. 3: 10.41 BOPD

LEASE PRODUCTION RECORD

LEVICK STATE "C"
W½, Section 15, Township 11 South, Range 27 East, N.M.P.M.
Coyote-Queen Field, Chaves County, New Mexico

Date	August	September	October
1	12.76	16.19	29.49
2	21.00	15.09	15.61
3	21.00	0.00	13.88
4	19.80	0.00	13.88
5	18.64	18.03	24.86
6	0.00	6.97	15.03
7	28.00	6.94	17.35
8	33.32	13.72	21.97
9	0.00	4.63	19.66
10	28.00	.58	9.80
11	26.76	4.65	6.94
12	38.44	12.80	11.56
13	22.70	11.60	10.99
14	12.18	8.08	13.95
15	12.18	9.25	13.88
16	0.00	13.88	8.57
17	6.38	13.88	5.30
18	11.60	6.94	27.76
19	12.76	10.47	16.77
20	4.06	5.81	12.14
21	0.00	10.99	13.88
22	0.00	16.19	15.03
23	0.00	0.00	17.35
24	0.00	3.47	17.34
25	30.32	1.16	13.88
26	36.16	5.20	28.10
27	30.32	20.24	13.91
28	50.12	1.15	13.88
29	31.48	0.00	37.62
30	33.22	5.78	29.48
31	0.00		23.72
Total	541.20	237.91	513.61

HANSON, WATERS AND WILLIAMSON
Levick State "D"
E½, Section 15, Township 11 South, Range 27 East, N.M.P.M.
Coyote-Queen Field
Chaves County, New Mexico

Producing wells on lease:
Hanson, Waters & Williamson - #1 Levick State "D"

Lease Production Summary:

Total amt. oil produced from Aug. 1, to Oct. 31:	418.91 barrels
Daily average for 92 producing days:	4.55 barrels
Daily average for period Oct. 1, to Oct. 31:	9.90 barrels

Individual Well Production Record:

Hanson, Waters & Williamson - #1 Levick State "D"

Same as Lease Production Summary

31 day potential test; Oct. 1, to Oct. 31: 9.90BOPD

Levick State "D"

LEASE PRODUCTION RECORD

LEVICK STATE "D"
E½, Section 15, Township 11 South, Range 27 East, N.M.P.M.
Coyote-Queen Field, Chaves County, New Mexico

Date	August	September	October
1	0.00	4.12	5.51
2	0.00	0.00	13.71
3	0.00	0.00	19.31
4	0.00	0.00	12.40
5	0.00	0.00	0.00
6	0.00	0.00	24.82
7	0.00	0.00	15.16
8	0.00	0.00	19.31
9	0.00	0.00	20.68
10	0.00	0.00	9.67
11	0.00	0.00	11.04
12	0.00	0.00	16.48
13	0.00	0.00	4.11
14	0.00	0.00	8.22
15	0.00	0.00	5.58
16	0.00	0.00	8.22
17	0.00	0.00	8.22
18	0.00	0.00	9.59
19	0.00	0.00	0.00
20	0.00	0.00	2.74
21	15.16	0.00	4.11
22	0.00	0.00	2.74
23	0.00	0.00	4.11
24	0.00	0.00	6.85
25	27.58	0.00	7.56
26	17.42	0.00	8.73
27	6.80	0.00	11.05
28	8.22	0.00	8.15
29	8.22	0.00	9.87
30	13.70	0.00	14.45
31	10.84		14.46
Total	107.94	4.12	306.85

HANSON, WATERS AND WILLIAMSON
Hanson State "A"
E½, Section 16, Township 11 South, Range 27 East, N. M. P. M.
Coyote-Queen Field
Chaves County, New Mexico

Producing wells on lease:
Hanson, Waters & Williamson - #1 Hanson State "A"
Hanson, Waters & Williamson - #2 Hanson State "A"

Lease Production Summary:

Total amt. oil produced from Aug. 1, to Oct. 31:	856.63 barrels
Daily average for 92 producing days:	9.31 barrels
Daily average for period Oct. 1, to Oct. 31:	13.42 barrels

Individual Well Production Record:

Hanson, Waters & Williamson - #1 Hanson State "A"

Date	November
1	14.55
2	2.32
3	7.57
4	16.25
5	10.41
6	13.87
7	13.88
8	5.78
9	13.88
Total	98.51

9 day potential test; Nov. 1, to Nov. 9: 10.95 BOPD

Hanson State "A"

Individual Well Production Record: (Continued)

Hanson, Waters & Williamson - #2 Hanson State "A"

Date	November
1	1.16
2	1.17
3	1.16
4	1.16
5	.59
6	1.74
7	1.16
8	1.17
9	1.16
Total	10.47

9 day potential test; Nov. 1, to Nov. 9: 1.16 BOPD

LEASE PRODUCTION RECORD

HANSON STATE "A"
E½, Section 16, Township 11 South, Range 27 East, N.M.P.M.
Coyote-Queen Field, Chaves County, New Mexico

Date	August	September	October
1	0.00	16.55	34.47
2	0.00	19.31	50.66
3	0.00	16.55	38.71
44	0.00	16.55	41.37
5	0.00	13.79	0.00
6	0.00	16.55	27.58
7	0.00	16.55	17.92
8	0.00	0.00	34.47
9	0.00	0.00	22.07
10	0.00	13.79	24.82
11	0.00	2.81	24.44
12	0.00	0.00	4.11
13	0.00	2.81	6.85
14	0.00	16.55	4.11
15	0.00	0.00	0.00
16	0.00	24.82	8.22
17	0.00	0.00	5.48
18	0.00	7.55	2.74
19	0.00	15.16	8.22
20	33.10	15.16	6.85
21	35.84	20.68	12.33
22	0.00	17.92	4.11
23	19.18	2.74	4.11
24	0.00	0.00	6.98
25	0.00	0.00	5.82
26	0.00	0.00	1.75
27	0.00	0.00	0.00
28	5.48	0.00	2.32
29	0.00	0.00	3.49
30	0.00	91.02	3.49
31	0.00		8.73
Total	93.60	346.86	416.17

HANSON, WATERS AND WILLIAMSON
Pan American State "A"
W½, Section 22, Township 11 South, Range 27 East, N.M.P.M.
Coyote-Queen Field
Chaves County, New Mexico

Producing wells on lease:
Hanson, Waters & Williamson - #1 Pan American State "A"

Lease Production Summary:

Total amt. oil produced from August 1, to October 31:	243.17 barrels
Daily average for 92 producing days:	2.64 barrels
Daily average for period Oct. 1, to Oct. 31:	2.52 barrels

Individual Well Production Record:

Hanson, Waters & Williamson - #1 Pan American State "A"

Same as Lease Production Summary

31 day potential test; Oct. 1, to Oct. 31:	2.52 BOPD

Pan Am. State "A"

LEASE PRODUCTION RECORD

PAN AMERICAN STATE "A"
W½, Section 22, Township 11 South, Range 27 East, N.M.P.M.
Coyote-Queen Field, Chaves County, New Mexico

Date	August	September	October
1	11.04	1.38	2.76
2	6.27	1.38	0.00
3	6.27	1.38	4.15
4	2.76	0.00	2.76
5	9.54	0.00	2.76
6	5.48	0.00	2.77
7	6.80	5.52	2.75
8	5.45	4.15	2.76
9	5.48	4.14	2.75
10	0.00	4.14	4.14
11	0.00	4.15	2.76
12	2.74	5.52	2.75
13	0.00	5.53	4.14
14	4.11	5.52	2.75
15	0.00	2.76	6.89
16	2.74	2.77	2.07
17	0.00	2.76	2.76
18	5.48	4.14	2.77
19	0.00	4.15	2.76
20	2.74	4.14	2.76
21	0.00	1.38	1.38
22	1.37	2.76	2.76
23	0.00	2.77	1.39
24	0.00	4.14	2.76
25	0.00	0.00	2.76
26	0.00	0.00	1.38
27	4.11	0.00	0.00
28	0.00	0.00	1.38
29	2.74	0.00	1.38
30	0.00	2.76	2.77
31	2.74		0.00
Total	87.86	77.34	77.97

AVAILABLE WATER SOURCES
FOR
PILOT INJECTION FLOOD
COYOTE QUEEN POOL
CHAVES COUNTY, NEW MEXICO

Available sources and previous tests conducted for a water supply in the area of the Coyote Queen Pool, Chaves County, New Mexico.

DEVONIAN:

Richfield - #1 Comanche Unit
Sec. 13, T. 11 S., R. 26 E., N.M.P.M.
Total Depth 6129'
Lease presently owned by Ernest A. Hanson

Richfield - #2 Comanche Unit
Sec. 24, T. 11 S., R. 26 E., N.M.P.M.
Perf. 6118-42' and 6157-84'; F. 15 BXWPH
Lease presently owned by Ernest A. Hanson

Kewannee - #1 De Kalb Federal
Sec. 25, T. 11 S., R. 26 E., N.M.P.M.
DST 6184-6202'; op. 2 hrs., rec. 2160' XW

Honolulu - #1 State
Sec. 13, T. 11 S., R. 27 E., N.M.P.M.
DST 6692-6743'; op. 2 hrs., rec. 5880' X&SW

Texas Co. - #1 State "AM"
Sec. 13, T. 11 S., R. 27 E., N.M.P.M.
Perf. 6583-93'; F. 10 BXWPH

De Kalb - #1 Coll
Sec. 18, T. 11 S., R. 27 E., N.M.P.M.
Perf. 6315-25'; F. 35 BXWPH

Union & De Kalb - #1 State
Sec. 27, T. 11 S., R. 27 E., N.M.P.M.
DST 7400-95'; op. 2 hrs., rec. 1000' SG&MCXW
and 4000' GCXW

GLORIETTA:

Hanson, Waters & Williamson - #2-X Levick State "D"
Sec. 15, T. 11 S., R. 27 E., N.M.P.M.
Potentialed for 625 BXWPD

QUEEN:

Eide - #2 Gorman Federal
Sec. 19, T. 11 S., R. 27 E., N.M.P.M.
Perf. Penrose section; unable to swab down XW
Est. 600 - 1200 BXWPD

Peters - #1-B Federal Kelly
Sec. 19, T. 11 S., R. 27 E., N.M.P.M.
Perf. Penrose section; unable to swab down XW
Est. 600 - 1200 BXWPD

YATES:

Whaley Co. water well
Sec. 10, T. 11 S., R. 27 E., N.M.P.M.
Est. 300 BWPD

Hanson, Waters & Williamson - #1-X Levick State "B"
Sec. 26, T. 11 S., R. 27 E., N.M.P.M.
Potentialed 650 BWPD

PHONE OR 4-4366

JAMES E. RUSSELL
P. M. BRIDGES
C. O. DENNIS
D. A. FLANAGAN
A. L. JENKE

RUSSELL ENGINEERING
PETROLEUM CONSULTANTS
CORE ANALYSTS
101 PETROLEUM BUILDING
ABILENE, TEXAS

BEFORE THE
OIL CONSERVATION COMMISSION
SANTA FE, NEW MEXICO
App. EXHIBIT No. R-3
CASE 1728

September 5, 1959

Hanson, Waters, and Williamson
P. O. Box 852
Roswell, New Mexico

Re: Complete Water Analysis
and Compatibility Tests
Water Supply Well No. 2-X
Coyote (Queen) Pool
Chaves County, New Mexico

Gentlemen:

Two samples of water taken from the Glorietta Sandstone at an approximate depth of 3200 feet in the above well were submitted to our laboratory for complete analysis. The samples were sealed in one-gallon polystyrene containers before shipment. The results of the analyses are shown in both tabular and graphical form. The water contained a pH of 6.5 and carbon dioxide content of 125 parts per million, indicating that it is potentially corrosive to metal surfaces with which it may come in contact. The extremely high iron content (500 parts per million total iron) is, in all probability, the result of reaction between the pipe in this well and the corrosive water. It is doubtful that the iron content is representative of formation water.

Special compatibility tests were conducted using the current water sample and a sample of water from a fresh water supply well analyzed in our laboratory, July 13, 1959 and presented as our Laboratory No. W-414. Waters from Water Supply Well No. 2-X and from the fresh water supply well were mixed in the ratios of 1 to 3, 1 to 1, and 3 to 1 and checked for formation of precipitates, pH content, alkalinity, and supersaturation. Results of these tests indicated that these waters are compatible in all ratios tested under laboratory conditions.

We trust that the above data may be of assistance.

Very truly yours,

RUSSELL ENGINEERING

A. L. Jenke

A. L. Jenke

ALJ:cw
6 copies - Addressee
1 copy - Frank B. Waters Oil Company

Hanson, Waters & Williamson

	Lease	Description	(1) Size hole	(2) Size Pipe	(3) Length	(4) length factor	(5) weight	(6) cement circulated?	(7) No. of sacks	(8) Calculated No of Sax	(9) 150 % Calculated No	(10) % Silk wtr used to Circ.
1	Levick	State "A"										
2		1-O 21-11-27	7 7/8"	5 1/2"	930'		14 16.	Yes	250	119.8	179	208
3	Levick	State "B"										
4		2-A 21-11-27	6 1/4"	4 1/2"	931'	.0933	9 1/2 16.	Yes	175	86.86	130	201
5		1-B 21-11-27	6 1/4"	4 1/2"	920'	.0933	9 1/2 16.	Yes	150	85.84	129	195
6	Levick	State "C"							225?			
7		1-M 15-11-27	6 1/4"	4 1/2"	940'	.0933	9 1/2 16	No	100	87.70	132	
8		2-L 15-11-27	6 1/4"	4 1/2"	918'	.0933	9 1/2 16.	No	100	85.65	129	
9		3-K 15-11-27	6 1/4"	4 1/2"	966'	.0933	9 1/2 16	No	100	90.13	135	
10		4-F 15-11-27	6 1/4"	4 1/2"	932'	.0933	9 1/2 16	No	100	86.96	130	
11	Levick	State "D"										
12		1-G 15-11-27	6 1/4"	4 1/2"	964'	.0933	9 1/2 16	No	100	89.94	135	
13	Hanson	State "A"										
14		1-P 16-11-27	6 1/4"	4 1/2"	927'	.0933	9 1/2 16	No	100	86.49	130	
15		2-I 16-11-27	6 1/4"	4 1/2"	927'	.0933	9 1/2 16	No	100	86.49	130	
16	Pan American	State A										
17		1-D 22-11-27	6 1/2"	4 1/2"	959'	.0933	9 1/2 16	No	100	89.47	134	
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
32												

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9-

Hanson, Waters & Williamson

① Size hole	② Size Pipe	③ Length	④ length factor	⑤ weight	⑥ cement circulated?	⑦ No. of sacks	⑧ Calculated No. of Sacks	⑨ 150 % Calculated No.	⑩ % fill up used to Circ.	⑪	⑫
7 7/8"	5 1/2"	930'		14 16.	Yes	250	119.8	179	208		
6 1/4"	4 1/2"	931'	.0933	9 1/2 16.	Yes	175	86.86	130	201		
6 1/4"	4 1/2"	920'	.0933	9 1/2 16.	Yes	150	85.84	129	175		
						225?					
6 1/4"	4 1/2"	940'	.0933	9 1/2 16	No	100	87.70	132			
6 1/4"	4 1/2"	918'	.0933	9 1/2 16.	No.	100	85.65	129			
6 1/4"	4 1/2"	966'	.0933	9 1/2 16	No	100	90.13	135			
6 1/4"	4 1/2"	932'	.0933	9 1/2 16	No	100	86.96	130			
6 1/4"	4 1/2"	964'	.0933	9 1/2 16	No	100	89.94	135			
6 1/4"	4 1/2"	927'	.0933	9 1/2 16	No	100	86.49	130			
6 1/4"	4 1/2"	927'	.0933	9 1/2 16	No	100	86.49	130			
6 1/2"	4 1/2"	959'	.0933	9 1/2 16	No	100	89.47	134			

1 v 89

NEW MEXICO OIL CONSERVATION COMMISSION

APPLICATION OF HANSON, WATERS & WILLIAMSON DRILLING COMPANY

FOR A

PILOT WATER FLOOD PROJECT

AND CERTAIN PROPOSED LOCATIONS FOR WELLS

IN THE

COYOTE QUEEN POOL

CHAVES COUNTY, NEW MEXICO

N. Mex. Oil

RUSSELL ENGINEERING
PETROLEUM CONSULTANTS
101 Petroleum Building
Abilene, Texas

PHONE OR 4-4386

JAMES E. RUSSELL
P. M. BRIDGES
C.O. DENNIS
A.L. JENKE

RUSSELL ENGINEERING
PETROLEUM CONSULTANTS
CORE ANALYSTS
101 PETROLEUM BUILDING
ABILENE, TEXAS

July 23, 1959

New Mexico Oil Conservation Commission
Capitol Building
Santa Fe, New Mexico

Gentlemen:

The following data are submitted in reference to the case covering application of Hanson, Waters & Williamson for an order authorizing a pilot water flooding project in the Coyote Queen Pool, Chaves County, New Mexico and approval for the drilling of several unorthodox locations for wells in this water flood project.

Exhibit 1 is submitted showing a map of the area and includes all the wells drilled in the pool to date. Also shown on this exhibit is the Pilot Area and the locations of the proposed new wells.

The Coyote Queen Pool is producing from the Queen Sand at an approximate depth of 835 feet subsurface. Exhibit 2 is a structure map on top of the Queen Sand.

None of the injection wells have been drilled as yet; however gamma ray-acoustilogs of Hanson, Waters & Williamson Levick State "C" Wells Nos 1 and 2 and Hanson State "A" Wells Nos. 1 and 2 are presented as Exhibit 3. Core graphs of the same wells are presented as Exhibit 4. Future wells in the pilot area are not expected to vary much from those already completed.

Pilot Area: The proposed pilot area will consist of six injection wells to be drilled. Two producers will be completely enclosed by injection wells and eight producers will be outside wells for control purposes. The distance between injection wells will be 933 feet resulting in 20-acre 5-spots. The layout of the pilot area is shown on Exhibit 1.

Proposed completion procedure for the injection wells is to set approximately 900 feet of 4-1/2" - 9.5# continuous weld casing through the pay zone

and circulate cement to the surface. The casing will be tested in the conventional manner prior to perforating. The wells will be perforated with four shots per foot of pay in the porous zones and hydraulically fractured with 250 pounds of sand per foot of pay.

It is anticipated that source water for this project can be obtained from a dry hole originally drilled by DeKalb as Compton State No. 2-X-A at a location designated on Exhibit No. 1, 660 feet from the North line and 660 feet from the East line of Section 15, Township 11-S, Range 27-E. The source horizon is the Glorietta formation of Permian age at approximately 2800 feet. The producing capacity of this well is not known at this time.

Reservoir Fluid Characteristics: Average core data from 12 wells cored in this field indicate porosity of 11.9 percent and average horizontal permeability of 16 millidarcys. Connate water saturation determined by dynamic oil flooding tests is 32.3 percent. Average residual oil saturation after complete sweep of this reservoir rock is 24.0 percent.

A stock tank sample of the produced oil tested 39.7° API gravity and 4.34 centipoises viscosity at 80° F.

Production History: The productive limits of this field are not as yet defined by the drilling to date. There is no evidence of an active water drive in this reservoir, and it is believed the primary producing mechanism is solution gas drive.

The first production from this Pool was from a well drilled and completed in Section 21, T-11-S, R-27-E by George Williams in January, 1958. Exhibit 5 is a production curve of this well. The M. G. Peters (formerly Steinberger Drilling Company) has a similar production history. The average rate of production of these wells has been submarginal since completion.

Development has been quite recent on the Hanson, Waters & Williamson

leases with first production in March, 1959. Production date for the Levick State "B" lease is tabulated below:

Month	Barrels
March	728
April	1,024
May	232
June	1,528
Total	3,562

Although the reservoir characteristics are more favorable for productivity on the Hanson, Waters & Williamson wells than on the George Williams well, it is anticipated they will be submarginal producers within six to nine months after completion.

Water Requirements: Based on injectivity calculations for the average permeability of this reservoir of 16 millidarcys and the reservoir fluid characteristics, it has been determined that 4.5 barrels per day per foot of sand will be the maximum injection rate at 650 psi surface pressure. Average thickness of the pay in the pilot area is 42 net feet. Average injection rate per well should be 190 barrels per day or 1140 barrels for the six proposed injection wells.

Results Expected: Maximum recoverable oil reserves for this flood project are 215 barrels per acre foot or 9000 barrels per acre for the area represented in the pilot flood. Total oil recovery from the two enclosed producing wells should be approximately 361,000 barrels. This represents an increase over continued primary operations of 283,600 barrels.

Optimum Spacing: Detailed calculations were performed to determine the optimum spacing for this flood assuming maximum injection rates per well. Considered in these computations were development costs, operating costs, reserves, and producing life. A sufficient number

of cases were computed between one and 40-acre spacing units to develop a mathematical relationship between spacing and all other factors. Results of this study indicated the maximum net cash realization occurs on a spacing pattern of 20-acre 5-spots. When taxes and value of money are considered, the optimum spacing is even less.

It is estimated that 12-14 years will be required to flood-out the average 20-acre unit. With wider spacing such as 40-acre units, the life is extended considerably and cash realization reduced because of higher operating and equipment costs. Our experience has shown that the useful life of equipment in continuous use in water flooding operations is seldom more than 15 years and that replacement costs often cause premature abandonment and consequently loss of potentially recoverable reserves.

Conclusions: Based on the evidence submitted and in the interest of conservation, it is requested that the Oil Conservation Commission grant a permit for this pilot water flood project and that approval be given for the drilling of the following wells at the locations indicated:

Well No.	Lease	Township	Range	Section	Location
Proposed Injection Wells:					
W-100	Hanson State "A"	T-11-S	R-27-E	16	1650' FSL 330' FWL
W-100	Levick State "C"	T-11-S	R-27-E	15	990' FSL 330' FWL
W-101	Levick State "C"	T-11-S	R-27-E	15	1650' FSL 990' FWL
W-102	Levick State "C"	T-11-S	R-27-E	15	2310' FSL 1650' FWL
W-103	Levick State "C"	T-11-S	R-27-E	15	2310' FNL 990' FWL
W-104	Levick State "C"	T-11-S	R-27-E	15	2310' FSL 330' FWL
Proposed Producing Wells:					
P-6	Levick State "C"	T-11-S	R-27-E	15	1650' FSL 330' FWL
P-7	Levick State "C"	T-11-S	R-27-E	15	1650' FSL 1650' FWL

Well No.	Lease	Township	Range	Section	Location
Proposed Producing Wells (Continued):					
P-8	Levick State "C"	T-11-S	R-27-E	15	2310' FNL 1650' FWL
P-9	Levick State "C"	T-11-S	R-27-E	15	2310' FNL 330' FWL

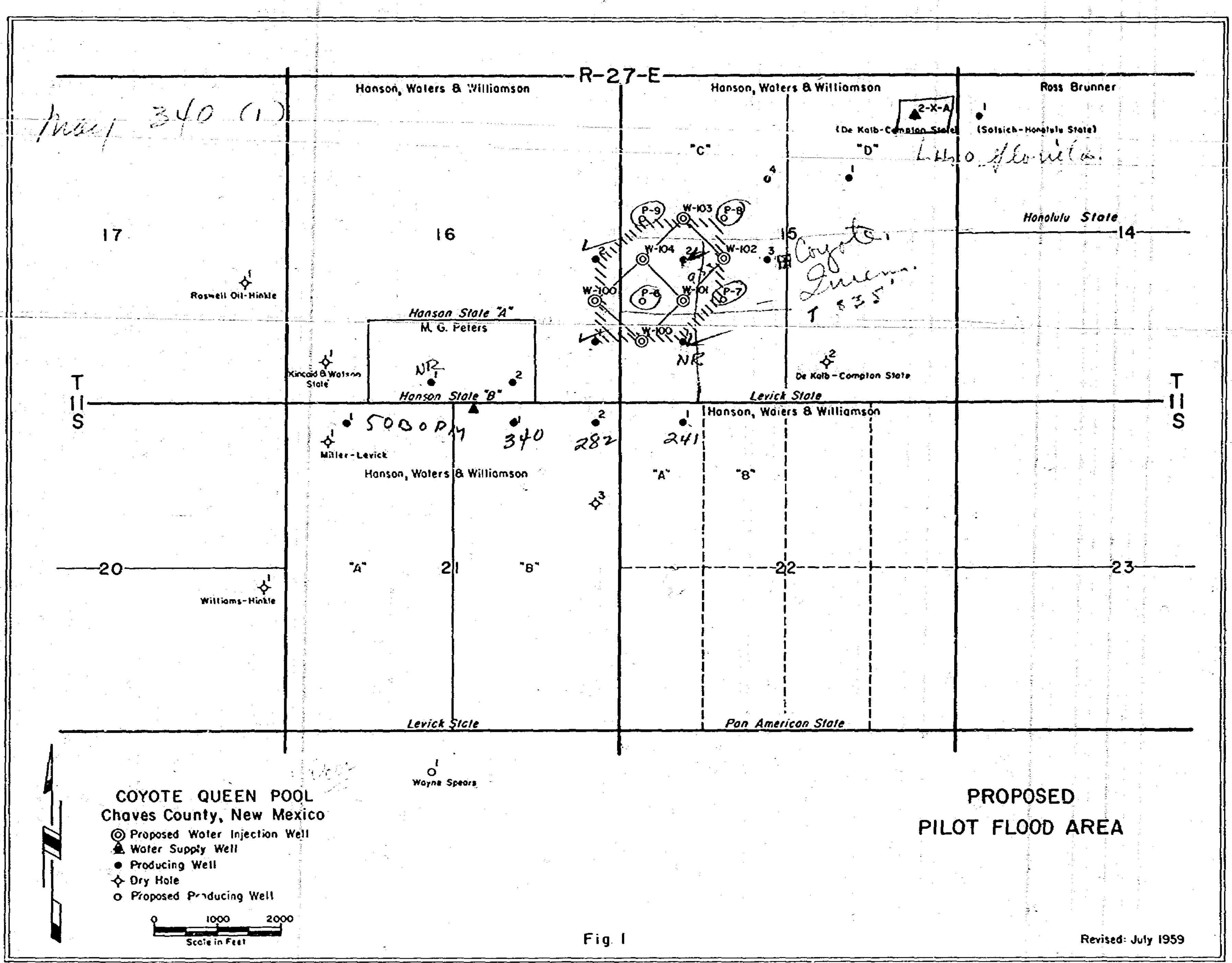
For Hanson, Waters & Williamson:

Yours very truly,

RUSSELL ENGINEERING

James E. Russell

JER:gc



R-27-E
Hanson, Waters & Williamson
Hanson, Waters & Williamson
Ross Brunner
2-X-A
(De Kalb-Compton State)
(Salsich-Honolulu State)
"C"
"D"
17
16
15
14
Honolulu State
W-103
W-104
W-102
W-100
W-101
W-105
P-9
P-8
P-7
Roswell Oil-Hinkle
Hanson State "A"
M. G. Peters
Kincaid & Watson State
Hanson State "B"
Levick State
De Kalb-Compton State
T 11 S
T 11 S
Hanson, Waters & Williamson
Miller-Levick
Hanson, Waters & Williamson
"A"
"B"
"A"
"B"
20
21
22
23
Williams-Hinkle
Levick State
Pan American State
Wayne Spears
Russell Engineering Petroleum Consultants
1000
2000
Scale in Feet
May 340 (1)
5000 PM
340
282
241
NR
NR
Coyote Queen

COYOTE QUEEN POOL
Chaves County, New Mexico

- ◎ Proposed Water Injection Well
- ▲ Water Supply Well
- ● Producing Well
- ⟡ Dry Hole
- ○ Proposed Producing Well

PROPOSED
PILOT FLOOD AREA

Fig. I

Revised: July 1959

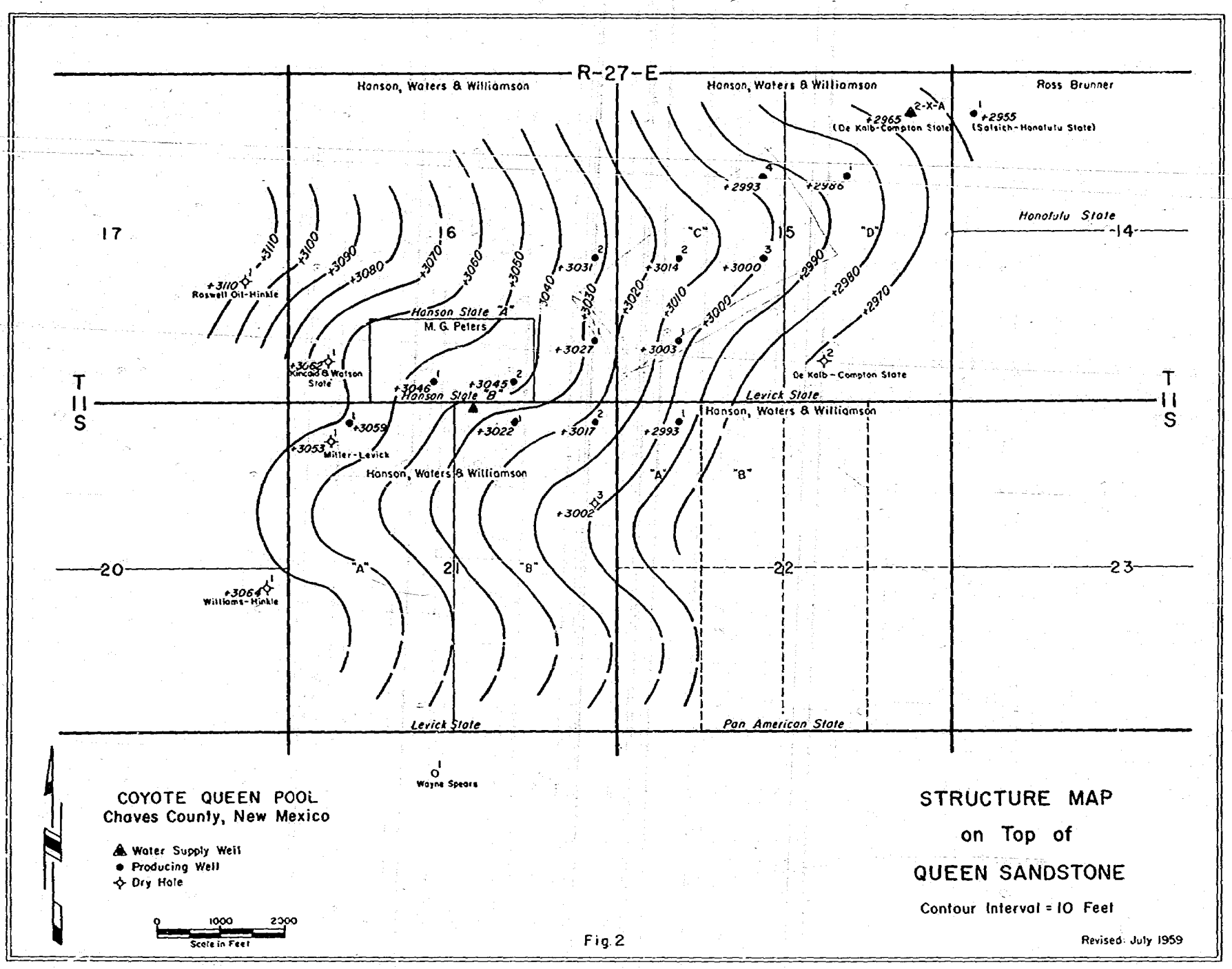
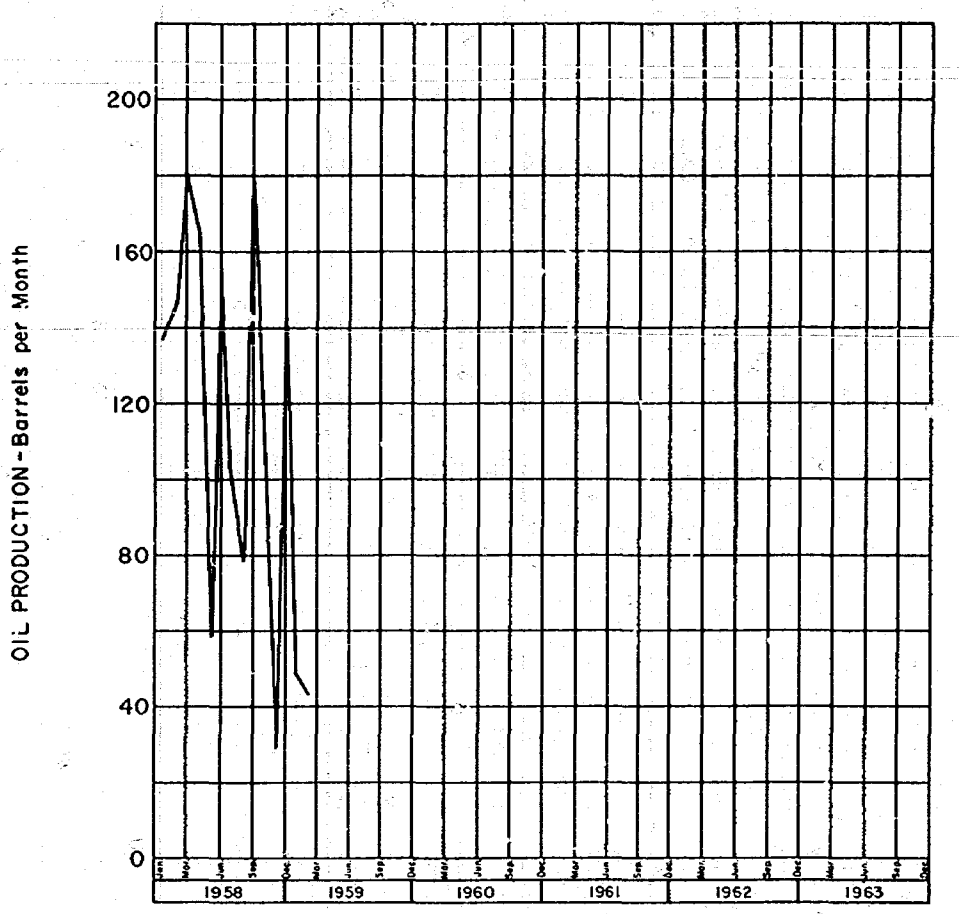

R-27-E
Hanson, Waters & Williamson
Hanson, Waters & Williamson
Ross Brunner
+2965
(De Kalb-Compton State)
2-X-A
+2955
(Salsich-Honolulu State)
+2993
+2986
Honolulu State
17
16
15
14
"C"
"D"
+3110 X1
+3110
Roswell Oil-Hinkle
+3100
+3090
+3080
+3070
+3060
+3050
+3040
+3031 2
+3030
+3014 2
+3020
+3010
+3000
+2990
+2980
+2970
+3000 3
Hanson State "A"
M. G. Peters
+3027 1
+3003 1
+3062 X1
Kincaid & Watson State
+3046 1
+3045 2
Hanson State "B"
De Kalb-Compton State
T 11 S
Levick State
T 11 S
+3059 1
+3053 X1
Miller-Levick
+3022 1
+3017 2
+2993 1
Hanson, Waters & Williamson
Hanson, Waters & Williamson
"A"
"B"
+3002 X3
20
21
22
23
+3064 1
Williams-Hinkle
Levick State
Pan American State
0 1
Wayne Spears
COYOTE QUEEN POOL
Chaves County, New Mexico
Water Supply Well
Producing Well
Dry Hole
0 1000 2000
Scale in Feet
RUSSELL ENGINEERING
PETROLEUM CONSULTANTS
STRUCTURE MAP
on Top of
QUEEN SANDSTONE
Contour Interval = 10 Feet
Revised: July 1959

Fig. 2



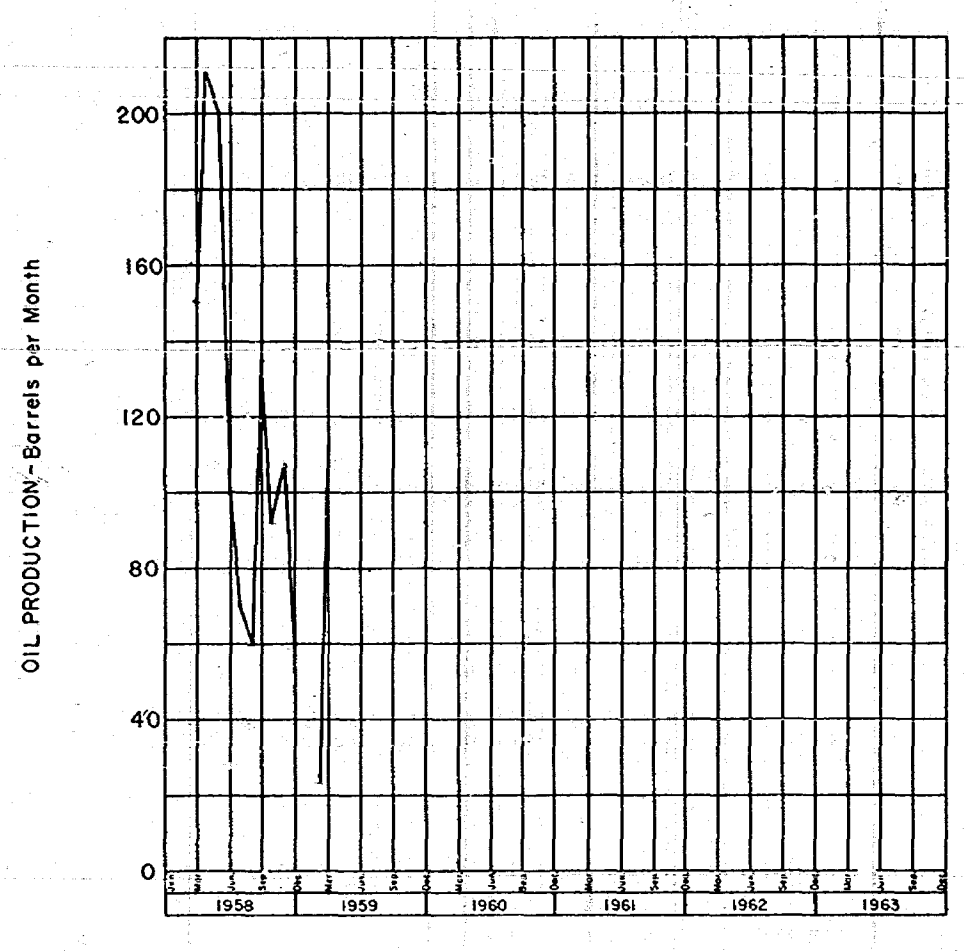
PRODUCTION HISTORY

George Williams #1 NW Sec 21
Levick State Lease

COYOTE QUEEN POOL
Chaves County, New Mexico

Fig. 5

RUSSELL ENGINEERING
PETROLEUM CONSULTANTS



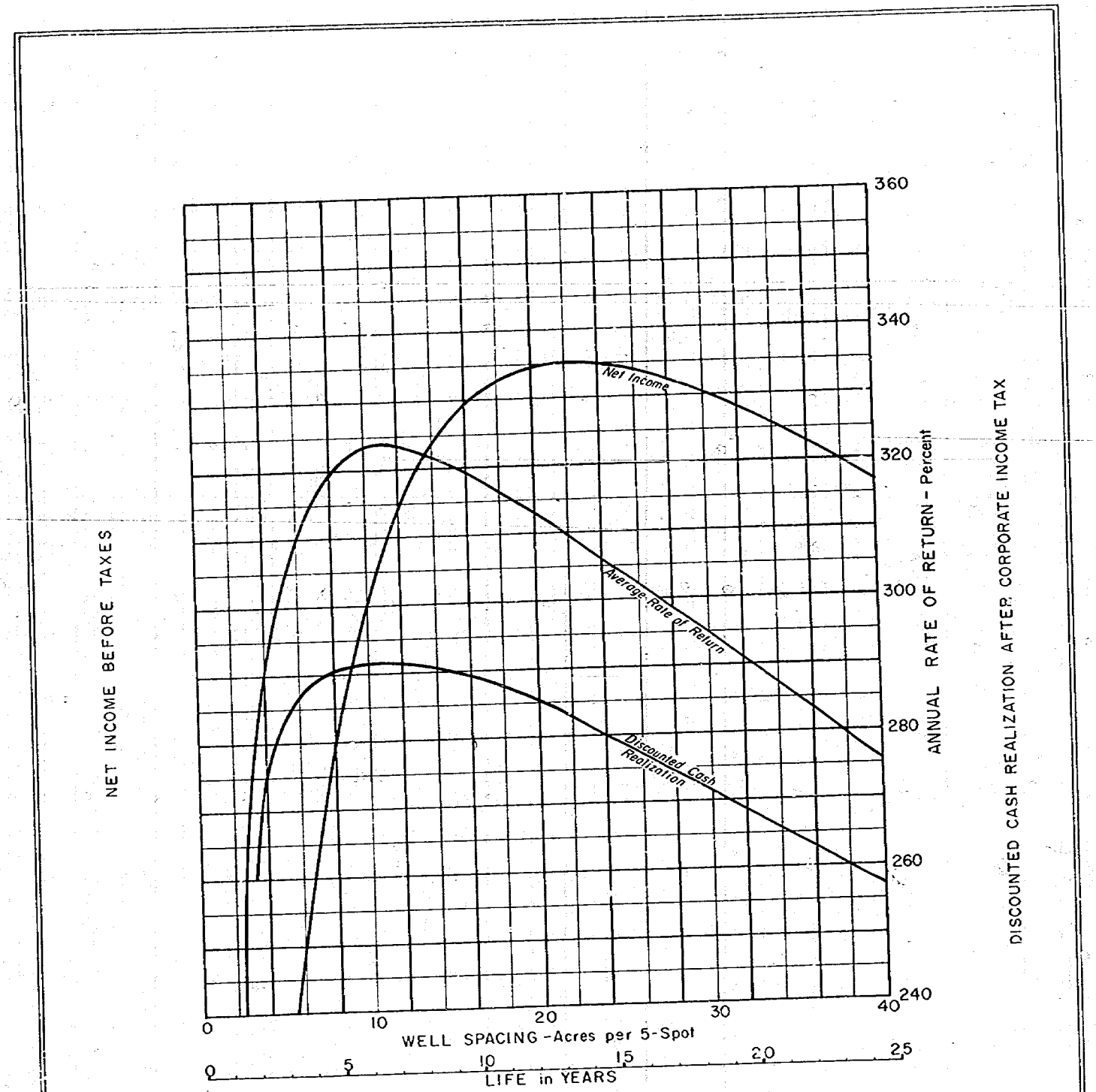
PRODUCTION HISTORY

M.G. Peters
(Steinberger Drilling Co.)
Hanson State Lease

COYOTE QUEEN POOL
Chaves County, New Mexico

Fig. 5A

RUSSELL ENGINEERING
PETROLEUM CONSULTANTS



OPTIMUM SPACING ANALYSIS

COYOTE QUEEN POOL
Chaves County, New Mexico

Fig. 6

RUSSELL ENGINEERING
PETROLEUM CONSULTANTS

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
November 18, 1959
REGULAR HEARING

IN THE MATTER OF:

Application of Hanson, Waters, and Williamson for a hearing de novo before the Oil Conservation Commission in Case No. 1728, Order No. R-1473, which was an application for a pilot water flood project in the Coyote-Queen Pool, Chaves County, New Mexico, and for capacity allowables for 12 wells in said project, and for the establishment of an administrative procedure for expanding said project and for granting capacity allowables to wells in said project. Case 1728

BEFORE:

Mr. A. L. Porter, Jr.
Mr. Murray Morgan
Governor John Burroughs

TRANSCRIPT OF HEARING

MR. PORTER: The meeting will come to order. At this time I would like to announce that the Commission has decided that the normal unit allowable for December will be 36 barrels per day for the Southeast, will remain at 52 barrels for the Northwest.

We will take up next Case 1728.

MR. PAYNE: Case 1728: Application of Hanson, Waters, and Williamson for a hearing de novo before the Oil Conservation Commission in Case No. 1728, Order No. R-1473, which was an application for a pilot water flood project in the Coyote-Queen Pool, Chaves County, New Mexico, and for capacity allowables for 12 wells

in said project, and for the establishment of an administrative procedure for expanding said project and for granting capacity allowables to wells in said project.

MR. KELLAHIN: If the Commission please, Jason Kellahin, Kellahin and Fox, representing the Applicant. Before we start with any testimony in the case, I would like to make a brief statement and kind of review the situation which arose and occasioned our being before the Commission de novo at this time.

The case was first heard before an Examiner on July the 28th, following which the Commission entered its order denying the application for the water flood, and basing the denial on two findings: One, that the proposed producing wells which have been potentialed all were reported as being capable of producing in excess of top unit allowable for the Coyote-Queen Pool; and the other, that the Applicants presented no evidence to show they have an adequate supply of water for said project.

We feel that the findings were based on a misapprehension of our testimony. However, we probably didn't make it as clear as we should have, and at this time we will offer additional testimony on those two points.

The case was originally filed back in July 1959 and well before a hearing had been called in Case 1787, which resulted in Order No. R-1525; as a matter of information for the Commission, I feel that the Commission should still give full consideration to the fact that this application was based upon an application for

capacity allowables. I don't know what consideration they will see fit to give to the provision of Order No. R-1525. We are prepared to go ahead with some additional information in connection with the capacity allowable features, by offering to the Commission additional reservoir information which we think is pertinent to the issues.

In connection with the presentation of this testimony I would like to point out that our application for hearing de novo was filed on September 11th of 1959 and under the Statute, the case should have been heard at the hearing in Roswell on October 14th. At the request of the Commission staff, we did not press for hearing at that time and consented to hearing at a later date. Had it been heard at that date, of course, the provisions of this order would not have been in effect, and I think that should be given some consideration by the Commission.

In presenting our case we will have two witnesses, Mr. Schram and Mr. Russell.

MR. PORTER: Will you have your witnesses stand and be sworn, please?

(Witnesses sworn.)

MR. KELLAHIN: My first witness will be Mr. Schram.

HARRY F. SCHRAM

called as a witness, having been first duly sworn on oath, testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Will you state your name, please?

A My name is Harry F. Schram.

Q By whom are you employed, and in what position?

A As geologist for Ernest A. Hanson.

Q Mr. Schram, have you had any education in the field of geology and experience in that field, and would you outline that education and experience for the Commission?

A I hold a Bachelor of Science degree in Geology from the University of New Mexico, and have been working as a geologist for Mr. Hanson for the past four years.

Q Are you familiar with the geology and reservoir involved in this case in the Coyote-Queen Pool?

A Yes, I've worked as geologist on it since the discovery well was drilled.

MR. KELLAHIN: Are the witness's qualifications acceptable?

MR. PORTER: Yes, sir, they are.

Q (By Mr. Kellahin) Mr. Schram, you heard the statement that I made at the outset of this case. Have you prepared any information based on the production of the wells involved in the proposed water flood project?

A Yes, I have.

Q Has that been prepared in exhibit form?

A Yes. In the beginning, I have available water sources.

(Applicant's Exhibit No. R-1 marked for identification.)

Q Referring to what has been marked as Exhibit No. 1, will you discuss that exhibit, please?

A All right. On the first page, which is a production summary for all of the holdings that Hanson, Waters, Williamson have, and proposed pilot flood in Coyote-Queen Field in Chaves County. The total number of wells in the Field are eleven, and the total field production from August 1st, 1959, to October 31, 1959, was 5,251.34 barrels. The daily field average, which this period is 92 producing days and which are the 11 wells, was 57.08 barrels. For the daily well average for 92 days, 5.19 barrels of oil per day, for that period. The total field production from October 1st to 31st, which during that period those wells were producing as much as they possibly could, we went back the month before and did quite a bit of remedial work in cleaning out the well so that we could get at least a good thirty-day test, and that total was 2,106.52 barrels. The daily average was, for 31 producing days for the 11 wells, was 67.95 barrels, and the daily well average for 31 producing days was 6.18 barrels of oil per day. At the bottom of that page, I put down the tests that were taken on the wells that would be affected by the proposed water flood.

The Hanson State "A" No. 1 on a test which is explained farther in the presentation is 10.95 barrels of oil per day. No.

2 Hanson State was 1.16 barrels of oil per day. No. 1 Levick State "C" was 5.32 barrels of oil per day; and the No. 2 Levick State "C" was 3.01 barrels of oil per day, for the total daily oil produced by the affected wells would be 20.44 barrels of oil per day. The daily average of the affected wells is 5.09 barrels of oil per day. That would be the area affected by the proposed pilot flood.

Second page is a map of the proposed pilot area, and also will show you where the different well numbers are.

Q Does that also show the lease ownership?

A It also shows the lease ownership of our leases in there.

Q Have you prepared reports on the individual leases involved in this application?

A Yes, I have; not only the individual leases but the individual wells.

Q Without going through the information entirely, could you summarize the information which is shown on Exhibit No. 1 in that regard?

A Well, the main point of this exhibit, of course, is the wells to be affected by the proposed pilot flood, with each lease is an individual test where we have Levick State "A" and Levick State "B" and so forth. We have a ten-day test or a thirty-day test or three-day test which those wells were produced at their maximum during that period. In the case of the Levick State "A",

which only has one -- let's see, Levick State "A" has only just one well on it; for thirty-one day potential test from October 1st to October 31st, 1959, the average was 2.57 barrels of oil per day.

In the case of your Levick State "B", the No. 1 "B" for ten day potential test from November 1st to November 10th, 1959, it was 19.12 barrels of oil per day. The No. 2 Levick State "B" was 8.56 barrels of oil per day for a ten-day test over that same period.

Your Levick State "C", which two of those wells, I believe, are requested in this pilot flood, the No. 1 and the No. 2, the No. 1 for five-day potential test from the 1st to the 5th of November is 5.32 barrels of oil per day. Over that same period the No. 2 "C" averages 3.01 barrels of oil per day. No. 3 "C" was 4.63 barrels of oil per day, and the No. 4 "C" was 10.41 barrels of oil per day.

No. 1 "D", which is the lone well on the "D" lease, the Levick State "D", averaged 9.90 barrels of oil per day.

The Hanson State No. 1-A, which will be affected by the flood, on the nine-day potential test from the 1st of November to the 9th of November averaged 10.95 barrels of oil per day; and the No. 2 averaged 1.16 barrels of oil per day, which two will be affected by your pilot flood.

And your Pan American State "A", for thirty-one day potential test from October 1st to October 31st, 1959, averaged 2.52 barrels of oil per day; and each of these lease summaries

or production records, you have a day by day production total for that lease for the months of August, September, and October.

Q Now, Mr. Schram, your Levick State "B" lease which shows 19.12 barrels of oil per day, is that inside the proposed project area?

A No, I don't believe it is.

Q Then the best well you would have in the project area potentialed at 10.95 barrels per day?

A That's right.

Q That would be the Hansen State "A"?

A No. 1.

Q No. 1?

A Yes.

Q That is the best well in the project area, is that correct?

A Yes, definitely.

Q You don't have any wells which are top allowable wells?

A No.

Q Now in your opinion, Mr. Schram, has this field reached a stage of stripper operation?

A I would say definitely it is.

Q On the basis of your potential test, do you believe it is ready for water flooding?

A Yes, definitely.

Q Have you prepared any information on the sources of

water?

A Yes, I have.

MR. KELLAHIN: Would you have that marked as Exhibit No. 2?

(Applicant's Exhibit No. R-2 marked for identification.)

Q Referring to what has been marked as Exhibit No. 2, would you discuss that exhibit, please?

A It is a list of available water sources for the pilot injection flood, Coyote-Queen Pool, Chaves County, New Mexico. We have taken tests or have gone back over the records and put down the tests and what we have actually done ourselves in the area, as far as developing an available water source for pilot flood, in this case I took your Devonian formation first, mainly because there are a lot of deep dry holes in the area which we hold the oil and gas lease on these particular leases. Richfield No. 1 Comanche Unit in Section 13, Township 11 South, Range 26 East, was drilled to a total depth of 6129, and the lease is presently owned by Ernest A. Hanson. However, there is no information available as to whether they had tested the Devonian for water or oil or anything else. However, your Richfield No. 2 Comanche Unit, which is directly south, Section 24, Township 11 South, Range 26 East, the well had pipe set on it, was perforated from 6118 to 42 and 6157 to 84; flowed fifteen barrels of salt water per hour, and the lease is presently owned by Ernest A. Hanson.

Your Kewannee No. 1 De Kalb Federal, Section 25,

11, 26, drill stem tested at 6184 to 6202, open two hours and recovered 2160 feet of salt water.

Honolulu No. 1 State, Section 13, 11, 27, drillstem tested 6692 to 6743, open two hours, recovered 5880 feet of salt and sulphur water.

Texas Company No. 1 State "AM", Section 13, 11, 27, perforated 6583 to 93, flowed 10 barrels of salt water per hour.

Your De Kalb No. 1 Coll in Section 18, 11,27, was perforated 6315 to 25 and flowed 35 barrels of salt water per hour.

Your Union and De Kalb No. 1 State, Section 27, 11, 27, had a drillstem test from 7400 to 95, open two hours, recovered 1000 feet of slightly gas and mud cut salt water and 4000 feet of salt cut water.

Although these wells, we don't have the leases on these wells, I think it does definitely show that there is adequate water in the Devonian.

Q Now, Mr. Schram, your organization, or Hanson, Waters and Williamson have leases in the area which could be developed as sources of water from the formations you have discussed?

A Yes. We have three leases that have these deep holes on them.

Q Are you familiar with the characteristics of the Devonian formation with regard to the production of water?

A Well, in general, your Devonian water, if you have fairly good drillstem test or you treat the Devonian, if you do

get water generally it will rise pretty close to the surface.

Q Is it generally considered a prolific source of brine where it is not oil productive, is that correct?

A Yes.

Q Do you have adequate water supply available presently for the proposed project area?

A Yes.

Q Would you just discuss where that is coming from and what it consists of?

A On the second page under your heading of "Glorietta" we went back into the De Kalb well in Section 15, 11, 27, which we have designated the No. 2 Levick State "D", we ran pipe, four and a half inch casing as a tubing string and put a pretty fair size pump on that and potentialed that well for 625 barrels of water per day.

Q Do you have adequate water supplies, potential water supplies to carry the project to a completion as you presently anticipate?

A I would say definitely yes. However, it is a matter of developing these supplies more as you go along. They're there, in your Queen you have two wells over to the west which have had, well, really amazing shows of water in them; and then we have one well in the Yates in Section 26, 11, 27, that we have potentialed for 650 barrels of water per day, which between the two wells would certainly take us through our pilot stages of this flood.

Q Do you have any water analysis that has been prepared?

A Yes.

(Applicant's Exhibit No. R-3 marked for identification.)

A On the water analysis run by Russell Engineering, Abilene, Texas, on the water from the No. 2-X Levick State "D", which is the old well we went back into and completed in your Glorietta formation, well, your main point being that your chloride ran 145,000 parts per million, for a total dissolved solids was 238,400 parts per million, which is exceedingly salty water.

MR. PORTER: It wouldn't be fit to drink?

A Definitely not. Now I called in this morning and we had an analysis run on the water from the 1-X Levick State "B", which is the Yates supply that we have developed. It's in Section 26, 11, 27, went into the interval of 120 feet and 170 feet deep, it's out of the Yates formation. It is, the total dissolved solids in that is 2680 parts per million, which is a point between being fresh and salty.

MR. PORTER: That is 170 feet?

A Between 120 and 170 feet deep. That well was 650 barrels of water per day.

Q (By Mr. Kellahin) Were Exhibits R-1, 2 and 3 prepared by you or under your direction and supervision?

A Yes.

MR. KELLAHIN: At this time we would like to offer in

evidence Exhibits R-1, 2 and 3.

MR. PORTER: Without objection the exhibits will be admitted to the record.

MR. KELLAHIN: In order that cross examination can be properly carried on, and for the record at this time, I overlooked offering the record and exhibit from the original hearing in July in this case, and I would like to do so, in order that any further cross examination along that testimony could be brought in at this time.

MR. PORTER: Would there be any objection to the admission of the earlier record in this case? Let the record show that the record at the previous hearing will become a part of this case.

MR. KELLAHIN: Could I ask a further question?

Q (By Mr. Kellahin) Did you give the volumes of water from the shallow well?

A Yes, 650 barrels of water a day, that's with a Reda pump.

MR. KELLAHIN: That's all the questions I have.

CROSS EXAMINATION

BY MR. PORTER:

Q . Mr. Schram, are all of these water sources you give here either salt water or bordering on salt water?

A Well, all but your Yates; there apparently are shallower zones in there that are somewhat fresh. I doubt whether you would

want to drink them yourself, but they are on that borderline, I would say.

Q Has there any fresh water at all been found in this area which you would deem fresh?

A Well, fresh, for cattle.

Q I mean for human consumption or cattle.

A No, not for human consumption; cattle, yes.

Q With reference to your testimony concerning the potentials of these wells, do you recall the Commission examined quite a few of the potentials which were filed shortly after completion of a number of these wells, several of them, and potentials reported there was, oh, about thirty to forty barrels, something like that, and your performance history indicates that no well in the pool or at least none of these wells, will produce anything like the earlier potential reported. How do you account for this higher potential figure as previously reported, would that be, do you think, a portion of the frack oil was being recovered at that time, or do these wells just decline that rapidly?

A Well, I think there are several reasons for it. The main reason being these wells were potentialed after the frack oil was recovered; however, in the area you have bottomhole pressure that is too slight to measure. Consequently, you get one figure influx of oil which falls off to a stripper well within a matter of two or three months.

Q Would you say that you might get a potential like say

36 barrels a day on one of these wells today, and tomorrow you would get considerably less?

A Well, if it was a new well, you would probably get top allowable after your frack was back, you would probably get, a top allowable well for possibly thirty to sixty days, and then it just falls right off.

Q Well, apparently production history on these wells indicates that you haven't had any that held up that well?

A Very few.

Q For a period of thirty to sixty days?

A Right after you do frack the wells, and after you do get your load oil back, they would hold up for, oh, several days.

Q Now, going back to the report on the production, well, one example is your Levick State "B" where that well was shut down for some period of time.

A It was shut down for repairs and equipment to be installed on the well.

Q Did it build up again?

A No, it was shut in for thirty days in September, it made 306.85 barrels in October, which would be 9.908 barrels per day average.

Q Would you term this entire field a stripper field, as far as the wells are concerned individually?

A Yes, I would.

MR. PORTER: Does anyone else have a question of the

witness? Mr. Nutter.

BY MR. NUTTER:

Q Mr. Schram, did you give the chloride content on the Yates water?

A Your chloride content on your Yates water is ninety parts per million.

Q Nine?

A Ninety.

Q Ninety. The solids were 2680, correct?

A Right.

Q Now, on the Glorietta water, did I understand that you had 238,000 parts per million of dissolved solids?

A Yes.

Q Was the Glorietta potentialed with the pump in the hole?

A Yes.

Q Was that Reda pump in there?

A No, that was pump jack with a regular four and a half inch pump in the well.

Q You have four formations listed here on this exhibit that could be potential sources of water. What do you expect that you would actually use for your water supply, which of the four?

A For the pilot flood?

Q Yes.

A I think Jim Russell could probably answer that better than I can on the estimates.

Q Has a study been made for the compatibility of the water of any of the four zones with the natural formations water in the Queen formation here?

A Not, well. in your Queen formation we make a little bit of water with our wells out there, and of course, it is compatible there; as far as compatibility tests, we -- on the Glorietta water, quote this report of Mr. Russell here: "Special compatibility tests were conducted using the current water sample and a sample of water from a fresh water supply well analyzed in our laboratory, July 13, 1959 and presented as our laboratory No. W-414. Waters from Water Supply Well No. 2-X and from the fresh water supply well were mixed in the ratios of 1 to 3, 1 to 1, and 3 to 1 and checked for formation of precipitates, pH content, alkalinity, and supersaturation. Results of these tests indicated that these waters are compatible in all ratios tested under laboratory conditions."

Q You expect for your water flood you would be using the water from the 2-X and 1-X and mixing them?

A Well, I don't know. I know we have the water available now; however, I'm not sure that we would want to use that. It's kind of hard to develop a water supply without knowing whether you can go on to a pilot flood or not.

Q Whether you need the water or not, you do have a Reda pump installed in the 1-X well, however?

A Yes.

Q Mr. Schram, I notice in these daily production tests that you have conducted, particularly during October, that there is a wide variation in the amount of oil that the well will produce from one day to the next. How do you account for that phenomena?

A Well, in most cases in the field you have one day, you'll have a big slug of water come into the well, anywhere from zero to ten barrels of water, and possibly the next day, which will apparently replace part of your oil in there; you are making a, usually a pretty constant rate of fluid; however, we are pulling these wells pretty hard for the test.

Q Are these all 24-hour tests?

A No, they aren't pumping 24 hours straight in there. They run about 4 hours twice a day, and they are in -- it takes about an hour and a half or so to draw the wells down to nothing.

Q By producing them four hours a day, though, you have, four hours twice a day, I mean, you have withdrawn from the well all the fluids that were coming into the hole?

A Yes, in a matter of an hour or hour and a half.

Q Your total fluid production is relatively constant, it is a variation between the amount of oil and the amount of water?

A Right.

Q Now some days I notice there isn't any oil produced. Is this a day that you are producing one hundred percent water?

A Well, in several cases; however, I think the main

reason for that particularly in the month of October, is that you have to shut the wells down while they pick up oil and they will usually come in and gauge the tanks early in the morning, and sometimes the trucks won't come around and pick it up until the next day.

Q How about the producing history of the various wells? What is the maximum amount of oil that any well has made?

A Well, it would be right after you have recovered your frack oil.

Q I mean the total production, do you have the figures on the total production from any well?

A Not over the entire history of the field, no, I don't, I went back three months where we had accurate gauges in the field to find out mainly what they were doing presently.

Q This production of August through October here, does that represent the total well's production in some cases?

A No, I don't think in any case. Not in any case would cover the entire production of that well.

Q Every well had some production prior to August, then?

A Yes. In fact, I think part of that was presented in that last hearing.

Q I thought maybe some of these were new wells that hadn't been completed.

A No, none of these are new wells since that previous hearing.

MR. NUTTER: I believe that's all.

MR. PORTER: In that connection, are there any new wells completed in the pool?

A No, not right -- well, we haven't any since the first hearing.

MR. PAYNE: Is your next witness going to testify to the proposed injection plan and well completion methods and so forth, or --

MR. KELLAHIN: That testimony is already in the record, Mr. Payne. If you want to supplement it in any way, he will be available to answer any questions.

MR. PAYNE: Your next witness?

MR. KELLAHIN: Yes.

MR. PORTER: Anyone else have a question of this witness? Mr. Irby.

MR. IRBY: Frank Irby, State Engineer's Office.

BY MR. IRBY:

Q Mr. Schram, for my information I would like to have a few things clarified in your Exhibit No. 2, R-2.

A Yes, sir.

Q Under the Richfield No. 2 Well, you have 15 with these five letters following. Now "B" is Barrels --

A Barrels, "X" is salt, "W" water, "P" per, and "H" hour.

Q Now under the Kewannee, that would be 2160 feet of salt water?

A Of salt water, yes, sir.

Q Is that a column in the casing, or what is this?

A That is a column from the total depth of your hole, or if it was a straddle packed test, it would be from the bottom of the bottom packer in the drill pipe.

Q This is merely an indication of pressure, and not quantity of water, right?

A You can, if you had the detailed drillstem test in there, it will also give your pressures and this is actually what the drill pipe filled up in a matter of two hours. The tool was open for two hours for that test, and that 2160 feet of salt water filled up from the bottom into the drill pipe.

Q Now what factor do we have to use there to convert that to quantity volume?

A Well, in your case, in a case like that, or as in an oil well, you don't know until you have treated that well or perforated in a cased hole. Now in the case of other Devonian tests that are listed there where they have set casing and cemented and perforated, such as your De Kalb No. 1 Coll, that was flowing 35 barrels of salt water per hour. There wasn't any, there's hardly any way that you can compare that until you actually set pipe and try to produce that water. All it gives you is an indication that you do have water in there, and of course, the higher it rises over the shorter period, the better your water supply will probably be down there.

Q Then you couldn't convert this to volume by using the inside diameter of your column pipe?

A No.

Q Then down to your Honolulu No. 1 State --

A Yes.

Q -- explain that "S" in those letters following 5880 feet.

A Salt and sulphur water.

Q Sulphur?

A Yes.

Q And under the Union and De Kalb No. 1 State, those letters following 1000 feet there?

A That's slightly gas and mud cut salt water.

Q Did the exhibit you submitted include chemical analysis on the two wells in the Yates formation, the Whaley Company water well and the Hanson No. 1-X State "B"?

A On the No. 1 State XB, yes. On the other well, no. They are apparently using that water for drilling and mud purposes.

Q Was that analysis in the one case submitted in your original presentation to the Commission, or was it presented today?

A No, it was presented today.

Q Could that be made available to the State Engineer?

A I don't know.

MR. KELLAHIN: I believe it was filed as an exhibit in the other case that was submitted to the Commission.

MR. PORTER: Mr. Irby, if we have a copy of it, we

will be glad to reproduce it and give you a copy.

MR. IRBY: That's all the questions we have.

MR. KELLAHIN: We will be glad to supply one, in any event. I would like to call as our next witness Mr. Jim Russell.

JAMES E. RUSSELL

called as a witness, having been first duly sworn on oath, was examined and testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Will you state your name, please?

A James E. Russell.

Q Are you the same Mr. Russell who testified in this case at the hearing in July as an expert engineer?

A Yes, sir.

Q With whom are you associated, Mr. Russell?

A Russell Engineering in Abilene, Texas.

Q Were you employed by Hanson, Waters and Williamson to investigate the feasibility of the project which is proposed in this application?

A I was.

MR. KELLAHIN: Are the witness's qualifications acceptable?

MR. PORTER: Yes, sir.

Q (By Mr. Kellahin) Mr. Russell, are you familiar with the provisions of Order No. R-1525 which was recently adopted by

the Commission governing water flood projects?

A I'm familiar with it.

Q In that connection have you made any further study of the reservoir in the Coyote-Queen Pool which is involved in this application?

A Yes, sir, I have given it quite a bit of thought and of course, our original application was prior to the adoption of this rule, and of course, at that time we had applied for two 20-acre five-spots in the Coyote-Queen Pool in this original hearing. The location of these two five-spots, of course, would encompass five 40-acre proration units, and by adopting the rule as set forth, the entire project area would include twenty-one 40-acre proration units, if I interpret the rule correctly.

Of course, at this time all of these 40-acre proration units are not developed and would not be within the area to be affected by the six injection wells.

Q Before you draw any conclusions as to the effect of the new order, Mr. Russell, would you discuss the additional reservoir information which you have prepared?

A We have prepared for illustrative purposes here a cross section prepared from the core analysis data, which might assist in clarifying the data presented in the first hearing with respect to the reservoir itself. I might just put this up here on the board. This illustration shows that in the Coyote-Queen Pool the reservoir actually consists of, in most cases, of about

five separate zones, based on an analysis of cores from each of these wells through which the cross section has been drawn.

In the north part of the reservoir, this is from a southwest to a northeast direction, you will note where we have colored in yellow on this exhibit there is actually a separation between various zones in the Queen formation. For all practical purposes, we have at least four separate reservoirs in this Queen formation. In our original application we applied with the idea of injecting water into each, in all of these formations at the same time. As a consequence, we felt by going to capacity injection rates, that we would flood most economically these five separate zones at the same time.

It is my opinion that if rates have to be restricted, the injection rates have to be restricted, and due to the permeability profiles and the characteristics of this sand, there's a strong possibility that in one or more of these formations or reservoirs that injectivity into those formations would be reduced practically to negligible amount.

At the proposed injection rate that I believe was presented in the prior hearing, 190 barrels per day per well, that is an average of .226 barrels per day per acre foot in each of the 20-acre five-spots. I don't believe that we want to present this cross section as an exhibit, but we do have one prepared using the electrologs, which shows the same pictorial review, that we would like to put into the record.

Q Mr. Russell, you say that curtailing the rates would have an effect on the production of the oil from these five different strata. Would you amplify that and say what effect it would have, in your opinion?

A You will note that in several of these zones that the permeability is quite -- there's quite a spread in the permeability between various zones, and that from my experience in water flooding, that in many cases at low injections rates, there's a phenomenon referred to as a threshold pressure that exists; and that at rates below, injection rates below a certain wellhead pressure, that certain of these formations, we do not know in this case, but from my experience I have seen this many times, that some of these zones will not take water at low pressure, and if we have to restrict our injection rates below the maximum rate, there is a good possibility and a strong possibility that we would actually suffer loss of oil in such a program.

Q Now what would be the alternative to that, Mr. Russell, in the event the injection rates are curtailed?

A Of course, the alternative, if they are curtailed, the alternative would be to perhaps flood each of these zones separately, and if that were done, for example, if we were to flood the bottom zone first, which we have estimated the overall project to take from twelve to fourteen years on the average five-spot to be flooded, as you can see, if we flooded each of them separately, then it would extend the life of this project to such

a long period of time that it would become almost uneconomically feasible to proceed with some of the other zones due to deterioration of equipment, for one thing, additional expense, operating cost, that actually would limit the economic feasibility of such a curtailed type of program.

Q Would a curtailed type of program result in the necessity of buying additional equipment and of reworking wells or other factors which would affect the economics of this project?

A Yes, if we had to flood these zones separately at the present time, the wells in the project are perforated through the entire section, and to flood the zone separately would necessitate either plugging of the zones that are presently perforated, setting packers with tubing strings, and which would add expense to such a project, yes.

Q Now, under the provisions of Order R-1525, as you will recall, an allowable of 42 barrels per proration unit plus a one unit additional allowable on the unit, with certain restrictions, is granted to the operator of a water flood. Have you applied that rule to this project to determine what effect it would have on your injection rates?

A Yes, sir. In the area proposed when it is completely developed with the wells that we had asked for to be drilled and completed, and applying this rule, which would be four wells on a 40-acre tract; in other words, if there are four wells on a 40-acre tract, my interpretation is that it would be an 84 barrel

allowable for that four-acre unit.

When these wells are all completed, there would be a total of twenty wells in this pilot area. The computations on that basis would give us a project allowable of 588 barrels per day. If the entire project area were developed with four wells on each 40 acres, and which would be 84 barrels per day allowable, the total maximum allowable from the project would be 1764 barrels per day. However, the field has not been delineated at this time, we do not know what the limits of the field are; and of course, it is doubtful that we would extend this project to a full completion at this time to the point where we would be entitled to 1764 barrels of oil per day, until at least we know what the pilot project, the results of the pilot.

My calculations indicate that an injection rate of 190 barrels per day per well, that the peak, average peak oil producing rate per well will probably reach 100 to 110 barrels per day, which I think I mentioned earlier that this injection rate, the injection rate would be equivalent to .226 barrels per day per acre foot, which in my opinion is also quite a low rate of injection.

We must keep in mind that we can probably live under this rule if we were to consider this as four or five separate reservoirs and if we were to be granted the 42 barrels per day per well per reservoir, which is the case in most water floods that you get into, that you only have one reservoir that you are flooding

at a time; in that particular case, we would be dealing with ten or eleven feet of sand per reservoir. In this case we have 42 to 50 feet of sand that we're injecting into and producing, so that we in this particular case with 42 barrel a day allowable, it would be a producing rate of one barrel per day per foot of sand; with ten foot section, why we could have four times that.

Q What is your recommendation to the Commission in connection with the injection rates, then, Mr. Russell?

A My recommendation is to grant us permission to inject at capacity injection rates, and to be able to produce these four or five separate reservoirs at their capacity, which each of those reservoirs would be less than the 42 barrels per day as provided by this rule.

I think I mentioned that if we had to reduce the injection rates over the life of this, it would probably amount to about a fifty percent reduction in order to stay within the allowable; and at that rate, the injectivity would be at 0.113 barrels per day per acre foot, or about one-ninth of the magic figure of one barrel per day per acre foot.

Q Would that have an adverse effect on the recovery of oil from this pool?

A In my opinion it would. It would result in economic waste, and with the heterogenity that exists here, the permeabilities that exist, it would be definitely my opinion that there would be considerable loss.

Q Now you heard Mr. Schram's testimony in regard to production figures on this pool. Are you familiar with the manner in which that production has been achieved?

A Yes. It's my understanding that most of the wells in this area have been fracked with what would be in my opinion a considerably high amount of fracking material. In my opinion, these high rates and high volume frack jobs are not the most desirable for any project in which secondary recovery methods are to be applied.

Q For what reason?

A Because of the possibility of creating artificial pipe lines or permeability within the reservoir too great a distance from the well bore, and that premature water breakthrough could occur, and a loss of production resulting therefrom.

I think it was testified by Mr. Schram that the average producing rate now per well is about five to six barrels per day per well. At this rate, these are not too economical; by the same token, if pressure could be applied to this reservoir and these rates maintained, it would eliminate the necessity of high volume frack jobs, and I believe it would increase the efficiency of the flooding.

Q Now you heard Mr. Schram testify in regard to the available water supply; in connection with that, in your opinion, is there an adequate supply of water available for the pilot project?

A Insofar as I know, there is an adequate water supply.

I think that by using all these available sources, if that is our only source of water, both shallow supply and the deep supply, these waters could be mixed and treated if necessary, and even going into an open system where the water could be treated so that they could all be compatible. In other words, we could correct the compatibilities of these waters if any should develop through a system on the surface, and make it a good clean water prior to injection into the reservoirs.

Q Following that practice, would sufficient supplies of water be available to carry the project through, in the event it is feasible?

A To the best of my knowledge, and from the information at hand, I think that is correct.

Q You said you had a cross section prepared on the basis of electrologs. Would you get that and have it marked as Exhibit R-4?

(Applicant's Exhibit No. R-4 marked for identification.)

Q Mr. Russell, referring to what has been marked as Exhibit No. R-4, have you compared the information contained on that exhibit to the cross section which you prepared upon the basis of core analysis?

A Yes, sir. The information as exhibited from the cross section prepared from these logs correlates very definitely with the results obtained from core analyses, so that the inter-

pretation from one would be the same as the interpretation from the other.

Q In your opinion does that support your conclusion that there are five producing zones involved here which are separated by effective separation?

A A maximum of five, yes. In some cases there are only three, but it is definitely correlatable from well to well and from the logs and core analyses, shows a definite separation between these zones.

MR. KELLAHIN: At this time we would like to offer in evidence Exhibit R-4.

MR. PORTER: Without objection the exhibit will be admitted.

Q (By Mr. Kellahin) Do you have anything further to add, Mr. Russell?

A I don't believe so.

MR. KELLAHIN: That's all the questions I have. Mr. Payne inquired as to whether this witness would testify in regard to well completions, as I understand him; that information was presented at the hearing held in July and we had not contemplated offering anything additional. However, Mr. Russell I'm sure will answer any questions he's able to, and if necessary, Mr. Williamson is present in the hearing room and we will put him on if you want any information that Mr. Russell cannot cover.

MR. PORTER: Mr. Russell -- I think we can work that

out later, Mr. Kellahin. I have a question or two.

CROSS EXAMINATION

BY MR. PORTER:

Q Now, I believe that you testified that you didn't think these frack jobs under excessive pressures, intense pressures, is desirable in this formation?

A That is correct.

Q To some extent wouldn't you encounter the same danger with high injection rates of water?

A Only if we exceeded the over-burden pressure.

Q Now you also testified, I believe, that you have four zones, four separate reservoirs, I believe you said,in the Queen sand formation?

A Yes, sir.

Q In this pool. Do you find that true throughout the pool?

A Well, from the development to date, and I think this cross section is fairly representative of that.

Q How many wells have you examined for that purpose?

A We have examined all the wells that are completed in the pool.

Q That would be about how many?

A Twelve, eleven or twelve.

MR. SCHRAM: Eleven of ours.

Q (By Mr. Porter) You have just examined your own wells,

nobody else's?

A That's all that I can testify to.

Q You haven't found any instances within the well bore where these separate zones come together?

A Only as depicted by this cross section, sir.

Q I see.

A In this "D"-1, yes, sir; what we have classified here as zone four and five in our opinion do come together.

Q Couldn't that happen in any of the other zones between the well bore?

A It certainly could, but it has not in this area, as far as the information available from the cores.

Q From the well bore?

A From the well bore.

MR. PORTER: Mr. Payne.

BY MR. PAYNE:

Q Do you propose to inject through tubing or through the casing?

A It was our original intention to inject down the casing in a four and a half inch casing by perforation in each of the zones.

Q Is this old casing or relatively new?

A So far as I know, it is relatively new.

Q You feel it will adequately protect other waters or --

A The intention was to cement the wells to the surface

for that protection.

Q Are you familiar with the manner in which the wells are completed in this area?

A I haven't been present when these wells were completed. It is only from evidence that I know or have heard to be the case, yes.

Q What I'm interested in is whether the cement is circulated to the surface.

A None of the injection wells have been drilled.

Q I'm talking about the producing wells.

A I do not have first-hand knowledge of this. However, I understand that attempts have been made to circulate cement to the surface by circulating as much as 300 percent more than the amount required to reach surface, and have not been able to do so.

MR. KELLAHIN: In connection with that, we'll put Mr. Williamson on and I believe he can answer the question.

MR. PAYNE: I have one more question of this witness in this regard.

Q (By Mr. Payne) When you run into this kind of problem, it is possible to use some kind of an agent in the cement to lighten it and thereby be able to circulate to the surface?

A I know of certain agents for loss circulation materials and such as that, yes.

Q Now, I believe you testified that you are going to inject or you would propose to inject some 190 barrels of water

per day per well?

A On the average, yes.

Q On the average. You do feel that you have an adequate water supply for that to inject that amount?

A For the pilot area.

Q Well, yes, pilot area first, yes.

A Yes, sir.

Q And also for the expanded flood?

A To the best of my knowledge, I think we would have enough.

MR. PAYNE: That's all. Thank you.

MR. PORTER: Mr. Nutter.

BY MR. NUTTER:

Q Mr. Russell, you mentioned that you had five sands here. This is a rather common occurrence in the Queen formation, is it not, to have individual stringers of permeability and porosity?

A Yes, I think that you could say that it's an occurrence in the Queen sand, but never have I run into a case where it is so evident as in this particular case.

Q Do you know of any pools in the State of New Mexico where the Oil Conservation Commission has established separate pools for the various stringers in the Queen sand?

A No, sir, I do not have knowledge of it.

Q You wouldn't recommend that the Commission should separate the pools and establish them as different pools and

require dual completion methods before they are completed into a common well bore?

A I'm not recommending dual completion, no, sir. That problem certainly would not in a water flood where we have capacity allowables and capacity injection rates,would not be a problem. It would be under proration, yes.

Q Mr. Russell, when you instituted your study of the feasibility of water flooding the Coyote-Queen area, did you study the feasibility of flooding on a 20-acre pattern as opposed to a 40-acre pattern?

A We studied the feasibility of flooding on patterns varying from one acre to 40 acres each case.

Q How did 20 and 40 compare as far as the effectiveness of the water flood is concerned?

A Of course, our primary study was from, a study of the feasibility based on economics, and the economics of the 40-acre spacing was at least 25 percent less favorable than on the 20-acre spacing.

Q You get a more rapid depletion of the reservoir with the 20-acre than you do the 40, is that correct?

A That's correct.

Q And that gives a more attractive development picture?

A Even though the development costs are higher, the economics are considerably better than the 40-acre spacing.

Q Comparing unrestricted production with restricted

production gives a more attractive economic picture, also?

A Yes, sir.

Q What, Mr. Russell, do you base this fifty percent loss, I think I heard you say something about fifty percent loss of recovery --

A No.

Q -- on the restricted rate?

A No, please don't misinterpret that. I said that under restricted rates of production and to stay below the allowable, I'm estimating that we would have to restrict our injection rate by fifty percent.

MR. NUTTER: I see. I believe that's all. Thank you.

MR. PORTER: Anyone else have a question of Mr. Russell? Mr. Kellahin.

REDIRECT EXAMINATION

BY MR. KELLAHIN:

Q In connection with the Exhibit R-4 and the other exhibit based upon the core analyses which was not offered in evidence, what area does that cover?

A You mean the areal extent of that?

Q Yes, sir.

A It covers the area from the Levick State "B", which is the extreme southwest developed part of this reservoir, to the Levick State "D"-4 which is the extreme northeast portion of development on these properties.

Q Approximately how far is that?

A Approximately a mile, I would say.

Q Now in regard to drilling the wells on the 20-acre pattern versus a 40-acre pattern, would that have any effect on the ultimate recoveries of oil from the reservoir?

A Yes, when all factors are considered.

Q Which would you recommend?

A The 20-acre or the 40-acre --

Q Yes.

A -- pattern?

Q Yes.

A I would recommend 20-acre patterns now, as I have before.

MR. KELLAHIN: That's all the questions I have.

BY MR. PAYNE:

Q Was it your testimony you would get more oil if you drilled on 20 than you would if you drill on 40's?

A I did not testify to that, sir. I think I could say this, that when economics are considered, that I can say it without doubt that that is the case.

MR. PAYNE: Thank you.

MR. PORTER: Anyone else have a question? The witness may be excused.

(Witness excused.)

MR. PORTER: Mr. Kellahin, I believe we would like

to call Mr. Williamson in regard to the cement casing program.

(Witness sworn.)

MR. PORTER: Mr. Payne, I believe you were concerned in this questioning.

MR. WILLIAMSON

called as a witness, having been first duly sworn on oath, testified as follows:

DIRECT EXAMINATION

BY MR. PAYNE:

Q Could you give us some information on how the producing wells in this proposed pilot area have been completed and the difficulties that you may have encountered?

A Well, in this area we have encountered some loss of circulation in several of the wells, and we have run an excess of 150 percent of cement trying to circulate these wells, and haven't been able to.

Q That's the case in all of them?

A Well, not all of them.

Q Have you attempted to put some agent into the cement and then try circulating to the surface?

A Well, we have used a 50-50 loss mix and cement and tried that and haven't had any success with this.

MR. PORTER: Is this a loss circulation material?

A It is a filling agent, yes.

Q (By Mr. Payne) You feel you have used all reasonable

efforts to attempt to circulate to the surface?

A Yes.

MR. PAYNE: That's all. Thank you.

CROSS EXAMINATION

BY MR. PORTER:

Q Mr. Williamson, in that connection, were you aware that some of the other operators, or at least one other operator in the pool has gone back in and squeezed, cemented the casing to the surface?

A Not at the time we cemented our wells, I wasn't.

Q Well, I mean since that time.

A Yes.

Q You are familiar with the field operations?

A Yes.

Q In your opinion, should these -- now as I understand it, you only have one string of casing?

A That's right.

Q And our rules require that the cement be brought to the surface?

A Yes.

Q Would it be your recommendation that a water flood project be carried on unless the cement were circulated to the surface?

A Well, I don't think actually that it has any bearing on it with the amount of cement that we put in per well.

Q But it still hasn't returned to the surface?

A That's right.

Q Do you know how the other operator in the pool accomplished this circulation of the cement to the surface?

A By going in and re-perforating, in the case that I know of, he went in and re-perforated his casing and squeezed with cement and had quite a job of it.

Q Do you think the same thing might be accomplished in your well?

A Well, it's possible, but on this other operation, they didn't have any loss circulation troubles.

Q How many of your wells have you encountered this trouble in?

A About five.

Q And out of eleven or twelve?

A Yes, out of eleven.

Q In the others you did achieve circulation to the surface?

A No, sir.

Q What was the matter in that case?

A We just didn't seem to be able to get enough cement to circulate.

Q But you still hadn't encountered loss circulation?

A No.

MR. PORTER: Anyone else have a question? Mr. Nutter.

BY MR. NUTTER:

Q Do you have room to run a one-inch pipe on the side of the casing and pump cement down the one inch?

A I doubt that, I don't think we would at this time. When the wells were new we might could have done that, but the locations have been cleaned up, they have been filled in and I very much doubt if you could get a one-inch pipe down the side of it.

MR. KELLAHIN: How much cement have you used in these wells?

A We have run up as high as 250 sacks, which is some 150 percent excess, trying to circulate these wells with cement.

MR. KELLAHIN: You put an excess amount of cement in all of your wells, is that correct?

A Yes.

MR. PORTER: Is that on 1100 foot string of casing?

A Yes, sir, 900 foot, rather.

MR. PORTER: 900?

A 950, somewhere along there.

MR. PORTER: Does anyone else have a question? The witness may be excused.

(Witness excused.)

MR. KELLAHIN: If the Commission please, that's all we have to offer at this time. We urge the Commission to re-consider the order heretofore entered and grant approval of the

water flood project with the capacity allowables as originally requested.

MR. PAYNE: I feel that the record in Case 1787 should most probably be incorporated into this record.

MR. PORTER: Any objection to counsel's motion?

MR. KELLAHIN: If the Commission please, for the sake of the record, we would object on the basis of the situation in which this case was presented and the fact that it was not heard at the time that it should have been heard, when this record would not have been available. However, I'm sure the Commission will want to consider all aspects of it, and we have no serious objection to inclusion of the record in this case.

MR. PORTER: The record in Case 1787 will be made a part of the record in this case.

Does anyone have anything further to offer in this case? If not, we will take the case under advisement, and we're going to recess the hearing.

The hearing will reconvene at 1:30.

(Recess.)

****

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, ADA DEARNLEY, Notary Public in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Hearing was reported by me in Stenotype, and that the same was reduced to typewritten transcript under my personal supervision and contains a true and correct record of said proceedings, to the best of my knowledge, skill and ability.

DATED this 5th day of December, 1959, in the City of Albuquerque, County of Bernalillo, State of New Mexico.

Ada Dearnley
NOTARY PUBLIC

My commission expires:

June 19, 1963.

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
July 28, 1959

EXAMINER HEARING

IN THE MATTER OF:

Case 1728

DEARNLEY - MEIER & ASSOCIATES
GENERAL LAW REPORTERS
ALBUQUERQUE NEW MEXICO
Phone CHapel 3-6691

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
July 28, 1959

EXAMINER HEARING

IN THE MATTER OF:

Application of Hanson, Waters and Williamson, for an order authorizing a pilot water flood project, for capacity allowable for twelve wells in said project area, and for establishment of an administrative procedure for expansion of said project, conversion of wells to water injection, and for granting capacity allowables. Applicant, in the above-styled cause, seeks an order authorizing it to institute a pilot water flood project in the Coyote-Queen Pool in Chaves County, New Mexico. Applicant proposes to inject water into the Queen formation through six wells located in Sections 15 and 16, Township 11 South, Range 27 East. Applicant also seeks capacity allowables for twelve wells in said project. Applicant further seeks the establishment of a procedure whereby the project area may be expanded, wells may be converted to water injection, and capacity allowables granted without notice and hearing.

Case 1728

BEFORE:

Mr. Elvis A. Utz, Examiner

TRANSCRIPT OF HEARING

MR. UTZ: The next case is 1728.

MR. PAYNE: Case 1728. "Application of Hanson, Waters and Williamson, for an order authorizing a pilot water flood project, for capacity allowable for twelve wells in said project

area, and for establishment of an administrative procedure for expansion of said project, conversion of wells to water injection, and for granting capacity allowables."

MR. KELLAHIN: If the Commission please, Jason Kellahin, Kellahin & Fox, Santa Fe, New Mexico, representing the applicant. We have two witnesses, Mr. Russell and Mr. Williamson.

(Witnesses sworn.)

MR. KELLAHIN: We call as our first witness, Mr. Russell.

MR. UTZ: Any other appearances to be made in this case?

MR. RUSSELL: If the Commission please, John F. Russell of Campbell and Russell, making appearance on behalf of the Pecos Valley Artesian Conservancy District.

MR. KELLAHIN: May I inquire as to the interest of the Pecos Valley Artesian Conservancy District? It is my understanding that the area involved in the applicati... lies outside of the district.

MR. PAYNE: Do you care to state for the record, Mr. Russell, what the interest of the Pecos Valley Artesian Conservancy District is?

MR. RUSSELL: We wanted to find out what we can as to the proposed operation in order to determine whether or not it would affect the waters of the Roswell Basin.

MR. PAYNE: You do not intend to present testimony?

MR. RUSSELL: I'm not going to present any testimony.

MR. KELLAHIN: We have no objection to your appearance. I wanted to clarify the record on it.

MR. UTZ: You may proceed.

JAMES E. RUSSELL

called as a witness, having been first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q State your name, please. A James E. Russell.

Q What business are you engaged in, Mr. Russell?

A I own a consulting engineering firm in Abilene, Texas.

Q Have you ever testified before the Oil Conservation Commission?

A No, sir, I have not.

Q For the benefit of the Commission, would you outline your education and experience as a petroleum engineer?

A I was graduated from the University of Kansas in 1941 with a degree in petroleum engineering. I have operated as a consulting petroleum engineer since 1951. I have had approximately fifteen years' experience in water flood engineering and operation.

Q Where was this experience acquired?

A In New Mexico, Texas, Kansas and Oklahoma.

Q Are you the head of the Russell Engineering Firm?

A Yes, sir, that is correct.

Q How many employees do you have, Mr. Russell?

A Sixteen at the present time.

Q Are they under your supervision?

A That is correct.

Q In connection with your work as a consulting engineer, have you studied the area involved in this application in the Coyote-Queen Oil Pool?

A Yes, sir, we have studied it.

MR. KELLAHIN: Are the witness' qualifications acceptable?

MR. UTZ: Yes, sir, they are.

Q Are you familiar with the application that is before the Commission in this case, Mr. Russell?

A I am.

Q Have you prepared a report involving the feasibility of the water flood project?

A We have prepared a fairly detailed report concerning the feasibility of this project, yes, sir.

MR. KELLAHIN: We have some exhibits. Would the Commission like to have them all marked?

MR. UTZ: Yes, sir, they would.

A These exhibits are attached to the back part of this.

(Thereupon the documents above referred to were marked Applicant's Exhibits Nos. 1 through 6, for identification.)

Q Do you want to get the exhibits marked too?

A These exhibits are logs in the vicinity of the pilot flood. Hanson State "A" No. 1. Hanson State "A" No. 2.

MR. UTZ: This will be Exhibit No. 2.

A That will be fine.

MR. UTZ: Exhibit 3.

A Yes, sir. State "C" No. 1.

MR. UTZ: Exhibit No. 4.

A Yes, sir. State "C" No. 2.

MR. UTZ: Exhibit No. 5.

A Yes, sir. This is a log of the proposed water supply well.

MR. UTZ: Exhibit No. 6.

Q (By Mr. Kellahin) Now, Mr. Russell, referring to what has been marked as Exhibit No. 1 and the first plat which appears as an attachment to that exhibit, would you discuss that, please?

A This plat shows the proposed pilot flood area, the lease involved, owned and operated by Hanson, Waters and Williamson, and designation of various offset operators.

Q Does the plat show the pilot area involved?

A The plat does show the pilot area.

Q Does it show the location of the proposed wells in the area?

A Yes, it does.

Q Have these injection wells been drilled as yet?

A The injection wells have not been drilled.

Q From what formation is the Coyote-Queen Oil Pool producing?

A It is producing from the Queen.

Q At what depth is that found?

A The top of the Queen pay zone in this area is approximately 835 feet below the surface.

Q Have you prepared a structure map at the top of the Queen?

A Yes, the second plat shows a contour map on top of the Queen zone.

Q Does that contour map indicate that the Queen zone is a continuous formation through the area?

A It appears to be from this exhibit and from our studies.

Q What is the basis of your controls for that plat?

A All the wells that have been drilled in the area.

Q Have any gamma ray logs been run on any of these wells?

A Yes, sir. Gamma ray and acoustic logs have been run on all the wells to my knowledge in the area.

Q Would you expect that future wells in the pilot area

would vary to any considerable degree from those that have been, that have already been drilled?

A No. I think the drilling to date fairly defines the productive area and future wells drilled in the area should not vary too much from those already drilled.

Q Directing your attention to the pilot area, will you discuss what is proposed to be done there?

A In the pilot area there will be six new injection wells drilled on a proposed 20 acre five spot unit basis. In addition to that, one additional producing well must be drilled at the location shown as P-6 on the Levick State "C" Lease. Additional producing wells outside of the direct pilot area, or outside the wells that will be completely closed by the injection wells, are P-9 and P-7 and P-8 on the Levick State "C", which will comprise a total of six injection wells and eight producing wells to be directly affected by the pilot flood.

Q In referring to your plat attached to Exhibit No. 1 showing the pilot area, how are the injection wells designated and how are the proposed producing wells designated on that plat?

A The injection wells are designated as W-100, W-101, W-102, W-103, W-104. All wells located on the Levick State "C" Well and one injection well on the Hanson State "A" are designated as W-100.

Q How are the producing wells designated?

A The producing wells are designated as P-6, P-7, P-8, P-9 on the Levick State "C" Lease.

Q You also have some on the Hanson State "A" Lease, do you not?

A We have two wells already completed on the Hanson State "A" Lease, Hanson State "A" 1 and 2.

Q That completes for the pilot area the proposed wells?

A Well, we do have two wells already completed on the Levick State "C" Lease designated hereon as 1 and 2.

Q That concludes all the wells then in the pilot area?

A In the pilot area.

Q What is the distance between the injection wells and the producing wells?

A The distance between like wells, in other words, from injection well to injection well is 933 feet, and the same distance would apply between the producing wells.

Q That would result in a 20 acre spacing, would it not?

A That is right.

Q It would be a five spot location?

A Five spot locations.

Q What is your proposed completion procedure?

A It is proposed to drill with rotary through the pay section, set four and a half inch nine point five pound continuous well casing through the pay zone, which will be approximately

900 feet, and perforate the pay sections, approximately four shots per foot of pay. The casing will be cemented to the surface.

Q Will a test be run on the casing prior to --

A Yes, a test will be run on the casing to assure it is properly completed.

Q In your opinion does that casing program adequately protect surface water?

A Yes, in my opinion the circulation of the cement to the surface should adequately protect the surface water.

Q What kind of perforations do you propose to make?

A At the present time it is our plan to perforate the pay zone, which is actually comprised of five separate permeable zones with four shots per foot of pay section.

Q Do you plan to fract?

A Yes. If these wells need fracting it probably will be done with about 250 pounds of sand per foot.

Q What is your source of water for the project, Mr. Russell?

A At the present time an old well drilled as a DeKalb Compton State No. 1 in the Northeast corner of Section 15 is being entered and recompleted as a possible source of water for this operation. The pay or the water shown will be the Glorietta formation, and will be according to our Exhibit No. 6, the water will be secured from a depth of approximately 2570 feet

to over a zone of about 100 feet in thickness.

Q Has that well yet been completed for water production?

A It has not been completed for water production. However, casing is set in the well at approximately 1370 feet, I believe.

Q Do you know whether work is now being done on the well to complete it for water production?

A Yes, sir, the operators are presently completing this well for testing purposes to see if adequate water is available from the Glorietta horizon.

Q At this time do you have any information on the analysis of the water from the Glorietta formation?

A We, at this time, do not have a complete nor detailed analysis of the water other than by analogy from other Glorietta waters that it is a brine. The water samples that have been obtained have been too badly contaminated for analysis purposes. We are unable at this time to submit an analysis of the water.

Q Are you willing to submit to this Commission and to the State Engineer or any other interested parties the analysis of the water when it is available?

A Yes, sir.

Q Would you discuss the fluid characteristics in the Coyote-Queen reservoir?

A All the wells in this reservoir drilled by Hanson,

Waters and Williamson have been cored, analysis of the cores indicate an average porosity of 11.9% and average horizontal permeability of 16 millidarcys.

Q How many cores were available for that study?

A Twelve cores.

Q What did you find in the way of connate water saturation?

A Based on laboratory tests where the core samples were dynamically flooded with oil in the lab, the average connate water saturation as it is a function of permeability is 32.3% of the pore space.

Q What is the average residual oil saturation after the sweep of the reservoir rock?

A From our lab determinations it is 24%.

Q Do you have any stock tank analysis of the oil?

A Yes, a test of a stock tank sample was 39.7 degrees API at 60 degrees, and 4.34 centipoises viscosity at 80 degrees, which is the estimated reservoir temperature.

Q Do you have any information on the production history of the area?

A Yes. Two or three wells have been produced in this general area over the period of the last year and a half or so; shown as an attachment to this Exhibit 1 are two production curves on a George Williamson, a well drilled by George Williamson.

Q It is George Williams, is it not?.

A I am sorry, George Williams. No. 1-T Levick State "A" Lease in the Northwest Quarter of Section 21, we have presented a production curve of this well. The average production since the beginning of 1958, has shown a rapid decline, and at last reports that were available to us, the well was producing somewhere in the vicinity of about 50 barrels a month.

A similar decline in production history is shown for the M. G. Peters 80 acre tract just to the north of the Williams Well, and shows a similar production history. These wells are presently producing at submarginal levels.

All of the wells drilled to date by Hanson, Waters and Williamson are relatively new and very little production history is available on those wells at this time.

Q Is the average rate of production on the wells in the pool submarginal?

A On those wells with which we have any adequate production history at all, it is indicated that they are at a submarginal level and will produce at that level during their primary life. It is our testimony, or it's my opinion that these wells drilled to date by Hanson, Waters and Williamson also will be submarginal wells within a short period of time.

Q Do you have any production history on the Levick State "B" Lease?

A Yes. At the present time that is the only production history that we have which covers a period of four months, in 1959 March, April, May and June. The cumulative production from that lease has been 3562 barrels.

Q There has been a wide fluctuation in the production from month to month, has there not?

A Yes, there has.

Q How do you account for that?

A In March, which is the first month any production was reported from the well, no doubt was a short production month. Some of this oil has been used for fracting additional wells. However, the producing capacity of this well has shown a tendency for declining in its rate of production.

Q What do you anticipate your water requirements will be for the pilot project area?

A Based on injectivity calculations using permeability as a perimeter and what we consider to be a maximum injection pressure that can be used in this reservoir, we estimate that about 4.5 barrels per day per foot of sand would be the maximum injection rate. Based on the six wells proposed for this pilot flood and 42 feet of pay, the total anticipated injection rate will be about 1140 barrels per day.

Q At what pressure do you anticipate your injection rate will be calculated?

A It is my opinion that 650 pounds will be the maximum pressure that we can use for this operation.

MR. UTZ: Surface pressure?

A Surface pressure.

Q What is the average thickness of the pay in the pilot area?

A Forty-two feet.

Q What results do you anticipate from this pilot area?

A Based on the information available at this time, strictly from a volumetric calculation because of the lack of available data or history on flooding, this particular reservoir in this particular area we estimate that the maximum recoverable oil by water flooding this Queen sand to be 215 barrels per acre foot, and based on 42 feet of pay would be 9,000 barrels per acre for the area represented in the pilot flood.

Q What was that figure again?

A Nine thousand barrels per acre.

Q Do you have any estimate on the total recovery for the two inside locations?

A For a complete and efficient sweep of the enclosed areas, the two enclosed areas as shown on plat No. 1, the estimated recovery from those two producing wells is 361,000 barrels.

Q How does that compare with your estimates of your recovery on the primary operations?

A Our estimate of the increase as a direct result of water injection would be 283,600 barrels of primary.

Q Does that figure represent oil that would not be recovered if the pilot injection program were not instituted?

A That is correct. That is the amount of oil available on these calculations as a direct result of the water injection program.

Q As I understand it, you are proposing 20 acre spacing pattern in these five spot locations, for what reason have you done that?

A We have made some detailed calculations pertaining to optimum spacing for this particular reservoir, and the results of that study indicate 20 acre five spots to be the optimum spacing. In our opinion the maximum recovery can be obtained at the maximum economic feasibility.

Q What factors did you take into consideration in determining that spacing?

A In this type of analogy we used development costs, operating costs, the reserve estimates, and the anticipated life of such a project under various spacing patterns. A sufficient number of determinations were made over a wide spacing program from one to forty acres and by a number of computations in the plotting of curves, which is shown also as a part of this Exhibit No. 1 as Figure 6, the maximum net realization from such a

project could be obtained by developing the area on 20 acres.

Q Now, what life do you estimate for the pool under the water flood on the basis of 20 acre spacing?

A It is estimated at twelve to fourteen years.

Q Would that be different if the area were developed on 40 acre?

A Yes, the wider the spacing the longer life it would be probably up to twenty-five to thirty years on 40 acre units.

Q Would that affect the cash recovery from the pool?

A In my opinion it would. The useful life of equipment in a water flood, of course, is in our experience about fifteen years is considered maximum. After that period replacement costs could be extremely high, and often these costs can cause premature abandonment loss of reserves.

Q Would that result in loss of oil in the reservoir that would not be recovered?

A If in the operation of this project, because of corrosive waters that we expect to be using from this supply source and with subsequent replacement of equipment, it is very probable that potentially reserves could be lost.

Q Now, in the application, capacity allowables are requested for this project. Is there a need for capacity allowables in this area?

A Well, I might say, of course, that one of the primary

reasons for requesting a pilot operation is to determine the accuracy of our predictions, also to determine the actual rate of water injection that we can obtain in this particular reservoir. As stated earlier we estimate about four and a half barrels per day per foor per sand capacity injection. Actually it will take a field test to determine whether this is a reasonable figure for injectivity, and in conjunction with that it is my opinion that capacity injection will be necessary to properly evaluate this flooding program. As a direct corollary to capacity injection, we would need capacity allowables in order to obtain maximum results from this operation.

Q What is your injection rate per foot? I believe you mentioned it earlier.

A Four and a half barrels per day per foot of pay at 650 pound surface pressure.

Q Your injection rate per acre foot of sand would be what?

A I don't have that figure in front of me, but I believe it would be .225 barrels per day per acre foot on 20 acre spacing.

Q In the event you are not granted capacity allowables, would it be economical to develop this area on 20 acre spacing?

A Well, of course that was taken into consideration in our analysis of the optimum spacing of this reservoir, and

capacity allowables certainly would enhance the economic feasibility. The closer the spacing, of course, the higher the development cost, the wider the spacing the higher the operating cost, so there has to be an economic balance arrived at based on cost for development and operating as well as the rate at which oil can be removed from the reservoir. Anything less than capacity allowables would certainly lessen the economic feasibility of this project. We do not know at this time, of course, the results definitely that we can expect by field operation.

Q In connection with the operation of the project area, are you willing to file with this Commission, and any other parties as the Commission may direct, reports on the progress of the pilot area?

A Yes, we would be very happy to do so.

Q The application also proposes an administrative procedure for conversion of wells from production to injection. Is there a need for that?

A Yes. There's a definite need for that, particularly if under this pilot operation the operator would proceed with the drilling of additional wells in the field, the possible future location for injection wells could be drilled and later converted to water injection upon expansion of the project.

Q There is also a proposal for administrative procedure for expansion of the project area. Is there any need for that?

A Yes, sir, as this is only a pilot operation and covers only a small portion of the Coyote Pool, there's a definite need for administrative procedure to expand this operation.

Q Would you be willing to file with this Commission the necessary reports to support an application for expansion of the area for the conversion of wells?

A Yes, sir.

Q Based on your examination of the area and the engineering work which you have done, in your opinion is this pilot project economically feasible?

A Based upon our investigation, it is economically feasible.

Q Is it in the interest of conservation and the prevention of waste?

A In my opinion it is.

Q In your opinion will it result in a greater ultimate recovery of oil from the area?

A If the results from the pilot flooding bear out our initial studies and investigations, it definitely will be.

Q Would that be oil which would not otherwise be recovered?

A Yes, sir.

Q Do you have any other comments?

A I believe not.

Q You have submitted to the Commission certain logs.

Do you have any comments to make on the logs which have been offered in evidence?

A Yes, these logs fairly represent the area.

Q Would you refer to them individually and by exhibit number for identification?

A The exhibit numbers on those logs, I don't have them in front of me. I would prefer to discuss them, all four logs as a group.

Q That is what I would like.

A The four logs on the presently completed four producing wells in the pilot area as Exhibits 2, 3, 4 and 5, on these logs we have shown the completion intervals for the five zones which we consider to be correlative in the reservoir. The pay zones and perforated intervals are shown on these logs in red. We have additional logs, I don't know --

Q From your examination of the logs and from your examination of the core data on the twelve wells which was available to you, in your opinion is this a uniform continuous reservoir?

A Yes. In the analysis of the cores and the study of the gamma ray and acoustic logs, the sand is correlatable from well to well and is fairly uniform from well to well.

Q What total volumes of water would you anticipate injecting in the pilot area, or did you cover that?

A I think we covered it. I don't mind repeating it.

We estimated 440 barrels per day into the six wells.

Q Were exhibits 1 through 5 prepared by you and under your supervision?

A They were.

MR. KELLAHIN: We would like to offer Exhibits 1 through 5.

(The documents heretofore marked Applicant's Exhibits Nos. 1 through 5 were offered in evidence by counsel for the Applicant.)

MR. UTZ: Without objection the Exhibits 1 through 5 will be accepted. I believe there were six exhibits.

Q Was Exhibit No. 6 prepared by you or under your direction and supervision?

A Of course Exhibit No. 6 is an electical survey of the well and was not --

Q Have you examined it, and in your opinion is it representative of the well?

A Yes, sir.

MR. KELLAHIN: We would like to offer Exhibit No. 6.

(The document heretofore marked Applicant's Exhibit No. 6 was offered in evidence by counsel for the Applicant.)

MR. UTZ: Without objection it will be accepted. Are there questions of the witness?

MR. RUSSELL: Mr. Porter, I have one. Mr. Utz.

BY MR. RUSSELL:

Q Mr. Russell, I believe you stated that the maximum spacing which you contemplate is 20 acre five spots, is that correct?

A That is considered to be optimum spacing, yes, sir.

Q You anticipate the expansion of this pilot program?

A Yes. I might qualify that by stating that it would be entirely dependent upon the results of the pilot flooding.

Q Do you have any opinion as to the area in which this water flood project may apply? How large an area?

A Well, the reservoir is not completely defined by the drilling to date. I would say that it would comprise at least 640 acres.

Q And that would be developed on the same spacing as the pilot as far as you know at this time?

A That is correct.

Q Have you arrived at any maximum daily figures for the production of water that may be required in your expanded program?

A The production of water --

Q Water.

A I don't quite understand you.

Q For injection purposes.

A The supply well water?

Q That is correct.

A Well, it's rather difficult to say what our total water requirements will be, but if our original calculations as to the injectivity capacity of this sand are correct, we will probably need as much as 4,000 barrels per day, or more, in the expanded flood.

Q Now, that would be on the basis of a 640 acre reservoir?

A Yes, I think, as I say, it is difficult to say how large this eventually will be. I can say that the average injection rate on an expanded flood we calculate at about 190 barrels per injection well. That would be multiplied by the future number of injection wells that we would have.

Q At the present time your study on this problem or project has been limited to the pilot program and a reservoir of approximately 640 acres?

A Yes.

Q For expanded purposes? A Yes.

Q Have you any information, or have you made any study as to the effect of withdrawal from the Glorietta formation in this area, upon the effect of the water in the Glorietta or San Andres to the west of you?

A No, sir, I have not.

MR. RUSSELL: I believe that's all.

MR. UTZ: Mr. Porter.

BY MR. PORTER:

Q Mr. Russell, do you make any prediction as to when you think you may have a response from the first injection?

A The response should be very soon after initial injection; because of the relatively small amount of fluid withdrawals to date, we should reach a hydraulic balance within a very short period of time. I would say in a matter of a few months.

Q Would that time be influenced by your spacing pattern, by your 20 or 40?

A Not appreciably.

Q I believe that you testified that the capacity allowables would be desirable here for the purposes of adequately utilizing this area by this pilot flood, or something to that effect?

A Yes, sir.

Q Do you think waste might occur if we didn't grant the capacity allowables?

A Well, I might answer it this way, if I may: That we have not made particular studies as to the desirability of slow flooding versus fast flooding, but in my opinion the injectivity capacity of this reservoir will be so low that it is possible that waste of oil could occur by decreasing our injectivities

below what the capacity injectivity of the same could be.

Q At this point your purpose, primary purpose, is for evaluating the project, that is your primary purpose in asking capacity allowables is for evaluating the project?

A That is correct.

Q I believe you testified, maybe I misunderstood it, but I believe you testified that more oil, in your opinion more oil would be recovered on a 20 acre pattern than a 40 acre, is that correct?

A Yes, sir. It is conceivable that more oil will be recovered on a 20 as opposed to a 40 acre.

Q Are you testifying just with reference to this particular pool or do you think that might apply to any pool?

A I'm testifying only to this particular pool.

MR. PORTER: Thank you.

MR. UTZ: Any other questions.

MR. RUSSELL: If the Commission please, I have a couple others.

MR. UTZ: All right.

BY MR. RUSSELL:

Q Now, your present water producing well has not been completed, is that correct?

A No, it is in the process of being completed at this time.

Q Do you know in the drilling of that well whether you encountered any water in the Aluvium?

A I am not acquainted with those facts, no, sir.

Q You do not know whether there is water in the Aluvium, the quality or the quantity of it?

A No, sir.

MR. UTZ: Any other questions?

MR. PAYNE: Yes, sir.

BY MR. PAYNE:

Q Is the proposed water supply well, does that have the capacity to produce all the water you need for the pilot?

A We do not know that at the present time. It will be necessary to recomplete the well which is in process at the present time and make production tests as to its capacity.

Q In your opinion does it cause waste to lessen the injection rate, once you have started injecting at a certain daily rate, to cut that figure down?

A I think it's possible in certain reservoirs.

Q So you think it's preferable to continue injecting at a constant rate?

A Yes, sir.

Q You feel you will have enough water for this purpose?

A If we don't get it from this particular well from the Glorietta, we must seek additional sources.

MR. PAYNE: Thank you.

BY MR. UTZ:

Q What is the status of the No. 3 well on the Levick State Lease?

A It is presently completed. I do not believe it has been potentialed as yet.

Q Is it capable of producing oil from the Queen?

A Yes, sir.

Q Then it is actually a part of this water flood project, is it not?

A It is a part of the project. However, it is outside of the area which we considered to be the immediate pilot area. Although it should respond or have some effect from the flood zone.

Q If it responds, is it part of the project?

A I think it is a part of the project which should be considered under the extension of the flooding at that time.

Q I believe you said these wells were all producing at the present time?

A They have been completed, I cannot testify as to whether they are all producing.

Q Well, can you tell me what they're capable of producing, or better yet, what they have produced for the month of June?

A No oil was run from those wells during the month of June to my knowledge.

Q Go ahead.

A I don't believe they have been potentialed during the month of June.

Q None of the five wells in question here have been potentialed?

A The five wells in question are the 1, 2, 3, 4 on the "C" Lease and the 1 and 2 on the Hanson "A" Lease.

Q Yes, sir.

A I cannot testify to that.

MR. KELLAHIN: I believe Mr. Williams will be able to give you some testimony on that.

MR. UTZ: All right.

Q Regarding your DeKalb Compton State water well, I understood you to say that there were water zones in the neighborhood of 2500 feet, is that correct?

A That is correct.

Q What is the area in the neighborhood of 750 to 900 feet that you have marked on this log?

A That is in the production section of the Queen, which we propose to water flood.

Q Is this water brackish, did I understand you to say?

A From the Glorietta?

Q Yes, sir.

A The indications that we have to date is that it is

brackish.

Q But you don't have an analysis?

A No, sir. The water has been too badly contaminated during the early testing period to obtain a chemical analysis of the water.

Q Mr. Russell, what is your definition of a pilot flood?

A Pilot flood is a project which is for the purpose of determining in the field the floodability characteristics of a reservoir.

Q How many injection wells would you have to have to accomplish that purpose?

A I think that a minimum of six wells which I have proposed for this project in order to obtain an adequate and sufficient cross section of injectivity and production capacities of the area are required in this particular case. The requirements of a pilot flood can vary from reservoir to reservoir, and I don't believe any definite statement as to the number of wells required for any or all pilot floods could be made.

Q You don't think four injection wells would pilot this area?

A Four injection wells would give us one complete five spot. It would not, in my opinion, give us adequate cross section on the same amount of information that the two opposing five spots would give us.

Q If this flood were not successful, then you would have drilled some unnecessary wells, would you not?

A Insofar as the injection wells are concerned?

Q Yes, sir, or producing wells.

A Yes, if the flood is unsuccessful, naturally the injection wells would be excess wells.

Q So the more wells you drill, the more economic waste would occur in that instance?

A But, I think that the drilling and completion and the use of the six injection wells in this particular case is pertinent to the analysis of expansion of the flood over the entire reservoir. With only four injection wells and one producing well completely enclosed, possibly could give us some misleading information which would lead to further economic waste if we did not have the six injection wells as proposed herein.

MR. UTZ: Does anyone have any questions of the witness? If not, the witness may be excused.

(Witness excused.)

MR. KELLAHIN: I would like to call as our next witness, Mr. Williamson

N. R. WILLIAMSON

called as a witness, having been first duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. KELLAHIN:

Q Would you state your name, please?

A N. R. Williamson.

Q Are you engaged in business, Mr. Williamson?

A Yes.

Q What business are you engaged in?

A In the oil business.

Q With whom are you associated?

A Hanson, Waters and Williamson.

Q Is that a partnership?

A The Waters and Williamson is, Hanson is individual.

Q In regard to the application before the Commission, does that constitute a joint venture between Hanson, Waters and Williamson?

A Yes.

Q Who is in charge of the project?

A Waters and Williamson.

Q What position do you hold in connection with the project?

A I am a co-partner and operate the lease.

Q Are you familiar with the application before the Commission?

A Yes.

Q In regard to the plat which is shown attached to

Exhibit No. 1, there appears to be one lease in the immediate vicinity which is not held by the joint venture, being the M. G. Peters Lease.

A Yes.

Q Do you anticipate that would be affected by the project area?

A Well, not at this time.

Q In the event it is, what arrangements have you made with Mr. Peters in regard to that lease?

A I have discussed this matter with Mr. Peters and they said they would be glad to join us in this operation.

Q On the cross examination of Mr. Russell, some questions were asked as to the tests on the producing wells which have already been drilled. Would you discuss those wells and explain to the Examiner the present status of those wells?

A Well, the "C" No. 1 Well, it has been completed and potentialed, the "C" No. 2 is ready for potential at this time, and also the "C" -3 Well, the "C" 3 is the only one that is in this. The Hanson "A" 1 and "A" 2 has been completed and should be ready for potential within the next couple of days.

Q Would you be willing to supply any information obtained from those tests to the Commission?

A Well, we have recovered all the fract oil on the "C" 2 and "C" 3, the Hanson "A" No. 2 we lacked approximately 100

barrels of recovering the fract oil the last time I was on the lease, which was day before yesterday. We should have recovered all the fract oil on the Hanson "A" No. 2 at this time.

Q Do you knowwhat any of the wells which have been potentialed showed?

A The "C" 1 potentialed I believe for 43 barrels after recovering fract oil, but has declined from that considerably.

Q Do you consider the well a submarginal well?

A Yes.

Q Mr. Williamson, in connection with our application it has been proposed that an administrative procedure be set up for conversion of wells and for expansion of the project area with capacity allowables. Have you any suggestion to make to the Commission in regard to the procedure to be followed?

A Well, nothing except that I think it would be a great deal expensive not to go through with that procedure.

Q Would you be willing to follow any procedure prescribed by the Commission as to filing reports with the Commission in connection with your application to any interested operator and to the office of the State Engineer?

A Yes.

Q At that time would you be willing to submit to the State Engineer's office and to this Commission estimates as to water to be used and source of water supply?

A Yes.

Q And in the event your application were not approved, would you be willing to present your evidence to the Commission?

A Yes.

MR. KELLAHIN: That's all the questions I have.

CROSS EXAMINATION

BY MR. UTZ:

Q How long will it be before you can supply the Commission the information regarding all five of these wells?

A Probably within, I would say, five days.

Q Will you do that as soon as it's available as to their initial potentials?

A Yes.

Q Do you intend to put these wells on the line and produce them as soon as they are completed?

A Yes.

Q I wonder if you would also supply the Commission with the producability of these wells, say after the first week or so of production?

A Yes.

Q Would you think that the water flood in this area immediately after drilling the initial well might be premature?

A Well, from the information that we have on the surrounding area, I wouldn't think so.

Q You mean as to the producability of the wells in the surrounding area?

A Yes, that's right.

MR. PAYNE: Are any of the surrounding wells top allowable wells, Mr. Williamson?

A No, definitely not.

MR. PAYNE: What do they make, average, about ten barrels?

A I would say they would average out just about ten barrels per day.

Q (By Mr. Utz) There actually has been no production on this lease up to the present time?

A That's right.

Q So you really don't know until you complete the wells what the potential is?

A That is true.

MR. UTZ: Any other questions of the witness?

BY MR. RUSSELL:

Q Would you furnish to the State Engineer any information you obtain as to presence or encountering of water in the Aluvium in these wells that you drill?

A Yes, I will.

Q Do you know, Mr. Williamson as to whether there is water in the Aluvium?

A Well, I think the only water that we have in that area is a shallow water which is in the Yates, and as far as I know there is no water in the San Andres. That is from the information that has been gathered off some cable tool holes in that particular area.

Q Do you know whether that is fresh water or brackish?

A Your Yates water is fresh water at approximately 120 to 60 feet.

Q Do you have sufficient information to determine whether there is a sufficient quantity of the water in the Yates formation which you could use for water flood purposes?

A Well, I would think that there are from the information that we have in there, we have a water well there, but I don't think that the water would be sufficient itself for a water flood purposes.

Q In quantity? A Well, yes.

Q Do you feel that it could be used perhaps in an expanded program in conjunction with the water you would be taking presently from the Glorietta?

A I don't think so.

MR. UTZ: Why not?

A Well, it's a fresh water and we are trying to stay with salt water all the way to flood this area with.

Q (By Mr. Russell) The question that I was referring to

was as to the quantity of water available there.

MR. KELLAHIN: Would you restate the question, please?

A I don't follow you there.

Q Do you have any information as to the quantity of water which is available in the Yates formation?

A No, not on a per barrel or per gallon basis. I know there is some water there, but I don't know how much.

Q You can't tell the Examiner at this time whether there would be a sufficient quantity available in the Yates formation to supply your water flood project?

A No, I couldn't.

Q In the drilling of future water supply wells, or your injection wells, would you be able to determine from them as to the quantity?

A I wouldn't think so, not the way we drilled those wells.

Q You don't run any tests in the Yates formation?

A No, that's right.

MR. RUSSELL: That's all.

BY MR. PAYNE:

Q You say you propose in the pilot and the expanded flood to use salt water if at all possible, is that right?

A Yes, sir.

MR. PAYNE: That's all.

BY MR. UTZ:

Q You have not yet developed this source of salt water, is that true?

A No, that's true. We do know it is salt water. They run a baler test, but it is insufficient to present at this time.

Q So actually you don't know just how much water you have got for this project, do you?

A That's right.

Q When do you intend to investigate the DeKalb Well?

A This next week we are putting a pump on it, this week.

Q Would you furnish the information as soon as it is available regarding your water supply and the availability of the water?

A Yes.

Q That is Glorietta water? A Glorietta water.

MR. UTZ: Any questions of the witness? If not, the witness may be excused.

(Witness excused.)

MR. KELLAHIN: That's all I have.

MR. UTZ: Any other statements to be made in this case? If there are none, the case will be taken under advisement. The hearing will recess until 1:15.

(Recess.)

STATE OF NEW MEXICO)
: ss
COUNTY OF BERNALILLO)

I, ADA DEARNLEY, Court Reporter, do hereby certify that the foregoing and attached transcript of proceedings before the New Mexico Oil Conservation Commission at Santa Fe, New Mexico, is a true and correct record to the best of my knowledge, skill and ability.

IN WITNESS WHEREOF I have affixed my hand and notarial seal this 5th day of August, 1959.

Ada Dearnley
Notary Public - Court Reporter

My Commission Expires:

June 19, 1963.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 1228, heard by me on Aug. 5, 1959.

New Mexico Oil Conservation Commission, Examiner

DEARNLEY - MEIER & ASSOCIATES
GENERAL LAW REPORTERS
ALBUQUERQUE, NEW MEXICO
Phone CHapel 3-6691

RUSSELL ENGINEERING

Water Analysis Report

for

LAB NO. W-423

HANSON, WATERS, & WILLIAMSON

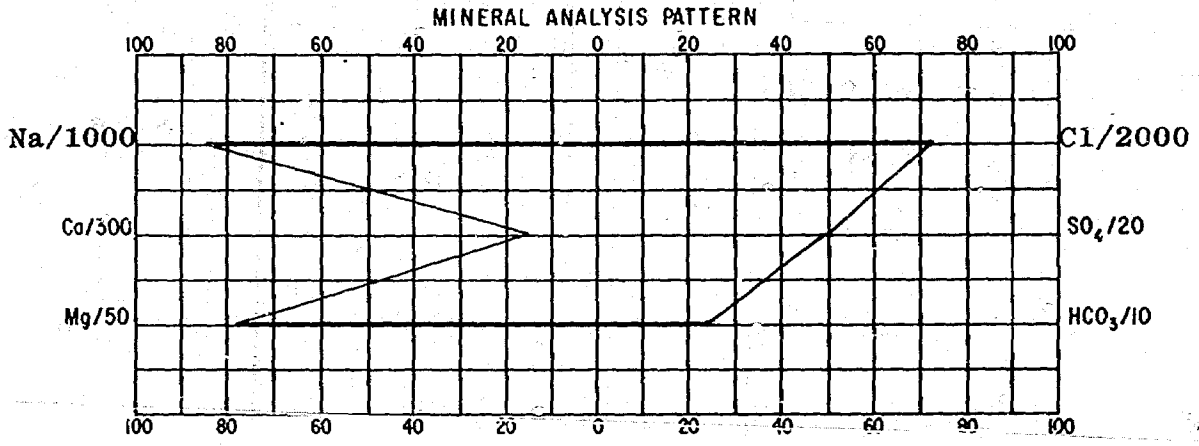
WELL Water Supply Well No. 2-X DATE SAMPLED 8-29-59 DATE ANALYZED 8-31-59

FIELD Coyote (Queen) Pool COUNTY Chaves STATE New Mexico

SOURCE Glorietta Sand, 3200' Depth.

SAMPLE OF: PRODUCED WATER ☒ INJECTION WATER ☐ OTHER ☐

MINERAL ANALYSIS PATTERN



SUSPENDED SOLIDS	PPM
TURBIDITY as SiO_2 (Agitated)	160+
TURBIDITY as SiO_2 (Filtered)	4
IRON	495

DISSOLVED GASES	PPM
HYDROGEN SULPHIDE	0
CARBON DIOXIDE	125
OXYGEN	N.D.

PHYSICAL PROPERTIES	PPM
SPECIFIC GRAVITY	1.164
pH	6.5
CONDUCTIVITY	0.050

DISSOLVED SOLIDS	PPM
TOTAL ALKALINITY as $CaCO_3$	200
SUPERSATURATION as $CaCO_3$	4
UNDERSATURATION as $CaCO_3$	-
CALCIUM	4,540
MAGNESIUM	3,860
BARIUM	0
SODIUM (Calculated)	84,500
CHLORIDE	145,000
SULPHATE	1,000
SILICA	3
IRON	5
IRON (Total)	500
TOTAL DISSOLVED SOLIDS (Calculated)	238,400

N.D. - Not determined.

No. 26-59

DOCKET: EXAMINER HEARING JULY 28, 1959

Oil Conservation Commission - 9 a.m., Mabry Hall, State Capitol, Santa Fe, New Mexico

The following cases will be heard before Elvis A. Utz, Examiner, or A. L. Porter, Jr., Secretary-Director

Continued Case

CASE 1720: (Continued) Application of Skelly Oil Company for an oil-oil dual completion. Applicant, in the above-styled cause, seeks an order authorizing the dual completion of its W. P. Saunders Well No. 1, located in the SW/4 SE/4 of Section 11, Township 26 North, Range 11 West, San Juan County, New Mexico, in such a manner as to produce oil from the Gallegos-Gallup Oil Pool and to produce oil from an undesignated Dakota pool through parallel strings of tubing.

NEW CASES

CASE 1725: Application of Amerada Petroleum Corporation for an oil-oil dual completion and for permission to commingle the production from two separate pools. Applicant, in the above-styled cause, seeks an order authorizing the dual completion of its State "Q" Well No. 1, located in the NW/4 SE/4 of Section 16, Township 20 South, Range 37 East, Lea County, New Mexico, in such a manner as to permit the production of oil from the Eunice-Monument Pool and the production of oil from an undesignated Tubb pool, through parallel strings of tubing. Applicant further seeks permission to commingle the production from said pools produced from the said State "Q" Well No. 1.

CASE 1726: Application of Amerada Petroleum Corporation for an oil-oil dual completion. Applicant, in the above-styled cause, seeks an order authorizing the dual completion of its Ka Da Pa Well No. 1, located in the SW/4 SW/4 of Section 4, Township 25 North, Range 12 West, San Juan County, New Mexico, in such a manner as to permit the production of oil from the Bisti-Lower Gallup Oil Pool and the production of oil from an interval designated by the applicant as the Lower Mancos sand through parallel strings of tubing.

CASE 1727: Application of Skelly Oil Company for an oil-gas dual completion. Applicant, in the above-styled cause, seeks an order authorizing the dual completion of its Jicarilla "B" Well No. 20, located in the NW/4 NW/4 of Section 31, Township 25 North, Range 5 West, Rio Arriba County, New Mexico, in such a manner as to permit production of oil from the Otero-Gallup Oil Pool and the production of gas from an undesignated Dakota pool through parallel strings of tubing.

CASE 1728: Jason Kellahin Application of Hanson, Waters and Williamson, for an order authorizing a pilot water flood project, for capacity allowable for twelve wells in said project area, and for establishment of an administrative procedure for expansion of said project, conversion of wells to water injection, and for granting capacity allowables. Applicant, in the above-styled cause, seeks an order authorizing it to institute a pilot water flood project in the Coyote-Queen Pool in Chaves County, New Mexico. Applicant proposes to inject water into the Queen formation through six wells located in Sections 15 and 16, Township 11 South, Range 27 East. Applicant also seeks capacity allowables for twelve wells in said project. Applicant further seeks the establishment of a procedure whereby the project area may be expanded, wells may be converted to water injection, and capacity allowables granted without notice and hearing.

CASE 1729: Application of El Paso Natural Gas Products Company for permission to produce more than 16 wells in a common tank battery. Applicant, in the above-styled cause, seeks an order authorizing the production of more than 16 wells in the Horseshoe-Gallup Oil Pool into a common tank battery. Said wells are located on applicant's Horseshoe Ute Lease comprising portions of Sections 27, 28, 33 and 34, Township 31 North, Range 16 West, San Juan County, New Mexico.

CASE 1610: Application of Wood River Oil & Refining Company, Inc., for an amendment of Order No. R-1352. Applicant, in the above-styled cause, seeks an amendment of Order No. R-1352, to provide that the unorthodox well locations for well Nos. 8 and 9 of the Wills Water Flood Project, Rhodes Pool, Lea County, New Mexico, be 1135 feet from the South line and 1315 feet from the West line of Section 35, and 1135 feet from the South line and 20 feet from the West line of Section 35 respectively, both in Township 26 South, Range 37 East.

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BEFORE THE OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO

APPLICATION OF HANSON, WATERS AND WILLIAMSON FOR AUTHORITY TO INSTITUTE A PILOT WATER FLOOD PROJECT IN THE COYOTE-QUEEN POOL IN CHAVES COUNTY, NEW MEXICO WITH APPROVAL OF CAPACITY ALLOWABLES FOR TWELVE WELLS, WITH AN ADMINISTRATIVE PROCEDURE FOR EXPANSION OF THE PROJECT AREA, CONVERSION OF WELLS TO INJECTION WELLS, AND GRANTING OF CAPACITY ALLOWABLES.

Case No. 1728

A P P L I C A T I O N

Comes now the Applicant, Hanson, Waters and Williamson, composed of E. A. Hanson, individually, and M. A. Waters, Jr., and N. R. Williamson, a partnership, and applies to the Commission for authority to institute a pilot water flood project in the Coyote-Queen Pool in Chaves County, New Mexico, capacity allowables for twelve wells in the project area of said water flood project, and for establishment of an administrative procedure for expansion of the project area, conversion of producing wells to injection wells, and the granting of capacity allowables brought into the project area by such procedure, and in support of such application would show:

1. Said pilot project area will consist of the following described area, and such other area as may properly be included after notice, and hearing before the Commission or its duly qualified examiner:

Township 11 South, Range 27 East, NMPM

Section 15 - $NW\frac{1}{4}$ $SW\frac{1}{4}$, $W\frac{1}{2}$ $NE\frac{1}{4}$ $SW\frac{1}{4}$, $NE\frac{1}{4}$ $NE\frac{1}{4}$ $SW\frac{1}{4}$,

Gordon Mabell 1-18-57

N½ SW¼ SW¼, SW¼ SW¼ SW¼, S½ SW¼ NW¼, NE¼ SW¼ NW¼, SW¼ SE¼ NW¼.

Section 16 - S½ NE¼ SE¼, NE¼ NE¼ SE¼, NE¼ SE¼ SE¼.

2. Proposed injection wells will be located as follows:

Levick State C No. 100, 990 FSL, 990 FWL, Section 15

Levick State C No. 101, 1650 FSL, 990 FWL, Section 15

Levick State C No. 102, 2310 FSL, 1650 FWL, Section 15

Levick State C No. 103, 2310 FNL, 990 FWL, Section 15

Levick State C No. 104, 2310 FSL, 330 FWL, Section 15

Hanson State A No. 100, 1650 FWL, 330 FEL, Section 16

3. Proposed producing wells for which capacity allowables are sought are:

Levick State C No. 1, 990 FWL, 990 FWL, Section 15

Levick State C No. 2, 2310 FWL, 990 FWL, Section 15

Levick State C No. 3, 2310 FWL, 2310 FWL, Section 15

Levick State C No. 5, 330 FSL, 330 FWL, Section 15

Levick State C No. 6, 1650 FWL, 330 FWL, Section 15

Levick State C No. 7, 1650 FWL, 1650 FWL, Section 15

Levick State C No. 8, 2310 FNL, 1650 FWL, Section 15

Levick State C No. 9, 2310 FNL, 330 FWL, Section 15

Levick State C No. 10, 1650 FNL, 990 FWL, Section 15

Hanson State A No. 1, 990 FWL, 330 FEL, Section 16

Hanson State A No. 2, 3210 FSL, 330 FEL, Section 16

Hanson State A No. 3, 1650 FSL, 990 FEL, Section 16

4. That all of the wells involved in this application which are presently producing, are producing from the Queen formation, and are not producing from any other formation.

5. The name, description, and depth of the formations to be affected by the proposed injection are as follows:

Formation: Queen Formation.

Water to be injected between 800 feet and 960 feet.

6. Simultaneously with the filing of this application, applicant has filed with the office of the State Engineer, P. O. Box 1079, Santa Fe, New Mexico, a copy of this application, and will file within the immediate future, an analysis of the water to be used in this project, and other information pertinent to this application.

7. Applicant further requests that it be authorized to convert any other wells located within the above described area to water injection, or production at capacity allowable rates, or expansion of the project area, without notice and hearing, subject to administrative approval by the Commission, when it has been established to the satisfaction of the Secretary-Director of the Commission that the proposed water injection well has experienced a substantial response to the water flood project, or is directly off-set by a producing well which has experienced such response. It is hereby stipulated that the State Engineer of the State of New Mexico is an interested party and is to be notified of any requests for expansion of the project area.

8. Applicant further requests an exception to Rule 502 in order to prevent waste, and that capacity allowables may be authorized for expansion of the water flood project area.

WHEREFORE, Applicant respectfully requests that this matter be set for hearing before the Commission's duly authorized examiner, or before the Commission, and that after notice and hearing as provided by law, the Commission enter its order granting the relief prayed for.

Respectfully submitted,

HANSON, WATERS & WILLIAMSON

By Jason W. Kellahin

Kellahin and Fox
P. O. Box 1713
Santa Fe, New Mexico

Attorneys for Applicant

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

CASE No. 1728
Order No. R-1473-A

APPLICATION OF HANSON, WATERS,
AND WILLIAMSON FOR AN ORDER
AUTHORIZING A WATER FLOOD
PROJECT IN THE COYOTE-QUEEN
POOL, CHAVES COUNTY, NEW MEXICO,
FOR CAPACITY ALLOWABLES FOR
12 WELLS IN SAID PROJECT, AND
FOR THE ESTABLISHMENT OF AN
ADMINISTRATIVE PROCEDURE FOR
EXPANDING SAID PROJECT AND FOR
GRANTING CAPACITY ALLOWABLES
TO WELLS IN SAID PROJECT

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on July 28, 1959, at Santa Fe, New Mexico, before Elvis A. Utz, Examiner duly appointed by the Oil Conservation Commission of New Mexico in accordance with Rule 1214 of the Commission Rules and Regulations, and Order No. R-1473 was entered denying the applicants' request for authorization to institute a water flood project. This cause came on for hearing de novo at 9 o'clock a.m. on November 18, 1959, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission."

NOW, on this 24th day of November, 1959, the Commission, a quorum being present, having considered the application and the evidence adduced, and being fully advised in the premises,

FINDS:

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

(2) That after an Examiner hearing, Commission Order No. R-1473 was entered denying, for several reasons, the applicants' request for authorization to institute a water flood project in the Coyote-Queen Pool, Chaves County, New Mexico.

(3) That the applicants requested and were granted a hearing de novo before the Oil Conservation Commission.

(4) That in the subject hearing de novo the applicants proposed to institute a water flood project in the Coyote-Queen Pool with injection of water into the Queen formation through the six following-described wells in Township 11 South, Range 27 East, NMPM, Chaves County, New Mexico:

Levick State C Well No. W-100, located 990 feet from the South line and 330 feet from the West line of Section 15;

Levick State C Well No. W-101, located 1650 feet from the South line and 990 feet from the West line of Section 15;

Levick State C Well No. W-102, located 2310 feet from the South line and 1650 feet from the West line of Section 15;

Levick State C Well No. W-103, located 2310 feet from the North line and 990 feet from the West line of Section 15;

Levick State C Well No. W-104, located 2310 feet from the South line and 330 feet from the West line of Section 15;

Hanson State A Well No. W-100, located 1650 feet from the South line and 330 feet from the East line of Section 16.

(5) That the applicants further proposed that they be granted capacity allowables for 12 wells and that administrative procedures be established for granting capacity allowables to additional wells in said project.

(6) That the record in Case No. 1787 was incorporated into this case and administrative notice was taken of Order No. R-1525, entered in said Case No. 1787.

(7) That the applicants, seeking an exception to statewide Rule 701 of the Commission Rules and Regulations, have failed to prove by a preponderance of the evidence that restriction of production in the subject water flood project will result in a loss of ultimate oil recovery.

(8) That the primary production in the area proposed to be water flooded has rapidly declined to the point where it may properly be termed as stripper production.

(9) That the proposed water flood project should be authorized and the operation thereof should be governed by the provisions

of Rule 701 of the Commission Rules and Regulations, including those provisions regarding allocation of allowables and expansion of the project area.

(10) That the casing and cementing program for all wells in said project should be as approved by the District Supervisor of the Commission. Provided however, that in the event a single string of casing is used, cement should be circulated to the surface in all wells completed in said project. If the applicants find it necessary to perforate the casing in order to achieve such circulation, water injection should be through tubing and packer.

IT IS THEREFORE ORDERED:

(1) That the applicants be and the same are hereby authorized to institute a water flood project in the Coyote-Queen Pool and to inject water into the Queen formation through the six following-described wells in Township 11 South, Range 27 East, NMPM, Chaves County, New Mexico:

Levick State C Well No. W-100, located 990 feet from the South line and 330 feet from the West line of Section 15;

Levick State C Well No. W-101, located 1650 feet from the South line and 990 feet from the West line of Section 15;

Levick State C Well No. W-102, located 2310 feet from the South line and 1650 feet from the West line of Section 15;

Levick State C Well No. W-103, located 2310 feet from the North line and 990 feet from the West line of Section 15;

Levick State C Well No. W-104, located 2310 feet from the South line and 330 feet from the West line of Section 15;

Hanson State A Well No. W-100, located 1650 feet from the South line and 330 feet from the East line of Section 16.

(2) That the casing and cementing program for all wells in said project shall be as approved by the District Supervisor of the Commission. Provided however, that in the event a single string of casing is used, cement shall be circulated to the surface in all wells completed in said project. If the applicants find it necessary to perforate the casing in order to achieve such circulation, water shall be injected through tubing and packer.

(3) That the applicants' request for capacity allowables for 12 wells and for an administrative procedure for granting capacity allowables to additional wells in said project be and the same is hereby denied.

(4) That the operation of the water flood project herein authorized shall be governed by the provisions of Rule 701 of the Commission Rules and Regulations, including those provisions regarding allocation of allowables and expansion of the project area.

(5) That monthly progress reports on the water flood project herein authorized shall be submitted to the Commission in accordance with Rule 704 and Rule 1119 of the Commission Rules and Regulations.

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

JOHN BURROUGHS, Chairman

MURRAY E. MORGAN, Member

A. L. PORTER, Jr., Member & Secretary

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BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

CASE NO. 1728
Order No. R-1473

APPLICATION OF HANSON, WATERS,
AND WILLIAMSON FOR AN ORDER
AUTHORIZING A PILOT WATER FLOOD
PROJECT IN THE COYOTE-QUEEN POOL,
CHAVES COUNTY, NEW MEXICO, FOR
CAPACITY ALLOWABLES FOR 12 WELLS
IN SAID PROJECT, AND FOR THE
ESTABLISHMENT OF AN ADMINISTRA-
TIVE PROCEDURE FOR EXPANDING SAID
PROJECT AND FOR GRANTING CAPACITY
ALLOWABLES TO WELLS IN SAID PRO-
JECT.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 o'clock a.m. on July 28, 1959, at Santa Fe, New Mexico, before Elvis A. Utz, Examiner duly appointed by the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission," in accordance with Rule 1214 of the Commission Rules and Regulations.

NOW, on this 14 day of September, 1959, the Commission, a quorum being present, having considered the application, the evidence adduced, and the recommendations of the Examiner, Elvis A. Utz, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter therof.

(2) That the applicants, Hanson, Waters, and Williamson, propose to institute a pilot water flood project in the Coyote-Queen Pool, Chaves County, New Mexico, by the injection of water into the Queen formation through six wells to be located in Sections 15 and 16, Township 11 South, Range 27 East.

(3) That the applicants seek capacity allowables for twelve wells in said project.

(4) That the applicants further seek the establishment of an administrative procedure whereby approval may be granted for conversion of additional wells within said project to water injection and whereby capacity allowables may be granted to wells in said project.

(5) That of the proposed producing wells which have been potentialed, all were reported as being capable of producing in excess of top unit allowable for the Coyote-Queen Pool.

(6) That the applicants presented no evidence to show that they have an adequate source of water for the proposed project.

(7) That in view of Findings 5 and 6, the application must be considered premature and should, therefore, be denied.

IT IS THEREFORE ORDERED:

That the application of Hanson, Waters, and Williamson for authorization to institute a pilot water flood project in the Coyote-Queen Pool, Chaves County, New Mexico, be and the same is hereby denied.

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

JOHN BURROUGHS, Chairman

MURRAY E. MORGAN, Member

A. L. PORTER, Jr., Member & Secretary

lcr/

OIL CONSERVATION COMMISSION
P. O. BOX 871
SANTA FE, NEW MEXICO

May 12, 1960

COPY

Mr. Robert G. Prentice
Room 5 - Bacon Building
Abilene, Texas

Dear Mr. Prentice:

We are enclosing a copy of the transcript of the Examiner Hearing July 28, 1959 and the Hearing De Novo November 18, 1959, of Case No. 1728, the application of Hanson, Waters, and Williamson for a Water Flood Project in the Coyote-Queen Pool, Chaves County, New Mexico. This is in accordance with the request of your attorney, Mr. Howard C. Bratton, Roswell, New Mexico.

Please return the transcripts when you are finished with them.

Very truly yours,

DANIEL S. NUTTER
Chief Engineer

DSN/og
cc- Howard Bratton

J. M. HERVEY 1874-1953

HIRAM M. DOW
CLARENCE E. HINKLE
W. E. BONDURANT, JR.
GEORGE H. HUNKER, JR.
HOWARD C. BRATTON
S. B. CHRISTY IV
LEWIS C. COX, JR.

PAUL W. EATON, JR.
ROBERT C. BLEDSOE

LAW OFFICES
HERVEY, DOW & HINKLE
HINKLE BUILDING
ROSWELL, NEW MEXICO

TELEPHONE MAIN 2-6510
POST OFFICE BOX 547

May 11, 1960

Mr. Dan Nutter
New Mexico Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

Dear Dan:

We have today filed an Application for a waterflood project in the Coyote Queen Pool on behalf of C. T. Robertson. It is my understanding that there had been previous hearings on a waterflood project by Hanson, Waters and Williamson in the Coyote Queen Pool which hearings were held in Case No. 1728. There was an Examiner hearing and a de novo hearing.

I would appreciate it if you would send me transcripts of the hearings held in Case No. 1728. I believe that I mentioned this to you in our telephone discussion a few days ago. If you have not already sent the transcripts when this letter arrives, please send them direct to:

Mr. Robert G. Prentice
Room 5
Bacon Building
Abilene, Texas

Your early attention to this matter would be appreciated.

With best personal regards.

Very truly yours,

HERVEY, DOW & HINKLE

By _____

HCB:db
cc: Mr. Robert G. Prentice

OIL CONSERVATION COMMISSION
P. O. BOX 871
SANTA FE, NEW MEXICO

November 30, 1959

Hanson, Waters & Williamson
c/o Mr. Ernest A. Hanson
Box 852
Roswell, New Mexico

Gentlemen:

Reference is made to Commission Order No. R-1473-A, entered by the Commission November 27, 1959, in Case No. 1728, approving the HWW-Coyote Queen Water Flood Project.

According to our calculations, when all of the authorized injection wells have been placed on active injection, the maximum allowable which this project will be eligible to receive under the provisions of Rule 701-E-3 is 490 barrels per day.

Please report any error in this calculated maximum allowable immediately, both to the Santa Fe office of the Commission and the appropriate District proration office.

In order that the allowable assigned to the project may be kept current, and in order that the operator may fully benefit from the allowable provisions of Rule 701, it behooves him to promptly notify both of the aforementioned Commission offices by letter of any change in the status of wells in the project area, i.e., when active injection commences, when additional injection or producing wells are drilled, when additional wells are acquired through purchase or unitization, when wells have received a response to water injection, etc.

Your cooperation in keeping the Commission so informed as to the status of the project and the wells therein will be appreciated.

Very truly yours,

A. L. PORTER, Jr.
Secretary-Director

DSN:ig
cc: OCC - Hobbs
OCC - Artesia

OIL CONSERVATION COMMISSION
P. O. BOX 871
SANTA FE, NEW MEXICO

Case File
1728

December 21, 1959

Hanson, Waters & Williamson
c/o Mr. Ernest A. Hanson
P. O. Box 852
Roswell, New Mexico

Dear Mr. Hanson:

We are in receipt of your letter of December 14, 1959, wherein you have inquired as to the maximum calculated allowable for the HWW-Coyote Queen Water Flood Project.

Our original calculation indicated that with the wells which have been drilled, plus the six proposed water injection wells, there would be a maximum total allowable of 490 barrels per day. Your calculation indicates a maximum allowable of 546 barrels per day.

It would appear that the discrepancy between the two figures results from your inclusion of the following wells in the project area, while to our knowledge these are still undrilled locations, just as indicated on the plat which you enclosed with your letter.

P-6	NW/4 SW/4 Section 15
P-7	NE/4 SW/4 Section 15
P-8	SE/4 NW/4 Section 15
P-9	SW/4 NW/4 Section 15

At such time as these wells or any other wells are drilled and completed which would affect the project area allowable and we are so notified by letter, we shall be most happy to make the appropriate adjustments in the allowable.

Very truly yours,

DANIEL S. NUTTER
Chief Engineer

DSN/og
cc: Oil Conservation Commission - Hobbs
Oil Conservation Commission - Artesia

ROSWELL PETROLEUM BUILDING
PHONE MA 2-7330

67 RIVERSIDE
PHONE MA 2-6923

ERNEST A. HANSON
OIL OPERATOR
P. O. BOX 852
ROSWELL, NEW MEXICO

MAIN OFFICE OCC
DEC 15 AM 8:58

December 14, 1959

file in Case File Case - 1728
W/ reply

Oil Conservation Commission
State of New Mexico
P. O. Box 871
Santa Fe, New Mexico

Attn: Mr. A. L. Porter, Jr.
Secretary Director

Re: Commission Order No. R-1473-A
Dated Nov. 27, 1959, in Case No. 1728
H W W - Coyote Queen Water Flood Project

Dear Mr. Porter:

By letter of November 30, 1959, addressed to Hanson, Waters & Williamson, c/o Mr. Ernest A. Hanson, you requested that we report any error in the calculated allowable of 490 barrels under Rule 701-E-3, and keep the Commission offices currently informed at all times of any change in the status of project wells.

We have conferred with our water-flood consultants, Russell Engineering of Abilene, and find that our figure of 546 barrels per day is an increase of 56 barrels over the 490 barrels calculated by the Commission.

Our calculations follow:

40 Acre Tract	No. Wells	Allowable
f	2	56
g	2	56
h	1	42
i	2	56
k	4	84
m	3	70
p	1	42
q	2	56
t	1	42
u	1	42
	23	546

If our calculations appear to be out of line, please let us know.

As requested, we will attempt to keep the Commission fully informed at all times regarding the status of the project and the wells therein.

Yours very truly,

HANSON, WATERS & WILLIAMSON

cc: Oil Conservation Commission, Hobbs, N. M.
Oil Conservation Commission, Artesia, N. M.
Waters & Williamson
Frank Waters Oil Company

EAH/mws

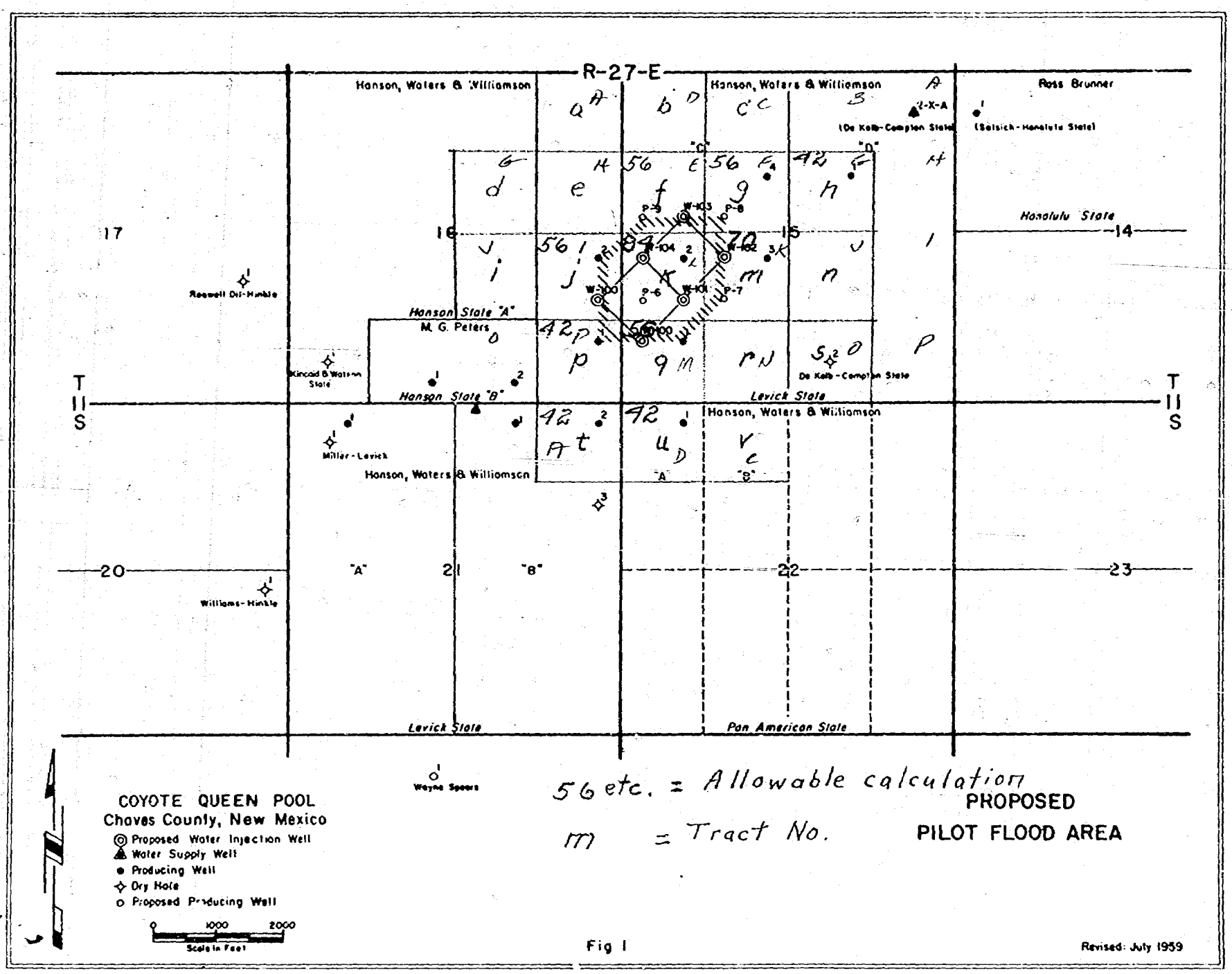

Fig 1

Revised: July 1959

BEFORE THE OIL CONSERVATION COMMISSION

OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
COMMISSION OF NEW MEXICO FOR
THE PURPOSE OF CONSIDERING:

CASE NO. 1728
ORDER NO. R-1473

APPLICATION OF HANSON, WATERS, AND WILLIAMSON FOR AN ORDER AUTHORIZING A PILOT WATER FLOOD PROJECT IN THE COYOTE-QUEEN POOL, CHAVES COUNTY, NEW MEXICO, FOR CAPACITY ALLOWABLES FOR 12 WELLS IN SAID PROJECT, AND FOR THE ESTABLISHMENT OF AN ADMINISTRATIVE PROCEDURE FOR EXPANDING SAID PROJECT AND FOR GRANTING CAPACITY ALLOWABLES TO WELLS IN SAID PROJECT.

APPLICATION FOR HEARING DE NOVO

Comes now the applicant in the above styled and numbered case, and applies to the Oil Conservation Commission of New Mexico for a hearing de novo, as provided by law, and in support thereof would show:

1. The above styled and numbered case was heard by the duly appointed Commission Examiner on July 28, 1959. Thereafter, on the 1st day of September, 1959, the Commission entered its order No. R-1473, denying the application herein on the grounds that (1) the proposed producing wells which have been potentialed were reported as being capable of producing in excess of top unit allowable for the Coyote-Queen Pool, and (2) that the applicants presented no evidence to show that they have an adquate source of water for the proposed project.

2. Applicant proposes to offer additional testimony relative to the project, including evidence and testimony that was not

available at the time of the hearing on July 28, 1959, evidence and testimony offered before the Commission's Examiner, and such other and additional testimony and evidence available on the nature of the reservoir and the feasibility and necessity for the proposed pilot water flood project.

WHEREFORE, applicant prays that this matter be set for hearing de novo before the Oil Conservation Commission, as provided by law, at the regular Commission hearing in October, or as soon as applicant may be heard.

Respectfully submitted,

HANSON, WATERS & WILLIAMSON

By Jason W. Kellahin

Kellahin & Fox
P. O. Box 1713
Santa Fe, New Mexico

Attorneys for Applicant

OIL CONSERVATION COMMISSION
P. O. BOX 871
SANTA FE, NEW MEXICO

COPY

September 1, 1959

Mr. Jason Kellahin
P. O. Box 1713
Santa Fe, New Mexico

Dear Mr. Kellahin:

On behalf of your client, Hanson, Waters & Williamson, we enclose one copy of Order R-1473 issued by the Oil Conservation Commission on September 1, 1959, in Case No. 1728.

Very truly yours,

A. L. PORTER, Jr.
Secretary-Director

ir/

Enclosure

Copies sent to
John Russell
Campbell & Russell
Hobbs Office
Artesia Office

Operator

Wayne J. Spears, Ind	Spears State #1	28-11-27 NENW	40 BOPDF	27,000 gals + 100,000#
Hanson, Waters & Williamson	Hanson State A #2	16-11-27 NESE	37 BOPDF	700 bbls + 120,000#
-do-	Levick State C #3	15-11-27 NESW	37 BOPDF	700 bbls + 150,000#
-do-	Levick State C #4	15-11-27 SENW	37 BOPDF	700 bbls + 150,000#
-do-	Levick State C #2	15-11-27 NWSW	36 BOPDF	700 bbls + 150,000#
-do-	Levick State D #1	15-11-27 SWNE	38 BOPDF	700 bbls + 150,000#
-do-	Hanson State A #1	16-11-27 SESE	36 BOPDF	700 bbls + 130,000#

7 New wells completed in Coyote Queen Pool.

No. 39-59

DOCKET: REGULAR HEARING NOVEMBER 18, 1959

Oil Conservation Commission 9 a.m., Mabry Hall, State Capitol, Santa Fe, New Mexico

Allowable: (1) Consideration of the oil allowable for December, 1959.

(2) Consideration of the allowable production of gas for December, 1959, for six prorated pools in Lea County, New Mexico and for the allowable production of gas for seven prorated pools in San Juan, Rio Arriba, and Sandoval Counties, New Mexico, for December, 1959; also presentation of purchasers' nominations for the six-month period beginning January 1, 1960, for the six prorated pools in Lea County, New Mexico.

CASE 1728: (Hearing de Novo)
Application of Hanson, Waters, and Williamson for a hearing de novo before the Oil Conservation Commission in Case No. 1728, Order No. R-1473, which was an application for a pilot water flood project in the Coyote-Queen Pool, Chaves County, New Mexico, and for capacity allowables for 12 wells in said project, and for the establishment of an administrative procedure for expanding said project and for granting capacity allowables to wells in said project.

NEW CASES

CASE 1757: Application of J. C. Williamson for an order establishing 80-acre proration units in an undesignated Devonian pool in Chaves County, New Mexico. Applicant, in the above-styled cause, seeks an order establishing 80-acre proration units in an undesignated Devonian pool in Chaves County, New Mexico. The discovery well is located 660 feet from the North and East lines of Section 1, Township 12 South, Range 28 East.

CASE 1809: Southeastern New Mexico nomenclature case calling for an order creating and extending existing pools in Lea, Eddy, and Chaves Counties, New Mexico:

(a) Create a new pool, classified as an oil pool for Abo production, designated as the Baish-Abo Pool, and described as:

TOWNSHIP 17 SOUTH, RANGE 32 EAST, NMPM
Section 21: SE/4

(b) Create a new pool, classified as an oil pool for Silurian production, designated as the Fowler-Upper Silurian Pool, and described as:

TOWNSHIP 24 SOUTH, RANGE 37 EAST, NMPM	
Section 22:	E/2

(c) Create a new pool, classified as an oil pool for Tubb production, designated as the Monument-Tubb Pool, and described as:

TOWNSHIP 20 SOUTH, RANGE 37 EAST, NMPM	
Section 16:	SE/4

(d) Create a new pool classified as an oil pool for Wolfcamp production, designated as the Canyon-Wolfcamp Pool, and described as:

TOWNSHIP 19 SOUTH, RANGE 24 EAST, NMPM	
Section 36:	NW/4

(e) Extend the East Crossroads-Devonian Pool to include therein:

TOWNSHIP 9 SOUTH, RANGE 37 EAST, NMPM	
Section 19:	N/2 SE/4

(f) Extend the Culwin-Queen Pool to include therein:

TOWNSHIP 18 SOUTH, RANGE 31 EAST, NMPM	
Section 31:	SW/4

(g) Extend the Dayton-Abo Pool to include therein:

TOWNSHIP 18 SOUTH, RANGE 26 EAST, NMPM	
Section 25:	W/2
Section 26:	S/2
Section 36:	NW/4

(h) Extend the High Lonesome Pool to include therein:

TOWNSHIP 16 SOUTH, RANGE 29 EAST, NMPM	
Section 12:	SE/4

(i) Extend the Little Lucky Lake-Devonian Pool to include therein:

TOWNSHIP 15 SOUTH, RANGE 30 EAST, NMPM	
Section 29:	SW/4

(j) Extend the Red Lake-Pennsylvanian Gas Pool to include therein:

TOWNSHIP 18 SOUTH, RANGE 27 EAST, NMPM	
Section 8:	SE/4
Section 17:	NE/4

(k) Extend the Robinson Pool to include therein:

TOWNSHIP 16 SOUTH, RANGE 32 EAST, NMPM	
Section 30:	SE/4
Section 31:	SW/4

CASE 1810: Northwestern New Mexico nomenclature case calling for an order creating and extending existing pools in Rio Arriba and San Juan Counties, New Mexico:

(a) Create a new gas pool for Pictured Cliffs production, designated as the Pine Lake-Pictured Cliffs Pool and described as:

TOWNSHIP 26 NORTH, RANGE 2 WEST, NMPM	
Section 7:	S/2 (partial)
Section 8:	SW/4
Section 18:	All (partial)
Section 19:	All (partial)
Section 20:	W/2

TOWNSHIP 26 NORTH, RANGE 3 WEST, NMPM	
Section 1:	All
Section 2:	All
Section 3:	E/2
Section 10:	E/2
Section 11:	All
Section 12:	All
Section 13:	All
Section 14:	E/2
Section 23:	NE/4
Section 24:	All

TOWNSHIP 27 NORTH, RANGE 3 WEST, NMPM	
Section 11:	All (partial)
Section 14:	All
Section 15:	All
Section 16:	All
Section 17:	All
Section 18:	All
Section 22:	All
Section 23:	All
Section 24:	S/2
Section 25:	All
Section 26:	All
Section 27:	All
Section 34:	E/2
Section 35:	All
Section 36:	W/2

(b) Extend the Blanco-Pictured Cliffs Pool to include therein:

TOWNSHIP 29 NORTH, RANGE 9 WEST, NMPM	
Section 1:	W/2
Section 2:	All
Section 3:	All
Section 4:	NE/4
TOWNSHIP 30 NORTH, RANGE 9 WEST, NMPM	
Section 27:	SE/4
Section 33:	E/2
Section 34:	All
Section 35:	All
Section 36:	S/2

(c) Extend the Gavilan-Pictured Cliffs Pool to include therein:

TOWNSHIP 25 NORTH, RANGE 2 WEST, NMPM	
Section 9:	NE/4

(d) Extend the Tapacito-Pictured Cliffs Pool to include therein:

TOWNSHIP 27 NORTH, RANGE 5 WEST, NMPM	
Section 29:	NE/4

(e) Extend the Blanco-Mesaverde Pool to include therein:

TOWNSHIP 27 NORTH, RANGE 9 WEST, NMPM	
Section 1:	E/2
Section 12:	E/2

(f) Extend the Bisti-Lower Gallup Oil Pool to include therein:

TOWNSHIP 25 NORTH, RANGE 11 WEST, NMPM	
Section 15:	S/2 NW/4
Section 16:	S/2 NE/4

(g) Extend the Horseshoe-Gallup Oil Pool to include therein:

TOWNSHIP 31 NORTH, RANGE 16 WEST, NMPM	
Section 34:	SW/4 NE/4 & NW/4 SE/4
TOWNSHIP 31 NORTH, RANGE 17 WEST, NMPM	
Section 13:	NW/4 SW/4

(h) Extend the Verde-Gallup Oil Pool to include therein:

TOWNSHIP 31 NORTH, RANGE 14 WEST, NMPM	
Section 21:	SE/4 NW/4 & SW/4 NE/4

(i) Extend the South Blanco-Dakota Pool to include therein:

TOWNSHIP 26 NORTH, RANGE 5 WEST, NMPM	
Section 5:	All
Section 6:	All
Section 7:	All
Section 8:	W/2

TOWNSHIP 26 NORTH, RANGE 6 WEST, NMPM	
Section 1:	All
Section 2:	All
Section 3:	All
Section 4:	E/2 & NW/4
Section 7:	All
Section 8:	W/2 & SE/4
Section 9:	NE/4
Section 10:	N/2 & SE/4
Section 11:	All
Section 12:	All
Section 14:	N/2

TOWNSHIP 26 NORTH, RANGE 7 WEST, NMPM	
Section 1:	SE/4
Section 12:	E/2
Section 13:	N/2

TOWNSHIP 27 NORTH, RANGE 6 WEST, NMPM	
Section 32:	E/2
Section 33:	All
Section 34:	All

Case 1728

JASON W. KELLAHIN
ROBERT E. FOX

KELLAHIN AND FOX
ATTORNEYS AT LAW
54½ EAST SAN FRANCISCO STREET
POST OFFICE BOX 1713
SANTA FE, NEW MEXICO

TELEPHONES
YUcca 3-9396
YUcca 2-2266

September 11, 1959

New Mexico Oil Conservation Commission
P. O. Box 871
Santa Fe, New Mexico

Attention: Mr. A. L. Porter

Dear Mr. Porter:

I am enclosing application for hearing de novo before the Oil Conservation Commission of New Mexico on Case No. 1728, Order No. R-1473, entered by the Commission on September 1.

In behalf of Hanson, Waters & Williamson, applicants, we request that this hearing be set, if possible, for the regular monthly hearing in October.

Yours very truly,

Jason W. Kellahin

Jason W. Kellahin

jwk:mas
enclosure (1)
cc: Mr. Ernest A. Hanson
Waters & Williamson
Russell Engineering

Docket Mailed 11-3-59

BEFORE THE OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO

APPLICATION OF HANSON, WATERS AND WILLIAMSON FOR AUTHORITY TO INSTITUTE A PILOT WATER FLOOD PROJECT IN THE COYOTE-QUEEN POOL IN CHAVES COUNTY, NEW MEXICO, WITH APPROVAL OF CAPACITY ALLOWABLES FOR TWELVE WELLS, WITH AN ADMINISTRATIVE PROCEDURE FOR EXPANSION OF THE PROJECT AREA, CONVERSION OF WELLS TO INJECTION WELLS, AND GRANTING OF CAPACITY ALLOWABLES.

No. 1728

AMENDMENT OF APPLICATION

Comes now the applicant in the above captioned case and requests leave of the Oil Conservation Commission to amend the application heretofor filed by adding thereto the following:

9. The source of water for the pilot water flood project will be the De Kalb Well No. 2 XA located 660 feet from the North and East lines of Section 15, Township 11 South, Range 27 East; salt water to be produced from the Glorietta formation between approximately 2500 and 2800 feet. Upon completion of said wellfor water production, information on its quality will be furnished to the office of the State Engineer, and to any other party as the Commission may direct.

10. It is estimated that approximately 1,140 barrels of water per day will be used initially for injection purposes.

11. Attached hereto and made a part hereof is a plat showing well locations, lease ownership, and offsetting ownership in the area involved in this application.

Except as amended by the furnishing of the additional information contained herein, said application to be submitted for hearing as heretofore filed. Simultaneously with the filing of this amendment, a copy thereof has been furnished to the office of the State Engineer. WHEREFORE, applicant respectfully requests that this amendment be accepted for filing, and that hearing on the application, as amended, procede as scheduled.

Respectfully submitted,

HANSON WATERS & WILLIAMSON

By Jason W. Kellahin

Kellahin & Fox

Attorneys for Applicant