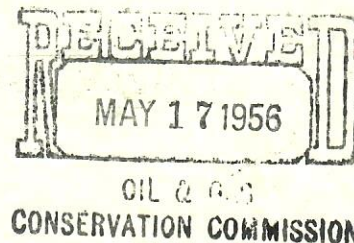


H. E. ZOLLER, JR.
PETROLEUM GEOLOGIST
CALIFORNIA BUILDING
DENVER, COLORADO



Final Report

March 12, 1956

Chandler & Huegrove
#1 Durland-Phillips
Commenced: 2/28/56
Completed: 5 1/2" run 3/11/56
Elevation: 4888.8 G.L.
4896 K.B.

Logan County, Colorado
SW SW Sec. 20-12N-55W
Casing: 8-5/8" @ 502'
5-1/2" @ 6268'
Total Depth: 6286 Rotary
6274 Schlumberger

Samples were examined on the above well from 5180 feet to total depth. A Schlumberger N.S. log was run from the base of the surface pipe to total depth and a micro-log was run from 5970' to total depth. Schlumberger measurements appeared to be consistently 12 feet higher than rotary measurements. All cores, drill stem tests, etc., described in this report have been corrected to Schlumberger. The following are electric log formation tops. (Note: All measurements are taken from Kelly bushings.)

Niobrara	5241	(- 345)
Fort Hays	5553	(- 657)
Carlile	5620	(- 724)
Greenhorn	5810	(-914)
Bentonite	5976	(-1080)
"D" Sand	6083	(-1186)
"J" Sand	6191	(-1295)
Skull Creek	6266	(-1370)

"D" Sand

One Core was taken in the "D" Sand as follows:

- Core #1 6085-6115 (full recovery)
6085-6087 Sandstone light gray very fine grain argillaceous hard, 50% dark gray silty shale, heavily reworked, no porosity or permeability, no show.
6087-6097 Sandstone gray very fine grain silty hard with 30% dark gray shale partings and inclusions finely reworked, no - very low porosity and permeability. (6090-92) sandstone gray fine grain arkosic very hard with 20% dark gray silty shale partings, light stain, weak-fair odor, vertical fractures, very low porosity and permeability.
6097-6106 Sandstone white-light gray very fine grain silty hard with 40% dark gray silty shale partings interbedded, no show, no low porosity and permeability.
6106-6115 Shale dark gray fissile bentonitic.



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Core Analysis

<u>Depth</u>	<u>Horizontal Perm.</u>	<u>Vertical Perm.</u>	<u>Por.</u>	<u>Oil</u>	<u>Water</u>
6090-91	0.0	0.0	9.9	9.1	23.2
6091-92	0.0	0.0	7.1	12.7	28.2

Coring Time

6085-86	27	6095-96	9	6005-06	5
86-87	19	96-97	9	06-07	16
87-88	8	97-98	7	07-08	18
88-89	8	98-99	7	08-09	14
89-90	10	99-6100	6	09-10	17
90-91	14	6100-01	8	10-11	19
91-92	6	01-02	5	11-12	18
92-93	4	02-03	7	12-13	16
93-94	9	03-04	8	13-14	19
94-95	9	04-05	5	14-15	19

No drill stem tests were taken in the "D" Sand.

"J" Sand

Three cores were taken in the "J" Sand as follows:

Core #2	6192-6215½	full recovery (barrel jammed)
	6192-6193½	Siltstone dark grey trace sand inclusions.
	6193½-6198	Sandstone light grey very fine grain silty hard with 50% black carbonaceous shale inclusions, no show, no porosity or permeability.
	6198-6202	Sandstone grey fine grain clean very hard spotted stain and fluorescence (top two feet very spotted) very low porosity and permeability vertical fractures.
	6202-6208½	Sandstone grey very fine grain friable hard vertical fractures low-fair porosity and permeability trace of bleeding oil and gas, even stain and saturation, no water taste.
	6208½-6212½	Siltstone dark grey hard trace sand stringers interbedded throughout.
	6212½-6215½	Shale dark grey fissile bentonitic.



Core Analysis

<u>Depth</u>	<u>Horiz. Perm.</u>	<u>Vert. Perm.</u>	<u>Por.</u>	<u>Oil</u>	<u>Water</u>
6198-99	2.6	1.3	17.1	0.0	82.5
6199-6200	2.6	1.3	14.8	0.0	67.7
6200-01	4.0	2.6	15.4	11.0	48.6
6202-03	8.4	4.0	16.3	12.9	44.0
6203-04	22	8.9	18.0	14.5	41.6
6204-05	10	1.3	19.6	15.8	38.3
6205-06	29	11	12.3	26.8	57.6
6206-07	41	31	11.3	30.0	63.7
6207-08	96	90	14.0	29.2	58.5
6208-09	77	54	13.3	27.8	61.7

Coring Time

6192-93	21	6198-99	16	6204-05	12	6210-11	22
6193-94	19	6199-6200	15	6205-06	10	6211-12	19
6194-95	13	6200-01	13	6206-07	13	6212-13	23
6195-96	15	6201-02	12	6207-08	26	6213-14	22
6196-97	18	6202-03	5	6208-09	22	6214-15	16
6197-98	11	6203-04	9	6209-10	24		

Core #3 6216-21 full recovery (barrel jammed)
6216-20 Shale dark gray silty
6220-21 Sandstone white-gray fine grain friable clay
filled, no odor, trace spotted fluorescence,
no - low permeability, low porosity.

Core Analysis

<u>Depth</u>	<u>Horiz. Perm.</u>	<u>Vert. Perm.</u>	<u>Por.</u>	<u>Oil</u>	<u>Water</u>
6220-21	0.9	0.4	14.5	0.0	40.6

Coring Time

6216-17	73	6219-20	7
17-18	14	20-21	5
18-19	22		

Core #4 6222-52 Recover 14.8 ft.
4' Sandstone gray fine-medium grain friable good odor and tain,
spotted fluorescence (spotty fluorescence possibly due to
cementing material) low permeability and porosity, vertical
fractures.
10.8' Sandstone white-cream fine grain friable clay filled trace
black carbonaceous thin shale inclusions, no odor stain or
fluorescence, low porosity and permeability, possibly water
bearing.

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Core Analysis

Depth (Samp. No.)	Horiz. Perm.	Vert. Perm.	Por.	Oil	Water
1	7.0	5.4	9.7	12.4	32.0
2	5.4	4.4	14.3	0.0	60.8
3	1.9	0.9	14.2	0.0	65.5
4	21.0	18.0	13.0	6.2	43.9
5 (9 ftin core)	0.0	0.4	17.7	0.0	74.6

Coring Time

6222-23	81	6232-33	2	6242-43	1
23-24	4	33-34	13	43-44	4
24-25	3	34-35	13	44-45	4
25-26	8	35-36	7	45-46	14
26-27	3	36-37	2	46-47	5
27-28	2	37-38	2	47-48	6
28-29	1	38-39	2	48-49	7
29-30	1	39-40	2	49-50	6
30-31	1	40-41	1	50-51	8
31-32	3	41-42	2	51-52	11

One Drill Stem test was taken in the "J" Sand as follows:

Drill Stem Test #1 6198½-6215½

Tool open one and a half hours shut in 30 minutes, strong blow throughout test, gas to surface in 23 minutes, recover 750' fluid, 400 feet of oil, 50 feet of oil and gas cut mud and 300 feet of muddy and slightly oil cut water, initial hydrostatic pressure 3285 psi., initial flow pressure 42 psi., final flow pressure 272 psi., shut in pressure 1485½, final hydrostatic pressure 3285½.

Summary

Structurally, measuring from the "J" Sand sub-sea datum, the #1 Durland-Phillips is three feet higher than the Dalfern Oil Company #1 Peavy a "D" Sand producer located 1320 feet west and is thirteen feet higher than the #2 Peavy, a "J" Sand producer located 2640 feet north and 1320 feet west.

The "D" Sand in this test was very poorly developed and contained only non-commercial shows. The first bench of the "J" Sand came in 20 feet higher than the first bench which is also the producing bench in the #2 Peavy.

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The drill stem test of the first bench recovered in addition to 400 feet of oil approximately 300 feet of muddy water. This is not an unusually large amount of drill stem test water for this area. Water samples of both the drill stem test water and the #2 Heavy production water were analyzed by Schlumberger the results of which were fairly inconclusive. The drill stem test water was partially filtrate and partially formation water and it was difficult to determine the quantity of each from the resistivity analysis and comparison. Despite a core analysis which showed this zone might be water bearing, it was my recommendation that production casing be run for further tests due to the high structural position the zone and the positive drill stem test.

The drilling samples and core chips taken on this well have been placed on file at the American Stratigraphic Company, Denver, Colorado.

Respectfully submitted,

A handwritten signature in dark ink, appearing to read "M. E. Koller, Jr.".
M. E. KOLLER, JR.



BIT RECORD

Chandler & Musgrove
#1 Durland-Phillips

March 12, 1956

<u>Run No.</u>	<u>Size</u>	<u>Type</u>	<u>Serial</u>	<u>Depth</u>		<u>Feet</u>	<u>Hours</u>
				<u>From</u>	<u>To</u>		
1	7-7/8	OSC-35	67314	502	3260	2758	22-3/4
2	7-7/8	OSC-35	67387	3260	4133	873	17-1/2
3	7-7/8	OSC-35	16985	4133	4772	639	20
4	7-7/8	OSC-35	68640	4772	5333	581	18-3/4
5	7-7/8	OSC-35	67378	5333	6097	744	18
6	7-7/8	OW	82840	6097	6181	54	4
7	7-7/8	OW	62161	6181	6204	25	1-3/4
8	7-7/8	WTR	90265	6204	6286	82	9
9	6-3/4	WTR	27934	Ran Five Feet			

DURLAND-PHILLIPS NO. 1



I N D E X

History of Workover	1-B
Summary of Workover	1-B
Summary:	
Squeeze Job	2-B
Producing Perforations	3-B
Total Depth Inside Casing	3-B
Treatment Through Perforations	3-B
Producing Record	3-B
Initial Production	3-B
Tubing Record	3-B
Pump Record	4-B
Rod Record	4-B

HISTORY OF WORKOVER

Moved in Cable Tools	8-3-56
Ran Tubing w/Retrievable Retainer	8-4-56
Squeezed off perforations	8-4-56
Drilling Cement	8-5-56
Tested Squeezed off Perforations for Shut-off	8-7-56
Perforated Csg. (6198-6204)	8-7-56
Ran Tubing and Halliburton HHM Packer to break-down Perforation	8-7-56
Pulled tubing to swab Csg.	8-7-56
Swabbed Csg.	8-8-56
Control-Flow Job down Csg.	8-8-56
Swab Testing	8-9-56
Ran Tubing & HHM Packer	8-11-56
San-frac 5000 Gal./3500# Sand	8-11-56
Pulled Tubing and Packer	8-11-56
Swab Testing Through Csg.	8-12-56
Treated w/500 Gal. Hull. MCA	8-14-56
Swab Testing	8-15-56
Ran Tubing and Rods	8-16-56
Installed Pumping Unit	8-20-56
Initial Production	8-27-56

SUMMARY OF WORKOVER

We moved in L & L Drilling Company's Cable Tools, rigged up and ran a Baker RT-8 retrievable cement retainer on 2 3/8" OD, EUE, 4.7#, J-55, 8rd thd, smls tubing. The retainer was set at 6155'; casing annulus was loaded with water, then upon pumping through the tubing and into the formation @ 800 psi and 1900 psi @ 3 BWPM; we then mixed 75 sxs. of regular cement and displaced 60 sxs. into the formation. Then slowed down pump and after a total of 63 sxs. had been displaced into the formation, it squeezed @ 4600 psi, checked cement for flow-back by releasing - no flow-back; released Baker tool and reversed out 12 sxs of cement, pulled tubing and retainer. After waiting 18 hours, the casing was swabbed down and drilling of cement commenced after a period of 24 total hours had elapsed since the completion of the squeeze job. Cement was drilled and cleaned out to a total depth inside of the casing to 6206'. The hole was bailed dry indicating that no fluid was entering through the former perforations; however, it was deemed necessary to assure that old perforations were completely squeezed-off before continuing. We, therefore, mixed 15 gallons of Morflow in 15 bbls. of crude oil and pumped into the casing followed by additional crude to load the hole and pressured up to

SUMMARY OF WORKOVER(Con't.):

2700 psi standing pressure, indicating complete shut-off of old perforations. Schlumberger found total depth inside of casing at 6206' and perforated casing from 6198' to 6204' with 4 Jets per foot. Repressured up on casing to 2700 psi standing. We then ran Halliburton HHM Packer on the tubing and set packer at 6145', filled annulus and held 2700 psi back-pressure on same. Pressured up on tubing to 4550' psi and broke to 3400 psi and pumped 15 bbls. of crude in @ $2\frac{1}{2}$ BOPM, equalized pressure and rigged up to tubing swab but was unable to get swab below 2200'. We, therefore, unseated packer and pulled tubing. The casing was swabbed down and dry with nothing coming in. We then treated down the casing with 50 gallons of Control-flow in 50 bbls. of crude and displaced at 2700-2900 psi and overdisplaced with 40 bbls. of crude at 2700 to 3000 psi final pressure, bleeding to 2150 psi in 5 minutes; shut-in same for twelve hours. Casing was then swabbed down recovering casing volume of load. Then followed the swabbing of water emulsion, sand-pumping heavy emulsion, mud, shale, and foreign matter. Gas began to show; however, no fluid was being recovered. We then ran tubing and Halliburton HHM packer set @ 6145', spearheaded with 15 gallons of Hy-flow mixed in 15 bbls. of crude followed by 5000 gallons of Black Gold oil mixed with 3500# of sand and displaced at 4950 to 5150 psi with final pressure of 3400 psi and standing pressure of 1800 psi bleeding to zero in one hour.

Tubing and packer were pulled and swabbing through casing was commenced. After two days of swabbing, the well was only making 0.88 BOPH. We then treated down the casing with 500 gallons MCA displacing same with oil, breaking down at 3050 to 2300, treating at 2300 with only 11.76 bbls. being displaced into the formation. Swabbing of casing began immediately and after cleaning up, the well was swabbing at a rate of 5 BOPH. Tubing and rods were run. Pumping unit and engine were installed but it was necessary to wait a week for replacement of the damaged gear box. On August 26, 1956, the well was put to pumping and the first 20 hours, the well pumped 77 bbls. of oil or an initial producing rate of 96.3 BOPD.

SUMMARY:SQUEEZE JOB:

Perforations Squeezed - 6198' to 6205 $\frac{1}{2}$ '
Squeezed through 2 3/8" OD EUE Tbg. beneath Baker RT-8
retrievable retainer set @ 6155'
Squeezed w/63 sxs. @ 4600 psi

SUMMARY (Con't.):PRODUCING PERFORATIONS:

Schlumberger Jets 4/Ft. @ 6198' to 6204'

TOTAL DEPTH INSIDE CASING - 6206'

TREATMENT THROUGH PERFORATIONS:

Broke down with Morflow through tubing under HHM Packer
@ 4550 - 3400 psi

Treated w/50 gallons Control-flow in 50 bbls. Crude

Treating pressure down Csg. 2700 - 3000 psi

San-frac 5000 gal/3500# sand through tubing under HHM
Packer

Treating pressure - 4950-5150 psi

Final pressure - 3400 psi

Standing pressure - 1800 psi

MCA Treatment 500 gal. - down casing

Treating pressure - 3050 to 2300 psi

PRODUCING RECORD:

After Perforating - nothing

After Breaking down w/Mor-flow - nothing

After Control-flow - showing of gas, no fluid

After San-frac - 0.88 BOPH swabbing

After MCA Job - 5 BOPH swabbing

INITIAL PRODUCTION - on Pump

96.3 BOPD, no water.

TUBING RECORD:

198 pcs - 6098.78 (thds.off) - 2 3/8" OD, EUE, 4.7#, J-55,	
8rd thd smls tubing @	6105'
Anchor	31'
Bottom of tubing Perforations	6074'
Tubing Perforations	3'
	6071'
Seating Nipple	1'
Top of Seating Nipple	6070'

DURLAND-PHILLIPS NO. 1



4-B

SUMMARY (Con't.):

PUMP RECORD:

1 - 2" x $1\frac{1}{4}$ " x 16' Fluid pack Volume Producer w/Bottom
Hold-down and $7\frac{1}{2}$ " gas anchor

ROD RECORD:

240 - $\frac{3}{4}$ " x 25' Rods
1 - $\frac{3}{4}$ " x 8' Pony Rod
2 - $\frac{3}{4}$ " x 6' Pony Rod
1 - $\frac{3}{4}$ " x 2' Pony Rod on top of pump