GEOLOGICAL REPORT

Prospect:	Noonan Ranch
Operator:	The Anschutz Corporation, Inc.
Farm name:	No. 1 Noonan
Location:	SE¼ SE¼ Section 14, Township 3 South, Range 59 West (660' FEL, 800' FSL) Adams County, Colorado
Elevation:	5160' ground, 5169' KB
Contractor:	Denco Drilling, Inc., Denver, Colorado
Spud date:	September 9, 1967
Completion date:	September 26, 1967
Casing:	8-5/8" @ 135' w/125 sacks; 5½" @ 6233' w/150 sacks.
Total depth:	6292'
Status:	Oil well
Surveys:	Schlumberger IES and Gamma Ray Density-Caliper logs
Cores:	None
Drill stem tests:	DST No. 1 6119-6135' ("D" sandstone) DST No. 2 6196-6210' ("J" sandstone)
Samples:	Deposited at American Stratigraphic Service, Denver, Colorado

SCHLUMBERGER TOPS

	Sample	Log
Bentonite marker	6032	6001
"D" sandstone	6113	6098 (-929)
"J" sandstone	6192	6192 (-1023)
Total depth	6292	6292

DEVIATION SURVEYS

Depth	Deviation
3102'	2-3/4°
4351'	1-3/4°
5503'	1/2°

MUD PROGRAM

Mud program was supervised by a Plains Mud Company engineer. Mud properties were controlled with Milgel, phosphate, soda ash and caustic. No oil or diesel oil was added to the mud system. Weight varied from 10.0 to 10.2, viscosity from 60 to 76 and water loss from 5.6 to 10.0.

CHRONOLOGICAL WELL HISTORY

9/9/67	Spud 4:00 p.m. Set 8-5/8" @ 135' w/125 sacks.
9/10/67	W.O.C.
9/11/67	Drilling 2000'.
9/12/67	Drilling 3400'.
9/13/67	Drilling 4760'.
9/14/67	Drilling 5600'. Weight 10.0, Viscosity 60, Water loss 10.0
9/15/67	Drilling 6002'. Weight 10.0, Viscosity 60, Water loss 6.0
9/16/67	T.D. 6135', running DST No. 1. Weight 10.2, Viscosity 65, Water loss 5.6
9/17/67	T.D. 6229', on trip. Weight 10.0, Viscosity 76, Water loss 5.6
9/18/67	T.D. 6292', running DST No. 2.
9/19/67	T.D. 6292'. Ran Schlumberger logs. Preparing to run casing and complete as oil well.

CORES

None.

DRILL STEM TESTS

DST No. 1 — 6119 to 6135 feet ("D" sandstone)
4 minute pre flow, SI 1 hour, open 1 hour, SI 1 hour, good blow immediately, gas to surface in 6 minutes, gauged:
105 MCF after 10 minutes
112 MCF after 20 minutes
101 MCF after 30 minutes
86.3 MCF after 40 minutes
64 MCF after 50 minutes
53.4 MCF after 60 minutes.
Had good blow throughout test. Recovered 1200' free oil, 38° gravity, 210' heavily oil and gas cut mud.
IHP 3325, FHP 3314, IFP 109, FFP 305, ISIP 1524, FSIP 1502, BHT 180°.
Tester: Virg's Testers, Inc.

DST No. 2 — 6196 to 6210 feet ("J" sandstone) Straddle packer test.
No ISIP, Open 1 hour, SI 1 hour.
Opened with weak blow for 5 minutes. After 5 minutes, there was a slow loss of mud in annulus due to a leak in a tool joint. Blow continued throughout test.
Recovered 640' fluid, as follows:
210' drilling mud, 180' water cut mud, 250' very slightly mud cut water (R_w 0.90 ohm @ 76° F.). No trace of oil or gas. IHP 3443, FHP 3434, IFP 22, FFP 196, FSIP 1350.
Bottom packer held OK. SIP indicates good permeability.
BHT 185°.

SAMPLE DESCRIPTIONS

(Not lagged. Sample quality poor to fair.)

6050-6113 — Shale, dark grey to black, micaceous, soft, silty in part, bentonitic.

"D" sandstone

6113-6135 — Sandstone, white to very light grey, fine grained, sub-angular, clean, glassy grains, fair to good porosity, hard and clay filled in part, fair to good porosity, good to excellent fluorescence, poor oil stain, poor cut -- fair oil show. Took DST No. 1.

6135-6165 — Sandstone, as above, with interbedded shale, siltstone and tightly-cemented quartzitic sandstone with no shows. Sandstone has good to excellent fluorescence, poor stain, poor cut -- fair oil show.

6165-6175 Sandstone, as above, very fine grained, low to medium porosity, poor oil stain, very good fluorescence, poor cut, with interbedded shale and siltstone. Sandstone decreasing slightly.

6175-6180 Sandstone, as above, increasing. Approximately 40% of sandstone has no show. Some brown shale and grey carbonaceous shale, silty shale, and siltstone.

6180-6190 Carbonaceous shale, siltstone, and sandstone interbedded. Sandstone, as above, with show as above in 50-60% of sand.

6190-6195 Sandstone decreasing, mostly tight and with no show.

6195-6200 Sandstone increasing, with about 30% having shows as above. Mostly shale, siltstone and silty shale.

6200-6205 Grey silty, pyritic shale and siltstone, dark grey to black shale, and some sandstone. Sandstone mostly appears wet, but about 30% has hydrocarbon show as above.

6205-6210 Sandstone, light grey to white, sub-angular to rounded, fine grained, with some loose rounded coarse grains, low to medium porosity, no stain, weak fluorescence in a few grains, very poor cut; grey, dirty siltstone; and grey to very dark grey pyritic shale.

6210-6220 As above, but with several clusters exhibiting fair fluorescence. One medium loose, frosted sand grain (@6210-15) has questionable stain and fluorescence.

6220-6231 Grey siltstone, shale and sandstone, light grey, fine grained, low porosity, shaly in part; sandstone with weak fluorescence, very poor cut, and no stain, believed to be cavings from "D", most sandstone has no show.

6231-6240 Interbedded shale, siltstone and sandstone, as above. Two pieces of sandstone in 6235-40' sample have fair fluorescence, questionable stain, and no visible cut.

Circulated samples @ 6241'

15 min. - mostly shale, siltstone and dirty sandstone, with trace of fine grained, clean, sub-rounded to sub-angular sandstone having low to fair porosity and weak fluorescence and cut.

30 min. - Same, with some loose, medium, frosted, rounded quartz sand and some chert (no shows), fluorescence decreasing.

45 min. - Same. One cluster has fair oil staining, fair fluorescence and slow cut upon crushing.

60 min. - Similar, but grey shale increasing, sandstone decreasing, and show decreasing.

6240-6245 Silty shale, siltstone and some fine grained sandstone with low porosity and weak fluorescence and no stain or cut.

Circulated samples @ 6253' for 1½ hours

15 min. - Same as above.

30 min. - Same as above.

45 min. - Same as above, with very slight increase of tight sandstone, trace weak fluorescence, no stain or cut.

60 min. - Same as above, with very slight decrease of tight sandstone, trace weak fluorescence, no stain or cut. One loose, medium, rounded grain has questionable stain and weak fluorescence.

75 min. - Similar to above, sandstone decreasing, very fine loose grains with weak fluorescence (too small to pick up and try to cut), few clusters with no fluorescence.

90 min. - Similar to above, trace sandstone and fine loose sand with no show.

105 min. - Same, hole clean.

Circulated samples <u>mostly shale and silty shale</u> (99%).

Circulated samples @ 6275'

85 min. - Interbedded siltstone, shale, and tight grey sandstone.

Circulated samples @ 6292'

90 min. - As above.

T.D. 6292.

LOG CALCULATIONS

	Porosity	S_w
6112-6121' ("D" sandstone)	14%-16%	37%
6194-6214' ("J" sandstone)	8%-11%	65%-100%
6223-6241'	11%-12%	65%- 90%

REMARKS

This prospect had as objectives the "D" sandstone, J_1 sandstone and J_2 sandstone.

The D_1 sandstone was found to be oil productive. The well was drilled downdip from a well (SW¼SW¼ Section 13) that encountered heavily oil cut mud on drill stem test of this zone, and updip from a well (NW¼NE¼ Section 22) that recovered 1900 feet of slightly gas cut water from this same interval. The J_1 sandstone contained slight oil shows in samples but recovered 250 feet of water on drill stem test. This zone is productive in the area at nearby wells. The J_2 sandstone, also productive in nearby wells, was not tested. It consisted of tightly-cemented sandstone with only very poor oil shows.

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September 26, 1967

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