

NORTH DAKOTA GEOLOGICAL SURVEY CIRCULAR NO. 222

Summary of the Calvert Drilling, Inc., and Leach Oil Corporation
Patterson Land Company #1
Burleigh County, North Dakota
Well No. 1409 - Permit No. 1421

by Herbert A. Mendoza
December 1959

The Calvert-Leach, Patterson Land Company #1, located in Cen. NW 1/4, SE 1/4, sec. 11, T.140N., R. 92W., Burleigh County, North Dakota. Elevation of Kelly bushing - 2019 feet; ground level - 2008 feet.

The well was spudded March 26, 1957 and drilled to a depth of 6,595 feet, plugged and abandoned as a dry hole on April 20, 1957.

Logs Run:

Schlumberger electric
Schlumberger gamma ray-neutron
Schlumberger microlog

Core Record:

6505'-6520'-recovered 15 feet.

Tests: None

Casing Record:

Surface pipe set at 587' with 450 sacks of cement.

Plugging Record:

#1 6500' to 6435' with 20 sacks cement
#2 5700' to 5635' with 20 sacks cement
#3 4090' to 4025' with 20 sacks cement
#4 2840' to 2775' with 20 sacks cement
#5 610' to 560' with 25 sacks cement

No plug in top of surface, left open for landowner.

Formation tops were determined by the samples and mechanical logs. Color names used are those of the National Research Council Color Chart.

FORMATION TOPS

Cretaceous System	
Pierre formation	820
Niobrara formation	1672
Greenhorn formation	2212
Mowry Member	2590
Fall River Member	2850
Jurassic System	
Piper Limestone	3380
Triassic System	
Spearfish formation	3510

Mississippian System	
Madison group	3828
Devonian System (?)	
Birdbear formation	4918
Silurian System	
Interlake formation	5370
Ordovician System	
Stony Mountain formation	5520
Red River formation	5708
Winnipeg formation	
Shale member	6328
Sandstone member	6510
Cambro-Ordovician System	
Deadwood formation	6528
Total Depth	6595

Calvert Drilling, Inc. & Leach Oil Corporation - Patterson Land Company #1 Loc
- C NW SE Sec. 11-140N-77W, Burleigh County, North Dakota.

0-50	Siltstone, dusky yellow green (5GY5/2), medium grain, poorly cemented, shaly, common selenite gypsum, clear.
50-70	Limestone, moderate yellowish brown (10YR5/4), hard, quartzose, siltstone, same as above.
70-260	Sandstone, medium gray (N5), fine grained, poorly cemented, silty to argillaceous, micaceous, slightly calcareous, glauconitic.
260-280	Sandstone, as above, siltstone, light olive gray (5Y6/1), medium grained, well cemented.
280-290	Sandstone, medium gray (N5), fine grained, poorly cemented, argillaceous, lignite, black.
290-300	Sandstone, dusky yellow green (5GY5/2), fine to medium grained, slightly calcareous, poorly cemented, lignite, black, red clay.
300-310	Sandstone, medium gray (N5), fine to medium grained, argillaceous, shale, dark gray (N3), carbonaceous, little lignite, pyrite.
310-390	Sandstone, light bluish gray (5B7/1) to medium light gray (N6), fine to medium grained, loosely cemented, silt.
390-460	Sandstone, medium light gray (N6), fine to medium grain, silty, loosely cemented, slightly calcareous.
460-640	Sandstone, dusky yellow green (5GY5/2), fine to medium grain, silty, loosely cemented, limestone, moderate yellowish brown (10YR5/4), dense, hard, subcrystalline.
640-680	Sandstone as above, abundant siltstone, light olive gray (5Y5/2), fine grained, carbonaceous, rare glauconite.
680-700	Siltstone, light olive gray (5Y5/2), fine grained, common sandstone as above.
700-790	Siltstone, greenish gray (5G6/1), fine grained, shaly, limestone, dark greenish gray (5GY4/1), hard, dense, rare gypsum, white, soft.
790-820	Shale, medium gray (N5), soft, silty, abundant white specks.
Pierre - 820	
820-930	Shale, same as above.
930-1070	Shale, medium light gray (N6), soft, white specks, rare limestone, light olive gray (5Y6/1), dense, subcrystalline.

1070-1230 Shale, light bluish gray (5B7/1), compact, massive, clayey, slightly calcareous, common limestone, light olive gray (5Y6/1), fine crystalline, dense.

1230-1580 Shale, and limestone as above, common calcite prisms.

1580-1670 Shale, light gray (N7) to medium dark gray (N4), lumpy to splintery, common siltstone, medium gray (N5), loosely cemented, rare white specks.

Niobrara - 1672

1670-1810 Shale, dark gray (N3), soft, abundant white specks, common calcite prisms.

1810-1950 Shale, as above, and limestone, olive gray (5Y4/1), dense, abundant white specks, common calcite prisms.

1950-2080 Shale, medium gray (N5), soft, bentonitic, common pyrite, rare white specks.

2080-2210 Shale, medium light gray (N6), platy, compact, rare bentonite grains, white specks, common pyrite calcite prisms.

Greenhorn - 2212

2210-2330 Shale as above, sandy, calcareous, abundant calcite prisms, white specks.

2330-2520 Same as above, rare limestone, very light gray (N8), grainy, abundant white specks and calcite prisms, common pyrite.

2520-2590 Shale, medium light gray to medium dark gray, soft, platy, calcareous, abundant white specks and calcite prisms, common forams.

Mowry - 2590

2590-2630 Same as above.

2630-2760 Shale, medium gray to dark gray (N3), platy to fissile, compact, few white specks, common bentonite, white to light bluish gray (5B7/1), soft.

2760-2850 Shale, medium light gray (N6), laminated to splintery, silty, bentonitic common calcite prisms, rare glauconite, pyrite.

Fall River - 2850

2850-2900 Same as above.

2900-2950 Shale, medium gray (N5), platy to splintery, soft common siderite, pale reddish brown (10R5/4), hard, rounded pellets, rounded quartz grains.

2950-3080 Shale, as above, common sandstone, yellowish gray (5Y7/2), fine grained, loosely cemented, abundant quartz grains.

3080-3160 Shale, medium dark gray (N4), platy, soft, silty, quartz grains, siderite pellets, pyrite.

3160-3300 Shale, as above, common sandstone, white to moderate reddish orange (10R6/6), fine grained, well cemented.

3300-3380 Shale, medium gray to greenish gray (5GY6/1), platy, soft, common sandstone, as above.

Piper Limestone - 3380

3380-3450 Shale as above, common limestone, white, cryptocrystalline, little sandstone, moderate reddish orange (10R6/6), fine grained, well cemented.

- 3450-3490 Limestone, white to very light gray (N8), fine to medium sucrosic to grainy, abundant shale, medium gray to greenish gray (5GY6/1), platy, soft.
- 3490-3510 Shale, greenish gray to medium gray (N5) to moderate reddish brown (10R4/6), platy, clayey to silty, little limestone as above, common anhydrite, white to moderate red (5R4/6).

Spearfish - 3510

- 3510-3600 Same as above.
- 3600-3650 Shale, same as above, little anhydrite, white, grainy.
- 3650-3670 Anhydrite, moderate pink (5R7/4), compact, shale greenish gray to dark gray to moderate red (5R4/6) platy.
- 3670-3760 Shale, medium dark gray (N4), platy to fissile, little anhydrite as above, common quartz grains.
- 3790-3820 Shale as above, abundant anhydrite, moderate reddish orange (10R6/6), earthy, lumpy, disaggregated.

Charles Limestone - 3828

- 3820-3830 Shale, greenish gray to grayish black (N2), platy to fissile, common quartz grains.
- 3830-3870 Shale as above, abundant limestone, white, sucrosic to grainy.
- 3870-3910 Shale, medium dark gray (N4) to moderate reddish brown (10R4/6), platy to splintery, common limestone, white, sucrosic, quartz grains, rare anhydrite, white.
- 3910-4000 Limestone, white to pale yellowish brown (10YR6/2), fine crystalline, sucrosic to subcrystalline, shale as above, common anhydrite, white.
- 4000-4050 Limestone, pale yellowish brown (10YR6/2), subcrystalline to pseudo-oolitic, common shale, medium dark gray, silty, splintery, common anhydrite, white.
- 4050-4070 Shale, greenish gray to medium dark gray to moderate reddish brown (10R4/6), platy to fissile, little limestone, white and anhydrite.

Mission Canyon - 4072

- 4070-4100 Anhydrite, bluish white (5B9/1), soft, shale as above, little limestone.
- 4100-4160 Limestone, pale yellowish brown (10YR6/2), medium grainy, to oolitic, pinpoint porosity, little shale, medium gray, platy.
- 4160-4200 Limestone, same as above.
- 4200-4250 Limestone, grayish orange pink (5YR7/2), medium crystalline, grainy to oolitic, pinpoint porosity, common shale, medium gray (N5), splintery.
- 4250-4270 Shale, medium gray to moderate reddish brown (10R4/6), platy to splintery, little limestone, as above.
- 4270-4360 Limestone, pale yellowish brown (10YR6/2), fine to medium, sucrosic to grainy, little shale, medium gray, common anhydrite, white.

Lodgepole - 4355

- 4360-4440 Shale, medium gray to moderate reddish brown (10R4/6), platy to splintery, little limestone as above.
- 4440-4510 Shale, greenish gray to medium gray, platy, calcareous, little limestone and anhydrite.
- 4510-4560 Shale as above, abundant limestone, light bluish gray (5B7/1), grainy to subcrystalline.

4560-4620 Limestone, light bluish gray (5B7/1), medium grainy to suboolitic, abundant shale, medium gray, platy.

4620-4630 Shale, greenish gray to medium gray (N5), platy, common limestone, as above.

4630-4700 Limestone, light gray (N7), medium grainy to suboolitic, common shale as above, quartz grains.

4700-4720 Limestone, light gray (N7), medium grainy to suboolitic, abundant chert, light greenish gray (5GY8/1), smooth, common shale, medium gray, platy, quartz grains.

4720-4760 Limestone, pale yellowish brown (10YR6/2), medium crystalline, grainy, common chert, moderate yellowish brown (10YR5/4), smooth angular.

4760-4800 Limestone, medium light gray (N6), subcrystalline, anhydrite, very pale blue (5B8/2), euhedral, chert, light gray (N7), chalcedonic, angular.

4800-4860 Shale, greenish to medium gray, platy to splintery, little limestone as above, common anhydrite, white.

4860-4910 Limestone, light gray (N7), subcrystalline, common shale, as above, anhydrite, white.

4910-4920 Shale, medium gray (N5), platy to splintery, common limestone as above.

Birdbear - 4918

4920-4980 Limestone, pale yellowish brown (10YR6/2), fine to medium crystalline, sucrosic and grainy, common shale as above, quartz grains, anhydrite.

4980-5000 Shale, medium gray (N5), platy, little limestone as above, common anhydrite white to very pale blue (5B8/2).

5000-5130 Limestone, pale yellowish brown (10YR6/2), fine crystalline, sucrosic, anhydritic, shale as above, silty, little anhydrite, common pyrite.

5130-5350 Limestone, light gray (N7), to light brownish gray (5YR6/1), fine to medium crystalline, sucrosic, grainy to suboolitic, common shale, medium to greenish gray (5GY6/1), soft, little anhydrite, white, common quartz grains, subrounded, frosted to clear.

5350-5390 Shale, greenish to medium gray (N5), to moderate reddish brown (10R4/6), silty, platy to splintery, common limestone and anhydrite as above, pyrite, subhedral to amorphous.

Interlake - 5390 (?)

5390 Circulation

5390-5440 Limestone, pale yellowish brown (10YR6/2) to moderate orange pink (10R7/4), grainy to subcrystalline anhydritic, common shale, medium gray, platy, amorphous pyrite, and white anhydrite.

5440-5460 Shale, medium gray (N5), platy to splintery, common limestone as above, pyrite, little anhydrite.

5460-5520 Limestone, light gray (N7) to moderate orange pink (10R7/4), fine to medium crystalline, sucrosic, grainy to suboolitic, anhydritic, common shale as above, and pyrite, Stegerhynchus? rare glauconite, poorly cemented, common quartz grains.

Stony Mountain - 5520

5520-5550 Same as above.

5550-5620 Limestone, light gray to white, medium crystalline, grainy, common shale, medium to greenish gray (5GY6/1), soft, common quartz grains, pyrite, amorphous.

5620-5700 Shale, medium to greenish gray (5GY6/1), platy, soft, common limestone as above, quartz grains, rounded, frosted, pyrite, subhedral to amorphous.

Red River - 5708

5700-5720 Same as above.

5720-5960 Limestone, grayish orange pink (5YR7/2), medium crystalline, grainy, little shale, medium gray, splintery, rare hematite, earthy, common amorphous pyrite, rare glauconite.

5960-6320 Limestone, very light gray (N8), sublithographic, grainy to subcrystalline, little shale, medium gray.

Winnipeg - 6328

6320-6330 Same as above.

6330-6410 Shale, greenish to medium gray (N5), soft, platy, slightly silty and calcareous, little limestone, medium light gray (N6), grainy to subcrystalline.

6410-6505 Shale, grayish green (10GY5/2), to medium gray, waxy, platy.

Core #1

6505-6506 Shale, medium gray (N5), soapy, massive, compact to slaty, hard.

6506-6510 Shale as above, interbedded sandstone, white fine to medium grained, angular to subangular, vitreous well cemented, calcareous.

6510-6513 Sandstone, medium light gray (N6), very fine to fine grained, subangular, vitreous, well cemented, siliceous cementation, interbedded dolomite, light brownish gray (5YR6/1), subcrystalline.

6513-6520 Sandstone, white, fine to medium grained, subangular, well cemented, calcareous, pyritic.

Deadwood - 6528

6520-6530 Shale, grayish green (10GY5/2), soapy, slaty, hard.

6530-6590 Shale, grayish green to medium dark gray (N4), platy to splintery, compact.

6590-6595 Circulation