SUMMARY OF WELL DATA

Well Name:	Decalta Et Al., Rond Lake No. 1
Location:	Approximately, 57° 04' 51" N., Latitude 128° 28' 18" W., Longitude
Elevation:	Ground 391' K. B. 399'
Spudded:	January 7 1960
Suspended:	February 17, 1960
Abandoned:	March 19, 1960
Total Depth:	1,497'
Surface Casing:	247' of 6 5/8", J-55, 24 lb. casing, cemented with 45 sax, set at 255'K. B.
Logs:	E-log (point curve)
Classification:	Stratigraphic Test
Abandonment:	Plug No. 1, 980' to 1200'. 27 sax, plug did not hold. Plug No. 2, 990' to 1080', 11 sax, plug at 1040'. Plug No. 3, bailled hole to base of surface casing and dumped in 12 sax cement. Welded plate with 2" pipe on top of surface casing, marked R L #1.

Markers	Depth	Subsea	Thickness
Drift			173'
Lower Ramparts	173'	+226'	289'
Bear Rock	462'	- 63'	808'
Silurian	1270'	-871'	

Summary Of Cores

Core #1	959' to 979' Rec. 10 feet limestone, vugs, fractures some permeability, oil stain.
Core #2	995' to 1005' Rec. 10 feet. tight limestone minor shale.
Core #3	1101' to 1109' Rec. 8 feet. limestone, some porosity and fractures no oil stain.
Core #4	1280' to 1290' Rec 10 feet. dolomite.
Core #5	1347' to 1351' Rec. 4 feet. fractured, vuggy dolomite.

Summary Of Formation Tests

DST #1	944' to 969' misrun, disk plugged.
DST #2	900' to 1005' VO 60 min, steady weak blow. Recovered 500' mud. HH 418 lbs., Min. FP 10 lbs., Max. FP 238 lbs. Packer rubber damaged.

DST #3	935' to 1005' misrun, packer failed to seat.
DST #4	940' to 1005' misrun, packer failed to seat.
DST #5	930' to 1005' misrun, packer failed to seat.
DST #6	1326' to 1351' VO 80 min. flowed fresh water in 1 hr. 15 min. HH 694 lbs. Min. FP 190 lbs. Max. FP 630 lbs.
Bailing	February 18, 1960. Plug top at 1046'. Bailed hole to 600' ±, recovered sulphur water, oil cut. Fluid level rose to 45' K. B. in three days.
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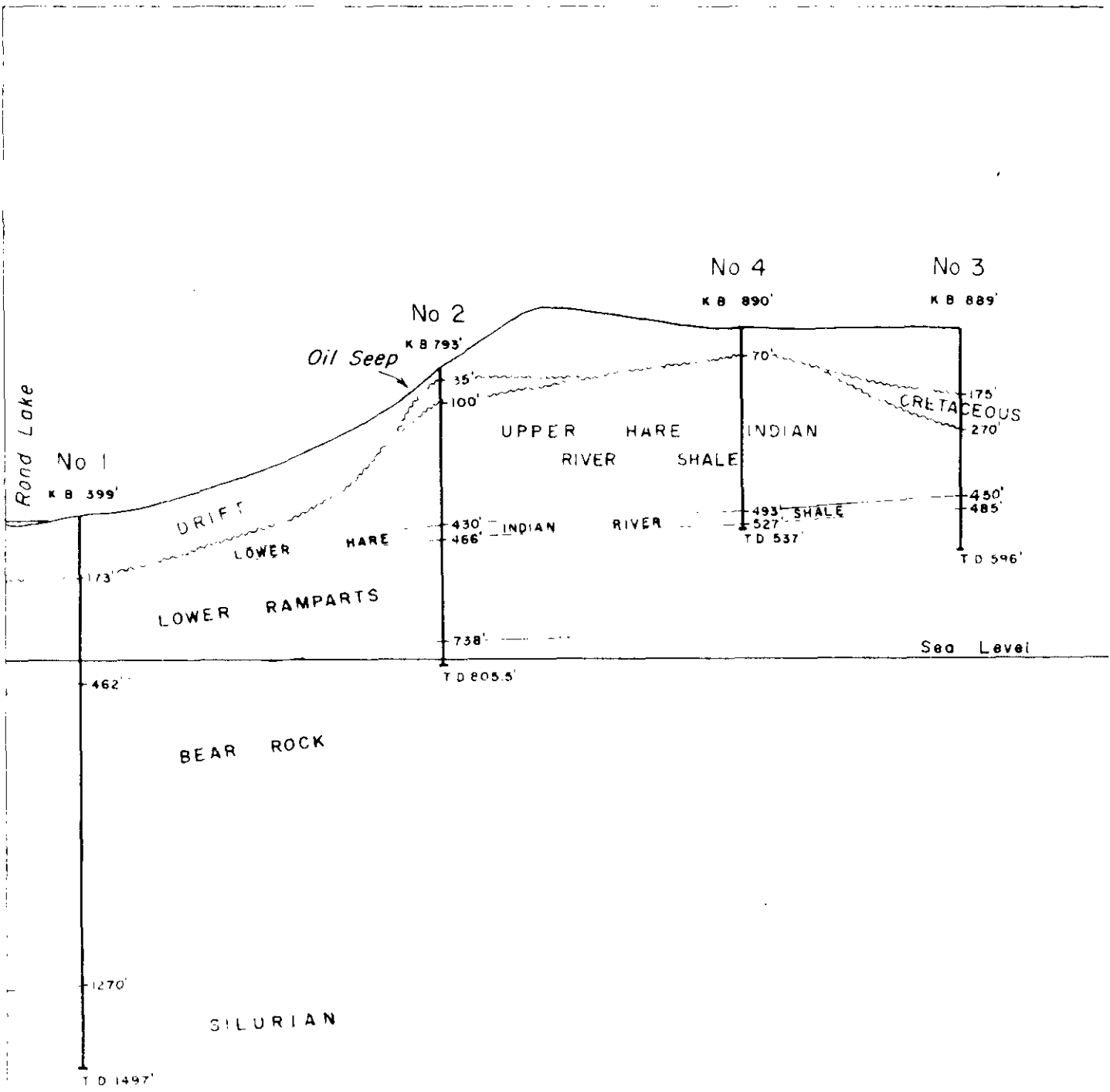

CROSS SECTION WELLS 1 to 4

Scale Vertical - 1" to 400'
Horizontal - 1" to Approx 3300'
(Photo scale)

SAMPLE AND CORE DESCRIPTION

0' - 173' Sand and gravel - grains and fragments of quartz, igneous rock, limestone, dolomite, sandstone, hard green shale, grey shale with spores, rare black chert. Rock appears to be mainly medium to coarse grained sand of quartz with some igneous grains which are very well rounded, layers of gravel and boulders occur throughout the section. Cuttings of sandstone are usually porous and oil stained.

173' Lower Ramparts.

173' - 190' Limestone - brownish grey, argillaceous, very fine crystalline, rich in fossils - ostracods, brachiopods and gastropods.

190' - 195' Limestone - as above 90%.

Shale - brownish grey, calcareous, rounded fragments of limestone, probably fossils, 10%

195' - 205' Limestone - as above 90%.

Limestone - brown, vitreous, clean, probably coral material 10%.

205' - 220' Limestone - brownish grey, argillaceous, ostracods and brachiopod fragments, brown shaly partings, some with crinoids, traces of clean, fine crystalline limestone (corals?).

220' - 255' (Cavings fairly bad)

Limestone - light brownish grey, very fine, nearly dense, tiny broken fossil debris scattered throughout. Trace of green calcareous shale and greenish grey argillaceous limestone (some of the argillaceous material is up to fine silt size). Pyrite common at top, minor amounts throughout.

(End of bad cavings)

255' - 300' Limestone - as above but fewer fragments 50%.

Shaly limestone and limy shale - gradational from shale to limestone - greenish, calcareous, soft and flaky to hard, 50%.

300' - 462' Limestone - greenish to brownish grey, the brown limestone is fragmental and fossiliferous, fragments of crinoids, brachiopods and ostracods. greenish limestone is argillaceous, 80%.

300' - 462'(cont'd.)
In places fossils make up to 20% of the limestone.

Shale - green, calcareous, 20%

462' Bear Rock.

462' - 505' Limestone -brown, very fine crystalline to dense, texture often shows pellet like structure, very fine to medium, round, forms in a clear matrix, may be bahamite or algal texture, this texture varies from very faint to pronounced.

505' - 525' Limestone - tan, brown to grey, sub-lithographic, some brown limestone as above, thin partings of hard, dark grey argillaceous material.

525' - 590' Limestone - tan, some grey, sub-lithographic, 50%.

Limestone - brown, very fine crystalline, clear calcite network or inclusions, traces of bahamite or algal texture, 50% ±. Dark argillaceous partings and stylolites, these may be bituminous but have negative CC/4 reaction.

590' - 712' Gradational with above.

Limestone - grey to brown, very fine crystalline to nearly dense, traces of sub-lithographic limestone, algal (?) texture common in upper part, outlined by clear calcite, becomes rare downward; argillaceous partings or stylolites abundant.

630' Trace of clear calcite crystals.

650' Trace of clear calcite crystals.

695' Traces of green shale.

712' - 722' Drilling break, possibly caused by presence of shale. Trace of shale-green, calcareous, disintegrates quickly in water.

Limestone - brown and grey, mostly microcrystalline to sub-lithographic, practically no change from above. Algal texture very rare.

722' - 900' Limestone - as above.

Traces of shale - dark and bright green, slightly to non-calcareous, hard(disintegrates quickly in water).

722' - 900'(cont'd.)

Some of the shale contains what appears to be roun ded limestone grains, also pyrite.

840' Trace of pin point porosity.

Some of the limestone has a slight greenish cast and contains a small amount of very fine silt and argillaceous material.

900' - 937' Limestone - as above, some waxy green shale with rounded limestone grains, algal texture more common.

910' Trace of pin point porosity with oil stain.

937' - 965' Limestone - as above 50%

Dolomite - light brownish grey, very fine crystalline, granular, 50%.

Trace of pin point porosity with oil stain occurs at 940' and below.

965' - 969' Limestone - as below - slight granular texture, brown to grey, micro-crystalline, partings and stylolites of grey and green shale.

CORE #1 969' - 979'

969' - 979' Limestone - light brownish grey, micro-crystalline, very homogeneous, tight. Many tiny stylolites, a few partings up to 1/4" thick of green and grey, laminated, slightly calcareous shale. A few fractures, lined by coarse crystalline calcite - some porosity and oil stain associated with the fractures.

979' - 995' Limestone - as above, no oil stain.

CORE #2 995' - 1005'

995' - 1005' Limestone - light brownish grey, micro-crystalline, some nearly sub-lithographic(lime mud) many dark, thin argillaceous partings. One fracture tightly sealed with calcite. One tiny oil stained vug.

1005' - 1070' Limestone - light grey to brown, micro-crystalline, traces of calcite and green shale.

1070' - 1075' Limestone - brown, micro-crystalline, dark to black shale partings (brown streak).

1075'-1085' Limestone - as above 1070', traces of the dark partings.

1085'-1101' Limestone - as above, some limestone - light grey, very fine crystalline, some pin point and inter-crystalline porosity. Porosity only a trace except below 1095'.

CORE #3 1101' - 1109'

1101'-1109' Limestone - light grey, micro-crystalline, very fine stylolites. Rare fractures lined with medium sized calcite crystals, some very fine limestone associated with the fractures - probably permeable.

1109'-1118' Limestone - light grey, micro-crystalline. (As in core above)

1118'-1125' Limestone - brownish grey, fine crystalline, some porosity. Some limestone as above.

1125'-1150' Limestone - light grey and brownish grey, micro-crystalline, some light and some brownish grey, fine crystalline porous limestone.

1150'-1180' Limestone - light grey and brownish grey, micro-crystalline, mere traces of pin point porosity. Traces of dark green shale, a few very thin stylolites, a few calcite crystals.

1180'-1215' Limestone - as above but no trace of porosity. Trace of darker limestone with pyrite at the base.

1215'-1225' Limestone - brown, fine granular, trace of calcite.

1225'-1235' Limestone - brown, micro-crystalline.

1235'-1270' Limestone - light grey to brown, micro-crystalline, in part has a chalky appearance, a few dark shale partings.

1270' Silurian

1270'-1280' Dolomite - brown, very fine to fine crystalline very slightly silty, tight, pyrite, trace of green waxy shale, some white vein dolomite.

CORE #4 1280' - 1290'

1280'-1290' Rec. 10'

Dolomite - brown, slightly mottled, very fine crystalline, very slightly silty, many fine fractures tightly sealed with clear dolomite, larger fracture shows minor brecciation.

1290'-1337' Dolomite - brown to light brownish grey, traces of small drusy vugs, traces of porosity with oil stain at 1330'.

1337' - 1347' Dolomite - as above, traces of porosity to 1342', below 1342' considerable fine crystalline dolomite with good inter-crystalline porosity.

CORE #5 1347' - 1351'

1347'-1351' Rec. 4'

Dolomite - brown, very fine crystalline, very hard, many small vugs up to 3/8" and irregular fractures. Lining vugs is fine to medium crystalline dolomite with good porosity - excellent permeability. Some mottling and texture which probably represents organisims, possibly a reef or reef breccia.

1351'-1365' Dolomite - as above, considerable amount of good porosity, some limy dolomite.

1365'-1420' Dolomite - brown and light brown, very fine crystalline, some with a lighter and softer appearance, generally tight, trace of porosity as seen above. Small amount of very fine silt.

1420'-1440' Dolomite - as above 70%.

Dolomite - fine crystalline, excellent inter-crystalline porosity, 30%.

1440'-1455' Dolomite - brown, fine to very fine crystalline, very slightly silty, traces of intercrystalline porosity, white, coarse crystalline dolomite, probably from vug or fracture filling.

1455'-1485' Dolomite - brown to light brownish grey, very fine crystalline, very slightly silty, trace of porosity, signs of drusy vugs, s me white dolomite crystals.

1485'-1497' Dolomite - brown, very fine crystalline, rare trace of porosity.

STRATIGRAPHY

GENERAL

In the Rond Lake area, the upper part of the Stratigraphic Section is as follows.

Glacial Deposits

Till and lake sands, up to 200', nearly everywhere present.

Cretaceous

Poorly consolidated quartz sand, thin, random, patchy distribution.

Middle Devonian - Ramparts Formation

Upper Ramparts Limestone - 200'$\pm$ not present in any of the wells drilled, forms the scarp west of Rond Lake.

Middle Ramparts Shale; also called Hare Indian River Shale - 600' to 700' of green shale, 30' at base contains interbedded dark brown shale.

Lower Ramparts Limestone - 300 feet minus, fossiliferous limestone.

Bear Rock Formation

800'±, very fine algal rich limestone, equivalent to the dolomite breccia of the Norman Wells area.

Silurian

Thickness unknown, dolomite with reefs.

PLEISTOCENE AND RECENT

Rond Lake No. 1 encountered 173 feet of glacial deposits - sand and pebbles in a clay matrix. The deposits are chiefly medium to coarse grained quartz sand, with layers of gravel composed of a variety of sedimentary rocks of local derivation as well as a few grains of igneous rock.

LOWER RAMPARTS LIMESTONE

The Lower Ramparts limestone consists of argillaceous, fossiliferous limestone with interbedded green, calcareous shale. Brachiopods, ostracods and cup-corals are common throughout. The upper 82 feet are predominantly limestone, much of which is formed from layers of colonial corals. The lower 207 feet contain more interbedded shale.

In Rond Lake No. 1, the Lower Ramparts is 289 feet thick, this is 17 feet thicker than in Rond Lake No. 2, the only other well to penetrate the full section. Two hundred eighty nine feet is probably not the full thickness of the Lower Ramparts, as glacial deposits directly overlie the limestone. From a comparison of E-logs in wells No. 1 and No. 2, it can be seen that in well No. 1 the lower part of the section, between 312 feet and 462 feet, thins gradually from 150 feet in No. 1 to 138 feet in No. 2, accounting for 12 of the 17 foot difference.

BEAR ROCK

Rond Lake No. 1 penetrated the full Bear Rock section between 462 and 1270 feet. The formation is 808 feet thick and is composed predominantly of clean, very fine, nearly dense limestone. There are many stylolites and thin partings of brown shale. The texture of the rock indicates that it probably originated as a lime mud bound together by algal material. Ostracods are common throughout the section aside from ostracods and algae, there is no trace of organic material. A characteristic of the Bear Rock formation is the presence, throughout the section of quartz in the form of tiny euhedral crystals.

Traces of pin point porosity occur throughout the lower 430 feet of the formation. Some poor porosity occurs in the layers from 937 to 965 feet and from 1150 to 1180 feet; the layer from 937 to 965 is in part granular dolomite. Better porosity, associated with fractures, occurs from 1095 to 1109 feet and from 1118 to 1125 feet. Good intercrystalline porosity is present between 1125 to 1150 feet.

The oil stained porous layer from 940 to 965 feet was tested by Drill Stem Test No. 2 and by later bailing operations, oil cut sulphur water was obtained. Lower porous layers were not oil stained and were not tested.

SILURIAN

The Silurian was encountered at a depth of 1270 feet and 227 feet were drilled; the total thickness of the Silurain is unknown. The drilled section consists of brown, fine crystalline dolomite, very fine detrital silt is present throughout. Core No. 4, taken near the top of the Silurian shows that the dolomite has a mottled appearance, it is cut by several fracturers tightly sealed by crystalline dolomite, minor brecciation is associated with the larger fractures.

Porous layers occur between 1342 and 1365 feet and between 1420 and 1440 feet. In addition traces of porosity are present throughout the section below 1337 feet. Core No. 5 was cut in the upper porous section; good inter-

crystalline porosity is associated with many small vugs and fracturers, these vugs and porous patches occur within a body of tight hard, fine dolomite, however the permeability is excellent. The lower porous layer has excellent inter-crystalline porosity.

No recognizable fossils were seen in the cores or samples, however the arrangement and shape of the vugs gives an impression of organic material.

The upper porous zone was tested and contained sulphur water.

WELL NAME	OWNER	YR	CORE	TOP	BOTTOM	LOCATION	TYPE
ROND LAKE NO.1	DECALTA	60	2	997		C-13733	PALYN
			5	1350		C-13734	

WELL NAME	OWNER	YR	CORE	TOP	BOTTOM	LOCATION	TYPE
ROND LAKE NO.L	DECALTA&A	60	1	997			PYROL
			5	1350			

WELL NAME	OWNER	YR CORE	TOP	BOTTOM	LOCATION	TYPE
ROND LAKE NO.5	DECALTA	60	552		C-24415	PALYN

FORM "B"

DEPARTMENT OF NORTHERN AFFAIRS AND NATIONAL RESOURCES

NORTHERN ADMINISTRATION BRANCH

RESOURCES DIVISION

For the period from . . . . . .

to . . . . . .

REPORT of ~~COMPLETION~~ ~~REWORK~~ ~~RECOMPLETION~~ ~~SUSPENSION~~ ABANDONMENT of a Well

Permit No. 1484. .

Name of well **Desalta Et.Al., Rond.Lake No. 1** . . . . . Lease No. . . . .

Registered owner **Western Desalta Petroleum** Drilling Company .**Big.Indian** . . .

Location . .**67°.04'.51"** . . . . . N. Lat.**128°.28'.18"** W. Long.

Survey description, if available . . . . . .

Elevation: Ground . .**391** . . . Last previous depth . . . . . .

Kelly bushing. . **399** . . . Present depth . . .**1497** . . . . . .

Spudded **January 7,.1960** . . . . . Finished drilling .**Feb.17** Rig Released

. **Feb. 17** . . . . .

Deviations from vertical . **969' - 3/4°, 1100 - 3/4°, 1240' - 3/4°, 1370' - 3/4°,**

. 1496 - 5°. . . . . . .

CASING RECORD

	Date	Size O.D.	Weight lbs/ft	Grade	Set at feet	Sacks Cement	Top of Cement
1	**Jan.15**	**6 5/8**	**24**	**J-55**	**255**	**46**	**Surface**
2							
3							
4							

TUBING RECORD

Size	Wt.Lbs/foot	Grade	Amount	Landed Depth	Remarks

Wellhead . . . . . .(Manufacturer). . . . (Size). . . .(Series)

Status of well on completion of drilling . . **Dry Hole.** . . . . . .

Producing Injection Zone . . . . . .and formation . . . . . .

Cord intervals **.969' to 979', .994' to 1005',** . . . . . .

. . . . . **1101' to 1109', 1280' to 1290', 1347' to 1351'** . . . . . .

. . . . . .

. . . . . .

Interval logged: E-log **.255. - 1497** . . . . Other logs . . . . . .

R-log . . . . . .

M-log . . . . . .

Velocity log 0 - 1497 acc . . . . . .

The above logs (~~were~~) (will be) submitted in accordance with Section 65 of the Regulations.

DRILL STEM TESTS

Test No.	Date	Interval Tested	Duration	Results
1	Jan. 28	944-969	15 Min.	Misrun, tool plugged.
2	Jan. 30	900-1005	60 Min.	Watery Mud
3	Jan. 31	935-1005	Seat failed	Misrun
4	Jan. 31	940-1005	"	Misrun
5	Feb. 1	990 - 1005	"	Misrun
6	Feb. 9	1326-1351	80 Min.	Water to surf. in 75 min. acc

(If space insufficient, attach further sheet)

(Strike out the non-applicable) (~~Completion~~) (~~Recompletion~~) (~~Recompletion~~)

Perforations Bullet. . . . . .

. . . . . .

Shootings . . . . . .

Hydraulic fracturing . . . . . .

Chemical treatment . . . . . .

Date initial production tests . . . . . .

Initial production data . . . . . .

Pumping or flowing . . . . . .

Plug back . . . . . .

Other . . . . . .

. . . . . .

. . . . . .

. . . . . .

. . . . . .

CEMENT PLUGS SET

Date	Plug set at	Sacks cement	Method	Top found at
Feb.13	980-1200	27	Mud. Pump	Did Not Hold.
Feb.15.	990-1080	11	Mud. Pump	1046.
March 19	Bailed to base of surface casing & dumped 12 sax			
March 19	5 sax on top			

Washed well samples have been sent to Geological Survey of Canada, Calgary

Cores will be stored at . Western Decalta, Calgary. . . . . .

Core analysis (was made) of the Intervals . . . . . .
(to be made)

Oil analysis (was made) of the Intervals. . . . . .
(to be made)

Gas analysis (was made) of the Intervals. . . . . .
(to be made)

Water analysis (was made) of the Intervals. above 1046, 1326-1351 . . .
(to be made)

The above analyses (was made)
(will be) submitted in accordance with Section 70(2) of the Regulations.

ADDITIONAL DETAILS AND COMMENTS

Well suspended after running plug 990-1080 awaiting bailing equipment . . .

Feb. 18, bailed to 600', oil cut sulphur water. . . . . .

March 7, bailed to 600', oil cut sulphur water. . . . . .

Natural fluid level 45' KB. . . . . .

. . . . . .

Signed. J. M. Williams. Address 627 - 8th Ave, S.W., CALGARY.

Date . May . . . 19 60 . . .

(To be submitted in triplicate in accordance with Sections 68, 69, 70 and 71, of the Territorial Oil and Gas Regulations to the Oil Conservation Engineer at Calgary, Alberta.)

DRILLING REPORT

DECALTA ET AL., ROND LAKE NO. 1

N.W.T.

D. BRUCE BULLOCK & ASSOCIATES LTD.

CONSULTING GEOLOGISTS

MARCH, 1960

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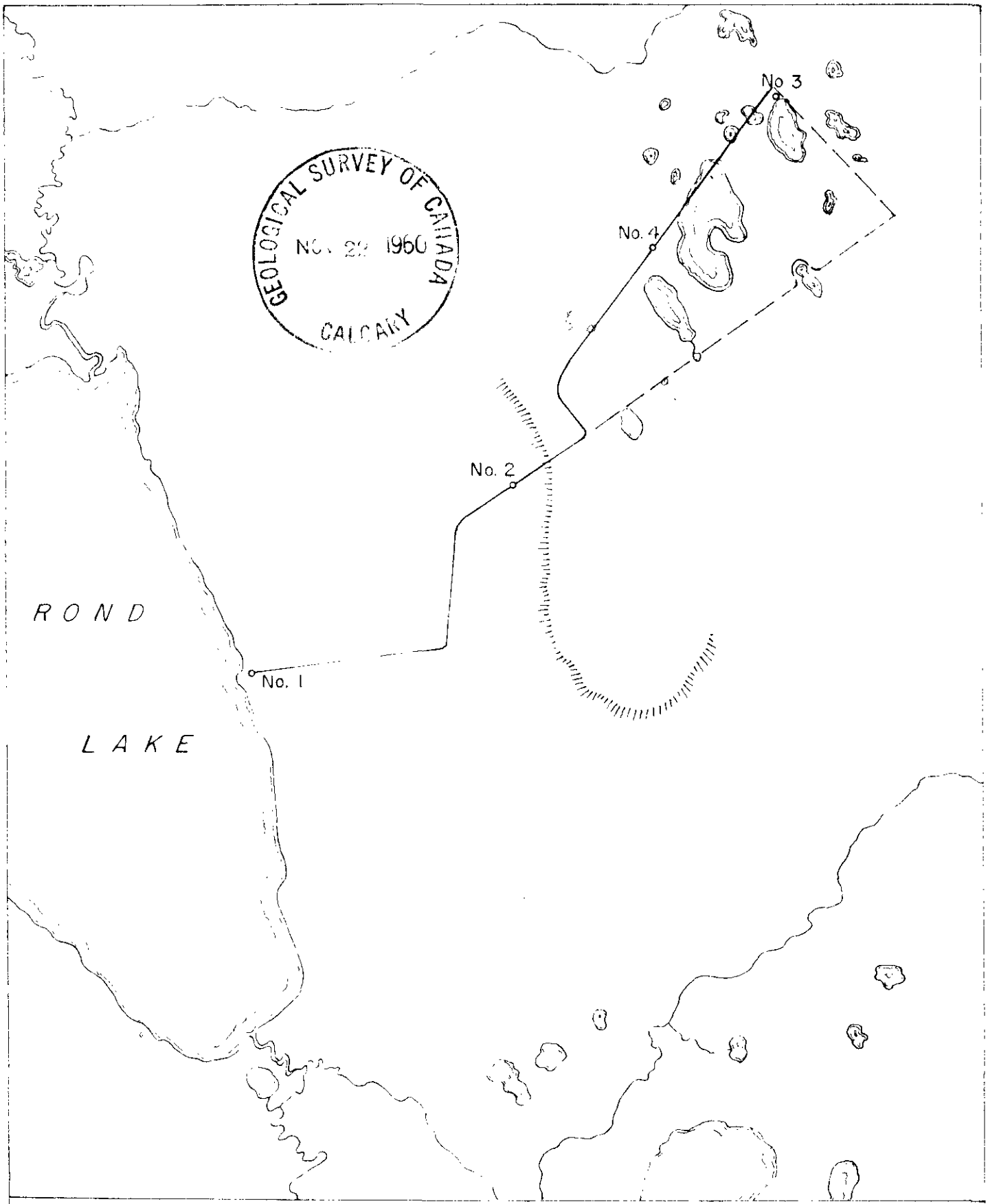
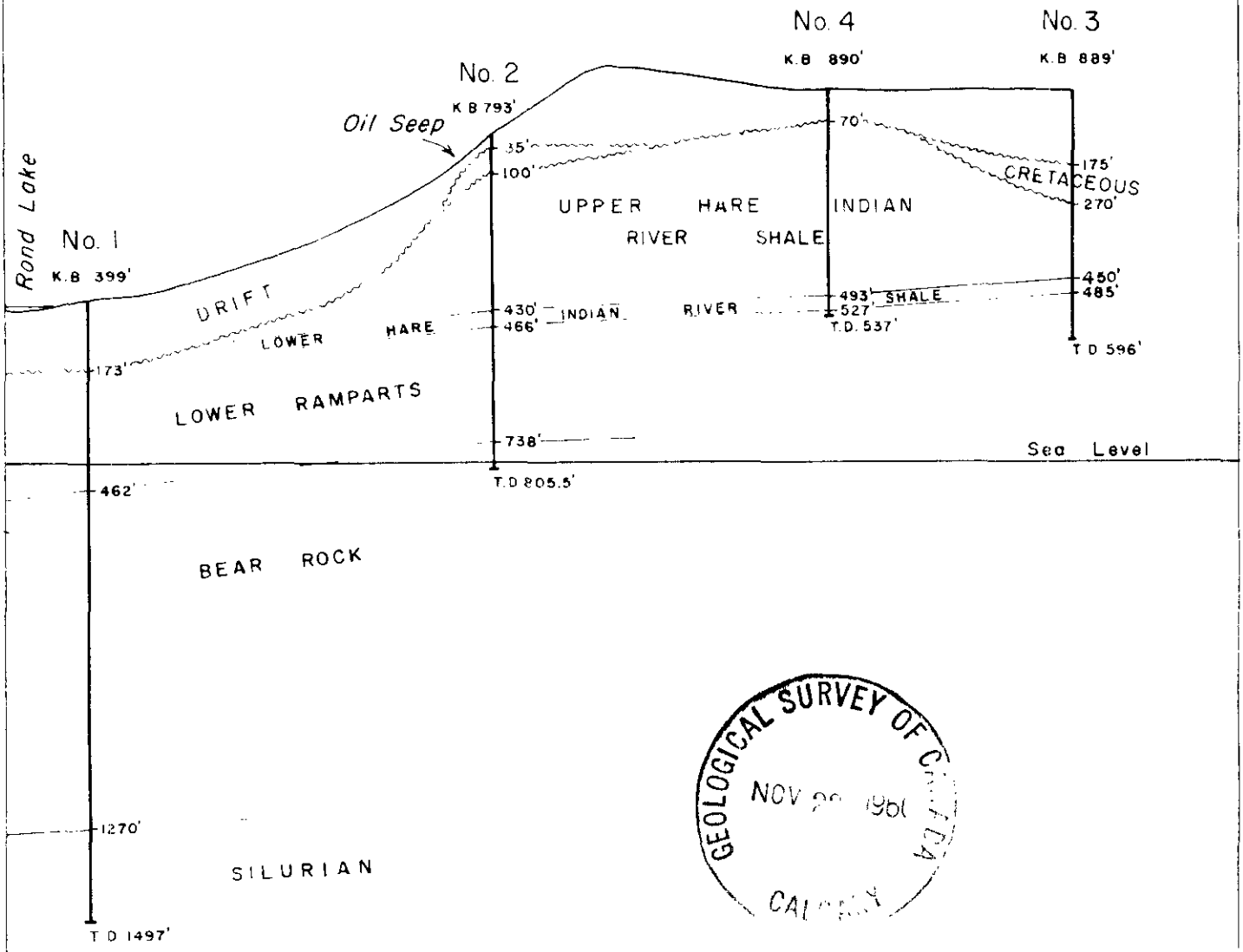
ILLUSTRATIONS



MAP SHOWING LOCATION OF WELLS RELATIVE TO ROND LAKE

SCALE 1" to Approx. 3300'
(Photo Scale)

—— ROAD
– – – CUT LINE



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DAILY PROGRESS REPORTS

January 7, 1960

Mud:	Wt. 8.6, Vis. 43, add. 700 lbs. gel.
Current Operation:	Drilling 4 3/4". (Spud 6:00 P. M.)
Depth: 95'	6 hrs. drilling.
Operations:	Drill; from 0' to 95'
Rock Types Penetrated:	From 0' to 95', drift (permafrost)

January 8.

Mud:	Wt. 9.6, Vis. 47.
Current Operation:	Drilling 4 3/4"
Depth: 207'	18 3/4 hrs. drilling
	2 1/4 hrs. repairs
	1 hr. trip
	1 hr. service
	1 hr. ream tight hole
Operations:	Drill 4 3/4" from 95' to 207'
Rock Types Penetrated:	From 95' to 173' drift (permafrost)
	From 173' - 207' dense limestone.

January 9:

Mud:	Wt. 10.3, Vis. 55.
Current Operation:	Stuck pipe.
Depth: 222'	4 1/4 hrs. drilling
	11 3/4 hrs. cleaning pump and mud lines
	8 hrs. working pipe
Operations:	Drill from 207' to 222'
Rock Types Penetrated:	From 207' to 222' - dense limestone.

January 10.

Mud:	Wt. 8.7, Vis. 32, WL 60+add.
	100 lbs. Calcium Chloride.
Current Operation:	Circulating.
Depth: 222'	22 hrs. working pipe
	2 hrs. circulating

January 11.

Mud:	Wt. 9.9, Vis. 76, add 750 lbs. gel., 20 lbs. spersene, 8 lbs. caustic.
Current Operation:	Conditioning mud.
Depth: 253'	2 hrs. ream 4 3/4"
	8 1/4 hrs. drill 4 3/4"
	4 hrs. repairs
	1/4 hrs. service
	3 1/2 hrs. circulate
	4 hrs. trips
	2 hrs. ream to 8 5/8"
Operations:	Drill 4 3/4" 222' to 253'
	Ream 8 5/8" 0' to 10'
Rock Types Penetrated:	From 222' to 253' - limestone and minor shale.

January 12.

Mud:	Wt. 9.7, Vis. 45, add 1100 lbs. gel.
Current Operations:	Reaming to 8 5/8"
Depth: 253'	15 hrs. ream
	7 hrs, work on mud system
	1 hr. service
	1 hr. trip
Operations:	Ream 8 5/8" 10' to 180'

January 13.

Mud:	Wt. 10.5, Vis. 48.
	Pit heater constructed and working.
Current Operation:	Reaming to 8 5/8"
Depth: 253'	20 1/4 hrs. reaming
	1/2 hr. service
	2 1/4 hrs. trip
	1/2 hr. repairs
	1/2 hr. move pump
Operations:	Ream from 180' to 211'

January 14.

Mud:	Wt. 10.6, Vis. 48.
Current Operation:	Preparing to run surface casing.
Depth: 255'	16 1/2 hrs. ream 1/2 hr. service 1 hr. circulate 3 hr. work on light plant. 3 hrs. trip and lay down pipe.
Operations:	Ream from 211' to 253' Drill from 253' to 255'

January 15.

Current Operation:	Waiting on cement.
Depth: 255'	5 1/2 hrs. run casing 1 3/4 hrs. cement casing 16 3/4 hrs. waiting on cement
Operations:	Set 247', 6 5/8", 24 lb., J-55 with 46 sax set at 255 K.B.

January 16.

Mud:	Wt. 9.3, Vis. 34, W.L. 33, pH 9.2, add 100 lbs. Bicarbonate of soda.
Current Operations:	Thawing mud lines.
Depth: 255'	6 hrs. W.O.C. and nippling up. 1/2 hr. service 2 1/2 hrs. trip 10 1/2 hrs. thawing mud lines 1 3/4" circulate and pressure up 2 3/4" drill out plug

January 17.

Mud:	Wt. 9.8, Vis. 40, W.L. 16, pH 10.5, add 10 lbs. Quebracho, 5 lbs. caustic.
Current Operation:	Drilling.
Depth: 387'	19 3/4 hrs. drilling 1/2 hr. service 1 3/4 hrs. trip 2 hrs. pressure up
Operations:	Drill from 255' to 387'
Rock types Penetrated:	From 255' to 387' - limestone and shale.

January 18.

Mud:	Wt. 10, Vis. 42, W. L. 11.8, pH 10, add 200 lbs. gel, 15 lbs. Quebracho, 5 lbs. caustic, 25 gals. water.
Current Operation:	Drilling
Depth: 474'	22 hrs. drilling 1/4 hr. service 1 3/4 hrs. trip
Operations:	Drill from 387' to 474'
Rock Types Penetrated:	From 387' - 462' - limestone and shale. From 462' to 474' - fine to dense limestone.

January 19.

Mud:	Wt. 9.8, Vis. 37, W. L. 7.6, pH 10, add 50 lbs. bicarbonate, 10 lbs. Quebracho, 5 lbs. caustic.
Current Operation:	Drilling
Depth: 526''	22 1/2 hrs. drilling 1/2 hr. service 1 hr. trip
Operations:	Drill, from 474' to 526'
Rock Type Penetrated:	From 474' to 526' - dense limestone.

January 20.

Mud:	Wt. 9.7, Vis. 36, W. L. 10, pH 10, add 50 lbs. bicarbonate, 50 lbs. Anti - Gyp.
Current Operation:	Drilling
Depth: 578'	22 1/4 hrs. drilling 1 1/4 hrs. trip 1/2 hr. service
Operations:	Drill from 526' to 578'
Rock Types Penetrated:	From 526' to 578' - dense limestone

January 21.

Mud:	Wt. 9.7, Vis. 37, W.L. 9.8, pH 10,
Current Operation:	Drilling
Depth: 614'	19 1/2 hrs. drilling
	3 hrs. trips
	1/2 hr. service
	1 hr. repairs
Operations:	Drill from 578' to 614'
Rock types penetrated:	From 578' to 614' - dense limestone.

January 22.

Mud:	Wt. 9.5, Vis. 38, W.L. 9.2, pH 9.4, add 450 lbs. gel.
Current Operation:	Drilling
Depth: 654'	21 1/2 hrs. drilling
	1/2 hr. service
	1/4 hr. repairs
	1 3/4 hrs. trip
Operations:	Drill from 614' to 654'
Rock Types Penetrated:	From 614 to 654' - dense limestone.

January 23.

Mud:	Wt. 9.4, Vis. 40, WH 9.3, pH 9.5,
Current Operation:	Drilling.
Depth: 696'	22 1/4 hrs. drilling
	1/2 hr. service
	1 1/4 hrs. trip
Rock Types Penetrated:	From 654' to 694' - dense limestone.

January 24.

Mud:	Wt. 9.4, Vis. 43, WL 9.4, pH 9.2, add 250 lbs. gel.
Current Operation:	Drilling

January 24. (cont'd.)

Depth: 757'	23 1/2 hrs. drilling 1/2 hr. service
Rock Type Penetrated:	From 696' to 757' - dense limestone.

January 25.

Mud:	Wt. 9.4, Vis. 42, WL 9.3, pH 9.5, add 5 lbs Quebracho, 2 lbs. caustic.
Current Operation:	Drilling.
Depth: 816'	20 1/4 hrs. drilling 1 1/2 hrs. trip 1 hr. service 1 1/4 hrs. repairs
Operations:	Drill from 757' to 816'
Rock Types Penetrated:	From 757' to 816' - dense limestone.

January 26.

Mud:	Wt. 9.5, Vis. 42, WL 8.4, pH 9.5,
Current Operation:	Drilling
Depth: 881'	22 1/4 hrs. drilling 1 1/2 hrs. trip 1/4 hr. service
Operations:	Drill from 816' to 881'.
Rock Types Penetrated:	From 816' to 881' - dense limestone.

January 27.

Mud:	Wt. 9.5, Vis. 45, WL 7.2, pH 9.5, add 600 lbs. gel., 10 lbs. Quebracho, 5 lbs caustic.
Current Operation:	Drilling.
Depth: 941'	19 1/4 hrs. Drilling 1 3/4 hrs. trip 1/2 hr. service 2 1/2 hrs. repairs
Operations:	Drill from 881' to 941'
Rock Types Penetrated:	From 881' to 937' - dense limestone, minor shale. From 937' to 941' - tight dolomite.

January 28.

Mud:	Wt. 9.5, Vis. 64, WL 7.0. pH 9.5, add 2 1/2 lbs. high viscosity driscose.
Current Operation:	Coring and testing.
Depth: 969'	11 1/4 hrs. drilling 1 3/4 hrs. circulate 7 hrs. trip and test 3 3/4 hrs. trip and rig to core 1/4 hr. core Drillstem test No. 1, 944' to 969', misrun, disk pierced but not shattered plugged.

January 29.

Mud:	Wt. 9.5, Vis. 52, WL 7.4, pH 9.5.
Current Operation:	Coring
Depth: 1005'	3 1/2 hrs. coring 1 hr. preparing to core 7 1/2 hrs. trips 3 1/2 hrs. log and survey 1 1/4 hrs. circulate 1 1/4 hrs. ream 5 hrs. drilling 1/2 hr. repairs 1/2 hr. service
Operations:	Core; from 969' to 979' Drill; from 979' to 995' Core; from 995' to 1005'
Rock types Penetrated:	From 969' to 1005', tight limestone.
Core #1	From 969' to 979' Recovered 10' tight limestone, few vugs and fractures.
Core #2	From 995' to 1005' Recovered 10 ' tight limestone, minor shale.

Survey at 969' - 3/4°

January 30.

Mud:	Wt. 9.4, Vis. 42, WL 7.8, pH 9, (after test)
Current Operation:	Testing.
Depth: 1005'	9 1/4 hrs. trips 1/2 hr. handling core 2 1/4 hrs. ream 1 1/2 hrs. rig to test 1 hr. test 1 1/2 hrs. wait on orders 7 1/2 hrs. circulate 1/2 hr. repairs
Test #2	900' to 1005' VO one hour, Initial puff, steady weak blow, recovered 500' mud, Hydrstatic pressure 418 lbs. Min. flow pressure 10 lbs. Max. flow pressure 238 lbs. Packer rubber damaged.

January 31.

Mud:	Wt. 9.3, Vis. 54, WL 6.8, pH 8.5, add 200 lbs gel., 5 lbs. High Viscosity Driscose.
Current Operation:	Testing
Depth: 1005'	12 hrs. circulating 12 hrs. trips for DST 3 and 4
Test #3	935' to 1005' misrun, packer seat failure (Tool run without dart)
Test #4	940' to 1005' misrun, packer failed to seat (tool run without dart)

February 1, 1960.

Mud:	Wt. 9.5, Vis. 48, WL 6.1, pH 9.0, add 20 lbs. spersene, 10 lbs. caustic.
Current Operation:	Test and drilling.
Depth: 1035'	4 1/2 hrs. circulate 7 hrs. trips and attempt to test 1/2 hr. service 1 1/2 hrs. ream bottom 40' 3/4 hr. repairs 9 3/4 hrs. drill
Operations:	Drill from 1005' to 1035'
Rock Type Penetrated:	From 1005' to 1035' - tight limestone.
Test #5	930' to 1005' misrun, packer failed to seat.

February 2.

Mud:	Wt. 9.6, Vis. 48, WL 6.5, pH 10.
Current Operation:	Drilling
Depth: 1088'	18 3/4 hrs. drill 1/2 hr. service 2 3/4 hrs. trip 2 hrs. repair
Operations:	Drill from 1035' to 1088'
Rock Types Penetrated:	From 1035' to 1088' - tight limestone.

February 3.

Mud:	Wt. 9.8, Vis. 46, WL 6.3, pH 10.
Current Operation:	Drilling, coring.
Depth: 1133'	12 hrs. drill 6 1/2 hrs. trips 2 1/4 hrs. core 1 hr. handle core 1/2 hr. service 1 3/4 hrs. ream
Operations:	Drill from 1088' to 1101' Drill from 1109' to 1133' Core from 1101' to 1109'

February 3 (cont'd.)

Rock Types Penetrated:	From 1088' to 1133' - tight limestone with thin layers of porosity, few fractures.
Core #3	From 1101' to 1109'. Recovered 8' limestone, a few fractures, some crystal lined - no oil stain.

February 4.

Mud:	Wt. 9.8, Vis. 43, WL 6.6, pH 9.5, add 100 lbs. gel.
Current Operation:	Drilling
Depth: 1197'	21 1/2 hrs. drilling 1/2 hr. service 2 hrs. trip
Operations:	Drill from 1133' to 1197'.
Rock Types Penetrated:	From 1133' to 1197' - tight limestone.

February 5.

Mud:	Wt. 9.9, Vis. 45, WL 6.8, pH 8.5, add 300 lbs. gel.
Current Operation:	Drilling
Depth: 1255'	19 hrs. drilling 2 hrs. trip 1/2 hr. service 2 1/2 hrs. repair
Operations:	Drill from 1197' to 1255'
Rock Types Penetrated:	Tight limestone.

February 6.

Mud:	Wt. 9.9, Vis. 55, WL 7.1, pH 9.3, add 5 lbs. caustic, 20 lbs. spersene, 2 1/2 lbs. High Viscosity Driscose.
Current Operation:	Drilling, coring.

February 6 (cont'd.)

Depth: 1290'	12 1/4 hrs. drill 1 1/2 hrs. repair 1/2 hr. service 1 1/2 hrs. circulate and condition mud 5 hrs. trips 2 1/4 hrs. core 1 hr. ream
Operations:	Drill from 1255' to 1280' Core from 1280' to 1290'
Rock Types Penetrated:	From 1255' to 1270' - tight limestone. 1270' to 1290' - tight fine dolomite. Silurian at 1270'
Core #4	From 1280' to 1290'. Rec. 10', brown, very fine crystalline mottled dolomite, several small fractures sealed by coarse crystalline dolomite.

February 7.

Mud:	Wt. 10.1, Vis. 54, WL 6.6, pH 9.3, add 500 lbs. Antigyp.
Current Operation:	Drilling
Depth: 1320'	17 1/2 hrs. drill 1/2 hr. service 3 hrs. trip 3 hrs. repair
Operations:	Drill from 1284' to 1320'.
Rock Types Penetrated:	Tight dolomite.

February 8.

Mud:	Wt. 9.9, Vis. 56, WL 6.5, pH 8.5, add 5 lbs High Viscosity.
Current Operation:	Drilling and coring.

February 8 (cont'd.)

Depth: 1351'	12 3/4 hrs. drilling
	2 hrs. mix mud and circulate
	1/2 hr. service
	6 hrs. trips
	1 1/2 hrs. repairs
	1 1/4 hrs. core
Operations:	Drill from 1320' to 1347'
	Core from 1347' to 1351'
Rock Types Penetrated:	From 1320' to 1337' - tight dolomite
	From 1337' to 1347' - some porosity
Core #5	1347' to 1351' (core jammed) Rec. 4' Dolomite with good porosity and excellent permeability.

February 9.

Mud:	Wt. 10 lbs., Vis. 54, WL 7.2, pH 8, add 400 lbs. gel.
Current Operations:	Test and drill.
Depth: 1365'	1 hr. mix mud
	3/4 hr. ream
	1 1/4 hrs. circulate
	8 1/4 hrs. trips
	1 1/2 hrs. rig to test
	2 1/2 hrs. test
	3 hrs. work on mud lines
	5 1/4 hrs. drill
	1/2 hr. repair
Operations:	Ream from 1347' to 1351'
	Test from 1326' to 1351'
	Drill from 1351' to 1365'

Test No. 6 — 1326' to 1351'
Valve open 1 hr. and 20 min.
Steady blow, drill pipe filled with sulphur water to within a few feet of the surface. When packer pulled loose, main valve stuck open, allowed mud to displace all water from the pipe.

Hydrostatic head	694 lbs.
Initial flow pressure	190 lbs.
Final flow pressure	630 lbs.

Rock Types Penetrated: From 1351' to 1365' - dolomite with interbedded zones of good porosity.

February 10.

Mud: Wt. 9.9, Vis. 47, WL 6.4. pH 8.5, add 20 lbs. Quebracho, 10 lbs. caustic.
Current Operation: Drilling.
Depth: 1412'
20 3/4 hrs. drilling
1/2 hr. service
2 3/4 hrs. trip
Operations: Drill from 1365' to 1412'
Rock Types Penetrated: Brown, fine dolomite, mostly tight, some porosity.

February 11.

Mud: Wt. 9.9. Vis. 43, WL 6.4, pH 9.5.
Current Operation: Drilling
Depth: 1449'
19 1/2 hrs. drilling
1/2 hr. service
1 hr. repairs
3 hrs. trip
Operations: Drill from 1412' to 1449'
Rock Types Penetrated: From 1412' to 1449' - brown fine crystalline dolomite, some porosity.

February 12.

Mud:	Wt. 10.1, Vis. 47, WL 6.8, pH 8.5,
Current Operation:	Drilling
Depth: 1486'	20 1/4 hrs. drilling
	3 1/4 hrs. trip
	1/2 hr. service
Operations:	Drill from 1449' to 1486'
Rock Types Penetrated:	From 1449' to 1486' - brown to grey dolomite, trace of porosity.

February 13.

Mud:	Wt. 10.1, Vis. 46, WL 6.6, pH 8.5.
Current Operation:	Logging and velocity survey.
Depth: 1497'	7 hrs. drilling
	3 hrs. trip
	7 1/2 hrs. log
	5 hrs. velocity survey
	1 1/2 hrs. plug
Operations:	Drill from 1486' to 1497'
	Log hole
	Run velocity survey
	Run Plug No. 1, 980' - 1200'
	27 sax, displaced with
	3 barrels of mud.
Rock Types Penetrated:	From 1486' to 1497' - fine brown dolomite.
	Surveys 1300' - 3/4°
	1240' - 6 3/4°
	1370' - 5 3/4°
	1496' - 5°

February 14.

Mud:	Add 400 lbs. bicarbonate.
Current Operation:	Waiting on cement, feel for plug.
Depth: 1497'	12 hrs. circulate, W.O. C.
	2 hrs. circulate trip
	8 hrs. circulate and treat mud.
	Plug not set, mud contaminated, ran into 1080' for plug No. 2.

February 15.

Mud: Wt. 9.6, Vis. 57.
Current Operation: Set plug No. 2.
Depth: 1497'

5 1/2 hrs.	circulate and treat, mud.
5 hrs.	trips
1 1/2 hrs.	Plug No. 2
11 1/2 hrs.	W.O.C.
1/2 hr.	feel plug

Operations: Bypassed contaminated mud and treated remainder, cleaned hole to 1080'.
Ran plug No. 2, 990' to 1080', 11 sax cement, displaced with 2 3/4 barrels water, ran 2 barrels water ahead of plug.
Circulated W.O.C.
Tried to feel plug at midnight, still soft.

February 16.

Mud: Mixed 420 lbs. Calcium Chloride in water and displaced mud.
Current Operation: Bailing.
Depth: 1497'

3 hrs.	trips
8 hrs.	W.O.C. & cleaning pits
1 1/2 hrs.	trip to feel plug
3 hrs.	displace mud
2 1/2 hrs.	repair B.O.P.
6 hrs.	bail

Operations: Feel plug No. 2 at 1046', took full weight. Bailed, using float upside down in drill collar, using drill pipe.

February 17.

Current Operation: Rig down.
Depth: 1497'

February 17 (cont'd.)

10	hrs.	bail
1/2	hr.	service
2 1/2	hrs.	lay down pipe
11	hrs.	rig down and move

Bailed 16 1/2 barrels, fluid level should be at 710', last trip indicated possibly 465' of fluid.

TIME DRILLING RECORD

1 Foot Intervals

186' - 190'	*12,	32,	13,	13.						
190' - 200'	18,	15,	13,	19,	17,	29,	18,	16,	17,	15.
200' - 210'	16,	15,	24,	24,	31,	22,	20,	22,	13,	15.
210' - 220'	12,	17,	17,	18,	22,	14,	14,	11,	12,	11.
220' - 230'	11,	12,	*6,	13,	15,	11,	19,	15,	13,	12.
230' - 240'	12,	13,	31,	24,	16,	13,	8,	8,	11,	10.
240' - 250'	13,	9,	9,	8,	9,	9,	12,	16,	23,	30.
250' - 260'	40,	30,	15,	-,	-,	*7,	5,	7,	4,	5.
260' - 270'	6,	8,	6,	7,	8,	9,	5,	5,	5,	4.
270' - 280'	9,	10,	10,	6,	7,	6,	9,	6,	6,	5.
280' - 290'	6,	6,	8,	5,	8,	6,	7,	8,	7.	9.
290' - 300'	11,	9,	6,	5,	5,	5,	5,	4,	6,	9.
300' - 310'	6,	10,	16,	8,	16,	18,	14,	10,	12,	15.
310' - 320'	19,	20,	12,	8,	8,	7,	8,	9,	12,	10.
320' - 330'	10,	9,	11,	12,	8,	9,	19,	13,	12,	9.
330' - 340'	13,	16,	15,	13,	13,	10,	13,	11,	9,	6.
340' - 350'	10,	13,	10,	13,	12,	11,	11,	12,	17,	12.
350' - 360'	14,	12,	12,	11,	9,	9,	10,	11,	13,	13.
360' - 370'	15,	*5,	5,	6,	6,	8,	8,	8,	7,	7.
370' - 380'	8,	9,	7,	5,	6,	7,	6,	5,	7,	7.
380' - 390'	9,	7,	7,	8,	9,	12,	11,	10,	7,	7.
390' - 400'	8,	8,	9,	13,	8,	9,	5,	7,	7,	8.
400' - 410'	7,	6,	8,	9,	10,	11,	9,	10,	11,	8.
411' - 420'	8,	9,	13,	13,	21,	9,	8,	8,	10,	15.
420' - 430'	15,	11,	7,	8,	9,	10,	14,	16,	12,	12.
430' - 440'	13,	13,	13,	12,	14,	11,	10,	9,	10,	13.
440' - 450'	18,	18,	17,	12,	7,	12,	10,	9,	10,	11.
450' - 460'	12,	14,	17,	16,	23,	16,	10,	12,	17,	15.
460' - 470'	17,	18,	25,	35,	25,	37,	45,	50,	30.	45.
470' - 480'	*15,	16,	20,	20,	22,	18,	10,	15,	20,	20.
480' - 490'	20,	22,	23,	20,	21,	24,	22,	27,	10,	11.
490' - 500'	20,	25,	15,	18,	29,	36,	27,	22,	34,	33.
500' - 510'	27,	34,	35,	33,	35,	30,	30,	34,	37,	34.
510' - 520'	37,	31,	41,	32,	10,	20,	37,	38,	35,	22.
520' - 530'	26,	28,	49,	15,	17,	30,	*20,	25,	27,	23.

* New Bit

530' - 540'	21,	22,	20,	20,	20,	21,	22,	20,	22,	25.
540' - 550'	27,	33,	35,	31,	24,	18,	21,	35,	36,	36.
550' - 560'	40,	32,	38,	21,	26,	27,	25,	31,	35,	33.
560' - 570'	20,	37,	33,	30,	25.	25,	32,	21,	19,	10.
570' - 580'	12,	19,	22,	23,	26,	20,	18,	18,	17,	17.
580' - 590'	20,	19,	24,	*25.	30,	30,	30,	37,	39,	50.
590' - 600'	44,	42,	33,	30,	25,	35,	55,	50,	45,	55.
600' - 610'	40,	36,	*25,	30,	34,	25,	32,	29,	34,	29.
610' - 620'	33,	25,	14,	18,	20,	18,	20,	25,	30,	35.
620' - 630'	30,	35,	32,	35.	36,	32,	20,	30,	30,	35.
630' - 640'	32,	25,	28,	27,	34,	35,	37,	36,	32,	24.
640' - 650'	48,	30,	31,	34,	45,	45,	37,	45,	*18,	27.
650' - 660'	27,	18,	16,	28,	28,	27,	26,	31,	32,	24.
660' - 670'	29,	29,	30,	32,	28,	35,	28,	30,	37,	30.
670' - 680'	30,	34,	14,	18,	24,	35,	30,	29,	31,	40.
680' - 690'	30,	37,	31,	31,	41,	45,	39,	38,	38,	55.
690' - 700'	45,	45,	30,	30,	*20,	20,	15,	15,	17,	18.
700' - 710'	20,	24,	19,	22,	25,	27,	18,	20,	25,	20.
710' - 720'	20,	15,	11,	10,	11,	9,	10,	9.	9,	10.
720' - 730'	7,	8,	18,	8,	11,	12,	20,	28,	17,	21.
730' - 740'	23,	31,	32,	32,	34,	20,	26,	36,	41,	34.
740' - 750'	27,	40,	50,	33,	33.	39,	44,	36,	32,	30.
750' - 760'	28,	22,	16,	24,	23,	22,	21,	*12,	16,	14.
760' - 770'	18,	13,	15,	17,	15,	15,	15,	15,	14,	16.
770' - 780'	15,	12,	18,	16,	14,	17,	18,	20,	20,	20.
780' - 790'	25,	13,	19,	22,	24,	24,	28,	24,	21,	20.
790' - 800'	21,	26,	16,	20,	27,	30,	14,	22,	20,	16.
800' - 810'	13,	15,	25,	38,	27,	40,	20,	17,	15,	10.
810' - 820'	25,	21,	19,	25,	30,	25,	27,	22,	18,	17.
820' - 830'	15,	17,	18,	25,	30,	30,	25,	*13,	17,	20.
830' - 840'	18,	14,	12,	16,	20,	15,	20,	17,	18,	21.
840' - 850'	21,	20,	21,	21,	22,	22,	22,	17,	14,	14.
850' - 860'	23,	22,	20,	18,	16,	13,	12,	15,	23,	21.
860' - 870'	31,	28,	31,	22,	26,	23,	18,	15,	12,	16.
870' - 880'	30,	21,	18,	18,	19,	20,	19,	22,	22,	24.
880' - 890'	23,	25,	23,	22,	21,	20,	17,	22,	21,	27.
890' - 900'	23,	28,	22,	19,	21,	25,	30,	30,	*15,	11.

* New Bit

900' - 910'	5, 11, 9, 10, 10, 10, 10, 9, 11, 14.
910' - 920'	17, 14, 11, 13, 18, 19, 19, 15, 14, 15.
920' - 930'	16, 15, 18, 23, 23, 27, 23, 20, 15, 21.
930' - 940'	24, 24, 16, 21, 19, 14, 26, 21, 22, 32.
940' - 950'	35, 30, 43, 27, 28, 27, 15, 18, 20, 20.
950' - 960'	14, 16, 28, 28, 18, 22, 27, 28, 20, 21.
900' - 970'	19, 17, 22, 18, 23, 26, 25, 25, 22, -.

Coring Time

969' - 979'	8, 9, 9, 10, 9, 11, 13, 10, 14, 14.

Reaming Time

969' - 979'	6, 5, 8, 8, 8, 7, 10, 9, 9, 9.

Drilling Time

	----------16.
980' - 990'	25, 26, 25, 24, 26, 20, 21, 12, 11, 12.
990' - 1000'	13, 15, 15, 14, 11, - - - - -

Coring Time

995' - 1005'	9, 8, 9, 9, 9, 10, 10, 10, 10, 10.

Drilling Time

1005' - 1010'	20, 19, 19, 18, 19, -- -- -- -- -- -.
1010' - 1020'	23, 17, 24, 25, 20, 22, 15, 15, 15, 18.
1020' - 1030'	17, 22, 25, 21, 15, 18, 21, 20, 20, 21.
1030' - 1040'	20, 18, 18, 19, 18, 26, 21, 22, 18. 17.
1040' - 1050'	18, 22, 20, 23, 20, 20, 18, 19, 18, 19.
1050' - 1060'	16, 19, 21, 16, 19, 22, 23, 25, 23, 18.
1060' - 1070'	23. 27, 35, 27, 23, 34, 23, 20, 33, 28.
1070' - 1080'	20, 36, 50, *12, 14, 14, 17, 15, 18, 19.
1080' - 1090'	18, 18, 17, 18, 15, 13, 14, 18, 19, 19.
1090' - 1100'	22, 21, 24, 15, 15, 20, 17, 16, 16, 18.
1100' - 1110'	22 - - - - - - - - -

* New Bit

Coring Time

-, 14, 15, 11, 15, 14, 13, 10, 11, -.
(Core Jammed)

Drilling Time

	-	-	-	-	-	-	-	-	-	13.
1110'-1120'	14,	14,	13,	14,	14,	15,	16,	20,	20,	23.
1120'-1130'	22,	23,	20,	18,	20,	15,	22,	28,	30,	17.
1130'-1140'	17,	18,	18,	20,	20,	15,	15,	14,	16,	18.
1140'-1150'	20,	16,*	18,	19,	19,	20,	15,	17,	24,	25.
1150'-1160'	28,	22,	15,	15,	25,	20,	20,	21,	18,	21.
1160'-1170'	20,	21,	22,	21,	20,	22,	20,	22,	23,	19.
1170'-1180'	16,	18,	17,	20,	20,	18,	22,	27,	24,	24.
1180'-1190'	21,	19,	22,	21,	20,	16,	14,	20,	19,	21.
1190'-1200'	24,	16,	15,	18,	24,	23,	20,	25,	20,	24.
1200'-1210'	26,	25,	25,	20,	20,	19,	16,	18,	20,	27.
1210'-1220'	16,	15,	13,	22,	25,	22,	28,	22,	18,	25.
1220'-1230'	25,	30,	20,	17,	16,	15,	15,	14,	15,	17.
1230'-1240'	15,	15,	16,	16,	20,	18,	18,	20,	18,	19.
1240'-1250'	18,	18,	15,	19,	20,	16,	20,	18,	17,	19.
1250'-1260'	18,	19,	19,	21,	21,	22,	20,	25,	23,	27.
1260'-1270'	23,	22,	24,	22,	18,	20,	19,	19,	21,	25.
1270'-1280'	33,	34,	21,	39,	38,	39,	41,	32,	44,	54.

Coring Time

1280'-1290'	6,	6,	7,	9,	8,	9,	8,	9,	10,	9.

Reaming Time

1280'-1290'	15,	16,	14,	13,	17,	16,	19,	16,	16,	16.

Drilling Time

1290'-1300'	27,	32,	28,	31,	21,	17,	25,	26,	25,	24.
1300'-1310'	25,	34,	33,	23,	18,	24,	27,	19,	31,	36.
1310'-1320'	32,	40,	65,	46,	48,	50,*	20,	30,	28,	22.
1320'-1330'	25,	23,	24,	23,	27,	25,	25,	20,	28,	33.
1330'-1340'	24,	38,	44,	43,	40,	38,	37,	23,	18,	20.

* New Bit

1340'-1350' 28, 33, 23, 15, 27, 25, 30.

Coring Time

1347'-1351' 6, 7, 7, 9.
(Core Jammed)

Drilling Time

1350'-1360'	-,	30,	20,	19,	20,	25,	12,	13,	12,	18.
1360'-1370'	28,	20,	20,	24,	25,	27,	27,	26,	22,	19.
1320'-1380'	20,	23,	23,	23,	28,	28,	28,	27,	29,	26.
1380'-1390'	28,	26,	12,	12,	18,	21,	19,	21,	20,	21.
1390'-1400'	19,	27,	29,	32,	37,	35,	29,	30,	23,	19.
1400'-1410'	26,	32,	36,	30,	29,	31,	36,	35,	26,	23
1410'-1420'	*17,	24,	24,	25,	28,	34,	41,	32,	23,	41.
1420' - 1430'	29,	35,	32,	25,	21,	26,	27,	21,	28,	29.
1430'-1440'	26,	30,	28,	34,	29,	30,	31,	28,	24,	23.
1440'-1450'	28,	32,	28,	34,	35,	35,	61,	55,	50,	*33.
1450'-1460'	37,	29,	29,	35,	37,	29,	36,	29,	28,	27.
1460'-1470'	36,	40,	35,	16,	17,	20,	28,	21,	29,	26.
1470'-1480'	27,	27,	28,	32,	25,	26,	39,	41,	35,	43.
1480'-1490'	*44,	34,	37,	43,	40,	45,	39,	39,	39,	36.
1490'-1500'	37,	40,	43,	32,	45,	39,	38,	-	-	-

MUD RECORD

Date	Wt.	Vis.	W. L.	pH	Additives
Jan. 7	8.6	43			700 lbs. gel.
8	9.6	47			
9	10.3	55			
10	8.7	32	60+		800 lbs. calcium chloride
11	9.9	76			750 lbs. gel.
12	9.7	45			1100 lbs. gel. (started using two mud pits).
13	10.5	48			
14	10.6	48			
15					
16	9.3	34	33	9.2	100 lbs. bicarbonate
17	9.8	40	16	10.5	10 lbs. quebracho, 5 lbs. caustic.
18	10	42	11.8	10	200 lbs. gel, 15 lbs. quebracho & 5 lbs. caustic.
19	9.8	37	7.6	10	50 lbs. bicarbonate, 10 lbs. quebracho, 5 lbs. caustic.
20	9.7	36	10	9.7	50 lbs. bicarbonate, 50 lbs. Anti. Gyp.
21	9.7	37	9.8	10	
22	9.5	38	9.2	9.4	450 lbs. gel.
23	9.4	40	9.3	9.5	
24	9.4	43	9.4	9.2	250 lbs. gel.
25	9.4	42	9.3	9.5	5 lbs. quebracho, 2 lbs. caustic.
26	9.5	42	8.4	9.5	
27	9.4	45	7.2	9.5	600 lbs. gel., 10 lbs. quebracho, 5 lbs. caustic
28	9.5	64	7.0	9.5	2 1/2 lbs. High Viscosity Driscose.
29	9.5	52	7.4	9.5	
30	9.4	42	7.8	9	
31	9.3	54	6.8	8.5	200 lbs. gel, 5 lbs. High Vis.

MUD RECORD

Date	Wt.	Vis.	W. L.	pH	Additives
Feb. 1	9.5	48	6.1	9.0	20 lbs. Spersene, 10 lbs. caustic.
2	9.6	48	6.5	10	
3	9.8	46	6.3	10	
4	9.8	43	6.6	9.5	100 lbs. gel.
5	9.9	45	6.8	8.5	300 lbs. gel.
6	9.9	55	7.1	9.3	20 lbs. Spersene, 5 lbs. caustic, 2 1/2 lbs. High Viscosity.
7	10.1	65	5.4	6.6	500 lbs. Anti. Gyp. (Sand 9.3)
8	9.9	56	6.5	8.5	5 lbs. High Viscosity
9	10	54	7.2	8	400 lbs. gel.
10	9.9	47	6.4	8.5	20 lbs. quebracho, 10 lbs. caustic
11	9.9	43	6.4	9.5	
12	10.1	47	6.8	8.5	
13	10.1	46	6.6	8.5	
14					400 lbs. bicarbonate of soda.
15	9.6	57			
16					420 lbs. calcium chloride.

BIT RECORD

NO.	SERIAL	SIZE	MAKE	TYPE	FROM	TO	FEET	HOURS	REMARKS
1	9726	4 3/4	Williams	K2	0	175	175	14	Good
2	7743	4 3/4	Williams	K1	175	185	10	4	Near new
3	3105	4 3/4	Varel	V1	185	222	37	12	Good
4	3095	4 3/4	Varel	V1	222	253	31	8 1/2	Bearings loose
5	62811	8 5/8	Hughes	OWV	0	202	202	30 1/2	Fair
6	54963	8 5/8	Hughes	OWV	202	255	53	22	Bearings loose
7	9725	4 3/4	Williams	K2	255	361	106	20 1/4	Bearings loose, dull
8	9729	4 3/4	Williams	K2	361	470	109	22 3/4	Bearings, loose, teeth good.
9	9728	4 3/4	Williams	K2	470	526	56	24 1/4	
10	9727	4 3/4	Williams	K2	526	583	57	24 1/4	
11	3059	4 3/4	Varel	V1	583	602	19	11 3/4	
12	9724	4 3/4	Williams	K2	602	648	46	24 3/4	
13	571	4 3/4	Williams	K2	648	694	46	24	
14	573	4 3/4	Williams	K2	694	757	63	24 1/4	
15	572	4 3/4	Williams	K2	757	827	70	24 1/4	
16	570	4 3/4	Williams	K2	827	898	71	24 3/4	
17	569	4 3/4	Williams	K2	898	969	71	24	
	Core				969	979	10	1 3/4	Good
18	607	4 3/4	Williams	K2	979	995	16	10 1/2	
	Core				995	1005	20	3 1/2	Good
19	9284	4 3/4	Williams	K3	1005	1074	69	24	
20	9281	4 3/4	Williams	K3	1074	1152	78	24	
21	9285	4 3/4	Williams	K3	1152	1222	70	24 1/2	
22	9282	4 3/4	Williams	K3	1222	1280	58	22 1/4	
23	568	4 3/4	Williams	K2	1280	1290	10		Reaming
					1290	1316	26	16 1/4	Dull, loose

BIT RECORD (cont'd.)

NO.	SERIAL	SIZE	MAKE	TYPE	FROM	TO	FEET	HOURS	REMARKS
24	9411	4 3/4	Williams	K2	1316	1347	31	14 3/4	
24	9411				1347	1351	4		Reaming
25	8659	4 3/4	Varel	V1	1351	1410	59	25 1/4	Dull & loose
26	3008	4 3/4	Varel	V1	1410	1449	39	20 1/4	Dull
27	7444	4 3/4	Williams	K1	1449	1480	31	16 1/4	Very dull, loose
28	7746	4 3/4	Williams	K1	1480	1497	18	11	

DRILL STEM TEST NO. 1

Date -	January 28, 1960
Type of tool -	Made by Drill Stem Testers Ltd.
Formation tested -	Bear Rock.
Size of hole -	4 3/4"
Size of rubber -	3 5/8"
Length of tail pipe -	25'
Perforations -	25'
Depth -	969'
Interval tested -	944' to 969'
Remarks -	Misrun, dart made a clean hole through disk, causing disk to plug.

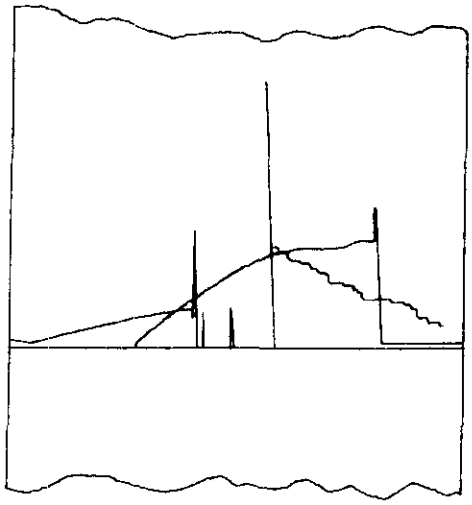
DRILL STEM TEST NO. 2

Date -	January 30, 1960
Type Of Tool -	Made by Drill Stem Testers Ltd.
Formation Tested -	Bear Rock
Size Of Hole -	4 3/4"
Size Of Rubber -	3 5/8"
Length Of Tail Pipe -	105'
Perforations -	25'
Depth -	1,005'
Valve Open -	1 hour
Shut In -	Nil
Nature Of Blow -	Good initial puff, steady weak blow.
Interval Tested -	900' - 1,005'

Initial flowing pressure - 10 lbs.
Final flowing pressure - 238 lbs.
Hydrostatic pressure - 418 lbs.

Recovery - 500' of watery mud, sulphur odour, no salt.

Remarks - Packer broke 4" from top and telescoped, necessary to rotate to pull loose. Tool run without disk sub.



DRILL STEM TEST NO. 3

Date -	January 31, 1960.
Type of tool -	Made by Drill Stem Testers Ltd.
Formation tested -	Bear Rock
Size of hole -	4 3/4"
Size of rubber -	3 5/8"
Length of tail pipe -	70'
Perforations -	20'
Depth -	1005'
Interval tested -	935' to 1005'
Remarks -	Misrun, packer failed to seat, tool run without disk sub.

DRILL STEM TEST NO. 4

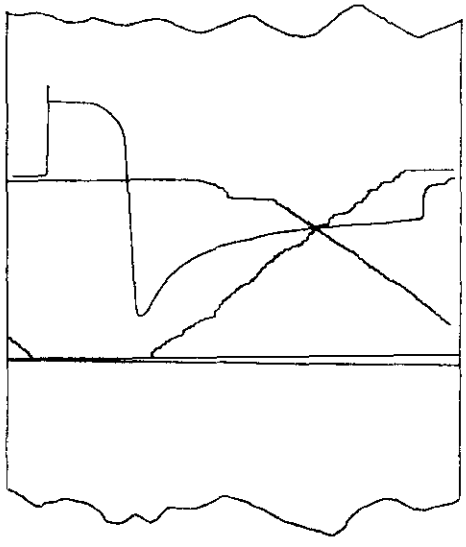
Date -	January 31, 1960
Type of tool -	Made by Drill Stem Testers Ltd.
Formation tested -	Bear Rock
Size of hole -	4 3/4"
Size of rubber -	3 5/8"
Length of tail pipe -	65'
Perforations -	25'
Depth -	1005'
Interval tested -	940' to 1005'
Remarks -	Misrun, packer failed to seat, tool run with disk sub.

DRILL STEM TEST NO. 5

Date -	February 1, 1960
Type of tool -	Made by Drill Stem Testers Ltd.
Formation tested -	Bear Rock
Size of hole -	4 3/4"
Size of rubber -	3 5/8"
Length of tail pipe -	75'
Perforations -	25'
Depth -	1005'
Remarks -	Misrun, packer failed to seat, tool run with disk sub.

DRILL STEM TEST NO. 6

Date -	February 9, 1960
Type Of Tool -	Made by Drill Stem Testers Ltd.
Formation Tested -	Silurian
Size Of Hole -	4 3/4"
Size Of Rubber -	3 5/8"
Length Of Tail Pipe -	25'
Perforations -	25'
Depth -	1, 351'
Valve Open -	80 minutes
Shut In -	Nil
Nature Of Blow -	Good initial puff, weak steady blow.
Interval Tested -	1, 326' to 1, 351'
Initial flowing pressure -	190 lbs.
Final flowing pressure -	630 lbs.
Hydrostatic pressure -	694 lbs.
Recovery -	full string of sulphur water.
Remarks -	When packer was pulled loose the main valve remained open, mud displaced the water which began to flow from the hose immediately indicating the pipe was nearly full of water.



BREAKDOWN OF TIME SPENT ON THE HOLE

Drilling 4 3/4"	484 3/4 hours
Reaming tight hole	4 1/2 hours
Reaming to 8 5/8"	53 3/4 hours
Setting surface casing, W.O.C., drilling out, pressuring up	36 1/2 hours
Circulating	6 1/2 hours
Trips	62 hours
Testing, including trips, conditioning mud, waiting for daylight	71 hours
Coring, including trips, conditioning mud, handling core	53 1/2 hours
Repairs	34 1/2 hours
Service	15 3/4 hours
Logging, including velocity log	16 hours
Cement plugs, including W.O.C.	65 hours
Bailing	16 hours
Stuck in hole	30 hours
Time lost due to freezing mud lines	29 1/4 hours
TOTAL TIME ON HOLE	979 hours

SAMPLE AND CORE DESCRIPTION

0' - 173'	Sand and gravel - grains and fragments of quartz, igneous rock, limestone, dolomite, sandstone, hard green shale, grey shale with spores, rare black chert. Rock appears to be mainly medium to coarse grained sand of quartz with some igneous grains which are very well rounded, layers of gravel and boulders occur throughout the section. Cuttings of sandstone are usually porous and oil stained.
173'	Lower Ramparts.
173' - 190'	Limestone - brownish grey, argillaceous, very fine crystalline, rich in fossils - ostracods, brachiopods and gastropods.
190' - 195'	Limestone - as above 90%. Shale - brownish grey, calcareous, rounded fragments of limestone, probably fossils, 10%
195' - 205'	Limestone - as above 90%. Limestone - brown, vitreous, clean, probably coral material 10%.

205' - 220' Limestone - brownish grey, argillaceous, ostracods and brachiopod fragments, brown shaly partings, some with crinoids, traces of clean, fine crystalline limestone (corals?).

220' - 255' (Cavings fairly bad)

Limestone - light brownish grey, very fine, nearly dense, tiny broken fossil debris scattered throughout. Trace of green calcareous shale and greenish grey argillaceous limestone (some of the argillaceous material is up to fine silt size). Pyrite common at top, minor amounts throughout.

(End of bad cavings)

255' - 300' Limestone - as above but fewer fragments 50%.

Shaly limestone and limy shale - gradational from shale to limestone - greenish, calcareous, soft and flaky to hard, 50%.

300' - 462' Limestone - greenish to brownish grey, the brown limestone is fragmental and fossiliferous, fragments of crinoids, brachiopods and ostracods, greenish limestone is argillaceous, 80%.

300' - 462'(cont'd.)
In places fossils make up to 20% of the limestone.

Shale - green, calcareous, 20%

462' Bear Rock.

462' - 505' Limestone -brown, very fine crystalline to dense, texture often shows pellet like structure, very fine to medium, round, forms in a clear matrix, may be bahamite or algal texture, this texture varies from very faint to pronounced.

505' - 525' Limestone - tan, brown to grey, sub-lithographic, some brown limestone as above, thin partings of hard, dark grey argillaceous material.

525' - 590' Limestone - tan, some grey, sub-lithographic, 50%.

Limestone - brown, very fine crystalline, clear calcite network or inclusions, traces of bahamite or algal texture, 50% $\pm$. Dark argillaceous partings and stylolites, these may be bituminous but have negative CC/4 reaction.

590' - 712' Gradational with above.

Limestone - grey to brown, very fine crystalline to nearly dense, traces of sub-lithographic limestone, algal (?) texture common in upper part, outlined by clear calcite, becomes rare downward; argillaceous partings or stylolites abundant.

630' Trace of clear calcite crystals.

650' Trace of clear calcite crystals.

695' Traces of green shale.

712' - 722' Drilling break, possibly caused by presence of shale. Trace of shale-green, calcareous, disintegrates quickly in water.

Limestone - brown and grey, mostly microcrystalline to sub-lithographic, practically no change from above. Algal texture very rare.

722' - 900' Limestone - as above.

Traces of shale - dark and bright green, slightly to non-calcareous, hard(disintegrates quickly in water).

722' - 900'(cont'd.)

Some of the shale contains what appears to be roun ded limestone grains, also pyrite.

840' Trace of pin point porosity.

Some of the limestone has a slight greenish cast and contains a small amount of very fine silt and argillaceous material.

900' - 937' Limestone - as above, some waxy green shale with rounded limestone grains, algal texture more common.

910' Trace of pin point porosity with oil stain.

937' - 965' Limestone - as above 50%

Dolomite - light brownish grey, very fine crystalline, granular, 50%.

Trace of pin point porosity with oil stain occurs at 940' and below.

965' - 969' Limestone - as below - slight granular texture, brown to grey, micro-crystalline, partings and stylolites of grey and green shale.

CORE #1 969' - 979'

969' - 979' Limestone - light brownish grey, micro-crystalline, very homogeneous, tight. Many tiny stylolites, a few partings up to 1/4" thick of green and grey, laminated, slightly calcareous shale. A few fractures, lined by coarse crystalline calcite - some porosity and oil stain associated with the fractures.

979' - 995' Limestone - as above, no oil stain.

CORE #2 995' - 1005'

995' - 1005' Limestone - light brownish grey, micro-crystalline, some nearly sub-lithographic(lime mud) many dark, thin argillaceous partings. One fracture tightly sealed with calcite. One tiny oil stained vug.

1005' - 1070' Limestone - light grey to brown, micro-crystalline, traces of calcite and green shale.

1070' - 1075' Limestone - brown, micro-crystalline, dark to black shale partings (brown streak).

1075'-1085' Limestone - as above 1070', traces of the dark partings.

1085'-1101' Limestone - as above, some limestone - light grey. very fine crystalline, some pin point and inter-crystalline porosity. Porosity only a trace except below 1095'.

CORE #3 1101' - 1109'

1101'-1109' Limestone - light grey, micro-crystalline, very fine stylolites. Rare fractures lined with medium sized calcite crystals, some very fine limestone associated with the fractures - probably permeable.

1109'-1118' Limestone - light grey, micro-crystalline.(As in core above)

1118'-1125' Limestone - brownish grey, fine crystalline, some porosity. Some limestone as above.

1125'-1150' Limestone - light grey and brownish grey, micro-crystalline, some light and some brownish grey, fine crystalline porous limestone.

1150'-1180' Limestone - light grey and brownish grey, micro-crystalline, mere traces of pin point porosity. Traces of dark green shale, a few very thin stylolites, a few calcite crystals.

1180'-1215' Limestone - as above but no trace of porosity. Trace of darker limestone with pyrite at the base.

1215'-1225' Limestone - brown, fine granular, trace of calcite.

1225'-1235' Limestone - brown, micro-crystalline.

1235'-1270' Limestone - light grey to brown, micro-crystalline, in part has a chalky appearance, a few dark shale partings.

1270' Silurian

1270'-1280' Dolomite - brown, very fine to fine crystalline very slightly silty, tight, pyrite, trace of green waxy shale, some white vein dolomite.

CORE #4 1280' - 1290'

1280'-1290' Rec. 10'

Dolomite - brown, slightly mottled, very fine crystalline, very slightly silty, many fine fractures tightly sealed with clear dolomite, larger fracture shows minor brecciation.

1290'-1337' Dolomite - brown to light brownish grey, traces of small drusy vugs, traces of porosity with oil stain at 1330'.

1337' - 1347' Dolomite - as above, traces of porosity to 1342', below 1342' considerable fine crystalline dolomite with good inter-crystalline porosity.

CORE #5 1347' - 1351'

1347'-1351' Rec. 4'

Dolomite - brown, very fine crystalline, very hard, many small vugs up to 3/8" and irregular fractures. Lining vugs is fine to medium crystalline dolomite with good porosity - excellent permeability. Some mottling and texture which probably represents organisims, possibly a reef or reef breccia.

1351'-1365' Dolomite - as above, considerable amount of good porosity, some limy dolomite.

1365'-1420' Dolomite - brown and light brown, very fine crystalline, some with a lighter and softer appearance, generally tight, trace of porosity as seen above. Small amount of very fine silt.

1420'-1440' Dolomite - as above 70%.

Dolomite - fine crystalline, excellent intercrystalline porosity, 30%.

1440'-1455' Dolomite - brown, fine to very fine crystalline, very slightly silty, traces of intercrystalline porosity, white, coarse crystalline dolomite, probably from vug or fracture filling.

1455'-1485' Dolomite - brown to light brownish grey, very fine crystalline, very slightly silty, trace of porosity, signs of drusy vugs, some white dolomite crystals.

1485'-1497' Dolomite - brown, very fine crystalline, rare trace of porosity.

STRATIGRAPHY

GENERAL

In the Rond Lake area, the upper part of the Stratigraphic Section is as follows.

Glacial Deposits

Till and lake sands, up to 200', nearly everywhere present.

Cretaceous

Poorly consolidated quartz sand, thin, random, patchy distribution.

Middle Devonian - Ramparts Formation

Upper Ramparts Limestone - 200'± not present in any of the wells drilled, forms the scarp west of Rond Lake.

Middle Ramparts Shale; also called Hare Indian River Shale - 600' to 700' of green shale, 30' at base contains interbedded dark brown shale.

Lower Ramparts Limestone - 300 feet minus, fossiliferous limestone.

Bear Rock Formation

800'±, very fine algal rich limestone, equivalent to the dolomite breccia of the Norman Wells area.

Silurian

Thickness unknown, dolomite with reefs.

PLEISTOCENE AND RECENT

Rond Lake No. 1 encountered 173 feet of glacial deposits - sand and pebbles in a clay matrix. The deposits are chiefly medium to coarse grained quartz sand, with layers of gravel composed of a variety of sedimentary rocks of local derivation as well as a few grains of igneous rock.

LOWER RAMPARTS LIMESTONE

The Lower Ramparts limestone consists of argillaceous, fossiliferous limestone with interbedded green, calcareous shale. Brachiopods, ostracods and cup-corals are common throughout. The upper 82 feet are predominantly limestone, much of which is formed from layers of colonial corals. The lower 207 feet contain more interbedded shale.

In Rond Lake No. 1, the Lower Ramparts is 289 feet thick, this is 17 feet thicker than in Rond Lake No. 2, the only other well to penetrate the full section. Two hundred eighty nine feet is probably not the full thickness of the Lower Ramparts, as glacial deposits directly overlie the limestone. From a comparison of E-logs in wells No. 1 and No. 2, it can be seen that in well No. 1 the lower part of the section, between 312 feet and 462 feet, thins gradually from 150 feet in No. 1 to 138 feet in No. 2, accounting for 12 of the 17 foot difference.

BEAR ROCK

Rond Lake No. 1 penetrated the full Bear Rock section between 462 and 1270 feet. The formation is 808 feet thick and is composed predominantly of clean, very fine, nearly dense limestone. There are many stylolites and thin partings of brown shale. The texture of the rock indicates that it probably originated as a lime mud bound together by algal material. Ostracods are common throughout the section aside from ostracods and algae, there is no trace of organic material. A characteristic of the Bear Rock formation is the presence, throughout the section of quartz in the form of tiny euhedral crystals.

Traces of pin point porosity occur throughout the lower 430 feet of the formation. Some poor porosity occurs in the layers from 937 to 965 feet and from 1150 to 1180 feet; the layer from 937 to 965 is in part granular dolomite. Better porosity, associated with fractures, occurs from 1095 to 1109 feet and from 1118 to 1125 feet. Good intercrystalline porosity is present between 1125 to 1150 feet.

The oil stained porous layer from 940 to 965 feet was tested by Drill Stem Test No. 2 and by later bailing operations, oil cut sulphur water was obtained. Lower porous layers were not oil stained and were not tested.

SILURIAN

The Silurian was encountered at a depth of 1270 feet and 227 feet were drilled; the total thickness of the Silurain is unknown. The drilled section consists of brown, fine crystalline dolomite, very fine detrital silt is present throughout. Core No. 4, taken near the top of the Silurian shows that the dolomite has a mottled appearance, it is cut by several fracturers tightly sealed by crystalline dolomite, minor brecciation is associated with the larger fractures.

Porous layers occur between 1342 and 1365 feet and between 1420 and 1440 feet. In addition traces of porosity are present throughout the section below 1337 feet. Core No. 5 was cut in the upper porous section; good inter-

crystalline porosity is associated with many small vugs and fracturers, these vugs and porous patches occur within a body of tight hard, fine dolomite, however the permeability is excellent. The lower porous layer has excellent inter-crystalline porosity.

No recognizable fossils were seen in the cores or samples, however the arrangement and shape of the vugs gives an impression of organic material.

The upper porous zone was tested and contained sulphur water.

DISCUSSION

Rond Lake No. 1 took 42 days to drill 1497 feet. Slow drilling in the hard carbonates, especially reaming to 8 5/8" for surface casing, is one reason for the slow progress but other factors are involved.

The drill pipe became frozen in the hole at 220 feet, a result of not tripping out while making repairs on the mud pump. Although the pipe was rotated and the kelly worked periodically, the hole iced up in twelve hours. This freezing on the wall of the hole happened again during bailing operations, within twenty four hours enough ice formed on the walls of the hole that the bailer could not get down.

Another big time waster was the series of misruns which were a result of running a packer rubber which had been left out in the cold (down to 65 below) between tests. The one successful test of this series was the result of an accident - the packer rubber broke in two and telescoped, fortunately the telescoping occured with the expanded part of the rubber pointing upwards, otherwise the testing

tool would probably still be in the hole.

The third problem that used a lot of time were the attempts to plug back for a test of the upper porous zone. The permeability in the Silurian was so good that the cement plugs slowly sank, displacing mud into the formation. Actually as it turned out the first drill stem test of this upper zone, which recovered 500 feet of watery mud, effectively evaluated the zone, but the significance was missed because of the complete lack of indications of salt.

Thin zones of porosity with only fair permeability were found low in the Bear Rock formation, cuttings from the upper porous layer had oil stain. Fluid recovered from the zone was oil cut water with a sulphur odour. Thicker, good porosity with excellent permeability was encountered in the Silurian, this layer tested sulphur water. Formation pressures are low, approximately equal to the hydrostatic head of Rond Lake. From results of Rond Lake No. 2 it is evident that there is no permeability barrier between the Silurian and the Bear Rock reservoirs.

Much of the porous rocks, from the upper porous zone in the Bear Rock was oil stained.

G. K. Williams, P. Eng.

CGL-6

CHEMICAL & GEOLOGICAL LABORATORIES LTD.

Edmonton — Fort St. John — Calgary

WATER ANALYSIS REPORT

Field ..... Well No. Rond Lake #1.

Operator Western Decalta Petroleums Limited Date Received March 21, 1960.

Formation ..... Depths .....

Other pertinent data Rond Lake drinking water.

Date April 6, 1960 Lab. No. C 2783-4

PARTS PER MILLION (MILLIGRAMS PER LITER)

Na & K	Ca	Mg	Fe	SO_4	Cl	CO_3	HCO_3	OH	H_2S
34	35	10		31	14		185		

MILLIGRAM EQUIVALENTS

1.49	1.75	0.82		0.64	0.39		3.03		

MILLIGRAM EQUIVALENTS IN PERCENT

18.35	21.55	10.10		7.88	4.80		37.32		

Total Solids in Parts per Million

By evaporation	212
After ignition	142
Calculated	215
Specific Gravity	1.003
Observed pH	8.1
Resistivity	7.42 ohm meters @ 68° F.

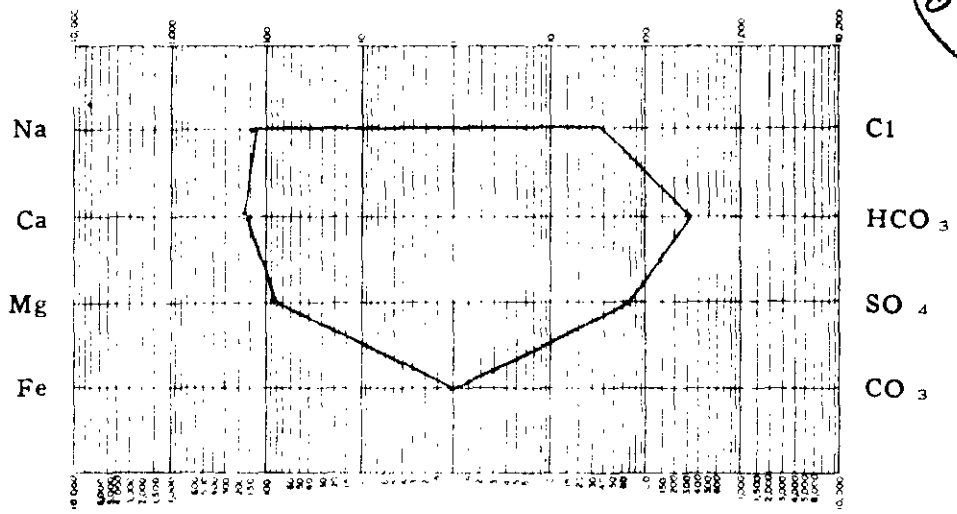
Properties of Reaction in Percent

Primary salinity	25.36
Secondary salinity	---
Primary alkalinity	11.34
Secondary alkalinity	63.30
Chloride salinity	37.85
Sulfate salinity	62.15

Remarks and conclusions Organic matter present in total solids.

Milligram equivalents multiplied by 100 on the graph.

LOGARITHMIC PATTERN
MEQ per unit



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WATER ANALYSIS REPORT

Field ..... Well No. Rond Lake #1

Operator Western Decalta Petroleums Limited Date Received March 21, 1960

Formation ..... Depths 1046'

Other pertinent data Boiling sample March 8, 1960, oil scum.

Date April 6, 1960 Lab. No. C 2783-1

PARTS PER MILLION (MILLIGRAMS PER LITER)

Na & K	Ca	Mg	Fe	SO_4	Cl	CO_3	HCO_3	OH	H_2S
1,678	239	175		523	2,900		405		Present

MILLIGRAM EQUIVALENTS

72.98	11.93	14.39		10.88	81.78		6.64		

MILLIGRAM EQUIVALENTS IN PERCENT

36.75	6.01	7.24		5.48	41.18		3.34		

Total Solids in Parts per Million

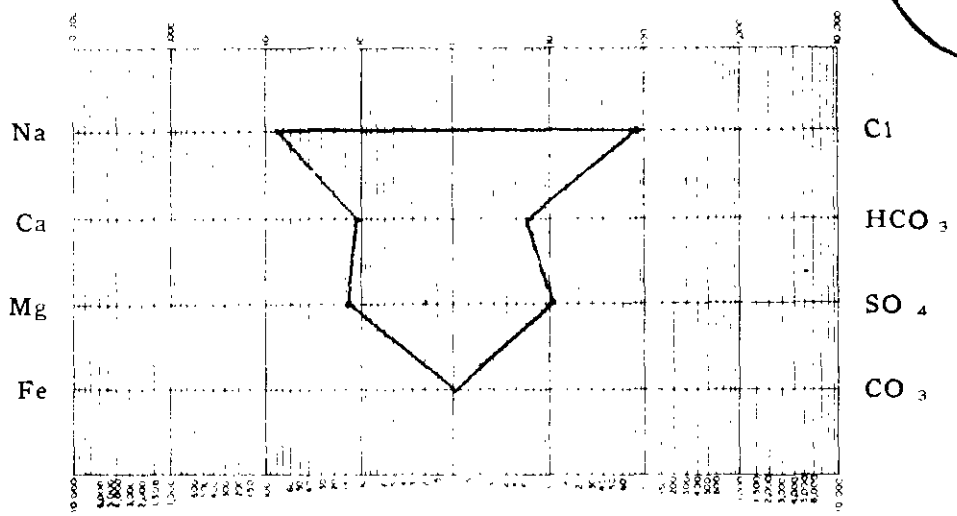
By evaporation	6,760
After ignition	5,040
Calculated	5,708
Specific Gravity	1.008
Observed pH	8.3
Resistivity	0.943 ohm meters @ 68° F.

Properties of Reaction in Percent

Primary salinity	73.50
Secondary salinity	19.82
Primary alkalinity	---
Secondary alkalinity	6.68
Chloride salinity	88.26
Sulfate salinity	11.74

Remarks and conclusions

LOGARITHMIC PATTERN
MEQ per unit



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Edmonton — Fort St. John — Calgary

WATER ANALYSIS REPORT

Field ..... Well No. Rond Lake #1.

Operator Western Decalta Petroleums Limited Date Received March 21, 1960.

Formation ..... Depths .....

Other pertinent data Rond Lake drinking water.

Date April 6, 1960 Lab. No. C 2783-4

PARTS PER MILLION (MILLIGRAMS PER LITER)

Na & K	Ca	Mg	Fe	SO_4	Cl	CO_3	HCO_3	OH	H_2S
34	35	10		31	14		185		

MILLIGRAM EQUIVALENTS

1.49	1.75	0.82		0.64	0.39		3.03		

MILLIGRAM EQUIVALENTS IN PERCENT

18.35	21.55	10.10		7.88	4.80		37.32		

Total Solids in Parts per Million

By evaporation 212

After ignition 142

Calculated 215

Specific Gravity 1.003

Observed pH 8.1

Resistivity 7.42 ohm meters @ 68° F.

Properties of Reaction in Percent

Primary salinity 25.36

Secondary salinity ---

Primary alkalinity 11.34

Secondary alkalinity 63.30

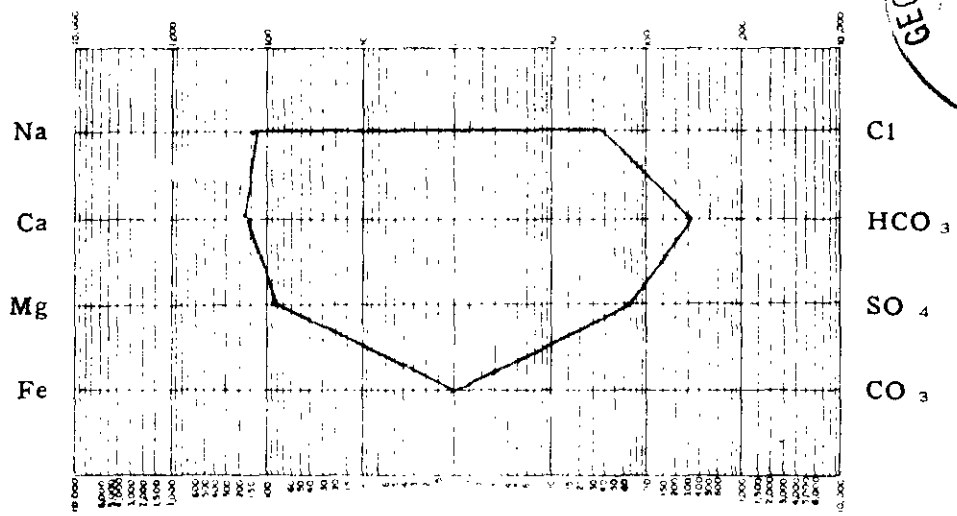
Chloride salinity 37.85

Sulfate salinity 62.15

Remarks and conclusions Organic matter present in total solids.

Milligram equivalents multiplied by 100 on the graph.

LOGARITHMIC PATTERN
MEQ per unit



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Edmonton — Fort St. John — Calgary

WATER ANALYSIS REPORT

Field ..... Well No. Rond Lake #1

Operator Western Decalta Petroleums Limited Date Received March 21, 1960

Formation ..... Depths 1046'

Other pertinent data Boiling sample March 8, 1960.

Date April 6, 1960 Lab. No. C 2783-2

PARTS PER MILLION (MILLIGRAMS PER LITER)

Na & K	Ca	Mg	Fe	SO_4	Cl	CO_3	HCO_3	OH	H_2S
1,471	367	102		685	2,400		535		Present

MILLIGRAM EQUIVALENTS

64.01	18.31	8.38		14.25	67.68		8.77		

MILLIGRAM EQUIVALENTS IN PERCENT

35.29	10.09	4.62		7.86	37.31		4.83		

Total Solids in Parts per Million

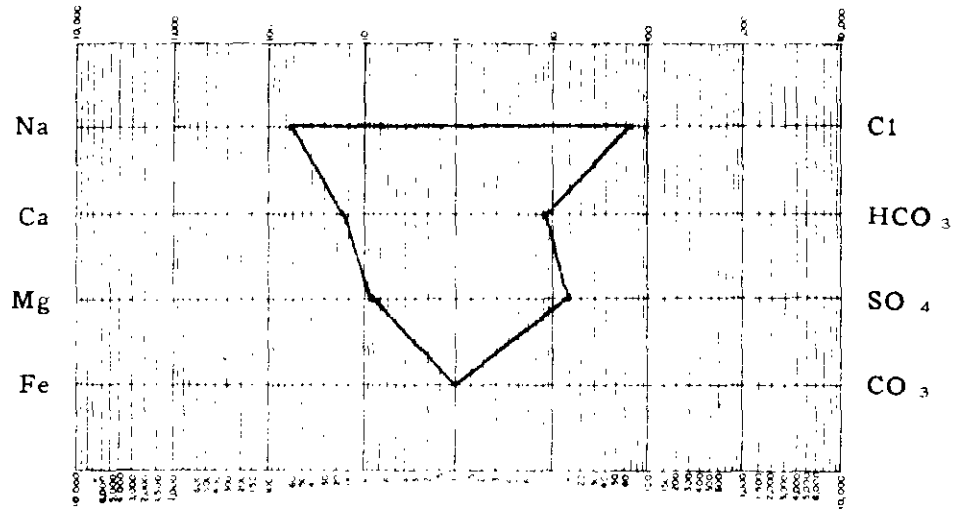
By evaporation	5,290
After ignition	4,500
Calculated	5,288
Specific Gravity	1.007
Observed pH	7.8
Resistivity	1.042 ohm meters @ 68° F.

Properties of Reaction in Percent

Primary salinity	70.58
Secondary salinity	19.76
Primary alkalinity	---
Secondary alkalinity	9.66
Chloride salinity	82.60
Sulfate salinity	17.40

Remarks and conclusions

LOGARITHMIC PATTERN
MEQ per unit



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WATER ANALYSIS REPORT

Field ..... **Well No.** Rond Lake #1

Operator Western Decalta Petroleums Limited **Date Received** March 21, 1960

Formation ..... **Depths** Depth of 1046'.

Other pertinent data Boiled by drill pipe, oil scum on top. Boiling trip No. 4, 3 singles from base.

Date April 6, 1960 **Lab. No.** C 2783-3

PARTS PER MILLION (MILLIGRAMS PER LITER)

Na & K	Ca	Mg	Fe	SO_4	Cl	CO_3	HCO_3	OH	H_2S
1,084	4,530	---		91	9,500	72		17	

MILLIGRAM EQUIVALENTS

47.14	226.05			1.89	267.90	2.40		1.00	

MILLIGRAM EQUIVALENTS IN PERCENT

8.63	41.37			0.35	49.03	0.44		0.18	

Total Solids in Parts per Million

By evaporation	19,160
After ignition	13,880
Calculated	15,294
Specific Gravity	1.013
Observed pH	11.2
Resistivity	0.452 ohm meters @ 68° F.

Properties of Reaction in Percent

Primary salinity	17.26
Secondary salinity	81.50
Primary alkalinity	---
Secondary alkalinity	1.24
Chloride salinity	99.29
Sulfate salinity	0.71

Remarks and conclusions

Milligram equivalents multiplied by 10 on the graph,

LOGARITHMIC PATTERN
MEQ per unit