W E L L H I S T O R Y R E P O R T

for

CANOE RIVER CHANCE

YT J - 19

YUKON

Canoe River Exploration Ltd.
Calgary

H. W. Meech
Pres., Canoe River Exploration

February, 1968

I N D E X

SUMMARY OF WELL DATA

Well Name & Number: Canoe River Chance YT J-19

Permittee: Western Minerals Ltd.

Operator: Canoe River Exploration Ltd.

Location: Unit J, Section 19, Grid N 66°10', W 137°30'
Latitude: 66°08'31.20"N, Longitude: 137°32'28.022"

Co-ordinates: 50' S, 66' W of S.P 8 on Seisline NB

Permit Number: 3363

Drilling Contractor: Nabors Drilling Limited, Rig #1 - Oilwell 76

Drilling Authority: #277, Nov. 10, 1967

Classification: ~~Wildcat~~ Exploratory outpost

Elevations: Ground 1687', K.B. 1701.5'

Spudded: 10:30 P.M., Dec. 14, 1967

Completed Drilling: 4:00 P.M., Feb. 12, 1968

Total Depth: Driller 4745', Schlumberger 4740'

Well Status: Suspended Gas & Oil Well

Rig Released: 8:00 A.M., Feb. 17, 1968

Hole Size: ~~8 5/8"~~ 20" - Surface to 70'
12¼" - 70' - 809'
8⅝" - 809' - TD

Casing: Conductor Pipe: 84.74' X 13 3/8" X 54.5# J-55, landed at 70' K.B.

Surface: 809.38' X 9 5/8" X 36# J-55, landed at 809' K.B.

Production: 692.47' X 7" X 26# & 4034.61' X 7" X 23#, landed at 4725' K.B.

Universal Well Location Reference - Lat. 66.14199° N.
Long. 137.54111° W.

Unique Well Identifier - 3007196610137300

Form E-11—1M-12-63-Kal.

CANOE RIVER EXPLORATION LTD.

FORMATION RECORD

Company Canoe River Exploration Date Feb. 15, 1968

Well CANOE RIVER CHANCE YT J - 19 Field WC - Y.T.

Formation Information Taken from Logs, Samples and Cores

HORIZON	DEPTH From	DEPTH To	Subsea Top	Eff. Ft. Pay	REMARKS
Upper Cretaceous	Surf.	2318'	Eroded	Nil	Shale, Siltstone & some Coal.
Shale	"	"	"		
Blacky Sand	2318	2626	-616	Nil	Sandstone; s & p - lt.bn, v.f-f, gen.tight. Some p.por. Wet.
Lower Cretaceous	2626	4058	-924	Nil	
New Shale	"	"	"		Shale & Siltstone
Permo-Pennsylvanian	4060 (crs) 4058	Not Pen.	-2356		
Chance SS (Eroded)	4060 (crs) 4058	4489	-2356	Gas 177' Oil 42'	Sandstone; s & p, m - v crs., with poor to good porosity.
L. Alder L.S. (Bse. Chance)	4498 (crs) 4489	4138 731 Not Pen.	-2787	Gas 9'	Limestone; gy bn, silic, chty. bec. arg. in lower pt. Thin bed por. SS in int. 4557-68'.

SHEET No.

Form E-16—1M-12-63-Kal.

CANOE RIVER EXPLORATION LTD.

CORE SUMMARY

Company Canoe River Exploration Ltd. Date Feb. 6, 1968

Well CANOE RIVER CHANCE YT J-19 Field WC - Y.T.

Core No.	INTERVAL	Feet Cut	Feet Rec.	% Rec.	TYPE OF EQUIPMENT	Formation
1	4079 - 4135	56	53	95	6 1/8" Chris Diamond	Chance SS.
2	4136 - 4196	60	58.5	98	" " "	Chance SS.
3	4197 - 4245	48	46	96	" " "	Chance SS.
4	4388 - 4448	60	56	93.5	" " "	Chance SS.
5	4449 - 4503	54	52.7	97.5	" " "	Chance SS. & Alder L.S.
6	4560 - 4567	7	6.4	91	" " "	Alder L.S.

SHEET No. .....

CORE DESCRIPTIONS

Core #1: Interval 4079' - 4135' (Cut 56', Recovered 53')

4079.0 - 4084.0	5.0'	Sandstone; light brown, feldspathic, fine to medium, poor sorted, angular to subangular quartz and gray white feldspar grains well cemented with silica and kaolin. Tight. No stain or fluorescence. Oassy odor.
4084.0 - 4085.8	1.8'	Sandstone; light to dark brown, argillaceous, silty, very fine to fine, well cemented with clay, tight. Common partings of dark gray brown, very argillaceous sandstone in lower part showing very low angle to flat dip. Common finely disseminated pyrite.
4085.8 - 4090.3	4.5'	Sandstone; salt and pepper, feldspathic, medium to coarse, fair sorted, angular to subangular quartz, feldspar and common dark gray brown chert grains well cemented with silica. Occasional green chlorite grains. Poor to fair apparent porosity and permeability. No stain. Trace light yellow fluorescence.
4090.3 - 4094.2	3.9'	Sandstone; light brown argillaceous, silty, very fine to medium, poor sorted, angular, well cemented with kaolin, tight.
4094.2 - 4097.3	3.1'	Sandstone; dark gray brown, feldspathic, fine to coarse, poor sorted, subangular to subround quartz and feldspar and occasional dark brown gray chert grains well cemented with clay. Poor apparent porosity and permeability. No stain or fluorescence. Oassy odor.
4097.3 - 4105.5	8.2'	Sandstone, as above, gray brown, medium grained, well sorted with fair apparent porosity and permeability. No stain or fluorescence. Oassy odor.
4105.5 - 4107.8	2.3'	Sandstone, as above, very fine to medium, poor sorted, tight. Oassy odor.
4107.8 - 4115.8	8.0'	Sandstone, as above, light to medium brown, fine to medium, fair sorted, poor apparent porosity and permeability. No stain or fluorescence. Oassy odor.
4115.8 - 4119.8	4.0'	Sandstone, as above, gray brown, argillaceous, fine to medium, tight.
4119.8 - 4122.0	2.2'	Sandstone, as above, medium to coarse, tight.

Core #1: (cont'd.)

4122.0 - 4126.2	4.2'	Sandstone; salt and pepper, medium to coarse, fair sorted, subangular to subround quartz, feldspar and gray to dark brown gray chert grains, well cemented with clay and silica. Good porosity and permeability. No stain or fluorescence.
4126.2 - 4127.3	1.1'	Sandstone, as above, dark gray brown, very fine to medium, poor sorted, tight.
4127.3 - 4129.5	2.2'	Sandstone, as above, gray brown, medium to coarse, fair sorted, subround. Good apparent porosity and permeability. No stain or fluorescence. Gassy odor.
4129.5 - 4129.8	0.3'	Sandstone, as above, very fine, crossbedded, tight.
4129.8 - 4132.0	2.2'	Sandstone; salt and pepper, medium to coarse, fair sorted, subangular to subround, quartz feldspar and dark brown gray chert grains, well cemented with silica. Fair apparent porosity and permeability. No stain. Very light yellow fluorescene, poor cut. Gassy odor.

Coring Time: (min./ft.) (4080) 16, 50, 39, 27, 31, 30, 41, 37, 35, 50, 36, 38, 49, 61, 70, 53, 53, 31, 18, 17, 17, 20, 36, 36, 33, 51, 49, 41, 37, 33, 30, 31, 34, 42, 47, 23, 55, 53, 56, 46, 51, 46, 53, 35, 34, 32, 40, 34, 51, 48, 39, 65, (4135).

Core #2: Interval 4136' - 4196' (Cut 60', Recovered 58.5')

4136.0 - 4140.7	4.7'	Sandstone; salt and pepper, medium to coarse, fair sorted, subangular to subround quartz, feldspar and dark brown gray chert grains cemented with silica and clay. Good to excellent apparent porosity and permeability. No staining, faint yellow fluorescence. Poor cut, good odor.
4140.7 - 4141.7	1.0'	Sandstone; light brown, fine to medium, fair sorted, subangular quartz and common feldspar grains well cemented with calcite. No stain. Faint yellow fluorescence. No cut. Gassy odor.
4141.7 - 4142.4	0.7'	Sandstone; light brown, feldspathic, medium to coarse, fair sorted, subangular to subround quartz, feldspar and dark gray chert grains well cemented with calcite, tight.
4142.4 - 4150.4	8.0'	Sandstone and Limestone, Interbedded. Sandstone; medium brown, calcareous, fine to medium and medium to coarse, fair sorted, subangular to subround quartz, feldspar and dark gray chert grains well cemented with calcite, tight. Limestone; light tan, sandy, microcrystalline, tight.

Core #2: (cont'd.)

4150.4 - 4151.4	1.0'	Sandstone; salt and pepper, medium grained, well sorted, subangular to subround quartz, feldspar and common dark chert grains loosely cemented with calcite. Fair porosity. Poor permeability. Light yellow fluorescence. Poor cut.
4151.4 - 4152.7	1.3'	Sandstone; gray brown, feldspathic, fine to coarse, poor sorted, subangular to subround, quartz, feldspar and common dark chert grains well cemented with calcite. Poor porosity and permeability. No stain, faint yellow fluorescence, very poor cut. Common pyrobitumen staining. Oily odor.
4152.7 - 4154.7	2.0'	Sandstone, as above, pyrobituminous, medium to coarse, tight.
4154.7 - 4156.5	1.8'	Sandstone, as above, light brown; fine to medium, tight.
4156.5 - 4158.4	1.9'	Sandstone; salt and pepper, calcareous, medium to very coarse, poor sorted, subangular quartz, feldspar and common dark chert grains well cemented with calcite, tight.
4158.4 - 4161.8	3.4'	Sandstone; salt and pepper, feldspathic, medium to coarse, fair sorted, subangular to subround feldspar, quartz and minor dark chert grains, cemented with calcite. Fair porosity. Good permeability, very light brown staining, faint yellow fluorescence, poor cut, gassy odor.
4161.8 - 4169.4	7.6'	Sandstone, as above, pyrobituminous, fine to medium, tight.
4169.4 - 4170.2	0.8'	Shale; black, sandy, micaceous, very low angle to flat dip.
4170.2 - 4171.0	0.8'	Sandstone; light brown, calcareous, fine grained, well sorted, subangular quartz and feldspar well cemented with calcite, tight.
4171.0 - 4172.8	1.8'	Limestone; light tan, sandy, coarse crystalline, tight.
4172.8 - 4178.9	6.1'	Sandstone; salt and pepper, feldspathic, pyrobituminous, fine to medium in upper 1.5', medium to very coarse in lower 4.6', poor sorted, well cemented with calcite, tight.
4178.9 - 4183.5	4.6'	Sandstone; as above, medium to very coarse, poor sorted, poor to fair apparent porosity, poor permeability. No stain or fluorescence. Abundant pyrobitumen.

Core #2: (cont'd.)

4183.5 - 4192.0	8.5'	Sandstone; as above, medium to coarse, Good apparent porosity and permeability. No stain or fluorescence, very poor cut. Gassy odor. Common pyrobitumen.
4192.0 - 4194.5	2.5'	Sandstone, as above, very pyrobituminous, medium to very coarse, poor sorted, tight.

Coring Time (min./ft.): (4136) 9, 10, 12, 9, 9, 14, 20, 24, 49, 18, 18, 20, 15, 15, 13, 7, 6, 17, 15, 9, 12, 15, 16, (4160) 8, 13, 14, 13, (4164) 18, 20, 20, 27, 23, 30, 26, 25, 34, 17, 32, 18, 13, 12, 13, 12, (4180) 8, 10, 9, 9, 9, 8, 8, 9, 9, 9, 10, 10, 12, 11, 14, 15, (4196) 22.

Core #3: Interval 4197' - 4245' (Cut 48', Recovered 46')

4197.0 - 4201.9	4.9'	Sandstone; salt and pepper, feldspathic, pyrobituminous, medium to very coarse, angular to subangular, well cemented with calcite, becomes calcareous, nonpyrobbituminous and subrounded in basal 1'. Tight.
4201.9 - 4206.7	4.8'	Sandstone and sandy Limestone interbedded. Sandstone; light brown, feldspathic, calcareous, very fine at top grading to fine to medium in lower part. Tight. Limestone; light gray, very sandy, microcrystalline, dense. One long (approximately 1') oblique slump fracture in-filled with very coarse sandstone, as above, at base. Bleeding condensate from fracture. Poor dip of approximately 9°.
4206.7 - 4210.8	4.1'	Sandstone, as above, fine to medium, tight. Bleeding condensate.
4210.8 - 4216.5	5.7'	Limestone; as above, very sandy. Paper thin shaly partings in basal 1½'. Dip approximately 8 - 10°.
4216.5 - 4220.5	4.0'	Shale; brown black, calcareous, silty, micromicaceous. Dip approximately 6°. Contact with underlying limestone abrupt and unconformable.
4220.5 - 4222.2	1.7'	Limestone; medium gray, very sandy, microcrystalline, dense.
4222.2 - 4229.0	6.8'	Sandstone; salt and pepper, very calcareous, medium to coarse, well cemented, tight.
4229.0 - 4231.2	2.2'	Sandstone; medium brown, very calcareous, fine to medium, poor sorted, quartz and dark chert grains well cemented with calcite grading to sandy Limestone at base. Tight. One open oblique fracture at base stained with dry black residue.

Core #3: (cont'd.)

4231.2 - 4233.0	1.8'	Limestone; as above, fractured, common open horizontal and vertical fractures stained with black residue.
4233.0 - 4239.0	6.0'	Shale; brown black, calcareous, silty, micromicaceous. Dip approximately 5°.
4239.0 - 4241.0	2.0' (appx.)	Limestone; very dark brown gray, very argillaceous, silty, sandy, microcrystalline, dense. Interval very broken (rubble) due to core bit.
4241.0 - 4243.0	2.0'	Shale, as above.

Coring Time (min./ft.): (4198) 20, 16, 20, 20, 30, 25, 27, 29, 32, 23, 19, 30, 22, 28, 34, 38, 35, 37, 41, 37, 44, 40, (4220) 34, 36, 42, 48, 80, 42, 49, 48, 45, 46, 53, 70, 60, 51, 47, 48, 52, 45, 49, 43, 47, 60, 54, 67, 57, (4245) 54.

Core #4: Interval 4388' - 4448' (Cut 60', Recovered 56')

4388.0 - 4390.3	2.3'	Sandstone; salt and pepper, feldspathic, coarse to very coarse, fair sorted, subrounded to rounded, frosted quartz, gray white weathered feldspar, gray brown to dark gray and black chert grains well cemented with silica. Poor to fair apparent porosity. Good apparent permeability. No stain, gassy odor, violet yellow fluorescence, poor cut.
4390.3 - 4390.9	0.6'	Sandstone, as above, very fine to medium, poor sorted, poor apparent porosity and permeability.
4390.9 - 4394.5	3.6'	Sandstone, as above, coarse to very coarse. Fair to good apparent porosity and permeability.
4394.5 - 4395.6	1.1'	Sandstone, as above, medium to coarse. Fair to good apparent porosity and permeability.
4395.6 - 4399.6	4.0'	Sandstone, as above, with good to excellent porosity and permeability. Common black pyrobitumen staining. No stain, good light yellow fluorescence, poor cut.
4399.6 - 4403.3	3.7'	Sandstone, as above, coarse to very coarse. Good porostiy and permeability, poor cut grading to medium to very coarse with poor to fair porosity and some pyrobitumen in-filling at base.

Core #4: (cont'd.)

4403.3 - 4410.6	7.6'	Sandstone; light gray brown, feldspathic, very fine to medium, poor sorted, subangular, well cemented with silica, tight. Common pyrobitumen in-filling.
4410.6 - 4413.1	2.5'	Sandstone, as above, medium to coarse, poor to fair porosity. Common pyrobitumen.
4413.1 - 4422.3	9.2'	Sandstone, as above, medium to very coarse, pyrobituminous, tight.
4422.3 - 4423.7	1.4'	Sandstone, as above, with poor porosity.
4423.7 - 4426.2	2.5'	Sandstone; salt and pepper, feldspathic, medium to coarse, fair sorted, subangular quartz, feldspar and dark chert grains well cemented with silica. Poor to fair porosity, very light oil staining, light yellow fluorescence, poor cut, gassy odor. Some horizontal fractures.
4426.2 - 4426.7	0.5'	Sandstone, as above, medium to very coarse, pyrobituminous, tight.
4426.7 - 4431.2	4.5'	Sandstone; light gray brown, feldspathic, medium to coarse, poor sorted, subangular to subround quartz feldspar and minor light to dark gray brown chert grains cemented with kaolin. Poor porosity. Some horizontal fractures.
4431.2 - 4444.0	12.8'	Sandstone, as above, pyrobituminous, tight. Common horizontal fractures.

Coring Time (min./ft.): (4389)-42, 60, 47, 44, 41, 36, 40, 60, 30, 40, 30, (4400)-32, 48, 67, 78, 52, 35, 22,20, 32, 30, (4410)-28, 23, 15, 23, 24, 30, 28, 18, 16, 18, (4420)-19, 17, 21, 23, 18, 18, 18, 25, 27, 21, (4430)-21, 20, 22, 21, 20, 20, 22, 13, 17, 13, (4440)-17, 20, 15, 13, 15, 23, 24, 26, (4448)-26

Core #5: Interval 4449' - 4503' (Cut 54', Recovered 52.7')

4449.0 - 4450.0	1.0'	Sandstone; light gray, feldspathic, pyrobituminous, medium to coarse, poor sorted, angular to subround quartz and white feldspar grains cemented with silica and kaolin, tight.
4450.0 - 4453.5	3.5'	Sandstone; salt and pepper, pyrobituminous, coarse to very coarse, fair sorted, subrounded quartz, light to dark gray chert and white feldspar grains cemented with silica. Good porosity, very light brown stain, gassy odor, good light yellow fluorescence, fair cut. Becomes fine to medium grained and tight at base.
4453.5 - 4467.7	14.2'	Sandstone, as above, fair to medium grained, tight.

Core #5: (cont'd.)

4467.7 - 4472.3	4.6'	Sandstone; salt and pepper, feldspathic, medium to very coarse, poor sorted, subangular to subround quartz, gray white weathered feldspar, and minor dark gray chert grains cemented with kaolin and silica. Fair porosity, fair light brown staining, gassy odor, light yellow fluorescence, poor cut.
4472.3 - 4475.8	3.5'	Sandstone, as above, medium to coarse. Poor porosity, fair staining, light yellow fluorescence, fair cut.
4475.8 - 4490.2	14.4'	Sandstone, as above, medium to very coarse. Fair to good porosity, fair staining, good light yellow fluorescence, fair cut. Sharp undulating contact with underlying limestone.
4490.2 - 4494.9	4.7'	Limestone; gray white, sandy, microcrystalline, dense.
4494.9 - 4497.1	2.2'	Sandstone; gray brown to salt and pepper, very calcareous, medium to coarse, fair sorted, subrounded, tight.
4497.1 - 4497.4	0.3'	Sandstone; salt and pepper, medium to coarse, fair sorted, subrounded quartz, dark gray and brown chert and common feldspar grains cemented with calcite. Fair porosity, fair light brown staining, light yellow fluorescence, fair cut.
4497.4 - 4498.9	1.5'	Sandstone; as above, very calcareous, tight.
4498.9 - 4501.7	2.8'	Limestone; gray brown, sandy, argillaceous, microcrystalline, tight. Common horizontal fractures in bottom one foot.

Coring Time (min./ft.): (4450)-28, 31, 24, 20, 21, 21, 19, 17, 16, 19, (4460)-15, 18, 16, 15, 18, 18, 20, 17, 24, 16, (4470)-18, 21, 18, 20, 23, 23, 18, 26, 35, 32, (4480)-27, 30, 34, 33, 34, 18, 23, 28, 24, 27, (4490)-27, 29, 45, 29, 30, 25, 40, 43, 44, 58, (4500)-58, 62, 72, 60.

Core #6: Interval 4560' - 4567' (Cut 7', Recovered 6.4')

4560.0 - 4562.5	2.5'	Sandstone; salt and pepper, medium to coarse, fair sorted, subrounded quartz, weathered feldspar, and dark gray chert grains cemented with silica. Poor to fair apparent porosity, light brown staining, light yellow fluorescence, fair cut. Quartz grains commonly show secondary quartz outgrowth.
4562.5 - 4564.0	1.5'	Sandstone; as above, light brown, fine grained, well sorted, with poor apparent porosity, light brown staining, light yellow fluorescence, poor cut. Becomes tight at base.
4564.0 - 4564.8	0.8'	Sandstone; light gray brown, calcareous, pyrobituminous, fine grained, well sorted, subangular, well cemented with calcite. Tight.
4564.8 - 4564.9	0.1'	Chert; milky white, vitreous, and light gray weathered, sub-vitreous, cryptocrystalline.
4564.9 - 4565.6	0.7'	Limestone; dark gray brown, silty, sandy, pyrobituminous, microcrystalline, sucrosic, with fair intercrystalline porosity. No staining. Trace light yellow fluorescence.
4565.6 - 4566.0	0.4'	Limestone; very dark gray brown, pyrobituminous, microcrystalline, with poor intercrystalline porosity. No staining or fluorescence. Mod dip - 15°.
4566.0 - 4566.25	0.25'	Chert; as above with abundant random hairline closed fractures.
4566.25- 4566.4	0.15'	Limestone, as above, cherty.

Coring Time: (4561)-33, 29, 21, 25, 57, 29, (4567)-37
(min./ft.)

SAMPLE DESCRIPTIONS

Interval	Description
10 - 20	Siltstone; light green gray, argillaceous, micromicaceous.
20 - 30	Siltstone, as above. Common Shale; light green gray, silty, micromicaceous. Abundant Ironstone.
30 - 40	Shale, as above. Common Siltstone, as above.
40 - 60	Shale, as above. Common brown sideritic shale.
60 - 100	Shale; dark brown gray, micromicaceous, flaky.
100 - 110	Shale; dark gray, micromicaceous and light green gray to medium gray, silty, micromicaceous. Common Shale; gray brown, sideritic, silty, micromicaceous. Abundant Ironstone. Trace hematite.
110 - 130	Shale; light green gray, micromicaceous.
130 - 140	Shale, as above, silty.
140 - 150	Shale; light green gray to dark brown gray, micromicaceous.
150 - 170	Shale, as above and dark gray, silty, micromicaceous. Common Shale; medium to dark gray brown, silty, micromicaceous, sideritic. Common Ironstone.
170 - 180	Shale; light green gray, silty, micromicaceous.
180 - 200	Shale; very dark gray, very micromicaceous, blocky. Common Shale; light green gray, micromicaceous.
200 - 210	Shale, as above and Shale; medium to dark gray, silty, micromicaceous grading to gray brown, argillaceous Siltstone. Trace Sandstone; salt and pepper, argillaceous, very fine to fine, welll cemented, tight.
210 - 220	Shale; light green gray and dark gray brown, micromicaceous, chunky.
220 - 230	Shale, as above, silty. Common Siltstone; light brown gray to salt and pepper, argillaceous, micromicaceous. Common Ironstone. Trace Siderite.
230 - 250	Shale; dark gray, micromicaceous, silty in part, chunky.

Interval	Description
250 - 260	Shale; light green gray to medium brown gray, micromicaceous, silty in part.
260 - 270	Shale; dark gray, micromicaceous, chunky.
270 - 290	Shale; light green gray and medium to dark brown gray, silty, micromicaceous, chunky.
290 - 300	Shale; dark gray, micromicaceous, chunky.
300 - 330	Shale; dark brown gray, silty, micromicaceous.
330 - 360	Siltstone; light gray brown to salt and pepper, argillaceous, sandy, micromicaceous. Shale; dark brown gray, micromicaceous, firm.
360 - 390	Shale, as above, silty, fissile in part, chunky.
390 - 400	Shale, as above. Common Siltstone, as above, slightly chloritic.
400 - 410	Siltstone, as above.
410 - 420	Siltstone and Shale, as above.
420 - 430	Siltstone, as above. Common Shale, as above. Common Ironstone.
430 - 440	Siltstone; dark brown gray to dark gray brown, argillaceous, micromicaceous.
440 - 450	Siltstone and Shale, as above.
450 - 460	Siltstone; medium to dark gray brown, argillaceous, micromicaceous.
460 - 470	Shale; dark gray, micromicaceous, chunky. Common Siltstone; light gray to light brown gray, argillaceous, micromicaceous. Trace Sandstone; salt and pepper, silty, argillaceous, very fine to fine, tight.
470 - 480	Siltstone, as above. Common Shale, as above, silty.
480 - 490	Shale; dark gray, micromicaceous, chunky.
490 - 510	Shale; medium to dark brown gray, silty, micromicaceous, chunky.
510 - 520	Shale; medium to dark brown gray, silty, micromicaceous, chunky. Siltstone; medium gray brown, argillaceous, micromicaceous.

Interval	Description
520 - 550	Shale; medium to dark gray, micromicaceous, chunky and medium to dark brown gray, silty, micromicaceous.
550 - 560	Shale; light gray brown, bentonitic, soft.
560 - 570	Shale; medium to dark gray, micromicaceous, chunky.
570 - 590	Shale, as above, and light gray brown, bentonitic, soft.
590 - 640	Shale; medium to dark brown gray, silty, micromicaceous, carbonaceous. Common Siltstone; salt and pepper to medium brown gray, sandy, argillaceous, micromicaceous. Common Coal.
640 - 650	Shale; medium to dark brown gray, micromicaceous, chunky.
650 - 660	Sandstone; light gray brown to salt and pepper, argillaceous, silty, slightly chloritic, very fine to fine, tight. Shale, as above. Common Shale; light gray to light green gray, micromicaceous, chunky.
660 - 670	Siltstone; light brown gray, sandy, argillaceous, micromicaceous. Shale; medium to dark brown gray, slightly carbonaceous, micromicaceous.
670 - 680	Shale; medium to dark brown gray, micromicaceous, chunky.
680 - 690	Shale and Sandstone, as above.
690 - 700	Shale, as above, carbonaceous. Common Coal.
700 - 710	Schistone; salt and pepper, argillaceous, silty, micromicaceous, carbonaceous, very fine to fine, tight. Shale; medium brown gray, silty, micromicaceous, chunky.
710 - 720	Shale; medium to dark brown gray, micromicaceous, silty, firm.
720 - 750	Shale, as above, bentonitic, soft.
750 - 770	Shale; medium to dark brown gray, silty, micromicaceous, firm. Common Siltstone; light brown gray, argillaceous, micromicaceous.
770 - 780	Shale; medium to dark brown gray, silty, micromicaceous, bentonitic in part, soft.
780 - 800	Shale, as above. Siltstone, as above.
800 - 810	Shale; medium to dark brown gray, silty, micromicaceous, firm.
810 - 830	Shale, as above. Common Sandstone; light brown gray, argillaceous, chloritic, very fine to fine, tight.

Interval	Description
810 - 830	(cont'd.) Common Shale; light gray brown, bentonitic.
830 - 840	Shale, as above. Common bentonitic Shale, as above.
840 - 850	Shale; medium to very dark brown gray, micromicaceous. Common Coal.
850 - 860	No Sample.
860 - 880	Coal Common Shale, as above. Common Shale; light to medium gray green, chunky.
880 - 890	Coal.
890 - 900	Shale; light gray brown, bentonitic, silty, hematitic in part. Common Coal.
900 - 910	Coal and Bentonitic Shale, as above. Abundant white calcite fragments. Common flakes of Fe_2O_3. Trace Aragonite. Common Siltstone; light gray brown, argillaceous.
910 - 920	Coal and Bentonite, as above. Shale; very dark gray, bituminous. Common Fe_2O_3 and white calcite fragments, as above. Some Siltstone, as above.
920 - 940	Coal and Shale, as above. Common Bentonitic Shale, as above. Common Fe_2O_3, as above. Some Siltstone, as above. Trace white calcite fragments.
940 - 1010	Sandstone; salt and pepper, kaolinitic, chloritic, very fine to medium, poor sorted, angular, friable, tight. Common Bentonitic Shale, as above.
1010 - 1040	Shale; medium to dark gray brown, silty, micromicaceous, firm, Sandstone, as above, very kaolinitic.
1040 - 1050	Sandstone; salt and pepper, kaolinitic, chloritic, fine to medium, poor sorted, angular, well cemented, hard, tight. Common Shale, as above.
1050 - 1110	Shale, as above. Sandstone, as above, very fine to fine.
1110 - 1150	Sandstone; arkosic, salt and pepper, kaolinitic, slightly chloritic, fine to medium, poor sorted, argillaceous, well cemented, tight. Common Shale; medium to dark gray brown and brown gray, very silty, micromicaceous. Trace Shale; light gray green to light green gray, silty, micromicaceous.

Interval	Description
1150 - 1160	Sandstone, as above. Shale; medium to dark gray brown and brown gray, silty, micromicaceous grading to Siltstone. Trace Coal.
1160 - 1190	Sandstone, as above. Carbon Shale, as above. Trace Coal.
1190 - 1220	Siltstone; light gray brown, argillaceous, micromicaceous, carbonaceous, hard.
1220 - 1230	Shale; medium gray brown, micromicaceous and dark brown gray to very dark gray, silty, micromicaceous. Trace light gray green, micromicaceous Shale.
1230 - 1250	Shale; light gray brown, bentonitic, soft and dark brown gray, silty, micromicaceous.
1250 - 1260	Siltstone; light gray brown, sandy, micromicaceous, grading to very fine, silty sandstone.
1260 - 1280	Sandstone; salt and pepper, slightly chloritic, slightly carbonaceous, very fine to medium, poor sorted, angular, well cemented with kaolin, tight. Trace ironstone. Trace hematite.
1280 - 1300	Sandstone; salt and pepper, medium to coarse, poor sorted, sub-angular, well cemented with kaolin, with spotty poor apparent porosity. No apparent permeability. No stain or fluorescence.
1300 - 1310	Shale; medium to dark gray brown, silty, micromicaceous.
1310 - 1320	Shale, as above. Sandstone, as above, fine to medium, tight.
1320 - 1360	Shale; very dark brown gray, very silty, micromicaceous grading to argillaceous siltstone.
1360 - 1380	Shale; dark brown gray, very silty, very micromicaceous.
1380 - 1420	Sandstone; arkosic, salt and pepper, chloritic, fine to coarse, poor sorted, subangular, well cemented with kaolin with poor porosity and permeability, spotty oil staining, light yellow fluorescence, poor cut.
1420 - 1440	Shale; very dark brown gray, very silty, micromicaceous grading to argillaceous siltstone. Trace ironstone.
1440 - 1450	Shale; medium to dark gray brown, waxy.
1450 - 1460	Shale; dark brown gray, very silty, micromicaceous.
1460 - 1470	Shale, as above. Siltstone; light brown gray, argillaceous, micromicaceous.

Interval	Description
1470 - 1480	Shale, as above. Trace Ironstone. Trace Coal.
1480 - 1490	Shale; dark gray brown, very silty, sandy, very micromicaceous. Trace Siderite.
1490 - 1500	Shale; very dark brown gray to gray black, silty, micromicaceous.
1500 - 1530	Shale; very dark gray brown, very silty, micromicaceous.
1530 - 1540	Shale; very dark brown gray, slightly silty, micromicaceous, carbonaceous in part.
1540 - 1550	Siltstone; gray brown, argillaceous, very micromicaceous.
1550 - 1570	Siltstone, as above. Shale; dark brown gray to gray brown, very silty, micromicaceous.
1570 - 1600	Shale, as above. Common Sandstone; salt and pepper, kaolinitic, micromicaceous, very fine to fine, well cemented with kaolin, tight.
1600 - 1620	Shale, as above. Common Sandstone; gray brown, argillaceous, sideritic, slightly chloritic, carbonaceous, very fine to fine, poor sorted, angular quartz, light to dark gray and black chert grains, light gray feldspar grains and common green chloritic grains well cemented with kaolin and siderite, tight.
1620 - 1630	Shale, as above, sandy.
1630 - 1650	Shale; gray brown to very dark brown gray, micromicaceous, silty. Siltstone; very light brown gray, sandy, argillaceous, micromicaceous. Trace Coal.
1650 - 1660	Shale; dark brown gray, silty, micromicaceous.
1660 - 1690	Siltstone; medium to dark gray brown, argillaceous, micromicaceous.
1690 - 1700	Siltstone, as above. Shale, as above. Trace Ironstone.
1700 - 1720	Siltstone; and Shale, as above. Common Shale; gray brown to gray black, carbonaceous, micromicaceous.
1720 - 1740	Shale; dark brown gray, silty, micromicaceous. Trace Shale; gray black, bituminous.
1740 - 1760	Shale; gray brown to dark brown gray, very silty, micromicaceous, slightly carbonaceous. Common Siltstone; gray brown, argillaceous, micromicaceous. Common Ironstone.

Interval	Description
1780 - 1790	Siltstone; light gray, brown, argillaceous, micromicaceous.
1790 - 1810	Shale; medium to dark gray, micromicaceous, carbonaceous, chunky. Trace Ironstone.
1810 - 1820	Shale; medium to dark gray brown, silty, micromicaceous. Common Shale; light gray, carbonaceous, micromicaceous, chunky. Common Ironstone.
1820 - 1830	Sandstone; light gray brown, silty, argillaceous, micromicaceous, very fine to fine, well cemented with kaolin, tight.
1830 - 1840	Shale; dark gray to dark brown gray, micromicaceous, carbonaceous, chunky.
1840 - 1860	Siltstone; light gray and light gray green to light gray brown, argillaceous, micromicaceous. Common Shale; dark gray brown, chunky.
1860 - 1870	Shale; light to medium brown gray and light gray brown, carbonaceous, micromicaceous, silty.
1870 - 1880	Siltstone; medium to dark gray brown, very argillaceous, chloritic, micromicaceous. Common Shale; dark brown gray, silty, micromicaceous.
1880 - 1890	Shale; very dark brown gray, micormicaceous, chunky.
1890 - 1900	Sandstone; light gray brown, argillaceous, slightly chloritic, micromicaceous, fine to medium, poor sorted, angular, clear quartz and light to very dark gray chert grains with common light gray feldspar and occasional green chloritic grains well cemented with siderite and kaolin, tight.
1900 - 1910	Sandstone, as above, kaolinitic.
1910 - 1920	Sandstone, as above. Shale; dark gray brown to dark brown gray, micromicaceous, carbonaceous, chunky.
1920 - 1930	Sandstone, as above. Common Shale, as above. Common Ironstone.
1930 - 1950	Shale, as above, silty, Siltstone; medium to dark gray brown, argillaceous, micromicaceous.
1950 - 1980	Shale; dark brown gray, micromicaceous.
1980 - 2000	Shale, as above. Siltstone; dark gray brown, argillaceous, micromicaceous.
2000 - 2020	Shale; dark brown gray, silty, micomicaceous. Siltstone; light brown gray to gray brown, argillaceous, micromicaceous. Common Ironstone.

Interval	Description
2020 - 2030	Shale; dark gray to dark brown gray, carbonaceous, micromicaceous, chunky. Siltstone, as above. Trace Ironstone.
2030 - 2040	Shale; dark gray brown, micromicaceous, fissile, chunky.
2040 - 2060	Shale; dark brown gray, silty, micromicaceous. Common Shale; very dark brown gray, carbonaceous, micromicaceous. Trace Coal.
2060 - 2080	Siltstone; gray brown, argillaceous, micromicaceous.
2080 - 2090	Siltstone, as above. Shale; dark gray brown to dark brown gray, silty, micromicaceous, carbonaceous in part.
2090 - 2110	Shale, as above. Sandstone; light gray brown, silty, argillaceous, slightly glauconitic, sideritic, micromicaceous, very fine to fine, well cemented, tight, grading to sandy siltstone.
2110 - 2140	Shale, Sandstone and Siltstone, as above.
2140 - 2150	Siltstone; gray white, kaolinitic, slightly glauconitic, slightly sideritic, sandy, micromicaceous.
2150 - 2160	Shale; dark gray brown, silty, micromicaceous, fissile.
2160 - 2190	Siltstone; dark gray brown, argillaceous, micromicaceous, sandy. Common Ironstone.
2190 - 2200	Siltstone, as above. Shale; very dark brown gray, carbonaceous, micromicaceous.
2200 - 2210	Sandstone; very light brown to salt and pepper, carbonaceous, slightly glauconitic, very fine to fine, well cemented with kaolin, tight.
2210 - 2230	Sandstone; very light gray, argillaceous, silty, micromicaceous, very fine to fine, well cemented with kaolin, tight.
2230 - 2240	Sandstone; light brown, sideritic, slightly glauconitic, fine to medium, poor sorted, angular to subangular, well cemented with kaolin, tight. Trace Ironstone.
2240 - 2250	Shale; medium to very dark gray brown, silty in part, micromicaceous, carbonaceous, chunky. Common Ironstone.
2250 - 2260	Sandstone; very light gray to light brown, silty, argillaceous, slightly chloritic, micromicaceous, very fine to fine, well cemented, tight grading to sandy, argillaceous siltstone.
2260 - 2290	Shale, as above.

Interval	Description
2290 - 2300	Sandstone; light brown, sideritic, silty, very fine to fine, poor sorted, well cemented with siderite and kaolin, tight, grading to sandy siltstone, as above.
2300 - 2310	Sandstone, Siltstone and Shale, as above.
2310 - 2320	Shale and Siltstone, as above. Sandstone; salt and pepper, bituminous, slightly glauconitic, fine grained, well sorted, subangular quartz and common gray white feldspar and dark gray chert grains well cemented with kaolin. Poor porosity and permeability. No stain or fluorescence. Abundant pyrobitumen in-filling.
2320 - 2350	Sandstone; very light brown to salt and pepper, sideritic, fine grained, well sorted, angular to subangular quartz and minor brown siderite grains, and gray white feldspar grains well cemented with kaolin, tight. Some Shale; very dark, gray brown, carbonaceous, micromicaceous, chunky. Trace Coal.
2350 - 2370	Shale; very dark gray brown, silty in part, micromicaceous. Trace Coal.
2370 - 2380	Shale; gray brown, micromicaceous, chunky. Siltstone; brown, argillaceous, micromicaceous.
2380 - 2400	Sandstone; very light brown, sideritic, slightly glauconitic, fine grained, well sorted, angular to subangular, quartz and minor dark brown siderite grains and very light gray feldspar grains well cemented with kaolin. Trace poor porosity and permeability. No staining. Good light yellow fluorescence, no cut or odor.
2400 - 2410	Sandstone; as above, silty, very fine, tight. No stain, fluorescence or cut.
2410 - 2420	Sandstone, as above, very fine to fine, poor apparent porosity and permeability. No stain, very dull yellow fluorescence. No cut or odor.
2420 - 2430	Sandstone, as above, tight.
2430 - 2440	Sandstone, as above, fine to medium, trace poor porosity, no permeability. No stain, fluorescence or cut. Common Shale; medium to dark gray brown, silty, micromicaceous. Common Ironstone.
2440 - 2450	Sandstone; salt and pepper, bituminous, fine to medium, poor sorted, angular to subangular quartz, very dark gray brown grains, common gray white feldspar grains and occasional light gray green chlorite grains well cemented with kaolin, tight. Siltstone; light to dark gray brown, argillaceous, micromicaceous. Common Shale; dark gray brown to very dark brown gray, micromicaceous, silty.

Interval	Description
2450 - 2460	Sandstone; white to light gray brown and salt and pepper, slightly glauconitic, very fine to fine, well cemented with silica and kaolin, tight. Common Siltstone and Shale, as above.
2460 - 2480	Siltstone, as above. Common Shale; very dark gray brown, bituminous, chunky.
2480 - 2510	Sandstone, as above.
2510 - 2520	Sandstone and Shale, as above.
2520 - 2530	Shale, as above. Siltstone; gray, brown, argillaceous, sandy, micromicaceous.
2530 - 2540	Shale and Sandstone, as above.
2540 - 2560	Shale, Sandstone and Siltstone, as above.
2560 - 2570	Sandstone; very light brown, silty, very fine grained, fair sorted, loosely cemented with kaolin, friable, tight.
2570 - 2580	Sandstone, as above, well cemented, hard. Siltstone, as above, dark gray brown. Shale, as above, very dark gray brown.
2580 - 2600	Siltstone, as above. Common Shale; very dark gray brown, micromicaceous, silty in part, chunky.
2600 - 2610	Sandstone, as above.
2610 - 2620	Shale, as above. Common Siltstone and Sandstone, as above.
2620 - 2640	Sandstone; light gray brown, silty, micromicaceous, very fine grained, well cemented with kaolin, tight.
2640 - 2680	Shale; very dark brown gray, silty, very micromicaceous, fissile. Common Shale; brown, black bituminous, chunky. Trace Shale; light gray green, micromicaceous, waxy.
2680 - 2710	Shale; dark brown gray, silty, very micromicaceous, fissile. Trace Shale; very dark brown gray to brown black, bituminous.
2710 - 2730	Shale, as above. Siltstone; medium gray brown, argillaceous, micromicaceous.
2730 - 2740	Shale, as above.
2740 - 2760	Shale, as above, very dark brown gray. Common Siltstone, as above.

Interval	Description
2760 - 2830	Shale, as above. Common Shale; brownish black, bituminous, micromicaceous, chunky.
2830 - 2850	Shale, as above.
2850 - 2860	No Sample.
2860 - 2870	Shale, as above. Common Shale; brownish black, slightly micromicaceous, chunky. Trace Ironstone.
2870 - 2890	Shale; very dark brownish gray, micromicaceous, fissile, flaky. Common Shale; very dark grayish brown to brownish black, slightly micromicaceous, chunky. Common Ironstone.
2890 - 2900	Shale, as above, silty. Trace Ironstone.
2900 - 2930	Shale; very dark brownish gray, micromicaceous, fissile, flaky. Trace Ironstone.
2930 - 2950	Shale; very dark brownish gray to brownish black, slightly micromicaceous, chunky.
2950 - 3050	Shale; very dark gray, micromicaceous, fissile, platy. Shale; very dark brownish gray to brownish black, chunky to blocky.
3050 - 3060	Shale; dark brownish gray, silty, micromicaceous, fissile, platy.
3060 - 3080	Shale; dark brownish gray, silty, sandy, micromicaceous, fissile, flaky.
3080 - 3100	Shale; dark brownish gray, silty, micromicaceous, chunky.
3100 - 3110	Sandstone; medium to dark gray brown, argillaceous, very glauconitic, very fine to fine grained, poor sorted, sub-angular to subrounded, quartz and dark gray brown grains well cemented with kaolin, tight. Common Ironstone. Common Shale; dark gray brown to dark brown gray, silty, micromicaceous, glauconitic. Common chert pebbles; light to dark gray and amber, rounded.
3110 - 3120	Siltstone; medium to dark gray brown, sandy, argillaceous, very glauconitic, micromicaceous. Common Ironstone.
3120 - 3130	Siltstone, as above. Shale; very dark gray brown, bituminous, micromicaceous, chunky. Common Ironstone.

Interval	Description
3130 - 3150	Siltstone; dark gray brown, glauconitic, argillaceous, micromicaceous. Abundant Ironstone.
3150 - 3160	Siltstone, as above. Common Shale; black, bituminous, micromicaceous.
3160 - 3200	Siltstone, as above. Common Pyrite. Common black Shale, as above.
3200 - 3240	Siltstone; dark brown gray, argillaceous, sandy, micromicaceous. Common Shale; black, micromicaceous. Trace Pyrite.
3240 - 3250	No Sample.
3250 - 3260	Sandstone; light to medium brown gray, kaolinitic, silty, glauconitic, micromicaceous, very fine, tight. Common Ironstone. Trace Pyrite.
3260 - 3320	Siltstone; medium to dark brown gray, argillaceous, sandy, micromicaceous. Common Shale; medium to dark gray brown and black, micromicaceous. Common Pyrite.
3320 - 3360	Siltstone, as above. Common Shale; very dark gray brown to brown black, slightly micromicaceous, splintery. Trace Pyrite.
3360 - 3480	Siltstone; medium to dark brown gray, argillaceous, micromicaceous. Shale; dark brown gray, silty, micromicaceous. Common Shale; brown black, slightly micromicaceous, chunky. Common Pyrite. Trace Ironstone.
3480 - 3500	Shale; very dark brown gray to brown black, slightly micromicaceous, chunky to splintery. Siltstone, as above. Common Pyrite.
3500 - 3520	Shale; medium to dark brown gray, very silty, very micromicaceous. Common Shale; very dark gray brown to brown black, slightly micromicaceous, chunky to splintery.
3520 - 3530	Shale, as above. Common brown to black Shale, as above. Abundant Ironstone. Common Siderite. Trace Pyrite.
3530 - 3590	Shale, as above. Common brown to black Shale, as above. Trace Ironstone and Pyrite.

Interval	Description
3590 - 3600	Shale, as above. Trace brownish black shale, as above. Common loose, very fine quartz sand grains.
3600 - 3610	Shale, as above.
3610 - 3630	Shale, as above. Common brown to black Shale. Common Chert pebbles; light to dark gray, black and amber, rounded.
3630 - 3650	Shale; medium to dark brownish gray, silty, very micromicaceous. Trace Pyrite and Ironstone.
3650 - 3680	Shale, as above. Trace Pyrite. Trace Chert pebbles and fragments, as above. Trace black Shale, as above.
3680 - 3700	Shale, as above. Common Ironstone. Trace pyrite and chert pebbles.
3700 - 3730	Shale, as above, very silty, grading to argillaceous siltstone. Abundant Ironstone. Common brown to black Shale. Trace Chert pebbles.
3730 - 3740	Shale; medium to dark brown gray, very silty, micromicaceous. Abundant Ironstone.
3740 - 3790	Shale, as above. Common Shale; very dark grayish brown to brownish black, slightly micromicaceous. Common Ironstone. Trace Pyrite. Trace white gypsum fragments.
3790 - 3800	Shale, as above. Common Ironstone and Gypsum. Trace Siderite.
3800 - 3820	Siltstone; medium to dark brownish gray, argillaceous, sandy, glauconitic, micromicaceous. Common grayish white Gypsum. Trace Pyrite. Some Shale; very dark grayish brown to brownish black, carbonaceous in part.
3820 - 3860	Siltstone, as above, light to medium gray, very glauconitic. Common Shale, as above. Common white Gypsum.
3860 - 3910	Siltstone, as above. Trace Shale, as above. Trace Ironstone.
3910 - 3920	Siltstone, as above. Trace Ironstone. Trace Dolomite fragments; white to cream, cryptocrystalline, dense. Trace Pyrite.
3920 - 3940	Siltstone, as above. Common Dolomite fragments; stained reddish brown with Fe_2O_3, silty in part, microcrystalline, hard, dense. Trace Siderite, Hematite and Pyrite.

Interval	Description
3940 - 3950	Shale; medium to dark gray, silty, micromicaceous. Trace Limestone; amber colored, cryptocrystalline, dense.
3950 - 3960	Shale; very dark gray to black, micromicaceous, fissile, flaky to splintery. Limestone; dark gray brown, argillaceous, cryptocrystalline, dense. Common Limestone, as above.
3960 - 3980	Shale; very dark gray, silty, sandy, micromicaceous. Common Shale, as above. Trace Pyrite. Common quartz sand grains; loose, fine to medium, subrounded.
3980 - 3990	Shale, as above. Siltstone; dark brown gray, sandy, argillaceous, micromicaceous, glauconitic. Common loose sand grains, as above. Common Pyrite and Ironstone. Common gray white Gypsum.
3990 - 4000	Siltstone; dark gray brown, argillaceous, micromicaceous. Shale; dark brown gray to very dark gray brown, silty, micromicaceous. Trace limestone; dark gray brown, very argillaceous, crypto to microcrystalline, dense. Common Pyrite.
4000 - 4020	Siltstone and Shale, as above. Common Shale; medium to very dark gray, micromicaceous, pyritic. Abundant Ironstone, commonly pyritic. Abundant finely disseminated Pyrite. Some green white Gypsum. Trace light gray green sandy Shale.
4020 - 4040	Siltstone, as above. Shale; very dark gray to brownish black, splintery. Abundant Pyrite. Common Gypsum; gray white to greenish white, commonly speckled with amber colored selenite crystals.
4040 - 4050	Sandstone; dark gray brown, very glauconitic, argillaceous, pyritic, fine to medium, poor sorted, subrounded, well cemented with Clay, tight. Shale; dark brown gray, silty, micromicaceous, glauconitic.
4050 - 4060	Siltstone; brown gray, argillaceous, very glauconitic, sandy, micromicaceous, pyritic. Shale; dark gray brown, silty, micromicaceous. Abundant Pyrite and Glauconite.
4060 - 4070	Sandstone; very light brown, tripolitic, fine to coarse, poor sorted, subangular to rounded quartz and gray white weathered feldspar grains and common light gray chert grains well cemented with silica, tight. Abundant gray white Tripoli (altered feldspar). No stain or fluorescence. Slight gassy oder.
4070 - 4079	Sandstone; as above, fine to medium, tight. No stain or fluorescence. Slight gassy oder.

Interval	Description
4079 - 4245	See Core Description (Cores #1, 2 and 3)
4245 - 4250	Limestone; light to dark gray brown, very argillaceous, silty, tight. Common Shale; brown black, calcareous, silty, micromicaceous. Trace very dark gray Chert.
4250 - 4255	Shale; medium to dark gray brown, white speckled, very limy, silty, common slickensided with a very gassy odor. Fossil crinoid oscicle. Common Limestone, as above, dark gray brown.
4255 - 4260	Shale, as above. Common Limestone, as above. Common crinoid oscicles, very gassy odor.
4260 - 4265	Shale; very dark brown gray, calcareous, silty, micromicaceous, very gassy odor. Common Shale, as above.
4265 - 4270	Shale; dark gray brown, white speckled, limy, silty, micromicaceous, very gassy odor.
4270 - 4280	Shale, as above. Common slickensided, very gassy odor.
4280 - 4300	Sand, as above, medium to dark gray brown, petroliferous, very gassy odor. Common crinoid oscicles.
4300 - 4310	Shale; very dark gray brown, white speckled in part, calcareous, silty, micromicaceous, petroliferous, very gassy odor. Abundant crinoid oscicles.
4310 - 4315	Shale; light medium gray brown, very limy, silty, micromicaceous, petroliferous. Abundant crinoid oscicles. Trace brachippod fragments, very gassy odor. Some pyrobitumen. Common floating black rounded chert pebbles. Trace floating coarse quartz sand grains.
4315 - 4320	Shale, as above, very dark brown gray. Limeston; dark gray brown, very argillaceous, silty, microcrystalline, dense. Common crinoids. Trace floating black rounded chert pebbles as above, very gassy odor.
4320 - 4330	Limeston; light to medium gray brown, speckled, very argillaceous, soft and very dark gray brown, dense. Crinoid fragments. Trace pyrobitumen.
4330 - 4340	Shale; very dark brown, gray, calcareous, very silty, micromicaceous, petroliferous.
4340 - 4350	Limestone; gray white, silty, sandy, chalky, tight. Common Limestone; gray brown, silty, siliceous, microcrystalline, dense, very hard. Common Chert pebbles; light to dark gray, rounded.

Interval	Description
4350 - 4355	Sandstone; salt and pepper, very calcareous, medium to very coarse, poor sorted, subrounded to rounded, light to dark gray chert grains and minor quartz grains, well cemented with calcite, tight.
4355 - 4360	Sandstone, as above. Common Shale; black, sooty, splintery, hard.
4360 - 4388	Sandstone,as above. Poor porosity. No stain. Very light yellow fluorescence.
4388 - 4503	See Core Descriptions (Cores #4 and 5)
4503 - 4505	Limestone; dark gray brown, argillaceous, siliceous, micrograined, dense. Trace crinoid ossicles.
4505 - 4510	Limestone; as above, silty. Shale; very dark brown gray, calcareous, silty, micromicaceous. Common Shale; black, sooty, blocky, hard. Common Sandstone; salt and pepper, very calcareous, medium to very coarse, subrounded to rounded, well cemented, tight. Trace green shale.
4510 - 4520	Limestone; gray buff and brown mottled, silty, chalky with common calcite fracture in-fillings and Limestone; dark gray brown, argillaceous, very siliceous, fossiferous, micrograined, tight. Abundant brachiopod fragments.
4520 - 4530	Limestone; light gray buff with dark brown mottlings, chalky and dark gray brown, argillaceous, siliceous, fossiliferous as above.
4530 - 4540	Limestone, as above, slightly cherty. Chert; light gray to amber, vitreous.
4540 - 4545	Limestone, as above, very cherty (50 - 60%). Chert; amber colored, vitreous.
4545 - 4550	Limestone; gray white, silty, very cherty (30 - 40%), chalky, tight. Abundant Chert, as above.
4550 - 4555	Limestone; white to very light buff, very cherty, chalky. Sandstone; salt and pepper, very calcareous, cherty, medium to coarse, poor sorted, subrounded to rounded quartz and dark gray chert grains well cemented with calcite, tight. Abundant Chert; milky white to light gray and amber, vitreous.
4555 - 4560	Sandstone; gray brown, calcareous, medium to very coarse, poor sorted, subrounded, frosted, quartz and dark gray chert grains in a matrix of buff, micro to cryptocrystalline Limestone, tight. Abundant Chert, as above.
4560 - 4567	See Core Descriptions (Core #6).

Interval	Description
4567 - 4570	Chert; white to light gray, silty, weathered, cryptocrystalline. Limestone; very dark gray bfown, siliceous, argillaceous, cherty, microcrystalline, dense, very hard. Common Limestone; cream, siliceous, microcrystalline, dense. Common black sooty shale. Abundant clear, coarse quartz crystals (vein in-filling).
4570 - 4575	Shale; black, silty, micromicaceous, sooty, blocky, hard.
4575 - 4580	Shale, as above. Chert; light gray brown and white mottled, spicular, subvitreous and light blue gray to amber and gray brown, vitreous, cryptocrystalline. Limestone; light buff, siliceous, cherty, microcrystalline, dense, hard.
4580 - 4595	Limestone, as above, very cherty. Abundant quartz vein in-filling. Common black Shale, as above.
4595 - 4605	Limestone, as above, fractured. Abundant Limestone; gray white to light gray brown, chalky to earthy. Chert; light gray, subvitreous and amber to light gray, vitreous, cryptocrystalline.
4605 - 4615	Limestone; dark gray brown, siliceous, very cherty, microcrystalline, dense, very hard. Common gray white chalky Limestone. Chert, as above. Common open fractures, stained black.
4615 - 4620	Limestone and Chert, as above. Sandstone; light gray, feldspathic, medium to coarse, fair sorted, subrounded, quartz, white feldspar and light gray chert grains cemented with silica. Quartz grains show secondary quartz outgrowth. Fair porosity, no staining. (Cavings ?).
4620 - 4630	Limestone, as above, very cherty and light gray, siliceous, chalky to earthy. Chert, as above. Abundant quartz vein in-filling.
4630 - 4635	Limestone and Chert, as above.
4635 - 4640	Limestone; light buff, siliceous, very cherty, microcrystalline, dense, very hard.
4640 - 4660	Limestone, as above and gray white, siliceous, earthy. Common clear, coarse quartz crystals.
4660 - 4685	Limestone; dark gray brown, siliceous, argillaceous, cherty, cryptocrystalline, dense, very hard. Abundant Chert; amber to dark gray brown, vitreous, cryptocrystalline. Common gray white chalky to earthy Limestone. Common Shale; black, sooty, splintery.

Interval	Description
4685 - 4705	Limestone; dark gray brown, siliceous, argillaceous, cherty, microcrystalline, dense, very hard. Common Limestone; very light gray brown, chalky to earthy. Common Shale; black, calcareous, sooty. Abundant hairline fractures in-filled with quartz. Common Chert; light blue gray to amber, vitreous.
4705 - 4710	Limestone, as above. Trace Sandstone; salt and pepper, medium to coarse, fair sorted, subangular quartz and light to dark gray chert grains cemented with silica, tight. Some pyrobitumen staining. Brachippod and crinoid oscicles.
4710 - 4715	Limestone, as above. Common Sandstone, as above with some poor apparent porosity. No staining or fluorescence (Cavings)
4715 - 4730	Limestone, as above, cryptocrystalline, fractured. Abundant Limestone; light buff, chalky to earthy. Common Shale; black, sooty, silty, micromicaceous. Common Chert, as above. Brachiopod and crinoid oscicles.
4730 - 4735	Limestone; as above, very dark gray brown to brown black, silty in part and gray white to light buff, chalky to earthy. Common Sandstone (Cavings ?), light gray, fine to coarse, poor sorted, subangular to subround, frosted quartz, white, weathered feldspar and common light to dark gray chert grains cemented with silica. Common pyrobitumen staining. Good porosity. No oil staining, no fluorescence. Trace Sandstone; salt and pepper, very calcareous, very fine to medium, well cemented, tight. Trace Siltstone; light brown, silica, cemented. Common Shale, as above. Common crinoid oscicles.
4735 - 4740	Limestone, as above. Common Sandstone; light brown, bituminous, slightly glauconitic, very fine to fine, well cemented with silica, tight. Common Shale; dark brown gray, calcareous, silty, micro-micaceous.

DRILL STEM TEST SUMMARY

Pressures given are field pressures.

D.S.T. #1: Interval 2384' - 2441' (Blacky Sand)

Preflow 9', I.S.I. 60', V.O. 60', F.S.I. 60'
Weak air blow on preflow. Blow remained steady throughout.
No gas to surface. Recovered 535' fresh water cut mud.
I.H.P. 1230 psi., I.F.P. 140 psi., I.S.I.P. 810 psi.
F.H.P. 1230 psi., F.F.P. 230 psi., F.S.I.P. 790 psi.
Temp. 82°

D.S.T. #2: Interval 4066' - 4136' (Chance Sandstone)

Preflow 15', I.S.I. 30', V.O. 180', F.S.I. 120'
Skidded tool 20' to bottom. Lost approximately 5 bbls. mud.
Gas with mud spray to surface in 4'. Clean gas with condensate spray in 45' at 6.52 MMcf. Steady to end of test.
Recorder depth -. Rec. 140 Condensate
I.H.P. 2040 psi., I.F.P. 1520 psi., I.S.I.P. 1850 psi.,
F.H.P. 2040 psi., F.F.P. 1630 psi., F.S.I.P. 1850 psi.

D.S.T. #3: Interval 4150' - 4197' (Chance Sandstone)

Preflow 6', I.S.I. 30', V.O. 150', F.S.I. 120'
Gas to surface in 1½'. Maximum flow 4.05 MMcf in 10 min.
Steady for first 60 '. Intermittent mud and condensate spray in 60 minutes. Flow rate varied from 3.06 to 4.05 MMcf during last 90' of flow period. Recovered 50' mud cut condensate.
Recorder depth 4173'.
I.H.P. 2100 psi., I.F.P. 1120 psi., I.S.I.P. 1900 psi.
F.H.P. 2100 psi., F.F.P. 1450 psi., F.S.I.P. 1910 psi.
Temperature 106°.

D.S.T. #4: Interval 4196' - 4363' (Chance Zone)

Preflow 5', I.S.I. 60', V.O. 195', F.S.I. 195'
Gas to surface in 4', increasing to a maximum of 99.8 Mcf in 60'. Decreased to 76.2 Mcf in 120'. Steady to end of test.
Recovered 140' black sulphury slightly gas cut mud.
Recorder depth 4208'.
I.H.P. 2080 psi., I.F.P. 30 psi., I.S.I. 1810 psi.
F.H.P. 2080 psi., F.F.P. 30 psi., F.S.I. 1780 psi.

D.S.T. #5: Interval 4364' - 4449' (Chance Sandstone)

Preflow 3', I.S.I. 30', V.O. 120', F.S.I. 30'
Skidded 20' to bottom. Lost approximately 5 bbls. mud.
Gas to surface in 3', mud to surface in 10'.
Maximum gas flow 5.04 MMcf in 60', leveled at 4.2 MMcf in 90'.
Recovered 180' dark brown high gravity crude.
Recorder depth 4365'
I.H.P. 2370 psi., I.F.P. 1350 psi., I.S.I. 1930 psi.,
F.H.P. 2340 psi., F.F.P. 1420 psi., F.S.I. 1930 psi.

D.S.T. #6: Interval 4449' - 4504' (Chance Sandstone)

Preflow 6 ', I.S.I. 60', V.O. 60', F.S.I. 90'
Skidded 10' to bottom. Lost approximately 2 bbls. of mud.
Good initial puff. Gas to surface in 25', too small to measure, Steady throughout.
Recovered 1640' gassy oil (31.8 grav.) and 360' water (24,031 ppm total solids)
Recorder depth 4450'.
I.H.P. 2430 psi., I.F.P. 400 psi., I.S.I.P. 1940 psi.
F.H.P. 2410 psi., F.F.P. 760 psi., F.S.I.P. 1940 psi.
Temp. 112°

D.S.T. #7: Interval 4625' - 4745' (Permo-Penn/Alder Limestone)

Misrun.

D.S.T. #8: Interval 4520' - 4570' (Permo-Penn/Alder Limestone)

Preflow 4', I.S.I. 35', V.O. 90', F.S.I. 90'
Good initial puff. Gas to surface in 2'. Maximum of 2.214 MMcf in 15'. Decreased to 1.919 MMcf in 60'. Steady to end of test. Recovered 300' gassy oil cut mud. Recorder depth 4508'.
I.H.P. 2440 psi., I.F.P. 6000psi., I.S.I.P. 1990 psi.
F.H.P. 2410 psi., F.F.P. 550 psi., F.S.I.P. 1990 psi.
Temp. 116°

D.S.T. #9: Interval 4580' - 4745' (Permo-Penn/Alder Sandstone)

Preflow 6', I.S.I. 30', V.O. 65', F.S.I. 60'
Good initial puff. Gas to surface in 5'. Maximum flow 20 MCF in 45', leveled at 19.0 MCF in 50'.
Recovered 465' gassy mud, 185' gassy muddy water, 525' slat water.
Recorder depth 4582'.
I.H.P. 2490 psi., I.F.P. 300 psi., I.S.I.P. 1990 psi.
F.H.P. 2480 psi., F.F.P. 570 psi., F.S.I.P. 1950 psi.
Temp. 110°

CASING RECORD

Conductor Pipe: Ran 3 jts. (84.74') X 13 3/8" X 54.5# J-55, Rg. 2 new casing, landed at 70' k.B. Pumped 16 bbls. water, cemented with 75 sax Fondu cement. Displaced with 5 bbls. water. Plug down at 10:15 P.M., Dec. 16. Good returns to surface (15 sax).

Surface Casing: Ran 26 jts. (809.38') X 9 5/8" X 36# J-55, Rg.2, S T & C new casing, landed at 809' K.B. Three centralizers at 15', 45' and 75' from bottom of string. Spot welded float shoe, float collar and first 3 jts. of casing. Cemented with 325 sax Fondu cement. Displaced with 60 bbls. of water. Plug down at 4:30 P.M., Dec. 21. Good returns to surface (30 bbls.).

Production Casing: Ran 150 jts. X 7" S & L, Rg. 2, 8 thread, consisting of 22 jts. (692.47') 26#, and 128 jts. (4034.61') 23# casing, landed at 4725' K.B. Cemented with 450 sax construction cement with 15 bbls. water plus wiper ahead of cement and 10 bbls. water behind. Pumped plug with Rig Pump 218P, bumped with 1200 psi. Floats holding. Plug down at 11:55 P.M., Feb. 15, 1968.

Suspension Record

Replaced 1000' mud with diesel fuel and installed 10" 900 series wellhead equipment

Form E-6—1M-12-63-Kal.

CANOE RIVER EXPLORATION LTD.

CASING DATA SHEET

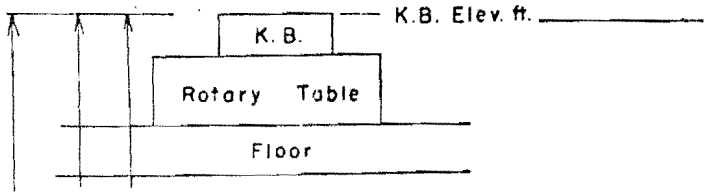
COMPANY Canoe River Exploration Ltd. DATE Dec. 16, 1967

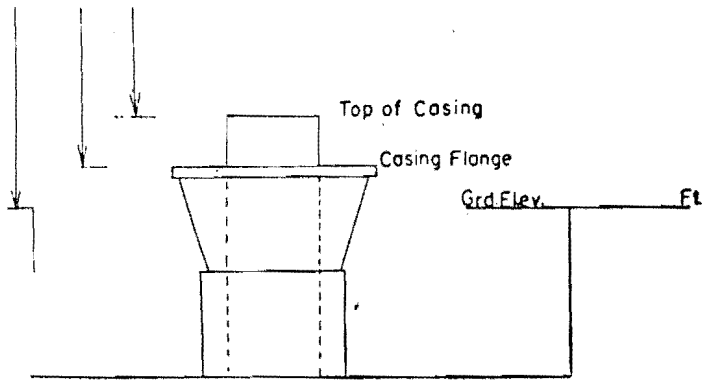
WELL NAME Canoe River Chance YT J-19 LOCATION J - 19

TOTAL DEPTH 70' HOLE SIZE 20"

Size	Wt.	Grade	Rge.	Thread and Collar	No. of Threads	Seamless or E.W.	New or Used	Manuf.	No. of Joints	Footage
13 3/8	54.5	J55	2	ST &C	8 round	Seamless	New	S & L	4	117.47

CENTRALIZERS		SCRATCHERS		Sub Total	
Make	BJ	Nil		Cross-over Joint	Nil
Type	Belly Spring			Float and Guide Equipment	Nil
Depth	40'			Total Casing Run (A)	83.59
				Minus, Cut-off	18.95
				TOTAL CASING LEFT IN HOLE	66.00
				Plus Distance (K.B. to top of casing)	4.00
				DEPTH CASING LANDED	70.00
				Casing left on Rack (B)	33.88
				Total Casing Tallied (A & B)	117.47





FLOAT AND GUIDE EQUIPMENT

	Make	Type	Depth Set
Shoe	Nil		
Collar	Nil		

REMARKS: (TENSION LEFT IN PIPE, ETC.)

No tension. Shoe & casing joints spot welded. Filled casing & hole with 16 bbls. water. Cemented with 75 sax cement. Displaced w/5 bbls. water, Used as conductor pipe.

ENGINEER Harry Martinoff

SHEET NO.

Form E-6—1M-12-63-Kal.

CANOE RIVER EXPLORATION LTD.

CASING DATA SHEET

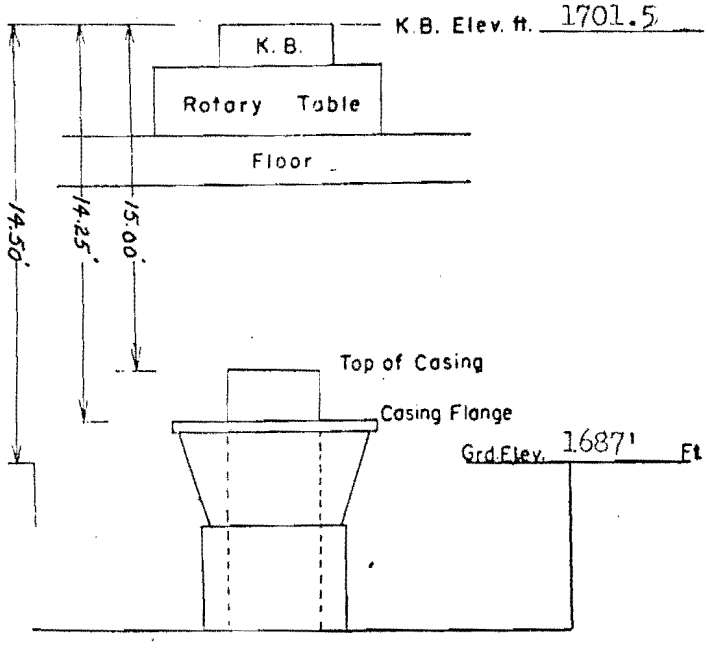
COMPANY Canoe River Exploration Ltd. DATE Dec. 21, 1967

WELL NAME Canoe River Chance YT J - 19 LOCATION J - 19

TOTAL DEPTH 809' HOLE SIZE 12¼"

Size	Wt.	Grade	Rge.	Thread and Collar	No. of Threads	Seamless or E.W.	New or Used	Manuf.	No. of Joints	Footage
9 5/8	36	J55	2	LT &C	8 round	Seamless	New	Mannes.	29	901.26

CENTRALIZERS		SCRATCHERS		Sub Total	
Make	BJ	Nil		Cross-over Joint	Nil
Type	Belly Spring			Float and Guide Equipment	3.05
Depth	794			Total Casing Run (A)	809.38
	764			Minus, Cut-off	18.43
	715			TOTAL CASING LEFT IN HOLE	794.00
				Plus Distance (K.B. to top of casing)	15.00
				DEPTH CASING LANDED K.B.	809.00
				Casing left on Rack (B)	91.88
				Total Casing Tallied (A & B)	901.26



FLOAT AND GUIDE EQUIPMENT

	Make	Type	Depth Set
Shoe	Davis	Float	809
Collar	Davis		

REMARKS: (TENSION LEFT IN PIPE, ETC.)

No tension. Spot welded float shoe, float collar and first 3 jts. of casing.

ENGINEER Harry Martinoff

SHEET NO.

Form E-6—1M-12-63-Kal.

CANOE RIVER EXPLORATION LTD.

CASING DATA SHEET

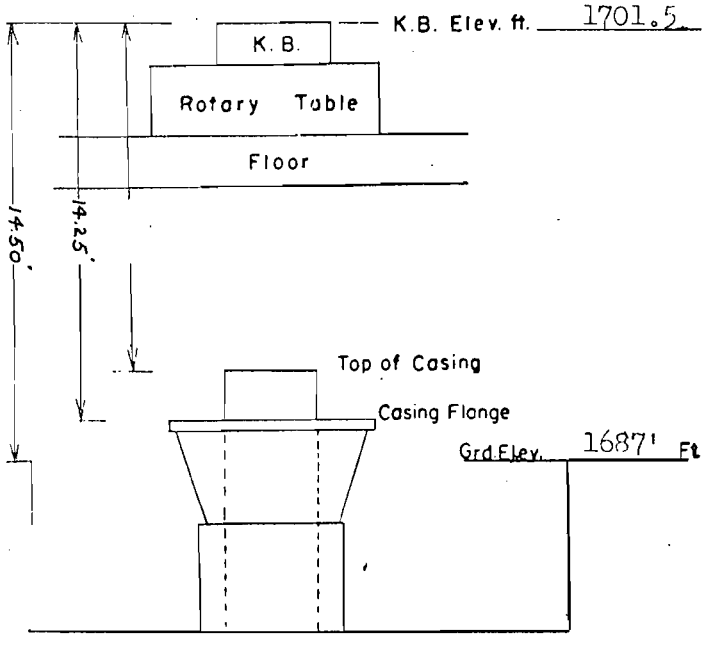
COMPANY Canoe River Exploration Ltd. DATE Feb. 15, 1968

WELL NAME Canoe River Chance YT J-19 LOCATION J - 19

TOTAL DEPTH 4745' HOLE SIZE 8 5/8"

Size	Wt.	Grade	Rge.	Thread and Collar	No. of Threads	Seamless or E.W.	New or Used	Manuf.	No. of Joints	Footage
7	26	NS	2	LT &C	8	Seamless	New	S & L	22	692.47
7	23	NS	2	LT &C	8	"	New	S & L	169	4684.73

CENTRALIZERS			SCRATCHERS		Sub Total	
Make	B & W		Haliburton		Cross-over Joint	
Type	Spring				Float and Guide Equipment	3.20
Depth	4610	2200	4590 4557	4186 4153	Total Casing Run (A)	4727.08
	4505		4537 4505	4123 4092	Minus, Cut-off	19.50
	4420		4474 4442	4061 4031	TOTAL CASING LEFT IN HOLE	4710.78
	4325		4409 4377		Plus Distance (K.B. to top of casing)	14.50
	4322		4345 4315		DEPTH CASING LANDED	4725.28
	4133		4283 4251		Casing left on Rack (B)	650.12
	4059		4219		Total Casing Tallied (A & B)	5377.20



FLOAT AND GUIDE EQUIPMENT

	Make	Type	Depth Set
Shoe	Davis	Float	4725
Collar	BJ	Float	4696.58

REMARKS: (TENSION LEFT IN PIPE, ETC.)

Spot welded shoe, float, & 3rd joint. 40,000 tension on slips. Left 1000' diesel in casing. Reciprocated casing 40' 2½ hrs. while circulating.

ENGINEER Wm. Semeniuk

SHEET NO.

Sheet No. .....

BIT RECORD

Company Canoe River Exploration Ltd. Date Feb. 17, 1968

Well Canoe River Chance YT J-19 Field WC - Y.T.

Bit No.	DEPTH From	DEPTH To	Size	MAKE AND TYPE	Footage	Hours Run	Dull Condition REMARKS T	B	G
1	70	860	8 5/8	H.W. OSCIG	790	28½	2	2	I
2	70	809	12 1/4	Pilot Reamer	739	32½	3	2	1
3	790	1493	8 5/8	H.W. XIG-J	633	23	3	2	1
4	1493	2049	"	H.W. XIG-J	556	29	3	2	1
5	2049	2265	"	H.W. XIG-J	216	15¾	3	2	1
6	2265	2441	"	H.W. OWV-J	176	17½	3	2	1
7	2441	2565	"	H.W. OWC	124	15¼	3	2	1
8	2565	2797	"	H.W. OWV	232	17¼	3	2	1
9	2797	3285	"	H.W. OSCIG	488	24½	2	3	1
10	3285	3602	"	H.W. OSCIG	317	24½	2	3	1
11	3602	3957	"	H.W. XIG	355	32¼	2	1	1
12	3957	4063	"	Reed YHWG	106	18½	3	2	1
13	4063	4079	"	H.W. RG7X	16	2	1	1	1
14	4079	4135	6 1/8	Chris Diamond	56	38¾	Cracked		
15	4135	4136	8 5/8	H.W. RGI-J	Drld.1 Rmd.56	17¾	1	1	1
16	4136	4196	6 1/8	Chris Diamond	60	15¼	1	1	1
17	4136	4197	8 5/8	H.W. RGI-RR	Drld.1 Rmd.60	18½			
18	4197	4245	6 1/8	Chris Diamond	48	32¾	3	2	1
19	4197	4245	8 5/8	H.W. RGI-RR	Rmd.48	19½	2	3	1
20	4245	4343	"	Reed YHWG	98	19¼	3	2	1
21	4343	4363	"	Reed YHWG	20	8	3	2	1
22	4363	4388	"	H.W. X-55R-RR	25	5¾	1	1	1
23	4388	4448	6 1/8	Chris Diamond	60	29	Good		
24	4448	4449	8 5/8	Reed YHG	Drld.1 Rmd.60	11¼	3	3	1
25	4449	4449	"	" "	Cleaned 110' fill.				

Sheet No. .....

BIT RECORD

Company Canoe River Exploration Ltd. Date Feb. 17, 1968

Well Canoe River Chance YT J-19 Field WC - Y.T.

Bit No.	DEPTH From	DEPTH To	Size	MAKE AND TYPE	Footage	Hours Run	Dull Condition REMARKS T B G
26	4449	4503	6 1/8	Chris Diamond	54	26¼	Good
27	4503	4504	8 5/8	H.W. W7R	Drld.1 Rmd.54	15¾	2 2 1
28	4504	4560	"	H.W. X55R-RR	56	14	1 1 1
29	4560	4567	6 1/8	Chris Diamond	7	4¾	Good
30	4567	4574	8 5/8	H.W. W7R2	Drld.7 Rmd. 7	5½	3 2 1
31	4574	4655	"	H.W. X55R	81	32½	2 3 1
32	4655	4716	"	H.W. X55R	61	32½	2 4 1
33	4716	4745	"	H.W. W7R	29	16¾	2 2 1

DRILLING MUD SUMMARY

Additive	Amount	Additive	Amount
Gel	145,000 lbs.	Walnut Shells	3,250 lbs. (65 sax)
Lime	140 "	DRLO	65 gals.
Soda Ash	300 "	Quick Vis.	7 gals.
Pelten	16,600 "	Sawdust	145 sax
Caustic	5,900 "	Cello-flake	42 "
CMC	1,350 "	Mica	43 "
Soltex	4,000 "	Fiberton	10 "
Baroid	192,300 "		

DEVIATION RECORD

DATE	DEPTH	DEGREE
Dec. 18/67	60	1
" "	109	7/8
" 19	190	3/4
" "	270	3/4
" "	436	7/8
" "	610	7/8
" "	793	5/8
" 24	1038	5/8
" 25	1220	1/4
" "	1493	1/4
" 26	1750	1/4
" "	2049	1/4
" 28	2265	1/2
" 29	2441	1
" 31	2565	1

DATE	DEPTH	DEGREE
Jan. 1/68	2797	1
" 3	3265	1
" 4	3602	1 1/4
" 6	3957	1 3/4
" 16	4245	2
" 18	4363	2
Feb. 8	4574	2½

REPORT OF BLOWOUT

The well blew out at approximately 4:15 P.M., Jan. 18,1968, while pulling the testing tool through the table after completion of D.S.T. #4, in the interval 4196' to 4363'. Since the mud level in the annulus remained steady throughout the test period and the initial and final hydrostatic pressures (2080 psi.) recorded on the D.S.T. were the same, it appears that the well was swabbed in from the overlying porous Chance Sand (4060' to 4191') while pulling the packer. The shut in pressure of the tested interval was 1810 psi. giving a pressure differential of 270 psi.

The mud weight prior to the test was 9.6 lb. per gallon. This would give a hydrostatic of 2030 psi. at the top of the Chance Sandstone at 4060'. The shut in pressure recorded for the Chance Sandstone (D.S.T. #2) was 1850 psi. giving a pressure differential of 180 psi.

The blow came through the equalizing ports of the testing tool. The hydril was closed on the jars below the hydraulic tool with the equalizing ports being above the hydril. Seven feet of the testing tool was above the table. The equalizing ports eventually plugged and froze off after several hours, effectively shutting in the well.

Commenced mixing mud and lost circulation material. Pressure on casing bowl was initially 1300 psi. Pumped mud and lost circulation material down hole and bled off to tanks. Pressure on casing bowl decreased to 775 psi. at 12:00 noon on Jan. 21. Bled well off and pumped down 79 bbls. of mud, then finished tripping out with testing tool at 8:00 A.M., Jan.22. Began tripping in with bit. Hit bridge at 860'. The goose neck and kelly were hooked up, the gas circulated out of the mud and the bridge was reamed. The well blew out immediately when the bridge was reamed. This indicates that the bridge had effectively sealed off the underlying gas. Mixed mud, pumped down, bled off and circulated gas cut mud until casing bowl pressure to a safe level to permit running in more pipe. This procedure was continued through successive bridges at approximately 940', 1020', 1580' and 1804'. Finished tripping in at 10:30 A.M., Jan. 27, when the well was considered effectively controlled. Cleaned fill, reamed bridges, conditioned mud to 10:15 P.M. Tripped for new bit and commenced drilling at 5:30 A.M., Jan.28.

The total mud required to kill the well and recondition the system for further drilling is as follows: weight material - 182,300 lbs., gel 48,600 lbs., Peltex 4,500 lbs., Caustic 1550 lbs., CMC 550 lbs., walnut shells 3,250 lbs., sawdust 55 sax, Celloflake 22 sax, Mica 43 sax, Fibertex 10 sax, Quick Vis - 1 gallon.

The mud weight was maintained at 10.5 lb./gallon after drilling was resumed. No lost circulation problems were created as a result of the added weight nor was there any significant evidence of mudding off as indicated by D.S.T. #5, 6, 8 and 9.

SUMMARY OF LOGS RUN

Run No.	Date	Type of Log	Interval
1	Feb. 5/68	BHC Sonic w/Caliper	4543' - 808'
2	" 13/68	" " " "	4732' - 4300'
1	" 6/68	I.E.S.	4544' - 803'
2	" 13/68	"	4739' - 4000'
1	" 13/68	Microlog Caliper	4739' - 4000'

(Logs - See attachment)

ANALYSIS

(a) Summary of Lab Reports

(b) Core Analysis (See Appendix)

Lab File No.	From	To	Source	Remarks
CNP-4-4093	4079	4135	Core #1	Full Diameter Analysis
"	4136	4196	Core #2	" " "
"	4197	4245	Core #3	" " "
"	4388	4448	Core #4	" " "
"	4449	4503	Core #5	" " "
"	4560	4567	Core #6	" " "

(c) Water Analysis (See Appendix)

Lab File No.	From	To	Source	Remarks
CBH-2-2548	2384	2441	DST #1	Top of Recovery
"	2384	2441	DST #1	Top of Tool
"	4196	4363	DST #4	Bottom
CBH-2-2657	4449	4504	DST #6	Top of Tool
"	4580	4745	DST #9	

(d) Gas Analysis (See Appendix)

Lab File No.	From	To	Source	Remarks
CBH-2-2548	4066	4136	DST #2	Flareline
"	4150	4197	DST #3	
"	4196	4363	DST #4	
CBH-2-2657	4364	4449	DST #5	
"	4520	4570	DST #8	
"	4580	4745	DST #9	

(e) Oil Analysis (See Appendix)

Lab File No.	From	To	Source	Remarks
CBH-2-2548	4066	4136	DST #2	Top of Tool, Condensate Sample
"	4150	4197	DST #3	" "
CBH-2-2657	4364	4449	DST #5	Condensate Sample
"	4449	4504	DST #6	Crude Oil Sample

Form E-4—1M-12-63-Kal.

CANOE RIVER EXPLORATION LTD.

CEMENTING REPORT

DATE Dec. 16, 1967

COMPANY Canoe River Exploration Ltd. FIELD WC - Y.T.

WELL NAME Canoe River Chance YT J - 19 LOCATION J - 19

Depth 70' Hole Size 20"

Casing being Cemented Size 13 3/8 Wt. 54.5 Grade J 55, Rg.2 Thread 8 Round

Make Stewart & Lloyd Collars Short

No. Joints delivered 4 No. joints left in hole 3

Thd's off tally delivered 117.47 Thd's off tally left in hole 83.59

Thd's on tally delivered Thd's off tally left in hole

Kelly Bushing elevation 1701.5 Depth Shoe below Kelly Bushing 70'

Cut off 18.95

Time started running casing 9:30 P.M. Time casing in hole 10:00 P.M.

Time started circulating No Circulation Time started cementing 10:00 P.M.

No. sacks mixed 75 Made Fondu Type Oilwell

Calcium Chloride added Nil Aquagel added Nil

Avg. slurry weight 13.5 Time cement in pipe

Type of plug used Nil Plug pumped down by

Time plug down Bumped plug with psi.

Cement returns 15 sax gals. Pressure left on head psi.

Cementing Co. BJ Service Cementer Paul Seeman

Make well head Nil Size

Remarks Conductor Pipe displaced with 5 bbls. water & left appx. 20' cement in casing. Good returns.

Engineer Harry Martinoff

SHEET No. 1

Form E-4—1M-12-63-Kal.

CANOE RIVER EXPLORATION LTD.

CEMENTING REPORT

DATE Dec. 21, 1967

COMPANY Canoe River Exploration Ltd. FIELD WC - Y.T.

WELL NAME Canoe River Chance YT J - 19 LOCATION J - 19

Depth 809' Hole Size 12¼"

Casing being Cemented Size 9 5/8" Wt. 36# Grade J 55, Rg. 2 Thread 8 Round

Make Mannesman Collars Short

No. Joints delivered 29 No. joints left in hole 26

Thd's off tally delivered 901.26 Thd's off tally left in hole 809.38

Thd's on tally delivered 901.26 Thd's off tally left in hole 809.38

Kelly Bushing elevation 1701.5 Depth Shoe below Kelly Bushing 809

Time started running casing 9:30 A.M., Dec. 21/67 Time casing in hole 2:30 P.M.

Time started circulating 2:30 P.M. Time started cementing 3:30 P.M.

No. sacks mixed 325 Made Fondu Type Oilwell

Calcium Chloride added Nil Aquagel added Nil

Avg. slurry weight 14.6 Time cement in pipe 4:15 P.M.

Type of plug used Rubber Plug pumped down by BJ Cementing Unit

Time plug down 4:30 P.M. Bumped plug with 800 p.s.i psi.

Cement returns 30 bbls. gals. Pressure left on head Nil psi.

Cementing Co. BJ Service Cementer Paul Seeman

Make well head OCT (Casing bowl only) Size 10", 900 Series

Remarks Good returns.

Engineer

SHEET No. 2

Form E-4—1M-12-63-Kal.

CANOE RIVER EXPLORATION LTD.

CEMENTING REPORT

DATE Feb. 15, 1968

COMPANY Canoe River Exploration Ltd. FIELD WC - Y.T.

WELL NAME Canoe River Chance YT J- 19 LOCATION J - 19

Depth 4745' Hole Size 8 5/8"

Casing being Cemented Size 7 Wt. 23 & 26# Grade NS Thread 8 Round

Make Stewart & Lloyd Collars LT & C

No. Joints delivered 169 No. joints left in hole 149

Thd's off tally delivered 5377.20 Thd's off tally left in hole 4727.08

Thd's on tally delivered Thd's off tally left in hole 4727.08

Kelly Bushing elevation 1701.5' Depth Shoe below Kelly Bushing 4725'.28

Time started running casing 5:45 A.M., Feb. 15/68 Time casing in hole 7:00 P.M.

Time started circulating 7:00 P.M. Time started cementing 10:00 P.M.

No. sacks mixed 450 Made Portland Type Construction

Calcium Chloride added Nil Aquagel added Nil

Avg. slurry weight 13.5 Time cement in pipe 11:15

Type of plug used BJ Plug pumped down by 218P(Rig Pump)

Time plug down 11:55 P.M., Feb. 15 Bumped plug with 1400 psi.

Cement returns Nil gals. Pressure left on head Nil psi.

Cementing Co. BJ Service Cementer Paul Seeman

Make well head OCT Size 10# - 900

Remarks ~~No well head; casing bowl & 7" slips only.~~ Replaced 1000' mud with diesel fuel. Installed 10 - 900 series wellhead equipment.

Engineer W. E. Semenuk

SHEET No. 3

CORE LABORATORIES-CANADA LTD.
CALGARY ALBERTA

Company - CANOE RIVER EXPLORATION LTD.
Well - CANOE RIVER CHANCE YT J-19
Field - WILDCAT
Location - YUKON TERRITORIES

Date Report - MARCH 1, 1968
Formation - -
D. Fluid - WATER BASE MUD
Analysis - FULL DIAMETER

Page - 1 of 7
File - CNP-4-4093
Analysts - MM
Core - DIAMOND CORES

NOTE: All samples sandblasted prior to analysis

SAMPLE NUMBER	DEPTH REPRESENTED FEET	FOOT. REPR.	PERMEABILITY TO AIR (HORIZONTAL K MAX	HORIZONTAL K 90°)	VERTICAL	PERM. × FEET	POROSITY PER CENT	POROSITY × FEET	DENSITY BULK	DENSITY GRAIN	VISUAL EXAMINATION
CORED INTERVAL 4388' - 4567'											
CORE No. 4 4388' - 4448' (Rec. 56.0') (12 BOXES)											
99	4388.0-4389.1	1.1	108.00	81.20	76.00	118.80	11.3	12.43	2.33	2.62	CS
100	4389.1-4390.2	1.1	76.30	68.00	64.20	83.93	11.3	12.43	2.33	2.63	CS
101	4390.2-4391.3	1.1	59.40	55.80	31.00	65.34	11.2	12.32	2.32	2.62	CS
102	4391.3-4392.2	0.9	108.00	94.60	48.90	97.20	11.6	10.44	2.32	2.62	CS
103	4392.2-4393.0	0.8	23.20	14.20	4.62	18.56	11.3	9.04	2.34	2.64	FS MS
104	4393.0-4394.1	1.1	66.10	54.90	33.10	72.71	11.6	12.76	2.32	2.62	CS
105	4394.1-4395.3	1.2	28.70	21.00	5.21	34.44	11.5	13.80	2.35	2.66	FS CS
106	4395.3-4396.4	1.1	23.00	19.80	2.81	25.30	10.6	11.66	2.35	2.63	FS CS
107	4396.4-4397.5	1.1	19.00	16.10	4.01	20.90	11.6	12.76	2.33	2.63	FS CS
108	4397.5-4399.0	1.5	59.90	45.20	29.50	89.85	11.9	17.85	2.31	2.62	MS CS
109	4399.0-4399.5	0.5	3.63	3.30	1.74	1.82	10.6	5.30	2.34	2.62	FS MS
110	4399.5-4400.7	1.2	28.60	21.30	19.20	34.32	9.6	11.52	2.36	2.61	CS
111	4400.7-4401.3	0.6	63.40	58.90	35.60	38.04	11.5	6.90	2.31	2.61	MS CS
112	4401.3-4402.3	1.0	13.80	11.40	9.02	13.80	7.8	7.80	2.41	2.62	CS
113	4302.3-4303.4	1.1	36.00	25.40	10.40	39.60	11.1	12.21	2.33	2.62	MS CS
114	4303.4-4304.1	0.7	7.34	6.92	2.10	5.14	11.0	7.70	2.33	2.62	FS CS
115	4304.1-4305.4	1.3	3.24	2.86	0.51	4.21	10.5	13.65	2.34	2.62	FS MS
116	4305.4-4306.3	0.9	7.32	6.90	5.13	6.59	10.0	9.00	2.34	2.60	CS
117	4306.3-4307.4	1.1	0.49	0.43	<0.01	0.54	8.5	9.35	2.40	2.63	FS Silty
118	4307.4-4308.6	1.2	0.54	0.52	0.28	0.65	8.8	10.56	2.41	2.64	FS Silty

SAMPLE NUMBER	DEPTH REPRESENTED FEET	FOOT. REPR.	PERMEABILITY TO AIR) HORIZONTAL K MAX	K 90°	)VERTICAL	PERM. x FEET	POROSITY PER CENT	POROSITY x FEET	DENSITY BULK	GRAIN	VISUAL EXAMINATION
Core No.4 Cont'd											
119	4308.6-4309.8	1.2	0.43	0.06	<0.01	0.52	8.6	10.32	2.39	2.62	FS Silty
120	4309.8-4311.0	1.2	1.15	0.76	0.15	1.38	8.5	10.20	2.37	2.59	FS MS
121	4311.0-4312.2	1.2	3.02	2.03	1.87	3.62	9.8	11.76	2.34	2.59	MS CS
122	4312.2-4313.3	1.1	2.06	1.91	0.40	2.27	10.0	11.00	2.32	2.58	MS
123	4313.3-4314.6	1.3	2.17	1.77	1.34	2.82	8.7	11.31	2.37	2.59	CS
124	4314.6-4315.7	1.1	2.18	1.47	0.34	2.40	10.4	11.44	2.35	2.62	FS MS
125	4315.7-4316.8	1.1	4.12	3.64	2.26	4.53	10.2	11.22	2.32	2.59	FS MS
126	4316.8-4318.1	1.3	2.66	2.17	0.83	3.46	10.3	13.39	2.34	2.60	FS MS
127	4318.1-4319.1	1.0	13.70	13.00	6.45	13.70	11.0	11.00	2.31	2.60	MS CS
128	4319.1-4320.2	1.1	8.57	5.81	2.61	9.43	11.7	12.87	2.30	2.61	FS MS
129	4320.2-4321.3	1.1	2.22	1.75	1.17	2.44	10.2	11.22	2.32	2.59	FS MS
130	4321.3-4322.5	1.2	2.24	1.39	0.57	2.69	10.1	12.12	2.33	2.60	FS MS
131	4322.5-4323.7	1.2	6.40	6.18	3.07	7.68	11.2	13.44	2.31	2.60	FS MS
132	4323.7-4325.2	1.5	16.30	12.20	7.56	24.45	12.1	18.15	2.30	2.62	MS CS
133	4325.2-4326.0	0.8	0.58	0.51	<0.01	0.46	8.7	6.96	2.39	2.61	FS MS Shaly
134	4326.0-4327.2	1.2	19.30	12.80	3.51	23.16	10.8	12.96	2.33	2.61	MS CS
135	4327.2-4328.4	1.2	1.31	1.08	0.16	1.57	9.0	10.80	2.36	2.59	FS MS
136	4328.4-4329.4	1.0	1.91	1.46	0.33	1.91	8.6	8.60	2.36	2.59	FS MS
137	4329.4-4330.7	1.3	4.27	3.36	1.57	5.55	9.4	12.22	2.33	2.58	FS MS
138	4330.7-4331.9	1.2	1.95	1.65	1.06	2.34	8.7	10.44	2.36	2.58	FS MS
139	4331.9-4332.7	0.8	34.70	33.60	17.80	27.76	12.0	9.60	2.31	2.62	MS CS
140	4332.7-4333.9	1.2	7.15	5.16	4.12	8.58	9.6	11.52	2.33	2.57	MS CS
141	4333.9-4335.1	1.2	8.61	6.30	5.85	10.33	9.6	11.52	2.33	2.58	MS CS
142	4335.1-4336.3	1.2	3.44	3.39	0.25	4.10	10.7	12.84	2.33	2.61	MS CS
143	4336.3-4337.3	1.0	4.15	3.58	1.80	4.15	10.2	10.20	2.32	2.58	FS MS
144	4337.3-4338.6	1.3	25.70	21.40	13.10	33.41	11.5	14.95	2.30	2.60	FS MS
145	4338.6-4340.0	1.4	32.60	25.60	15.10	45.64	10.6	14.84	2.31	2.59	MS CS
146	4340.0-4340.9	0.9	22.10	20.40	9.60	19.89	10.8	9.72	2.31	2.59	MS CS
147	4340.9-4341.8	0.9	9.99	7.91	6.79	8.99	9.0	8.10	2.34	2.57	MS CS
148	4341.8-4342.8	1.0	22.00	48.90	16.27	22.00	10.0	10.00	2.31	2.57	MS CS

SAMPLE NUMBER	DEPTH REPRESENTED FEET	FOOT. REPR.	PERMEABILITY TO AIR HORIZONTAL) K MAX	K 90°) VERTICAL	PERM. × FEET	POROSITY PER CENT	POROSITY × FEET	DENSITY BULK	DENSITY GRAIN	VISUAL EXAMINATION
Core No.4 Cont'd										
149	4342.8-4344.0	1.2	21.00	20.00	11.80	25.20	10.1	12.12	2.32	2.58	MS CS
-	4344.0-4348.0	4.0	-	-	-	-	-	-	-	-	Lost Core
-	4348.0-4349.0	1.0	-	-	-	-	-	-	-	-	Drilled

SAMPLE NUMBER	DEPTH REPRESENTED FEET	FOOT. REPR.	PERMEABILITY TO AIR (HORIZONTAL) K MAX	K 90°	VERTICAL	PERM. X FEET	POROSITY PER CENT	POROSITY X FEET	DENSITY BULK	DENSITY GRAIN	VISUAL EXAMINATION
CORE NO. 5 4449' - 4503' (REC. 53') (13 BOXES)											
150	4449.0-4450.1	1.1	19.70	18.80	0.61	21.67	9.4	10.34	2.34	2.59	FS. CS.
151	4450.1-4451.4	1.3	74.60	72.00	34.20	96.98	11.3	14.69	2.31	2.61	CS.
152	4451.4-4452.6	1.2	8.14	7.98	3.15	9.77	9.1	10.92	2.34	2.57	FS. CS.
153	4452.6-4453.7	1.1	5.13	4.67	1.03	5.64	9.4	10.34	2.34	2.58	FS. CS.
154	4453.7-4454.9	1.2	12.50	12.30	1.67	15.00	10.1	12.12	2.35	2.61	FS. CS.
155	4454.9-4456.0	1.1	19.60	17.10	8.18	21.56	12.2	13.42	2.28	2.60	FS. MS.
156	4456.0-4457.0	1.0	18.70	15.90	9.39	18.70	11.4	11.40	2.29	2.59	FS. MS.
157	4457.0-4458.3	1.3	7.74	6.54	3.34	10.06	11.3	14.69	2.31	2.60	FS. MS.
158	4458.3-4459.5	1.2	10.00	9.44	1.72	12.00	12.2	14.64	2.30	2.62	FS. MS.
159	4459.5-4460.7	1.2	11.30	9.28	5.60	13.56	11.7	14.04	2.29	2.60	MS. CS.
160	4460.7-4461.8	1.1	3.50	2.71	1.72	3.85	10.4	11.44	2.32	2.58	MS. CS.
161	4461.8-4463.1	1.3	3.66	3.27	1.08	4.76	10.7	13.91	2.32	2.60	FS. MS.
162	4463.1-4464.3	1.2	4.90	4.29	2.10	5.88	10.6	12.72	2.31	2.59	FS. MS.
163	4464.3-4465.5	1.2	5.66	4.56	3.16	6.79	9.8	11.76	2.32	2.57	MS. CS.
164	4465.5-4466.8	1.3	5.99	5.41	2.06	7.79	10.8	14.04	2.31	2.59	FS. MS.
165	4466.8-4468.3	1.5	16.20	12.70	3.16	24.30	12.2	18.30	2.30	2.62	FS. MS.
166	4468.3-4469.7	1.4	31.20	27.10	17.80	43.68	12.8	17.92	2.28	2.62	FS. MS.
167	4469.7-4470.8	1.1	21.80	21.00	8.58	23.98	12.6	13.86	2.30	2.63	FS. MS.
168	4470.8-4472.3	1.5	29.40	24.50	14.30	44.10	12.3	18.45	2.29	2.61	FS. MS.
169	4472.3-4473.7	1.4	16.90	13.90	4.31	23.66	11.5	16.10	2.31	2.62	FS. MS.
170	4473.7-4474.8	1.1	5.03	4.83	0.71	5.03	9.8	9.80	2.37	2.63	FS. MS.
171	4474.8-4476.0	1.2	7.99	7.02	0.71	9.59	10.4	12.48	2.35	2.62	FS. MS.
172	4476.0-4477.1	1.1	100.00	93.60	78.00	110.00	12.0	13.20	2.31	2.63	CS.
173	4477.1-4478.3	1.2	72.30	68.10	35.00	86.76	11.1	13.32	2.33	2.62	MS. CS.
174	4478.3-4479.6	1.3	89.80	74.80	34.20	116.74	11.0	14.30	2.32	2.60	CS.
175	4479.6-4481.0	1.4	204.00	181.00	127.00	285.60	11.7	16.38	2.32	2.62	CS.
176	4481.0-4482.0	1.0	167.00	133.00	97.80	167.00	11.8	11.80	2.32	2.63	CS.
177	4482.0-4483.4	1.4	81.50	77.60	37.50	114.10	11.4	15.96	2.32	2.62	CS.
178	4483.4-4484.4	1.0	93.20	71.10	23.90	93.20	12.9	12.90	2.30	2.64	FS. MS. F.
179	4484.4-4485.6	1.2	87.30	74.80	51.40	104.76	13.5	16.20	2.27	2.62	FS. MS.

SAMPLE NUMBER	DEPTH REPRESENTED FEET	FOOT. REPR.	PERMEABILITY TO AIR (HORIZONTAL) K MAX	K 90°	VERTICAL	PERM. X FEET	POROSITY PER CENT	POROSITY X FEET	DENSITY BULK	DENSITY GRAIN	VISUAL EXAMINATION
CORE NO. 5 (Cont'd)											
180	4485.6-4486.7	1.1	96.70	81.60	60.30	106.37	12.2	13.42	2.29	2.61	CS.
181	4486.7-4488.0	1.3	77.40	68.10	34.80	100.62	13.1	17.03	2.28	2.63	MS. CS.
182	4488.0-4489.2	1.2	72.20	51.60	37.70	86.64	12.1	14.64	2.30	2.62	CS.
183	4489.2-4490.5	1.3	52.20	46.80	21.70	67.86	12.4	16.12	2.30	2.63	FS. MS.
-	4490.5-4402.0	11.5	-	-	-	-	-	-	-	-	Dense, Limy
-	4402.0-4503.0	1.0	-	-	-	-	-	-	-	-	Lost Core
-	4503.0-4560.0	57.0	-	-	-	-	-	-	-	-	Drilled.
CORE NO. 6 4560' - 4567' (REC. ~~10~~ 6') (~~5~~ 3 BOXES)											
184	4560.0-4561.3	1.3	142.00	138.00	51.80	184.60	13.9	18.07	2.27	2.63	FS. MS.
185	4561.3-4562.3	1.0	101.00	92.80	46.90	101.00	13.9	13.90	2.26	2.62	MS. CS.
186	4562.3-4562.9	0.6	9.28	8.94	1.91	5.57	12.1	7.26	2.32	2.64	FS. MS.
187	4562.9-4563.9	1.0	64.10	58.60	30.60	64.10	13.5	13.50	2.28	2.64	FS. MS.
188	4563.9-4564.6	0.7	0.69	0.67	<0.01	0.48	5.9	4.13	2.47	2.63	FS., Shaly
189	4564.6-4565.6	1.0	0.89	0.83	0.59	0.89	6.0	6.00	2.40	2.56	FS., Shaly, Lime Breaks
-	4565.6-4566.0	0.4	-	-	-	-	-	-	-	-	Dense
-	4566.0-4567.0	1.0	-	-	-	-	-	-	-	-	Lost Core.

Core with Permeability less than 0.10 Millidarcys - Nil

Core with Permeability 0.10 to 0.49 Millidarcys

Total footage of core with 0.10 to 0.49 millidarcys permeability	2.3'	
Weighted average porosity of core with 0.10 to 0.49 millidarcys permeability	8.55%	(19.67)
Per cent of analyzed core having 0.10 to 0.49 millidarcys permeability	2.2%	
Weighted average horizontal permeability of core with 0.10 to 0.49 md.	0.46 md.	(1.06)

Core with Permeability 0.50 to 0.99 Millidarcys

Total footage of core with 0.50 to 0.99 millidarcys permeability	3.7'	
Weighted average porosity of core with 0.50 to 0.99 millidarcys permeability	7.47%	(27.65)
Per cent of analyzed core having 0.50 to 0.99 millidarcys permeability	3.6%	
Weighted average horizontal permeability of core with 0.50 to 0.99 md.	0.67 md.	(2.48)

Core with Permeability 1.0 to 9.9 Millidarcys

Total footage of core with 1.0 to 9.9 millidarcys permeability	39.1'	
Weighted average porosity of core with 1.0 to 9.9 millidarcys permeability	10.03%	(392.20)
Per cent of analyzed core having 1.0 to 9.9 millidarcys permeability	37.9%	
Weighted average horizontal permeability of core with 1.0 to 9.9 md.	4.69 md.	(183.26)

Core with Permeability 10 Millidarcys and Greater

Total footage of core with permeabilities 10 md. and greate	58.0'	
Weighted average porosity of core with permeabilities 10 md. and greater	11.61%	(673.16)
Per cent of analyzed core having permeabilities 10 md. and greater	56.3%	
Weighted average permeability of core with permeabilities 10 md. and greater	54.08 md.	(3136.54)

Cored Interval	4388' - 4567'	
Total footage	179.0'	
Footage analyzed	103.1'	
Footage not analyzed ---------- dense 11.9'; lost 6.0'; drilled 58.0'	75.9'	
Weighted average porosity of core analyzed	10.79%	(1112.68)
Weighted average horizontal permeability of core analyzed	32.23 md.	(3323.34)

Note: Figures in parentheses indicate porosity feet and permeability feet

CORE LABORATORIES-CANADA LTD.
CALGARY ALBERTA

Company - CANOE RIVER EXPLORATION LTD.
Well - CANOE RIVER CHANCE YT-J-19
Field - WILDCAT, YUKON TERRITORIES
Location - -

Date Report - FEBRUARY 8, 1968
Formation - -
D. Fluid - WATER BASE MUD
Analysis - FULL DIAMETER

Page - 1 of 8
File - CNP-4-4093
Analysts - MM
Remarks - DIAMOND CORES

SAMPLE NUMBER	DEPTH REPRESENTED FEET	FOOTAGE REPRESENTED	PERMEABILITY TO AIR (HORIZONTAL) K MAX	PERMEABILITY TO AIR (HORIZONTAL) K 90°	PERMEABILITY TO AIR VERTICAL	PERM. X FEET	POROSITY PER CENT	POROSITY X FEET	DENSITY BULK	DENSITY GRAIN	VISUAL EXAMINATION
CORED INTERVAL 4079' - 4245'											
CORE NO. 1 4079' - 4135' (Rec. 53.0') (11 boxes)											
1	4079.0-4080.3	1.3	2.14	2.05	<0.01	2.78	11.6	15.08	2.32	2.63	Fine sand, silty
2	4080.3-4081.5	1.2	10.80	9.23	0.43	12.96	13.9	16.68	2.26	2.62	Fine sand, silty
3	4081.5-4082.9	1.4	20.10	17.10	2.73	28.14	15.7	21.98	2.22	2.63	Fine Sand, silty F
4	4082.9-4083.9	1.0	5.94	5.89	0.46	5.94	11.8	11.80	2.31	2.62	Fine sand, silty
5	4083.9-4084.9	1.0	2.04	1.77	<0.01	2.04	9.8	9.80	2.36	2.62	Fine sand, silty
6	4084.9-4085.9	1.0	0.10	<0.01	<0.01	0.10	8.6	8.60	2.37	2.60	Fine sand, silty
7	4085.9-4087.3	1.4	63.60	44.90	35.10	89.04	11.6	16.24	2.31	2.62	Coarse sand, F
8	4087.3-4088.6	1.3	60.10	36.00	22.20	79.13	15.0	19.50	2.23	2.62	Medium Sand, S
9	4088.6-4089.9	1.3	28.10	21.30	7.32	36.53	13.2	17.16	2.29	2.64	Fine sand, F
10	4089.9-4090.6	0.7	1.33	1.09	0.22	0.93	7.8	5.46	2.41	2.61	Medium sand, silty F
11	4090.6-4091.8	1.2	0.09	0.07	<0.01	0.11	6.6	7.92	2.45	2.62	Fine sand, silty
12	4091.8-4093.4	1.6	<0.01	<0.01	<0.01	-	6.3	10.08	2.45	2.61	Fine sand, silty
13	4093.4-4094.7	1.3	0.96	0.96	0.31	1.25	9.7	12.61	2.36	2.61	Fine sand, silty
14	4094.7-4095.9	1.2	0.95	0.95	0.23	1.14	11.0	13.20	2.33	2.62	Fine sand, silty
15	4095.9-4097.1	1.2	4.58	3.53	2.14	5.50	12.8	15.36	2.28	2.61	Fine sand, silty
16	4097.1-4098.4	1.3	48.70	46.90	28.90	63.31	15.8	20.54	2.21	2.63	Medium sand
17	4098.4-4099.6	1.2	183.00	171.00	166.00	219.60	18.8	22.56	2.12	2.61	Fine sand, F
18	4099.6-4100.8	1.2	271.00	232.00	164.00	325.20	19.0	22.80	2.12	2.62	Fine sand
19	4100.8-4102.1	1.3	129.00	112.00	114.00	167.70	18.6	24.18	2.14	2.63	Fine sand
20	4102.1-4103.3	1.2	118.00	109.00	106.00	141.60	17.4	20.88	2.18	2.63	Fine sand, F
21	4103.3-4104.3	1.0	104.00	47.40	39.30	104.00	15.5	15.50	2.22	2.63	Fine sand, F
22	4104.3-4105.5	1.2	35.90	31.80	4.38	43.08	14.7	17.64	2.24	2.62	Fine sand
23	4105.5-4106.7	1.2	10.10	9.25	<0.01	12.12	12.7	15.24	2.31	2.65	Fine sand

SAMPLE NUMBER	DEPTH REPRESENTED FEET	FOOT. REPR.	PERMEABILITY TO AIR HORIZONTAL (K MAX	K 90°	VERTICAL)	PERM. × FEET	POROSITY PER CENT	POROSITY × FEET	DENSITY BULK	DENSITY GRAIN	VISUAL EXAMINATION
Core No. 1 Cont'd											
24	4106.7-4108.0	1.3	2.69	2.18	0.28	3.50	12.7	16.51	2.30	2.63	Fine sand, silty
25	4108.0-4109.2	1.2	41.00	32.60	11.80	49.20	15.1	18.12	2.23	2.63	Fine sand
26	4109.2-4110.2	1.0	15.00	13.20	6.77	15.00	15.0	15.00	2.23	2.63	Fine sand
27	4110.2-4111.3	1.1	130.00	117.00	72.30	143.00	17.6	19.36	2.16	2.63	Fine sand
28	4111.3-4112.3	1.0	11.20	9.32	6.60	11.20	16.0	16.00	2.21	2.63	Fine sand
29	4112.3-4113.3	1.0	156.00	138.00	30.20	156.00	16.5	16.50	2.19	2.62	Fine sand
30	4113.3-4114.5	1.2	177.00	173.00	8.98	212.40	18.3	21.96	2.16	2.65	Fine sand
31	4114.5-4115.8	1.3	24.30	23.40	11.30	31.59	14.3	18.59	2.25	2.62	Fine sand
32	4115.8-4116.8	1.0	38.70	7.48	6.79	38.70	12.9	12.90	2.29	2.63	Fine sand, slightly limy
33	4116.8-4118.0	1.2	0.07	0.02	<0.01	0.08	8.9	10.68	2.38	2.62	Fine sand, silty
34	4118.0-4119.0	1.0	0.01	<0.01	<0.01	0.01	8.1	8.10	2.41	2.62	Fine sand, silty
35	4119.0-4119.8	0.8	15.60	13.80	0.84	12.48	11.8	9.44	2.32	2.63	Fine sand
36	4119.8-4120.6	0.8	11.10	9.80	3.96	8.88	13.6	10.88	2.27	2.63	Fine sand
37	4120.6-4121.7	1.1	46.20	41.60	12.20	50.82	13.3	14.63	2.28	2.63	Medium sand, slightly limy
38	4121.7-4122.7	1.0	326.00	160.00	67.30	326.00	17.2	17.20	2.18	2.63	Medium sand
39	4122.7-4123.8	1.1	225.00	215.00	163.00	247.50	17.9	19.69	2.15	2.62	Medium sand
40	4123.8-4124.6	0.8	220.00	188.00	18.40	176.00	17.0	13.60	2.17	2.62	Medium sand
41	4124.6-4125.3	0.7	532.00	380.00	199.00	372.40	18.9	13.23	2.13	2.63	Medium sand
42	4125.3-4126.4	1.1	544.00	544.00	528.00	598.40	19.1	21.01	2.13	2.64	Medium sand
43	4126.4-4127.6	1.2	31.50	30.90	6.78	37.80	13.9	16.68	2.26	2.62	Fine sand
44	4127.6-4128.3	0.7	752.00	649.00	87.80	526.40	18.1	12.67	2.15	2.62	Fine sand
45	4128.3-4129.2	0.9	88.60	50.60	0.15	79.74	12.9	11.61	2.28	2.62	Medium sand, shale breaks
46	4129.2-4129.8	0.6	495.00	305.00	407.00	297.00	19.0	11.40	2.13	2.64	Medium sand
47	4129.8-4130.2	0.4	15.90	11.60	20.01	6.36	11.0	4.40	2.32	2.61	Fine sand, shale breaks
48	4130.2-4131.0	0.8	265.00	261.00	83.90	212.00	17.0	13.60	2.19	2.64	Medium sand
49	4131.0-4132.0	1.0	144.00	144.00	0.74	144.00	14.9	14.90	2.24	2.63	Medium sand, slightly limy

SAMPLE NUMBER	DEPTH REPRESENTED FEET	FOOT. REPR.	PERMEABILITY TO AIR (HORIZONTAL K MAX	HORIZONTAL K 90°)	VERTICAL	PERM. x FEET	POROSITY PER CENT	POROSITY x FEET	DENSITY BULK	DENSITY GRAIN	VISUAL EXAMINATION
Core No. 1 Cont'd											
-	4132.0-4135.0	3.0	-	-	-	-	-	-	-	-	Lost Core
-	4135.0-4136.0	1.0	-	-	-	-	-	-	-	-	Drilled

F - Fracture

SAMPLE NUMBER	DEPTH REPRESENTED FEET	FOOT. REPR.	PERMEABILITY TO AIR HORIZONTAL K MAX	PERMEABILITY TO AIR HORIZONTAL K 90°	PERMEABILITY TO AIR VERTICAL	PERM. × FEET	POROSITY PER CENT	POROSITY × FEET	DENSITY BULK	DENSITY GRAIN	VISUAL EXAMINATION
CORE NO. 2 4136' - 4196' (Rec. 58.5') (13 Boxes)											
50	4136.0-4136.8	0.8	429.00	383.00	3.26	343.20	16.0	12.80	2.20	2.62	M. Sand
51	4136.8-4137.2	0.4	49.50	43.90	0.22	19.80	13.9	5.56	2.28	2.65	F. sand, Sh. brks.
52	4137.2-4137.9	0.7	530.00	455.00	2.45	371.00	16.9	11.83	2.18	2.63	M. sand, Sl. Limy
53	4137.9-4138.8	0.9	169.00	165.00	21.20	152.10	16.5	14.85	2.19	2.63	F. sand, Sl. Limy
54	4138.8-4139.9	1.1	418.00	363.00	272.00	459.80	19.0	20.90	2.12	2.62	F. sand
55	4139.9-4140.9	1.0	658.00	625.00	509.00	658.00	19.9	19.90	2.10	2.63	F. sand
56	4140.9-4142.2	1.3	76.40	72.30	0.30	99.32	11.0	14.30	2.35	2.64	M. sand, Limy, Pyr.
57	4142.2-4143.5	1.3	0.06	0.01	<0.01	0.08	4.6	5.98	2.51	2.63	F. sand, Sh. brks., Limy
-	4143.5-4144.3	0.8	-	-	-	-	-	-	-	-	Dense, Limy
58	4144.3-4145.7	1.4	0.03	<0.01	<0.01	0.04	1.0	1.40	2.61	2.64	F. sand, Limy
59	4145.7-4146.7	1.0	0.03	<0.01	<0.01	0.03	2.9	2.90	2.54	2.62	F. sand, Limy, Sh. brks.
-	4146.7-4147.7	1.0	-	-	-	-	-	-	-	-	Dense, Limy
60	4147.7-4148.6	0.9	0.09	0.02	<0.01	0.08	4.4	3.96	2.50	2.61	F. sand, Limy, Sh. brks.
61	4148.6-4149.6	1.0	0.06	0.04	<0.01	0.06	5.3	5.30	2.49	2.63	F. sand, Limy
62	4149.6-4150.5	0.9	0.79	0.06	<0.01	0.71	5.9	5.31	2.49	2.65	F. sand, Limy, F.
63	4150.5-4151.6	1.1	186.00	164.00	37.40	204.60	17.6	19.36	2.15	2.61	F. sand
64	4151.6-4152.7	1.1	18.90	18.90	9.41	20.79	12.7	13.97	2.28	2.61	F. sand, Limy
65	4152.7-4153.7	1.0	0.06	0.04	<0.01	0.06	3.9	3.90	2.51	2.61	F. sand, Limy
66	4153.7-4154.7	1.0	0.11	0.05	<0.01	0.11	4.1	4.10	2.50	2.61	F. sand, Limy
67	4154.7-4156.3	1.6	4.04	3.72	1.75	6.46	10.3	16.48	2.37	2.64	F. sand, Sl. Limy
68	4156.3-4157.5	1.2	0.17	0.15	<0.01	0.20	6.0	7.20	2.44	2.60	F. sand, Limy
-	4157.5-4157.9	0.4	-	-	-	-	-	-	-	-	Dense, Limy
69	4157.9-4158.8	0.9	0.14	0.11	<0.01	0.13	4.9	4.41	2.48	2.61	F. sand, Limy
70	4158.8-4159.9	1.1	58.10	56.20	31.80	63.91	13.6	14.96	2.27	2.63	F. sand
71	4159.9-4160.8	0.9	7.72	7.29	0.23	6.95	10.7	9.63	2.36	2.65	F. sand, Limy
72	4160.8-4161.7	0.9	3.80	3.11	0.17	3.42	10.3	9.27	2.35	2.62	F. sand, Sh. brks.
73	4161.7-4162.8	1.1	0.39	0.19	<0.01	0.43	7.4	8.14	2.44	2.64	F. sand, Sh. brks. Limy

SAMPLE NUMBER	DEPTH REPRESENTED FEET	FOOT. REPR.	PERMEABILITY TO AIR HORIZONTAL K MAX	PERMEABILITY TO AIR HORIZONTAL K 90°	PERMEABILITY TO AIR VERTICAL	PERM. × FEET	POROSITY PER CENT	POROSITY × FEET	DENSITY BULK	DENSITY GRAIN	VISUAL EXAMINATION
CORE NO. 2 (Cont'd.)											
74	4162.8-4164.1	1.3	0.15	0.14	<0.01	0.20	5.4	7.02	2.50	2.64	F. sand, Sh. brks., Limy
-	4164.1-4167.6	3.5	-	-	-	-	-	-	-	-	Dense, Limy
75	4167.6-4168.8	1.2	0.01	<0.01	<0.01	0.01	2.4	2.88	2.57	2.64	F. sand, Limy
-	4168.8-4169.7	0.9	-	-	-	-	-	-	-	-	Dense Shale
76	4169.7-4171.4	1.7	2.29	2.00	0.74	3.89	8.9	15.13	2.41	2.64	F. sand, Limy
-	4171.4-4173.1	1.7	-	-	-	-	-	-	-	-	Dense, Limy
77	4173.1-4174.3	1.2	0.96	0.96	<0.01	1.15	6.6	7.92	2.42	2.60	F. sand, Limy
78	4174.3-4175.2	0.9	3.63	3.57	0.48	3.27	11.4	10.26	2.25	2.54	F. sand
79	4175.2-4176.5	1.3	3.41	3.36	7.49	4.43	12.8	16.64	2.23	2.56	F. sand
80	4176.5-4177.8	1.3	2.66	2.47	3.43	3.46	9.2	11.96	2.25	2.48	F. sand
81	4177.8-4179.0	1.2	5.24	3.09	1.19	6.29	10.5	12.60	2.24	2.51	F. sand
82	4179.0-4180.0	1.0	139.00	124.00	106.00	139.00	17.1	17.10	2.15	2.59	F. sand
83	4180.0-4181.2	1.2	195.00	174.00	131.00	234.00	17.6	21.12	2.15	2.60	F. sand
84	4181.2-4182.5	1.3	96.90	96.40	60.70	125.97	16.8	21.84	2.16	2.60	F. sand
85	4182.5-4183.5	1.0	81.50	73.10	66.60	81.50	15.9	15.90	2.17	2.59	F. sand
86	4183.5-4184.8	1.3	86.10	80.40	79.80	111.93	16.5	21.45	2.16	2.59	F. sand, VF.
87	4184.8-4186.0	1.2	93.30	84.90	77.10	111.96	16.2	19.44	2.17	2.59	C. sand
88	4186.0-4187.4	1.4	88.30	73.70	56.80	123.62	16.3	22.82	2.17	2.58	C. sand
89	4187.4-4188.5	1.1	101.00	85.40	78.20	111.10	15.8	17.38	2.17	2.58	C. sand
90	4188.5-4189.8	1.3	109.00	95.70	87.10	141.70	16.1	20.93	2.17	2.59	C. sand
91	4189.8-4191.0	1.2	85.80	78.90	48.30	102.96	16.0	19.20	2.19	2.60	C. sand
92	4191.0-4192.1	1.1	21.20	20.90	12.70	23.32	13.0	14.30	2.22	2.55	C. sand
93	4192.1-4193.3	1.2	4.14	3.03	2.80	4.97	9.2	11.04	2.31	2.55	C. sand, Limy
94	4193.3-4194.5	1.2	6.97	4.54	1.66	8.36	10.5	12.60	2.26	2.52	C. sand
-	4194.5-4196.0	1.5	-	-	-	-	-	-	-	-	Lost Core
-	4196.0-4197.0	1.0	-	-	-	-	-	-	-	-	DRILLED

Core with Permeability less than 0.10 Millidarcys

Total footage of core with less than 0.10 millidarcys permeability	12.8'	
Weighted average porosity of core with less than 0.10 millidarcys permeability	4.93%	(63.10)
Per cent of analyzed core having less than 0.10 millidarcys permeability	11.9%	
Weighted average horizontal permeability of core with less than 0.10 md.	0.04 md	(0.56)

Core with Permeability 0.10 to 0.49 Millidarcys

Total footage of core with 0.10 to 0.49 millidarcys permeability	7.7'	
Weighted average porosity of core with 0.10 to 9.49 millidarcys permeability	5.80%	(44.63)
Per cent of analyzed core having 0.10 to 0.49 millidarcys permeability	7.1%	
Weighted average horizontal permeability of core with 0.10 to 0.49 md.	0.20 md	(1.55)

Core with Permeability 0.50 to 0.99 Millidarcys

Total footage of core with 0.50 to 0.99 millidarcys permeability	4.6'	
Weighted average porosity of core with 0.50 to 0.99 millidarcys permeability	8.49%	(39.04)
Per cent of analyzed core having 0.50 to 0.99 millidarcys permeability	4.3%	
Weighted average horizontal permeability of core with 0.50 to 0.99 md.	0.92 md	(4.25)

Core with Permeability 1.0 to 9.9 Millidarcys

Total footage of core with 1.0 to 9.9 millidarcys permeability	22.3'	
Weighted average porosity of core with 1.0 to 9.9 millidarcys permeability	10.00%	(223.02)
Per cent of analyzed core having 1.0 to 9.9 millidarcys permeability	20.6%	
Weighted average horizontal permeability of core with 1.0 to 9.9 md.	3.66 md	(81.55)

Core with Permeability 10 Millidarcys and Greater

Total footage of core with permeabilities 10 md. and greater	60.6'	
Weighted average porosity of core with permeabilities 10 md. and greater	15.75%	(954.18)
Per cent of analyzed core having permeabilities 10 md. and greater	56.1%	
Weighted average permeability of core with permeabilities 10 md. and greater	144.78 md	(8773.86)

Cored Interval	4079.0' -	4245.0'
Total footage	166.0'	
Footage analyzed	108.0'	
Footage not analyzed ------- Dense 8.3' Lost 6.5' Drilled 2.0' Not analyzed by request 41.2'	58.0'	
Weighted average porosity of core analyzed	12.26%	(1323.97)
Weighted average horizontal permeability of core analyzed	82.05 md	(8861.77)

Note: Figures in parentheses indicate porosity feet and permeability feet.

SAMPLE NUMBER	DEPTH REPRESENTED FEET	FOOT. REPR.	PERMEABILITY TO AIR (HORIZONTAL K MAX	HORIZONTAL K 90°	VERTICAL)	PERM. × FEET	POROSITY PER CENT	POROSITY × FEET	DENSITY BULK	DENSITY GRAIN	VISUAL EXAMINATION
CORE NO. 3 4197' - 4245' (Rec. 45.0') (10 Boxes)											
95	4197.0-4198.2	1.2	3.46	2.59	2.24	4.15	7.3	8.76	2.34	2.53	C. sand
96	4198.2-4199.4	1.2	2.59	2.52	1.24	3.11	6.9	8.28	2.35	2.52	C. sand, Sl. Limy
97	4199.4-4200.6	1.2	1.75	1.64	<0.01	2.10	5.3	6.36	2.40	2.53	C. sand, Sl. Limy
98	4200.6-4201.8	1.2	0.32	0.21	<0.01	0.38	4.3	5.16	2.47	2.58	C. sand, Limy
-	4201.8-4243.0	41.2	-	-	-	-	-	-	-	-	Not Analyzed by Request
-	4243.0-4245.0	2.0	-	-	-	-	-	-	-	-	Lost Core

F. sand - Fine sand
M. sand - Medium sand
C. sand - Coarse sand
Sh. brks. - Shale breaks
Sl. Limy - Slightly Limy
Pyr. - Pyrite
VF. - Vertical fracture
F. - Fracture

CORE LABORATORIES-CANADA LTD.

PETROLEUM RESERVOIR ENGINEERING

CALGARY, ALBERTA

OIL ANALYSIS

Company Canoe River Exploration Ltd. Page 2 of 7

Well Canoe River Chance YT J-19 File CEH-2-2657

Field Wildcat, Yukon Territory Analysts RG SF

Location Elevation KB 1701.5

Formation Chance SS Depths 4364' - 4449'

Sampled from DST No. 5 by of

Date Sampled Feb.1, 1968 Date Received Feb.13, 1968 Date Analyzed Feb.27, 1968

DST Recovery 180' Gassy Oil, 4.2 MMCF Gas

API Gravity @ 60°F 54.6 Sulphur, weight % 0.57

Viscosity, S.U.S. @ °F, @ °F, @ °F

Pour Point Salt Content 3.7 lb/1000 bbl

Contents of sample container Condensate

B S & W of Oil Layer BS-0.1%: H_2O-TRACE B S & W of Oil Analyzed TRACE

DISTILLATION

% Recovery	Temperature °F @ 678 mmHg
Initial Boiling Point	104
5	147
10	169
15	178
20	190
25	200
30	210
35	218
40	226
45	236
50	247
55	260
60	275
65	289
70	320
75	364
80	440
85	590
87	700 (FBP)

% Recovery 87.0
% Residue 12.0
% Distillation loss 1.0

CORE LABORATORIES-CANADA LTD.

PETROLEUM RESERVOIR ENGINEERING

EDMONTON CALGARY REGINA

WATER ANALYSIS

File CBH-2-2548

Company Canoe River Exploration Ltd. Page 3 of 8

Well Name Canoe River Chance YT-J-19 Sample No.

Formation Blackie Sand Depth 2384' - 2441'

Location 66 08' 31.20" N.L. 137 32' 28.022" W.L. Field Wildcat Province Yukon Territories

Date Sampled Dec. 29/67 Date Analyzed Feb. 1/68 Analyst MB

Sampled From DST # 1 (Top of Recovery) By

Recovery 535' Fresh Water Cut Mud Elevation Grd. - 1680'

Constituents:

1. Total Solids 5,161 mg/Liter 2. pH 8.95 3. Sp.Gr. 1.0067 @60°F.

4. Resistivity 2.14 Ohm-meters @ 75 °F 5. H_2S Absent

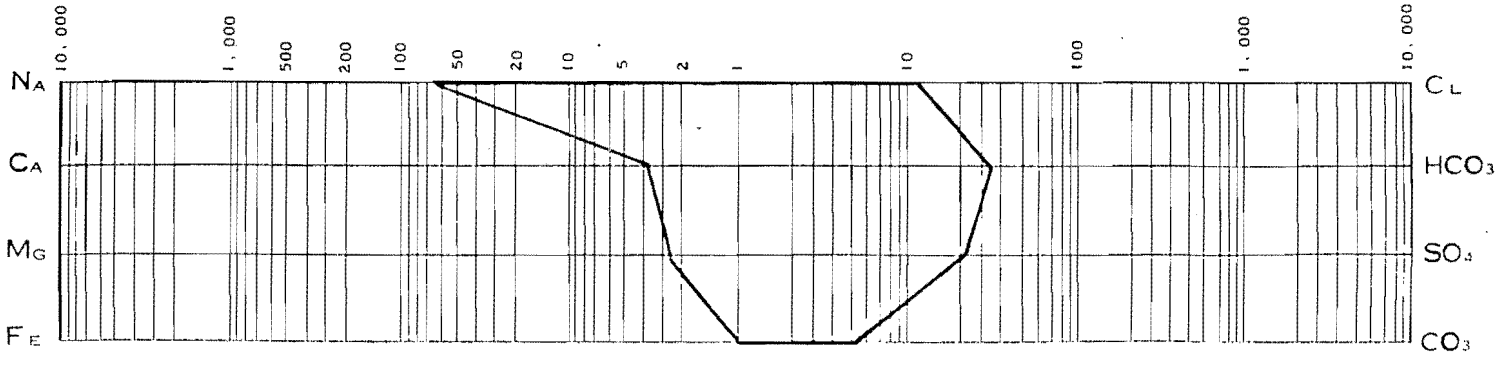
MILLIGRAMS PER LITER

Na & K	Ca	Mg	Fe	Ba		Cl	HCO_3	SO_4	CO_3	OH	
1472	76	34	Abs.	Abs.		424	2030	971	154	-	

MEQ PER LITER

64.0	3.8	2.8	Abs.	Abs.		12.0	33.3	20.2	5.1	-	

LOGARITHMIC PATTERN MEQ PER LITER



CORE LABORATORIES-CANADA LTD.

PETROLEUM RESERVOIR ENGINEERING

EDMONTON CALGARY REGINA

WATER ANALYSIS

File CBH-2-2548

Company Canoe River Exploration Ltd. Page 4 of 8

Well Name Canoe River Chance YT-J-19 Sample No.

Formation Blackie Sand Depth 2384' - 2441'

Location 66 08' 31.20" N.L. 137 32' 28.022' W.L. Field Wildcat Province Yukon Territories

Date Sampled Dec. 29/67 Date Analyzed Feb. 1/68 Analyst MB

Sampled From DST # 1 (Top of Tool) By

Recovery 535' Fresh Water Cut Mud Elevation Grd. - 1680'

Constituents:

1. Total Solids 5,056 mg/liter 2. pH 8.75 3. Sp.Gr. 1.0065 @60°F.

4. Resistivity 1.8 Ohm-meters @ 72 °F 5. H_2S Absent

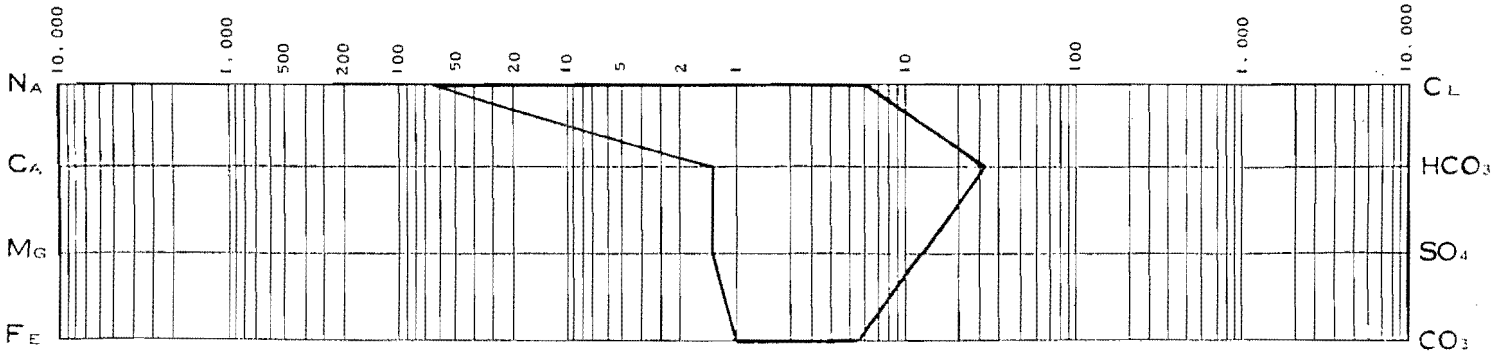
MILLIGRAMS PER LITER

Na & K	Ca	Mg	Fe	Ba		Cl	HCO_3	SO_4	CO_3	OH	
1463	28	17	Trace	Abs.		212	2513	655	168	-	

MEQ PER LITER

63.6	1.4	1.4	Trace	Abs.		6.0	41.2	13.6	5.6	-	

LOGARITHMIC PATTERN MEQ PER LITER



CORE LABORATORIES-CANADA LTD.

PETROLEUM RESERVOIR ENGINEERING

EDMONTON CALGARY REGINA

WATER ANALYSIS

File CBH-2-2548

Company Canoe River Exploration Ltd. Page - 5 of 8

Well Name Canoe River Chance YT-J-19 Sample No.

Formation Permo-Penn Depth 4196' - 4363'

Location 66 08' 31.20" N.L. 137 32' 28.022" W.L. Field Wildcat Province Yukon Territories

Date Sampled Jan. 19/68 Date Analyzed Feb. 1/68 Analyst MB

Sampled From DST # 4 (Bottom) By

Recovery 13' Sulphurous Mud Elevation Grd. - 1680'

Constituents:

1. Total Solids 12,919 mg/liter 2. pH 9.15 3. Sp.Gr. 1.0162 @60°F.

4. Resistivity 0.833 Ohm-meters @ 75 °F 5. H_2S Absent

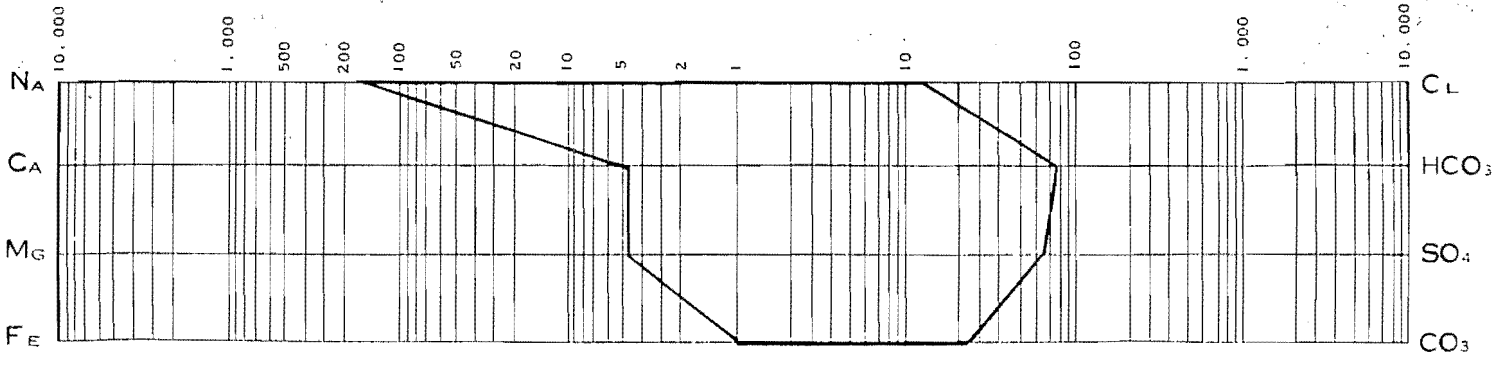
MILLIGRAMS PER LITER

Na & K	Ca	Mg	Fe	Ba		Cl	HCO_3	SO_4	CO_3	OH	
3869	95	57	Pres.	Abs.		494	4592	3082	730	-	

MEQ PER LITER

168.2	4.7	4.7	Pres.	Abs.		13.9	75.3	64.1	24.3	-	

LOGARITHMIC PATTERN MEQ PER LITER



CORE LABORATORIES-CANADA LTD.

PETROLEUM RESERVOIR ENGINEERING

EDMONTON CALGARY REGINA

WATER ANALYSIS

File CBH-2-2657 (Page 7 of 7)

Company Canoe River Exploration Ltd.

Well Name Canoe River Chance YT J-19 Sample No.

Formation Chance Sandstone Depth 4449' - 4504'

Location YT J-19 Field Province Yukon Territories

Date Sampled Feb. 4/68 Date Analyzed Feb. 29/68 Analyst M.B.

Sampled From DST #6 (Top of Tool) By

Recovery 1640' Gassy Oil, 360' Water Elevation K.B. - 1701.5'

Constituents:

1. Total Solids 24,031 mg/liter 2. pH 7.95 3. Sp.Gr. 1.0165 @60°F.

4. Resistivity 0.35 Ohm-meters @ 77 °F 5. H_2S Present

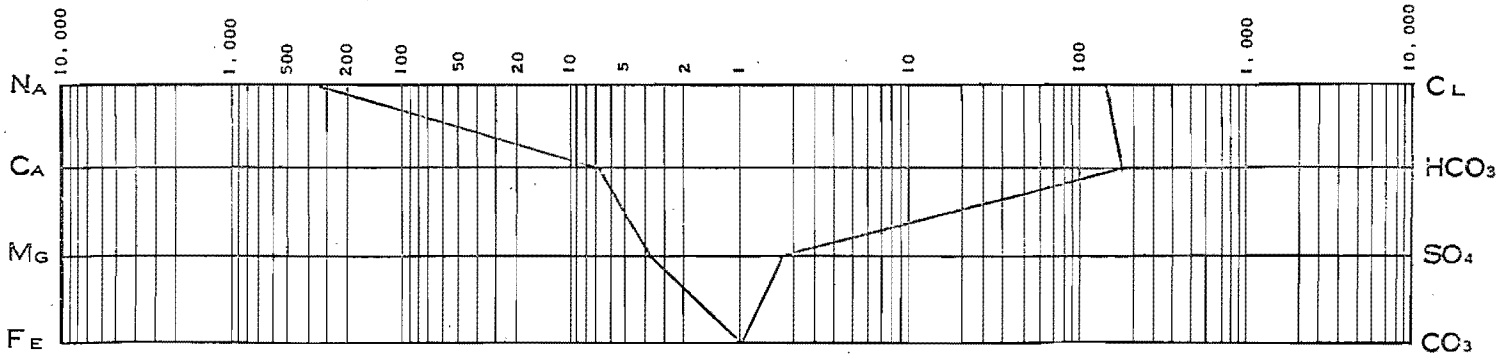
MILLIGRAMS PER LITER

N_A & K	C_A	M_G	F_E	B_A		C_L	HCO_3	SO_4	CO_3	OH	
7,401	135	45	Abs.	Abs.		5,260	11,102	88	-	-	

MEQ PER LITER

321.8	6.7	3.7	Abs.	Abs.		148.3	182.1	1.8	-	-	

LOGARITHMIC PATTERN MEQ PER LITER



CORE LABORATORIES-CANADA LTD.
PETROLEUM RESERVOIR ENGINEERING
EDMONTON CALGARY REGINA

WATER ANALYSIS

File CBH-2-2657 (Page 6 of 7)

Company Canoe River Exploration Ltd.

Well Name Canoe River Chance YT J-19 Sample No.

Formation Alder Limestone Depth 4580' - 4745'

Location Field Wildcat Province Yukon Territory

Date Sampled Feb. 14, 1968 Date Analyzed Feb.19, 1968 Analyst

Sampled From DST No. 9 By

Recovery 180' Gassy Muddy Water, 525' Brackish Water, 465' Gassy Mud KB 1701.5 (Elev.)

Constituents:

1. Total Solids 24,495 mg/liter 2. pH 8.50 3. Sp.Gr. 1.0177 @ 75 °F.

4. Resistivity 0.362 Ohm-meters @ 75 °F 5. H_2S Absent

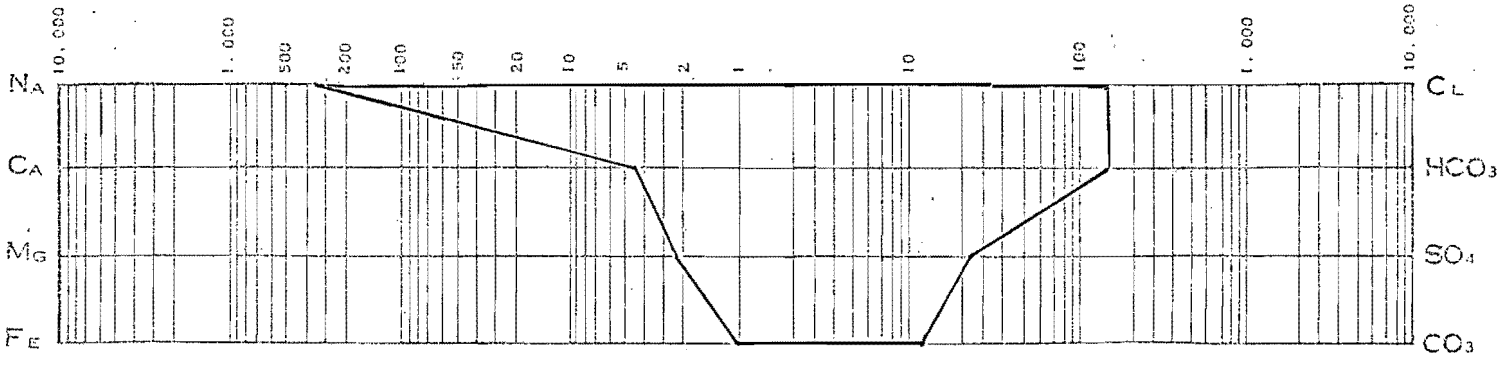
MILLIGRAMS PER LITER

Na & K	Ca	Mg	Fe	Ba		Cl	HCO_3	SO_4	CO_3	OH	
7832	87	26	-	-		5472	9618	1100	360	-	

MEQ PER LITER

341	4.3	2.1	-	-		154	158	22.9	12.0	-	

LOGARITHMIC PATTERN MEQ PER LITER



CORE LABORATORIES-CANADA LTD.

PETROLEUM RESERVOIR ENGINEERING

CALGARY, ALBERTA

OIL ANALYSIS

Company Canoe River Exploration, Ltd. Page 3 of 7

Well Canoe River Chance YT J-19 File CEH-2-2657

Field Wildcat, Yukon Territory Analysts RG SF

Location Elevation KB 1701.5

Formation Chance SS Depths 4449' - 4504'

Sampled from DST No. 6 by of

Date Sampled Feb.4, 1968 Date Received Feb.13, 1968 Date Analyzed Feb.27, 1968

DST Recovery 1640' of Gassy Oil; 360' of water

API Gravity @ 60°F 31.8 Sulphur, weight % 1.11

Viscosity, S.U.S. 8.6 @ 80 °F, 6.0 @ 100 °F, 4.2 @ 120 °F

Pour Point + 10°F Salt Content 5.7 lb/1000 bbl

Contents of sample container Crude Oil

B S & W of Oil Layer BS-Trace; H_2O-11% B S & W of Oil Analyzed Trace

DISTILLATION

% Recovery	Temperature °F @ 678 mmHg
Initial Boiling Point	134
5	195
10	234
15	270
20	328
25	362
30	425
35	479
40	525
45	567
50	618
55	653
60	690
62	700 (FBP)

% Recovery 62.0
% Residue 37.0
% Distillation loss 1.0

CORE LABORATORIES-CANADA LTD.

PETROLEUM RESERVOIR ENGINEERING

CALGARY, ALBERTA

OIL ANALYSIS

Company Canoe River Exploration Ltd. Page 1 of 8

Well Canoe River Chance YT-J-19 File CBH-2-2548

Field Wildcat, Yukon Territories Analysts RG DG

Location 66 08' 31.20" N.L. 137 32' 28.022" W.L. Elevation Grd. 1680'

Formation Chance Sandstone Depths 4066' - 4136'

Sampled from DST # 2 (Top of Tool) by Canoe River Exploration of

Date Sampled Jan. 12/68 Date Received Jan. 26/68 Date Analyzed Feb. 1/68

DST Recovery 140' Fluid

API Gravity @ 60°F 64.4° Sulphur, weight % 0.08

Viscosity, S.U.S. @ °F, @ °F, @ °F

Pour Point Salt Content 13.1 lb/1000 bbl

Contents of sample container Condensate

B S & W of Oil Layer BS = trace H_2O = Nil B S & W of Oil Analyzed Trace

DISTILLATION

% Recovery	Temperature °F Corrected to 760 (658 mmHg)
Initial Boiling Point	104
5	137
10	154
15	167
20	176
25	185
30	192
35	199
40	207
45	214
50	220
55	227
60	238
65	246
70	258
75	271
80	286
85	312
90	350
95	424
96	430 (Cracking Temp.)

% Recovery 96.0
% Residue 2.0
% Distillation loss 2.0

CORE LABORATORIES-CANADA LTD.

PETROLEUM RESERVOIR ENGINEERING

CALGARY, ALBERTA

OIL ANALYSIS

Company Canoe River Exploration Ltd. Page 2 of 8

Well Canoe River Chance YT-J-19 File CBH-2-2548

Field Wildcat, Yukon Territories Analysts RG DG

Location 66 08'31.20" N.L. 137 32'28.022" W.L. Elevation Grd. - 1680'

Formation Chance Sandstone Depths 4150' - 4197'

Sampled from DST # 3 (Top of Tool) by Canoe River Exploration of

Date Sampled Jan. 12/68 Date Received Jan. 26/68 Date Analyzed Feb. 1/68

DST Recovery 50' Mud Cut Condensate

API Gravity @ 60°F 63.0° Sulphur, weight % 0.11

Viscosity, S.U.S. @ °F, @ °F, @ °F

Pour Point Salt Content 6.6 lb/1000 bbl

Contents of sample container Condensate

B S & W of Oil Layer BS - 24%, H_2O - 12% B S & W of Oil Analyzed Trace

DISTILLATION

% Recovery	Temperature °F Corrected to 760
Initial Boiling Point	98 (658 mmHg)
5	128
10	141
15	152
20	160
25	168
30	175
35	183
40	189
45	196
50	203
55	211
60	218
65	227
70	235
75	245
80	259
85	282
90	315
94	370 (Cracking Temp.)

% Recovery	94.0
% Residue	5.0
% Distillation loss	1.0

CORE LABORATORIES-CANADA LTD.

PETROLEUM RESERVOIR ENGINEERING

CALGARY, ALBERTA

GAS ANALYSIS

Company Canoe River Exploration Ltd. Page 6 of 8

Well Canoe River Chance YT-J-19 File CBH-2-2548

Field Wildcat, Yukon Territories Analysts JLK

Location 66 08' 37.20" N.L. 137 32' 28.022" W.L. Date February 15, 1968

Elevation: Grd. - 1680'

SAMPLING CONDITIONS

Formation Chance Sandstone Depths 4066' - 4136'

Sampled from DST # 2 (Flareline) By Canoe River Exploration Ltd.

Date Sampled Jan. 10/68 Date Received Jan. 29/68 Date Analyzed Jan. 30/68

Pressure _____ psig Temperature _____ °F. Atmospheric Temp. _____ °F.

DST Recovery or Flowrate 140' Fluid

Method of Analysis CHROMATOGRAPH

Pressure in Container 52 psig. 73 °F when received in laboratory

COMPONENT	MOL %	U.S. GPM at 14.696 and 60°F.	Imp. GPM at 14.65 and 60°F.
NITROGEN	3.60		
CARBON DIOXIDE	5.33		
HYDROGEN SULFIDE			
METHANE	76.01		
ETHANE	6.82		
PROPANE	4.66	1.282	1.064
ISOBUTANE	0.69	0.226	0.188
N-BUTANE	1.21	0.381	0.316
ISOPENTANE	0.55	0.201	0.167
N-PENTANE	0.38	0.137	0.114
HEXANES	0.38	0.156	0.129
Heptanes plus	0.37	0.170	0.141
TOTAL	100.00	2.553	2.119
Actual Pentanes +		0.664	0.551

Vapor pressure (Calculated) of actual Pentanes + 11.4 Psia @ 100°F

Hydrogen Sulphide—Grains per 100 cu. ft. _____

Gross Heating Value B.T.U. per SCF 1152.3 psia & 60°F at 14.696 | 1148.7 psia & 60°F at 14.65

Specific Gravity—Measured _____ Calculated 0.764

REMARKS:

The above datum complies with requirements of the Alberta Oil and Gas Conservation Board.

CORE LABORATORIES-CANADA LTD.
PETROLEUM RESERVOIR ENGINEERING
CALGARY, ALBERTA

GAS ANALYSIS

Company Canoe River Exploration Ltd. Page 7 of 8
Well Canoe River Chance YT - J - 19 File CBH-2-2548
Field Wildcat, Yukon Territories Analysts JLK
Location 66 08' 37.20" N.L. 137 32' 28.022" W.L. Date February 15, 1968

Elevation Grd. - 1680'

SAMPLING CONDITIONS

Formation Chance Sandstone Depths 4150' - 4197'
Sampled from DST # 3 By Canoe River Exploration Ltd.
Date Sampled Jan. 12/68 Date Received Jan. 26/68 Date Analyzed Jan. 30/68
Pressure _____ psig Temperature _____ °F. Atmospheric Temp. _____ °F.

DST Recovery or Flowrate 50' Mud Cut Condensate
Method of Analysis CHROMATOGRAPH

Pressure in Container 25 psig. 75° F
when received in laboratory

COMPONENT	MOL %	U.S. GPM at 14.696 and 60°F.	Imp. GPM at 14.65 and 60°F.
NITROGEN	0.59		
CARBON DIOXIDE	5.19		
HYDROGEN SULFIDE	0.02		
METHANE	83.61		
ETHANE	6.32		
PROPANE	2.41	0.663	0.550
ISOBUTANE	0.33	0.108	0.090
N-BUTANE	0.83	0.261	0.217
ISOPENTANE	0.19	0.069	0.057
N-PENTANE	0.16	0.058	0.048
HEXANES	0.17	0.070	0.058
Heptanes plus	0.18	0.083	0.069
TOTAL	100.00	1.312	1.089
Actual Pentanes +		0.280	0.232

Vapor pressure (Calculated) of actual Pentanes + 10.4 Psia @ 100°F

Hydrogen Sulphide—Grains per 100 cu. ft. _____

Gross Heating Value B.T.U. per SCF 1093.1 psia & 60°F at 14.696 | 1089.7 psia & 60°F at 14.65

Specific Gravity—Measured _____ Calculated 0.694

REMARKS:

The above datum complies with requirements of the Alberta Oil and Gas Conservation Board.

CORE LABORATORIES-CANADA LTD.
PETROLEUM RESERVOIR ENGINEERING
CALGARY, ALBERTA

GAS ANALYSIS

Company Canoe River Exploration Ltd. Page 8 of 8
Well Canoe River Chance YT-J-19 File CBH-2-2548
Field Wildcat, Yukon Territories Analysts JLK
Location 66 08' 31.20" N.L. 137 32' 28.022" W.L. Date February 15, 1968

SAMPLING CONDITIONS Elevation Grd. 1680'
Formation Permo-Penn Depths 4196' - 4363'
Sampled from DST # 4 By Canoe River Exploration Ltd. of
Date Sampled Jan. 19/68 Date Received Jan. 29/68 Date Analyzed Jan. 29/68
Pressure ____ psig Temperature ____ °F. Atmospheric Temp. ____ °F.

DST Recovery or Flowrate 13' Sulphurous Mud
Method of Analysis CHROMATOGRAPH

Pressure in Container 23 psig. 73°F when received in laboratory

COMPONENT	MOL %	U.S. GPM at 14.696 and 60°F.	Imp. GPM at 14.65 and 60°F.
NITROGEN	1.27		
CARBON DIOXIDE	5.22		
HYDROGEN SULFIDE			
METHANE	82.88		
ETHANE	6.23		
PROPANE	2.44	0.671	0.557
ISOBUTANE	0.34	0.111	0.092
N-BUTANE	0.61	0.192	0.159
ISOPENTANE	0.18	0.066	0.055
N-PENTANE	0.14	0.051	0.042
HEXANES	0.18	0.074	0.061
Heptanes plus	0.51	0.235	0.195
TOTAL	100.00	1.400	1.161
	Actual Pentanes +	0.426	0.353

Vapor pressure (Calculated) of actual Pentanes + 7.0 Psia @ 100°F

Hydrogen Sulphide—Grains per 100 cu. ft. ____

Gross Heating Value B.T.U. per SCF 1097.4 psia & 60°F at 14.696 | 1094.0 psia & 60°F at 14.65

Specific Gravity—Measured ____ Calculated 0.703

REMARKS:

The above datum complies with requirements of the Alberta Oil and Gas Conservation Board.

CORE LABORATORIES-CANADA LTD.
PETROLEUM RESERVOIR ENGINEERING
CALGARY, ALBERTA

GAS ANALYSIS

Company Canoe River Exploration Ltd. Page 1 of 7
Well Canoe River Chance YT J-19 File CBH-2-2657
Field Wildcat, Yukon Territory Analysts J.L.K.
Location Date Feb. 29, 1968

SAMPLING CONDITIONS:
Formation Chance SS Depths 4364' - 4449' Elev. KB 1701.5'
Sampled from DST No. 5 By of
Date Sampled Feb. 1, 1968 Date Received Feb.13, 1968 Date Analyzed Feb.15, 1968
Pressure psig Temperature °F. Atmospheric Temp. °F.

DST Recovery or Flowrate 180' Gassy Oil, 4.2 MMCF Gas
Method of Analysis CHROMATOGRAPH

Pressure in Container 703 psig. @ 63°, when received in laboratory

COMPONENT	MOL %	U.S. GPM at 14.696 and 60°F.	Imp. GPM at 14.65 and 60°F.
NITROGEN	0.42		
CARBON DIOXIDE	7.24		
HYDROGEN SULFIDE	0.42		
METHANE	80.93		
ETHANE	6.15		
PROPANE	2.58	0.710	0.589
ISOBUTANE	0.35	0.114	0.095
N-BUTANE	0.71	0.224	0.186
ISOPENTANE	0.25	0.091	0.076
N-PENTANE	0.25	0.090	0.075
HEXANES	0.28	0.115	0.095
Heptanes plus	0.42	0.193	0.160
TOTAL	100.00	1.537	1.276
Actual Pentanes +		0.489	0.406

Vapor pressure (Calculated) of actual Pentanes + 8.9 Psia @ 100°F

Hydrogen Sulphide—Grains per 100 cu. ft.

Gross Heating Value B.T.U. per SCF: 1092.8 psia & 60°F at 14.696; 1089.4 psia & 60°F at 14.65

Specific Gravity—Measured Calculated 0.727

REMARKS:

The above datum complies with requirements of the Alberta Oil and Gas Conservation Board.

CORE LABORATORIES-CANADA LTD.
PETROLEUM RESERVOIR ENGINEERING
CALGARY, ALBERTA

GAS ANALYSIS

Company Canoe River Exploration Ltd. Page 4 of 7
Well Canoe River Chance YT J-19 File CBH-2-2657
Field Wildcat, Yukon Territory Analysts J.L.K.
Location Date Feb. 29, 1968

SAMPLING CONDITIONS
Formation Chance Sand Depths 4520' - 4570' elev. 1701.5 KB
Sampled from DST No. 8 By of
Date Sampled Feb.13, 1968 Date Received Feb.19, 1968 Date Analyzed Feb.26, 1968
Pressure psig Temperature °F. Atmospheric Temp. °F.

DST Recovery or Flowrate 300' Gassy Oil Cut Mud, 2.214 MMCF/D
Method of Analysis CHROMATOGRAPH

COMPONENT	MOL %	U.S. GPM at 14.696 and 60°F.	Imp. GPM at 14.65 and 60°F.
NITROGEN	0.37		
CARBON DIOXIDE	5.08		
HYDROGEN SULFIDE	0.00		
METHANE	84.29		
ETHANE	5.99		
PROPANE	2.49	0.685	0.569
ISOBUTANE	0.31	0.101	0.084
N-BUTANE	0.64	0.202	0.168
ISOPENTANE	0.19	0.069	0.057
N-PENTANE	0.15	0.054	0.045
HEXANES	0.18	0.074	0.061
	0.31	0.143	0.119
TOTAL	100.00	1.328	1.103
Actual Pentanes +		0.340	0.282

Pressure in Container psig. when received in laboratory

Vapor pressure (Calculated) of actual Pentanes + 8.8 Psia @ 100°F

Hydrogen Sulphide—Grains per 100 cu. ft.

Gross Heating Value B.T.U. per SCF: 1097.1 psia & 60°F at 14.696 | 1095.7 psia & 60°F at 14.65

Specific Gravity—Measured Calculated 0.692

REMARKS:

The above datum complies with requirements of the Alberta Oil and Gas Conservation Board.

CORE LABORATORIES-CANADA LTD.

PETROLEUM RESERVOIR ENGINEERING

CALGARY, ALBERTA

GAS ANALYSIS

Company Canoe River Exploration Ltd. Page 5 of 7

Well Canoe River Chance YT J-19 File CBH-2-2657

Field Wildcat, Yukon Territory Analysts JLK

Location _____ Date Feb. 29, 1968

SAMPLING CONDITIONS

Formation Alder Limestone Depths 4580' - 4745' Elev. 1701.5'

Sampled from DST No. 9 By _____ of _____

Date Sampled Feb. 14, 1968 Date Received Feb. 19, 1968 Date Analyzed Feb. 23, 1968

Pressure _____ psig Temperature _____ °F. Atmospheric Temp. _____ °F.

DST Recovery or Flowrate 180' Gassy Muddy Water. 525' Brackish Water, 465' Gassy Mud

Method of Analysis CHROMATOGRAPH

COMPONENT	MOL %	Pressure in Container when received in laboratory psig.	
		U.S. GPM at 14.696 and 60°F.	Imp. GPM at 14.65 and 60°F.
NITROGEN	0.42		
CARBON DIOXIDE	7.26		
HYDROGEN SULFIDE	0.00		
METHANE	81.39		
ETHANE	6.20		
PROPANE	2.69	0.740	0.614
ISOBUTANE	0.35	0.114	0.095
N-BUTANE	0.72	0.227	0.188
ISOPENTANE	0.23	0.084	0.070
N-PENTANE	0.24	0.087	0.072
HEXANES	0.22	0.090	0.075
	0.28	0.129	0.107
TOTAL	100.00	1.471	1.221
Actual Pentanes +		0.390	0.324

Vapor pressure (Calculated) of actual Pentanes + 10.0 Psia @ 100°F

Hydrogen Sulphide—Grains per 100 cu. ft. _____

Gross Heating Value B.T.U. per SCF 1085.7 psia & 60°F at 14.696 | 1082.3 psia & 60°F at 14.65

Specific Gravity—Measured _____ Calculated 0.720

REMARKS:

The above datum complies with requirements of the Alberta Oil and Gas Conservation Board.