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GEOLOGICAL REPORT ON ST. MAURICE EXPLORATION PROPERTY

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GEOLOGICAL REPORT

ON

ST. MAURICE EXPLORATION PROPERTY

IN

THE ST. LAWRENCE LOWLANDS

PROVINCE OF QUEBEC

PUBLIC

Ministère des Richesses Naturelles, Québec

SERVICE DES GÎTES MINÉRAUX

No GM- 5290

R. C. WILSON, MEMBER A.I.M.E., F.G.S..

THREE RIVERS

PROVINCE OF QUEBEC

May 23rd, 1957.

GEOLOGICAL REPORT ON ST. MAURICE EXPLORATION PROPERTY IN THE ST. LAWRENCE LOWLANDS, PROVINCE OF QUEBEC

INTRODUCTION

The term "St. Lawrence Lowlands" is used to designate the lowlands area lying on both sides of the St. Lawrence river. The area is triangular in shape with the apex at Quebec City, and stretching from there to approximately 60 miles southwest of Montreal. To the north it is bounded by the Laurentian upland, to the southeast by the Appalachian mountain system, to the south by the Adirondack massif, and altogether encompasses an area of 7,500 square miles.

The area is essentially lowlying, generally rising gently, but persistently, northward from the St. Lawrence river to the Precambrian hills. It is trenched and dissected by numerous rivers and streams draining into the St. Lawrence river; the most important of these are the St. Maurice, Ste Anne, and l'Assomption on the north bank, and Richelieu, St François, and Nicolet on the south bank.

The area is well settled. It is served by an excellent network of first class roads, and by both the Canadian Pacific and Canadian National railway systems. Mixed farming is mainly practised, and numerous industries have sprung-up in the smaller towns: Three Rivers is a particularly important centre of the paper industry, while the Montreal region is a vast centre of both light and heavy industry.

Numerous occurrences of natural gas in the glacial drift have been recorded in the region, but are concentrated in three main areas, namely Yamachiche, Ste Genevieve and Mascouche; these have been discovered by chance while drilling for water. Some of these wells are supplying gas for domestic purposes, and are reported to have been so in use for over a century.

GEOLOGY

STRUCTURE

Structurally, this area consists of an elongated synclinal basin with its axis practically parallel to and lying south of the St. Lawrence river.

To the north the beds dip in a general south to southeast direction toward the axis with an average dip of two degrees. Here most of the sedimentary - Precambrian contact is along major normal fault planes. These faults trend in a general northeast-southwest direction. On the northern limb several normal faults parallel to these have been deduced from surface geology, while limited subsurface data to date indicates the presence of further normal faulting.

To the southeast of the axis the basin is bounded by a zone of complex thrust faulting dipping to the southeast: this thrust faulting is associated with the Appalachian mountain system.

GEOLOGY

STRATIGRAPHY

The sedimentary rocks in the St. Lawrence Lowlands area are of Ordovician or older age. The Cambrian and early Ordovician sediments indicate shelf or shallow water deposition, while middle Ordovician deposits (late Trenton) indicate a progressively sinking geosynclinal basin. The thickness of the middle and upper Ordovician units therefore tend to increase toward the south and southeast, as the centre of the geosyncline is approached. The presence of the geosynclinal belt with its variable succession of sediments affords suitable source rocks for generation of gas and oil.

Another important feature is the thinning and eventual disappearance in a northeastern direction of the pre-Trenton groups - Potsdam, Beekmantown, Chazy, Black River - along the northwestern margin of the basin (see Exhibit 1). The Potsdam sandstone thins from 1700' northwest of Montreal to 420' at Joliette and is absent north of Three Rivers. The Beekmantown group thins from 540' at Joliette to 30' north of Three Rivers, where it is exclusively sandstone: further to the northeast it is absent and near Quebec City the Trenton limestone rests directly on Precambrian.

A table of formations with thicknesses expected in Three Rivers area follows:

Period	Group	Formation	Lithology	Expected thickness in ft.
Ordovician	Lorraine	St Hilaire	Calcareous shale with some limestone and sandstone	1550
		Chambly	Shale with fine grained Sandstone	

Period	Group	Formation	Lithology	Expected thickness in ft.
		Breault	Dark grey sandy shale	
	Utica		Dark grey to black shale	300
	Trenton	Terrebonne-Tetreauville equivalents	Dense dark grey limestone and interbedded shale	700
		Montreal - Mile End equivalents	Finely to coarsely crystalline limestone	
	Black River	Leray-Lowville	Cryptocrystalline limestone	60
		Pamelia	Sandy limestone	
	Chazy	Laval - St. Dominique	Crystalline limestone and sandstone	250
		Beldens	Sandstone sandy dolomite and dense limestone	
	Beekmantown - Potsdam	Basal Palaeozoic Sandstone	Sandstone	100
			Expected total	2960

Possible reservoir rocks are the Trenton limestone (especially the lower crystalline formations), the Chazy sandstones and the basal Palaeozoic sandstones: development of porosity and permeability in the dolomitic facies of the Beekmantown group is possible.

Glacial drift covers most of the area and in places is in excess of 300 feet in thickness. A gravel or conglomerate bed, which is generally developed on the bedrock surface, is another potential reservoir.

RECENT DEVELOPMENTS

Within the last two years increasing interest has been shown in the St. Lawrence Lowlands sedimentary basin. A land map (exhibit 2) shows the areas presently under concession to various companies: a well location map (exhibit 3) shows the status of wells drilled in the area.

The first most significient development was the occurrence of gas at a depth of 205' in a well being drilled for water. This well blew out of control and was eventually plugged under government supervision. A final open-flow potential in excess of five million cubic feet per day was recorded for this well.

The most recent development has been the discovery of gas in the Trenton limestone in a well near Batiscan. This well has a potential rated at 3.5 million cubic feet per day from a depth of approximately 2200 feet.

Presently five rigs are actively drilling on acreage belonging to two companies.

ST. MAURICE PROPERTIES

St. Maurice Exploration, in partnership with Canso Natural Gas Limited, of Calgary, Alberta presently hold three concessions in the area covering a total of 180,000 acres (Exhibit 2).

The concessions are situated on the northwest limb of the syncline with the regional dip to the south and southeast. With normal faulting trending in a general northeast-southwest direction and potential reservoir rocks present, conditions are favourable for hydrocarbon entrapment.

The updip thinning of potential reservoir formations from the synclinal axis should lead to stratigraphic-type traps, thereby increasing the possibility of hydrocarbon entrapment.

The thinning of pre-Trenton groups in a northeast direction from Montreal to Quebec city, with faulting to the northwest, should also offer conditions very favourable for hydrocarbon accumulation.

Gas occurrences in the glacial drift are numerous in the general Yamachiche and Louiseville areas, while several interesting shows have been recorded in the general Sorel area.

The possibility of developing a gas reservoir in the glacial drift is considered good.

During the latter part of 1956, five wells were drilled in the general Three Rivers - Yamachiche area. The primary aim of this programme was to test the surface drift. Four wells were drilled into bedrock to total depths of 330 - 405', one was completed as a gas well producing from interval 160-170' in the glacial drift with shut-in well-head pressure of 75 psi and an open flow potential of 220 MCF/D. An interesting

gravel-conglomerate bed lying directly on the bedrock tested gas and salt water in two wells.

A fifth well was drilled to a total depth of 1811' (Driller), where operations were suspended as the rig had reached its mechanical limit. At this depth the well was in Utica shale and the objective, the Trenton limestone, was not reached.

Details of the operation are attached in an appendix.

Arrangements have now been made to bring a heavier duty rotary rig into the area from Oklahoma. Early this summer deep tests will be drilled to test all potential reservoir horizons: a number of shallow tests will also be drilled to explore and develop gas accumulations in the glacial drift.

R. C. Wilson

Signed R. C. Wilson, Member A.I.M.E., F.G.S..

May 23rd, 1957.

CERTIFICATE covering geological report on St. Maurice Exploration Inc. properties in the St. Lawrence Lowlands, Province of Quebec and dated May 23, 1957.

I, ROBERT CLAUDE WILSON, a geologist by profession, and resident at 2905 Boulevard St. Louis, Three Rivers, Province of Quebec, do hereby certify that:

1. I am an honours graduate in Geology of Trinity College, Dublin University, Ireland, obtaining honours B.A. and B.Sc. degrees in 1948.

2. I have practised in the petroleum industry for the past eight years and am presently engaged in it as a geologist.

3. I am a member, in good standing, of the American Institute of Mining, Metallurgical, and Petroleum Engineers and a fellow of the Geological Society of London, England.

4. This report is based on personal examination of available data, including both surface geology data and subsurface well data.

5. I have no interest, directly or indirectly, in the securities of St. Maurice Exploration Inc., nor do I expect to receive any.

R. C. Wilson

R. C. WILSON.

Sworn before me at Three Rivers,
this twenty third day of May, 1957.

J. Cloutier C.C.S.P.Q.

J. CLOUTIER
A commissioner of the Superior
Court of the Province of Quebec.

May 23, 1957.

A P P E N D I X

SUMMARIES OF DATA ON FIVE WELLS DRILLED ON PERMIT NO. 29739 DURING THE LATTER PART OF 1956

SUMMARY REPORT

A 59

WELL: Canso-Inter City Pointe-du-Lac #1
LOCATION: Lot 265, Parish Pointe-du-Lac.
ELEVATION: Ground 52' K.B. 57'
CONTRACTOR: Trennd Enterprises Ltd.
TYPE RIG: Mahew 2000'

DATE SPUDDED: October 20, 1956
DRILLING COMPLETED: October 22, 1956
RIG RELEASED: October 22, 1956

TOTAL DEPTH: 180' (driller)

CASING DATA: 7 7/8" hole to 180'
Could not run 5½" O.D. water well casing below 60'.
Abandoned attempt and plugged well.

LOGS: Widco Electrical log from 171' to surface.
Baroid gas detector log from 171' to surface.

TESTING: None

STATUS: Abandoned.

PLUGS: Spotted 15 sacks cement and 65 sacks Stratalite at 180': no cement returns.

SUMMARY REPORT

WELL: Canso-Inter City Pointe-du-Lac #1A
LOCATION: Lot 265, Parish Pointe-du-Lac.
ELEVATION: Ground 52' K.B. 57'
CONTRACTOR: Trennd Enterprises Ltd.
TYPE RIG: Mahew 2000 (rotary)

DATE SPUDDED: October 22, 1956
DRILLING COMPLETED: November 13, 1956
RIG RELEASED: November 18, 1956

TOTAL DEPTH: 1811' (driller)
1804' (E-log)

CASING DATA: 9" hole to 169'.
5½" O.D., 10#, grade B, seamless water well casing cemented at 168' using 10 sacks cement, 75 sacks Stratalite and 10 sacks cement plus 4% $CaCl_2$.
4 3/4" hole 169' to total depth.

LOG: Widco Electrical log from surface to total depth.
Baroid gas detector log from surface to total depth.

GEOLOGICAL MARKERS: Top Lorraine Shale 307' (-250' subsea)

TESTING: D.S.T. #1 168 - 310 Four misruns. Packers did not hold.

OPEN HOLE TESTS:
(1) 168-1811 Bailed for 20 hours recovering a total of 63½ bbls of mud and watery mud; fluid level varied from 130' to 200'. Maximum depth to which bailer was run, 250'. No sign of gas while bailing. On running in with bit found hole bridged at 210'. Could not re-enter original hole below 300'.

TESTS THROUGH CASING: None

STATUS: Plugged and abandoned.

PLUGS: Cement plugs from 190' to 350' and from 20' to 170'.

SAMPLE DESCRIPTION

POINTE-DU-LAC #1A

By: G.G. Scruggs

0 - 10	SAND - medium grained, well rounded quartz and feldspar with some clay, light grey.
10 - 20	CLAY - Light grey, soft.
20 - 30	As above.
30 - 40	CLAY (40%) SAND (40%) Pebbles (20%)(granitic)
40 - 50	CLAY - light grey.
50 - 70	Pebbles - from coarse sand to occasional $\frac{1}{2}$" pebbles derived from eroded granite.
70 - 80	SAND (60%) coarse grained. Pebbles (30%) CLAY (10%)
80 - 90	SAND (20%) fine grained; 70% medium grained;and coarse to very coarse grained (10%). Very clean, mainly sub-angular quartz and feldspar with 10-15% dark ferro-magnesian minerals.
90 - 110	As above with slight clay content.
110 - 170	SAND - as above, clean to very slightly clayey.
170 - 180	No sample.
180 - 200	SAND - (85%)medium grained; (15%) coarse to very coarse grained; grains mostly quartz and feldspar with 15% dark minerals.
200 - 220	As above with few pebbles.
220 - 240	CLAY - light grey with 15% sand.
240 - 300	CLAY - light grey, with slight amount imbedded sand.
300 - 310	SAND - very poorly sorted, fine to coarse grained. (50%) pebbles, small well rounded. (30% shale, dark grey to medium grey, slightly calcareous and arenaceous with trace grey, fine crystalline limestone (20%).
	TOP LORRAINE FORM 308'
310 - 320	SHALE - medium to dark grey, quite silty, slightly calcareous with 30% sand and pebbles (cavings) trace of grey limestone.

310 - 320 SHALE - as above, grading in part to slightly calcareous, argillaceous siltstone with some sand cavings.

330 - 470 SHALE - medium to dark grey, fissile, slightly mica and calcareous with stringers of argillaceous siltstone.

470 - 490 SHALE - as above with up to 20% of hard, very slightly calcareous siltstone.

490 - 515 SHALE - dark grey, fissile, mica., very slightly silty.

515 - 525 SHALE - as above and medium grey, silty blocky.

525 - 540 SHALE - as above, with up to 80% sand, fine to medium grained, arkosic. (appears to be recirculated sand from mud pits due to heavy condition of mud).

540 - 555 No samples returned.

560 - 580 SHALE - medium to dark grey, fissile, mica., and slightly silty with some argillaceous siltstone. (abundant very fine sand in samples. May represent thin sandstone and siltstone stringers that have been completely ground up, as cuttings are very fine.)

580 - 680 SHALE - medium to dark grey, fissile to blocky with some quite silty bands.
(Some samples have up to 15 - 20% loose very fine, sand).

680 - 710 SHALE - as above with minor hard, argillaceous siltstone laminae.

710 - 1155 SHALE - Medium to dark grey, very slightly silty, calcareous and mica, minor amounts quite silty shale.

1155 - 1160 SHALE - as above with dark brown, petroliferous shale with brown streak.

1160 - 1200 SHALE - dark grey, in part flaky, in part blocky, slightly calcareous, mica, and silty with some fairly silty stringers.

1200 - 1215 SHALE - dark grey, blocky, slightly calcareous & mica., fairly silty.

1215 - 1250 SHALE - dark grey, flaky, very slightly calcareous and
Shale - dark grey, blocky, slightly calcareous, mica., and silty (40%).

1260 - 1270 SHALE - as above with trace brown, very fine crystalline, slightly argillaceous and silty dolomite.

1285 - 1305 SHALE - becoming more flaky.

1305 - 1330	SHALE - mainly dark grey, flaky or slightly blocky, slightly calcareous with trace hard, slightly argillaceous brown, very fine crystalline dolomite.
1330 - 1335	Increase in dolomite to 1% or 2%.
1335 - 1350	SHALE - dark grey, blocky, silty & slightly calcareous with trace to nil of dolomite as above.
1350 - 1365	SHALE - with no dolomite.
1365 - 1385	SHALE - as above with trace dolomite.
1385 - 1400	SHALE - dark grey, blocky, silty, slightly calcareous with 2% argillaceous siltstone and 1% dolomite, dark grey-brown, fine crystalline.
1400 - 1420	As above minus the siltstone.
1420 - 1470	SHALE - dark grey, hard, blocky, slightly calcareous with trace light brown, very fine crystalline, dolomitic in part.
1470 - 1485	SHALE - as above with increase in buff to brown fine crystalline argillaceous dolomite up to 1-2%.
1485 - 1490	With 5% dolomite.
1490 - 1625	SHALE - dark grey, in part flaky and part blocky, slightly calcareous with trace quite argillaceous dolomite throughout. (shales are softer than higher in section and have a light brown streak compared to a light grey one earlier)
1625 - 1655	SHALE - medium to dark grey, slightly blocky, slightly calcareous; minute trace argillaceous very fine crystalline dolomite.
1655 - 1795	SHALE - as above. No dolomite except an occasional fragment. Shale becomes noticeably darker in color in last 100'. Pipe tally at 1748' found 16' out. Should read 1764'. Hence last samples should ready 16' deeper.

SUMMARY REPORT

WELL: Canso-Inter City Pointe-du-Lac #2
LOCATION: Lot 17, Parish Pointe-du-Lac.
ELEVATION: Ground 30' K.B. 35'
CONTRACTOR: Trennd Enterprises Ltd.
TYPE RIG: Mahew 2000 (Rotary)

Date Spudded: October 27, 1956
Drilling Completed: December 4, 1956
Rig Released: December 4, 1956

TOTAL DEPTH: 405' (Driller)
403' (E-Log)

CASING DATA: 9 5/8" hole to 168'.
5½" O.D., 10#, grade B, seamless water well casing cemented at 143' using 5 sacks cement, 95 sacks Stratalite and 10 sacks cement plus 3% $CaCl_2$.
4 3/4" hole 168' to total depth.

LOGS: Widco Electrical log from surface to total depth
Baroid gas detector log from surface to total depth.

GEOLOGICAL MARKERS: Top Lorraine Shale 255' (220' subsea)

TESTING: D.S.T. None

OPEN HOLE TESTS:
(1) 165 - 290 Bailed for two hours recovering a total of 6 bbls. of fluid, the last 1½ bbls. being mud-flecked water with fluid level standing at 50-60'. Maximum depth to which bailer was run 150', recovery being fresh water. On closing well in for half hour, had no pressure build-up: fluid level stood at 45'
On running in to drill ahead found hole bridged at 180'.

TESTS THROUGH CASING: None.

STATUS: Plugged and abandoned.

PLUGS: Cement plug from surface to 300'.

SAMPLE DESCRIPTION

POINTE-DU-LAC #2

By: G.G. Soruggs

0 - 30'	No samples.
30 - 130'	CLAY - light grey, soft, silty; grading to clayey silt in part.
130 - 140'	Pebbles - small, well rounded (20%) SAND (coarse to medium grained (60%) CLAY - (20%)
140 - 150'	SAND (75%), Pebbles 5%), Clay (20%)
150 - 160'	As above but pebbles slightly larger.
160'- 170'	Sand, very clean, well sorted, mainly medium to coarse grained; very little dark minerals, mostly feldspar and quartz.
189 - 200	CLAY - grey, soft.
200 - 210	CLAY - as above.
210 - 220	CLAY - as above.
220 - 230	CLAY - as above.
230 - 240	CLAY - as above.
240 - 250	CLAY - grey, soft, occasionally very slightly silty.
	TOP LORRAINE SHALE 255' (Elog)
250 - 260	CLAY - grey, occasionally silty. Sparse quartz pebbles and grey, silty, shale.
260 - 270	CLAY - grey, occasionally silty. Sparse grey, dark grey, silty shale imbedded in the clay.
270 - 275	SHALE (95%) grey to dark grey, hard, non-calcareous, silty, grading into an argillaceous siltstone. CLAY (10%) as above.
275 - 280	SHALE 90%) as above. SILTSTONE - (10%) grey, hard, occasionally slightly calcareous.
280 - 285	SHALE (95%) as above. SILTSTONE (5%) as above.

285 - 290	SHALE (95%) as above. SILTSTONE (5%) as above.
290 - 300	SHALE (60%) as above. SAND (40%) medium grained to coarse grained, grading into gravel - probably cavings.
300 - 310	SHALE (70%) as above. SAND (25%) as above. SILTSTONE (5%) as above.
310 - 320	SHALE (95%)as above. SILTSTONE (5%) as above.
320 - 330	SHALE (85%) grey to dark grey, hard, non-calcareous, silty. SAND (10%) medium grained, sub-angular, quartzose: probably cavings. SILTSTONE(5%) grey, hard, non-calcareous, silty.
330 - 340	All as above.
340 - 350	SHALE (95%) as above. SILTSTONE (5%)
350 - 360	SHALE (95%) as above. SILTSTONE (5%) grey, hard, occasionally slightly calcareous.
360 - 370	SHALE (90%) as above. SILTSTONE (10%) as above.
380 - 390	SHALE (85%) as above. SILTSTONE (15%) as above.
390 - 400	SHALE (85%) as above. SAND (10%) medium grained, sub-angular to sub-rounded, quartzose: cavings?
400 - 405	All as above.

SUMMARY REPORT

WELL: Canso-Inter City Ste. Anne #1
LOCATION: Lot 275, Parish Ste. Anne d'Yamachiche.
ELEVATION: Ground 34' K.B. 39'
CONTRACTOR: Trennd Enterprises Ltd.
RIG: Mahew 2000 (Rotary)

DATE SPUDDED: October 24, 1956
DRILLING COMPLETED: November 18, 1956
RIG RELEASED
(After completion): December 8, 1956
TOTAL DEPTH: 405' (driller)
405' (E-Log)

CASING DATA: 7 7/8" hole to 166'. $5\frac{1}{2}$" O.D., 10#, grade B, seamless water well casing cemented at 163' using 5 sacks cement, 65 sacks Stratalite and 10 sacks cement plus 4% $CaCl_2$.
4 3/4" hole 166' to total depth.

$3\frac{1}{2}$" O.D., 7.7# line pipe cemented at 367' using 5 sacks cement, 40 sacks Stratalite and 15 sacks cement.

LOGS: Widco Electrical log from surface to total depth.
Baroid gas detector log from surface to total depth.

GEOLOGICAL MARKERS: Top Lorraine Shale 332' (293 subsea)

TESTING: D.S.T. (1) 163-352 Misrun.

OPEN HOLE TESTS: (1) 163-352' Bailed 5 bbls mud, fluidlevel standing at 60'. Shut in, with valve leaking slightly, pressure rose to 3 p.s.i. in 15 mins. and remained static for a further $1\frac{1}{4}$ hours, when bled off: gas is combustible. Found fluid level at 30'. After bailing a further 12 bbls. mud started recovering slightly salty water with fluid level standing at 30' to 45'. Shut well in for $1\frac{1}{2}$ hrs: pressure rose to 14 p.s.i. Ran bailer to 260' where it stopped: recovered water. On running in with bit to drill ahead, found hole bridged at 293'.

TESTS THROUGH CASING:
(1) 322-332' With hole filled with water perforated interval with 6 jets per foot: no flow. Closed well in for 1 hr and pressure built up to 17.5 p.s.i. Bled off gas. Ran bailer and found fluid level at 15'. Bailed for $2\frac{1}{2}$ hours recovering 10 bbls. slightly salty water with fine sand.

STATUS: Shut in.

SAMPLE DESCRIPTION

Canso-Inter City Ste. Anne #1

0 - 20	CLAY - light grey, quite silty.
20 - 50	CLAY - light grey, slightly silty, trace shell frags. at 30'.
50 - 140	CLAY - light grey with few coarse sand grains imbedded in clay.
164 - 170	CLAY - light grey occasionally slightly silty. Sparse reddish brown clay.
170 - 180	All as above.
180 - 190	CLAY (95%) light grey as above. CLAY (5%) reddish brown. Sparse rose quartz grains, sub-angular, coarse.
190 - 200	All as above.
200 - 210	CLAY, light grey, Sparse reddish brown clay.
210 - 220	Ass as above.
220 - 230	CLAY (85%) light grey, more silty, all as above Quartz grains, (15%) coarse to medium grained, poorly sorted clear to rose coloured, sub-angular. Sparse reddish brown clay.
230 - 240	CLAY (85% light grey, silty. Quartz grains (15%) as above.
240 - 250	CLAY (80%) light grey, silty. Quartz grains, as above (20%)
250 - 260	CLAY (100%) light grey, occasionally slightly silty.
260 - 270	CLAY (100% as above.
270 - 280	CLAY (100%) as above. Sparse reddish brown clay.
280 - 290	CLAY - as above.
290 - 300	CLAY - as above.
300 - 310	CLAY - light grey, as above. Sparse reddish brown clay.

310 - 320	CLAY - as above.
320 - 330	CLAY (70%) as above. QUARTZ grains (30%) coarse, poorly sorted, sub-angular, frosted and rose-coloured.
	TOP LORRAINE SHALE 332'
330 - 332	SHALE (70%)grey, hard, non-calcareous. SILTSTONE (10%) grey, hard, argillaceous. QUARTZ GRAINS (20%) as above.
3320 - 337	SHALE (60%) grey, hard, non-calcareous, occ. silty. Quartz grains (40%) as above.
337 - 342	Quartz Grains (60%) as above. SHALE (40%) as above.
342 - 347	SHALE (90%) as above. Quartz Grains (10%) as above.

		DRILLER	E LOG
Ran electrical log:	Casing shoe	163	163
	Bottom	353	352

Sand at 322' to 330': net sand 6'.

353 - 360	SHALE - grey, hard, non-calcareous, silty, grading into an argillaceous siltstone. Sparse sandstone, light grey, hard, medium grained, well cemented, tight.
360 - 365	All as above.
365 - 370	All as above.
370 - 375	Shale as above.
375 - 380	SHALE (90%) as above. SANDSTONE (5%) grey, hard, silty, tight.
380 - 385	SHALE as above.
385 - 390	SHALE as above.
390 - 395	SHALE (95%) as above. SILTSTONE (5%) grey, hard, dense, sandy.
395 - 400	SHALE (98% SILTSTONE (2%)
400 - 405	SHALE as above.

SUMMARY REPORT

WELL: Canso-Inter City Ste. Anne #2
LOCATION: Lot 1, Parish Ste. Anne d'Yamachiche
ELEVATION: Ground 20' K.B.25'
CONTRACTOR: Trennd Enterprises Ltd.
RIG: Mahew 2000 (rotary)

DATE SPUDDED: October 25, 1956
DRILLING COMPLETED: November 22, 1956
RIG RELEASED:
(after completion): December 7, 1956
TOTAL DEPTH: 330' (driller)
329' (E-Log)

CASING DATA: 7 7/8" hole to 171'. $5\frac{1}{2}$" O.D., Grade B, seamless water well casing cemented at 148' using 5 sacks cement, 65 sacks Stratalite and 10 sacks cement plus 4% $CaCl_2$.

4 3/4" hole from 171' to total depth. $3\frac{1}{2}$" O.D., 7.7# line pipe cemented at 311' using 25 sacks cement and 40 sacks Stratalite.

LOGS: Widco electrical log from surface to total depth.
Baroid gas detector log from surface to total depth.

GEOLOGICAL MARKERS: Top Lorraine Shale 291' (266' subsea)

TESTS: D.S.T. - None.

OPEN HOLE TESTS:
148' - 171' After drilling out $5\frac{1}{2}$" casing shoe at 148' and hard cement to 154', well unloaded water from annulus. Closed well in. Maximum wellhead shut-in pressure 69 p.s.i. Flowed well for 113 mins: rate varied from 186 to 220 MCF/D. Killed well with mud.

TESTS THROUGH CASING:
(1) 276 - 282 Bailed hole dry. Perforated with 6 jets/ft. Well flowed water and gas by heads: estimated initial rate 12 bbls. water per day and 25 MCF/D gas: flow decreased to nil in two hours. Set cement plug 253' to 194'.

(2) 160 - 170 Bailed hole to 50' (water in hole). Perforated with 6 jets per foot. Well flowed gas at 139 to 210 MCF/D. Tubing head shut-in pressure 62 p.s.i. after 5 mins. shut-in time. Perforations now open.

STATUS: Shut-in Gas Well. Open Flow Potential 220 MCF/D.

PLUGS: Cement plug from 194' to 253'.

SAMPLE DESCRIPTION

Canso-Inter City Ste. Anne #2

0 - 10	CLAY, light grey, slightly silty with about 25% dirty silt.
10 - 20	SAND - mainly fine grained, 35% with 15% small pebbles and 50% Clay or silty Clay as above.
20 - 160	CLAY - light grey, soft.
171 - 176	No sample
176 - 180	CLAY - light grey, occasionally slightly silty.
180 - 190	CLAY - as above.
190 - 200	CLAY - as above.
200 - 210	CLAY - light grey, as above. Sparse reddish brown clay.
210-- 220	CLAY, light grey, as above.
220 - 230	CLAY, as above.
230 - 240	CLAY, as above.
240 - 250	CLAY, as above.
250 - 260	CLAY, as above.
260 - 270	CLAY, as above.
270 - 280	CLAY, as above.
	TOP OF GRAVEL BED 275' (Drilling Time)
280 - 290	CLAY (60%) light grey, as above. GRAVEL (40%) composed mainly of coarse, poorly sorted, sub-angular, clear to rose-coloured quartz grains; some feldspar and ferro-magnesian minerals.
	TOP LORRAINE SHALE 290'
290 - 295	SHALE (90%) grey to dark grey, hard, non-calcareous, silty. GRAVEL (10%) as above. Sparse Sandstone, light grey to white, hard, medium grained, well-cemented, tight.

Ste. Anne #2 (Continued)

295 - 302	SHAIE , as above.
302 - 305	SHALE, as above, grading into argillaceous siltstone.
305 - 310	As above.
310 - 315	As above.
315 - 320	As above.
320 - 325	As above.
325 - 330	As above.

SUMMARY REPORT

WELL: Canso-Inter City Three Rivers #1 CONTRACTOR: Trennd Enterprises Ltd.
LOCATION: Lot 34, Parish Three Rivers. RIG: Mahew 2000
ELEVATION: Ground 22' K.B. 27'

DATE SPUDDED: October 26, 1956
DRILLING COMPLETED: November 24, 1956
RIG RELEASED:
(after completion): December 8, 1956
TOTAL DEPTH: 405' (driller)
402' (E-Log)

CASING DATA: 7 7/8" hole to 165'. $5\frac{1}{2}$" O.D., 10#, Grade B, seamless water well casing cemented at 105' using 5 sacks cement, 65 sacks Stratalite and 10 sacks cement plus 4% $CaCl_2$.

4 3/4" hole from 165' to T.D. $3\frac{1}{2}$" O.D., 7.7# line pipe cemented at 263' using 5 sacks cement, 40 sacks Stratalite and 15 sacks cement plus 4% $CaCl_2$.

LOGS: Widco Electrical log from surface to Total Depth.
Baroid gas detector log from surface to Total Depth.

GEOLOGICAL MARKERS: Top Lorraine Shale 207' (180' subsea)

TESTING: D.S.T. #1 209 - 226 Could not get below 192' (two attempts).

OPEN HOLE TESTS: None.

TESTS THROUGH CASING:

(1) 208 - 218' Bailed hole to 60' (water in hole). Perforated with 6 jets per foot. No pressure build up after 20 mins. shut in. Opened needle valve and had slight gas blow. Found fluid level at 80'. Bailed hole dry. No fluid entry after 20 mins: no pressure build-up after 45 mins.

(2) 204 - 209 Perforated 6 jets per foot with hole full of water. Bailed an estimated 14 bbls of slightly salty water in 3 hours with fluid level standing at 45'; no sign of gas.

STATUS: Shut in.

SAMPLE DESCRIPTION

Canso-Inter City Three Rivers #1

0 - 20	SAND - grey, mainly medium grained, quartzose with some feldspar and ferro-mag minerals; grains mainly sub-angular.
20 - 30	SAND - as above with trace shell fragments.
30 - 40	SAND, medium grained.
40 - 60	SAND, coarse grained (50%); with 20% very fine grained and grading to silt, trace shell fragment.
60 - 70	Grit to fine pebbles 75%; Clay 10%; Sand and fine silt 15% Trace shells.
70 - 80	SAND - coarse grained (50%); fine and medium grained (50%) Few shell fragments.
80 - 90	Grit and small pebbles (75%); Silt and light grey clay (25%)
90 - 100	CLAY - light grey, silty to slightly sandy.
100 - 110	SAND - poorly sorted, silt to coarse grained, mainly medium grey. CLAY (10%)
110 - 120	As above with 10% small pebbles.
120 - 160	SAND, mainly medium grained, with trace pebbles and shell gragments. increase in pebbles at 160.
160 - 170	SAND - poorly sorted, few pebbles, some shell frags. 15% light grey clay and 10% silt.
171 - 180	CLAY - light grey, occasionally silty (80%) PEBBLES - sub angular to angular, mainly unweathered granite (20%)
180 - 190	CLAY (70%) light grey, as above. PEBBLES (30%) as above. Sparse siltstone, grey, hard, non-calcareous, argillaceous.
190 - 200	CLAY (30%) light grey, as above. PEBBLES (40%) sub. angular, to angular, unweathered granite, quartz and feldspar. SAND (30%) medium to coarse grained, sub-angular, mainly quartzose. Sparse siltstone, as above.
	TOP LORRAINE SHALE 207' (Drilling time)
200 - 210	CLAY (30%) as above. PEBBLES (30%) as above. SHALE (40%) grey, hard, non-calcareous, silty, grading into an argillaceous siltstone.

210 - 215 SHALE (75%) as above.
CLAY (20%) as above.
PEBBLES (10%) as above.

215 - 220 SHALE (90%) as above.
PEBBLES (10%) as above.

220 - 225 SHALE (90%) as above, more silty.
PEBBLES (10%)

RAN WIDCO LOG

	DRILLER	WIDCO
Casing shoe	105	104
Bottom	226	223
TOP LORRAINE SHALE		207

225 - 226 SHALE (80%) grey to dark grey, hard, non-calcareous, silty.
SILTSTONE (20%) grey, hard, non-calcareous, occ. sandy, tight.

226 - 230 SHALE (90%) as above.
SILTSTONE (10%) as above.
Abundant cavings - pebbles and sand.

230 - 235 SHALE (90%) as above.
SILTSTONE (10%) as above.

235 - 240 SHALE (95%) as above.
SILTSTONE (5%) as above.
Sparse sandstone, light grey, hard, medium grained, non-calcareous, well cemented, tight.

240 - 245 SHALE (90%) as above.
SILTSTONE (10%)

245 - 250 SHALE (95%)
SILTSTONE (5%)

250 - 255 All as above.

255 - 260 SHALE (100%) as above.
Sparse sandstone as 235 - 240.

260 - 265 SHALE (95%) as above.
SILTSTONE (5%) as above.

265 - 270 SHALE (90%) as above.
SILTSTONE (10%) as above.

270 - 275 SHALE (85%) as above.
SILTSTONE (15%) as above.

275 - 280	No sample
280 - 285	SHALE (75%) as above. SILTSTONE (25%) as above.
285 - 290	All as above.
290 - 295	SHALE (80%) as above; ribbed shell cast. SILTSTONE (20%) as above.
295 - 300	SHALE (95%) as above. SILTSTONE (5%) as above.
300 - 305	SHALE (90%) as above. SILTSTONE (10%) as above.
305 - 310	SHALE (95%) as above. SILTSTONE (15%) as above.
310 - 315	No sample.
315 - 320	SHALE (90%) as above. SILTSTONE (10%) as above.
320 - 325 -	SHALE (95%) as above. SILTSTONE (5%) as above.
325 - 330	SHALE (80%) as above. SILTSTONE (20%) as above.
335 - 340	SHALE (75%) as above. SILTSTONE (25%) light grey, hard, non-calcareous, generally sandy, tight. Sparse sandstone as in 235 - 240.
340 - 345	SHALE (95%) SILTSTONE (5%) light grey, hard, non-calcareous, tight.
345 - 355	SHALE (100%) grey to dark grey, hard, non-calcareous, silty, grading into argillaceous siltstone. Sparse sandy siltstone.
355 - 360	As above. Abundant quartzose sand - cavings.
360 - 365	All as above, incl. sand.
365 - 370	SHALE (90%) SILTSTONE (5%) grey, hard, non-calcareous, tight. SANDSTONE (5%) light grey, medium grained, silty, non-calcareous, well cemented, tight. Quartz sand - cavings.

Canso-Inter City Three Rivers #1 (Cont'd)

370 - 375	SHALE (95%) as above. SILTSTONE (5%) as above.
375 - 380	All as above.
380 - 385	All as above. Quartz sand - cavings.
385 - 390	All as above (incl. quartz sand - cavings)
390 - 395	SHALE (85%) as above. SILTSTONE (15%) as above. Sparse sandstone, grey, medium grained, well cemented, tight.
395 - 400	SHALE (90%) as above. SILTSTONE (10%) as above. SPARSE Sandstone, as above.
400 - 405	SHALE (90%) as above. SILTSTONE (10%) as above.