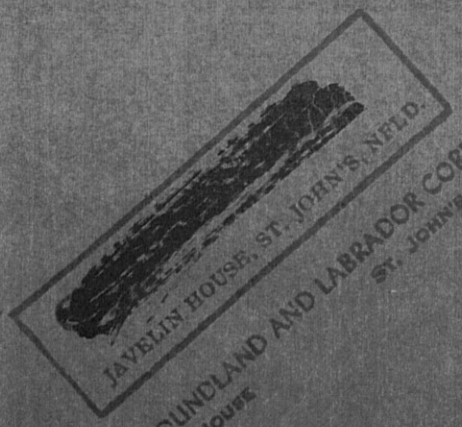
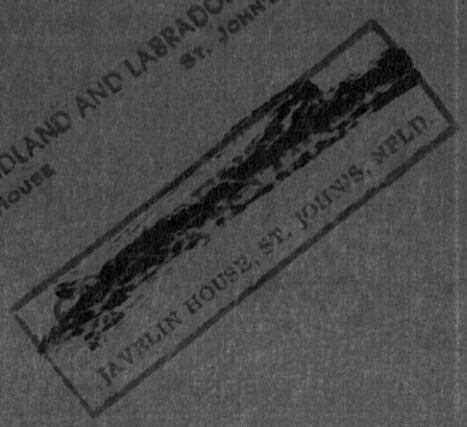


WELL COMPLETION RECORD

NALCO WELL 1-65

PARSON'S POND

By K. C. O'Toole



WELL COMPLETION RECORD

WELL # 1-65

PARSON'S POND, ST. BARBES DIST.,

NEWFOUNDLAND

012H/0077

CONFIDENTIAL

JAVELIN HOUSE, ST. JOHN'S, NFLD.

NEWFOUNDLAND AND LABRADOR CORP. LTD.
JAVELIN HOUSE ST. JOHN'S NFLD.

Newfoundland & Labrador Corp.
Javelin House
109 Water Street, St. John's

August 1, 1966

DRILL RIG MODEL:	36-L Bucyrus Erie. Cable Tool Machine
LOCATION	Lat. 50° 00' 30" Long. 57° 30' 00"
ELEVATION:	± 10 feet
FINAL DEPTH:	4,271 feet
CASING:	20 feet of 10 3/4" O.D. 852 feet of 8 5/8" O.D.
BIT SIZE:	10" to 852 8" to 4,271 feet
CEMENTED:	From - 3683' to 3700' From - 4248' to 4210'

GENERAL

Well # 1-65 was spudded in at approximately fifty feet north of Well # 23 in order to test the petroleum potential of both Green Point and Humber Arm formations, and to evaluate reported zones in the old well. The original objective was 1,500' - 3,000'. This was later revised to 5,000' + in order to penetrate the Table Head formation and top of the St. Georges. Minor pockets of "Sweet" Natural gas were encountered throughout the 1,000'

Green Point limestones and Shales. Fresh water was encountered at 59 feet and the well was drilled "Wet" until 8 5/8" casing was set at 651 feet. No crude oil was encountered until 1,000', at the faulted contact between the Green Point and Humber Arm formations (Blow Me Down). Natural gas occured in pockets throughout and the best showing was evidenced following the final footage "run" (4271 feet).

CHRONOLOGY

- The well was spudded into bedrock and a twenty five foot joint of 10 3/4" casing was set and cemented. This cement was old and lumpy so presumably is not very strong.

- Fresh water was first encountered at 59 feet and the fluid arose to within 12 feet of the surface. The Well was drilled "Wet" to a depth of 651 feet before shut off with 8 5/8" casing.

- Drilling continued to 1951 feet in an open hole. Free oil was encountered at 1,024 feet but did not seriously contaminate cutting above 1,800 feet. Another possible crude petroleum show was recorded at 1151 feet; and again at 1530 feet, while the best appeared at 1793 feet. The initial flow of the last zone was better by three times than that of 1530 feet. Several bucketfuls were bailed with the rock cuttings. Thereafter crude oil was in the bailed cutting at all times.

- The 8 5/8" casing was pulled alloving water to flood in and reaming commenced with the intention of setting the casing at 1951' but caving and soft formations hindered this objective.

- The casing was again set, this time at 852 feet in soft gouge-like shale and an effective surface water shut-off was accomplished.

- The best natural gas showing was evidenced at the very bottom of the Well (4271 feet). One could sit in the Dog-House (shack ajoining Derrick House) and hear it belching through thirty feet of fluid. This activity leveled off and one month later, when we acquired proper testing equipment the pressure had dropped to the point where no deflection is seen on a pressure gauge.

- Drilling continued to 4,271 feet when a broken stem, considerable caving, and an overtaxed drilling rig caused abandonment of hole.

WELL # 1-65

PETROLEUM SHOWS

1001'	- 1009'	(Rainbow)
1024'	- 1031'	(Free oil)
1151'	- 1153'	(possible)
*1530'	- 1537'	(fair)
1793'	- 1800'	(better by 3 times then 1530 - 1537)
2004'	- 2010'	(possible)
2079'	- 2081'	"
2612'	- 2620'	"
2834'	- 2843'	"
3267'	- 3277'	"
4035'	- 4040'	"
4188'	- 4194'	"

NATURAL GAS SHOWS

150'	- 157'	Small show through 135' of fluid
235'	- 242'	" " better than 150' - 157'
582'	- & Area	gas in bailed cuttings
*1530'	- 1537'	Samll show
1959'	- 1964'	" "
2184'	- 2192'	" "
2442'	- 2449'	" "
2612'	- 2620'	" "
3612'	- 3615'	" puff
4061'	- 4068'	" "
4271'		Strongest gas show. Audible for 30' -40' from drill rig-bâlching through

30 feet column of fluid.

WEEKEND CURDE PETROLEUM TESTS (24 HRS.)

1253' - Several gals. gassy crude

1537' - " " " "

1800' - Several bucketfuls

1951' - 5.5 bbls.

1986' - 5 bbls.

2122' - 5 bbls.

2399' - 3 bbls.

2688' - 3.2 bbls.

2931' - 3.0 bbls.

3093' - 3.18 bbls.

3348' - 2.03 bbls.

3686' - 1.9 bbls.

4188' - 2.0 bbls.

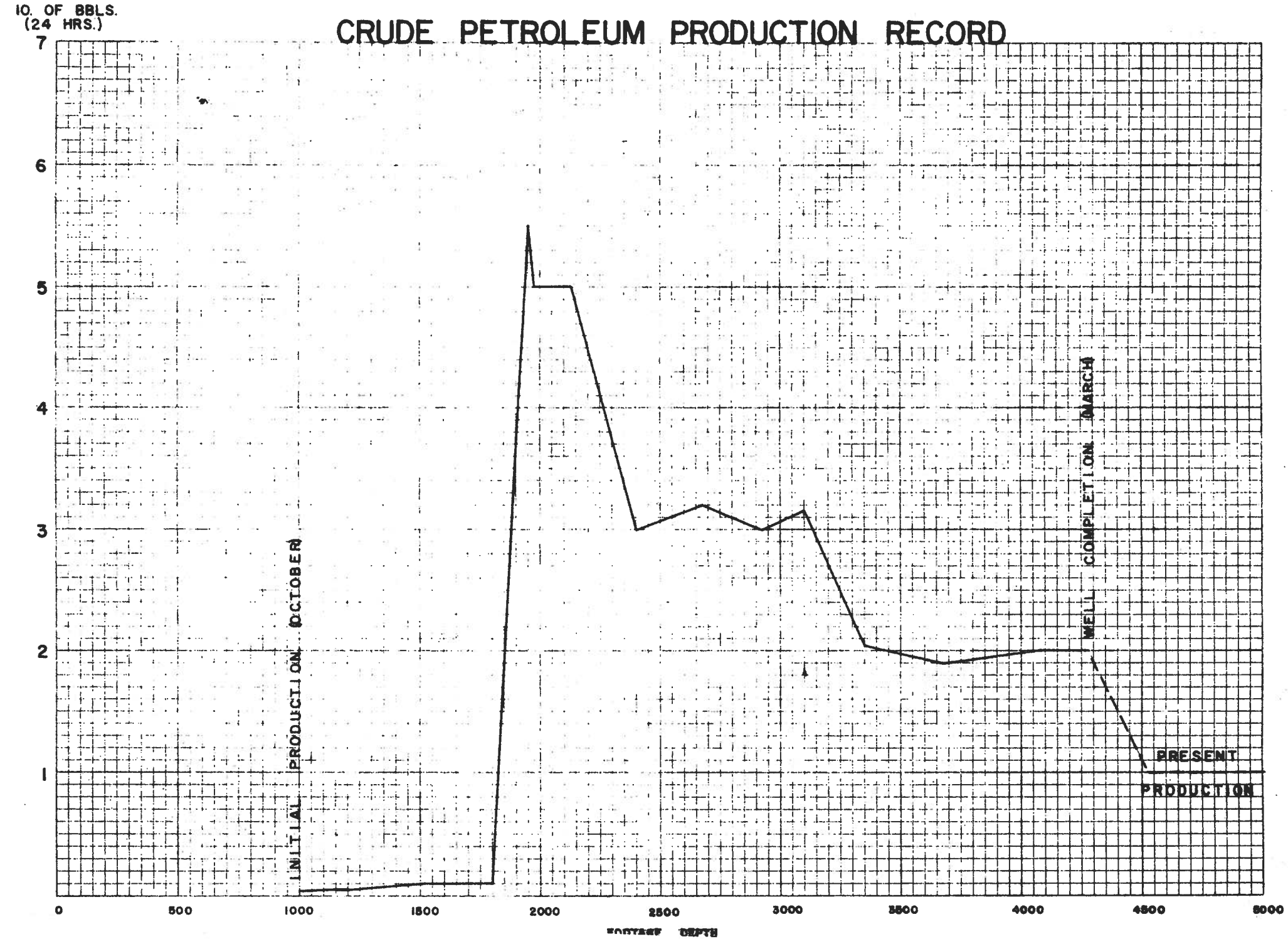
4271' - 2.0 bbls.

Present production has diminished to approximately 1 bbl per day.

NFLD. & LAB. CORP.

WELL NO. 1-93
PARSONS . ND, NFLD.
AUGUST 1966.

CRUDE PETROLEUM PRODUCTION RECORD



CRUDE PETROLEUM SHOWING IN WELL # 1 - 65

DEPTH IN FEET	DRILLER'S DISCRIPTION	GEOLOGICAL DISCRIPTION	TESTS: IMMEDIATE CRUDE GENERATION	TESTS: WEEKEND TESTS	TESTS: ACETONE	REMARKS
*1001 to 1009	Rainbow of colors	Ss.-Quartzoes, grey-green 40% Ls.-chalky & grey 10% Sh.- black 50%	Very thin layer of high gravity oil. Enough to show a rainbow.	Nil	Negative	Chips of rock are essential for the acetone test. Unfortunately in most cases only crushed sand was present in the bailings; hence, tests are inconclusive.
1009 to 1017	Same	Same as above	same as above	Nil	Negative	
1017 to 1024	Nil	Ss.-up to 1mm. grey-green slightly calcareous matrix quartzose 60% Ls.-transitional 10% Sh.-grey& green 30%	Nil	Nil	Negative	
*1024 to 1031	(free oil) Small show	Ss.-grey, calcareous, quartzose, excellent porosity 60% Sh.-black 40%	Several gallons with each bailing.	Nil	Negative	
1031 to 1039	Nil	Ss.-Quartzose grey-green 80% Sh.-black 20%	less than several gallons	Nil	Negative	
1143 to 1151	Nil	Same as above with accessory pyrite		Nil	Negative	
1151 to 1153	Possible Shows Crude thicker & darker	Ss.-less than 2mm., quartzose clear, globular, subangular black opaque mineral slightly caleareous, grey-green 70%, Sh.-black slatey 30% Accessory calcite 10%		Several gallons	Negative	Crude petroleum present in open hole while drilling

DEPTH IN FEET	DRILLER'S DISCRIPTION	GEOLOGICAL DISCRIPTION	T E S T S			
			IMMEDIATE CRUDE GENERATION	WEEKEND TESTS	ACETONE	REMARKS
1153 to 1160	Nil	Same as above	Nil	Same	Negative	
1523 to 1530	Nil	Ss.- 80% Sh.- 20%	Nil	Nil	Negative	
1530 to 1537	(fair show)	Ss.-less then 2mm., quartzose clear globular grains, minor green qtz., black vitreous fragments, calcareous, grey-green 90% Sh.- black, sheared, probable caving 10%.	Several gallons	several gallons	Positive slight discoloration	
1537 to 1544	Nil	Ss.- 40% Sh.-black & dark blue 80%	Nil	Nil	Negative	
1544 to	Nil	Ss.-same as 1537 80% Sh.-Same " " 20%	Nil	--	Negative	
1793 to 1800	Better by 3 than 1537	Ss.-similiar no green fragments 100%	Several bucketfuls			
1800 to 1803	Nil	Ss. less than 2mm., fissile, friable 100%	Nil	Nil	Negative	
2004'	possible	Ss.-less than 1mm. quartzose calcareous matrix, grey-green 70% Sh.-Blue(dark) 30%	Appears blacker & thicker	Nil		No increase in crude production
2079'	possible	Ss.-less than 1mm, grey-green 70% Sh.- Blue 30%	Similiar			Same as above

DEPTH IN FEET	DRILLER'S DISCRIPTION	GEOLOGICAL DISCRIPTION	IMMEDIATE CRUDE GENERATIONS	WEEKEND TESTS	ACETONE	REMARKS
			T E S T S			
2612	Possible	Ss.-less than 2mm, Quartzose grey-green 60% Sh.-blue 40%	Similiar			no increase in crude production
2834	Possible	Ss.-less than 2mm, quartzose 70%, Sh.-black 30%,	Similiar			Same as above
3267	Possible	Ss.-ground to grey sand 80%, Sh.-black 20%	Similiar			Same as above
4035	Possible	Ss.-less than 1mm. quartzose greey-grey 80%, Sh.-black & dark blue 20%.	Similiar			Same as above

* Actual Oil Shows

CLARIFICATION OF THE TERMS & ABBREVIATIONS USED FOR CRUDE OIL ANALYSES

1. TYPES OF OIL ANALYSES

   (a) Elemental analysis which describe primary points such as specific gravity, heating value, and percentages of hydrogen, carbon, nitrogen and sulphur. These analyses furnish rough indices of the value of the oils before refining.

   (b) Fractional Distillation is a more satisfactory type. A small amount of oil is placed in a flask and distilled. The products from the distillation are expressed in percentages or fractions, hence the name.

   (c) Commercial Analysis are obtained from actual trial tests and show in percent and in barrels the amount of various products received.

2. THE SPECIFIC GRAVITY (s. G.) of a substance is its weight per unit volume as compared to an equal unit of water. (eg. S.G. of pure gold is 19.3 times as heavy as water)

   Since most petroleum is lighter than water, then S.G. must be expressed as a decimal fraction. (eg. .801 & .812 etc)

   In order to make rapid measurements of fluids lighter than water the hydrometer was developed. The principle used here is that of bouyancy. A sealed glass tube is set in a bath of the fluid and will float higher or

lower depending on whether the fluid is respectively dense or less dense. This glass tube is then divided in 90 equal units starting 10° (where the tube floats in pure water or S.G. 1) and progressive divided up to 100°. This is the API (American Petroleum Institute) scale. It is directly opposit to the decimal fraction system of Specific Gravity in that it increases numerically as the gravity becomes lighter (eg. API 12° is heavy and viscious; whereas, API 40° is light and freeflowing) In order to convert from API gravity to S.G. a formula must be used.(Refer Levorsen (1)* p. 339)

It will be noted that:

(a) API gravity of 10° = the specific gravity of water (or unity). This is set arbitarily.

(b) API gravity does not have a straight-line relationship with specific gravity, nor the other properties correlated with specific gravity, such as viscosity. This is due to the fact that a hydrometer does not sink with equal intervals when relating it to fractions of Specific Gravity.

(c) High values of API gravity correspond to low specific gravity, and low values of API gravity to high specific gravity; so the scale cannot be used directly in engineering calculations.

*(1) A.I. Levorsen - GEOLOGY OF PETROLEUM Published by W. H. Freeman & Co. in 1954.

(d) Since the price of crude oil is commonly based on "gravity" the measurements are very important. The higher the API gravity, the higher the price paid of the crude; the reason being that this oil contains a higher gasoline fraction.

(e) Crude oil may run from API 7° up to API 70°; the normal is API 27° - 35°.

3. VISCOSITY - is the inverse measure of the ability of a substance to flow and is expressed in many different systems, eg. Saybolt Furol Seconds (S.S.F.) at $^{\circ}F$, or Saybolt Universal Seconds (S.U.S.) at $^{\circ}F$. This latter system is based on a unit of water passing through an oriface in one second, as opposed to another equal amount of fluid passing through the same oriface in X seconds at an equal temperature. Viscosity is directly related to specific gravity and temperature , and amount of dissolved gas. (Refer p. 348, Levorsen). Viscosity conversion factors may be found on page 664 of Levorsen.

4. POUR POINT - is the temperature point reached where the oil is no longer fluid. This determination is important when considering pumping oil from the well-head during winter months. (Refer p. 354, Levorsen).

5. FLASH POINT - is the temperature at which the vapors rising off the surface of the heated oil will ignite with a flash of very short duration when a flame is passed

over the surface. This measure is important when considering inflammability or fire-hazard.

6. DISTILLATION - begins by recording the initial boiling point (IBP) of the oil in degrees F^{o}, and continues recording the distillate at constant intervals along with the temperatures required to boil off each fraction. (Usually 10% of distillate) The process is carried through until there is no more vaporization (cracking point). With a Commercial Analysis the fractions or portions of the distillate are usually broken into products of percentage gasoline, stove oil, furnace oil and some grade of Bunker. It must be noted that through the use of "Cracking" up to 65% gasoline may be extracted from light gravity crudes. "Cracking" is the breaking down of heavy complex molecular structures under controlled temperature and pressure, with or without a catalyst, and then reconstituting to form new lighter compounds which fall in the gasoline fraction. (Refer p. 324 & 502, Levorsen).

7. SALT CONTENT - When salt content ranges over 15-25 lbs./ 1,000 bbls. then equipment must be installed to extract it at added cost. (Refer P. 335, Levorsen).

8. SULPHUR occures in crude petroleum as three types:

   (a) Free sulphur (s)

   (b) Hydrogen Sulphide (H_2S)

   (c) Organic sulphur compounds

sulphur is not desireable in crude oil because of its corrosive qualities.

Its presence in gasoline causes corrosion, bad odor and poor explosion, but with todays methods of sulphur extraction, the price paid for high or low sulphur bearing crude oil is almost equalized.

The typical sulphur content ranges from 0.1% - 5.5% (by weight) less than 0.5% is designated "low sulphur crude"

9. BS & W VOLUMN PERCENTAGE - refers to the "bottom settlement & water" content of the crude before distillation. The bottom settlement is similar to "sludge".

10. CRACKING TEMPERATURE - refers to the temperature during fractional distillation at which there is no further evaporation at normal pressure.

The two appended tables compare Parson's Pond crude petroleum with other world fields.

May 24, 1966

K. C. O'Toole

COMPARISON OF CRUDE OIL ANALYSES

PROPERTIES OF PETROLEUM	POWELL N.E. TEXAS WOODBINE SAND (CRETACEOUS)	SPRING CREEK WYOMING MADISON LIMESTONE (MISSISSIP-PIAN)	LAGUNILLAS VENEZUELA La ROSA (L.MIOCENE)	ABQAIQ SAUDI ARABIA (JURASSIC)	KIRKUK IRAQ ASMARI LIMESTONE (OLIGOCENE - MIOCENE)	RANGELY COLORADO WEBER SAMD (PENNSYLV-ANIAN)	RODESSA TEXAS - LOUISANNA OOLITIC LIMESTONE (L.CRETAC-EOUS)	BRADFORD PENNSYLVAN-IAN BRADFPRD SAND (DEVONIAN)	NFLD. PARSON'S POND QUARTZOSE SANDSTONE (ORDOVICIAN)
Specific gravity	Not specified		.948	.84	.844	.85-.87	.812	.801	.802
API Gravity	37°	12.6°	17.8°	37°	36.1°	31.3°-35.2°	42.8°	45.2°	43.4°
Viscosity Saybolt Universal Seconds 100°F SSU	42	6,000 +	992	40.2	350	45-53	39	38	43
Pour Point Point		30°F	-20°F	-15°F	below °F	below 5°F	below 5°F	below 5°F	+20°F

COMPARISON OF CRUDE ANALYSES

PROPERTIES OF PETROLEUM	NEW MEXICO JACKSON AREA EDDY CO. MONUMENT FIELD	K. M. A. CRUDE WICHITA COUNTY, TEXAS	WELL # 1-65 CRUDE PARSON'S BOND, WEST COAST NEWFOUNDLAND
API gravity	35.9°	43.0°	43.4°
Pour Point °F	20°	below 0°	+20°
IBP °F	95°	-----	121°
Bs & W %	0.1	0.5	----
Sulphur %	0.86	0.24	0.26
Distillate %	73.3	46	63
Residuum %	25.5	52	36
Viscosity at 122° S.S.F.	177	--	35

WELL # 1-65

36-L BUCYRUS ERIE DRILL RIG PERFORMANCE

FROM	TO	24hr day *TIME	AVERAGE FOOTAGE GAIN/day	REMARKS
0	500	9	55.5	
500	1000	7	71.4	
1000	1500	5.5	90.9	
1500	2000	7.5	66.6	3 days reaming out hole from 676' to 852' (Not included)
2000	2500	12	41.6	(Included) 1¾ days changing drill line & fishi bailer.
2500	3000	12	41.6	Included) 1 day changing line end for end. ½ day fishing bailer
3000	3500	13	38.4	(Included) ½ day replacing brake lining & ½ da changing sand line.
3500	4000	15.5	32.2	(Included) 2½ days stuck with tools & ½ day cleaning out 17' of cavings.
	TOTALS	81,5	438.2	

AVERAGE FOOTAGE GAIN/DAY=54.7'

* ACTUAL TIME SPENT DRILLING

May 3rd /66

K C U Doole

WELL # 1-65

No. 1

DRILLING (WIRE) LINE ANALYSIS

LENGTH	DIAMETER	TYPE	FOOTAGE GAIN	NORMAL LOSS	ABNORMAL LOSS	TOTAL LOSS	COST $	¢
3,000'	3/4"	Acquired from shears	1,825'	525'	---	525'	270	00
4,000'	7/8"	Canada Wire	1,231'	1,200'	---	1,200'	720	00
6,500	7/8	Greening	1,215'	3,500'	---	3,500'	2,100	00
6,500	7/8	Canada Wire	spudding	---	---	---		

SAND LINE ANALYSIS

TOTAL	1,000'	1,500	2,500'	1,000. 00

TOTAL COST $4,090. 00

NOTE: Cost slightly less then $1.00 per foot drilled.

No. 2

BRAKE LININGS -- 3 sets at $250.00 = $750.00

No. 3

WELDING RODS -- Total $640.00

OXYGEN & ACETYLENE Total $ 600.00

No 4

Approximately:

Fuel	1,500 gal.	per month =	$ 375.00
Oil	20 gal.	per month =	30.00
Grease	$2.00	per month =	2.00
Gasoline	100 gal.	per month =	50.00
			427.00

Approximately $427.00 x 7 Months, = $2,989.00

No. 5

Approximately:

General maintenance (Casing loss, tool wear, independent mechanical & electrical employees, equel-gel, fire brick etc.)

Approximately- per 1,000ft. = $2925.00

Nos. 4 & 5 -- Approximately costing-all receipts not available.