EXTENDED FLOW TEST RESULTS
PARAMOUNT ET AL CAMERON L-47
UNIT L SEC 47 GRID 60-10-117-30

McDANIEL & ASSOCIATES
CONSULTANTS LTD.
Oil and Gas Reservoir Engineering

9211-P33-4-2.

OTTAWA COPY

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COVERING LETTER

McDANIEL & ASSOCIATES
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May 24, 1990

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Manager, Northern Region
C.O.G.L.A.
Bellance Building
6th Floor, 4914 - 50th Street
Box 1500
Yellowknife, N.W.T.
X1A 2Rs

Dear Sir:

We hereby present for your consideration, on behalf of Paramount Resources Ltd., a report summarizing the results of an extended flow test conducted on the well Paramount et al Cameron L-47 during February and March 1990.

We would be pleased to answer any questions which you may have pertaining to this report.

Sincerely,

McDANIEL & ASSOCIATES CONSULTANTS LTD.

G.C. Knutson, P.Eng.

Encls.

GCK/lmm

EXTENDED FLOW TEST RESULTS
PARAMOUNT ET AL CAMERON L-47
UNIT L SEC 47 GRID 60-10-117-30

INTRODUCTION

An extended flow test was conducted on the Paramount et al Cameron L-47 well during the period February 16 through March 15, 1990. The main objective of this test was to obtain sufficient production and reservoir pressure performance data in order to determine the extent of the porosity development and to determine the performance characteristics and productive capacity of the well after an extended production period. A maximum production volume of 100,000 barrels of crude oil was approved by C.O.G.L.A. for the test. Retrieval of reservoir fluid samples for laboratory study was included as part of the testing procedure. This report presents the information which was obtained during the testing period and discusses the results.

HISTORICAL INFORMATION

Preliminary production tests conducted shortly after completion of the Paramount et al Cameron L-47 well indicated the possibility of a commercial oil discovery in the Keg River zone. These tests indicated an apparent high productive capacity which could be attributable to reservoir fracturing. The Keg River zone in this well is mainly dense with porosity development in the upper dolomite facies.

Due to the high cost of development in this area, the primary concern relating to the exploitation and development of this discovery is the extent of the porosity development. Porosity development cannot be reliably determined from seismic information because of the complex lithology. Therefore, an extended flow test was proposed by Paramount Resources Limited in December 1989 and subsequently approved by the C.O.G.L.A. in January 1990. The main purpose for the extended flow test was to produce sufficient volumes of crude oil to provide a reliable indication that the reservoir contains commercial volumes of oil reserves. A secondary objective of the test was to determine the long term production characteristics of the well and to obtain information which would assist in designing an optimum depletion scheme for the reservoir providing that reserves were found to be commercial.

SUMMARY OF EXTENDED FLOW TEST

The extended flow test began on February 17, 1990 when pressure monitoring instruments were lowered into the well and the well placed on production. Reservoir pressure data were recorded during the first 174 hours of the extended flow test. These reservoir pressure data are presented in Appendix 1. Reservoir pressure data were also recorded during a final pressure buildup period of 72 hours beginning March 18, 1990 following the extended flow test. A static gradient pressure measurement was taken on March 21, 1990 following the 72 hour buildup period. These reservoir pressure data are presented in Appendix 2. Crude oil, gas and water production statistics during the entire testing

period are summarized on Table 1 and are shown graphically on Figure 1 with Day 1 on Figure 1 corresponding to February 17, 1990.

Bottomhole reservoir fluid samples were taken during the testing period for routine laboratory analysis. Results of the laboratory analyses are presented in Appendix 3.

DISCUSSION OF RESULTS

A total of 5,100 barrels (810.4 m3) of crude oil was produced during the entire test period. Oil production was briefly interrupted on a few occasions to facilitate needed well dewaxing activity. Oil production rates varied during the testing period from 35 to 457 barrels per day (5.6 m3/d to 72.6 m3/d). Producing gas oil ratios ranged mainly from about 340 to 1000 scf/bbl (60 m3/m3 to 190 m3/m3) and water production was observed to increase throughout the testing period from nil to over 30 percent watercut. Figure 1 shows the trends in the reported oil production rate, gas oil ratio and watercut throughout the test period.

The extended flow test, as originally proposed, called for crude oil production of up to 100,000 barrels so that a sufficiently large volume of crude oil withdrawals could be attained to provide a reliable indication that the reservoir contains commercial volumes of oil reserves. A total of only 5,100 barrels of crude oil were produced during the test due to problems associated with surface handling and transportation of the produced volumes of oil and water.

The reported pressure data in Appendix 1 indicate that pressure drawdowns during flow periods are relatively small (usually less than 250 kPa) considering the oil production rates achieved during the test. High oil production rates when associated with small pressure drawdowns are characteristic of very high well productivity or productive capacity and excellent near wellbore permeability. The pressure data do not however provide a reliable means of estimating quantitatively a measure of the well productivity due to the relatively low pressure drawdowns and rapid variation of well production rates experienced during the test. The small pressure pertubations observed in the reported data are attributable to the times when the well was dewaxed. No production data was reported for February 21 and February 25, 1990 even though pressure data indicate that the well was flowing during this time. This inconsistency raises some degree of unreliability in the reported production data.

Reservoir pressure data measured during the final shut-in period following the extended flow test are given in Appendix 2. The reported pressure performance during the first 16 hours after the reported shut-in time is not consistent with the expected pressure buildup trend associated with shutting in the well. It appears that production may have continued after the reported shut-in time during this 16 hour period. The remaining pressure data indicate an irregular increase in reservoir pressures and are not analyzable using conventional pressure transient analysis methods. Examination of this pressure buildup data indicates that the magnitude of pressure changes reported during

the buildup period is sufficiently small to place doubt on interpretations made based on the observed trends.

A summary of the available reservoir pressure history obtained for the Keg River zone in the L-47 well is presented in Table 2. The pressure data have been corrected to a reference depth of -775 metres subsea (mid-point of perforations) for comparison. It appears that no appreciable decline in reservoir pressure has been experienced as a result of the fluid withdrawals made during the extended flow test.

Results of the reservoir fluid study, given in Appendix 3, indicate that the bubble point pressure of the reservoir fluid is 10 190 kPaa (1478 psia) at a reservoir temperature of 46°C (114.8°F). Measured data indicate that the initial reservoir pressure is higher than the bubble point pressure determined from the reservoir fluid study, therefore the reservoir fluid at initial reservoir pressure may be an undersaturated fluid.

CONCLUSIONS

The major conclusions which may be made from the information obtained from the extended flow test are as follows:

1. Reservoir fluid withdrawals during the extended flow test were not large enough to provide an indication of the extent of the porosity system in the vicinity of the L-47 well. Essentially no pressure depletion was observed as a result of production during the extended flow test. Therefore, the data do not provide a means of quantifying the extent of the oil accumulation discovered at the L-47 location.

2. Very small pressure drawdowns observed during flow periods indicate excellent well productive capacity.

3. The presence of water during the extended flow test and reported watercuts of more than 30 percent by the end of the test indicates that water production under sustained production operations can be expected.

TABLE 1

TABLE 1

PARAMOUNT ET AL CAMERON L-47
EXTENDED FLOW TEST
PRODUCTION STATISTICS

DATE	CRUDE OIL M3	GAS 103M3	GOR M3/M3	WATER M3	WATER CUT %
1990-02-17	17.31	1.04	60.08	-	-
1990-02-18	49.71	3.08	61.96	-	-
1990-02-19	50.12	3.00	59.86	-	-
1990-02-20	52.39	3.02	57.64	-	-
1990-02-21					
1990-02-22	72.56	4.71	64.91	-	-
1990-02-23	42.49	2.56	60.25	-	-
1990-02-24	34.25	2.13	62.19	7.40	18
1990-02-25					
1990-02-26	40.52	7.02	173.25	2.28	5
1990-02-27	43.75	4.16	95.59	11.13	20
1990-02-28	36.57	3.05	83.40	10.18	22
1990-03-01	26.95	4.25	157.70	3.99	13
1990-03-02	28.74	3.52	122.48	6.59	19
1990-03-03	19.26	3.66	190.03	8.50	23
1990-03-04	25.39	3.15	124.06	8.57	31
1990-03-05	36.28	3.24	89.30	7.67	17
1990-03-06	31.15	3.24	104.01	7.20	19
1990-03-07	26.45	2.87	108.51	7.94	23
1990-03-08	31.04	2.54	81.83	7.50	19
1990-03-09	29.56	2.54	85.93	10.37	26
1990-03-10	15.35	1.07	69.71	5.75	29
1990-03-11	5.60	2.83	505.36	1.98	26
1990-03-12	24.77	4.23	170.77	9.21	27
1990-03-13	31.70	3.24	102.21	14.05	31
1990-03-14	18.83	3.24	172.06	9.69	34
1990-03-15	19.76	3.24	163.97	11.40	37

TABLE 2

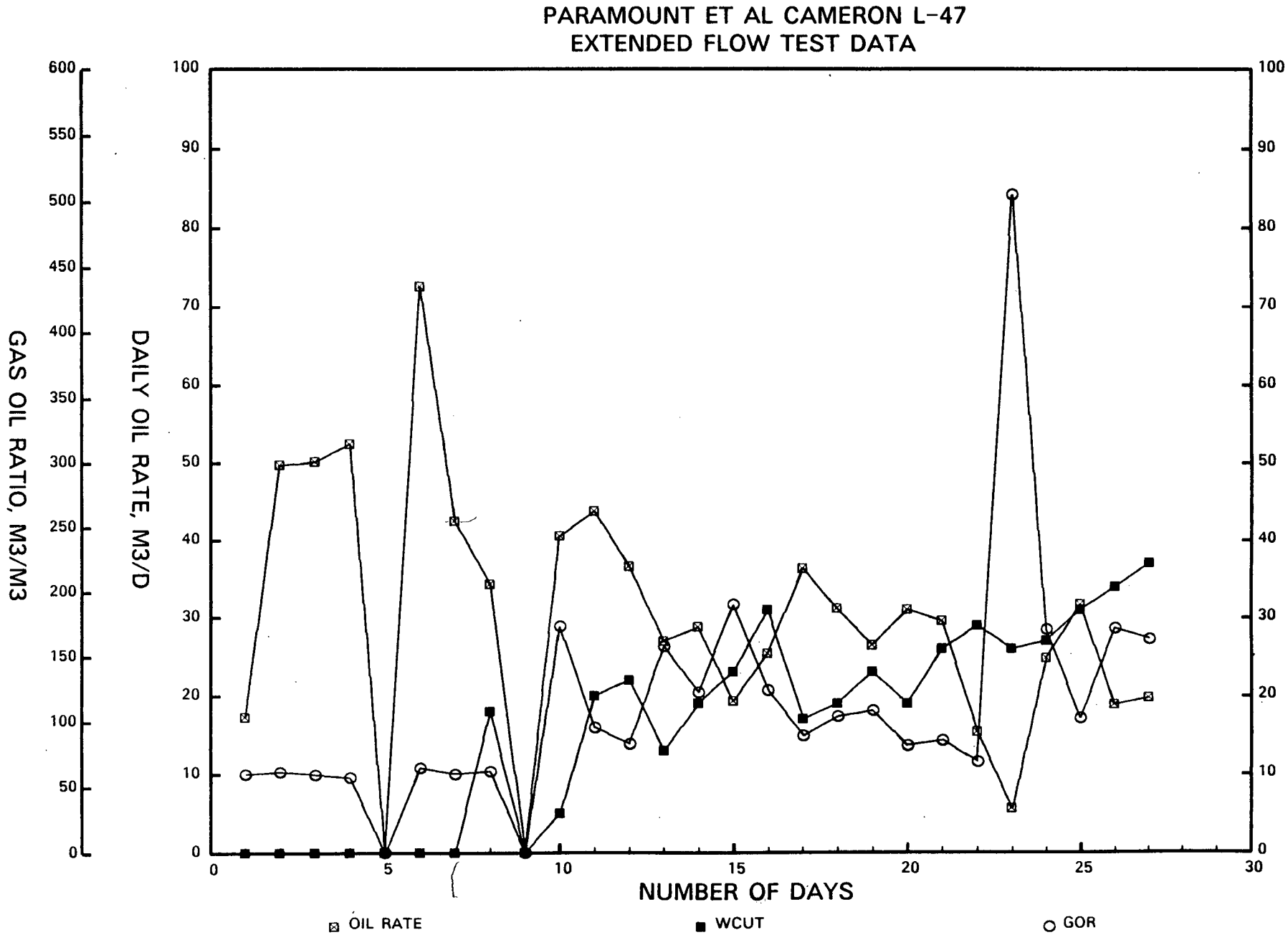
TABLE 2

PARAMOUNT ET AL CAMERON L-47 - KEG RIVER ZONE
SUMMARY OF PRESSURE TESTS
REFERENCE DEPTH = -775 METRES SUBSEA (MID-POINT PERFS)

DATE	TYPE OF TEST	ELEMENT SERIAL NUMBER	RUN DEPTH (M) KB OR CF	RUN DEPTH (M) SS	PRESSURE AT RUN DEPTH KPag	BOTTOM-HOLE GRADIENT Kpa/M	REFERENCE DEPTH PRESSURE KPag
89/02/28	DST 2	13829	1,486.8	-763.8	10,619	7.725(2)	10,706
					10,667(1)	7.725(2)	10,754
90/03/18	BH	14361N	1,469.0	-749.7	10,568	7.725(2)	10,763
		14363N	1,471.0	-751.7	10,560	7.725(2)	10,740
90/03/21	SG	14361N	1,492.0	-772.7	10,711	7.735	10,729
		14363N	1,494.0	-774.7	10,698	7.716	10,700

(1) HORNER EXTRAPOLATION
(2) ESTIMATED FROM STATIC GRADIENT RUNS

FIGURES



McDaniel Engineering Services Ltd.

FIGURE #1

SUBSURFACE PRESSURE MEASUREMENTS

COMPANY : PARAMOUNT RESOURCES LTD
ADDRESS : CALGARY ALTA
FIELD & POOL :
TYPE OF TEST : FLOW & BUILDUP
PERF/O.H. INT : 1492.8 to 1495.3
ELEV.(CF) : 719.3 (KB) : 723.0
POOL DATUM :

WELL NAME : PARAMOUNT ET AL CAMERON
LOCATION : L-47
STATUS : OIL
DATE OF TEST : FEB 17-25/90
PROD. THROUGH : TUBING
MID-POINT OF PROD. INTERVAL : 1494.1
DATUM DEPTH OF WELL : 0.0

STATIC TEST

TUBING PRES : 5700
CASING PRES :
RUN DEPTH : 1468.0
TEMPERATURE AT RUN DEPTH :
PRES. AT RUN DEPTH : 10454.8

SHUT-IN TIME : FEB 24 @ 0800 HRS
ON/OFF BOT. : 17/2@1000-25/2@0813 HRS
SURFACE TEMP. :
PRES. AT MID-POINT OF PERF. : 0.0
DATUM DEPTH PRESS. : 0.0

NOTE : All above units in metric (Depth in metres (CF) ; Pressure in KPAG)

ELEMENT SERIAL NO. : 14352N
RANGE : 0 - 25166
CAL. EQU. : 499.31 * Defl. - 31.04

CLOCK RANGE : 180 HR
LATEST CALIBRATION : 6/12/89

COMMENTS	TIME hrs	DEFL mm	PRESSURE KPAG CALC	CORR	CORRECTED
epth : 1468.0 m					
ON BOTTOM	0.00	21.138	10523.3	-19.8	10503.5
FEB 17@ 1000 HRS	2.00	21.158	10533.3	-19.9	10513.4
	4.00	21.165	10536.8	-19.9	10516.9
	6.00	21.158	10533.3	-19.9	10513.4
	7.00	21.200	10554.3	-20.0	10534.3
	8.00	21.200	10554.3	-20.0	10534.3
	10.00	21.200	10554.3	-20.0	10534.3
	12.00	21.192	10550.3	-20.0	10530.3
	16.00	21.182	10545.3	-19.9	10525.3
	20.00	21.182	10545.3	-19.9	10525.3
	24.00	21.178	10543.3	-19.9	10523.4
	30.00	21.178	10543.3	-19.9	10523.4
	36.00	21.158	10533.3	-19.9	10513.4
	42.00	21.145	10526.8	-19.9	10507.0
	48.00	21.145	10526.8	-19.9	10507.0
	54.00	21.145	10526.8	-19.9	10507.0
	60.00	21.128	10518.3	-19.8	10498.5
	66.00	21.128	10518.3	-19.8	10498.5
	72.00	21.110	10509.3	-19.8	10489.6
	78.00	21.110	10509.3	-19.8	10489.6

REMARKS :

RVEY COMPANY : SOLID WIRELINE TEST BY : K.T.

S O L I D W I R E L I N E S E R V I C E S

SUBSURFACE PRESSURE MEASUREMENTS

OMPANY : PARAMOUNT RESOURCES LTD WELL NAME : PARAMOUNT ET AL CAMERON
DATE OF TEST : FEB 17-25/90 LOCATION : L-47
DEPTH : 1468.0 SERIAL NO. : 14352N

COMMENTS	TIME hrs	DEFL mm	PRESSURE KPAG CALC	CORR	CORRECTED
	84.00	21.110	10509.3	-19.8	10489.6
	90.00	21.110	10509.3	-19.8	10489.6
	96.00	21.110	10509.3	-19.8	10489.6
	102.00	21.100	10504.4	-19.8	10484.6
	108.00	21.100	10504.4	-19.8	10484.6
	114.00	21.100	10504.4	-19.8	10484.6
	120.00	21.080	10494.4	-19.7	10474.7
	120.25	21.190	10549.3	-20.0	10529.3
	120.50	21.212	10560.3	-20.0	10540.3
	120.75	21.192	10550.3	-20.0	10530.3
	121.00	21.148	10528.3	-19.9	10508.4
	121.50	21.052	10480.4	-19.6	10460.7
	122.00	21.032	10470.4	-19.6	10450.8
	123.00	21.070	10489.4	-19.7	10469.7
	124.00	21.088	10498.4	-19.7	10478.6
	128.00	21.088	10498.4	-19.7	10478.6
	132.00	21.088	10498.4	-19.7	10478.6
	138.00	21.068	10488.4	-19.7	10468.7
	144.00	21.065	10486.9	-19.7	10467.2
	150.00	21.065	10486.9	-19.7	10467.2
	156.00	21.065	10486.9	-19.7	10467.2
	162.00	21.065	10486.9	-19.7	10467.2
	166.00	21.065	10486.9	-19.7	10467.2
WELL SHUT-IN	0.00	21.065	10486.9	-19.7	10467.2
FEB 24@ 0800 HRS	.25	21.178	10543.3	-19.9	10523.4
	.50	21.210	10559.3	-20.0	10539.3
	.75	21.192	10550.3	-20.0	10530.3
	1.00	21.140	10524.3	-19.8	10504.5
	1.50	21.060	10484.4	-19.7	10464.7
	2.00	21.028	10468.4	-19.6	10448.8
	3.00	21.032	10470.4	-19.6	10450.8
	4.00	21.040	10474.4	-19.6	10454.8
	6.00	21.040	10474.4	-19.6	10454.8
	8.00	21.040	10474.4	-19.6	10454.8

CHART RAN OUT @ 8 HRS OF SHUT-IN.
RECORDERS OFF BOTTOM FEB 25 @ 0813 HRS.

S O L I D W I R E L I N E S E R V I C E S

SUBSURFACE PRESSURE MEASUREMENTS

JMPANY : PARAMOUNT RESOURCES LTD
ADDRESS : CALGARY ALTA
FIELD & POOL :
TYPE OF TEST : FLOW & BUILDUP
PERF/O.H. INT : 1492.8 to 1495.3
ELEV.(CF) : 719.3 (KB) : 723.0
POOL DATUM :

WELL NAME : PARAMOUNT ET AL CAMERON
LOCATION : L-47
STATUS : OIL
DATE OF TEST : FEB 17-25/90
PROD. THROUGH : TUBING
MID-POINT OF PROD. INTERVAL : 1494.1
DATUM DEPTH OF WELL : 0.0

STATIC TEST

TUBING PRES : 5700
CASING PRES :
RUN DEPTH : 1470.0
TEMPERATURE AT RUN DEPTH :
PRES. AT RUN DEPTH : 10492.7

SHUT-IN TIME : FEB 24 @ 0800 HRS
ON/OFF BOT. : 17/2@1000-25/2@0813 HRS
SURFACE TEMP. :
PRES. AT MID-POINT OF PERF. : 0.0
DATUM DEPTH PRESS. : 0.0

NOTE : All above units in metric (Depth in metres (CF) ; Pressure in KPAG)

ELEMENT SERIAL NO. : 14366N
RANGE : 0 - 25166
CAL. EQU. : 505.48 * Defl. - 32.02

CLOCK RANGE : 180 HR
LATEST CALIBRATION : 6/12/89

COMMENTS	TIME hrs	DEFL mm	PRESSURE KPAG CALC	CORR	CORRECTED
Depth : 1470.0 m					
ON BOTTOM	0.00	21.040	10603.3	-32.3	10571.0
FEB 17@ 1000 HRS	2.00	21.050	10608.4	-32.3	10576.0
	4.00	21.050	10608.4	-32.3	10576.0
	6.00	21.040	10603.3	-32.3	10571.0
	7.00	21.065	10616.0	-32.4	10583.6 ✓
	8.00	21.065	10616.0	-32.4	10583.6
	10.00	21.060	10613.5	-32.4	10581.1
	12.00	21.060	10613.5	-32.4	10581.1
	16.00	21.060	10613.5	-32.4	10581.1
	20.00	21.060	10613.5	-32.4	10581.1
	24.00	21.060	10613.5	-32.4	10581.1
	30.00	21.050	10608.4	-32.3	10576.0
	36.00	21.058	10612.4	-32.4	10580.1
	42.00	21.058	10612.4	-32.4	10580.1
	48.00	21.058	10612.4	-32.4	10580.1
	54.00	21.058	10612.4	-32.4	10580.1
	60.00	21.065	10616.0	-32.4	10583.6 ✓
	66.00	21.058	10612.4	-32.4	10580.1
	72.00	21.058	10612.4	-32.4	10580.1
	78.00	21.050	10608.4	-32.3	10576.0

MARKS :

SURVEY COMPANY : SOLID WIRELINE

TEST BY : K.T.

S O L I D W I R E L I N E S E R V I C E S

SUBSURFACE PRESSURE MEASUREMENTS

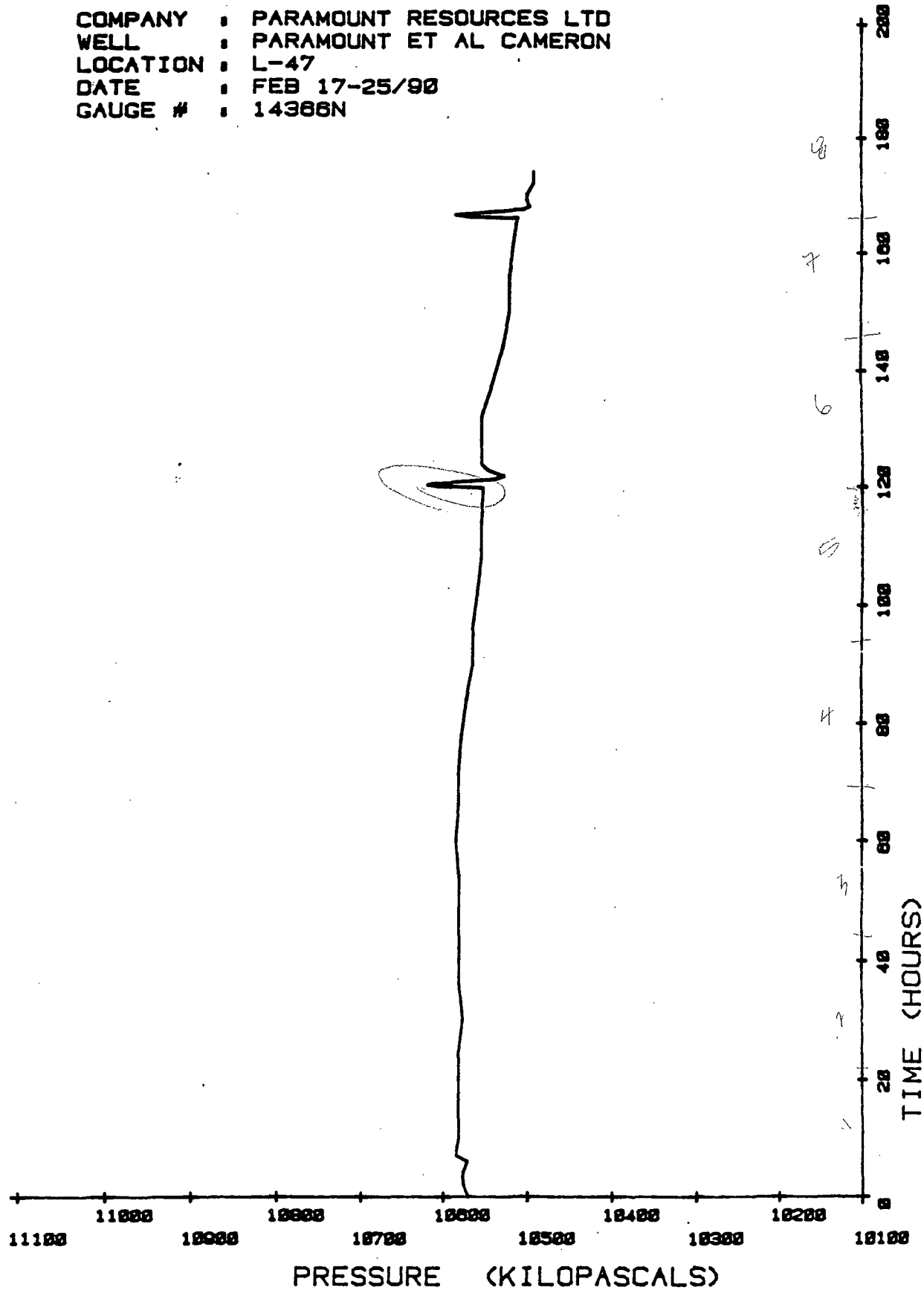
COMPANY : PARAMOUNT RESOURCES LTD
DATE OF TEST : FEB 17-25/90
DEPTH : 1470.0

WELL NAME : PARAMOUNT ET AL CAMERON
LOCATION : L-47
SERIAL NO. : 14366N

COMMENTS	TIME hrs	DEFL mm	PRESSURE KPAG CALC	CORR	CORRECTED	
	84.00	21.040	10603.3	-32.3	10571.0	
	90.00	21.025	10595.8	-32.3	10563.4	
	96.00	21.025	10595.8	-32.3	10563.4	
	102.00	21.015	10590.7	-32.3	10558.4	
	108.00	21.005	10585.7	-32.3	10553.3	
	114.00	21.005	10585.7	-32.3	10553.3	
	120.00	21.000	10583.1	-32.3	10550.8	
	120.25	21.108	10637.7	-32.4	10605.4	
	120.50	21.132	10649.8	-32.4	10617.5	✓ 10803
	120.75	21.122	10644.8	-32.4	10612.4	
	121.00	21.065	10616.0	-32.4	10583.6	
	121.50	20.972	10569.0	-32.3	10536.6	
	122.00	20.952	10558.9	-32.3	10526.5	
	123.00	20.990	10578.1	-32.3	10545.7	
	124.00	21.005	10585.7	-32.3	10553.3	
	128.00	21.005	10585.7	-32.3	10553.3	
	132.00	21.005	10585.7	-32.3	10553.3	
	138.00	20.978	10572.0	-32.3	10539.7	
	144.00	20.955	10560.4	-32.3	10528.0	
	150.00	20.940	10552.8	-32.3	10520.5	
	156.00	20.940	10552.8	-32.3	10520.5	
	162.00	20.930	10547.7	-32.3	10515.4	
	166.00	20.922	10543.7	-32.3	10511.4	
WELL SHUT-IN FEB 24@ 0800 HRS	0.00	20.922	10543.7	-32.3	10511.4	
	.25	21.040	10603.3	-32.3	10571.0	
	.50	21.068	10617.5	-32.4	10585.1	
	.75	21.042	10604.4	-32.3	10572.0	
	1.00	20.990	10578.1	-32.3	10545.7	
	1.50	20.908	10536.6	-32.3	10504.3	
	2.00	20.895	10530.0	-32.3	10497.7	
	3.00	20.900	10532.6	-32.3	10500.3	
	4.00	20.900	10532.6	-32.3	10500.3	
	6.00	20.885	10525.0	-32.3	10492.7	
	8.00	20.885	10525.0	-32.3	10492.7	

CHART RAN OUT @ 8 HRS OF SHUT-IN.
RECORDERS OFF BOTTOM FEB 25 @ 0813 HRS.

COMPANY : PARAMOUNT RESOURCES LTD
WELL : PARAMOUNT ET AL CAMERON
LOCATION : L-47
DATE : FEB 17-25/90
GAUGE # : 14366N



S O L I D W I R E L I N E S E R V I C E S

SUBSURFACE PRESSURE MEASUREMENTS

COMPANY : PARAMOUNT RESOURCES LTD
ADDRESS : CALGARY ALTA
FIELD & POOL :
TYPE OF TEST : BUILDUP
PERF/O.H. INT : 1492.8 to 1495.8
ELEV.(CF) : 719.3 (KB) : 723.0
POOL DATUM :

WELL NAME : PARAMOUNT ET AL CAMERON
LOCATION : L-47 (N.W.T.)
STATUS : OIL
DATE OF TEST : MARCH 18-21/90
PROD. THROUGH : TUBING
MID-POINT OF PROD. INTERVAL : 1494.3
DATUM DEPTH OF WELL : 0.0

STATIC TEST

TUBING PRES : 3460;4900
CASING PRES :
RUN DEPTH : 1469.0
TEMPERATURE AT RUN DEPTH : 56 C
PRES. AT RUN DEPTH : 10567.9

SHUT-IN TIME : MAR 18 @ 0730 HRS
ON/OFF BOT. : 18/3@0930-21/3@1240 HRS
SURFACE TEMP. :
PRES. AT MID-POINT OF PERF. : 0.0
DATUM DEPTH PRESS. : 0.0

NOTE : All above units in metric (Depth in metres (CF) ; Pressure in KPAG)

ELEMENT SERIAL NO. : 14361N
RANGE : 0 - 25511
CAL. EQU. : 508.74 * Defl. - 21.53

CLOCK RANGE : 72 HR
LATEST CALIBRATION : 12/2/90

COMMENTS	TIME hrs	DEFL mm	PRESSURE KPAG CALC	CORR	CORRECTED
Depth : 1469.0 m					
ON BOTTOM	2.00	20.740	10529.8	-21.8	10508.0
MAR 18@ 0930 HRS	2.25	20.783	10551.7	-21.9	10529.8
WELL SHUT-IN	2.50	20.790	10555.2	-21.9	10533.4
MAR 18@ 0730 HRS	2.75	20.790	10555.2	-21.9	10533.4
	3.00	20.800	10560.3	-21.9	10538.5
	3.25	20.820	10570.5	-21.9	10548.6
	3.50	20.832	10576.6	-21.9	10554.7
	3.75	20.850	10585.8	-21.9	10563.9
	4.00	20.862	10591.9	-21.9	10569.9
	4.50	20.850	10585.8	-21.9	10563.9
	5.00	20.850	10585.8	-21.9	10563.9
	5.50	20.825	10573.1	-21.9	10551.2
	6.00	20.813	10566.9	-21.9	10545.1
	7.00	20.800	10560.3	-21.9	10538.5
	8.00	20.790	10555.2	-21.9	10533.4
	8.25	20.882	10602.0	-21.9	10580.1
	8.50	20.765	10542.5	-21.9	10520.7
	9.00	20.795	10557.8	-21.9	10535.9
	10.00	20.795	10557.8	-21.9	10535.9
	12.00	20.795	10557.8	-21.9	10535.9

REMARKS :

SURVEY COMPANY : SOLID WIRELINE TEST BY : K.T.

S O L I D W I R E L I N E S E R V I C E S

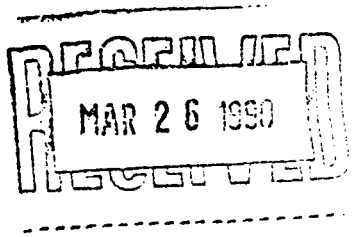
SUBSURFACE PRESSURE MEASUREMENTS

COMPANY : PARAMOUNT RESOURCES LTD
DATE OF TEST : MARCH 18-21/90
DEPTH : 1469.0

WELL NAME : PARAMOUNT ET AL CAMERON
LOCATION : L-47 (N.W.T.)
SERIAL NO. : 14361N

COMMENTS	TIME hrs	DEFL mm	PRESSURE KPAG CALC	CORR	CORRECTED
	14.00	20.795	10557.8	-21.9	10535.9
	14.50	20.890	10606.1	-21.9	10584.2
	15.00	20.755	10537.4	-21.8	10515.6
	16.00	20.780	10550.2	-21.9	10528.3
	18.00	20.792	10556.3	-21.9	10534.4
	20.00	20.800	10560.3	-21.9	10538.5
	22.00	20.800	10560.3	-21.9	10538.5
	24.00	20.800	10560.3	-21.9	10538.5
	28.00	20.808	10564.4	-21.9	10542.5
	32.00	20.818	10569.5	-21.9	10547.6
	36.00	20.823	10572.0	-21.9	10550.1
	40.00	20.835	10578.1	-21.9	10556.2
	44.00	20.842	10581.7	-21.9	10559.8
	48.00	20.842	10581.7	-21.9	10559.8
	52.00	20.845	10583.2	-21.9	10561.3
	56.00	20.850	10585.8	-21.9	10563.9
	60.00	20.855	10588.3	-21.9	10566.4
	64.00	20.858	10589.8	-21.9	10567.9
	68.00	20.858	10589.8	-21.9	10567.9
	72.00	20.858	10589.8	-21.9	10567.9

CHART RAN OUT @ 72 HRS OF SHUT-IN.
RECORDERS OFF BOTTOM MARCH 21 @ 1240 HRS.



S O L I D W I R E L I N E S E R V I C E S

SUBSURFACE PRESSURE MEASUREMENTS

COMPANY : PARAMOUNT RESOURCES LTD
ADDRESS : CALGARY ALTA
FIELD & POOL :
TYPE OF TEST : BUILDUP
PERF/O.H. INT : 1492.8 to 1495.8
ELEV.(CF) : 719.3 (KB) : 723.0
POOL DATUM :

WELL NAME : PARAMOUNT ET AL CAMERON
LOCATION : L-47 (N.W.T.)
STATUS : OIL
DATE OF TEST : MARCH 18-21/90
PROD. THROUGH : TUBING
MID-POINT OF PROD. INTERVAL : 1494.3
DATUM DEPTH OF WELL : 0.0

STATIC TEST

TUBING PRES : 3460;4900
CASING PRES :
RUN DEPTH : 1471.0
TEMPERATURE AT RUN DEPTH : 56 C
PRES. AT RUN DEPTH : 10560.0

SHUT-IN TIME : MAR 18 @ 0730 HRS
ON/OFF BOT. : 18/3@0930-21/3@1240 HRS
SURFACE TEMP. :
PRES. AT MID-POINT OF PERF. : 0.0
DATUM DEPTH PRESS. : 0.0

NOTE : All above units in metric (Depth in metres (CF) ; Pressure in KPAG)

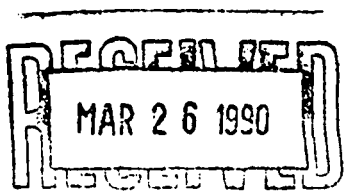
ELEMENT SERIAL NO. : 14363N
RANGE : 0 - 25511
CAL. EQU. : 512.62 * Defl. - 51.32

CLOCK RANGE : 72 HR
LATEST CALIBRATION : 12/2/90

COMMENTS	TIME hrs	DEFL mm	PRESSURE KPAG CALC	CORR	CORRECTED
Depth : 1471.0 m					
ON BOTTOM	2.00	20.680	10549.6	-40.9	10508.7
MAR 18@ 0930 HRS	2.25	20.722	10571.1	-40.9	10530.3
WELL SHUT-IN	2.50	20.725	10572.6	-40.9	10531.8
MAR 18@ 0730 HRS	2.75	20.725	10572.6	-40.9	10531.8
	3.00	20.728	10574.2	-40.9	10533.3
	3.25	20.733	10576.7	-40.9	10535.9
	3.50	20.745	10582.9	-40.8	10542.1
	3.75	20.760	10590.6	-40.8	10549.7
	4.00	20.772	10596.7	-40.8	10555.9
	4.50	20.768	10594.7	-40.8	10553.8
	5.00	20.768	10594.7	-40.8	10553.8
	5.50	20.750	10585.5	-40.8	10544.6
	6.00	20.740	10580.3	-40.9	10539.5
	7.00	20.740	10580.3	-40.9	10539.5
	8.00	20.732	10576.2	-40.9	10535.4
	8.25	20.792	10607.0	-40.8	10566.2
	8.50	20.708	10563.9	-40.9	10523.1
	9.00	20.720	10570.1	-40.9	10529.2
	10.00	20.720	10570.1	-40.9	10529.2
	12.00	20.728	10574.2	-40.9	10533.3

REMARKS :

SURVEY COMPANY : SOLID WIRELINE TEST BY : K.T.



S O L I D W I R E L I N E S E R V I C E S

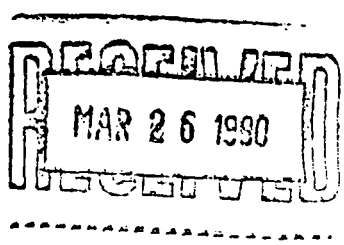
SUBSURFACE PRESSURE MEASUREMENTS

COMPANY : PARAMOUNT RESOURCES LTD
DATE OF TEST : MARCH 18-21/90
DEPTH : 1471.0

WELL NAME : PARAMOUNT ET AL CAMERON
LOCATION : L-47 (N.W.T.)
SERIAL NO. : 14363N

COMMENTS	TIME hrs	DEFL mm	PRESSURE KPAG CALC	CORR	CORRECTED
	14.00	20.728	10574.2	-40.9	10533.3
	14.50	20.805	10613.7	-40.8	10572.8 ✓
	15.00	20.700	10559.8	-40.9	10519.0
	16.00	20.725	10572.6	-40.9	10531.8
	18.00	20.740	10580.3	-40.9	10539.5
	20.00	20.745	10582.9	-40.8	10542.1
	22.00	20.745	10582.9	-40.8	10542.1
	24.00	20.750	10585.5	-40.8	10544.6
	28.00	20.753	10587.0	-40.8	10546.2
	32.00	20.758	10589.6	-40.8	10548.7
	36.00	20.760	10590.6	-40.8	10549.7
	40.00	20.763	10592.1	-40.8	10551.3
	44.00	20.765	10593.2	-40.8	10552.3
	48.00	20.768	10594.7	-40.8	10553.8
	52.00	20.772	10596.7	-40.8	10555.9
	56.00	20.775	10598.3	-40.8	10557.4
	60.00	20.778	10599.8	-40.8	10559.0
	64.00	20.780	10600.8	-40.8	10560.0
	68.00	20.780	10600.8	-40.8	10560.0
	72.00	20.780	10600.8	-40.8	10560.0

CHART RAN OUT @ 72 HRS OF SHUT-IN.
RECORDERS OFF BOTTOM MARCH 21 @ 1240 HRS.



S O L I D W I R E L I N E S E R V I C E S

SUBSURFACE PRESSURE MEASUREMENTS

COMPANY : PARAMOUNT RESOURCES LTD
ADDRESS : CALGARY ALTA
FIELD & POOL :
TYPE OF TEST : STATIC GRADIENT
PERF/O.H. INT : 1492.8 to 1495.8
ELEV.(CF) : 719.3 (KB) : 723.0
POOL DATUM :

WELL NAME : PARAMOUNT ET AL CAMERON
LOCATION : L-47 (N.W.T.)
STATUS : OIL
DATE OF TEST : MARCH 21/90
PROD. THROUGH : TUBING
MID-POINT OF PROD. INTERVAL : 1494.3
DATUM DEPTH OF WELL : 0.0

STATIC TEST

TUBING PRES : 4900
CASING PRES :
RUN DEPTH TOP : 1492.0
TEMPERATURE AT RUN DEPTH : 56 C
GRAD. AT RUN DEPTH TOP : 7.735
PRES. AT RUN DEPTH TOP : 10711.2

SHUT-IN TIME : MAR 18 @ 0730 HRS
ON BOTTOM/OFF BOTTOM : 1452-1502 HRS
SURFACE TEMPERATURE :
PRES. AT MID-POINT OF PERF. : 10729.0
DATUM DEPTH PRESS. : 0.0

NOTE : All above units in metric (Depth in meters (CF) ; Pressure in KPAG)

ELEMENT SERIAL NO. : 14361N
RANGE : 0 - 25511
CAL. EQUATION : 508.74 * Defl. + -21.53

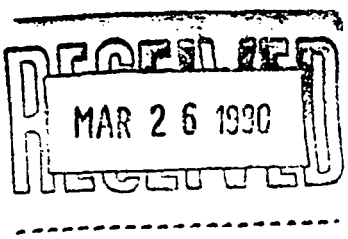
CLOCK RANGE : 3 HR
LATEST CALIBRATION : 12/2/90

TOP RECORDER DEPTH (m)	DEFLECTION mm	CALCULATED PRESSURE KPAG	CORRECTION P + PC KPAG	CORRECTED PRESSURE KPAG	GRADIENT KPAG/m
0.0	9.690	4908.2	8.1	4916.3	0.000
0.0	9.640	4882.8	8.2	4890.9	0.000
298.0	9.930	5030.3	7.6	5037.9	.490
598.0	10.210	5172.7	6.8	5179.6	.472
898.0	11.970	6068.1	1.7	6069.8	2.967
1198.0	16.642	8445.0	-12.0	8433.0	7.877
1298.0	18.185	9230.0	-16.5	9213.5	7.805
1398.0	19.708	10004.8	-21.0	9983.8	7.704
1448.0	20.470	10392.4	-21.6	10370.8	7.740
1492.0	21.140	10733.3	-22.1	10711.2	7.735

REMARKS :

FINAL SURFACE FLEX PRESSURE THIS REC'D = 4878.8 KPAG.

SURVEY COMPANY : SOLID WIRELINE TEST BY : K.T.



S O L I D W I R E L I N E S E R V I C E S

SUBSURFACE PRESSURE MEASUREMENTS

COMPANY : PARAMOUNT RESOURCES LTD
ADDRESS : CALGARY ALTA
FIELD & POOL :
TYPE OF TEST : STATIC GRADIENT
PERF/O.H. INT : 1492.8 to 1495.8
ELEV.(CF) : 719.3 (KB) : 723.0
POOL DATUM :

WELL NAME : PARAMOUNT ET AL CAMERON
LOCATION : L-47 (N.W.T.)
STATUS : OIL
DATE OF TEST : MARCH 21/90
PROD. THROUGH : TUBING
MID-POINT OF PROD. INTERVAL : 1494.3
DATUM DEPTH OF WELL : 0.0

STATIC TEST

TUBING PRES : 4900
CASING PRES :
RUN DEPTH BOT. : 1494.0
TEMPERATURE AT RUN DEPTH : 56 C
GRAD. AT RUN DEPTH BOT. : 7.716
PRES. AT RUN DEPTH BOT. : 10698.5

SHUT-IN TIME : MAR 18 @ 0730 HRS
ON BOTTOM/OFF BOTTOM : 1452-1502 HRS
SURFACE TEMPERATURE :
PRES. AT MID-POINT OF PERF. : 10700.8
DATUM DEPTH PRESS. : 0.0

NOTE : All above units in metric (Depth in meters (CF) ; Pressure in KPAG)

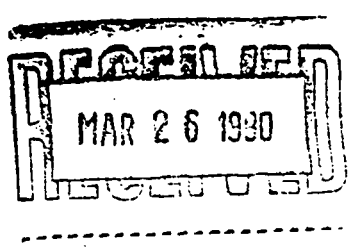
ELEMENT SERIAL NO. : 14363N
RANGE : 0 - 25511 CLOCK RANGE : 3 HR
CAL. EQUATION : 512.62 * Defl. + -51.32 LATEST CALIBRATION : 12/2/90

BOTTOM RECORDER DEPTH (m)	DEFLECTION mm	CALCULATED PRESSURE KPAG	CORRECTION P + PC KPAG	CORRECTED PRESSURE KPAG	GRADIENT KPAG/m
0.0	9.740	4941.6	-9.9	4931.6	0.000
0.0	9.690	4915.9	-9.6	4906.3	0.000
300.0	9.950	5049.2	-11.0	5038.2	.440
600.0	10.232	5193.8	-11.9	5181.9	.479
900.0	12.000	6100.1	-17.3	6082.7	3.003
1200.0	16.620	8468.4	-31.6	8436.8	7.847
1300.0	18.135	9245.0	-36.3	9208.7	7.719
1400.0	19.635	10013.9	-40.9	9973.0	7.643
1450.0	20.388	10399.9	-40.9	10359.0	7.720
1494.0	21.050	10739.2	-40.8	10698.5	7.716

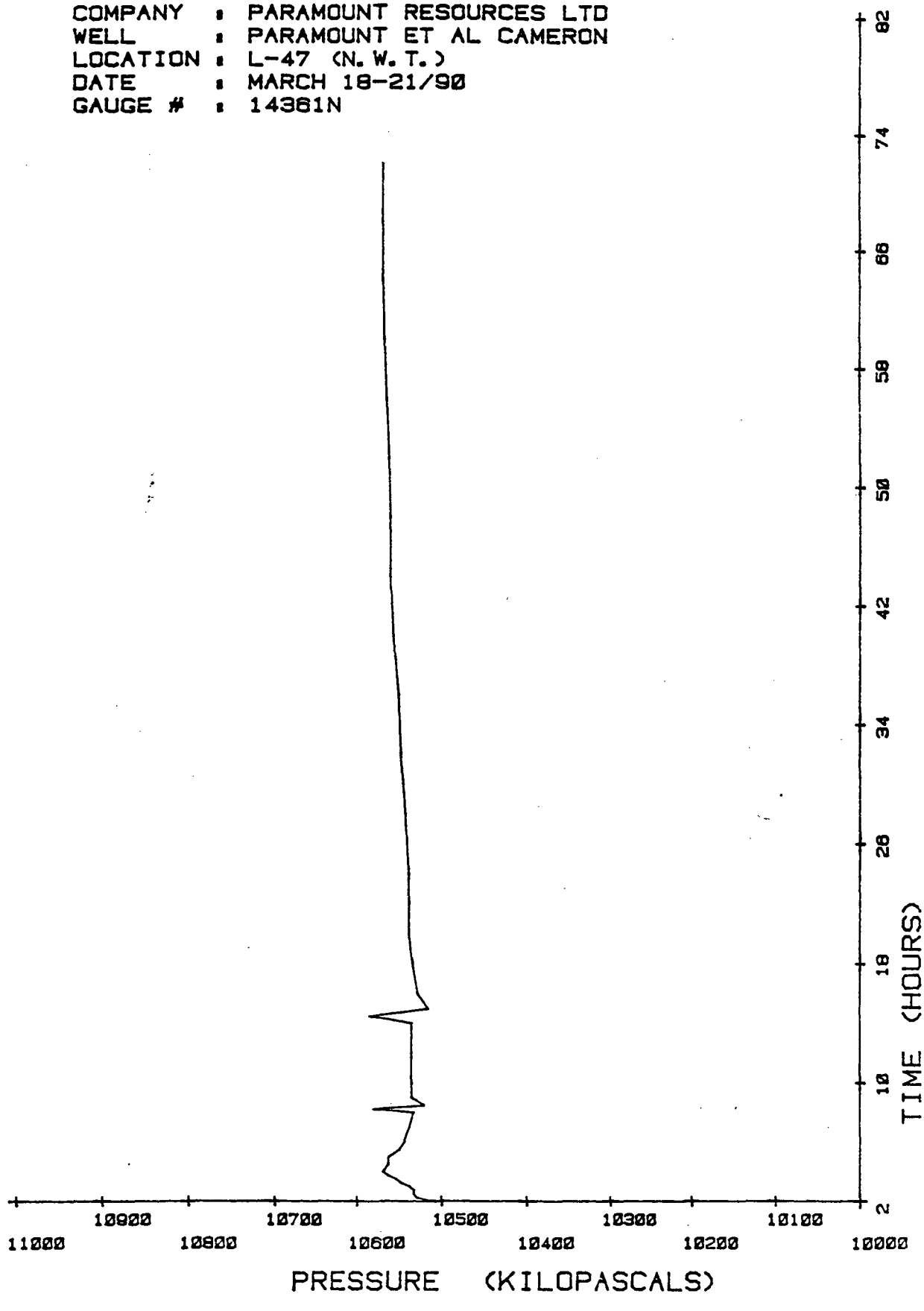
REMARKS :

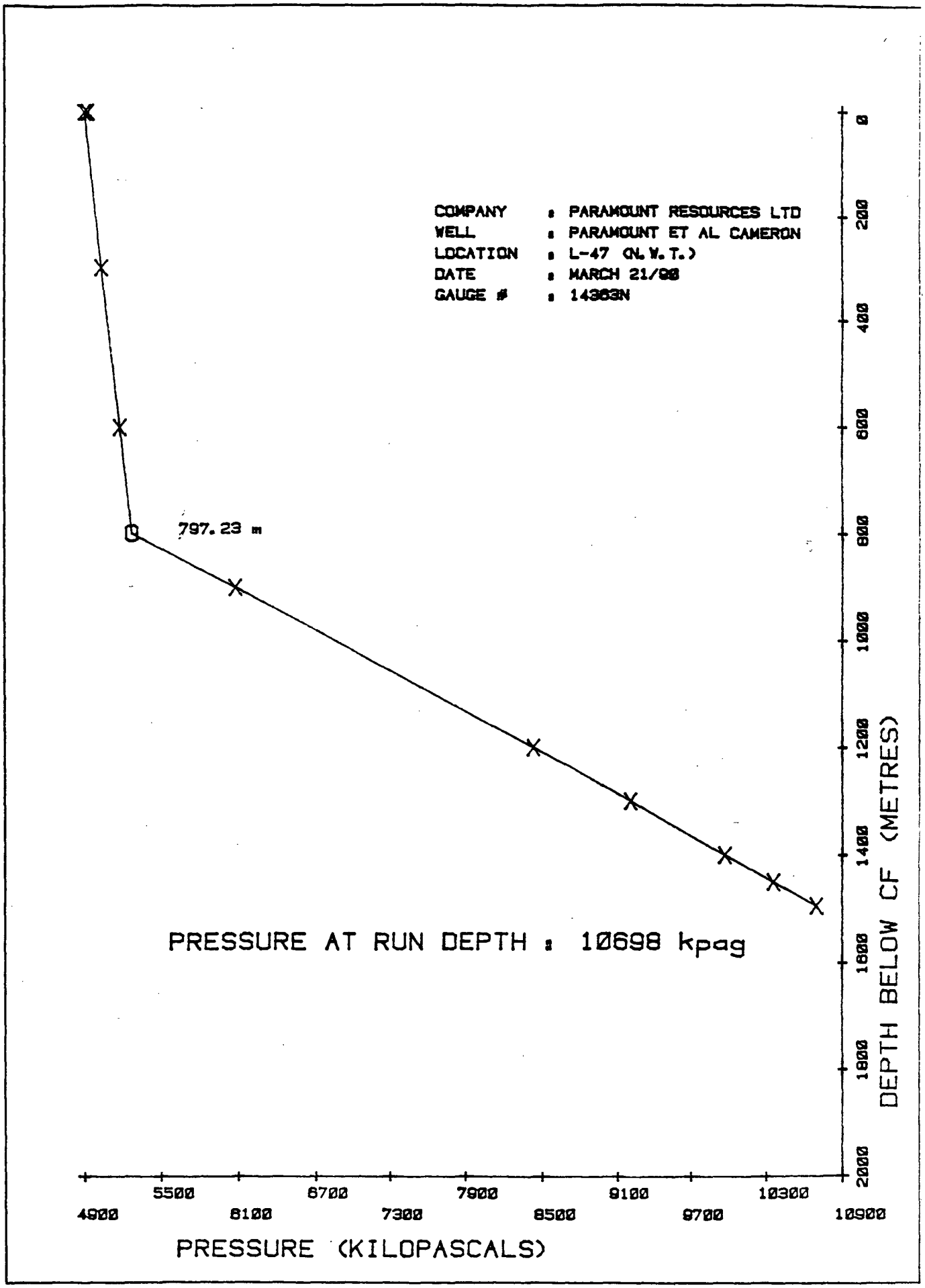
FINAL SURFACE FLEX PRESSURE THIS REC'D = 4878.1 KPAG.

SURVEY COMPANY : SOLID WIRELINE TEST BY : K.T.



COMPANY : PARAMOUNT RESOURCES LTD
WELL : PARAMOUNT ET AL CAMERON
LOCATION : L-47 (N. W. T.)
DATE : MARCH 18-21/90
GAUGE # : 14361N




COMPANY : PARAMOUNT RESOURCES LTD
WELL : PARAMOUNT ET AL CAMERON
LOCATION : L-47 (N.W.T.)
DATE : MARCH 21/90
GAUGE # : 14363N
797.23 m
PRESSURE AT RUN DEPTH : 10698 kpag
DEPTH BELOW CF (METRES)
0
200
400
600
800
1000
1200
1400
1600
1800
2000
4900
5500
6100
6700
7300
7900
8500
9100
9700
10300
10900
PRESSURE (KILOPASCALS)

RESERVOIR FLUID STUDY
PARAMOUNT et al CAMERON
L-47

Prepared for:

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DATE: MARCH 19, 1990
WORK ORDER NO. P1193

TABLE OF CONTENTS

I. INTRODUCTION

Bottom-hole samples were collected from Well No. L-47 for the purpose of performing a routine PVT study. The reservoir fluid was found to be saturated at the pressure and temperature of 10190 kPa absolute (1478 psia) and 46°C (114.8°F).

All of the fluid properties requested have been studied, tabulated and presented in graphical form.

II. EXPERIMENTAL METHODS

A bottom-hole sample collected from Well No. L-47 was placed in a windowed PVT cell. The cell is a three-windowed, high pressure, stainless steel vessel of 400 ml capacity enclosed in a thermostatically controlled temperature bath. The cell can be rotated to establish equilibrium of the cell contents.

The saturation pressure of the sample was found to be 10190 kPa absolute (1478 psia). This pressure was determined from the pressure-volume (PV) measurements at reservoir temperature.

The reservoir fluid was flashed to separator conditions and then to stock tank conditions. The reservoir fluid was also analyzed by low temperature fractional distillation to determine the composition. (Appendix A-1).

The differential liberation characteristics were then evaluated at ten discrete pressure steps (Table 4). At each step the equilibrium gas was expelled from the cell, measured and analyzed. The formation volume factor, solution gas-oil ratio, liberated gas compressibility factor and oil gravity were measured and calculated at each step.

A fixed volume of reservoir fluid was then flowed through a capillary viscometer at various pressures. This apparatus consists of a known sized capillary tube and a constant displacement pump. The pressure drop across the tubing was measured with a differential pressure transducer, and the viscosity at each pressure was calculated using Hagen-Poiseuille's law. The dead oil viscosity was measured with a cross-arm viscometer.

III. DISCUSSION OF RESULTS

1. Table 1 summarizes the results obtained in this study. Separator test results are shown in Table 3.

2. In the pressure-volume relationship test, the Y function was used. The function was smoothed with least squares fit with pressure. The fit is used to confirm the visually determined bubble point. The equation for the Y function is outlined below:

$$Y = a + bp = (P_b - P)/(P(V/V_b - 1))$$

3. Gas viscosities were calculated using the correlation by Carr, Kobayashi and Burrows, Trans AIME 1954.

4. Live oil viscosities were measured by means of a capillary viscometer and calculated by the Hagen-Poiseuille equation. If the differential pressure across a capillary tube is measured and the flow rate of the fluid through this tube is known, the fluid viscosity can be calculated. The Hagen-Poiseuille equation is written as follows:

$$\mu\,(cp) = \frac{P(psi)\ D^4(in)}{Q(cm^3/hr.\ L\ (ft)} \times 8.459 \times 10^8$$

Where: ΔP is the differential pressure across the tube,
Q is the fluid flow rate,
D is the internal diameter of the capillary tube,
L is the length of the capillary tube.

In the measurement apparatus used, L was 19.85 feet and D was 0.0225 inches, which reduces the Hagen-Poiseuille equation to:

$$\mu = \Delta P/Q \times 10.826$$

All results are presented in good faith based upon present day technology, material and information provided, but no express or implied warranty is intended or given. AGAT Laboratories assumes no liability for any use made of these recommendations nor for any results obtained from the use of AGAT's services and products and based thereon.

IV. CONCLUSIONS

1. The reservoir fluid has a saturation pressure of 10190 kPa absolute (1478 psia) at the reservoir temperature of 46°C (114.8°F) and a measured total GOR of 54.66 m^3/m^3 STO (308.5 SCF/STB). The formation volume factor is 1.153 at the saturation pressure. The density of the oil at the saturation pressure is 0.7924g/cm^3 (47.0° API).

2. The viscosity of oil at the saturation pressure of 10190 kPa absolute (1478 psia) is 2.192 cp.

File Number : P1193
Company Name : PARAMOUNT RESOURCES LTD.
Well Location: L-47

Table 1

PVT Summary

Reservoir Temperature, C (F)	46.0	114.8
Saturation Pressure, kPa abs. (psia)	10190	1478
Saturated Oil Properties (Oil at Bubble Point)		
Density, g/cm3		0.7924
Specific Volume, dcm3/kg		1.2620
Viscosity, measured (1) at 10190 kPa abs. (1478 psia), mPa.s		2.192
Formation Volume Factor from Flash Test, m3/m3		1.153
Formation Volume Factor from Differential Liberation Test, m3/m3		1.148
Gas-Oil Ratio from Flash Test, m3API/m3 (SCF/STB)	54.66	308.5
Gas-Oil Ratio from Differential Liberation Test, m3API/m3 (SCF/STB)	56.11	316.6
Compressibility of Saturated Oil Co.(Vol./Vol./kPa x 10-6,Vol./Vol./psia x 10-6)		
From 10273 kPa abs. (1490 psia) to 10990 kPa abs. (1594 psia)	0.908	6.262
From 10990 kPa abs. (1594 psia) to 11852 kPa abs. (1719 psia)	0.889	6.131
From 11852 kPa abs. (1719 psia) to 13693 kPa abs. (1986 psia)	0.864	5.958
Thermal Expansion:		
Volume at Reservoir Temperature / Volume at 15 C		1.032

Note:

(1) Measured by capillary tube viscometer.

Page Number : 2
File Number : P1193
Company Name : PARAMOUNT RESOURCES LTD.
Well Location: L-47

Table 2

Pressure-Volume Relationship of Reservoir Fluid at 46 C

PRESSURE kPa abs.	PRESSURE psia	RELATIVE VOLUME Experimental	(V/Vsat) Smoothed	Y-FUNCTION Experimental	Y-FUNCTION Smoothed
13693	1986	0.9969			
11852	1719	0.9985			
10990	1594	0.9993			
10273	1490	0.9999			
10190	1478	1.0000			
9777	1418	1.0125	1.0125	3.3935	3.3970
9487	1376	1.0221	1.0221	3.3579	3.3527
8763	1271	1.0502	1.0502	3.2448	3.2419
8218	1192	1.0758	1.0760	3.1641	3.1585
7639	1108	1.1085	1.1088	3.0788	3.0699
7157	1038	1.1415	1.1415	2.9952	2.9960
6633	962	1.1846	1.1840	2.9056	2.9158
5729	831	1.2818	1.2803	2.7627	2.7776
5005	726	1.3900	1.3884	2.6559	2.6668
4275	620	1.5410	1.5417	2.5578	2.5549
3606	523	1.7435	1.7445	2.4560	2.4525
2958	429	2.0341	2.0390	2.3647	2.3533

Notes:

(1) Psat = Saturation pressure = 10190 kPa absolute (1478 psia).
(2) Vsat = Volume of reservoir fluid at saturation pressure.
(3) Y-Function = (Psat-P)/[P((V/Vsat)-1)].
(4) Smoothed Y = 1.9006 + 0.0011 * P (where P is in psia).
(5) Standard Deviation = 0.0079

Table 3

Two Stage Separator Flash Test

Barometric Pressure: 88.4 kPa absolute (12.8 psia)
Reservoir Temperature: 46°C (114.8°F)

Flashed from a pressure of 13790 kPa absolute to separation conditions.

	First Stage Separation 345kPag,15°C	Second Stage Separation 0kPag,15°C	Total
Gas-oil ratio (m^3/m^3 STO)	50.20	4.47	54.67
Volume factor (m^3/m^3 STO)	1.134	1.014	1.148
Formation volume factor adjusted to saturation pressure	-	-	1.153
Gas gravity (flashed gas)	0.751	-	

NOTES:

1. Gas-oil ratio represents the cubic meters of gas at 101.325 kPa absolute and 15°C per cubic meter of stock tank oil at 15°C.

2. Volume factor represents the cubic meters of oil at the indicated separation pressure and temperature per cubic meter of stock tank oil at 15°C.

3. Total volume factor (formation volume factor) represents the cubic meters of saturated oil at 10190 kPa absolute and 46°C per cubic meter of stock tank oil at 15°C.

4. Stock tank oil density at 15°C is 855.9 kg/m^3.

5. Stock tank oil gravity at 60°F is 33.70° API.

Page Number: 3A
File Number: P1193
Company Name: PARAMOUNT RESOURCES LTD.
Well Location: L-47

Table 3A

Single Stage Separator Flash Test

Barometric Pressure: 88.8 absolute (kPa)

Gas-oil ratio (m^3/m^3 STO)	62.64
Separator volume factor (m^3/m^3 STO)	1.168
Density of Stock Tank Oil (kg/m^3 15/15°C	858.3
Gas Gravity (Flashed Gas)	0.786

NOTES:

1. Separator oil flashed from 13790 kPag and 46°C to 0 kPag, 15°C.
2. Gas-oil ratio represents the cubic meters of gas at 101.325 kPa absolute and 15°C per cubic meter of stock tank oil at 15°C.
3. Separator volume factor represents the cubic meters of separator oil at 10100 kPag and 46°C per cubic meter of stock tank fluid at 15°C.

File Number : P1193
Company Name : PARAMOUNT RESOURCES LTD.
Well Location: L-47

Table 4

Differential Liberation at 46 C

PRESSURE kPa abs.	OIL DENSITY g/cc	(1) RELATIVE OIL VOLUME	(2) RELATIVE TOTAL VOLUME	(3) SOLUTION GAS-OIL RATIO	GAS GRAVITY	CUM. GAS GRAVITY	DEVIATION FACTOR	(4) GAS FORM VOL FACTOR	GAS EXPANSION FACTOR
10198	0.7924	1.1480	1.1480	56.11					
9197	0.7958	1.1389	1.1822	52.00	0.6590	0.6590	0.8632	0.0106	94.28
8170	0.7988	1.1302	1.2263	47.62	0.6580	0.6585	0.8761	0.0120	83.36
7157	0.8025	1.1204	1.2797	43.07	0.6600	0.6590	0.8871	0.0139	72.19
6150	0.8062	1.1105	1.3479	38.32	0.6610	0.6595	0.9010	0.0165	60.68
5157	0.8100	1.1002	1.4366	33.34	0.6710	0.6620	0.9137	0.0202	49.49
4123	0.8138	1.0898	1.5555	28.23	0.6740	0.6642	0.9297	0.0252	39.64
3116	0.8176	1.0795	1.7199	23.10	0.6900	0.6682	0.9447	0.0341	29.32
2124	0.8215	1.0688	1.9766	17.83	0.7180	0.6751	0.9602	0.0503	19.89
1103	0.8256	1.0563	2.5650	11.77	0.8000	0.6921	0.9760	0.0992	10.08
90	0.8370	1.0162	17.2076	0.00	1.1780	0.7941	0.9960	1.2521	0.80

Notes:

(1) cc's oil at indicated pressure and temperature as per cc of residual oil at 15 degrees C.
(2) cc's oil plus liberated gas at indicated temperature and pressure per cc residual oil at 15 degrees C.
(3) cc's gas at 101.325 kPa absolute and 15 degrees C. per cc residual oil at 15 degrees C.
(4) cc's gas at indicated pressure and temperature per cc at 101.325 kPa absolute and 15 degrees C.

File Number : P1193
Company Name : PARAMOUNT RESOURCES LTD.
Well Location: L-47

Table 5

Oil Density at 46 C

PRESSURE (kPa abs., psia)		DENSITY (g/cm3)
13693	1986	0.7948
11852	1719	0.7936
10990	1594	0.7930
10273	1490	0.7924
10190	1478	0.7924
9197	1334	0.7958
8170	1185	0.7988
7157	1038	0.8025
6150	892	0.8062
5157	748	0.8100
4123	598	0.8138
3116	452	0.8176
2124	308	0.8215
1103	160	0.8256
90	13	0.8370

Notes:

(1) Densities above bubble point are calculated from the volumetric data of the pressure-volume relationship test.
(2) Gravity of residual oil at 15 C = 33.1 API.

Table 6

Oil Viscosity at 46 C

PRESSURE (kPa abs., psia)		VISCOSITY (cp) Measured (1)
13651	1980	2.364
12059	1749	2.290
11376	1650	2.245
10687	1550	2.216
10190	1478	2.192
9301	1349	2.307
8384	1216	2.400
7467	1083	2.519
6550	950	2.632
5640	818	2.742
4709	683	2.855
3792	550	2.976
2875	417	3.070
1958	284	3.188
1034	150	3.352
90	13	4.344

Note:

(1) Measured by capillary viscometer.

Table 7

Gas Viscosity From Differential Liberation Test

PRESSURE (kPa abs., psia)		VISCOSITY (cp)(1)
9197	1334	0.014307
8170	1185	0.013813
7157	1038	0.013302
6150	892	0.012815
5157	748	0.012314
4123	598	0.011531
3116	452	0.011364
2124	308	0.011234
1103	160	0.011069
90	13	0.010243

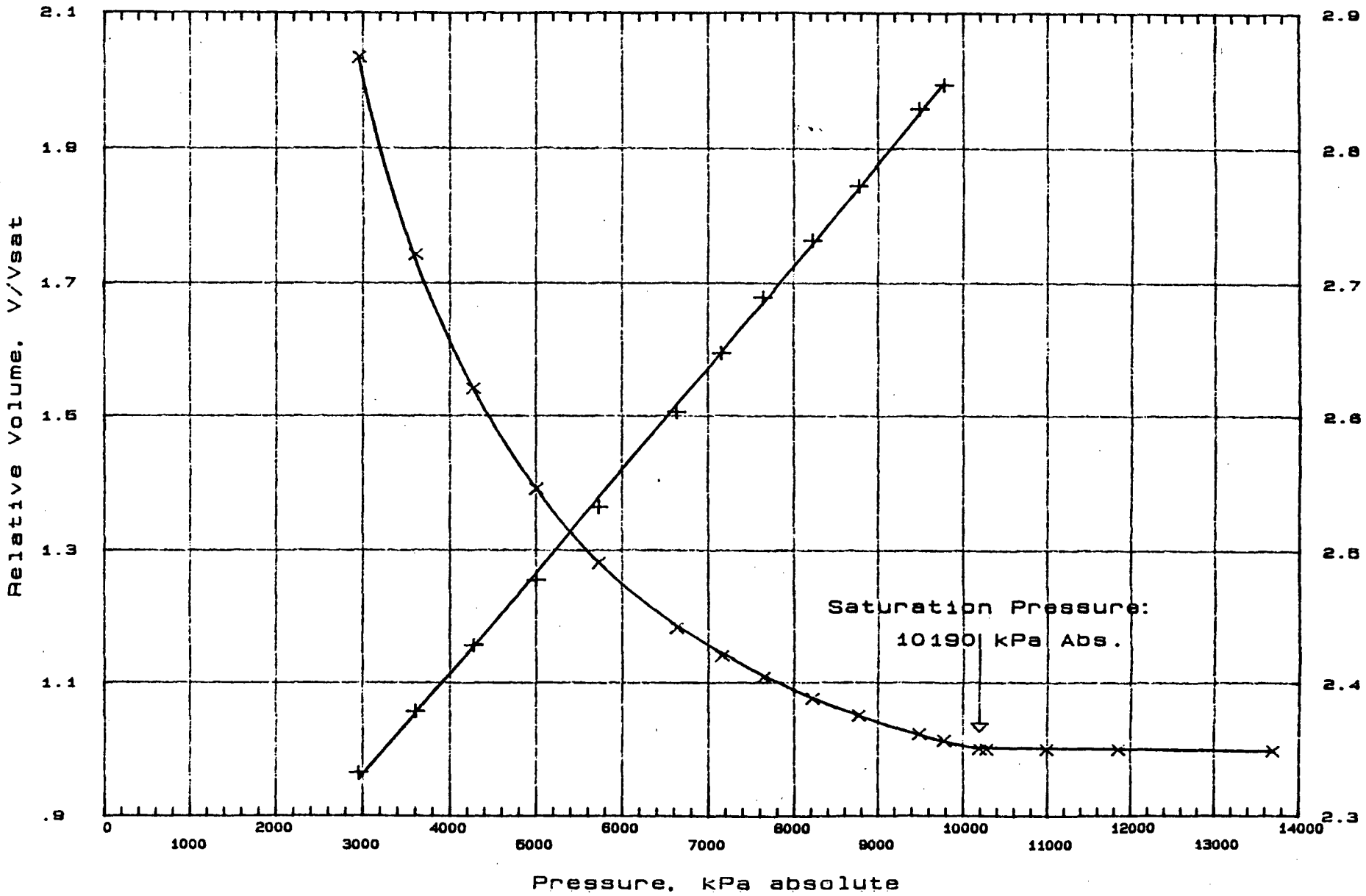
Note:

(1) Values calculated using the composition of liberated gas and the correlation of Carr,Kobayashi and Burrows:
"Viscosity of Hydrocarbon Gases Under Pressure" Trans. AIME,1954.

AGAT Laboratories

Work Order No. P1193
Company PARAMOUNT RESOURCES LTD.
Well Location L-47

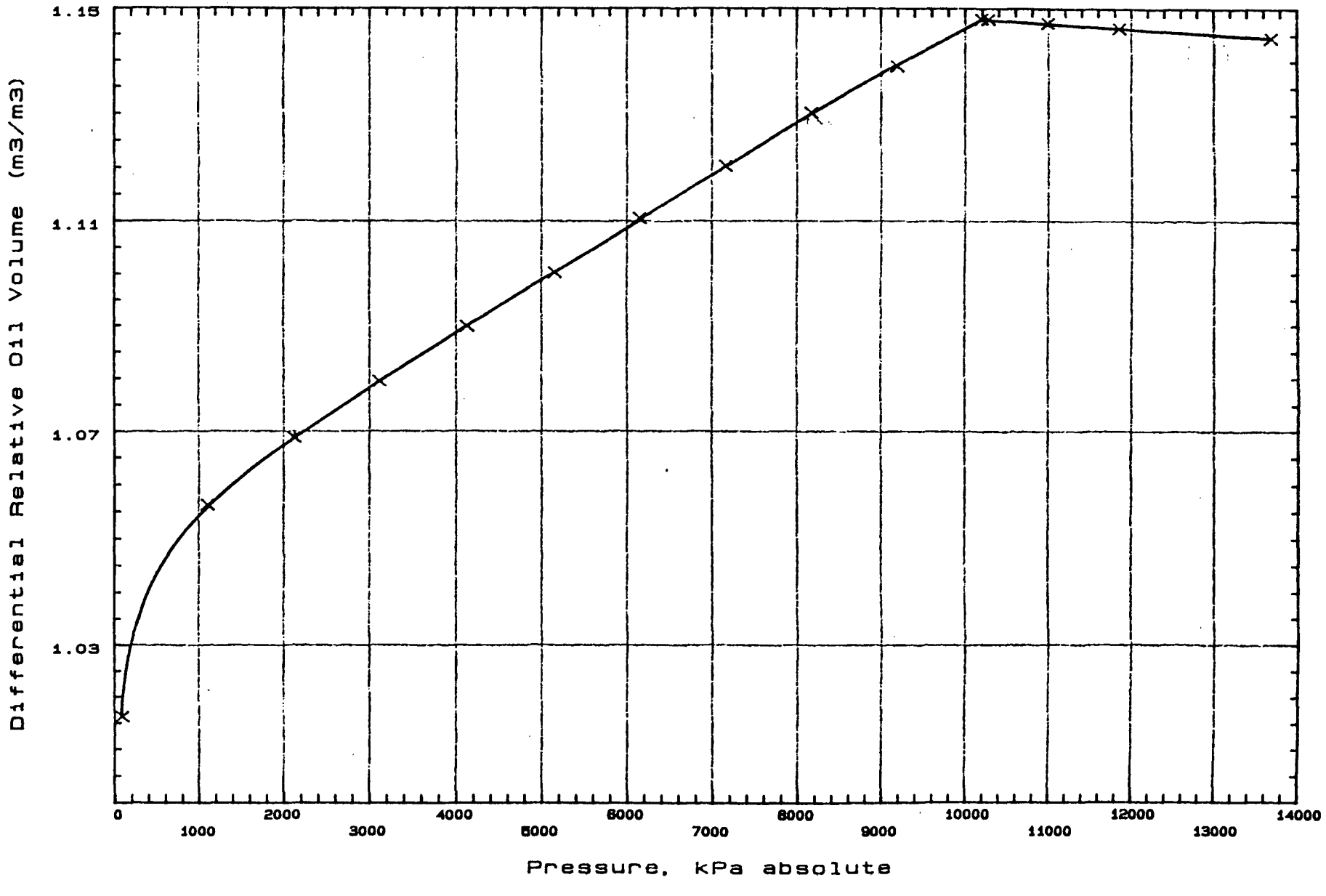
Figure 1: Pressure Volume Relationship at 46 C



Work Order No. P1193
Company PARAMOUNT RESOURCES LTD.
Well Location L-47

AGAT Laboratories

Figure 2: Differential Relative Oil Volume at 46 C



Work Order No. P1193
Company PARAMOUNT RESOURCES LTD.
Well Location L-47

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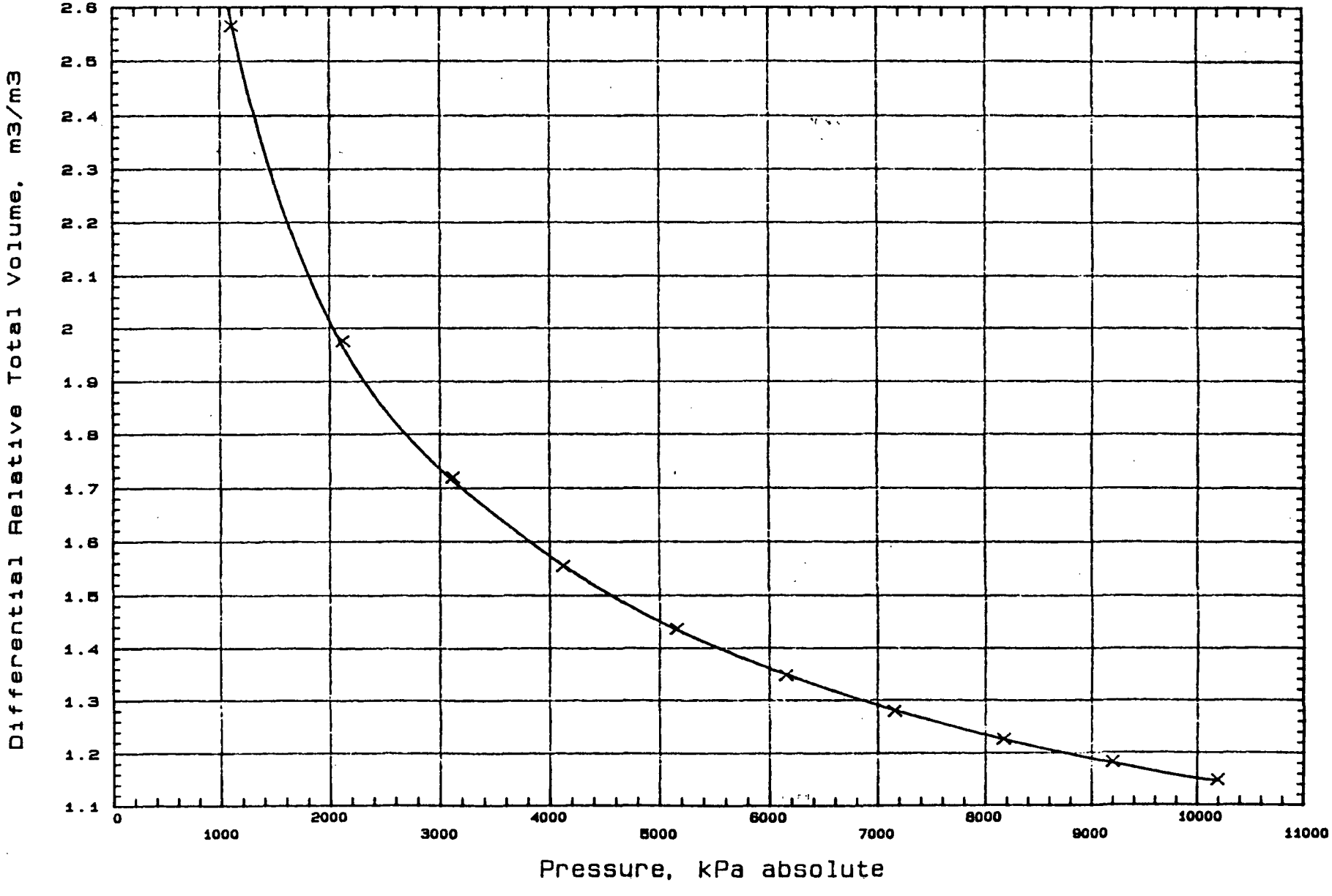
Figure 3: Differential Relative Total Volume at 46 C



Work Order No. P1193
Company PARAMOUNT RESOURCES LTD.
Well Location L-47

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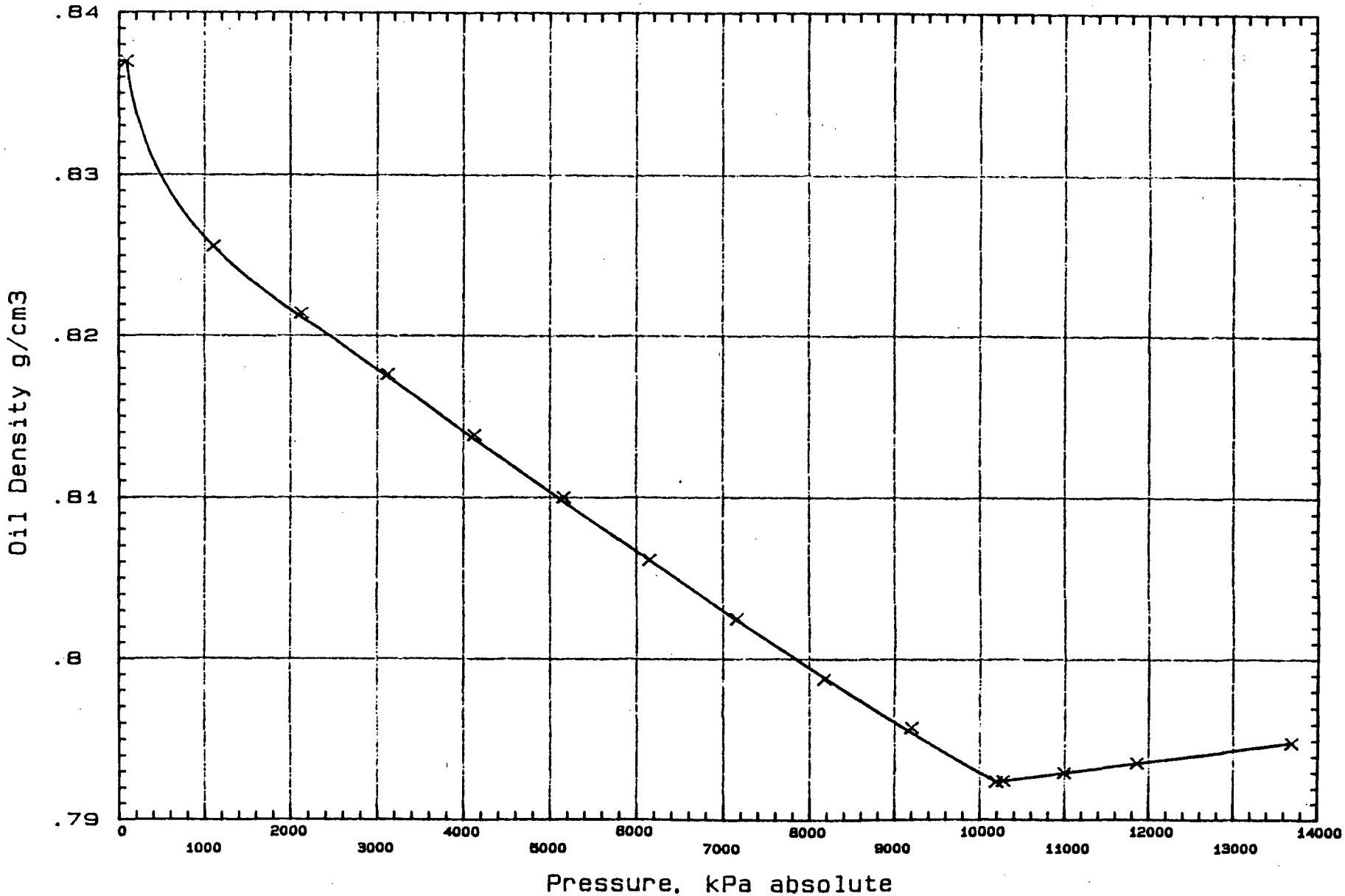
Figure 4: Oil Density at 46 C



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Company PARAMOUNT RESOURCES LTD.
Well Location L-47

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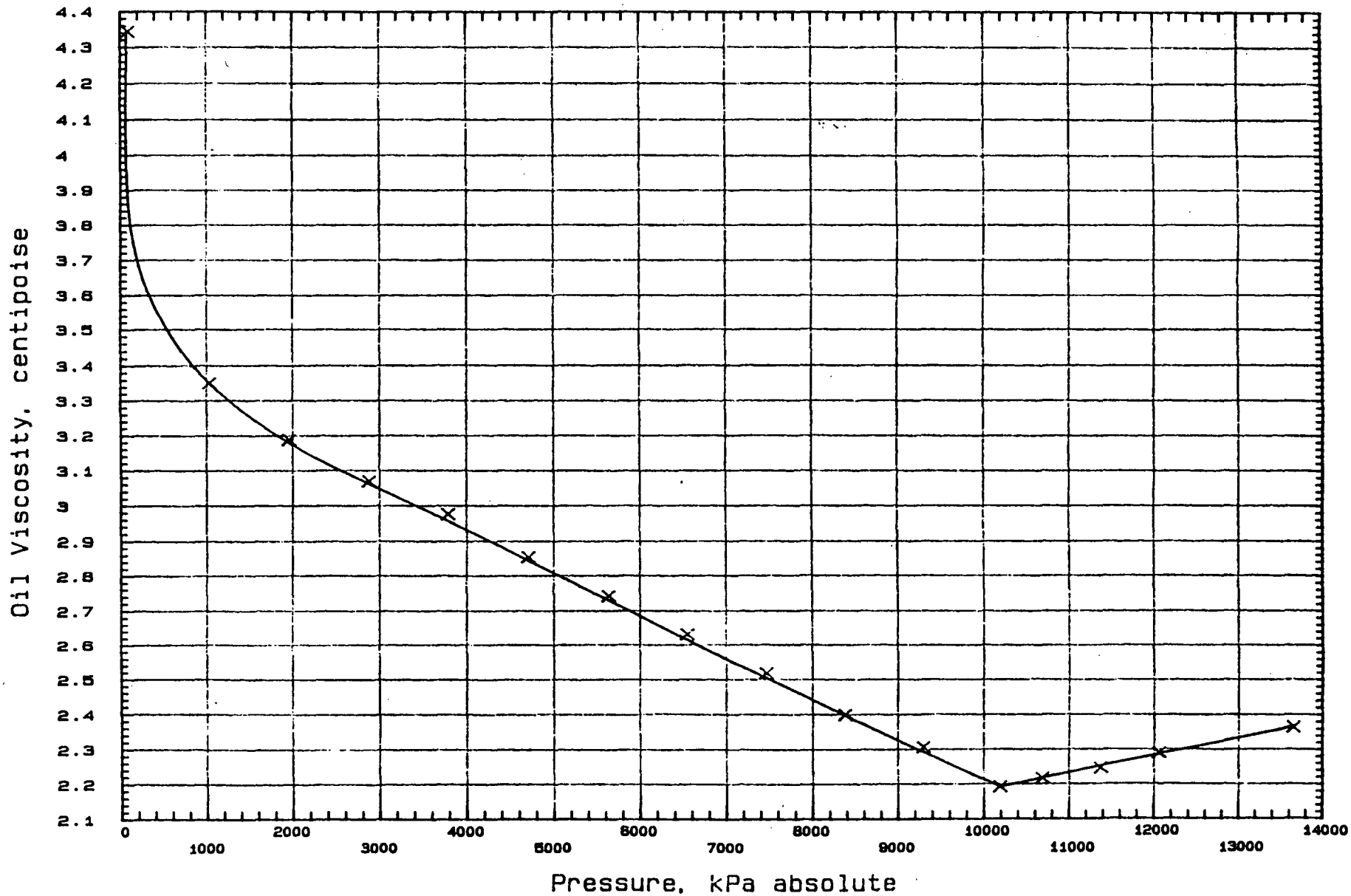
Figure 5: Oil Viscosity at 46 C



Work Order No. P1193
Company PARAMOUNT RESOURCES LTD.
Well Location L-47

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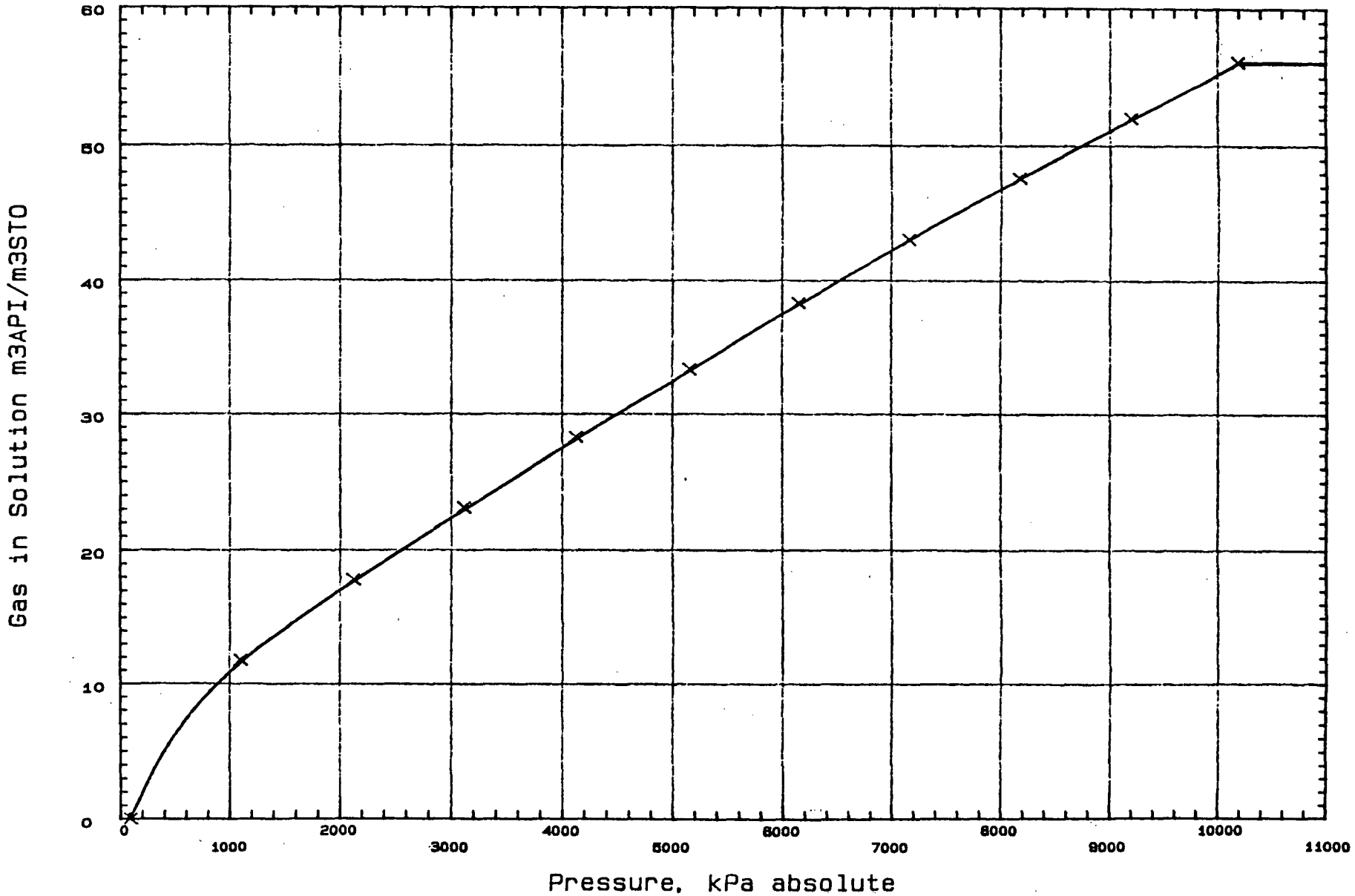
Figure 6: Gas in Solution at 46 C



Work Order No. P1193
Company PARAMOUNT RESOURCES LTD.
Well Location L-47

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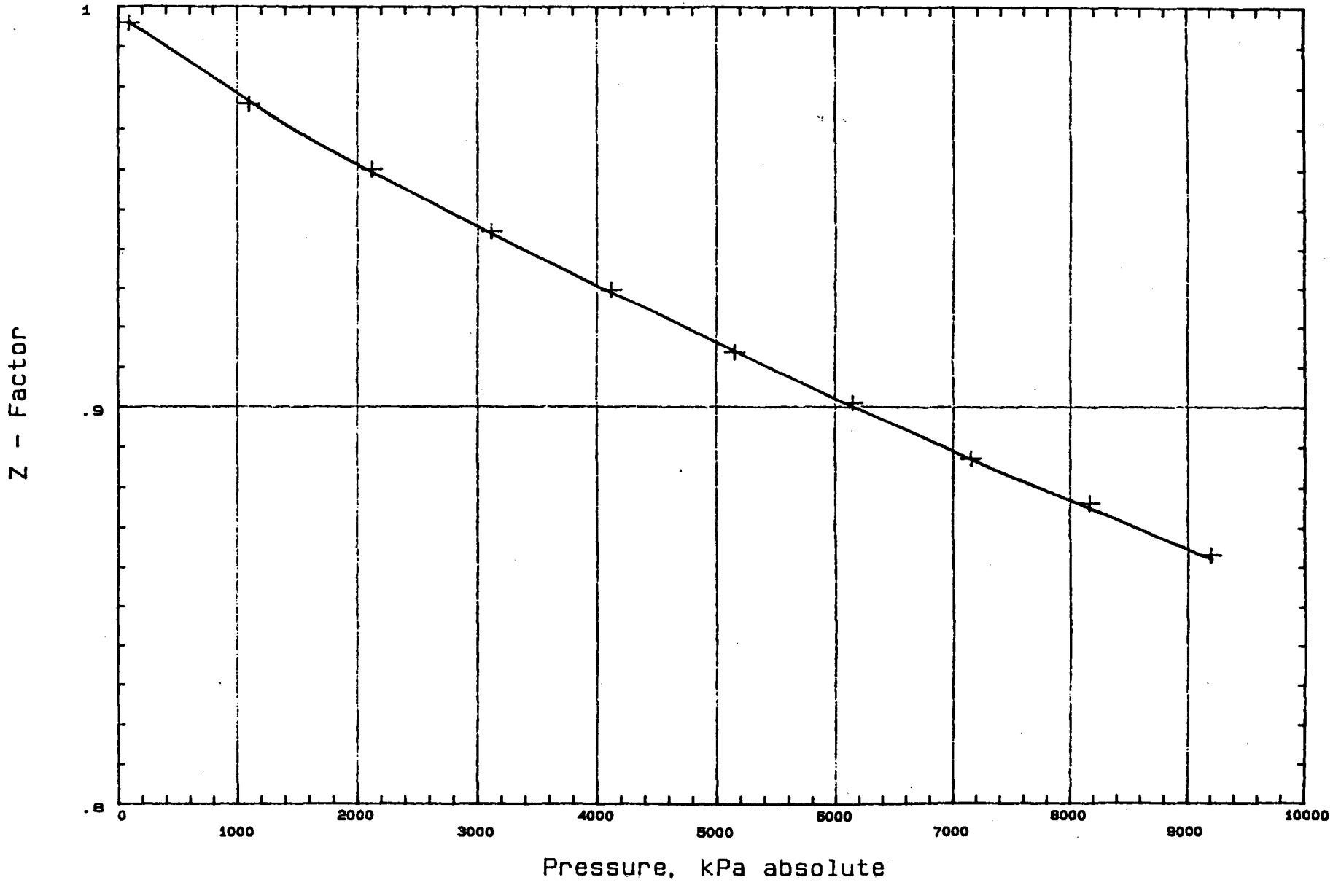
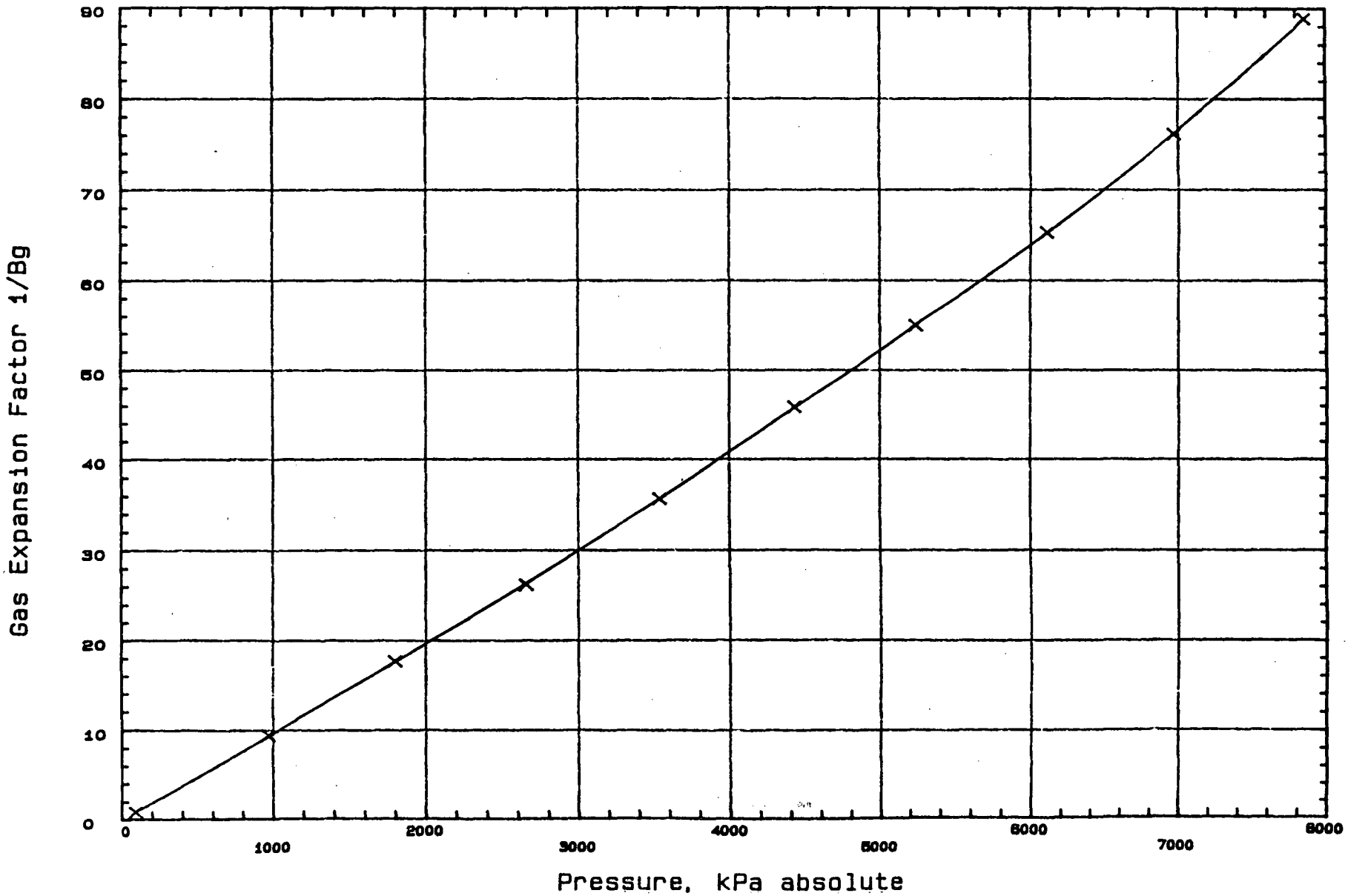
Figure 7: Gas Compressibility (Z) Factor



AGAT Laboratories

Work Order No. P1161
Company B.P. RESOURCES CANADA LTD.
Well Location 06-34-042-06W5

Figure 8: Gas Expansion Factor at 39 C



HYDROCARBON LIQUID ANALYSIS

A-1

CONTAINER IDENTIFICATION	LABORATORY NUMBER
LAB CELL	CP1193R

OPERATOR NAME: PARAMOUNT RESOURCES LTD. ****

UNIQUE WELL IDENTIFIER	WELL NAME	ELEVATIONS KB m	ELEVATIONS GRD m
	PARAMOUNT etal CAMERON L-47		

FIELD OR AREA	POOL OR ZONE	NAME OF SAMPLER	COMPANY
CAMERON, N.W.T.	KEG RIVER	DL	AGAT

TEST TYPE	NO	TEST RECOVERY
BHS		

TEST INTERVAL OR PERFS:

SAMPLING POINT: RESERVOIR FLUID

* Bubble Point

	SEPARATOR	TREATER	RESERVOIR	SOURCE	SAMPLED	RECEIVED
GAUGE PRESSURE kPa						*
TEMPERATURE °C						*

DATE SAMPLED (Y-M-D)	DATE RECEIVED (Y-M-D)	DATE REPORTED (Y-M-D)	ANALYST	OTHER INFORMATION
90-02-25	90-02-26		DR	RESERVOIR FLUID

COMP	MOLE FRACTION	MASS FRACTION	VOLUME FRACTION
N_2	0.0044	0.0009	0.0009
CO_2	0.0159	0.0050	0.0049
H_2S	0.0212	0.0052	0.0052
C_1	0.2606	0.0298	0.0786
C_2	0.0345	0.0074	0.0165
C_3	0.0347	0.0109	0.0170
IC_4	0.0089	0.0037	0.0052
NC_4	0.0215	0.0089	0.0121
IC_5	0.0142	0.0073	0.0093
NC_5	0.0171	0.0088	0.0111
C_6	0.0390	0.0225	0.0260
C_7+	0.5280	0.8896	0.8132
C_8			
C_9			
C_{10}			
C_{11}			
12+			
TOTAL	1.0000	1.0000	1.0000

OBSERVED PROPERTIES OF C_7+ RESIDUE (15/15° C)

867.3 kg/m³	0.8680	31.4
DENSITY	RELATIVE DENSITY	API @ 15.5° C

236.2

RELATIVE MOLECULAR MASS

CALCULATED PROPERTIES OF TOTAL SAMPLE (15/15° C)

793.3 kg/m³	0.7940	46.5
DENSITY	RELATIVE DENSITY	API @ 15.5° C

140.2

RELATIVE MOLECULAR MASS

REMARKS:

EXTENDED ANALYSIS
SEE NEXT PAGE

EXCEED NORMAL LIMITS : N2 , CO2

File No. : CP1193R
Company : PARAMOUNT RESOURCES LTD.
Well No. :

PROPERTIES OF C6+ FRACTION

BOILING POINT RANGE (C)	COMPONENT	MOLE FRACTION	MASS FRACTION	VOLUME FRACTION
36.1- 68.9	HEXANES----------C6	0.0262	0.0161	0.0192
68.9- 98.3	HEPTANES----------C7	0.0283	0.0248	0.0254
98.3-125.6	OCTANES----------C8	0.0357	0.0357	0.0355
125.6-150.6	NONANES----------C9	0.0288	0.0324	0.0315
150.6-173.9	DECANES----------C10	0.0375	0.0467	0.0449
173.9-196.1	UNDECANES----------C11	0.0380	0.0520	0.0493
196.1-215.0	DODECANES----------C12	0.0331	0.0494	0.0463
215.0-235.0	TRIDECANES----------C13	0.0347	0.0560	0.0519
235.0-252.2	TETRADECANES----------C14	0.0294	0.0510	0.0471
252.2-270.6	PENTADECANES----------C15	0.0304	0.0564	0.0516
270.6-287.8	HEXADECANES----------C16	0.0246	0.0486	0.0442
287.8-302.8	HEPTADECANES----------C17	0.0223	0.0470	0.0425
302.8-317.2	OCTADECANES----------C18	0.0187	0.0416	0.0374
317.2-330.0	NONADECANES----------C19	0.0163	0.0384	0.0343
330.0-344.4	EICOSANES----------C20	0.0148	0.0367	0.0326
344.4-357.2	HENEICOSANES----------C21	0.0124	0.0321	0.0285
357.2-369.4	DOCOSANES----------C22	0.0110	0.0298	0.0265
369.4-380.0	TRICOSANES----------C23	0.0092	0.0262	0.0232
380.0-391.1	TETRACOSANES----------C24	0.0088	0.0262	0.0231
391.1-401.7	PENTACOSANES----------C25	0.0078	0.0240	0.0211
401.7-412.2	HEXACOSANES----------C26	0.0063	0.0203	0.0179
412.2-422.2	HEPTACOSANES----------C27	0.0051	0.0167	0.0148
422.2-431.7	OCTACOSANES----------C28	0.0044	0.0152	0.0133
431.7-441.1	NONACOSANES----------C29	0.0032	0.0115	0.0100
441.1 PLUS	TRIACONTANES PLUS-------C30+	0.0042	0.0154	0.0135
	AROMATICS			
80.0	BENZENES----------C6	0.0002	0.0002	0.0002
110.6	TOLUENE----------C7	0.0072	0.0058	0.0047
136.2	ETHYLBENZENE----------C8	0.0042	0.0040	0.0031
138.4-144.4	XYLENES----------C8	0.0195	0.0180	0.0147
168.9	1,2,4 TRIMETHYLBENZENE--C9	0.0083	0.0087	0.0070
	NAPHTHENES			
48.9	CYCLOPENTANE----------CC5	0.0128	0.0064	0.0068
72.2	METHYLCYCLOPENTANE------MCC5	0.0066	0.0043	0.0046
81.1	CYCLOHEXANE----------4CC6	0.0063	0.0047	0.0042
101.1	METHYLCYCLOHEXANE-------MCC6	0.0107	0.0092	0.0083

The above hexanes plus values are based upon a measured mass fraction and a calculated mole fraction, and assume a total hydrocarbon recovery from the chromatographic system.

OIL ANALYSIS

A-2

CONTAINER IDENTIFICATION: CYL . #1

LABORATORY NUMBER: OP1193

OPERATOR NAME: PARAMOUNT RESOURCES LTD. *****

UNIQUE WELL IDENTIFIER:

WELL NAME: PARAMOUNT et al CAMERON

ELEVATIONS KB m: GRD m:

FIELD OR AREA:

POOL OR ZONE:

NAME OF SAMPLER:

COMPANY: AGAT

TEST TYPE:

NO:

TEST RECOVERY:

SAMPLING POINT: BHS

AMT & TYPE OF CUSHION:

MUD RESISTIVITY/ Ω m @25° C:

TEST INTERVAL OR PERFS:

	SEPARATOR	TREATER	RESERVOIR	SOURCE	SAMPLED	RECEIVED
GAUGE PRESSURE kPa						
TEMPERATURE ° C						

DATE SAMPLED (Y-M-D): 90-02-25

DATE RECEIVED (Y-M-D): 90-02-27

DATE REPORTED (Y-M-D): 90-03-15

ANALYST: T,B,L

OTHER INFORMATION:

SAMPLE PROPERTIES

COLOUR OF CLEAN OIL: DARK BROWN

B.S. & W. (VOLUME FRACTION)

WATER	SEDIMENT	TOTAL
0.000	0.002	0.002

COLOUR NUMBER ASTM D-155: D 8 A.S.T.M

DENSITY

RELATIVE		ABSOLUTE g/kg·m⁻³	
AS RECEIVED	AFTER CLEANING	AS RECEIVED	AFTER CLEANING
0.8589		858.1	

API GRAVITY @ 15° C: 33.25

TOTAL SULPHUR (MASS FRACTION): 0.00897

TOTAL SALT g·m⁻³:

POUR POINT / ° C

U.S.B.M.	A.S.T.M.
	0

RVP/kPa:

CARBON RESIDUE (MASS FRACTION)

CONRADSON	RAMSBOTTOM

VISCOSITY

TEMP / °C	ABSOLUTE/mPa·s	KINEMATIC/mm²·s-1
25	7.93	9.31
38	5.14	6.09
50	3.91	4.68

DISTILLATION

VOLUME FRACTION	TEMP. / °C
0.05	122.7
0.10	152.1
0.15	183.4
0.20	206.7
0.25	230.0
0.30	251.2
0.35	271.5
0.40	295.8
0.45	314.0
0.50	330.2
0.55	349.4
0.60	365.6
0.65	374.7
0.70	381.8
0.75	388.9
0.80	396.0
0.85	403.0
0.90	
0.95	
1.00	
F.B.P	403.0
CRACKED	

METHOD: A.S.T.M.-D86*

INITIAL BOILING POINT: 83.2

ABS BAROM PRESS/kPa: 87.9

ROOM TEMP./°C: 24.0

DISTILLATION SUMMARY (VOLUME FRACTION)

200° C NAPHTHA	275° C KEROSENE	350° C LIGHT GAS OIL
0.19	0.36	0.55

RECOVERED	RESIDUE	DISTILLATION LOSS
0.90	0.08	0.02

CHARACTERIZATION FACTOR: 11.9

REMARKS: * THE DISTILLATION TEMPERATURES HAV
BEEN CORRECTED TO 101.3 KPA(ABS).

A-3

CONFIDENTIAL - TIGHT HOLE

Reservoir, Well and Sampling Information

Field _____

Location (Province) _____

Reservoir Characteristics

Type of formation _____

Formation name _____

Date first well completed _____

Original reservoir pressure, kPag (psig) _____ _____

Depth at which pressure was taken, m subsea _____

Original gas-oil interface, m subsea _____

Original oil-water interface, m subsea _____

Original separator pressure, kPag (psig) _____ _____

Original separator temperature, °C (°F) _____ _____

Original separator gas flow rate, m^3/day (at 101.325 kPa abs. and 15°C) _____

Original stock tank oil flow rate, m^3/day (at 15°C) _____

Original separator gas/stock tank oil ratio, m^3/m^3 _____

Original oil density (at 15°C), kg/m^3 _____

Page Number: 20
File Number: P1193
Company Name: PARAMOUNT RESOURCES LTD.
Well Location: L-47

CONFIDENTIAL - TIGHT HOLE

Well Characteristics

Well name _____

Elevation, mKB (m GRD) _____ _____

Total depth, mKB (m GRD) _____ _____

Production intervals, mKB _____

_____

Tubing size, mm _____

Tubing depth, mKB _____

Casing size, mm _____

Casing depth, mKB _____

Date well on production _____

Last shut-in bottom hole pressure,
kPag (psig) _____ _____

Depth at which pressure was taken, m GRD _____

Type of pressure survey _____

Pressure survey by _____

Date of survey _____

Last shut-in bottom hole temperature,
°C (°F) _____ _____

Depth at which temperature was taken, m GRD _____

Temperature obtained by _____

Date temperature obtained _____

Date well shut-in (prior to pressure
and temperature surveys) _____

Well making water _____

Status of well _____

Page Number: 21
File Number: P1193
Company Name: PARAMOUNT RESOURCES LTD.
Well Location: L-47

CONFIDENTIAL - TIGHT HOLE

Sampling Conditions (Surface Samples)

Separator pressure, kPag (psig)	_____	_____
Separator temperature, °C (°F)	_____	_____
Separator gas flow rate, m^3/day (at 101.325 kPa abs. and 15°C)	_____	
Stock tank oil flow rate, m^3/day (at 15°C)	_____	
Separator gas/stock tank oil ratio m^3/m^3	_____	
Date samples taken	_____	
Samples taken by	_____	

Sampling Conditions (Bottom Hole Samples)

Time shut-in prior to sampling, hours	_____	
Sampling depth, m	_____	
Pressure at sampling depth, kPag (psig)	_____	_____
Temperature at sampling depth, °C (°F)	_____	_____
Tubing pressure at surface, kPag (psig)	_____	_____
Casing pressure at surface, kPag (psig)	_____	_____
Type of sampler used	_____	
Date sample taken	_____	
Samples taken by	_____	