ADDENDUM 5.

Drillstem Test Report

Hermes No. 1

Permit Vic/P18

Victoria, Australia

Drillstem Test Report

Hermes No. 1

Permit Vic/P18

Victoria, Australia

by

Phillips Australian Oil Company

Perth, Australia

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INTRODUCTION

In the Hermes No. 1 well, Vic/P18, during the drilling of the section 4375-4442m (14,354-14,573 ft), high rates of penetration, strong gas shows, cutting fluorescence, and coarse grains were observed.

Electric logs indicated fair porosities and, using an assumed formation water resistivity consistent with shallow reservoirs in the area, water saturations were calculated to be low. The caliper log showed the 8-1/2" hole to be very overgauge, possibly indicating a very unconsolidated formation. Sidewall cores showed coarse sands, at least partially infilled with soft clays. The SP logs showed reversal, indicating the formation water to be fresh and highly resistive.

To determine the true nature of the formation and its contents, it was decided to run 7 inch casing and selectively perforate and drillstem test the section. The first drillstem test in the lower part of the section, DST No. 1 perforations 4415-4425m, 4427-4431m and 4432-4442m (14,485-14,518 ft, 14,524-14,536 ft, and 14,542-14,574 ft.) produced water of resistivity 1.195 ohm metres (relatively fresh) and dry gas at low rates. The second test, higher, DST No. 2, perforations 4383-4388m and 4400-4403m (14,379-14,395 ft and 14,435-14,445 ft.) similarly produced water of high resistivity and dry gas at low rates.

Re-evaluation of the electric logs using the resistivity of the recovered formation water gave high water saturations. Evaluation of the drillstem test data showed the formation to be brackish-water-bearing, with some gas, of very low permeability, with negligible formation damage, and slightly overpressured (0.510 psi/ft, compared with normal gradient of 0.435 psi/ft).

Due to the unconsolidated nature of the formation, to avoid the plugging of the test tools due to sand entry, the tests were programmed for one long flow period, followed by an appropriate shut-in pressure build-up period. A short initial flow, followed by an initial shut-in, would have permitted settlement of the sand in the tools and aborted the test before meaningful results were obtained. The tests as conducted were successful in that they fully achieved their objectives in conclusively determining the true nature of the reservoir as being overpressured, tight, brackish water and gas bearing, and therefore of no commercial interest.

Data generated from the DSTs and fluid and gas analyses are included as Tables 1 and 2.

In the following pages, two separate detailed reports are presented for each DST. Test reports prepared and presented by Flopetrol are included as Appendices A, B, C and D.

Table 1

Permit VIC/P18 Australia
Hermes No. 1

Drillstem Test Measured and Calculated Results

	DST No. 1	DST No. 2
Test Interval	m ft. 4415-4425 14485-14518 4427-4431 14524-14536 4432-4442 14542-14574	m ft. 4383-4388 14379-14395 4400-4403 14435-14445
Bottom hole temperature (BHT)	153°C (307°F)	152°C (305°F)
Producing interval (h)	24m (77 ft.)	8m (26 ft.)
Flow Rate (Q)	125 BPD	145 BPD
Flowing well pressure (Pwf)	1842 PSIG	750 PSIG
Flowing time (t)	2033 minutes	723 minutes
Build-up time (Δt)	845 minutes	310 minutes
Original bottom hole pressure (P*)	7320 PSIG	7450 PSIG
Kh	4.14 md-ft	2.26 md-ft
Permeability (K)	0.054 md	0.087 md
Skin (s)	1.351	- 0.494
Productivity ratio	0.76	1.15

Table 2

Permit Vic/P18 Australia
Hermes No. 1
Drillstem Test Gas and Water Analysis

	DST No. 1	DST No. 2
Gas Analysis (%)		
Nitrogen	14.61	0.08
Carbon-Dioxide	2.53	6.54
Methane	71.24	80.62
Ethane	6.96	7.63
Propane	2.99	3.24
I-Butane	0.39	0.46
N-Butane	0.71	0.82
I-Pentane	0.20	0.21
N-Pentane	0.20	0.21
Hexanes	0.10	0.11
Heptanes plus	0.07	0.08
Total	100.00	100.00
Specific gravity	0.729	0.717
Molecular weight	21.127	20.780
Molecular weight of Heptanes plus	103.950	102.025
Water Analysis *		
Resistivity (ohm-metres) @ 77°F	1.195	0.513
Specific Gravity @ 62°F	1.008	1.018
ph @ 77°F	8.500	8.550
Chlorides (ppm)	2486.000	8648.000

*Measurements possibly effected by seawater mud filtrate.

Permit Vic/P18 Australia

Hermes No. 1

Drillstem Test No. 1

SUMMARY

Drillstem Test No. 1 was conducted over the interval 4415-4425m 4427-4431m and 4432-4442m (14,485-14,518 ft., 14,524-14,536 ft, and 14,542-14,574 ft.) RKB in the exploratory well Hermes No. 1. The results of the initial flow period data were indicative of a well flowing in heads. Throughout the test, the well flowed formation water with slugs of gas. The pressure build-up data indicates that the reservoir is extremely tight with a permeability in the range of 0.054 md.

Fluid samples recovered during the test had an average resistivity of 1.195 ohm - metres at 25°C (77°F) and a chloride content of 2486 ppm. Analysis of gas samples indicated high percentages of methane, small percentages of carbon dioxide and no hydrogen sulphide. The test was an operational success. Data obtained determined that the reservoir has no possibility of commercial hydrocarbon production.

JUSTIFICATION

A drillstem test was recommended over the Hermes No. 1 interval 4415-4425 metres 4427-4431 metres and 4432-4442 metres (14,485-14,518 feet, 14,524-14,536 feet, and 14,542-14,574 feet.) RKB, as there were several indications that the zone could contain hydrocarbons. These indications were patchy yellow- green-gold primary fluorescence in drill cuttings and sidewall cores with associated strong cut fluorescence from 4375 to 4442 metres (14,354-14,573 ft.) RKB. The initial wireline log analysis within the zone indicated fair porosity, low water saturation, and the presence of moveable hydrocarbons.

Log sections over the test interval are included as Figure 1.

TEST

After a forty barrel low water loss mud pill had been spotted in the well bore and the test interval perforated with four shots per foot, the drillstem test tools were made up and internally pressure tested to 2500 psi. Next, the tools were run in the hole, externally pressure testing each drillpipe connection to 6000 psi. After all down hole equipment had been run and a 3109 metre (10,200 feet) diesel cushion added, the surface equipment was rigged up and successfully tested to 6000 psi.

The well profile is shown in Figure 2 and the composite test string in Figure 3. The particulars of the test are included as Table 3.

Several attempts were made to rig up the Flopetrol wireline rams and lubricator but due to a machining error in a crossover, the lubricator could not be rigged up. Therefore, the surface pressure read out (SPRO) equipment could not be used on this test. The packer was set at 4398 metres (14,429 ft.) and the hanger was landed in the 16-3/4 inch wellhead. The test was then ready to begin.

The Halliburton LPR tool was opened at 0722 hours on May 3, 1983 for an effective flow period of 2033 minutes (33 hours 53 minutes). During this time the well alternately flowed fresh formation water at about 2 bbls/hour and slugged water and gas.

Water samples were taken and preparations were made to install the SPRO equipment and wireline lubricator for the pressure build-up period (a new crossover was fabricated ashore and flown to the rig during the flow period). The well was closed in at the surface. The lubricator and SPRO equipment were rigged up and tested. The lubricator leaked.

The subsea test tree was closed in and the leak rectified. The well was opened up at the surface to bleed down pressure. A weak point in the SPRO latch broke and the SPRO tool dropped and landed in the subsea test tree, partially opening the valve. The annular pressure bled off and the LPR valve shut the well in down hole. The pressure build up period began. The well remained shut-in for a period of 845 minutes (14 hours 5 minutes)

Pressure data obtained from the flow period and build-up period are included as Tables 4 and 6. A diagram of the pressure chart is included as Figure 4.

After enough build-up information had been obtained, the M-2 circulating valve was closed-in and the contents of the wellbore were circulated out and sampled. (The Flopetrol analysis of the samples caught during the test and the circulation period are included as Appendices C and D.)

After all samples were collected, attempts were made to unseat the packer and pull the tools out of the hole. When the tools became visible at the surface, it was discovered that 7.3 metres (24 feet) of test tools were left in the hole. (The 2-7/8 inch EUE pin on the Big John jars broke off when the string was picked up to unseat the packer. The break was caused by an incorrect machining tolerance when the threads on the jars were recut). An overshot was run in the hole and the remaining test tools were successfully fished out of the hole.

A job log showing the particulars of the test is included as Table 5.

RESERVOIR PARAMETER CALCULATIONS

Analysis of the data resulting from the test indicate the reservoir is extremely tight. The log-log plot (Table 7 and Figure 5) showed that wellbore storage effects ended 100 minutes after the pressure build-up had started. The semi-log straight line portion of the build-up was reached as seen on Table 8 and Figure 6.

The following values are used for calculations:

Assumptions:

Viscosity (μ)	=	0.23 centipoise
Formation volume factor (Bw)	=	1.0 RB/STB
Porosity (Phi)	=	11%
Compressibility (c)	=	0.0002 psi^{-1}
Wellbore radius (Rw)	=	0.258 feet (7 inch casing)

Measured Values:

Flowing well pressure (Pwf)	=	1842 PSI
Perforated interval (h)	=	77 feet
Flow rate (Q)	=	125 BPD

Horner plot data (Figure 6):

Pressure at one hour (P1 hr)	=	5600 PSI
Semi-log straight line slope (m)	=	1130 psi/cycle
Original bottom hole pressure (P*)	=	7320 PSI

Permeability Calculations (K):

$$Kh = (162.6\ Q\mu B) \div m$$
$$Kh = (162.6 \times 125 \times 0.23 \times 1.0) \div 1130$$
$$Kh = 4.14 \text{ md-ft}$$
$$K = 4.14 \div h$$
$$K = 4.14 \div 77$$
$$K = 0.054 \text{ md}$$

Skin Calculation(s)

$$S = 1.151 \left[\frac{P1hr - Pwf}{m} - \log \frac{K}{Phi\,\mu\, CRw^2} + 3.23\right]$$

$$S = 1.151 \left[\frac{5600-1842}{1130} - \log \frac{0.054}{0.11 \times 0.23 \times 0.0002 \times 0.258^2} + 3.23\right]$$

$$S = 1.351$$

Pressure across the skin calculation (ΔPs):

$$\Delta Ps = (141.2\ QB\mu S) \div (Kh)$$
$$\Delta Ps = (141.2 \times 125 \times 1.0 \times 0.23 \times 1.351) \div (4.14)$$
$$\Delta Ps = 1325 \text{ psi}$$

Productivity ratio calculation:

$$\frac{Jactual}{Jideal} = \frac{P^* - Pwf - \Delta Ps}{P^* - Pwf} = \frac{7320 - 1842 - 1325}{7320 - 1842} = 0.76$$

Radius of investigation calculation (ri):

$$ri = 0.029 \sqrt{(Kt) \div (Phi \mu C)}$$

$$ri = 0.029 \sqrt{(0.054 \times 33.9) \div (0.11 \times 0.23 \times 0.0002)}$$

$$ri = 17.44 \text{ feet}$$

The exact value for the flow rate (Q) was unknown due to the well not flowing to the separator. The well would flow at approximately 2 barrels per hour and would then slug gas and water. For the calculations, an optimisitc flow rate of 125 barrels per day was assumed. This high value for "Q" will result in an optimistic value for the permeability (K).

As can be seen from the field type calculations, the tested reservoir is extremely tight with a permeability in the range of 0.05 md. The skin factor (1.35) indicates moderate formation damage. The productivity ratio indicates that the well was producing at 76 percent of its ideal capacity.

CONCLUSIONS

Drillstem test No. 1 on Hermes No. 1 well test interval was an operational success and determined that the tested formation is extremely tight. Field type calculations indicate the reservoir permeability is of the order of 0.05 md.

Analyses of gas and water samples obtained during the test indicated high percentages (71%) of methane gas and an average water resistivity of 1.195 ohm-metres at 25°C (77°F). Data obtained determined that the interval tested has no possibility of commercial hydrocarbon production.

Table 3

Permit VIC/P18 Australia
Hermes No. 1
DST No. 1
Test Information

Hole Data		
	SI	API
Perforated Interval:	4415-4425m 4427-4431m 4432-4442m	14,485-14,518 ft. 14,524-14,536 ft. 14,542-14,574 ft.
Net Interval:	24m	77 ft.
Packer Depth:	4398m	14,429 ft.
Plug Back Depth:	4517m	14,819 ft.
Gross Tested Footage:	119m	390 ft.
RKB to MSL:	23m	75 ft.
Bottom Hole Temperature:	153°C	307°F
Casing:	7 inch 29 PPF	
Mud Weight:	10.1 PPG	
Mud Viscosity:	40 seconds	
Cushion:	3109m (10,200 ft.) of 8.6 PPG Diesel Oil	
Equipment Data		
Bottom Hole Choke:	2 inches	
Final Surface Choke:	1 inch fixed and 1-1/4 inch adjustable.	
Recovered Fluid		
The test interval was open to flow for an effective period of 33 hours 53 minutes, during which time the formation produced mud filtrate followed by brackish formation water with gas at a very low rate. The produced water had an average resistivity of 1.195 ohm-metres of 25°C (77°F) and a chloride content of 2486 ppm. The gas analysis indicated high percentage of methane, small percentages of carbon dioxide and no hydrogen sulphide.		

Table 4

Permit VIC/P18 Australia
Hermes No. 1
DST No. 1
Main Results

Point	Description	Top Gauge Number 16955 4392m (14,408 ft.) 120 hour clock (open)		Bottom Gauge Number 48461 4401m (14,438 ft.) 120 hour clock (blanked off)	
		Pressure (PSIG)	Time (Minutes)	Pressure (PSIG)	Time (Minutes)
0	Initial Hydrostatic	7997	0	7613	0
1	Initial Flow	4555	0	4197	0
2	Final Flow	1842	1798	1635	1798
2	Initial Surface Shut-in	1842	0	1635	0
3	Final Surface Shut-in	3040	235	2939	235
3	Initial Down Hole Shut-in	3040	0	2939	0
4	Final Down Hole Shut-in	6738	825	6708	845

Table 5

Permit Vic/P18 Australia
Hermes No. 1
DST No. 1
Job Log

Time (Hours)	Surface Pressure (PSIG)	Bottom Hole Pressure (PSIG)	Remarks
30-04-83 2000			Perforated with 4SPF 4415-4425m, 4427-4431m, and 4432-4442m (14,485-14,518 ft., 14,524-14,536 ft., and 14,542-14,574 ft.)
1-05-83 1200			Made dummy run with fluted hanger to check ram positions on slick joint.
1500			Started making up test string.
1735			Loaded B.T. # 30508 - 120 hour clock # F-4782. and B.T. # 16955 - 120 hour clock # F-13188 (top).
1830			Loaded B.T. # 48461 - 120 hour clock # F-13190 and B.T. # 33961 - 72 hour clock # E-8688 (bottom).
1900			Made up APR-A & M2 valves. Internally tested slip joints and DST tools to 2500 psi. RIH externally testing, drill pipe connections to 2500 psi.
2-05-83 1930			Picked up subsea test tree (SSTT) & lubricator valve. RIH with same. Function tested tree.
3-05-83 0100			Set RTTS packer at 4398m (14,429 ft.)
0223			Pressure tested surface lines.
0700			Closed lower 5 inch pipe rams.

Hermes No. 1
DST No. 1
Job Log
(Continued)

Time (Hours)	Surface Pressure (PSIG)	Bottom Hole Pressure (PSIG)	Remarks
3-05-83 0722			Pressured annulus to open LPR valve. Well open through 1/4" bubble hose.
0729		4555	No indication of flow.
0731		4569	Occasional bubbles.
0737		4598	LPR cycled to open again.
0752		4657	Weak blow thru bubble hose.
1612	13	5535	Diesel cushion to surface.
1650		5600	Opened choke to 1-1/4" adj. and flowed to gauge tank.
1653		5580	Opened 1" fixed choke (well flowing through 1-1/4" adj. & 1" fixed choke).
2000	4	5534	Diesel flow rate estimated at 2 bbls/hr.
2300	4	5345	Approximately 19 bbls diesel returned to tank.
2322		5105	Gas to surface. Tank by-passed - flow to burners.
2330		4856	Closed wing valve on flow line to repair leaking cross over.
4-05-83 0022	330	4951	Opened well to gas flare on 1/4" adj. choke.

Hermes No. 1
DST No. 1
Job Log
(Continued)

Time (Hours)	Surface Pressure (PSIG)	Bottom Hole Pressure (PSIG)	Remarks
4-05-83			
0025	250		Increased choke to 3/8" adj.
0032			Well started to slug diesel.
0036	160		Increased choke to 1/2" adj.
0043	60		Increased choke to 1-1/4" adj. and opened 1" fixed choke.
0130	3		Well flowing gas and diesel to flare.
0510			Mud to surface (slugging with gas)
0600	0	3617	Well flowing gas with small amount of mud.
0700	35	3132	Well flowing water and gas (samples 4-8 taken).
0800	1	2851	Well flowing water and gas.
0846	50		Water to surface (samples 10-17 taken).
0925		2067	Switch flow to gas flare.
0945	1		Only gas to surface.
1225	1		Closed in well at surface master valve to rig up Flopetrol surface pressure read out (SPRO) equipment.
1245	1		Re-opened well, no flow.
1322		1842	Closed in well at master valve. Rigged up Flopetrol surface pressure read out and lubricator. Tested lubricator. Lubricator leaked.

Hermes No. 1
DST No. 1
Job Log
(Continued)

Time (Hours)	Surface Pressure (PSIG)	Bottom Hole Pressure (PSIG)	Remarks
4-05-83			
1612		2600	Closed subsea test tree (SSTT). Rectified leak.
1640		2872	Closed swab valve
1645		2951	Opened master valve to bleed down pressure.
1710		3030	Opened swab valve.
1711 1712			Weak point of SPRO latch broke. Tool dropped into hole partially opening SSTT. Lubricator valve closed. Hoses damaged. Unable to open hydraulically.
1715		3040	Annulus pressure bled off. LPR valve closed. Well shut in down hole. Pressure build up continued.
1900		5888	Attempted to open lubricator valve by pumping into string.
1940	0	6010	Lubricator valve open. Gas pressure to surface. Took gas sample A 8695 from choke manifold.
2225	500	6360	Took gas sample A 12870 from choke manifold.
2335			Opened choke manifold to flare to bleed off pressure.

Hermes No. 1
DST No. 1
Job Log
(Continued)

Hermes No. 1
DST No. 1
Job Log
(Continued)

Time (Hours)	Surface Pressure (PSIG)	Bottom Hole Pressure (PSIG)	Remarks
5-05-83 0725			Pressured annulus to 3000 psi to open APR-M2 valve.
0748			Started circulating mud to kill well.
0950			Took fluid samples.
1002			Opened well to burners thru adj. choke. (Collected samples 1-3).
1036			Circulated and conditioned mud.
1350			Rigged down surface equipment.
1435			Unseated packer and pulled out of hole.
1520			Lubricator valve on surface (hoses damaged).
1625			SSTT on surface. SPRO latch assembly stuck in hydraulic assembly of SSTT.
6-05-83 0330			Slip joints at surface.
0410			Broke out M2 & APR valves
0645			Pressure gauges on surface. RTTS packer still in hole.
0800			Schlumberger RIH to tag packer. Tagged fish at 4394m (14,416 ft.)

Hermes No. 1
DST No. 1
Job Log
(Continued)

Time (Hours)	Surface Pressure (PSIG)	Bottom Hole Pressure (PSIG)	Remarks
6-05-83 1900			RIH with fishing bottom hole assembly.
7-05-83 0130			Engaged fish and unsealed packer. Pulled out of hole.
0923			Fish at surface.
0950			Lower bundle carrier on surface.

END DST NO. 1

Table 6

Permit Vic/P18 Australia
Hermes No. 1
DST No. 1
Pressure Data

Top gauge Number 16955 4392m (14,408 ft.) 120 hour clock (open)		Bottom gauge Number 48461 4401m (14,438 ft.) 120 hour clock (blanked off)	
Time (Minutes)	Pressure (PSIG)	Time (Minutes)	Pressure (PSIG)
Initial Flowing Period			
0	4555	0	4197
53	4752	53	4356
248	5263	248	4947
458	5531	458	5267
571	5580	571	5327
698	5559	698	5301
818	5504	818	5347
998	4881	998	4465
1298	4396	1298	3399
1538	2507	1538	2319
1798	1842	1798	1635
Surface Shut-in Period			
0	1842	0	1635
30	1978	30	1832
60	2142	60	2019
90	2306	90	2188
120	2468	120	2370
150	2623	150	2560
180	2798	180	2669
235	3040	235	2939
Pressure Build-up Period			
0	3040	0	2939
10	4149	10	3912
20	4777	20	4520
30	5065	30	4909
60	5544	60	5487
135	6007	125	5935
255	6273	245	6216
375	6436	365	6385
465	6518	485	6503
525	6578	545	6546
645	6649	665	6623
765	6714	785	6678
825	6738	845	6708

Table 7

Permit Vic/P18 Australi
Hermes No. 1
DST No. 1
Log-Log Plot Data

Top gauge Number 16955 4392m (14,408 ft.) 120 hour clock (open)		44 120 hou
Δ t (Minutes)	Δ P (PSIG)	Δ t (Min
10	1109	10
20	1737	20
30	2025	30
60	2504	60
135	2967	125
255	3233	245
375	3396	365
465	3478	485
525	3538	545
645	3609	665
765	3674	785
825	3698	845

Table 8

Permit Vic/P18 Australia
Hermes No. 1
DST No. 1
Horner Plot Data

Top gauge Number 16955 4392m (14,408 ft.) 120 hour clock (open)			Bottom gauge Number 48461 4401m (14,438 ft.) 120 hour clock (blanked off)		
$\frac{\Delta t}{}$ (Mins.)	$\frac{t+\Delta t}{\Delta t}$	Pressure (PSIG)	Δt (Mins)	$\frac{t+\Delta t}{\Delta t}$	Pressure (PSIG)
10	204.30	4149	10	204.30	3912
20	102.65	4777	20	102.65	4520
30	68.77	5065	30	68.77	4909
60	34.88	5544	60	34.88	5487
135	16.06	6007	125	17.26	5935
255	8.97	6273	245	9.30	6216
375	6.42	6436	365	6.57	6385
465	5.37	6518	485	5.19	6503
525	4.87	6578	545	4.73	6546
645	4.15	6649	665	4.06	6623
765	3.66	6714	785	3.59	6678
825	3.46	6738	845	3.41	6708

t = 2033 minutes

PERMIT VIC/P18 AUSTRALIA

HERMES-1

DST NO.1

LOG ANALYSIS

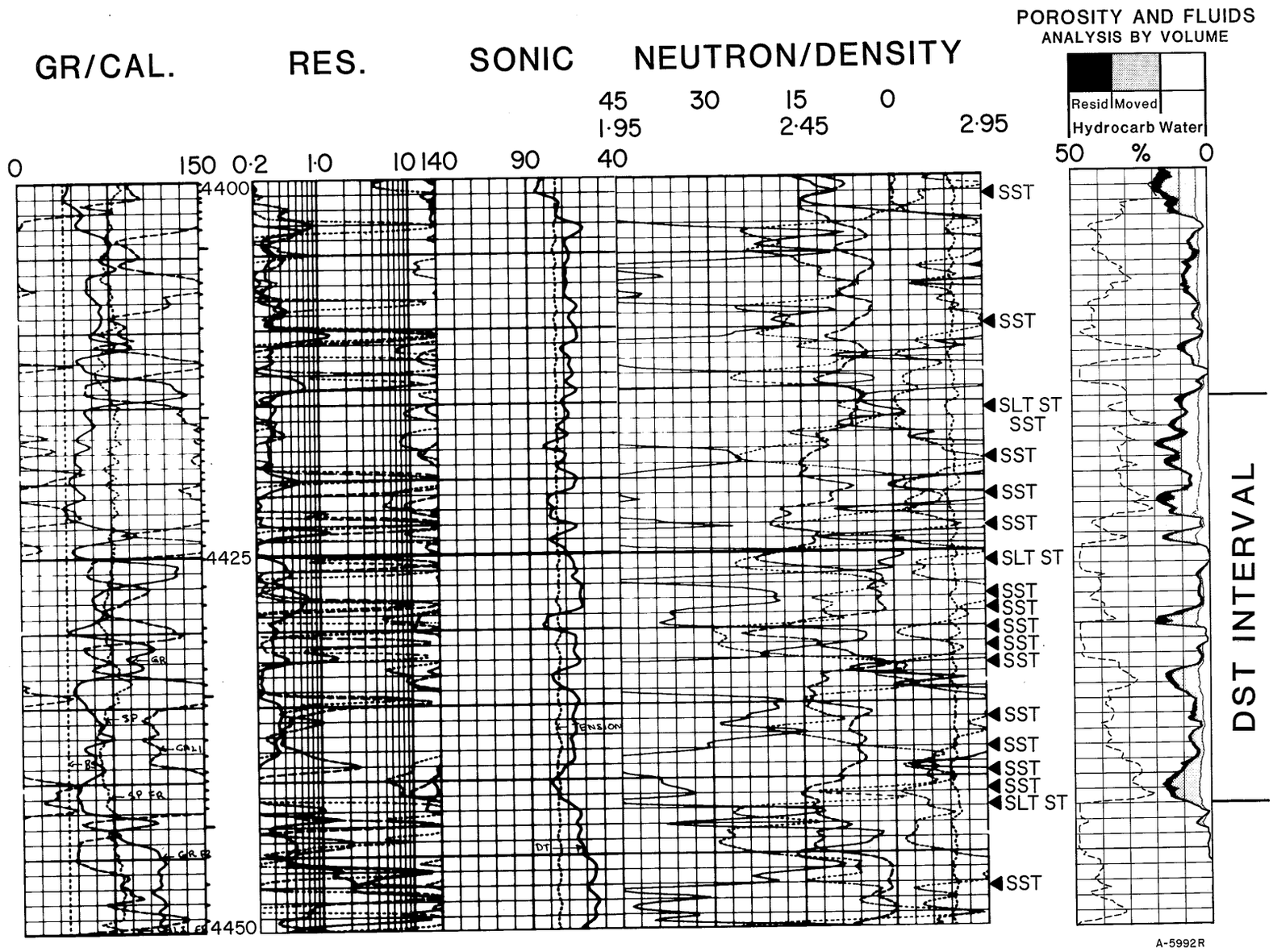
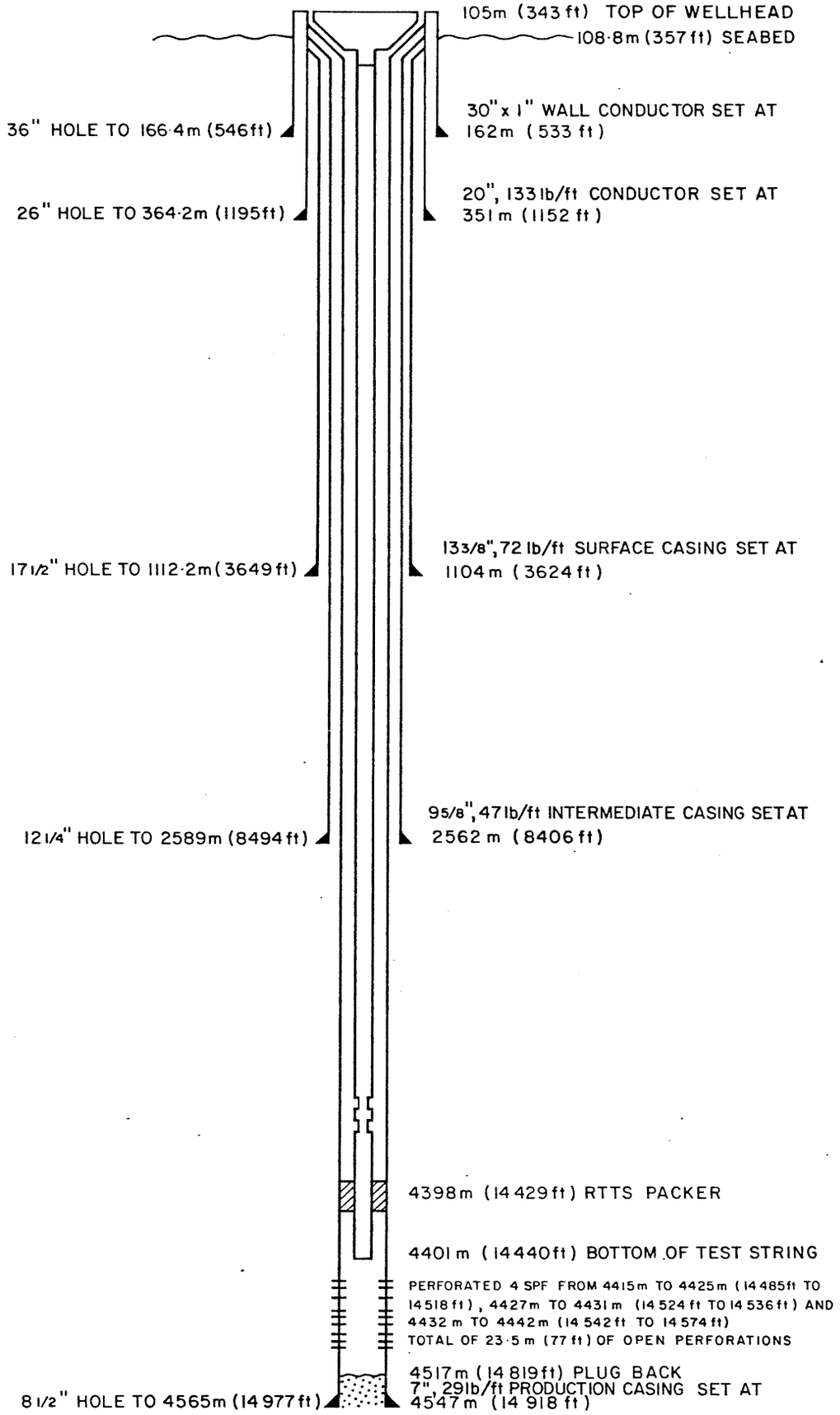


FIGURE 1

PERMIT VIC/P18 AUSTRALIA
HERMES-1
DST No.1
WELL PROFILE



A-5903

Figure 2

Figure 3

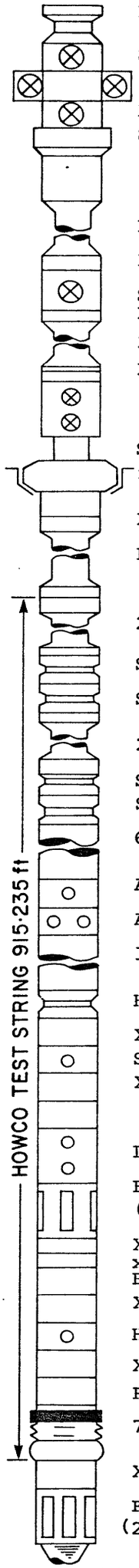
Permit Vic/P18 Australia

Hermes No. 1

DST No. 1

Test String

HERMES NO. 1 - DST String - DST No. 1



	O.D. Inches	I.D. Inches	Length Feet	Depth Feet
Lift Sub w/lubricator adapter				
Swab valve		2.68		
Remote control safety valve		2.68		
Master valve		2.68		
Swivel		2.68		
Rig Floor				0.0
Required 5" drillpipe to rig floor	5.00	4.27	92.86	
XO			0.99	
Subsea lubricator valve			4.88	
XO			0.89	
2-Stand 5" drillpipe + 1 double	5.00	4.27	249.34	
XO			.94	
			8.88	
Subsea test tree with fluted hanger and slick joint			5.08	
			1.11	345.0
XO			1.25	
Required 3½" drillpipe	3.50	2.25	13169.74	
2 Joints drillpipe 3½"	4.75	2.76	97.34	
Slip joint extended	5.00	2.25		
Slip joint extended	5.00	2.25		
2 joints drillpipe 3½"	4.75	2.76	87.98	
Slip joint closed	5.00	2.25		
Slip joint closed	5.00	2.25		
6 stands 4-3/4" drill collars	4.75	2.25	562.98	
APR-A circulating Valve	5.00	2.25	3.00	
APR-M2 circulating valve	5.00	2.25	7.53	14,269.0
1-stand 4-3/4" drill collars	4.75	2.25	93.87	
Handling sub	4.75	2.50	4.87	
X-over (3½" IF box x 3½" FH pin)	4.75	2.38	1.52	
Side port drain valve	5.00	2.25	1.00	
X-over (3½" FH box x 3½" IF pin)	4.75	2.38	0.77	
LPR Tester valve w/SPRO adapter	5.00	2.25	24.49	
Ful-Flo B.T. running case (2 B.T. and 1 temp. gauge)	5.38	2.25	7.97	14,407.8
X-over (3½" IF box x 3½" EUE pin)	4.63	2.90	0.98	
x-over (3½" EUE box x 2-7/8" EUE pin)	4.50	2.38	0.83	
Big John jars 2-7/8" E	4.63	2.25	4.87	
X-over (2-7/8" EUE box x 3½" IF pin)	4.75	2.63	0.52	
Hydraulic by-pass	4.63	2.25	6.87	
X-over (3½" IF box x 2-7/8" EUE pin)	4.75	2.00	0.73	
RTTS safety joint	4.87	2.44	2.75	
7" RTTS packer	5.63	2.40	4.36	14,431.2
X-over (2-7/8" EUE box x 3½" IF pin)	4.75	2.37	0.85	
Ful-Flo B.T. running case (2 B.T. and 1 temp. gauge)	5.38	2.25	7.97	14,438.5
				14,440.0

PERMIT VIC/P18 AUSTRALIA

HERMES-1

DST No.1

LOWER PRESSURE CHART No.48461

4401m (14438ft)

120 HOUR CLOCK (Blanked off)

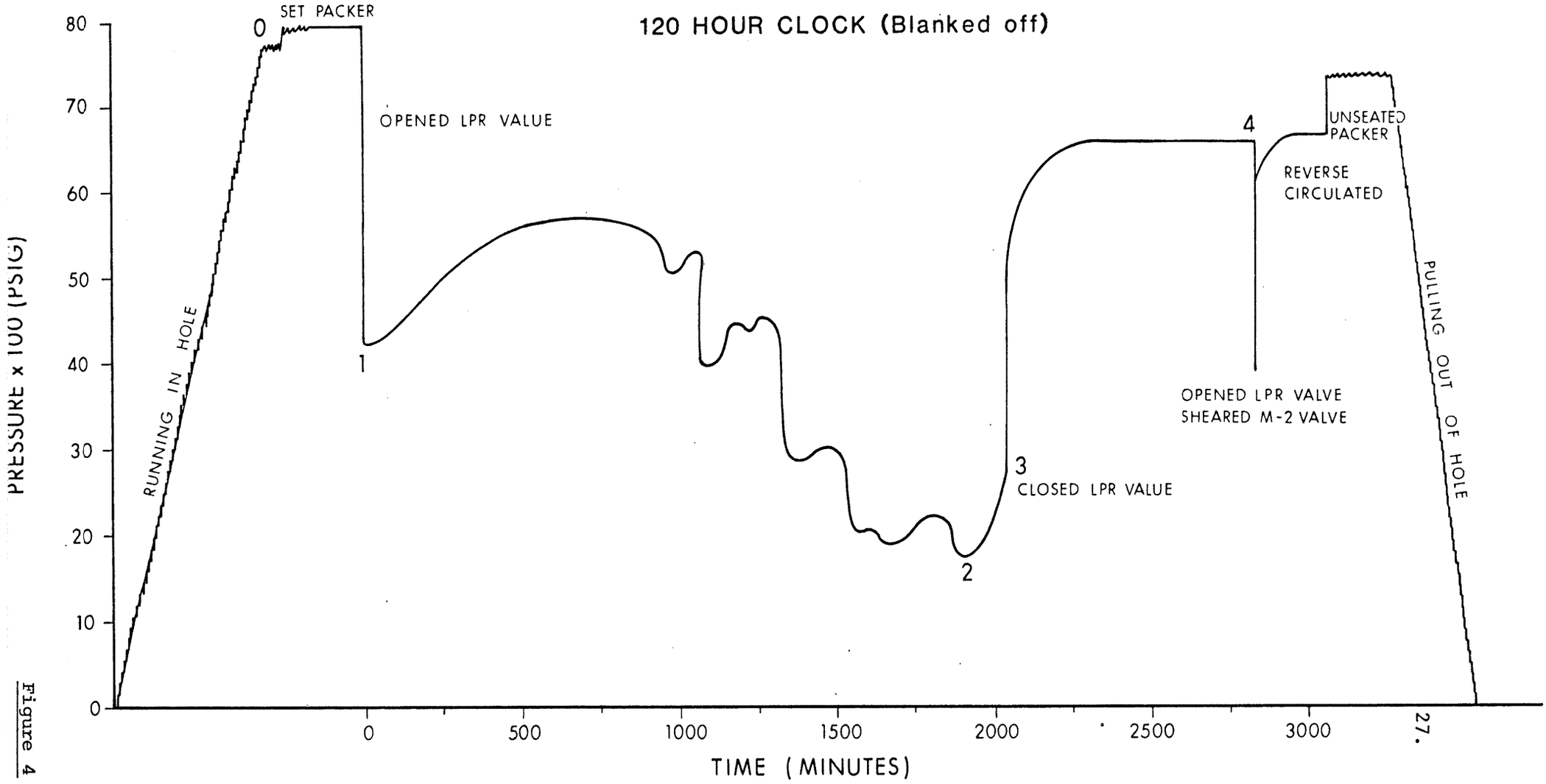


Figure 4

0. Initial hydrostatic pressure (7613 psi)
1. Initial flowing pressure (4197psi)
2. Final flowing/Initial surface shut-in pressure. (1635psi)
3. Final surface shut-in / initial downhole shut-in pressure (2939 psi)
4. Final downhole shut-in pressure (6708psi)

HERMES-1
DST No. 1
LOG-LOG PLOT

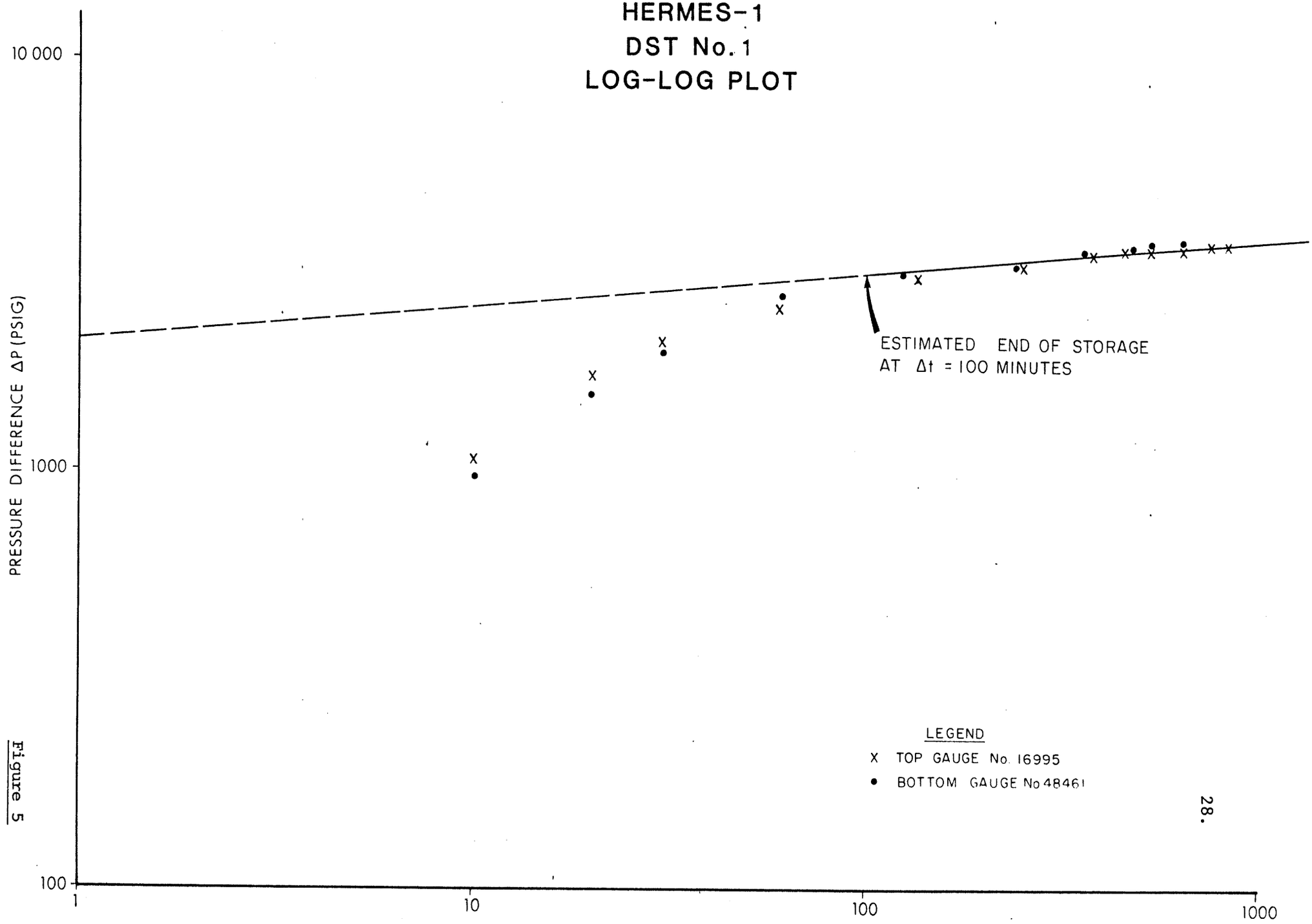


Figure 5

A-5973

PERMIT VIC/P18 AUSTRALIA

HERMES-1
DST No.1
HORNER PLOT

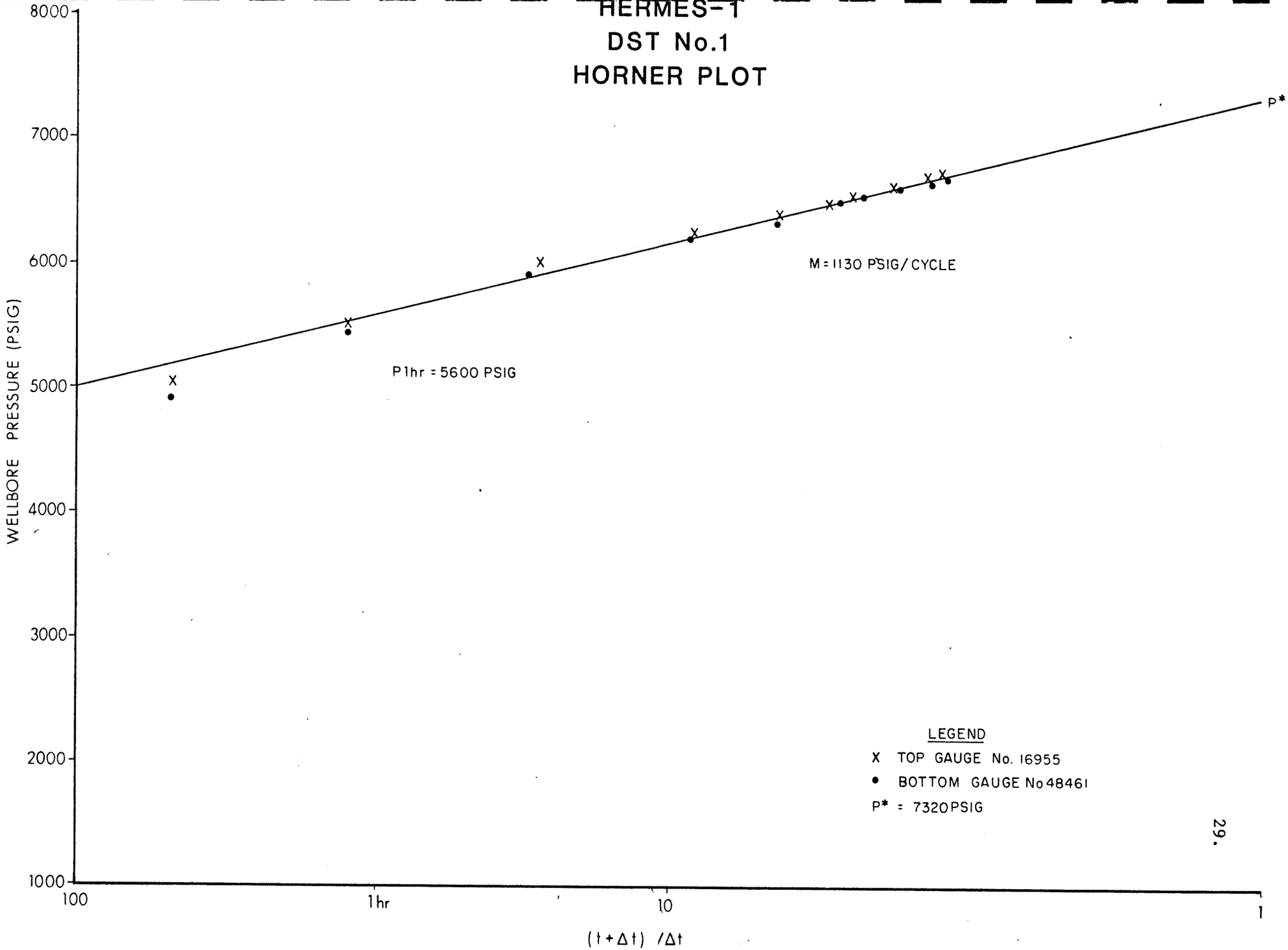


Figure 6

A-5972

Permit Vic/P18 Australia

Hermes No. 1

Drillstem Test No. 2

SUMMARY

A drillstem test was conducted over the interval 4383-4388 metres and 4400-4403 metres (14,379-14,395 feet and 14,435-14,445 feet) RKB in the exploratory well, Hermes No. 1. The results of the initial flow period data were indicative of a well flowing in heads. Throughout the test, the well flowed brackish formation water with small amounts of oil emulsion (condensate) and slugs of gas. The pressure build up data indicated that the reservoir is extremely tight with a permeability in the range of 0.09 md.

Fluid samples recovered during the test had an average resistivity of 0.513 ohm-metres at 25°C (77°F) and a chloride content of 8648 ppm. Analyses of gas samples indicate high percentages of methane, small percentages of carbon dioxide and no hydrogen sulphide. The test was an operational success. Data obtained determined that the reservoir has no possibility of commercial hydrocarbon production.

JUSTIFICATION

A drillstem test was recommended over the Hermes No. 1 interval 4383-4388 metres and 4400-4403 metres (14,379-14,395 and 14,435-14,445 feet) RKB, as there were several indications that the zone could contain hydrocarbons. These indications were patchy yellow-green-gold primary fluorescence in drill cuttings and sidewall cores with associated strong cut fluorescence from 4375 to 4442 metres (14,354-14,573 feet) RKB. The initial wireline log analysis within the zone indicated good porosity, low water saturations, and the presence of moveable hydrocarbons.

Log sections over the test interval are included as Figure 7.

TEST

After a thirty-six barrel KCL/Brine mud pill had been spotted in the well bore and the test interval perforated with four shots per foot, the drillstem test string was made up. The test tools were internally pressure tested to 2500 psi with nitrogen and run in the hole while externally pressure testing each drillpipe connection to 4000 psi. After all downhole equipment had been run and a cushion of 500 feet of water and 1500 gallons of liquid nitrogen added, the surface equipment was rigged up and the entire DST string was tested to 6000 psi. Next, the packer was set at 4370 metres (14,338 feet) and the hanger was landed in the 16-3/4 inch wellhead.

The well profile is shown in Figure 8 and the composite test string in Figure 9. The particulars of the test are included as Table 9.

After the initial pressure on the drillpipe had been bled down to 3350 psi, the Flopetrol surface pressure read out (SPRO) equipment was run in the hole on a wireline and latched to the SPRO connector in the test string. The Halliburton LPR tool was opened at 0653 hours on May 10, 1983 for an uninterupted flow period of 723 minutes (12 hours). The well flowed gas (140,000 to 450,000 cubic feet/day) and brackish formation water (145 bbl/day) with small amounts of oil emulsion to the surface in slugs.

Even though the well would not clean up and flow at a steady flow rate, the pressure build-up period was started. The well was closed in for a period of 310 minutes to determine the reservoir characteristics.

Pressure data obtained from the flow period and build-up period are included as Tables 10 and 12. A diagram of the pressure chart is included as Figure 10. (Note: the pressure difference between the SPRO gauge and the two Bourdon tube gauges is due to insufficent flow in the SPRO crossover which restricted pressure transient.)

After the pressure build-up period was completed, a short flow period was initiated to allow the entrapment of formation fluid samples in the test tool sample chamber. Thereafter, the contents of the drillstem test string were reverse circulated out and sampled. The analysis of the samples caught during the flow period and the reverse circulation are included as Appendices C and D.

After all samples had been collected, the packer was unseated and the drillstem test tools were pulled out of the hole.

A job log showing the particulars of the test is included as Table 11.

RESERVOIR PARAMETER CALCULATIONS

Analysis of the data resulting from the test indicate the reservoir is extremely tight. The log-log plot (Table 13 and Figure 11) showed that wellbore storage effects ended 75 minutes after the pressure build-up had started. The semi-log straight line portion of the build-up was reached as seen on Table 14 and Figure 12.

The following values are used for calculations:

Assumptions:

Viscosity (μ)	=	0.23 centipoise
Formation volume factor (Bw)	=	1.0 RB/STB
Porosity (Phi)	=	10%
Compressibility (c)	=	0.0002 psi^{-1}
Wellbore radius (Rw)	=	0.258 feet (7 inch casing)

Measured Values:

Flowing well pressure (Pwf)	=	750 psig
Perforated interval (h)	=	26 feet
Flow rate (Q)	=	145 BPD

Horner plot data (Figure 12):

Pressure at one hour (P1 hr)	=	4900 psig
Semi-log straight line slope (m)	=	2400 psi/cycle
Original bottom hole pressure (P*)	=	7450 psig

Permeability Calculations (K):

$$Kh = (162.6\ Q\mu B) \div m$$
$$Kh = (162.6 \times 145 \times 0.23 \times 1.0) \div 2400$$
$$Kh = 2.26 \text{ md-ft}$$
$$K = 2.26 \div h$$
$$K = 2.26 \div 26$$
$$K = 0.087 \text{ md}$$

Skin Calculation(s):

$$S = 1.151 \left[\frac{P1hr - Pwf}{m} - \log \frac{K}{Phi\ \mu CRw^2} + 3.23\right]$$

$$S = 1.151 \left[\frac{4900-750}{2400} - \log \frac{0.087}{0.1 \times 0.23 \times 0.0002 \times 0.258^2} + 3.23\right]$$

$$S = -0.4944$$

Pressure across the skin calculation (ΔPs):

$$\Delta Ps = (141.2\ QB\mu\ S) \div (Kh)$$
$$\Delta Ps = (141.2 \times 145 \times 1.0 \times 0.23 \times -0.4944) \div (2.26)$$
$$\Delta Ps = -1030 \text{ psi}$$

Productivity ratio calculation:

$$\frac{Jactual}{Jideal} = \frac{P^* - Pwf - \Delta Ps}{P^* - Pwf} = \frac{7450 - 750 + 1030}{7450 - 750} = 1.15$$

Radius of investigation calculation (ri):

$$ri = 0.029 \sqrt{(Kt) \div (Phi \mu C)}$$

$$ri = 0.029\sqrt{(0.087 \times 12) \div (0.1 \times 0.23 \times 0.0002)}$$

$$ri = 13.82 \text{ feet}$$

As can be seen from the field type calculations, the tested reservoir is extremely tight with a permeability in the range of 0.09 md. The negative skin factor indicates that the permeability of the skin zone is greater than that of the formation, which is probably attributable to the enlargement of the perforations in the unconsolidated sand. This can also be seen by the calculation of the productivity ratio which indicates that the well was producing at 115% of its ideal capacity.

CONCLUSIONS

Drillstem test No. 2 on Hermes No. 1 well test interval was an operational success and determined that the tested formation is extremely tight. Field type calculations indicate the reservoir permeability is of the order of 0.09 md.

Analyses of gas and water samples obtained during the test indicated high percentages (81%) of methane gas and an average water resistivity of 0.513 ohm-metres at 25°C (77°F). Data obtained determined that the interval tested has no possibility of commercial hydrocarbon production.

Table 9

Permit VIC/P18 Australia
Hermes No. 1
DST No. 2
Test Information

Hole Data		
	SI	API
Perforated Interval:	4383-4388m 4400-4403m	14,379-14,395 ft. 14,435-14,445 ft.
Net Interval:	8m	26 ft.
Packer Depth:	4370m	14,338 ft.
Plug Back Depth:	4411m	14,472 ft.
Gross Tested Footage:	41m	134 ft.
RKB to MSL:	23m	75 ft.
Bottom Hole Temperature:	152°C	305°F
Casing:	7 inch 29 PPF	
Mud Weight:	10.1 PPG	
Mud Viscosity:	40 seconds	
Cushion:	500 ft. water & 1500 gallons Nitrogen	
Equipment Data		
Bottom Hole Choke:	2 inches	
Final Surface Choke:	1/4 inch adjustable	
Recovered Fluid		
The test interval was open to flow for an uninterupted period of 12 hours, during which time the well produced brackish formation water with gas in slugs. The produced water had an average resistivity of 0.513 ohm - metres at 25°C (77°F) and a chloride content of 8648 ppm. The gas analysis indicated high percentages of methane, small percentages of carbon dioxide and no hydrogen sulphide.		

Table 10

Permit VIC/P18 Australia
Hermes No. 1
DST No. 2
Main Results

Point	Description	SPRO Gauge Number 83411 4356m (14,290 ft.)		Top Gauge Number 33961 4363m (14,315 ft.) 72 hour clock (open)		Bottom Gauge Number 48461 4373m (14,347 ft.) 120 hour clock (blanked off)	
		Pressure (PSIG)	Time (Minutes)	Pressure (PSIG)	Time (Minutes)	Pressure (PSIG)	Time (Minutes)
0	Initial Hydrostatic	7330	0	7285	0	7350	0
1	Initial Flow	904	0	1499	0	1463	0
2	Final Flow	1360	719	1663	723	1623	723
2	Initial Down Hole Shut-in	1360	0	1663	0	1623	0
3	Final Down Hole Shut-in	6298	313	6258	310	6275	310

Table 11

Permit Vic/P18 Australia
Hermes No. 1
DST No. 2
Job Log

Time (Hours)	Surface Pressure (PSIG)	Bottom Hole Pressure (PSIG)	Remarks
8-05-83 1330			Perforated with 4 SPF 4383-4388m and 4400-4403m (14,379 - 14,395 ft. and 14,435 - 14,445 ft.).
1930			Started making up DST tools.
2230			Loaded B.T. # 33961 - 72 hour clock # E-8688 (Top).
2319			Loaded B.T. # 16955N - 120 hour clock # F-13188 and B.T. # 48461 - 120 hour clock # F-13190 (bottom).
2331			Internally tested tools to 2500 psi. RIH externally testing each stand of drill pipe to 4000 psi.
9-05-83 1030			Picked up and RIH with subsea test tree (SSTT).
1125			Rigged up flowhead, surface equipment and wireline lubricator.
1352			Closed master valve, pressure tested surface equipment to 6000 psi, with nitrogen.
1405			Bled down pressure through choke manifold.
1418			Pumped 3 barrels water into string.
1425			Shut in well at choke manifold. Pressure tested drill pipe to 6000 psi with nitrogen.

Hermes No. 1
DST No. 2
Job Log
(Continued)

Time (Hours)	Surface Pressure (PSIG)	Bottom Hole Pressure (PSIG)	Remarks
9-05-83 1615			Bled down pressure to 4000 psi through choke manifold to flare.
1642			Set RTTS packer at 4370m (14,338 ft.)
1645			Attempted to RIH with surface pressure read out (SPRO) latch assembly.
1704			Bled down drillpipe pressure to 3000 psi.
1717			RIH with SPRO latch assembly.
1941			SPRO latched on to gauge.
1945			Waited on daylight to start test.
10-05-83 0652			Pressured up annulus to open LPR valve. Well shut in at choke manifold.
0653	3030	1499	LPR tool open. Pressure indication at surface.
0655	3100	1514	Opened well at choke manifold through 1/4" adj. choke to flare. Bleeding down nitrogen.
0658	2600	1524	Increased choke to 7/16" adj.
0659	2300	1534	Increased choke to 1/2" adj.
0701	1850	1533	Increased choke to 9/16" adj.
0703	1400	1539	Increased choke to 11/16" adj.
0705	950		Increased choke to 3/4" adj.

Hermes No. 1
DST No. 2
Job Log
(Continued)

Time (Hours)	Surface Pressure (PSIG)	Bottom Hole Pressure (PSIG)	Remarks
10-05-83 0723	50		Opened well up fully on 1-1/4" adj. and 1" fixed choke.
0724			Gas to surface.
0725			Switched flow to burners.
0726		919	
0800		1751	
0949			Liquid to surface (oil and water).
1009			Switched flow to flare.
1010	50-100		Well slugging gas/water.
1016	40	1383	Water sample No. 8 taken.
1030	40	1285	Flowed through separator to take gas sample.
1055	15		Separator by-passed.
1057		1269	Took gas sample A 12769 from separator.
1224			Well slugging gas/water.
1230	20	1410	Water sample No. 7 taken.
1335		1278	Water sample No. 5 taken.
1712	45	1167	Shut in fixed choke. Choked back adj. choke to 1/4".
1750	100	1375	Took gas sample No. A12683 downstream of choke manifold.

Hermes No. 1
DST No. 2
Job Log
(Continued)

Time (Hours)	Surface Pressure (PSIG)	Bottom Hole Pressure (PSIG)	Remarks
10-05-83			
1805	135	1420	Finished taking gas sample.
1815	200	1513	Water sample No. 6 taken.
1856		1663	Shut in LPR tool for final build up.
1900		2697	Well shut in at choke manifold to obtain gas sample A 5869.
2355			Bled tubing pressure to zero thru choke manifold.
11-05-83			
0006			Pressured annulus to open LPR valve to catch sample. End of pressure build up.
0010			Lost wire line signal. High pressure differential across LPR valve pulled cable out of rope socket. Pulled wireline out of hole.
0038			Sheared M2 reverse circulating tool.
0106			Reverse circulated.
0136			Water to surface. Samples collected.
0154			End of sampling.
0200			Circulated and conditioned mud.
0230			Rigged down lubricator and grease head.

Hermes No. 1
DST No. 2
Job Log
(Continued)

Time (Hours)	Surface Pressure (PSIG)	Bottom Hole Pressure (PSIG)	Remarks
11-05-83 0401			Unseated packer and Pulled out of hole.
0535			SSTT on surface.
1310			Retrieved gas sample from Halliburton M2 sampler in sample bottle 20112-113.
1430			All DST tools on surface.

END DST NO. 2

Table 12

Permit VIC/P18 Australia
Hermes No. 1
DST No. 2
Pressure Data

Time (Minutes)	Pressure (PSIG)		
	SPRO Number 83411 4356m (14,290')	Top Gauge Number 33961 4363m (14,315') 72 hour clock (open)	Bottom Gauge Number 48461 4373m (14,347') 120 hour clock (blanked off)
Initial Flowing Period			
0	4630	1499	1463
14	1987	1502	1527
112	1384	1943	1918
157	1670	2079	2004
232	800	1283	1269
337	1058	1410	1439
457	712	1190	1233
547	746	1170	1230
639	892	1301	1211
697	1257	1575	1573
723	1360	1663	1623
Pressure Build-up Period			
0	1360	1663	1623
4	2114	2697	2565
9	2786	3065	2804
14	3252	3350	3089
19	3661	3559	3396
24	3876	3769	3596
29	4098	3981	3774
34	4286	4157	3917
39	4447	4268	4007
44	4586	4405	4186
49	4707	4499	4313
54	4813	4619	4443
114	5526	5355	5261
174	5863	5698	5703
234	6085	5923	5920
294	6249	6090	6101
310	6286	6258	6275

Table 13

Permit VIC/P18 Australia
Hermes No. 1
DST No. 2
Log-Log Plot Data

△t (Minutes)	△P (PSIG)		
	SPRO Number 83411 4356m (14,290')	Top Gauge Number 33961 4363m (14,315') 72 hour clock (open)	Bottom Gauge Number 48461 4373m (14,347') 120 hour clock (blanked off)
4	754	1034	942
9	1426	1402	1181
14	1892	1687	1466
19	2241	1936	1773
24	2516	2106	1973
29	2738	2318	2151
34	2926	2494	2294
39	3087	2623	2384
44	3226	2742	2563
49	3347	2836	2690
54	3453	2956	2820
114	4166	3692	3638
174	4503	4035	4080
234	4725	4260	4297
294	4889	4427	4478
310	4926	4595	4652

Table 14

Permit VIC/P18 Australia
Hermes No. 1
DST No. 2
Horner Plot Data

Δt (Minutes)	$\frac{t + \Delta t}{\Delta t}$	Pressure (PSIG)		
		SPRO Number 83411 4356m (14,290')	Top Gauge Number 33961 4363m (14,315') 72 hour clock (open)	Bottom Gauge Number 48461 4373m (14,347') 120 hour clock (blanked off)
4	181.75	2114	2697	2565
9	81.33	2786	3065	2804
14	52.64	3252	3350	3089
19	39.05	3601	3599	3396
24	31.13	3876	3769	3596
29	25.93	4098	3981	3774
34	22.26	4286	4157	3917
39	19.54	4447	4268	4007
44	17.43	4586	4405	4186
49	15.56	4707	4499	4313
54	14.39	4813	4619	4443
114	7.34	5526	5355	5261
174	5.16	5863	5698	5703
234	4.09	6085	5923	5920
294	3.46	6249	6090	6101
310	3.33	6286	6258	6275

t = 723 minutes.

PERMIT VIC/P18 AUSTRALIA

HERMES-1

DST NO.2

LOG ANALYSIS

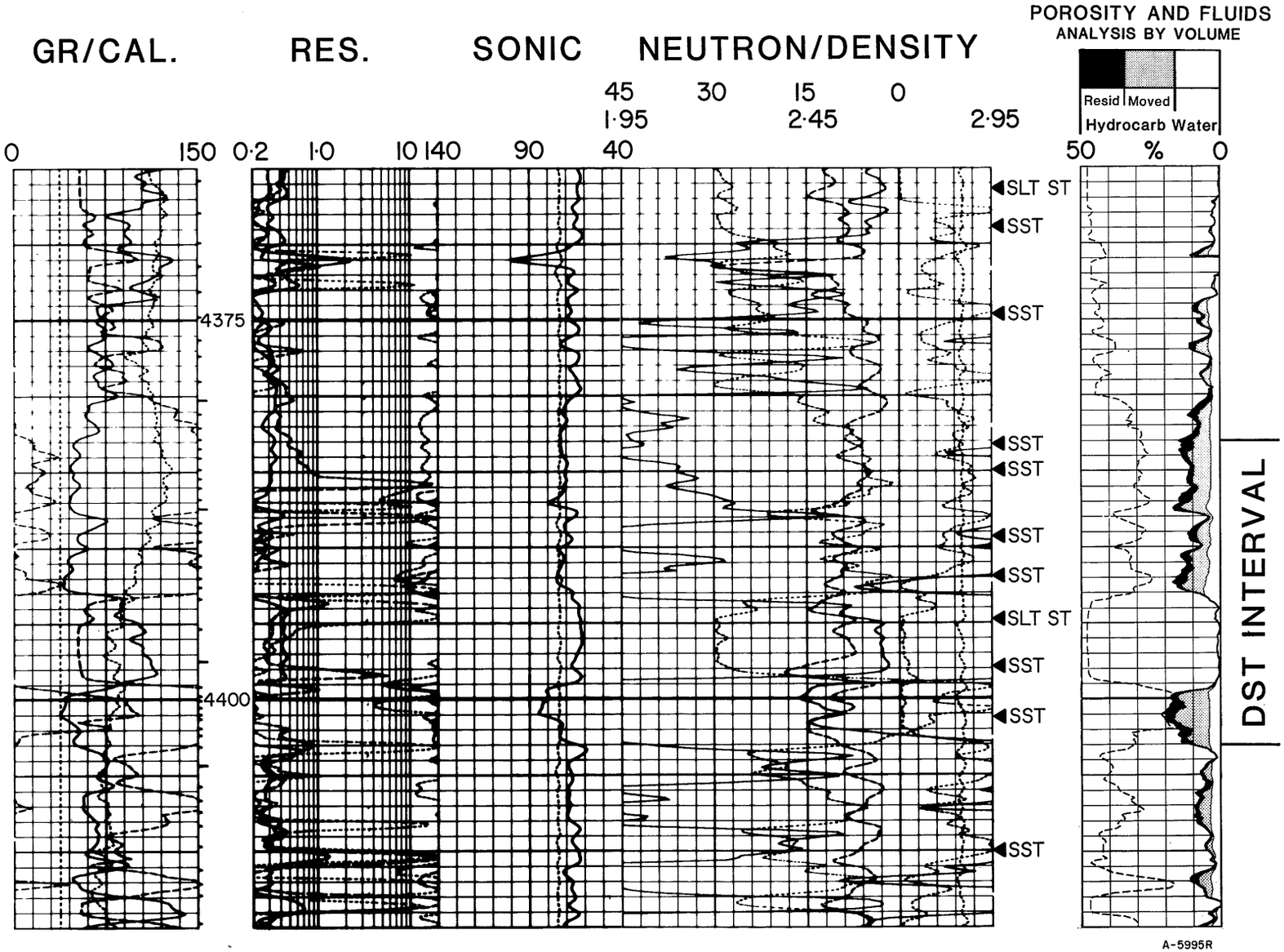
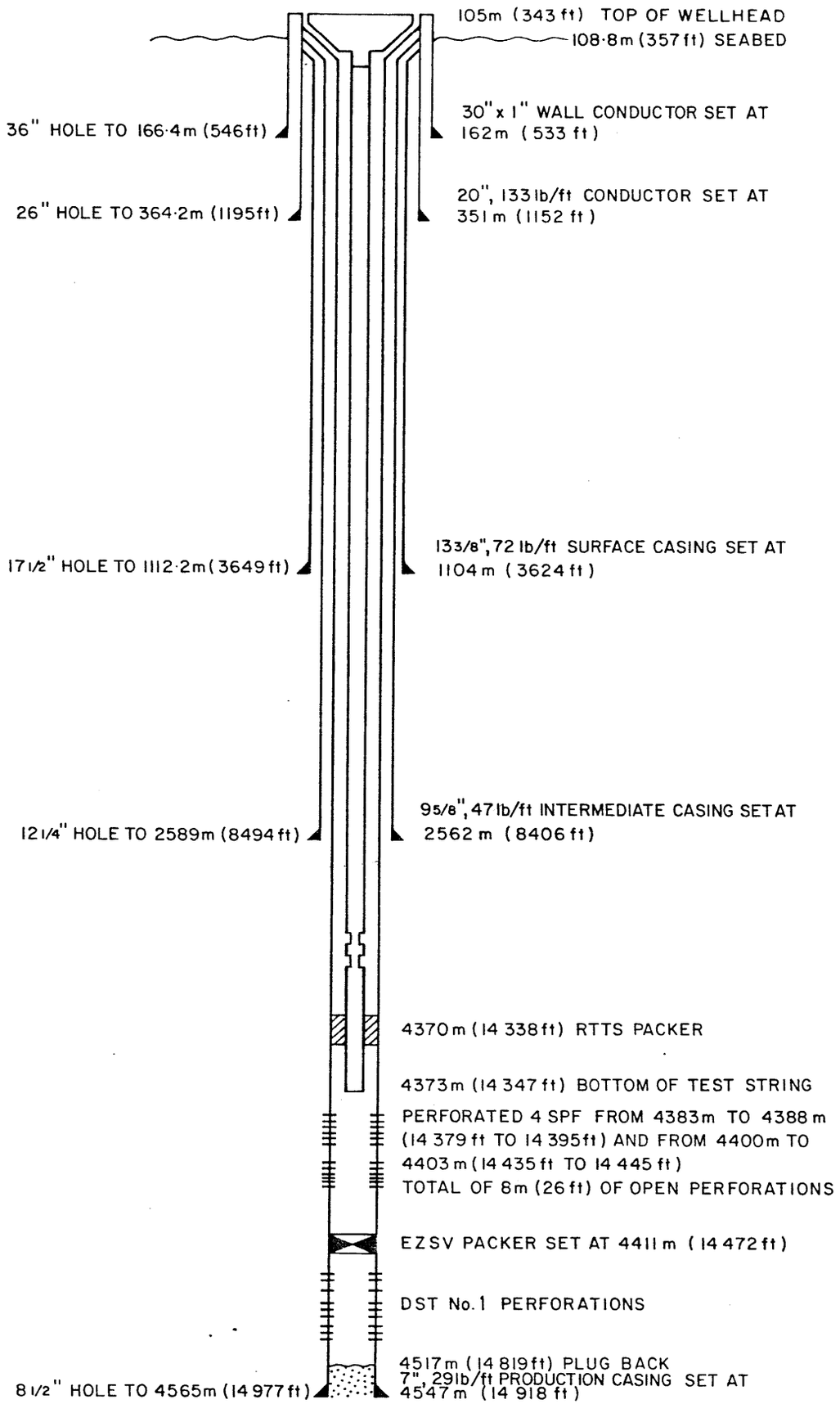


FIGURE 7

PERMIT VIC/P18 AUSTRALIA
HERMES-1
DST No.2
WELL PROFILE



A-5903

Figure 8

Figure 9

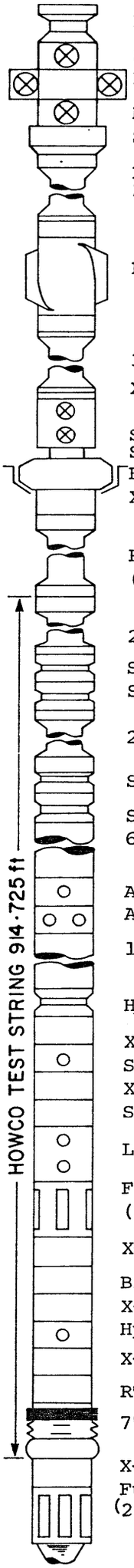
Permit Vic/P18 Australia

Hermes No. 1

DST No. 2

Test String

HERMES NO. 1 TEST STRING - DST No. 2



	O.D. inches	I.D. inches	Length Feet	Depth Feet
Lift Sub w/lubricator adapter		2.68		
Swab valve		2.68		
Remote control safety valve		2.68		
Master valve		2.68		
Swivel		2.68		
Rig Floor				0.0
2 joints 5" drillpipe (4½" IF)	6.625	4.27	62.68	
Riser centralizer (4½" IF)	16.0	4.27	3.96	
3-Stands 5" drillpipe (4½" IF)	6.625	4.27	282.05	
X-over (4½" IFx4½" Acme pin)	6.625	3.00	1.07	
Subsea test tree	10.75	3.00		
Slick joint	5.00	4.27	14.98	
Fluted hanger	13.00	4.27		345.0
X-over (4½" Acme pin x 3½" IF pin)	5.25	2.25	1.17	
Required 3½" drillpipe (140 stands plus 1 single)	4.75	2.76	13077.52	
2 joints drill pipe 3½"	4.75	2.76		
Slip joint (open)	5.00	2.25	97.34	
Slip joint (open)	5.00	2.25		
2-joints drillpipe 3½"	4.75	2.76		
Slip joint (closed)	5.00	2.25	87.98	
Slip joint (closed)	5.00	2.25		
6 stands 4-3/4" drill collars	4.75	2.25	562.98	
APR-A circulating valve (3½" IF)	5.00	2.25	3.00	
APR-M2 circulating valve (3½" IF)	5.00	2.25	7.53	14,177.0
1 stand 4-3/4" drill collars (3½"IF)	4.75	2.25	93.87	
Handling sub (3½" IF)	4.75	2.50	4.87	
X-over (3½" IF box x 3½" FH pin)	4.75	2.38	1.52	
Side port drain valve (3½" FH)	5.00	2.25	1.00	
X-over (3½" FH box x 3½" IF pin)	4.75	2.38	.77	
SPRO adapter (3½" IF)				14,287.5
LPR tester valve	5.00	2.25	24.49	14,290.5
Ful-Flo B.T. running case (3½" IF) (2 B.T. and 1 temp gauge)	5.38	2.25	7.97	14,315.5
X-over (3½" IF box x 3½" FH pin)	4.75	2.44	0.85	
Big John jars (3½ FH)	5.0	1.75	5.0	
X-over (3½" FH box x3½" IF pin)	4.75	2.44	0.84	
Hydraulic by-pass (3½" IF)	4.63	2.25	6.87	
X-over (3½" IF box x 2-7/8" EUE pin)	4.75	2.37	0.73	
RTTS safety joint (2-7/8" EUE)	4.87	2.44	2.75	
7" RTTS packer (2-7/8" EUE)	5.62	2.40	4.36	14,338.4
X-over (2-7/8" EUE box x 3½" IF pin)	4.75	2.37	0.85	
Ful-Flo B.T. running case (3½" IF) (2 B.T. and 1 temp gauge)	5.37	2.25	7.97	14,345.7
				14,347.2

PERMIT VIC/P18 AUSTRALIA

HERMES-1

DST No.2

LOWER PRESSURE CHART No.48461

4373m(14347ft)

120 HOUR CLOCK(Blanked off)

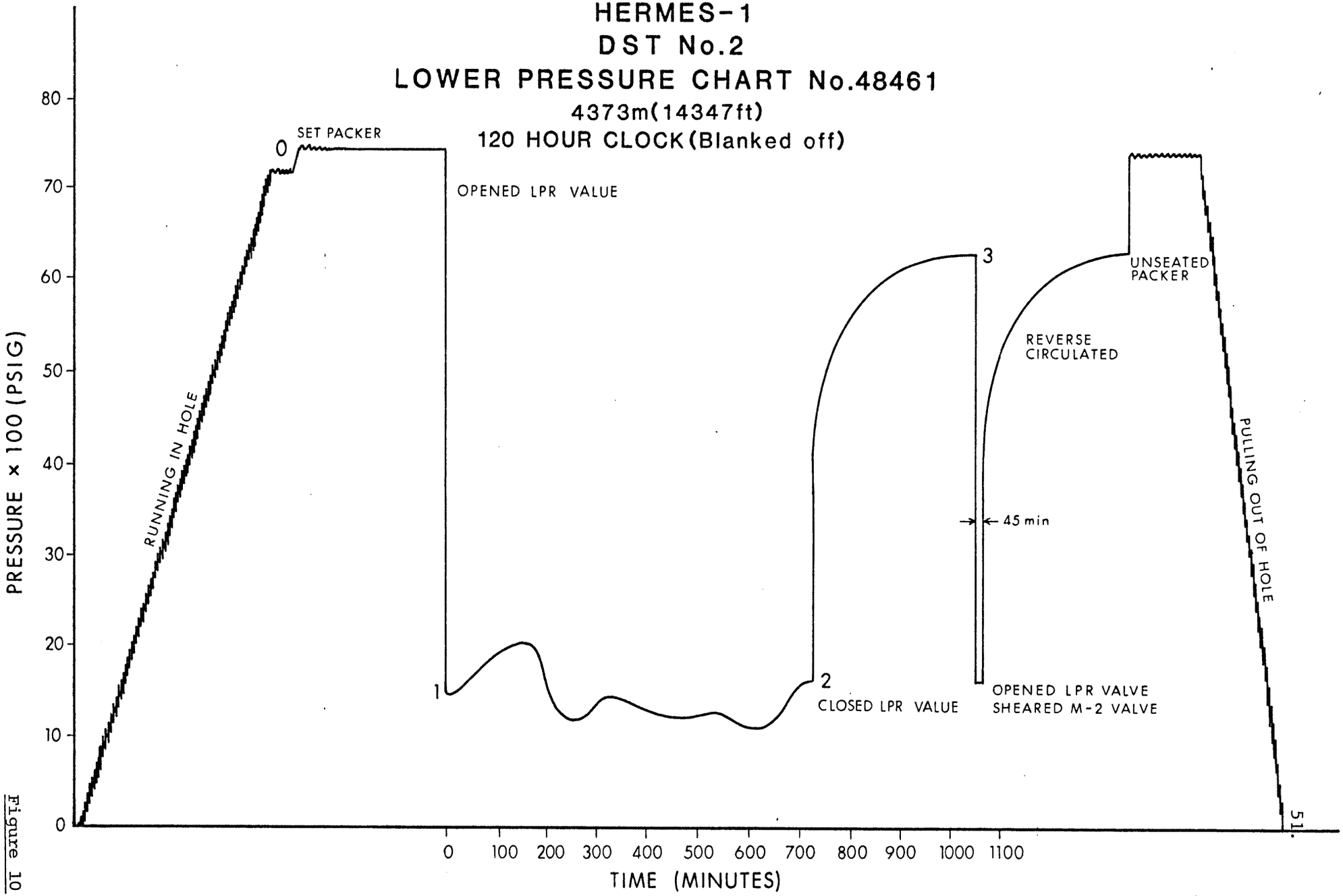


Figure 10

0. Initial hydrostatic pressure (7350psig)
1. Initial flowing pressure (1463 psig)
2 Final flowing / initial shut-in pressure (1623 psig)
3. Final shut-in pressure (6275 psig)

Note: The curve between points 1 and 2 is indicative of a well flowing in heads.

A-5952

PERMIT VIC/P 18 AUSTRALIA

HERMES-1
DST No.2
LOG-LOG PLOT

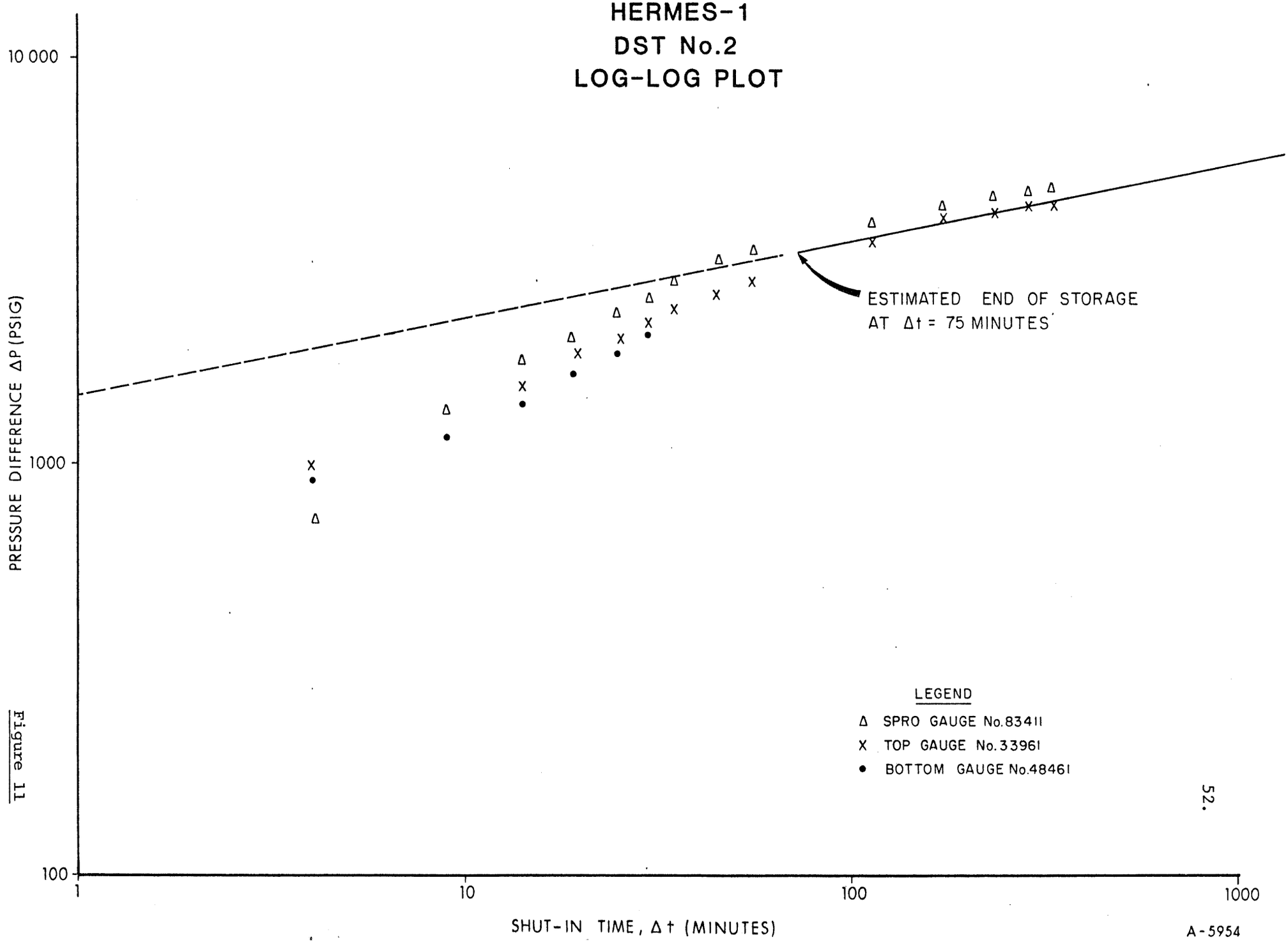


Figure 11

A-5954

HERMES-1
DST No.2
HORNER PLOT

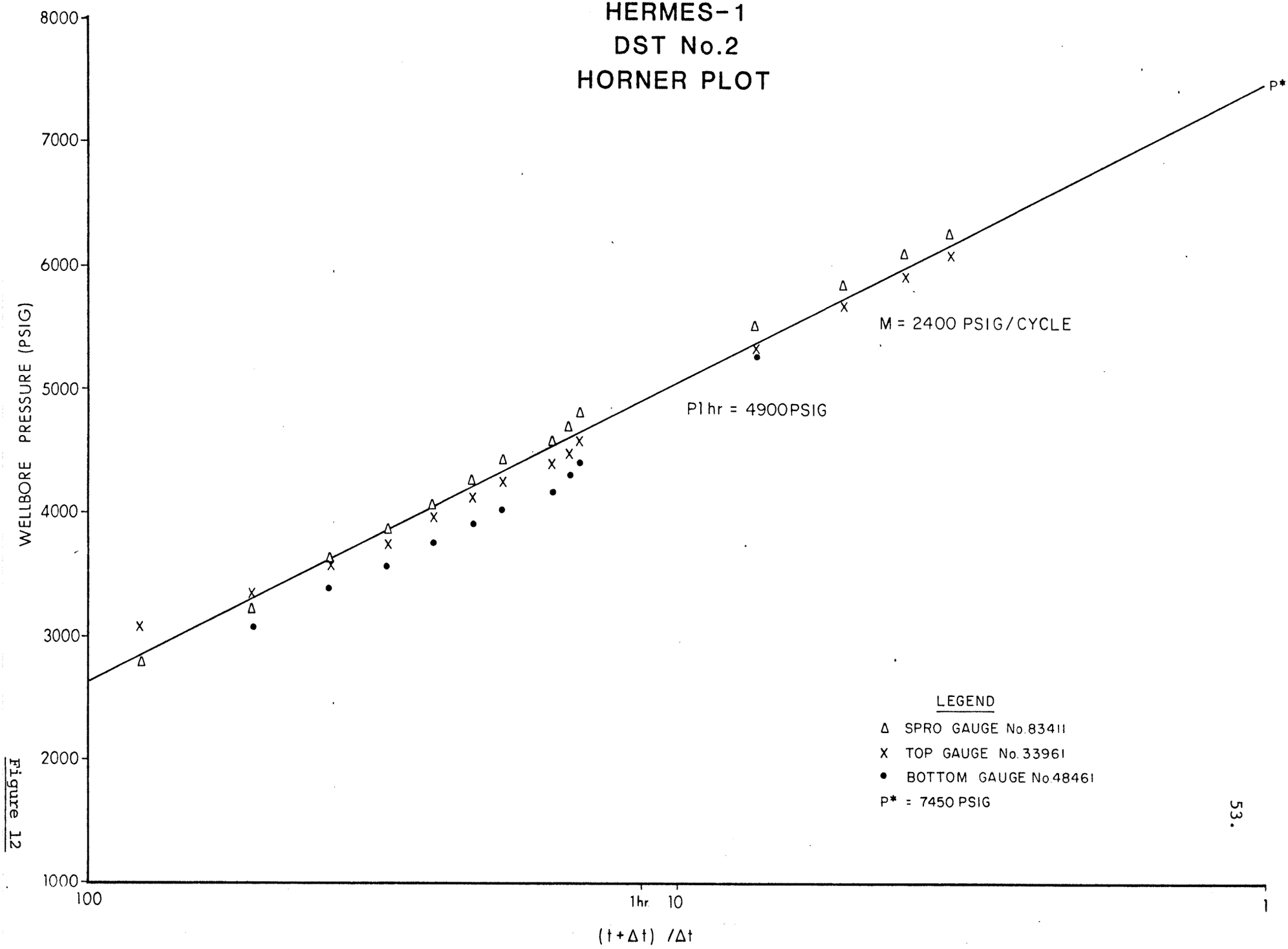


Figure 12

APPENDIX A

FLOPETROL TEST REPORT

(DST NOS. 1 and 2)

FLOPETROL

DIVISION : AUD

BASE : PEO/PERTH

REPORT N° : 010582110582

Well Testing Report

Client : PHILLIPS

Field : HERMES Well : NO. 1

Zone : - Date : MAY 1983

DST #1 - 1st MAY - 6th MAY 1983

DST #2 - 8th MAY - 11th MAY 1983

V°: DOP 100

INDEX

Flopetrol chief operator
Name : C. DAVIES

Client representative
Name : M. ORMSBERG

TEST PROCEDURE - DST #1

1. Schlumberger perforate interval 4415-4425 m, 4427-4431 m, 4432.5-4442 m.

2. The DST string was RIH. The string consisted of : 2 bundle carriers, RTTS packer, LPR test tool with Flopetrol SPRO adapter, APR-M2 sampler, APR-4 circulating valve, two slip joints, Flopetrol SSTT (EZ Tree), Flopetrol lubricator v/v and a surface flowhead.

3. A diesel cushion of 100 stands was placed in the string.

4. The RTTS packer was set at 4400 m.

5. The LPR test valve was opened and the well was flowing through a ¼" bubble hose - weak blow.

6. Once diesel returned to surface the choke was increased to 1¼" ADJ and the flow directed to a gauge tank.

7. The well was shut in to repair a leaking crossover.

8. The well was reopened slowly to 1¼" ADJ + 1" fixed choke.

9. The well then cleaned up and was flowing gas and slugging water.

10. The well was shut in at the master v/v to rig up W.L. The SPRO latch assembly was dropped down the hole damaging the EZ Tree.

11. Annulus pressure was bled off to shut in down hole for P.B.U.

12. The well was then killed by circulation to the shakers. As soon as formation fluid was returned the lines were changed to the flow line to enable sampling to be performed. 3 samples (5 gall containers were taken).

TEST PROCEDURE - DST #2

1. Schlumberger perforate interval 4399.7-4402 m, 4382.5-4387.5 m.
2. The DST string was RIH. The string was the same as for DST #1 with the exception of no lubricator v/v.
3. Halliburton pressure test string + surface lines to 6,000 psi with nitrogen.
4. Bleed off nitrogen to 3,000 psi for nitrogen cushion.
5. The RTTS packer was set at 4370 m.
6. The SPRO latch assembly was RIH.
7. Pressure annulus to open LPR v/v - indication at surface.
8. Open well slowly to 1¼" ADJ + 1" fixed choke to flare bleeding off nitrogen.
9. Gas, then water with small amounts of oil came after nitrogen bled down.
10. Water samples taken. Resistivity and chlorides measured.
11. Close LPR v/v for P.B.U. - well shut in at c/m to obtain gas sample.
12. Bleed tbg pressure to zero.
13. Reopen LPR v/v - W.L. looses signal.
14. W.L. POOH.
15. Reverse circulate - water samples taken.
16. Unseat packer + POOH.
17. Gas sample from Halliburton test tool collected.

END OF DST #2

MAIN RESULTS - DST #1

Tested interval: - Perforations: 4415-4425 m, 4427-4431 m, 4432.5-4442 m.

OPERATION	DURATION	BOTTOM HOLE PRESSURE	WELL HEAD PRESSURE	OIL PROD. RATE	GAS PROD. RATE	G.O.R
Units	Mins	PSIG	PSIG			
Well open to choke manifold thru ¼" bubble hose.	571	4,983	16	-	-	-
Well open on 1¼" ADJ + 1" fixed choke - flowing diesel	597	4,185	4	Estimated 48 Bbls/day	Inconsistent flow	-
Well shut in to repair x over	52	4,354	330	-	-	-
Well open on 1¼" ADJ + 1" fixed choke to burner	778	1,245	20	-	Inconsistent flow	-
Well shut in for P.B.U. at surface	235	2,443	-	-	-	-
Well shut in downhole for P.B.U.	842	6,145	-	-	-	-

Depth of bottom hole measurements : 4400.64 m Reference : RT

Temperature : 306.9°F at : 4400.64 m depth

Separator gas gravity (air : 1) at choke size : 0.76

STO gravity at choke size : -

BSW : See section 7 Water cut : -

REMARKS AND OTHER OPERATIONS

Pressures last ones recorded in the relevant section.
P.B.U. pressure not stabilised.

MAIN RESULTS - DST #2

Tested interval: - Perforations: 4399.7-4402.7 m
4382.5-4387.5 m

OPERATION	DURATION	BOTTOM HOLE PRESSURE	WELL HEAD PRESSURE	OIL PROD. RATE	GAS PROD.RATE	G.O.R
Units	Mins	PSIG	PSIG			
Flowing period 1¼" ADJ + 1" fixed choke	69	1,149	5	-	-	-
Flowing period ¼" ADJ choke	104	1,641	280	-	Estimated 83 MSCFD	-
Well shute in downhole for P.B.U.	310	6,258	-	-	-	-

Depth of bottom hole measurements : 4372.35 m Reference : RT

Temperature : 304.9°F at : 4372.35 m depth

Separator gas gravity (air : 1) at choke size : -

STO gravity at choke size : -

BSW : See Section 7. Water cut : -

REMARKS AND OTHER OPERATIONS

Pressures last ones recorded in the relevant section.
P.B.U. pressure not stabilised (refer (SPRO report).

- OPERATING AND MEASURING CONDITIONS -

A - TYPE OF GAUGE -

BOTTOM HOLE :
Pressure : AMERDA - RPG 3) in two bundle carriers above + below
Temperature : RT7) packer. Both below test tool.

WELL HEAD :
Pressure : FOXBORO, DWT, BOURDON GAUGE
Temperature : FOXBORO, Hg THERMOETER

SEPARATOR :
Pressure :
Temperature :

B - PRODUCTION RATE CONDITIONS AND SOURCES -

OIL PRODUCTION RATE
- ☒ Tank
- ☐ Meter
- ☐ Dump
- ☐ Floco
- ☐ Rotron
- ☐ _____

Reference conditions -
- ☐ Separator
- ☐ Atmospheric pressure 60°F

Shrinkage measurement -
- ☐ With tank
- ☐ With shrinkage tester

GAS PRODUCTION RATE
- ☐ Orifice meter
- ☐ _____

Standard conditions -
14.73 psig @ 60°F

WATER PRODUCTION RATE
- ☐ Tank
- ☐ Meter
- ☐ _____

C - WELL DATA -

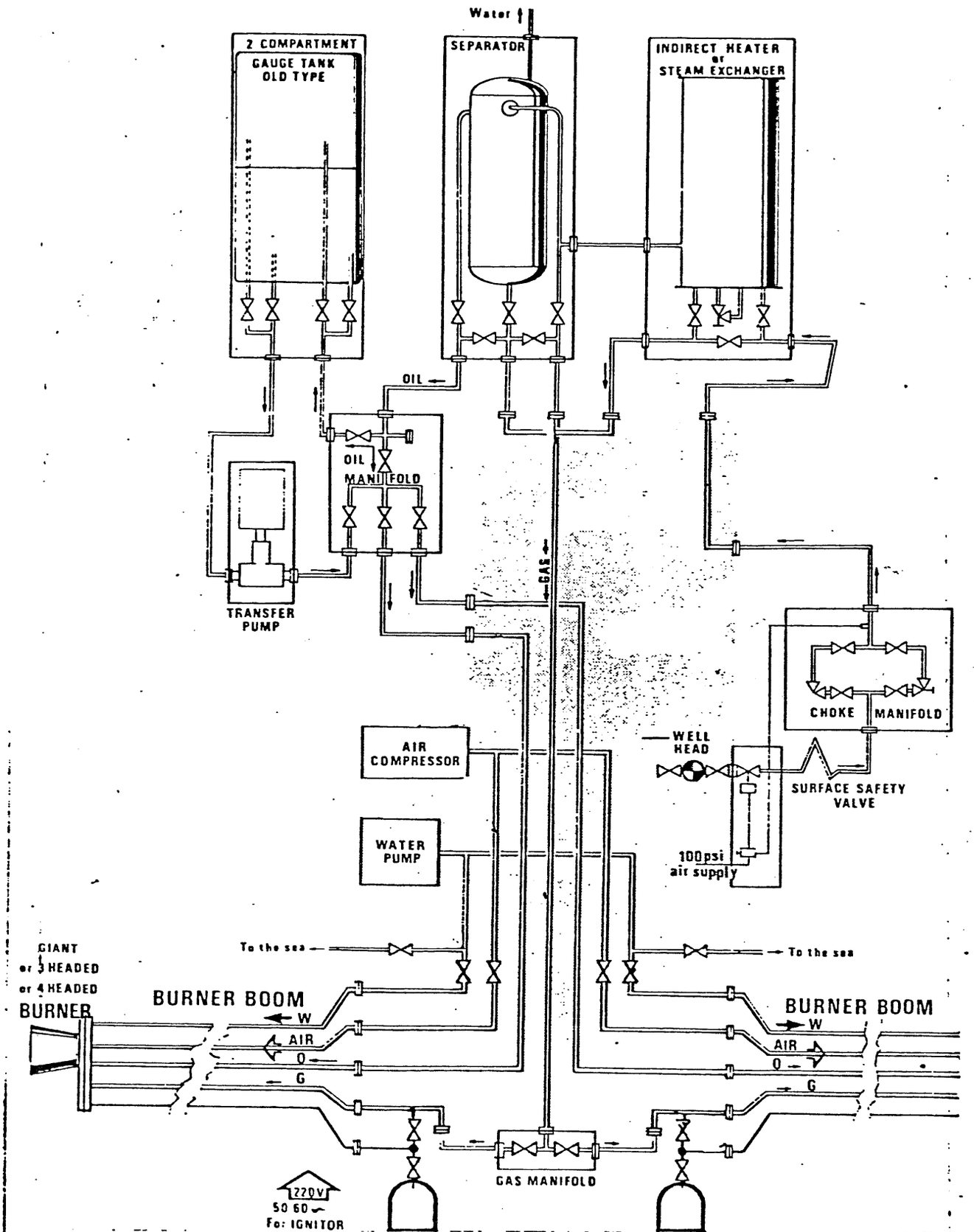
WELL STATE DURING SURVEY :

Well producing through : tubing / drill pipe / casing
Main casing size 7" set at 4547.1 m Total well depth 4564.7 m
Tubing size 3½" D.P. set at _____ Packer RTTS set at 4400 m
Perforations :
- Zone DST #1 From 4415 to 4425 m From 4427 to 4431 m
- Zone - From 4432.5 to 4442 m From _____ to _____
-

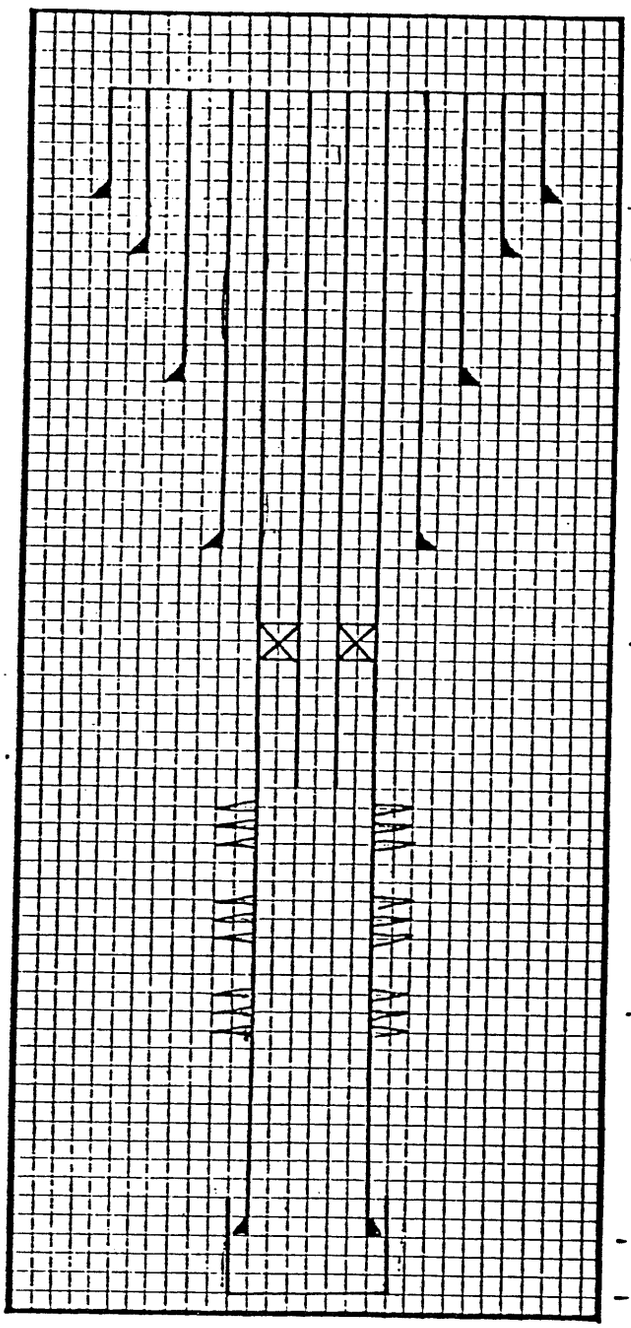
WELL STATE BEFORE TEST :

- ☐ Well closed since -
- ☐ Well flowing since - Producing zone -
  Choke size -

- SURFACE EQUIPMENT LAYOUT -



- WELL COMPLETION DATA - DST No 1

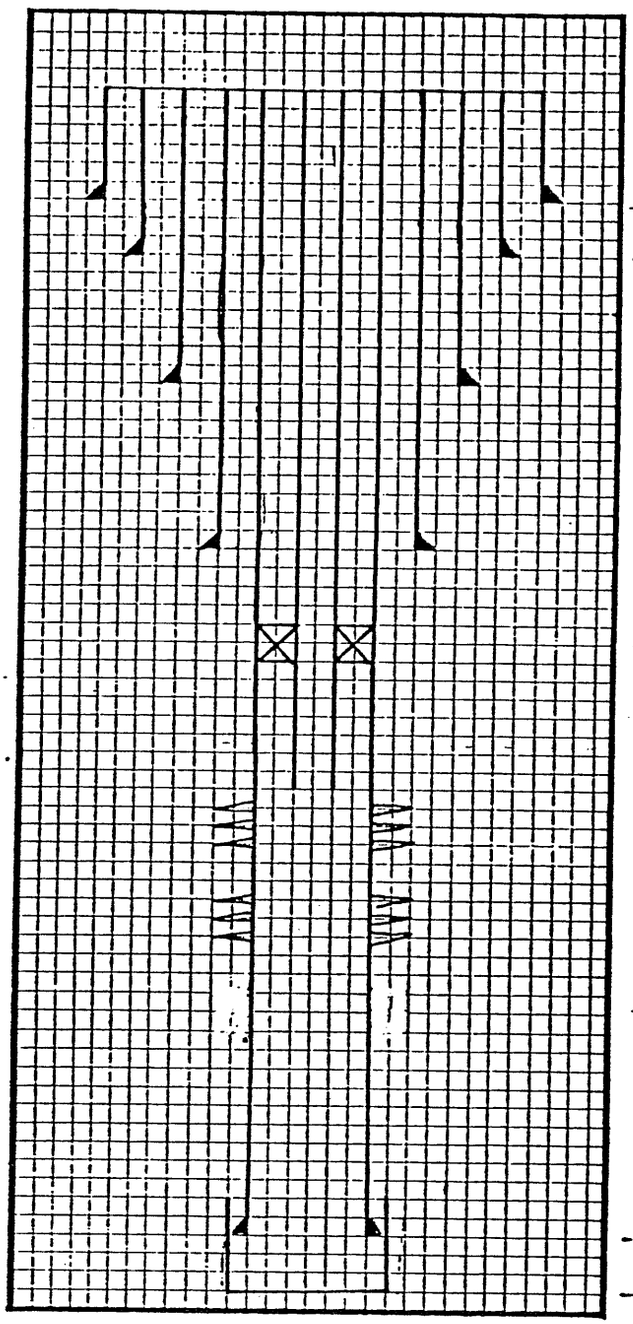


-182 30" Csg
-351·1 20" Csg
-1105 13-3/8" Csg
-2582·3 9-5/8" Csg
-4400 Packer
-4415-4425
-4427-4431
-4432·5-4442
Perforations
-4547·1 7" Csg
-4564·7

REMARKS :

Not to scale.
All measurments in metres.

- WELL COMPLETION DATA - DST No 2



-182 30" Csg
-351·1 20" Csg

-1105 13-3/8" Csg

-2582·3 9-5/8" Csg

-4370 Packer

-4382·5-4387·5
-4399·7-4402·7
Perforations

-4547·1 7" Csg
-4564·7

REMARKS :

Not to scale.
All measurments in metres.

- SEQUENCE OF EVENTS -

DATE	TIME	OPERATION
		DST # 1
		Perforations at 4415-4425 m, 4427-4431 m, 4432.15 - 4442 m.
		Packer: RTTS at 4400 m
		Cushion: Diesel (65 Bbls)
1.5.83	1200	Make dummy run with fluted hanger to check ram positions on
		slick joint
	1500	Make up Halliburton test tools
	1735	Gauges put in bundle carrier (top)
	1830	Gauges put in bundle carrier (bottom)
2.5.83	2030	EZ Tree unlatched on surface + RIH
	2130	Lubricate v/v RIH
3.5.83	0100	Set RTTS packer
	0223	Pressure test surface lines
	0700	Close lower 5" pipe rams
	0722	Pressure annulus to open LPR. Well open through ¼" bubble hose.
	0729	No indication of flow
	0731	Occasional bubble
	0737	LPR cycled to open again
	0738	Occasional bubble
	0749	Bubble intensity starts to increase
	0752	Weak blow thru bubble hose
	0830	Geoservice sample air to regular intervals
	1612	Diesel cushion to surface
	1618	Start flowing to 200 l drum
	1650	Open choke to 1¼" ADJ and flow to gauge tank
	1653	Open 1" fixed choke
	200	Flow rate estimated 2 Bbls/hr

SEQUENCE OF EVENTS (Continuation)

DATE	TIME	OPERATION
3.5.83	2322	Tank bypassed - flow to burners
	2330	Close wing valve on flowline to repair leaking crossover
4.5.83	0022	Open wing v/v thru ¼" ADJ choke
	0025	Increase ADJ choke to 3/8"
	0030	Increase ADJ choke to ½"
	0032	Well slugging diesel
	0043	Increase ADJ choke to 1¼" and open 1" fixed choke
	0345	Well slugging diesel and gas
	0510	Mud to surface
	0700	Water to surface (samples 4-8 taken)
	0800	Only gas to surface
	0846	Water to surface (samples 10-17 taken)
	0925	Switch flow to gas flare
	0945	Only gas to surface
	1305	Water to surface. Rig up W.L. for SPRO operation
	1320	Close master v/V. P.B.U. starts - surface shut in
	1612	Close EZ Tree
	1640	Close swab v/v
	1645	Open master v/v against c/m
	1650	Riser Tbg pressure bled to zero
	1653	Rig up lubricator
	1710	Open swab v/v
	1711	Tool string dropped into hole partially opening EZ Tree
	1712	Lubricator v/v closed - damaged hoses
	1715	LPR v/v closed - well shut in down hole
	1900	Attempts made to open lubricator v/v by pumping into string
	1940	Lubricator v/v open gas pressure to surface. Gas sample taken
		(A8695)
	1955	Finish taking gas sample A8695
	2225	Take gas sample from c/m (A12870)

_ SEQUENCE OF EVENTS _(Continuation)

DATE	TIME	OPERATION
4.5.83	2225	Take gas sample from c/m (A12870)
	2250	Finish taking gas sample A12870
	2335	Open c/m to flare to bleed off pressure
5.5.83	0725	Pressure annulus to open Apr-M2. Nil pressure at c/m
	0748	Start to kill the well by circulation
	0950	Connect flow line to rig manifold to take reservoir fluid
		samples
	1000	Close c/m open rig manifold
	1002	Open well to burners thru adjustable choke. Collect samples
		1-3 in 5 gall plastic containers.
	1036	Close c/m. Continue to circulate to condition
	1500	POOH test string
	1520	Lubricator v/v on surface (hoses damaged)
	1625	EZ Tree on surface - SPRO latch assembly stuck in hydraulic
		assembly of EZ Tree
6.5.83	0645	Pressure gauges on surface
		RTTS packer still in hole
		Schlumberger RIH to tag packer
		RIH to fish packer
7.5.83	0923	Fish on surface
	0950	Lower bundle carrier on surface
		END OF DST #1

- SEQUENCE OF EVENTS -

DATE	TIME	OPERATION
		DST #2
		Perforations : 4399.7 - 4402.7 m, 4382.5 - 4387.5 m
		RRTS Packer : 4370 m
		Cushion : Nitrogen
8.5.83		Schlumberger RIH to perforate internal : 4399.7 - 4402.7 m,
		4382.5 - 4387.5 m
	2235	Fit gauges in lower carrier (gauges RPG 3 : 16955N, 48461,
		RT7 54306
	2319	Fit gauges in upper carrier (gauges RPG3 : 33861, 30508,
		RT7 - Nil)
	2321	RIH with Halliburton test tools
9.5.83	1030	RIH with EZ Tree
	1125	Rig up flowhead, surface equipment + W.L. lubricator
	1352	Close master v/v. Pressure test surface equipment to 6,000 psi
	1405	Bleed down. Pressure through choke manifold
	1418	Halliburton pump 3 Bbls water into string
	1425	Shut in at choke manifold, Halliburton pressure test Tbg to
		6,000 psi
	1615	Bleed down Tbg pressure to 4,000 psi through choke manifold
		(c/m) to flare
	1642	Set packer
	1645	Attempt to RIH with SPRO latch assembly
	1704	Bleed down Tbg pressure to 3,000 psi
	1717	RIH with SPRO latch assembly
	1941	SPRO latched onto gauge
10.5.83	0652	Pressure annulus to open LPR. Well shut in at c/m
	0653	LPR tool open. Pressure indication at surface

SEQUENCE OF EVENTS (Continuation)

DATE	TIME	OPERATION
10.5.83	0655	Open well at c/m through ¼" ADJ choke to flare
	0658	Increase choke to 7/16" ADJ
	0659	Increase choke to ½" ADJ
	0701	Increase choke to 9/16" ADJ
	0703	Increase choke to 11/16" ADJ
	0705	Increase choke to 3/4" ADJ
	0723	Open well up fully on 1¼" ADJ + 1" fixed choke
	0724	Gas to surface
	0725	Switch flow to burners
	0949	Liquid to surface (oil + water)
	1009	Switch flow to flare
	1010	Well slugging gas/water
	1016	Water sample taken in container No. 8
	1030	Flow through separator to take gas sample
	1055	Separator by passed
	1057	Take gas sample A12769 from separator
	1224	Well slugging gas/water
	1230	Water sample taken in container No. 7
	1335	Water sample taken in container No. 5
	1712	Shut in fixed choke. Choke back to ¼" ADJ
	1750	Take gas sample downstream c/m into bottle No. A12683
	1805	Finish taking gas sample
	1815	Water sample taken in container No. 6
	1850	Well shut in. Downhole for P.B.U.
	1900	Well shut in at c/m to obtain gas sample
	2355	Bleed Tbg pressure to zero
11.5.83	0006	Pressure annulus to open LPR v/v. End of P.B.U.
	0010	W.L. looses signal. POOH
	0106	Start to reverse circulate
	0136	Water to surface. Samples collected.

_ SEQUENCE OF EVENTS _(Continuation)

DATE	TIME	OPERATION
11.5.83	0154	End of sampling
	0200	Continue to circulate
	0400	Unseat packer + POOH
	0535	EZ Tree on surface
	1310	Halliburton test tools on surface

No.: DOP 109

FLOPETROL

Base : PEO/PERTH

Client : PHILLIPS

Field : HERMES

Well : NO. 1

- WELL TESTING DATA SHEET -

Section : 7

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Report N° :

DATE - TIME		PRESSURE AND TEMPERATURE MEASUREMENTS							PROD. RATES AND FLUID PROPERTIES					GOR			
		BOTTOM HOLE		WELL HEAD			SEPARATOR		OIL OR CONDENSATE			GAS					
Time	Cumul	Temp.	Pressure	Tg.temp	Tg. press.	Cg. press.	Temp.	Press.	Rate	Gravity	BSW	Rate	Gravity Air = 1				Units
		DST #1															
		Perforations at 4415 - 4425 m, 4427 - 4431 m, 4432.5 - 4442 m.															
		RTTS packer set at 4400 m.															
		Cushion - Diesel 65 Bbls.															
0722	0	306.9		Pressure annulus to open LPR v/v					-	-	-	-	-	-	-	-	-
0729	7	-	4197	No indication of flow at surface					-	-	-	-	-	-	-	-	-
0731	9	-	4198	Occasional bubbles			-	-	-	-	-	-	-	-	-	-	-
0733	11	-	4199	Pressure test water coming back					-	-	-	-	-	-	-	-	-
0737	15	-	4221	Cycle LPR v/v to reopen					-	-	-	-	-	-	-	-	-

LIQUID FLOW RATE MEASURING CONDITIONS :

14.73 psig at 60°F

TESTED INTERVAL : As above

DEPTH REFERENCE : RT

DEPTH OF B.H. MEASUREMENTS : 4372.36 m

FLOPETROL — WELL TESTING DATA SHEET (Continuation)

Page Report N°: 17 — Section : 7

DATE - TIME		PRESSURE AND TEMPERATURE MEASUREMENTS							PROD. RATES AND FLUID PROPERTIES					GOR			
3.5.83		BOTTOM HOLE		WELL HEAD			SEPARATOR		OIL OR CONDENSATE			GAS			AIR FLOW		
Time	Cumul	Temp.	Pressure	Tg. temp	Tg. press.	Cg. press.	Temp.	Press.	Rate	Gravity	BSW	Rate	Gravity		RATE		
HRS	MINS	°F	PSIG	°C	PSIG								Air=1		L/MIN		Units
0737																	
0738	16	-	4236	Occasional bubble					-	-	-	-	-	-	-	-	-
0741	19	-	4239	Water still returning					-	-	-	-	-	-	-	-	-
0745	23	-	4251	Occasional bubble					-	-	-	-	-	-	-	-	-
0749	27	-	4251	Bubble intensity increases					-	-	-	-	-	-	-	-	-
0751	29	-	4258	Water still returning					-	-	-	-	-	-	-	-	-
0752	30	-	4260	Weak blow		-	-	-	-	-	-	-	-	-	-	-	-
0753	31	-	4267	Weak/medium blow		-	-	-	-	-	-	-	-	-	-	-	-
0759	37	-	-	Hose to bottom of bucket. Weak/medium blow					-	-	-	-	-	-	-	-	-
0800	38	306.3	4298	16	1	-	-	-	-	-	-	-	-	-	-	-	-
0830	68	-	4416	16	1	Geoservices analyse			gas. Nil hydrocarbons			-	-	-	-	-	-
0925	123	-	-	16	1	Geoservices analyse			gas. Nil hydrocarbons			-	-	-	-	-	-
-	-	-	-	Between 0925 and 1400 hrs - no change						-	-	-	-	-	-	-	-
1400	398	307.8	5220	16	1	-	-	-	-	-	-	-	-	-	480	-	-
1415	413	-	5233	16	1	-	-	-	-	-	-	-	-	-	420	-	-
1430	428	-	5247	16	1	-	-	-	-	-	-	-	-	-	360	-	-
1445	443	-	5259	16	1	-	-	-	-	-	-	-	-	-	480	-	-
1500	458	307.8	5269	16	1	-	-	-	-	-	-	-	-	-	420	-	-

FLOPETROL — WELL TESTING DATA SHEET (Continuation)

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DATE - TIME		PRESSURE AND TEMPERATURE MEASUREMENTS							PROD. RATES AND FLUID PROPERTIES					GOR			
3.5.83		BOTTOM HOLE		WELL HEAD			SEPARATOR		OIL OR CONDENSATE			GAS			AIR FLOW RATE		
Time	Cumul	Temp.	Pressure	Tg. temp	Tg. press.	Cg. press.	Temp.	Press.	Rate	Gravity	BSW	Rate	Gravity				
HRS	MINS	°F	PSIG	°C	PSIG								Air=1		1/MIN		Units
1500																	
1515	473	-	5277	16	1	-	-	-	-	-	-	-	-	-	420	-	-
1530	488	-	5287	16	1	-	-	-	-	-	-	-	-	-	540	-	-
1545	503	-	5309	16	1	-	-	-	-	-	-	-	-	-	420	-	-
1600	518	307.9	5320	16	1	-	-	-	-	-	-	-	-	-	420	-	-
1612	530	-	-	16	13	Diesel	to surface		-	-	-	-	-	-	-	-	-
1618	536	-	-	Start	to flow	to 200	1 drum		-	-	-	-	-	-	-	-	-
1620	538	-	-	16	13	-	-	-	-	-	-	-	-	-	-	-	-
1630	548	-	5332	16	15	-	-	-	-	-	-	-	-	-	-	-	-
1645	563	-	5320	16	16	-	-	-	-	-	-	-	-	-	-	-	-
1650	568	307.9	5322	Drum	full.	Switch	flow to	gauge	tank through 1.3/14" ADJ choke					-	-	-	-
1653	571	307.9	5327	Open	1" fixed	choke	(well flowing	through 1¼" ADJ	+ 1" fixed choke)					-	-	-	-
1700	578	307.9	5322	16	3	-	-	-	-	-	-	-	-	-	-	-	-
1715	593	-	5322	16	3	-	-	-	-	-	-	-	-	-	-	-	-
1730	608	-	520	16	3	-	-	-	-	-	-	-	-	-	-	-	-
1745	623	-	5315	16	3	Geoservices	sample		gas every	30 mins.	Nil	hydrocarbons		-	-	-	-
1800	638	307.9	5312	15	3	-	-	-	-	-	-	-	-	-	-	-	-
1900	698	07.9	5301	16	4	-	-	-	-	-	-	-	-	-	-	-	-

o: DOP 110

FLOPETROL — WELL TESTING DATA SHEET (Continuation)

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Section : 7

DATE - TIME		PRESSURE AND TEMPERATURE MEASUREMENTS							PROD. RATES AND FLUID PROPERTIES					GOR			
3.5.83		BOTTOM HOLE		WELL HEAD			SEPARATOR		OIL OR CONDENSATE			GAS			H_2S	CO_2	
Time	Cumul	Temp.	Pressure	Tg. temp	Tg. press.	Cg. press.	Temp.	Press.	Rate	Gravity	BSW	Rate	Gravity		PPM	%	
HRS	MINS	°F	PSIG	°C	PSIG								Air=1				Units
1900																	
2000	758	307.9	5284	16	4	Diesel flow rate estimated at 2 BBls/hr						-	-	-	-	-	-
2100	818	307.9	5247	16	4	-	-	-	-	-	-	-	-	-	-	-	-
2130	848	-	5224	16	4	-	-	-	-	-	-	-	-	-	-	-	-
2200	878	307.9	5200	16	4	-	-	-	-	-	-	-	-	-	-	-	-
2230	908	-	5136	16	3	-	-	-	-	-	-	-	-	-	-	-	-
2300	938	307.9	5015	14	4	Approx. 19 Bbls. diesel returned to tank						-	-	-	-	-	-
2330	968	-	4341	Shut in at flow wing v/v to repair leaking crossover								-	-	-	-	-	-
4.5.83																	
0022	1020	-	4422	14	330	Open well to gas flare on ¼" ADJ choke						-	-	-	-	-	-
0023	1021	-	-	14	290	-	-	-	-	-	-	-	-	-	-	-	-
0024	1022	-	-	14	280	Increase choke to 5/16" ADJ						-	-	-	0	Trace	-
0025	1023	-	-	14	250	Increase choke to 3/8" ADJ						-	-	-	-	-	-
0030	1028	-	-	14	267	-	-	-	-	-	-	-	-	-	-	-	-
0032	1030	-	-	Well starting to slug diesel					-	-	-	-	-	-	-	-	-
0036	1034	-	-	Increase choke to ½" ADJ				-	-	-	-	-	-	-	-	-	-
0037	1035	-	3990	14	205	-	-	-	-	-	-	-	-	-	-	-	-
0040	1038	-	-	15	205	-	-	-	-	-	-	-	-	-	-	-	-

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DATE - TIME		PRESSURE AND TEMPERATURE MEASUREMENTS							PROD. RATES AND FLUID PROPERTIES					GOR			
4.5.83		BOTTOM HOLE		WELL HEAD			SEPARATOR		OIL OR CONDENSATE			GAS			H_2S		
Time	Cumul	Temp.	Pressure	Tg. temp	Tg. press.	Cg. press.	Temp.	Press.	Rate	Gravity	BSW	Rate	Gravity		PPM		
HRS	MINS		PSIG	°C	PSIG								Air=1				Units
0040																	
0043	1041	-	-	Increase choke to 1½" ADJ + 1" fixed. Gas + diesel to surface									-	-	-	-	-
0050	1048	-	3694	17	60	-	-	-	-	-	-	-	-	-	-	-	-
0055	1053	-	-	17	15	-	-	-	-	-	-	-	-	-	-	-	-
0100	1058	307.9	3689	17	10	-	-	-	-	-	-	-	-	-	0	-	-
0105	1063	-	-	16	5	-	-	-	-	-	-	-	-	-	-	-	-
0110	1068	-	-	16	4	-	-	-	-	-	-	-	-	-	-	-	-
0115	1073	-	3737	16	3	-	-	-	-	-	-	-	-	-	-	-	-
0120	1078	-	-	16	3	-	-	-	-	-	-	-	-	-	-	-	-
0130	1088	-	3782	16	3	-	-	-	-	-	-	-	-	-	-	-	-
0200	1118	-	3856	16	3	-	-	-	-	-	-	-	-	-	0	-	-
0230	1148	-	3925	15	1	-	-	-	-	-	-	-	-	-	-	-	-
0300	1178	307.3	4000	15	1	-	-	-	-	-	-	-	-	-	0	-	-
0330	1208	-	4002	15	5	Slug of diesel/gas. Lubricator v/v hose damaged. v/v remains open											
0345	1223	-	-	15	4	-	-	-	-	-	-	-	-	-	-	-	-
0400	1238	-	3973	15	4	-	-	-	-	-	-	-	-	-	0	-	-
0500	1298	307.1	3999	15	4	-	-	-	-	-	-	-	-	-	-	-	-
0510	1308	-	-	Mud to surface		-	-	-	-	-	-	-	-	-	-	-	-

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DATE - TIME		PRESSURE AND TEMPERATURE MEASUREMENTS							PROD. RATES AND FLUID PROPERTIES					GOR			
4.5.83		BOTTOM HOLE		WELL HEAD			SEPARATOR		OIL OR CONDENSATE			GAS			H_2S	SAMPLE	SALINIT
Time	Cumul	Temp.	Pressure	Tg. temp	Tg. press.	Cg. press.	Temp.	Press.	Rate	Gravity	BSW	Rate	Gravity		PPM	NO.	PPM
HRS	MINS		PSIG	°C	PSIG								Air=1				Units
0510																	
0520	1318	-	-	BSW: 10% sediment, 90% mud					-	-	-	-	-	-	-	-	-
0530	1328	-	3455	15	30	BSW : 10% mud, 90% water			-	-	-	-	-	-	-	(1	17000
0540	1338	-	-	Water samples 1-3 taken for baroid					-	-	-	-	-	-	-	(2	17000
0552	1350	-	-	15	0	-	-	-	-	-	-	-	-	-	-	(3	17000
0600	1358	-	3248	15	0	-	-	-	-	-	-	-	-	-	0	(4	15000
0615	1373	-	-	14	4	-	-	-	-	-	-	-	-	-	-	(5	16000
0630	1388	-	3253	14	15-20	-	-	-	-	-	-	-	-	-	-	(6	10000
0645	1403	-	-	15	25-30	BSW : trace sediment, 5% condensate, 95% water							-	-	-	(7	10000
0700	1418	305.2	2848	15	35	Water samples 4-9 taken for Baroid					-	-	-	-	0	(8	9000
0715	1433	-	-	15	25	BSW : Trace sediment, 3% mud, 97% water						-	-	-	-	(9	8000
0730	1448	-	2500	15	6	-	-	-	-	-	-	-	-	-	-	-	-
0745	1463	-	-	15	1	-	-	-	-	-	-	-	-	-	-	-	-
0800	1478	-	2539	15	1	-	-	-	-	-	-	-	-	-	0	-	-
0815	1493	-	-	15	1	Nil liquid production - only gas					-	-	-	-	-	-	-
0830	1508	-	2640	15	1	-	-	-	-	-	-	-	-	-	-	(17	6000
0846	1524	-	-	15	50	Liquid to surface			samples 10-17 taken for Baroid				-	-	-	(18	5000
0850	1528	-	-	BSW : 2% sediment, 98% mud/water					-	-	-	-	-	-	-	-	-

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DATE - TIME		PRESSURE AND TEMPERATURE MEASUREMENTS							PROD. RATES AND FLUID PROPERTIES					GOR			
4.5.83		BOTTOM HOLE		WELL HEAD			SEPARATOR		OIL OR CONDENSATE			GAS			H_2S		
Time	Cumul	Temp.	Pressure	Tg.temp	Tg. press.	Cg. press.	Temp.	Press.	Rate	Gravity	BSW	Rate	Gravity		PPM		
HRS	MINS	°F	PSIG	°C	PSIG								Air=1				Units
0850																	
0855	1533	-	-	BSW : 99% water, 1% condensate					-	-	-	-	-	-	-	-	-
0900	1538	303.4	2319	19	60	-	-	-	-	-	-	-	-	-	0	-	-
0915	1553	-	-	21	80	-	-	-	-	-	-	-	-	-	-	-	-
0925	1563	-	1874	Switch flow to gas flat				-	-	-	-	-	-	-	-	-	-
0930	1568	-	1849	20	80	BSW : 1% sediment			99% water. Sample 18 taken for Baroid					-	-	-	-
0945	1583	-	-	20	1	Nil liquid production. Only gas					-	-	-	-	-	-	-
1000	1598	-	1875	20	1	-	-	-	-	-	-	-	-	-	0	-	-
1015	1613	-	-	18	1	-	-	-	-	-	-	-	-	-	-	-	-
1030	1628	-	1903	15	3	-	-	-	-	-	-	-	-	-	-	-	-
1045	1643	-	-	20	25	-	-	-	-	-	-	-	-	-	-	-	-
1100	1658	300.5	1717	16	1	-	-	-	-	-	-	-	-	-	0	-	-
1115	1673	-	-	16	1	-	-	-	-	-	-	-	-	-	-	-	-
1130	1688	-	1803	16	1	-	-	-	-	-	-	-	0.76	-	-	-	-
1145	1703	-	-	16	1	-	-	-	-	-	-	-	-	-	-	-	-
1200	1718	-	1892	16	1	-	-	-	-	-	-	-	-	-	-	-	-
1215	1733	-	-	16	1	-	-	-	-	-	-	-	-	-	-	-	-
1230	1748	-	2025	15	1	-	-	-	-	-	-	-	-	-	-	-	-

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DATE - TIME		PRESSURE AND TEMPERATURE MEASUREMENTS							PROD. RATES AND FLUID PROPERTIES					GOR			
4.5.83		BOTTOM HOLE		WELL HEAD			SEPARATOR		OIL OR CONDENSATE			GAS			H_2S		
Time	Cumul	Temp.	Pressure	Tg.temp	Tg. press.	Cg. press.	Temp.	Press.	Rate	Gravity	BSW	Rate	Gravity		PPM		
HRS	MINS	°F	PSIG	°C	PSIG								Air=1				Units
1230																	
1245	1763	-	-	16	1	-	-	-	-	-	-	-	-	-	-	-	-
1300	1778	299.0	1759	21	30	Water to surface.			Start to rig up SPRO W.L.				-	-	0	-	-
1315	1793	-	-	20	20	-	-	-	-	-	-	-	-	-	-	-	-
1320	1798	299.1	1635	Close master v/v. Rig up lubricator						-	-	-	-	-	-	-	-
1320	0	-	1635	Well shut in at surface. P.B.U. starts						-	-	-	-	-	-	-	-
1612	172	-	2653	Close EZ Tree		-	-	-	-	-	-	-	-	-	-	-	-
1640	200	-	-	Close swab v/v			-	-	-	-	-	-	-	-	-	-	-
1645	205	-	-	20	680	Open master v/v against c/m				-	-	-	-	-	-	-	-
1650	210	-	-	Bleed down pressure to zero					-	-	-	-	-	-	-	-	-
1653	213	-	-	Continue rigging up lubricator					-	-	-	-	-	-	-	-	-
1710	230	-	-	Open swab v/v			-	-	-	-	-	-	-	-	-	-	-
1711	231	-	-	Weak point of SPRO latch breaks. Tool dropped into hole partially opening EZ Tree										-	-	-	-
1712	232	-	-	Lubricator v/v closed. Damaged hoses unable to open hydraulically										-	-	-	-
1715	235	-	-	Annulus pressure bled off. LPR v/v closed						-	-	-	-	-	-	-	-
1715	0	-	-	Well shut in down hole. P.B.U. continues						-	-	-	-	-	-	-	-
1900	105	-	-	Attempt to open lubricator v/v with pressure from above								-	-	-	-	-	-
1940	145	-	-		0	Start taking gas sample from c/m.				Container No. A8695 #1				-	-	-	-

FLOPETROL — WELL TESTING DATA SHEET (Continuation)

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4.5.83		BOTTOM HOLE		WELL HEAD			SEPARATOR		OIL OR CONDENSATE			GAS					
Time	Cumul	Temp.	Pressure	Tg. temp	Tg. press.	Cg. press.	Temp.	Press.	Rate	Gravity	BSW	Rate	Gravity				
HRS	MINS		PSIG		PSIG								Air=1				Units
1940																	
1955	160	-	-	Finish taking gas sample A8695					-	-	-	-	-	-	-	-	-
2225	310	-	-	-	500	Start taking gas sample from c/m.			Container A12870 #2.					Tbg pressure being bled			
				through c/m		-	-	-	-	-	-	-	-	-	-	-	-
2230	315	-	-	-	140	c/m closed		-	-	-	-	-	-	-	-	-	-
2235	320	-	-	-	150	-	-	-	-	-	-	-	-	-	-	-	-
2240	325	-	-	-	160	-	-	-	-	-	-	-	-	-	-	-	-
2245	330	-	-	-	165	-	-	-	-	-	-	-	-	-	-	-	-
2250	335	-	-	-	170	Finish taking gas sample A12870			-	-	-	-	-	-	-	-	-
2255	340	-	-	-	170	-	-	-	-	-	-	-	-	-	-	-	-
2300	345	-	-	-	172	-	-	-	-	-	-	-	-	-	-	-	-
2305	350	-	-	-	177	-	-	-	-	-	-	-	-	-	-	-	-
2310	355	-	-	-	180	-	-	-	-	-	-	-	-	-	-	-	-
2315	360	-	-	-	182	-	-	-	-	-	-	-	-	-	-	-	-
2320	365	-	6385	-	185	-	-	-	-	-	-	-	-	-	-	-	-
2325	370	-	-	-	187	-	-	-	-	-	-	-	-	-	-	-	-
2330	375	-	-	-	190	-	-	-	-	-	-	-	-	-	-	-	-
2335	380	-	-	Bleed off pressure to zero					-	-	-	-	-	-	-	-	-

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DATE - TIME		PRESSURE AND TEMPERATURE MEASUREMENTS							PROD. RATES AND FLUID PROPERTIES					SAMPLE			
		BOTTOM HOLE		WELL HEAD			SEPARATOR		OIL OR CONDENSATE			GAS		NUMBER	RESIST-IVITY	BSW	CENTRIF RESIST.
Time HRS	Cumul MINS	Temp.	Pressure	Tg. temp	Tg. press.	Cg. press.	Temp.	Press.	Rate	Gravity	BSW	Rate	Gravity Air=1				Units
2335																	
5.5.83																	
0717	842	-	-	Pressure annulus to open APR-M_2					-	-	-	-	-	-	-	-	-
0748	-	-	-	Start to kill well by circulating mud					-	-	-	-	-	-	-	-	-
0950	-	-	-	Connect rig manifold to flowline to collect resevoir samples									-	-	-	-	-
1000	-	-	-		2500	c/m closed, rig manifold open					-	-	-	(1	0.526 @ 60.5°F	7% SED 2% OIL 91% MUD/H_2O	0.503 @ 61.5°F
1020	-	-	-	Open to burners through ADJ choke. Collect samples 1, 2, 3										(2	1.49 @ 60.5°F	5% SED 2% OIL 93% MUD/H_2O	1.45 @ 62°F
1036	-	-	-	Close c/m. Continue to circulate					-	-	-	-	-	(3	1.19 @ 60.5°F	1% sed H_2O 99% water	1.140 @ 62°F
1435	-	-	-	Unseat packer			-	-	-	-	-	-	-	-	-	-	-
			END OF DST #1														

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FLOPETROL

Base : PEO/PERTH

Client : PHILLIPS

Field : HERMES

Well : NO. 1

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DATE - TIME		PRESSURE AND TEMPERATURE MEASUREMENTS							PROD. RATES AND FLUID PROPERTIES					GOR			
10.5.83		BOTTOM HOLE		WELL HEAD			SEPARATOR		OIL OR CONDENSATE			GAS					
Time	Cumul	Temp.	Pressure	Tg.temp	Tg. press.	Cg. press.	Temp.	Press.	Rate	Gravity	BSW	Rate	Gravity				
HRS	MINS	°F	PSIG	°C	PSIG								Air = 1				Units
		DST #2															
		Perforated at 4399.6 - 4402.6 m, 4382.5 - 4387.5 m															
		RTTS packer set at 4370 m															
		Cushion : Nitrogen															
0652		Pressure annulus to open LPR valve. Well shut in at choke manifold (c/m)															
0653		-	-	-	3030	-	-	-	-	-	-	-	-	-	-	-	-
0653	0	LPR tool open			-	-	-	-	-	-	-	-	-	-	-	-	-
0655	2	Open well at choke manifold through ¼" ADJ. Choke to flare									-	-	-	-	-	-	-
0655	2	304.9	1514	16	3100	-	-	-	-	-	-	-	-	-	-	-	-

LIQUID FLOW RATE MEASURING CONDITIONS :

TESTED INTERVAL : As above

DEPTH REFERENCE : RT

DEPTH OF B.H. MEASUREMENTS : 4400.64 m

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10.4.83		BOTTOM HOLE		WELL HEAD			SEPARATOR		OIL OR CONDENSATE			GAS					
Time	Cumul	Temp.	Pressure	Tg.temp	Tg. press.	Cg. press.	Temp.	Press.	Rate	Gravity	BSW	Rate	Gravity				
HRS	MINS	°F	PSIG	°C	PSIG								Air=1				Units
0655																	
0656	3	-	1518	16	3050	-	-	-	-	-	-	-	-	-	-	-	-
0657	4	-	1518	16	2850	-	-	-	-	-	-	-	-	-	-	-	-
0658	5	Increase choke to 7/16" ADJ				-	-	-	-	-	-	-	-	-	-	-	-
0658	5	-	1324	16	2600	-	-	-	-	-	-	-	-	-	-	-	-
0659	6	Increase choke to ½" ADJ				-	-	-	-	-	-	-	-	-	-	-	-
0659	6	-	1334	16	2300	-	-	-	-	-	-	-	-	-	-	-	-
0700	7	300.8	1333	15	2100	-	-	-	-	-	-	-	-	-	-	-	-
0701	8	Increase choke to 9/16" ADJ				-	-	-	-	-	-	-	-	-	-	-	-
0701	8	-	1533	15	1850	-	-	-	-	-	-	-	-	-	-	-	-
0702	9	-	1539	14	1600	-	-	-	-	-	-	-	-	-	-	-	-
0703	10	Increase choke to 21/32" ADJ				-	-	-	-	-	-	-	-	-	-	-	-
0703	10	-	-	13	1400	-	-	-	-	-	-	-	-	-	-	-	-
0704	11	Increase choke to 11/16" ADJ				-	-	-	-	-	-	-	-	-	-	-	-
0704	11	-	-	13	1150	-	-	-	-	-	-	-	-	-	-	-	-
0705	12	Increase choke to 3/4" ADJ				-	-	-	-	-	-	-	-	-	-	-	-
0705	12	-	-	13	950	-	-	-	-	-	-	-	-	-	-	-	-
0706	13	-	-	12	850	-	-	-	-	-	-	-	-	-	-	-	-

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DATE - TIME		PRESSURE AND TEMPERATURE MEASUREMENTS							PROD. RATES AND FLUID PROPERTIES					GOR			
10.4.83		BOTTOM HOLE		WELL HEAD			SEPARATOR		OIL OR CONDENSATE			GAS					
Time	Cumul	Temp.	Pressure	Tg.temp	Tg. press.	Cg. press.	Temp.	Press.	Rate	Gravity	BSW	Rate	Gravity				
HRS	MINS	°F	PSIG	°C	PSIG								Air=1				Units
0706																	
0707	14	-	15	12	775	Nil hydrocarbons			-	-	-	-	-	-	-	-	-
0708	15	-	-	12	700	-	-	-	-	-	-	-	-	-	-	-	-
0709	16	-	-	12	650	-	-	-	-	-	-	-	-	-	-	-	-
0710	17	-	-	12	560	-	-	-	-	-	-	-	-	-	-	-	-
0711	18	-	-	12	450	-	-	-	-	-	-	-	-	-	-	-	-
0712	19	-	1541	12	400	Nil hydrocarbons			-	-	-	-	-	-	-	-	-
0713	20	-	-	12	375	-	-	-	-	-	-	-	-	-	-	-	-
0714	21	-	-	12	300	-	-	-	-	-	-	-	-	-	-	-	-
0715	22	2975	-	12	220	-	-	-	-	-	-	-	-	-	-	-	-
0716	23	-	-	12	180	-	-	-	-	-	-	-	-	-	-	-	-
0717	24	-	1580	12	155	-	-	-	-	-	-	-	-	-	-	-	-
0718	25	-	-	12	120	Nil hydrocarbons			-	-	-	-	-	-	-	-	-
0719	26	-	-	12	120	-	-	-	-	-	-	-	-	-	-	-	-
0720	27	-	-	12	110	-	-	-	-	-	-	-	-	-	-	-	-
0721	28	-	-	12	85	-	-	-	-	-	-	-	-	-	-	-	-
0722	29	-	1611	12	80	-	-	-	-	-	-	-	-	-	-	-	-
0721	30	0	full	11	ART + 1" fl												

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DATE - TIME		PRESSURE AND TEMPERATURE MEASUREMENTS							PROD. RATES AND FLUID PROPERTIES					GOR			
10.4.83		BOTTOM HOLE		WELL HEAD			SEPARATOR		OIL OR CONDENSATE			GAS					
Time	Cumul	Temp.	Pressure	Tg. temp	Tg. press.	Cg. press.	Temp.	Press.	Rate	Gravity	BSW	Rate	Gravity				
HRS	MINS	°F	PSIG	°C	PSIG								Air=1				Units
0723																	
0723	30	-	-	13	50	-	-	-	-	-	-	-	-	-	-	-	-
0724	31	Gas to surface			-	-	-	-	-	-	-	-	-	-	-	-	-
0725	32	Switch flow to burners				-	-	-	-	-	-	-	-	-	-	-	-
0726	33	-	-	14	46	-	-	-	-	-	-	-	-	-	0	-	-
0727	34	-	1628	14	41	-	-	-	-	-	-	-	-	-	-	-	-
0728	35	-	-	14	36	-	-	-	-	-	-	-	-	-	-	-	-
0729	36	-	-	14	33	-	-	-	-	-	-	-	-	-	-	15	-
0730	37	299.6	-	15	31	-	-	-	-	-	-	-	-	-	-	-	-
0731	38	-	-	15	29	-	-	-	-	-	-	-	-	-	-	-	-
0732	39	-	1650	15	28	-	-	-	-	-	-	-	-	-	-	-	-
0733	40	-	-	15	26	-	-	-	-	-	-	-	-	-	-	-	-
0734	41	-	-	15	25	-	-	-	-	-	-	-	-	-	-	-	-
0735	42	-	-	15	25	-	-	-	-	-	-	-	-	-	-	-	-
0740	47	-	-	16	20	-	-	-	-	-	-	-	-	-	-	-	-
0745	52	301.8	-	16	19	-	-	-	-	-	-	-	-	-	-	2	-
0750	57	-	-	16	16	-	-	-	-	-	-	-	-	-	-	-	-
0755	62	-	-	16	15	-	-	-	-	-	-	-	-	-	0	-	-

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DATE - TIME		PRESSURE AND TEMPERATURE MEASUREMENTS							PROD. RATES AND FLUID PROPERTIES					GOR			
10.4.83		BOTTOM HOLE		WELL HEAD			SEPARATOR		OIL OR CONDENSATE			GAS			H_2S	CO_2	CHLORI
Time	Cumul	Temp.	Pressure	Tg.temp	Tg. press.	Cg. press.	Temp.	Press.	Rate	Gravity	BSW	Rate	Gravity		PPM	%	mg/l
HRS	MINS	°F	PSIG	°C	PSIG								Air=1				Units
0755																	
0800	67	302.2	1751	16	16	-	-	-	-	-	-	-	-	-	0	Trace	-
0805	72	-	-	16	17	-	-	-	-	-	-	-	-	-	-	-	-
0810	77	-	-	16	17	-	-	-	-	-	-	-	-	-	-	-	-
0815	82	301.7	1814	16	17	-	-	-	-	-	-	-	-	-	-	-	-
0820	87	-	-	16	17	-	-	-	-	-	-	-	-	-	-	-	-
0825	92	-	-	16	15	-	-	-	-	-	-	-	-	-	-	-	-
0830	97	307.7	1872	17	14	-	-	-	-	-	-	-	-	-	0	Trace	-
0835	102	-	-	17	13	-	-	-	-	-	-	-	-	-	-	-	-
0840	107	-	-	17	11	-	-	-	-	-	-	-	-	-	-	-	-
0845	112	300.7	1943	17	11	-	-	-	-	-	-	-	-	-	-	-	-
0900	127	300.5	2012	17	8	-	-	-	-	-	-	-	-	-	0	Trace	-
0915	142	300.5	2068	17	5	-	-	-	-	-	-	-	-	-	-	-	-
0930	157	300.4	2079	17	5	-	-	-	-	-	-	-	-	-	-	-	-
0945	172	300.4	1905	17	10	-	-	-	-	-	-	-	-	-	-	-	-
0949	176	Oil + water to surface. 45% water, 55% oil							-	-	-	-	-	-	-	-	-
0955	182	-	-	17	40	-	-	-	-	-	-	-	-	-	-	-	2500
0957	184	-	-	17	50	-	-	-	-	-	-	-	-	-	-	-	7500

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DATE - TIME		PRESSURE AND TEMPERATURE MEASUREMENTS							PROD. RATES AND FLUID PROPERTIES					GOR			
10.5.83		BOTTOM HOLE		WELL HEAD			SEPARATOR		OIL OR CONDENSATE			GAS			H_2S	CHLORIDE	RESIS
Time	Cumul	Temp.	Pressure	Tg.temp	Tg. press.	Cg.press.	Temp.	Press.	Rate	Gravity	BSW	Rate	Gravity		PPM	mg/l	@ °F
HRS	MINS	°F	PSIG	°C	PSIG								Air=1				Units
0957																	
1000	187	300.2	1602	17	50	-	-	-	-	-	-	-	-	-	0	-	-
1005	192	-	-	17	100	-	-	-	-	-	-	-	-	-	-	3 140000	-
1009	196	Switch flow to flare		-	-	-	-	-	-	-	-	-	-	-	-	-	-
1010	197	Tbg pressure fluctuating 50-100 psig					-	-	-	-	-	-	-	-	-	4 62000	
1013	200	BSW - 2% sediment, 4% oil, 94% water					-	-	-	-	-	-	-	-	-	-	-
1015	202	299.0	1383	19	40	-	-	-	-	-	-	-	-	-	-	-	-
1016	203	Water sample taken in container No. 8						-	-	-	-	-	-	-	-	-	-
1020	207	-	-	19	60	-	-	-	-	-	-	-	-	-	-	5 22500	-
1023	210	BSW - 2% sediment, 5% oil/condesante, 93% water							-	-	-	-	-	-	-	-	-
1025	213	-	-	21	50	-	-	-	-	-	-	-	-	-	-	-	-
1030	217	Flow through separator to take gas sample						-	-	-	-	-	-	-	0	-	-
1030	217	297.7	1285	21	40	-	-	-	-	-	-	-	-	-	-	-	-
1035	222	-	-	19	30	-	-	-	-	-	-	-	-	-	-	-	-
1043	230	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7 16500	-
1045	232	297.3	1238	19	20	-	-	-	-	-	-	-	-	-	-	-	-
1054	241	BSW - 2% sediment, 1% condensate emulsion, 97% water								-	-	-	-	-	-	-	0.2975
																	@ 71°F

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DATE - TIME		PRESSURE AND TEMPERATURE MEASUREMENTS							PROD. RATES AND FLUID PROPERTIES					GOR			
10.5.83		BOTTOM HOLE		WELL HEAD			SEPARATOR		OIL OR CONDENSATE			GAS					RESIS
Time	Cumul	Temp.	Pressure	Tg.temp	Tg. press.	Cg.press.	Temp.	Press.	Rate	Gravity	BSW	Rate	Gravity		H2S	CHLORIDE	@ °F
HRS	MINS	°F	PSIG	°C	PSIG								Air=1		PPM	Mg/L	Units
1054																	
1055	242	-	-	19	15	-	-	-	-	-	-	-	-	-	-	-	-
1055	242	BY PASS SEPARATOR FLOW TO FLARE							-	-	-	-	-	-	-	-	-
1057	244	TAKE GAS SAMPLE A12769 FROM SEPARATOR							-	-	-	-	-	-	-	-	-
1100	247	296.6	1269	16	13	-	-	-	-	-	-	-	-	-	0	8 16500	-
1107	254	FINISH TAKING GAS SAMPLE #A12769 #3					-	-	-	-	-	-	-	-	-	-	-
1115	262	295.8	1307	16	6	-	-	-	-	-	-	-	-	-	-	9 15500	-
1130	277	295.9	1346	16	4	-	-	-	-	-	-	-	-	-	-	10 14000	0.307 @ 65°F
1130	277	BSW - 2% SEDIMENT, TRACE CONDENSATE 98% WATER							-	-	-	-	-	-	-	-	-
1145	292	295.3	1405	15	2	-	-	-	-	-	-	-	-	-	-	11 1200	0.325 @ 68°F
															0	-	-
1224	331	WELL SLUGGING WATER/GAS				-	-	-	-	-	-	-	-	-	-	13000	-
1230	337	294.5	1419	16	20	-	-	-	-	-	-	-	-	-	-	-	-
1230	337	WATER SAMPLE TAKEN IN CONTAINER NO. 7					-	-	-	-	-	-	-	-	-	-	-
1245	352	294.1	1365	18	25	-	-	-	-	-	-	-	-	-	-	-	-
1245	352	BSW - 2% SEDIMENT 98% WATER				-	-	-	-	-	-	-	-	-	-	-	-
1315	382	293.9	1310	18	20	-	-	-	-	-	-	-	-	-	-	10500	-

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DATE - TIME		PRESSURE AND TEMPERATURE MEASUREMENTS							PROD. RATES AND FLUID PROPERTIES					GOR			
0.5.83		BOTTOM HOLE		WELL HEAD			SEPARATOR		OIL OR CONDENSATE			GAS			H_2S	CHLORIDE	RESIS
ime	Cumul	Temp.	Pressure	Tg.temp	Tg. press.	Cg.press.	Temp.	Press.	Rate	Gravity	BSW	Rate	Gravity		ppm	Mg/L	@ °F
RS	MIHS	°F	PSIG	°C	PSIG								Air=1				Units
315																	
330	397	293.5	1278	19	15	-	-	-	-	-	-	-	-	-	-	14 10000	-
335	402	WATER SAMPLE TAKEN IN CONTAINER NO. 5						-	-	-	-	-	-	-	-	-	-
345	412	292.7	1237	20	15	-	-	-	-	-	-	-	-	-	-	15 9000	.464 @629
345	412	BSW - TRACE SEDIMENT, TRACE CONDENSATE 98% WATER							-	-	-	-	-	-	-	16 8500	-
400	427	292.3	1214	19	10	-	-	--	-	-	-	-	-	-	-	17 8000	-
405	432	BSW - TRACE SEDIMENT, TRACE CONDENSATE, 98% WATER							-	-	-	-	-	-	-	-	-
415	442	292.0	1201	17	15	-	-	--	-	-	-	-	-	-	-	18 7500	-
430	457	291.3	1100	19	12	-	-	--	-	-	-	-	-	-	-	19 7500	-
430	457	BSW - TRACE SEDIMENT, TRACE CONDENSATE, 98% WATER							-	-	-	-	-	-	-	-	.512 @ 61°F
445	472	290.9	1217	18	5	-	-	-	-	-	-	-	-	-	-	20 7000	.560 @ 61°F
500	487	290.8	1240	18	2	-	-	-	-	-	-	-	-	-	0	21 7000	-
515	502	291.3	1253	18	5	-	-	-	-	-	-	-	-	-	-	22 7000	.560 @ 61°F
530	517	290.9	1237	18	5	-	-	-	-	-	-	-	-	-	-	23 6750	-
545	532	290.4	1212	18	8	-	-	-	-	-	-	-	-	-	-	24 6750	-
545	532	BSW - TRACE SEDIMENT, 5% CONDENSATE EMULSION, 95% water							-	-	-	-	-	-	-	-	-
600	547	289.9	1170	18	20	-	-	-	-	-	-	-	-	-	0	25 6500	0
615	562	289.6	1140	18	6	-	-	-	-	-	-	-	-	-	-	26 6250	.626 @61oF

FLOPETROL — WELL TESTING DATA SHEET (Continuation) — Page : 34 — Report N°: — Section : 7

DATE - TIME		PRESSURE AND TEMPERATURE MEASUREMENTS							PROD. RATES AND FLUID PROPERTIES					GOR			
10.5.83		BOTTOM HOLE		WELL HEAD			SEPARATOR		OIL OR CONDENSATE			GAS			H_2S	CHLORIDE	RESIS
Time	Cumul	Temp.	Pressure	Tg. temp	Tg. press.	Cg. press.	Temp.	Press.	Rate	Gravity	BSW	Rate	Gravity		ppm	Mg/L	@ °F
HRS	MINS	°F	PSIG	°C	PSIG							MSCFD	Air=1				Units
1615																	
1615	562	BSW - TRACE SEDIMENT, 5% CONDENSATE EMULSION, 95% WATER															
1630	577	289.4	1130	17	10	-	-	-	-	-	-	-	-	-	-	27 6500	-
1645	592	289.0	1125	16	10	-	-	-	-	-	-	-	-	-	-	28 6250	.602 @ 61°F
1645	592	BSW - TRACE SEDIMENT, 5% CONDENSATE EMULSION, 95% WATER							-	-	-	-	-	-	-	-	-
1700	607	288.7	1149	16	5	-	-	-	-	-	-	-	-	-	0	29 6000	-
1712	619	SHUT IN FIXED CHOKE, CHOKE BACK TO ¼" ADJ.					-		-	-	-	-	-	-	-	-	-
1715	622	288.6	1172	16	45	-	-	-	-	-	-	ESTIMATED 83.0	-	-	-	30 6000	-
1730	637	289.0	1301	16	83	-	-	-	-	-	-	-	-	-	-	-	-
1745	652	289.3	1375	16	100	-	-	-	-	-	-	-	-	-	-	-	-
1750	657	TAKE GAS SAMPLE FROM C/M INTO BOTTLE A12683 #4					-	-	-	-	-	-	-	-	-	-	-
1800	667	289.7	1420	17	135	-	-	-	-	-	-	-	-	-	0	-	-
1805	672	FINISH GAS SAMPLE #A12683				-	-	-	-	-	-	-	-	-	-	-	-
1815	682	290.2	1513	17	200	-	-	-	-	-	-	-	-	-	-	31 -	.705 @ 57°F
1815	682	WATER SAMPLE TAKEN IN CONTAINER NO. 6					-	-	-	-	-	-	-	-	-	-	-
1830	697	290.7	1575	17	250	-	-	-	-	-	-	-	-	-	-	-	-
1845	712	290.2	1641	17	280	-	-	-	-	-	-	-	-	-	-	-	-
1856	723/0	WELL SHUT IN DOWN HOLE FOR P.B.U.					-	-	-	-	-	-	-	-	-	-	-

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FLOPETROL _WELL TESTING DATA SHEET_(Continuation)

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DATE - TIME		PRESSURE AND TEMPERATURE MEASUREMENTS							PROD. RATES AND FLUID PROPERTIES					GOR			
10.5.83		BOTTOM HOLE		WELL HEAD			SEPARATOR		OIL OR CONDENSATE			GAS					
Time	Cumul	Temp.	Pressure	Tg. temp	Tg. press.	Cg. press.	Temp.	Press.	Rate	Gravity	BSW	Rate	Gravity				
HRS	MINS												Air=1				Units
1856																	
1900	4	WELL SHUT IN AT C/M TO OBTAIN GAS SAMPLE #5							-	-	-	-	-	-	-	-	-
1905	9	START TAKING GAS SAMPLE A5869		-			-	-	-	-	-	-	-	-	-	-	-
1915	19	FINISH TAKING SAMPLE A5869		-			-	-	-	-	-	-	-	-	-	-	-
2355	299	BLEED Tbg PRESSURE TO ZERO THRU C/M					-	-	-	-	-	-	-	-	-	-	-
11.5.83																	
0006	310	PRESSURE ANNULUS TO OPEN LPR V/V - END OF P.B.U.							-	-	-	-	-	-	-	-	-
0010	-	W.L. LOOSES SIGNAL - P.O.O.H.					-	-	-	-	-	-	-	-	-	-	-
0106	-	START TO REVERSE CIRCULATE					-	-	-	-	-	-	-	-	-	-	-
0136	-	WATER TO SURFACE - SAMPLES COLLECTED IN 5 GAL PLASTIC CONTAINERS									-	-	-	-	-	-	-
0154	-	END OF SAMPLING	-	-	-		-	-	-	-	-	-	-	-	-	-	-
0200	-	CONTINUE TO CONDITION WELL		-			-	-	-	-	-	-	-	-	-	-	-
0400	-	UNSEAT PACKER AND POOH TEST STRING					-	-	-	-	-	-	-	-	-	-	-
0535	-	EZ TREE ON SURFACE		-	-		-	-	-	-	-	-	-	-	-	-	-
.310	-	TAKE GAS SAMPLE FROM HALLIBURTON TEST TOOL IN OIL SAMPLE BOTTLE 20112-113 #6											-	-	-	-	-
.320	-	CONDENSATE S.G. FROM TEST TOOL - API 50 AT 68°F															
									END DST #2								

INDEX of ANNEXES

BOTTOM HOLE PRESSURE AND TEMPERATURE MEASUREMENTS

A - PRESSURE -

a) READING USING CALIBRATED CHART :

Chart is read using as reference line the base line drawn at atmospheric pressure.

$$P = KY + a + C$$

Y is the deflection for pressure P.
K, a and C (non linearity correction) are obtained from calibration by least square calculation.

b) READING USING REFERENCE LINE METHOD :

Chart is read using as reference line a line drawn at pressure P_R.

$$P = KY + P_{RC} + C$$

Y is the deflection for pressure P read from the reference line.
$P_{RC} = KY_R + a$: calculated pressure for reference line.
P_{RC}, K and C are obtained from calibration data.

B - TEMPERATURE -

Chart is read from zero at base line.
Bottom hole temperature is read from constructor's calibration tables at the point corresponding to the deflection

☐ Base line is drawn with adjusting knob held against the stop.
Therefore $Y_O = 0$

☐ Base line is drawn at temperature $T_O =$ _____ -
From calibration tables the corresponding deflection $Y_O =$ _____ -

C - GENERAL INFORMATION -

Reference depth : _____
Difference level between the two pressure elements : _____

SUMMARY OF GAUGES USED:

DST 1

PRESSURE ELEMENT	RECORDING SECTION	CLOCK NO.	CLOCK RANGE	BUNDLE CARRIER
30508/10K	11893	F4782	120 HR	UPPER
16955/10K	10730	F13188	120 HR	UPPER
H338/60-400°F	-	E12677	72 HR	UPPER
33961/10K	27317	E8688	72 HR	LOWER
48461/10K	2384	F13190	120 HR	LOWER
54306/200-350°F	26032	E8687	72 HR	LOWER

DST 2

16955/10K	10730	F13188	120 HR	LOWER
48461/10K	2384	F13190	120 HR	LOWER
54306/200-350°F	26032	E8687	72 HR	LOWER
33961/10K	71372	E8688	72 HR	UPPER
30508/10K	11893	F4782	120 HR	UPPER
SPRO GAUGE - SEE SEPARATE REPORT				

BOTTOM HOLE PRESSURE GAUGE CALIBRATION SHEET

DATE : 23.04.83 CALIBRATION No. : 1

EQUIPMENT DATA

Calibration cell No. : _____ Manufacturer : _____
Dead weight tester No. : _____ Manufacturer : _____ Range : _____
Recording element No. : 10730 Manufacturer : GRC
Pressure element No. : 16995N Manufacturer : GRC Range : 0-10000 psig

MISCELLANEOUS INFORMATION

Base line drawing temperature : 20°C
Reference line data - temperature : _____ - pressure P_R : _____ - reading Y_R : _____
Calibration data - temperature : 300°F - step drawing : [X] with crank [ ] with clock

Equivalent pressure p of level difference between Dwt and bellows
Level difference : _____ [ ] + in case of Dwt above
Oil specific gravity : _____ p = _____ [ ] - in case of Dwt beneath bellows.

CALIBRATION READING AND CALCULATIONS

P (Dwt) PSIG	Y INCH	ΔY	Y^2 Units on this line	Y P	Pc = KY+a PSI	C=P-Pc PSI
1000	0.1936				1017.59	-17.59
2000	0.3872				2005.40	- 5.40
3000	0.5818				2998.31	1.69
4000	0.7759				3988.67	11.33
5000	0.9715				4986.68	13.32
6000	1.1669				5983.67	16.33
7000	1.3646				6992.40	7.60
8000	1.5635				8007.24	-7.24
9000	1.762				9020.05	-20.05
45000	8.7670	Σ	10.8447	55594.100		Σ+ : 50.29 Σ- : -50.29

$A = \frac{\Sigma P}{n} =$ 5000.00 $B = \frac{\Sigma Y}{n} =$ 0.9741

$D = \frac{\Sigma (YP)}{\Sigma Y} =$ 61341.2912 $C = \frac{\Sigma (Y^2)}{\Sigma Y} =$ 1.2370 $K = \frac{A - D}{C - B} =$ _____

$a' = A - BK =$ 28.78 $a' = D - CK =$ 29.78

FINAL RESULTS

K = 5102.3100 psi/inch $P_{RC} = KY_R + a =$ _____
$a = a' + p =$ _____

BOTTOM HOLE PRESSURE GAUGE CALIBRATION SHEET

DATE : 23.04.83 CALIBRATION No. : 2

EQUIPMENT DATA

Calibration cell No. : _____ Manufacturer : _____
Dead weight tester No. : _____ Manufacturer : _____ Range : _____
Recording element No. : 2382 Manufacturer : GRC
Pressure element No. : 48461 Manufacturer : GRC Range : 0-10000 psi

MISCELLANEOUS INFORMATION

Base line drawing temperature : 20°C
Reference line data - temperature : - - pressure P_R : - - reading Y_R : -
Calibration data - temperature : 300°F - step drawing : ☐ with crank ☐ with clock

Equivalent pressure p of level difference between Dwt and bellows
Level difference : - ☒ + in case of Dwt above
Oil specific gravity : - p = - ☐ - in case of Dwt beneath bellows.

CALIBRATION READING AND CALCULATIONS

P (Dwt)	Y	ΔY	Y^2	Y P	Pc = KY + a	C = P - Pc
PSIG	INCH		Units on this line -		PSI	PSI
1000	0.1960				1020.03	-20.03
2000	0.3898				2010.48	-10.48
3000	0.5817				2991.22	8.78
4000	0.7765				3986.78	13.22
5000	0.9730				4991.03	8.97
6000	1.1671				5983.01	16.99
7000	1.3632				6985.21	14.79
8000	1.5625				8003.77	- 3.77
9000	1.7630				9028.46	-28.46
45000	8.7728	Σ	10.8484	55603.7		Σ+ = 62.75 Σ- = - 62.75

$A = \frac{\Sigma P}{n} =$ 5000.0 $B = \frac{\Sigma Y}{n} =$ 0.9748 $K = \frac{A - D}{C - B} =$ _____

$D = \frac{\Sigma (YP)}{\Sigma Y} =$ 6338.1931 $C = \frac{\Sigma (Y^2)}{\Sigma Y} =$ 1.2366

$a' = A - BK =$ 18.34 psi $a' = D - CK =$ 18.34 psi

FINAL RESULTS

K = 5110.6779 psi/inch $P_{RC} = K Y_R + a =$ _____
a = a' + p = _____

FLOPETROL	Client : PHILLIPS	Section : ANNEX 7.1
Base : PERTH	Field : HERMES Well : #1	Page : 41 Report N :

- BOTTOM HOLE PRESSURE GAUGE CALIBRATION SHEET -

DATE : 23.04.83 CALIBRATION No. :

- EQUIPMENT DATA -

Calibration cell No. : - Manufacturer :

Dead weight tester No. : - Manufacturer : Range :

Recording element No. : 27317 Manufacturer : GRC

Pressure element No. : 33961 Manufacturer : GRC Range : 0-10000 psig

- MISCELLANEOUS INFORMATION -

Base line drawing temperature : 20°C

Reference line data - temperature : - - pressure P_R : - reading Y_R :

Calibration data - temperature : 300°F - step drawing : ☒ with crank ☐ with clock

Equivalent pressure p of level difference between Dwt and bellows

Level difference : ☐ + in case of Dwt above

Oil specific gravity : p = ☐ - in case of Dwt beneath bellows.

- CALIBRATION READING AND CALCULATIONS -

P (Dwt)	Y	ΔY	Y^2	YP	Pc = KY + a	C = P - Pc
PSIG	INCH		Units on this line -		PSI	PSI
1000	0.1940				1012.89	-12.89
2000	0.3851				2005.79	- 5.79
3000	0.5719				2976.34	23.66
4000	0.7692				4001.45	- 1.45
5000	0.9616				5001.10	- 1.10
6000	1.532				5996.59	3.41
7000	1.3460				6998.32	1.68
8000	1.5390				8001.08	-1.08
9000	1.7325				9006.45	-6.45
45000	8.6525	Σ	10.5410	54810.400		Σ+ : 28.75 Σ- : -28.75

$A = \frac{\Sigma P}{n} =$ 5000.00 $B = \frac{\Sigma Y}{n} =$ 0.9614 $K = \frac{A - D}{C - B} =$

$D = \frac{\Sigma (YP)}{\Sigma Y} =$ 6334.6316 $C = \frac{\Sigma (Y^2)}{\Sigma Y} =$ 1.2183

$a' = A - BK =$ 4.93 $a' = D - CK =$ 4.93

- FINAL RESULTS -

$K =$ 5195.6786 $P_{RC} = K Y_R + a =$

$a = a' + p =$

o.: DOP 114

BOTTOM HOLE PRESSURE GAUGE CALIBRATION SHEET

DATE : 23.04.83 CALIBRATION No. :

EQUIPMENT DATA

Calibration cell No. : - Manufacturer :
Dead weight tester No. : - Manufacturer : Range :
Recording element No. : 11893 Manufacturer : GRC
Pressure element No. : 30508 Manufacturer : GRC Range : 0-10000 psig

MISCELLANEOUS INFORMATION

Base line drawing temperature : 20 °C
Reference line data - temperature : - °C - pressure P_R : - reading Y_R :
Calibration data - temperature : 300 °F - step drawing : ☒ with crank ☐ with clock

Equivalent pressure p of level difference between Dwt and bellows
Level difference : - ☐ + in case of Dwt above
Oil specific gravity : - p = - ☐ - in case of Dwt beneath bellows.

CALIBRATION READING AND CALCULATIONS

P (Dwt)	Y	ΔY	Y^2	Y P	Pc = KY + a	C = P - Pc
PSIG	INCH		Units on this line		PSIG	PSI
1000	0.2043				1003.81	- 3.81
2000	0.3915				2000.14	- 0.14
3000	0.5795				3000.72	- 0.72
4000	0.7663				3994.92	5.08
5000	0.9547				4997.63	2.37
6000	1.1427				5998.22	1.78
7000	1.3310				7000.40	-1.40
8000	1.5195				8003.65	-3.65
9000	1.7068				9000.50	-0.50
45000	8.5963	Σ	10.3289		Σ+ : 9.23 Σ- : - 9.23	

$A = \frac{\Sigma P}{n} =$ 5000.00 $B = \frac{\Sigma Y}{n} =$ 0.9551 $K = \frac{A - D}{C - B} =$

$D = \frac{\Sigma (YP)}{\Sigma Y} =$ 6311.4247 $C = \frac{\Sigma (Y^2)}{\Sigma Y} =$ 1.2015

$a' = A - BK =$ -83.52 $a' = D - CK =$ -83.52

FINAL RESULTS

$K =$ 5322.2574 $P_{RC} = K Y_R + a =$

$a = a' + p =$

No.: DOP 114

Division: AUD

FLOPETROL Schlumberger

Centre: PEO PERTH

Service order:

AMERADA CHART

Customer: PHILLIPS PETROLEUM

Field: VP-18

Well: HERMES #1

Date: 1.5.83 to 6.5.83

Remarks: DST #1

LOCATED IN UPPER CARRIER

Pressure element 10000 psi n° 16955

Clock 120 hours n° F-13188 HI TEMP

Division: AUD

FLOPETROL Schlumberger

Centre: PEO/PERTH

Service order:

AMERADA CHART

Customer: PHILLIPS PETROLEUM

Field: VP-18

Well: HERMES #1

Date: 1.5.83 to 6.5.83

Remarks: RT7-FAILED

LOCATED IN UPPER CARRIER CARRIER

Pressure element 60-400°F psi n° H338

Clock 72 hours n° E12677 HI TEMP

Division: AUD

FLOPETROL Schlumberger

Centre: PEO PERTH

Service order:

AMERADA CHART

Customer: PHILLIPS PETROLEUM

Field: VP-18

Well: HERMES #1

Date: 1.5.83 to 6.5.83

Remarks: DST #1 - FINAL BUILD UP

NOT SHOWN AS CLOCK RAN OUT

LOCATED IN UPPER CARRIER

Pressure element 10000 psi n° 30508

Clock 120 hours n° F4782 HI TEMP

Division: AUD

FLOPETROL Schlumberger

Centre: PEO/PERTH

Service order:

AMERADA CHART

Customer: PHILLIPS PETROLEUM

Field: VP-18

Well: HERMES #1

Date: 1.5.83 - 7.5.83

Remarks: DST #1

LOCATED IN LOWER CARRIER

Pressure element 200-3000 F. psi n° 54306

Clock 72 hours n° E8657 HI TEMP

Division: AUD

FLOPETROL Schlumberger

Centre: PEO/PERTH

Service order:

AMERADA CHART

Customer: PHILLIPS PETROLEUM

Field: VP-18

Well: HERMES #1

Date: 1.5.83 to 7.5.83

Remarks: DST #1

GAUGES IN LOWER CARRIER

Pressure element 10000 psi n° 33961

Clock 72 HR hours n° E8688

Division: AUD

FLOPETROL Schlumberger

Centre: PEO PERTH

Service order:

AMERADA CHART

Customer: PHILLIPS PETROLEUM

Field: VP-18

Well: HERMES #1

Date: 1.5.83 to 7.5.83

Remarks: D.S.T. #1

GAUGES IN LOWER CARRIER

Pressure element 10000 psi n° 48461

Clock 120 hours n° F13190 HI TEMP

AMERADA CHART

Division: AUD

FLOPETROL Schlumberger

Centre: PEO PERTH

Service order:

Customer: PHILLIPS

Field: VP-18

Well: HERMES #1

Date: 11.5.83

Remarks: DST #2 TOP CARRIER

Pressure element 10000 psi psi n° 33961

Clock 72 hours n° E8688

AMERADA CHART

Division: AUD

FLOPETROL Schlumberger

Centre: PEO PERTH

Service order:

Customer: PHILLIPS

Field: VP-18

Well: HERMES #1

Date: 11.5.83

Remarks: D.S.T. 2 ROP CARRIER

Pressure element 30508 psi n° 10000 psi

Clock 120 hours n° F4782 HI TEMP

Division: AUD

FLOPETROL Schlumberger

Centre: PEO/PERTH

Service order:

AMERADA CHART

Customer: PHILLIPS

Field: HERMES

Well: 1

Date: 10.5.83

Remarks: DST. #2
LOCATED IN LOWER CARRIER

Pressure element 48461 psi n° 48461

Clock 120 hours n° F13190 HI TEMP

Division: AUD

FLOPETROL Schlumberger

Centre: PEO/PERTH

Service order:

AMERADA CHART

Customer: PHILLIPS

Field: HERMES

Well: 1

Date: 10.5.83

Remarks: DST 2 LOWER CARRIER

Pressure element 200-350° psi n° 54306

Clock 72 hours n° E8687 HI TEMP

Division: AUD

FLOPETROL Schlumberger

Centre: PEO/PERTH

Service order:

AMERADA CHART

Customer: PHILLIPS

Field: HERMES

Well: 1

Date: 10.5.83

Remarks: DST. #. 2
LOCATED IN LOWER CARRIER

Pressure element 10000 psi n° 16955. N.

Clock 120 hours n° F13188 Hi Temp

GRC

6540 East Apache
P. O. Box 15968
Tulsa, Okla. U.S.A.
74112
Telephone
(918) 834-9600
Telex: 49-2426

CALIBRATION DATA

Amerada® Thermometer

Type RT 7

Serial No. 54306

Range 200°-350°F

Temperature Degrees F°	Deflection Inches

Checked RCC

Date 9-29-82

AMERADA ELEMENT, SER. 9436
CALIBRATED AT 200 TO 350 DEG. F
SEPT 29, 1992

DEFL	TEMP	DEFL	TEMP
.000	204.9	.050	213.6
.001	205.1	.051	213.8
.002	205.2	.052	213.9
.003	205.4	.053	214.1
.004	205.6	.054	214.3
.005	205.8	.055	214.4
.006	205.9	.056	214.6
.007	206.1	.057	214.7
.008	206.3	.058	214.9
.009	206.5	.059	215.1
.010	206.6	.060	215.2
.011	206.8	.061	215.4
.012	207.0	.062	215.6
.013	207.2	.063	215.7
.014	207.3	.064	215.9
.015	207.5	.065	216.1
.016	207.7	.066	216.2
.017	207.9	.067	216.4
.018	208.0	.068	216.6
.019	208.2	.069	216.7
.020	208.4	.070	216.9
.021	208.6	.071	217.0
.022	208.7	.072	217.2
.023	208.9	.073	217.4
.024	209.1	.074	217.5
.025	209.3	.075	217.7
.026	209.4	.076	217.9
.027	209.6	.077	218.0
.028	209.8	.078	218.2
.029	209.9	.079	218.4
.030	210.1	.080	218.5
.031	210.3	.081	218.7
.032	210.5	.082	218.8
.033	210.6	.083	219.0
.034	210.8	.084	219.2
.035	211.0	.085	219.3
.036	211.2	.086	219.5
.037	211.3	.087	219.7
.038	211.5	.088	219.8
.039	211.7	.089	220.0
.040	211.9	.090	220.2
.041	212.0	.091	220.3
.042	212.2	.092	220.5
.043	212.4	.093	220.7
.044	212.6	.094	220.8
.045	212.7	.095	221.0
.046	212.9	.096	221.1
.047	213.1	.097	221.3
.048	213.3	.098	221.5
.049	213.4	.099	221.6

AMERADA ELEMENT, SER. 54306
CALIBRATED AT 200 TO 350 DEG. F
SEPT. 29, 1982

DEFL	TEMP	DEFL	TEMP
.100	221.8	.150	229.5
.101	222.0	.151	229.6
.102	222.1	.152	229.8
.103	222.3	.153	229.9
.104	222.4	.154	230.1
.105	222.6	.155	230.2
.106	222.7	.156	230.3
.107	222.9	.157	230.5
.108	223.0	.158	230.6
.109	223.2	.159	230.8
.110	223.3	.160	230.9
.111	223.5	.161	231.0
.112	223.6	.162	231.2
.113	223.8	.163	231.3
.114	224.0	.164	231.5
.115	224.1	.165	231.6
.116	224.3	.166	231.7
.117	224.4	.167	231.9
.118	224.6	.168	232.0
.119	224.7	.169	232.2
.120	224.9	.170	232.3
.121	225.0	.171	232.4
.122	225.2	.172	232.6
.123	225.3	.173	232.7
.124	225.5	.174	232.9
.125	225.7	.175	233.0
.126	225.8	.176	233.1
.127	226.0	.177	233.3
.128	226.1	.178	233.4
.129	226.3	.179	233.6
.130	226.4	.180	233.7
.131	226.6	.181	233.8
.132	226.7	.182	234.0
.133	226.9	.183	234.1
.134	227.0	.184	234.3
.135	227.2	.185	234.4
.136	227.3	.186	234.5
.137	227.5	.187	234.7
.138	227.7	.188	234.8
.139	227.8	.189	235.0
.140	228.0	.190	235.1
.141	228.1	.191	235.2
.142	228.3	.192	235.4
.143	228.4	.193	235.5
.144	228.6	.194	235.7
.145	228.7	.195	235.8
.146	228.9	.196	235.9
.147	229.0	.197	236.1
.148	229.2	.198	236.2
.149	229.3	.199	236.4

AMERADA ELEMENT, SER. 54306
CALIBRATED AT 200 TO 350 DEG. F
SEPT 29, 1982

DEFL	TEMP	DEFL	TEMP
.200	236.5	.250	243.2
.201	236.6	.251	243.3
.202	236.8	.252	243.4
.203	236.9	.253	243.5
.204	237.0	.254	243.7
.205	237.2	.255	243.8
.206	237.3	.256	243.9
.207	237.4	.257	244.0
.208	237.6	.258	244.2
.209	237.7	.259	244.3
.210	237.8	.260	244.4
.211	238.0	.261	244.5
.212	238.1	.262	244.6
.213	238.2	.263	244.8
.214	238.4	.264	244.9
.215	238.5	.265	245.0
.216	238.6	.266	245.1
.217	238.8	.267	245.2
.218	238.9	.268	245.4
.219	239.0	.269	245.5
.220	239.2	.270	245.6
.221	239.3	.271	245.7
.222	239.4	.272	245.8
.223	239.6	.273	246.0
.224	239.7	.274	246.1
.225	239.9	.275	246.2
.226	240.0	.276	246.3
.227	240.1	.277	246.4
.228	240.3	.278	246.6
.229	240.4	.279	246.7
.230	240.5	.280	246.8
.231	240.7	.281	246.9
.232	240.8	.282	247.0
.233	240.9	.283	247.2
.234	241.1	.284	247.3
.235	241.2	.285	247.4
.236	241.3	.286	247.5
.237	241.5	.287	247.6
.238	241.6	.288	247.8
.239	241.7	.289	247.9
.240	241.9	.290	248.0
.241	242.0	.291	248.1
.242	242.1	.292	248.2
.243	242.3	.293	248.4
.244	242.4	.294	248.5
.245	242.5	.295	248.6
.246	242.7	.296	248.7
.247	242.8	.297	248.8
.248	242.9	.298	249.0
.249	243.1	.299	249.1

AMERADA ELEMENT, SER. 5430
CALIBRATED AT 200 TO 350 DEG. F
SEPT 29, 1982

DEFL	TEMP	DEFL	TEMP
.300	249.2	.350	254.9
.301	249.3	.351	255.0
.302	249.4	.352	255.1
.303	249.5	.353	255.2
.304	249.7	.354	255.3
.305	249.8	.355	255.4
.306	249.9	.356	255.5
.307	250.0	.357	255.7
.308	250.1	.358	255.8
.309	250.2	.359	255.9
.310	250.3	.360	256.0
.311	250.5	.361	256.1
.312	250.6	.362	256.2
.313	250.7	.363	256.3
.314	250.8	.364	256.4
.315	250.9	.365	256.5
.316	251.0	.366	256.6
.317	251.1	.367	256.7
.318	251.3	.368	256.8
.319	251.4	.369	257.0
.320	251.5	.370	257.1
.321	251.6	.371	257.2
.322	251.7	.372	257.3
.323	251.8	.373	257.4
.324	251.9	.374	257.5
.325	252.1	.375	257.6
.326	252.2	.376	257.7
.327	252.3	.377	257.8
.328	252.4	.378	257.9
.329	252.5	.379	258.0
.330	252.6	.380	258.1
.331	252.7	.381	258.2
.332	252.8	.382	258.4
.333	253.0	.383	258.5
.334	253.1	.384	258.6
.335	253.2	.385	258.7
.336	253.3	.386	258.8
.337	253.4	.387	258.9
.338	253.5	.388	259.0
.339	253.6	.389	259.1
.340	253.8	.390	259.2
.341	253.9	.391	259.3
.342	254.0	.392	259.4
.343	254.1	.393	259.5
.344	254.2	.394	259.7
.345	254.3	.395	259.8
.346	254.4	.396	259.9
.347	254.6	.397	260.0
.348	254.7	.398	260.1
.349	254.8	.399	260.2

AMERADA ELEMENT, SER. 5430
CALIBRATED AT 200 TO 350 DEG. F
SEPT 29, 1982

DEFL	TEMP	DEFL	TEMP
.400	260.3	.450	265.4
.401	260.4	.451	265.5
.402	260.5	.452	265.6
.403	260.6	.453	265.7
.404	260.7	.454	265.8
.405	260.8	.455	265.9
.406	260.9	.456	266.0
.407	261.0	.457	266.1
.408	261.1	.458	266.2
.409	261.2	.459	266.3
.410	261.3	.460	266.4
.411	261.4	.461	266.5
.412	261.5	.462	266.6
.413	261.6	.463	266.7
.414	261.7	.464	266.8
.415	261.8	.465	266.9
.416	261.9	.466	267.0
.417	262.0	.467	267.1
.418	262.1	.468	267.2
.419	262.2	.469	267.3
.420	262.3	.470	267.4
.421	262.4	.471	267.5
.422	262.5	.472	267.6
.423	262.6	.473	267.7
.424	262.7	.474	267.8
.425	262.9	.475	267.9
.426	263.0	.476	267.9
.427	263.1	.477	268.0
.428	263.2	.478	268.1
.429	263.3	.479	268.2
.430	263.4	.480	268.3
.431	263.5	.481	268.4
.432	263.6	.482	268.5
.433	263.7	.483	268.6
.434	263.8	.484	268.7
.435	263.9	.485	268.8
.436	264.0	.486	268.9
.437	264.1	.487	269.0
.438	264.2	.488	269.1
.439	264.3	.489	269.2
.440	264.4	.490	269.3
.441	264.5	.491	269.4
.442	264.6	.492	269.5
.443	264.7	.493	269.6
.444	264.8	.494	269.7
.445	264.9	.495	269.8
.446	265.0	.496	269.9
.447	265.1	.497	270.0
.448	265.2	.498	270.1
.449	265.3	.499	270.2

AMERADA ELEMENT, S/N 9616
CALIBRATED AT 200 TO 350 DEG. F
SEPT 29, 1982

DEFL	TEMP	DEFL	TEMP
.500	270.3	.550	274.8
.501	270.4	.551	274.9
.502	270.5	.552	275.0
.503	270.6	.553	275.1
.504	270.7	.554	275.2
.505	270.8	.555	275.2
.506	270.8	.556	275.3
.507	270.9	.557	275.4
.508	271.0	.558	275.5
.509	271.1	.559	275.6
.510	271.2	.560	275.7
.511	271.3	.561	275.8
.512	271.4	.562	275.9
.513	271.5	.563	275.9
.514	271.6	.564	276.0
.515	271.7	.565	276.1
.516	271.7	.566	276.2
.517	271.8	.567	276.3
.518	271.9	.568	276.4
.519	272.0	.569	276.5
.520	272.1	.570	276.6
.521	272.2	.571	276.6
.522	272.3	.572	276.7
.523	272.4	.573	276.8
.524	272.5	.574	276.9
.525	272.5	.575	277.0
.526	272.6	.576	277.1
.527	272.7	.577	277.2
.528	272.8	.578	277.3
.529	272.9	.579	277.4
.530	273.0	.580	277.4
.531	273.1	.581	277.5
.532	273.2	.582	277.6
.533	273.3	.583	277.7
.534	273.4	.584	277.8
.535	273.5	.585	277.9
.536	273.5	.586	278.0
.537	273.6	.587	278.1
.538	273.7	.588	278.1
.539	273.8	.589	278.2
.540	273.9	.590	278.3
.541	274.0	.591	278.4
.542	274.1	.592	278.5
.543	274.2	.593	278.6
.544	274.3	.594	278.7
.545	274.4	.595	278.8
.546	274.4	.596	278.8
.547	274.5	.597	278.9
.548	274.6	.598	279.0
.549	274.7	.599	279.1

AMERADA ELEMENT, S/N 9616
CALIBRATED AT 200 TO 350 DEG. F
SEPT 29, 1982

DEFL	TEMP	DEFL	TEMP
.600	279.2	.650	283.2
.601	279.3	.651	283.3
.602	279.4	.652	283.4
.603	279.4	.653	283.4
.604	279.5	.654	283.5
.605	279.6	.655	283.6
.606	279.7	.656	283.7
.607	279.8	.657	283.7
.608	279.8	.658	283.8
.609	279.9	.659	283.9
.610	280.0	.660	284.0
.611	280.1	.661	284.1
.612	280.2	.662	284.1
.613	280.2	.663	284.2
.614	280.3	.664	284.3
.615	280.4	.665	284.4
.616	280.5	.666	284.4
.617	280.6	.667	284.5
.618	280.6	.668	284.6
.619	280.7	.669	284.7
.620	280.8	.670	284.8
.621	280.9	.671	284.8
.622	281.0	.672	284.9
.623	281.0	.673	285.0
.624	281.1	.674	285.1
.625	281.2	.675	285.2
.626	281.3	.676	285.2
.627	281.4	.677	285.3
.628	281.4	.678	285.4
.629	281.5	.679	285.5
.630	281.6	.680	285.5
.631	281.7	.681	285.6
.632	281.8	.682	285.7
.633	281.8	.683	285.8
.634	281.9	.684	285.9
.635	282.0	.685	285.9
.636	282.1	.686	286.0
.637	282.2	.687	286.1
.638	282.2	.688	286.2
.639	282.3	.689	286.2
.640	282.4	.690	286.3
.641	282.5	.691	286.4
.642	282.6	.692	286.5
.643	282.6	.693	286.6
.644	282.7	.694	286.6
.645	282.8	.695	286.7
.646	282.9	.696	286.8
.647	283.0	.697	286.9
.648	283.0	.698	286.9
.649	283.1	.699	287.0

AMERADA ELEMENT, SER. 54306
CALIBRATED AT 200 TO 350 DEG. F
SEPT. 29, 1962

DEFL	TEMP	DEFL	TEMP
.700	287.1	.750	290.8
.701	287.2	.751	290.9
.702	287.2	.752	290.9
.703	287.3	.753	291.0
.704	287.4	.754	291.1
.705	287.5	.755	291.2
.706	287.5	.756	291.2
.707	287.6	.757	291.3
.708	287.7	.758	291.4
.709	287.8	.759	291.4
.710	287.8	.760	291.5
.711	287.9	.761	291.6
.712	288.0	.762	291.7
.713	288.1	.763	291.7
.714	288.1	.764	291.8
.715	288.2	.765	291.9
.716	288.3	.766	292.0
.717	288.4	.767	292.0
.718	288.4	.768	292.1
.719	288.5	.769	292.2
.720	288.6	.770	292.2
.721	288.7	.771	292.3
.722	288.7	.772	292.4
.723	288.8	.773	292.5
.724	288.9	.774	292.5
.725	289.0	.775	292.6
.726	289.0	.776	292.7
.727	289.1	.777	292.7
.728	289.2	.778	292.8
.729	289.2	.779	292.9
.730	289.3	.780	293.0
.731	289.4	.781	293.0
.732	289.5	.782	293.1
.733	289.5	.783	293.2
.734	289.6	.784	293.2
.735	289.7	.785	293.3
.736	289.8	.786	293.4
.737	289.8	.787	293.5
.738	289.9	.788	293.5
.739	290.0	.789	293.6
.740	290.1	.790	293.7
.741	290.1	.791	293.8
.742	290.2	.792	293.8
.743	290.3	.793	293.9
.744	290.4	.794	294.0
.745	290.4	.795	294.0
.746	290.5	.796	294.1
.747	290.6	.797	294.2
.748	290.7	.798	294.3
.749	290.7	.799	294.3

AMERADA ELEMENT, SER. 54306
CALIBRATED AT 200 TO 350 DEG. F
SEPT 29, 1962

DEFL	TEMP	DEFL	TEMP
.800	294.4	.850	297.8
.801	294.5	.851	297.9
.802	294.5	.852	297.9
.803	294.6	.853	298.0
.804	294.7	.854	298.1
.805	294.7	.855	298.1
.806	294.8	.856	298.2
.807	294.9	.857	298.3
.808	294.9	.858	298.3
.809	295.0	.859	298.4
.810	295.1	.860	298.5
.811	295.1	.861	298.5
.812	295.2	.862	298.6
.813	295.3	.863	298.7
.814	295.4	.864	298.8
.815	295.4	.865	298.8
.816	295.5	.866	298.9
.817	295.6	.867	299.0
.818	295.6	.868	299.0
.819	295.7	.869	299.1
.820	295.8	.870	299.2
.821	295.8	.871	299.2
.822	295.9	.872	299.3
.823	296.0	.873	299.4
.824	296.0	.874	299.4
.825	296.1	.875	299.5
.826	296.2	.876	299.6
.827	296.2	.877	299.6
.828	296.3	.878	299.7
.829	296.4	.879	299.8
.830	296.4	.880	299.8
.831	296.5	.881	299.9
.832	296.6	.882	300.0
.833	296.6	.883	300.0
.834	296.7	.884	300.1
.835	296.8	.885	300.2
.836	296.8	.886	300.2
.837	296.9	.887	300.3
.838	297.0	.888	300.4
.839	297.1	.889	300.5
.840	297.1	.890	300.5
.841	297.2	.891	300.6
.842	297.3	.892	300.7
.843	297.3	.893	300.7
.844	297.4	.894	300.8
.845	297.5	.895	300.9
.846	297.5	.896	300.9
.847	297.6	.897	301.0
.848	297.7	.898	301.1
.849	297.7	.899	301.1

AMERADA ELEMENT, SER. 54306
CALIBRATED AT 200 TO 350 DEG. F
SEPT 29, 1962

DEFL	TEMP	DEFL	TEMP
.900	301.2	.950	304.5
.901	301.3	.951	304.6
.902	301.3	.952	304.6
.903	301.4	.953	304.7
.904	301.5	.954	304.8
.905	301.5	.955	304.8
.906	301.6	.956	304.9
.907	301.7	.957	305.0
.908	301.7	.958	305.0
.909	301.8	.959	305.1
.910	301.9	.960	305.2
.911	301.9	.961	305.2
.912	302.0	.962	305.3
.913	302.1	.963	305.4
.914	302.1	.964	305.4
.915	302.2	.965	305.5
.916	302.3	.966	305.6
.917	302.3	.967	305.6
.918	302.4	.968	305.7
.919	302.5	.969	305.8
.920	302.5	.970	305.8
.921	302.6	.971	305.9
.922	302.7	.972	306.0
.923	302.7	.973	306.0
.924	302.8	.974	306.1
.925	302.9	.975	306.2
.926	302.9	.976	306.2
.927	303.0	.977	306.3
.928	303.0	.978	306.3
.929	303.1	.979	306.4
.930	303.2	.980	306.5
.931	303.2	.981	306.5
.932	303.3	.982	306.6
.933	303.4	.983	306.7
.934	303.4	.984	306.7
.935	303.5	.985	306.8
.936	303.6	.986	306.9
.937	303.6	.987	306.9
.938	303.7	.988	307.0
.939	303.8	.989	307.1
.940	303.8	.990	307.1
.941	303.9	.991	307.2
.942	304.0	.992	307.3
.943	304.0	.993	307.3
.944	304.1	.994	307.4
.945	304.2	.995	307.5
.946	304.2	.996	307.5
.947	304.3	.997	307.6
.948	304.4	.998	307.7
.949	304.4	.999	307.7

AMERADA ELEMENT, SER. 54306
CALIBRATED AT 200 TO 350 DEG. F
SEPT 29, 1962

DEFL	TEMP	DEFL	TEMP
1.000	307.8	1.050	310.9
1.001	307.9	1.051	311.0
1.002	307.9	1.052	311.0
1.003	308.0	1.053	311.1
1.004	308.0	1.054	311.1
1.005	308.1	1.055	311.2
1.006	308.2	1.056	311.3
1.007	308.2	1.057	311.3
1.008	308.3	1.058	311.4
1.009	308.4	1.059	311.5
1.010	308.4	1.060	311.5
1.011	308.5	1.061	311.6
1.012	308.5	1.062	311.6
1.013	308.6	1.063	311.7
1.014	308.7	1.064	311.8
1.015	308.7	1.065	311.8
1.016	308.8	1.066	311.9
1.017	308.9	1.067	312.0
1.018	308.9	1.068	312.0
1.019	309.0	1.069	312.1
1.020	309.0	1.070	312.1
1.021	309.1	1.071	312.2
1.022	309.2	1.072	312.3
1.023	309.2	1.073	312.3
1.024	309.3	1.074	312.4
1.025	309.4	1.075	312.5
1.026	309.4	1.076	312.5
1.027	309.5	1.077	312.6
1.028	309.5	1.078	312.6
1.029	309.6	1.079	312.7
1.030	309.7	1.080	312.8
1.031	309.7	1.081	312.8
1.032	309.8	1.082	312.9
1.033	309.9	1.083	312.9
1.034	309.9	1.084	313.0
1.035	310.0	1.085	313.1
1.036	310.0	1.086	313.1
1.037	310.1	1.087	313.2
1.038	310.2	1.088	313.3
1.039	310.2	1.089	313.3
1.040	310.3	1.090	313.4
1.041	310.3	1.091	313.4
1.042	310.4	1.092	313.5
1.043	310.5	1.093	313.6
1.044	310.5	1.094	313.6
1.045	310.6	1.095	313.7
1.046	310.7	1.096	313.8
1.047	310.7	1.097	313.8
1.048	310.8	1.098	313.9
1.049	310.8	1.099	313.9

AMERADA ELEMENT, SER. 5436
CALIBRATED AT 200 TO 350 DEG. F
SEPT 29, 1982

DEFL	TEMP	DEFL	TEMP
1.100	314.0	1.150	317.1
1.101	314.1	1.151	317.2
1.102	314.1	1.152	317.2
1.103	314.2	1.153	317.3
1.104	314.2	1.154	317.3
1.105	314.3	1.155	317.4
1.106	314.4	1.156	317.5
1.107	314.4	1.157	317.5
1.108	314.5	1.158	317.6
1.109	314.6	1.159	317.7
1.110	314.6	1.160	317.7
1.111	314.7	1.161	317.8
1.112	315.7	1.162	317.8
1.113	314.8	1.163	317.9
1.114	314.9	1.164	318.0
1.115	314.9	1.165	318.0
1.116	315.0	1.166	318.1
1.117	315.1	1.167	318.2
1.118	315.1	1.168	318.2
1.119	315.2	1.169	318.3
1.120	315.2	1.170	318.3
1.121	315.3	1.171	318.4
1.122	315.4	1.172	318.5
1.123	315.4	1.173	318.5
1.124	315.5	1.174	318.6
1.125	315.6	1.175	318.7
1.126	315.6	1.176	318.7
1.127	315.7	1.177	318.8
1.128	315.7	1.178	318.8
1.129	315.8	1.179	318.9
1.130	315.9	1.180	319.0
1.131	315.9	1.181	319.0
1.132	316.0	1.182	319.1
1.133	316.0	1.183	319.1
1.134	316.1	1.184	319.2
1.135	316.2	1.185	319.3
1.136	316.2	1.186	319.3
1.137	316.3	1.187	319.4
1.138	316.4	1.188	319.5
1.139	316.4	1.189	319.5
1.140	316.5	1.190	319.6
1.141	316.5	1.191	319.6
1.142	316.6	1.192	319.7
1.143	316.7	1.193	319.8
1.144	316.7	1.194	319.8
1.145	316.8	1.195	319.9
1.146	316.9	1.196	320.0
1.147	316.9	1.197	320.0
1.148	317.0	1.198	320.1
1.149	317.0	1.199	320.1

AMERADA ELEMENT, SER. 5436
CALIBRATED AT 200 TO 350 DEG. F
SEPT 29, 1982

DEFL	TEMP	DEFL	TEMP
1.200	320.2	1.250	323.1
1.201	320.3	1.251	323.2
1.202	320.3	1.252	323.2
1.203	320.4	1.253	323.3
1.204	320.4	1.254	323.3
1.205	320.5	1.255	323.4
1.206	320.5	1.256	323.4
1.207	320.6	1.257	323.5
1.208	320.7	1.258	323.6
1.209	320.7	1.259	323.6
1.210	320.8	1.260	323.7
1.211	320.8	1.261	323.7
1.212	320.9	1.262	323.8
1.213	321.0	1.263	323.9
1.214	321.0	1.264	323.9
1.215	321.1	1.265	324.0
1.216	321.1	1.266	324.0
1.217	321.2	1.267	324.1
1.218	321.2	1.268	324.1
1.219	321.3	1.269	324.2
1.220	321.4	1.270	324.3
1.221	321.4	1.271	324.3
1.222	321.5	1.272	324.4
1.223	321.5	1.273	324.4
1.224	321.6	1.274	324.5
1.225	321.7	1.275	324.6
1.226	321.7	1.276	324.6
1.227	321.8	1.277	324.7
1.228	321.8	1.278	324.7
1.229	321.9	1.279	324.8
1.230	321.9	1.280	324.8
1.231	322.0	1.281	324.9
1.232	322.1	1.282	325.0
1.233	322.1	1.283	325.0
1.234	322.2	1.284	325.1
1.235	322.2	1.285	325.1
1.236	322.3	1.286	325.2
1.237	322.3	1.287	325.2
1.238	322.4	1.288	325.3
1.239	322.5	1.289	325.4
1.240	322.5	1.290	325.4
1.241	322.6	1.291	325.5
1.242	322.6	1.292	325.5
1.243	322.7	1.293	325.6
1.244	322.8	1.294	325.7
1.245	322.8	1.295	325.7
1.246	322.9	1.296	325.8
1.247	322.9	1.297	325.8
1.248	323.0	1.298	325.9
1.249	323.0	1.299	325.9

AMERADA ELEMENT, SER. 54306
CALIBRATED AT 200 TO 350 DEG. F
SEPT. 29, 1982

DEFL	TEMP	DEFL	TEMP
1.300	326.0	1.350	328.8
1.301	326.1	1.351	328.9
1.302	326.1	1.352	328.9
1.303	326.2	1.353	329.0
1.304	326.2	1.354	329.0
1.305	326.3	1.355	329.1
1.306	326.3	1.356	329.1
1.307	326.4	1.357	329.2
1.308	326.4	1.358	329.2
1.309	326.5	1.359	329.3
1.310	326.6	1.360	329.4
1.311	326.6	1.361	329.4
1.312	326.7	1.362	329.5
1.313	326.7	1.363	329.5
1.314	326.8	1.364	329.6
1.315	326.8	1.365	329.6
1.316	326.9	1.366	329.7
1.317	327.0	1.367	329.8
1.318	327.0	1.368	329.8
1.319	327.1	1.369	329.9
1.320	327.1	1.370	329.9
1.321	327.2	1.371	330.0
1.322	327.2	1.372	330.0
1.323	327.3	1.373	330.1
1.324	327.3	1.374	330.1
1.325	327.4	1.375	330.2
1.326	327.5	1.376	330.3
1.327	327.5	1.377	330.3
1.328	327.6	1.378	330.4
1.329	327.6	1.379	330.4
1.330	327.7	1.380	330.5
1.331	327.7	1.381	330.5
1.332	327.8	1.382	330.6
1.333	327.8	1.383	330.6
1.334	327.9	1.384	330.7
1.335	328.0	1.385	330.8
1.336	328.0	1.386	330.8
1.337	328.1	1.387	330.9
1.338	328.1	1.388	330.9
1.339	328.2	1.389	331.0
1.340	328.2	1.390	331.0
1.341	328.3	1.391	331.1
1.342	328.4	1.392	331.2
1.343	328.4	1.393	331.2
1.344	328.5	1.394	331.3
1.345	328.5	1.395	331.3
1.346	328.6	1.396	331.4
1.347	328.6	1.397	331.4
1.348	328.7	1.398	331.5
1.349	328.7	1.399	331.5

AMERADA ELEMENT, SER. 54306
CALIBRATED AT 200 TO 350 DEG. F
SEPT. 29, 1982

DEFL	TEMP	DEFL	TEMP
1.400	331.6	1.450	334.3
1.401	331.7	1.451	334.4
1.402	331.7	1.452	334.4
1.403	331.8	1.453	334.5
1.404	331.8	1.454	334.5
1.405	331.9	1.455	334.6
1.406	331.9	1.456	334.6
1.407	332.0	1.457	334.7
1.408	332.0	1.458	334.7
1.409	332.1	1.459	334.8
1.410	332.1	1.460	334.8
1.411	332.2	1.461	334.9
1.412	332.2	1.462	334.9
1.413	332.3	1.463	335.0
1.414	332.4	1.464	335.1
1.415	332.4	1.465	335.1
1.416	332.5	1.466	335.2
1.417	332.5	1.467	335.2
1.418	332.6	1.468	335.3
1.419	332.6	1.469	335.3
1.420	332.7	1.470	335.4
1.421	332.7	1.471	335.4
1.422	332.8	1.472	335.5
1.423	332.8	1.473	335.5
1.424	332.9	1.474	335.6
1.425	333.0	1.475	335.7
1.426	333.0	1.476	335.7
1.427	333.1	1.477	335.8
1.428	833.1	1.478	335.8
1.429	333.2	1.479	335.9
1.430	333.2	1.480	335.9
1.431	333.3	1.481	336.0
1.432	333.3	1.482	336.0
1.433	333.4	1.483	336.1
1.434	333.4	1.484	336.1
1.435	333.5	1.485	336.2
1.436	333.5	1.486	336.2
1.437	333.6	1.487	336.3
1.438	333.7	1.488	336.4
1.439	333.7	1.489	336.4
1.440	333.8	1.490	336.5
1.441	333.8	1.491	336.5
1.442	333.9	1.492	336.6
1.443	333.9	1.493	336.6
1.444	334.0	1.494	336.7
1.445	334.0	1.495	336.7
1.446	334.1	1.496	336.8
1.447	334.1	1.497	336.8
1.448	334.2	1.498	336.9
1.449	334.2	1.499	336.9

AMERADA ELEMENT, SER. 54406
CALIBRATED AT 200 TO 350 DEG. F
SEPT 29, 1982

DEFL	TEMP	DEFL	TEMP
1.500	337.0	1.550	339.5
1.501	337.1	1.551	339.6
1.502	337.1	1.552	339.6
1.503	337.2	1.553	339.7
1.504	337.2	1.554	339.7
1.505	337.3	1.555	339.8
1.506	337.3	1.556	339.8
1.507	337.4	1.557	339.9
1.508	337.4	1.558	339.9
1.509	337.5	1.559	340.0
1.510	337.5	1.560	340.0
1.511	337.6	1.561	340.1
1.512	337.6	1.562	340.1
1.513	337.7	1.563	340.2
1.514	337.7	1.564	340.2
1.515	337.8	1.565	340.3
1.516	337.8	1.566	340.3
1.517	337.9	1.567	340.4
1.518	337.9	1.568	340.4
1.519	338.0	1.569	340.5
1.520	338.0	1.570	340.5
1.521	338.1	1.571	340.6
1.522	338.1	1.572	340.6
1.523	338.2	1.573	340.7
1.524	338.2	1.574	340.7
1.525	338.3	1.575	340.8
1.526	338.3	1.576	340.8
1.527	338.4	1.577	340.9
1.528	338.4	1.578	340.9
1.529	338.5	1.579	341.0
1.530	338.5	1.580	341.0
1.531	338.6	1.581	341.1
1.532	338.6	1.582	341.1
1.533	338.7	1.583	341.2
1.534	338.7	1.584	341.2
1.535	338.8	1.585	341.3
1.536	338.8	1.586	341.3
1.537	338.9	1.587	341.4
1.538	338.9	1.588	341.4
1.539	339.0	1.589	341.5
1.540	339.0	1.590	341.5
1.541	339.1	1.591	341.6
1.542	339.1	1.592	341.6
1.543	339.2	1.593	341.7
1.544	339.2	1.594	341.7
1.545	339.3	1.595	341.8
1.546	339.3	1.596	341.8
1.547	339.4	1.597	341.9
1.548	339.4	1.598	341.9
1.549	339.5	1.599	342.0

AMERADA ELEMENT, SER. 54316
CALIBRATED AT 200 TO 350 DEG.
SEPT 29, 1982

DEFL	TEMP	DEFL	TEMP
1.600	342.0	1.650	344.4
1.601	342.0	1.651	344.4
1.602	342.1	1.652	344.5
1.603	342.1	1.653	344.5
1.604	342.2	1.654	344.6
1.605	342.2	1.655	344.6
1.606	342.3	1.656	344.7
1.607	342.3	1.657	344.7
1.608	342.4	1.658	344.8
1.609	342.4	1.659	344.8
1.610	342.5	1.660	344.9
1.611	342.5	1.661	344.9
1.612	342.6	1.662	345.0
1.613	342.6	1.663	345.0
1.614	342.7	1.664	345.1
1.615	342.7	1.665	345.1
1.616	342.8	1.666	345.2
1.617	342.8	1.667	345.2
1.618	342.9	1.668	345.3
1.619	342.9	1.669	345.3
1.620	343.0	1.670	345.4
1.621	343.0	1.671	345.4
1.622	343.1	1.672	345.5
1.623	343.1	1.673	345.5
1.624	343.2	1.674	345.6
1.625	343.2	1.675	345.6
1.626	343.2	1.676	345.6
1.627	343.3	1.677	345.7
1.628	343.3	1.678	345.7
1.629	343.4	1.679	345.8
1.630	343.4	1.680	345.8
1.631	343.5	1.681	345.9
1.632	343.5	1.682	345.9
1.633	343.6	1.683	346.0
1.634	343.6	1.684	346.0
1.635	343.7	1.685	346.1
1.636	343.7	1.686	346.1
1.637	343.8	1.687	346.2
1.638	343.8	1.688	346.2
1.639	343.9	1.689	346.3
1.640	343.9	1.690	346.3
1.641	344.0	1.691	346.4
1.642	344.0	1.692	346.4
1.643	344.1	1.693	346.5
1.644	344.1	1.694	346.5
1.645	344.2	1.695	346.6
1.646	344.2	1.696	346.6
1.647	344.3	1.697	346.7
1.648	344.3	1.698	346.7
1.649	344.4	1.699	346.8

AMERADA ELEMENT, SER. 54306
CALIBRATED AT 200 TO 350 DEG. F
SEPT 29, 1982

DEFL	TEMP	DEFL	TEMP
1.700	346.8	1.750	349.1
1.701	346.8	1.751	349.1
1.702	346.9	1.752	349.1
1.703	346.9	1.753	349.2
1.704	347.0	1.754	349.2
1.705	347.0	1.755	349.3
1.706	347.1	1.756	349.3
1.707	347.1	1.757	349.4
1.708	347.2	1.758	349.4
1.709	347.2	1.759	349.5
1.710	347.3	1.760	349.5
1.711	347.3	1.761	349.5
1.712	347.3	1.762	349.6
1.713	347.4	1.763	349.6
1.714	347.4	1.764	349.7
1.715	347.5	1.765	349.7
1.716	347.5	1.766	349.8
1.717	347.6	1.767	349.8
1.718	347.6	1.768	349.9
1.719	347.7	1.769	349.9
1.720	347.7	1.770	350.0
1.721	347.7	1.771	350.0
1.722	347.8	1.772	350.0
1.723	347.8	1.773	350.1
1.724	347.9	1.774	350.1
1.725	347.9	1.775	350.2
1.726	348.0	1.776	350.2
1.727	348.0	1.777	350.3
1.728	348.1	1.778	350.3
1.729	348.1	1.779	350.4
1.730	348.2	1.780	350.4
1.731	348.2	1.781	350.4
1.732	348.2	1.782	350.5
1.733	348.3	1.783	350.5
1.734	348.3	1.784	350.6
1.735	348.4	1.785	350.6
1.736	348.4	1.786	350.7
1.737	348.5	1.787	350.7
1.738	348.5	1.788	350.8
1.739	348.6	1.789	350.8
1.740	348.6	1.790	350.9
1.741	348.6	1.791	350.9
1.742	348.7	1.792	350.9
1.743	348.7	1.793	351.0
1.744	348.8	1.794	351.0
1.745	348.8	1.795	351.1
1.746	348.9	1.796	351.1
1.747	348.9	1.797	351.2
1.748	349.0	1.798	351.2
1.749	349.0	1.799	351.3

AMERADA ELEMENT, SER. 54306
CALIBRATED AT 200 TO 350 D.G.
SEPT 29, 1982

DEFL	TEMP	DEFL	TEMP
1.800	351.3	1.850	353.5
1.801	351.3	1.851	353.5
1.802	351.4	1.852	353.6
1.803	351.4	1.853	353.6
1.804	351.5	1.854	353.7
1.805	351.5	1.855	353.7
1.806	351.6	1.856	353.8
1.807	351.6	1.857	353.8
1.808	351.7	1.858	353.9
1.809	351.7	1.859	353.9
1.810	351.8	1.860	353.9
1.811	351.8	1.861	354.0
1.812	351.8	1.862	354.0
1.813	351.9	1.863	354.1
1.814	351.9	1.864	354.1
1.815	352.0	1.865	354.2
1.816	352.0	1.866	354.2
1.817	352.0	1.867	354.2
1.818	352.1	1.868	354.3
1.819	352.1	1.869	354.3
1.820	352.2	1.870	354.4
1.821	352.2	1.871	354.4
1.822	352.3	1.872	354.5
1.823	352.3	1.873	354.5
1.824	352.4	1.874	354.6
1.82	352.4	1.875	354.6
1.82	352.4	1.876	354.6
1.82	352.5	1.877	354.7
1.82	352.5	1.878	354.7
1.	352.6	1.879	354.8
1.	352.6	1.880	354.8
1.	352.7	1.881	354.9
1.83	352.7	1.882	354.9
1.833	352.8	1.883	355.0
1.834	352.8	1.884	355.0
1.835	352.8	1.885	355.0
1.836	352.9	1.886	355.1
1.837	352.9	1.887	355.1
1.838	353.0	1.88	355.2
1.839	353.0	1.88	355.2
1.840	353.1	1.890	355.3
1.841	353.1	1.891	355.3
1.842	353.1	1.892	355.3
1.843	353.2	1.893	355.4
1.844	353.2	1.894	355.4
1.845	353.3	1.895	355.5
1.846	353.3	1.896	355.5
1.847	353.4	1.897	355.6
1.848	353.4	1.898	355.6
1.849	353.5	1.899	355.7

CALIBRATED AT 200 TO 400 °F
SEPT 27, 1967

DEFL	TEMP	DEFL	TEMP
1.900	355.7	1.950	357.8
1.901	355.7	1.951	357.8
1.902	355.8	1.952	357.9
1.903	355.8	1.953	357.9
1.904	355.9	1.954	358.0
1.905	355.9	1.955	358.0
1.906	356.0	1.956	358.1
1.907	356.0	1.957	358.1
1.908	356.0	1.958	358.1
1.909	356.1	1.959	358.2
1.910	356.1	1.960	358.2
1.911	356.2	1.961	358.3
1.912	356.2	1.962	358.3
1.913	356.2	1.963	358.3
1.914	356.3	1.964	358.4
1.915	356.3	1.965	358.4
1.916	356.4	1.966	358.5
1.917	356.4	1.967	358.5
1.918	356.5	1.968	358.6
1.919	356.5	1.969	358.6
1.920	356.5	1.970	358.6
1.921	356.6	1.971	358.7
1.922	356.6	1.972	358.7
1.923	356.7	1.973	358.8
1.924	356.7	1.974	358.8
1.925	356.8	1.975	358.9
1.926	356.8	1.976	358.9
1.927	356.8	1.977	358.9
1.928	356.9	1.978	359.0
1.929	356.9	1.979	359.0
1.930	357.0	1.980	359.1
1.931	357.0	1.981	359.1
1.932	357.0	1.982	359.1
1.933	357.1	1.983	359.2
1.934	357.1	1.984	359.2
1.935	357.2	1.985	359.3
1.936	357.2	1.986	359.3
1.937	357.3	1.987	359.4
1.938	357.3	1.988	359.4
1.939	357.3	1.989	359.4
1.940	357.4	1.990	359.5
1.941	357.4	1.991	359.5
1.942	357.5	1.992	359.6
1.943	357.5	1.993	359.6
1.944	357.5	1.994	359.6
1.945	357.5	1.995	359.7
1.946	357.6	1.996	359.7
1.947	357.7	1.997	359.8
1.948	357.7	1.998	359.8
1.949	357.8	1.999	359.9

UPPER BUNDLE CARRIER

- BOTTOM HOLE PRESSURE CALCULATIONS -

Well producing through . ~~casing~~ / tubing / drill pipe 3½"

Bottom hole temperature : 306.9°F at depth 4372.36m with RT7

INSTRUMENT DATA	LOWER GAUGE	UPPER GAUGE
Instrument type :	RPG 3	RPG3
Press. element. No. and range :	30508 1000 psi	16955 10000 psi
Recording element. No. :	11893 SPLS	10730 SPLS
Clock. No. and capacity :	F-4782	F-13188 120 hr Hi Temp
CALIBRATION DATA		
Calibration. No. and date :	4 23.04.83	1 23.04.83
Calibration temperature :	300°F	300°F
Calibration range :	1000-9000 psi	1000-9000 psi
K :	S319.60	5099.54
a, (calibrated chart) :	82.60	30.93
P_{RC}, (non calibrated chart) :	-	-

DATE-TIME Time HR MIN	DATE-TIME Cumul MIN	Choke size INCH	W.H. pressure PSIG	Depth MH	Y INCH	C * -	P PSIG	Y INCH	C * -	P PSIG
				4391.28						
					D.S.T. #1					
	GAUGE NO. 30508 NOT READ DUE TO CLOCK MALFUNCTION									
1.5.83										
1717	-	AMERADA RPG-3 NO.			30508 CLOCK AND		STYLUS ON			
1722	-	AMERADA RPG-3 NO.			16955 CLOCK AND		STYLUS ON			
1735	-	GAUGES MADE UP IN			UPPER BUNDLE					
		CARRIER								
2.5.83		RUNNING TEST STRING								
3.5.83										
0722	-	PRESSURE ANNULUS TO OPEN LPR VALVE								
0722	0	-	-	-	-	-	-	1.5561	-	7997.4

REMARKS :

* Only used if its value is significant compared to the accuracy of the gauge.

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B.H. PRESSURE CALCULATIONS (Continuation)

02.5.83				LOWER GAUGE				UPPER GAUGE		
DATE - TIME		Choke size	W.H. pressure	Depth	Y	C *	P	Y	C *	P
Time HRS	Cumul. MINS	INCH	PSIG	M+	INCH	-	PSIG	INCH	-	PSIG
0729	0	-	-	-	-	-	-	1.8811	-	4555
0731	9	-	-	-	-	-	-	.8839	-	4569
0733	11	-	-	-	-	-	-	.8801	-	4580
0737	15	-	-	-	-	-	-	.8896	-	4598
0737	15	CYCLE LPR VALVE			-	-	-	.8896	-	-
0737	15	-	-	-	-	-	-	-	-	-
0738	16	-	-	-	-	-	-	0.8891	-	4595
0741	19	-	-	-	-	-	-	0.8915	-	4598
0745	23	-	-	-	-	-	-	0.8964	-	4633
0749	27	-	-	-	-	-	-	0.8985	-	4643
0751	29	-	-	-	-	-	-	0.9011	-	4657
0752	10	-	-	-	-	-	-	0.9012	-	4657
0753	31	-	-	-	-	-	-	0.9018	-	4660
0754	32	-	-	-	-	-	-	0.9021	-	4662
0755	33	-	-	-	-	-	-	0.9023	-	4663
0800	38	-	-	-	-	-	-	0.9089	-	4696
0815	53	-	-	-	-	-	-	0.9199	-	4752
0830	68	-	-	-	-	-	-	0.9281	-	4794
0845	83	-	-	-	-	-	-	0.9379	-	4844
0900	98	-	-	-	-	-	-	0.9479	-	4895
0915	113	-	-	-	-	-	-	0.9563	-	4938
0930	178	-	-	-	-	-	-	0.9646	-	4980
0945	143	-	-	-	-	-	-	0.9731	-	5024
1000	158	-	-	-	-	-	-	0.9799	-	5058
1030	188	-	-	-	-	-	-	0.9953	-	5137
1100	218	-	-	-	-	-	-	1.0081	-	5202
1130	248	-	-	-	-	-	-	1.0201	-	5263
1200	278	-	-	-	-	-	-	1.0315	-	5322
1230	308	-	-	-	-	-	-	.10408	-	5374

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B.H. PRESSURE CALCULATIONS (Continuation)

3.05.83				LOWER GAUGE				UPPER GAUGE		
DATE - TIME		Choke size	W.H. pressure	Depth	Y	C *	P	Y	C *	P
Time	Cumul.									
HR MIN	MIN	INCH	PSIG	M+	INCH	-	PSIG	INCH	-	PSIG
1330	368	-	-	-	-	-	-	1.0481	-	5406
1400	398	-	-	-	-	-	-	1.0651	-	5493
1500	458	-	-	-	-	-	-	1.0726	-	5531
1600	518	-	-	-	-	-	-	1.0799	-	5568
1650	568	-	SWITCH FLOW TO GAUGE TANK							
			THROUGH 1¼" ADJ. CHOKE							
1650	568	-	-	-	-	-	-	1.0826	-	5600
1653	571	1"	OPEN 1" ADJ. CHOKE			-	-	-	-	5580
1653	571	1"	-	-	-	-	-	1.0821	-	5580
1700	578	1"	-	-	-	-	-	1.0816	-	5577
1800	638	1"	-	-	-	-	-	1.0781	-	5559
1900	698	1"	-	-	-	-	-	1.0781	-	5559
2000	758	1"	-	-	-	-	-	1.0731	-	5534
2100	818	1"	-	-	-	-	-	1.0672	-	5504
2200	878	1"	-	-	-	-	-	1.0591	-	5462
2300	938	1"	-	-	-	-	-	1.0361	-	5345
2322	960	1"	BY PASS GAUGE TANK TO BURNER GAS TO SURFACE						-	-
2322	963	1"	-	-	-	-	-	0.9891	-	5105
2325	968	1"	LEAK AT CROSSOVER			-	-	-	-	-
2330	968	1"	-	-	-	-	-	0.9256	-	4856
2400	998	1"	-	-	-	-	-	0.9451	-	4881
4.05.83										
0022	1020	-	OPEN WELL ON 1½" ADJ. + 1" FIXED					0.9589	-	4951
0100	1058	1½"	FIXED	-	-	-	-	0.7982	-	4232
0200	1118	1½"	-	-	-	-	-	0.8286	-	4557
0300	1178	1½"	-	-	-	-	-	0.8549	-	4421
0400	1238	1½"	-	-	-	-	-	0.8499	-	4395
0500	1298	1½"	-	-	-	-	-	0.8501	-	4396

B.H. PRESSURE CALCULATIONS (Continuation)

03.05.83

DATE - TIME		Choke	W.H.	LOWER GAUGE				UPPER GAUGE		
Time	Cumul.	size	pressure	Depth	Y	C *	P	Y	C *	P
HR MIN	MIN	INCH	PSIG	m+	INCH	-	PSIG	INCH	-	PSIG
0600	1358	1½	-	-	-	-	-	0.6973	-	3617
0700	1418	1½"	-	-	-	-	-	0.6021	-	3132
0800	1478	1½"	-	-	-	-	-	0.5411	-	2821
0900	1538	1½"	-	-	-	-	-	0.4796	-	2507
0925	1563	1½"	-	-	-	-	-	0.3951	-	2076
0925	-	SWITCHED FLOW TO GAS FLARE					-	-	-	-
0925	-	1" FIXED ½" ADJ.		-	-	-	-	-	-	-
1000	1598	1"	-	-	-	-	-	0.3949	-	2075
1100	1658	1"	-	-	-	-	-	0.3651	-	1923
1200	1718	1	-	-	-	-	-	0.3968	-	2085
1300	1778	1"	-	-	-	-	-	0.3691	-	1944
1320	1798	1"	-	-	-	-	-	0.3491	-	1842
1320	0	CLOSE MASTER VALVE TO A220W								
		RIGGING UP OF SPRO LATCH								
1320	0	PRESSURE BUILD-UP		-	-	-	-	-	-	-
1325	5	-	-	-	-	-	-	0.3521	-	1857
1330	10	-	-	-	-	-	-	0.3541	-	1867
1335	15	-	-	-	-	-	-	0.3599	-	1897
1350	30	-	-	-	-	-	-	0.3759	-	1978
1405	45	-	-	-	-	-	-	0.3923	-	2062
1470	60	-	-	-	-	-	-	0.4081	-	2142
1435	75	-	-	-	-	-	-	0.4236	-	2222
1450	90	-	-	-	-	-	-	0.4401	-	2306
1505	105	-	-	-	-	-	-	0.4561	-	2387
1520	120	-	-	-	-	-	-	0.4719	-	2468
1535	135	-	-	-	-	-	-	0.4871	-	2545
1550	150	-	-	-	-	-	-	0.5023	-	2623
1605	165	-	-	-	-	-	-	0.5191	-	2599
1620	180	-	-	-	-	-	-	0.5466	-	2798

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B.H. PRESSURE CALCULATIONS (Continuation)

24.5.83				LOWER GAUGE				UPPER GAUGE		
DATE – TIME		Choke size	W.H. pressure	Depth	Y	C*	P	Y	C*	P
Time	Cumul									
HR MIN	MIN	INCH	PSIG	M+	INCH		PSIG	INCH		PSIG
1635	195	–	–	–	–	–	–	0.5511	–	2872
1650	210	–	–	–	–	–	–	0.5661	–	2951
1705	225	–	–	–	–	–	–	0.5806	–	3022
1715	235	–	–	–	–	–	–	0.5841	–	3040
1715	0	CLOSE L.P.R. TOOL P.B.U.								
1720	5	–	–	–	–	–	–	0.7041	–	3652
1725	10	–	–	–	–	–	–	0.8016	–	4149
1730	15	–	–	–	–	–	–	0.8631	–	4463
1735	20	–	–	–	–	–	–	0.9169	–	4777
1740	25	–	–	–	–	–	–	0.9413	–	4862
1745	30	–	–	–	–	–	–	0.9811	–	5065
1800	45	–	–	–	–	–	–	1.0376	–	5353
1815	60	–	–	–	–	–	–	1.0751	–	5544
1830	75	–	–	–	–	–	–	1.1041	–	5692
1900	105	–	–	–	–	–	–	1.1426	–	5888
1930	135	–	–	–	–	–	–	1.1659	–	6007
2000	165	–	–	–	–	–	–	1.1814	–	6068
2030	195	–	–	–	–	–	–	1.1951	–	6156
2100	225	–	–	–	–	–	–	1.2081	–	6222
2130	255	–	–	–	–	–	–	1.2181	–	6273
2200	285	–	–	–	–	–	–	1.2276	–	6322
2230	315	–	–	–	–	–	–	1.2351	–	6360
2300	345	–	–	–	–	–	–	1.2441	–	6397
2330	375	–	–	–	–	–	–	1.2501	–	6436
2400	405	–	–	–	–	–	–	1.2561	–	6467
05.5.83										
0100	465	–	–	–	–	–	–	1.2661	–	6518
0200	525	–	–	–	–	–	–	1.2778	–	6578
0300	585	–	–	–	–	–	–	1.2839	–	6609

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B.H. PRESSURE CALCULATIONS (Continuation)

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05.5.83

DATE - TIME		Choke	W.H.	LOWER GAUGE				UPPER GAUGE		
Time	Cumul	size	pressure	Depth	Y	C *	P	Y	C *	P
HRS MIN	MIN	INCHES	PSIG	M+	INCH	-	PSIG	INCH	-	PSIG
0400	645	-	-	-	-	-	-	1.2919	-	6649
0500	705	-	-	-	-	-	-	1.2976	-	6679
0600	765	-	-	-	-	-	-	1.3046	-	6714
0700	825	-	-	-	-	-	-	1.3093	-	6738
				CIRCULATE						

LOWER BUNDLE CARRIER

BOTTOM HOLE PRESSURE CALCULATIONS

Well producing through . ~~casing~~ / ~~tubing~~ / drill pipe 3½"

Bottom hole temperature : 306.9°F at depth 4372.36m with RT7

INSTRUMENT DATA	LOWER GAUGE	UPPER GAUGE
Instrument type :	R.P.G. 3	R.P.G.3
Press. element. No. and range :	48461 10000 psi	33961 10000 psi
Recording element. No. :	2384 S.P.L.S.	27317 S.P.L.S.
Clock. No. and capacity :	F13190 120 HR Hi Temp	E-8688 72 HRS
CALIBRATION DATA		
Calibration. No. and date :	2-23/4/83	3-23/4/83
Calibration temperature :	300°F	300°F
Calibration range :	1000-9000 psi	1000-9000 psi
K :	5108.12	5193.08
a, (calibrated chart) :	20	6.6
P_{RC}, (non calibrated chart) :	-	-

DATE - TIME Time HRS MIN	DATE - TIME Cumul MIN	Choke size 64	W.H. pressure PSIG	Depth MTR	Y INCH	C * -	P PSIG	Y INCH	C * -	P PSIG
				4400.64						
					DST #1					
1.5.83										
1741			Gauge		33961		Clock and	Stylus on		
1744			Gauge		48461		Clock and	Stylus on		
1830			Gauges made up to bundle carrier							
2.5.83			Running test string							
3.5.83	-	-	-		1.4845	-	7613	1.4490	-	7531
0722	0	¼" Bubble hose	Pressure annulus to open LPR valve							
0729	7	"	-	-	0.8178	-	4197	0.8100	-	4213
0731	9	"	-	-	0.8180	-	4198	0.8120	-	4223
0737	11	"	-	-	0.8182	-	4199	0.8137	-	4232
0737	15	"	-	-	0.8225	-	4221	0.8165	-	4247
0737	15	"	Cycle LPR valve							
0737	15	"	-	-	-	-	-	-	-	-

REMARKS :

* Only used if its value is significant

B.H. PRESSURE CALCULATIONS (Continuation)

3.5.83				~~LOWER GAUGE~~				~~UPPER GAUGE~~		
DATE - TIME		Choke	W.H.	Depth	Y	C*	P	Y	C*	P
Time	Cumul	size	pressure							
HR MIN	MIN	64	PSIG	MTR	INCH	-	PSIG	INCH	-	PSIG
0738	16	"	-	-	0.8260	-	42360	0.8175	-	4252
0741	19	¼" Bubble Hose	-	-	0.8260	-	4239	0.8198	-	4264
0745	23	"	-	-	0.8282	-	4251	0.8205	-	4268
0749	27	"	-	-	0.8282	-	4251	0.8235	-	4283
0751	29	"	-	-	0.8297	-	4258	0.8252	-	4292
0752	30	"	-	-	0.8300	-	4260	0.8265	-	4299
0753	31	"	-	-	0.8315	-	4267	0.8278	-	4305
0754	32	"	-	-	0.8320	-	4270	0.8284	-	4309
0755	33	"	-	-	0.8337	-	4279	0.8291	-	4312
0800	38	"	1	-	0.8375	-	4298	0.8330	-	4332
0815	53	"	1	-	0.8488	-	4356	0.8458	-	4399
0830	68	"	1	-	0.8605	-	4416	0.8570	-	4457
0845	83	"	1	-	0.8703	-	4466	0.8675	-	4512
0900	98	"	1	-	0.8800	-	4515	0.8795	-	4574
0915	113	"	1	-	0.8905	-	4569	0.8875	-	4615
0930	128	"	1	-	0.8989	-	4612	0.8962	-	4616
1000	158	"	1	-	0.9161	-	4700	0.9135	-	4750
1030	188	"	1	-	0.9350	-	4816	0.9300	-	4836
1100	218	"	1	-	0.9482	-	4864	0.9450	-	4914
1130	248	"	1	-	0.9645	-	4947	0.9582	-	4983
1200	278	"	1	-	0.9775	-	5013	0.9710	-	5049
1230	308	"	1	-	0.9901	-	5078	0.9825	-	5109
1330	338	"	1	-	0.9955	-	5105	0.9942	-	5170
1330	368	"	1	-	1.0125	-	5192	1.0038	-	5219
1400	398	"	1	-	1.0179	-	5220	1.0085	-	5244
1415	413	"	1	-	1.0205	-	5233	1.0115	-	5259
1430	428	"	1	-	1.0232	-	5247	1.0145	-	5275
1445	443	"	1	-	1.0257	-	5259	1.0155	-	5280
1500	458	"	1	-	1.0275	-	5267	1.0175	-	5291

FLOPETROL

B.H. PRESSURE CALCULATIONS (Continuation)

3.5.83				~~LOWER GAUGE~~				~~UPPER GAUGE~~		
DATE - TIME		Choke size	W.H. pressure	Depth	Y	C*	P	Y	C*	P
Time	Cumul									
HR MIN	MIN	INCH	PSIG	MTR	INCH	-	PSIG	POOH	-	PSIG
1500	458	"	-	-	-	-	-	-	-	-
1515	473	"	-	-	1.0291	-	5277	1.0205	-	5306
1530	488	"	-	-	1.0312	-	5287	1.0225	-	5317
1545	503	"	-	-	1.0355	-	5309	1.0245	-	5327
1600	518	"	-	-	1.0375	-	5320	1.0270	-	5340
1615	533	"	DIESEL TO SURFACE -	-	1.0409	-	5337	1.0291	-	5351
1630	548	"	-	-	1.0400	-	5332	1.0289	-	5350
1645	563	"	-	-	1.0375	-	5320	1.0270	-	5340
1650	568	"	-	-	1.0380	-	5322	1.0270	-	5340
1650	568	Switch flow to gauge tank through adj. choke								
1653	571	Open 1" adj. choke			1.0390		5327	1.0270	-	5340
1700	578	1¼" + 1	-	-	1.0380	-	5322	1.0263	0	5336
1715	593	"	-	-	1.0380	-	5322	1.0265	-	5336
1730	608	"	-	-	1.0375	-	5320	1.0260	-	5335
1745	623	"	-	-	1.0365	-	5315	1.0245	-	5327
1800	638	"	-	-	1.0360	-	5312	1.0245	-	5327
1900	698	"	-	-	1.0338	-	5301	1.0220	-	5304
2000	758	"	-	-	1.0305	-	5284	1.0175	-	5291
2100	818	"	-	-	1.0232	-	5347	1.0111	-	5257
2130	848	"	-	-	1.0187	-	5224	1.0065	-	5233
2200	878	"	-	-	1.0140	-	5200	1.002	-	5201
2230	908	"	-	-	1.0015	-	5136	0.9911	-	5153
2300	938	"	-	-	0.9779	-	5015	0.9697	-	5042
2322	960	"	-	-	0.8621	-	4424	0.8630	-	4488
2322	960	By pass gauge tank to burner - gas to surface								
2325	963	Leak at X-over								
2330	968	Close wing valve on Flowhead								
2330	968	Closed	-	-	0.8460	-	4341	0.8492	-	4417

B.H. PRESSURE CALCULATIONS (Continuation)

3.5.83				LOWER GAUGE				UPPER GAUGE		
DATE - TIME		Choke	W.H.	Depth	Y	C*	P	Y	C*	P
Time	Cumul	size	pressure							
HR MIN	MIN	64	PSIG	MTR	INCH	-	PSIG	INCH	-	PSIG
2330	968	Closed	-	-	-	-	-	-	-	-
2331	969	"	-	-	-	-	-	0.8499	-	4420
2332	970	"	-	-	-	-	-	0.8500	-	4421
2333	971	"	-	-	-	-	-	0.8519	-	4431
2334	972	"	-	-	-	-	-	0.8521	-	4432
2335	973	"	-	-	0.8480	-	4352	0.8530	-	4436
2340	978	"	-	-	0.8518	-	4371	0.8581	-	4463
2345	983	"	-	-	0.8571	-	4398	0.8641	-	4494
2400	998	"	-	-	0.8702	-	4465	0.8790	-	4591
4.5.83										
0015	1013	"	-	-	0.8820	-	4525	"	-	-
0022	1020	"	-	-	0.8618	-	4422	0.8525	-	4434
0022	"	Open well to flare slowly increasing adj.								
0022	"	-	-	-	-	-	-	-	-	-
0037	1035	-	-	-	0.7772	-	3990	0.7516	-	3910
0050	1048	-	-	-	0.7192	-	3694	0.7220	-	3756
0050	1048	1¼" adj. + 1" fixed	Adj. on 1¼ + 1" fixed choke							
0100	1058	"	-	-	0.7182	-	3689	0.7241	-	3767
0115	1073	"	-	-	0.7277	-	3737	0.7380	-	3839
0130	1088	"	-	-	0.7365	-	3782	0.7475	-	3888
0145	1103	"	-	-	0.7431	-	3816	0.7557	-	3931
0200	1118	"	-	-	0.7510	-	3856	0.7639	-	3974
0230	1148	"	-	-	0.7645	-	3925	0.7781	-	4047
0300	1178	"	-	-	0.7792	-	4000	0.7905	-	4112
0330	1208	"	-	-	0.7795	-	4002	0.7859	-	4088
0400	1238	"	-	-	0.7739	-	3973	0.7819	-	4067
0430	1268	"	-	-	0.7878	-	4044	0.8009	-	4166
0500	1298	"	-	-	0.7790	-	3399	0.7565	-	3935
0530	1328	"	-	-	0.6725	-	3455	0.6469	-	3366

B.H. PRESSURE CALCULATIONS (Continuation)

4.5.83				~~LOWER GAUGE~~				UPPER GAUGE		
DATE → TIME		Choke	W.H.	Depth	Y	C*	P	Y	C*	P
Time	Cumul	size	pressure							
HR MINS	MINS	64	PSIG	MTR	INCH	-	PSIG	INCH	-	PSIG
0530	1328	-	-	-	-	-	-	-	-	-
0600	1358	1¼" +	-	-	0.6320	-	3248	0.6360	-	3309
0630	1388	1" fixed		-	0.6330	-	3253	0.6221	-	3237
0700	1418	1"		-	0.5537	-	2848	0.5222	-	2718
0730	1448	"	-	-	0.4855	-	2500	0.4780	-	2489
0800	1478	"	-	-	0.4932	-	2539	0.4973	-	2589
0830	1508	"	-	-	0.5130	-	2640	0.5099	-	2655
0900	1538	"	-	-	0.4500	-	2319	0.3989	-	2078
0925	1563	"	-	-	0.3630	-	1874	0.3352	-	1747
0925	1563	Switched flow to gas flare				-	-	-	-	-
0930	1568	"	-	-	0.3580	-	1849	0.3355	-	1749
1000	1598	"	-	-	0.3632	-	1875	0.3538	-	1844
1030	1628	"	-	-	0.3687	-	1903	0.3225	-	1681
1100	1658	"	-	-	0.3322	-	1717	0.3225	-	1681
1130	1688	"	-	-	0.3490	-	1803	0.3415	-	1780
1200	1718	"	-	-	0.3663	-	1892	0.3635	-	1894
1230	1748	"	-	-	0.3925	-	2025	0.3925	-	2045
1300	1778	"	-	-	0.3405	-	1759	0.3105	-	1619
1320	1798	"	-	-	0.3161	-	1635	0.2962	-	1545
1320	1798	Close master valve to allow rigging up of SPRO latch								
1320	0	-	-	-	0.3161	-	1635	0.2962	-	1545
1321	1	-	-	-	0.3195	-	1652	0.2955	-	1541
1322	2	-	-	-	0.3225	-	1667	0.2980	-	1554
1323	3	-	-	-	0.3237	-	1673	0.2985	-	1557
1324	4	-	-	-	0.3252	-	1681	0.300	-	1565
1325	5	-	-	-	0.3260	-	1685	0.3005	-	1567
1330	10	-	-	-	0.3370	-	1741	0.3091	-	1612
1335	15	-	-	-	0.3385	-	1749	0.3162	-	1649

B.H. PRESSURE CALCULATIONS (Continuation)

4.5.83				LOWER GAUGE				UPPER GAUGE		
DATE - TIME		Choke	W.H.	Depth	Y	C *	P	Y	C *	P
Time	Cumul	size	pressure							
HR MIN	MIN	64	PSIG	MTR	INCH	-	PSIG	INCH	-	PSIG
1335	15									
1340	20	-		-	0.3450	-	1782	0.3227	-	1682
1345	25	-		-	0.3501	-	1808	0.3285	-	1713
1350	30	-		-	0.3547	-	1832	0.3341	-	1742
1405	45	-		-	0.3762	-	1942	0.3530	-	1840
1420	60	-		-	0.3914	-	2019	0.3720	-	1938
1435	75	-		-	0.4060	-	2094	0.3897	-	2030
1450	90	-		-	0.4245	-	2188	0.4075	-	2123
1520	120	-		-	0.4600	-	2370	0.4439	-	2312
1550	150	-		-	0.4933	-	2560	0.4794	-	2496
1612	172	-		-	0.5155	-	2653	0.5029	-	2618
1612	-	Close EZ Tree					-	-	-	-
1620	180	-	-	-	0.5244	-	2669	0.5109	-	2660
1715	235	Well shut in downhole P.B.U. continues								
1720	5	-		-	0.8005	-	4109	End of chart		
1820	65	-		-	1.0845	-	5560	72 hr clock		
1920	125	-		-	1.1580	-	5935	-	-	-
2020	185	-		-	1.1892	-	6095	-	-	-
2120	245	-		-	1.2130	-	6216	-	-	-
2220	305	-		-	1.2305	-	6306	-	-	-
2320	365	-		-	1.2460	-	6385	-	-	-
5.5.83										
0020	425	-		-	1.2585	-	6447	-	-	-
0120	485	-		-	1.2691	-	6503	-	-	-
0220	545	-		-	1.27775	-	6546	-	-	-
0320	605	-		-	1.2850	-	6584	-	-	-
0420	665	-		-	1.2927	-	6623	-	-	-
0520	725	-		-	1.2981	-	6651	-	-	-
0620	785	-		-	1.3035	-	6678	-	-	-

DST No. 1

Lower Bundle Carrier

Gauge No. 48461

Additional Readings

May 4, 1983

Time (Hr. min)	Cumulative (min)	Pressure (PSIG)
1715	0	2939
1720	5	3685
1725	10	3912
1730	15	4252
1735	20	4520
1740	25	4720
1745	30	4909
1750	35	5037
1755	40	5149
1800	45	5269
1805	50	5324
1810	55	5421
1815	60	5487
1820	65	5560

B.H. PRESSURE CALCULATIONS (Continuation)

DATE - TIME		Choke size	W.H. pressure	LOWER GAUGE				UPPER GAUGE		
Time	Cumul			Depth	Y	C *	P	Y	C *	P
HR MIN	MIN				INCH		PSIG			
0620										
0717	845	-	-	-	1.3090	-	6708	-	-	-
0720	1080							-	-	-
0717	842	Pressure annulus to start to kill well						-	-	-
0748	-	Start to kill well								
1435	-	Packer unset (Tool sheared off)								
6.5.83		Gauges in hole waiting fishing								
7.5.83										
0950	-	Gauges on surface			-	-	-	-	-	-
1005	-	R.P.G.-3 33961, Clock and stylus off								
1010	-	R.P.G.-3 48461 Clock and stylus off								
					END OF D.S.T. #1					

FLOPETROL	Client : PHILLIPS	Section : ANNEX 1.2
Base : PEO/PERTH	Field : HERMES Well : 1	Page : 55 Report N° :

DST #2 — UPPER BUNDLE CARRIER

BOTTOM HOLE PRESSURE CALCULATIONS

Well producing through . ~~casing~~ / ~~tubing~~ / drill pipe 3½"
Bottom hole temperature : 304.9 at depth 4401m with RT7

INSTRUMENT DATA	~~LOWER GAUGE~~	~~UPPER GAUGE~~
Instrument type :		-
Press. element. No. and range :	33961 10,000 psi	-
Recording element. No. :	27317	-
Clock. No. and capacity :	E8688 72 hr	-
CALIBRATION DATA		
Calibration. No. and date :	3-23/4/83	-
Calibration temperature :	300°F	-
Calibration range :	1000-9000 psi	-
K :	5193.08 psi/inch	-
a, (calibrated chart) :	6.6 psi	-
P_{RC}, (non calibrated chart) :	-	

DATE-TIME		Choke	W.H.	Depth	Y	C *	P	Y	C *	P
Time	Cumul	size	pressure							
HRS	MINS	INCHES	psig	M	INCHES		PSI			
				4363.15						
		DST #2								
8.5.83										
2319		Amerada gauge No. 33961 clock and stylus on								
9.5.83										
10.5.83										
0652	-	-	-	3747	1.4015	-	7285	Pressure to open tool		
0653	0	-	-	"	0.2873	-	1499	LPR Tool open		
0654	1	-	-	"	0.2903	-	1514	-	-	-
0655	2	¼"	3100	"	0.2903	-	1514	Open well at C/N		
0656	3	"	3050	"	0.2910	-	1518	-	-	-
0657	4	"	2850	"	0.2910	-	1518	-	-	-
0658	5	7/16"	2600	"	0.2922	-	1324	-	-	-
0659	6	½"	2300	"	0.2941	-	1534	-	-	-
0700	7	"	2100	"	0.2940	-	1533	-	-	-
0701	8	9/16"	1850	"	0.2940	-	1533	-	-	-
0702	9	"	1600	"	0.2950	-	1539	-	-	-
0707	14	"	775	"	0.2880	-	1502	-	-	-

REMARKS :

* Only used if its value is significant

FLOPETROL

B.H. PRESSURE CALCULATIONS (Continuation)

DATE - TIME		Choke	W.H.	LOWER GAUGE				UPPER GAUGE		
Time	Cumul	size	pressure	Depth	Y	C *	P	Y	C *	P
HRS	MINS	INCHES	PSIG	M	INCHES		PSI			
0707	14	–	–	–	–	–	–	–	–	–
10.5.83		9/46"	–	–	–	–	–	–	–	–
0712	19	"	400	3747	0.2955	–	1545	–	–	–
0717	24	"	155	"	0.3030	–	1580	–	–	–
0722	29	"	80	"	0.3090	–	1611	–	–	–
0723	301	1" Fixed open well up fully on 1½" + 1" fixed choke								
0727	34	+ 1½" adj.	41	3747	0.3122	–	1628	–	–	–
0732	390	"	28	"	0.3165	–	1650	–	–	–
0737	44	"	–	"	0.3200	–	1668	–	–	–
0742	49	"	–	"	0.3235	–	1687	–	–	–
0747	54	"	–	"	0.3270	–	1705	–	–	–
0752	59	"	–	"	0.3300	–	1720	–	–	–
0757	64	"	–	"	0.3340	–	1741	–	–	–
0800	67	"	17	"	0.3360	–	1751	–	–	–
0815	82	"	17	"	0.3480	–	1814	–	–	–
0830	87	"	14	"	0.3592	–	1872	–	–	–
0845	112	"	11	"	0.3728	–	1943	–	–	–
0900	127	"	8	"	0.3862	–	2012	–	–	–
0915	142	"	5	"	0.3970	–	2068	–	–	–
0930	157	"	5	"	0.3990	–	2079	–	–	–
0945	172	"	10	"	0.3655	–	1905	–	–	–
1000	187	"	50	"	0.3072	–	1602	–	–	–
1015	202	"	40	"	0.2651	–	1383	–	–	–
1030	217	"	40	"	0.2262	–	1285	–	–	–
1045	232	"	20	"	0.2372	–	1238	–	–	–
1100	247	"	13	"	0.2430	–	1269	–	–	–
1115	262	"	6	"	0.2505	–	1307	–	–	–
1130	277	"	4	"	0.2580	–	1346	–	–	–
1145	292	"	2	"	0.2692	–	1405	–	–	–

FLOPETROL

B.H. PRESSURE CALCULATIONS (Continuation)

DATE – TIME		Choke	W.H.	LOWER GAUGE				UPPER GAUGE		
Time	Cumul	size	pressure	Depth	Y	C *	P	Y	C *	P
HRS	MINS	INCHES	PSIG	M	INCHES		PSI			
1145										
1200	307	+ 1¼" adj.								
1215	322	1" fixed	–	3747	0.3825	–	1993	–	–	–
1230	337	+ 1¼" adj.	20	"	0.2720	–	1410	–	–	–
1245	352	"	25	"	0.2615	–	1365	–	–	–
1300	367	"	20	"	0.2555	–	1333	–	–	–
1315	382	"	20	"	0.2510	–	1310	–	–	–
1330	397	"	15	"	0.2448	–	1278	–	–	–
1345	412	"	15	"	0.2370	–	1237	–	–	–
1400	427	"	10	"	0.2325	–	1214	–	–	–
1415	442	"	15	"	0.2300	–	1201	–	–	–
1430	457	"	12	"	0.2278	–	1190	–	–	–
1445	472	"	5	"	0.2330	–	1217	–	–	–
1500	487	"	2	"	0.2375	–	1240	–	–	–
1515	502	"	5	"	0.2400	–	1253	–	–	–
1530	517	"	5	"	0.2370	–	1237	–	–	–
1545	532	"	8	"	0.2322	–	1212	–	–	–
1600	547	"	20	"	0.2240	–	1170	–	–	–
1615	562	"	6	"	0.2195	–	1146	–	–	–
1630	577	"	10	"	0.2164	–	1130	–	–	–
1645	592	"	10	"	0.2153	–	1125	–	–	–
1700	607	"	5	"	0.2200	–	1149	–	–	–
1712	619	¼" adj.	–	"	0.2235	–	1167	Close fixed choke ¼" on adj.		
1715	622	"	45	"	0.2245	–	1172	–	–	–
1730	639	"	83	"	0.2492	–	1301	–	–	–
1745	652	"	100	"	0.2635	–	1375	–	–	–
1800	667	"	135	"	0.2722	–	1420	–	–	–
1815	682	"	200	"	0.2900	–	1513	–	–	–
1830	697	"	250	"	0.3020	–	1575	–	–	–

FLOPETROL

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B.H. PRESSURE CALCULATIONS (Continuation)

DATE - TIME		Choke	W.H.	LOWER GAUGE				UPPER GAUGE		
Time	Cumul	size	pressure	Depth	Y	C *	P	Y	C *	P
HRS	MINS	INCHES	PSIG	M	INCHES		PSI			
1830										
1845	712	¼" adj.	280	3747	0.3148	-	1641	-	-	-
1856	723	"	-	"	0.3190	-	1663	Close LPR Tool		
1856	0	-	Shut in for pressure build up							
1900	4	-	-	"	0.5180	-	2697	-	-	-
1905	9	-	-	"	0.5885	-	3065	-	-	-
1910	14	-	-	"	0.6438	-	3350	-	-	-
1915	19	-	-	"	0.6918	-	3599	-	-	-
1920	24	-	-	"	0.7245	-	3769	-	-	-
1925	29	-	-	"	0.7654	-	3981	-	-	-
1930	34	-	-	"	0.7992	-	4157	-	-	-
1935	39	-	-	"	0.8205	-	4268	-	-	-
1940	44	-	-	"	0.8470	-	4405	-	-	-
1945	49	-	-	"	0.8651	-	4499	-	-	-
1950	54	-	-	"	0.8882	-	4619	-	-	-
2050	114	-	-	"	1.0300	-	5355	-	-	-
2150	174	-	-	"	1.0960	-	5698	-	-	-
2250	234	-	-	"	1.1392	-	5923	-	-	-
2350	294	-	-	"	1.1715	-	6090	-	-	-
11.5.83										
0006	310	-	-	"	1.2038	-	6258	-	-	-
0006	310	Open LPR v/v		end of	PBU	-	-	-	-	-

DOP 116

DST #2

LOWER BUNDLE CARRIER

BOTTOM HOLE PRESSURE CALCULATIONS

Well producing through . ~~casing / tubing~~ / drill pipe 3½"
Bottom hole temperature : 304.9 at depth 4401m with RT7

INSTRUMENT DATA	~~LOWER GAUGE~~	~~UPPER GAUGE~~
Instrument type :		
Press. element. No. and range :	16955N 10000 psi	48461 10000 psi
Recording element. No. :	10730	2384
Clock. No. and capacity :	F13188 120 hrs hi temp	F13190 120 hrs Temp
CALIBRATION DATA		
Calibration. No. and date :	1-23/4/83	2-23/4/83
Calibration temperature :	300°F	300°F
Calibration range :	1000-9000 psi	1000-9000 psi
K :	5099.5436 psi/inch	5108.12 psi/inch
a, (calibrated chart) :	30.93 psi	20.0 psi
P_{RC}, (non calibrated chart) :	-	-

DATE - TIME		Choke	W.H.	Depth	Y	C *	P.	Y	C *	P
Time	Cumul	size	pressure							
HRS	MINS	INCHES	PSIG	M	INCHES		PSI	INCHES		PSI
				4372.35						
			DST #2							
8.5.83										
2235		Amerada gauges No. 169 SSN and No. 48461								
		Stylus and clock engaged.								
9.5.83		R.I.H. with DST string								
10.5.83										
0652	-	Pressure annulus to open LPR Tool								
0653	Tool	open		3754	1.4368	-	7359	1.4350	-	7350
0653	0	-	-	"	0.3240	-	1684	0.2825	-	1463
0654	1	-	-	"	0.3250	-	1689	0.2880	-	1491
0655	2	-	3100	"	0.3242	-	1685	0.2910	-	1506
0655	2	¼" open at choke manifold on ½" adj.								-
0656	3	"	3050	3754	0.3242	-	1685	0.2910	-	1506
0657	4	"	2850	"	0.3242	-	1685	0.2910	-	1506
0658	5	"	2600	"	0.3250	-	1689	0.2920	-	1512

REMARKS :

* Only used if its value is significant compared to the accuracy of the gauge

FLOPETROL

B.H. PRESSURE CALCULATIONS (Continuation)

DATE – TIME		Choke	W.H.	LOWER GAUGE				UPPER GAUGE		
Time	Cumul.	size	pressure	Depth	Y	C *	P	Y	C *	P
HRS	MINS	INCHES	PSIG	M	INCHES		PSI	INCHES		PSI
0658										
0659	6	¼"	2300	3754	0.3258	–	1693	0.2920	–	1512
10.5.83										
0700	7	"	2100	–	–	–	–	–	–	–
0701	8	9/16"	1850	3754	0.3290	–	1709	0.2940	–	1522
0702	9	"	1600	"	0.3291	–	1710	0.2940	–	1522
0707	14	"	775	"	0.3315	–	1722	0.2951	–	1527
0712	19	"	400	"	0.3325	–	1727	0.3030	–	1568
0717	24	"	155	"	0.3379	–	1755	0.3081	–	1602
0722	29	"	80	"	0.3450	–	1791	0.3128	–	1618
0723	30	1" fixed Open well up fully on 1¼" + 1" fixed choke								
0723	30	1¼" adj. –		3754	0.3451	–	1791	0.3129	–	1618
0727	34	"	41	"	0.3494	–	1813	0.3145	–	1627
0732	39	"	28	"	0.3525	–	1829	0.3195	–	1652
0737	44	"	–	"	0.3551	–	1842	0.3212	–	1661
0742	49	"	–	"	0.3572	–	1853	0.3250	–	1680
0747	54	"	–	"	0.3600	–	1867	0.3280	–	1695
0752	59	"	–	"	0.3631	–	1883	0.3320	–	1716
0757	64	"	–	"	0.3655	–	1895	0.3350	–	1731
0800	67	"	17	"	0.3672	–	1904	0.3370	–	1741
0815	82	"	17	"	0.3768	–	1953	0.3470	–	1793
0830	87	"	14	"	0.3868	–	2004	0.3588	–	1853
0845	112	"	11	"	0.3972	–	2057	0.3715	–	1918
0900	127	"	8	"	0.4082	–	2113	0.3840	–	1982
0915	142	"	5	"	0.4207	–	2177	0.3940	–	2037
0930	157	"	5	"	0.4285	–	2217	0.3962	–	2044
0945	172	"	10	"	0.4280	–	2214	0.3960	–	2043
1000	187	"	50	"	0.3907	–	2024	0.3610	–	1864
1015	202	"	40	"	0.3330	–	1730	0.3050	–	1578

FLOPETROL

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B.H. PRESSURE CALCULATIONS (Continuation)

DATE → TIME		Choke	W.H.	LOWER GAUGE				UPPER GAUGE		
Time	Cumul	size	pressure	Depth	Y	C *	P	Y	C *	P
HRS	MINS	INCHES	PSIG	M	INCHES	–	PSIG	INCHES	–	PSI
1015										
1030	217	+ 1¼" adj.								
1045	232	"	20	3754	0.2880	–	1500	0.2445	–	1269
10.5.83										
1100	247	+ 1¼" adj.	13	3754	0.2825	–	1472	0.2390	–	1241
1115	262	"	6	"	0.2850	–	1485	0.2415	–	1254
1130	277	"	4	"	0.2896	–	1508	0.2460	–	1277
1145	292	"	2	"	0.2972	–	1547	0.2536	–	1315
1200	307	"	2	"	0.3061	–	1592	0.2625	–	1361
1215	322	"	–	"	0.3168	–	1647	0.2800	–	1450
1230	337	"	20	"	0.3145	–	1635	0.277	–	1439
1245	352	"	25	"	0.3030	–	1577	0.2762	–	1431
1300	367	"	20	"	0.2960	–	1541	0.2692	–	1392
1315	382	"	20	"	0.2913	–	1517	0.2645	–	1371
1330	397	"	15	"	0.2845	–	1482	0.2577	–	1336
1345	412	"	15	"	0.2788	–	14553	0.2520	–	1307
1400	427	"	10	"	0.2710	–	1413	0.2442	–	1267
1415	442	"	15	"	0.2682	–	1399	0.2414	–	1253
1430	457	"	12	"	0.2641	–	1378	0.2374	–	1233
1445	472	"	5	"	0.2631	–	1373	0.2364	–	1228
1500	487	"	2	"	0.2673	–	1395	0.2404	–	1248
1515	502	"	5	"	0.2721	–	1419	0.2454	–	1274
1530	517	"	5	"	0.2721	–	1419	0.2454	–	1274
1545	532	"	8	"	0.2688	–	1402	0.2424	–	1258
1600	547	"	20	"	0.2632	–	1374	0.2368	–	1230
1615	562	"	6	"	0.2561	–	1337	0.2298	–	1194
1630	577	"	10	"	0.2525	–	1319	0.2263	–	1176
1645	592	"	10	"	0.2500	–	1306	0.2130	–	1108

B.H. PRESSURE CALCULATIONS (Continuation)

DATE – TIME		Choke	W.H.	LOWER GAUGE				UPPER GAUGE		
Time	Cumul	size	pressure	Depth	Y	C *	P	Y	C *	P
HRS	MINS	INCHES	PSIG	M	INCHES		PSI	INCHES		PSI
1645										
1700	607	+1¼" adj.	5	"	0.2500	–	1306	0.2152	–	1119
1712	619	"	–	"	0.2522	–	1318	0.2152	–	1119
1712	619	¼"	Close	fixed	choke ¼"	on adj				
1715	622	"	45	3754	0.2522		1318	0.2152	–	1119
1715	624	–	–	–	–	–	–	–	–	–
10.5.83		¼" adj.–		–	–	–	–	–	–	–
1730	639	"	83	3754	0.2700	–	1408	0.2332	–	1211
1745	652	"	100	"	0.2861	–	1490	0.2492	–	1293
1800	667	"	135	"	0.2978	–	1550	0.2602	–	1349
1815	682	"	200	"	0.3090	–	1607	0.2712	–	1405
1830	697	"	250	"	0.3232	–	1680	0.3042	–	1575
1845	712	"	280	"	0.3338	–	1734	0.3105	–	1606
1850	717	"	–	"	0.3432	–	1782	0.3128	–	1618
1856	723 /0	Close LPR Tool. Record build up								1623
1900	40	–		"	0.5072	–	2617	0.4982	–	2565
1905	9	–		"	0.5560	–	2866	0.5450	–	2804
1910	14	–		"	0.6132	–	3158	0.6008	–	3089
1915	19	–		"	0.6615	–	3404	0.6610	–	3396
1920	24	–		"	0.7065	–	3634	0.6995	–	3596
1925	29	–		"	0.7380	–	3794	0.7350	–	3774
1930	34	–		"	0.7750	–	3983	0.7630	–	3917
1935	39	–		"	0.8008	–	4115	0.7805	–	4007
1940	44	–		"	0.8261	–	4244	0.8155	–	4186
1945	49	–		"	0.8480	–	4355	0.8404	–	4313
1950	54	–		"	0.8648	–	4414	0.8658	–	4443
2050	114	–		"	1.0325	–	5296	1.0261	–	5261
2150	174	–		"	1.1062	–	5672	1.1125	–	5703
2250	234	–		"	1.1545	–	5918	1.1550	–	5920

B.H. PRESSURE CALCULATIONS (Continuation)

DATE - TIME		Choke	W.H.	LOWER GAUGE				UPPER GAUGE		
Time	Cumul	size	pressure	Depth	Y	C *	P	Y	C *	P
HRS	MINS	INCHES	PSIG	M	INCHES	-	PSIG	INCHES		PSI
2250										
2350	294	-		3754	1.1908	-	6103	1.1904	-	6101
11.5.83										
0006	310	-		3754	1.2240	-	6273	1.2245	-	6275
0006	310	Open LPR - end of P.B.O.								
				END OF DST #2						

DST #1

LOWER GAUGE

BOTTOM HOLE TEMPERATURE CALCULATIONS

INSTRUMENT DATA

Temperature element No. 54306 Manufacturer - Range 200-350°F

Recording element No. 26032 Clock No. E8687 Range 72 hr

DATE – TIME		Choke size	Depth	W.H. temp.	Y	Y + Y_o	T	Remarks
Time	Cumul							
HRS	MINS	INCHES	M	°C	INCHES		°F	Units
			4400.6M					
1.5.83					DST #1			
		Gauge	54306 was in lower carrier					
1750		Clock	and stylus on					
2.5.83		Run in with DST string						
3.5.83								
0100	-	Packer set		-	-	-	-	-
0722	0	Pressure up to open			LPR v/v	-	-	-
0722	0	½" Bubble Hose	4372	-	0.9865	-	306.9	-
0737	15	"	"	-	0.9664	-	306.9	Cycle LPR Tool
0800	38	"	"	16	0.9778	-	306.3	-
0900	98	"	"	-	0.9883	-	307.0	-
1000	158	"	"	-	0.9939	-	307.4	-
1100	218	"	"	-	0.9978	-	307.7	-
1200	278	"	"	-	1.0005	-	307.8	-
1300	338	"	"	-	1.0005	-	307.8	-
1400	398	"	"	16	1.0005	-	307.8	-
1500	458	"	"	16	1.0005	-	307.8	-
1600	518	"	"	16	1.0010	-	307.9n	-
1650	568	"	"	-	1.0010	-	307.9	-
1653	571	1¼" adj.	"	-	1.0010	-	307.9	Open well thru C/M
1700	578	+ 1" fixed	"	16	1.0010	-	307.9	-

FLOPETROL

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B.H. TEMPERATURE CALCULATIONS (Continuation)

DATE – TIME		Choke size	Depth	W.H. temp.	Y	Y + Yo	T	Remarks
Time	Cumul							
HRS	MINS	INCHES	M	°C	INCHES		°F	Units
1700	578	–	–	–	–	–	–	–
1800	638	1¼" adj.	4372	15	1.0010	–	307.9	–
		+1¼" fixed	"	–	–	–	–	–
4.5.88		"	"	–	–	–	–	–
0100	1058	"	"	17	1.0010	–	307.9	–
0300	1178	"	"	15	0.9930	–	307.3	–
0500	1298	"	"	15	0.9900	–	307.1	–
0700	1418	"	"	15	0.9625	–	305.3	–
0900	1538	"	"	19	0.9328	–	303.4	–
1100	1658	"	"	16	0.8892	–	300.5	–
1300	1778	"	"	21	0.8680	–	299.0	–
1320	1798	"	"		0.8690	–	299.1	–
1320	1798	Close master valve			to rig up SPRO			
		End of chart						
					END OF DST #1			

BOTTOM HOLE TEMPERATURE CALCULATIONS

INSTRUMENT DATA

Temperature element No. 54306 Manufacturer _____ Range 200-350°F

Recording element No. 26032 Clock No. E8687 Hi Temp Range 72 HR

DATE – TIME		Choke size	Depth	W.H. temp.	Y	Y + Y_o	T	Remarks
Time	Cumul							
HRS	MINS	INS	M	°C	INCHES		°F	Units
10.05	83		4372.35					
0652	0	–	4401	–	0.9660	–	305.6	Pressure Annulus/ Open LPR
0655	3	–	"	16	0.9556	–	304.9	Open at C/M
0700	8	½"	"	15	0.8942	–	300.8	½" adj. choke
0715	23	3/4	"	12	0.8451	–	297.5	3/4 adj. choke
0723	31	1" fixed	"	12	0.8452	–	297.5	Open fully on 1¼ adj.
–	–	+ ¼"adj.	"	–	–	–	297.5	and 1" fixed choke
0730	38	"	"	15	0.8765	–	299.6	–
0745	53	"	"	16	0.9085	–	301.8	–
0800	68	"	"	16	0.9150	–	302.2	–
0815	63	"	"	16	0.9080	–	301.7	–
0830	98	"	"	17	0.8928	–	300.7	–
0845	113	"	"	17	0.8928	–	300.7	–
0900	128	"	"	17	0.8897	–	300.5	–
0815	143	"	"	17	0.8890	–	300.5	–
0830	158	"	"	17	0.8882	–	300.4	–
0845	173	"	"	17	0.8880	–	300.4	–
1000	188	"	"	17	0.8858	–	300.2	–
1015	203	"	"	19	0.8675	–	299.0	–
1030	218	"	"	21	0.8487	–	297.7	–
1045	233	"	"	19	0.8418	–	297.3	–
1100	248	"	"	16	0.8320	–	296.6	–
1115	263	"	"	16	0.8208	–	295.8	–
1130	278	"	"	16	0.8218	–	295.9	–
1145	293	"	"	15	0.8130	–	295.3	–
1200	308	"	"	14	0.8069	–	294.9	–

FLOPETROL

B.H. TEMPERATURE CALCULATIONS (Continuation)

DATE - TIME		Choke size	Depth	W.H. temp.	Y	Y + Yo	T	Remarks
Time	Cumul							
HRS	MINS	INS	M	°C	INCHES		°F	Units
1200								
1215	323	+1½" adj.	4401	14	0.8047	-	294.7	-
1230	338	1" fixed	4401	16	0.8015	-	294.5	-
1245	353	+1½" adj.	"	18	0.7962	-	294.1	-
1300	368	"	"	18	0.7929	-	293.9	-
1315	383	"	"	18	0.7934	-	293.9	-
1330	398	"	"	19	0.7870	-	293.5	-
1345	413	"	"	20	0.7768	-	292.7	-
1400	428	"	"	19	0.7710	-	292.3	-
1415	443	"	"	17	0.7658	-	292.0	-
1430	458	"	"	19	0.7573	-	291.3	-
1445	473	"	"	18	0.7515	-	290.9	-
1500	488	"	"	18	0.7495	-	290.8	-
1515	503	"	"	18	0.7570	-	291.3	-
1530	518	"	"	18	0.7510	-	290.9	-
1545	533	"	"	18	0.7441	-	290.4	-
1600	548	"	"	18	0.7383	-	289.9	-
1615	563	"	"	18	0.7340	-	289.6	-
1630	578	"	"	17	0.7310	-	289.4	-
1645	593	"	"	16	0.7252	-	289.0	-
1700	608	"	"	16	0.7215	-	288.7	-
1712	Shut-in	fixed	choke.	Choke	back to ½"	adj.		
1712	620	½" adj.	"	-	0.7190	-	288.5	-
1715	623	"	"	16	0.7200	-	288.6	-
1730	638	"	"	16	0.7245	-	289.0	-
1745	653	"	"	16	0.7295	-	289.3	-
1800	668	"	"	17	0.7350	-	289.7	-
1815	683	"	"	17	0.7420	-	290.2	-
1830	698	"	"	17	0.7480	-	290.7	-
1845	713	"	"	17	0.7551		290.2	

FLOPETROL

B.H. TEMPERATURE CALCULATIONS (Continuation)

DATE – TIME		Choke size	Depth	W.H. temp.	Y	Y + Yo	T	Remarks
Time	Cumul							
HRS	MINS	INS	M	°C	INCHES		°F	Units
1845								
1850	718	¼" adj.	4401	17	0.7575	–	291.4	Shut in at LPR
1855	723		"	–	0.8230	–	296.0	Build up
1900	728		"	–	0.8920	–	300.7	–
1905	733		"	–	0.9215	–	302.7	–
1910	738		"	–	0.9415	–	304.0	–
1915	743		"	–	0.9580	–	305.0	–
1920	748		"	–	0.9670	–	305.6	–
1925	753		"	–	0.9732	–	306.0	–
1930	758		"	–	0.9814	–	306.5	–
1935	763		"	–	0.9851	–	306.8	–
1940	768		"	–	0.9882	–	307.0	–
1945	773		"	–	0.9918	–	307.3	–
2000	778		"	–	0.9969	–	307.6	–
2030	818		"	–	0.9980	–	307.7	–
2100	848		"	–	0.9980	–	307.7	–
11/5/83	–	–	"	–	–	–	–	–
0106	–	–	"	–	0.9888	–	307.0	Before reversing
					END DST #2			

- LIQUID PRODUCTION RATE MEASUREMENT -

2.1 - MEASUREMENT WITH TANK -

$$V_o = V \times K \times (1 - BSW)$$

V_o : Net oil volume at 60°F and atmospheric pressure.
V : Gross oil volume measured by tank gauging.
K : Volume correction factor to be applied between the tank temperature during gauging and 60°F.
BSW: Basic sediments and water.

2.2 - MEASUREMENT WITH METER -

a) Shrinkage factor is measured by shrinkage tester.

$$V_o = V_S \times f \times (1 - Shr) \times K \times (1 - BSW)$$

V_o : Net oil volume at 60°F and atmospheric pressure.
V_S : Gross oil volume measured by meter under separator conditions.
f : Meter correction factor = $\frac{\text{Volume measured in tank}}{\text{Volume measured by meter}}$
Shr: Percentage of oil volume reduction between separator and tank conditions, reported to oil volume at separator conditions.
K : Volume correction factor to be applied between the final temperature during shrinkage measurement and 60°F.
BSW: Basic sediments and water.

b) Shrinkage factor is measured with tank.

$$V_o = V_S \times (1 - Shr') \times K \times (1 - BSW)$$

V_o, V_S, K and BSW : Same meaning as in a).
$(1 - Shr')$: Shrinkage factor including meter correction factor.

.: DOP 120

FLOPETROL

Client : PHILLIPS

Field : HERMES

Well : NO. 1

Base : PEO/PERTH

WATER PRODUCTION RATE -

MEASUREMENT WITH TANK

Section : ANNEX 2.1

Page : 73

Report N° :

DATE - TIME		Gauge	TANK VOLUME		STO GRAVITY			K	BSW	Net volume of STO V_o	Net STO product. rate	Cumulative production	
Time	Interval	graduation	Volume V	Temp.	Gravity	Temp.	Grav. 60°F						
HR MIN	-	CM							%		BBLS/day	BBLS	Units
		0											
							DST #1						
3.5.83													
0722	-	Well opened		-	-	-	-	-	-	-	-	-	-
0650	-	Flow switched to tank through 1 3/16" adj. choke						-	-	-	-	-	-
1653	-	Open 1" fixed choke as well			-	-	-	-	-	-	-	-	-
2000	-	Flow rate estimated at +/- 2 bbls per hour					-	-	-	-	-	-	-
2100	-	43	11.35	-	-	-	-	-	-	-	-	11.35	-
2130	-	49	1.58	Note - Results are approximate				-	-	-	38	23.93	-
2200	-	55	1.58	Due to heavy swells				-	-	-	38	14.51	-
2230	-	65	2.64	-	-	-	-	-	-	-	63	17.15	-
2300	-	75	2.64	-	-	-	-	-	-	-	63	19.97	-
2322	-		By-pass tank due to gas to surface massive										
-	-		slug of Diesel to tank give total returns of ± 45-50 bbls										
-	-		Note 1cm = 0.264 bbls										

NOTE: Returns to gauge tank were only Diesel cushion.

TESTED INTERVAL : -

PERFORATIONS : 4415-4425m - 4427-4431m
4432.5 - 4442m

Summary of samples taken:

	SAMPLE NUMBER	BOTTLE NUMBER	NATURE	DATE	TIME
DST 1	1	A8695	GAS	4/5/83	19:40
	2	A12870	GAS	4/5/83	22.25
DST 2	3	A12769	GAS	10/5/83	10.57
	4	A12683	GAS	10/5/83	17.50
	5	A5869	GAS	10/5/83	19.05
	6	20112-113	B.H. GAS	11/5/83	13.10

FLOPETROL

Base : PEO/PERTH

Client : PHILLIPS

Field : HERMES

Well : No. 1

Section: ANNEX 42

Page : 75

Report N°: -

- SURFACE SAMPLING -

Date of sampling : 4.05.83 Service order : - Sampling No.: 1

Sample nature : GAS Sampling point : DOWNSTREAM C/M

A - RESERVOIR AND WELL CHARACTERISTICS -

Producing zone : - Perforations : 4415-4425, 4427 4431, 4432.5-4442m Sampling interval : -

Depth origin : R.T. Tubing Dia. : 3½" DP Casing Dia. : 7"

Surface elevation : 23m AMSL (RT) Shoe : - Shoe : 4547.1m

Bottom hole static conditions	Initial pressure : -	at depth : -	date : -
	Latest pressure measured : -	at depth : -	date : -
	Temperature : -	at depth : -	date : -

B - MEASUREMENT AND SAMPLING CONDITIONS -

Time at which sample was taken : 1940 HR Time elapsed since stabilisation : -

Bottom hole dynamic conditions	Choke size : -	since : -	Well head pressure : -	Well head temp. : -
	Bottom hole pressure : -	at depth : -	date : -	
	Bottom hole temp. : -	at depth : -	date : -	

Flow measurement of sampled gas - Gravity (air: 1) : 0.76 Factor Fpv = $\frac{1}{\sqrt{Z}}$: -

Values used for calculations : TAKEN FROM EARLIER SAMPLE

Separator	Pressure : - PSIG Temp. : - °F	Rates - Gas : - SCFD Oil (separator cond.) : - BOPD [B] [C]	GOR : - (separator cond.)
Stock tank	Atmosphere : - mmHg - °F Tank temperature : - °F	Oil at 60 °F : - BOPD [A] [B] [C] [a] [b]	

BSW : - % WLR : - %

Transfering fluid : VACUUM

Transfer duration : 15 min

Final conditions of the shipping bottle : A8695

Pressure : 1 psi Temp : 16 °C

C - IDENTIFICATION OF THE SAMPLE -

Shipping bottle No. : A8695 sent on : - by : - Shipping order No. : -

Addressee : FLOPETROL PVT LAB

Coupled with	LIQUID	GAS
Bottom hole samples No.		DST #2 20112-113
Surface samples No.		DST #1 A12870 DST #2 A12769 A12683 A5869

Measurement conditions,

[A] - Tank ; [B] - Meter . [C] - Dump .

[a] - Corrected with shrinkage tester. [b] - Corrected with tank .

D - REMARKS -

SAMPLE TAKEN FOR COMPOSIION ONLY

Visa Chief Operator

C. DAVIES

o.: DOP 127

FLOPETROL

Base : PEO/PERTH

Client : PHILLIPS

Field : HERMES

Well : NO. 1

Section : ANNEX 42

Page : 76

Report N° : -

DST #1

- SURFACE SAMPLING -

Date of sampling : 4.05.83 Service order : - Sampling No. : 2

Sample nature : GAS Sampling point : CHOKE MANIFOLD

A - RESERVOIR AND WELL CHARACTERISTICS -

Producing zone : - Perforations : 4415-4425, 4427-4431, 4432.5-4442 Sampling interval : 23.5m

Depth origin : R.T. Tubing Dia. : 3½" DP Casing Dia. : 7"

Surface elevation : 23m AMSL (RT) Shoe : - Shoe : -

Bottom hole static conditions	Initial pressure	: -	at depth : -	date : -
	Latest pressure measured	: -	at depth : -	date : -
	Temperature	: -	at depth : -	date : -

B - MEASUREMENT AND SAMPLING CONDITIONS -

Time at which sample was taken : 2225 HR Time elapsed since stabilisation : -

Bottom hole STATIC conditions	Choke size : -	since : -	Well head pressure : 170 psig	Well head temp. : 16°C
	Bottom hole pressure : -	at depth : -	date : -	
	Bottom hole temp. : -	at depth : -	date : -	

Flow measurement of sampled gas - Gravity (air: 1) : 0.76 Factor Fpv = $\frac{1}{\sqrt{Z}}$: -

Values used for calculations : TAKEN FROM EARLIER SAMPLE

Separator	Pressure : - PSIG Temp. : - °F	Rates - Gas : - SCFD Oil (separator cond.) : - BOPD [B] [C]	GOR : - (separator cond.)
Stock tank	Atmosphere : - mmHg - °F Tank temperature : - °F	Oil at 60 °F : - BOPD [A] [B] [C] [a] [b]	

BSW : - % WLR : - %

Transfering fluid : VACUUM Transfer duration : 25 MINS

Final conditions of the shipping bottle : -

Pressure : 170 PSIG Temp : 15°C

C - IDENTIFICATION OF THE SAMPLE -

Shipping bottle No. : A12870 sent on : - by : - Shipping order No. : -

Addressee : FLOPETROL PVT LAB

Coupled with	LIQUID	GAS
Bottom hole samples No.		DST #2 20112-113
Surface samples No.		DST #1 A8695 DST #2 A12769 A12683 A5869

Measurement conditions,

[A] - Tank. [B] - Meter. [C] - Dump.

[a] - Corrected with shrinkage tester. [b] - Corrected with tank.

D - REMARKS -

SAMPLE TAKEN FOR COMPOSITION ONLY

Visa Chief Operator

C. DAVIES

D.: DOP 127

FLOPETROL	Client : PHILLIPS	Section: ANNEX 42
Base : PEO/PERTH	Field : HERMES Well : NO. 1	Page : 77 Report N° :

- SURFACE SAMPLING -

Date of sampling : 10.05.83 Service order : - Sampling No. : 3
Sample nature : GAS Sampling point : SEPARATOR

A - RESERVOIR AND WELL CHARACTERISTICS -

Producing zone : - Perforations : 4399.7-4402.7 / 4382.5-4387.5 Sampling interval : 8m
Depth origin : RT Tubing Dia. : 3½ DP Casing Dia. : 7"
Surface elevation : 23m AMSL (RT) Shoe : - Shoe : 4547.1m

Bottom hole static conditions	Initial pressure	: -	at depth : -	date : -
	Latest pressure measured	: -	at depth : -	date : -
	Temperature	: -	at depth : -	date : -

B - MEASUREMENT AND SAMPLING CONDITIONS -

Time at which sample was taken : 1057 Time elapsed since stabilisation :

Bottom hole dynamic conditions	Choke size : -	since : -	Well head pressure : 13 PSIG	Well head temp. : 16°C
	Bottom hole pressure : -	at depth : -	date : -
	Bottom hole temp. : -	at depth : -	date : -

Flow measurement of sampled gas - Gravity (air: 1) : - Factor Fpv = $\frac{1}{\sqrt{Z}}$: -
Values used for calculations :

Separator	Pressure : - PSIG Temp. : - °F	Rates - Gas : - SCFD Oil (separator cond.) : - BOPD [B] [C]	GOR : - (separator cond.)
Stock tank	Atmosphere : - mmHg - - °F Tank temperature : - °F	Oil at 60 °F : - BOPD [A] [B] [C] [a] [b]	

BSW : - % WLR : - %

Transfering fluid : VACUUM Transfer duration : 10MIN

Final conditions of the shipping bottle : A12769
Pressure : 13 PSIG Temp : 16°C

C - IDENTIFICATION OF THE SAMPLE -

Shipping bottle No. : A12769 sent on : by : Shipping order No. :
Addressee : FLOPETROL PVT LABORATORY

Coupled with	LIQUID	GAS
Bottom hole samples No.		DST #2 20112-113
Surface samples No.		DST #1 A8695, A12870; DST #2 A12683, A5869

Measurement conditions,
[A] - Tank. [B] - Meter. [C] - Dump.
[a] - Corrected with shrinkage tester. [b] - Corrected with tank.

D - REMARKS -

SAMPLE TAKEN FOR COMPOSITION ONLY

Visa Chief Operator

C. DAVIES

o.: DOP 127

FLOPETROL	Client : PHILLIPS	Section: ANNEX 42
Base : PEO/PERTH	Field : HERMES Well : NO. 1	Page : 78 Report N° :

DST #2

- SURFACE SAMPLING -

Date of sampling : 10.05.83 Service order : - Sampling No. : 4
Sample nature : GAS Sampling point : C/M

A - RESERVOIR AND WELL CHARACTERISTICS -

Producing zone : - Perforations : 4393.7-4402.7 / 4382.5-4387.5 Sampling interval : 8M
Depth origin : RT Tubing Dia. : 3½ DP Casing Dia. : 7"
Surface elevation : 23m AMSL (RT) Shoe : - Shoe : 4547.1m

Bottom hole static conditions	Initial pressure : -	at depth : -	date : -
	Latest pressure measured : -	at depth : -	date : -
	Temperature : -	at depth : -	date : -

B - MEASUREMENT AND SAMPLING CONDITIONS -

Time at which sample was taken : 1750 Time elapsed since stabilisation : -

Bottom hole dynamic conditions	Choke size : -	since : -	Well head pressure : -	Well head temp. : -
	Bottom hole pressure : -	at depth : -	date : -	
	Bottom hole temp. : -	at depth : -	date : -	

Flow measurement of sampled gas - Gravity (air : 1) : - Factor Fpv = $\frac{1}{\sqrt{Z}}$: -
Values used for calculations :

Separator	Pressure : - PSIG Temp. : - °F	Rates - Gas : - SCFD Oil (separator cond.) : - BOPD [B] [C]	GOR : - (separator cond.)
Stock tank	Atmosphere : - mmHg - °F Tank temperature : - °F	Oil at 60 °F : - BOPD [A] [B] [C] [a] [b]	

BSW : - % WLR : - %

Transfering fluid : VACUUM Transfer duration : 15 min

Final conditions of the shipping bottle : A12683
Pressure : 130 psig Temp : 16 °C

C - IDENTIFICATION OF THE SAMPLE -

Shipping bottle No. : A12683 sent on : - by : - Shipping order No. : -
Addressee : FLOPETROL PVT LABORATORY

Coupled with	LIQUID	GAS
Bottom hole samples No.		DST #2 20112-113
Surface samples No.		DST A8695 DST #2 A12769 A12870 A5869

Measurement conditions,
[A] - Tank. [B] - Meter. [C] - Dump.
[a] - Corrected with shrinkage tester. [b] - Corrected with tank.

D - REMARKS -

SAMPLE TAKEN FOR COMPOSITION ONLY

Visa Chief Operator

C. DAVIES

o.: DOP 127

FLOPETROL

Base : PEO/PERTH

Client : PHILLIPS

Field : HERMES

Well : NO. 1

Section: ANNEX 42

Page : 79

Report N°:

DST #2

- SURFACE SAMPLING -

Date of sampling : 10.05.83 Service order : _____ Sampling No.: 5

Sample nature : GAS Sampling point : C/M

A - RESERVOIR AND WELL CHARACTERISTICS -

Producing zone : - Perforations: 4399.7-4402.7 / 4382.5-4387.5m Sampling interval: 8M

Depth origin : R.T. Tubing Dia.: 3½" DP Casing Dia.: 7"

Surface elevation: 23m AMSL (RT) Shoe : - Shoe : 4547.1m

Bottom hole static conditions					
Initial pressure	: -	at depth: -	date: -
Latest pressure measured	: -	at depth: -	date: -
Temperature	: -	at depth: -	date: -

B - MEASUREMENT AND SAMPLING CONDITIONS -

Time at which sample was taken: 1905 Time elapsed since stabilisation: -

Bottom hole dynamic conditions					
Choke size: -	since: -	Well head pressure: -	Well head temp.: -
Bottom hole pressure: -	at depth: -	date: -
Bottom hole temp. : -	at depth: -	date: -

Flow measurement of sampled gas - Gravity (air: 1): - Factor Fpv = $\frac{1}{\sqrt{Z}}$: -

Values used for calculations :

Separator			
Pressure: - PSIG	Rates - Gas : - SCFD	GOR: -
Temp. : - °F	Oil (separator cond.): - BOPD [B] [C]	(separator cond.)

Stock tank		
Atmosphere : - mmHg - - °F	Oil at 60 °F : - BOPD
Tank temperature: - - °F	[A] [B] [C] [a] [b]

BSW: - % WLR: - %

Transfering fluid : VACUUM Transfer duration: 10 MIN

Final conditions of the shipping bottle : A5869

Pressure : 320 psig Temp: 14 °C

C - IDENTIFICATION OF THE SAMPLE -

Shipping bottle No.: A5869 sent on : _____ by: _____ Shipping order No.: _____

Addressee : FLOPETROL PVT LABORATORY

Coupled with	LIQUID	GAS
Bottom hole samples No.		DST #2 20112-113
Surface samples No.		DST #1 A8695 DST # 2 A12769 A12870 A12683

Measurement conditions.

[A] - Tank. [B] - Meter. [C] - Dump.

[a] - Corrected with shrinkage tester. [b] - Corrected with tank.

D - REMARKS -

SAMPLE TAKEN FOR COMPOSITION ONLY

Visa Chief Operator

C. DAVIES

o.: DOP 127

FLOPETROL

Base : PEO/PERTH

Client : PHILLIPS

Field : HERMES

Well : NO. 1

Section: ANNEX 42

Page : 80

Report N°: –

– SURFACE SAMPLING –

Date of sampling : 11.5.83 Service order : – Sampling No.: 6

Sample nature : GAS Sampling point : Halliburton sample champer (M2)

A – RESERVOIR AND WELL CHARACTERISTICS –

Producing zone : – Perforations : 4333.7-4402.7 / 4382.5-4387.5 Sampling interval : 8m

Depth origin : RT Tubing Dia. : 3½" DP Casing Dia. : 21

Surface elevation : 23m AMSL Shoe : – Shoe : 4547.1m

Bottom hole static conditions	Initial pressure	: –	at depth : –	date : –
	Latest pressure measured	: –	at depth : –	date : –
	Temperature	: –	at depth : –	date : –

B – MEASUREMENT AND SAMPLING CONDITIONS –

Time at which sample was taken : 13.10 Time elapsed since stabilisation : –

Bottom hole dynamic conditions	Choke size : –	since : –	Well head pressure : –	Well head temp. : –
	Bottom hole pressure : –	at depth : –	date : –
	Bottom hole temp. : –	at depth : –	date : –

Flow measurement of sampled gas – Gravity (air: 1) : – Factor Fpv = $\frac{1}{\sqrt{Z}}$: –

Values used for calculations :

Separator	Pressure : – PSIG	Rates – Gas : – SCFD	GOR :
	Temp. : – °F	Oil (separator cond.) : – BOPD [B] [C]	(separator cond.)
Stock tank	Atmosphere : – mmHg – °F	Oil at 60 °F : – BOPD	
	Tank temperature : – °F	[A] [B] [C] [a] [b]	

BSW : – % WLR : – %

Transfering fluid : Flush Transfer duration : –

Final conditions of the shipping bottle : 20112-113

Pressure : 240 Temp : 62 °F

C – IDENTIFICATION OF THE SAMPLE –

Shipping bottle No. : 20112-113 sent on : – by : – Shipping order No. : –

Addressee : FLOPETROL PVT LABORATORY

Coupled with	LIQUID	GAS
Bottom hole samples No.		
Surface samples No.		DST #1 A8695 DST #7 A12769 A12870 A12683 A5869

Measurement conditions,

[A] – Tank. [B] – Meter. [C] – Dump.

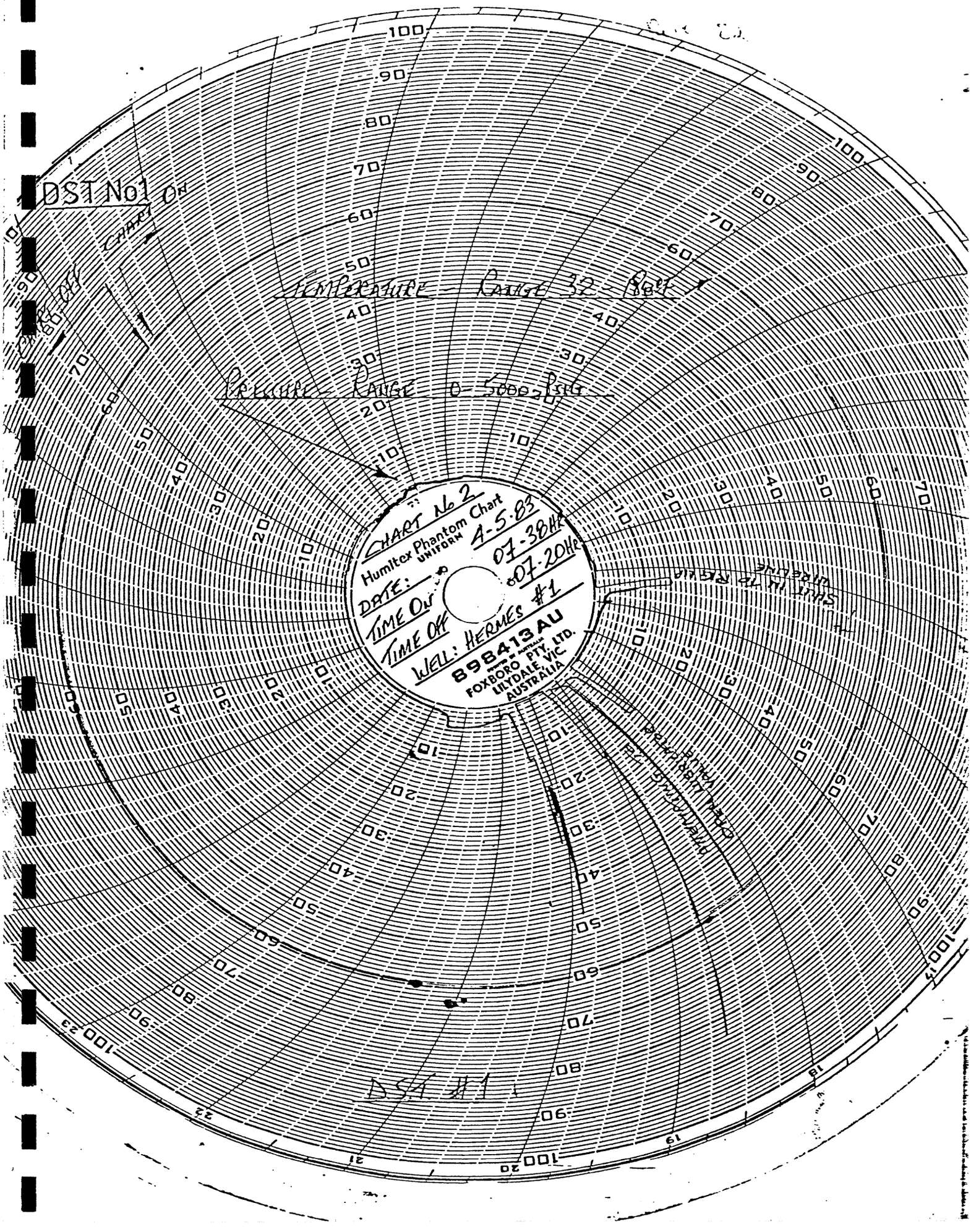
[a] – Corrected with shrinkage tester. [b] – Corrected with tank.

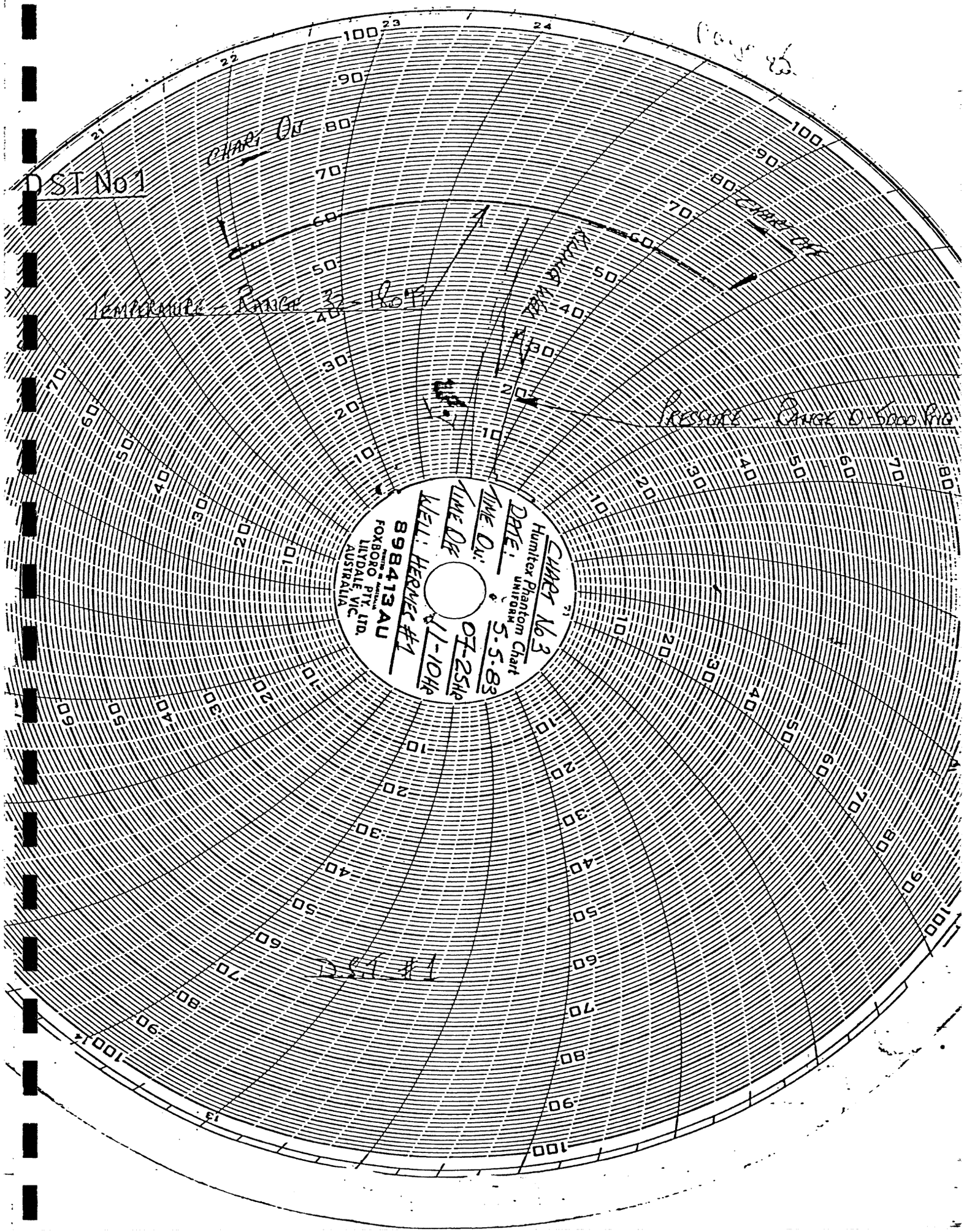
D – REMARKS –

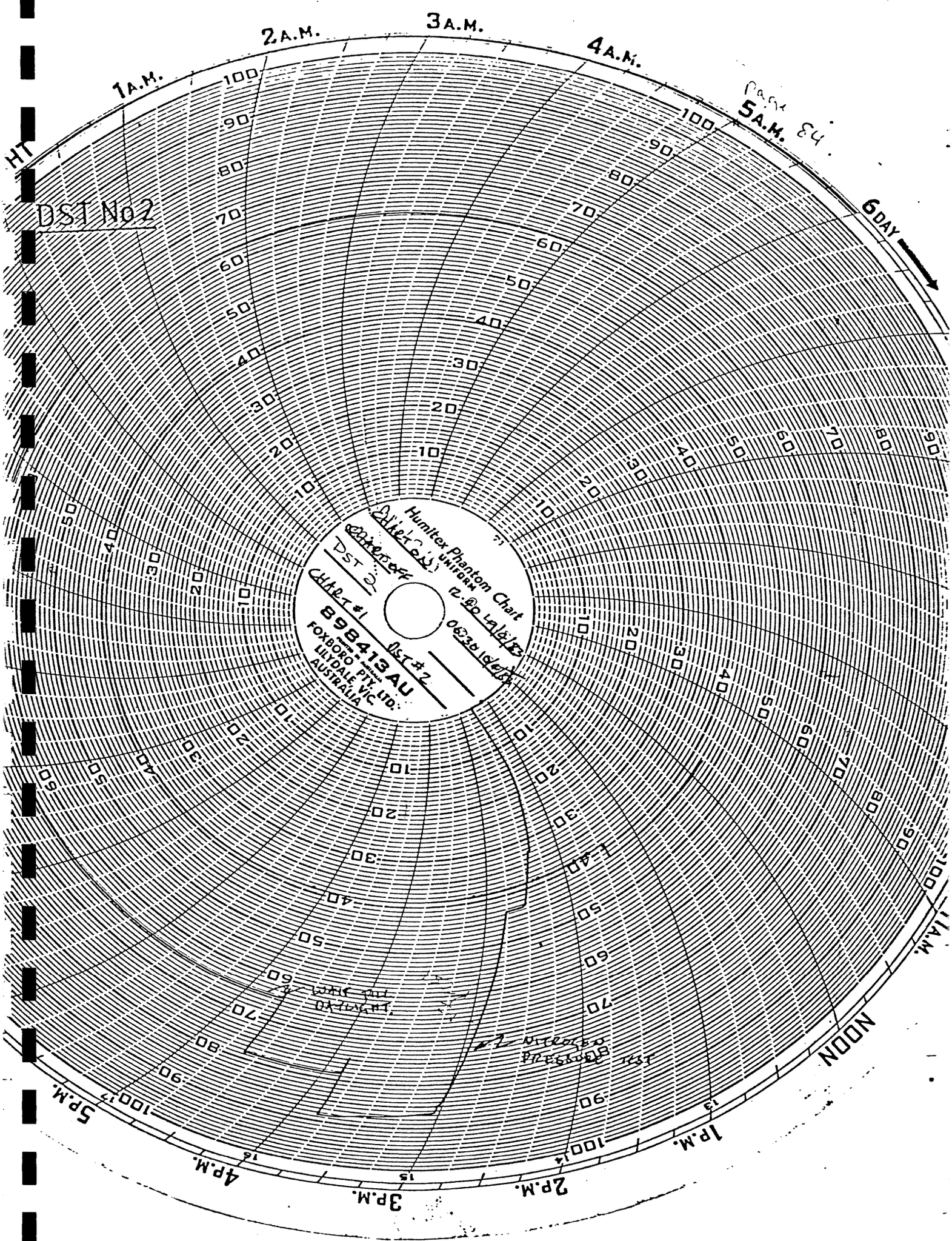
Sample taken from Halliburton M_2 Tool after test tools removed from hole

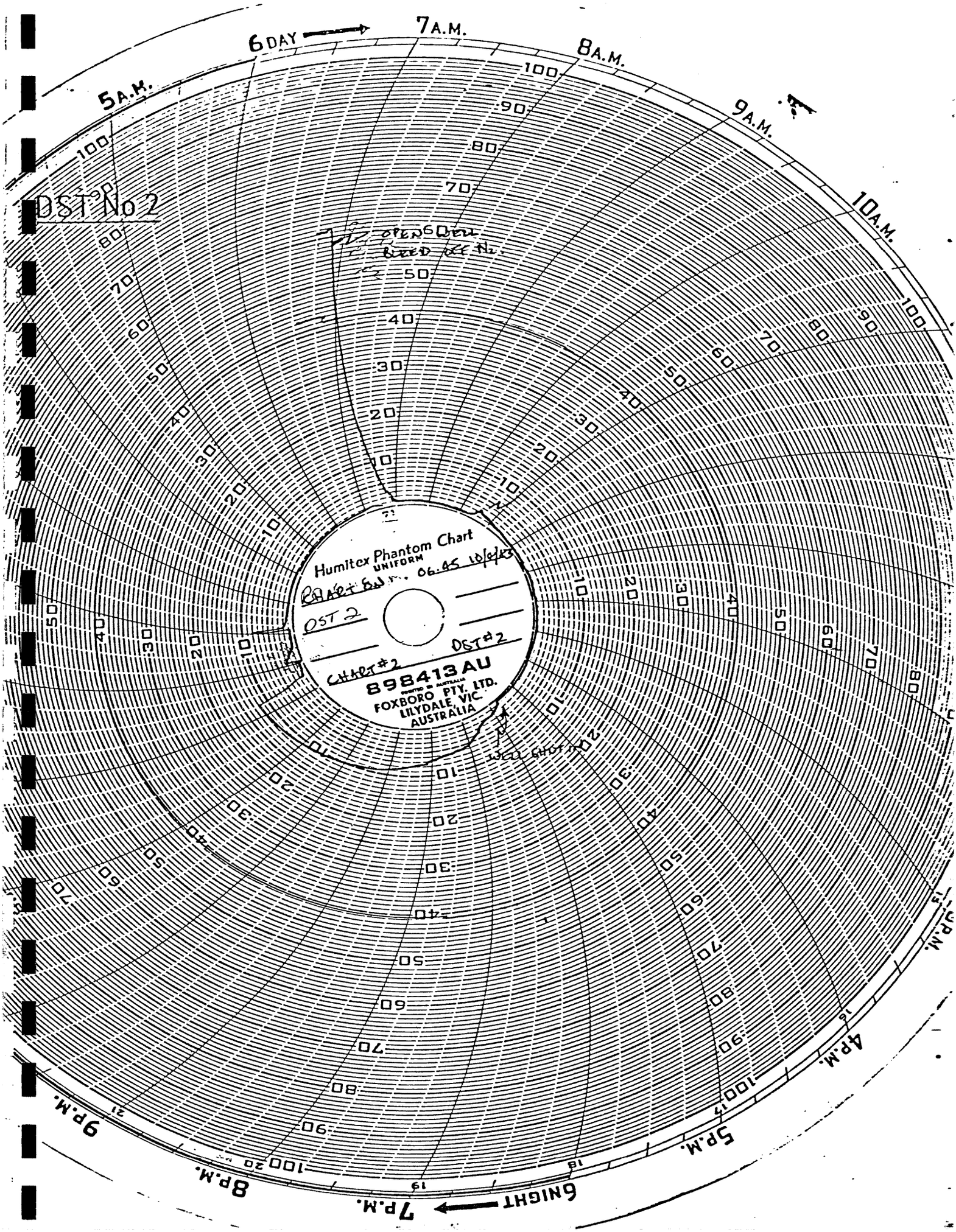
Visa Chief Operator

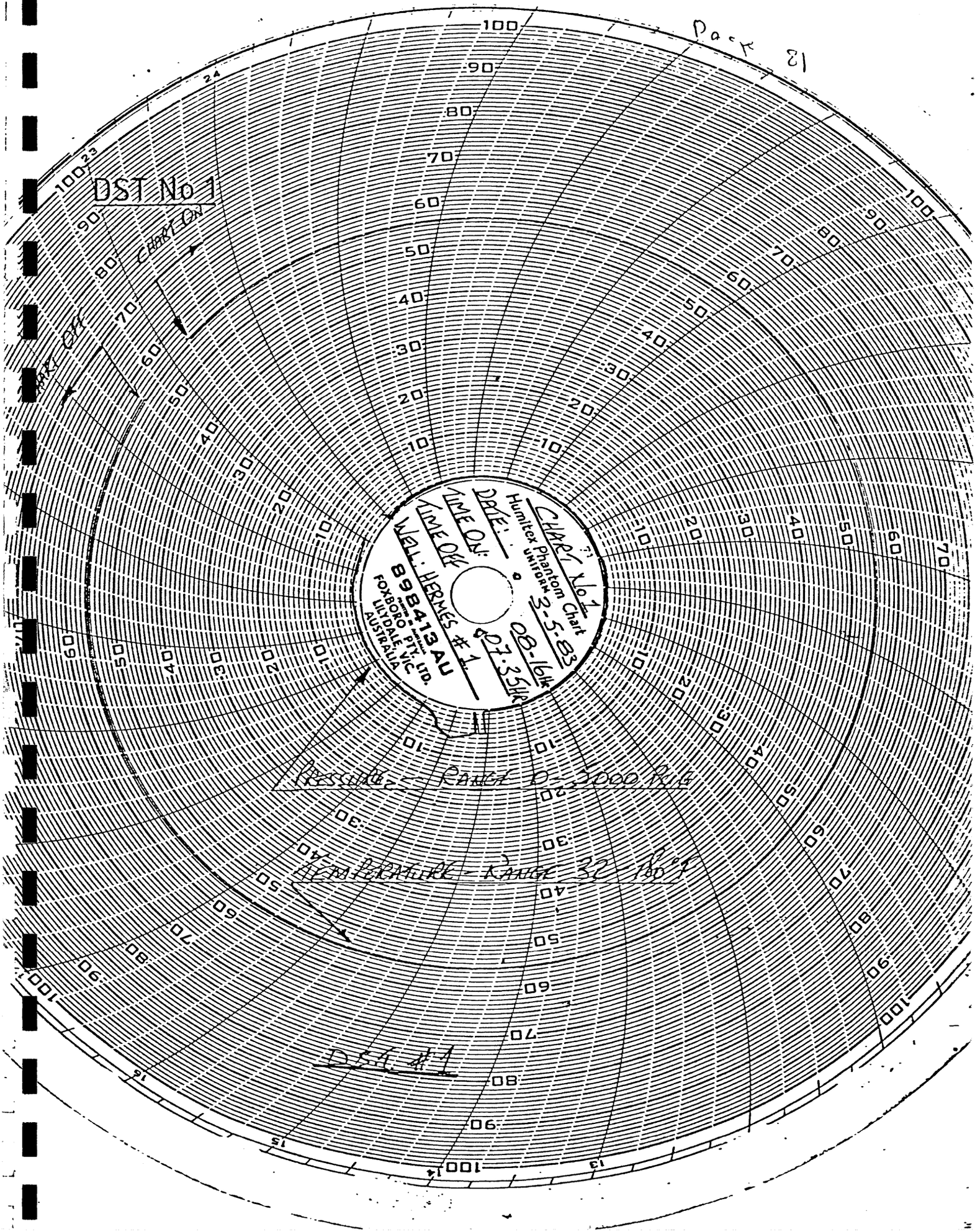
C. DAVIES


DST No1 ON
CHART
TEMPERATURE - RANGE 32 - 80°C
PRESSURE - RANGE 0 - 5000 PSIG
CHART No 2
Humitex Phantom Chart
UNIFORM
DATE: 4-5-83
TIME ON 07-38HR
TIME OFF 07-20HR
WELL: HERMES #1
898413AU
FOXBORO PTY. LTD.
LILYDALE, VIC
AUSTRALIA
DST #1


DST No 1
CHART ON
CHART OFF
TEMPERATURE - RANGE 32 - 160°F
PRESSURE - GAUGE 0-5000 PSI
CHART No 3
Humitex Phantom Chart
UNIFORM
DATE: 5-5-83
TIME ON: 07-25hrs
TIME OFF: 11-10hrs
WELL: HERMES #1
9884134U
FOXBORO
LILYDALE VIC
AUSTRALIA
DST #1


DST No 2
HT
1A.M.
2A.M.
3A.M.
4A.M.
5A.M.
6DAY
1P.M.
2P.M.
3P.M.
4P.M.
5P.M.
NOON
Humiter Phantom Chart
UNIFORM
898413AU
FOXBORO PTY. LTD.
LILYDALE VIC.
AUSTRALIA


DST No 2
6 DAY
5 A.M.
7 A.M.
8 A.M.
9 A.M.
10 A.M.
4 P.M.
5 P.M.
6 NIGHT
7 P.M.
8 P.M.
9 P.M.
OPEN Q
BLEED OFF N2
Humitex Phantom Chart
UNIFORM
DST 2
CHART #2
898413 AU
FOXBORO PTY. LTD.
LILYDALE, VIC.
AUSTRALIA


Pack 13
DST No 1
CHART ON
CHART OFF
CHART No 1
Humitex Phantom Chart
UNIFORM
DATE: 3-5-83
TIME ON: 08-16hr
TIME OFF 07.35HR
WELL: HERMES #1
89841 3 AU
FOXBORO (AUST) PTY. VIC. LTD.
ULLDALE, VIC.
AUSTRALIA
PRESSURE - RANGE 0-3000 PSI
TEMPERATURE - RANGE 32-180°F
DST #1

APPENDIX B

FLOPETROL SPRO REPORT

(DST NO. 2)

FLOPETROL JOHNSTON Schlumberger	PRESSURE SURVEY REPORT NO: 090583100583 FLOPETROL ENGINEER: I. WRIGHT	PAGE: 1/1
REGION : FTR DISTRICT : AUD BASE : PEO LOCATION : AUSTRALIA	SPRO REPORT	FIELD : HERMES ZONE : DST #2 WELL : #1 CLIENT : PHILLIPS

BOTTOMHOLE PRESSURE / TEMPERATURE SURVEY

FIELD : HERMES
ZONE : DST #2
CLIENT : PHILLIPS
DATE :
FROM : 9th May 1983
TO : 10th May 1983

WELL : HERMES #1

REPORT NO : 090583100583

FLOPETROL JOHNSTON / Schlumberger	PRESSURE SURVEY REPORT NO: 090583100583 FLOPETROL ENGINEER: I. WRIGHT		PAGE: 2/1
	REGION : FTR DISTRICT : AUD BASE : PEO LOCATION : AUSTRALIA	INDEX	FIELD : HERMES ZONE : DST #2 WELL : #1 CLIENT : PHILLIPS

DST #2

9TH to 10TH MAY 1983

FLOPETROL JOHNSTON Schlumberger	PRESSURE SURVEY REPORT NO: 090583100583 FLOPETROL ENGINEER: I. WRIGHT	PAGE: 3/1
REGION : FTR DISTRICT : AUD BASE : PEO LOCATION : AUSTRALIA	CONTENT	FIELD : HERMES ZONE : DST #2 WELL : #1 CLIENT : PHILLIPS

SECTION

FLOPETROL JOHNSTON Schlumberger	PRESSURE SURVEY REPORT NO: 090583100583 FLOPETROL ENGINEER: I. WRIGHT		PAGE: 4/1
REGION : FTR DISTRICT : AUD BASE : PEO LOCATION : AUSTRALIA		SUMMARY/COMMENTS	FIELD : HERMES ZONE : DST #2 WELL : #1 CLIENT : PHILLIPS

Dst #2 tested 2 intervals, 4399.6 to 4402.6 metres, 4382.5m and 4387.5m The test carried out with Halliburton L.P.R. test tool with Flopetrol SPRO adaptor fitted and 7" RTTS packer set at 4370m. A nitrogen cushion of surface pressure 3150 psi above the L.P.R. used to encourage flow from perforated intervals. SPRO system was in hole and latched on under N_2 pressure.

First flow period extended 720 mins with choke sizes of 1 x 1¼" x 1 x 1" Ø after N_2 cushion had been bled off through choke manifold. Well produced a steady influx of water initially although not strong enough to reach surface. Occasionally water produced at surface influenced by gas migration through the water in the test string pushing it up.

A down hole shut-in was carried out for 313 mins with SPRO monitoring pressure build-up under LPR test valve. With completion of the build-up the tool was re-opened to trap a downhole fluid sample before reversing out, however with the high differential pressure across to tool the cable was pulled out from the rope socket and surface readout was discontinued, cable removed from test string and abandoment procedures implemented.

END OF TEST

FLOPETROL JOHNSTON Schlumberger

PRESSURE SURVEY REPORT NO: 090583100583 FLOPETROL ENGINEER: I. WRIGHT		PAGE: 1/2
REGION : FTR DISTRICT : AUD BASE : PEO LOCATION : AUSTRALIA	**OPERATING AND MEASURING CONDITIONS**	FIELD : HERMES ZONE : DST #2 WELL : #1 CLIENT : PHILLIPS

WELL STATUS : ☒ FIRST TEST ON NEW WELL / NEW FIELD
☐ NEW WELL / NEW FIELD
☐ NEW WELL / PRODUCING FIELD
☐ OLD WELL / PRODUCING FIELD

WELL PRODUCING : ☐ OIL ☒ GAS ☐ GAS CONDENSATE ☒ WATER

OPERATION	DURATION	PRODUCTION RATE			COMMENTS
UNITS	MINS	MSCFD	WATER		
MAIN FLOW					
Full choke 1 x 1¼" Ø 1 x 1"	1440	83	-		Water produced intermittently
FINAL SHUT-IN	313	-	-		

REMARKS:

Gas calculation based on critical flow proves equation.

SEPARATOR GAS GRAV (CHOKE SIZE) : 0.76 on a 2 x 1¼" Ø
STO GRAVITY (CHOKE SIZE) : N/A
BSW / WATER CUT : 100%

WELL PRODUCING THROUGH : ☐ TUBING ☒ DRILL PIPE ☐ CASING

MAIN CASING SIZE : 7" DIA SET AT 4547.1M TOTAL WELL DEPTH
TUBING SIZE : 5" D/P SET AT - PACKER SET AT 4370M
PERFORATIONS : 4399.6M to 4402.6M zone #2
4882.5M to 4387.5M - zone #3

DEPTH OF BOTTOM HOLE MEASUREMENTS 14290.5' REFERENCE: ROTARY TABLE
GAUGE SERIAL NO: 83411

TYPE OF GAUGE/OPERATION: SPRO with Halliburton LPR. test tool

FLOPETROL JOHNSTON Schlumberger

PRESSURE SURVEY REPORT NO: 090583100583 FLOPETROL ENGINEER: I. WRIGHT		PAGE: 1/3
REGION : FTR DISTRICT : AUD BASE : PEO LOCATION : AUSTRALIA	**SEQUENCE OF EVENTS**	FIELD : HERMES ZONE : DST #2 WELL : #1 CLIENT : PHILLIPS

DATE	TIME	OPERATION
		DST #2
9th May		
	1230	Started to rig up lubricator and BOP and flowhead
	1345	Completed rig-up of pressure control equipment
	1400	Pressure tested and pressure equipment to 6000 psi with Nitrogen
	1420	Pressure test completed
	1433	Started to pressure test test string and pressure control equipment with Nitrogen to 6000 psi
	1610	Nitrogen pressure 6000 psi - pressure test good
	1630	Bleed down Nitrogen to 3000 psi in string
	1645	Set packer @ 4370M
	1715	Started to RIH with SPRO latch
	1941	Latched onto gauge signal good on surface
10th May	1983	
	0652	Tool opened for first flow
	0655	Well opened to burners bleeding down
		Nitrogen cushion choke 1" x 1½" Ø 1 x 1½" Ø
	1712	Decreased choke to ½" fixed. Gas flow calculation using critical flow conditions.
	1852	Shut-in test tool (LPR) for final build-up
11th May		
	0005	Tool opened to catch sample in string
		High differential across valve pulled cable
		out of rope socket. End of signal, pulled out of

FORM: 06 AVT 82

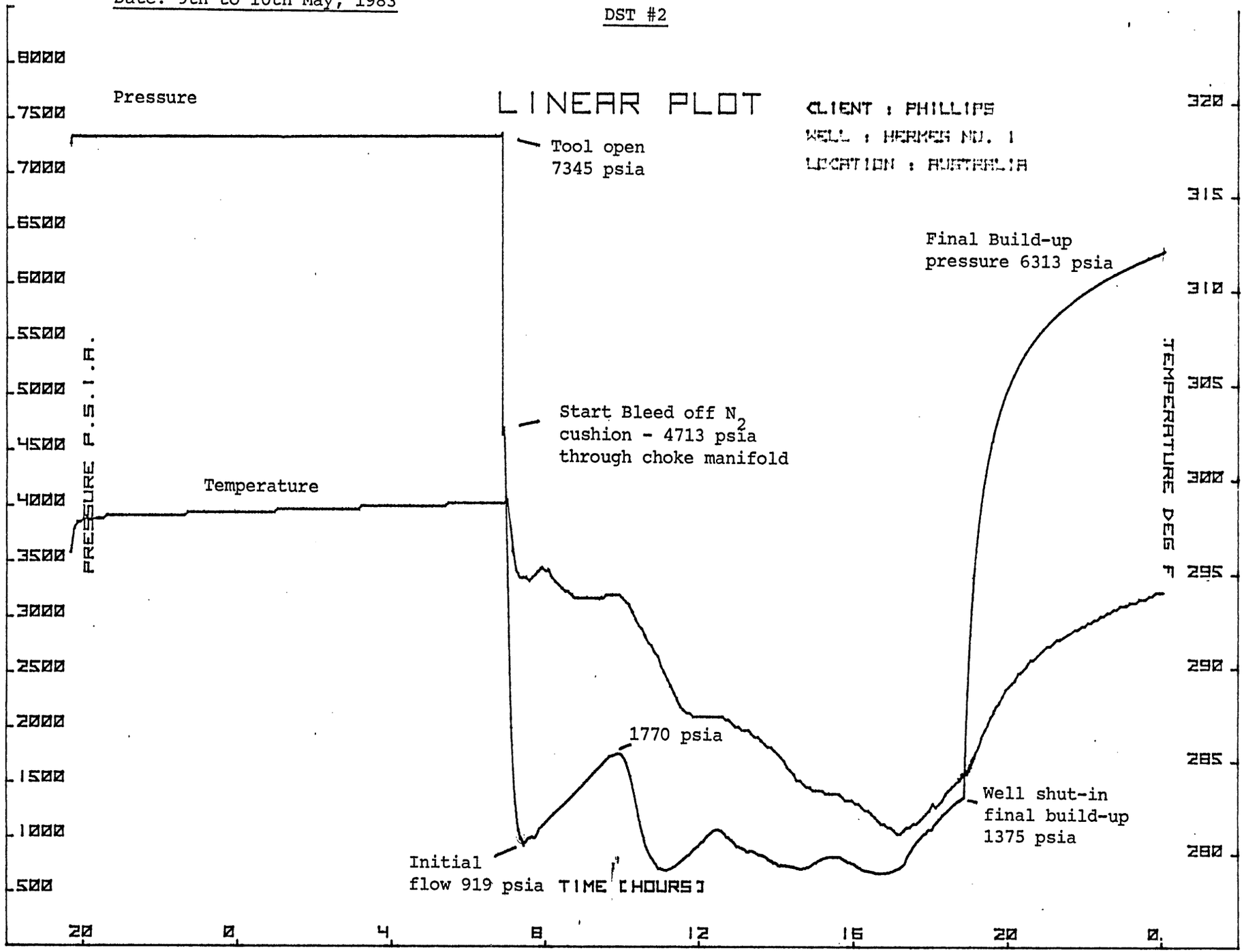
FLOPETROL JOHNSTON Schlumberger

PRESSURE SURVEY REPORT NO: 090583100583 FLOPETROL ENGINEER: I. WRIGHT		PAGE: 2/3
REGION : FTR DISTRICT : AUD BASE : PEO LOCATION : AUSTRALIA	**SEQUENCE OF EVENTS**	FIELD : HERMES ZONE : DST #2 WELL : #1 CLIENT : PHILLIPS

DATE	TIME	OPERATION
	0005	hole with cable. Well still flowing on 1 x 1¼" and 1 x 1"
		chokes
	0106	Cable jammed in pressure control equipment.
		Broke cable @ 4000 lbs by top sheave wheel
		Cable lost in hole 1744'
		END SURVEY

Date: 9th to 10th May, 1983

DST #2

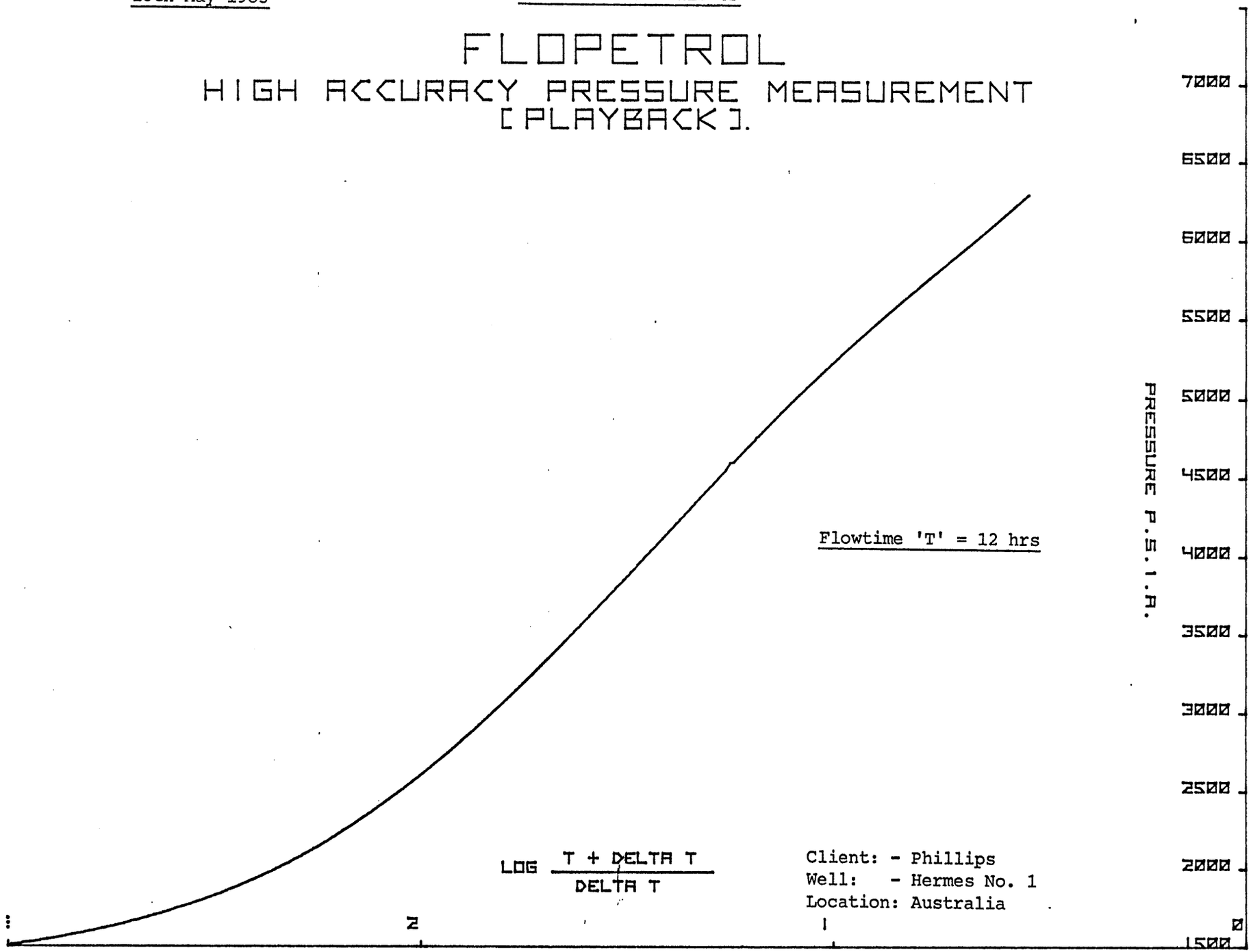


10th May 1983

DST #2 FINAL BUILD-UP

FLOPETROL

HIGH ACCURACY PRESSURE MEASUREMENT [PLAYBACK].



PRESSURE & TEMPERATURE CALCULATIONS

TIME HR.MN.SS	PRESS. PSIA	TEMP. DEG.F	DEL.T (MINUTES)	LOG DEL.T	DEL.P PSIA	LOG DEL.P	LOG T+DEL.T / DEL.T	REMARKS
4.55. 0	7343.12							11
5. 0. 0	7343.26	298.6						
5. 5. 0	7343.27	298.6						
5.10. 0	7343.34	298.6						
5.15. 0	7343.40	298.6						
5.20. 0	7343.49	298.6						
5.25. 0	7343.58	298.6						
5.30. 0	7343.70	298.8						
5.35. 0	7343.79	298.8						
5.40. 0	7343.81	298.8						
5.45. 0	7343.93	298.8						
5.50. 0	7343.84	298.8						
5.55. 0	7344.05	298.8						
6. 0. 0	7344.21	298.8						
6. 5. 0	7344.13	298.8						
6.10. 0	7344.39	298.8						
6.15. 0	7344.41	298.8						
6.20. 0	7344.44	298.8						
6.25. 0	7344.27	298.8						
6.30. 0	7344.42	298.8						
6.30.30	7344.42	298.8						
6.31. 0	7344.43							
6.31.30	7344.43							
6.32. 0	7344.43							
6.32.30	7344.43							
6.33. 0	7344.44							
6.33.30	7344.44							
6.34. 0	7344.44							
6.34.30	7344.45							
6.35. 0	7344.45							
6.35.30	7344.46							
6.36. 0	7344.48							
6.36.30	7344.51							
6.37. 0	7344.54							
6.37.30	7344.53							
6.38. 0	7344.51							
6.38.30	7344.51	298.8						
6.39. 0	7344.52							
6.39.30	7344.52							
6.40. 0	7344.52							
6.40.30	7344.53							
6.41. 0	7344.53							

Date: 10th May 1983

Latched on to gauge @ 14287'

TIME HR.MN.SS	PRESS. PSIA	TEMP. DEG.F	DEL.T (MINUTES)	LOG DEL.T	DEL.P PSIA	LOG DEL.P	LOG $\frac{T+DEL.T}{DEL.T}$	REMARKS
6.41.30	7344.59							
6.42. 0	7344.64							
6.42.30	7344.64							
6.43. 0	7344.64							
6.43.30	7344.63							
6.44. 0	7344.57							12
6.44.30	7344.65							
6.45. 0	7344.65							
6.45.30	7344.71							
6.46. 0	7344.68							
6.46.30	7344.77	298.8						
6.47. 0	7344.73							
6.47.30	7344.73							
6.48. 0	7344.74							
6.48.30	7344.79							
6.49. 0	7344.80							
6.49.30	7344.77							
6.50. 0	7344.89							
6.50.30	7344.99							
6.51. 0	7344.97							
6.51.30	7359.47	298.8						
6.52. 0	7371.35							
6.52.30	7376.04							Well opened 065230 hrs
6.53. 0	4645.17							
6.53.30	4652.46		0.50	-0.3010	2723.58	3.4351		Bleeding down N_2 cushion through choke manifold
6.54. 0	4674.36		1.00	-0.0000	2701.68	3.4316		
6.54.30	4696.30		1.50	0.1761	2679.74	3.4281		
6.55. 0	4713.47		2.00	0.3010	2662.57	3.4253		
6.55.30	4686.14		2.50	0.3979	2689.90	3.4297		
6.56. 0	4624.34		3.00	0.4771	2751.70	3.4396		
6.56.30	4549.99	298.8	3.50	0.5441	2826.05	3.4512		
6.57. 0	4450.25		4.00	0.6021	2925.79	3.4662		
6.57.30	4345.89		4.50	0.6532	3030.15	3.4815		
6.58. 0	4220.25		5.00	0.6990	3155.79	3.4991		
6.58.30	4094.72		5.50	0.7404	3281.32	3.5160		
6.59. 0	3953.69		6.00	0.7782	3422.35	3.5343		
6.59.30	3807.48		6.50	0.8129	3568.56	3.5525		
7. 0. 0	3668.64		7.00	0.8451	3707.40	3.5691		
7. 0.30	3538.70		7.50	0.8751	3837.34	3.5840		
7. 1. 0	3416.33		8.00	0.9031	3959.71	3.5977		
7. 1.30	3277.03	298.9	8.50	0.9294	4099.01	3.6127		
7. 2. 0	3143.07		9.00	0.9542	4232.97	3.6266		

TIME HR.MN.SS	PRESS. PSIA	TEMP. DEG.F	DEL.T (MINUTES)	LOG DEL.T	DEL.P PSIA	LOG DEL.P	LOG $\frac{T+DEL.T}{DEL.T}$	REMARKS
7. 2.30	3011.85		9.50	0.9777	4364.19	3.6399		
7. 3. 0	2883.21		10.00	1.0000	4492.83	3.6525		
7. 3.30	2755.30		10.50	1.0212	4620.74	3.6647		
7. 4. 0	2625.78		11.00	1.0414	4750.26	3.6767		
7. 4.30	2500.55		11.50	1.0607	4875.49	3.6880		
7. 5. 0	2397.24		12.00	1.0792	4978.80	3.6971		
7. 5.30	2287.73		12.50	1.0969	5088.31	3.7066		
7. 6. 0	2182.62		13.00	1.1139	5193.42	3.7155		
7. 6.30	2091.15	297.5	13.50	1.1303	5284.89	3.7230		13
7. 7. 0	2002.04		14.00	1.1461	5374.00	3.7303		
7. 7.30	1920.59		14.50	1.1614	5455.45	3.7368		
7. 8. 0	1846.15		15.00	1.1761	5529.89	3.7427		
7. 8.30	1784.27	296.2	15.50	1.1903	5591.77	3.7475		
7. 9. 0	1722.39		16.00	1.2041	5653.65	3.7523		
7. 9.30	1660.51		16.50	1.2175	5715.53	3.7571		
7.10. 0	1603.42		17.00	1.2304	5772.62	3.7614		
7.10.30	1551.61		17.50	1.2430	5824.43	3.7653		
7.11. 0	1504.66		18.00	1.2553	5871.38	3.7687		
7.11.30	1459.32		18.50	1.2672	5916.72	3.7721		
7.12. 0	1419.43		19.00	1.2788	5956.61	3.7750		
7.12.30	1379.13		19.50	1.2900	5996.91	3.7779		
7.13. 0	1327.96		20.00	1.3010	6048.08	3.7816		
7.13.30	1303.37		20.50	1.3118	6072.67	3.7834		
7.14. 0	1268.54		21.00	1.3222	6107.50	3.7859		
7.14.30	1237.50		21.50	1.3324	6138.54	3.7881		
7.15. 0	1218.30	295.2	22.00	1.3424	6157.74	3.7894		
7.15.30	1184.34		22.50	1.3522	6191.70	3.7918		
7.16. 0	1155.04		23.00	1.3617	6221.00	3.7939		
7.16.30	1127.29		23.50	1.3711	6248.75	3.7958		
7.17. 0	1106.35		24.00	1.3802	6269.69	3.7972		
7.17.30	1095.51		24.50	1.3892	6280.53	3.7980		
7.18. 0	1059.24		25.00	1.3979	6316.80	3.8005		
7.18.30	1052.77		25.50	1.4065	6323.27	3.8009		
7.19. 0	1069.76		26.00	1.4150	6306.28	3.7998		
7.19.30	1029.57		26.50	1.4232	6346.47	3.8025		
7.20. 0	1037.20	294.8	27.00	1.4314	6338.84	3.8020		
7.20.30	1000.26		27.50	1.4393	6375.78	3.8045		
7.21. 0	981.70		28.00	1.4472	6394.34	3.8058		
7.21.30	1006.70		28.50	1.4548	6369.34	3.8041		
7.22. 0	998.38		29.00	1.4624	6377.66	3.8047		
7.22.30	993.14		29.50	1.4698	6382.90	3.8050		
7.23. 0	981.62		30.00	1.4771	6394.42	3.8058		

TIME HR.MN.SS	PRESS. PSIA	TEMP. DEG.F	DEL.T (MINUTES)	LOG DEL.T	DEL.P PSIA	LOG DEL.P	LOG $\frac{T+DEL.T}{DEL.T}$	REMARKS
7.23.30	972.53		30.50	1.4843	6403.51	3.8064		
7.24. 0	964.51		31.00	1.4914	6411.53	3.8070		
7.24.30	944.45		31.50	1.4983	6431.59	3.8083		Choke 2 x 1¼" Ø
7.25. 0	951.65	294.8	32.00	1.5051	6424.39	3.8078		
7.25.30	934.54		32.50	1.5119	6441.50	3.8090		
7.26. 0	931.79		33.00	1.5185	6444.25	3.8092		
7.26.30	919.53		33.50	1.5250	6456.51	3.8100		
7.27. 0	954.83		34.00	1.5315	6421.21	3.8076		
7.27.30	956.35		34.50	1.5378	6419.69	3.8075		
7.28. 0	951.86		35.00	1.5441	6424.18	3.8078		
7.28.30	950.53		35.50	1.5502	6425.51	3.8079		
7.29. 0	949.77		36.00	1.5563	6426.27	3.8080		
7.29.30	952.97		36.50	1.5623	6423.07	3.8077		
7.30. 0	958.53	294.8	37.00	1.5682	6417.51	3.8074		14
7.30.30	965.15		37.50	1.5740	6410.89	3.8069		
7.31. 0	971.56		38.00	1.5798	6404.48	3.8065		
7.31.30	978.23		38.50	1.5855	6397.81	3.8060		
7.32. 0	983.22		39.00	1.5911	6392.82	3.8057		
7.32.30	987.78		39.50	1.5966	6388.26	3.8054		
7.33. 0	990.62		40.00	1.6021	6385.42	3.8052		
7.33.30	991.26		40.50	1.6075	6384.78	3.8051		
7.34. 0	990.83		41.00	1.6128	6385.21	3.8052		
7.34.30	991.18		41.50	1.6180	6384.86	3.8052		
7.35. 0	992.53		42.00	1.6232	6383.51	3.8051		
7.35.30	994.03	294.6	42.50	1.6284	6382.01	3.8050		
7.36. 0	994.37		43.00	1.6335	6381.67	3.8049		
7.36.30	995.56		43.50	1.6385	6380.48	3.8049		
7.37. 0	997.56		44.00	1.6435	6378.48	3.8047		
7.37.30	999.91		44.50	1.6484	6376.13	3.8046		
7.38. 0	1002.77		45.00	1.6532	6373.27	3.8044		
7.38.30	1004.64		45.50	1.6580	6371.40	3.8042		
7.39. 0	1006.52		46.00	1.6628	6369.52	3.8041		
7.40. 0	1002.01		47.00	1.6721	6374.03	3.8044		
7.41. 0	998.64	294.8	48.00	1.6812	6377.40	3.8046		
7.42. 0	997.56		49.00	1.6902	6378.48	3.8047		
7.43. 0	997.30		50.00	1.6990	6378.74	3.8047		
7.44. 0	997.31		51.00	1.7076	6378.73	3.8047		
7.45. 0	1006.97	295.0	52.00	1.7160	6369.07	3.8041		
7.46. 0	1016.62		53.00	1.7243	6359.42	3.8034		
7.47. 0	1026.42		54.00	1.7324	6349.62	3.8027		
7.48. 0	1038.02		55.00	1.7404	6338.02	3.8020		
7.49. 0	1055.51		56.00	1.7482	6320.53	3.8008		

TIME HR.MN.SS	PRESS. PSIA	TEMP. DEG.F	DEL.T (MINUTES)	LOG DEL.T	DEL.P PSIA	LOG DEL.P	LOG $\frac{T+DEL.T}{DEL.T}$	REMARKS
7.50. 0	1071.12	295.2	57.00	1.7559	6304.92	3.7997		
7.51. 0	1080.42		58.00	1.7634	6295.62	3.7990		
7.52. 0	1084.98		59.00	1.7709	6291.06	3.7987		
7.53. 0	1090.78		60.00	1.7782	6285.26	3.7983		
7.54. 0	1096.24		61.00	1.7853	6279.80	3.7979		
7.55. 0	1101.60	295.3	62.00	1.7924	6274.44	3.7976		
7.56. 0	1107.86		63.00	1.7993	6268.18	3.7971		
7.57. 0	1113.21		64.00	1.8062	6262.83	3.7968		
7.58. 0	1119.90		65.00	1.8129	6256.14	3.7963		
7.59. 0	1125.09		66.00	1.8195	6250.95	3.7959		
8. 0. 0	1132.89	295.2	67.00	1.8261	6243.15	3.7954		
8. 1. 0	1140.78		68.00	1.8325	6235.26	3.7949		
8. 2. 0	1147.21		69.00	1.8388	6228.83	3.7944		
8. 3. 0	1152.71		70.00	1.8451	6223.33	3.7940		
8. 4. 0	1158.62		71.00	1.8513	6217.42	3.7936		
8. 5. 0	1165.27	295.2	72.00	1.8573	6210.77	3.7931		15
8. 6. 0	1171.29		73.00	1.8633	6204.75	3.7927		
8. 7. 0	1177.70		74.00	1.8692	6198.34	3.7923		
8. 8. 0	1184.25		75.00	1.8751	6191.79	3.7918		
8. 9. 0	1191.23		76.00	1.8808	6184.81	3.7913		
8.10. 0	1197.46	294.8	77.00	1.8865	6178.58	3.7909		
8.11. 0	1203.52		78.00	1.8921	6172.52	3.7905		
8.12. 0	1209.11		79.00	1.8976	6166.93	3.7901		
8.13. 0	1215.16		80.00	1.9031	6160.88	3.7896		
8.14. 0	1221.06		81.00	1.9085	6154.98	3.7892		
8.15. 0	1225.97	294.6	82.00	1.9138	6150.07	3.7889		
8.16. 0	1232.03		83.00	1.9191	6144.01	3.7885		
8.17. 0	1237.94		84.00	1.9243	6138.10	3.7880		
8.18. 0	1244.61		85.00	1.9294	6131.43	3.7876		
8.19. 0	1249.51		86.00	1.9345	6126.53	3.7872		
8.20. 0	1254.96	294.4	87.00	1.9395	6121.08	3.7868		
8.21. 0	1260.28		88.00	1.9445	6115.76	3.7865		
8.22. 0	1265.18		89.00	1.9494	6110.86	3.7861		
8.23. 0	1271.31		90.00	1.9542	6104.73	3.7857		
8.24. 0	1277.07		91.00	1.9590	6098.97	3.7853		
8.25. 0	1282.20	294.3	92.00	1.9638	6093.84	3.7849		
8.26. 0	1286.78		93.00	1.9685	6089.26	3.7846		
8.27. 0	1292.84		94.00	1.9731	6083.20	3.7841		
8.28. 0	1298.75		95.00	1.9777	6077.29	3.7837		
8.29. 0	1303.14		96.00	1.9823	6072.90	3.7834		
8.30. 0	1309.37	294.1	97.00	1.9868	6066.67	3.7830		
8.31. 0	1315.03		98.00	1.9912	6061.01	3.7825		

TIME HR.MN.SS	PRESS. PSIA	TEMP. DEG.F	DEL.T (MINUTES)	LOG DEL.T	DEL.P PSIA	LOG DEL.P	LOG $\frac{T+DEL.T}{DEL.T}$	REMARKS
8.32. 0	1322.05		99.00	1.9956	6053.99	3.7820		
8.33. 0	1327.47		100.00	2.0000	6048.57	3.7817		
8.34. 0	1333.04		101.00	2.0043	6043.00	3.7813		
8.35. 0	1338.06	294.1	102.00	2.0086	6037.98	3.7809		
8.36. 0	1344.82		103.00	2.0128	6031.22	3.7804		
8.37. 0	1350.08		104.00	2.0170	6025.96	3.7800		
8.38. 0	1356.53		105.00	2.0212	6019.51	3.7796		
8.39. 0	1361.93		106.00	2.0253	6014.11	3.7792		
8.40. 0	1367.09	293.9	107.00	2.0294	6008.95	3.7788		
8.41. 0	1372.72		108.00	2.0334	6003.32	3.7784		
8.42. 0	1379.25		109.00	2.0374	5996.79	3.7779		
8.43. 0	1386.95		110.00	2.0414	5989.09	3.7774		
8.44. 0	1392.85		111.00	2.0453	5983.19	3.7769		
8.45. 0	1398.61	293.7	112.00	2.0492	5977.43	3.7765		
8.46. 0	1405.35		113.00	2.0531	5970.69	3.7760		
8.47. 0	1412.34		114.00	2.0569	5963.70	3.7755		16
8.48. 0	1418.00		115.00	2.0607	5958.04	3.7751		
8.49. 0	1423.52		116.00	2.0645	5952.52	3.7747		
8.50. 0	1430.20	293.7	117.00	2.0682	5945.84	3.7742		
8.51. 0	1436.55		118.00	2.0719	5939.49	3.7737		
8.52. 0	1443.83		119.00	2.0755	5932.21	3.7732		
8.53. 0	1448.37		120.00	2.0792	5927.67	3.7729		
8.54. 0	1452.70		121.00	2.0828	5923.34	3.7726		
8.55. 0	1458.29	293.7	122.00	2.0864	5917.75	3.7722		
8.56. 0	1464.20		123.00	2.0899	5911.84	3.7717		
8.57. 0	1470.89		124.00	2.0934	5905.15	3.7712		
8.58. 0	1478.44		125.00	2.0969	5897.60	3.7707		
8.59. 0	1485.92		126.00	2.1004	5890.12	3.7701		
9. 0. 0	1492.55	293.7	127.00	2.1038	5883.49	3.7696		
9. 1. 0	1500.24		128.00	2.1072	5875.80	3.7691		
9. 2. 0	1506.57		129.00	2.1106	5869.47	3.7686		
9. 3. 0	1513.55		130.00	2.1139	5862.49	3.7681		
9. 4. 0	1519.98		131.00	2.1173	5856.06	3.7676		
9. 5. 0	1526.57	293.7	132.00	2.1206	5849.47	3.7671		
9. 6. 0	1533.61		133.00	2.1239	5842.43	3.7666		
9. 7. 0	1540.18		134.00	2.1271	5835.86	3.7661		
9. 8. 0	1547.29		135.00	2.1303	5828.75	3.7656		
9. 9. 0	1553.38		136.00	2.1335	5822.66	3.7651		
9.10. 0	1560.04	293.7	137.00	2.1367	5816.00	3.7646		
9.11. 0	1566.85		138.00	2.1399	5809.19	3.7641		
9.12. 0	1573.32		139.00	2.1430	5802.72	3.7636		
9.13. 0	1579.95		140.00	2.1461	5796.09	3.7631		

TIME HR.MN.SS	PRESS. PSIA	TEMP. DEG.F	DEL.T (MINUTES)	LOG DEL.T	DEL.P PSIA	LOG DEL.P	LOG $\frac{T+DEL.T}{DEL.T}$	REMARKS
9.14. 0	1585.69		141.00	2.1492	5790.35	3.7627		
9.15. 0	1591.68	293.7	142.00	2.1523	5784.36	3.7623		
9.16. 0	1597.15		143.00	2.1553	5778.89	3.7618		
9.17. 0	1603.00		144.00	2.1584	5773.04	3.7614		
9.18. 0	1609.67		145.00	2.1614	5766.37	3.7609		
9.19. 0	1616.10		146.00	2.1644	5759.94	3.7604		
9.20. 0	1622.10	293.7	147.00	2.1673	5753.94	3.7600		
9.21. 0	1627.69		148.00	2.1703	5748.35	3.7595		
9.22. 0	1633.70		149.00	2.1732	5742.34	3.7591		
9.23. 0	1639.48		150.00	2.1761	5736.56	3.7587		
9.24. 0	1645.58		151.00	2.1790	5730.46	3.7582		
9.25. 0	1651.25	293.7	152.00	2.1818	5724.79	3.7578		
9.26. 0	1657.30		153.00	2.1847	5718.74	3.7573		
9.27. 0	1663.56		154.00	2.1875	5712.48	3.7568		
9.28. 0	1670.25		155.00	2.1903	5705.79	3.7563		
9.29. 0	1677.02		156.00	2.1931	5699.02	3.7558		17
9.30. 0	1684.48	293.7	157.00	2.1959	5691.56	3.7552		
9.31. 0	1691.70		158.00	2.1987	5684.34	3.7547		
9.32. 0	1698.51		159.00	2.2014	5677.53	3.7542		
9.33. 0	1704.84		160.00	2.2041	5671.20	3.7537		
9.34. 0	1711.24		161.00	2.2068	5664.80	3.7532		
9.35. 0	1717.34	293.9	162.00	2.2095	5658.70	3.7527		
9.36. 0	1723.39		163.00	2.2122	5652.65	3.7523		
9.37. 0	1728.96		164.00	2.2148	5647.08	3.7518		
9.38. 0	1734.82		165.00	2.2175	5641.22	3.7514		
9.39. 0	1741.29		166.00	2.2201	5634.75	3.7509		
9.40. 0	1746.91	293.9	167.00	2.2227	5629.13	3.7504		
9.41. 0	1750.03		168.00	2.2253	5626.01	3.7502		
9.42. 0	1750.13		169.00	2.2279	5625.91	3.7502		
9.43. 0	1750.46		170.00	2.2304	5625.58	3.7502		
9.44. 0	1751.60		171.00	2.2330	5624.44	3.7501		
9.45. 0	1752.70	293.9	172.00	2.2355	5623.34	3.7500		
9.46. 0	1754.40		173.00	2.2380	5621.64	3.7499		
9.47. 0	1756.61		174.00	2.2405	5619.43	3.7497		
9.48. 0	1760.15		175.00	2.2430	5615.89	3.7494		
9.49. 0	1763.09		176.00	2.2455	5612.95	3.7492		
9.50. 0	1766.19	293.9	177.00	2.2480	5609.85	3.7490		
9.51. 0	1768.17		178.00	2.2504	5607.87	3.7488		
9.52. 0	1769.60		179.00	2.2529	5606.44	3.7487		
9.53. 0	1770.21		180.00	2.2553	5605.83	3.7486		
9.54. 0	1770.75		181.00	2.2577	5605.29	3.7486		
9.55. 0	1770.61	293.9	182.00	2.2601	5605.43	3.7486		

TIME HR.MN.SS	PRESS. PSIA	TEMP. DEG.F	DEL.T (MINUTES)	LOG DEL.T	DEL.P PSIA	LOG DEL.P	LOG $\frac{T+DEL.T}{DEL.T}$	REMARKS
9.56. 0	1769.08		183.00	2.2625	5606.96	3.7487		
9.57. 0	1767.22		184.00	2.2648	5608.82	3.7489		
9.58. 0	1763.81		185.00	2.2672	5612.23	3.7491		
9.59. 0	1757.95		186.00	2.2695	5618.09	3.7496		
10. 0. 0	1750.57	293.7	187.00	2.2718	5625.47	3.7502		
10. 1. 0	1742.58		188.00	2.2742	5633.46	3.7508		
10. 2. 0	1733.05		189.00	2.2765	5642.99	3.7515		
10. 3. 0	1721.53		190.00	2.2788	5654.51	3.7524		
10. 4. 0	1709.12		191.00	2.2810	5666.92	3.7533		
10. 5. 0	1695.52	293.5	192.00	2.2833	5680.52	3.7544		
10. 6. 0	1680.61		193.00	2.2856	5695.43	3.7555		
10. 7. 0	1662.99		194.00	2.2878	5713.05	3.7569		
10. 8. 0	1643.92		195.00	2.2900	5732.12	3.7583		
10. 9. 0	1624.56		196.00	2.2923	5751.48	3.7598		
10.10. 0	1605.51	293.4	197.00	2.2945	5770.53	3.7612		18
10.11. 0	1586.21		198.00	2.2967	5789.83	3.7627		
10.12. 0	1564.69		199.00	2.2989	5811.35	3.7643		
10.13. 0	1540.44		200.00	2.3010	5835.60	3.7661		
10.14. 0	1515.19		201.00	2.3032	5860.85	3.7680		
10.15. 0	1491.19	293.0	202.00	2.3054	5884.85	3.7697		
10.16. 0	1465.96		203.00	2.3075	5910.08	3.7716		
10.17. 0	1439.18		204.00	2.3096	5936.86	3.7736		
10.18. 0	1410.54		205.00	2.3118	5965.50	3.7756		
10.19. 0	1380.26		206.00	2.3139	5995.78	3.7778		
10.20. 0	1350.01	292.6	207.00	2.3160	6026.03	3.7800		
10.21. 0	1320.71		208.00	2.3181	6055.33	3.7821		
10.22. 0	1291.11		209.00	2.3201	6084.93	3.7843		
10.23. 0	1261.20		210.00	2.3222	6114.84	3.7864		
10.24. 0	1229.88		211.00	2.3243	6146.16	3.7886		
10.25. 0	1200.37	292.3	212.00	2.3263	6175.67	3.7907		
10.26. 0	1172.57		213.00	2.3284	6203.47	3.7926		
10.27. 0	1143.58		214.00	2.3304	6232.46	3.7947		
10.28. 0	1116.44		215.00	2.3324	6259.60	3.7965		
10.29. 0	1091.05		216.00	2.3345	6284.99	3.7983		
10.30. 0	1067.04	292.1	217.00	2.3365	6309.00	3.8000		
10.31. 0	1040.09		218.00	2.3385	6335.95	3.8018		
10.32. 0	1018.00		219.00	2.3404	6358.04	3.8033		
10.33. 0	995.19		220.00	2.3424	6380.85	3.8049		
10.34. 0	974.03		221.00	2.3444	6402.01	3.8063		
10.35. 0	949.12	291.7	222.00	2.3464	6426.92	3.8080		
10.36. 0	933.09		223.00	2.3483	6442.95	3.8091		
10.37. 0	914.22		224.00	2.3502	6461.82	3.8104		

TIME HR.MN.SS	PRESS. PSIA	TEMP. DEG.F	DEL.T (MINUTES)	LOG DEL.T	DEL.P PSIA	LOG DEL.P	LOG $\frac{T+DEL.T}{DEL.T}$	REMARKS
10.38. 0	896.95		225.00	2.3522	6479.09	3.8115		
10.39. 0	884.34		226.00	2.3541	6491.70	3.8124		
10.40. 0	870.77	291.4	227.00	2.3560	6505.27	3.8133		
10.41. 0	853.72		228.00	2.3579	6522.32	3.8144		
10.42. 0	843.33		229.00	2.3598	6532.71	3.8151		
10.43. 0	835.24		230.00	2.3617	6540.80	3.8156		
10.44. 0	821.92		231.00	2.3636	6554.12	3.8165		
10.45. 0	814.74	291.2	232.00	2.3655	6561.30	3.8170		
10.46. 0	809.49		233.00	2.3674	6566.55	3.8173		
10.47. 0	800.88		234.00	2.3692	6575.16	3.8179		
10.48. 0	791.04		235.00	2.3711	6585.00	3.8186		
10.49. 0	780.43		236.00	2.3729	6595.61	3.8193		
10.50. 0	769.05	290.8	237.00	2.3747	6606.99	3.8200		
10.51. 0	762.80		238.00	2.3766	6613.24	3.8204		
10.52. 0	755.66		239.00	2.3784	6620.38	3.8209		19
10.53. 0	746.14		240.00	2.3802	6629.90	3.8215		
10.54. 0	731.60		241.00	2.3820	6644.44	3.8225		
10.55. 0	725.97	290.7	242.00	2.3838	6650.07	3.8228		
10.56. 0	712.53		243.00	2.3856	6663.51	3.8237		
10.57. 0	715.42		244.00	2.3874	6660.62	3.8235		
10.58. 0	718.06		245.00	2.3892	6657.98	3.8233		
10.59. 0	718.63		246.00	2.3909	6657.41	3.8233		
11. 0. 0	713.24	290.1	247.00	2.3927	6662.80	3.8237		
11. 1. 0	710.32		248.00	2.3945	6665.72	3.8238		
11. 2. 0	710.28		249.00	2.3962	6665.76	3.8238		
11. 3. 0	706.66		250.00	2.3979	6669.38	3.8241		
11. 4. 0	704.33		251.00	2.3997	6671.71	3.8242		
11. 5. 0	701.64	289.8	252.00	2.4014	6674.40	3.8244		
11. 6. 0	699.86		253.00	2.4031	6676.18	3.8245		
11. 7. 0	701.66		254.00	2.4048	6674.38	3.8244		
11. 8. 0	702.20		255.00	2.4065	6673.84	3.8244		
11. 9. 0	696.28		256.00	2.4082	6679.76	3.8248		
11.10. 0	702.41	289.4	257.00	2.4099	6673.63	3.8244		
11.11. 0	705.86		258.00	2.4116	6670.18	3.8241		
11.12. 0	706.87		259.00	2.4133	6669.17	3.8241		
11.13. 0	710.32		260.00	2.4150	6665.72	3.8238		
11.14. 0	710.48		261.00	2.4166	6665.56	3.8238		
11.15. 0	713.76	289.0	262.00	2.4183	6662.28	3.8236		
11.16. 0	718.09		263.00	2.4200	6657.95	3.8233		
11.17. 0	720.32		264.00	2.4216	6655.72	3.8232		
11.18. 0	723.88		265.00	2.4232	6652.16	3.8230		
11.19. 0	728.63		266.00	2.4249	6647.41	3.8227		

TIME HR.MN.SS	PRESS. PSIA	TEMP. DEG.F	DEL.T (MINUTES)	LOG DEL.T	DEL.P PSIA	LOG DEL.P	LOG $\frac{T+DEL.T}{DEL.T}$	REMARKS
11.20. 0	731.03	288.7	267.00	2.4265	6645.01	3.8225		
11.21. 0	732.75		268.00	2.4281	6643.29	3.8224		
11.22. 0	734.27		269.00	2.4298	6641.77	3.8223		
11.23. 0	736.83		270.00	2.4314	6639.21	3.8221		
11.24. 0	745.54		271.00	2.4330	6630.50	3.8215		
11.25. 0	753.09	288.3	272.00	2.4346	6622.95	3.8211		
11.26. 0	757.24		273.00	2.4362	6618.80	3.8208		
11.27. 0	763.33		274.00	2.4378	6612.71	3.8204		
11.28. 0	766.38		275.00	2.4393	6609.66	3.8202		
11.29. 0	770.23		276.00	2.4409	6605.81	3.8199		
11.30. 0	775.02	288.0	277.00	2.4425	6601.02	3.8196		
11.31. 0	779.19		278.00	2.4440	6596.85	3.8193		
11.32. 0	785.44		279.00	2.4456	6590.60	3.8189		
11.33. 0	790.97		280.00	2.4472	6585.07	3.8186		
11.34. 0	795.21		281.00	2.4487	6580.83	3.8183		20
11.35. 0	801.02	287.8	282.00	2.4502	6575.02	3.8179		
11.36. 0	807.19		283.00	2.4518	6568.85	3.8175		
11.37. 0	812.30		284.00	2.4533	6563.74	3.8172		
11.38. 0	815.79		285.00	2.4548	6560.25	3.8169		
11.39. 0	820.41		286.00	2.4564	6555.63	3.8166		
11.40. 0	824.70	287.6	287.00	2.4579	6551.34	3.8163		
11.41. 0	830.09		288.00	2.4594	6545.95	3.8160		
11.42. 0	835.46		289.00	2.4609	6540.58	3.8156		
11.43. 0	838.71		290.00	2.4624	6537.33	3.8154		
11.44. 0	838.43		291.00	2.4639	6537.61	3.8154		
11.45. 0	841.64	287.6	292.00	2.4654	6534.40	3.8152		
11.46. 0	851.15		293.00	2.4669	6524.89	3.8146		
11.47. 0	860.61		294.00	2.4683	6515.43	3.8139		
11.48. 0	866.15		295.00	2.4698	6509.89	3.8136		
11.49. 0	871.55		296.00	2.4713	6504.49	3.8132		
11.50. 0	879.41	287.4	297.00	2.4728	6496.63	3.8127		
11.51. 0	886.92		298.00	2.4742	6489.12	3.8122		
11.52. 0	892.16		299.00	2.4757	6483.88	3.8118		
11.53. 0	895.00	287.4	300.00	2.4771	6481.04	3.8116		
11.54. 0	901.13		301.00	2.4786	6474.91	3.8112		
11.55. 0	907.26		302.00	2.4800	6468.78	3.8108		
11.56. 0	913.39		303.00	2.4814	6462.65	3.8104		
11.57. 0	917.08		304.00	2.4829	6458.96	3.8102		
11.58. 0	918.66		305.00	2.4843	6457.38	3.8101		
11.59. 0	918.13		306.00	2.4857	6457.91	3.8101		
12. 0. 0	929.72		307.00	2.4871	6446.32	3.8093		
12. 1. 0	939.86	287.4	308.00	2.4886	6436.18	3.8086		

TIME HR.MN.SS	PRESS. PSIA	TEMP. DEG.F	DEL.T (MINUTES)	LOG DEL.T	DEL.P PSIA	LOG DEL.P	LOG $\frac{T+DEL.T}{DEL.T}$	REMARKS
12. 2. 0	949.25		309.00	2.4900	6426.79	3.8080		
12. 3. 0	954.57		310.00	2.4914	6421.47	3.8076		
12. 4. 0	958.16		311.00	2.4928	6417.88	3.8074		
12. 5. 0	961.18		312.00	2.4942	6414.86	3.8072		
12. 6. 0	963.67	287.4	313.00	2.4955	6412.37	3.8070		
12. 7. 0	963.50		314.00	2.4969	6412.54	3.8070		
12. 8. 0	975.59		315.00	2.4983	6400.45	3.8062		
12. 9. 0	985.58		316.00	2.4997	6390.46	3.8055		
12.10. 0	996.23		317.00	2.5011	6379.81	3.8048		
12.11. 0	1002.55	287.4	318.00	2.5024	6373.49	3.8044		
12.12. 0	1009.29		319.00	2.5038	6366.75	3.8039		
12.13. 0	1016.54		320.00	2.5051	6359.50	3.8034		
12.14. 0	1022.37		321.00	2.5065	6353.67	3.8030		
12.15. 0	1028.03		322.00	2.5079	6348.01	3.8026		
12.16. 0	1030.41	287.4	323.00	2.5092	6345.63	3.8025		
12.17. 0	1036.50		324.00	2.5105	6339.54	3.8021		21
12.18. 0	1041.88		325.00	2.5119	6334.16	3.8017		
12.19. 0	1048.05		326.00	2.5132	6327.99	3.8013		
12.20. 0	1053.19		327.00	2.5145	6322.85	3.8009		
12.21. 0	1059.59	287.4	328.00	2.5159	6316.45	3.8005		
12.22. 0	1063.23		329.00	2.5172	6312.81	3.8002		
12.23. 0	1066.16		330.00	2.5185	6309.88	3.8000		
12.24. 0	1068.45		331.00	2.5198	6307.59	3.7999		
12.25. 0	1069.08		332.00	2.5211	6306.96	3.7998		
12.26. 0	1071.25	287.4	333.00	2.5224	6304.79	3.7997		
12.27. 0	1073.49		334.00	2.5237	6302.55	3.7995		
12.28. 0	1074.90		335.00	2.5250	6301.14	3.7994		
12.29. 0	1074.51		336.00	2.5263	6301.53	3.7994		
12.30. 0	1072.72		337.00	2.5276	6303.32	3.7996		
12.31. 0	1069.43	287.4	338.00	2.5289	6306.61	3.7998		
12.32. 0	1066.49		339.00	2.5302	6309.55	3.8000		
12.33. 0	1064.51		340.00	2.5315	6311.53	3.8001		
12.34. 0	1061.61		341.00	2.5328	6314.43	3.8003		
12.35. 0	1058.09		342.00	2.5340	6317.95	3.8006		
12.36. 0	1052.99	287.4	343.00	2.5353	6323.05	3.8009		
12.37. 0	1048.09		344.00	2.5366	6327.95	3.8013		
12.38. 0	1042.88		345.00	2.5378	6333.16	3.8016		
12.39. 0	1037.39		346.00	2.5391	6338.65	3.8020		
12.40. 0	1030.82		347.00	2.5403	6345.22	3.8024		
12.41. 0	1018.18	287.2	348.00	2.5416	6357.86	3.8033		
12.42. 0	1005.80		349.00	2.5428	6370.24	3.8042		
12.43. 0	1005.22		350.00	2.5441	6370.82	3.8042		

TIME HR.MN.SS	PRESS. PSIA	TEMP. DEG.F	DEL.T (MINUTES)	LOG DEL.T	DEL.P PSIA	LOG DEL.P	LOG $\frac{T+DEL.T}{DEL.T}$	REMARKS
12.44. 0	1005.24		351.00	2.5453	6370.80	3.8042		
12.45. 0	1003.40		352.00	2.5465	6372.64	3.8043		
12.46. 0	996.97	287.2	353.00	2.5478	6379.07	3.8048		
12.47. 0	991.11		354.00	2.5490	6384.93	3.8052		
12.48. 0	983.83		355.00	2.5502	6392.21	3.8057		
12.49. 0	979.78		356.00	2.5514	6396.26	3.8059		
12.50. 0	974.80		357.00	2.5527	6401.24	3.8063		
12.51. 0	968.14	287.1	358.00	2.5539	6407.90	3.8067		
12.52. 0	963.16		359.00	2.5551	6412.88	3.8071		
12.53. 0	958.44		360.00	2.5563	6417.60	3.8074		
12.54. 0	954.32		361.00	2.5575	6421.72	3.8077		
12.55. 0	948.85		362.00	2.5587	6427.19	3.8080		
12.56. 0	940.89	286.9	363.00	2.5599	6435.15	3.8086		
12.57. 0	927.74		364.00	2.5611	6448.30	3.8094		
12.58. 0	914.50		365.00	2.5623	6461.54	3.8103		
12.59. 0	918.48		366.00	2.5635	6457.56	3.8101		22
13. 0. 0	921.12		367.00	2.5647	6454.92	3.8099		
13. 1. 0	919.76	286.9	368.00	2.5658	6456.28	3.8100		
13. 2. 0	915.39		369.00	2.5670	6460.65	3.8103		
13. 3. 0	911.17		370.00	2.5682	6464.87	3.8106		
13. 4. 0	908.25		371.00	2.5694	6467.79	3.8108		
13. 5. 0	906.21		372.00	2.5705	6469.83	3.8109		
13. 6. 0	905.18	286.7	373.00	2.5717	6470.86	3.8110		
13. 7. 0	902.47		374.00	2.5729	6473.57	3.8111		
13. 8. 0	898.77		375.00	2.5740	6477.27	3.8114		
13. 9. 0	894.69		376.00	2.5752	6481.35	3.8117		
13.10. 0	891.27		377.00	2.5763	6484.77	3.8119		
13.11. 0	889.55	286.7	378.00	2.5775	6486.49	3.8120		
13.12. 0	883.11		379.00	2.5786	6492.93	3.8124		
13.13. 0	874.34		380.00	2.5798	6501.70	3.8130		
13.14. 0	866.23		381.00	2.5809	6509.81	3.8136		
13.15. 0	867.61		382.00	2.5821	6508.43	3.8135		
13.16. 0	874.54	286.7	383.00	2.5832	6501.50	3.8130		
13.17. 0	870.25		384.00	2.5843	6505.79	3.8133		
13.18. 0	875.96		385.00	2.5855	6500.08	3.8129		
13.19. 0	878.19		386.00	2.5866	6497.85	3.8128		
13.20. 0	878.75		387.00	2.5877	6497.29	3.8127		
13.21. 0	878.71	286.5	388.00	2.5888	6497.33	3.8127		
13.22. 0	878.96		389.00	2.5899	6497.08	3.8127		
13.23. 0	876.70		390.00	2.5911	6499.34	3.8129		
13.24. 0	872.33		391.00	2.5922	6503.71	3.8132		
13.25. 0	870.33		392.00	2.5933	6505.71	3.8133		

TIME HR.MN.SS	PRESS. PSIA	TEMP. DEG.F	DEL.T (MINUTES)	LOG DEL.T	DEL.P PSIA	LOG DEL.P	LOG $\frac{T+DEL.T}{DEL.T}$	REMARKS
13.26. 0	868.35	286.3	393.00	2.5944	6507.69	3.8134		
13.27. 0	865.35		394.00	2.5955	6510.69	3.8136		
13.28. 0	860.47		395.00	2.5966	6515.57	3.8140		
13.29. 0	855.36		396.00	2.5977	6520.68	3.8143		
13.30. 0	852.20		397.00	2.5988	6523.84	3.8145		
13.31. 0	849.76	286.3	398.00	2.5999	6526.28	3.8147		
13.32. 0	844.62		399.00	2.6010	6531.42	3.8150		
13.33. 0	840.96		400.00	2.6021	6535.08	3.8153		
13.34. 0	841.61		401.00	2.6031	6534.43	3.8152		
13.35. 0	842.16		402.00	2.6042	6533.88	3.8152		
13.36. 0	839.76	286.2	403.00	2.6053	6536.28	3.8153		
13.37. 0	838.98		404.00	2.6064	6537.06	3.8154		
13.38. 0	837.21		405.00	2.6075	6538.83	3.8155		
13.39. 0	835.00		406.00	2.6085	6541.04	3.8156		
13.40. 0	833.06		407.00	2.6096	6542.98	3.8158		
13.41. 0	830.45	286.0	408.00	2.6107	6545.59	3.8159		23
13.42. 0	828.24		409.00	2.6117	6547.80	3.8161		
13.43. 0	825.34		410.00	2.6128	6550.70	3.8163		
13.44. 0	819.65		411.00	2.6138	6556.39	3.8167		
13.45. 0	815.84		412.00	2.6149	6560.20	3.8169		
13.46. 0	810.17	285.8	413.00	2.6160	6565.87	3.8173		
13.47. 0	802.43		414.00	2.6170	6573.61	3.8178		
13.48. 0	797.67		415.00	2.6180	6578.37	3.8181		
13.49. 0	796.36		416.00	2.6191	6579.68	3.8182		
13.50. 0	790.55		417.00	2.6201	6585.49	3.8186		
13.51. 0	786.91	285.8	418.00	2.6212	6589.13	3.8188		
13.52. 0	783.99		419.00	2.6222	6592.05	3.8190		
13.53. 0	782.42		420.00	2.6232	6593.62	3.8191		
13.54. 0	775.47		421.00	2.6243	6600.57	3.8196		
13.55. 0	767.28		422.00	2.6253	6608.76	3.8201		
13.56. 0	770.47	285.6	423.00	2.6263	6605.57	3.8199		
13.57. 0	772.78		424.00	2.6274	6603.26	3.8198		
13.58. 0	769.90		425.00	2.6284	6606.14	3.8199		
13.59. 0	767.09		426.00	2.6294	6608.95	3.8201		
14. 0. 0	761.70		427.00	2.6304	6614.34	3.8205		
14. 1. 0	757.56	285.4	428.00	2.6314	6618.48	3.8208		
14. 2. 0	751.04		429.00	2.6325	6625.00	3.8212		
14. 3. 0	744.02		430.00	2.6335	6632.02	3.8216		
14. 4. 0	746.71		431.00	2.6345	6629.33	3.8215		
14. 5. 0	742.59		432.00	2.6355	6633.45	3.8217		
14. 6. 0	743.64	285.3	433.00	2.6365	6632.40	3.8217		
14. 7. 0	750.00		434.00	2.6375	6626.04	3.8213		

TIME HR.MN.SS	PRESS. PSIA	TEMP. DEG.F	DEL.T (MINUTES)	LOG DEL.T	DEL.P PSIA	LOG DEL.P	LOG $\frac{T+DEL.T}{DEL.T}$	REMARKS
14. 8. 0	750.23		435.00	2.6385	6625.81	3.8212		
14. 9. 0	745.73		436.00	2.6395	6630.31	3.8215		
14.10. 0	745.43		437.00	2.6405	6630.61	3.8216		
14.11. 0	747.08	285.1	438.00	2.6415	6628.96	3.8214		
14.12. 0	747.24		439.00	2.6425	6628.80	3.8214		
14.13. 0	747.56		440.00	2.6435	6628.48	3.8214		
14.14. 0	745.66		441.00	2.6444	6630.38	3.8215		
14.15. 0	738.44		442.00	2.6454	6637.60	3.8220		
14.16. 0	739.90	284.7	443.00	2.6464	6636.14	3.8219		
14.17. 0	741.35		444.00	2.6474	6634.69	3.8218		
14.18. 0	740.24		445.00	2.6484	6635.80	3.8219		
14.19. 0	741.33		446.00	2.6493	6634.71	3.8218		
14.20. 0	739.87		447.00	2.6503	6636.17	3.8219		
14.21. 0	739.09	284.5	448.00	2.6513	6636.95	3.8220		
14.22. 0	736.82		449.00	2.6522	6639.22	3.8221		24
14.23. 0	735.24		450.00	2.6532	6640.80	3.8222		
14.24. 0	733.39		451.00	2.6542	6642.65	3.8223		
14.25. 0	733.79		452.00	2.6551	6642.25	3.8223		
14.26. 0	733.19	284.4	453.00	2.6561	6642.85	3.8224		
14.27. 0	731.53		454.00	2.6571	6644.51	3.8225		
14.28. 0	727.49		455.00	2.6580	6648.55	3.8227		
14.29. 0	726.74		456.00	2.6590	6649.30	3.8228		
14.30. 0	726.59		457.00	2.6599	6649.45	3.8228		
14.31. 0	724.08	284.0	458.00	2.6609	6651.96	3.8229		
14.32. 0	721.11		459.00	2.6618	6654.93	3.8231		
14.33. 0	720.46		460.00	2.6628	6655.58	3.8232		
14.34. 0	719.49		461.00	2.6637	6656.55	3.8232		
14.35. 0	716.34		462.00	2.6646	6659.70	3.8235		
14.36. 0	715.65	284.0	463.00	2.6656	6660.39	3.8235		
14.37. 0	715.17		464.00	2.6665	6660.87	3.8235		
14.38. 0	714.70		465.00	2.6675	6661.34	3.8236		
14.39. 0	716.00		466.00	2.6684	6660.04	3.8235		
14.40. 0	716.44		467.00	2.6693	6659.60	3.8234		
14.41. 0	719.00	283.8	468.00	2.6702	6657.04	3.8233		
14.42. 0	721.96		469.00	2.6712	6654.08	3.8231		
14.43. 0	722.56		470.00	2.6721	6653.48	3.8230		
14.44. 0	721.70		471.00	2.6730	6654.34	3.8231		
14.45. 0	724.11		472.00	2.6739	6651.93	3.8229		
14.46. 0	725.99	283.6	473.00	2.6749	6650.05	3.8228		
14.47. 0	729.15		474.00	2.6758	6646.89	3.8226		
14.48. 0	731.94		475.00	2.6767	6644.10	3.8224		
14.49. 0	730.89		476.00	2.6776	6645.15	3.8225		

TIME HR.MN.SS	PRESS. PSIA	TEMP. DEG.F	DEL.T (MINUTES)	LOG DEL.T	DEL.P PSIA	LOG DEL.P	LOG $\frac{T+DEL.T}{DEL.T}$	REMARKS
14.50. 0	729.27		477.00	2.6785	6646.77	3.8226		
14.51. 0	734.26	283.6	478.00	2.6794	6641.78	3.8223		
14.52. 0	740.25		479.00	2.6803	6635.79	3.8219		
14.53. 0	743.47		480.00	2.6812	6632.57	3.8217		
14.54. 0	746.55		481.00	2.6821	6629.49	3.8215		
14.55. 0	750.63		482.00	2.6830	6625.41	3.8212		
14.56. 0	755.49	283.5	483.00	2.6839	6620.55	3.8209		
14.57. 0	761.17		484.00	2.6848	6614.87	3.8205		
14.58. 0	766.35		485.00	2.6857	6609.69	3.8202		
14.59. 0	769.99		486.00	2.6866	6606.05	3.8199		
15. 0. 0	771.88		487.00	2.6875	6604.16	3.8198		
15. 1. 0	772.85	283.5	488.00	2.6884	6603.19	3.8198		
15. 2. 0	773.48		489.00	2.6893	6602.56	3.8197		
15. 3. 0	777.85		490.00	2.6902	6598.19	3.8194		
15. 4. 0	781.96		491.00	2.6911	6594.08	3.8192		25
15. 5. 0	786.47		492.00	2.6920	6589.57	3.8189		
15. 6. 0	790.27	283.5	493.00	2.6928	6585.77	3.8186		
15. 7. 0	793.10		494.00	2.6937	6582.94	3.8184		
15. 8. 0	796.37		495.00	2.6946	6579.67	3.8182		
15. 9. 0	799.06		496.00	2.6955	6576.98	3.8180		
15.10. 0	802.47		497.00	2.6964	6573.57	3.8178		
15.11. 0	805.17	283.5	498.00	2.6972	6570.87	3.8176		
15.12. 0	807.45		499.00	2.6981	6568.59	3.8175		
15.13. 0	810.51		500.00	2.6990	6565.53	3.8173		
15.14. 0	812.46		501.00	2.6998	6563.58	3.8171		
15.15. 0	814.28		502.00	2.7007	6561.76	3.8170		
15.16. 0	816.03		503.00	2.7016	6560.01	3.8169		
15.17. 0	817.49	283.3	504.00	2.7024	6558.55	3.8168		
15.18. 0	819.78		505.00	2.7033	6556.26	3.8167		
15.19. 0	821.41		506.00	2.7042	6554.63	3.8165		
15.20. 0	820.51		507.00	2.7050	6555.53	3.8166		
15.21. 0	823.25	283.3	508.00	2.7059	6552.79	3.8164		
15.22. 0	824.85		509.00	2.7067	6551.19	3.8163		
15.23. 0	825.67		510.00	2.7076	6550.37	3.8163		
15.24. 0	826.50		511.00	2.7084	6549.54	3.8162		
15.25. 0	827.34		512.00	2.7093	6548.70	3.8162		
15.26. 0	827.18		513.00	2.7101	6548.86	3.8162		
15.27. 0	826.52	283.3	514.00	2.7110	6549.52	3.8162		
15.28. 0	822.69		515.00	2.7118	6553.35	3.8165		
15.29. 0	822.61		516.00	2.7126	6553.43	3.8165		
15.30. 0	824.08		517.00	2.7135	6551.96	3.8164		
15.31. 0	823.48		518.00	2.7143	6552.56	3.8164		

TIME HR.MN.SS	PRESS. PSIA	TEMP. DEG.F	DEL.T (MINUTES)	LOG DEL.T	DEL.P PSIA	LOG DEL.P	LOG $\frac{T+DEL.T}{DEL.T}$	REMARKS
15.32. 0	823.92	283.3	519.00	2.7152	6552.12	3.8164		
15.33. 0	825.67		520.00	2.7160	6550.37	3.8163		
15.34. 0	826.00		521.00	2.7168	6550.04	3.8162		
15.35. 0	826.00		522.00	2.7177	6550.04	3.8162		
15.36. 0	823.35		523.00	2.7185	6552.69	3.8164		
15.37. 0	824.74	283.3	524.00	2.7193	6551.30	3.8163		
15.38. 0	826.70		525.00	2.7202	6549.34	3.8162		
15.39. 0	824.10		526.00	2.7210	6551.94	3.8164		
15.40. 0	819.41		527.00	2.7218	6556.63	3.8167		
15.41. 0	815.72		528.00	2.7226	6560.32	3.8169		
15.42. 0	810.48	283.1	529.00	2.7235	6565.56	3.8173		
15.43. 0	807.40		530.00	2.7243	6568.64	3.8175		
15.44. 0	804.75		531.00	2.7251	6571.29	3.8177		
15.45. 0	800.25		532.00	2.7259	6575.79	3.8179		
15.46. 0	795.86		533.00	2.7267	6580.18	3.8182		26
15.47. 0	792.50	282.9	534.00	2.7275	6583.54	3.8185		
15.48. 0	789.34		535.00	2.7284	6586.70	3.8187		
15.49. 0	785.66		536.00	2.7292	6590.38	3.8189		
15.50. 0	779.75		537.00	2.7300	6596.29	3.8193		
15.51. 0	774.88		538.00	2.7308	6601.16	3.8196		
15.52. 0	776.67	282.9	539.00	2.7316	6599.37	3.8195		
15.53. 0	777.73		540.00	2.7324	6598.31	3.8194		
15.54. 0	776.26		541.00	2.7332	6599.78	3.8195		
15.55. 0	772.76		542.00	2.7340	6603.28	3.8198		
15.56. 0	770.89		543.00	2.7348	6605.15	3.8199		
15.57. 0	768.18	282.9	544.00	2.7356	6607.86	3.8201		
15.58. 0	766.67		545.00	2.7364	6609.37	3.8202		
15.59. 0	764.47		546.00	2.7372	6611.57	3.8203		
16. 0. 0	761.01		547.00	2.7380	6615.03	3.8205		
16. 1. 0	755.54		548.00	2.7388	6620.50	3.8209		
16. 2. 0	750.54	282.7	549.00	2.7396	6625.50	3.8212		
16. 3. 0	745.72		550.00	2.7404	6630.32	3.8215		
16. 4. 0	742.64		551.00	2.7412	6633.40	3.8217		
16. 5. 0	740.40		552.00	2.7419	6635.64	3.8219		
16. 6. 0	734.08		553.00	2.7427	6641.96	3.8223		
16. 7. 0	731.37	282.7	554.00	2.7435	6644.67	3.8225		
16. 8. 0	727.91		555.00	2.7443	6648.13	3.8227		
16. 9. 0	725.03		556.00	2.7451	6651.01	3.8229		
16.10. 0	722.79		557.00	2.7459	6653.25	3.8230		
16.11. 0	718.99		558.00	2.7466	6657.05	3.8233		
16.12. 0	713.47	282.6	559.00	2.7474	6662.57	3.8236		
16.13. 0	709.59		560.00	2.7482	6666.45	3.8239		

TIME HR.MN.SS	PRESS. PSIA	TEMP. DEG.F	DEL.T (MINUTES)	LOG DEL.T	DEL.P PSIA	LOG DEL.P	LOG $\frac{T+DEL.T}{DEL.T}$	REMARKS
16.14. 0	707.16		561.00	2.7490	6668.88	3.8241		
16.15. 0	705.36		562.00	2.7497	6670.68	3.8242		
16.16. 0	702.67		563.00	2.7505	6673.37	3.8243		
16.17. 0	699.35	282.4	564.00	2.7513	6676.69	3.8246		
16.18. 0	698.89		565.00	2.7520	6677.15	3.8246		
16.19. 0	699.46		566.00	2.7528	6676.58	3.8246		
16.20. 0	698.91		567.00	2.7536	6677.13	3.8246		
16.21. 0	695.17		568.00	2.7543	6680.87	3.8248		
16.22. 0	696.79	282.4	569.00	2.7551	6679.25	3.8247		
16.23. 0	697.70		570.00	2.7559	6678.34	3.8247		
16.24. 0	694.03		571.00	2.7566	6682.01	3.8249		
16.25. 0	692.86		572.00	2.7574	6683.18	3.8250		
16.26. 0	691.57		573.00	2.7582	6684.47	3.8251		
16.27. 0	690.52	282.2	574.00	2.7589	6685.52	3.8251		27
16.28. 0	689.91		575.00	2.7597	6686.13	3.8252		
16.29. 0	687.94		576.00	2.7604	6688.10	3.8253		
16.30. 0	685.93		577.00	2.7612	6690.11	3.8254		
16.31. 0	685.44		578.00	2.7619	6690.60	3.8255		
16.32. 0	684.28		579.00	2.7627	6691.76	3.8255		
16.33. 0	679.63	282.0	580.00	2.7634	6696.41	3.8258		
16.34. 0	677.88		581.00	2.7642	6698.16	3.8260		
16.35. 0	676.69		582.00	2.7649	6699.35	3.8260		
16.36. 0	676.68		583.00	2.7657	6699.36	3.8260		
16.37. 0	677.41		584.00	2.7664	6698.63	3.8260		
16.38. 0	677.24	281.8	585.00	2.7672	6698.80	3.8260		
16.39. 0	674.83		586.00	2.7679	6701.21	3.8262		
16.40. 0	674.50		587.00	2.7686	6701.54	3.8262		
16.41. 0	676.60		588.00	2.7694	6699.44	3.8260		
16.42. 0	677.60		589.00	2.7701	6698.44	3.8260		
16.43. 0	677.08	281.7	590.00	2.7709	6698.96	3.8260		
16.44. 0	676.85		591.00	2.7716	6699.19	3.8260		
16.45. 0	677.67		592.00	2.7723	6698.37	3.8260		
16.46. 0	678.00		593.00	2.7731	6698.04	3.8259		
16.47. 0	678.65		594.00	2.7738	6697.39	3.8259		
16.48. 0	678.67	281.7	595.00	2.7745	6697.37	3.8259		
16.49. 0	678.35		596.00	2.7752	6697.69	3.8259		
16.50. 0	679.37		597.00	2.7760	6696.67	3.8259		
16.51. 0	680.68		598.00	2.7767	6695.36	3.8258		
16.52. 0	681.13		599.00	2.7774	6694.91	3.8257		
16.53. 0	681.83	281.5	600.00	2.7782	6694.21	3.8257		
16.54. 0	680.77		601.00	2.7789	6695.27	3.8258		
16.55. 0	682.82		602.00	2.7796	6693.22	3.8256		

TIME HR.MN.SS	PRESS. PSIA	TEMP. DEG.F	DEL.T (MINUTES)	LOG DEL.T	DEL.P PSIA	LOG DEL.P	LOG $\frac{T+DEL.T}{DEL.T}$	REMARKS
16.56. 0	685.11		603.00	2.7803	6690.93	3.8255		
16.57. 0	687.76		604.00	2.7810	6688.28	3.8253		
16.58. 0	690.61	281.5	605.00	2.7818	6685.43	3.8251		
16.59. 0	693.06		606.00	2.7825	6682.98	3.8250		
17. 0. 0	694.84		607.00	2.7832	6681.20	3.8249		
17. 1. 0	697.52		608.00	2.7839	6678.52	3.8247		
17. 2. 0	700.33		609.00	2.7846	6675.71	3.8245		
17. 3. 0	702.98	281.3	610.00	2.7853	6673.06	3.8243		
17. 4. 0	705.29		611.00	2.7860	6670.75	3.8242		
17. 5. 0	707.69		612.00	2.7868	6668.35	3.8240		
17. 6. 0	710.59		613.00	2.7875	6665.45	3.8238		
17. 7. 0	714.04		614.00	2.7882	6662.00	3.8236		
17. 8. 0	717.04	281.1	615.00	2.7889	6659.00	3.8234		
17. 9. 0	719.71		616.00	2.7896	6656.33	3.8232		
17.10. 0	719.18		617.00	2.7903	6656.86	3.8233		
17.11. 0	721.28		618.00	2.7910	6654.76	3.8231		
17.12. 0	728.29		619.00	2.7917	6647.75	3.8227		- Choke decreased to ½" fixed
17.13. 0	731.93	281.1	620.00	2.7924	6644.11	3.8224		
17.14. 0	736.47		621.00	2.7931	6639.57	3.8221		
17.15. 0	740.40		622.00	2.7938	6635.64	3.8219		
17.16. 0	745.70		623.00	2.7945	6630.34	3.8215		
17.17. 0	749.96		624.00	2.7952	6626.08	3.8213		
17.18. 0	754.68	281.3	625.00	2.7959	6621.36	3.8209		
17.19. 0	761.52		626.00	2.7966	6614.52	3.8205		
17.20. 0	770.12		627.00	2.7973	6605.92	3.8199		
17.21. 0	790.87		628.00	2.7980	6585.17	3.8186		
17.22. 0	807.02		629.00	2.7987	6569.02	3.8175		
17.23. 0	819.18	281.5	630.00	2.7993	6556.86	3.8167		
17.24. 0	831.04		631.00	2.8000	6545.00	3.8159		
17.25. 0	841.25		632.00	2.8007	6534.79	3.8152		
17.26. 0	850.69		633.00	2.8014	6525.35	3.8146		
17.27. 0	860.56		634.00	2.8021	6515.48	3.8139		
17.28. 0	870.67	281.5	635.00	2.8028	6505.37	3.8133		
17.29. 0	878.72		636.00	2.8035	6497.32	3.8127		
17.30. 0	887.17		637.00	2.8041	6488.87	3.8122		
17.31. 0	896.61		638.00	2.8048	6479.43	3.8115		
17.32. 0	906.80		639.00	2.8055	6469.24	3.8109		
17.33. 0	917.38	281.7	640.00	2.8062	6458.66	3.8101		
17.34. 0	926.23		641.00	2.8069	6449.81	3.8095		
17.35. 0	934.37		642.00	2.8075	6441.67	3.8090		
17.36. 0	942.62		643.00	2.8082	6433.42	3.8084		
17.37. 0	950.74		644.00	2.8089	6425.30	3.8079		

TIME HR.MN.SS	PRESS. PSIA	TEMP. DEG.F	DEL.T (MINUTES)	LOG DEL.T	DEL.P PSIA	LOG DEL.P	LOG $\frac{T+DEL.T}{DEL.T}$	REMARKS
17.38. 0	958.76	281.7	645.00	2.8096	6417.28	3.8074		
17.39. 0	966.06		646.00	2.8102	6409.98	3.8069		
17.40. 0	973.81		647.00	2.8109	6402.23	3.8063		
17.41. 0	981.26		648.00	2.8116	6394.78	3.8058		
17.42. 0	989.70		649.00	2.8122	6386.34	3.8053		
17.43. 0	995.83	281.8	650.00	2.8129	6380.21	3.8048		
17.44. 0	1000.10		651.00	2.8136	6375.94	3.8045		
17.45. 0	1005.34		652.00	2.8142	6370.70	3.8042		
17.46. 0	1013.23		653.00	2.8149	6362.81	3.8036		
17.47. 0	1019.99		654.00	2.8156	6356.05	3.8032		
17.48. 0	1027.33	282.0	655.00	2.8162	6348.71	3.8027		
17.49. 0	1032.02		656.00	2.8169	6344.02	3.8024		
17.50. 0	1037.41		657.00	2.8176	6338.63	3.8020		
17.51. 0	1041.83		658.00	2.8182	6334.21	3.8017		29
17.52. 0	1042.97		659.00	2.8189	6333.07	3.8016		
17.53. 0	1043.53	282.2	660.00	2.8195	6332.51	3.8016		
17.54. 0	1051.77		661.00	2.8202	6324.27	3.8010		
17.55. 0	1062.07		662.00	2.8209	6313.97	3.8003		
17.56. 0	1071.92		663.00	2.8215	6304.12	3.7996		
17.57. 0	1077.96		664.00	2.8222	6298.08	3.7992		
17.58. 0	1078.44	282.4	665.00	2.8228	6297.60	3.7992		
17.59. 0	1077.25		666.00	2.8235	6298.79	3.7993		
18. 0. 0	1076.63		667.00	2.8241	6299.41	3.7993		
18. 1. 0	1076.68		668.00	2.8248	6299.36	3.7993		
18. 2. 0	1078.52		669.00	2.8254	6297.52	3.7992		
18. 3. 0	1086.56	282.7	670.00	2.8261	6289.48	3.7986		
18. 4. 0	1099.91		671.00	2.8267	6276.13	3.7977		
18. 5. 0	1112.04		672.00	2.8274	6264.00	3.7969		
18. 6. 0	1123.26		673.00	2.8280	6252.78	3.7961		
18. 7. 0	1128.75		674.00	2.8287	6247.29	3.7957		
18. 8. 0	1135.79	282.6	675.00	2.8293	6240.25	3.7952		
18. 9. 0	1142.20		676.00	2.8299	6233.84	3.7948		
18.10. 0	1148.93		677.00	2.8306	6227.11	3.7943		
18.11. 0	1155.87		678.00	2.8312	6220.17	3.7938		
18.12. 0	1163.07		679.00	2.8319	6212.97	3.7933		
18.13. 0	1170.22	282.7	680.00	2.8325	6205.82	3.7928		
18.14. 0	1176.75		681.00	2.8331	6199.29	3.7923		
18.15. 0	1183.23		682.00	2.8338	6192.81	3.7919		
18.16. 0	1190.15		683.00	2.8344	6185.89	3.7914		
18.17. 0	1197.45		684.00	2.8351	6178.59	3.7909		
18.18. 0	1203.94	282.9	685.00	2.8357	6172.10	3.7904		
18.19. 0	1209.98		686.00	2.8363	6166.06	3.7900		

TIME HR.MN.SS	PRESS. PSIA	TEMP. DEG.F	DEL.T (MINUTES)	LOG DEL.T	DEL.P PSIA	LOG DEL.P	LOG $\frac{T+DEL.T}{DEL.T}$	REMARKS
18.20. 0	1216.60		687.00	2.8370	6159.44	3.7895		
18.21. 0	1223.11		688.00	2.8376	6152.93	3.7891		
18.22. 0	1228.95		689.00	2.8382	6147.09	3.7887		
18.23. 0	1234.06	283.3	690.00	2.8388	6141.98	3.7883		
18.24. 0	1238.15		691.00	2.8395	6137.89	3.7880		
18.25. 0	1242.60		692.00	2.8401	6133.44	3.7877		
18.26. 0	1248.12		693.00	2.8407	6127.92	3.7873		
18.27. 0	1254.69		694.00	2.8414	6121.35	3.7868		
18.28. 0	1261.83	283.5	695.00	2.8420	6114.21	3.7863		
18.29. 0	1266.61		696.00	2.8426	6109.43	3.7860		
18.30. 0	1271.86		697.00	2.8432	6104.18	3.7856		
18.31. 0	1277.78		698.00	2.8439	6098.26	3.7852		
18.32. 0	1283.36		699.00	2.8445	6092.68	3.7848		
18.33. 0	1290.44	283.6	700.00	2.8451	6085.60	3.7843		30
18.34. 0	1296.78		701.00	2.8457	6079.26	3.7839		
18.35. 0	1301.62		702.00	2.8463	6074.42	3.7835		
18.36. 0	1306.65		703.00	2.8470	6069.39	3.7831		
18.37. 0	1311.53		704.00	2.8476	6064.51	3.7828		
18.38. 0	1316.44	283.8	705.00	2.8482	6059.60	3.7824		
18.39. 0	1321.39		706.00	2.8488	6054.65	3.7821		
18.40. 0	1326.97		707.00	2.8494	6049.07	3.7817		
18.41. 0	1332.78		708.00	2.8500	6043.26	3.7813		
18.42. 0	1337.69		709.00	2.8506	6038.35	3.7809		
18.43. 0	1341.54	284.0	710.00	2.8513	6034.50	3.7806		
18.44. 0	1344.46		711.00	2.8519	6031.58	3.7804		
18.45. 0	1347.87		712.00	2.8525	6028.17	3.7802		
18.46. 0	1351.19		713.00	2.8531	6024.85	3.7799		
18.47. 0	1355.08		714.00	2.8537	6020.96	3.7797		
18.48. 0	1359.52	284.2	715.00	2.8543	6016.52	3.7793		
18.49. 0	1362.87		716.00	2.8549	6013.17	3.7791		
18.50. 0	1367.02		717.00	2.8555	6009.02	3.7788		31
18.50.10	1367.59	284.4	717.17	2.8556	6008.45	3.7788		
18.50.20	1368.08	284.4	717.33	2.8557	6007.96	3.7787		
18.50.30	1368.60		717.50	2.8558	6007.44	3.7787		32
18.50.40	1369.28	284.4	717.67	2.8559	6006.76	3.7786		
18.50.50	1369.97	284.4	717.83	2.8560	6006.07	3.7786		
18.51. 0	1370.56	284.4	718.00	2.8561	6005.48	3.7785		
18.51.10	1370.86		718.17	2.8562	6005.18	3.7785		
18.51.20	1371.72	284.4	718.33	2.8563	6004.32	3.7785		
18.51.30	1372.50	284.4	718.50	2.8564	6003.54	3.7784		
18.51.40	1373.09	284.4	718.67	2.8565	6002.95	3.7784		33
18.51.50	1373.77		718.83	2.8566	6002.27	3.7783		

TIME HR.MN.SS	PRESS. PSIA	TEMP. DEG.F	DEL.T (MINUTES)	LOG DEL.T	DEL.P PSIA	LOG DEL.P	LOG $\frac{T+DEL.T}{DEL.T}$	REMARKS	
18.52. 0	1374.59	284.4	0.00					SHUT IN TIME	
18.52.10	1374.87	284.4	0.17	-0.7782	0.28	-0.5528	3.6356	18.52. 0	
18.52.20	1413.27	284.4	0.33	-0.4771	38.68	1.5875	3.3347		
18.52.30	1451.39	284.4	0.50	-0.3010	76.80	1.8854	3.1587	FLOWING PRES.	
18.52.40	1492.11		0.67	-0.1761	117.52	2.0701	3.0338	1374.59	
18.52.50	1528.75	284.4	0.83	-0.0792	154.16	2.1880	2.9370		34
18.53. 0	1567.16	284.4	1.00	0.0000	192.57	2.2846	2.8579	FLOW TIME T	
18.53.10	1601.64	284.4	1.17	0.0669	227.05	2.3561	2.7911	[HOURS]	
18.53.20	1637.93		1.33	0.1249	263.34	2.4205	2.7332	12. 0. 0	
18.53.30	1670.80	284.4	1.50	0.1761	296.21	2.4716	2.6821		
18.53.40	1706.21	284.4	1.67	0.2218	331.62	2.5206	2.6365		
18.53.50	1740.78	284.4	1.83	0.2632	366.19	2.5637	2.5952		35
18.54. 0	1770.92	284.4	2.00	0.3010	396.33	2.5981	2.5575		
18.54.10	1802.66		2.17	0.3358	428.07	2.6315	2.5228		
18.54.20	1833.95	284.4	2.33	0.3680	459.36	2.6622	2.4908		
18.54.30	1866.58	284.4	2.50	0.3979	491.99	2.6920	2.4609		
18.54.40	1896.22	284.4	2.67	0.4260	521.63	2.7174	2.4330		
18.54.50	1925.87		2.83	0.4523	551.28	2.7414	2.4067		
18.55. 0	1955.70	284.4	3.00	0.4771	581.11	2.7643	2.3820		
18.55.10	1985.70	284.4	3.17	0.5006	611.11	2.7861	2.3586		36
18.55.20	2014.86	284.4	3.33	0.5229	640.27	2.8064	2.3365		
18.55.30	2042.81	284.4	3.50	0.5441	668.22	2.8249	2.3154		
18.55.40	2071.91		3.67	0.5643	697.32	2.8434	2.2953		
18.55.50	2098.91	284.4	3.83	0.5836	724.32	2.8599	2.2761		
18.56. 0	2128.83	284.4	4.00	0.6021	754.24	2.8775	2.2577		
18.56.10	2154.43	284.4	4.17	0.6198	779.84	2.8920	2.2400		
18.56.20	2181.73		4.33	0.6368	807.14	2.9069	2.2231		37
18.56.30	2208.71	284.4	4.50	0.6532	834.12	2.9212	2.2068		
18.56.40	2236.88	284.4	4.67	0.6690	862.29	2.9357	2.1911		
18.56.50	2262.27	284.4	4.83	0.6842	887.68	2.9483	2.1760		
18.57. 0	2289.05		5.00	0.6990	914.46	2.9612	2.1614		
18.57.10	2315.32	284.4	5.17	0.7132	940.73	2.9735	2.1472		
18.57.20	2338.14	284.5	5.33	0.7270	963.55	2.9839	2.1335		
18.57.30	2362.63	284.5	5.50	0.7404	988.04	2.9948	2.1203		38
18.57.40	2387.35		5.67	0.7533	1012.76	3.0055	2.1074		
18.57.50	2412.26	284.5	5.83	0.7659	1037.67	3.0161	2.0949		
18.58. 0	2435.27	284.5	6.00	0.7782	1060.68	3.0256	2.0828		
18.58.10	2457.83		6.17	0.7901	1083.24	3.0347	2.0710		
18.58.20	2479.66	284.5	6.33	0.8016	1105.07	3.0434	2.0595		
18.58.30	2501.89	284.5	6.50	0.8129	1127.30	3.0520	2.0483		
18.58.40	2524.75		6.67	0.8239	1150.16	3.0608	2.0374		
18.58.50	2544.75	284.5	6.83	0.8346	1170.16	3.0682	2.0268		39

TIME HR.MN.SS	PRESS. PSIA	TEMP. DEG.F	DEL.T (MINUTES)	LOG DEL.T	DEL.P PSIA	LOG DEL.P	LOG T+DEL.T / DEL.T	REMARKS
18.59. 0	2567.89	284.5	7.00	0.8451	1193.30	3.0767	2.0164	
18.59.10	2587.14		7.17	0.8553	1212.55	3.0837	2.0063	
18.59.20	2608.43	284.5	7.33	0.8653	1233.84	3.0913	1.9964	
18.59.30	2629.05		7.50	0.8751	1254.46	3.0985	1.9868	
18.59.40	2648.37	284.5	7.67	0.8846	1273.78	3.1051	1.9773	
18.59.50	2668.62	284.5	7.83	0.8939	1294.03	3.1119	1.9681	
19. 0. 0	2688.19	284.7	8.00	0.9031	1313.60	3.1185	1.9590	40
19. 0.10	2707.76		8.17	0.9120	1333.17	3.1249	1.9502	
19. 0.20	2726.93	284.7	8.33	0.9208	1352.34	3.1311	1.9415	
19. 0.30	2744.74		8.50	0.9294	1370.15	3.1368	1.9330	
19. 0.40	2763.57	284.7	8.67	0.9379	1388.98	3.1427	1.9247	
19. 0.50	2782.08	284.7	8.83	0.9461	1407.49	3.1484	1.9165	
19. 1. 0	2801.02	284.7	9.00	0.9542	1426.43	3.1543	1.9085	
19. 1.10	2819.07		9.17	0.9622	1444.48	3.1597	1.9006	
19. 1.20	2836.61	284.7	9.33	0.9700	1462.02	3.1650	1.8929	41
19. 1.30	2853.97	284.7	9.50	0.9777	1479.38	3.1701	1.8853	
19. 1.40	2871.29		9.67	0.9853	1496.70	3.1751	1.8778	
19. 1.50	2888.33	284.7	9.83	0.9927	1513.74	3.1801	1.8705	
19. 2. 0	2905.75		10.00	1.0000	1531.16	3.1850	1.8633	
19. 2.10	2923.35	284.7	10.17	1.0072	1548.76	3.1900	1.8562	
19. 2.20	2939.65	284.7	10.33	1.0142	1565.06	3.1945	1.8493	
19. 2.30	2955.49	284.9	10.50	1.0212	1580.90	3.1989	1.8424	42
19. 2.40	2971.49		10.67	1.0280	1596.90	3.2033	1.8357	
19. 2.50	2987.18	284.9	10.83	1.0348	1612.59	3.2075	1.8291	
19. 3. 0	3004.13	284.9	11.00	1.0414	1629.54	3.2121	1.8225	
19. 3.10	3019.57		11.17	1.0479	1644.98	3.2162	1.8161	
19. 3.20	3034.83	284.9	11.33	1.0544	1660.24	3.2202	1.8098	
19. 3.30	3051.11	284.9	11.50	1.0607	1676.52	3.2244	1.8035	
19. 3.40	3066.05		11.67	1.0669	1691.46	3.2283	1.7974	
19. 3.50	3080.88	284.9	11.83	1.0731	1706.29	3.2321	1.7913	43
19. 4. 0	3095.64	284.9	12.00	1.0792	1721.05	3.2358	1.7853	
19. 4.10	3111.56		12.17	1.0852	1736.97	3.2398	1.7794	
19. 4.20	3125.76	284.9	12.33	1.0911	1751.17	3.2433	1.7736	
19. 4.30	3141.02	284.9	12.50	1.0969	1766.43	3.2471	1.7679	
19. 4.40	3154.99		12.67	1.1027	1780.40	3.2505	1.7622	
19. 4.50	3170.16	285.1	12.83	1.1083	1795.57	3.2542	1.7567	
19. 5. 0	3183.71	285.1	13.00	1.1139	1809.12	3.2575	1.7512	
19. 5.10	3197.56		13.17	1.1195	1822.97	3.2608	1.7457	44
19. 5.20	3212.24	285.1	13.33	1.1249	1837.65	3.2643	1.7404	
19. 5.30	3225.42	285.1	13.50	1.1303	1850.83	3.2674	1.7351	
19. 5.40	3238.94	285.1	13.67	1.1357	1864.35	3.2705	1.7298	
19. 5.50	3252.27		13.83	1.1409	1877.68	3.2736	1.7247	

TIME HR.MN.SS	PRESS. PSIA	TEMP. DEG.F	DEL.T (MINUTES)	LOG DEL.T	DEL.P PSIA	LOG DEL.P	LOG $\frac{T+DEL.T}{DEL.T}$	REMARKS
19. 6. 0	3266.41	285.1	14.00	1.1461	1891.82	3.2769	1.7196	
19. 6.10	3279.06	285.1	14.17	1.1513	1904.47	3.2798	1.7145	
19. 6.20	3292.61	285.1	14.33	1.1563	1918.02	3.2829	1.7095	45
19. 6.30	3305.35		14.50	1.1614	1930.76	3.2857	1.7046	
19. 6.40	3318.84	285.1	14.67	1.1663	1944.25	3.2888	1.6998	
19. 6.50	3332.08	285.3	14.83	1.1712	1957.49	3.2917	1.6950	
19. 7. 0	3344.90	285.3	15.00	1.1761	1970.31	3.2945	1.6902	
19. 7.10	3356.77		15.17	1.1809	1982.18	3.2971	1.6855	
19. 7.20	3369.62	285.3	15.33	1.1856	1995.03	3.2999	1.6808	
19. 7.30	3381.37	285.3	15.50	1.1903	2006.78	3.3025	1.6763	46
19. 7.40	3394.04		15.67	1.1950	2019.45	3.3052	1.6717	
19. 8. 0	3417.85	285.3	16.00	1.2041	2043.26	3.3103	1.6628	
19. 9. 0	3487.32		17.00	1.2304	2112.73	3.3248	1.6370	47
19.10. 0	3553.86	285.4	18.00	1.2553	2179.27	3.3383	1.6128	
19.11. 0	3616.12		19.00	1.2788	2241.53	3.3505	1.5899	
19.12. 0	3676.70		20.00	1.3010	2302.11	3.3621	1.5682	
19.13. 0	3733.17		21.00	1.3222	2358.58	3.3727	1.5476	
19.14. 0	3787.63		22.00	1.3424	2413.04	3.3826	1.5280	
19.15. 0	3840.21	285.8	23.00	1.3617	2465.62	3.3919	1.5093	
19.16. 0	3890.45		24.00	1.3802	2515.86	3.4007	1.4914	
19.17. 0	3937.73		25.00	1.3979	2563.14	3.4088	1.4742	
19.18. 0	3983.63		26.00	1.4150	2609.04	3.4165	1.4578	
19.19. 0	4028.42		27.00	1.4314	2653.83	3.4239	1.4420	
19.20. 0	4070.72	286.3	28.00	1.4472	2696.13	3.4307	1.4267	
19.21. 0	4112.57		29.00	1.4624	2737.98	3.4374	1.4121	
19.22. 0	4152.31		30.00	1.4771	2777.72	3.4437	1.3979	
19.23. 0	4191.16		31.00	1.4914	2816.57	3.4497	1.3843	
19.24. 0	4229.20		32.00	1.5051	2854.61	3.4555	1.3711	
19.25. 0	4265.60	286.7	33.00	1.5185	2891.01	3.4610	1.3583	
19.26. 0	4300.93		34.00	1.5315	2926.34	3.4663	1.3459	
19.27. 0	4335.07		35.00	1.5441	2960.48	3.4714	1.3339	
19.28. 0	4368.42		36.00	1.5563	2993.83	3.4762	1.3222	
19.29. 0	4401.17		37.00	1.5682	3026.58	3.4810	1.3109	
19.30. 0	4431.97	287.1	38.00	1.5798	3057.38	3.4853	1.2999	
19.31. 0	4462.06		39.00	1.5911	3087.47	3.4896	1.2892	
19.32. 0	4491.51		40.00	1.6021	3116.92	3.4937	1.2788	
19.33. 0	4520.23		41.00	1.6128	3145.64	3.4977	1.2686	
19.34. 0	4548.94	287.4	42.00	1.6232	3174.35	3.5017	1.2587	
19.35. 0	4593.11		43.00	1.6335	3218.52	3.5077	1.2491	
19.36. 0	4601.01		44.00	1.6435	3226.42	3.5087	1.2396	
19.37. 0	4626.49		45.00	1.6532	3251.90	3.5121	1.2304	
19.38. 0	4651.59	287.6	46.00	1.6628	3277.00	3.5155	1.2215	

TIME HR.MN.SS	PRESS. PSIA	TEMP. DEG.F	DEL.T (MINUTES)	LOG DEL.T	DEL.P PSIA	LOG DEL.P	LOG $\frac{T+DEL.T}{DEL.T}$	REMARKS
19.39. 0	4675.54		47.00	1.6721	3300.95	3.5186	1.2127	
19.40. 0	4698.84		48.00	1.6812	3324.25	3.5217	1.2041	48
19.41. 0	4721.41	288.0	49.00	1.6902	3346.82	3.5246	1.1957	
19.42. 0	4743.93		50.00	1.6990	3369.34	3.5275	1.1875	
19.43. 0	4765.87		51.00	1.7076	3391.28	3.5304	1.1795	
19.44. 0	4787.07		52.00	1.7160	3412.48	3.5331	1.1716	
19.45. 0	4807.96		53.00	1.7243	3433.37	3.5357	1.1639	
19.46. 0	4828.02	288.1	54.00	1.7324	3453.43	3.5383	1.1563	
19.47. 0	4847.70		55.00	1.7404	3473.11	3.5407	1.1489	
19.48. 0	4867.05		56.00	1.7482	3492.46	3.5431	1.1417	
19.49. 0	4885.89		57.00	1.7559	3511.30	3.5455	1.1345	
19.50. 0	4904.22		58.00	1.7634	3529.63	3.5477	1.1276	
19.51. 0	4922.57	288.5	59.00	1.7709	3547.98	3.5500	1.1207	
19.52. 0	4939.97		60.00	1.7782	3565.38	3.5521	1.1139	
19.53. 0	4957.30		61.00	1.7853	3582.71	3.5542	1.1073	
19.54. 0	4974.17		62.00	1.7924	3599.58	3.5563	1.1008	
19.55. 0	4990.76		63.00	1.7993	3616.17	3.5582	1.0944	
19.56. 0	5006.81	288.9	64.00	1.8062	3632.22	3.5602	1.0881	
19.57. 0	5022.61		65.00	1.8129	3648.02	3.5621	1.0820	
19.58. 0	5037.92		66.00	1.8195	3663.33	3.5639	1.0759	
19.59. 0	5053.10		67.00	1.8261	3678.51	3.5657	1.0699	
20. 0. 0	5067.96		68.00	1.8325	3693.37	3.5674	1.0640	
20. 1. 0	5082.58	289.0	69.00	1.8388	3707.99	3.5691	1.0582	
20. 2. 0	5096.54		70.00	1.8451	3721.95	3.5708	1.0525	
20. 3. 0	5110.43		71.00	1.8513	3735.84	3.5724	1.0469	
20. 4. 0	5124.36		72.00	1.8573	3749.77	3.5740	1.0414	
20. 5. 0	5137.60		73.00	1.8633	3763.01	3.5755	1.0360	
20. 6. 0	5150.94	289.2	74.00	1.8692	3776.35	3.5771	1.0306	
20. 7. 0	5163.76		75.00	1.8751	3789.17	3.5785	1.0253	
20. 8. 0	5176.61		76.00	1.8808	3802.02	3.5800	1.0201	
20. 9. 0	5189.16		77.00	1.8865	3814.57	3.5814	1.0150	
20.10. 0	5201.46		78.00	1.8921	3826.87	3.5828	1.0099	
20.11. 0	5213.55		79.00	1.8976	3838.96	3.5842	1.0049	
20.12. 0	5225.45	289.4	80.00	1.9031	3850.86	3.5856	1.0000	
20.13. 0	5236.98		81.00	1.9085	3862.39	3.5869	0.9951	
20.14. 0	5248.44		82.00	1.9138	3873.85	3.5881	0.9904	
20.15. 0	5259.63		83.00	1.9191	3885.04	3.5894	0.9856	
20.16. 0	5270.74		84.00	1.9243	3896.15	3.5906	0.9810	49
20.17. 0	5281.65		85.00	1.9294	3907.06	3.5919	0.9764	
20.18. 0	5292.17		86.00	1.9345	3917.58	3.5930	0.9718	
20.19. 0	5302.69		87.00	1.9395	3928.10	3.5942	0.9674	
20.20. 0	5313.21		88.00	1.9445	3938.62	3.5953	0.9629	

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20.21. 0	5323.44		89.00	1.9494	3948.85	3.5965	0.9586	
20.22. 0	5333.65		90.00	1.9542	3959.06	3.5976	0.9542	
20.23. 0	5343.70		91.00	1.9590	3969.11	3.5987	0.9500	
20.24. 0	5353.55		92.00	1.9638	3978.96	3.5998	0.9458	
20.25. 0	5363.37	289.9	93.00	1.9685	3988.78	3.6008	0.9416	
20.26. 0	5372.68		94.00	1.9731	3998.09	3.6019	0.9375	
20.27. 0	5382.31		95.00	1.9777	4007.72	3.6029	0.9334	
20.28. 0	5391.63	290.1	96.00	1.9823	4017.04	3.6039	0.9294	
20.29. 0	5400.71		97.00	1.9868	4026.12	3.6049	0.9255	
20.30. 0	5409.78		98.00	1.9912	4035.20	3.6059	0.9215	
20.31. 0	5418.76	290.3	99.00	1.9956	4044.17	3.6068	0.9176	
20.32. 0	5427.48		100.00	2.0000	4052.89	3.6078	0.9138	
20.33. 0	5436.36	290.5	101.00	2.0043	4061.77	3.6087	0.9100	
20.34. 0	5444.77		102.00	2.0086	4070.18	3.6096	0.9063	
20.35. 0	5453.17		103.00	2.0128	4078.58	3.6105	0.9026	
20.36. 0	5461.58		104.00	2.0170	4086.99	3.6114	0.8989	
20.37. 0	5470.04		105.00	2.0212	4095.45	3.6123	0.8953	
20.38. 0	5478.26		106.00	2.0253	4103.67	3.6132	0.8917	
20.39. 0	5486.35		107.00	2.0294	4111.76	3.6140	0.8881	
20.40. 0	5494.23		108.00	2.0334	4119.64	3.6149	0.8846	
20.41. 0	5502.19	290.5	109.00	2.0374	4127.60	3.6157	0.8811	
20.42. 0	5509.81		110.00	2.0414	4135.22	3.6165	0.8777	
20.43. 0	5517.60		111.00	2.0453	4143.01	3.6173	0.8743	
20.44. 0	5525.19		112.00	2.0492	4150.60	3.6181	0.8709	
20.45. 0	5532.75		113.00	2.0531	4158.16	3.6189	0.8676	
20.46. 0	5540.21	290.7	114.00	2.0569	4165.62	3.6197	0.8643	
20.47. 0	5547.49		115.00	2.0607	4172.90	3.6204	0.8610	
20.48. 0	5554.72		116.00	2.0645	4180.13	3.6212	0.8577	
20.49. 0	5561.93		117.00	2.0682	4187.34	3.6219	0.8545	
20.50. 0	5569.15		118.00	2.0719	4194.56	3.6227	0.8514	
20.51. 0	5576.14	290.8	119.00	2.0755	4201.55	3.6234	0.8482	
20.52. 0	5583.10		120.00	2.0792	4208.51	3.6241	0.8451	
20.53. 0	5589.91		121.00	2.0828	4215.32	3.6248	0.8420	
20.54. 0	5596.92		122.00	2.0864	4222.33	3.6256	0.8390	
20.55. 0	5603.55		123.00	2.0899	4228.96	3.6262	0.8359	
20.56. 0	5610.26	291.0	124.00	2.0934	4235.67	3.6269	0.8329	
20.57. 0	5616.73	291.2	125.00	2.0969	4242.14	3.6276	0.8299	50
20.58. 0	5623.15		126.00	2.1004	4248.56	3.6282	0.8270	
20.59. 0	5629.57		127.00	2.1038	4254.98	3.6289	0.8241	
21. 0. 0	5635.99		128.00	2.1072	4261.40	3.6296	0.8212	
21. 1. 0	5642.40		129.00	2.1106	4267.81	3.6302	0.8183	
21. 2. 0	5648.82		130.00	2.1139	4274.23	3.6309	0.8155	

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21. 3. 0	5655.22		131.00	2.1173	4280.63	3.6315	0.8127	
21. 4. 0	5661.37		132.00	2.1206	4286.78	3.6321	0.8099	
21. 5. 0	5667.47		133.00	2.1239	4292.88	3.6327	0.8071	
21. 6. 0	5673.53		134.00	2.1271	4298.94	3.6334	0.8044	
21. 7. 0	5679.61	291.2	135.00	2.1303	4305.02	3.6340	0.8016	
21. 8. 0	5685.41		136.00	2.1335	4310.82	3.6346	0.7989	
21. 9. 0	5691.38		137.00	2.1367	4316.79	3.6352	0.7963	
21.10. 0	5697.20		138.00	2.1399	4322.61	3.6357	0.7936	
21.11. 0	5703.07		139.00	2.1430	4328.48	3.6363	0.7910	
21.12. 0	5708.77	291.4	140.00	2.1461	4334.18	3.6369	0.7884	
21.13. 0	5714.41		141.00	2.1492	4339.82	3.6375	0.7858	
21.14. 0	5719.98		142.00	2.1523	4345.39	3.6380	0.7832	
21.15. 0	5725.64		143.00	2.1553	4351.05	3.6386	0.7807	
21.16. 0	5731.28		144.00	2.1584	4356.69	3.6392	0.7782	
21.17. 0	5736.74	291.6	145.00	2.1614	4362.15	3.6397	0.7756	
21.18. 0	5742.17		146.00	2.1644	4367.58	3.6402	0.7732	
21.19. 0	5747.53		147.00	2.1673	4372.94	3.6408	0.7707	
21.20. 0	5752.86		148.00	2.1703	4378.27	3.6413	0.7683	
21.21. 0	5758.16	291.6	149.00	2.1732	4383.57	3.6418	0.7658	
21.22. 0	5763.30	291.6	150.00	2.1761	4388.71	3.6423	0.7634	
21.23. 0	5768.21	292.1	151.00	2.1790	4393.62	3.6428	0.7610	51
21.24. 0	5772.99		152.00	2.1818	4398.40	3.6433	0.7587	
21.25. 0	5777.78		153.00	2.1847	4403.19	3.6438	0.7563	
21.26. 0	5782.57		154.00	2.1875	4407.98	3.6442	0.7540	
21.27. 0	5787.35		155.00	2.1903	4412.76	3.6447	0.7517	
21.28. 0	5792.14		156.00	2.1931	4417.55	3.6452	0.7494	
21.29. 0	5796.93		157.00	2.1959	4422.34	3.6457	0.7471	
21.30. 0	5801.71		158.00	2.1987	4427.12	3.6461	0.7448	
21.31. 0	5806.50		159.00	2.2014	4431.91	3.6466	0.7426	
21.32. 0	5811.29		160.00	2.2041	4436.70	3.6471	0.7404	
21.33. 0	5816.07		161.00	2.2068	4441.48	3.6475	0.7382	
21.34. 0	5820.86		162.00	2.2095	4446.27	3.6480	0.7360	
21.35. 0	5825.64		163.00	2.2122	4451.06	3.6485	0.7338	
21.36. 0	5830.43		164.00	2.2148	4455.84	3.6489	0.7316	
21.37. 0	5835.22		165.00	2.2175	4460.63	3.6494	0.7295	
21.38. 0	5840.00		166.00	2.2201	4465.41	3.6499	0.7273	
21.39. 0	5844.79		167.00	2.2227	4470.20	3.6503	0.7252	
21.40. 0	5849.58		168.00	2.2253	4474.99	3.6508	0.7231	
21.41. 0	5854.36		169.00	2.2279	4479.77	3.6513	0.7210	
21.42. 0	5859.15		170.00	2.2304	4484.56	3.6517	0.7189	
21.43. 0	5863.94		171.00	2.2330	4489.35	3.6522	0.7169	
21.44. 0	5868.72		172.00	2.2355	4494.13	3.6526	0.7148	

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21.45. 0	5873.51		173.00	2.2380	4498.92	3.6531	0.7128	
21.46. 0	5878.17		174.00	2.2405	4503.58	3.6536	0.7108	
21.47. 0	5882.58		175.00	2.2430	4507.99	3.6540	0.7088	
21.48. 0	5886.84		176.00	2.2455	4512.25	3.6544	0.7068	
21.49. 0	5891.16		177.00	2.2480	4516.57	3.6548	0.7048	
21.50. 0	5895.51	292.1	178.00	2.2504	4520.92	3.6552	0.7029	
21.51. 0	5899.63		179.00	2.2529	4525.04	3.6556	0.7009	
21.52. 0	5903.86		180.00	2.2553	4529.27	3.6560	0.6990	
21.53. 0	5908.00		181.00	2.2577	4533.41	3.6564	0.6970	
21.54. 0	5912.29		182.00	2.2601	4537.70	3.6568	0.6951	
21.55. 0	5916.35	292.3	183.00	2.2625	4541.76	3.6572	0.6932	
21.56. 0	5920.37		184.00	2.2648	4545.78	3.6576	0.6914	
21.57. 0	5924.49		185.00	2.2672	4549.90	3.6580	0.6895	
21.58. 0	5928.57		186.00	2.2695	4553.98	3.6584	0.6876	
21.59. 0	5932.52		187.00	2.2718	4557.93	3.6588	0.6858	
22. 0. 0	5936.61	292.3	188.00	2.2742	4562.02	3.6592	0.6839	
22. 1. 0	5940.52		189.00	2.2765	4565.93	3.6595	0.6821	
22. 2. 0	5944.52		190.00	2.2788	4569.93	3.6599	0.6803	
22. 3. 0	5948.54		191.00	2.2810	4573.95	3.6603	0.6785	
22. 4. 0	5952.49		192.00	2.2833	4577.90	3.6607	0.6767	
22. 5. 0	5956.41	292.5	193.00	2.2856	4581.82	3.6610	0.6749	
22. 6. 0	5960.33		194.00	2.2878	4585.74	3.6614	0.6731	
22. 7. 0	5964.16		195.00	2.2900	4589.57	3.6618	0.6714	
22. 8. 0	5968.07		196.00	2.2923	4593.48	3.6621	0.6696	
22. 9. 0	5971.84		197.00	2.2945	4597.25	3.6625	0.6679	
22.10. 0	5975.61	292.5	198.00	2.2967	4601.02	3.6629	0.6662	
22.11. 0	5979.35		199.00	2.2989	4604.76	3.6632	0.6645	
22.12. 0	5983.11		200.00	2.3010	4608.52	3.6636	0.6628	
22.13. 0	5986.80		201.00	2.3032	4612.21	3.6639	0.6611	
22.14. 0	5990.50		202.00	2.3054	4615.91	3.6643	0.6594	
22.15. 0	5994.27	292.6	203.00	2.3075	4619.68	3.6646	0.6577	
22.16. 0	5997.85		204.00	2.3096	4623.26	3.6649	0.6560	
22.17. 0	6001.47		205.00	2.3118	4626.88	3.6653	0.6544	
22.18. 0	6004.98		206.00	2.3139	4630.39	3.6656	0.6527	
22.19. 0	6008.68		207.00	2.3160	4634.09	3.6660	0.6511	
22.20. 0	6012.25	292.6	208.00	2.3181	4637.66	3.6663	0.6495	
22.21. 0	6015.84		209.00	2.3201	4641.25	3.6666	0.6479	
22.22. 0	6019.45		210.00	2.3222	4644.86	3.6670	0.6463	
22.23. 0	6023.03		211.00	2.3243	4648.44	3.6673	0.6447	
22.24. 0	6026.62		212.00	2.3263	4652.03	3.6676	0.6431	
22.25. 0	6029.83	292.8	213.00	2.3284	4655.24	3.6679	0.6415	
22.26. 0	6033.28		214.00	2.3304	4658.69	3.6683	0.6399	

TIME HR.MN.SS	PRESS. PSIA	TEMP. DEG.F	DEL.T (MINUTES)	LOG DEL.T	DEL.P PSIA	LOG DEL.P	LOG $\frac{T+DEL.T}{DEL.T}$	REMARKS
22.27. 0	6036.73		215.00	2.3324	4662.14	3.6686	0.6384	
22.28. 0	6040.18		216.00	2.3345	4665.59	3.6689	0.6368	
22.29. 0	6043.63		217.00	2.3365	4669.04	3.6692	0.6353	
22.30. 0	6047.08		218.00	2.3385	4672.49	3.6695	0.6337	
22.31. 0	6050.48		219.00	2.3404	4675.89	3.6699	0.6322	
22.32. 0	6053.74		220.00	2.3424	4679.15	3.6702	0.6307	
22.33. 0	6057.29		221.00	2.3444	4682.70	3.6705	0.6292	
22.34. 0	6060.60		222.00	2.3464	4686.01	3.6708	0.6277	
22.35. 0	6063.80	293.0	223.00	2.3483	4689.21	3.6711	0.6262	
22.36. 0	6067.12		224.00	2.3502	4692.53	3.6714	0.6247	
22.37. 0	6070.37		225.00	2.3522	4695.78	3.6717	0.6232	
22.38. 0	6073.75		226.00	2.3541	4699.16	3.6720	0.6218	
22.39. 0	6077.05		227.00	2.3560	4702.46	3.6723	0.6203	
22.40. 0	6080.08	293.0	228.00	2.3579	4705.49	3.6726	0.6189	
22.41. 0	6083.48		229.00	2.3598	4708.89	3.6729	0.6174	
22.42. 0	6086.60		230.00	2.3617	4712.01	3.6732	0.6160	
22.43. 0	6089.83		231.00	2.3636	4715.24	3.6735	0.6146	
22.44. 0	6092.98		232.00	2.3655	4718.39	3.6738	0.6131	
22.45. 0	6096.15	293.2	233.00	2.3674	4721.56	3.6741	0.6117	
22.46. 0	6099.27		234.00	2.3692	4724.68	3.6744	0.6103	
22.47. 0	6102.34		235.00	2.3711	4727.75	3.6747	0.6089	
22.48. 0	6105.48		236.00	2.3729	4730.89	3.6749	0.6075	
22.49. 0	6108.78		237.00	2.3747	4734.19	3.6752	0.6062	
22.50. 0	6111.68	293.2	238.00	2.3766	4737.09	3.6755	0.6048	
22.51. 0	6114.70		239.00	2.3784	4740.11	3.6758	0.6034	
22.52. 0	6117.77		240.00	2.3802	4743.18	3.6761	0.6021	
22.53. 0	6120.81		241.00	2.3820	4746.22	3.6763	0.6007	
22.54. 0	6123.77		242.00	2.3838	4749.18	3.6766	0.5994	
22.55. 0	6126.84	293.4	243.00	2.3856	4752.25	3.6769	0.5980	
22.56. 0	6129.82		244.00	2.3874	4755.23	3.6772	0.5967	
22.57. 0	6132.79		245.00	2.3892	4758.20	3.6774	0.5954	
22.58. 0	6135.83		246.00	2.3909	4761.24	3.6777	0.5940	
22.59. 0	6138.82		247.00	2.3927	4764.23	3.6780	0.5927	
23. 0. 0	6141.76	293.4	248.00	2.3945	4767.17	3.6783	0.5914	
23. 1. 0	6144.62		249.00	2.3962	4770.03	3.6785	0.5901	
23. 2. 0	6147.63		250.00	2.3979	4773.04	3.6788	0.5888	
23. 3. 0	6150.50		251.00	2.3997	4775.91	3.6791	0.5875	
23. 4. 0	6153.43		252.00	2.4014	4778.84	3.6793	0.5863	
23. 5. 0	6156.28	293.4	253.00	2.4031	4781.69	3.6796	0.5850	
23. 6. 0	6159.11		254.00	2.4048	4784.52	3.6798	0.5837	
23. 7. 0	6161.92		255.00	2.4065	4787.33	3.6801	0.5825	
23. 8. 0	6164.90		256.00	2.4082	4790.31	3.6804	0.5812	

TIME HR.MN.SS	PRESS. PSIA	TEMP. DEG.F	DEL.T (MINUTES)	LOG DEL.T	DEL.P PSIA	LOG DEL.P	LOG $\frac{T+DEL.T}{DEL.T}$	REMARKS
23. 9. 0	6167.60		257.00	2.4099	4793.01	3.6806	0.5800	
23.10. 0	6170.60		258.00	2.4116	4796.01	3.6809	0.5787	53
23.11. 0	6173.35		259.00	2.4133	4798.76	3.6811	0.5775	
23.12. 0	6176.09		260.00	2.4150	4801.50	3.6814	0.5763	
23.13. 0	6178.84		261.00	2.4166	4804.25	3.6816	0.5750	
23.14. 0	6181.59		262.00	2.4183	4807.00	3.6819	0.5738	
23.15. 0	6184.34		263.00	2.4200	4809.75	3.6821	0.5726	
23.16. 0	6187.08		264.00	2.4216	4812.49	3.6824	0.5714	
23.17. 0	6189.88		265.00	2.4232	4815.29	3.6826	0.5702	
23.18. 0	6192.62		266.00	2.4249	4818.03	3.6829	0.5690	
23.19. 0	6195.32		267.00	2.4265	4820.73	3.6831	0.5678	
23.20. 0	6198.05	293.5	268.00	2.4281	4823.46	3.6834	0.5666	
23.21. 0	6200.63		269.00	2.4298	4826.04	3.6836	0.5654	
23.22. 0	6203.30		270.00	2.4314	4828.71	3.6838	0.5643	
23.23. 0	6205.97		271.00	2.4330	4831.38	3.6841	0.5631	
23.24. 0	6208.59		272.00	2.4346	4834.00	3.6843	0.5619	
23.25. 0	6211.29	293.7	273.00	2.4362	4836.70	3.6845	0.5608	
23.26. 0	6213.76		274.00	2.4378	4839.17	3.6848	0.5596	
23.27. 0	6216.47		275.00	2.4393	4841.88	3.6850	0.5585	
23.28. 0	6219.00		276.00	2.4409	4844.41	3.6852	0.5574	
23.29. 0	6221.64		277.00	2.4425	4847.05	3.6855	0.5562	
23.30. 0	6224.18	293.7	278.00	2.4440	4849.59	3.6857	0.5551	
23.31. 0	6226.69		279.00	2.4456	4852.10	3.6859	0.5540	
23.32. 0	6229.27		280.00	2.4472	4854.68	3.6862	0.5528	
23.33. 0	6231.69		281.00	2.4487	4857.10	3.6864	0.5517	
23.34. 0	6234.32		282.00	2.4502	4859.73	3.6866	0.5506	
23.35. 0	6236.81	293.7	283.00	2.4518	4862.22	3.6868	0.5495	
23.36. 0	6239.19		284.00	2.4533	4864.60	3.6870	0.5484	
23.37. 0	6241.77		285.00	2.4548	4867.18	3.6873	0.5473	
23.38. 0	6244.29		286.00	2.4564	4869.70	3.6875	0.5462	
23.39. 0	6246.60		287.00	2.4579	4872.01	3.6877	0.5451	
23.40. 0	6249.30	293.9	288.00	2.4594	4874.71	3.6879	0.5441	
23.41. 0	6251.57		289.00	2.4609	4876.98	3.6882	0.5430	
23.42. 0	6253.97		290.00	2.4624	4879.38	3.6884	0.5419	
23.43. 0	6256.50		291.00	2.4639	4881.91	3.6886	0.5409	
23.44. 0	6258.89		292.00	2.4654	4884.30	3.6888	0.5398	
23.45. 0	6261.29	293.9	293.00	2.4669	4886.70	3.6890	0.5387	
23.46. 0	6263.57		294.00	2.4683	4888.98	3.6892	0.5377	
23.47. 0	6265.96		295.00	2.4698	4891.37	3.6894	0.5366	
23.48. 0	6268.30		296.00	2.4713	4893.71	3.6896	0.5356	
23.49. 0	6270.49		297.00	2.4728	4895.90	3.6898	0.5346	
23.50. 0	6273.05		298.00	2.4742	4898.46	3.6901	0.5335	

TIME HR.MN.SS	PRESS. PSIA	TEMP. DEG.F	DEL.T (MINUTES)	LOG DEL.T	DEL.P PSIA	LOG DEL.P	LOG $\frac{T+DEL.T}{DEL.T}$	REMARKS
23.51. 0	6275.40		299.00	2.4757	4900.81	3.6903	0.5325	
23.52. 0	6277.66	294.1	300.00	2.4771	4903.07	3.6905	0.5315	
23.53. 0	6279.92		301.00	2.4786	4905.33	3.6907	0.5305	
23.54. 0	6282.28		302.00	2.4800	4907.69	3.6909	0.5294	
23.55. 0	6284.48		303.00	2.4814	4909.89	3.6911	0.5284	
23.56. 0	6286.87	294.1	304.00	2.4829	4912.28	3.6913	0.5274	54
23.57. 0	6288.98		305.00	2.4843	4914.39	3.6915	0.5264	
23.58. 0	6291.30		306.00	2.4857	4916.71	3.6917	0.5254	
23.59. 0	6293.62		307.00	2.4871	4919.03	3.6919	0.5244	
24. 0. 0	6296.60		308.00	2.4886	4922.01	3.6921	0.5234	
0. 1. 0	6298.28		309.00	2.4900	4923.69	3.6923	0.5225	- Date 11th May 1983
0. 2. 0	6300.41		310.00	2.4914	4925.82	3.6925	0.5215	
0. 3. 0	6302.65		311.00	2.4928	4928.06	3.6927	0.5205	
0. 4. 0	6305.23		312.00	2.4942	4930.64	3.6929	0.5195	
0. 5. 0	6313.08		313.00	2.4955	4938.49	3.6936	0.5186	End of final shut-in

END OF SURVEY

APPENDIX C

FLOPETROL WATER ANALYSIS REPORT

WATER ANALYSIS REPORT

CLIENT: PHILLIPS AUSTRALIA OIL CO.

SAMP. DATE: 05-10-11/06/83 WELL: HERMES #1

REPORT: 21/AL/83 DATE: JUNE 1983

ADELAIDE LABORATORY

FLOPETROL JOHNSTON
Schlumberger

FLOPETROL INTERNATIONAL S.A.

3 Charles Street,
Allenby Gardens,
South Australia. 5009

WATER ANALYSIS

COMPANY: PHILLIPS AUSTRALIA OIL CO. FILE: 1

WELL NAME: HERMES #1 SAMPLE NO:

FORMATION: TOP SAMPLE DEPTH: REVERSE CIRCULATION SAMPLE FROM: DST No.2

LOCATION: - FIELD: - STATE: WEST AUSTRALIA

DATE SAMPLED: 11.05.83 DATE ANALYSED: - ANALYST: -

SAMPLING SOURCE POINT: N/A

17715 mg/L Calculated

TOTAL DISSOLVED SOLIDS: 20000 mg/L Residue Evap at 180°C SPECIFIC GRAVITY: 1.015 @ 62 °F

RESISTIVITY: 0.520 ohm-meters @ 77 °F HYDROGEN SULFIDE(H2S): 0.10 mg/L

pH 8.7 @ 77 °F

*Constituents	meq/L	mg/L	Constituents	meq/L	mg/L
Sodium (NA)	280.3	6450	Chloride (CL)	227.0	8051
Calcium (CA)	8.2	165	Bicarbonate (HCO3)	47.5	2897
Magnesium (Mg)	3.5	42	Sulfate (SO4)	14.8	710
Iron (Fe)	-	90	Carbonate (CO3)	9.1	273
Barium (BA)	-	39	Hydroxide (OH)	0.0	0.0
Potassium (K)	15.2	595.0	Nitrate (NO3)	0.1	Less than 4
			Silica (SiO3)	-	395

Total Hardness: 585 mg/L
as CACO3
Carbonate Hardness as CACO3 : 585 mg/L
Non-Carbonate Hardness as CACO3: Less than 1 mg/L
Total Alkalinity as CACO3 : 2830 mg/L
Conductivity (E.C.) : 19276 micro-s/cm at 77°F

Report: 21/AL/83

* Analysis except iron determination performed on a filtered sample.

FLOPETROL JOHNSTON
Schlumberger

FLOPETROL INTERNATIONAL S.A.

3 Charles Street,
Allenby Gardens,
South Australia. 5009

WATER ANALYSIS

COMPANY: PHILLIPS AUSTRALIA OIL CO — FILE: 2

WELL NAME: HERMES #1 — SAMPLE NO: 3

FORMATION: - — DEPTH: TOP CIRCULATION SAMPLE — SAMPLE FROM: DST No.1

LOCATION: - — FIELD: - — STATE: WEST AUSTRALIA

DATE SAMPLED: 05.05.83 — DATE ANALYSED: - — ANALYST: -

SAMPLING SOURCE POINT: N/A

6096 mg/L Calculated

TOTAL DISSOLVED SOLIDS: 7000 mg/L Residue Evap at 180°C — SPECIFIC GRAVITY: 1.005 @ 62 °F

RESISTIVITY: 1.32 ohm-meters @ 77 °F — HYDROGEN SULFIDE(H2S): Less than 0.05 mg/L

pH 8.3 @ 77 °F

*Constituents	meq/L	mg/L	Constituents	meq/L	mg/L
Sodium (NA)	100.0	2300	Chloride (CL)	57.5	2038
Calcium (CA)	3.1	62.0	Bicarbonate (HCO3)	40.7	2485
Magnesium (Mg)	1.3	16.0	Sulfate (SO4)	7.2	345
Iron (Fe)	-	175	Carbonate (CO3)	0.0	0.0
Barium (BA)	-	16	Hydroxide (OH)	0.0	0.0
Potassium (K)	2.8	109.0	Nitrate (NO3)	0.1	Less than 4
			Silica (SiO2)	-	145

Total Hardness: 221 mg/L as CACO3
Carbonate Hardness as CACO3 : 221 mg/L
Non-Carbonate Hardness as CACO3: Less than 1 mg/L
Total Alkalinity as CACO3 : 2037 mg/L
Conductivity (E.C.) : 7452 micro-s/cm at 77°F

Report: 21/AL/83

* Analysis except iron determination performed on a filtered sample.

FLOPETROL JOHNSTON
Schlumberger

FLOPETROL INTERNATIONAL S.A.

3 Charles Street,
Allenby Gardens,
South Australia. 5009

WATER ANALYSIS

COMPANY: PHILLIPS AUSTRALIA OIL CO. FILE: 3

WELL NAME: HERMES #1 SAMPLE NO: 5

FORMATION: BOTTOM SAMPLE DEPTH: CIRCULATION SAMPLE SAMPLE FROM: DST No.2

LOCATION: - FIELD: - STATE: WEST AUSTRALIA

DATE SAMPLED: 10.05.83
13 hrs 35 DATE ANALYSED: - ANALYST: -

SAMPLING SOURCE POINT: N/A

19095 mg/L Calculated

TOTAL DISSOLVED SOLIDS: 25000 mg/L Residue Evap at 180°C SPECIFIC GRAVITY: 1.020 @ 62 °F

RESISTIVITY: 0.505 ohm-meters @ 77 °F HYDROGEN SULFIDE(H2S): 0.10 mg/L

pH 8.4 @ 77 °F

*Constituents	meq/L	mg/L	Constituents	meq/L	mg/L
Sodium (NA)	304.5	7000	Chloride (CL)	243.9	8648
Calcium (CA)	6.7	135	Bicarbonate (HCO3)	36.9	2252
Magnesium (Mg)	4.1	50	Sulfate (SO4)	33.3	1600
Iron (Fe)	-	120	Carbonate (CO3)	3.0	90
Barium (BA)	-	42	Hydroxide (OH)	0.0	0.0
Potassium (K)	11.8	460	Nitrate (NO3)	0.1	Less than 4
			Silca (SiO2)	-	450

Total Hardness: 543 mg/L
as CACO3
Carbonate Hardness as CACO3 : 543 mg/L
Non-Carbonate Hardness as CACO3: Less than 1 mg/L
Total Alkalinity as CACO3 : 1996 mg/L
Conductivity (E.C.) : 19804 micro-s/cm at 77°F

Report: 21/AL/83

* Analysis except iron determination performed on a filtered sample.

FLOPETROL JOHNSTON
Schlumberger

FLOPETROL INTERNATIONAL S.A.

3 Charles Street,
Allenby Gardens,
South Australia. 5009

WATER ANALYSIS

COMPANY: PHILLIPS AUSTRALIA OIL CO. FILE: 4

WELL NAME: HERMES #1 SAMPLE NO: 2

FORMATION: BOTTOM HOLE DEPTH: CIRCULATION SAMPLE SAMPLE FROM: DST No. 1

LOCATION: - FIELD: - STATE: WEST AUSTRALIA

DATE SAMPLED: 05.06.83 DATE ANALYSED: - ANALYST: -

SAMPLING SOURCE POINT: N/A

7350 mg/L Calculated

TOTAL DISSOLVED SOLIDS: 8900 mg/L Residue Evap at 180°C SPECIFIC GRAVITY: 1.010 @ 62 °F

RESISTIVITY: 1.07 ohm-meters @ 77 °F HYDROGEN SULFIDE(H2S): 0.05 mg/L

pH 8.7 @ 77 °F

*Constituents	meq/L	mg/L	Constituents	meq/L	mg/L
Sodium (NA)	113.1	2600	Chloride (CL)	70.1	2486
Calcium (CA)	6.5	130	Bicarbonate (HCO3)	43.9	2681
Magnesium (Mg)	2.5	30	Sulfate (SO4)	9.5	455
Iron (Fe)	-	210	Carbonate (CO3)	7.0	210
Barium (BA)	-	55	Hydroxide (OH)	0.0	0.0
Potassium (K)	3.0	118	Nitrate (NO3)	0.1	Less than 4
			Silica (SiO2)		

Total Hardness: 448 mg/L
as CACO3
Carbonate Hardness as CACO3 : 448 mg/L
Non-Carbonate Hardness as CACO3: Less than 1 mg/L
Total Alkalinity as CACO3 : 2547 mg/L
Conductivity (E.C.) : 9363 micro-s/cm at 77°F

Report: 21/AL/83

* Analysis except iron determination performed on a filtered sample.

APPENDIX D

FLOPETROL GAS ANALYSIS REPORT

FLOPETROL JOHNSTON
Schlumberger

P.V.T.STUDY REPORT

Client:PHILLIPS AUSTRALIAN OIL CO
Field :HERMES Well : HERMES#1
Zone :4382-4403M Samp. date:10/05/1983

Report #:16/AL/83 Date: MAY,1983

ADELAIDE LABORATORY

FLOPETROL JOHNSTON Schlumberger

COMPANY : PHILLIPS AUSTRALIAN OIL CO

WELL : HERMES#1

INDEX

FLOPETROL JOHNSTON Schlumberger

COMPANY : PHILLIPS AUSTRALIAN OIL CO

WELL : HERMES#1

TABLE 1

SAMPLING CONDITIONS

I. RESERVOIR AND WELL CHARACTERISTICS

Producing zone	:	4382-4403M
Static pressure	:	7344 psia at 4358.6 M
Bottom hole temperature	:	298 F at 4358.6 M
Tubing diameter	:	3 1/2" DP
Casing size	:	7"
Casing shoe	:	4541.1 M

II. SAMPLING CONDITIONS

A) SURFACE SAMPLE(S)

Date	:	10/05/1983
Choke	:	1 9/16" since 07hrs23
Flowing bottom hole pressure	:	713 psia at 4358.6 M
Well head pressure	:	13 psig
Separator pressure	:	N/A
Well head temperature	:	16 C
Separator temperature	:	N/A
Gas rate (Separator)	:	N/A
Stock tank temperature	:	N/A
Compressibility factor	:	N/A
Gas gravity	:	N/A
Liquid rate (Separator)	:	N/A
G.L.R.	:	N/A
Sample(s) received	:	gas A12769 Sampling at separator liq.N/A

B) BOTTOM HOLE SAMPLE(S)

Date	:	N/A
Choke	:	N/A
Sample(s) received	:	N/A

FLOPETROL JOHNSTON Schlumberger

COMPANY : PHILLIPS AUSTRALIAN OIL CO

WELL : HERMES#1

TABLE 2

SAMPLING CONDITIONS

I. RESERVOIR AND WELL CHARACTERISTICS

Producing zone	:	4382-4403M
Static pressure	:	7344 psia at 4358.6 M
Bottom hole temperature	:	298 F at 4358.6 M
Tubing diameter	:	3 1/2" DP
Casing size	:	7"
Casing shoe	:	4541.1 M

II. SAMPLING CONDITIONS

A) SURFACE SAMPLE(S)

Date	:	10/05/1983
Choke	:	N/A
Flowing bottom hole pressure	:	N/A
Well head pressure	:	N/A
Separator pressure	:	N/A
Well head temperature	:	N/A
Separator temperature	:	N/A
Gas rate (Separator)	:	N/A
Stock tank temperature	:	N/A
Compressibility factor	:	N/A
Gas gravity	:	N/A
Liquid rate (Separator)	:	N/A
G.L.R.	:	N/A
Sample(s) received	:	gas A5869Sampling point C/M D/STREAM liq.N/A

B) BOTTOM HOLE SAMPLE(S)

Date	:	N/A
Choke	:	N/A
Sample(s) received	:	N/A

FLOPETROL JOHNSTON Schlumberger

COMPANY : PHILLIPS AUSTRALIAN OIL CO

WELL : HERMES #1

TABLE 3

SAMPLING CONDITIONS

I. RESERVOIR AND WELL CHARACTERISTICS

Producing zone	:	4382-4403M
Static pressure	:	7344 psia at 4358.6 M
Bottom hole temperature	:	298 F at 4358.6 M
Tubing diameter	:	3 1/2" DP
Casing size	:	7"
Casing shoe	:	4541.1 M

II. SAMPLING CONDITIONS

A) SURFACE SAMPLE(S)

Date	:	10/05/1983
Choke	:	1/4" Since 17hrs12
Flowing bottom hole pressure	:	1052 psia at 4358.6 M
Well head pressure	:	130 psig
Separator pressure	:	130 psig
Well head temperature	:	16 C
Separator temperature	:	16 C
Gas rate (Separator)	:	N/A
Stock tank temperature	:	N/A
Compressibility factor	:	N/A
Gas gravity	:	N/A
Liquid rate (Separator)	:	N/A
G.L.R.	:	N/A
Sample(s) received	:	gas A12683 Sampling point Separator liq.N/A

B) BOTTOM HOLE SAMPLE(S)

Date	:	N/A
Choke	:	N/A
Sample(s) received	:	N/A

FLOPETROL JOHNSTON
Schlumberger

COMPANY : PHILLIPS AUSTRALIAN OIL CO

WELL : HERMES #1

RECEPTION OF SEPARATOR GASES

	CYLINDER A12769	CYLINDER A5869	CYLINDER A12683
Water content	NIL	180 cm3	NIL

FLOPETROL JOHNSTON Schlumberger

COMPANY : PHILLIPS AUSTRALIAN OIL CO

WELL : HERMES#1

TABLE 4

MOLECULAR COMPOSITION OF FIELD SEPARATOR GAS(ES)

(mole percent)

Components	Cylinder 12769	Cylinder 5869	Cylinder 12683
Nitrogen	0.00	0.15	0.16
Carbon dioxide	6.82	6.59	6.55
Hydrocarbons:			
Methane	79.72	80.78	80.90
Ethane	7.63	7.64	7.61
Propane	3.39	3.21	3.11
I - Butane	0.52	0.44	0.41
N - Butane	0.97	0.77	0.71
I - Pentane	0.29	0.16	0.17
N - Pentane	0.31	0.17	0.17
Hexanes	0.19	0.07	0.10
Heptanes plus	0.16	0.02	0.11
TOTAL	100.00	100.00	100.00
Molecular weight	21.209	20.636	20.663
Gravity (Air=1)	0.732	0.712	0.713
Molecular weight of heptanes plus	103.7	100.2	104.0

The cylinder 5869 has been used for recombination

FLOPETROL JOHNSTON
Schlumberger

COMPANY : PHILLIPS AUSTRALIAN OIL CO

WELL : HERMES#1

VISCOSITY OF SEPARATOR GASES

Pressure (psig)	CYLINDER A12769 cp	CYLINDER A5869 cp	CYLINDER A12683 cp
1000	0.0142	0.0143	0.0143
750	0.0136	0.0137	0.0137
500	0.0131	0.0131	0.0131
320		0.0128	
250	0.0125		0.0125
130			0.0125
100	0.0123		
13	0.0124		

FLOPETROL JOHNSTON
Schlumberger

COMPANY : PHILLIPS AUSTRALIAN OIL CO

WELL : HERMES #1

G.P.M OF SEPARATOR GASES (Gallons per thousand standard cubic

HEAT CONTENT (API research project 44)

	CYLINDER A12769	CYLINDER A5869	CYLINDER A12683
G.P.M			
C3 +	1.774	1.422	1.425
C4 +	0.845	0.542	0.573
C5 +	0.371	0.157	0.216
HEAT CONTENT	1118.78	1091.47	1093.67

FLOPETROL JOHNSTON Schlumberger

COMPANY : PHILLIPS AUSTRALIAN CO

WELL : HERMES#1

TABLE 5

SAMPLING CONDITIONS

I. RESERVOIR AND WELL CHARACTERISTICS

Producing zone	:	4334-4403M
Static pressure	:	7344 psia at 4358.6 M
Bottom hole temperature	:	288 F at 4358.6 M
Tubing diameter	:	3 1/2" DP
Casing size	:	N/A
Casing shoe	:	4541.1 M

II. SAMPLING CONDITIONS

A) SURFACE SAMPLE(S)

Date	:	11/05/83
Choke	:	N/A
Flowing bottom hole pressure	:	N/A
Well head pressure	:	N/A
Separator pressure	:	N/A
Well head temperature	:	N/A
Separator temperature	:	N/A
Gas rate (Separator)	:	N/A
Stock tank temperature	:	N/A
Compressibility factor	:	N/A
Gas gravity	:	N/A
Liquid rate (Separator)	:	N/A
G.L.R.	:	N/A
Sample(s) received	:	gas 20112/113 Sampling poin Halliburton sample liq.chamber M2

B) BOTTOM HOLE SAMPLE(S)

Date	:	N/A
Choke	:	N/A
Sample(s) received	:	N/A

FLOPETROL JOHNSTON
Schlumberger

COMPANY : PHILLIPS AUSTRALIAN CO

WELL : HERMES#1

RECEPTION OF GAS

CYLINDER
20112/113

Water content NIL

FLOPETROL JOHNSTON Schlumberger

COMPANY : PHILLIPS AUSTRALIAN CO

WELL : HERMES#1

TABLE 6

MOLECULAR COMPOSITION OF FIELD SEPARATOR GAS(ES)

(mole percent)

Components	Cylinder 20112/113
Nitrogen	0.03
Carbon dioxide	6.19
Hydrocarbons:	
Methane	81.06
Ethane	7.66
Propane	3.26
I - Butane	0.46
N - Butane	0.83
I - Pentane	0.21
N - Pentane	0.20
Hexanes	0.08
Heptanes plus	0.02
TOTAL	100.00
Molecular weight	20.613
Gravity (Air=1)	0.711
Molecular weight of heptanes plus	100.2

The cylinder 20112/113 has been used for recombination

FLOPETROL JOHNSTON
Schlumberger

COMPANY : PHILLIPS AUSTRALIAN CO

WELL : HERMES#1

VISCOSIYY OF GAS

CYLINDER
20112/113

cp

Pressure (psig)	
1000	0.0142
750	0.0136
500	0.0130
250	0.0124
240	0.0096

FLOPETROL JOHNSTON
Schlumberger

COMPANY : PHILLIPS AUSTRALIAN CO

WELL : HERMES#1

GXPXM OF GAS (Gallons per thousand standard cubic)

HEAT CONTENT (API research project 44)

	CYLINDER 20112/113
G.P.M	
C3 +	1.494
C4 +	0.601
C5 +	0.191
HEAT CONTENT	1102.22

FLOPETROL JOHNSTON Schlumberger

COMPANY : PHILLIPS AUSTRALIAN CO

WELL : HERMES#1

TABLE 7

SAMPLING CONDITIONS

I. RESERVOIR AND WELL CHARACTERISTICS

Producing zone	:	4415-4442 M
Static pressure	:	7536 psig at 14429 feet
Bottom hole temperature	:	275 F at 4400 M
Tubing diameter	:	3 1/2" DP
Casing size	:	7"
Casing shoe	:	4547.1 M

II. SAMPLING CONDITIONS

A) SURFACE SAMPLE(S)

Date	:	04/05/83
Choke	:	1 9/16" Since 00hrs43
Flowing bottom hole pressure	:	N/A
Well head pressure	:	0 psig
Separator pressure	:	N/A
Well head temperature	:	N/A
Separator temperature	:	N/A
Gas rate (Separator)	:	N/A
Stock tank temperature	:	N/A
Compressibility factor	:	N/A
Gas gravity	:	N/A
Liquid rate (Separator)	:	N/A
G.L.R.	:	N/A
Sample(s) received	:	gas A8695 Sampling point C/M DOWN STREAM liq.

B) BOTTOM HOLE SAMPLE(S)

Date	:	N/A
Choke	:	N/A
Sample(s) received	:	N/A

FLOPETROL JOHNSTON Schlumberger

COMPANY : PHILLIPS AUSTRALIAN CO

WELL : HERMES#1

TABLE 8

SAMPLING CONDITIONS

I. RESERVOIR AND WELL CHARACTERISTICS

Producing zone	:	4415-4442 M
Static pressure	:	7536 psig at 14429 feet
Bottom hole temperature	:	275 F at 4400 M
Tubing diameter	:	3 1/2" DP
Casing size	:	7"
Casing shoe	:	4547.1 M

II. SAMPLING CONDITIONS

A) SURFACE SAMPLE(S)

Date	:	04/05/83
Choke	:	N/A
Flowing bottom hole pressure	:	6289 psig at 14429 feet
Well head pressure	:	170 psig
Separator pressure	:	N/A
Well head temperature	:	16 C
Separator temperature	:	N/A
Gas rate (Separator)	:	N/A
Stock tank temperature	:	N/A
Compressibility factor	:	N/A
Gas gravity	:	N/A
Liquid rate (Separator)	:	N/A
G.L.R.	:	N/A
Sample(s) received	:	gas A12870 Sampling point Choke manifold liq.

B) BOTTOM HOLE SAMPLE(S)

Date	:	N/A
Choke	:	N/A
Sample(s) received	:	N/A

FLOPETROL JOHNSTON
Schlumberger

COMPANY : PHILLIPS AUSTRALIAN CO

WELL : HERMES#1

RECEPTION OF SEPARATOR GASES

	CYLINDER A8695	CYLINDER A12870
Water content	NIL	NIL

FLOPETROL JOHNSTON Schlumberger

COMPANY : PHILLIPS AUSTRALIAN CO

WELL : HERMES#1

TABLE 9

MOLECULAR COMPOSITION OF FIELD SEPARATOR GAS(ES)

(mole percent)

Components	Cylinder 8695	Cylinder 12870
Nitrogen	29.17	0.06
Carbon dioxide	5.06	0.00
Hydrocarbons:		
Methane	56.36	86.12
Ethane	5.55	8.38
Propane	2.27	3.72
I - Butane	0.30	0.48
N - Butane	0.64	0.77
I - Pentane	0.20	0.19
N - Pentane	0.23	0.17
Hexanes	0.12	0.08
Heptanes plus	0.10	0.03
TOTAL	100.00	100.00
Molecular weight	23.173	19.080
Gravity (Air=1)	0.800	0.658
Molecular weight of heptanes plus	103.0	104.9

The cylinder 12870 has been used for recombination

FLOPETROL JOHNSTON
Schlumberger

COMPANY : PHILLIPS AUSTRALIAN CO

WELL : HERMES#1

VISCOSITY OF SEPARATOR GASES

	CYLINDER A8695	CYLINDER A12870
	cp	cp
Pressure (psig)		
1000	0.0172	0.0142
750	0.0195	0.0132
500	0.0215	0.0122
250	0.0231	0.0112
170		0.0109
100	0.0251	
0	0.0273	

FLOPETROL JOHNSTON
Schlumberger

COMPANY : PHILLIPS AUSTRALIAN CO

WELL : HERMES#1

G.P.M OF SEPARATOR GASES (Gallons per thousand standard cub

HEAT CONTENT (API research project 44)

	CYLINDER A8695	CYLINDER A12870
G.P.M		
C3 +	1.173	1.595
C4 +	0.550	0.576
C5 +	0.252	0.178
HEAT CONTENT	785.58	1175.13

NOMENCLATURE

P	:	Pressure
V	:	Volume
T	:	Temperature
Pi	:	Initial static pressure
Pb	:	Bubble point pressure
Pd	:	Dew point pressure
Vr=V/V Pb	:	Relative volume (oil reservoir fluid)
Vr=V/V Pd	:	Relative volume (gas reservoir fluid)
$c = -\frac{1}{V} x \frac{dV}{dP}$	:	Compressibility factor of reservoir fluid
$\alpha = \frac{1}{V} x \frac{dV}{dT}$	:	Thermal expansion of reservoir fluid
$Y = \frac{Pb/P-1}{Vr-1}$	:	Dimensionless compressibility function
Bo	:	Oil formation volume factor
Rs	:	Solution gas oil ratio
Z	:	Gas compressibility factor or gas deviation factor
Bg	:	Gas formation volume factor
do	:	Reservoir oil density
Go	:	Residual oil gravity
G	:	Gas gravity (Air=1)
sto	:	Stock tank oil
GOR	:	Gas oil ratio
GLR	:	Gas liquid ratio
WOR	:	Water liquid ratio
Shrinkage factor	:	Oil volume at standard conditions / Oil volume at separator conditions
$Z = \frac{PV}{nRT}$	:	n=Total moles of a mixture in the gas state R=Universal gas constant (per mole)
GPM	:	Gallons per thousand standard cubic feet
Standard conditions	:	For gas volumes =60 F and 14.7 psia
	:	For oil measurements=60 F and atmospheric pressure

Gross heat content is calculated from API research project 44
Molecular weights,densities,critical values are from CRC Handbook of chemistry and physics
Gas viscosity is calculated with equations from Standing (Behavior of oil field hydrocarbon systems)