



CORE LABORATORIES

PETROLEUM DIVISION

28 DEC 1995

***A Reservoir Fluid Study
of Sample
from
Turrum #6
Gippsland Basin***

Prepared for
Esso Australia Ltd.

November 1995

File : AFL 95034

Reservoir Fluid Laboratory
Core Laboratories
Perth
Australia



CORE LABORATORIES

23 November 1995

Esso Australia Ltd.
360 Elizabeth Street,
Melbourne
Victoria 3000

Attention: Mr. Michael Scott

Subject: Reservoir Fluid Study
Well: Turrum #6
Location: Gippsland Basin
File: AFL 95034

Dear Mr. Scott,

One MDT sample taken from the Turrum #6 well was submitted to our Perth laboratory for quality checking and analysis. Presented in the following report are the results of the requested analysis.

Core Laboratories appreciates this opportunity to be of service to Esso Australia Ltd. Should you have any questions regarding this report, or if we may be of any further assistance, please feel free to contact me at your convenience.

Yours Faithfully,
For **CORE LABORATORIES**

Kevin Daken
Laboratory Supervisor

Esso Australia Ltd.
Turrum #6
AFL 95034

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LABORATORY PROCEDURES

Samples

One MDT sample was submitted to our Perth laboratory for sample transferral and analysis. On arrival the opening pressure of the chamber was determined. This was found to be 1810 psig at 15.5 °C. The sample was then pressured to 6000 psig and stabilized for 24 hours prior to transferral to laboratory cylinders. The MDT was then returned to Schlumberger, the results of the transfer are reported on page 1.

Compositional Determination

The hydrocarbon composition of the MDT sample from BB-90 was determined through dodecanes plus using isothermal flash/chromatographic techniques. This result is reported on page 2.

Pressure Volume Relations

A known volume of the reservoir fluid sample was charged to a high pressure visual cell stabilised at 6000 psig and the reported reservoir temperature of 113 °C. On entering the cell at 6000 psig the sample appeared as a yellow fog indicating it was possibly below its dew point. The sample was stabilised for 12 hours and became clear, however the mercury in contact with the sample had a slight wet appearance indicating trace amounts of liquid had settled on it. The sample was then subjected to pressure volume relation measurements. On reducing the pressure a dampness was noticed on the cell walls which gradually got heavier with further pressure reduction. No liquid was measureable until a pressure of 2400 psig was reached.

The pressure volume relations were completed and the sample was re-equilibrated at 7500 psig and 113 °C for 2 days, the sample still appeared to be below the dew point pressure. The compressibility factor of the sample was then measured at 6000 psig and 113 °C, and used along with the pressure volume relations to calculate the compressibility factors down to the reservoir pressure of 3770 psig. This data is presented on page 3 along with the pressure volume relation and liquid measurements.

The sample was then discharged from the high pressure cell, the cell was cleaned and a second sample charged to verify the above observations. This produced results similar to the first (sample was already below dew point at 6000 psig and 113 °C). As the sample was considered not to be representative no further work was performed.

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PRELIMINARY QUALITY CHECKS
PERFORMED ON SAMPLES RECEIVED IN LABORATORY

Sample I.D.	Sampling Depth (m mdrkb)	Opening Conditions		Reservoir Conditions		Approximate Sample Volume (cc)	Water Recovered
		psig	°C	psig	°C		
MRSC BB 90	2621.5	1810	15.5	3770	113	1910*	60

*at 6000 psig and 15.5 °C

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Cylinder # MRSC-BB-90

Component	Mol %	Weight %
Hydrogen Sulfide	0.00	0.00
Carbon Dioxide	22.33	38.65
Nitrogen	0.20	0.22
Methane	68.09	42.95
Ethane	4.57	5.40
Propane	2.15	3.73
Iso-Butane	0.38	0.87
N-Butane	0.58	1.33
Iso-Pentane	0.21	0.60
N-Pentane	0.21	0.60
Hexanes	0.23	0.76
Heptanes	0.30	1.13
Octanes	0.30	1.27
Nonanes	0.19	0.91
Decanes	0.12	0.65
Undecanes	0.06	0.37
Dodecanes Plus	0.08	0.56
Total	100.00	100.00

Properties of Heptanes Plus

°API Gravity at 60 °F 54.9
Density, gm/cc at 60 °F 0.7583
Molecular Weight 117.72

Properties of Dodecanes Plus

°API Gravity at 60 °F 41
Density, gm/cc at 60 °F 0.8197
Molecular Weight 186.75

Average Total Molecular Weight of Sample = 25.42

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PRESSURE-VOLUME RELATIONS

(at 113 °C)

Pressure psig	Relative Volume (A)	Liquid Volume Percent (B)	Deviation Factor Z
6000	0.7272	TSTM	1.023
5500	0.7654	TSTM	0.987
5000	0.8127	TSTM	0.953
4500	0.8736	TSTM	0.922
4300	0.9030	TSTM	0.911
4100	0.9361	TSTM	0.901
3900	0.9734	TSTM	0.891
R»3770	1.0000	TSTM	0.885
3700	1.0155	TSTM	
3600	1.0390	TSTM	
3500	1.0641	TSTM	
3400	1.0911	TSTM	
3300	1.1201	TSTM	
3200	1.1513	TSTM	
3100	1.1850	TSTM	
3000	1.2214	TSTM	
2900	1.2607	TSTM	
2800	1.3034	TSTM	
2700	1.3498	TSTM	
2600	1.4003	TSTM	
2500	1.4554	TSTM	
2400	1.5158	0.01	
2300	1.5821	0.03	
2200	1.6551	0.04	
2000	1.8255	0.05	
1798	2.0399		
1550	2.3856		
1354	2.7539		
1203	3.1231		
1078	3.5095		
959	3.9729		
860	4.4575		
773	4.9864		

TSTM: To small to measure

R : Reservoir Pressure

(A) Relative Volume: V/V_{sat} or volume at indicated pressure per volume at saturation pressure.

(B) Percent of the total volume of gas and liquid at the indicated pressure and 113 °C.