

DEPT. NAT. RES & ENV



PE902884

INTERSTATE OIL LIMITED

I.O.I. WOOLSTHORPE NO.1 WELL

WELL COMPLETION REPORT

October, 1968

I.O.L. WOOLSTHORPE NO.1 WELL

OTWAY BASIN, VICTORIA

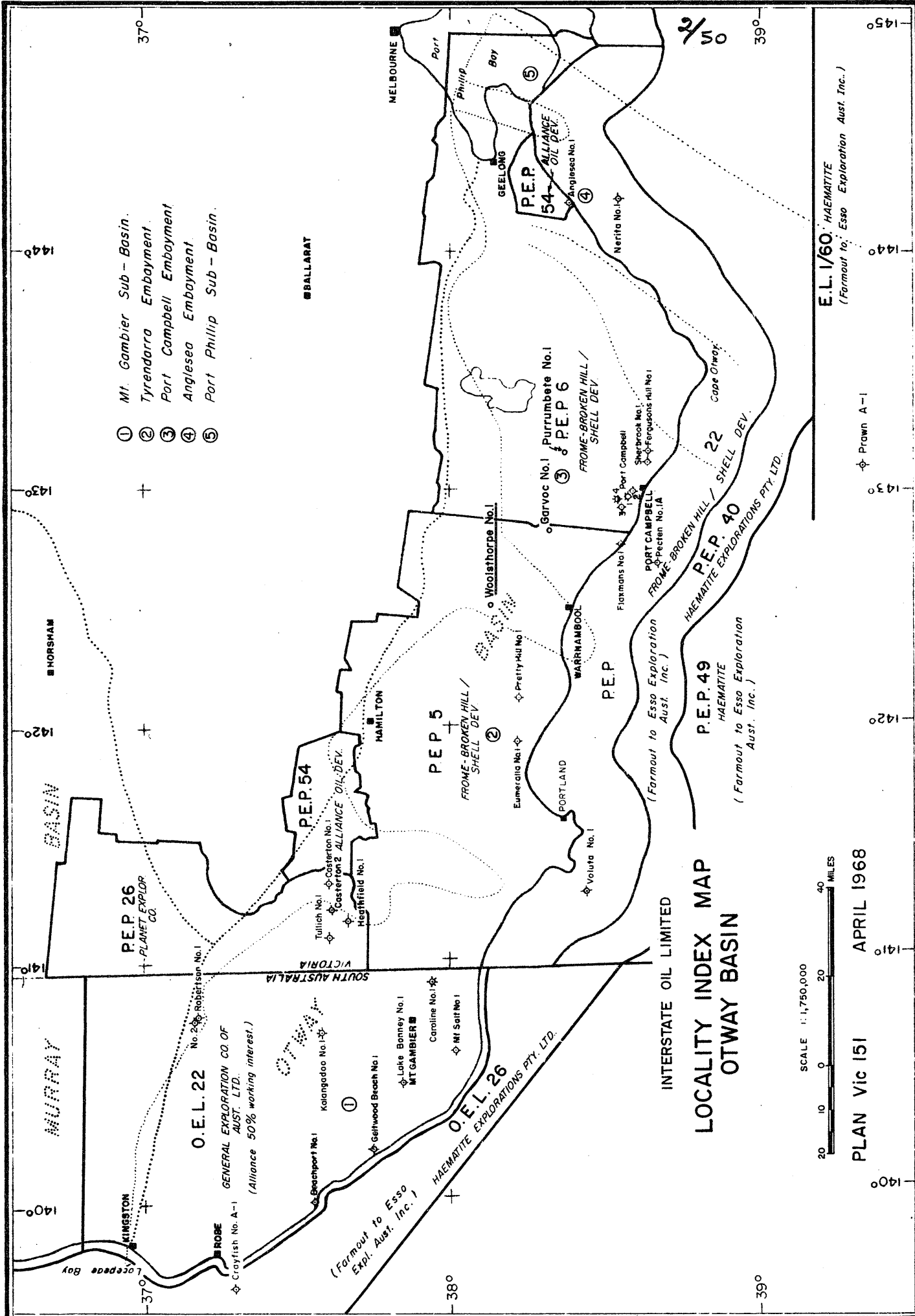
WELL COMPLETION REPORT

by

R.B. Leslie (Interstate Oil Ltd.)

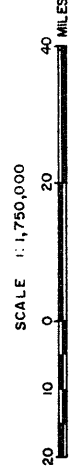
and

B.H. Sell (Mines Administration Pty. Ltd.)



- ① Mt. Gambier Sub - Basin.
- ② Tyrendarra Embayment.
- ③ Port Campbell Embayment.
- ④ Anglesea Embayment.
- ⑤ Port Phillip Sub - Basin.

INTERSTATE OIL LIMITED
LOCALITY INDEX MAP
OTWAY BASIN



PLAN Vic 151 APRIL 1968

E.L. 1/60 HAEMATITE
 (Farmout to Esso Exploration Aust. Inc.)

Drawn A-1

MURRAY BASIN OTWAY BASIN MELBOURNE

PE.P. 26 PLANET EXPLOR. CO.

PE.P. 49 HAEMATITE (Farmout to Esso Exploration Aust. Inc.)

PE.P. 54 ALLIANCE OIL DEV. (Farmout to Esso Exploration Aust. Inc.)

PE.P. 5 FROME-BROKEN HILL / SHELL DEV.

PE.P. 6 PURRUMBETE No. 1 FROME-BROKEN HILL / SHELL DEV.

PE.P. 40 HAEMATITE EXPLORATIONS PTY. LTD.

O.E.L. 22 GENERAL EXPLORATION CO. OF AUST. LTD. (Alliance 50% working interest.)

O.E.L. 26 HAEMATITE EXPLORATIONS PTY. LTD.

WELLS: Lake Bonney No. 1, Mt Gambier, Caroline No. 1, Mt Saff No. 1, Kalangadoo No. 1, Geitwood Beech No. 1, Beachport No. 1, Crayfish No. A-1, No. 26, Robertson No. 1, Tullich No. 1, Casterton No. 1, Casterton 2, Heathfield No. 1, Eumeralla No. 1, Pretty Hill No. 1, Woolsthorpe No. 1, Woolsthorpe No. 2, Woolsthorpe No. 3, Woolsthorpe No. 4, Woolsthorpe No. 5, Woolsthorpe No. 6, Woolsthorpe No. 7, Woolsthorpe No. 8, Woolsthorpe No. 9, Woolsthorpe No. 10, Woolsthorpe No. 11, Woolsthorpe No. 12, Woolsthorpe No. 13, Woolsthorpe No. 14, Woolsthorpe No. 15, Woolsthorpe No. 16, Woolsthorpe No. 17, Woolsthorpe No. 18, Woolsthorpe No. 19, Woolsthorpe No. 20, Woolsthorpe No. 21, Woolsthorpe No. 22, Woolsthorpe No. 23, Woolsthorpe No. 24, Woolsthorpe No. 25, Woolsthorpe No. 26, Woolsthorpe No. 27, Woolsthorpe No. 28, Woolsthorpe No. 29, Woolsthorpe No. 30, Woolsthorpe No. 31, Woolsthorpe No. 32, Woolsthorpe No. 33, Woolsthorpe No. 34, Woolsthorpe No. 35, Woolsthorpe No. 36, Woolsthorpe No. 37, Woolsthorpe No. 38, Woolsthorpe No. 39, Woolsthorpe No. 40, Woolsthorpe No. 41, Woolsthorpe No. 42, Woolsthorpe No. 43, Woolsthorpe No. 44, Woolsthorpe No. 45, Woolsthorpe No. 46, Woolsthorpe No. 47, Woolsthorpe No. 48, Woolsthorpe No. 49, Woolsthorpe No. 50.

Other locations: KINGSTON, ROBES, GEELONG, WARRAMBOOL, PORTLAND, VOLUFA No. 1, PORT CAMPBELL, SHEARWATER No. 1, SHEARWATER No. 2, SHEARWATER No. 3, SHEARWATER No. 4, SHEARWATER No. 5, SHEARWATER No. 6, SHEARWATER No. 7, SHEARWATER No. 8, SHEARWATER No. 9, SHEARWATER No. 10, SHEARWATER No. 11, SHEARWATER No. 12, SHEARWATER No. 13, SHEARWATER No. 14, SHEARWATER No. 15, SHEARWATER No. 16, SHEARWATER No. 17, SHEARWATER No. 18, SHEARWATER No. 19, SHEARWATER No. 20, SHEARWATER No. 21, SHEARWATER No. 22, SHEARWATER No. 23, SHEARWATER No. 24, SHEARWATER No. 25, SHEARWATER No. 26, SHEARWATER No. 27, SHEARWATER No. 28, SHEARWATER No. 29, SHEARWATER No. 30, SHEARWATER No. 31, SHEARWATER No. 32, SHEARWATER No. 33, SHEARWATER No. 34, SHEARWATER No. 35, SHEARWATER No. 36, SHEARWATER No. 37, SHEARWATER No. 38, SHEARWATER No. 39, SHEARWATER No. 40, SHEARWATER No. 41, SHEARWATER No. 42, SHEARWATER No. 43, SHEARWATER No. 44, SHEARWATER No. 45, SHEARWATER No. 46, SHEARWATER No. 47, SHEARWATER No. 48, SHEARWATER No. 49, SHEARWATER No. 50.

C O N T E N T S

	<u>Page</u>	
I	SUMMARY	1
	(1) Drilling	1
	(2) Geological	1
II	INTRODUCTION	3
III	WELL HISTORY	4
	(1) General data	4
	(2) Drilling data	4
	(3) Formation Sampling	6
	(4) Logging and Surveys	8
	(5) Testing	8
IV	GEOLOGY	9
	(1) General	9
	(2) Stratigraphic Table	10
	(3) Lithologic Description	11
V	REFERENCES	16
VI	ENCLOSURES	
	(1) Map showing location in relation to Structure Contours.	
	(2) Cross section Pretty Hill No. 1 - Woolsthorpe No.1..	
	(3) Composite Well Log.	
	(4) Copies of Test Charts.	
	(5) Copies of Induction - Electric logs, Sonic Gama-Ray logs, Micro logs and Continuous Dipmeter. } in box	
	(6) Cross section of Port Campbell Embayment (added 11/11/99)	
	(7) Well Velocity Data (added by DNRE 11/11/99)	
	<u>A P P E N D I C E S</u>	
I	Petrological Report	
II	Palaentological Report	
III	Palynological Report	
IV	Water Analysis	
V	Core Descriptions and Analyses	
VI	List of Schlumberger Logs	
VII	Details of Drill Stem Testing	
VII	Seismic Survey (added by DNRE 11/11/99)	

CORE DESCRIPTIONSI.O.L. WOOLSTHORPE NO. 1

by

B.H. Sell and D.A. Short

Mines Administration Pty. Limited.

Equipment : Hughes "J" type 20ft. barrel cutting a $3\frac{3}{8}$ " diameter core.

CORE No. 1

Interval : 4790' - 4799'

Recovery : 8'6" or 94%

4790'-4795'

5 ft. Sandstone: Medium grey, mostly medium grained with minor coarser grained, fairly hard. It is irregularly current bedded at 20°-30°. Grains are mostly clear quartz with minor reddish siliceous, and grey green argillaceous lithic fragments. The matrix is light grey, kaolinitic and abundant. Porosity is low. Grains are sub-angular to well rounded but poorly sorted.

4795'-4798'6"

3'6" Siltstone - shale: siltstone medium grey, quartzose, lithic, argillaceous, micaceous, carbonaceous, grading to shale dark grey, carbonaceous, micaceous, silty in part.

Several slickensided intervals are present, especially in the shaley sections.

Overall dip: Appears to be approximately 50

Signs of oil/gas: Nil

CORE No. 2

Interval : 4860' - 4883'

Recovery : 11'6" or 50%

4860'-4862'

2 ft. Sandstone: Greenish grey to green, fine to medium grained, fairly hard, poorly bedded to massive. It is composed of quartz, greenish lithic fragments, and minor weathered feldspar and mica in an abundant bluish green clay matrix. Porosity and permeability are very poor. Grains are sub angular to rounded, poorly sorted.

4862'-4864'

2 ft. Shale: dark grey to greenish, carbonaceous and micaceous at the top, grading to silty, micaceous at the base of the interval. Much of the interval is slickensided and broken. Probably several feet of core was lost in this section as it came out of the barrel in pieces too small to recover.

4864'-4865'

1 ft. Siltstone: grey green quartzose, lithic, argillaceous, slightly micaceous.

- 2 -

- 4865'-4866' 1 ft. Sandstone: Light greenish grey, fine grained, fairly hard, poorly bedded. It is composed of quartz, lithic fragments and a trace of mica in a whitish clay matrix - tight.
- 4866'-4868' 2 ft. Sandstone: white to greenish fine to medium grained irregularly bedded. There is a shaley parting at 4866'9" and several shale clasts (up to 3"). The sandstone is dominantly quartzose, with minor lithic grains and rare mica in a white clay matrix. Grains are sub-angular to rounded and well sorted in part. Porosity is poor to fair.
- 4868'-4871'6" 3'6" Sandstone: white, medium to coarse grained, soft to very soft and crumbly. Except for a suggestion of current bedding at 4869 ft., the sandstone is poorly bedded to massive. It is composed of quartz (mostly clear) minor lithic fragments and a trace of mica, in a fairly abundant kaolinitic matrix. Grains are sub-angular to rounded, and generally well sorted. Porosity and permeability are fair to very good.

Overall dip: Indeterminable - possibly 5° - 8°

Signs of oil/gas: Patchy to spotty blue white to yellowish fluorescence - about 5% of all the soft sands.

CORE No. 3

Interval : 5708'-5727'
Recovery : 13'6" or 71%

- 5708'-5712' 4 ft. Sandstone: greenish grey, medium to coarse grained extremely soft and friable, massive. It is composed of quartz, minor lithic fragments, rare garnet and mica, in a white clay matrix. Although there is a considerable amount of clay, the porosity and permeability appear very good. Grains are sub-angular to rounded, well sorted.
- 5712'-5714' 2 ft. Sandstone: greenish grey, fine to medium grained, fairly hard. Its composition is similar to the sandstone 5708-5712, but it is more argillaceous and tight.
- 5714'-5721'6" 7 ft. 6 ins. Sandstone as for 5708'-5712'
Most of the 5'6" not recovered was in the barrel but as loose sand.

Overall Dip: Indeterminable

Signs of oil/gas: Trace of blue white to yellow fluorescence

I.O.L. WOOLSTHORPE - 1 WELLSidewall Sample Descriptions

by

Shell Development (Australia) Pty. Ltd.

<u>Depth</u>	<u>Description</u>
4300'	<u>Claystone</u> , light grey, micaceous, feldspathic, silty.
4362'	<u>Quartz Sandstone</u> , porous, white, medium to coarse grained, well sorted, angular to sub-rounded.
4515'	<u>Siltstone</u> , dark grey, micaceous, soft.
4642'	<u>Siltstone</u> , grading to <u>Claystone</u> , medium to dark grey, micaceous, soft.
4750'	<u>Claystone</u> , dark grey, slightly micaceous, firm, massive.
4841'	<u>Quartz Sandstone</u> , slightly porous, white, locally abundant white clay cement, fine to coarse grained, locally pebbly, angular to subrounded, soft, very friable, lithic.
4932'	<u>Sub-lithic Sandstone</u> , dense, white to light grey, well sorted, fine grained, quartzose, feldspathic, trace of green lithics, clay matrix.
4970'	<u>Quartz Sandstone</u> , light grey-white, dense, fine to medium grained, well sorted, angular to sub-rounded, red and grey lithics, feldspathic, white clay cement.
5005'	<u>Siltstone</u> , banded light and dark grey, sandy, micaceous, carbonaceous
5040'	<u>Quartz Sandstone</u> , slightly porous to dense, locally porous, white, medium grained, well sorted, sub-angular to rounded, feldspathic, lithic, trace garnet, locally white clay cement, very friable, abundant rose quartz.
5178'	<u>Claystone</u> , silty, dark grey, massive.
5275'	<u>Siltstone</u> , banded light to dark grey, carbonaceous, grades into very fine grained <u>sandstone</u> , silty.
5380'	<u>Quartz Sandstone</u> , slightly porous to dense, white, fine to medium grained, well sorted, angular to sub-rounded, lithic, feldspathic, white clay cement, green to dark grey lithics, rose quartz, locally very porous and very friable.
5495'	<u>Quartz Sandstone</u> , dense to slightly porous, white, fine to medium grained, well sorted, abundant white clay cement, rose quartz, very friable, local yellow staining of quartz.
5900'	<u>Quartz Sandstone</u> , dense to slightly porous, white, medium grained, very well sorted, feldspathic, rose quartz and garnet, local white clay cement, few dark lithic grains, locally grades into coarse grained, well sorted, very porous.
6090'	<u>Claystone</u> , silty, dark brown, massive.
6130'	<u>Siltstone</u> , dark grey, slightly carbonaceous, with white to light grey, very fine grained <u>sandstone</u> layers, silty, grades into very silty sandstone, dark grey.

<u>Depth</u>	<u>Description</u>
6230'	<u>Siltstone</u> , dark grey, micaceous, massive.
6260'	<u>Siltstone</u> , as for 6230'
6380'	<u>Claystone</u> , dark grey to black, fissile, probably faulted.
6398'	<u>Volcanic</u> , light grey - green, light grey matrix with light to dark grey crystalline phenocrysts 1 to 3 m.m. across.
6400'	<u>Volcanic</u> , weathered crystalline groundmass with dark green phenocrysts.
6418'	<u>Volcanic</u>
6428'	<u>Volcanic</u> , possibly serpentinitised along shears in core, porphyritic, intermediate to basic volcanic.

CORE LABORATORIES AUSTRALIA LTD.

Petroleum Reservoir Engineering
BRISBANE, AUSTRALIA

40/50

Company Mines Administration Pty. Ltd. Formation _____ Page 1 of 1
Well Interstate Woolsthorpe No. 1 Cores _____ File AP-1-168
Field _____ Drilling Fluid _____ Date Report 7 JUNE 1968
Country Victoria State Australia Elevation _____ Analysts NF
Location _____ Remarks _____

CORE ANALYSIS RESULTS

(Figures in parentheses refer to footnote remarks)

SAMPLE NUMBER	DEPTH FEET	PERMEABILITY MILLIDARCYS		POROSITY PERCENT	RESIDUAL SATURATION		PROBABLE PRODUCTION	REMARKS
		HORIZONTAL	VERTICAL		OIL % VOLUME	TOTAL WATER % PORE		
1	4868	54	-	22.3	* 0.0	79.8	WATER	Sandstone, Wh, Med grn, Argil.
2	4871	9784	-	22.3	* 0.0	82.1	WATER	Sandstone, Wh, Cse grn, Argil.

* NOTE: Distinct Blue-white fluorescence appeared in spots and patches throughout both samples. Test showed the presence of live-oil, however the quantity was too small to be measured.

NOTE:

- (*) REFER TO ATTACHED LETTER.
(1) INCOMPLETE CORE RECOVERY—INTERPRETATION RESERVED.

(2) OFF LOCATION ANALYSES—NO INTERPRETATION OF RESULTS

These analyses, opinions or interpretations are based on observations and materials supplied by the client to whom, and for whose exclusive and confidential use, this report is made. The interpretations or opinions expressed represent the best judgment of Core Laboratories, Inc. (all errors and omissions excepted); but Core Laboratories, Inc., and its officers and employees, assume no responsibility and make no warranty or representations, as to the productivity, proper operation, or profitability of any oil, gas or other mineral well or sand in connection with which such report is used or relied upon.

CORE ANALYSIS RESULTS

NOTE: (i) Unless otherwise stated, porosities and permeabilities were determined on two plugs (V&H) cut vertically and horizontally to the axis of the core. (ii) Oil and water saturations were determined using Ruska porosimeter and permeameter were used with air and dry nitrogen as the saturating and flowing media respectively. (iii) Oil and water saturations were determined using Soxhlet type apparatus. (iii) Acetone test precipitates are recorded as Neg., Trace, Fair, Strong or Very Strong.

WELL NAME AND NO. WOOLSTHORPE No. 1

DATE ANALYSIS COMPLETED 21st June, 1968.

Core No.	Sample Depth		Lithology	Average Effective Porosity two plugs (% Bulk Vol.)	Absolute Permeability (Millidarcy)		Average Density (gm/cc.)		Fluid Saturation (% pore space)		Core Water Salinity (p.p.m. NaCl)	Acetone Test	Fluorescence of freshly broken core
	From	To			V	H	Dry Bulk	Apparent Grain	Water	Oil			
1A	4792' 1"	4792' 5"	sandstone	11	13	1.4	2.47	2.76	44	NIL	N.D.	Neg.	NIL
1B	4794'	4794' 4"	"	12	NIL	NIL	2.42	2.73	68	NIL	N.D.	Neg.	NIL
1C	4796' 1"	4796' 5"	siltstone & sandstone	13	N.D.	NIL	2.52	2.90	61	NIL	N.D.	Neg.	NIL
1D	4798' 2"	4798' 6"	shale & sandstone	13	NIL	3	2.53	2.89	58	NIL	N.D.	Neg.	NIL
2A	4861' 11"	4862' 3"	siltstone & sandstone	12	NIL	NIL	2.41	2.41	93	NIL	N.D.	Neg.	NIL
2B	4863' 9"	4864'	"	13	N.D.	N.D.	2.42	2.78	84	NIL	N.D.	Neg.	NIL
2C	4865' 11"	4866' 3"	sandstone	17	NIL	2	2.23	2.69	88	NIL	N.D.	Neg.	speckled whitish-blue
2D	4867' 10"	4868' 1"	"	21	N.D.	21	2.12	2.68	73	NIL	N.D.	Neg.	whitish-blue

Remarks: - Core samples were received in a sealed condition.

General File No. 62/399
Well File No. 62/2019

APPENDIX V(d)

41/50

CORE ANALYSIS RESULTS

NOTE: (i) Unless otherwise stated, porosities and permeabilities were determined on two plugs (V&H) cut vertically and horizontally to the axis of the core. Ruska porosimeter and permeameter were used with air and dry nitrogen as the saturating and flowing media respectively. (ii) Oil and water saturations were determined using Soxhlet type apparatus. (iii) Acetone test precipitates are recorded as Neg., Trace, Fair, Strong or Very Strong.

WELL NAME AND NO. WOOLSTHORPE No. 1

DATE ANALYSIS COMPLETED 21st June, 1968.

Core No.	Sample Depth		Lithology	Average Effective Porosity two plugs (% Bulk Vol.)	Absolute Permeability (Millidarcy)		Average Density (gm/cc.)		Fluid Saturation (% pore space)		Core Water Salinity (p.p.m. NaCl)	Acetone Test	Fluorescence of freshly broken core
	From	To			V	H	Dry Bulk	Apparent Grain	Water	Oil			
2E	4870'	4870'4"	sandstone	21	N.D.	N.D.	2.07	2.63	100	NIL	N.D.	Neg.	speckled whitish-blue

Remarks: -

General File No. 62/399
Well File No. 68/2019

CORE ANALYSIS RESULTS

NOTE: (i) Unless otherwise stated, porosities and permeabilities were determined on two plugs (V&H) cut vertically and horizontally to the axis of the core. (ii) Oil and water saturations were determined using Ruska porosimeter and permeameter were used with air and dry nitrogen as the saturating and flowing media respectively. (iii) Acetone test precipitates are recorded as Neg., Trace, Fair, Strong or Very Strong.

WELL NAME AND NO. WOOLSTHORPE No. 1

DATE ANALYSIS COMPLETED 28th June 1968.

Core No.	Sample Depth		Lithology	Average Effective Porosity two plugs (% Bulk Vol.)	Absolute Permeability (Millidarcy)		Average Density (gm/cc.)		Fluid Saturation (% pore space)		Core Water Salinity (p.p.m. NaCl)	Acetone Test	Fluorescence of freshly broken core
	From	To			V	H	Dry Bulk	Apparent Grain	Water	Oil			
3A	5710'	5710'4"	Sandstone	28	N.D.	N.D.	1.90	2.63	88	NIL	N.D.	Neg.	NIL
3B	5712'3"	5712'7"	"	21	3	N.D.	2.13	2.69	69	NIL	N.D.	Neg.	NIL
3C	5714'	5714'4"	"	21	N.D.	32	2.12	2.69	98	NIL	N.D.	Neg.	NIL
3D	5716'1"	5716'4"	"	25	N.D.	184	1.98	2.64	79	NIL	N.D.	Neg.	NIL
3E	5718'	5718'4"	"	21	N.D.	54	2.14	2.71	94	NIL	N.D.	Neg.	NIL
3F	5721'1"	5721'4"	"	25	N.D.	N.D.	1.97	2.62	93	NIL	N.D.	Neg.	NIL

Remarks: - Core samples were received in a sealed condition.

General File No. 62/399

Well File No. 68/2019

CORE ANALYSIS RESULTS

NOTE: (i) Unless otherwise stated, porosities and permeabilities were determined on two plugs (V&H) cut vertically and horizontally to the axis of the core. Ruska porosimeter and permeameter were used with air and dry nitrogen as the saturating and flowing media respectively. (ii) Oil and water saturations were determined using Soxhlet type apparatus. (iii) Acetone test precipitates are recorded as Neg., Trace, Fair, Strong or Very Strong.

WELL NAME AND NO. WOOLSTHORPE No. 1

DATE ANALYSIS COMPLETED 27th August, 1968.

Core No.	Sample Depth		Lithology	Average Effective Porosity two plugs (% Bulk Vol.)	Absolute Permeability (Millidarcy)		Average Density (gm/cc.)		Fluid Saturation (% pore space)		Core Water Salinity (p.p.m. NaCl)	Acetone Test	Fluorescence of freshly broken core
	From	To			V	H	Dry Bulk	Apparent Grain	Water	Oil			
3A	5710'	5710'4"	sandstone, medium-grained		3701	3405							
3B	5712'3"	5712'7"	sandstone, very fine-grained		4	204							
3C	5714'	5714'4"	sandstone, fine-grained		4	294							
3D	5716'1"	5716'4"	"		698	1353							
3E	5718'	5718'4"	sandstone, very fine-grained		46	37							
3F	5721'1"	5721'4"	sandstone, medium-grained		104	4909							

Remarks: - All samples mounted in wax.

General File No. 62/399

Well File No. 62/2019