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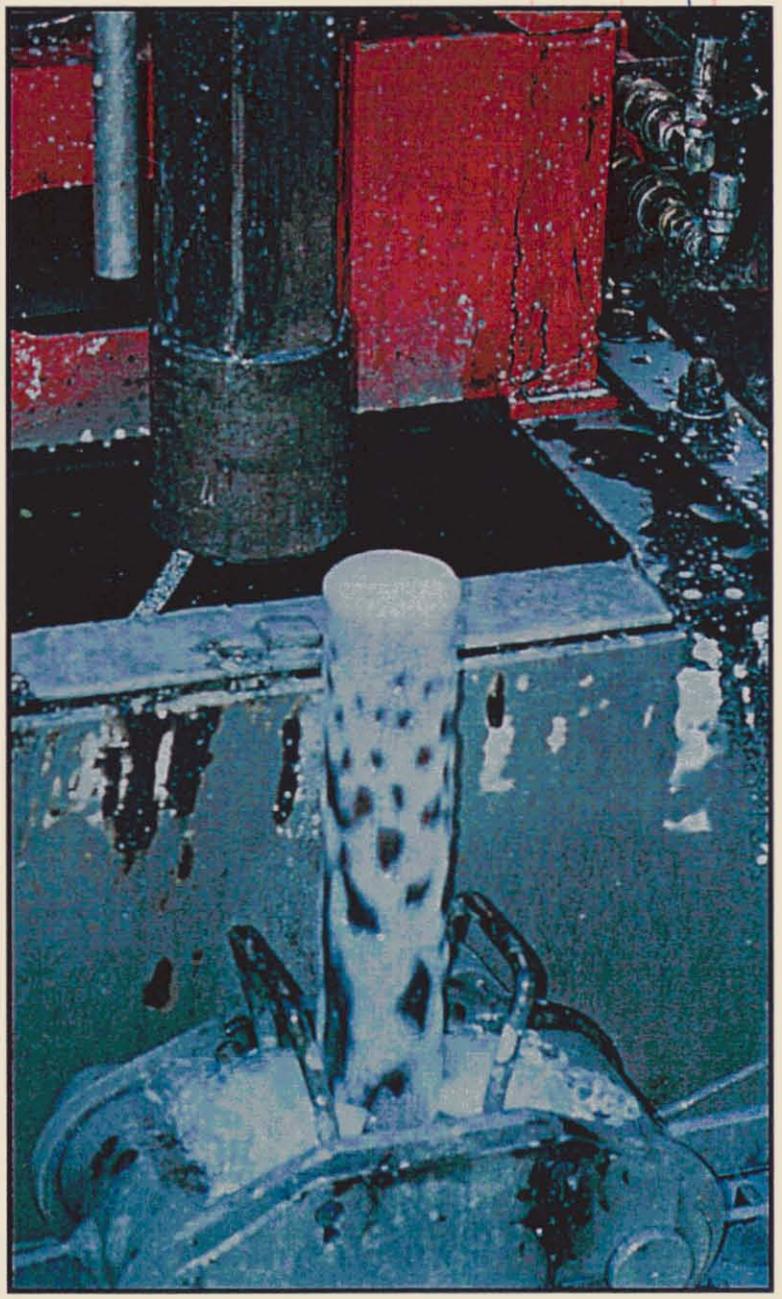
GREAT SOUTH LAND MINERALS PTY LTD.

ACN 068 650 386

Report on Drilling Operations June 1997

By Dr. Clive Burrett

MINERAL RESOURCES	
FILE NO.	
24 JUL 1997	
OFFICE	
EL188 PT 10	
See folio 9	
EL9/95	
See folio 39	



97-4028

REPORT ON DRILLING OPERATIONS
GR SOUTHLAND MIN. - JUNE 1997
C. BURRETT - EL'S 1/88 AND 9/95

GREAT SOUTHLAND MINERALS PTY LTD

ACN 068 650 386

RESULTS OF DRILLING OPERATIONS

on the

TASMANIAN BASIN

1996 - 1997

WELL SITES

Bruny Island

Shittim

Gilgal

Jericho

Lonnavale

Hunterstone

Sorell

Clifton

Great South Land Minerals P/L Pty Ltd

Great South Land Minerals was formed in 1995 to take over the leases and interests of Condor Oil Investments Pty Ltd. In doing so it accelerated the drilling program by financing the drilling of two further exploration holes and the collection and synthesis of a large amount of geological data.

The company has since taken out two more exploration leases and currently holds the three exploration licences in Tasmania (EL 1/88, EL 9/95 and EL 21/95).

The above areas are considered to have economic potential for oil and gas and they cover over 70% of the accessible part of the Tasmanian Basin.

Mr Robert Young a world authority on oil and gas exploration based in Texas, has recently compiled a report for the company.

In his report, dated March 1996, he concluded that:

- "all of this builds a good case for finding commercial oil and gas in the Basin..."
- "work to date has certainly established a play for oil and gas" and
- "a core hole program to evaluate the Basin and explore for hydrocarbons can be designed. The economic factors for the area are very attractive and would sustain the costs of such a program".

The Corporate Directory of Great South Land Minerals P/L

Directors

Dr Gordon Wise	Chairman
Mr David Tanner	Director and Exploration Manager
Mr Malcolm Bendall	Director Special Projects
Mr David Bendall	Director and Company Secretary
Dr Clive Burrett	Director and Chief Geologist
Mr David Wise	Director

Address

3rd Floor MLC Building, 65 Murray Street, Hobart, Tasmania, Australia 7000

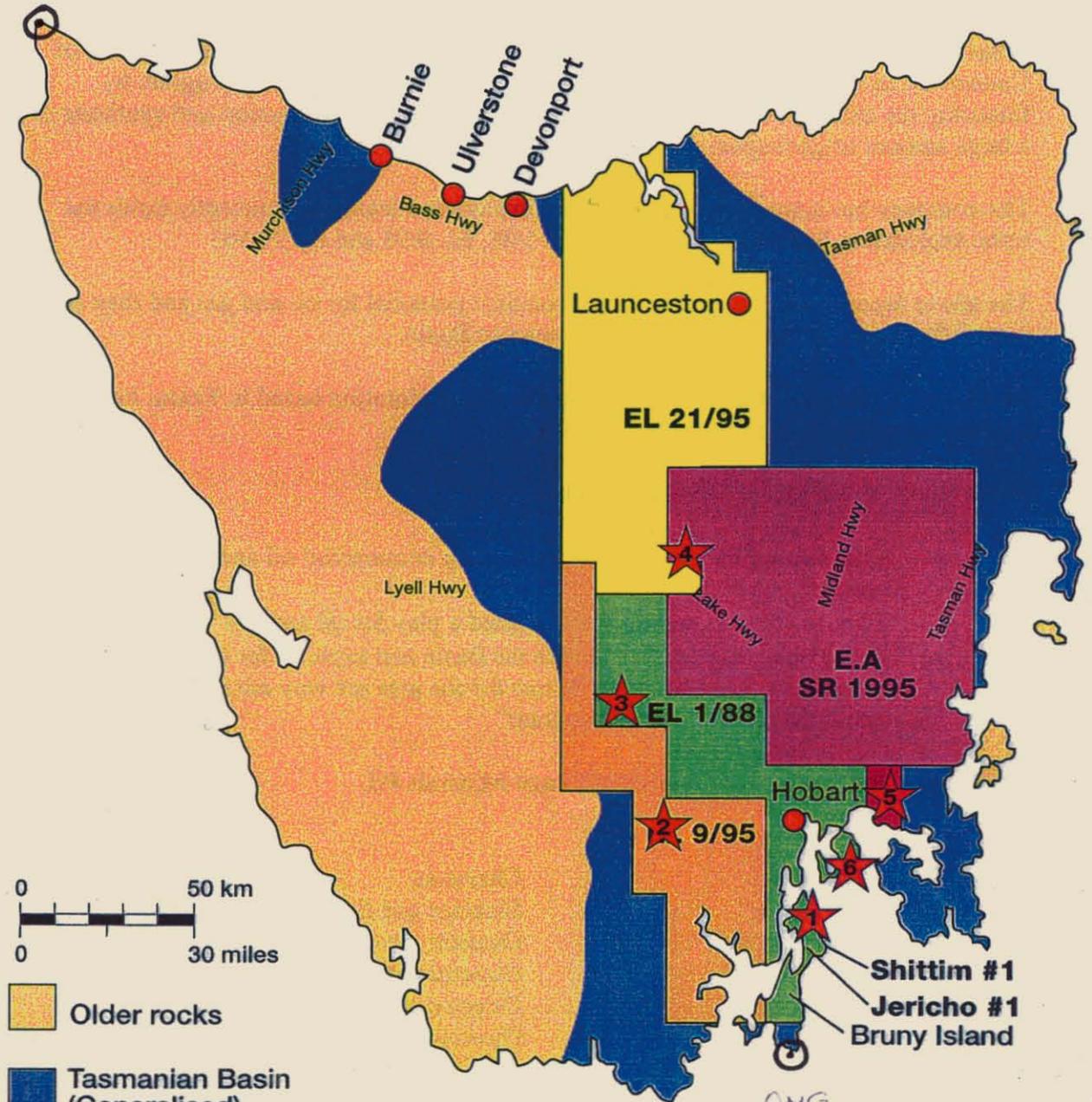
Telephone: (03) 6231 9339

Facsimile: (03) 6231 9338

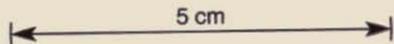
Proposed Drill Holes and Exploration Licences in the Tasmanian Basin Owned by Great South Land Minerals Pl.

AMG REFERENCE POINTS ADDED

AMG 307050E
549905N



- Older rocks
- Tasmanian Basin (Generalised)
- EL 1/88
- EL 9/95
- EL 21/95
- Under request
- E.A. SR Not available for mining exploration



AMG
533060E
5181060N

- Proposed Drill Holes
- 1 - Bruny Is.
- 2 - Lonnvale
- 3 - Ellendale
- 4 - Hunterston
- 5 - Sorell
- 6 - Clifton

POTENTIAL RESERVE CALCULATIONS

In any exploration program it is normal to calculate the potential hydrocarbon reserves. It is predicted that the potential reservoir sandstones of the Permian-age glaci-fluvial Liffey/Faulkner Groups will be intersected below seal sequences in all five planned holes to be drilled in 1997 in the onshore mainland Tasmanian Basin. A detailed study of these potential reservoir sandstones, which are very similar to the Permian glaci-fluvial reservoir sandstones of Oman and the Cooper Basin, has been carried out by Maynard (1996, thesis University of Tasmania) who found that the potential reservoir sequence averages 35m thickness with an average porosity of 10%.

If we assume 30% of each structure has been charged, 60% hydrocarbon saturation and 30% recovery factor then the following reserves may be present:

Hunterston Dome

Fill area = 2,094,666 square metres with a potential yield of 8,797,597 barrels of oil with a gross worth of AUD\$184,749,537. If the reservoir is charged with gas then it may contain 18.6 billion cubic feet.

Sorell -Forcett Dome

Fill area = 12,568,000 square metres (dome radius = 2km) with a potential yield of 16,363,536 barrels with a potential gross worth of AUD\$343,634,256.

Lonnvale

The Lonnvale fault block is 1.2 x 1km with an area of 1,200,000 square metres and a potential yield of 1,151,200 barrels and a gross worth of AUD\$31,752,000.

DOLLAR VALUE OF TOTAL RESERVES (EXPLORATION FIRST PHASE)

Most fault blocks in the Tasmania Basin have a similar area to that at Lonnvale and the other two holes at Ellendale and Clifton Beach have similar potential yields.

Therefore, assuming that the reservoirs are charged only with oil the risked reserves are:

	Barrels of Oil	Value @ AUD21 per barrel
Hunterston	8,797,597	\$184,749,537
Sorell-Forcett	16,363,536	\$343,634,256
Lonnvale	1,151,200	\$31,752,000
Ellendale	1,151,200	\$31,752,000
Clifton Beach	1,151,200	\$31,752,000
Totals:	28,614,733	\$600,909,393

Calculated unrisked reserves are 85,844,199 barrels worth AUD\$1,802,728,179.

ECONOMIC POTENTIAL

The results summarised herein are very encouraging and all three holes drilled have yielded hydrocarbons. Shittim#1 yielded significant quantities of helium. The Lonnavale precollar encountered increasing amounts of wet gas with depth including heptane (C7) from 3.47% at 50m to 17.47% at 96m (air, nitrogen and carbon dioxide corrected).

The widespread occurrence of one of the richest oil source rocks in the world (the Tasmanite Oil Shale) which has produced a seep of heavy crude near Lonnavale, and which is overlain by a promising sandstone reservoir formation, promises significant discoveries in the onshore Tasmanian Basin.

Australia imports most of its heavy crude oil and all of its helium so our new results are of considerable economic significance (see *Petroleum Gazette* v.32 no.2 1997 page 44).

There is a potential market for natural gas in Tasmania both from domestic and heavy industrial customers. The Australian Gas Light Company (AGL) would like to see natural gas developed in Tasmania and would be willing to purchase and distribute the gas once Great South Land has proved it up.

The company is presently moving towards becoming a NL company and a public float is planned for the latter part of 1997.

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BRUNY ISLAND

Oil was first reported from a seep at Johnson's Well in North Bruny Island in 1929.

In the 1980's the Condor Oil company embarked on an exploration program including drilling three stratigraphic holes on North Bruny to ascertain the geological structure, and to determine whether economic deposits of hydrocarbons occurred at depth. Great South Land Minerals P/L has expanded on this program.

The sites of these three stratigraphic holes, Shittim, Jericho and Gilgal are shown on Figures 1 and 2. The siting of each has its own particular relevance.

- The siting of Shittim was to determine a correlation between offshore seismic work that had recently been completed in Storm Bay and the stratigraphy onshore. Drilling has reached a depth of 1751 m
- The siting of Jericho was to endeavour to establish the nature of the reported finding at nearby Johnson's Well. Drilling has reached a depth of 676 m
- The siting of Gilgal was to determine the nature of the stratigraphy and trap potential beside a significant north - south trending fault line. Drilling has involved a precollar to 150m.

All three holes have produced gas. The hole at Shittim was temporarily flared under controlled conditions on two separate occasions.

The gas from Shittim and Jericho consists of methane, higher hydrocarbons to C₈, nitrogen, helium and some hydrogen.

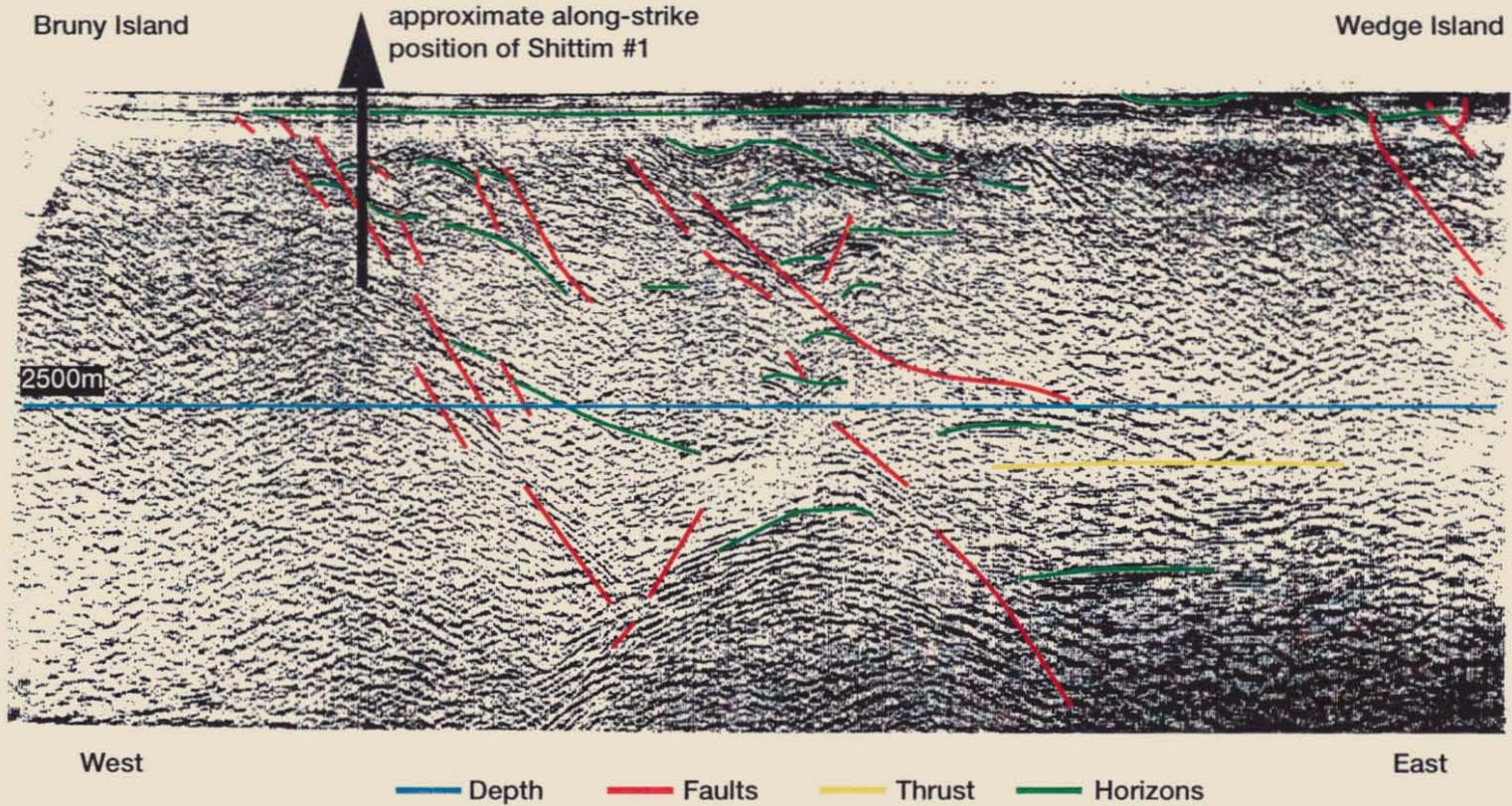
Traces of oil were found in the Shittim well at a depth of 1676 m. The oil had a similar geochemical "signature" to hydrocarbons extracted from the Ordovician limestone at Ida Bay in southern Tasmania.

These findings show that this part of the Tasmanian Basin is live with respect to hydrocarbons and also that helium may be present in economic quantities.

These results have encouraged the company to continue with its drilling and exploration program.

Seismic Section across Storm Bay, Southern Tasmania

A Preliminary Interpretation



Interpretation by Leaman

392008

REPORT FROM THE SHITTIM HOLE ON BRUNY ISLAND

INTRODUCTION

A stratigraphic drillhole on north Bruny Island was planned in 1994 to test structures identified on nearby seismic, gravity and magnetics and on marine seismic lines across Storm Bay (Fig. 1). The hole, known as Shittim #1, was suspended at 1751m. and a full analysis of the geochemical results to date are included herein. A dipmeter survey showed that the hole did not deviate from the vertical by more than 5 degrees. The fully cored stratigraphic succession is summarised in Fig. 2.

A comparison can be made with a precollar hole (Jericho) drilled some 2.5 km west of Shittim, in which quantities of gas, including hydrogen, were found at shallow depth. This gas was not tested for helium (see Fig. 2A). The rig is presently operational at this site.

Notes on the method of collection of samples and on the collection of data are included at the end of this document.

STRATIGRAPHY

The Lower Parmeener Supergroup (Upper Carboniferous-Permian) in Shittim #1 has been intruded by two major dolerite sills - an upper sill which is 580m thick and a lower sill which is 250m thick. In addition there are thinner sills with one minor sill being 3m thick.

All of the sedimentary succession in Shittim #1 has been contact metamorphosed (heated) by one or both of the thick dolerite sills. Details of the mineralogy of the contact metamorphics and of the metallic minerals in the dolerite can be found in Bottrill (1995) and Woods (1995). Metamorphic assemblages and vitrinite reflectance data, which are indicators of the level of heating, show that all of the Parmeener metasedimentary rocks have experienced temperatures of 300-500°C.

The formations however, are easily recognised (Forsyth 1995) and are summarised in the attached log. The uppermost formation cored is the Deep Bay Fm, followed by the Bundella Fm (and its several members), then by the Woody Island Fm and Truro Tillite.

There are no surprises in the stratigraphy of the Lower Parmeener Supergroup and even the very thin formations (probably best regarded as members) erected on Satellite Island (previously Woody Island) by Banks *et al* (1955) can be readily identified. The Truro Tillite at slightly over 400m is thicker than in most other Tasmanian sections. The Truro Fm also contains minor conglomerate, sandstone, shale and limestone interbeds, all of which have been recorded in other Tasmanian sections of the Truro Fm.

STRUCTURE

The section is jointed throughout, is cut by several small faults and the more ductile Woody Island Formation is deformed. Horizontal fracturing in the Woody Island Fm may indicate low angle faulting.

The lower dolerite sill is underlain at 1568m by 33cm of metatillite. At 1568.3m there is a 10cm wide, horizontally striated fault zone and beneath the fault is 183m core thickness of highly deformed slates and phyllites with very minor marble (dolomite + calcite) beds. Spotting in the phyllite/slate rocks decreases away from the fault suggesting that this low angle fault is pre-dolerite in age.

A low angle, probably listric, fault was identified on a seismic line from nearby in Storm Bay by Leaman in 1987.

POROSITY AND PERMEABILITY

Porosity measurements were carried out on the sandstones of the Bundella Fm. Woods (1995) found a relationship between both porosity and permeability and distance from the upper dolerite sill. Porosities range from 7.5% to 12% and permeabilities from 0.1 to 9.8 md.

Porosity has probably been enhanced by decarboxylation. The potential reservoirs intersected are few and include a few metres of porous sandstones in the Bundella Fm. This is the distal facies equivalent of the thicker glaci-fluvial sandstones of the Liffey and Faulkner Groups that do not occur on Bruny Island but are attractive reservoir targets on the mainland of Tasmania (Maynard 1996).

Fracture porosity may be present in several of the formations but is most obvious in the Woody Island Fm. Fracture porosity is difficult to measure and it is not possible to say whether or not a potential reservoir exists in the Shittim #1 area based solely on fracture porosity. Elevated levels of wet gas and helium occur within fractured and veined sections of the phyllite/slate complex between 1700 and 1730m (Figs. 3, 4, 5).

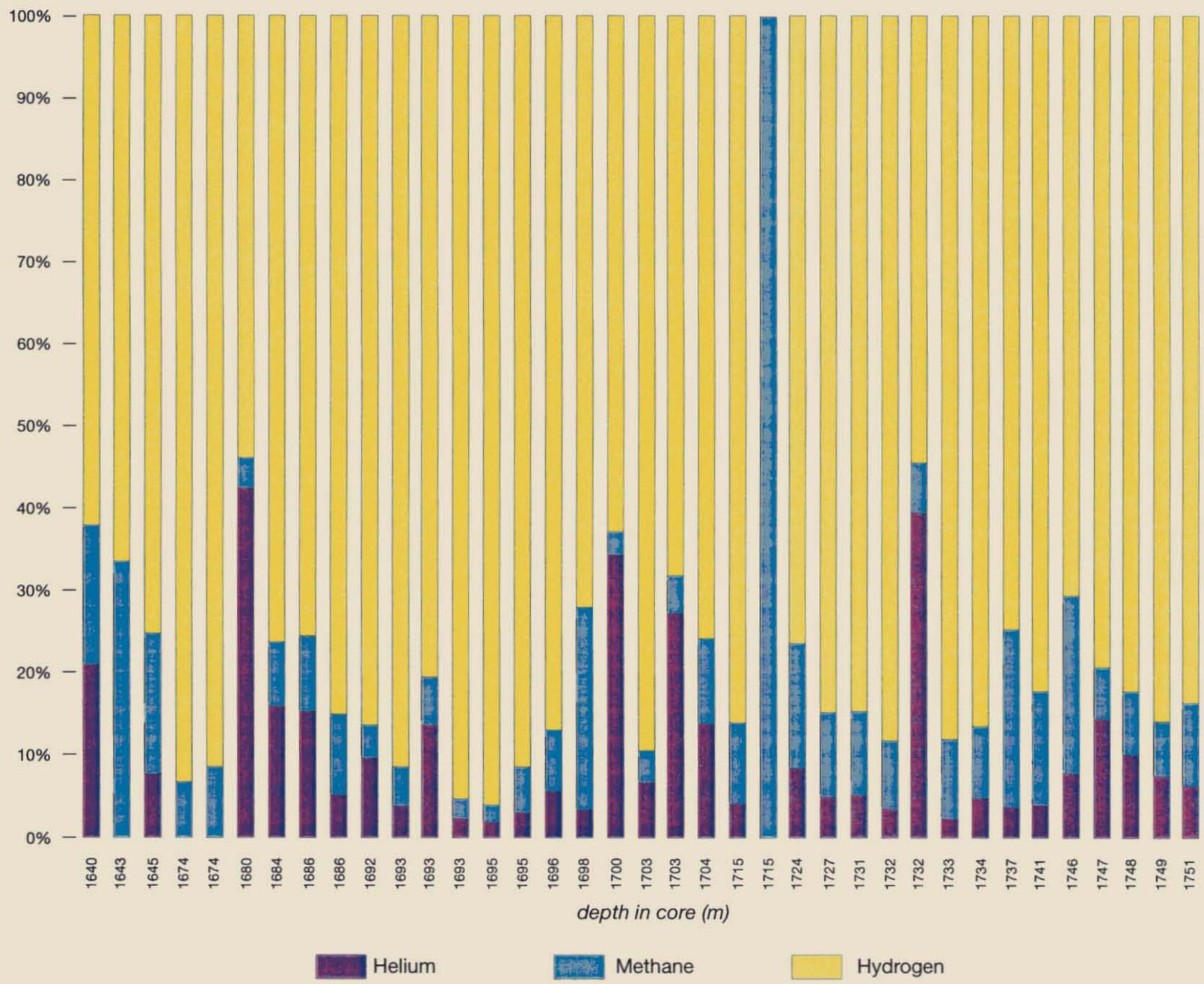
PRE-PARMEENER METAMORPHICS

A total of 183m of pre-Parmeener metamorphics has been drilled. These grey to black metamorphics vary from phyllite to slate and all have an intense, closely spaced cleavage. The cleavage maintains a high angle to the core and the bedding, where identifiable, is usually (but not always) at a low angle of about 10-15 degrees.

At least two thin (15cm) beds of highly deformed dolomitic marble are present. There is a suggestion of a stromatolitic texture in one of these beds.

Gas Analysis for Shittim #1C

Cuttings gas analysis (air, nitrogen and CO₂ corrected)
(AMDEL Laboratories, Adelaide)



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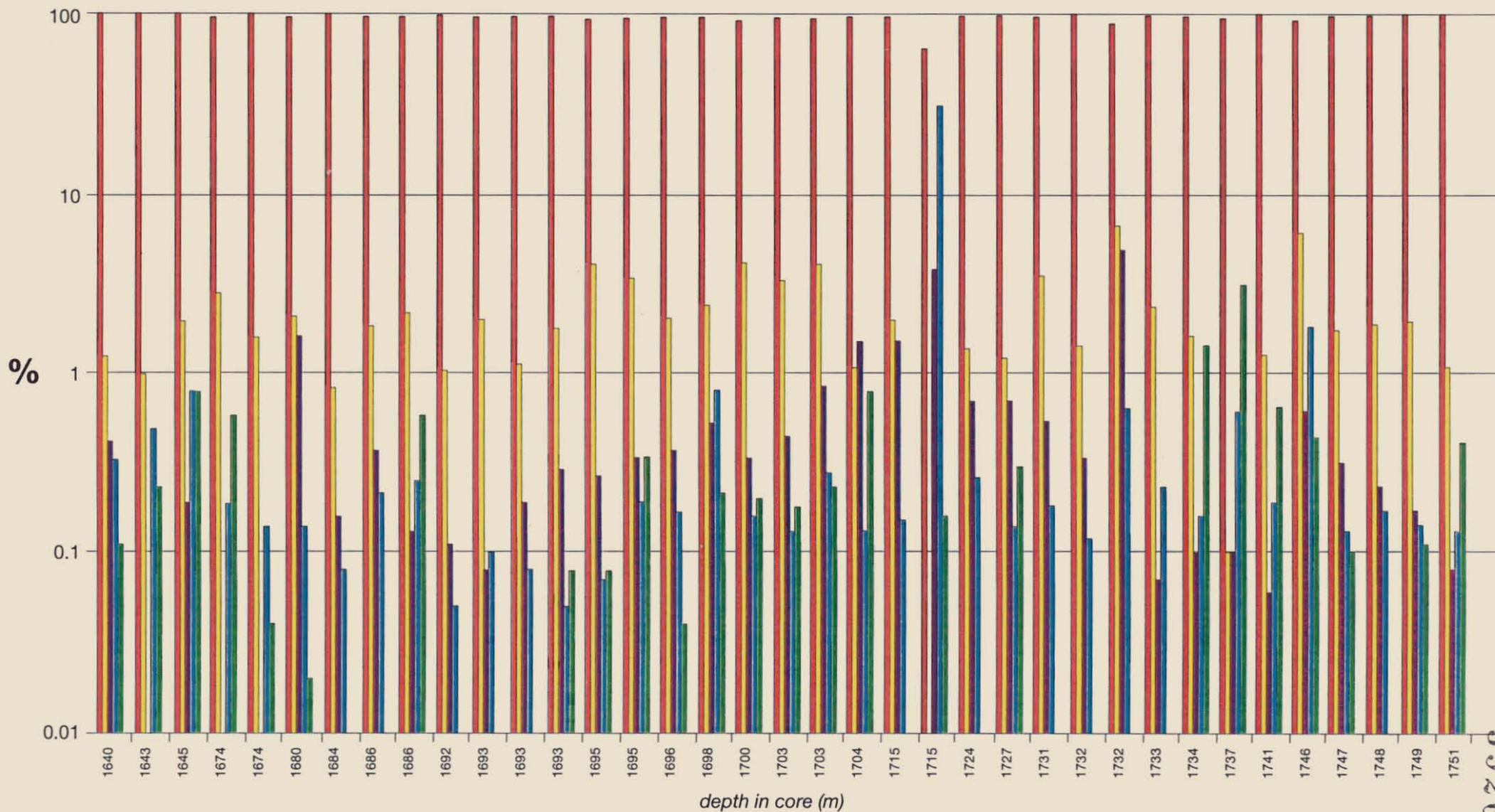
Helium
 Methane
 Hydrogen

Figure 3

392012

Gas Analysis for Shittim #1C

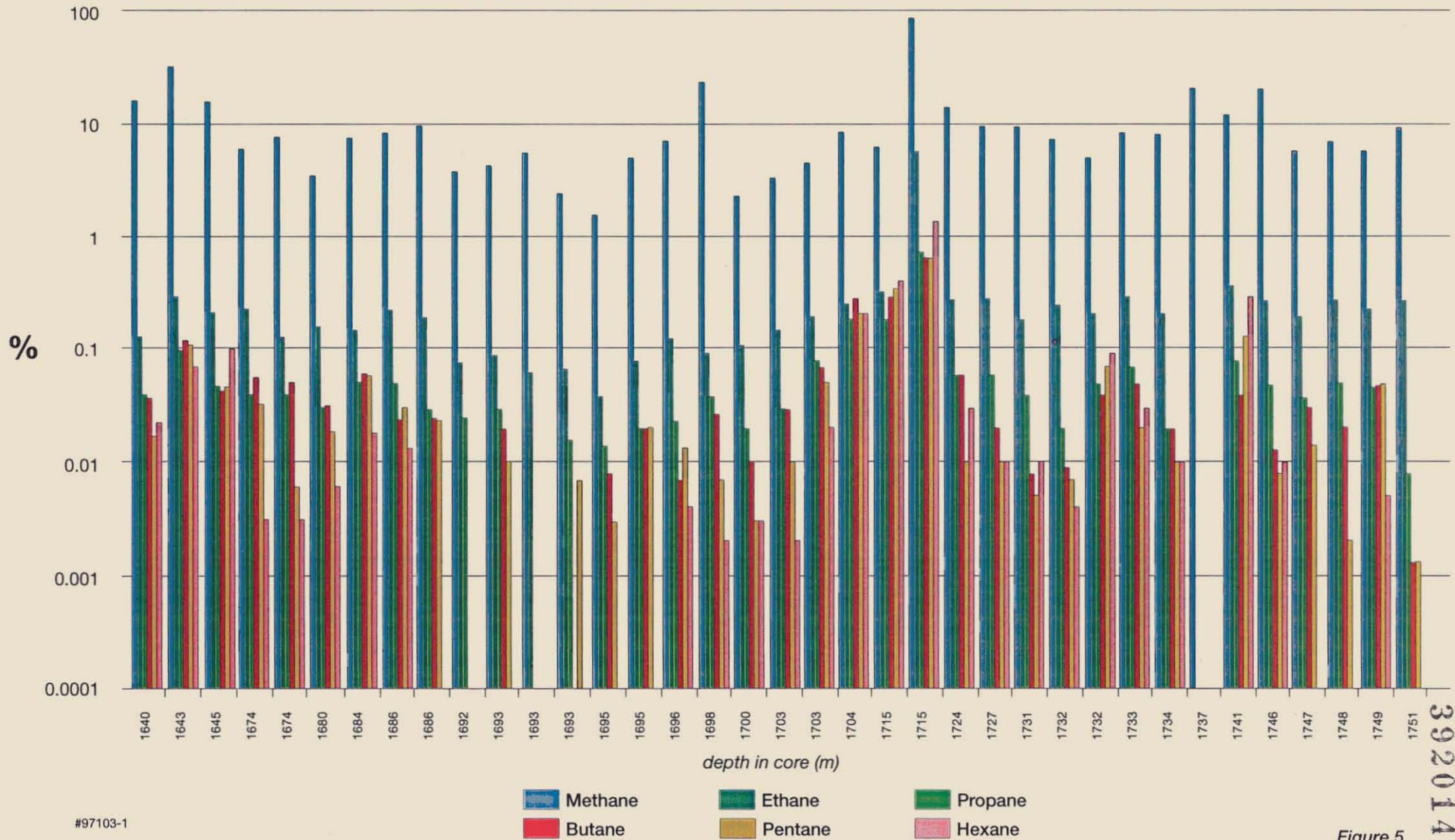
Values of nitrogen, helium, methane and CO₂ (Air corrected)
(AMDEL Laboratories, Adelaide)



■ Nitrogen ■ Hydrogen ■ Helium
■ Methane ■ CO₂

392013

Gas Analysis for Shittim #1C
 Hydrocarbon results (air, nitrogen, and CO₂ corrected)
 (AMDEL Laboratories, Adelaide)



#97103-1

Figure 5

392014

These phyllites and slates are lithologically reminiscent of some parts of the Ordovician-Devonian Mathinna Group (particularly near granites), of some highly deformed pelitic areas of the Ordovician to Devonian Eldon Group and of some parts of the Upper Proterozoic metamorphics of Tasmania such as the Oonah Fm.

The dolomitic limestones probably suggest that the greatest similarity is to the Late Proterozoic (Precambrian) metamorphics of Tasmania.

NATURAL GAS AND OIL

Although Shittim #1 was designed as a stratigraphic hole, the discovery of hydrocarbons was not totally unexpected, as oil and gas had been reported in a nearby shallow hole at Johnson's Well in 1929.

Gas was reported by the drillers at shallow depths and high pressures were reported in porous sandstones within the Bundella Fm correlate under the first thick dolerite sill at about 800m. This necessitated the installation of a hotwire below this level.

Total gas units from 875m to 1685m are shown in Figure 2. A more sensitive gas chromatograph was installed at 1021m which could detect total gas, hydrogen, methane and C₂+ separately. Generation of hydrogen caused by acid-water reaction with drill rods was prevented by increasing the pH of the drilling fluids.

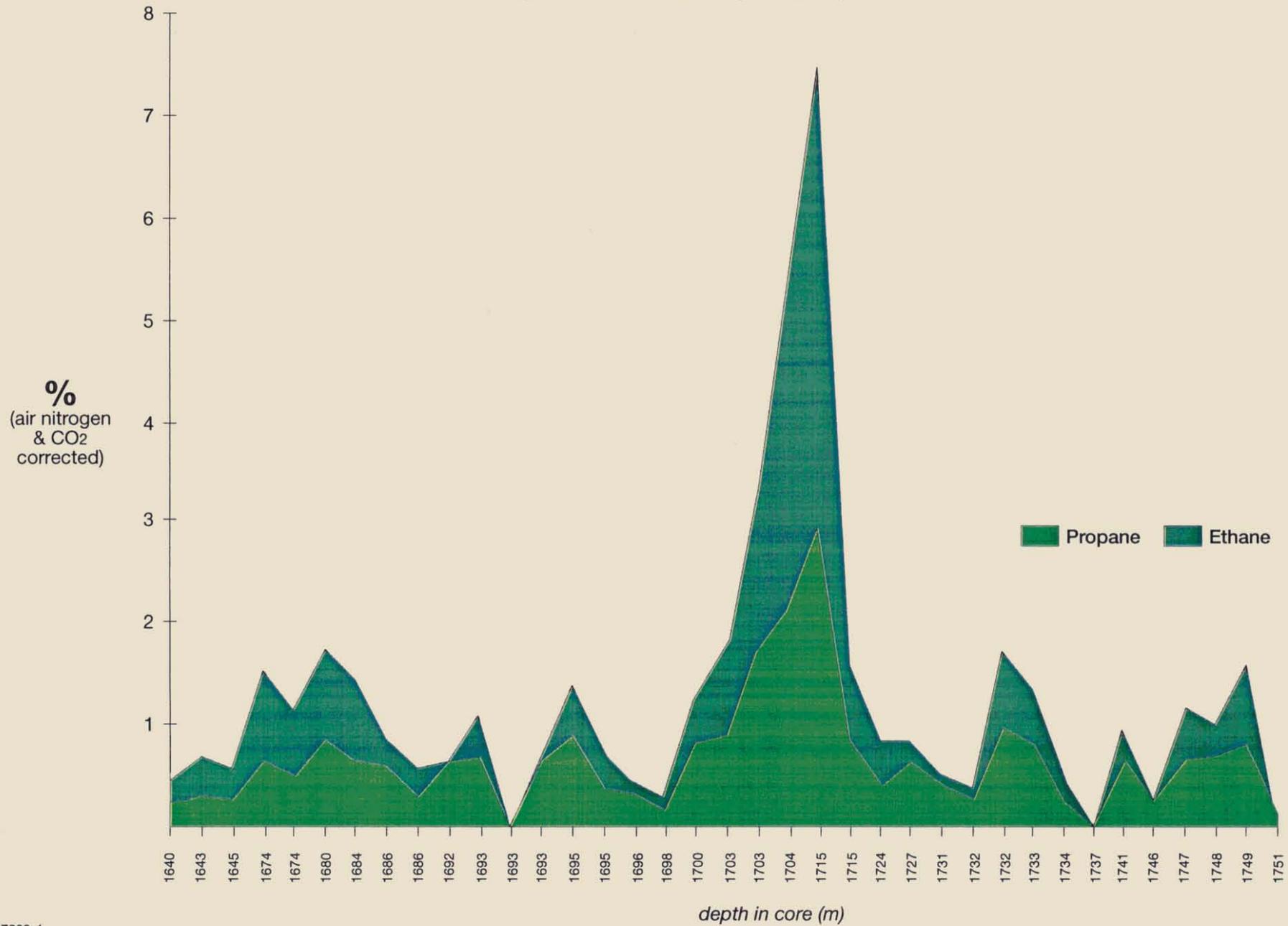
However, hydrogen occurred in all samples and ranges from 0.45% to 8.49% (air corrected). The reactivity of hydrogen makes air-corrections based on oxygen unreliable due to the probable removal of free oxygen by hydrogen to form water. Air-corrected values of hydrocarbons cited here are probably underestimates due to this effect.

The uncertainties for air correction also make it difficult to be sure of the nitrogen composition of the gas. Values range from 55 - 98% and suggest that nitrogen is a major component of the gas. The analyses show that from 1630-1686m there is a decrease in hydrogen, an increase in nitrogen and a decrease in carbon dioxide to zero.

Methane (C₁) was recorded continuously from about 800m to 1686m and samples were collected at regular intervals from 1686m to 1751m and sent to AMDEL for analysis. Methane levels increased below the lower dolerite sill on entering the phyllite/slate complex at 1568m.

Background methane for most of the section ranged from a few hundred to a few thousand parts per million. The highest value (air corrected) is 31% at 1715m. The carbon isotope values of the methane ranged from -50 to -59 parts per thousand PDB, placing it firmly in the middle of the "gas associated with oil generation" range (, 1977). These figures overlap with the carbon isotope values (-55 and -56) from methane collected from the surface at nearby Johnson's Well and the Saw Pit (Revill and Volkman 1994).

Gas Analysis for Shittim #1C
Hydrocarbon results (air, nitrogen, and CO₂ corrected)
(AMDEL Laboratories, Adelaide)



Ethane (C₂) was first detected at low levels in four samples collected from trip gas at 1528m (Davies 1996). Samples collected from the phyllite/slate complex from 1630 to 1751m show generally increasing though fluctuating levels of wet gas (Figs. 3 - 5). The highest level of wet gas was recorded at 1715m (Fig. 6) and consisted of 88% methane, 6% ethane, 0.75% propane, 0.67% butane, 0.63% pentane, 1.38% hexane, 1.18% heptane, 1.24% octanes and higher, and helium 0.1% (air, nitrogen and CO₂ corrected).

A graph of the ratios of C₂ to C₃ show that the gas is typical of 'gas associated with oil and gas provinces' (Fig. 7) and is unlike that from 'non-associated gases' (Nikonov 1972).

A core sample of black slate with a TOC of 0.12 from 1676m was crushed at AMDEL laboratories in Adelaide and traces of an oil were analysed (see Fig.8). This oil has the characteristics of an algal-derived oil and the unusual predominance of C₁₈ and the pristane/phytane ratio of around 1 is very similar to a sample from the Ordovician Gordon Limestone at Bender's Quarry, at Lune River in SW Tasmania (Volkman, 1990).

As the rocks containing the oils and wet-gas are low grade regional metamorphics and are most unlikely to be sources for the hydrocarbons, then both the oil and gas must have migrated in either laterally or from depth. A deep crustal or even mantle origin is likely for the helium.

HELIUM

Helium is present in eight samples with concentrations ranging from air-corrected values of 0 to 4.83%. Several samples have greater values than the economic cut-off value of 0.3% (Figs.3, 4)

A sample from 1680m contains 0.18% (air-corrected) (see Fig.4) and 42% (air and nitrogen corrected)(see Fig. 3). A sample taken from the choke manifold at 1635m, is probably the least contaminated by air and has an uncorrected helium value of 0.9% and an air, nitrogen and carbon dioxide corrected helium value of 1.2%. A sample from 1732.8m contains 4.83% (air corrected) and 39.57% (air, nitrogen and CO₂ corrected).

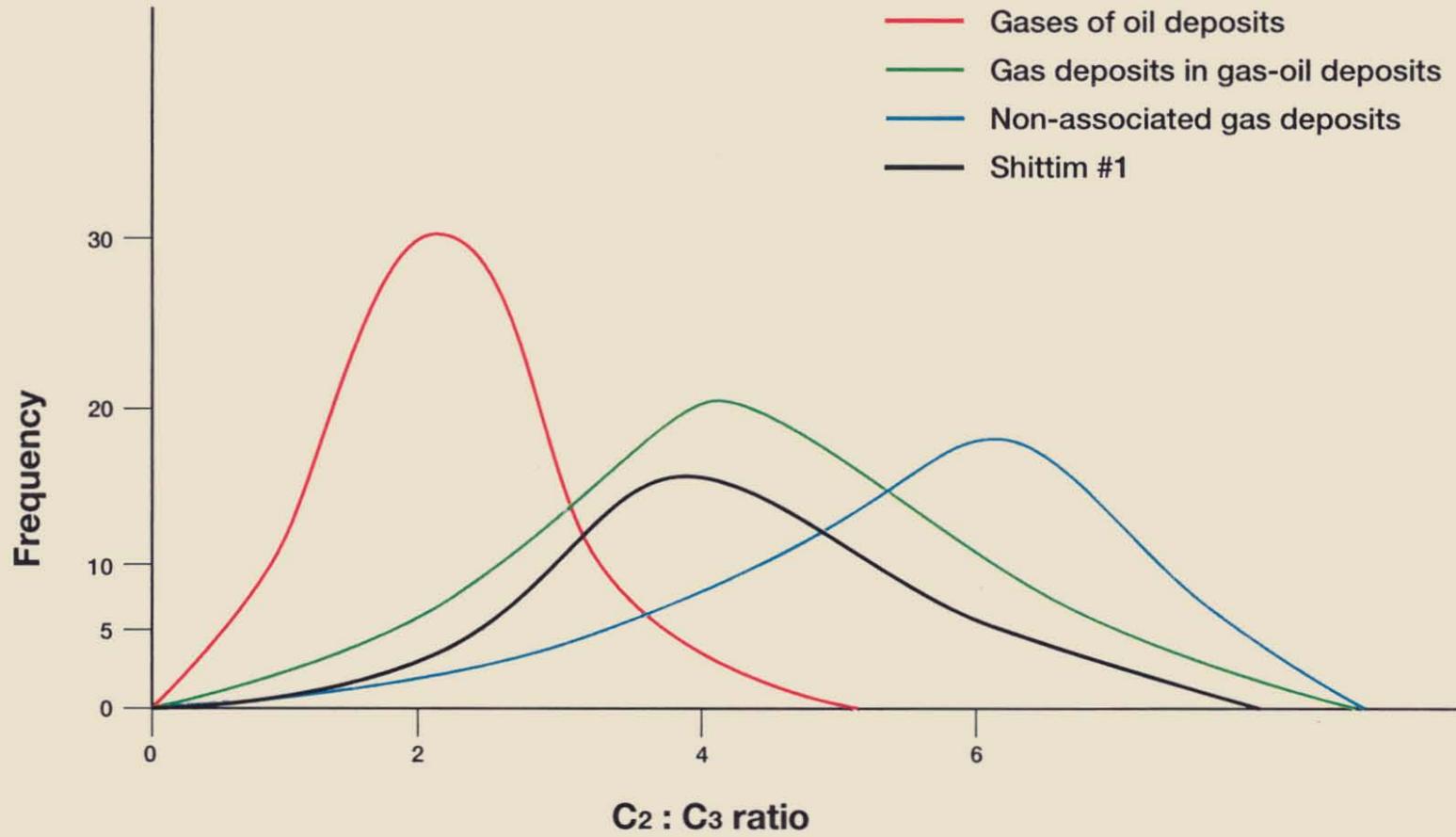
Nikonov (1973) has shown that the majority of high helium-bearing gases are found in oil and gas fields, with high (mode of 22%) nitrogen and "hydrocarbons (up to C₆) are nearly always present in nitrogen helium-bearing gases. In nitrogen gases with 1% or more helium the C₂ divided by the sum of the heavy hydrocarbons is less than 1.5", and this value is characteristic of the gases of oil-gas and oil deposits.

The average value of the gas from the Shittim hole is 1.286.

These results strongly suggest the possibility of economic quantities of helium on Bruny Island. It should be recognised that helium is already some 30 times more

Natural Gas Analysis *(from Nikonov 1972)*

A comparison with the Shittim #1C data



valuable than petroleum gas, and it is recognised that by the end of the century, most of the helium-rich natural gas fields currently supplying helium will be exhausted.

CONCLUSIONS

The results of gas and trace oil show that the Shittim #1 stratigraphic hole is 'live' with respect to hydrocarbons. The levels of wet gas with hydrocarbons of C8 and above are encouraging. If good flow rates are encountered, then the levels of helium already sampled are probably economic.

Results from Shittim #1 have been reviewed by independent, international, petroleum consultant Mr Gerald Carne. In a report to the company dated January 1997, he notes *inter alia* that:

- Shittim was drilled for stratigraphic purposes
- the shows are significant and demonstrate that gas, condensate and oil have been generated in the north Bruny Island area
- the identification of gas, condensate, oil, hydrogen and helium provides considerable optimism towards the future of the onshore petroleum industry in Tasmania.

DATA COLLECTION

A hotwire (readings taken by Mr E. McNally) was used to record hydrocarbons from 880m to 1025m. A gas chromatograph supplied by Colin Higgins and Associates Pty Ltd and operated by Mr M. Purvins under the direction of Mr Higgins was used to measure and plot total gas, hydrogen and C₁ to C₅ from 1025m to 1650m.

Hydrocarbon samples were collected by Mr M. Purvins, Dr C. Burrett and M. Bendall, using glass and metal gas collecting containers provided by CSL and AMDEL and analyses were carried out by Dr N. Davies at the Central Science Laboratory (CSL) of the University of Tasmania and by AMDEL Laboratories in Adelaide.

Geological logging was carried out by Mr M. Purvins (Colin Higgins and Associates), by Mr T. Woods, Ms Cheryl-Lee Randell and Dr C. Burrett of the Geology Department, University of Tasmania and Mr S. Forsyth (Mines Department).

XRD analyses were carried out by the Mines Department and porosity and permeability determinations by ACS Laboratories in Brisbane.

Analysis of Oil Samples
Core Sample, 1676m Total GC of Saturates Fraction in Shittim #1C
Comparison with GC from rock at Benders Quarry

The dominance of n-C₁₈ and the Pr/Ph ratio is very similar to the sample from Benders Quarry in Ordovician Gordon Gp. Limestone from Lune River.

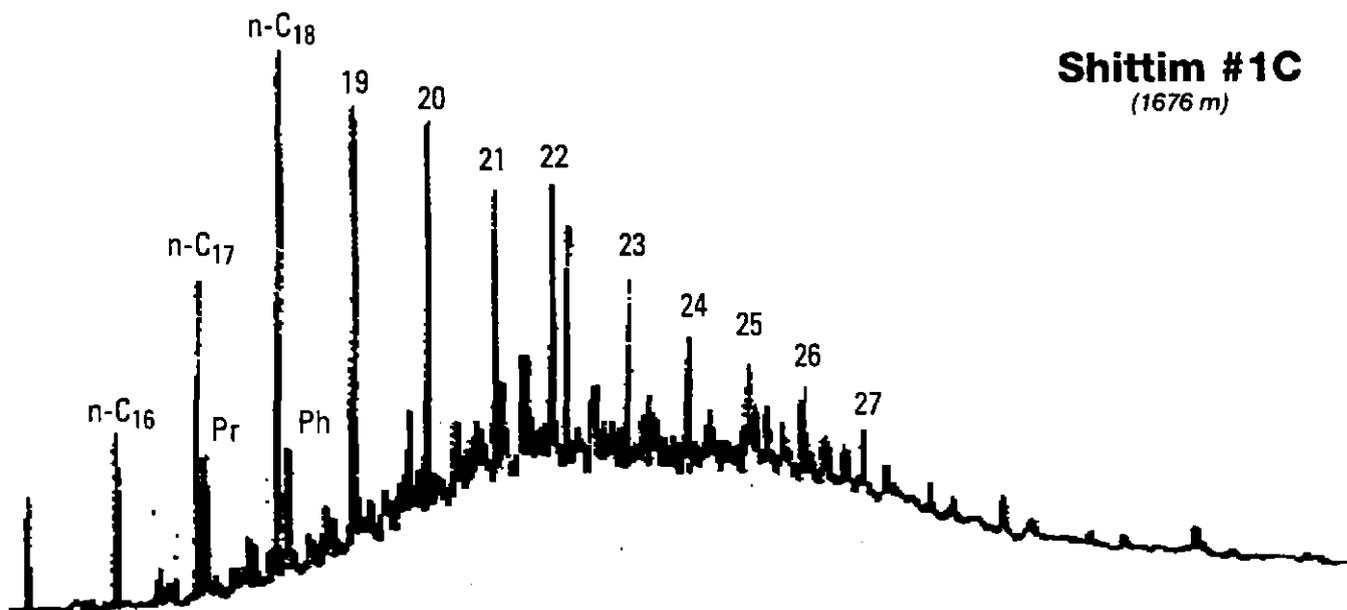


Figure 8A

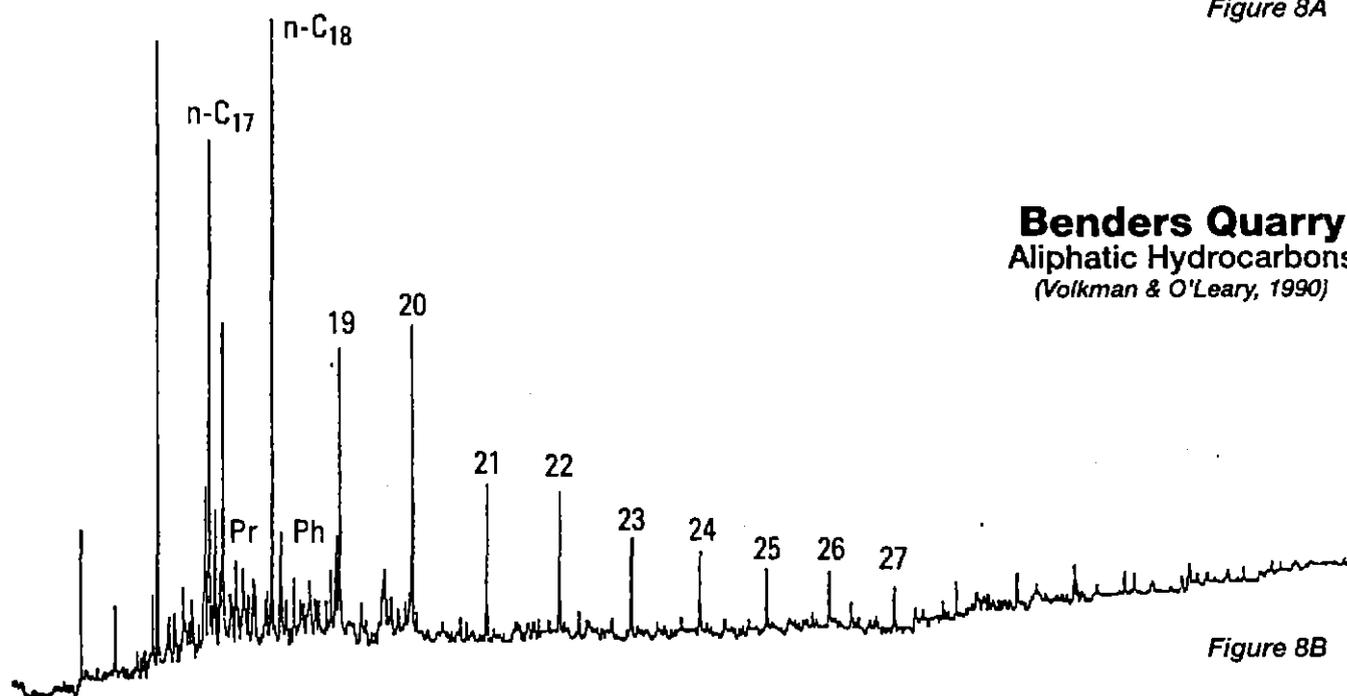


Figure 8B

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REPORT FROM THE JERICHO WELL ON BRUNY ISLAND

INTRODUCTION

The site of the Jericho #1 well is close to Johnson's Well at Great Bay on North Bruny Island. Oil seeps were reported from Johnson's Well in 1929 and a hole was drilled in that year by the Tasmanian Oil Company. However the company crashed with the stock market, and no further drilling work was done on the site until 1995.

The site is situated approximately 100m north of the reported oil finds, and lies close to a north - south trending fault line (Fig. 1). It is updip within a sequence of Permian sedimentary rocks intruded by at least one thick Jurassic dolerite sill (Fig. 2).

Jericho #1 was pre-collared in Permian metasediments to a depth of 223 metres in 1995, with gas being recorded at up to 50 hot wire units (Fig 3). Drilling was suspended and the hole cemented while blowout prevention equipment was procured.

In 1997 the hole was re-entered and drilling continued. A dolerite sill was encountered at 255 metres. Drilling has continued to 640 metres. Gas continued to be encountered with a similar "signature" to that found at the Shittim well. At 625 metres an altered fracture zone within the dolerite was encountered and the hole wedged off. Drilling is continuing.

A full analysis of the geochemical results to date are included herein. The fully cored stratigraphic succession is summarised in Fig 3. Notes on the method of collection of samples and on the collection of data are included at the end of this document.

STRATIGRAPHY

In 1995 Jericho #1 was pre-collared from the Abels Bay Fm to the top of the Bundella Fm to a depth of 223m. The metasedimentary succession at Jericho #1 dips at 10 degrees to the west. The stratigraphy as logged by Woods (1995) and Randel (1996)

The stratigraphy is expected to be the same as for Shittim #1 with the major unknown being the thickness and position of dolerite sills. The Bundella Fm at 215m is baked and spotted due to sericite after metamorphic porphyroblasts. A thick sill is present below the Bundella Fm, as shown on the cross section.

To date, drilling has encountered 255 m of Permian metasediments and over 385m of dolerite. At 625m the dolerite has been altered along a near vertical structure. An assemblage consisting of serpentine, altered dolerite, calcite and minor chalcopryrite has caused some drilling difficulties.

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The sedimentary succession is as for Shittim #1. It has been contact metamorphosed (heated) by one or both of the thick dolerite sills. Details of the mineralogy of the contact metamorphics and of the metallic minerals in the dolerite can be found in Bottrill (1995) and Woods (1995). Metamorphic assemblages and vitrinite reflectance data, which are indicators of the level of heating, show that all of the Parmeener metasedimentary rocks have experienced temperatures of 300-500°C.

The formations however, are easily recognised (Forsyth 1995) and are summarised in the attached log (Fig 3). The uppermost formation cored is the Deep Bay Fm, followed by the Bundella Fm and its several members.

There are no surprises in the stratigraphy of the Lower Parmeener Supergroup and even the very thin formations (probably best regarded as members) erected on Satellite Island (previously Woody Island) by Banks *et al* (1955) can be readily identified.

The pre-Parmeener at Shittim #1 consists of phyllites to slates with minor marbles. These are in listric-fault contact with meta-tillite and may be Proterozoic or early to middle Palaeozoic in age. As yet we do not know whether a similar succession and structural situation exists at depth at Jericho #1.

STRUCTURE

The structure is expected to be similar to Shittim #1. At Shittim, the section is jointed throughout, is cut by several small faults and the more ductile Woody Island Formation is deformed. Horizontal fracturing in the Woody Island Fm may indicate low angle faulting.

POROSITY AND PERMEABILITY

Porosity measurements were carried out on the sandstones of the Bundella Fm on Shittim #1. Woods (1995) found a relationship between both porosity and permeability and distance from the upper dolerite sill. Porosities range from 7.5% to 12% and permeabilities from 0.1 to 9.8 md.

Porosity has probably been enhanced by decarboxylation. The potential reservoirs intersected are few and include a few metres of porous sandstones in the Bundella Fm. This is the distal facies equivalent of the thicker glaci-fluvial sandstones of the Liffey and Faulkner Groups that do not occur on Bruny Island but are attractive reservoir targets on the mainland of Tasmania (Maynard 1996).

Fracture porosity may be present in several of the formations at Jericho #1. More details later

NATURAL GAS AND OIL

In 1995, gas was reported by the drilling crew and was recorded on the hot wire detector from 15m through to 160m with a peak of 50 hot wire gas units at 125m. A loss of water return at 160m prevented further gas measurement.

The present drilling program has encountered gas. Samples have been collected at various intervals and a typical selection of samples are presented here.

Hydrocarbons are present and represent the range from C₁ to C₆. Methane is present at levels of up to 10% air corrected. Helium has been present in 3 shallow samples at levels of around 0.2%.

This shallow gas appears to be the same type as was found at much greater depths at the Shittim #1 site, and it appears to be a nitrogen / wet gas / helium mixture.

Carbon isotope analysis has been performed on a sample from 640 metres and a value of -33.5 ppt obtained. This value is significantly lower than those obtained from surface samples at Johnson's Well (Reville and Volkmann 1994), which were -55.2 and -56.1 ppt.

The Johnson's Well samples fall within the "gas associated with oil generation" field of Fuex (1983), the values of which range from -40 to -60. This would suggest that neither samples are of biogenic origin, but rather are thermogenic. The recent result from Jericho falls within the "commercial and dry gas" field and indicates a definite thermogenic origin.

HELIUM

CONCLUSIONS

The results to date are encouraging as they come from within a thick dolerite sill and may suggest leakage from reservoirs at depth and/or laterally. Drilling on to the possible reservoir sandstones of the Bundella Fm beneath the dolerite is indicated by these results, estimated to be a further 150 m.

DATA COLLECTION

A hotwire was used to record hydrocarbons. Hydrocarbon samples were collected by Dr C. Burrett, D. Tanner and M. Bendall, using glass and metal gas collecting containers provided by AMDEL. Analyses were carried out by AMDEL Laboratories in Adelaide.

Geological logging was carried out by Dr C.Burrett of the Geology Department, University of Tasmania.

XRD analyses were carried out by the Mines Department and porosity and permeability determinations by ACS Laboratories in Brisbane.

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REPORT FROM THE GILGAL WELL ON BRUNY ISLAND

INTRODUCTION

Gilgal #1 is located at the top of the saddle between Shittim #1 and Jericho #1, just north of the convict church ruins on North Bruny Island.

The site is "on structure", and is close to a NW / SE trending fault. It is updip from a thick section of Permian sedimentary rocks intruded by at least one Jurassic dolerite sill.

The hole was pre-collared to a depth of 51 m in 1994 although this work was not completed due to gas emanating from the hole. The hole was cased and cemented.

STRATIGRAPHY

In 1995 Gilgal #1 was pre-collared in the Abels Bay Fm to a depth of 51 m. The sedimentary and metasedimentary rocks at Gilgal #1 dip at 10 degrees to the west. The stratigraphy was logged by Woods (1995).

The stratigraphy is expected to be the same as for Shittim #1 with the major unknown being the thickness and position of dolerite sills

STRUCTURE

The structure is expected to be similar to Shittim #1. In this hole, the section is jointed throughout, is cut by several small faults and the more ductile Woody Island Formation is deformed. Horizontal fracturing in the Woody Island Fm may indicate low angle faulting.

POROSITY AND PERMEABILITY

NATURAL GAS AND OIL

In 1995, gas was reported by the drilling crew but no record was kept at the time.

HELIUM

CONCLUSIONS

REFERENCES

- Banks, M.R., Hale, G.E., and Yaxley, M., (1955) - The Permian rocks of Woody Island, Tasmania. *Papers and Proceedings of the Royal Society of Tasmania* 89, 218-230.
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- Volkman, J., and O'Leary, Y. (1990) - Aliphatic and aromatic hydrocarbons in some bitumens and sediments - CSIRO Marine Laboratories Hobart Report 90 HC3, 1-65
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- Wythe, S.(1996) - AMDEL Report, 2pp

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REPORT FROM THE LONNAVALE WELL NEAR HUONVILLE

INTRODUCTION

The Lonnavale site is located at the top end of river flats near Jollystone Creek, a northern tributary of the Russell River near Lonnavale, about 8 km upstream of its junction with the Huon River.

Based on reconnaissance mapping in the area around the proposed drillsite it is clear that dips of the Parmeener Supergroup in the immediate surrounding area are shallow and usually less than 5 degrees and are dominantly to the east and southeast.

An oil seep has recently been reported about 2.5 km to the northwest in a quarry site (Bottrill 1996 and AMDEL 1996).

The hole was precollared to 164m in May 1997. A succession of Triassic and Upper Permian sandstones overlying Permian siltstones with *Fenestella* has been logged from chip samples.

STRATIGRAPHY

The geological succession in the area is little known. Mather (1955) studied and mapped the area to the south near Huonville and Glen Huon and found a "doubtful occurrence" of the "Cascades Fm" overlain by definite Woodbridge Glacial Fm (about 150m thick) and Ferntree Fm (170m).

A more realistic estimate of the succession is probably represented by that found at Maydena, approximately 23km to the NNW. The Maydena area was studied by Jago (1966) and by BHP (1981-2). The Maydena succession is summarised below:

Triassic Sandstone 330m
 Cygnet Coal Measures 3m
 Ferntree Mudstone 170m
 Malbina Sandstone 70m
 Cascades Group 85m
 Mersey Group 30m
 Bundella Fm 30m
 Darlington Limestone 3m
 fossiliferous siltstone 3m
 Woody Island Fm 200m
 Wynyard Tillite 230m
 >>>>unconformity<<<<<
 Precambrian or Gordon Group limestone

Malbina Fm and a probable Risdon Fm correlate outcrop along the road to the south of the Russell River and are overlain by a Ferntree Mudstone Fm correlate along Compton and Pimple Roads. Cascade Gp correlate outcrops 600m east of the proposed drillsite and dips at 4 degrees to the southeast.

A dolerite-Ferntree Fm contact occurs along Compton Road at 150m ASL, and dolerite outcrops along the Russell River from the Russell Road bridge to the Lorkins Road bridge. The dolerite appears is a sill dipping at about 8 degrees to 220 degrees.

The drillhole was precollared in (in June 1997) in Triassic sandstone which is about 100m thick and overlays about 3m of late Permian coal measures and 170m of Ferntree Mudstone, 70m of Malbina Fm and 85m of Cascades Fm.

It is expected to core about 300m of dolerite and then about 450m collectively of Mersey Gp, Bundella, Woody Island and Truro Tillite Formations. Pre-Parmeener rocks may be Precambrian dolomites or Ordovician limestone and should be encountered at about 750 -1000m depth.

The nature of the basal formations in the hole is uncertain. BHP (1981,1982) reported 200m of Woody Island Fm with tasmanite seams just to the north in the Styx River Valley, and this is also likely to be the case at Lonnvale #1. The basal Truro Tillite is highly variable in thickness but may well exceed 300m. Alternatively, the tillite may be thin or absent.

The pre-Parmeener rocks may consist of Precambrian dolomites as in the Jubilee Region nearby, or of Precambrian quartzite, or of Cambrian volcanics, or of Gordon Group Limestones. The drillsite is on the northern flanks of a pronounced magnetic anomaly that runs WNW from Cygnet and joins with early Cambrian ultramafics at its northern end. Leaman has interpreted this anomaly to be due to Cambrian ultramafics. However these may not be present at this site.

NATURAL GAS AND OIL

Gas was reported but not analysed by BHP (1982, p.2) in their Styx River hole S1. Petroleum may be present, as tasmanite-sourced seeps of a migrated, low-sulphur, heavy crude were found by Bottrill about 2.5 km to the northwest within joint planes of a differentiated dolerite. (AMDEL 1996).

Cuttings gas samples from 50, 90 and 96m in Lonnvale #1 were analysed by AMDEL who found low levels of C1 to C7 (AMDEL 1997).

Air,nitrogen and carbon dioxide corrected values are summarised below (as MOL%):

Depth	Methane	Ethane	Propane	Butanes	Pentanes	Hexanes	Heptanes
50m	89	0.58	0.67	1.32	1.80	3.41	3.47
90m	45	9.41	8.89	10.54	7.91	11.45	6.93
96m	52	2.68	1.91	8.04	7.53	10.46	17.47

Oil has been extracted from water samples and results should be available soon.

CONCLUSION

DATA COLLECTION

A hotwire was used to record hydrocarbons. Hydrocarbon samples were collected by Dr C. Burrett and M. Bendall, using glass and metal gas collecting containers provided by AMDEL. Analyses were carried out by AMDEL Laboratories in Adelaide.

Geological logging was carried out by Dr C. Burrett of the Geology Department, University of Tasmania.

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Sandstones of 10-15m thickness, some of up to 15% porosity, occur in the Poatina Group and in the Malbina Fm. The 33m of the Liffey Group sandstone has a porosity averaging 12%. These and the 5m thick Risdon Sandstone correlate may be charged with fluids.

STRUCTURE

POROSITY

NATURAL GAS AND OIL

HELIUM

CONCLUSION

DATA COLLECTION

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Lower Parmeener Supergroup

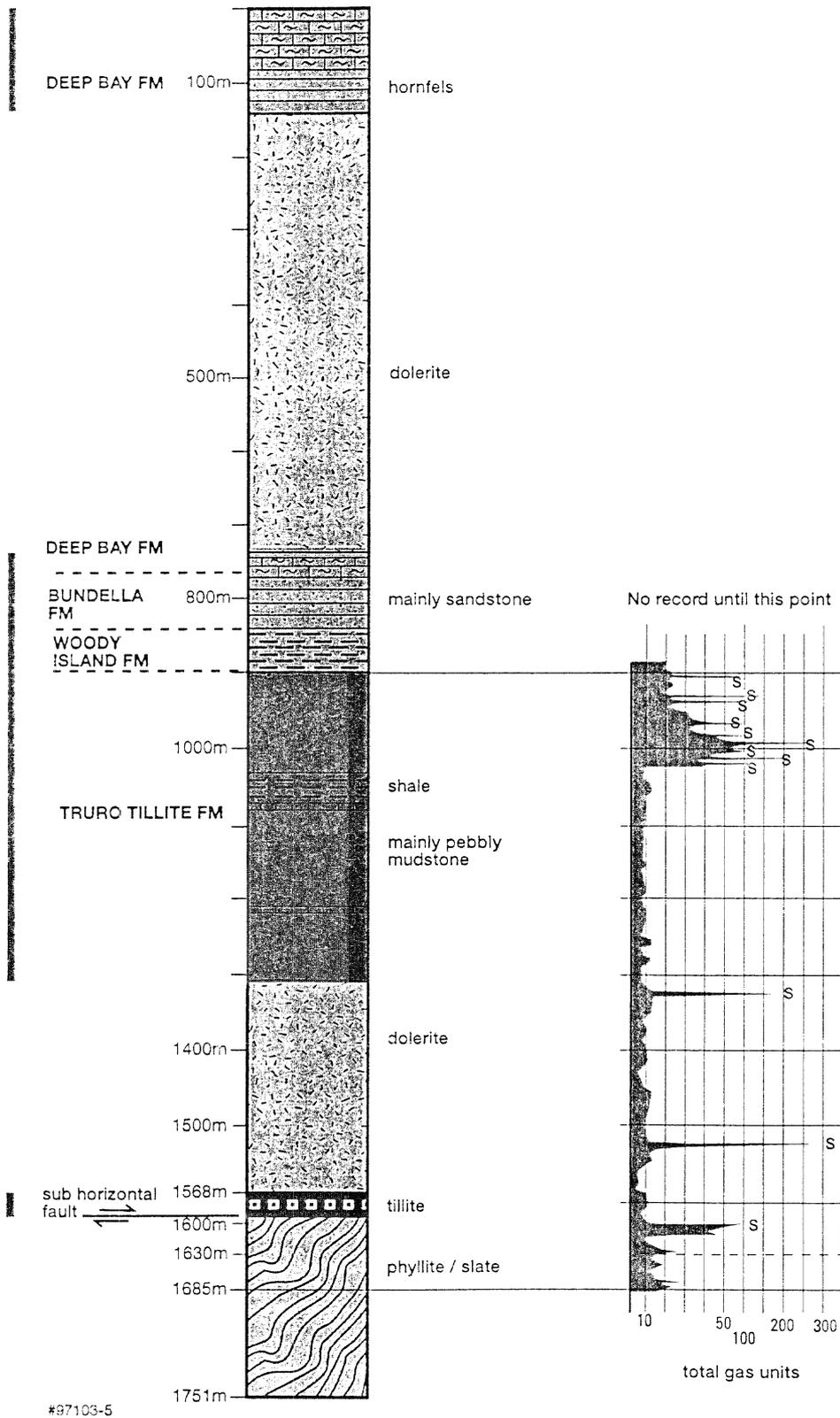


Figure 15—Shittim #1. Lithology and gas.

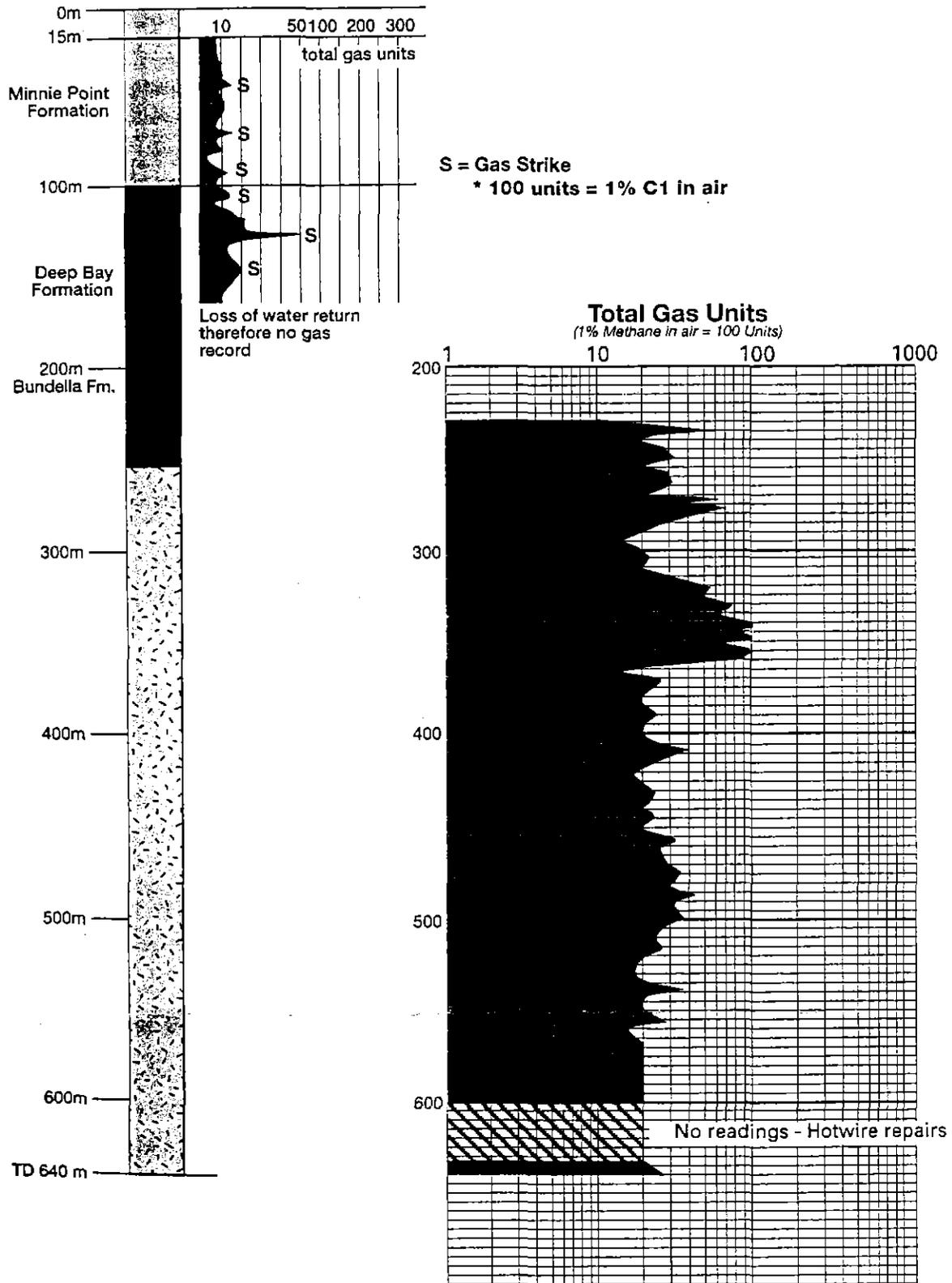


Figure 17—Jericho #1 well log, North Bruny Island.

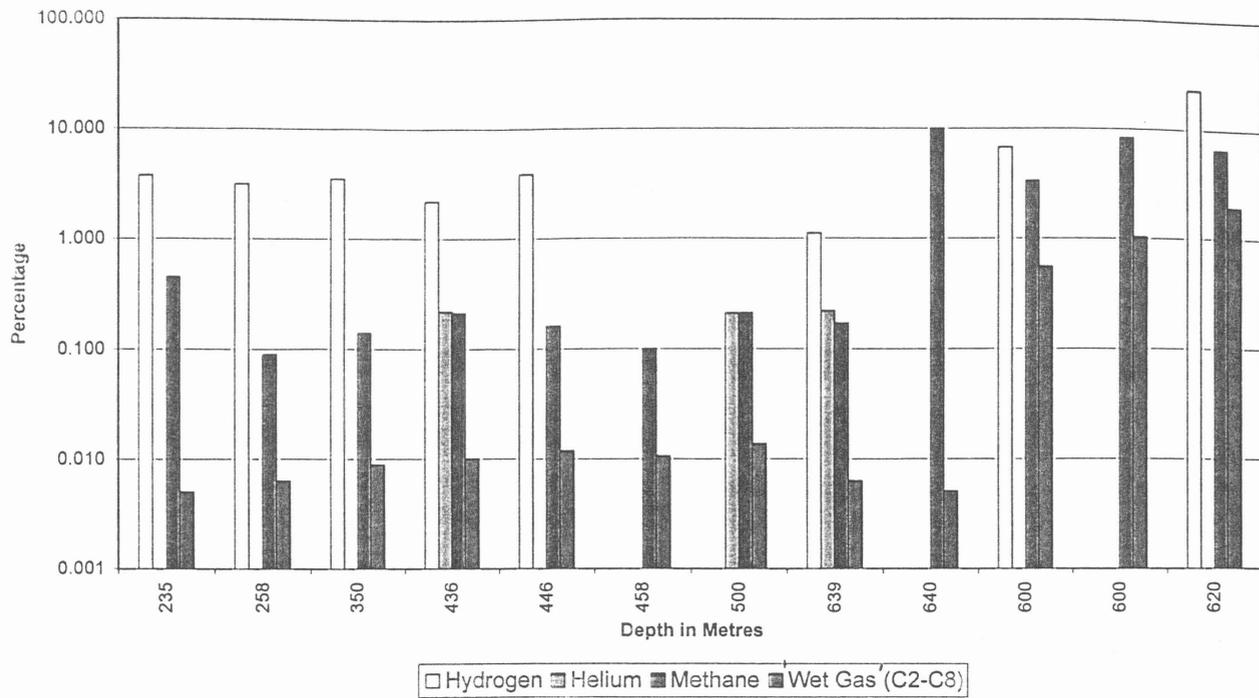


Figure 18—Gas analysis for Jericho #1. Hydrogen, helium, methane and “wet gas” (air corrected).