



W864

WYRALLAH-I

ATTACHMENT 10 to WCR

ATTACHMENT 10

**OPEN FILE**

PETROGRAPHY  
WYRALLAH NO.1  
VIC/P17

W.C.R.

26 FEB 1985

BY: AMDEL

**OIL and GAS DIVISION**



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30 May 1984

F3/422/0  
6789/84 - Part 2

Australian Aquitaine Petroleum Pty. Ltd.,  
99 Mount Street,  
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Attention: Mr Claude Lambert

REPORT F6789/84 - Part 2

CLIENT REFERENCE:	Transmittal 014464
SAMPLE IDENTIFICATION:	878, 947, 1020, 1151 metres
MATERIAL:	SWC
LOCALITY:	WRYALLAH-1
DATE RECEIVED:	8 May 1984
WORK REQUIRED:	Petrography

Investigation and Report by: Dr Brian G. Steveson

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Brief petrographic descriptions of material from four SWC's are provided.

As far as can be determined these are argillaceous, immature sandstones in which pores are completely occluded by the abundant clayey matrix.

✓ WRYALLAH No.1, 878 m (TS 45388)

Most of the thin section consists of individual detrital grains; some have attachments of brown clay material. The grains are predominantly single quartz crystals in the size range 0.1 to 0.6 mm (average: ~0.2 mm); many larger grains are well-rounded whereas the majority of the grains are angular to sub-round. Minor grain components are clayey lithic fragments, mica and heavy minerals.

In some places there are a few grains cemented by brown clay matrix - the presence of these suggests that the rock is an argillaceous sandstone with a relatively abundant clay matrix which fills most of the inter-granular space. One small fragment appears to be cemented by glauconite(?).

As far as can be deduced from the thin section, this is a rather poorly sorted sandstone which is argillaceous and impervious.

WRYALLAH No.1, 947 m (TS 45387)

This sample, also, consists mainly of separate detrital grains but there are some multigranular fragments which indicate (presumably) the overall features of the rock sampled in the SWC. Description will be confined to these large fragments.

Brown clay matrix comprises at least 20% of each of the fragments; it is homogeneous and hence is interpreted as an argillaceous muddy matrix deposited with, or soon after, the quartz grains. This matrix completely fills the spaces between the grains and the optically-visible porosity is zero. The detrital grains are ill-sorted and range in size from well-rounded grains 1-2 mm in diameter to numerous sub-angular chips of very fine sand or coarse silt grade. Large and small grains occur together indiscriminately.

The size, shape and distribution of single grains is consistent with their having been derived from sandstones like that described. Feldspar and authigenic phases are notably absent. There are traces of heavy minerals (including ?staurolite).

WRYALLAH No.1, 1020 m (TS 45386)

In terms of brown matrix abundance and absence of authigenic phases, this sandstone is similar to that from 947 m. Optically-visible porosity is absent.

There is a markedly bimodal grain-size distribution in this rock: most of the detrital material is present as fairly well-rounded quartz grains more than 1 mm in size. Some are single crystals but most have coarsely granular textures. There is a population of grains in the size range 0.1 to 0.3 mm. These grains tend to be more angular and as far as can be determined, large and small grains occur randomly together.

The thin section contains mainly single grains and the interpretation above is based on the few coherent sandstone grains.

WRYALLAH No.1, 1151 m (TS 45389)

This is a compact rock which consists of clay/mica matrix (~35-40%) and sand and silt-grade detrital grains. The detrital grains consist mainly of single crystals of quartz but there is a wide range of quartzite grains and chert. One large grain is a quartz-veined metasediment. Exceptional grains are 3 mm in size but most in the thin section are in the size range of <0.5 mm to 0.8 mm. The rock is very poorly sorted.

The grains do not appear to form a framework and the rock is, consequently, matrix-supported. Birefringent clays (?illite) and mica form most of the matrix and they have a random orientation. The material is a genuine argillaceous muddy matrix - possibly somewhat recrystallised during lithification and burial.

There are some large pores in the thin section but these are almost certainly a product of the sectioning process; in situ, the rock is impervious as a result of the abundance of matrix material.