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PETROLOGICAL DESCRIPTION OF
SAMPLE NO.3, EAST MEREENIE NO.14

OILMIN NL
PR84/ 31F
PETROLOGICAL DESCRIPTION OF SAMPLE NO. 3, EAST MERENIE #14

1. TEXTURE

The rock is a moderately sorted fine sandstone with an average grain size of approximately 0.2mm. In thin-section the rock appears to be slightly laminated or cross-bedded.

Grains were originally mainly rounded to subangular when deposited, but grain shapes have subsequently been modified by diagenetic processes, particularly quartz overgrowth cementation. The original outlines of the grains are clearly visible due to coating by fine-grained haematite. The coating is then often enclosed within later overgrowth cement.

2. COMPOSITION

The estimated composition of the rock is as follows:

- 65-70% Quartz
- 15-20% Feldspar
- 3-5% Opaque minerals, mainly haematite as grain coatings, isolated grains and rarely as pore fillings.
- 1-2% Non-opaque heavy minerals mainly tourmaline and zircon
- <1% Micas
- <1% Micaceous metamorphic rock fragments
- <1% Siderite
- 1-2% Clay
- 8-10% Visible porosity

3. DISCUSSION

The feldspars are mostly microcline and orthoclase with minor amounts of oligoclase also present. The orthoclase grains in particular commonly show varying degrees of dissolution.

The rock is cemented by quartz overgrowths and by minor siderite. Some feldspar overgrowths are also present. Cementation is the main porosity reducing diagenetic process along with some grain margin dissolution to produce sutured grain contacts and occasional microstylolites.

NORTHERN TERRITORY GEOLOGICAL SURVEY
Despite the effects of cementation, significant amounts of porosity remain in the rock. Primary porosity occurs where overgrowth cements have not filled all available intergranular space and secondary porosity in the form of larger but more irregularly distributed pores, results mainly from the dissolution of feldspar grains. The combination of primary and secondary porosity results in a relatively well interconnected pore system. The 8-10% estimated visible porosity suggests a probable log or core porosity of 12-14% and permeability is estimated to be possibly as high as 200md.

A comparison with the cuttings from East Mereenie #13 examined earlier indicates that the porosity in even the most porous interval (5090'-5110') is lower than in the East Mereenie #14 sample with pores more widely separated with less interconnection. As a result it is considered likely that the permeability of the P3-120/130 interval in East Mereenie #13 would be considerably below that of the East Mereenie #14 sample.

7th June, 1984

K.R. MARTIN