

3. PETROLOGY

3.1 King #1, Core plug 2, depth 1398.60m

Thin section description

The sample is a laminated, moderately well sorted siltstone. Laminae are outlined by the concentration of detrital clay matrix and rarely have been disrupted, probably due to bioturbation. Grains range in diameter from 0.01mm (medium silt) to 0.15mm (fine sand) and have an average of coarse silt. Typically grains are subangular to angular with low to moderate sphericity. Texturally the siltstone is grain supported with dominantly point and tangential grain contacts. There is no evidence of mechanical compaction.

Porosity has an irregular distribution and is restricted to those laminae which have minimal cement and matrix (Fig. 1). Total porosity is a combination of primary intergranular pores and secondary pores. Secondary pores have resulted from the dissolution of labile grains and possibly cement. Rarely these pores are oversized. The dissolution of cement could have resulted in the recreation of primary pores. Rare fractures are associated with the unconsolidated laminae.

Framework grains are comprised of quartz, feldspar, lithics, muscovite, tourmaline, zircon and opaques. Pale brown anhedral clays and opaque material (?organic matter) concentrate in selected laminae. The dominant authigenic mineral is micritic carbonate that has rarely recrystallised to spar. In addition, isolated micas have been replaced by kaolin, there are examples of pyrite framboids and minor silicification is suggested by triple point junctions between quartz grains.

Visual Estimate of Composition		%
Framework grains	Quartz	52
	Feldspar	2
	Lithics	1
	Mica	4
	Accessory minerals	tr
Matrix	Clay	6
	Opaque material	4
Authigenic minerals and cements	Quartz	1
	Carbonate	7
	Pyrite	tr
	Kaolin	1
Porosity	Intergranular	15
	Dissolution	1
	Fractures	5