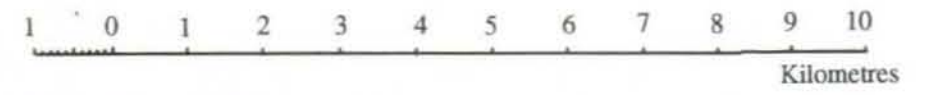


GEOLOGICAL MAP OF THE LOWER WANGANUI RIVER VALLEY

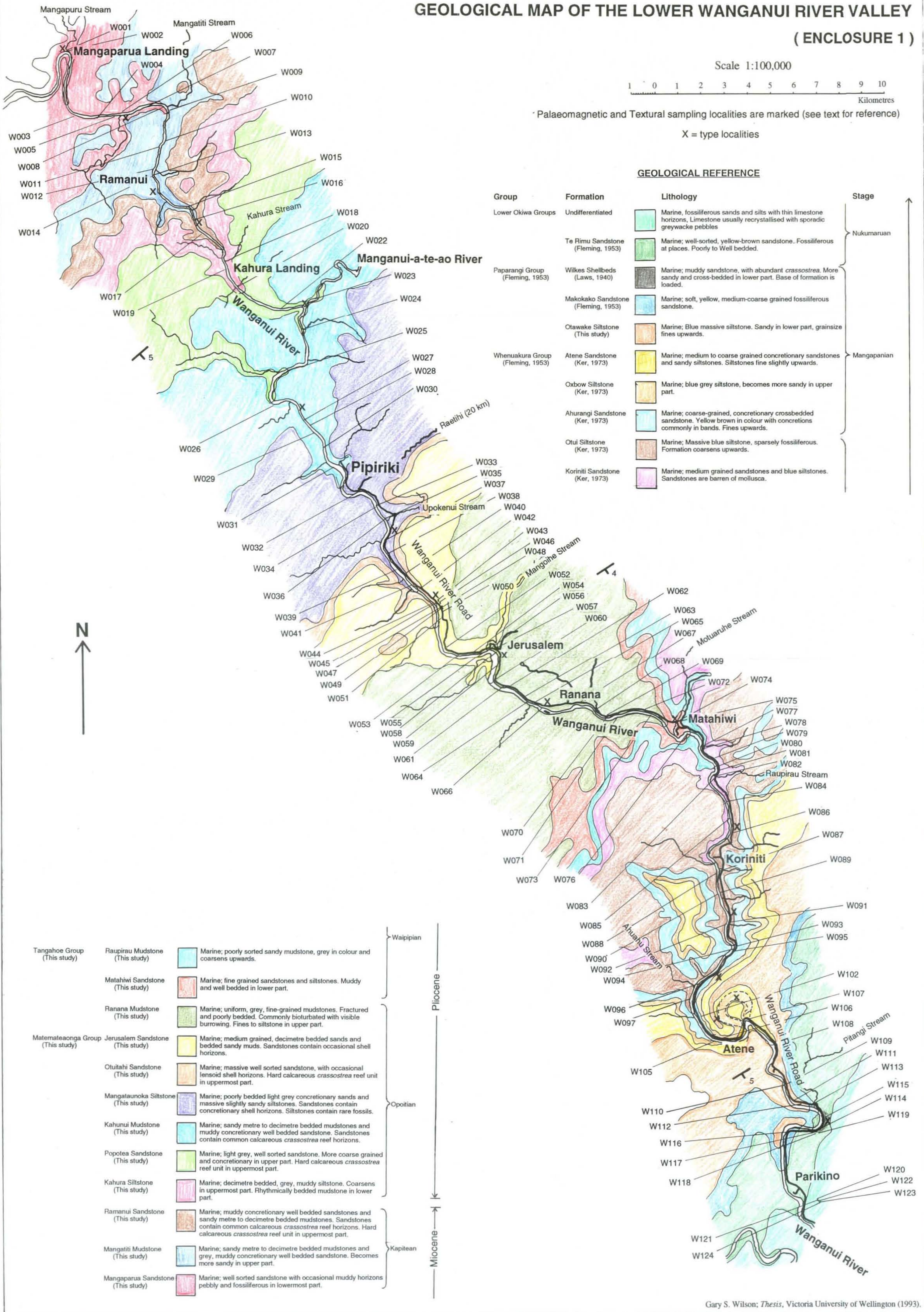
(ENCLOSURE 1)

Scale 1:100,000



Palaeomagnetic and Textural sampling localities are marked (see text for reference)

X = type localities



GEOLOGICAL REFERENCE

Group	Formation	Lithology	Stage	
Lower Okiwa Groups	Undifferentiated	Marine, fossiliferous sands and silts with thin limestone horizons. Limestone usually recrystallised with sporadic greywacke pebbles.	Nukumaruan	
	Te Rimu Sandstone (Fleming, 1953)	Marine; well-sorted, yellow-brown sandstone. Fossiliferous at places. Poorly to Well bedded.		
	Paparangi Group (Fleming, 1953)	Wilkes Shellbeds (Laws, 1940)		Marine; muddy sandstone, with abundant <i>crassostrea</i> . More sandy and cross-bedded in lower part. Base of formation is loaded.
	Makokako Sandstone (Fleming, 1953)	Marine; soft, yellow, medium-coarse grained fossiliferous sandstone.		
Whenuakura Group (Fleming, 1953)	Otawake Siltstone (This study)	Marine; Blue massive siltstone. Sandy in lower part, grainsize fines upwards.	Mangapanian	
	Atene Sandstone (Ker, 1973)	Marine; medium to coarse grained concretionary sandstones and sandy siltstones. Siltstones fine slightly upwards.		
	Oxbow Siltstone (Ker, 1973)	Marine; blue grey siltstone, becomes more sandy in upper part.		
	Ahurangi Sandstone (Ker, 1973)	Marine; coarse-grained, concretionary crossbedded sandstone. Yellow brown in colour with concretions commonly in bands. Fines upwards.		
	Oturi Siltstone (Ker, 1973)	Marine; Massive blue siltstone, sparsely fossiliferous. Formation coarsens upwards.		
	Koriniti Sandstone (Ker, 1973)	Marine; medium grained sandstones and blue siltstones. Sandstones are barren of mollusca.		

Group	Formation	Lithology	Stage
Tangahoe Group (This study)	Raupirau Mudstone (This study)	Marine; poorly sorted sandy mudstone, grey in colour and coarsens upwards.	Waipipian
	Matahiwi Sandstone (This study)	Marine; fine grained sandstones and siltstones. Muddy and well bedded in lower part.	
	Ranana Mudstone (This study)	Marine; uniform, grey, fine-grained mudstones. Fractured and poorly bedded. Commonly bioturbated with visible burrowing. Fines to siltstone in upper part.	
Matemateaonga Group (This study)	Jerusalem Sandstone (This study)	Marine; medium grained, decimetre bedded sands and bedded sandy muds. Sandstones contain occasional shell horizons.	Opoitian
	Otuitahi Sandstone (This study)	Marine; massive well sorted sandstone, with occasional lensoid shell horizons. Hard calcareous <i>crassostrea</i> reef unit in uppermost part.	
	Mangataunoka Siltstone (This study)	Marine; poorly bedded light grey concretionary sands and massive slightly sandy siltstones. Sandstones contain concretionary shell horizons. Siltstones contain rare fossils.	
	Kahunui Mudstone (This study)	Marine; sandy metre to decimetre bedded mudstones and muddy concretionary well bedded sandstone. Sandstones contain common calcareous <i>crassostrea</i> reef horizons.	
	Popotea Sandstone (This study)	Marine; light grey, well sorted sandstone. More coarse grained and concretionary in upper part. Hard calcareous <i>crassostrea</i> reef unit in uppermost part.	
	Kahura Siltstone (This study)	Marine; decimetre bedded, grey, muddy siltstone. Coarsens in uppermost part. Rhythmically bedded mudstone in lower part.	
	Ramanui Sandstone (This study)	Marine; muddy concretionary well bedded sandstones and sandy metre to decimetre bedded mudstones. Sandstones contain common calcareous <i>crassostrea</i> reef horizons. Hard calcareous <i>crassostrea</i> reef unit in uppermost part.	
	Mangatiti Mudstone (This study)	Marine; sandy metre to decimetre bedded mudstones and grey, muddy concretionary well bedded sandstone. Becomes more sandy in upper part.	
	Mangaparua Sandstone (This study)	Marine; well sorted sandstone with occasional muddy horizons pebbly and fossiliferous in lowermost part.	

Pliocene
Miocene

VICTORIA UNIVERSITY OF WELLINGTON