BOREHOLE No. BH19

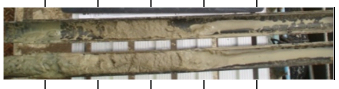
Project: RTA Wharf Upgrade
Location: Bell Bay
Job No: PI30328

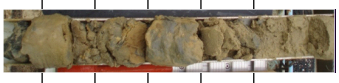
Client: Rio Tinto Aluminum
Start - Finish Date: 02/12/08 - 06/12/08
Bore dia: 150/100mm

Driller: Darren Richardson
Rig: Pioneer
Surface Conditions: Water

Northings: 5446452.8mN Logged: MT
Eastings: 489185.7mE Checked: DRAFT
RL: -7.0 Oriented: -90

LABORATORY DATA						FIELD DATA				SOIL DESCRIPTION		SOIL CONDITION		COMMENTS
dry density (t/m³)	moisture content (%)	liquid limit (%)	plasticity index (%)	percent fines (%)	design / test data	field & other tests	sample type	field tests	ground water depth (m)	graphic log	soil type, unified classification, colour, structure, particle characteristics, minor components	consistency/ density	moisture condition	drilling method, well construction, water and additional observations
	80	54	25			0/0/0 (N=0)	●				SANDY CALY (CH) dark grey, with fine to coarse sand, with shell fragments and fine gravel, occasional coarse black basaltic gravel	VS		wash boring SPT 45cm penetration with weight
									1					
											SILT (ML)	S		
						1/1/2 (N=3)			2					SPT no sample
									3		CLAYEY SAND (SC)/SILTY SAND (SM) brown, fine sand	MD		
						3/6/11 (N=17)			4					SPT no sample
	21.2	20	3	19.4							SILTY SAND (SM) brown and pale brown, fine to medium sand, fines of low plactisity	MD		push tube 45cm Gs=2.67
						6/9/12 (N=21)			5					SPT no sample
											SILTY CLAY (CL) light grey, trace fine sand	St		
									6		SILTY SAND (SM)/ SAND (SP) light grey , fine to medium sand, trace lenses of clay	MD		push tube 10cm
						6/7/7 (N=14)					Basaltic GRAVEL, black, coarce, with sand			
											SAND (SP)/SALTY SAND (SM) brown, fine to medium sand	MD		
									7					
											fine to coarse sand, occasional coarse black basaltic gravel			
						12/6/6 (N=12)					SILTY CLAY (CL) brown, occasional coarse black basaltic gravel	St		push tube refuse, SPT no sample, 30cm coring
									8					
											SILTY CLAY (CH) dark grey, brown	VSt		
									9					push tube 40cm
						4/6/12 (N=18)								
									10					





LABORATORY DATA
- UQN Unconfined Comp. (Natural)
- UQC Unconfined Comp. (Compacted)
- TQN Uncons. Undrained Triax. (Natural)
- TQC Uncons. Undrained Triax. (Compacted)
- TRX Consolidated Undrained Triaxial with pwp measurement
- PSA Particle Size Analysis
- CS 1D oedometer Test
- LPM Laboratory Permeability

FIELD DATA ABBREVIATIONS
- Suv = Uncorrected vane shear (kPa)
- Sup = Pocket penetrometer (kPa)
- N = SPT blows per 300mm
- FPM = Field permeability

GROUNDWATER SYMBOLS
- = Water level (static)
- = Water level (during drilling)
- = Outflow / Inflow

FIELD DATA SYMBOLS
- × = Shear vane test
- ⊥ = Pocket Penetrometer test
- ▽ = Standard Penetration Test (SPT top = start of N blowcount)
- ▼ = SPT Spoon Sample (Pushed)
- ■ = Undisturbed Tube Sample
- ● = Disturbed Sample
- ◧ = Bulk Sample

DENSITY (N-value)

VL	(very loose)	0 - 4
L	(loose)	4 - 10
MD	(medium dense)	10 - 30
D	(dense)	30 - 50
VD	(very dense)	50 - 100
CO	(compact)	>50/150mm

MOISTURE CONDITION
D = Dry M = Moist W = Wet

CONSISTENCY (Su)

VS	(very soft)	< 12 kPa
S	(soft)	12 - 25
F	(firm)	25 - 50
St	(stiff)	50 - 100
VSt	(very stiff)	100 - 200
H	(hard)	> 200 kPa

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											SILTY CLAY (CH) light grey, trace of medium sand	St		
						2/4/6 (N=10)			11					SPT 20cm above depth
1.49	29.8	53	29		UQN Su=133	Sup=225 Suv=137								push tube 90cm above depth
						8/4/7 (N=11)			12					
											SILTY SAND (SM) pale brown, fine to medium, low plastic fines	MD		change in drilling rate
									13					
									14					
	22.3			15.2		2/7/11 (N=18)								SPT 25cm above depth
									15					
											SILTY CLAY (CH) grey	F		change in drilling rate
									16					
						Sup=125 Suv=122								push tube 60cm above depth
									17		SILTY SAND (SM) brown, fine to coarse sand, trace black coarse sand	L		
						1/3/3 (N=6)					brown			SPT 65cm above depth
									18					sand boiling
						Sup=50 1/4/7 (N=11)					SANDY SILT (ML)/ SILTY SAND (SM) light grey, fine sand, trace black basaltic medium to coarse gravel	St		SPT 25cm above depth coring
									19		SILTY SAND (SM) grey, fine to medium, fines of low plactisity			
1.61	22.6	20	4	19.2					20					Gs=2.65

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											SILT (ML)/SILTY CLAY (CL) grey, with thin layers of brown	VSt		
						2/6/12 (N=18) Sup=125			21					
											SANDY SILT/SILT (ML) grey, fine sand			
									22		SILTY CLAY (CL) dark gray, black, trace fine to medium black basaltic gravel			
											SILT (ML) grey, trace thin layer bands	H		
											SILTY CLAY (CL)			
											SILT (ML)			
									23		SILTY CLAY (CL)			
						Sup=75					black Basaltic band			
						Sup=175					SILTY CLAY (CL) dark grey, with thin layer bands			
						4/9/13 (N=21)			24		SILT (ML)/SILTY CLAY (CL) dark grey, black	VSt		
						Sup=100								
						Sup=175					SILTY CLAY (CH)	VSt		
1.41	34.1	54	25	91.9	TRX c'=19 ϕ'=41°	Sup=>275			25		dark brown, trace brown thin layer, trace of fine to coarse sand, with thin different colour bands			Gs=2.62
					UQN Su=285	Sup=>225								
									26					
									27					
						Sup=>225								
									28					
						Sup=>225								
1.42	32.6			91.2	UQN Su=349				29					Gs=2.60
					TRX c'=66 ϕ'=31°	6/10/15 (N=25)					dark grey-brown, trace of fine to medium sand, with thin different colour bands	Vst		
									30		Borehole terminated in SILTY CLAY at 29.95m			

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