



William C. Cromer Pty. Ltd. Environmental, engineering and groundwater geologists:										DDH – SF7				
Engineering log – Cored borehole										Sheet 1 of 3				
Incorporating the Unified Rock Classification System (URCS)														
Project HYDRO TASMANIA DUNGROVE SCHEME					Location Southernfield (dam axis, lower west side)									
Coordinates			Drill type		Hole started		Hole finished							
490339.6mE 5320625.9mN			Hydra Power Scout		5 February 2008		7 February 2008							
Datum			Equipment		Drilled by		Checked by							
GDA94			120mm hollow auger NQTT triple tube core drilling		D. Roberts KMR Drilling Pty. Ltd.		W. Cromer							
RL			Drill fluid(s)		Logged by		Checked by							
Approx. 419m ASL			Water		D. Bear		W. Cromer							
Inclination														
84°														
Bearing														
010°														
Drilling information			Rock substance				Rock mass defects							
Bit type/size	Case type/size/lift	Fluid loss/water	Notes	Core recovery	RQD	metres	Graphic log	Substance description	Weathering	Est. strength	Nature of defects	Defect spacing (mm)	Defect description	Geol Interp
			3.3m 3.8kg 3.5m 2.2kg 5.9m 2.2kg SPT 2.2.3 N=5 SPT 4.5.7 N=12	30% 40% 60% 80%	20% 40% 60% 80%	Vertical depth Inclined depth		CLAY: dark brown to brown grading to yellow brown; sandy; moist; firm, to stiff towards end of interval	A B C D E	A B C D E	A B C D E	30 100 300 1000 3000	Significant General	Soil
			Auger run used on sandstone	1.4m 2.8kg (only)				SAND: brown-grey, slightly clayey, moist to wet, loose					1mm joints, clean, planar with inclined bedding	
			Packer test 2.3 to 6.0m Lugones = 0.0 Core alignment attempted at each run - unsuccessful					SANDSTONE: yellow brown and grey; fine grained; bedded					1-2mm joints clay infill planar along bedding	
			Packer test 2.3 to 6.0m Lugones = 0.0 Core alignment attempted at each run - unsuccessful					0.1m core loss (clay seam?)					1mm joint, clean along bedding, 1mm joint, clean angular	
			Packer test 2.3 to 6.0m Lugones = 0.0 Core alignment attempted at each run - unsuccessful					0.5m core loss (sand?)					10mm joint, clay infill with black oxide staining	
			Packer test 2.3 to 6.0m Lugones = 0.0 Core alignment attempted at each run - unsuccessful					SANDSTONE: brown; fine grained; bedded with minor small gravel; fossiliferous					1mm joints clean, planar along bedding	
			Packer test 2.3 to 6.0m Lugones = 0.0 Core alignment attempted at each run - unsuccessful					SILTSTONE: sandy; grey; bedded; minor black grains and thin bands					1mm joints clean, planar along bedding	
			Packer test 2.3 to 6.0m Lugones = 0.0 Core alignment attempted at each run - unsuccessful					SANDSTONE: brown; bedded; fine grained; minor shell fragments and some thin oxide stained bands					1mm joints clean, planar along bedding, plus 1mm steeply inclined across bedding	
			Packer test 2.3 to 6.0m Lugones = 0.0 Core alignment attempted at each run - unsuccessful										Fractured 7.3-7.95m joints closely spaced, clean, planar along bedding, plus 1mm steeply inclined across bedding	
			Packer test 2.3 to 6.0m Lugones = 0.0 Core alignment attempted at each run - unsuccessful										1mm = 4 MPa diametral 1mm = 2 MPa diametral / 6 MPa axial	
			Packer test 2.3 to 6.0m Lugones = 0.0 Core alignment attempted at each run - unsuccessful											Lower Triassic sedimentary rocks





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Project HYDRO TASMANIA DUNGROVE SCHEME						Location Southernfield (dam axis, lower west side)								
Coordinates 490339.6mE 5320625.9mN			Drill type Hydra Power Scout		Hole started 5 February 2008		Datum GDA94			Equipment 120mm hollow auger		Hole finished 7 February 2008		
RL Approx. 419m ASL			Drill fluid(s) Water		Logged by D. Roberts		Inclination 84°			Checked by W. Cromer				
Bearing 010°M														
Drilling information			Rock substance						Rock mass defects			Geol interp		
Bit type/size	Case type/size/lift	Fluid loss/water	Notes	Core recovery	RQD	metres	Graphic log	Substance description	Weathering	Est. strength	Nature of defects		Defect spacing (mm)	Defect description
			20% 40% 60% 80%	20% 40% 60% 80%	Vertical depth Inclined depth				A B C D E	A B C D E	A B C D E	30 100 300 1000 3000	Significant General	
			Packer test 0.34 to 13.0m Lugones = 1.2 Core alignment attempted at each run – unsuccessful			10		SANDSTONE: brown with yellow and red oxide staining as infill in fine veining; fine grained; bedded,					1mm joint, clean planar subhorizontal bedding $I_{p,ax} = 2.7\text{MPa}$ diametral, 4.7MPa axial	Lower Triassic sedimentary rocks
			Packer test 12.84 to 16.6m Lugones = 2.0			11		SANDSTONE: grey-brown; bedding sub-horizontal with some cross-bedding; fine grained					80mm wide clay seam 1mm joints, clean planar along bedding $I_{p,ax} = 4\text{MPa}$ diametral	
			Packer test 16.4 to 21.06m Lugones = 10g			12							1mm joints, clean, planar, along bedding and 45° across bedding 1mm joints, clean planar along bedding $I_{p,ax} = 3\text{MPa}$ diametral, 5.8MPa axial	
						13							1mm joints, clean, planar, along bedding and 45° across bedding 1mm joints, clean, planar, along bedding 3mm joints, planar, black oxide infill across bedding at 45°	
						14							30mm clay band at 15.2 1-2mm jts clean, planar Fractured zone 15.3-15.55 to 16.0 Clean jts along bedding, and vertical jts Fragmented 16.7 - 18.33	
						15							1mm joints, clean, planar, along bedding Fragmented 17.5 - 17.55 $I_{p,ax} = 3\text{MPa}$ axial	
						16								
						17								
						18		SANDSTONE: light brown, occasional small voids filled with pink clay (ie clay pellets); fine grained, visible sub-horizontal bedding						

Drilling T = Triple tube coring B = Blades R = Roller/Triaxone A = Auger W = Wash boring DT = Double tube coring HAM = Rotary hammer	Case lift Casing used No loss 50% loss 100% loss Barrel withdrawn	Fluid loss No loss 50% loss 100% loss	RQD (Rock Quality Designation Index) The sum of the lengths of sound core pieces >100mm in a drilling run is divided by the total core run length. Expressed as % Core length measured along centreline. Core drilling breaks not included.	Water <input type="checkbox"/> Level <input type="checkbox"/> Inflow <input type="checkbox"/> Outflow Unit weight (UW, g/cc) A = >2.55 B = 2.40-2.55 C = 2.25-2.40 D = 2.10-2.25 E = <2.10 Strength Hammer impact test Approx. point load strength index (IS/50), MPa Approx. UCS MPa A = rebound (RQ) >4 >103 B = pl (PG) 2-4 55-103 C = dent (DQ) 1-2 21-55 D = crater (CQ) 0.25-1 7-21 E = moldable, friable (MQ) <0.25 <7 Note: X on log is test result. Otherwise, strength is visually estimated. US = Unconfined Compressive Strength	Samples and Notes R = SPT penetration refusal D = Disturbed sample N = Standard Penetration Test pp = Hard penetrometer test SV = In-site Shear Vane test CS = Core Sample Ux = Undisturbed tube sample (x mm diameter) Nt = SPT and Disturbed Sample	Soil consistency Fine grained soils VS = Very Soft S = Soft F = Firm St = Stiff VSt = Very stiff H = Hard	Defects Joint Van Shear zone Crush zone Infill seam EW seam A = Solid random breaks (SRB) B = Solid preferential breaks (SPB) C = Solid latent breaks (SLB) D = Non intersecting planes (2-D) E = Intersecting open planes (3-D) Core loss Core loss (interval known) Core loss (interval unknown) Loss is shown in Graphic log column at top of run
Weathering A = Micro fresh state (MFS) B = Visually fresh state (VFS) C = Stained state (STS) D = Partly decomposed state (PDS) E = Completely decomposed state (CDS)	Soil density index Coarse grained soils Fb = Friable VL = Very Loose MD = Medium Dense D = Dense VD = Very Dense						





Drilling information										Rock substance										Rock mass defects									
Bit type/size	Case type/size/lift	Fluid loss/water	Notes Samples, tests, unit weight (UW, g/cc)	Core recovery 20% 40% 60% 80%	RQD 20% 40% 60% 80%	metres Vertical depth	metres Inclined depth	Graphic log	Substance description rock type, grain characteristics, colour, structure, minor components	Weathering A B C D E	Est. strength A B C D E	Nature of defects A B C D E	Defect spacing (mm) 50 100 200 1000 3000	Defect description thickness, type, inclination, planarity, roughness, coating	Geol Interp														
William C. Cromer Pty. Ltd. Environmental, engineering and groundwater geologists Engineering log – Cored borehole Incorporating the Unified Rock Classification System (URCS)										DDH – SF7 Sheet 3 of 3																			
Project HYDRO TASMANIA DUNGROVE SCHEME Location Southernfield (dam axis, lower west side)										Coordinates 490339.6mE 5320625.9mN Drill type Hydra Power Scout Hole started 5 February 2008 Datum GDA94 Equipment 120mm hollow auger Hole finished 7 February 2008 RL Approx. 419m ASL Drilled by D. Roberts Logged by D. Bear Inclination 84° Drill fluid(s) Water Checked by W. Cromer Bearing 010°M																			
Bit type/size: 1 1/2" Case type/size/lift: 100mm Fluid loss/water: Packer test 1B 4 to 21.05m Lugrems = 100 Notes: Samples, tests, unit weight (UW, g/cc) Core recovery: 20%, 40%, 60%, 80% RQD: 20%, 40%, 60%, 80% metres: Vertical depth, Inclined depth Graphic log: [Patterned area]										Substance description: SANDSTONE: light brown; visible sub-horizontal bedding; fine grained; occasional small voids filled with pink clay (ie clay pellets) Weathering: [Vertical scale] Est. strength: [Vertical scale] Nature of defects: [Vertical scale] Defect spacing (mm): [Vertical scale] Defect description: 1. ~4 5MPa diametral 1mm joints, planar with bedding, sub-horizontal clean Fragmented section 19.3-19.45m Vertical fractures from 20.1-20.85 (fragmented) 20.2 to 20.55										Geol Interp: [Empty]									
End of hole 21.05m metres: 22, 23, 24, 25, 26, 27										[Empty]										[Empty]									

