William C. Cromer Pty. Ltd. Environmental, engineering and groundwater geologists

Engineering log – Cored borehole

Incorporating the Unified Rock Classification System (URCS)

DDH – SF2

Sheet 1 of 1

Project HYDRO TASMANIA DUNGROVE SCHEME **Location** Southernfield (W embankment dam)

Coordinates		**Drill type**	Hydra Power Scout	**Hole started**	8 February 2008
489899mE 5320294mN		**Equipment**	120mm hollow auger 0-1.5m NQTT triple tube core drilling	**Hole finished**	8 February 2008
Datum	GDA94			**Drilled by**	D. Roberts KMR Drilling Pty. Ltd.
RL	Approx. 561 ASL				
Inclination	84°	**Drill fluid(s)**	Water	**Logged by**	D. Bear
Bearing	230°M			**Checked by**	W. Cromer

Drilling information: 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, Inclined depth)

Rock substance: 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)

Rock mass defects: Nature of defects (A B C D E); Defect spacing (mm) (30 100 300 1000 3000); Defect description (thickness, type, inclination, planarity, roughness, coating) Significant / General

Geol interp

Depth	Substance description	Defect description	Geol interp
A	SAND, grey brown, med grained, D; L-MD		Soil
	Silty CLAY grading to sandy CLAY: yellow-brown, low to intermediate plasticity, D; H		
	SANDSTONE and SILTSTONE yellow brown, distinctly weathered, low to medium strength		Lower Triassic sedimentary rocks
NO	SILTSTONE fine grained, yellow brown; bedded, with clay infill seams in joints	1mm joints clean along bedding planes	
		1-3mm joints along bedding, and angled clay infill	
		2mm joints along bedding, and clay infill, clay seam to 50mm at 2.35 – 2.4	
	clay infill seam	Highly jointed and fragmented	
		Joints 1 – 2mm wide, randomly orientated; clay infill 50-75mm spacing	
	End of hole at 5.5m		

SPT 2,2,5 N=7
SPT 22, >25, N>30

Drilling
T = Triple tube coring
B = Blades
R = Roller/Tricone
A = Auger
W = Wash boring
DT = Double tube coring
HAM = Rotary hammer

Case lift: Casing used; Barrel withdrawn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 Level Inflow 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	pit (PQ)	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 = Hand penetrometer test
SV = In-situ Shear Vane test
CS = Core Sample
Ux = Undisturbed tube sample (x mm diameter)
Nd = SPT and Disturbed Sample

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 consistency
Fine grained soils
VS = Very Soft
S = Soft
F = Firm
St = Stiff
VSt = Very stiff
H = Hard

Soil density index
Coarse grained soils
Fb = Friable
VY = Very Loose
L = Loose
MD = Medium Dense
D = Dense
VD = Very Dense

Defects
Joint, Vein, 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