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

Engineering log – Cored borehole

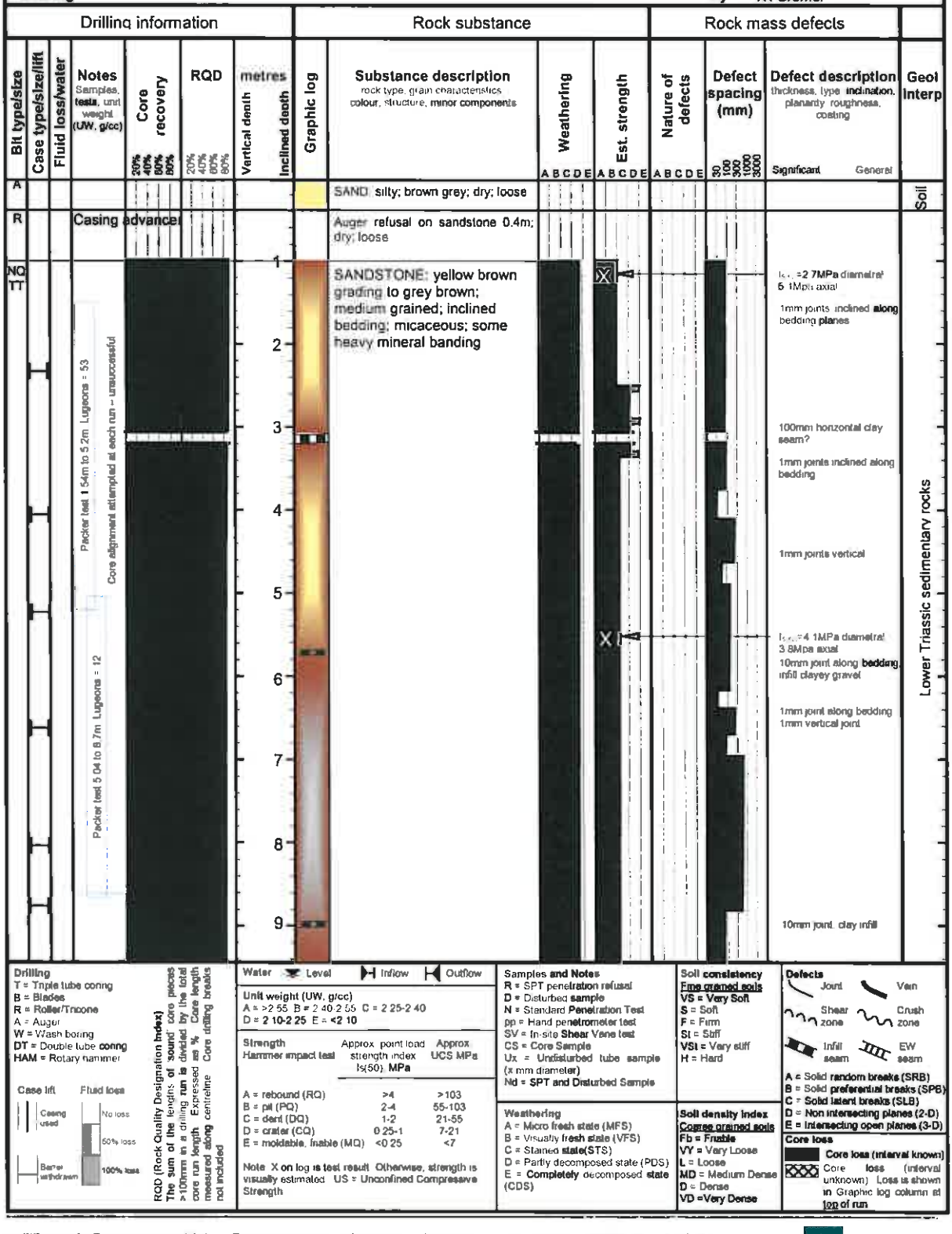
Incorporating the Unified Rock Classification System (URCS)

DDH – SF8

Sheet 1 of 2

Project HYDRO TASMANIA DUNGROVE SCHEME **Location** Southernfield (dam axis, east side)

Coordinates	490439.8mE 5320670.0mN	**Drill type**	Hydra Power Scout	**Hole started**	1 February 2008
Datum	GDA94	**Equipment**	120mm hollow auger NQTT triple tube core drilling	**Hole finished**	4 February 2008
RL	Approx. 537m ASL			**Drilled by**	D. Roberts KMR Drilling Pty. Ltd.
Inclination	Vertical	**Drill fluid(s)**	Water	**Logged by**	D. Bear
Bearing				**Checked by**	W. Cromer



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

Case lift / Fluid loss: Casing used; Barrel withdrawn; No loss; 50% loss; 100% loss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

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Bearing				**Checked by**	W. Cromer

Drilling information

Bit type/size: NQ TT

Case type/size/lift

Fluid loss/water

Notes Samples tests unit weight (UW g/cc): Core alignment attempted at each run – unsuccessful; Packer test 8.64 to 12.3m Lugeons = 1.6; Packer test 10.85 to 14.5m Lugeons = 0.03

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
10	SANDSTONE: m.g; yellow brown to brown; micaceous; grading to grey at 10.0m	1.0m joints, clean, inclined 10mm joint inclined, clay and limonite infill $I_{s(50)}$ = 1.6MPa diametral, 1.8Mpa axial
11		$I_{s(50)}$ = 1.6MPa diametral, 1.8Mpa axial
12		1mm joints, clean, inclined 1-2mm joints inclined with bedding, limonite stained
13	CLAYSTONE: grey to yellow brown; inclined bedding	50mm claystone band 12.6-12.65m
14		$I_{s(50)}$ = 0.2MPa diametral, 1.5Mpa axial
	End of hole 14.5m	**Note** Joints typically sub-horizontal along bedding planes, smooth, dark brown-black Fe-oxide staining. Bedding clearly visible, even in the claystone. Sandstone often has heavy mineral banding
15		
16		
17		
18		

Lower Triassic sedimentary rocks

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