



Hunter Water Corporation

TILLEGRA DAM DESIGN - CONSULTANCY 361802

Storage Rim Stability and Seepage Potential Engineering Geotechnical Report

VOLUME II

Report No. 08–GN31A–R2 Final Report V 4.1 February 2009

T 02 93727814 F 02 9372 7822 E dene.jamieson@commerce.nsw.gov.au

TABLE OF CONTENTS

VOLUME II – APPENDICES

- A: Definitions of Terms
- B: Investigation locations/geological field maps
- C: Tillegra Fault (trench log/photographic record)
- D: Investigation Trenches T1 and T2 (trench logs/photographic record)
- E: Test Pit logs TP1 to TP151

Appendix A

Definitions of Terms

DEFINITIONS OF ENGINEERING GEOLOGICAL TERMS

This classification system provides a standard terminology for the engineering description of rock.

TERM	SYMBOL	DEFINITION
Residual Soil	RS	Rock is converted to soil. The mass structure and material fabric are destroyed. There is a large change in volume, but the soil has not been significantly transported.
Extremely Weathered	EW	Rock substance affected by weathering to the extent that the rock exhibits soil properties - i.e. it can be remoulded and can be classified according to the Unified Classification System, but the texture of the original rock is still evident.
Highly Weathered	HW	Rock substance affected by weathering to the extent that limonite staining or bleaching affects the whole of the rock substance, and other signs of chemical or physical decomposition are evident. Porosity and strength may be increased or decreased compared to the fresh rock, usually as a result of iron bleaching or deposition. The colour and strength of the original substance is no longer recognisable.
Moderately Weathered	MW	Rock substance affected by weathering to the extent that staining extends throughout the whole of the rock substance, and the original colour of the fresh rock is no longer recognisable.
Slightly Weathered	SW	Rock substance affected by weathering to the extent that partial staining or discolouration of the rock substance, usually by limonite has taken place. The colour and texture of the fresh rock is recognisable.
Fresh (stained)	F _s	Rock substance unaffected by weathering. Weathering is limited to the surface of major discontinuities, for example an iron-stained joint.
Fresh	F	Rock substance unaffected by weathering.

DEGREE OF WEATHERING ¹

ROCK STRENGTH²

Rock strength is defined by the Point Load Strength Index (Is (50)), and refers to the strength of the rock substance in the direction normal to the bedding.

TERM	Is (50)	FIELD GUIDE	APPROX. qu MPa *
Extremely Weak (EW)		Easily remoulded by hand to a material with soil properties.	
	0.03		0.7
Very weak (VW)		May be crumbled in the hand. Sandstone is "sugary" and friable.	
` ,	0.1		2.4
Weak (W)		A piece of core 150mm long x 50mm dia. may be broken by hand and easily scored with a knife. Sharp edges of core may be friable and break during handling.	
	0.3		7
Medium Strong (MS)		A piece of core 150mm long x 50mm dia. may be broken by hand with considerable difficulty. Readily scored with a knife.	
	1		24
Strong (S)		A piece of core 150mm long x 50mm dia. cannot be broken by unaided hands, may be slightly scratched or scored with knife.	
	3		70
Very Strong (VS)		A piece of core 150mm long x 50mm dia. may be broken readily with hand held hammer. Cannot be scratched with pen knife.	
	10		240
Extremely Strong (ES)		A piece of core 150mm long x 50mm dia. is difficult to break with hand held hammer. Rings when struck with hammer.	

The approximate unconfined compressive strength (qu) shown in the table is based on an assumed ratio to the point load index of 24:1. This ratio may vary widely and should be calibrated on site.

*

STRATIFICATION SPACING²

TERM	SEPARATION OF STRATIFICATION PLANES
Thinly laminated	< 6mm
Laminated	6mm - 20mm
Very thinly bedded	20mm - 60mm
Thinly bedded	60mm - 200mm
Medium bedded	200mm - 600mm
Thickly bedded	600mm - 2m
Very thickly bedded	> 2m

DISCONTINUITY SPACING³

TERM	SPACING	
Very widely spaced	> 2m	
Widely spaced	600mm - 2m	
Moderately widely spaced	200mm 600mm	
Closely spaced	60mm - 200mm	
Very closely spaced	20mm - 60mm	
Extremely closely spaced	< 20mm	

APERTURE OF DISCONTINUITY SURFACES ⁴

The degree to which a discontinuity is open, or to which the faces of the discontinuity have been separated and the space subsequently infilled (such as in a vein, fault or joint).

TERM	APERTURE THICKNESS (Discontinuities, veins, faults, joints)
Wide	> 200mm
Moderately wide	60mm - 200mm
Moderately narrow	20mm - 60mm
Narrow	6mm - 20mm
Very narrow	2mm - 6mm
Extremely narrow	> 0 - 2 mm
Tight	Zero

BLOCK SHAPE AND SIZE ⁴

The following descriptive terms define shape:

Blocky	- approximately equidimensional.
Tabular	- one dimension considerably shorter than the other two.
Columnar	- one dimension considerably larger than the other two.

Block sizes are defined by the following descriptive terms:

TERM	BLOCK SIZE	EQUIVALENT DISCONTINUITY SPACINGS IN BLOCKY ROCK
Very large	> 8m ³	Extremely wide
Large	$> 0.2m^3 - 8m^3$	Very wide
Medium	$> 0.008 m^3 - 0.2 m^3$	Wide
Small	$> 0.0002 m^3 - 0.008 m^3$	Moderately wide
Very small	$\leq 0.0002m^{3}$	Less than moderately wide

REFERENCES

- 1. Modifications of:
 - (a) McMahon, B.K., Douglas, D.J., & Burgess, P.J., 1975. Engineering classification of sedimentary rocks in the Sydney area. <u>Australian Geomechanics Journal, G5 (1), 51-53.</u>
 - (b) Geological Society Engineering Group Working Party, 1977. The description of rock masses for engineering purposes. <u>Quarterly Jour. Engg. Geology</u>, 10 (4), 355-388.
- 2. McMahon, B.K., Douglas , D.J., & Burgess, P. J., 1975. Engineering classification of sedimentary rocks in the Sydney area. <u>Australian Geomechanics Journal, G5 (1), 51 -53.</u>
- 3. ISRM Commission on Standardisation of Laboratory and Field Tests, 1978. Suggested methods for the quantitative description of discontinuities in rock masses. <u>J1. Rock Mechanics Min. Sci. and Geomech. Abstra., 15, 319-368.</u>
- 4. Geological Society Engineering Group Working Party, 1977. The description of rock masses for engineering purposes. <u>Quarterly Journ. Engg Geology</u>, 10 (4), 355-388.

Appendix B

Investigation Locations/Geological Field Maps

Test Pit	Location	Easting (m)	Northing (m)	RL (m)
TP1		376039.4	6424891.7	116.6
TP2		376130.8	6424942.3	129.6
TP3		376241.4	6425023.1	146.8
TP4		376148.1	6424795.2	122.7
TP5		376076.1	6424664.6	114.4
TP6		375924.1	6424780.2	110.4
TP7		375942.7	6425073.0	118.7
TP8	1 5	376168.8	6425122.8	134.0
TP9	l llo	376353.5	6425145.0	160.4
TP10	6	376295.2	6425169.2	148.9
TP11	all	375768.7	6425092.0	123.7
TP12		375818.9	6425269.3	135.5
TP13	i.	375914.6	6425412.9	148.9
TP14		376101.5	6425460.5	161.6
TP15		376087.1	6425292.0	145.1
TP16	l illi	376056.7	6425122.9	125.3
TP17	l Š	376193.2	6425204.9	134.4
TP18	l nge	376563.5	6425539.6	235.2
TP19	Rai	376634.0	6425388.6	237.4
TP20	fer	376667.6	6425186.6	236.5
TP21	lest	376691.9	6425131.5	242.1
TP22	nich	376710.1	6425059.2	255.9
TP23	5	376703.2	6424945.1	268.8
TP24	of	376730.2	6424816.8	272.2
TP25] obe	376538.1	6425201.1	206.3
TP26	ı slo	376506.0	6425439.4	218.1
TP27	j tie	376264.3	6425425.9	176.0
TP28	/est	375789.7	6425574.3	132.0
TP29		375729.1	6425638.2	126.6
TP30		375893.0	6425743.2	130.8
TP31		375984.9	6425887.7	134.8
TP32		376129.0	6425755.1	160.0
TP33		376231.2	6425757.7	171.4
TP34		376251.2	6425947.0	161.6
TP35	-	376566.0	6425899.4	245.1
TP36		376545.9	6426099.1	240.3
TP37		376914.4	6423409.7	92.1
TP38	site	377079.7	6423385.6	90.6
TP39	ty m	377330.5	6423466.5	89.0
TP40	i dɛ	377241.9	6423639.0	94.4
TP41	pro 1 of	377140.4	6423587.1	95.4
TP42	ey] ean	377004.1	6423535.5	97.1
TP43	arl	377042.1	6423551.8	96.8
TP44	h H WN	376947.5	6423518.6	95.6
TP45	op)	376952.8	6423636.0	106.8
TP46		376984.8	6423676.9	109.1

Department of Commerce Test Pit Locations

TP47		377024.0	6423701.6	108.3
TP48	Farley property	377051.9	6423722.7	108.6
TP49		377066.7	6423779.5	112.6
TP50	continued	377123.9	6423777.5	107.0
TP51		377062.6	6423813.0	116.2
 TP52		377036.5	6423780.8	117.3
TP53		376878.3	642630.8	108.7
TP54	- Left spillway	376828.1	6423692.7	114.8
TP55	- alignment	376764.3	6423753.2	112.4
TP56		376927.6	6424072.0	145.8
	- Lowrey	377030.0	6424088.2	125.1
TP58	- property	377116.0	6423948.7	118.3
	Left spillway crest	376704.5	6423884.2	165.7
TP60		376498.8	6423649.7	127.8
		376508.1	6423598.3	118.4
TP62		376491.7	6423531.8	112.1
TP63	eut	376447 1	6423683.8	140.9
TP64	- E	376436.9	6423631.7	129.8
TP65	- apr	3764197	6423596.6	119.6
TP66	- ³ U	376398.8	6423544.5	104.8
TP67	- Te -	376369.0	6423451.2	96.2
TP68		376369.4	6423422.3	93.3
TP69		376366.9	6423375.0	93.1
TP70		376265.4	6423420.6	101.8
TP71	Upstreamcoffer dam	376266.0	6423386.2	98.4
TP72		376271 7	6423341.3	95.0
TP73		376630.7	6423273.2	103.4
TP7/		376692 5	6423206.5	103.2
TP75	Diversion	376780.2	64231321	99.7
TD76	outlet/right	376727 1	6423097.5	103.8
TP77	- spillway	376672.4	6423069.6	108.5
TD78	alignment	376825.9	6423161.0	97.1
TP70	-	376005.1	6423194.1	94.3
TD90	Dight spillway	376517.7	6422913 3	176.9
	_ Right Spilway	376/80 1	6423006 7	169.3
	CICSI	376468 3	6423052.9	160.9
TD92	-	376477.8	6423106.3	148 5
TD94	t	376486.2	6423162.3	137.3
TD05	me l	376471.0	6423102.5	127.4
	- Jut	376460.4	6423245.4	116.4
TD97	t al	376445.6	6423094 7	150.9
	– igh	376/22 0	6423132.0	130.3
	- ☆	276/15 2	6423175.0	128.6
1189 TD00	-	276402.0	6/23202.2	120.0
		275051 /	6423203.3	104.3
	Elwari Mtn.	275050 2	6/222/6 1	104.3
	eastern slope	275050 0	6422340.1	103.0
	S	276600 0	6422122 7	116.6
1194	See over	3/0009.8	0423133./	110.0

TP95		376656.2	6423155.5	109.4
TP96		376699.8	6423175.4	103.7
TP97	sut –	376751.1	6423204.8	98.2
TP98		376788.4	6423224.0	96.9
TP99	– igi	376835.1	6423237.0	95.2
TP100	y al	376897.1	6423258.1	93.6
TP101	way	376794.7	6423291.5	95.1
TP102		376726.4	6423308.3	96.4
TP103	t st	376607.9	6423347.4	96.3
TP104	ligh	376596.4	6423191.4	115.1
TP105		376708.1	6422995.9	112.1
TP106	lise	376788.8	6422982.9	104.9
TP107	- Sev	376873.7	6423009.3	101.4
TP108		376887.3	6423109.4	99.2
TP109		376813.0	6423070.0	99.8
TP110		377184.8	6424889.9	134.6
TP111		377131.1	6424880.0	141.9
TP112		377144.3	6424881.9	140.1
TP113		377096.1	6424874.0	147.5
TP114		377070.9	6424870.2	151.2
TP115		377019.6	6424859.0	164.6
TP116		376996.2	6424850.4	172.9
TP117		377097.4	6424513.8	139.3
TP118		377008.6	6424524.9	150.5
TP119	nge -	376938.4	6424524.4	165.9
TP120	Ra	376972.0	6424538.6	157.9
TP121	per	376894.6	6424552.6	176.3
TP122	lle£	377123.3	6424629.6	136.0
TP123		377057.2	6424642.1	148.1
TP124	of	377021.4	6424651.1	157.3
TP125	J	376972.6	6424663.0	172.4
TP126	wre vre	377035.4	6424572.0	144.3
TP127	Cov	377006.3	6424571.2	146.2
TP128]]	377096.6	6425342.7	132.6
TP129	e e	377037.0	6425331.3	143.4
TP130		376998.2	6425321.2	152.9
TP131		376959.5	6425310.5	163.5
TP132		376866.9	6425268.7	200.5
TP133		376980.8	6425315.2	157.6
TP134		376935.8	6425299.8	171.8
TP135		376927.6	6425583.2	157.4
TP136		376977.0	6425581.7	146.1
TP137		376953.5	6425581.9	151.0
TP138	A	376324.4	6425440.1	182.2
TP139	p 2	376338.4	6425497.0	198.7
TP140	Isli	376310.7	6425452.1	186.4
TP141	anc	376455.9	6425466.7	212.2
TP142		376413.5	6425438.3	198.8

TP143		376386.4	6425455.3	193.4
TP144		376488.7	6425400.7	210.9
TP145	V I	376471.4	6425429.5	209.8
TP146	p 2 ued	376416.0	6425525.7	213.7
TP147	lslij	376380.2	6425516.9	206.8
TP148	and	376454.6	6425540.4	221.0
TP149	Γ	376216.0	6425250.1	143.5
TP150		376162.6	6425326.3	142.9
TP151		376174.4	6425344.0	148.1

Department of Commerce Diamond Drilling

Borehole	Location	Easting (m)	Northing (m)	RL (m)
DDH1	Spillway	376501.0	6422961.5	173.8
DDH2	alignment	376684.2	6423075.2	107.2
DDH3	Dight abutmont	376494.2	6423242.4	118.7
DDH4		376309.3	6423178.8	122.4
DDH5		376387.2	6423508.8	97.7
DDH6	Left abutment	376455.7	6423606.5	127.6
DDH7		376506.0	6423774.1	147.5
DDH8		376696.6	6423871.6	165.6
DDH9	Quarry Area B	375664.0	6423067.3	163.4
DDH29	Londelin 2A	376556.3	6425443.1	227.4
DDH30	Lanuship ZA	376469.8	6425528.9	221.6

Douglas Partners Diamond Drilling (Salisbury Road Realignment)

Borehole	Location	Easting (m)	Northing (m)	RL (m)
412		376674	6425591	231.7
413		376219	6427216	244.0
414	Salisbury Road	376615	6425914	247.2
421	realignment	377035	6424898	231.7
422		376916	6425026	182.0
423		376866	6425265	202.0







...\TILLEGRA\geology\geo_B2A.dgn 23/01/2009 9:11:09 AM



...\TILLEGRA\geology\geo_B2B.dgn 22/01/2009 9:42:05 AM

Appendix C

Tillegra Fault (trench log/photographic log)





		JOHN LEE Director General – N.S.W. Department of Commerce	N LEE . Department of Commerce		IST	a že A	т
DETAILS OF AMENDMENTS		NEW SOUTH WALES WATER SOLUTIONS WATER TECHNOLOGIES LEVEL 13, MeKELL BUILDING	GEOTECHNICAL AND ENVIRONMENTAL	SUPERVISOR J.F.YOUNG DRAFTED J.D.EDWARDS		Commerce	TI TI
		2-24 RAWSON PLACE SYDNEY 2000 PHONE (02) 93727873 FAX (02) 93727877		CHECKED J.F.YOUNG	MAY 2008		Investigation
30 390	50	150				I	



Plate TF1. Chn.4.3m. Meta-shale, bedding dipping upstream at 50° in direction 250°M.



Plate TF2. Chn.8.3m. Meta-shale, dipping upstream at 65° to 70° in direction 275°M.



Plate TF3. Chn.17m to 22m. General view of the fault plane dipping downstream (to the right of the photograph).



Plate TF4. Chn.17m to 22m. Fault plane dipping (downstream) into the floor of the trench.



Plate TF5. Chn.11.4m. Fault plane dipping downstream (to the right of the photograph). Brecciated zone overlying meta-shale.



Plate TF6. Chn.14.3m. Fault plane dipping downstream, with shearing parallel to the fault plane.



Plate TF7. Chn.19.5m. Fault plane dipping downstream.



Plate TF8. Chn.19.5m. Narrow clayey zone (pale grey), immediately above the fault plane.



Plate TF9. Chn.20.5m. Fault plane dipping downstream with shearing parallel to the fault plane.



Plate TF10. Fault plane dipping into the floor of the trench.



Plate TF11. Infilling slopewash deposit above fault plane.



Plate TF12. Chn.37m to 52m. General view of the meta-shale downstream of the fault zone (dipping downstream at 40° to 30° in direction 060°M to 072°M.



Plate TF13. Chn.37m. Well defined bedding dipping downstream at 40° in direction 073°M.



Plate TF14. Chn.39m. As above (refer to Plate 13).

Appendix D

Investigation Trenches T1 and T2 (trench logs/photographic record)





T1A – Refusal/difficult digging on moderately weathered/slightly weathered tuffaceous sandstone

AM G:NS\Watertec\Geotech\PCAD\TILLEGRA\TRENCHES\tr





T1B

Contact between meta-shale and underlying tuffaceous sandstone



LOGGED: J.F.Y, 16.01.08 SOUTH 12metres DEPTH (metres) Meta-shale; thinly laminated/laminated, yellowbrown/greybrown,HW to MW with depth, VW to W/MS. Defect spacing extremely close to very close (occasionally close).Surface Fe/Mn stained, commonly clay coated. Direct contact with underlying tuffaceous sandstone 25°/245°(uphill side) 30 °/250° downhill side. Bedding 25°/232° 12°/230° 18°/255°(uphill side). Major joint sets 60°/043° 65°/053° 87° /121° T1C FILE No. **TILLEGRA DAM** GN31A **TRENCH 1** FIGURE No.

)

T1



T2B – Contact between meta-shale and

underlying tuffaceous sandstone

T2A – Refusal on slightly weathered tuffaceous sandstone



T2C – Gravelly silty clay overlying meta-shale

ILLEGRA DAM	FILE No. GN31A
TRENCH 2	FIGURE No.
neter – Chichester Range	T2



Plate T1A. Chn.4.5m to 10m. Refusal/difficult digging on moderately weathered/slightly weathered tuffaceous sandstone.



Plate T1B. Chn.9m. Contact between meta-shale and underlying tuffaceous sandstone.



Plate T1C. Chn.9m. Contact between meta-shale and underlying tuffaceous sandstone.



Plate T2A. Chn.6.5m. Refusal on slightly weathered tuffaceous sandstone.



Plate T2B. Chn.9.5m. Contact between meta-shale and underlying tuffaceous sandstone.



Plate T2C. Chn.10.7m. Gravelly silty clay overlying meta-shale.

Appendix E

Test Pit Logs – TP1 to TP151



GEOTECHNICAL & ENVIRONMENTAL

TEST PIT

TP1

PROJECT: TILLEGRA DAM

RA DAM

LOCATION: STORAGE/STORAGE RIM

DATE: 24.10.07

SURFACE RL: 116.6m

CONTRACTOR: R.& I. CONTRACTING OPERATOR: PHIL GARLAND EQUIPMENT: KOMATSU PC220

DEPTH (m)	WATER	BIT	SAMPLE TEST	SOIL Group	GRAPHIC Log	SOIL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks
0				SM (v)	<u>, </u>	TOPSOIL - sandy slit, rootlets;
	N.G.E			CL/CI (v)		pale brown; firm; just moist.
				ROCK		TUFFACEOUS SANDSTONE; END at 0.75 moderately weatherd; weak/medium strong; fine grained; pale brown. Appears flatly bedded
- 1 - 1						10 / 290 ; Illassive, slow digging.
						-
-						
3						- · · · · · · · · · · · · · · · · · · ·
						-
						-
4						
• • • •						-
стания Бала						
U D SPT CPT	I SAMPI Undist Distur Stand	LE OR urbed bed ord Pe Penetr	I TEST enetration Te ration Test	y : vîs l : lat est	ual poratory	WATERFIELD SUPERVISOR:J.F.YOUNGWater TablePROJECT COORDINATOR:J.F.YOUNGWater InflowSHEET1 OF1SCALE1:25

Comin	nerce		GEOTEC	HNICA	L& E	INVIRONMENTAL	TEST	PIT	TP2	
PROJE LOCA Cont	ECT: TION: RACTO	TI S R: R. 8	LLEGRA TORAGE, (I. CONT	DAM /Stor Racti	AGE I NG 0	RIM PERATOR: PHIL GARLA	DATE: 24.1 Surface RL: ND Equipment:	0.07 129.6m KOMATSU	PC220	
DEPTH (m)	WATER	BIT	SAMPLE of test	SOIL GROUP	GRAPHIC Log	Soil type, co	SOIL DESCRIP blour, consistency, g	TION roinsize, moisture	, remarks	
10				SM (v)		TOPSOIL - sandy sil brown; firm; dry.	t, rootlets;			0.30
	N.G.E			ROCK	· · · · · · · · · · · · · · · · · · ·	META-SHALE; laminated; moderately medium strong; defe bedding 50° /165.°	weathered; ge ct spacing very	nerally close/close	;;	
- 1					$\langle - \langle - \rangle$ $\langle - \langle - \rangle$ $\langle - \langle - \rangle$	Endo og obovo			END a	nt 1.00-
<u>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</u>						Ends as above.		·		
-2										
3										
4						- 				
uluuluu R										
U U D SPT CPT	L SAMPI Undist Distur Stand Cone	E OR urbed bed ard Po Peneti	TEST Tenetration T ation Test	v : vis l : lat est	l val voratory	WATER FIEL Water Table Water Inflow SC/	D SUPERVISOR: Ject Coordinato et 1 of Ale 1:2	J. DR: J. 1 SHEETS 5	F.YOUNG F.YOUNG	

a 🛎 å	
KRHENAL_	
o succes	
NSW Department of	
0000000000	

GEOTECHNICAL & ENVIRONMENTAL

TEST PIT

TP3

Com	iterce										· · · · · · · · · · · · · · · · · · ·	
PROJE	CT:	TIL	LEGRA	DAM				DA	ATE: 24.10.0	7		
LOCA	TION:	S	TORAGE/	STOR	AGE	RIM		รเ	URFACE RL:	146.8 m		
CONT	RACTO	R: R. &	I. CONT	RACT	ING (PERATOR: PH	IL GA	RLAND E	QUIPMENT: KO	MATSU	PC220	
DEPTH	WATCO	DIT	SAMPLE	SOIL	GRAPHIC			S0	IL DESCRIPTION			
(n)	M A I G N	DII	TËST	GROUP	LOG		Soil type, colour, consistency, grainsize, moisture, remarks					
0	ered			SM (v)			- sandy	/ silt, roo drv	tlets;			0.15-
	counte			SM/SC		Slightly C	LAYEY	SANDY	SILT;			
 	er Enc			(V)		orangebro	wn; tirn	i; ary to	just moist.			0.65
-1	iroundwate			ROCK		META-SH laminated; bedding 7	ALE; modera 3 º/195	ntely wea °.	thered; gener	rally wea	ık;	ىلىيىلى
	No G					-					ENC	at 1.30
						Ends as a	above.					
-												
-				1								1
2												
-												
-												
_												- T
-												
-3												
<u> </u>												4
-												_
-												111
-												
				1								
-4 :												4
-			-									
				1								Ę
5												
	SAMP	LEOR	TEST	v : vis	ual	WATER		FIELD SU	PERVISOR:		J.F.YOUNG	-
UUndisturbed L : laboratory DDisturbed						🖌 🔽 Water	Toble	PROJECT	COORDINATOR:	CHEETS	J.F.YOUNG	
SPTStandard Penetration Test CPTCone Penetration Test						Voter	Inflow	SCALE	1: 25	J1661 C	- 	


TEST PIT

TP4

PROJECT:

TILLEGRA DAM

STORAGE/STORAGE RIM LOCATION:

DATE: 24.10.07

SURFACE RL: 122.7m

DEPŢH	PTH WATER BIT SAMPLE SOIL GRAPHIC SOIL DESCRIPTION		SOIL DESCRIPTION				
(M) 			TEST	UKUUP		Soil type, colour, consistency, grainsize, moisture, remarks	
0			- HERAL	SM (v)		TOPSOIL - SANDY SILT, rootlets; 0.20 _ pale brown; loose; dry.	
	N.G.E			SC (v)		CLAYEY SAND/SANDY CLAY with gravel; yellowbrown/brown, mottled; stiff; dry.	
- - - - - -				ROCK	/ ·/ / · · · · · / · - · · - /	TUFFACEOUS SANDSTONE; extremely weathered; extremely weak; behaves as slightly clayey sand.	
	- -					Refusal on tuffaceous sandstone; moderately weathered/slightly weathered; medium strong/strong. Massive, no indication of bedding.	
						· · ·	1111111
3							بليتنايب
4							
– 0 U D SPT CPT] SAMPI Undist Distur Stand Cone	LE OR urbed bed ard P Penet	I TEST enetration T ration Test	v : vis l : loi est	ual boratory	WATERFIELD SUPERVISOR:J.F.YOUNGWater TablePROJECT COORDINATOR:J.F.YOUNGWater InflowSHEET1 OF1SCALE1:25	



TEST PIT

.

TP5

PROJECT: TILLEGRA DAM

LOCATION: STORAGE/STORAGE RIM

DATE: 24.10.07

SURFACE RL: 114.4m

DEPTH (m)	WATER	BIT	SAMPLE of test	SOIL Group	GRAPHIC Log	SOIL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks
0				SM (v)		TOPSOIL - sandy silt, rootlets;pale brown; loose; dry.0.30
		No Groundwater Encountered	D	CL/CI (v)	· · · · ·	SANDY CLAY; pale brown with orangebrown streaks; stiff/very stiff; just moist. 0.75-
1 1 2 3	No Groundwater Encountered		D	ROCK	I <td>CONGLOMERATIC TUFFACEOUS SANDSTONE; extremely weathered; extremely weak; behaves as clayey sand with well rounded gravel/cobbles; yellowbrown/orangebrown, mottled. END at 3.00 Ends as above, highly weathered/moderately weathered. No Indication of bedding.</td>	CONGLOMERATIC TUFFACEOUS SANDSTONE; extremely weathered; extremely weak; behaves as clayey sand with well rounded gravel/cobbles; yellowbrown/orangebrown, mottled. END at 3.00 Ends as above, highly weathered/moderately weathered. No Indication of bedding.
4 5 U SPT. CPT.	SAMP Undis I Distur Stanc Cone	LE OR turbed bed fard P Penet	TEST enetration Te	v : vis l : lol est	ual boratory	WATER FIELD SUPERVISOR: J.F.YOUNG Water Table PROJECT COORDINATOR: J.F.YOUNG Water Table SHEET 1 OF 1 Water Inflow SCALE 1: 25 25



ENVIRONMENTAL Q.

TEQT PIT

TP6

			GEVIEC	muica					
PROJI		TI	LEGRA	DAM			DATE: 24.10.07		
LOCA	TION:	S	TORAGE/	STOR	AGE I	RIM	SURFACE RL: 110.	4m	
CONT	RACTO	R: R. 8		RACT	ING o	PERATOR: PHIL GARLA	ID EQUIPMENT: KOMA	TSU PC22	20
05011			SAMPLE	COII	CDYDRIC		SOIL DESCRIPTION		
(M)	WATER	BIT	TEST	GROUP	LOG	Soil type, co	our, consistency, grainsize,	noisture, remor	s
0	 			SM	1.7.	TOPSOIL - sandy silt	rootiets:		
- -	pa			(v)	<u>/./</u>	_ pale brown; loose; dry	•		
,	Iter				• • •	SANDY CLAY with g	ravel;		
	Inoc			CL/CI	· · · ·	stiff; just moist.	iwii, streakeu,		
	Ēn			(v)	· · · ·				
	ater				• • •				
-1	Mpu				$\frac{\cdot \cdot \cdot}{-1}$,			1.00-
	irou					META-SHALE; highly weathered/mod	lerately weathered; g	enerally	
	0			ROCK		medium strong; lamina	ated to very thinly b	edded;	
	Z					bedding 13 7 100 °.			
•					- \ - \ -			-	
						Ends as above.			
~									
- 2						4			
									- T
						- /			
-3									
									Ę
-4									l l l l l l l l l l l l l l l l l l l
,									
				· .					
<u> </u>									
									1
- 	1								
5				<u> </u>				, ,	
11	SAMP	LE OR	TEST	v : vis	ual boratorv	WATER FIELD	SUPERVISOR:	J.F.YOL	
DDisturbed						Water Toble PROJ	T 1 OF 1 S	J.M.TOL HEETS	
SPTStandard Penetration Test CPTCone Penetration Test						♥ Water Inflow SCA	LE 1:25		

TEST PIT

PROJECT: TILLEGRA DAM

LOCATION: STORAGE/STORAGE RIM

DATE: 24.10.07

SURFACE RL: 118.7m

CONTRACTOR: R.& I. CONTRACTING OPERATOR: PHIL GARLAND EQUIPMENT: KOMATSU PC220

DEPTH (m)	WATER	BIT	SAMPLE of test	SOIL Group	GRAPHIC Log	SOIL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	
- 0				SM (v)		TOPSOIL - sandy silt, rootlets; pale brown; loose; dry. 0.	- 30-
2	No Groundwater Encountered	D	SC V		<text></text>	00 00100000000000000000000000000000000	
3				ROCK		CONGLOMERATIC TUFFACEOUS SANDSTONE; highly weathered; generally weak. Includes well rounded gravel. No Indication of bedding.	TILLILL
4						Ends as above. Slight seepage into pit.	
U D SPT CPT	SAMPI Undist Distur Stand Cone	E OR urbed bed ard Pi Peneti	TEST enetration Te ration Test	v : vis l : lot est	ual oratory	WATER FIELD SUPERVISOR: J.F.YOUNG Water Table PROJECT COORDINATOR: J.F.YOUNG Water Inflow SHEET 1 OF 1 SHEETS SCALE 1: 25	

TP7

	_
CALCE	
NSW Department of	è
Jommerce	

PROJECT:

GEOTECHNICAL & ENVIRONMENTAL

TEST PIT

TP8

TILLEGRA DAM

LOCATION: STORAGE/STORAGE RIM

DATE: 24.10.07

SURFACE RL: 134.0m

DEPTH (m)	WATER	BIT	SAMPLE or test	SOIL Group	GRAPHIC Log	SOIL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	· .
0	ą			SM (v)		TOPSOIL - sandy silt with trace of clay, rootlets; pale brown; loose; dry.	0.30
	Encountere			SC (v)		CLAYEY SAND; orangebrown; stiff; just moist.	0.80
1 1 1	iroundwater			ROCK		TUFFACEOUS SANDSTONE; highly weathered; very weak/weak; medium grained; possible bedding 35º/147º.	
	No G					END	at 1.70-
2				. ,		Ends as above.	ليتبات
e a l'a r a r l							بالبيبا
3				,			لىبىلى
		:					
4							ليتبابي
							بلتبيلي
5							
SAMPLE OR TEST UUndisturbed DDisturbed SPTStandard Penetration Test CPTCone Penetration Test			v : vis l : lat st	ual poratory	WATERFIELD SUPERVISOR:J.F.YOUNGWater TablePROJECT COORDINATOR:J.F.YOUNGWater InflowSHEET10F1SCALE1:25		

Comr	nerce		GEOTEC	HNICA	L& E	ENVIRONMENTAL	TEST PI	т ТР9	
PROJ	ECT:	TI	LEGRA	DAM			DATE: 24.10.07	1	
LOCA	TION:	S	TORAGE/	STOR	AGE I	RIM	SURFACE RL: 10	60.4m	
CONT	RACTO	R: R.8	I. CONT	RACT	ING 0	PERATOR: PHIL GA	RLAND EQUIPMENT: KOI	MATSU PC220	
DEPTH	WATED	DIT	SAMPLE	SOIL	GRAPHIC		SOIL DESCRIPTION		
(m)		μn	TĔŚT	GROUP	LOG	Soil ty	ype, colour, consistency, grainsi	ze, moisture, remorks	
0				SM (v)		TOPSOIL - sandy pale brown; loose	y silt, rootlets; e; dry.		0.25-
	tered			GM (v)	0,0,0	GRAVELLY SILT	Y SAND;		0.50
	ount				<u> </u>		ANDSTONE:		5.00
E	Enc				(-) - (-)	highly weahered;	generally weak;	0	1:1:
	ater				· \ - \ - - \ - \ - /	tine grained; posi	sible bedding 44-7200		
E -1	Mpu			ROCK	····/				-
	Srou				$\cdot \cdot - \cdot -$, la
Ē	9				·_\-/				
Ē								END	at 1.70
-		·		<u></u>	<u> </u>				
						Ends as above.			1.1
2									-
Ē								,	
Ē									
				:					-
Ē						•			
È,									
-3									-
Ē									_
È									-
					· ·				
F									
Ea									-
Ę									
Ē									
Ē									-
Ē									
5				<u> </u>		LIATED			
U D SPT. CPT.	SAMPI Undist Distur Stand Cone	.E OR urbed bed ord Pe Penetr	TEST enetration Tu ation Test	v : vis l : lol	ual boratory	WATER Water Table Water Inflow	FIELD SUPERVISOR: PROJECT COORDINATOR: SHEET 1 OF 1 SCALE 1 : 25	J.F.YOUNG J.F.YOUNG SHEETS	



GEOTECHNICAL & ENVIRONMENTAL

STORAGE/STORAGE RIM

TEST PIT

TP10

PROJECT: TILLEGRA DAM

DATE: 24.10.07

SURFACE RL: 148.9m

DEPTH (m)	WATER	BIT	SAMPLE of test	SOIL Group	GRAPHIC Log	SOIL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remar	ks
-0				SM (v)	[.].]	TOPSOIL - sandy silt, rootlets; -> pale brown; loose; dry.	0.20-
	I.G.E			CL/CI (v)	· · · · ·	CLAYEY SILT with gravel; dark brown with orangebrown streaks; stiff; just moist.	0.60-
- - - - - - - - - - -			•	ROCK		TUFFACEOUS SANDSTONE; highly weathered/moderately weathered; weak/medium strong; fine grained; possible bedding 10°/176°.	END at 1.00-
						Ends as above.	
	·						
-							1
2							
3							L
				-			
-4							
1 Inni							
E 5 U D SPT. CPT.	SAMP Undist Distur Stand Cone	LE OR urbed bed lard Pi Peneti	TEST enetration Ta ration Test	v : vis l : la est	ual boratory	WATERFIELD SUPERVISOR:J.F.YOWater TablePROJECT COORDINATOR:J.F.YOWater InflowSHEET1 OF1SCALE1:25	UNG UNG

NSW Department of
Commerce

TEST PIT

TP11

PROJECT: TILLEGRA DAM

LOCATION: STORAGE/STORAGE RIM

DATE: 24.10.07

SURFACE RL: 123.7m

DEPTH (m)	WATER	BIT	SAMPLE or test	SOIL Group	GRAPHIC Log	SOIL DESCRIPTIC Soil type, colour, consistency, grai	N nsize, moisture, remarks
0	N.G.E			SM (v)		OPSOIL - sandy silt, rootlets; pale brown; loose; dry.	0.25-
1 1 1 1 1 1 F						UFFACEOUS SANDSTONE; highly weathered/moderately weathe generally medium strong; medium gra possibly flat lying.	END at 0.30 - red; ained;
-						inds as above.	
		:		· .			
-2							
-3							
• • •							
4							
5	SAMP	LE OR	TEST	y : yis	U01 .	WATER FIELD SUPERVISOR:	J.F.YOUNG
U D SPT CPT	Undist Distur Stand Cone	urbed bed lard Pe Penetr	enetration Te ation Test	<u>ll : lat</u> est	boratory	Water Table PROJECT COORDINATOR SHEET 1 OF 1 SCALE 1: 25	SHEETS



GEOTECHNICAL & ENVIRONMENTAL

STORAGE/STORAGE RIM

TEST PIT

TP12

PROJECT: TILLEGRA DAM

DATE: 24.10.07

SURFACE RL: 135.5m

DEPTH (m)	WATER	BIT	SAMPLE OF TEST	SOIL GROUP	GRAPHIC Log	SOIL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	
0				SM (v)	[.]. .	TOPSOIL - sandy silt, rootlets; 0.15	5-7-7
	N.G.E			SC (v)		Slightly CLAYEY SAND; orangebrown/yellowbrown, streaked; firm; just moist. 0.61	
- - - -				ROCK	<u></u> 	TUFFACEOUS SANDSTONE; highly weathered/moderately weathered; medium strong; fine grained. Thisly hedded at 10% (120%	1 1 1 1 7
		-	-			Refusal on medium grained massive tuffaceous sandstone; moderately weathered; medium strong.	
• •				-			111111
2							1.1.1.1.1
3							
, , , , , , , , , , , , , , , , , , ,							
4							
، ، بابیدار							
5							
U D SPT. CPT.	SAMP Undist Distur Stond Cone	LE OR urbed bed lard P Penet	TEST enetration T ration Test	v : vis l : lol est	ual boratory	WATERFIELD SUPERVISOR:J.F.YOUNGStater TablePROJECT COORDINATOR:J.F.YOUNGWater InflowSHEET1 OF1SCALE1:25	



GEOTECHNICAL & ENVIRONMENTAL

STORAGE/STORAGE RIM

TEST PIT

TP13

PROJECT: TILLEGRA DAM

DATE: 24.10.07

SURFACE RL: 148.9m

DEPTH (m)	WATER	BIT	SAMPLE of TEST	SOIL GROUP	GRAPHIC Log	SOIL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	
0	N.G.E			SM (v) CL/C1 (v)		TOPSOIL - sandy silt, rootlets; pale brown; loose; dry. SANDY CLAY; yellowbrown; very stiff; dry.	0.15
				ROCK	· · · · · · · · · · · · · · · · · · ·	TUFFACEOUS SANDSTONE; END moderately weathered; medium strong; END medium grained; bedding appears flat lying. Possible bedding 5 º/125 º.	0.60-
						Ends as above.	l
2		-				- - -	يبيليبيلي
r l				· ·			
- - - - - - - - - - - - - - - - - - -							
							ليتباينيا
5 U D SPT CPT	SAMPI .Undist .Distur Stand Cone	.E OR urbed bed ard Pa Peneta	TEST enetration Tration Test	v : vis l : lol	ual poratory	WATERFIELD SUPERVISOR:J.F.YOUNGYuter TablePROJECT COORDINATOR:J.F.YOUNGWater InflowSHEET1 OF1SCALE1:2525	



GEOTECHNICAL & ENVIRONMENTAL

STORAGE/STORAGE RIM

TEST PIT

TP14

PROJECT: TILLEGRA DAM

DATE: 25.10.07

SURFACE RL: 161.6m

DEPTH (m)	WATER	BIT	SAMPLE of test	SOIL Group	GRAPHIC Log	SOIL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks			
0	tered			SM (v)		TOPSOIL - sandy silt with trace of clay, rootlets; pale brown; loose; dry.	0.25-		
huuluu	ter Encoun			CL/CI {v}		SILTY CLAY with sand; yellowbrown/orangebrown, streaked; stiff; moist.	0.70		
1) Groundwa			ROCK	· · · · · · · · · · · · · · · · · · ·	TUFFACEOUS SANDSTONE; moderately weathered; medium strong/strong; fine grained; bedding 5°/295°. Major joint set 72°/007°. Defect spacing very close/close.			
	No				- \ \	END	at 1.25-		
						Ends as above.			
2							1111		
							Luil		
						· · · · ·			
3				-					
l									
4									
			-				يباب		
5									
U D SPT CPT	SAMPL Undist Distur Stand	.E OR urbed bed ard Pe Penetr	TEST enetration Te ration Test	v : vis l : lat	uol oratory	WATERFIELD SUPERVISOR:J.F.YOUNGWater TablePROJECT COORDINATOR:J.F.YOUNGWater InflowSHEET1 OF1SCALE1:2525			

C ^{NSW Dep}	ertment of	k	GEOTECI	INICA	L & E	NVIRONMEN	ſAL	TEST PIT	TF	915
PROJE LOCA CONT	ECT: TION: Racto	TII S R:	LLEGRA I TORAGE/ R.& I. C	DAM STOR CONTE	AGE F	RIM MGRATOR: PHIL	GAR	DATE: 25.10.07 SURFACE RL: 145 LAND EQUIPMENT: KOMA	5.1m Atsu PC220	
DEPTH (m)	WATER	BIT	SAMPLE of test	SOIL Group	GRAPHIC Log		Soil typ	SOIL DESCRIPTION be, colour, consistency, grainsize,	moisture, remarks	
Eo	pa			SM (v)		TOPSOIL -	sandy loose;	silt with clay, rootlets; ; dry.		0.20-
	ater Encountere			GM (v)		GRAVELLY orangebrowr	SILTY ; loos	(SAND; e to medium dense; jus	ND; medium dense; just molst.	
	Mpuno		, ,			TUFFACEOL	JS S/	ANDSTONE, includes rare	e well	1,00-
	No Gr			ROCK		rounded gra with slightly fine to med	vel; g weat ium g 0/215	enerally moderately wea thered lenses; medium s grained; bedding indistinc	athered strong/strong; t, El	ND at 1.50
						Ends as abo	ove.	•		
							,			
									*	
Ē										
-3								·		
4										
ي ب										
E b U D SPT. (PT	SAMP Undist Distur Stand	LE OR urbed bed lard P Penet	TEST enetration Te ration Test	v : vis l : lol est	l val poratory	WATER Water Ta Water Inf	ble low	FIELD SUPERVISOR: PROJECT COORDINATOR: SHEET 1 OF 1 SCALE 1: 25	J.F.YOUNG J.F.YOUNG SHEETS	

Comp	Merce		GEOTEC	HNICA	L & E	NVIRONMENTAL	TEST PIT	TP16
PROJE LOCA CONT	ECT: TION: Racto	TII S R: R.8	LLEGRA TORAGE/ & I. CONT	DAM 'STOR Ract	AGE R	RIM PERATOR: PHIL GARL	DATE: 25.10.07 SURFACE RL: 125.3 AND EQUIPMENT: KOMAT	Bm ISU PC220
DEPTH (m)	WATER	BIT	SAMPLE of test	SOIL Group	GRAPHIC Log	Soil type,	SOIL DESCRIPTION colour, consistency, grainsize, m	oisture, remarks
L 0			Jihn, ,	SM (v)		TOPSOIL - sandy s pale brown; loose; d	silt, rootlets; iry.	0.30
1 2 2 2 2 2 2 2	No Groundwater Encountered			SC (v)		SANDY CLAY/CLA orangebrown; stiff; J	YEY SAND; ust moist.	3.00
3 1				CH (v)		SILTY CLAY with grey with orangebr - gravelly, very mot Ends on tuffaceous weathered; medium	trace of sand; own mottle; stiff; moist. ist from 4.5m. s sandstone; moderately strong; fine grained.	END at 4.70
U D SPT. CPT.	SAMP Undist Distur Stanc Cone	LE OR LE OR bed Jord P Penet	TEST enetrotion T ration Test	v : vis l : lo est	ual boratory	WATER FI Water Toble Si Water Inflow Si	ELD SUPERVISOR: Roject coordinator: Heet 1 of 1 SF Scale 1:25	J.F.YOUNG J.F.YOUNG IEETS

Compared and a second	partment of	-	GEOTEC	HNICA	L& I	ENVIRONMENTAL	TEST PIT	TP17
PROJ		TI	LLEGRA	DAM			DATE: 25.10.07	an a
	TINN-	ç	TORAGE	/STOR	AGE	RIM	SURFACE RL: 134.4	4m
CONT	RACTO	R: R. 8	k I. CONT	RACTI	NG (OPERATOR: PHIL GARLA	ND EQUIPMENT: KOMA	TSU PC220
ЛЕРТН	WATCO	0.T	SAMPLE	SOIL	GRAPHIC		SOIL DESCRIPTION	
(m)	WAICK	011	TËST	GROUP	LOG	Soil type, c	otour, consistency, grainsize, m	oisture, remorks
				SM (v)	;/;;/ ;/;;/ ;/;;/	TOPSOIL - sandy si pale brown; loose; dr	lt, rootiets; y.	0.30
······································	No Groundwater Encountered			CH (v)		SILTY CLAY with s grey/orangebrown, m	and; lottled; stiff; moist.	2.89
3 4 4				ROCK		TUFFACEOUS SANE extremely weathered fine grained; behaves No indication of bed Ends at 4.3m on his tuffaceous sandston	DSTONE; d/highly weahered; extr s as silty clay with gr ding. ghly weathered e; weak.	remely weak; avel; molst. END at 4.30
с 5 0 СРТ	SAMP Undist Distur Stanc Cone	LE OR urbed bed lard P Penet	TEST enetration T	v : vis l : lat est	ual poratory	WATER FIEI Water Table SHE Water Inflow SC	LD SUPERVISOR: DJECT COORDINATOR: EET 1 OF 1 SH ALE 1: 25	J.F.YOUNG J.F.YOUNG EETS

COMP	Merce		GEOTEC	HNICA	L& I	ENVIRONMENTAL	TEST PIT	TP1	8
PROJI LOCĂ CONT	<u>Herce</u> Ect: Tion: Racto	TI S R: R. 8	LLEGRA TORAGE	DAM /Stor Racti	AGE I NG 0	RIM IPERATOR: PHIL GARL	DATE: 25.10.07 SURFACE RL: 235. AND EQUIPMENT: KOMA	.2m TSU PC220	
DEPTH (m)	WATER	BIT	SAMPLE of TEST	SOIL GROUP	GRAPHIC Log	Soil type,	SOIL DESCRIPTION colour, consistency, grainsize, n	noisture, remarks	
E O				SM (v)		TOPSOIL - sandy paie brown: loose: d	silt, rootlets; rv.		0.20-
	Щ		· · · · ·	SM/SC (v)		SILTY SAND with orangebrown; firm; d	trace of clay; ry.		0.60-
	N			ROCK	· · · · · · · · · · · · · · · · · · ·	META-SHALE; generally moderate medium strong; lam	y weathered with clay inated; bedding 30 º/176	ey seams; 5º.	
			-		<u>````</u>			END	at 1.20-
بىلىپ						Ends as above.			
		:							
2									
									-
					-				-
									-
-3								3	-
									-
4									-
									-
							. *		
L									
5					L				-
U D SPT CPT	SAMP Undist Distur Stand Cone	LE OR urbed bed lard Pi Peneti	TEST enetration T ration Test	v : vis l : lol	ual boratory	WAILK FI Water Toble SI Water Inflow S	ELU SUPERVISUR: ROJECT COORDINATOR: IEET 1 OF 1 SF CALE 1:25	J.F.YOUNG J.F.YOUNG IEETS	

-



TP19

0.25

0.80

GEOTECHNICAL & ENVIRONMENTAL TEST PIT Commerce DATE: 25.10.07 TILLEGRA DAM PROJECT: SURFACE RL: 237.4m STORAGE/STORAGE RIM LOCATION: OPERATOR: PHIL GARLAND EQUIPMENT: KOMATSU PC220 CONTRACTOR: R.& I. CONTRACTING SOIL DESCRIPTION SAMPLE DEPTH {m} SOIL Group GRAPHIC WATER BIT TEST LOG Soil type, colour, consistency, grainsize, moisture, remarks 0 TOPSOIL - sandy silt with clay, rootlets; SM (v) pale brown; loose; dry. META-SHALE; N.G.E extremely weathered/highly weathered; clayey to ROCK very weak; laminated; bedding 30°/170°. ROCK TUFFACEOUS SANDSTONE; END at 1.00 highly weathered/moderately weathered; 1 weak/medium strong; fine grained. Ends as above. 2 3 4 5 WATER J.F.YOUNG FIELD SUPERVISOR: : visual : laboratory SAMPLE OR TEST V.....Vndisturbed **PROJECT COORDINATOR:** J.F.YOUNG D......Disturbed SPT....Standard Penetration Test 🗶 Woter Table SHEET 1 OF 1 SHEETS

Water Inflow

SCALE

25

1:

CPT....Cone Penetration Test

	;
NSW Departmen	t of
lommer	се

GEOTECHNICAL & ENVIRONMENTAL

STORAGE/STORAGE RIM

TEST PIT

TP20

PROJECT: TILLEGRA DAM

DATE: 25.10.07

SURFACE RL: 236.5m

DEPTH (m)	WATER	BIT	SAMPLE or test	SOIL Group	GRAPHIC Log	SOIL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remar	ks
0				SM (v)		TOPSOIL - sandy silt, rootlets; pale brown; loose; dry.	0.25-
.	N.G.E			CL/CI (v)	· · · · · · · ·	SILTY CLAY with sand; brown/orangebrown, streaked; stiff; just moist.	- - 0.60-
				ROCK	·_·-/ ·_·-/	TUFFACEOUS SANDSTONE; moderately weathered/slightly weathered; strong; No distinct bedding.	END at 0.89
1						Ends as above, refusal.	
2							
1 1 1 1 1							
3							
4							
		: .					
5 SAMPLE OR TEST UUndisturbed DDisturbed SPTStandard Penetration Test CPTCone Penetration Test					l ual poratory	WATERFIELD SUPERVISOR:J.F.YOUYeater TablePROJECT COORDINATOR:J.F.YOUWater InflowSHEET1 OF1SCALE1 : 2525	JNG JNG

Comp	artment of		GEOTEC	HNICA	L& 1	ENVIRONMENTAL	TEST PI	r TP21	
PROJ	ECT:	TI	LLEGRA	DAM		and the second	DATE: 25.10.07		
LOCA	TION:	S	STORAGE/	/STOR	AGE	RIM	SURFACE RL: 2	42.1 m	
CONT	RACTO	R: R. &	I. CONTR	RACTI	NG (OPERATOR: PHIL GARLA	ND EQUIPMENT: KON	MATSU PC220	
DEPTH (m)	WATER	BIT	SAMPLE or TEST	SOIL Group	GRAPHIC Log	Soil type, c	SOIL DESCRIPTION	e, moisture, remarks	
0				SM (v)		TOPSOIL - sandy si pale brown; loose; dr	it with trace of clar y.	/, rootlets; 0.3	
L L.	ш			SC		CLAYEY SAND; yellowbrown/orangel	prown, mottled; stiff;	just moist.	
E	N.G.			(*)			. 0.7	′5 ⁻	
- - - 1				ROCK	ROCK $\begin{pmatrix} -\sqrt{-7} \\ \sqrt{-7} \\ -\sqrt{-7} \\ -\sqrt{-7} \end{pmatrix}$ META-SHALE; moderately weathered; medium strong; lamin bedding 30 °/185 °.		aminated;		
E.					1-1-1-7			END at 1.2	<u>:0-</u>
						Ends as above.			-
E									-
									-
E-2									
								•	-
E									
E									
Ē,									
Ē									
									-
E				i i					
									_
Ē									-
-4									
									-
									-
									-
U U SPT.	SAMP Undist Distur Stand	LE OR urbed bed ard P	TEST	v : vis l : lat	l ual poratory	WATER FIE Water Table SH	LD SUPERVISOR: DJECT COORDINATOR: EET 1 OF 1	J.F.YOUNG J.F.YOUNG SHEETS	

C ^{NSW Dep}	arteni of		GEOTEC	HNICA	L & E	NVIRONMENTAL	TEST PIT	TP22			
PROJE LOCA CONT	ECT: TION: Racto	TIL S R: R. &	LEGRA TORAGE	DAM /STOR RACT	AGE F	RIM PERATOR: PHIL GARLA	DATE: 25.10.07 SURFACE RL: 256.9m ND EQUIPMENT: KOMATSU PC:	220			
DEPTH (m)	WATER	BIT	SAMPLE or test	SOIL GROUP	GRAPHIC LOG	SOIL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks					
	red		·····	SM (v)		TOPSOIL - sandy sil brown; firm; dry.	TOPSOIL - sandy silt with clay, rootlets; brown; firm; dry.				
	Icounter			SM (v)		SILTY SAND with clay; orangebrown; stiff; just moist.		0.60-			
<u></u> 1	Image: Second stress of the second stress						slightly weathered with depth trong; laminated to very thinly /230°.				
	No							END at 1.50			
1 1 2						Ends on moderately meta-shale.	weathered/slightly weathered				
ي المريداني											
- - - - 3						· · ·					
4											
<u>r le reler</u> e								_			
- - - 5											
U D SPT. CPT	SAMP Undist Distur Stone	LE OR Turbed bed Jord Pr	TEST enetration T	v : vis l : lo	ual boratory	WATER FIE Water Table PR(Water Inflow Sri	LD SUPERVISOR: J.F.Y Dject coordinator: J.F.Y Eet 1 of 1 sheets Ale 1:25	OUNG OUNG			



GEOTECHNICAL & ENVIRONMENTAL

STORAGE/STORAGE RIM

TEST PIT

TP23

PROJECT: TILLEGRA DAM

DATE: 25.10.07

SURFACE RL: 268.8m

DEPTH {m}	WATER	BIT	SAMPLE of test	SOIL Group	GRAPHIC Log	SOIL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	
	Intered			GM (v)	/ 0 / 0 / 0 / 0 / 0 / 0 / 0 / 0 / 0 / 0	TOPSOIL - sandy slit with gravel, rootlets; pale brown; loose; dry. Gravel increases with depth.	0.30
	water Encou			ROCK	· · · · · · / · · · · · · · / · · · · ·	META-SHALE, rootlets continue; highly weathered with clayey lenses; generally weak; laminated. META-SHALE continues; moderately weathered; weak/medium_strong;	0.60
1	No Ground			ROCK		bedding 25°/220°. Major joint set 85°/220°. Defect spacing generally very close. END at	ין יין t 1.45
3						Ends as above.	
U D SPT CPT	SAMPI Undist Distur Stand Cone	.E OR urbed bed ord Pi Peneti	TEST enetration Tr ration Test	v : vis l : lot 2st	ual boratory	WATERFIELD SUPERVISOR:J.F.YOUNGWater TablePROJECT COORDINATOR:J.F.YOUNGWater InflowSHEET1 OF1SCALE1:25	

C NSW Der	artment of		GEOTEC	HNICA	L& E	ENVIRONMENTAL	TEST PI	r TP24	
PROJ	terce	TI	LLEGRA	DAM			DATE: 25.10.07	n an	
LOCA	TION:	S	TORAGE	STOR	AGE	RIM	SURFACE RL: 2	72.2m	
CONT	RACTO	R: R.8	I. CONT	RACT	NG o	PERATOR: PHIL GARLA	ND EQUIPMENT: KON	MATSU PC220	
DEPTH	WATER	RIT	SAMPLE	SOIL	GRAPHIC		SOIL DESCRIPTION		
(n) 		U 11	TĚŠT	GROUP	LUU	Soil type, c	olour, consistency, grainsiz	ze, moisture, remorks	
				GM (v)		TOPSOIL - sandy sil	t with gravel, rootle y. Gravel increases	ots; 0.10- with depth.	
Ē				ROCK		META-SHALE;			
E	G.E				[\ _ \ _ [_ \ _ \ _ /	highly weathered wi weak/medium strong	th clayey lenses; y; laminated to thin!	y bedded.	
ROCK META-SHALE continues; moderately weathered; medium strong;									
-1				L	$\left[\frac{1}{1},\frac{1}{2}\right]$	bedding 23°/230°.Ma	jor joint set 55 %34 .close/close	0° (across bedding).	
				:		Ende as above			
Ē									
E-									
È.									
2				ļ		· · ·			
Ē								-	
E.									
Ē									
Ē									
1								:	
Ē									
								- -	
E									
								-	
4								-	
E									
E									
Ę									
			1						
- 5	S V MD		TEST	y : vis	<u> </u>	WATER FIFI	D SUPERVISOR:	J.F.YOUNG	
U	Undisl	urbed		li : lo	boratory	Water Table PRC	JECT COORDINATOR:	J.F.YOUNG	
SPT. CPT.	Stand Cone	lard P Peneti	enetration To ration Test	est		Water Inflow SHE	ET 1 OF 1 Ale 1:25	SHEETS	

.

Comr	nerce		GEOTEC	HNICA	L &	ENVIRONMENTAL	TEST PIT	TF	25
PROJ	ECT:	TI	LLEGRA	DAM			DATE: 25.10.07		
LOCA	TION:	S	TORAGE	/STOR	AGE	RIM	SURFACE RL: 206.	.3m	
CONT	RACTO	R: R.8	I. CONT	RACTI	NG	OPERATOR: PHIL GARLA	ND EQUIPMENT: KOMA	TSU PC220	
DEPTH (m)	WATER	BIT	SAMPLE TEST	SOIL Group	GRAPHIC Log	Snil tyne ri	SOIL DESCRIPTION	noisture, remarks	
0	-	 		SM (v)	/./.	TOPSOIL - sandy sil	it, rootlets;	•	0.20
والمتعد المعيدا	N.G.E			SC (v)		CLAYEY SAND; orangebrown; stiff; mo	oist.		100
1 1 1				ROCK		TUFFACEOUS SANE	OSTONE; ed/slightly weathered;	strong; El	ND at 1.20-
F						fine grained; possible	bedding 30°/220°.		/
						Ends as above, refus	Sal.		-
E.									-
E									
2									
<u>-</u>									
Ē									-
Ē		ļ							
<u> </u>			· .						-
									-
⊢3		Į							
Ē		ľ							-
Ē		ļ							_
									-
E									-
Ē		1							-
4		ļ							-
Ē				ł					-
F									
F									
E									-
5			:						
U D SPT. CPT.	SAMP Undist Distur Stand Cone	LE OR Turbed bed lard Pr Peneti	TEST enetration T ration Test	v : vis l : lot est	ual poratory	WATER FIEL Water Table PRO Water Inflow SC	LD SUPERVISOR: DJECT COORDINATOR: :ET 1 OF 1 SH ALE 1: 25	J.F.YOUNG J.F.YOUNG HEETS	1



PROJECT:

GEOTECHNICAL & ENVIRONMENTAL

TEST PIT

TILLEGRA DAM

TILLEGRA DAM

LOCATION: STORAGE/STORAGE RIM

DATE: 25.10.07

SURFACE RL: 218.1m

CONTRACTOR: R.& I. CONTRACTING OPERATOR: PHIL GARLAND EQUIPMENT: KOMATSU PC220

DEPTH (m)	WATER	BIT	SAMPLE or TEST	SOIL Group	GRAPHIC LOG	SOIL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remark	s
0	N.G.E			SM (v) CL/CI (v)		TOPSOIL - sandy silt with trace of clay, rootlets; pale brown; loose; dry. SANDY CLAY; orangebrown/yellowbrown, streaked; stiff; moist.	0.35-
1					· · · ·	Refusal on tuffaceous sandstone; moderately weathered/slightly weathered; medium strong/strong; fine grained. No indication of bedding.	END at 1.10
2							بليديد ليبي ايب ب
3							
					-		
4	· · · · · · · · · · · · · · · · · · ·		- * -				
- 5 0 SPT CPT	SAMPI Undist Distur Stand Cone	E OR urbed bed ard Pe Penetr	TEST Inetration Te ation Test	v : vis l : lot est	ual poratory	WATERFIELD SUPERVISOR:J.F.YOUYuter TablePROJECT COORDINATOR:J.F.YOUWater TableSHEET1 OF1Water InflowSCALE1:25	NG NG

TP26

Comm	vierce	-	GEOTEC	HNICA	L & E	INVIRONMENTAL	TEST PIT	TP27
PROJE LOCA CONT	CT: TION: RACTO	TII S R:R.&	LEGRA TORAGE/ I. CONTE	DAM /STOR Ractii	AGE F NG 0	RIM PERATOR: PHIL GARLA	DATE: 25.10.07 SURFACE RL: 176.0m ND EQUIPMENT: KOMATS	U PC220
DEPTH {m}	WATER	BIT	SAMPLE Of Test	SOIL GROUP	GRAPHIC Log	Soil type, co	SOIL DESCRIPTION lour, consistency, grainsize, mois	ture, remorks
0 				CL/CI (v)		TOPSOIL - silty clay dark grey; firm; just n SILTY SAND with cl yellowbrown/orangeb	/clayey silt with sand, ro noist. ay; rown; firm to stiff; moist	ootlets; 0.50-
1	dwater Encountered			SM/SC (v)				2.20
<u></u>	No Groum			ROCK		TUFFACEOUS SAND extremely weathered fine grained; behaves grey/orangebrown, st No indication of bedo	STONE; ; esxtremely weak; as clayey sand; reaked. ling.	END at 3.90
4 5			•			Ends as above, extre	emely weathered/highly	weathered.
U D SPT CPT	SAMP Undist. DisturStanc	LE OR urbed bed lard Pe	TEST Tenetration T	v : vis l : lat est	uol poratory	WATER FIEL Water Table PRO Water Inflow Str	D SUPERVISOR: JECT COORDINATOR: ET 1 OF 1 SHEE ALE 1: 25	J.F.YOUNG J.F.YOUNG TS



TEST PIT

TP28

TILLEGRA DAM PROJECT:

STORAGE/STORAGE RIM LOCATION:

DATE: 26.10.07

SURFACE RL: 132.0m

DEPTH (m)	WATER	BIT	SAMPLE or test	SOIL Group	GRAPHIC Log	o SOIL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remark	s
0				SM (v)		TOPSOIL - silty sand with clay, rootlets; - pale brown; loose; dry.	0.20-
	N.G.F	- -		CL/CI (v)		SILTY CLAY with sand; brown/orangebrown, mottled; very stiff; dry.	END at 0.60-
						Refusal on tuffaceous sandstone; moderately weathered/slightly weathered; medium strong/strong; fine grained. Appears flat lying. Possible bedding 15°/310°.	
2							
3							
4							
5							
U D SPT CPT	SAMPI Undist Distur Stand Cone	LE OR urbed bed lard Pe Penetr	TEST Inetration Te ation Test	v : vis : lat st	ual xoratory	WATERFIELD SUPERVISOR:J.F.YOLYuter TablePROJECT COORDINATOR:J.F.YOUWater InflowSHEET1 OF1 SHEETSSCALE1:2525	

NSW Department of
Lommerce

TEST PIT

TP29

TILLEGRA DAM PROJECT:

STORAGE/STORAGE RIM LOCATION:

DATE: 26.10.07 SURFACE RL: 126.6m

DEPTH (m)	WATER	BIT	SAMPLE or test	SOIL Group	GRAPHIC Log	SOIL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remar	ks
0				SC {v}		TOPSOIL - clayey sand, rootlets; - pale brown/brown; loose; dry.	0.20
	N.G.E			SM (v)		SILTY SAND with clay; brown/orangebrown; very stiff; dry.	0.55
				ROCK	· \ _ \ _ \ _ \ _ \ _ \ _ \ _ \ _ \ _ \	META-SHALE; moderately weathered with clayey seams; medium strong; laminated.	END at 0.90
1						Refusal on meta-shale (tight); moderately weathered/ slightly weathered; medium strong; bedding 2º/170º (horizontal). º	
2					- - -		
3							, Lunlurul
							يبيايينا
4		:	, ,				
л			· · ·				
U D SPT CPT	L SAMPI Undist Distur Stand Cone	LE OR urbed bed ord Pe Peneti	TEST TEST enetration Te ration Test	v : vis l : lat est	L ual poratory	WATERFIELD SUPERVISOR:J.F.YOUYeater TablePROJECT COORDINATOR:J.F.YOUWater TableSHEET1 OF1Water InflowSCALE1 : 25	JNG JNG

NSW Department of
Commerce

TEST PIT

TP30

PROJECT: TILLEGRA DAM

LOCATION: STORAGE/STORAGE RIM

DATE: 26.10.07

SURFACE RL: 130.8m

DEPTH (m)	WATER	BIT ·	SAMPLE of test	SOIL GROUP	GRAPHIC Log	SOIL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks	5
0	ntered			SM (v)		TOPSOIL - silty sand with trace of clay, rootlets; pale brown; dry.	0.29
	ter Encou			SC (v)		CLAYEY SAND/SANDY CLAY; yellowbrown/brown; very stiff; dry.	
- - - - 1	Groundwa			ROCK	····· ·····	META-SHALE; highly weathered/moderately weathered with clayey lenses;	0.80
<u> </u>	Ŷ	. :				weak/medium strong; thinly bedded.	END at 1.30
						Ends on meta-shale; moderately weathered/slightly weathered; bedding 8º /070º .	
						· · · · · · · · · · · · · · · · · · ·	-
							-
							1
Ē							-
							-
-3							·
Ē							I
-							
							. 1
							-
-4							
							-
							-
							, de la
5							
U	SAMPL Undist	.E OR urbed	TEST	v : vis	ual oratory	WAIER FIELD SUPERVISOR: J.F.YOU	NG ·
Ď Spt	.Distur Stand	bed ard Pi	enetration Ti	est		Water Table SHEET 1 OF 1 SHEETS	
CPT.	Cone	Peneti	ration Test			woter Inflow SCALE 1: 25	

NSW Depa	rtment of		GEOTEC	HNICA	_ & E	NVIRONMENTAL	TEST PIT	TP31	
PROJE LOCAT	CT: CT: FION: RACTOR	TIL S' 8: R.&	LEGRA TORAGE I. CONT	DAM /STOR/ Ractii	AGE R NG 01	RIM PERATOR: PHIL GARLA	DATE: 26.10.07 SURFACE RL: 134. ND EQUIPMENT: KOMA	8m TSU PC220	
DEPTH (m)	WATER	BIT	SAMPLE of test	SOIL Group	GRAPHIC Log	Soil type, c	SOIL DESCRIPTION olour, consistency, grainsize,	noisture, remarks	
E O			<u></u>		- <u>/</u> -/-	TOPSOIL - sandy si	It with trace of clay, i y.	rootlets;	0.10-
	9.E			SC (v)	· / · /	CLAYEY SAND/SAN brown/yellowbrown,	IDY CLAY; mottled; stiff; just mois	st.	0.60-
	N			ROCK		TUFFACEOUS SAN highly weathered/m clayey seams; weak medium grained.	DSTONE; oderately weathered /medium strong; fine	with to END	at 1.00
						Ends on tuffaceous medium strong; pos	sandstone; moderatel sible bedding 7°/025	y weathered; °.	tilti
									- - - - - - - - - - - - - - - - - - -
							· · ·		ılıılı
ىلىبىل									111
ىلىيىرل	-								
uuluu									
5						WATER F	IFI D SUPERVISOR:	J.F.YOUNG	
U D SP	SAN Und Dist TSta	APLE O isturbe urbed indard e Pen	R TEST d Penetration stration Te	n Test	aborator	ry Water Table F Water Inflow	PROJECT COORDINATOR: Sheet 1 of 1 Scale 1: 25	J.F.YOUNG SHEETS	

8/10/2008 1:52:24 PMg:\IS\Watertec\Geotech\PCAD\BORELOGS\tillegra tp2.dgn

NSW De	partment of		GEOTEC	HNICA	L& E	NVIRONMENTAL	TEST PIT	TP32
Com	nerce	TI		DAM			DATE: 26.10.07	
	TION.	۰۱ د	TOPAGE			RIM	SURFACE RI - 160.	Om
LUCA	TIUN:	ت م n o		DACT				
LUNI	RALIU	R: N.O					IND EQUIPTICAT: SOMA	
DEPTH	WATER	BIT	SAMPLE	SOIL	GRAPHIC		SOIL DESCRIPTION	ана. Спорта страна страна Страна страна
(M) 			TËST	URUUP		Soil type, c	olour, consistency, grainsize, m	ioisture, remarks
Ęο				614	1.7.	TOPSOIL - sandy sil	t, rootlets;	
Ē				(v)	1.1.	pale brown; loose; dr	y.	0.35-
Ē					· / ·	CLAVEY SAND with	dravel:	
E					(. <i>`</i> /.	orangebrown/brown,	mottled; stiff; moist.	
E								· · · · · ·
E				SC/CI				-
E-1		:		11/1				
-	ered				. /.			
F	unte							1.40-
F	nco						STONE	
-	1 m				$\frac{1}{\sqrt{-1}}$	extremely weathered	l/hifghly weathered (a	ltered);
Ē	vate					extremely weak/very	y weak; defect spacing	g extremely
E	hdv				· · · · · · ·	shear zone. Highly w	eathered with depth.	
- 2	i ot							
E	0			-	····/			
E	Z			ROCK		- -		-
E								-
E								-
E					·-·-/			-
E .								
-3					· \ _ \ _ /			-
E								END at 3.30-
E						······································		
E-						Ends as above.		
E			· ·					-
E								
E								- -
Ē								-
E,							·	
Ē								-
Ē	1							-
F								:
Ē_				,				
5				<u> </u>	Ļ	() 1 FFA	D. 6005050600	
1	SAMPI Undiet	LE OR	TEST	v : vis l : lol	ual poratory		U SUPERVISOR:	
О	Distur	bed land D	naturting T			Woter Table SHF	ET 1 OF 1 SH	IEETS
(PT	srana Cone	Peneti	ation Test	221		Water Inflow SC	ALE 1:25	

COND	herce		GEOTEC	HNICA	L& E	ENVIR	ONMENTAL		TEST P	IT	TP33
PROJ	ECT:	TI	LLEGRA	DAM			· · · · · · · · · · · · · · · · · · ·		DATE: 26.10.0	7	
LOCA	TION:	S	TORAGE	/STOR	AGE I	RIM		·	SURFACE RL:	171.4m	
CONT	RACTO	R: R.8	I. CONT	RACT	ING O	PERAT	OR: PHIL GA	ARLAN	ID EQUIPMENT: KC	MATSU PO	;220
DEPTH	WATER	RIT	SAMPLE	SOIL	GRAPHIC				SOIL DESCRIPTION	ł	
(n)		110	TĔŚT	GROUP	LOG		Soil	type, colo	our, consistency, grain	size, moisture, re	morks
Eo	red			CII	1.1	то	PSOIL - san	dy silt,	rootlets;		
⊧ ⊨	unte			{v)		pale	e brown; loos	se; dry.			0.40
E	inco		· · ·		1.	CL	AYEY SAND	Y GRA	VEL, includes we	ell rounded	
Ē	ter			GC	000	gra	vel fraction-s	lopewa	ash; brown/yellov	vbrown,	
 	dwa					500	saksu, still, c	41 y .			0.90
E1	roun				· \ _ \ _ - \ _ \ _ /	TUI	FFACEOUS	SANDS	TONE;		
	No G			ROCK		higi mea	hly weathere dlum strong.	ed/mod Appea	erately weather rs flat lying.	ed; weak/	END at 1.30
Ę						End	ls as above.	moder	atelv weathered		_
Ē						wei	sk/medium	strong.			-
E.a											· ·
<u> </u>											
Ē											
Ē											
			· · ·								
-3											-
Ē											_
Ē											
								•			
Ē											
-4											
Ē											
									·		-
È.											-
Ē 5	,										
Ų	SAMPI Undist	E OR urbed	TEST	v : vis l : lot	ual poratory		WATER Water Table	FIELD	SUPERVISOR: CT COORDINATOR:	J.F.Y J.F.Y	OUNG OUNG
SPT	Stand Cone	oeu ard Pe Penetr	enetration Tr ation Test	est			Water Inflow	SHEET	T 1 OF 1 E 1:25	SHEETS	

الار د	54				-			<u>and and a contra</u>
Com	arterce		GEOTEC	HNICA	L& E	ENVIRONMENTAL	TEST PIT	TP34
PROJI Loca Cont	ECT: TIDN: RACTO	TI S R: R.8	LLEGRA TORAGE	DAM /Stor Racti	AGE I	RIM IPERATOR: PHIL GARI	DATE: 26.10.07 SURFACE RL: 16 LAND EQUIPMENT: KOM	1.6m ATSU PC220
DEPTH (m)	WATER	BIT	SAMPLE of TEST	SOIL GROUP	GRAPHIC Log	Soil type	SOIL DESCRIPTION colour, consistency, grainsize	e, moisture, remarks
0				SM (v)		TOPSOIL - sandy greybrown; loose; d	silt, rootlets; iry.	0.40
	red			SC (v)		Slightly CLAYEY S yellowbrown/orang	SAND; ebrown, mottled; stiff; j	ust moist.
2 3	No Groundwater Encounte			ROCK		Conglomeratic TUF highly weathered; No indication of be	FACEOUS SANDSTO very weak/weak (easy adding.	NE; y digging). - - - - - - - - - - - - - - - - - - -
4 5						Ends as above, hig weathered, weak/r	ghly weathered/modera nedium strong.	ately
U D SPT CPT	L SAMPI Undist Distur Stand Cone	LE OR urbed bed lard P Penet	TEST enetration T ration Test	v : vis l : lat est	ual boratory	WATER F Woter Table F Water Inflow	IELD SUPERVISOR: Project coordinator: Sheet 1 of 1 Scale 1: 25	J.F.YOUNG J.F.YOUNG SHEETS

- NSW Department of
Commerce

TEST PIT

TP35

PROJECT: TILLEGRA DAM LOCATION: STORAGE/STORAGE RIM

DATE: **26.10.07**

SURFACE RL: 245.1m

DEPTH (m)	WATER	BIT	SAMPLE or TEST	SOIL GROUP	GRAPHIC Log	SOIL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks
0				SM (v)		TOPSOIL - sandy silt, rootlets; 0.20-
1 1 1 1 1 1	No Groundwater Encountered			GC (v)		CLAYEY SANDY GRAVEL, rootlets; brown; loose; dry. 0.65
1				ROCK		META-SHALE; highly weathered/moderately weathered with clayey seams; weak/medium strong; laminated; bedding 5°/270°. END at 1.70-
2		× .	· .			Refusal on tuffaceous sandstone; moderately weathered; medium strong; fine grained.
3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1						
4						
Luuluuuluu						
E 5 U D SPT CPT	SAMPI Undist Distur Stand Cone	LE OR urbed bed ard P Penet] TEST enetration T ration Test	v : vis L : lat est	uai poratory	WATERFIELD SUPERVISOR:J.F.YOUNGWater TablePROJECT COORDINATOR:J.F.YOUNGWater InflowSHEET1 OF1SCALE1 : 25



TEST PIT

TP36

TILLEGRA DAM PROJECT:

STORAGE/STORAGE RIM LOCATION:

DATE: 26.10.07

SURFACE RL: 240.3m

DEPTH	WATER	BIT	SAMPLE of test	SOIL GROUP	P GRAPHIC LOG	SOIL DESCRIPTION			
(m) 						Soil type, colour, consistency, grainsize, moisture, remarks			
0	ered			SM (v)		TOPSOIL - sandy silt, rootlets; pale brown; loose; dry. 0.25			
1	No Groundwater Encounte			Rock		META-SHALE; highly weathered/moderately weathered with clay seams; weak/medium strong; laminated; bedding 2 º/250 º. END at 1.35			
r - - 1 +						Refusal on tuffaceous sandstone; moderately weathered; medium strong; fine grained.			
2 3 4						Weathered; medium strong; nne graineu.			
5 5									
SAMPLE OR TEST UUndisturbed DDisturbed SPTStandard Penetration Test CPTCone Penetration Test						WATERFIELD SUPERVISOR:J.F.YOUNGWater TablePROJECT COORDINATOR:J.F.YOUNGWater InflowSHEET1 OF1SCALE1:25			

Comp	Merce		GEOTEC	HNICA	L & E	INVIRONMENTAL	TEST P	іт ТР	37
PROJECT: TILLEGRA DAM LOCATION: FARLEYS PROPERTY - / CONTRACTOR: R. & I. CONTRACTING OPE						DATE: 29.10.07 ALLUVIAL FLAT SURFACE RL: 92.1m ERATOR: PHIL GARLAND EQUIPMENT: KOMATSU PC220			
DEPTH {m}	WATER	BIT	SAMPLE of test	SOIL GROUP	GRAPHIC Log	Soil type,	SOIL DESCRIPTION , colour, consistency, grain	l size, moisture, remorks	
5	×					(continued from CLAYEY SAND; grey/orangebrown, moist to very mois	previous sheet) mottled; firm to so t with depth.	ft;	
6 1			D	SC (v)		· · · · · · · · · · · · · · · · · · ·			
7		-		-	·/·/· ·/·/·	Ends as above. No	water encountered	EN	D at 7.00
0									
יין זייין 1									
10									
U D SPT. CPT.	SAMP Undist Distur Stand Cone	LE OR turbed rbed dard P Penet	TEST enetration T ration Test	v:vis : la est	ual boratory	WATER F Water Table P Water Inflow S	IELD SUPERVISOR: Roject Coordinator: Heet 2 of 2 Scale 1:25	J.F.YOUNG J.F.YOUNG SHEETS	

NSW De	partment of		GEOTEC	CHNICA	L& E	NVIRONMENTAL	TEST PIT	TP38
PROJ LOCA CONT	<u>nerce</u> ECT: TION: RACTO	T F R: R. {	LLEGRA ARLEYS & I. CON	DAM PROPI TRACT	ERTY - ING 01	ALLUVIAL FLAT PERATOR: PHIL GARLA	DATE: 29.10.07 SURFACE RL: 90.6 ND EQUIPMENT: KOMA	Sm TSU PC220
DEPTH (m)	WATER	BIT	SAMPLE OF TEST	SOIL Group	GRAPHIC Log	Soil type, c	SOIL DESCRIPTION olour, consistency, grainsize,	moisture, remarks
- 0				SM (v)		TOPSOIL - sandy sll dark grey; loose; just	t with clay, rootlets; molst.	0.40
				· · ·		Slightly CLAYEY SIL brown; firm (pit sides	.TY SAND; s collapsing); just mois	st.
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	oundwater Encountered			SC (v)		· · ·	· · · . ''.	
ىرىلىيىلىيىلىيىلى	No Gro			GM (v)		SANDY GRAVEL; well rounded; brown; Gravel ranges to col	loose; just moist. bble size.	2.50
	- 				0,	Ends in gravel. Pit c	ollapsing.	END at 3.70
4 								
U U D SPT CPT	SAMF Undis Distu Stan Cone	LE OR turbed rbed dard P Penet	TEST Penetration ration Test	v : vi: l : la Test	sual boratory	WATER FIE Water Table Water Inflow SC	LD SUPERVISOR: DJECT COORDINATOR: EET 1 OF 1 S ALE 1: 25	J.F.YOUNG J.F.YOUNG SHEETS


C ^{NSW D}	antent of		GEOTEC	HNICA	L & E	NVIRONMENTAL	TEST PIT	TP40
PROJI LOCA CONT	ECT: TION: Ractor	T∥ F ₹: R. (LLEGRA ARLEYS & I. CONT	DAM PROPE Ract	ERTY ING O	PERATOR: PHIL GAR	DATE: 29.10.07 SURFACE RL: 94.4m LAND EQUIPMENT: KOMATSI	J PC220
DEPTH (m)	WATER	BIT	SAMPLE Dr Test	SOIL Group	GRAPHIC Log	Soil typ	SOIL DESCRIPTION e, colour, consistency, grainsize, maist	ure, temorks
E O		<u> </u>		SM (v)		TOPSOIL - sandy – pale brown: loose;	silt with trace of clay, root dry.	ets; 0.20-
ا بينا بينا				CL/CI (v)		SANDY CLAY; yellowbrown/brow just moist.	n, streaked; stiff/very stiff;	
	No Groundwater Encountered			CL/Cl (v)		SILTY CLAY/CLA redbrown/grey, mo very stiff; just mol	YEY SILT; ottled; ist. EY SAND/CLAYEY SAND v	0.so
<u></u>				SC (v)		pale grey/orangel Gravel well rounde	orown, mottled; very stiff; jus d to 75mm dia.	t moist.
E 5 U D SPT CPT.	SAMP Undis Distu Stand Cone	LE OR turbed tbed tard P Penet	TEST Penetration T ration Test	v : vis l : la est	sual boratory	WATER Water Table Water Inflow	FIELD SUPERVISOR: PROJECT COORDINATOR: SHEET 1 OF 1 SHEE SCALE 1:25	J.F.YOUNG J.F.YOUNG IS

NSW Des	nerce		GEOTEC	CHNICA	L & E	NVIRONMENTAL	TEST PIT	TP41	
PROJ	ECT:	TI			RTV	<u> </u>	DATE: 29.10.07		
CONT	RACTO	ר ז: R	. & I. COI	NTRAC	TING 0	PERATOR: PHIL GARLA	ND EQUIPMENT: KOMATSU	PC220	
DEPTH (m)	WATER	BIT	SAMPLE OF TEST	SOIL Group	GRAPHIC Log	Soil type, co	SOIL DESCRIPTION blour, consistency, grainsize, moistu	re, remarks	-984F -
0				CL/CI (v)		TOPSOIL - clayey si pale brown; loose; dry	ilt with sand, rootlets; y.		0.35-
						SILTY CLAY; grey; very stiff; just i	moist.		
1									
				CH (v)		· · ·			
2	Icountered							·.	_
-	ndwater Er								-
3	lo Grour								3.10
-						SANDY GRAVEL; brown; medium dens Gravel well rounded f	e/dense; just moist/moist. to cobble size.		
4				GM (v)					-
-					0 / 0 / 0 / 0 / 1 0 /	• • • • • • • • • • • • • • • • • • •			-

5.00-5 SAMPLE OR TEST U......Undisturbed D......Disturbed SPT...Standard Penetration Test CPT....Cone Penetration Test WATER J.F.YOUNG FIELD SUPERVISOR: v : visual l : laboratory J.F.YOUNG PROJECT COORDINATOR: 🗲 Water Table \geq 1 OF 2 SHEET SHEETS Water Inflow SCALE 1: 25

NSW Deg	auriment of		GEOT	ECF	INICA	L& E	INVIR	ONMENTAL		TES	τ ριτ	•	TP4	1
Comř	nerce	TI		ΔΓ	λM				l	DATE: 29	.10.07			
100	561: TION.	F		ר ב יא נ	2 2 R Ö P	FRTY				SURFACE F	RL: 95	5.4m		
	- 110M:	0.R	& I C	י ט דאר	RACI	LING O	PFRAT	NR. PHIL GA	RLA	ND EQUIPMENT	: KON	IATSU P	C220	
CONT	1	A: 11.												
DEPTH	WATER	BIT	SAHPL	E	SOIL GROUP	GRAPHIC				SOIL DESUR	IP I IUN			
,, 	-							5011	ype, col	lour, consistency	, grainsiz	e, moiscure, r	EUULAS	·
		-			GM (v)	01010	SAI bro ligh	NDY GRAVEL wn; medium (tly cemented	.; dense I; just	to dense (moist/moist	toward . Grave	s 5.5m); I well		
<u> </u>						0,0	rou	nded to cobi	DIE SI	ze			END	at 5.50-
							End	ls as above.						=
E.														-
- - A														·
Ē		-												-
Ē														
														-
								· ·						! =
E														
E-7								н 						
												•		-
					-									-
F													·	-
Ē														
8														
Ē														
Ē														
Ē														
-			1											-
Ē														. :
Ē9														- -
Ę														-
Ē														
Ē.	1													
Ę														
Ē		1												-
E 10						<u> </u>	<u> </u>		-1					
U D SPT CPT	SAMP Undis Distu Stan Cone	PLE OR turbed rbed dard P Penet	TEST Penetration	on Te est	v : vis l : lo est	sual boratory		WATER Water Toble Water Inflow	FIEL PRO SHE SC	D SUPERVISOR Ject Coordin Et 2 of Ale 1 :	8:. Ator: 2 25	J.F J.F Sheets	YOUNG YOUNG	

	purtment of		GEOTE	CHNICA	L & E	INVIRONMENTAL	TEST PIT	TP	42
PROJ	ECT:	TI	LLEGRA	DAM			DATE: 29.10.07	· · · · · · · · · · · · · · · · · · ·	
LOCA	TION:	F	ARLEYS	PROPI	ERTY		SURFACE RL: 97		
CONT	RACTO	R: R .	& I. COI	NTRAC	TING 0	PERATOR: PHIL GARLA	ND EUUIPMENT: KOW	A150 PC220	
DEPTH (m)	WATER	BIT	SAMPLE of test	SOIL GROUP	GRAPHIC Log	Soil type, co	SOIL DESCRIPTION Nour, consistency, grainsize	e, moisture, remarks	
0				SM (v)		TOPSOIL - sandy sil pale brown; loose; dry	t, rootlets; /.	·	0.20-
	щ			SC (v)	· / · /	CLAYEY SANDY SIL pale brown; firm; dry.	T/SILTY SAND;		0.50-
	N.G			CL/CI (v)	· · · ·	SANDY CLAY;	f; dry.		0.70
				ROCK		TUFFACEOUS SAND highly weathered/mo	STONE; derately weathered	; weak; ENI) at 1.00-
						 fine grained; massive, indication of bedding, 	difficult digging. No possibly flat lying.		/]
						Ends as above.			
-									- T
E									
E									-
-2									
E.									
E							· · · ·		
5									
						· ·			
	·								
Ē									-
Ē						· · · ·			
Ē									
-4						2			
Ē									-
E									-
Ē									-
-									
5						1			
U D SPT CDT	SAMP Undis Distur Stan	LE OR turbed rbed dard F	TEST enetration	v : vis l : la Test	sual boratory	WATER FIEL Water Table PRC Water Inflow SH	D SUPERVISOR: DJECT COORDINATOR: ET 1 OF 1 ALE 1: 25	J.F.YOUNG J.F.YOUNG SHEETS	

	Tree		GEOTEC	HNICA	L & E	NVIRONMENTAL	TEST P	IT	TP43
ROJECT OCATION ONTRAC	: N: Ctor	TII F R. R.	LLEGRA ARLEYS & I. CON	DAM PROPE TRACI	RTY ING 0	PERATOR: PHIL GARLA	DATE: 29.10.0 SURFACE RL: .ND EQUIPMENT: KC)7 96.8m)MATSU PC2	20
PTH N) WA	TER	BIT	SAMPLE or test	SOIL Group	GRAPHIC Log	Soil type, c	SOIL DESCRIPTIO	N size, moisture, remo	rks
)			00000 9 ,	SM (v)		TOPSOIL - sandy si pale brown; loose; dr	lt, rootlets; y.		0.30
	oundwater Encountered			CH (v)		SILTY CLAY; greybrown with oran just moist/moist.	gebrown streaks;	stiff	140
	No			ROCK		TUFFACEOUS SAND extremely weathered medium grained; beh brown; just moist.	DSTONE; d; extremely weak aves as clayey s	; and;	END at 1.90
						Ends as above.			
						• .			-
									-
								•	
5 S/ Di PTS	AMP1 ndist istur tand	E OR urbed bed ard P	TEST enetration 1	v : vis l : lal	ual poratory	WATER FIE Water Table SH	LD SUPERVISOR: Dject coordinator: Eet 1 of 1	J.F.YC J.F.YC SHEETS	DUNG

8/10/2008 1:59:06 PM g:\IS\Watertec\Geotech\PCAD\80RELOGS\tillegra f.dgn

NSW Der	artment of		GEOTEC	HNICA	L & E	NVIRONMENTAL	TEST PIT	TP44	
PROJI LOCA CONT	ECT: TION: Racto	TII F R: R ,	LLEGRA ARLEYS & I. CONT	DAM PROPI TRACT	ERTY ING O	PERATOR: PHIL GARL	DATE: 29.10.07 SURFACE RL: 95.6 AND EQUIPMENT: KOMA	m TSU PC220	
DEPTH (m)	WATER	BIT	SAMPLE of test	SOIL Group	GRAPHIC Log	Soil type,	SOIL DESCRIPTION colour, consistency, grainsize, i	noisture, remorks	
E O				SM (v)		TOPSOIL - sandy s dark grey; loose; dr	ilt with clay, rootlets; y.	(- 0.25-
استدابيتات						CLAYEY SAND; pale grey/orangebro moist to very moist Seepage into pit at	own, mottled; firm to s t with depth. : 2.5m.	tiff;	
		-		SC (v)		· · · ·			بليتيليبنان
ا بينا بينا ي	> 2.5m					SANDY GRAVEL; brown; medium den Gravel well rounded	se; just moist/moist. to cobble size.		2.60
				SM (v)					
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1						Dense towards 4.0	m, lightly cemented.		4.09
باببياب						Ends as above.			
						• •			
- 3 U D SPT CPT	SAMF Undis Distu Stan Cone	LE OR turbed rbed dard F Penet	TEST Penetration T ration Test	v : vis L : la	l sual boratory	WATER FI Water Table S Water Inflow S	IELD SUPERVISOR: Roject coordinator: Heet 1 of 1 S Scale 1: 25	J.F.YOUNG J.F.YOUNG HEETS	

C NSW Dep	artment of		GEOTEC	HNICA	L & E	NVIRONMENTAL	TEST PIT		TP4	5
PROJE LOCA CONT	TION: Racto	TIL F R: R. (LEGRA ARLEYS & I. CON	DAM PROPI TRACI	ERTY ·	- ALLUVIAL FLAT PERATOR: PHIL GARL	DATE: 29.10.07 SURFACE RL: 10 AND EQUIPMENT: KOM	6.8m ATSU PC2	20	
DEPTH (m)	WATER	BIT	SAMPLE or test	SOIL GROUP	GRAPHIC Log	Soil type,	SOIL DESCRIPTION colour, consistency, grainsize	, moisture, remo	rks	
	red			SM (v)	/ / /=/=/	TOPSOIL - gravelly \pale brown; loose; d	sandy silt, rootlets; ry.	· · · · · · · · · · · · · · · · · · ·		0.15
	Groundwater Encounte			ROCK		META-SHALE; highly weathered; w Bedding 33°/245°. 54°/072° (across close/close.	eak/medium strong; Major joint sets: 68 º/ bedding). Defect spac	aminated. '343 º (into ing very	LA),	
	Ň				<pre>\\/ \\/ \\/</pre>	Highly weathered/m 1,5m; medium strong	noderately weathered g.	towards	END	at 1.50-
2 3 4						Ends as above.				
- - - - 5						WATED I C				
U D SPT. CPT.	SAMP Undis Distu Stan Cone	LE OR turbed rbed dard P Penet	TEST enetration ration Test	lv : vis l : lo Test	ual boratory	WATER FI Water Table SI Water Inflow S	ELD SUPERVISOR: Roject coordinator: Heet 1 of 1 Cale 1:25	J.F.YC J.F.YC SHEETS	OUNG	

Comp	attant of Derice		GEOTEC	HNICA	L& E	NVIRO	NMENTAL		TEST P	IT	TP4	6
PROJE		TI	LLEGRA	DAM					DATE: 30.10.0	7	*	
LOCA	TION:	F	ARLEYS	PROP				DI ANT	SURFACE RL: 1	109.1m MATELL DC	220	
CONT	RACTO	R: K.	& I. CON			PERATOR	PHIL GA	KLAN		WAISU POZ		
DEPTH (m)	WATER	BIT	SAMPLE or test	SOIL Group	GRAPHIC Log		Soil t	ype, coloi	SOIL DESCRIPTION ar, consistency, grains	ize, moisture, rem	orks	
Ē				SM (v)	· · · ·		OIL - sand	y siltv e∙drv	with trace of cla	ay, rootiets;		0.15- /-
- - - - - - - - - - - - - - - - - - -	roundwater Encountered			ROCK		MET A Interk weak Bedd beddi Surfa	A-SHALE w beds; highly /mediumn s ing 41º/248 ing). Defect ices ironsta	ith fine weath strong; 3°; majo spacing ined, m	e grained tuffac ered/moderately laminated to thi or joint set 73 % g very close/clo inor clay coating	eous sandsto weathered; nly bedded. 068 ° (across ose. g,	ne	
-	Vo Gi		•		- \ _ \ _ \ _ \ _ / \ _ \ _ \ _ /	÷						- Tri-
-											END	
<u> </u>						Ends	as above.					- l - l
Ē					-					· ·		
Ē												1
									۰ ۰			
Ē												
												11
-3												111
												11
Ē												-
					1.							111
- 4						· .						
F												. II
E				1.								
Ē	,											
E												
- 5	C 1 110		TECT					בוכו ח		.I E V		
U D SPT. CPT.	SAMP Undisl Distur Stanc Cone	LE UK urbed bed lard P Penet	enetration ration Test	l : lo l : lo	boratory	<u>~</u> " ~ "	later Table later Inflow	PROJE SHEET SCAL	CT COORDINATOR: 1 OF 1 E 1: 25	J.F.YO SHEETS	OUNG	

Comm	nerce		GEOTEC	HNICA	.L & E	ENVIRONMENTAL	TEST PIT	TP47
PROJI LOCA CONT	ECT: TION: Racto	TII F R: R. 8	LEGRA ARLEYS & I. CONT	DAM PROPI RACT	ERTY ING 0	PERATOR: PHIL GARLA	DATE: 30.10.07 SURFACE RL: 108.3m ND EQUIPMENT: KOMATSU I	PC220
DEPTH (m)	WATER	BIT	SAMPLE OF TEST	SOIL Group	GRAPHIC Log	Soil type, co	SOIL DESCRIPTION lour, consistency, grainsize, moisture,	remarks
0				SM (v)	/./	TOPSOIL - sandy silf \pale brown; loose; dry	t, rootlets; /.	0.15- /-
	N.G.E			CL/CI (v)		SANDY SILTY CLAY brown with orangebro	own streaks; stiff; just moist	0.75
1				ROCK	· \ \ \ / \ / \ / . \ \ /	Pebbly TUFFACEOUS well rounded gravel to generally weak (diffic \ No indication of bedd	S SANDSTONE, includes 55mm dia; highly weathere cult digging); fine grained. ling. (may represent GRAVEI	d; END at 1.10- LY /
						CLAYEY SAND, lightl Ends as above.	y cemented).	
								-
-2	•		-					-
					· · ·			-
3								
							· · · · ·	
-4 								
ı ı ı	-		· .					- - -
5 U D SPT	SAMP Undist Distur Stand	LE OR bed lard P	TEST enetration T	v : vis l : la est	l sual boratory	WATER FIEL Water Table SHE Water Inflow cr	D SUPERVISOR: J. Ject Coordinator: J. Et 1 of 1 sheets Alf 1 25	F.YOUNG F.YOUNG

بالز ن								
NSW Dep	urtanent of		GEOTEC	HNICA	L& E	NVIRONMENTAL	TEST PIT	TP48
PROJE LOCA CONTI	TETCE CT: FION: RACTOI	TI F R: R.	LLEGRA ARLEYS & I. CON	DAM PROPE TRACT	RTY ING 0	PERATOR: PHIL GARL	DATE: 30.10.07 SURFACE RL: 108.6m AND EQUIPMENT: KOMATS	U PC220
EPTH {m}	WATER	BIT	SAMPLE Dt TEST	SOIL Group	GRAPHIC LOG	Soil type,	SOIL DESCRIPTION colour, consistency, groinsize, mois	ture, remorks
0	-			SM (v)	7. /. . /	TOPSOIL - sandy s _pale brown; loose; d	ilt, rootlets; ry.	. 0.
	-			CL/CI (v)	· · · · · · · ·	SANDY SILTY CLA brown with orangeb	Y; rown streaks; stiff; just m	oist.
1						GRAVELLY CLAYEY brown/yellowbrown; includes well rounde	Y SAND; stiff/very stiff; just moist ed gravel to 5mm dia.	
		-	-				
				SC (v)			·	
2	ncountered					Extremely weathere extremely weak/ve	ed/highly weathered towa ry weak.	rds 2.0m;
3	No Groundwater E					GRAVELLY SANDY greybrown; stiff/ver includes highly wea sandstone/meta-sha dimension. Rare wel dia still persists.	CLAY/CLAYEY SAND; y stiff; just moist. athered angular tuffaceous ale fragments to 15mm I rounded gravel to 5mm	2.1
4				GC (v)			•	
-								
5 U D SPT. (PT	SAMP Undistu Distu Stand	LE OR turbed tord P dord P	TEST Penetration T ration Test	v : vis l : lat	ual poratory	WATER FI Water Table SI Water Inflow S	ELD SUPERVISOR: Roject coordinator: Heet 1 of 2 shee Icale 1:25	5. J.F.YOUNG J.F.YOUNG TS

C ^{NSW Der}	artment of		GEOTEC	HNICA	L & E	NVIRONMENTAL	TEST	ΡΙΤ	TP48
PROJI LOCA CONT	TION: RACTO	TII F R: R.	LEGRA ARLEYS & I. CON	DAM PROPI TRACI	ERTY	PERATOR: PHIL GARLA	DATE: 30.1 SURFACE RL: ND EQUIPMENT:	0.07 108.6m KOMATSU	PC220
DEPTH (m)	WATER	BIT	SAMPLE of TEST	SOIL Group	GRAPHIC Log	Soil type, c	SOIL DESCRIP olour, consistency, g	TION rainsize, moistu	re, remorks
5				GC (v)		GRAVELLY SANDY greybrown; stiff/very Includes highly weat sandstone/meta-shal dimension. Rare well dia still persists.	CLAY/CLAYEY stiff; just mols hered angular e fragments to rounded gravel	SAND; t. tuffaceous 15mm to 5mm	
6	-				0/0/				END at 6.00-
<u>ا</u>						Ends as above.			
7									
8 								. '	
<u>uluu</u> 9									
- 10 - "	SAMF	PLE OR	TEST	V : Vis 1 : Lo	boratory	WATER FIE	LD SUPERVISOR:		J.F.YOUNG
0 0 SPT CPT	Distu Stan Cone	rbed rbed dord P Penet	enetration ration Test	Test		Water Toble SH	EET 2 OF	0K: 2 SHEET 25	5.F. TOONG S

C ^{NSW D}	artment of		GEOTE	CHNICA	L & E	INVIRONMENTAL	TEST PIT	TP49
PROJI LOCA CONT	Herce Ect: Tion: Ractoi	TII F R: R. 8	LEGRA ARLEYS & I. CON	DAM PROPI TRACT	ERTY'-	- ALLUVIAL FLAT PERATOR: PHIL GARLA	DATE: 30.10.07 SURFACE RL: 112.6m ND EQUIPMENT: KOMATS	U PC220
DEPTH (m)	WATER	BIT	SAMPLE or TEST	SOIL Group	GRAPHIC Log	Soil type, co	SOIL DESCRIPTION lour, consistency, grainsize, mois	ture, remarks
0			- 4400	SM (v)	·/./ ////	TOPSOIL - slightly c ∖pale brown; loose; dr	layey sandy silt, rootlets /.	s; 0.15- /-
	N.G.E	-		SC (v)	· · · ·	GRAVELLY CLAYEY brown/yellowbrown, r	SAND; nottled; stiff; dry.	0.55
<u></u> 1 1				GC (v)	000	CLAYEY SANDY GR pale greybrown; very Has the appearance Gravel fraction comp meta-sedimentary fra	AVEL; stiff/hard; just moist. of concrete. ises angular, weathered gments to 25mm.	END at 0.75
						Ends as above (very	difficult digging).	
						•		
2								
						· · · · · · · · · · · · · · · · · · ·		
								- - - -
- - 3								
					*			
						· · · · · · · · ·		
يلىبىد								
± 5 U D SPT CPT	SAMP Undis Distu Stan Cone	LE OR turbed rbed dord P Penet	 TEST enetration ration Test	v : vis l : la Test	sual boratory	WATER FIE Water Table SHI Water Inflow SC	LD SUPERVISOR: Dject coordinator: Set 1 of 1 shee Ale 1: 25	J.F.YOUNG J.F.YOUNG TS

8/10/2008 1:59:11 PM g:\IS\Watertec\Geotech\PCAD\BORELOGS\tillegra f.dgn

C NSW Dep	artment of		GEOTEC	HNICA	L& E	NVIRONMENTAL	TEST PIT	TP50
PROJE LOCA CONT	ILEFCE CT: TION: Ractoi	TIL F R:R. &	LEGRA ARLEYS I. CONT	DAM PROPE RACTI	ERTY - NG O	ALLUVIAL FLAT PERATOR: PHIL GARLA	DATE: 30.10.07 SURFACE RL: 107.0r ND EQUIPMENT: KOMATS	n SU PC220
DEPTH {m}	WATER	BIT	SAMPLE of test	SOIL Group	GRAPHIC Log	Soil type, c	SOIL DESCRIPTION plour, consistency, grainsize, moi	sture, remarks
-0			<u></u>	SM (v)		TOPSOIL - slightly o pale brown; loose; dr	layey sandy slit, rootlet y.	is;0.2
	o Groundwater Encountered			CH (V)		SILTY CLAY/CLAYE	Y SILT; stiff; moist.	1.6
	2			GC (v)	0 0 0 0	CLAYEY SANDY GR fragments to 25mm clayey sand/sandy very weak/weak - p	AVEL; angular meta-sed in greybrown/orangebro clay matrix; cemented; probable slopewash.	imentary own END at 1.90
- <u>1</u> 						Ends as above. Mas	sive, slow digging.	
U D SPT CPT	SAMP Undis Distu Stan Cone	LE OR turbed rbed dard P Penet	TEST enetration ration Test	v : vis l : la Test	sual boratory	WATER FIE Water Table SH Water Inflow St	LD SUPERVISOR: OJECT COORDINATOR: EET 1 OF 1 SHE CALE 1:25	J.F.YOUNG J.F.YOUNG ETS

.

Comp	nerce		GEOTEC	HNICA	L& E	NVIRONMENTAL	TEST PIT		TP51
PROJI LOCA CONT	ECT: TION: Racto	TII F R: R. (LLEGRA ARLEYS & I. CONT	DAM PROPI TRACT	ERTY	- ALLUVIAL FLAT PERATOR: PHIL GARLA	DATE: 30.10.07 SURFACE RL: 11 ND EQUIPMENT: KON	6.2m IATSU PC22	20
DEPTH {m}	WATER	BIT	SAMPLE of test	SOIL Group	GRAPHIC Log	Soil type, c	SOIL DESCRIPTION alour, consistency, grainsiz	e, moisture, remork	(5
0				SC (v)		TOPSOIL - gravelly greybrown; loose; dry META-SHALE;	clayey sand, rootlet	s;	0.15
<u>r </u>	N.G.E	•		ROCK		moderately weathere Common clay fill to	eu; meaium strong; t 0.7m depth. Bedding	g 42°/073°.	
يبابينان			· · ·			Ends as above, mode weathered; medium	erately weathered/s strong/strong.	lightly	
<u>1</u> 2								• • •	· -
ıuluul									- · · <u>-</u>
									-
3 									-
السياسية									-
4									-
<u>1</u> 5									-
U D SPT. CPT.	SAMP Undis Distu Stanu Stanu	LE OR Turbed rbed dard P Penet	TEST Tenetration T ration Test	v : vis l : la est	ual boratory	WATER FIE Water Table SH Water Inflow SC	LD SUPERVISOR: DJECT COORDINATOR: EET 1 OF 1 ALE 1: 25	J.F.YOU J.F.YOU SHEETS	JNG JNG

									441
NSW Day	interest of		GEOTEC	HNICA	L& E	NVIRONMENTAL	TEST PIT	TP5	2
PROJE Locat Conti	ICT: FION: Ractoi	TII F R: R. (.LEGRA ARLEYS & I. CON	DAM PROPI FRACI	ERTY FING 0	- ALLUVIAL FLAT PERATOR: PHIL GARLA	DATE: 30.10.07 SURFACE RL: 11 AND EQUIPMENT: KOM	7.3m IATSU PC220	
)EPTH (m)	WATER	BIT	SAMPLE of test	SOIL GROUP	GRAPHIC Log	Soil type, c	SOIL DESCRIPTION olour, consistency, groinsiz	e, moisture, remarks	
` 0				SC (v)		TOPSOIL - gravelly pale brown; loose; dr	sandy silt, rootlets; y.	······································	0.20
1	undwater Encountered			ROCK		TUFFACEOUS SANI moderately weather strong/strong; very close to moderately 58 º/265 º ? Major je	DSTONE; ed/slightly weathere fine grained. Defect s wide. Bedding indis oint sets 20 º/073 º	d; medium spacing very tinct. Possibly across bedding ?	
2	No Gro					·		END	at 2.1
						Ends as above.			
						• •			
3									
-									
.4									
- 5									•
U D SPT. CPT.	I SAMP Undis Distur Stand Stand	LE OR turbed rbed dard P Penet	TEST enetration T ration Test	v : vis l : la	l sual. boratory	WATER FIE Water Table SH Water Inflow St	LD SUPERVISOR: Oject coordinator: Ieet 1 of 1 Cale 1:25	J.F.YOUNG J.F.YOUNG SHEETS	-

C NSW Det	artment of		GEOTEC	HNICA	L & E	NVIRONMENTAL	TEST PIT	•	ГР53
PROJI LOCA CONT	ECT: TION: Racto	TII L R: R.&	LEGRA A - SPIL I. CONT	DAM LWAY RACTI	CHANI NG OF	NEL PERATOR: PHIL GARLA	DATE: 30.10.07 SURFACE RL: 10 ND EQUIPMENT: KON	8.7m IATSU PC22	0
DEPTH (m)	WATER	BIT	SAMPLE of TEST	SOIL Group	GRAPHIC Log	Soil type, c	SOIL DESCRIPTION olour, consistency, grainsiz	e, moisture, remari	S
E o				SM (v)		TOPSOIL - clayey s	ilty sand, rootlets; v.		0.20-
البيناي	ncountered			SC (v)		GRAVELLY CLAYEY brown with orangebr	SAND; rown mottle; stiff; dry	<i>I</i> .	0.70
<u>1</u>	lo Groundwater El		,	ROCK		META-SHALE; moderately weathers to thinly bedded. Be 55°/005° (into LA). partings) very close/ commonly clay coat	ed; medium strong; la dding 36°/265°. Ma Defect spacing (inc /close. Surfaces iron ed.	aminated jor joint set luding stalned,	
	2				· \ _ \ _ \ _ \ _ \ _ / - \ _ \ _ \ _				END at 1.60-
- - - - - - - - 2						Ends as above; mod Close to refusal.	erately weathered; t	ight.	
								· .	
-3						,			
4									-
									-
U D SPT CPT	SAMF Undis Distu Stan Cone	LE OR turbed rbed dard F Penel	TEST Penetration tration Test	y : vi l : la Fest	sual boratory	WATER FIE Water Toble PR Water Inflow St	ELD SUPERVISOR: OJECT COORDINATOR: IEET 1 OF 1 Cale 1:25	J.F.YO J.F.YO SHEETS	JNG JNG

Contraction	ariment of	- ·	GEOTEC	HNICA	L & E	NVIRONMENTAL	TEST PIT	TP54
PROJE		TII	LEGRA	DAM			DATE: 30.10.07	
LOCA	TION:	L	A - SPIL	LWAY	CHAN	NEL	SURFACE RL: 114.8m	
CONT	RACTO	R: R. 8		RACT	NG of	PERATOR: PHIL GARLA	ND EQUIPMENT: KOMATSU	PC220
			SAMPI F	C 011	CDADUIC	<u></u>	SOIL DESCRIPTION	
	WATER	BIT	TEST	GROUP	LOG	Soil type, co	lour, consistency, groinsize, moistu	re, remorks
Fo					1.1	TODOOU ocody all	rootlete:	
Ę	ed			(V)		pale greybrown; loose	; dry	0.25-
F	nter				· · · ·	SANDY SILTY CLAY;		
Ē	гол		•	CL/CI (v)	· · ·	brown/yellowbrown, m verv_stiff: just moist.	nottled;	
E.	r En	:			· · · ·			0.75-
Ē	/atei				· · - · - /	TUFFACEOUS SAND	STONE;	-
	vbn					highly weathered/mo	derately weathered; generation Iding Defect spacing	rally
	srou			ROCK		generally moderately	wide, Iron stained surfac	es
E	0					clay coated.		
Ę	Z						·	END at 1.50-
F			· ·					
Ę						Ends as above, mode	erately weathered, tight. R	efusal.
Ę		• •		ļ				
-2								-
E								-
E								-
F		·						
E								
Ē								
Ē-3			· •					-
Ē								
-								
E								_
E								
E.								-
È,								· · · · ·
4			1					
Ē					1			-
Ē			1					
Ē					1			-
E								-
- 3	C A MI			<u>v</u> .vi	 sual	WATER FIEL	D SUPERVISOR:	J.F.YOUNG
Ų	SARI Undis	turber	1231		iboratory	Woter Table PRC	JECT COORDINATOR:	J.F.YOUNG
SPT	Stan	iroea I brob	Penetration	Test		Water Inflow SHE	ET 1 OF 1 SHEET	rs
I CPT	Lone	Pene	tration lest				ALC 1: 20	

Comm	herce		GEOTEC	HNICA	L & E	NVIRONMENTAL	TEST PI	т ТР55
PROJE LOCA CONT	CT: TION: RACTO	TII L R: R.8	LEGRA A - SPILI I. CONT	DAM _WAY Racti	CHAN NG 0	NEL PERATOR: PHIL GARL	DATE: 30.10.07 SURFACE RL: 11 AND EQUIPMENT: KON	2.4m Matsu PC220
DEPTH (m)	WATER	BIT	SAMPLE of TEST	SOIL Group	GRAPHIC Log	Soil type	SOIL DESCRIPTION , colour, consistency, grainsiz	ze, moisture, remorks
	ed			SM (v)		TOPSOIL - clayey pale brown; loose;	sandy silt, rootlets; dry.	0.25
	No Groundwater Encounter		· ·	ROCK		TUFFACEOUS SA highly weathered; Defect spacing clo Surfaces Fe/Mn s to 1.3m.	NDSTONE; very weak/weak. Bed se to generally mode tained, commonly clay	ding:40°/245°. erately wide. coated END at 1.55
					<u>- \ \</u>	Ends as above, mo	derately weathered, t	tight. Refusal.
2			· · ·					
4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1								- - -
U D SPT. CPT.	SAMP Undisl Distur Stanc Cone	LE OR urbed bed lard P Penet	TEST enetration T ration Test	v : vis l : la est	ual boratory	WATER F Water Table F Water Inflow	FIELD SUPERVISOR: PROJECT COORDINATOR: Sheet 1 of 1 Scale 1: 25	J.F.YOUNG J.F.YOUNG SHEETS

Comp	nerce		GEOTEC	HNICA	L& I	ENVIRONMENTAL	TEST PIT	TP56
PROJE LOCA CONT	ECT: TION: Racto	TI L R:R.&	LLEGRA .OWREYS I. CONTI	DAM PROP Ractii	PERTY NG (PERATOR: PHIL GARL	DATE: 31.10.07 SURFACE RL: 145.8r AND EQUIPMENT: KOMATS	m SU PC220
DEPTH (m)	WATER	BIT	SAHPLE of test	SOIL Group	GRAPHIC Log	Soil type,	SOIL DESCRIPTION colour, consistency, grainsize, moi	sture, remorks
E ·				SM (v)		TOPSOIL - sandy s pale yellowbrown; lo	ilt, rootlets; ose; dry.	0.25-
L	water Encountered			SC (v)		GRAVELLY CLAYEN orangebrown/pale y firm; just moist.	/ SAND; ellowbrown, mottled;	
l	No Ground			ROCK		TUFFACEOUS SAN highly weathered; ve medium to thickly i	DSTONE; ery weak; fine grained; bedded. Bedding 43°/240	1.40- 0 º
3 4 4						Ends as above, high weathered, tight. Ref	ly weathered/moderately iusal.	
5 U D SPT CPT	SAMPI Undist Distur Stand Cone	.E OR urbed bed ord Pe Penetr	TEST Inetration To ation Test	y : vist I : lab	ual oratory	WATER FIE Water Table SH Water Inflow SC	LD SUPERVISOR: Oject coordinator: Eet 1 of 1 shee Cale 1:25	J.F.YOUNG J.F.YOUNG

9/10/2008 7:52:22 AMg:\IS\Watertec\Geotech\PCAD\BORELOGS\tillegra LA.dgn

CNSW Dep	artment of		GEOTEC	HNICA	L& E	ENVIRONMENTAL	1	EST PIT	•	TP57
PROJ	ECT:	TI	LLEGRA	DAM			DATE:	31.10.07		
LOCA	TION:	L	OWREYS	PROP	ERTY		SURF/	ACE RL: 125		20
CONT	RACTO	R: R.	& I. CONI	RACI		PERATOR: PHIL GAI	KLAND EUUIP	MENT: KUMA		
DEPTH	WATER	BIT	SAMPLE	SOIL	GRAPHIC		SOIL D	ESCRIPTION		
			151	0.001		Soil ty	pe, colour, consis	stency, grainsize,	moisture, remor	ks
Ē				SM (v)		TOPSOIL - sandy pale brown; loose	silt, rootlet ; dry.	s;		0.20
	No Groundwater Encountered			SC (v) ROCK		pale brown; loose CLAYEY SAND/S orangebrown/yell META-SHALE; highly weathered weak/medium st Bedding: 40 °/225 Ends as above.	; dry. SANDY CLA pwbrown mo /moderately rong; laminat ; ⁰ .	Y with trace ottled; firm; me weathered; ed to thinly	of gravel; olst. bedded.	1.80 END at 2.00
		•								
Ē		•								-
Ē										
- 4										-
Ē										
Ē										
Ē										
Ē										-
E 5									<u></u>	
U D SPT CPT	SAMPL .Undist .Distur Stand Cone	.E OR urbed bed ord Pe Penetr	TEST enetration Te ation Test	v : vis l : lat st	ual Joratory	WATER Water Table Water Inflow	FIELD SUPERV PROJECT COO Sheet 1 Scale	VISOR: Rdinator: OF 1 S 1:25	J.F.YOU J.F.YOU HEETS	JNG JNG

Comi	nerce		GEOTEC	HNICA	L& 1	ENVIRONMENTAL	TEST PIT	TP58
PROJI Loca Cont	ECT: TION: RACTO	TI L R: R.8	LLEGRA OWREYS & I. CONT	DAM PROP RACT	ERTY	OPERATOR: PHIL GARLA	DATE: 31.10.07 SURFACE RL: 118.1m ND EQUIPMENT: KOMATSU	PC220
DEPTH (m)	WATER	BIT	SAMPLE of test	SOIL GROUP	GRAPHIC LOG	Soil type, c	SOIL DESCRIPTION olour, consistency, grainsize, moisture	e, remorks
E O				SM (v)		TOPSOIL - sandy sil \pale brown; loose; dr	t with clay, rootlets; y.	0.15- /-
	ountered	ć		SC (v)	CLAYEY SAND with orangebrown/yellowb	gravel; rown, streaked; firm; just mo	oist.
	No Groundwater Enco		• •	ROCK		META-SHALE; highly weathered/mo generally medium st bedded. Includes thin depth. Bedding: 13 º/1	derately weathered; rong; lamianted to very thir clay seams to approx 1.3 25 °.	0.85-
			· ·		$\frac{1}{1}$			END at 1.70-
						Ends as above.		
3				· · · · · · · · · · · · · · · · · · ·				
4					- - -			
5							•	
U D SPT CPT	L SAMPL .Undist .Distur Stond Cone	.E OR urbed bed ard Pe Penetr	TEST enetration Te ation Test	v : vis l : lot est	L ual ooratory	WATER FIEL Water Table Water Inflow	D SUPERVISOR: J. Ject Coordinator: J. Et 1 of 1 sheets Ale 1:25	F.YOUNG F.YOUNG

Com	nerce	1	GEOTEC	HNICA	L&	ENV	IROI	NME	NTAL			TES	T PI	Τ.		TP	59	
PROJ	ECT: TION.	TI	LLEGRA		CRES	 ?T				·	DAT	E: 31	.10.07	7 65 7m	, 1			
CONT	RACTO	R: R.	& I. CONT	RACT	ING (DPER	ATOR:	PH	IL GA	RLAN	ID EQU	IPMENT	: KO	MATS	SU PC:	220		
DEPTH (m)	WATER	BIT	SAMPLE of test	SOIL GROUP	GRAPHIC Log				Soil	type, colo	SOIL our, con	DESCR sistency	IPTION , grainsi	ize, nois	ture, rem	orks		
E O	· · ·			SM (v)		T T	OPS ale	OIL brow	- sanc n; loos	dy silt, se; dry.	rootle	ets;				- -	0.2	20-
huulu	N.G.E			SC (v)	· · / · /	C b	CAY rowr	′EY ∶ n∕yel	SAND; lowbro	own, mo	ottled;	; stiff;	dry.			_	0.1	
- - - - - -				ROCK	$\begin{array}{c} \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot & \cdot \\ \cdot & \cdot &$	T h o	UFF. ighly f bec	ACE we dding	OUS : athere J. Joint	SANDS d; very t sets: from	TONE weat 60º /1	i; k∕wea I20° a {in na	ik. No and 8	indica 5 º/34	tion 0°.	ENI	D at 1.0)0 7
		-			•		vide. nds	Surf	aces (Ibove,	planar, tight. C	rough Close	, Fe/N to re	<u>In sta</u> fusal.	ined.				
										-				·		·		
<u> </u>																		luul
1 [÷								بلببينا
- - - - - - - - - - - - - - - - - - -									·									
																		liili
																		IIIIII
- - - -																		
ليبيل																		liiili
5						*****	-										·	111111
U D SPT CPT	L SAMPL Undist Distur StandCone	.E OR urbed bed ard Pe Penetr	TEST enetration Te ation Test	v : visi l : lob est	L ual oratory	× ×	₩/ ₩ ₩ ₩ ₩	ATER ater ater l	Table Inflow	FIELD PROJE Sheet Scal	SUPER CT CO r E	RVISOR: Ordina 1 of 1 :	TOR: 1 25	SHEET	J.F.YC J.F.YC TS	DUNG		

Comm	nerce		GEOTEC	HNICA	L&	ENVIRONMENTAL	TEST	PIT	TP	50
PROJE	CT:	TI	LLEGRA	DAM			DATE: 31.1	0.07		
LOCA	TION:	L	A - D/S	OUTE	R ZO	NE	SURFACE RL	: 127.8 m		1
CONT	RACTO	R: R.8	I. CONT	RACTI	NG	OPERATOR: PHIL GA	RLAND EQUIPMENT:	KOMATSU	PC220	
DĘPŢĤ	WATER	RIT	SAMPLE	SOIL	GRAPHIC	•	SOIL DESCRIP	TION		
			TĚŚT	GROUP	106	Soil t	ype, colour, consistency, g	jrainsize, moisture	, remarks	
F 0				SM (v)		TOPSOIL - sand pale brown; dry.	y silt with trace o	f clay, rootlet:	5;	0.25-
المتدايي	intered			SC (v)	· · / · / · · / · /	CLAYEY SAND; pale brown/oran;	gebrown, mottled; fi	rm; moist.		
<u></u>	idwater Encou				· · · · · · · · · · · · · · · · · · ·	TUFFACEOUS S highly weathered clay fill up to 10 with depth. Bedd	ANDSTONE; I; generally weak; f mm, ranging to cla ing: 46°/252°. Majo	ine grained; y coatings or joint sets:		0.90-
·	No Groun			ROCK		75 %333 °(into L, Bedding thicknes Defect spacing c planar, rough, iron	A), 80°/104 ° (across varies from thir lose/moderately w stained, commonly	oss bedding) Ily bedded to vide. Surfaces v clay coated	thick.	
									END	at 2.30
						Ends as above, h tight. Refusal.	ighly weathered/m	oderately we	athered,	
									. · · · ·	.
E-3										, Th
[]							· · · · ·			· • • • • • • • • • • • • • • • • • • •
										1
										-
									r	
									·	
										-
			•							
F								,		
					-					-
5										-
	SAMPI	E OR	TEST	v : visu	al	WATER	FIELD SUPERVISOR	J.F	YOUNG	
U n	Undistu Disturb	rbed		1 : lob	oratory	🗙 Water Table	PROJECT COORDINATO)R: J.F	YOUNG	· .
SPT	Stando Cone P	ird Pe Ienetri	netration Te ation Test	st		→ Water Inflow	SHEET 1 OF SCALE 1:2	I SHEETS 5		

9/10/2008 7:52:25 AMg:\IS\Watertec\Geotech\PCAD\BORELOGS\tillegra LA.dgn

Comp	nerce		GEOTEC	HNICA	L&	ENVIRONMENTAL	TEST PI	TP61	
PROJI LOCA CONT	ECT: Tion: Racto	TI L R: R.8	LLEGRA .A - D/S & I. CONT	DAM OUTE RACT	r zoi Ing (NE DPERATOR: PHIL GA	DATE: 31.10.07 SURFACE RL: 11 RLAND EQUIPMENT: KON	8.4m IATSU PC220	
DEPTH (m)	WATER	BIT	SAMPLE of TEST	SOIL Group	GRAPHIC LOG	Soil t	SOIL DESCRIPTION ype, colour, consistency, groinsiz	e, moisture, remorks	
E o	red			SM (v)		TOPSOIL - sand	y silt, rootlets; e drv		0.20
	dwater Encounte			SC (v)		SANDY CLAY/C pale brown/oran dry to just mois	LAYEY SAND; gebrown, mottled; stiff; t.		0.95
- 1	No Groun			ROCK	· · · · / · · · · · / · · · · · · / · · · ·	TUFFACEOUS S highly weathered Includes meta-sh laminated. Beddin	ANDSTONE; I; generally weak; fine g ale interbed (200mm t g: 46 º/260 °. No joint pa	rained. hick); attern visible. END at	1.40-
<u>. 1</u>						Ends as above, f tight. Refusal.	nighly weathered/moder	ately weathered;	
U D SPT CPT	SAMPL .Undist .Distur Stand Cone	.E OR urbed bed ord Pe Penetr	TEST enetration Tr ation Test	v : vis I : lab est	ual Ioratory	WATER Water Table Water Inflow	FIELD SUPERVISOR: PROJECT COORDINATOR: SHEET 1 OF 1 SCALE 1: 25	J.F.YOUNG J.F.YOUNG SHEETS	

Com	nerce	•	GEOTEC	HNICA	NL &	ENVIRONMENTAL	TEST PIT	TP62	
PROJI LOCA CONT	ECT: TION: Racto	TI L R: R.8	LLEGRA .A - D/S & I. CONT	DAM OUTE RACT	r zoi Ing (NE DPERATOR: PHIL GAR	DATE: 31.10.07 SURFACE RL: 112 LAND EQUIPMENT: KOM	2.1m ATSU PC220	
DEPTH (m)	WATER	BIT	SAMPLE of TEST	SOIL Group	GRAPHIC LOG	Soil typ	SOIL DESCRIPTION e, colour, consistency, grainsize	e, moisture, remarks	
				SM (v)		TOPSOIL - sandy pale brown; loose;	silt, rootlets; dry.	0,	.25-
Ē			· .	SC (v)		SANDY CLAY wit	h gravel; n. mottled: stiff: drv.	О.	.45-
1 1	No Groundwater Encountered	•		ROCK		META-SHALE; highly weathered laminated to very to 1.1m depth. Mo from 1.1m. Bedding (into LA), 42 °/055 (including partings) Surfaces planar, ge clay coated	with clayey seams; ge thinly bedded. Clayey derately weathered; me g: 40 °/258 °. Major join o (across bedding). De extremely close to v enerally rough, Fe/Mn	nerally weak; seams persist adium strong t set: 65 °/345 ° fect spacing ery close. stained, END at 2.	5
1						Ends as above. Ve NOTE: Pit across s weathered tufface shale band approx	ry slow digging. trike. Highly weathered ous sandstone at east imately 1.6m thick.	l/moderately ern end. Meta-	
4 5			· · ·						
U D SPT CPT	SAMPL Undist Disturl Stand Cone	E OR urbed oed ord Pe Penetr	TEST enetration Te otion Test	v : visı l : lab est	jal oratory	WATER F Water Table P Water Inflow	IELD SUPERVISOR: Roject coordinator: Heet 1 of 1 Scale 1:25	J.F.YOUNG J.F.YOUNG SHEETS	

9/10/2008 7:52:26 AMg:\IS\Watertec\Geotech\PCAD\BORELOGS\tillegra LA.dgn

Com	nerce		GEOTEC	CHNICA	AL & I	ENVIRONMENTAL	TEST P	іт ТІ	⁵ 63
PROJ	ECT:	TI	LLEGRA	DAM		аруы	DATE: 31.10.0	7	
LOCA	TION:	L	A - TOE	SLAE	ALIG	NMENT	SURFACE RL:	140.9m	
CONT	RACTO	R: R .	& I. CON	TRAC	ring o	PERATOR: PHIL GAR	LAND EQUIPMENT: KO	MATSU PC220	
ОГРТН		51 7	SAMPLE	SOIL	GRAPHIC		SOIL DESCRIPTION		
[m]	WATER	BII	TEST	GROUP	LOG	Soil type	e, colour, consistency, grains	iize, moisture, remarks	
E o	ed			SM (v)	///	TOPSOIL - sandy	silt, rootlets;		0.15-
Ē	Inter				· · ·	SANDY CLAY;	ury.		/
Ē	ncot			CL/CI	· · · ·	grey/orangebrown,	mottled; stiff; dry. Ind	cludes	
E	ter			(v)	• • • •				
E	dwat				· · · ·				
E 1	Loun				- \ - \ -				1.00-
	9 0			ROCK		highly weathered;	weak/medium strong	; fine grained;	
Ē	Z				$\frac{1}{1}$	No indications of t	bedding. Massive.	E	ND at 1.40
						Ends as above, hig	hly weathered/mode	erately	
E.						weathered, tight. R	efusal.		
F									
2									- I - I - I - I - I - I - I - I - I - I
Ē									. 1
F									
Ē									
Ē								· ·	
-3									
Ē									
Ē						· · ·			
E									•
Ē									
Ē									
4									
Ē									-
E									
Ē									
E E									
Ê 5									-
U D SPT CPT	SAMPI Undist Distur Stand Cone	LE OR urbed bed ard Pi Peneti	TEST enetration T ration Test	v : vis l : lol est	ual boratory	WATER F Water Table F Water Inflow	IELD SUPERVISOR: PROJECT COORDINATOR: Sheet 1 of 1 Scale 1: 25	J.F.YOUNG J.F.YOUNG SHEETS	1

.

Com	artment of		GEOT	ECHN	IICA	L & I	ENVIRONMENTAL	TEST PIT	•	TP64	
PROJ		TI	LLEGR	A DA	M		. · · · · · · · · · · · · · · · · · · ·	DATE: 31.10.07			
LOCA	TION:	L	.A - TC	DE S	LAB	ALIG	NMENT	SURFACE RL: 12	9.8m		
CONT	RACTO	R: R.	& I. CO	NTR	ACTI	NG (PERATOR: PHIL GARLA	ND EQUIPMENT: KON	ATSU PC:	220	
DEPTH (m)	WATER	BIT	SAMPLE OF TEST	E G	SOIL Roup	GRAPHIC Log	Soil type, co	SOIL DESCRIPTION lour, consistency, grainsize	e, moisture, rem	orks	
0					SM (v)		TOPSOIL - sandy sill	, rootlets;		C	0.15
	N.G.E				SC (v)	·/·/ ·/·/	CLAYEY SAND; pale brown/orangebro Includes boulder scre	own, mottled; stiff; ju e to 300mm dia.	st moist.		
					ľ	,				END at O	 .90-
1							Ends on tuffaceous s moderately weathere Refusal,	sandstone; highly we d; medium strong; m	eathered/ assive.		
									1		
						, ,					
-2											
							х -				-
-3											
											-
							-				-
											-
											-
											-
											_
											-
- ס U D SPT CPT	SAMPL Undist Disturl Stand Cone I	E OR urbed bed ord Pe Penetr	TEST netrotion ation Tes	Test	: visu : labo	al oratory	WATER FIELD Water Table PROJ Water Inflow SCA) SUPERVISOR: ECT COORDINATOR: T 1 OF 1 Le 1: 25	J.F.YC J.F.YC SHEETS	DUNG DUNG	

9/10/2008 7:52:28 AMg:\IS\Watertec\Geotech\PCAD\80RELOGS\tillegra`LA.dgn

NSW De	partment of		GEOTEC	HNICA	L& 1	ENVIRONMENTAL	TEST PIT	TP65
PROJ	<u>nerce</u> ECT:	TI	LLEGRA	DAM			DATE: 31,10.07	<u></u>
LOCA	TION:	L	A - TOE	SLAB	ALIG	INMENT	SURFACE RL: 119.	6m
CONT	RACTO	R: R.8	k I. CONT	RACT	ING (OPERATOR: PHIL GARLA	ND EQUIPMENT: KOMA	TSU PC220
DEPTH	WATED	01T	SAMPLE	SOIL	GRAPHIC		SOIL DESCRIPTION	<u></u>
	MAICK	DII	TËST	GROUP	LOG	Soil type, c	olour, consistency, groinsize,	moisture, remarks
ĘO	ered			SM (v)		TOPSOIL - sandy sil	t, rootlets; y.	0.20-
Ē	counte			SC (v)		CLAYEY SAND with pale grey/yellowbrow	gravel; vn, streaked; stiff; dry.	0.50
<u> </u>	No Groundwater End			ROCK		META-SHALE (overly sandstone at the ear moderately weathere to very thinly bedde joint set: 30°/100° very close/close. Su Clay infill to 5mm pe clay coated.	ying fine grained tuff stern end of the pit); d; medium strong; lam d. Bedding: 43°/255°. (across bedding). Defe rfaces iron stained, pl ersists to 1.2m depth	aceous hinated Major ect spacing anar, rough. h, otherwise
Ē			··		<u>- </u>	Tightens towards 1.4		
Ē		•		1		Ends as above, tight.	Difficult digging.	-
						NOTE: Refusal on hig	hly weathered/moder	ately weathered
5						tuffaceous sandstone	eastern end) at 1m.	
	. I							
F								
Ē								
Ē								
Ē								-
∃ 3								-
Ē					:			
Ē								
F								
Ē								-
E								
-4								
E								-
F								
Ē								
F								
F								
E 5								-
U D SPT CPT	SAMPL Undist Distur Stond Cone	.E OR urbed bed ard Pe Penets	TEST enetration To ation Test	v : visi L : lab est	uol ioratory	WATER FIEL Water Table Water Inflow SC	D SUPERVISOR: Ject Coordinator: Et 1 of 1 si Ale 1:25	J.F.YOUNG J.F.YOUNG HEETS

Comm	merce	;	GEOTE	CHNICA	NL &	ENVIRONMENTAL	TEST P	іт ТР	266
PROJI Loca Cont	ECT: TION: Racto	TI L R: R.8	LLEGRA .A - TOI & I.CON	DAM E SLAE TRACT	BALIG	INMENT OPERATOR: PHIL GA	DATE: 31.10.0 SURFACE RL: RLAND EQUIPMENT: KC	7 104.8m MATSU PC220	
DEPTH (m)	WATER	BIT	SAMPLE OF TEST	SOIL Group	GRAPHIC Log	Soil ty	SOIL DESCRIPTION ope, colour, consistency, grains	l vize, moisture, remarks	
EO.				SM (v)		TOPSOIL - sandy greybrown; loose;	y silt, rootlets; dry.		0.20-
	tered			SC (v)		GRAVELLY CLA brown/orangebro	YEY SAND; wn, mottled; stiff; dry.		0.50-
	No Groundwater Encount			ROCK		META-SHALE; highly weathered strong; laminated clayey seams pa possible shear zo depth. Bedding: 41 (across bedding). (including parting planar, generally clay coatings. Gr weathered towar	/moderately weather to thinly bedded. Incl rallel to bedding, 150m ones. Clay fill to 8mm 5°/260°. Major joint s 81°/320° (into LA). I s) very close/close. S smooth, minor iron sta ading to moderately to ds 1.85m.	ed; medium udes altered im thick - persists to 1.6m et 44 °/105 ° Defect spacing urfaces ining, common weathered/slightly	
				· .	·//	· .	-	EN	ID at 1.85-
2	*					Ends as above, t	ight. Difficult digging.		
				· .					
ո 3								·	ببليبيبلي
								· · · · ·	يتليبيلين
- 4									بالبيطي
<u></u> 5									يبطيبناليين
U D SPT CPT	SAMPL Undist Disturl Stand Cone 1	E OR urbed bed ord Pe Penetr	TEST enetration ation Test	v : vísi l : lab ſest	L Jol Joratory	WATER Water Table Water Inflow	FIELD SUPERVISOR: PROJECT COORDINATOR: SHEET 1 OF 1 SCALE 1 : 25	J.F.YOUNG J.F.YOUNG SHEETS	

Comm	herce		GEOTEC	HNICA	AL &	ENVIRONMENTAL		TEST P	IT T	P67
PROJ	ECT:	TI	LLEGRA	DAM				DATE: 01.11.07	7	
LOCA	TION:	L	A - TOE	SLAB	ALIG	INMENT		SURFACE RL:	96.2m	
CONT	RACTO	R: R. 8	& I. CONT	RACT	ING (OPERATOR: PHIL GA	RLA	ND EQUIPMENT: KO	MATSU PC220	
DEPTH	WATED	01T	SAMPLE	SOIL	GRAPHIC	·		SOIL DESCRIPTION	ł	
(m)	Π ΛΙ 5 5	UII	TËST	GROUP	LOG	Soil ty	ype, col	lour, consistency, grains	size, moisture, remarks	
₽ 0				FILL		TOPSOIL - grave	elly s	andy silt with tra	ace of clay,	0 20
Ē						rootlets;	e: drv	_		0.20-
				FILL	\bigotimes	SILTY CLAY/CL	AYEY	' SILT;		
E					\bigotimes	dark brown; stiff;	; dry/	just molst.		
Ē					\bigotimes					- 0.75
Ê.					\bigotimes	CLAYEY SANDY	GRA um d	AVEL; ense; just moist.		_
E	red				\bigotimes	e e				
F	Intel				\bigotimes					-
F	ncol				\bigotimes					
E	erE				\boxtimes					-
È.	łwat				\bigotimes					
Ē,	ouno			FILL	\bigotimes					_
Ē	Ū				\bigotimes					-
	No				\bigotimes					
Ē					\bigotimes					
Ē					\bigotimes					-
E					\bigotimes					
-3					\boxtimes	· ·				
Ę				ROCK				STONE.		3.10-
					- \ - \ -	moderately weat	hered	l; medium strong,	/strong; El	-/-ND at 3.30
						∖fine grained. Ends as above t	tiaht. (Close to refusal.	·	/
E										1 1 1
-4										-1-
										-
										-
- 5		FND	TEST	y · vie	L	WATER	FIFI D		J.F.YOUNG	}
U	Undist. Dietur	urbed had		li : lob	oratory	Woter Toble	PROJ	ECT COORDINATOR:	J.F.YOUNG	3
SPT	.Stand	ard Pe Penate	netration Tu ation Test	est		Water Inflow	SHEE	T 1 OF 1	SHEETS	
LP1	Lone	Penetr	ation lest				SCA	LE 1:25		

Com	nerc'e		GEOTEC	HNICA	AL & I	ENVIRONMENTAL	TEST PIT	TP68
PROJ	ECT:	TI	LLEGRA	DAM	•		DATE: 01.11.07	
LOCA	TION:	L	A - TOE	SLAB	ALIG	NMENT	SURFACE RL: 93.3m	
CONT	RACTO	R: R.	& I. CON1	RACT	ING (OPERATOR: PHIL GAI	RLAND EQUIPMENT: KOMATSU PC22	20
DEPTH	WATER	RIT	SAMPLE	SOIL	GRAPHIC		SOIL DESCRIPTION	
(m)		011	TĚŠT	GROUP	100	Soil ty	pe, colour, consistency, grainsize, moisture, remar	(S
				SM (v)		TOPSOIL - sandy brown; loose; dry.	silt, rootlets;	0.50-
	countered			SC (v)		SANDY CLAYEY brown/orangebrow	SILT; wn, mottled; firm; moist.	150
	oundwater Enc		-	SC (v)		SANDY CLAY/CL pale grey/orange	AYEY SAND; brown, streaked; firm to stiff; moist.	1.50-
× 1	No Gr			ROCK		TUFFACEOUS S/ highly weathered, weak/medium str indicates close to Fe/Mn stained, co	ANDSTONE; /moderately weathered; rong; fine grained; spoll dimension o moderately wide defect spacing. mmonly clay coated mered/slightly weathered towards 3.3	2.10-
4 5						Ends as above, ti	ght. Very difficult digging.	
U D SPT CPT	SAMPL Undist Disturl Standu Cone	E OR urbed oed ord Pe Penetr	TEST netration Te ation Test	v : visu l : lab st	ial oratory	WATER Water Table Water Inflow	FIELD SUPERVISOR:J.F.YOUPROJECT COORDINATOR:J.F.YOUSHEET10FSCALE125	NG NG

Com	herce		GEOTEC	CHNICA	L& I	ENVIRONMENTAL		TEST F	ит Т	P69
PROJ Loca Cont	ECT: TION: Racto	TI L R: R.	LLEGRA .A - TOE & I. CON	DAM SLAB TRACT	ALIG	NMENT OPERATOR: PHIL GA	ARLÁN	DATE: 01.11.0 SURFACE RL: ID EQUIPMENT: KC	7 93.1m DMATSU PC220)
DEPTH (m)	WATER	BIT	SAMPLE or TEST	SOIL Group	GRAPHIC Log	Soil	type, col	SOIL DESCRIPTIO our, consistency, grain	N size, moisture, remorks	
0 بىلىيىلىيىدا				SM (v)		TOPSOIL - sligh dark brown; loos	ntiy cla se; dry	ayey sandy silt,	rootlets;	
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	No Groundwater Encountered		D	SC (v) GM/GC (v)		CLAYEY SAND/ mid brown; firm; CLAYEY SANDY (continued ne	/SAND moist. / GRA ext she	Y CLAY; VEL; eet)		4.70
U D SPT CPT	SAMPL Undist Disturl Stand Cone	E OR urbed bed ard Pe Penetr	TEST enetration T ation Test	v : visu L : lob est	ial orotory	WATER Water Table Water Inflow	FIELD PROJE Sheet Scal	SUPERVISOR: CT COORDINATOR: I OF 2 E 1:25	J.F.YOUN J.F.YOUN SHEETS	G G

9/10/2008 7:52:31 AM g:\IS\Watertec\Geotech\PCAD\BORELOGS\fillegra LA.dgn

•

Comm	terce		GEOTEC	HNICA	L & I	ENVIRONMENTAL	TEST PI	т ТР69
PROJE	CT:	TI	LLEGRA	DAM			DATE: 01.11.07	
LOCA.	TION:	L	A - TOE	SLAB	ALIG	NMENT	SURFACE RL: 9	3.1m
CONTI	RACTO	R: R. 8	L CONT	RACT	NG	PERATOR: PHIL GARLA	AND EQUIPMENT: KOI	MATSU PC220
DĘPŢH	WATER	RIT	SAMPLE	SOIL	GRAPHIC	·	SOIL DESCRIPTION	
{m}		0.1.	TĚŠT	GRUUP	LUU	Soil type, c	colour, consistency, grainsi	ze, moisture, remorks
5 1001001	-		D	· ·		(continued from CLAYEY SANDY GR brown; loose; moist. C to 100mm dia.	previous sheet) ?AVEL; Gravel well rounded,	rarely –
		-	-					
					1010			-
6				GM/GC (v)	0,0			-
					010			
							·	
					0 / 0 /		·	
					0,0	5		-
			-		,			END at 7.00
7					<u></u>			
						Ends as above. Pit c	collapsed.	
Ē								
						,		-
-8		-						_
-								-
E								
Ē								
ŧ I								
-9								
E								· · · ·
Ē								
E								
E 10								
U D	SAMPL Undist Distur Stand	E OR urbed bed ard Pe	TEST enetration Te	v : visi l : lab	ial oratory	WATER FIEL	LD SUPERVISOR: Dject coordinator: Eet 2 of 2	J.F.YOUNG J.F.YOUNG SHEETS

Com	nerce		GEOTEC	HNICA	L&	ENVIRONMENTAL	TEST PI	т ТР70
PROJ	ECT:	TI	LLEGRA	DAM		<u></u>	DATE: 01.11.07	
LOCA	TION:	U	IPSTREAM	1 COF	FER	DAM	SURFACE RL: 1	01.8m
CONT	RACTO	R: R.8	I. CONT	RACTI	NG	OPERATOR: PHIL GARL	AND EQUIPMENT: KOI	MATSU PC220
DĘPŢH	WATER	RIT	SAMPLE	SOIL	GRAPHI		SOIL DESCRIPTION	
(m) 			TËST	GROOP	LU0	Soil type, i	colour, consistency, grainsi	ze, moisture, remorks
E O				SM (v)	[.]. [.].	TOPSOIL - sandy s	ilt, rootlets; ry.	0.20
					· · · ·	SANDY CLAY with	gravel;	
Ē				CL/CI	· · · ·	grey/orangebrown, s	treaked; stiff; dry.	-
Ē				(v)				
Ē	ered							1.00
1	ounti				·	TUFFACEOUS SAN	DSTONE;	· · · · · · · · · · · · · · · · · · ·
-	Ц Ш Ш				· · · · · ·	highly weathered/m	oderately weathered	d;
Ē	ater				(-)	Bedding: 33 º /225 º. I	Major joint sets:88	/165 (into
F	Ňp					RA), 35°/070° (aci (including partings) v	ross bedding). Detec very close to mode	rately wide.
E	Lour				· <u>·</u> ···	Surfaces planar, rou	gh, Fe/Mn_stained, c commonly_clay_coa	ccasionally
Ē	9			ROCK	· · / · · · /	1.8m depth	commonly oldy oou	
	z				- \ _ \ _ \ _ \ _ /	Moderately weather	ed, medium strong/	strong towards 2.1m.
Ē								-
Ē					· \ _ \ _ _ \ _ \ _ /			
F.					· - · - /	· ·		-
								END at 2.80
È.						Fods as above tight	Verv difficult diga	ina
E								
F								
F								_
Ē					· ·			· · ·
E.								-
È,								
Ē								•
E.								· –
E								-
F								-
5								
	SAMPL	E OR	TEST	v : visi l : lab	jal oratorv	WATER FIE	LD SUPERVISOR:	J.F.YOUNG
0 0	Disturi Disturi Stand	orded ned Dr	onetration To	ict.		Woter Toble PRI	EET 1 OF 1	J.F.YOUNG SHEETS
CPT	Cone	Penetr	ation Test			► Water Inflow SC	ALE 1:25	

9/10/2008 7:52:33 AMg:\IS\Watertec\Geotech\PCAD\80RELOGS\tillegra LA.dgn

Com	merice	 !	GEOTEC	HNICA	L&	ENVIRONMENTAL	TEST PI	т ТР71
PROJ	ECT:	TI	LLEGRA	DAM			DATE: 01.11.07	
LOCA	TION:	ι	IPSTREAM	A COP	FER	DAM	SURFACE RL: 9	8.4m
CONT	RACTO	R: R.8	k I. CONT	RACT	NG (OPERATOR: PHIL GARL	AND EQUIPMENT: KON	MATSU PC220
DĘPŢH	WATER	BIT	SAMPLE	SOIL	GRAPHIC		SOIL DESCRIPTION	
(m)	-		TËST	L RKOON	LŲU	Soil type	, colour, consistency, grainsiz	ze, moisture, remorks
		-		SM (v)		TOPSOIL - sandy pale brown; loose;	silt with clay, rootlets dry.	0.30
						SANDY CLAY/CLA grey/orangebrown,	YEY SAND; streaked; stiff; just m	oist.
1		•		SC (v)	. . .			
			•		/ . / . / . / .			
				- *	/ · / · / · / ·	ı		190-
E_2	ered				1.	CLAYEY SANDY G	RAVEL:	
	onut				%	pale greengrey wil	th orangebrown stream	ks;
<u>-</u>	Enc					Gravel fraction wel	rounded to 100mm	dia.
È.	ater			-	000			-
Ē	Mpu				。。。			
E			×		000			-
-3	9				0			
Ē					°/°/			
				GC	°/°/			
				(v)				
					000			
4					000			
E								-
					°, °,			
Ē					<u>^</u>			
Ēĸ								END at 4.90
F 3		FOR	TEST	y : visi	l Jol	WATER FI	ELD SUPERVISOR:	J.F.YOUNG
U	Undist. Nietzel	urbed		<u>l : lab</u>	oratory	Woter Toble	ROJECT COORDINATOR:	J.F.YOUNG
SPT	Stand Cone	ard Pe Penetr	netration Te ation Test	st		Water Inflow	HEET 1 OF 1 Scale 1 : 25	SHEETS

9/10/2008 7:52:33 AMg:\IS\Watertec\Geotech\PCAD\BORELOGS\tillegra LA.dgn

Comp	Artment of		GEOTEC	HNICA	NL &	ENVIRONMENTAL	TEST PIT	TP	72		
PROJ		TI	LLEGRA	DAM		· · · · · · · · · · · · · · · · · · ·	DATE: 01.11.07				
Inra		1	IPSTREAM		FER	DAM	SURFACE RL: 95.0m				
CONT	D.X.C.T.O.	D. R	& LCON	TRAC.				SU PC220			
	1	n. I.									
DEPTH	WATER	BIT	SAMPLE	SOIL	GRAPHIC		SOIL DESCRIPTION				
[11]			TEST	UKUUP	100	Soil type, c	olour, consistency, grainsize, moi	sture, remorks			
₽0					11	TOPSOIL - sandy si	It, rootlets;		_		
E				SM (v)		dark brown; loose; dr	y.				
Ē					1.1.				0.45-		
				,	· · · ·	GRAVELLY SILTY C	LAY;				
Ē			<u>.</u>		· · · ·	dark grey with oran	gebrown/redbrown spec	kles;	-		
F	-			01/01	• • •	towards the base of	the horizon.	uumm,	-		
Ē,	fere			(v)	· · · ·						
	nno										
F					•••						
Ē	Ŀ				$\frac{\cdot \cdot \cdot}{-1}$				1.40-		
F	Na I				$\frac{1}{1}$	extremely weathered	/highly_weathered; extr	emely			
	n n n					weak/very weak.Be	haves as clayey sand; g	rey/	11		
Ē	5					orangebrown, streake Highly weathered/mo	oderately weathered fro	m 1.8m ,	11		
-2	2 N					generally medium st	rong. Probable bedding:	50 º/230 º.			
Ē				ROCK		bedding). Defect space	ing very close to mode	o (across rately			
Ē			- -		$\dot{-}\dot{-}\dot{-}$	wide, surfaces planar	, rough, Fe/Mn stained,				
						occasional clay fill to	omm, common ciay coa	ungs			
									-		
					· _ \ _ \ _ /			END	at 2 00		
5					<u>__/</u>				at 2.30		
E						Ends as above, mode	erately weathered, mediu	m strong.			
È						BIOCKY excavation, v	ery slow digging.		-		
E									E		
E I											
E									Ē		
El									E		
<u>-</u> 4											
Εl									1		
E											
ΕI						· ·			Ē		
E I									1		
5									Ē		
	SAMPL	E OR	TEST	y : visi	ial'	WATER FIEL	D SUPERVISOR:	J.F.YOUNG			
U D	.Undistu Disturi	ntpeq peq		l : lop	oratory	🖌 🖌 Water Table 🛛 PRO	JECT COORDINATOR:	J.F.YOUNG			
SPT	.Stand	ard Pe	netration Te	st		► Water Inflow SHE	ET 1 OF 1 SHEE	TS			
	.cone f	CUCH	011011 1631				1:20				
COND	herce		GEOTEC	TEST P	IT	TP7	′3				
-----------------------	----------------------------	-----------------	----------------------------------	----------------------	----------------	---	---	--	--	-------------------------------	----------------------
PROJI LOCA CONT	ECT: TION: Racto	TI F R: R	LLEGRA IA - DIVE .& I. CON	DAM RSION TRAC	TUNN TING 0	NEL OUTLET POR IPERATOR: PHIL GAF	TAL RLAN	DATE: 01.11.07 SURFACE RL: DEQUIPMENT: KO	7 103.4m MATSU PC	220	
DEPTH (m)	WATER	BIT	SAMPLE or test	SOIL Group	GRAPHIC Log	Soil ty	ype, colo	SOIL DESCRIPTION bur, consistency, groins	ize, moisture, re	norks	
				SM (v)		TOPSOIL - sandy pale brown; loose	y silt, e; dry.	rootlets;	100-0480		0.25
				CL/CI (v)	· · · ·	SANDY CLAY wi pale grey/orange just moist.	ith gr ebrow	avel; n, streaked; firm	to stiff;		0.50
2 3 3	No Groundwater Encountered			CL/CI (v)		just moist. META-SHALE with interbeds; highly very weak (tufffa strong (meta-shall thinly bedded. Ber 50 °/008 ° (across partings) extremel smooth to rough, Occasional clay in Grades to genera	ith thi weath aceou ale). M adding ss be aly clo , iron infill po ally n	in tuffaceous san hered/moderately is sandstone) to eta-shale is lami :60 °/235 ° Majo dding). Defect sp ose to close. Sun stained, common ersists to 1.8m	ndstone weathered; weak/mediu nated to ve r joint set: acing (incluo faces plana ly clay coat depth.	Im ry Iing r, ed.	
					· · · ·					END	at 3.90 ⁻
E 4						Ends as above S	Slow	digging (still exc	avatable).		
F-	<u>ا مام ک</u>	F ND		y · vie	1	WATER	FIELD	SUPERVISOR	J.F.Y	OUNG	
Ų	.Undist	urbed	1 k. 4 i.	l : lab	ioratory		PROJ	CT COORDINATOR:	J.F.1	OUNG	
D SPT	Distur Stand	bed ard Po	enetration 'Te	st		Water lable	SHEE	T 1 0F 1	SHEETS		
ČP1	Cone	Peneti	ation Test			🔪 🎽 Water Inflow	SCAL	.E 1:20			

9/10/2008 8:28:45 AMg:\IS\Watertec\Geotech\PCAD\BORELOGS\tillegra RA.dgn

Com	herce	-	GEOTEC	HNICA	L& I	ENVIRONMENTAL	TEST F	PIT TI	P74
PROJI LOCA CONT	ECT: TION: RACTO	TI F R: R. 8	LLEGRA RA - DIVE K I. CONT	DAM RSION RACTI	TUNI NG (NEL OUTLET POR OPERATOR: PHIL GAT	DATE: 01.11.0 TAL SURFACE RL: RLAND EQUIPMENT: KO	7 103.2m OMATSU PC220	Linkawa
DEPTH (m)	WATER	BIT	SAMPLE of test	SOIL Group	GRAPHIC Log	Soil ty	SOIL DESCRIPTIO pe, colour, consistency, grain	N nsize, moisture, remarks	
				SM (v)		TOPSOIL - sandy pale brown; loose	silt, rootlets; ; dry.	-	0.25
						SANDY CLAY/CL pale brown; stiff;	.AYEY SAND; just moist/moist.	-	
				SC (v)					
			·						
					·/·/		· .		1.50
<u>، ایرانیان</u> 11	vater Encountered					CLAYEY SAND; pale grey with o	rangebrown streaks;	stiff; molst.	
	No Ground	-		SC (v)					
<u>4</u>				ROCK		TUFFACEOUS S extremely weathe Behaves as claye redbrown, mottled May represent lig	ANDSTONE; ered; extremely weak ey sand; greybrown/o htly cemented slope	; fine grained. prangebrown/ wash material.	3.30
U D SPT CPT	SAMPL Undist Distur Stand	.E OR urbed bed ard Pe Penetr	TEST enetrotion Te ation Test	v : visi l : lab est	Jal oratory	WATER Water Table Water Inflow	FIELD SUPERVISOR: PROJECT COORDINATOR: SHEET 1 OF 2 SCALE 1 : 20	J.F.YOUNG J.F.YOUNG SHEETS	3

Com	nerce		GEOTEC	HNICA	L & F	ENVIRONMENTAL	r	EST PI	Т	TP74
PROJ	ECT:	TI	LLEGRA	DAM			DATE:	01.11.07		
LOCA	TION:	R	RA - DIVE	RSION	TUNN	NEL OUTLET POR	TAL SURF	ACE RL: 10	03.2m	
CONT	RACTO	R: R.	& I. CONI	RACT	ING o	PERATOR: PHIL GA	RLAND EQUIP	MENT: KOI	MATSU PC2	20
DEPTH	WATED	BIT	SAMPLE	SOIL	GRAPHIC		SOIL C	ESCRIPTION	4 M.H.H.	
(m)	174165	ווע	TËST	GROUP	LOG	Soil ty	ype, colour, consis	stency, groinsi	ze, moisture, remor	ks
4 11				ROCK		(continued fro TUFFACEOUS S extremely weath Behaves as clay redbrown, mottled May represent lig - Highly weatherd Behaves as clay rounded pebbles	om previous ANDSTONE; ered; extreme ey sand; gre d. ghtly cement ed from app ey sand, incl to 3mm dia	sheet) ely weak; f ybrown/or aed slopew prox 5.0m, udes minor a.	line grained. angebrown/ ash material. very weak. r well	
6										END at 6.00-
E						Ends as above.S	Still easy dig	ging.		-
F										
E										-
F		•								-
Ē										-
Ē										-
-7										-
Ē										_
Ē								,		-
È.										
E										-
E										=
È-										
E 8										
11	SAMP	E OR	TEST	v : vis	ual oratory	WATER	FIELD SUPER	/ISOR:	J.F.YO	UNG
U	Distur	urbed bed	natestics T			🗙 Water Table	PROJECT COO Sheft 2	RDINATOR:	J.F.YO	UNG
CPT.	Srana Cone	eneti Peneti	ration Test	51		➤ Water Inflow	SCALE	1: 20		

Com	anterce		GEOTEC	HNICA	AL & F	ENVIRONMENTAL	TEST PIT	TP75
PROJ	ICT:	ΤI	LLEGRA	DAM			DATE: 02.11.07	
LOCA	TION:	F	A - SPIL	LWAY	CHAN	INEL	SURFACE RL: 99.7m	
CONT	RACTO	R- R .8		RACT	ING o	PERATOR: PHIL GA	RLAND EQUIPMENT: KOMATSU	PC220
				1	r			
DEPTH	WATER	BIT	SAMPLE	SOIL	GRAPHIC		SOIL DESCRIPTION	
			TEST	UKOUP	LUU	Soil ty	/pe, colour, consistency, grainsize, moistur	e, remorks
-0		A		SM (v)		TOPSOIL - sandy pale brown; loose	y silt, rootlets; ə; dry.	0.20
1 1 2 2	undwater Encountered			SC (v)		CLAYEY SAND/S grey/yellowbrown stiff; Just moist. G angular, highly we weathered, meta- to 50mm max d	SANDY CLAY with gravel; n/orangebrown, mottled; aravel fraction comprises eathered/moderately sedimentary fragments mostly imension - probable slopewash	
E	C C L		• .				· ·	2.40
۲ ۲ ۲ ۲ ۲ ۲ ۲ ۲ ۲ ۲ ۲ ۲ ۲ ۲ ۲ ۲ ۲ ۲ ۲	NO			ROCK		Interbedded MET TUFFACEOUS S highly weathered medium strong, I Sandstone is ext weathered with Ends as above. S	A-SHALE and medium grained ANDSTONE; Meta-shale is I/moderately weathered, weak/ aminated to very thinly bedde tremely weathered to highly depth, extremely weak to wea	d. k. END at 4.00-
SAMPLE OR TEST Y : visual						WATER	FIELD SUPERVISOR: J	.F.YOUNG
U D SPT CPT	.Undist .Distur Stand Cone	urbed bed ord Pa Penetr	enetration T ation Test	est	, vi u i vi y	₩ Water Table ₩ Water Inflow	PROJECT COORDINATOR: J Sheet 1 of 1 Sheets Scale 1: 20	.F.YOUNG



9/10/2008 8:28:48 AMg:\IS\Watertec\Geotech\PCAD\BORELOGS\tillegra RA.dgn

Comp	nerce		GEOTEC	HNICA	L& I	ENVIRONMENTAL	TEST P	т ТР2	76
PROJ	ECT:	TI	LLEGRA	DAM			DATE: 02.11.0	7	-
LOCA	TION:	F	RA - SPIL	LWAY	CHAN	INEL	SURFACE RL: 1	103.8m	
CONT	RACTO	R: R	.& I. CON	TRAC	TING (PERATOR: PHIL GAF	RLAND EQUIPMENT: KO	MATSU PC220	
DĘPŢH	WATER	RIT	SAMPLE	SOIL	GRAPHIC		SOIL DESCRIPTION		
(m)			TËST	GROOP	100	Soil ty	pe, colour, consistency, grains	ize, moisture, remorks	
				SC (v)	[] 	(continued from	m previous sheet)		4.10 [=
Ē						CLAYEY SAND v greybrown/orange	with trace of gravel; ebrown/redbrown, mot	tied;	
E						stiff; just moist/m	oist. unded, rarely to 10mm	n dia.	
E						SILTY CLAY;			-
E						fissured; mid_grey streaks; stiff/very	/ with occasional oran / stiff; just moist.	gebrown	
								·	
									11
			D						
				СН		:			
				(v)					LL
Ē									
Ē									
								х.	1.1.1
6									
							······		11
								END	
Ē									- 1
-						Ends as above.			
-									
-7									. .
Ē									1.1
Ē									-
					,				
E									
Ē									_
- 8		E UB	TEST	y : vis	l	WATER	FIELD SUPERVISOR:	J.F.YOUNG	
U D	.Undist .Distur	urbed bed		l : lob	oratory	🗙 Water Toble	PROJECT COORDINATOR:	J.F.YOUNG	
SPT CPT	Stand Cone	ard Pr Penetr	enetration Te ration Test	est		► Water Inflow	SHEET 2 OF 2 SCALE 1:20	SHEETS	

PROJECT: TILLEGRA DAM DATE: 02.11.07 LOCATION: SPILLWAY CHANNEL SURFACE RL: 108.5m CONTRACTOR.R.& L.CONTRACTING DPERATOR: PHIL GARLAND ELUPHENT: KOMATSU PC220 DEFINI WATER BIT SAMPLE TEST Solid post clear, censister, grainize, anistare, remarks O SM TOPSOLL - sendy silt, rootlets; pale brown; loose; dry.	PROJECT: LOCATION: CONTRACT DEPTH (m) O O O O O O O O O O O O O O O O O O O	T tor: R. ter bit	TILLEGRA SPILLWAY R.& I. CONTI	DAM CHANNEL RACTING	OPERATOR: PHIL GARLA	DATE: 02.11.07 SURFACE RL: 108.5m	
LOCATION: SPRACE RL: 108.5m CONTRACTOR: R.& L.CONTRACTING DPERATOR: PHIL GARLAND EQUIPHENT: KOMATSU PC220 BEPH WATER BIT SMPLE SUB SUB SUB (SECREPTION) CONTRACTING: SUB SUB SUB SUB DESCRIPTION SOB SUB SUB SUB SUB SUB SUB SUB CONTRACTING: SUB	LOCATION: CONTRACT DEPTH Im) CONTRACT CONTRACT	N: TOR: R. TER BIT	SPILLWAY R.& I. CONTI	CHANNEL RACTING	OPERATOR: PHIL GARLA	SURFACE RL: 108.5m	
CONTRACTOR.R.& L CONTRACTING OPERATOR. PHIL GARLAND EQUIPMENT: KOMATSU PC220 DPTH MATER BIT SAMPLE TEST SOL GROUP SOL Lie SOL Sol type, colour, consistenty, grainsize, solstare, resorts Image: Colour Consistenty, grainsize, solstare, resorts TOPSOIL - sandy silt, rootlets; pale brown; loose; dry.		TOR: R.	R.& I. CONTI		OPERATOR: PHIL GARLA		
DEPTH Image: Solution of the second secon		TER BIT	SAMPLE	, , , , , , , , , , , , , , , , , , ,		AND EQUIPMENT: KOMATSU	PC220
0 Jun Type, form, for strenk y, grinster, grinster			TEST	SOIL GRAP GROUP LOG	IIC Sail hung d	SOIL DESCRIPTION	sa samaske
2 SM W DOPSOIL - sandy silt, rootlets; pale brown; loose; dry. 0.355 GRAVELLY SANDY CLAY; orangebrown/yellowbrown, mottled; stif//very stiff, dry to just motsl Gravel fraction comprises angular, highly weathered meta-sedimentary regenerally to 25mm max dimension - probable slopewash. 0.355 1 0 0 0 2 0 0 0 3 0 0 0 4 0 0 0 5 0 0 0 6 0 0 0 1 0 0 0 2 0 0 0 3 0 0 0 3 0 0 0 5 0 0 0 1 0 0 0 1 0 0 0 2 0 0 0 3 0 0 0 1 0 0 0 1 0 0 0 1 0 0 0 1 0	>				Sur Type, t	LOLOUI, CONSISTENCY, GROMSIZE, MOISTO	
Image: Section of the section of th				SM /	TOPSOIL - sandy si	ilt, rootlets;	
CLAYEY SAND Y CLAY; orangebrown/yellowbrown, mottled; stiff/very orangebrown/yellowbrown, mottled; stiff/very angular, highly weathered meta-sedimentary fragments generally to 25mm max dimension - - - 0 - 1 - 1 -				(v)		y.	
CLAYEY SAND with gravel; CLAYEY SAND; CLAYEY S						<u></u>	
1 stiff; dry to just moist. Gravel fraction comprises angular, highly weathered meta-sedimentary fragments generally to 25mm max dimension - probable slopewash. 1				• • •	GRAVELLY SANDY	GLAY; brown, mottled; stiff/very	-
angular, nigny weatnered meta-sedimentary ragments generally to 25mm max dimension - probable slopewash. - probable slopewash. 				•••	stiff; dry to just moi	st. Gravel fraction comprise	s –
- probable slopewash. - probable slopewash. - probable slopewash. 					fragments generally	to 25mm max dimension	
1 1 1	L				- probable slopewas	h.	
CL/CI CL					•		
2 istructure 2 istructure 2 istructure 3 istructure 3 istructure 3 istructure 3 istructure 3 istructure 5 istructure 6 istructure 1 istructure <td></td> <td></td> <td></td> <td>•••</td> <td>•</td> <td></td> <td>-</td>				•••	•		-
2 istructure 2 istructure 3 istructure 4 istructure 5 istructure 6 istructure 1 istructure <td></td> <td></td> <td>·</td> <td></td> <td>•</td> <td></td> <td>· •</td>			·		•		· •
Pattern (i) Pattern (ii) Pattern (iii) Pattern (iiii) Pattern (iiii) Pattern (iiiii) Pattern (iiiiii) Pattern (iiiiiii) Pattern (iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii	E				•		-
2 Description 2 Let by purpose 3 Let by purpose	Ē			(v) · · ·	•		
2 area area <t< td=""><td>e p</td><td>3</td><td></td><td></td><td>•</td><td></td><td>. .</td></t<>	e p	3			•		. .
2 at the second sec	Iter			· · ·	•		-
2 ister in the initial initialinitial initial initialinitial initialinitial initial initial init					•	• •	-
2 at a base of the second	E <u>u</u>	i			•		· · · · · · · · · · · · · · · · · · ·
Sec 2.40 Sc CLAYEY SAND with gravel; brown/orangebrown, mottled; hard; dry. Gravel fraction as above, generally to 5mm dimension. Includes charcoal fragments. 1 Sc W Sc 3 GRAVELLY CLAYEY SAND; pale grey with orangebrown streaks; very stiff to hard (lightly cemented, slow digging); dry. Gravel fraction angular meta-sedimentary; highly weathered; very weak; generally to 10mm dimension. Slopewash. 3					•		
3 CLAYEY SAND with gravel; brown/orangebrown, mottled; hard; dry. Gravel fraction as above, generally to 5mm dimension. Includes charcoal fragments. 3 3 SC W GRAVELLY CLAYEY SAND; pale grey with orangebrown streaks; very stiff to hard (lightly cemented, slow digging); dry. Gravel fraction angular meta-sedimentary; highly weathered; very weak; generally to 10mm dimension. Slopewash.							· _
0 2.40- 0 2 0 2 0 2 0 2 0 2 0 2 0 2 0 2 0 2 0 2 0 2 0 2 0 2 0 2 0 2 0 2 0 2 1 2 <					-		
CLAYEY SAND with gravel; brown/orangebrown, mottled; hard; dry. Gravel fraction as above, generally to 5mm dimension. Includes charcoal fragments. SC (W) GRAVELLY CLAYEY SAND; pale grey with orangebrown streaks; very stiff to hard (lightly cemented, slow digging); dry. Gravel fraction angular meta-sedimentary; highly weathered; very weak; generally to 10mm dimension. Slopewash.						• • • • • • • • • • • • • • • • • • •	2.40-
SC Gravel fraction as above, generally to 5mm dimension. Includes charcoal fragments. SC (v) GRAVELLY CLAYEY SAND; pale grey with orangebrown streaks; very stiff to hard (lightly cemented, slow digging); dry. Gravel fraction angular meta-sedimentary; highly weathered; very weak; generally to 10mm dimension. Slopewash.	E Ž				CLAYEY SAND with	gravel; mottled: bord: dry	-
SC Includes charcoal fragments. 3 SC W GRAVELLY CLAYEY SAND; pale grey with orangebrown streaks; very stiff to hard (lightly cemented, slow digging); dry. SC Gravel fraction angular meta-sedimentary; highly weathered; very weak; generally to 10mm dimension. Slopewash. Slopewash.					Gravel fraction as at	bove, generally to 5mm dir	mension.
SC (W) GRAVELLY CLAYEY SAND; pale grey with orangebrown streaks; very stiff to hard (lightly cemented, slow digging); dry. Gravel fraction angular meta-sedimentary; highly weathered; very weak; generally to 10mm dimension. Slopewash.					Includes charcoal fra	igments.	
3 3.30 3.30	F			SC .			
SC (V) SC (V)	E 3						
SC GRAVELLY CLAYEY SAND; Image: SC (v) Gravel fraction angular meta-sedimentary; highly SC SC SC							
SC (v) SC (v)							3.30
SC (v) SC	E			× 1		SAND	
SC (lightly cemented, slow digging); dry. Gravel fraction angular meta-sedimentary; highly weathered; very weak; generally to 10mm dimension. SIOPEwash.	F				pale grey with oran	gebrown streaks; very stiff	ito hard
weathered; very weak; generally to 10mm dimension.	E			sc	(lightly cemented, slo	ow digging); dry.	, 1
E Slopewash.	E			Ĭvī · .	weathered; very wea	ak; generally to 10mm dim	ension.
F I I I I I I I I I I I I I I I I I I I				· /.)	Slopewash.		-
	[4]			· ·/.			_
SAMPLE OR TEST Y : VISUAL WATER FIELD SUPERVISOR: J.F.YOUNG	SAM				•		
UDisturbed Water Table PROJECT COORDINATOR: J.F.YOUNG	UUndis	MPLE OR	DR TEST	y : visual	WATER FIEL	LD SUPERVISOR:	J.F.YOUNG
I SPT Standard Papatration Tast I ST I SHEET 1 OF 2 SHEETS I	SPTStan	MPLE OR isturbed	DR TEST ed	v : visual l : laborato	y WATER FIEL	LD SUPERVISOR:	J.F.YOUNG J.F.YOUNG

Con	herce		GEOTEC	HNICA	L& 1	ENVIRONMENTAL	TEST P	т ТР77
PROJ	ECT:	TI	LLEGRA	DAM			DATE: 02.11.0	7
LOCA	TION:	S	PILLWAY	CHAN	NEL		SURFACE RL:	108.5m
CONT	RACTO	R: R. 8	I. CONT	RACTI	NG	OPERATOR: PHIL GAR	RLAND EQUIPMENT: KO	MATSU PC220
DĘPŢH	WATER	BIT	SAMPLE	SOIL	GRAPHIC		SOIL DESCRIPTION	
		•	TËST	GROOP	LUU	Soil ty	oe, colour, consistency, groins	ize, moisture, remarks
						(continued from GRAVELLY CLAYE pale grey with ora (lightly cemented, s Gravel fraction ang	m previous sheet) Y SAND; ngebrown streaks; ver low digging); dry. ular meta-sedimentary	ry stiff to hard ;highly
					• • • • •	weathered; very we Slopewash.	eak; generally to 10m	m dimension.
					·/./.			
5				SC	·/·/·			-
				(v)	. / . /			
					·/./.			
E					·/./.		·	
		•			. / . /			
					•/•/.			
-				:	·/./.			
Ē					(.	· · ·		END at 6.20-
E							Alti an an an ait fa an Hanada an	
Ē						Ends as above. S	till reasonable digging.	-
		i						
Ē								
Ē								
Ē								-
E								-
E ·								
Ē								
			· .					
- 8		5 VD	TEST	v . vie		WATER I	FIFLD SUPERVISOR	J.F.YOUNG
U D.	.Undist Distur	urbed bed	,	l : lob	oratory	Woter Toble	PROJECT COORDINATOR:	J.F.YOUNG
SPT CPT	Stand Cone	ard Pe Penetr	enetration Te ation Test	st		► Water Inflow	SHEET 2 OF 2 SCALE 1 : 20	SHEETS

Comi	nerce		, GEOTEC	HNICA	L& I	ENVIRONMENTAL		TEST P	ІТ	TP78
PROJI Loca Cont	ECT: TION: RACTO	TI F R: R. 8	LLEGRA RA - SPIL & I. CONT	DAM Lway Ract	CHAN Ing 0	INEL OPERATOR: PHIL GA	RLAND	DATE: O2.11.0 SURFACE RL: DEQUIPMENT: KC	7 97.1m DMATSU PC2	20
DEPTH (m)	WATER	BIT	SAMPLE DF TEST	SOIL Group	GRAPHIC Log	Soil t	ype, colou	SOIL DESCRIPTION r, consistency, grain	ł size, moisture, remo	rks
				SM (v)		TOPSOIL - sand pale brown; loos	ly silt, r e; dry.	ootlets;		0.2 5
۲ ۱۱ ۲	No Groundwater Encountered			SC (v)		GRAVELLY CLA brown/yellowbro stiff/very stiff; d Gravel fraction g weathered/mode fragments genera includes minor w - probable slope	YEY SA own/oral dry to j generally rately to vell roun wash.	AND/SANDY Cl ngebrown, motti just moist with y comprises an weathered meta 25mm max dia ded pebbles to	LAY; ed; depth. gular highly a-sedimentary mension. Also 55mm dia.	
3 1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.					(./. /././					3.30
<u>1</u>				GM/GC (v)		Well rounded gra clayey sand mat just moist. Matrix highly weathered fragments. (proba	avel/bou trix; pale (includ d angula abiy allu	ulders to 150m e greengrey; me es extremely v ar meta-sedime uvial)	m dia in edium dense; veathered/ ntary	
U D SPT CPT	SAMPI Undist Distur Stand	.E OR urbed bed ord Pe Penetr	TEST enetration Te ation Test	v : visi l : lab est	jal oratory	WATER Water Table Water Inflow	FIELD S PROJEC Sheet Scale	SUPERVISOR: T Coordinator: 1 OF 2 1: 20	J.F.YO J.F.YO SHEETS	UNG UNG

Comp	GEOTECHNICAL & ENVIRONMENTAL TEST PIT TP78											
PROJI Ļoca cont	ECT: TION: Racto	TI F R: R. 8	LLEGRA {A-SPILLW & I.CONTI	DAM /AY C Racti	HANN NG (EL IPERATOR: PHIL GARLA	DATE: 02.11.07 SURFACE RL: 97.1m ND EQUIPMENT: KOMATSU	J PC220				
DEPTH (m)	WATER	BIT	SAMPLE DF TEST	SOIL Group	GRAPHIC LOG	Soil type, c	SOIL DESCRIPTION olour, consistency, groinsize, moistu	ıre, remarks				
4 1				GM/GC {v}		(continued from Well rounded gravel/ clayey sand matrix; just moist. Matrix inc highly weathered an fragments. (probably	previous sheet) boulders to 150mm dla ir pale greengrey; medium d ludes extremely weathere gular meta-sedimentary alluvial)) ense; ed/				
					0,10,			END at 5.30				
				-		Ends on tuffaceous generally weak; mas	sandstone; highly weatherd sive, very slow digging.	ed;				
							ż					
··· ··· ··· 7						х.	· · · · · · · · · · · · · · · · · · ·					
							· · · · · · · · · · · · · · · · · · ·					
E 8 U D SPT CPT	SAMPL Undist Distur Stand Cone	.E OR urbed bed ard Pe Penetr	TEST TEST enetration Te ation Test	v : vis l : lob st	ual orotory	WATER FIEL Water Table PRC Water Inflow SC	D SUPERVISOR: DJECT COORDINATOR: ET 2 OF 2 Sheets Ale 1:20	J.F.YOUNG J.F.YOUNG S				

Comr	nerce	;	GEOTEC	HNICA	AL &	ENVIRONMENTAL	TEST PIT	TP79
PROJ LOCA Cont	ECT: TION: RACTO	TI I R: R .	ILLEGRA RA - SPIL & I. CON'	DAM LWAY TRACI	CHAI	NNEL OPERATOR: PHIL GARL	DATE: 02.11.07 SURFACE RL: 94. AND EQUIPMENT: KOMA	3m ATSU PC220
DEPTH (m)	WATER	BIT	SAMPLE of TEST	SOIL Group	GRAPHIC	Soil type	SOIL DESCRIPTION , colour, consistency, grainsize,	moisture, remarks
				SM (v)		TOPSOIL - sandy pale brown; loose; (silt with trace of clay, dry.	rootlets;
<u></u>	countered			SC (v)		GRAVELLY CLAYE brown/yellowbrown moist. Gravel fraction com dia, with highly we sedimentary fragme	Y SAND/SANDY CLAN , mottled; stiff/very stif aprises well rounded gr athered/moderately any ents to 30mm dimension	/; if; just avel to 25mm gular meta- on.
- - - - - - - - - - - - - - - - - - -	No Groundwater Enc			GM (v)		Well rounded grave clayey sand matrix orangebrown iron s just moist. Matrix ir highly weathered, a to 20mm dimensio	l/cobbles to 150mm d ;; pale greengrey with tained bands; medium ncludes extremely wea ngular meta-sedimentar n. (probably alluvial)	1.40- ia in dense; thered/ y fragments 2.10
				ROCK		TUFFACEOUS SAN highly weathered; g	IDSTONE; enerally weak; fine gra	ined.
4		-				Ends as above, ma	ssive, slow digging.	
U D SPT CPT	SAMPL Undisti Disturl Standu Cone f	E OR urbed oed ard Pe Penetr	TEST netrotion Te otion Test	v : visı l : lob st	oratory	WATER Fil Water Table SH Water Inflow S	ELD SUPERVISOR: Roject coordinator: IEET 1 of 1 Si Cale 1: 20	J.F.YOUNG J.F.YOUNG HEETS

9/10/2008 8:28:53 AMg:\IS\Watertec\Geotech\PCAD\BORELOGS\tillegra RA.dgn

NSW De	partment of		GEOTEC	HNICA	L&	ENVIRONMENTAL	TEST PIT	TP80	C
PRO	nerce	TI	LIEGRA	DAM			DATE: 05.11.07		
LOCA	TION	L	A-SPILLW	VAY C	REST		SURFACE RL: 176.9m		
CONT	RACTO	R: R .	& I. CON	TRAC	ring (OPERATOR: PHIL GARLA	ND EQUIPMENT: KOMATSU	J PC220	
DEPTH (m)	WATER	BIT	SAMPLE Of TEST	SOIL Group	GRAPHIC Log	Soil type, co	SOIL DESCRIPTION lour, consistency, grainsize, moist	ıre, remarks	·
F0				SM (v)	1.1	TOPSOIL - silty sand	l, rootlets;		0.15
	untered			SP (v)		yellowbrown; loose; m Slightly CLAYEY GR	oist. AVELLY SAND, rootlets p n molet	ersist;	0.50
1	No Groundwater Encou			ROCK		pale yellowbrowh; firm Interbedded META-SI SANDSTONE. Meta-sh moderately weathere strong; laminated. Bed 62°/353° (into RA). very close to close. Fe/Mn stained, clay of highly weathered to weathered with dept	n; moist. HALE and TUFFACEOUS vale; highly weathered to d with depth; weak to m ding: 43 %243 ° Major join Defect spacing (including Surfaces planar, generally coated. Tuffaceous sands highly weathered/modera h; weak to medium stron	edium nt set: partings) y rough, tone: ntely ^{g.} END a	0.80-
2						Ends as above, slow Refusal on tuffaceous	digging in meta-siltstone sandstone at 1.1m.	•	
4		· · · · · · · · · · · · · · · · · · ·							
U D SPT CPT	SAMPL Undisti Disturt Standu	E OR urbed bed ord Pe Penetr	TEST Instruction Te Tation Test	v : visi 1 : lab est	ual oratory	WATER FIELD Water Table PROJ Water Inflow SCA) SUPERVISOR: ECT COORDINATOR: T 1 OF 1 SHEET! LE 1:25	J.F.YOUNG J.F.YOUNG	

9/10/2008 7:52:35 AMg:\IS\Watertec\Geotech\PCAD\BORELOGS\tillegra LA.dgn

Com	nerce		GEOTEC	HNICA	L&	ENVIRONMENTAL	TEST PIT	TP81
PROJI LOCA CONT	ECT: TION: Racto	TI L R: R.8	LLEGRA .A - SPIL & I. CONT	DAM LWAY RACT	CRES	ST OPERATOR: PHIL GARI	DATE: 05.11.07 SURFACE RL: 169.3 AND EQUIPMENT: KOMA	Bm FSU PC220
DEPTH {m}	WATER	BIT	SAMPLE of TEST	SOIL Group	GRAPHIC LOG	Soil type	SOIL DESCRIPTION , colour, consistency, grainsize, m	oisture, remarks
E O				SC (v)	/	TOPSOIL - clayey brown; loose; just n	silty sand, rootlets; noist.	0.20
	untered			CL/CI (v)	· · · · · · · · · · · · · · · · · · ·	SANDY CLAY, root orangebrown/yellov firm to stiff; just r	llets still persist; wbrown, mottled; noist.	
	No Groundwater Encou			ROCK		TUFFACEOUS SA highly weathered; g thinly to medium Major joint sets: 68 (across bedding). D very close to mod iron stained, clay c	NDSTONE; generally weak; fine grain bedded. Bedding: 46 °/248 °/330 ° (into RA) 64 °/0 refect spacing (including lerately wide. Surfaces p coated, rare fill.	0.90- ned; 3° partings) lanar, rough,
						Ends as above, hig weathered, very slo zones with wider c	hly weathered/moderate ow digging. Close to ref lefect spacing.	2.29 ly usal on
3								
4								
5							· · ·	
U D SPT CPT	SAMPL Undistr Disturt Standu Cone f	E OR urbed oed ord Pe Penetr	TEST netrotion Te ation Test	v : visi I : lob est	ual oratory	WATER FI Water Table S Water Inflow S	ELD SUPERVISOR: Roject coordinator: Heet 1 of 1 Shi Scale 1:25	J.F.YOUNG J.F.YOUNG EETS

Comm	nerce		GEOTEC	HNICA	L &	ENVIRONMENTAL	TEST F	۰. ۲	TP82
PROJI Loca Cont	ECT: TION: R RACTO	TI A-IN R: R.8	LLEGRA TERSECTION I. CONT	DAM ON OF Ract	∶¢c.& ING (TOE SLAB ALIGNM	DATE: 05.11.0 ENT SURFACE RL: AND EQUIPMENT: KO)7 160.9m DMATSU PC22	20
DEPTH (m)	WATER	BIT	SAMPLE or test	SOIL Group	GRAPHIC Log	Snil type	SOIL DESCRIPTIO	N Noize moisture remort	(5
-0				SM (v)	/ · / ·	TOPSOIL - silty sar	nd, rootlets;		0.10 /=
	untered			SC (v)		CLAYEY GRAVELLY yellowbrown; loose;]	oist. / SAND, rootlets p just moist.	persist;	0.50
<u></u>	No Groundwater Enco			ROCK		TUFFACEOUS SAN Tuffaceous sandsto strong/strong; fine g moderately wide, su minor clay coatings. generally weak; lami Major joint set: 75% (including partings) e Surfaces planar, gen	DSTONE with met ne; moderately we grained. Defect spa rfaces planar, roug Meta-shale; highly nated. Bedding: 48 320 ⁰ (into LA). D extremely close/ve nerally rough, iron	ta-shale interbed athered; medium icing generally gh, iron stained, weathered; 0/250 0 efect spacing ery close. stained,clay	
ı lanılı						Ends as above in m	neta-shale, slow di	gging.	END at 1.40
		•					is salusione at i.		1 1 1 1 1 1 1
L2									1
					-				
• • • •		-							
3									
يتلتينا	×								
E 4 U D SPT CPT	SAMPL Undist Distur Stand Cone	E OR urbed oed ord Pe Penetr	TEST netration Te ation Test	v : visu l : lob st	ial oratory	WATER FIE Water Table PRC Water Inflow SC	LD SUPERVISOR: DJECT COORDINATOR: EET 1 OF 1 ALE 1: 20	J.F.YOU J.F.YOU SHEETS	- NG NG

Comr	nerce		GEOTEC	HNICA	L &	ENVIRONMENTAL	TEST PIT	TP83
PROJ LOCA CONT	ECT: TION: F Racto	TI RA - R: R.8	LLEGRA INTERSEC & I. CONT	DAM TION RACT	୦F ଜୁ ING ଏ	(UPPER ABUTMENT) OPERATOR: PHIL GARLA	DATE: 05.11.07 SURFACE RL: 148.5 ND EQUIPMENT: KOMAT	im SU PC220
DEPTH (m)	WATER	BIT	SAMPLE of TEST	SOIL Group	GRAPHIC Log	Soil type, co	SOIL DESCRIPTION Nour, consistency, grainsize, m	pisture, remorks
E O				SM (v)	<u>/.</u> / 	TOPSOIL - silty sand	i, rootlets; st.	0.10
1 1 1 1	tered			SP (v)	· · · · · ·	Slightly CLAYEY GR	AVELLY SAND, rootlet rown, mottled; loose; mo	s persist; bist.
	uno:						· · ·	0.50
	No Groundwater Enc			ROCK		META-SHALE; highly weathered to (0.9m); weak to gene to very thinly bedded joint sets: 80 °/345 ° bedding). Defect spac extremely close to c rough, iron stained. Cl persist to 0.9m, rare 0.9m.	moderately weathered rally medium strong; I d. Bedding: 60°/245° I (into LA) 52°/068° (ing (including partings) close, surfaces palnar, ay fill/clayey seams clay coatings below	with depth aminated Major – across –
				<u> </u>	<u> </u>			END at 1.40
-						Ends as above in me digging, tightening.	eta-shale, slower	
							• •	
-2								
- ,							·	
				ŀ				
-								
-								
-								_
-								<u></u>
- 3								
-								
-								
-		1						-
<u> </u>								-
-								· -
- 4				ļ				· · · · · · · · · · · · · · · · · · ·
U D SPT CPT	SAMPL Undist Disturl Stand	E OR urbed bed ard Pe Penetr	TEST enetration Te ation Test	v : visi l : lab est	jal oratory	WATER FIELD	D SUPERVISOR: Ject Coordinator: .t 1 of 1 Shi .le 1: 20	J.F.YOUNG J.F.YOUNG ETS

Com	nerce	*****	GEOTEC	HNICA	L& I	ENVIRC	ONMENTAI	_	Т	EST P	IT	TF	984
PROJI LOCA CONT	ECT: TION: RACTO	TI F R: R	LLEGRA RA - CEN & I. CON	DAM TRELIN TRAC1	NE (UF Fing (PER A	ABUTMENT R: PHIL G	') Arlan	DATE: Surfa ID Equipa	05.11.07 ce rl: 1 1ent: KO	7 37.3m MATSU	PC220	
DEPTH {m}	WATER	BIT	SAMPLE of test	SOIL GROUP	GRAPHIC Log		Soil	type, col	SOIL DE our, consist	ESCRIPTION lency, grains	ize, moisture	, remarks	
Lo Lund			- -	SM (v)		TOP brow	SOIL - silty vn; loose; m	y sand, oist.	, rootlets	;			0.10
	N,G,E	-		SM/SC (v)		SILT yella	Y SAND v wbrown; lo	vith tra ose; mo	ice of cl bist.	ay, rootle	ts persist	t;	0.50
				ROCK		TUFI highi	FACEOUS ly weather	SANDS ed; gen	STONE; erally we	eak; fine	grained.	EN	D at 0.80
- - - - -						Ends tuffa	s on moder aceous san	ately v dstone,	veathere strong, 1	d/slightly tight. Refi	weather Isal.	ed	
L													ليبيلين
<u>، ا ، ، ، ا ، ، ، ، ، ، ، ، ، ، ، ، ، ،</u>		-				·							
2													
luulu													لببيلي
3													Lunlu
يىلىم													
- - - 4													
U D SPT CPT	SAMPL Undist Distur Stand Cone	E OR urbed bed ord Pe Penetr	TEST enetration Te ation Test	lv : visu l : lob est	ial oratory	× >	NATER Nater Table Nater Inflow	FIELD PROJI Shee Scai	SUPERVI ECT COORI T 1 .E	SOR: DINATOR: OF 1 1 : 20	J.I J.I SHEETS	F.YOUNG F.YOUNG	

Comi	nerce		GEOTEC	HNICA	L&	ENVIRONMENTAL	TEST PI	т ТР	85
PROJ LOCA CONT	ECT: TION: RACTO	TI F R: R. 8	LLEGRA RA - CEN R I. CONT	DAM TRELII RACT	NE (MI ING (DDLE ABUTMENT) DPERATOR: PHIL GARLA	DATE: 05.11.07 SURFACE RL: 12 ND EQUIPMENT: KOP	27.4m Matsu PC220	
DEPTH •. (m)	WATER	BIT	SAMPLE of TEST	SOIL Group	GRAPHIC	Soil type, c	SOIL DESCRIPTION olour, consistency, grainsi	ze, moisture, remarks	
F o E	ed			SM (v)	<i></i>	TOPSOIL - silty san	d, rootlets;		0.10
ل ، <u>ا</u>	Encounter			SP (v)		Slightly CLAYEY GR pale yellowbrown; loc	AVELLY SAND, roo ose; dry.	tlets persist;	
	No Groundwater			ROCK		TUFFACEOUS SAND highly weathered/mo thinly to medium be 47 %245 ^o Major joint (across bedding). Def very close (rarely) to planar, rough, iron sta	STONE; derately weathered dded (where visible t sets: 66 ⁰ /340 [°] (i ect spacing (includ o moderately wide. lined. Rare clay coa	l; medium strong; e). Bedding: nto LA) 55 %105 ^o ing partings) Surfaces atings,	1.14
<u> </u>		×				Ends as above, tight.	Refusal.		
2						· ·			
يا يريدا يريدا يريد						- -			
3 3						• •	·		
<u> </u>									
U D SPT CPT	SAMPL Undist Disturl Stand Cone	E OR urbed bed ard Pe Penetr	TEST netrotion Tr ation Test	v : visu l : lab est	ial oratory	WATER FIEL Woter Table PRO. Woter Inflow SCA	D SUPERVISOR: JECT COORDINATOR: ET 1 OF 1 LLE 1: 20	J.F.YOUNG J.F.YOUNG SHEETS	

CNNW DE	anterior		GEOTEC	HNICA	L& I	ENVIRONMENTAL	TEST PI	T ·	TP86
PROJ	ECT:	TI	LLEGRA	DAM			DATE: 05.11.07	,	
LOCA	TION:	- F	RA - CEN	TRELI	NE (MI	DDLE ABUTMENT)	SURFACE RL: 1	16.4m	~
CONT	RACTO	R: R.8	A I. CONT	RACT	NG C	PERATOR: PHIL GARL	AND EQUIPMENT: KOI	MAISU PC2	20
DEPTH	WATER	BIT		SOIL	GRAPHIC		SOIL DESCRIPTION	•••	L-
		-	[[5]	SM		Soil type,	colour, consistency, grainsi	ZE, MOISTUCE, CEMOI	KS
Ē				(v)	(. <i>. (.</i>	TOPSOIL - silty sa pale brown; loose; d	nd with trace of cla Iry.	y, rootlets;	0.10_
	Э.			SC (v)		GRAVELLY CLAYE yellowbrown; loose;	Y SAND, rootlets pe dry.	rsist;	0.45
	N.G			ROCK	· · · · · · · · · · · · · · · · · · ·	TUFFACEOUS SAN highly weathered/m strong, blocky, tight	d; medium ing,	l.u	
	, ,	-			[<u>``</u> _`	generally moderate	iy wide.		END at 0.90
[-1						Endo oo ohovo tigh	+ Pofucal		
Ē						Enus as above, ligh	n. neruşai.		
Ē									
									-
Ē	÷.								
E,									· -
E									
			``						
									· 1
-3 E								·	
E_									
Ē									
Ē									
4	SAMPI	EOR	TEST	y : vis	l	WATER FIE	LD SUPERVISOR:	J.F.YO	JNG
U D	.Undist .Distur	urbed	T	<u> : lob</u>	oratory	Woter Toble	OJECT COORDINATOR:	J.F.YO	JNG
SPT	Srand Cone	ura Pe Penetr	ation Test	251		Water Inflow Si	CALE 1:20	JII661J	`

.

Comp			GEOTEC	HNICA	L& I	ENVIRONMENTAL	TEST PIT	TP8	7
PROJE LOCA CONT	ECT: TION: R RACTO	TII A-TC R: R.8	LLEGRA DE SLAB (I. CONTI	DAM ALIGI RACTI	NMENT	(UPPER ABUTMENT) DPERATOR: PHIL GARLA	DATE: 05.11.07 SURFACE RL: 15 ND EQUIPMENT: KOM	0.9m ATSU PC220	
DEPTH (m)	WATER	BIT	SAMPLE or test	SOIL Group	GRAPHIC Log	Soil type, co	SOIL DESCRIPTION lour, consistency, grainsize	e, moisture, remarks	
E O				SM (v)	·/. /	TOPSOIL - silty sand	with trace of clay	, rootlets;	0.10 /-
ليبيابيه	N.G.E			CL/CI (v)	· · · · · · · · · · · · · · · · · · ·	SANDY CLAY; yellowbrown/orangeb firm to stiff; moist.	rown, mottled;		0.60
	ROCK								
			. · ·			Blocky excavation, de wide/wide. Ends as above, tight.	fect spacing moder	ately	
			:						
		-					· ·		1.1.1.1.1.1
- - - - - - - - - - - - - - - - - - -							н 		
يا يو يو ايو ي									
			· · · ·						
E 4 U D SPT	SAMPI .Undist .Distur Stand	E OR urbed bed ord P(TEST	v : vis l : lot est	ual boratory	WATER FIEL Water Table PRO. SHEI	D SUPERVISOR: Ject coordinator: Et 1 of 1	J.F.YOUNG J.F.YOUNG SHEETS	

9/10/2008 8:28:57 AMg:\IS\Watertec\Geotech\PCAD\BORELOGS\tillegra RA.dgn

Comp	nerce		GEOTEC	HNICA	L& E	INVIRONMENTAL	TEST PIT	TP88
PROJI LOCA CONT	ECT: TION: I RACTO	TII RA-T R: R. 8	LLEGRA OE SLAB	DAM ALIG RACTI	NMENT	UPPER ABUTMENT	DATE: 05.11.07) SURFACE RL: 139.3 ND EQUIPMENT: KOMA	3m TSU PC220
DEPTH (m)	WATER	BIT	SAMPLE or test	SOIL Group	GRAPHIC LOG	Soil type, co	SOIL DESCRIPTION lour, consistency, grainsize, m	oisture, remarks
- 0				SM (v)	[.]. ././	TOPSOIL - silty sanc _ brown; loose; just moi	l, rootlets; st.	0.15
1.1.1.1.1	ounterèd			CL/CI (V)	· · · · · · · · · · · · ·	SANDY CLAY, rootlet yellowbrown/orangeb	s persist; rown, mottled; firm; mol	st
	No Groundwater Enc			ROCK		TUFFACEOUS SAND interbeds. Tuffaceous moderately weathere Defect spacing mode rough, iron stained. Co Meta-shale: highly we weak to medlum str Major joint sets: 75 % bedding). Defect spac close to close. Surfa	STONE with minor me sandstone; highly we d; medium strong; fine rately wide. Surfaces ommonly clay coated. athered/moderately w ong; laminated. Bedding 345° (into LA) 45°0 ing(including partings) ces, smooth to rough,	eta-shale athered/ grained. planar, /eathered; g: 43°/243° 18° (across /ery iron stained,
						Ends as above, mode	rately weathered, stro	ng. Refusal.
						· .		
<u> </u> -2								
			•					
			-					
								- - - - -
3								
								-
- 4 U 0 SPT CPT	SAMPI Undist Distur Stand Cone	LE OR urbed bed lard Pi Peneti	TEST enetration To otion Test	v : vis I : lot est	l val poratory	WATER FIEL Water Table PRO. Water Inflow SCA	D SUPERVISOR: JECT COORDINATOR: ET 1 OF 1 SH ALE 1: 20	J.F.YOUNG J.F.YOUNG EETS

Com	nerce		GEOTEC	HNICA	AL& E	INVIRONMENTAL	TEST PIT	TP89
PROJ LOCA CONT	ECT: TION: Racto	TI RA-T R: R.8	LLEGRA OE SLAB	DAM Alig Ract	NMEN ⁻ ING 0	T (MIDDLE ABUTMEN PERATOR: PHIL GARLA	DATE: 05.11.07 T) SURFACE RL: 128.6n ND EQUIPMENT: KOMATS	n SU PC220
DEPTH (m)	WATER	BIT	SAMPLE of TEST	SOIL Group	GRAPHIC Log	Soil type, c	SOIL DESCRIPTION olour, consistency, grainsize, mois	iture, remarks
-0			L	SM (v)		TOPSOIL - silty san brown; loose; dry.	d with gravel, rootlets;	0.20
				CL/CI (v)		SANDY CLAY; yellowbrown/orangeb just moist.	prown/grey, mottled; stiff;	- - 0.80
- - - - - - - - - - - - - - - - - - -	No Groundwater Encountered			ROCK		META-SHALE; highly weathered, gra with depth (1.1m); we laminated to very th Major joint sets: 700, 33 °/120 ° (across b (including partings); e Surfaces planar, gen Common clay coatin	ading to moderately weak to generally medium inly bedded. Bedding: 55 / 340 0 (into LA) 440/0 redding). Defect spacing extremely close to close erally rough, iron stained g to 1.5m depth. 2.1m. Slow digging.	ethered strong; 9/247 0 65 0to
						Ends as above. Very in part on underlying moderately weathere	slow digging in meta-s tuffaceous sandstone l ed; medium strong/stron	- bed, g. -
U D SPT. CPT.	SAMP Undist Distur Stand Cone	LE OR Jurbed bed Jard Po Peneti	TEST enetration Tr ration Test	v : vis l : lol est	ual borotory	WATER FIEL Water Table PRC Water Inflow SC	LD SUPERVISOR: Dject coordinator: Eet 1 of 1 shee Ale 1: 20	J.F.YOUNG J.F.YOUNG TS

Comr	herce		GEOTEC	HNICA	L & E	ENVIRONMENTAL	TEST	PIT	TP90
PROJ	ECT:	TI	LLEGRA	DAM			DATE: 05.11.	07	
LOCA	TION: F	RA-T	OE SLAB	ALIG	NMENT	MIDDLE ABUTM	ENT) SURFACE RL:	122.3m	
CONT	RACTO	R: R. 8	& I. CONT	RACT	ING o	PERATOR: PHIL GAR	LAND EQUIPMENT: K	COMATSU PC	220
DEPTH	WATER	DIT	SAMPLE	SOIL	GRAPHIC	· · · · · · · · · · · · · · · · · · ·	SOIL DESCRIPTI	ON	
[WAILK	ÐIL	TEST	GROUP	LOG	Soil typ	pe, colour, consistency, gra	insize, noisture, rem	arks
		:		SM (v)		TOPSOIL - clayey brown; loose; dry.	y silty sand, rootlet	8;	0.20-
	itered			SM		GRAVELLY SAND yellowbrown/oran	9Y CLAY; gebrown/grey, mott	led;	· · ·
Ē	Coun					oun, juor muist.			0.60
L	No Groundwater En			ROCK		META-SHALE; moderately weath weathered/slightly (1.0m); medium st thinly bedded. Bed across bedding) 7 (including partings close. Surfaces pl common clay coa	ered, ranging to mo y weathered, quickly rong/strong; laminat dding: 44 %2470 Ma 8%160% (into RA). e) extremely close lanar, generally roug tings to 1.0m dept	oderately y with depth ed to very jor joint sets: 3 Defect spacing to occasionally gh, iron stained, h.	5º/070º
Ę					<u>}=\=/</u>			····	
<u> </u>						Ends on underlyin weathered, mediur	ng tuffaceous sands n strong, fine grain	stone, moderatel ed, tight. Refusa	
E									
F									-
									-
Ē									
E a									
									·
Ē									
E									
Ē									
E 4 U D SPT. CPT	SAMPI Undist Distur Stand Cone	E OR urbed bed ard Pr Peneti	 TEST enetration Te ration Test	v : vis l : lat est	 ual poratory	WATER Water Table Water Inflow	FIELD SUPERVISOR: PROJECT COORDINATOF SHEET 1 OF 1 SCALE 1 20	J.F.YC R: J.F.YC SHEETS	DUNG DUNG

CONV	artest of		GEOTEC	HNICA	L& E	INVIRONMENTAL	TEST PI	т ТР91	
PROJ	ECT:	TI	LLEGRA	DAM			DATE: 06.11.07		
	TION:	E 0. 27 S			ING o		SURFACE RL: T AND FOLIIPMENT: KOI	04.3m MATSU PC220	
	T	K: 11.0						······································	
(m)	WATER -	BIT	TEST	GROUP	LOG	Soil type,	colour, consistency, grainsi	ze, moisture, remorks	
0 لىساسىيا	untered			SM (v)		TOPSOIL - silty sau dark brown; loose; n	nd, rootiets; noist.	0.	40-
	ndwater Enco			CL/CI (V)	· · · · · · · · · · · · · · · · · · ·	SANDY SILTY CLA greybrown with ora just moist/moist.	Y; ngebrown streaks; s	tiff; A	
- - - - -	No Groui		D	ROCK	· · · · · · · · · · · · · · · ·			1	.15
					- \ _ \ _ \ - \ _ \ _ /	yellowbrown/orange stiff/very stiff; just No visible defects, cemented slopewas	r SAND; brown, mottled; molst. very difficult digging h.	END at 1. ı - possibly	30
						Ends as above.			بأبداءتنا
									يتبايبنا
3									بيبايتياء
يتتابينات									
- - - 4									
U D SPT CPT	SAMPI Undist Distur Stand Cone	LE OR urbed bed ard Pi Peneti	TEST enetration Te ration Test	v : vis l : lat est	ual boratory	WATER FIE Water Table PR Water Inflow St	ELD SUPERVISOR: OJECT COORDINATOR: IEET 1 OF 1 CALE 1: 20	J.F.YOUNG J.F.YOUNG SHEETS	-

9/10/2008 8:34:06 AMg:\IS\Watertec\Geotech\PCAD\BORELOGS\tillegra ba.dgn

Comm	herce		GEOTEC	HNICA	L& 1	ENVIRONMENTAL	TEST PI	т ТР9)2
PROJI LOCA CONT	ECT: TION: RACTO	TI B R: R. &	LLEGRA ORROW	DAM AREA RACTI	NG (PPERATOR: PHIL GAR	DATE: 06.11.07 SURFACE RL: 1 RLAND EQUIPMENT: KOP	03.0m MATSU PC220	
DEPTH (m)	WATER	BIT	SAMPLE OF TEST	SOIL Group	GRAPHIC	Soil typ	SOIL DESCRIPTION pe, colour, consistency, grainsi	ze, moisture, remarks	
	-			SM (v)		TOPSOIL - slighti dark brown; loose	y clayey silty sand, ro ; moist.	ootlets;	0.25
	ncountered			CL/CI (v)		SANDY SILTY CL greybrown/yellow	_AY; brown, streaked; stiff; r	noist.	
بادىيىلىيىيا 1	No Groundwater E	•		ROCK		META-SHALE; highly weathered quickly with dept laminated. Bedding 70 °/ 350 ° 15 °/1 (including partings	to moderately weath h (1.3m); weak to mec g: 68 % 253 ° Major joi l27 ° (across bedding). s) very close to close	ered, lium strong; nt sets: Defect spacing END	0.80-
<u></u>						Ends as above, st	till reasonable digging.		
U D SPT CPT	SAMPL Undist Distur Stand.	.E OR urbed bed ard Pa Peneta	TEST enetration T ation Test	y : vis l : lab est	ual Ioratory	WATER Water Table Water Inflow	FIELD SUPERVISÓR: PROJECT COORDINATOR: SHEET 1 OF 1 SCALE 1: 20	J.F.YOUNG J.F.YOUNG SHEETS	

CONT	artment of		GEOTEC	HNICA	L& I	ENVIRONMENTAL	TEST I	PIT	TP93
PROJI LOCA CONT	ECT: TION: Ractoi	TI B R: R.	LLEGRA ORROW & I. CON	DAM AREA FRACT	ING (OPERATOR: PHIL GAI	DATE: 06.11.0 SURFACE RL: RLAND EQUIPMENT: K	07 103.0m OMATSU PC22	20
DEPTH (m)	WATER	BIT	SAMPLE or test	SOIL GROUP	GRAPHIC Log	Soil ty	SOIL DESCRIPTIC pe, colour, consistency, grai)N nsize, moisture, remort	ks
Eo				SM (v)	/./	TOPSOIL - silty	sand, rootlets;	· · · · · · · · · · · · · · · · · · ·	0.15
	ter Encountered			CH (v)		SILTY CLAY; brown; firm to st	iff; moist.		1.00-
	No Groundwat			GC (v)		CLAYEY SANDY comprises well ro Sandy matrix wit angular, weathere fragments to 30	GRAVEL; unded gravel to 120 h clayey pockets, in d meta-sedimentary nm dimension.	mm dia. Icludes rock	END at 190
<mark>2</mark>						Ends as above.			
1.1.3 1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.		5							
U D SPT CPT	SAMPL .Undist .Distur Stand Cone	.E OR urbed bed ard Po Peneti	TEST enetration T ation Test	v : vis l : lab	ual oratory	WATER Water Table Water Inflow	FIELD SUPERVISOR: PROJECT COORDINATOR: SHEET 1 OF 1 SCALE 1: 20	J.F.YOU J.F.YOU SHEETS	ING ING

9/10/2008 8:34:07 AMg:\IS\Watertec\Geotech\PCAD\BORELOGS\tillegra ba.dgn

l

CNSW Day	anter ce		GEOTEC	HNICA	L & E	ENVIRONMENTAL		TEST	ΡΙΤ	TP94
PROJI LOCA CONT	ECT: TION: Racto	TII R R: R. 8	LEGRA A, ALTER & I. CONT	DAM NATIV Ract	E SPII	LLWAY ALIGNMEN PERATOR: PHIL GAI	NT RLAN	DATE: 25.0 SURFACE RL D EQUIPMENT:	03.08 : 116.6r KOMAT	n SU PC220
DEPTH (m)	WATER	BIT	SAMPLE or TEST	SOIL Group	GRAPHIC Log	Soil ty	ype, colo	SOIL DESCRIP our, consistency, g	PTION grainsize, mo	isture, remorks
EO				SM {v}	///	TOPSOIL - silty	sand,	rootlets; pale	e brown; l	oose; dry. 0.20-
. لي				•		Slightly CLAYEY pale brown/brow angular meta-sed weathered, range Predominantly tur	SAN (n; stif limenta s to l ffaced	DY GRAVEL; f; just moist. ary, highly w boulder size, bus sandston	Gravel fra eathered/ 350mm e. Slopew	action /moderately dia. vash.
- - - - - - - - - - - - - - - - - - -						At 1.1m - clayey	sand	grades to	pale yello	wbrown.
2 2	oundwater Encountered			GC (v)		At 2.1m - Contin very stiff; slow (ues a diggin	s above, mat g.	trix pale	brown;
3 3 4	No Gro							• •		
					000					
U D SPT CPT	SAMPI Undist Distur Stand Cone	LE OR urbed bed ard Pe Penetr	TEST enetration Te ation Test	y : vis l : lat est	ual loratory	WATER Water Table Water Inflow	FIELD Proje Sheet Scal	SUPERVISOR: CT COORDINAT I DF E 1:2	OR: 2 SHE 25	J.F.YOUNG J.F.YOUNG ETS

9/10/2008 8:44:33 AMg:\IS\Watertec\Geotech\PCAD\BORELOGS\TP94 TP109.dgn

.

Com	nerce		GEOTEC	HNICA	L& E	ENVIRONMENTAL	TEST P	ит Т	P94
PROJI LOCA CONT	ECT: TION: Racto	۲۱ R R: R. ٤	LLEGRA A, ALTER & I.CONT	DAM NATIV RACTI	'E SPII NG 0	LLWAY ALIGNMENT PERATOR: PHIL GARL	DATE: 25.03.0 SURFACE RL: AND EQUIPMENT: KC	08 116.6m OMATSU PC220)
DEPTH (m)	WATER	BIT	SAMPLE of test	SOIL GROUP	GRAPHIC Log	Soil type,	SOIL DESCRIPTIO colour, consistency, grain	V size, moisture, remarks	
Eo				SM (v)	1.1	TOPSOIL - silty sa	nd, rootlets; pale br	own; loose; dry.	0.20-
. I l l						Slightly CLAYEY S pale brown/brown; angular meta-sedime weathered, ranges f Predominantly tuffa	ANDY GRAVEL; stiff; just moist. Gra entary, highly weatl to boulder size, 350 ceous sandstone. S	vel fraction nered/moderately Dmm dia, Slopewash.	
	þe					At 1.1m - clayey sa	and grades to pale	yellowbrown.	
2 3 4 5	No Groundwater Encountered			GC (v)		At 2.1m - Continue very stiff; slow dig	s as above, matrix ging.	pale brown;	
U D SPT CPT	SAMPL .Undist .Distur Stand Cone	.E OR urbed bed ord Pe Penetr	TEST Inetration Te ation Test	lv : vis L : lob est	ual loratory	WATER FI Water Table PR Water Inflow St	ELD SUPERVISOR: Roject coordinator: IEET 1 of 2 Cale_1:25	J.F.YOUN J.F.YOUN SHEETS	IG IG

Comp	attent of		GEOTEC	HNICA	L&	ENVIRONMENTAL	TEST	PIT	TP94
PROJ	ECT:	TI	LLEGRA	DAM			DATE: 25.0	3.08	.,
LOCA	TION:	R	A, ALTER	NATIV	E SPI	ILLWAY ALIGNMEN	T SURFACE RL:	116.6m	
CONT	RACTO	R: R. 8	& I.CONT	RACTI	NG	OPERATOR: PHIL GAP	RLAND EQUIPMENT:	KOMATSU PC	220
DEPTH (m)	WATER	BIT	SAMPLE or test	SOIL Group	GRAPHIC Log	soil ty	SOIL DESCRIPT pe, colour, consistency, gr	'ION ainsize, moisture, ren	norks
5 1				C (v) ROCK		(continued fro Slightly CLAYEY pale brown/brown angular meta-sedi weathered, ranges Predominantly tuf TUFFACEOUS SA highly weathered fine grained. No is spacing appears	m previous sheet) SANDY GRAVEL; n; stiff; just molst. G mentary, highly we to boulder size, 3 faceous sandstone ANDSTONE; very weak to we ndication of beddin very close/close.	 iravel fraction athered/modera 550mm dia. 550mm dia. 550mm dia. 50mm dia. 930mm dia. 900mm dia	5.10-
						Ends as above, v	ery slow digging.		<u></u>
						WATED			
U D SPT CPT	SAMPI Undist Distur Stand Cone	LE OR vrbed bed ord Pi Peneti	TEST enetration Tr ration Test	v : vis L : lat est	ual poratory	WATER Water Table Water Inflow	FIELD SUPERVISOR: PROJECT COORDINATO SHEET 2 OF 3 SCALE 1 : 25	J.F.Y)R: J.F.Y 2 SHEETS 5	OUNG

Comm	nerce		GEOTEC	HNICA	L & E	INVIRONMENTAL	TEST PIT	TP95		
PROJ	:CT:	TI	LLEGRA	DAM			DATE: 25.03.08			
LOCA	TION:	R	A - ALTE	ERNAT	IVE S	PILLWAY ALIGNME	NT SURFACE RL: 109.4m			
CONT	RACTO.	R: R. 8	LCONTF		NG 0	PERATOR: PHIL GAR	LAND EQUIPMENT: KOMATS	U PC220		
DEPTH (m)	WATER	BIT	SAMPLE of test	SOIL GROUP	GRAPHIC Log	Soil typ	SOIL DESCRIPTION e, colour, consistency, grainsize, moist	ure, remarks		
10 1111				SM (v)		TOPSOIL - silty s dark greybrown; lo	and with trace of clay, root bose; dry.	tlets; 0.40-		
				SC (v)		SANDY CLAY/CL yellowbrown/pale stiff; moist.	AYEY SAND; brown/orangebrown, mottlec	l; 1.30-		
يتقياعتما يت	g			GC (v)		Slightly CLAYEY grey/greybrown; h fraction angular, m generally weak (t tuffaceous sandst	SANDY GRAVEL; ard (slightly cemented); dry. leta-sedimentary; hlghly wea o medium strong). Predomin one. Slopewash. Very slow	. Gravel hthered; antly digging. 1.95-		
-2 	2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0					Slightly SANDY C pale greybrown; v	EAY; ery stiff; just moist.	2 40		
<u></u>	No Groundwater Enco			GC (v)		Slightly CLAYEY pale greybrown/b cemented); dry. Gr sedimentary; highly weathered; weak tuffaceous sandst	SANDY GRAVEL; rown, streaked; hard (partly avel fraction angular, meta- y weathered/moderately to medium strong. Predomin one. Slopewash.	antly		
4				CL/C3 (v)		SILTY CLAY with trace of gravel; pale greybrown; very stiff; just moist/moist. Gravel fraction extremely weathered; extremely weak; appears as a cream fleck.				
E 5				GC (v)	<u>^</u>	CLAYEY SANDY G	ìRAVEL; (co	ntinued next sheet)		
U D SPT CPT	I	LE OR urbed bed ord Pe Penetr	TEST inetration Te ation Test	v : visi l : lob	<u>, o / o /</u> ual oratory	WATER Water Table Water Inflow	FIELD SUPERVISOR: Project coordinator: Sheet 1 of 2 Sheet Scale 1:25	J.F.YOUNG J.F.YOUNG [S		

PROJECT: TILLEGRA DAM DATE: 25.03.08 LOCATION: RA - ALTERNATIVE SPILLWAY ALIGNMENT SUPACE RI: 109.4m CONTRACTOR: R. & LCONTRACTING OPERATOR: PHIL GARLAND BOUMMENT: KOMATSU PC220 DIPIN WATER BIT Solit OPERATOR: PHIL GARLAND BOUMMENT: KOMATSU PC220 DIPIN WATER BIT Solit OPERATOR: PHIL GARLAND BOUMMENT: KOMATSU PC220 DIPIN WATER BIT Solit OPERATOR: PHIL GARLAND BOUMMENT: KOMATSU PC220 DIPIN WATER BIT Solit OPERATOR: Consistence, preserve Solit OPERATOR: Consistence, preserve Solit OPERATOR: Consistence, preserve Solit OPERATOR: Consistence, preserve Solit OPERATOR: Solit Preserve Solit OPERATOR: Consistence, preserve Solit Preserve Solit OPERATOR: Solit OPERATOR: Solit Preserve Solit Preserve Solit OPERATOR: Solit	C NSW Dr	partment of		GEOTEC	HNICA	L & E	NVIRONMENTAL	TEST	ΡΙΤ	TP95
LOCATION: RA - ALTERNATIVE SPILLWAY ALIGNMENT SURFACE RL: 109.4m CONTRACTOR: R. & LCONTRACTING OPERATOR: PHIL GARLAND EQUIPMENT: KOMATSU PC220 DEPTH WATER BIT SAMPLE GOB CONTRACTING OPERATOR: PHIL GARLAND EQUIPMENT: KOMATSU PC220 Soll DESCRIPTION Soll Type, colour, consistency, grainize, noisture, remarks Soll type, colour, consistency, grainize, noisture, remarks Soluce and type, colour, consistency, grainize, noisture, remarks Soluce and type, colour, consistency, grainize, noisture, grainize, noisture, remarks Soluce and type, colour, consistency, grainize, noisture, remarks Soluce and type, colour, consistency, grainize, noisture, remarks Soluce and type, colour, consistency, grainize, and type, colour, consistency, grainize, noisture, grainize, noisture, colour, consistency, grainize, noisture, colour, consistency, grainize, noisture, colour, consistency, grainize, noisture, colour, consistency, grainize, noisture, colour, colour, colour, colour, colour, colour, colour, colour, c	PROJ	ECT:	TI	LLEGRA	DAM			DATE: 25.0	3.08	
CONTRACTING OPERATOR: PHIL GARLAND EQUIPMENT: KOMATSU PC220 DEPTH INTER SAMPLE BODY INTER SAMPLE INTER SAMPLE BODY INTER SAMPLE INTER SAMPLE INTER SAMPLE INTER INTER SAMPLE INTER INTER INTER <td>LOCA</td> <td>TION:</td> <td>R</td> <td>A - ALTE</td> <td>RNAT</td> <td>IVE S</td> <td>PILLWAY ALIGNMI</td> <td>ENT SURFACE RL:</td> <td>109.4m</td> <td></td>	LOCA	TION:	R	A - ALTE	RNAT	IVE S	PILLWAY ALIGNMI	ENT SURFACE RL:	109.4m	
DEFTH Infl WATER Infl BIT SAMPLE TEST Sum GROUP TEST Sum December Test Sum December Test Sum De	CONT	RACTO	R: R. 8	& I.CONTI	RACTI	NG 0	PERATOR: PHIL GAF	RLAND EQUIPMENT:	KOMATSU PC2	220
Image: State Structure If Est GROUP Lo6 Sail type, colour, consistency, grainsize, misture, remarks Image: State Structure <	DEPTH	WATED	DIT	SAMPLE	SOIL	GRAPHIC		SOIL DESCRIPT	TION	
5	[m]	WALER -	DII	TËST	GROUP	LOG	Soit ty	pe, colour, consistency, gr	ainsize, moisture, rem	arks
SAMPLE OR TEST Y y/ y/ y/ water Table Field Supervision 10 SAMPLE OR TEST Y y/ y/ water Table 10 SAMPLE OR TEST Y y/ y/ 10 SAMPLE OR TEST Y y/ 10 Water Table Field Supervision: J.F.YOUNG 10 SAMPLE OR TEST Y y/ 10 Water Table Water Table Field Supervision: J.F.YOUNG 10 Sample termina Test Y water Table Steret 1 J.F.YOUNG	5					%	(continued fro	m previous sheet)		
3 0 <td>-</td> <td></td> <td></td> <td></td> <td></td> <td>%</td> <td>CLAYEY SANDY</td> <td>GRAVEL;</td> <td>brown mottled:</td> <td></td>	-					%	CLAYEY SANDY	GRAVEL;	brown mottled:	
10 Image: Superally highly weathered; weak. Predominantly turfaceus eandstone to them dimension. Appears turfaceus eandstone turface	Ē				GC	%	very stiff/hard; ju	ist moist. Gravel fra	iction angular;	=
6 Ends as above. Very slow digging. 7 Ends as above. Very slow digging. 8 Image: State of the state o	F				(v)	$\langle \rangle \langle \rangle$	generally highly w	weathered; weak. P	redominantly	
6 Stopewash. END at 5.90 6 Ends as above. Very slow digging. 7 Ends as above. Very slow digging. 7 Image: Stopewash. 8 Image: Stopewash. 9 Image: Stopewash. 10 SAMPLE OR TEST 11 Image: Stopewash. 10 SAMPLE OR TEST 11 Image: Stopewash. 10 Stopewash. 10 Stopewash. 10 Stopewash. 10 Image: Stopewash. 10 Image: Stopewash. 10 Image: Stopewash. 10 Image: Stopewash. 11 Image: Stopewash. 12 Image: Stopewash. 13 Image: Stopewash. 14 Image: Stopewash. 15 Image: Stopewash. 16 Image: Stopewash. 17 Image: Stopewash. 16 Image: Stopewash. 16 Image: Stopewash. 17 Image: Stopewash. 18 Image: Stopewash. 19 Image: Stope	F					$\langle \rangle \rangle$	very lightly ceme	inted.	ionologia Appeare	
6 Ends as above. Very slow digging. 7 Ends as above. Very slow digging. 7 Image: State of the s	Ē					<u>^</u> ,	Slopewash.			END at 5.90-
7 7 8 7 9 9 10 SAMPLE OR TEST 11 10 SAMPLE OR TEST Y. visual 12 Water Table 13 Water Table 14 Water Table 15 Water Table 16 Supervisore: 17 J.F.YOUNG 18 Water Table 19 Water Table 10 Supervisore: 11 Supervisore: 12 Supervisore: 13 Supervisore: 14 Supervisore: 15 Supervisore: 16 Supervisore: 17 Supervisore: 18 Supervisore: 19 Supervisore: 10 Super	-6						Ends as above. V	erv slow digging.		
7 7 8 7 9 9 10 SAMPLE OR TEST Y:: visual Value 1: loboratory WATER PROJECT COORDINATOR: J.F.YOUNG Statisticated Propertorion Test Water Table Statisticated Propertorion Test Water Inflow	Ē									
7 8 8 9 10 SAMPLE OR TEST Y:: visual Visual V	Ē							,		-
7 8 8 9 10 SAMPLE OR TEST Vbristurbed 9 9 10 Water Table Set Table Set Table Set Table Water Table Set Table Set Table Water Table Water Table Set Table Water Table Water Table Set Table Water Table State 1 - 2 0 F 2 SHEETS	E									
7 8 8 9 9 9 10 SAMPLE OR TEST V	E									
7 8 8 9 9 9 10 SAMPLE OR TEST VDisturbed Y: visual STStandard Penetration Test VIDisturbed STStandard Penetration Test	E									
8 9 10 SAMPLE OR TEST U	E,									
8 9 10 SAMPLE OR TEST U	E'									=
8 8 9 9 10 SAMPLE OR TEST U	-									
-8 -8 -9 -9 -9 -10 SAMPLE OR TEST UUndisturbed SPTStandgrd Penetrotion Test TPTGane Penetrotion Test TPTStandgrd Penetrotion Test V	E		:							
SAMPLE OR TEST UUndisturbed DDisturbed SPTStandard Penetration Test PTStandard Penetration Test Water Inflow Water	Ē									=
SAMPLE OR TEST V: visual Solution Test Water Table SPTStandard Penetration Test Water Table Water Table Water Table Stater 2 OF 2 SHEETS STATer 1: 25	E.									
-8 Image: Sample or Test -9 Image: Sample or Test UUndisturbed Y: visual UUndisturbed Water Table Sample or Test Y: visual Water Table Sharper table Standard Penetration Test (PR)	E									-
-9 -9 -10 SAMPLE OR TEST UUndisturbed DDisturbed SPTStandard Penetration Test PILStandard Penetration Test PIL	-8									-
-9 10 SAMPLE OR TEST UDisturbed SpTStandard Penetration Test FILL SUPERVISOR: J.F.YOUNG Water Table Water Table Water Inflow Security	F.									
9 9 10 SAMPLE OR TEST V	Ē									-
9 9 10 SAMPLE OR TEST VDisturbed V: visual SPTStandard Penetration Test V: visual VOLDisturbed V: visual SPTStandard Penetration Test Vater Table Vater Inflow Vater 1	Ē.									
9 -9 -10 SAMPLE OR TEST VDisturbed V: visual SPTStandard Penetration Test ✓ Water Table VDisturbed ✓ Water Table SPTStandard Penetration Test ✓ Water Inflow	_	[-
-9 -9 -10 SAMPLE OR TEST VUndisturbed V: visual VDisturbed V: visual SPTStandard Penetration Test Water Table VMater Table Water Table VMater Table SHEET 2 OF 2 SHEETS SHEETS	<u>-</u>									
IO SAMPLE OR TEST Y : visual UUndisturbed Y : visual DDisturbed Water Table SPTStandard Penetration Test Water Inflow FIELD SUPERVISOR: J.F.YOUNG SHEET 2 OF STANDARD SHEETS	E.9									-
SAMPLE OR TEST V : visual UUndisturbed V : visual DDisturbed V : visual V : visual V : visual	Ē			1						
IO SAMPLE OR TEST V: visual WATER FIELD SUPERVISOR: J.F.YOUNG UUndisturbed I: laboratory Water Table PROJECT COORDINATOR: J.F.YOUNG SPTStandard Penetration Test Water Table Water Inflow SHEET 2 OF 2 SHEETS	-									
Image: Sample or Test v: visual Water FIELD SUPERVISOR: J.F.YOUNG UDisturbed V: visual Vater Vater PROJECT COORDINATOR: J.F.YOUNG SPTStandard Penetration Test Vater Inflow SCALE SCALE SCALE SCALE 1: 25	Ē	1								
Image: Sample or Test V: visual Water FIELD SUPERVISOR: J.F.YOUNG UDisturbed I: laboratory Vector Table PROJECT COORDINATOR: J.F.YOUNG SPTStandard Penetration Test Vector Table Vector Table SCALE SCALE SCALE SCALE 1: 25	Ē									-
SAMPLE OR TEST v : visual WATER FIELD SUPERVISOR: J.F.YOUNG UDisturbed L : laboratory Water Table PROJECT COORDINATOR: J.F.YOUNG SPTStandard Penetration Test Water Inflow SCALE 1 : 25	Ē					1				-
SAMPLE OR TEST v : visual WATER FIELD SUPERVISOR: J.F.YOUNG UUndisturbed L : laboratory V Water Table PROJECT COORDINATOR: J.F.YOUNG DDisturbed V Water Table SPTStandard Penetration Test Vater Inflow SCALE 1 · 25	E 10									
UUndisturbed I: laboratory DDisturbed Water Table SPTStandard Penetration Test Water Inflow PROJECT COORDINATOR: J.F.YOUNG SPTStandard Penetration Test Water Inflow SCALE 1 - 25	<u> </u>	SAMP	LE OR	TEST	y : vis	ual .	WATER	FIELD SUPERVISOR:	J.F.Y	DUNG
SPTStandard Penetration Test CPT Cone Penetration Test Vater Inflow SCALE 1, 25	U n	Undist Distur	urbed hed		<u> : lo</u>	oratory	🖌 🖌 Water Table	PROJECT COORDINAT)R: J.F.Y	DUNG
	SPT.	Stand	ard Pi Ponati	enetration Te	est		- Water Inflow	SHEET 2 OF STALF 1 2	2 SHEETS 5	

28/05/2008 1:17:14 PM G:\IS\Watertec\Geotech\PCAD\BORELOGS\TP94 TP109.dgn

Comm PRO II	arbused of nerce		GEOTECI		.L&E	INVIRONMENTAL	DATE: 25.03	PIT 3.08	TP96			
LOCA	TION:	F	A, ALTER	NATIV	'E SPII	LWAY ALIGNMEN	T SURFACE RL:	103.7m	ļ			
CONT	RACTO	R: R. (& I.CONTI		NG 0	PERATOR: PHIL GAR	LAND EQUIPMENT: I	KOMATSU PC2	20			
DEPTH Im)	WATER	BIT	SAMPLE of test	SOIL Group	GRAPHIC Log	Soil typ	SOIL DESCRIPT e, colour, consistency, gr	ION ainsize, moisture, rema	rks			
Eo				SM (v)		TOPSOIL - slightly dark grey to grey	y clayey silty san v with depth; loose	d, rootlets; e; just moist.	0.25			
<u> </u> 				CL/CI (v)		SILTY CLAY with pale greybrown/or mottled; stiff; mois meta-sedimentary; moderately weath Predominantly tuff dimension.	gravel; rangebrown/redbro t. Gravel fraction a highly weathered/ ered; weak to med faceous sandstone	own, ngular, / dium strong. to 10mm	1.30			
						SANDY CLAY wit	th gravel;					
					•••	pale greybrown w mottle; very stiff;	pale greybrown with occasional orangebrown mottle; very stiff; just moist. Includes clayey sand					
					· · · ·	lenses; very stiff/	hard. (appears slig	htly cemented).				
2 3 5 10 10 10 10 10 10 10 10 10 10 10 10 10	No Groundwater Encountered			CL/Ci (v)		Gravel fraction inc angular; meta-sedin highly weathered; to 30mm dimensi	reases slightly wi mentary; extremely extremely weak t ion. Slopewash.	th depth; weathered/ o very weak,				
ų	SAMPI Undist	LE OR	TEST	v : vis l : lot	ual poratory	WATER Water Table	FIELD SUPERVISOR: PROJECT COORDINATO	J.F.YO R: J.F.YO	UNG			
SPT CPT	DDisturbed SPTStandard Penetration Test CPTCone Penetration Test					→ Water Inflow	SHEET 1 OF 2 Scale 1 : 25	2 SHEETS 5				

Comp	artment of		GEOTEC	HNICA	L & E	ENVIRONMENTAL		TEST PI	Т	TP9	6
PROJ	ECT:	TI	LLEGRA	DAM	•••		I	DATE: 25.03.0	8		
LOCA	TION:	R	A, ALTER	ΝΑΤΙν	e spii	LLWAY ALIGNMEN	IT	SURFACE RL: 1	03.7m		
CONT	RACTO	R: R. (& I.CONT	RACTI	NG 0	PERATOR: PHIL GAP	RLAN	DEQUIPMENT: KO	MATSU PC2	220	
DEPTH	WATER	RIT	SAMPLE	SOIL	GRAPHIC			SOIL DESCRIPTION			
(m)	"""	UII	TËST	GROUP	L06 -	Soil ty	pe, colo	our, consistency, grainsi	ize, moisture, remo	irks	
5 6				CL/CI (v)		(continued fro SANDY CLAY wi pale greybrown w mottle; very stiff; lenses; very stiff, Gravel fraction ind angular; meta-sed highly weathered, to 30mm dimens	ith gr ith gr ith gr just /hard creas liment ; extr sion. S	revious sheet) avel; occasional orange moist. Includes cl . (appears slightly es slightly with ary; extremely w emely weak to v slopewash.	brown ayey sand cemented). depth; eathered/ very weak,	END	at 6.00-
Ē						Ends as above.					-
U D SPT CPT	SAMPI Undist Distur Stand Cone	LE OR urbed bed ard Pi Peneti	TEST enetration Te ration Test	l v : visi l : lab est	ual oratory	WATER Water Table Water Inflow	FIELD PROJI Shee Scai	SUPERVISOR: ECT COORDINATOR: T 2 OF 2 .E 1: 25	J.F.YC J.F.YC SHEETS	DUNG	

Comm	artment of 1erce		GEOTEC	HNICA	L & E	NVIRONMENTAL	TEST	PIT	TP97
PROJ	:(1:	TI	LLEGRA	DAM			DATE: 25.0	3.08	
LOCA	TION:	R	A - ALTE		IVE SI		AND COMPACE RL:	98.2m Коматен I	PC220
CONT	касто: Г	к: К. d							. VEBV
DEPTH (m)	WATER	BIT	SAMPLE or TEST	SOIL Group	GRAPHIC Log	Soil type	SUIL DESCRIP1 , colour, consistency, gr	ainsize, moisture,	, remarks
				ML (v)	· · · · · · · · · · · · · · · · · · ·	TOPSOIL - sandy dark grey; loose; ju	clayey silt, rootle ıst moist.	ts;	0.39
<u></u>	r Encountered			CH (v)		SILTY CLAY; mid grey; stiff; mol:	st.		
3 4 4	No Groundwater			CL/CI (v) GC	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	SANDY CLAY; pale grey with ora very stiff; just moi	angebrown streak ist. GRAVEL;	.'S;	2.60-
- 5		<u> </u>		(V)		(continued nex	t sheet)		
U D SPT. CPT.	SAMP Undist Distur Stand Cone	LE OR turbed tbed tord Pi Peneti	TEST enetration T ration Test	v : vis l : lol est	sual boratory	WATER F Water Table F Water Inflow	FILLD SUPERVISOR: PROJECT COORDINATI SHEET 1 OF SCALE 1:2	J. OR: J. 2 Sheets 5	F.YOUNG

Com	artment of		GEOTEC	HNICA	L & E	INVIRONMENTAL	TEST	PIT	TP97
PROJ	ECT:	TI	LLEGRA	DAM		an a tradical y as a	DATE: 25.0	3.08	
LOCA	TION:		A - ALTI	ERNAT	IVE S	PILLWAY ALIGNMEN	T SURFACE RL:	98.2m	220
CONT	RACTO	R: R.	& I.CONT			PERATOR: PHIL GARLA	AND EQUIPMENT:	KUMAISU PC	
DEPTH (m)	WATER	BIT	SAMPLE TEST	SOIL GROUP	GRAPHIC Log	Soil type,	SOIL DESCRIP1 colour, consistency, gr	'ION oinsize, moisture, ren	orks
- 5					%	(continued from	previous sheet)		
Ē.					000	CLAYEY SANDY GI	RAVEL; rown.streaked:1	nedium dense/	
Ē					。 。 。	dense with depth; ju	ist moist to dry.	Gravel is well ng to boulders	
È				GC	000	(maximum 150mm d	liameter)		
				(v)	•	Orangebrown with d	lepth. Matrix incl	ludes rare	
-6					°, °,				-
Ē				ļ	<u>~</u> ~				END at 6.40
- -									
Ē									-
-									
									-
-8									
Ē									
									1
									1
-9									
Ē									
									- - -
E									
E									
E 10									-
	SAMPI	.E OR	TEST	v : visi l : lab	jal oratory	WATER FIE	LD SUPERVISOR:	J.F.Y	
D	.Distur .Stond	ordeu ord Pr	enetration Tr	est		Woter Table SH	EET 2 OF 2	ik: J.H.Y 2 SHEETS	
ČPT	Cone	Penetr	ation Test			🕨 🕨 Water Inflow 🛛 SC	ALE 1 : 2	5	

Com	anter ce		GEOTEC	HNICA	L& E	ENVIRONMENTAL		TEST	PIT	TP98			
PROJ	CT:	TI	LLEGRA	DAM				DATE: 25.03	3.08				
LOCA	TION:	F	A. ALTER	NATIV	E SPI	LLWAY ALIGNMEN	NT	SURFACE RL:	96.9m				
CONT	RACTO	₹: R. å	& I.CONT	RACTI	NG o	PERATOR: PHIL GA	RLAN	D EQUIPMENT: H	COMATSU PC	220			
	1		н. не	T									
DEPTH	WATER	BIT	SAMPLE	SOIL	GRAPHIC			SOIL DESURIPT	10N				
(8)			IESI		200	Soil ty	Soil type, colour, consistency, grainsize, moisture, remorks						
Eo				ML		TOPSOIL - sandy	y clay	vey silt, rootlet	ts;				
Ē.				(v)	· · · · ·	dark grey; loose;	dark grey; loose; just moist.						
E						SILTY CLAY;							
-						pale greybrown;	soft to	o stiff; moist.					
E				(v)						1			
E													
Eı										1.00-			
E					· · · ·	SANDY CLAY;	occa	sional orangehi	rown streaks:				
F				CL/CI	· · · ·	stiff; just moist.	0000	Siellar et allgebi					
F					· · · ·					1.55			
E					0/0/	Slightly CLAVEY	SAN	DY GRAVEL					
E.					000	mid grey/orangel	brown	/redbrown, str	eaked; dense/	· ·			
-	ק				000	very dense; just	moist	to dry with d	lepth. ble size randing				
-2	tere				000	to rare boulders	200r	nm diameter.	ste size, runging				
Ę	Dun				000					-			
E	uc Luc				000					-			
-	er I									_			
E	wat									-			
	pun												
È,	Gro				000								
3	Ν°				000	Orangebrown wit	th dep	əth.					
E				GC	<i>。</i>								
E				(v)	<u> </u>	:				-			
F					00					-			
È					0								
 					<u></u>								
Ē٩				ŀ	00					1-			
Ē					0					-			
					0					-			
E					<u> </u>					-			
E													
E					0	Continues as ab	ove; re	edbrown; ferru	ginized.				
						Gravel is well rou generally to 30p	unded nm di	to occasional mension.	ly subrounded,	=			
- 5	C 4 110	r 00		 	<u>/</u>	WATED		SUDEDVICOD.	1 E V	5.00- DUNG			
U	SAMPL Undist.	r nK npeq	1521		ioratory			CT COORDINATO	R: J.F.Y	OUNG			
D Spt	.Distur Stand	oed ard Ps	enetration Tr	est		Woter Table	SHEET	1 0F 2	SHEETS				
ČPŤ	.Cone I	Penetr	ation Test			🔊 🗩 Water Inflow	SCAL	E 1:25	i				

NSW Der	autment of		GEOTEC	HNICA	L & E	ENVIRONMENTAL	TEST PI	т ТР9	8
PROJ	ECT:	TI	LLEGRA	DAM			DATE: 25.03.0	8	
LOCA	TION:	R	A, ALTER	NATIV	'E SPI	LLWAY ALIGNMENT	SURFACE RL: 9	6.9m	
CONT	RACTO	₹: R.	& I.CONT	RACT	ING o	PERATOR: PHIL GARLA	ND EQUIPMENT: KOI	MATSU PC220	
DEPTH	WATER	BIT	SAMPLE	SOIL	GRAPHIC		SOIL DESCRIPTION		
(m)	11.01.61	011	TĚŠT	GROUP	LUU	Soil type, o	olour, consistency, grainsi	ze, moisture, remarks	
5				GC	0/0/	Slightly CLAYEY SA	NDY GRAVEL;		-
				(v)	<u>~/~</u>	redbrown; ferruginize $\overline{1}$ to occasionally sub	d, Gravel is well rou ounded, generally t	nded o 30mm	5.30- /-
Ē				ROCK				END	at 5.55
Ē					/	highly weathered; ve	ry weak/weak;		/=
Ē						\fine to medium gra	ned; yellowbrown.		
6				:		Ends as above, diffi	cult digging.		. .
Ę									
Ē									
<u>-</u> E									
-									
									•
E7									-
Ē									
Ē									-
Ę									-
Ē									
- 8									-
Ē									
Ē									-
E F									
Ē									
Ē									-
-9									
Ē									-
Ē									_
Ē									-
<u>= 10</u>				<u> </u>	<u> </u>				
<u> </u>	SAMPI Undist	.E OR urbed	TEST	v : vis l : lat	ual oratory	WAILK FIE	LD SUPERVISOR: DJECT COORDINATOR:	J.F.YOUNG	
D SPT	Distur Stand Cone	bed ard Pi Peneti	enetration T ration Test	est		Water Inflow SH	EET 2 OF 2 Ale 1:25	SHEETS	
C NSW Dep	artment of		GEOTEC	HNICA	L& E	NVIRONMENTAL	TEST PIT	TP99	
--	--	---	--------------------------------------	---------------------------	---	---	---	------------------------------	
ppni	nerce	 TII		DAM			DATE: 26.03.08		
	TIUN.	D			E SPII	LWAY ALIGNMENT	SURFACE RL 95.2m		
CON-	DYUL:	ח ק. גם מ		RACTI		PERATOR. PHIL CAD	AND FOUIPMENT. KOMATCH	PC220	
	1.4CIU							~	
DEPTH {m}	WATER	BIT	SAMPLE or test	SOIL Group	GRAPHIC LOG	Soit type	SOIL DESCRIPTION 2, colour, consistency, grainsize, moisture	?, remarks	
				SM (v)		TOPSOIL - slightly dark brown; loose;	r clayey sandy silt, rootlets; just moist.	0.35-	
				CH (v)		SILTY CLAY; grey; stiff; moist.		1.15-	
	er Encountered					CLAYEY SANDY (pale brown with o dense; just molst. C rounded, generally to rare boulders 2	GRAVEL; brangebrown streaks; medium Gravel subrounded to well gravel to cobble size, ranging 200mm dimension.		
2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	No Groundwat			GC (v)		Yellowbrown/orang	gebrown, streaked from 2.1m.	3.20-	
<u>. </u>				ROCK	0 0 · - · - · - · - · - · - · - · - · - · - · - · - · - · - · - · - · - · -	TUFFACEOUS SA highly weathered weak to medium yellowbrown.	NDSTONE; to moderately weathered wil strong; fine/medium grained;	h depth; END at 3.90-	
4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1						Ends as above, ve moderately weath	ery difficult digging in ered rock.		
U D SPT CPT	SAMPI Undist Distur Stand Cone	LE OR urbed bed ard Pe Penetr	TEST 2netration Te 1ation Test	v : vis l : lob est	ual ioratory	WATER F Water Table S Water Inflow	FIELD SUPERVISOR: J PROJECT COORDINATOR: J Sheet 1 of 1 sheets Scale 1:25	.F.YOUNG .F.YOUNG	

Comp	winent of		GEOTEC	HNICA	L& E	ENVIRONMENTAL	TEST PIT	TP100
PROJI LOCA CONT	ECT: TION: Racto	TI F R: R.	LLEGRA RA, ALTER & I.CONT	DAM Inativ Fract	E SPI	LLWAY ALIGNMENT OPERATOR: PHIL GARLA	DATE: 26.03.08 SURFACE RL: 93.6m ND EQUIPMENT: KOMATS	U PC220
DEPTH (m)	WATER	BIT	SAMPLE of TEST	SOIL Group	GRAPHIC LOG	Soil type, ca	SOIL DESCRIPTION plour, consistency, grainsize, mois	ture, remarks
EO				SM (v)		TOPSOIL - slightly c	layey sandy silt, rootlets st moist.	»; 0.20 ⁻
	vater Encountered			GC (v)		CLAYEY SANDY GR pale yellowbrown; me just moist. Gravel sub gravel to cobble size 250mm dimension.	AVEL; edium dense/dense; rounded to wellrounded , ranging to boulders up	to 160-
2 2 2	No Groundw			ROCK		META-SHALE; moderately weathere depth; medium strong bedded; greybrown to Includes shear zone wide, crushed, clayey (across bedding), 74 Defect spacing gener surface Fe/Mn stain	d to slightly weathered g; laminated to very thin o mid grey. Bedding 45 ^c parallel to bedding 150m . Major joint sets: 44 ° /(C o /297 ° (towards LA). rally very close to close ed, tight.	with /247 ° m 082 ° o, END at 2.80-
						Ends as above, very Fine grained tufface meta-shale in wester weathered to moder	difficult digging. ous sandstone overlies rn end of pit, highly ately weathered with de	pth.
U D SPT CPT	SAMPI .Undist .Distur Stand Cone	.E OR urbed bed ord Po Penetr	TEST enetration Tr ation Test	v : vis l : lob est	ual oratory	WATER FIEL Water Table PRO Water Inflow SC/	D SUPERVISOR: Ject Coordinator: Et 1 of 1 shee Ale 1: 25	J.F.YOUNG J.F.YOUNG TS

Comm	antanent of		GEOTEC	HNICA	L& I	ENVIRONMENTAL	TEST I	ЪİТ	TP101
PROJI LOCA CONT	ECT: TION: RACTO	TI <i>A</i> R: R.	LLEGRA ADJACENT & I.CONT	DAM TO Ract	SALIS ING (BURY ROAD	DATE: 26.03. SURFACE RL: AND EQUIPMENT: K	08 95.1m OMATSU PC2	20
DEPTH (m)	WATER	BIT	SAMPLE or test	SOIL Group	GRAPHIC LOG	Soil type,	SOIL DESCRIPTIO	IN nsize, moisture, remo	rks
				SM (v)		TOPSOIL - clayey s dark grey; loose; jus	sandy silt, rootlets at moist.	;	0.25-
henderer				CL/CI (v)		Slightly SANDY SIL greybrown/brown; st	TY CLAY; tiff; moist.		
11. 2	Groundwater Encountered			SC (v)		CLAYEY SAND; pale grey with orar stiff/very stiff; just	ngebrown streaks; moist.		2.10
	No			GC (v) ROCK		CLAYEY SANDY Gi pale grey/orangebro dense/dense; just m to generally well rou size up to 200mm META-SHALE; moderately weather	RAVEL; own, streaked; med oist. Gravel subrou unded ranging to dimension. red/slightly weath	llum Inded boulder ered;	2.70
-3					· \ _ \ _ \ - \ _ \ _ / - \ _ \ _ \	medium strong; lami bedded; greybrown/	nated to very thi grey.	nly	END at 3.20-
4 5						Ends as above, slov	v digging, tight.		
U D SPT CPT	SAMPI .Undist .Distur Stand Cone	E OR urbed bed ord Pe Penetr	TEST enetration Te ation Test	v : vis L : lat est	ual poratory	WATER FIE Woter Toble Woter Inflow St	ELD SUPERVISOR: OJECT COORDINATOR: EET 1 OF 1 CALE 1 : 25	J.F.YO J.F.YO SHEETS	DUNG DUNG

NSW D	artment of		GEOTEC	HNICA	L& E	INVIRONMENTAL	TEST	ΡΙΤ	TP102
PPOL	nerce	TII	LEGRA	DAM			DATE: 26.03	3.08	
	TION.	Δ	D.IACENT	то	SALIS	BURY ROAD	SURFACE RL:	96.4m	
CONT	11011: DACTO	רי ה בי ה			NG n			COMATSU PC2	20
CONT	КАСТО Т	K: N. C							
DEPTH	WATER	BIT	SAMPLE	SOIL	GRAPHIC		SOIL DESCRIPTI	ION	
	-		TEST	UNUUF	100	Soil type, co	llour, consistency, gro	iinsize, moisture, rema	rks
Ē			<u>umrr,, i i i i i i i i i i i i i i i i i i</u>	SM (v)		TOPSOIL - slightly c dark brown; loose; jus	layey sandy sil at moist.	t, rootlets;	0.20
	ntered			SC (v)		CLAYEY SAND; pale brown with orar	ngebrown mottle	; stiff; just moist	· 0.55
	No Groundwater Encour			ROCK		META-SHALE; moderately weathere laminated to very th Bedding: 58 ° /245 ° (towards LA), 30 ° / Defect spacing extre Fe/Mn stained, comm	d; medium stror inly bedded; gre Major joint set 110° (across I mely close to o only clay coate	ng; ybrown. s: 80 ° /337 ° bedding). close, surfaces ad.	
-				ļ	· · - · -				END at 1.80-
ովորվորվումիրովորվորվումիրովոր 5						Ends as above, mode weathered, tight, slow	erately weathere	ed/silightly	
U D SPT. CPT.	J SAMP Undist Distur Stand Cone	LE OR urbed bed ord Pe Penetr	TEST enetration Tr ation Test	v : vis l : lol est	ual poratory	WATER FIEL Water Toble Water Inflow	D SUPERVISOR: Ject Coordinato et 1 of 1 Ale 1: 25	J.F.YC R: J.F.YC SHEETS	DUNG DUNG

CNSW Day	artment of		GEOTEC	HNICA	L & E	INVIRONMENTAL	TEST PIT	TP103
PROJ	iterce	TII	LEGRA	DAM			DATE: 26.03.08	
LOCA	TION:	A	DJACENT	то	SALIS	BURY ROAD	SURFACE RL: 96.3m	
CONT	RACTO	R: R. 8		RACTI	NG 0	PERATOR: PHIL GARL	AND EQUIPMENT: KOMATSU	PC220
0.07			SAMPI F	C0!!	GDADING		SOIL DESCRIPTION	, <u>ata ata ata</u>
(m)	WATER	BIT	TEST	GROUP	LOG	Soil type,	colour, consistency, grainsize, moistu	ire, remorks
				SM (v)		TOPSOIL - slightly dark brown; loose; ji	clayey sandy silt, rootlets; ust moist.	0.30
1				SC (v)		GRAVELLY CLAYEY pale brown to grey stiff; just moist. Gray sedimentary; highly includes occasional 30mm dimension. Probable slopewash	Y SAND; brown with depth; stiff/ver vel fraction angular meta- weathered; very weak; well rounded gravel to h.	y
E					4.4			1.40-
1	No Groundwater Encountered			GC (v)		Slightly CLAYEY S yellowbrown/mid br dry. Gravel rounded boulder size (increa dimension (rarely).	ANDY GRAVEL; own; medium dense/dense; to well rounded, gravel to sing with depth) to 450mm	
				ROCK		moderately weather medium to coarse	grained; yellowbrown.	
= 5					<u>-7-'74</u>			END at 5.00
U D SPT CPT.	SAMP Undist Distur Stand Cone	LE OR urbed bed lord Pe Peneti	IESI enetration To ration Test	v : vis <u>i : lo</u> l est	uai boratory	Water Table St Water Inflow S	ROJECT COORDINATOR: HEET 1 OF 1 SHEET CALE 1:25	J.F.YOUNG S

C NSW De			GEOTEC	HNICA	L & I	ENVIRONMENTAL	TEST	PIT	TP104
PROJ		TII	LEGRA	DAM			DATE: 26.0	3.08	
LOCA	TION:	D	IVERSION	OUTI	LET P	ORTAL	SURFACE RL:	115.1m	
CONT	RACTO	R: R. 8	& I.CONT	RACTI	NG (PERATOR: PHIL GARLA	ND EQUIPMENT:	KOMATSU PC	220
DEPTH	WATER	RIT	SAMPLE	SOIL	GRAPHIC		SOIL DESCRIP	TION	
(m)		011	TËST	GROUP	LUU	Soit type, c	olour, consistency, g	rainsize, moisture, rem	orks
L O			.	SM (v)	·/./ ·/·/	TOPSOIL - gravelly \pale brown; loose; jui	sandy silt, root st moist/dry.	lets;	0.15-
Ē	erec			SC	·/./	GRAVELLY CLAYEY	SAND, rootlets	s persist;	
E	ount			1.47	. / . /	orangebrown/brown,	mottled; stiff; ju	ist moist.	0.60-
Ē	Enc				· · · · · · · · · · · · · · · · · · ·	TUFFACEOUS SAND	STONE;		
Ē	ater				· \ _ \ _ \ _ \ _ \ _ /	fine grained; brown/g	ed; medium stri jreybrown.	ong;	
F1	Mpu			ROCK		Bedding: 60 ° /245 °	[∙] Major joint s º ∕135 º	ets: 43 ° /355 °	
	Grou					Defect spacing very moderately wide), su	close to close rfaces Fe/Mn	e (ranging to stained.	
Ē	٩								
					(-, -)				END at 1.65-
Ē						Ends as above, verv	difficult diggin	g, tight.	l l l l
									Ē
-2									
<u> </u>									l l
E									1
Ē									
Ē.				:					
F									-
-3									
E									
							-		
E.									
Ē									
F									
-4									
Ē									-
<u>-</u>									
Ē									_
E									=
Ē 5									
U D SPT. rpt	SAMP Undist Distur Stanc Cone	LE OR turbed tbed lard P Peneti	TEST enetration T ration Test	v : vis l : lo est	ual boratory	WATER FIE Water Table Water Inflow SC	LD SUPERVISOR: Dject coordinat Eet 1 of Ale 1:2	J.F.Y OR: J.F.Y 1 Sheets 25	'OUNG 'OUNG

Com	nerce		GEOTEC	HNICA	L& E	INVIRONMENTAL	TEST PIT	TP105
PROJ LOCA CONT	ECT: TION: Racto	TII R R:R. 8	LLEGRA I A, SOUTH I.CONTR	DAM OF RACTII	SPILLM NG 0	VAY ALIGNMENT IPERATOR: PHIL GAR	DATE: 26.03.08 SURFACE RL: 112 LAND EQUIPMENT: KOM	2.1m ATSU PC220
DEPTH {m}	WATER	BIT	SAMPLE of TEST	SOIL Group	GRAPHIC Log	Soil typ	SDIL DESCRIPTION e, colour, consistency, grainsize	e, moisture, remorks
			<u></u>	SM (v)		TOPSOIL - sandy brown; loose; just	silt, rootlets; moist.	0.35
<u></u>				GC (v)		CLAYEY SANDY pale brown with just moist/moist. (sedimentary; highly generally to 50m	GRAVEL; orangebrown streaks; s Gravel fraction angular r y weathered/moderatel n dimension. Slopewas	tiff; neta- y weathered; h. 1.20
بد ا و ب و ا و ب و ا و ب و	P					GRAVELLY CLAY mid greybrown w stiff/very stiff; ju above, generally f dimension. Slopew	EY SAND; th orangebrown streak at moist. Gravel fraction ighly weathered to 15 ash.	s; as mm
2 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	- 4 No Groundwater Encountered					Gravel component moderately weath hard; dry. Slow di	including dimension;	
5	CAND		TECT	u . vie		WATER	FIFLD SUPERVISOR	J.F. YOUNG
U D SPT. CPT.	Undist Distur Stand Cone	urbed bed lard Pi Peneti	enetration Te ration Test	li ilai est	boratory	✓ Water Table ➤ Water Inflow	PROJECT COORDINATOR: Sheet 1 of 2 Scale 1:25	J.F.YOUNG SHEETS

	artmeet of		GEOTEC	HNICA	L& E	INVIRONMENTAL	TEST	ΡΙΤ	TP105	
PROIP		TI	LLEGRA	DAM			DATE: 26.0	3.08	<u> </u>	
	TION	R	A. SOUTH	I OF	SPILLV	VAY ALIGNMENT	SURFACE RL	112.1 m		
CONT	RVLIU	R. R . /	& LCONT	RACT	ING 0	PERATOR: PHIL GARLA	ND EQUIPMENT:	KOMATS	U PC220	
CONT			<u>и перит</u>	т <u>т</u>	1					
DEPTH	WATER	BIT	SAMPLE	SOIL	GRAPHIC		SOIL DESCRIP	TION		
[111]			IF21	GROOT		Soil type, c	olour, consistency, g	rainsize, mois	fure, remorks	
5				SC		(continued from	previous sheet)		
E.				{v}	· / · /	GRAVELLY CLAYEY	SAND; orangebrown s	streaks:	END at 5.3	면
E						stiff/very stiff; just r	noist. Gravel fra	action as		[]
						dimension. Slopewast	ly weathered	to 19mm		Π
E						Ende as above (dry	hard).		······································	
Ē										
- 6										
Ē										1.1
=										-
Ē.										
Ē										
Ē										L 1
Ē.,,				;						-
E'										-
Ē										
E										-
Ē										
Ē										
E										
-8										
Ē										
=										111
Ē										. .
Ē										
-										1.1
Ē										1,1
Ē				1						
E-										TL
Ē										
E										1.1
E										. I .
E 10										111
		LE UB	I TEST	y : vis	ual	WATER FIE	D SUPERVISOR:	···· ·	J.F.YOUNG	
U	.Undist	urbed			boratory	Water Table PRO	JECT COORDINAT	OR:	J.F.YOUNG	
SPT	.Stand	ard Pi Donati	enetration Tr ration Test	est		Water Inflow	ET 20F	2 SHEE 25	TS	

Com	automation nerce		GEOTEC	HNICA	\L & E	INVIRONMENTAL	TEST PIT	TP106		
PROJ	ECT:	TI	LLEGRA	DAM			DATE: 26.03.08			
LOCA	TION:	R	A, SOUTH	OF	SPILLV	VAY ALIGNMENT	SURFACE RL: 104.9m			
CONT	RACTO	R: R. (& I.CONT	RACT	ING 0	PERATOR: PHIL GARI	LAND EQUIPMENT: KOMATSU	PC220		
0070			SAMPLE	CUII	GDYDNIL		SOIL DESCRIPTION			
(m)	WATER	BIT	TEST	GROUP	LOG	Soil type	e, colour, consistency, grainsize, moisture	e, remorks		
				SM (v)		TOPSOIL - sandy greybrown; loose; n	silt, rootlets; noist.	0.35-		
2	ountered			SC (v)		GRAVELLY CLAYE pale brown with o just moist with dep sedimentary; highly weathered; general	GRAVELLY CLAYEY SAND/SANDY CLAY; pale brown with orangebrown streaks; stiff; moist to just moist with depth. Gravel fraction angular, meta- sedimentary; highly weathered/moderately weathered; generally to 15mm dimension. Slopewash.			
<u> 3</u>	No Groundwater Enco			CL/CI (v)	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Slightly SANDY Si grey/greybrown w very stiff; just mol	ILTY CLAY; ith orangebrown mottle; st/moist.	3.40		
				SC (v)		GRAVELLY CLAY pale brown/orange just moist. Gravel f highly weathered; Slopewash.	EY SAND; ebrown, streaked; very stiff; iraction angular, meta-sedimen generally to 25mm dimensior	tary;		
U D SPT CPT	SAMP Undist Distur Stand Cone	E OR urbed bed ard Pe Penetr	TEST enetration Te ration Test	v : vis L : lol 2st	ual boratory	WATER F Water Table F Water Inflow	FIELD SUPERVISOR: J PROJECT COORDINATOR: J Sheet 1 of 2 sheets Scale 1: 25	.F.YOUNG .F.YOUNG		

	artment of		GEOTEC	HNICA	L& E	NVIRONMENTAL	TEST PI	Г	TP106
Comn	nerce			DAM		<u></u>	DATE: 26.03.08	2	
PROJ	:L1:	11						,)1.0m	
LOCA	TION:	H	A, SOUT		SPILLV	VAT ALIGINIVIENT	SURPALE RL: N	/4.JII	20
CONT	RACTO	R: R .	& I.CONT		ING 0	PERATOR: PHIL GARLA		/AISU PC2.	
DEPTH	WATER	BIT	SAMPLE	SOIL	GRAPHIC		SOIL DESCRIPTION		
(m)		011	TEST	GROUP	1.00	Soil type, co	lour, consistency, grainsi	ze, moisture, remar	ks
5				SC (v)	<u> </u>	(continued from)	previous sheet) SAND:		END at 5.20-
						pale brown/orangebr	own, streaked; very	stiff;	E
Ē						just moist. Gravel frac highly weathered; get	nerally to 25mm d	imension.	A
E						Slopewash.	• •]
-						Ends as above, slow	digging (very stif	f).	
2									
- 6									
-									
E									-
È.									
5									
									-
E,									-
E'									
F									
È									
E									
E									-
									-
-8									
E									-
E									
Ē									
E									
E									
Ē									
-9									
E									
									-
-									
Ē									
E					1				-
<u>- 10</u>					<u> </u>				
n	SAMP	LE OR	TEST	v : vis	ual boratory	WATER FIEL	D SUPERVISOR:	J.F.YO	UNG
D	Distur	peq	anatantina T		,	Water Table	ET 2 OF 2	SHEETS	VIL
CPT	sranc Cone	iaro P Penet	enerration i ration Test	521		₩oter Inflow SC	ALE 1:25		

٦

Com	nerce		GEOTEC	HNICA	L& E	ENVIRONMENTAL		TEST PIT	TP	107
PROJ	ECT:	TI	LLEGRA	DAM				DATE: 27.03.08		
LOCA	TION:	F	A, SOUTH	OF	SPILLV	WAY ALIGNMENT		SURFACE RL: 101.4	4m	
CONT	RACTO	R: R. (& I.CONT	RACTI	NG O	PERATOR: PHIL GAI	RLAN	ID EQUIPMENT: KOMA	TSU PC220	
DEPTH (m)	WATER	BIT	SAMPLE or TEST	SOIL Group	GRAPHIC Log	Soil ty	ype, col	SOIL DESCRIPTION our, consistency, grainsize, r	noisture, remarks	
-0				SM (v)		TOPSOIL - slight	tiy cia loose	ayey sandy silt, rooti • iust moist.	ets;	0.20
				SC (v)		SANDY CLAY/CI mid greybrown w stiff; moist.	LAYE with c	Y SAND with trace	of gravel; a streaks;	1.20-
2 2	er Encountered			GC (v)		Slightly CLAYEY greybrown with o dry. Gravel fractio fragments and o gravel generally f	SAN orang on inc ccasi to 10	IDY GRAVEL; ebrown streaks; hard cludes highly meta-se onal subrounded to v mm dimension. Slope	(cemented); edimentary vell rounded wash.	
3 3	No Groundwat			ROCK		TUFFACEOUS S extremely weath fine/medium grai	SANDS hered; ined;	STONE; extremely weak to dark greybrown/brov	very weak; vn.	3.90
4 5				ROCK		TUFFACEOUS S highly weathered fine grained; pale Bedding exposed Ends as above, h weathered, difficu	SANDS d; very brow d on highly ult dig	STONE; y weak to weak; wn/orangebrown, laye western end of trend weathered/moderate gging.	red; sh 43 ^o /210 ⁰ ely EN	D at 5.00-
U D SPT CPT	L	.E OR urbed bed ord Pe Penetr	TEST enetration Te ation Test	v : vis l : lob est	uol ooratory	WATER Water Table Water Inflow	FIELC PROJ Shee Sca) SUPERVISOR: ECT COORDINATOR: T 1 OF 1 SH LE 1: 25	J.F.YOUNG J.F.YOUNG IEETS	

Conv	writtent of		GEOTEC	HNICA	L & E	ENVIRONMENTAL	TEST PI	T TF	P108
PROJ		TI				NAV ALIGNMENT	DATE: 27.03.08	3 9 2m	
CONT	RACTO	n R: R. 8	k I.CONTF	RACTI		PERATOR: PHIL GARLA	ND EQUIPMENT: KON	MATSU PC220	
DEPTH (m)	WATER	BIT	SAMPLE of test	SOIL GROUP	GRAPHIC Log	Soil type, c	SOIL DESCRIPTION olour, consistency, grainsi	ze, moisture, remarks	
0				SM (v)		TOPSOIL - sandy si dark grey to pale g	lt, rootlets; rey with depth; loo	se; moist.	0.25
	untered			SC (v)		GRAVELLY CLAYEY yellowbrown/oranget	SAND; prown streaked; stif	f; molst.	0.60-
1	No Groundwater Enco			ROCK		TUFFACEOUS SANI highly weathered; ve pale yellowbrown wi No indication of bed (towards LA).	DSTONE; ry weak/weak; fine th orangebrown str ding. Major joint set	grained; eaks. 60°/010°	
								E	ND at 1.80-
2 2 3 4 5						Ends as above, high weathered, very diff	y weathered/mode cult digging.	rately	
U D SPT CPT	SAMPI Undist Distur Stand Cone	.E OR urbed bed ard Pr Peneti	TEST enetration To ration Test	v : vis l : lot est	ual ooratory	WATER Water Table Water Inflow SC	LD SUPERVISOR: DJECT COORDINATOR: Eet 1 of 1 Ale 1:25	J.F.YOUNG J.F.YOUNG SHEETS)

C NSW D	artment of		GEOTEC	HNICA	L& F	ENVIRONMENTAL	TEST PIT	TP109				
PROJ	ECT:	TI	LLEGRA	DAM			DATE: 27.03.08					
LOCA	TION:	F	RA, SOUTH	I OF	SPILLV	WAY ALIGNMENT	SURFACE RL: 99.8	m				
CONT	RACTO	R: R. 8	I.CONTE	RACTI	VG a	PERATOR: PHIL GAR	AND EQUIPMENT: KOMAT	SU PC220				
DEPTH (m)	WATER	BIT	SAHPLE or TEST	SOIL GROUP	GRAPHIC LOG	Soil typ	SOIL DESCRIPTION e, colour, consistency, grainsize, ma	oisture, remorks				
				SM (v)		TOPSOIL - sandy dark grey; loose; n	silt, rootlets; noist.	0.30				
	countered			SC (v)		Slightly CLAYEY/(pale brown with o moist to just mois of meta-sedimenta weathered, to 10m	Slightly CLAYEY/CLAYEY SAND; pale brown with orangebrown streaks; stiff; moist to just moist with depth. Includes trace of meta-sedimentary gravel, generally highly weathered, to 10mm dimension.					
2 2	No Groundwater Enc			CL/CI (v)		GRAVELLY SAND dark grey; very st angular; meta-sedir to moderately we dimension. Slopewa	Y CLAY; iff; just moist. Gravel fract nentary; highly weathered athered; generally to 30n ish.	tion I nm 2.75-				
3 1				ROCK		TUFFACEOUS SA highly weathered; yellowbrown/orang	NDSTONE; very weak to weak;fine ebrown.	grained; END at 3.60-				
4 5		2				Ends as above, slo	ow digging.					
U D SPT CPT	SAMPI Undist Distur Stand Cone	E OR urbed bed ord Po Peneto	TEST enetration To ration Test	v : vis l : lot est	ual Ioratory	WATER Water Table Water Inflow	IELD SUPERVISOR: PROJECT COORDINATOR: HEET 1 OF 1 SHI Scale 1:25	J.F.YOUNG J.F.YOUNG EETS				

C NSW De			GEOTEC	HNICA	L&	ENVIRONMENTAL	TEST PI	T .	TP110
PROJ	ECT:	TI	LLEGRA	DAM		,,,,,, _	DATE: 30.06.0	8	
LOCA	TION:				Y TING A		SURFACE RL: 13	4.0M MATELL DC22	0
CONT	RACTO	R: K.				OPERATOR: PHIL GARLAN		WA150 PC22	
DEPTH (m)	WATER	BIT	SAMPLE OF TEST	SOIL Group	GRAPHIC Log	Soil type, col	SOIL DESCRIPTION lour, consistency, grainsi	ze, moisture, remart	s
0	eq			C _(v) CL		TOPSOIL - clayey sli dark brown; loose; mo	t, rootlets; ist.	· · · · · · · · · · · · · · · · · · ·	0.10
	ounter				· · · · · · · · · · · · · · · · · · ·	SILTY CLAY, rootlets	persist; ttled; firm_to_stiff	; moist.	0.30
	ter Enc					CLAYEY GRAVEL; grey; firm to stiff; mo meta-shale, moderatel	ist. Gravel fraction v weathered/sligh	is angular, tly weathered;	0.60- 7-
- - - - - - - - - - - - - - - - - - -	No Groundwa		•	ROCK		generally medium str META-SHALE; slightly weathered; me Bedding: 15 ° /048 ° Defect spacing extrem	ong, to 50mm dim edium strong; grey Major joint sets: 8 nely close to occ	nension. //greybrown. 0 º /292 º asionally	
					$\frac{1}{1}$				END at 1.25
						Ends as above.			-
F									-
Ē									
-							· · ·	ž	-
- 2					÷ .				
- -									
									-
									·
2					•				
									-
									-
									1.1
E		•							
F F		-							
E									
4									
U D SPT CPT	SAMPL .Undist .Distur Stand Cone	.E OR urbed bed ord Pr Penetr	TEST enetration Te ation Test	v : vis l : lob est	ual Ioratory	WATER FIELD Water Table PROJ Water Inflow SCA) SUPERVISOR: ECT COORDINATOR: T 1 OF 1 LE 1: 20	J.F.YOU J.F.YOU SHEETS	NG NG

9:02:30 AMg:\IS\Watertec\Geotech\PCAD\BORELOGS\tillegra tu.dgn 9/10/2008

NSW De	artment of		GEOTEC	HNICA	L& E	ENVIRONMENTAL	TEST PIT	TP111
PROJI LOCA CONT	<u>Herce</u> Ect: Tion: Racto	TI T R: R.	LLEGRA 'URIN PR & I. CON'	DAM OPERT TRACT	Y 'ING 0	PPERATOR: PHIL GARLA	DATE: 30.06.08 SURFACE RL: 141.9m ND EQUIPMENT: KOMATSU	PC220
DEPTH (m)	WATER	BIT	SAMPLE of test	SOIL GROUP	GRAPHIC Log	Soil type, c	SOIL DESCRIPTION olour, consistency, groinsize, moistu	re, remarks
				SM (v)	[.].]	TOPSOIL - sandy si	lt, rootlets; ist.	0.15
				CL (v)	· · · · ·	SILTY CLAY/CLAYE	Y SILT; mottled; stiff; moist.	0.40
<u>1</u> 1 1	Groundwater Encountered			ROCK		META-SHALE; moderately weathere medium strong; grey Bedding: 5 º /060 º 85 º /345º . Defect clay film on surface	ed/slightly weathered; /greybrown. Major joint sets: 73 º /23 t spacing very close to cl es.	3 0 ose;
<u>uluu</u> luu	No			ROCK		CLAYEY SAND LAY tuffaceous sandstom META-SHALE contin moderately weathere	ER (extremely weathered e); pale grey; stiff; just moi ues; ed/slightly weathered; med	1.80 1.87 st. /- ium strong
				ROCK	<pre>\\/ ' \\/ ' \\/ \\/ \/ \\/ ' \/ ' \/ ' \/ ' \/ ' \/ ' \/ ' \/ ' \/ ' \/ ' \/ ' \/</pre>	TUFFACEOUS SANI highly weathered; ve	OSTONE; ry weak;	2.50 2.50 END at 2.70
<u>دارید.</u> 3 4		-				Ends on meta-shale; strong/stong; tight.	slightly weathered; mediun	/
U D SPT CPT	L SAMPI Undist Distur Stand Cone	LE OR urbed bed ord Pi Peneti	TEST enetration T ration Test	v : vis l : lob est	uol oratory	WATER FIEL Water Table PRC Water Inflow SC	LD SUPERVISOR: DJECT COORDINATOR: EET 1 OF 1 SHEETS ALE 1: 20	J.F.YOUNG J.F.YOUNG

Com	therce		GEOTEC	HNICA	L& I	ENVIRONMENTAL	TEST F	эιт	TP112
PROJI LOCA CONT	ECT: TION: Racto	T T R: R. 8	LLEGRA URIN PRO & I. CONT	DAM DPERT RACT	Y ING (OPERATOR: PHIL GAF	DATE: 30.06. SURFACE RL: 1 RLAND EQUIPMENT: K	08 40.1m Omatsu PC	220
DEPTH (m)	WATER	BIT	SAMPLE of test	SOIL GROUP	GRAPHIC Log	Soil ty	SOIL DESCRIPTIO pe, colour, consistency, grain	IN nsize, moisture, re	morks
				SM (v)	7.7	TOPSOIL - slight	ly clayey sandy silt,	rootlets;	0.10
				CI (v)	· · · · · · · · · · · · · · · · · · ·	CLAYEY SILT, ro brown/yellowbrow	otlets persist; vn; firm; molst.		/
	ter Encountered			GC (v)		CLAYEY GRAVEL grey; firm to stif meta-shale; model medium strong.	.; f; moist. Gravel fractic rately weathered; gei	on is angular, nerally	
-	No Groundwat			ROCK		META-SHALE; moderately weath medium strong; g Bedding: 7 º/050	nered/slightly weath rey/greybrown. º Major joint set: 8	ered; 7 0/1960 .	1.10
				ROCK		TUFFACEOUS SA	ANDSTONE BED; ; very weak; pale yel	llowbrown.	1.80- END at 2.00-
					<u>, , , , , , , , , , , , , , , , , , , </u>	Ends on meta-sh	ale, slightly weathere	d, medium st	rong.
ليبيد ايب									
- 									
5									
					*			· .	
U U D SPT CPT	SAMPI Undist Distur Stand Cone	LE OR urbed bed ord Pe Peneti	TEST Test enetration Tu ration Test	v : vis l : lol est	l ual boratory	WATER Water Table Water Inflow	FIELD SUPERVISOR: PROJECT COORDINATOR: SHEET 1 OF 1 SCALE 1 : 20	J.F.Y J.F.Y Sheets	YOUNG YOUNG

Comp	artent of		GEOTEC	HNICA	L& I	ENVIRONMENTAL	TEST PIT	TP113
PROJ	ECT:	TI	LLEGRA	DAM			DATE: 30.06.08	
LOCA	TION:	Т	URIN PRO	OPERT	Y		SURFACE RL: 147.	5m
CONT	RACTO	R: R. (& I. CONT	RACT	'ING (PERATOR: PHIL GAR	LAND EQUIPMENT: KOM	ATSU PC220
DĘPŢH	WATER	RIT	SAMPLE	SOIL	GRAPHIC		SOIL DESCRIPTION	
(m) 			TĚŠT	GROUP	100	Soil typ	e, colour, consistency, grainsize	, moisture, remarks
E O				SM (v)	/./	TOPSOIL - sandy	silt, rootlets; t.	0.10 /-
Ē	-			SC ·	/./.	CLAYEY SAND;		
Ē	tere				./.	yellowbrown/orang firm to stiff; mois	gebrown, mottled; :t.	0.50
Ē	con					TUFFACEOUS SA	ANDSSTONE;	
	Ē			ROCK	··/ · · -··-/	moderately weath	ierd; medium strong; fine	e grained.
E	wate				·_·-·		•	0.90
- 1	punc					META-SHALE; moderately weath	ered/slightly weathered	
E	5			BOCK		medium strong; ge Bedding: 7.0./102	enerally grey. 0 Major joint set: 85.0	/265.0
Ē	ž			NUCK		Defect spacing ex	tremely close to close	
Ē						commonly clay co	Jateo.	
-								END at 1.60-
Ē						Ends as above, si	igntiy weathered, mediui	m strong/strong, tight
Ē								
2							-	
-								-
Ē							-	
E								-
F								
Ē						· ·		-
Ē								
3								
-						· ·	·	
Ē								
Ę								
								-
Ē								-
4								
11	SAMPI	E OR	TEST	v:vis l:lot	ual voratory	WATER	FIELD SUPERVISOR:	J.F.YOUNG
D	Distur Stond	ard Pi	enetration Ti	est	,	Water Table	SHEET 1 OF 1	SHEETS
CPT.	Cone	Peneti	ration Test			Water Inflow	SCALE 1: 20	

.

	nerce	I	GEOTEC	HNICA	L& I	ENVIRONMENTAL	TEST F	лт ТР	114
PROJ	ECT:	TI	LLEGRA	DAM		<u></u>	DATE: 30.06.	08	conditie :
LOCA	TION:	T	URIN PRO) PERT	Y ·		SURFACE RL:	151.2 m	
CONT	RACTO	R: R	& ICONT	RACT	ING (OPERATOR: PHIL GARL	AND EQUIPMENT: K	OMATSU PC220	
DEPTH (m)	WATER	BIT	SAMPLE of test	SOIL Group	GRAPHIC Log	Soil type,	SOIL DESCRIPTIO , colour, consistency, grain	N nsize, moisture, remarks	
Ē				SM (v)		TOPSOIL - sandy : dark brown; loose; l	silt, rootlets; moist.		0.15
L	tered			SC (v)		GRAVELLY CLAYE pale brown; firm to angular, meta-sedin to 30mm dimensio	Y SAND; o stiff; moist. Grave nentary, generally h n.	l fraction ighly weathered; we	ak;
	ndwater Encoun					META-SHALE; moderately weathe highly fractured. De sandy clay fill com Bedding: 70 ⁰ /085	red; generally medi efect spacing extre mon; °	um strong; mely close,	
ليديد احييه احييه ا	No Groui			ROCK			• •		
2				~~~~	· · - · - /	•		ENI	-) at 2.00-
						Ends as above, mo defect spacing gen	derately weathered erally close.	l/slightly weathered,	
<u></u>							·	· .	
3									· · · · · · · · · · · · · · · · · · ·
<u>uluu</u> luu 4						· · · · · ·	•		
U D SPT CPT	SAMPL .Undist .Distur Stand Cone	.E OR urbed bed ard Pe Penetr	TEST enetration Te ation Test	v : visi I : lab st	ual oratory	WATER FI Water Table PF Water Inflow S	ELD SUPERVISOR: Roject coordinator: Heet 1 of 1 Cale 1: 20	J.F.YOUNG J.F.YOUNG SHEETS	



Cosw Day	Antiment of		GEOTEC	HNICA	L& I	ENVIRONMENTAL		TEST	PIT	TP	16
PROJI LOCA CONT	<u>nerce</u> Ect: Tion: Racto	TI T R: R	LLEGRA URIN PRO & ICONT	DAM OPERT RACT	Y ING (OPERATOR: PHIL GA	RLAND	DATE: 30.0 SURFACE RL: DEQUIPMENT:	6.08 172.9m KOMATSL	J PC220	
DEPTH (m)	WATER	BIT	SAMPLE TEST	SOIL Group	GRAPHIC Log	Soil t	ype, colou	SOIL DESCRIP1 r, consistency, gr	'ION ainsize, moisti	ure, remarks	
L O				SM (v)	7 	TOPSOIL - silty dark grey; loose;	sand, r moist.	ootlets;			0.10
	Encountered			SC (v)		CLAYEY GRAVE orangebrown/bro	LLY S <i>i</i> wn; loo	AND; se; moist.			1.00
1	No Groundwater			ROCK		TUFFACEOUS S highly weathered medium strong; 1 spacing very clo	ANDST I/mode line gra se/clos	ONE; rately weath ained; redbrov se. No indica	ered; gene wn. Defect tion of bec	rally Iding.	
					<u></u> /	Ends as above, s	still reas	sonable diggi	Ing.	ENL	
3				-				·			
- - - -											
U D SPT CPT	SAMPL Undist Distur Stand Cone	L OR urbed bed ord Pe Peneti	TEST TEST enetration Te ration Test	v : visi L : lab est	ual orotory	WATER Water Table Water Inflow	FIELD S PROJEC SHEET SCALE	SUPERVISOR: T coordinato 1 of 1 1: 20	R: I SHEET D	J.F.YOUNG J.F.YOUNG S	

.

C ^{NSW D}	antosat of		GEOTEC	HNICA	L& E	INVIRONMENTAL	TEST PIT	TP	117
PROJI LOCA CONT	<u>Herce</u> Ect: Tion: Racto	TI L R: R	LLEGRA .OWREY'S & ICONT	DAM PROI RACT	PERTY ING 0	PERATOR: PHIL GAR	DATE: 01.07.08 SURFACE RL: 139 LAND EQUIPMENT: KOM).3m ATSU PC220	
DEPTH (m)	WATER	BIT	SAMPLE OF TEST	SOIL Group	GRAPHIC Log	Soil typ	SOIL DESCRIPTION e, colour, consistency, grainsize	e, moisture, remorks	
E O			· · · · · · · · · · · · · · · · · · ·	SM (v)		TOPSOIL - sandy dark grey; loose; l	silt, rootlets; noist.		0.20-
		•		SC (v)	•/•/	GRAVELLY CLAY greybrown with o firm; moist to wet	EY SAND; rangebrown streaks;		0.50
<u> </u>	No Groundwater Encountered	· ·		SC (v)		GRAVELLY CLAY grey/orangebrown (cemented in part angular to subrou to slightly weathe dimension. Slopew	EY SAND; , streaked (horizontal);); just moist. Gravel frac nded, varies from highl ered, meda-sedimentary ash.	very stiff stion is y weathered to 100mm END) at 2.00-
2						Ends as above.		L 1 V L	<u>, at 2.00</u>
<u>danaluurluurluurluurluurluurluur</u> 4	SAMD	E UD	TFST	y · vic	uol	WATER	FIELD SUPERVISOR:	J.F.YOUNG	
U D SPT CPT	SAMP Undist Distur Stand Cone	urbed bed lard P Penet	enetration Tr ration Test	st : lat	oratory	Water Table	PROJECT COORDINATOR: SHEET 1 OF 1 SCALE 1: 20	J.F.YOUNG SHEETS	

. .

9/10/2008 9:26:59 AMg:\IS\Watertec\Geotech\PCAD\BORELOGS\tillegra lo.dgn

CNSW Day	artment of		GEOTEC	HNICAL	& E	NVIRONMENTAL		TEST P	IT	TP1	18
PROJI LOCA CONT	ECT: TION: Racto	TI L R: R.	LLEGRA OWREY'S & I. CON1	DAM PROPE RACTIN	RTY	PERATOR: PHIL GAR	rLAND	DATE: 01.07.C SURFACE RL: 1 EQUIPMENT: KC	98 50.5m OMATSU P	C220	
DEPTH (m)	WATER	BIT	SAMPLE or test	SOIL GROUP	RAPHIC Log	Soil typ	S pe, colour,	OIL DESCRIPTIO consistency, grain	ł size, moisture, r	emorks	
				SM (v)		TOPSOIL - silty s dark greybrown; l	sand wi loose; m	th trace of g oist.	ravel, rootle	ts;	0.30
	itered			SC (v)		CLAYEY SAND; pale brown; firm; r	moist.				0.90 11.11.11.11.1
1 2	No Groundwater Encoun			SC/GC (v)		CLAYEY GRAVEL grey/yellowbrown stiff (partly cemel generally angular, dimension; highly weathered. Slopev	LY SA /orange nted); ju , meta-s weather wash.	ND; brown, streak ist moist. Grav edimentary to red to modera	ed; very rel fraction 120mm ately		2
					·/. /./.	Ends as above.	. <u></u> .			END	at 2.30
s S								•			سيليبالينا
يعديا يددا يبيا يب											
4									<u></u>		
U D SPT CPT	SAMP Undist Distur Stand Cone	LE OR urbed bed ard P Penet	TEST enetration T ration Test	v : visua l : labor est	l ratory	WATER Water Table Water Inflow	FIELD SU PROJECT SHEET SCALE	JPERVISOR: Coordinator: 1 of 1 1: 20	J.F. J.F. Sheets	YOUNG YOUNG	

Com	nerce		GEOTEC	HNICA	L& E	ENVIRONMENTAL	TEST PI	т ТР119	
PROJ	ECT:	TI	LLEGRA	DAM	***		DATE: 01.07.0	8	
LOCA	TION:	L	OWREY'S	PRO	PERTY		SURFACE RL: 16	5.9m	
CONT	RACTO	R: R.	& I. CONT	FRACT	ring o	OPERATOR: PHIL GARL	AND EQUIPMENT: KO	MATSU PC220	
DEPTH	WATED	DIT	SAMPLE	SOIL	GRAPHIC		SOIL DESCRIPTION		
{m}		UII	TËST	GROUP	LOG	Soil type	, colour, consistency, grains	ize, moisture, remarks	
F.o					1.1	TOPSOIL - silty sa	and, rootlets;		
Ē				SM	1.1	dark brown; loose;	moist.		_
Ē				(4)				0.4	o
F	Ш. Э.				/./	Slightly CLAVEV S	: AND:		
E	Z			sc	·/./	yellowbrown; firm; n	noist. Angular tufface	ious	.
E				(v)	/./	sandstone gravel w	lith depth to 150mm	dimension.	1 1
					/./			END at 0.8	5
F						Ends on tuffaceou	s sandstone; slightly	weathered/fresh.	-
F 1						Refusal, No indicati	ion of bedding.		-
E									-
F					-				-
F									-
E									_
									-
F									_
E									-
2									-
E			1					,	_
E									-
F									
Ę									
Ē									-
E									-
Ę									-
-3	1			\ \					
E									-
E									-
È.									-
Ē			1						
F F	1								
E	1								
F⊿									
F	I SAMP	LE OR	TEST	v : vis	ual .	WATER F	IELD SUPERVISOR:	J.F.YOUNG	
U	Undist	urbed		l : la	boratory	Water Table P	ROJECT COORDINATOR:	J.F.YOUNG	
SPT.	Stand	lard P	enetration T	est		→ Water Inflow	HEET 1 OF 1	SHEETS	
ן נאו.	tone	L 6116 L	rusion rest						

Com	nerce		GEOT	ECHNICA	L& I	INVIRONMENTAL	TEST F	РІТ	TP120
PROJ LOCA CONT	ECT: TION: RACTO	TI L R: R .	ULEGRA OWREY & I. CO	A DAM ('S PROF Intract	PERTY ING 0	PERATOR: PHIL GARL	DATE: 01.07.0 SURFACE RL: 1 AND EQUIPMENT: KC	08 57.9m DMATSU PC2	20
DEPTH (m)	WATER	BIT	SAMPLE of TEST	SOIL GROUP	GRAPHIC Log	Soil type,	SOIL DESCRIPTIO colour, consistency, grain	N Isize, moisture, remo	rks
		-		SM (v)		TOPSOIL - silty sar dark grey; loose; mo	nd, rootlets; list.		0.35
- - - - - - - - - - - - - - - - - - -	iter Encountered			SC (v)		CLAYEY SAND with orangebrown/yellow Gravel fraction, angu	n gravel; brown, streaked; fir lar, meta-sedimenta	rm; moist. ary to 50mm	dimension
	No Groundwa			ROCK		TUFFACEOUS SAN slightly weathered/f Defect spacing gene No indication of bed	DSTONE; fresh; strong to ve erally close to mo Iding.	ery strong. derately wide.	FND at 2.00-
2						Ends as above, very	/ difficult digging.		
	SAMPI Undist Distur	.E OR urbed bed	TEST	v : visi l : lab	ual loratory	WATER FIE Water Table PR	LD SUPERVISOR: Oject coordinator:	J.F.YO J.F.YO	UNG

Com	nerce		GEOTEC	HNICA	L& 1	ENVIRONMENTAL	TEST I	PIT	TP121
PROJ	ECT:	Ti	LLEGRA	DAM			DATE: 01.07.	08	
LOCA	TION:	L	OWREY'S	PROF	PERTY	, ·	SURFACE RL:	176.3m	
CONT	RACTO	R: R. 8	I. CONT	RACT	ING (OPERATOR: PHIL GARI	LAND EQUIPMENT: K	OMATSU PC	220
DĘPŢH	WATEP	BIT	SAMPLE	SOIL	GRAPHIC		SOIL DESCRIPTIO)N	
(m)	ΠΛΙ Ι Ν -	ווע	TËST	GROUP	LOG	Soil type	e, colour, consistency, grai	nsize, moisture, rem	arks
⊧ ∘					1.1	TOPSOIL - silty si	and, rootlets;		
E				5M (v)	1.1	dark grey; loose; m	n oist .		0.907
Ę	pa		- ·		1.1	SILTY SAND WITH	gravel: mid brown:	firm: moist	
Ē	nter			SM (v)	1.1.	Gravel fraction ang	jular, meta-sediment	ary to 30mm	
Ē	lcou					aimension; highly w		ny weathered.	0.60-
Ē	ř Er					Interbedded TUFF	ACEOUS SANDSTC to moderately weat	JNE/META-SHA	мше; — — — — — — — — — — — — — — — — — — —
Ē	wate					medium strong to	strong. Bedding: 40	⁰ /248 ⁰	hedding
-1	pun						J /J40 -,48 - /Ul		
Ę	Gro			ROCK	<u> /</u> -/	-			
Ē	٩					-			
Ē									
Ę						•]			END at 1.60-
						Ends as above, mod	derately weathered,	, tight, slow dig	ging.
Ē									
ŧ,									
Ē									-
F									
F									
E									
									-
F									
									· _
– 3									
Ē						1			- - -
E			· ·						-
Ē									
Ē									
Ē					1				
-									·
E 4									-
D	SAMP	EOR	TEST	v : visi	ual Iorntorv	WATER F	IELD SUPERVISOR:	J.F.YC	DUNG
U D	undist Distur	bed		L <u> </u>		│ 🗙 Water Table │ ₽	PROJECT COORDINATOR:	: J.F.YC Sheets	JUNG
SPI.	Stand Cone	ara P Peneti	enerration I. Pation Test	621		► Water Inflow	SCALE 1: 20	5116613	

Comp	artment of		GEOTEC	HNICA	L& E	ENVIRONMENTAL	TEST P	IT	TP122
PROJ	ECT:	TII	LEGRA	DAM			DATE: 01.07.0	8	
LOCA	TION:	L	OWREY'S	PROP	PERTY		SURFACE RL:	136.0m	
CONT	RACTO	R: R. 8	I. CONT	RACT	ING O	PERATOR: PHIL GARLA	ND EQUIPMENT: KC	MATSU PC2	20
DEDIH		017	SAMPLE	SOIL	GRAPHIC		SOIL DESCRIPTIO	1	
(m)	WAIEK	BII	TËST	GROUP	LOG	Soil type, co	olour, consistency, grain	size, noisture, reno	rks
E O				SM (v)		TOPSOIL - silty sand	with trace of c	lay; rootlets;	0.15
	Encountered			SC (v)		GRAVELLY CLAYEY orangebrown/grey, me angular, highly weath meta-shale to 50mm close to close.	SAND; ottled; firm; moist, ered/moderately dimension. Defec	Gravel fraction weathered, st spacing very	0.60
	Vo Groundwater E		•	ROCK		META-SHALE; highly weathered to weak to medium str joint sets: 82 ⁰ /004	slightly weathere ong. Bedding: 5 ^o o _, 85 ^o /278 ^o	d with depth; /147 º Major across beddin	g).
Ē							, ,	· .	-
Ē					·····			-	END at 1.50
					-	Ends as above (mod	lerately weathere	d meta-shale).	
-2									
<u></u>									.
Ē									
-									
E_3		•							
Ē									
Ē									111
Ē									
Ē									
Ē	1								
E 4					<u> </u>				-
U D SPT. CPT.	SAMP Undist Distur Stonc Cone	LE OR urbed bed lard P Peneti	TEST enetration T ration Test	v:vis l:lo est	ual boratory	WATER FIEL Water Table PRO SHE Water Inflow SC	.D SUPERVISOR: IJECT COORDINATOR: ET 1 of 1 ALE 1 : 20	J.F.YC J.F.YC SHEETS	DUNG

9/10/2008 9:27:03 AMg:\IS\Watertec\Geotech\PCAD\BORELOGS\tillegra lo.dgn

Comm PROJI LOCA CONT	nerce ECT: TION: RACTO	TII L R: R. 8	GEOTEC LLEGRA OWREY'S & I. CONT	HNICA DAM PROI RACT	NL & E PERTY ING 0	ENVIRONMENTAL PERATOR: PHIL GARLA	TEST PI DATE: 01.07.08 SURFACE RL: 14 ND EQUIPMENT: KOM	г Т 8.1m ИАТSU PC220	P123			
DEPTH (m)	WATER	BIT	SAMPLE of TEST	SOIL GROUP	GRAPHIC Log	Soil Type, co	SOIL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks					
E o				SM (v)	1.1	TOPSOIL - sandy sil dark grey; loose; mois	t, rootlets; st.	1-248-4 	0.20			
	ounterec			SM GF		GRAVELLY SANDY Solver Street	SILT, rootlets persi	st;	0.50			
	No Groundwater Enc			ROCK		META-SHALE; highly weathered to weak to medium str spacing very close f joint sets: 80 º/168	moderately weather ong; brown/greybro to close. Bedding: 2 0 _, 50 0/255 0 (ad	ered with depti own. Defect 6 ⁰ /063 ⁰ Majo cross bedding)	n; pr –			
			≁u7		· · _ · _ · _ /				END at 1.30			
<u></u>												
U U	SAMP Undist Distur Stand	LE OR urbed bed ard Pe	TEST	v : vis l : lol	ual	WATER FIEL Water Toble SHE Water Inflow	D SUPERVISOR: JECT COORDINATOR: ET 1 OF 1	J.F.YOU J.F.YOU SHEETS				

Comi	nerce		GEOTEC	HNICA	L& I	ENVIRONMENTAL	TEST	ріт ТІ	P124	
PROJI LOCA Cont	ECT: TION: RACTO	TI L R: R . (LLEGRA .OWREY'S & I. CONT	DAM PROI RACT	PERTY ING (OPERATOR: PHIL GAR	DATE: 01.07. SURFACE RL: LAND EQUIPMENT: K	08 157.3m OMATSU PC220		
DEPTH (m)	WATER	BIT	SAMPLE of test	SOIL Group	GRAPHIC Log	Soil typ	SOIL DESCRIPTIC e, colour, consistency, groi)N nsize, moisture, remorks		
				SM (v)		TOPSOIL - sandy dark grey; loose; r	silt, rootlets; noist.		0.30	
<u> </u>	No Groundwater Encountered			ROCK		META-SHALE; highly weathered weak to medium spacing extremely (sheared). No indic	to moderately wea strong; brown/greyl close/very close, ation of bedding.	thered with depth; prown. Defect ranging to close	VD at 2.00	
2	· · · · ·					Ends as above (m	oderately weathere	d meta-shale).		
-3										
U D SPT CPT	SAMPLE OR TEST v : visual WATER FIELD SUPERVISOR: J.F.YOUNG UDisturbed I : loboratory Water Table PROJECT COORDINATOR: J.F.YOUNG SPTStandard Penetration Test Water Inflow SCALE 1 : 20									

Comp	and the role		GEOTEC	HNICA	L & E	ENVIRONMENTAL	TEST F	лт Т	FP125
PROJI LOCA CONT	ECT: TION: Ractoi	TI L R: R.	LLEGRA OWREY'S & I. CON	DAM PROF FRAC	PERTY FING (PERATOR: PHIL GAI	DATE: 01.07.0 SURFACE RL: 1 RLAND EQUIPMENT: KO	08 172.4m DMATSU PC22	0
DEPTH (m)	WATER	BIT	SAMPLE or test	SOIL Group	GRAPHIC Log	Soil ty	SOIL DESCRIPTIO pe, colour, consistency, grain	N Isize, moisture, remarks	s
				SM (v)		TOPSOIL - sandy dark grey; loose;	v silt, rootlets; moist.	· · · · · · · · · · · · · · · · · · ·	0.20-
	Groundwater Encountered			GM (v)		SANDY GRAVEL yellowbrown; firm highly weathered strong meta-sedi	with trace of clay; to stiff; moist. Grave /moderately weather mentary. Slopewash.	el fraction angular ed; weak to med	llum
يتتايدينايدي	No G			ROCK		TUFFACEOUS S moderately weath Defect spacing v of bedding.	ANDSTONE; nered; medium strong ery close/close. No i	g; greybrown. Indication	END at 1.80
						Ends as above.			
2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	SAMPI	-E OR	TEST	Y : YİS	uoł	WATER	FIELD SUPERVISOR:	J.F.YOU	NG
U D SPT CPT	UUndisturbed UDisturbed SPTStandard Penetration Test CPTCone Penetration Test					➤ Water Table ➤ Water Inflow	PROJECT COORDINATOR: Sheet 1 of 1 Scale 1: 20	J.F.YOU SHEETS	NG

Comp	nerce		GEOTEC	HNICA	1L & E	ENVIRONMENTAL	TEST P	IT -	TP126
PROJ		TI	LLEGRA	DAM			DATE: 01.07.0	8	
LOCA	TION:	L	OWREY'S	PRO	PERTY		SURFACE RL: 14	4.3m	н. Н
CONT	RACTO	R: R.	& I. CON	[RAC]	FING o	PERATOR: PHIL GAR	AND EQUIPMENT: KO	MATSU PC22	0
05070			SAMPLE	011	CDADMIC		SOIL DESCRIPTION	· · · · · · · · · · · · · · · · · · ·	
	WATER	BIT	TEST	GROUP	LOG	Soil type	, colour, consistency, grains	ize, moisture, remork	s
Fo	 			-	1.1	TODEOIL condu	silt rootlets:		
E.				SM		dark grey; loose; m	ioist.		
	-			(v)	1.1.				0 40-
È.	tere								
Ē	onu					moderately weather	ered to moderately	weathered/	
E	Enc				$\begin{array}{c} - \cdot \cdot - \cdot \\ - \cdot - \cdot - \cdot \\ - \cdot - \cdot - \cdot \end{array}$	slightly weathered Defect spacing ext	with depth; medium tremely close to ve	strong. ry close/close.	
Ē	ater				· - · - /	Probable bedding:	30 º /058 º		1
Ē.	mpu			ROCK	· · · · · · · · ·				-
E	irou								-
	0						· .		
Ē	~								· -
E	1				· - · - /				
-			· · ·		<u>- , - 7</u>	Ende en obeve (m	odorotoly, weathered	/eliabtly	END at 1.00-
-						weathered meta-sl	hale).	/ Signary	
E									-
-2	-								
Ē									
Ē									
F									
Ę									1.1
F							ſ		1 1
Ē								`	-
Ē									· · · · ·
E									
E									-
F					ļ				
Ē									
Ē									-
Ē									· •
<u></u>			·					······································	
U.	SAMPI Undist	LE OR urbed	TEST	v:vis l:la	ual poratory	WATER F	IELD SUPERVISOR:		NG NG
0 SPT	.Distur Stand	bed ard P	enetration Ti	est		Woter Table S	SHEET 1 OF 1	SHEETS	
čpt	CPTCone Penetration Test Water Inflow SCALE 1: 20								

9/10/2008 9:27:06 AMg:\IS\Watertec\Geotech\PCAD\BORELOGS\tillegra lo.dgn

CNSW Da	artment of		GEOTEC	HNICA	L& F	ENVIRONMENTAL	TEST	PIT	TP127
PROJ	ECT:	TI	LLEGRA	DAM			DATE: 01.07	7.08	
LOCA	TION:	L	OWREY'S	PRO	PERTY		SURFACE RL:	146.3m	
CONT	RACTO	R: R.	& I. CON1	RACT	'ING o	PERATOR: PHIL GARLA	AND EQUIPMENT: I	KOMATSU PC	220
DEPTH (m)	WATER	BIT	SAMPLE of test	SOIL Group	GRAPHIC Log	Soil type, c	SOIL DESCRIPT colour, consistency, gr	ION ainsize, moisture, ren	norks
	<u> </u>			SM (v)		TOPSOIL - sandy si dark grey; loose; mo	lt, rootlets; ist.		0.25
<u>, , , , , , , , , , , , , , , , , , , </u>	No Groundwater Encountered			ROCK		TUFFACEOUS SANI moderately weather Defect spacing very wide. Probable beddi	DSTONE; ed; medium stro close/close, rai ing: 45 º /245 º	ng; brown/greyt nging top mode Major joint set	prown. rately : 85 °/343 °
				:	(-)				END at 1.90
-2						Ends as above.			
4 4 4									
U D SPT. CPT.	SAMPI Undist Distur Stand Cone	LE OR urbed bed ard P Peneti	TEST enetration Ti ration Test	v : vis : lot est	uai poratory	WATER FIE Water Table Water Inflow SC	LU SUPERVISOR: DJECT COORDINATO EET 1 OF 1 ALE 1: 20	J.F.Y R: J.F.Y SHEETS D	OUNG

Com	artment of nerce	-	GEOTEC	HNICA	L &	ENVIRONMENTAL	TEST	PIT	TP128
PROJE	:CT:	TI	LLEGRA	DAM			DATE: 02.07	7.08	
LOCA	TION:	Т	URIN PR	OPERT	Y		SURFACE RL:	132.3m	
CONT	RACTO	R: R. 8	& I. CONT	RACT	ING	OPERATOR: PHIL GARLA	ND EQUIPMENT: 1	COMATSU PO	220
DEPTH	WATER	BIT	SAMPLE	SOIL	GRAPHIC		SOIL DESCRIPT	ION	
			IESI			Soil type, co	lour, consistency, gro	oinsize, moisture, re	MOTKS .
				SM (v) -		TOPSOIL - sandy silf dark brown; loose; mo	t, rootlets; bist.		0.20-
	Intered			SM/SC (v)		SANDY SILT/SILTY rootlets persist; mid l	SAND with trac brown; firm; mois	ce of clay, st	0.55
- - - - - - - - - - - - -	undwater Encou			POCK		META-SHALE; highly weathered to weathered with depti spacing very close t Major joint sets: 87 ^o	moderately we h; medium stror o ciose. Beddin /161 ^o , 68 ^o /2	athered/slighti ng; defect g: 3 %088 ° 90 ° .	y 1
	No Gro			NOOK					END at 1.60-
			·		<u>- \ </u>	Ends as above (sligh	tly weathered	meta-shale).	
									·
					,				
-2									
-									
-									Ξ
-			:						
-									
-									-
-						· · ·			-
-3									=
- -									-
=									=
<u> </u>									-
									-
- 4				 	<u> </u>			`. e •	
U D SPT CPT	SAMPI .Undist .Distur Stand Cone	.E OR urbed bed ard Pe Penetr	IEST enetration T ation Test	lv : vis l : lot est	uat Ioratory	WATER FIEL Water Table PRO. Water Inflow SCA	D SUPERVISUR: JECT COORDINATO ET 1 OF 1 ALE 1: 20	J.F.' R: J.F.' Sheets	OUNG

9/10/2008 9:02:34 AMg:\IS\Watertec\Geotech\PCAD\BORELOGS\tillegra_tu.dgn

CNSW De	partment of		GEOTEC	HNICA	L &	ENVIRONMENTAL	TEST PI	Т	TP129
PROJ	<u>nerce</u> ECT:	TI	LEGRA	DAM		· · · · · · · · · · · · · · · · · · ·	DATE: 02.07.0	8	
	TION	ĩ	URIN PR	OPERT	Υ		SURFACE RL: 143	3.4m	
CONT	RACTO	R: R. 8	I. CONT	FRACT	ING	OPERATOR: PHIL GARLA	ND EQUIPMENT: KOI	MATSU PC2	20
DEPTH	WATED	DIT	SAMPLE	SOIL	GRAPHIC		SOIL DESCRIPTION		
{m}	-	Dil	TËST	GROUP	LOG	Soil type, co	olour, consistency, grainsi	ze, moisture, remo	rks
				SM (v)		TOPSOIL - silty sand dark grey; loose; moi	d, rootlets; st.		0.25
	untered			SC (v)	•/•/•	GRAVELLY CLAYEY brown/orangebrown, i fraction angular, meta	SAND; mottled; firm; moist. a-sedimentary, highl	Gravel y weathered	0.50
	Enco					/moderately weather	ed; to 30mm dime	nsion.	/
	lwater (· · · · · · · · · · · · · · · · · · ·	META-SHALE; moderately weathere slightly weathered w	d to moderately v rith depth; medium	veathered/ strong.	-
E-1	Duno.			ROCK		Bedding: 5 º /085 º	. Major joint sets:	73 0 /237 0	-
	0				$ \begin{pmatrix} 1 \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\$	(very prominent) 50	o /154 o .		_
E	Ž					, . ,			-
				:		-			END at 1.50
Ē						Ends as above.	-		
Ē									
Ē				1					
E-2				· · .					-
Ē									-
Ē									
Ē.									<u>.</u>
Ē									
<u> </u>									- -
Ē									
-3 -									
Ē			1						-
Ę									
F								,	
E									
-									
Ē,									
⊢ 4 <u>V</u>	 SAMP Undist	LE OR Urbed	I TEST	v : vis l : lo	l. Sual boratory	WATER FIEL	.D SUPERVISOR: DIECT COORDINATOR:	J.F.YO J.F.YO	UNG
D SPT. CPT	Vistur Stanc Cone	bed lard P Penet	enetration T ration Test	ſest		Water Inflow SHE	ET 1 OF 1 ALE 1:20	SHEETS	

Comp	nerce		GEOTEC	HNICA	L& I	ENVIRONMENTAL	TEST PIT	TP130
PROJI LOCA CONT	ECT: TION: Racto	TI T R: R.	LLEGRA TURIN PRO & I. CONT	DAM OPERT FRAC1	Y TING (OPERATOR: PHIL GARL	DATE: 02.07.08 SURFACE RL: 152.9m AND EQUIPMENT: KOMATSU P	C220
DEPTH (m)	WATER	BIT	SAMPLE TEST	SOIL Group	GRAPHIC Log	Soil type,	SOIL DESCRIPTION , colour, consistency, groinsize, moisture, r	emorks
E O		i .		SM (v)		TOPSOIL - sandy dark grey; loose; m	silt, rootlets; oist.	0.20
است	ountered			SC (v)		GRAVELLY CLAYE grey/orangebrown,r Gravel fraction ang highly weathered; t	Y SAND; nottled; firm to stiff; moist. ular, meta-sedimentary; o 30mm dimension.	0.60-
<u> </u> 	No Groundwater Enco			SM (v)		META-SHALE; moderately weathe slightly weathered Defect spacing gen Bedding: 18 ⁰ /070 (very prominent).	red to moderately weathered/ with depth; medium strong. erally very close to close. ^D . Major joint sets: 55 ⁰ /254 ⁰	
						Ends as shove	- 	END at 1.60
۰٬۱۰۰٬۰۰٬۰٬۰٬۰٬۰٬۰٬۰٬۰٬۰٬۰٬۰٬۰٬۰٬۰٬۰٬۰٬								
U D SPT CPT	SAMPI Undist Distur Stand	E OR urbed bed ord Pr Penetr	TEST TEST	v : vis l : lot est	ual poratory	WATER FI Water Table SI Water Inflow SI	ELD SUPERVISOR: J.F. Roject coordinator: J.F. Heet 1 of 1 sheets Cale 1:20	YOUNG YOUNG

Comm	artment of nerce		GEOTEC	HNICA	L& F	ENVIRONMENTAL	TEST PIT	TP131
PROJE LOCA CONT	ECT: TION: RACTO	TII T R: R.	LEGRA URIN PRO & I. CONT	DAM DPERT TRACT	Y 'ING O	PERATOR: PHIL GAR	DATE: 02.07.08 SURFACE RL: 163.5m ILAND EQUIPMENT: KOMATSU P	C220
DEPTH (m)	WATER	BIT	SAMPLE of TEST	SOIL Group	GRAPHIC Log	Soil typ	SOIL DESCRIPTION be, colour, consistency, grainsize, moisture, r	enotks
				SM (v)		TOPSOIL - silty a	sand, rootlets; noist.	0.15
ليتبيد التقيدا				SC (v)		CLAYEY SAND; pale greybrown; fi	irm to stiff; moist.	
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	No Groundwater Encountered			GM (v) ROCK		SANDY GRAVEL yellowbrown/orang just molst. Gravel generally highly v to 80mm dimensi TUFFACEOUS SA highly weathered; yellowbrown. No in to enter). Ends as above (s	with trace of clay; gebrown, streaked; medium dense fraction angular, meta-sedimentar veathered/moderately weathered ion. Slopewash. ANDSTONE; very weak; very fine/fine graine ndication of bedding (pit too dee still easy digging).	0.90 »; y, , a sd; P END at 3.20
U D SPT CPT	SAMPI .Undist .Distur Stand Cone	.E OR urbed bed ard Pe Penetr	TEST metration Te ation Test	v : vis l : lab est	ual oratory	WATER Water Table Water Inflow	FIELD SUPERVISOR: J.F. PROJECT COORDINATOR: J.F. SHEET 1 OF 1 SHEETS SCALE 1: 20	YOUNG YOUNG

Comm	nerce		GEOTEC	HNICA	L& I	ENVIRONMENTAL	TEST PIT	TP132
PROJI LOCA Cont	ECT: TION: Racto	דו ד R: R. ו	LLEGRA URIN PRO & I. CONT	DAM DPERT RACT	Y (Boi ING d	re 432 drill pad) PERATOR: PHIL GARL	DATE: 02.07.08 SURFACE RL: 200.5m AND EQUIPMENT: KOMATSU	PC220
DEPTH (m)	WATER	BIT	SAMPLE or test	SOIL Group	GRAPHIC Log	Soil type, i	SOIL DESCRIPTION colour, consistency, grainsize, moisture	e, remarks
0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	No Groundwater Encountered			ROCK		CONGLOMERATE/C rounded to well roun grained tuffaceous diameter 200mm. Ma very weak, ranging pockets), generally v No Indication of bed	ONGLOMERATIC SANDSTC nded gravel to boulders in f sandstone matrix. Maximum atrix generally highly weather to moderately weathered (in weak to medium strong. Iding.	END at 3.20
U D SPT CPT	SAMPL Undist Disturl Stand Cone	.E OR urbed bed ard Pe Penetr	TEST enetration Te ation Test	v : visi l : lob st	jal oratory	WATER FIE Water Table Water Inflow SC	LD SUPERVISOR: J. Dject coordinator: J. Eet 1 of 1 sheets Gale 1: 20	F.YOUNG F.YOUNG

ł
								TD122			
Com	nerce		GEOTEC	HNICA	LÖL	ENVIKUNMENIAL		1 - 100			
PROJ	ECT:	TI	LLEGRA	DAM			DATE: 02.07.08				
LOCA	TION:	T	URIN PRO	OPERT	Y		SURFACE RL: 157.6m				
ÇONT	RACTO	R: R.	& I. CON1		ING (OPERATOR: PHIL GAR	LAND EQUIPMENT: KOMATS				
DEPTH	WATER	BIT	SAMPLE	SOIL	GRAPHIC		SOIL DESCRIPTION				
			TEST			Soil typ	Soil type, colour, consistency, grainsize, moisture, remarks				
Ē				SM (v)	1.1	TOPSOIL - silty s	eand, rootlets; noist.				
Ē					///			0.25			
Ē.					/./.	GRAVELLY CLAY	EY SAND; gebrown, streaked; stiff;	-			
						just moist to mois sedimentary, gener	t. Gravel fraction angular, me rally highly weathered/	ta			
Ē	ed				·/.	moderately weath	ered, to 60mm dimension. S	lopewash			
Ē	unter			SC (v)							
E1	incot										
	ter E				/./.			-			
E.	dwa	,	.»			-					
F	roun				<u>···</u>	META QUALE.		1.40-			
Ē	lo G					highly weathered	to moderately weathered w	/ith			
Ē	2					Defect spacing ex	edium strong; brown/greybro tremely close/very close,	own.			
				ROCK		occasionally rangi Possible bedding:	ng to close. 30 º /095º.				
2											
					(-, -, -)						
					$\frac{1}{1}$			END at 2.30			
Ē						Ends as above (m	noderately weathered meta-	shale).			
								· · ·			
Ē								-			
Ē											
-3											
E						· · ·					
E						· ·		-			
F											
E								- 			
Ē		-									
F.A											
	L Sampi	.E OR	I TEST	y : vis	ual .	WATER	FIELD SUPERVISOR:	J.F.YOUNG			
U D	Undist Distur	urbed bed _	, –	<u>[l : lob</u>	oratory	🖌 Woter Table 🕴	PROJECT COORDINATOR:	J.F.YOUNG			
SPT CPT	Stand Cone	ard Po Peneto	enetration Te ation Test	st		► Water Inflow	STALE 1:20	ა 			

9/10/2008 9:02:38 AMg:\IS\Watertec\Geotech\PCAD\BORELOGS\tillegra tu.dgn

2

C NSW Dep	artment of		GEOTEC	HNICA	L& E	NVIRONMENTAL	TEST PI	т ТР1	34	
PROJI LOCA CONT	ECT: TION: Racto	TII T R: R .	LLEGRA URIN PRO & I. CONT	DAM OPERT FRACT	Y ING 0	PERATOR: PHIL GARL	DATE: 02.07.0 SURFACE RL: 17 AND EQUIPMENT: KO	8 1.8m MATSU PC220		
DEPTH (m)	WATER	BIT	SAMPLE of test	SOIL Group	GRAPHIC Log	SOIL DESCRIPTION Soil type, colour, consistency, grainsize, moisture, remarks				
• ••			AA14	SM (v)		TOPSOIL - silty sau dark brown; loose; n	nd, rootlets; noist.		0.23	
	countered			SM (v)		SANDY GRAVEL w yellowbrown/orange dense; moist. Gravel sedimentary, modera	ith trace of clay; brown streaked; me fraction angular, me ately weathered, me	dlum ta- dium strong.	0.85	
1 1 2	No Groundwater End			ROCK		META-SHALE; moderately weather with depth; pale bro Defect spacing extr moderately wide). B Major joint sets: 720	red to slightly weat own/greybrown (to remely close to clo edding: 7º/263 º . o/167 º , 80 º /062 ¢	hered grey). se (rarely).	at 2.00-	
2 	SAMP	FOR	TEST	v : vis	- \ _ \ \ \	Ends as above (slis WATER FI	ghtly weathered me	ta-shale).		
U D SPT. CPT.	SAMP Undist Distur Stand Cone	LE UR Urbed bed lard Pi Peneti	enetration T ration Test	l : lol est	poratory	Water Table St Water Inflow S	ROJECT COORDINATOR: HEET 1 OF 1 CALE 1: 20	J.F.YOUNG SHEETS		

	writesent of		GEOTEC	HNICA	L & E	NVIRONMENTAL	TEST PIT	TP13	5
PROJI	ECT:	TI	LLEGRA I	DAM			DATE: 02.07.08		
LOCA	TION:	T	URIN PRO) PERT	Y		SURFACE RL: 157.4m		
CONT	RACTO	₹: R. 8	I. CONT	RACTI	ING 0	PERATOR: PHIL GARLA	ND EQUIPMENT: KOMATSU PC	220	
DEPTH	WATED	DIT	SAMPLE	SOIL	GRAPHIC		SOIL DESCRIPTION		
(m)		DII	TĚST	GROUP	LOG	Soil type, co	lour, consistency, grainsize, moisture, rei	narks	
-0				SM (v)		TOPSOIL - silty sand dark brown; loose; mo	i, rootlets; bist.		0.20
		·		GP (v)		GRAVELLY SAND wi yellowbrown with ora dense; moist. Gravel fr weathered meta-sedi Slopewash.	ith trace of clay; ingebrown streaks; medium raction angular, highly mentary, to 30mm dimension.		
					o o				_
-									100
1	ered					TUFFACEOUS SAND highly weathered; we Defect spacing gener	STONE; ak; yellowbrown/greybrown. ally very close/close. No		1.007 1 1 1 1
-	n t				·	Indication of bedding.	(possibly dipping into the hill		
-	UC					at approximately 20	o).		-
·	Ш 눈								L.
-	vati				· · · · · · · · · · · · · · · · · · ·				Ī
	- vpu				· · · · · ·				-
-	<u>e</u>	,			$\langle - \rangle - \rangle$				-
-2	0								_
	Ž			ROCK	· · · · · ·				-
-					· · - · - /				
·					- \ - \ -				1
-									
-					__/ \ __/				-
-					-1 - 1	· · · ·			
-						·			
-									
- 3					$\cdot \cdot - \cdot - \cdot - \cdot$				-
Ţ					$\left[\begin{array}{c} \ddots & \ddots \\ \ddots & \ddots \end{array}\right]$				
<u> </u>					-\-/			END a	<u>t 3.20-</u>
-					· ·	Ends as above.			-
`				1		•			1
2				·					
-									
_									. –
- - ^ A									·]
_ 4	SAMPI Undist	.E OR urbed	TEST	v : vis l : lat	ual poratory	WATER FIEL	D SUPERVISOR: J.F.N JECT COORDINATOR: J.F.N	OUNG	
DDisturbed SPTStandard Penetration Test CPTCone Penetration Test						Woter Inflow SHE	ET 1 OF 1 SHEETS ALE 1:20		

9/10/2008 9:02:39 AMg:\IS\Watertec\Geotech\PCAD\BORELOGS\tillegra_tu.dgn

.

Com	ierce		GEOTEC	HNICA	L&	ENVIRONMENTAL	TEST PI	т Т	P136
PROJI	:(T:	TI	LLEGRA	DAM			DATE: 02.07.0	8	
LOCA	TION:	Т	URIN PRO	OPERT	Y		SURFACE RL: 14	6.1m	
CONT	RACTO	R: R.	& I. CON1	RACT	ING (DPERATOR: PHIL GARLA	AND EQUIPMENT: KO	MATSU PC220)
DEPTH	WATER	RIT	SAMPLE	SOIL	GRAPHIC		SOIL DESCRIPTION		
(m)	90160	911	TĔŜĨ	GROUP	LOG	Soil type, c	olour, consistency, grainsi	ze, moisture, remorks	
Ē	ered			SM (v) GP	<u>7.7</u>	TOPSOIL - silty san \dark brown; loose; m	d, rootlets; oist.		0.10
	Icounte	- - - - -		(v)		SANDY GRAVEL wi	th trace of clay; oist. Gravel is angul	ar, highly	0.30
E	л Ц				(-, -)	weathered meta-sed	limentary, to 20mm	dimension.	
-	wate			ROCK		moderately weather	osione; ed/slightly weather	ed; medium	
	pun			NOOK	$\frac{1}{1}$	strong; very fine gra bedding: 17 0/165 0.	ined; greybrown. Pro Defect spacing ver	obable v close/close.	-
 -	0 0 0					Major joint set: 88º/	255 ⁰ (very promi	nent).	-
-1	2 N								END at 1.10
Ē					<u>- · - · -</u>	Ends as above.			
									-
-									-
-									
									_
									-
-									
									-
<u> </u>									-
-									-
1									-
1									-
-3									-
									-
			-*						
Ľ.									
					1				
Ē ⊿									-
	SAMPI	.E OR	I TEST	v : vis	uol	WATER FIE	LD SUPERVISOR:	J.F.YOUN	IG
ປ ກ	.Undist Nistur	urbed hed	·	<u> : lab</u>	oratory	Water Table PRC	JECT COORDINATOR:	J.F.YOUN	IG
SPT CPT	Stand Cone	ard Pe Penetr	enetration Tr ation Test	est		Water Inflow SHI	ET 1 OF 1 ALE 1 : 20	SHEETS	

Т



9/10/2008 9:30:04 AMg:\IS\Watertec\Geotech\PCAD\TILLEGRA\logs\LOG TP137.dgn



Plate TP137A. General view of the test pit looking from west to east (up the slope).



Plate TP137B. Highly weathered, crushed meta-shale in eastern half of test pit. Geological hammer marks clayey zone.



Plate TP137C. Probable bedding dipping into the western end of the test pit.

GEOTECHNICAL & ENVIR	ONMENTAL		TEST PIT	ТР	138
PROJECT: TILLEGRA DAM LOCATION: SLIP 2A CONTRACTOR: R & I CONTRACTING OPERAT	OR: PHIL	DATE: SURFACE RL: EQUIPMENT:	18.08.08 182.2m KOMATSU	PC220	
		12			
					8
TOPSC trace)IL – silty sand wit of clay;dark grey; moist.	h			
- <u>SM(V)</u>	1.2m high				
2m`	TOPSOIL				
and the start is real with the start is a	SANDY with gra mottled.	CLAY/CLAYEY S ivel; yellowbrown	SAND /orangebrowr	հ	
TUFFACEOUS S highly weather weathered; bloc loose.	ANDSTONE; ed; moderately :ky excavation;				
Ex Ti sl	cavated to approxi Iffaceous sandston ower digging.	imately 5m e tighter,			
r. A					
n. B					
· ·				â	ž.
	FIELD) SUPERVISOR: ECT COORDINATOR:	J.F.YOUN J.F.YOUN	G G	
а а			AUGUST	2008	

Com	herce		GEOTEC	HNICA	L & F	ENVIRONMENTAL	TEST PIT	TP139	
PROJI LOCA CONT	ECT: TION: Racto	TI S R: R. (LLEGRA SLIP 2A & I. CONT	DAM FRAÇT	ING C	OPERATOR: PHIL	DATE: 18.08.08 SURFACE RL: 198.7m EQUIPMENT: KOMATSU	PC220	
DEPTH (m)	WATER	BIT	SAHPLE or TEST	SOIL GROUP	GRAPHIC Log	Soil type, co	SOIL DESCRIPTION lour, consistency, grainsize, moistu	re, remorks	
	Encountered			SM (v)		TOPSOIL - silty sand dark grey; loose to f	i with trace of clay, rootle irm; moist.	ets;	
	roundwater			SC (v)		CLAYEY SAND; yellowbrown/orangeb stiff/very stiff; moist.	CLAYEY SAND; yellowbrown/orangebrown, streaked; stiff/very stiff; molst.		
	No			ROCK	· · · · · · · · · · · · · · · · · · ·	TUFFACEOUS SAND highly weathered to with depth; weak to	STONE; moderately weathered medium strong; yellowbro	wn	
						Ends on moderately medium strong; coars	weathered tuffaceous sar se grained. Refusal (insitu s	ndstone; rock).	
- - - - - - - - - - - - - - - - - - -									
			•						
يرابيهايي									
E 4 U D SPT CPT	SAMPI .Undist .Distur Stand Cone	.E OR urbed bed ard Pi Peneti	TEST enetration T ration Test	v : visi l : lob est	ual oratory	WATER FIEL Water Table PRO. Water Inflow SCA	D SUPERVISOR: JECT COORDINATOR: ET 1 OF 1 SHEETS ILE 1: 20	J.F.YOUNG J.F.YOUNG	

9/10/2008 10:31:07 AMg:\IS\Watertec\Geotech\PCAD\BORELOGS\tillegra 2A.dgn

CON	nerce		GEOTEC	HNICA	L& I	ENVIRONMENTAL	TEST P	it T	P140	
PROJI LOCA CONT	ECT: TION: Racto	דוו S R: R. 8	LLEGRA LIP 2A & I. CONT	DAM RACT	ING C	PERATOR: PHIL	DATE: 18.08.0 SURFACE RL: 1 EQUIPMENT: KC	98 86.4m MATSU PC220		
DEPTH (m)	WATER	BIT	SAMPLE of test	SOIL Group	GRAPHIC Log	RAPHIC LOG Soil type, colour, consistency, grainsize, moisture, rem				
				SM (v)		TOPSOIL - silty sa dark grey; loose to	and with trace of cl o firm; moist.	ay, rootlets;	0.35	
-	oundwater Encountered			SC (v)		CLAYEY SAND; yellowbrown; firm; r	noist.			
<u></u>	No Gr			ROCK		TUFFACEOUS SA extremely weather extremely weak to medium grained; yo streaked.	NDSTONE; ed to highly weath o very weak with d ellowbrown/pale gre	ered; epth; y, E	1.60-	
3 4						Ends in tuffaceous weak; medium grai	sandstone; highly v ned. No indication o	veathered; f bedding.		
U D SPT CPT	SAMPI Undist Distur Stond	E OR urbed bed ard Pe Penetr	TEST enetration Tr ation Test	v ; vis l : lot est	i val oratory	WATER F Water Table S Water Inflow S	IELD SUPERVISOR: Roject coordinator: Heet 1 of 1 Scale 1: 20	J.F.YOUN J.F.YOUN SHEETS	G G	

Comr	nerce		GEOTEC	HNICA	L & E	INVIRONMENTAL	TEST PI	Т	TP141
PROJ	ECT:	TI	LLEGRA	DAM			DATE: 18.08.08	3	
LOCA	TION:	S	SLIP 2A	-			SURFACE RL: 2	12.2 m	
CONT	RACTO	R: R.	& I. CON	FRACT	'ING o	PERATOR: PHIL	EQUIPMENT: KOI	MATSU PC22	20
DEPTH (m)	WATER	BIT	SAMPLE of TEST	SOIL GROUP	GRAPHIC Log	Soil typ	SOIL DESCRIPTION , colour, consistency, grainsi	ze, moisture, remor	ks
-0	 						and with trace of old		
						dark grey; loose t	o firm; moist.	iy, i bollets,	· -
E				SM (v)					-
	g								0.507
E	tere				7.7	CLAVEY SAND	·		
F	uno				/./	pale brown with o	rangebrown fleck;		
	Enc			SC	/	firm to stiff; mois			
F	ter			(W) .					3
[]	dwa				·/. /				1.10
Ę	uno				$(\underline{)},\underline{)}$	TUFFACEOUS SA	NDSTONE:		
F	ษั				- \ _ \ _	variably weathere	l, sllightly weathered	boulders	
Ę_	No No			ROCK		in extremely weat matrix is extreme	hered/highly weather y weak to weak wit	ed matrix; h depth;	
E					1 - 1 - 1	medium grained; o	rangebrown with pale	grey seams.	
Ē					:_:_;				
E							s		END at 1.80-
E									-
-2						Ends in tuffaceous	s; highly weathered/m	oderately	1
Ę						Difficult digging.	ly weak, course gran	100.	
Ē									
Ē									
Ē.									
F						х -			· _
E.									
Ē									
[-3	-								
Ē							·		-
È									-
Ē									
	· .								-
<u>4</u>						1			-
11	SAMP	E OR	TEST	v : vis t : lob	ual loratory	WATER	IELD SUPERVISOR:	J.F.YOL	
D	Distur	peq	nnatentian T			🗶 Water Toble	ROJELI LOOKDINATUR:	J.F.YOU SHEETS	טאנ
CPT.	srund Cone	Penetr	ration Test	231		≫— Water Inflow `	SCALE 1: 20		

٠





9/10/2008 10:33:34 AM:\IS\Watertec\Geotech\PCAD\TILLEGRA\logs\log 143.dgn

Com	nerce		GEOTEC	HNICA	AL & I	ENVIRONMENTAL	BOREHOLE	TP144
PROJ LOCA CONT	ECT: TION: Racto	TI S R: R.	LLEGRA SLIP 2A & I. CON	DAM TRAC	TING (PERATOR: PHIL	DATE: 18.08.08 SURFACE RL: 210.9m EQUIPMENT: KOMATSU	PC220
DEPTH (m)	WATER	BIT	SAMPLE of test	SOIL GROUP	GRAPHIC Log	Soil ty	SOIL DESCRIPTION pe, colour, consistency, grainsize, moisture	, remorks
- 0 	-	2		SM (v)		TOPSOIL - silty dark grey; loose;	sand, rootlets; moist.	0.35
.	icountered			SC (v)		SANDY CLAY; orangebrown/yell stiff; molst.	owbrown/pale_grey, streaked;	0.00
	No Groundwater En		· ·	ROCK		TUFFACEOUS Sa highly weathered orangebrown with Probable bedding	ANDSTONE; ; very weak; medium grained; a pale grey streaks. : 13 º / 207 º	END at 2.00-
2 1						Ends as above, h medium strong. D	ighly weathered/moderately we	eathered,
U D SPT CPT	SAMPL .Undist .Distur Stand Cone	.E OR urbed bed ord Pe Penetr	TEST enetration T ation Test	v : visi l : lob est	ual Ioratory	WATER Water Table Water Inflow	FIELD SUPERVISOR: J. PROJECT COORDINATOR: J. Sheet 1 of 1 sheets Scale 1: 20	F.YOUNG F.YOUNG

C ^{NSW Dep}	artment of		GEOTEC	HNICA	L& E	INVIRONMENTAL	TEST PIT	TP145
PROJI LOCA Cont	ECT: TION: Racto	T1 S R: R	LLEGRA SLIP 2A & I CONT	DAM TRACT	ING 0	PERATOR: PHIL	DATE: 19.08.08 SURFACE RL: 209.8m EQUIPMENT: KOMATSI	J PC220
DEPTH [m]	WATER	BIT	SAMPLE or test	SOIL Group	GRAPHIC Log	Soil type, i	SOIL DESCRIPTION colour, consistency, grainsize, moist	ure, remorks
				SM (v)		TOPSOIL - silty sar dark grey; loose; mo	nd, rootlets; ist.	
- 1 1 1 1	oundwater Encountered		•	SC (v)		SANDY CLAY/CLAY pale brown/orangeb stiff; molst.	/EY SAND; rown mottled;	
ايبيابينابي	No Gro			ROCK		TUFFACEOUS SAN extremely weathere No indication of bec	DSTONE; d; extremely weak/very w lding.	veak END at 1.80-
2 3 3						Ends as above, high	ly weathered, very weak.	
4			TLCT			WATED EI		
U D SPT. CPT.	SAMP Undist Distur Stanc Cone	ut UR vrbed vbed lard P Penet	enetration T ration Test	est	ooratory	Water Table SH Water Inflow	OJECT COORDINATOR: EET 1 OF 1 SHEET CALE 1: 20	J.F.YOUNG

9/10/2008 10:31:10 AMg:\IS\Watertec\Geotech\PCAD\BORELOGS\tillegra 2A.dgn

Com	nterce		GEOTEC	CHNICA	L&	ENVIRONMENTAL	TEST	PIT	TP14	46
PROJ	ECT:	TI	LLEGRA	DAM			DATE: 19.0 8	3.08		
LOCA	TION:	S	SLIP 2A				SURFACE RL:	213.7m		
CONT	RACTO	R: R. (& I. CON	TRACT	ING (OPERATOR: PHIL	EQUIPMENT:	KOMATSU	PC220	
DEPTH	WATER	RIT	SAMPLE	SOIL	GRAPHIC	C .	SOIL DESCRIPT	ION		
(m)		Un	TĚST	GROUP	L00	Soil typ	e, colour, consistency, gr	oinsize, moistur	e, remarks	
10 11 11 11				SM (v)		TOPSOIL - silty s includes tuffaceou 0.4m dia; dark gr	sand, rootlets; us sandstone bould rey; loose; moist.	ders to		0.40-
<u>1</u>	o Groundwater Encountered			ROCK		TUFFACEOUS SA moderately weath Topsoil infill to 5m Bedding: 15 ° / 195	ANDSTONE; lered; weak. im in defects, oper o	ì.		
E	ž			ROCK	/					1.55-
E.					$\frac{1}{1}$	META-SHALE; moderately weath	ered; medium stro	ng; brecciate	ed.	[]
F.				ROCK	····/	Thin pale grey cl	ay layer at base o	of bed.		
2					· - · - / · - · - / · - · - /	TUFFACEOUS SA extremely weathe extremely weak/v	ANDSTONE; red/highly weather very weak; medium	red; grained;	END	at 2.10
E ·						brown/orangebrow	vn.			/_
						Ends as above.				عدا بر
E.										-
F								•		
Ē										1
Ęз										
Ę			Ę	`						
-										
Ē										L + L
Ē										
Ē										
										[
Ē,										
4		E 00	1 TEST	y . vie		WATER I	FIFI N SIIDEDVISND.	1		
U	Undist.	urbed	1231	l : lab	oratory	Water Table	PROJECT COORDINATO	R: J.	F.YOUNG	
SPT	.visrur Stand	ueo ard Pe	netration T	est		Water Inflow	SHEET 1 OF 1	SHEETS		
ן נצו	Lone	renetr	arion lest				SLALE 1 : 20)		

9/10/2008 10:31:10 AMg:\IS\Watertec\Geotech\PCAD\BORELOGS\tillegra 2A.dgn



Test Pit TP146. Brecciated meta-shale bed, 1.55m to 1.65m depth.

Com	nerce	:	GEOTEC	HNICA	L& I	ENVIRONMENTAL	TEST F	РΙΤ	TP147
PROJ	ECT:	TI	LLEGRA	DAM			DATE: 19.08 .	08	
LOCA	TION:	S	SLIP 2A				SURFACE RL:	206.8m	
CONT	RACTO	R: R. -	& I. CONI	FRACT	ING (PERATOR: PHIL	EQUIPMENT: K	OMATSU PC22	20
перти			SAMPLE	sou	СБУБНІС		SOIL DESCRIPTIO	N	- ***D2*****
(m)	WAIER	BH	TEST	GROUP	LOG	Soil type	e, colour, consistency, grain	nsize, moisture, remor	ks
<u>-</u> 0					17	TOPSOIL - silty s	and rootlets:		
-				911		dark grey; loose; m	noist.		-
				(v)			· ·		-
E	eq								0.50
<u> </u>	Inter				Z•/.	SANDY CLAY;			
Ē	ncon			SC (v)	/./.	brown/orangebrow	n; firm; moist.	,	
Ē	E				\. <u>'</u> .				0.90
E1	wate			ROCK	- \ _ \ _ - \ _ /	TUFFACEOUS SA	NDSTONE;		-
Ē	punc			ROCK	$\overline{ \cdot \cdot \cdot \cdot \cdot }$	<pre> extremely weather fine grained; yellow </pre>	ed; extremely weak /brown/orangebrowi	;; n	1.05
	ů,				$\frac{1}{\sqrt{1-\sqrt{1-1}}}$	Crushed TUFFACE	OUS SANDSTONE	layer up	7=
	No				· · · · · · ·	\ to 350mm thick, t \ (to 5mm), 15 ° / 22	hin dark grey clay 28 o	layer at base	1.20
				ROCK		TUFFACEOUS SA	NDSTONE continue	S;	······································
F				- -	· \ _ \ _ \ _ \ _ / - \ _ \ _ \ _	extremely weather	ed; extremely weak		
					· · · · · · · · · · · · · · · · · · ·				END at 1.80-
Ē						Ends as above his	hly weathered wea	ık.	11
E ²						dark grey clay lay	ver on floor, (second	d creep plane).	
Ē									
Ē					-				-
E								·	
-									
Ē									4
E									
Ęз									
									-
Ē									
-		:							4
Ē									-
Ē									
F									4
- 4									
	SAMPL	E OR	TEST	v : visu 1 : lab	al orotorv	WATER F	ELD SUPERVISOR:	J.F.YOU	NG
 D Срт	.Disturl Stand	orden Ded nrd Da	netration Tr	est		Water Table S	RUJELI COORDINATOR: HEET 1 OF 1	J.F.YOU Sheets	NG
CPT.	Cone I	Penetr	ation Test	- 31		► Water Inflow	CALE 1: 20	U 1744 I U	





Comr	nerce		GEOTEC	HNICA	L& I	ENVIRONMENTAL	TEST PIT	TP148
PROJ	ECT:	TI	LLEGRA	DAM			DATE: 19.08.08	
LOCA	TION:	S	SLIP 2A				SURFACE RL: 221.0m)
CONT	RACTO	R: R.	& I. CON	TRACT	'ING (PERATOR: PHIL	EQUIPMENT: KOMATS	SU PC220
NEDIH	ULL TEN	BIT	SAMPLE	SOIL	GRAPHIC	. <u></u>	SOIL DESCRIPTION	
(m)	MAICK	DII	TEST	GROUP	LOG	Soil type, c	olour, consistency, grainsize, mois	iture, remorks
				SM (v)		TOPSOIL - silty san dark grey; loose; moi	d, rootlets; st.	0.45
				ROCK	×	CLAYEY SAND;		0.40
Ē					<u> </u>	brown/orangebrown;	firm; molst.	0.70
	No Groundwater Encountered					TUFFACEOUS SANI moderately weather Rock mass open pa defects to 10mm th - Pale grey clay lay Truncated by joint o	DSTONE; ed; medium srong. le grey infill in lick. er at 1.6m (parallel to bo on north pit wall.	edding).
 				ROCK		TUFFACEOUS SANI extremely weathered yellowbrown.pale gr (disturbed).	DSTONE; d; extremely weak; orange ey; fill persists in some o	ebrown/ defects
Ē					<u>; </u>	- pale grey clay lay	er at 2.4m (parallel to b	edding). 2.40-
 				ROCK	·/ · \/ · - \/ · - \/ · \/	TUFFACEOUS SANE extremely weathered	DSTONE; I/highly weathered; very	weak
-l3 3 4								
SAMPLE OR TEST UUndisturbed DDisturbed SPTStandard Penetration Test CPTCone Penetration Test					ual oratory	WATER FIEL Water Table PRO Water Inflow SC.	.D SUPERVISOR: DECT COORDINATOR: ET 1 OF 1 SHEE ALE 1: 20	J.F.YOUNG J.F.YOUNG TS

Com	nerce								
PROJ	ECT:	TILL	.EGRA	DAM			DATE: 19.08.08		
LOCA	TION:	SL	IP 2A				SURFACE RL: 143.5m		
CONT	RACTO	R: R. &	I. CON	TRACT	ING 0	PERATOR: PHIL	EQUIPMENT: KOMATS	SU PC220	
DEPTH	WATED	017	SAMPLE	SOIL	GRAPHIC		SOIL DESCRIPTION		
(n)	WAILK	ы	TEST	GROUP	LOG	Soil t	ype, colour, consistency, grainsize, mois	sture, remorks	
-0				-	1.1	TOPSOIL - silty	sand, rootlets;		
<u>. </u>				SM (v)		dark grey; loose; moist.			
-						·		0.35	
·						GRAVELLY CLA	GRAVELLY CLAYEY SAND/SANDY CLAY;		
-						brown/orangebrown; firm; moist.			
		:			/./				
_			sc (v)		/./				
				SC (v)	/./				
- 1					/./			、	
					/./			-	
					/./				
					Ľ.A			1.44	
	ed			CH (v)		Pale grey clayey slide plane.		165	
	nter				<u> </u> <u></u>		ANDSTONE (crushed)		
	Cou				· · · · · · ·	moderately weat	hered; weak; loose.	-	
	Ē								
-2	atei				__/ __/				
-	Mpu				드는/	1		-	
	irou				는는기				
	0 0	***		ROCK					
	Z								
<u> </u>									
-3								-	
				:		a			
								3.30	
				CH (v)		CLAYEY ZONE;	yellowbrown.		
-				<u> </u>	└ <u>└</u> ┙ <u>┥</u>	TUFFACEOUS SANDSTONE (crushed); moderately weathered; weak; loose.			
-									
<u>.</u>				ROCK	(1, -)				
4									
	<u>s</u> ampi	E OR TI	EST	v : vis	1 <u></u> 1 ual	WATER	FIELD SUPERVISOR:	J.F.YOUNG	
U	. Undist	urbed		1 : 105	oratory	🔀 Water Table	PROJECT COORDINATOR:	J.F.YOUNG	
					1		CUEET 4 AE 2 CUEE	TC	

Water Inflow

SHEETS

SHEET

SCALE

1 OF 2

1: 20

11:42:54 AB:\IS\Watertec\Geotech\PCAD\BORELOGS\tillegra 2A.dgn 20/01/2009

SPT....Standard Penetration Test CPT....Cone Penetration Test

GEOTECHNICAL &				HNICA	L& I	ENVIRONMENTAL	TEST P	іт ТР	149
PROJ	ECT:	TI	LLEGRA	DAM		- 2007 avec	DATE: 19.08.0	8	
LOCA	TION:	S	SLIP 2A				SURFACE RL: 14	43.5m	
CONT	RACTO	R: R. 8	& I. CONT	RACT	ING (OPERATOR: PHIL	EQUIPMENT: KO	MATSU PC220	
DEPTH	WATED	RIT	SAMPLE	SOIL	GRAPHIC	miliaitiit	SOIL DESCRIPTION		
(m)	1777 LA	UII	TËST	GROUP	L0G	Soil type	, colour, consistency, grains	ize, moisture, remarks	
-4						(continued from	previous sheet)		
Ē						moderately weathe	red; weak; loose.	,	
E									
E				ROCK					111
È.									
E									111
E									
Ē					·····				-
								~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	5.10
				ROCK		TUFFACEOUS SAI	NDSTONE; disturbed		, lu
Ē					/		alotal your	END	at 5.40
-									÷ [ ]
E						Ends as above.			
Ē									
F									L L
Ē									
Fo									
E									
E									-
-									11
E									- I
-			4						1
E-			•						
-									
E									1
F									
E									- -
				1					
E									
E g									1
		ξUD	 TEST	y · vier		WATER FI		J.F.YOUNG	
Ų	Undist.	urbed	1631	li : lab	oratory	Watas Tabla Pl	ROJECT COORDINATOR:	J.F.YOUNG	
UDisturbed SPTStandard Penetration Test							HEET 2 OF 2	SHEETS	
CPTCone Penetration Test						woter inflow S	CALE 1 : 20		





9/10/2008 10:36:43 AM:\IS\Watertec\Geotech\PCAD\TILLEGRA\logs\log 151.dgn