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Retrieved from the Queensland Geotechnical Database http://qgd.org.au/

Instant Generation         Instant Generation         Instant Generation         Instant Generation           ARTON         Instant Generation         Supervised Base CB: 1058pt.         COORDINATES         COORDINATES         COORDINATES         Z2273.0E; 2563           ARTON         Instant Generation         Note of Supervised Base CB: 1058pt.         COORDINATES         COORDINATES         Z2273.0E; 2563           Not         Instant Generation         Note of Supervised Base CB: 1058pt.         COORDINATES         Z2273.0E; 2563         Z227400         COORDINATES         Z274.0E; 2764		<u>1</u> of <u>1</u>
NTON         Expandment - North of Sugarbule Boat, Ot. 192800:         COORDINATE         2712720 E. 7837           IECT No (2014)         SURFACE R.L. 10230;         PLUNCE         DATE STARTED [71274]         ORIUM 200401M           No         HEIGHT DATUM         AED.         BEARING         DATE STARTED [71274]         BRILLER NO QUINN           No         HEIGHT DATUM         AED.         BEARING         DATE STARTED [71274]         BRILLER NO QUINN           No         HEIGHT DATUM         AED.         BEARING         DATE STARTED [71274]         BRILLER NO QUINN           No         Sindy CLAY (TOPSOL)         BEARING         DESCRIPTION         BIOSCINCT BESCRIPTION         ADDITIONAL DATA           10729300         Sindy CLAY (TOPSOL)         DESCRIPTION         BIOSCINCT BESCRIPTION         Control State State         ADDITIONAL DATA           1033         Heichim Datas bord fibre to coarse grained         Control State State         Control State         State         No           9.93         G         GRANODIORITE (Kgwu)         Control State         Control State         State         No         State         No           9.93         G         GRANODIORITE (Kgwu)         H <th>EFER FORM F:GEOT 017/8-2014</th> <th>12100</th>	EFER FORM F:GEOT 017/8-2014	12100
EGT No F_019194		
No         HEIGHT DATUM         AHD         DEARING         DATE COMPLETED         DILLER         NO Delium           RL (07)         US         No         No         No         No         ADDITIONAL DATA AND           1033         Second 1032         Executive concests         Second 1033		
Rin (m)       POD (1)       NATERIAL (m)       DESCRIPTION       INTACT (m)       DEFECT (m)       CADUITIONAL DATA (m)       ADDITIONAL DATA (m)         10273       And Chart (POPS)L)       Internet (m)       Internet		
(m)         Set (1)%         MATERIAL         Standy CLAY (TOPSOIL)           1027         Sandy CLAY (TOPSOIL)         Black, moist, stiff.         (G)         Image: Comparison of the coarse grained         Image: Comparison of the coarse grained         (G)         Image: Comparison of the coarse grained         Image: Comparison of the coarse grained         (G)         Image: Comparison of the coarse grained         Image: Coarse grained         Image: Coarse grained		
DESCRIPTION         DESCRIPTION <thdescription< th=""> <thdescription< th=""></thdescription<></thdescription<>		ТА
10.33       Sandy CLAY (TOPSOL)         Black, most, firm.       (C)         9.93       CLAY (ALLUVIN)         Black, most, firm.       (C)         Medium Plasticity.       (C)         A CLAY (RESIDUAL)       (C)         Carange, grey, most, stiff.       (C)         Medium Plasticity.       (C)         Sandy CLAY (RESIDUAL)       (C)         Carange, grey, most, stiff.       (C)         Carange, grey, most, stiff.       (C)         Carange, grey, most, stiff.       (C)         Sandy CLAY (RESIDUAL)       (C)         Carange, grey, most, stiff.       (C)		
10.33       Sandy CLAY (TOPSOL)         Black, most, firm.       (C)         9.93       CLAY (ALLUVIN)         Black, most, firm.       (C)         Medium Plasticity.       (C)         A CLAY (RESIDUAL)       (C)         Carange, grey, most, stiff.       (C)         Medium Plasticity.       (C)         Sandy CLAY (RESIDUAL)       (C)         Carange, grey, most, stiff.       (C)         Carange, grey, most, stiff.       (C)         Carange, grey, most, stiff.       (C)         Sandy CLAY (RESIDUAL)       (C)         Carange, grey, most, stiff.       (C)		s
3.93       Medium plasticity, Fine to corse grained sand. Kools & not fibres.       (Ci)         3.93       CLAY (ALLUVIM)       Elack, most, fifm.         Medium Plasticity.       (Ci)       Sump 210M         A CLAY (RESIDUAL)       (Ci)       Sump 210M         Sandy CLAY (RESIDUAL)       Carage, gray, while, most, stiff.       Sump 210M         Carage, gray, while, most, stiff.       Medium Plasticity.       2.2         Sandy CLAY (RESIDUAL)       Carage, gray, while, most, stiff.       N         Carage, gray, while, most, stiff.       Sump 2250kf.       N         Carage, gray, while, most, stiff.       N       Suppre>2250kf.         Carage, gray, while, most, stiff.       N       Suppre>2250kf.         Carage, gray, while, most, stiff.       N       N         Suppre>2250kf       N       N         Carage, gray, while, most, stiff.       N       N         Max       N       N       N         Basticity.       N       N       N		
9.33       CLAY (ALL UVUM)       CO         Back, most, firm, Medium Plasticity, Orange, grey, molts, stiff, Sand is fire to coarse grained. Medium       Co         Medium Plasticity, Orange, grey, while, stiff, Sand is fire to coarse grained. Medium       Co         Clayey Sand bands 1.30-1.80m and 3.20-4.00m       Clayey Sand bands 1.30-1.80m and 3.20-4.00m         Clayey Sand bands 1.30-1.80m and 3.20-4.00m       Clayey Sand bands 1.30-1.80m and 3.20-4.00m         Clayey Sand bands 1.30-1.80m and 3.20-4.00m       Clayey Sand bands 1.30-1.80m and 3.20-4.00m         Clayey Sand bands 1.30-1.80m and 3.20-4.00m       Clayey Sand bands 1.30-1.80m and 3.20-4.00m         Clayey Sand bands 1.30-1.80m and 3.20-4.00m       Clayey Sand bands 1.30-1.80m and 3.20-4.00m         Clayey Sand bands 1.30-1.80m and 3.20-4.00m       Clayey Sand bands 1.30-1.80m and 3.20-4.00m         Clayey Sand bands 1.30-1.80m and 3.20-4.00m       Clayey Sand bands 1.30-1.80m and 3.20-4.00m         Clayey Sand bands 1.30-1.80m and 3.20-4.00m       Clayey Sand bands 1.30-1.80m and 3.20-4.00m         E       +       +         Medium Plasticity, White grey, orange, phaneritic, +       +         H       +       +         H       +       +         H       +       +         H       +       +         H       +       +         H		
9.43       Black, moist, firm.       Clay (RESIDUAL)       Stuge=1004         A       Crange, grey, moist, stiff.       Stuge=11044         Sange, grey, while, moist, stiff.       Sange (Step)       Stuge=11044         Back, moist, stiff.       Sange (Step)       Stuge=11044         Sange, grey, while, moist, stiff.       Sange (Step)       Stuge=11044         Sange, grey, while, moist, stiff.       Sange (Step)       Stuge=250kf         C       C       Stuge=250kf         C       Stuge=250kf       Stuge=250kf         B       Sange, prey, moist, stiff.       Sange         B       Sange, prey, moist, stiff.       Sange         B       Sange, prey, moist, stiff.       Sange         C       Stuge=250kf       Stuge=250kf         C       Stuge=250kf       Stuge=250kf         B       Sange       Stuge=250kf         B       Stuge=110kf       Stuge=250kf         B       Stuge=110kf       Stuge=110kf         B       Stuge=110kf       Stuge=250kf         B       Stuge=110kf       Stuge=110kf         C       Stuge=110kf       Stuge=110kf         B       Stuge=110kf       Stuge=110kf         B       Stuge=110kf<	(CI)	
9.43       CLAY (PESIDUAL)       Support 1005         Orange, grey, while, stiff.       Sadage (Fe), while, stiff.       Sadage (Fe), while, stiff.         Base of the street of the stift.       Sadage (Fe), while, stiff.       Sadage (Fe), while, stiff.         Base of the street of th		
6.73         Clavey Sand bands 1.30-1.80m and 3.20-4.00m         2.1           6.73         Clavey Sand bands 1.30-1.80m and 3.20-4.00m         Clavey Sand bands 1.30-1.80m and 3.20-4.00m         Clavey Sand bands 1.30-1.80m and 3.20-4.00m           C         Clavey Sand bands 1.30-1.80m and 3.20-4.00m           C         GRANODIORITE (Mgwu)         +         +         -           D         GRANODIORITE (Mgwu)         +         +         -           E         +         +         -         10.19, Ne           extremely low strength.         +         +         -         10.19, Ne           extremely low strength.         +         +         -         10.19, Ne           extremely low strength.         +         +         -         10.19, Ne           Image: Clave Strength         +         +         -         10.19, Ne           Image: C		, <sub>P)</sub> =110kPa;
6.73         Orange, grey, while, moist, stiff.         2.2           8.73         Clayey Sand bands 1.30-1.80m and 3.20-4.00m         (C)           9         GRANODIORITE (Kgwu)         +           9         GRANODIORITE (Kgwu)         +           1.53         GRANODIORITE (Kgwu)         +		
6.73         B		
6.73         Clayey Sand bands 1.30-1.80m and 3.20-4.00m         (C)         Su <sub>yey</sub> =>250kf           C         Su <sub>yey</sub> =>250kf		2,2,3
8.73       0       3.20-4.00m       Supper>250kF         0       GRANODIORITE (Kgwu) extremely low strength.       +       +       10.19, N=         4.23       GRANODIORITE (Kgwu) HW: White, grey, orange, phaneritic, very low strength.       +       +       18.24, N=         4.23       GRANODIORITE (Kgwu) HW: White, grey, orange, phaneritic, very low strength.       +       +       18.24, N=         1.53       GRANODIORITE (Kgwu) HW: White, grey, orange, phaneritic, very low strength.       +       +       14.31, N=         1.53       GRANODIORITE (Kgwu) HW: White, grey, black, very low to low       +       +       4////		N=5
6.73       0       GRANODIORITE (Kgwu) 2W: White grey, orange, phaneritic, extremely low strength.       +       +       +       10.19, N=         E       +       +       +       +       14.18, N=         F       +       +       +       14.23         G       GRANODIORITE (Kgwu) HW: White grey, orange, phaneritic, very low strength.       +       +       18.24, N=         1.53       G       +       +       +       14.31, N=         H       +       +       +       23.44/1         H       +       +       40/1         1.53       GRANODIORITE (Kgwu) HW: White, grey, black, very low to low       +       +	(CI)	
6.73       0       GRANODIORITE (Kgwu) XW: White grey, orange, phaneritic, extremely low strength.       +       +       +       10.19, N=         E       +       +       +       +       N=         4.23       F       -       18.24, N=       18.24, N=         G       GRANODIORITE (Kgwu) HW: White grey, orange, phaneritic, very HW: White grey, orange, phaneritic, very HW: White grey, orange, phaneritic, very HW: White grey, orange, phaneritic, very HH       +       14.31, N=         1.53       GRANODIORITE (Kgwu) HW: White grey, black, very low to low       +       +       40/1		
1.53       GRANODIORITE (Kgwu)       +         -       -         -       -         -       +         -       +         -       -         -       -         -       -         - <td< td=""><td></td><td>,=&gt;250kPa;</td></td<>		,=>250kPa;
1.53       GRANODIORITE (Kgwu)       +         -       -         -       -         -       +         -       +         -       -         -       -         -       -         - <td< td=""><td></td><td></td></td<>		
1.53       GRANODIORITE (Kgwu)       +         A.23       GRANODIORITE (Kgwu)       +         F       +       +         GRANODIORITE (Kgwu)       +         H       +         GRANODIORITE (Kgwu)       +         H       +         18.24, N         SRANODIORITE (Kgwu)       +         H       +         GRANODIORITE (Kgwu)       +         H       +         1.53       GRANODIORITE (Kgwu)         H       +         H       -         GRANODIORITE (Kgwu)       +         +       +         +       +         -       -         1.53       -		
4.23       extremely low strength.       +	+	10,19,21 N=40
4.23       F       +       +       14,18, N=         +       +       +       +       18,24, N=         -       +       +       18,24, N=       18,24, N=         -       -       -       -       -         -       -       -       -       -         -       -       -       -       -         -       -       -       -       -       -         -       -       -       -       -       -       -         -       -       -       -       -       -       -       -       -         -	+	11-40
4.23       F      XW      XW         F       ++-++	[+]	
4.23       F      XW      XW         F       ++-++		14,18,33
4.23       F	-	N=51
4.23       F	-'-    : : : : : <b>∓</b> : : : :	
4.23       Image: Constraint of the second sec		
4.23       GRANODIORITE (Kgwu)       +         HW: White, grey, orange, phaneritic, very low strength.       +         G       +       14,31, N=         +       +       -         H       +       -         H       +       -         H       +       -         G       +       +         H       +       -         H       +       -         H       +       -         H       +       -         H       +       -         GRANODIORITE (Kgwu)       +       -         +       -       -         1.53       -       -	[+]  ‡	18,24,35 N=59
1.53       Image: White, grey, brange, phaneritic, very low strength.       Image: White, grey, brange, phaneritic, very low strength.       Image: White, grey, brange, phaneritic, very low strength.         Image: White, grey, brange, phaneritic, very low to low low low low low low low low low lo	+++++++++++++++++++++++++++++++++++++	
G	ry     : : : : : : : : : :	
1.53       Image: Constraint of the second sec		14,31,38
1.53     Image: High state s		N=69
1.53         H         +         -         -         23,44/1           +         +         +         -         +         23,44/1           +         +         +         -         +         40/1           GRANODIORITE (Kgwu)         +         +         -         40/1		
1.53 GRANODIORITE (Kgwu) HW: White, grey, black, very low to low		23 44/100
1.53 GRANODIORITE (Kgwu) + 40/1 HW: White, grey, black, very low to low +	[+]  ····· <u>‡</u> ·····	23,44/120
1.53 GRANODIORITE (Kgwu) + 40/1 HW: White, grey, black, very low to low +		
1.53 GRANODIORITE (Kgwu) + HW: White, grey, black, very low to low		
HW: White, grey, black, very low to low		40/100
	:::::::+:::	

ENGINEERING

AND .

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Borehole terminated at 13m. .

13,00

MH 20

## ENGINEERING **BOREHOLE LOG**

BOREHOLE No	<u>_BH159_</u> _
SHEET	<u>2</u> of <u>2</u>
REFERENCE No	12100

FOR GEOTECHNICAL TERMS AND SYMBOLS REFER FORM F:GEOT 017/8-2014

PROJECT	<u>Macka</u>	ay Ring F	Road	<u>Geotechnical Investigation - Stage 1</u>									
LOCATION	_Emba	n <u>kment -</u>	Nor	th of Sugarshed Road; CH: 10859m;					COORD	INATES 721	278.0 E; 766	3107.	<u>1 N </u>
PROJECT N	o <u>FG618</u>	<u> 34</u>		SURFACE R.L. <u>10.73m</u> PLUNGE			DATE S	TARTED <u>17</u>	/12/14	GRID DATU	M <u>GDA 94</u>	/MGA	<u>Zone 55</u>
JOB No				HEIGHT DATUM <u>AHD</u> BEARING			DATE COM	IPLETED <u>17</u>	/12/14	DRILLE	R <u>ND Drill</u>	ing Pty	<u>/ Ltd</u>
(m) (m) (m) (m) (m) (m) (m) (m) (m) (m)	AUGER CASING WASH BORING CORE DRILLING	RQD ()% CORE REC%	SAMPLE	MATERIAL DESCRIPTION	ГІТНОГОGY	USC WEATHERING	INTACT STRENGTH	DEFECT SPACING (mm)	GRAPHIC LOG	ADDITION/ ANI TEST RE	D		SAMPLES TESTS
		(73) 100 (78) 100	К	GRANODIORITE (Kgwu) HW: (Cont'd) GRANODIORITE (Kgwu) MW: White, grey, brown, phaneritic, massive, medium strength, with extremely high strength band. Defects: - Js; 45°-60° (6/m); - Js; 0°-15° (5/m); - Js; 45°-60° (1/m);	+ + + + + + + + + + + + + + + + + + + +	HW					45	//140 [	SPT -

REMARKS Kgwu - Wundaru Granodiorite;

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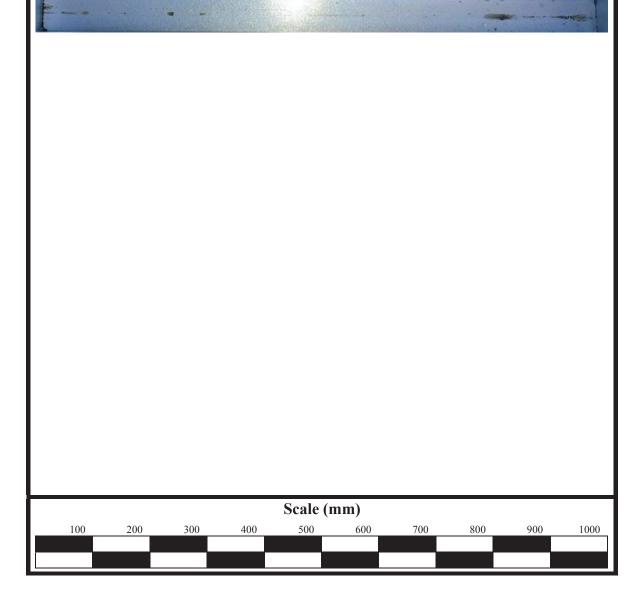
## CORE PHOTO LOG

DEPARTMENT OF TRANSPORT & MAIN ROADS Geotechnical Branch 35 Butterfield Street, HERSTON Qld 4006 Phone 07 3066 3336



Department of Transport and Main Roads

Project Name	Mackay – Ring Road		
Project No	FG6184	Date	17/12/14
Borehole No	BH159	TMR H No	12100
Location	North of Sugarshed Road	Start Depth (m)	11.4
Detail	Embankment	Finish Depth (m)	13.0
Chainage	10859m	Submitted By	DC
Remarks			
8 1408·1133	BH159 (2)		13.00 (3.8%)



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