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BOREHOLE: BHUA-17

SHEET: 1 OF 11
DRILL RIG: HYDRAPOWER SCOUT Mk5
CONTRACTOR: Twin Hills
LOGGED: ENGEO DATE: 9/6/23
CHECKED: SF DATE: 7/7/23

CLIENT: SMEC COORDS: 660250.0 m 7667396.8 m GDA 2020 MGA Zone 55
PROJECT: Pioneer Burdekin PHES GI SURFACE RL: 875.96 m DATUM: AHD
LOCATION: Dalrymple Heights INCLINATION: -83° DIRECTION: 230°
JOB NO: 23117.000.001 HOLE DIA: 96/100 mm HOLE DEPTH: 48.00 m

Drilling				Sampling		Field Material Description						
METHOD / SUPPORT	PENETRATION RESISTANCE	WATER	LENGTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
SSA	EP		0.0	875.96				CI	TOPSOIL: CLAY with silt trace sand medium plasticity, brown, with silt, trace fine grained sand, MnO throughout	w < PL	St	TOPSOIL
			0.25	875.71				CI	CLAY with silt trace sand medium plasticity, red brown, with silt, trace fine grained sand			Coring water returns were not recorded.
WB	MP		0.5	SPT 1.50-1.95 m 3, 3, 5 N=8					w < PL	F - St		
			1.0									
			1.5									
			2.0									
			2.5									
3.0	3.00	872.98	LL = 70% PI = 37% LS = 13.5% MC = 31.1% Soil Particle Density (t/m³) = 2.59 SPT 3.00-3.45 m 2, 3, 5 N=8		MH	Clayey SILT with sand medium liquid limit, orange brown mottled pale grey and black, with fine to coarse grained sand		w ~ PL	F			
3.5												
4.0												
4.5	SPT 4.50-4.95 m 1, 2, 3 N=5											
5.0												

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ENGEO 2.00 2.2 L/B GLB Log ENGEO NON-CORED FULL PAGE PIONEER BURDEKIN -MASTERBHT03 REWORK-AUSLAPTOP008.GPJ <<DrawingFile>> 30/10/2024 20:59 10.03.00.09 Datagel Tools



BOREHOLE: BHUA-17

SHEET: 2 OF 11
DRILL RIG: HYDRAPOWER SCOUT Mk5
CONTRACTOR: Twin Hills
LOGGED: ENGEO DATE: 9/6/23
CHECKED: SF DATE: 7/7/23

CLIENT: SMEC COORDS: 660250.0 m 7667396.8 m GDA 2020 MGA Zone 55
PROJECT: Pioneer Burdekin PHES GI SURFACE RL: 875.96 m DATUM: AHD
LOCATION: Dalrymple Heights INCLINATION: -83° DIRECTION: 230°
JOB NO: 23117.000.001 HOLE DIA: 96/100 mm HOLE DEPTH: 48.00 m

Drilling				Sampling		Field Material Description						
METHOD / SUPPORT	PENETRATION RESISTANCE	WATER	LENGTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
WB	MP		5.0					MH	Clayey SILT with sand medium liquid limit, orange brown mottled pale grey and black, with fine to coarse grained sand			
			5.5									
			6.0		SPT 6.00-6.45 m 1, 2, 2 N=4							
			6.5									
			7.0							w ~ PL	F	
			7.5	7.50 868.52	SPT 7.50-7.95 m 1, 3, 5 N=8				7.50 m: trace gravel, fine, sub-angular			
			8.0									
			8.5									
			9.0	9.00 867.03	U 9.00-9.50 m ECN = 5 Soil Particle Density (t/m³) = 2.50			SM	Silty SAND fine to coarse grained, well graded, orange brown mottled pale grey and black, with fine to coarse grained, sub-angular gravel, with clay, low plasticity fines.			
			9.5							w ~ PL	St	
			10.0									

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ENGEO 2.00 2.2 L/B GLB Log ENGEO NON-CORED FULL PAGE PIONEER BURDEKIN -MASTERBHT03 REWORK-AUSLAPTOP008.GPJ <<DrawingFile>> 30/10/2024 20:59 10.03.00.09 Datagel Tools



SHEET: 3 OF 11

DRILL RIG: HYDRAPOWER SCOUT Mk5

CONTRACTOR: Twin Hills

LOGGED: ENGEO DATE: 9/6/23

CHECKED: SF DATE: 7/7/23

CLIENT: SMEC

COORDS: 660250.0 m 7667396.8 m GDA 2020 MGA Zone 55

PROJECT: Pioneer Burdekin PHES GI

SURFACE RL: 875.96 m DATUM: AHD

LOCATION: Dalrymple Heights

INCLINATION: -83° DIRECTION: 230°

JOB NO: 23117.000.001

HOLE DIA: 96/100 mm HOLE DEPTH: 48.00 m

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SHEET: 4 OF 11

DRILL RIG: HYDRAPOWER SCOUT Mk5

CONTRACTOR: Twin Hills

LOGGED: ENGEO DATE: 9/6/23

CHECKED: SF DATE: 7/7/23

CLIENT: SMEC

COORDS: 660250.0 m 7667396.8 m GDA 2020 MGA Zone 55

PROJECT: Pioneer Burdekin PHES GI

SURFACE RL: 875.96 m DATUM: AHD

LOCATION: Dalrymple Heights

INCLINATION: -83° DIRECTION: 230°

JOB NO: 23117.000.001

HOLE DIA: 96/100 mm HOLE DEPTH: 48.00 m

Drilling				Field Material Description							Defect Information			
METHOD / SUPPORT	WATER	TCR	RQD	DRILLED LENGTH (metres)	DEPTH RL	GRAPHIC LOG	MATERIAL DESCRIPTION	DETAILED WEATHERING	INFERRED STRENGTH I_{s0} (MPa) (AS1726:2017)	MEASURED STRENGTH: UCS & I_{s90} (MPa) ($\sigma_{d,u}$)	DEFECT DESCRIPTION Mechanical Discontinuities / non-intact defects shown only. See attached De-tailed Defect Log for all recorded discontinuities and defects	AVERAGE DEFECT SPACING (mm) (ISO14689:2017)		
				10.0										
				10.5										
				11.0										
				11.5										
				12.0										
				12.5										
				13.0										
				13.5										
				14.0										
				14.5										
				14.58										
				861.49										

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BOREHOLE: BHUA-17

SHEET: 5 OF 11

CLIENT: SMEC

COORDS: 660250.0 m 7667396.8 m GDA 2020 MGA Zone 55

DRILL RIG: HYDRAPOWER SCOUT Mk5

PROJECT: Pioneer Burdekin PHES GI

SURFACE RL: 875.96 m DATUM: AHD

CONTRACTOR: Twin Hills

LOCATION: Dalrymple Heights

INCLINATION: -83° DIRECTION: 230°

LOGGED: ENGEO DATE: 9/6/23

JOB NO: 23117.000.001

HOLE DIA: 96/100 mm HOLE DEPTH: 48.00 m

CHECKED: SF DATE: 7/7/23

Drilling					Field Material Description					Defect Information				
METHOD / SUPPORT	WATER	TCR	RQD	DRILLED LENGTH (metres)	DEPTH RL	GRAPHIC LOG	MATERIAL DESCRIPTION	DETAILED WEATHERING	INFERRED STRENGTH Is _u (MPa) (AS1728:2017)	MEASURED STRENGTH: UCS & I _{u50} (A0.1) (MPa)	DEFECT DESCRIPTION			AVERAGE DEFECT SPACING (mm) (ISO14689:2017)
											Mechanical Discontinuities / non-intact defects shown only. See attached Detailed Defect Log for all recorded discontinuities and defects			EC-29 VC-20 C-200 M-600 W-2000 VW
HQ3		94	30	15.0	861.07	+	GRANODIORITE Coarse grained, phaneritic igneous. Pale orange-brown mottled pale brown-white. Crystalline, anhedral and subhedral. Poorly developed foliated, (15°-35°), indistinct. Some mafic minerals and feldspars completely lost to weathering. Mechanical Defects: Js; gentle to moderate; (5-10/m); Pln to Und; Ro to CRo; TI to OP; FeO and MnO Stn to Ct. Js; steep to very steep; (2-5/m); Pln to Und; Ro to CRo; TI to OP; FeO and MnO Stn to Ct.	HW			14.99-15.01 m: J, 24°, Pln, Sm, Vr			
				15.5	15.65	+					15.20-15.25 m: J, 46°, Pln, Ro, MnO			
				15.73	860.35	+					15.55-15.61 m: J, 70°, Pln, Ro, MnO Vr			
		100	0	16.0		+	CORE LOSS				16.13-16.15 m: J, 15°, Pln, Ro, Vr			
				16.5		+	GRANODIORITE (Described as per 14.58)				16.24-16.25 m: J, 15°, Pln, Ro, MnO Vr			
				17.0	16.96	+					16.51-16.67 m: J, 89°, Pln, Sm, MnO Vr			
		100	20	17.5	859.13	+					16.63-16.70 m: J, 75°, Pln, VRo, MnO Vr 16.65-16.77 m: J, 74°, Stp, Ro, MnO Vr			
				18.0	17.75	+					16.78-16.82 m: J, Pln, Ro, Vr 16.82-16.83 m: J, 16°, Pln, Ro, Vr 16.82-17.02 m: J, 80°, Pln, Ro, Vr 16.82-16.83 m: J, 16°, Pln, Ro, Vr			
				18.5	857.85	+					17.11-17.13 m: J, 38°, Pln, Ro, MnO Vr 17.15-17.24 m: J, 54°, Pln, Ro, MnO Vr			
				19.0	857.81	+	DOLERITE DYKE / SILL Fine grained, phaneritic igneous. Grey brown to dark grey. Aphanitic groundmass, porphyritic with few fine to medium grained phenocrysts. Trace FeO near upper contact. Integral Discontinuities: Vn; <2 mm wide; moderate to very steep; (>5/m); Pln; CA FL Mechanical Defects: Js; moderate to steep; (>10/m); Pln to Irr; Ro; TI to OP; CA (?) Stn to Ct., 18.05 m - 18.25 m: becoming Extremely Weathered, orange-brown, and clayey above lower contact. 18.18 m: Shallow dipping defect with carbonate (?) FL				17.29-17.33 m: J, 50°, Pln, Ro, MnO Vr 17.40-17.44 m: J, 30°, Pln, Sm, MnO Vr			
				19.5		+					17.61-17.76 m: J x3, 60°, Pln, Ro, MnO Vr			
		100	35	20.0	20.00	+		MW			17.74-18.36 m: Fa, 55°, MnO 17.75-18.85 m: J, 60°, Pln, Ro, MnO			
						+	ALTERED GRANODIORITE Coarse grained, phaneritic igneous. Pale white-grey, dark grey and black. Crystalline, anhedral to subhedral. Poorly developed foliation, (20°-35°), indistinct. With some mafic inclusions (<5/m), mm to cm scale; irregular shaped, angular to rounded, sharp to diffuse margins. With few DOLERITE intrusions (<1-3/m); up to 220 mm wide. Patched, weak, calcic / potassic / propylitic alteration throughout, (pale white-green-grey). Integral Discontinuities: Vn/veinlets; Steep to subvertical; (2-5/m); some // to FOL, some discordant; most <1 mm wide; CA FL; some with alteration halos <5 mm wide. Mechanical Defects: Js; gentle to moderate; (>1/m) Pln to Und; Ro; TI to OP; Cn. Js; very steep; (~1/m) Pln to Und; Ro; Cn. 18.29 m - 18.31 m, 18.37 m - 18.47 m, and 18.76 m - 18.96 m: DOLERITE DYKES / SILLS, Fine grained, phaneritic igneous; dark grey; aphanitic groundmass, porphyritic with some fine grained	XW			17.95-18.06 m: J, 75°, Und, Ro, MnO Vr 18.01-18.02 m: J, 10°, Pln, VRo, MnO 18.07-18.18 m: J x3, 55°, Pln, Sm, MnO			
						+		HW			18.18-18.21 m: J, Pln, Sm, Std 18.23-18.31 m: Cs, 51°, Pln, Sm			
						+		SA - FR			19.17-19.22 m: J, 64°, Pln, Ro, Qz Cn			
		100	100			+					19.30-19.32 m: J, Pln, Ro, Qz Cn 19.33-19.40 m: J, Pln, Sm, Qz FL 19.41-19.45 m: J, 65°, Pln, Sm, Qz FL			

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BOREHOLE: BHUA-17

SHEET: 6 OF 11

CLIENT: SMEC
PROJECT: Pioneer Burdekin PHES GI
LOCATION: Dalrymple Heights
JOB NO: 23117.000.001

COORDS: 660250.0 m 7667396.8 m GDA 2020 MGA Zone 55
SURFACE RL: 875.96 m DATUM: AHD
INCLINATION: -83° DIRECTION: 230°
HOLE DIA: 96/100 mm HOLE DEPTH: 48.00 m

DRILL RIG: HYDRAPOWER SCOUT Mk5
CONTRACTOR: Twin Hills
LOGGED: ENGEO DATE: 9/6/23
CHECKED: SF DATE: 7/7/23

Drilling				Field Material Description							Defect Information			
METHOD / SUPPORT	WATER	TCR	RQD	DRILLED LENGTH (metres)	DEPTH RL	GRAPHIC LOG	MATERIAL DESCRIPTION	DETAILED WEATHERING	INFERRED STRENGTH I_{s0} (MPa) (AS1726:2017)	MEASURED STRENGTH: UCS & I_{p50} (MPa) (A.0.1)	DEFECT DESCRIPTION	AVERAGE DEFECT SPACING (mm) (ISO14689:2017)		
HQ3		100	100	20.0	856.11		phenocrysts; sharp upper and lower contacts; with some moderate to steep CA veinletts <1 mm wide.	SA - FR			20.13-20.20 m: Cs, Irr, VRo, Qz Cru, Crushed seamed due to intersecting joints			
							ALTERED GRANODIORITE Coarse grained, phaneritic igneous. Pale white-grey, dark grey and black. Crystalline, anhedral to subhedral. Poorly developed foliation, (20°-35°), indistinct. With many mafic inclusions (>5/m), mm to cm scale; irregular shaped, angular to rounded, sharp to diffuse margins, some strongly / intensely altered (propylitic alteration), with Chlorite and Epidote. Patchy, weak to moderately intense calcic / potassic / propylitic alteration throughout, (pale white-green-grey). Integral Discontinuities: Vn/veinletts; Steep to subvertical; (5-10/m); some // to FOL, some discordant; most <1 mm wide; CA FL; some with alteration halos <5 mm wide. Mechanical Defects: Js; gentle to moderate; (2-5/m) Pln to Und; Ro; TI to OP; some CA FL. Js; steep to very steep; (<1-2/m) Pln; Ro; CA FL.				20.36-20.41 m: J, 51°, Und, VRo, Cn 20.38-20.46 m: J, 70°, Pln, Ro, Qz			
		100	100	20.5			20.67-20.75 m: J, 65°, Pln, Sm							
				21.0			21.13-21.22 m: J x2, 58°, Und, Ro, Qz 21.29-21.32 m: J, 56°, Und, VRo, Qz 21.37-21.42 m: J, 53°, Pln, Ro, Qz							
		90	90	21.5			UCS=104 21.75-21.87 m: J, 70°, Und, Qz, Quartz crystals appear finer grained along joint surface ζ 22.10-22.18 m: J, 60°, Und, Sm, Cn							
				22.0										
		100	100	22.5			22.47-22.55 m: J, 57°, Pln, VRo, Qz Cn 22.60-22.65 m: J, 64°, Pln, Sm, FL 22.61-22.69 m: J, 75°, Pln, Sm, Qz FL, Unknown purple infill mineral, scratches with nail ζ							
				23.0	23.00 853.13		23.00 - 25.00m: Some larger (dm scale) mafic inclusions noted. Fine grained, phaneritic igneous; dark grey; porphyritic with some fine to med grained phenocrysts; variable sharp to diffuse margins; with some moderate to steep CA veinletts <1mm wide.				22.93-23.00 m: J, 47°, Pln, Sm, Qz Vr 23.03-23.12 m: J, 80°, Pln, Sm, Vr			
		100	95	23.5			UCS=96.3 23.24-23.30 m: J, 65°, Pln, Ro, Qz FL 23.30-23.34 m: J, 65°, Pln, Ro, Qz FL 23.32-23.37 m: J, 37°, Und, Ro, Qz Cn 23.33-23.43 m: J, 63°, Und, Ro, Qz Vr 23.45-23.55 m: J, 68°, Pln, Sm, Qz FL							
				24.0			23.74-23.79 m: J, 34°, Pln, Ro, Qz Cn 23.83-23.88 m: J, 50°, Und, Ro, Vr 23.98-24.05 m: J, 40°, Und, Ro, Qz Vr							
		100	90	24.5			24.11-24.13 m: J, 60°, Pln, Sm, Qz Cn 24.15-24.19 m: J, 65°, Pln, Sm, FL 24.34-24.38 m: J, 48°, Pln, Ro, Qz Cn 24.36-24.40 m: J, 45°, Pln, Sm, Qz Cn							
			25.0	25.00					24.71-24.75 m: J, 54°, Und, Ro, Qz Vr					

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BOREHOLE: BHUA-17

SHEET: 7 OF 11

CLIENT: SMEC

COORDS: 660250.0 m 7667396.8 m GDA 2020 MGA Zone 55

DRILL RIG: HYDRAPOWER SCOUT Mk5

PROJECT: Pioneer Burdekin PHES GI

SURFACE RL: 875.96 m DATUM: AHD

CONTRACTOR: Twin Hills

LOCATION: Dalrymple Heights

INCLINATION: -83° DIRECTION: 230°

LOGGED: ENGEO DATE: 9/6/23

JOB NO: 23117.000.001

HOLE DIA: 96/100 mm HOLE DEPTH: 48.00 m

CHECKED: SF DATE: 7/7/23

Drilling						Field Material Description						Defect Information			
METHOD / SUPPORT	WATER	TCR	RQD	DRILLED LENGTH (metres)	DEPTH RL	GRAPHIC LOG	MATERIAL DESCRIPTION	DETAILED WEATHERING	INFERRED STRENGTH Is _u (MPa) (AS1726:2017)	MEASURED STRENGTH: UCS & I _{u50} (MPa) (A.0.1)	DEFECT DESCRIPTION	AVERAGE DEFECT SPACING (mm) (ISO14689:2017)			
											Mechanical Discontinuities / non-intact defects shown only. See attached Detailed Defect Log for all recorded discontinuities and defects	EC ₂₀	VC ₂₀	C ₂₀₀	M ₆₀₀
HQ3			100	90	25.0	851.15	ALTERED GRANODIORITE Coarse grained, phaneritic igneous. Pale white-grey, pale grey-green and dark grey. Crystalline, anhedral to euhedral. Feldspars are elongated. Poorly developed foliation, (25°- 45°), indistinct. With many mafic inclusions (>5/m), mm to cm scale; irregular shaped, angular to rounded, sharp to diffuse margins, some strongly / intensely altered (propylitic alteration), with Chlorite and Epidote. Patchy, weak to moderately intense calcic / potassic / propylitic alteration, throughout, (pale white-green-grey). Integral Discontinuities Vn/veinlets; gentle to moderate; (2-5 /m); some // to FOL, some discordant; most <1mm wide; CA FL; some with alteration halos <5mm wide. Vn/veinlets; Steep to subvertical; (5-10/m); some // to FOL, some discordant; most <1mm wide; few <5mm wide; CA FL; some with alteration halos <5mm wide. Mechanical Defects: Js; gentle to moderate; (2-5/m) Pln to Und; Ro; TI to OP; some CA FL. 25.50 m: Some patchy pale pink-brown zones of potassic alteration, with pink orthoclase.	SA - FR				25.04-25.06 m: J, 60°, Und, Sm, Qz Vr 25.08-25.10 m: J, 19°, Und, Ro, Cn			
					25.5	25.50 850.65 850.65		SA			25.71-25.75 m: J, 38°, Stp, Ro, Qz Vr				
					26.0						26.02-26.07 m: J, 25°, Stp, Ro, Qz Vr				
			100	95	26.5						26.26-26.29 m: J, 16°, Und, VRo, Qz Vr 26.34-26.37 m: J, Und, Ro, Qz Vr				
					27.0	27.08 849.08					26.50-26.61 m: J, 67°, Pln, Sm, Qz 26.60-26.65 m: J, 38°, Und, VRo 26.61-26.74 m: J, Pln, Ro, Qz FL				
					27.5						27.21-27.26 m: J, 68°, Pln, Ro, Qz Cn 27.36-27.41 m: J, 68°, Pln, Sm, Vr 27.49-27.55 m: J, 63°, Pln, Sm, Vr				
			100	15	28.0						27.85-27.89 m: J, 42°, Pln, Qz Cn 27.89-27.95 m: J, 78°, Und, Ro, Qz Vr				
					28.5						28.07-28.12 m: J, 50°, Pln, Sm, Qz Cn				
					29.0	28.90 847.28					28.66-28.75 m: J, 84°, Und, Ro, Qz Vr 28.80-28.87 m: J, 63°, Pln, Qz Vr				
			100	85	29.5	29.56 846.62					29.60-29.67 m: J, 65°, Pln, Sm, Cn 29.61-29.81 m: Cs, 65°, Und, Ro, Qz FL 29.70-29.74 m: J, 65°, Und, Ro, Qz Vr 29.73-29.89 m: J, 70°, Und, Ro, Qz Vr				
					30.0	30.00	29.56 m - 29.75 m: DOLERITE dyke, fine grained, dark grey, (50-60°), <30 mm thick. Note CA veins along lower margin and parallel, thin CA veins / veinlets below lower margin to 30.05 m.				29.88-29.92 m: J, 74°, Pln, Sm, Qz Vr				

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BOREHOLE: BHUA-17

SHEET: 8 OF 11

CLIENT: SMEC

COORDS: 660250.0 m 7667396.8 m GDA 2020 MGA Zone 55

DRILL RIG: HYDRAPOWER SCOUT Mk5

PROJECT: Pioneer Burdekin PHES GI

SURFACE RL: 875.96 m DATUM: AHD

CONTRACTOR: Twin Hills

LOCATION: Dalrymple Heights

INCLINATION: -83° DIRECTION: 230°

LOGGED: ENGEO DATE: 9/6/23

JOB NO: 23117.000.001

HOLE DIA: 96/100 mm HOLE DEPTH: 48.00 m

CHECKED: SF DATE: 7/7/23

Drilling				Field Material Description						Defect Information			
METHOD / SUPPORT	WATER	TCR	RQD	DRILLED LENGTH (metres)	DEPTH RL	GRAPHIC LOG	MATERIAL DESCRIPTION	DETAILED WEATHERING	INFERRED STRENGTH Is _u (MPa) (AS1726:2017)	MEASURED STRENGTH: UCS & Is ₅₀ (A.0.1) (MPa)	DEFECT DESCRIPTION	AVERAGE DEFECT SPACING (mm) (ISO14689:2017)	
											Mechanical Discontinuities / non-intact defects shown only. See attached Detailed Defect Log for all recorded discontinuities and defects	EC-29 VC ₉₀ C 200 M 600 W >200 WW	
HQ3				30.0	846.19	+	ALTERED GRANODIORITE Coarse grained, phaneritic igneous. Pale white-grey, pale grey-green and dark grey. Crystalline, anhedral to euhedral. Feldspars are elongated. Poorly developed foliation, (25°- 45°), indistinct. With many mafic inclusions (>5/m), mm to cm scale; irregular shaped, angular to rounded, sharp to diffuse margins. With few (<1/m) DOLERITE dykes, up to 1 mm wide. Patchy, weak to moderately intense calcic / potassic and propylitic alteration throughout, (pale white-green-grey). Integral Discontinuities: Vn / veinlets; gentle to moderate; (<1-5 /m); some // to FOL, some discordant; most <1mm wide; CA FL; some with alteration halos < 5mm wide. Vn /veinlets; Steep to subvertical; (5-10/m); some // to FOL, some, discordant; most <1mm wide; few <5mm wide; CA FL. Mechanical Defects: Js; gentle to moderate; (<1/m) Pln; Sm; Cn. Js; steep to very steep; (<1 - 2/m) Pln; Sm; FeO Str 30.74 m - 31.04 m: DOLERITE dyke; fine grained (aphanitic); dark grey; with sharp upper and lower contacts.	SA			30.00-30.05 m: J, 50°, Pln, Ro, Qz Cn		
				30.5		+					30.83-30.85 m: J, 54°, Und, Fe Cn		
			100	30.74	845.45	+					31.03-31.04 m: J, 10°, Stp, Cn 31.08-31.10 m: J, 25°, Und, Qz Vr 31.11-31.12 m: J, 25°, Und, Qz Vr		
			100			+					31.57-31.68 m: J, 70°, Pln, Ro, Cn		
				31.0		+							
				31.5		+							
				31.90	844.30	+					32.85-32.88 m: J, 40°, Pln, Qz Cn		
			100			+							
				32.0		+							
				32.5		+							
HQ3				33.0	843.31	+	DOLERITE DYKE / SILL Fine grained, aphanitic to phaneritic igneous. Grey to dark grey. Aphanitic groundmass, porphyritic with many fine to medium grained phenocrysts. Upper and lower contacts inclined at 40° and 75° respectively. Integral Discontinuities: Hairline veins / veinlets; gentle to moderate; (1-2/m); CA FL. Hairline vein / veinlets; subvertical; (~3-5/m); CA FL., 33.35 m - 33.60 m: becoming medium to coarse grained, porphyritic, with increased feldspar content (microdiorite), with transitional upper and lower margins.	SA			33.59-33.63 m: J, 54°, Pln, Qz Vr		
				33.5		+							
			100			+							
				34.0	842.27	+		SA			33.91-33.98 m: J, 80°, Und, Qz Cn		
			100			+							
				34.5		+							
				34.61	841.61	+		SA					
			100			+							
				35.0	840.00	+							
						+							

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It has been prepared for geotechnical purposes only.



BOREHOLE: BHUA-17

SHEET: 9 OF 11

CLIENT: SMEC

COORDS: 660250.0 m 7667396.8 m GDA 2020 MGA Zone 55

DRILL RIG: HYDRAPOWER SCOUT Mk5

PROJECT: Pioneer Burdekin PHES GI

SURFACE RL: 875.96 m DATUM: AHD

CONTRACTOR: Twin Hills

LOCATION: Dalrymple Heights

INCLINATION: -83° DIRECTION: 230°

LOGGED: ENGEO

DATE: 9/6/23

JOB NO: 23117.000.001

HOLE DIA: 96/100 mm HOLE DEPTH: 48.00 m

CHECKED: SF

DATE: 7/7/23

Drilling						Field Material Description						Defect Information							
METHOD / SUPPORT	WATER	TCR	RQD	DRILLED LENGTH (metres)	DEPTH RL	GRAPHIC LOG	MATERIAL DESCRIPTION	DETAILED WEATHERING	INFERRED STRENGTH Is _u (MPa) (AS1726:2017)	MEASURED STRENGTH: UCS & I _{ps} (MPa) (A.D.1)	DEFECT DESCRIPTION	AVERAGE DEFECT SPACING (mm) (ISO14689:2017)							
												EC-30	VC-60	C-200	M-600	W-2000	VW		
HQ3				35.0	841.22		DOLERITE DYKE / SILL. Fine grained, aphanitic to phaneritic igneous. Grey to dark grey. Aphanitic groundmass, porphyritic with many fine to medium grained phenocrysts. Upper and lower contacts inclined at 40° and 75° respectively., Integral Discontinuities: Hairline veins / veinlets; gentle to moderate; (2-5/m); CA FL. 35.52 m - 35.78 m: Becoming medium to coarse grained, porphyritic, with increased feldspar content (microdiorite). 35.52 m - 35.65 m: Brecciated, with intense pale pink-brown potassic alteration. 35.78 m - 36.00 m: Transitionally grading into porphyritic DOLERITE.	SA											
		100	100	35.5	35.52 840.71 840.71							35.71-35.76 m: J, 45°, Pln, Ro, Qz Cn							
					35.78 840.45														
				36.0								35.98-36.05 m: J, 60°, Pln, Ro, Qz							
					36.25 839.98			36.25 m - 36.69 m: Transitionally becoming medium to coarse grained, porphyritic, with increased feldspar content (microdiorite).											
				36.5															
					36.58 839.65 36.69 839.55			36.58 m - 36.69 m: With intense pale grey potassic (?) alteration above lower margin.	SA										
		100	100					ALTERED SHEARED GRANODIORITE Coarse grained, phaneritic igneous. Pink and pale green. Sheared at ~70° - 90°, and completely altered by intense potassic (pink) and propylitic (pale green) alteration.	SA										
				37.0	36.99 839.25 839.24			ALTERED GRANODIORITE Coarse grained, phaneritic igneous. Pale white-grey, pale grey-green and dark grey. Poorly developed foliation at 35°-55°, indistinct., With many (>5/m) mafic inclusions, mm to cm scale; irregular shaped, angular to rounded, sharp to diffuse margins Pervasive, moderately intense, calcic / potassic /propylitic alteration throughout, (pale white-green-grey), more intense adjacent, to moderate and steep hairline CA veinlets. Integral Discontinuities: Vein/veinlets; (<1 mm wide); gentle to moderate; (<5/m); CA FL. Mechanical Defects: Js; subhorizontal to shallow; (<3/m); Pln to Und; Cn to CA Ct. 37.00 m - 37.45 m: K-feldspar vein (70° - 90°), up to 30 mm thick; Und; coarse grained K-feldspar FL.	SA			37.71-37.77 m: J, 37°, Pln, Sm, Qz Cn 37.77-37.82 m: J, 44°, Pln, Sm, Qz Vr							
				37.5															
				38.0							37.96-38.02 m: J, 54°, Pln, Ro, Qz Cn								
	100	100																	
				38.5															
					38.70 837.55 38.80 837.45		38.70 m - 38.90 m: K-feldspar vein (80°), up to 20 mm thick; Und; coarse grained K-feldspar FL. 38.80 m - 40.00 m: Becoming strongly, pervasively altered (propylitic and potassic) with increasing proportion of K-feldspars towards 40.00 m.				38.62-38.92 m: Sz, 75°, Pln, Ro, Qz Cru								
	100	100																	
				39.0															
				39.5															
	100	100																	
				40.0	40.00														

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BOREHOLE: BHUA-17

SHEET: 11 OF 11
DRILL RIG: HYDRAPOWER SCOUT Mk5
CONTRACTOR: Twin Hills
LOGGED: ENGEO DATE: 9/6/23
CHECKED: SF DATE: 7/7/23

CLIENT: SMEC COORDS: 660250.0 m 7667396.8 m GDA 2020 MGA Zone 55
PROJECT: Pioneer Burdekin PHES GI SURFACE RL: 875.96 m DATUM: AHD
LOCATION: Dalrymple Heights INCLINATION: -83° DIRECTION: 230°
JOB NO: 23117.000.001 HOLE DIA: 96/100 mm HOLE DEPTH: 48.00 m

Drilling					Field Material Description					Defect Information				
METHOD / SUPPORT	WATER	TCR	RQD	DRILLED LENGTH (metres)	DEPTH RL	GRAPHIC LOG	MATERIAL DESCRIPTION	DETAILED WEATHERING	INFERRED STRENGTH Is _u (MPa) (AS1726:2017)	MEASURED STRENGTH: UCS & I _{u50} (MPa) (A.O.U.)	DEFECT DESCRIPTION	AVERAGE DEFECT SPACING (mm) (ISO14689:2017)		
											Mechanical Discontinuities / non-intact defects shown only. See attached Detailed Defect Log for all recorded discontinuities and defects	EC-29	VC-29	VC-29
HQ3					45.0	831.30	ALTERED GRANODIORITE Coarse grained, phaneritic igneous. Pale white-grey, pale grey-green and dark grey. Poorly developed foliation at 25°-55°, indistinct. With few (<5/m) mafic inclusions, mm to cm scale; irregular shaped, angular to rounded, sharp to diffuse margins Pervasive, moderately intense, calcic / potassic /propylitic alteration throughout, (pale white-green-grey), more intense adjacent, to moderate and steep hairline CA veinlets. Integral Discontinuities: Vein/veinlets; (<1 mm wide); gentle to moderate; (<5/m); CA FL. Mechanical Defects: Js; moderate to steep; (<3/m); Pln to Und; Cn to CA Ct. DOLERITE DYKE / SILL Fine grained, aphanitic to phaneritic igneous. Grey to dark grey. Aphanitic groundmass, porphyritic with many fine to medium grained phenocrysts. Moderate to strongly altered. Extremely to very closely spaced hairline veins, with CA FL ALTERED GRANODIORITE Described as per 45.00 m. With propylitic alteration halos on some moderate veins, up to 10 mm wide.	SA			45.14-45.16 m: J, 33°, Cvd, Sm, Cn 45.35-45.39 m: J, 32°, Pln, Sm, Qz Cn			
					45.5	830.75		SA						
					46.0	830.26		SA			46.06-46.10 m: J, 45°, Pln, Sm, Qz Cn			
					46.5						46.55-46.72 m: J, 75°, Cvd, Sm, Qz Std			
					47.0						46.91-46.94 m: J, 30°, Cvd, FL			
					47.5									
					48.0	828.32								
					48.5									
					49.0									
					49.5									
					50.0		END OF BOREHOLE @ 48.00 m TARGET DEPTH GROUNDWATER ENCOUNTERED @ 1.80 m DEPTH STANDPIPE INSTALLED - REFER TO APPENDIX 10 FOR STANDPIPE CONSTRUCTION DETAILS Bearing is approximate only.							

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JOB No.:	30032772
Client:	Queensland Hydro
Site:	Pioneer-Burdekin

Borehole ID:	BHUA-17
Termination Depth:	48.00

Depth (m)			Type	Angle (°)	Roughness	Shape	Infill	Weathering	Nature	Comments
From	To	Midpoint								
14.58	14.68	14.84	Joint		73 Rough	Planar	MnO		Clean	
14.68	15.02	14.95	Joint		86 Rough	Curved	MnO		Healed	
14.79	14.82	14.99	Joint		31 Smooth	Planar				
14.88	14.90	15.01	Joint		22 Smooth	Planar	Quartz	Highly Weathered (DW)	Healed	
14.91	15.01	15.08	Joint		90 Rough	Curved			Healed	
14.97	15.08	15.18	Joint		4 Smooth	Planar			Healed	
14.99	15.01	15.15	Joint		24 Smooth	Planar		Highly Weathered (DW)	Veneer	
15.03	15.08	15.31	Joint		28 Smooth	Planar			Healed	
15.15	15.19	15.32	Joint		40 Smooth	Irregular	MnO		Healed	
15.20	15.25	15.32	Joint		46 Rough	Planar	MnO			
15.29	15.36	15.37	Joint		50 Smooth	Planar	MnO		Hairline	
15.38	15.43	15.43	Joint		40 Rough	Planar	MnO		Hairline	
15.44	15.55	15.46	Joint		88 Rough	Planar	MnO		Hairline	
15.55	15.61	15.49	Joint		70 Rough	Planar	MnO		Veneer	
15.73	15.86	15.80	Weathered Zone		Rough	Irregular	MnO		Crushed	Intersecting joints broken while drilling
15.96	15.98	15.97	Weathered Zone		Very Rough	Irregular				Material behaving like silty sand
16.01	16.09	16.05	Joint		82 Rough	Planar	MnO		Healed	
16.05	16.06	16.06	Joint		5 Rough	Planar			Healed	
16.13	16.15	16.14	Joint		15 Rough	Planar			Veneer	
16.24	16.25	16.25	Joint		15 Rough	Planar	MnO		Veneer	
16.25	16.34	16.30	Joint		76 Rough	Planar			Hairline	
16.38	16.48	16.43	Joint		89 Rough	Planar	MnO		Hairline	
16.40	16.52	16.46	Joint		73 Rough	Planar	Clay		Hairline	
16.42	16.45	16.55	Joint		20 Rough	Planar	MnO		Hairline	
16.51	16.67	16.59	Joint		89 Smooth	Planar	MnO		Veneer	
16.63	16.70	16.67	Joint		75 Very Rough	Planar	MnO		Veneer	
16.65	16.77	16.71	Joint		74 Rough	Stepped	MnO		Veneer	
16.78	16.82	16.80	Joint		Rough	Planar			Veneer	
16.82	16.83	16.83	Joint		16 Rough	Planar			Veneer	
16.82	17.02	16.92	Joint		80 Rough	Planar			Veneer	
17.11	17.13	17.12	Joint		38 Rough	Planar	MnO		Veneer	
17.15	17.24		Joint		54 Rough	Planar	MnO		Veneer	
17.29	17.33	17.31	Joint		50 Rough	Planar	MnO		Veneer	
17.40	17.44	17.42	Joint		30 Smooth	Planar	MnO		Veneer	
17.61	17.76	17.69	Joint		60 Rough	Planar	MnO		Veneer	J x3, 60°, Pln, Ro, MnO Vr
17.74	18.36	17.79	Fault		55		MnO			
17.75	17.85	17.80	Joint		60 Rough	Planar	MnO			
17.87	18.01	17.94	Vein		66 Rough	Plaar	Clay			
17.95	18.06	18.01	Joint		75 Rough	Undulating	MnO		Veneer	
18.01	18.02	18.02	Joint		10 Very Rough	Planar	MnO			
18.07	18.18	18.13	Joint							J x3, 55°, Pln, S
18.18	18.21	18.20	Joint		Smooth	Planar			Stained	
18.23	18.31	18.27	Seam - Crushed		51 Smooth	Planar				
18.50	18.58	18.54	Vein		74 Smooth	Planar	MnO			
18.51	18.56	18.54	Vein		33 Smooth	Planar	Quartz			
18.84	18.86	18.85	Vein		20 Smooth	Planar	MnO		Veneer	
18.86	18.93	18.90	Vein		69 Smooth	Planar	MnO			
18.94	18.99	18.97	Vein		Smooth	Planar				
19.03	19.07	19.05	Joint		60 Smooth	Planar	MnO		Intact	
19.12	19.14	19.13	Joint		24 Smooth	Planar	MnO		Intact	
19.17	19.22	19.20	Joint		64 Rough	Planar	Quartz		Clean	
19.30	19.32	19.31	Joint		Rough	Planar	Quartz		Clean	
19.33	19.40	19.37	Joint		Smooth	Planar	Quartz		Infilled	
19.41	19.45	19.43	Joint		65 Smooth	Planar	Quartz		Infilled	
19.54	19.59	19.57	Vein		60 Smooth	Planar	Quartz		Filled	
19.81	19.82	19.82	Joint		5 Smooth	Planar			Intact	
19.81	19.88	19.85	Joint		72 Rough	Planar			Intact	
19.87	19.87	19.87	Vein		5 Rough	Planar			Intact	

Depth (m)			Type	Angle (°)	Roughness	Shape	Infill	Weathering	Nature	Comments																														
From	To	Midpoint																																						
19.88	19.98	19.93	Joint	69	Rough	Planar	Quartz			Crushed seamed due to intersecting joints																														
20.13	20.20	20.17	Seam - Crushed		Very Rough	Irregular					Crushed																													
20.20	20.24	20.22	Joint		58	Very Rough					Planar	Intact																												
20.30	20.31	20.31	Vein		5	Smooth					Planar	Intact																												
20.31	20.33	20.32	Vein		15	Smooth					Planar	Intact																												
20.36	20.41	20.39	Joint		51	Very Rough					Undulating	Clean																												
20.38	20.46	20.42	Joint		70	Rough					Planar	Quartz																												
20.46	20.54	20.50	Joint		57	Rough					Planar		Intact																											
20.46	20.55	20.51	Joint		66	Rough					Planar		Intact																											
20.67	20.75	20.71	Joint		65	Smooth					Planar		Quartz																											
20.74	20.78	20.76	Vein	17	Smooth	Planar	Infilled																																	
20.91	20.95	20.93	Vein	21	Smooth	Planar	Infilled																																	
20.93	20.95	20.94	Joint	84	Rough	Planar	Hairline																																	
21.13	21.22	21.18	Joint	56	Very Rough	Undulating	Quartz	Jx2, 58°,Und, Ro, Qz																																
21.29	21.32	21.31	Joint						53	Rough	Planar			Quartz																										
21.37	21.42	21.40	Joint						70		Undulating			Quartz	Intact																									
21.50	21.60	21.55	Joint									3				Planar	Planar	Intact																						
21.75	21.87	21.81	Joint																3	Planar	Planar	Intact																		
21.76	21.77	21.77	Joint																				50	Smooth	Planar	Intact														
21.81	21.82	21.82	Joint										10														Rough	Planar	Intact											
21.93	21.96	21.95	Vein																											10	Smooth		Intact							
22.02	22.03	22.03	Vein																															60	Smooth	Undulating	Clean			
22.03	22.04	22.04	Vein																																			78	Rough	Undulating
22.10	22.18	22.14	Joint	30	Smooth	Planar	Intact																																	
22.12	22.16	22.14	Joint					75																																
22.13	22.18	22.14	Joint						72	Smooth	Planar			Quartz																										
22.13	22.18	22.16	Joint									25			Rough	Undulating	Quartz																							
22.17	22.24	22.21	Vein															25	Smooth	Planar	Quartz																			
22.26	22.29	22.28	Vein																			71	Rough	Undulating	Quartz															
22.28	22.31	22.30	Vein										20													Rough	Planar	Quartz												
22.31	22.34	22.33	Vein																										57	Very Rough	Planar	Quartz								
22.34	22.37	22.36	Vein																														64	Smooth	Planar	Quartz				
22.47	22.55	22.51	Joint																																		64	Smooth	Planar	Quartz
22.60	22.65	22.63	Joint	75																																				
22.61	22.69	22.65	Joint					26																																
22.69	22.72	22.71	Vein						50	Smooth	Undulating			Quartz																										
22.71	22.77	22.74	Vein									70			Rough	Planar	Quartz																							
22.82	23.00	22.91	Vein															47	Smooth	Planar	Quartz																			
22.93	23.00	22.97	Joint																			80	Smooth	Planar	Quartz															
23.03	23.12	23.08	Joint										65													Rough	Planar	Quartz												
23.24	23.30	23.27	Joint																										65	Rough	Planar	Quartz								
23.30	23.34	23.32	Joint																														37	Rough	Undulating	Quartz				
23.32	23.37	23.35	Joint																																		63	Rough	Undulating	Quartz
23.33	23.43	23.38	Joint	70	Rough	Undulating	Quartz																																	
23.45	23.47	23.46	Vein					68																																
23.45	23.55	23.50	Joint						62	Smooth	Planar			Quartz																										
23.70	23.74	23.72	Vein									34			Rough	Planar	Quartz																							
23.74	23.79	23.77	Joint															37	Smooth	Planar	Quartz																			
23.77	23.82	23.80	Vein																			50	Rough	Undulating	Quartz															
23.83	23.88	23.86	Joint										23													Smooth	Planar	Quartz												
23.90	23.93	23.92	Vein																										40	Rough	Undulating	Quartz								
23.98	24.05	24.02	Joint																														50	Rough	Undulating	Quartz				
24.06	24.10	24.08	Joint																																		60	Smooth	Planar	Quartz
24.11	24.13	24.12	Joint	65	Smooth	Planar	Quartz																																	
24.15	24.19	24.17	Joint					48																																
24.34	24.38	24.36	Joint						45	Smooth	Planar			Quartz																										
24.36	24.40	24.38	Joint									54			Rough	Undulating	Quartz																							
24.71	24.75	24.73	Joint															65	Smooth	Undulating	Quartz																			
24.74	24.81	24.78	Joint																			27	Rough	Undulating	Quartz															
24.83	24.86	24.85	Vein										37													Rough	Planar	Quartz												
24.97	25.00	24.99	Vein																																					

Depth (m)			Type	Angle (°)	Roughness	Shape	Infill	Weathering	Nature	Comments
From	To	Midpoint								
25.04	25.06	25.05	Joint		60	Smooth	Undulating	Quartz		
25.08	25.10	25.09	Joint		19	Rough	Undulating			
25.18	25.22	25.20	Vein		45	Rough	Undulating			
25.19	25.23	25.21	Vein		44	Rough	Undulating	Quartz		
25.71	25.75	25.73	Joint		38	Rough	Stepped	Quartz		
25.90	25.95	25.93	Joint		68	Rough	Undulating	Quartz		
25.90	26.05	25.98	Vein		84	Rough	Undulating	Quartz		
26.02	26.07	26.05	Joint		25	Rough	Stepped	Quartz		
26.10	26.19	26.15	Vein					Quartz		V x3, 60°,Pln, Ro, Qz, FL, 1mm aperture
26.11	26.23	26.17	Vein		69	Rough	Undulating	Quartz		
26.26	26.29	26.28	Joint		16	Very Rough	Undulating	Quartz	Veneer	
26.26	26.48	26.37	Vein		86	Rough	Irregular	Quartz	Infilled	
26.34	26.37	26.36	Joint			Rough	Undulating	Quartz	Veneer	
26.46	26.56	26.51	Vein		68	Very Rough	Irregular	Quartz	Infilled	
26.50	26.61	26.56	Joint		67	Smooth	Planar	Quartz		
26.60	26.65	26.63	Joint		38	Very Rough	Undulating			
26.61	26.74	26.68	Joint			Rough	Planar		Infilled	
26.69	26.80	26.75	Joint		74	Rough	PlanarUndulatingr	Quartz	Hairline	
26.82	26.95	26.89	Joint		74	Rough	Planar	Quartz	Intact	Unknown purple infill mineral, scratches with nail
26.84	26.97	26.91	Joint		74	Rough	Undulating	Quartz	Hairline	
27.21	27.26	27.24	Joint		68	Rough	Planar	Quartz	Clean	
27.36	27.41	27.39	Joint		68	Smooth	Planar		Veneer	
27.49	27.55	27.52	Joint		63	Smooth	Planar		Veneer	
27.50	27.14	27.32	Vein		52	Rough	Planar	Unknown	Infilled	
27.75	27.87	27.81	Vein		90		Planar	Quartz	Hairline	
27.85	27.89	27.87	Joint		42		Planar	Quartz	Clean	
27.89	27.95	27.92	Joint		78	Rough	Undulating	Quartz	Veneer	
27.97	28.01	27.99	Vein		44	Smooth	Undulating	Quartz	Veneer	
28.07	28.12	28.10	Joint		50	Smooth	Planar	Quartz	Clean	Unknown purple infill mineral, scratches with nail
28.15	28.42	28.29	Vein		88		Undulating	Quartz	Hairline	
28.66	28.75	28.71	Joint		84	Rough	Undulating	Quartz	Veneer	
28.80	28.87	28.84	Joint		63		Planar	Quartz	Veneer	
28.92	29.11	29.02	Vein		86		Undulating		Veneer	
28.99	29.30	29.15	Vein		70		Planar	Quartz	Clean	
29.46	29.61	29.54	Vein		65		Undulating	Quartz	Veneer	
29.60	29.67	29.64	Joint		65	Smooth	Planar		Clean	
29.61	29.81	29.71	Seam - Crushed		65	Rough	Undulating	Quartz	Infilled	
29.70	29.74	29.72	Joint		65	Rough	Undulating	Quartz	Veneer	
29.73	29.89	29.81	Joint		70	Rough	Undulating	Quartz	Veneer	Unknown purple infill mineral, scratches with nail
29.88	29.92	29.90	Joint		74	Smooth	Planar	Quartz	Veneer	
30.00	30.05	30.03	Joint		50	Rough	Planar	Quartz	Clean	
30.10	30.18	30.14	Vein		64		Undulating	Quartz	Hairline	
30.19	30.20	30.20	Vein		10		Undulating		Hairline	
30.30	30.31	30.31	Vein		10		Undulating	FeO	Hairline	
30.68	30.82	30.75	Contact		80		Planar	FeO	Clean	
30.80	30.92	30.86	Contact		74		Planar	FeO	Clean	
30.83	30.85	30.84	Joint		54		Undulating	FeO	Clean	
31.03	31.04	31.04	Joint		10		Stepped		Clean	
31.08	31.10	31.09	Joint		25		Undulating	Quartz	Veneer	V x5, 44°,Pln, Sm, Qz,
31.11	31.12	31.12	Joint		25		Undulating	Quartz	Veneer	
31.57	31.68	31.63	Joint		70	Rough	Planar		Clean	
31.68	31.69	31.69	Vein		5	Rough	Undulating		Veneer	
31.80	31.81	31.95	Vein		42	Smooth	Undulating		Healed	
32.02	32.58	32.30	Vein							
32.82	32.83	32.13	Vein		42	Smooth	Undulating	Quartz	Healed	
32.85	32.88	32.87	Joint		40		Planar	Quartz	Clean	
32.92	32.93	32.93	Vein		25		Undulating		Veneer	
33.05	33.12	33.09	Vein		55		Planar		Veneer	
33.15	33.19	33.17	Vein		55		Undulating	Quartz	VeneeHairliner	
33.21	33.37	33.29	Vein		85		Planar	Quartz	Hairline	
33.32	33.45	33.39	Vein		85		Planar		Veneer	
33.59	33.63	33.61	Joint		54		Planar	Quartz	Veneer	

Depth (m)			Type	Angle (°)	Roughness	Shape	Infill	Weathering	Nature	Comments
From	To	Midpoint								
33.63	33.72	33.68	Vein	76		Undulating			Hairline	V x5, 48°,UN, Ro, Qz
33.64	33.65	33.65	Vein	20		Undulating	Quartz		Hairline	
33.65	33.73	33.69	Joint	78	Rough	Undulating	Quartz		Healed	
33.91	33.98	33.95	Joint	80		Undulating	Quartz		Clean	
34.08	34.55	34.32	Vein	72		Irregular	Quartz		Healed	
34.37	14.54	24.46	Vein	77	Rough	Undulating	Quartz		Veneer	
35.22	35.25	35.24	Vein	27		Undulating	Quartz		Veneer	
35.25	35.26	35.26	Vein	20		Planar	Quartz		Clean	
35.36	35.40	35.38	Vein	30		Undulating	Quartz			
35.39	35.44	35.42	Vein	35		Undulating	Quartz		Veneer	
35.47	35.60	35.54	Vein	53		Undulating			Filled	
35.59	35.63	35.61	Joint	47	Rough	Undulating	Quartz		Intact	
35.63	35.69	35.66	Vein	58	Smooth	Undulating	Quartz		Healed	
35.69	35.73	35.71	Vein	63	Rough	Planar	Quartz		Hairline	
35.71	35.73	35.72	Vein	63		Undulating	Quartz		Hairline	
35.71	35.76	35.74	Joint	45	Rough	Planar	Quartz		Clean	
35.84	35.89	35.87	Vein	64		Undulating	Quartz		Clean	
35.89	35.94	35.92	Vein	52		Undulating	Quartz		Clean	
35.92	35.96	35.94	Vein	40		Undulating	Quartz		Clean	
35.98	36.05	36.02	Joint	60	Rough	Planar	Quartz			
36.19	36.22	36.21	Vein	41		Planar	Quartz		Clean	
36.24	36.30	36.27	Vein	56		Planar	Quartz		Hairline	
36.30	36.34	36.32	Vein	71	Rough	Undulating			Clean	
36.41	36.43	36.42	Vein	43	Smooth	Planar	Quartz		Clean	
36.44	36.52	36.48	Vein				Quartz			
36.44	36.53	36.49	Vein	66	Rough	Undulating	Quartz		Hairline	
36.50	37.00	36.75	Vein	79	Rough	Undulating	Quartz		Filled	
36.51	36.56	36.54	Vein	35	Rough	Undulating	Quartz		Infilled	
36.55	36.60	36.58	Vein	35	Rough	Undulating	Quartz		Infilled	
36.77	36.90	36.84	Vein	69	Rough	Undulating	Quartz		Veneer	
36.95	37.17	37.06	Vein	70		Undulating	Quartz		Infilled	
37.00	37.24	37.12	Vein	75		Undulating			Clean	
37.25	37.48	37.37	Lamination Parting				Quartz			
37.71	37.77	37.74	Joint	37	Smooth	Planar	Quartz		Clean	
37.87	37.82	37.85	Joint	44	Smooth	Planar	Quartz		Veneer	
37.96	38.02	37.99	Joint	54	Rough	Planar	Quartz		Clean	
38.62	38.92	38.77	Sheared - Zone	75	Rough	Planar	Quartz		Crushed	
39.08	39.13	39.11	Vein	57		Undulating	Quartz		Clean	
39.26	39.31	39.29	Vein	60		Undulating	Quartz		Clean	
39.27	39.31	39.29	Vein	53		Undulating			Clean	
39.54	39.76	49.60	Vein	89	Rough	Undulating			Hairline	
39.56	39.65	39.61	Vein	70	Rough	Undulating			Healed	
39.58	39.75	39.67	Vein	78	Rough	Undulating			Hairline	
39.77	39.86	39.82	Vein	72		Undulating	FeO		Clean	
39.80	39.85	39.83	Vein	58	Rough	Undulating	Quartz		Infilled	
39.87	39.92	39.90	Vein	66	Rough	Undulating	Quartz		Hairline	
39.93	40.00	39.97	Vein	70		Undulating	Quartz		Veneer	
39.98	40.06	40.02	Joint	56	Rough	Undulating	MnO		Clean	
40.08	40.12	40.10	Vein	71	Smooth	Undulating	Quartz		Clean	
40.10	40.23	40.17	Vein	84		Planar	MnO			
40.12	40.18	40.15	Vein	65	Rough	Undulating	Quartz		Clean	
40.20	40.26	40.23	Joint	50	Rough	Planar	Quartz		Clean	
40.32	40.42	40.37	Vein	75	Smooth	Undulating	Quartz		Healed	
40.36	40.48	40.42	Vein				Quartz			
40.55	40.64	40.60	Vein	70	Smooth	Undulating			Hairline	
40.66	40.77	40.72	Contact	80	Rough	Undulating	Quartz		Intact	
40.80	40.86	40.83	Joint	45	Smooth	Planar	Quartz		Veneer	
40.87	40.91	40.89	Joint	45	Smooth	Planar	Quartz		Veneer	
40.95	41.05	41.00	Vein	77	Rough	Irregular			Healed	
40.97	41.03	41.00	Vein	56	Smooth	Planar	Quartz		Veneer	
41.03	41.12	41.08	Joint	55	Rough	Undulating			Veneer	
41.15	41.19	41.17	Joint	42	Smooth	Planar	Quartz		Clean	

Depth (m)				Type	Angle (°)	Roughness	Shape	Infill	Weathering	Nature	Comments
From	To	Midpoint									
	41.28	41.28	41.28	Joint		35	Rough	Undulating	Zeolite		
	41.41	41.46	41.44	Joint		40	Rough	Undulating	Chlorite		
	42.28	42.38	42.33	Vein		70		Undulating	Quartz		
	42.60	42.70	42.65	Vein		65		Planar	FeO		
	42.67	42.80	42.74	Vein		85	Rough	Undulating	FeO		
	42.72	42.84	42.78	Vein		84		Planar			
	43.05	43.15	43.10	Joint		65	Rough	Undulating	FeO		
	43.13	43.22	43.18	Vein		65		Quartz			V x3, 65°,UN, Sm, Qz
	43.37	43.42	43.40	Joint		75	Rough	Undulating	FeO		
	43.40	43.44	43.42	Joint		55	Rough	Undulating	Quartz		
	43.63	43.83	43.73	Joint		74	Smooth	Undulating	Quartz		
	43.80	43.90	43.85	Vein				Quartz			V x3, 40°,UN, Sm, Qz, FL, 1mm aperture
	43.80	43.90	43.85	Vein		60	rough	Undulating	Quartz		V x3, 65°,UN, Ro, , FL, 1mm aperture
	43.89	43.97	43.93	Joint		58	Smooth	Undulating	Quartz		
	44.04	44.14	44.09	Vein		70	Rough	Undulating	Chlorite		
	44.10	44.33	44.22	Joint		75	Smooth	Undulating			
	44.13	44.22	44.18	Vein		55			Quartz		V x3, 55°,CU, Sm, Qz
	44.25	44.48	44.37	Joint		82	Rough	Undulating	Clay		
	44.83	44.90	44.87	Joint		75	Smooth	Planar			
	45.14	45.16	45.15	Joint		33	Smooth	Curved			
	45.23	45.35	45.29	Vein		55	Smooth	Undulating	Quartz		
	45.35	45.39	45.37	Joint		32	Smooth	Planar	Quartz		
	45.46	45.50	45.48	Vein		62		Curved			
	45.49	45.52	45.51	Vein		45		Undulating			
	45.52	45.56	45.54	Vein		70		Undulating	Quartz		
	45.52	45.87	45.70	Joint		85	Smooth	Undulating	Quartz		
	45.53	45.89	45.71	Joint		85		Undulating			
	45.58	45.61	45.60	Vein		45		Undulating	Quartz		
	45.60	45.65	45.63	Vein		65		Undulating			
	45.90	46.10	46.00	Vein					Quartz		V x20, 50°,CU, Ro, Qz
	46.06	46.10	46.08	Joint		45	Smooth	Planar	Quartz		
	46.29	46.34	46.32	Vein		40	Smooth	Planar	Quartz		
	46.32	46.34	46.33	Vein		60	Rough	Undulating	FeO		
	46.38	46.46	46.42	Vein		64	Rough	Undulating	FeO		
	46.50	46.53	46.52	Vein		20	Smooth	Curved	Quartz		
	46.55	46.72	46.64	Joint		75	Smooth	Curved	Quartz		
	46.85	47.40	47.13	Vein		85	Smooth	Irregular			
	46.91	46.94	46.93	Joint		30		Curved			
	47.25	47.38	47.32	Vein		78		Curved	Quartz		
	47.50	47.59	47.55	Vein		74		Stepped	Quartz		

ENGEO

Borehole No.: BHUA-17		Depth Range: 18.00 – 22.00		Box: 2 / 9	
JOB NO: 30032772PROJECT: Pioneer-Burdekin BOREHOLE ID: BHUA-17CORE TRAY NO: Box 2 DEPTH: 18.0-22.0DATE: 15-12-23 0.10.20.30.40.50.60.70.80.91.0 CHALK MARKS DENOTE HANDLING OR DRILLING BREAKS 18.019.020.021.0 Sample 21.49-21.98					
		Geotechnical Investigation Borehole Photos		Client: SMEC	
				Project: Pioneer-Burdekin PHES	
				Project No. 23117.000.001	
				Date Drilled: 12/07/23	
		Drawn: HG		Page No. 2/9	
		Checked: SF		Size: A4	
		Revision: 0		Scale: N/A	

Borehole No.: BHUA-17		Depth Range: 22.00 – 26.00		Box: 3 / 9	
JOB NO: 30032772 BOREHOLE ID: BHUA-17 DEPTH: 22.0-26.0 DATE: 15-12-23 PROJECT: Pioneer-Burdekin CORE TRAY NO: Box 3 CHALK MARKS DENOTE HANDLING OR DRILLING BREAKS 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0					
22.0 23.0 24.0 25.0 22.54 SAMPLE 22.99 →					

	Geotechnical Investigation Borehole Photos	Client: SMEC			
		Project: Pioneer-Burdekin PHES		Drawn: HG	Page No. 3/9
		Project No. 23117.000.001		Checked: SF	Size: A4
		Date Drilled: 12/07/23		Revision: 0	Scale: N/A

ENGEO

ENGEO

ENGEO

ENGEO

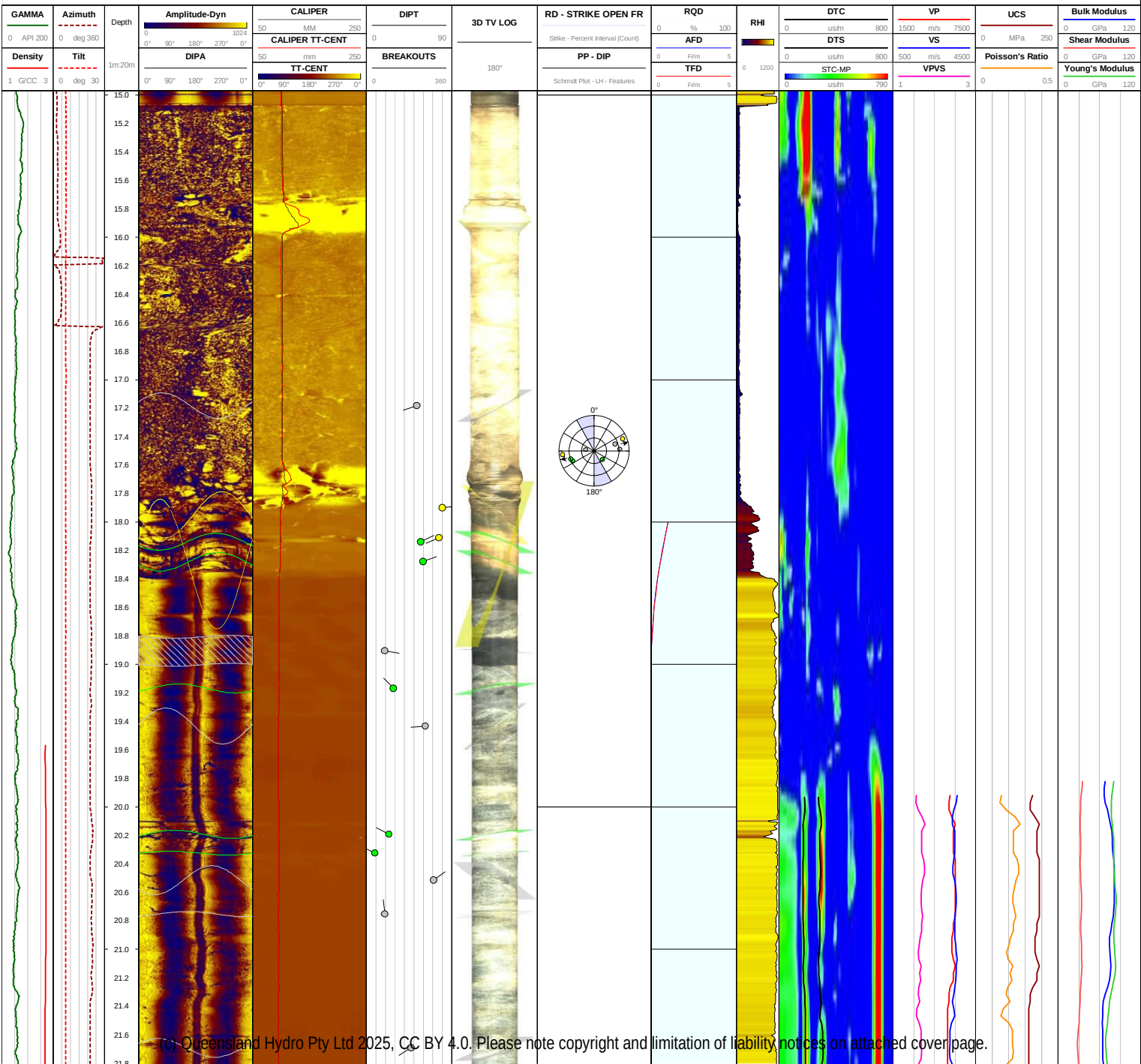
ENGEO

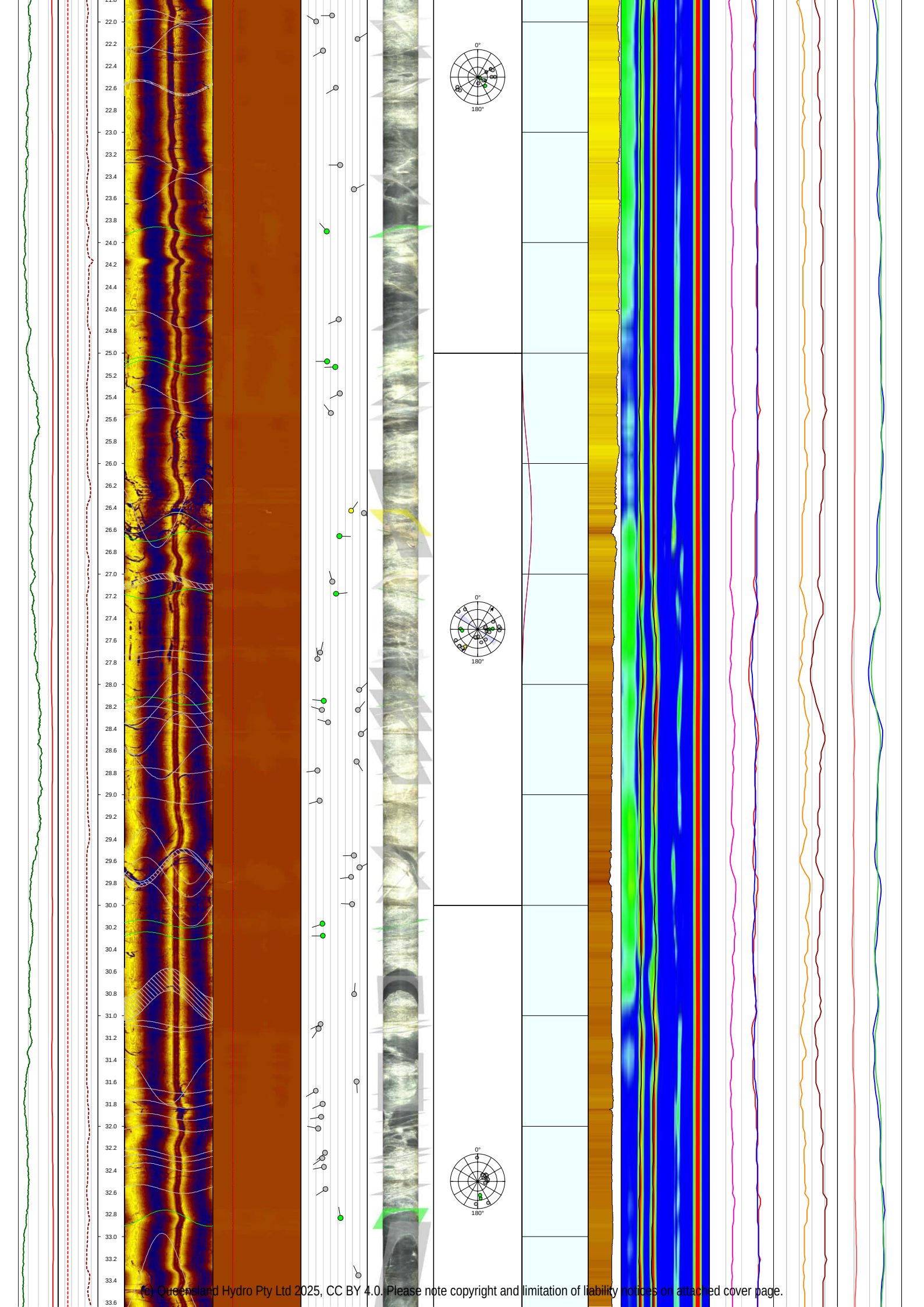
ENGEO

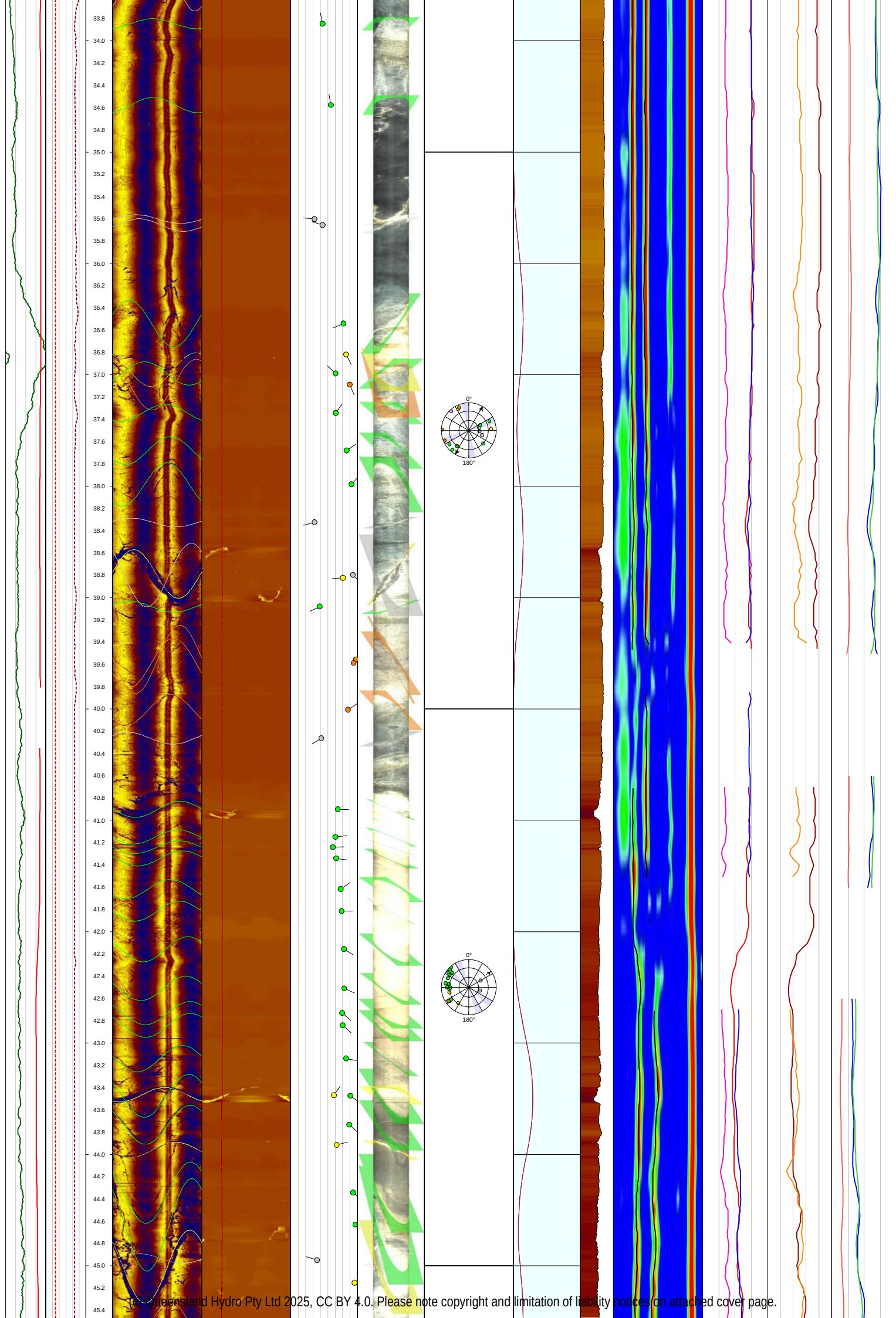
		COMPOSITE LOG BOREHOLE TELEVIEWER AND FULL WAVEFORM SONIC LOGS AND ADVANCED ANALYSIS				Epiroc	
Hole NameBHUA17 FieldEUNGELLA Log Date20/06/23 LocationPIONEER-BURDEKIN		Drill Depth48.0m Bit Size99mm Casing TypeSTEEL Casing Depth15.0m		Grid Name Collar Easting660133m Collar Northing7667219m Reduced Level		Logging UnitSV013 EngineerDAMON HOSKING Client RepresentativeTIM HARTIGAN Service TypeTeleviewer Interpretation	

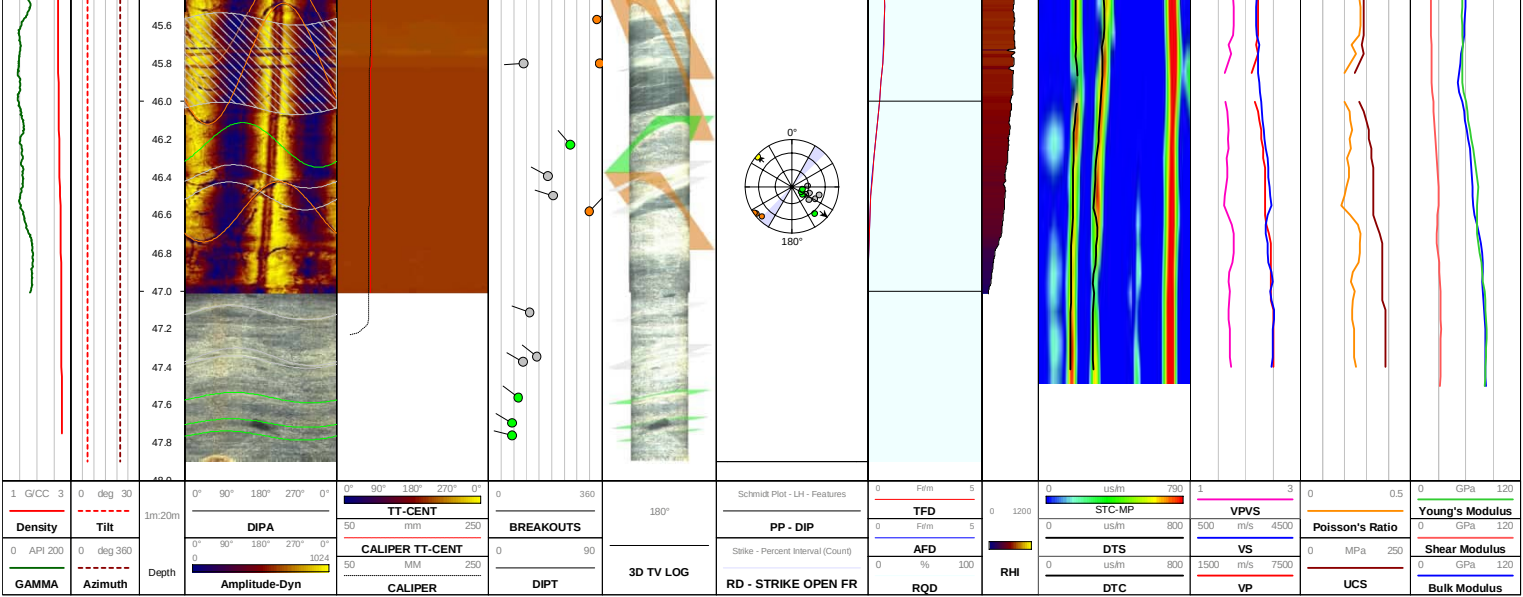
TELEVIEWER LOGS		STRUCTURAL LOGS		FEATURES & TADPOLES	
Amplitude	ATV Amplitude Image	DIPA	Apparent Dip Feature Picks (Sinusoid Presentation)	Partially Open Fracture Closed Fracture Foliation/Banding/Bedding Healed Fracture/Vein	
TT-CENT	Centralised ATV Travel Time Image	DIPT	True Dip Feature Picks (Tadpole Presentation)		
3D TV LOG	3D Televiewer Image	RD - STRIKE	Rose Diagram - Strike Open Fract. (Arrows represent Mean Vector)		
Caliper TT-CENT	Acoustic Travel Time Caliper	PP - DIP	Polar Projection - Dip (Schmidt) (Lower Hemisphere)		
OTV Picture	Optical Televiewer Image				
FULL WAVEFORM SONIC LOG & MECHANICAL PROPERTIES		STRUCTURAL ANALYSIS LOGS		COMMENTS	
STC-MP	Monopole Slowness-Time-Coherence Projection	RQD	Rock Quality Designation (Partial) Open Apparent Fracture Density	Image and azimuth data are presented oriented to True north. The magnetic declination correction is +8.12 degrees. Rock Quality Designation (RQD) is the (Sum of length of image interval sections of more than 10 cm length unaffected by open fractures, faults & breakouts) divided by the (Total length of the interval) times (100%). RQD has been calculated for one meter intervals.	
DTC	Compressional wave slowness	AFD	(Partial) Open True Fracture Density		
DTS	Shear wave slowness	TFD	Rock Hardness Index		
VP	Compressional wave velocity	RHI			
VS	Shear wave velocity	GEOPHYSICAL AND VERTICALITY LOGS		The STC-MP track was produced by processing the RX1-1A (60 cm), RX2-1A (80 cm), RX3-1A (100 cm) and RX4-1A (120 cm) receiver data after applying a moving average filter, stacking and a frequency filter. Uniaxial Compressive Strength (UCS) was calculated using an exponential trendline between DTC and UCS (McNally, 1987): $UCS = 1200 * \exp(-0.036 * DTC)$, with UCS in MPa and DTC in $\mu s/m$ units. Poisson's Ratio was calculated from DTC & DTS. Young's, Bulk & Shear Modulus were calculated from DTC, DTS & Density estimated as $\rho = 0.31.Vp \exp(1/4)$	
VPVS	Compressional to Shear wave velocity ratio	Density	Density Log		
UCS	Uniaxial (Unconfined) Compressive Strength	GAMMA	Natural Gamma Ray		
Poisson's Ratio	Indicator of material elastic deformation	Tilt	Hole Inclination (0 = Vertical Down)		
Young's Modulus	Material length change by applied stress	Azimuth	Hole Azimuth		
Bulk Modulus	Change in material volume by applied stress	CALIPER	Mechanical Caliper		
Shear Modulus	Transverse material displacement by applied stress				

IMPORTANT NOTE					
The following interpretations are opinions based upon inferences from borehole logs, Epiroc Kinetic Logging Services cannot and does not guarantee the correctness or accuracy of any interpretations. Therefore, Epiroc Kinetic Logging Services shall not be liable or responsible for any loss, damage, cost or expense incurred or sustained by anyone resulting from any interpretations.					









BHUA_17 Televiewer Structures

Feature Depth	Depth	Azimuth	Dip	Aperture	Visible Azimuth Ranges	Type	Features
m	m	deg	deg	mm	deg		
17.18	17.18	252.11	53.03	0		5	Healed Fracture/Vein
17.9	17.95	83.2	79.99	0	131.55-291.75	2	Partially Open Fracture
18.11	18.29	247.16	76.59	0	28.53-96.93	2	Partially Open Fracture
18.14	18.14	64.6	57.26	0		4	Foliation/Banding/Bedding
18.28	18.28	69.98	59.8	0		4	Foliation/Banding/Bedding
18.9	18.9	99.7	19.45	192.18		5	Healed Fracture/Vein
19.17	19.17	315.62	28.42	0		4	Foliation/Banding/Bedding
19.43	19.43	265.79	61.99	0		5	Healed Fracture/Vein
20.19	20.19	297.34	23.71	0		4	Foliation/Banding/Bedding
20.32	20.32	295.47	8.87	0		4	Foliation/Banding/Bedding
20.51	20.51	52.8	70.67	0		5	Healed Fracture/Vein
20.75	20.75	353.66	19.4	0		5	Healed Fracture/Vein
21.69	21.69	238.7	47.1	0		5	Healed Fracture/Vein
21.94	21.94	269.28	42.21	0		5	Healed Fracture/Vein
22	22	302.19	20.82	0		5	Healed Fracture/Vein
22.16	22.16	57.7	76.81	0		5	Healed Fracture/Vein
22.26	22.26	240.7	30.11	0		5	Healed Fracture/Vein
22.6	22.6	240.24	47.28	7.75		5	Healed Fracture/Vein
23.3	23.3	269.51	53.01	0		5	Healed Fracture/Vein
23.52	23.52	62.95	71.94	0		5	Healed Fracture/Vein
23.9	23.9	319.34	35.02	0		4	Foliation/Banding/Bedding
24.7	24.7	245.88	51.16	0		5	Healed Fracture/Vein
25.08	25.08	271.39	35.26	0		4	Foliation/Banding/Bedding
25.13	25.13	268.7	46.78	0		4	Foliation/Banding/Bedding
25.37	25.37	244.48	52.68	0		5	Healed Fracture/Vein
25.54	25.54	321.45	40.4	0		5	Healed Fracture/Vein
26.43	26.53	35.98	68.12	0	191.31-255.21	2	Partially Open Fracture
26.45	26.45	132.48	85.45	0		5	Healed Fracture/Vein
26.66	26.66	90.89	52.16	0		4	Foliation/Banding/Bedding
27.07	27.07	343.55	42.48	31.77		5	Healed Fracture/Vein
27.18	27.18	84.75	47.67	0		4	Foliation/Banding/Bedding
27.71	27.71	13.95	26.03	0		5	Healed Fracture/Vein
27.77	27.77	354.49	22.57	0		5	Healed Fracture/Vein
28.05	28.05	46.84	79.33	0		5	Healed Fracture/Vein
28.15	28.15	277.14	30.81	0		4	Foliation/Banding/Bedding
28.23	28.23	38.77	77.32	0		5	Healed Fracture/Vein
28.23	28.23	285.85	28.6	0		5	Healed Fracture/Vein
28.34	28.34	284.81	36.81	0		5	Healed Fracture/Vein
28.45	28.45	47.06	81.69	0		5	Healed Fracture/Vein
28.7	28.7	147.71	75.55	0		5	Healed Fracture/Vein
28.78	28.78	262.99	22.51	0		5	Healed Fracture/Vein
29.05	29.05	255.17	25.06	0		5	Healed Fracture/Vein
29.55	29.55	268.33	72.15	0		5	Healed Fracture/Vein
29.66	29.66	62.87	79.38	14.45		5	Healed Fracture/Vein
29.74	29.74	263.17	68.09	0		5	Healed Fracture/Vein

Feature Depth	Depth	Azimuth	Dip	Aperture	Visible Azimuth Ranges	Type	Features
m	m	deg	deg	mm	deg		
29.99	29.99	273.38	69.57	0		5	Healed Fracture/Vein
30.17	30.17	251.51	29.15	0		4	Foliation/Banding/Bedding
30.28	30.28	268.42	29.77	0		4	Foliation/Banding/Bedding
30.81	30.81	4.03	72.16	68.31		5	Healed Fracture/Vein
31.08	31.08	244.34	26.83	0		5	Healed Fracture/Vein
31.12	31.12	215.9	24.06	0		5	Healed Fracture/Vein
31.6	31.6	178.09	75.62	0		5	Healed Fracture/Vein
31.68	31.68	238.71	20.02	0		5	Healed Fracture/Vein
31.8	31.8	247.27	29.52	0		5	Healed Fracture/Vein
31.92	31.92	261	27.55	0		5	Healed Fracture/Vein
32.02	32.02	282.92	23.26	0		5	Healed Fracture/Vein
32.24	32.24	230.22	32.69	0		5	Healed Fracture/Vein
32.29	32.29	233.59	28.76	0		5	Healed Fracture/Vein
32.37	32.37	258.83	31.22	0		5	Healed Fracture/Vein
32.57	32.57	236.81	33.23	0		5	Healed Fracture/Vein
32.83	32.83	349.36	53.6	0		4	Foliation/Banding/Bedding
33.35	33.35	333.85	77.94	0		5	Healed Fracture/Vein
33.85	33.85	349.61	42.91	0		4	Foliation/Banding/Bedding
34.58	34.58	349.45	54.2	0		4	Foliation/Banding/Bedding
35.6	35.6	275.67	32.21	0		5	Healed Fracture/Vein
35.66	35.66	289.16	42.98	0		5	Healed Fracture/Vein
36.54	36.54	246.72	70.97	0		4	Foliation/Banding/Bedding
36.82	36.95	153.46	74.68	0	285.08-307.58	2	Partially Open Fracture
36.99	36.99	312.54	60.68	0		4	Foliation/Banding/Bedding
37.09	37.09	157	79.42	0		3	Closed Fracture
37.34	37.34	36.1	60.9	0		4	Foliation/Banding/Bedding
37.68	37.68	54.24	75.63	0		4	Foliation/Banding/Bedding
37.98	37.98	40.62	81.84	0		4	Foliation/Banding/Bedding
38.33	38.33	255.18	32.19	0		5	Healed Fracture/Vein
38.8	38.8	137.17	84.1	0		5	Healed Fracture/Vein
38.82	38.79	266.45	70.5	0	221.69-147.89	2	Partially Open Fracture
39.08	39.08	245.25	38.87	0		4	Foliation/Banding/Bedding
39.56	39.56	92.34	88.14	0		3	Closed Fracture
39.59	39.59	66.98	84.84	0		3	Closed Fracture
40.01	40.01	55.33	77.54	0		3	Closed Fracture
40.26	40.26	240.29	41.52	0		5	Healed Fracture/Vein
40.9	40.9	91.15	63.47	0		4	Foliation/Banding/Bedding
41.15	41.15	83.16	60.28	0		4	Foliation/Banding/Bedding
41.24	41.24	88.8	56.56	0		4	Foliation/Banding/Bedding
41.34	41.34	99.47	61.55	0		4	Foliation/Banding/Bedding
41.62	41.62	54.75	67.57	0		4	Foliation/Banding/Bedding
41.82	41.82	89.69	68.72	0		4	Foliation/Banding/Bedding
42.16	42.16	121.95	71.86	0		4	Foliation/Banding/Bedding
42.51	42.51	113.54	72.24	0		4	Foliation/Banding/Bedding
42.73	42.73	130.37	69.49	0		4	Foliation/Banding/Bedding
42.84	42.84	131.15	70.32	0		4	Foliation/Banding/Bedding

Feature Depth	Depth	Azimuth	Dip	Aperture	Visible Azimuth Ranges	Type	Features
m	m	deg	deg	mm	deg		
43.14	43.14	100.14	74.57	0		4	Foliation/Banding/Bedding
43.47	43.46	33.45	58.21	0	306.03-244.83	2	Partially Open Fracture
43.47	43.47	127.34	80.76	0		4	Foliation/Banding/Bedding
43.73	43.73	131.92	79.11	0		4	Foliation/Banding/Bedding
43.92	43.96	74.62	61.99	0	249.61-348.61	2	Partially Open Fracture
44.34	44.34	133.71	84.29	0		4	Foliation/Banding/Bedding
44.63	44.63	138.74	87.11	0		4	Foliation/Banding/Bedding
44.95	44.93	287	35.63	0	260.44-19.24	5	Healed Fracture/Vein
45.15	45.01	131.04	86.15	0	76.78-4.78	2	Partially Open Fracture
45.57	45.57	52.39	85.68	0		3	Closed Fracture
45.8	45.8	267.05	27.76	386.79		5	Healed Fracture/Vein
45.8	45.8	54.5	88.18	0		3	Closed Fracture
46.23	46.23	319.71	64.77	0		4	Foliation/Banding/Bedding
46.4	46.4	298.71	47.08	0		5	Healed Fracture/Vein
46.5	46.5	286.98	51.42	0		5	Healed Fracture/Vein
46.58	46.58	44.76	79.73	0		3	Closed Fracture
47.11	47.11	290.98	32.68	0		5	Healed Fracture/Vein
47.35	47.35	308.25	38.37	0		5	Healed Fracture/Vein
47.37	47.37	298.66	27.62	0		5	Healed Fracture/Vein
47.56	47.56	306.88	23.76	0		4	Foliation/Banding/Bedding
47.7	47.7	299.81	18.75	0		4	Foliation/Banding/Bedding
47.76	47.76	284.17	19.04	0		4	Foliation/Banding/Bedding

BHUA17

SMEC - Pioneer-Burdekin

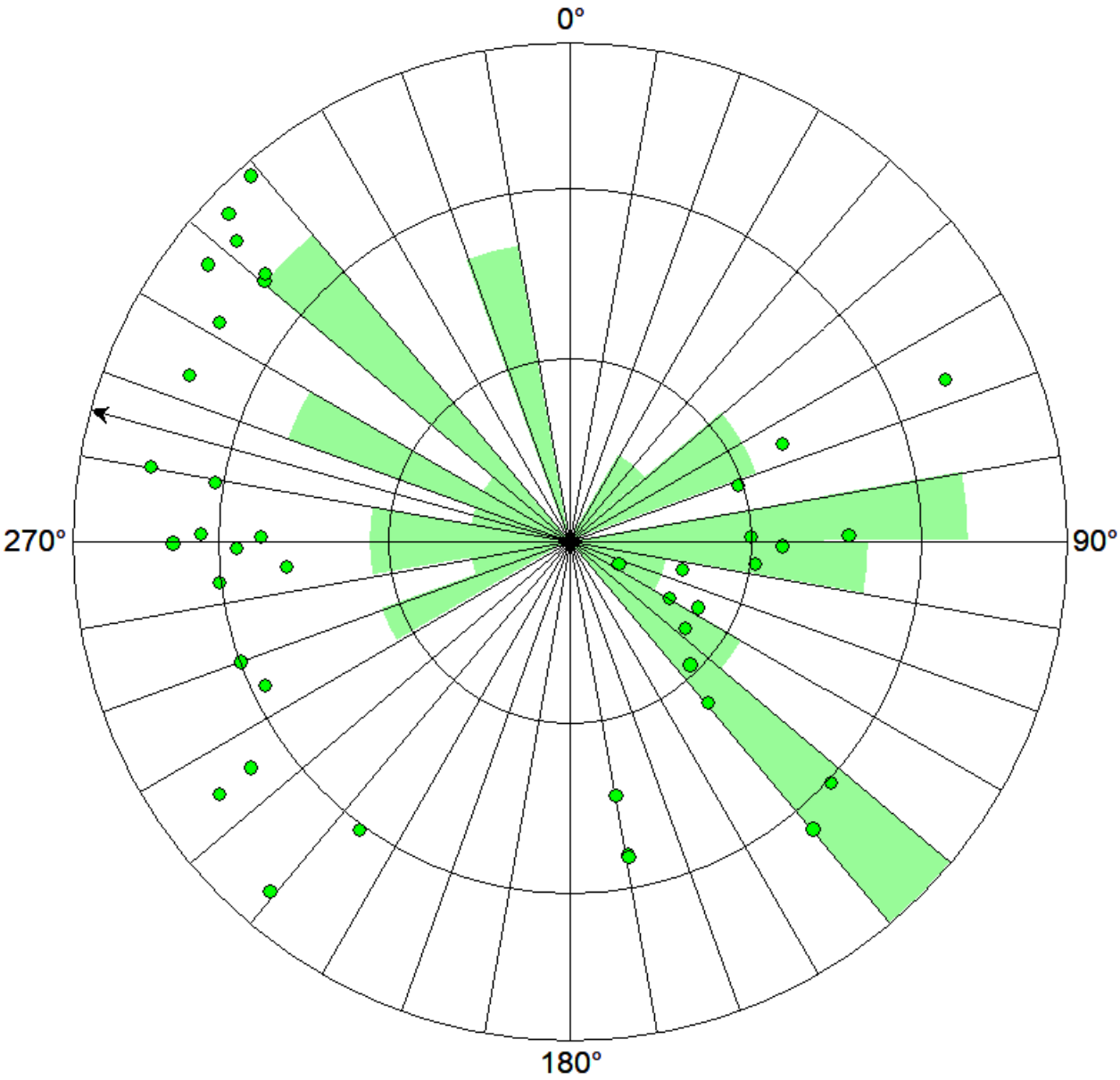
**Acoustic and Optical Televiewer image log Schmidt
Stereonet evaluation for interpreted log interval**

Log Date: 20 June 2023

IMPORTANT NOTE

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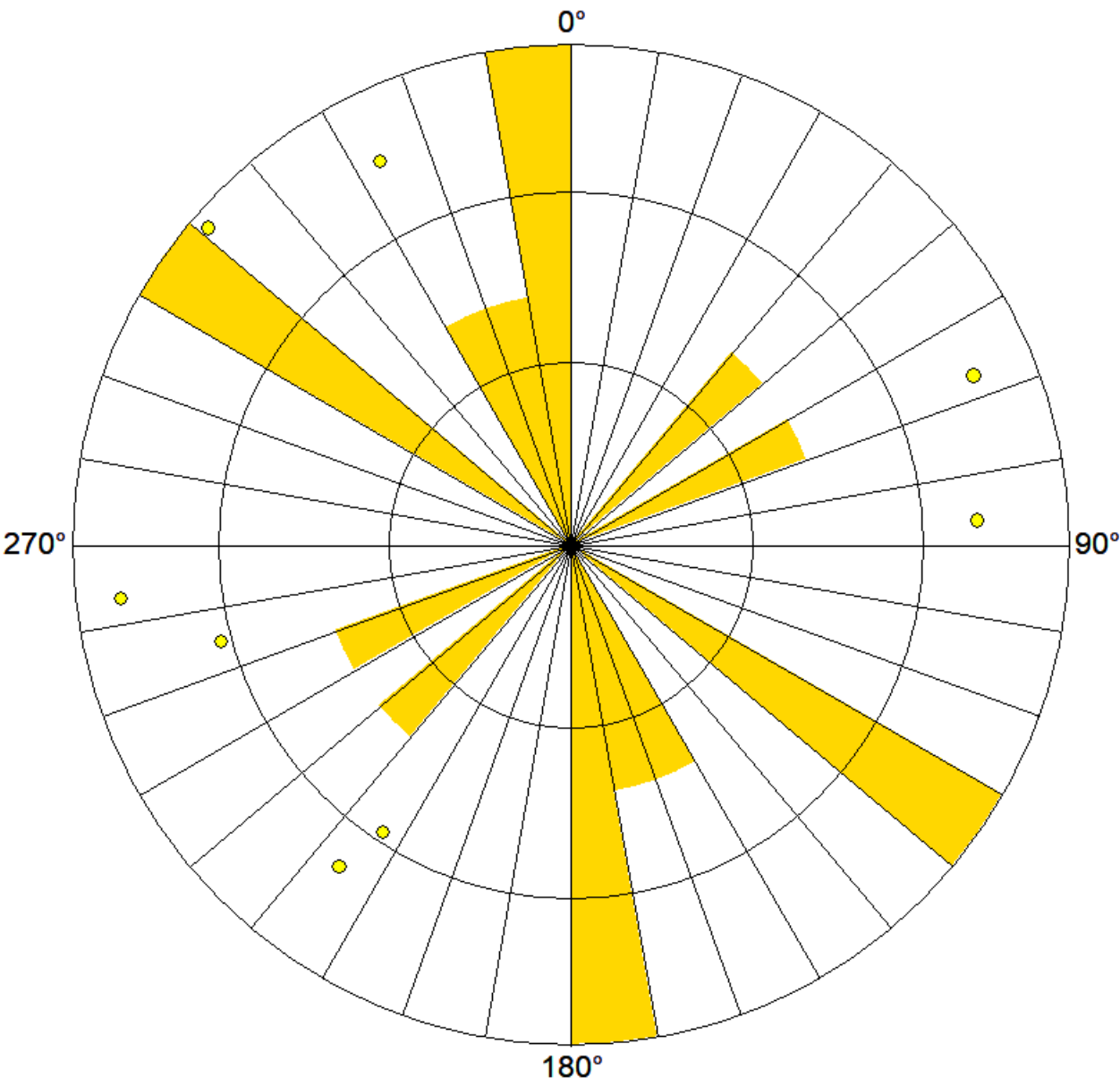
FOLIATIONS – 15.0 TO 47.9 M



	Counts	Dip [deg]	Azimuth [deg]	Strike [deg]
Mean	41	85.54	285.36	15.36 - 195.36

Foliations: Scattered dip azimuth directions

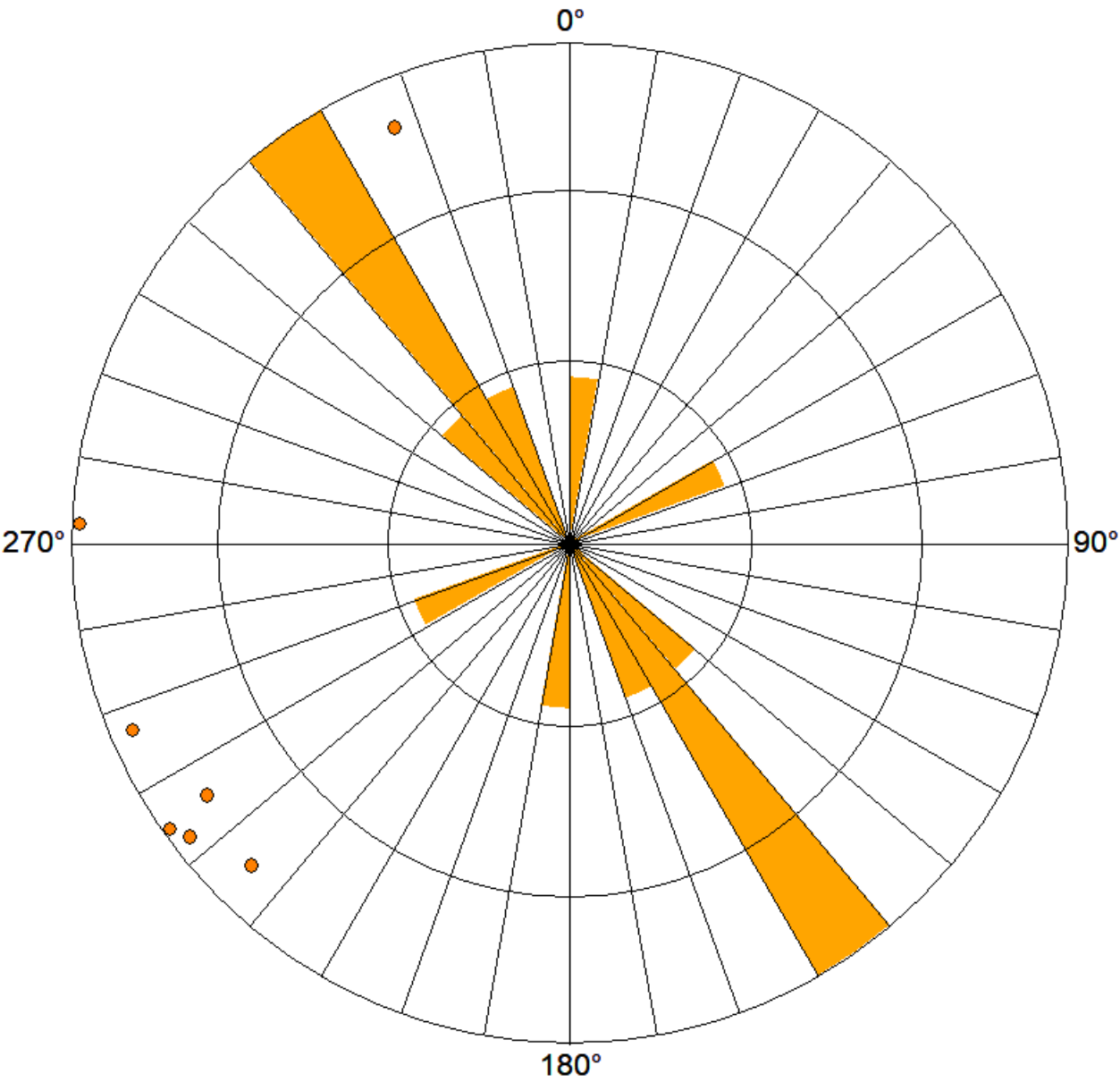
PARTIAL OPEN FRACTURES – 15.0 TO 47.9 M



	Counts	Dip [deg]	Azimuth [deg]	Strike [deg]
Mean	8	79.50	75.00	165.00 – 345.00

Partial Open Fractures: Scattered strike directions with a bimodal preference in the N to S and SE to NW strike directions

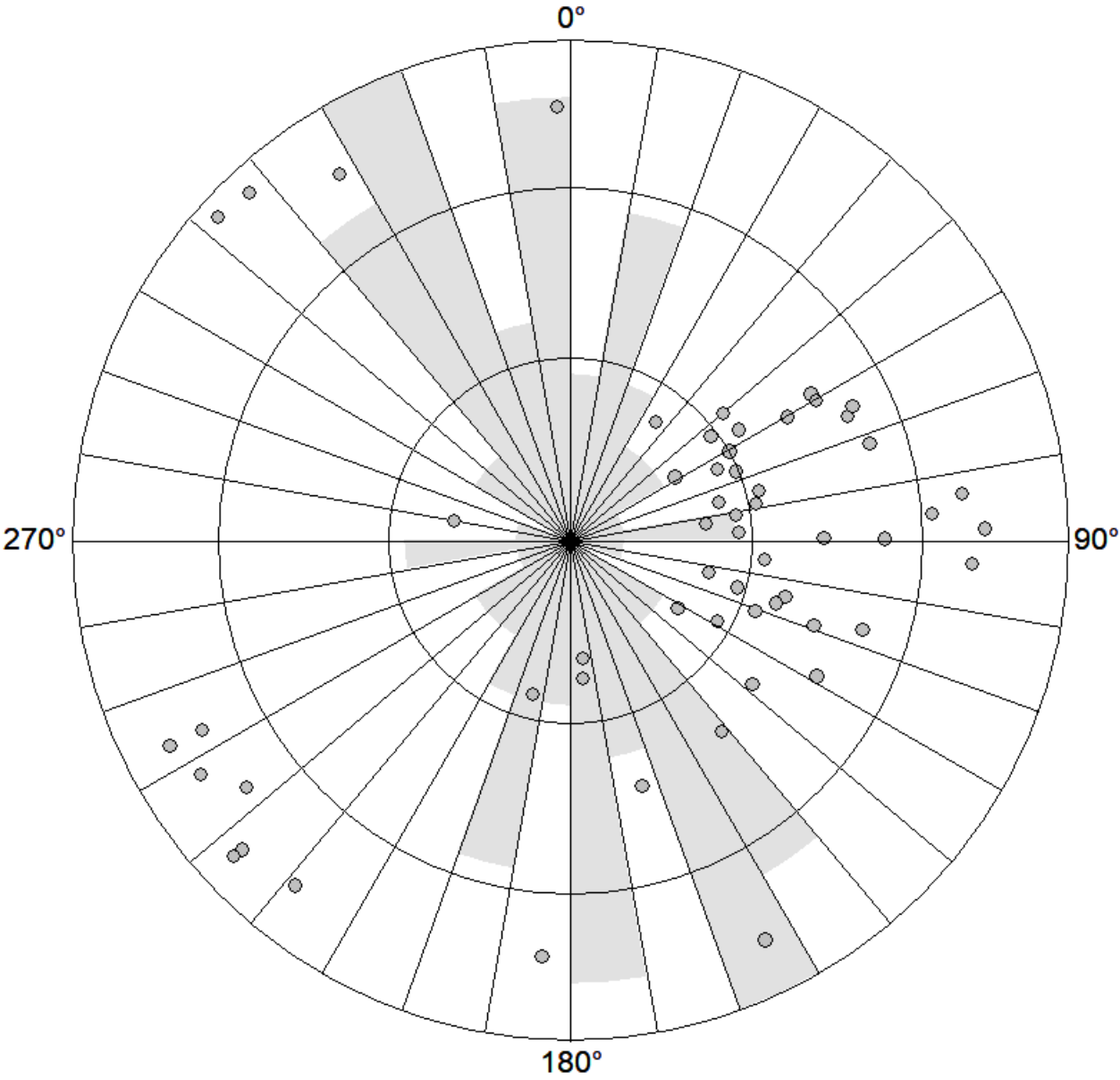
CLOSED FRACTURES – 15.0 TO 47.9 M



	Counts	Dip [deg]	Azimuth [deg]	Strike [deg]
Mean	7	83.96	58.91	148.91 - 328.91

Closed Fractures: Scattered strike directions with a preference in the SSE to NNW strike direction

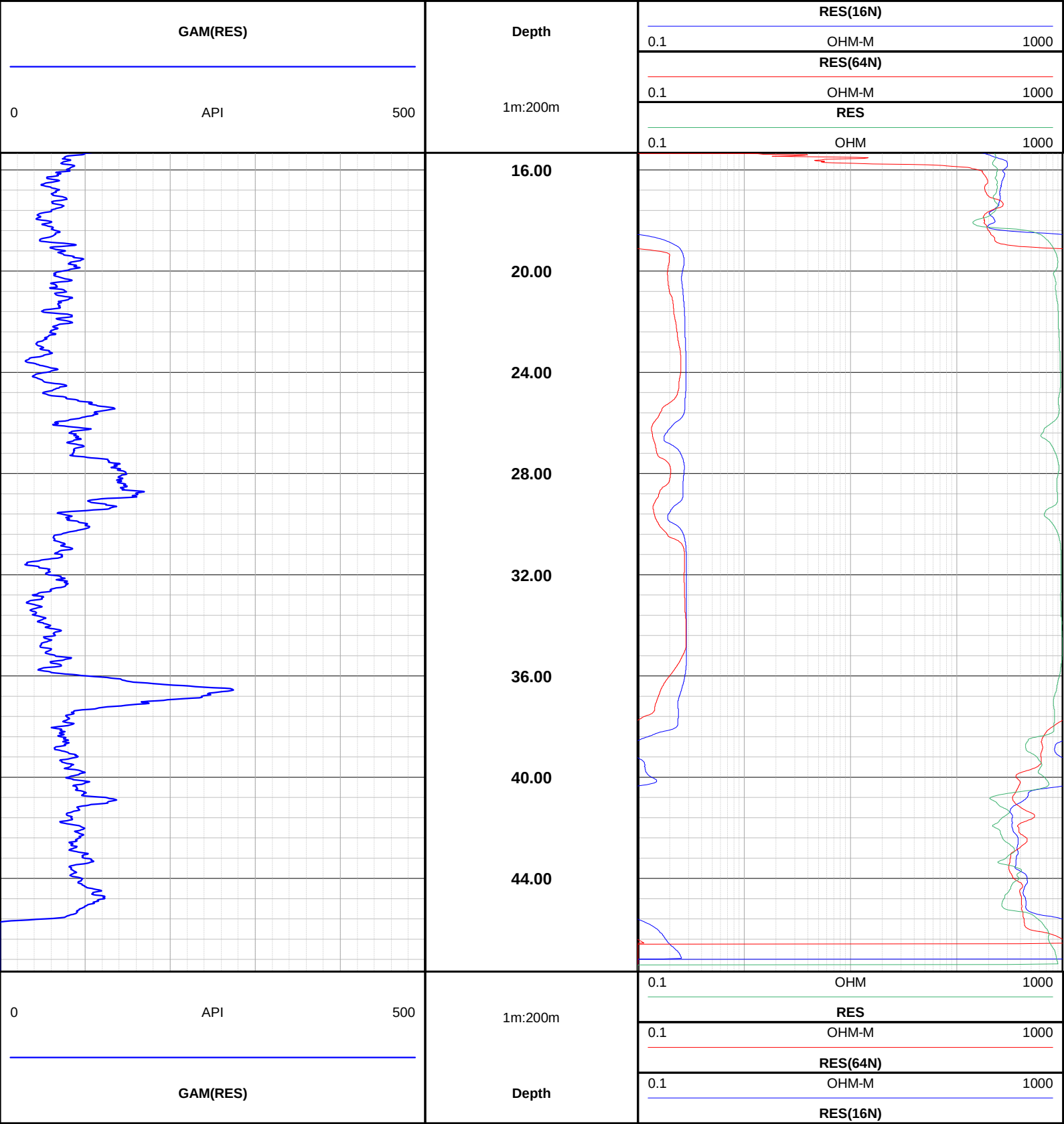
HEALED FRACTURES AND VEINS – 15.0 TO 47.9 M



	Counts	Dip [deg]	Azimuth [deg]	Strike [deg]
Mean	57	35.87	268.23	178.23 - 358.23

Healed Fractures and Veins: Scattered strike directions with a preference in the SSE to NNW strike direction

				MULTI-RES LOG BHUA17																			
COMPANY WELL				SMEC BHUA17				FIELD LOCATION				DALRYMPLE RD PIONEER-BURDEKIN				STATE COUNTRY				QLD AUSTRALIA			
LOCATION: PIONEER-BURDEKIN FIELD: DALRYMPLE RD STATE: QLD WELL: BHUA17 COMPANY: SMEC				LOG MEASURED FROM				GL		ELEVATIONS:				OTHER SERVICES:									
				DRILLING MEASURED FROM				GL		KB				1.									
				PERMANENT DATUM						DF				2.									
				PERMANENT DATUM ELEVATION						GL				3.									
				LICENSE		SECTION		TOWNSHIP		RANGE		MAGNETIC DECLINATION											
												8.12deg											
DATE		20-06-2023						RECORDED BY		DTH													
TIME		12-20						WITNESSED BY															
RUN NUMBER		1						LOGGING UNIT		V013													
DEPTH-DRILLER		48m						RIG NUMBER															
DEPTH-LOGGER		47.23m						TOOL TYPE		9057A													
BIT SIZE		96mm						TOOL SERIAL NO.		2796													
CASING TYPE		STEEL						EASTING		660133													
CASING ID		100mm						NORTHING		7667219													
CASING BOTTOM		14m						SAMPLE INT.		.01m													
FLUID TYPE		0						LOG DIRECTION		U													
TRUCK CAL NO.		0.09787						FEET OR METER		M													
WATER LEVEL								SOURCE TYPE				SOURCE ID											
LOGGER COMMENTS:																							
1.																							
2.																							
3.																							
MNEMONICS																							
GAM(RES) NATURAL GAMMA FROM MULTI-RES TOOL																							
RES(16N) 16" NORMAL RESISTIVITY																							
RES(64N) 64" NORMAL RESISTIVITY																							
RES SINGLE POINT RESISTIVITY																							
IMPORTANT NOTE				The following interpretations are opinions based upon inferences from borehole logs, Epiroc Kinetic Logging Services cannot and does not guarantee the correctness or accuracy of any interpretations. Therefore, Epiroc Kinetic Logging Services shall not be liable or responsible for any loss, damage, cost or expense incurred or sustained by anyone resulting from any interpretations.																			



DEPTH SCALE 1:200

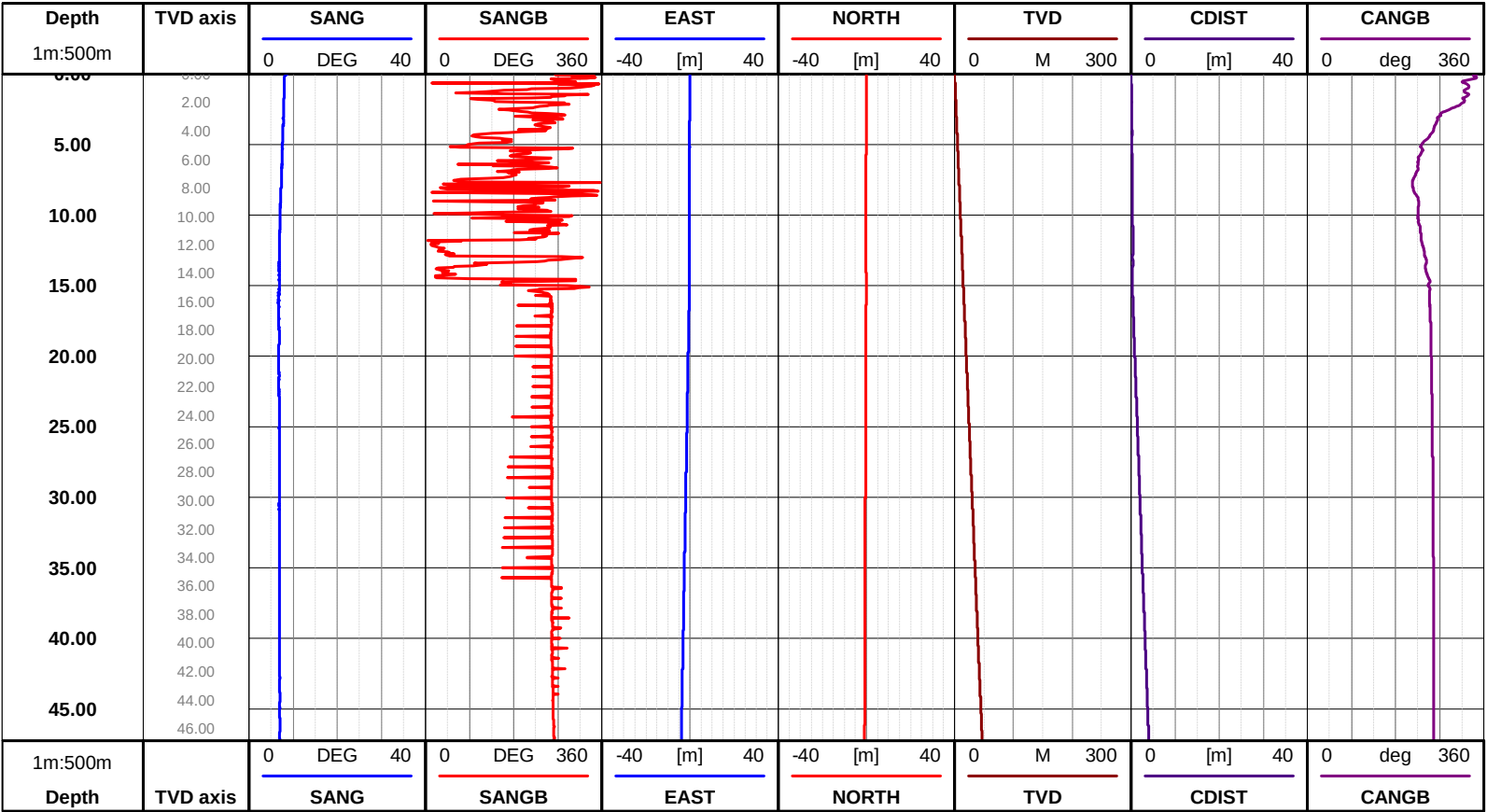
		VERTICALITY ANALYSIS BHUA17									
COMPANY WELL		SMEC BHUA17		FIELD LOCATION		DALRYMPLE RD DALRYMPLE RD, EUNGELLA		STATE COUNTRY		QLD AUSTRALIA	
DALRYMPLE RD, EUNGELLA FIELD: DALRYMPLE RD STATE: QLD WELL: BHUA17 COMPANY: SMEC		PERMANENT DATUM PERMANENT DATUM ELEVATION LOG MEASURED FROM GL DRILLING MEASURED FROM GL				ELEVATIONS: KB DF GL		REMARKS: 1. 2.			
		LICENSE	SECTION	TOWNSHIP	RANGE	MAG DECL. 8.12deg					
		DATE	20-06-2023				RECORDED BY	DTH			
TIME	11-49				WITNESSED BY						
RUN NUMBER	1				LOGGING UNIT	V013					
DEPTH-DRILLER	48m				RIG NUMBER						
DEPTH-LOGGER	47.27m				TOOL TYPE	9702A					
BIT SIZE	96mm				TOOL SERIAL NO.	2798					
CASING TYPE	STEEL				EASTING						
CASING ID	100mm				NORTHING						
CASING BOTTOM	15m				SAMPLE INT.	.01m					
FLUID TYPE	0				LOG DIRECTION	U					
TRUCK CAL NO.	0.09787				FEET OR METER	M					
WATER LEVEL					SOURCE TYPE		SOURCE ID				

IMPORTANT NOTE

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DEVIATION LIST							
MNEMONIC DESCRIPTORS							
SANGB	SAMPLE ANGLE BEARING			NORTH	BOREHOLE NORTH DEVIATION		
SANG	SAMPLE SLANT ANGLE (0 DEG = VERTICAL DOWN)			CDIST	DEVIATED CLOSURE DISTANCE		
TVD	TRUE VERTICAL DEPTH			CANGB	DEVIATED CLOSURE ANGLE BEARING		
EAST	BOREHOLE EAST DEVIATION						
ALL CO-ORDINATES ARE PRESENTED ORIENTED TO TRUE NORTH				MAGNETIC DECLINATION	8.12deg		
DEPTH	SANG	SANGB	EAST	NORTH	TVD	CDIST	CANGB
m	deg	deg	m	m	m	m	deg
0.00	8.71336	346.515	-999.25	-999.25	0	-999.25	-999.25
1.00	7.98197	297.314	-0.0623624	0.0989981	0.99009	0.117003	327.792
2.00	7.84198	137.675	-0.0502472	0.0605416	1.98053	0.078677	320.309
3.00	7.76332	183.396	-0.128935	-0.00146069	2.9712	0.128943	269.351
4.00	7.72618	259.19	-0.237456	-0.0541169	3.96203	0.243544	257.161
5.00	7.58348	86.4312	-0.177467	-0.133622	4.95315	0.222147	233.022
6.00	7.49238	270.473	-0.201278	-0.18488	5.94446	0.273301	227.432
7.00	7.37086	100.941	-0.235232	-0.259969	6.93609	0.318278	222.471
8.00	7.2988	350.562	-0.18245	-0.261027	7.92782	0.31847	214.952
(c) Queensland Hydro Pty Ltd 2025, CC BY 4.0. Please note copyright and limitation of liability notices on attached cover page.							

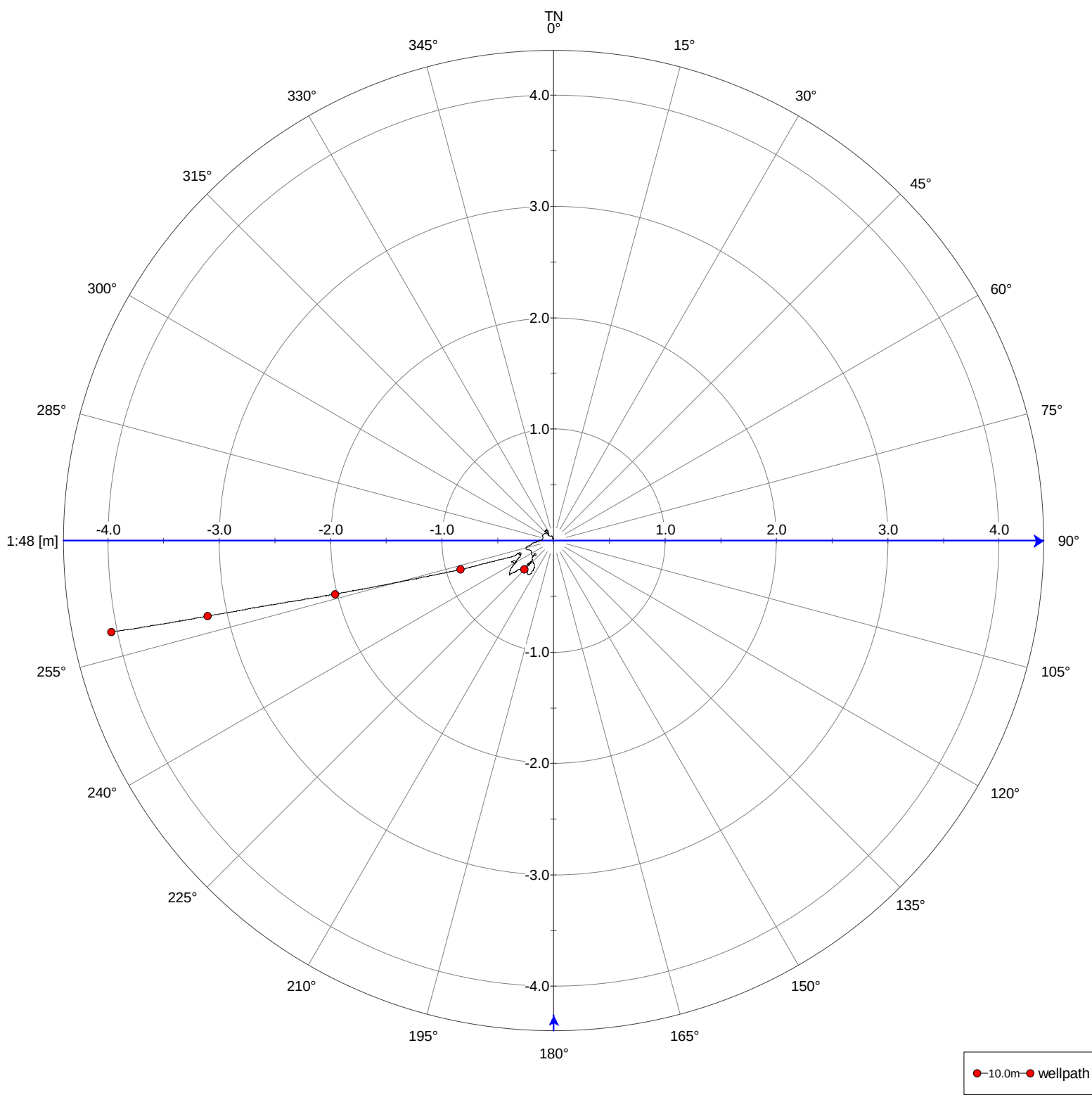
9.00	7.1078	16.4074	-0.216372	-0.202768	8.91989	0.296533	226.859
10.00	7.04741	174.043	-0.261248	-0.257465	9.91222	0.366795	225.418
11.00	6.953	213.908	-0.327952	-0.268203	10.9047	0.423657	230.723
12.00	6.85348	12.8131	-0.392675	-0.285648	11.8974	0.485581	233.966
13.00	6.86582	329.022	-0.3379	-0.188464	12.8903	0.386905	240.849
14.00	6.7952	36.4114	-0.320453	-0.166536	13.8832	0.361143	242.54
15.00	6.83274	289.283	-0.301161	-0.129681	14.8761	0.327895	246.703
16.00	6.61843	254.429	-0.396457	-0.15039	15.8691	0.424023	249.227
17.00	6.64998	257.302	-0.505628	-0.176791	16.8623	0.535644	250.728
18.00	6.80234	256.471	-0.61264	-0.204112	17.8554	0.645748	251.574
19.00	6.86439	256.197	-0.723438	-0.232796	18.8482	0.759972	252.162
20.00	6.77941	258.42	-0.833591	-0.259741	19.8412	0.87312	252.693
21.00	6.79434	256.983	-0.942591	-0.281829	20.8342	0.983822	253.354
22.00	6.79647	256.884	-1.05626	-0.305706	21.8272	1.09961	253.858
23.00	6.80767	257.738	-1.16623	-0.326546	22.8202	1.21108	254.358
24.00	6.84819	257.274	-1.28049	-0.35069	23.8131	1.32765	254.684
25.00	6.84349	51.6486	-1.39197	-0.373147	24.806	1.44112	254.994
26.00	6.85287	259.02	-1.50636	-0.394665	25.7988	1.5572	255.319
27.00	6.89981	256.304	-1.62132	-0.418754	26.7917	1.67452	255.518
28.00	6.87652	256.834	-1.73126	-0.437574	27.7845	1.7857	255.816
29.00	6.87976	258.178	-1.84531	-0.458456	28.7774	1.90141	256.048
30.00	6.85969	258.075	-1.96123	-0.480965	29.7702	2.01934	256.221
31.00	6.81626	258.099	-2.07358	-0.499571	30.7631	2.13291	256.454
32.00	6.8158	258.644	-2.18736	-0.519995	31.756	2.24832	256.628
33.00	6.80273	259.043	-2.29923	-0.537198	32.7489	2.36115	256.849
34.00	6.88512	258.668	-2.41469	-0.556571	33.7417	2.478	257.02
35.00	6.87731	259.009	-2.52773	-0.574243	34.7346	2.59214	257.201
36.00	6.88279	258.004	-2.64313	-0.595246	35.7274	2.70933	257.308
37.00	6.91316	257.725	-2.75927	-0.616279	36.7201	2.82726	257.41
38.00	6.8971	259.1	-2.87571	-0.637189	37.7128	2.94545	257.506
39.00	6.87518	259.693	-2.9911	-0.658228	38.7057	3.06267	257.589
40.00	6.86786	258.391	-3.10691	-0.67721	39.6985	3.17986	257.704
41.00	6.87313	258.564	-3.22329	-0.698536	40.6913	3.29812	257.772
42.00	6.92369	259.54	-3.34063	-0.720375	41.6841	3.41741	257.831
43.00	6.91099	259.899	-3.45831	-0.739506	42.6767	3.53649	257.93
44.00	6.98195	260.134	-3.57697	-0.758442	43.6694	3.65649	258.029
45.00	6.92614	260.406	-3.6967	-0.779111	44.662	3.77791	258.099
46.00	7.00899	262.449	-3.81609	-0.798308	45.6547	3.8987	258.184
47.00	6.98343	263.108	-3.93672	-0.814559	46.6472	4.02011	258.31



NOTES ON VERTICALITY PLOTS

1. The following verticality plots are scaled automatically to obtain the best visual effect within the default page size.
2. All co-ordinates are presented oriented to True North.

DEVIATION PLOT



Depth [m] 1:216
Horiz [m] 1:54

wellpath 

