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BOREHOLE: BHL-12

Project: Pioneer-Burdekin PHES
Location: Netherdale/Dalrymple Heights
Client: Queensland Hydro
Job No.: PS138693

Position: Lower Reservoir
Coords: 660324.9 m E 7661426.3 m N MGA2020-55
Surface RL: 175.90 m AHD
Contractor: Twin Hills Engineering & Drilling Drill Rig: Hanjin D&B-8DTM
Inclination: -87° Direction: 172°

Sheet 1 of 12
Date Started: 26/10/2023
Date Completed: 8/11/2023
Logged: JRC/NLP

Drilling				Sampling		Field Material Description					
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
ADV	E	Groundwater Not Encountered	0	175.90			GM	FILL Sandy Silty GRAVEL: fine to coarse, rounded, brown and grey, sand is fine to coarse grained; trace low plasticity clay.	D	L	FILL
			0.50	175.40			CL	Sandy CLAY: low plasticity, brown and grey, sand is fine to coarse grained; trace fine to coarse gravel.		St	RESIDUAL SOIL
	F		1	174.40	SPT 1.50-1.95 m 5.8,10 N=18 D 1.50-1.95 m PB-BHL-12-001			Brown mottled red-brown, black and white, with silt.	w<PL	VSt	
F-H		Groundwater Not Observed	2	173.40			SC	Clayey SAND: fine to coarse grained, brown-orange mottled white, clay is low plasticity.			
			3		SPT 3.00-3.45 m 13,19,21 N=40 D 3.00-3.36 m PB-BHL-12-002 PP 3.20 m =270-330 kPa D 3.36-3.45 m PP 3.36 m =460-600 kPa		SC	Gravelly Clayey SAND: fine to coarse grained, brown-orange mottled yellow-brown and pale grey, clay is low plasticity; gravel is fine.			
			4	171.91							
WB		Groundwater Not Observed	5		SPT 4.50-4.93 m 19,30,30/125 mm D 4.50-4.93 m PB-BHL-12-003 PP 4.89 m =150-250 kPa				M	VD	EXTREMELY WEATHERED MATERIAL
			6		SPT 6.00-6.45 m 18,22,27 N=49 D 6.00-6.45 m PB-BHL-12-004 PP 6.20 m =180-220 kPa						
			7		SPT 7.50-7.79 m 29,38/140 mm D 7.50-7.79 m PB-BHL-12-005 PP 7.64 m =90-100 kPa						
			8								
			8.70	167.21			CI	Sandy CLAY: medium plasticity, mottled orange, black, brown, brown-yellow, and pale grey, sand is fine to coarse grained; trace fine gravel.	w<PL	VSt-H	
			9		SPT 9.00-9.39 m 11,27,30/90 mm D 9.00-9.39 m PB-BHL-12-006 PP 9.00 m =130 kPa PP 9.35 m =280 kPa						
			10								
Comments											Checked GEM Date 19/10/2024

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BOREHOLE: BHL-12

Project: Pioneer-Burdekin PHES

Location: Netherdale/Dalrymple Heights

Client: Queensland Hydro

Job No.: PS138693

Position: Lower Reservoir

Coords: 660324.9 m E 7661426.3 m N MGA2020-55

Surface RL: 175.90 m AHD

Contractor: Twin Hills Engineering & Drilling Drill Rig: Hanjin D&B-8DTM

Inclination: -87° Direction: 172°

Sheet 2 of 12

Date Started: 26/10/2023

Date Completed: 8/11/2023

Logged: JRC/NLP

Drilling				Sampling		Field Material Description						
METHOD	PENETRATION RESISTANCE	WATER	DEPTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	SOIL/ROCK MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
WB		Groundwater Not Observed	10	165.91	SPT 10.50-10.62 m 30/120 mm D 10.50-10.62 m PB-BHL-12-007			GW	Sandy GRAVEL: fine to coarse, sub-angular to angular, brown mottled pale grey, sand is fine to coarse grained; with medium plasticity clay.	M	VD	EXTREMELY WEATHERED MATERIAL
			11									
SPT			12	12.00 163.92 12.25	SPT 12.00-12.25 m 3.30/95 mm D 12.00-12.25 m PB-BHL-12-008				Brown-orange mottled yellow-brown and white, trace low to medium plasticity clay.			
									Continued as Cored Borehole			
			13									
			14									
			15									
			16									
			17									
			18									
			19									
			20									

Comments

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Date 19/10/2024

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BOREHOLE: BHL-12

Project: Pioneer-Burdekin PHES

Location: Netherdale/Dalrymple Heights

Client: Queensland Hydro

Job No.: PS138693

Position: Lower Reservoir

Coords: 660324.9 m E 7661426.3 m N MGA2020-55

Surface RL: 175.90 m AHD

Contractor: Twin Hills Engineering & Drilling

Inclination: -87° Direction: 172°

Sheet 3 OF 12

Date Started: 26/10/2023

Date Completed: 8/11/2023

Logged: JRC/NLP

Drilling					Field Material Description				Defect Information			
METHOD	WATER	TCR	RQD	DEPTH (metres)	DEPTH RL	GRAPHIC LOG	ROCK / SOIL MATERIAL DESCRIPTION	WEATHERING	INFERRED STRENGTH (MPa)	DEFECT DESCRIPTION & Additional Observations (Core partings shown - refer to Detailed Defect Descriptions table for all logged features)		AVERAGE DEFECT SPACING (mm)
								VL J L M H VH EH	2 5 10 20 40 60 80 100			10 30 100 300 1000 3000
				10								
				11								
				12								
				12.25			Continuation from non-cored borehole					
				163.67			NO CORE 0.60m (12.25-12.85)					
				12.85								
				13								
				13.00			GRANODIORITE: brown-orange, red-brown, yellow-brown, pale red, and black, recovered as GRAVEL, medium to coarse grained, angular.	HW				
				162.92								
				13.21								
				13.37			NO CORE 0.21m (13.00-13.21)	HW				
				162.55								
				14			GRANODIORITE: brown-orange, pale red, yellow-brown, and black, recovered as GRAVEL, fine to coarse grained, sub-angular to angular.					
				14.76			NO CORE 1.39m (13.37-14.76)					
				161.16								
				15			GRANODIORITE: coarse grained, brown-orange, pale grey, black, and white, crystalline, massive.	HW - MW				
				16								
				16.21			Pale grey, white, black, and brown.	MW - SW				
				159.71								
				16.74			Pale grey, brown-orange, black, and white.					
				159.18								
				17								
				17.76			Pale grey, black, and white.	SW				
				158.16								
				18								
				19								
				20								
				20.00								

Comments

Checked GEM
Date 19/10/2024



BOREHOLE: BHL-12

Project: Pioneer-Burdekin PHES

Location: Netherdale/Dalrymple Heights

Client: Queensland Hydro

Job No.: PS138693

Position: Lower Reservoir

Coords: 660324.9 m E 7661426.3 m N MGA2020-55

Surface RL: 175.90 m AHD

Contractor: Twin Hills Engineering & Drilling

Drill Rig: Hanjin D&B-8DTM

Inclination: -87° Direction: 172°

Sheet 4 OF 12

Date Started: 26/10/2023

Date Completed: 8/11/2023

Logged: JRC/NLP

Drilling						Field Material Description				Defect Information				
METHOD	WATER	TCR	RQD	DEPTH (metres)	DEPTH RL	GRAPHIC LOG	ROCK / SOIL MATERIAL DESCRIPTION	WEATHERING	INFERRED STRENGTH (MPa)	DEFECT DESCRIPTION & Additional Observations (Core partings shown - refer to Detailed Defect Descriptions table for all logged features)		AVERAGE DEFECT SPACING (mm)		
HQ3	90-95% Water Return		100	81	20	155.93		GRANODIORITE: coarse grained, pale grey, black, and white, crystalline, massive.	SW		20.31: J, 55°, ph or-br SN, IR, RF			
						20.53: J, 25°, ph or-br SN, IR, RF								
					21	21.10 154.83		Pink, pale grey, dark grey, and black.			21.20: J, 10°, ph or-br SN, IR, RF			
			100	91				21.21: J, 85°, ph wh to pk mi VN, PR, SM, ph or-br SN						
					22	21.93 154.00		White, grey, and black.			21.25: J, 10°, ph or-br SN, IR, SM			
			100	69	23			21.40: J, 20°, ph or-br SN, IR, SM						
					24			MW SW		21.58: J, 40°, ph wh mi CT, PR, SM, ph or-br SN				
			100	100	25					21.70: J, 70°, ph or-br SN, PR, RF				
			100	100	26			SW		21.78: J, 20°, ph or-br SN, UN, SM				
					27					22.23-23.75: core stained by drilling				
					28					22.45: J, 10°, ph br VN, IR, SM				
			100	93	29					22.62: J, 55°, ph br VN, UN, SM, ph or-br SN				
			100	100	30	30.00				22.68: J, 20°, ph br VN, PR, SM				

Comments

Checked GEM
Date 19/10/2024



BOREHOLE: BHL-12

Project: Pioneer-Burdekin PHES

Location: Netherdale/Dalrymple Heights

Client: Queensland Hydro

Job No.: PS138693

Position: Lower Reservoir

Coords: 660324.9 m E 7661426.3 m N MGA2020-55

Surface RL: 175.90 m AHD

Contractor: Twin Hills Engineering & Drilling

Inclination: -87° Direction: 172°

Sheet 5 OF 12

Date Started: 26/10/2023

Date Completed: 8/11/2023

Logged: JRC/NLP

Drilling						Field Material Description				Defect Information			
METHOD	WATER	TCR	RQD	DEPTH (metres)	DEPTH RL	GRAPHIC LOG	ROCK / SOIL MATERIAL DESCRIPTION	WEATHERING	INFERRED STRENGTH (MPa)	DEFECT DESCRIPTION & Additional Observations (Core partings shown - refer to Detailed Defect Descriptions table for all logged features)		AVERAGE DEFECT SPACING (mm)	
				30	145.94		GRANODIORITE: coarse grained, white, grey, and black, crystalline, massive, decreasing percentage of black crystals and paler in colour	SW		30.05: J, 25°, CN, PR, SM			
		100	100							30.38: J, 20°, CN, PR, RF			
										30.58: J, 30°, CN, CU, RF			
				31						30.89: J, 10°, CN, PR, SM			
										31.08: J, 10°, CN, PR, RF			
										31.54: J, 45°, CN, PR			
		100	95	32						31.73: J, 20°, CN, UN, RF			
										32.19: J, 0°, CN, PR, SM			
										32.56: J, 5°, CN, PR, RF			
										32.70: J, 25°, CN, CU, RF			
				33						33.13: J, 40°, CN, PR, RF			
										33.18: J, 40°, CN, PR, RF			
		100	92							33.37: J, 10°, CN, PR, RF			
										33.39: J, 0°, CN, PR, RF			
										33.68: J, 20°, CN, PR, SM			
				34						34.24: J, 5°, CN, PR, SM			
										34.39: J, 35°, CN, PR, SM			
										34.99: J, 40°, CN, PR, RF			
		100	94	35						35.25: J, 25°, CN, PR, RF			
										36.03: J, 5°, CN, PR, RF			
										36.73: J, 30°, CN, PR, RF			
				36						37.21: J, 25°, CN, PR, RF			
										38.32: J, 30°, CN, PR, RF			
										39.21: J, 10°, CN, PR, RF			
										39.42: J, 10°, CN, PR, RF			
		100	100	38						39.65-40.00: PLT (A) Is 50 = 8.30MPa (M)			
				39									
							slightly altered, pink						
		100	100	40	40.00								

Comments

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Date 19/10/2024

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Date Started: 26/10/2023
Date Completed: 8/11/2023
Logged: JRC/NLP

HQ3

Checked	GEM
Date	19/10/2024



BOREHOLE: BHL-12

Project: Pioneer-Burdekin PHES
Location: Netherdale/Dalrymple Heights
Client: Queensland Hydro
Job No.: PS138693

Position: Lower Reservoir
Coords: 660324.9 m E 7661426.3 m N MGA2020-55
Surface RL: 175.90 m AHD
Contractor: Twin Hills Engineering & Drilling Drill Rig: Hanjin D&B-8DTM
Inclination: -87° Direction: 172°

Sheet 7 OF 12
Date Started: 26/10/2023
Date Completed: 8/11/2023
Logged: JRC/NLP

Drilling						Field Material Description				Defect Information			
METHOD	WATER	TCR	RQD	DEPTH (metres)	DEPTH RL	GRAPHIC LOG	ROCK / SOIL MATERIAL DESCRIPTION	WEATHERING	INFERRED STRENGTH (MPa)	DEFECT DESCRIPTION & Additional Observations (Core partings shown - refer to Detailed Defect Descriptions table for all logged features)		AVERAGE DEFECT SPACING (mm)	
HQ3	90-95% Water Return	100	94	50	125.97		49.93 - 50.08m: grey mafic inclusion, 30-45 degree contact GRANODIORITE: coarse grained, white, grey, and black, crystalline, massive.	SW		50.21: J, 30°, CN, PR, RF		10	
										50.62: J, 40°, CN, PR, RF		30	
		100	93	51						51.33: J, 60°, pk SN, PR, SM 51.38: J, 40°, CN, PR, SM 51.54: J, 40°, CN, PR, RF 51.61: J, 30°, CN, PR, RF 51.77: J, 25°, CN, PR, RF		100	
				52						52.11: J, 30°, CN, PR, SM		300	
		100	43	53						52.39: J, 30°, CN, PR, RF 52.40: J, 40°, CN, PR, RF 52.41: J, 90°, CN, PR, RF 52.51: J, 90°, CN, UN 52.56: J, 0°, CN, UN, RF 52.72: J, 0°, CN, UN, RF 52.74: J, 45°, CN, PR, RF 52.79: J, 50°, CN, UN, RF 52.83: J, 85°, CN, IR, RF 52.84: J, 85°, CN, IR, RF 52.85: J, 30°, CN, UN, RF 52.87: J, 20°, CN, IR, RF 52.91: J, 30°, CN, IR, RF 53.03: J, 20°, CN, PR, SM 53.06: J, 75°, CN, IR, RF 53.07: J, 45°, CN, PR, RF 53.13: J, 0°, CN, PR, RF 53.26: J, 5°, CN, PR, RF 53.34: J, 35°, CN, PR, RF 54.31: J, 20°, CN, PR, SM 54.61: J, 20°, ph wh mi VN, PR, SM		1000	
				54						54.98: J, 30°, ph gy mi VN, PR, SM, possible DB 55.14: J, 25°, CN, UN, RF, possible DB		3000	
		100	97	55						55.53: J, 15°, gr mi SN, PR, SM			
				56						56.18: J, 20°, CN, PR, SM			
		100	100	56						56.95: J, 20°, CN, PR, SM			
				57						57.43: J, 0°, CN, PR, VR, possible DB 57.58: J, 5°, CN, UN, VR, possible DB			
		100	100	58						58.25: J, 30°, CN, PR, RF 58.28: J, 0°, CN, PR, RF 58.29: J, 30°, CN, PR, SM			
				59						59.60: J, 20°, CN, PR, SM			
		100	100	60									

Comments

Checked GEM
Date 19/10/2024



BOREHOLE: BHL-12

Project:	Pioneer-Burdekin PHES	Position:	Lower Reservoir	Sheet	8 OF 12
Location:	Netherdale/Dalrymple Heights	Coords:	660324.9 m E 7661426.3 m N MGA2020-55	Date Started:	26/10/2023
Client:	Queensland Hydro	Surface RL:	175.90 m AHD	Date Completed:	8/11/2023
Job No.:	PS138693	Contractor:	Twin Hills Engineering & Drilling Drill Rig: Hanjin D&B-8DTM	Logged:	JRC/NLP
		Inclination:	-87° Direction: 172°		

Drilling						Field Material Description				Defect Information			
METHOD	WATER	TCR	RQD	DEPTH (metres)	DEPTH RL	GRAPHIC LOG	ROCK / SOIL MATERIAL DESCRIPTION	WEATHERING	INFERRED STRENGTH (MPa)	DEFECT DESCRIPTION & Additional Observations (Core partings shown - refer to Detailed Defect Descriptions table for all logged features)		AVERAGE DEFECT SPACING (mm)	
									VL-2 J M H VH EH	■ - UCS		10 30 100 300 1000 3000	
HQ3	90-95% Water Return		100	100	60	115.98	GRANODIORITE: coarse grained, white, grey to dark grey, and black, crystalline, massive, slightly altered.	SW		60.34: J, 30°, CN, PR, SM			
					61			60.59: J, 20°, ph wh and rd mi VN, PR, SM					
						61.06: J, 30°, ph wh mi VN, PR, SM							
			100	100	62			61.50-61.80: PLT (A) Is 50 = 7.30MPa (M) 61.49: J, 10°, CN, PR, SM					
					63								
			100	75	64			63.21: J, 15°, CN, PR, SM 63.32: J, 65°, ph wh and br mi CT, PR, SM 63.38: J, 60°, ph wh mi VN, PR, SM 63.38: J, 40°, CN, UN, SM 63.41: J, 80°, CN, PR, SM 63.52: J, 50°, wh mi CT, PR, SM 63.56: J, 40°, CN, CU, RF 63.56: J, 30°, CN, PR, SM 63.57: J, 70°, ph wh mi VN, IR, SM 63.58: J, 50°, CN, PR, SM 63.62: J, 40°, CN, PR, SM 63.63: J, 50°, CN, PR, SM 63.64: J, 40°, CN, PR, SM 63.81: J, 40°, CN, PR, SM 63.97: J, 40°, CN, PR, RF 64.13: J, 20°, CN, PR, SM 64.21: J, 30°, CN, PR, RF 64.45: J, 25°, CN, CU, SM, 5 mm pl gr-br halo 64.53: J, 70°, ph bk and wh mi VN, PR, SM, pl or halo 64.67: J, 40°, wh mi CT, ST, SM 64.77: J/V, 75°, wh mi CT, PR, SM, <2 mm 64.80: J, 0°, CN, IR, VR, possible DB 64.83: J, 35°, CN, IR, VR, possible DB 64.92: J, 20°, ph wh mi VN, UN, SM 64.96: J, 40°, ph wh mi VN, UN, SM 65.04: J/V, 50°, wh mi CT, PR, SM, <2 mm 65.25: J, 40°, wh mi CT, PR, SM 65.26: J, 0°, CN, PR, SM 65.44: J, 10°, CN, PR, RF 65.76: J, 0°, bk SN, PR, SM, possibly drilling oil 65.81: J, 0°, CN, CU, SM, possible DB, drill spun 66.04: J, 50°, CN, UN, SM 66.63: J, 30°, CN, PR, SM 66.90: J, 60°, CN, PR, RF, pl br alt 66.90: J, 60°, CN, PR, RF, pl br alt 66.92: J, 0°, CN, PR, SM, pl br alt 66.94: J, 40°, ph bk SN, PR, SM, pl br alt 67.02: J, 35°, ph wh mi VN, PR, SM 67.17: J, 10°, CN, UN, SM 67.24: J, 5°, CN, PR, SM					
					65			slightly altered halos around some defects, alteration generally pale orange to white and grey-green, rare muscovite possibly pyrite	SW - FR				
					66								
					67								
					68						67.83: J, 5°, CN, IR, possible DB		
			69					68.31: J, 25°, ph wh mi VN, PR, SM 68.51: J, 40°, CN, UN, RF 68.64: J, 30°, CN, IR, RF, possible DB					
		100	87					69.22: J, 0°, CN, PR, RF, possible DB 69.24: J, 65°, ph wh mi VN, PR, SM					
				70.00				69.82: J, 20°, CN, UN, RF					

Comments	Checked	GEM
	Date	19/10/2024



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Date Started: 26/10/2023
Date Completed: 8/11/2023
Logged: JRC/NLP

Drilling						Field Material Description						Defect Information											
METHOD	WATER	TCR	RQD	DEPTH (metres)	DEPTH RL	GRAPHIC LOG	ROCK / SOIL MATERIAL DESCRIPTION	WEATHERING	INFERRED STRENGTH (MPa) ■ - UCS						DEFECT DESCRIPTION & Additional Observations (Core partings shown - refer to Detailed Defect Descriptions table for all logged features)	AVERAGE DEFECT SPACING (mm)							
									VL	J	N	H	VH-200	EH		10	30	100	300	1000	3000		
HQ3	90-95% Water Return	100	87	70	106.00		GRANODIORITE: coarse grained, white, grey to dark grey, and black, crystalline, massive, slightly altered.	SW - FR							69.88: J, 40°, CN, IR, SM 69.94: J, 45°, ph wh mi VN, PR, SM 69.97: J, 80°, ph wh mi VN, UN, SM 69.98: J, 80°, ph wh mi VN, UN, SM 70.06: J, 90°, ph wh mi VN, UN, SM 70.14: J, 15°, ph wh mi VN, UN, RF 70.33: J, 55°, ph wh mi VN, PR, SM, ph gy SILT, possible drilling mud								
		100	40	71				pink, fine to medium grained, moderately altered	SW							70.40: J, 20°, ph wh mi VN, UN, SM 70.71: J, 20°, ph wh mi VN, IR, RF 70.77: J, 85°, ph wh mi VN, UN, SM 70.84: J, 40°, CN, CU, SM, possible DB 70.85: J, 60°, CN, UN, SM 70.87: J, 30°, CN, UN, SM 70.92: J, 75°, ph wh mi VN, UN, SM 71.05: J, 70°, ph wh mi VN, PR, SM 71.06: J, 70°, ph wh mi VN, UN, SM 71.08: J, 60°, ph wh mi VN, PR, SM 71.11: J, 30°, ph wh mi VN, PR, SM 71.14: J, 20 - 30°, wh mi VN, IR, SM 71.25: J, 40°, ph wh mi VN, UN, SM 71.30: J, 45°, ph wh mi VN, UN, RF 71.34: J, 40°, ph wh mi VN, PR, SM 71.38: J, 60°, ph wh mi VN, PR, SM 71.44: J, 40°, ph wh mi VN, UN, SM 71.49: J, 40°, VN, UN, SM 71.52: J, 55°, VN, UN, SM 71.56: J, 45°, ph wh mi VN, UN, SM 71.67: J, 20°, ph wh mi VN, UN, SM 71.69: J, 50°, ph wh mi VN, UN, SM 71.73: J, 30°, ph wh mi VN, UN, SM 71.85: J, 70°, ph wh mi VN, UN, SM 71.89: J, 30°, ph wh mi VN, UN, SM 71.90: J, 80°, ph wh mi VN, UN, SM 71.91: J, 80°, ph wh mi VN, UN, SM 71.95: J, 60°, ph wh mi VN, UN, SM 72.02: J, 60°, CN, PR, SM 72.08: J, 50°, wh mi CT, PR, SM 72.31: J, 35°, ph wh mi VN, PR, SM 72.39: J, 85°, ph wh mi VN, UN, SM 72.45: J, 60°, ph wh mi VN, PR, SM 72.52: J, 35°, wh mi VN, PR, SM 72.61: J, 30°, CN, PR, SM 72.62: J, 50°, CN, PR, SM 72.68: J, 30°, ph wh mi VN, PR, SM 72.72: J, 30°, ph wh mi VN, PR, SM 72.77: J, 30°, ph wh mi VN, PR, SM 72.79: J, 35°, ph wh mi VN, PR, SM 72.80: J, 40°, ph wh mi VN, PR, SM							
		100	36	72												72.90: J, 70°, CN, PR, SM 72.94: J, 30°, CN, IR, SM 73.01: J, 30°, CN, UN, SM 73.03: J, 20°, CN, UN, SM 73.06: J, 60°, ph wh mi VN, UN, SM 73.13: J, 60°, CN, PR, SM 73.16: J, 50°, CN, PR, SM 73.17: J, 20°, CN, ST, SM 73.21: J, 90°, CN, PR, SM 73.25: J, 65°, wh mi VN, CU, SM 73.31: J, 30°, CN, PR, SM 73.38: J, 20°, IR 73.38: J, 10°, CN, PR, SM 73.39: J, 30°, ph wh mi VN, PR, SM 73.44: J, 30°, CN, IR, SM 73.49: J, 30°, wh mi VN, CU, SM 73.51: J, 60°, CN, UN, SM 73.52: J, 30°, wh mi VN, PR, SM 73.59: J, 50°, CN, PR, SM 73.64: J, 55°, UN 73.74: J, 65°, wh mi VN, CU, SM 73.78: J, 40°, CN, PR, PR 73.82: J, 50°, CN, PR, PR 73.89: J, 60°, CN, UN, RF 73.91: J, 60°, ph wh mi VN, PR, SM 73.93: J, 35°, ph wh mi VN, PR, SM 73.95: J, 45°, CN, IR, RF 73.96: J, 40°, ph wh mi VN, PR, SM 73.98: J, 60°, ph wh mi VN, PR, SM 73.99: J, 60°, ph wh mi VN, PR, SM 74.10: J, 30°, ph wh mi VN, PR, SM 74.14: Jx3, 60°, CN, PR, SM 74.34: J, 5° CN, PR, RF 74.47: J, 5°, ph wh mi VN, PR, SM 74.96: J, 30°, wh mi VN, PR, SM 74.98: J, 80°, wh and rd mi VN, IR, SM 75.05: J, 45°, ph wh mi VN, PR, SM 75.07: J, 40°, ph wh mi VN, PR, SM 75.13: J, 40°, ph wh mi VN, UN, SM 75.25: J, 40°, ph wh mi VN, CU, SM							
		100	49	74																			
		100	29	75			green-yellow slight alteration																
		100	56	77				sub-angular to sub-rounded inclusion of Basaltic PORPHYRY, fine to coarse grained, black and white, crystalline, fine grained black matrix, medium to coarse grained white phenocrysts															
		100	54	79																			
		100	38	80	80.00																		
		Comments																Checked	GEM				
																		Date	19/10/2024				



BOREHOLE: BHL-12

Project:	Pioneer-Burdekin PHES	Position:	Lower Reservoir	Sheet	10 OF 12
Location:	Netherdale/Dalrymple Heights	Coords:	660324.9 m E 7661426.3 m N MGA2020-55	Date Started:	26/10/2023
Client:	Queensland Hydro	Surface RL:	175.90 m AHD	Date Completed:	8/11/2023
Job No.:	PS138693	Contractor:	Twin Hills Engineering & Drilling Drill Rig: Hanjin D&B-8DTM	Logged:	JRC/NLP
		Inclination:	-87° Direction: 172°		

Drilling						Field Material Description				Defect Information						
METHOD	WATER	TCR	RQD	DEPTH (metres)	DEPTH RL	GRAPHIC LOG	ROCK / SOIL MATERIAL DESCRIPTION	WEATHERING	INFERRED STRENGTH (MPa)	DEFECT DESCRIPTION & Additional Observations (Core partings shown - refer to Detailed Defect Descriptions table for all logged features)	AVERAGE DEFECT SPACING (mm)					
HQ3	90-95% Water Return	100	38	80	96.01		GRANODIORITE: coarse grained, white, grey, and black, crystalline, massive, slightly altered pink and green yellow.	SW		75.44: J, 50°, wh mi VN, PR, SM						
										75.51: J, 60°, ph wh mi VN, PR, SM						
										75.55: J, 30°, wh mi CT, UN, SM						
										75.63: J, 30°, ph wh mi VN, IR, SM						
										75.77: J, 70°, wh mi CT, PR, SM						
										75.84: J, 10°, wh mi VN, UN						
										75.85: J, 30°, ph wh mi VN, UN, SM						
										75.92: J, 50°, wh mi CT, UN, SM						
										76.00: J, 50°, ph wh mi VN, PR, SM						
										76.01: J, 50°, ph wh mi VN, PR, SM						
		100	74	81						76.02: J, 50°, ph wh mi VN, PR, SM						
										76.04: J, 50°, ph wh mi VN, UN, RF						
										76.09: J, 30°, ph mi VN, PR, SM						
										76.12: J, 90°, wh mi VN, UN, RF						
										76.23: J, 60°, ph wh mi VN, PR, SM						
										76.40: J, 50°, ph wh mi VN, PR, SM						
										76.40: J, 50°, ph wh mi VN, PR, SM						
										76.52: J, 50°, ph wh mi VN, PR, SM						
										76.56: J, 65°, ph wh mi VN, UN, SM, DB						
										76.58: J, 50°, CN, PR, SM, possible DB						
										76.59: J, 60°, CN, UN, SM						
										76.62: J, 40°, ph wh mi VN, PR, SM						
										76.64: J, 45°, ph wh mi VN, PR, SM						
										76.66: J, 35°, ph wh mi VN, PR, SM						
										76.68: J, 25°, ph wh mi VN, UN, SM						
										76.95: J, 50°, CN, PR, SM						
										77.09: J, 35°, CN, PR, SM						
										77.16: J, 80°, wh mi CT, UN, SM, <2 mm pl or to wh halo						
										77.18: J, 40°, CN, IR, SM						
										77.28: J, 35°, CN, UN, RF						
										77.50: J, 65°, wh mi VN, PR, SM						
										77.53: J, 65°, ph wh mi VN, PR, SM						
										77.54: J, 0°, CN, IR, SM, possible DB						
										77.60: J, 65°, ph wh mi VN, PR, SM						
										77.80: J, 35°, CN, PR, SM						
										77.87: J, 40°, ph wh mi VN, PR, SM						
										77.90: J, 80°, ph wh mi VN, PR, SM						
										77.94: J, 40°, CN, PR, SM						
										78.03: J, 40°, CN, PR, SM						
										78.19: J, 40°, wh mi VN, UN, SM						
										78.29: J, 60°, CN, IR, SM						
										78.55: J, 85°, CN, UN, SM, possible DB						
										78.56: J, 30°, CN, UN, SM, <2 mm pl or halo						
										78.73: J, 20°, CN, PR, SM						
										78.80: J, 25°, CN, SM, SM						
										78.85: J, 25°, ph wh mi VN, PR, SM						
										79.00: J, 65°, ph wh mi VN, PR, SM						
										79.01: J, 20°, ph wh mi VN, PR, SM						
										79.02: J, 20°, ph wh mi VN, PR, SM						
										79.02: J, 20°, ph wh mi VN, PR, SM						
										79.05: J, 10°, ph wh mi VN, PR, SM						
										79.06: J, 65°, ph wh mi VN, UN, SM						
										79.08: J, 15°, ph wh mi VN, PR, SM						
										79.09: J, 15°, ph wh mi VN, PR, SM						
										79.18: J, 35°, ph wh mi VN, PR, SM						
										79.29: J, 90°, CN, PR, SM						
										79.31: J, 15°, CN, UN, SM						
										79.33: J, 75°, ph wh mi VN, UN, SM						
										79.35: J, 30°, CN, PR, SM						
										79.38: J, 30°, CN, IR, VR						
										79.45: J, 5°, CN, IR, RF						
										79.48: J, 55°, CN, IR, RF						
										79.51: J, 55°, CN, IR, VR						
										79.52: J, 70°, CN, IR, VR						
										79.54: J, 30°, CN, CU, SM						
										79.76: J, 20°, ph wh mi VN, IR, SM						
										79.83: J, 30°, ph wh mi VN, CU, RF						
										79.89: J, 40°, ph wh mi VN, IR, RF						
										79.92: J, 75°, ph wh mi VN, UN, SM						
										79.97: J, 25°, ph wh mi VN, IR, SM						
										80.06: J, 30°, CN, PR, VR						
										80.10: J, 25°, CN, UN, VR						
										80.17: J, 20°, wh mi VN, PR, SM						
										80.50: J, 45°, CN, UN, RF						
										81.05: J, 10°, CN, IR, RF						
										81.15: J, 10°, ph wh mi VN, UN, SM						
										81.17: J, 20°, wh mi VN, UN, SM						
										81.44: J, 5°, wh mi VN, IR, VR						
										81.71: J, 5°, CN, PR, VR						
										81.81: J, 70 - 90°, CN, CU, VR						
										81.85: J, 40°, CN, PR, SM						
										81.88: J, 70 - 90°, CN, CU, VR						
										81.91: J, CN, CU, RF						
										81.92: J, 50°, CN, UN, SM						
										82.29: J, 0°, CN, ST, RF						
										82.31: J, 80°, ph wh mi VN, UN, SM						
										82.35-82.60: PLT (A) Is 50 = 6.50MPa (M) PLT (D) Is 50 = 0.56MPa (M)						
										82.33: J, 45°, CN, PR, RF, possible DB						
Comments											Checked GEM					
											Date 19/10/2024					



BOREHOLE: BHL-12

Project:	Pioneer-Burdekin PHES	Position:	Lower Reservoir	Sheet	11 OF 12
Location:	Netherdale/Dalrymple Heights	Coords:	660324.9 m E 7661426.3 m N MGA2020-55	Date Started:	26/10/2023
Client:	Queensland Hydro	Surface RL:	175.90 m AHD	Date Completed:	8/11/2023
Job No.:	PS138693	Contractor:	Twin Hills Engineering & Drilling Drill Rig: Hanjin D&B-8DTM	Logged:	JRC/NLP
		Inclination:	-87° Direction: 172°		

Drilling						Field Material Description					Defect Information									
METHOD	WATER	TCR	RQD	DEPTH (metres)	DEPTH RL	GRAPHIC LOG	ROCK / SOIL MATERIAL DESCRIPTION	WEATHERING	INFERRED STRENGTH (MPa)			DEFECT DESCRIPTION & Additional Observations (Core partings shown - refer to Detailed Defect Descriptions table for all logged features)		AVERAGE DEFECT SPACING (mm)						
								SW	VL 2	J 15°	M 30°	H 40°	VR 200	EH	10	30	100	300	1000	3000
HQ3	90-95% Water Return		100	100	90	86.02	GRANODIORITE: coarse grained, white, grey, black, crystalline, massive, slightly altered pink throughout, fine to coarse grained, black and white, crystalline, fine grained black matrix, medium to coarse grained white phenocrysts. 95.60-97.60m: moderately altered halo around a sub-vertical defect, alteration is generally green	SW						82.34: J, 75°, wh mi CT, UN, SM 82.36: J, 15°, ph wh mi VN, UN, SM 82.73: J, 40°, VN, UN, RF 82.74: J, 60°, CN, PR, SM 82.75: J, 55°, wh mi VN, PR, SM 82.82: J, 70°, ph wh mi VN, UN, SM 82.93: J, 45°, CN, UN, SM 83.02: J, 35°, ph wh mi VN, UN, SM 83.14: J, 50°, wh mi CT, PR, SM 83.16: J, 25°, CN, UN, SM 83.22: J, 70°, ph wh mi CT, IR, RF 83.28: J, 80°, wh mi CT, PR, SM 83.32: J, 45°, ph wh mi VN, PR, SM 83.46: J, 40°, wh mi VN, PR, SM 83.48: J, 30°, CN, UN, SM 83.64: J, 45°, ph wh mi VN, UN, SM 83.68: J, 40°, ph wh mi VN, PR, RF 83.76: J, 30°, CN, PR, RF 83.77: J, 85°, CN, UN, SM 83.81: J, 15°, CN, PR, RF 83.90: J, 40°, CN, PR, SM 83.96: J, 10°, CN, UN, RF 83.97: J, 75°, CN, PR, SM 84.08: J, 80°, ph wh mi VN, UN 84.12: J, 70°, CN, PR, SM, possible DB 84.13: J, 10°, ph wh mi VN, PR, SM 84.14: J, 70°, ph wh mi VN, PR, SM 84.19: J, 30°, CN, UN, SM, possible DB 84.22: J, 70°, ph wh mi VN, UN, SM 84.51: J, 30°, CN, PR, SM, possible DB 84.58: J, 60°, ph wh mi VN, PR, SM, ph rd SN 84.66: J, 75°, CN, UN, SM 84.71: J, 75°, ph wh mi VN, PR, SM 84.86: J, 25°, CN, PR, SM 85.11: J, 70°, ph wh mi VN, PR, RF, ph or SN 85.21: J, 40°, CN, PR, RF 85.38: J, 70°, ph wh mi VN, PR, SM 85.41: J, 50°, CN, CU, SM 85.44: J, 70°, CN, PR, SM 85.49: J, 60°, CN, PR, SM 85.56: J, 50°, ph wh mi VN, PR, SM 85.59: J, 65°, CN, PR, SM 85.62: J, 65°, wh mi CT, PR, SM 85.65: J, 5°, CN, IR, SM, possible DB 85.68: J, 80°, wh mi VN, UN, SM 85.71: J, 90°, wh mi VN, UN, SM 85.75: J, 45°, CN, PR, RF, possible DB 85.79: J, 40°, wh mi VN, IR, SM 85.89: J, 70°, ph wh mi VN, PR, RF 85.97: J, 20°, CN, PR, RF 85.99: J, 85°, CN, UN, RF 86.02: J, 20°, CN, UN, RF 86.07: J, 70°, wh mi CT, UN, SM 86.09: J, 70°, ph wh mi VN, UN, SM 86.15: J, 90°, wh mi CT, UN, SM 86.18: J, 20°, CN, PR, SM 86.20: J, 30°, CN, PR, SM 86.23: J, 20°, CN, PR, SM 86.32: J, 85°, CN, PR, SM 86.33: J, 85°, CN, PR, SM 86.37: J, 35°, CN, PR, SM 86.44: J/V, 90°, wh mi, UN, SM, <2 mm 86.52: J, 10°, CN, PR, SM 86.63: J, 40°, CN, PR, SM 86.71: J, 90°, wh mi CT, UN, SM 86.84: J, 15°, ph wh mi VN, PR, SM 87.09: J, 30°, CN, PR, SM 87.14: J, 35°, CN, PR, SM 87.33: J, 30°, ph wh mi VN, PR, SM 87.45: J, 25°, ph wh mi VN, CU, SM 87.80: J, 35°, ph wh mi VN, PR, SM 88.42: J, 40°, CN, PR, SM 88.53: J, 40°, CN, PR, SM 88.72: J, wh mi VN, IR, VR 88.74: J, CN, IR, SM 88.75: J, 50°, ph wh mi VN, PR, SM 88.82: J, 90°, wh mi CT, UN, SM 89.03: J, 85°, wh mi CT, PR, SM 89.10: J, 10°, CN, PR, RF 89.11: J, 70°, wh mi VN, UN, SM 89.26: J, 55°, CN, PR, RF, possible DB 89.29: J, 5°, CN, PR, RF 89.33: J, 5°, CN, PR, RF, possible DB 89.36: J, 90°, wh mi CT, UN, SM, rd-or SN 89.43: J, CN, IR, VR, possible DB 90.15: J, 70°, UN, incipient 90.19: J, 90°, UN, incipient 90.23: J, 10°, CN, PR, SM, possible DB 90.25: J, 10°, CN, PR, RF, possible DB						
			100	100	92			SW - FR												
			100	100	94															
			100	87	95															
			100	88	96															
			100	59	98															
			100	95	99															
					100	100.00														
		Comments															Checked	GEM		
																	Date	19/10/2024		



BOREHOLE: BHL-12

Project: Pioneer-Burdekin PHES

Location: Netherdale/Dalrymple Heights

Client: Queensland Hydro

Job No.: PS138693

Position: Lower Reservoir

Coords: 660324.9 m E 7661426.3 m N MGA2020-55

Surface RL: 175.90 m AHD

Contractor: Twin Hills Engineering & Drilling

Inclination: -87° Direction: 172°

Sheet 12 OF 12

Date Started: 26/10/2023

Date Completed: 8/11/2023

Logged: JRC/NLP

Drilling						Field Material Description				Defect Information			
METHOD	WATER	TCR	RQD	DEPTH (metres)	DEPTH RL	GRAPHIC LOG	ROCK / SOIL MATERIAL DESCRIPTION	WEATHERING	INFERRED STRENGTH (MPa)	DEFECT DESCRIPTION & Additional Observations (Core partings shown - refer to Detailed Defect Descriptions table for all logged features)		AVERAGE DEFECT SPACING (mm)	
HQ3	90-95% Water Return	100	95	100	76.04		GRANODIORITE: coarse grained, white, grey, black and pink, crystalline, massive, slightly altered pink throughout, slightly altered halo around a sub-vertical defect, alteration is generally green.	SW - FR			90.75: J, 30°, CN, PR, VR		
											91.00: J, 30°, CN, IR, RF		
											92.00: J, 25°, CN, PR, SM, possible DB		
											92.24: J, 25°, ph wh mi VN, PR, SM, possible DB		
											92.39: J, 25°, ph wh mi VN, ST, SM, possible DB		
											93.20: J, 25°, CN, PR, SN		
											93.56: J, 30°, ph wh mi VN, PR, SM		
											94.19: J, 10°, CN, UN, SM		
											94.37: J, 0°, ph wh mi VN, CU, SM		
											94.44: J, 15°, CN, PR, RF		
HQ3	90-95% Water Return	100	100	101							94.56: J, 30°, ph wh mi VN, PR, SM, SA gr-gy		
											94.65: J, 10°, CN, PR, RF		
											95.16: J, 20°, CN, IR, SM		
											95.63: J, 40°, ph wh mi VN, ST, SM		
											96.14: J, 40°, ph wh mi VN, ST, SM		
											96.84: J, 55°, ph wh mi VN, PR, SM		
											96.89: J, CN, ST, RF		
											96.96: J, 90°, wh mi CT, PR, SM		
											96.99: J, 50°, CN, PR, SM		
											97.04: J, 90°, ph wh mi VN, IR, RF, gr alt halo		
HQ3	90-95% Water Return	100	100	102							97.44: J, 90°, ph wh mi VN, UN, SM, possible DB		
											97.70: J, 35°, ph wh mi VN, PR, SM, possible DB		
											97.91: J, 0°, CN, PR, RF		
											98.03: J, 70°, ph wh mi VN, IR, SM		
											98.07: J, 50°, ph wh mi VN, UN, SM		
											98.16: J, 60°, ph wh mi VN, PR, RF, possible DB		
											98.31: J, 50°, CN, PR, SM		
											98.33: J, 70°, CN, PR, SM		
											98.45: J, 60°, ph bk SN, PR, SM		
											98.53: J, 40°, wh mi CT, ST, SM		
HQ3	90-95% Water Return	100	88	103							98.71: J, 40°, CN, PR, SM		
											99.00: J, 10°, CN, UN, SM		
											99.47: J, 45°, CN, PR, SM, possible DB		
											99.50: J, 70°, CN, PR, SM, gr alt		
											99.87: J, 80°, wh mi CT, PR, SM		
											99.94: J, 20°, CN, PR, RF		
											100.11: J, 35°, CN, ST, SM		
											100.80: J, 30°, CN, PR, RF		
											102.49: J, 25°, CN, PR, SM		
											102.93: J, 30°, ph wh mi CT, PR, SM		
HQ3	90-95% Water Return	100	100	104							103.03: J, 35°, ph wh mi CN, PR, SM, <5 mm gr alt halo		
											103.13: J, 15°, CN, CU, SM, SA gr		
											103.33: J, 40°, ph rd SN, PR, SM		
											104.25-104.70: PLT (A) Is 50 = 7.10MPa (M) : PLT (D) Is 50 = 16.00MPa (M)		
											104.23: J, 30°, CN, PR, SM		
											104.94: J, 45°, CN, PR, SM		
											105.04: J, 40°, CN, PR, SM		
											105.08: J, 60°, ph wh mi VN, PR, SM		
											105.09: J, 60°, ph wh mi VN, PR, SM		
											105.69: J, 30°, CN, PR, SM		
HQ3	90-95% Water Return	100	97	105							105.70: J, 75°, ph wh and rd mi VN, PR, SM		
											105.72: J, 20°, CN, PR, SM		
											106.49: J, 30°, CN, UN, SM		
											106.91: J, 10°, CN, PR, RF, possible DB		
											107.08: J, 35°, CN, PR, SM		
											107.88: J, 80°, ph wh mi VN, PR, SM, possible DB		
											108.29: J, 10°, CN, PR, SM		
											108.39: J/V, 90°, wh mi CT, UN, SM, pl br and gr alt halo		
											108.43: J, 10°, CN, PR, RF, possible DB		
											108.89: J, 80°, wh mi CT, PR, SM, <5 mm gr and pl or alt halo		
HQ3	90-95% Water Return	100	100	106							109.12: J, 40°, ph wh mi VN, UN, SM		
											Hole Terminated at 110.00 m		
											Target depth. Vibrating Wire Piezometers Installed.		

Comments

Checked GEM
Date 19/10/2024



Pioneer-Burdekin Pumped Hydro Energy Scheme: Tranche 1 – BHL-12 Defects List

Refer to Explanatory Notes sheets for abbreviation definitions

PointID	Depth	Bottom	Fracture Set	Defect Number	Type	Type Suffix	Dip Minimum (degrees)	Dip Maximum (degrees)	Infilling Material	Aperture Observation	Planarity	Roughness	Aperture Measurement Sign	Aperture Measurement	Aperture	Spacing	Remark
BHL-12	14.78				J		0		or-br	SN	PR	RF					
BHL-12	14.79				J		55		or-br	SN	PR	RF					
BHL-12	14.80				hJ		60		or-br		PR						
BHL-12	14.84				hJ		55		or-br		UN						
BHL-12	14.86				J		35		or-br	SN	PR	RF					
BHL-12	14.88				hJ		90		or-br		PR						
BHL-12	14.91				hJ		55		or-br		PR						
BHL-12	14.94				J		60		br	SN	PR	RF					
BHL-12	15.00				hJ		55		or-br		PR	RF					
BHL-12	15.08				J		10		br	SN	ST	RF					
BHL-12	15.09				hJ		35		br		PR						
BHL-12	15.18				J		60		br	SN	PR	RF					
BHL-12	15.20				hJ		30		bk		PR						
BHL-12	15.24				J		45		or-br	SN	PR	RF					
BHL-12	15.30				J		45		or-br	SN	PR	RF					
BHL-12	15.35				J		65		or-br	SN	UN	RF					
BHL-12	15.36				J		20		or-br	SN	IR	RF					
BHL-12	15.37				J		65		or-br	SN	PR	RF					
BHL-12	15.43				J		50		rd-br and bk	SN	PR	RF					
BHL-12	15.47				J		50		or-br	SN	PR	RF					
BHL-12	15.51				hJ		60		or-br		PR						
BHL-12	15.52				hJ		50		or-br		PR						
BHL-12	15.55				hJ		25		or-br		IR						
BHL-12	15.60				J		35		or-br	SN	PR	RF					
BHL-12	15.62				hJ		35		or-br		PR						
BHL-12	15.66				J		55		br	SN	ST	RF					
BHL-12	15.74				hJ		5		or-br		PR						
BHL-12	15.76				hJ		5		or-br		PR						
BHL-12	15.77				J		75		or-br	SN	UN	RF					
BHL-12	15.82				hJ		0		or-br		PR						
BHL-12	15.85				hJ		10		or-br		PR						
BHL-12	15.87				hJ		0		or-br		PR						
BHL-12	15.88				hJ		65		or-br		PR						
BHL-12	15.89				J		40		or-br	VN	PR						
BHL-12	15.90				hJ		40		or-br		PR						
BHL-12	15.93				hJ		30		bk		PR						
BHL-12	16.02				J		70		br	SN	PR	RF					
BHL-12	16.03				J		50		br	SN	PR	RF					
BHL-12	16.06				J		35		or-br	SN	ST	RF					
BHL-12	16.08				J		85		or-br	SN	PR	RF					
BHL-12	16.13				J		48		or-br	SN	ST	RF					
BHL-12	16.16				J		85		or-br	SN	PR	RF					
BHL-12	16.18				hJ		35		or-br		PR						
BHL-12	16.19				J		25		or-br	SN	PR	RF					
BHL-12	16.26				J		35		or-br	SN	IR	RF					
BHL-12	16.32				hJ		55		rd-br		UN						
BHL-12	16.36				hJ		55		rd-br		PR						
BHL-12	16.36	16.44			Js		40	80	or-br		UN						incipient
BHL-12	16.47				J		90		or-br	CT	UN						
BHL-12	16.49				hJ		20		or-br		PR						
BHL-12	16.51				hJ		60		bk		PR						
BHL-12	16.54				hJ		80		or-br		PR						
BHL-12	16.65				hJ		90		or-br		UN						
BHL-12	16.70				hJ		20		or-br		PR						
BHL-12	16.71				hJ		70		or-br		PR						
BHL-12	16.74				J		15		or-br	SN	ST	RF					
BHL-12	16.79				hJ		10		or-br		PR						
BHL-12	16.81				V		40		pl rd and or-br		PR		6				incipient
BHL-12	16.86				hJ		10		or-br		PR						
BHL-12	16.88				hJ		30		or-br		PR						
BHL-12	16.90				J		35		br	VN	PR	RF					
BHL-12	17.05				J		50		br	SN	PR	RF					
BHL-12	17.07				J		50		or-br	SN	PR	RF					
BHL-12	17.13				hJ		75		or-br		UN						
BHL-12	17.33				hJ		45		or-br		UN						
BHL-12	17.51				hJ		85		or-br		UN						
BHL-12	17.57				hJ		35		rd-br		PR						
BHL-12	17.61				V		35		pl rd and or-br		PR		4				incipient
BHL-12	17.67				hJ		25		or-br		UN						
BHL-12	17.76				hJ		20		dk br		UN						
BHL-12	18.00				J		20		or-br	SN	ST						
BHL-12	18.01				hJ		60		bk		PR						
BHL-12	18.02				hJ		60		wh		PR						
BHL-12	18.03				hJ		60		bk		UN						
BHL-12	18.04				hJ		50		bk		PR						
BHL-12	18.12				hJ		45		or-br		PR						
BHL-12	18.23				J		30		or-br and gr	SN	ST	RF					
BHL-12	18.26				V		35		pl rd		PR		8				incipient
BHL-12	18.77				J		0		or-br	SN	ST	RF					



Pioneer-Burdekin Pumped Hydro Energy Scheme: Tranche 1 – BHL-12 Defects List

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PointID	Depth	Bottom	Fracture Set	Defect Number	Type	Type Suffix	Dip Minimum (degrees)	Dip Maximum (degrees)	Infilling Material	Aperture Observation	Planarity	Roughness	Aperture Measurement Sign	Aperture Measurement	Aperture	Spacing	Remark
BHL-12	18.97				hJ		20		or-br		ST						
BHL-12	19.11				hJ		90		or-br		UN						
BHL-12	19.18				V		60		pl yl-wh		PR			2			incipient
BHL-12	19.20				hJ		90		bk		PR						
BHL-12	19.21				hJ		70		wh		UN						
BHL-12	19.26				J		20			CN	IR	RF					
BHL-12	19.29				MB												
BHL-12	19.31				J		30		ph or-br	SN	IR	RF					
BHL-12	19.42				J		60		or-br	SN	PR	SM					
BHL-12	19.46				hJ		30				PR						
BHL-12	19.48				hJ		30				UN						
BHL-12	19.49				hJ		20				PR						
BHL-12	19.58				J		20		or-br	SN	IR	RF					
BHL-12	19.59				hJ		25				PR						
BHL-12	19.68				J		10		ph or-br	SN	UN	RF					
BHL-12	19.78				hJ		25				UN						20 mm pl yl halo
BHL-12	20.09				hJ		45		pl gy mi		IR						
BHL-12	20.28				hJ		90				UN						<20 mm ph fe halo
BHL-12	20.31				J		55		ph or-br	SN	IR	RF					
BHL-12	20.53				J		25		ph or-br	SN	IR	RF					
BHL-12	20.63				hJ		70				UN						
BHL-12	20.65				hJ		5				UN						
BHL-12	20.75				hJ		35				UN						
BHL-12	20.78				MB												
BHL-12	21.20				J		10		ph or-br	SN	IR	RF					
BHL-12	21.21				J		85		ph wh to pk mi	VN	PR	SM					ph or-br SN
BHL-12	21.22				hJ		20				UN						
BHL-12	21.24				hJ		70		or-br		CU						
BHL-12	21.25				J		10		ph or-br	SN	IR	SM					
BHL-12	21.28				hJ		70				IR						
BHL-12	21.33				hJ		70				PR						
BHL-12	21.40				J		20		ph or-br	SN	IR	SM					
BHL-12	21.58				J		40		ph wh mi	CT	PR	SM					ph or-br SN
BHL-12	21.62				hJ		75				CU						
BHL-12	21.70				J		70		ph or-br	SN	PR	RF					
BHL-12	21.72				hJ		30				CU						
BHL-12	21.78				J		20		ph or-br	SN	UN	SM					
BHL-12	21.82				hJ		75				IR						
BHL-12	21.92				hJ												
BHL-12	22.05				hJ		80				IR						
BHL-12	22.23				hJ												
BHL-12	22.45				J		10		ph br	VN	IR	SM					
BHL-12	22.62				J		55		ph br	VN	UN	SM					ph or-br SN
BHL-12	22.68				J		20		ph br	VN	PR	SM					
BHL-12	22.91				J		5			CN	IR	SM					possible DB
BHL-12	22.97				J		10			CN	UN	SM					possible DB
BHL-12	23.21				J		15		ph or-br	SN	IR	SM					possible DB
BHL-12	23.32				J		15		ph or-br	SN	IR	SM					DB
BHL-12	23.38				J		20			CN	IR	SM					
BHL-12	23.44				J		25		ph or-br	SN	IR	SM					
BHL-12	23.53				hJ												
BHL-12	23.62				J		10			CN	IR	SM					
BHL-12	23.85				hJ		90		bk mi		UN						
BHL-12	24.11				J		5			CN	PR	SM					
BHL-12	24.15				hJ		90		bk mi		PR						
BHL-12	24.38				J		5			CN	PR	SM					
BHL-12	24.47				hJ		90		pl gy mi		UN						
BHL-12	24.66				hJ		70		bk mi		PR						
BHL-12	24.72				J		0		or	SN	PR	RF					
BHL-12	24.73				hJ		0				PR						
BHL-12	24.75				hJ		90				PR						
BHL-12	24.79				hJ		90				PR						
BHL-12	24.83	24.88			V		30				PR						APLITE, coarse grained, pk, wh, and bk
BHL-12	24.91				hJ		90				PR						
BHL-12	24.94	24.99			V		40				PR						
BHL-12	25.01				hJ		80				PR						
BHL-12	25.02				hJ		90				PR						
BHL-12	25.04				hJ		90				PR						
BHL-12	25.07				hJ		80				UN						
BHL-12	25.38				J		0			CN	PR	SM					
BHL-12	25.46				hJ		90				PR						
BHL-12	25.51				J		15			CN	PR	RF					
BHL-12	25.72				J		20			CN	PR	RF					
BHL-12	25.74				hJ		20		bk mi		PR						
BHL-12	25.75				hJ		15		bk mi		PR						
BHL-12	25.79				J		20			CN	PR	RF					
BHL-12	25.86				hJ		0		pl gr mi		PR						
BHL-12	25.87				hJ		5		pl gr mi		PR						
BHL-12	25.96				hJ		20		bk mi		PR						



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PointID	Depth	Bottom	Fracture Set	Defect Number	Type	Type Suffix	Dip Minimum (degrees)	Dip Maximum (degrees)	Infilling Material	Aperture Observation	Planarity	Roughness	Aperture Measurement Sign	Aperture Measurement	Aperture	Spacing	Remark
BHL-12	25.96				hJ		15		bk mi		PR						
BHL-12	25.98				hJ		20		bk mi		PR						
BHL-12	25.99				hJ		20		bk mi		PR						
BHL-12	26.03				J		5			CN	PR	SM					
BHL-12	26.07				hJ		85		bk mi		PR						
BHL-12	26.16				J		0			CN	PR	SM					
BHL-12	26.32				hJ		0		bk mi		UN						
BHL-12	26.39				J		15			CN	PR	SM					
BHL-12	26.55	26.55			V		0				PR						APLITE, fine grained, pk and wh
BHL-12	27.01	27.05			V		0				CU						APLITE, coarse grained, pk, wh, bk
BHL-12	27.15				J		30			CN	PR	SM					
BHL-12	27.19				hJ		45		bk mi		CU						
BHL-12	27.29				hJ		20		bk mi		PR						
BHL-12	27.30				hJ		20		bk mi		PR						
BHL-12	27.43				hJ		35		bk mi		CU						
BHL-12	27.52				J		40			CN	PR	SM					
BHL-12	27.53				J		0			CN	PR	SM					
BHL-12	27.77				J		10			CN	PR	SM					
BHL-12	28.03				J		15			CN	PR	SM					
BHL-12	28.07				hJ		85		bk mi		PR						
BHL-12	28.11				hJ		5		bk mi		PR						
BHL-12	28.26				hJ		15		bk mi		CU						
BHL-12	28.34				J		0			CN	PR	SM					
BHL-12	28.54				hJ		90		bk mi		PR						
BHL-12	28.67				J		45			CN	PR	RF					
BHL-12	28.70				hJ		25		bk mi		PR						
BHL-12	28.71				hJ		30		bk mi		PR						
BHL-12	28.75				hJ		30		bk mi		PR						
BHL-12	28.77				hJ		30		bk mi		PR						
BHL-12	28.88				hJ		35		bk mi		PR						
BHL-12	28.96				J		10			CN	PR	RF					
BHL-12	29.08	29.09			V		10				PR						APLITE, fine grained, pk and wh
BHL-12	29.11				hJ		25		bk mi		PR						
BHL-12	29.13				hJ		20		bk mi		PR						
BHL-12	29.15				hJ		30		bk mi		PR						
BHL-12	29.21				J		20			CN	PR	SM					
BHL-12	29.23				hJ		30		bk mi		PR						
BHL-12	29.29	29.29			V		20				PR						APLITE, fine grained, pk and wh
BHL-12	29.36				J		5			CN	PR	SM					
BHL-12	29.38	29.38			V		20				PR						APLITE, fine grained, pk, wh, and bk
BHL-12	29.46				hJ		45		bk mi		PR						
BHL-12	29.62				hJ		70		bk mi		PR						
BHL-12	29.65	29.65			V		45				CU						APLITE, fine grained, pk and wh
BHL-12	29.73	29.73			V		45				CU						APLITE, fine grained, pk and wh
BHL-12	29.88				hJ		90		bk mi		PR						
BHL-12	29.98	30.00			V		30				PR						APLITE, fine grained, pk, wh, bk
BHL-12	30.05				J		25			CN	PR	SM					
BHL-12	30.14				hJ		45		bk mi		UN						
BHL-12	30.23				V		40				PR			30			APLITE, fine to coarse grained, pk, wh, and bk
BHL-12	30.35				hJ		85		bk mi		PR						
BHL-12	30.38				J		20			CN	PR	RF					
BHL-12	30.43	30.47			V		35				PR						APLITE, fine to medium grained, pk, wh, and bk
BHL-12	30.56				hJ		40		bk mi		CU						
BHL-12	30.58				J		30			CN	CU	RF					
BHL-12	30.89				J		10			CN	PR	SM					
BHL-12	30.92				hJ		90		bk mi		PR						
BHL-12	30.95				hJ		30		bk mi		PR						
BHL-12	31.03				hJ		90		bk mi		PR						
BHL-12	31.08				J		10			CN	PR	RF					
BHL-12	31.12				hJ		60		bk mi		PR						
BHL-12	31.21				hJ		90		bk mi		PR						
BHL-12	31.39				hJ		90		bk mi		PR						
BHL-12	31.54				J		45			CN	PR						
BHL-12	31.62				hJ		50		bk mi		PR						
BHL-12	31.73				J		20			CN	UN	RF					
BHL-12	31.79				hJ		65		bk mi		PR						
BHL-12	31.92				hJ		70		bk mi		PR						
BHL-12	31.93				hJ		50		bk mi		UN						
BHL-12	31.97				hJ		60		bk mi		PR						
BHL-12	32.10				hJ		70		bk mi		PR						
BHL-12	32.19				J		0			CN	PR	SM					
BHL-12	32.36	32.39			V		30				PR		<	85			APLITE, fine to coarse grained, pk, wh, and bk
BHL-12	32.56				J		5			CN	PR	RF					
BHL-12	32.64				hJ		80		bk mi		PR						
BHL-12	32.70				J		25			CN	CU	RF					
BHL-12	32.73	32.73			V		20				PR			3			APLITE, fine grained, pk, wh, and bk
BHL-12	32.79				hJ		40		bk mi		PR						
BHL-12	32.84				hJ		40		bk mi		PR						
BHL-12	33.13				J		40			CN	PR	RF					



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PointID	Depth	Bottom	Fracture Set	Defect Number	Type	Type Suffix	Dip Minimum (degrees)	Dip Maximum (degrees)	Infilling Material	Aperture Observation	Planarity	Roughness	Aperture Measurement Sign	Aperture Measurement	Aperture	Spacing	Remark
BHL-12	33.18				J		40			CN	PR	RF					
BHL-12	33.37				J		10			CN	PR	RF					
BHL-12	33.39				J		0			CN	PR	RF					
BHL-12	33.56	33.56			V		30				PR			3			APLITE, fine grained, pk and wh
BHL-12	33.68				J		20			CN	PR	SM					
BHL-12	33.81				hJ		0		bk mi		UN						
BHL-12	33.87				hJ		0		bk mi		PR						
BHL-12	34.18				hJ		45				PR						
BHL-12	34.24				J		5			CN	PR	SM					
BHL-12	34.39				J		35			CN	PR	SM					
BHL-12	34.50				hJ		70		bk mi		PR						
BHL-12	34.69				hJ		55		pl gr mi		PR						
BHL-12	34.83				hJ		10		bk mi		PR						
BHL-12	34.99				J		40			CN	PR	RF					
BHL-12	35.02				hJ		35		pl gr mi		PR						
BHL-12	35.25				J		25			CN	PR	RF					
BHL-12	35.61				hJ		40		bk mi		PR						
BHL-12	35.69	35.69			V		40				PR			3			APLITE, fine grained, pk and wh
BHL-12	36.03				J		5			CN	PR	RF					
BHL-12	36.08				hJ		20		pk mi		PR						
BHL-12	36.33				hJ		50		bk mi		PR						
BHL-12	36.73				J		30			CN	PR	RF					
BHL-12	36.87				hJ		0		bk mi		PR						
BHL-12	36.99				hJ		85		pk mi		PR						
BHL-12	37.21				J		25			CN	PR	RF					
BHL-12	37.91	37.91			V		20				PR			3			APLITE, fine grained, pk and wh
BHL-12	38.08				hJ		30		pk mi		PR						
BHL-12	38.32				J		30			CN	PR	RF					
BHL-12	38.47	38.55			V		20				PR			75			APLITE, coarse grained, pk, wh, and bk
BHL-12	38.62	38.64			V		60				PR			10			APLITE, fine to coarse grained, pk, wh, and bk
BHL-12	38.97				hJ		55		yl mi		PR						
BHL-12	39.07	39.12			V		25				PR			43			APLIE, coarse grained, pk, wh, and bk
BHL-12	39.21				J		10			CN	PR	RF					
BHL-12	39.42				J		10			CN	PR	RF					
BHL-12	39.66				hJ		25		yl mi		PR						
BHL-12	40.54				J		0			CN	PR	RF					
BHL-12	40.81				J		5			CN	PR	RF					
BHL-12	40.89				J		10			CN	PR	SM					
BHL-12	40.93				J		30			CN	PR	SM					
BHL-12	41.05				J		20			CN	PR	SM					
BHL-12	41.22				J		20			CN	PR	RF					
BHL-12	41.30				hJ		40		bk mi		PR						
BHL-12	41.35				hJ		20		bk mi		PR						
BHL-12	41.54	41.56			V		20				PR			12			APLITE, fine to medium grained, pk, wh, and bk
BHL-12	41.72				J		35			CN	PR	SM					
BHL-12	41.88				hJ		45		pk mi		PR						
BHL-12	42.05				J		0			CN	PR	RF					
BHL-12	42.14				hJ		70		bk mi		PR						
BHL-12	42.23	42.25			V		20				PR						APLITE, coarse grained, pk, wh, and bk
BHL-12	42.33				J		35			CN	PR	RF					
BHL-12	42.38				hJ		30		bk mi		PR						
BHL-12	42.48				hJ		65		yl mi		PR						
BHL-12	42.50				J		10			CN	IR	RF					
BHL-12	42.65				J		10			CN	PR	RF					
BHL-12	43.03				hJ		50		bk mi		PR						
BHL-12	43.09				J		15			CN	PR	SM					
BHL-12	43.23				hJ		60		bk mi		PR						
BHL-12	43.45				hJ		65		bk mi		PR						
BHL-12	43.53				hJ		60		bk mi		PR						
BHL-12	43.79				J		40			CN	PR	RF					pale yellow alteration halo 15mm
BHL-12	43.91				J		5			CN	PR	RF					pale yellow alteration halo 15mm
BHL-12	44.03				J		60			CN	PR	RF					pale yellow alteration halo 5mm
BHL-12	44.05				J		60			CN	PR	RF					pale yellow alteration halo 5mm
BHL-12	44.07	44.09			V		40				PR						APLITE, fine to coarse grained, pk, wh, and bk
BHL-12	44.12				hJ		60		bk mi		PR						pale yellow alteration halo 2mm
BHL-12	44.21				hJ		60		yl mi		PR						pale yellow alteration halo 2mm
BHL-12	44.23	44.26			V		30				PR						APLITE, coarse grained, pk, wh, and bk
BHL-12	44.26				J		40			CN	PR	SM					
BHL-12	44.47				hJ		60		bk mi		PR						
BHL-12	44.51				J		0			CN	PR	RF					
BHL-12	44.54				hJ		30		pl gr mi		PR						
BHL-12	44.62				J		45			CN	PR	RF					
BHL-12	44.66				J		45			CN	PR	SM					
BHL-12	44.72				hJ		45		bk mi		PR						
BHL-12	44.75				hJ		25		bk mi		PR						
BHL-12	44.81				hJ		25		bk mi		PR						
BHL-12	44.85				hJ		60		yl mi		PR						
BHL-12	44.87				J		20			CN	PR	SM					
BHL-12	44.90	45.13			V		20				PR			20			APLITE, coarse grained, gr, pk, wh, and bk



Pioneer-Burdekin Pumped Hydro Energy Scheme: Tranche 1 – BHL-12 Defects List

Refer to Explanatory Notes sheets for abbreviation definitions

PointID	Depth	Bottom	Fracture Set	Defect Number	Type	Type Suffix	Dip Minimum (degrees)	Dip Maximum (degrees)	Infilling Material	Aperture Observation	Planarity	Roughness	Aperture Measurement Sign	Aperture Measurement	Aperture	Spacing	Remark
BHL-12	45.05				J		5			CN	IR	SM					
BHL-12	45.10				J		25			CN	PR	SM					
BHL-12	45.32				hJ		20		bk mi		PR						
BHL-12	45.63				J		20			CN	PR	RF					
BHL-12	45.72				hJ		30		gr mi		PR						
BHL-12	45.84				hJ		55		bk mi		PR						
BHL-12	45.92				hJ		45		pl gr mi		PR						
BHL-12	45.94				hJ		60		yl mi		PR						
BHL-12	45.99				hJ		70		bk mi		PR						
BHL-12	46.03				hJ		45		bk mi		PR						
BHL-12	46.07				hJ		65		bk mi		PR						
BHL-12	46.17				J		25			CN	PR	RF					
BHL-12	46.28				hJ		20		bk mi		PR						
BHL-12	46.30				hJ		15		bk mi		PR						
BHL-12	46.33				hJ		65		pl yl mi		PR						
BHL-12	46.36				V		30				PR						APLITE, fine to coarse grained, yl, pk, and wh
BHL-12	46.56				hJ		60				PR						
BHL-12	46.65				hJ		70		yl mi		PR						
BHL-12	46.72				hJ		70		yl mi		UN						
BHL-12	46.76				hJ		50		yl mi		PR						
BHL-12	46.86				hJ		35		bk mi		PR						
BHL-12	46.99				J		50			CN	PR	RF					
BHL-12	47.03				hJ		15		bk mi		PR						
BHL-12	47.11				J		5			CN	PR	SM					
BHL-12	47.15				hJ		10		bk mi		UN						
BHL-12	47.19				hJ		50		wh mi		PR						
BHL-12	47.29				hJ		40		bk mi		IR						
BHL-12	47.33				J		35			CN	PR	SM					
BHL-12	47.40	47.40			V		30				PR			15			APLITE, fine to coarse grained, pk, bk, and wh
BHL-12	47.42				J		30			CN	PR	RF					
BHL-12	47.43				J		30			CN	IR	RF					
BHL-12	47.48				J		40			CN	PR	SM					
BHL-12	47.49				J		55			CN	IR	RF					
BHL-12	47.52				V		40				PR			8			APLIE, fine to coarse grained, pk, wh, and bk
BHL-12	47.60				J		40			CN	PR	RF					
BHL-12	47.63				J		65			CN	PR	RF					
BHL-12	47.69				V		60		bk and yl mi		PR						
BHL-12	47.76				hJ		70		bk and yl mi		PR						
BHL-12	47.88				hJ		60		bk and yl mi		PR						
BHL-12	47.92				hJ		40		bk and yl mi		PR						
BHL-12	48.05				J		35			CN	PR	RF					
BHL-12	48.20				J		40			CN	PR	SM					
BHL-12	48.36	48.37			V		30				PR			9			APLITE, bk
BHL-12	49.13				J		50			CN	PR	SM					
BHL-12	49.35				hJ		0		bk mi		IR						
BHL-12	49.44				hJ		30		bk and rd mi		PR						
BHL-12	50.21				J		30			CN	PR	RF					
BHL-12	50.45	50.57			V		30				CU			115			APLITE, pk, wh, and bk
BHL-12	50.54				hJ		90		rd mi		PR						
BHL-12	50.62				J		40			CN	PR	RF					
BHL-12	50.82				hJ		60		yl mi		PR						
BHL-12	50.99	51.05			V		40				PR			45			APLITE, pk, wh, and bk
BHL-12	51.33				J		60		pk	SN	PR	SM					
BHL-12	51.38				J		40			CN	PR	SM					
BHL-12	51.54				J		40			CN	PR	RF					
BHL-12	51.57				hJ		70		bk mi		PR						
BHL-12	51.61				J		30			CN	PR	RF					
BHL-12	51.77				J		25			CN	PR	RF					
BHL-12	51.81	51.85			V		20				PR			37			APLITE, coarse grained, pk, wh, and bk
BHL-12	51.91	51.94			V		30				PR			20			APLITE, fine to coarse grained, pk, wh, and bk
BHL-12	52.01				hJ		30		bk mi		PR						
BHL-12	52.02				hJ		0		bk mi		PR						
BHL-12	52.05				hJ		40		bk mi		CU						
BHL-12	52.11				J		30			CN	PR	SM					
BHL-12	52.16				hJ		90		yl mi		PR						
BHL-12	52.17				hJ		45		bk mi		PR						
BHL-12	52.32				hJ		90		bk mi		PR						
BHL-12	52.39				J		30			CN	PR	RF					
BHL-12	52.40				J		40			CN	PR	RF					
BHL-12	52.41				J		90			CN	PR	RF					
BHL-12	52.50				hJ		90		bk mi		PR						
BHL-12	52.51				J		90			CN	UN						
BHL-12	52.56				J		0			CN	UN	RF					
BHL-12	52.72				J		0			CN	UN	RF					
BHL-12	52.74				J		45			CN	PR	RF					
BHL-12	52.79				J		50			CN	UN	RF					
BHL-12	52.83				J		85			CN	IR	RF					
BHL-12	52.84				J		85			CN	IR	RF					
BHL-12	52.85				J		30			CN	UN	RF					



Pioneer-Burdekin Pumped Hydro Energy Scheme: Tranche 1 – BHL-12 Defects List

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PointID	Depth	Bottom	Fracture Set	Defect Number	Type	Type Suffix	Dip Minimum (degrees)	Dip Maximum (degrees)	Infilling Material	Aperture Observation	Planarity	Roughness	Aperture Measurement Sign	Aperture Measurement	Aperture	Spacing	Remark
BHL-12	52.87				J		20			CN	IR	RF					
BHL-12	52.91				J		30			CN	IR	RF					
BHL-12	53.03				J		20			CN	PR	SM					
BHL-12	53.06				J		75			CN	IR	RF					
BHL-12	53.07				J		45			CN	PR	RF					
BHL-12	53.13				J		0			CN	PR	RF					
BHL-12	53.17				hJ		40		bk mi		PR						
BHL-12	53.20				hJ		15		bk mi		UN						
BHL-12	53.23				hJ		10		bk mi		PR						
BHL-12	53.26				J		5			CN	PR	RF					
BHL-12	53.29	53.29			V		20				PR			2			APLITE, fine grained, pk and wh
BHL-12	53.34				J		35			CN	PR	RF					
BHL-12	53.46				hJ		45		bk mi		PR						
BHL-12	53.50				hJ		45		pl gr mi		PR						
BHL-12	53.54				hJ		40		bk mi		PR						
BHL-12	53.60				hJ		40		bk mi		PR						
BHL-12	53.61				hJ		40		bk mi		PR						
BHL-12	53.64				hJ		35		bk mi		PR						
BHL-12	53.68				hJ		25		bk mi		PR						
BHL-12	54.05				hJ		20		gr-gy mi		PR						
BHL-12	54.18				hJ		65				PR						
BHL-12	54.31				J		20			CN	PR	SM					
BHL-12	54.35				hJ		60		gy mi		UN						
BHL-12	54.37				hJ		90				CU						
BHL-12	54.47				hJ		25		wh mi		PR						
BHL-12	54.48				hJ		90		wh mi		UN						
BHL-12	54.56				hJ		40		wh mi		UN						
BHL-12	54.61				J		20		ph wh mi	VN	PR	SM					
BHL-12	54.67				hJ		10		wh mi		PR						
BHL-12	54.68				hJ		10		wh mi		PR						
BHL-12	54.72				V		30				UN			1			APLITE, pk
BHL-12	54.77				hJ		70				PR						
BHL-12	54.86				hJ		65		gy mi		PR						
BHL-12	54.98				J		30		ph gy mi	VN	PR	SM					possible DB
BHL-12	55.02				hJ		65		wh mi		UN						possible DB
BHL-12	55.14				J		25			CN	UN	RF					
BHL-12	55.38				hJ		40		wh mi		UN						
BHL-12	55.51	55.57			V		30				PR			50			APLITE, coarse grained, pk, wh, and bk
BHL-12	55.53				J		15		gr mi	SN	PR	SM					
BHL-12	55.60				hJ		20				PR						HB
BHL-12	55.67				hJ		90										
BHL-12	55.76				hJ		20		wh mi		PR						
BHL-12	55.85				hJ		80				UN						1 mm wh halo
BHL-12	56.03				hJ		60		bk and wh mi		PR						
BHL-12	56.10				hJ		25				PR						
BHL-12	56.18				J		20			CN	PR	SM					
BHL-12	56.19				hJ		20		wh mi		PR						
BHL-12	56.21				hJ		20		wh mi		PR						
BHL-12	56.79				V		15				PR			8			APLITE, fine to coarse grained, pk, wh, and bk
BHL-12	56.88				hJ		25		wh mi		PR						
BHL-12	56.95				J		20			CN	PR	SM					
BHL-12	57.17				hJ												
BHL-12	57.22				hJ		5				IR						
BHL-12	57.43				J		0			CN	PR	VR					possible DB
BHL-12	57.58				J		5			CN	UN	VR					possible DB
BHL-12	57.79				hJ		30				PR						
BHL-12	58.25				J		30			CN	PR	RF					
BHL-12	58.28				J		0			CN	PR	RF					
BHL-12	58.29				J		30			CN	PR	SM					
BHL-12	59.60				J		20			CN	PR	SM					
BHL-12	59.84				hJ		20				PR						HB
BHL-12	59.97				hJ		55		bk mi		PR						3 mm bleached halo
BHL-12	60.34				J		30			CN	PR	SM					
BHL-12	60.36				V		20				IR		<	8			APLITE, coarse grained, pk, wh, bk
BHL-12	60.39				hJ		90		bk mi		PR						5 mm bleached halo
BHL-12	60.46				hJ		40		bk mi		PR						
BHL-12	60.59				J		20		ph wh and rd mi	VN	PR	SM					
BHL-12	60.80				hJ		10		bk mi		PR						
BHL-12	60.86				hJ		20				PR						
BHL-12	61.06				J		30		ph wh mi	VN	PR	SM					
BHL-12	61.47				V		40				PR		<	2			APLITE, fine grained, pk, <3 mm bleached halo
BHL-12	61.49				J		10			CN	PR	SM					
BHL-12	61.56				hJ		40			CN	PR						1 mm bleached halo
BHL-12	61.87				hJ		60				PR						5 mm bleached halo
BHL-12	62.51				hJ		15		bk mi		PR						
BHL-12	62.83				hJ		30		wh mi		PR						
BHL-12	62.86				hJ		15		wh mi		PR						
BHL-12	63.04				hJ		40		wh mi		PR						
BHL-12	63.06				hJ		0				PR						



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PointID	Depth	Bottom	Fracture Set	Defect Number	Type	Type Suffix	Dip Minimum (degrees)	Dip Maximum (degrees)	Infilling Material	Aperture Observation	Planarity	Roughness	Aperture Measurement Sign	Aperture Measurement	Aperture	Spacing	Remark
BHL-12	63.10				hJ		5				PR						
BHL-12	63.12				hJ		20		bk mi		PR						
BHL-12	63.13				hJ		10		bk mi		PR						
BHL-12	63.15				hJ		5		bk and wh mi		PR						
BHL-12	63.16				hJ		5		bk and wh mi		PR						
BHL-12	63.17				hJ		20		bk mi		PR						
BHL-12	63.20				hJ		0		bk mi		PR						
BHL-12	63.21				J		15			CN	PR	SM					
BHL-12	63.24				hJ		20				PR						
BHL-12	63.31				hJ		50		wh mi		UN						
BHL-12	63.32				J		65		ph wh and br mi	CT	PR	SM					
BHL-12	63.33				hJ		75		bk mi		PR						
BHL-12	63.34				hJ		30		wh mi		IR						
BHL-12	63.34				hJ		40		bk and wh mi		IR						
BHL-12	63.35				hJ		30		wh mi		IR						
BHL-12	63.36				hJ		50		wh mi		PR						
BHL-12	63.38				J		60		ph wh mi	VN	PR	SM					
BHL-12	63.38				hJ		20		wh mi		IR						
BHL-12	63.38				J		40			CN	UN	SM					
BHL-12	63.40				hJ		20		wh and bk mi		PR						
BHL-12	63.41				J		80			CN	PR	SM					
BHL-12	63.42				hJ		75		wh mi		IR						
BHL-12	63.43				hJ		40		wh and bk mi		IR						
BHL-12	63.44				hJ		50		wh mi		UN						5 mm pl br halo, incipient
BHL-12	63.45				hJ		60		wh mi		PR						3 mm pl br halo
BHL-12	63.46				hJ		90		wh mi		IR						
BHL-12	63.49				hJ		40				IR						
BHL-12	63.50				hJ		60				PR						
BHL-12	63.51				hJ		90				IR						
BHL-12	63.52				hJ		60		wh mi		PR						
BHL-12	63.52				J		50		wh mi	CT	PR	SM					
BHL-12	63.54				hJ		20				IR						
BHL-12	63.55				hJ		50				IR						
BHL-12	63.56				J		40			CN	CU	RF					
BHL-12	63.56				J		30			CN	PR	SM					
BHL-12	63.57				J		70		ph wh mi	VN	IR	SM					
BHL-12	63.58				hJ		50		wh mi		PR						
BHL-12	63.58				J		50			CN	PR	SM					
BHL-12	63.59				hJ		45		bk mi		PR						
BHL-12	63.61				hJ		55				PR						
BHL-12	63.62				J		40			CN	PR	SM					
BHL-12	63.62				hJ		80										
BHL-12	63.63				J		50			CN	PR	SM					
BHL-12	63.64				J		40			CN	PR	SM					
BHL-12	63.65				hJ		20				PR						
BHL-12	63.69				hJ		40		wh mi		PR						
BHL-12	63.70				hJ		60		wh mi		UN						
BHL-12	63.72				hJ		30		bk mi		PR						
BHL-12	63.79				hJ		70		wh mi		UN						ph or SN
BHL-12	63.81				J		40			CN	PR	SM					
BHL-12	63.84	63.86			V		20				PR			22			APLITE, or, wh, bk, possible SN
BHL-12	63.95				hJ		40		bk and wh mi		PR						
BHL-12	63.97				J		40			CN	PR	RF					
BHL-12	64.01				hJ		20		bk mi		PR						
BHL-12	64.04				hJ		30		bk mi		PR						
BHL-12	64.04				hJ		30		bk mi		PR						
BHL-12	64.05				hJ		80		bk mi		PR						
BHL-12	64.05				hJ		30		bk mi		PR						
BHL-12	64.08				hJ		30		bk mi		PR						
BHL-12	64.09				hJ		30		bk mi		PR						
BHL-12	64.11				hJ		70		bk mi		UN						
BHL-12	64.13				J		20			CN	PR	SM					
BHL-12	64.21				J		30			CN	PR	RF					
BHL-12	64.29				hJ		20		bk mi		PR						
BHL-12	64.33				hJ		30		bk mi		PR						
BHL-12	64.39				hJ		20		bk mi		PR						
BHL-12	64.43				hJ		30		bk mi		PR						
BHL-12	64.45				J		25			CN	CU	SM					5 mm pl gr-br halo
BHL-12	64.48				hJ		25		bk mi		PR						
BHL-12	64.49				hJ		30		bk and br mi		PR						
BHL-12	64.50				hJ		10		bk and br mi		PR						incipient
BHL-12	64.53				J		70		ph bk and wh mi	VN	PR	SM					pl or halo
BHL-12	64.58				hJ		20				IR						
BHL-12	64.61				V		90		wh mi		IR			4			
BHL-12	64.61				hJ		50				IR						
BHL-12	64.65				hJ		5		bk mi		PR						3 mm pl br to or halo
BHL-12	64.66				hJ		30		bk mi		PR						
BHL-12	64.66				hJ		60		wh mi		IR						
BHL-12	64.67				J		40		wh mi	CT	ST	SM					



Pioneer-Burdekin Pumped Hydro Energy Scheme: Tranche 1 – BHL-12 Defects List

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PointID	Depth	Bottom	Fracture Set	Defect Number	Type	Type Suffix	Dip Minimum (degrees)	Dip Maximum (degrees)	Infilling Material	Aperture Observation	Planarity	Roughness	Aperture Measurement Sign	Aperture Measurement	Aperture	Spacing	Remark
BHL-12	64.70				hJ		30				UN						
BHL-12	64.71				hJ		30				PR						
BHL-12	64.72				hJ		50		wh mi		UN						
BHL-12	64.72				hJ		50		bk mi		PR						<5 mm pl br halo
BHL-12	64.75				hJ		85		wh mi		UN						
BHL-12	64.76				hJ		60		wh mi		UN						
BHL-12	64.77				J	/V	75		wh mi	CT	PR	SM	<	2			
BHL-12	64.79				hJ		60										
BHL-12	64.80				J		0			CN	IR	VR					possible DB
BHL-12	64.83				J		35			CN	IR	VR					possible DB
BHL-12	64.92				J		20		ph wh mi	VN	UN	SM					
BHL-12	64.96				J		40		ph wh mi	VN	UN	SM					
BHL-12	65.01				hJ		50		wh mi		PR						
BHL-12	65.04				J	/V	50		wh mi	CT	PR	SM	<	2			
BHL-12	65.06				hJ		90		wh and bk mi		PR						
BHL-12	65.11				hJ		50		wh mi		PR						1 mm pl or halo
BHL-12	65.14				hJ		40		wh mi		PR						<2 mm pl or halo
BHL-12	65.17				hJ		40		wh mi		PR						<1 mm pl or halo
BHL-12	65.20				hJ		40		wh mi		PR						
BHL-12	65.25				J		40		wh mi	CT	PR	SM					
BHL-12	65.26				J		0			CN	PR	SM					
BHL-12	65.27				hJ		50		wh mi		IR						
BHL-12	65.28				hJ		20		wh mi		PR						
BHL-12	65.30				hJ		70		wh mi		PR						
BHL-12	65.44				J		10			CN	PR	RF					
BHL-12	65.53				hJ		60				IR						
BHL-12	65.57				hJ		50		bk mi		PR						
BHL-12	65.60				hJ		55		wh mi		PR						
BHL-12	65.65				hJ		50		or mi		PR						
BHL-12	65.68				hJ		60		wh and bk mi		IR						
BHL-12	65.69				hJ		60		or mi		UN						
BHL-12	65.76				J		0		bk	SN	PR	SM					possibly drilling oit
BHL-12	65.81				J		0			CN	CU	SM					possible DB, drill spun
BHL-12	65.84				hJ		90				CU						incipient
BHL-12	65.95				hJ		80		wh and or mi		PR						DB, 3 mm or halo
BHL-12	65.97				hJ		20		wh mi		PR						
BHL-12	66.00				hJ		60		wh mi		PR						
BHL-12	66.02				V		40		or mi		ST			2			
BHL-12	66.04				J		50			CN	UN	SM					
BHL-12	66.08				V		10		or mi		PR			3			
BHL-12	66.14				hJ		75		wh mi		PR						1 mm ph or halo
BHL-12	66.16				hJ		40		wh mi		PR						
BHL-12	66.23				hJ		15		bk mi		PR						
BHL-12	66.43				V		30		or mi		PR			3			
BHL-12	66.46				hJ		5		bk mi		PR						
BHL-12	66.49				hJ		5		bk mi		PR						
BHL-12	66.58				hJ		85		bk mi		PR						
BHL-12	66.63				J		30			CN	PR	SM					
BHL-12	66.68				hJ		65		wh mi		UN						<1 mm ph or halo
BHL-12	66.72				hJ		40		bk mi		PR						
BHL-12	66.74				hJ		40		bk mi		PR						
BHL-12	66.76				hJ		70		bk mi		IR						
BHL-12	66.83				V		5		or mi		PR			1			
BHL-12	66.84				hJ		60		wh mi		PR						10 mm pl or halo
BHL-12	66.87				hJ		5		wh mi		IR						1 mm pl or halo
BHL-12	66.90				J		60			CN	PR	RF					pl br alt
BHL-12	66.90				J		60			CN	PR	RF					pl br alt
BHL-12	66.92				J		0			CN	PR	SM					pl br alt
BHL-12	66.94				J		40		ph bk	SN	PR	SM					pl br alt
BHL-12	66.97				hJ		60		wh mi		PR						
BHL-12	67.01				hJ		20				UN						DB
BHL-12	67.02				J		35		ph wh mi	VN	PR	SM					
BHL-12	67.07				hJ		30		wh mi		PR						
BHL-12	67.11				hJ				bk mi		IR						
BHL-12	67.12				hJ		30		bk and wh mi		PR						
BHL-12	67.17				J		10			CN	UN	SM					
BHL-12	67.20				hJ				bk mi		PR						
BHL-12	67.21				hJ		0		bk mi		PR						
BHL-12	67.22				hJ		0		bk mi		PR						
BHL-12	67.24				J		5			CN	PR	SM					
BHL-12	67.31				hJ		0		bk mi		PR						
BHL-12	67.33				hJ		5		bk mi		PR						
BHL-12	67.35				hJ		5		bk mi		PR						
BHL-12	67.36				hJ		20		bk mi		UN						
BHL-12	67.37				hJ		5		bk mi		PR						
BHL-12	67.44				hJ		20		bk mi		PR						
BHL-12	67.44				hJ		20		wh and bk mi		PR						
BHL-12	67.46				hJ		20		bk, wh, and rd mi		PR						
BHL-12	67.50				hJ		40		wh mi		PR						<1 mm gr-gy halo



Pioneer-Burdekin Pumped Hydro Energy Scheme: Tranche 1 – BHL-12 Defects List

Refer to Explanatory Notes sheets for abbreviation definitions

PointID	Depth	Bottom	Fracture Set	Defect Number	Type	Type Suffix	Dip Minimum (degrees)	Dip Maximum (degrees)	Infilling Material	Aperture Observation	Planarity	Roughness	Aperture Measurement Sign	Aperture Measurement	Aperture	Spacing	Remark
BHL-12	67.53				hJ		85		bk and gy mi		UN						<3 mm wh to pl or halo
BHL-12	67.55				hJ		5				UN						DB
BHL-12	67.59				hJ		20		bk mi		IR						
BHL-12	67.62				hJ		10				UN						
BHL-12	67.64				hJ		10		wh mi		PR						1 mm gr-gy halo
BHL-12	67.70				hJ		85		gy and wh mi		UN						<2 mm pl or halo
BHL-12	67.75				hJ		5		wh mi		PR						
BHL-12	67.76				hJ		30		wh mi		UN						
BHL-12	67.80				hJ		20		bk and wh mi		PR						
BHL-12	67.81				hJ		40		bk mi		IR						
BHL-12	67.83				J		5			CN	IR						possible DB
BHL-12	67.88				hJ		30				PR						DB
BHL-12	68.03				hJ		20				PR						
BHL-12	68.12				V	/hJ	20		APLITE, fine to coarse grained		PR			2			
BHL-12	68.20				V		20		APLITE, fine to coarse grained		PR			3			
BHL-12	68.27				hJ		20		bk mi		PR						
BHL-12	68.29				hJ		20		bk mi		PR						
BHL-12	68.31				J		25		ph wh mi	VN	PR	SM					
BHL-12	68.40				hJ		40				PR						
BHL-12	68.51				J		40			CN	UN	RF					
BHL-12	68.55				hJ		20				PR						
BHL-12	68.56				hJ		85				UN						
BHL-12	68.59				hJ		20				UN						
BHL-12	68.64				J		30			CN	IR	RF					possible DB
BHL-12	68.73				hJ		20		bk mi		PR						
BHL-12	69.06				hJ		10		bk mi		UN						
BHL-12	69.17				hJ		60		wh mi		PR						
BHL-12	69.18				hJ		60		wh mi		PR						<3 mm gr alt halo
BHL-12	69.19				hJ		60		wh mi		PR						
BHL-12	69.19				hJ		60		wh mi		PR						
BHL-12	69.20				hJ		60		wh mi		PR						
BHL-12	69.22				hJ		60		wh mi		PR						
BHL-12	69.22				J		0			CN	PR	RF					possible DB
BHL-12	69.24				J		65		ph wh mi	VN	PR	SM					
BHL-12	69.30				hJ		10				UN						incipient
BHL-12	69.35				V		25		APLITE, coarse grained, pk		PR			15			possible alt
BHL-12	69.40				hJ		20				PR						
BHL-12	69.42				hJ		20		bk mi		PR						
BHL-12	69.43				hJ		85		wh mi		UN						<3 mm alt halo
BHL-12	69.54				hJ		20				PR						
BHL-12	69.61				V		25		APLITE, coarse grained, pk		PR			7			possible alt
BHL-12	69.68				hJ		50		wh mi		PR						
BHL-12	69.70				hJ		50		wh mi		PR						
BHL-12	69.82				J		20			CN	UN	RF					
BHL-12	69.86				hJ		0				UN						
BHL-12	69.88				J		40			CN	IR	SM					
BHL-12	69.94				J		45		ph wh mi	VN	PR	SM					
BHL-12	69.95				hJ		40				UN						
BHL-12	69.97				J		80		ph wh mi	VN	UN	SM					
BHL-12	69.98				J		80		ph wh mi	VN	UN	SM					
BHL-12	70.06				J		90		ph wh mi	VN	UN	SM					
BHL-12	70.14				J		15		ph wh mi	VN	UN	RF					
BHL-12	70.31				hJ		60				PR						
BHL-12	70.33				J		55		ph wh mi	VN	PR	SM					ph gy SILT, possible drilling mud
BHL-12	70.35				hJ												
BHL-12	70.36				hJ		50				PR						
BHL-12	70.36				hJ		90				UN						incipient
BHL-12	70.36				hJ		90				UN						incipient
BHL-12	70.38				hJ		90				UN						incipient
BHL-12	70.39				hJ		90				UN						incipient
BHL-12	70.40				J		20		ph wh mi	VN	UN	SM					
BHL-12	70.43				hJ						PR						
BHL-12	70.49				hJ		0				IR						
BHL-12	70.50				hJ		60				UN						
BHL-12	70.56				V		85		wh mi		PR		<	2			
BHL-12	70.64				hJ		75				UN						incipient
BHL-12	70.65				hJ		75				UN						incipient
BHL-12	70.68				hJ		60				UN						incipient
BHL-12	70.69				hJ		75				UN						incipient
BHL-12	70.71				J		20		ph wh mi	VN	IR	RF					
BHL-12	70.73				hJ		10		bk mi		PR						
BHL-12	70.74				hJ		85		bk mi		UN						
BHL-12	70.76				hJ		0				UN						
BHL-12	70.77				J		85		ph wh mi	VN	UN	SM					
BHL-12	70.77				hJ						IR						
BHL-12	70.82				hJ		85				UN						
BHL-12	70.84				J		40			CN	CU	SM					possible DB
BHL-12	70.85				J		60			CN	UN	SM					
BHL-12	70.87				J		30			CN	UN	SM					



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PointID	Depth	Bottom	Fracture Set	Defect Number	Type	Type Suffix	Dip Minimum (degrees)	Dip Maximum (degrees)	Infilling Material	Aperture Observation	Planarity	Roughness	Aperture Measurement Sign	Aperture Measurement	Aperture	Spacing	Remark
BHL-12	70.92				J		75		ph wh mi	VN	UN	SM					
BHL-12	70.94				hJ		85		wh mi		PR						
BHL-12	71.02				hJ		70		wh mi		PR						
BHL-12	71.05				J		70		ph wh mi	VN	PR	SM					
BHL-12	71.06				J		70		ph wh mi	VN	UN	SM					
BHL-12	71.06				hJ		0				IR						
BHL-12	71.08				J		60		ph wh mi	VN	PR	SM					
BHL-12	71.11				J		30		ph wh mi	VN	PR	SM					
BHL-12	71.12				hJ		40				UN						
BHL-12	71.14				hJs	/Js											zone of many hJs and incipient Js
BHL-12	71.14				J		20	30	wh mi	VN	IR	SM					
BHL-12	71.18				hJ		30		wh mi		UN						
BHL-12	71.19				hJ		40		wh mi		PR						
BHL-12	71.25				J		40		ph wh mi	VN	UN	SM					
BHL-12	71.30				J		45		ph wh mi	VN	UN	RF					
BHL-12	71.34				J		40		ph wh mi	VN	PR	SM					
BHL-12	71.38				J		60		ph wh mi	VN	PR	SM					
BHL-12	71.40				hJ		40		wh mi		UN						
BHL-12	71.44				J		40		ph wh mi	VN	UN	SM					
BHL-12	71.49				J		40			VN	UN	SM					
BHL-12	71.52				J		55			VN	UN	SM					
BHL-12	71.53				hJ		75		wh mi		PR						
BHL-12	71.53				hJ		30		wh mi		UN						
BHL-12	71.55				hJ		60		wh mi		PR						
BHL-12	71.56				J		45		ph wh mi	VN	UN	SM					
BHL-12	71.58				hJ		90		wh mi		UN						
BHL-12	71.59				hJ		50		wh mi		UN						
BHL-12	71.63				hJ		5		wh mi		UN						
BHL-12	71.64				hJ		90		wh mi		UN						
BHL-12	71.67				J		20		ph wh mi	VN	UN	SM					
BHL-12	71.69				J		50		ph wh mi	VN	UN	SM					
BHL-12	71.70				hJ		60		wh mi		UN						
BHL-12	71.73				J		30		ph wh mi	VN	UN	SM					
BHL-12	71.77				hJ		70		wh mi		UN						
BHL-12	71.78				hJ		50		wh mi		UN						
BHL-12	71.79				hJ		40		wh mi		UN						
BHL-12	71.81				hJ		75		wh mi		UN						
BHL-12	71.82				hJ		70		wh mi		UN						
BHL-12	71.83				hJ		50		wh mi		UN						
BHL-12	71.84				hJ		50		wh mi		UN						
BHL-12	71.85				J		70		ph wh mi	VN	UN	SM					
BHL-12	71.86				hJ		50		wh mi		UN						
BHL-12	71.87				hJ		50		wh mi		UN						
BHL-12	71.89				J		30		ph wh mi	VN	UN	SM					
BHL-12	71.90				J		80		ph wh mi	VN	UN	SM					
BHL-12	71.91				J		80		ph wh mi	VN	UN	SM					
BHL-12	71.91				hJ		70				UN						
BHL-12	71.95				J		60		ph wh mi	VN	UN	SM					
BHL-12	71.97				hJ		35				UN						
BHL-12	72.01				hJ		60				PR						
BHL-12	72.02				J		60			CN	PR	SM					
BHL-12	72.02				hJ		50				UN						
BHL-12	72.05				hJ		50				UN						
BHL-12	72.08				J		50		wh mi	CT	PR	SM					
BHL-12	72.19				hJ		80				UN						
BHL-12	72.21				hJ		30				UN						
BHL-12	72.24				hJ				wh mi		IR						
BHL-12	72.25				hJ		50		wh mi		PR						
BHL-12	72.27				hJ		60		wh mi		PR						
BHL-12	72.31				J		35		ph wh mi	VN	PR	SM					
BHL-12	72.35				hJ		50		wh mi		PR						
BHL-12	72.36				hJ		50				PR						
BHL-12	72.39				J		85		ph wh mi	VN	UN	SM					
BHL-12	72.40				hJ		50		wh mi		PR						
BHL-12	72.42				hJ		60				UN						
BHL-12	72.45				J		60		ph wh mi	VN	PR	SM					
BHL-12	72.49				hJ		50				PR						
BHL-12	72.50				hJ		30				PR						
BHL-12	72.51				hJ		90				IR						
BHL-12	72.52				J		35		wh mi	VN	PR	SM					
BHL-12	72.52				hJ		15				UN						
BHL-12	72.53				hJ		80				UN						<1 mm wh halo
BHL-12	72.54				hJ		50		wh mi		PR						<3 mm wh halo
BHL-12	72.54				hJ		55		wh mi		PR						
BHL-12	72.57				hJ		5				IR						
BHL-12	72.59				hJ						IR						
BHL-12	72.61				J		30			CN	PR	SM					
BHL-12	72.62				J		50			CN	PR	SM					
BHL-12	72.63				hJ		50		wh mi		UN						<3 mm wh to pl or halo



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PointID	Depth	Bottom	Fracture Set	Defect Number	Type	Type Suffix	Dip Minimum (degrees)	Dip Maximum (degrees)	Infilling Material	Aperture Observation	Planarity	Roughness	Aperture Measurement Sign	Aperture Measurement	Aperture	Spacing	Remark
BHL-12	72.64				hJ		25				UN						
BHL-12	72.68				J		30		ph wh mi	VN	PR	SM					
BHL-12	72.72				J		30		ph wh mi	VN	PR	SM					
BHL-12	72.73				hJ		70				UN						
BHL-12	72.75				hJ		30		wh mi		UN						
BHL-12	72.77				J		30		ph wh mi	VN	PR	SM					
BHL-12	72.79				J		35		ph wh mi	VN	PR	SM					
BHL-12	72.80				J		40		ph wh mi	VN	PR	SM					
BHL-12	72.83				hJ		35		wh mi		PR						
BHL-12	72.86				hJ		65				PR						
BHL-12	72.87				hJ		40				PR						
BHL-12	72.89				hJ		50				PR						
BHL-12	72.90				J		70			CN	PR	SM					
BHL-12	72.91				hJ		60				PR						
BHL-12	72.94				J		30			CN	IR	SM					
BHL-12	72.96				hJ		45				PR						
BHL-12	73.01				J		30			CN	UN	SM					
BHL-12	73.03				J		20			CN	UN	SM					
BHL-12	73.06				J		60		ph wh mi	VN	UN	SM					
BHL-12	73.07				hJ		50				UN						
BHL-12	73.11				hJ		60				PR						
BHL-12	73.12				hJ						IR						
BHL-12	73.13				J		60			CN	PR	SM					
BHL-12	73.14				hJ		40				PR						
BHL-12	73.16				J		50			CN	PR	SM					
BHL-12	73.17				J		20			CN	ST	SM					
BHL-12	73.20				hJ		70				PR						
BHL-12	73.21				J		90			CN	PR	SM					
BHL-12	73.25				J		65		wh mi	VN	CU	SM					
BHL-12	73.27				hJ		65				PR						
BHL-12	73.31				J		30			CN	PR	SM					
BHL-12	73.34				hJ		90				UN						
BHL-12	73.34				hJ		60				PR						
BHL-12	73.37				hJ		30			CN	UN	SM					
BHL-12	73.38				J		20				IR						
BHL-12	73.38				J		10			CN	PR	SM					
BHL-12	73.39				J		30		ph wh mi	VN	PR	SM					
BHL-12	73.41				hJ		90				UN						
BHL-12	73.42				hJ		90				UN						
BHL-12	73.43				hJ		90				UN						
BHL-12	73.44				J		30			CN	IR	SM					
BHL-12	73.46				hJ		50				PR						
BHL-12	73.48				hJ		40				PR						
BHL-12	73.49				J		30		wh mi	VN	CU	SM					
BHL-12	73.51				J		60			CN	UN	SM					
BHL-12	73.52				J		30		wh mi	VN	PR	SM					
BHL-12	73.55				hJ		80				UN						
BHL-12	73.56				hJ		40			CN	PR	SM					
BHL-12	73.59				J		50			CN	PR	SM					
BHL-12	73.64				J		55				UN						
BHL-12	73.65				hJ		55				PR						
BHL-12	73.71				hJ		90				UN						
BHL-12	73.72				hJ		60				UN						
BHL-12	73.73				hJ		60				PR						
BHL-12	73.73				hJ						IR						
BHL-12	73.74				J		65		wh mi	VN	CU	SM					
BHL-12	73.75				hJ		90				PR						
BHL-12	73.75				hJ		90				UN						
BHL-12	73.77				hJ		50				UN						
BHL-12	73.78				J		40			CN	PR	PR					
BHL-12	73.82				J		50			CN	PR	PR					
BHL-12	73.83				hJ		90				PR						
BHL-12	73.83				hJ		85				PR						
BHL-12	73.89				J		60			CN	UN	RF					
BHL-12	73.91				J		60		ph wh mi	VN	PR	SM					
BHL-12	73.93				J		35		ph wh mi	VN	PR	SM					
BHL-12	73.95				J		45			CN	IR	RF					
BHL-12	73.96				J		40		ph wh mi	VN	PR	SM					
BHL-12	73.98				J		60		ph wh mi	VN	PR	SM					
BHL-12	73.99				J		60		ph wh mi	VN	PR	SM					
BHL-12	74.02				hJ		50				PR						
BHL-12	74.03				hJ		40		wh mi		PR						
BHL-12	74.10				J		30		ph wh mi	VN	PR	SM					
BHL-12	74.14				J	x3	60			CN	PR	SM					
BHL-12	74.15				hJ						IR						
BHL-12	74.16				hJ		50				PR						
BHL-12	74.19				hJ		35		wh mi		PR						
BHL-12	74.24				hJ		5		wh mi		UN						
BHL-12	74.26				hJ		45		wh mi		UN						



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PointID	Depth	Bottom	Fracture Set	Defect Number	Type	Type Suffix	Dip Minimum (degrees)	Dip Maximum (degrees)	Infilling Material	Aperture Observation	Planarity	Roughness	Aperture Measurement Sign	Aperture Measurement	Aperture	Spacing	Remark
BHL-12	74.34				J		5			CN	PR	RF					
BHL-12	74.37				hJ		50		wh mi		PR						
BHL-12	74.45				hJ		30		wh mi		PR						
BHL-12	74.47				J		5		ph wh mi	VN	PR	SM					
BHL-12	74.91				hJ		30				UN						
BHL-12	74.93				hJ		60				PR						
BHL-12	74.96				J		30		wh mi	VN	PR	SM					
BHL-12	74.98				J		80		wh and rd mi	VN	IR	SM					
BHL-12	75.05				J		45		ph wh mi	VN	PR	SM					
BHL-12	75.07				J		40		ph wh mi	VN	PR	SM					
BHL-12	75.09				hJ		50		wh mi		UN						
BHL-12	75.10				hJ		50		wh mi		UN						
BHL-12	75.13				J		40		ph wh mi	VN	UN	SM					
BHL-12	75.18				hJ		70		wh mi		PR						
BHL-12	75.23				hJ		15		wh mi		PR						
BHL-12	75.25				J		40		ph wh mi	VN	CU	SM					
BHL-12	75.29				hJ		70				UN						
BHL-12	75.44				J		50		wh mi	VN	PR	SM					
BHL-12	75.46				hJ		50		wh mi		PR						
BHL-12	75.47				hJ		50		wh mi		PR						
BHL-12	75.49				hJ		40		wh mi		PR						
BHL-12	75.50				hJ		60		wh mi		PR						
BHL-12	75.51				J		60		ph wh mi	VN	PR	SM					
BHL-12	75.55				J		30		wh mi	CT	UN	SM					
BHL-12	75.63				J		30		ph wh mi	VN	IR	SM					
BHL-12	75.66				hJ		30				IR						
BHL-12	75.69				hJ		60		wh mi		PR						
BHL-12	75.74				hJ		40		wh mi		PR						
BHL-12	75.75				hJ		40		wh mi		PR						
BHL-12	75.76				hJ		40		wh mi		PR						
BHL-12	75.77				J		70		wh mi	CT	PR	SM					
BHL-12	75.78				hJ		15				PR						
BHL-12	75.81				hJ		30				PR						
BHL-12	75.82				hJ						IR						
BHL-12	75.83				hJ		40				IR						
BHL-12	75.84				J		10		wh mi	VN	UN						
BHL-12	75.85				J		30		ph wh mi	VN	UN	SM					
BHL-12	75.87				hJ		30				IR						
BHL-12	75.88				hJ		60				IR						incipient
BHL-12	75.89				hJ		60				PR						incipient
BHL-12	75.90				hJ		60				PR						incipient
BHL-12	75.91				hJ		50				PR						incipient
BHL-12	75.92				J		50		wh mi	CT	UN	SM					
BHL-12	75.92				hJ		20		wh mi		IR						
BHL-12	75.94				hJ		60		wh mi		UN						
BHL-12	75.95				hJ		90				UN						
BHL-12	75.97				hJ		60		wh mi		PR						
BHL-12	76.00				J		50		ph wh mi	VN	PR	SM					
BHL-12	76.01				J		50		ph wh mi	VN	PR	SM					
BHL-12	76.02				J		50		ph wh mi	VN	PR	SM					
BHL-12	76.04				J		50		ph wh mi	VN	UN	RF					
BHL-12	76.06				hJ		45				PR						
BHL-12	76.07				hJ		60		wh mi		PR						
BHL-12	76.09				J		30		ph mi	VN	PR	SM					
BHL-12	76.11				hJ		55		wh mi		UN						
BHL-12	76.11				hJ		40				PR						
BHL-12	76.12				J		90		wh mi	VN	UN	RF					
BHL-12	76.13				hJ		40				PR						
BHL-12	76.14				hJ		85				UN						
BHL-12	76.15				hJ		55		wh mi		PR						
BHL-12	76.17				hJ		55										HB
BHL-12	76.23				J		60		ph wh mi	VN	PR	SM					
BHL-12	76.26				hJ		20		bk mi		PR						
BHL-12	76.28				hJ		60				IR						
BHL-12	76.29				hJ		50				PR						
BHL-12	76.34				hJ		50		wh mi		PR						
BHL-12	76.35				hJ		50		wh mi		PR						
BHL-12	76.37				hJ		20		ph wh mi		PR						
BHL-12	76.38				hJ		20		wh mi		PR						
BHL-12	76.40				J		50		ph wh mi	VN	PR	SM					
BHL-12	76.40				J		50		ph wh mi	VN	PR	SM					
BHL-12	76.41				hJ		50				PR						
BHL-12	76.44				hJ		40				UN						
BHL-12	76.48				hJ		50		wh mi		PR						
BHL-12	76.51				hJ		10		wh mi		PR						
BHL-12	76.52				J		50		ph wh mi	VN	PR	SM					
BHL-12	76.55				hJ		45		wh mi		PR						
BHL-12	76.56				J		65		ph wh mi	VN	UN	SM					DB
BHL-12	76.57				hJ		40		wh mi		PR						



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PointID	Depth	Bottom	Fracture Set	Defect Number	Type	Type Suffix	Dip Minimum (degrees)	Dip Maximum (degrees)	Infilling Material	Aperture Observation	Planarity	Roughness	Aperture Measurement Sign	Aperture Measurement	Aperture	Spacing	Remark
BHL-12	76.58				J		50			CN	PR	SM					possible DB
BHL-12	76.59				J		60			CN	UN	SM					
BHL-12	76.60				hJ		50				UN						
BHL-12	76.62				J		40		ph wh mi	VN	PR	SM					
BHL-12	76.64				J		45		ph wh mi	VN	PR	SM					
BHL-12	76.66				J		35		ph wh mi	VN	PR	SM					
BHL-12	76.68				J		25		ph wh mi	VN	UN	SM					
BHL-12	76.80				hJ		70		wh mi		PR						incipient
BHL-12	76.85				hJ		5			CN	IR	RF					HB
BHL-12	76.92				hJ		40				PR						incipient
BHL-12	76.93				hJ		55				PR						incipient
BHL-12	76.95				J		50			CN	PR	SM					
BHL-12	76.96				hJ		30				PR						
BHL-12	76.97				hJ		40				PR						
BHL-12	77.01				hJ		45				UN						
BHL-12	77.02				hJ		45				UN						
BHL-12	77.03				hJ		45				UN						
BHL-12	77.05				hJ		90				UN						<2 mm pl or to wh halo
BHL-12	77.06				hJ						IR						
BHL-12	77.09				J		35			CN	PR	SM					
BHL-12	77.11				hJ		90		wh mi		UN	SM					
BHL-12	77.16				J		80		wh mi	CT	UN	SM					<2 mm pl or to wh halo
BHL-12	77.18				J		40			CN	IR	SM					
BHL-12	77.19				hJ		60				UN						
BHL-12	77.28				J		35			CN	UN	RF					
BHL-12	77.34				hJ		85		wh mi		PR						
BHL-12	77.45				hJ						IR						
BHL-12	77.47				hJ		65				PR						incipient
BHL-12	77.47				hJ		35				PR						
BHL-12	77.50				J		65		wh mi	VN	PR	SM					
BHL-12	77.53				J		65		ph wh mi	VN	PR	SM					
BHL-12	77.54				J		0			CN	IR	SM					possible DB
BHL-12	77.57				hJ		65				PR						
BHL-12	77.60				J		65		ph wh mi	VN	PR	SM					
BHL-12	77.64				hJ		75				UN						
BHL-12	77.80				J		35			CN	PR	SM					
BHL-12	77.82				hJ		80				UN						
BHL-12	77.83				hJ		30				PR						
BHL-12	77.85				hJ		80				PR						
BHL-12	77.87				J		40		ph wh mi	VN	PR	SM					
BHL-12	77.89				hJ		40				PR						
BHL-12	77.90				J		80		ph wh mi	VN	PR	SM					
BHL-12	77.91				hJ		55				PR						
BHL-12	77.94				J		40			CN	PR	SM					
BHL-12	77.96				hJ		80				PR						
BHL-12	78.03				J		40			CN	PR	SM					
BHL-12	78.17				hJ		20				PR						
BHL-12	78.18				hJ		50				PR						
BHL-12	78.19				J		40		wh mi	VN	UN	SM					
BHL-12	78.21				hJ		55				UN						
BHL-12	78.27				hJ		25		bk mi		PR						
BHL-12	78.29				J		60			CN	IR	SM					
BHL-12	78.38				hJ		35				PR						
BHL-12	78.39				hJ		65				PR						
BHL-12	78.39				hJ		60				PR						
BHL-12	78.41				hJ		0				IR						
BHL-12	78.46				hJ		80		wh mi		UN						<2 mm pl or halo
BHL-12	78.53				hJ		50				UN						
BHL-12	78.54				hJ		85				UN						
BHL-12	78.55				J		85			CN	UN	SM					possible DB
BHL-12	78.56				J		30			CN	UN	SM					<2 mm pl or halo
BHL-12	78.58				hJ		20				UN						
BHL-12	78.59				hJ		20				UN						
BHL-12	78.60				hJ		20				UN						
BHL-12	78.61				hJ		85				UN						
BHL-12	78.70				hJ		90		bk mi		UN						
BHL-12	78.73				J		20			CN	PR	SM					
BHL-12	78.77				hJ		80				UN						
BHL-12	78.78				hJ		40				UN						
BHL-12	78.80				J		25			CN	SM	SM					
BHL-12	78.85				J		25		ph wh mi	VN	PR	SM					
BHL-12	78.88				hJ		50		wh mi		PR						
BHL-12	78.91				hJ		55		wh mi		UN						
BHL-12	79.00				J		65		ph wh mi	VN	PR	SM					
BHL-12	79.01				J		20		ph wh mi	VN	PR	SM					
BHL-12	79.02				J		20		ph wh mi	VN	PR	SM					
BHL-12	79.02				J		20		ph wh mi	VN	PR	SM					
BHL-12	79.05				J		10		ph wh mi	VN	PR	SM					
BHL-12	79.06				J		65		ph wh mi	VN	UN	SM					



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PointID	Depth	Bottom	Fracture Set	Defect Number	Type	Type Suffix	Dip Minimum (degrees)	Dip Maximum (degrees)	Infilling Material	Aperture Observation	Planarity	Roughness	Aperture Measurement Sign	Aperture Measurement	Aperture	Spacing	Remark
BHL-12	79.07				hJ		90				IR						
BHL-12	79.08				J		15		ph wh mi	VN	PR	SM					
BHL-12	79.09				J		15		ph wh mi	VN	PR	SM					
BHL-12	79.10				hJ		40				UN						incipient
BHL-12	79.11				hJ		10				PR						incipient
BHL-12	79.11				hJ		10				PR						incipient
BHL-12	79.13				hJ		70				UN						incipient
BHL-12	79.15				hJ		90				UN						incipient
BHL-12	79.16				hJ		45				UN						incipient
BHL-12	79.16				hJ		15				UN						incipient
BHL-12	79.18				J		35		ph wh mi	VN	PR	SM					
BHL-12	79.28				hJ		80		wh mi		UN						
BHL-12	79.29				J		90			CN	PR	SM					
BHL-12	79.31				J		15			CN	UN	SM					
BHL-12	79.33				J		75		ph wh mi	VN	UN	SM					
BHL-12	79.34				hJ		30				PR						
BHL-12	79.35				J		30			CN	PR	SM					
BHL-12	79.38				J		30			CN	IR	VR					
BHL-12	79.39				hJ		40				PR						incipient
BHL-12	79.41				hJ		70		wh mi		UN						
BHL-12	79.43				hJ		20				PR						incipient
BHL-12	79.44				hJ		85				PR						incipient
BHL-12	79.45				hJ		90				UN						incipient
BHL-12	79.45				J		5			CN	IR	RF					
BHL-12	79.47				hJ		90		wh mi		PR						incipient
BHL-12	79.48				hJ		90		wh mi		PR						incipient
BHL-12	79.48				J		55			CN	IR	RF					
BHL-12	79.51				J		55			CN	IR	VR					
BHL-12	79.52				J		70			CN	IR	VR					
BHL-12	79.53				hJ						IR						
BHL-12	79.54				hJ		50				IR						
BHL-12	79.54				J		30			CN	CU	SM					
BHL-12	79.55				hJ		90				UN						
BHL-12	79.58				hJ		75				UN						
BHL-12	79.59				hJ		30				UN						
BHL-12	79.60				V		70		wh mi		UN		<	2			
BHL-12	79.63				V		5		wh mi		UN		<	2			
BHL-12	79.64				V	/J	65		wh mi		PR	SM	<	4			
BHL-12	79.71				hJ		15				UN						
BHL-12	79.73				hJ		90				UN						
BHL-12	79.75				hJ		50				UN						
BHL-12	79.76				J		20		ph wh mi	VN	IR	SM					
BHL-12	79.77				hJ		5				UN						
BHL-12	79.83				J		30		ph wh mi	VN	CU	RF					
BHL-12	79.88				hJ		25				UN	RF					DB
BHL-12	79.89				J		40		ph wh mi	VN	IR	RF					
BHL-12	79.92				J		75		ph wh mi	VN	UN	SM					
BHL-12	79.97				J		25		ph wh mi	VN	IR	SM					
BHL-12	80.06				J		30			CN	PR	VR					
BHL-12	80.07				hJ		30		wh mi		PR						
BHL-12	80.08				hJ		20				PR						DB
BHL-12	80.10				J		25			CN	UN	VR					
BHL-12	80.12				hJ		20		bk mi		PR						
BHL-12	80.16				hJ		25		bk mi		PR						
BHL-12	80.17				J		20		wh mi	VN	PR	SM					
BHL-12	80.18				hJ		10		wh mi		UN						
BHL-12	80.28				hJ		15				UN						
BHL-12	80.45				hJ		80		wh mi		UN						<5 mm pl or alt halo
BHL-12	80.50				J		45			CN	UN	RF					
BHL-12	80.53				hJ		40		wh mi		UN						
BHL-12	80.56				hJ		50				PR						
BHL-12	80.58				hJ		5		wh mi		PR						
BHL-12	80.60				hJ		40		wh mi		UN						
BHL-12	80.63				hJ		40				PR						
BHL-12	80.65				hJ		30				PR						
BHL-12	80.71				hJ		30				PR						
BHL-12	80.72				hJ		60		wh mi		PR						
BHL-12	80.73				hJ		30				PR						
BHL-12	80.78				hJ		30				PR						
BHL-12	80.83				hJ						UN						
BHL-12	80.96				hJ		30				PR						
BHL-12	81.05				J		10			CN	IR	RF					
BHL-12	81.08				hJ		40				PR						DB
BHL-12	81.11				hJ		20		bk mi		PR						
BHL-12	81.14				hJ		60		wh mi		PR						
BHL-12	81.15				J		10		ph wh mi	VN	UN	SM					
BHL-12	81.17				J		20		wh mi	VN	UN	SM					
BHL-12	81.18				hJ		70		wh mi		PR						
BHL-12	81.21				hJ		50		wh mi		PR						



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PointID	Depth	Bottom	Fracture Set	Defect Number	Type	Type Suffix	Dip Minimum (degrees)	Dip Maximum (degrees)	Infilling Material	Aperture Observation	Planarity	Roughness	Aperture Measurement Sign	Aperture Measurement	Aperture	Spacing	Remark
BHL-12	81.26				hJ		70				PR						incipient
BHL-12	81.30				hJ		20				PR						incipient
BHL-12	81.44				J		5		wh mi	VN	IR	VR					
BHL-12	81.46				hJ		50				PR						incipient
BHL-12	81.48				hJ		50				IR						
BHL-12	81.51				hJ		70				UN						
BHL-12	81.52				hJ		20				IR						
BHL-12	81.55				hJ		80				UN						
BHL-12	81.56				hJ		20				PR						
BHL-12	81.58				hJ		90				UN						
BHL-12	81.62				hJ		10		wh mi		UN						
BHL-12	81.68				hJ		80		wh mi		UN						
BHL-12	81.71				J		5			CN	PR	VR					
BHL-12	81.81				J		70	90		CN	CU	VR					
BHL-12	81.85				J		40			CN	PR	SM					
BHL-12	81.88				J		70	90		CN	CU	VR					
BHL-12	81.91				J					CN	CU	RF					
BHL-12	81.92				J		50			CN	UN	SM					
BHL-12	82.02				hJ		80		wh mi		UN						
BHL-12	82.10				hJ		70		wh mi		UN						
BHL-12	82.14				hJ		20		wh mi		PR						
BHL-12	82.15				hJ		40		wh mi		PR						
BHL-12	82.17				hJ		60		bk mi		PR						
BHL-12	82.22				hJ		90		wh mi		UN						
BHL-12	82.29				J		0			CN	ST	RF					
BHL-12	82.31				J		80		ph wh mi	VN	UN	SM					
BHL-12	82.33				J		45			CN	PR	RF					possible DB
BHL-12	82.34				J		75		wh mi	CT	UN	SM					
BHL-12	82.35				hJ		45				PR						
BHL-12	82.36				J		15		ph wh mi	VN	UN	SM					
BHL-12	82.45				hJ		25				UN						
BHL-12	82.54				hJ		30				UN						
BHL-12	82.64				hJ		30				UN						<1 mm wh halo
BHL-12	82.73				J		40			VN	UN	RF					
BHL-12	82.74				J		60			CN	PR	SM					
BHL-12	82.75				J		55		wh mi	VN	PR	SM					
BHL-12	82.76				hJ		60				PR						
BHL-12	82.77				hJ						CU						<2 mm wh halo
BHL-12	82.78				hJ		85		wh mi		PR						
BHL-12	82.82				J		70		ph wh mi	VN	UN	SM					
BHL-12	82.84				hJ		50				PR						
BHL-12	82.88				hJ		80				PR						<1 mm wh halo
BHL-12	82.91				hJ		50				PR						
BHL-12	82.93				J		45			CN	UN	SM					
BHL-12	83.01				hJ		70				PR						<2 mm wh halo
BHL-12	83.02				J		35		ph wh mi	VN	UN	SM					
BHL-12	83.04				hJ		50		wh mi		PR						
BHL-12	83.06				hJ		80				PR						<3 mm wh to pl or halo
BHL-12	83.14				J		50		wh mi	CT	PR	SM					
BHL-12	83.16				J		25			CN	UN	SM					
BHL-12	83.22				J		70		ph wh mi	CT	IR	RF					
BHL-12	83.27				hJ						IR						
BHL-12	83.28				J		80		wh mi	CT	PR	SM					
BHL-12	83.29				hJ						IR						
BHL-12	83.29				hJ		90				IR						
BHL-12	83.32				J		45		ph wh mi	VN	PR	SM					
BHL-12	83.34				hJ		45				UN						
BHL-12	83.45				hJ		25				UN						
BHL-12	83.45				hJ		60				UN						incipient
BHL-12	83.46				J		40		wh mi	VN	PR	SM					
BHL-12	83.48				J		30			CN	UN	SM					
BHL-12	83.49				hJ		90				UN						incipient
BHL-12	83.51				hJ		90				IR						incipient
BHL-12	83.52				hJ		70				UN						incipient
BHL-12	83.53				hJ						IR						incipient
BHL-12	83.55				hJ		40				UN						incipient
BHL-12	83.58				hJ		70		wh mi and SILT		PR						
BHL-12	83.59				hJ		75				UN						incipient
BHL-12	83.64				J		45		ph wh mi	VN	UN	SM					
BHL-12	83.68				J		40		ph wh mi	VN	PR	RF					
BHL-12	83.76				J		30			CN	PR	RF					
BHL-12	83.77				J		85			CN	UN	SM					
BHL-12	83.79				hJ		60				UN						
BHL-12	83.81				J		15			CN	PR	RF					
BHL-12	83.84				hJ		50				UN						
BHL-12	83.85				hJ		75				UN						
BHL-12	83.90				J		40			CN	PR	SM					
BHL-12	83.92				hJ		40				UN						incipient
BHL-12	83.95				hJ		45				PR						incipient



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PointID	Depth	Bottom	Fracture Set	Defect Number	Type	Type Suffix	Dip Minimum (degrees)	Dip Maximum (degrees)	Infilling Material	Aperture Observation	Planarity	Roughness	Aperture Measurement Sign	Aperture Measurement	Aperture	Spacing	Remark
BHL-12	83.96				J		10			CN	UN	RF					
BHL-12	83.97				J		75			CN	PR	SM					
BHL-12	84.04				hJ		20				UN						incipient
BHL-12	84.08				J		80		ph wh mi	VN	UN						
BHL-12	84.12				J		70			CN	PR	SM					possible DB
BHL-12	84.13				J		10		ph wh mi	VN	PR	SM					
BHL-12	84.14				J		70		ph wh mi	VN	PR	SM					
BHL-12	84.16				hJ		70		wh mi		PR						
BHL-12	84.19				J		30			CN	UN	SM					possible DB
BHL-12	84.22				J		70		ph wh mi	VN	UN	SM					
BHL-12	84.23				hJ												possible DB
BHL-12	84.28				hJ		30		wh mi		PR						incipient
BHL-12	84.30				hJ		40		wh mi		IR						incipient
BHL-12	84.35				hJ		45		wh mi		UN						
BHL-12	84.36				hJ		80		wh and bk mi		UN						
BHL-12	84.40				hJ		40				PR						
BHL-12	84.44				hJ		10		bk mi		PR						
BHL-12	84.51				J		30			CN	PR	SM					possible DB
BHL-12	84.58				J		60		ph wh mi	VN	PR	SM					ph rd SN
BHL-12	84.60				hJ		10		wh mi		PR						
BHL-12	84.63				hJ		60				PR						DB
BHL-12	84.66				J		75			CN	UN	SM					
BHL-12	84.68				hJ		20				PR						
BHL-12	84.71				J		75		ph wh mi	VN	PR	SM					
BHL-12	84.74				hJ		20		wh mi		PR						
BHL-12	84.75				hJ		75		wh mi		PR						incipient
BHL-12	84.76				hJ		60				UN						incipient
BHL-12	84.78				hJ		50		wh mi		UN						incipient
BHL-12	84.83				hJ		5		bk mi		PR						
BHL-12	84.84				hJ		45		bk mi		PR						
BHL-12	84.86				J		25			CN	PR	SM					
BHL-12	84.94				hJ		0		bk mi		UN						
BHL-12	85.11				J		70		ph wh mi	VN	PR	RF					ph or SN
BHL-12	85.21				J		40			CN	PR	RF					
BHL-12	85.24				hJ		35		wh mi		PR						
BHL-12	85.29				hJ		35		bk mi		PR						
BHL-12	85.38				hJ		70		wh mi		UN						
BHL-12	85.38				J		70		ph wh mi	VN	PR	SM					
BHL-12	85.41				J		50			CN	CU	SM					
BHL-12	85.44				J		70			CN	PR	SM					
BHL-12	85.49				J		60			CN	PR	SM					
BHL-12	85.56				J		50		ph wh mi	VN	PR	SM					
BHL-12	85.59				J		65			CN	PR	SM					
BHL-12	85.62				J		65		wh mi	CT	PR	SM					
BHL-12	85.65				J		5			CN	IR	SM					possible DB
BHL-12	85.68				J		80		wh mi	VN	UN	SM					
BHL-12	85.71				J		90		wh mi	VN	UN	SM					
BHL-12	85.72				hJ		90		wh mi		UN						
BHL-12	85.74				hJ		90		wh mi		UN						
BHL-12	85.75				J		45			CN	PR	RF					possible DB
BHL-12	85.77				hJ		60				IR						incipient
BHL-12	85.79				hJ		20				IR						incipient
BHL-12	85.79				J		40		wh mi	VN	IR	SM					
BHL-12	85.83				hJ		15		wh mi		PR						
BHL-12	85.85				hJ		0		wh mi		PR						
BHL-12	85.85				hJ		0		wh mi		PR						incipient
BHL-12	85.89				hJ		0		wh mi		PR						incipient
BHL-12	85.89				J		70		ph wh mi	VN	PR	RF					
BHL-12	85.97				J		20			CN	PR	RF					
BHL-12	85.99				J		85			CN	UN	RF					
BHL-12	86.02				J		20			CN	UN	RF					
BHL-12	86.07				J		70		wh mi	CT	UN	SM					
BHL-12	86.09				J		70		ph wh mi	VN	UN	SM					
BHL-12	86.10				hJ		5		pl br mi		PR						
BHL-12	86.12				hJ		10				PR						
BHL-12	86.13				hJ		10				PR						
BHL-12	86.14				hJ		10				PR						
BHL-12	86.14				hJ		10				PR						
BHL-12	86.15				hJ		10				PR						
BHL-12	86.15				hJ		10				PR						
BHL-12	86.15				J		90		wh mi	CT	UN	SM					
BHL-12	86.18				J		20			CN	PR	SM					
BHL-12	86.20				J		30			CN	PR	SM					
BHL-12	86.23				J		20			CN	PR	SM					
BHL-12	86.27				hJ		25		wh mi		PR						
BHL-12	86.28				hJ		25				UN						
BHL-12	86.32				J		85			CN	PR	SM					
BHL-12	86.33				J		85			CN	PR	SM					
BHL-12	86.37				J		35			CN	PR	SM					



Pioneer-Burdekin Pumped Hydro Energy Scheme: Tranche 1 – BHL-12 Defects List

Refer to Explanatory Notes sheets for abbreviation definitions

PointID	Depth	Bottom	Fracture Set	Defect Number	Type	Type Suffix	Dip Minimum (degrees)	Dip Maximum (degrees)	Infilling Material	Aperture Observation	Planarity	Roughness	Aperture Measurement Sign	Aperture Measurement	Aperture	Spacing	Remark
BHL-12	86.40				hJ		35		bk mi		PR						
BHL-12	86.44				J	/V	90		wh mi		UN	SM	<	2			
BHL-12	86.52				J		10			CN	PR	SM					
BHL-12	86.63				J		40			CN	PR	SM					
BHL-12	86.67				hJ		80				PR						
BHL-12	86.70				hJ		0		wh mi		PR						
BHL-12	86.71				hJ		65		wh mi		PR						incipient
BHL-12	86.71				J		90		wh mi	CT	UN	SM					
BHL-12	86.84				J		15		ph wh mi	VN	PR	SM					
BHL-12	86.86				hJ		20		wh mi		PR						
BHL-12	86.89				V		80		wh mi		PR		<	4			<5 mm pl or to gr alt halo
BHL-12	86.90				hJ						IR						
BHL-12	86.93				hJ		90		wh mi		IR						
BHL-12	86.95				hJ		15		bk and wh mi		PR						
BHL-12	86.98				hJ		30				UN						
BHL-12	87.00				hJ		70		wh mi		PR						
BHL-12	87.00				hJ		70		wh mi		PR						
BHL-12	87.09				J		30			CN	PR	SM					
BHL-12	87.11				hJ		5				PR						
BHL-12	87.12				hJ				wh mi		IR						
BHL-12	87.13				hJ		10		wh mi		UN						
BHL-12	87.14				J		35			CN	PR	SM					
BHL-12	87.18				hJ		20				PR						
BHL-12	87.20				hJ		15		bk mi		PR						
BHL-12	87.25				hJ		80		bk mi		UN						
BHL-12	87.33				J		30		ph wh mi	VN	PR	SM					
BHL-12	87.38				hJ		90				IR						
BHL-12	87.41				hJ		90		wh mi		UN						<3 mm pl or alt halo
BHL-12	87.44				hJ		45				PR						
BHL-12	87.45				hJ		45				PR						
BHL-12	87.45				J		25		ph wh mi	VN	CU	SM					
BHL-12	87.47				hJ		35		wh mi		PR						
BHL-12	87.60				hJ		55				UN						
BHL-12	87.61				hJ		55		wh mi		UN						
BHL-12	87.63				hJ		20				PR						
BHL-12	87.64				hJ		20		bk mi		PR						
BHL-12	87.73				hJ		90				IR						
BHL-12	87.76				hJ		80		wh mi		UN						
BHL-12	87.80				J		35		ph wh mi	VN	PR	SM					
BHL-12	87.95				hJ		50				UN						
BHL-12	87.96				hJ		90		bk mi		UN						
BHL-12	88.07				hJ		75		bk to br mi		UN						
BHL-12	88.11				hJ		90		bk mi		UN						
BHL-12	88.20				hJ		90		bk mi		UN						
BHL-12	88.24				hJ		90		bk mi		UN						
BHL-12	88.29				hJ		70		bk mi		PR						
BHL-12	88.29				hJ		70		bk mi		PR						
BHL-12	88.38				hJ		40		bk mi		PR						
BHL-12	88.39				hJ		40		bk mi		PR						
BHL-12	88.42				J		40			CN	PR	SM					
BHL-12	88.45				hJ		70		wh mi		PR						
BHL-12	88.46				hJ		40		bk mi		PR						
BHL-12	88.52				hJ		25		wh mi		UN						
BHL-12	88.53				J		40			CN	PR	SM					
BHL-12	88.55				hJ		40		wh mi		PR						
BHL-12	88.58				hJ		90		wh mi		UN						
BHL-12	88.58				hJ		90		wh mi		UN						incipient
BHL-12	88.64				hJ		85		wh mi		UN						incipient
BHL-12	88.66				hJ		70		wh mi		UN						
BHL-12	88.67				hJ		85		wh mi		UN						<3 mm pl br halo
BHL-12	88.72				J				wh mi	VN	IR	VR					
BHL-12	88.74				J					CN	IR	SM					
BHL-12	88.75				J		50		ph wh mi	VN	PR	SM					
BHL-12	88.82				J		90		wh mi	CT	UN	SM					
BHL-12	89.02				hJ		85		wh mi		PR						
BHL-12	89.03				J		85		wh mi	CT	PR	SM					
BHL-12	89.10				J		10			CN	PR	RF					
BHL-12	89.11				J		70		wh mi	VN	UN	SM					
BHL-12	89.21				hJ		30		wh mi		PR						
BHL-12	89.23				hJ		35		wh mi		PR						
BHL-12	89.25				hJ		40		bk and wh mi		PR						1 mm gr alt halo
BHL-12	89.26				J		55			CN	PR	RF					possible DB
BHL-12	89.29				J		5			CN	PR	RF					
BHL-12	89.33				J		5			CN	PR	RF					possible DB
BHL-12	89.35				hJ		65		wh mi		UN						
BHL-12	89.36				J		90		wh mi	CT	UN	SM					rd-or SN
BHL-12	89.39				hJ		90		wh mi		UN						
BHL-12	89.43				J					CN	IR	VR					possible DB
BHL-12	89.46				hJ		30		wh mi		PR						



Pioneer-Burdekin Pumped Hydro Energy Scheme: Tranche 1 – BHL-12 Defects List

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PointID	Depth	Bottom	Fracture Set	Defect Number	Type	Type Suffix	Dip Minimum (degrees)	Dip Maximum (degrees)	Infilling Material	Aperture Observation	Planarity	Roughness	Aperture Measurement Sign	Aperture Measurement	Aperture	Spacing	Remark
BHL-12	89.48				hJ		80		wh mi		PR						
BHL-12	89.64				V		90		wh mi		UN		<	3			L-M strength
BHL-12	89.65				hJ		85		wh mi		UN						
BHL-12	89.72				hJ		90		wh mi		UN						
BHL-12	90.01				hJ		5		wh mi		PR						
BHL-12	90.04				hJ		90		wh mi		UN						
BHL-12	90.07				hJ		90		wh mi		UN						
BHL-12	90.09				hJ		0		wh mi		UN						
BHL-12	90.13				hJ		5		wh mi		UN						
BHL-12	90.15				J		70				UN						incipient
BHL-12	90.19				J		90				UN						incipient
BHL-12	90.23				J		10			CN	PR	SM					possible DB
BHL-12	90.25				J		10			CN	PR	RF					possible DB
BHL-12	90.37				V		65		APLITE, fine grained, pk		PR			9			
BHL-12	90.40				hJ		60		wh mi		IR						
BHL-12	90.41				hJ		90		wh mi		UN						
BHL-12	90.44				hJ		5		wh mi		UN						
BHL-12	90.44				hJ		85		wh mi		UN						
BHL-12	90.47				hJ	/V	90		wh mi		UN			1			
BHL-12	90.55				hJ		40		wh mi		PR						
BHL-12	90.57				hJ		30		wh mi		PR						
BHL-12	90.61				hJ		25		wh mi		PR						
BHL-12	90.63				hJ		20		wh mi		PR						
BHL-12	90.70				hJ		80				UN						
BHL-12	90.72				V		15		gr mi (qu?)		PR		<	3			
BHL-12	90.75				J		30			CN	PR	VR					
BHL-12	90.77				hJ		90				UN						
BHL-12	90.79				hJ		10		bk mi		PR						
BHL-12	90.80				hJ		90		wh mi		UN						incipient
BHL-12	90.86				hJ		20		bk mi		UN						
BHL-12	90.87				V		30		bk mi		PR		<	2			3 mm pl or halo
BHL-12	91.00				J		30			CN	IR	RF					
BHL-12	91.04				hJ		80		wh mi		UN						
BHL-12	91.06				V		85		wh mi		UN		<	2			
BHL-12	91.12				hJ		85		wh mi		UN						
BHL-12	91.33				hJ		15				UN						1 mm gr alt halo
BHL-12	91.38				hJ		15		gy mi		UN						
BHL-12	91.42				hJ		80		wh mi		UN						
BHL-12	91.46				hJ		5		wh mi		UN						
BHL-12	91.59				hJ		30		wh and bk mi		PR						
BHL-12	91.62				hJ		10		bk mi		PR						
BHL-12	92.00				J		25			CN	PR	SM					possible DB
BHL-12	92.24				J		25		ph wh mi	VN	PR	SM					possible DB
BHL-12	92.25				hJ		25		wh mi		PR						
BHL-12	92.39				J		25		ph wh mi	VN	ST	SM					possible DB
BHL-12	92.62				hJ		5		wh mi	IN	PR						
BHL-12	92.63				hJ		15		wh and rd mi		PR						
BHL-12	93.16				hJ		90		wh to or mi		PR						incipient
BHL-12	93.17				hJ		40				PR						incipient
BHL-12	93.20				J		25			CN	PR	SN					
BHL-12	93.25				hJ		90		wh mi		UN						
BHL-12	93.44				hJ		90		wh mi		UN						
BHL-12	93.56				J		30		ph wh mi	VN	PR	SM					
BHL-12	94.19				J		10			CN	UN	SM					
BHL-12	94.34				V		15		gy to wh mi (qu?)		PR		<	5			ph or-br SN
BHL-12	94.37				J		0		ph wh mi	VN	CU	SM					
BHL-12	94.41				hJ		10		bk mi		PR						
BHL-12	94.44				J		15			CN	PR	RF					
BHL-12	94.46				hJ		20		rd mi		PR						
BHL-12	94.49				hJ		90		wh mi		PR						
BHL-12	94.51				hJ		25		bk and wh mi		PR						
BHL-12	94.56				J		30		ph wh mi	VN	PR	SM					SA gr-gy
BHL-12	94.65				J		10			CN	PR	RF					
BHL-12	95.09				hJ		90		wh mi		PR						SA gr-gy
BHL-12	95.14				hJ		90				UN						
BHL-12	95.16				J		20			CN	IR	SM					
BHL-12	95.29				hJ		25		rd mi		PR						
BHL-12	95.31				hJ		90		wh mi		PR						
BHL-12	95.58				hJ		20		wh mi		PR						
BHL-12	95.63				J		40		ph wh mi	VN	ST	SM					
BHL-12	95.67				hJ		70		wh mi		PR						incipient
BHL-12	95.93				hJ		65		wh mi		PR						
BHL-12	95.99				hJ		90				PR						
BHL-12	96.01				hJ		25		wh mi		PR						
BHL-12	96.14				J		40		ph wh mi	VN	ST	SM					
BHL-12	96.17				V		90		wh, gr, bk, and rd mi		UN		<	6			<40 mm gr alt halo
BHL-12	96.18				hJ		40		wh mi		PR						
BHL-12	96.28				hJ						IR						incipient
BHL-12	96.35				hJ		30				UN						



Pioneer-Burdekin Pumped Hydro Energy Scheme: Tranche 1 – BHL-12 Defects List

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PointID	Depth	Bottom	Fracture Set	Defect Number	Type	Type Suffix	Dip Minimum (degrees)	Dip Maximum (degrees)	Infilling Material	Aperture Observation	Planarity	Roughness	Aperture Measurement Sign	Aperture Measurement	Aperture	Spacing	Remark
BHL-12	96.50				V		90		wh, gr, and bk mi		UN		<	10			<10 mm gr alt halo
BHL-12	96.73				hJ		0				IR						
BHL-12	96.74				hJ		90		wh mi		UN						
BHL-12	96.77				hJ		90		gr mi		UN						
BHL-12	96.83				hJ		50				PR						incipient
BHL-12	96.84				J		55		ph wh mi	VN	PR	SM					
BHL-12	96.85				hJ						IR						
BHL-12	96.87				hJ		40		wh mi		UN						
BHL-12	96.89				J					CN	ST	RF					
BHL-12	96.92				hJ		70				UN						incipient
BHL-12	96.94				hJ		40		wh mi		UN						
BHL-12	96.96				J		90		wh mi	CT	PR	SM					
BHL-12	96.99				J		50			CN	PR	SM					
BHL-12	97.04				J		90		ph wh mi	VN	IR	RF					gr alt halo
BHL-12	97.09				V				wh mi		UN			1			gr alt halo
BHL-12	97.10				V				wh mi		UN		<	5			gr alt halo
BHL-12	97.16				hJ		0				IR						gr alt halo
BHL-12	97.19				hJ		90		wh mi		UN						gr alt halo, incipient
BHL-12	97.21				hJ		90				UN						
BHL-12	97.24				hJ						IR						
BHL-12	97.28				hJ		90				UN						
BHL-12	97.30				V		90		wh and dk rd mi		UN		<	3			
BHL-12	97.44				J		90		ph wh mi	VN	UN	SM					possible DB
BHL-12	97.45				V	/J	90		ph wh mi	VN	UN	SM					
BHL-12	97.54				hJ		50				PR						
BHL-12	97.57				hJ		25		wh mi		UN						
BHL-12	97.61				hJ		30		gr mi		PR						
BHL-12	97.63				hJ		30		gr mi		PR						
BHL-12	97.65				hJ		5				UN						
BHL-12	97.68				hJ		20				PR						
BHL-12	97.70				J		35		ph wh mi	VN	PR	SM					possible DB
BHL-12	97.72				hJ		55		wh mi		UN						
BHL-12	97.91				J		0			CN	PR	RF					
BHL-12	98.03				J		70		ph wh mi	VN	IR	SM					
BHL-12	98.07				J		50		ph wh mi	VN	UN	SM					
BHL-12	98.11				hJ		90		wh mi		IR						
BHL-12	98.16				J		60		ph wh mi	VN	PR	RF					possible DB
BHL-12	98.31				J		50			CN	PR	SM					
BHL-12	98.32				hJ		50				PR						
BHL-12	98.33				J		70			CN	PR	SM					
BHL-12	98.36				hJ		45		wh mi		PR						
BHL-12	98.37				hJ		45		wh mi		PR						
BHL-12	98.38				hJ		45		wh mi		PR						
BHL-12	98.39				hJ		60		wh mi		PR						
BHL-12	98.40				hJ		60		wh mi		PR						
BHL-12	98.40				hJ		60		wh mi		PR						
BHL-12	98.45				J		60		ph bk	SN	PR	SM					
BHL-12	98.46				hJ		60		wh mi		PR						
BHL-12	98.49				hJ		30		wh mi		PR						
BHL-12	98.51				hJ		40		wh mi		PR						
BHL-12	98.53				J		40		wh mi	CT	ST	SM					
BHL-12	98.54				hJ		30		wh mi		UN						
BHL-12	98.56				hJ		70		wh mi		PR						
BHL-12	98.67				hJ		90		wh mi		UN						DB
BHL-12	98.71				J		40			CN	PR	SM					
BHL-12	99.00				J		10			CN	UN	SM					
BHL-12	99.13				V		90		wh mi		UN						gr alt halo
BHL-12	99.18				hJ		60		wh mi		PR						
BHL-12	99.21				hJ		90		wh mi		UN						gr alt halo
BHL-12	99.24				hJ		70		wh mi		IR						
BHL-12	99.25				hJ		60				PR						
BHL-12	99.26				hJ		70		wh mi		UN						
BHL-12	99.30				hJ		50		wh mi		UN						gr alt halo
BHL-12	99.33				hJ		40				PR						<1 mm gr alt halo
BHL-12	99.34				hJ		15		wh mi		PR						
BHL-12	99.36				hJ				wh mi		IR						incipient
BHL-12	99.38				hJ		60		wh mi		PR						<1 mm gr alt halo
BHL-12	99.42				hJ		45		wh mi		PR						
BHL-12	99.47				J		45			CN	PR	SM					possible DB
BHL-12	99.50				J		70			CN	PR	SM					gr alt
BHL-12	99.58				hJ		90		wh mi		IR						<1 mm gr alt halo
BHL-12	99.73				V		80		wh mi		UN		<	3			<10 mm gr alt halo
BHL-12	99.87				J		80		wh mi	CT	PR	SM					
BHL-12	99.92				hJ		90				PR						incipient
BHL-12	99.94				J		20			CN	PR	RF					
BHL-12	100.06				hJ		60		bk mi		PR						
BHL-12	100.09				hJ		80				UN						1 mm pk halo
BHL-12	100.11				J		35			CN	ST	SM					
BHL-12	100.18				hJ		90		wh mi		UN						<25 mm pl or halo



Pioneer-Burdekin Pumped Hydro Energy Scheme: Tranche 1 – BHL-12 Defects List

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PointID	Depth	Bottom	Fracture Set	Defect Number	Type	Type Suffix	Dip Minimum (degrees)	Dip Maximum (degrees)	Infilling Material	Aperture Observation	Planarity	Roughness	Aperture Measurement Sign	Aperture Measurement	Aperture	Spacing	Remark
BHL-12	100.52				hJ		20		wh mi		UN						incipient
BHL-12	100.53				hJ		30		bk mi		UN						
BHL-12	100.62				hJ		70				UN						<7 mm gr alt halo
BHL-12	100.77				hJ		90				UN						<5 mm pl or halo
BHL-12	100.80				J		30			CN	PR	RF					
BHL-12	100.82				hJ		20		wh mi		PR						
BHL-12	101.25				hJ		35				UN						
BHL-12	101.86				hJ		90		bk mi		UN						
BHL-12	101.96				hJ		80		rd mi		UN						
BHL-12	102.49				J		25			CN	PR	SM					
BHL-12	102.50				V		30		APLITE, fine grained, pl br		PR		<	20			
BHL-12	102.53				V		0		APLITE, fine to medium grained, pk		PR		<	14			
BHL-12	102.57				V		5		APLITE, fine to coarse grained, pk to pl br		PR		<	60			
BHL-12	102.60				hJ		80		wh mi		UN						
BHL-12	102.61				hJ		0		gr mi		PR						
BHL-12	102.71				hJ		0		bk mi		PR						
BHL-12	102.93				J		30		ph wh mi	CT	PR	SM					
BHL-12	102.96				hJ		90		wh mi		UN						
BHL-12	102.97				hJ		90		wh mi		UN						
BHL-12	102.98				hJ		90		wh mi		UN						
BHL-12	103.03				J		35		ph wh mi	CN	PR	SM					<5 mm gr alt halo
BHL-12	103.13				J		15			CN	CU	SM					SA gr
BHL-12	103.19				hJ		30		bk mi		PR						
BHL-12	103.20				hJ		30		bk mi		PR						
BHL-12	103.33				J		40		ph rd	SN	PR	SM					
BHL-12	103.53				hJ		40				PR						
BHL-12	103.56				hJ		80		rd mi		PR						
BHL-12	103.59				hJ		80		rd mi		PR						
BHL-12	103.63				hJ		90		wh mi		IR						
BHL-12	103.69				hJ		50		wh mi		PR						1 mm gr alt halo
BHL-12	103.82				hJ		45		wh mi		PR						1 mm gr alt halo
BHL-12	103.84				hJ		45		wh and rd mi		PR						<1 mm gr alt halo
BHL-12	103.97				hJ		70		wh and rd mi		PR						<1 mm gr alt halo
BHL-12	103.97				hJ		70		wh and rd mi		PR						<1 mm gr alt halo
BHL-12	103.98				hJ		70		wh and rd mi		PR						<1 mm gr alt halo
BHL-12	104.23				J		30			CN	PR	SM					
BHL-12	104.27				hJ		90		rd mi		PR						
BHL-12	104.39				hJ		25		bk mi		PR						
BHL-12	104.90				hJ		90		wh mi		PR						
BHL-12	104.94				J		45			CN	PR	SM					
BHL-12	105.04				J		40			CN	PR	SM					
BHL-12	105.05				hJ		85				PR						incipient
BHL-12	105.05				hJ		40		wh mi		PR						
BHL-12	105.07				hJ		40		wh mi		PR						
BHL-12	105.08				J		60		ph wh mi	VN	PR	SM					
BHL-12	105.09				J		60		ph wh mi	VN	PR	SM					
BHL-12	105.10				hJ		70				PR						incipient
BHL-12	105.20				hJ		90		wh mi		UN						
BHL-12	105.23				hJ		0		wh mi		UN						
BHL-12	105.32				V		80		wh mi		UN		<	3			<20 mm gr and pl br to pk alt halo
BHL-12	105.39				hJ		60		wh mi		PR						
BHL-12	105.42				hJ		60		wh mi		PR						
BHL-12	105.45				hJ		60		wh mi		PR						
BHL-12	105.46				hJ		60		wh mi		PR						
BHL-12	105.50				V		50		wh mi		PR		<	2			
BHL-12	105.52				V		50		wh mi		PR		<	2			
BHL-12	105.55				hJ		70		wh mi		UN						incipient
BHL-12	105.68				hJ		75		wh mi		PR						
BHL-12	105.69				J		30			CN	PR	SM					
BHL-12	105.70				J		75		ph wh and rd mi	VN	PR	SM					
BHL-12	105.72				J		20			CN	PR	SM					
BHL-12	105.79				V		75		wh mi		UN		<	4			<20 mm gr alt halo
BHL-12	105.84				hJ		90		wh mi		UN						
BHL-12	106.07				hJ		90				UN						incipient
BHL-12	106.08				hJ		90				UN						incipient
BHL-12	106.09				hJ		50		rd mi		PR						
BHL-12	106.13				hJ		30				PR						
BHL-12	106.13				hJ		90				UN						
BHL-12	106.14				hJ		60		wh mi		UN						
BHL-12	106.18				hJ		90		wh mi		UN						
BHL-12	106.33				hJ		50		rd mi		PR						
BHL-12	106.41				hJ				wh mi		UN						gr and pl br alt halo
BHL-12	106.44				hJ				wh mi		UN						gr and pl br alt halo
BHL-12	106.49				J		30			CN	UN	SM					
BHL-12	106.58				hJ		90		wh mi		UN						
BHL-12	106.68				V		90		wh mi		UN		<	4			<10 mm gr alt halo
BHL-12	106.76				hJ		70		wh mi		IR						
BHL-12	106.91				J		10			CN	PR	RF					possible DB
BHL-12	106.92				hJ		20		bk mi		UN						

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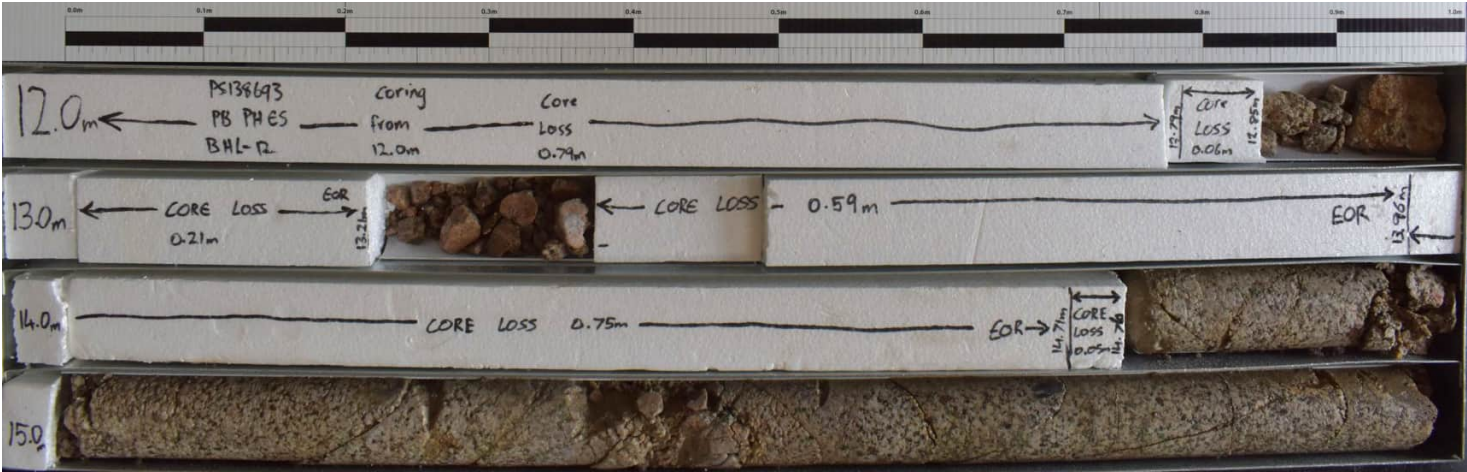


Pioneer-Burdekin Pumped Hydro Energy Scheme: Tranche 1 – BHL-12 Defects List

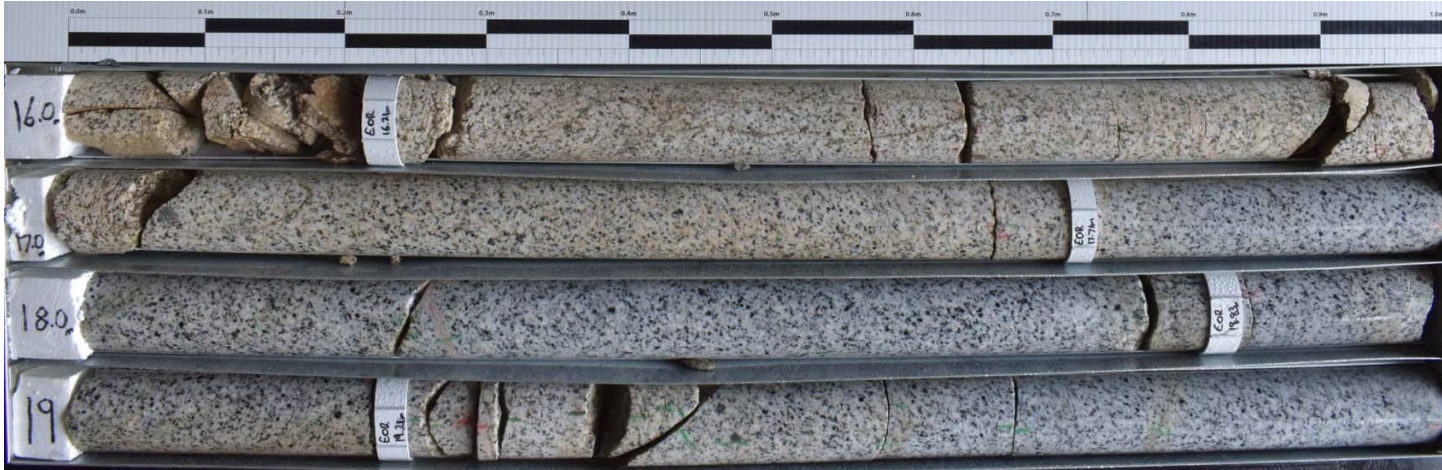
Refer to Explanatory Notes sheets for abbreviation definitions

PointID	Depth	Bottom	Fracture Set	Defect Number	Type	Type Suffix	Dip Minimum (degrees)	Dip Maximum (degrees)	Infilling Material	Aperture Observation	Planarity	Roughness	Aperture Measurement Sign	Aperture Measurement	Aperture	Spacing	Remark
BHL-12	107.08				J		35			CN	PR	SM					
BHL-12	107.13				hJ		90		wh mi		PR						
BHL-12	107.17				hJ		50		wh mi		PR						
BHL-12	107.19				hJ		15		wh mi		UN						
BHL-12	107.20				V		90		wh mi		UN		<	5			<10 mm gr alt halo
BHL-12	107.21				hJ		55				UN						
BHL-12	107.22				hJ						IR						
BHL-12	107.22				hJ		55		wh and rd mi		PR						
BHL-12	107.24				hJ		0		wh mi		UN						
BHL-12	107.25				hJ		90		wh mi		UN						
BHL-12	107.28				hJ		85		wh mi		UN						
BHL-12	107.57				hJ		20		wh mi		PR						
BHL-12	107.69				hJ		90		wh mi		PR						
BHL-12	107.82				hJ		70				UN						
BHL-12	107.86				hJ		90		wh and rd mi		UN						
BHL-12	107.88				J		80		ph wh mi	VN	PR	SM					possible DB
BHL-12	108.29				J		10			CN	PR	SM					
BHL-12	108.33				hJ		90		wh mi		UN						
BHL-12	108.37				hJ		10		wh mi		PR						
BHL-12	108.39				J	/V	90		wh mi	CT	UN	SM					pl br and gr alt halo
BHL-12	108.43				J		10			CN	PR	RF					possible DB
BHL-12	108.70				hJ		80		wh mi		PR						
BHL-12	108.79				hJ		90				UN						incipient
BHL-12	108.84				hJ		0		wh mi		UN						
BHL-12	108.86				hJ		90		wh mi		UN						2 mm gr alt halo
BHL-12	108.89				J		80		wh mi	CT	PR	SM					<5 mm gr and pl or alt halo
BHL-12	108.95				hJ		80		wh mi		UN						
BHL-12	109.04				V		45		wh mi		PR		<	2			
BHL-12	109.07				hJ		80				UN						incipient
BHL-12	109.12				J		40		ph wh mi	VN	UN	SM					
BHL-12	109.16				hJ		35		wh mi		PR						
BHL-12	109.87				hJ		50		wh mi		PR						<3 mm gr alt halo

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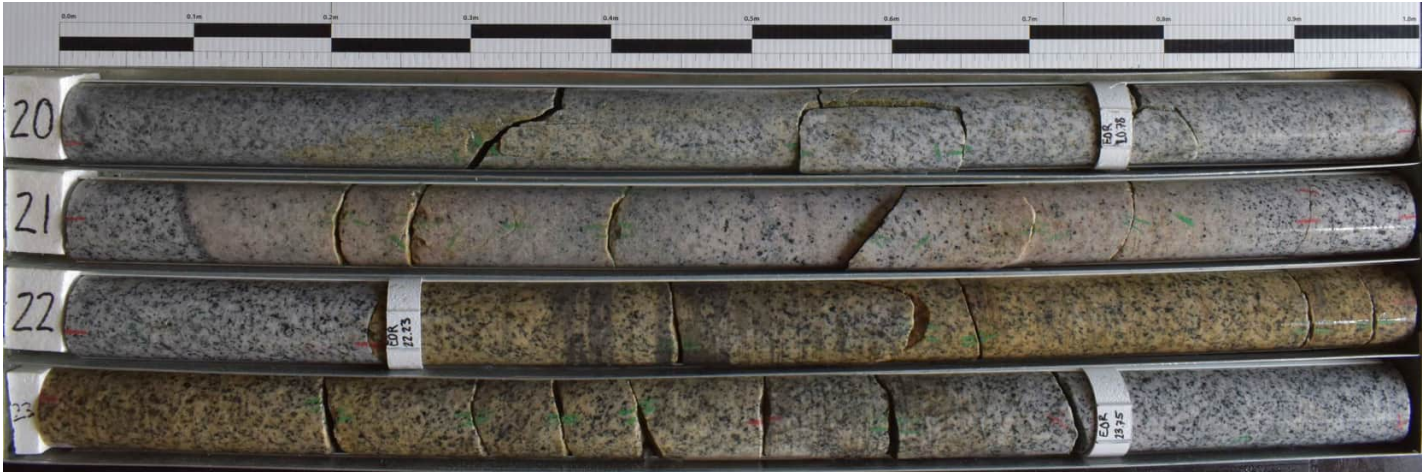
PointID : BHL-12 Depth Range: 12.00 - 16.00 m



PointID : BHL-12 Depth Range: 16.00 - 20.00 m

	TITLE Queensland Hydro Netherdale/Dalrymple Heights Pioneer-Burdekin PHES Core Photo - BHL-12	DRAWN	RC/PL	DATE	20/08/2024
		CHECKED	GEM	DATE	7/10/2024
		SCALE	Not To Scale		A4
		PROJECT No	PS138693		FIGURE No 1/13

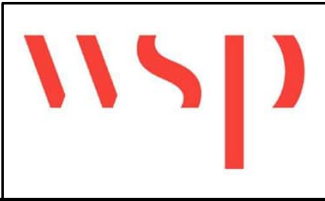
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PointID : BHL-12 Depth Range: 20.00 - 24.00 m



PointID : BHL-12 Depth Range: 24.00 - 28.00 m

	TITLE Queensland Hydro Netherdale/Dalrymple Heights Pioneer-Burdekin PHES Core Photo - BHL-12	DRAWN	RC/PL	DATE	20/08/2024
		CHECKED	GEM	DATE	7/10/2024
		SCALE Not To Scale			A4
		PROJECT No PS138693		FIGURE No 2/13	

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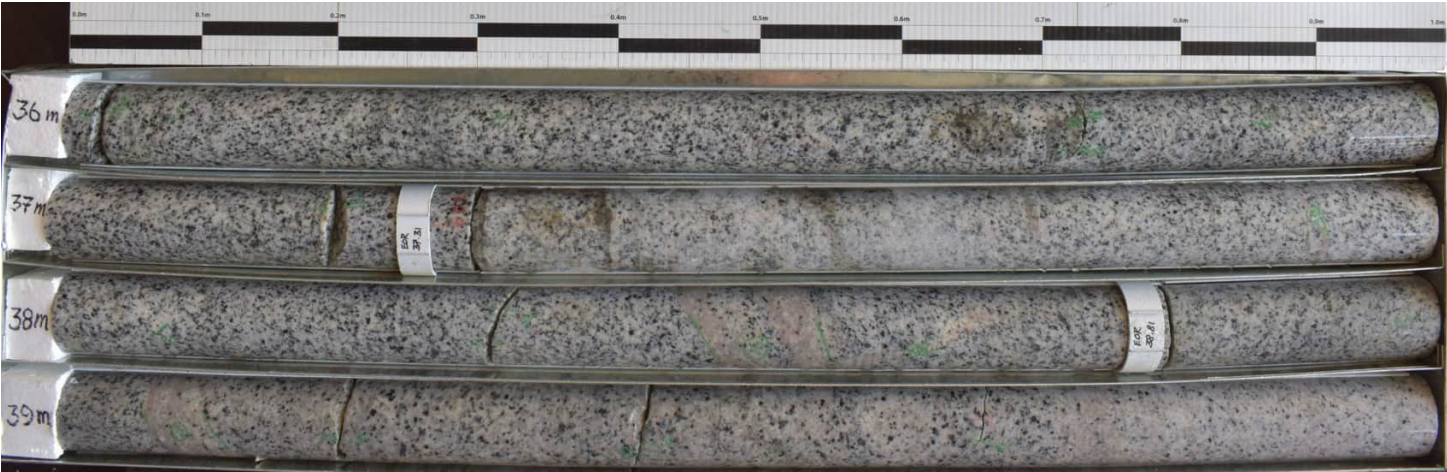
PointID : BHL-12 Depth Range: 28.00 - 32.00 m



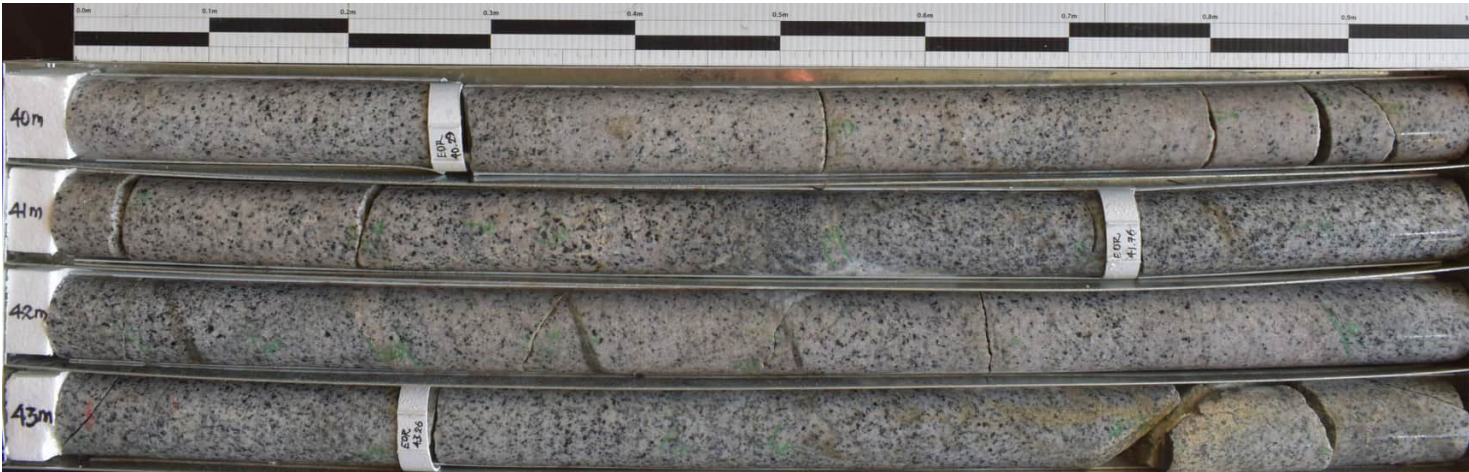
PointID : BHL-12 Depth Range: 32.00 - 36.00 m

	TITLE Queensland Hydro Netherdale/Dalrymple Heights Pioneer-Burdekin PHES Core Photo - BHL-12	DRAWN RC/PL		DATE 20/08/2024		
		CHECKED GEM		DATE 7/10/2024		
		SCALE Not To Scale				A4
		PROJECT No PS138693		FIGURE No 3/13		

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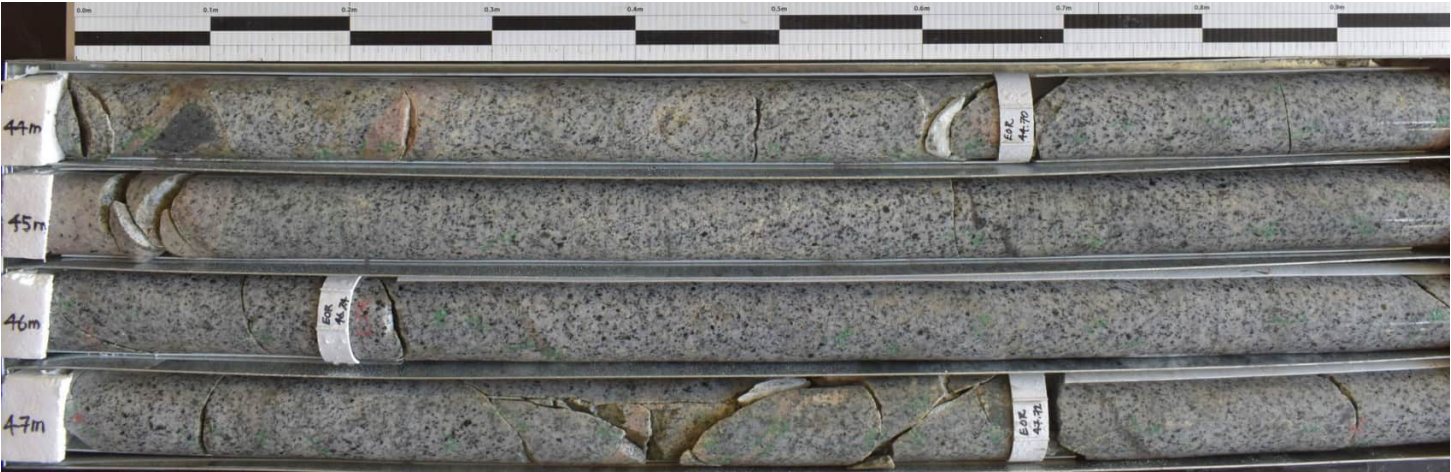
PointID : BHL-12 Depth Range: 36.00 - 40.00 m



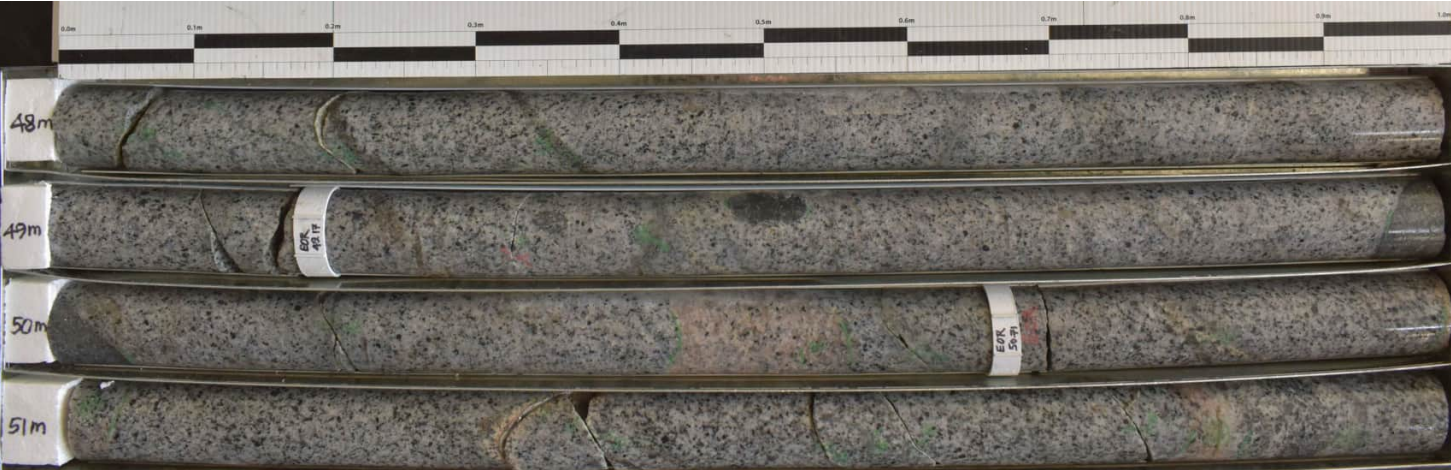
PointID : BHL-12 Depth Range: 40.00 - 44.00 m

	TITLE Queensland Hydro Netherdale/Dalrymple Heights Pioneer-Burdekin PHES Core Photo - BHL-12	DRAWN	RC/PL	DATE	20/08/2024
		CHECKED	GEM	DATE	7/10/2024
		SCALE	Not To Scale		A4
		PROJECT No	PS138693		FIGURE No 4/13

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PointID : BHL-12 Depth Range: 44.00 - 48.00 m



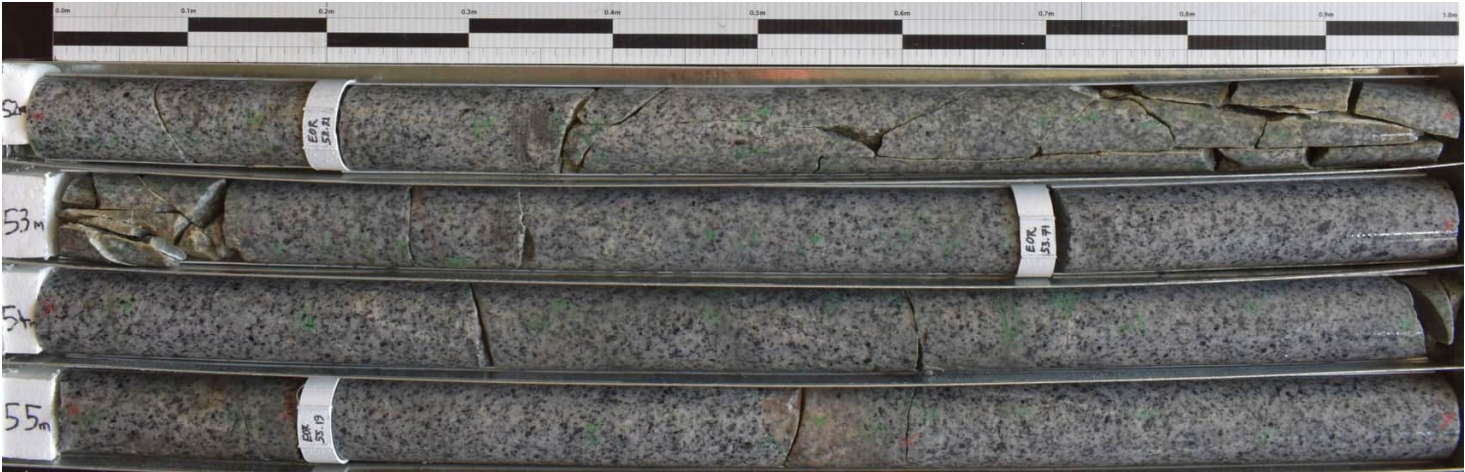
PointID : BHL-12 Depth Range: 48.00 - 52.00 m



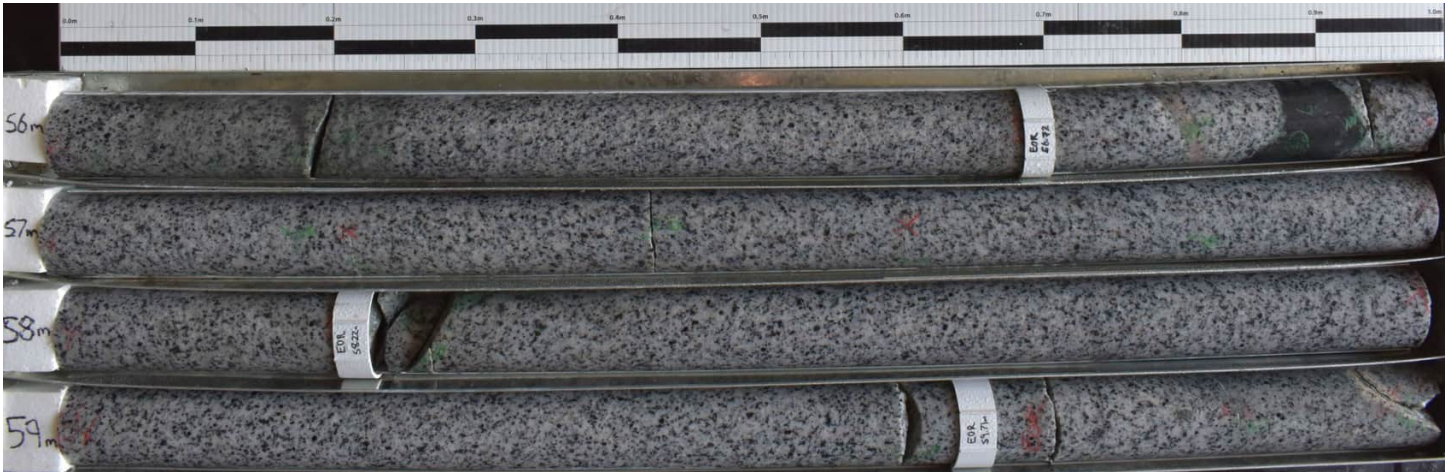
TITLE
Queensland Hydro
Netherdale/Dalrymple Heights
Pioneer-Burdekin PHES
Core Photo - BHL-12

DRAWN	RC/PL	DATE	20/08/2024
CHECKED	GEM	DATE	7/10/2024
SCALE	Not To Scale		A4
PROJECT No	PS138693		FIGURE No 5/13

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PointID : BHL-12 Depth Range: 52.00 - 56.00 m



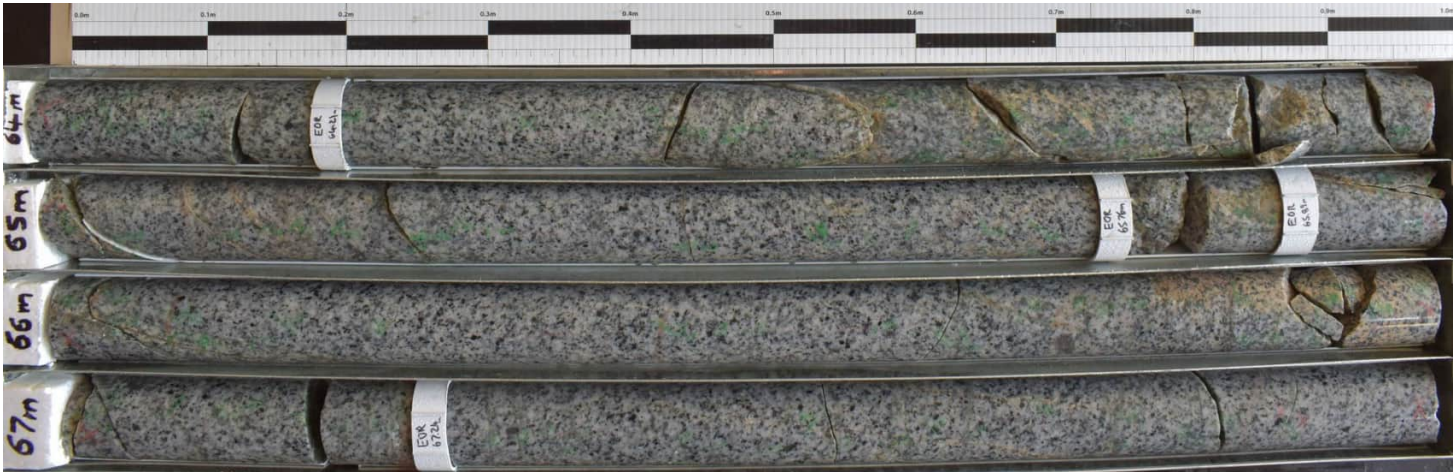
PointID : BHL-12 Depth Range: 56.00 - 60.00 m

	TITLE Queensland Hydro Netherdale/Dalrymple Heights Pioneer-Burdekin PHES Core Photo - BHL-12	DRAWN RC/PL	DATE 20/08/2024	
		CHECKED GEM	DATE 7/10/2024	
		SCALE Not To Scale		A4
		PROJECT No PS138693		FIGURE No 6/13

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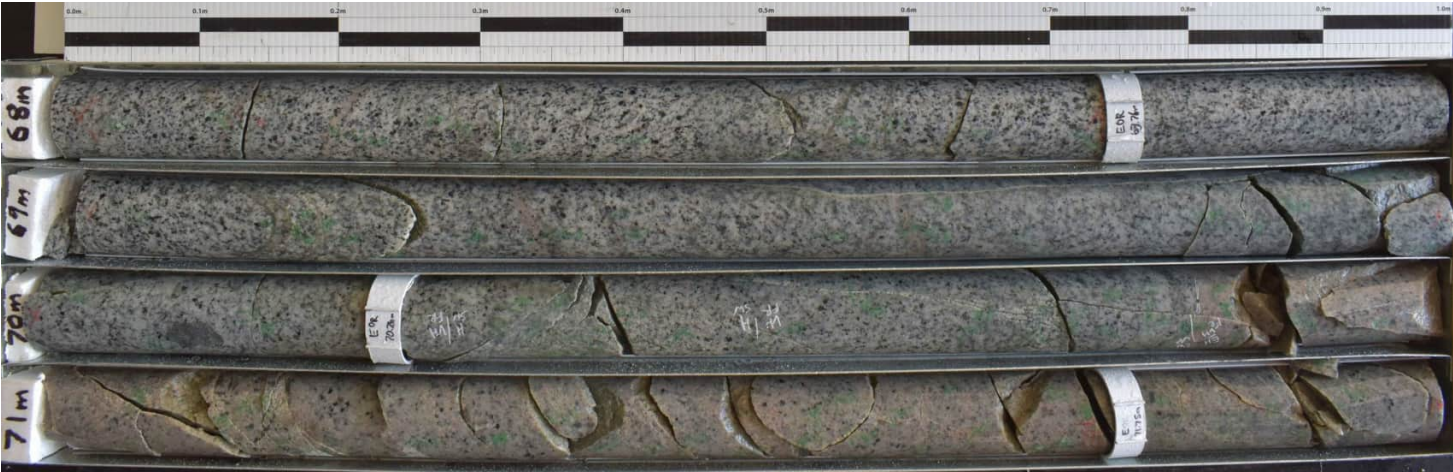


PointID : BHL-12 Depth Range: 60.00 - 64.00 m

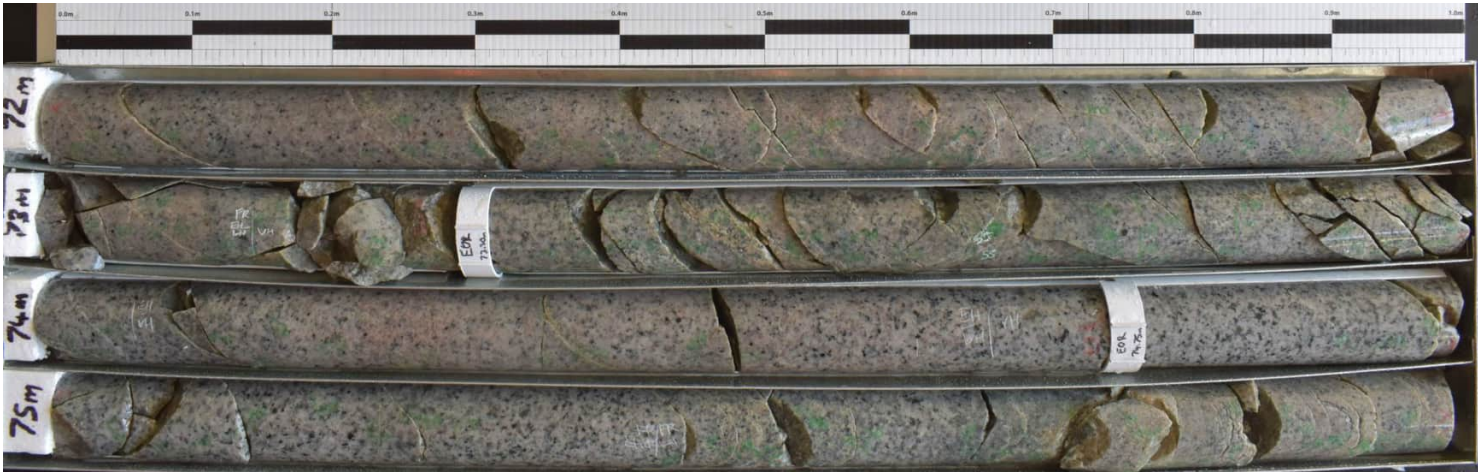


PointID : BHL-12 Depth Range: 64.00 - 68.00 m

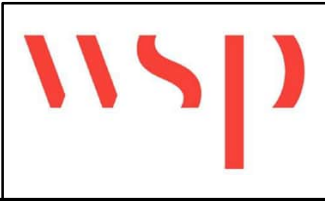
	TITLE Queensland Hydro Netherdale/Dalrymple Heights Pioneer-Burdekin PHES Core Photo - BHL-12	DRAWN	RC/PL	DATE	20/08/2024
		CHECKED	GEM	DATE	7/10/2024
		SCALE	Not To Scale		A4
		PROJECT No	PS138693		FIGURE No 7/13



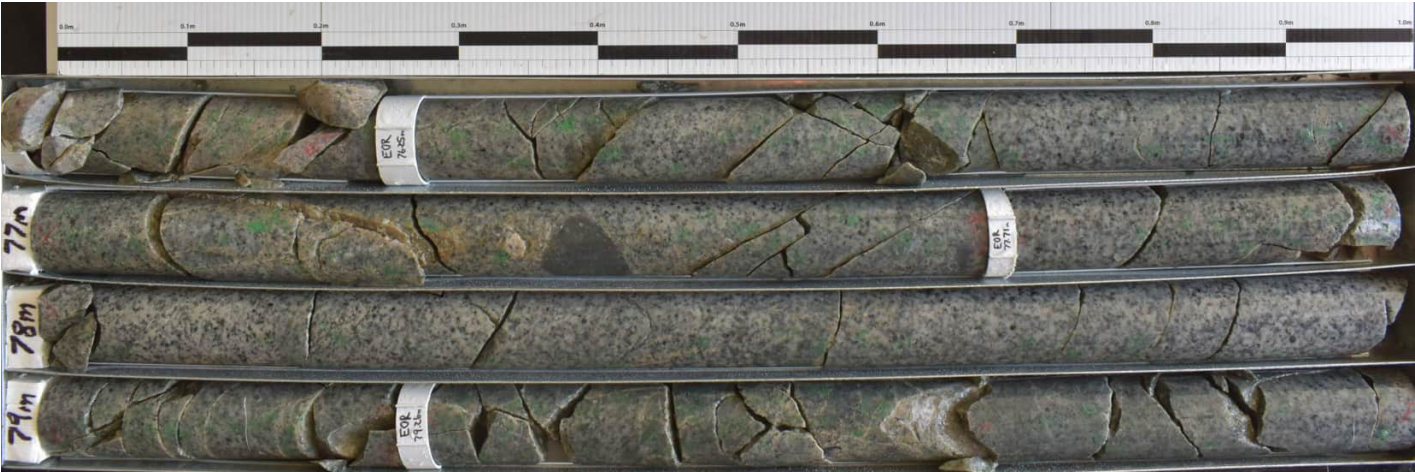
PointID : BHL-12 Depth Range: 68.00 - 72.00 m



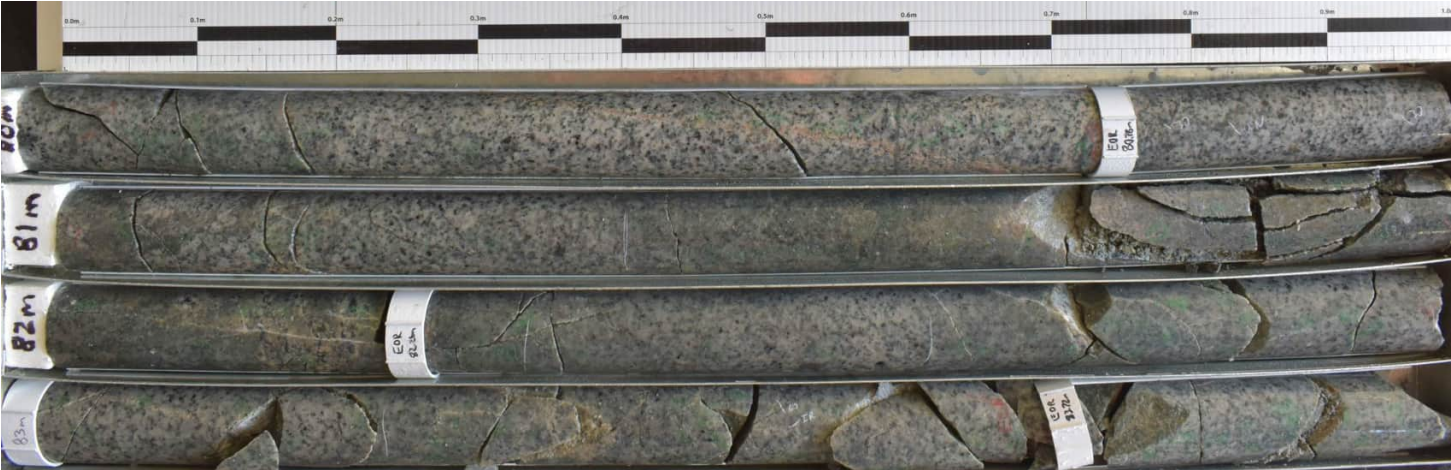
PointID : BHL-12 Depth Range: 72.00 - 76.00 m

	TITLE Queensland Hydro Netherdale/Dalrymple Heights Pioneer-Burdekin PHES Core Photo - BHL-12	DRAWN	RC/PL	DATE	20/08/2024
		CHECKED	GEM	DATE	7/10/2024
		SCALE	Not To Scale		A4
		PROJECT No	PS138693		FIGURE No 8/13

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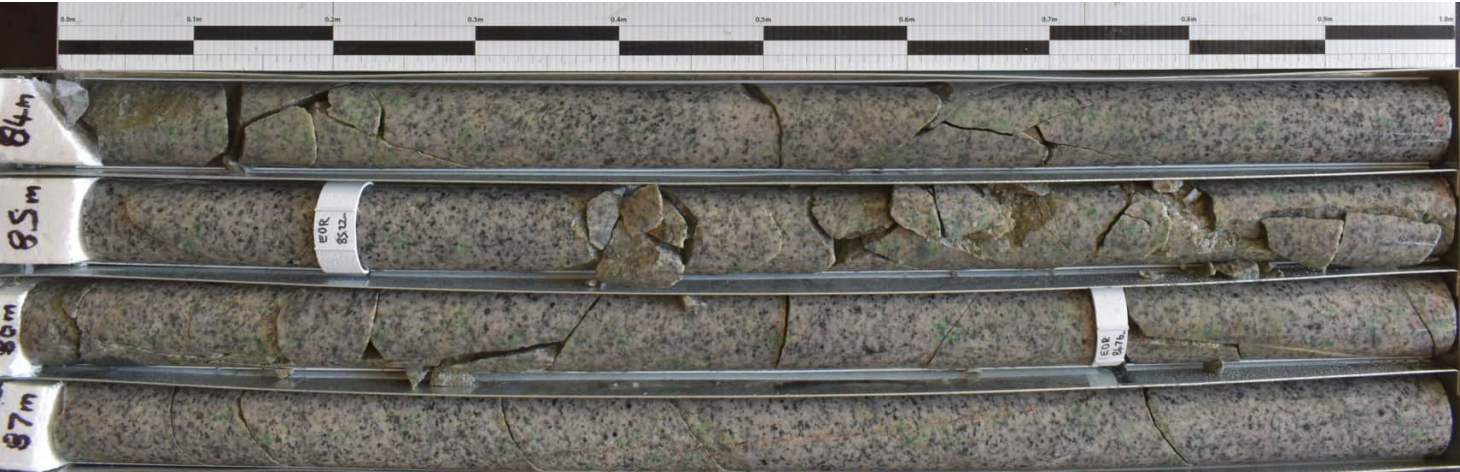
PointID : BHL-12 Depth Range: 76.00 - 80.00 m



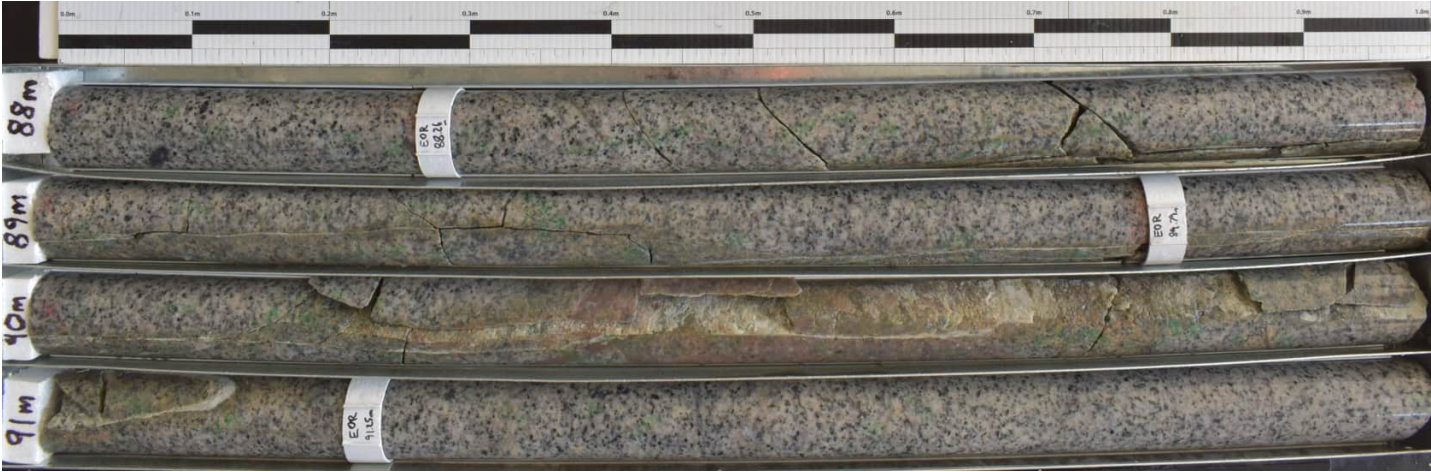
PointID : BHL-12 Depth Range: 80.00 - 84.00 m

	TITLE Queensland Hydro Netherdale/Dalrymple Heights Pioneer-Burdekin PHES Core Photo - BHL-12	DRAWN	RC/PL	DATE	20/08/2024	
		CHECKED	GEM	DATE	7/10/2024	
		SCALE			Not To Scale	A4
		PROJECT No		PS138693	FIGURE No	

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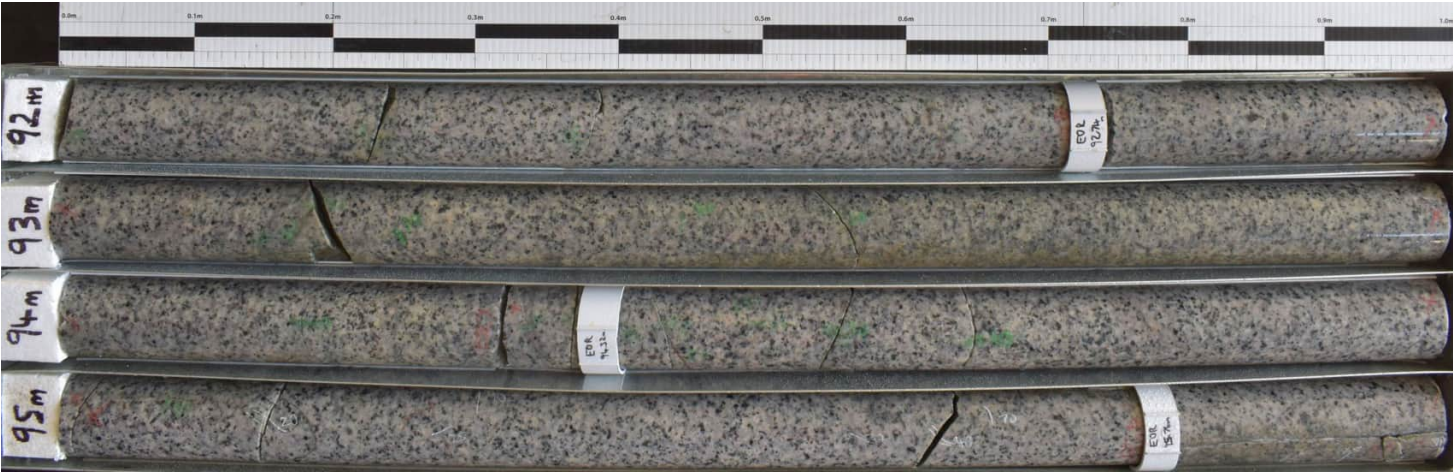
PointID : BHL-12 Depth Range: 84.00 - 88.00 m



PointID : BHL-12 Depth Range: 88.00 - 92.00 m

	TITLE Queensland Hydro Netherdale/Dalrymple Heights Pioneer-Burdekin PHES Core Photo - BHL-12	DRAWN RC/PL	DATE 20/08/2024	
		CHECKED GEM	DATE 7/10/2024	
		SCALE Not To Scale		A4
		PROJECT No PS138693		FIGURE No 10/13

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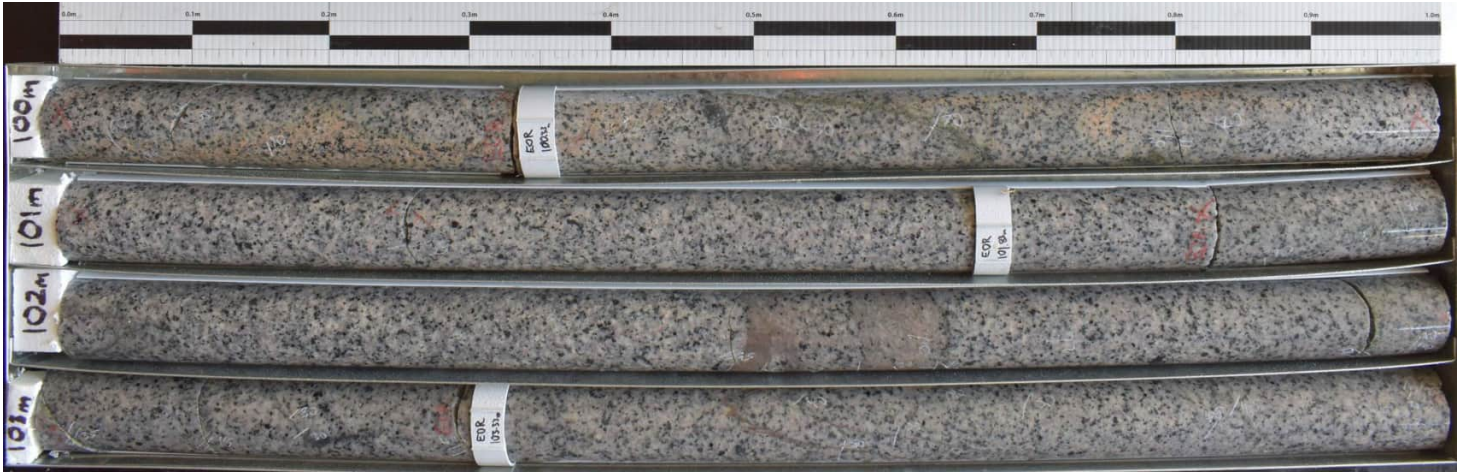
PointID : BHL-12 Depth Range: 92.00 - 96.00 m



PointID : BHL-12 Depth Range: 96.00 - 100.00 m

	TITLE Queensland Hydro Netherdale/Dalrymple Heights Pioneer-Burdekin PHES Core Photo - BHL-12	DRAWN	RC/PL	DATE	20/08/2024
		CHECKED	GEM	DATE	7/10/2024
		SCALE	Not To Scale		A4
		PROJECT No	PS138693		FIGURE No 11/13

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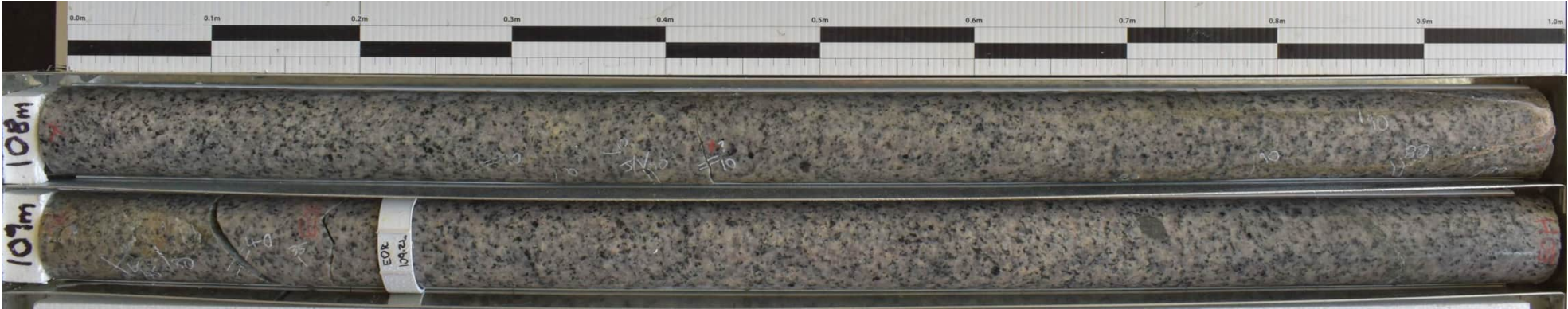


PointID : BHL-12 Depth Range: 100.00 - 104.00 m

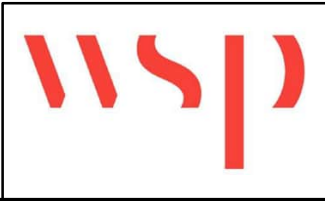


PointID : BHL-12 Depth Range: 104.00 - 108.00 m

	TITLE Queensland Hydro Netherdale/Dalrymple Heights Pioneer-Burdekin PHES Core Photo - BHL-12	DRAWN RC/PL		DATE 20/08/2024		
		CHECKED GEM		DATE 7/10/2024		
		SCALE Not To Scale				A4
		PROJECT No PS138693			FIGURE No 12/13	



PointID : BHL-12 Depth Range: 108.00 - 110.00 m

	TITLE Queensland Hydro Netherdale/Dalrymple Heights Pioneer-Burdekin PHES Core Photo - BHL-12	DRAWN	RC/PL	DATE	20/08/2024
		CHECKED	GEM	DATE	7/10/2024
		SCALE	Not To Scale		A4
		PROJECT No	PS138693		FIGURE No 13/13

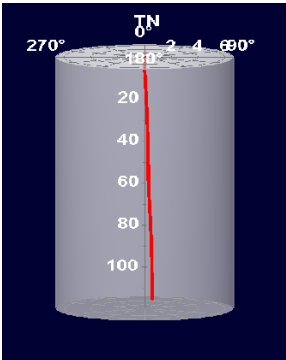
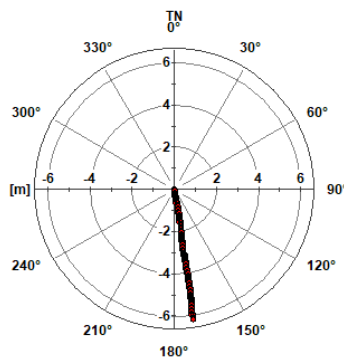


BHL-12 Structural Log



PROJECT:	Pioneer-Burdekin PHES	JOB #	PS138693
CLIENT:	Queensland Hydro	DATE:	15/03/2023

BOREHOLE DEVIATION



BOREHOLE DETAILS

DOCUMENT DETAILS

NOTES

LOCATION:	Lower Reservoir	BH DEPTH:	110.00 m
EASTING:	660324.868 m E	BH DIAMETER:	96 mm (HQ)
NORTHING:	7661426.256 m N	BH AZIMUTH:	172°
ELEVATION:	175.899 m	BH PLUNGE:	-87°
COORD SYSTEM:	MGA2020-55	CASING DEPTH:	16.11 m
LOGGING DATUM:	Ground Level	CASING TYPE:	HWT

LOGGED BY: G Hay
LOGGED DATE: 09-10/11/2023
DRAWN BY: SB
REVIEWED BY: GH
FILE: BHL-12_Structure_RevC
LOGGED DEPTH: 110.00 m

Image logs are oriented relative to high side. Final structures corrected to true north using magnetic declination of 8.2 deg East.

Mechanical calliper log used for structure dip corrections.

All logs zeroed to ground level. Cased section assumed straight for deviation calculations.

INTERPRETED STRUCTURES



Contact



Crushed Seam



Fracture Zone



Joint



Shear Seam



Sheared Surface



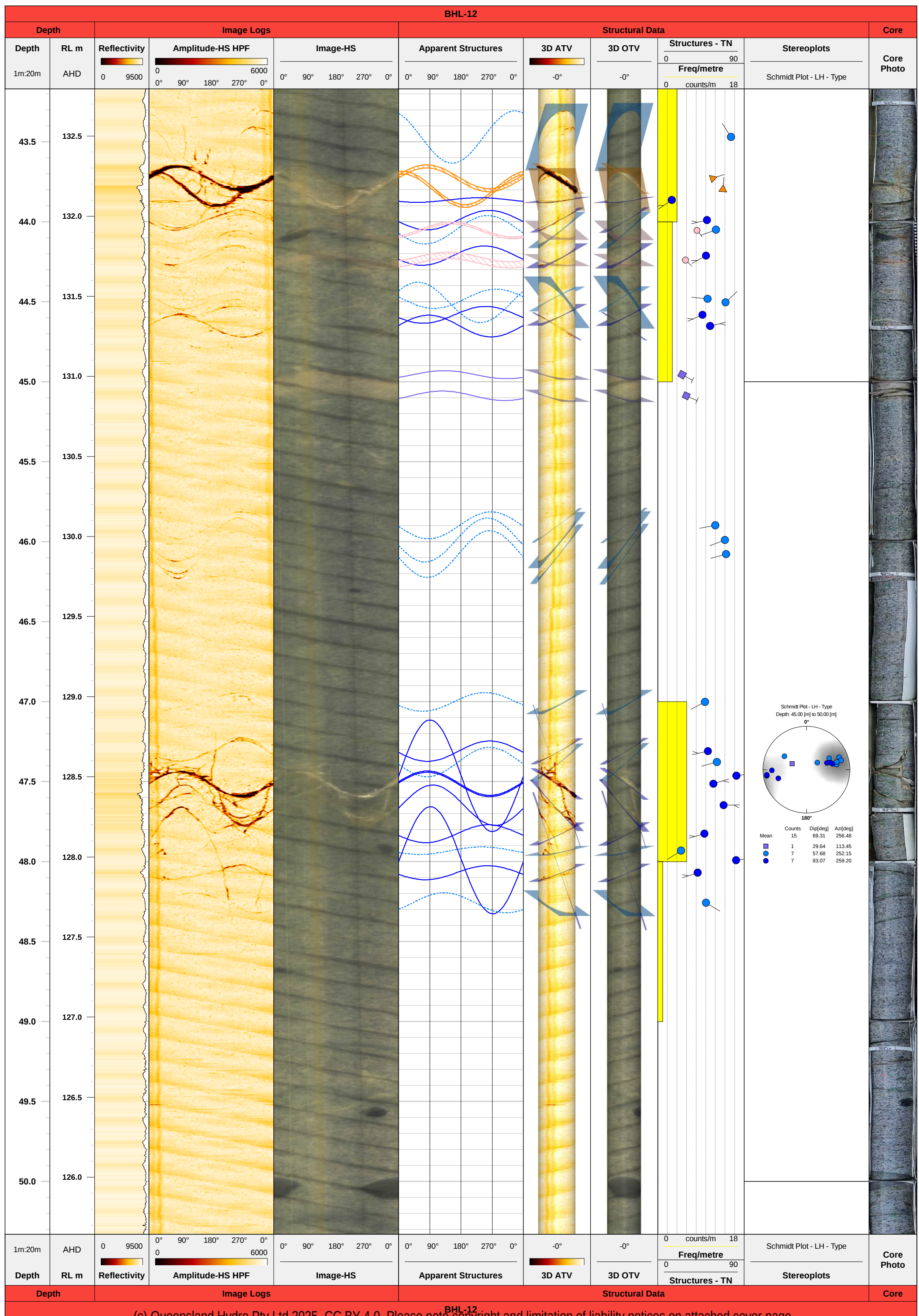
Vein

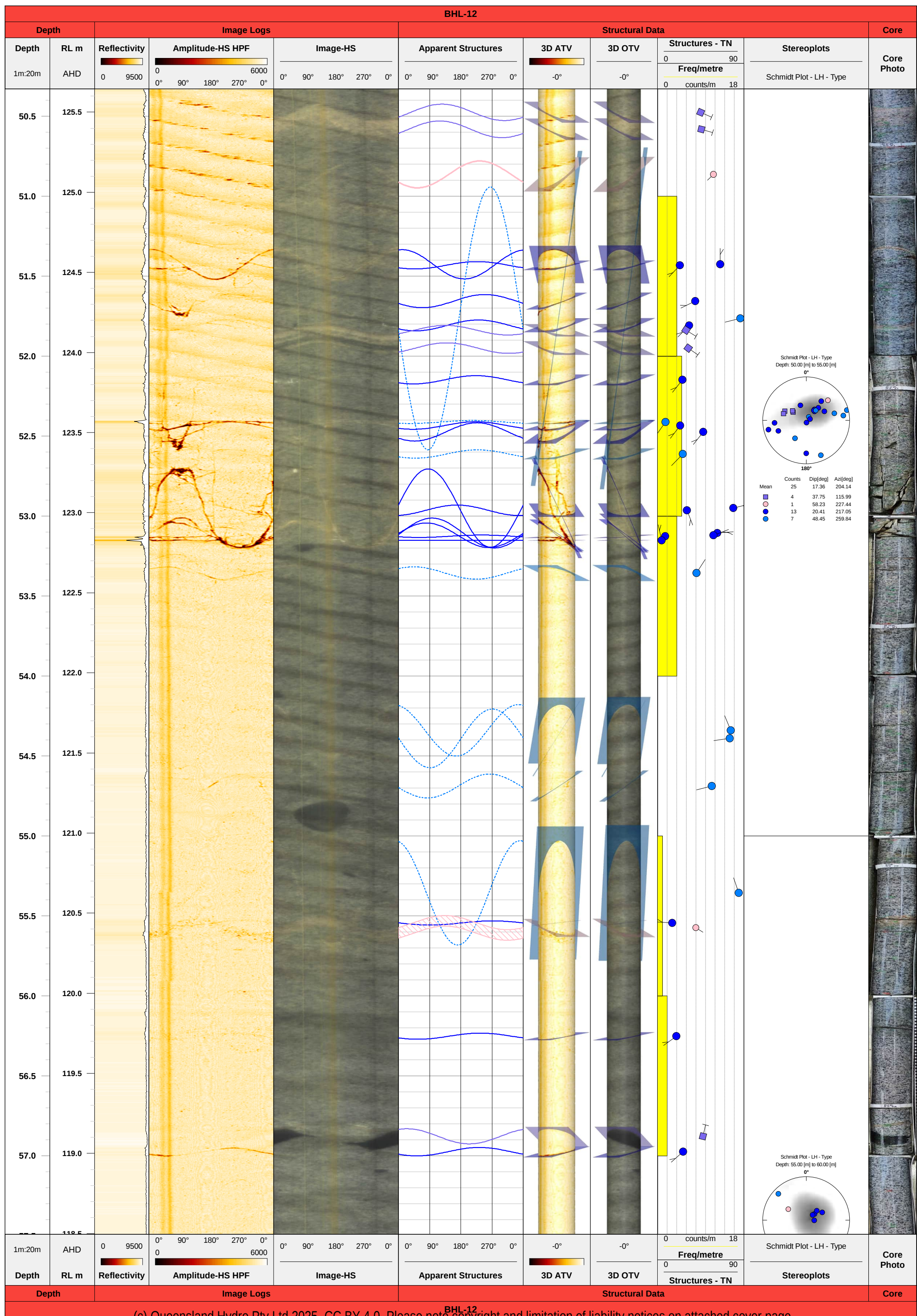


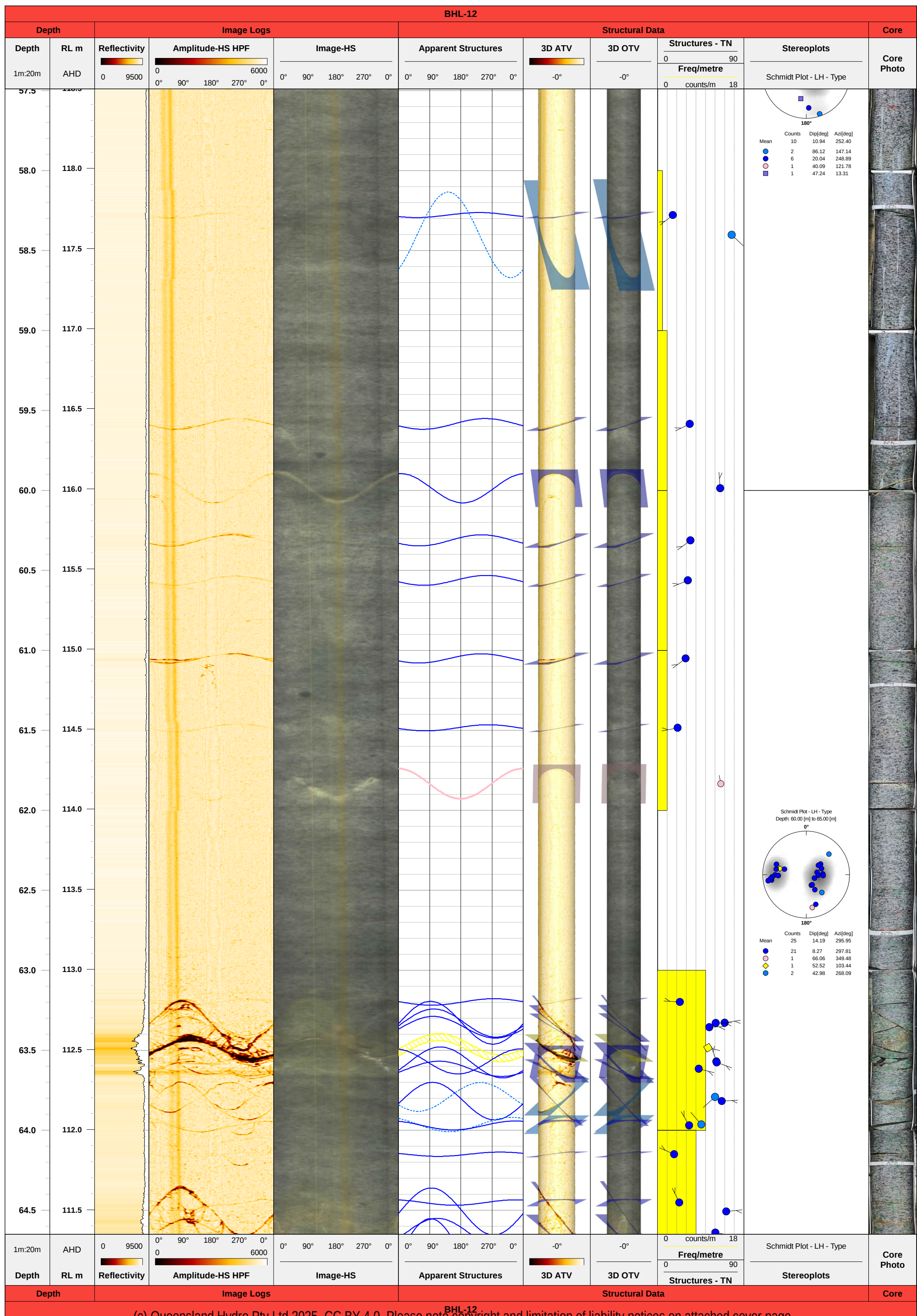
Healed Joint

BHL-12

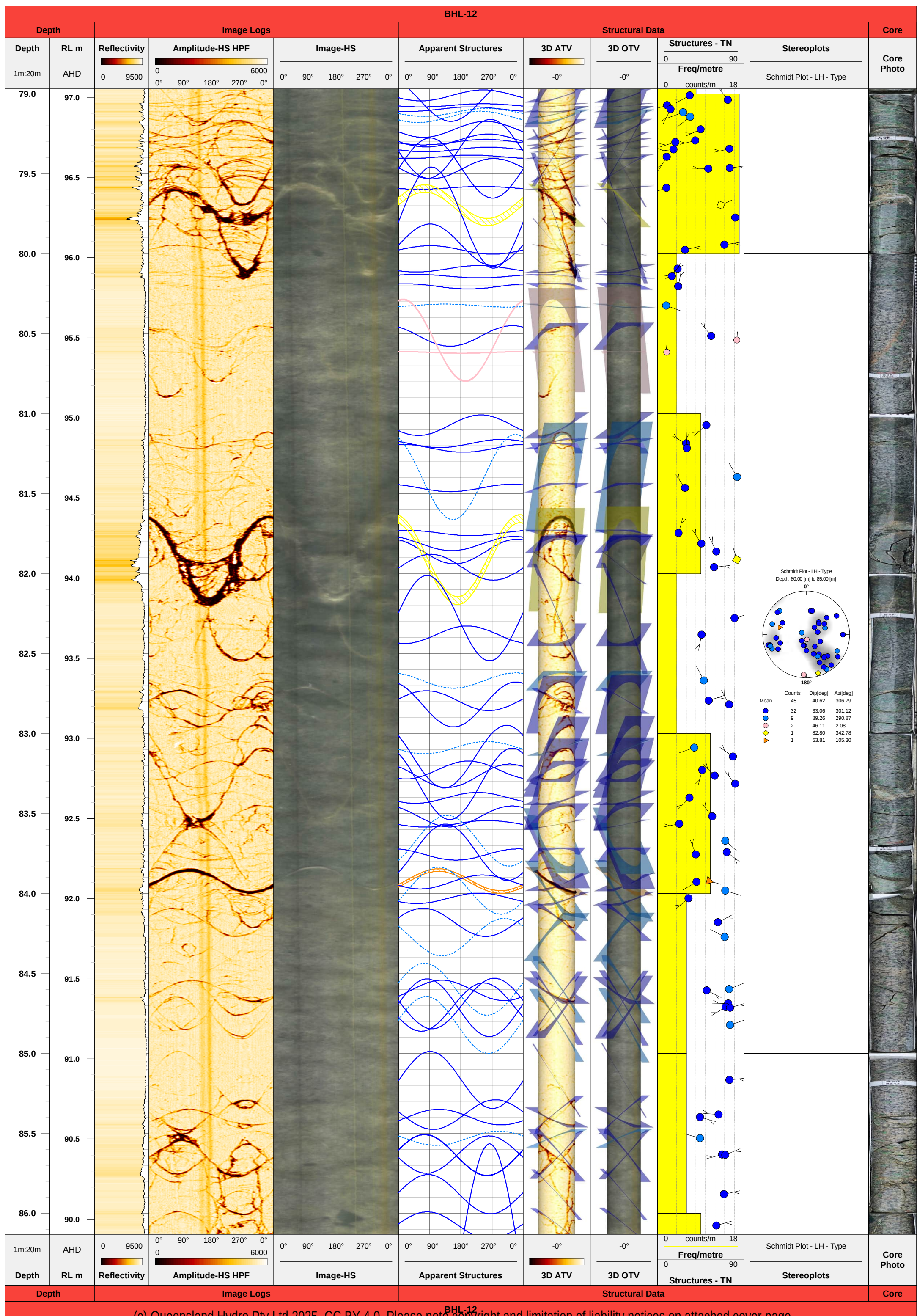
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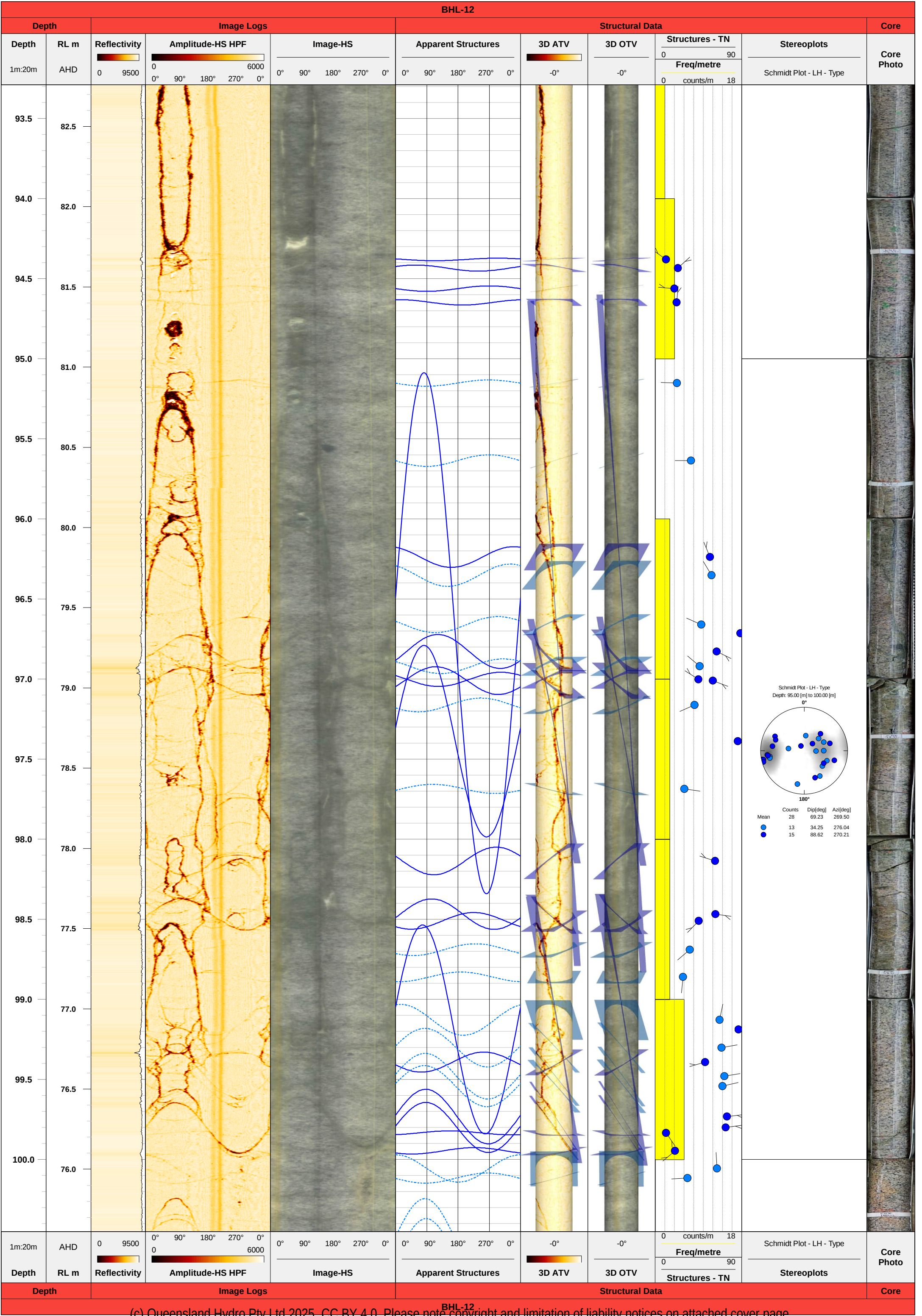
BHL-12										
Depth		Image Logs			Structural Data					Core
Depth	RL m	Reflectivity	Amplitude-HS HPF	Image-HS	Apparent Structures	3D ATV	3D OTV	Structures - TN	Stereoplots	Core Photo
1m:20m	AHD									
		0 9500	0 90° 180° 270° 0°	0° 90° 180° 270° 0°	0° 90° 180° 270° 0°	-0°	-0°	0 counts/m 18	Schmidt Plot - LH - Type	
72.0	104.0									
72.5	103.5									
73.0	103.0									
73.5	102.5									
74.0	102.0									
74.5	101.5									
75.0	101.0									
75.5	100.5									
76.0	100.0									
76.5	99.5									
77.0	99.0									
77.5	98.5									
78.0	98.0									
78.5	97.5									
1m:20m	AHD	0 9500	0° 90° 180° 270° 0°	0° 90° 180° 270° 0°	0° 90° 180° 270° 0°	-0°	-0°	0 counts/m 18	Schmidt Plot - LH - Type	Core Photo
Depth	RL m	Reflectivity	Amplitude-HS HPF	Image-HS	Apparent Structures	3D ATV	3D OTV	Structures - TN	Stereoplots	Core Photo
Depth		Image Logs			Structural Data					Core

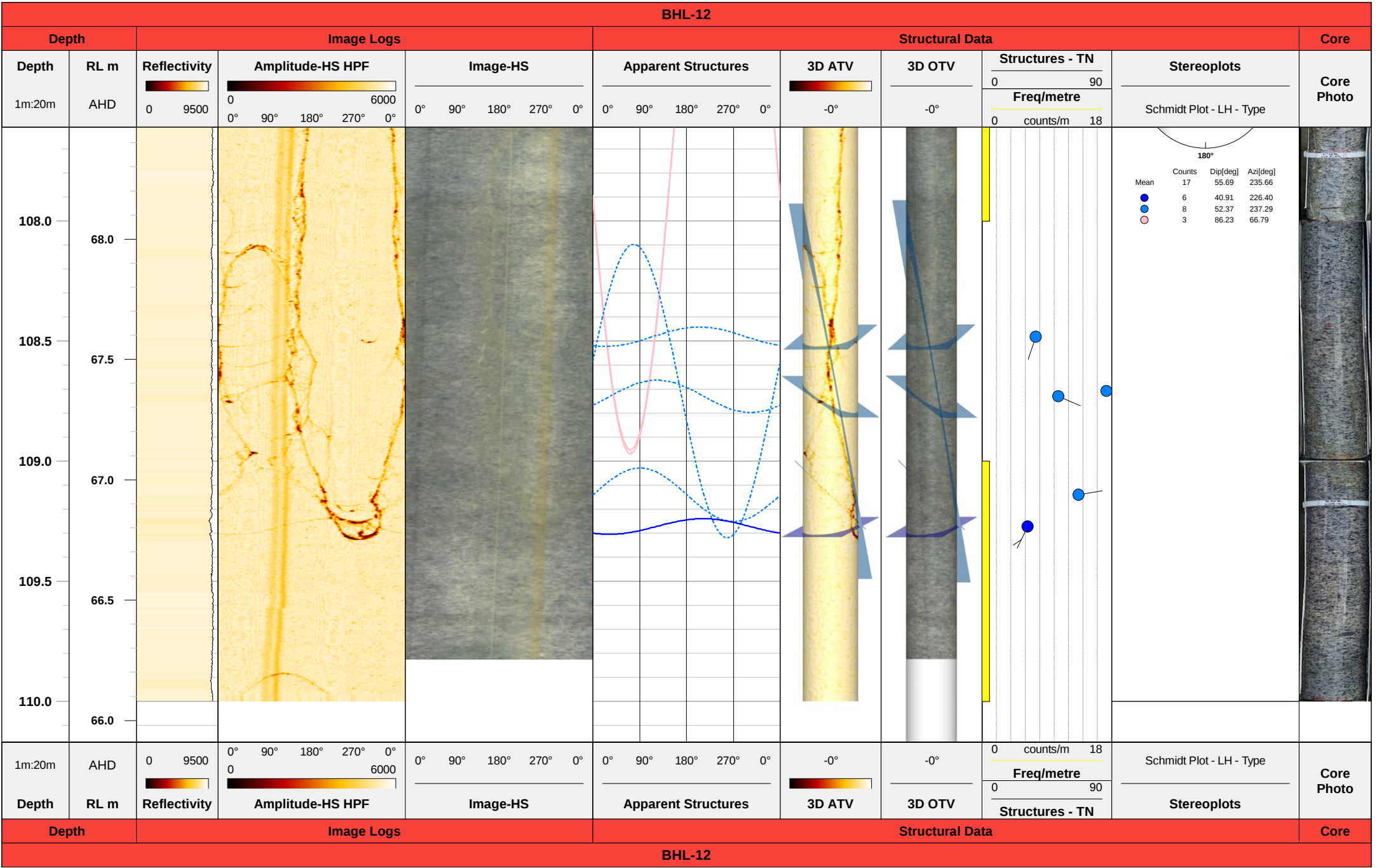


BHL-12																																		
Depth		Image Logs			Structural Data					Core																								
Depth	RL m	Reflectivity	Amplitude-HS HPF	Image-HS	Apparent Structures	3D ATV	3D OTV	Structures - TN	Stereoplots	Core Photo																								
1m:20m	AHD	0 9500	0 6000	0° 90° 180° 270° 0°	0° 90° 180° 270° 0°	-0°	-0°	0 90 Freq/metre 0 counts/m 18	Schmidt Plot - LH - Type	Core Photo																								
86.5	89.5								Schmidt Plot - LH - Type Depth: 85.00 [m] to 90.00 [m] Mean <table><tr><td>Counts</td><td>32</td><td>Dip[deg]</td><td>54.60</td><td>Az[deg]</td><td>249.83</td></tr><tr><td>27</td><td>53.38</td><td>249.27</td><td></td><td></td><td></td></tr><tr><td>5</td><td>70.43</td><td>332.21</td><td></td><td></td><td></td></tr></table>	Counts	32	Dip[deg]	54.60	Az[deg]	249.83	27	53.38	249.27				5	70.43	332.21										
Counts	32	Dip[deg]	54.60	Az[deg]	249.83																													
27	53.38	249.27																																
5	70.43	332.21																																
87.0	89.0																																	
87.5	88.5																																	
88.0	88.0																																	
88.5	87.5																																	
89.0	87.0																																	
89.5	86.5																																	
90.0	86.0																																	
90.5	85.5																																	
91.0	85.0																																	
91.5	84.5																																	
92.0	84.0								Schmidt Plot - LH - Type Depth: 90.00 [m] to 95.00 [m] Mean <table><tr><td>Counts</td><td>16</td><td>Dip[deg]</td><td>18.75</td><td>Az[deg]</td><td>241.80</td></tr><tr><td>8</td><td>16.20</td><td>269.23</td><td></td><td></td><td></td></tr><tr><td>6</td><td>46.76</td><td>236.77</td><td></td><td></td><td></td></tr><tr><td>2</td><td>41.65</td><td>102.86</td><td></td><td></td><td></td></tr></table>	Counts	16	Dip[deg]	18.75	Az[deg]	241.80	8	16.20	269.23				6	46.76	236.77				2	41.65	102.86				
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Depth	RL m	Reflectivity	Amplitude-HS HPF	Image-HS	Apparent Structures	3D ATV	3D OTV	Structures - TN	Stereoplots	Core Photo																								

BHL-12

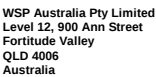
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BHL-12 Composite Log



PROJECT:	Pioneer-Burdekin PHES	JOB #	PS138693
CLIENT:	Queensland Hydro	DATE:	15/03/2023

PROJECT: Pioneer-Burdekin PHES
CLIENT: Queensland Hydro

JOB # PS138693
DATE: 15/03/2023

BOREHOLE DETAILS

LOCATION:	Lower Reservoir	BH DEPTH:	110.00 m
EASTING:	660324.868 m E	BH DIAMETER:	96 mm (HQ)
NORTHING:	7661426.256 m N	BH AZIMUTH:	172 °
ELEVATION:	175.899 m	BH PLUNGE:	-87°
COORD SYSTEM:	MGA2020-55	CASING DEPTH:	16.11 m
LOGGING DATUM:	Ground Level	CASING TYPE:	HWT

DOCUMENT DETAILS

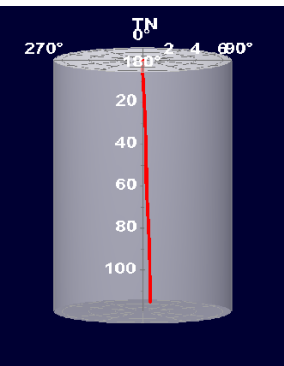
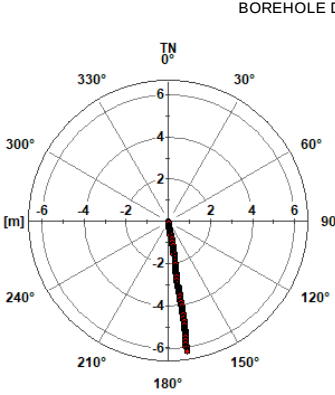
LOGGED BY: G Hay
LOGGED DATE: 09-10/11/2023
DRAWN BY: SB
REVIEWED BY: GH
FILE: BHL-12_Composite_RevC
LOGGED DEPTH: 110.00 m

NOTES

Image logs are oriented relative to high side. Final structures corrected to true north using magnetic declination of 8.2 deg East.

Mechanical calliper log used for structure dip corrections.

All logs zeroed to ground level. Cased section assumed straight for deviation calculations.



INTERPRETED STRUCTURES



Contact



Crushed Seam



Fracture Zone



Joint



Shear Seam



Sheared Surface



/ ein



Healed Joint

BHL-12

Depth	Image Logs			Calliper	Structural Logs			Sonic Logs	Gamma Logs			Electrical Logs		
Depth	Amplitude-HS HPF	Image-HS	Reflectivity	CAL	Structures - TN	3D ATV	Core	Vp	GR	K	N16	Ma64		
	500 6500 0° 90° 180° 270° 0°	0° 90° 180° 270° 0°	0 9500	80 mm 160	0 90	-0°		1000 m/s 7000		0 API 250	0 % 10	200 Ohm.m 20000	0 ms 50	
1m:50m					Freq/metre			Vs		Th	N32	Ma16		
	0° 90° 180° 270° 0°	0° 90° 180° 270° 0°	0 9500	80 mm 160	0 counts/m 18	-0°		1000 m/s 7000	0 API 250	0 ppm 20	200 Ohm.m 20000	0 ms 50		
										U	N8			
										0 ppm 10	200 Ohm.m 20000	0 ms 50		
0														
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														
11														
12														
13														
1m:50m	0° 90° 180° 270° 0° 500 6500	0° 90° 180° 270° 0°	0 9500	80 mm 160	0 counts/m 18	-0°		1000 m/s 7000	0 API 250	0 ppm 10	200 Ohm.m 20000	0 ms 50		
Depth	Amplitude-HS HPF	Image-HS	Reflectivity	CAL	Freq/metre	3D ATV	Core	Vs	GR	U	N8	Ma16		
					Structures - TN					Th	N32			
										K	N16	Ma64		
Depth	Image Logs			Calliper	Structural Logs			Sonic Logs	Gamma Logs			Electrical Logs		

BHL-12

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