BOREHOLE: BHUA-18

Project:	Pioneer-Burdekin PHES	Position:	Upper Reservoir	Sheet	1 of 7
Location:	Netherdale/Dalrymple Heights	Coords:	657500.0 m E 7666646.8 m N MGA2020-55		
Client:	Queensland Hydro	Surface RL:	895.7 m AHD	Date Started:	6/9/2023
Job No.:	PS138693	Contractor:	Twin Hills Engineering & Drilling Drill Rig: Hanjin D&B-8DTM	Date Completed:	12/9/2023
		Inclination:	-89° Direction: 157°	Logged:	SB

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
AD/V	F	Groundwater Not Encountered	0	895.71 *0.20* 895.51				CL	TOPSOIL Silty CLAY: low plasticity, red-brown, trace fine grained sand.	w<PL		TOPSOIL
								ML	Clayey SILT: low to medium plasticity, red-brown, with fine to medium grained sand.			RESIDUAL SOIL
			1		SPT 1.50-1.95 m 4,6,8 N=14 D 1.50-1.95 m PB-BHUA-18-001							
			2									
			3		SPT 3.00-3.45 m 3,7,8 N=15 D 3.00-3.45 m PB-BHUA-18-002					w<PL	St	
			4	*4.00* 891.71				ML	Clayey SILT: medium plasticity, red-brown, trace fine grained sand.			
			5		SPT 4.50-4.95 m 3,4,8 N=12 D 4.50-4.95 m PB-BHUA-18-003 U63 5.00-5.40 m BHUA-18 PP 5.40 m =420-460 kPa							
			6		SPT 6.00-6.45 m 4,4,5 N=9 D 6.00-6.45 m PB-BHUA-18-004							
			7	*6.30* 889.41				ML	Clayey SILT: medium plasticity, red-brown mottled pale brown and white, with fine grained sand.	w≈PL	F	
			8		SPT 7.50-7.95 m 3,3,3 N=6 D 7.50-7.95 m PB-BHUA-18-005 U63 8.00-8.35 m BHUA-18							
WB		Groundwater Not Observed	9	*8.50* 887.21	PP 8.35 m =305-550 kPa SPT 9.00-9.45 m 3,4,5 N=9 D 9.00-9.45 m PB-BHUA-18-006			ML	Clayey SILT: low plasticity, red-brown mottled pale brown and black, with medium grained sand; with veins.	M	L	
			10									

Comments

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BOREHOLE: BHUA-18

Project:	Pioneer-Burdekin PHES	Position:	Upper Reservoir	Sheet	2 of 7
Location:	Netherdale/Dalrymple Heights	Coords:	657500.0 m E 7666646.8 m N MGA2020-55		
Client:	Queensland Hydro	Surface RL:	895.7 m AHD	Date Started:	6/9/2023
Job No.:	PS138693	Contractor:	Twin Hills Engineering & Drilling Drill Rig: Hanjin D&B-8DTM	Date Completed:	12/9/2023
		Inclination:	-89° Direction: 157°	Logged:	SB

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	F		10	885.72				SM	Silty SAND: fine to medium grained, red-brown mottled pale brown and black.	M	L	EXTREMELY WEATHERED MATERIAL
					SPT 10.50-10.95 m 3,3,4 N=7 D 10.50-10.95 m PB-BHUA-18-007							
	H		11	*11.13*					Continued as Cored Borehole			
			12									
			13									
			14									
			15									
			16									
			17									
			18									
			19									
			20									

Comments

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BOREHOLE: BHUA-18

Project:	Pioneer-Burdekin PHES	Position:	Upper Reservoir	Sheet	3 OF 7
Location:	Netherdale/Dalrymple Heights	Coords:	657500.0 m E 7666646.8 m N MGA2020-55		
Client:	Queensland Hydro	Surface RL:	895.7 m AHD	Date Started:	6/9/2023
Job No.:	PS138693	Contractor:	Twin Hills Engineering & Drilling Drill Rig: Hanjin D&B-8DTM	Date Completed:	12/9/2023
		Inclination:	-89° Direction: 157°	Logged:	SB

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)
				10							
				11	11.13		Continuation from non-cored borehole				
HQ3	11/9/2023 07:00	8	0	12	884.59		NO CORE 0.55m (11.13-11.68) CORE LOSS: inferred SILT, low plasticity, red brown mottled pale brown and black, with fine to medium grained sand, inferred extremely weathered Lamprophyre.				
					11.68						
							LAMPROPHYRE: fine grained, brown grey and black, porphyritic.	HW			
					883.82		NO CORE 0.10m (11.73-11.83)	HW		11.91: J, 10°, CN, IR, RF	
								MW		12.05: J, 5°, IR, healed	
					12.33		LAMPROPHYRE: fine grained, brown grey and black, porphyritic.			12.14: J, 10°, CN, IR, RF	
		93	73		883.39		GRANITE: fine to medium grained, dark green grey and pale grey, crystalline, massive, highly altered, yellow alteration around healed defects.			12.17: J, 80°, CN, IR, RF 12.22-12.31: CS, 40°, VN, IR, RF 12.49: J, 5°, CN, IR, RF 12.55-12.80: PLT(A) Is50 = 7.4MPa (M); PLT(D) Is50 = 12MPa (M)	
				13			12.33-12.45m: inclusion, fresh lamprophyre, contact vertical with iron staining present.			12.51-12.54: CS, 10°, CN, IR, RF 12.81: J, 55°, VN, IR, RF 12.93: J, 5°, CN, PR, RF 12.95: J, 40°, CN, IR, RF 12.96: J, 20°, CN, IR, RF 12.99: J, 25°, CN, PR, RF 13.10: J, 20°, CN, IR, RF	
					13.23						
	9/9/2023 07:00				882.49		NO CORE 0.77m (13.23-14.00)				
		49	33		14.00						
				14	881.72		GRANITE: fine to medium grained, dark green grey and pale grey, crystalline, massive, highly altered, yellow alteration around healed defects.	MW		14.01: J, 5°, VN, IR, RF 14.13: J, 5°, VN, ST, RF 14.28: J, 25°, VN, IR, RF 14.30: J, 25°, VN, IR, RF 14.32: J, 25°, VN, IR, RF 14.34: J, 30°, VN, IR, RF 14.35: J, 5°, VN, IR, RF	
					14.50						
					881.22		Orange brown and grey.	HW			
					14.73						
					880.99		NO CORE 1.02m (14.73-15.75)				
		32	30	15							
					15.75						
	80% Water Return				15.90		GRANITE: fine to medium grained, orange brown, dark grey and pale grey, crystalline, massive, highly altered, yellow alteration around healed defects.	MW		15.77: J, 5°, SN, IR, iron stained	
					879.82			SW		15.98: J, 60°, CN, IR, RF	
				16	16.10						
					16.25		Dark grey and pale grey and pale yellow, slightly altered, some moderately altered around healed joints, possible quartz infill in healed joints.			16.40: J, 35°, CN, IR, RF	
					879.47		Moderately altered zone.				
							Highly altered zone.				
	0% Water Return	100	100	17	17.06						
					17.17		Slightly altered zone.			17.17-17.24: HB, drilling induced	
					878.48		NO CORE 0.07m (17.17-17.24)				
					17.50		Slightly altered zone.				
					878.22		No alteration.				
					17.84						
					877.88		Slightly altered zone.			17.94: J, 30°, CN, IR, RF 18.04: J, PR	
				18	18.24						
		100	100		877.48		Moderately altered zone.			18.22: J, 45°, CN, IR	
					19.00						
				19	876.72		Some mafic inclusions up to 25mm.	FR			
		100	100								
					20.00						
				20							

Comments

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BOREHOLE: BHUA-18

Project:	Pioneer-Burdekin PHES	Position:	Upper Reservoir	Sheet	4 OF 7
Location:	Netherdale/Dalrymple Heights	Coords:	657500.0 m E 7666646.8 m N MGA2020-55		
Client:	Queensland Hydro	Surface RL:	895.7 m AHD	Date Started:	6/9/2023
Job No.:	PS138693	Contractor:	Twin Hills Engineering & Drilling Drill Rig: Hanjin D&B-8DTM	Date Completed:	12/9/2023
		Inclination:	-89° Direction: 157°	Logged:	SB

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 VL .2 L .6 M .20 H .60 VH .200 EH	DEFECT DESCRIPTION & Additional Observations (Core partings shown - refer to Detailed Defect Descriptions table for all logged features)	AVERAGE DEFECT SPACING (mm) 10 30 100 300 1000 3000
HQ3	90-100% Water Return	100	100	20	875.72		GRANITE: fine to medium grained, orange brown, crystalline, massive, highly altered, yellow alteration around healed defects.	FR			
		100	100	21							
		100	100	22			with some mafic inclusions, up to 20mm diameter			22.22: J, 5°, CN, IR, RF 22.27: J, 25°, CN, IR, RF	
		100	100	23	*22.58* 873.14		Possible quartz infill in healed joints. possible flow banding of mafic inclusion				
		100	100	24			mafic inclusion				
		100	100	25	*25.10* 870.62 ***25.32***		Moderately altered, rare mafic inclusions.			24.93: J, 50°, CN, IR, RF	
		100	100	26	870.40		BASALT: fine grained, dark grey, crystalline, massive, some medium grained phenocrysts, possible quartz and occasional calcite infill in healed joints. medium to coarse grained phenocrysts present			25.32-26.82: HB, drilling induced 25.63: J, 60°, CN, IR, SM, potentially HB 25.67: J, 20°, CN, IR, RF 26.15-26.70: PLT(A) Is50 = 11MPa (M); PLT(D) Is50 = 13MPa (M)	
		100	100	27			some medium grained phenocrysts present				
	0% Water Return	100	100	28						27.75: J, 25°, CN, IR, RF 27.80: J, 45°, CN, IR, RF 28.07: J, 35°, CN, IR, RF 28.21: J, 35°, CN, IR, RF	
		100	100	29						29.44: J, 65°, CN, IR, RF	
		100	100	30						29.84: J, 80°, CT, PR, RF, calcite coating	

Comments

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BOREHOLE: BHUA-18

Project:	Pioneer-Burdekin PHES	Position:	Upper Reservoir	Sheet	5 OF 7
Location:	Netherdale/Dalrymple Heights	Coords:	657500.0 m E 7666646.8 m N MGA2020-55		
Client:	Queensland Hydro	Surface RL:	895.7 m AHD	Date Started:	6/9/2023
Job No.:	PS138693	Contractor:	Twin Hills Engineering & Drilling Drill Rig: Hanjin D&B-8DTM	Date Completed:	12/9/2023
		Inclination:	-89° Direction: 157°	Logged:	SB

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)
HQ3	0% Water Return 90-100% Water Return	100	100	30	30.28		BASALT: fine grained, dark grey, crystalline, massive, some medium grained phenocrysts, possible quartz and occasional calcite infill in healed joints.	FR			
					30.39						
					30.52		Some coarse grained phenocrysts present up to 5mm.			30.47: J, 50°, CN, IR, RF	
					865.20		Rare medium grained phenocrysts present.				
					30.79		Medium grained phenocrysts present.			30.69: J, 35°, CN, IR, RF	
					864.93		Rare medium grained phenocrysts present.			30.89: J, 30°, CN, IR, RF	
				31						31.10: J, 75°, CN, PR, RF, some calcite coating	
										31.44: J, 5°, CN, IR, RF	
					31.88						
					863.84		GRANITE: fine to coarse grained, dark grey and pale yellow and pale grey, crystalline, massive, highly altered, possible quartz infill in healed joints, pale yellow alteration around healed defects.				
		100	100	32	32.16					32.00-32.40: PLT(A) Is50 = 11MPa (M); PLT(D) Is50 = 12MPa (M)	
					863.56		Dark grey and white and black.			32.03: J, 5°, CT, IR, RF, clay	
										32.74: J, 45°, VN, IR, RF	
				33						32.78-33.64: EW, 90°, IR, CLAY, 2-5mm, significant defect	
										33.24: J, 5°, CN, IR, RF	
		100	100							33.67: J, CN, IR, RF	
										33.76: J, 60°, CT, IR, RF, clay, 1mm	
				34						33.81: J, 85°, CT, IR, RF, calcite	
										33.83: J, 10°, CT, IR, RF, calcite	
										33.84: J, 10°, CT, IR, RF, calcite	
										33.87: J, 50°, CT, IR, RF, calcite	
										34.18: J, 5°, CN, IR, RF	
										34.19: J, 80°, CT, IR, RF, clay, 1mm	
				35						34.27: J, 25°, VN, IR, RF	
										34.40: J, 80°, CT, IR, RF, clay	
										34.45: J, 10°, CN, IR, RF	
										34.46: J, 10°, CN, IR, SM	
										34.49: J, 10°, CN, IR, RF	
										34.58: J, 70°, CT, IR, RF, clay and quartz, 1mm, slight alteration halo 2mm around joint	
										35.38: J, 65°, CT, IR, RF, quartz, possible healed joint broken in drilling	
							medium to coarse grained illitisation present				
				36	36.06						
					859.66		BASALT: fine to coarse grained, dark grey and pale grey, crystalline, massive, some medium to coarse grained phenocrysts, calcite infill of healed joints.				
		100	100							36.34: J, CN, IR, RF, possible DB	
										36.35: J, 30°, CN, PR, RF, possible DB	
				37						36.76: J, 65°, CN, IR, RF	
										36.94: J, 65°, VN, IR, RF, calcite	
										37.96: J, 15°, CN, IR, RF	
		100	100	38							
										38.28: J, 5°, CN, IR, RF	
										38.38: J, 10°, CT, IR, RF, calcite	
										38.68: J, 65°, CN, IR, RF	
										38.70: J, 10°, CN, IR, RF	
										38.72: J, 65°, CN, IR, RF	
				39	39.14					38.95: J, CN, IR, RF	
					856.59		Partial intersection of moderately altered granodiorite, fine to medium grained, grey green and pale yellow, crystalline, rare medium grained phenocrysts.			39.12: J, 30°, CN, IR, RF	
		100	100		39.40						
										39.55-40.00: PLT(A) Is50 = 1.5MPa (W); PLT(D) Is50 = 8.7MPa (M)	
				40	40.00					39.72: J, 10°, CN, IR, RF	

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BOREHOLE: BHUA-18

Project:	Pioneer-Burdekin PHES	Position:	Upper Reservoir	Sheet	6 OF 7
Location:	Netherdale/Dalrymple Heights	Coords:	657500.0 m E 7666646.8 m N MGA2020-55		
Client:	Queensland Hydro	Surface RL:	895.7 m AHD	Date Started:	6/9/2023
Job No.:	PS138693	Contractor:	Twin Hills Engineering & Drilling Drill Rig: Hanjin D&B-8DTM	Date Completed:	12/9/2023
		Inclination:	-89° Direction: 157°	Logged:	SB

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)
HQ3	90-100% Water Return	100	100	40	855.73		BASALT: fine to coarse grained, dark grey and pale grey, crystalline, massive, some medium to coarse grained phenocrysts, calcite infill of healed joints.	FR		40.14: J, 15°, CN, IR, RF	
					40.31						
					855.42						
					40.57		Partial intersection of moderately altered granodiorite, fine to medium grained, pale grey green and pale yellow, crystalline, rare medium grained phenocrysts, contact 0 to 90 degrees.				
					855.16						
		100	100	41			Fine to coarse grained, dark grey and pale grey, crystalline, massive, some medium to coarse grained phenocrysts, calcite infill of healed joints.			41.05: J, 30°, CN, IR, RF 41.08: J, 30°, CN, IR, SM 41.10: J, 80°, CN, IR, SM	
					41.88						
					853.85		GRANITE: fine to medium grained, green grey, pale grey green, crystalline, massive, highly altered, yellow alteration around healed defects.			41.78: J, 20°, CN, IR, SM 41.80: J, 15°, CN, IR, RF 41.83: J, 45°, CN, IR, RF 41.87: J, 25°, CN, IR, RF 41.95: J, 35°, CN, IR, RF	
				42							
					42.38						
					42.52		BASALT: fine grained, dark grey and pale grey, crystalline, massive.				
					853.21						
		100	63				GRANITE: fine to medium grained, green grey and pale yellow, crystalline, massive, highly altered, yellow alteration around healed defects.			42.06-42.09: J, 45°, CN, IR, RF, closely spaced joints, 10mm average spacing 42.10: J, 45°, CT, IR, RF, clay 42.13: J, 45°, CT, IR, RF, clay 42.14: J, 20°, CT, IR, RF, clay 42.20: J, 35°, CT, IR, RF, clay 42.23: J, 80°, CT, IR, RF, clay	
				43	*43.03*						
					852.70		BASALT: fine grained, dark grey and grey and pale yellow, crystalline, massive.			42.31: J, 15°, CN, IR, RF 42.35: J, 10°, VN, IR, RF 42.38: J, 70°, CT, IR, RF, calcite, slight alteration halo 2mm thick	
		100	100		*43.68*						
	80% Water Return				852.05		inclusion in brecciated zone, fine to coarse grained, slightly altered			42.42: J, 85°, VN, IR, SM, calcite 42.49: J, 10°, CN, PR, SM 42.51: J, 5°, CN, IR, SM	
		100	81	44			GRANITE: fine to coarse grained, dark green grey, pale grey and pale yellow, crystalline, massive, generally highly altered, yellow alteration around healed defects.			42.58: J, 20°, VN, IR, SM, clay 42.77: J, 25°, CN, IR, RF 42.81: J, 20°, CN, IR, RF 42.87: J, 20°, CN, IR, RF 42.91: J, VN, IR, SM, calcite 42.97: J, 20°, CN, IR, SM 43.04: J, 10°, CN, IR, RF 43.06: J, 50°, VN, IR, RF 43.07: J, 10°, VN, IR, RF	
					44.30						
					851.43		BASALT: fine to medium grained, dark grey and grey, crystalline, massive.				
					44.85						
					850.88		GRANITE: fine to medium grained, dark green grey and pale yellow, crystalline, massive, highly altered, yellow alteration around healed defects.	XW FR		43.13: J, CN, IR, SM 43.16: J, 5°, VN, IR, RF, calcite 43.21: J, 10°, CT, IR, RF, clay 43.32: J, 30°, CN, PR, SM 43.36: J, 25°, VN, IR, RF 43.38: J, 25°, VN, IR, SM 43.68: J, 60°, CN, IR, RF 43.70: J, 10°, CN, PR, SM 43.72: J, 30°, CN, IR, RF 43.78: J, CN, IR, RF 43.98: J, 30°, CN, IR, RF 44.07: J, 50°, CN, PR, SM 44.11: J, CN, PR, SM 44.24-44.33: J, 20°, CT, IR, RF, clay, extremely closely spaced joints, 10mm spacing, anastomised pattern 44.37-44.40: J, 10°, VN, IR, RF, closely spaced joint set, 10mm spacing, anastomised pattern 44.44: J, 10°, CN, IR, SM 44.45: J, 20°, CN, IR, SM 44.45-44.47: J, 20°, VN, IR, SM, clay, extremely closely spaced joints, 5mm spacing 44.65: J, 10°, CN, IR, SM 44.75: J, 20°, VN, IR, SM 44.77: J, 20°, VN, IR, SM 44.85-44.94: EW, 50°, IR, SM, Gravelly CLAY infill, significant defect 44.97: J, 40°, CN, IR, SM 45.10-45.50: PLT(A) Is50 = 6.3MPa (M); PLT(D) Is50 = 5.5MPa (M) 45.53: J, 30°, VN, IR, SM 46.52: J, 30°, VN, IR, SM 46.79: J, 20°, CN, PR, SM 47.02: J, 90°, CN, IR, RF 47.04: J, 40°, CN, IR, RF 47.37: J, 30°, CN, IR, RF 47.71: J, 20°, CN, IR, SM 47.79: J, 10°, CN, IR, RF 48.71: J, 5°, CN, IR, SM 48.96: J, 30°, CN, IR, SM 49.30: J, 15°, CN, PR, RF	
		100	100	45							
				46							
				47							
		100	100				some veins of aplite, pale red and white feldspars present				
				48							
		100	100								
					48.75						
					846.98		Fine grained, dark grey and grey green, crystalline, massive, highly altered, yellow alteration around healed defects.				
		100	100	49							
					49.58						
					846.15		Fine to coarse grained, dark grey and pale grey green and pale yellow, Crystalline, massive, slightly altered zones.				
		100	100	50	*50.00*						

Comments

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BOREHOLE: BHUA-18

Project:	Pioneer-Burdekin PHES	Position:	Upper Reservoir	Sheet	7 OF 7
Location:	Netherdale/Dalrymple Heights	Coords:	657500.0 m E 7666646.8 m N MGA2020-55		
Client:	Queensland Hydro	Surface RL:	895.7 m AHD	Date Started:	6/9/2023
Job No.:	PS138693	Contractor:	Twin Hills Engineering & Drilling Drill Rig: Hanjin D&B-8DTM	Date Completed:	12/9/2023
		Inclination:	-89° Direction: 157°	Logged:	SB

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 (VL -2, L -6, M -20, H -60, VH -200, EH)	DEFECT DESCRIPTION & Additional Observations (Core partings shown - refer to Detailed Defect Descriptions table for all logged features)	AVERAGE DEFECT SPACING (mm) (10, 30, 100, 300, 1000, 3000)
HQ3		100	100	50	845.73		GRANITE: fine to coarse grained, dark grey and pale grey green and pale yellow, Crystalline, massive, slightly altered zones.	FR		50.27: J, 20°, CN, PR, RF 50.68: J, 40°, VN, IR, RF 50.70: J, 20°, VN, IR, RF 50.93: J, 60°, CN, IR, RF	
				51	*51.02* 844.71		Hole Terminated at 51.02 m Target depth. Backfilled with grout.			51.02: J, 15°, IR	
				52							
				53							
				54							
				55							
				56							
				57							
				58							
				59							
				60							

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Pioneer-Burdekin Pumped Hydro Energy Scheme: Tranche 1 – BHUA-18 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
BHUA-18	11.91				J		10			CN	IR	RF					
BHUA-18	12.05				J		5				IR						healed
BHUA-18	12.14				J		10			CN	IR	RF					
BHUA-18	12.17				J		80			CN	IR	RF					
BHUA-18	12.22	12.31			CS		40			VN	IR	RF					
BHUA-18	12.49				J		5			CN	IR	RF					
BHUA-18	12.51	12.54			CS		10			CN	IR	RF					
BHUA-18	12.55				HB												
BHUA-18	12.81				J		55			VN	IR	RF					
BHUA-18	12.93				J		5			CN	PR	RF					
BHUA-18	12.95				J		40			CN	IR	RF					
BHUA-18	12.96				J		20			CN	IR	RF					
BHUA-18	12.99				J		25			CN	PR	RF					
BHUA-18	13.10				J		20			CN	IR	RF					
BHUA-18	13.23				DB												
BHUA-18	14.01				J		5			VN	IR	RF					
BHUA-18	14.13				J		5			VN	ST	RF					
BHUA-18	14.28				J		25			VN	IR	RF					
BHUA-18	14.30				J		25			VN	IR	RF					
BHUA-18	14.32				J		25			VN	IR	RF					
BHUA-18	14.34				J		30			VN	IR	RF					
BHUA-18	14.35				J		5			VN	IR	RF					
BHUA-18	14.50	14.64			J		20			VN	IR	RF					closely spaced defects at 30mm spacing
BHUA-18	15.77				J		5			SN	IR						iron stained
BHUA-18	15.98				J		60			CN	IR	RF					
BHUA-18	16.40				J		35			CN	IR	RF					
BHUA-18	16.57				MB												
BHUA-18	17.00				HB												
BHUA-18	17.15				HB												
BHUA-18	17.17	17.24			HB												drilling induced
BHUA-18	17.94				J		30			CN	IR	RF					
BHUA-18	18.00				HB												
BHUA-18	18.04				J						PR						
BHUA-18	18.22				J		45			CN	IR						
BHUA-18	18.74				MB												
BHUA-18	19.00				HB												
BHUA-18	21.00				HB												
BHUA-18	22.00				HB												
BHUA-18	22.22				J		5			CN	IR	RF					
BHUA-18	22.27				J		25			CN	IR	RF					
BHUA-18	23.00				HB												
BHUA-18	23.16				MB												
BHUA-18	24.00				HB												
BHUA-18	24.93				J		50			CN	IR	RF					
BHUA-18	25.00				HB												
BHUA-18	25.60				HB												
BHUA-18	25.63				J		60			CN	IR	SM					potentially HB
BHUA-18	25.67				J		20			CN	IR	RF					
BHUA-18	25.95				HB												
BHUA-18	26.00				HB												
BHUA-18	26.07	26.16			HB												multiple handling breaks
BHUA-18	26.69				HB												
BHUA-18	26.72				HB												
BHUA-18	27.00				HB												
BHUA-18	27.75				J		25			CN	IR	RF					
BHUA-18	27.80				J		45			CN	IR	RF					
BHUA-18	28.00				HB												
BHUA-18	28.07				J		35			CN	IR	RF					
BHUA-18	28.21				J		35			CN	IR	RF					
BHUA-18	29.00				HB												
BHUA-18	29.44				J		65			CN	IR	RF					
BHUA-18	29.84				J		80			CT	PR	RF					calcite coating
BHUA-18	30.00				HB												
BHUA-18	30.47				J		50			CN	IR	RF					
BHUA-18	30.69				J		35			CN	IR	RF					
BHUA-18	30.89				J		30			CN	IR	RF					
BHUA-18	31.00				HB												
BHUA-18	31.08				HB												
BHUA-18	31.10				J		75			CN	PR	RF					some calcite coating
BHUA-18	31.44				J		5			CN	IR	RF					
BHUA-18	31.48				HB												
BHUA-18	32.00				HB												
BHUA-18	32.03				J		5			CT	IR	RF					clay
BHUA-18	32.74				J		45			VN	IR	RF					
BHUA-18	32.78	33.64			EW		90				IR						CLAY, 2-5mm, significant defect
BHUA-18	32.91				HB												
BHUA-18	32.96				HB												
BHUA-18	33.00				HB												
BHUA-18	33.11				hJ		75				IR						

Pioneer-Burdekin Pumped Hydro Energy Scheme: Tranche 1 – BHUA-18 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
BHUA-18	33.18				hJ		65				IR						
BHUA-18	33.24				J		5			CN	IR	RF					
BHUA-18	33.67				J					CN	IR	RF					
BHUA-18	33.76				J		60			CT	IR	RF					clay, 1mm
BHUA-18	33.81				J		85			CT	IR	RF					calcite
BHUA-18	33.83				J		10			CT	IR	RF					calcite
BHUA-18	33.84				J		10			CT	IR	RF					calcite
BHUA-18	33.87				J		50			CT	IR	RF					calcite
BHUA-18	34.00				HB												
BHUA-18	34.18				J		5			CN	IR	RF					
BHUA-18	34.19				J		80			CT	IR	RF					clay, 1mm
BHUA-18	34.27				J		25			VN	IR	RF					
BHUA-18	34.40				J		80			CT	IR	RF					clay
BHUA-18	34.45				J		10			CN	IR	RF					
BHUA-18	34.46				J		10			CN	IR	SM					
BHUA-18	34.49				J		10			CN	IR	RF					
BHUA-18	34.58				J		70			CT	IR	RF					clay and quartz, 1mm, slight alteration halo 2mm around joint
BHUA-18	34.83				HB												
BHUA-18	34.90				HB												
BHUA-18	35.00				HB												
BHUA-18	35.03				HB												
BHUA-18	35.35				HB												
BHUA-18	35.38				J		65			CT	IR	RF					quartz, possible healed joint broken in drilling
BHUA-18	36.00				HB												
BHUA-18	36.34				J					CN	IR	RF					possible DB
BHUA-18	36.35				J		30			CN	PR	RF					possible DB
BHUA-18	36.76				J		65			CN	IR	RF					
BHUA-18	36.94				J		65			VN	IR	RF					calcite
BHUA-18	37.00				HB												
BHUA-18	37.96				J		15			CN	IR	RF					
BHUA-18	38.00				HB												
BHUA-18	38.28				J		5			CN	IR	RF					
BHUA-18	38.38				J		10			CT	IR	RF					calcite
BHUA-18	38.68				J		65			CN	IR	RF					
BHUA-18	38.70				J		10			CN	IR	RF					
BHUA-18	38.72				J		65			CN	IR	RF					
BHUA-18	38.95				J					CN	IR	RF					
BHUA-18	39.00				HB												
BHUA-18	39.12				J		30			CN	IR	RF					
BHUA-18	39.72				J		10			CN	IR	RF					
BHUA-18	40.00				HB												
BHUA-18	40.14				J		15			CN	IR	RF					
BHUA-18	40.89				HB												
BHUA-18	40.92				HB												
BHUA-18	40.94				HB												
BHUA-18	40.97				HB												
BHUA-18	41.00				HB												
BHUA-18	41.05				J		30			CN	IR	RF					
BHUA-18	41.08				J		30			CN	IR	SM					
BHUA-18	41.10				J		80			CN	IR	SM					
BHUA-18	41.78				J		20			CN	IR	SM					
BHUA-18	41.80				J		15			CN	IR	RF					
BHUA-18	41.83				J		45			CN	IR	RF					
BHUA-18	41.87				J		25			CN	IR	RF					
BHUA-18	41.95				J		35			CN	IR	RF					
BHUA-18	42.00				HB												
BHUA-18	42.02				HB												
BHUA-18	42.06				HB												
BHUA-18	42.06	42.09			J		45			CN	IR	RF					closely spaced joints, 10mm average spacing
BHUA-18	42.10				J		45			CT	IR	RF					clay
BHUA-18	42.13				J		45			CT	IR	RF					clay
BHUA-18	42.14				J		20			CT	IR	RF					clay
BHUA-18	42.20				J		35			CT	IR	RF					clay
BHUA-18	42.23				J		80			CT	IR	RF					clay
BHUA-18	42.31				J		15			CN	IR	RF					
BHUA-18	42.35				J		10			VN	IR	RF					
BHUA-18	42.38				J		70			CT	IR	RF					calcite, slight alteration halo 2mm thick
BHUA-18	42.42				J		85			VN	IR	SM					calcite
BHUA-18	42.49				J		10			CN	PR	SM					
BHUA-18	42.51				J		5			CN	IR	SM					
BHUA-18	42.58				J		20			VN	IR	SM					clay
BHUA-18	42.77				J		25			CN	IR	RF					
BHUA-18	42.81				J		20			CN	IR	RF					
BHUA-18	42.87				J		20			CN	IR	RF					
BHUA-18	42.91				J					VN	IR	SM					calcite
BHUA-18	42.97				J		20			CN	IR	SM					
BHUA-18	43.00				HB												
BHUA-18	43.04				J		10			CN	IR	RF					
BHUA-18	43.06				J		50			VN	IR	RF					

Pioneer-Burdekin Pumped Hydro Energy Scheme: Tranche 1 – BHUA-18 Defects List

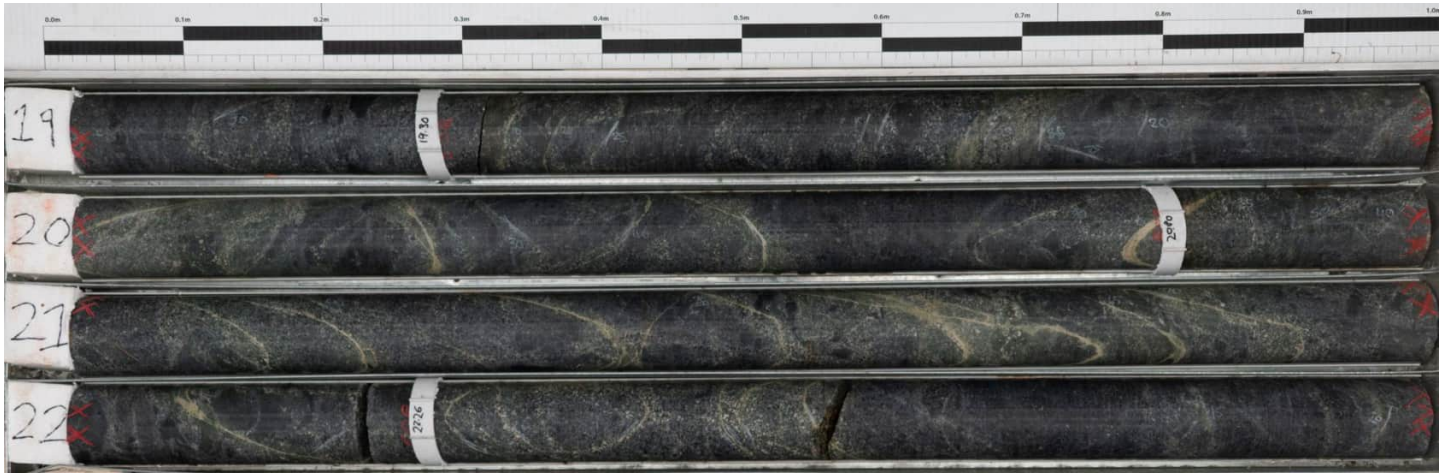
Refer to Explanatory Notes sheets for abbreviation definitions

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
BHUA-18	43.07				J		10			VN	IR	RF					
BHUA-18	43.13				J					CN	IR	SM					
BHUA-18	43.16				J		5			VN	IR	RF					calcite
BHUA-18	43.21				J		10			CT	IR	RF					clay
BHUA-18	43.32				J		30			CN	PR	SM					
BHUA-18	43.36				J		25			VN	IR	RF					
BHUA-18	43.38				J		25			VN	IR	SM					
BHUA-18	43.68				J		60			CN	IR	RF					
BHUA-18	43.70				J		10			CN	PR	SM					
BHUA-18	43.72				J		30			CN	IR	RF					
BHUA-18	43.78				J					CN	IR	RF					
BHUA-18	43.98				J		30			CN	IR	RF					
BHUA-18	44.00				HB												
BHUA-18	44.07				J		50			CN	PR	SM					
BHUA-18	44.11				J					CN	PR	SM					
BHUA-18	44.24	44.33			J		20			CT	IR	RF					clay, extremely closely spaced joints, 10mm spacing, anastomised pattern
BHUA-18	44.37	44.40			J		10			VN	IR	RF					closely spaced joint set, 10mm spacing, anastomised pattern
BHUA-18	44.44				J		10			CN	IR	SM					
BHUA-18	44.45				J		20			CN	IR	SM					
BHUA-18	44.45	44.47			J		20			VN	IR	SM					clay, extremely closely spaced joints, 5mm spacing
BHUA-18	44.65				J		10			CN	IR	SM					
BHUA-18	44.75				J		20			VN	IR	SM					
BHUA-18	44.77				J		20			VN	IR	SM					
BHUA-18	44.79				V		60				IR	RF					3mm thick, quartz infill
BHUA-18	44.85	44.94			EW		50				IR	SM					Gravelly CLAY infill, significant defect
BHUA-18	44.97				J		40			CN	IR	SM					
BHUA-18	45.53				J		30			VN	IR	SM					
BHUA-18	46.00				HB												
BHUA-18	46.52				J		30			VN	IR	SM					
BHUA-18	46.79				J		20			CN	PR	SM					
BHUA-18	46.96				HB												
BHUA-18	47.00				HB												
BHUA-18	47.02				J		90			CN	IR	RF					
BHUA-18	47.04				J		40			CN	IR	RF					
BHUA-18	47.37				J		30			CN	IR	RF					
BHUA-18	47.71				J		20			CN	IR	SM					
BHUA-18	47.79				J		10			CN	IR	RF					
BHUA-18	48.00				HB												
BHUA-18	48.40				HB												
BHUA-18	48.71				J		5			CN	IR	SM					
BHUA-18	48.96				J		30			CN	IR	SM					
BHUA-18	49.00				HB												
BHUA-18	49.30				J		15			CN	PR	RF					
BHUA-18	49.53				HB												
BHUA-18	49.71				HB												
BHUA-18	50.00				HB												
BHUA-18	50.27				J		20			CN	PR	RF					
BHUA-18	50.68				J		40			VN	IR	RF					
BHUA-18	50.70				J		20			VN	IR	RF					
BHUA-18	50.93				J		60			CN	IR	RF					
BHUA-18	51.02				J		15				IR						

PointID : BHUA-18 Depth Range: 11.13 - 15.00 m

PointID : BHUA-18 Depth Range: 15.00 - 19.00 m

wsp	TITLE: Queensland Hydro Netherdale/Dalrymple Heights Pioneer-Burdekin PHES Core Photo - BHUA-18	DRAWN: RC/PL	DATE: 23/08/2024
		CHECKED: GEM	DATE: 7/10/2024
		SCALE: Not To Scale	A4
		PROJECT No: PS138693	FIGURE No: 1/5



PointID : BHUA-18 Depth Range: 19.00 - 23.00 m

PointID : BHUA-18 Depth Range: 23.00 - 27.00 m

	TITLE: Queensland Hydro Netherdale/Dalrymple Heights Pioneer-Burdekin PHES Core Photo - BHUA-18	DRAWN: RC/PL	DATE: 23/08/2024
		CHECKED: GEM	DATE: 7/10/2024
		SCALE: Not To Scale	A4
		PROJECT No: PS138693	FIGURE No: 2/5

PointID : BHUA-18 Depth Range: 27.00 - 31.00 m

PointID : BHUA-18 Depth Range: 31.00 - 35.00 m

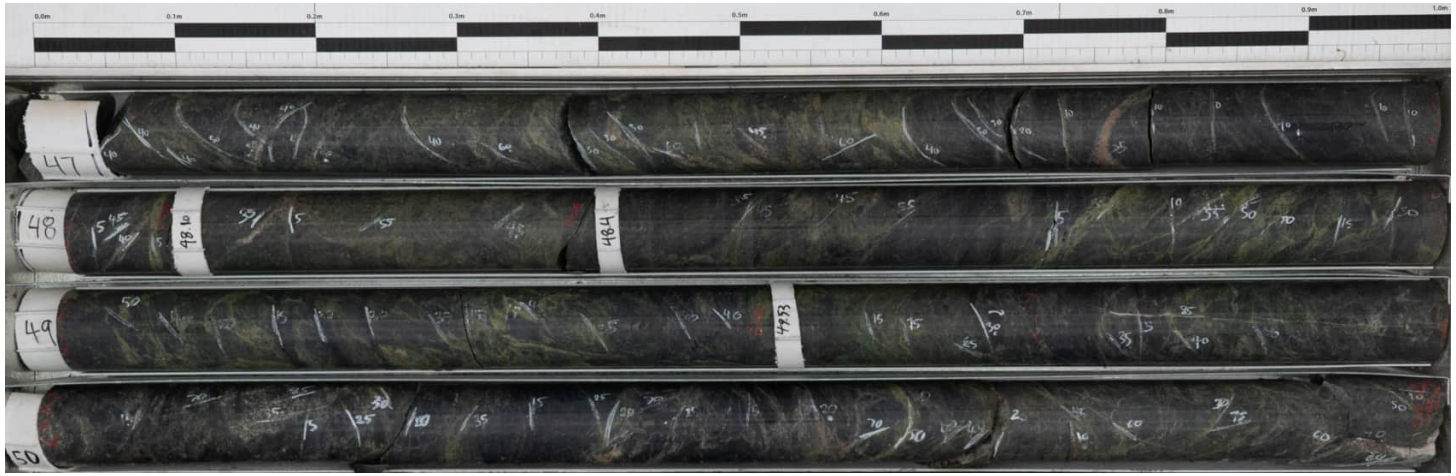
wsp	TITLE: Queensland Hydro Netherdale/Dalrymple Heights Pioneer-Burdekin PHES Core Photo - BHUA-18	DRAWN: RC/PL	DATE: 23/08/2024
		CHECKED: GEM	DATE: 7/10/2024
		SCALE: Not To Scale	A4
		PROJECT No: PS138693	FIGURE No: 3/5

PointID : BHUA-18 Depth Range: 35.00 - 39.00 m

PointID : BHUA-18 Depth Range: 39.00 - 43.00 m

	TITLE: Queensland Hydro Netherdale/Dalrymple Heights Pioneer-Burdekin PHES Core Photo - BHUA-18	DRAWN: RC/PL	DATE: 23/08/2024
		CHECKED: GEM	DATE: 7/10/2024
		SCALE: Not To Scale	A4
		PROJECT No: PS138693	FIGURE No: 4/5

PointID : BHUA-18 Depth Range: 43.00 - 47.00 m



PointID : BHUA-18 Depth Range: 47.00 - 51.02 m

wsp	TITLE: Queensland Hydro Netherdale/Dalrymple Heights Pioneer-Burdekin PHES Core Photo - BHUA-18	DRAWN: RC/PL	DATE: 23/08/2024
		CHECKED: GEM	DATE: 7/10/2024
		SCALE: Not To Scale	A4
		PROJECT No: PS138693	FIGURE No: 5/5

BHUA-18 Structural Log

WSP Australia Pty Limited
Level 12, 900 Ann Street
Fortitude Valley
QLD 4006
Australia

GEOPHYSICAL RECORD OF BOREHOLE: BHUA-18

PROJECT: Pioneer-Burdekin PHES JOB # PS138693

CLIENT: Queensland Hydro DATE: 01/11/2023

BOREHOLE DETAILS

LOCATION:	Upper Reservoir A	BH DEPTH:	50.73
EASTING:	657500.01 m E	BH DIAMETER:	96 mm (HQ)
NORTHING:	7666646.75 m N	BH AZIMUTH:	157 deg
ELEVATION:	895.71 m	BH PLUNGE:	-88.5 deg
COORD SYSTEM:	MGA2020-55	CASING DEPTH:	15.20
LOGGING DATUM:	Ground Level	CASING TYPE:	HWT

DOCUMENT DETAILS

LOGGED BY:	G Hay
LOGGED DATE:	13-15/09/2023
DRAWN BY:	SB
REVIEWED BY:	GH
FILE:	BHUA-18_Structure_RevC
LOGGED DEPTH:	50.73 m

NOTES

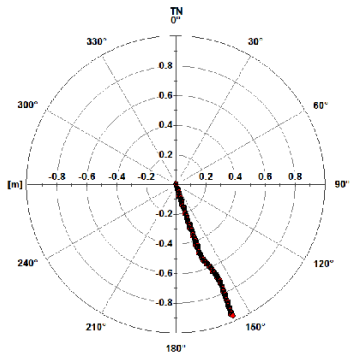
Image logs are oriented relative to magnetic north. Final structure log is oriented relative to true north using magnetic declination of 8.2° East.

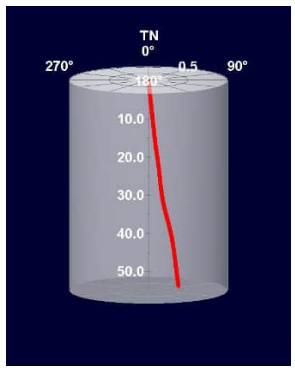
Mechanical calliper log used for structure dip corrections.

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

Manual correction made to image orientation above 16.5 m due to magnetic influence of casing.

BOREHOLE DEVIATION



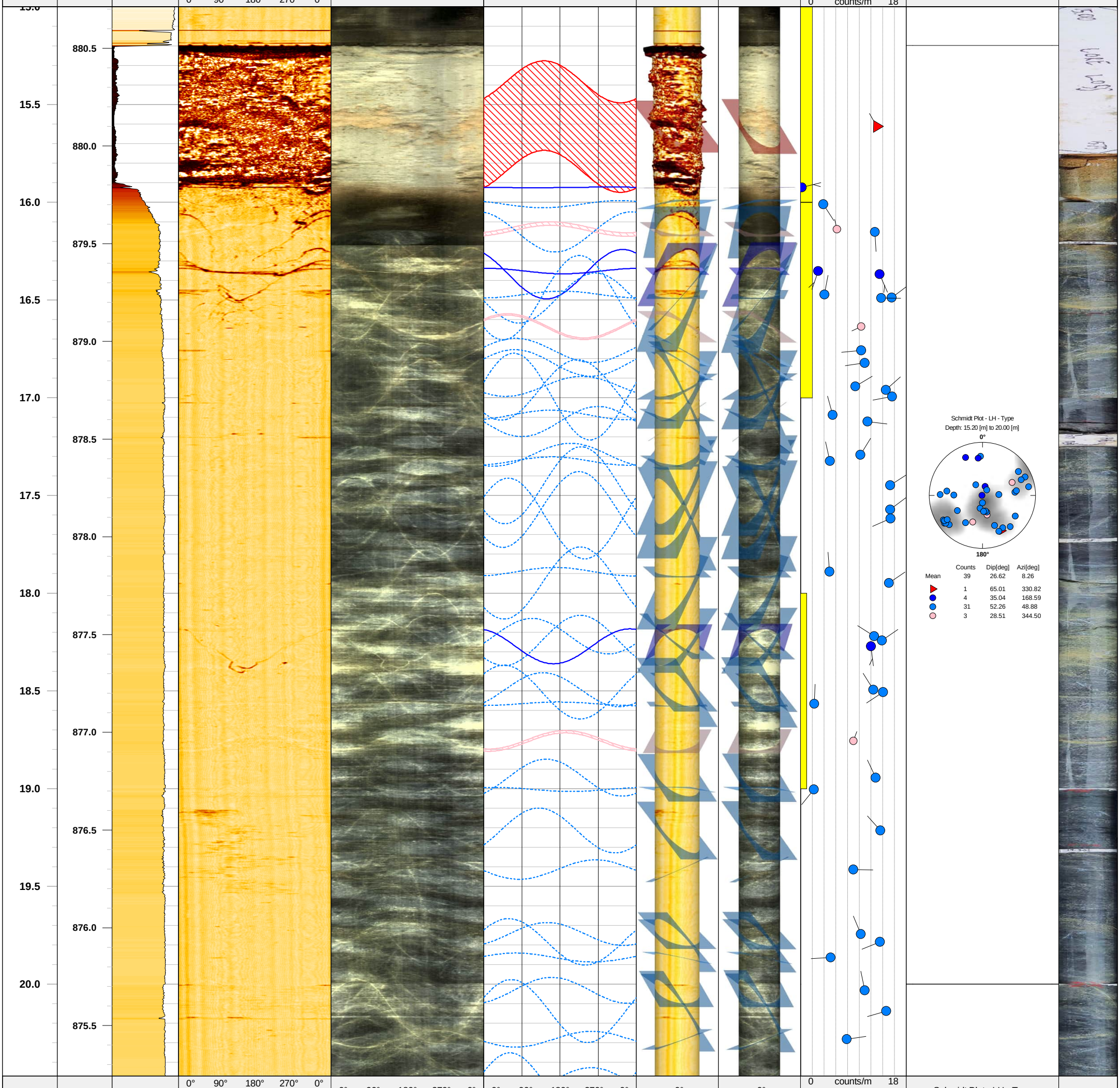


INTERPRETED STRUCTURES

Contact · Extremely Weathered Seam · Joint · Shear Seam · Sheared Surface · Vein · Healed Joint

BHUA-18

Depth		Image Logs			Structural Data					Core
Depth	RL m	Reflectivity	Amplitude-NM HPF	Image-NM	Apparent Structures	3D ATV	3D OTV	Structures - TN	Stereoplots	Core Photo
1m:20m	AHD		0 6000			-0°	-0°	0 90 Freq/metre 0 counts/m 18	Schmidt Plot - LH - Type	
			0° 90° 180° 270° 0°	0° 90° 180° 270° 0°	0° 90° 180° 270° 0°					

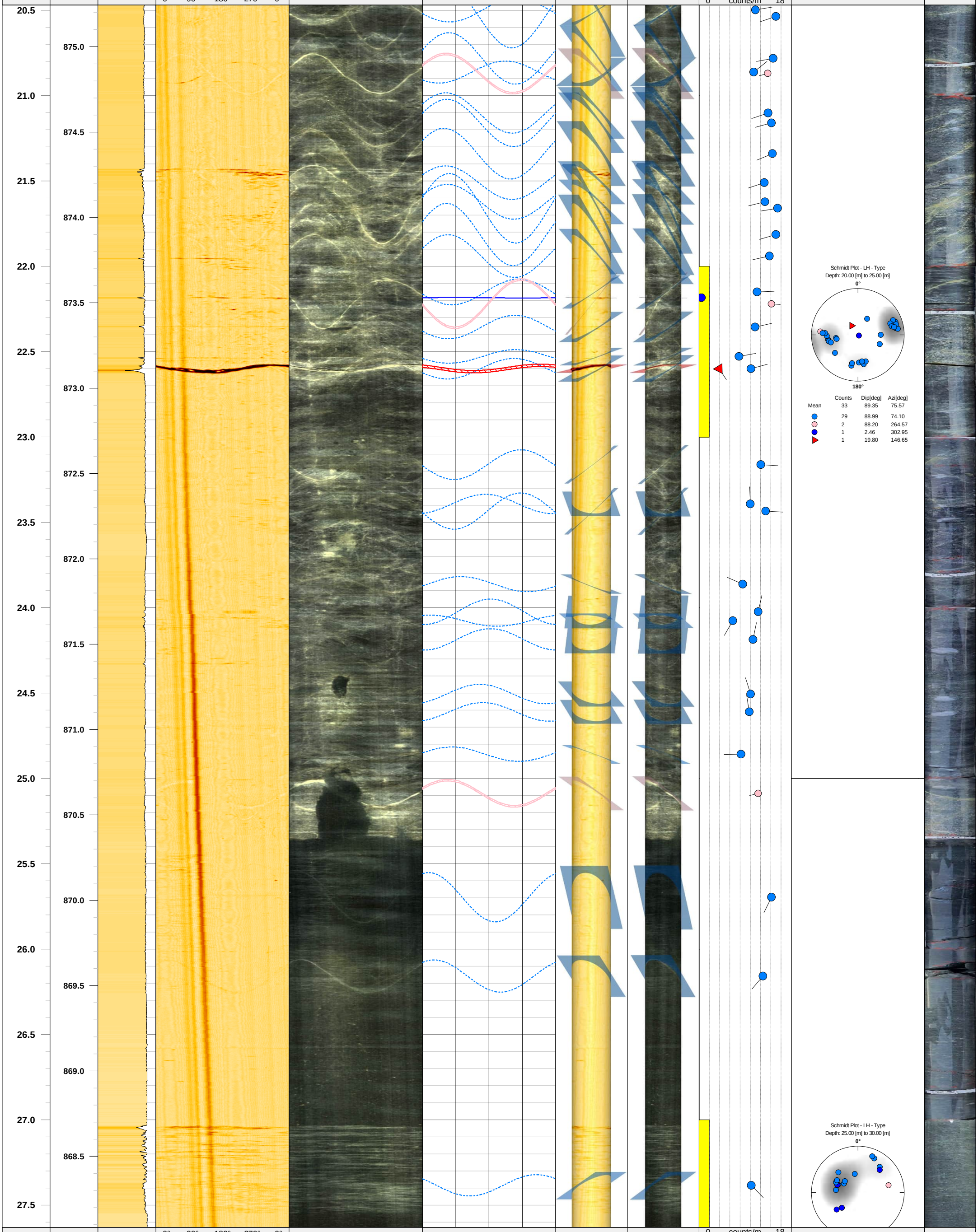


Depth		Image Logs			Structural Data					Core
1m:20m	AHD		0° 90° 180° 270° 0° 0 6000	0° 90° 180° 270° 0°	0° 90° 180° 270° 0°	-0°	-0°	0 counts/m 18 Freq/metre 0 90	Schmidt Plot - LH - Type	
Depth	RL m	Reflectivity	Amplitude-NM HPF	Image-NM	Apparent Structures	3D ATV	3D OTV	Structures - TN	Stereoplots	Core Photo
Depth		Image Logs			Structural Data					Core

BHUA-18

BHUA-18

Depth		Image Logs			Structural Data					Core
Depth 1m:20m	RL m AHD	Reflectivity	Amplitude-NM HPF 0 6000 0° 90° 180° 270° 0°	Image-NM 0° 90° 180° 270° 0°	Apparent Structures 0° 90° 180° 270° 0°	3D ATV -0°	3D OTV -0°	Structures - TN 0 90 Freq/metre 0 counts/m 18	Stereoplots Schmidt Plot - LH - Type	Core Photo



Depth		Image Logs			Structural Data					Core
1m:20m Depth	AHD RL m	Reflectivity	0° 90° 180° 270° 0° 0 6000 Amplitude-NM HPF	0° 90° 180° 270° 0° Image-NM	0° 90° 180° 270° 0° Apparent Structures	-0° 3D ATV	-0° 3D OTV	0 counts/m 18 Freq/metre 0 90 Structures - TN	Schmidt Plot - LH - Type Stereoplots	Core Photo

Depth	Image Logs	Structural Data	Core

BHUA-18.

BHUA-18

Depth		Image Logs			Structural Data					Core
Depth	RL m	Reflectivity	Amplitude-NM HPF	Image-NM	Apparent Structures	3D ATV	3D OTV	Structures - TN	Stereoplots	Core Photo
1m:20m	AHD		0 – 6000	0° 90° 180° 270° 0°	0° 90° 180° 270° 0°	-0°	-0°	0 – 90 Freq/metre 0 – 18 counts/m	Schmidt Plot - LH - Type	

Depth: 28.0 – 34.5 m; RL m: 868.0 – 861.0 AHD

Stereoplots:

180°

	Counts	Dip[deg]	Azi[deg]
Mean	16	32.31	130.13
	1	57.57	256.84
	11	36.82	141.38
	4	42.85	63.65

Schmidt Plot - LH - Type
Depth: 30.00 [m] to 35.00 [m]

0°

180°

	Counts	Dip[deg]	Azi[deg]
Mean	31	53.27	248.97
	19	60.84	244.79
	4	67.22	147.77
	1	63.31	286.19
	7	12.04	311.08

1m:20m | AHD | Reflectivity | Amplitude-NM HPF 0 – 6000 0° 90° 180° 270° 0° | Image-NM 0° 90° 180° 270° 0° | Apparent Structures 0° 90° 180° 270° 0° | 3D ATV -0° | 3D OTV -0° | Structures - TN 0 – 90 Freq/metre 0 – 18 counts/m | Schmidt Plot - LH - Type | Core Photo

Depth | RL m | Reflectivity | Amplitude-NM HPF | Image-NM | Apparent Structures | 3D ATV | 3D OTV | Structures - TN | Stereoplots | Core Photo

Depth | Image Logs | Structural Data | Core

BHUA-18

BHUA-18

Depth		Image Logs			Structural Data					Core
Depth	RL m	Reflectivity	Amplitude-NM HPF	Image-NM	Apparent Structures	3D ATV	3D OTV	Structures - TN	Stereoplots	Core Photo
1m:20m	AHD		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	

Depth: 35.0, 35.5, 36.0, 36.5, 37.0, 37.5, 38.0, 38.5, 39.0, 39.5, 40.0, 40.5, 41.0, 41.5

RL m: 860.5, 860.0, 859.5, 859.0, 858.5, 858.0, 857.5, 857.0, 856.5, 856.0, 855.5, 855.0, 854.5, 854.0

Schmidt Plot - LH - Type
Depth: 35.00 [m] to 40.00 [m]
0°
180°

	Counts	Dip[deg]	Azi[deg]
Mean	39	26.14	140.07
	6	48.31	269.97
	28	32.03	146.23
	5	26.31	118.62

1m:20m AHD Depth RL m Reflectivity Amplitude-NM HPF 0° 90° 180° 270° 0° 0 6000 Image-NM 0° 90° 180° 270° 0° Apparent Structures 0° 90° 180° 270° 0° 3D ATV -0° 3D OTV -0° 0 counts/m 18 Freq/metre 0 90 Structures - TN Schmidt Plot - LH - Type Stereoplots Core Photo
Depth Image Logs Structural Data Core
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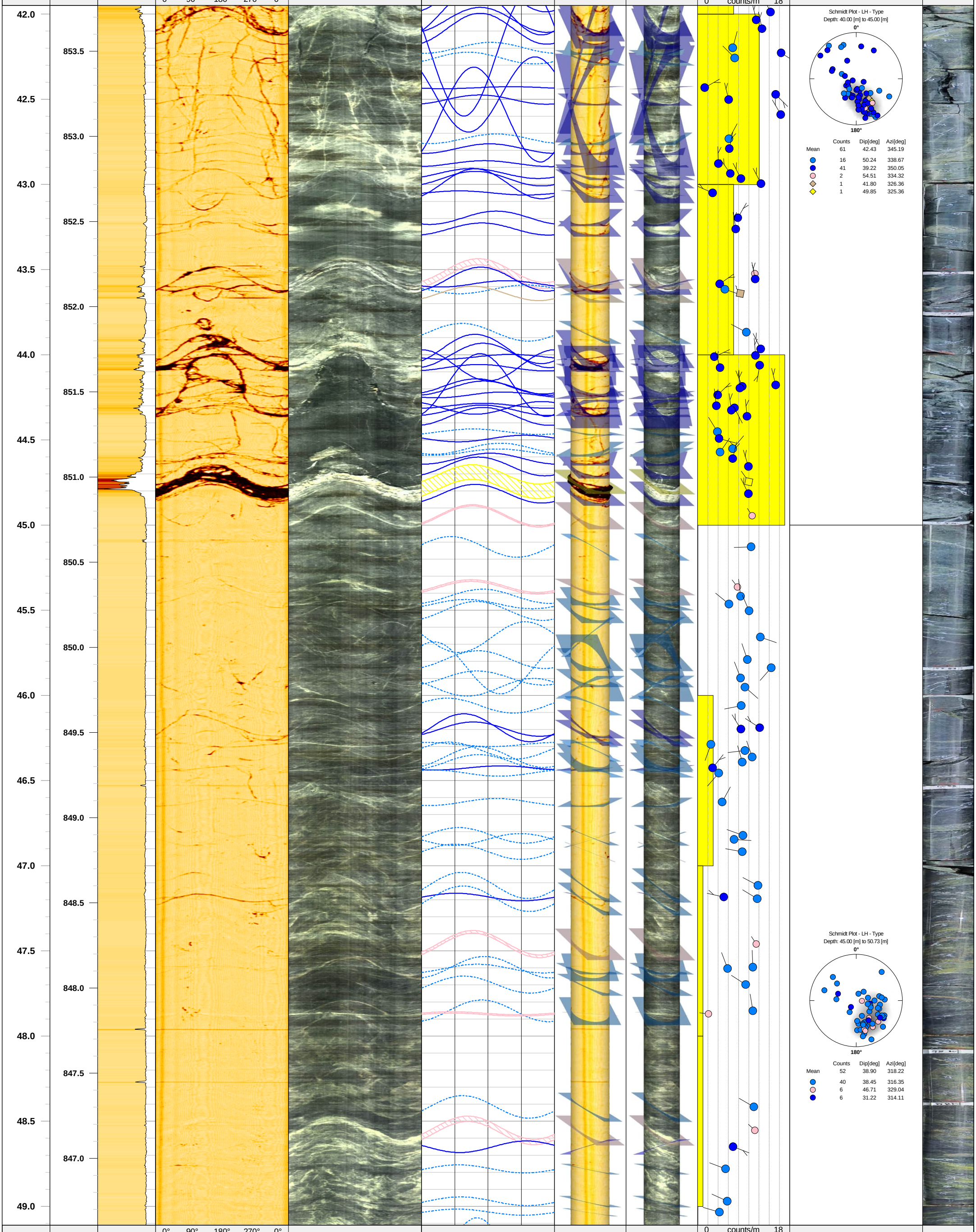
Depth		Image Logs			Structural Data					Core
Depth	RL m	Reflectivity	Amplitude-NM HPF	Image-NM	Apparent Structures	3D ATV	3D OTV	Structures - TN	Stereoplots	Core Photo
1m:20m	AHD		0 – 6000	0° 90° 180° 270° 0°	0° 90° 180° 270° 0°	-0°	-0°	0 – 90 Freq/metre; 0 counts/m 18	Schmidt Plot - LH - Type	



Depth		Image Logs			Structural Data					Core
1m:20m	AHD		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	
Depth	RL m	Reflectivity	Amplitude-NM HPF	Image-NM	Apparent Structures	3D ATV	3D OTV	Structures - TN	Stereoplots	Core Photo

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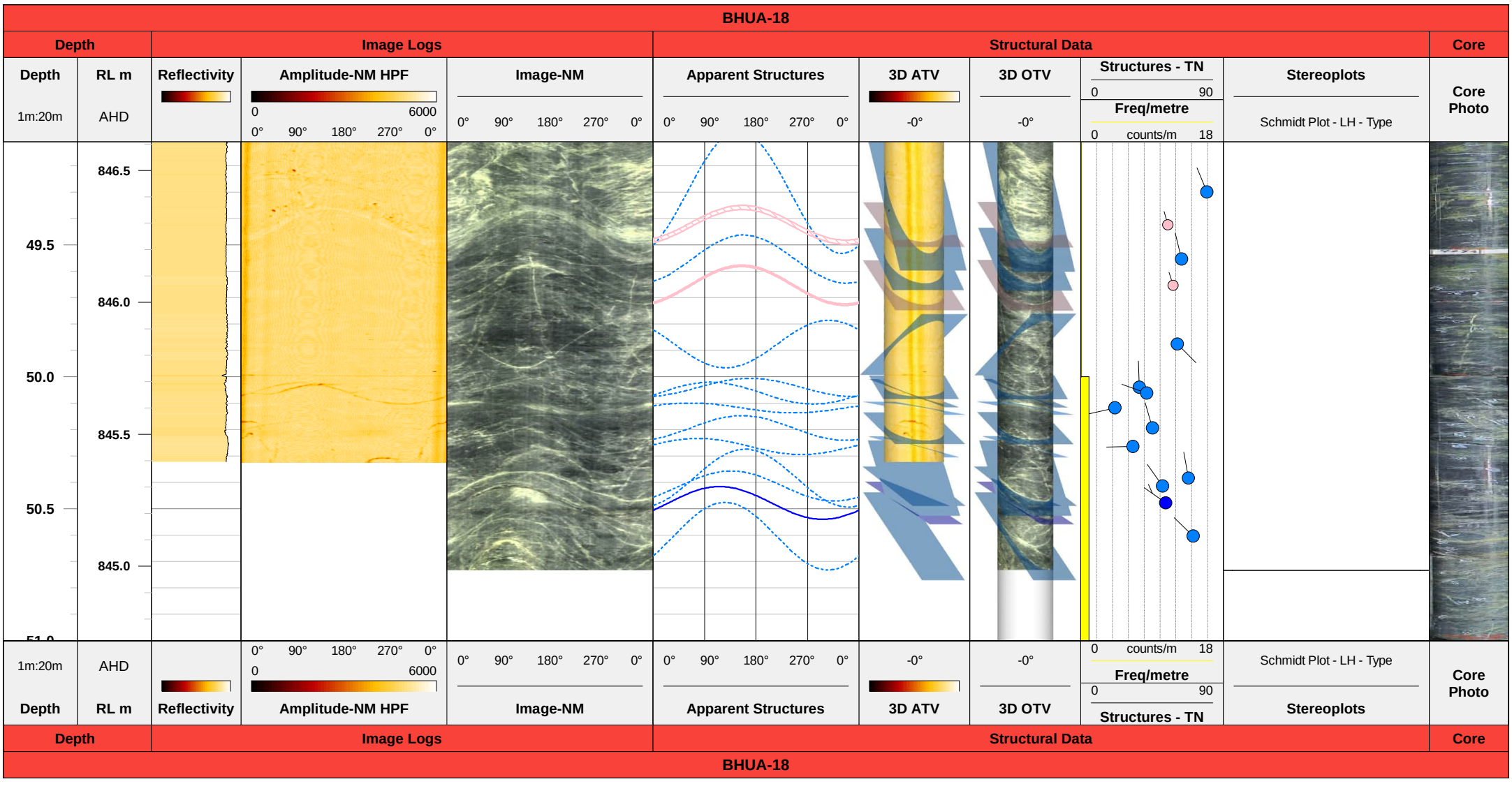


BHUA-18 Composite Log

WSP Australia Pty Limited
Level 12, 900 Ann Street
Fortitude Valley
QLD 4006
Australia

GEOPHYSICAL RECORD OF BOREHOLE: BHUA-18

PROJECT: Pioneer-Burdekin PHES JOB # PS138693

CLIENT: Queensland Hydro DATE: 01/11/2023

BOREHOLE DETAILS

LOCATION:	Upper Reservoir A	BH DEPTH:	50.73
EASTING:	657500.01 m E	BH DIAMETER:	96 mm (HQ)
NORTHING:	7666646.75 m N	BH AZIMUTH:	157°
ELEVATION:	895.71 m	BH PLUNGE:	-88.5°
COORD SYSTEM:	MGA2020-55	CASING DEPTH:	15.20
LOGGING DATUM:	Ground Level	CASING TYPE:	HWT

DOCUMENT DETAILS

LOGGED BY:	G Hay
LOGGED DATE:	13-15/09/2023
DRAWN BY:	SB
REVIEWED BY:	GH
FILE:	BHUA-18_Comp_RevC
LOGGED DEPTH:	50.73 m

NOTES

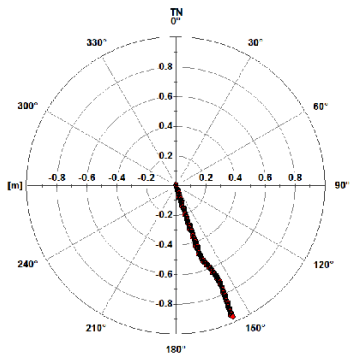
Image logs are oriented relative to magnetic north. Final structure log is oriented relative to true north using magnetic declination of 8.2° East.

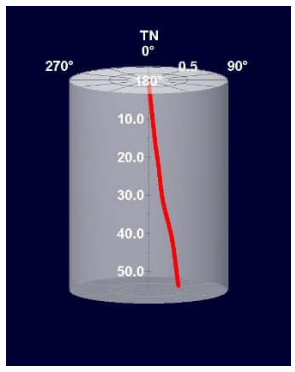
Mechanical calliper log used for structure dip corrections.

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

Manual correction made to image orientation above 16.5 m due to magnetic influence of casing.

BOREHOLE DEVIATION





INTERPRETED STRUCTURES

Contact · Extremely Weathered Seam · Joint · Shear Seam · Sheared Surface · Vein · Healed Joint

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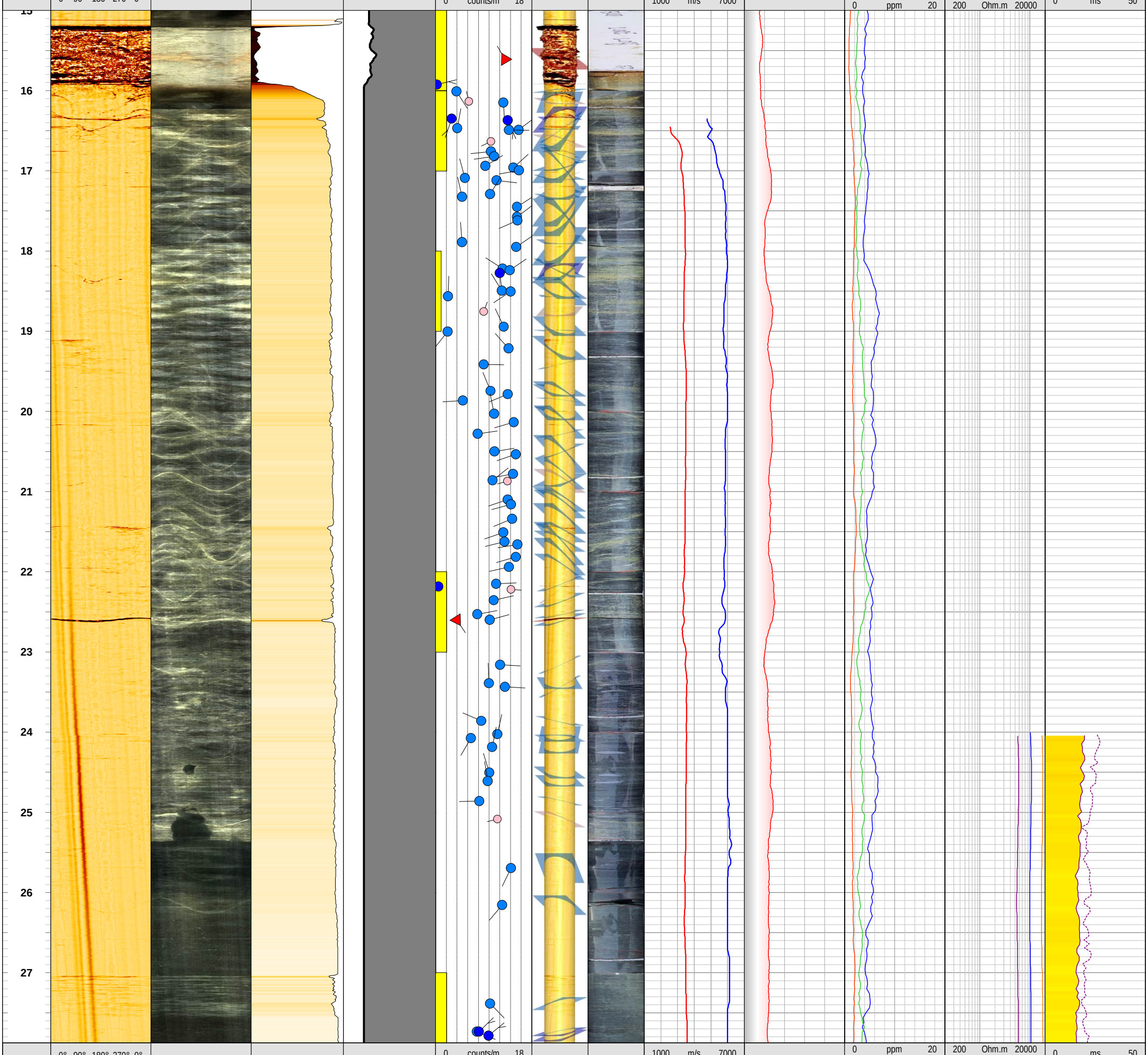
Depth	Image Logs			Calliper	Structural Logs			Sonic Logs	Gamma Logs		Electrical Logs	
Depth	Amplitude-NM HPF	Image-NM	Reflectivity	CAL	Structures - TN	3D ATV	Core	Vp	GR	K	N32	Ma64
1m:50m	500 6000	0° 90° 180° 270° 0°	0 9000	80 mm 160	0 90	-0°		1000 m/s 7000	0 API 250	0 % 10	200 Ohm.m 20000	0 ms 50
	0° 90° 180° 270° 0°				Freq/metre			Vs		U	N16	Ma16
					0 counts/m 18			1000 m/s 7000		0 ppm 10	200 Ohm.m 20000	0 ms 50
										Th	N8	
										0 ppm 20	200 Ohm.m 20000	



Depth	Image Logs			Calliper	Structural Logs			Sonic Logs	Gamma Logs		Electrical Logs	
Depth	Amplitude-NM HPF	Image-NM	Reflectivity	CAL	Structures - TN	3D ATV	Core	Vp	GR	K	N32	Ma64
1m:50m	500 6000	0° 90° 180° 270° 0°	0 9000	80 mm 160	0 90	-0°		1000 m/s 7000	0 API 250	0 % 10	200 Ohm.m 20000	0 ms 50
	0° 90° 180° 270° 0°				Freq/metre			Vs		U	N16	Ma16
					0 counts/m 18			1000 m/s 7000		0 ppm 10	200 Ohm.m 20000	0 ms 50
										Th	N8	
										0 ppm 20	200 Ohm.m 20000	

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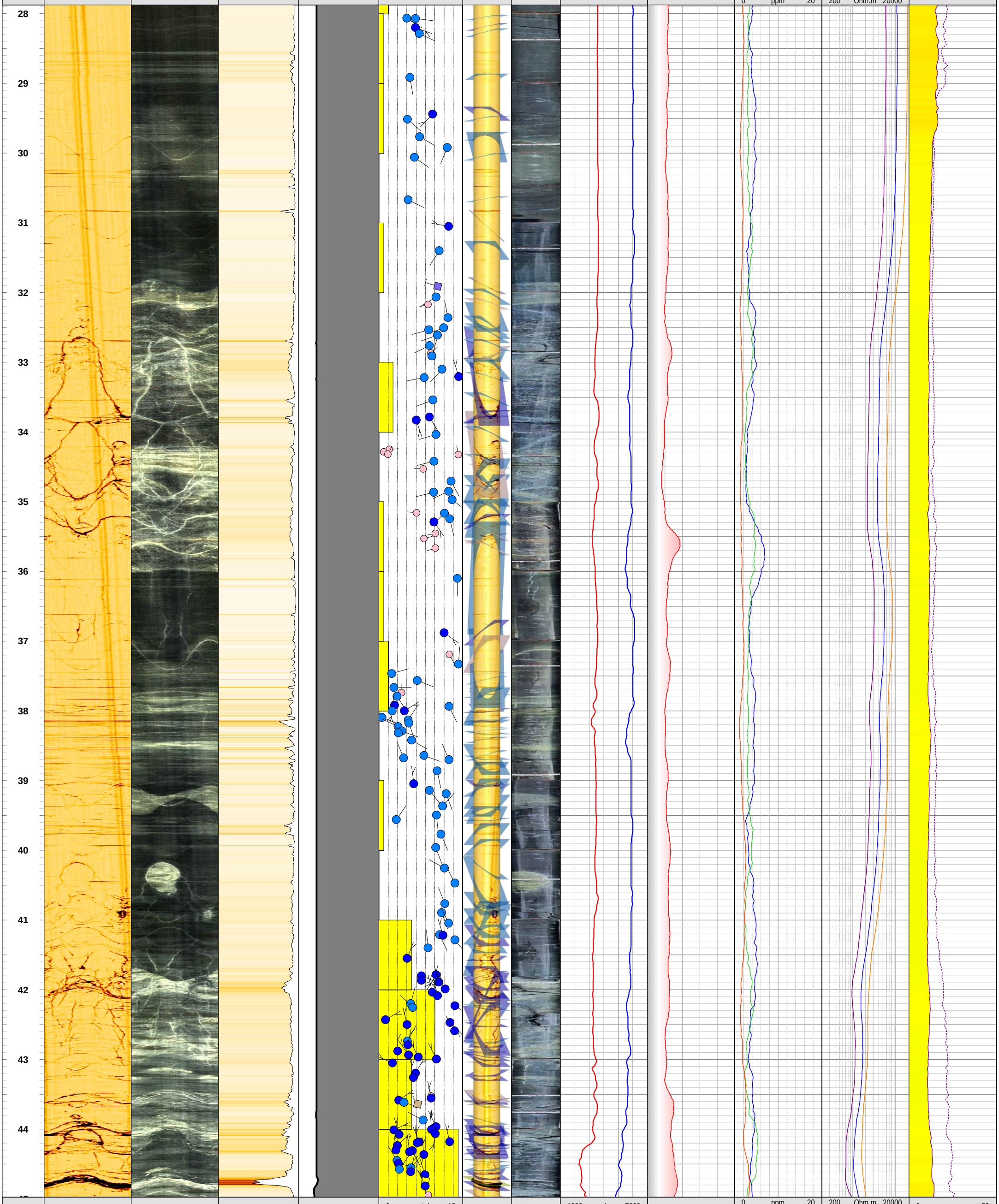
Depth	Image Logs			Calliper	Structural Logs			Sonic Logs	Gamma Logs		Electrical Logs	
Depth	Amplitude-NM HPF	Image-NM	Reflectivity	CAL	Structures - TN	3D ATV	Core	Vp	GR	K	N32	Ma64
1m:50m	500 6000	0° 90° 180° 270° 0°	0 9000	80 mm 160	0 90	-0°		1000 m/s 7000	0 API 250	0 % 10	200 Ohm.m 20000	0 ms 50
	0° 90° 180° 270° 0°				Freq/metre			Vs		U	N16	Ma16
					0 counts/m 18			1000 m/s 7000		Th	N8	
										0 ppm 10	200 Ohm.m 20000	0 ms 50



Depth	Image Logs			Calliper	Structural Logs			Sonic Logs	Gamma Logs		Electrical Logs	
Depth	Amplitude-NM HPF	Image-NM	Reflectivity	CAL	Structures - TN	3D ATV	Core	Vp	GR	K	N32	Ma64
1m:50m	500 6000	0° 90° 180° 270° 0°	0 9000	80 mm 160	0 90	-0°		1000 m/s 7000	0 API 250	0 % 10	200 Ohm.m 20000	0 ms 50
	0° 90° 180° 270° 0°				Freq/metre			Vs		U	N16	Ma16
					0 counts/m 18			1000 m/s 7000		Th	N8	
										0 ppm 10	200 Ohm.m 20000	0 ms 50
Depth	Image Logs			Calliper	Structural Logs			Sonic Logs	Gamma Logs		Electrical Logs	

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Depth	Image Logs			Calliper	Structural Logs			Sonic Logs	Gamma Logs		Electrical Logs	
Depth	Amplitude-NM HPF	Image-NM	Reflectivity	CAL	Structures - TN	3D ATV	Core	Vp	GR	K	N32	Ma64
1m:50m	500 6000	0° 90° 180° 270° 0°	0 9000	80 mm 160	0 90	-0°		1000 m/s 7000	0 API 250	0 % 10	200 Ohm.m 20000	0 ms 50
	0° 90° 180° 270° 0°				Freq/metre			Vs		U	N16	Ma16
					0 counts/m 18			1000 m/s 7000		0 ppm 10	200 Ohm.m 20000	0 ms 50
										Th	N8	
										0 ppm 20	200 Ohm.m 20000	

45 46 47 48 49 50 51

Depth	Image Logs			Calliper	Structural Logs			Sonic Logs	Gamma Logs		Electrical Logs	
1m:50m	0° 90° 180° 270° 0°	0° 90° 180° 270° 0°	0 9000	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
	500 6000				Freq/metre			Vs		Th	N8	Ma16
					0 90			1000 m/s 7000		0 ppm 10	200 Ohm.m 20000	0 ms 50
										U	N16	
										0 % 10	200 Ohm.m 20000	
Depth	Amplitude-NM HPF	Image-NM	Reflectivity	CAL	Structures - TN	3D ATV	Core	Vp	GR	K	N32	Ma64

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