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BOREHOLE: BHUA-20

SHEET: 1 OF 11

CLIENT: SMEC

COORDS: 660025.7 m 7667001.7 m GDA 2020 MGA Zone 55

DRILL RIG: HYDRAPOWER SCOUT Mk5

PROJECT: Pioneer Burdekin PHES GI

SURFACE RL: 888.90 m DATUM: AHD

CONTRACTOR: Twin Hills

LOCATION: Dalrymple Heights

INCLINATION: -89° DIRECTION: 210°

LOGGED: ENGEO

DATE: 1/7/23

JOB NO: 23117.000.001

HOLE DIA: 96/100 mm HOLE DEPTH: 48.10 m

CHECKED: SF

DATE: 24/8/23

Drilling				Sampling		Field Material Description						
METHOD / SUPPORT	PENETRATION RESISTANCE	WATER	LENGTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS
SSA			0.0	888.90					TOPSOIL: Clayey SILT with sand low liquid limit, red orange, with fine to medium grained sand	w ~ PL	St	TOPSOIL
				888.80				ML	Clayey SILT with sand low liquid limit, red orange, with fine to medium grained sand			RESIDUAL SOIL
			0.5									
			1.0									
				1.20								
				887.70				ML	Clayey SILT with gravel and sand low liquid limit, pale brown, with fine to coarse grained sand, with fine grained, angular gravel, possibly basalt ash material	w < PL	St	
			1.5		LL = 37% PI = 8% SPT 1.50-1.95 m 11, 5, 7 N=12							
			2.0									
			2.5									
				2.60								
				886.30				SM	Silty SAND with gravel fine to coarse grained, well graded, brown and orange, with fine grained, sub-angular gravel, low plasticity fines			
			3.0		ECN = 6 Soil Particle Density (t/m³) = 2.43 SPT 3.00-3.45 m 4, 12, 13 N=25							
			3.5									
			4.0									
			4.5		SPT 4.50-4.95 m 5, 6, 5 N=11					D	MD	
			5.0									

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BOREHOLE: BHUA-20

SHEET: 2 OF 11
DRILL RIG: HYDRAPOWER SCOUT Mk5
CONTRACTOR: Twin Hills
LOGGED: ENGEO DATE: 1/7/23
CHECKED: SF DATE: 24/8/23

CLIENT: SMEC COORDS: 660025.7 m 7667001.7 m GDA 2020 MGA Zone 55
PROJECT: Pioneer Burdekin PHES GI SURFACE RL: 888.90 m DATUM: AHD
LOCATION: Dalrymple Heights INCLINATION: -89° DIRECTION: 210°
JOB NO: 23117.000.001 HOLE DIA: 96/100 mm HOLE DEPTH: 48.10 m

Drilling				Sampling		Field Material Description					
WATER	LENGTH (metres)	DEPTH RL	SAMPLE OR FIELD TEST	RECOVERED	GRAPHIC LOG	GROUP SYMBOL	MATERIAL DESCRIPTION	MOISTURE CONDITION	CONSISTENCY DENSITY	STRUCTURE AND ADDITIONAL OBSERVATIONS	
	5.0					SM	Silty SAND with gravel fine to coarse grained, well graded, brown and orange, with fine grained, sub-angular gravel, low plasticity fines	D	MD	Push tube refusal and bent at 5.20m in material.	
		5.80 883.10	SPT 6.00-6.45 m 9, 20, 13 N=33			SM	Silty SAND fine to coarse grained, well graded, pale grey and brown mottled off-white, low plasticity fines				
								D	D		
	7.5		SPT 7.50 m 10/20mm HB				For Continuation Refer to Sheet 3				
	8.0										
	8.5										
	9.0										
	9.5										
	10.0										

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BOREHOLE: BHUA-20

SHEET: 3 OF 11
DRILL RIG: HYDRAPOWER SCOUT Mk5
CONTRACTOR: Twin Hills
LOGGED: ENGEO DATE: 1/7/23
CHECKED: SF DATE: 24/8/23

CLIENT: SMEC COORDS: 660025.7 m 7667001.7 m GDA 2020 MGA Zone 55
PROJECT: Pioneer Burdekin PHES GI SURFACE RL: 888.90 m DATUM: AHD
LOCATION: Dalrymple Heights INCLINATION: -89° DIRECTION: 210°
JOB NO: 23117.000.001 HOLE DIA: 96/100 mm HOLE DEPTH: 48.10 m

Drilling					Field Material Description					Defect Information				
METHOD / SUPPORT	WATER	TCR	RQD	DRILLED LENGTH (metres)	DEPTH RL	GRAPHIC LOG	MATERIAL DESCRIPTION	DETAILED WEATHERING	INFERRED STRENGTH Is _u (MPa) (AS1728:2017)	MEASURED STRENGTH: UCS & I _{u50} (MPa) (A.0.1)	DEFECT DESCRIPTION	AVERAGE DEFECT SPACING (mm) (ISO14688:2017)		
				5.0							Mechanical Discontinuities / non-intact defects shown only. See attached Detailed Defect Log for all recorded discontinuities and defects	EC ₂₀	VC ₆₀	VC ₂₀₀
				5.5										
				6.0										
				6.5										
				7.0										
				7.5	7.52		Continuation of Sheet 2							
					881.38		NO RECOVERY							
				8.0										
				8.5										
				9.0	8.83									
					880.07		DOLERITE (?) Fine grained with medium grained phenocrysts, igneous intrusive. Dark grey-grey. Crystalline, with some visible biotite crystals typically ~1 mm.	SW						
				9.5	9.12		ALTERED MICROGRANITE Fine to medium grained, igneous plutonic. Dark grey and pale grey. Described as from 10.00m overleaf.	MW						
					879.78									
				10.0	10.00									
											9.18-9.20 m: J, 28°, Und, Ro, MnO Vr 9.20-9.31 m: J, 85°, Irr, Ro, MnO Vr 9.25-9.30 m: J, 65°, Cvd, Ro, MnO Std 9.27-9.32 m: J, 58°, Cvd, MnO Std 9.34-9.45 m: J, 84°, Irr, Sm, MnO Std 9.41-9.44 m: J, 25°, Und, Ro, MnO Std 9.46-9.48 m: J, 11°, Und, Ro, MnO Std 9.49-9.50 m: J, 6°, Und, Ro, Cn 9.68-9.71 m: J, 26°, Irr, Vro, MnO Disp			

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BOREHOLE: BHUA-20

SHEET: 5 OF 11

CLIENT: SMEC

COORDS: 660025.7 m 7667001.7 m GDA 2020 MGA Zone 55

DRILL RIG: HYDRAPOWER SCOUT Mk5

PROJECT: Pioneer Burdekin PHES GI

SURFACE RL: 888.90 m DATUM: AHD

CONTRACTOR: Twin Hills

LOCATION: Dalrymple Heights

INCLINATION: -89° DIRECTION: 210°

LOGGED: ENGEO DATE: 1/7/23

JOB NO: 23117.000.001

HOLE DIA: 96/100 mm HOLE DEPTH: 48.10 m

CHECKED: SF DATE: 24/8/23

Drilling				Field Material Description						Defect Information			
METHOD / SUPPORT	WATER	TCR	RQD	DRILLED LENGTH (metres)	DEPTH RL	GRAPHIC LOG	MATERIAL DESCRIPTION	DETAILED WEATHERING	INFERRED STRENGTH I_{s0} (MPa) (AS1726:2017)	MEASURED STRENGTH: UCS & I_{s0} (MPa) (A.0.1)	DEFECT DESCRIPTION	AVERAGE DEFECT SPACING (mm) (ISO14689:2017)	
											Mechanical Discontinuities / non-intact defects shown only. See attached Detailed Defect Log for all recorded discontinuities and defects	EC-29 VC-29 C 200 M 600 W >200 WW	
HQ3			100	100	15.0		DACITE / ANDESITE (?) Fine to coarse grained, igneous intrusive. Dark grey and pale grey. Crystalline, porphyritic, faint flow banding or poorly developed, indistinct foliation (?). With frequent cm to dm scale xenoliths / inclusions, including, both mafic (dark grey, fine grained, (8-10/m)) and silicic (pale grey and dark grey, medium grained, (1-3/m), granitic texture)) in composition. Gradational lower contact with granite (at 18.10 m), contains zones of more granitic textured material and quartzolite material (?). Variable grain size and texture throughout.	FR - SA		$I_{s0}(A)>5.60$ UCS=131			
					15.5								
					16.0		16.00 m - 18.10 m: Becomes mainly pale grey, with pervasive siliceous alteration.	SA					
					16.00 872.90								
					16.5								
					17.0						16.82-16.85 m: J, 38°, Stp, Ro, Cn		
			100	100	17.5						17.07-17.08 m: J, 5°, Cvd, Ro, Cn		
					18.0						17.33-17.34 m: J, 4°, Pln, Ro, Cn		
			100	96	18.0								
			100	85	18.10 870.80								
HQ3			100	100	18.35 870.55		ALTERED GRANITE Medium to coarse grained, igneous plutonic. Pale grey and dark grey. Crystalline, phaneritic, generally equigranular, subhedral feldspar. Some (4-6/m) xenoliths / inclusions; fine to medium grained, dark grey, irregular, <50 mm wide, sharp margins. Pale green propylitic (?) alteration halos (mm to cm scale) associated with moderate to steep, healed/ intact, thin veins / veinlets. Integral Discontinuities Vn/veinlets; moderate to steep, (1-3/m), <1 mm - 2 mm wide, QZ FL. 18.35 m - 18.50 m: Intermediate to mafic inclusion / intrusion (?); fine grained, dark grey-grey, slight propylitic alteration, sharp margins.	FR - SA		UCS=216 $I_{s0}(D)>5.89$ $I_{s0}(A)=5.75$			
					18.5								
					19.0								
			100	100	19.5								
					19.66 869.24		19.66 m - 19.76 m: Intermediate inclusion (?) with hornblende and feldspar assemblages; fine to medium grained, grey and pale grey, rounded, sharp margins.						
			100	100	20.0								
					20.00								

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BOREHOLE: BHUA-20

SHEET: 6 OF 11
DRILL RIG: HYDRAPOWER SCOUT Mk5
CONTRACTOR: Twin Hills
LOGGED: ENGEO DATE: 1/7/23
CHECKED: SF DATE: 24/8/23

CLIENT: SMEC COORDS: 660025.7 m 7667001.7 m GDA 2020 MGA Zone 55
PROJECT: Pioneer Burdekin PHES GI SURFACE RL: 888.90 m DATUM: AHD
LOCATION: Dalrymple Heights INCLINATION: -89° DIRECTION: 210°
JOB NO: 23117.000.001 HOLE DIA: 96/100 mm HOLE DEPTH: 48.10 m

Drilling				Field Material Description						Defect Information			
METHOD / SUPPORT	WATER	TCR	RQD	DRILLED LENGTH (metres)	DEPTH RL	GRAPHIC LOG	MATERIAL DESCRIPTION	DETAILED WEATHERING	INFERRED STRENGTH I_{s0} (MPa) (AS1728:2017)	MEASURED STRENGTH: UCS & I_{p50} (MPa) (A.0.1)	DEFECT DESCRIPTION	AVERAGE DEFECT SPACING (mm) (ISO14689:2017)	
											Mechanical Discontinuities / non-intact defects shown only. See attached Detailed Defect Log for all recorded discontinuities and defects	EC-29 VC-29 C 200 M 600 W >200 WW	
HQ3			100	100	20.0	868.90	ALTERED MICROGRANITE (described as per 18.10m)	FR - SA					
					20.5								
					20.96	867.94	20.96 m - 21.10 m: Fractionation textures, mafic (hornblende (?)) / biotite (?), dark grey assemblages.						
					21.26	867.64	21.26 m - 21.67 m: DACITE (?) / ANDESITE (?) intrusion (?), fine grained, dark grey green, pervasive pale green propylitic (?) alteration.						
			100	100	21.5								
					22.0	22.04 866.86	ALTERED ANDESITE Fine grained, igneous intrusive. Dark grey and green-grey. Aphanitic, cryptocrystalline. Patchy pale green, propylitic (?) alteration. Sharp, irregular upper and lower margins.	SA					
					22.48	866.42	22.48 m - 22.75 m: Pale green propylitic (?) alteration becomes stronger.						
			100	96	23.0					$I_{50}(A) > 5.47$			
					23.30	865.60	ALTERED GRANITE Medium grained, igneous plutonic. Grey, pale grey and black. Crystalline, subhedral feldspar and hornblende, interstitial quartz. Poorly developed foliation (indistinct) at ~40°- 60°, defined by segregation of felsic minerals, and mineral elongation. Fractionation textures, dark assemblages of biotite and hornblende blebs <150 mm wide throughout. Variable composition and grain size throughout. Trace pink orthoclase. Patchy pale green propylitic alteration.	FR - SA					
			100	100	24.0								
			100	100	24.5	24.55 864.35	24.55 m - 24.90 m: Altered DACITE (?) intrusion (?); fine grained, dark grey-grey, gradational upper contact, sharp lower contact.						
					25.0								

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BOREHOLE: BHUA-20

SHEET: 7 OF 11
DRILL RIG: HYDRAPOWER SCOUT Mk5
CONTRACTOR: Twin Hills
LOGGED: ENGEO DATE: 1/7/23
CHECKED: SF DATE: 24/8/23

CLIENT: SMEC COORDS: 660025.7 m 7667001.7 m GDA 2020 MGA Zone 55
PROJECT: Pioneer Burdekin PHES GI SURFACE RL: 888.90 m DATUM: AHD
LOCATION: Dalrymple Heights INCLINATION: -89° DIRECTION: 210°
JOB NO: 23117.000.001 HOLE DIA: 96/100 mm HOLE DEPTH: 48.10 m

Drilling					Field Material Description					Defect Information				
METHOD / SUPPORT	WATER	TCR	RQD	DRILLED LENGTH (metres)	DEPTH RL	GRAPHIC LOG	MATERIAL DESCRIPTION	DETAILED WEATHERING	INFERRED STRENGTH Is _u (MPa) (AS1728:2017)	MEASURED STRENGTH: UCS & Is ₅₀ (MPa) (A.0.1)	DEFECT DESCRIPTION	AVERAGE DEFECT SPACING (mm) (ISO14689:2017)		
		100	100	25.0		+	ALTERED GRANITE Medium grained, igneous plutonic. Grey, pale grey and black. Crystalline, subhedral feldspar and hornblende, interstitial quartz. Poorly developed foliation (indistinct) at ~40°- 60°, defined by segregation of felsic minerals, and mineral elongation. Fractionation textures, dark assemblages of biotite and hornblende blebs <150 mm wide throughout. Variable composition and grain size throughout. Trace pink orthoclase, Patchy pale green propylitic alteration.	FR - SA		UCS=226				
				25.5		+								
		100	100	26.0		+				Is ₅₀ (A)>5.35				
				26.35		+								
				26.35	862.55	+	26.35 m - 26.40 m: Band of hornblende and mica rich rock, fine grained, dark grey. Cross-cuts host (DOLERITE (?)) micro-dyke (?)							
				26.5		+								
				27.0		+								
		100	100	27.5		+								
				28.0		+								
				28.5		+								
		100	100	29.0		+								
				29.30		+								
				29.30	859.60	+	29.30 m - 29.65 m: Altered MICRODIORITE (?) band; fine grained, dark grey, sharp upper contact, diffuse lower contact.							
				29.5		+								
		100	100	30.0	30.00	+					29.79-29.80 m: J, 11°, Pln, Sm, Epi 29.79-29.82 m: J, 50°, Pln, Ro, Epi 29.79-29.80 m: J, 11°, Pln, Sm, Epi			

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BOREHOLE: BHUA-20

SHEET: 8 OF 11

CLIENT: SMEC

COORDS: 660025.7 m 7667001.7 m GDA 2020 MGA Zone 55

DRILL RIG: HYDRAPOWER SCOUT Mk5

PROJECT: Pioneer Burdekin PHES GI

SURFACE RL: 888.90 m DATUM: AHD

CONTRACTOR: Twin Hills

LOCATION: Dalrymple Heights

INCLINATION: -89° DIRECTION: 210°

LOGGED: ENGEO DATE: 1/7/23

JOB NO: 23117.000.001

HOLE DIA: 96/100 mm HOLE DEPTH: 48.10 m

CHECKED: SF DATE: 24/8/23

Drilling				Field Material Description							Defect Information			
METHOD / SUPPORT	WATER	TCR	RQD	DRILLED LENGTH (metres)	DEPTH RL	GRAPHIC LOG	MATERIAL DESCRIPTION	DETAILED WEATHERING	INFERRED STRENGTH I_{s0} (MPa) (AS1728:2017)	MEASURED STRENGTH: UCS & I_{s0} (MPa) (A.0.1)	DEFECT DESCRIPTION	AVERAGE DEFECT SPACING (mm) (ISO14689:2017)		
HQ3				30.0	858.90		ALTERED GRANITE Described as per 23.30 m.	FR - SA			29.88-29.93 m: J, 68°, Pln, Ro, Qz FL 29.96-30.04 m: J, 60°, Stp, Ro, CA 30.00-30.09 m: J, 79°, Pln, Ro, CA FL, Fine grained pyrite crystals on joint surface 30.03-30.08 m: J, 79°, Pln, Ro, CA FL 30.32-30.36 m: J, 20°, Pln, Sm, CA Ct			
		100	100	30.5						$I_{s0}(A)=3.80$	30.83-30.92 m: J, 64°, Pln, Ro, CA FL			
				31.0										
				31.5										
				32.0							31.86-32.00 m: J, 70°, Stp, Ro, Epi FL			
		100	94	32.24	856.66		32.24 m - 32.51 m: MICRODIORITE dyke (?); fine to medium grained, dark grey and pale green, porphyritic, patchy propylitic alteration, sharp upper margin and transitional lower contact.							
				32.5										
				32.74	856.16		32.74 m - 33.67 m: DACITE (?) fine to medium grained, dark grey and grey, porphyritic, pervasive pale green propylitic alteration, more intensely altered surrounding healed joints and veins.	SA			32.83-32.90 m: J, 75°, Pln, Sm, CA FL			
				33.0										
		100	92	33.67	855.23		33.67 - 33.97m: ALTERED GRANITE grading to ALTERED MICROGRANITE (?) at 33.98 m.				33.75-33.82 m: J, 67°, Pln, Sm, CA FL			
				34.0										
				34.0	854.92		ALTERED MICROGRANITE Fine to medium grained, igneous intrusive. Dark grey and grey. Crystalline, porphyritic. Weak / poorly developed (indistinct) foliation defined by alignment of light and dark minerals., Pervasive pale green propylitic alteration throughout, more intense surrounding healed joints and veins, which also are commonly filled with carbonate.							
		100	100	34.5										
				34.72	854.18									
		100	100	34.91	853.99		34.91 m: Gradationally becoming fine grained,							
				35.0										

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BOREHOLE: BHUA-20

SHEET: 10 OF 11
DRILL RIG: HYDRAPOWER SCOUT Mk5
CONTRACTOR: Twin Hills
LOGGED: ENGEO DATE: 1/7/23
CHECKED: SF DATE: 24/8/23

CLIENT: SMEC COORDS: 660025.7 m 7667001.7 m GDA 2020 MGA Zone 55
PROJECT: Pioneer Burdekin PHES GI SURFACE RL: 888.90 m DATUM: AHD
LOCATION: Dalrymple Heights INCLINATION: -89° DIRECTION: 210°
JOB NO: 23117.000.001 HOLE DIA: 96/100 mm HOLE DEPTH: 48.10 m

Drilling					Field Material Description					Defect Information									
METHOD / SUPPORT	WATER	TCR	RQD	DRILLED LENGTH (metres)	DEPTH RL	GRAPHIC LOG	MATERIAL DESCRIPTION	DETAILED WEATHERING	INFERRED STRENGTH	MEASURED STRENGTH: UCS & I ₅₀ (A _{0.1}) (MPa)	DEFECT DESCRIPTION	AVERAGE DEFECT SPACING (mm)							
									Is ₉₀ (MPa) (AS1728:2017)			(ISO14689:2017)							
								VL 0.00 L 0.1 M 1.0 H 3.0 VH 10 EH				EC<20	VC60	C 200	M 600	W >2000	VW		
HQ3		100	100	40.0	848.90	+	ALTERED MICROGRANITE Fine to medium grained, igneous plutonic. Grey and pale grey. Crystalline, anhedral to subhedral crystals, variable texture, equigranular in part, fine grained bands grading to medium grained. Poorly developed foliation at 25°- 40°., Pink orthoclase, pyrite (fine) disseminated Pale green propylitic (?) alteration mainly on defects, halos up to 40mm. Poorly developed hornblende and biotite. Composition and texture varies throughout unit, possibly due to, fractionation, quenching and flow processes. 40.15 m - 40.40 m: DOLERITE intrusion, fine grained, dark grey, flow banding at top margin, sharp upper and lower margins. 40.72 m - 41.21 m: ANDESITE intrusion (?), fine grained, dark grey and pale grey green. Sandy texture on cut surface, trace MnO on defects, calcite on lower contact at 55°. Sharp upper contact, diffuse lower contact.	FR - SA		UCS=173	40.10-40.19 m: J, 56°, Und, Sm, CA FL								
				40.15	848.75	+													
				40.5		+													
				40.72	848.18	+													
				41.0		+													
		100	92	41.5		+													
				42.0		+													
				42.5		+													
		100	96	43.0		+													
				43.5		+													
			44.0		+														
	100	100	44.20	844.70	+	ALTERED ANDESITE Fine grained groundmass with few medium grained phenocrysts, igneous intrusion. Dark grey and dark green-grey. Cryptocrystalline, porphyritic, subhedral to euhedral plagioclase phenocrysts in an aphanitic groundmass., Quartz veining throughout with propylitic (?) alteration halos up to 50 mm	SA		I ₅₀ (A)=1.72 I ₅₀ (D)>5.89	40.83-40.84 m: J, 25°, Pln, Sm, Cn 40.94-40.95 m: J, 25°, Pln, Sm, Cn 41.64-41.65 m: J, 25°, Pln, Sm, Cn									
			44.5		^														
	100	100	45.0		^														

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

Borehole ID:	BHUA-20
Termination Depth:	48.1

Depth (m)			Type	Angle (°)	Roughness	Shape	Infill	Weathering	Nature	Comments
From	To	Mid								
8.83	8.88	8.86	Vein	48		Undulating	Quartz	Slightly Weathered	Healed	
8.86	8.94	8.90	Vein	83		Undulating	Quartz	Fresh	Hairline	
8.87	8.94	8.91	Vein	86		Undulating	Quartz	Fresh	Hairline	
8.95	9.00	8.98	Vein	64		Curved	Quartz	Slightly Weathered	Healed	
8.96	9.01	8.99	Vein	65		Curved	Quartz	Slightly Weathered	Healed	
9.04	9.12	9.08	Vein	38		Irregular	Quartz		Hairline	
9.11	9.14	9.13	Contact	50		Curved		Fresh	Intact	
9.12	9.18	9.15	Vein	50		Curved	Quartz	Fresh	Hairline	
9.18	9.20	9.19	Joint	28	Rough	Undulating	MnO	Moderately Weathered (DW)	Veneer	
9.20	9.31	9.26	Joint	85	Rough	Irregular	MnO	Moderately Weathered (DW)	Veneer	
9.25	9.30	9.28	Joint	65	Rough	Curved	MnO	Moderately Weathered (DW)	Stained	
9.27	9.32	9.30	Joint	58		Curved	MnO	Moderately Weathered (DW)	Stained	
9.34	9.45	9.40	Joint	84	Smooth	Irregular	MnO	Moderately Weathered (DW)	Stained	
9.34	9.43	9.39	Joint	75			MnO	Moderately Weathered (DW)	Stained	
9.41	9.44	9.43	Joint	25	Rough	Undulating	MnO	Moderately Weathered (DW)	Stained	
9.46	9.48	9.47	Joint	11	Rough	Undulating	MnO	Slightly Weathered	Stained	
9.49	9.50	9.50	Joint	6	Rough	Undulating		Slightly Weathered	Clean	
9.54	9.63	9.59	Vein	78		Undulating	Quartz	Slightly Altered	Stained	
9.55	9.56	9.56	Contact	10		Curved		Slightly Altered		
9.65	9.68	9.67	Vein	42		Irregular	Quartz	Slightly Weathered	Intact	
9.68	9.71	9.70	Joint	26	Very Rough	Irregular	MnO	Slightly Altered	Displaced	
9.72	9.75	9.74	Joint	30		Planar	Quartz	Moderately Altered (DA)	Healed	
9.73	9.77	9.75	Vein	60		Curved	Quartz	Slightly Weathered	Hairline	
9.75	9.78	9.77	Contact	38						
9.98	10.03	10.01	Vein	74		Curved	Quartz	Fresh	Hairline	
10.21	10.23	10.22	Vein	17		Irregular	Quartz	Slightly Altered	Healed	
10.28	10.33	10.31	Vein	13		Curved	Quartz	Fresh	Hairline	
10.31	10.35	10.33	Vein	45		Planar	Quartz	Fresh	Hairline	
10.46	10.76	10.61	Vein	82		Curved	Quartz	Fresh	Hairline	
10.82	11.03	10.93	Joint	84		Curved	Quartz	Slightly Altered	Healed	
11.44	11.70	11.57	Vein	76		Irregular	Quartz	Slightly Altered	Healed	
11.74	11.89	11.82	Vein	86		Irregular	Quartz	Fresh	Hairline	
11.89	12.87	12.38	Vein	84		Irregular	Quartz	Slightly Altered	Intact	Large vein with multiple minor parasites possible appite alteration angle changes between 87 and 81
11.91	12.00	11.96	Vein	81		Irregular	Quartz	Fresh	Hairline	
12.75	12.85	12.80	Vein	81		Undulating	Quartz	Fresh	Healed	
13.02	13.07	13.05	Vein	70		Irregular	Quartz	Slightly Altered	Healed	
13.05	13.09	13.07	Vein	26		Irregular	Quartz	Slightly Altered	Healed	V x2, 26°, Irr, Qz, HD
13.10	13.12	13.11	Vein	8		Curved	Quartz	Slightly Altered	Healed	
13.14	13.20	13.17	Vein	64		Planar	Quartz	Slightly Altered	Healed	
13.17	13.30	13.24	Vein	82	Rough	Curved		Fresh	Clean	
13.29	13.45	13.37	Vein	85		Irregular	Quartz	Apatite Alteration	Healed	
13.43	13.47	13.45	Vein	16		Curved	Quartz	Fresh	Hairline	
13.50	13.61	13.56	Vein	65		Curved	Quartz	Apatite Alteration	Healed	
13.64	13.67	13.66	Vein	35		Curved	Quartz	Apatite Alteration	Healed	
13.72	13.90	13.81	Vein	84		Irregular	Quartz	Fresh	Healed	
13.89	14.12	14.01	Vein	86		Curved	Quartz	Fresh	Healed	
14.16	14.28	14.22	Vein	74		Undulating	Quartz	Slightly Altered	Healed	
14.22	14.34	14.28	Vein	76		Curved		Fresh	Hairline	
14.41	14.80	14.61	Vein	85		Undulating	FeO	Slightly Altered	Healed	Slight pale green alteration
14.42	14.45	14.44	Vein	38		Planar	Quartz	Fresh	Hairline	
15.48	15.55	15.52	Foliation	60		Planar		Slightly Altered		
15.49	15.51	15.50	Vein	18		Undulating	Quartz	Fresh	Hairline	
15.67	15.69	15.68	Vein	25		Curved	Quartz	Fresh	Healed	
15.71	15.90	15.81	Vein	75		Planar	Quartz	Fresh	Hairline	
16.06	16.13	16.10	Vein	62		Undulating	Quartz	Apatite Alteration	Healed	
16.15	16.33	16.24	Vein	74		Curved	Quartz	Apatite Alteration	Healed	
16.28	16.34	16.31	Vein	70		Irregular	Quartz	Fresh	Healed	
16.31	16.37	16.34	Vein	60		Curved	Quartz	Fresh	Hairline	

Depth (m)			Type	Angle (°)	Roughness	Shape	Infill	Weathering	Nature	Comments
From	To	Mid								
16.35	16.55	16.45	Vein	78		Planar	Quartz	Fresh	Hairline	J x2, 65°, Pln, CA, HD
16.44	16.57	16.51	Vein	45		Irregular	Calcite	Slightly Weathered	Infilled	
16.57	16.57	16.57	Vein	5	Rough	Undulating	Calcite	Slightly Weathered	Infilled	
16.58	16.76	16.67	Vein	84		Curved	Quartz	Fresh	Hairline	
16.59	16.71	16.65	Vein	76		Planar	Quartz	Slightly Weathered	Hairline	
16.66	16.75	16.71	Vein	76		Planar	Quartz	Slightly Weathered	Hairline	
16.75	16.82	16.79	Vein	66		Planar	Quartz	Apatite Alteration	Hairline	
16.82	16.85	16.84	Joint	38	Rough	Stepped		Fresh	Clean	
16.93	16.97	16.95	Vein	54		Curved	Quartz	Slightly Altered	Healed	
17.07	17.08	17.08	Joint	5	Rough	Curved		Fresh	Clean	
17.33	17.34	17.34	Joint	4	Rough	Planar		Fresh	Clean	
17.34	17.49	17.42	Vein	76		Irregular	Quartz	Fresh	Healed	
17.36	17.43	17.40	Vein	57		Irregular	Quartz	Fresh	Healed	
17.38	17.55	17.47	Vein	70		Curved	Quartz	Fresh	Healed	
18.00	18.16	18.08	Vein	82	Rough	Curved	Calcite	Fresh	Healed	
18.08	18.14	18.11	Vein	53		Planar	Calcite	Fresh	Healed	
18.17	18.30	18.24	Vein	77		Planar	Calcite	Fresh	Healed	
18.31	18.43	18.37	Joint	65		Planar	Calcite	Fresh	Healed	
18.40	18.53	18.47	Vein	65		Planar	Calcite	Fresh	Hairline	
19.61	19.69	19.65	Vein	60	Rough	Curved	Calcite	Fresh	Infilled	
19.72	19.91	19.82	Vein	82	Smooth	Curved	Chlorite	Fresh	Infilled	
19.85	19.60	19.73	Vein	35	Rough	Undulating	Calcite	Fresh	Infilled	
19.90	20.00	19.95	Vein	70			Calcite	Fresh	Hairline	
20.00	20.12	20.06	Vein	70	Rough	Planar	Calcite	Fresh	Healed	
20.20	20.60	20.40	Vein	64	Rough	Planar	Feldspar	Fresh	Hairline	
20.40	20.57	20.49	Vein	72	Rough		Chlorite	Fresh	Hairline	
20.55	20.65	20.60	Vein	68	Smooth		Chlorite	Fresh	Hairline	
21.00	21.40	21.20	Vein	86	Rough	Undulating		Fresh	Hairline	
21.14	21.17	21.16	Vein	31	Rough	Planar	Unknown	Fresh	Hairline	
21.16	21.23	21.20	Vein	60	Rough	Curved	Chlorite	Chlorite Alteration	Infilled	
21.26	21.45	21.36	Vein	88	Rough	Undulating	Calcite	Fresh	Infilled	
21.40	21.70	21.55	Vein	85	Rough	Undulating	Calcite	Fresh	Infilled	
21.67	21.69	21.68	Vein	30	Smooth	Planar	Calcite	Fresh	Infilled	
22.40	22.44	22.42	Vein	60	Rough	Undulating			Hairline	
22.50	22.60	22.55	Vein	68	Smooth	Planar			Hairline	
22.85	22.87	22.86	Vein	60	Rough	Planar			Hairline	
23.30	23.40	23.35	Vein	70	Smooth	Planar	Quartz	Fresh	Infilled	
23.70	23.79	23.75	Joint	60	Rough	Planar	Unknown	Fresh	Healed	
24.30	24.42	24.36	Vein	70	Rough	Planar	Calcite	Fresh	Healed	
25.42	25.59	25.51	Vein	71	Rough	Planar	Unknown	Fresh	Hairline	
25.66	25.67	25.67	Vein	18	Rough	Planar	Calcite	Fresh	Healed	
25.67	25.81	25.74	Vein	79	Rough	Planar	Unknown	Fresh	Hairline	
26.16	26.30	26.23	Vein	70	Rough	Planar	Calcite	Fresh	Hairline	
26.35	26.40	26.38	Sill	5	Smooth	Curved	Basalt			30 mm thick
26.40	26.60	26.50	Vein	80	Rough	Planar	Unknown	Fresh	Hairline	
27.10	27.35	27.23	Vein	77	Rough	Planar	Calcite	Slightly Altered	Infilled	Slight brown alteration halo
27.32	27.53	27.43	Vein	78	Rough	Planar	Calcite	Slightly Altered	Hairline	Slight brown alteration halo
28.28	28.30	28.29	Vein	62	Rough	Undulating	Calcite	Fresh	Healed	
28.28	28.35	28.32	Vein	71	Rough	Undulating	Chlorite	Fresh	Infilled	
28.46	28.54	28.50	Vein	65	Rough	Planar	Unknown	Fresh	Hairline	
28.50	28.65	28.58	Vein	78	Rough	Planar	Unknown	Fresh	Hairline	
29.09	29.12	29.11	Fault	25	Rough	Planar		Fresh	Clean	Fault characteristics estimated. Drilling disturbance along fault surface as core spun in barrel. All drilling fluid lost.
29.14	29.30	29.22	Vein	72	Rough	Planar	Calcite	Fresh	Infilled	
29.23	29.31	29.27	Vein	72	Rough	Planar	Unknown	Fresh	Hairline	
29.30	29.31	29.31	Vein	15	Rough	Undulating	Unknown	Fresh	Hairline	
29.30	29.39	29.35	Vein	52	Rough	Planar	Calcite	Fresh	Infilled	
29.32	29.60	29.46	Vein	86	Rough	Undulating	Calcite	Fresh	Infilled	
29.44	29.70	29.57	Vein	80	Very Rough	Undulating	Calcite	Fresh	Infilled	
29.60	30.37	29.99	Vein	85	Rough	Planar	Quartz	Fresh	Infilled	
29.79	29.80	29.80	Joint	11	Smooth	Planar	Epidote	Fresh		
29.79	29.82	29.81	Joint	50	Rough	Planar	Epidote	Fresh		
29.82	29.84	29.83	Vein	40	Rough	Planar	Epidote	Fresh	Clean	

Depth (m)			Type	Angle (°)	Roughness	Shape	Infill	Weathering	Nature	Comments
From	To	Mid								
29.85	29.86	29.86	Vein	35	Rough	Planar	Epidote	Fresh	Clean	Fine grained pyrite crystals on joint surface
29.88	29.93	29.91	Joint	68	Rough	Planar	Quartz	Fresh	Infilled	
29.96	30.04	30.00	Joint	60	Rough	Stepped	Calcite			
30.00	30.09	30.05	Joint	79	Rough	Planar	Calcite	Fresh	Infilled	
30.03	30.08	30.06	Joint	79	Rough	Planar	Calcite	Fresh	Infilled	
30.10	30.14	30.12	Vein	26	Rough	Undulating	Calcite	Fresh	Hairline	
30.32	30.36	30.34	Joint	20	Smooth	Planar	Calcite	Fresh	Coated	
30.41	30.43	30.42	Vein	40	Rough	Planar	Unknown	Fresh	Hairline	
30.41	30.43	30.42	Vein	32	Rough	Planar	Unknown	Fresh	Hairline	
30.50	30.90	30.70	Vein	85	Rough	Curved	Quartz	Fresh	Infilled	25mm thick alteration halo
30.72	30.77	30.75	Vein	43	Rough	Planar	Epidote	Fresh	Infilled	
30.83	30.92	30.88	Joint	64	Rough	Planar	Calcite	Fresh	Infilled	
31.16	31.28	31.22	Vein	65	Rough	Planar	Calcite	Fresh	Infilled	
31.44	31.55	31.50	Vein	60	Rough	Planar	Epidote	Fresh	Infilled	
31.75	31.86	31.81	Joint	66	Rough	Planar		Fresh	Healed	
31.86	32.00	31.93	Joint	70	Rough	Stepped	Epidote	Fresh	Infilled	
32.10	32.21	32.16	Vein	63	Smooth	Planar	Calcite	Fresh	Infilled	
32.83	32.90	32.87	Joint	75	Smooth	Planar	Calcite	Fresh	Infilled	
33.00	33.14	33.07	Vein	80	Rough	Planar	Epidote	Fresh	Infilled	
33.00	33.40	33.20	Vein	89	Rough	Planar	Quartz	Fresh	Hairline	?
33.15	33.45	33.30	Vein	84	Rough	Planar	Quartz	Fresh	Infilled	
33.50	33.54	33.52	Joint	63	Rough	Stepped	FeO	Slightly Altered	Healed	
33.60	33.70	33.65	Joint	70	Smooth	Planar	Calcite	Fresh	Healed	
33.75	33.82	33.79	Joint	67	Smooth	Planar	Calcite	Fresh	Infilled	
34.00	34.07	34.04	Vein	63	Rough	Planar	Calcite	Fresh	Hairline	
34.14	34.22	34.18	Vein	65	Rough	Planar	Calcite	Slightly Altered	Infilled	
34.24	34.33	34.29	Joint	74	Rough	Planar		Fresh	Healed	
34.47	34.55	34.51	Vein	70	Smooth	Undulating	Epidote	Highly Altered (DA)	Infilled	
34.60	34.80	34.70	Vein	74	Smooth	Undulating	Epidote	Highly Altered (DA)	Infilled	
34.80	34.95	34.88	Vein	80	Smooth	Undulating	Epidote	Highly Altered (DA)	Infilled	J x5, 65°, Pln, HD
35.10	35.20	35.15	Vein	75	Smooth	Planar	Calcite	Highly Weathered (DW)	Infilled	
35.50	35.62	35.56	Vein	75	Smooth	Undulating	Calcite	Fresh	Infilled	
35.75	35.86	35.81	Vein	70	Smooth	Undulating				
35.85	36.00	35.93	Fault	79	Smooth	Planar	Calcite	Fresh	Infilled	
35.94	36.00	35.97	Vein	61	Smooth	Undulating	Calcite	Slightly Altered	Infilled	
36.35	36.45	36.40	Vein	72	Smooth	Undulating	Quartz	Fresh	Infilled	
36.43	36.49	36.46	Vein	73	Rough	Planar	Calcite	Fresh	Infilled	
37.00	37.15	37.08	Joint	65	Smooth	Planar		Fresh	Healed	
37.38	37.46	37.42	Vein	65	Smooth	Undulating	Calcite	Fresh	Healed	
37.65	37.75	37.70	Vein	71	Smooth	Undulating	Epidote	Highly Altered (DA)	Infilled	1mm wide
37.71	37.81	37.76	Vein	70	Smooth	Undulating	Epidote	Highly Altered (DA)	Infilled	
37.83	37.92	37.88	Joint	66	Smooth	Undulating	Calcite	Fresh	Infilled	
40.10	40.19	40.15	Joint	56	Smooth	Undulating	Calcite	Fresh	Infilled	
40.75	40.83	40.79	Vein	45	Rough	Planar	Quartz	Fresh	Infilled	
40.83	40.84	40.84	Joint	25	Smooth	Planar		Fresh	Clean	
40.94	40.95	40.95	Joint	25	Smooth	Planar		Fresh	Clean	
41.04	41.14	41.09	Vein	79	Rough	Curved	Calcite	Fresh	Infilled	
41.30	41.50	41.40	Vein	75	Rough	Undulating	Epidote	Fresh	Filled	
41.64	41.65	41.65	Joint	25	Smooth	Planar		Fresh	Clean	
41.70	41.93	41.82	Vein	80	Smooth	Undulating	Calcite	Fresh	Infilled	
41.70	42.05	41.88	Vein	88	Smooth	Undulating	Calcite	Fresh	Infilled	

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Borehole No.: BHUA-20		Depth Range: 20.0 – 24.0		Box: 4 / 10	
JOB NO: 300327 BOREHOLE ID: BHUA-20 DEPTH: 20-24m DATE: 12-7-23 PROJECT: PIONEER BURDEKIN CORE TRAY NO: 4 CHALK MARKS DENOTE HANDLING OR DRILLING BREAKS					
	Geotechnical Investigation Borehole Photos	Client: SMEC		Page No. 4/10	
		Project: Pioneer-Burdekin PHES		Drawn: HG	
		Project No. 23117.000.001		Checked: SF	
		Date Drilled: 12/07/23		Revision: 0	
				Size: A4	
				Scale: N/A	

Borehole No.: BHUA-20		Depth Range: 24.0 – 28.0		Box: 5 / 10	
JOB NO: 300327 BOREHOLE ID: BHUA-20 DEPTH: 24-28m DATE: 12-7-23 PROJECT: PIONEER BURDEKIN CORE TRAY NO: 5 CHALK MARKS DENOTE HANDLING OR DRILLING BREAKS					
	Geotechnical Investigation Borehole Photos	Client: SMEC			
		Project: Pioneer-Burdekin PHES	Drawn: HG	Page No. 5/10	
		Project No. 23117.000.001	Checked: SF	Size: A4	
		Date Drilled: 12/07/23	Revision: 0	Scale: N/A	

Borehole No.: BHUA-20		Depth Range: 28.0 – 32.0		Box: 6 / 10	
JOB NO: 300327 BOREHOLE ID: BHUA-20 DEPTH: 28 - 32m DATE: 12-7-23 PROJECT: PIONEER BURDEKIN CORE TRAY NO: 6 CHALK MARKS DENOTE HANDLING OR DRILLING BREAKS 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0 28 29 30 31 FOR 28-28 CL FOR 31-33					
ENGEO	Geotechnical Investigation Borehole Photos	Client: SMEC			
		Project: Pioneer-Burdekin PHES		Drawn: HG	Page No. 6/10
		Project No. 23117.000.001		Checked: SF	Size: A4
		Date Drilled: 12/07/23		Revision: 0	Scale: N/A

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BOREHOLE TELEVIEWER AND FULL WAVEFORM SONIC LOGS AND ADVANCED ANALYSIS



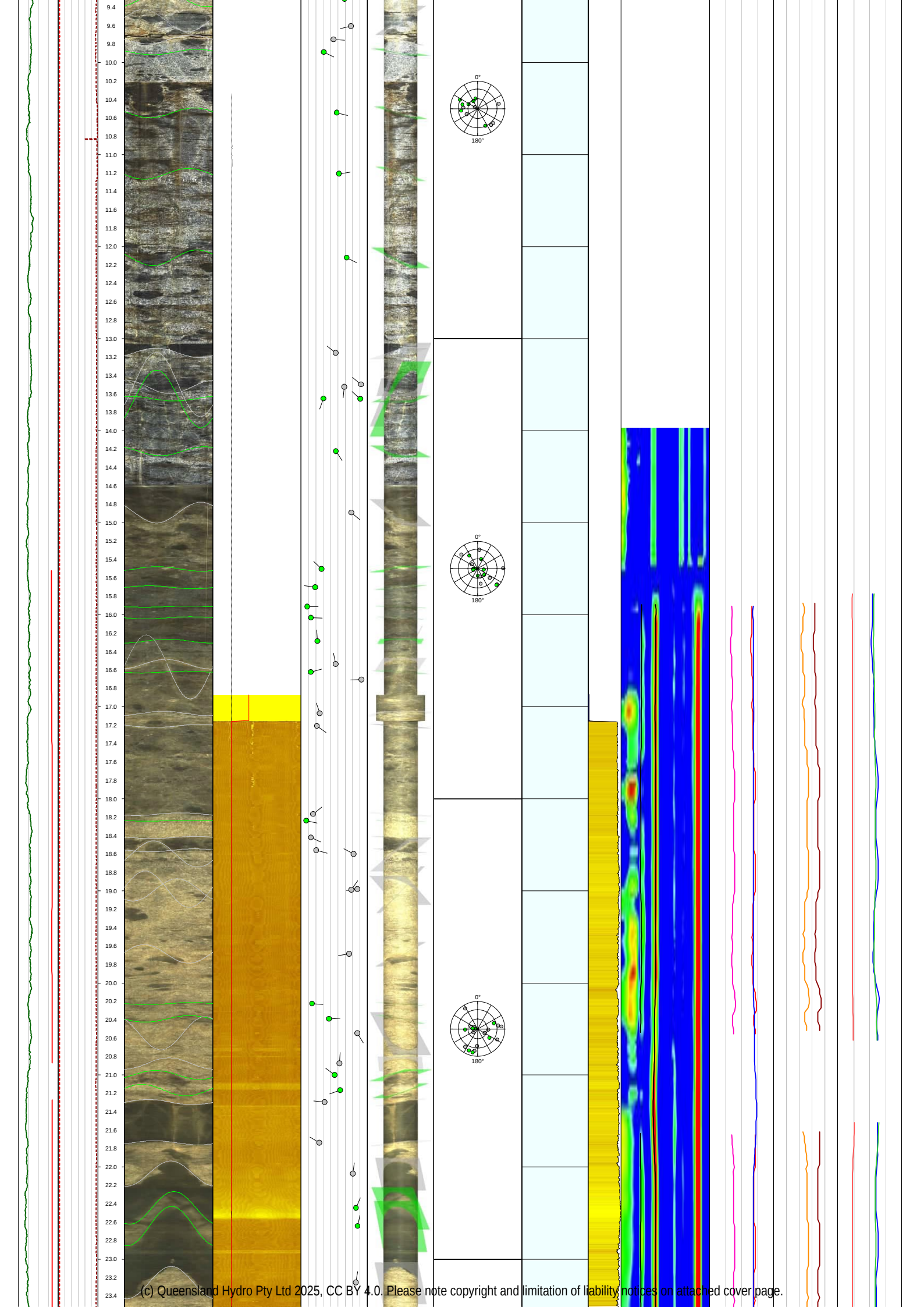
Hole Name	BHUA_20	Drill Depth	48.0m	Grid Name		Logging Unit	SV013
Field	EUNGELLA	Bit Size	96mm	Collar Easting	659911m	Engineer	DAMON HOSKING
Log Date	13/07/23	Casing Type	STEEL	Collar Northing	7666824m	Client Representative	ROB CAINE
Location	PIONEER-BURDEKIN	Casing Depth	1.3m	Reduced Level		Service Type	Televiever Interpretation

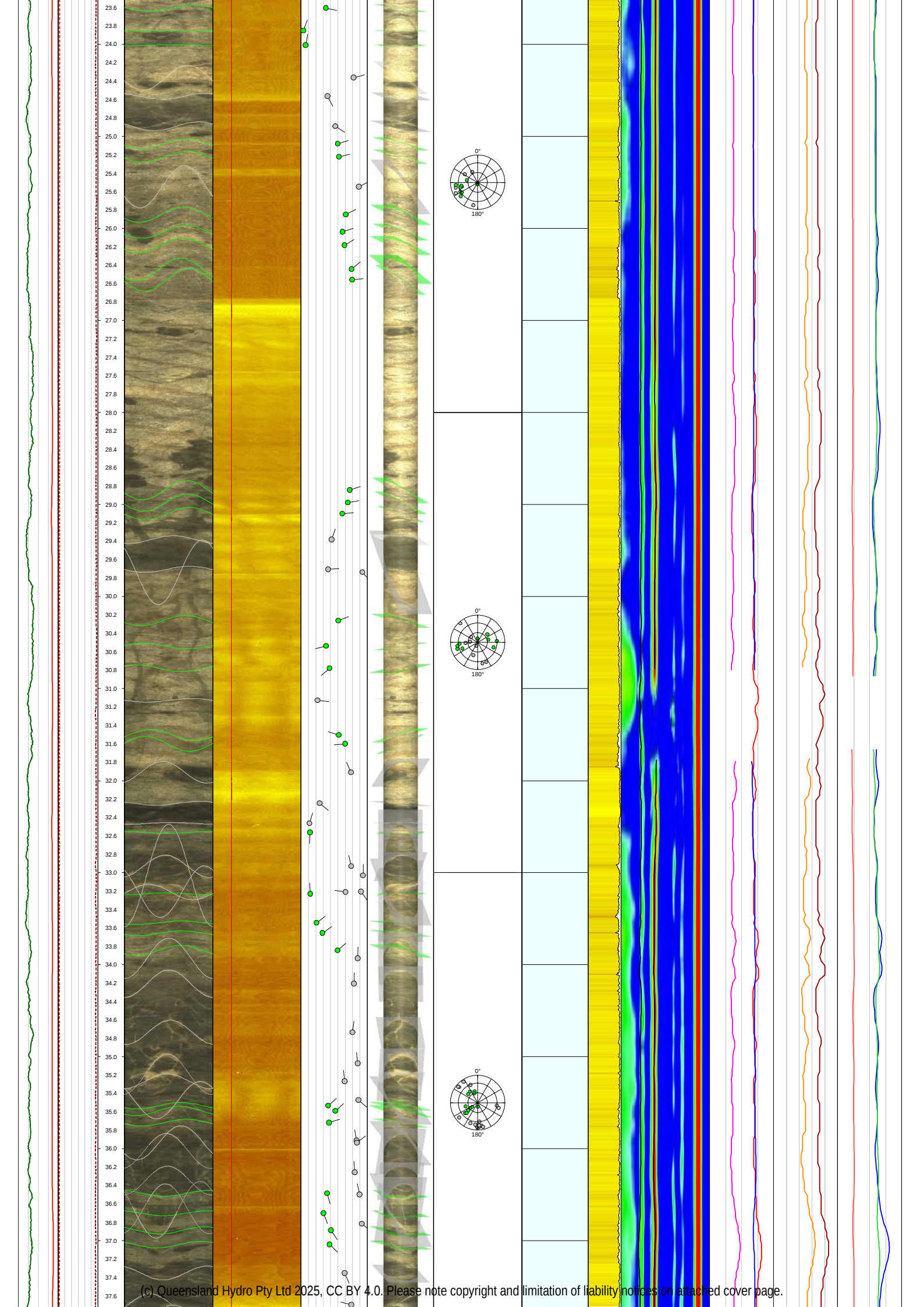
TELEVIEWER LOGS		STRUCTURAL LOGS		FEATURES & TADPOLES	
Amplitude	ATV Amplitude Image	DIPA	Apparent Dip Feature Picks (Sinusoid Presentation)		Foliation/Banding/Bedding
TT-CENT	Centralised ATV Travel Time Image				Healed Fracture/Vein
3D TV LOG	3D Televiewer Image	DIPT	True Dip Feature Picks (Tadpole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

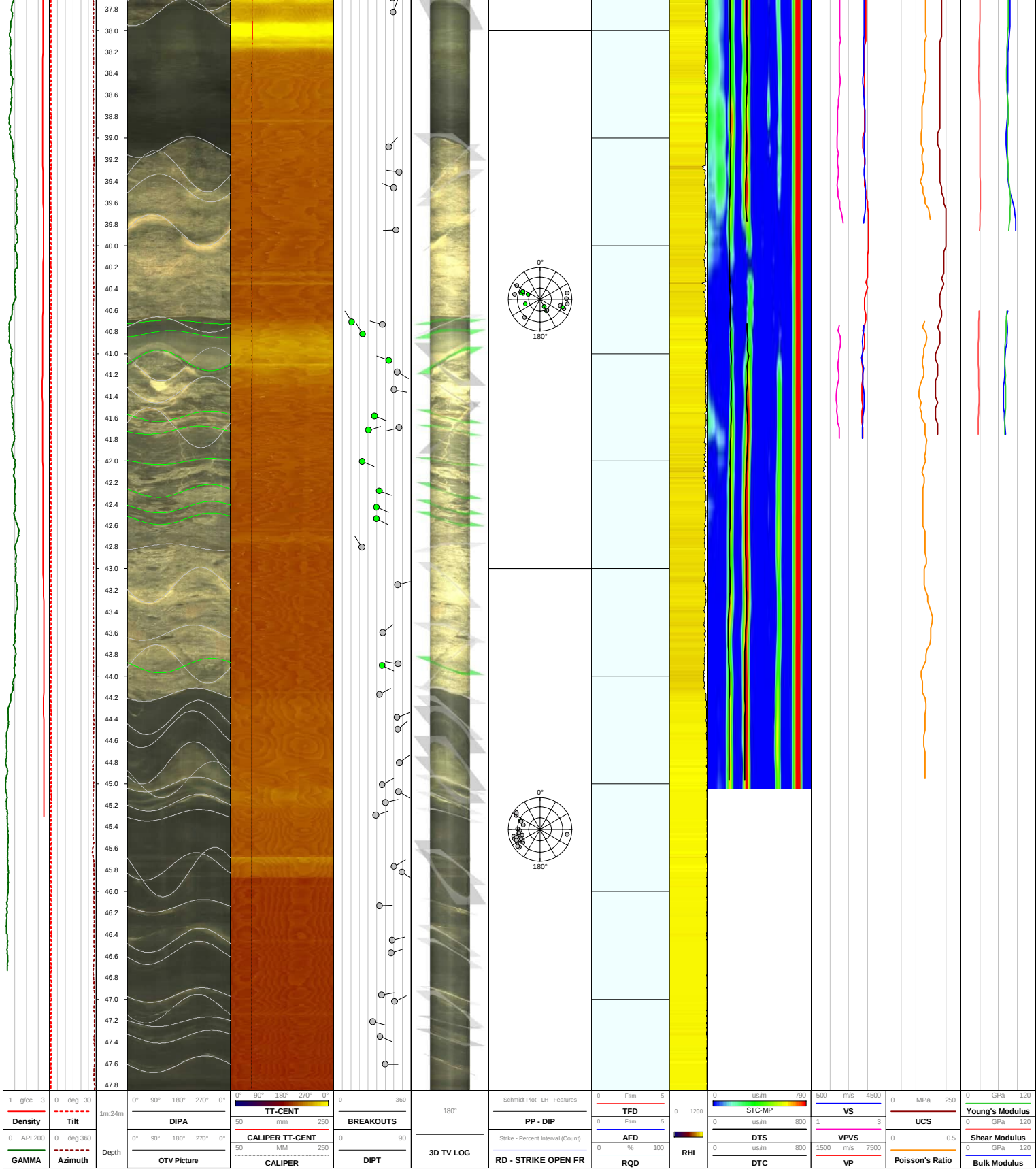
The following interpretations are opinions based upon inferences from borehole logs, Epiroc Kinetic Logging Services cannot and does not guarantee the correctness or accuracy of any interpretations. Therefore, Epiroc Kinetic Logging Services shall not be liable or responsible for any loss, damage, cost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

GAMMA		Azimuth		Depth	OTV Picture	CALIPER		DIPT	3D TV LOG		RD - STRIKE OPEN FR	RQD		RHI	DTC		VP	Poisson's Ratio	Bulk Modulus
0 API 200		0 deg 360			0° 90° 180° 270° 0°	50 MM 250		0 90			Strike - Percent Interval (Count)	0 % 100			0 us/m 800	1500 m/s 7500	0 0.5	0 GPa 120	
Density		Tilt		1m/24m	DIPA	CALIPER TT-CENT		BREAKOUTS			PP - DIP	AFD			DTS	VPVS	UCS	Shear Modulus	
1 g/cc 3		0 deg 30			0° 90° 180° 270° 0°	50 mm 250		0 360		180°	Schmidt Plot - LH - Features	0 Firm 5			0 us/m 800	1 3	0 MPa 250	0 GPa 120	
						TT-CENT						TFD			STC-MP	VS		Young's Modulus	
						0° 90° 180° 270° 0°						0 Firm 5			0 us/m 750	500 m/s 4500		0 GPa 120	
				1.2															
				1.4															
				1.6															
				1.8															
				2.0															
				2.2															
				2.4															
				2.6															
				2.8															
				3.0															
				3.2															
				3.4															
				3.6															
				3.8															
				4.0															
				4.2															
				4.4															
				4.6															
				4.8															
				5.0															
				5.2															
				5.4															
				5.6															
				5.8															
				6.0															
				6.2															
				6.4															
				6.6															
				6.8															
				7.0															
				7.2															
				7.4															
				7.6															
				7.8															
				8.0															
				8.2															
				8.4															
				8.6															
				8.8															
				9.0															
				9.2															

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BHUA_20

SMEC - Pioneer-Burdekin

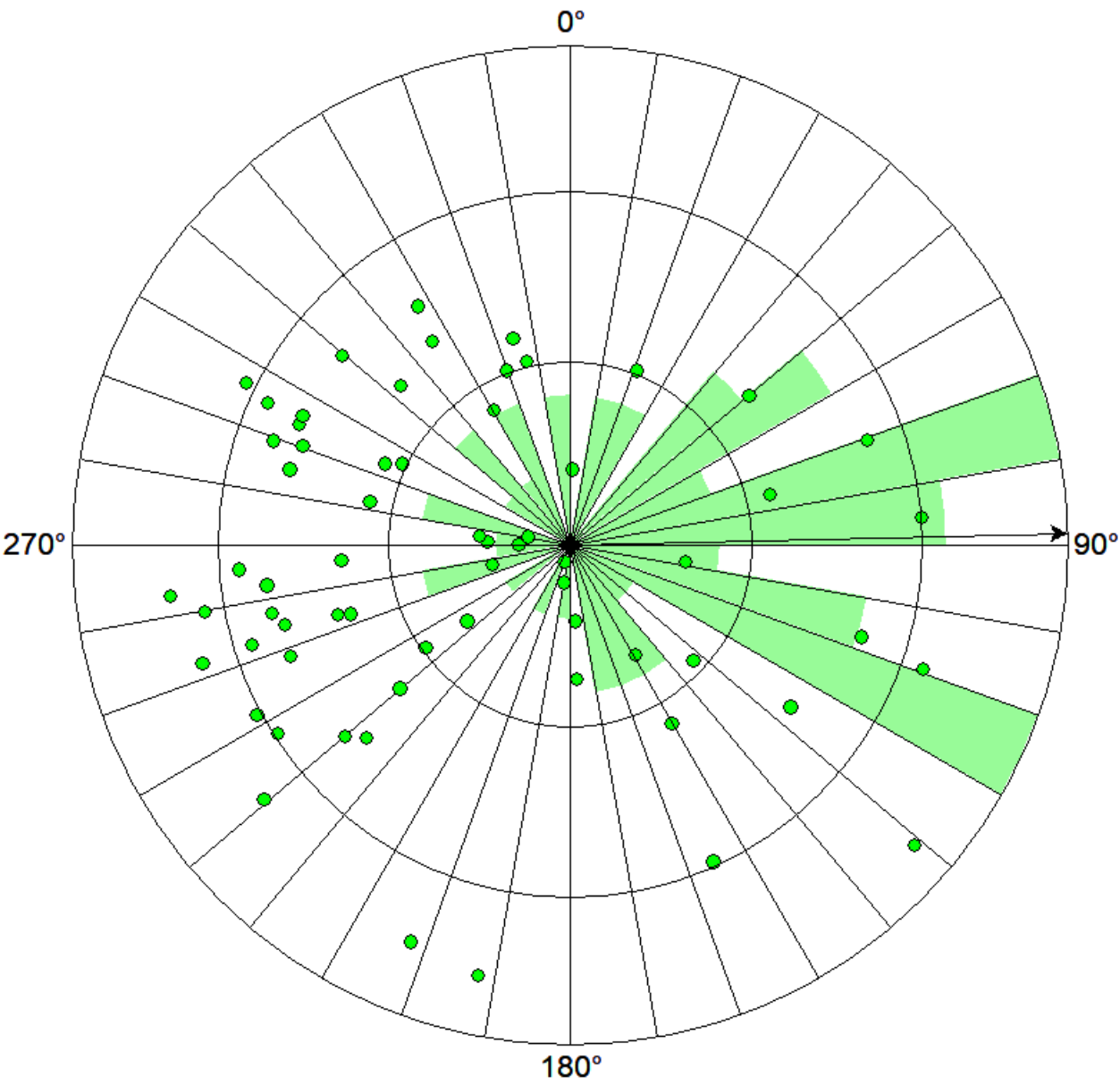
**Acoustic and Optical Televiewer image log Schmidt
Stereonet evaluation for interpreted log interval**

Log Date: 13 July 2023

IMPORTANT NOTE

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

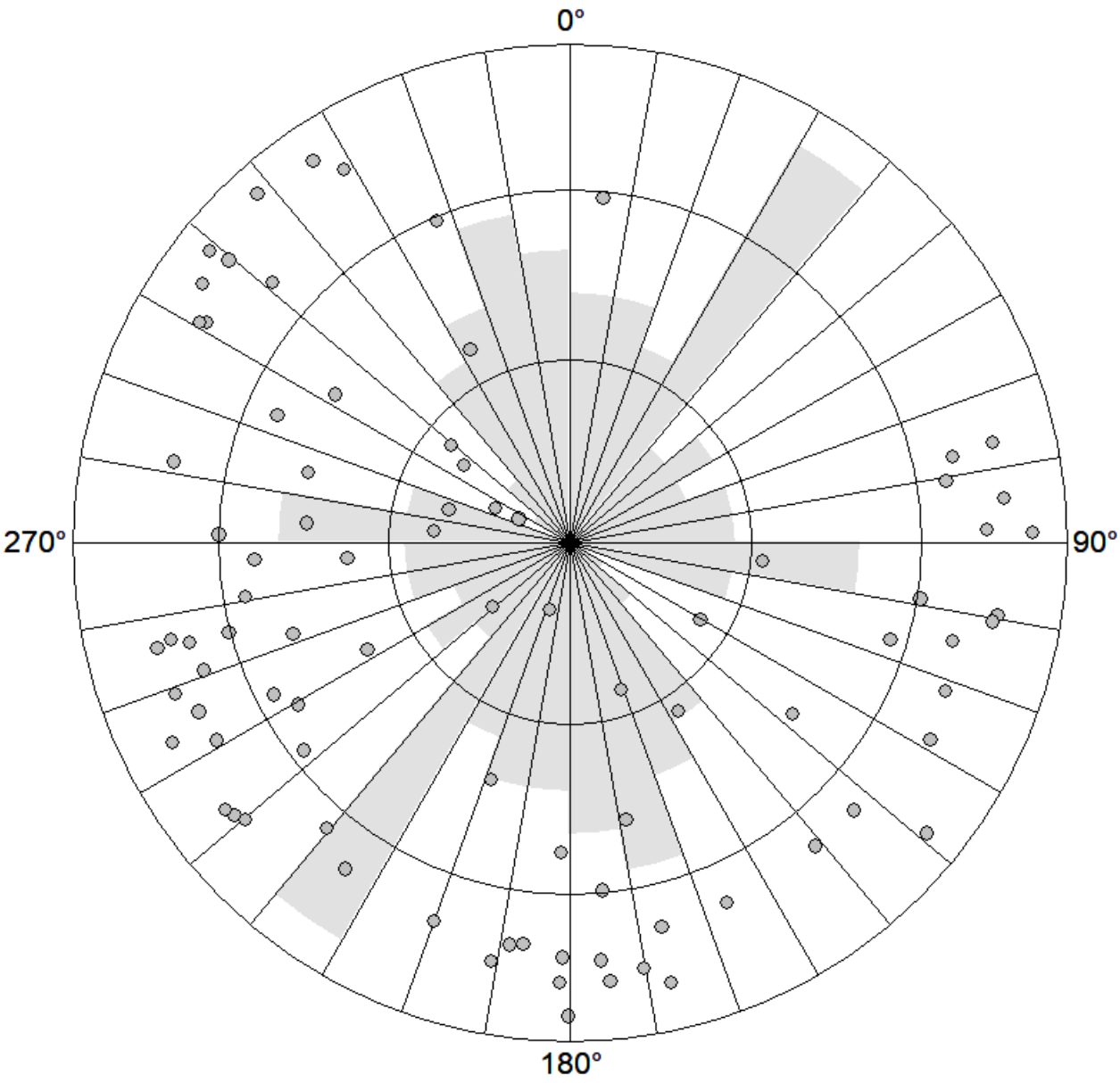
FOLIATIONS – 1.2 TO 47.8 M



	Counts	Dip [deg]	Azimuth [deg]	Strike [deg]
Mean	64	27.84	88.58	178.58 - 358.58

Foliations: Scattered dip azimuth directions with a preference in the E dip azimuth direction

HEALED FRACTURES AND VEINS – 1.2 TO 47.8 M



	Counts	Dip [deg]	Azimuth [deg]	Strike [deg]
Mean	86	62.17	83.44	173.44 - 353.44

Healed Fractures and Veins: Scattered strike directions



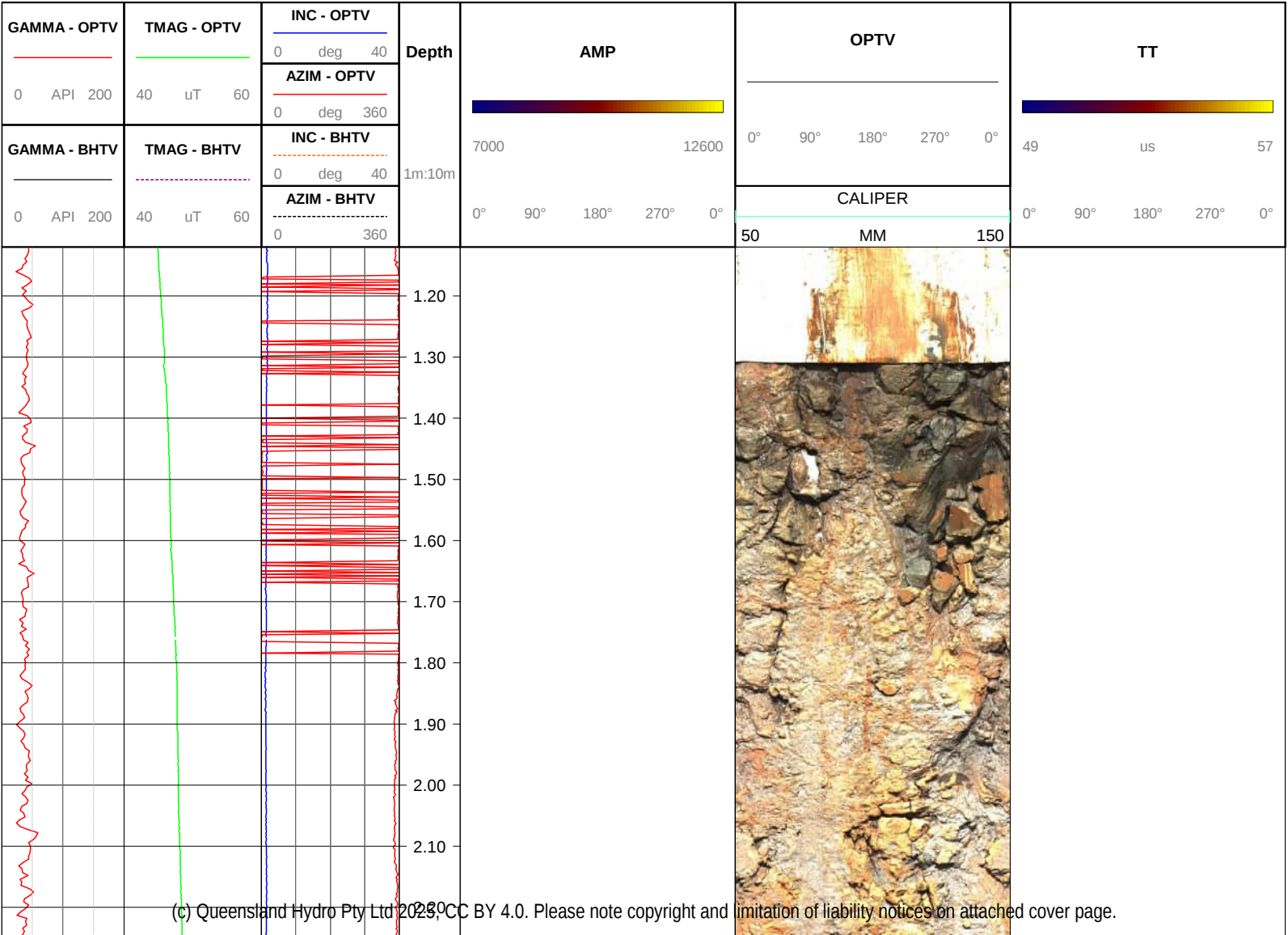
OPTV & BHTV LOG

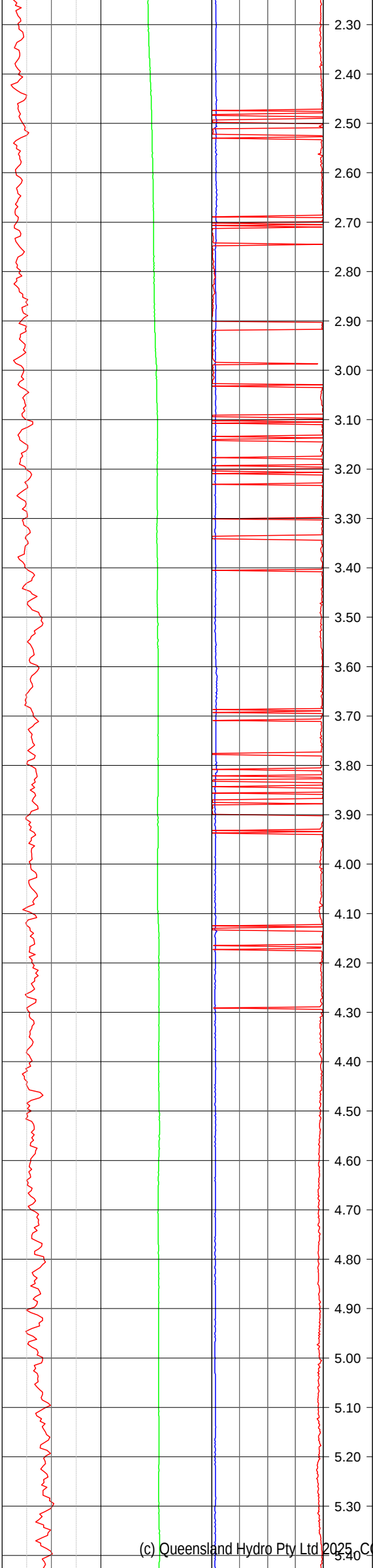
BHUA_20

WELL	BHUA_20	DRILL DEPTH	48.0m	DATE	13/07/23
FIELD	PIONEER-BURDEKIN	BIT SIZE	96mm	CLIENT REP	ROB CAINE
LOCATION	EUNGELLA	CASING WEIGHT	PVC	ENGINEER	DAMON HOSKING
UWI	SV013	CASING SIZE	100mm	EASTING	659911
COUNTRY	AUSTRALIA	CASING BOTTOM	1.3m	NORTHING	7666824

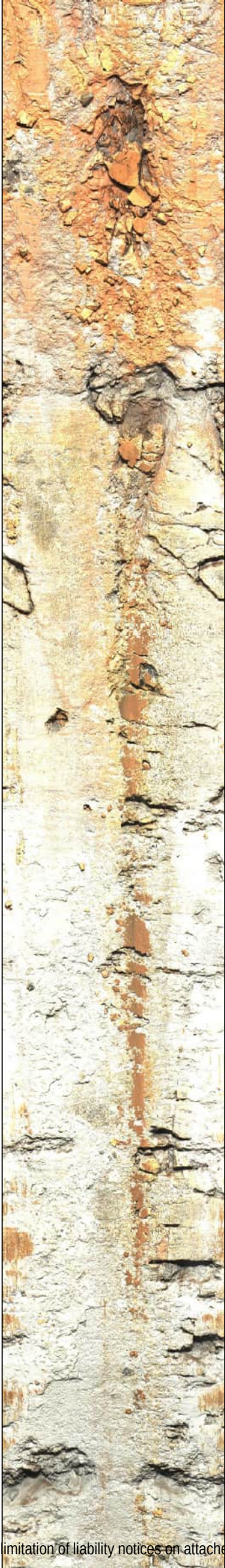
TELEVIEWER LOGS			COMMENTS		
GAMMA	Televiewer Gamma Ray	INC	Borehole Inclination (0 deg = Vertical Down)	All image log data is oriented to true north. The applied magnetic declination correction is 8.12 degrees.	
OPTV	OPTV RGB Image	AZIM	Borehole Magnetic Azimuth		
AMP	BHTV Amplitude	HGDELTA	Potential Field		
TT	BHTV Travel Time	TMAG	Televiewer Magnetic Field		

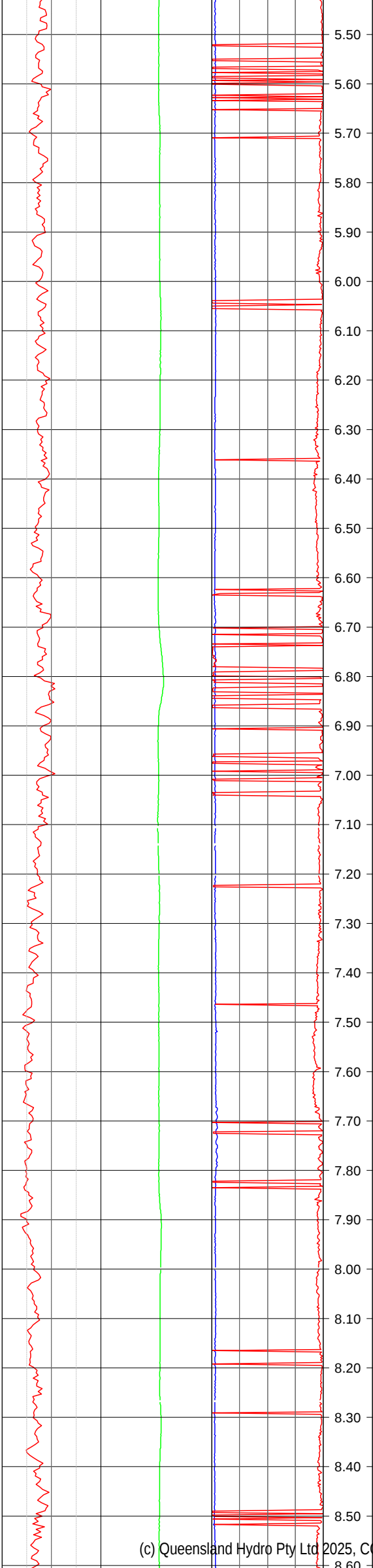
IMPORTANT NOTE	The following interpretations are opinions based upon inferences from borehole logs, Epiroc Kinetic Logging Services cannot and does not guarantee the correctness or accuracy of any interpretations. Therefore, Epiroc Kinetic Logging Services shall not be liable or responsible for any loss,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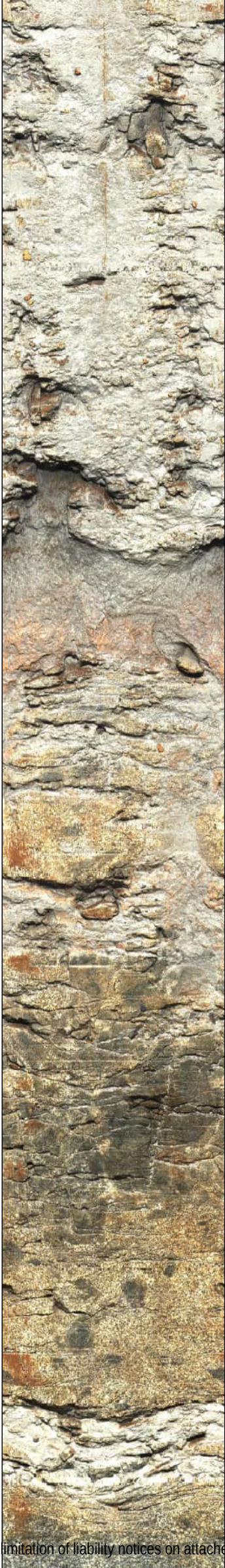


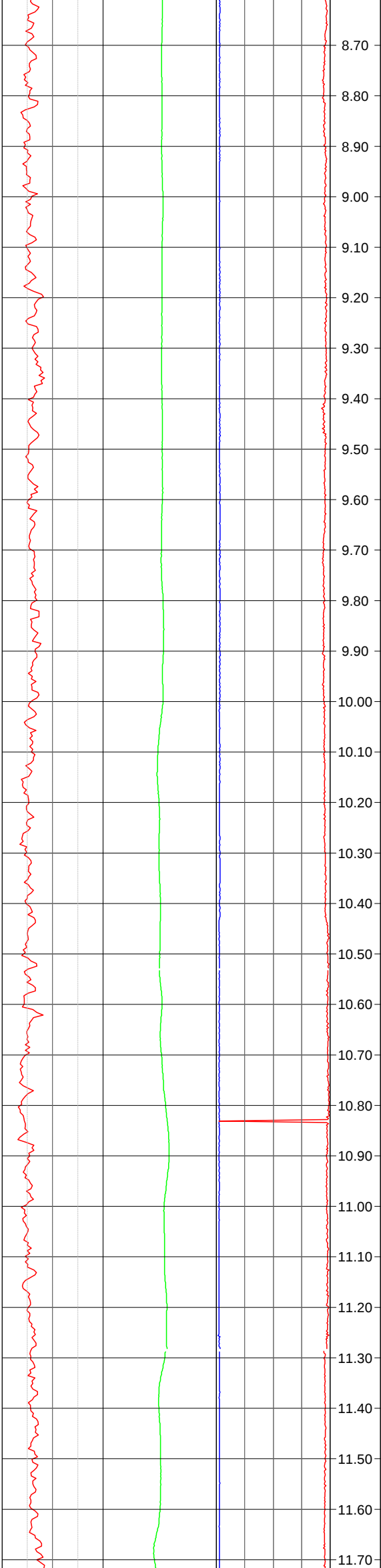
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2.40
2.50
2.60
2.70
2.80
2.90
3.00
3.10
3.20
3.30
3.40
3.50
3.60
3.70
3.80
3.90
4.00
4.10
4.20
4.30
4.40
4.50
4.60
4.70
4.80
4.90
5.00
5.10
5.20
5.30

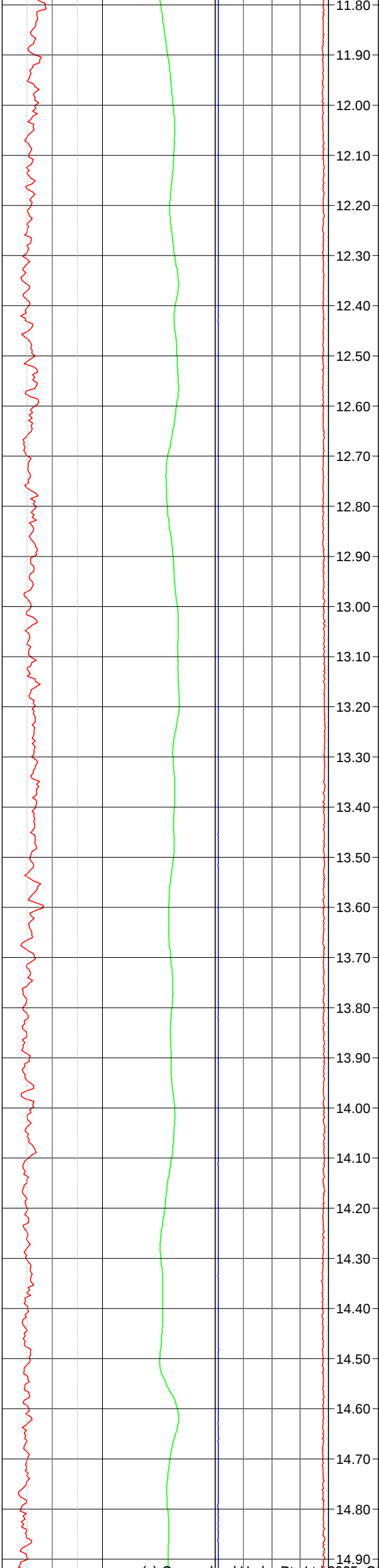


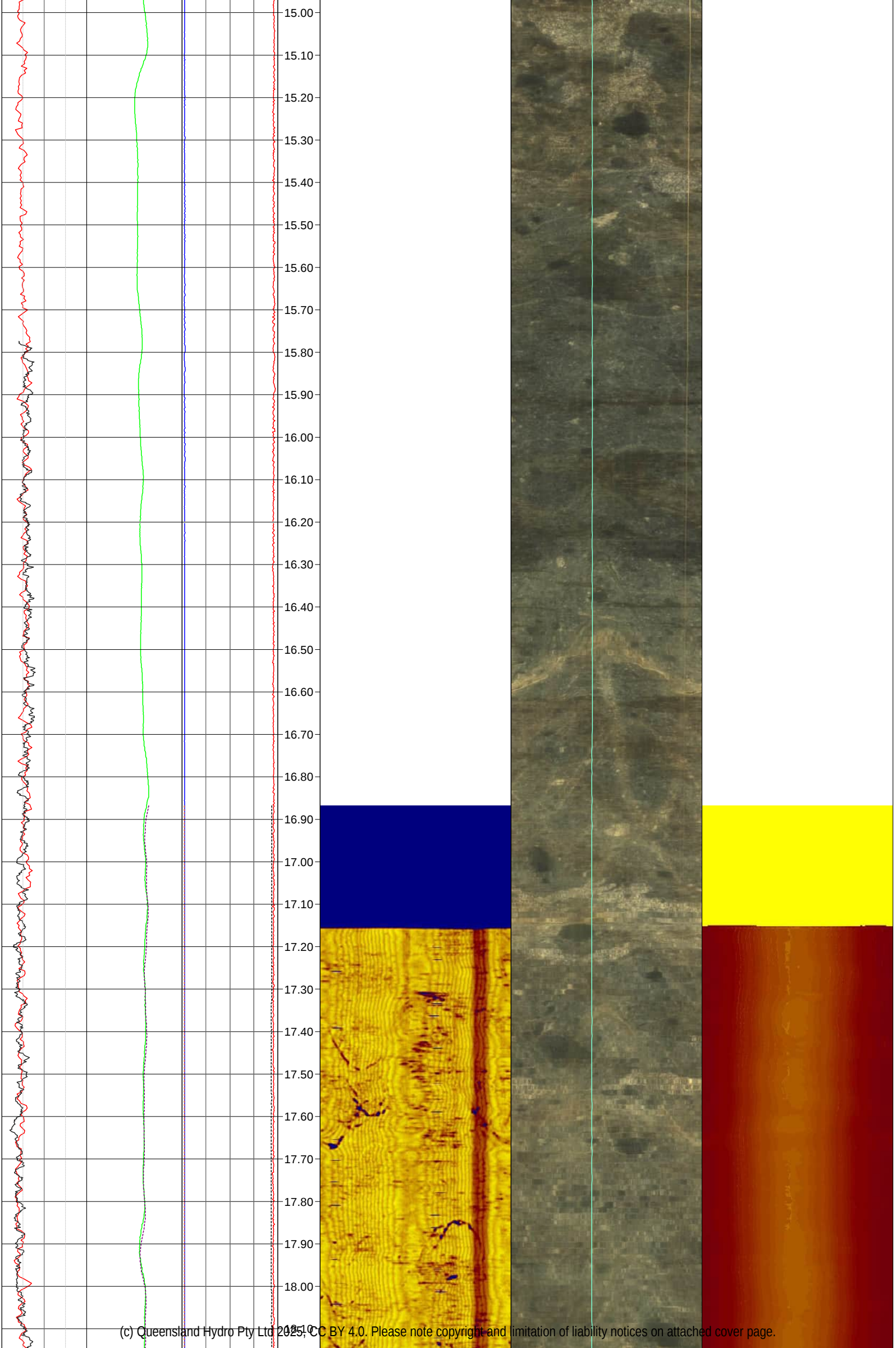


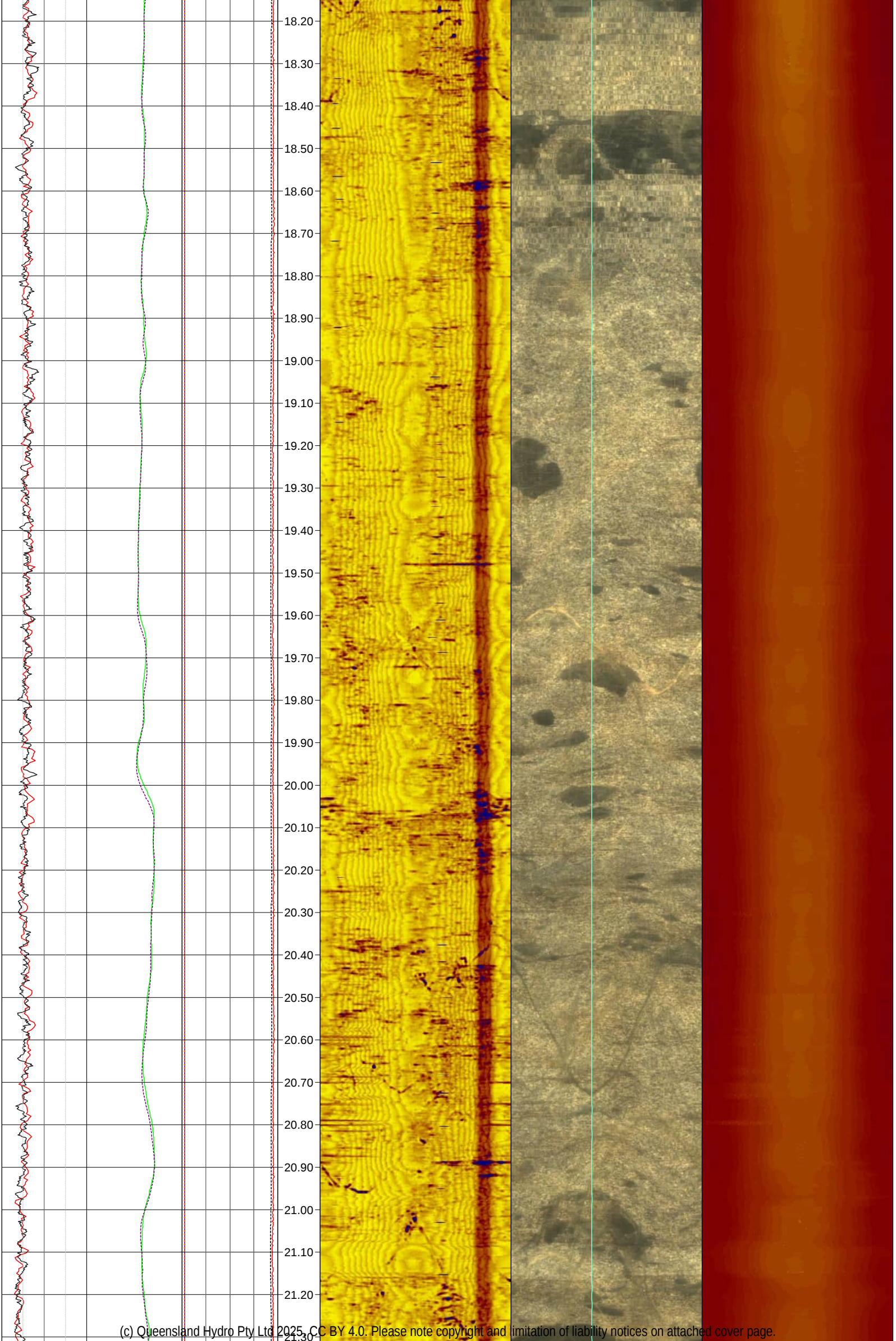
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5.80
5.90
6.00
6.10
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6.30
6.40
6.50
6.60
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8.50

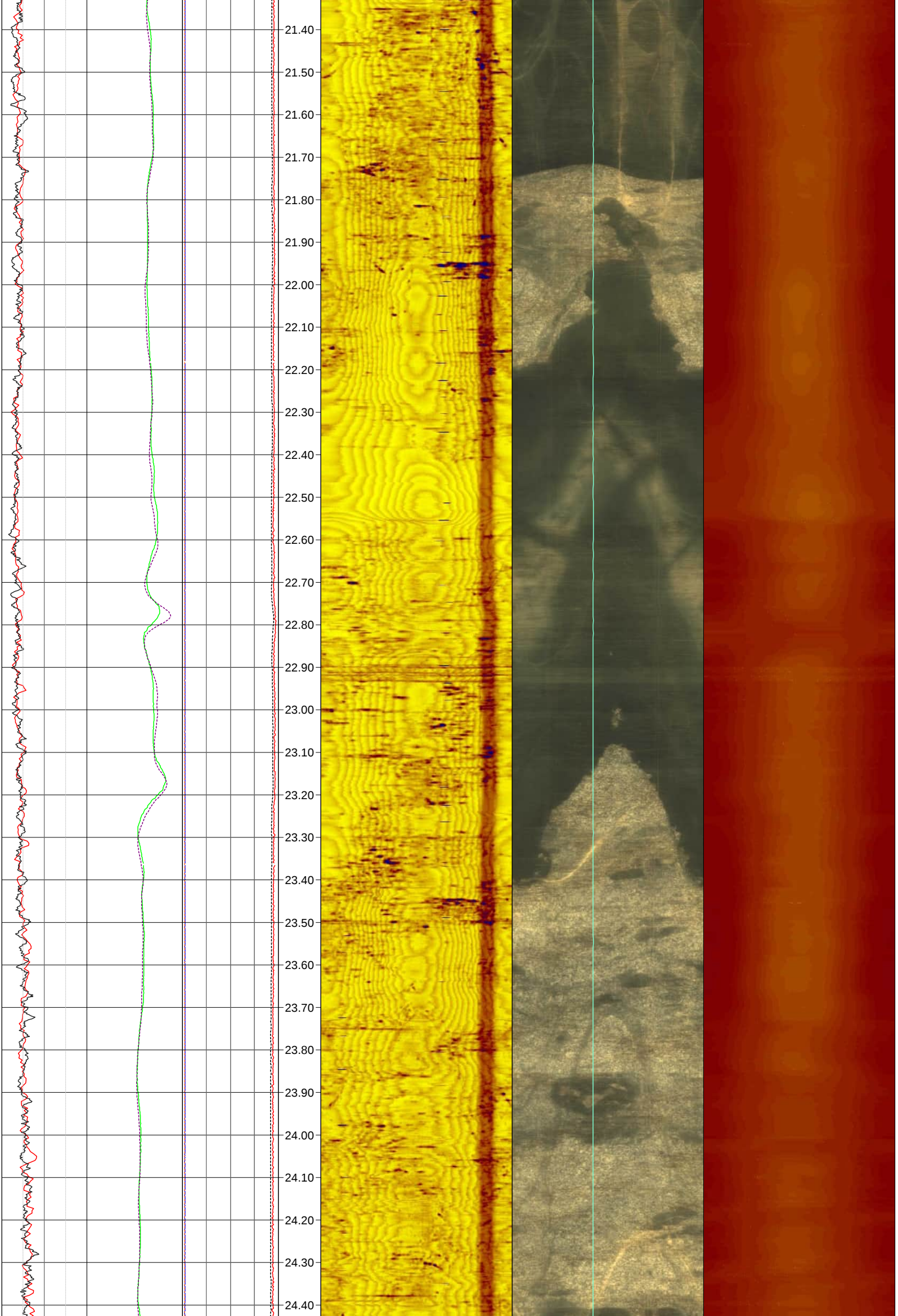


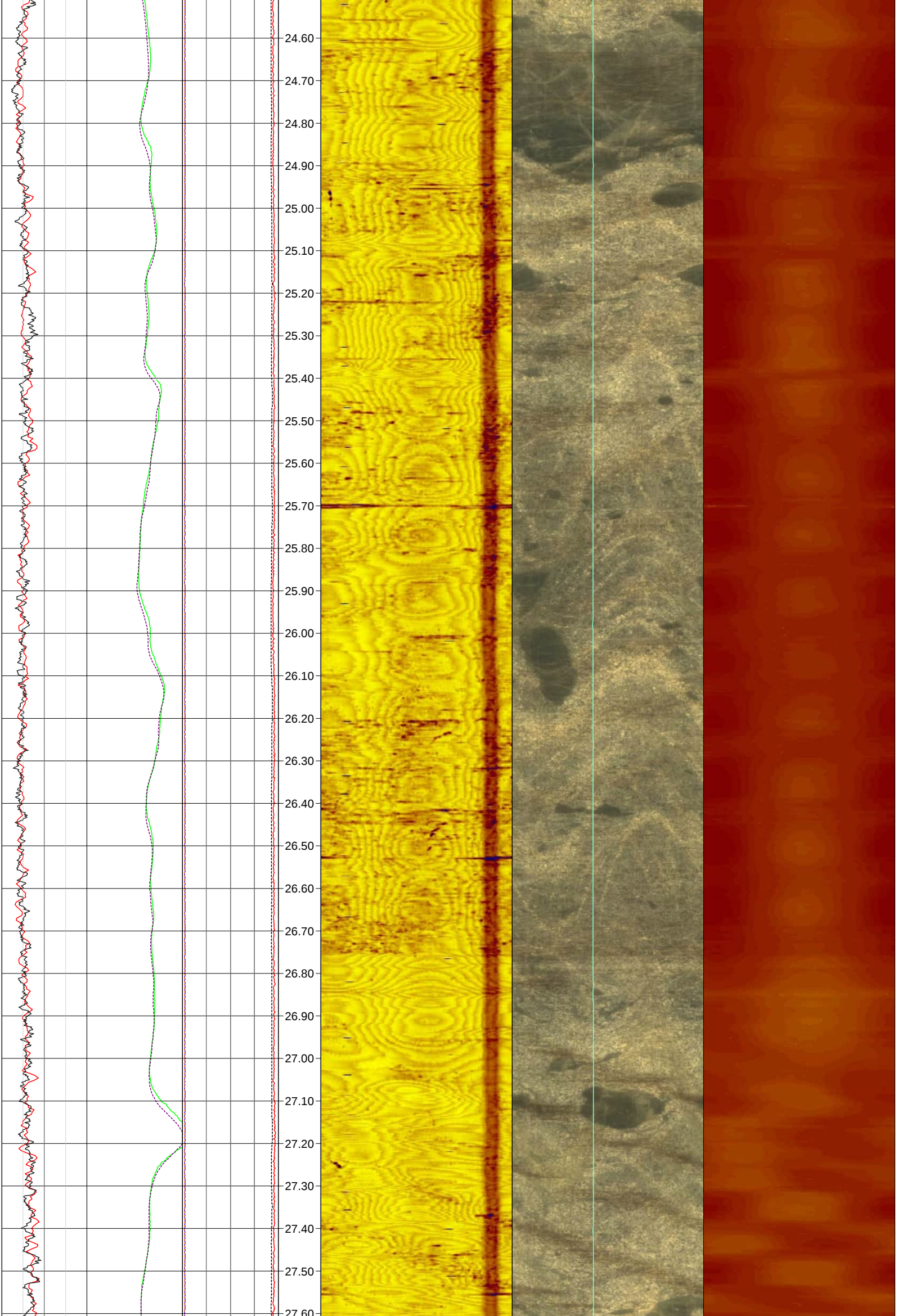


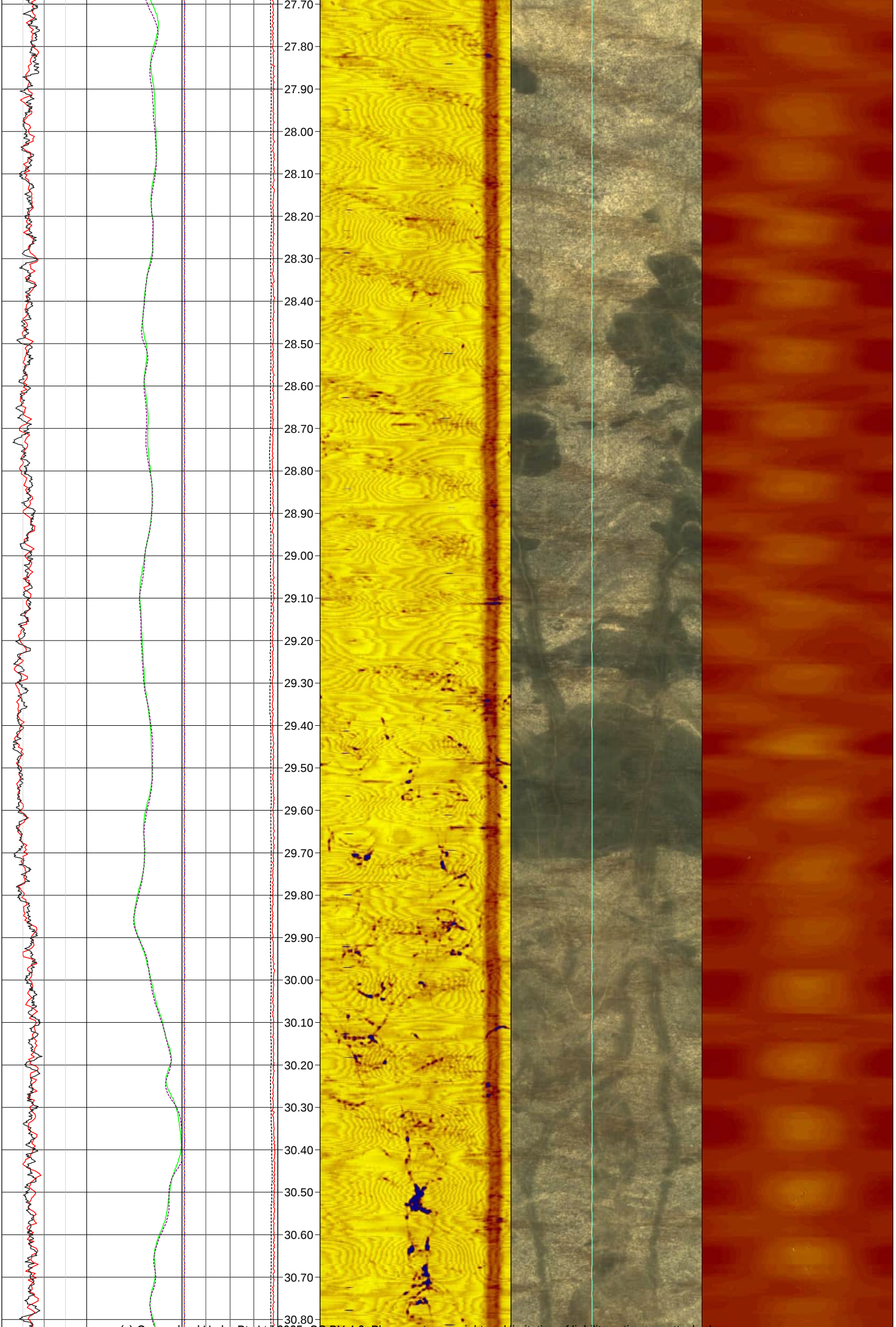


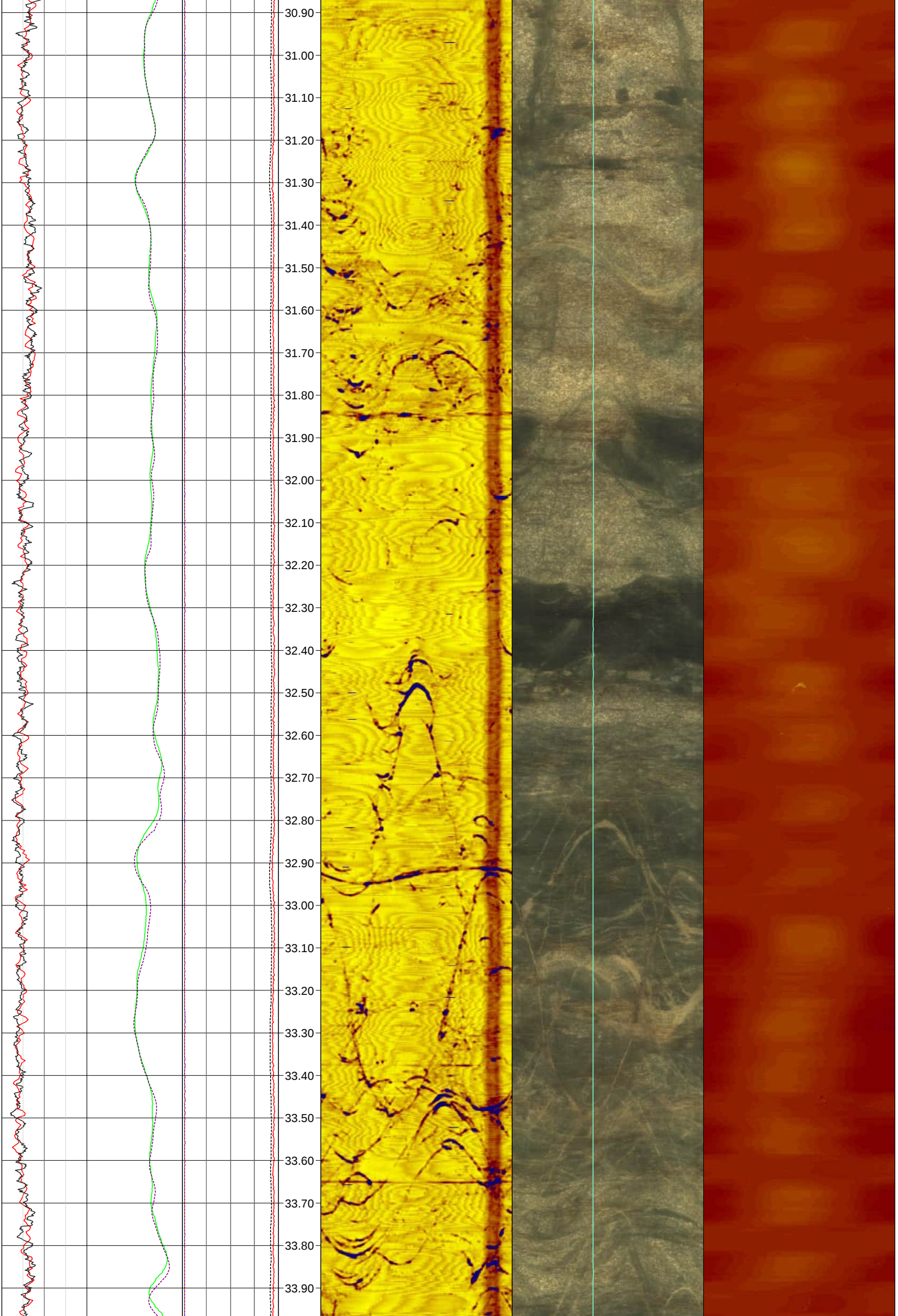


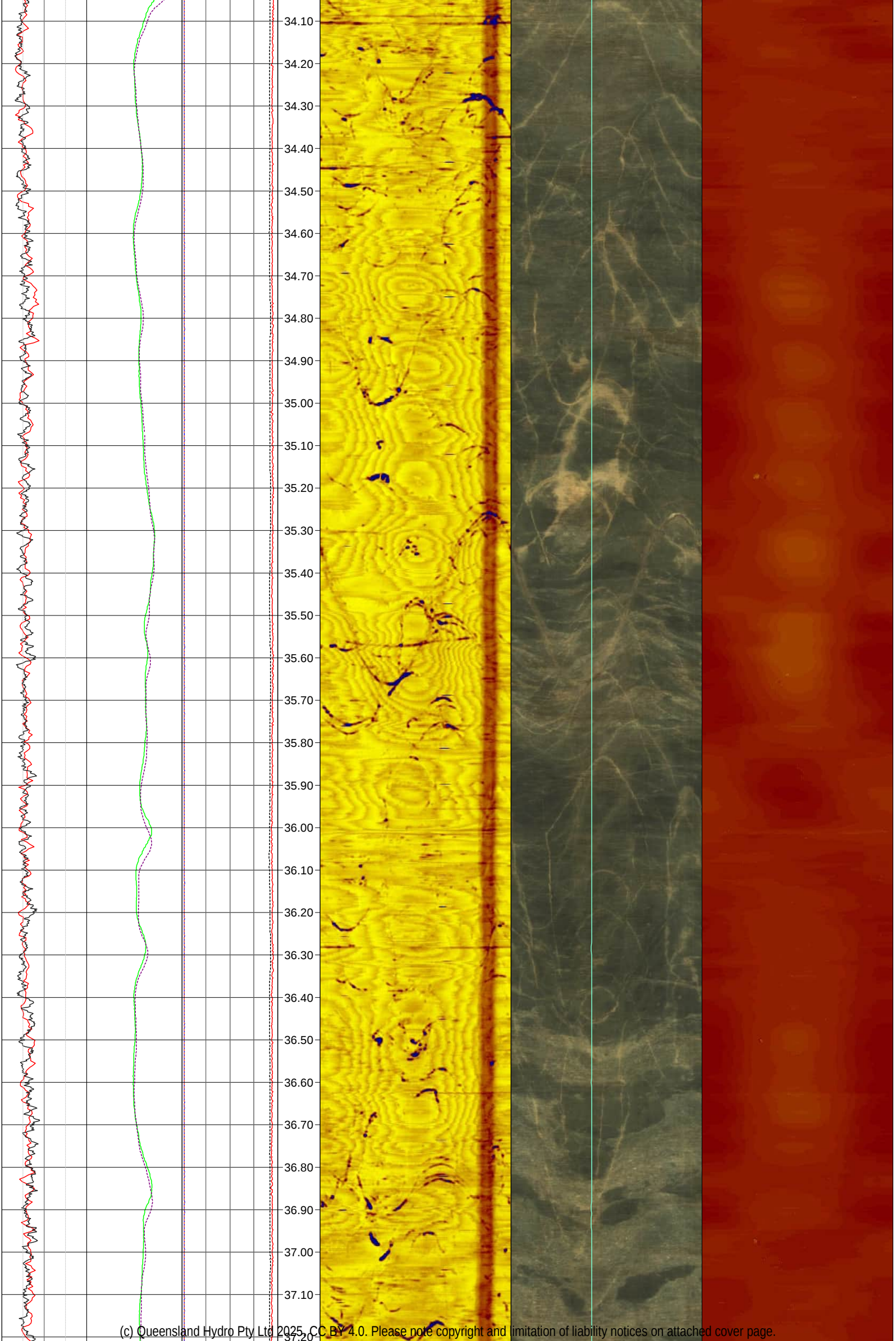


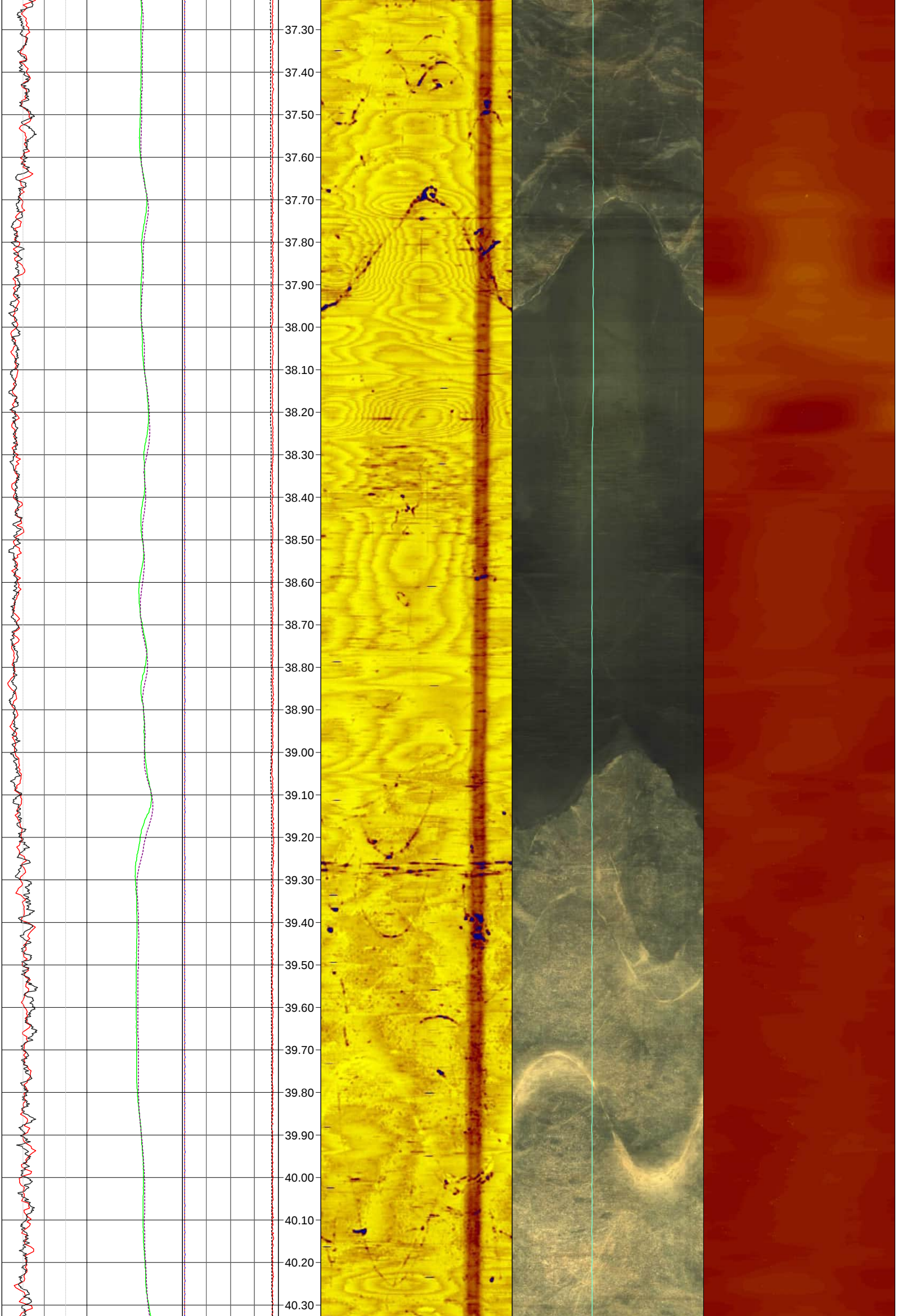


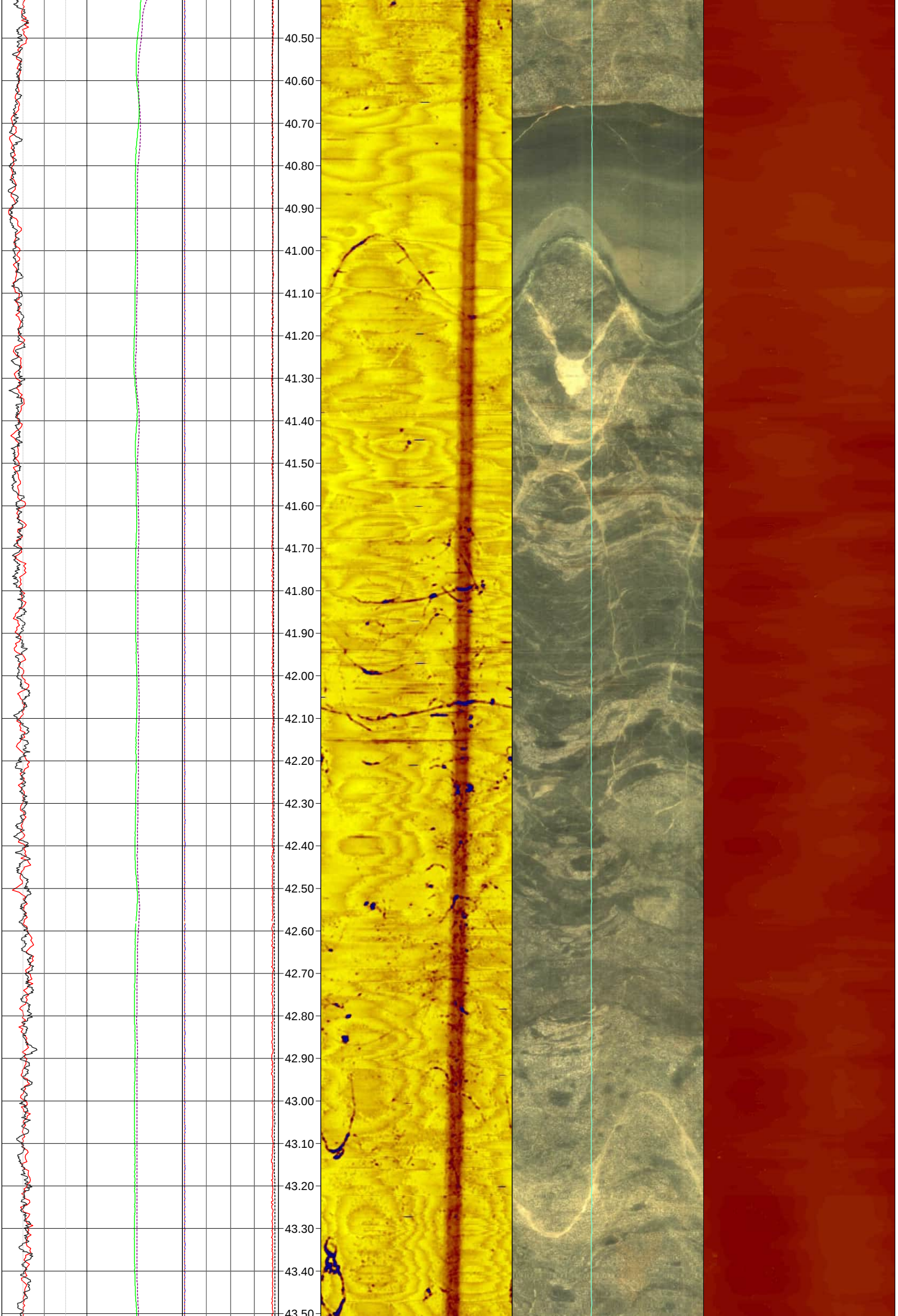


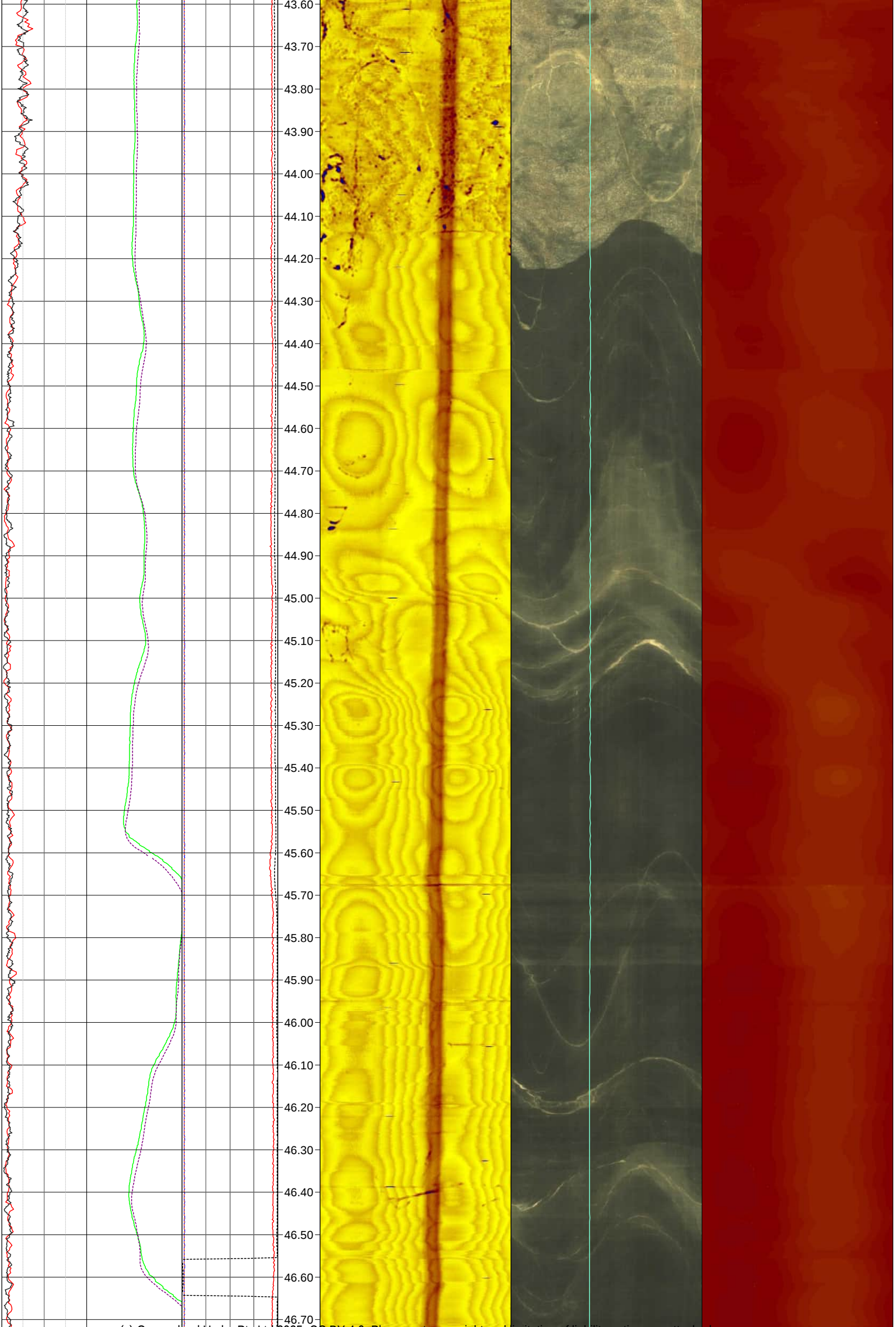


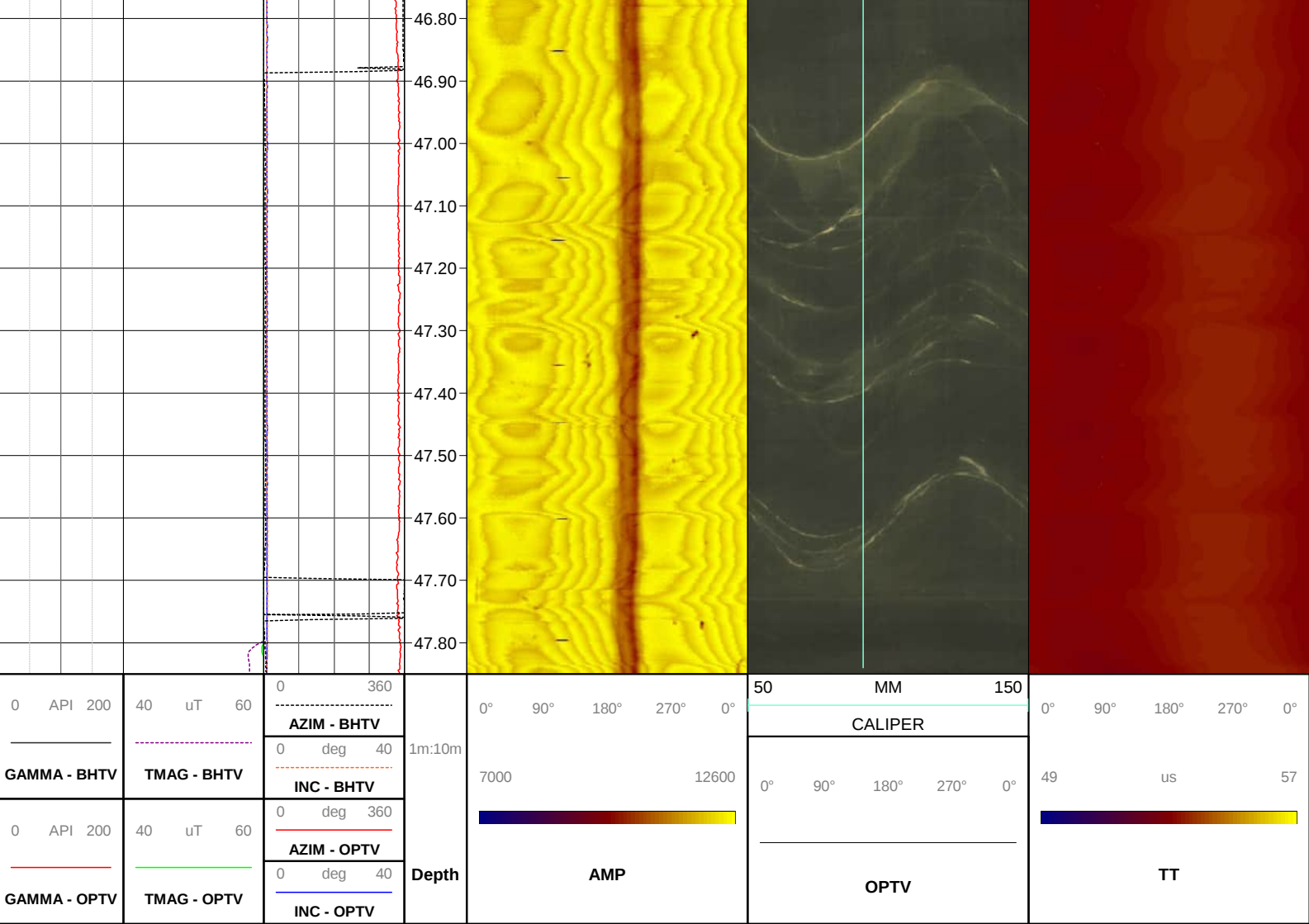












WELL BHUA_20	LOCATION EUNGELLA	DATE 13/07/23
FIELD PIONEER-BURDEKIN	DRILL DEPTH 48.0m	ENGINEER DAMON HOSKING

MULTI-RES LOG

BHUA_20

COMPANY WELL		SMEC BHUA_20		FIELD LOCATION		EUNGELLA PIONEER-BURDEKIN		STATE COUNTRY		QLD AUSTRALIA	
LOCATION: PIONEER-BURDEKIN FIELD: EUNGELLA STATE: QLD WELL: BHUA_20 COMPANY: SMEC	LOG MEASURED FROM			GL		ELEVATIONS:			OTHER SERVICES:		
	DRILLING MEASURED FROM			GL		KB			1.		
	PERMANENT DATUM					DF			2.		
	PERMANENT DATUM ELEVATION					GL			3.		
	LICENSE		SECTION		TOWNSHIP		RANGE		MAGNETIC DECLINATION 8.12deg		
DATE	13-07-2023				RECORDED BY		DTH				
TIME	10-16				WITNESSED BY						
RUN NUMBER	1				LOGGING UNIT		V013				
DEPTH-DRILLER	48.0m				RIG NUMBER						
DEPTH-LOGGER	48.07m				TOOL TYPE		6074A				
BIT SIZE	96mm				TOOL SERIAL NO.		2796				
CASING TYPE	STEEL				EASTING		659911				
CASING ID					NORTHING		7766682				
CASING BOTTOM	10.0m				SAMPLE INT.		.01m				
FLUID TYPE	0				LOG DIRECTION		U				
TRUCK CAL NO.	0.09787				FEET OR METER		M				
WATER LEVEL					SOURCE TYPE				SOURCE ID		

LOGGER COMMENTS:

1.

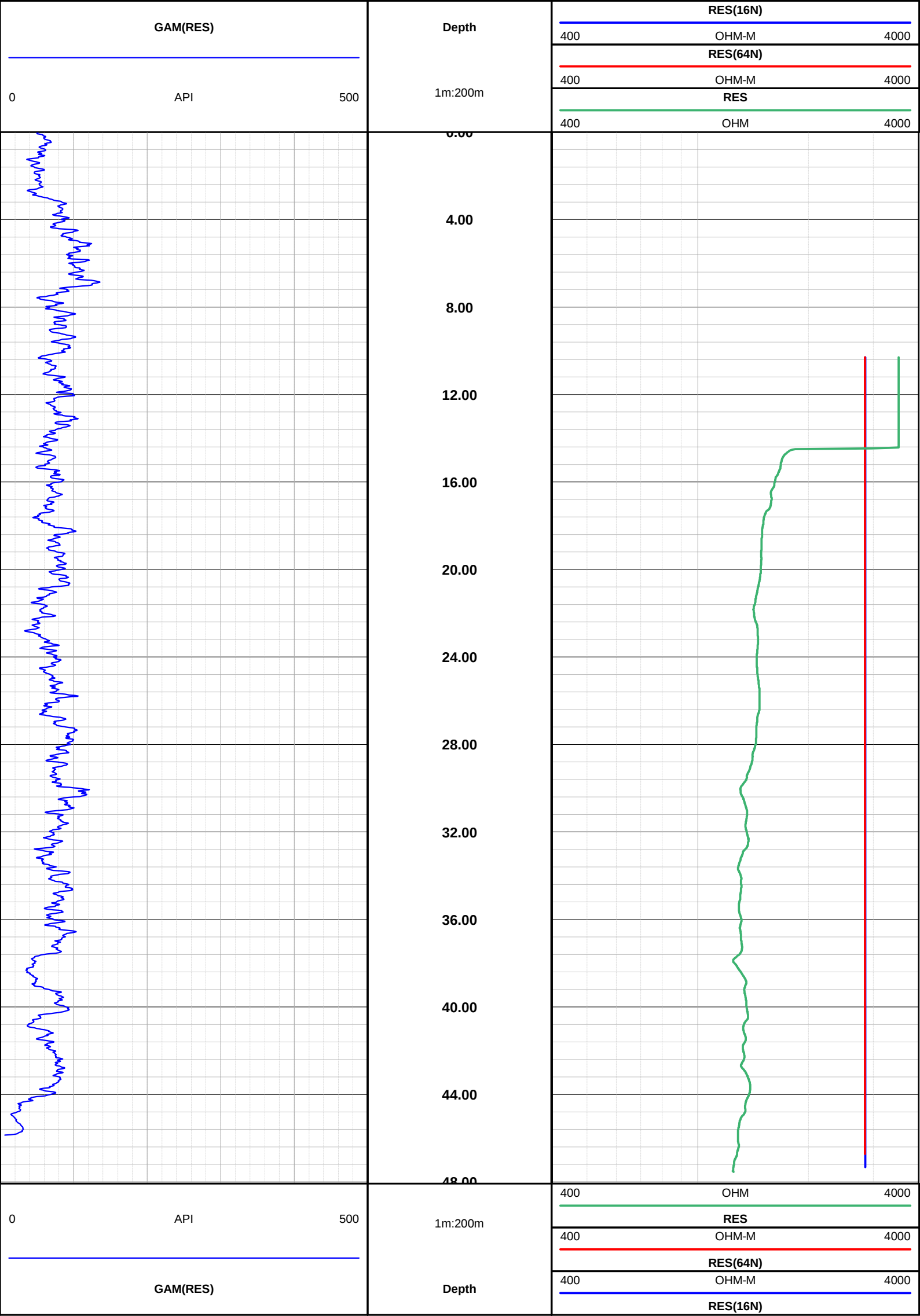
2.

3.

MNEMONICS	
GAM(RES)	NATURAL GAMMA FROM MULTI-RES TOOL
RES(16N)	16" NORMAL RESISTIVITY
RES(64N)	64" NORMAL RESISTIVITY
RES	SINGLE POINT RESISTIVITY

IMPORTANT NOTE

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VERTICALITY ANALYSIS

BHUA_20

COMPANY WELL		SMEC BHUA_20		FIELD LOCATION		EUNGELLA PIONEER-BURDEKIN		STATE COUNTRY		QLD AUSTRALIA	
LOCATION: PIONEER-BURDEKIN FIELD: EUNGELLA STATE: QLD WELL: BHUA_20 COMPANY: SMEC	PERMANENT DATUM PERMANENT DATUM ELEVATION LOG MEASURED FROM GL DRILLING MEASURED FROM GL				ELEVATIONS: KB DF GL		REMARKS: 1. 2.				
	LICENSE	SECTION	TOWNSHIP	RANGE	MAG DECL. 8.12deg						
DATE	13-07-2023				RECORDED BY		DTH				
TIME	10-40				WITNESSED BY						
RUN NUMBER	1				LOGGING UNIT		V013				
DEPTH-DRILLER	48.0m				RIG NUMBER						
DEPTH-LOGGER	47.87m				TOOL TYPE		9057A				
BIT SIZE	96mm				TOOL SERIAL NO.		361				
CASING TYPE	STEEL				EASTING		659911				
CASING OD	101mm				NORTHING		7666824				
CASING BOTTOM	10.0m				SAMPLE INT.		.01m				
FLUID TYPE	0				LOG DIRECTION		U				
TRUCK CAL NO.	0.09787				FEET OR METER		M				
WATER LEVEL	17.25				SOURCE TYPE				SOURCE ID		

DEVIATION LIST

MNEMONIC DESCRIPTORS

SANGB	SAMPLE ANGLE BEARING	NORTH	BOREHOLE NORTH DEVIATION
SANG	SAMPLE SLANT ANGLE (0 DEG = VERTICAL DOWN)	CDIST	DEVIATED CLOSURE DISTANCE
TVD	TRUE VERTICAL DEPTH	CANGB	DEVIATED CLOSURE ANGLE BEARING
EAST	BOREHOLE EAST DEVIATION		

ALL CO-ORDINATES ARE PRESENTED ORIENTED TO TRUE NORTH MAGNETIC DECLINATION 8.12deg

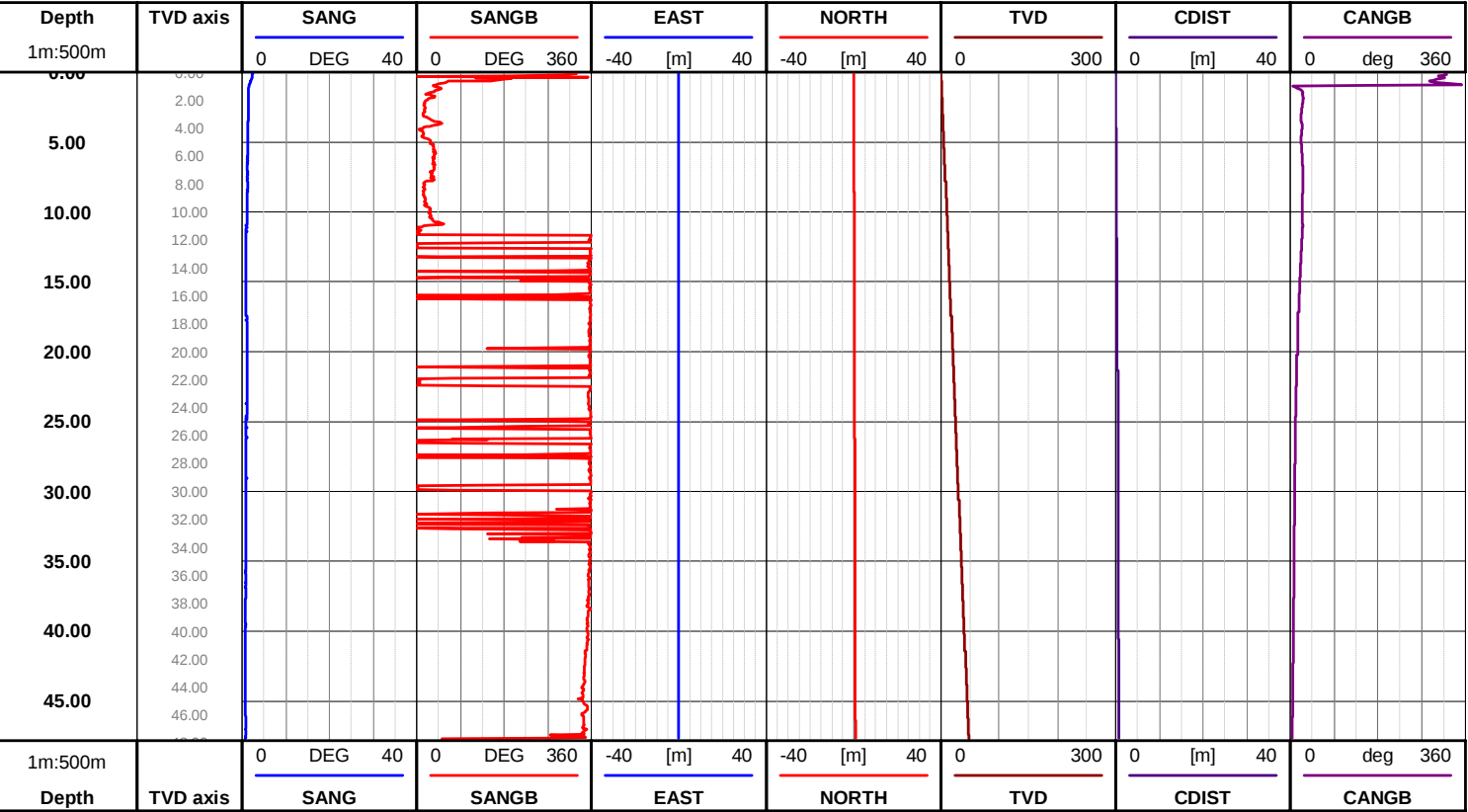
Depth	SANGB	SANG	EAST	NORTH	CDIST	CANGB	TVD
m	DEG	DEG	[m]	[m]	[m]	deg	
0.00	317.835	2.50167	-999.25	-999.25	-999.25	-999.25	-999.25
1.00	31.5976	1.55533	0.000777482	0.00914357	0.00917656	4.8602	0.999303
2.00	22.4396	1.42231	0.0147377	0.0295998	0.0330658	26.4687	1.99899
3.00	13.1754	1.39871	0.0217896	0.0533931	0.0576681	22.2002	2.99868
4.00	12.702	1.3343	0.0329352	0.0735546	0.0805916	24.1212	3.9984
5.00	29.2266	1.27916	0.0388341	0.0953966	0.102998	22.1503	4.99814
6.00	35.8755	1.20069	0.0508849	0.113147	0.124062	24.2147	5.99791
7.00	34.1743	1.19178	0.0627205	0.130342	0.144648	25.6968	6.99769
8.00	15.0029	1.21607	0.0725748	0.148612	0.165386	26.0287	7.99747
9.00	17.524	1.17038	0.0781098	0.168813	0.186008	24.83	8.99725
10.00	29.3066	1.1641	0.085746	0.187904	0.206544	24.5285	9.99704
11.00	5.3755	1.00277	0.096469	0.204122	0.22577	25.2957	10.9968
12.00	353.935	1.0263	0.0969513	0.221916	0.24217	23.5997	11.9967
13.00	358.145	1.03272	0.0966492	0.239761	0.258508	21.9547	12.9965
14.00	356.04	1.00872	0.0954613	0.257421	0.274551	20.3467	13.9964
15.00	358.641	1.0037	0.0948057	0.275126	0.291002	19.0135	14.9962
16.00	357.031	1.01128	0.094001	0.29251	0.307243	17.8153	15.9961
17.00	356.685	1.01832	0.0934276	0.310242	0.324004	16.7594	16.9959
18.00	355.551	1.02659	0.0929571	0.328533	0.341535	15.7035	17.9957

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19.00	359.561	1.06686	0.0912054	0.347	0.358786	14.7265	18.9956
20.00	355.883	1.07025	0.0903598	0.365642	0.376641	13.8812	19.9954
21.00	358.452	1.06944	0.0892711	0.38433	0.394562	13.0766	20.9952
22.00	8.78305	1.05111	0.0886305	0.40286	0.412495	12.4076	21.995
23.00	353.502	1.04586	0.0885084	0.421208	0.430406	11.8669	22.9949
24.00	355.917	1.04721	0.0866043	0.4394	0.447854	11.1499	23.9947
25.00	358.638	1.03582	0.0859884	0.45759	0.465599	10.6427	24.9945
26.00	358.59	1.02671	0.085238	0.475599	0.483177	10.1608	25.9944
27.00	359.522	1.0304	0.0849085	0.493608	0.500858	9.76027	26.9942
28.00	355.263	1.01903	0.0844111	0.511395	0.518314	9.37276	27.9941
29.00	355.46	1.04281	0.0835508	0.529167	0.535723	8.97242	28.9939
30.00	359.877	1.01997	0.0833958	0.546998	0.553319	8.66861	29.9937
31.00	358.38	1.01189	0.0826321	0.564618	0.570632	8.32616	30.9936
32.00	0.613541	1.00274	0.0822275	0.582129	0.587907	8.04002	31.9934
33.00	359.873	0.986147	0.0816717	0.599487	0.605025	7.75799	32.9933
34.00	357.911	0.918977	0.080936	0.615843	0.621139	7.48708	33.9931
35.00	355.837	0.902116	0.0800021	0.631463	0.636511	7.22051	34.993
36.00	352.438	0.881581	0.0787635	0.64688	0.651658	6.94211	35.9929
37.00	355.567	0.891111	0.0772574	0.662254	0.666745	6.65396	36.9928
38.00	354.888	0.869015	0.0756168	0.67756	0.681766	6.36796	37.9927
39.00	350.959	0.874385	0.0737754	0.692611	0.69653	6.08009	38.9925
40.00	350.623	0.871504	0.0714311	0.707709	0.711305	5.76351	39.9924
41.00	350.01	0.868321	0.0692272	0.722675	0.725983	5.47184	40.9923
42.00	347.403	0.84623	0.0663153	0.737229	0.740206	5.14004	41.9922
43.00	344.464	0.857527	0.0627461	0.75163	0.754245	4.77199	42.9921
44.00	339.447	0.846944	0.0588247	0.76595	0.768206	4.39167	43.992
45.00	343.011	0.867009	0.0540569	0.779981	0.781852	3.96456	44.9919
46.00	339.072	0.867722	0.0506657	0.794408	0.796022	3.64926	45.9918
47.00	346.837	0.879419	0.0463057	0.809444	0.810768	3.27414	46.9916

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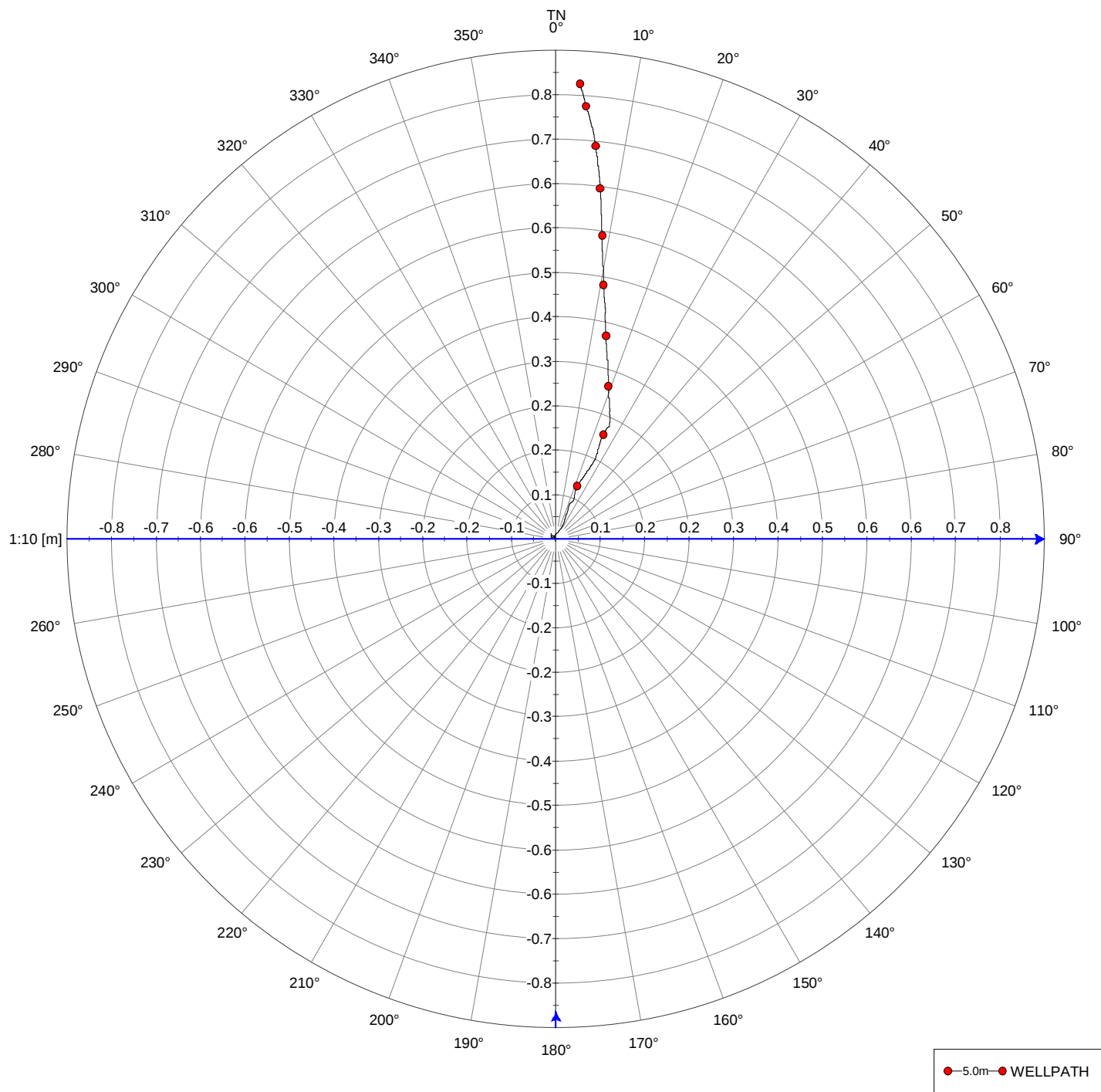


NOTES ON VERTICALITY PLOTS

1. The following verticality plots are scaled automatically to obtain the best visual effect within the default page size.

2. All co-ordinates are presented oriented to True North.

DEVIATION PLOT



Depth [m] 1.229
Holtz [m] 1.11

WELLPATH

