

Company: Noble Energy Inc

Well: Gruen 22-33

Field: Wattenberg

County: Weld State: Colorado

## Slim Cement Mapping Tool

County:	Weld				
Field:	Wattenberg				
Location:	SHL: 652' FSL x 660' FWL				
Well:	Gruen 22-33				
Company:	Noble Energy Inc				
Logging Date	Location:	SHL: 652' FSL x 660' FWL	Elev.:	K.B.	4729.00 ft
	Permanent Datum:			G.L.	4717.00 ft
	Log Measured From:			D.F.	4728.00 ft
	Drilling Measured From:				
	API Serial No.				
Run Number	05-123-22023	Section:	22	Township:	6N
Depth Driller					Range:
Schlumberger Depth					64W
Bottom Log Interval	7097.00 ft				
Top Log Interval	983.00 ft				
Casing Fluid Type	13.00 ft				
Salinity	Water				
Density					
Fluid Level	8.4 lbm/gal				
BIT/CASING/TUBING STRING	8.00 ft				
Bit Size	7.83 in				
From	792.00 ft				
To	7097.00 ft				
Casing/Tubing Size	4.5 in				
Weight	11.6 lbm/ft				
Grade	N/A				
From	0.00 ft				
To	7086.00 ft				
Max Recorded Temperatures	75 degF				
Logger on Bottom	20-Aug-2019	13:35:00			
Unit Number	401	Ft Morgan			
Recorded By	Avery Becker				
Witnessed By	Eric Peterson				

## Disclaimer

THE USE OF AND RELIANCE UPON THIS RECORDED-DATA BY THE HEREIN NAMED COMPANY (AND ANY OF ITS AFFILIATES, PARTNERS, REPRESENTATIVES, AGENTS, CONSULTANTS AND EMPLOYEES) IS SUBJECT TO THE TERMS AND CONDITIONS AGREED UPON BETWEEN SCHLUMBERGER AND THE COMPANY, INCLUDING: (a) RESTRICTIONS ON USE OF THE RECORDED-DATA; (b) DISCLAIMERS AND WAIVERS OF WARRANTIES AND REPRESENTATIONS REGARDING COMPANY'S USE AND RELIANCE UPON THE RECORDED-DATA; AND (c) CUSTOMER'S FULL AND SOLE RESPONSIBILITY FOR ANY INFERENCE DRAWN OR DECISION MADE IN CONNECTION WITH THE USE OF THIS RECORDED-DATA.

## Contents

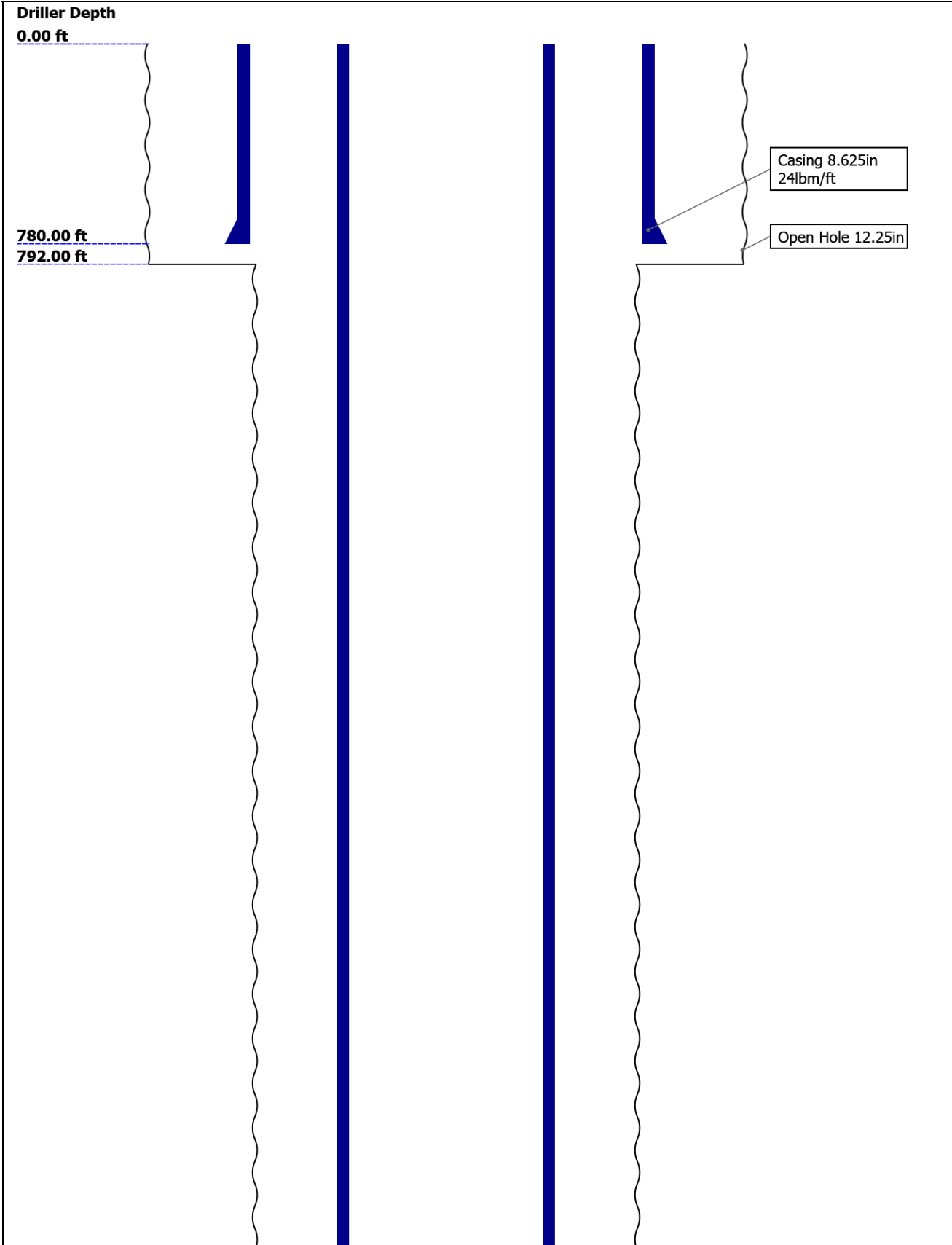
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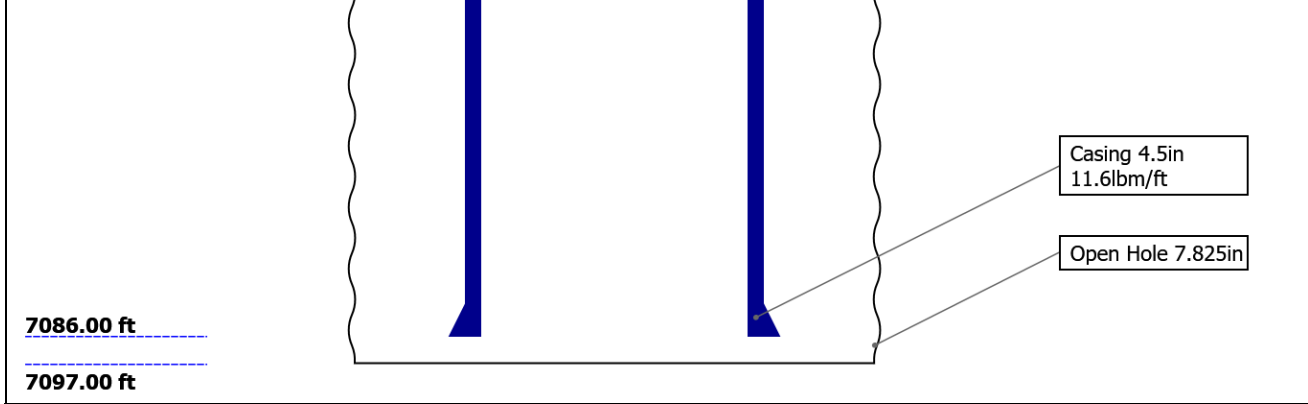
9.4 Log ( SCMT\_VDL\_Image )

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10. Tail

Well Sketch



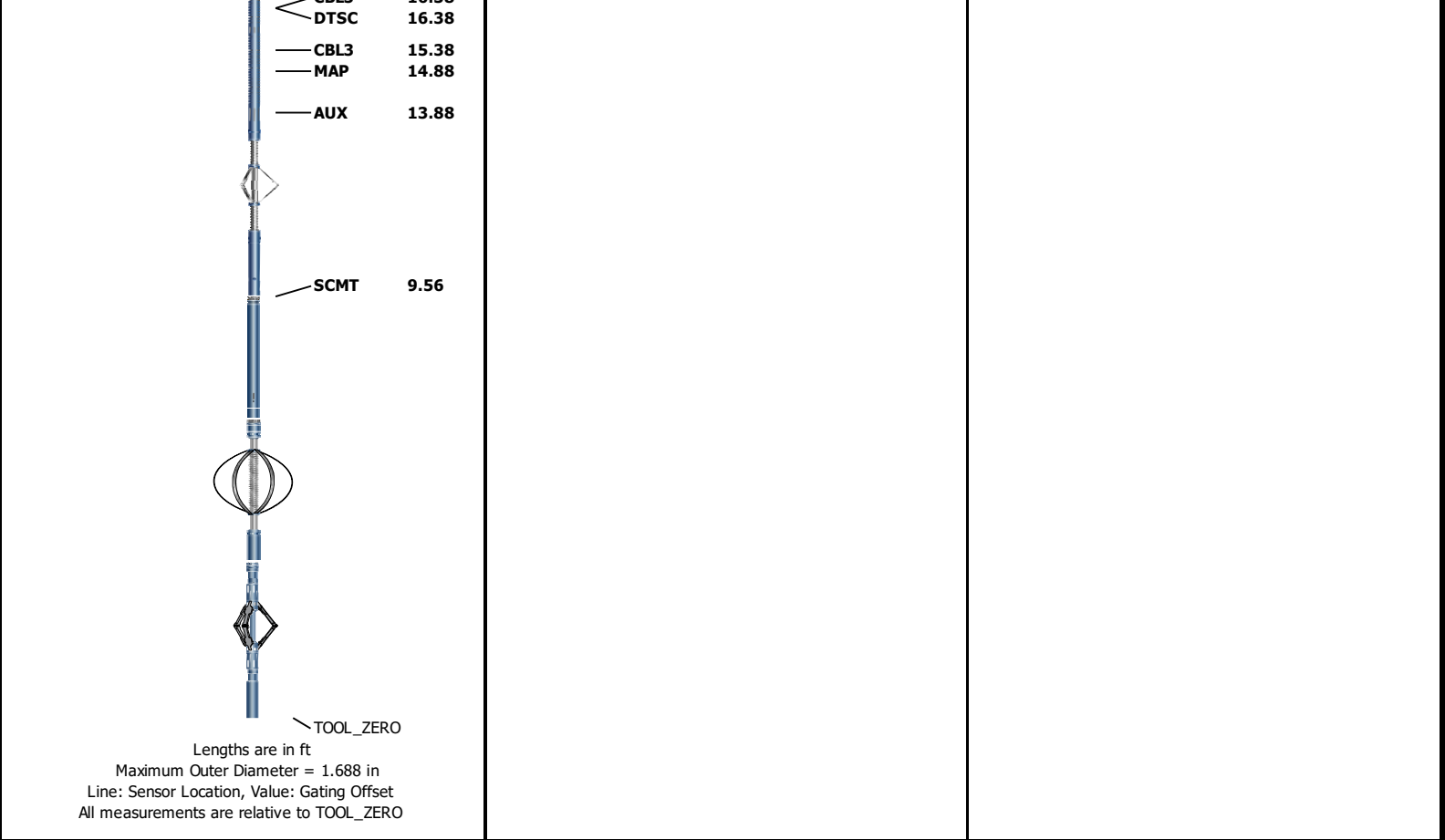


Borehole Size/Casing/Tubing Record

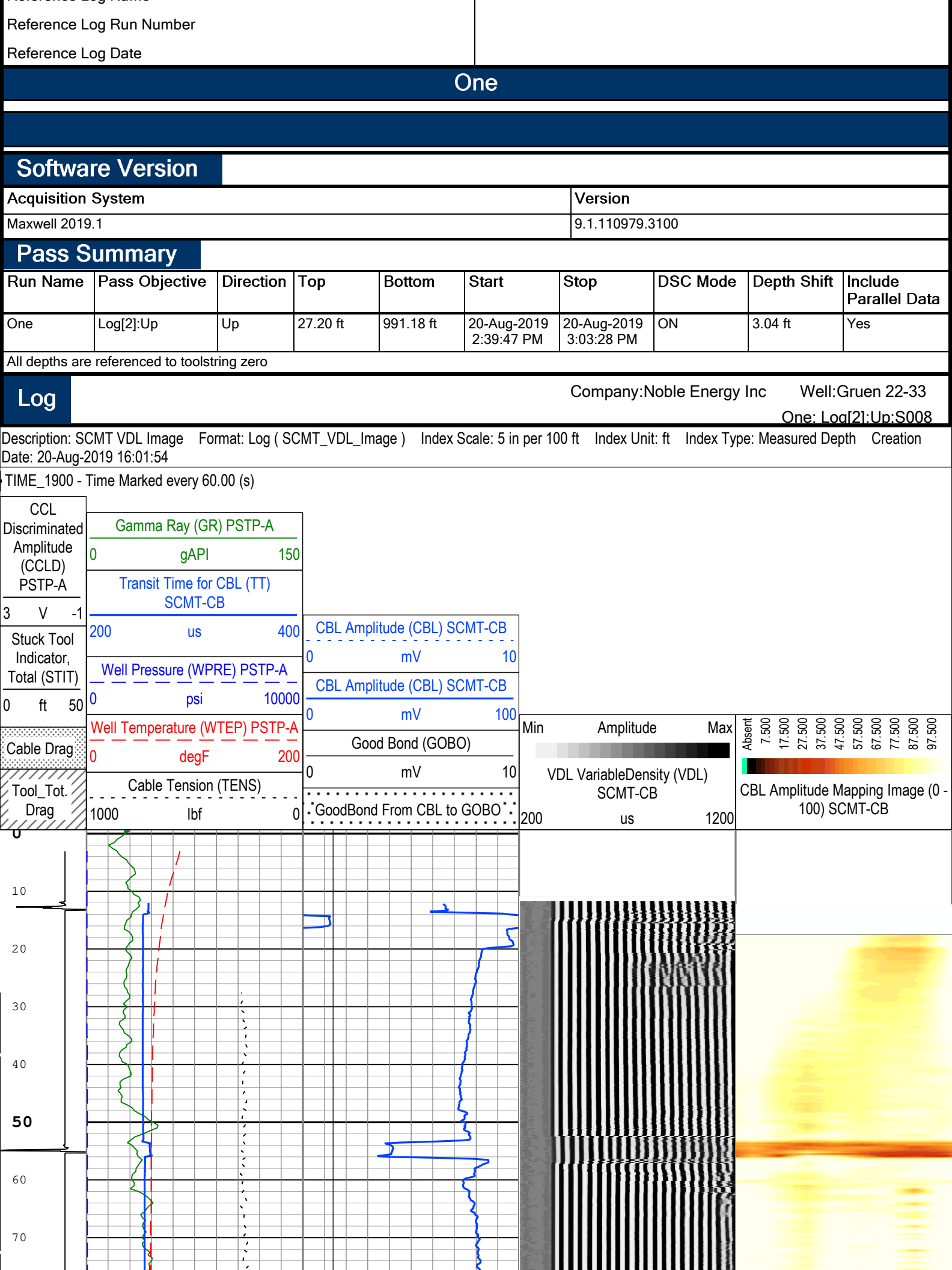
Bit						
Bit Size ( in )	12.25	7.825				
Top Driller ( ft )	0	792				
Top Logger ( ft )	0	792				
Bottom Driller ( ft )	792	7097				
Bottom Logger ( ft )	792	7097				
Casing						
Size ( in )	8.625	4.5				
Weight ( lbm/ft )	24	11.6				
Inner Diameter ( in )	8.097	4				
Grade	N/A	N/A				
Top Driller ( ft )	0	0				
Top Logger ( ft )	0	0				
Bottom Driller ( ft )	780	7086				
Bottom Logger ( ft )	780	7086				

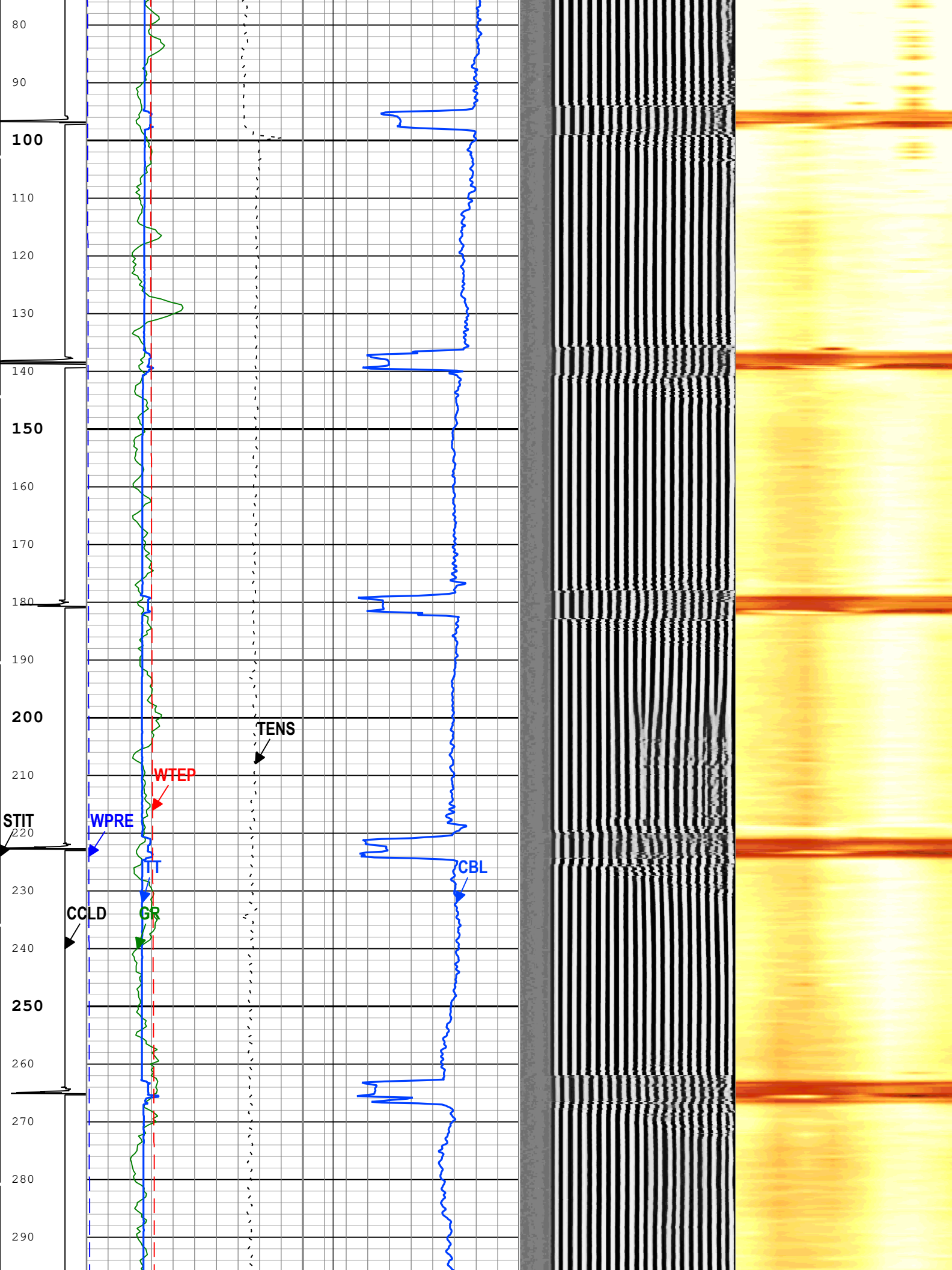
Remarks and Equipment Summary

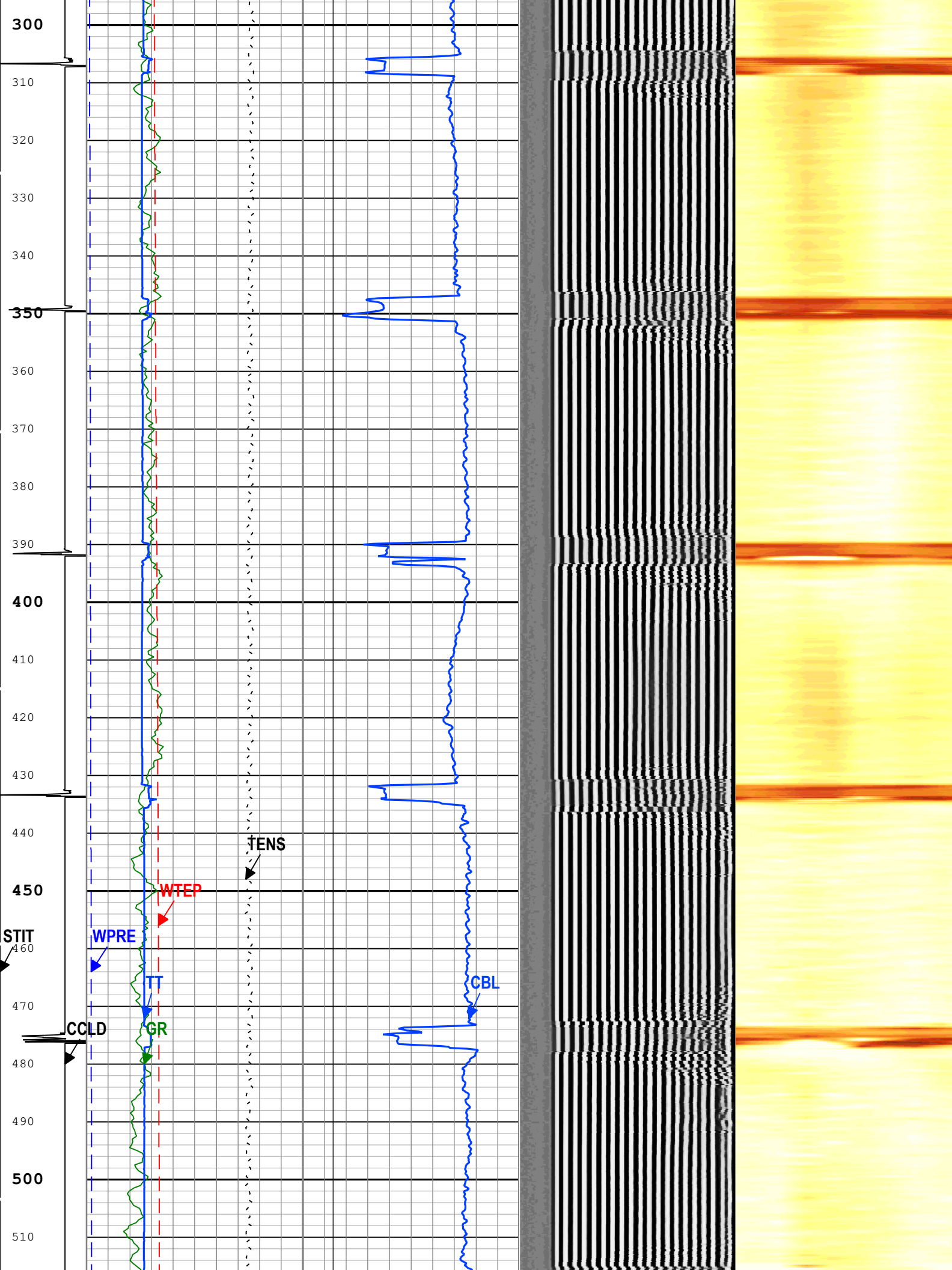
One: Toolstring				One: Remarks	
Equip name	Length	MP name	Offset	Toolstring run as per tool sketch	
PEH-EF	34.32			Casing cut at 982 ft	
				Log recorded by Avery Becker	
AH-38	31.96				
PSTP-A:37	31.68	GR	27.97		
63		PSTC	27.68		
PSC-A		PSTC To	0.00		
PSTC-A		ol String			
PBMS-A:37		Bottom			
63		Tempera	24.89		
Sapphire 10		ture			
kPSI		Sapphire	24.78		
		Pressur			
		e			
		CCL	24.16		
		PBMS	23.41		
SCMT-CB:	23.41				
8258					
SECH-CA:8					
088					
SCMC-CA:					
8089					
SCMS-CB:8					
258					
SCMX-CA:8					
213					
AH-278					
TTG-C:1704		DT	17.88		
CMIR-AG					
		CBL 5	16.38		

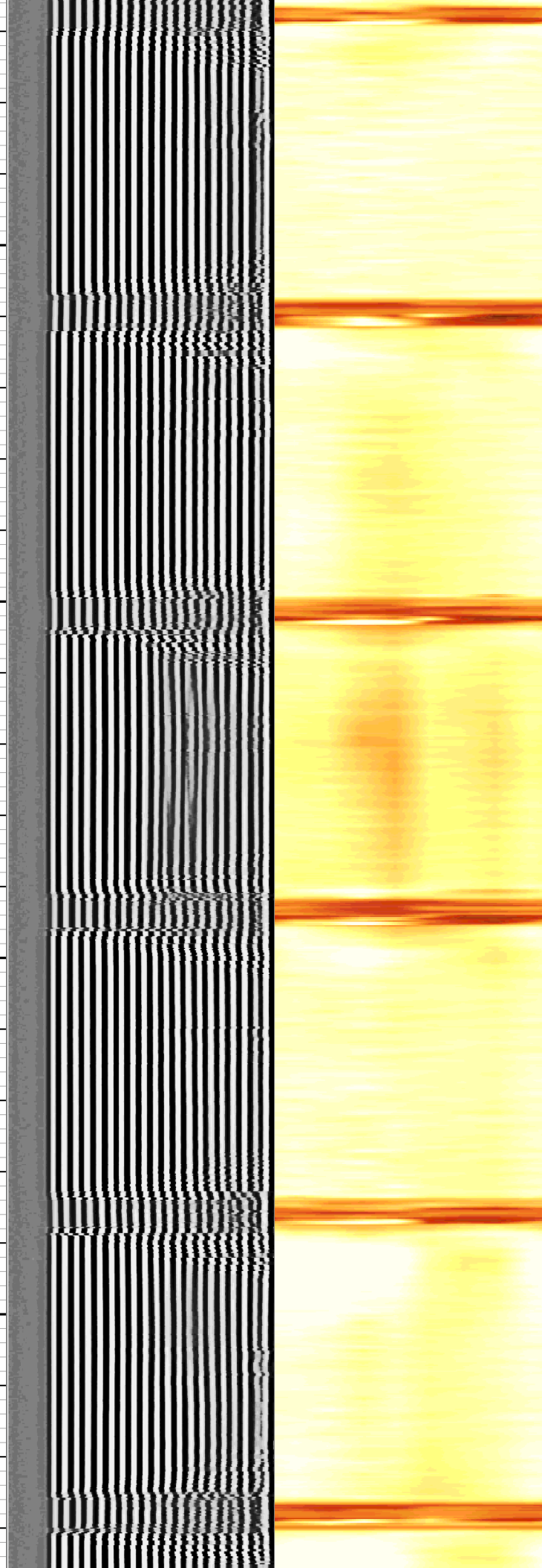
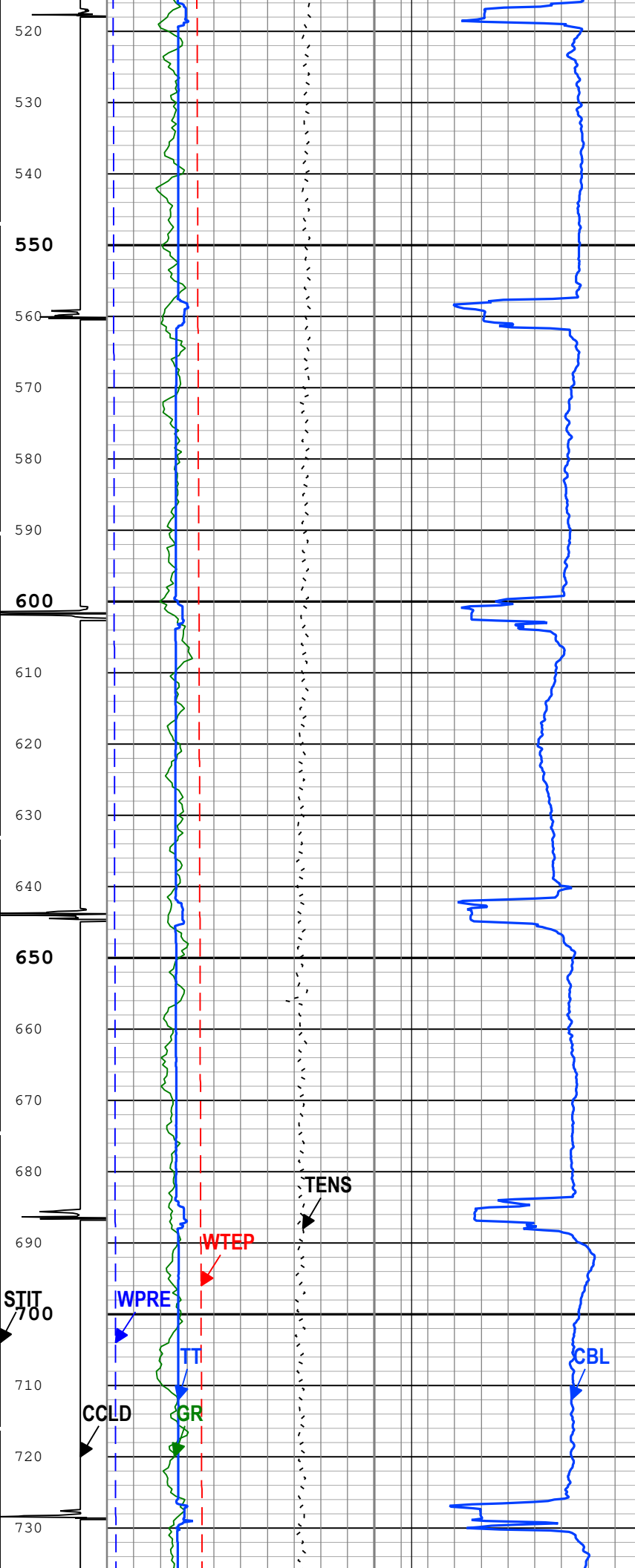


Depth Summary			
	One		
Depth Measuring Device			
Type	IDW-B		
Serial Number			
Calibration Date			
Calibrator Serial Number			
Calibration Cable Type			
Wheel Correction 1	0		
Wheel Correction 2	0		
Tension Device			
Type	CMTD-B/A		
Serial Number			
Calibration Date			
Calibrator Serial Number			
Number of Calibration Points	0		
Logging Cable			
Type	1-25ZA-XXS		
Serial Number			
Length	12000.00 ft		
Conveyance Type	Wireline		
Rig Type			
One:Depth Control Parameters		Depth Control Remarks	
Log Sequence	Subsequent Log In the Well	Log correlated to perforating log	
Reference Log Name			

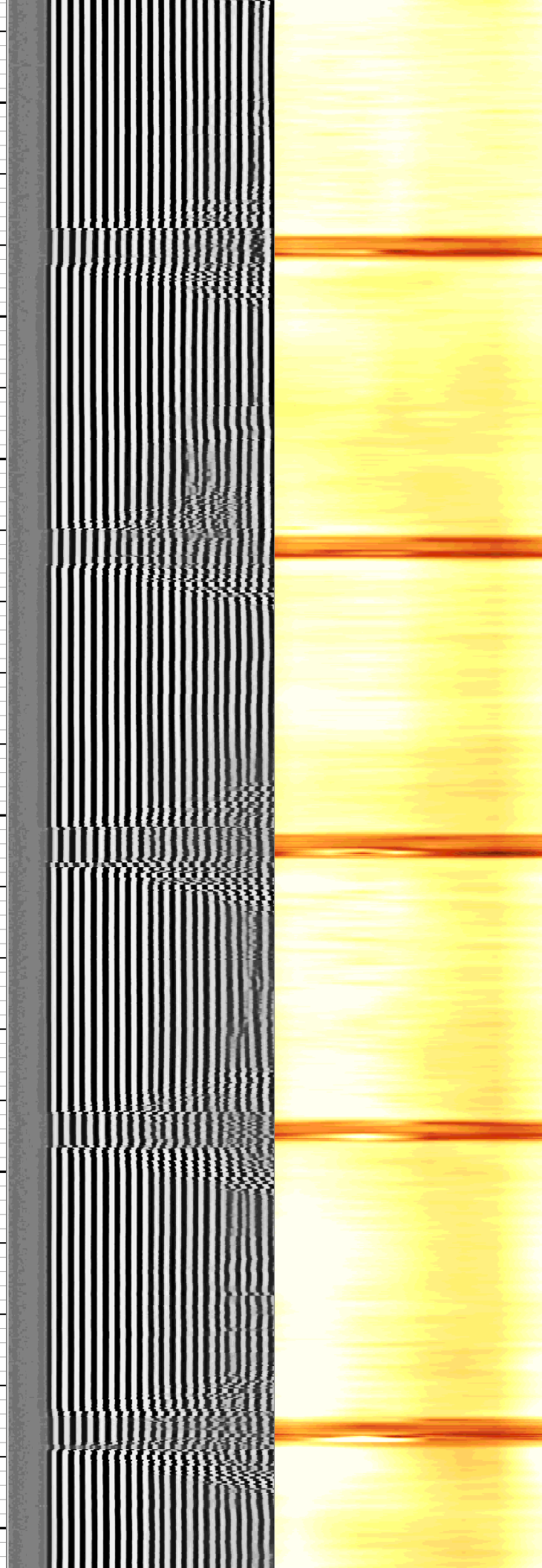
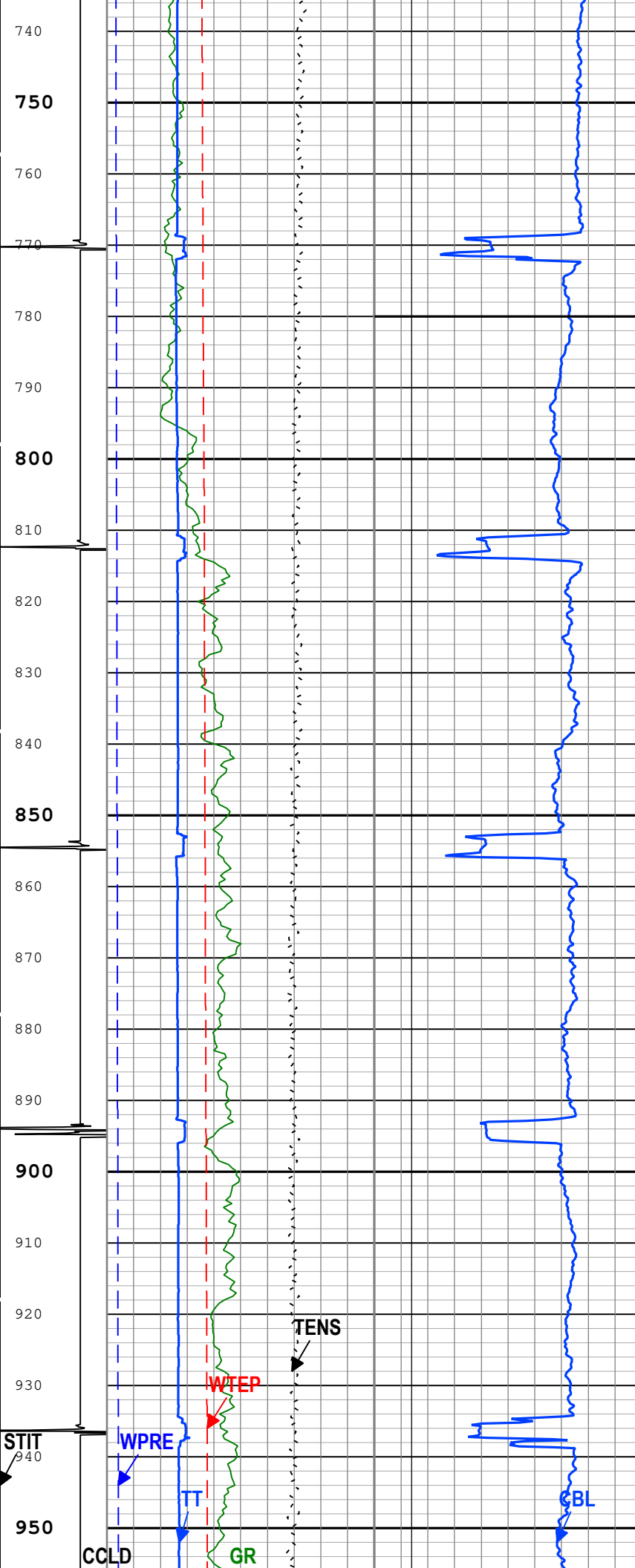


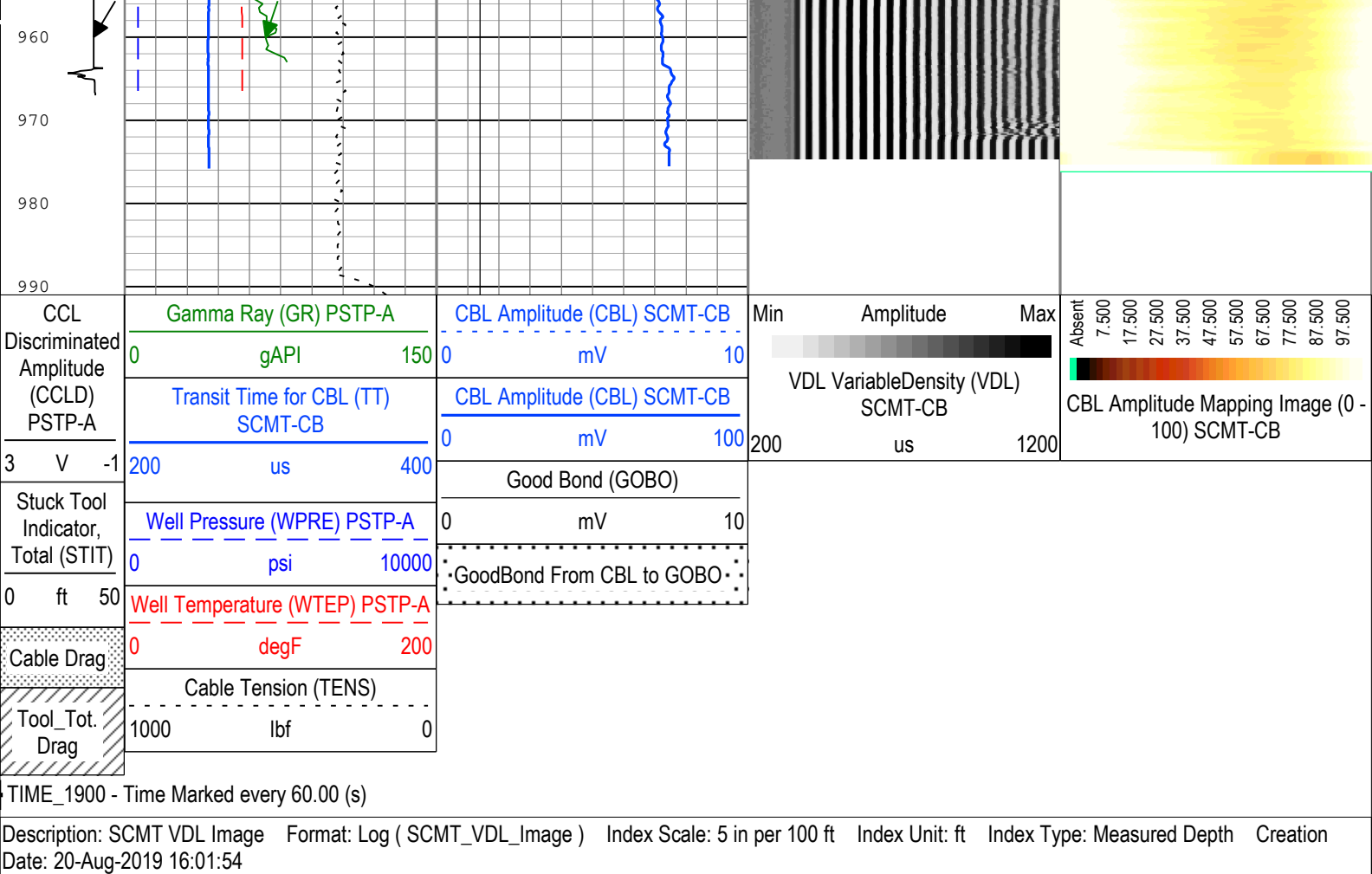












Description: SCMT VDL Image Format: Log ( SCMT\_VDL\_Image ) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 20-Aug-2019 16:01:54

Channel Processing Parameters				
One: Parameters				
Parameter	Description	Tool	Value	Unit
BHT	Bottom Hole Temperature	Borehole	75	degF
CB3G	SCMT CBL 3 ft Peak Detection T0_Delay and Noise Gate	SCMT-CB	241.18	us
CBLG	CBL Gate Width	SCMT-CB	30	us
CBRA	CBL LQC Reference Amplitude in Free Pipe	SCMT-CB	80	mV
THNO	Nominal Casing Thickness - Zoned along logger depths	WLSESSION	0.25	in
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFD	Drilling Fluid Density	Borehole	8.4	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	206	us/ft
FCF	CBL Fluid Compensation Factor	SCMT-CB	1.07	
GOBO_CURR	Good Bond in Arbitrary Cement	SCMT-CB	1.4	mV
GTSE	Generalized Temperature Selection, from Measured or Computed Temperature	Borehole	WTEP	
MAPG	SCMT MAP Peak Detection T0_Delay and Noise Gate	SCMT-CB	180.38	us
MATT_CURR	Maximum Attenuation in Arbitrary Cement	SCMT-CB	16.92	dB/ft
MCI	Minimum Cemented Interval for Isolation	SCMT-CB	Depth Zoned	ft
MMSA	MAP Minimum Sonic Amplitude	SCMT-CB	3.95	mV
MSA	Minimum Sonic Amplitude	SCMT-CB	0.51	mV
MSA_CURR	Minimum Sonic Amplitude in Arbitrary Cement	SCMT-CB	0.51	mV
RUN_SNUM	Run Sequence Number	WSDRUN	1	

Depth Zone Parameters			
Parameter	Value	Start ( ft )	Stop ( ft )
MCI	12 98	0	780

MCI	1.25	780	991
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All depth are actual.

## Tool Control Parameters

### One: Parameters

Parameter	Description	Tool	Value	Unit
CMTM	SCMT Operating Mode	SCMT-CB	Log	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	1800	ft/h

## One

## Software Version

Acquisition System	Version
Maxwell 2019.1	9.1.110979.3100

## Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
One	Log[5]:Up	Up	497.95 ft	856.98 ft	20-Aug-2019 3:14:54 PM	20-Aug-2019 3:24:21 PM	ON	3.26 ft	Yes

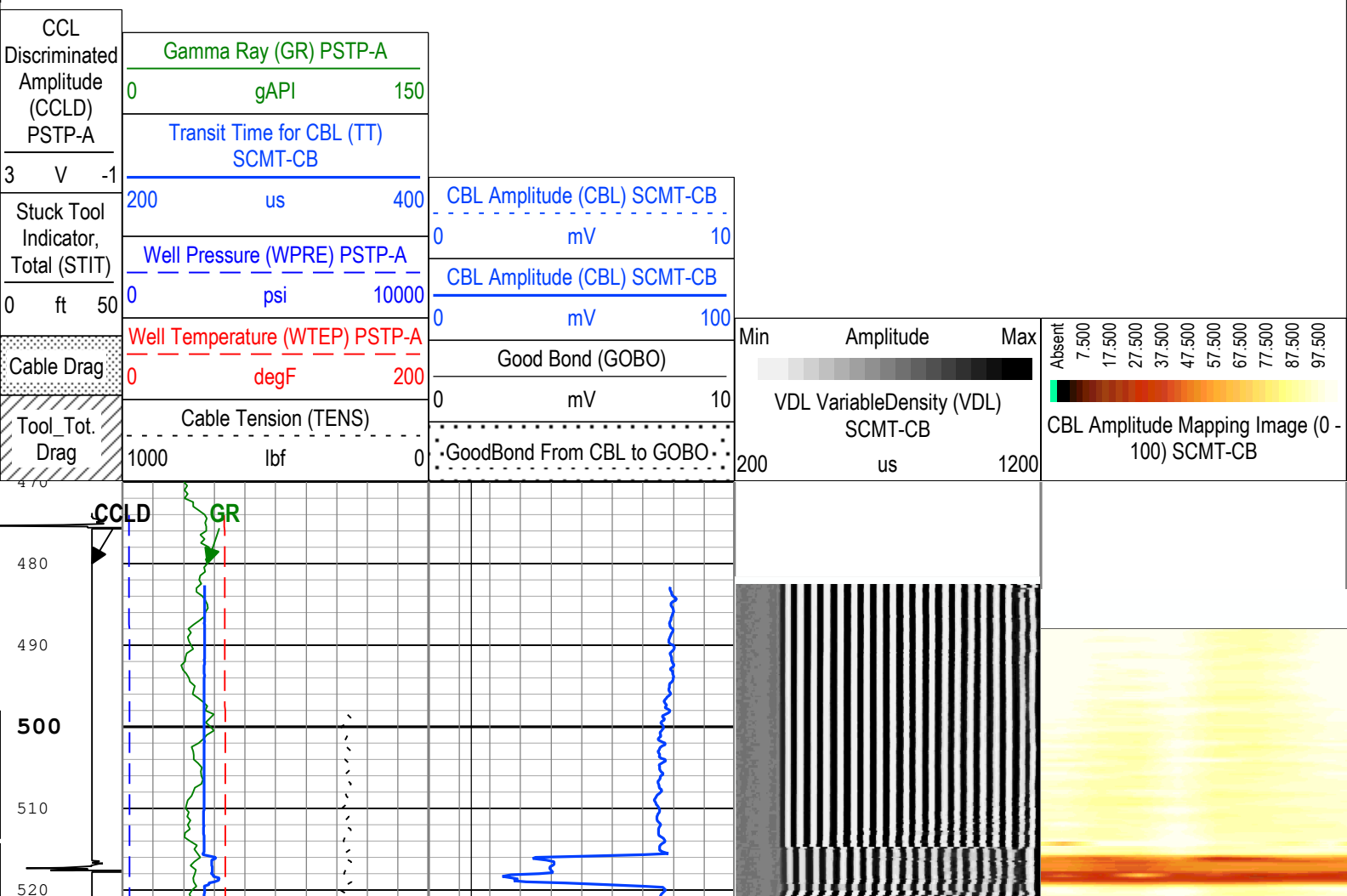
All depths are referenced to toolstring zero

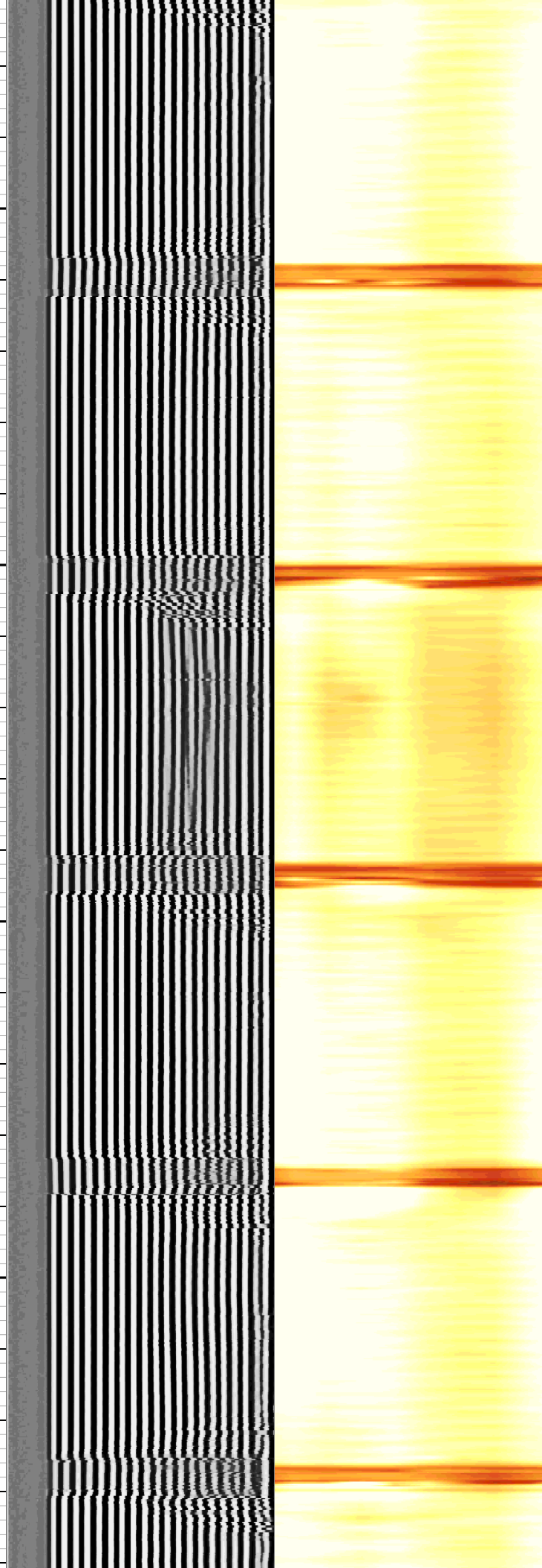
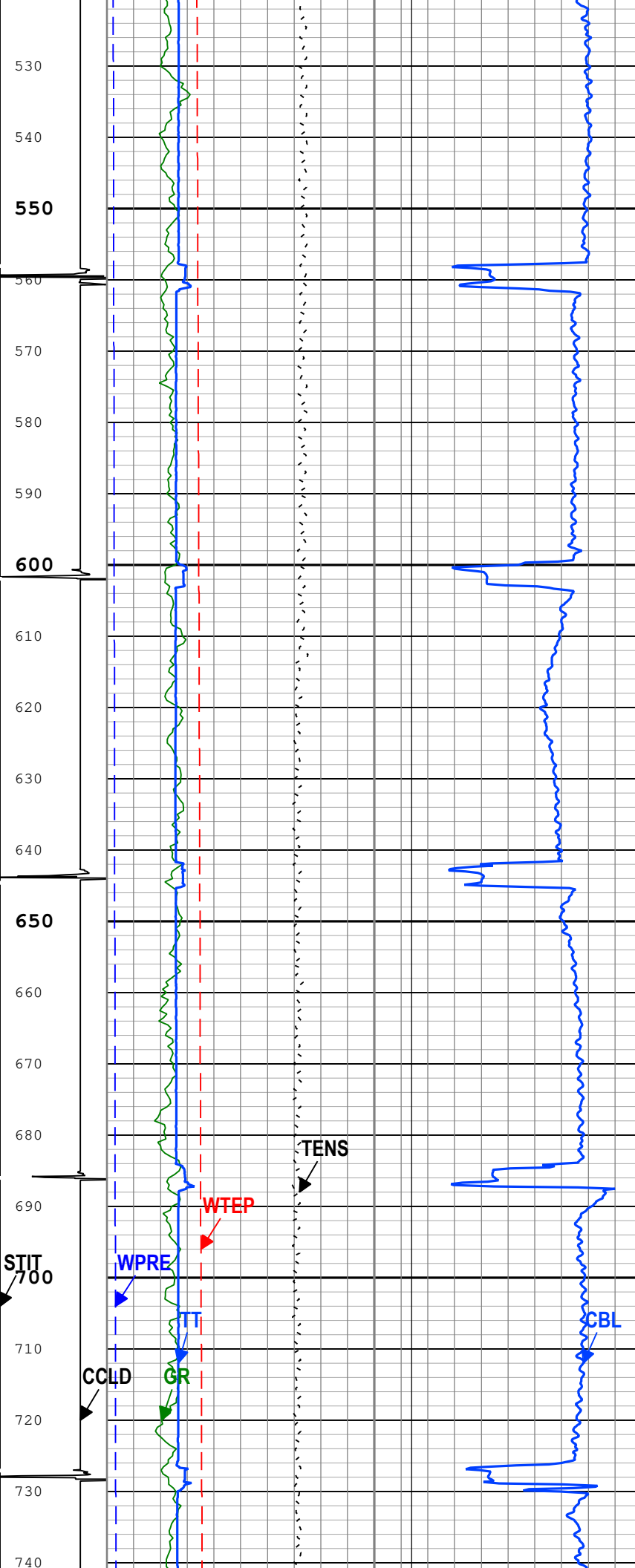
## Log

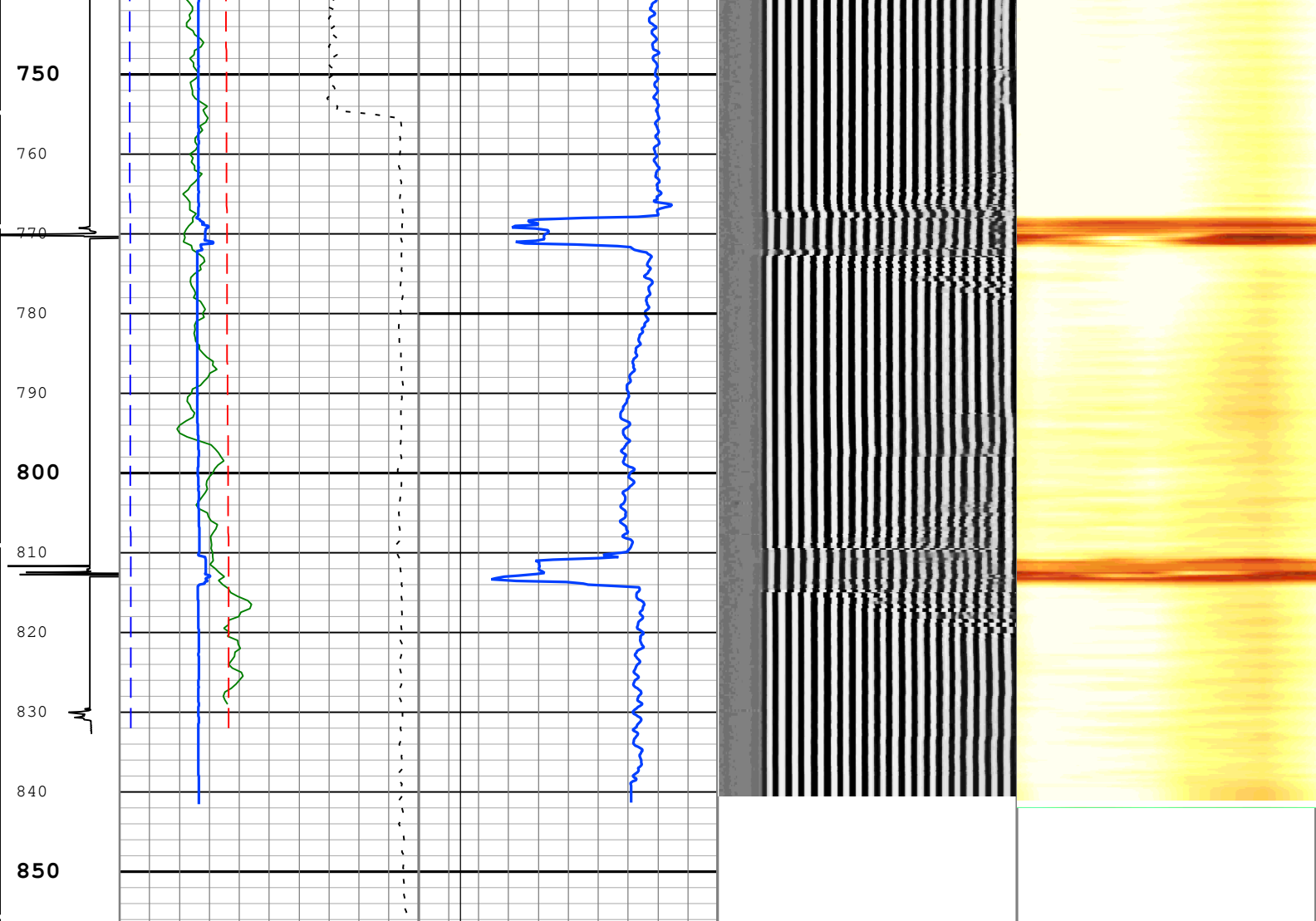
Company:Noble Energy Inc      Well:Gruen 22-33  
One: Log[5]:Up:S008

Description: SCMT VDL Image    Format: Log ( SCMT\_VDL\_Image )    Index Scale: 5 in per 100 ft    Index Unit: ft    Index Type: Measured Depth    Creation Date: 20-Aug-2019 16:02:01

TIME\_1900 - Time Marked every 60.00 (s)







CCL Discriminated Amplitude (CCLD) PSTP-A	Gamma Ray (GR) PSTP-A	CBL Amplitude (CBL) SCMT-CB	Min	Amplitude	Max
	0 gAPI 150	0 mV 10			
3 V -1	Transit Time for CBL (TT) SCMT-CB	CBL Amplitude (CBL) SCMT-CB	VDL VariableDensity (VDL) SCMT-CB		
	200 us 400	0 mV 100	200	us	1200

Stuck Tool Indicator, Total (STIT)	Well Pressure (WPRE) PSTP-A	0 mV 10	CBL Amplitude Mapping Image (0 - 100) SCMT-CB
	0 psi 10000	GoodBond From CBL to GOBO	
0 ft 50	Well Temperature (WTEP) PSTP-A		

Cable Drag	0 degF 200	
Tool_Tot. Drag	Cable Tension (TENS)	
	1000 lbf 0	

TIME\_1900 - Time Marked every 60.00 (s)

Description: SCMT VDL Image Format: Log ( SCMT\_VDL\_Image ) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 20-Aug-2019 16:02:01

## Channel Processing Parameters

### One: Parameters

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CBLG	CBL Gate Width	SCMT-CB	30	us
CBRA	CBL LQC Reference Amplitude in Free Pipe	SCMT-CB	80	mV

THNO	Nominal Casing Thickness - Zoned along logger depths	WLSESSION	0.25	in
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFD	Drilling Fluid Density	Borehole	8.4	lbm/gal
DFT_CATEGORY	Drilling Fluid Type	Borehole	Water	
DTMD	Borehole Fluid Slowness	Borehole	206	us/ft
FCF	CBL Fluid Compensation Factor	SCMT-CB	1.07	
GOBO_CURR	Good Bond in Arbitrary Cement	SCMT-CB	1.4	mV
GTSE	Generalized Temperature Selection, from Measured or Computed Temperature	Borehole	WTEP	
MAPG	SCMT MAP Peak Detection T0_Delay and Noise Gate	SCMT-CB	180.38	us
MATT_CURR	Maximum Attenuation in Arbitrary Cement	SCMT-CB	16.92	dB/ft
MCI	Minimum Cemented Interval for Isolation	SCMT-CB	Depth Zoned	ft
MMSA	MAP Minimum Sonic Amplitude	SCMT-CB	3.95	mV
MSA	Minimum Sonic Amplitude	SCMT-CB	0.51	mV
MSA_CURR	Minimum Sonic Amplitude in Arbitrary Cement	SCMT-CB	0.51	mV
RUN_SNUM	Run Sequence Number	WSDRUN	1	

Depth Zone Parameters			
Parameter	Value	Start ( ft )	Stop ( ft )
MCI	12.98	470	780
MCI	1.25	780	857
All depth are actual.			

Tool Control Parameters	
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One: Parameters				
Parameter	Description	Tool	Value	Unit
CMTM	SCMT Operating Mode	SCMT-CB	Log	
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	1800	ft/h

Company:	Noble Energy Inc	Schlumberger
Well:	Gruen 22-33	
Field:	Wattenberg	
County:	Weld	
State:	Colorado	
Slim Cement Mapping Tool		