

Company: Expedition Water Solutions LLC

Well: EWS 4

Field: Wattenburg

County: Weld State: Colorado

Platform Express	
Caliper	
Cement Volume	
NE SE 18-2N-63W	Elev.: K.B. 4869.00 ft G.L. 4856.00 ft D.F. 4869.00 ft
Location: Permanent Datum: NE SE 18-2N-63W	Ground Level
Log Measured From: Drilling Measured From:	Kelly Bushing Kelly Bushing
API Serial No. 05-123-44167	Section: 18 Township: 2N Range: 63W

Logging Date		22-Feb-2017		
Run Number		ONE		
Depth Driller		10204.00 ft		
Schlumberger Depth		10201.00 ft		
Bottom Log Interval		10204.00 ft		
Top Log Interval		8548.00 ft		
Casing Driller Size @ Depth		7 in @ 8547.00 ft		
Casing Schlumberger		8552 ft		
Bit Size		6.125 in		
Type Fluid In Hole		Fresh Water		
MUD	Density	9.1 lbm/gal	43 s	
	Fluid Loss	PH	8.8	
Source of Sample		Active Tank		
RM @ Meas Temp		0.5 ohm.m	@ 68 degF	
RMF @ Meas Temp		0.48 ohm.m	@ 68 degF	
RMC @ Meas Temp		0.36 ohm.m	@ 68 degF	
Source RMF	RMC	Calculated	Calculated	
RM @ BHT	RMF @ BHT	0.17 @ 212	0.16 @ 212	
Max Recorded Temperatures		258 degF		
Circulation Stopped		Time	21-Feb-2017	21:30:00
Logger on Bottom		Time	22-Feb-2017	05:35:00
Unit Number	Location:	OSL C-AR2 2161	Ft. Morgan	
Recorded By	L. Await			
Witnessed By	Jeremiah Demuth			

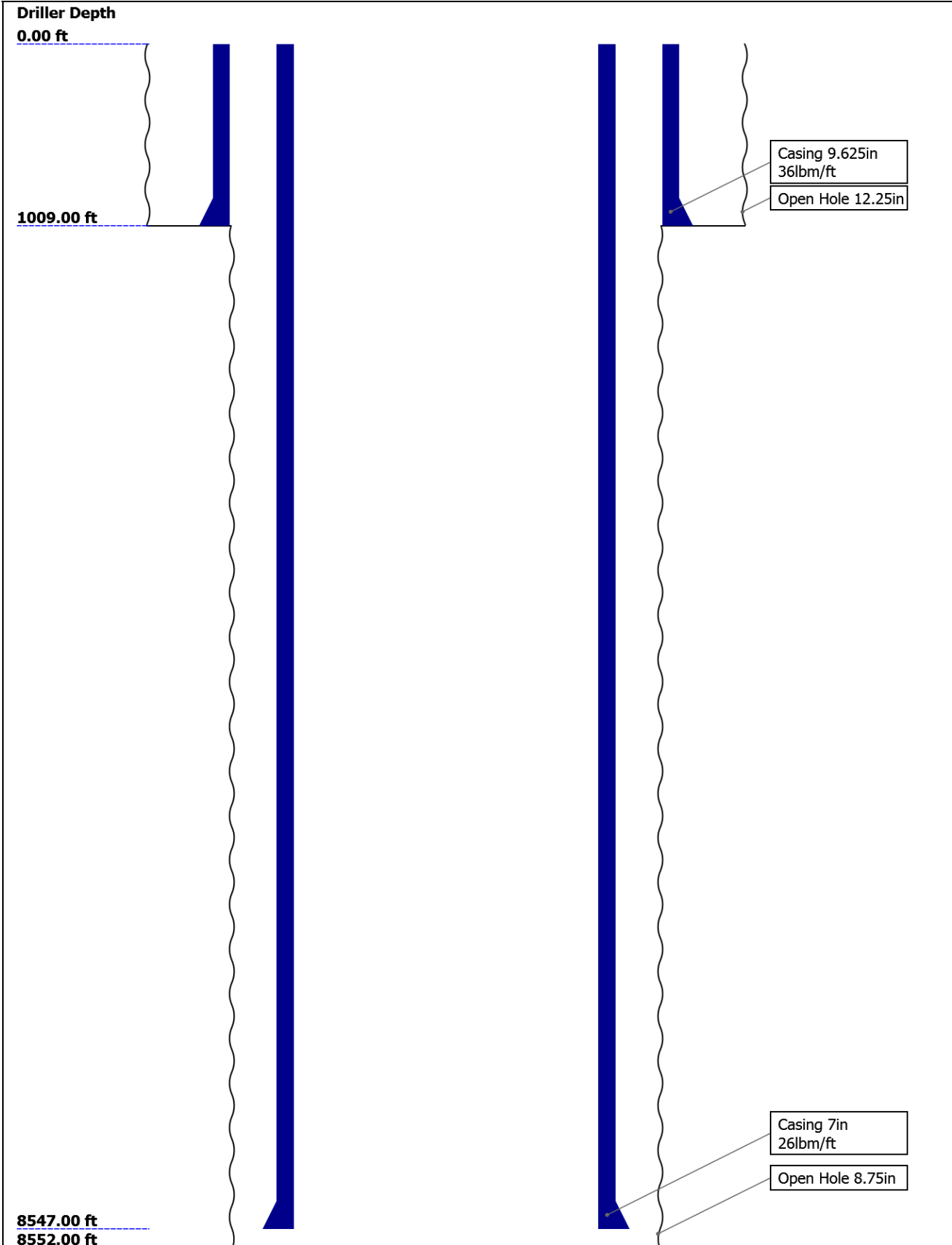
Disclaimer

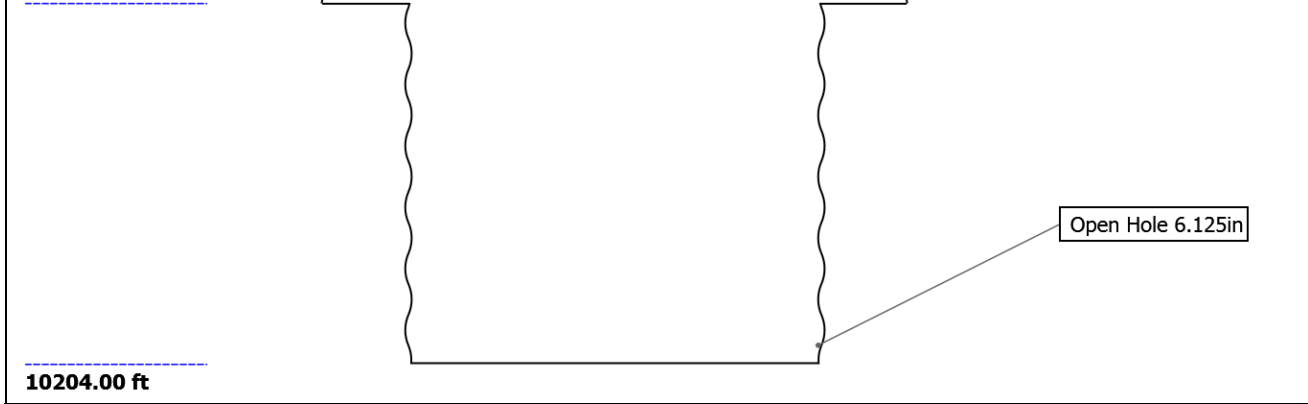
THE USE OF AND RELIANCE UPON THIS RECORDED-DATA BY THE HEREIN NAMED COMPANY (AND ANY OF ITS AFFILIATES, PARTNERS, REPRESENTATIVES, AGENTS, CONSULTANTS AND EMPLOYEES) IS SUBJECT TO THE TERMS AND CONDITIONS AGREED UPON BETWEEN SCHLUMBERGER AND THE COMPANY, INCLUDING: (a) RESTRICTIONS ON USE OF THE RECORDED-DATA; (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.

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Well Sketch





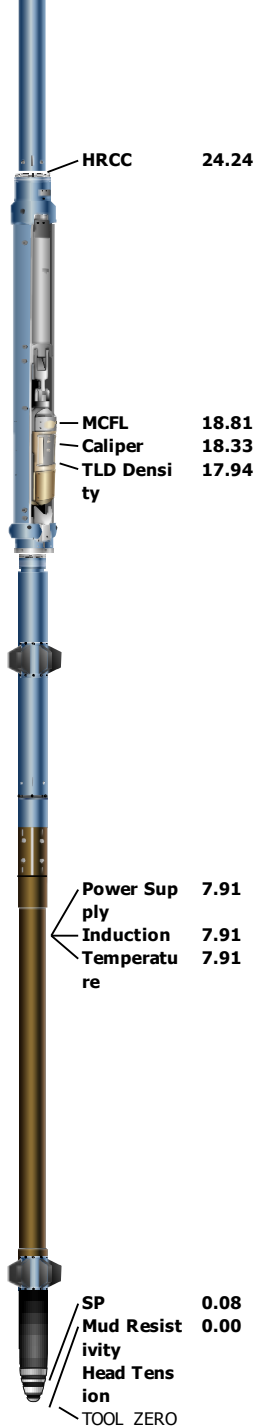
Borehole Size/Casing/Tubing Record

Bit						
Bit Size ( in )	12.25	8.75	6.125			
Top Driller ( ft )	0	1009	8552			
Top Logger ( ft )	0	1009	8552			
Bottom Driller ( ft )	1009	8552	10204			
Bottom Logger ( ft )	1009	8552	10201			
Casing						
Size ( in )	9.625	7				
Weight ( lbm/ft )	36	26				
Inner Diameter ( in )	8.921	6.276				
Grade	N/A	N/A				
Top Driller ( ft )	0	0				
Top Logger ( ft )	0	0				
Bottom Driller ( ft )	1009	8547				
Bottom Logger ( ft )	1009	8552				

Remarks and Equipment Summary

ONE: Toolstring				ONE: Remarks	
Equip name	Length	MP name	Offset	Thank you for choosing Schlumberger!	
LEH-QT	43.57			Run ONE: Log ran for open hole formation evaluation	
				Run ONE: Tool ran eccentricized as per tool sketch	
DTC-H	40.65	CTEM HV	39.75 0.00	Run ONE: Sandstone Matrix of 2.65g/cc used for TD-9800 & 8780 - Surface as per client req	
		TelStatus	37.65	Run ONE: Limestone Matrix of 2.71g/cc used for 9800-8780 as per client request.	
		ToolStatus	37.65	Run TWO: Log ran for casing and cement evaluation	
		Temperature	37.62	Run TWO: Tool ran centralized with two knuckles as per tool sketch	
HGNS-H	37.65	GR	36.91		
HGNH					
NPV-N					
NSR-F:5069					
HMCA-H					
HGNS-H					
HACCZ-H					
		CNL Porosity	30.57		
		HGNS	28.24		
		HMCA	28.24		
		Accelerometer	0.00		
HDPS-H	28.24				

HRMS-H  
ECH-MEB  
HRCC-H  
HRMS-H  
Backscatter  
GPV-Q  
Short Spacing  
:27786  
Long Spacing  
GSR-J:5471  
HRGD-H:4899



Lengths are in ft  
Maximum Outer Diameter = 9.000 in  
Line: Sensor Location, Value: Gating Offset  
All measurements are relative to TOOL\_ZERO

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

Serial Number

Length

Conveyance Type

Rig Type

7-46NT-XS

24000.00 ft

Wireline

Ensign 121

ONE:Depth Control Parameters

Depth Control Remarks

Log Sequence

First Log In the Well

Rig Up Length At Surface

Rig Up Length At Bottom

Rig Up Length Correction

Stretch Correction

Tool Zero Check At Surface

ONE

2" Cement Volume

Integration Summary

Output Channel(s)	Output Description	Input Parameter	Output Value	Unit
ICV	Integrated Cement Volume	GCSE_UP_PASS, FCD	195.51	ft3
IHV	Integrated Hole Volume	GCSE_UP_PASS	379.8	ft3

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	DSC Mode	Depth Shift	Include Parallel Data
ONE	Log[3]:Up	Up	13.94 ft	10220.98 ft	22-Feb-2017 5:31:59 AM	22-Feb-2017 8:02:44 AM	ON	-0.03 ft	Yes

All depths are referenced to toolstring zero

Log

Company:Expedition Water Solutions LLC

Well:EWS 4

ONE: Log[3]:Up:S015

Description:    Format: Log ( Caliper )    Index Scale: 2 in per 100 ft    Index Unit: ft    Index Type: Measured Depth    Creation Date: 24-Feb-2017 08:55:41

—IHV - Integrated Hole Volume every 100.00 (ft3)

—ICV - Integrated Cement Volume every 100.00 (ft3)

—ICV - Integrated Cement Volume every 10.00 (ft3)

—IHV - Integrated Hole Volume every 10.00 (ft3)

TIME\_1900 - Time Marked every 60.00 (s)

Integrated Cement Volume (ICV) RT  
ft3

Cable Tension (TENS)

10000      lbf      0

Caliper (HCAL) HDRS-H

23      in      3 3      in      23

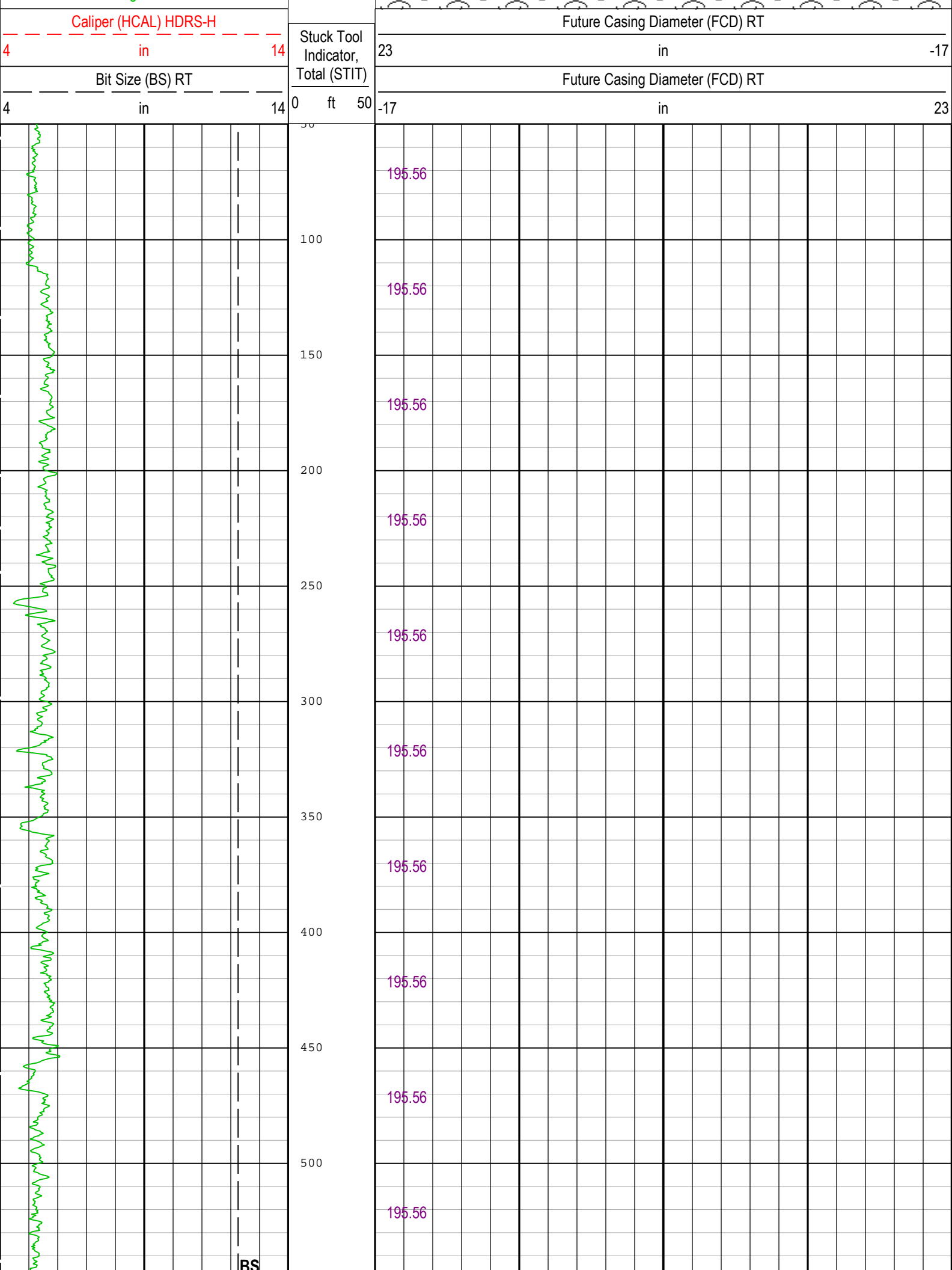
Bit Size (BS) RT

23      in      3 3      in      23

Gamma Ray (ECGR) HGNS-H

0      gAPI      200

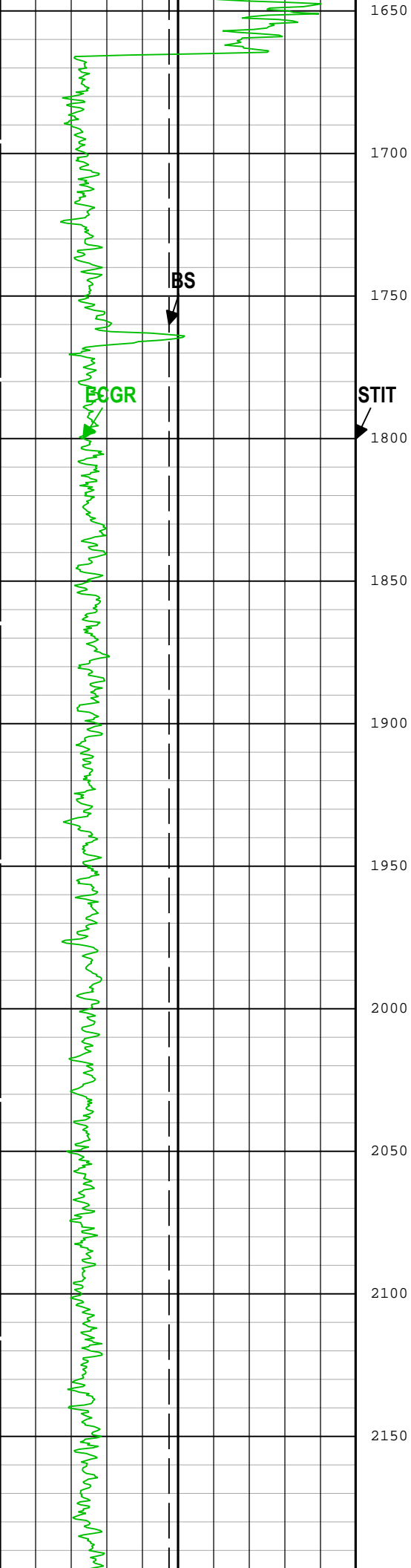
FCD2-FCD3











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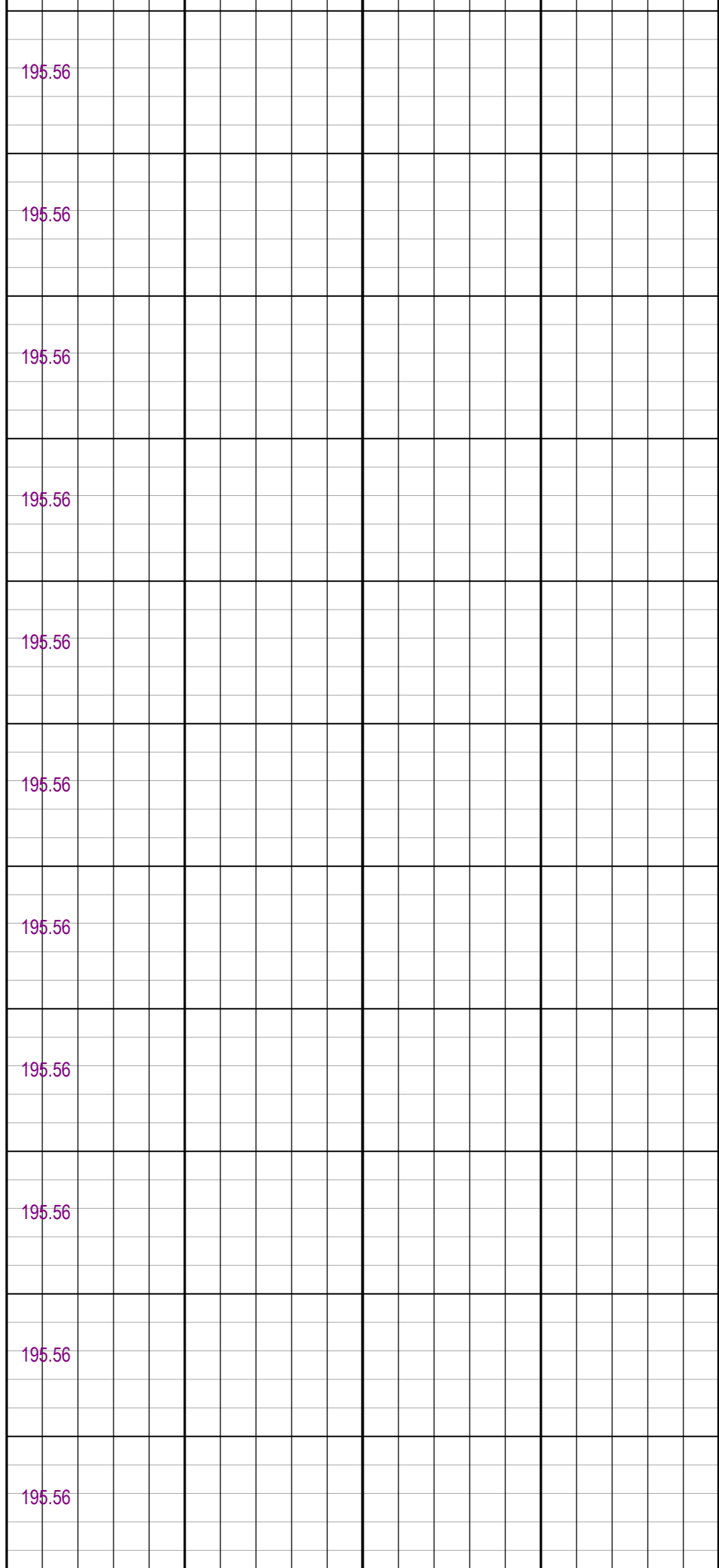
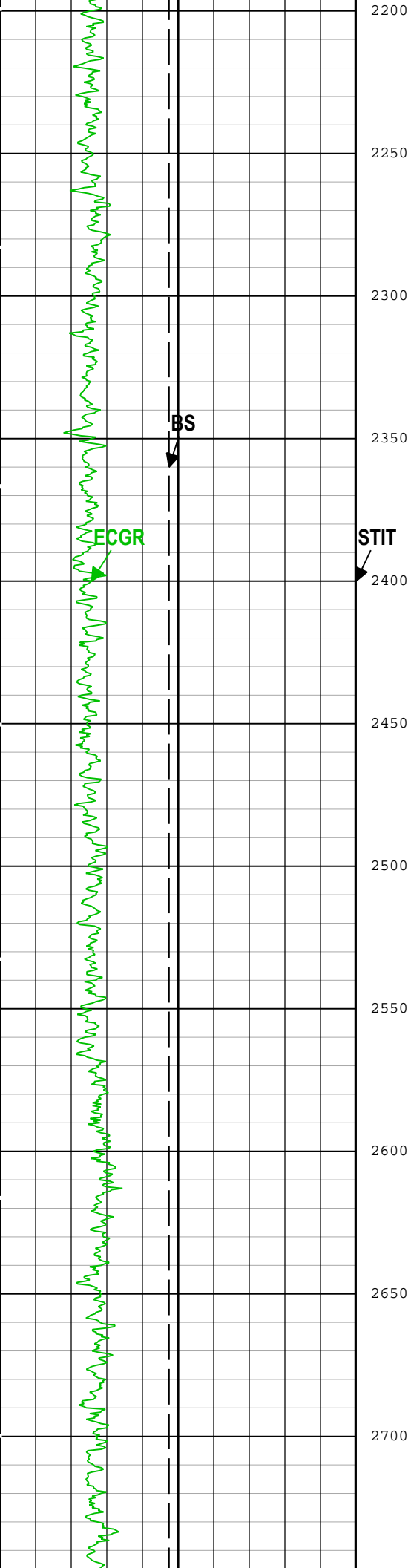
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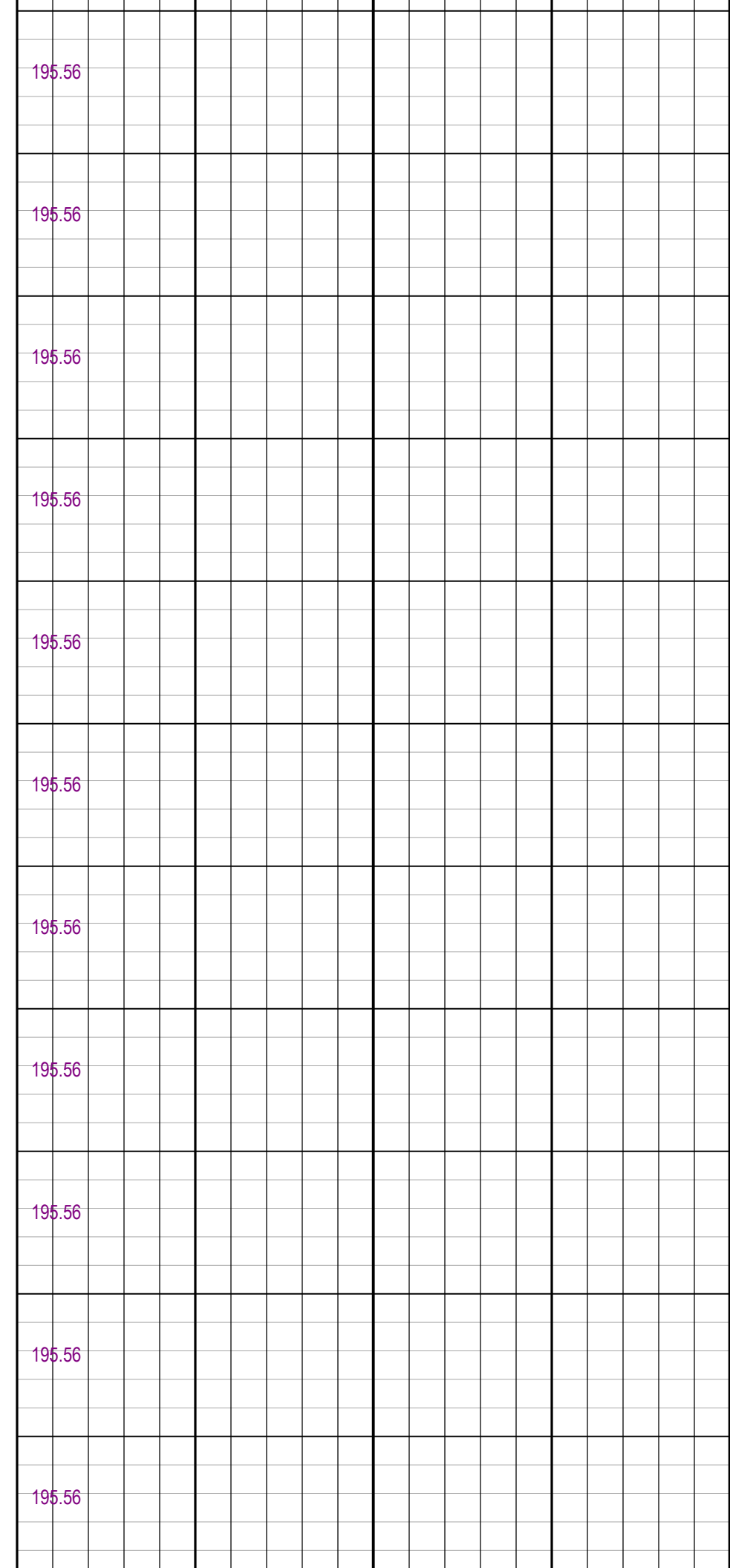
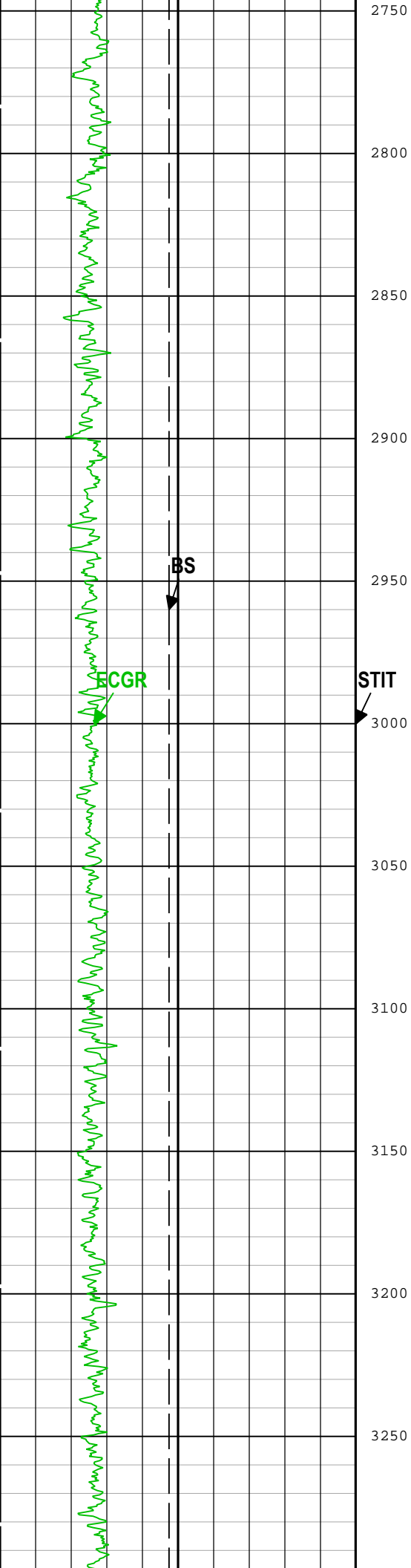
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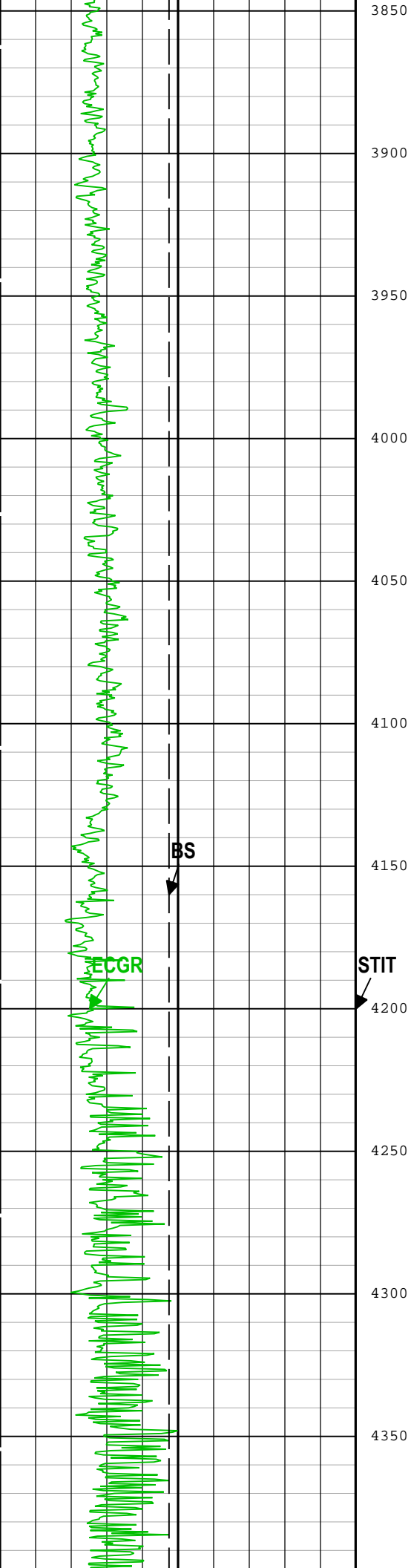
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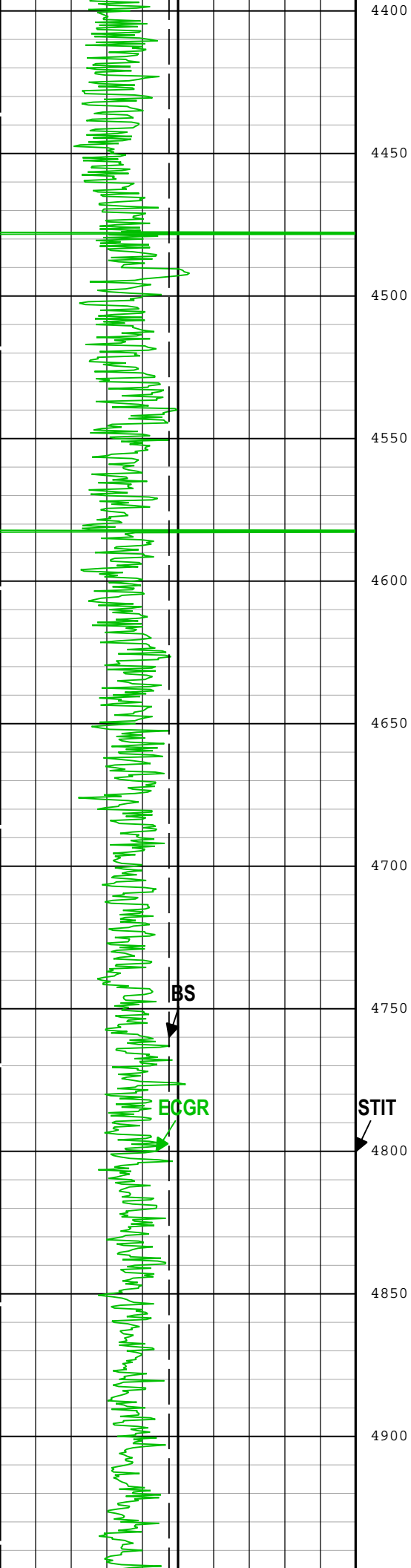
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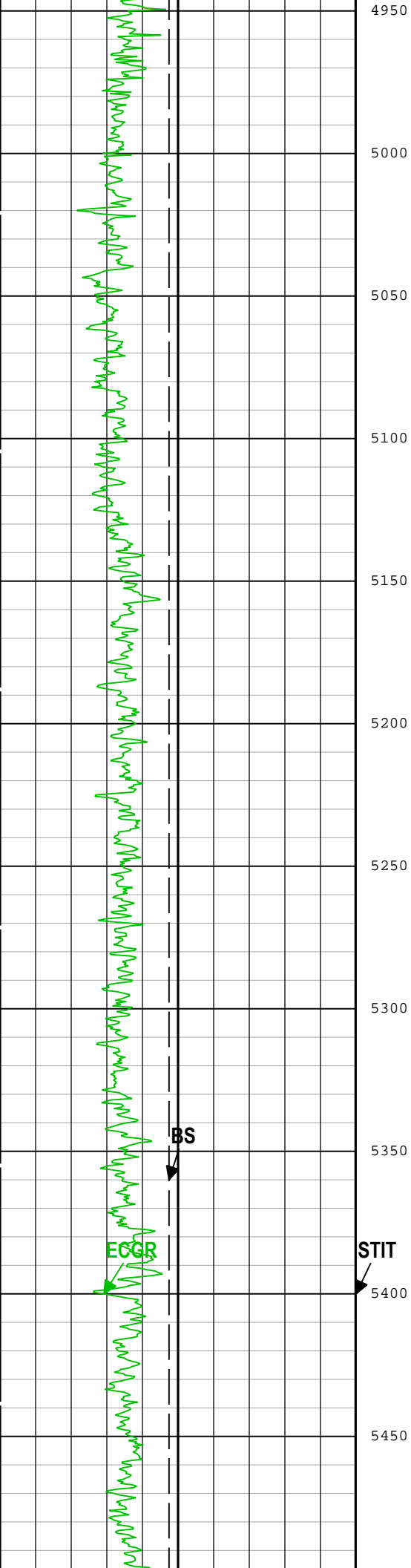
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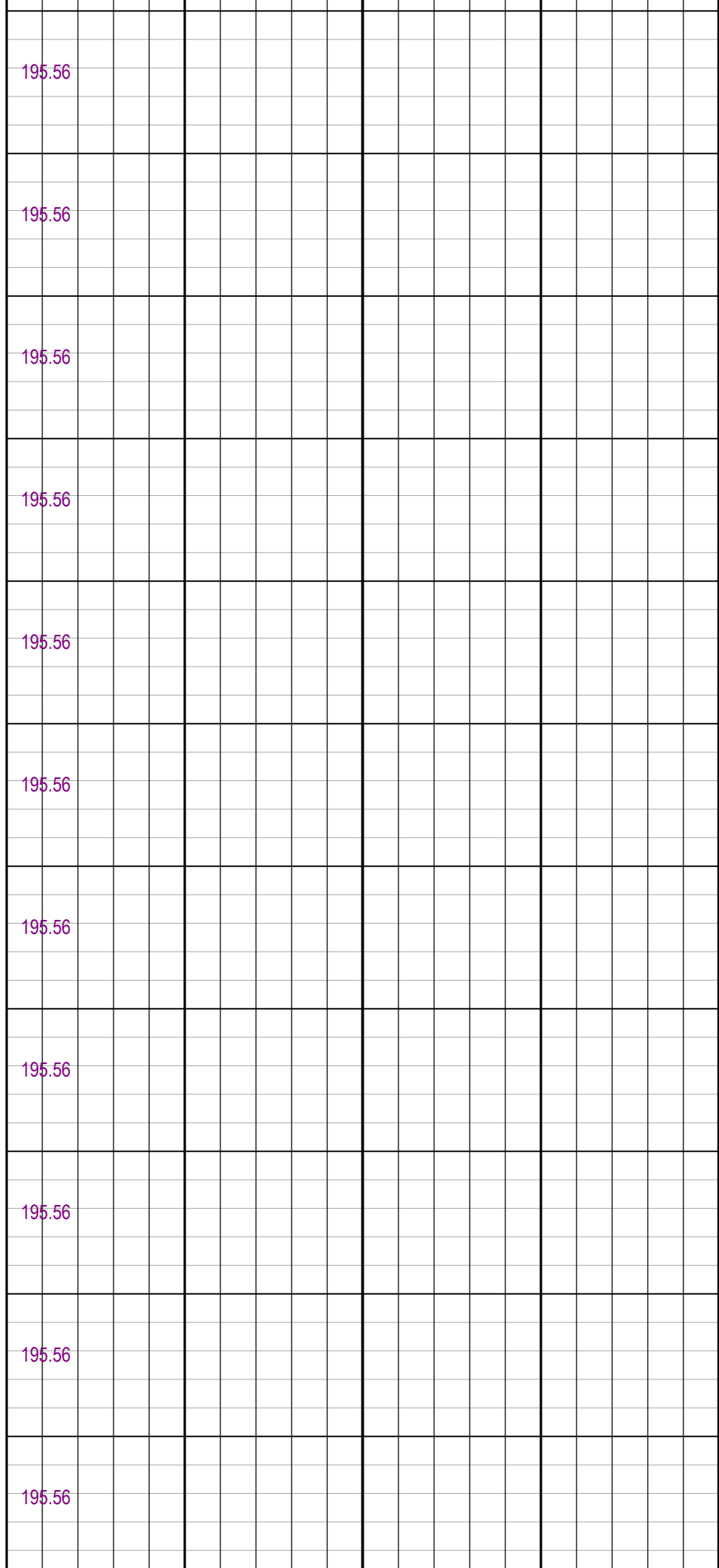
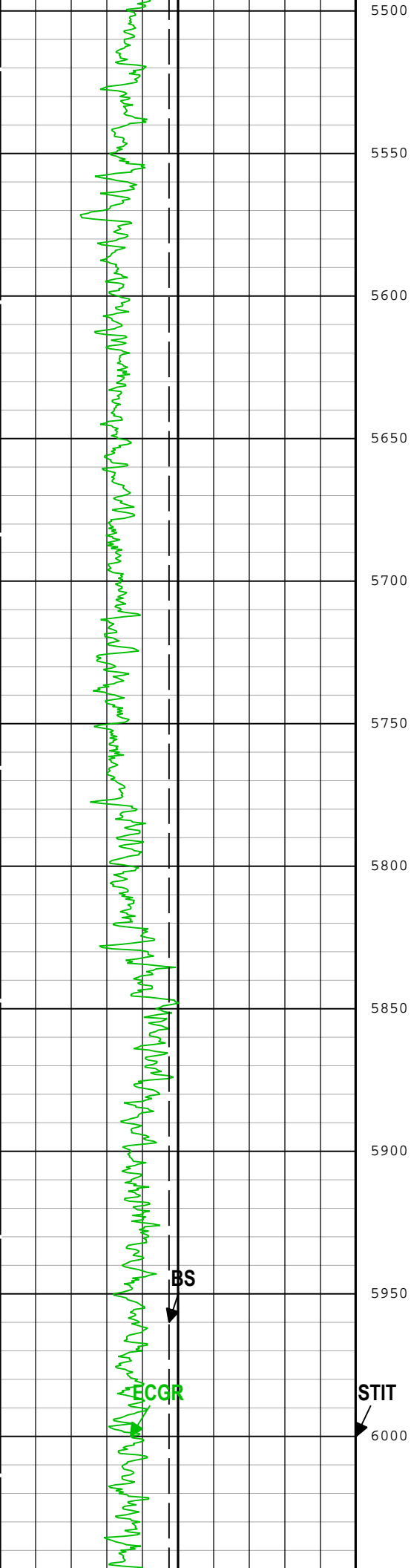
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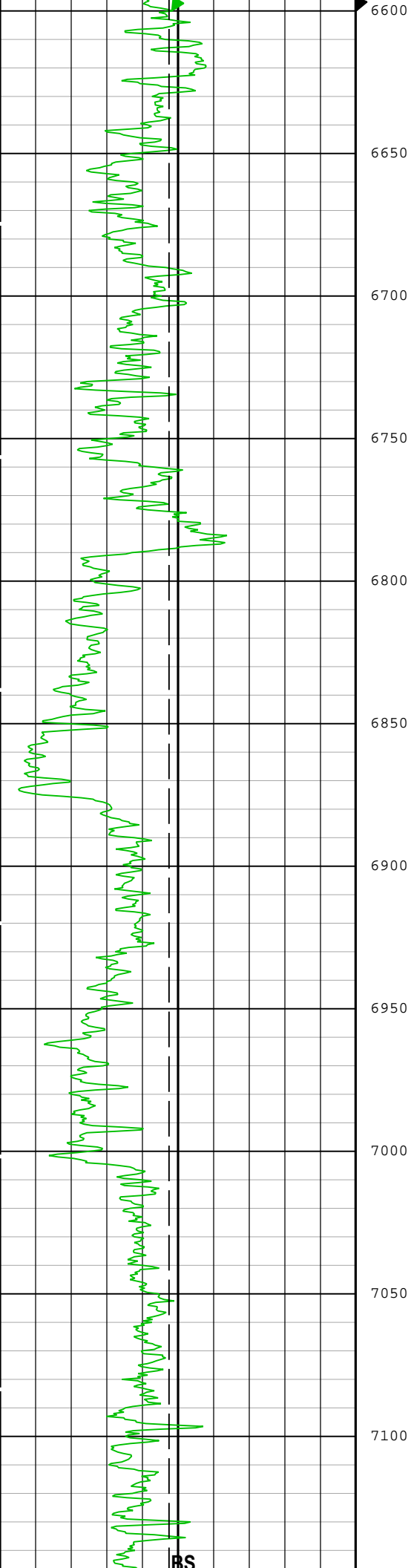
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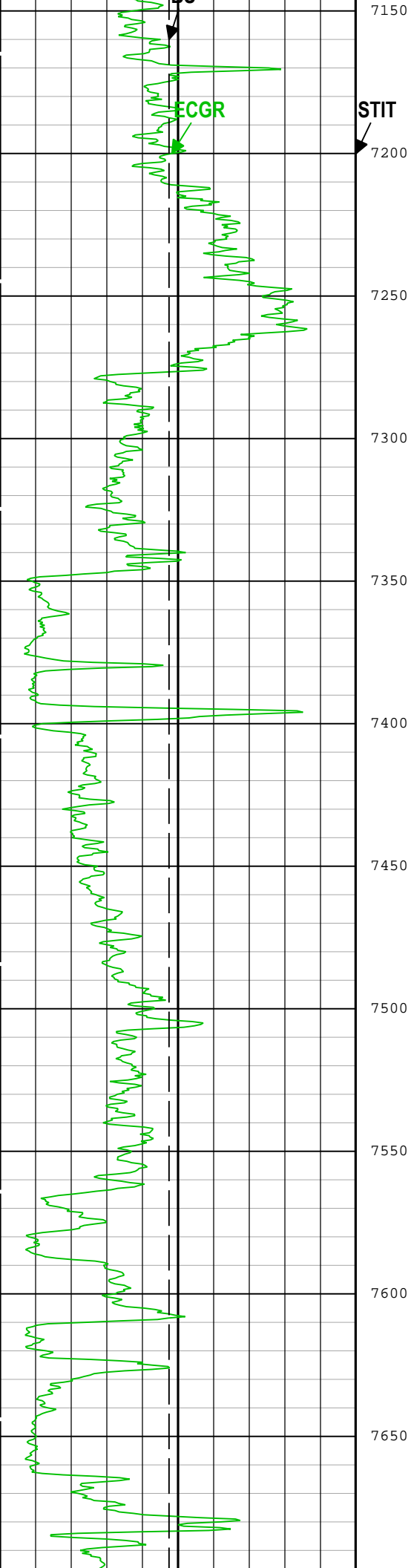
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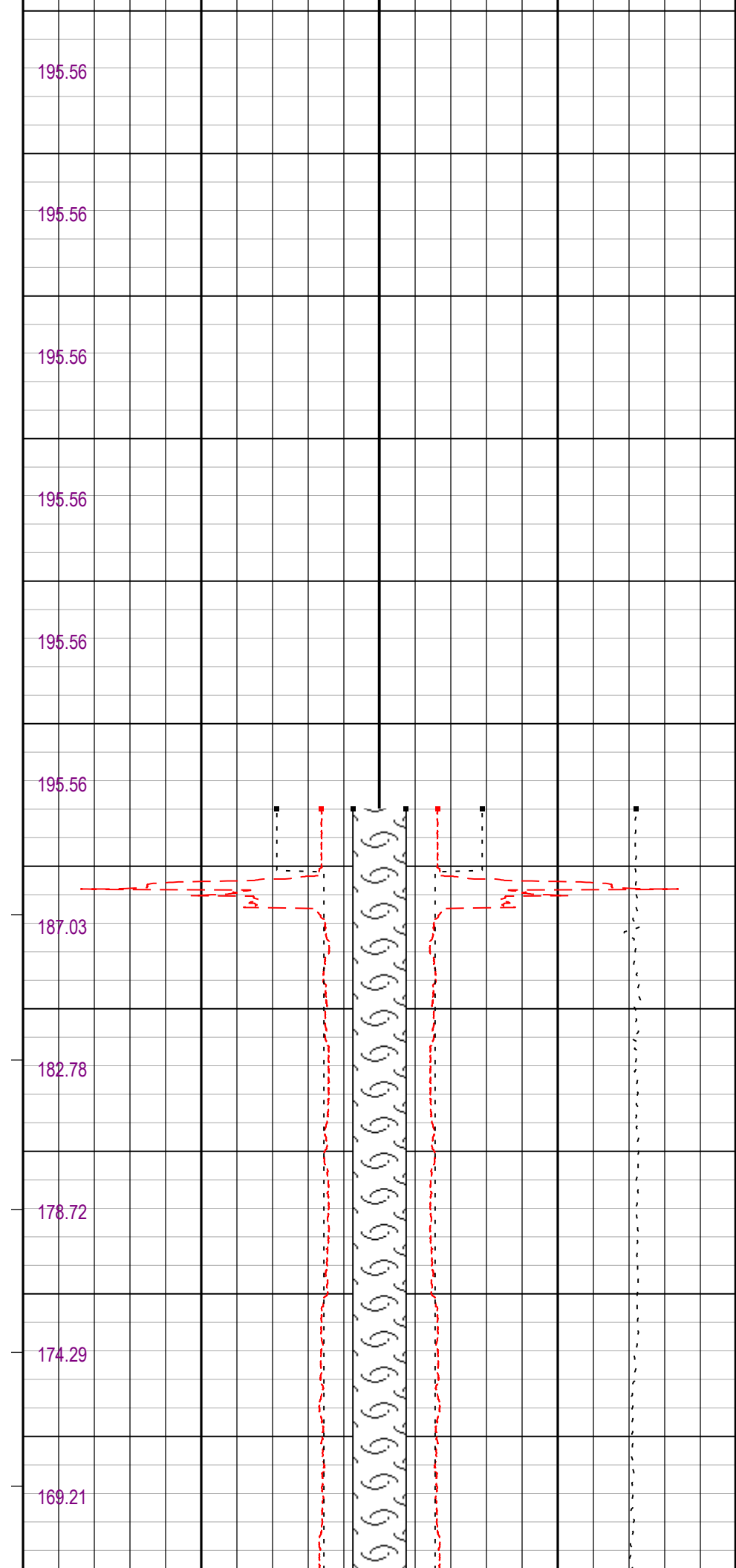
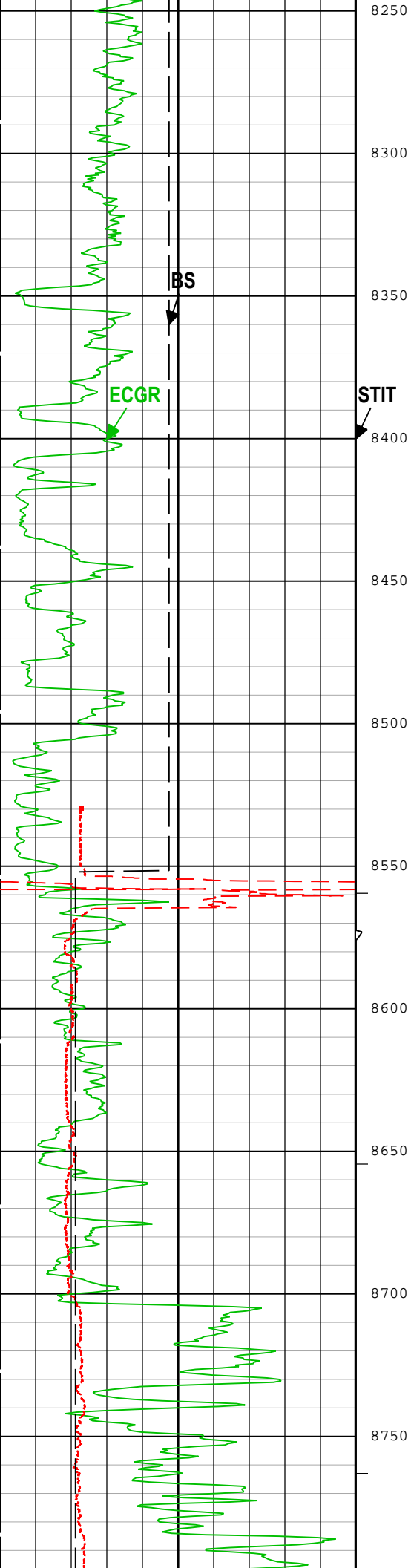
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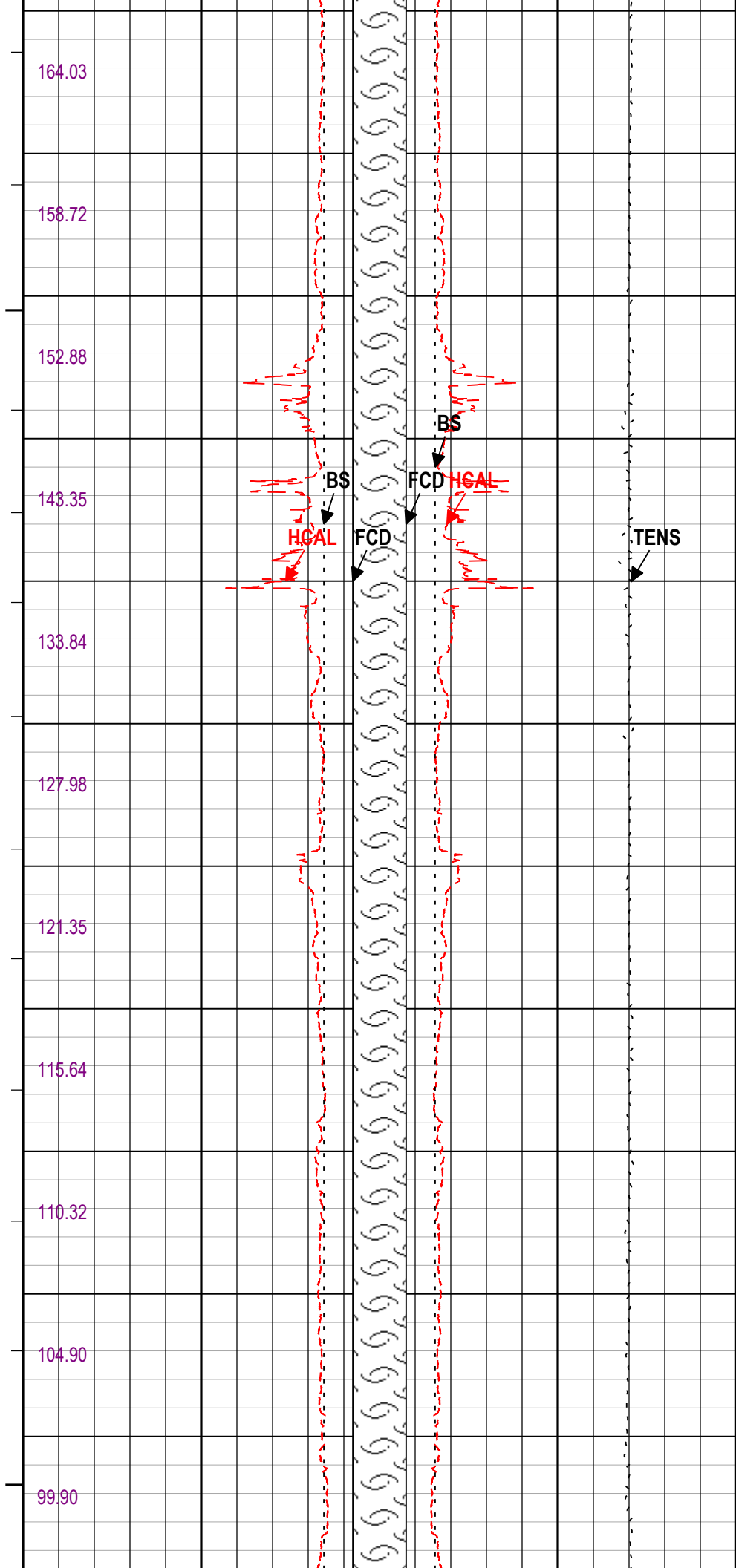
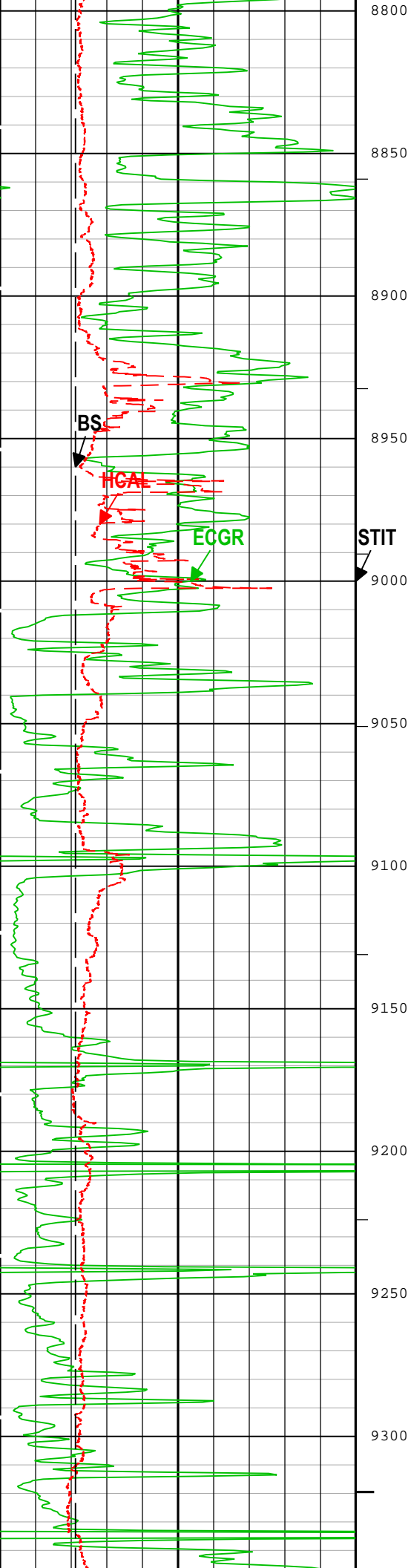
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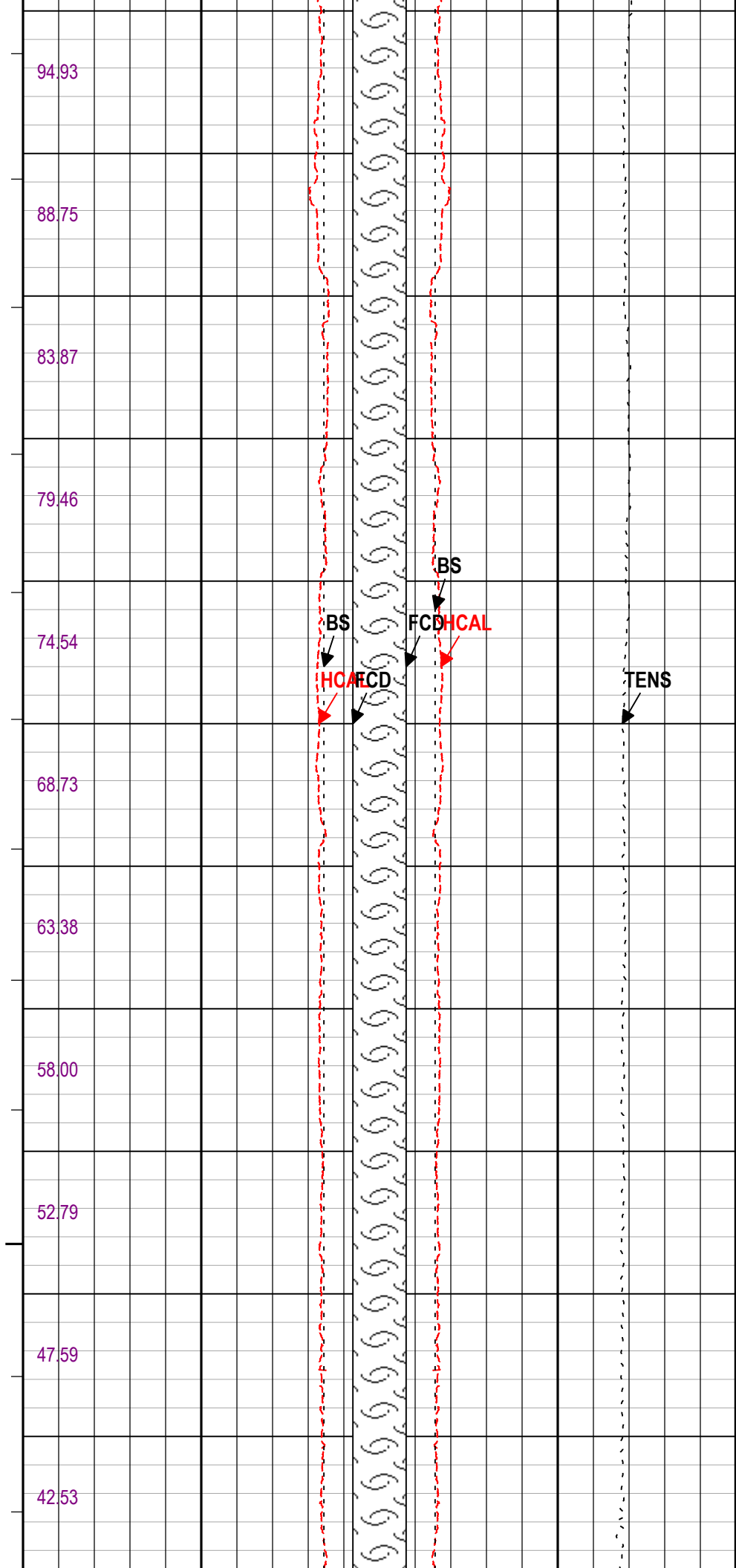
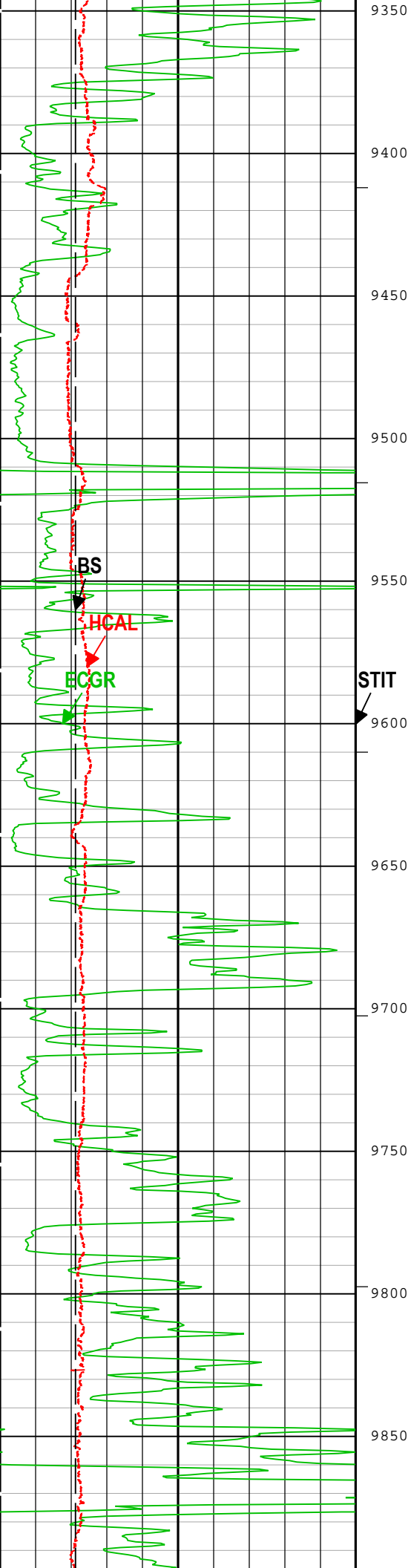
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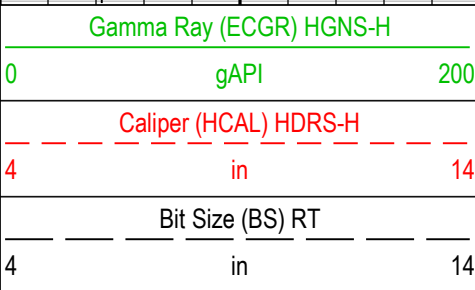
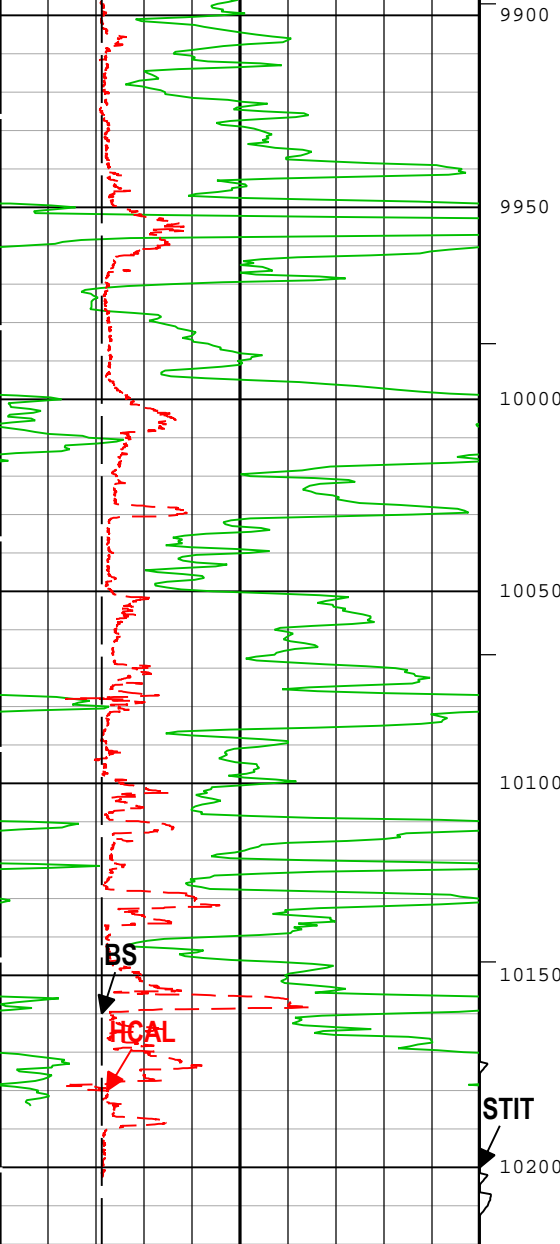
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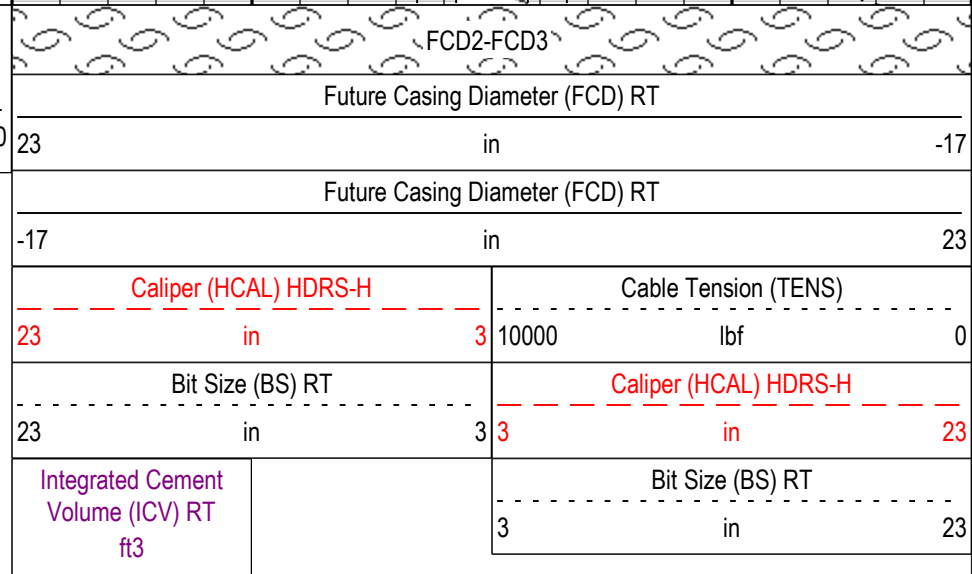
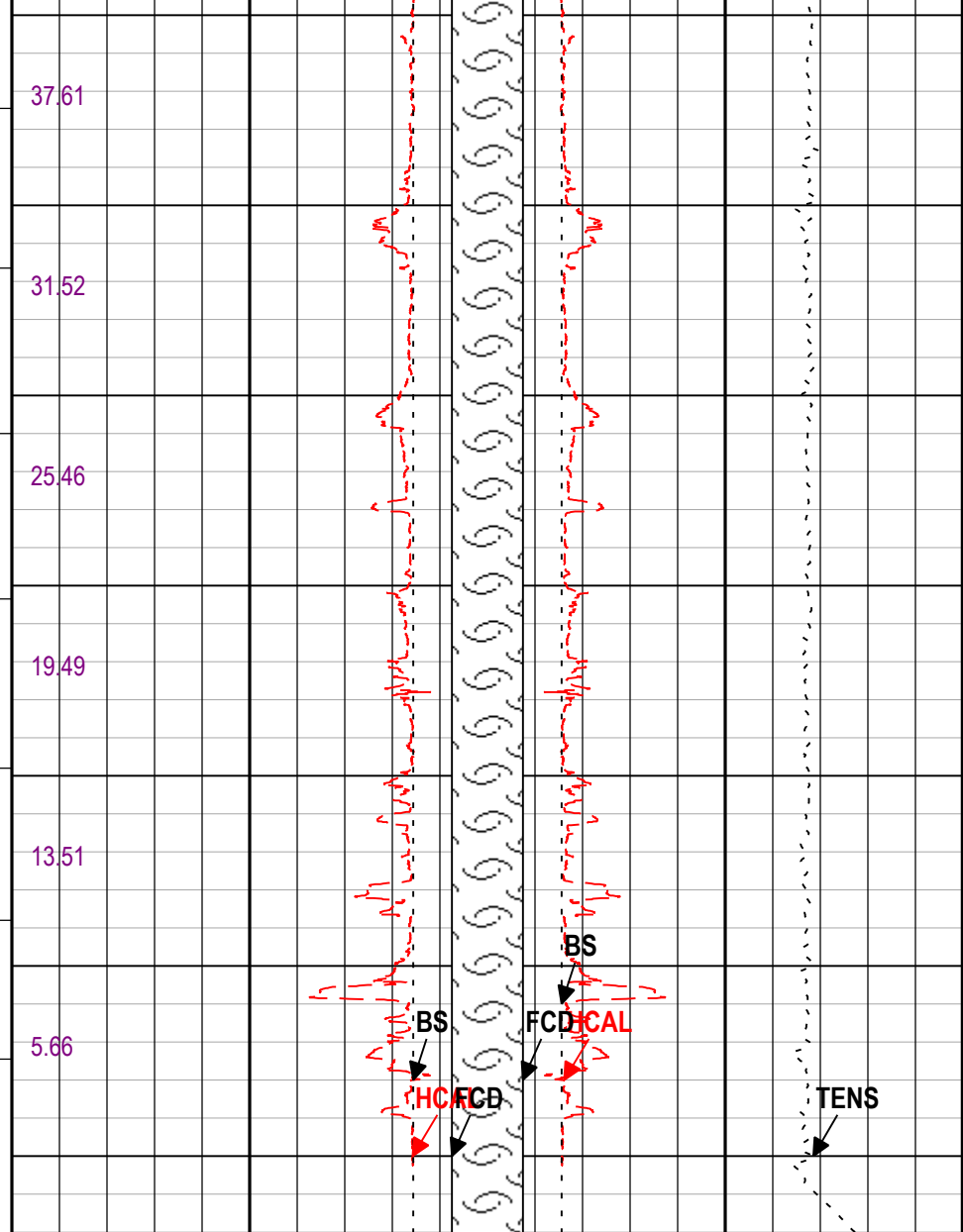








Stuck Tool  
Indicator,  
Total (STIT)



TIME\_1900 - Time Marked every 60.00 (s)

—IHV - Integrated Hole Volume every 10.00 (ft3)

—ICV - Integrated Cement Volume every 10.00 (ft3)

—ICV - Integrated Cement Volume every 100.00 (ft3)

—IHV - Integrated Hole Volume every 100.00 (ft3)



# Channel Processing Parameters

## ONE: Parameters

Parameter	Description	Tool	Value	Unit
ISSBAR	Barite Mud Presence Flag	Borehole	No	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BS	Bit Size	WLSESSION	Depth Zoned	in
CALI_SHIFT	CALI Supplementary Offset	HDRS-H	-0.01	in
CBLO	Casing Bottom (Logger)	WLSESSION	8552	ft
CDEN	Cement Density	HGNS-H	1.58	g/cm3
CSODDRL	Casing Outer Diameter - Zoned along driller depths	WLSESSION	7	in
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DFD	Drilling Fluid Density	Borehole	9.1	lbm/gal
FCD	Future Casing (Outer) Diameter	WLSESSION	4.5	in
GCSE_DOWN_PASS	Generalized Caliper Selection for WL Log Down Passes	Borehole	BS(RT)	
GCSE_UP_PASS	Generalized Caliper Selection for WL Log Up Passes	Borehole	CALI	
SOCO	Standoff Correction Option	HGNS-H	Yes	
TD	Total Measured Depth	Borehole	10204	ft

## Depth Zone Parameters

Parameter	Value	Start ( ft )	Stop ( ft )
BS	12.25	50	1009
BS	8.75	1009	8552
BS	6.125	8552	10201

All depth are actual.

## Tool Control Parameters

## ONE: Parameters

Parameter	Description	Tool	Value	Unit
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	3600	ft/h

## Calibration Report

### AIT-M (Array Induction Tool - M) Calibration - Run ONE

Primary Equipment :			
File code for AIT-MA Sonde Tool Element	AMIS	1305	
Auxiliary Equipment :			
File code for AIT Bottom Nose Tool Element	AMRM	1305	

### AIT Sonde Calibration - Test Loop Gain

Master (EEPROM):	19:45:52 30-Aug-2016						
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
Test Loop Gain - 0		Master	1.000	0.950	1.019	1.050	
Test Loop Phase - 0	deg	Master	0	-3.000	0.457	3.000	
Test Loop Gain - 1		Master	1.000	0.950	1.018	1.050	
Test Loop Phase - 1	deg	Master	0	-3.000	0.485	3.000	
Test Loop Gain - 2		Master	1.000	0.950	1.017	1.050	
Test Loop Phase - 2	deg	Master	0	-3.000	-1.158	3.000	
Test Loop Gain - 3		Master	1.000	0.950	1.014	1.050	
Test Loop Phase - 3	deg	Master	0	-3.000	-0.716	3.000	
Test Loop Gain - 4		Master	1.000	0.950	0.999	1.050	
Test Loop Phase - 4	deg	Master	0	-3.000	-0.186	3.000	
Test Loop Gain - 5		Master	1.000	0.950	0.997	1.050	
Test Loop Phase - 5	deg	Master	0	-3.000	-0.244	3.000	
Test Loop Gain - 6		Master	1.000	0.950	1.007	1.050	
Test Loop Phase - 6	deg	Master	0	-3.000	0.209	3.000	
Test Loop Gain - 7		Master	1.000	0.950	1.031	1.050	

Test Loop Gain - 7		Master	1.000	0.950	1.031	1.050	<div><div></div><div></div><div></div><div></div><div></div></div>
Test Loop Phase - 7	deg	Master	0	-3.000	0.072	3.000	<div><div></div><div></div><div></div><div></div><div></div></div>
AIT Sonde Calibration - Sonde Error Correction							
Master (EEPROM):		19:45:52 30-Aug-2016					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Real - 0	mS/m	Master	----	-231.000	-82.274	119.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Quad - 0		Master	----	-2250.000	-11.750	2250.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Real - 1	mS/m	Master	----	114.000	189.132	204.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Quad - 1		Master	----	-625.000	-99.398	625.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Real - 2	mS/m	Master	----	66.000	91.987	156.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Quad - 2		Master	----	-350.000	-163.766	350.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Real - 3	mS/m	Master	----	39.000	56.787	89.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Quad - 3		Master	----	-250.000	10.774	250.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Real - 4	mS/m	Master	----	15.000	27.318	35.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Quad - 4		Master	----	-63.000	-9.964	63.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Real - 5	mS/m	Master	----	4.000	11.520	24.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Quad - 5		Master	----	-50.000	21.600	50.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Real - 6	mS/m	Master	----	5.000	10.623	15.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Quad - 6		Master	----	-30.000	-5.057	30.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Real - 7	mS/m	Master	----	-5.000	-1.679	5.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Sonde Error Correction Quad - 7		Master	----	-30.000	3.884	30.000	<div><div></div><div></div><div></div><div></div><div></div></div>

AIT Mud Calibration - Mud Calibration Gain							
Master (EEPROM):		19:45:52 30-Aug-2016					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div><div></div><div></div><div></div><div></div></div>
Coarse Gain		Master	1.000	0.800	1.152	1.200	<div><div></div><div></div><div></div><div></div><div></div></div>
Fine Gain		Master	1.000	0.800	1.147	1.200	<div><div></div><div></div><div></div><div></div><div></div></div>

AIT Electronics Check - Thru Calibration Check							
Master (EEPROM):		19:45:52 30-Aug-2016 Expired by 85 days					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Mag - 0	V	Master	----	0.366	0.608	0.854	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Phase - 0	deg	Master	----	137.000	-172.932	-103.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Mag - 1	V	Master	----	0.762	1.246	1.778	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Phase - 1	deg	Master	----	136.000	-173.870	-104.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Mag - 2	V	Master	----	0.372	0.617	0.868	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Phase - 2	deg	Master	----	132.000	-177.254	-108.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Mag - 3	V	Master	----	0.420	0.699	0.980	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Phase - 3	deg	Master	----	131.000	-177.987	-109.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Mag - 4	V	Master	----	0.804	1.309	1.876	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Phase - 4	deg	Master	----	125.000	176.206	-115.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Mag - 5	V	Master	----	1.176	1.906	2.744	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Phase - 5	deg	Master	----	122.000	174.647	-118.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Mag - 6	V	Master	----	1.176	1.904	2.744	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Phase - 6	deg	Master	----	121.000	174.679	-119.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Mag - 7	V	Master	----	0.846	1.375	1.974	<div><div></div><div></div><div></div><div></div><div></div></div>
Thru Cal Phase - 7	deg	Master	----	115.000	173.699	-125.000	<div><div></div><div></div><div></div><div></div><div></div></div>
SPA Zero	mV	Master		-50.000	-0.126	50.000	<div><div></div><div></div><div></div><div></div><div></div></div>
SPA Plus	mV	Master		941.000	1004.288	1040.000	<div><div></div><div></div><div></div><div></div><div></div></div>
Temperature Zero	V	Master		-0.050	0.000	0.050	<div><div></div><div></div><div></div><div></div><div></div></div>
Temperature Plus	V	Master		0.870	0.930	0.960	<div><div></div><div></div><div></div><div></div><div></div></div>

Temperature Plus	V	Master	0.870	0.930	0.960	<div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><d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HDRS Short Spacing Detector	Short Spacing	27766
Cesium 137 Gamma-Ray Logging Source	GSR-J	5471
HILT High-Resolution Control Cartridge, 150 degC	HRCC-H	
HILT High-Resolution Mechanical Sonde, 150 degC	HRMS-H	

Calibration Parameter :

Small Ring Size (Caliper Calibration Small Ring)	8.00
Large Ring Size (Caliper Calibration Large Ring)	12.00

HDRS Caliper Calibration - Caliper Accumulations

Before (Measured): 17:13:38 20-Feb-2017 Expired by 1 days

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit		
Small Ring	in	Before	8.00	6.00	7.25	10.00		
Large Ring	in	Before	12.00	9.00	10.96	15.00		

HDRS Density Calibration - Inversion Results

Master (EEPROM): 15:35:40 17-Feb-2017

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit		
Rho Aluminum	g/cm3	Master	2.596	2.586	2.602	2.606		
Rho Magnesium	g/cm3	Master	1.686	1.676	1.682	1.696		
Pe Aluminum		Master	2.570	2.470	2.572	2.670		
Pe Magnesium		Master	2.650	2.550	2.618	2.750		

HDRS Density Calibration - Deviation Summary

Master (EEPROM): 15:35:40 17-Feb-2017

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit		
BS Average Deviation	%	Master	0	-0.6000	0.3901	0.6000		
BS Max Deviation	%	Master	0	-1.6000	0.8354	1.6000		
SS Average Deviation	%	Master	0	-1.0000	0.2566	1.0000		
SS Max Deviation	%	Master	0	-2.5000	0.8468	2.5000		
LS Average Deviation	%	Master	0	-1.5000	0.9914	1.5000		
LS Max Deviation	%	Master	0	-3.5000	2.1815	3.5000		

HDRS Density Calibration - Background Summary

Master (EEPROM): 15:35:40 17-Feb-2017 Before:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit		
BS Window Ratio		Master	1.0000		0.7373			
		Before			NOT DONE			
		Before-Master	----	----	----	----		
BS Window Sum	1/s	Master	1		25188			
		Before			NOT DONE			
		Before-Master	----	----	----	----		
SS Window Ratio		Master	1.0000		0.4824			
		Before			NOT DONE			
		Before-Master	----	----	----	----		
SS Window Sum	1/s	Master	1		10929			
		Before			NOT DONE			
		Before-Master	----	----	----	----		
LS Window Ratio		Master	1.0000		0.3002			
		Before			NOT DONE			
		Before-Master	----	----	----	----		
LS Window Sum	1/s	Master	1		1214			
		Before			NOT DONE			
		Before-Master	----	----	----	----		

HDRS Density Calibration - Photo-multiplier High Voltages

Master (EEPROM): 15:35:40 17-Feb-2017 Before:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit		
BS PM High Voltage	V	Master		1000	1504	2400		
		Before	----	----	----	----		
		Before-Master	----	----	----	----		
SS PM High Voltage	V	Master		1000	1448	2400		
		Before	----	----	----	----		
		Before-Master	----	----	----	----		

LS PM High Voltage	V	Master		1000	1496	2400	<table><tr><td></td><td></td><td></td><td></td></tr></table>				
		Before	----	----	----	----	<table><tr><td></td><td></td></tr></table>				
Before-Master	----	----	----	----	<table><tr><td></td><td></td></tr></table>						

## HDRS Density Calibration - Crystal Quality Resolutions

Master (EEPROM):		15:35:40 17-Feb-2017		Before:							
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<table><tr><td></td><td></td><td></td><td></td></tr></table>				
BS Crystal Resolution	%	Master		5.00	11.92	25.00	<table><tr><td></td><td></td><td></td><td></td></tr></table>				
		Before	----	----	----	----	<table><tr><td></td><td></td><td></td><td></td></tr></table>				
Before-Master	----	----	----	----	<table><tr><td></td><td></td><td></td><td></td></tr></table>						
SS Crystal Resolution	%	Master		5.00	10.52	20.00	<table><tr><td></td><td></td><td></td><td></td></tr></table>				
		Before	----	----	----	----	<table><tr><td></td><td></td><td></td><td></td></tr></table>				
Before-Master	----	----	----	----	<table><tr><td></td><td></td><td></td><td></td></tr></table>						
LS Crystal Resolution	%	Master		5.00	8.22	20.00	<table><tr><td></td><td></td><td></td><td></td></tr></table>				
		Before	----	----	----	----	<table><tr><td></td><td></td><td></td><td></td></tr></table>				
Before-Master	----	----	----	----	<table><tr><td></td><td></td><td></td><td></td></tr></table>						

## HDRS MCFL Calibration - MCFL Accumulations

Before:									
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<table><tr><td></td><td></td></tr></table>		
Main Resistivity - 0	ohm.m	Before	----	----	----	----	<table><tr><td></td><td></td></tr></table>		
Deep Resistivity - 0	ohm.m	Before	----	----	----	----	<table><tr><td></td><td></td></tr></table>		
Shallow Resistivity - 0	ohm.m	Before	----	----	----	----	<table><tr><td></td><td></td></tr></table>		

## HGNS-H (HILT Gamma-Ray and Neutron Sonde, 150 degC) Calibration - Run ONE

Primary Equipment :			
HILT Gamma-Ray and Neutron Sonde, 150 degC		HGNS-H	
Auxiliary Equipment :			
AmBe Neutron Logging Source		NSR-F	5069
Calibration Parameter :			
Water Temperature (Calibration Tank Water Temperature)		54.0	
Housing Size (Thermal Housing Size)		3.38	
JIG-BKG (Jig minus background reference)		165	

## HGNS Accelerometer Calibration - Accelerometer Accumulations

Before:								
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit		
AZ Vertical Measurement - 0	ft/s2	Before	----	----	----	----		

## HGNS Accelerometer EEPROM - Accelerometer EEPROM Read

Master:											
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<table><tr><td></td><td></td></tr></table>				
Accelerometer Manufacturer		Master			NOT DONE		<table><tr><td></td><td></td></tr></table>				
Accelerometer Reference Temperature		Master		-1.0	NOT DONE	50.0	<table><tr><td></td><td></td><td></td><td></td></tr></table>				
Accelerometer Coefficients - 0		Master	----	----	NOT DONE	----	<table><tr><td></td><td></td></tr></table>				
Accelerometer Coefficients - 1		Master	----	----	NOT DONE	----	<table><tr><td></td><td></td></tr></table>				
Accelerometer Coefficients - 2		Master	----	----	NOT DONE	----	<table><tr><td></td><td></td></tr></table>				
Accelerometer Coefficients - 3		Master	----	----	NOT DONE	----	<table><tr><td></td><td></td></tr></table>				
Accelerometer Coefficients - 4		Master	----	----	NOT DONE	----	<table><tr><td></td><td></td></tr></table>				
Accelerometer Coefficients - 5		Master	----	----	NOT DONE	----	<table><tr><td></td><td></td></tr></table>				
Accelerometer Coefficients - 6		Master	----	----	NOT DONE	----	<table><tr><td></td><td></td></tr></table>				
Accelerometer Coefficients - 7		Master	----	----	NOT DONE	----	<table><tr><td></td><td></td></tr></table>				
Accelerometer Coefficients - 8		Master	----	----	NOT DONE	----	<table><tr><td></td><td></td></tr></table>				
Accelerometer Coefficients - 9		Master	----	----	NOT DONE	----	<table><tr><td></td><td></td></tr></table>				

## HGNS Neutron Calibration - HGNS Neutron Accumulations

Master (EEPROM):		16:09:48 04-Feb-2017		Before:					
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	<table><tr><td></td><td></td></tr></table>		
Near Zero Measurement	1/s	Master	0	5.0	27.7	40.0	<table><tr><td></td><td><div></div></td></tr></table>		<div></div>
	<div></div>								
		Before	----	----	----	----	<table><tr><td></td><td></td></tr></table>		

		Before-Master	----	----	----	----	
Far Zero Measurement	1/s	Master Before Before-Master	0 ---- ----	5.0 ---- ----	27.4 ---- ----	40.0 ---- ----	
Near Plus Measurement	1/s	Master Before Before-Master	6031.0 ---- ----	4700.0 ---- ----	4965.0 ---- ----	6900.0 ---- ----	
Far Plus Measurement	1/s	Master Before Before-Master	2793.0 ---- ----	1900.0 ---- ----	2052.0 ---- ----	2900.0 ---- ----	
Near Corrected Plus Measurement	1/s	Master Before Before-Master	 ---- ----	4700.0 ---- ----	5042.0 ---- ----	6900.0 ---- ----	
Far Corrected Plus Measurement	1/s	Master Before Before-Master	 ---- ----	1900.0 ---- ----	2091.0 ---- ----	2900.0 ---- ----	

## HGNS Gamma-Ray Calibration - Gamma-Ray Accumulations

Before (Measured): 17:13:52 20-Feb-2017 Expired by 1 days							
Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit	
RGR Zero Measurement	gAPI	Before	30.0	0	92.3	120.0	
RGR Plus Measurement	gAPI	Before	185.4	157.1	196.5	206.3	
GR Calibration Gain		Before	0.89	0.80	0.84	1.05	

Company:	Expedition Water Solutions LLC	Schlumberger
Well:	EWS 4	
Field:	Wattenburg	
County:	Weld	
State:	Colorado	
Platform Express		
Caliper		
Cement Volume		