Schlumberger

Company: NIGHTHAWK PRODUCTION LLC

Well: TAOS 1-10

Field: WILDCAT

County: LINCOLN State: COLORADO

Borehole Compensated Sonic

County: LINCOLN
Field: WILDCAT
Location: NENE SEC 10, T6S, R54W
Well: TAOS 1-10
Company: NIGHTHAWK PRODUCTION LLC

Location:				
NENE SEC 10, T6S, R54W	Elev.	K.B.	5228.00 ft	
1091' FNL X 852' FEL		G.L.	5213.00 ft	
LAT/LONG: 39.547420/-103.419820		D.F.	5227.00 ft	
Permanent Datum:	Ground Level	Elev.:	5213.00 f	
Log Measured From:	Kelly Bushing	15.00 ft	above Perm.Datum	
Drilling Measured From:	Kelly Bushing			

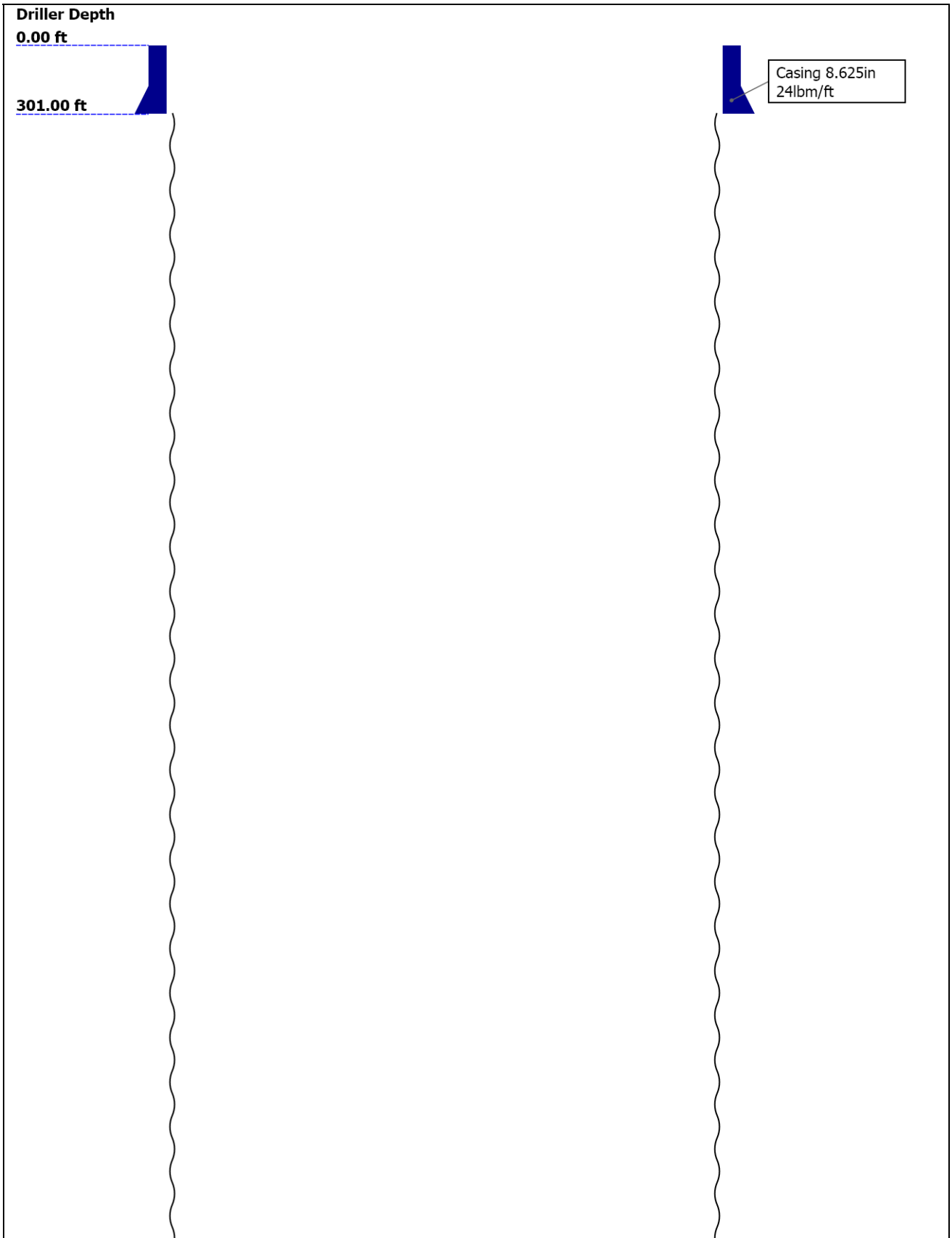
API Serial No.	Section:	Township:	Range:
05-073-06520-0000	10	6S	54W

Logging Date			31-May-2013			
Run Number			Run 1			
Depth Driller			8300.00 ft			
Schlumberger Depth			8315.00 ft			
Bottom Log Interval			8315.00 ft			
Top Log Interval			309.50 ft			
Casing Driller Size @ Depth			8.625 in @ 301.00 ft			
Casing Schlumberger			309.5 ft			
Bit Size			7.875 in			
Type Fluid In Hole			Fresh Water/DAP			
MUD	Density	Viscosity	9 lbm/gal	55 s		
	Fluid Loss	PH	12 cm3	7.2		
	Source of Sample		Flowline			
RM @ Meas Temp			0.75 ohm.m @ 89.68 degF			
RMF @ Meas Temp			0.56 ohm.m @ 75 degF			
RMC @ Meas Temp			0.94 ohm.m @ 75 degF			
Source RMF	RMC		Calculated	Calculated		
RM @ BHT	RMF @ BHT		0.4 @ 175.45	0.25 @ 175.45		
Max Recorded Temperatures			175.45 degF			
Circulation Stopped	Time		31-May-2013	11:00:00		
Logger on Bottom	Time		31-May-2013	16:15:00		
Unit Number	Location:		3022	FORT MORGAN, C		
Recorded By			Keri Loring			
Witnessed By			Anders Elgerd / Jim Wier			

Disclaimer

Contents

Well Sketch



Borehole Size/Casing/Tubing Record

Bit						
Bit Size (in)	7.875					
Top Driller (ft)	301					
Top Logger (ft)	309.5					
Bottom Driller (ft)	8300					
Bottom Logger (ft)	8315					
Casing						
Size (in)	8.625					
Weight (lbm/ft)	24					
Inner Diameter (in)	8.099					
Top Driller (ft)	0					
Top Logger (ft)	0					
Bottom Driller (ft)	301					
Bottom Logger (ft)	309.5					

Operational Run Summary

Parameter (unit)	Run 1					
Date Log Started	31-May-2013					
Time Log Started	15:38:56					
Date Log Finished	31-May-2013					
Time Log Finished	18:58:53					
Top Log Interval (ft)	309.50					
Bottom Log Interval (ft)	8315.00					
Total Depth (ft)	8300.00					
Max Hole Deviation (deg)	0.00					
Azimuth of Max Deviation (deg)	0.00					
Bit Size (in)	7.875					
Logging Unit Number	3022					
Logging Unit Location	FORT MORGAN, COLORADO					
Recorded By	Keri Loring					
Witnessed By	Anders Elgerd / Jim Wier					
Service Order Number	BX19-00078					

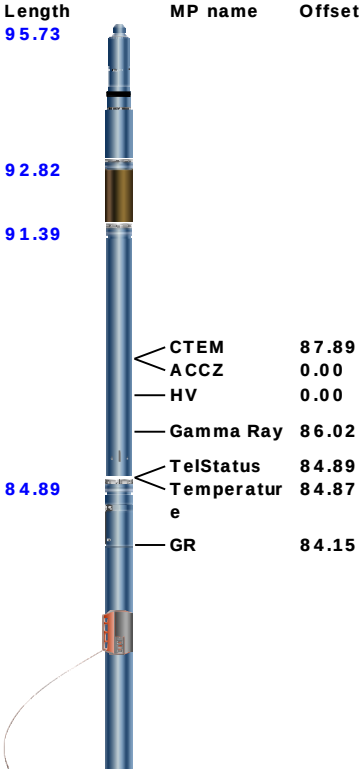
Borehole Fluids

Parameter(unit)	Run 1					
Fluid Type	Water					
Fluid Name	Fresh Water/DAP					
Max Recorded Temperatures (degF)	175.45					
Source of Sample	Flowline					
Salinity (ppm)	36327.1					
Density (lbm/gal)	9					
Funnel Viscosity (s)	55					
Fluid Loss (cm3)	12					
PH	7.2					
Date/Time Circulation Stopped	31-May-2013 11:00:00					
Date Logger on Bottom	31-May-2013					
Time Logger on Bottom	16:15:00					
Source RMF	Calculated					
RMC	Calculated					
RM @ Meas Temp (ohm.m@degF)	0.75 @ 89.68					
RMF @ Meas Temp (ohm.m@degF)	0.56 @ 75					
RMC @ Meas Temp (ohm.m@degF)	0.94 @ 75					
RM @ BHT (ohm.m@degF)	0.4 @ 175.45					
RMF @ BHT (ohm.m@degF)	0.25 @ 175.45					
RMC @ BHT (ohm.m@degF)	0.42 @ 175.45					
Total Solid (%)	5					
High Gravity Solids (%)	0					

Remarks and Equipment Summary

Run 1: Toolstring

Equip name	Length
LEH-QT:2110	**95.73**
LEH-QT:2110	
AH-369:1762	**92.82**
EDTC-B:9049	**91.39**
EDTH-B:9072	
EDTG-A	
EDTC-B:9049	
HGNS-B:863	**84.89**
HGNH:2883	
NSR-F:5069	
NPV-N	
HMCA-B	
HGNS-B:863	
HACCZ-B:452	



MP name	Offset
CTEM	**87.89**
ACCZ	**0.00**
HV	**0.00**
Gamma Ray	**86.02**
TelStatus	**84.89**
Temperatur e	**84.87**
GR	**84.15**

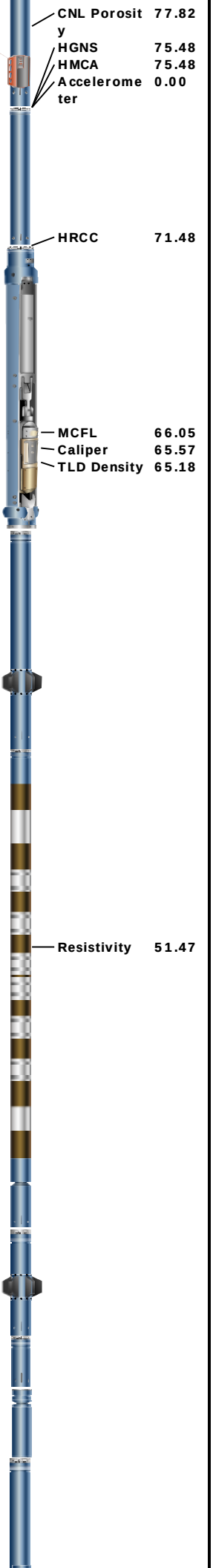
Run 1: Remarks

Toolstring run as per toolsketch

First run in hole.

Thank you for choosing Schlumberger Wireline.

Crew: J. Musgrave, J. Jump



HDRS-B:1754 **75.48**
ECH-MEB:1922
HRCC-B:791
HRMS-B:1754
GSR-J:5094
Backscatter
GPV-Q
Short Spacing
Long Spacing
HRGD-B:1849

HRLT-B:932 **63.24**
HRUH-B:946
HRUC-B:935
HRLS-B:932
HRLH-B:791
HRLC-B:791
AH-270

AH-184:2829 **39.04**

MAST-B:8181 **37.04**
ECH-SF:8023
MAPC-BA:8023
MAMS-BA:8181

Lengths are in ft
Maximum Outer Diameter = 5.000 in
Line: Sensor Location, Value: Gating Offset
All measurements are relative to TOOL_ZERO

Depth Summary

Depth Control Parameters	Run 1		
Conveyance Type	Wireline		
Rig Type	LAND		
Depth Remark Parameters	**Run 1**		
Depth Remark 1	All Schlumberger depth control		

	procedures followed.		
Depth Remark 2	IDW used as primary depth control device.		
Depth Remark 3	Z-chart used as secondary depth control device.		
Depth Measuring Device	**Run 1**		
Type	IDW-B		
Serial Number	6868A		
Calibration Date	24-OCT-2012		
Calibration Cable Type	7-39P-LXS		
Wheel Correction 1	-6		
Wheel Correction 2	-5		
Tension Device	**Run 1**		
Type	CMTD-B/A		
Serial Number	1109		
Calibration Date	30-MAR-2013		
Calibrator Serial Number	78135A		
Calibration Points	10		
Calibration RMS	15		
Calibration Peak Error	26		
Logging Cable	**Run 1**		
Type	7-39P-LXS		
Serial Number	U711136		
Logging Cable Length (ft)	17100.00		

Survey Record

Survey Calculation

Method :	Minimum Radius of Curvature	DLS Method :	Lubinski
North Reference :	True North	Total Correction Formula :	Magnetic Dec

Rig Location

Latitude :	39.547420 degrees	Longitude :	-103.41982 degrees

Tie In Point

Measured Depth:	0.00 ft	Inclination:	0.00 deg	Azimuth:	0.00 deg
True Vertical Depth:	0.00 ft	North Displacement:	0.00 ft	East Displacement:	0.00 ft

Survey Quality Index

9 : Manual 28 : Tie-In Point

Survey Correction Index

0 : No correction

Survey Description Index

0 : Not Flagged Survey

Seq	MD (ft)	Incl (deg)	Azim (deg)	Course (ft)	TVD (ft)	V Sec (ft)	N/ -S (ft)	E/ -W (ft)	Closure (ft)	at Azim (deg)	DLS deg/100ft	Tool Type	QI	CI	DI
1	0.00	0.00	0.00	- - - -	0.00	0.00	0.00	0.00	0.00	90.00	0.00	TIP	28	0	0
2	256.00	0.57	89.84	256.00	256.00	0.00	0.00	1.27	1.28	89.84	0.22	Other	9	0	0
3	347.00	0.80	131.70	91.00	346.99	-0.42	-0.42	2.20	2.23	100.75	0.59	Other	9	0	0
4	408.00	0.70	146.90	61.00	407.98	-1.01	-1.01	2.72	2.92	110.42	0.36	Other	9	0	0
5	469.00	0.80	133.50	61.00	468.98	-1.62	-1.62	3.23	3.61	116.59	0.33	Other	9	0	0
6	561.00	1.50	134.00	92.00	560.96	-2.90	-2.90	4.57	5.41	122.39	0.76	Other	9	0	0
7	652.00	1.30	136.30	91.00	651.93	-4.47	-4.47	6.14	7.58	126.08	0.23	Other	9	0	0
8	746.00	1.80	120.00	94.00	745.90	-5.98	-5.98	8.15	10.10	126.26	0.70	Other	9	0	0
9	838.00	2.30	107.10	92.00	837.84	-7.25	-7.25	11.17	13.32	122.97	0.74	Other	9	0	0
10	940.00	2.60	101.30	102.00	939.75	-8.30	-8.30	15.39	17.49	118.34	0.38	Other	9	0	0
11	1026.00	2.50	102.00	86.00	1025.66	-9.07	-9.07	19.14	21.19	115.36	0.12	Other	9	0	0
12	1111.00	2.20	109.60	85.00	1110.59	-10.01	-10.01	22.49	24.61	113.98	0.51	Other	9	0	0
13	1197.00	2.30	105.40	86.00	1196.52	-11.02	-11.02	25.71	27.99	113.20	0.22	Other	9	0	0

14	1282.00	2.40	109.20	85.00	1281.45	-12.06	-12.06	29.03	31.43	112.55	0.22	Other	9	0	0
15	1368.00	1.90	113.80	86.00	1367.39	-13.22	-13.22	32.04	34.65	112.43	0.61	Other	9	0	0
16	1453.00	1.80	122.40	85.00	1452.35	-14.51	-14.51	34.46	37.37	112.83	0.35	Other	9	0	0
17	1539.00	1.50	119.10	86.00	1538.31	-15.78	-15.78	36.58	39.83	113.33	0.37	Other	9	0	0
18	1626.00	1.80	114.50	87.00	1625.28	-16.90	-16.90	38.82	42.32	113.52	0.38	Other	9	0	0
19	1712.00	1.50	124.00	86.00	1711.24	-18.09	-18.09	40.98	44.78	113.82	0.47	Other	9	0	0
20	1797.00	1.30	113.80	85.00	1796.22	-19.10	-19.10	42.78	46.85	114.06	0.38	Other	9	0	0
21	1883.00	1.50	109.90	86.00	1882.19	-19.88	-19.88	44.74	48.95	113.96	0.26	Other	9	0	0
22	1968.00	1.20	114.70	85.00	1967.17	-20.63	-20.63	46.59	50.95	113.88	0.38	Other	9	0	0
23	2054.00	1.60	127.00	86.00	2053.14	-21.73	-21.73	48.37	53.02	114.19	0.58	Other	9	0	0
24	2139.00	1.50	135.60	85.00	2138.11	-23.23	-23.23	50.09	55.22	114.88	0.30	Other	9	0	0
25	2225.00	1.70	129.80	86.00	2224.08	-24.86	-24.86	51.86	57.51	115.61	0.30	Other	9	0	0
26	2310.00	1.40	122.80	85.00	2309.04	-26.22	-26.22	53.70	59.78	116.03	0.42	Other	9	0	0
27	2395.00	2.00	102.40	85.00	2394.01	-27.11	-27.11	56.02	62.24	115.82	0.99	Other	9	0	0
28	2483.00	2.00	98.70	88.00	2481.95	-27.67	-27.67	59.04	65.19	115.11	0.15	Other	9	0	0
29	2568.00	2.10	98.90	85.00	2566.90	-28.13	-28.13	62.05	68.11	114.39	0.12	Other	9	0	0
30	2654.00	2.30	98.00	86.00	2652.84	-28.62	-28.62	65.31	71.29	113.66	0.24	Other	9	0	0
31	2740.00	2.00	96.60	86.00	2738.78	-29.03	-29.03	68.51	74.41	112.96	0.35	Other	9	0	0
32	2825.00	2.30	103.60	85.00	2823.72	-29.60	-29.60	71.64	77.53	112.45	0.47	Other	9	0	0
33	2911.00	2.30	114.00	86.00	2909.65	-30.71	-30.71	74.90	80.94	112.29	0.48	Other	9	0	0
34	2996.00	2.40	116.80	85.00	2994.58	-32.21	-32.21	78.04	84.42	112.42	0.18	Other	9	0	0
35	3081.00	2.40	118.40	85.00	3079.50	-33.85	-33.85	81.20	87.96	112.63	0.08	Other	9	0	0
36	3167.00	2.20	118.60	86.00	3165.43	-35.50	-35.50	84.23	91.40	112.85	0.23	Other	9	0	0
37	3252.00	2.50	126.60	85.00	3250.36	-37.39	-37.39	87.15	94.82	113.22	0.52	Other	9	0	0
38	3337.00	1.30	116.60	85.00	3335.31	-38.92	-38.92	89.50	97.60	113.50	1.46	Other	9	0	0
39	3425.00	1.30	117.00	88.00	3423.29	-39.82	-39.82	91.28	99.61	113.57	0.01	Other	9	0	0
40	3512.00	1.40	107.30	87.00	3510.27	-40.59	-40.59	93.18	101.64	113.54	0.29	Other	9	0	0
41	3602.00	1.40	124.00	90.00	3600.24	-41.53	-41.53	95.14	103.81	113.58	0.45	Other	9	0	0
42	3688.00	1.50	133.00	86.00	3686.21	-42.89	-42.89	96.83	105.91	113.89	0.29	Other	9	0	0
43	3773.00	1.50	131.60	85.00	3771.18	-44.38	-44.38	98.48	108.01	114.26	0.04	Other	9	0	0
44	3859.00	1.40	142.50	86.00	3857.15	-45.96	-45.96	99.96	110.01	114.69	0.34	Other	9	0	0
45	3944.00	1.10	122.40	85.00	3942.13	-47.22	-47.22	101.28	111.75	115.00	0.62	Other	9	0	0
46	4030.00	1.30	124.40	86.00	4028.12	-48.22	-48.22	102.78	113.52	115.13	0.24	Other	9	0	0
47	4115.00	1.80	107.10	85.00	4113.09	-49.16	-49.16	104.85	115.81	115.12	0.80	Other	9	0	0
48	4201.00	1.60	101.90	86.00	4199.05	-49.80	-49.80	107.32	118.31	114.89	0.29	Other	9	0	0
49	4288.00	1.70	103.40	87.00	4286.01	-50.35	-50.35	109.76	120.77	114.64	0.13	Other	9	0	0
50	4374.00	1.80	95.50	86.00	4371.97	-50.77	-50.77	112.35	123.29	114.32	0.30	Other	9	0	0
51	4459.00	1.60	93.60	85.00	4456.93	-50.98	-50.98	114.86	125.66	113.93	0.24	Other	9	0	0
52	4545.00	1.50	74.30	86.00	4542.90	-50.75	-50.75	117.14	127.66	113.42	0.61	Other	9	0	0
53	4634.00	1.90	72.70	89.00	4631.86	-49.99	-49.99	119.67	129.69	112.67	0.45	Other	9	0	0
54	4720.00	1.80	77.40	86.00	4717.82	-49.28	-49.28	122.35	131.89	111.94	0.21	Other	9	0	0
55	4807.00	1.80	79.50	87.00	4804.78	-48.73	-48.73	125.03	134.19	111.29	0.08	Other	9	0	0
56	4893.00	2.00	70.20	86.00	4890.73	-47.97	-47.97	127.77	136.48	110.58	0.43	Other	9	0	0
57	4980.00	1.80	103.40	87.00	4977.68	-47.78	-47.78	130.53	139.01	110.10	1.27	Other	9	0	0
58	5067.00	2.00	106.60	87.00	5064.64	-48.53	-48.53	133.31	141.86	110.00	0.26	Other	9	0	0
59	5147.00	2.20	106.20	80.00	5144.58	-49.35	-49.35	136.12	144.78	109.93	0.25	Other	9	0	0
60	5233.00	2.00	109.10	86.00	5230.52	-50.31	-50.31	139.13	147.93	109.88	0.26	Other	9	0	0
61	5318.00	2.00	109.80	85.00	5315.47	-51.29	-51.29	141.92	150.92	109.87	0.03	Other	9	0	0
62	5404.00	2.00	112.80	86.00	5401.42	-52.38	-52.38	144.72	153.90	109.90	0.12	Other	9	0	0
63	5489.00	1.90	115.90	85.00	5486.37	-53.57	-53.57	147.36	156.79	109.98	0.17	Other	9	0	0
64	5575.00	1.80	106.10	86.00	5572.33	-54.57	-54.57	149.94	159.55	110.00	0.39	Other	9	0	0
65	5660.00	1.40	96.60	85.00	5657.29	-55.06	-55.06	152.25	161.91	109.88	0.56	Other	9	0	0
66	5746.00	1.60	105.20	86.00	5743.26	-55.50	-55.50	154.45	164.11	109.76	0.35	Other	9	0	0
67	5831.00	2.70	115.70	85.00	5828.20	-56.67	-56.67	157.40	167.29	109.80	1.37	Other	9	0	0

68	5917.00	2.80	126.50	86.00	5914.10	-58.80	-58.80	160.91	171.33	110.07	0.61	Other	9	0	0
69	6004.00	1.60	140.30	87.00	6001.04	-61.00	-61.00	163.40	174.41	110.47	1.50	Other	9	0	0
70	6090.00	1.40	141.10	86.00	6087.01	-62.74	-62.74	164.83	176.38	110.84	0.23	Other	9	0	0
71	6175.00	1.70	135.10	85.00	6171.98	-64.44	-64.44	166.37	178.41	111.17	0.40	Other	9	0	0
72	6261.00	1.30	131.90	86.00	6257.95	-66.00	-66.00	167.99	180.48	111.45	0.48	Other	9	0	0
73	6346.00	1.30	128.60	85.00	6342.93	-67.24	-67.24	169.47	182.32	111.64	0.09	Other	9	0	0
74	6431.00	1.80	123.30	85.00	6427.90	-68.58	-68.58	171.33	184.55	111.81	0.61	Other	9	0	0
75	6517.00	1.60	127.20	86.00	6513.86	-70.05	-70.05	173.42	187.04	111.99	0.27	Other	9	0	0
76	6603.00	1.40	124.50	86.00	6599.83	-71.37	-71.37	175.24	189.21	112.16	0.25	Other	9	0	0
77	6690.00	2.30	106.10	87.00	6686.78	-72.45	-72.45	177.80	191.99	112.17	1.23	Other	9	0	0
78	6776.00	2.10	101.00	86.00	6772.72	-73.23	-73.23	181.00	195.24	112.03	0.33	Other	9	0	0
79	6864.00	2.00	101.50	88.00	6860.66	-73.85	-73.85	184.09	198.36	111.86	0.12	Other	9	0	0
80	6949.00	2.10	106.60	85.00	6945.61	-74.59	-74.59	187.03	201.35	111.74	0.24	Other	9	0	0
81	7035.00	2.50	122.20	86.00	7031.54	-76.04	-76.04	190.13	204.76	111.80	0.86	Other	9	0	0
82	7123.00	2.50	120.80	88.00	7119.46	-78.04	-78.04	193.40	208.56	111.98	0.07	Other	9	0	0
83	7210.00	2.40	117.50	87.00	7206.38	-79.85	-79.85	196.65	212.24	112.10	0.20	Other	9	0	0
84	7295.00	1.80	106.60	85.00	7291.32	-81.06	-81.06	199.51	215.35	112.11	0.84	Other	9	0	0
85	7381.00	1.70	116.40	86.00	7377.28	-82.01	-82.01	201.94	217.95	112.10	0.37	Other	9	0	0
86	7466.00	1.50	138.80	85.00	7462.25	-83.41	-83.41	203.81	220.21	112.26	0.77	Other	9	0	0
87	7552.00	1.20	114.00	86.00	7548.22	-84.62	-84.62	205.37	222.11	112.39	0.76	Other	9	0	0
88	7641.00	1.10	107.00	89.00	7637.21	-85.25	-85.25	207.04	223.92	112.38	0.19	Other	9	0	0
89	7728.00	1.90	103.60	87.00	7724.18	-85.83	-85.83	209.24	226.15	112.30	0.92	Other	9	0	0
90	7771.00	2.40	110.30	43.00	7767.15	-86.31	-86.31	210.78	227.76	112.27	1.30	Other	9	0	0
91	7813.00	2.90	111.90	42.00	7809.10	-87.02	-87.02	212.59	229.69	112.26	1.20	Other	9	0	0
92	7855.00	3.00	115.20	42.00	7851.04	-87.88	-87.88	214.57	231.86	112.27	0.47	Other	9	0	0
93	7898.00	2.60	111.30	43.00	7893.99	-88.71	-88.71	216.49	233.96	112.28	1.03	Other	9	0	0
94	7941.00	2.20	113.60	43.00	7936.96	-89.40	-89.40	218.16	235.76	112.28	0.96	Other	9	0	0

Run 1

Integration Summary

Output Channel(s)	Output Description	Input Parameter	Output Value	Unit

Pass Summary

Run Name	Pass Objective	Direction	Top	Bottom	Start	Stop	Depth Shift	Include Parallel Data
Run 1	Main[3]:Up	Up	285.10 ft	8340.47 ft	31-May-2013 4:39:28 PM	31-May-2013 6:55:10 PM	10.52 ft	true

All depths are referenced to toolstring zero

Log

Run 1: Main[3]:Up

Description: SONI_Traditional_CompressionalDT_Curves Format: Log (Sonic Delta-t_1) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 31-May-2013 22:18:24

ITT - Integrated Transit Time every 1.00 (ms)

ITT - Integrated Transit Time every 10.00 (ms)

TIME_1900 - Time Marked every 60.00 (s)

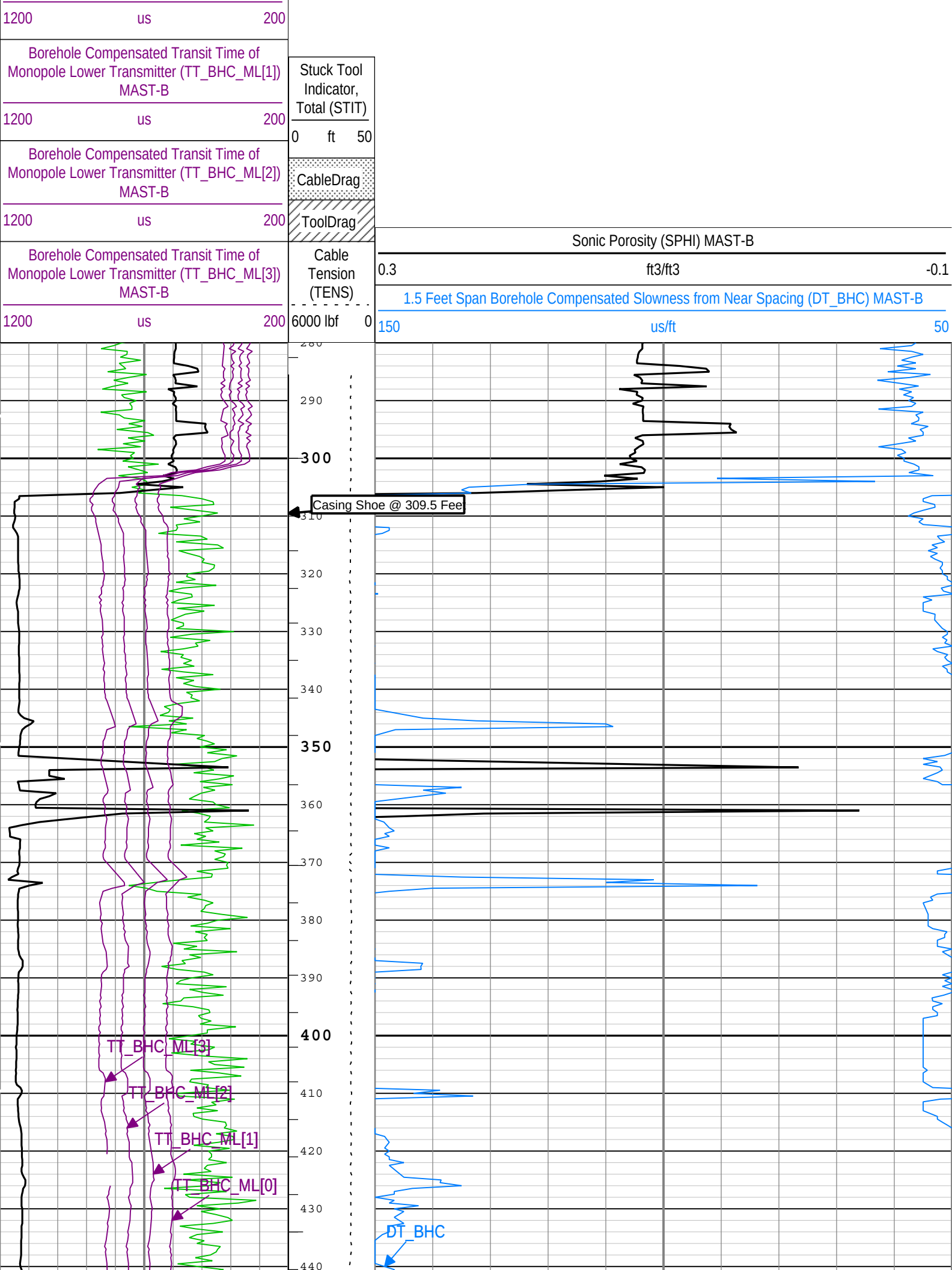
Raw Gamma Ray (RGR) HGNS-B

0 gAPI 150

Sonic Velocity (SVEL) MAST-B

5000 ft/s 25000

Borehole Compensated Transit Time of Monopole Lower Transmitter (TT_BHC_ML[0]) MAST-B


1200
us
200
Borehole Compensated Transit Time of Monopole Lower Transmitter (TT_BHC_ML[1]) MAST-B
1200
us
200
Borehole Compensated Transit Time of Monopole Lower Transmitter (TT_BHC_ML[2]) MAST-B
1200
us
200
Borehole Compensated Transit Time of Monopole Lower Transmitter (TT_BHC_ML[3]) MAST-B
1200
us
200
Stuck Tool Indicator, Total (STIT)
0
ft
50
CableDrag
ToolDrag
Cable Tension (TENS)
6000 lbf
0
Sonic Porosity (SPHI) MAST-B
0.3
ft3/ft3
-0.1
1.5 Feet Span Borehole Compensated Slowness from Near Spacing (DT_BHC) MAST-B
150
us/ft
50
290
300
Casing Shoe @ 309.5 Feet
320
330
340
350
360
370
380
390
400
410
420
430
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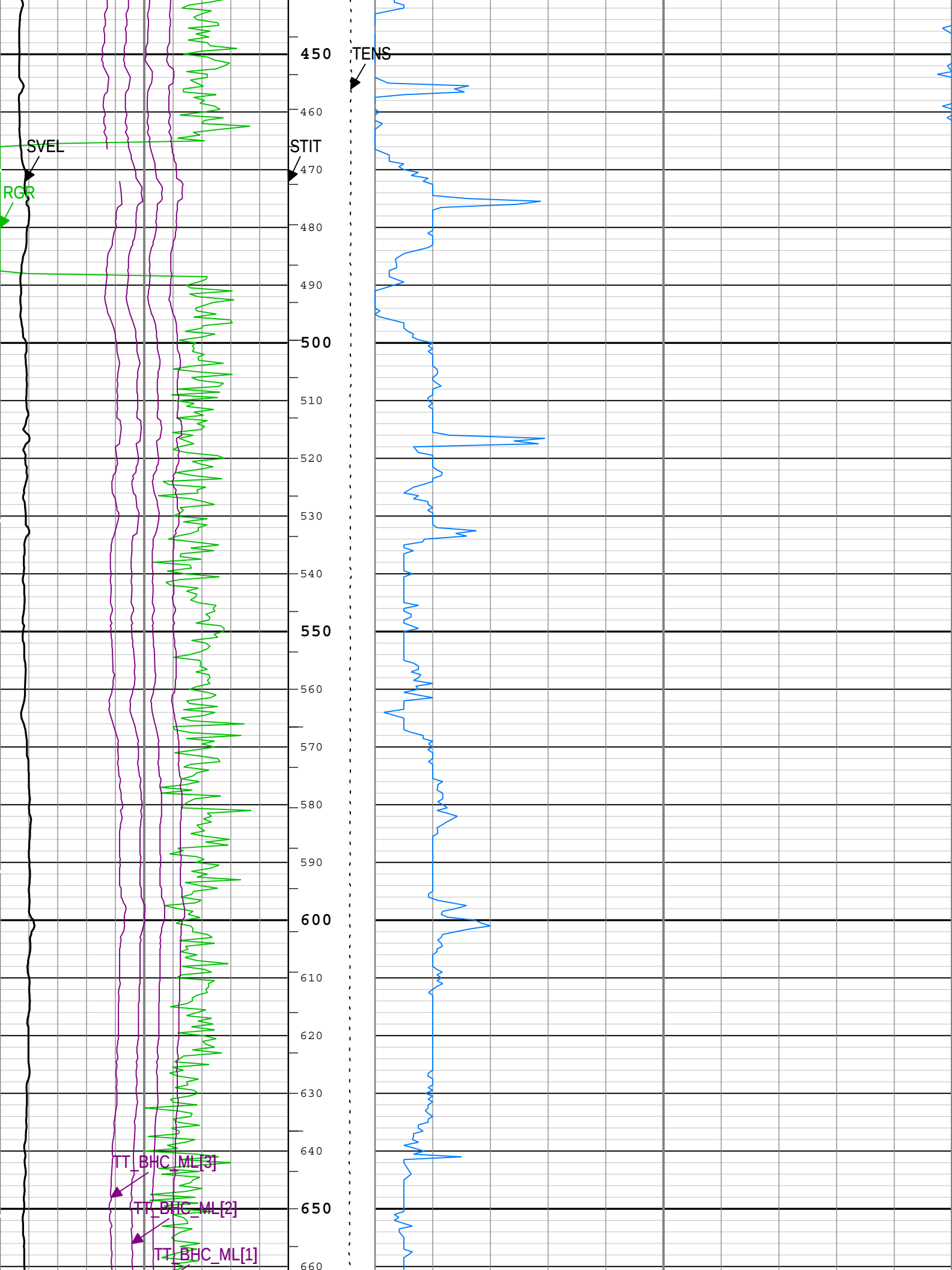
TT_BHC_ML[3]
TT_BHC_ML[2]
TT_BHC_ML[1]
TT_BHC_ML[0]
DT_BHC


TENS
SVEL
STIT
RGR
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TT_BHC_ML[2]
TT_BHC_ML[1]
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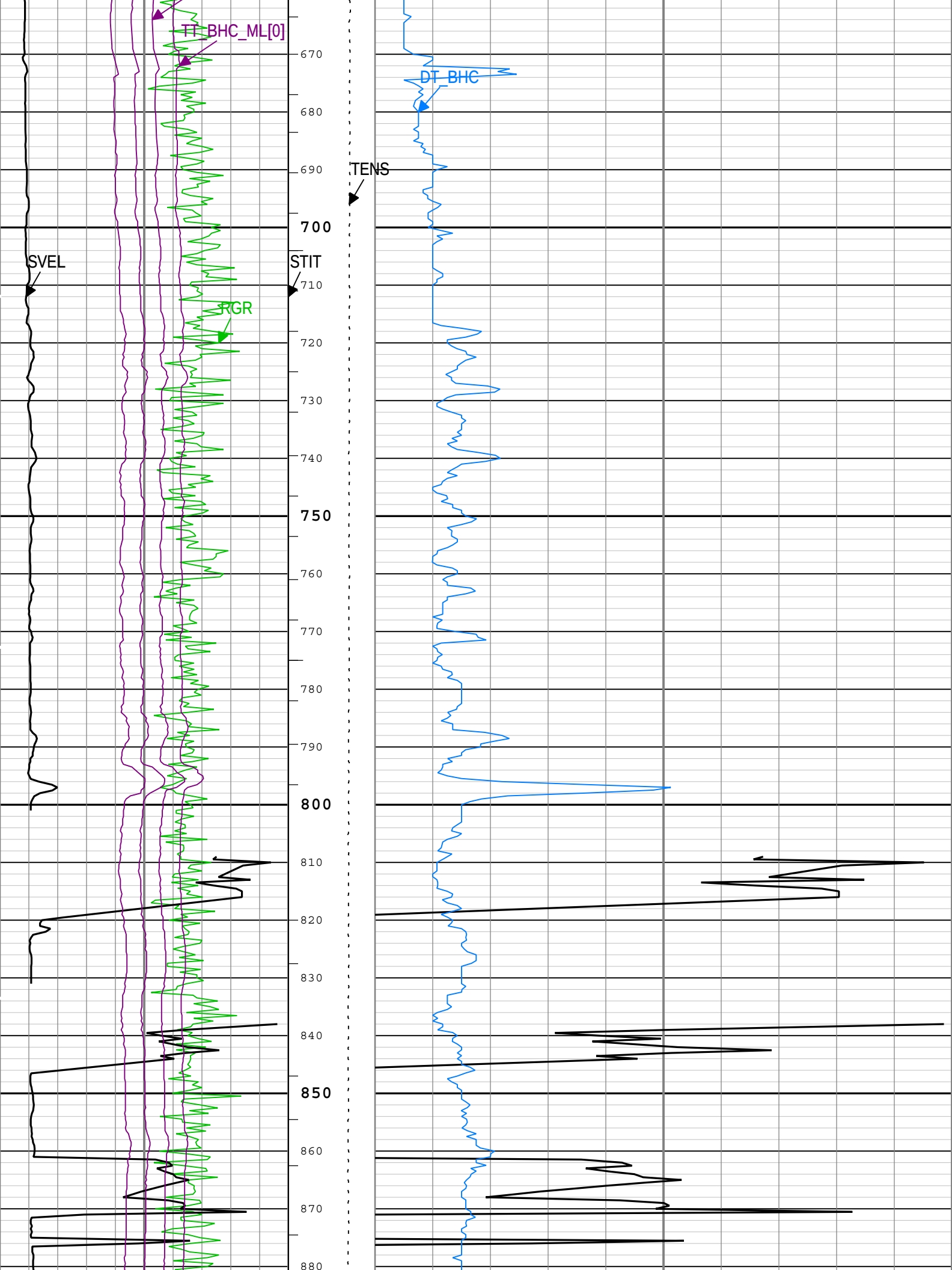
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RGR
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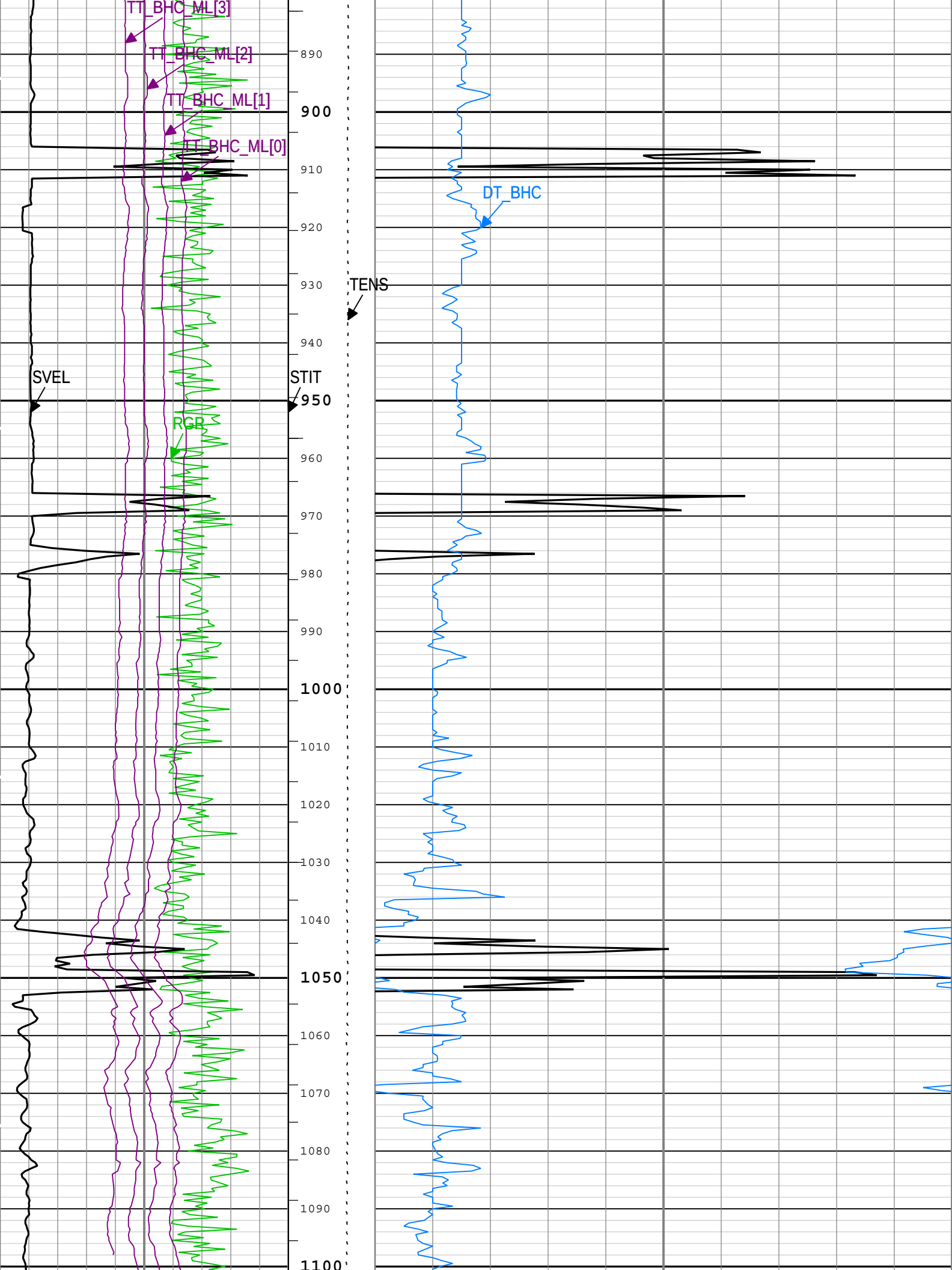
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TT_BHC_ML[0]
DT_BHC
TENS
SVEL
STIT
RGR
890
900
910
920
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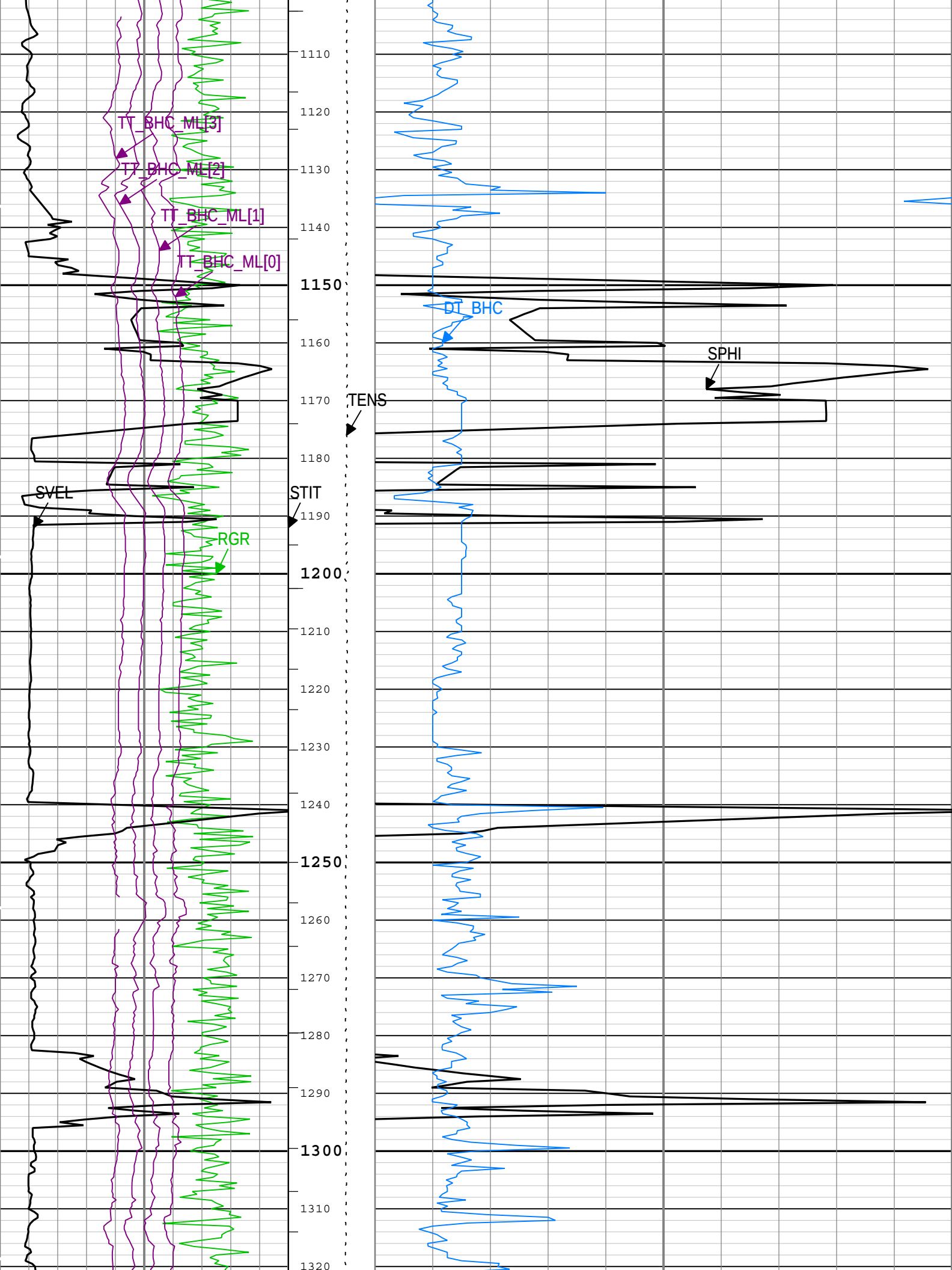
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TT_BHC_ML[2]
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TT_BHC_ML[0]
DT_BHC
SPHI
TENS
SVEL
STIT
RGR
1110
1120
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1140
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1160
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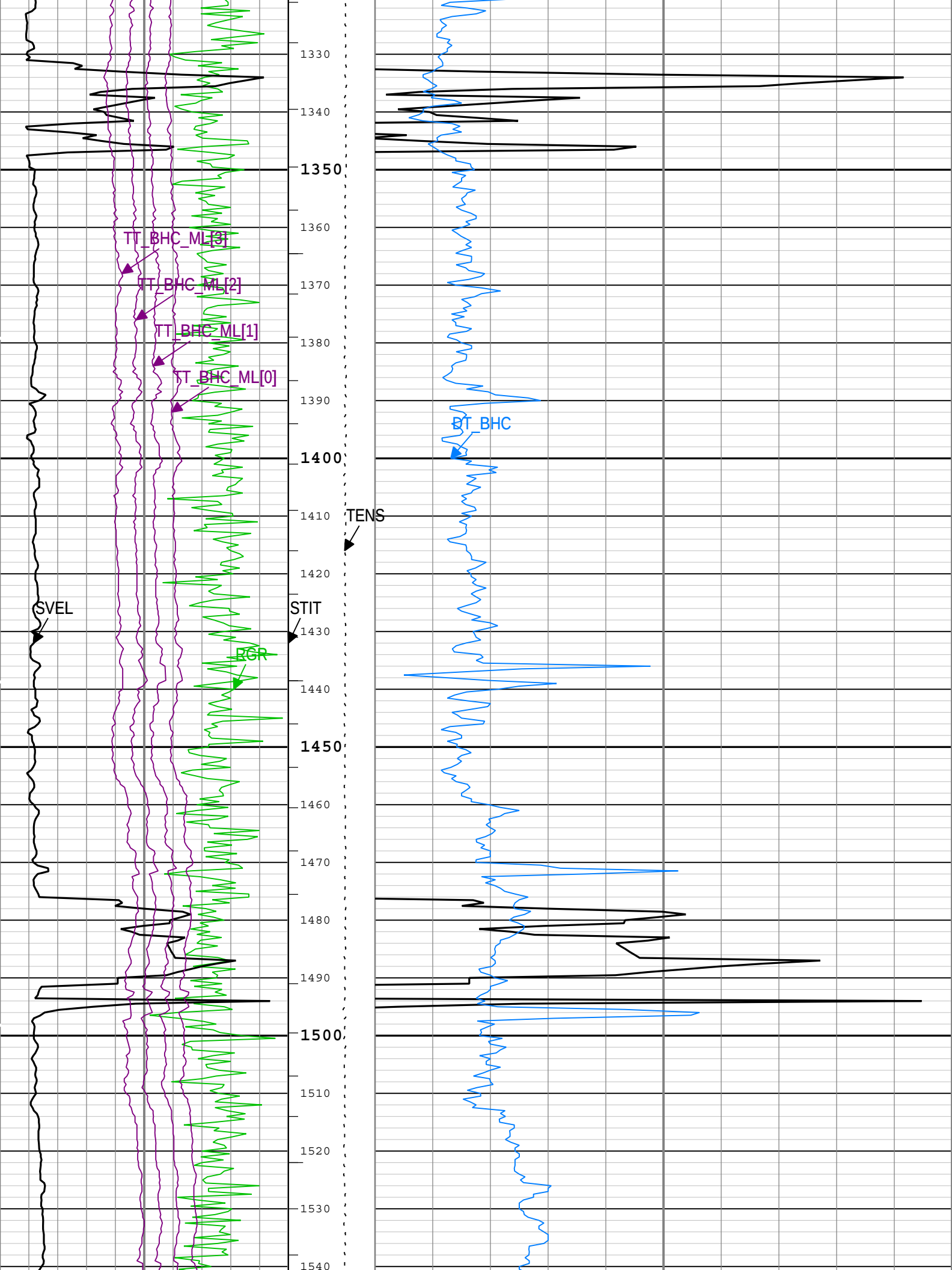
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TT_BHC_ML[3]
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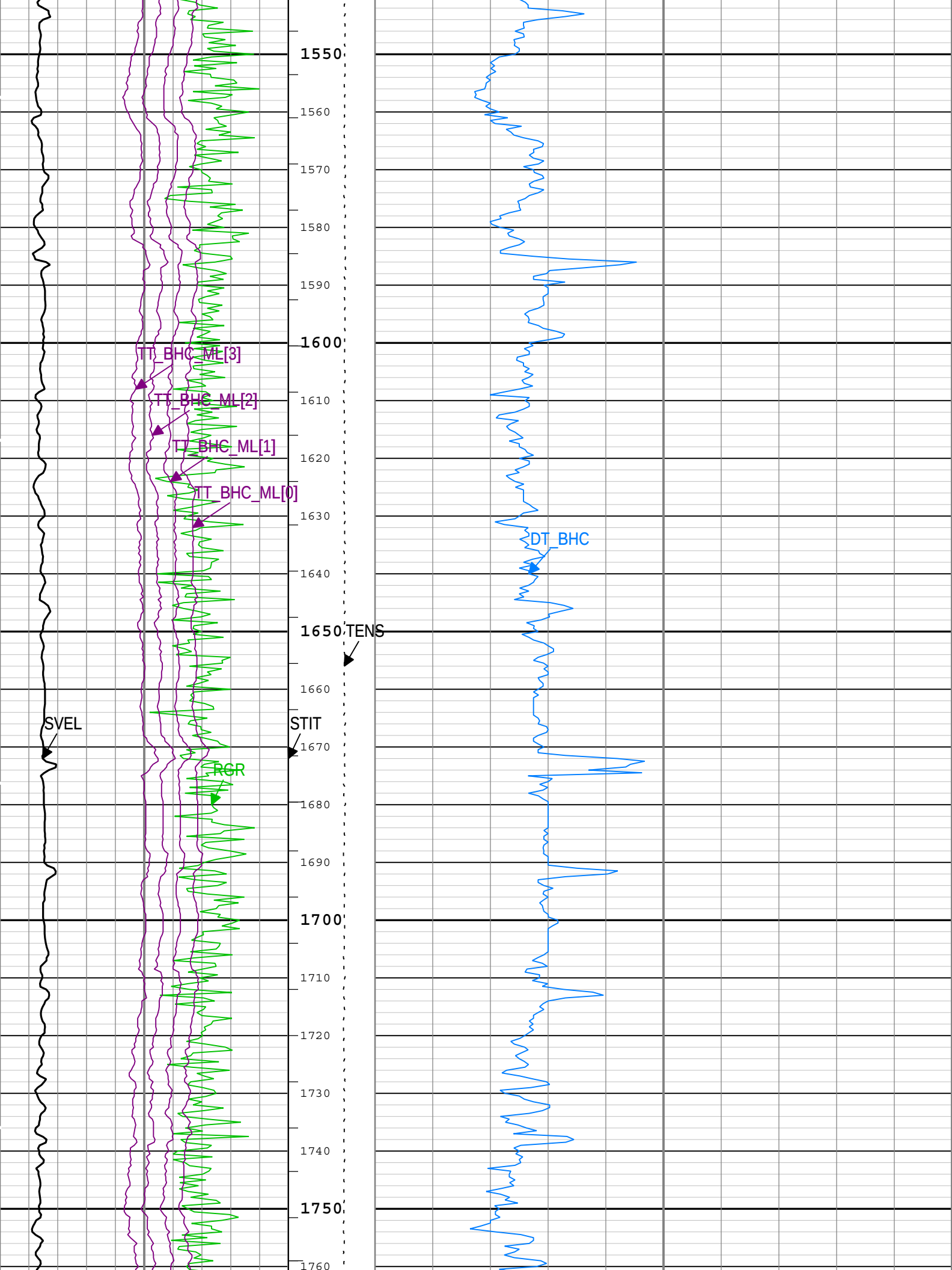
DT_BHC
TENS
SVEL
STIT
RGR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TT_BHC_ML[3]
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DT_BHC
TENS
SVEL
STIT
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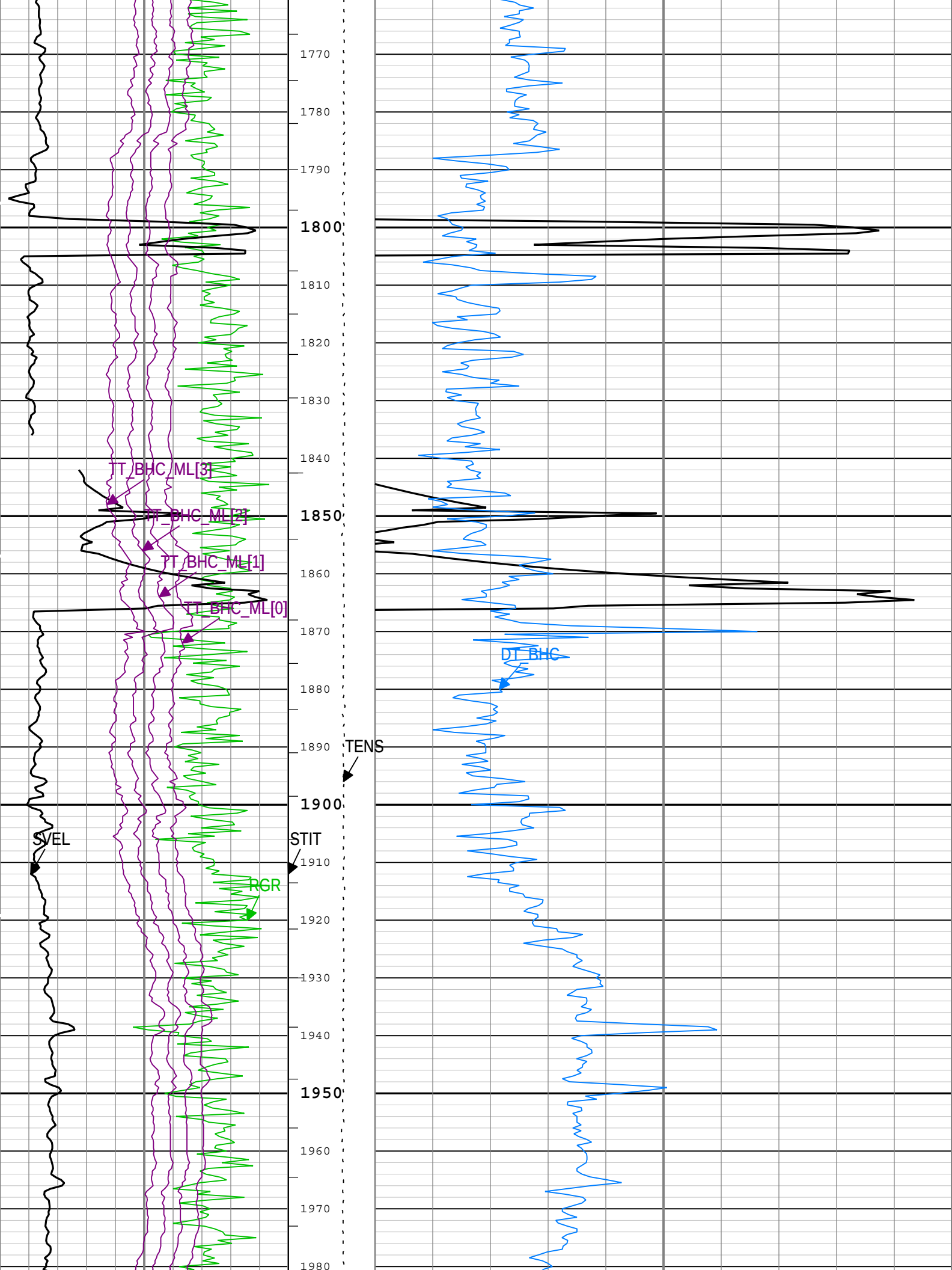
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1980
TT_BHC_ML[3]
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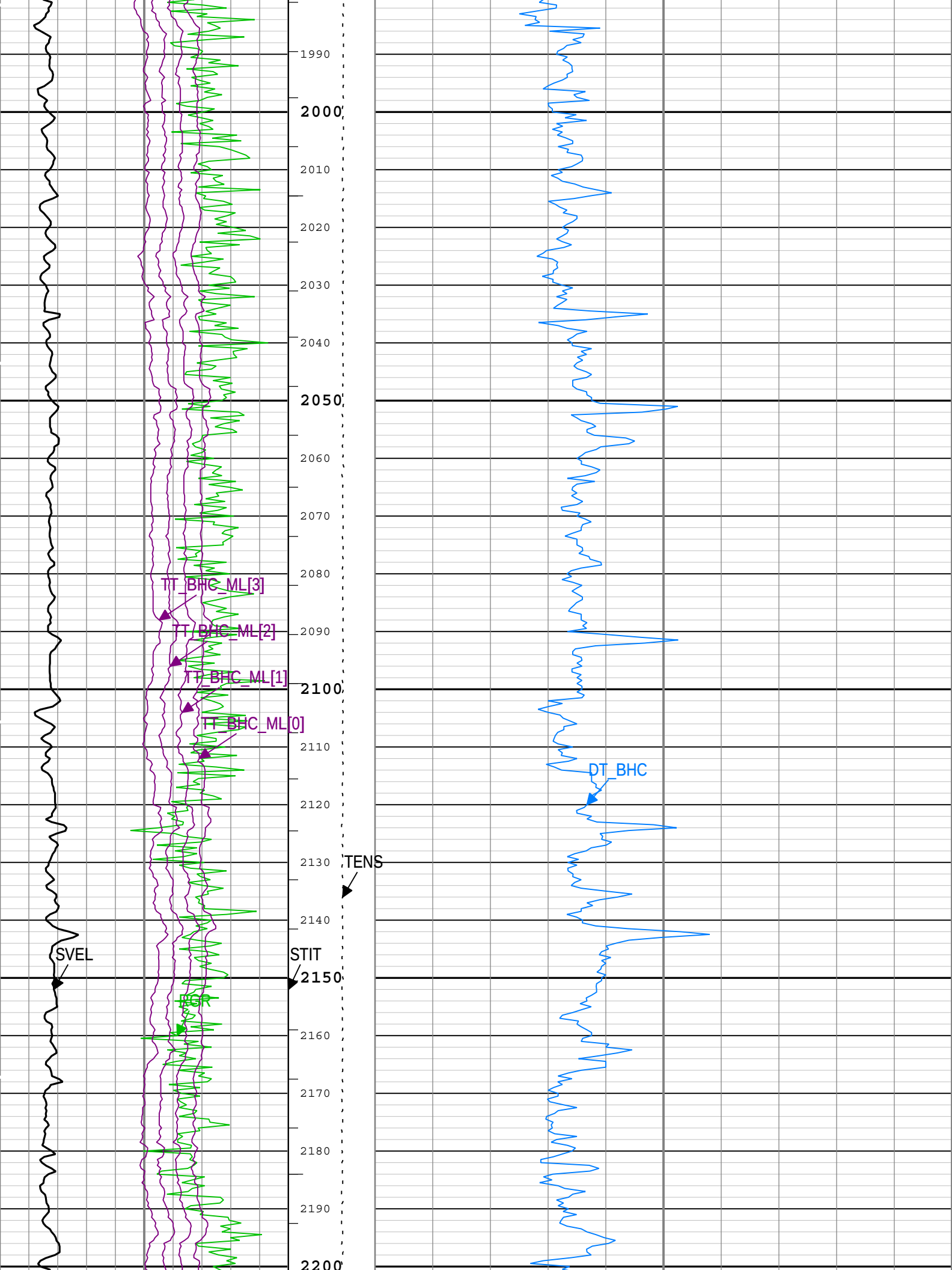
TT_BHC_ML[1]
TT_BHC_ML[0]
DT_BHC
TENS
SVEL
STIT
RGR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2180
2190
2200
TT_BHC_ML[3]
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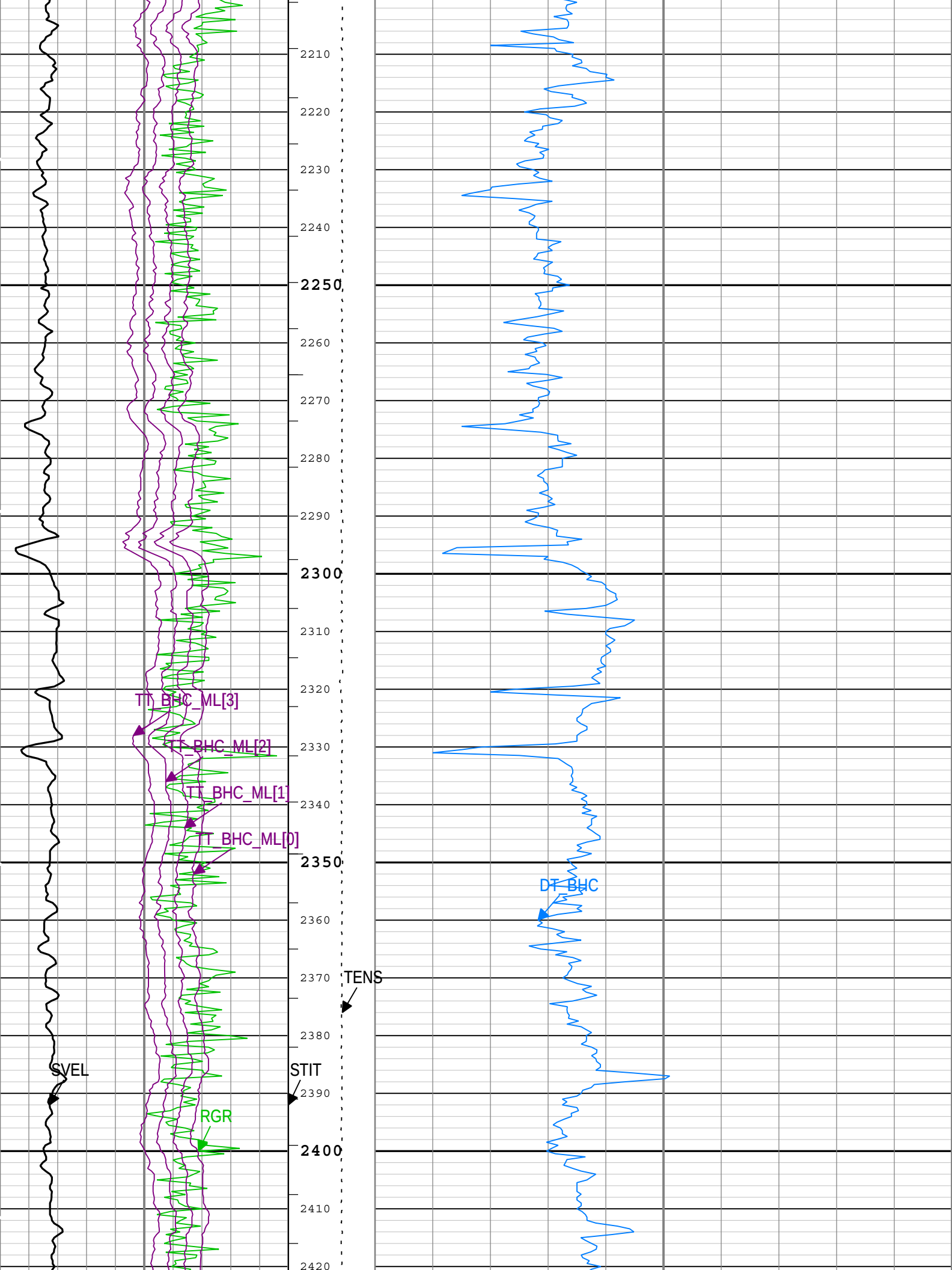
TT_BHC_ML[1]
TT_BHC_ML[0]
DT_BHC
TENS
SVEL
STIT
HGR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2420
TT_BHC_ML[3]
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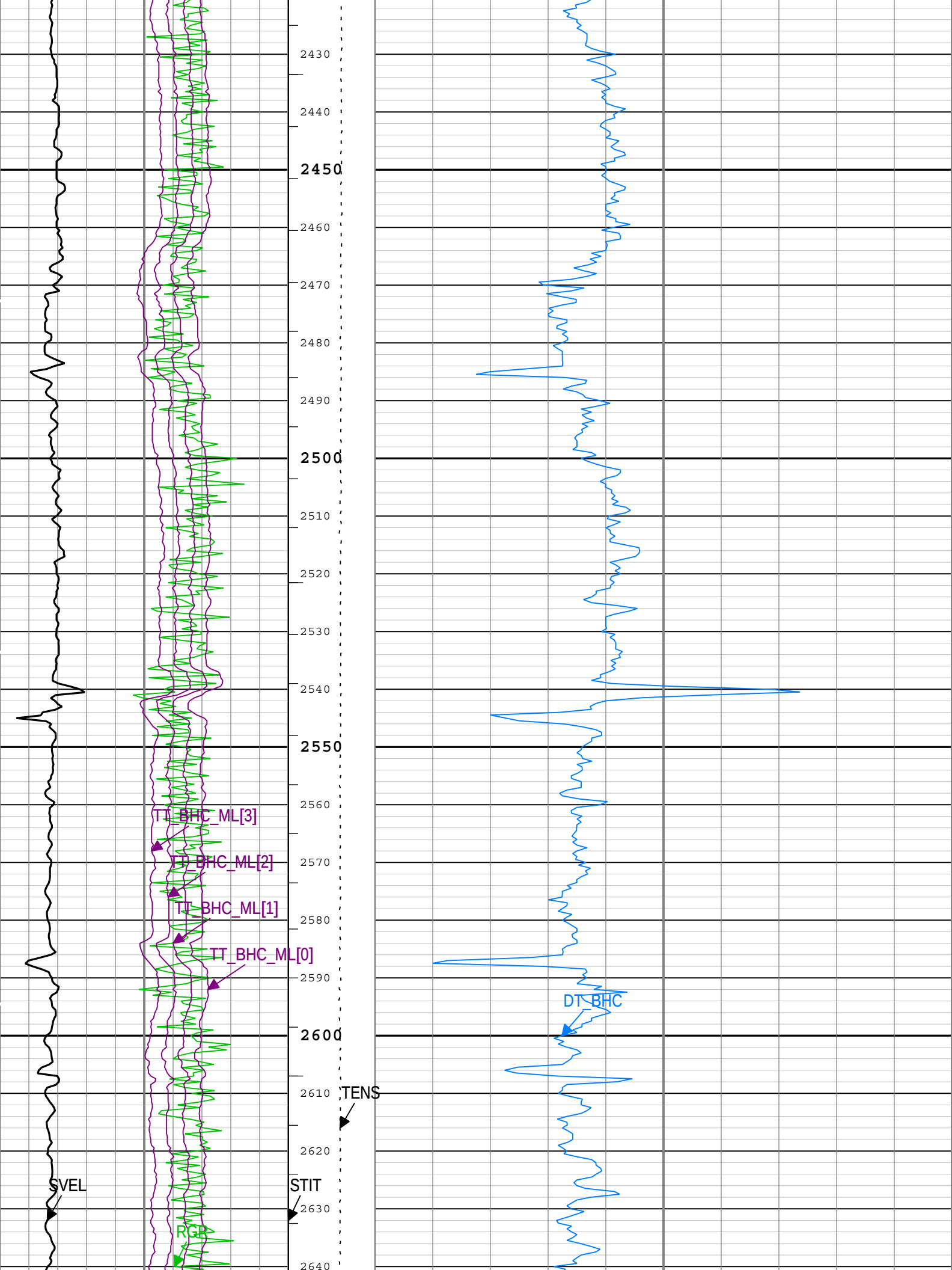
DT_BHC
TENS
SVEL
STIT
RGR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TT_BHC_ML[3]
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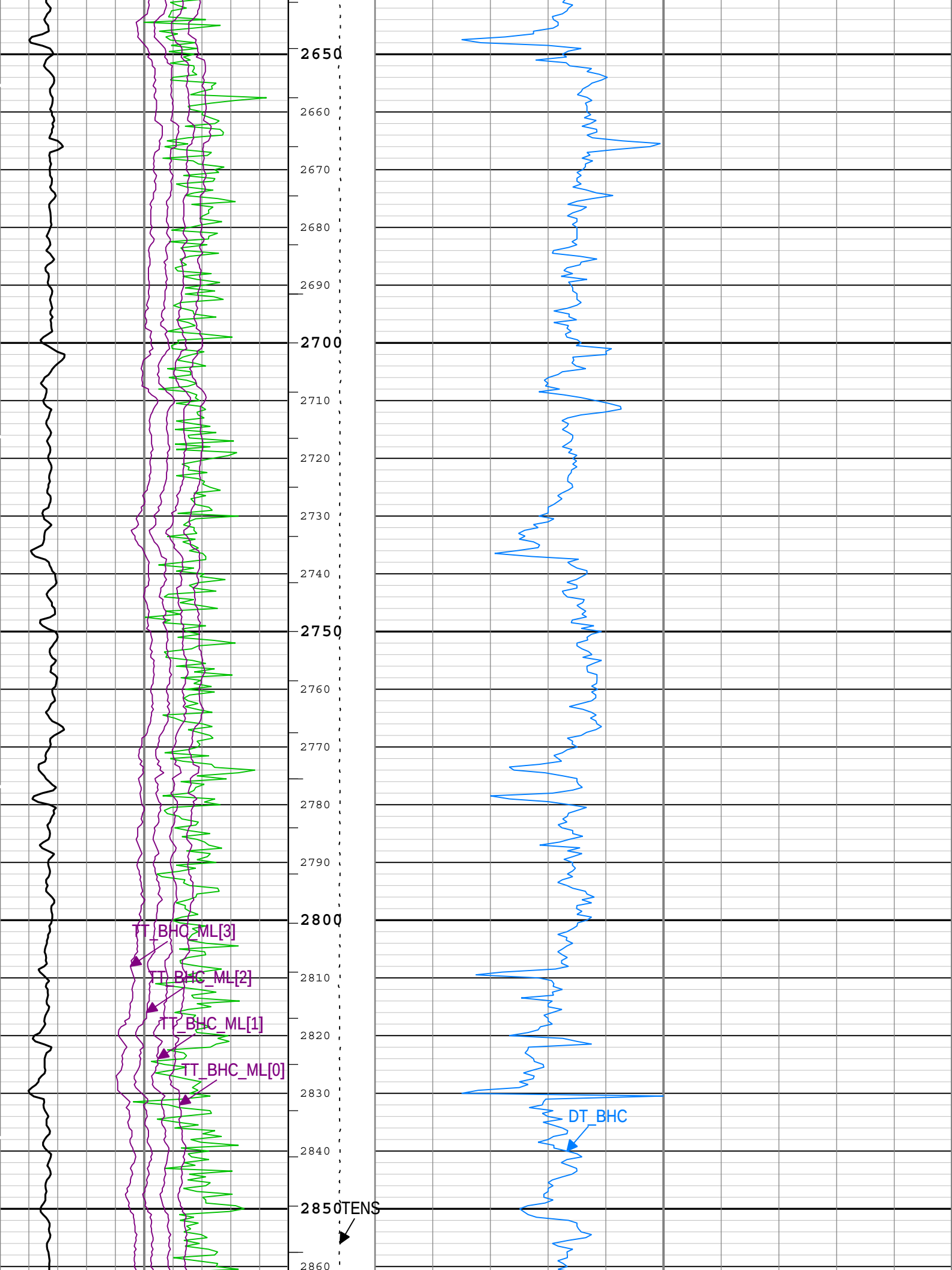
DT_BHC
TENS
SVEL
STIT
RGR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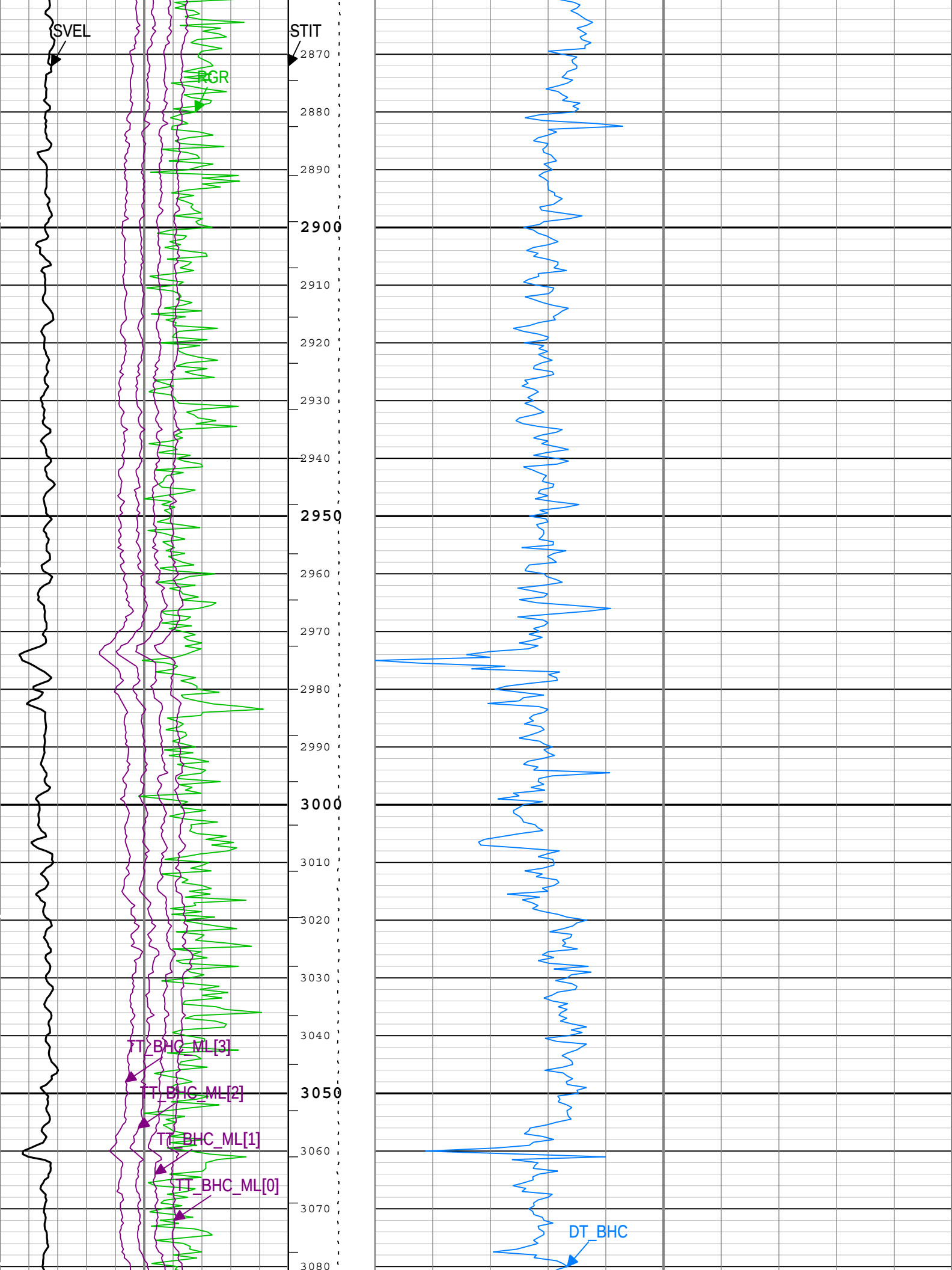
DT_BHC
TENS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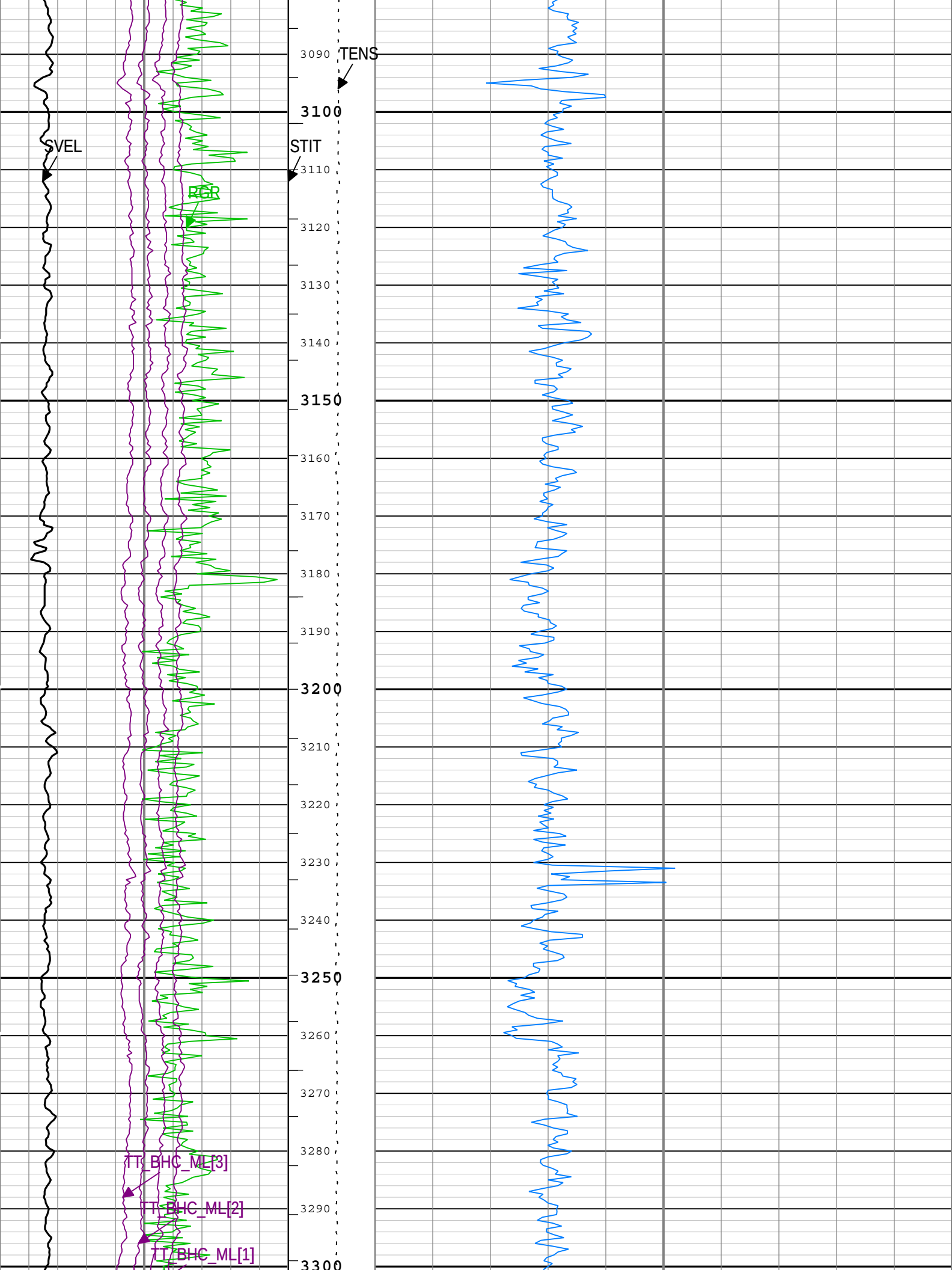
DT_BHC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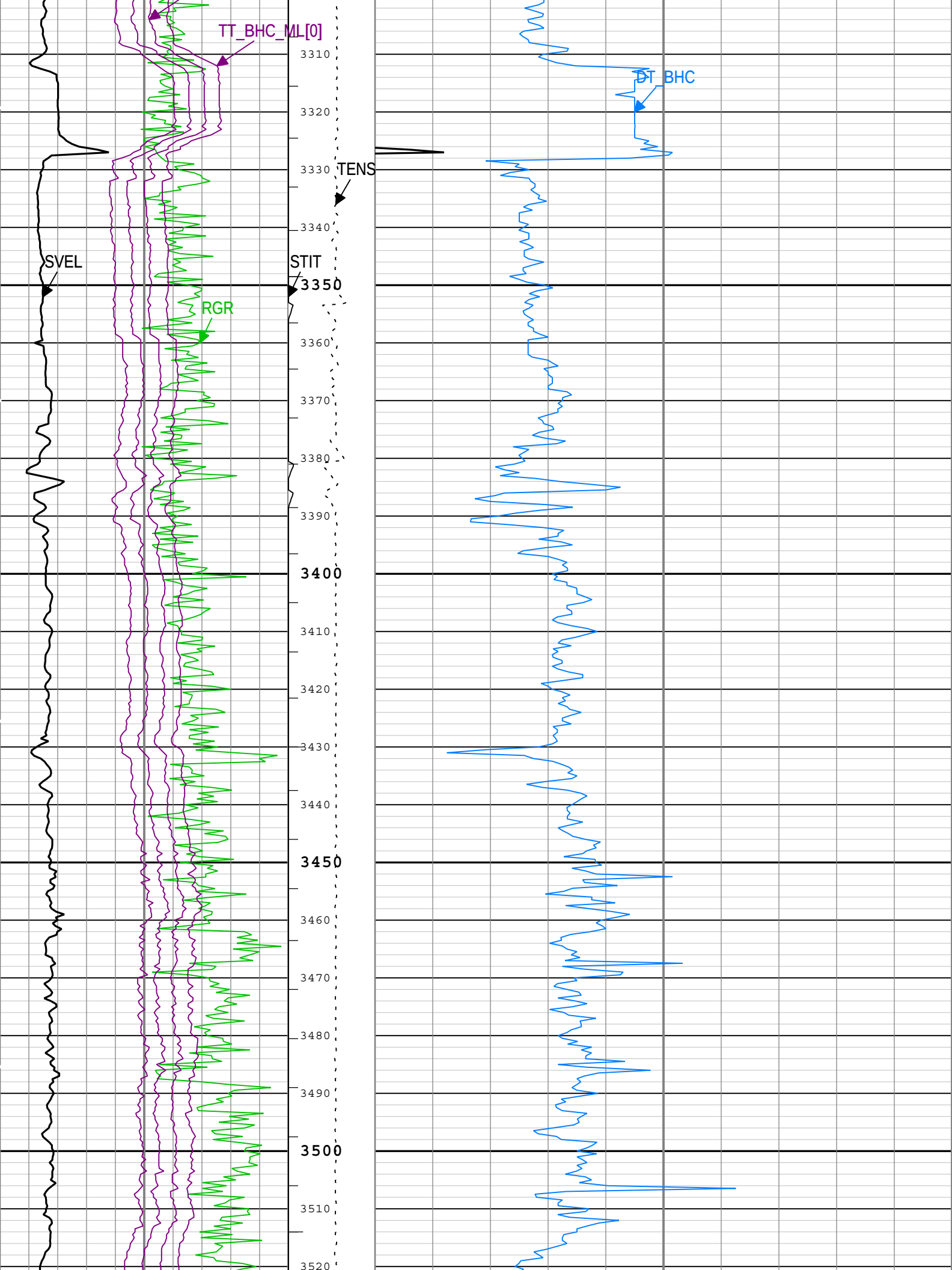
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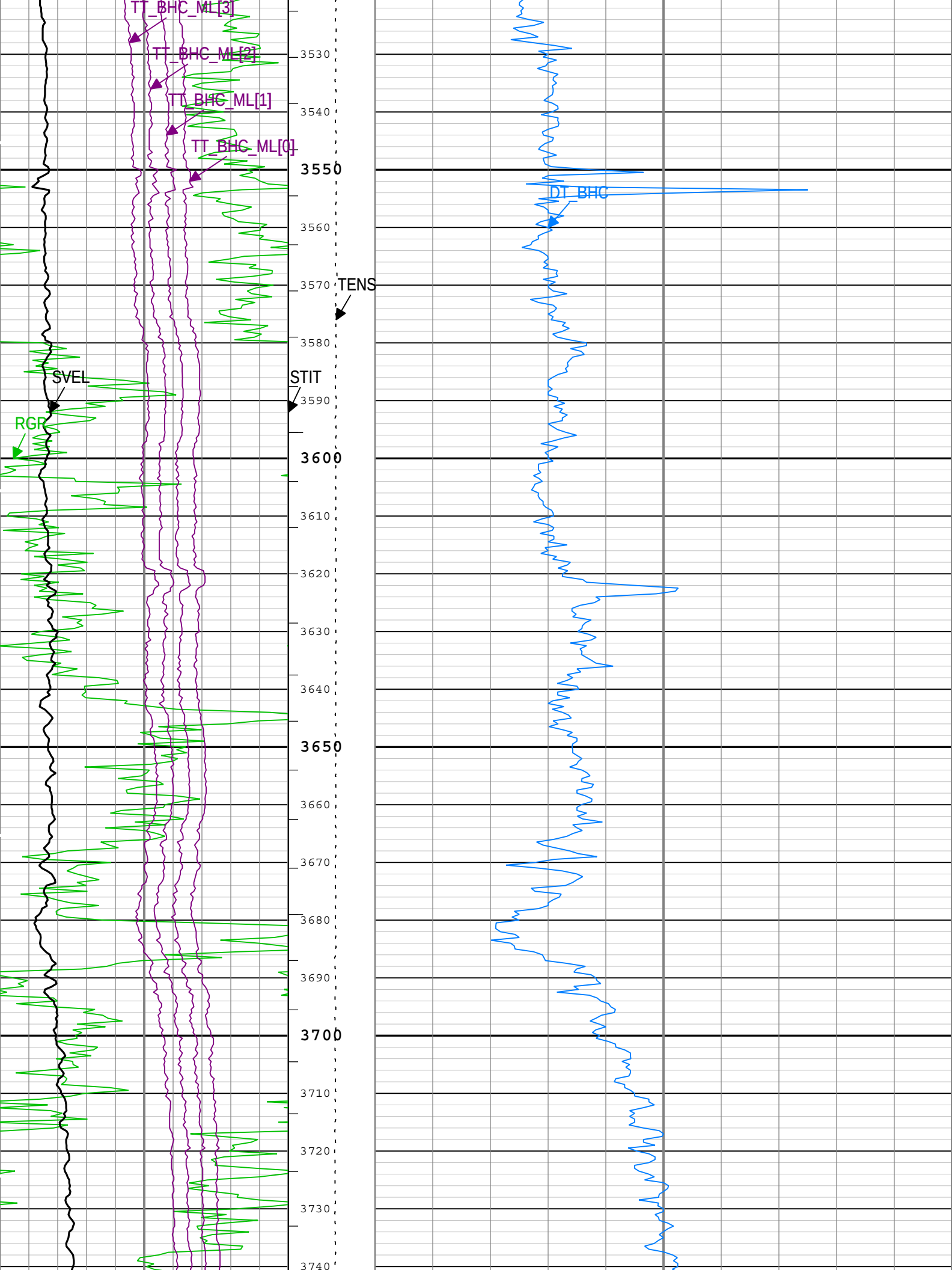
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TT_BHC_ML[2]
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TENS
SVEL
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RGR
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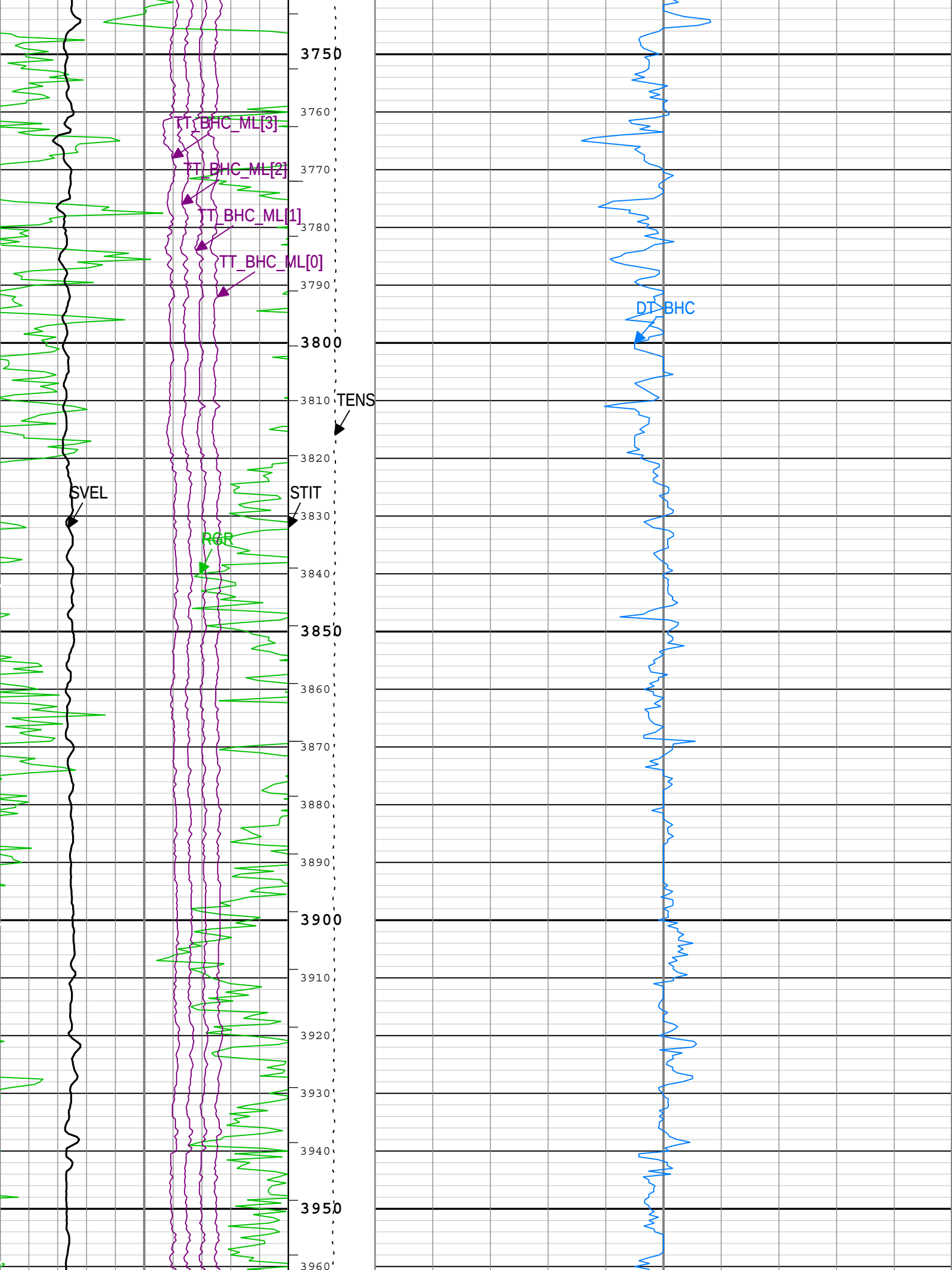
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TT_BHC_ML[3]
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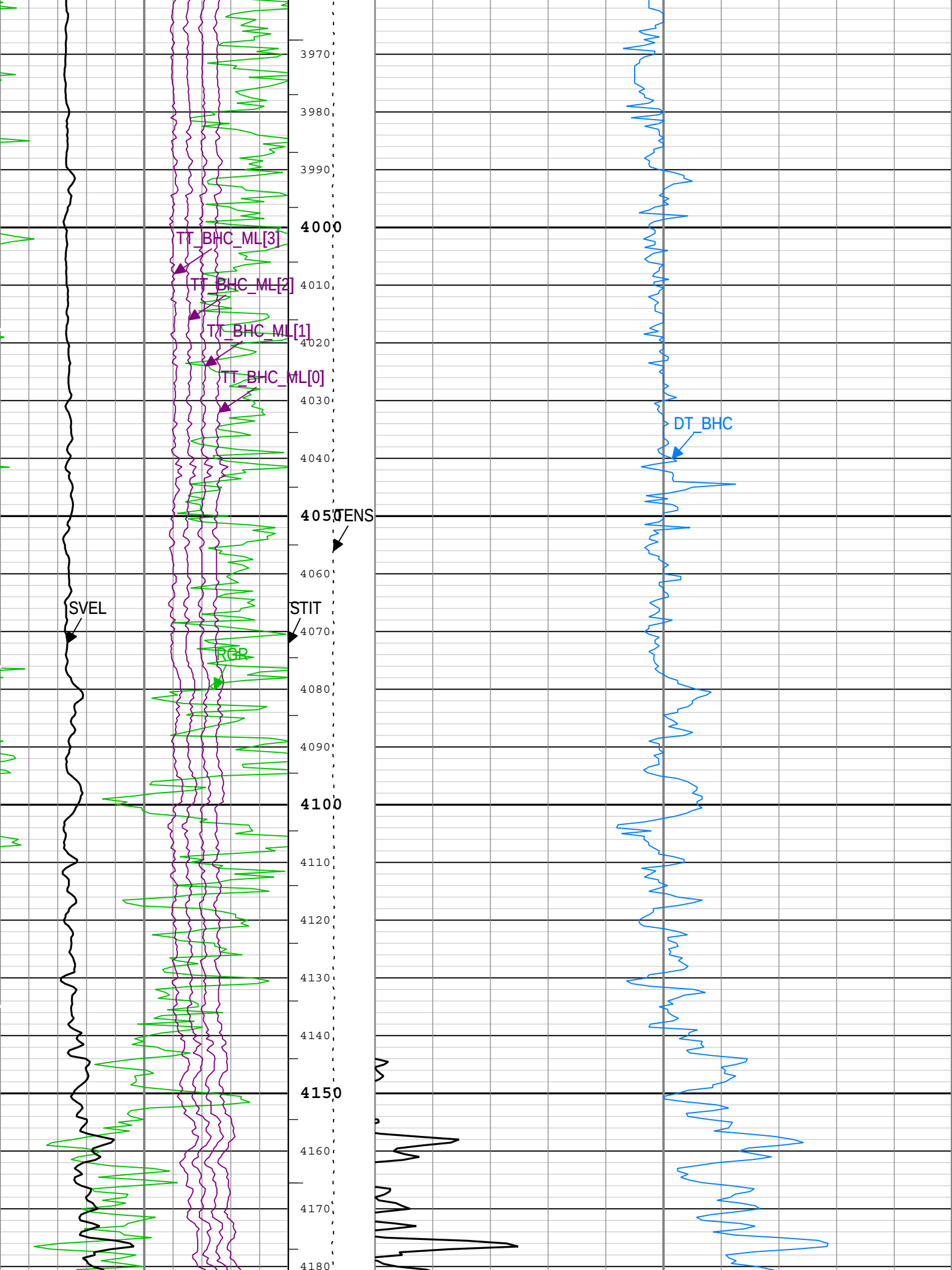
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TT_BHC_ML[3]
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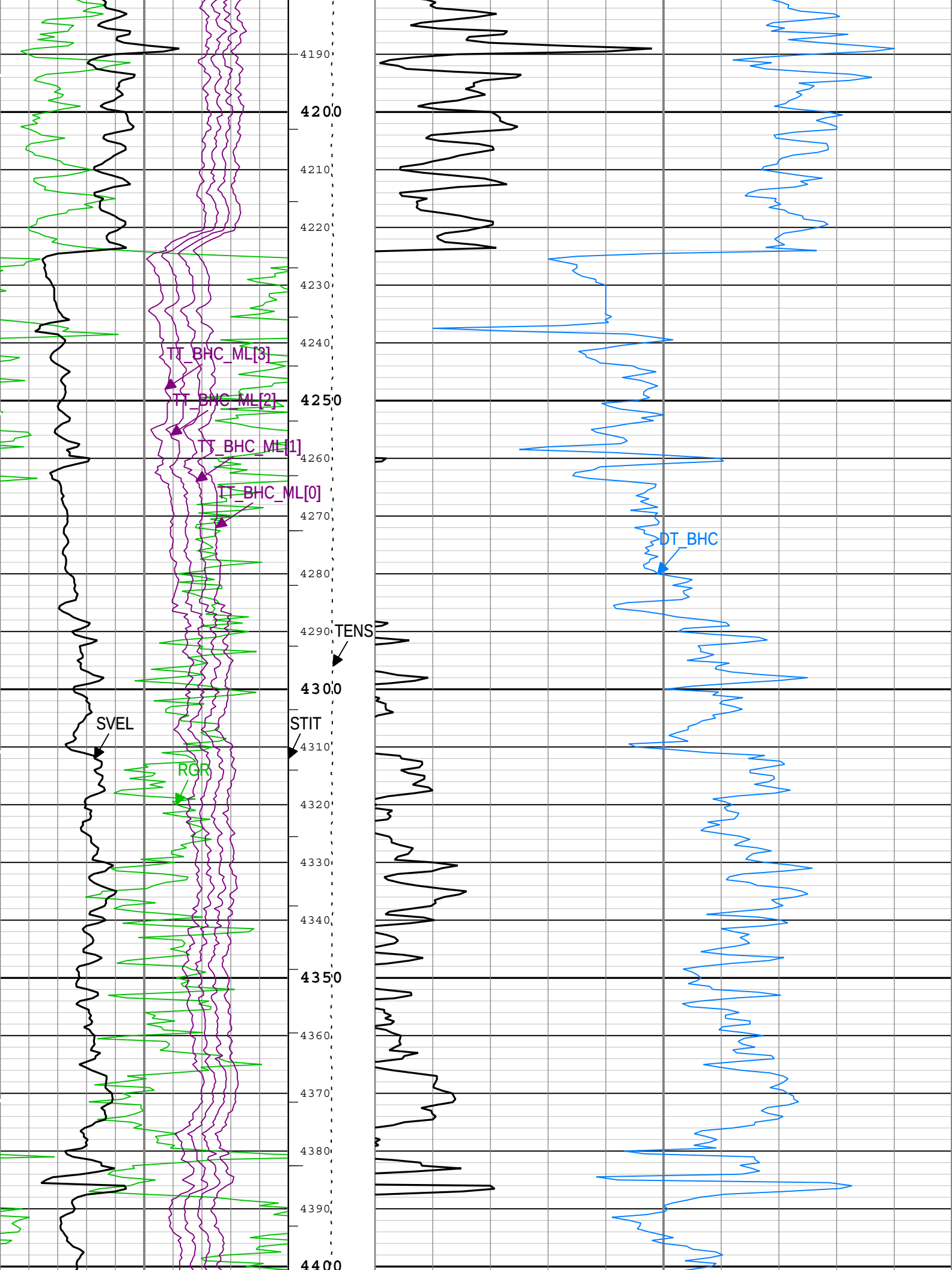
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TT_BHC_ML[3]
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SVEL
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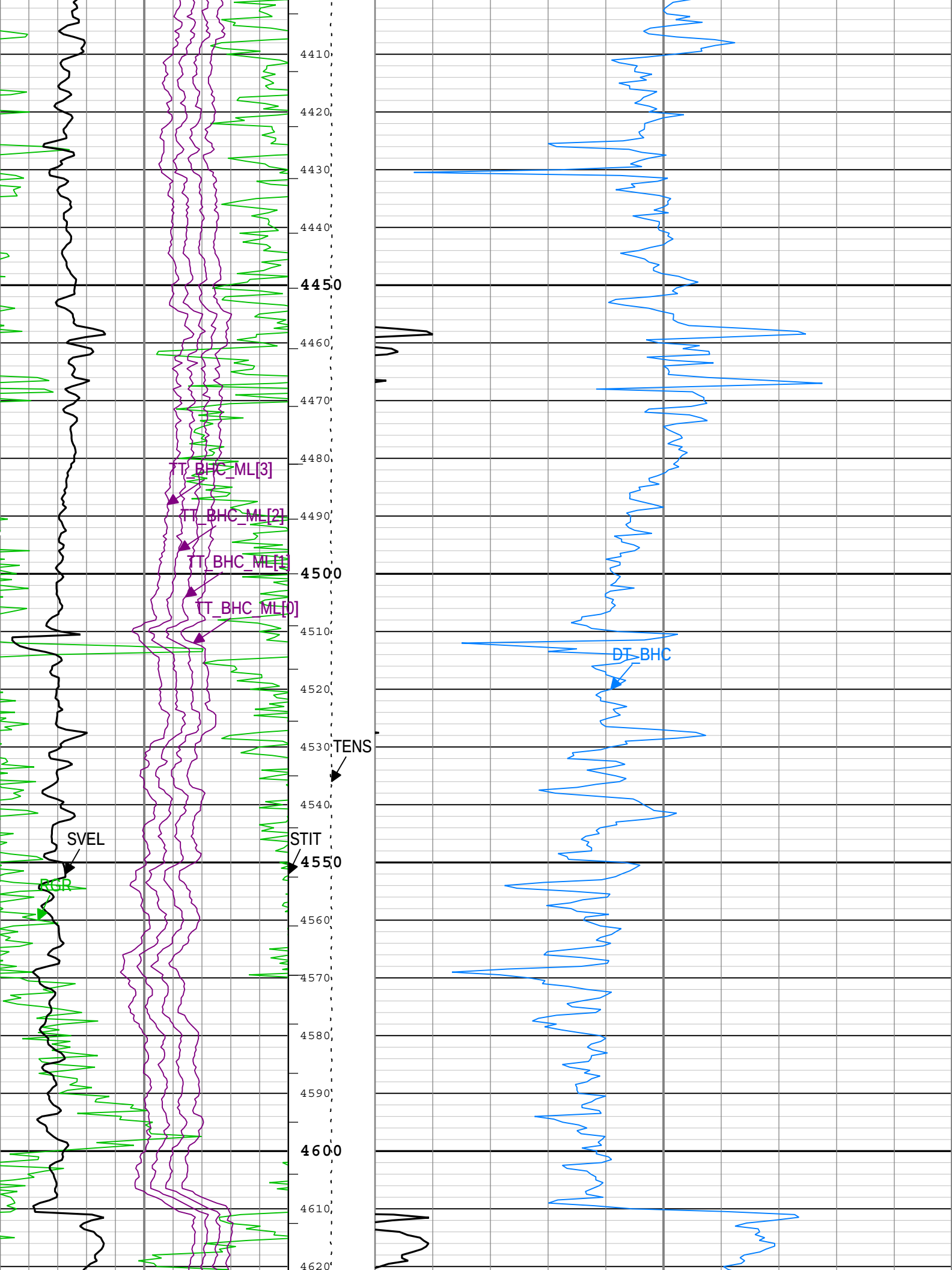
TENS
DT_BHC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TT_BHC_ML[3]
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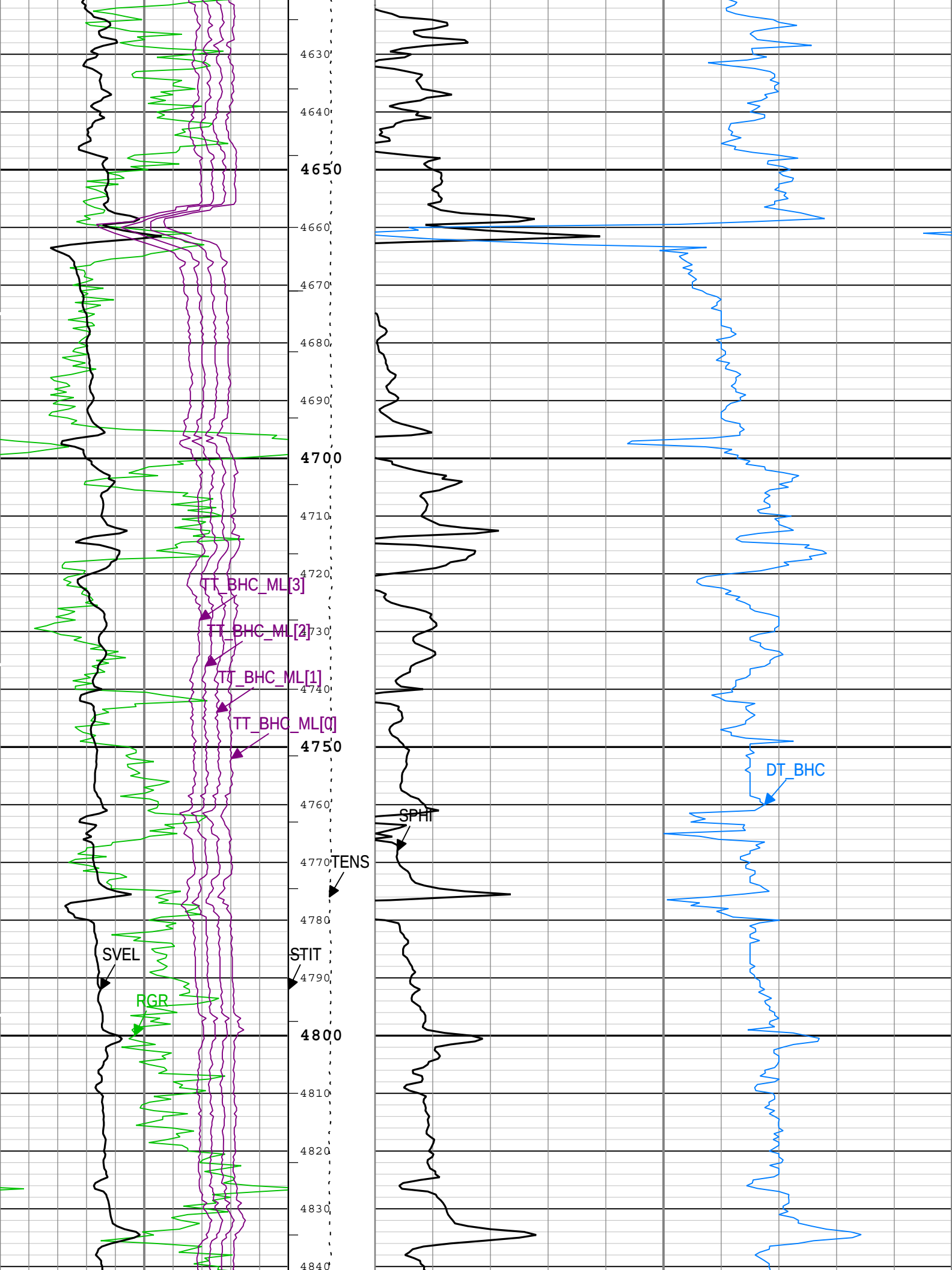
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TT_BHC_ML[3]
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SVEL
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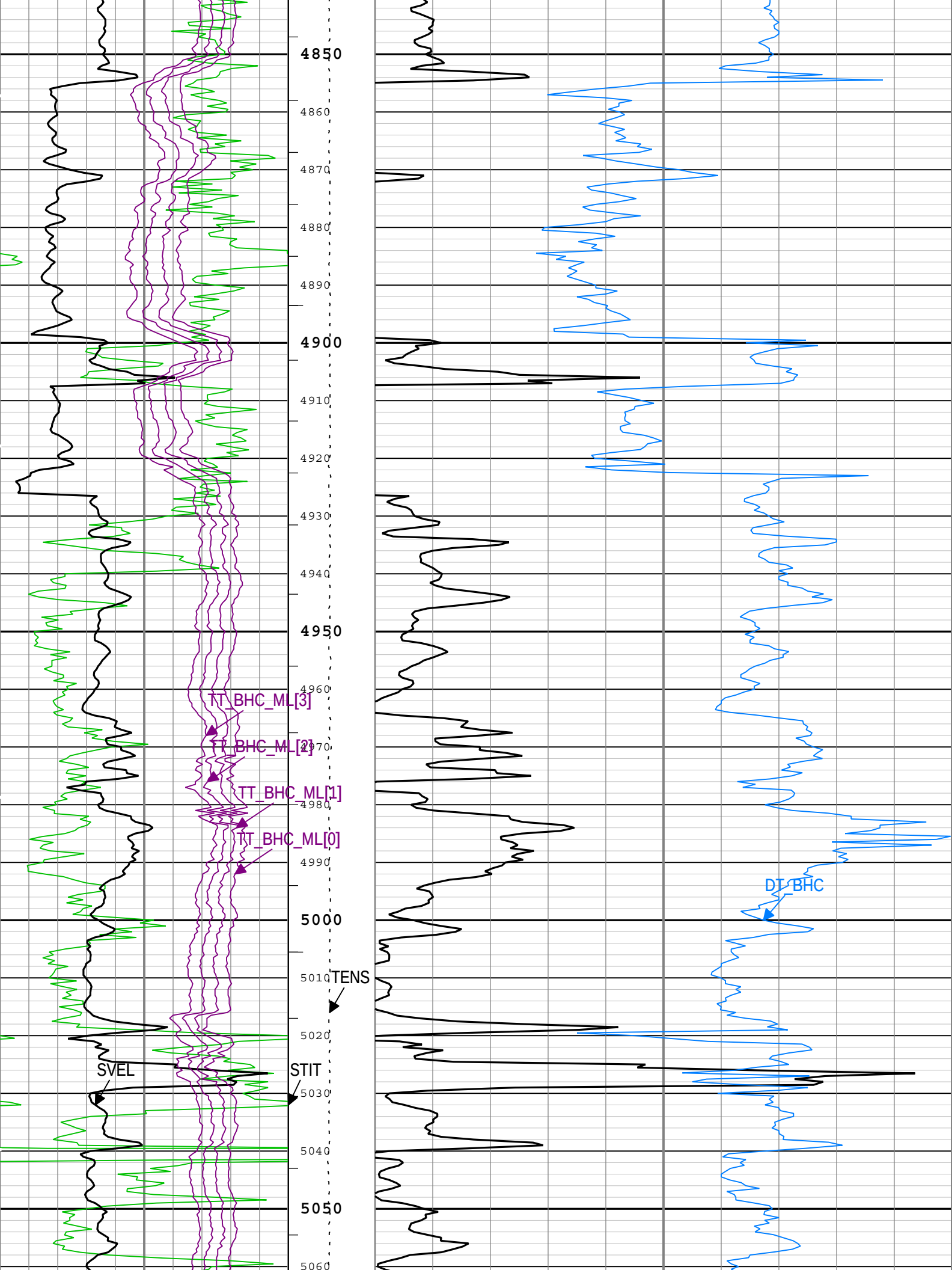
SPHI
DT_BHC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TENS
SVEL
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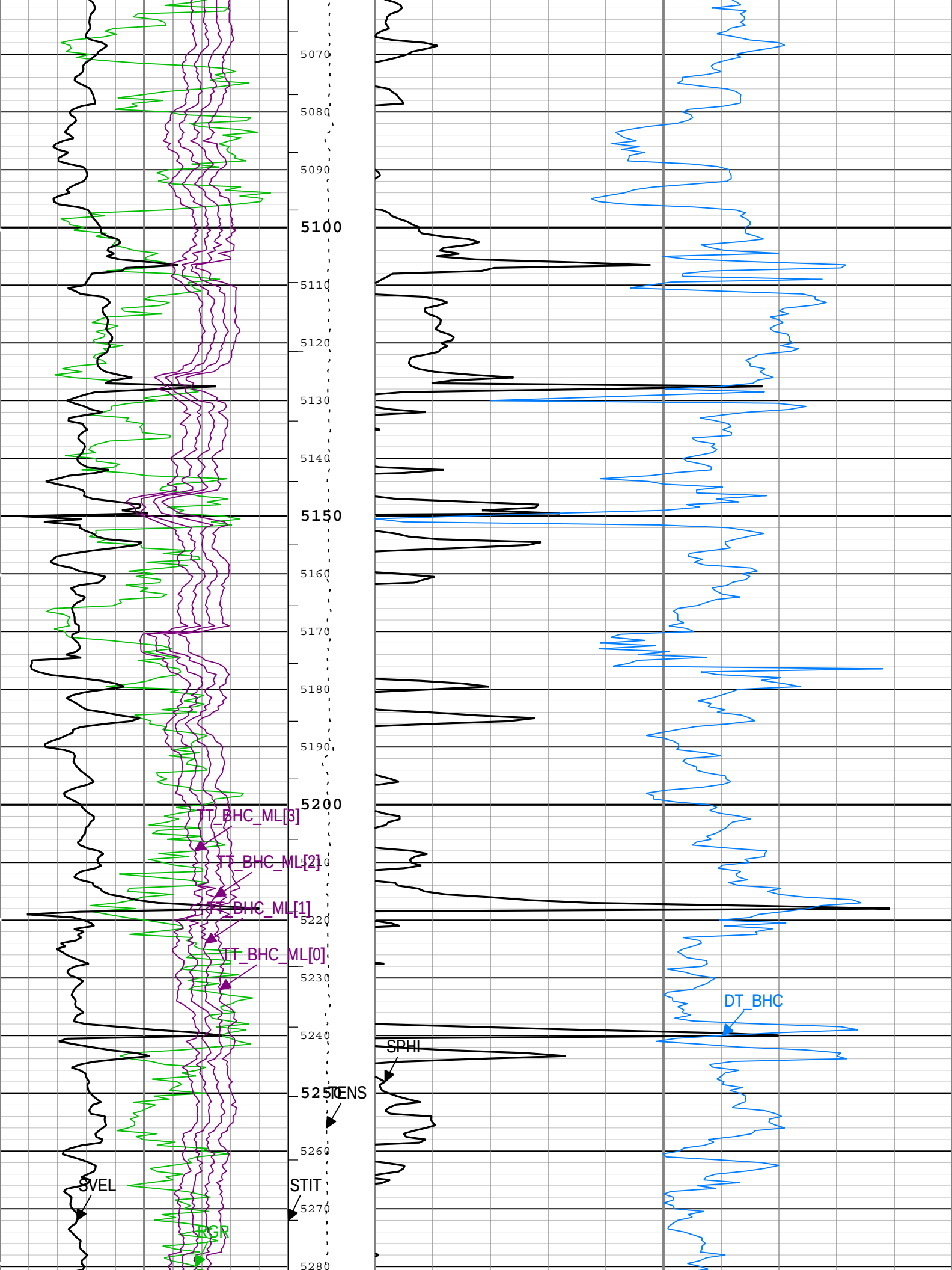
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TT_BHC_ML[3]
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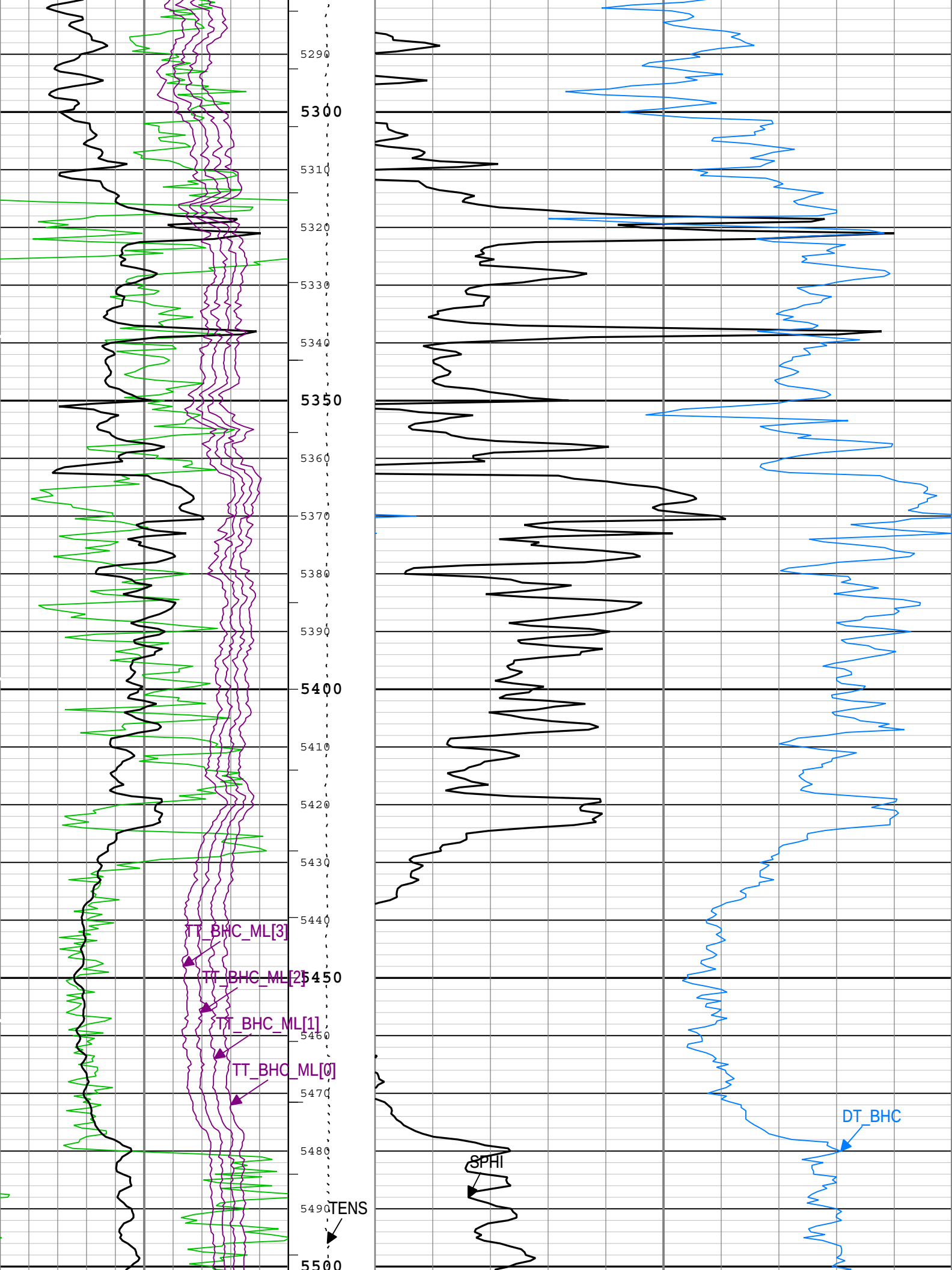
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TT_BHC_ML[2]
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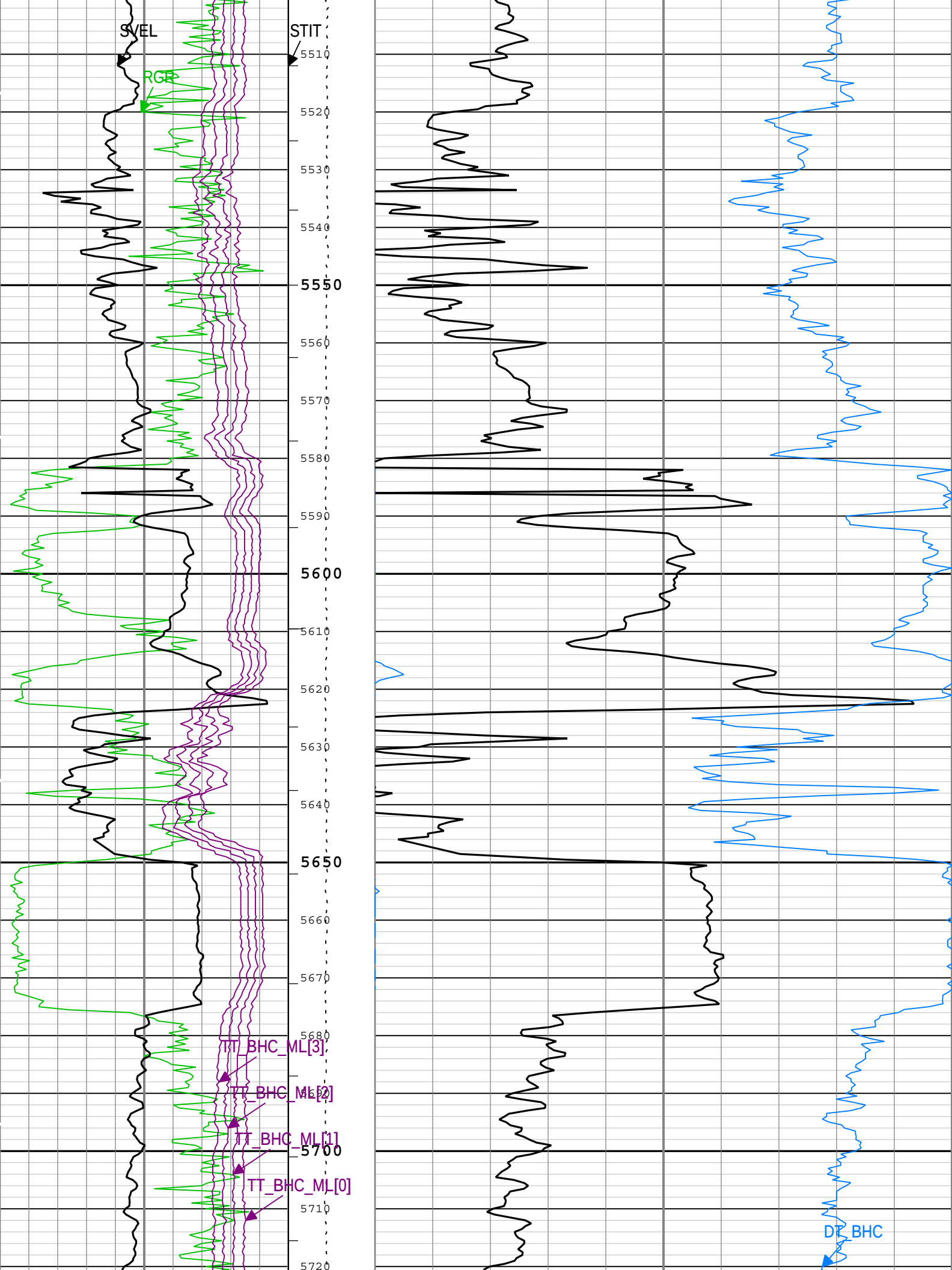
TENS
SPHI
DT_BHC


SVEL
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TT_BHC_ML[2]
TT_BHC_ML[1]
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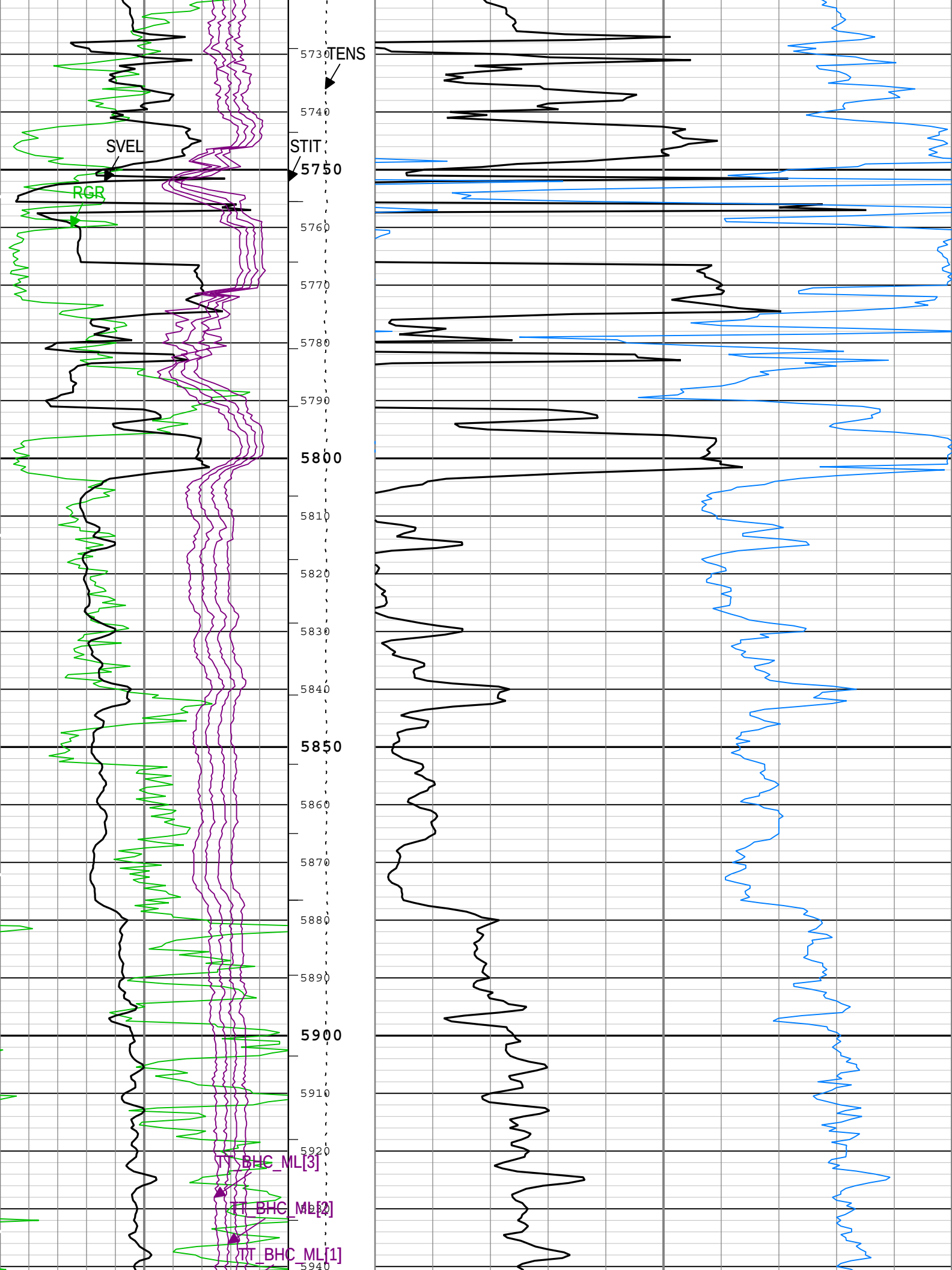
DT_BHC


TENS
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RGR
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TT_BHC_ML[3]
TT_BHC_ML[2]
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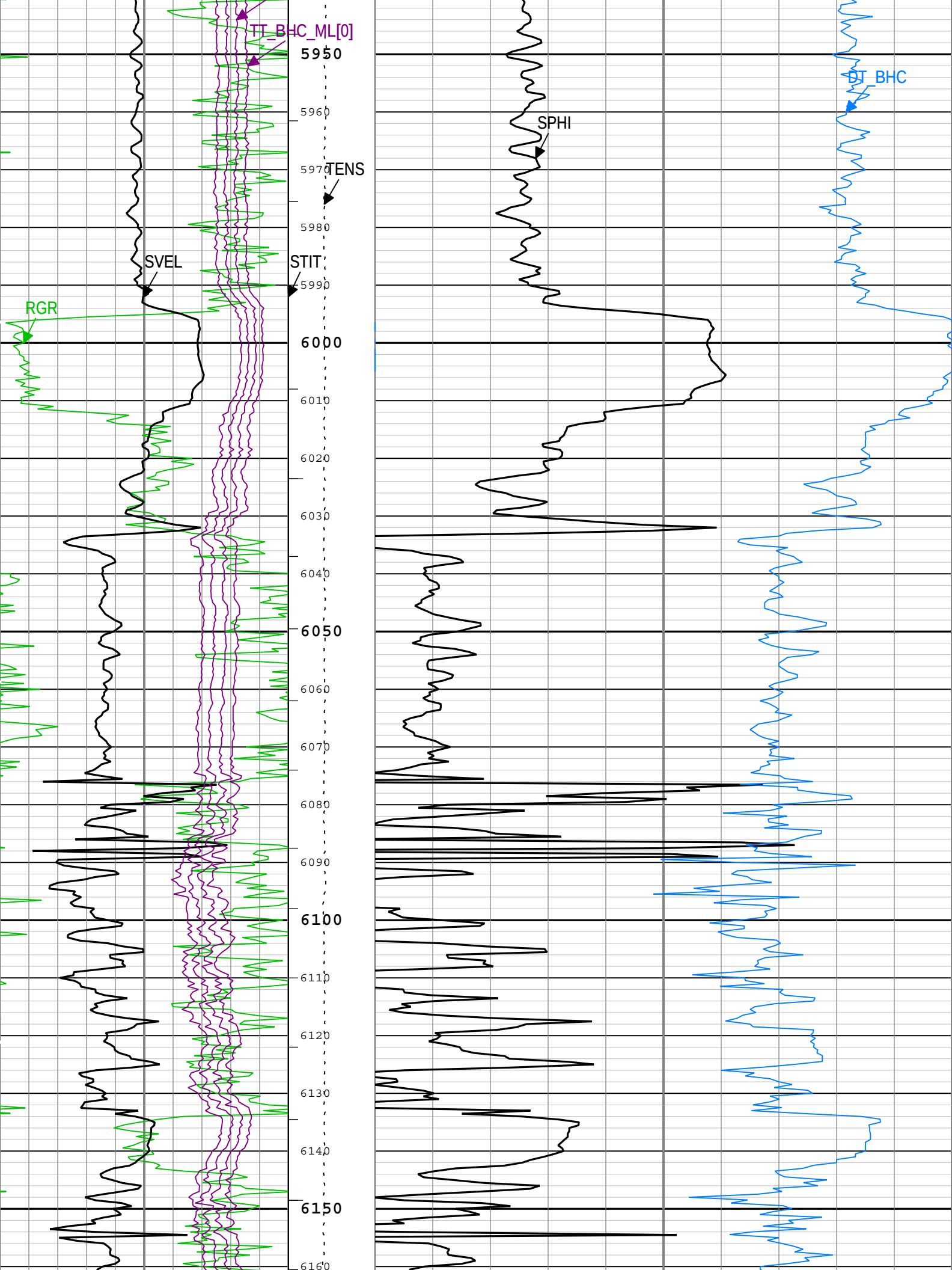
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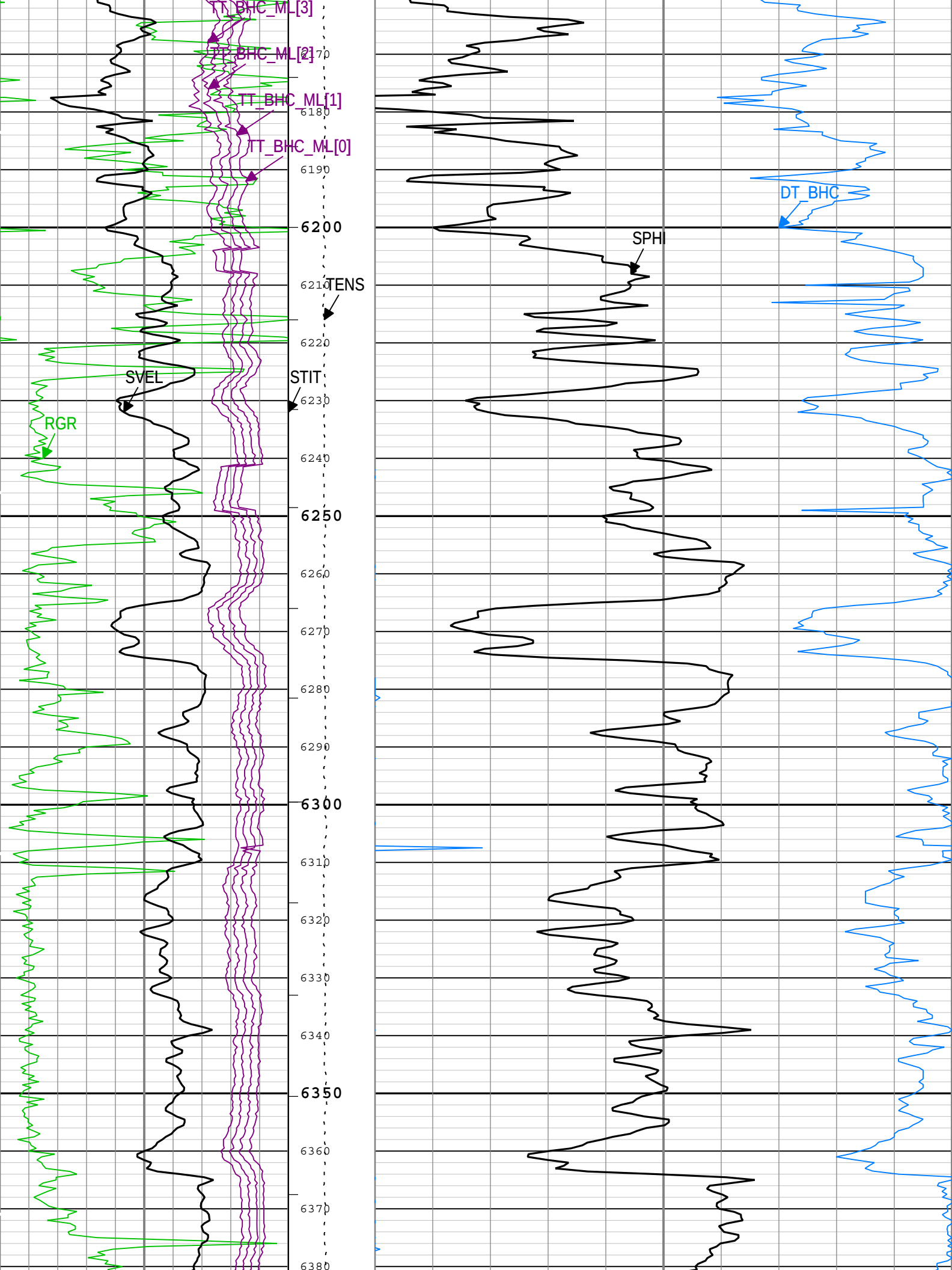
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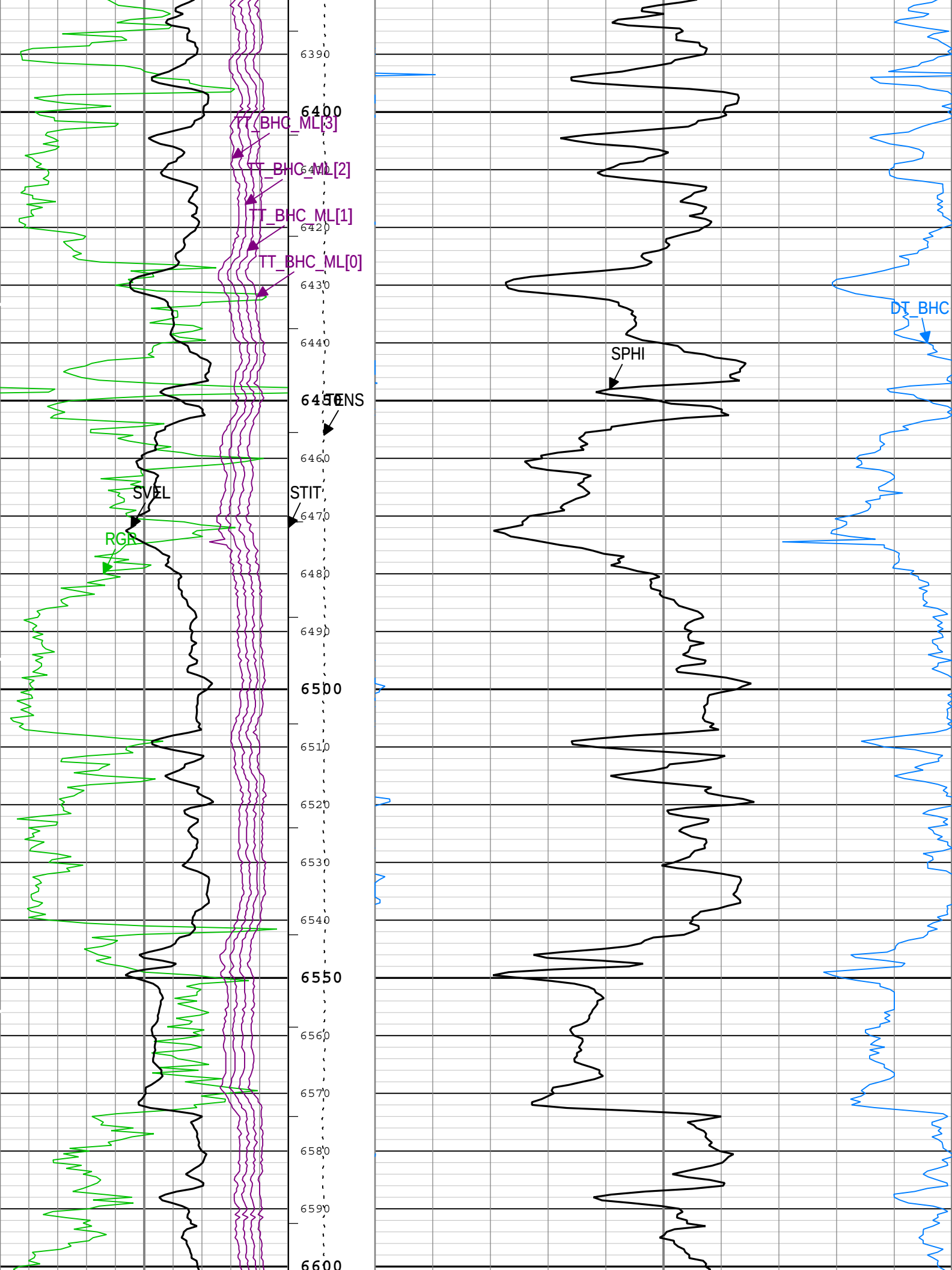
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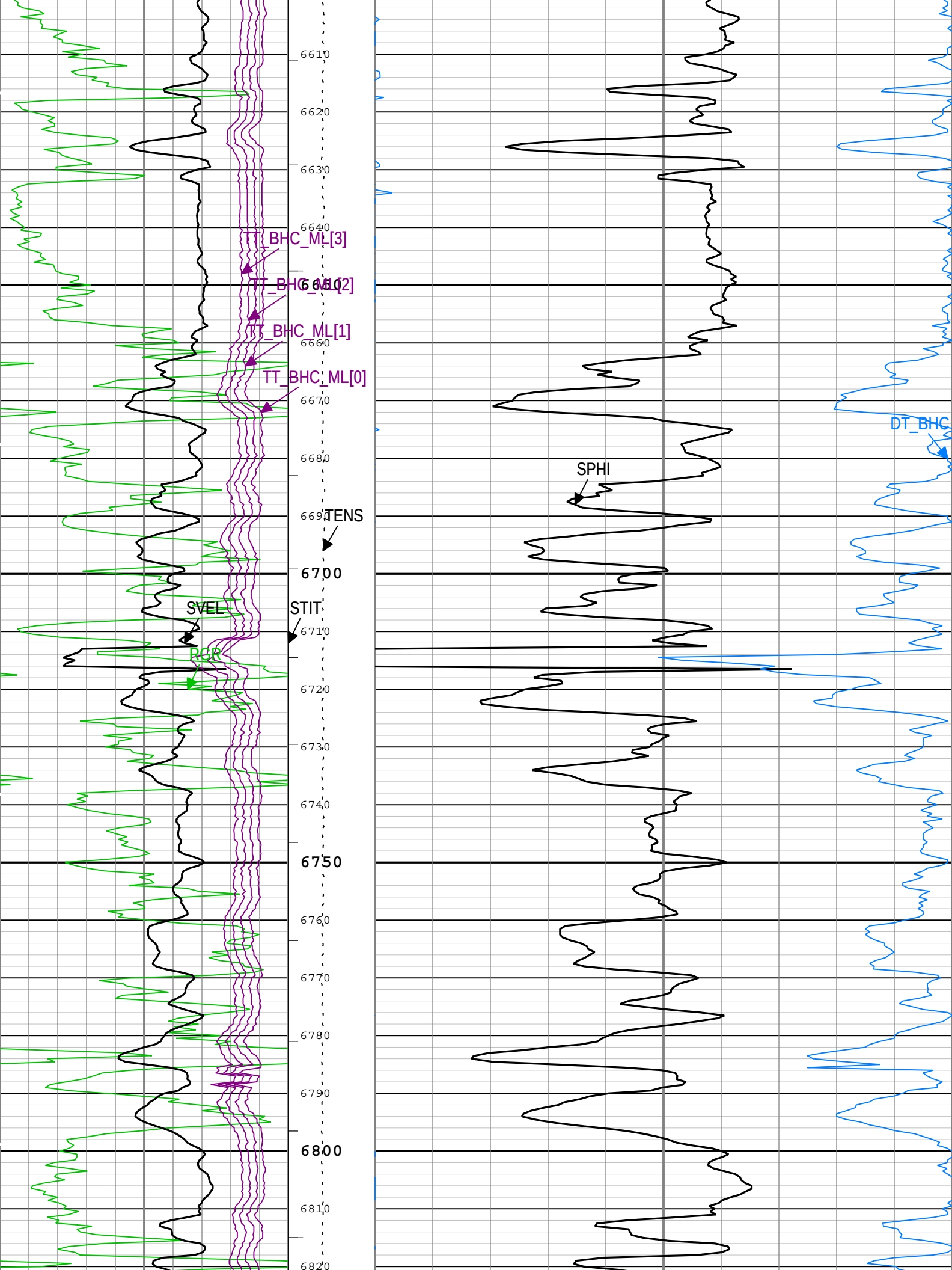
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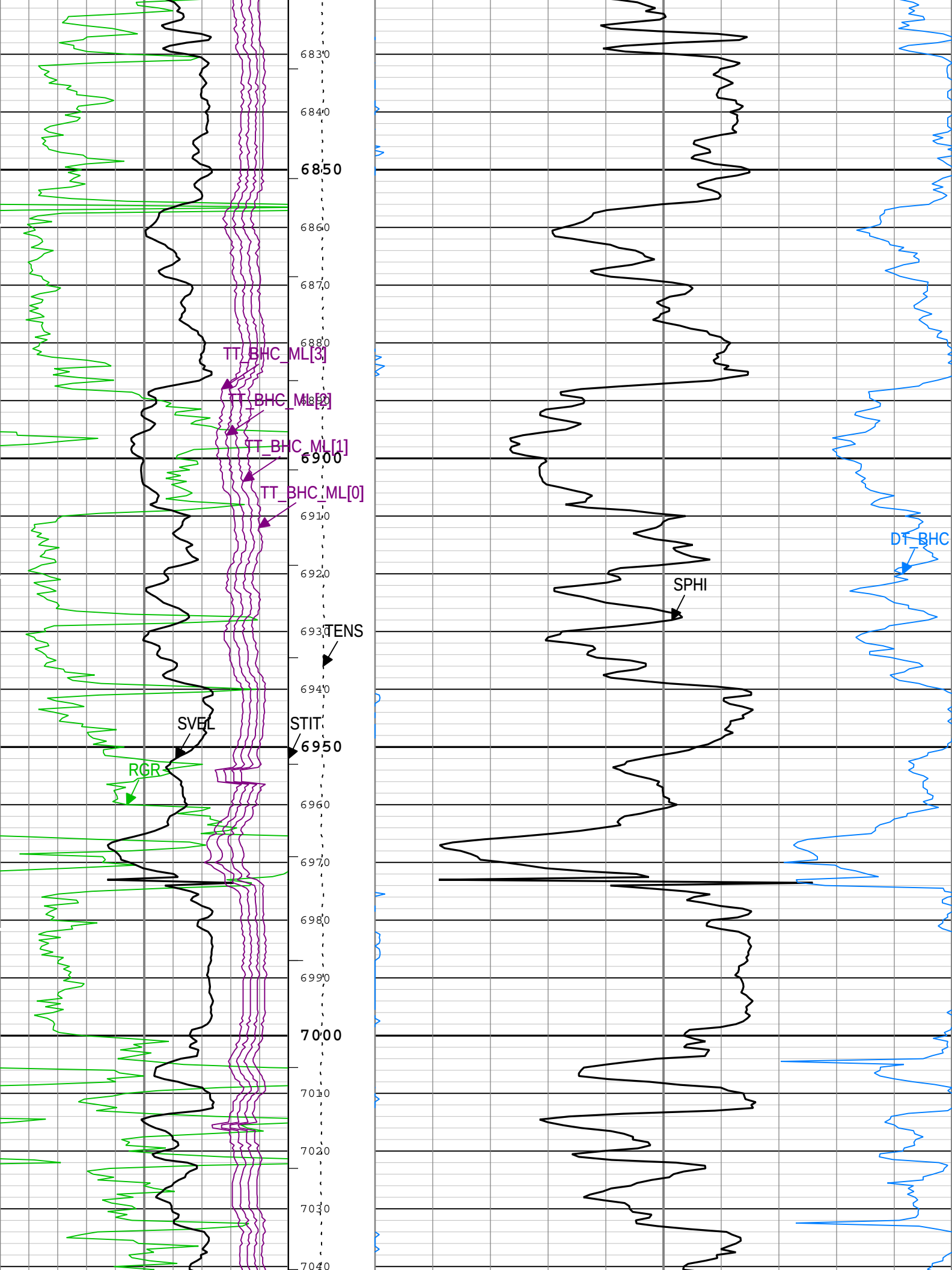
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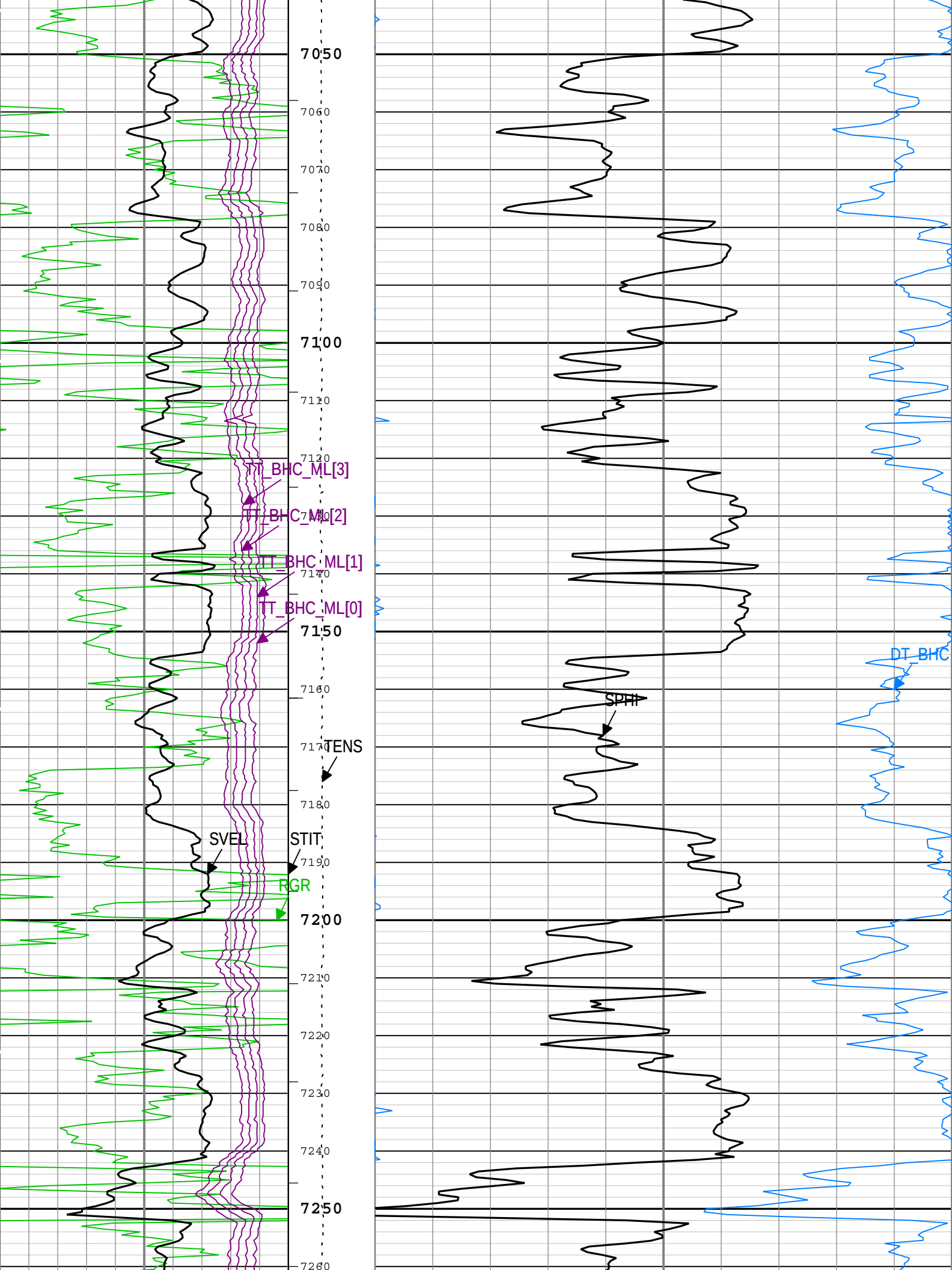
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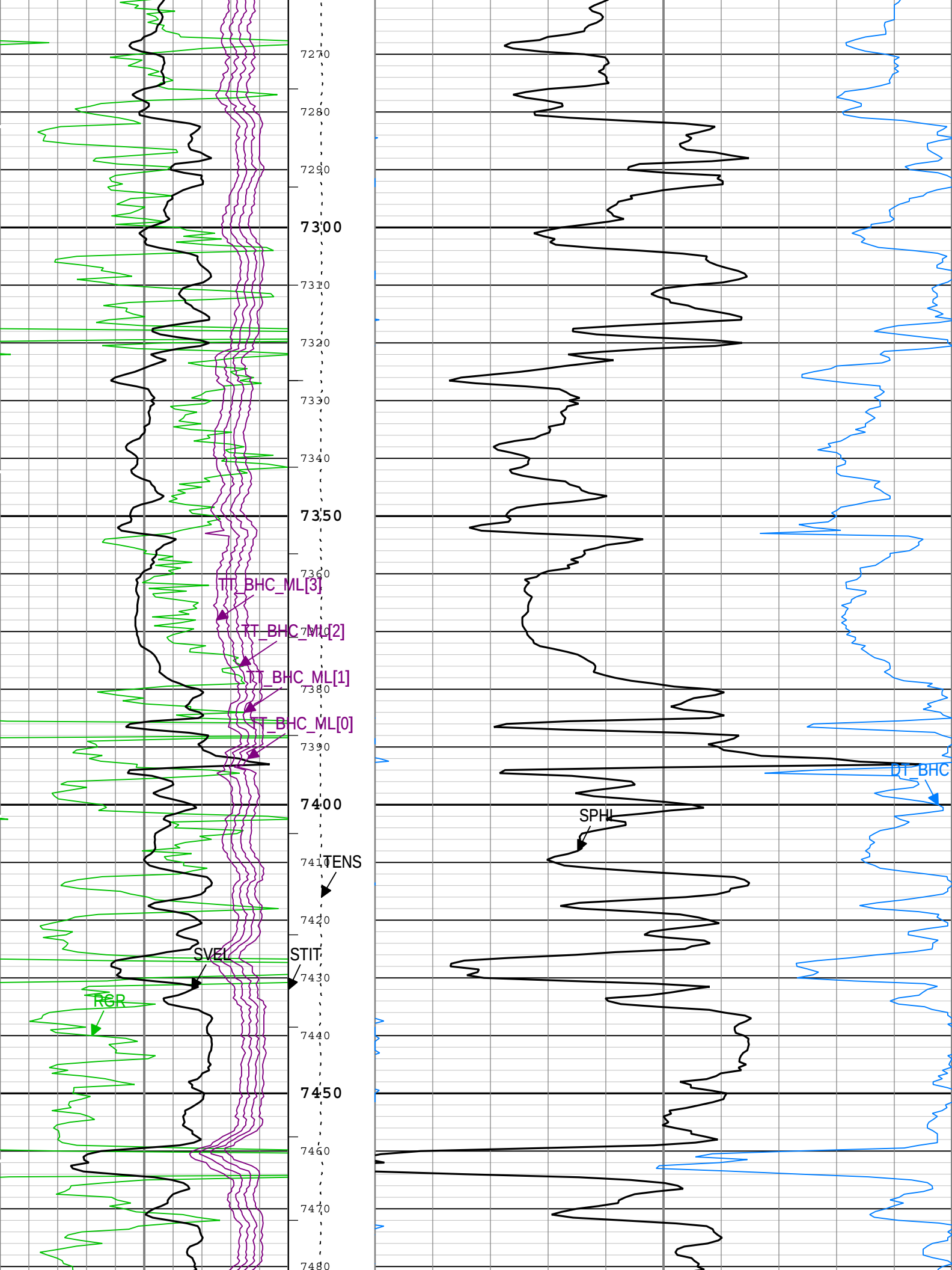
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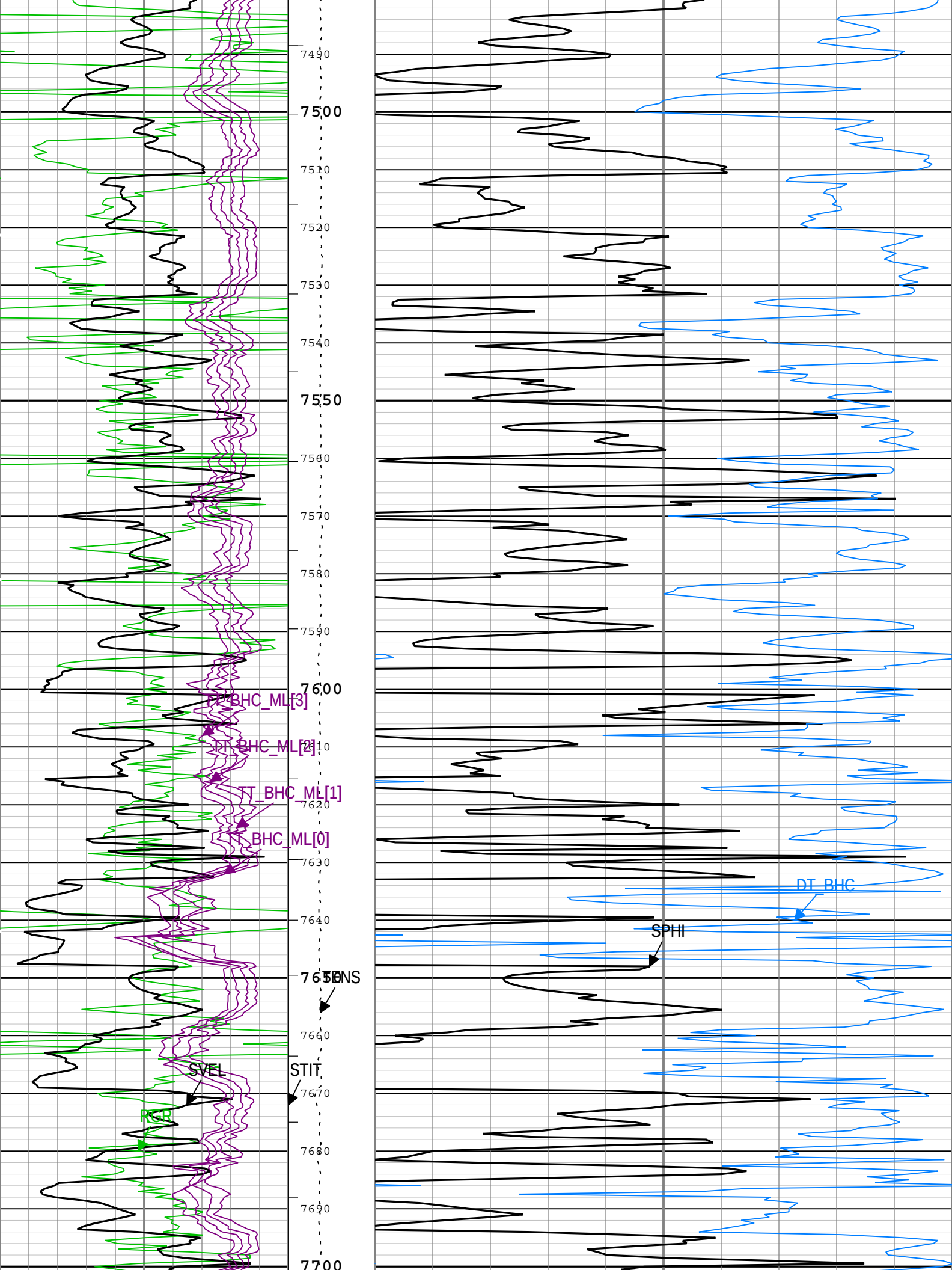
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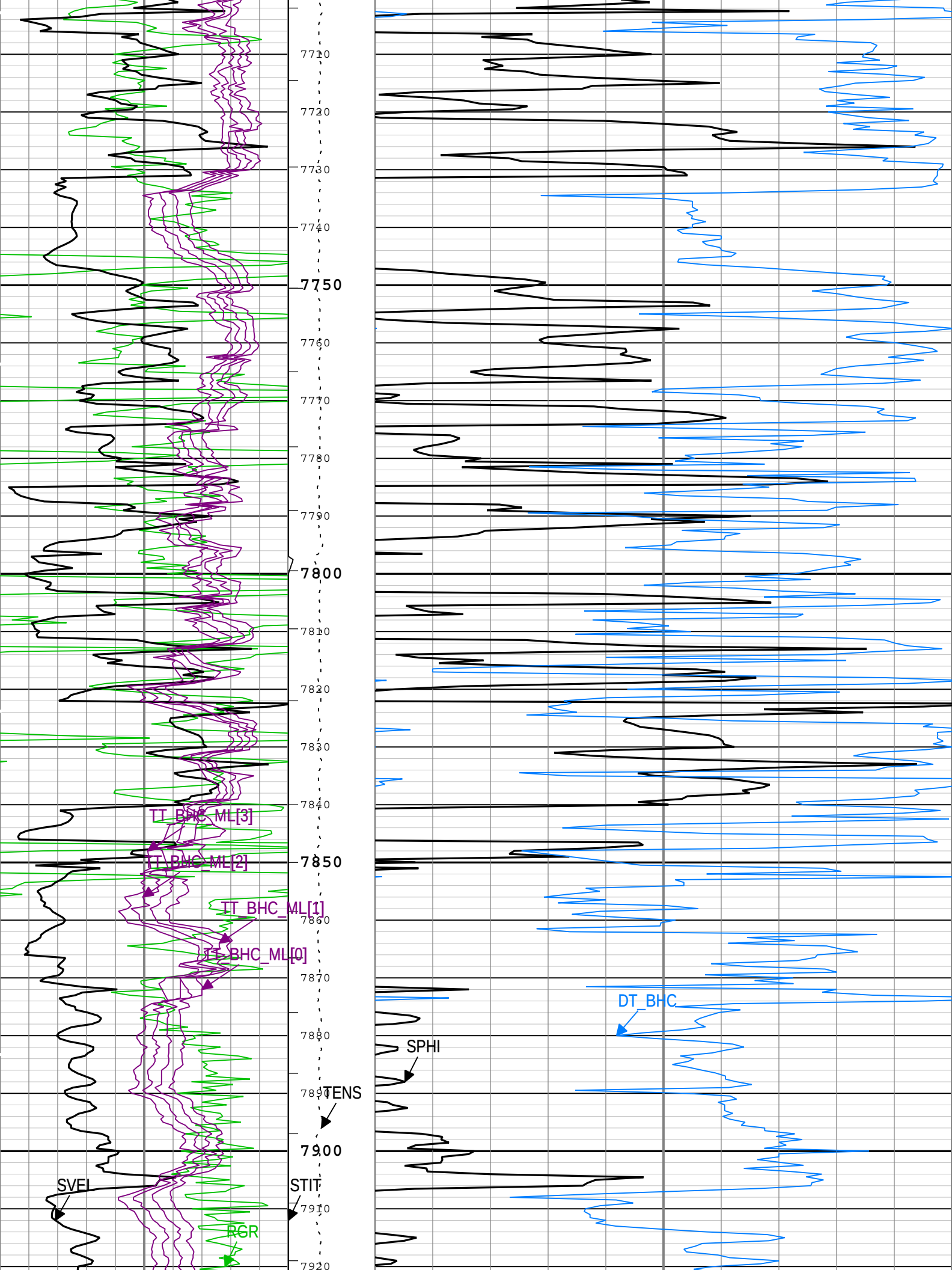
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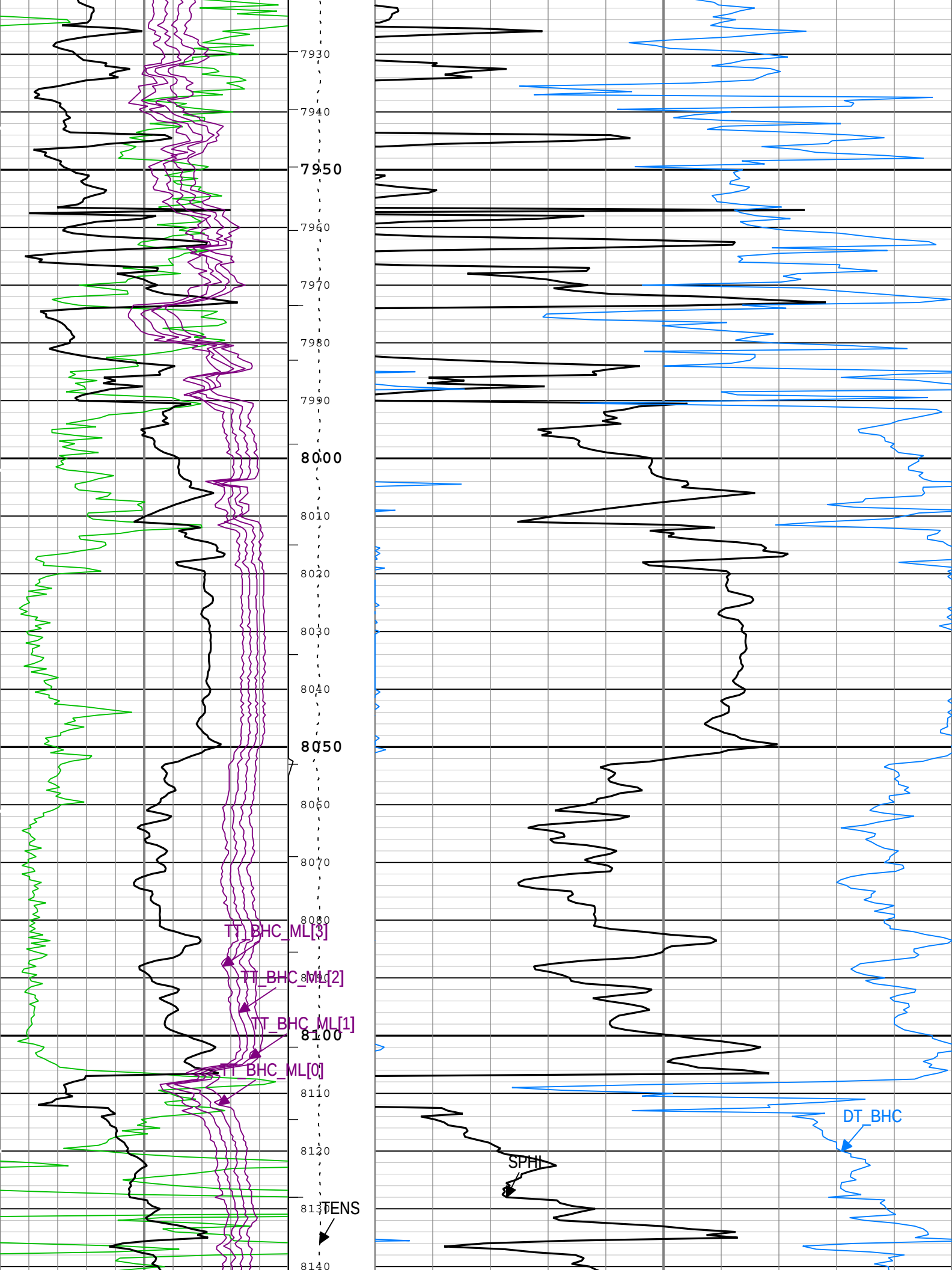
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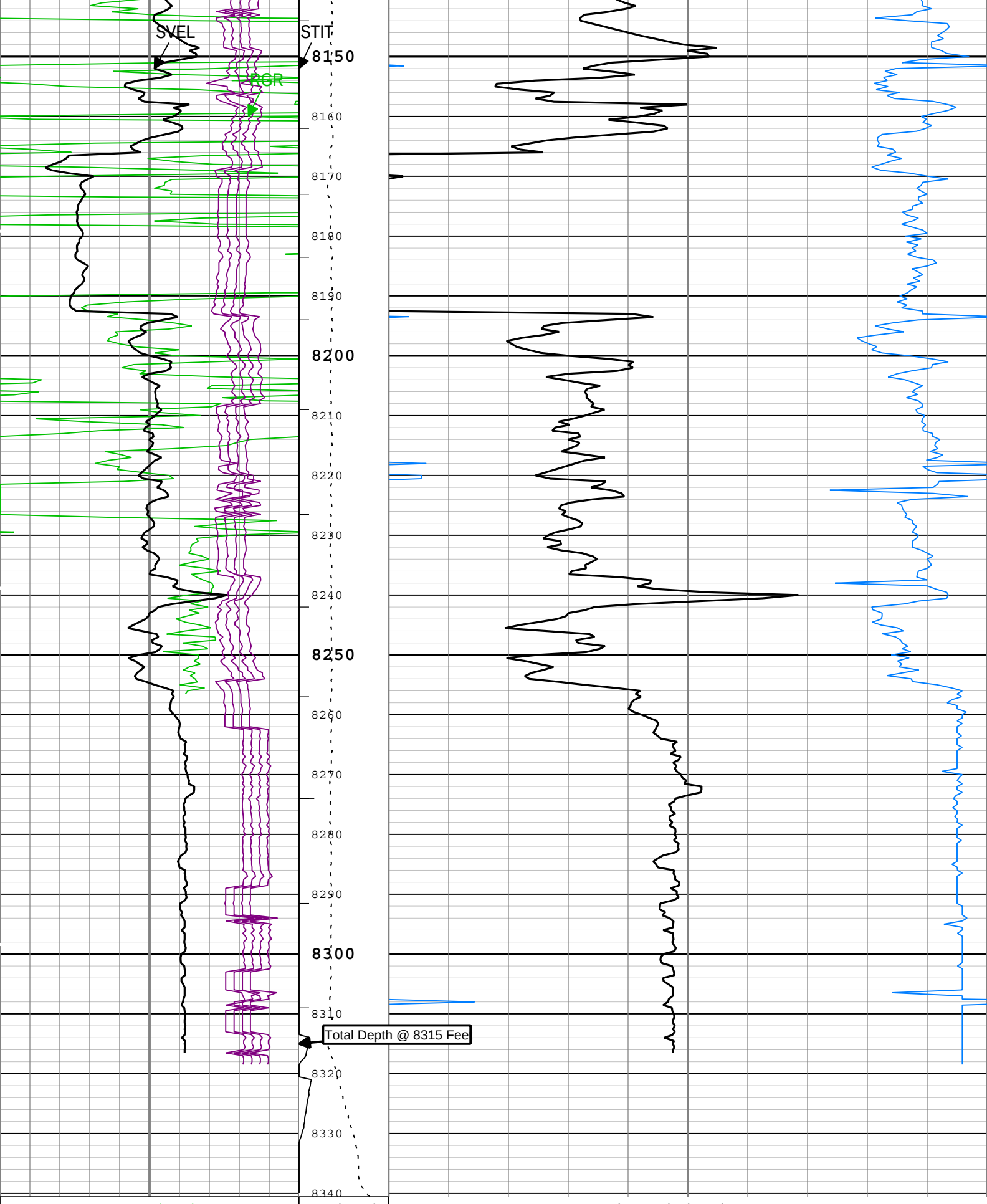
DT_BHC



Raw Gamma Ray (RGR) HGNS-B

0 gAPI 150

Sonic Velocity (SVEL) MAST-B

5000 ft/s 25000

Stuck Tool Indicator, Total (STIT)

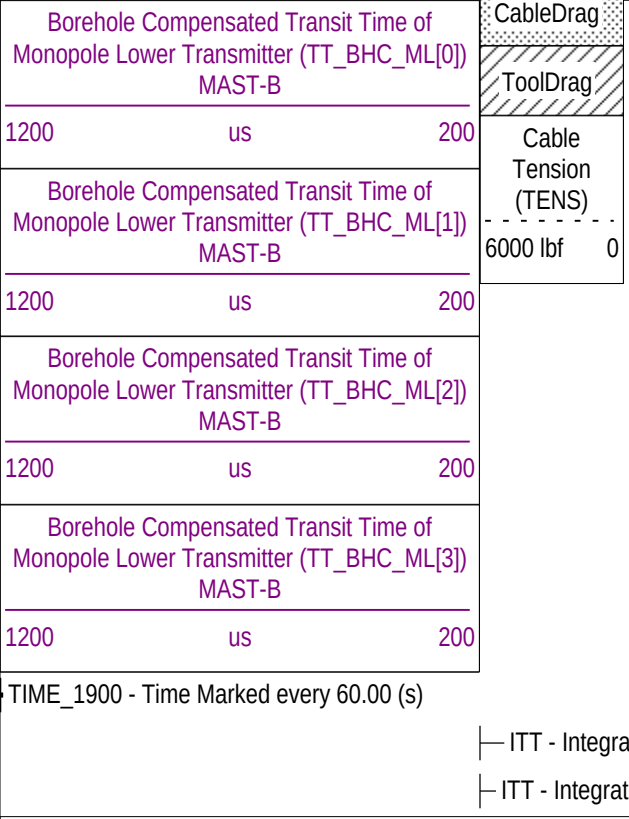
0 ft 50

Sonic Porosity (SPHI) MAST-B

0.3 ft3/ft3 -0.1

1.5 Feet Span Borehole Compensated Slowness from Near Spacing (DT_BHC) MAST-B

150 us/ft 50



Description: SONI_Traditional_CompressionalDT_Curves Format: Log (Sonic Delta-t_1) Index Scale: 5 in per 100 ft Index Unit: ft Index Type: Measured Depth Creation Date: 31-May-2013 22:18:24

Channel Processing Parameters

Parameter	Description	Tool	Value	Unit
BHCCTL	Borehole Compensated Processing Control Flag	MAST-B	On	
BHS	Borehole Status (Open or Cased Hole)	Borehole	Open	
BS	Bit Size	WLSESSION	Depth Zoned	in
CALI_SHIFT	CALI Supplementary Offset	HDRS-B	0.121	in
CBLO	Casing Bottom (Logger)	WLSESSION	309.5	ft
CDTS	Correction for Delta-T Shale, Empirical	Borehole	100	us/ft
DC_MODE	Depth Correction Mode	DepthCorrection	Real-time	
DET_STOP_MLM_M	Detection Stop Time for Monopole Lower Transmitter Mid Frequency Firing Monopole Component	MAST-B	583.33	us
DET_STOP_MUM_M	Detection Stop Time for Monopole Upper Transmitter Mid Frequency Firing Monopole Component	MAST-B	583.33	us
DET_STRT_MLM_M	Detection Start Time for Monopole Lower Transmitter Mid Frequency Firing Monopole Component	MAST-B	106.67	us
DET_STRT_MUM_M	Detection Start Time for Monopole Upper Transmitter Mid Frequency Firing Monopole Component	MAST-B	106.67	us
DFD	Drilling Fluid Density	Borehole	9	lbm/gal
DFT	Drilling Fluid Type	Borehole	Water	
DTF	Delta-T Fluid	Borehole	189	us/ft
DTM	Delta-T Matrix	Borehole	47.5	us/ft
DTMD	Borehole Fluid Slowness	Borehole	206	us/ft
FMDCTL_MLM_M	First Motion Detection Processing Control Flag for Monopole Lower Transmitter Mid Frequency Firing Monopole Component	MAST-B	On	
FMDCTL_MUM_M	First Motion Detection Processing Control Flag for Monopole Upper Transmitter Mid Frequency Firing Monopole Component	MAST-B	On	
FMDRS_MLM_M	First Motion Detection Receiver Selection for Monopole Lower Transmitter Mid Frequency Firing Monopole Component	MAST-B	[1, 1, 1, 1, 1, 1, 1, 1, 1, 0, 0, 0, 0]	
FMDRS_MUM_M	First Motion Detection Receiver Selection for Monopole Upper Transmitter Mid Frequency Firing Monopole Component	MAST-B	[0, 0, 0, 0, 1, 1, 1, 1, 1, 1, 1, 1, 1]	
GCSE_DOWN_PASS	Generalized Caliper Selection for WL Log Down Passes	Borehole	BS	
GCSE_UP_PASS	Generalized Caliper Selection for WL Log Up Passes	Borehole	CALI	
MODALCTL_MUM	Modal Decomposition Processing Control Flag for Monopole Upper Transmitter Mid Frequency Firing	MAST-B	On	

SFTY	Slowness Formation Type (Fast, Intermediate, Slow, etc.)	Borehole	Intermediate	
SPFS	Sonic Porosity Formula	Borehole	Raymer-Hunt	
SSCCTL_MUM	Sensor Sensitivity Correction Processing Control Flag for Monopole Upper Transmitter Mid Frequency Firing	MAST-B	On	
TD	Total Measured Depth	Borehole	8300	ft

Depth Zone Parameters

Parameter	Value	Start (ft)	Stop (ft)
BS	0	280	309.5
BS	7.875	309.5	8340.5

All depth are actual.

Tool Control Parameters

Parameter	Description	Tool	Value	Unit
DIGDEL	Waveform Digitizing Delay	MAST-B	[0, 0]	us
DIGDT	Sonic Waveform Digitizing Slowness	MAST-B	[0, 0]	us/ft
DIGTIME	Digitizing Time	MAST-B	[2550, 2550]	us
MAX_LOG_SPEED	Toolstring Maximum Logging Speed	WLSESSION	3600	ft/h
MSMT_LIST	Measurement List	MAST-B	[MUM, MLM]	
NUMMSMT	Number of active measurements	MAST-B	2	
RXSEL	Receiver Station Select	MAST-B	[[Off, On], [Off, On], [Off, On], [Off, On], [On, On], [On, On], [On, On], [On, On], [On, On], [On, Off], [On, Off], [On, Off], [On, Off]]	
SAMINT	Sonic Waveform Sampling Interval	MAST-B	[10, 10]	
SNSRSEL	Sensor Element Select	MAST-B	[[On, On], [Off, Off], [On, On], [Off, Off], [On, On], [Off, Off], [On, On], [Off, Off]]	

Calibration Report

MAST-B (Multimode Array Sonic Service Tool) Calibration - Run 1

Primary Equipment :

MAMS-BA Multimode Array Sonic Minimum Service Sonde MAMS-BA 8181

MAST Master Characterization Coefficients - Characterization Coefficients Summary

Master (EEPROM): 08:55:00 26-Sep-2012 Expired by 157 days

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Sensor Sensitivity Correction Factor Minimum		Master	1.000	0.500	0.937	1.700
Sensor Sensitivity Correction Factor Maximum		Master	1.000	0.500	1.080	1.700
Sensor Time Delay Factor Minimum	us	Master	0	-2.000	-0.679	2.000
Sensor Time Delay Factor Maximum	us	Master	0	-2.000	0.495	2.000
Sensor Sensitivity Correction Factor Low Frequency to High Frequency Ratio Minimum		Master	1.000	0.900	0.948	1.700
Sensor Sensitivity Correction Factor Low Frequency to High Frequency Ratio Maximum		Master	1.000	0.900	1.065	1.700

Characterization Coefficients

Master (EEPROM): 08:55:00 26-Sep-2012 Expired by 157 days

CALI_SSCF (Master) Sensor Sensitivity Correction Factor

Minimum/Nominal/Maximum 0.500/1.000/1.700 Unit

	RB1	RB2	RB3	RB4	RB5	RB6	RB7	RB8
SO1	0.973	1.027	1.014	0.999	1.033	0.984	0.995	1.034
SO2	0.975	1.038	0.983	0.987	1.027	1.033	0.988	0.937
SO3	1.001	0.952	0.965	0.982	1.000	0.986	1.006	0.990
SO4	0.979	1.003	1.002	0.963	0.997	1.041	1.014	1.004
SO5	1.029	1.014	0.989	1.000	1.007	0.982	1.033	0.983
SO6	0.955	0.947	1.022	0.957	1.080	1.029	0.991	1.009
SO7	0.981	1.026	0.982	0.958	0.970	1.029	1.016	0.998

SO8	0.993	1.002	0.993	1.060	1.029	1.019	1.033	0.998
SO9	0.986	1.019	1.006	1.027	1.021	1.035	0.994	0.998
SO10	0.986	0.961	1.008	1.026	1.010	0.971	0.971	0.994
SO11	0.984	1.046	0.994	1.005	0.987	1.062	0.995	1.036
SO12	0.987	0.994	1.031	1.004	0.983	1.006	0.992	0.979
SO13	0.986	0.983	1.013	0.983	1.049	1.034	1.002	1.010

CALI_STDF (Master)	Sensor Time Delay Factor							
Minimum/Nominal/Maximum	-2.000/0/2.000						Unit	us
	RB1	RB2	RB3	RB4	RB5	RB6	RB7	RB8
SO1	-0.159	-0.033	0.013	0.231	0.164	0.096	-0.013	-0.112
SO2	-0.303	-0.171	0.052	0.350	0.313	0.101	-0.052	-0.237
SO3	-0.217	-0.462	0.099	0.252	0.224	0.135	-0.099	-0.190
SO4	-0.276	-0.138	-0.048	-0.003	0.216	0.223	0.102	-0.141
SO5	-0.351	0.082	0.021	0.275	0.075	0.272	-0.376	-0.390
SO6	-0.131	0.048	-0.075	0.060	0.160	0.066	-0.218	-0.172
SO7	-0.002	-0.073	0.070	0.160	0.111	0.045	-0.279	-0.210
SO8	0.016	-0.016	0.156	0.331	0.069	-0.098	-0.186	-0.078
SO9	0.201	0.037	0.232	0.349	0.278	0.012	-0.197	-0.398
SO10	-0.053	0.129	0.460	0.205	0.186	-0.091	-0.679	-0.541
SO11	-0.290	0.026	0.147	0.279	0.084	-0.026	-0.472	-0.548
SO12	-0.266	-0.040	0.195	0.459	0.146	0.040	-0.308	-0.488
SO13	-0.390	-0.158	0.137	0.422	0.495	0.289	-0.137	-0.409

CALI_SSCR (Master)	Sensor Sensitivity Correction Factor Low Frequency to High Frequency Ratio							
Minimum/Nominal/Maximum	0.900/1.000/1.700						Unit	
	RB1	RB2	RB3	RB4	RB5	RB6	RB7	RB8
SO1	1.040	1.021	0.990	0.970	0.970	0.996	1.013	1.027
SO2	1.065	1.031	1.011	0.983	1.000	1.020	1.033	1.052
SO3	1.029	1.062	0.989	0.964	0.961	0.982	1.006	1.023
SO4	1.055	1.027	0.980	0.950	0.948	0.988	1.022	1.053
SO5	1.042	1.004	1.006	0.993	0.984	0.984	1.017	1.053
SO6	1.011	0.974	0.951	0.951	0.951	0.970	1.000	1.016
SO7	0.998	0.976	0.990	0.973	0.984	1.001	1.018	1.010
SO8	1.009	0.981	0.992	1.013	1.011	1.016	1.013	1.004
SO9	0.996	0.976	1.001	1.007	1.022	1.011	1.004	0.987
SO10	0.987	0.980	1.000	1.019	1.032	1.018	1.000	0.986
SO11	0.978	0.991	1.011	1.020	1.029	1.032	1.002	0.970
SO12	0.990	0.993	1.021	1.034	1.026	1.033	1.002	0.979
SO13	0.960	0.981	1.015	1.015	1.030	1.032	0.993	0.962

CALI_SSCTF (Master)	Sensor Sensitivity Correction Transmitter Failure Flag		
Minimum/Nominal/Maximum	0/0/0	Unit	
Monopole Upper Transmitter	0		
Monopole Lower Transmitter	0		

CALI_SSCHF (Master)	Sensor Sensitivity Correction High Frequency Diagnostic Failure Flag							
Minimum/Nominal/Maximum	0/0/0						Unit	
	RB1	RB2	RB3	RB4	RB5	RB6	RB7	RB8
SO1	0	0	0	0	0	0	0	0
SO2	0	0	0	0	0	0	0	0
SO3	0	0	0	0	0	0	0	0

SO4	0	0	0	0	0	0	0	0
SO5	0	0	0	0	0	0	0	0
SO6	0	0	0	0	0	0	0	0
SO7	0	0	0	0	0	0	0	0
SO8	0	0	0	0	0	0	0	0
SO9	0	0	0	0	0	0	0	0
SO10	0	0	0	0	0	0	0	0
SO11	0	0	0	0	0	0	0	0
SO12	0	0	0	0	0	0	0	0
SO13	0	0	0	0	0	0	0	0

CALI_SSCLF (Master)	Sensor Sensitivity Correction Low Frequency Diagnostic Failure Flag							
Minimum/Nominal/Maximum	0/0/0						Unit	
	RB1	RB2	RB3	RB4	RB5	RB6	RB7	RB8
SO1	0	0	0	0	0	0	0	0
SO2	0	0	0	0	0	0	0	0
SO3	0	0	0	0	0	0	0	0
SO4	0	0	0	0	0	0	0	0
SO5	0	0	0	0	0	0	0	0
SO6	0	0	0	0	0	0	0	0
SO7	0	0	0	0	0	0	0	0
SO8	0	0	0	0	0	0	0	0
SO9	0	0	0	0	0	0	0	0
SO10	0	0	0	0	0	0	0	0
SO11	0	0	0	0	0	0	0	0
SO12	0	0	0	0	0	0	0	0
SO13	0	0	0	0	0	0	0	0

CALI_SSCHA (Master)	Sensor Sensitivity Correction High Frequency Normalized Amplitudes							
Minimum/Nominal/Maximum	-----/1.000/-----						Unit	
	RB1	RB2	RB3	RB4	RB5	RB6	RB7	RB8
SO1	1.035	0.980	0.992	1.008	0.974	1.022	1.012	0.973
SO2	1.013	0.951	1.005	1.001	0.961	0.956	0.999	1.054
SO3	0.987	1.037	1.023	1.006	0.987	1.002	0.982	0.998
SO4	1.025	1.000	1.001	1.041	1.006	0.964	0.989	1.000
SO5	0.975	0.989	1.014	1.003	0.996	1.021	0.971	1.020
SO6	1.048	1.057	0.978	1.045	0.926	0.972	1.009	0.991
SO7	1.009	0.965	1.008	1.033	1.020	0.962	0.974	0.992
SO8	1.017	1.008	1.018	0.953	0.982	0.992	0.978	1.013
SO9	1.023	0.989	1.002	0.982	0.987	0.974	1.014	1.010
SO10	1.004	1.029	0.982	0.965	0.980	1.019	1.019	0.996
SO11	1.016	0.956	1.006	0.995	1.013	0.942	1.005	0.965
SO12	1.007	0.999	0.964	0.989	1.011	0.988	1.001	1.014
SO13	1.020	1.023	0.993	1.023	0.959	0.973	1.004	0.996

CALI_SSCLA (Master)	Sensor Sensitivity Correction Low Frequency Normalized Amplitudes							
Minimum/Nominal/Maximum	-----/1.000/-----						Unit	
	RB1	RB2	RB3	RB4	RB5	RB6	RB7	RB8
SO1	1.076	1.000	0.982	0.978	0.945	1.018	1.025	1.000
SO2	1.079	0.980	1.016	0.984	0.961	0.975	1.032	1.108
SO3	1.015	1.101	1.012	0.970	0.949	0.984	0.988	1.021

SO4	1.081	1.026	0.982	0.989	0.954	0.952	1.011	1.052
SO5	1.016	0.993	1.021	0.996	0.980	1.004	0.987	1.074
SO6	1.060	1.029	0.931	0.993	0.881	0.943	1.009	1.007
SO7	1.007	0.942	0.998	1.006	1.004	0.963	0.991	1.002
SO8	1.027	0.989	1.010	0.966	0.992	1.008	0.991	1.016
SO9	1.018	0.966	1.003	0.989	1.009	0.985	1.018	0.997
SO10	0.991	1.009	0.982	0.983	1.012	1.038	1.019	0.982
SO11	0.994	0.947	1.016	1.016	1.042	0.972	1.006	0.936
SO12	0.997	0.992	0.984	1.023	1.037	1.020	1.003	0.993
SO13	0.979	1.003	1.008	1.038	0.988	1.004	0.997	0.958

CALI_SSTRS (Master)	Sensor Sensitivity Correction Transmitter-Receiver Spacing		
Minimum/Nominal/Maximum	-----/4.000/-----	Unit	ft
Monopole Upper Transmitter	2.000		
Monopole Lower Transmitter	2.000		

CALI_TTMUH (Master)	Sensor Sensitivity Transit Time from Monopole Upper Transmitter High Frequency Firing							
Minimum/Nominal/Maximum	0/0/5000.000						Unit	us
	RB1	RB2	RB3	RB4	RB5	RB6	RB7	RB8
SO1	503.618	503.492	503.446	503.229	503.295	503.363	503.473	503.571
SO2	474.675	474.544	474.321	474.023	474.060	474.272	474.425	474.610
SO3	445.610	445.855	445.295	445.142	445.170	445.258	445.492	445.584
SO4	416.486	416.335	416.190	416.228	415.998	416.068	416.244	416.533
SO5	386.710	385.992	386.321	386.149	386.382	385.958	387.092	387.070
SO6	357.564	357.407	357.777	357.721	357.481	357.705	357.967	358.169
SO7	329.205	329.139	329.004	329.081	329.109	329.298	329.405	329.449
SO8	300.100	300.044	299.848	299.723	300.008	300.134	300.212	300.115
SO9	270.270	270.392	270.583	270.695	270.904	270.791	271.012	271.223
SO10	241.435	241.426	240.997	241.525	241.242	241.528	242.389	242.211
SO11	212.784	212.570	212.587	212.734	212.970	212.994	213.118	213.202
SO12	183.742	183.559	183.455	183.569	183.810	183.841	183.951	184.007
SO13	154.437	154.123	154.104	153.773	153.748	153.737	154.297	154.425

CALI_TTMLH (Master)	Sensor Sensitivity Transit Time from Monopole Lower Transmitter High Frequency Firing							
Minimum/Nominal/Maximum	0/0/5000.000						Unit	us
	RB1	RB2	RB3	RB4	RB5	RB6	RB7	RB8
SO1	153.818	153.717	153.690	153.604	153.612	153.596	153.780	153.811
SO2	183.467	183.372	183.231	183.080	182.906	182.932	183.095	183.360
SO3	212.537	212.669	212.262	212.093	212.052	212.020	212.364	212.409
SO4	241.445	241.320	241.285	241.158	240.950	240.866	240.931	241.129
SO5	270.680	270.534	270.327	269.990	270.157	270.186	270.349	270.399
SO6	299.532	299.330	299.206	298.992	299.033	298.995	299.303	299.007
SO7	328.193	328.400	328.250	327.993	328.063	328.004	328.546	328.365
SO8	357.376	357.497	357.349	357.123	357.362	357.570	357.668	357.550
SO9	385.918	386.123	385.542	385.195	385.129	385.775	385.970	386.161
SO10	415.868	415.512	415.279	415.261	415.582	415.852	416.165	416.068
SO11	444.818	444.502	444.381	444.249	444.444	444.554	445.000	445.075
SO12	473.877	473.651	473.416	473.153	473.465	473.572	473.919	474.099
SO13	503.156	502.924	502.629	502.344	502.271	502.477	502.902	503.175

CALI_AMPMUH (Master)	Sensor Sensitivity First Break Amplitude from Monopole Upper Transmitter High Frequency Firing		
Minimum/Nominal/Maximum	-50000.000/0/50000.000	Unit	

	RB1	RB2	RB3	RB4	RB5	RB6	RB7	RB8
SO1	4918.854	4660.642	4717.375	4790.962	4629.735	4860.645	4809.837	4627.874
SO2	5147.524	4833.222	5105.565	5086.984	4885.152	4856.544	5077.824	5355.684
SO3	5260.638	5528.238	5454.932	5363.803	5263.904	5342.244	5233.556	5320.045
SO4	5605.490	5512.267	5522.950	5713.398	5475.223	5278.393	5435.145	5493.216
SO5	5553.821	5623.736	5799.802	5730.599	5718.927	5858.813	5612.922	5874.553
SO6	6268.608	6379.341	5942.607	6340.446	5594.177	5969.061	6156.866	6060.853
SO7	6494.310	6207.356	6474.016	6688.234	6599.144	6297.773	6313.804	6394.772
SO8	6707.679	6671.410	6744.240	6302.334	6493.961	6544.330	6477.597	6691.002
SO9	7097.686	6895.200	6994.835	6903.170	7015.097	6873.482	7151.848	7040.804
SO10	7431.060	7650.454	7262.250	7162.927	7197.758	7544.166	7566.518	7413.387
SO11	7877.027	7441.563	7790.995	7705.304	7808.086	7304.537	7655.717	7497.623
SO12	8278.315	8127.109	7695.277	7760.696	7818.403	7641.230	7897.092	8218.479
SO13	8079.715	7857.935	7508.602	7361.271	6862.649	6929.336	7423.825	7604.011

CALI_AMPMLH (Master)	Sensor Sensitivity First Break Amplitude from Monopole Lower Transmitter High Frequency Firing	
Minimum/Nominal/Maximum	-50000.000/0/50000.000	Unit

	RB1	RB2	RB3	RB4	RB5	RB6	RB7	RB8
SO1	7632.407	6955.185	7123.000	7753.498	7639.262	7922.010	7544.948	7380.341
SO2	7788.852	7246.770	7702.103	7789.759	7542.573	7528.553	7845.175	8253.894
SO3	7472.361	7619.372	7651.748	7638.747	7545.062	7615.475	7457.310	7559.527
SO4	7336.669	7099.441	7110.967	7431.565	7241.186	6891.695	7054.330	7122.563
SO5	6713.721	6827.091	6964.169	6887.284	6812.300	6985.345	6592.854	6950.055
SO6	6920.665	6915.553	6364.925	6802.333	6056.722	6256.417	6532.400	6406.132
SO7	6335.038	6056.507	6342.901	6450.449	6372.131	5936.535	6070.868	6221.382
SO8	5992.949	5918.144	5968.376	5599.165	5763.803	5837.351	5735.936	5950.983
SO9	5758.902	5549.922	5611.817	5459.875	5431.432	5396.201	5624.625	5661.361
SO10	5510.917	5624.729	5392.241	5278.681	5417.062	5593.116	5578.115	5433.545
SO11	5243.175	4932.583	5190.332	5136.616	5229.331	4859.643	5184.866	4982.671
SO12	4994.819	4957.444	4780.680	4908.950	5015.236	4899.553	4965.610	5033.285
SO13	4771.646	4784.357	4646.711	4785.051	4483.539	4552.159	4695.229	4659.792

CALI_AMPMUL (Master)	Sensor Sensitivity First Break Amplitude from Monopole Upper Transmitter Low Frequency Firing	
Minimum/Nominal/Maximum	-50000.000/0/50000.000	Unit

	RB1	RB2	RB3	RB4	RB5	RB6	RB7	RB8
SO1	-7885.233	-7057.470	-6602.851	-6393.385	-6340.362	-7024.485	-7390.530	-7316.712
SO2	-8624.039	-7535.955	-7453.680	-7165.917	-7083.208	-7299.850	-8175.268	-8935.475
SO3	-9293.640	-9623.457	-8804.360	-8422.434	-8340.207	-8919.656	-9225.740	-9529.697
SO4	-10979.780	-10237.860	-9927.821	-10151.160	-9884.113	-9973.578	-10656.640	-10743.920
SO5	-11091.870	-11022.800	-11212.240	-11020.580	-11078.600	-11652.670	-11275.090	-12015.130
SO6	-14453.370	-14106.540	-12559.350	-13703.780	-12554.520	-13517.940	-13970.430	-13703.670
SO7	-20000.650	-18706.220	-19821.450	-19975.090	-19936.400	-19128.870	-19688.440	-19898.370
SO8	-19021.850	-18310.860	-18703.970	-17883.390	-18379.390	-18664.120	-18360.060	-18825.780
SO9	-20541.310	-19482.680	-20229.890	-19946.020	-20341.900	-19869.040	-20535.940	-20108.130
SO10	-21307.040	-21694.230	-21119.750	-21140.330	-21748.850	-22311.020	-21912.080	-21115.680
SO11	-22154.300	-21113.700	-22658.460	-22641.680	-23238.880	-21661.060	-22432.290	-20875.140
SO12	-23990.420	-23868.540	-23686.300	-24630.220	-24950.350	-24561.280	-24146.580	-23892.380
SO13	-26888.320	-27550.250	-27685.450	-28514.170	-27122.520	-27572.400	-27380.320	-26309.360

CALI_AMPMLL (Master)	Sensor Sensitivity First Break Amplitude from Monopole Lower Transmitter Low Frequency Firing	
Minimum/Nominal/Maximum	-50000.000/0/50000.000	Unit

Minimum/Nominal/Maximum	-50000.000/0/50000.000						Unit	
	RB1	RB2	RB3	RB4	RB5	RB6	RB7	RB8
SO1	-26711.230	-24839.500	-24382.580	-24276.440	-23464.390	-25285.000	-25456.870	-24817.060
SO2	-23743.420	-21571.850	-22360.280	-21664.670	-21158.770	-21460.810	-22715.260	-24392.720
SO3	-20292.570	-22011.810	-20234.270	-19388.570	-18965.330	-19676.990	-19746.440	-20413.600
SO4	-18222.910	-17296.790	-16545.840	-16670.090	-16078.120	-16050.310	-17039.070	-17734.040
SO5	-15283.510	-14944.080	-15359.540	-14984.310	-14749.620	-15113.480	-14860.110	-16157.190
SO6	-17592.920	-17089.410	-15450.680	-16489.840	-14627.480	-15654.730	-16754.240	-16716.220
SO7	-12399.050	-11159.630	-11524.960	-12001.790	-12268.390	-11311.340	-11582.550	-12011.350
SO8	-11210.210	-10616.130	-10696.310	-10136.680	-10336.910	-10550.140	-10629.080	-10942.040
SO9	-9952.709	-9455.252	-10122.050	-9846.866	-9857.343	-9702.685	-10148.650	-9687.742
SO10	-9000.264	-9281.105	-9418.891	-9278.706	-9517.096	-9625.797	-9384.342	-8954.240
SO11	-8375.236	-7897.982	-8917.625	-9203.213	-9495.128	-8721.273	-8755.293	-7873.586
SO12	-7259.255	-7179.980	-7496.602	-8101.029	-8576.190	-8157.604	-7476.865	-7279.889
SO13	-6810.136	-6944.175	-7420.967	-8107.574	-7850.999	-7648.115	-7274.476	-6706.094

Vertical Casing Check Coefficients

Before: After:

CALI_SVCNA (Before)	Sensor Vertical Casing Check Normalized Amplitudes (Before/After/BAChange)							
Minimum/Nominal/Maximum	-----/-----/-----						Unit	
	RB1	RB2	RB3	RB4	RB5	RB6	RB7	RB8
SO1	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO2	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO3	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO4	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO5	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO6	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO7	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO8	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO9	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO10	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO11	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO12	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO13	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE

CALI_SVCNA (After)	Sensor Vertical Casing Check Normalized Amplitudes (Before/After/BAChange)							
Minimum/Nominal/Maximum	-----/-----/-----						Unit	
	RB1	RB2	RB3	RB4	RB5	RB6	RB7	RB8
SO1	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO2	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO3	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO4	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO5	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO6	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO7	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO8	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO9	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO10	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO11	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE

SO12	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO13	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE

CALI_SVCTDF (Before)	Sensor Vertical Casing Check Time (Before/After/BAChange)							
Minimum/Nominal/Maximum	-----/-----/-----						Unit	us
	RB1	RB2	RB3	RB4	RB5	RB6	RB7	RB8
SO1	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO2	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO3	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO4	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO5	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO6	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO7	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO8	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO9	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO10	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO11	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO12	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO13	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE

CALI_SVCTDF (After)	Sensor Vertical Casing Check Time (Before/After/BAChange)							
Minimum/Nominal/Maximum	-----/-----/-----						Unit	us
	RB1	RB2	RB3	RB4	RB5	RB6	RB7	RB8
SO1	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO2	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO3	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO4	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO5	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO6	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO7	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO8	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO9	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO10	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO11	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO12	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO13	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE

CALI_SVCLF (Before)	Sensor Vertical Casing Check Low Frequency Diagnostics Failure Flag (Before/After/BAChange)							
Minimum/Nominal/Maximum	-----/-----/-----						Unit	
	RB1	RB2	RB3	RB4	RB5	RB6	RB7	RB8
SO1	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO2	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO3	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO4	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO5	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO6	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO7	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO8	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO9	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO10	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO11	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE

SO12	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO13	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE

CALI_SVCLF (After)	Sensor Vertical Casing Check Low Frequency Diagnostics Failure Flag (Before/After/BAChange)	
Minimum/Nominal/Maximum	-----/-----/-----	Unit

	RB1	RB2	RB3	RB4	RB5	RB6	RB7	RB8
SO1	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO2	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO3	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO4	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO5	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO6	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO7	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO8	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO9	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO10	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO11	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO12	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE
SO13	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE	NOT DONE

HGNS-B (HILT Gamma-Ray and Neutron Sonde, 125 degC) Calibration - Run 1

Primary Equipment :

HILT Gamma-Ray and Neutron Sonde, 125 degC	HGNS-B	863

Auxiliary Equipment :

HGNS Accelerometer, 125 degC	HACCZ-B	452
AmBe Neutron Logging Source	NSR-F	5069

Calibration Parameter :

Water Temperature	
Housing Size	
JIG-BKG (Jig minus background reference)	165

HGNS Accelerometer Calibration - Accelerometer Accumulations

Before (Measured): 15:41:18 31-May-2013

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
AZ Vertical Measurement	ft/s2	Before	32.2	31.5	31.8	32.8

HGNS Accelerometer EEPROM - Accelerometer EEPROM Read

Master (EEPROM): 00:00:00 15-Dec-1996

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Accelerometer Manufacturer		Master			Sunstrand	
Accelerometer Reference Temperature	degF	Master		30.2	68.0	122.0
Accelerometer Coefficients - 0		Master	-----	-----	51.000	-----
Accelerometer Coefficients - 1		Master	-----	-----	11.800	-----
Accelerometer Coefficients - 2		Master	-----	-----	0.011	-----
Accelerometer Coefficients - 3		Master	-----	-----	0.000	-----
Accelerometer Coefficients - 4		Master	-----	-----	2.182	-----
Accelerometer Coefficients - 5		Master	-----	-----	0.000	-----
Accelerometer Coefficients - 6		Master	-----	-----	0.000	-----
Accelerometer Coefficients - 7		Master	-----	-----	0.000	-----
Accelerometer Coefficients - 8		Master	-----	-----	293.400	-----
Accelerometer Coefficients - 9		Master	-----	-----	0.997	-----

HGNS Neutron Calibration - HGNS Neutron Accumulations

Master (EEPROM): 10:38:08 25-Feb-2013 Expired by 5 days Before (Measured): 13:45:42 30-May-2013 Expired by 1 days After:

Expired by 3 days Expired by 1 days

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
Near Zero Measurement	1/s	Master	0	5.0	27.8	40.0
		Before	0	5.0	29.0	40.0
		After	-----	-----	-----	-----
		Before-Master	-----	-4.2	1.2	4.2
		After-Before	-----	-----	-----	-----
Far Zero Measurement	1/s	Master	0	5.0	31.8	40.0
		Before	0	5.0	31.0	40.0
		After	-----	-----	-----	-----
		Before-Master	-----	-4.8	-0.8	4.8
		After-Before	-----	-----	-----	-----
Near Plus Measurement - 0	1/s	Master	6031.0	4700.0	4914.0	6900.0
		Before	-----	-----	-----	-----
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-----	-----
		After-Before	-----	-----	-----	-----
Far Plus Measurement - 0	1/s	Master	2793.0	1900.0	2076.0	2900.0
		Before	-----	-----	-----	-----
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-----	-----
		After-Before	-----	-----	-----	-----
Near Corrected Plus Measurement - 0	1/s	Master		4700.0	4881.0	6900.0
		Before	-----	-----	-----	-----
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-----	-----
		After-Before	-----	-----	-----	-----
Far Corrected Plus Measurement - 0	1/s	Master		1900.0	2041.0	2900.0
		Before	-----	-----	-----	-----
		After	-----	-----	-----	-----
		Before-Master	-----	-----	-----	-----
		After-Before	-----	-----	-----	-----

HGNS Gamma-Ray Calibration - Gamma-Ray Accumulations

Before (Measured): 13:48:38 30-May-2013 Expired by 1 days After:

Measurement	Unit	Phase	Nominal	Low Limit	Actual	High Limit
RGR Zero Measurement	gAPI	Before	30.0	0	81.9	120.0
		After	-----	-----	-----	-----
		After-Before	-----	-----	-----	-----
RGR Plus Measurement	gAPI	Before	185.4	157.1	168.3	206.3
		After			NOT DONE	
		After-Before	-----	-----	-----	-----
GR Calibration Gain		Before	0.89	0.80	0.98	1.05
		After	-----	-----	-----	-----
		After-Before	-----	-----	-----	-----

Company: NIGHTHAWK PRODUCTION LLC

Schlumberger

Well: TAOS 1-10

Field: WILDCAT

County: LINCOLN

State: COLORADO

Borehole Compensated Sonic