PATHFINDER

A Schlumberger Company

RESISTIVITY
GAMMA-RAY
CONDUCTIVITY

5" = 100'
FEET MD

COMPANY : TEKTON WINDSOR LLC
WELL : PAVISTMA SOUTH WELL #3
FIELD : WATTENBERG
COUNTY : WELD
STATE : CO
COUNTRY : USA
API No.: 05-123-36650

COMPANY : TEKTON WINDSOR LLC
WELL : PAVISTMA SOUTH WELL #3
FIELD : WATTENBERG
COUNTY : WELD
STATE : CO
COUNTRY : USA
API No.: 05-123-36650

WELL LOCATION

LAT:40°26'26"N LON:104°55'29"W
X:3,160,097' Y:1,403,834'NAD83

SEC: 32 TWP: 6N RANGE: 67W

OTHER SERVICES

ROP
DIRECTIONAL

DEPTH REF. : ROTARY TABLE
ELEVATION : 22.50 ft (ROTARY TABLE - GROUND LEVEL)
ALTITUDE : 4954.00 ft (GROUND LEVEL - MEAN SEA LEVEL)

BOREHOLE RECORD

HOLE SIZE in	FROM ft	TO ft
8 3/4	850	7750
6 1/8	7750	12018

CASING RECORD

CASING SIZE in	FROM ft	TO ft
9 5/8	0	850
7	0	7750

DEVIATION RECORD

INCLINATION deg	FROM ft	TO ft
00 - 10	213	4270
10+/-10	4270	6629
10 - 90	6629	7689
90 +/-4	7689	12018

DRILLING Co.: FRONTIER DRILLING
RIG : 10
LWD UNIT No.: N/A DISTRICT : CASPER
SPUD DATE : 22-AUG-13
LWD START DATE : 27-SEP-13 DEPTH : 7750 ft
LWD END DATE : 30-SEP-13 DEPTH : 12018 ft
TOTAL DEPTH : 12018 ft

RUN DATA

RUN NUMBER	1
START DATE	27-AUG-13
START TIME	17:30
END DATE	30-SEP-13
END TIME	17:45
DEPTH IN ft	7663
DEPTH OUT ft	12018
LOG TOP ft	7631
LOG BOTTOM ft	11986
HOLE SIZE in	6 1/8
MUD DATA @ ft	11269
MUD TYPE	WATER BASED
DENSITY lb/gal	9.40
VISCOSITY s/qt	49
pH	9.5
FLUID LOSS cm3/30	5.4
SALINITY mg/L	610
Rm ohmm @ deg F	1.253 @ 76
Rmf ohmm @ deg F	1.067 @ 73

MAX REC TEMP deg F	213					
Rm @ MAX TEMP ohmm	0.470					
LWD ENGINEER #1	B. RICHARD					
LWD ENGINEER #2	J. BREELAND					
LWD ENGINEER #3	M. FLORES					

REMARKS

TEKTON WINDSOR LLC.

PATHFINDER JOB #: 13CAS0215

ALL LOGGING DATA IS MEMORY UNLESS STATED OTHERWISE.

ALL REFERENCES TO LOG TOP, LOG BOTTOM, OR LOGGING TOOL DEPTH REFER TO THE GAMMA-RAY SENSOR UNLESS STATED OTHERWISE. SENSOR OFFSETS FOR THE OTHER LOGGING TOOLS ARE SHOWN IN THE BHA REPORT ON THE LOG TRAILER.

ALL ANNOTATIONS IN THE DEPTH TRACK ARE REFERENCED TO BIT DEPTH.

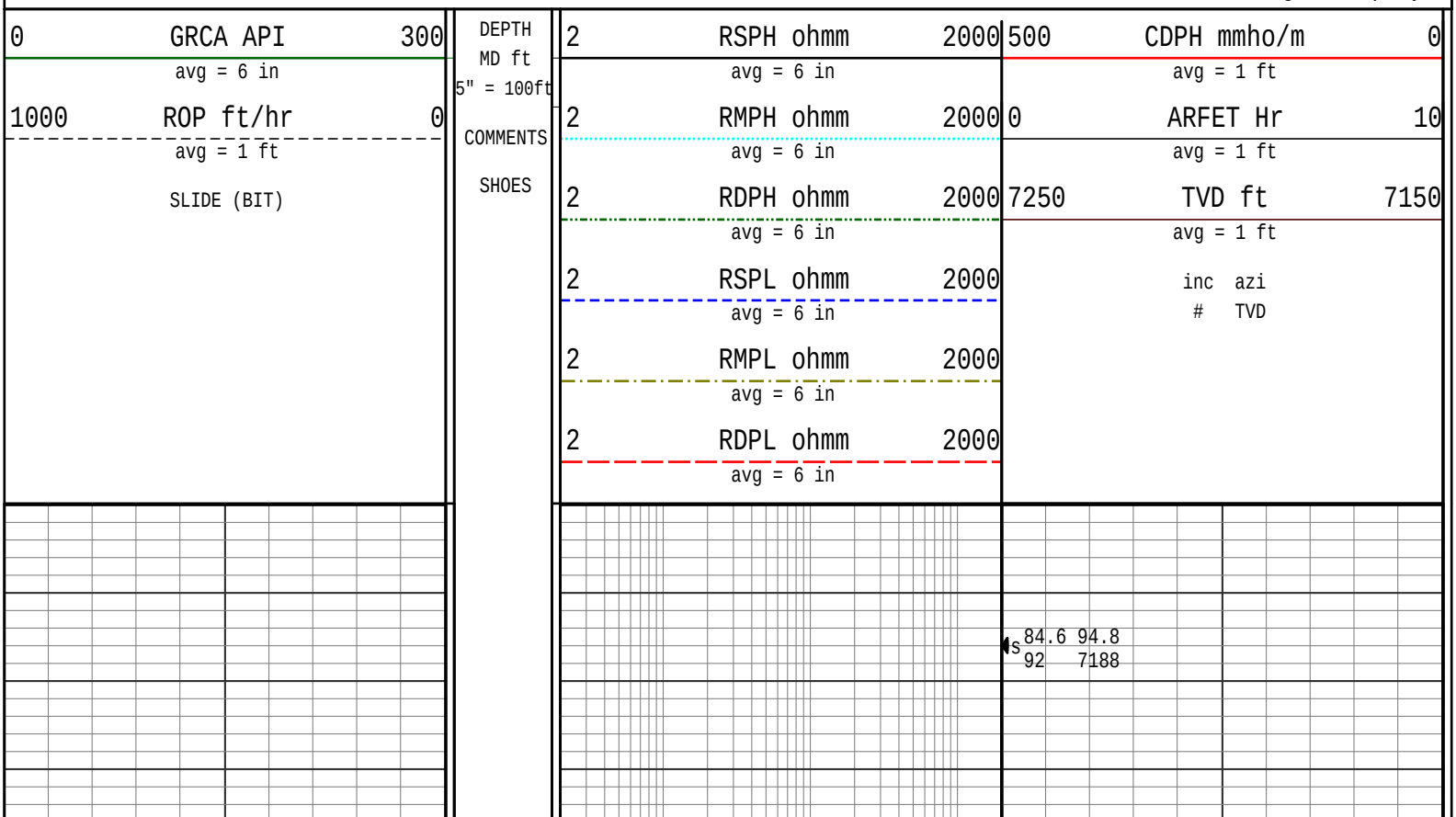
THIRD PARTY DEPTH TRACKING SERVICES PROVIDED BY PASON.

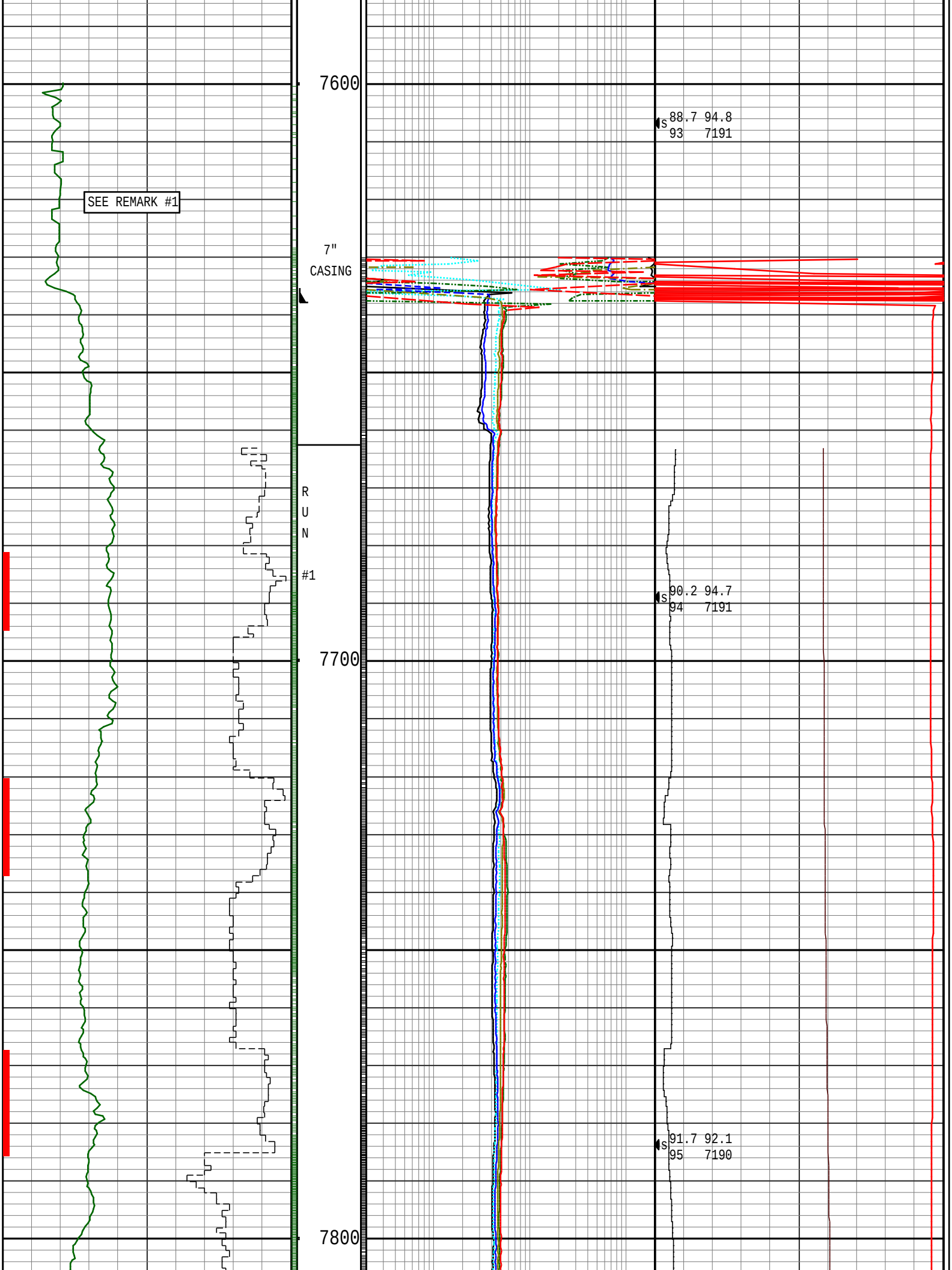
RUN #1: 4 3/4" HDS-1L/GAMMA/AWR LOGGING RUN.

RESISTIVITIES ARE CLAMPED (200 OHMM ATTENUATION AND 3000 OHMM PHASE) WHERE FORMATION RESISTIVITY IS BEYOND SENSOR LIMITATION.

REMARK #1: GAMMA-RAY LOGGED THROUGH CASING FROM 7600'-7638'MD (7190'-7191'TVD).

PATHFINDER - A Schlumberger Company




7600
7700
7800
SEE REMARK #1
7"
CASING
R
U
N
#1
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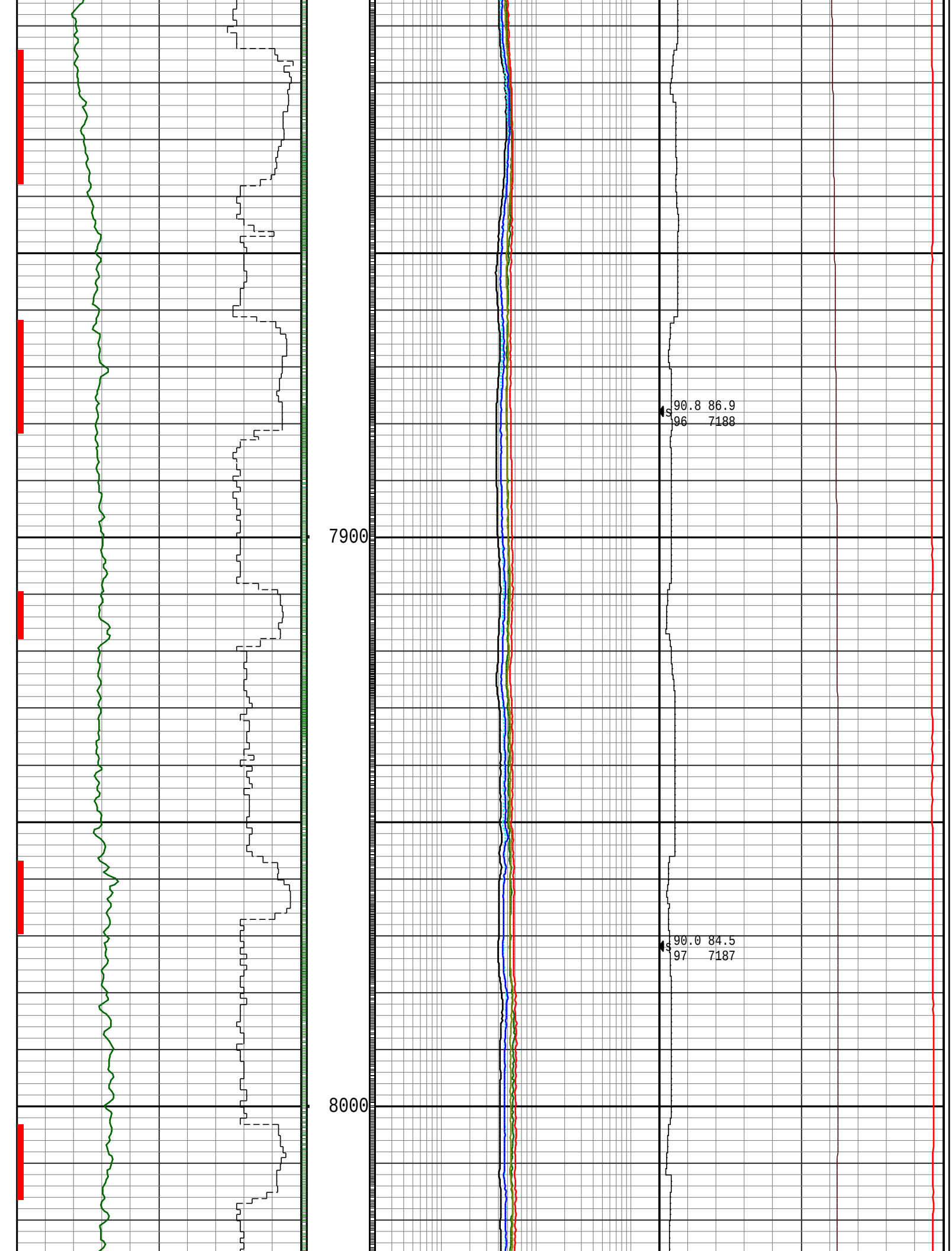
S 90.2 94.7
94 7191
S 91.7 92.1
95 7190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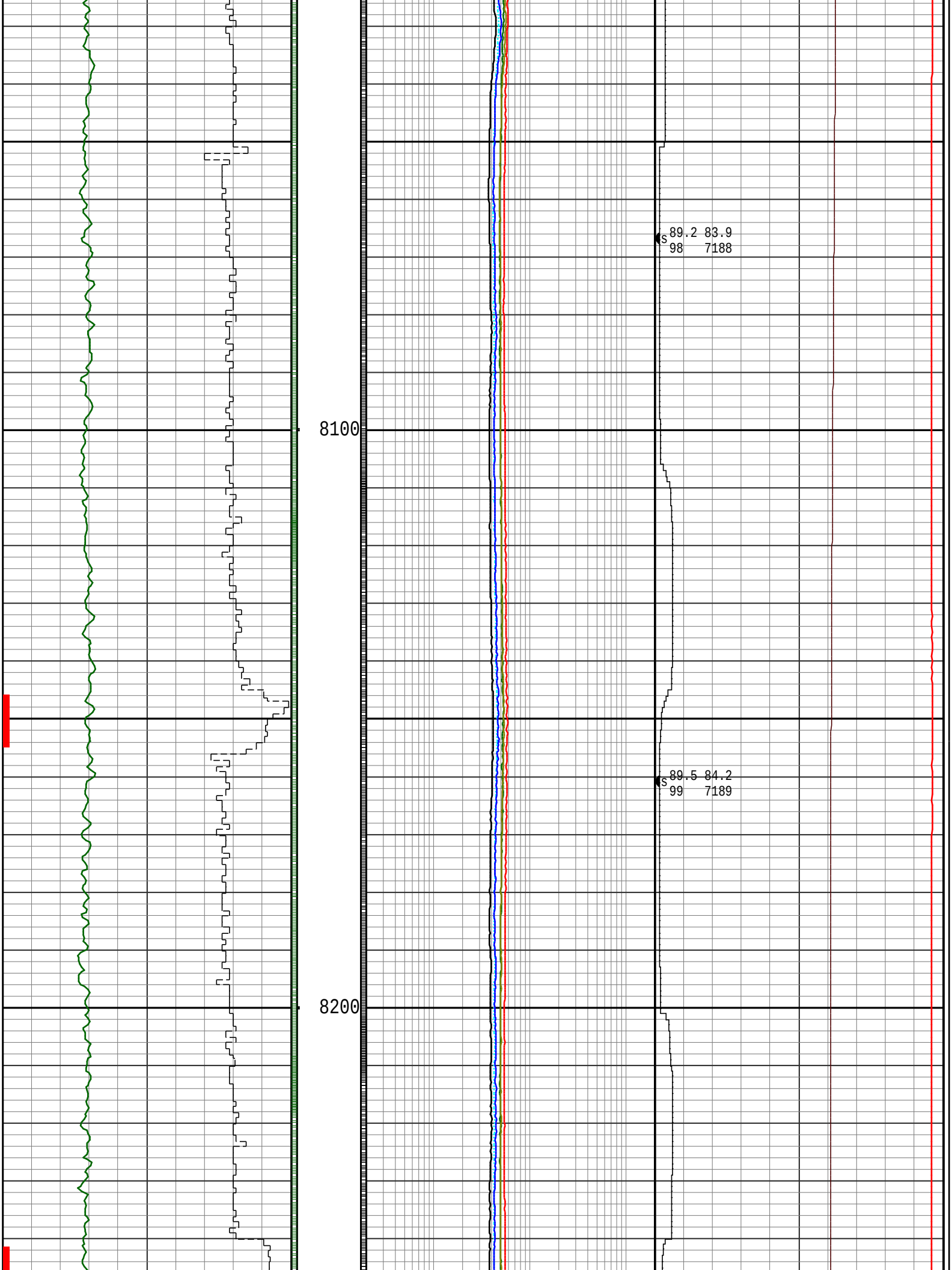
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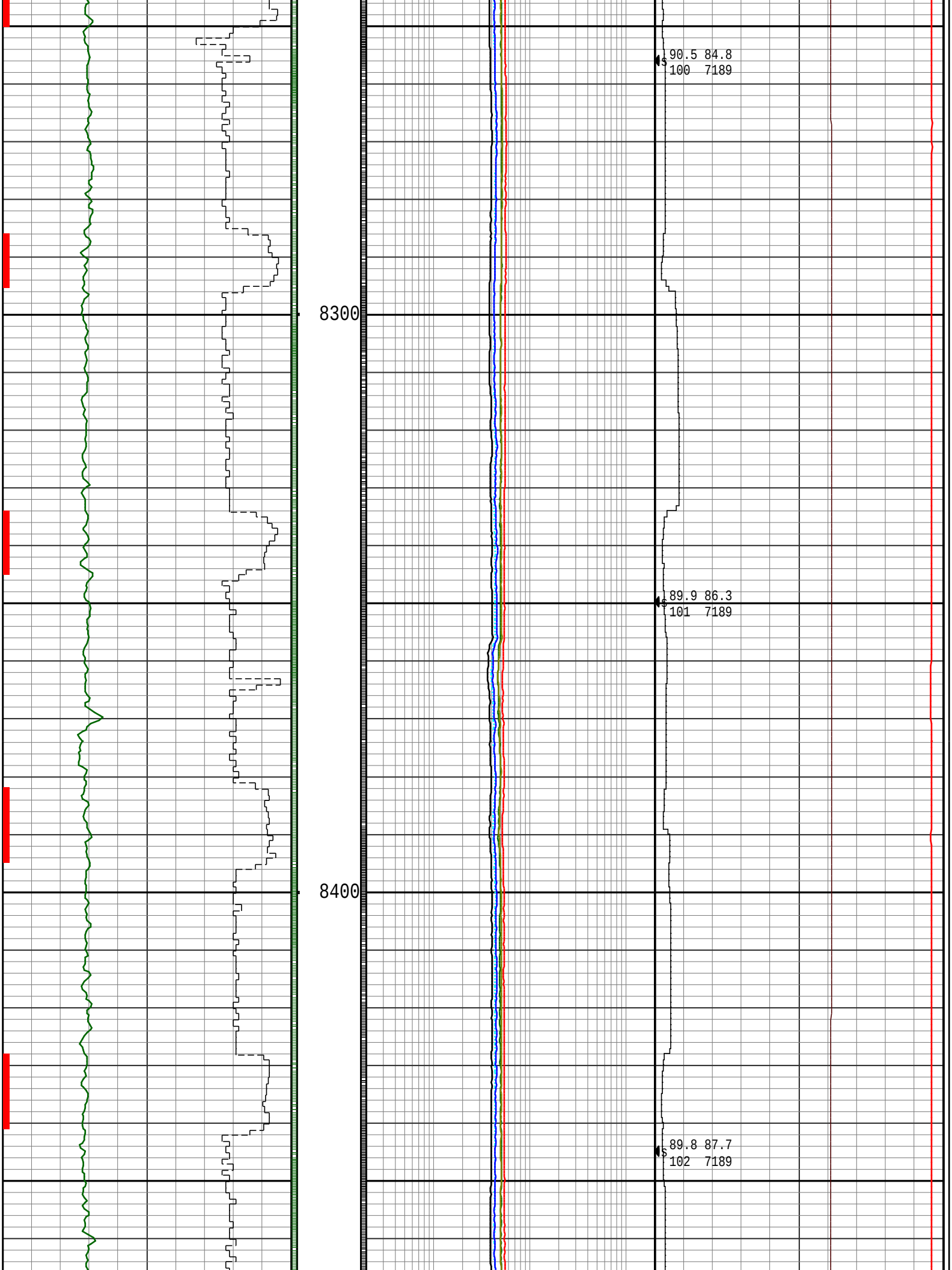
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8400
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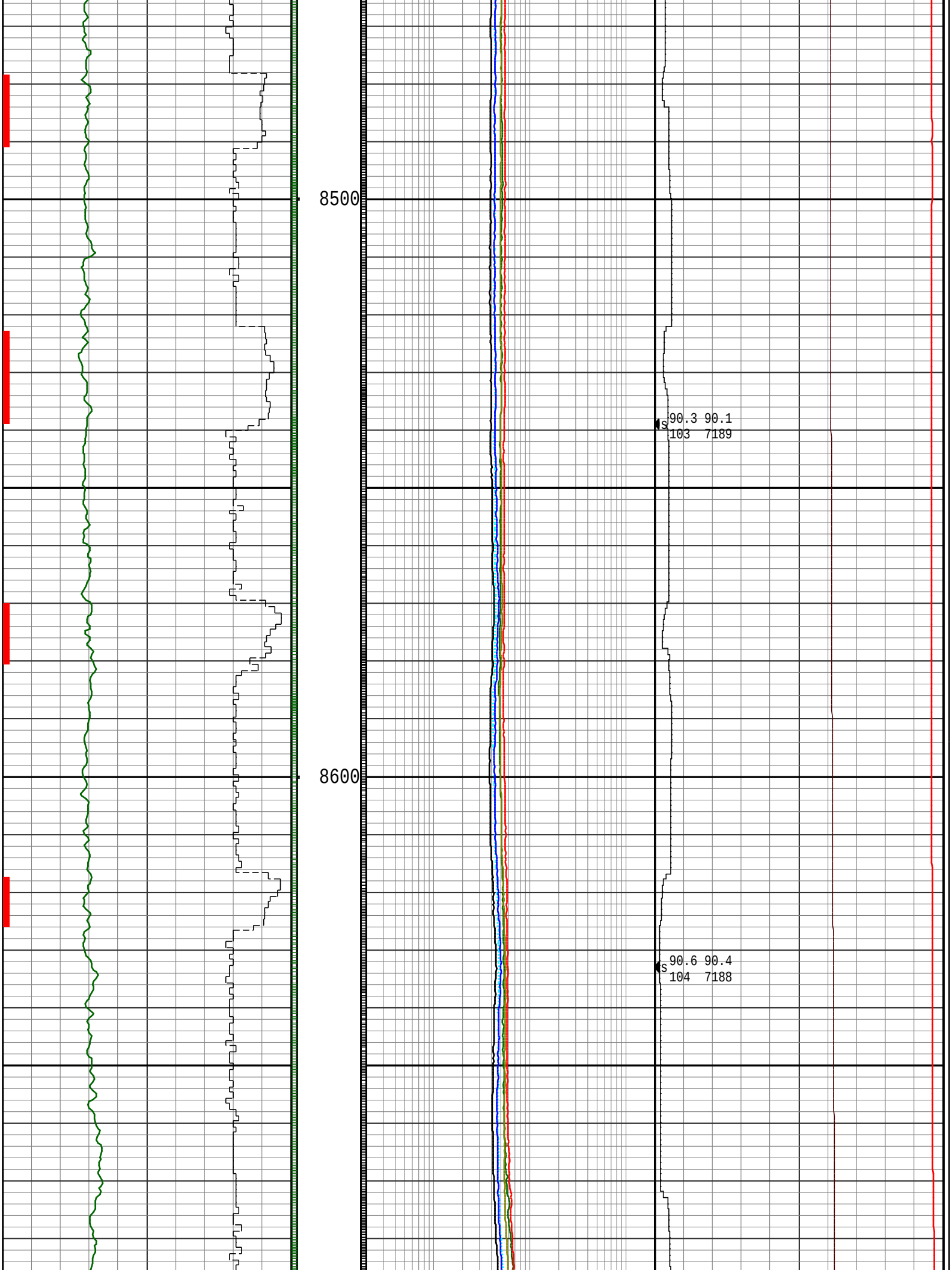
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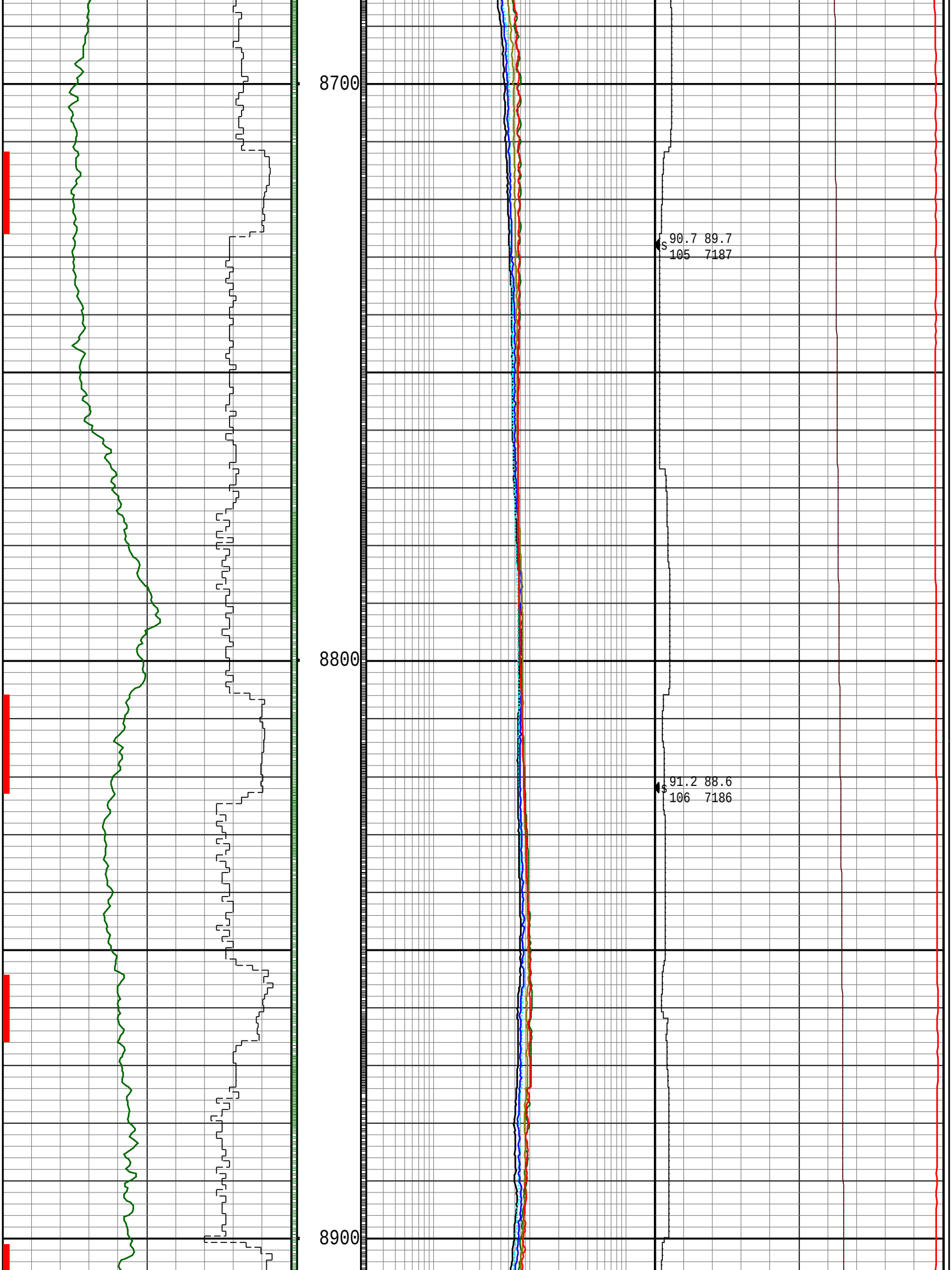
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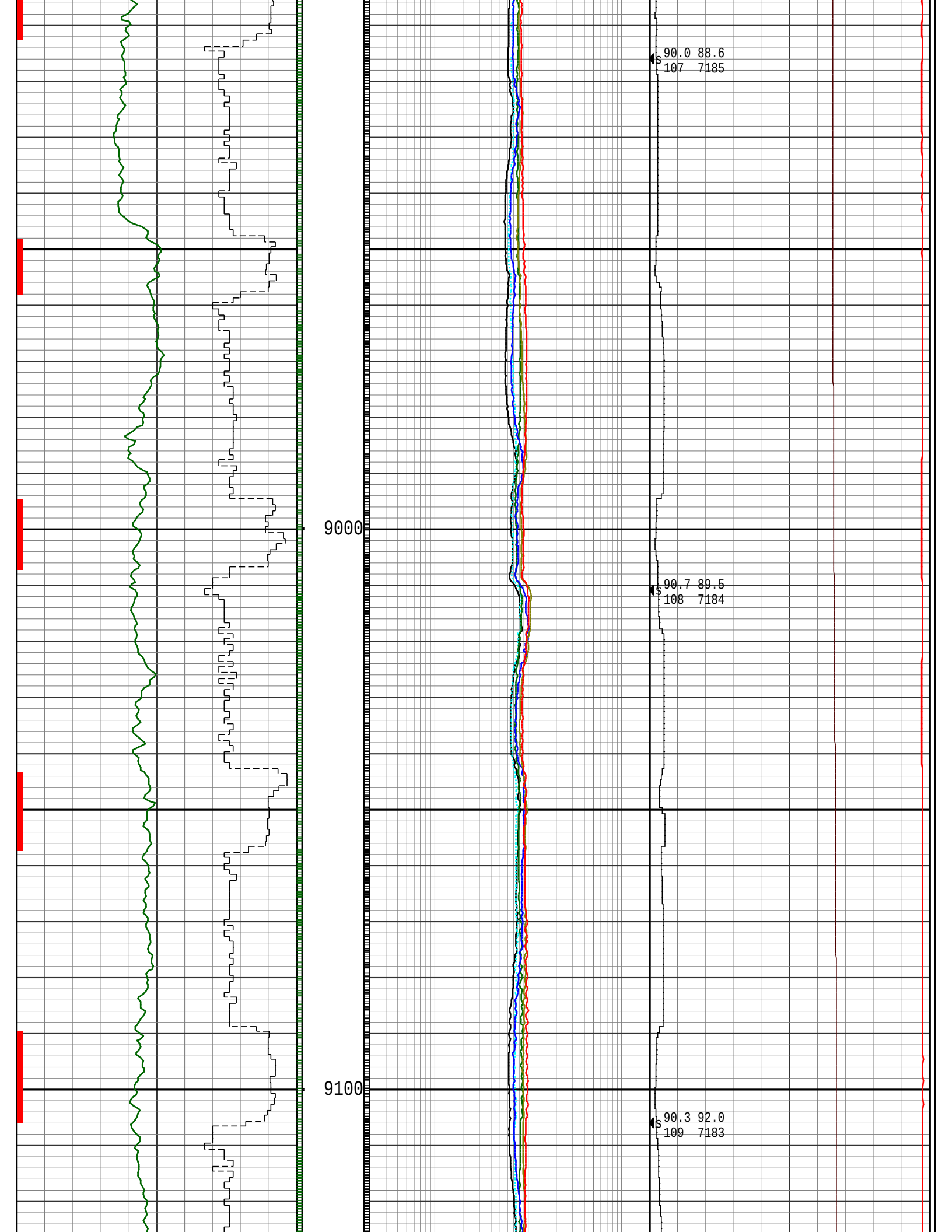
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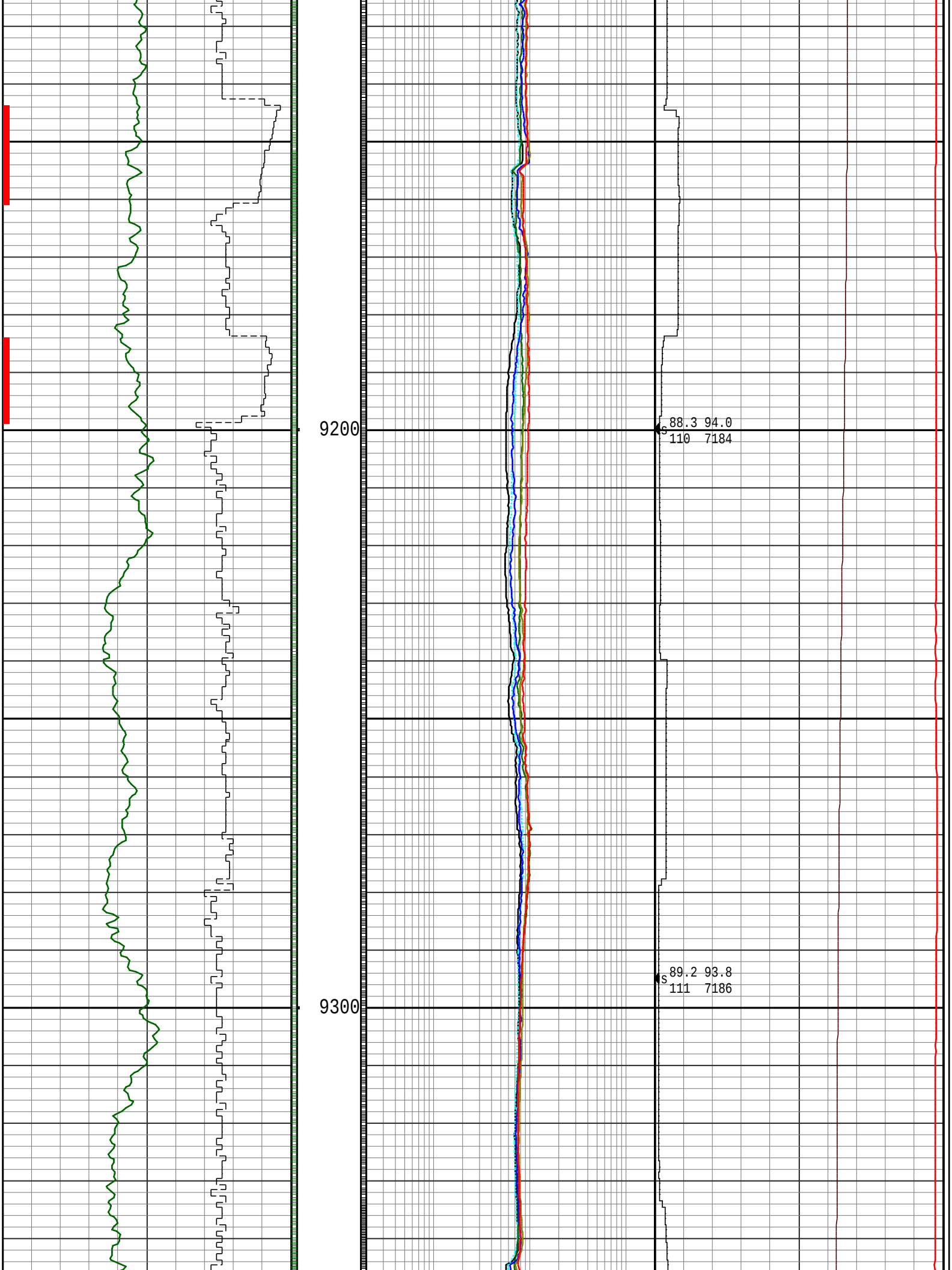
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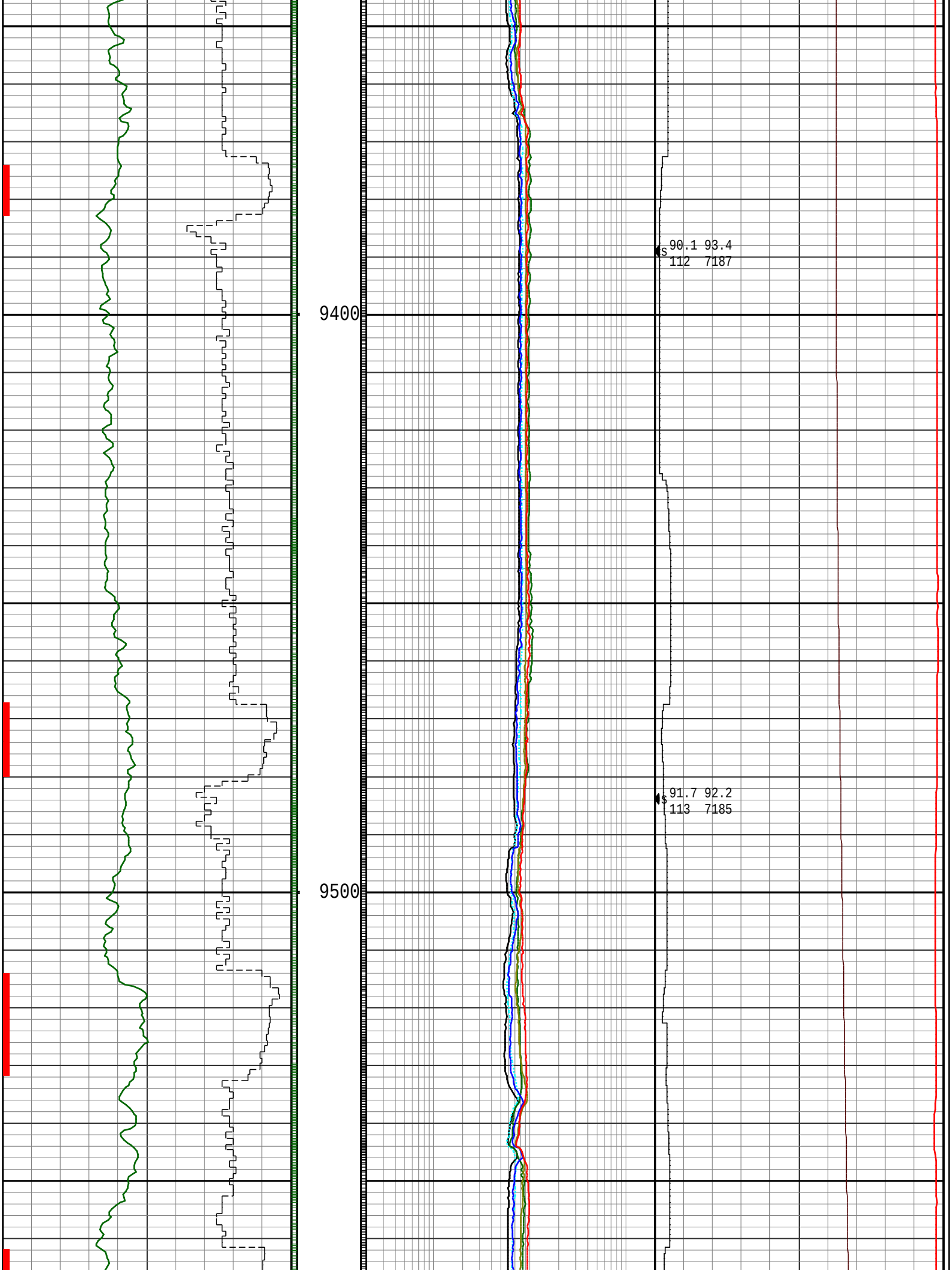
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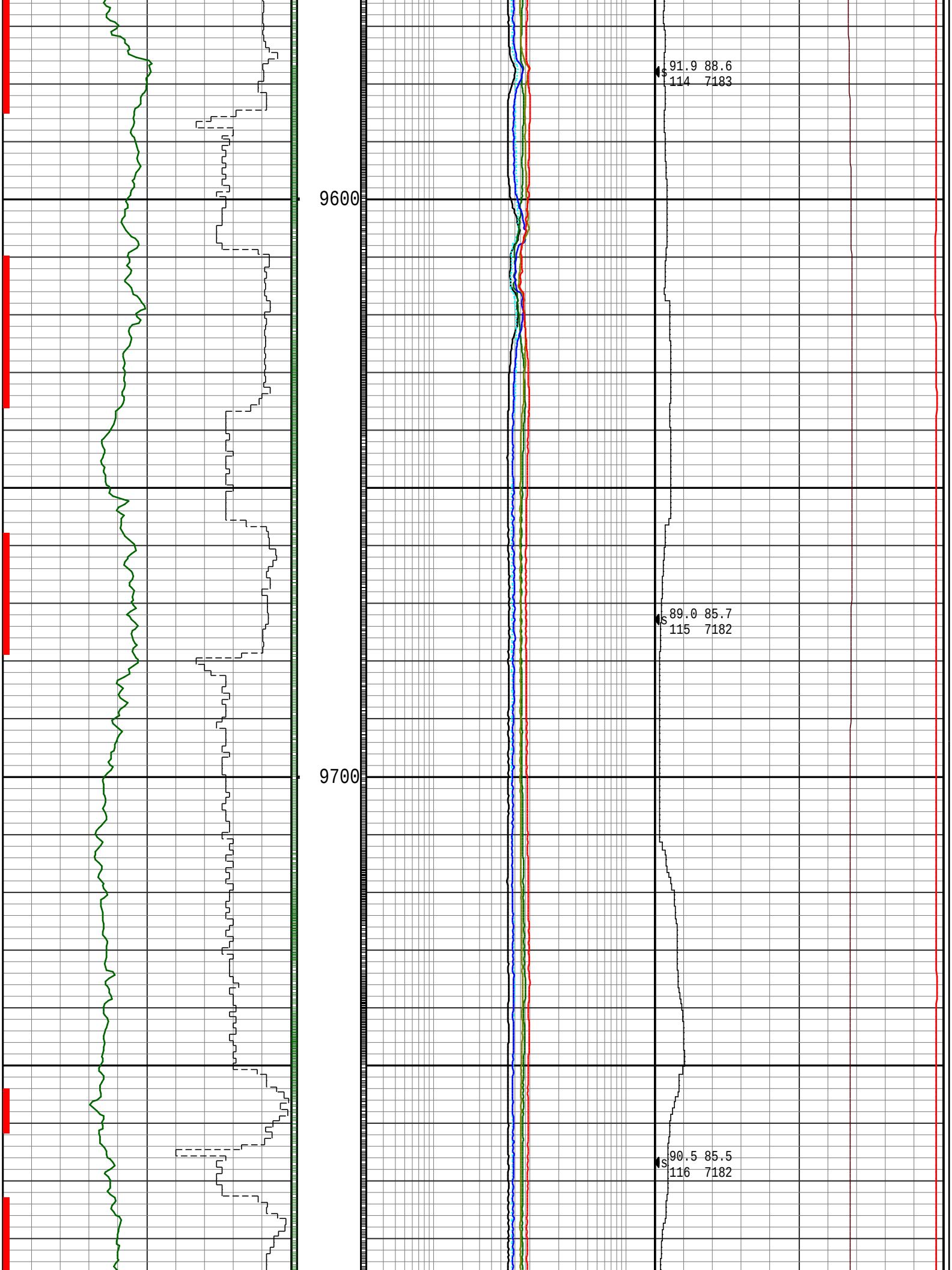
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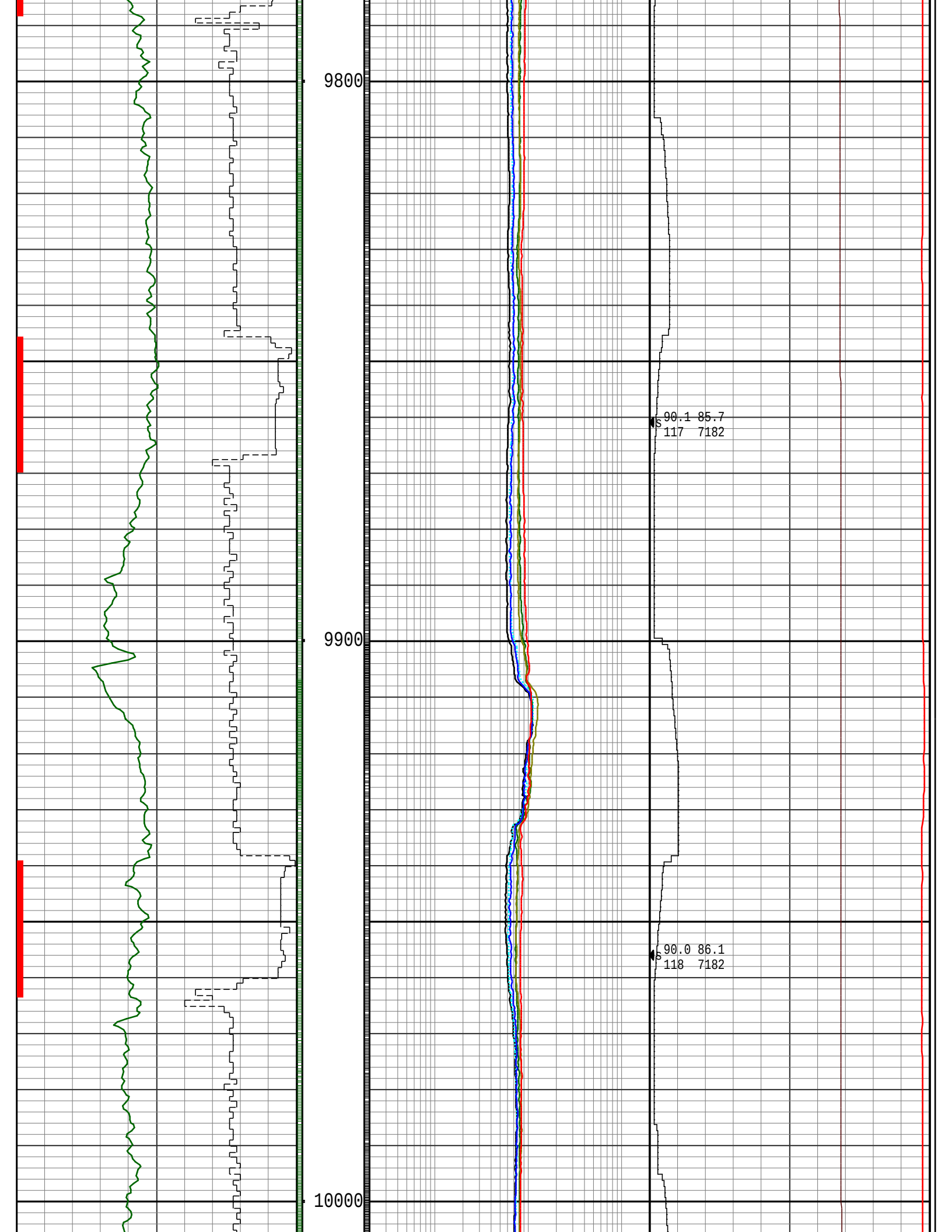
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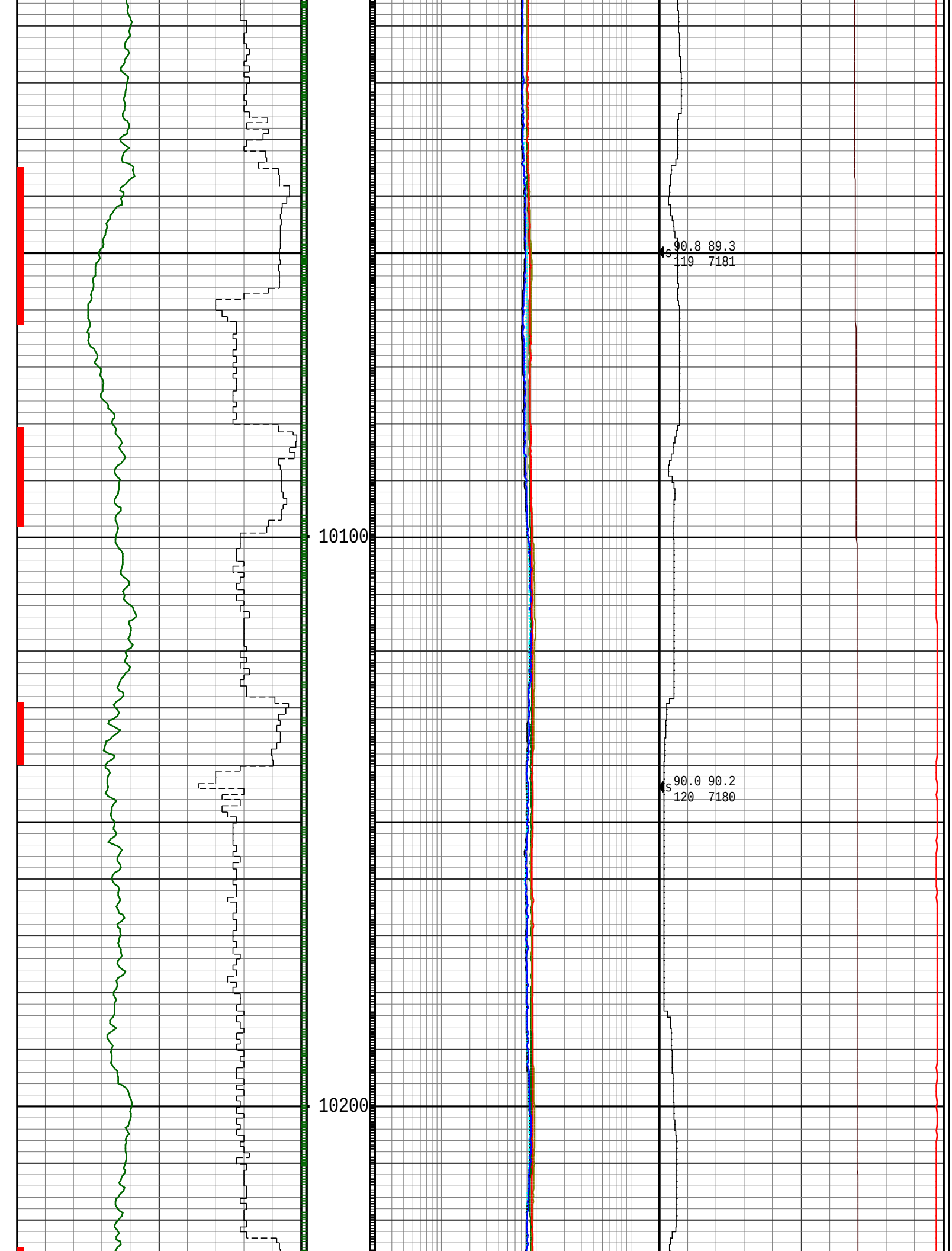
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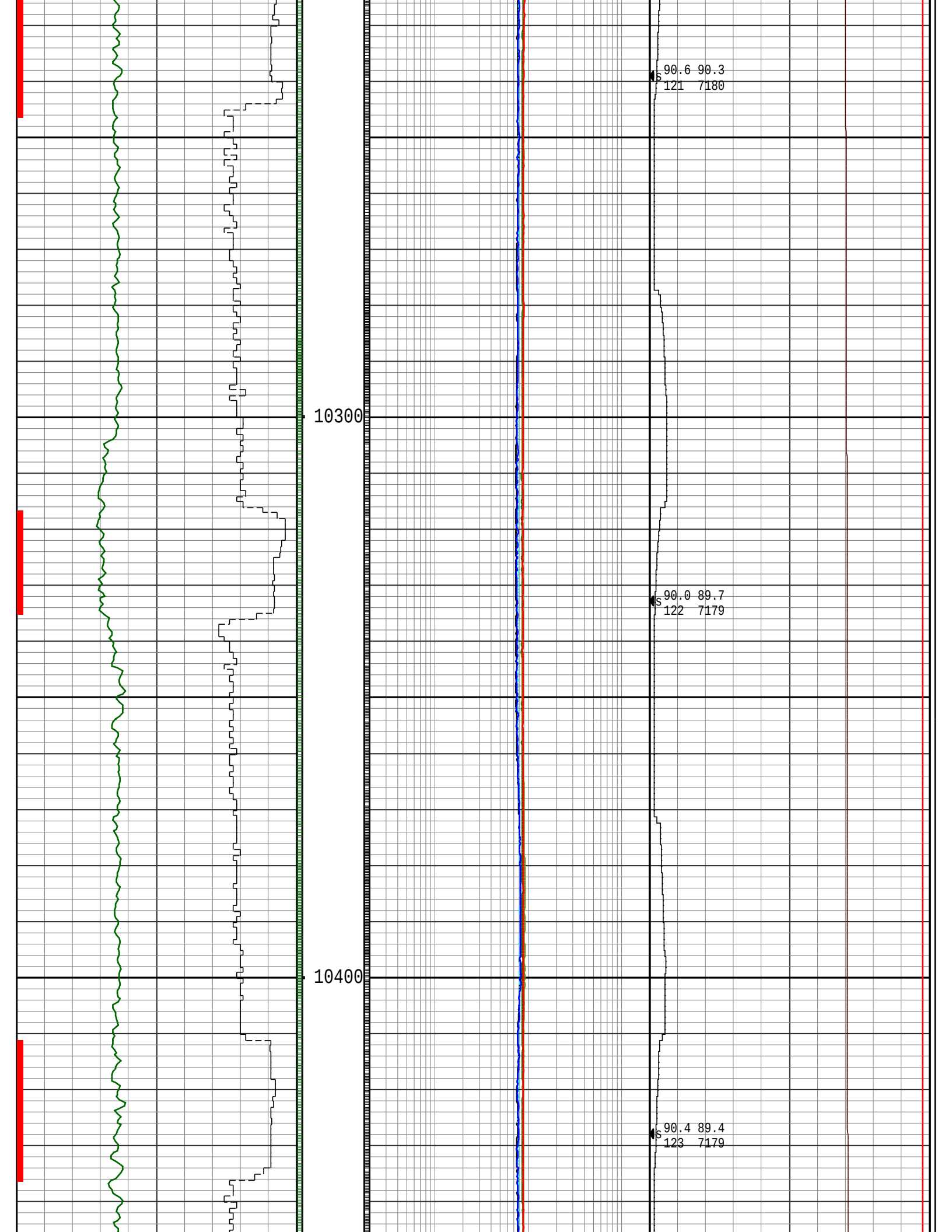
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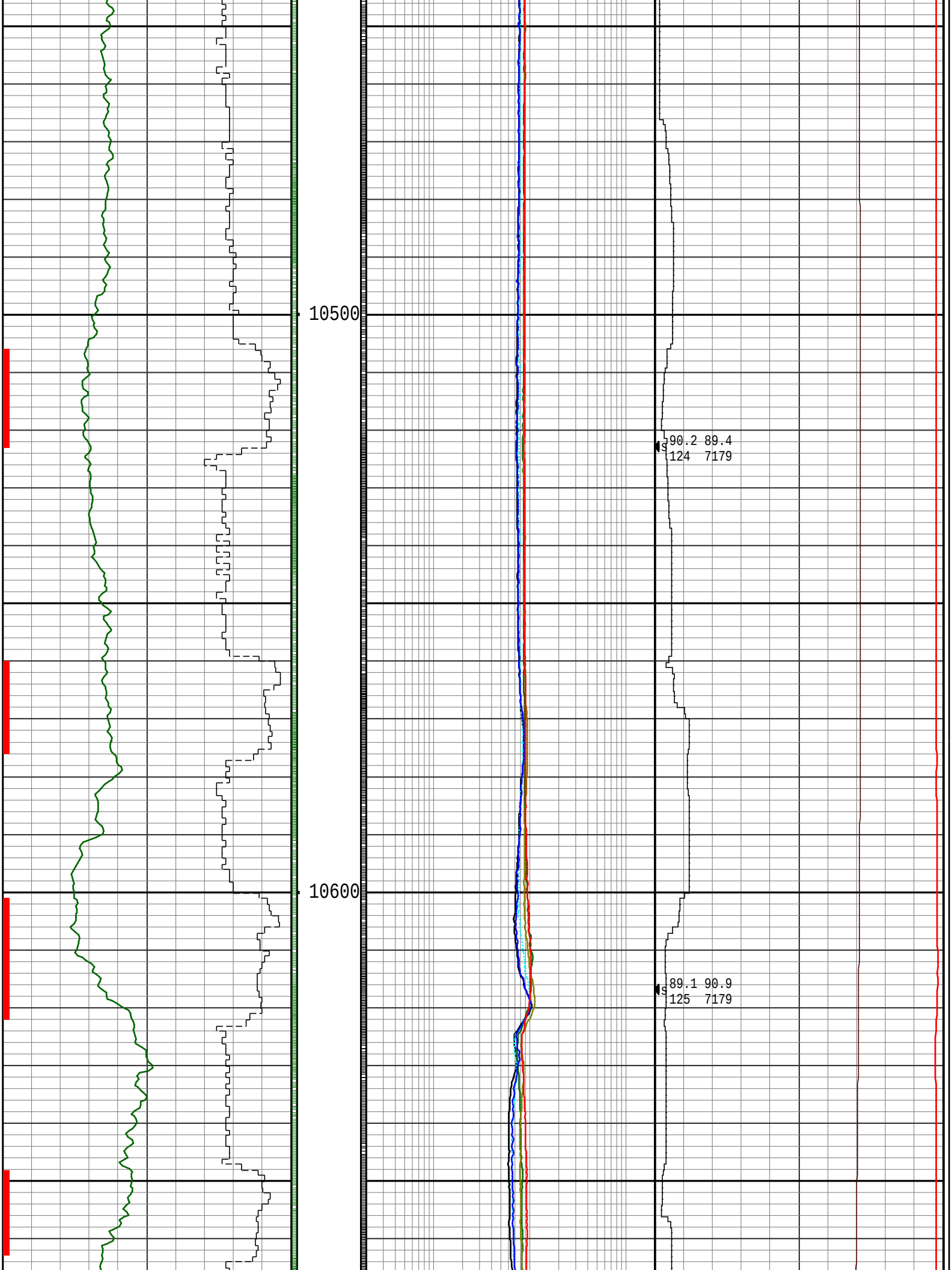
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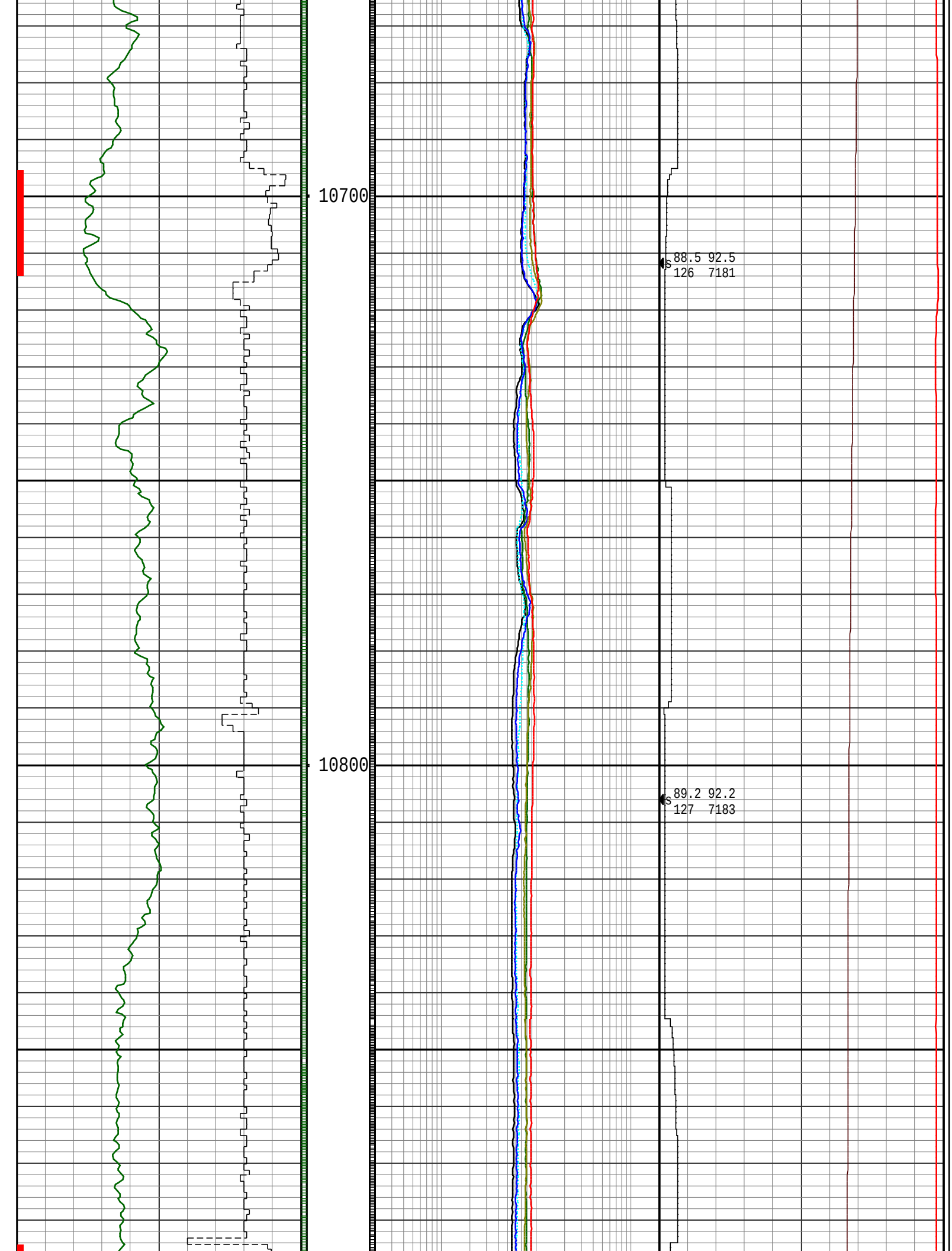
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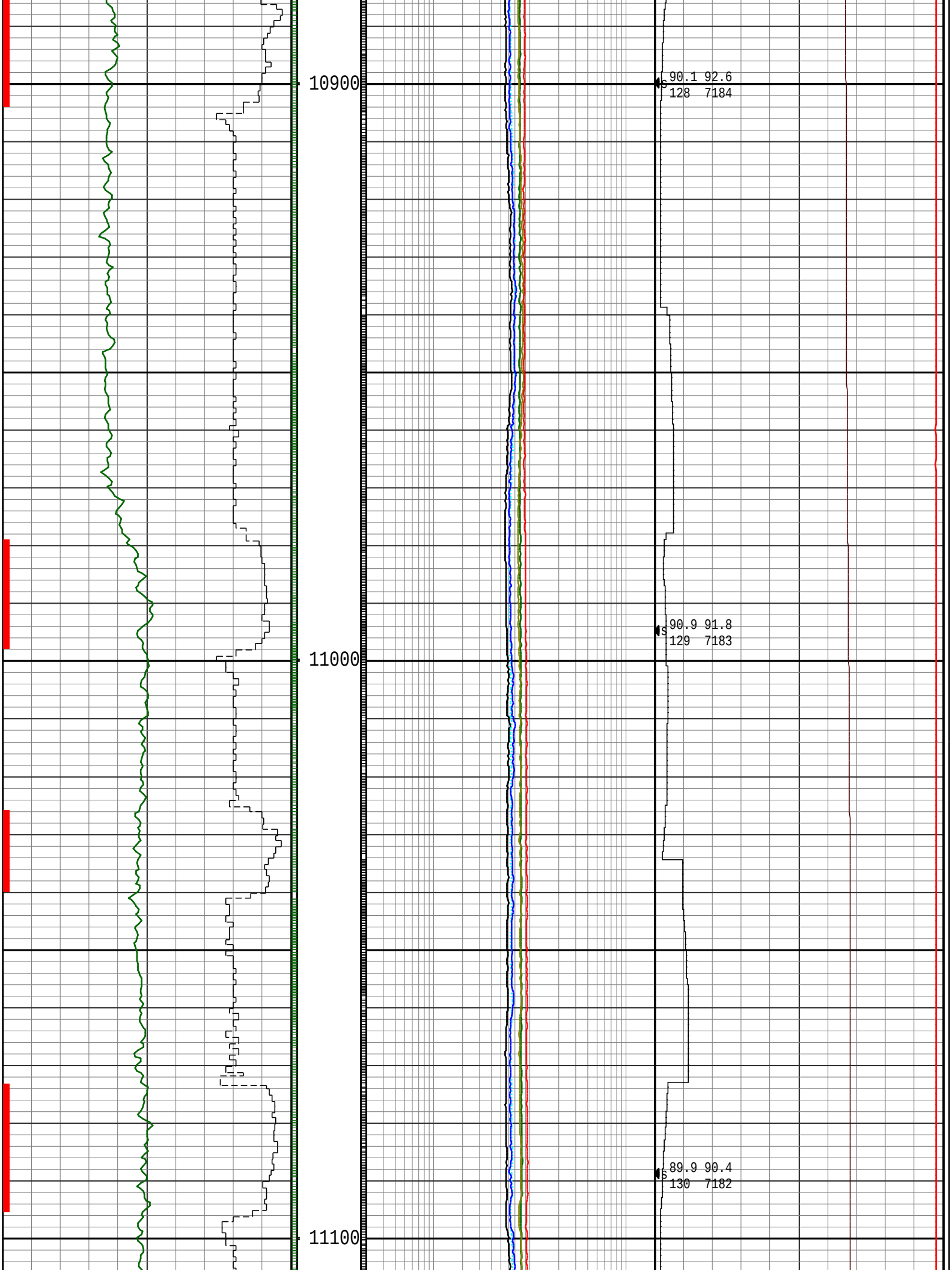
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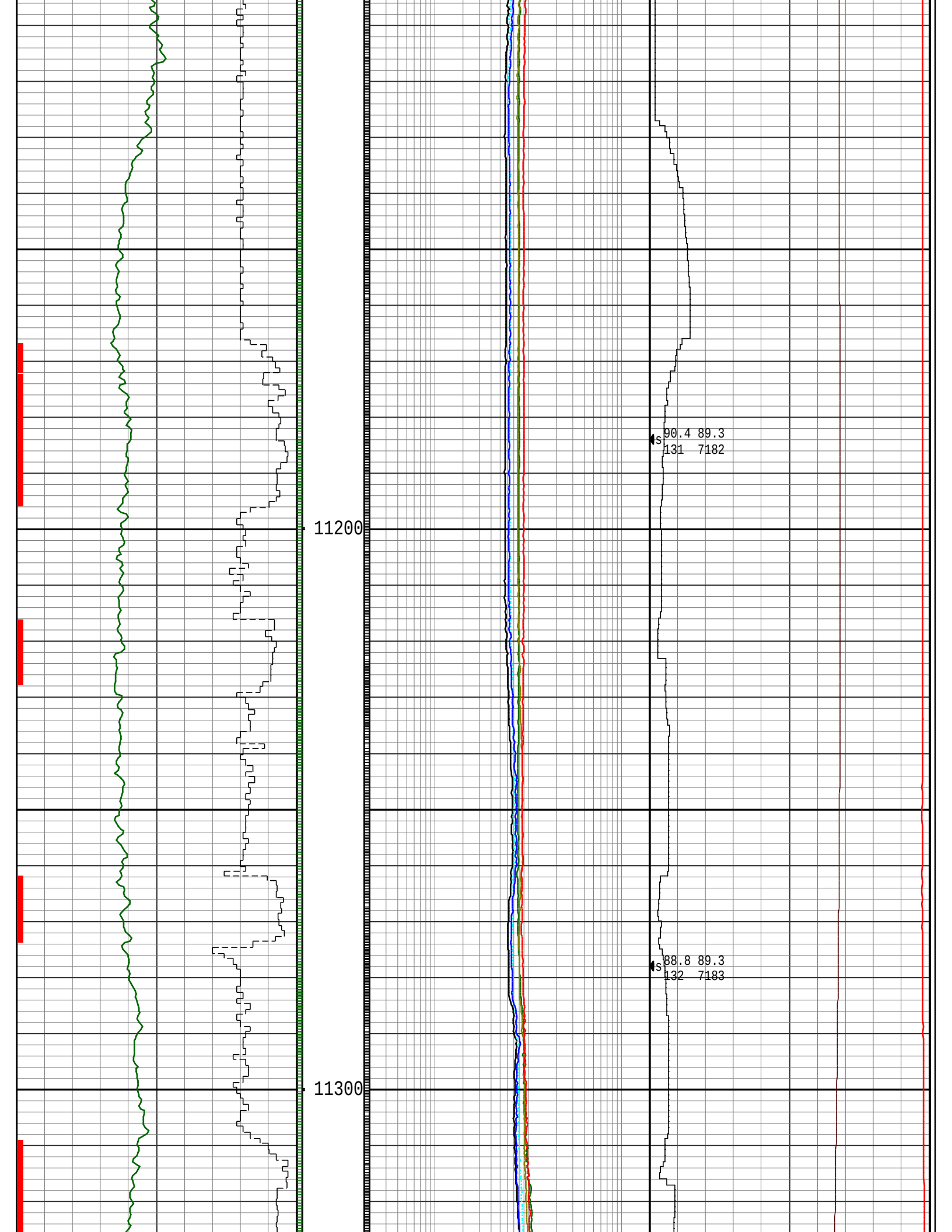
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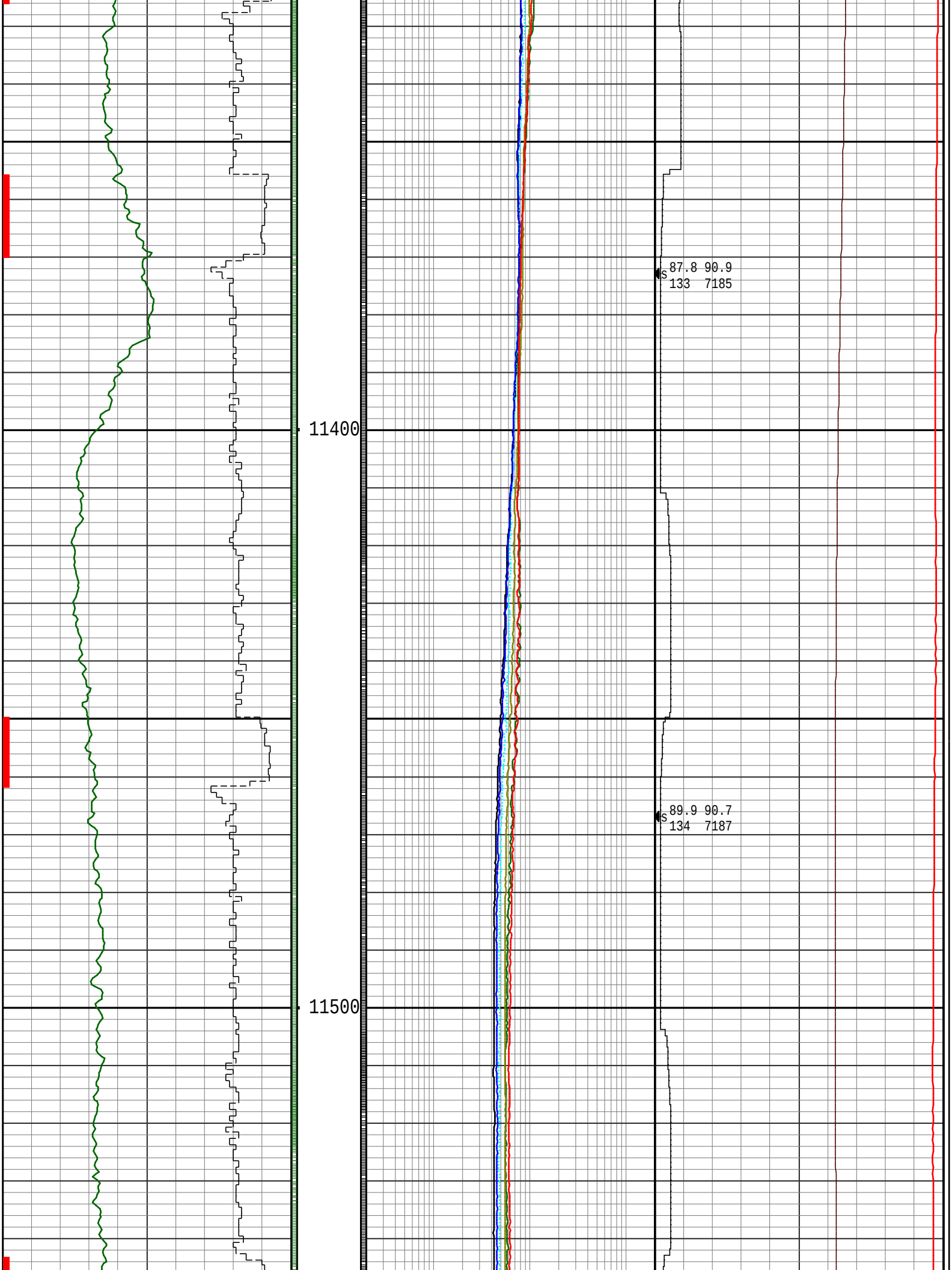
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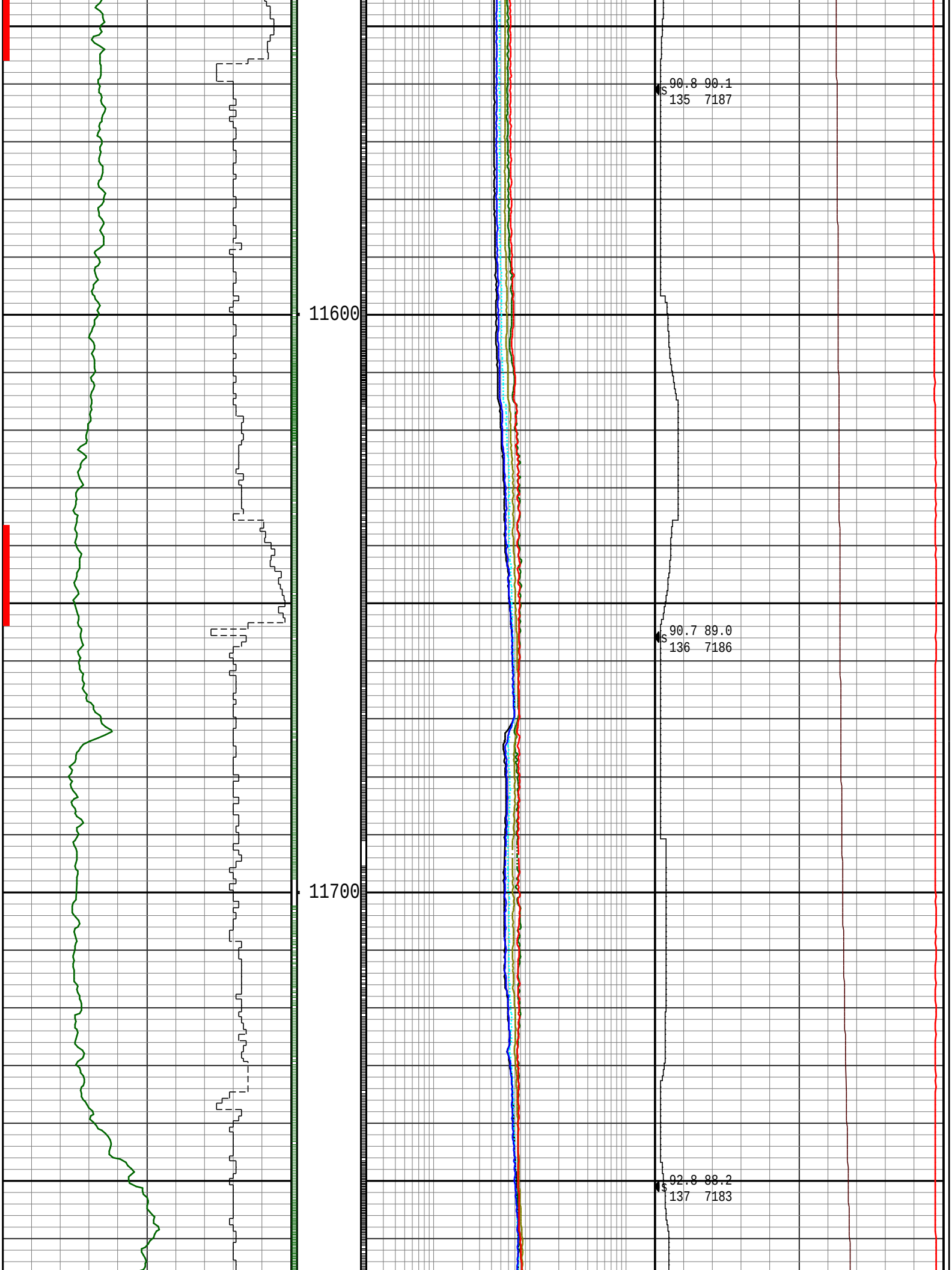
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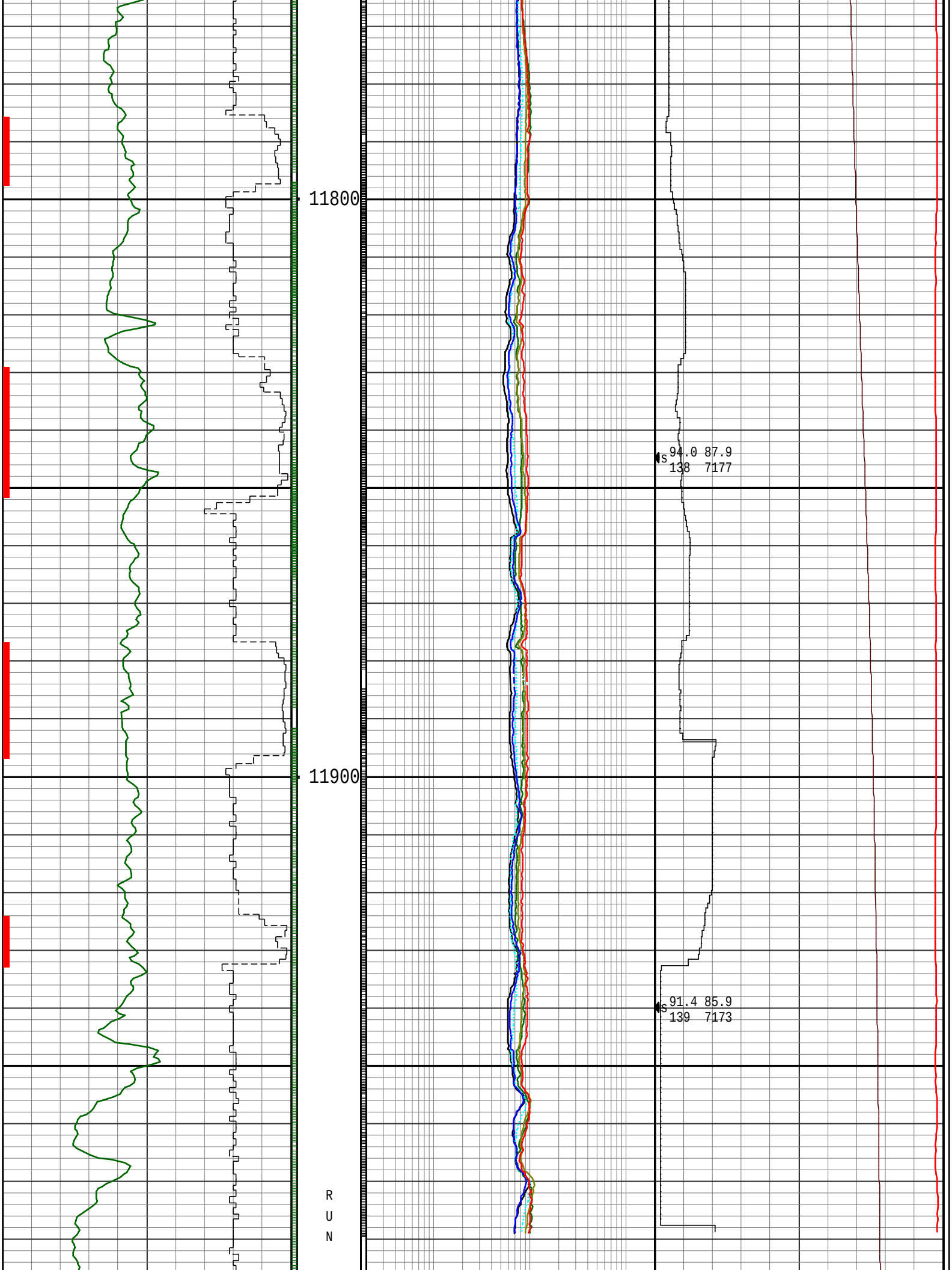
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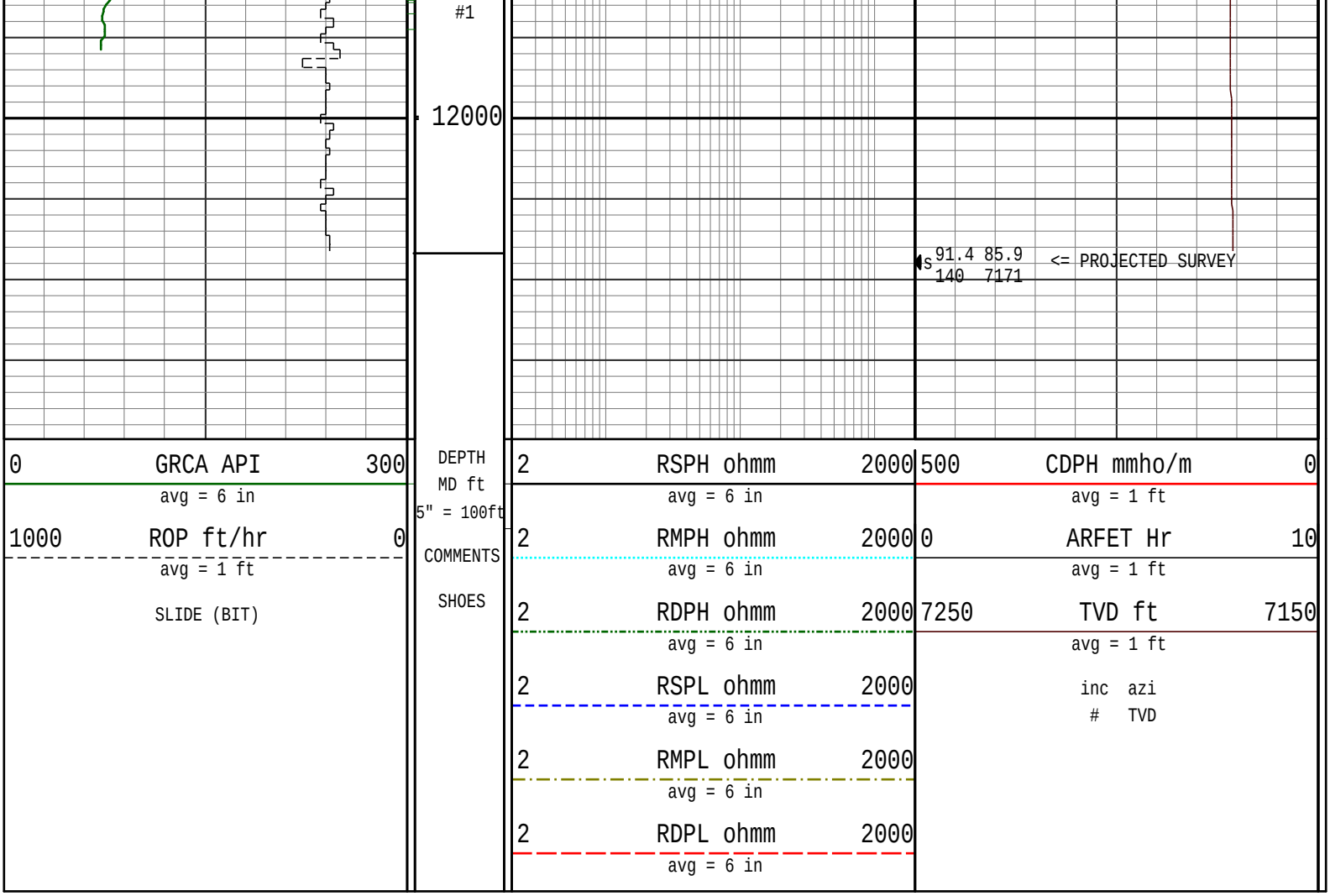
RUN



Survey Report

Vertical Section Plane: 96.31°	Total Correction: 8.66° East to True
Calculation Method: Minimum Curvature	Survey Reference: Wellhead
North Aligned to: True North	Well: PAVISTMA SOUTH WELL #3
RT: 22.5 FT ROTARY TABLE TO GROUND LEVEL.	FIELD: WATENBERG

Measured Depth (ft)	Inclination (deg)	Azimuth (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	Rect Co-ord North (ft)	Rect Co-ord East (ft)	Closure Distance (ft)	Closure Direction (deg)	Dog-leg Severity (dg/hft)	Temp (deg F)
0.00	0.00	0.00	0.00		-0.00	0.00 N	0.00 E	0.00	0.00		
THE FOLLOWING ARE ENSIGN DIRECTIONAL SERVICES MWD SURVEYS.											
213.00	0.30	10.10	213.00	213.00	0.04	0.55 N	0.10 E	0.56	10.10	0.14	
305.00	0.70	50.20	305.00	92.00	0.44	1.15 N	0.57 E	1.28	26.52	0.55	
397.00	0.60	23.30	396.99	92.00	0.97	1.95 N	1.19 E	2.28	31.51	0.35	
490.00	1.30	7.10	489.98	93.00	1.13	3.44 N	1.52 E	3.76	23.79	0.80	
582.00	1.10	298.00	581.96	92.00	0.32	4.89 N	0.87 E	4.97	10.04	1.49	
674.00	0.40	233.90	673.95	92.00	-0.73	5.12 N	0.17 W	5.12	358.06	1.08	
766.00	0.60	233.50	765.95	92.00	-1.32	4.64 N	0.82 W	4.71	349.99	0.22	
859.00	0.60	220.70	858.94	93.00	-1.96	3.98 N	1.53 W	4.27	339.01	0.14	
1000.00	0.90	221.60	999.93	141.00	-3.01	2.60 N	2.75 W	3.78	313.39	0.21	
1092.00	2.60	224.90	1091.89	92.00	-4.73	0.58 N	4.70 W	4.73	277.00	1.85	
1186.00	4.40	226.50	1185.71	94.00	-8.39	3.42 S	8.82 W	9.46	248.83	1.92	
1281.00	5.50	219.30	1280.35	95.00	-13.22	9.45 S	14.35 W	17.18	236.63	1.33	
1373.00	6.80	215.80	1371.82	92.00	-18.30	17.28 S	20.32 W	26.68	229.63	1.47	
1466.00	8.30	217.50	1464.01	93.00	-24.49	27.07 S	27.63 W	38.68	225.59	1.63	
1558.00	7.50	214.70	1555.14	92.00	-30.78	37.27 S	35.09 W	51.19	223.27	0.96	
1650.00	8.40	216.50	1646.25	92.00	-37.02	47.61 S	42.51 W	63.83	221.76	1.01	
1742.00	9.20	213.80	1737.17	92.00	-43.79	59.13 S	50.60 W	77.82	220.56	0.98	
1834.00	9.40	217.90	1827.96	92.00	-51.12	71.17 S	59.30 W	92.64	219.81	0.75	
1927.00	10.80	213.50	1919.52	93.00	-59.08	84.42 S	68.78 W	108.89	219.17	1.72	
2019.00	10.50	208.50	2009.94	92.00	-66.19	98.98 S	77.54 W	125.73	218.07	1.05	
2111.00	10.80	206.30	2100.35	92.00	-72.30	114.07 S	85.36 W	142.47	216.81	0.55	
2203.00	10.10	205.60	2190.83	92.00	-77.91	129.08 S	92.66 W	158.89	215.67	0.77	
2297.00	9.30	214.90	2283.49	94.00	-84.27	142.74 S	100.57 W	174.61	215.17	1.87	
2391.00	9.40	217.20	2376.24	94.00	-91.85	155.08 S	109.55 W	189.88	215.24	0.41	
2484.00	10.80	221.90	2467.80	93.00	-100.82	167.62 S	119.97 W	206.13	215.59	1.75	
2578.00	10.90	220.00	2560.12	94.00	-110.87	180.98 S	131.56 W	223.75	216.01	0.39	
2671.00	10.50	216.10	2651.50	93.00	-119.96	194.57 S	142.21 W	240.99	216.16	0.89	
2764.00	10.20	215.60	2742.99	93.00	-128.20	208.11 S	151.99 W	257.70	216.14	0.34	

2858.00	9.80	214.50	2835.56	94.00	-136.05	221.47 S	161.37 W	274.02	216.08	0.47
2952.00	9.50	213.60	2928.23	94.00	-143.38	234.52 S	170.19 W	289.77	215.97	0.36
3046.00	9.00	209.60	3021.01	94.00	-149.85	247.38 S	178.12 W	304.83	215.75	0.87
3139.00	9.10	214.30	3112.85	93.00	-156.18	259.78 S	185.85 W	319.42	215.58	0.80
3234.00	9.10	215.40	3206.66	95.00	-163.35	272.11 S	194.44 W	334.44	215.55	0.18
3327.00	9.40	221.20	3298.45	93.00	-171.27	283.82 S	203.70 W	349.35	215.67	1.05
3421.00	8.70	214.50	3391.28	94.00	-179.02	295.45 S	212.79 W	364.10	215.76	1.34
3514.00	8.40	222.80	3483.25	93.00	-186.39	306.23 S	221.38 W	377.88	215.86	1.36
3609.00	9.10	228.60	3577.15	95.00	-195.57	316.29 S	231.74 W	392.10	216.23	1.18
3704.00	9.50	224.70	3670.90	95.00	-205.49	326.83 S	242.89 W	407.20	216.62	0.79
3799.00	9.60	222.30	3764.58	95.00	-215.02	338.27 S	253.73 W	422.85	216.87	0.43
3894.00	10.10	219.40	3858.18	95.00	-224.22	350.56 S	264.35 W	439.06	217.02	0.74
3988.00	9.30	221.20	3950.84	94.00	-233.06	362.65 S	274.58 W	454.87	217.13	0.91
4081.00	9.40	220.70	4042.60	93.00	-241.65	374.06 S	284.49 W	469.95	217.25	0.14
4175.00	10.10	217.00	4135.24	94.00	-250.19	386.46 S	294.45 W	485.85	217.30	1.00
4270.00	10.00	217.00	4228.79	95.00	-258.66	399.70 S	304.43 W	502.43	217.29	0.10
4363.00	10.70	213.30	4320.27	93.00	-266.69	413.36 S	314.03 W	519.12	217.22	1.04
4457.00	10.40	211.50	4412.68	94.00	-274.27	427.89 S	323.25 W	536.27	217.07	0.47
4550.00	9.00	207.10	4504.35	93.00	-280.42	441.53 S	330.95 W	551.79	216.85	1.70
4645.00	9.50	212.20	4598.12	95.00	-286.48	454.78 S	338.52 W	566.93	216.66	1.01
4740.00	8.50	209.20	4691.95	95.00	-292.64	467.54 S	346.12 W	581.71	216.51	1.16
4834.00	9.00	213.80	4784.86	94.00	-298.73	479.71 S	353.60 W	595.95	216.39	0.92
4930.00	9.10	215.80	4879.66	96.00	-305.94	492.11 S	362.22 W	611.04	216.35	0.34
5024.00	7.30	213.60	4972.70	94.00	-312.33	503.11 S	369.87 W	624.44	216.32	1.94
5118.00	7.50	216.30	5065.91	94.00	-318.14	513.03 S	376.81 W	636.54	216.30	0.43
5213.00	5.90	215.00	5160.26	95.00	-323.58	522.03 S	383.28 W	647.62	216.29	1.69
5309.00	5.40	213.80	5255.80	96.00	-328.04	529.82 S	388.62 W	657.07	216.26	0.53
5403.00	3.70	201.50	5349.50	94.00	-330.87	536.32 S	392.19 W	664.42	216.18	2.07
5497.00	2.50	181.80	5443.36	94.00	-331.51	541.19 S	393.37 W	669.05	216.01	1.69
5591.00	1.60	135.60	5537.31	94.00	-330.33	544.18 S	392.52 W	670.97	215.80	1.92
5686.00	1.10	355.10	5632.29	95.00	-329.48	544.22 S	391.67 W	670.51	215.74	2.68
5779.00	1.20	335.80	5725.28	93.00	-330.15	542.44 S	392.14 W	669.34	215.86	0.43
5873.00	0.70	310.50	5819.26	94.00	-331.12	541.17 S	392.98 W	668.81	215.99	0.68
5967.00	1.00	272.70	5913.25	94.00	-332.42	540.76 S	394.24 W	669.21	216.09	0.66
6062.00	1.40	251.10	6008.23	95.00	-334.29	541.10 S	396.16 W	670.62	216.21	0.63
6156.00	1.20	256.70	6102.21	94.00	-336.26	541.70 S	398.21 W	672.31	216.32	0.25
6251.00	0.70	116.60	6197.20	95.00	-336.65	542.18 S	398.66 W	672.97	216.33	1.89
6346.00	1.50	85.80	6292.19	95.00	-334.88	542.35 S	396.90 W	672.07	216.20	1.02
6393.00	1.00	90.10	6339.17	47.00	-333.87	542.31 S	395.87 W	671.43	216.13	1.08
6440.00	1.00	89.70	6386.17	47.00	-333.06	542.31 S	395.05 W	670.94	216.07	0.02
6487.00	3.60	92.90	6433.12	47.00	-331.18	542.38 S	393.17 W	669.89	215.94	5.54

Survey Report

Vertical Section Plane: 96.31°	Total Correction: 8.66° East to True
Calculation Method: Minimum Curvature	Survey Reference: Wellhead
North Aligned to: True North	Well: PAVISTMA SOUTH WELL #3
RT: 22.5 FT ROTARY TABLE TO GROUND LEVEL.	FIELD: WATENBERG

Measured Depth (ft)	Inclination (deg)	Azimuth (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	Rect Co-ord North (ft)	Rect Co-ord East (ft)	Closure Distance (ft)	Closure Direction (deg)	Dog-leg Severity (dg/hft)	Temp (deg F)
6535.00	5.50	92.90	6480.97	48.00	-327.38	542.57 S	389.37 W	667.83	215.66	3.96	
6582.00	7.30	90.10	6527.68	47.00	-322.16	542.69 S	384.13 W	664.88	215.29	3.89	
6629.00	10.80	88.80	6574.08	47.00	-314.82	542.60 S	376.74 W	660.57	214.77	7.46	
6676.00	15.20	94.30	6619.87	47.00	-304.29	542.97 S	366.19 W	654.92	214.00	9.72	
6722.00	18.30	96.70	6663.91	46.00	-291.04	544.27 S	353.00 W	648.72	212.97	6.90	
6769.00	21.10	93.80	6708.16	47.00	-275.21	545.69 S	337.23 W	641.48	211.72	6.31	
6816.00	24.30	89.40	6751.52	47.00	-257.15	546.15 S	319.11 W	632.54	210.30	7.70	
6863.00	27.40	89.00	6793.81	47.00	-236.82	545.86 S	298.62 W	622.20	208.68	6.61	
6910.00	29.60	89.00	6835.11	47.00	-214.57	545.47 S	276.20 W	611.41	206.86	4.68	
6957.00	32.50	88.50	6875.37	47.00	-190.55	544.94 S	251.97 W	600.37	204.81	6.19	
7003.00	36.90	88.00	6913.18	46.00	-164.63	544.13 S	225.80 W	589.12	202.54	9.59	
7050.00	43.50	87.60	6949.06	47.00	-134.64	542.96 S	195.50 W	577.08	199.80	14.05	
7097.00	48.80	86.40	6981.61	47.00	-101.21	541.17 S	161.67 W	564.80	196.63	11.43	
7144.00	51.80	86.60	7011.63	47.00	-65.58	538.96 S	125.58 W	553.40	193.12	6.39	
7191.00	54.20	86.70	7039.91	47.00	-28.58	536.77 S	88.11 W	543.95	189.32	5.11	
7238.00	56.50	87.10	7066.63	47.00	9.56	534.68 S	49.50 W	536.97	185.29	4.94	
7285.00	57.40	89.20	7092.27	47.00	48.56	533.41 S	10.13 W	533.51	181.09	4.21	
7332.00	59.70	91.60	7116.79	47.00	88.43	533.70 S	29.96 E	534.54	176.79	6.55	
7376.00	64.20	93.60	7137.48	44.00	127.17	535.48 S	68.73 E	539.87	172.69	10.98	
7423.00	69.80	94.60	7155.83	47.00	170.38	538.58 S	111.87 E	550.07	168.27	12.07	
7471.00	74.30	95.20	7170.62	48.00	216.02	542.48 S	157.35 E	564.84	163.82	9.45	
7518.00	79.10	95.00	7181.43	47.00	261.74	546.55 S	202.90 E	582.99	159.63	10.22	
7566.00	84.60	94.80	7188.23	48.00	309.22	550.60 S	250.22 E	604.79	155.56	11.47	
TIED INTO ENSIGN DIRECTIONAL SERVICES MWD SURVEY AT 7607'MD.											
7607.00	88.70	94.80	7190.63	41.00	350.13	554.03 S	291.00 E	625.80	152.29	10.00	
THE FOLLOWING ARE PATHFINDER MWD SURVEYS.											
7689.00	90.22	94.70	7191.40	82.00	432.09	560.82 S	372.71 E	673.37	146.39	1.86	180.54
7784.00	91.71	92.07	7189.80	95.00	526.94	566.42 S	467.52 E	734.45	140.46	3.18	173.31
7878.00	90.84	86.88	7187.71	94.00	620.22	565.56 S	561.46 E	796.93	135.21	5.60	169.69
7972.00	89.96	84.51	7187.05	94.00	712.60	558.51 S	655.18 E	860.93	130.45	2.69	169.69
8067.00	89.16	83.89	7187.78	95.00	805.48	548.91 S	749.69 E	929.16	126.21	1.07	169.69
8161.00	89.52	84.25	7188.86	94.00	897.34	539.20 S	843.19 E	1000.85	122.60	0.54	169.69
8256.00	90.48	84.77	7188.86	95.00	990.33	530.11 S	937.75 E	1077.21	119.48	1.15	173.31

8350.00	89.87	86.27	7188.58	94.00	1082.67	522.77 S	1031.46 E	1156.37	116.88	1.72	173.31
8445.00	89.78	87.67	7188.87	95.00	1176.40	517.74 S	1126.32 E	1239.62	114.69	1.48	173.31
8539.00	90.31	90.05	7188.79	94.00	1269.60	515.87 S	1220.30 E	1324.86	112.92	2.59	173.31
8633.00	90.57	90.40	7188.07	94.00	1363.07	516.24 S	1314.29 E	1412.05	111.44	0.46	176.92
8728.00	90.66	89.70	7187.05	95.00	1457.50	516.33 S	1409.29 E	1500.89	110.12	0.74	176.92
8822.00	91.19	88.64	7185.54	94.00	1550.75	514.97 S	1503.26 E	1589.02	108.91	1.26	176.92
8916.00	90.04	88.64	7184.53	94.00	1643.91	512.73 S	1597.23 E	1677.51	107.80	1.22	180.54
9011.00	90.66	89.52	7183.95	95.00	1738.15	511.21 S	1692.21 E	1767.74	106.81	1.13	180.54
9106.00	90.31	91.98	7183.14	95.00	1832.69	512.45 S	1787.19 E	1859.21	106.00	2.62	176.92
9200.00	88.29	94.00	7184.29	94.00	1926.52	517.35 S	1881.05 E	1950.90	105.38	3.04	180.54
9295.00	89.16	93.83	7186.40	95.00	2021.41	523.84 S	1975.80 E	2044.07	104.85	0.93	184.15
9389.00	90.13	93.39	7186.99	94.00	2115.30	529.76 S	2069.61 E	2136.34	104.36	1.13	184.15
9484.00	91.71	92.16	7185.46	95.00	2210.10	534.36 S	2164.49 E	2229.47	103.87	2.11	184.15
9578.00	91.89	88.55	7182.51	94.00	2303.53	534.94 S	2258.42 E	2320.91	103.33	3.84	184.15
9673.00	88.99	85.74	7181.78	95.00	2397.30	530.21 S	2353.28 E	2412.27	102.70	4.25	187.76
9767.00	90.48	85.48	7182.21	94.00	2489.66	523.01 S	2447.00 E	2502.27	102.06	1.61	187.76
9861.00	90.13	85.65	7181.71	94.00	2582.01	515.74 S	2540.72 E	2592.54	101.47	0.41	191.38
9956.00	90.04	86.09	7181.57	95.00	2675.44	508.90 S	2635.47 E	2684.16	100.93	0.47	191.38
10050.00	90.75	89.26	7180.92	94.00	2768.36	505.09 S	2729.38 E	2775.72	100.48	3.46	194.99
10144.00	89.96	90.22	7180.34	94.00	2861.74	504.66 S	2823.38 E	2868.12	100.13	1.32	194.99
10239.00	90.57	90.31	7179.90	95.00	2956.21	505.10 S	2918.37 E	2961.76	99.82	0.65	198.61
10333.00	89.96	89.70	7179.47	94.00	3049.64	505.11 S	3012.37 E	3054.43	99.52	0.92	198.61
10428.00	90.40	89.43	7179.17	95.00	3143.98	504.39 S	3107.37 E	3148.04	99.22	0.54	198.61
10523.00	90.22	89.43	7178.65	95.00	3238.29	503.44 S	3202.36 E	3241.69	98.93	0.19	198.61
10617.00	89.08	90.93	7179.23	94.00	3331.75	503.74 S	3296.35 E	3334.62	98.69	2.00	198.61
10712.00	88.46	92.51	7181.27	95.00	3426.42	506.59 S	3391.29 E	3428.91	98.50	1.79	198.61
10806.00	89.25	92.24	7183.15	94.00	3520.18	510.48 S	3485.19 E	3522.37	98.33	0.89	202.22
10900.00	90.13	92.60	7183.65	94.00	3613.96	514.45 S	3579.10 E	3615.88	98.18	1.01	198.61
10995.00	90.92	91.80	7182.78	95.00	3708.71	518.10 S	3674.02 E	3710.37	98.03	1.18	198.61
11089.00	89.87	90.40	7182.14	94.00	3802.32	519.90 S	3768.00 E	3803.70	97.86	1.86	198.61
11184.00	90.40	89.34	7181.91	95.00	3896.71	519.69 S	3863.00 E	3897.80	97.66	1.25	198.61
11278.00	88.81	89.26	7182.56	94.00	3990.01	518.54 S	3956.99 E	3990.82	97.47	1.69	198.61
11373.00	87.76	90.93	7185.40	95.00	4084.40	518.70 S	4051.94 E	4085.00	97.29	2.08	202.22
11467.00	89.87	90.66	7187.35	94.00	4177.94	520.00 S	4145.90 E	4178.39	97.15	2.26	205.83
11561.00	90.75	90.05	7186.84	94.00	4271.43	520.58 S	4239.90 E	4271.74	97.00	1.14	205.83
11656.00	90.66	88.99	7185.67	95.00	4365.76	519.79 S	4334.89 E	4365.94	96.84	1.12	205.83
11751.00	92.77	88.20	7182.83	95.00	4459.85	517.46 S	4429.81 E	4459.93	96.66	2.37	205.83
11845.00	94.00	87.94	7177.28	94.00	4552.71	514.30 S	4523.59 E	4552.73	96.49	1.34	202.22

Survey Report

Vertical Section Plane: 96.31°	Total Correction: 8.66° East to True
Calculation Method: Minimum Curvature	Survey Reference: Wellhead
North Aligned to: True North	Well: PAVISTMA SOUTH WELL #3
RT: 22.5 FT ROTARY TABLE TO GROUND LEVEL.	FIELD: WATENBERG

Measured Depth (ft)	Inclination (deg)	Azimuth (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	Rect Co-ord North (ft)	Rect Co-ord East (ft)	Closure Distance (ft)	Closure Direction (deg)	Dog-leg Severity (dg/hft)	Temp (deg F)
11940.00	91.36	85.92	7172.83	95.00	4646.33	509.22 S	4618.34 E	4646.33	96.29	3.50	213.06
STRAIGHT LINE PROJECTION TO BIT DEPTH AT 12018'MD.											
12018.00	91.36	85.92	7170.98	78.00	4723.03	503.67 S	4696.12 E	4723.05	96.12	0.00	

PATHFINDER ENERGY SERVICES - TOOL CODES & DESCRIPTIONS

HDS1M	HIGH SPEED DIRECTIONAL SURVEY MULTILINK TOOL	CLSSM	COMPENSATED LONG SPACE SONIC TOOL
HDS1L	HIGH SPEED DIRECTIONAL SURVEY GAMMA TOOL	SCLSS	SLIM COMPENSATED LONG SPACE SONIC MULTILINK TOOL
HDS1R	HIGH SPEED DIRECTIONAL SURVEY GAMMA RETRIEVABLE TOOL	DPM	DYNAMIC PRESSURE MODULE
AWR	ARRAY WAVE RESISTIVITY GAMMA MULTILINK TOOL	PZIG	AT-BIT INCLINATION AND GAMMA RAY
CWRGM	COMPENSATED WAVE RESISTIVITY GAMMA MULTILINK TOOL	2DRS	2D ROTARY STEERING TOOL
SCWR	SLIM COMPENSATED WAVE RESISTIVITY TOOL	3DRS	3D ROTARY STEERING TOOL
DNSCM	DENSITY NEUTRON STANDOFF CALIPER MULTILINK TOOL	DFT	DRILLING FORMATION TESTER

PATHFINDER ENERGY SERVICES - MNEMONICS LIST

GENERAL

AHV	ANNULAR HOLE VOLUME TICKS	ROP	RATE OF PENETRATION
AHVT	ANNULAR HOLE VOLUME-ACCUMULATIVE TOTAL	GRW	RAW GAMMA RAY
BHV	BOREHOLE VOLUME TICKS	GRC	CALIBRATED GAMMA RAY
BHVT	BOREHOLE VOLUME-ACCUMULATIVE TOTAL	GREC	ENVIRONMENTALLY CORRECTED GAMMA RAY
DEPT	MEASURED DEPTH	RM	RESISTIVITY OF MUD
MTVD	MEASURED TRUE VERTICAL DEPTH	RMF	RESISTIVITY OF MUD FILTRATE

INC	INCLINATION	SHOES	CASING SHOE SYMBOLS
AZI	AZIMUTH	SURVS	SURVEY TEXT SYMBOLS

4 3/4" SCWR

C15A	CWR ATTENUATION CONDUCTIVITY (15")	R35A	CWR ATTENUATION RESISTIVITY (35")
C15P	CWR PHASE CONDUCTIVITY (15")	R35P	CWR PHASE RESISTIVITY (35")
C35A	CWR ATTENUATION CONDUCTIVITY (35")	UL1A	UNCOMPENSATED 15" ATTENUATION RESISTIVITY LOWER
C35P	CWR PHASE CONDUCTIVITY (35")	UL1P	UNCOMPENSATED 15" PHASE RESISTIVITY LOWER
CWRFET	CWR FORMATION EXPOSURE TIME	UL3A	UNCOMPENSATED 35" ATTENUATION RESISTIVITY LOWER
GRC	CALIBRATED GAMMA RAY	UL3P	UNCOMPENSATED 35" PHASE RESISTIVITY LOWER
GREC	ENVIRONMENTALLY CORRECTED GAMMA RAY	UU1A	UNCOMPENSATED 15" ATTENUATION RESISTIVITY UPPER
GRFET	GAMMA RAY FORMATION EXPOSURE TIME	UU1P	UNCOMPENSATED 15" PHASE RESISTIVITY UPPER
R15A	CWR ATTENUATION RESISTIVITY (15")	UU3A	UNCOMPENSATED 35" ATTENUATION RESISTIVITY UPPER
R15P	CWR PHASE RESISTIVITY (15")	UU3P	UNCOMPENSATED 35" PHASE RESISTIVITY UPPER

6 3/4", 8", & 9 1/2" CWR

C25A	CWR ATTENUATION CONDUCTIVITY (25")	R55A	CWR ATTENUATION RESISTIVITY (55")
C25P	CWR PHASE CONDUCTIVITY (25")	R55P	CWR PHASE RESISTIVITY (55")
C55A	CWR ATTENUATION CONDUCTIVITY (55")	UL2A	UNCOMPENSATED 25" ATTENUATION RESISTIVITY LOWER
C55P	CWR PHASE CONDUCTIVITY (55")	UL2P	UNCOMPENSATED 25" PHASE RESISTIVITY LOWER
CWRFET	CWR FORMATION EXPOSURE TIME	UL5A	UNCOMPENSATED 55" ATTENUATION RESISTIVITY LOWER
GRC	CALIBRATED GAMMA RAY	UL5P	UNCOMPENSATED 55" PHASE RESISTIVITY LOWER
GREC	ENVIRONMENTALLY CORRECTED GAMMA RAY	UU2A	UNCOMPENSATED 25" ATTENUATION RESISTIVITY UPPER
GRFET	GAMMA RAY FORMATION EXPOSURE TIME	UU2P	UNCOMPENSATED 25" PHASE RESISTIVITY UPPER
R25A	CWR ATTENUATION RESISTIVITY (25")	UU5A	UNCOMPENSATED 55" ATTENUATION RESISTIVITY UPPER
R25P	CWR PHASE RESISTIVITY (25")	UU5P	UNCOMPENSATED 55" PHASE RESISTIVITY UPPER

4 3/4", 6 3/4", 8", & 9 1/2" AWR

GRCA	AWR CALIBRATED GAMMA RAY	RDPH	DEEP PHASE RESISTIVITY FROM 2 MHZ FREQUENCY
GRWA	AWR RAW GAMMA RAY	RSAH	SHALLOW ATTENUATION RESISTIVITY FROM 2 MHZ FREQUENCY
TEMP_A	TEMPERATURE FROM AWR TOOL	RMAH	MEDIUM ATTENUATION RESISTIVITY FROM 2 MHZ FREQUENCY
INC_A	AWR STATIC INCLINATION	RDAH	DEEP ATTENUATION RESISTIVITY FROM 2 MHZ FREQUENCY
INCD_A	AWR DYNAMIC INCLINATION	CSPL	SHALLOW PHASE CONDUCTIVITY FROM 500 kHZ FREQUENCY
RSPL	SHALLOW PHASE RESISTIVITY FROM 500 kHZ FREQUENCY	CMPL	MEDIUM PHASE CONDUCTIVITY FROM 500 kHZ FREQUENCY
RMPL	MEDIUM PHASE RESISTIVITY FROM 500 kHZ FREQUENCY	CDPL	DEEP PHASE CONDUCTIVITY FROM 500 kHZ FREQUENCY
RDPL	DEEP PHASE RESISTIVITY FROM 500 kHZ FREQUENCY	CSPH	SHALLOW PHASE CONDUCTIVITY FROM 2 MHZ FREQUENCY
RSAL	SHALLOW ATTENUATION RESISTIVITY FROM 500 kHZ FREQUENCY	CMPH	MEDIUM PHASE CONDUCTIVITY FROM 2 MHZ FREQUENCY
RMAL	MEDIUM ATTENUATION RESISTIVITY FROM 500 kHZ FREQUENCY	CDPH	DEEP PHASE CONDUCTIVITY FROM 2 MHZ FREQUENCY
RDAL	DEEP ATTENUATION RESISTIVITY FROM 500 kHZ FREQUENCY	ARFET	AWR FORMATION EXPOSURE TIME
RSPH	SHALLOW PHASE RESISTIVITY FROM 2 MHZ FREQUENCY	GAFET	AWR GAMMA RAY FORMATION EXPOSURE TIME
RMPH	MEDIUM PHASE RESISTIVITY FROM 2 MHZ FREQUENCY		

4 3/4", 6 3/4", 8" DNSC

BS	BIT SIZE	NLIM	NEUTRON POROSITY (LIMESTONE MATRIX)
CALI	CALIPER	NNEAR	NEAR NEUTRON COUNT RATE
DDDN	DNSC DATA DENSITY (0 - 4 SAMPLES/FT)	NRAT	NEUTRON RATIO
DGAM	DENSITY GAMMA (NATURAL)	NSAC	ENVIRONMENTALLY CORRECTED NEUTRON
DNPH	NEUTRON POROSITY CORRECTION		
DNSFET	DNSC FORMATION EXPOSURE TIME	NSAN	NEUTRON POROSITY (SANDSTONE MATRIX)
DPE	PE CORRECTION	PE	PHOTOELECTRIC INDEX
DPHI	DENSITY POROSITY (GIVEN MATRIX)	PEMI	PHOTOELECTRIC INDEX (MINIMUM FILTER)
DHRM	DENSITY CORRECTION MINUS	RHOB	BULK DENSITY
DRHO	DENSITY CORRECTION	SDNP	STANDARD DEVIATION NEUTRON POROSITY
DRHP	DENSTIY CORRECTION PLUS	SDPE	STANDARD DEVIATION PE COMPUTATION
EDPH	DENSITY POROSITY-EVR PROCESSED	SDRH	STANDARD DEVIATION DENSITY
ENPH	NEUTRON POROSTIY-EVR PROCESSED	SOA	UNWEIGHTED DENSITY STANDOFF
ERHO	BULK DENSITY-EVR PROCESSED	TBDN	TIME BEHIND DNSC
NDOL	NEUTRON POROSTIY (DOLOMITE MATRIX)	WSOD	WEIGHTED STANDOFF DENSITY
NFAR	FAR NEUTRON COUNT RATE	WSON	WEIGHTED STANDOFF NEUTRON

4 3/4" SCLSS, 6 3/4" & 8" CLSS

ACFET	ACOUSTIC FORMATION EXPOSIRE TIME
SO	ACOUSTIC TOOL STANDOFF
SOFF	STANDOFF
DTCU	DELTA T COMP , UPPER XMITR-FIELD PROCESSED
DTCL	DELTA T COMP , LOWER XMITR-FIELD PROCESSED
DTP1	DELTA T COMP , UPPER XMITR-POST PROCESSED
DTP2	DELTA T COMP , LOWER XMITR-POST PROCESSED
DTS1	DELTA T SHEAR , UPPER XMITR-POST PROCESSED
DTS2	DELTA T SHEAR , LOWER XMITR-POST PROCESSED
SEM1	SEMBLANCE , UPPER XMITR-POST PROCESSED
SEM2	SEMBLANCE , LOWER XMITR-POST PROCESSED
SMX1	MAX COMP SEMBLANCE , UPPER XMITR
SMX2	MAX COMP SEMBLANCE , LOWER XMITR
SMN1	COMP SEMBLANCE MIN CUTOFF , UPPER XMITR
SMN2	COMP SEMBLANCE MIN CUTOFF , LOWER XMITR
SHS1	MAX SHEAR SEMBLANCE , UPPER XMITR
SHS2	MAX SHEAR SEMBLANCE , LOWER XMITR
SLS1	SHEAR SEMBLANCE MIN CUTOFF , UPPER XMITR
SLS2	SHEAR SEMBLANCE MIN CUTOFF , LOWER XMITR
WFT1	WAVEFORM XMITR1 , ALL 4 RCVRS (NON-PARSED)
WFT2	WAVEFORM XMITR2 , ALL 4 RCVRS (NON-PARSED)
W11C	PARSED WAVEFORM , XMITR 1 , RCVR 1
W12C	PARSED WAVEFORM , XMITR 1 , RCVR 2
W13C	PARSED WAVEFORM , XMITR 1 , RCVR 3
W14C	PARSED WAVEFORM , XMITR 1 , RCVR 4
W21C	PARSED WAVEFORM , XMITR 2 , RCVR 1
W22C	PARSED WAVEFORM , XMITR 2 , RCVR 2
W23C	PARSED WAVEFORM , XMITR 2 , RCVR 3
W24C	PARSED WAVEFORM , XMITR 2 , RCVR 4

4 3/4" , 6 3/4" , 8" & 9 1/2" DPM & QPM

ANPR	ANNULAR PRESSURE
BDEPS	BIT DEPTH STAMP
DAPR	PRESSURE TOOL DIFFERENTIAL PRESSURE
DPPR	PRESSURE TOOL DRILL PIPE PRESSURE
ECDM	EQUIVALENT CIRCULATING DENSITY
HDEPS	HOLE DEPTH STAMP
KPOSI	KELLY POSITION
MWC	MUD WEIGHT CALCULATED
MWI_P	MUD WEIGHT IN
SPP_I	STANDPIPE PRESSURE
SWOB	SURFACE WEIGHT ON BIT
TDPM	PRESSURE TOOL ANNULAR TEMPERATURE

6 3/4" DFT

DFGR	DFT GAMMA RAW
DFGRC	DFT GAMMA CALIBRATED
DFANPR	DFT ANNULAR PRESSURE
DFECD	DFT EQUIVALENT CIRCULATING DENSITY OF THE MUD
HYDA	HYDROSTATIC PRESSURE -- AFTER
HYDB	HYDROSTATIC PRESSURE -- BEFORE
FPRES	FORMATION PRESSURE

4 3/4", 6 3/4" PZIG

NBDINC	NEAR BIT DYNAMIC INCLINATION
NBSINC	NEAR BIT STATIC INCLINATION
NBGR	NEAR BIT GAMMA RAW
NBGRC	NEAR BIT GAMMA CALIBRATED
NBTMP	NEAR BIT TEMERATURE
NBIFET	NEAR BIT FORMATION EXPOSURE TIME

EQUIPMENT DATA

RUN NUMBER	1					
RES DTA	4568					
RES MANDREL	R47M568T					
RES SIZE in	4 3/4					
RES VERIFIER						
API BLANKET	0013					
HDS-1M DTA						
HDS-1M MANDREL						
HDS-1M SIZE in						
DNSC DTA						
DNSC MANDREL						
DNSC SIZE in						

DENSITY SOURCE NO.						
NEUTRON SOURCE NO.						
CLSS DTA						
CLSS MANDREL						
CLSS SIZE in						
DPM DTA						
DPM SIZE in						
DFT DTA						
DFT MANDREL						
DFT SIZE in						
PZIG UXM DTA						
PZIG LXM DTA						
PZIG SIZE in						

BOTTOM HOLE ASSEMBLY RECORD

RUN 1	ft						
6 1/8" PDC BIT	0.50						
1.5° MUD MOTOR	28.33						
AWR (RES/GAM)	19.92						
ABS (BATTERY)	15.18						
CROSSOVER SUB	1.13						
HDS-1L (DIR/GR)	28.75						
NMDC	30.92						
NMDC	30.90						
1 X 4" DP	31.44						
6 1/8" REAMER	7.40						
173 X 4" DP	5437.90						
CROSSOVER SUB	1.65						
60 X 4" HWDP	1849.06						
CROSSOVER SUB	1.12						
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TOTAL BHA LENGTH	7484.20						
SENSOR OFFSETS:							
DIRECTIONAL	76.57						
HDS-1L GAMMA-RAY	68.49						
RESISTIVITY	38.77						
AWR GAMMA-RAY	32.07						
AWR INCLINATION	31.67						

PATHFINDER
A Schlumberger Company

RESISTIVITY
GAMMA-RAY
CONDUCTIVITY

5" = 100'
FEET MD