

SLIM PHASE 4

1 : 240

[illegible]

WELL INFORMATION

MWD Run Number	300	400			
Date run completed	28-Feb-14	02-Mar-14			
Rig Bit Number	0300	0400			
Bit Size (in)	8.650	8.650			
Tool Nominal OD (in)	4.750	4.750			
Log Start Depth (MD, ft)	7,992.00	9,090.00			
Log End Depth (MD, ft)	9,090.00	12,111.00			
Drill or Wipe	Drill	Drill			
Drill/Wipe Start Date and Time	27-Feb-14 09:00	28-Feb-14 20:45			
Drill/Wipe End Date and Time	28-Feb-14 03:40	02-Mar-14 21:15			
Min Inc (deg) @ Depth (MD, ft)	87.22 @ 8,809.00	88.33 @ 11,665.00			
Max Inc (deg) @ Depth (MD, ft)	91.36 @ 8,333.00	91.73 @ 9,381.00			
Bit TFA(in2) / Bit Type	1.49 / PDC	1.49 / PDC			
Flow Rate (gpm)	294.74	267.42			
Max AV (fpm) / CV (fpm) @ MWD	N/A / N/A	N/A / N/A			
Fluid Type	Polymer	Polymer			
Density (ppg) / Viscosity (spqt)	10.50 / 41.00	10.60 / 41.00			
Filtrate CL (ppm)	1,300.00	1,300.00			
pH / Fluid Loss (mptm)	9.70 / 4	9.10 / 11			
PV (cP) / YP (lbf2)	13 / 15.00	13 / 15.00			
% Solids / % Sand	11.2 / 1.5	11.4 / 1.50			
% Oil / Oil:Water Ratio	N/A / N/A	N/A / N/A			
Rm @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			
Rmf @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			
Rmc @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			
Max Tool Temp (degF) / S	224.24 / N/A	222.42 / N/A			

Max Tool Temp (degF) / Source	204.94 / HCIM	226.12 / HCIM			
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A			
Lead MWD Engineer	Matthew Busche	Matthew Busche			
Customer Representative	Sam Taylor	Sam Taylor			

SENSOR INFORMATION

Downhole Processor Information

Tool Type	HCIM	HCIM			
Software Version	88.56	88.56			
Sub Serial Number	90376229	90376229			
Insert Serial Number	11754852	11754852			
Date and Time Initialized	26-Feb-14 23:24	28-Feb-14 11:39			
Date and Time Read	28-Feb-14 11:14	02-Mar-14 16:10			
ECMB SW Version	N/A	N/A			

Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	38.70	38.43			
Software Version	6.21	6.21			
Sub Serial Number	12310811	12310811			
Sonde Serial Number	11145671	11145671			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	289.10	148.24			

Gamma Ray Sensor Information

Tool Type	DGR	DGR			
Distance From Bit (ft)	60.70	60.43			
Recorded Sample Period (sec)	8	8			
Software Version	N/A	N/A			
Sub Serial Number	90376559	90376559			
Insert/Sonde Serial Number	062457	062457			

Resistivity Sensor Information

Tool Type	Slim P4	Slim P4			
Distance From Bit (ft)	53.70	53.43			
Recorded Sample Period (sec)	12	12			
Software Version	5.55	5.55			
Sub Serial Number	24652	24652			
Receiver Insert Serial Number	67486	67486			
Transmitter Insert Serial Number	24346	24346			
Receiver Orientation	Up	Up			

DDSr-DGR Sensor Information

Tool Type	DDSr-DGR	DDSr-DGR			
Distance From Bit (ft)	63.60	63.33			
Recorded Sample Period (sec)	12	12			
Software Version	10.88	10.88			
Sub Serial Number	90376559	90376559			
Insert Serial Number	11060455	11060455			
Sensor ID Number	5703	5703			

DDSr-Sonde Sensor Information

Tool Type	DDSr-Sonde	DDSr-Sonde			
Distance From Bit (ft)	25.70	25.43			

Distance From Bit (ft)	35.70	35.43			
Recorded Sample Period (sec)	12	12			
Software Version	80.88	80.88			
Sub Serial Number	123	123			
Insert Serial Number	11631535	11631535			
Sensor ID Number	8225	8225			

REMARKS

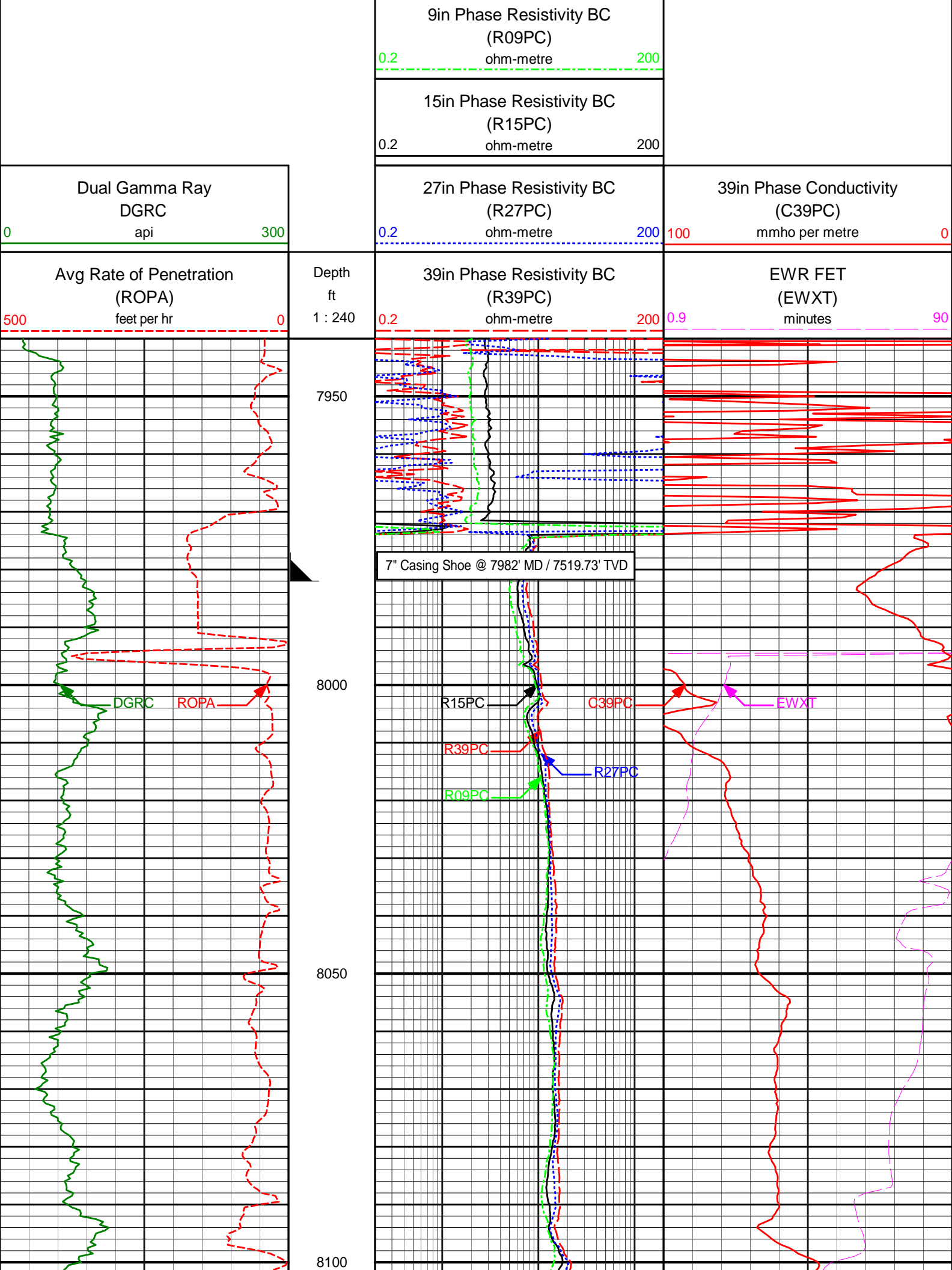
1. All depths are measured depths, referenced to the Driller's pipe tally and are measured from the Kelly Bushing, unless otherwise specified.
2. No depth corrections have been made for pipe stretch or compression.
3. All data presented is recorded data unless otherwise specified.
4. The final survey is a straight-line projection to the bit.
5. The following smoothing parameters have been applied to the data:
 - DGRC (Corrected Gamma Ray):
 - Interval Resolution: 0.5 ft
 - Interval Distance: 0.6 ft
 - Gap Fill: 3.0 ft
 - Resistivity/Conductivity
 - Interval Resolution: 0.5 ft
 - Interval Distance: 0.6 ft
 - Gap Fill: 3.0 ft
 - ROPA (Average Rate Of Penetration):
 - Interval Resolution: 0.5 ft
 - Interval Distance: 1.2 ft
 - Gap Fill: 3.0 ft

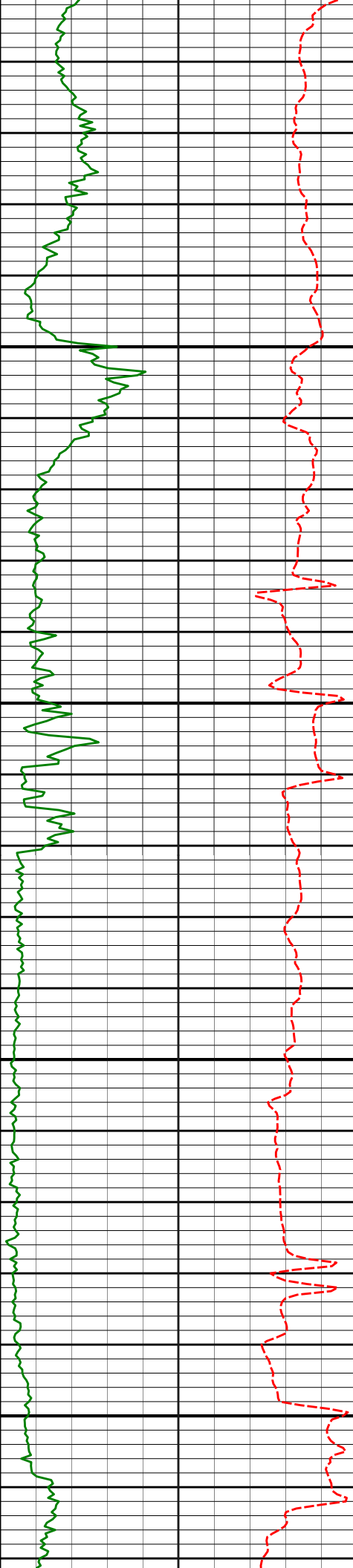
Insite version: 8.0

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Resistivity Main Log 1:240



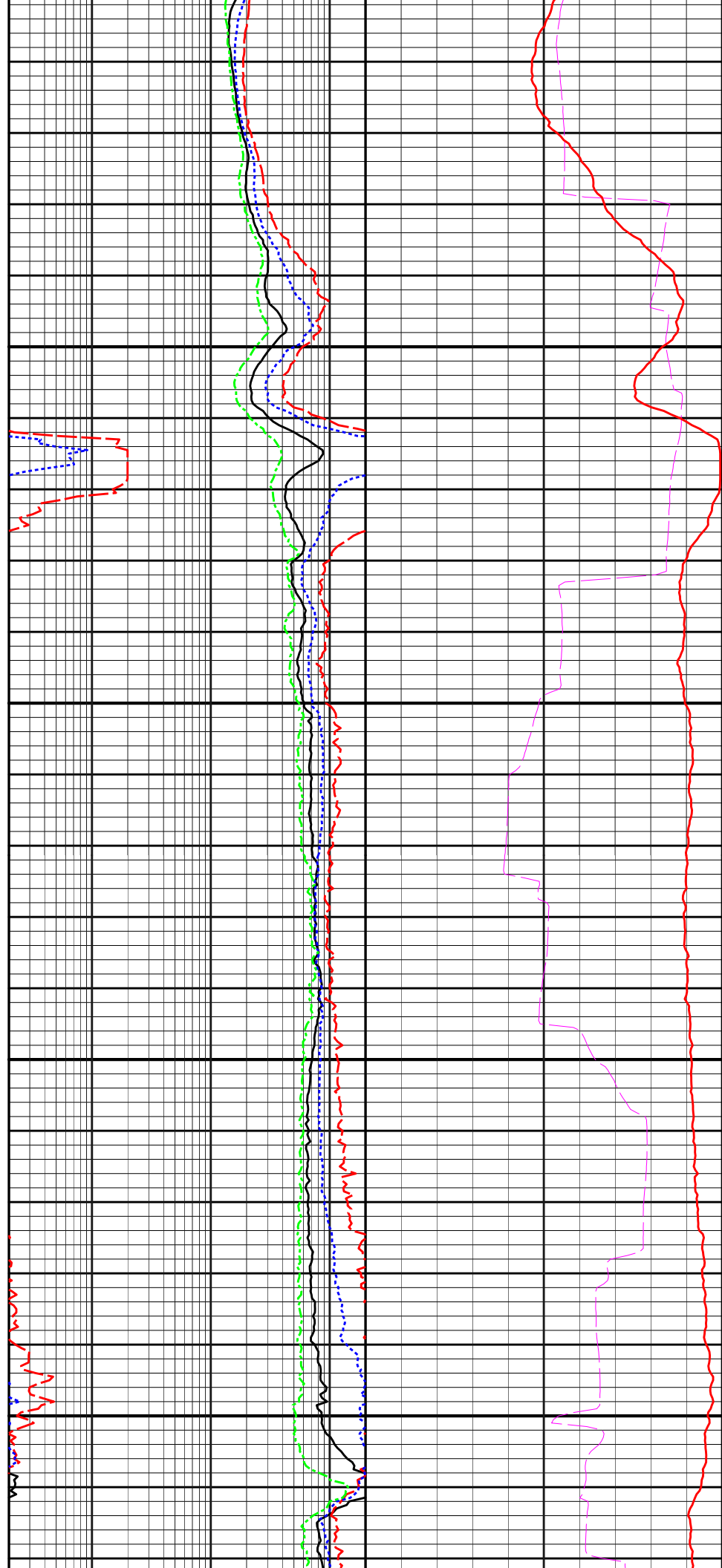


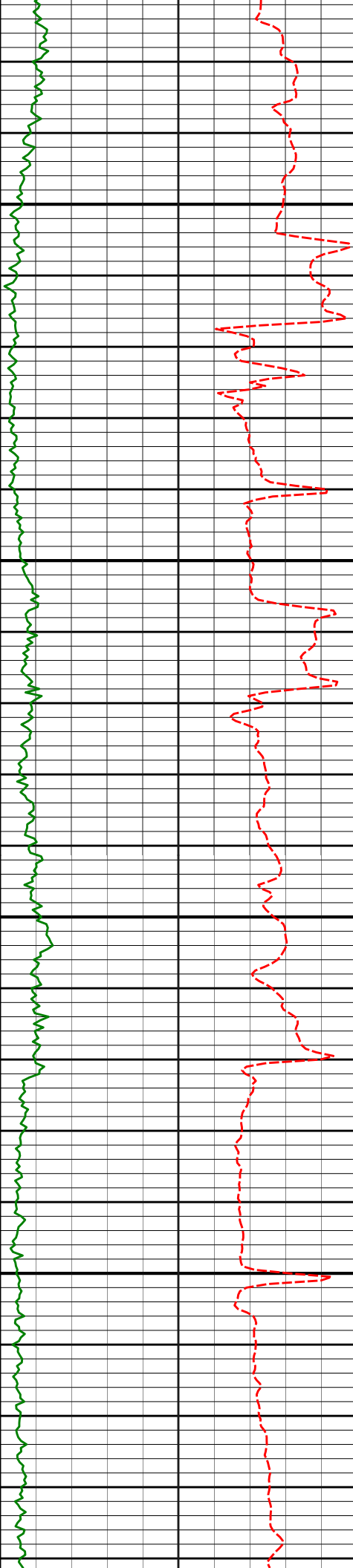
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8300



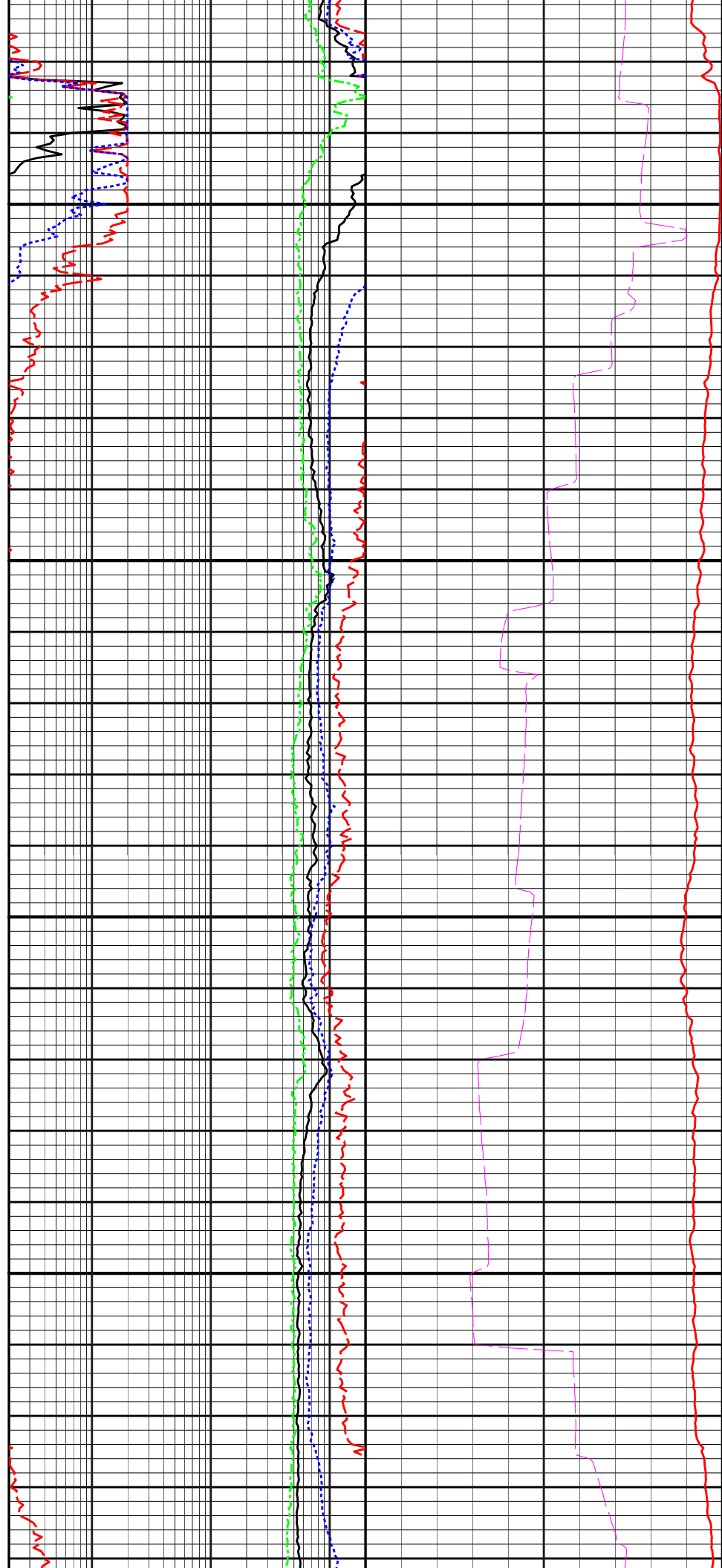


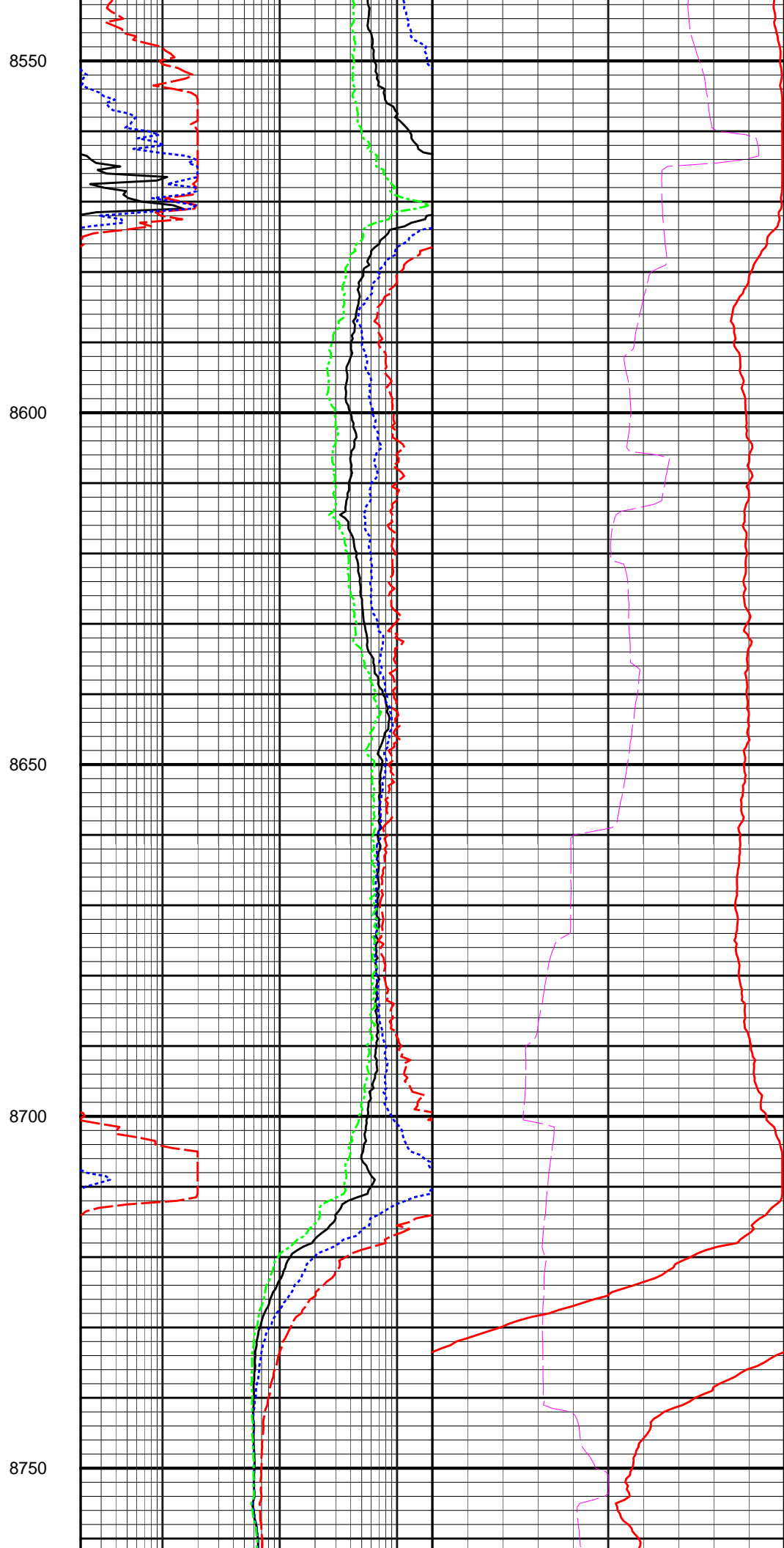
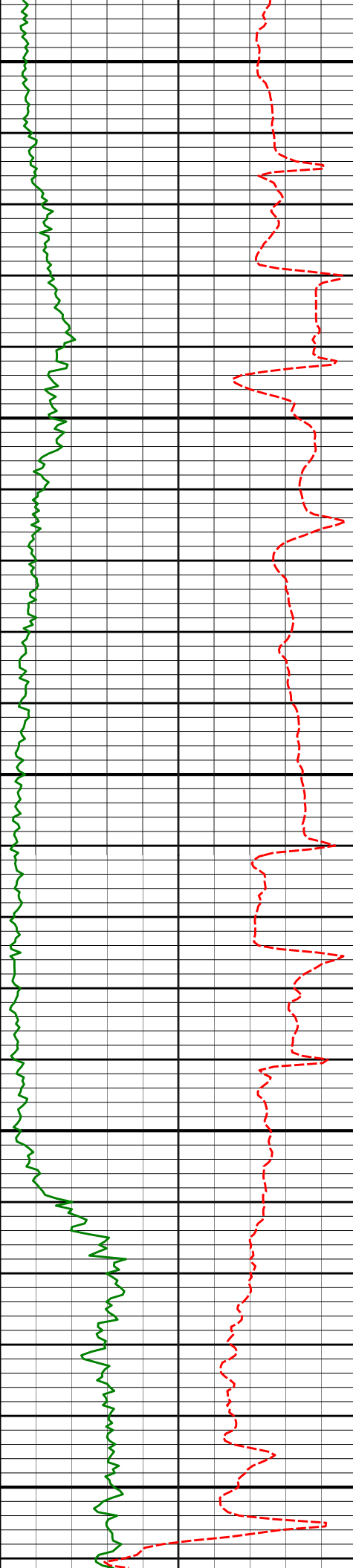
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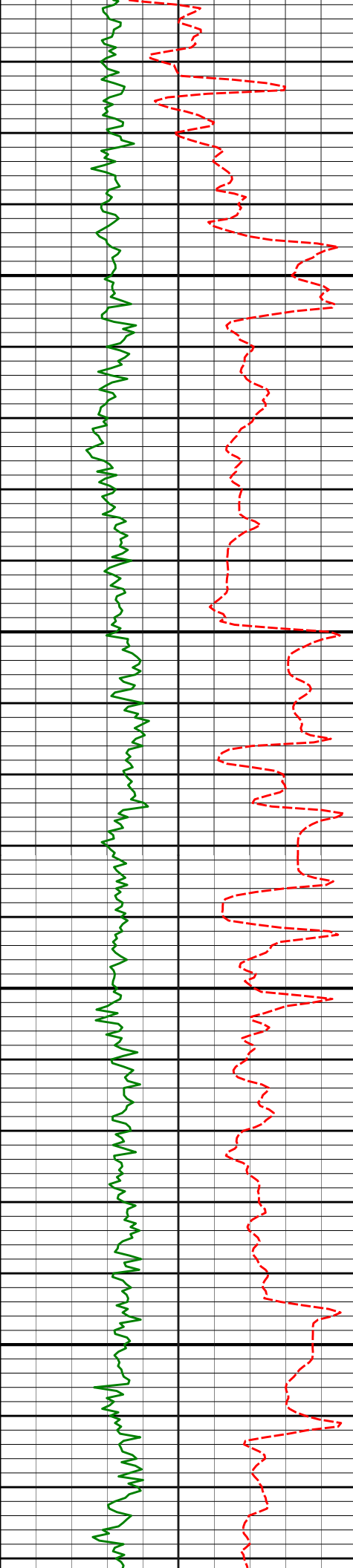
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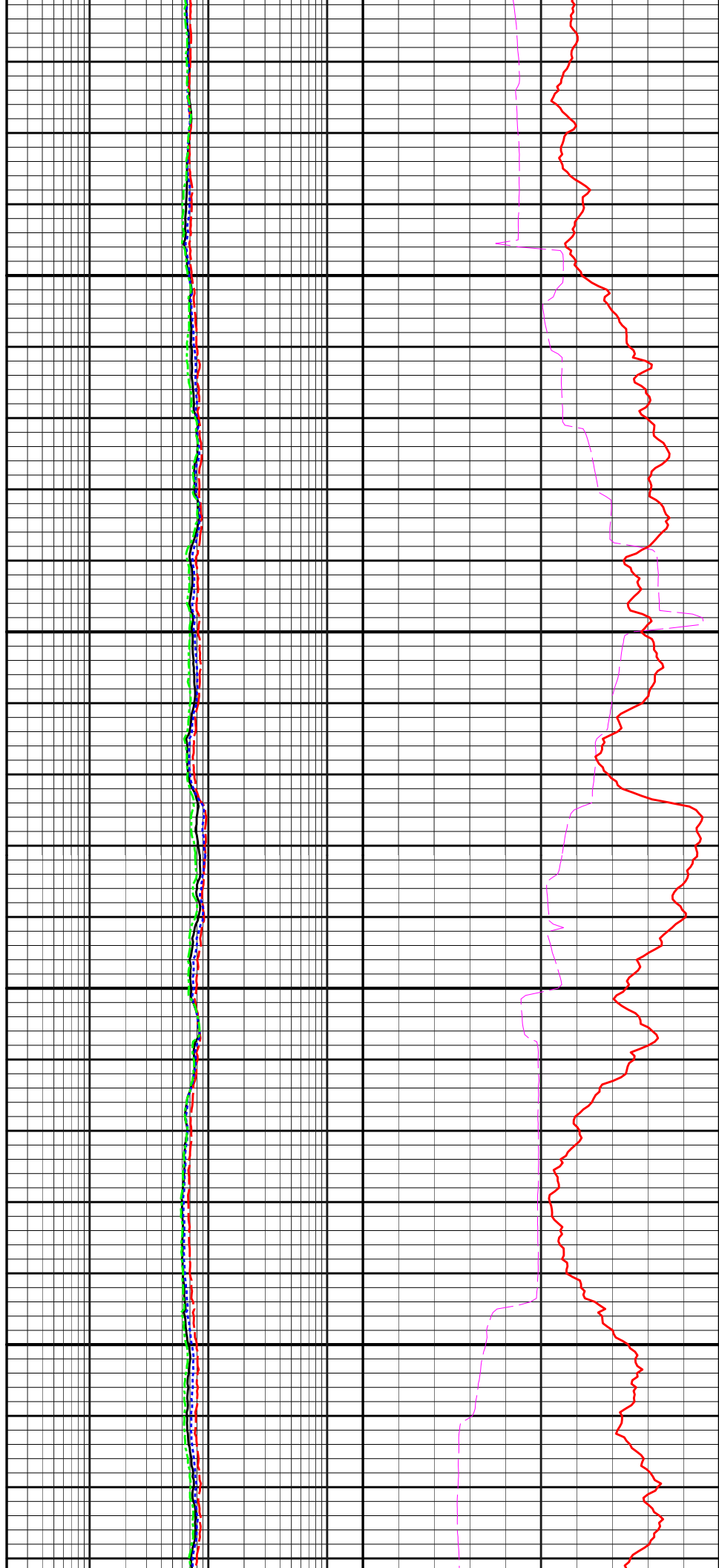


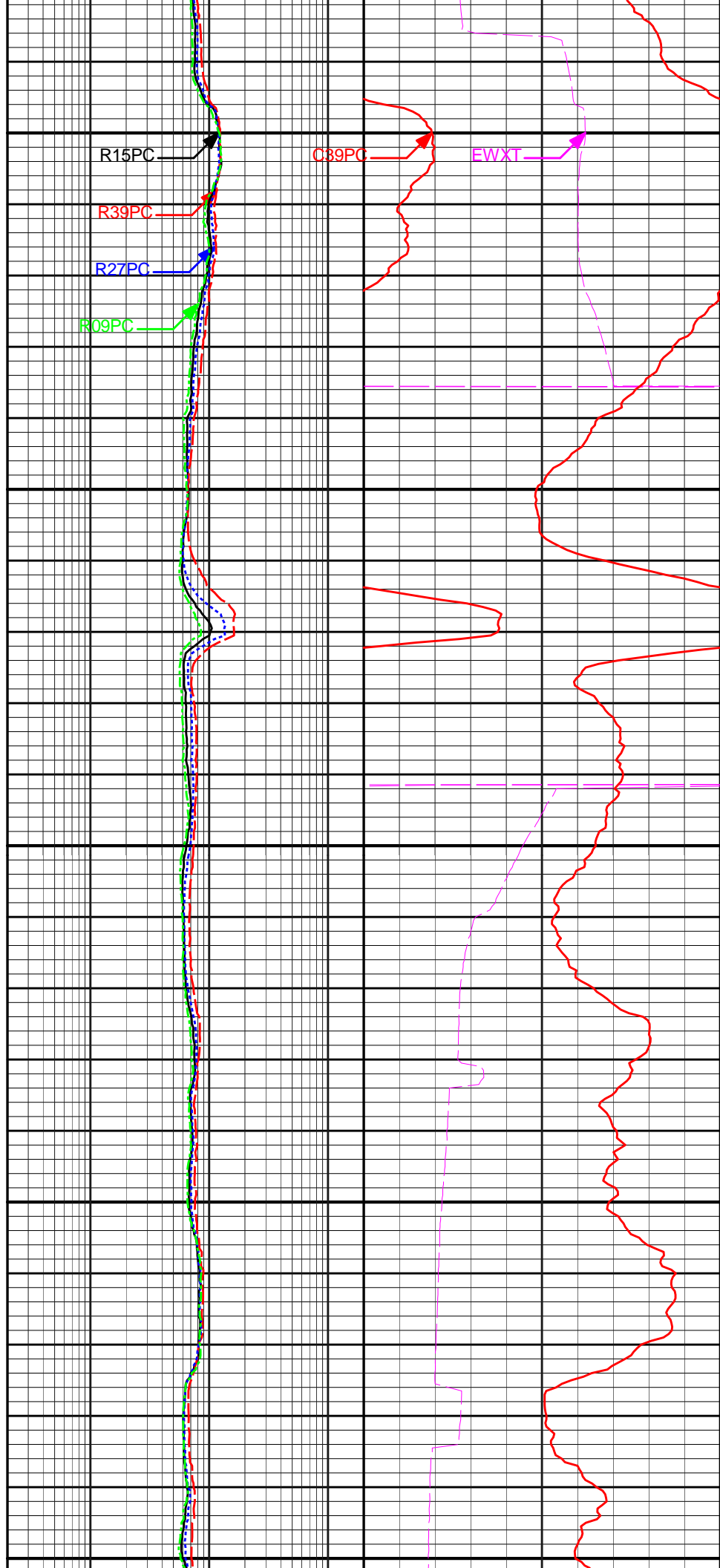
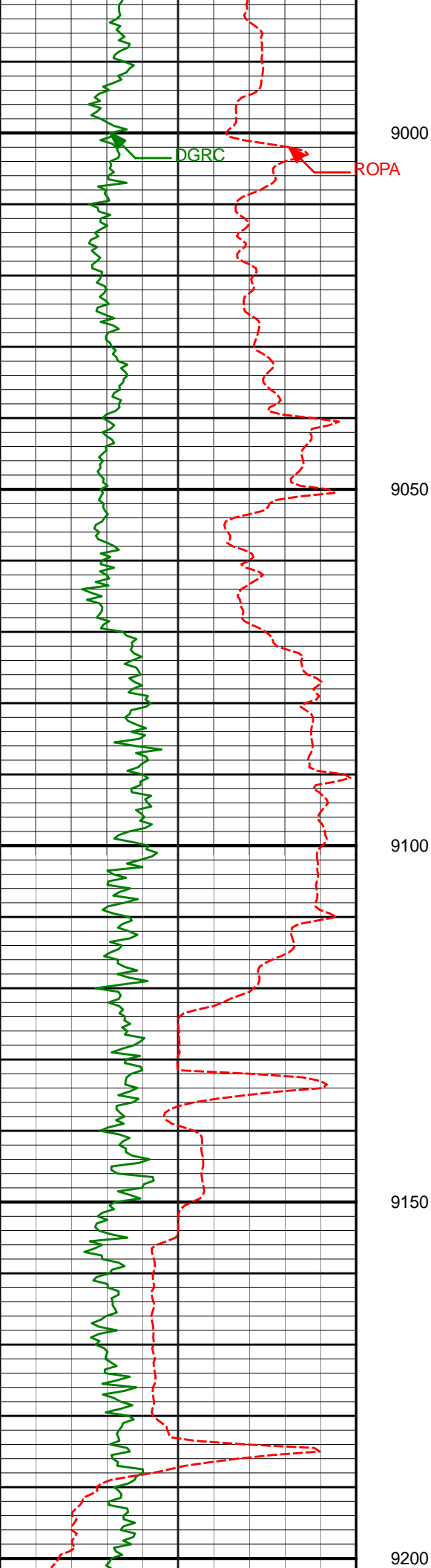
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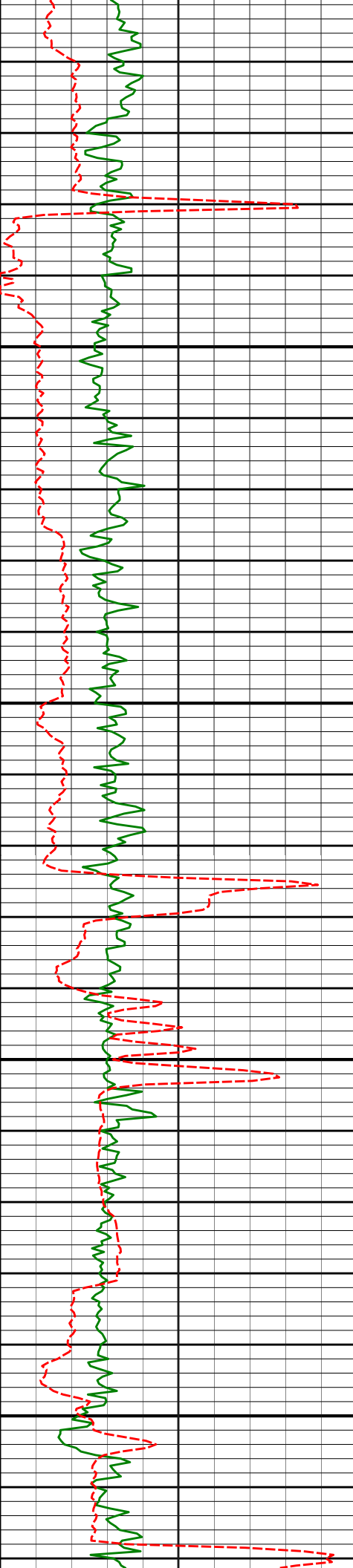
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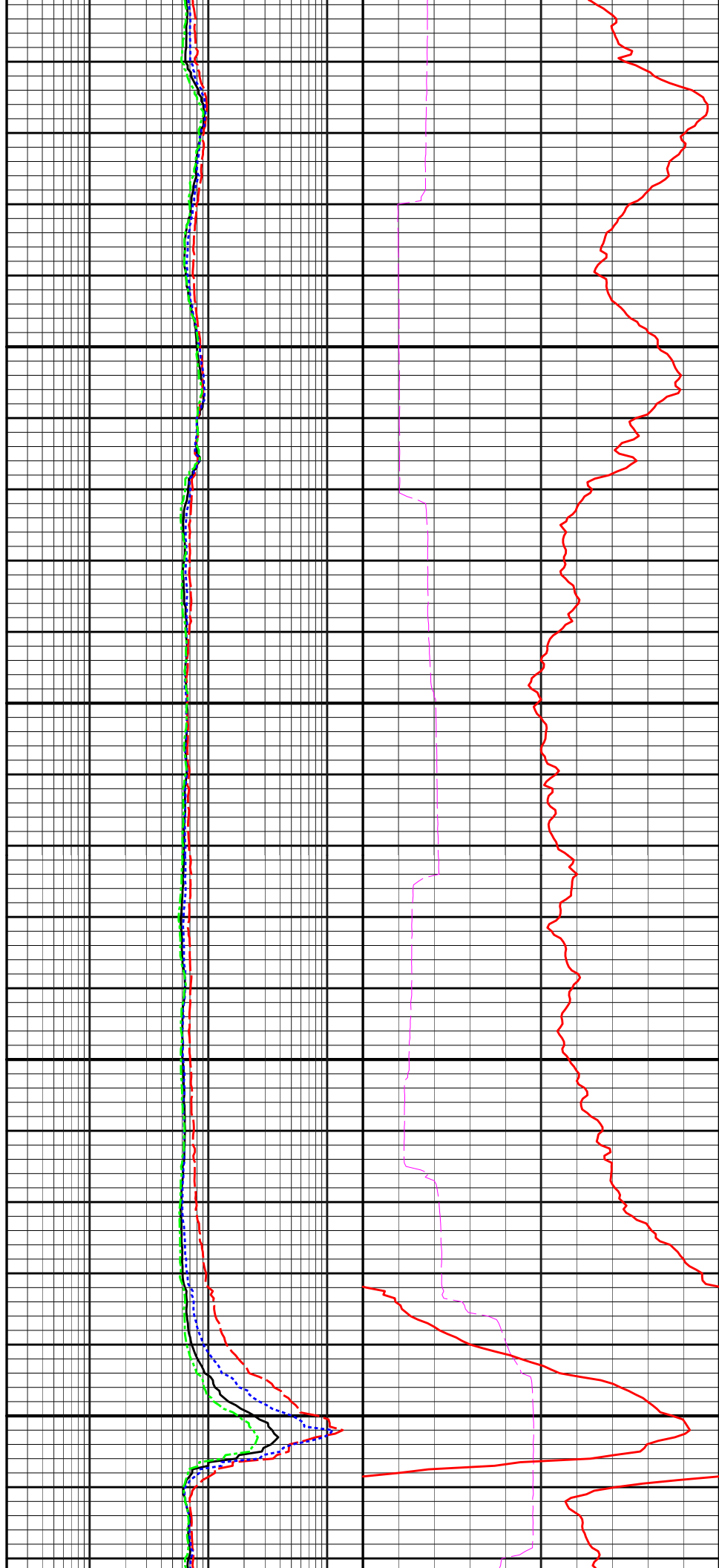


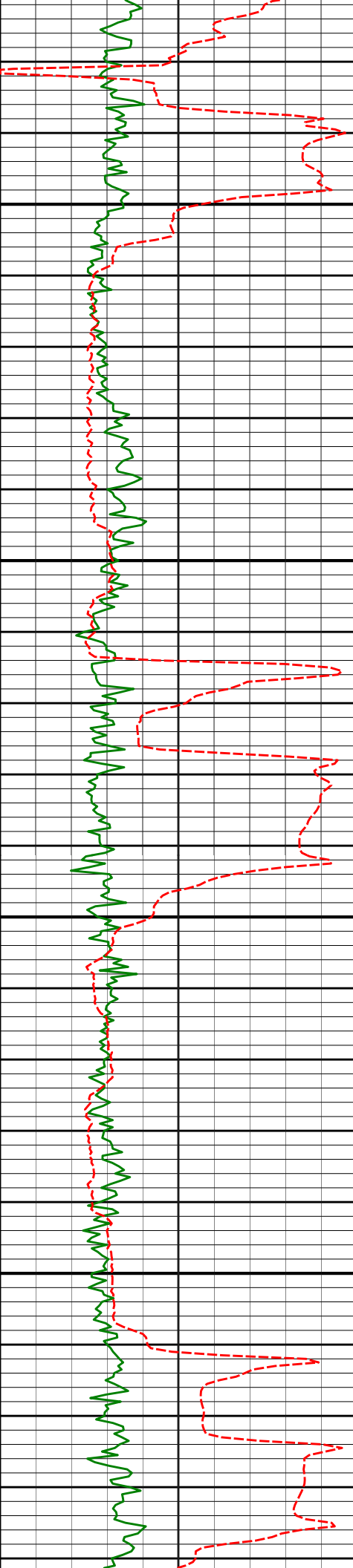
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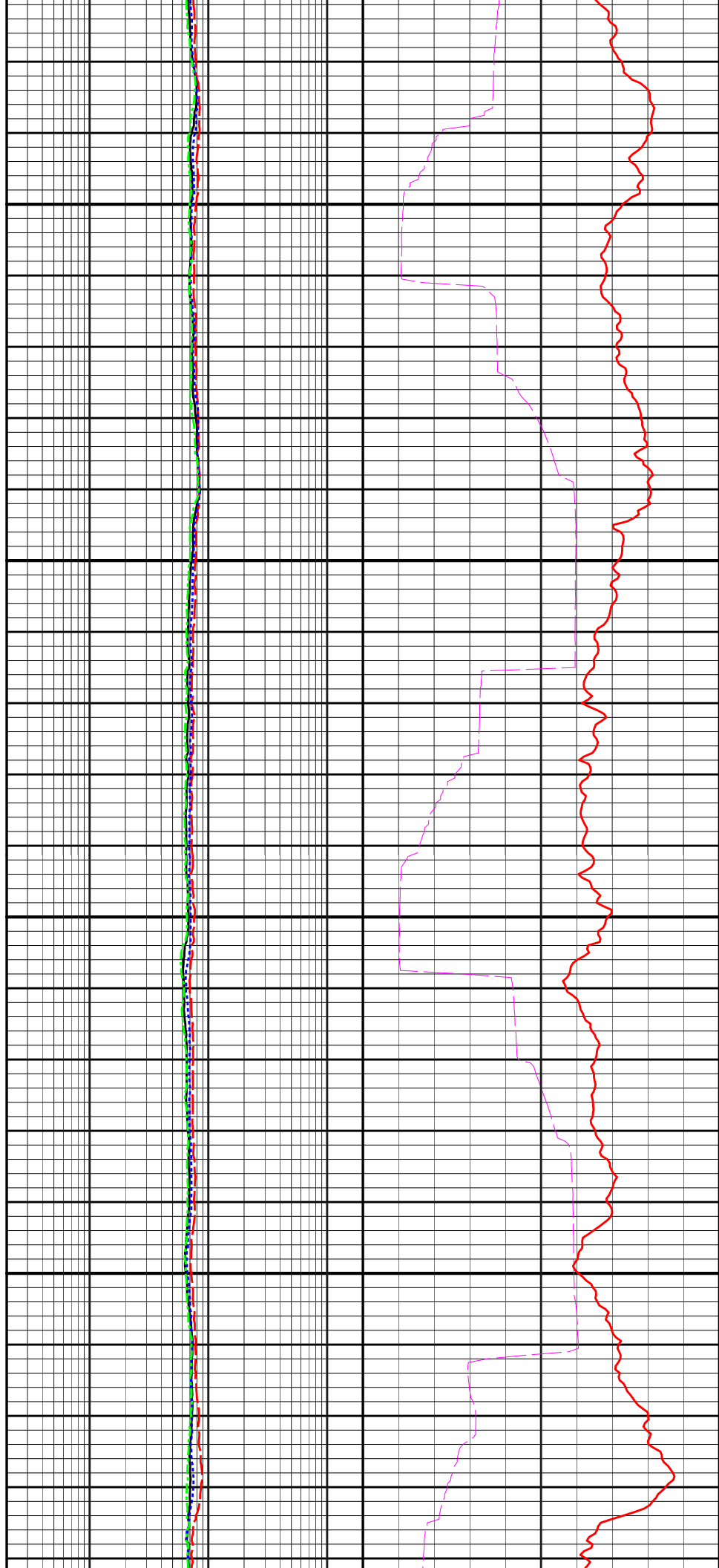


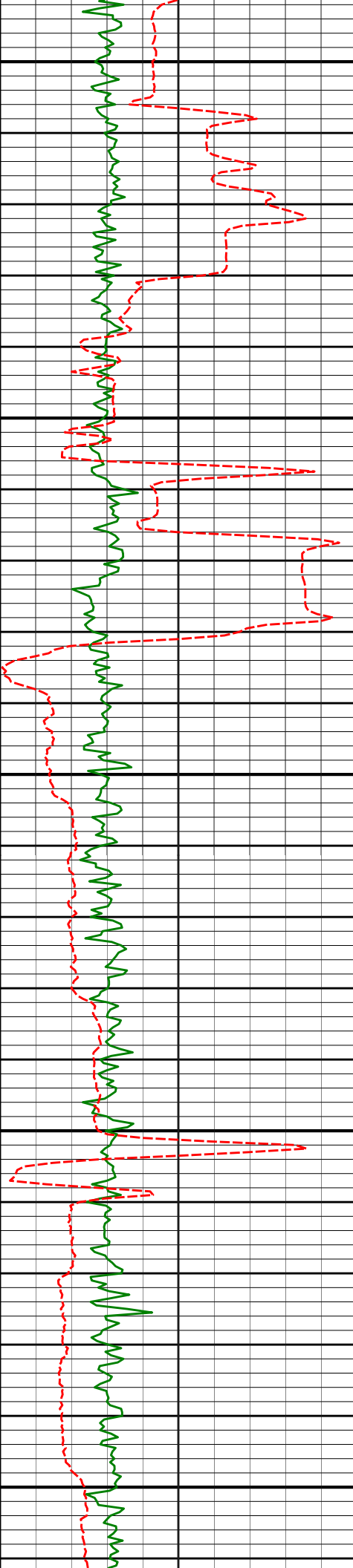
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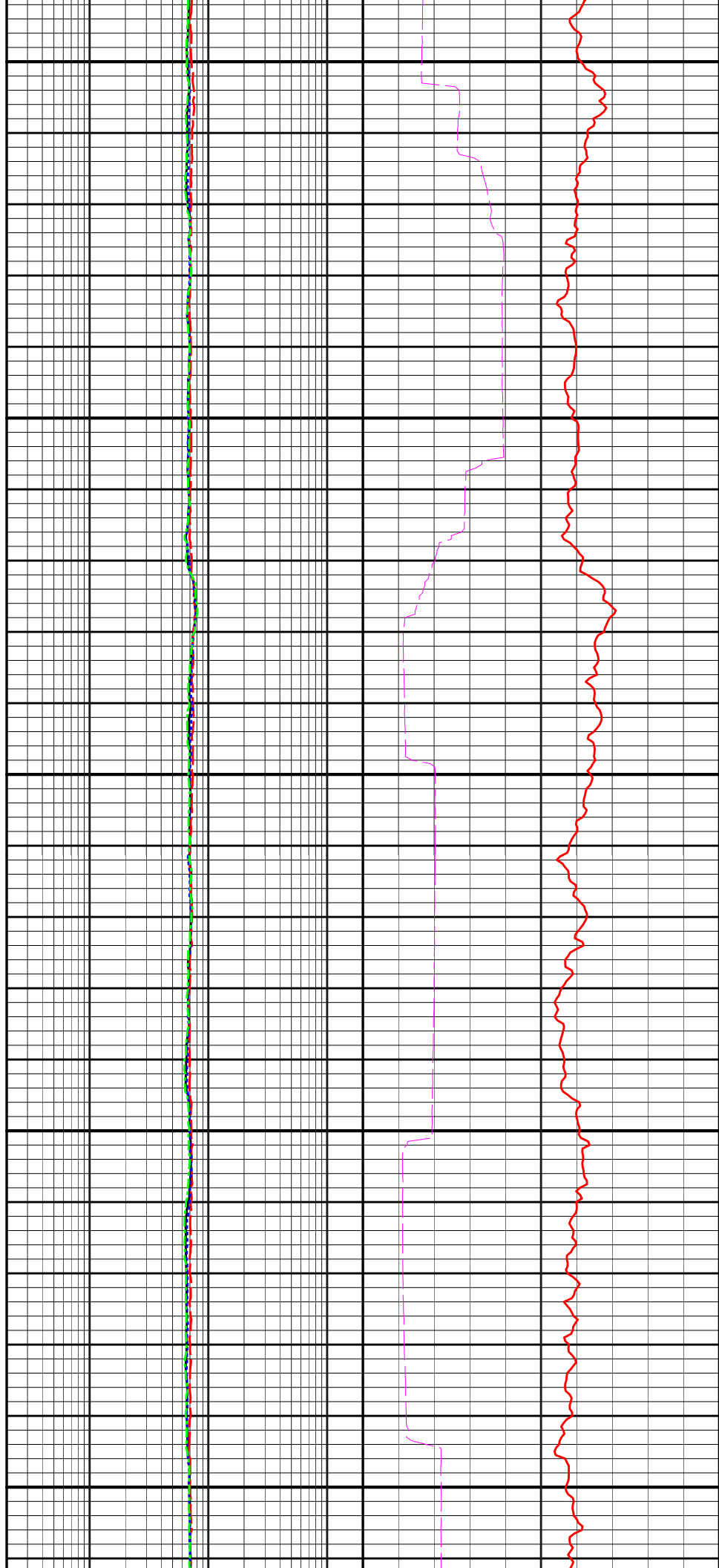
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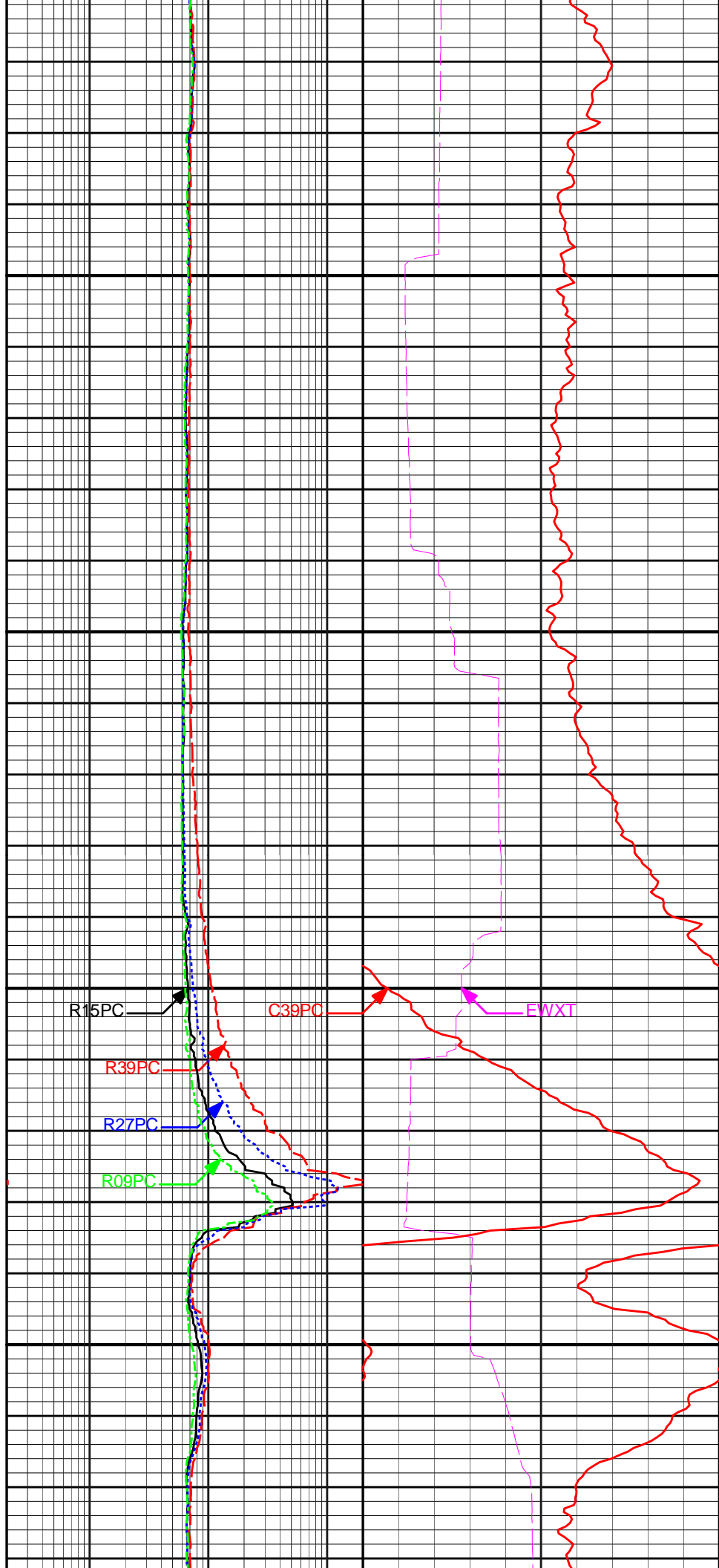
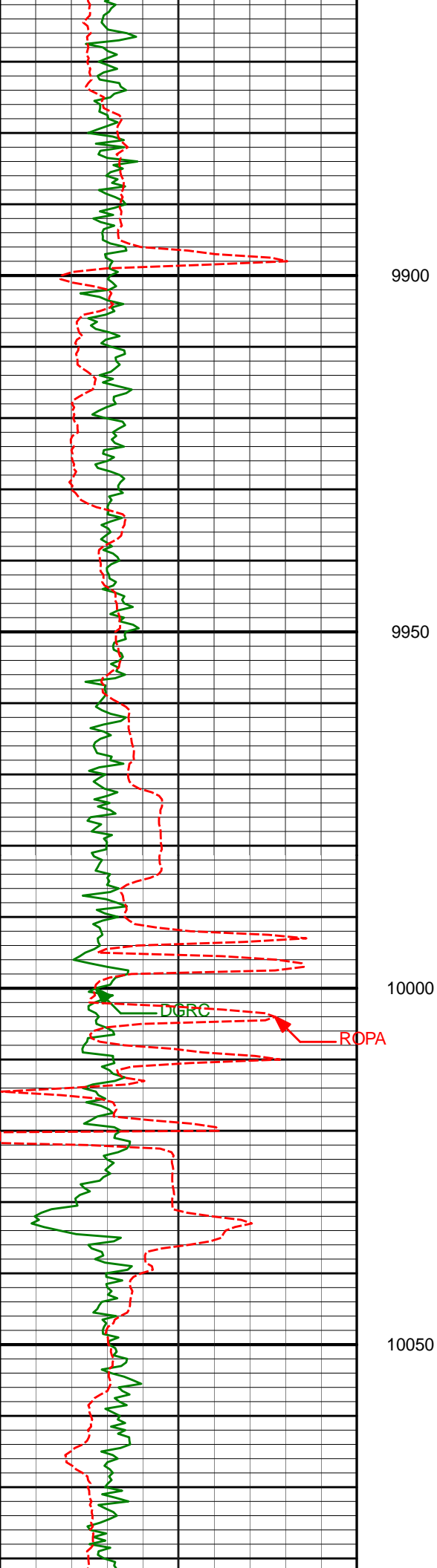
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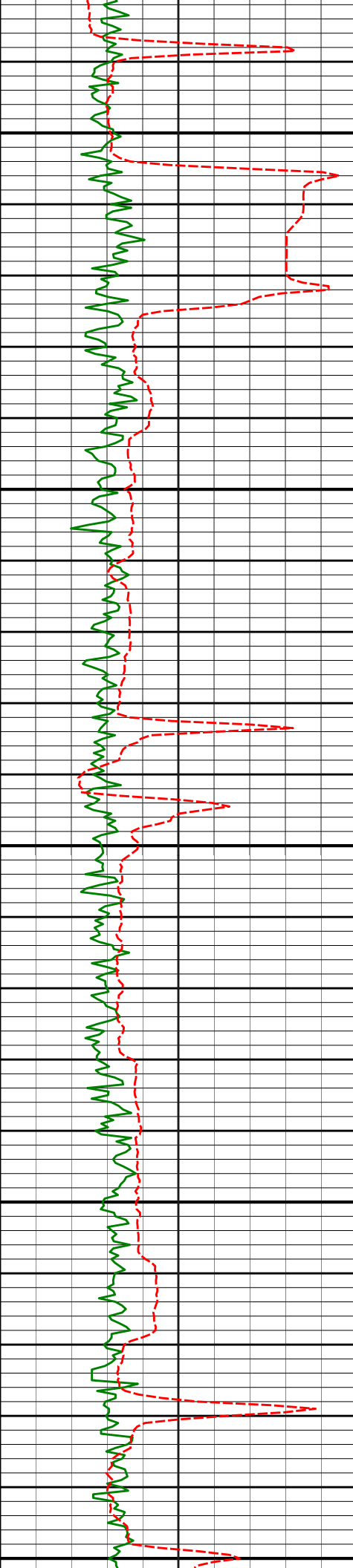
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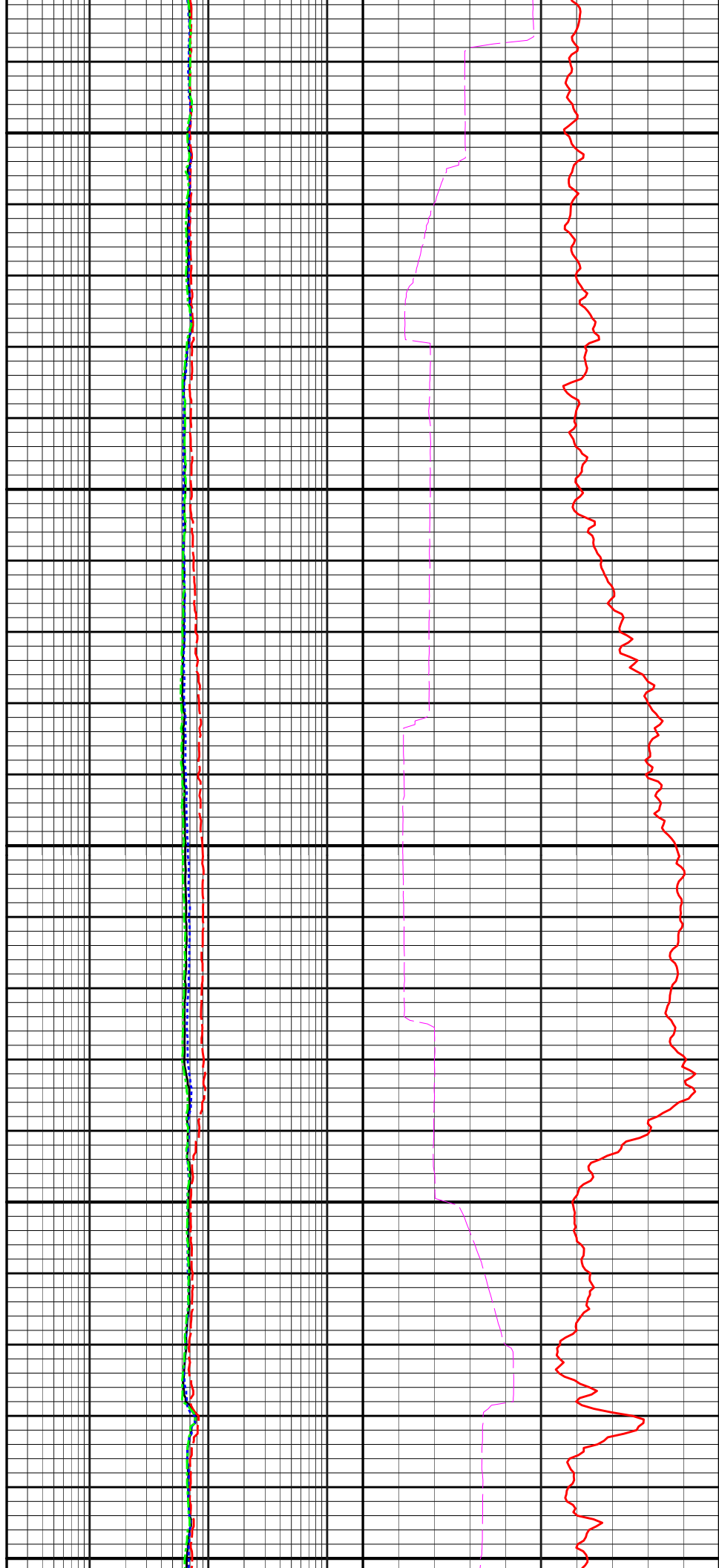
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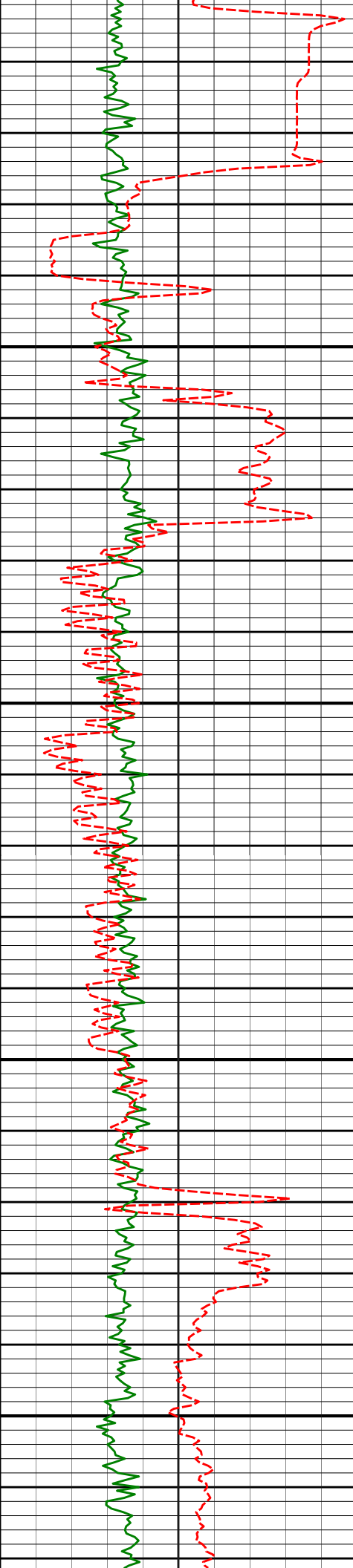
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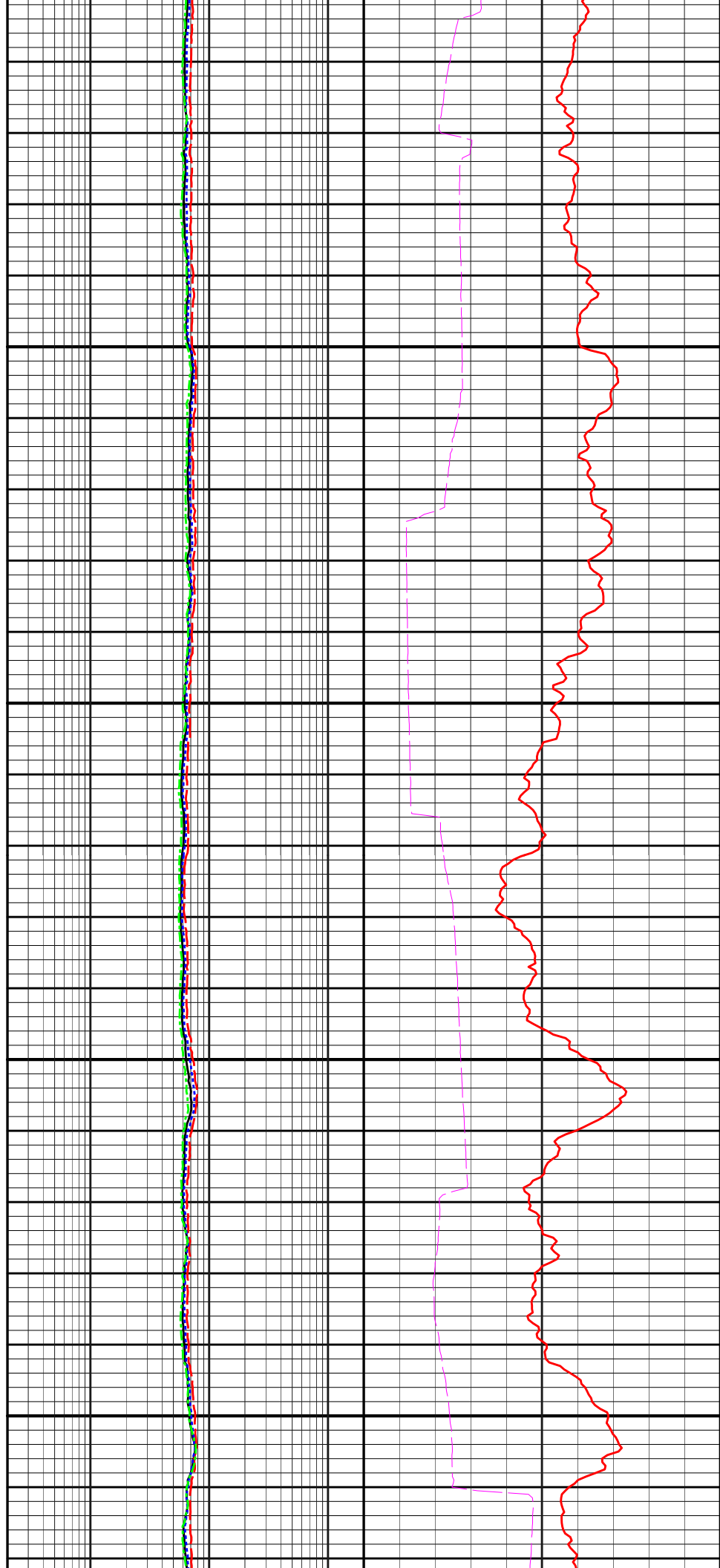


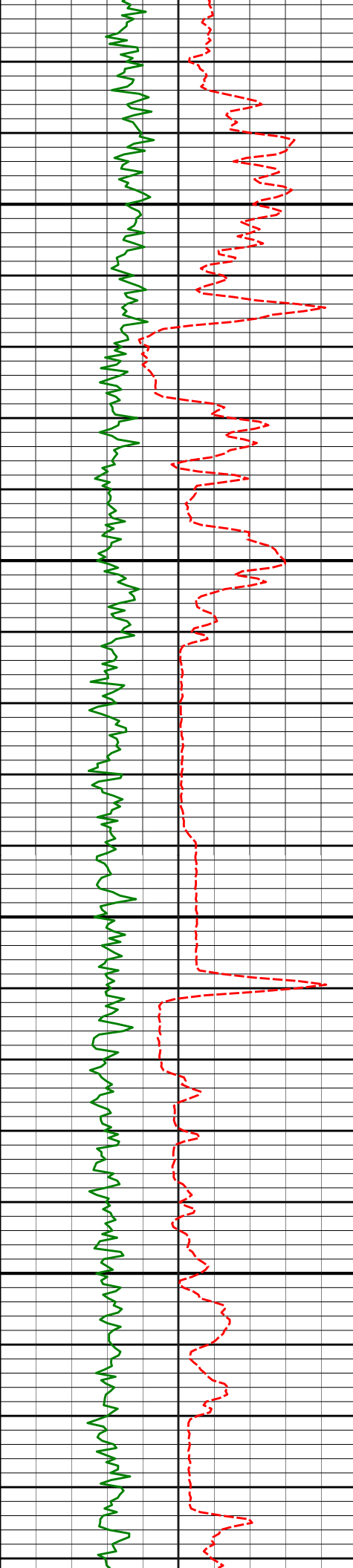
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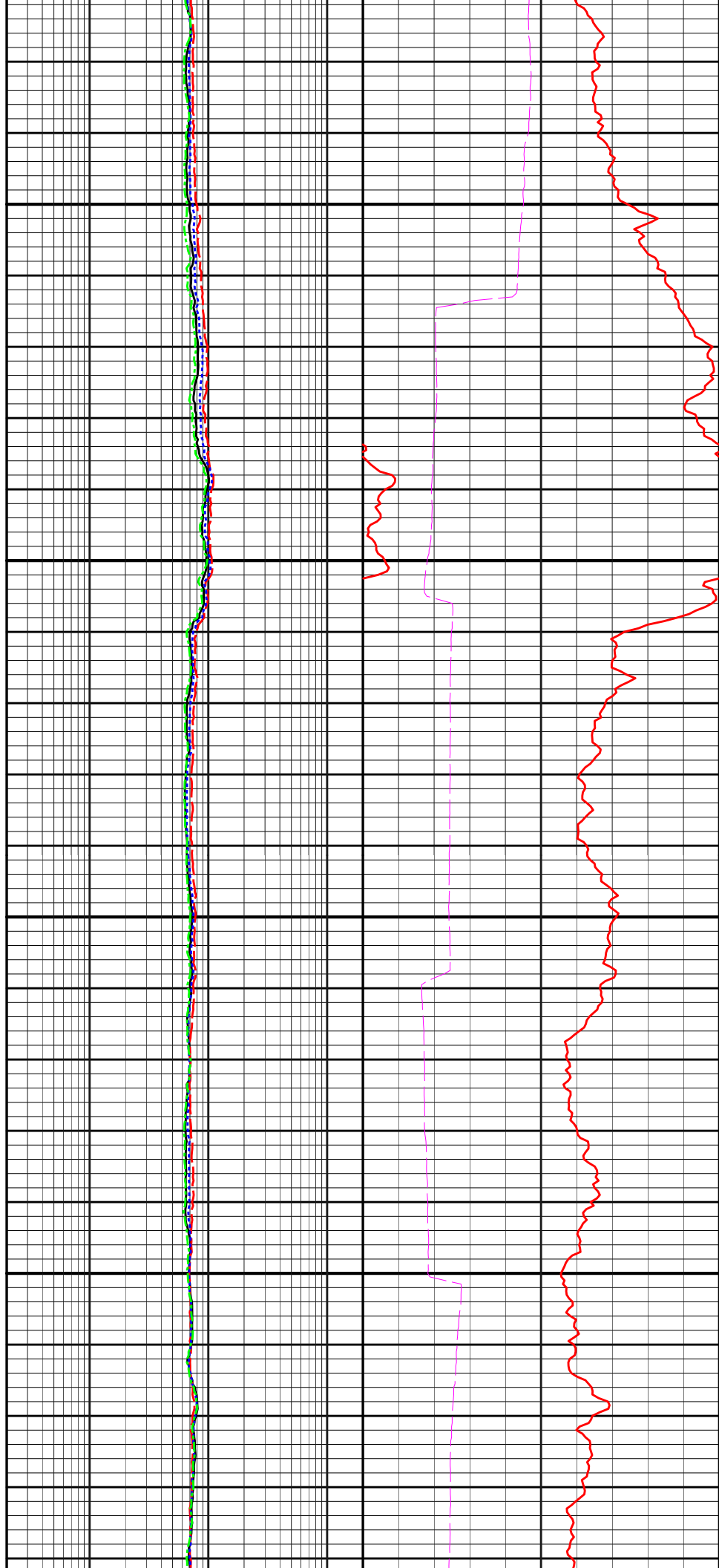


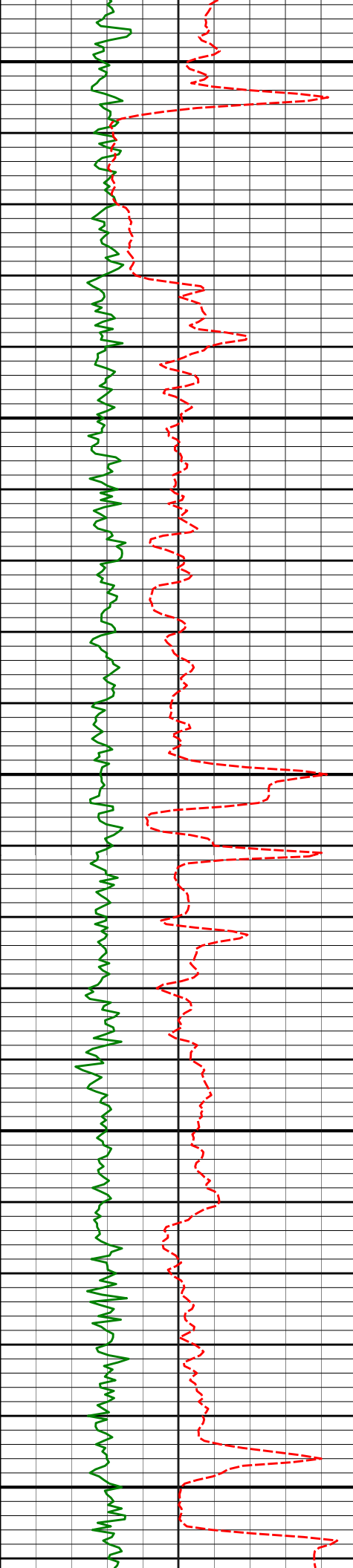
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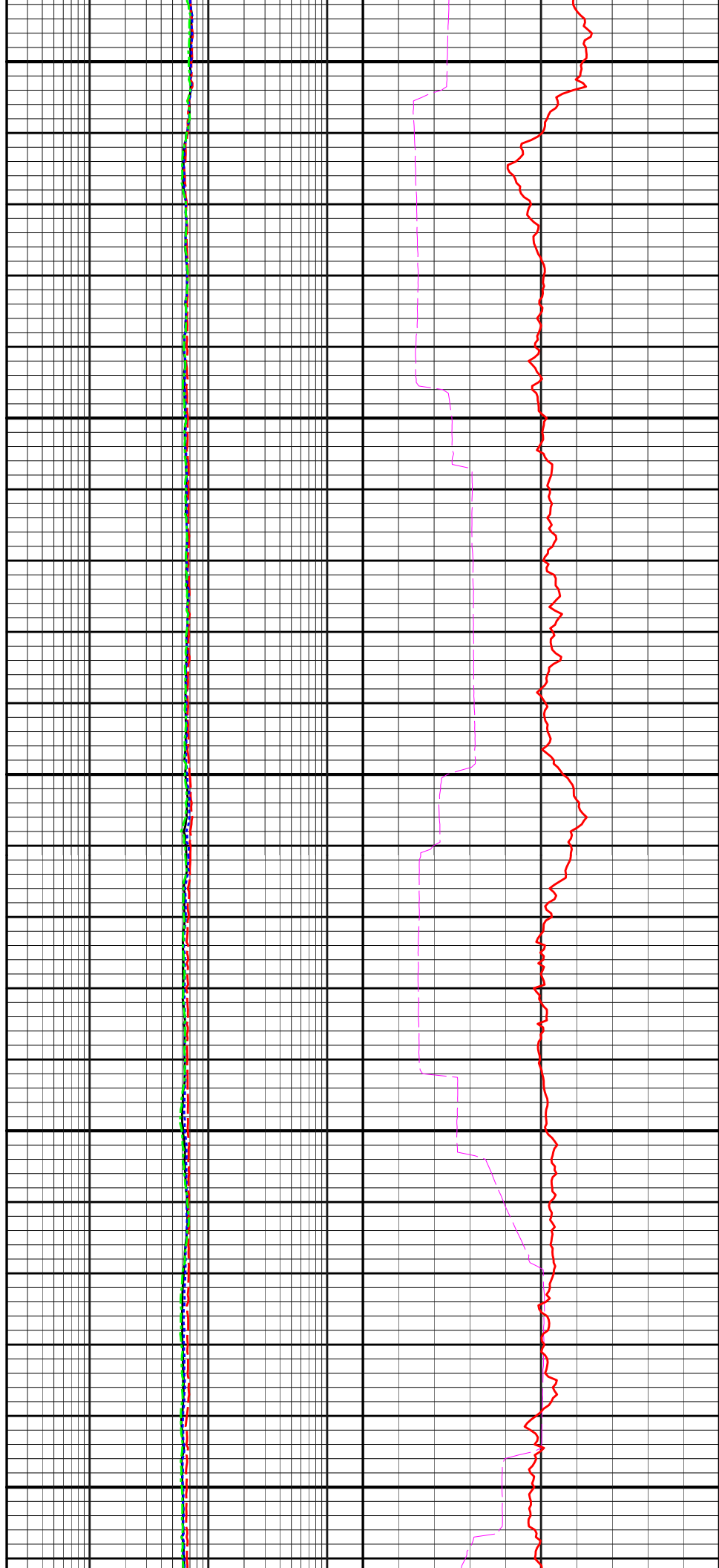
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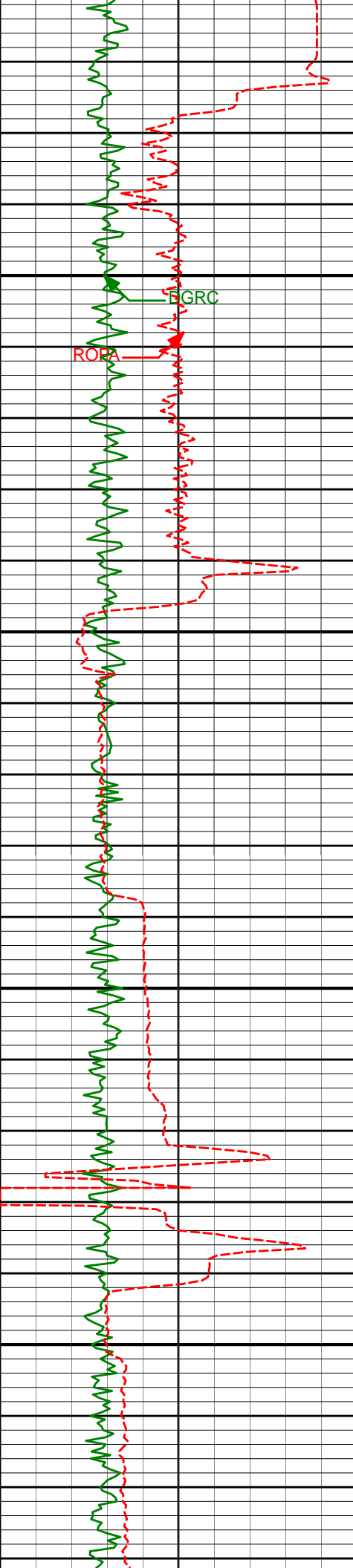
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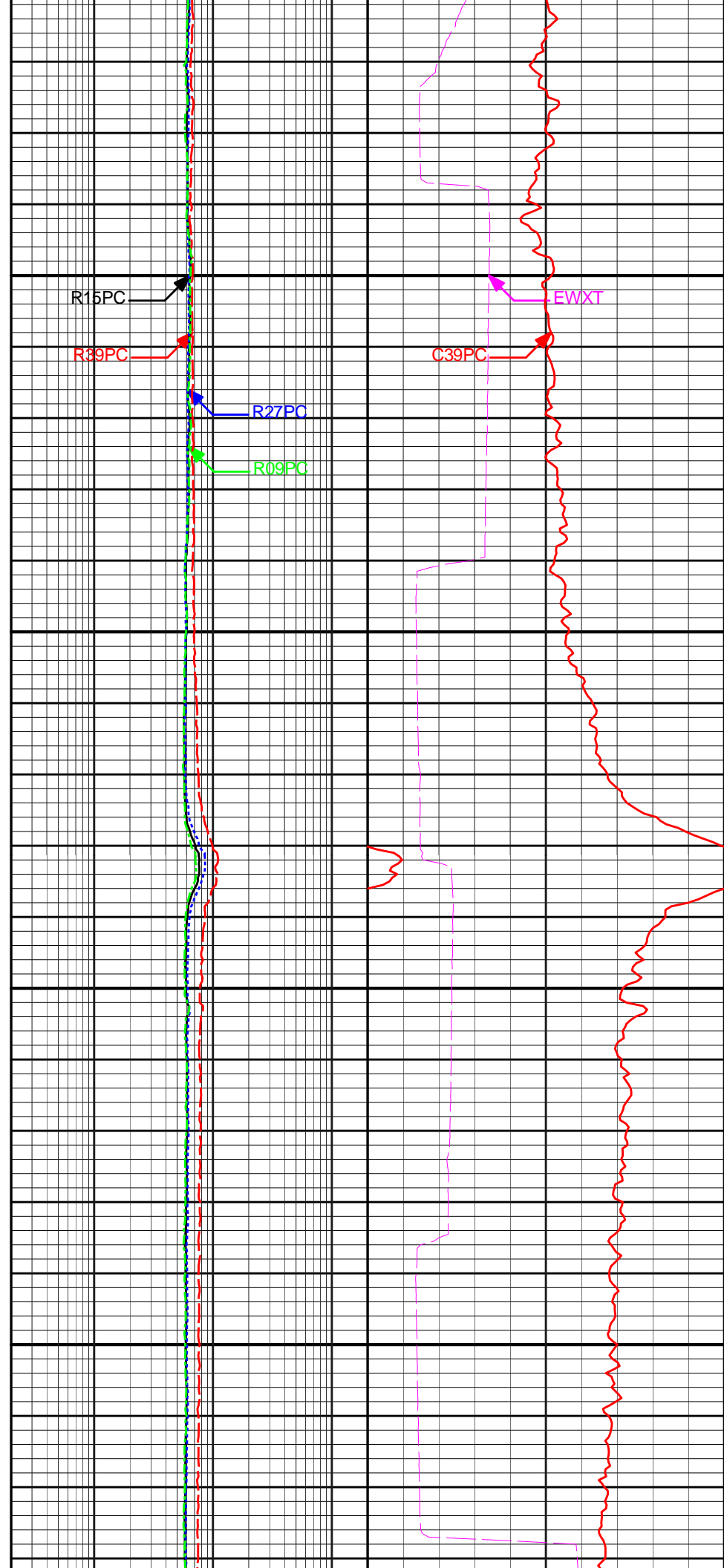


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11100

11150



R15PC

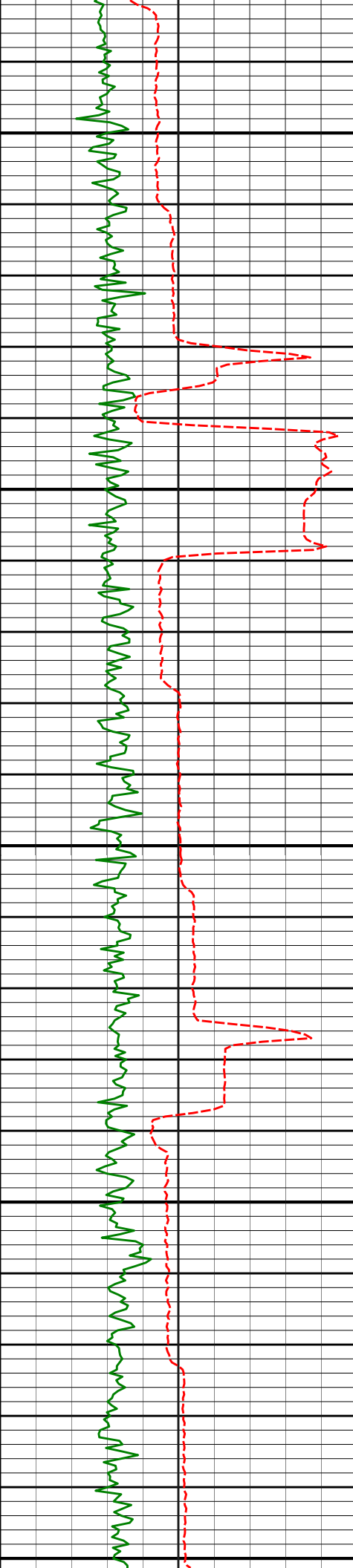
R39PC

R27PC

R09PC

C39PC

EWXT



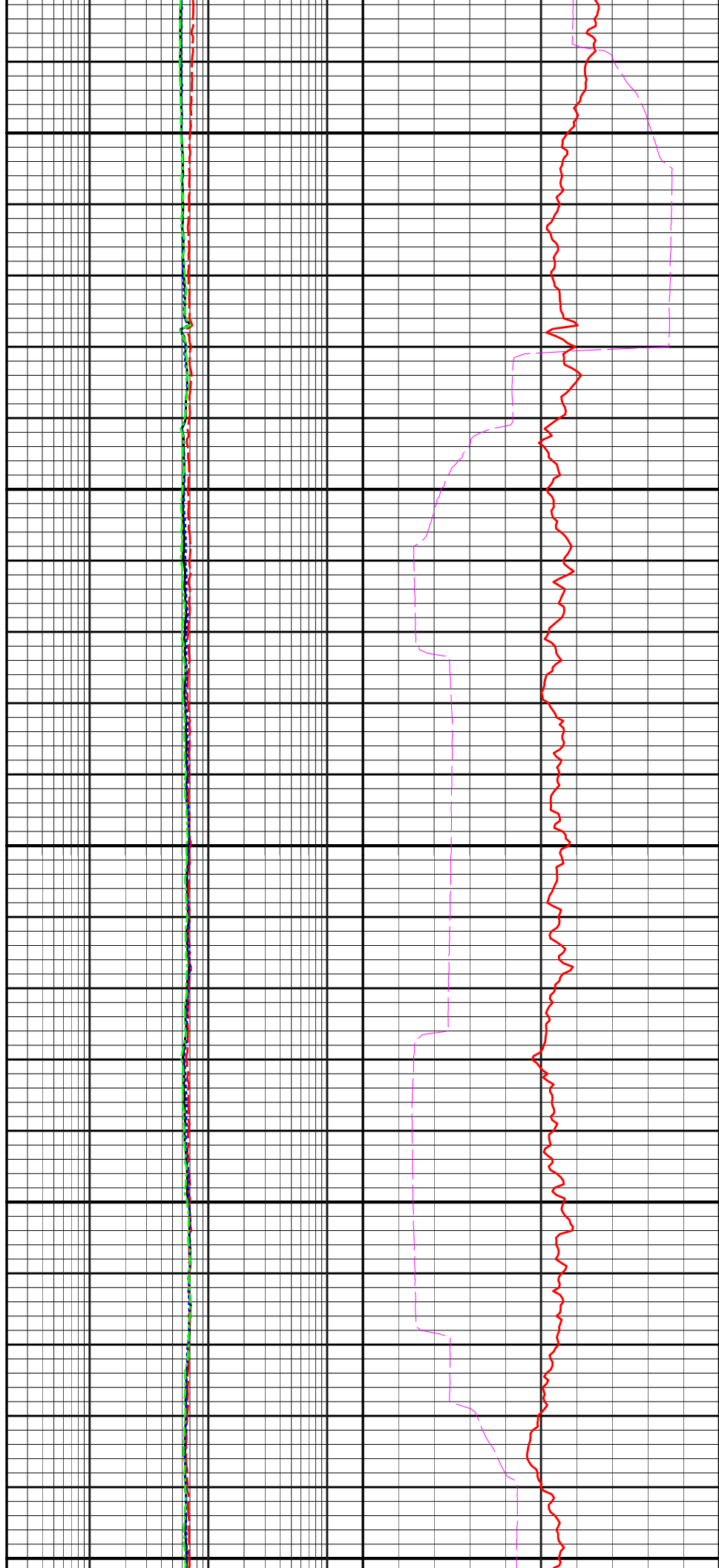
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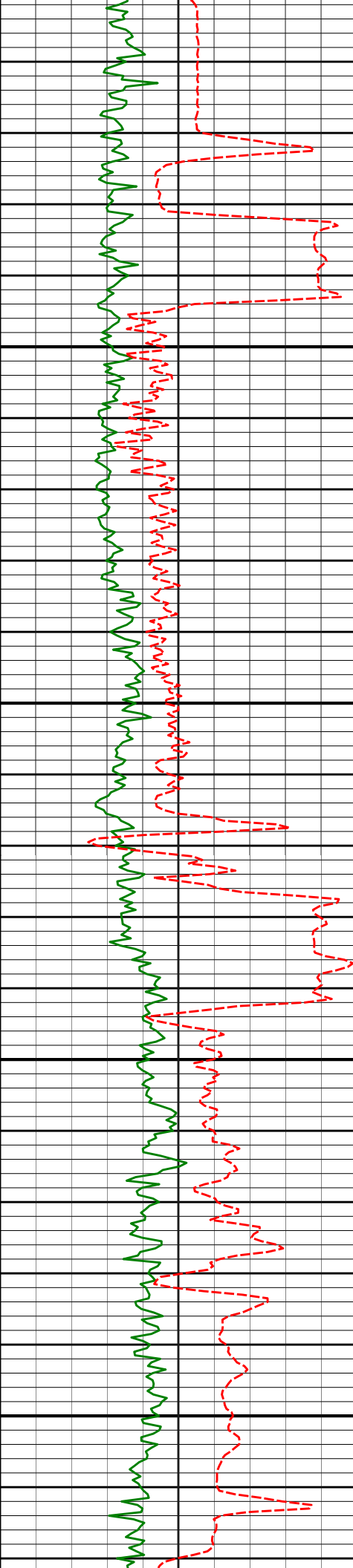
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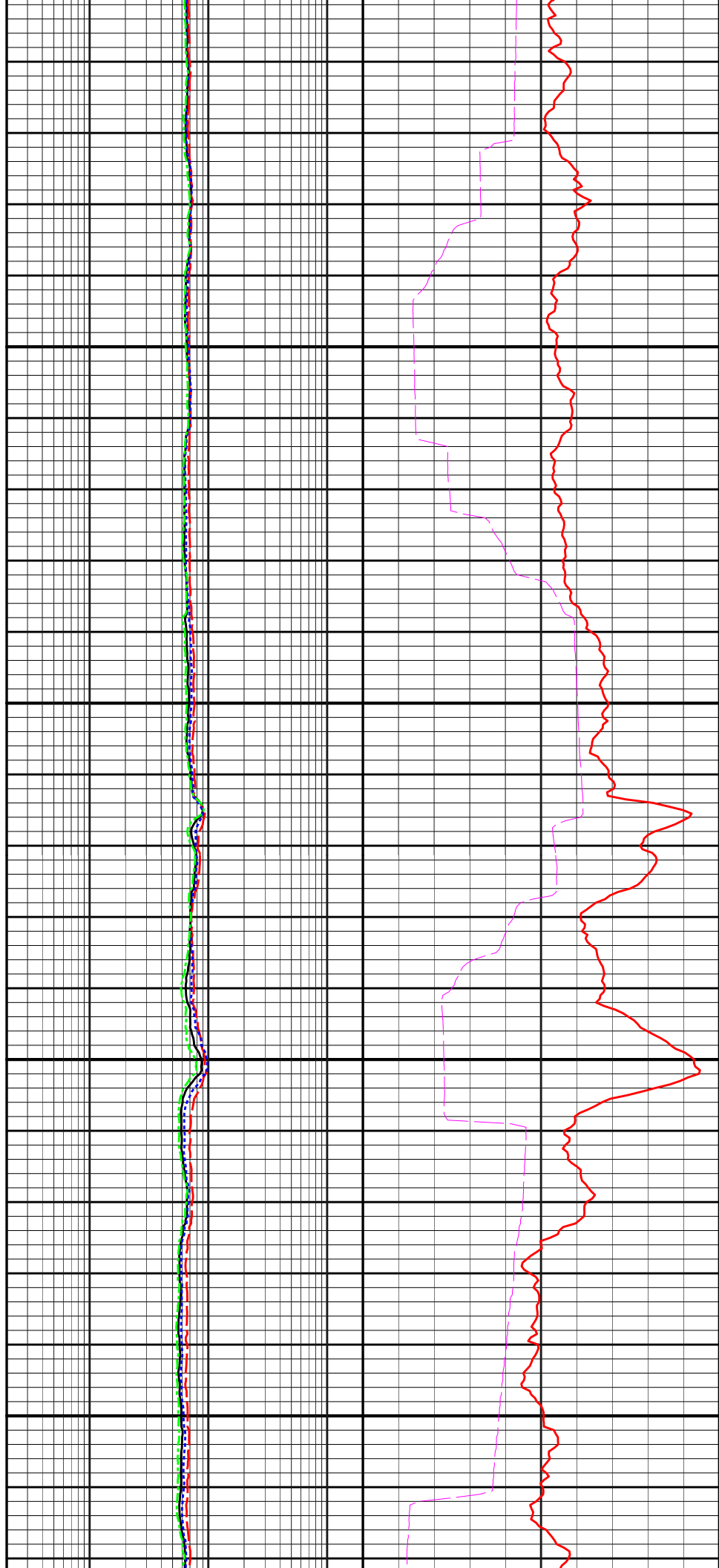


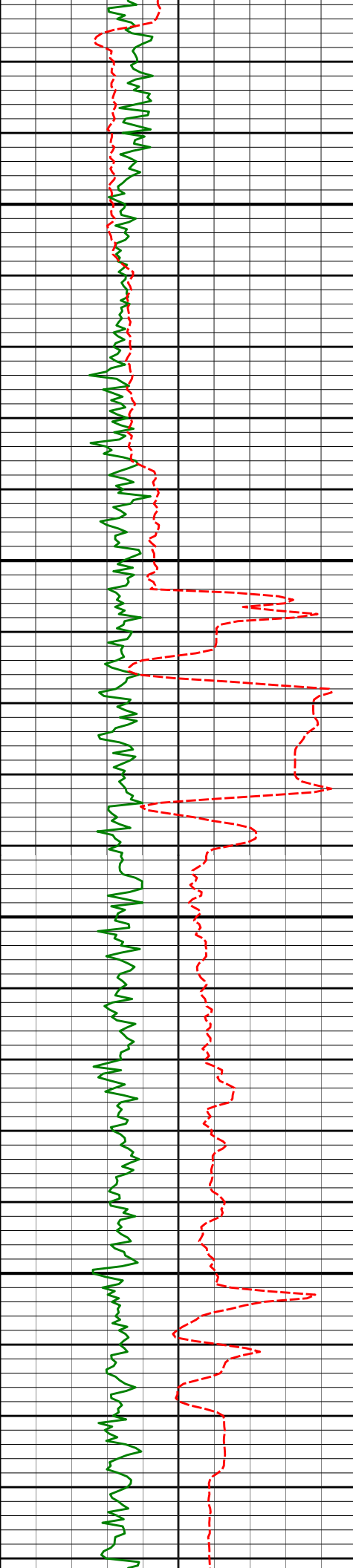
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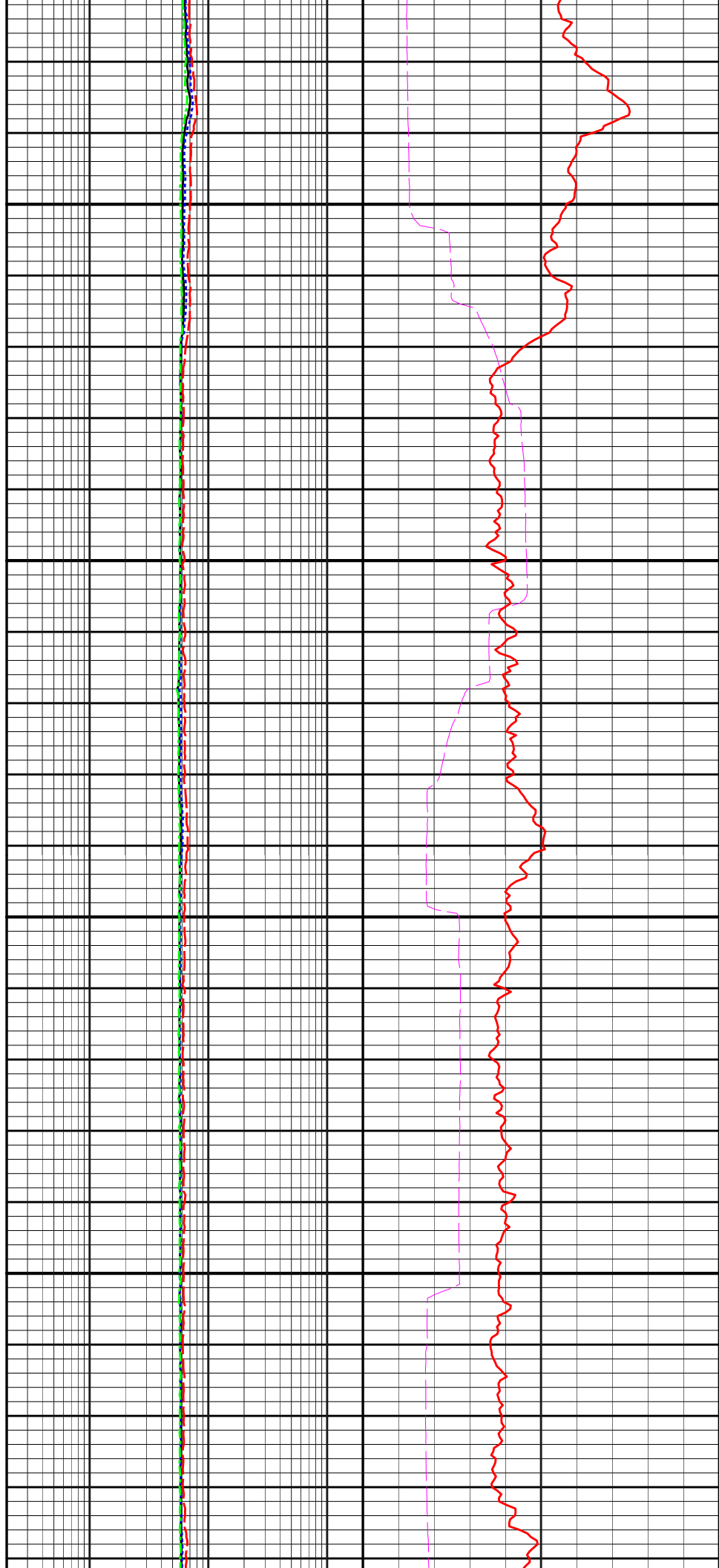


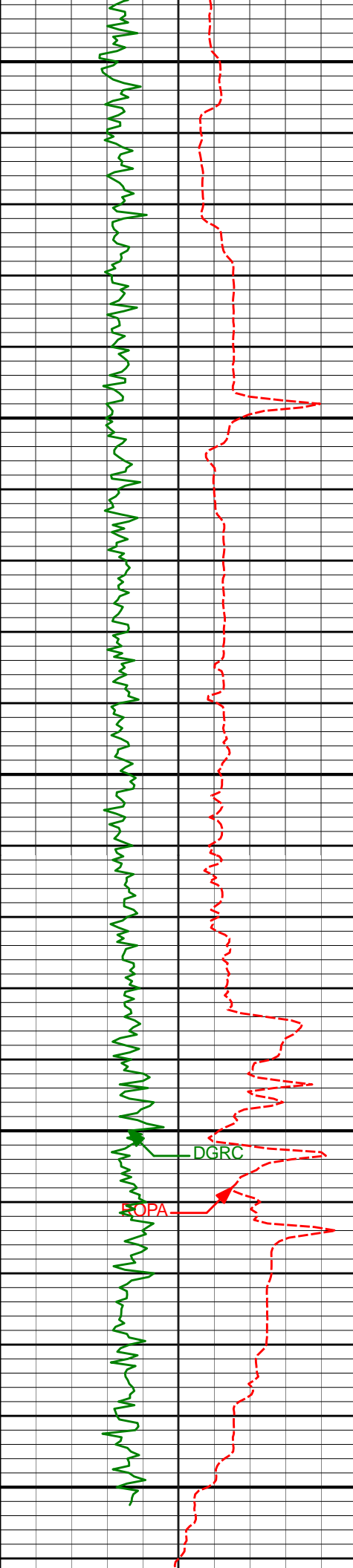
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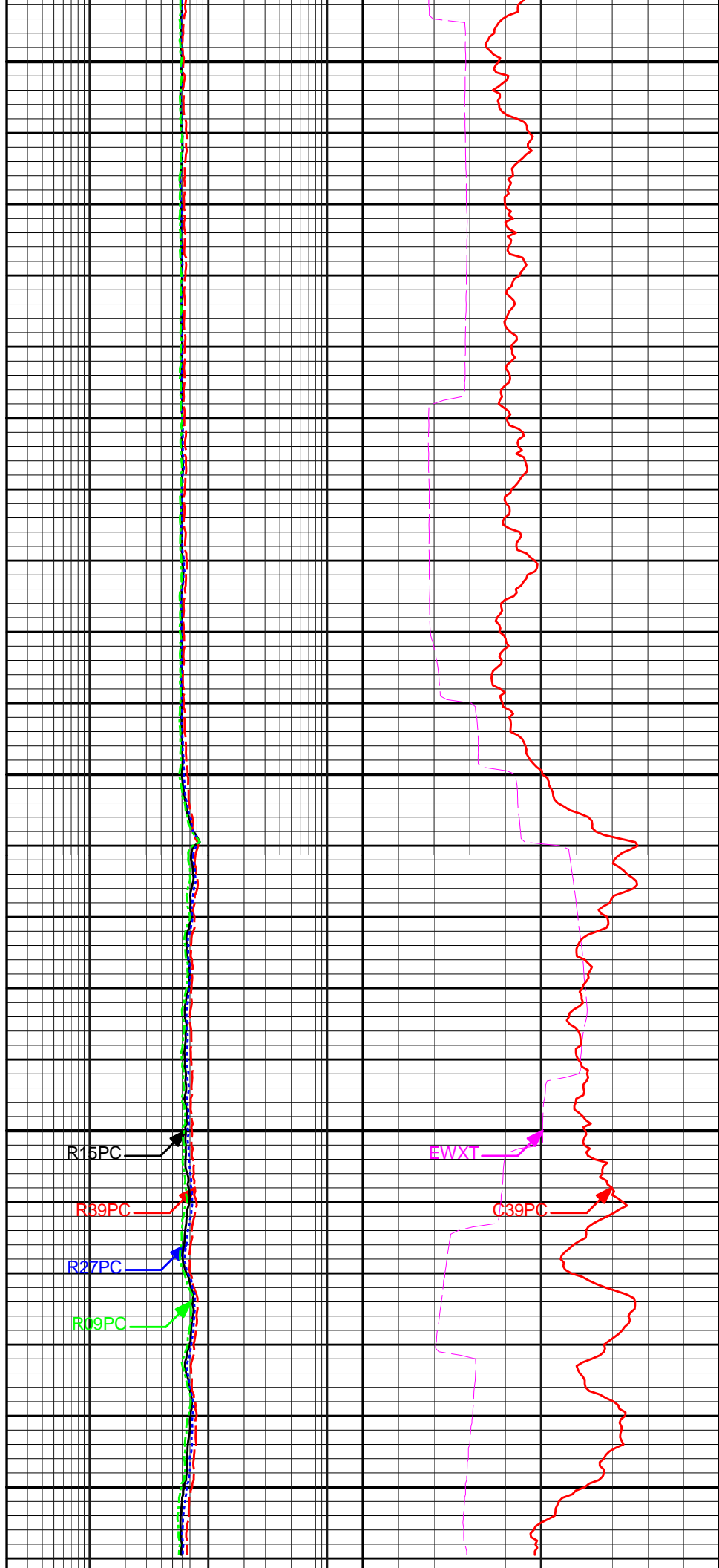
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DGRC

POPA



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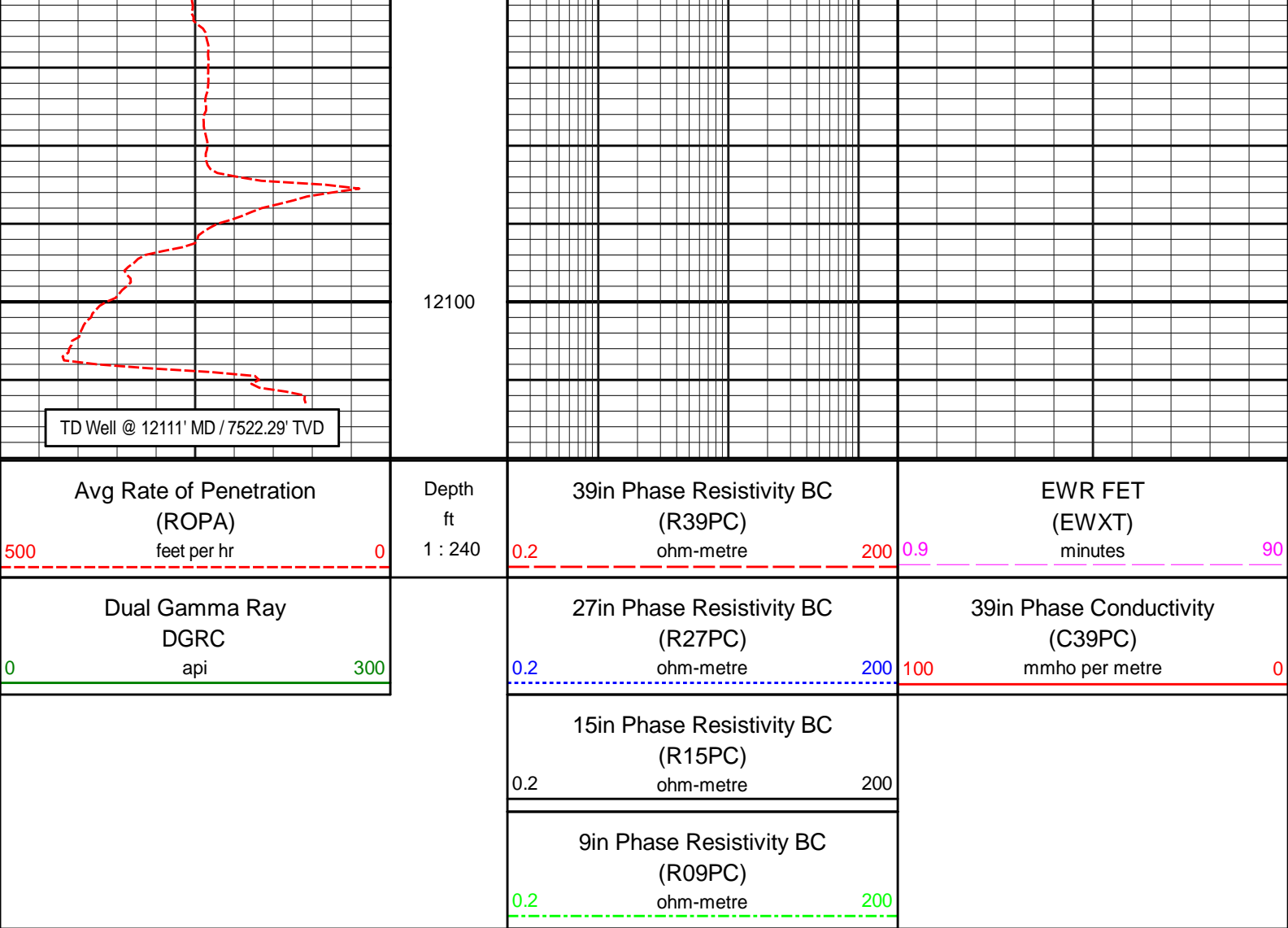
R39PC

R27PC

R09PC

EWXT

C39PC



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DIRECTIONAL SURVEY REPORT

Anadarko Petroleum Corporation
Lochbuie 4C-13HZ
Wattenberg
Weld Colorado
USA
CA-XX-0901047723

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
1193.00	0.42	68.21	1192.97	0.76 S	2.14 E	-0.76	TIE-IN
1284.00	0.20	29.00	1283.97	0.50 S	2.53 E	-0.50	0.32
1474.00	0.45	354.44	1473.97	0.54 N	2.62 E	0.54	0.16
1665.00	0.03	69.19	1664.96	1.30 N	2.59 E	1.30	0.23
1853.00	0.39	326.19	1852.96	1.85 N	2.28 E	1.85	0.21
1948.00	0.23	343.95	1947.96	2.30 N	2.05 E	2.30	0.19
2042.00	1.65	122.68	2041.95	1.75 N	3.13 E	1.75	1.95
2136.00	2.80	133.63	2135.88	0.56 S	5.93 E	-0.56	1.30
2230.00	4.56	123.05	2229.68	4.19 S	10.73 E	-4.19	2.00
2325.00	6.69	121.19	2324.22	9.11 S	18.63 E	-9.11	2.25
2419.00	8.97	120.23	2417.33	15.64 S	29.65 E	-15.64	2.43
2513.00	12.16	115.07	2509.73	23.52 S	44.95 E	-23.52	3.54
2607.00	12.99	112.69	2601.48	31.80 S	63.66 E	-31.80	1.04
2701.00	15.02	114.91	2692.68	41.00 S	84.46 E	-41.00	2.23
2795.00	13.54	115.39	2783.77	50.85 S	105.45 E	-50.85	1.58
2889.00	13.82	117.22	2875.10	60.71 S	125.27 E	-60.71	0.55

2889.00	15.82	117.23	2073.10	80.71 S	123.37 E	-80.71	0.35
3077.00	13.98	117.29	3057.60	81.39 S	165.52 E	-81.39	0.09
3172.00	15.61	120.88	3149.45	93.21 S	186.69 E	-93.21	1.97
3266.00	16.44	118.68	3239.80	106.09 S	209.22 E	-106.09	1.09
3360.00	14.97	117.54	3330.28	118.09 S	231.65 E	-118.09	1.60
3455.00	16.07	116.75	3421.82	129.68 S	254.27 E	-129.68	1.18
3550.00	13.79	115.24	3513.61	140.43 S	276.26 E	-140.43	2.43
3645.00	15.14	113.09	3605.59	150.12 S	297.91 E	-150.12	1.53
3740.00	14.06	114.35	3697.53	159.74 S	319.84 E	-159.74	1.18
3835.00	14.38	115.33	3789.61	169.55 S	341.01 E	-169.55	0.42
3930.00	16.02	115.71	3881.29	180.28 S	363.49 E	-180.28	1.73
4025.00	12.60	114.02	3973.33	190.19 S	384.77 E	-190.19	3.63
4120.00	14.10	114.40	4065.76	199.19 S	404.78 E	-199.19	1.58
4216.00	14.50	119.97	4158.79	210.02 S	425.84 E	-210.02	1.49
4311.00	15.69	121.10	4250.51	222.60 S	447.14 E	-222.60	1.29
4406.00	14.26	121.49	4342.28	235.35 S	468.12 E	-235.35	1.51
4501.00	15.56	118.33	4434.08	247.51 S	489.31 E	-247.51	1.61
4691.00	12.23	116.48	4618.50	268.58 S	529.77 E	-268.58	1.77
4786.00	13.45	112.74	4711.12	277.34 S	548.96 E	-277.34	1.55
4881.00	13.56	111.76	4803.49	285.74 S	569.50 E	-285.74	0.27
4976.00	14.42	117.98	4895.68	295.42 S	590.29 E	-295.42	1.82
5071.00	14.18	116.49	4987.74	306.16 S	611.15 E	-306.16	0.46
5165.00	12.96	117.19	5079.11	316.11 S	630.83 E	-316.11	1.31
5260.00	14.37	114.98	5171.42	325.96 S	650.99 E	-325.96	1.58
5355.00	13.07	114.86	5263.71	335.45 S	671.43 E	-335.45	1.37
5450.00	13.58	116.65	5356.15	344.97 S	691.14 E	-344.97	0.69
5545.00	14.63	121.86	5448.29	356.30 S	711.30 E	-356.30	1.73
5640.00	14.21	122.24	5540.29	368.86 S	731.35 E	-368.86	0.45
5735.00	13.02	120.91	5632.62	380.58 S	750.40 E	-380.58	1.30
5830.00	13.86	116.01	5725.02	391.06 S	769.81 E	-391.06	1.49
5925.00	14.95	116.06	5817.04	401.44 S	791.04 E	-401.44	1.15
6021.00	12.43	110.54	5910.31	410.50 S	811.84 E	-410.50	2.95
6116.00	13.63	115.97	6002.86	418.99 S	831.48 E	-418.99	1.80
6211.00	13.44	113.38	6095.22	428.28 S	851.68 E	-428.28	0.67
6306.00	11.57	107.07	6187.97	435.45 S	870.92 E	-435.45	2.44
6401.00	11.34	108.94	6281.08	441.28 S	888.87 E	-441.28	0.46
6496.00	8.95	101.92	6374.59	445.84 S	904.93 E	-445.84	2.83
6591.00	7.48	95.45	6468.61	447.95 S	918.32 E	-447.95	1.83
6686.00	5.58	97.77	6562.99	449.17 S	929.05 E	-449.17	2.02
6782.00	3.57	104.64	6658.68	450.55 S	936.57 E	-450.55	2.17
6877.00	1.47	107.14	6753.59	451.66 S	940.60 E	-451.66	2.21
6972.00	0.26	38.74	6848.57	451.85 S	941.90 E	-451.85	1.47
7067.00	2.17	0.42	6943.55	449.88 S	942.04 E	-449.88	2.08
7115.00	6.20	358.85	6991.41	446.38 S	942.00 E	-446.38	8.40
7162.00	9.24	355.29	7037.98	440.08 S	941.64 E	-440.08	6.54
7210.00	12.70	356.20	7085.10	430.97 S	940.97 E	-430.97	7.22
7257.00	16.64	358.60	7130.56	419.09 S	940.47 E	-419.09	8.48
7305.00	20.95	0.35	7175.99	403.63 S	940.35 E	-403.63	9.05
7352.00	25.83	1.42	7219.11	384.98 S	940.65 E	-384.98	10.42
7400.00	31.04	0.47	7261.31	362.13 S	941.02 E	-362.13	10.89
7447.00	36.17	359.70	7300.44	336.13 S	941.04 E	-336.13	10.95
7495.00	41.30	0.85	7337.87	306.11 S	941.20 E	-306.11	10.79
7543.00	46.00	2.05	7372.59	273.00 S	942.06 E	-273.00	9.94
7591.00	52.28	2.92	7403.98	236.75 S	943.64 E	-236.75	13.15
7638.00	58.57	2.35	7430.64	198.11 S	945.41 E	-198.11	13.42
7686.00	63.69	2.10	7453.80	156.12 S	947.04 E	-156.12	10.68
7733.00	68.87	0.30	7472.71	113.12 S	947.93 E	-113.12	11.56
7781.00	74.06	0.29	7487.96	67.62 S	948.16 E	-67.62	10.81
7828.00	76.32	0.92	7499.97	22.19 S	948.65 E	-22.19	4.98
7876.00	80.77	1.48	7509.50	24.83 N	949.63 E	24.83	9.34
7923.00	83.67	1.51	7515.86	71.38 N	950.85 E	71.38	6.17
7945.00	86.36	1.63	7517.77	93.28 N	951.45 E	93.28	12.24
8047.00	89.69	0.98	7521.29	195.18 N	953.77 E	195.18	3.33
8143.00	89.26	358.86	7522.17	291.17 N	953.63 E	291.17	2.25
8238.00	91.30	358.89	7521.71	386.15 N	951.77 E	386.15	2.15
8333.00	91.36	357.92	7519.50	481.08 N	949.13 E	481.08	1.02
8428.00	89.07	357.90	7519.14	576.01 N	945.66 E	576.01	2.41
8523.00	90.00	357.42	7519.92	670.93 N	941.78 E	670.93	1.10
8619.00	89.57	357.04	7520.27	766.82 N	937.14 E	766.82	0.60
8714.00	87.96	358.09	7522.32	861.71 N	933.11 E	861.71	2.02
8809.00	87.22	357.41	7526.32	956.55 N	929.38 E	956.55	1.06
8904.00	88.70	359.36	7529.70	1051.44 N	926.71 E	1051.44	2.58
8999.00	89.63	0.50	7531.08	1146.43 N	926.59 E	1146.43	1.55
9095.00	90.68	0.86	7530.82	1242.42 N	927.73 E	1242.42	1.16
9190.00	90.80	359.93	7529.60	1337.41 N	928.38 E	1337.41	0.99

9286.00	91.30	359.13	7527.84	1433.39 N	927.60 E	1433.39	0.98
9381.00	91.73	358.63	7525.33	1528.34 N	925.74 E	1528.34	0.69
9476.00	91.24	358.65	7522.86	1623.28 N	923.49 E	1623.28	0.52
9571.00	90.80	0.04	7521.17	1718.25 N	922.40 E	1718.25	1.53
9666.00	90.12	0.26	7520.41	1813.25 N	922.65 E	1813.25	0.75
9761.00	89.32	0.35	7520.88	1908.25 N	923.16 E	1908.25	0.85
9856.00	89.63	359.45	7521.75	2003.24 N	922.99 E	2003.24	1.00
9952.00	90.06	359.33	7522.01	2099.24 N	921.97 E	2099.24	0.47
10047.00	90.19	358.52	7521.80	2194.22 N	920.18 E	2194.22	0.86
10142.00	89.75	0.23	7521.85	2289.21 N	919.15 E	2289.21	1.86
10237.00	89.94	359.95	7522.10	2384.21 N	919.30 E	2384.21	0.36
10332.00	89.57	1.50	7522.51	2479.20 N	920.50 E	2479.20	1.68
10523.00	90.37	1.74	7522.61	2670.12 N	925.90 E	2670.12	0.44
10618.00	90.00	1.08	7522.30	2765.09 N	928.24 E	2765.09	0.80
10713.00	90.00	0.66	7522.30	2860.08 N	929.68 E	2860.08	0.44
10808.00	89.94	0.19	7522.35	2955.07 N	930.38 E	2955.07	0.50
10903.00	89.69	359.74	7522.66	3050.07 N	930.33 E	3050.07	0.54
10999.00	90.19	1.25	7522.76	3146.07 N	931.16 E	3146.07	1.66
11094.00	90.31	0.67	7522.35	3241.05 N	932.75 E	3241.05	0.62
11189.00	90.37	359.74	7521.78	3336.05 N	933.09 E	3336.05	0.98
11284.00	90.80	1.38	7520.81	3431.04 N	934.02 E	3431.04	1.78
11379.00	90.87	1.31	7519.43	3526.00 N	936.24 E	3526.00	0.10
11475.00	90.25	0.92	7518.49	3621.98 N	938.11 E	3621.98	0.76
11570.00	88.52	0.80	7519.51	3716.96 N	939.54 E	3716.96	1.83
11665.00	88.33	0.92	7522.12	3811.91 N	940.96 E	3811.91	0.24
11760.00	90.12	1.18	7523.41	3906.88 N	942.70 E	3906.88	1.90
11855.00	90.25	0.51	7523.10	4001.87 N	944.11 E	4001.87	0.72
11950.00	90.37	359.79	7522.59	4096.87 N	944.35 E	4096.87	0.77
12045.00	89.88	359.42	7522.38	4191.86 N	943.70 E	4191.86	0.65
12071.00	90.12	359.41	7522.38	4217.86 N	943.43 E	4217.86	0.92
12111.00	90.12	359.41	7522.29	4257.86 N	943.02 E	4257.86	0.00

CALCULATION BASED ON MINIMUM CURVATURE METHOD

**SURVEY COORDINATES RELATIVE TO WELL SYSTEM REFERENCE POINT
TVD VALUES GIVEN RELATIVE TO DRILLING MEASUREMENT POINT**

**VERTICAL SECTION RELATIVE TO WELL HEAD
VERTICAL SECTION IS COMPUTED ALONG A DIRECTION OF 0.00 DEGREES (TRUE)
A TOTAL CORRECTION OF 8.50 DEG FROM MAGNETIC NORTH TO TRUE NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 12111.00 FEET
IS 4361.04 FEET ALONG 12.49 DEGREES (TRUE)**

All directional surveys tied on to the last gyro survey at 1193.00' MD. Final survey is a straight-line projection to the bit.