

# DGR Dual Gamma Ray

1:240

[illegible]

## WELL INFORMATION

<b>MWD Run Number</b>	300				
<b>Date run completed</b>	07-Apr-13				
<b>Rig Bit Number</b>	0300				
<b>Bit Size (in)</b>	6.125				
<b>Tool Nominal OD (in)</b>	4.750				
<b>Log Start Depth (MD, ft)</b>	7,488.00				
<b>Log End Depth (MD, ft)</b>	16,620.00				
<b>Drill or Wipe</b>	Drill				
<b>Drill/Wipe Start Date and Time</b>	02-Apr-13 07:30				
<b>Drill/Wipe End Date and Time</b>	06-Apr-13 06:30				
<b>Min Inc (deg) @ Depth (MD, ft)</b>	86.48 @ 12,632.00				
<b>Max Inc (deg) @ Depth (MD, ft)</b>	92.78 @ 14,337.00				
<b>Bit TFA(in2) / Bit Type</b>	.61 / PDC				
<b>Flow Rate (gpm)</b>	265.48				
<b>Max AV (fpm) / CV (fpm) @ MWD</b>	377.0 / N/A				
<b>Fluid Type</b>	Mineral Oil Bas				
<b>Density (ppg) / Viscosity (spqt)</b>	9.50 / 59.00				
<b>Filtrate CL (ppm)</b>	51,000.00				
<b>pH / Fluid Loss (mptm)</b>	N/A / N/A				
<b>PV (cP) / YP (lhf2)</b>	12 / 10.00				
<b>% Solids / % Sand</b>	9.1 / 4.5				
<b>% Oil / Oil:Water Ratio</b>	60 / 69:31				
<b>Rm @ Measured Temp (degF)</b>	N/A @ N/A				
<b>Rmf @ Measured Temp (degF)</b>	N/A @ N/A				
<b>Rmc @ Measured Temp (degF)</b>	N/A @ N/A				
<b>Max Tool Temp (degF) / Source</b>	264.94 / HCIM				
<b>Rm @ Max Tool Temp (degF)</b>	N/A @ 264.94				
<b>Lead MWD Engineer</b>	Ryan White				
<b>Customer Representative</b>	Travis Lourence				

Sensor Information					
Downhole Processor Information					
Tool Type	HCIM				
Software Version	88.56				
Sub Serial Number	11512741				
Insert Serial Number	11174659				
Date and Time Initialized	02-Apr-13 00:55				
Date and Time Read	07-Apr-13 05:46				
ECMB SW Version	N/A				
Directional Sensor Information					
Tool Type	PCDC				
Distance From Bit (ft)	46.00				
Software Version	6.21				
Sub Serial Number	11108036				
Sonde Serial Number	11833236				
Sensor ID Number	N/A				
Toolface Offset (deg)	346.03				
Gamma Ray Sensor Information					
Tool Type	DGR				
Distance From Bit (ft)	65.68				
Recorded Sample Period (sec)	8				
Software Version	N/A				
Sub Serial Number	11512741				
Insert/Sonde Serial Number	10441358				
Resistivity Sensor Information					
Tool Type	Slim P4				
Distance From Bit (ft)	58.71				
Recorded Sample Period (sec)	6				
Software Version	5.55				
Sub Serial Number	11207473				
Receiver Insert Serial Number	265649				
Transmitter Insert Serial Number	192688				
Receiver Orientation	Down				
Pulser Controller Sensor Information					
Tool Type	PCM				
Software Version	8.04				
PIC Software Version					
Sub/HOC Serial Number	10507567				
Insert/Probe/Module SN	10809551				
Battery Serial Number	N/A				
Valve Insert SN	N/A				
DC Insert Serial Number	N/A				
Choke Size (32nd)	N/A				
Driver Current (amps)	N/A				
Driver SMI Current (amps)	N/A				
Boot Strap Version					
DDSr-DGR Sensor Information					
Tool Type	DDSr-DGR				
Distance From Bit (ft)	68.10				
Recorded Sample Period (sec)	12				
Software Version	10.72				

Sub Serial Number	11512741				
Insert Serial Number	11664672				
Sensor ID Number	8238				

REMARKS
<div>1. All depths are referenced to the Driller's pipe tally and are measured from the Drill Floor, unless otherwise specified.</div> <div>2. No depth corrections have been made for pipe stretch or compression.</div> <div>3. All data presented is recorded data unless otherwise specified</div> <div>4. The following smoothing parameters have been applied to the data:<div>Slim-Phase 4 (Electromagnetic Wave Resistivity):<div>Interval Resolution: 0.5ft Interval Distance: 0.6ft Gap Fill: 3.0ft</div><div>DGR (Corrected Gamma Ray):<div>Interval Resolution: 0.5 ft Interval Distance: 0.6 ft Gap Fill: 3.0 ft</div><div>ROPA (Average Rate of Penetration):<div>Interval Resolution: 0.5 ft Interval Distance: 1.2 ft Gap Fill : 3.0 ft</div></div></div></div><div>5. INSITE version 7.4.1</div></div>

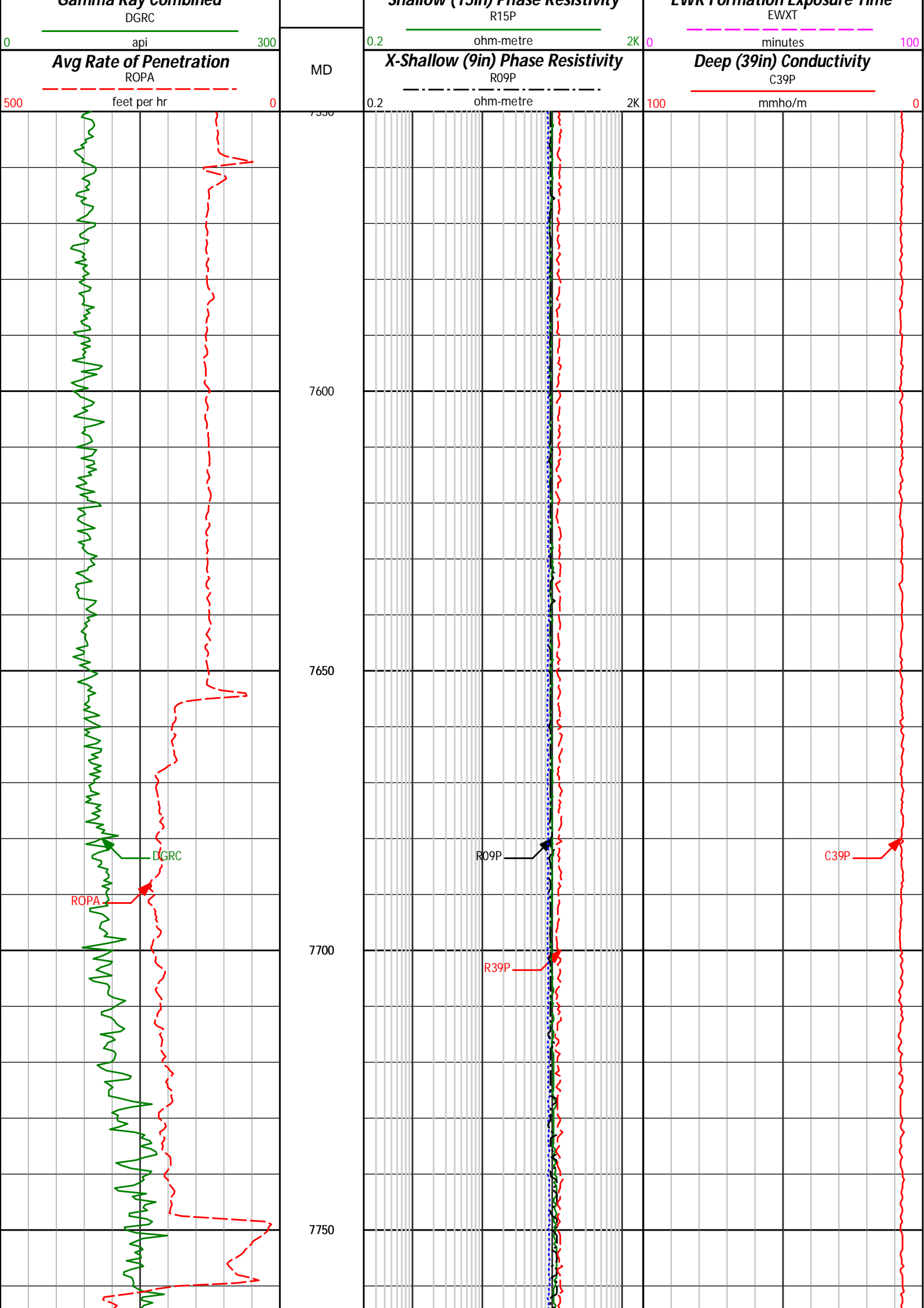
WARRANTY
HALLIBURTON WILL USE ITS BEST EFFORTS TO FURNISH CUSTOMERS WITH ACCURATE INFORMATION AND INTERPRETATIONS THAT ARE PART OF, AND INCIDENT TO, THE SERVICES PROVIDED. HOWEVER, HALLIBURTON CANNOT AND DOES NOT WARRANT THE ACCURACY OR CORRECTNESS OF SUCH INFORMATION AND INTERPRETATIONS. UNDER NO CIRCUMSTANCES SHOULD ANY SUCH INFORMATION OR INTERPRETATION BE RELIED UPON AS THE SOLE BASIS FOR ANY DRILLING, COMPLETION, PRODUCTION, OR FINANCIAL DECISION OR ANY PROCEDURE INVOLVING ANY RISK TO THE SAFETY OF ANY DRILLING VENTURE, DRILLING RIG OR ITS CREW OR ANY OTHER THIRD PARTY. THE CUSTOMER HAS FULL RESPONSIBILITY FOR ALL DRILLING, COMPLETION AND PRODUCTION OPERATION. HALLIBURTON MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO THE SERVICES RENDERED. IN NO EVENT WILL HALLIBURTON BE LIABLE FOR FAILURE TO OBTAIN ANY PARTICULAR RESULTS OR FOR ANY DAMAGES, INCLUDING, BUT NOT LIMITED TO, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES, RESULTING FROM THE USE OF ANY INFORMATION OR INTERPRETATION PROVIDED BY HALLIBURTON.

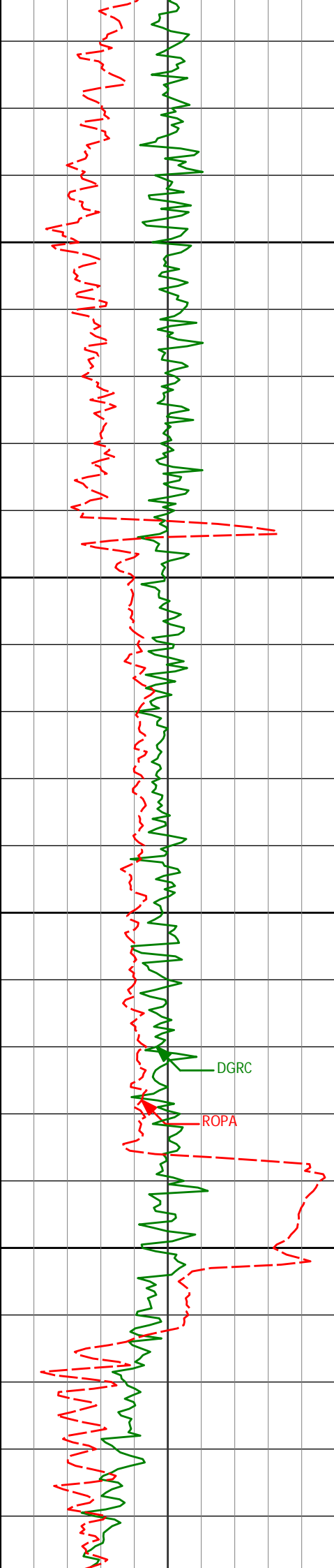
HALLIBURTON

Sperry Drilling Services

MD Detail Log 1:240

	<div>Deep (39in) Phase Resistivity</div> <div>R39P</div> <div><div>0.2</div><div>ohm-metre</div><div>2K</div></div>	
	<div>Medium (27in) Phase Resistivity</div> <div>R27P</div> <div><div>0.2</div><div>ohm-metre</div><div>2K</div></div>	
Gamma Ray Combined	Shallow (15in) Phase Resistivity	EWP Formation Exposure Time



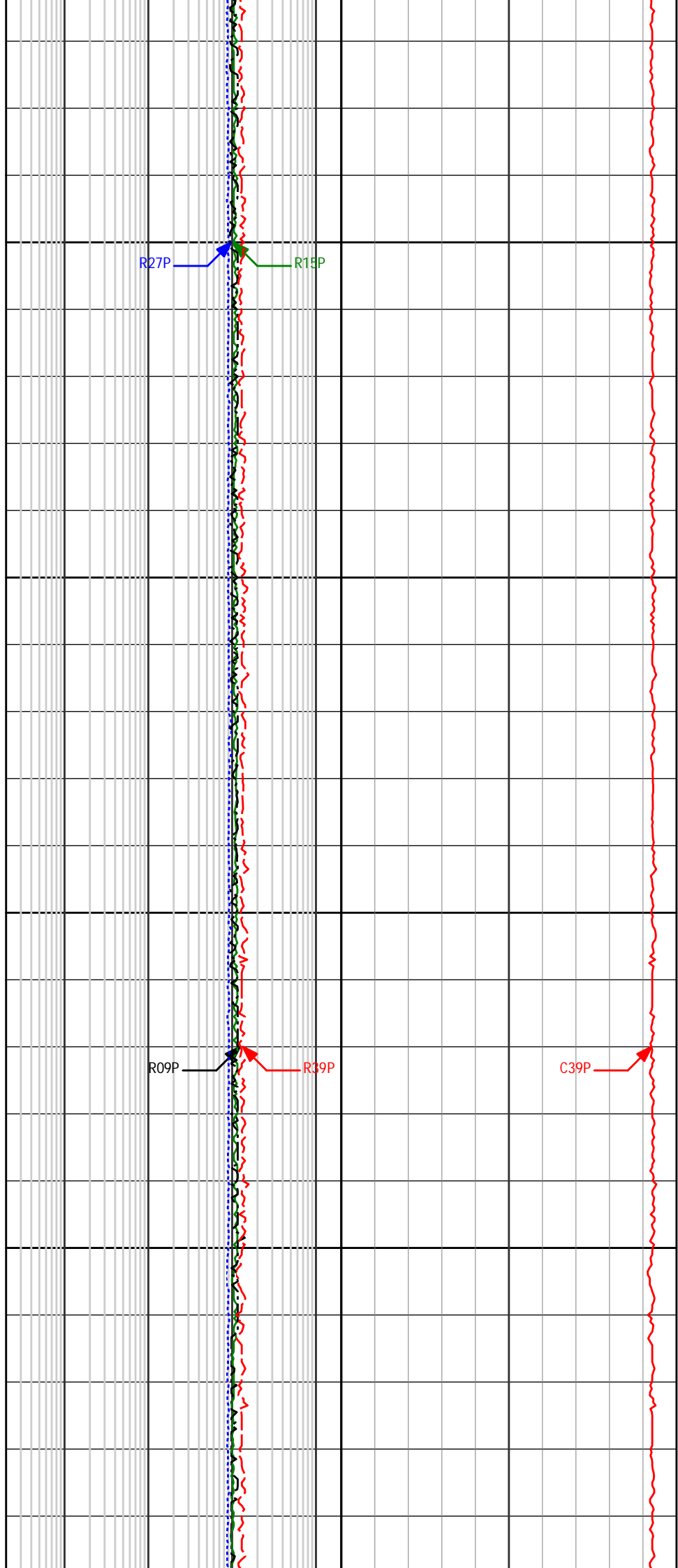


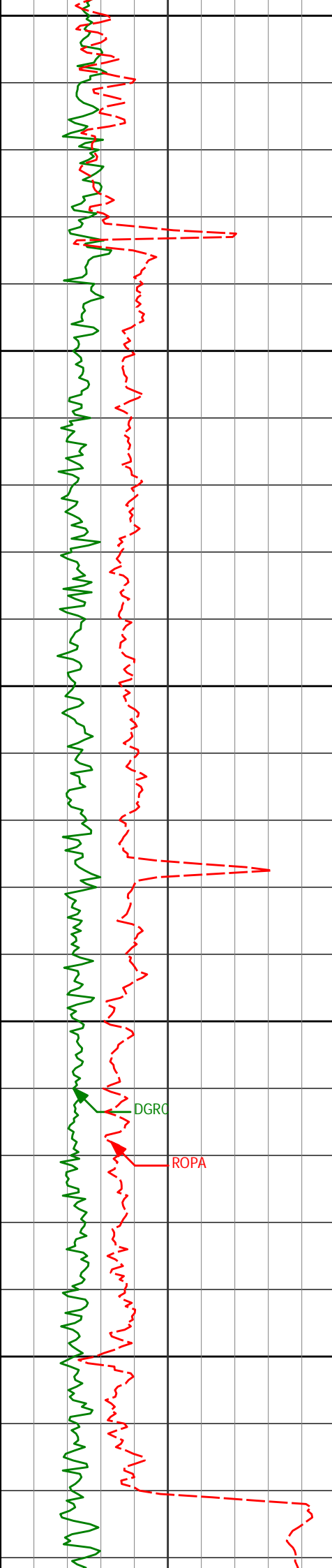
7800

7850

7900

7950





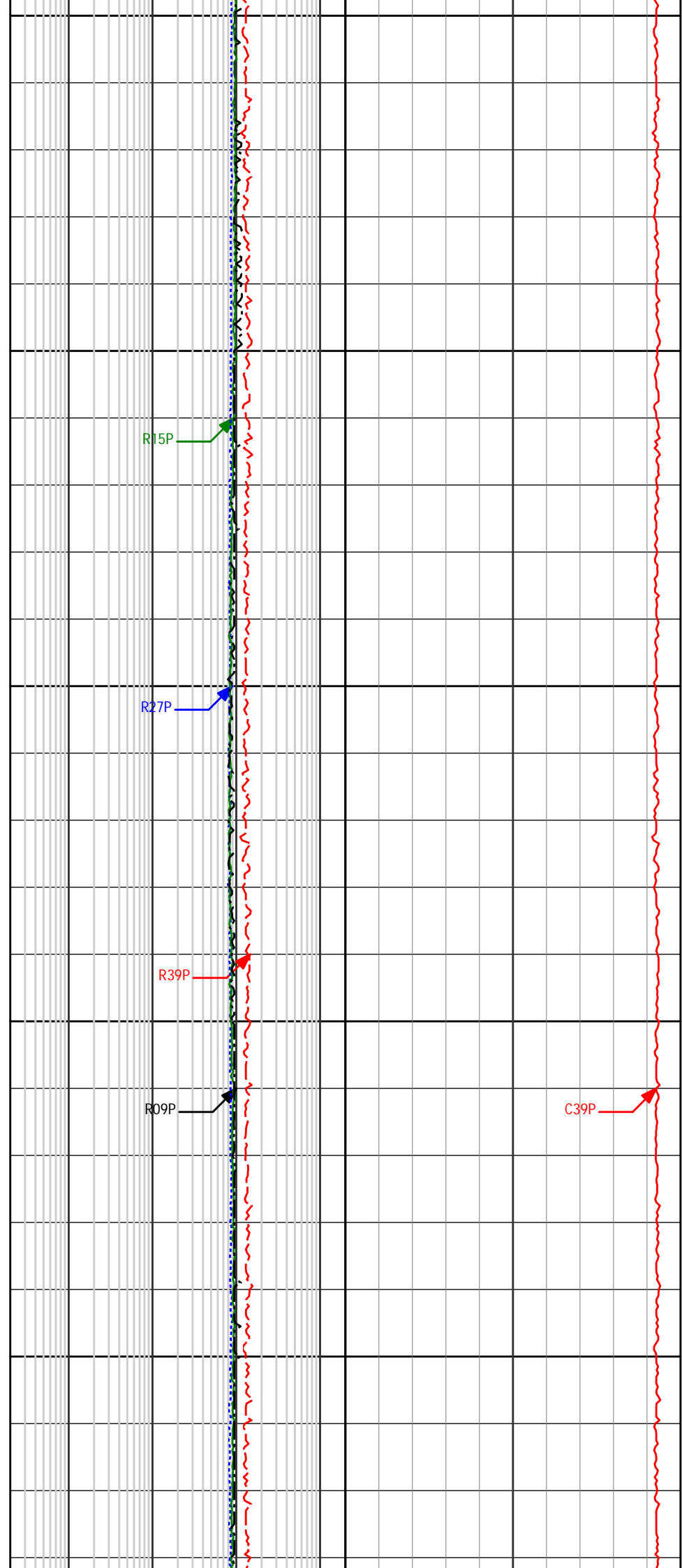
8000

8050

8100

8150

8200



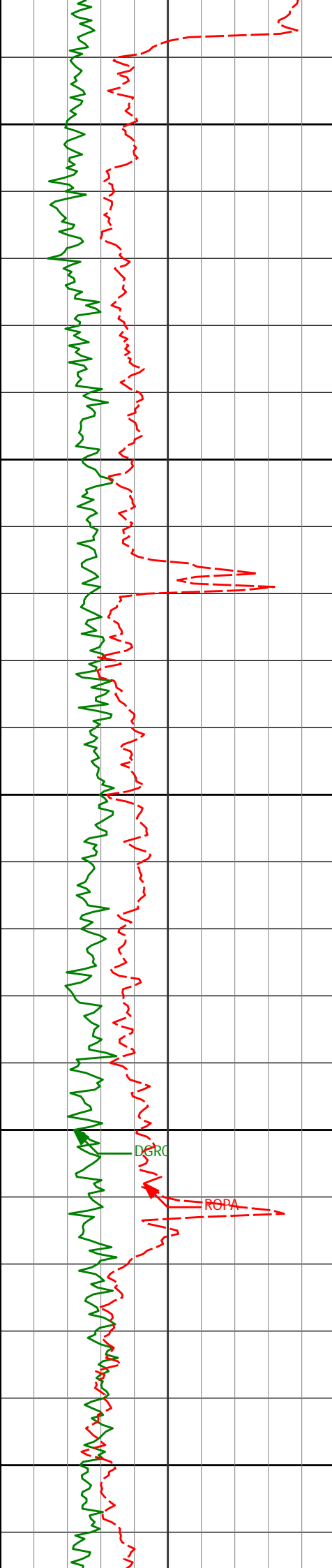
R15P

R27P

R39P

R09P

C39P



8250

8300

8350

8400

8450

R15P

R39P

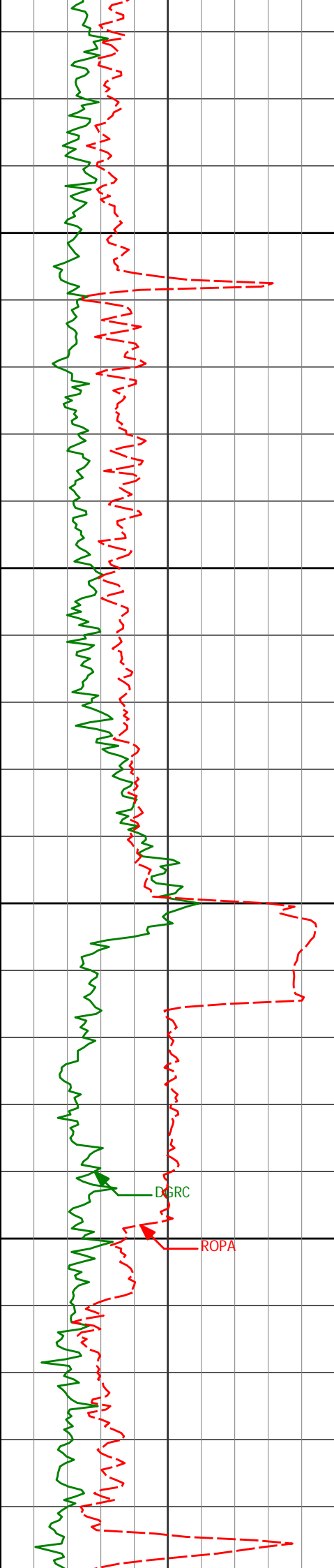
R27P

R09P

C39P

DGR0

ROPA



8500

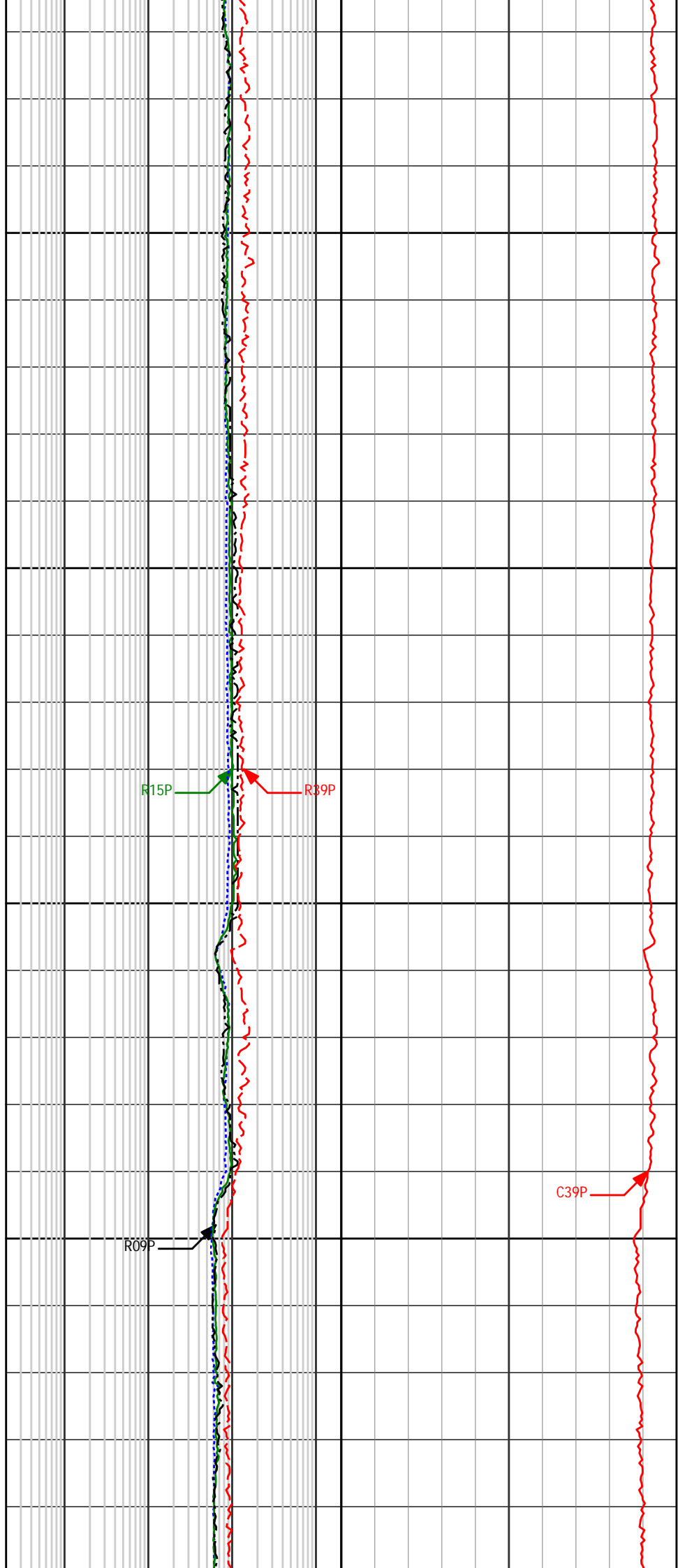
8550

8600

8650

D6RC

ROPA

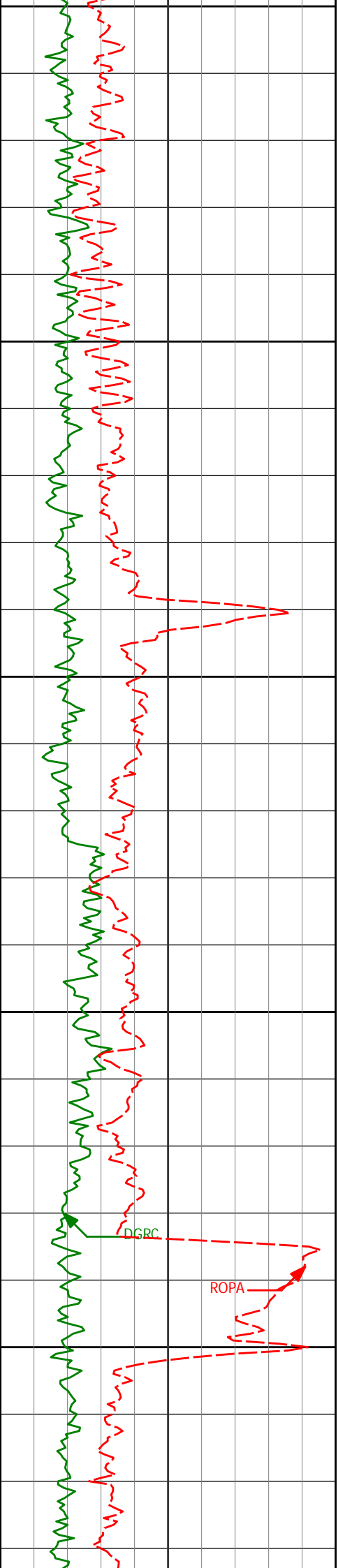


R15P

R39P

R09P

C39P



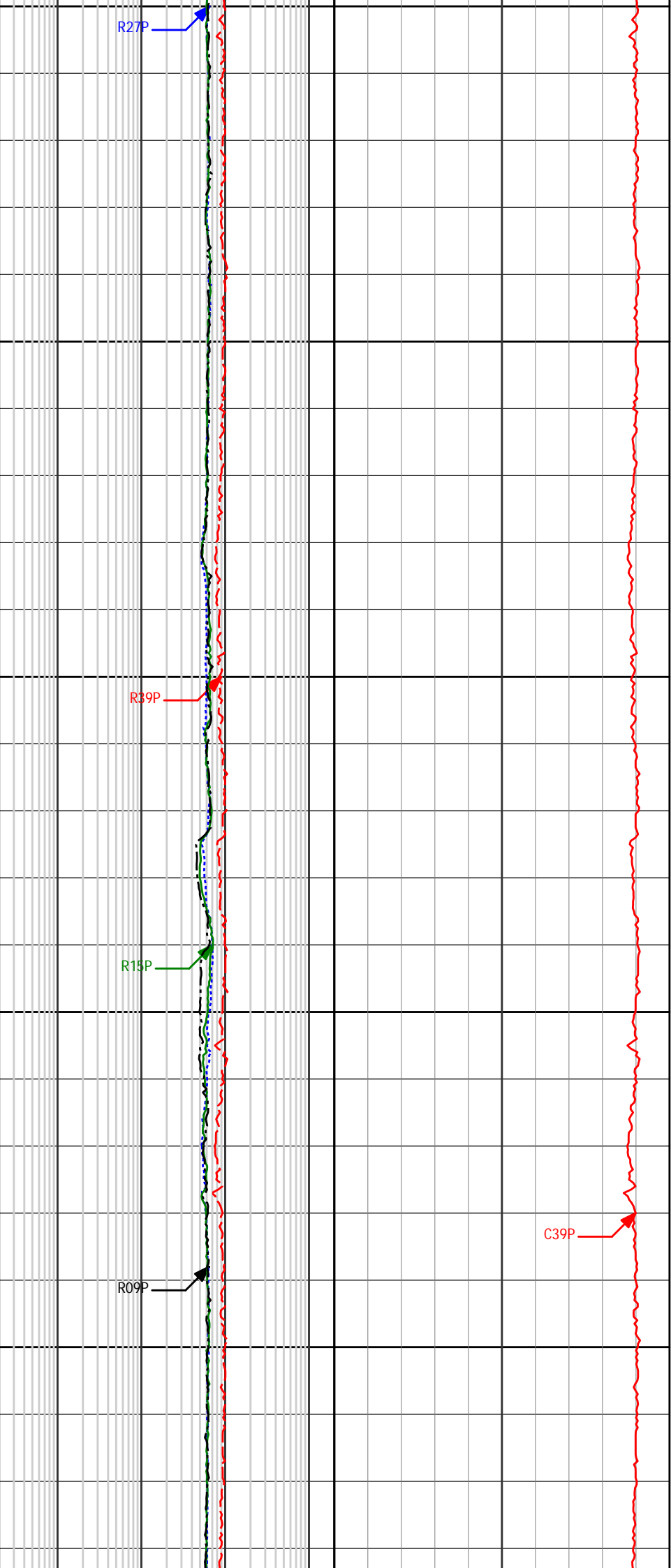
8700

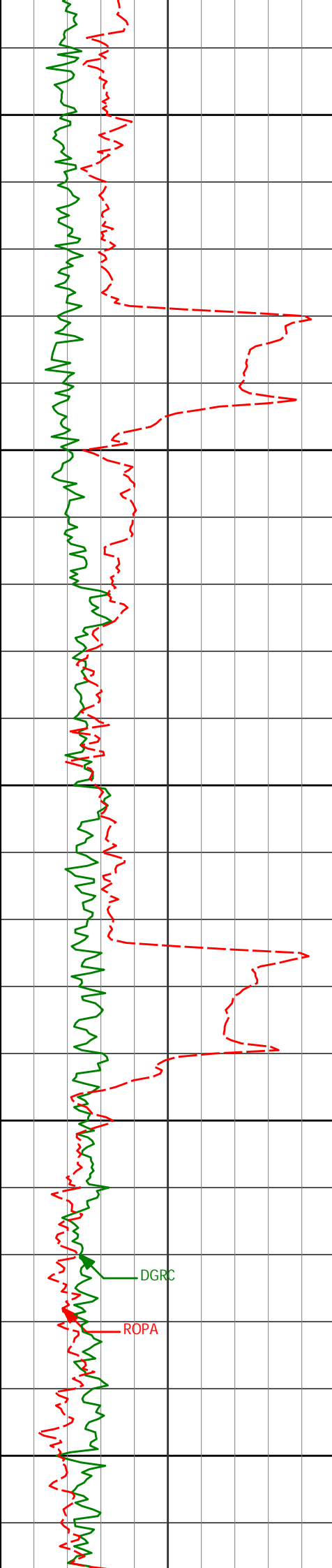
8750

8800

8850

8900





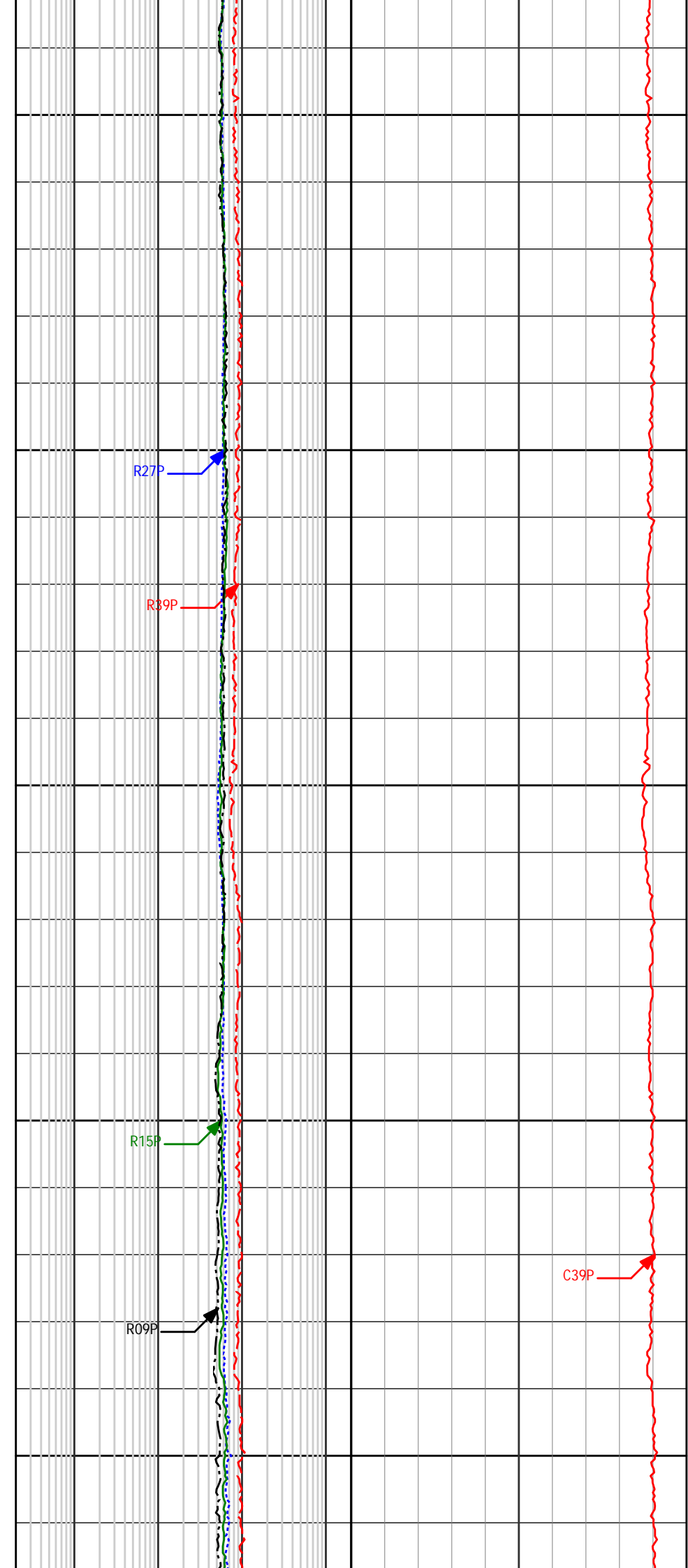
8950

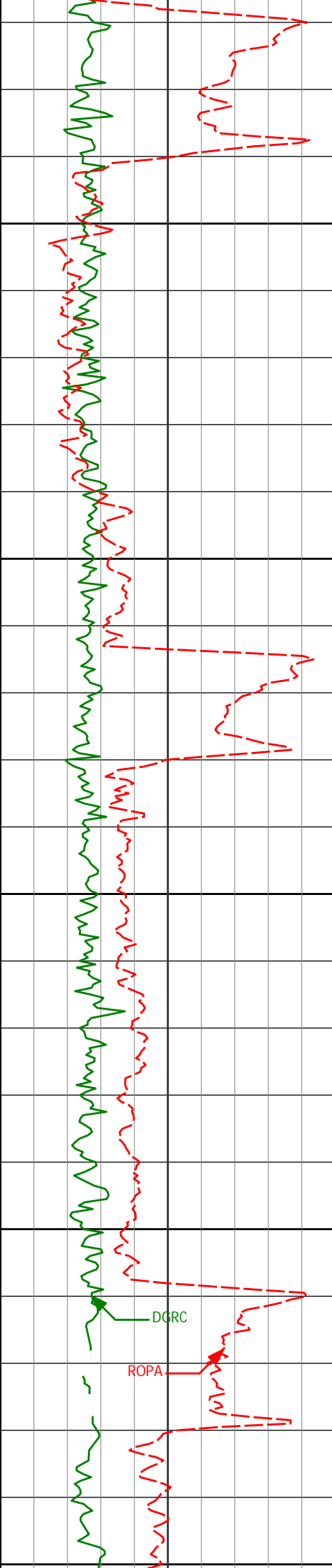
9000

9050

9100

9150





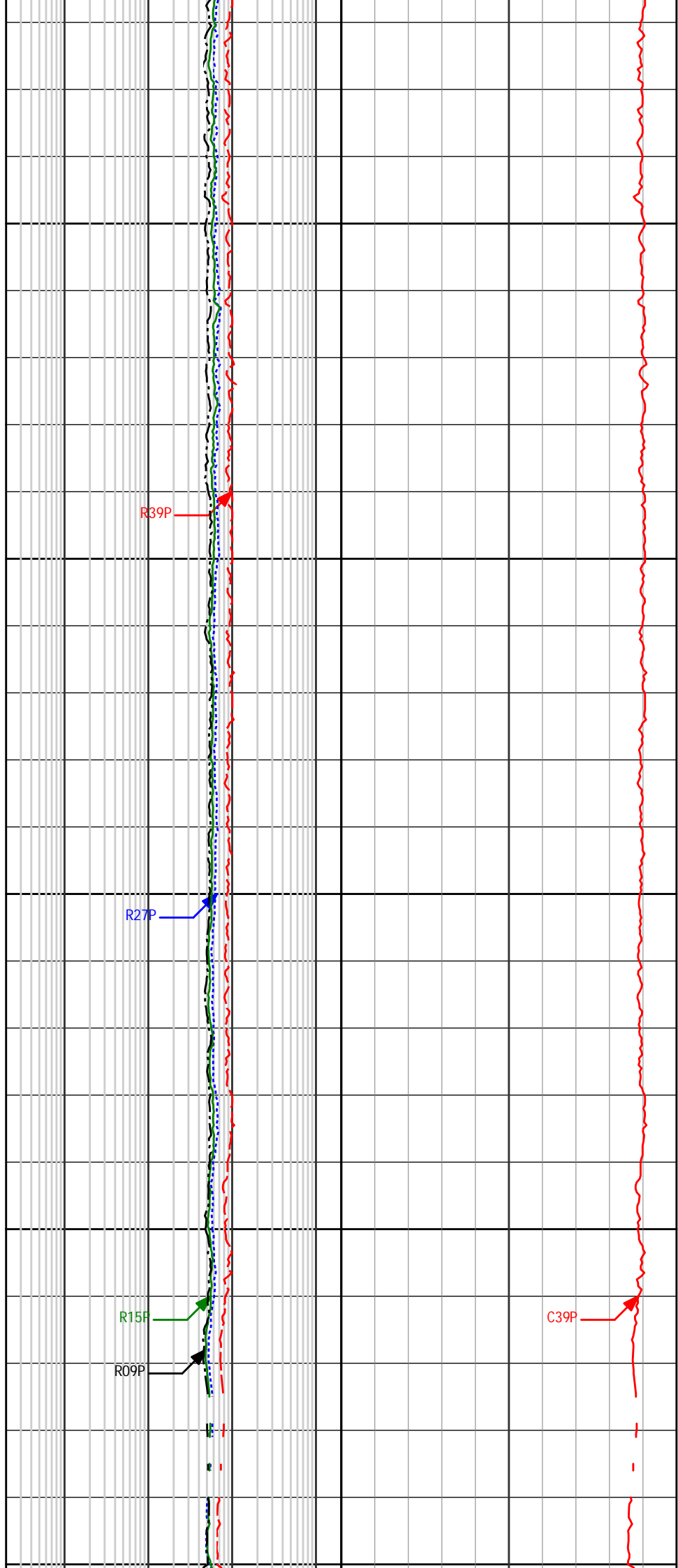
9200

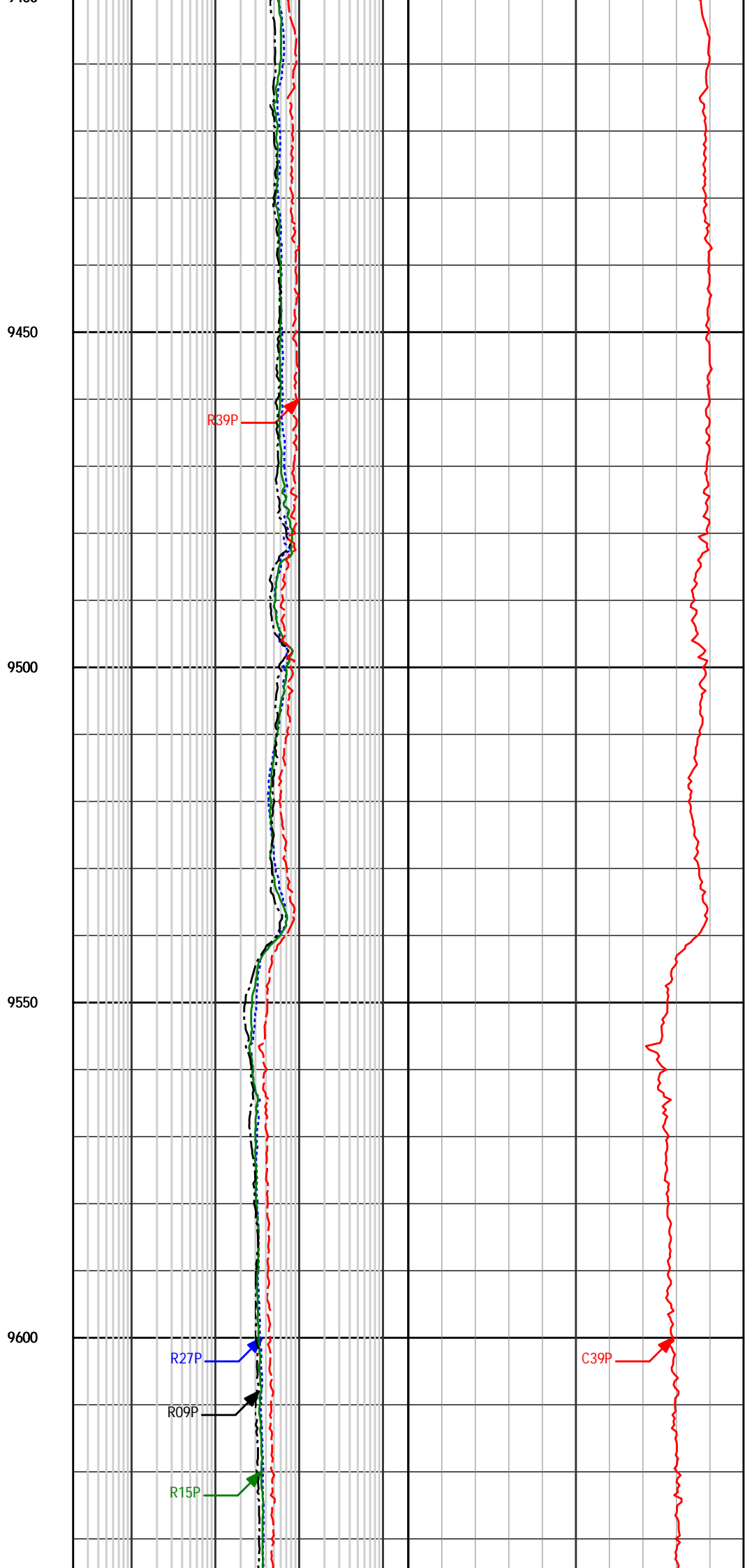
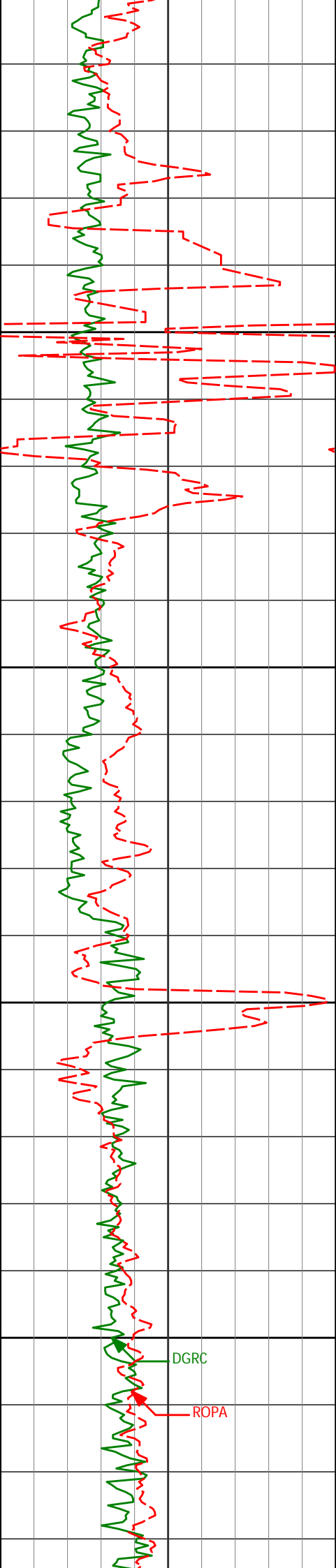
9250

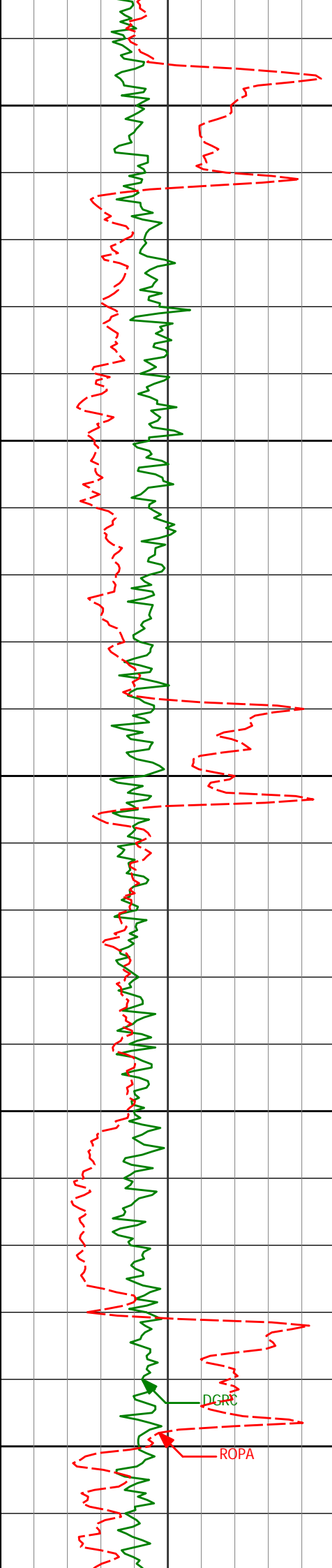
9300

9350

9400







9650

9700

9750

9800

9850

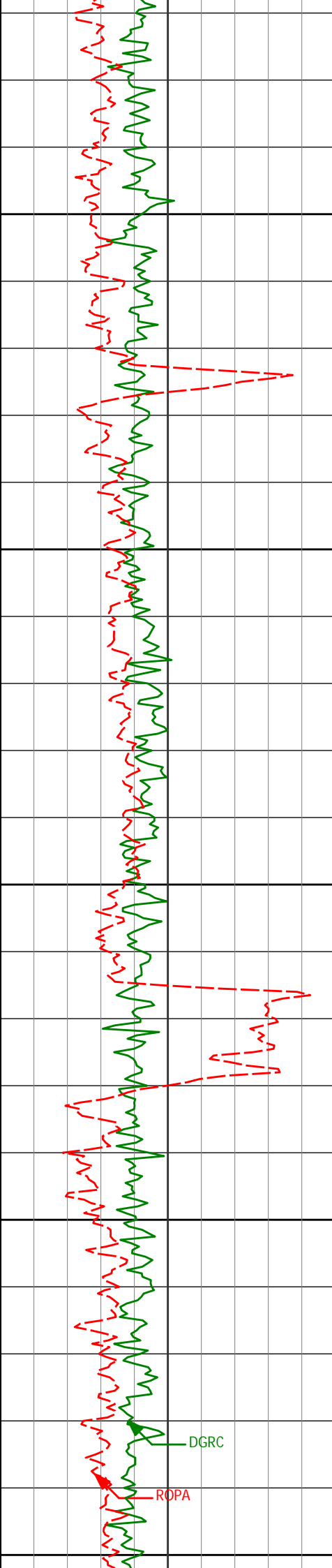
R39P

DGR

ROPA

R09P

C39P



9900

9950

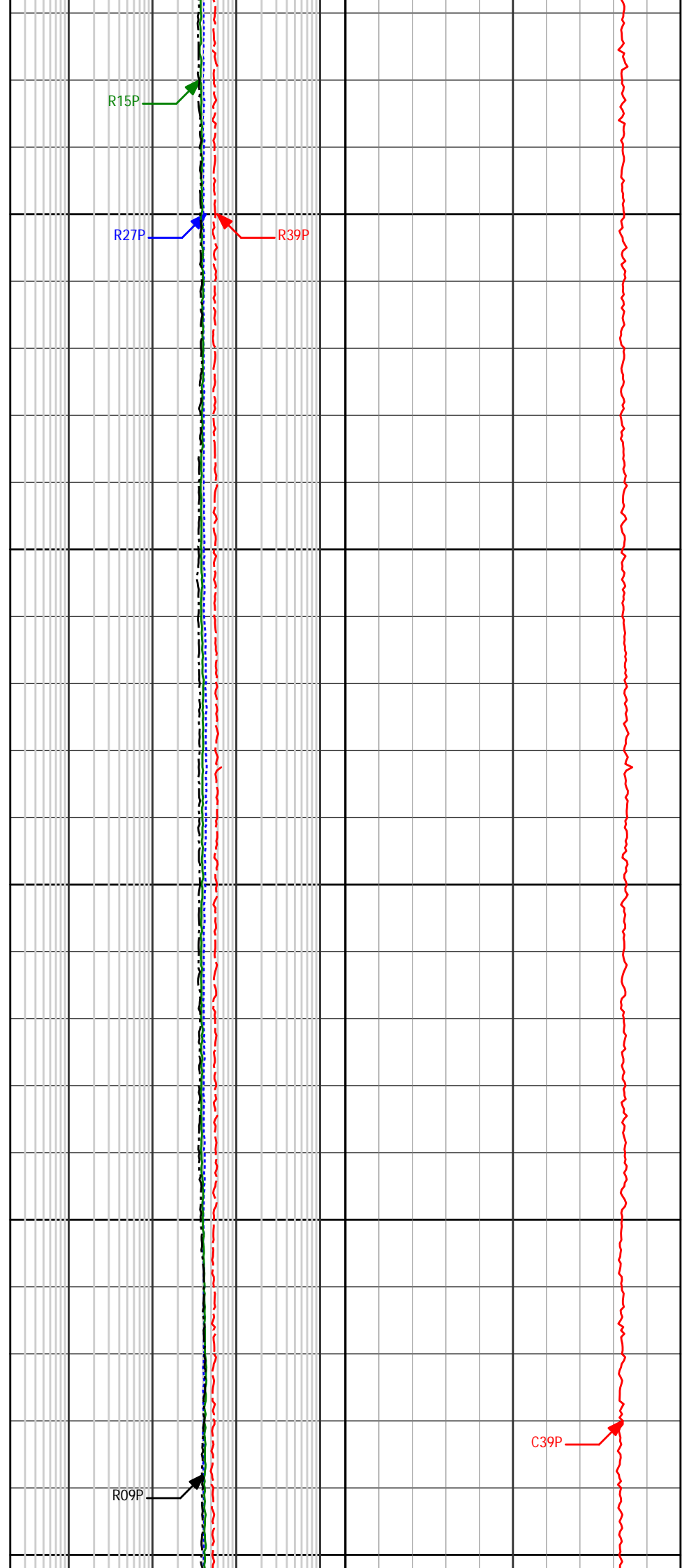
10000

10050

10100

DGRC

ROPA



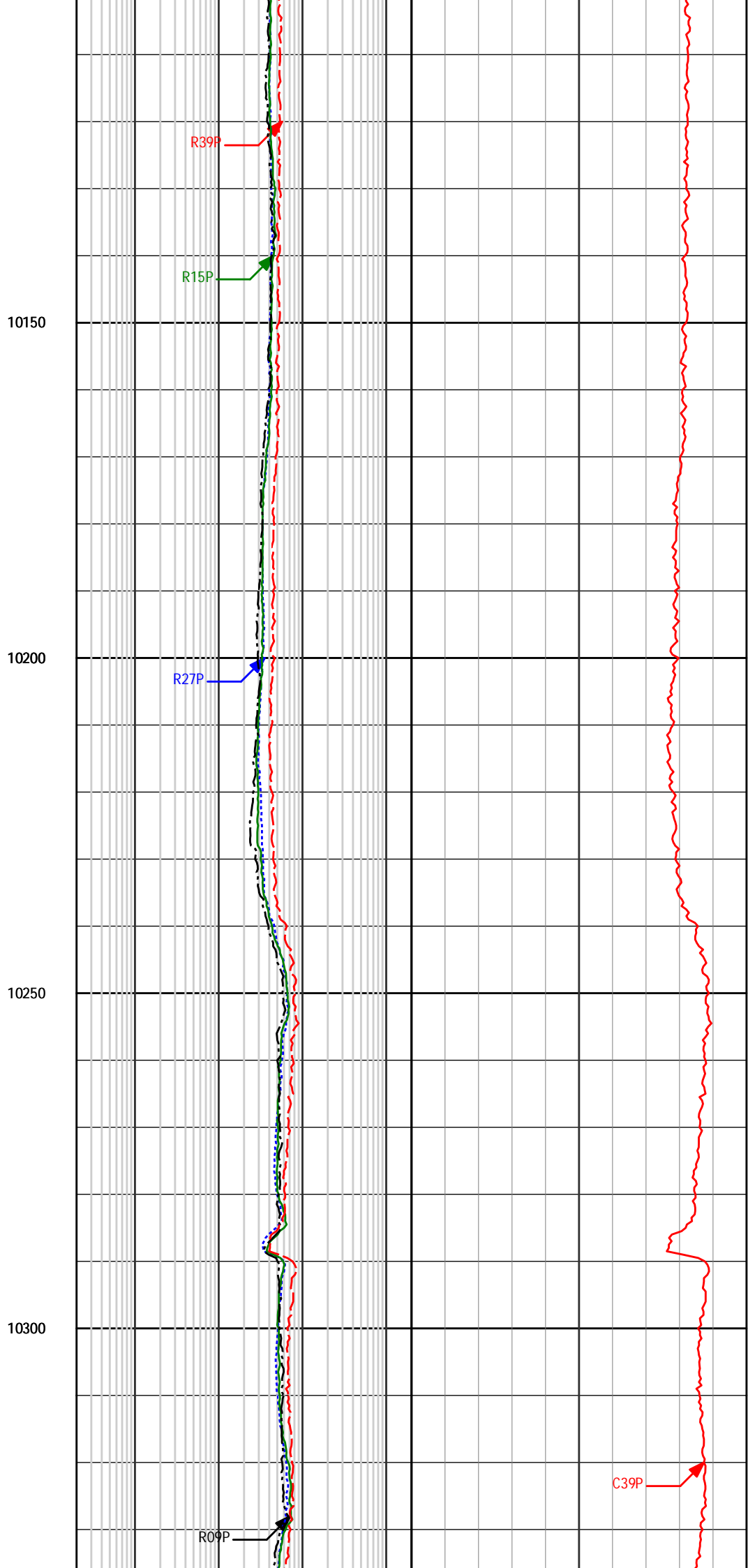
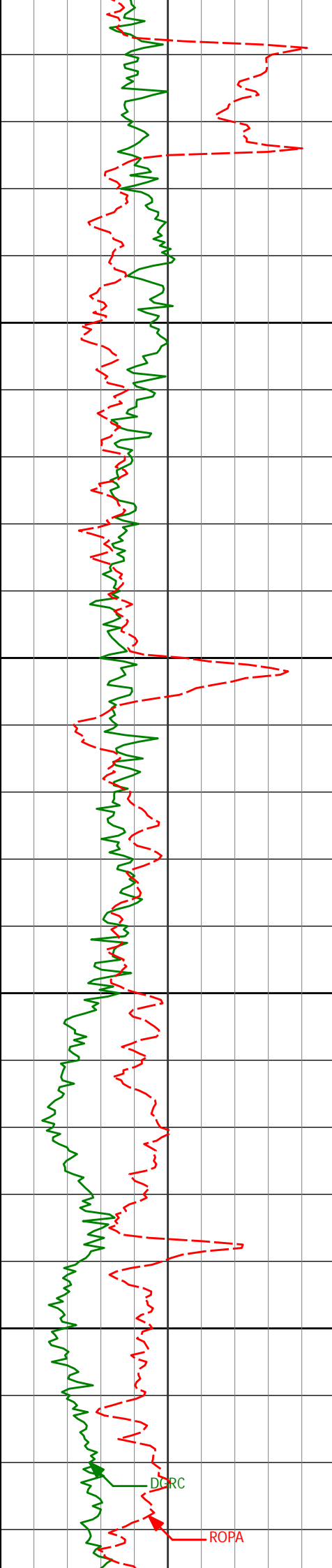
R15P

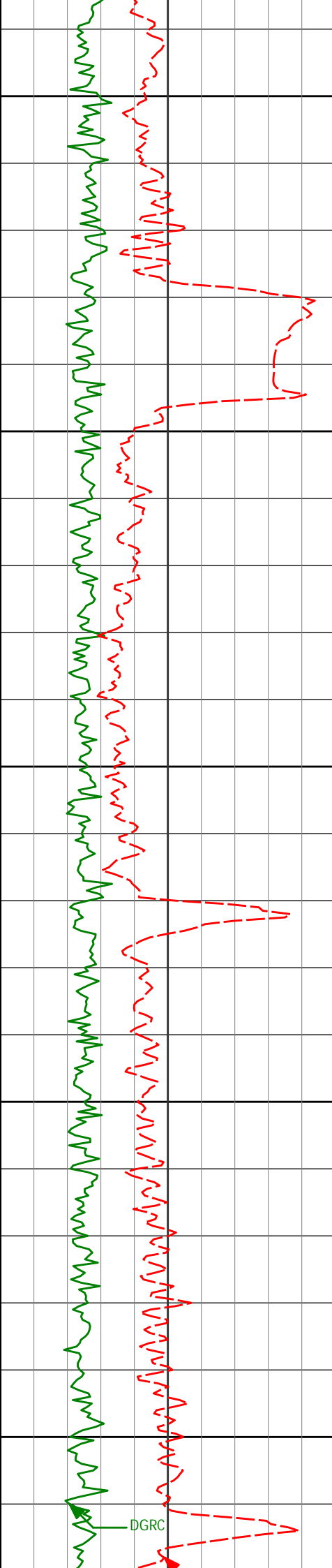
R27P

R39P

R09P

C39P





10350

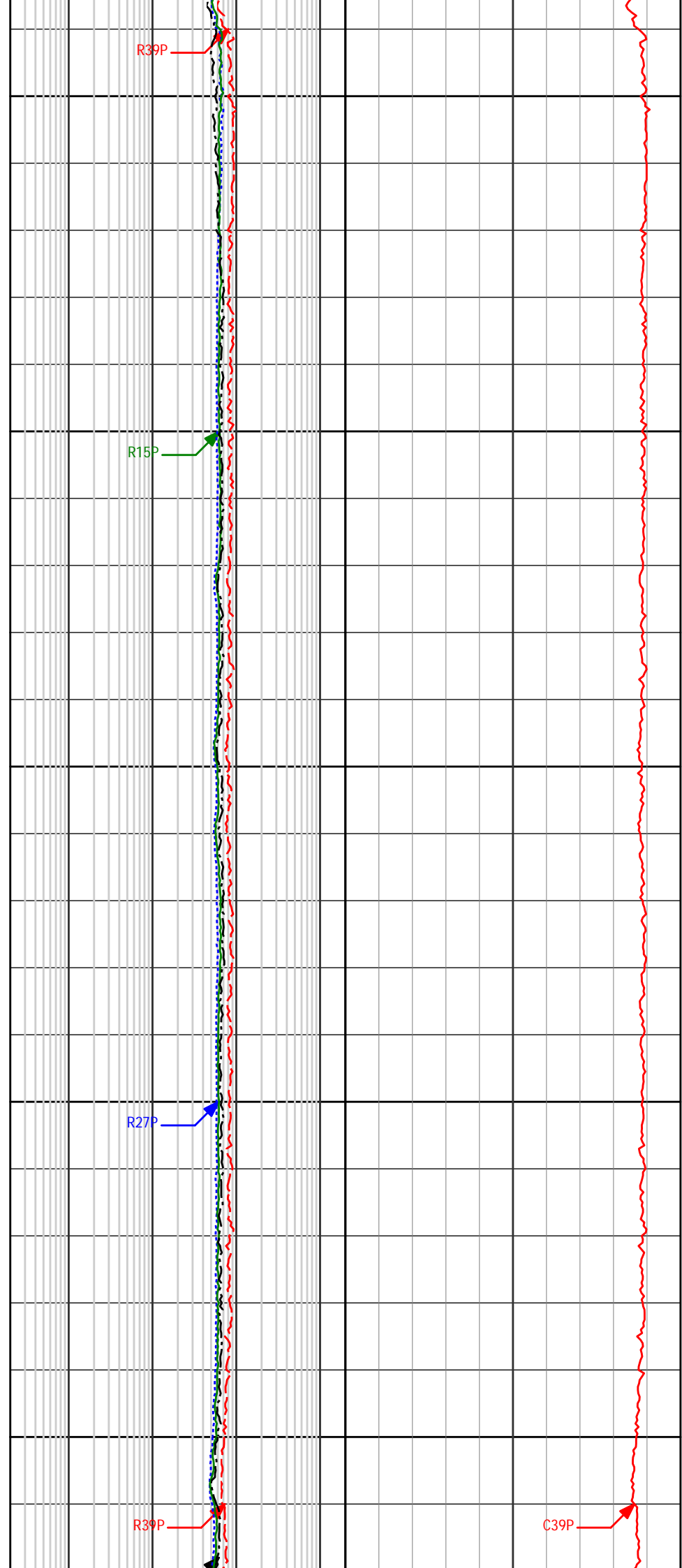
10400

10450

10500

10550

DGRC



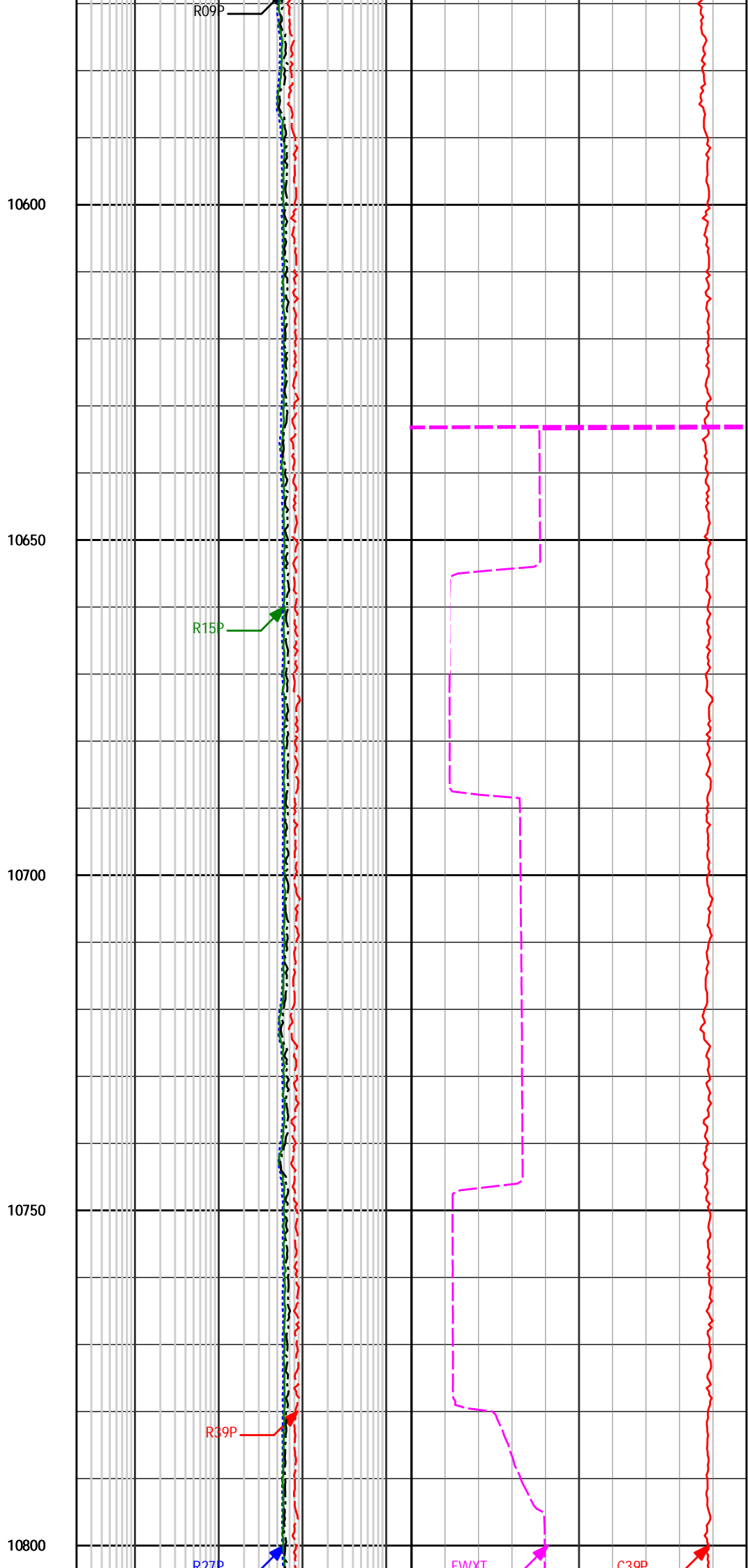
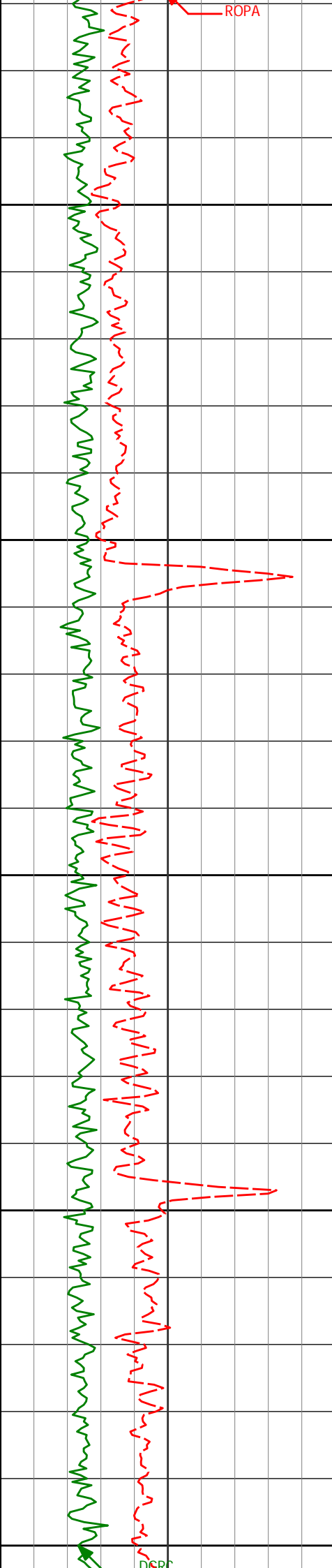
R39P

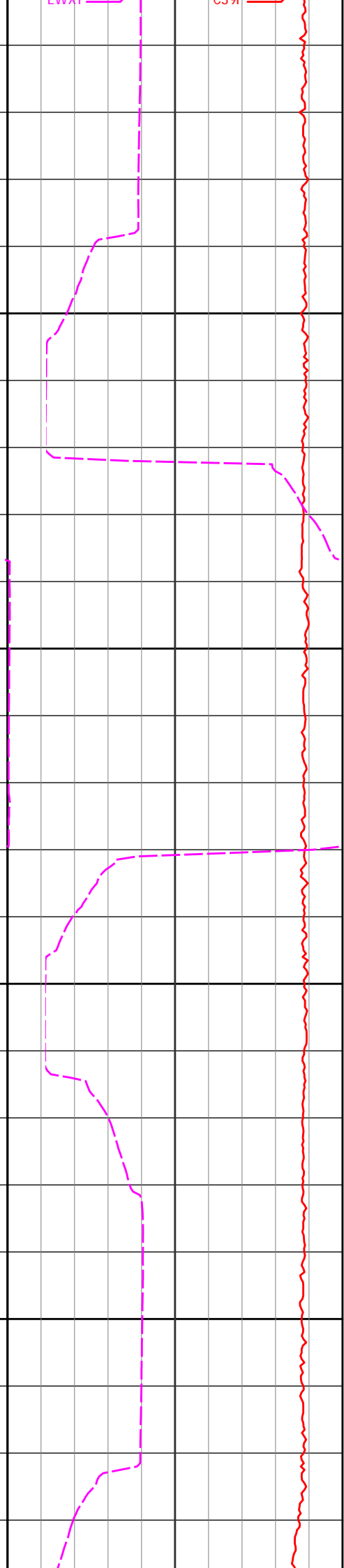
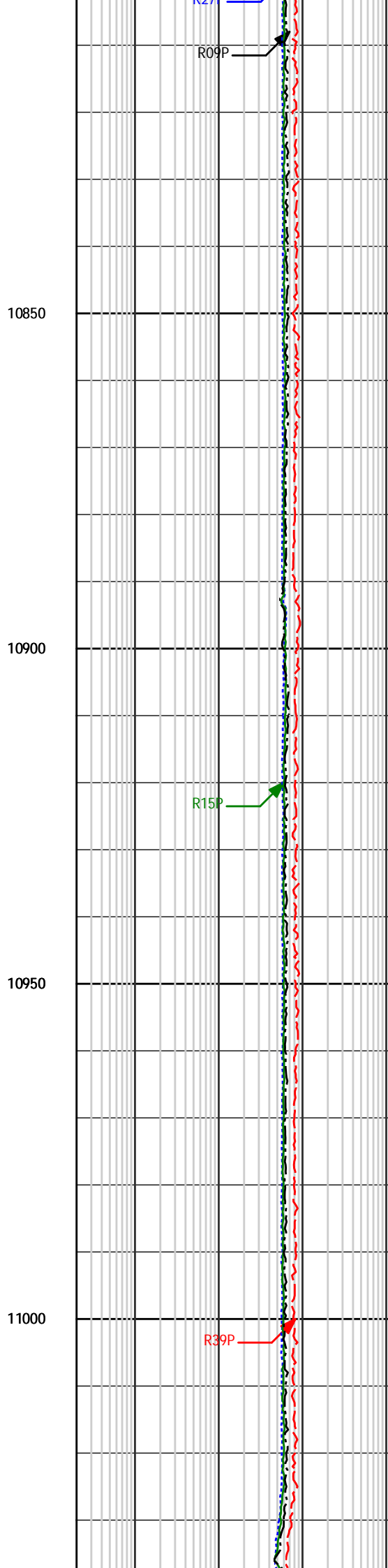
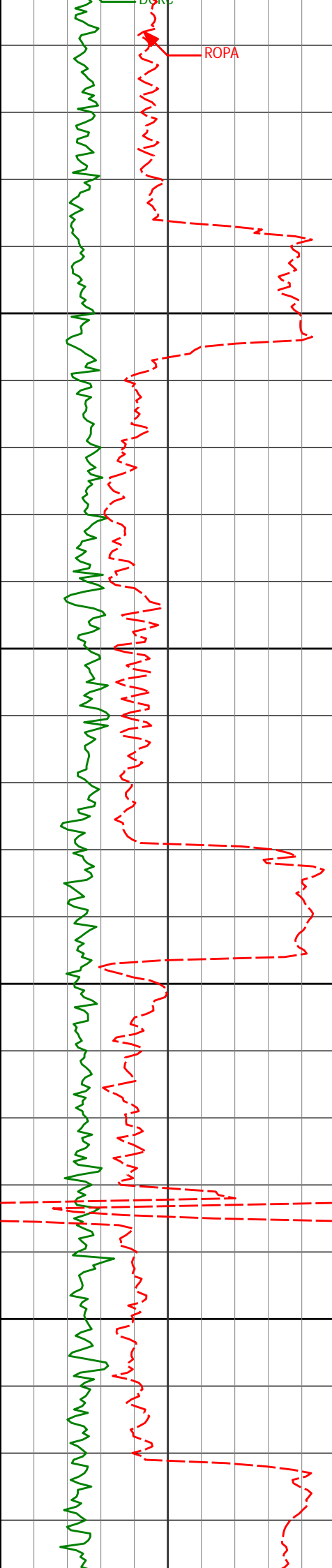
R15P

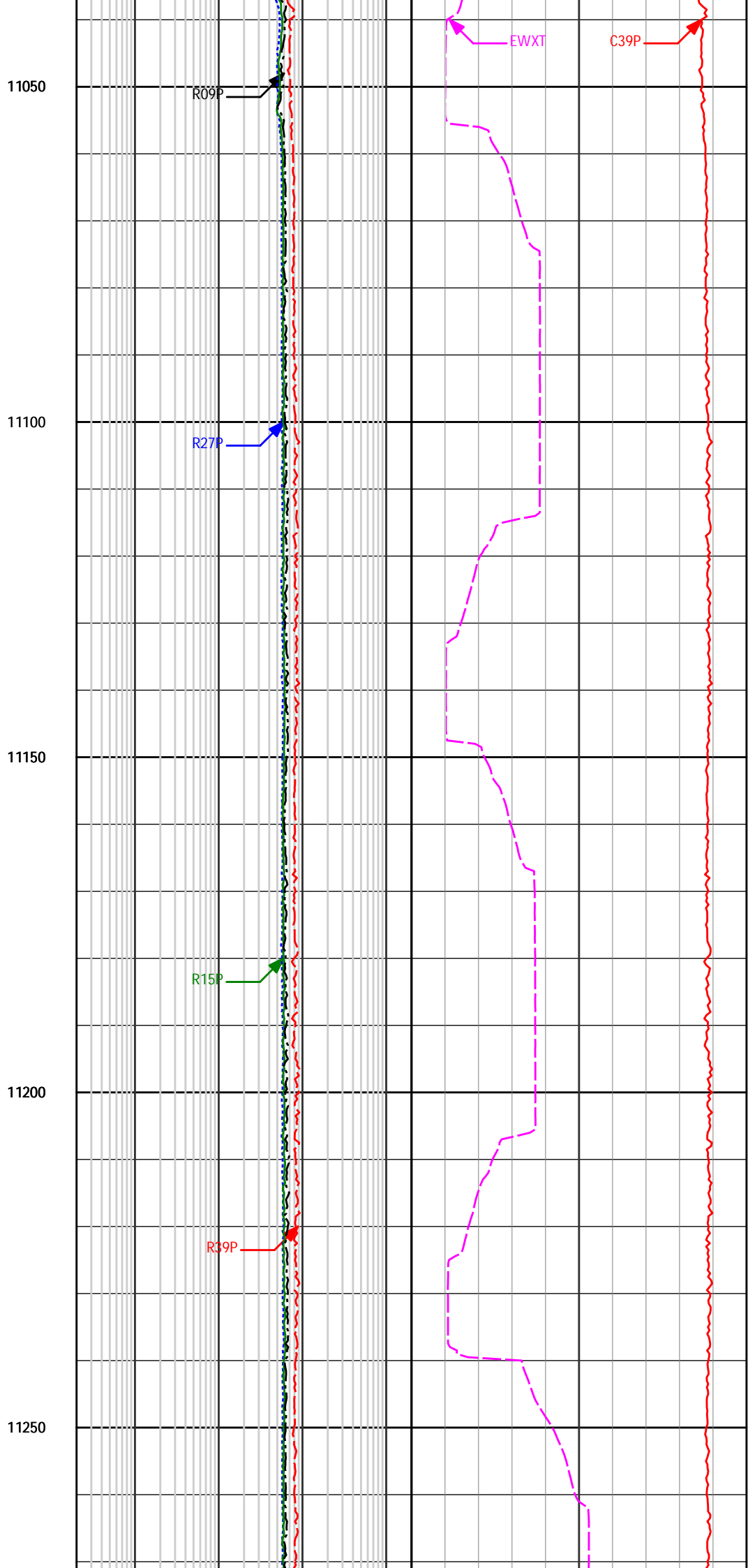
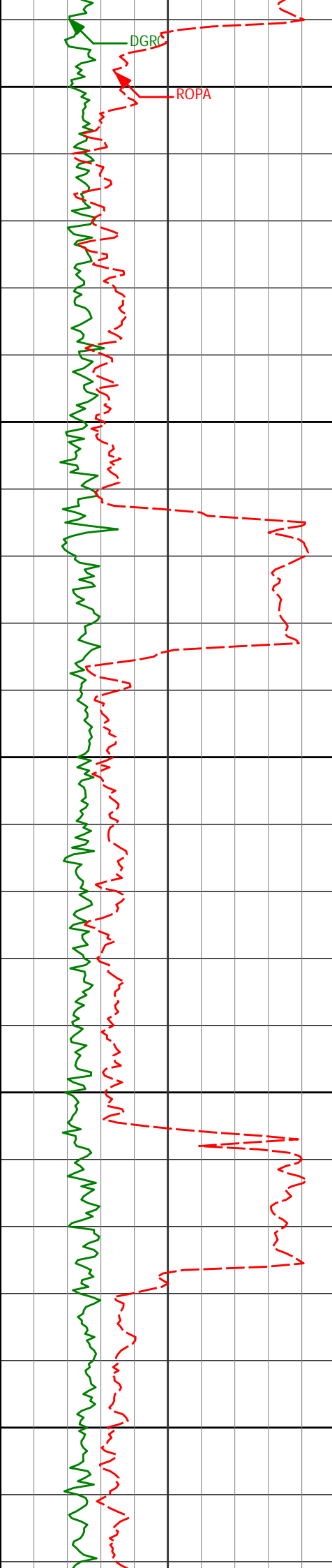
R27P

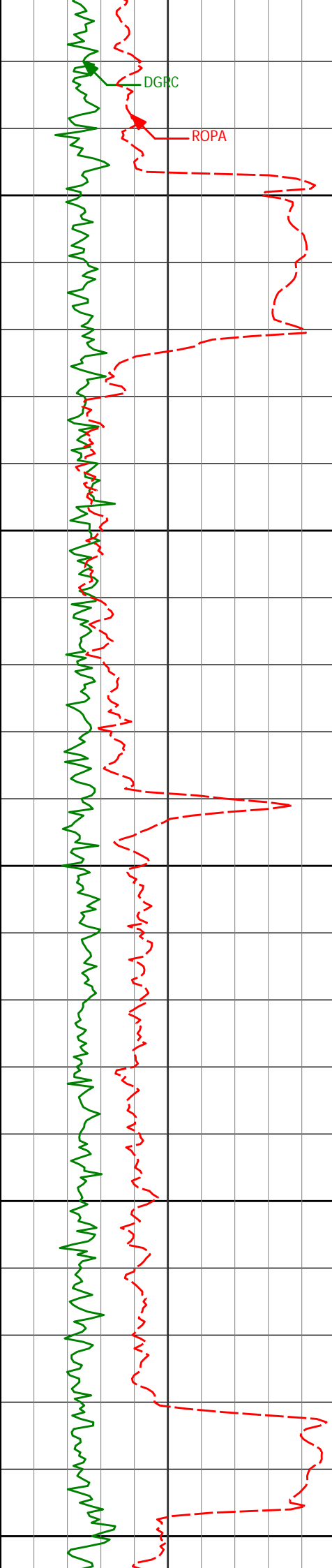
R39P

C39P









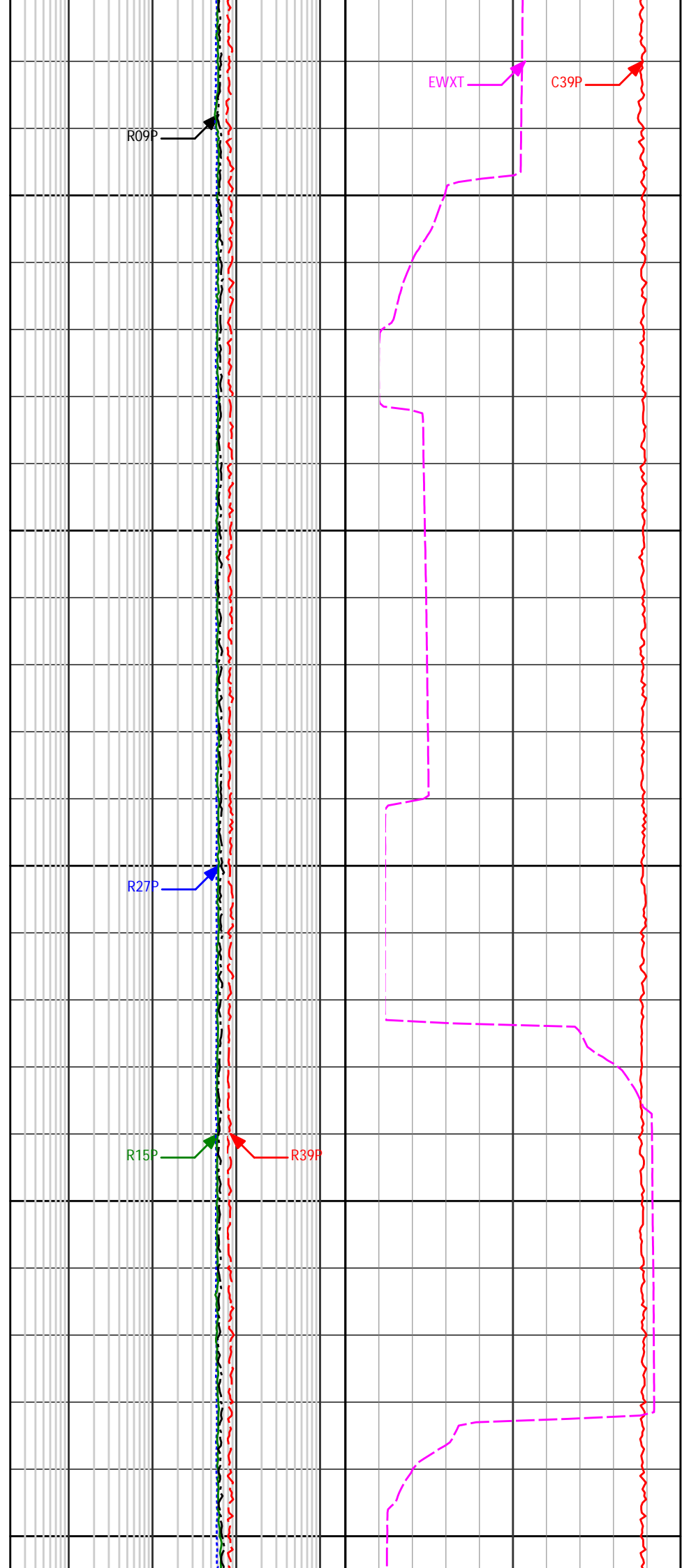
11300

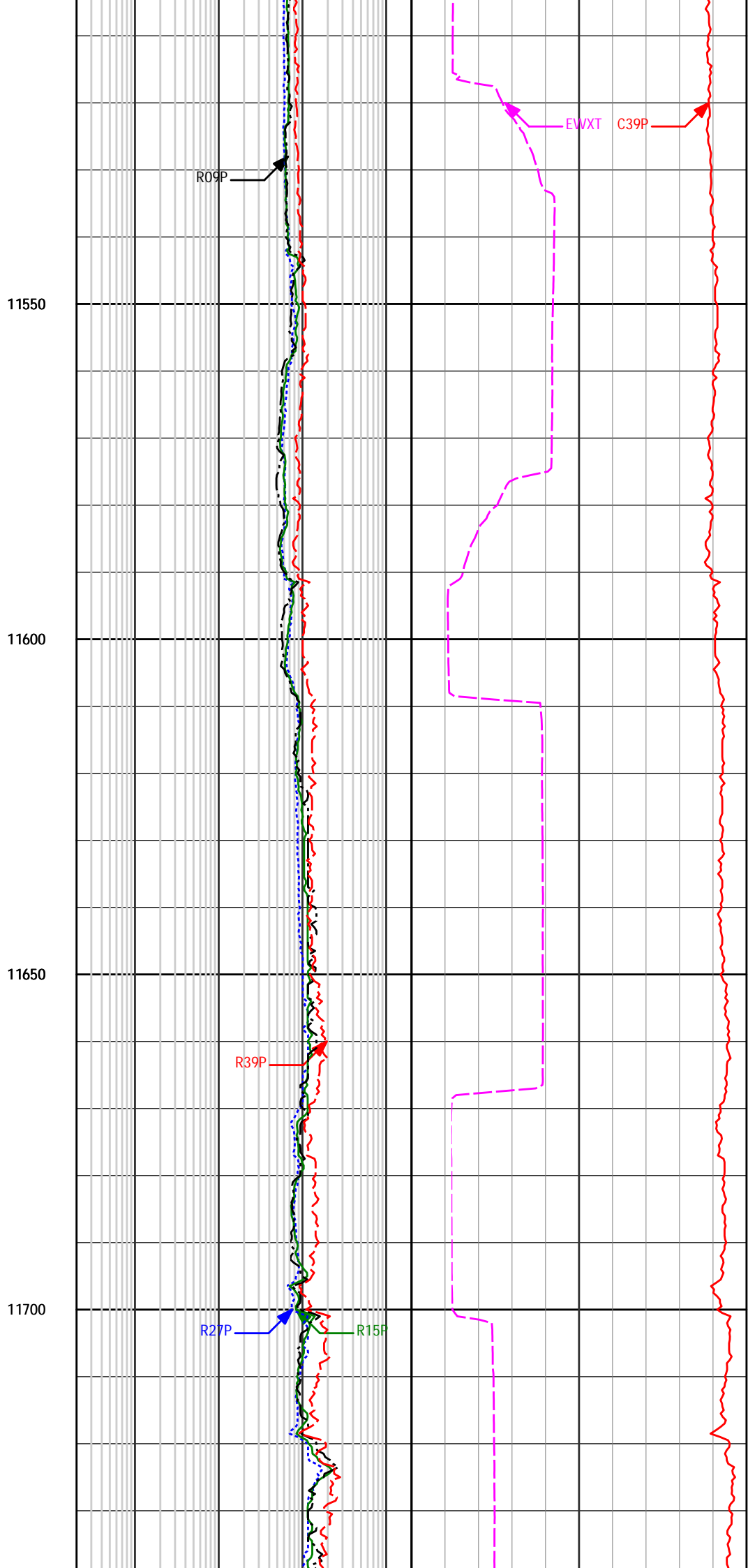
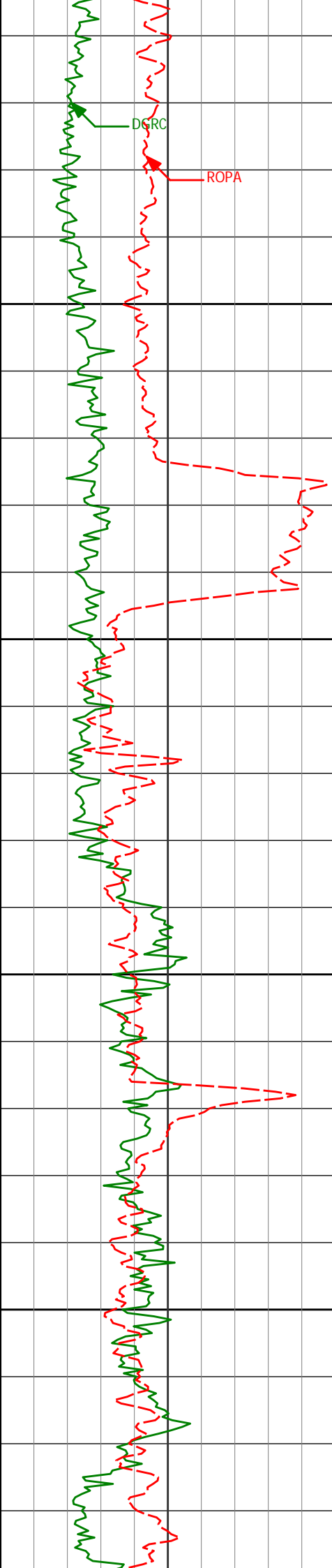
11350

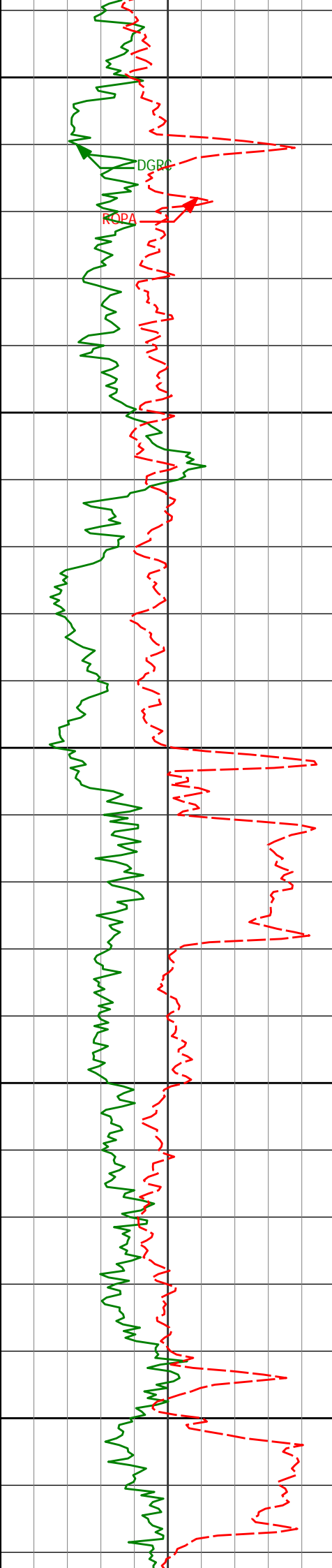
11400

11450

11500







11750

DGR

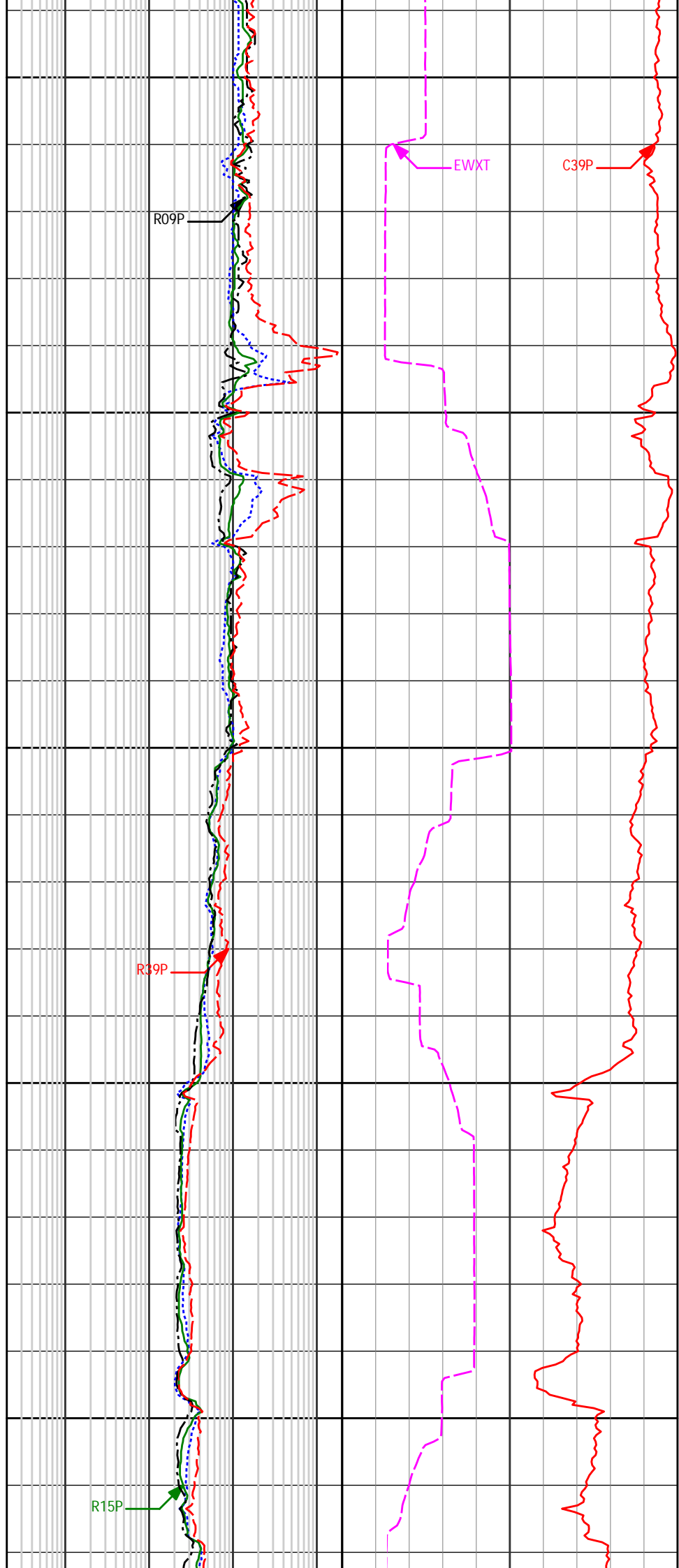
ROP

11800

11850

11900

11950



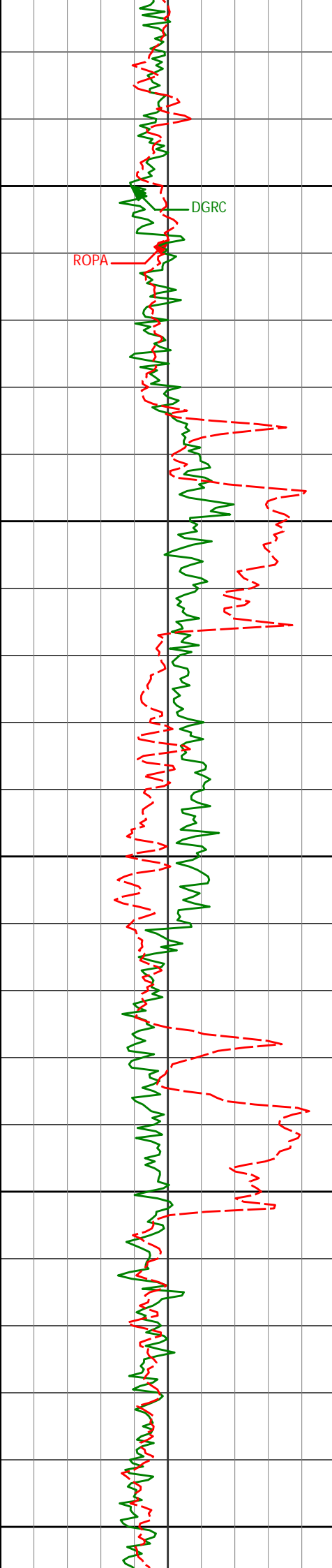
R09P

R39P

R15P

EWXT

C39P



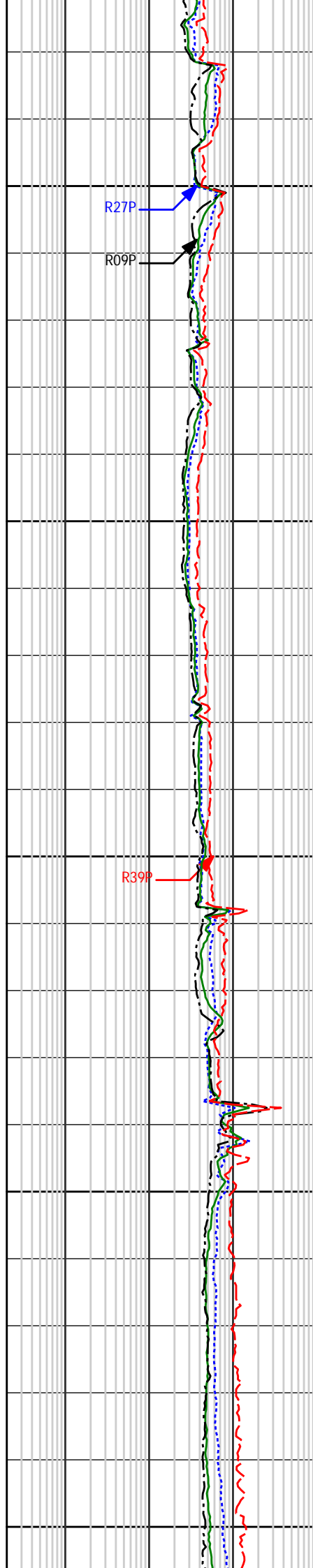
12000

12050

12100

12150

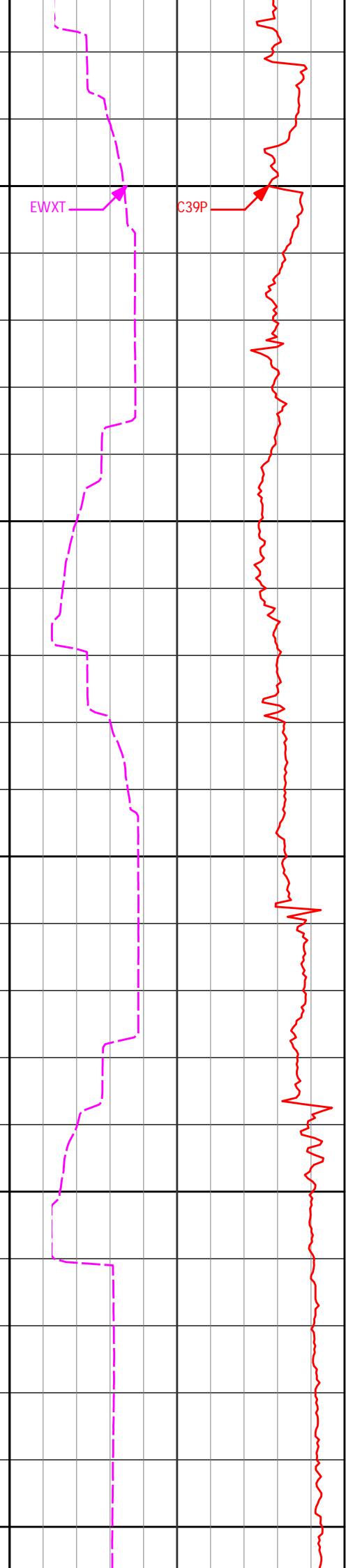
12200



R27P

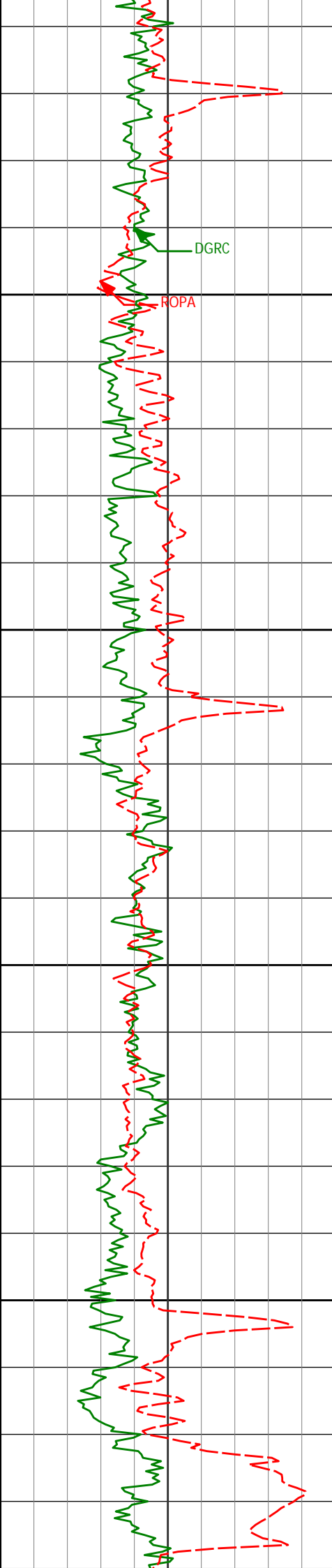
R09P

R39P



EWXT

C39P

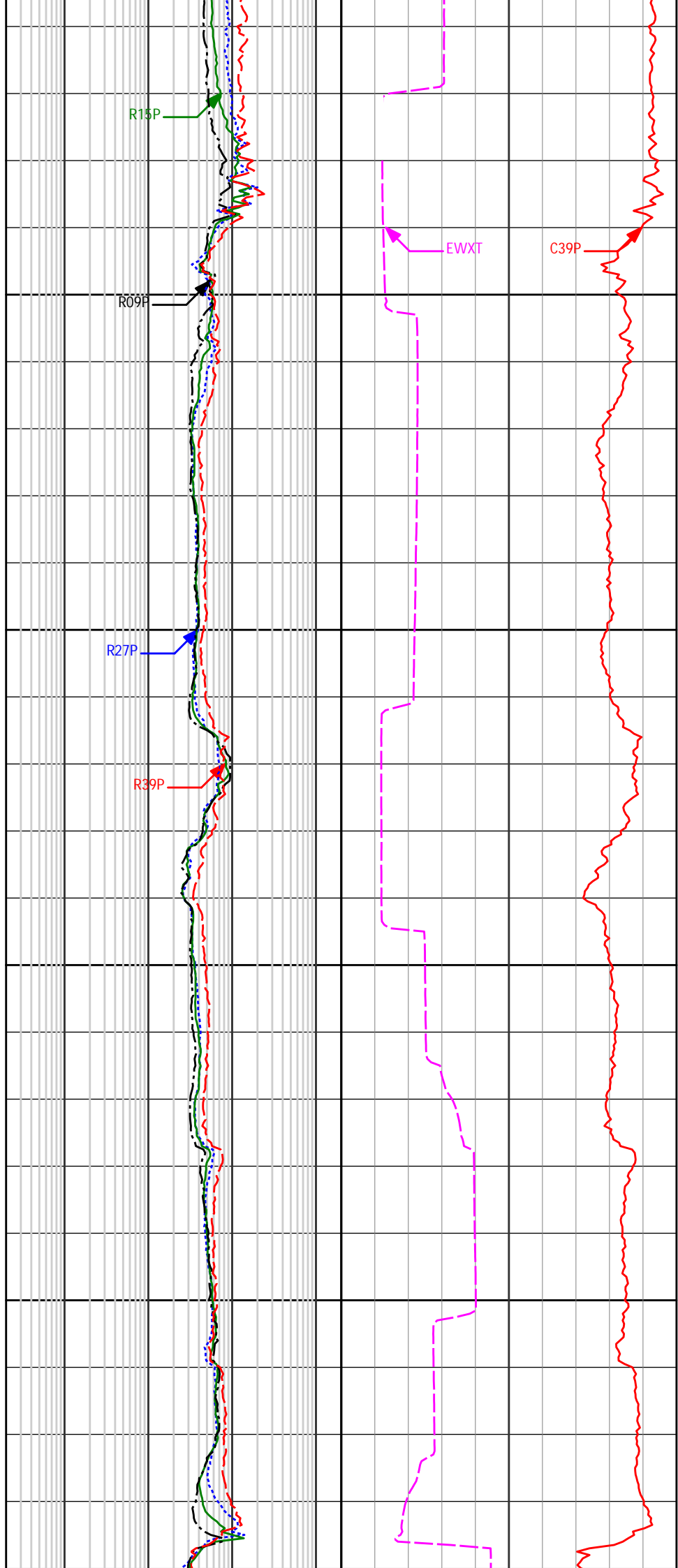


12250

12300

12350

12400



R15P

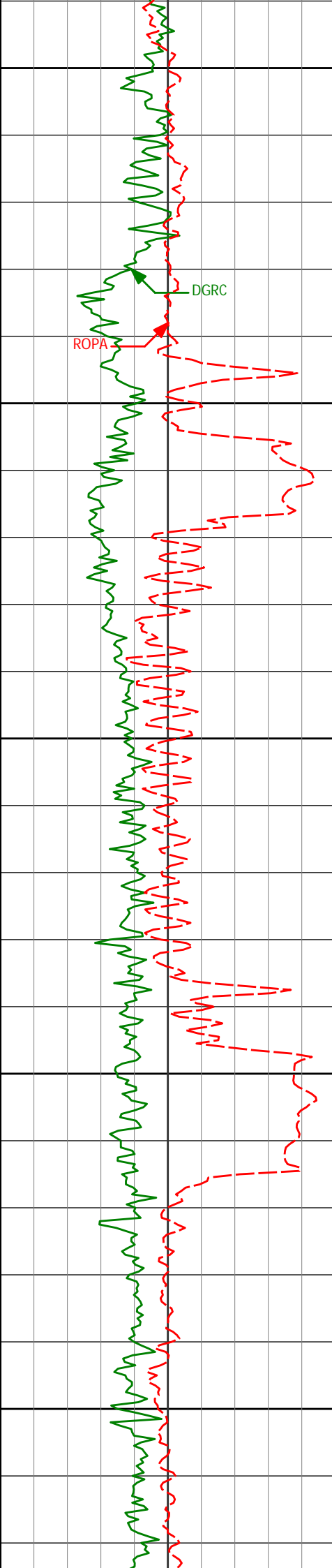
R09P

R27P

R39P

EWXT

C39P



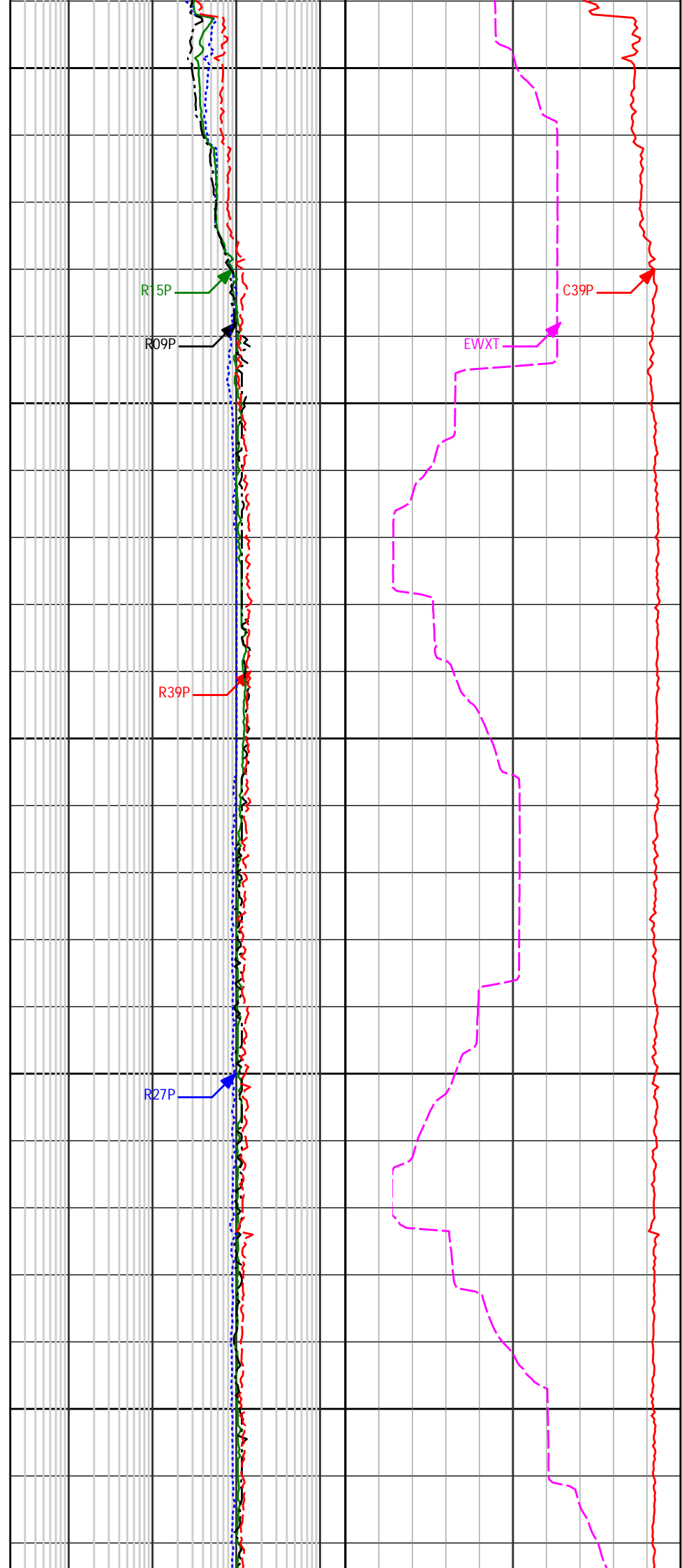
12450

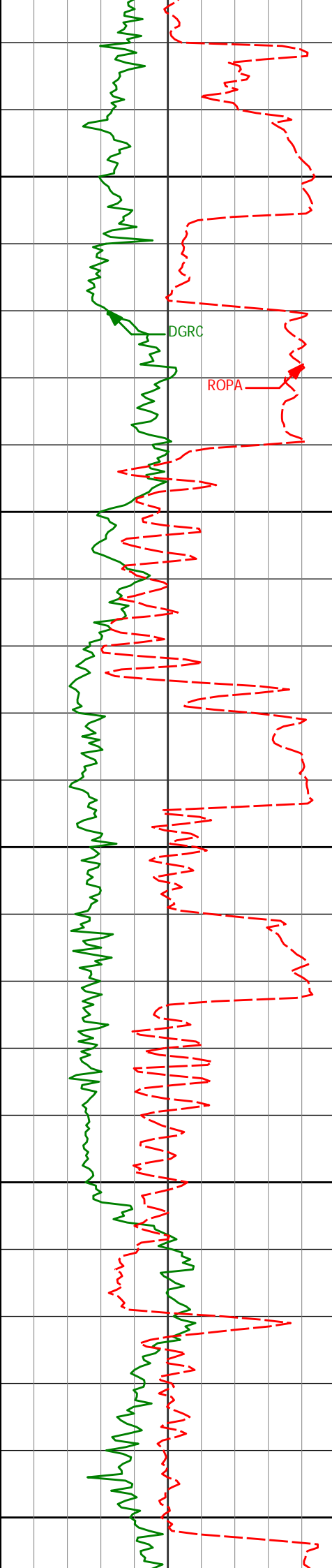
12500

12550

12600

12650





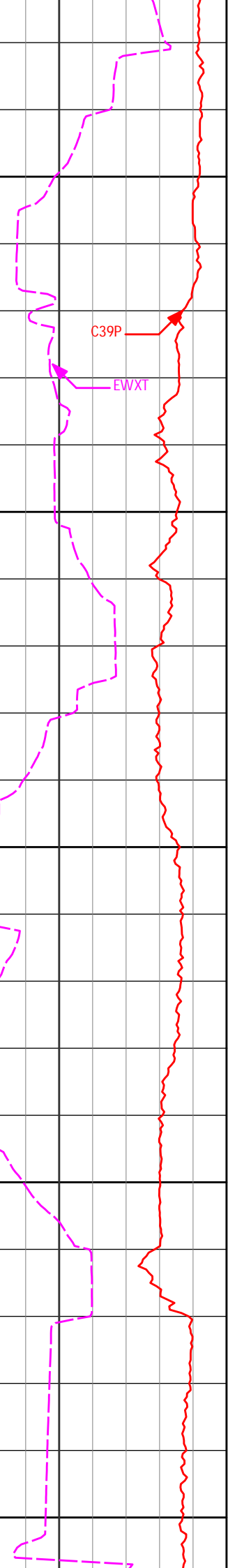
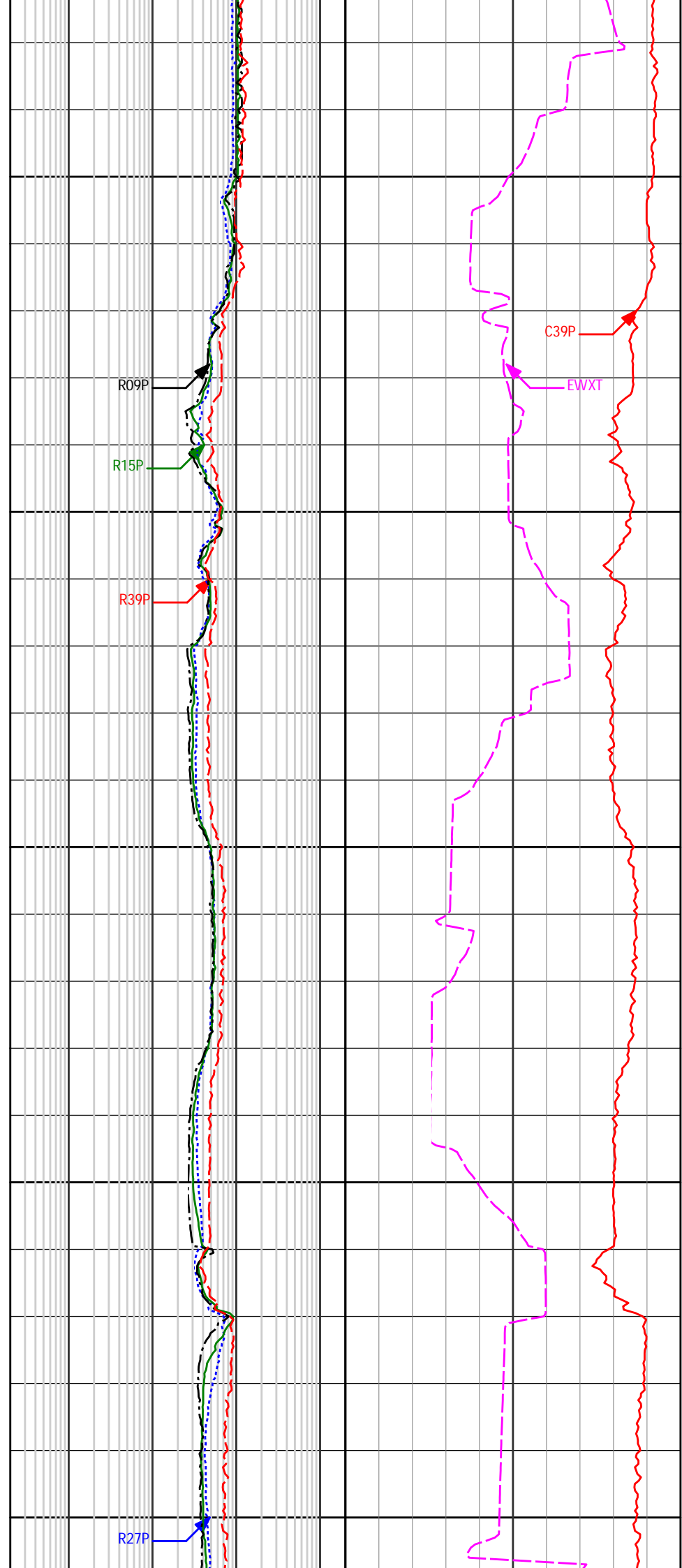
12700

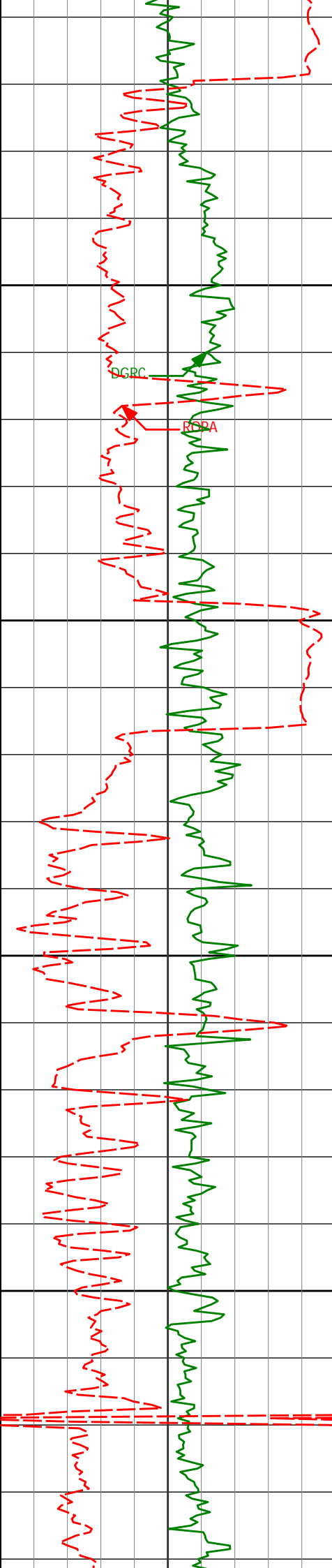
12750

12800

12850

12900



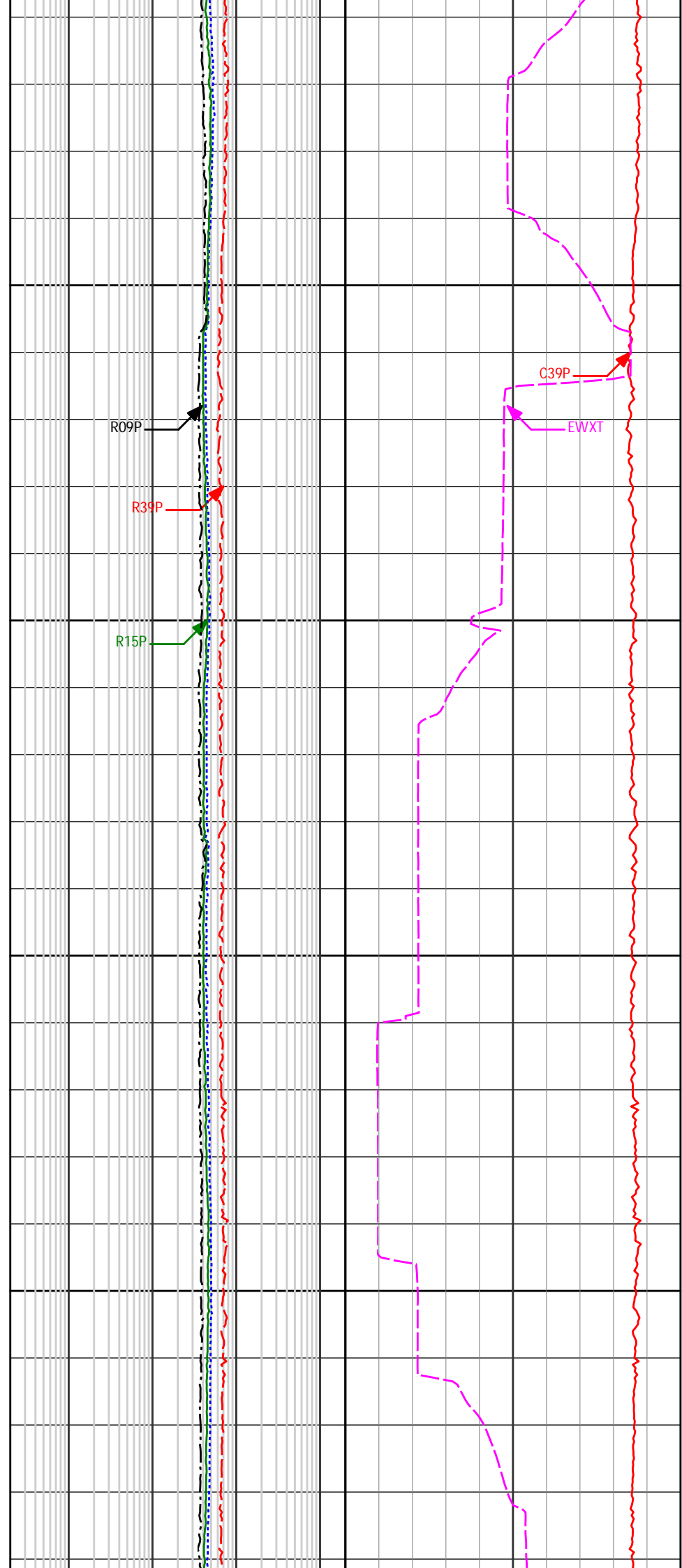


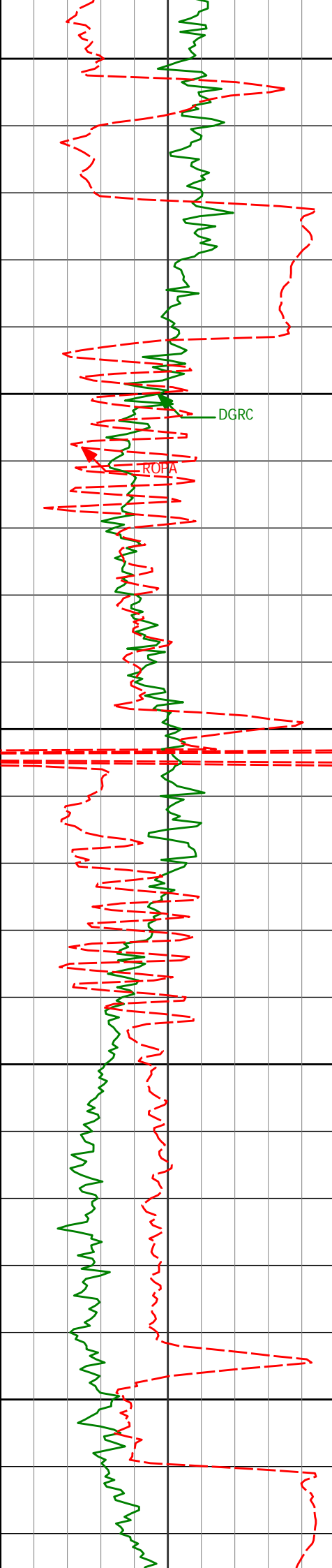
12950

13000

13050

13100





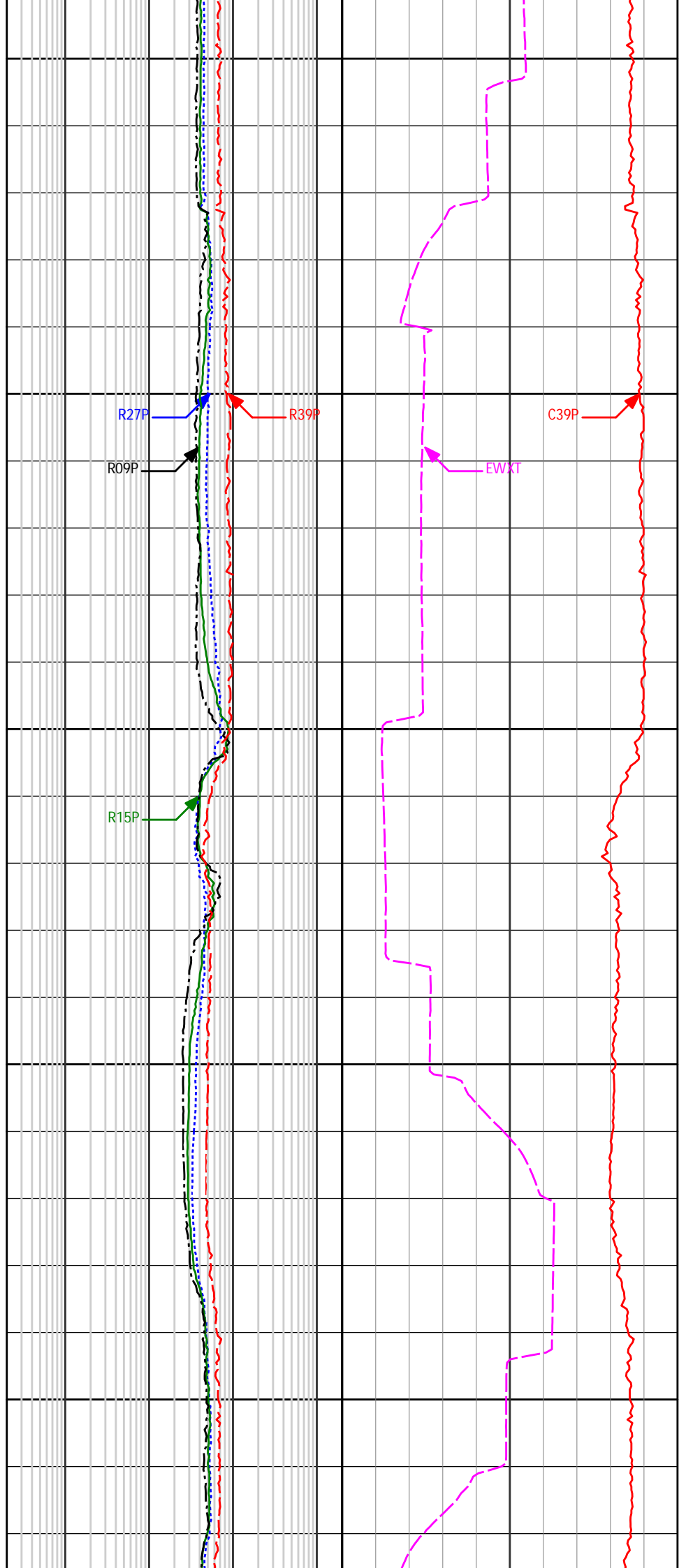
13150

13200

13250

13300

13350



R27P

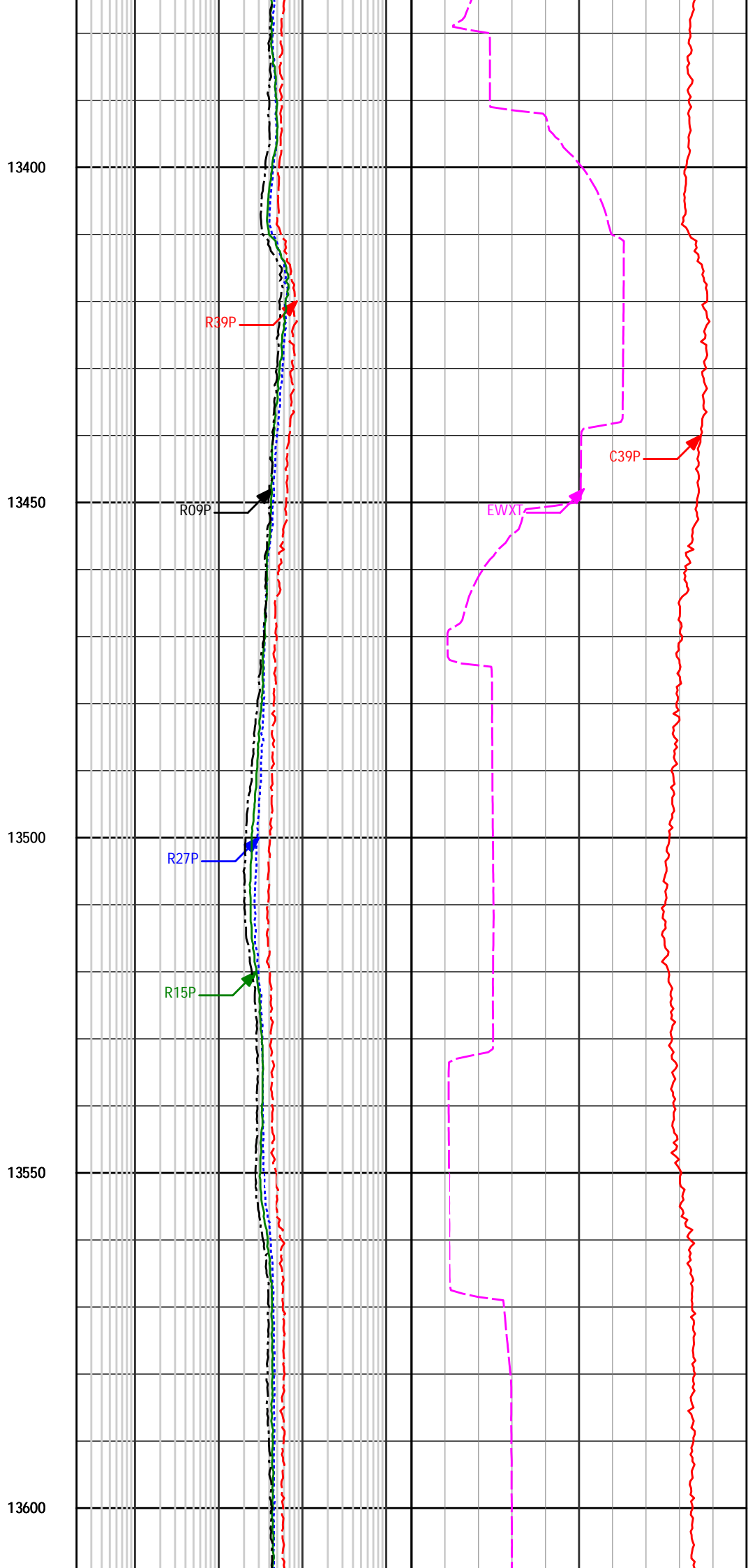
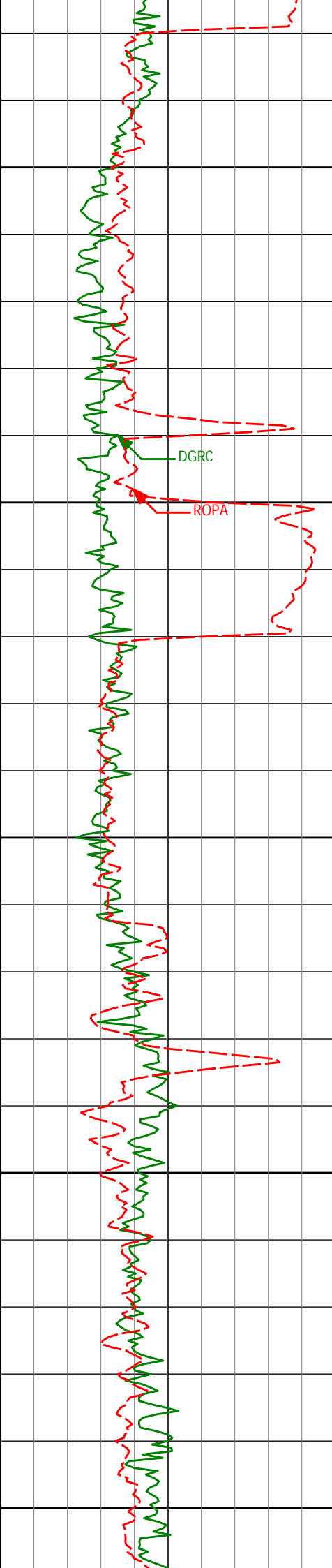
R09P

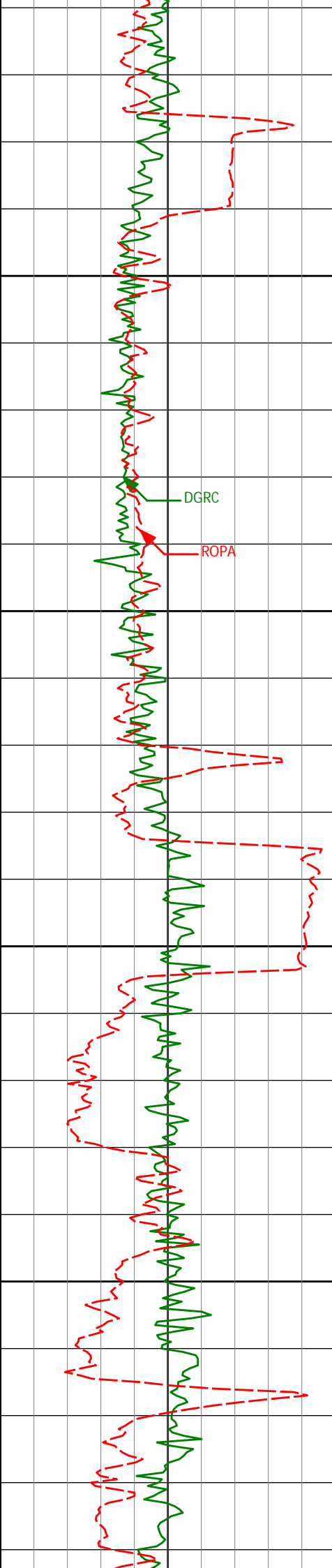
R39P

C39P

EWAT

R15P



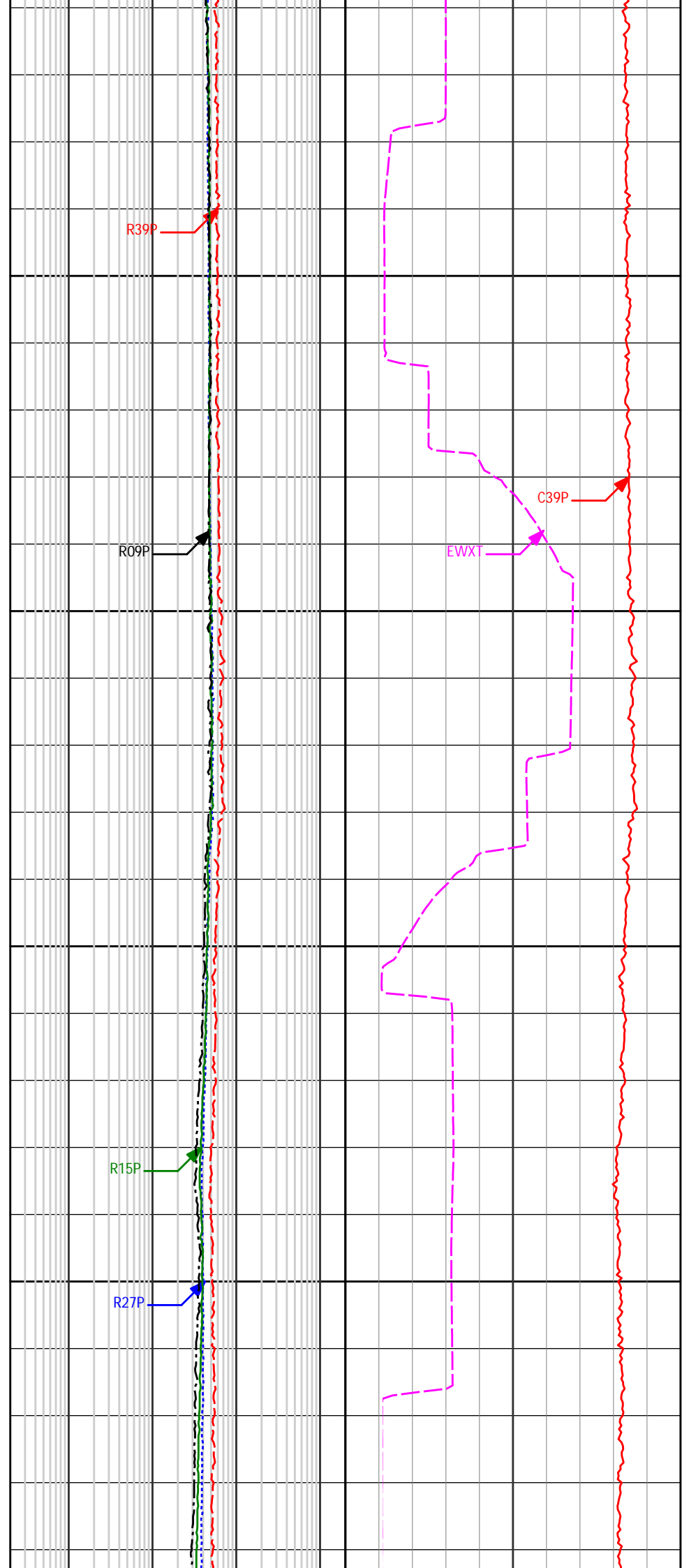


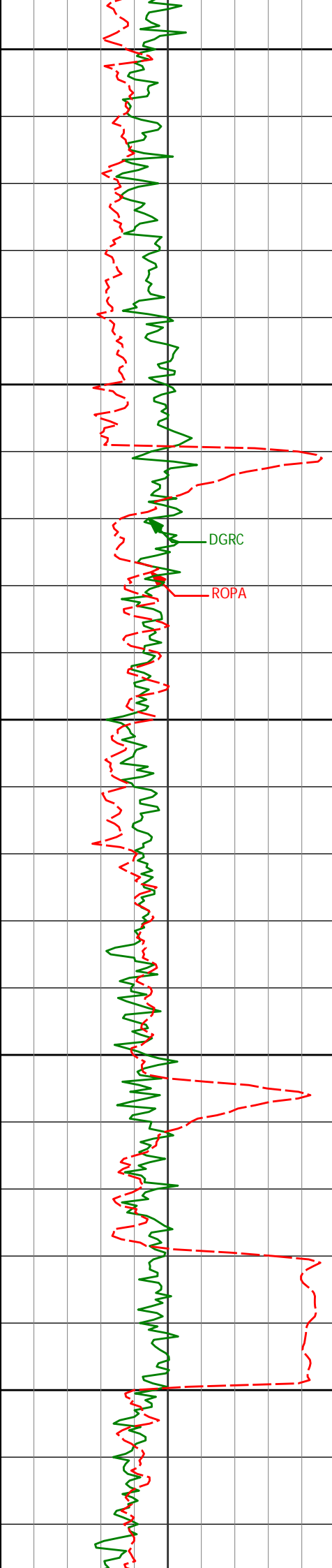
13650

13700

13750

13800





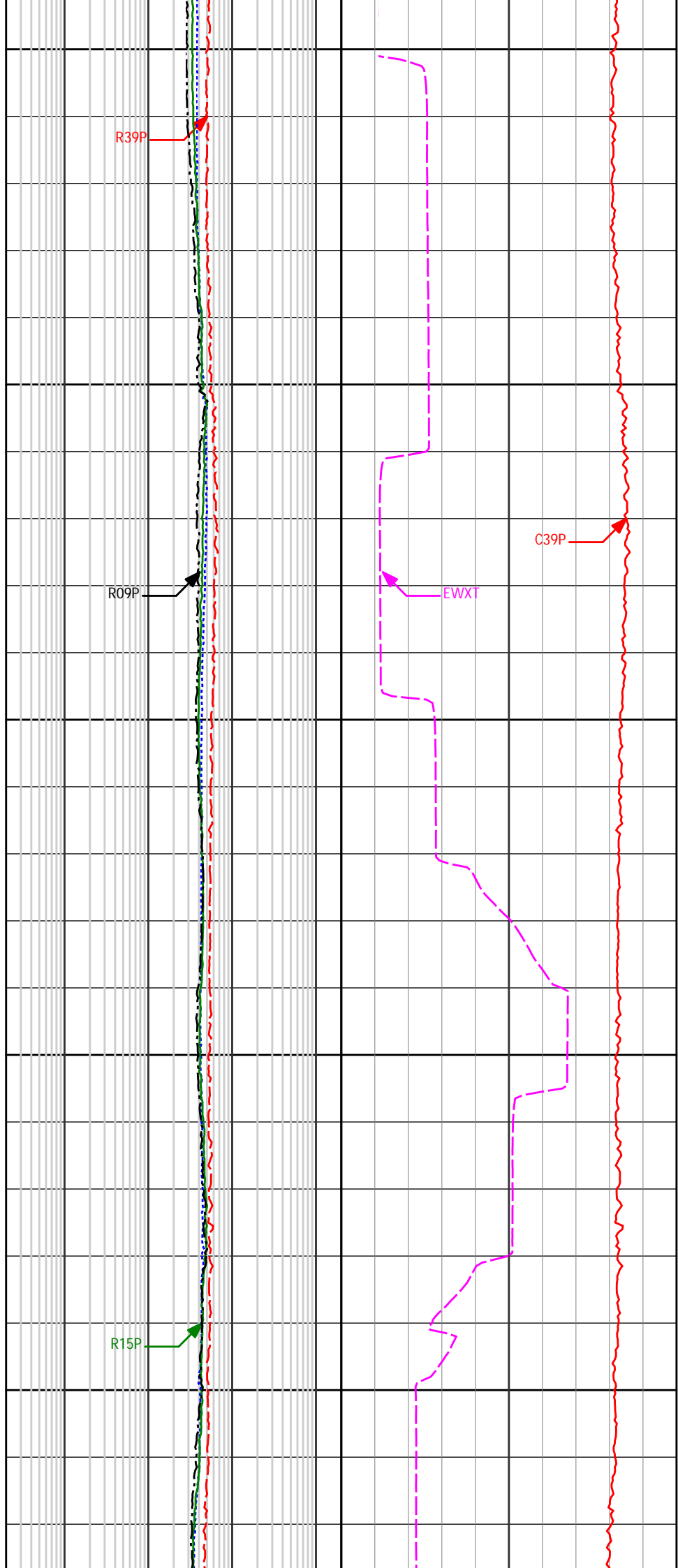
13850

13900

13950

14000

14050



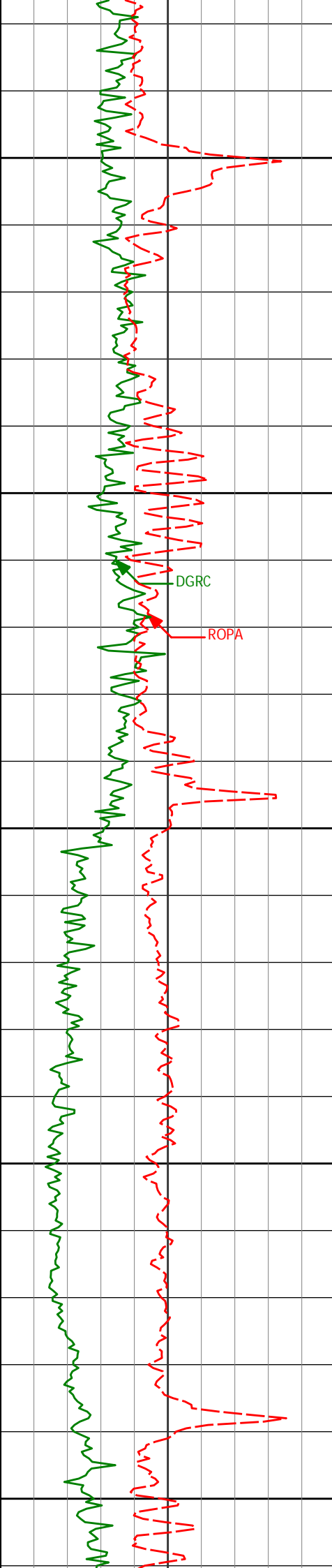
R39P

R09P

R15P

C39P

EWXT



14100

14150

14200

14250

14300



R39P

R27P

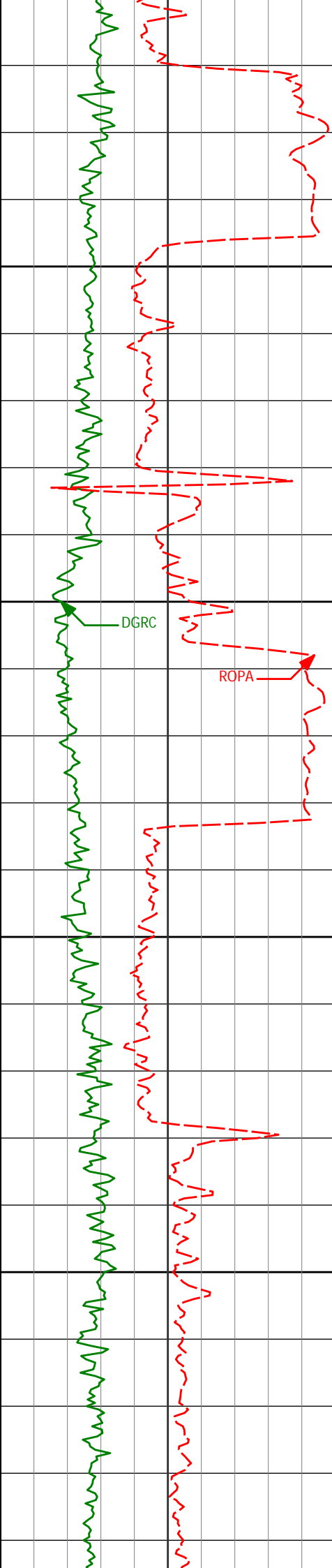
R09P

C39P

EWXT

R15P

R39P

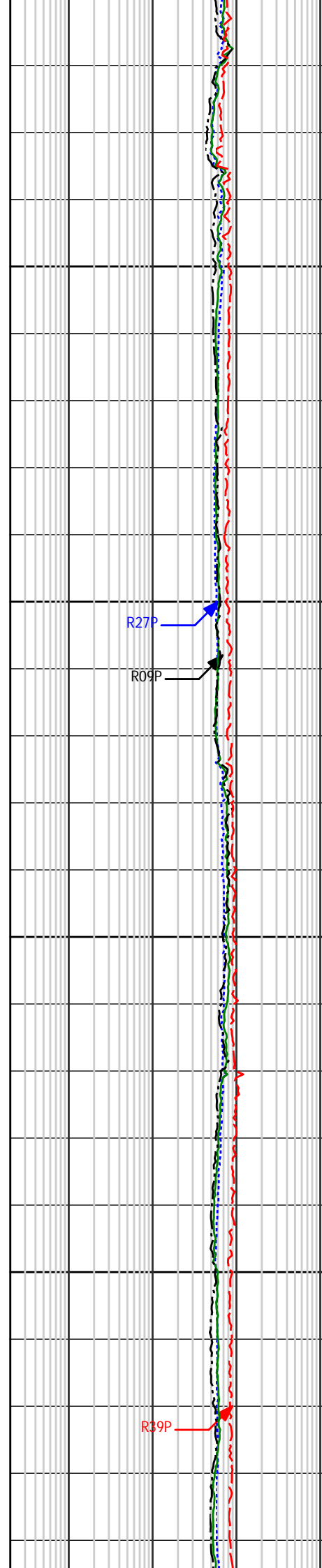


14350

14400

14450

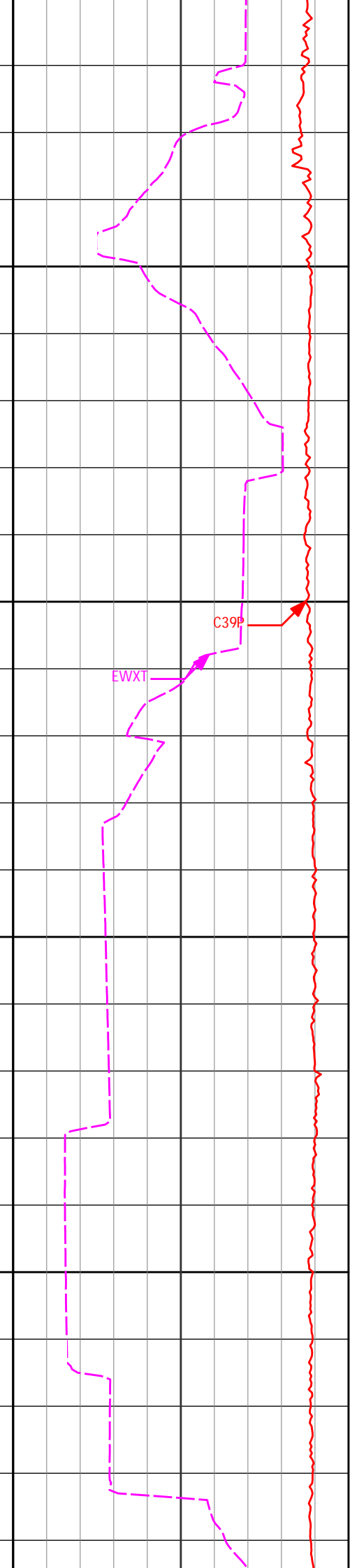
14500



R27P

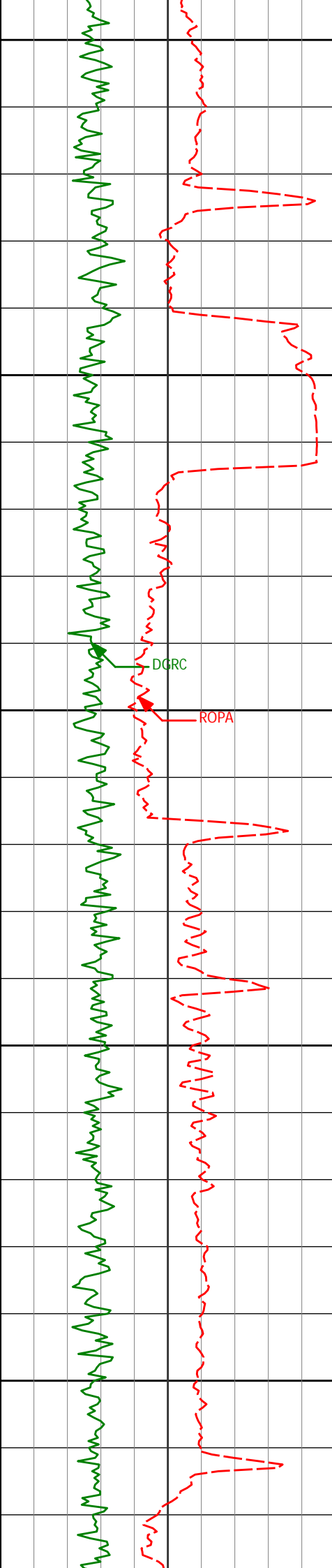
R09P

R39P



C39P

EWXT



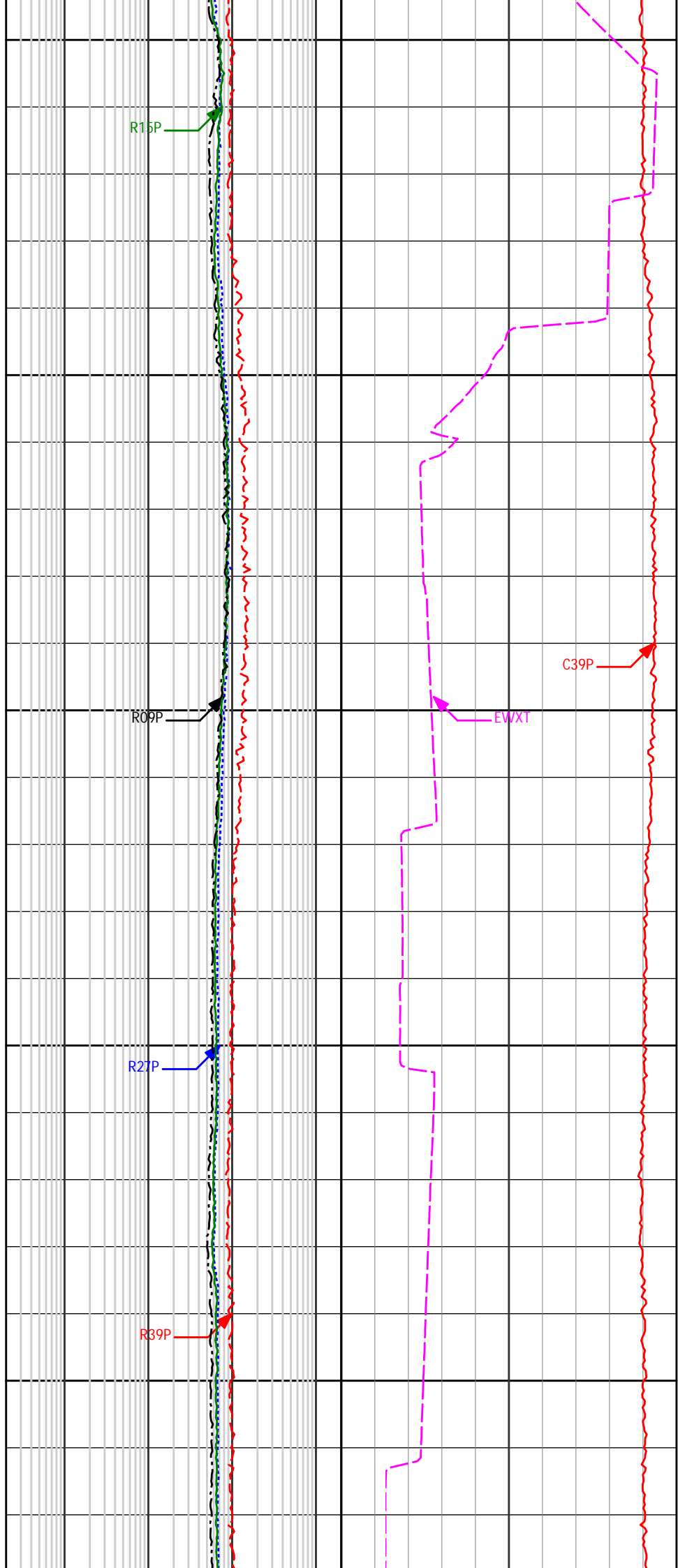
1450

1460

1465

1470

1475



R15P

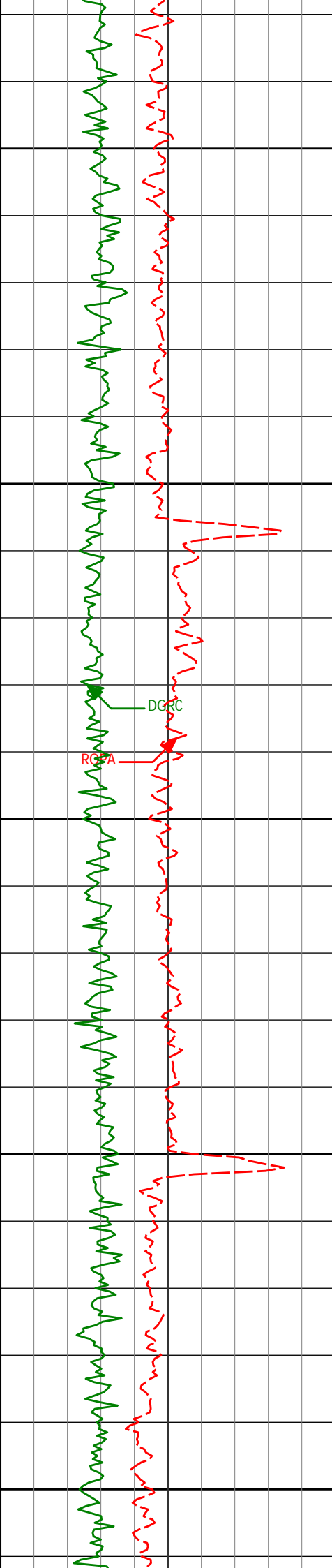
R09P

R27P

R39P

C39P

EWXT



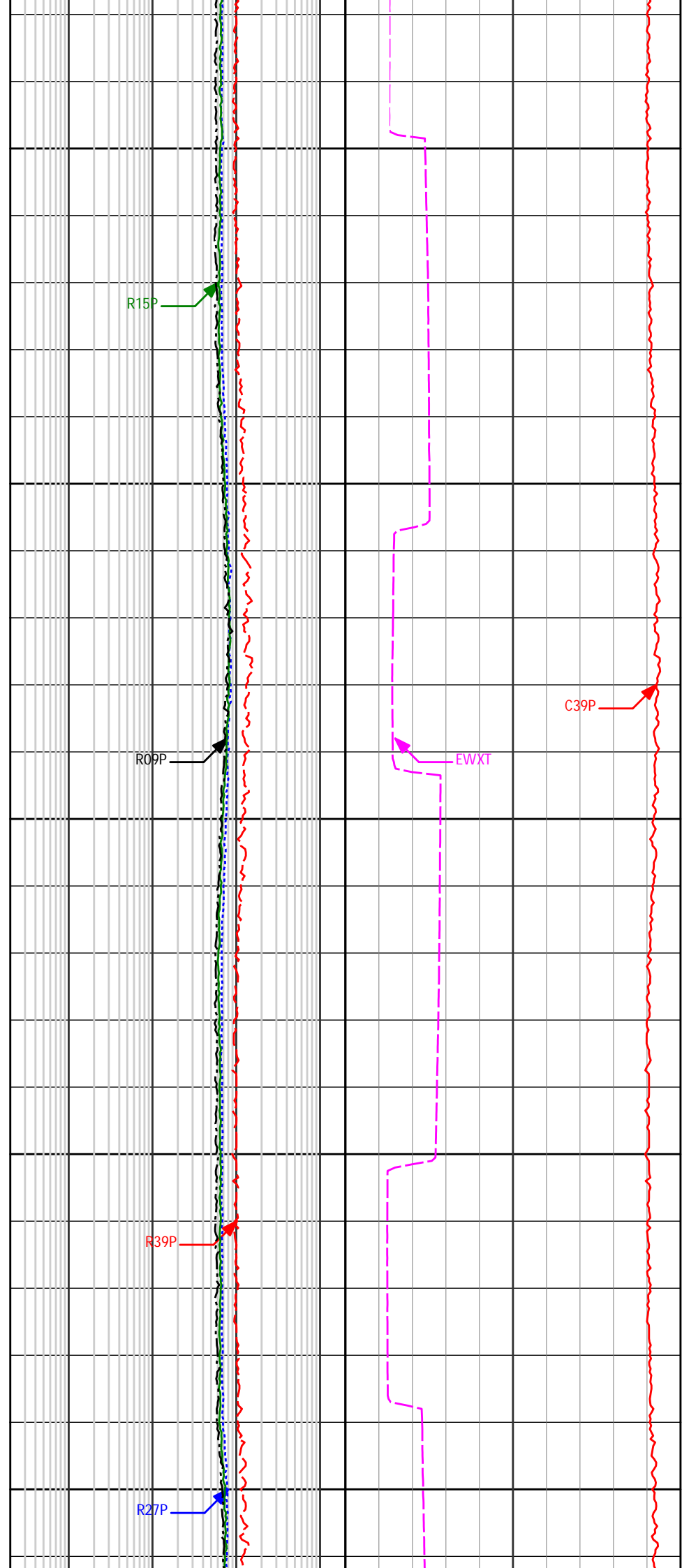
14800

14850

14900

14950

15000



R15P

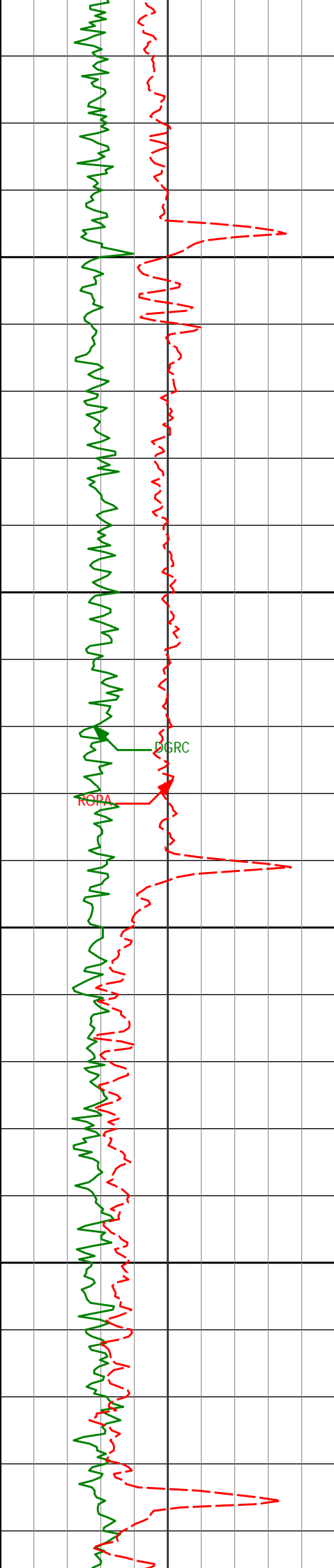
R09P

EWXT

C39P

R39P

R27P



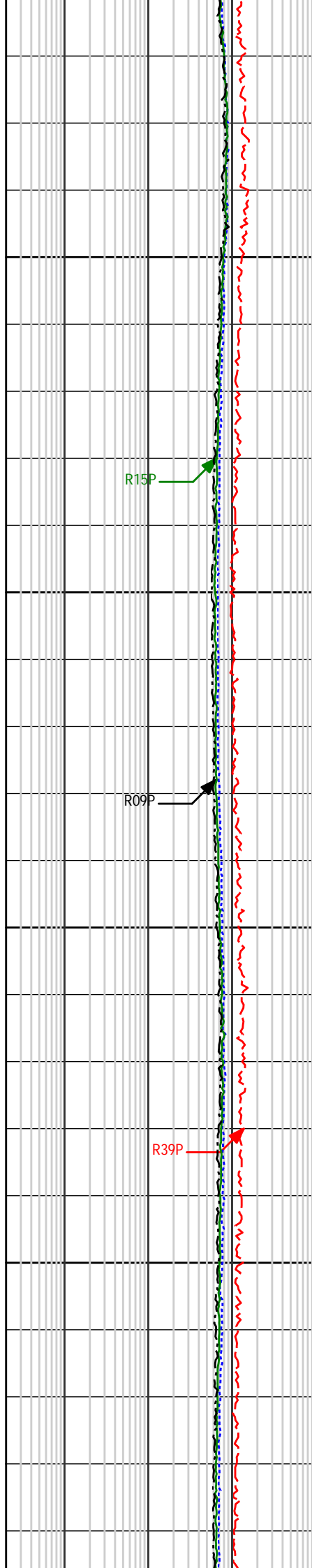
15050

15100

15150

15200

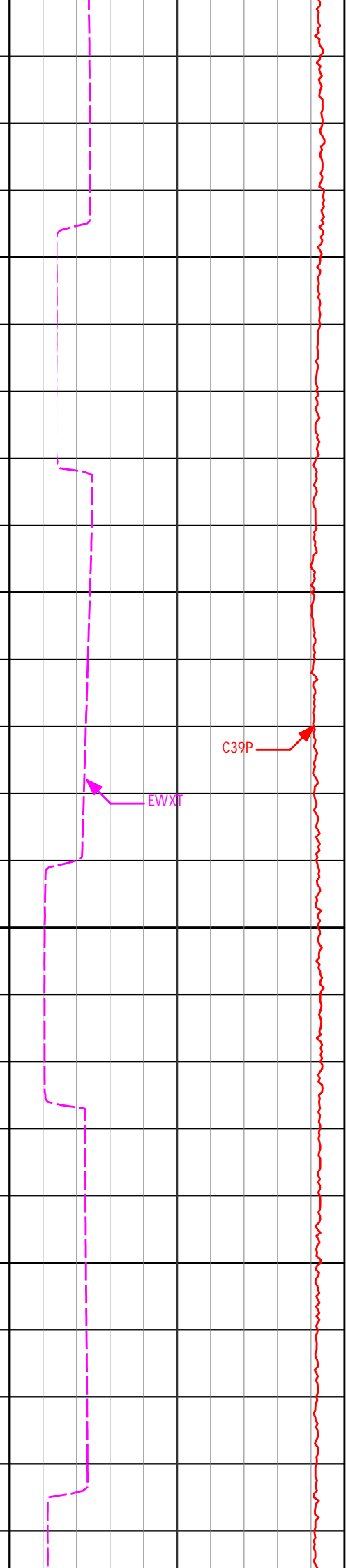
R09P  
DGRC



R15P

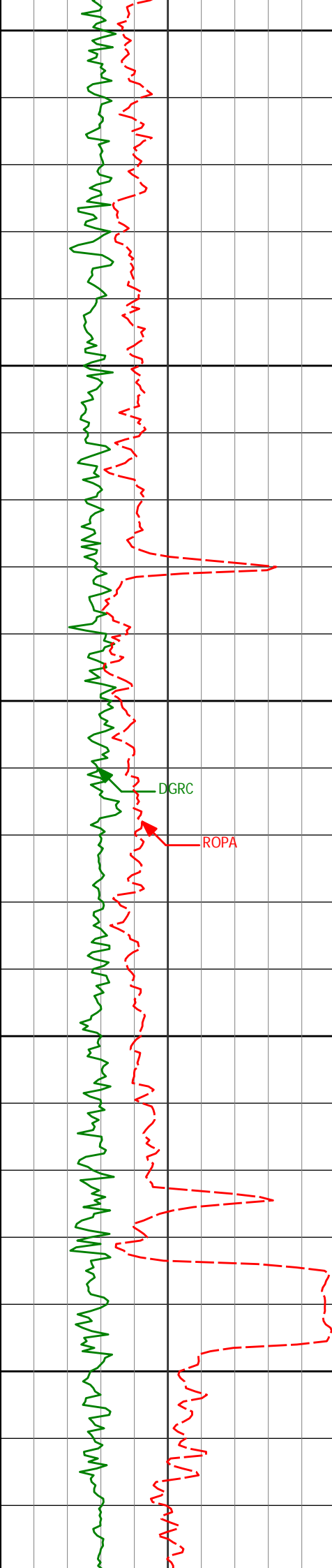
R09P

R39P



C39P

EWXT



15250

15300

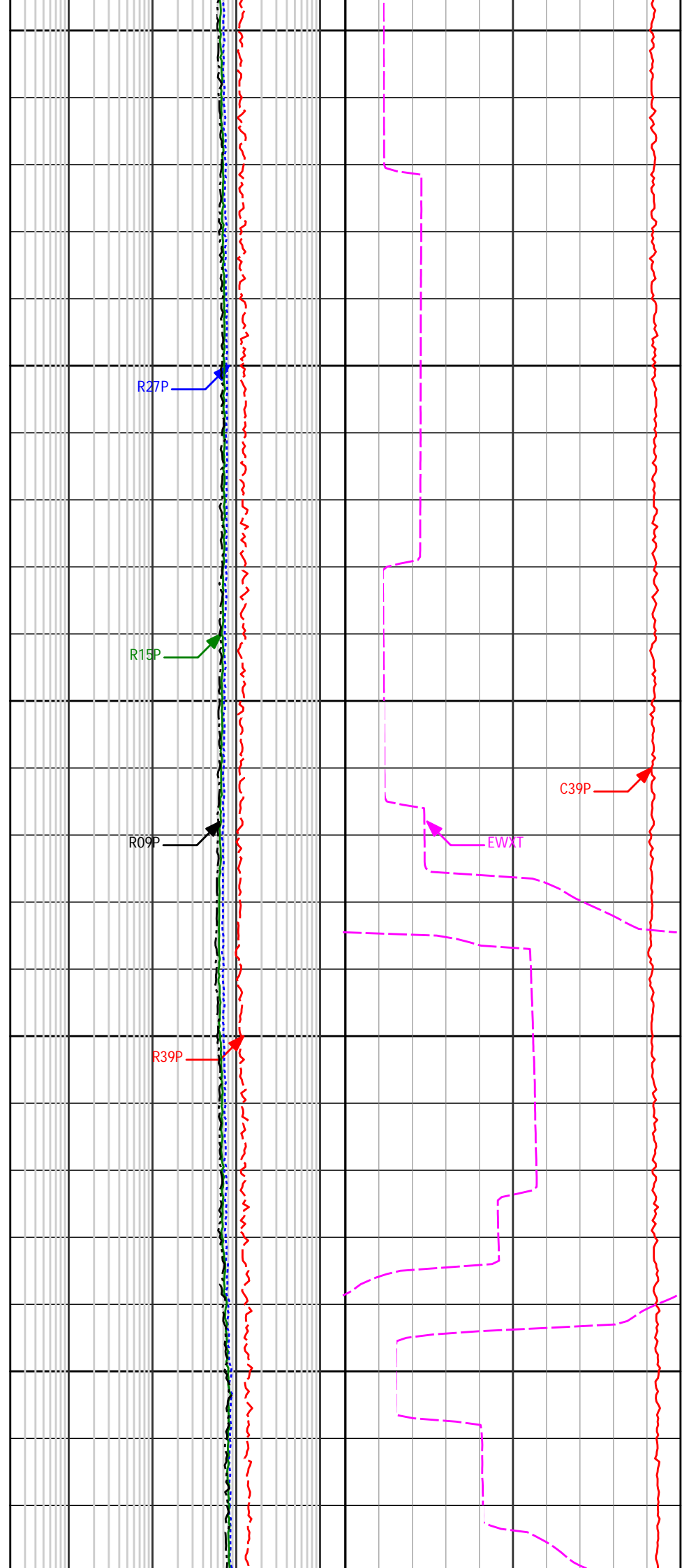
15350

15400

15450

DGRC

ROPA



R27P

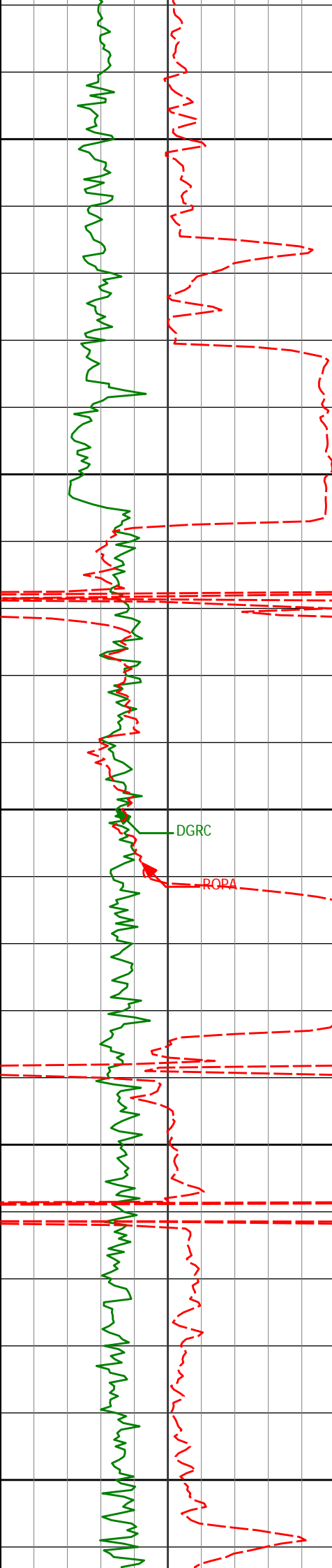
R15P

R09P

R39P

C39P

EWXT



15500

15550

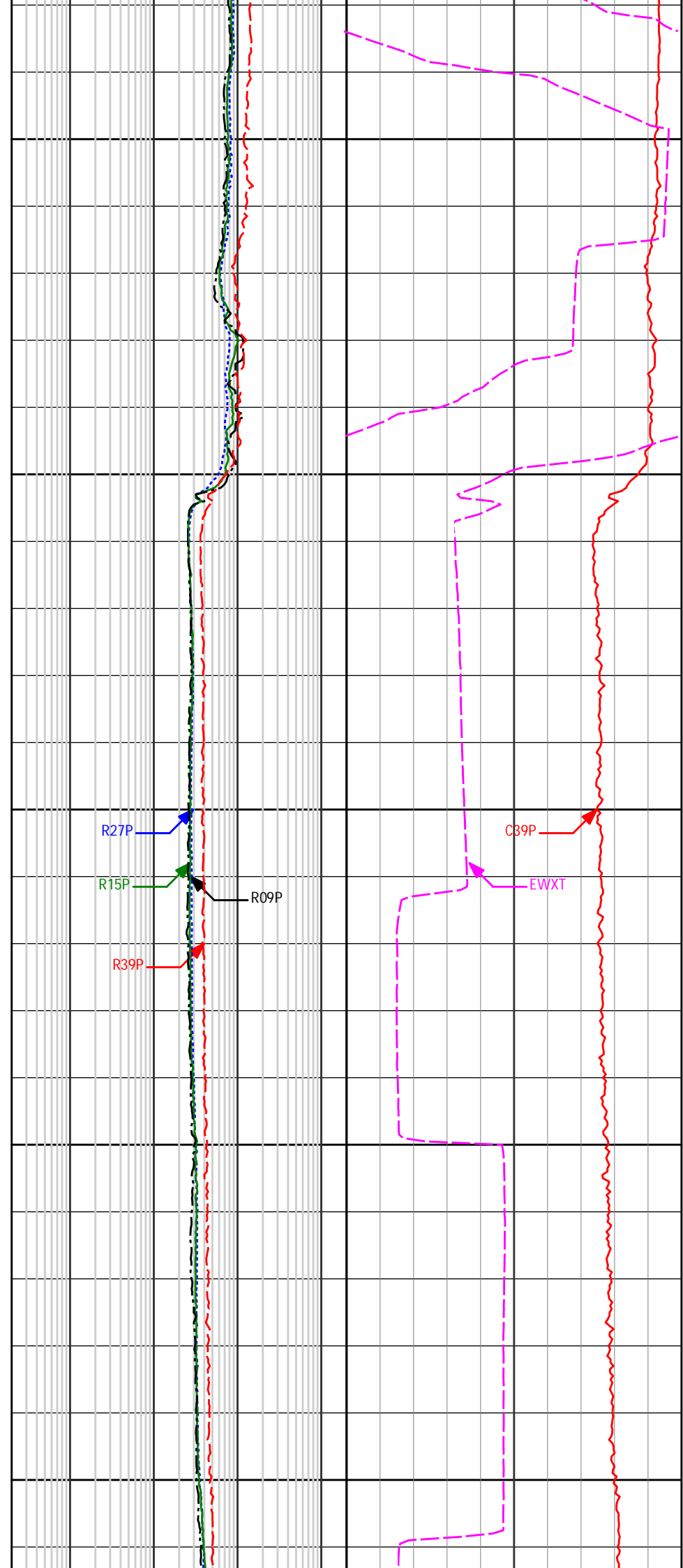
15600

15650

15700

DGRC

ROPA



R27P

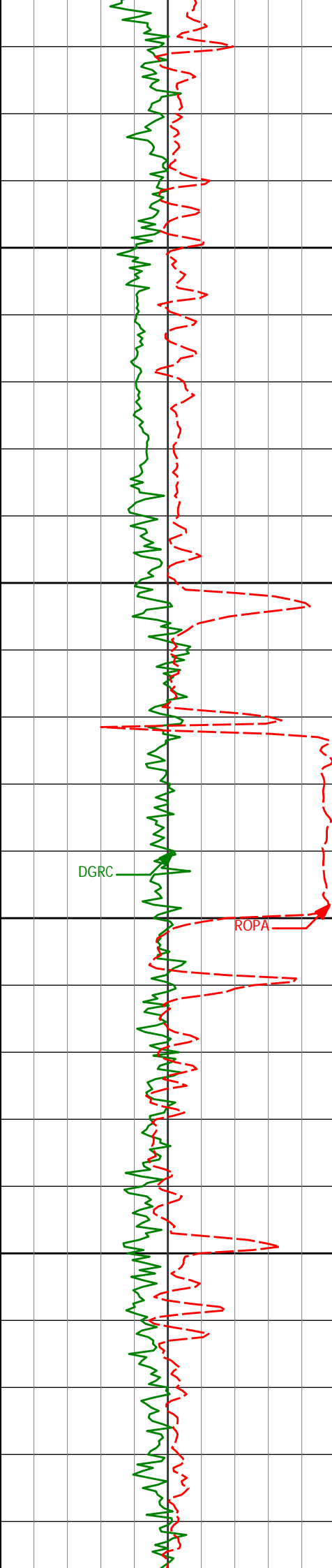
R15P

R09P

R39P

C39P

EWXT



15750

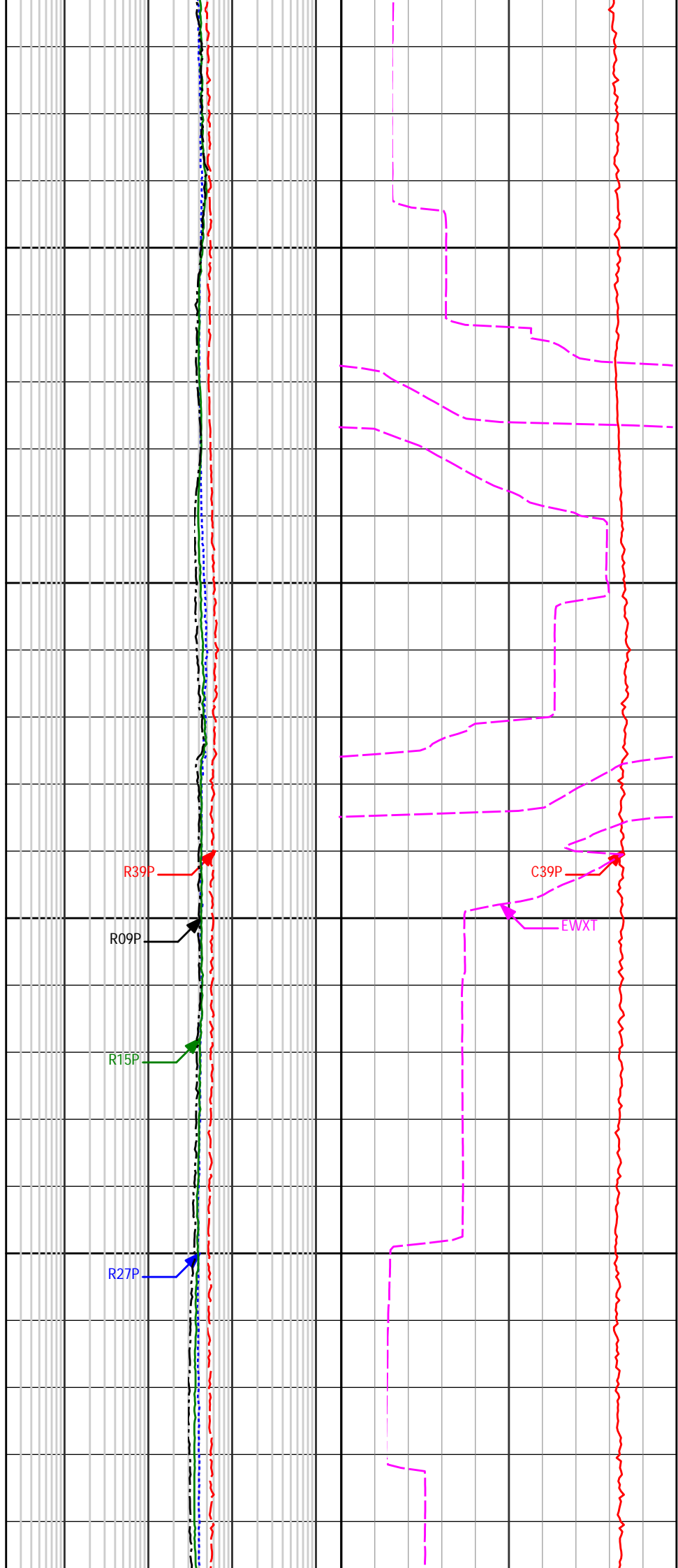
15800

15850

15900

DGRC

ROPA



R39P

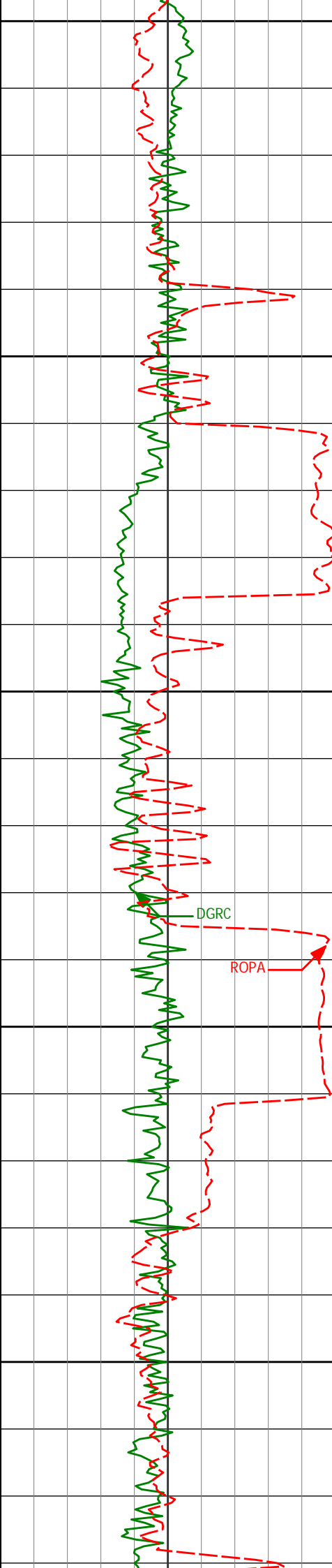
R09P

R15P

R27P

C39P

EWXT



15950

16000

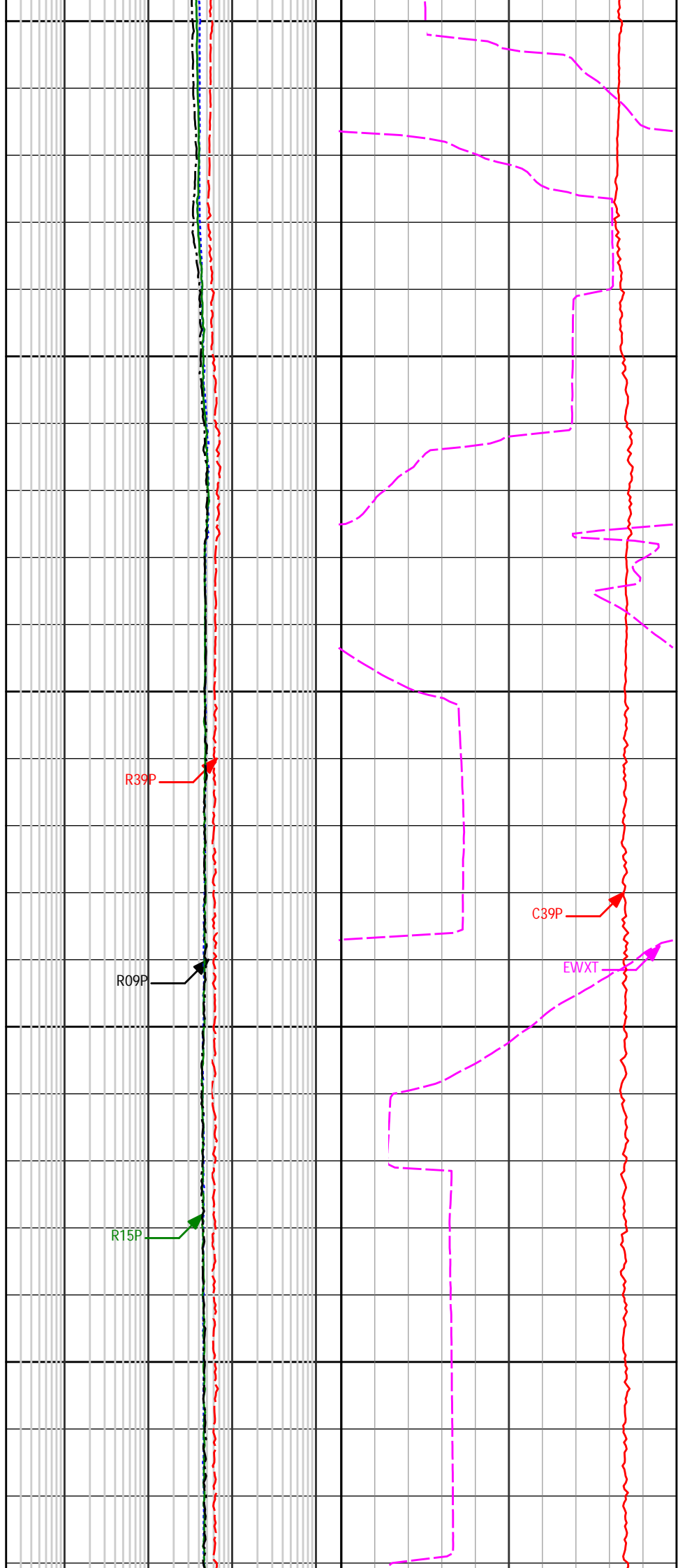
16050

16100

16150

DGRC

ROPA



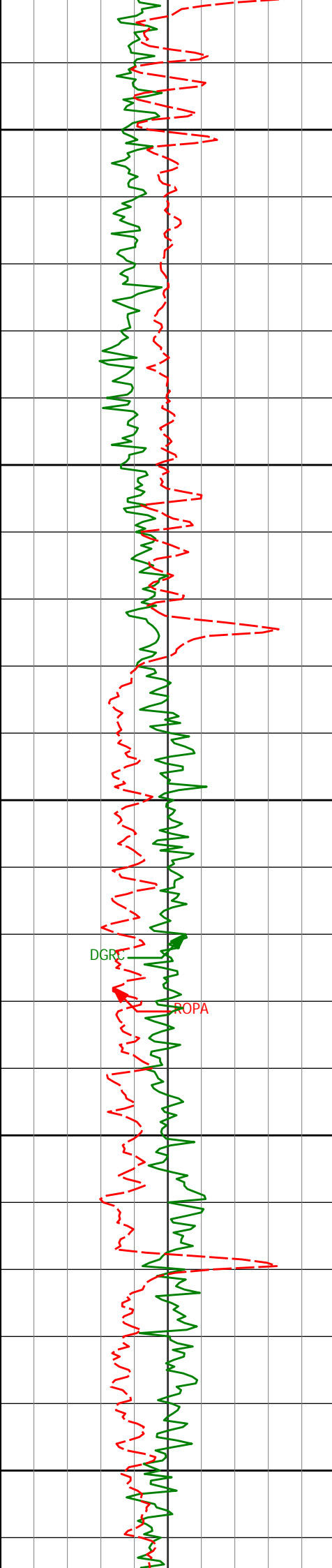
R39P

R09P

R15P

C39P

EWXT



16200

16250

16300

16350

16400

R27P

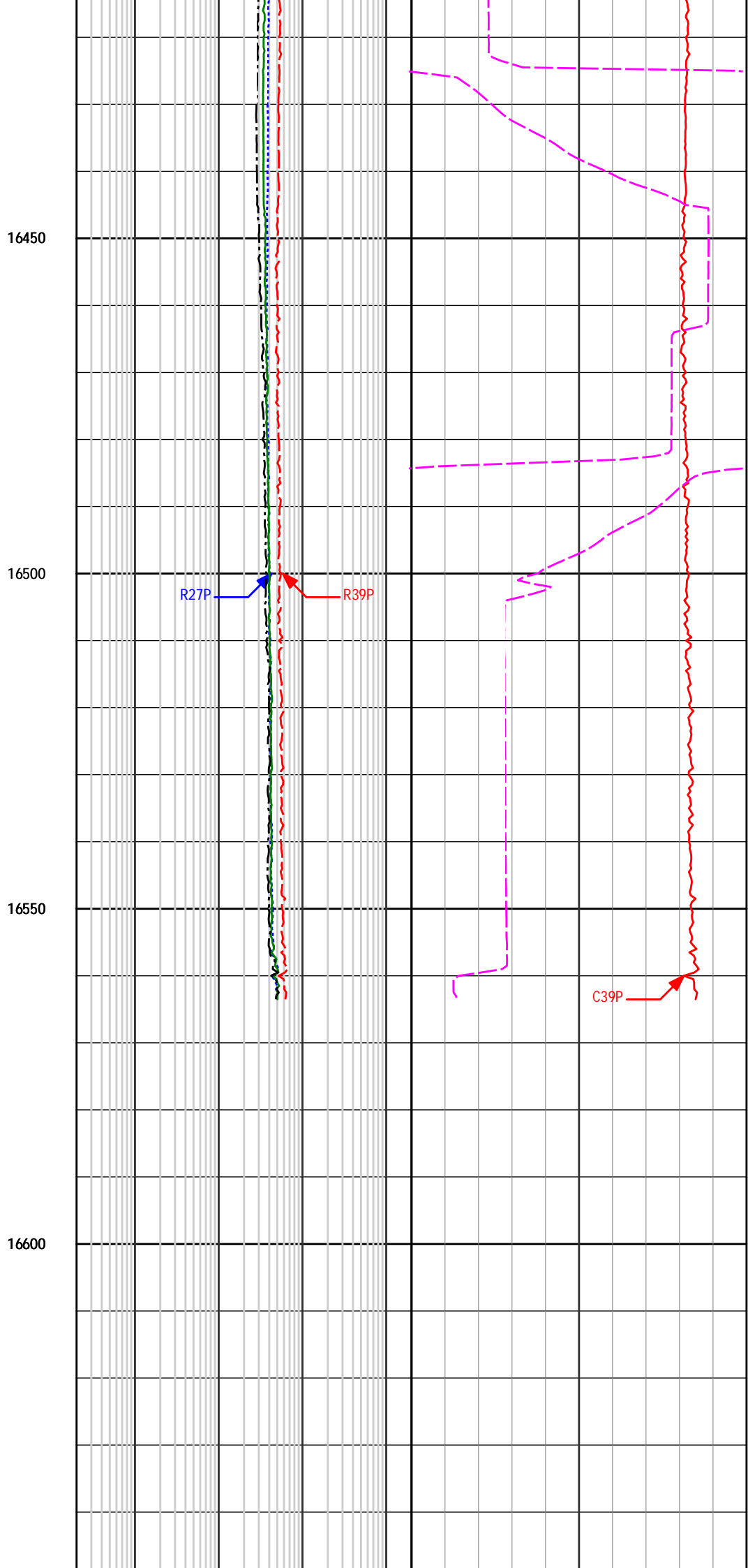
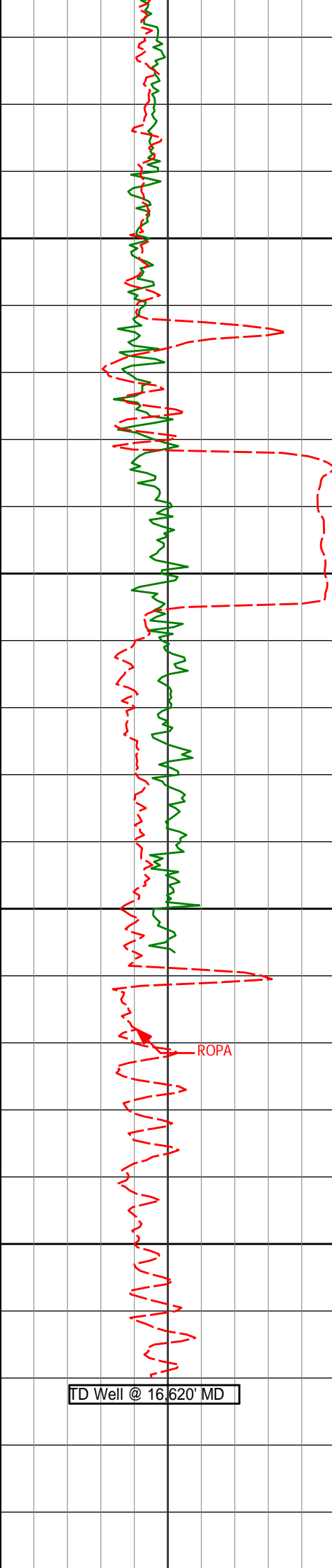
R39P

R09P

R15P

C39P

EWXT



<b>Avg Rate of Penetration</b> ROPA <div> <div>500</div> <div>feet per hr</div> <div>0</div> </div>	MD	<b>X-Shallow (9in) Phase Resistivity</b> R09P <div> <div>0.2</div> <div>ohm-metre</div> <div>2K</div> </div>	<b>Deep (39in) Conductivity</b> C39P <div> <div>100</div> <div>mmho/m</div> <div>0</div> </div>
		<b>Shallow (15in) Phase Resistivity</b> R15P <div> <div>0.2</div> <div>ohm-metre</div> <div>2K</div> </div>	<b>EWR Formation Exposure Time</b> EWXT <div> <div>0</div> <div>minutes</div> <div>100</div> </div>
<b>Gamma Ray Combined</b> DGRC <div> <div>0</div> <div>api</div> <div>300</div> </div>		<b>Medium (27in) Phase Resistivity</b> R27P <div> <div>0.2</div> <div>ohm-metre</div> <div>2K</div> </div>	
		<b>Deep (39in) Phase Resistivity</b> R39P <div> <div>0.2</div> <div>ohm-metre</div> <div>2K</div> </div>	

HALLIBURTON

Sperry Drilling Services

MD Detail Log 1:240



HALLIBURTON

DIRECTIONAL SURVEY REPORT

Anadarko Petroleum Corp.

Crowder 16N-19HZ

Wattenburg

Weld Colorado

USA

CA-XX-0900118958

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
980.00	1.05	18.63	979.90	7.72 N	7.43 W	-7.72	TIE-IN
1110.00	0.74	32.88	1109.88	9.55 N	6.59 W	-9.55	0.29
1202.00	1.49	306.99	1201.87	10.77 N	7.23 W	-10.77	1.76
1294.00	1.65	269.60	1293.84	11.48 N	9.51 W	-11.48	1.11
1386.00	1.59	229.92	1385.80	10.65 N	11.81 W	-10.65	1.20
1539.00	1.27	228.79	1538.76	8.17 N	14.71 W	-8.17	0.21
1723.00	1.35	238.20	1722.71	5.68 N	18.08 W	-5.68	0.12
1907.00	1.36	254.49	1906.66	3.96 N	22.03 W	-3.96	0.21
2096.00	0.73	262.83	2095.63	3.21 N	25.39 W	-3.21	0.34
2285.00	0.83	229.04	2284.61	2.16 N	27.61 W	-2.16	0.25
2474.00	1.57	217.40	2473.57	0.80 S	30.22 W	0.80	0.41
2664.00	1.63	249.30	2663.50	3.82 S	34.33 W	3.82	0.46
2758.00	2.05	234.59	2757.45	5.27 S	36.95 W	5.27	0.67
2853.00	2.78	259.62	2852.37	6.66 S	40.60 W	6.66	1.33
2948.00	3.24	283.43	2947.24	6.46 S	45.48 W	6.46	1.39
3042.00	3.34	280.41	3041.08	5.34 S	50.76 W	5.34	0.21
3232.00	2.86	279.84	3230.80	3.53 S	60.87 W	3.53	0.25
3421.00	2.64	278.67	3419.59	2.07 S	69.82 W	2.07	0.12
3611.00	2.83	279.59	3609.37	0.63 S	78.77 W	0.63	0.10
3800.00	2.44	259.45	3798.17	0.59 S	87.32 W	0.59	0.53
3895.00	2.36	264.58	3893.09	1.15 S	91.26 W	1.15	0.24
3989.00	2.20	317.80	3987.03	0.01 N	94.40 W	-0.01	2.18
4084.00	1.18	294.68	4081.99	1.77 N	96.51 W	-1.77	1.27
4178.00	1.24	282.08	4175.96	2.38 N	98.39 W	-2.38	0.29
4273.00	1.27	288.41	4270.94	2.93 N	100.39 W	-2.93	0.15
4462.00	1.25	292.35	4459.90	4.38 N	104.28 W	-4.38	0.05
4651.00	1.32	316.34	4648.85	6.74 N	107.69 W	-6.74	0.28
4746.00	0.80	307.56	4743.83	7.93 N	108.98 W	-7.93	0.57
4841.00	0.59	133.17	4838.83	8.00 N	109.14 W	-8.00	1.46
5030.00	0.68	80.11	5027.82	7.53 N	107.33 W	-7.53	0.30

5219.00	1.38	38.48	5216.79	9.50 N	104.81 W	-9.50	0.52
5408.00	1.03	44.76	5405.75	12.49 N	102.20 W	-12.49	0.20
5597.00	1.03	65.37	5594.72	14.40 N	99.46 W	-14.40	0.19
5786.00	0.25	92.94	5783.71	15.09 N	97.50 W	-15.09	0.43
5975.00	0.66	67.03	5972.70	15.50 N	96.09 W	-15.50	0.24
6070.00	0.51	11.54	6067.70	16.12 N	95.50 W	-16.12	0.59
6165.00	0.17	83.92	6162.69	16.55 N	95.27 W	-16.55	0.51
6354.00	0.35	85.83	6351.69	16.62 N	94.42 W	-16.62	0.10
6492.00	0.31	160.40	6489.69	16.30 N	93.87 W	-16.30	0.29
6543.00	1.32	170.84	6540.68	15.59 N	93.73 W	-15.59	1.99
6575.00	4.56	180.35	6572.64	13.96 N	93.68 W	-13.96	10.20
6606.00	6.87	183.14	6603.48	10.87 N	93.79 W	-10.87	7.50
6638.00	9.20	183.66	6635.17	6.41 N	94.06 W	-6.41	7.28
6669.00	11.51	187.27	6665.66	0.87 N	94.61 W	-0.87	7.74
6701.00	13.38	181.26	6696.91	6.00 S	95.09 W	6.00	7.10
6732.00	15.21	179.74	6726.95	13.66 S	95.16 W	13.66	6.03
6764.00	17.24	178.68	6757.67	22.60 S	95.03 W	22.60	6.41
6795.00	19.59	173.57	6787.08	32.35 S	94.34 W	32.35	9.19
6827.00	22.54	174.74	6816.94	43.80 S	93.18 W	43.80	9.31
6858.00	25.23	173.51	6845.28	56.28 S	91.88 W	56.28	8.82
6890.00	27.39	172.61	6873.97	70.36 S	90.17 W	70.36	6.86
6921.00	29.61	172.81	6901.21	85.03 S	88.29 W	85.03	7.17
6953.00	31.29	174.34	6928.79	101.14 S	86.48 W	101.14	5.78
6984.00	33.79	173.92	6954.93	117.73 S	84.77 W	117.73	8.10
7016.00	35.75	173.94	6981.21	135.87 S	82.84 W	135.87	6.13
7047.00	38.22	174.99	7005.97	154.44 S	81.05 W	154.44	8.22
7079.00	40.82	175.82	7030.66	174.73 S	79.42 W	174.73	8.29
7111.00	43.85	174.69	7054.31	196.20 S	77.63 W	196.20	9.76
7142.00	47.34	174.69	7076.00	218.25 S	75.59 W	218.25	11.26
7174.00	50.23	174.48	7097.08	242.21 S	73.31 W	242.21	9.04
7205.00	53.39	174.38	7116.24	266.46 S	70.95 W	266.46	10.20
7237.00	56.63	174.54	7134.59	292.55 S	68.42 W	292.55	10.13
7268.00	60.91	175.06	7150.66	318.94 S	66.02 W	318.94	13.88
7300.00	65.43	177.06	7165.10	347.42 S	64.07 W	347.42	15.19
7331.00	70.36	179.29	7176.76	376.12 S	63.16 W	376.12	17.24
7363.00	75.12	180.50	7186.25	406.67 S	63.11 W	406.67	15.31
7396.00	78.21	182.08	7193.87	438.77 S	63.84 W	438.77	10.46
7438.00	84.77	184.28	7200.08	480.21 S	66.15 W	480.21	16.45
7513.00	89.38	185.36	7203.90	554.83 S	72.44 W	554.83	6.31
7608.00	89.94	184.75	7204.47	649.46 S	80.81 W	649.46	0.87
7702.00	90.43	184.25	7204.16	743.17 S	88.19 W	743.17	0.74
7797.00	90.00	184.21	7203.81	837.91 S	95.19 W	837.91	0.45
7891.00	89.94	184.57	7203.86	931.63 S	102.39 W	931.63	0.39
7986.00	89.01	183.87	7204.73	1026.37 S	109.38 W	1026.37	1.23
8080.00	89.44	183.62	7206.00	1120.16 S	115.52 W	1120.16	0.53
8175.00	90.06	183.16	7206.41	1214.99 S	121.13 W	1214.99	0.81
8269.00	89.07	181.67	7207.13	1308.90 S	125.09 W	1308.90	1.90
8364.00	88.76	180.95	7208.93	1403.86 S	127.27 W	1403.86	0.83
8458.00	90.00	181.66	7209.94	1497.83 S	129.41 W	1497.83	1.52
8553.00	90.43	181.00	7209.59	1592.80 S	131.61 W	1592.80	0.83
8648.00	89.81	179.73	7209.39	1687.79 S	132.22 W	1687.79	1.49
8743.00	90.37	178.89	7209.24	1782.79 S	131.07 W	1782.79	1.06
8837.00	90.99	178.47	7208.12	1876.75 S	128.91 W	1876.75	0.80
8932.00	89.81	176.84	7207.46	1971.67 S	125.02 W	1971.67	2.12
9027.00	89.26	176.39	7208.23	2066.50 S	119.41 W	2066.50	0.75
9121.00	89.26	177.13	7209.45	2160.34 S	114.10 W	2160.34	0.79
9216.00	90.12	178.57	7209.96	2255.27 S	110.54 W	2255.27	1.77
9311.00	90.43	178.09	7209.50	2350.22 S	107.77 W	2350.22	0.60
9405.00	88.08	177.60	7210.73	2444.14 S	104.23 W	2444.14	2.55
9500.00	87.47	179.11	7214.41	2539.03 S	101.51 W	2539.03	1.71
9595.00	87.53	178.91	7218.56	2633.92 S	99.87 W	2633.92	0.22
9689.00	88.02	180.28	7222.21	2727.85 S	99.20 W	2727.85	1.55
9781.00	88.89	181.25	7224.69	2819.81 S	100.43 W	2819.81	1.42
9873.00	90.12	181.88	7225.48	2911.77 S	102.94 W	2911.77	1.50
9965.00	89.75	180.55	7225.59	3003.74 S	104.90 W	3003.74	1.50
10057.00	89.94	181.48	7225.84	3095.73 S	106.52 W	3095.73	1.03
10150.00	91.30	182.66	7224.83	3188.66 S	109.88 W	3188.66	1.94
10241.00	91.05	181.43	7222.96	3279.58 S	113.13 W	3279.58	1.38
10332.00	91.55	180.73	7220.90	3370.54 S	114.84 W	3370.54	0.95
10424.00	90.31	181.70	7219.41	3462.50 S	116.80 W	3462.50	1.71
10516.00	90.43	180.20	7218.81	3554.48 S	118.32 W	3554.48	1.64
10608.00	90.43	181.42	7218.12	3646.47 S	119.62 W	3646.47	1.33
10700.00	90.25	182.62	7217.58	3738.41 S	122.86 W	3738.41	1.32
10792.00	90.00	183.57	7217.37	3830.27 S	127.83 W	3830.27	1.07
10884.00	89.69	183.00	7217.62	3922.12 S	133.10 W	3922.12	0.71
10976.00	89.88	183.21	7217.07	4014.03 S	137.36 W	4014.03	0.78

10976.00	89.88	182.31	7217.97	4014.02 S	137.36 W	4014.02	0.78
11068.00	90.56	182.88	7217.62	4105.93 S	141.53 W	4105.93	0.96
11160.00	89.69	182.27	7217.42	4197.83 S	145.66 W	4197.83	1.15
11252.00	89.57	181.11	7218.01	4289.79 S	148.38 W	4289.79	1.27
11344.00	88.52	177.27	7219.54	4381.75 S	147.08 W	4381.75	4.33
11436.00	88.08	176.53	7222.27	4473.57 S	142.10 W	4473.57	0.94
11528.00	89.01	177.44	7224.61	4565.41 S	137.27 W	4565.41	1.41
11620.00	90.62	178.16	7224.91	4657.34 S	133.73 W	4657.34	1.92
11712.00	91.79	176.98	7222.97	4749.24 S	129.83 W	4749.24	1.81
11804.00	92.60	176.82	7219.45	4841.03 S	124.86 W	4841.03	0.90
11896.00	92.22	176.80	7215.58	4932.81 S	119.75 W	4932.81	0.41
11988.00	91.73	176.93	7212.41	5024.62 S	114.72 W	5024.62	0.55
12080.00	90.31	178.29	7210.77	5116.52 S	110.88 W	5116.52	2.14
12172.00	88.83	177.74	7211.46	5208.46 S	107.70 W	5208.46	1.72
12264.00	89.07	177.39	7213.15	5300.36 S	103.79 W	5300.36	0.46
12356.00	89.14	176.80	7214.58	5392.23 S	99.13 W	5392.23	0.65
12448.00	88.70	177.80	7216.32	5484.11 S	94.79 W	5484.11	1.19
12540.00	88.27	177.90	7218.75	5576.01 S	91.34 W	5576.01	0.48
12632.00	86.48	178.64	7222.96	5667.87 S	88.57 W	5667.87	2.11
12727.00	87.53	179.24	7227.93	5762.72 S	86.81 W	5762.72	1.27
12821.00	89.20	179.63	7230.61	5856.67 S	85.89 W	5856.67	1.82
12916.00	89.81	180.43	7231.43	5951.67 S	85.94 W	5951.67	1.06
13011.00	90.25	179.85	7231.38	6046.67 S	86.17 W	6046.67	0.77
13108.00	89.88	180.38	7231.27	6143.67 S	86.36 W	6143.67	0.67
13202.00	91.17	178.78	7230.41	6237.66 S	85.68 W	6237.66	2.19
13297.00	90.93	178.12	7228.67	6332.60 S	83.11 W	6332.60	0.74
13392.00	91.73	178.90	7226.46	6427.55 S	80.64 W	6427.55	1.18
13486.00	91.30	180.34	7223.98	6521.51 S	80.01 W	6521.51	1.60
13581.00	90.74	180.35	7222.29	6616.49 S	80.59 W	6616.49	0.59
13675.00	90.43	179.77	7221.33	6710.49 S	80.68 W	6710.49	0.70
13770.00	91.17	180.98	7220.00	6805.47 S	81.31 W	6805.47	1.49
13864.00	91.30	181.79	7217.97	6899.42 S	83.58 W	6899.42	0.87
13959.00	91.11	179.60	7215.98	6994.39 S	84.73 W	6994.39	2.31
14053.00	91.61	180.37	7213.75	7088.36 S	84.70 W	7088.36	0.98
14148.00	91.67	179.95	7211.03	7183.32 S	84.97 W	7183.32	0.45
14243.00	91.42	178.53	7208.46	7278.28 S	83.71 W	7278.27	1.52
14337.00	92.78	179.42	7205.02	7372.19 S	82.03 W	7372.19	1.73
14432.00	90.87	180.84	7202.00	7467.14 S	82.24 W	7467.14	2.50
14526.00	91.73	180.67	7199.86	7561.11 S	83.48 W	7561.11	0.93
14621.00	90.31	181.62	7198.17	7656.07 S	85.38 W	7656.07	1.80
14715.00	89.94	180.45	7197.97	7750.05 S	87.08 W	7750.05	1.31
14810.00	90.43	181.17	7197.66	7845.04 S	88.42 W	7845.04	0.92
14905.00	89.63	180.06	7197.61	7940.03 S	89.44 W	7940.03	1.44
14999.00	90.62	180.42	7197.40	8034.03 S	89.84 W	8034.03	1.12
15094.00	89.50	179.11	7197.31	8129.02 S	89.45 W	8129.02	1.81
15189.00	89.13	178.41	7198.44	8224.00 S	87.39 W	8224.00	0.83
15283.00	89.63	179.46	7199.46	8317.97 S	85.64 W	8317.97	1.24
15378.00	89.69	178.87	7200.02	8412.96 S	84.26 W	8412.96	0.62
15472.00	89.26	178.74	7200.88	8506.94 S	82.30 W	8506.93	0.48
15567.00	88.08	179.14	7203.09	8601.89 S	80.54 W	8601.89	1.31
15662.00	88.14	178.76	7206.22	8696.82 S	78.80 W	8696.82	0.40
15756.00	88.14	178.41	7209.27	8790.75 S	76.48 W	8790.75	0.37
15851.00	89.32	178.56	7211.38	8885.69 S	73.97 W	8885.69	1.25
15945.00	89.07	178.38	7212.70	8979.64 S	71.46 W	8979.64	0.33
16040.00	89.75	178.83	7213.68	9074.61 S	69.15 W	9074.61	0.86
16134.00	90.99	179.83	7213.07	9168.60 S	68.05 W	9168.60	1.69
16229.00	91.05	179.22	7211.38	9263.58 S	67.26 W	9263.58	0.65
16324.00	91.17	178.76	7209.54	9358.55 S	65.59 W	9358.55	0.50
16418.00	90.74	177.87	7207.97	9452.49 S	62.82 W	9452.49	1.05
16513.00	90.12	179.46	7207.26	9547.46 S	60.61 W	9547.46	1.80
16574.00	90.12	179.07	7207.13	9608.45 S	59.83 W	9608.46	0.64
16620.00	90.12	179.07	7207.03	9654.45 S	59.08 W	9654.45	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 180.00 DEGREES (TRUE)

A TOTAL CORRECTION OF 8.63 DEG FROM MAGNETIC NORTH TO TRUE NORTH HAS BEEN APPLIED

HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.

HORIZONTAL DISPLACEMENT(CLOSURE) AT 16620.00 FEET

IS 9654.63 FEET ALONG 180.35 DEGREES (TRUE)

