

PCGK - Pressure Case Gamma

[illegible]

WELL INFORMATION

MWD Run Number	100	200	300		
Date run completed	31-Dec-13	02-Jan-14	09-Feb-14		
Rig Bit Number	0100	0200	0300		
Bit Size (in)	8.740	8.750	6.125		
Tool Nominal OD (in)	6.750	6.750	4.750		
Log Start Depth (MD, ft)	1,060.00	7,569.00	7,885.00		
Log End Depth (MD, ft)	7,569.00	7,885.00	16,886.00		
Drill or Wipe	Drill	Drill	Drill		
Drill/Wipe Start Date and Time	29-Dec-13 10:30	01-Jan-14 01:15	06-Feb-14 00:00		
Drill/Wipe End Date and Time	31-Dec-13 10:20	01-Jan-14 18:30	08-Feb-14 11:35		
Min Inc (deg) @ Depth (MD, ft)	0.13 @ 1,856.00	52.80 @ 7,608.00	88.74 @ 15,331.00		
Max Inc (deg) @ Depth (MD, ft)	46.75 @ 7,565.00	86.15 @ 7,841.00	91.66 @ 8,553.00		
Bit TFA(in2) / Bit Type	PCD / 0.97	Tri-Cone / 1.05	PDC / 1.8561		
Flow Rate (gpm)	609.24	524.00	280.52		
Max AV (fpm) / CV (fpm) @ MWD	290.9 / 0.0	252.5 / 0.0	N/A / N/A		
Fluid Type	Native/Spud Mud	Fresh Water Gel	Mineral Oil Bas		
Density (ppg) / Viscosity (spqt)	8.40 / 28.00	10.20 / 51.00	9.30 / 75.00		
Filtrate CL (ppm)	2,200.00	3,300.00	268,514.00		
pH / Fluid Loss (mptm)	8.00 / 14	8.60 / 0	N/A / N/A		
PV (cP) / YP (lbf2)	1 / 8.00	15 / 15.00	26 / 10.00		
% Solids / % Sand	0.10 / 0.1	8.8 / 0.1	11.50 / 0.05		
% Oil / Oil:Water Ratio	N/A / N/A	N/A / N/A	58.00 / 66:34		
Rm @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		
Rmf @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		
Rmc @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		
Max Tool Temp (in F) / S	168.00 / 80M	168.00 / 80M	110.00 / 80M		

Max Tool Temp (degF) / Source	189.99 / PCM	189.99 / PCM	412.20 / PCM		
Rm @ Max Tool Temp (degF)	N/A @ 189.99	N/A @ 189.99	N/A @ 230.3		
Lead MWD Engineer	Clay Wass	Clay Wass	Caleb Jones		
Customer Representative	Jack Saunders	Jack Saunders	Scott Hancock		

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM	PCM		
Software Version	5.84	5.84	5.76		
Sub Serial Number	11342274	11342274	12334781		
Insert Serial Number	11680770	11680770	11680802		
Date and Time Initialized	28-Dec-13 13:38	01-Jan-70 00:00	02-Feb-14 07:04		
Date and Time Read	02-Jan-14 06:15	02-Jan-14 06:23	09-Feb-14 07:38		
ECMB SW Version	N/A	N/A	N/A		

Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC		
Distance From Bit (ft)	45.62	42.47	48.00		
Software Version	6.21	6.21	6.21		
Sub Serial Number	11342274	11342274	12334781		
Sonde Serial Number	11638590	11638590	11638587		
Sensor ID Number	N/A	N/A	N/A		
Toolface Offset (deg)	334.43	192.18	185.14		

Gamma Ray Sensor Information

Tool Type	PCG	PCG	PCG		
Distance From Bit (ft)	50.82	47.67	50.77		
Recorded Sample Period (sec)	10		10		
Software Version	8.15	8.15	8.15		
Sub Serial Number	11342274	11342274	12334781		
Insert/Sonde Serial Number	12071268	12071268	11579778		

REMARKS

1. All depths are measured depths, referenced to the Driller's pipe tally and are measured from the Drill Floor, unless otherwise specified.
2. No depth corrections have been made for pipe stretch or compression.
3. Critical annular velocities are calculated using the "Power Law" model for water based fluids and the "Bingham Plastic" model for oil and synthetic based fluids.
4. all data presented is recorded data unless otherwise specified.
5. The following smoothing parameters have been applied to the data:

PGRC (Corrected Gamma Ray):

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

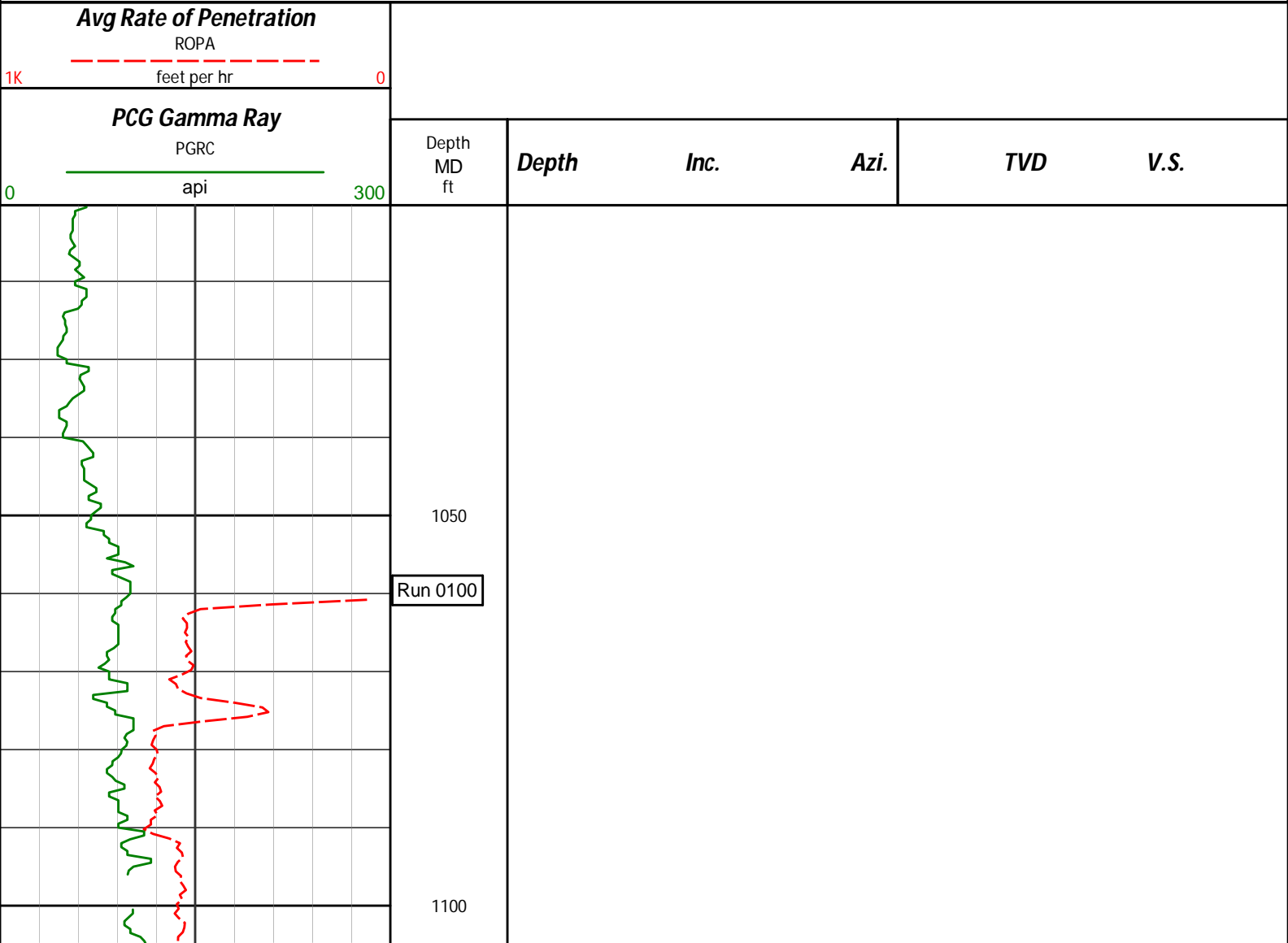
Insite version: 8.0.1

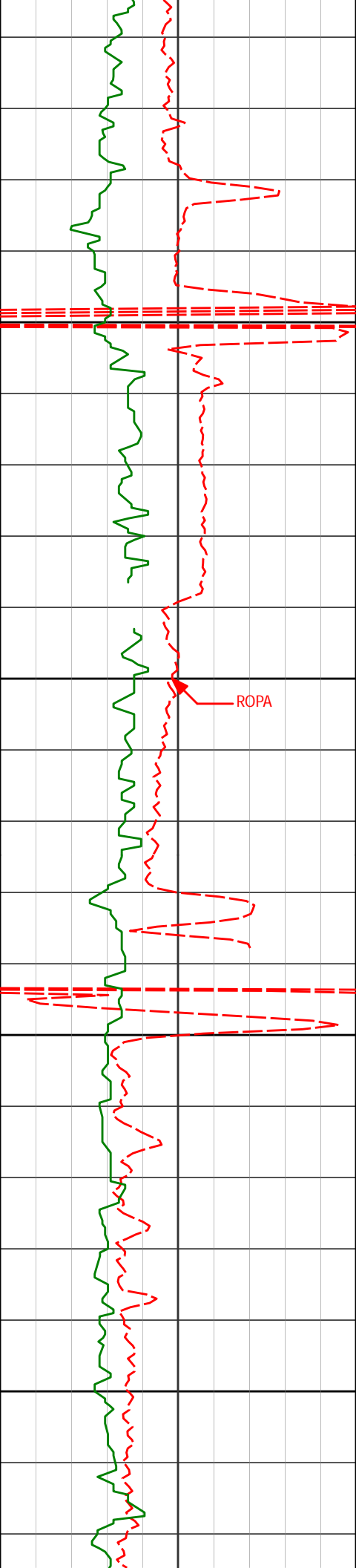
WARRANTY

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HALLIBURTON
Sperry Drilling Services
MD Detail Log 1:240

Anadarko PC
Grenemyer 35N-3HZ
Xtreme 22
34-T1N-R67W





1150

1200

ROPA

1250

1300

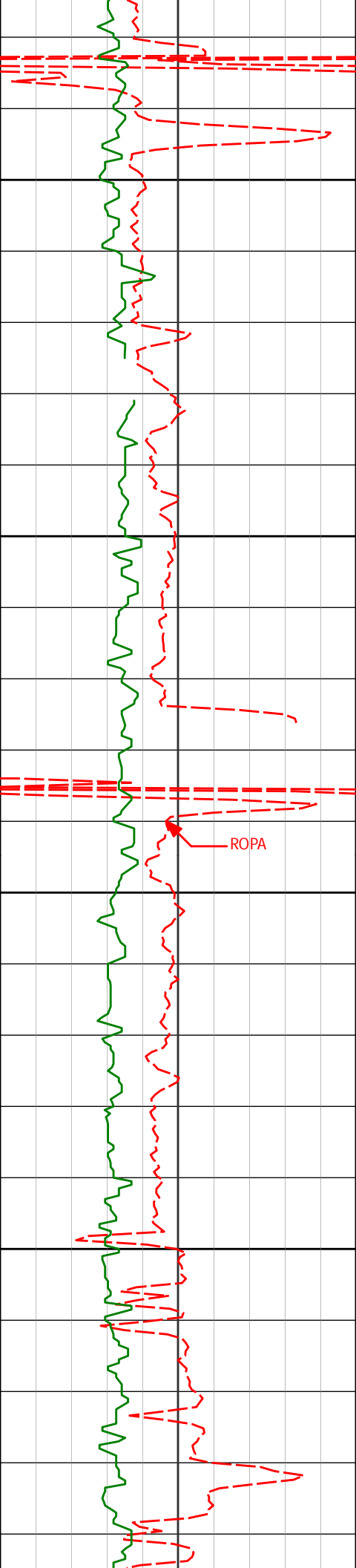
1295'

0.38°

21.43°

1294.99'

-1.97'



1350

1400

1450

1500

ROPA

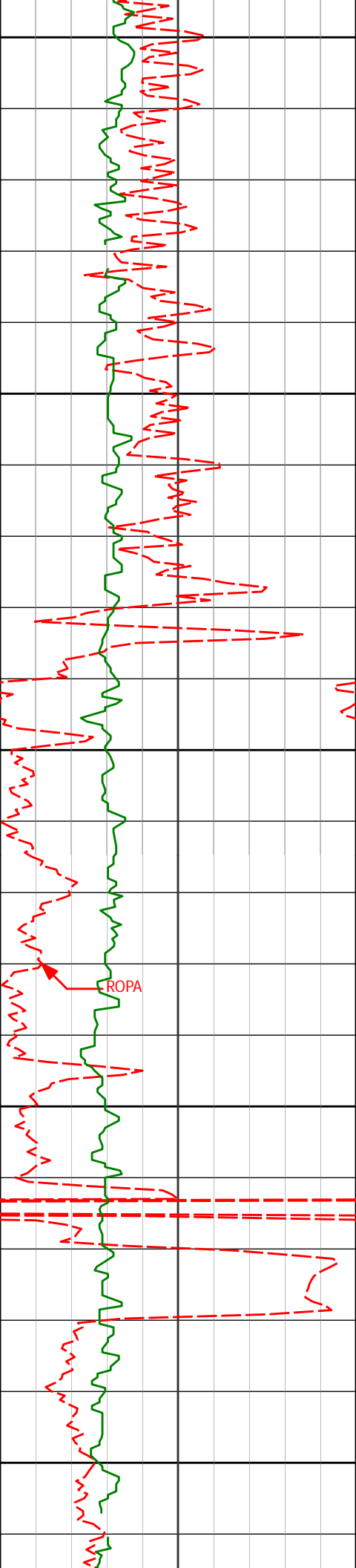
1484'

0.68°

19.93°

1483.98'

-3.61'



1550

1600

1650

1700

1750

1673'

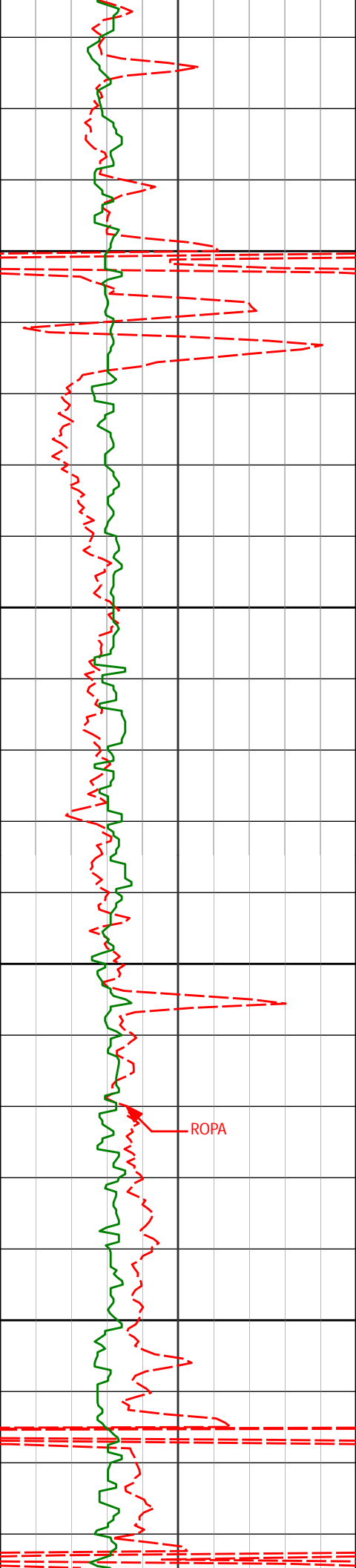
0.75°

11.08°

1672.96'

-5.87'

ROPA



1800

1850

1900

1950

1856'

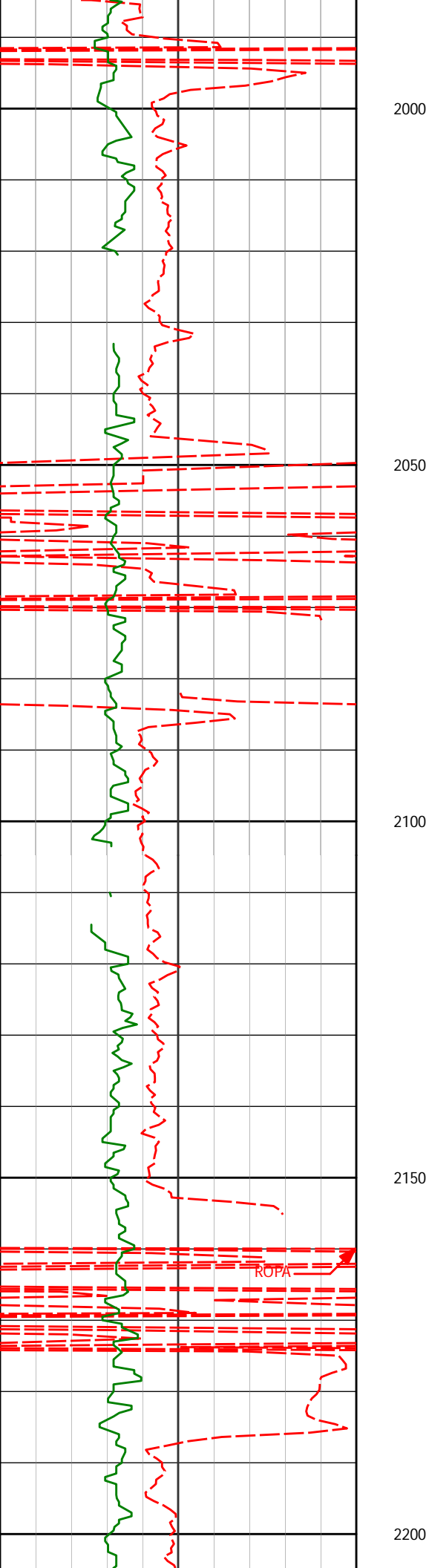
0.13°

270.33°

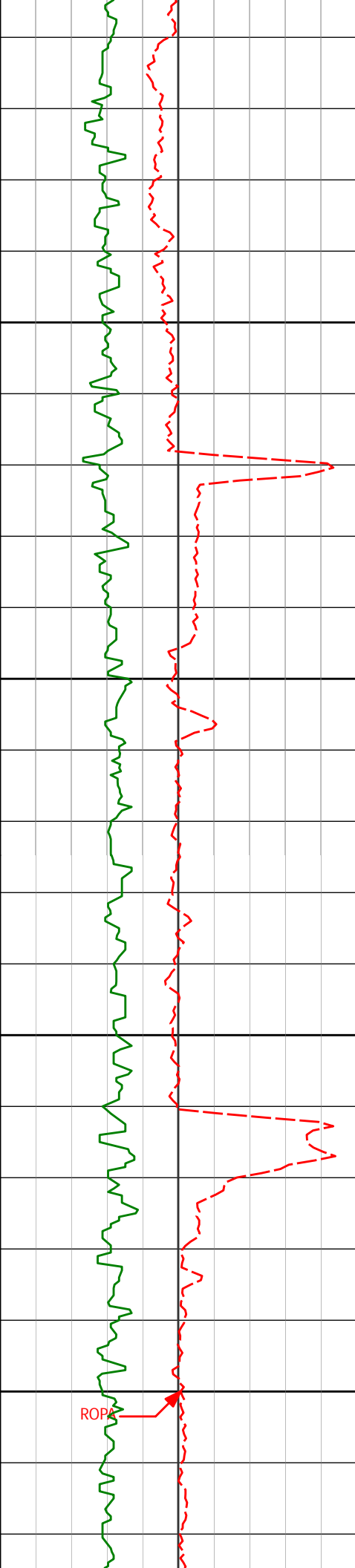
1855.96'

-7.05'

ROPA



2039' 0.22° 264.75° 2038.96' -7.02'



2222'

0.76°

110.08°

2221.95'

-6.57'

2250

2300

2350

2400

ROPA

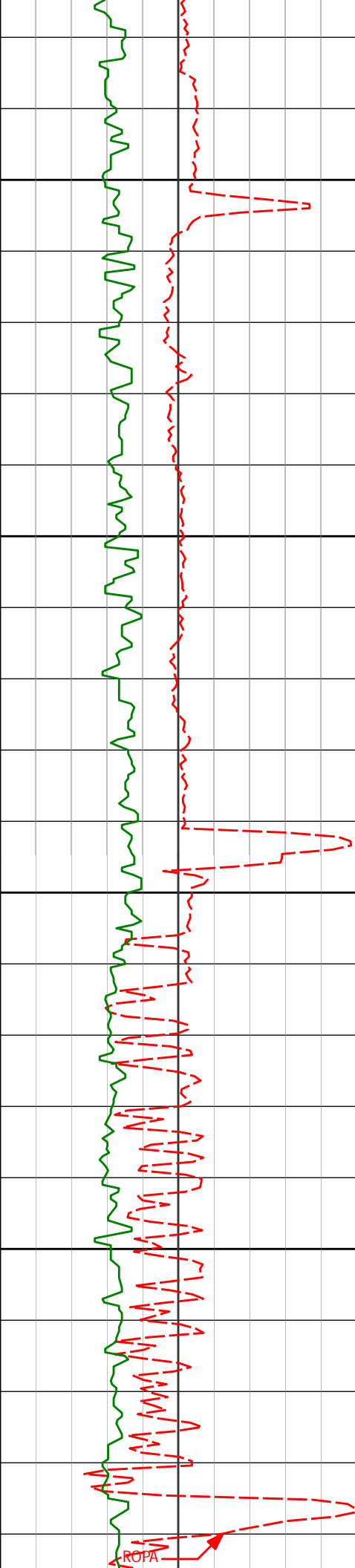
2406'

0.42°

214.69°

2405.95'

-5.59'



2450

2500

2550

2600

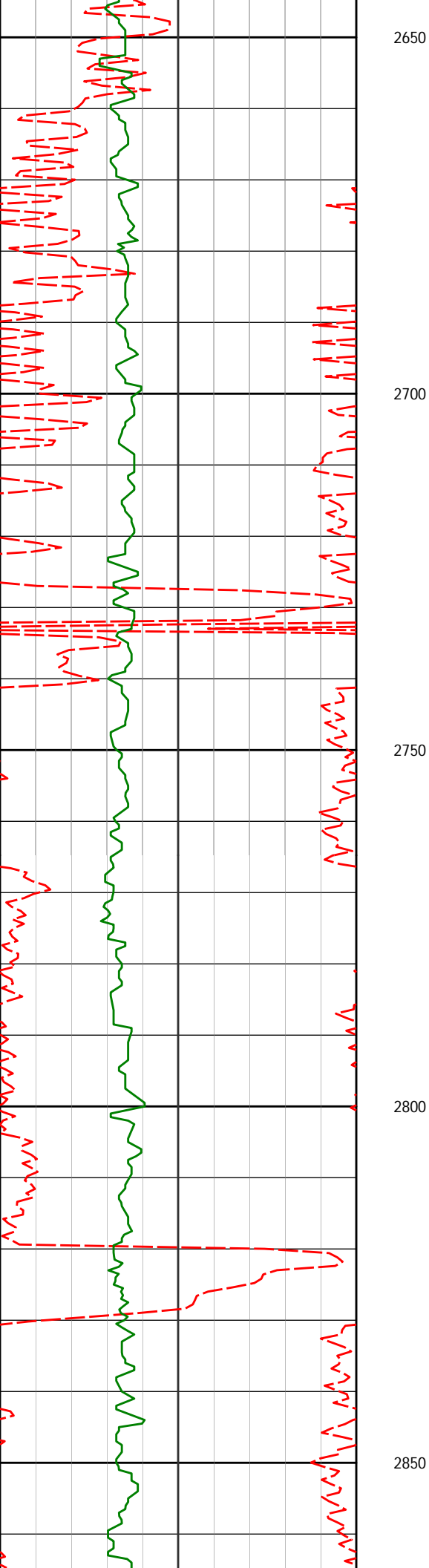
2587'

0.30°

160.45°

2586.94'

-4.60'



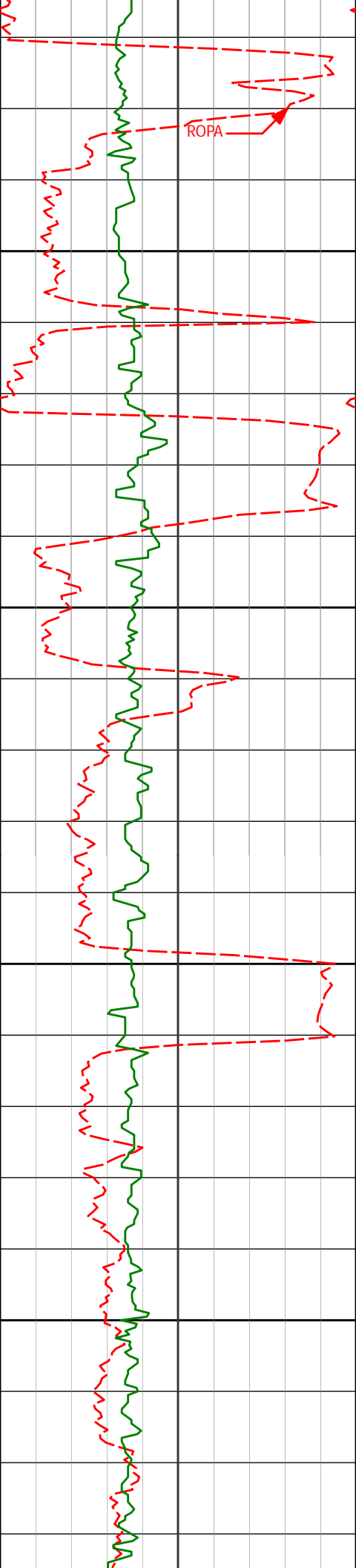
2769'

0.69°

255.83°

2768.94'

-3.89'



2900

2950

3000

3050

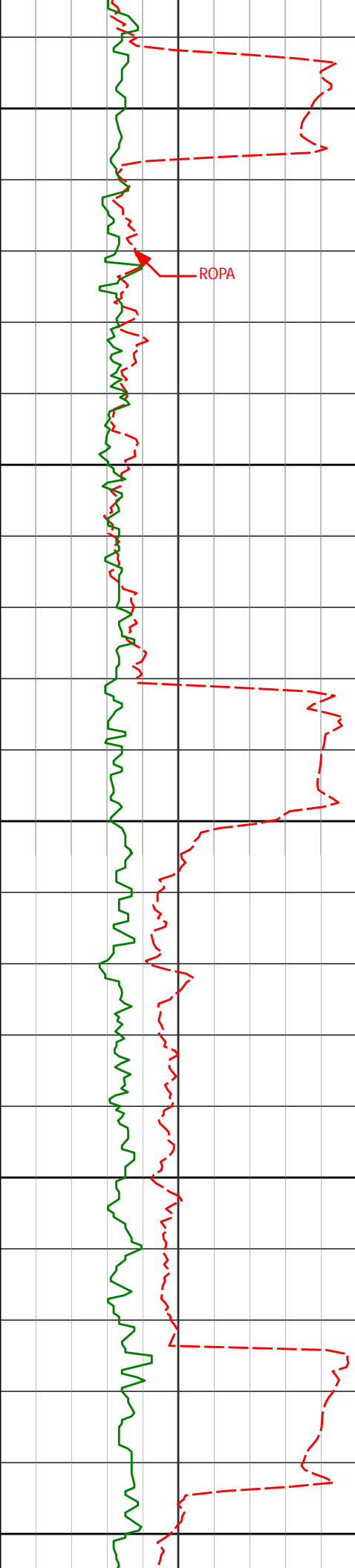
2952'

2.63°

88.92°

2951.89'

-3.68'



3100

3150

3200

3250

3300

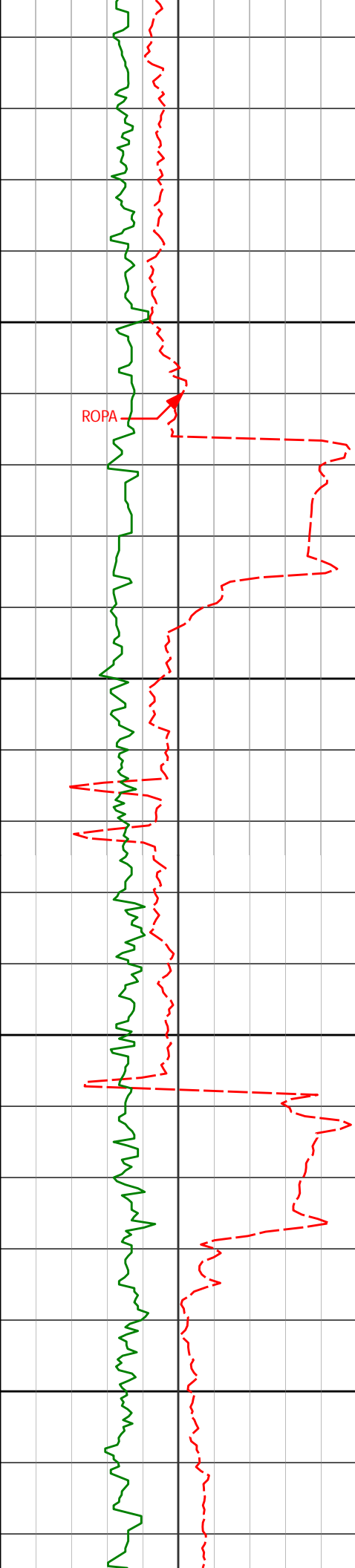
3134'

3.79°

75.18°

3133.60'

-5.24'



3318'

6.75°

73.61°

3316.80'

-9.76'

3350

ROPA

3400

3450

3495'

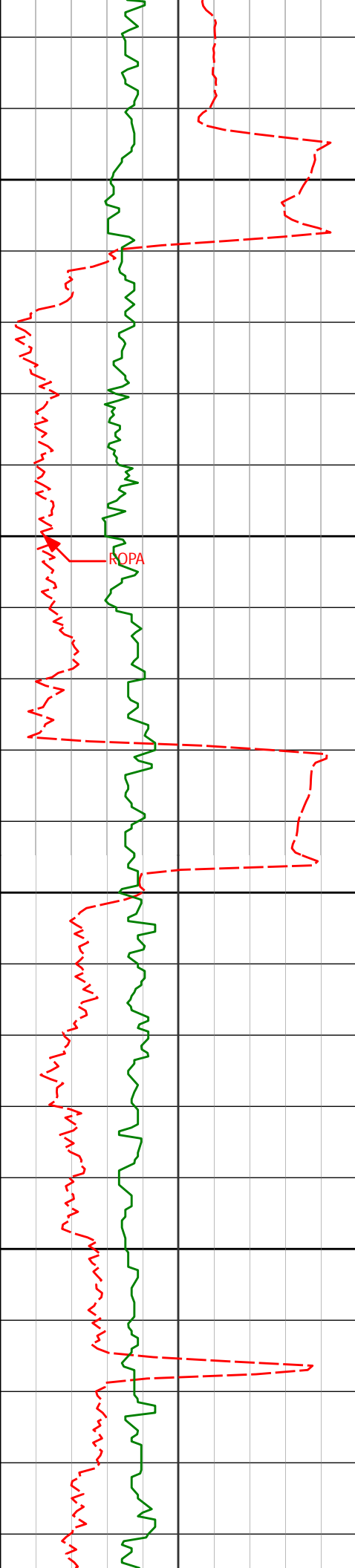
9.37°

74.91°

3492.04'

-16.31'

3500



3550

3600

3650

3700

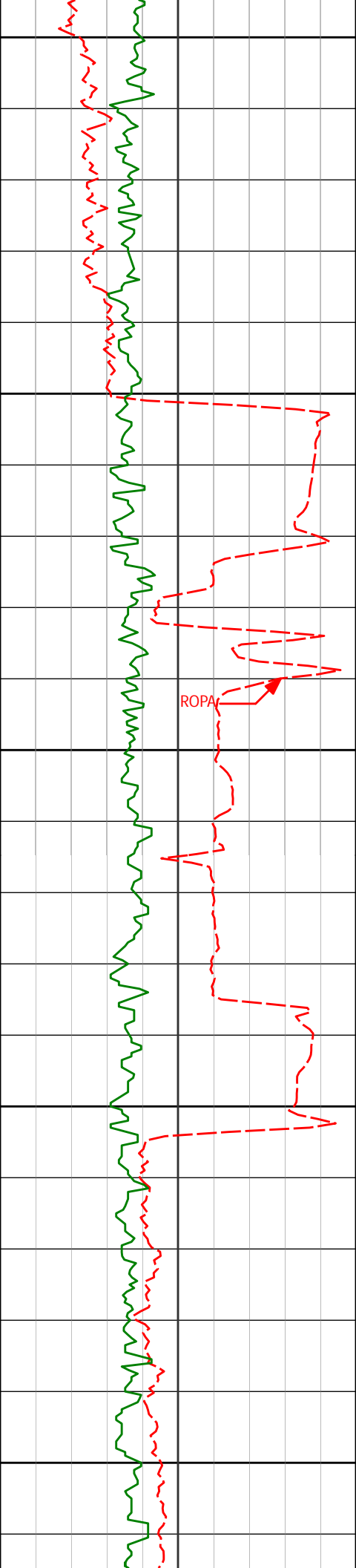
3667'

10.63°

73.49°

3661.42'

-24.31'



3750

3800

3850

3900

3950

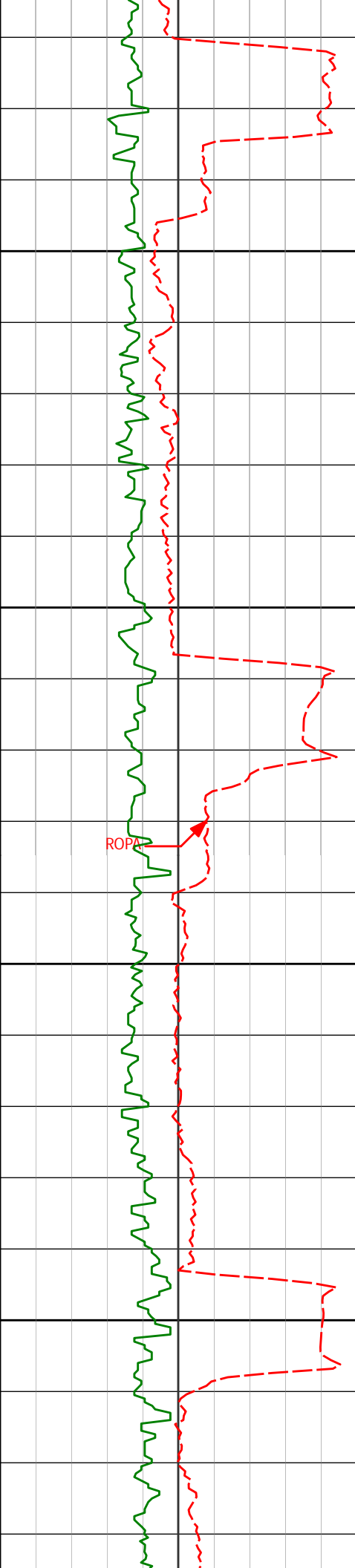
3838'

10.40°

76.40°

3829.55'

-32.25'



4000

4050

4100

4150

4009'

10.76°

73.37°

3997.65'

-40.28'

ROPAL

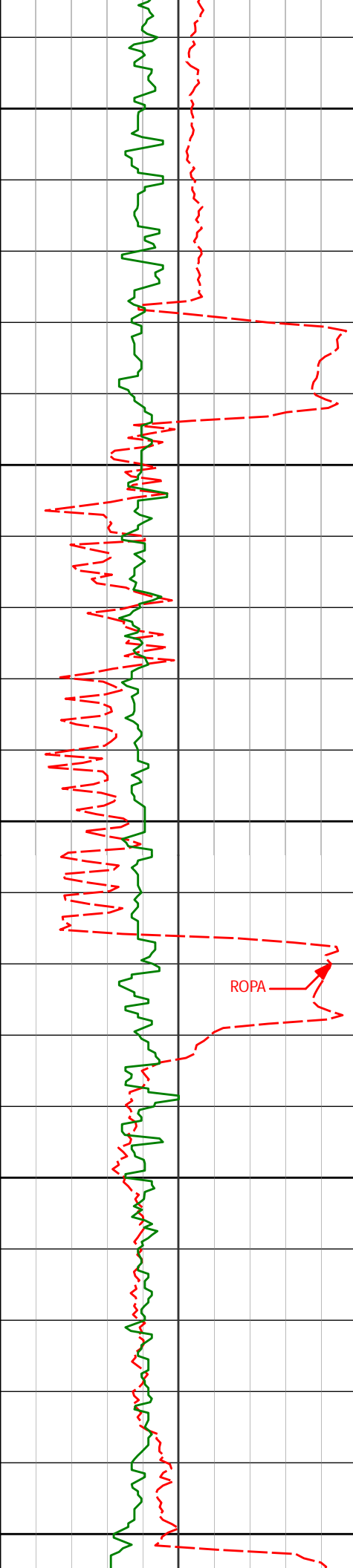
4181'

11.28°

72.90°

4166.47'

-49.64'



4200

4250

4300

ROPA

4350

4400

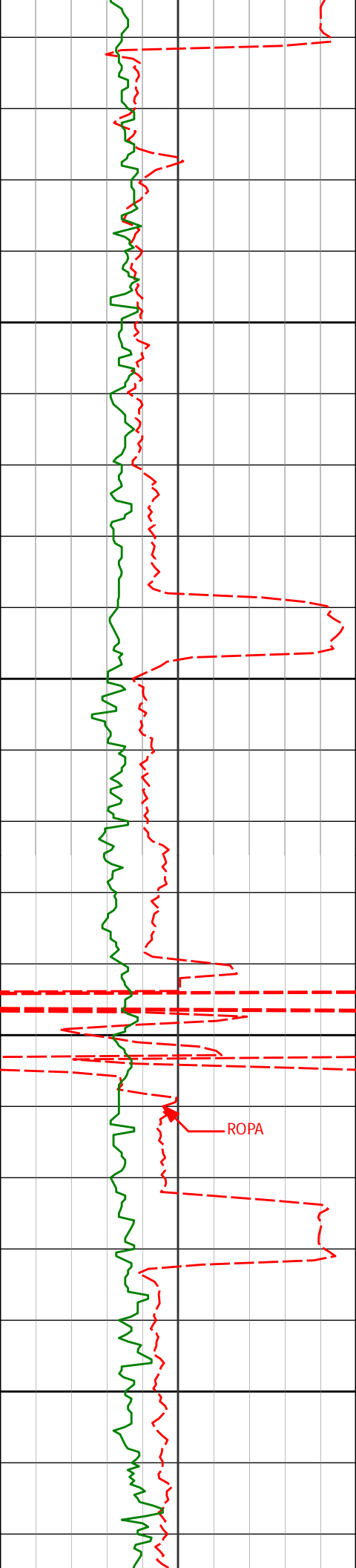
4352'

11.59°

76.80°

4334.08'

-58.30'



4450

4500

4523'

10.67°

75.68°

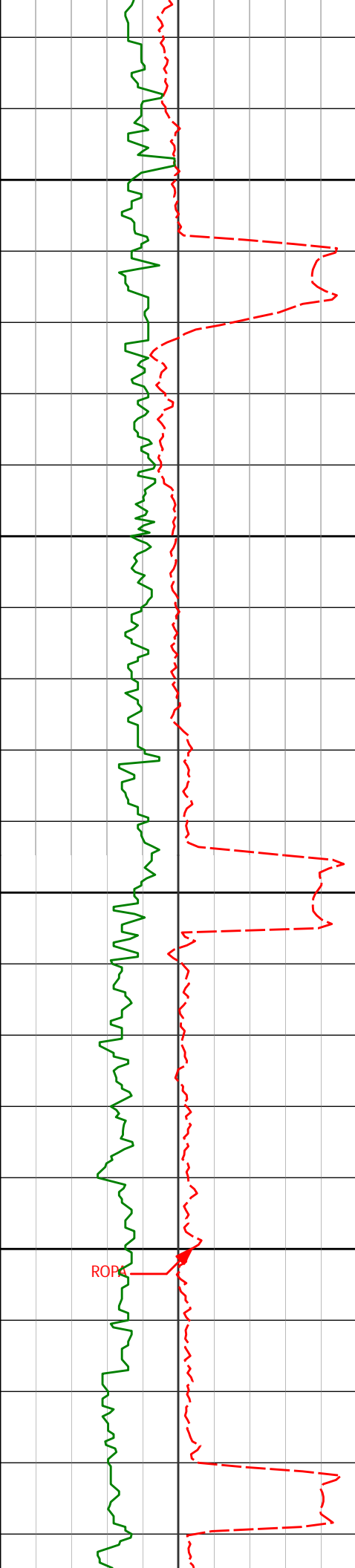
4501.86'

-65.96'

4550

ROPA

4600



4650

4694'

10.28°

78.14°

4670.01'

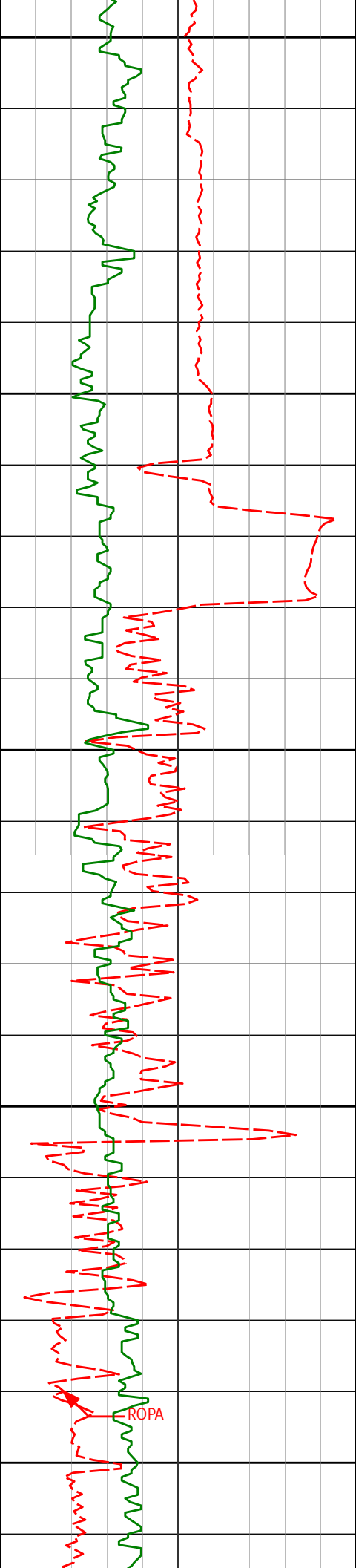
-72.84'

4700

4750

4800

ROP



4850

4866'

10.26°

76.61°

4839.26'

-79.38'

4900

4950

5000

5037'

11.05°

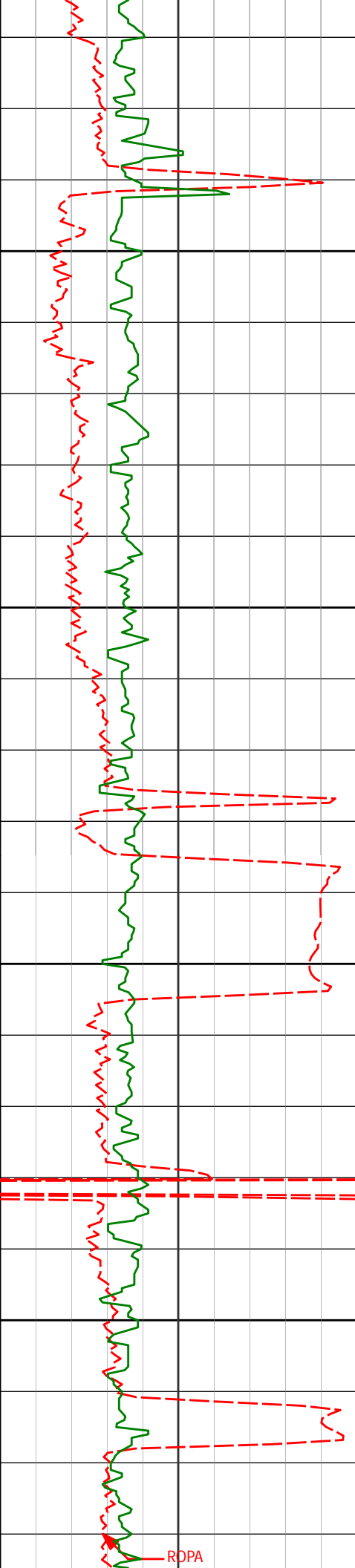
77.62°

5007.31'

-86.24'

5050

ROPA



5100

5150

5200

5250

5208'

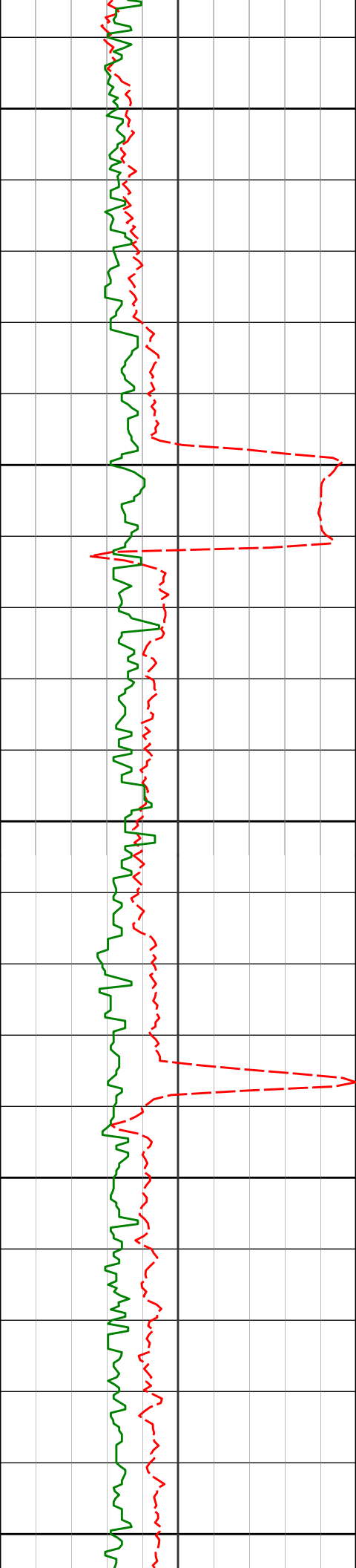
10.69°

80.18°

5175.24'

-92.29'

ROPA



5300

5350

5400

5450

5500

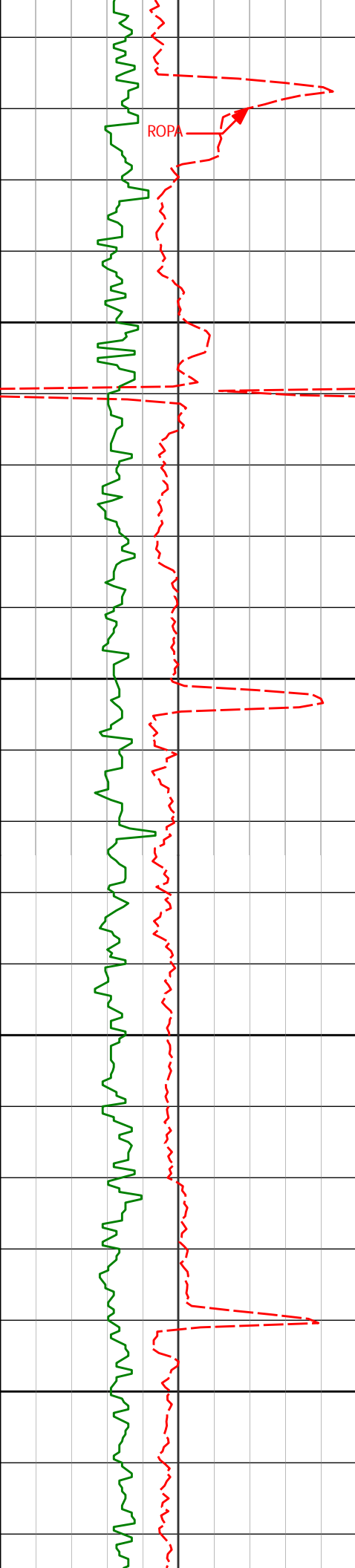
5379'

10.52°

72.16°

5343.33'

-99.60'



5550

5551'

8.78°

70.06°

5512.89'

-108.74'

5600

5650

5700

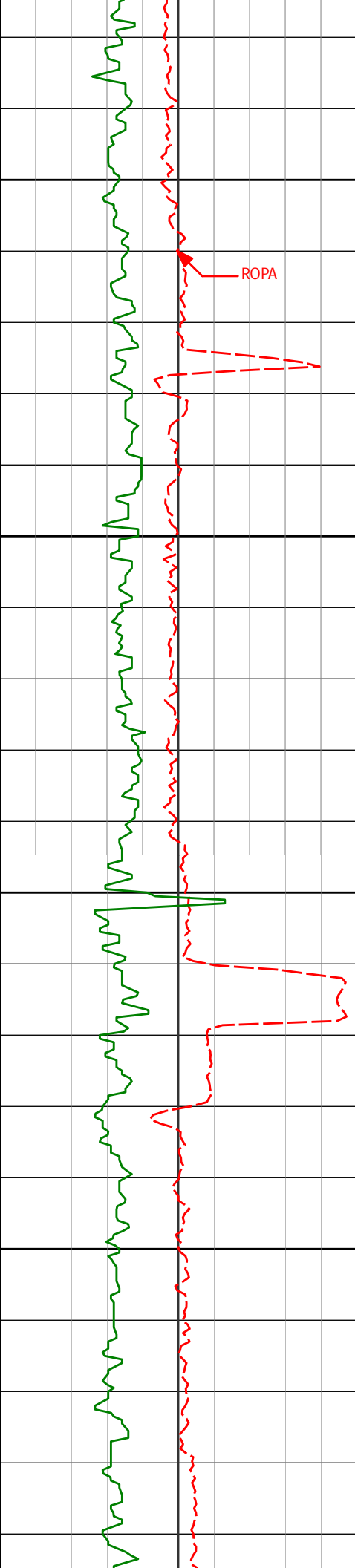
5722'

6.59°

65.75°

5682.35'

-117.10'



5750

ROPA

5800

5850

5893'

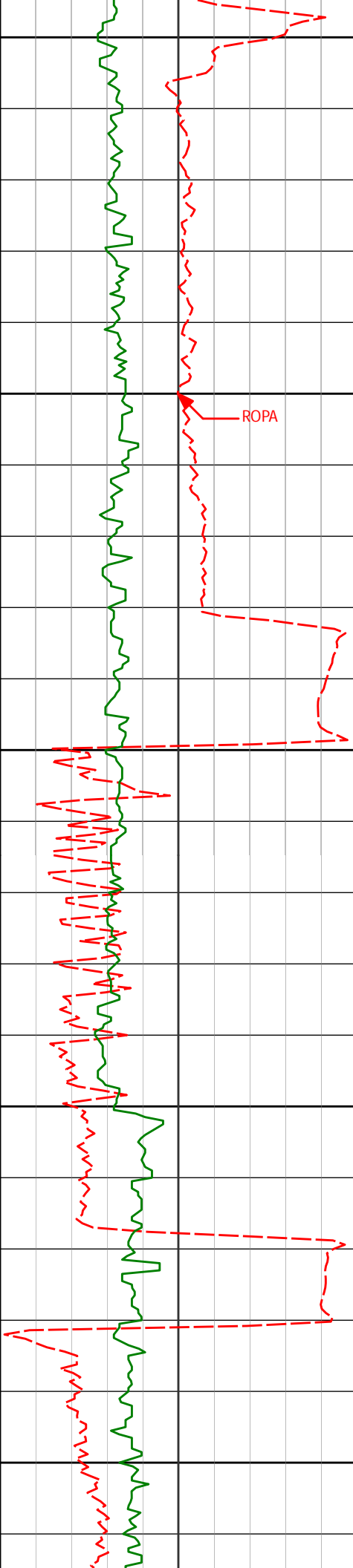
4.70°

65.35°

5852.51'

-123.97'

5900



5950

6000

ROPA

6050

6100

6150

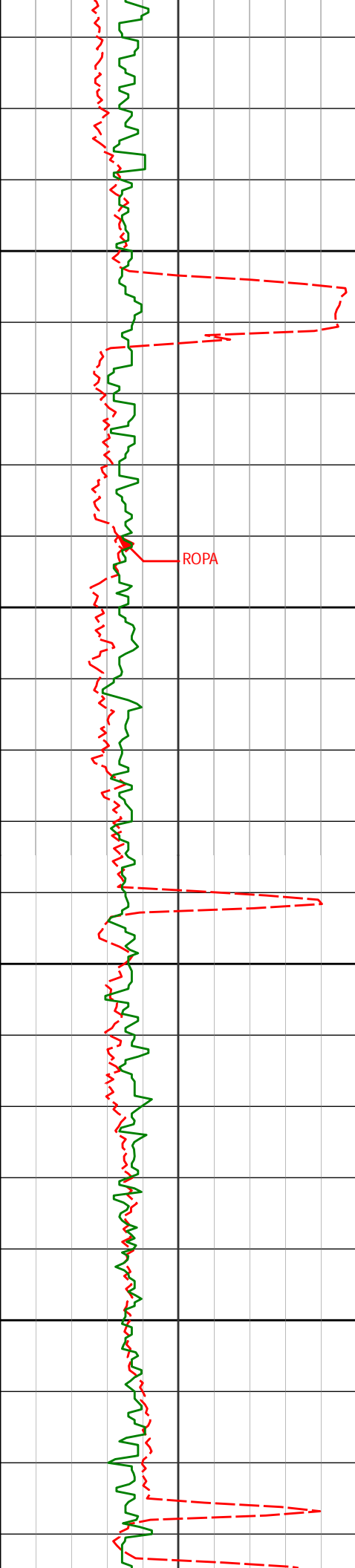
6065'

1.65"

71.21"

6024.23'

-127.66'



6200

6236'

0.79°

262.61°

6195.21'

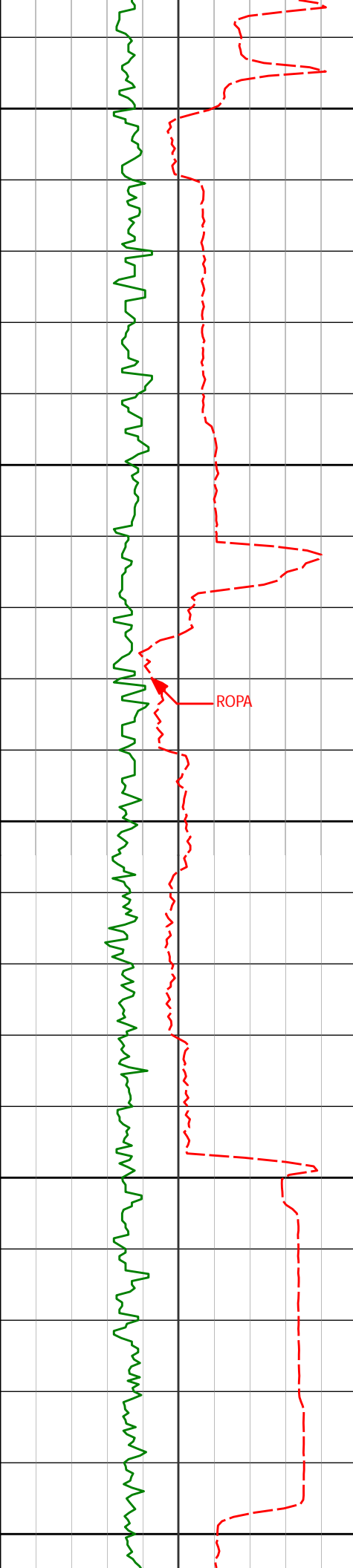
-128.29'

6250

6300

6350

ROPA



6400

6407'

0.54°

241.22°

6366.20'

-127.76'

6450

ROPA

6500

6550

6578'

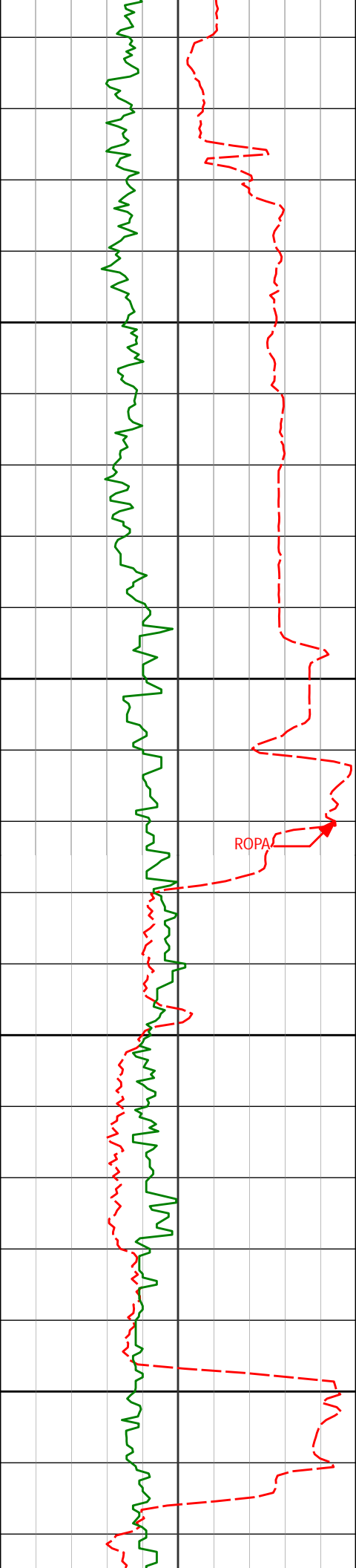
0.59°

251.93°

6537.19'

-127.11'

6600



6650

6700

ROPA

6750

6750'

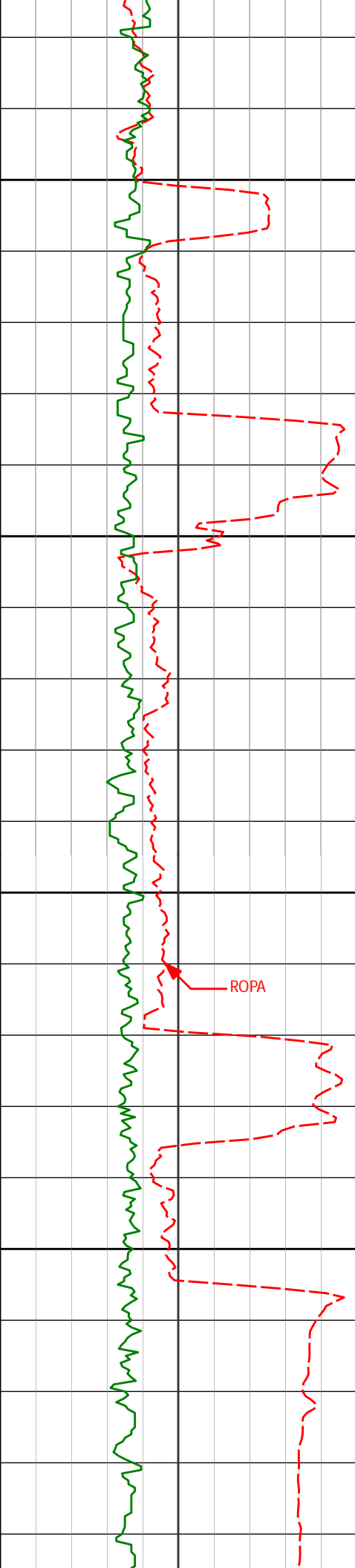
1.26°

237.31°

6709.16'

-125.83'

6800



6850

6900

6950

7000

6921'

1.72°

241.61°

6880.11'

-123.61'

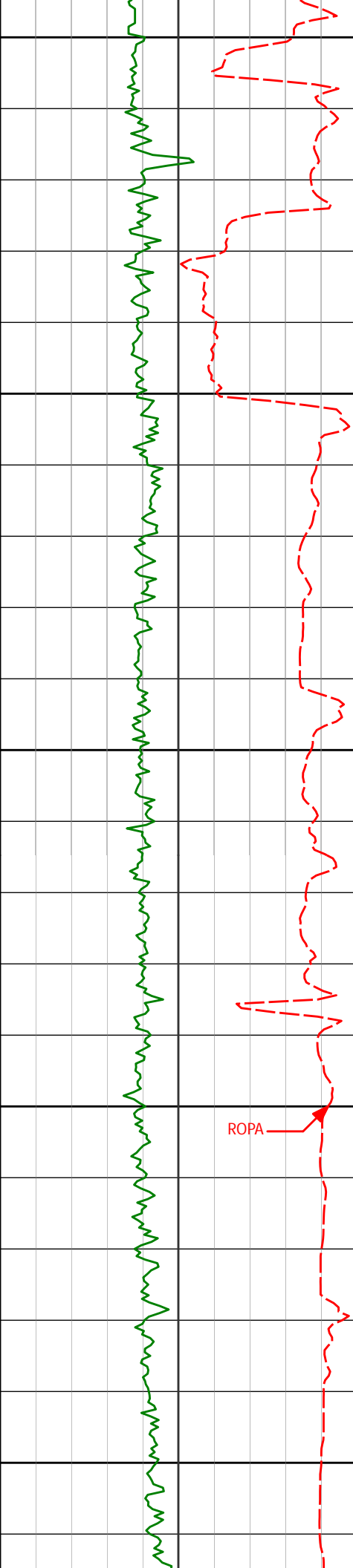
7006'

1.76°

243.15°

6965.07'

-122.43'



7050

7050'

5.62°

215.30°

7008.97'

-120.38'

7092'

6.21°

216.27°

7050.75'

-116.88'

7100

7136'

10.17°

202.17°

7094.29'

-111.38'

7150

7178'

13.12°

196.94°

7135.42'

-103.40'

7200

ROPA

7220'

17.82°

193.84°

7175.89'

-92.61'

7250

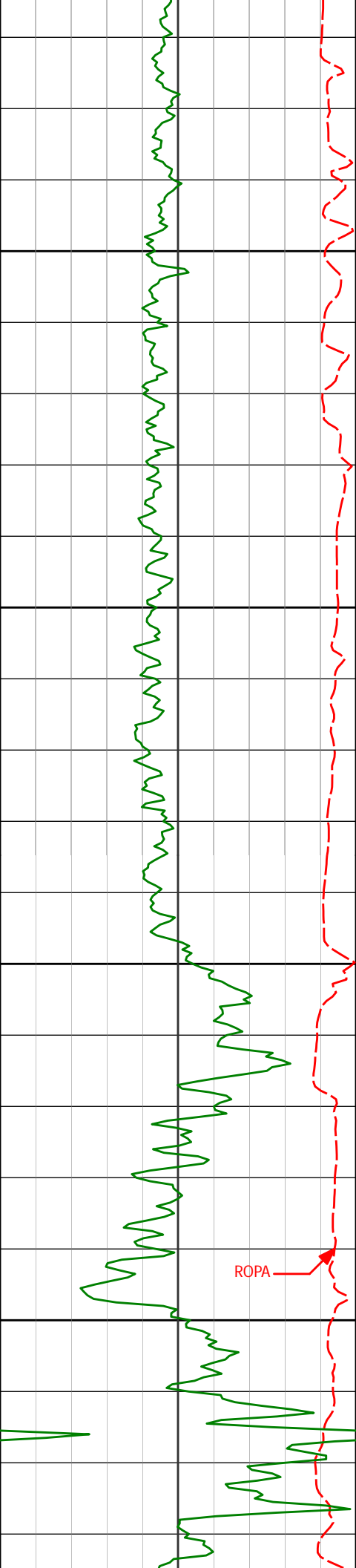
7263'

22.89°

191.77°

7216.19'

-78.04'



7300

7306'

24.50°

194.42°

7255.57'

-61.24'

7350

7349'

28.04°

192.73°

7294.12'

-42.77'

7400

7392'

32.84°

191.11°

7331.19'

-21.48'

7450

7435'

37.41°

188.15°

7366.35'

2.88'

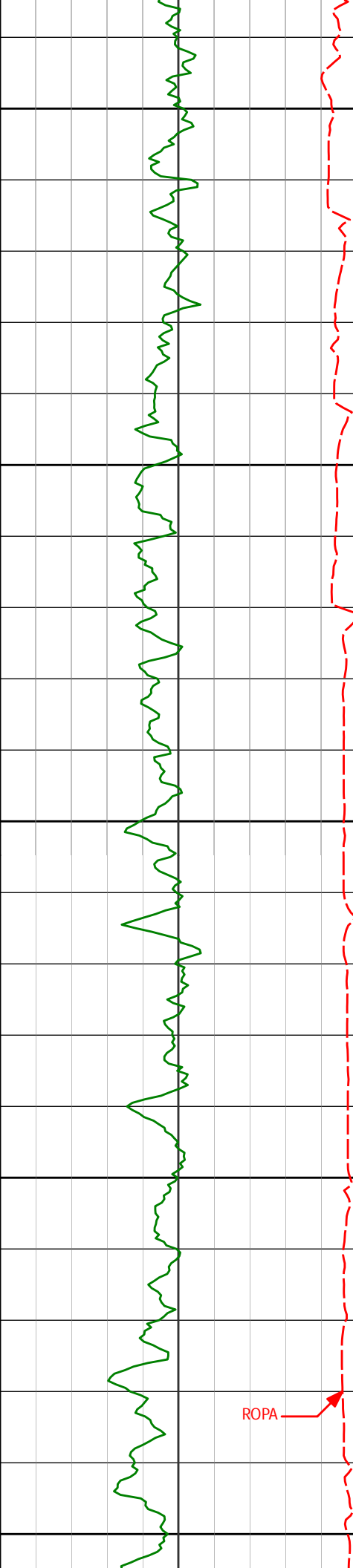
7478'

39.81°

189.75°

7399.95'

29.36'



7500

7521'

41.12°

190.77°

7432.66'

56.79'

7550

7565'

46.75°

187.02°

7464.34'

86.91'

Run 0200

7600

7608'

52.80°

183.88°

7492.10'

119.56'

7650

7651'

58.53°

179.79°

7516.35'

155.01'

ROPA

7692'

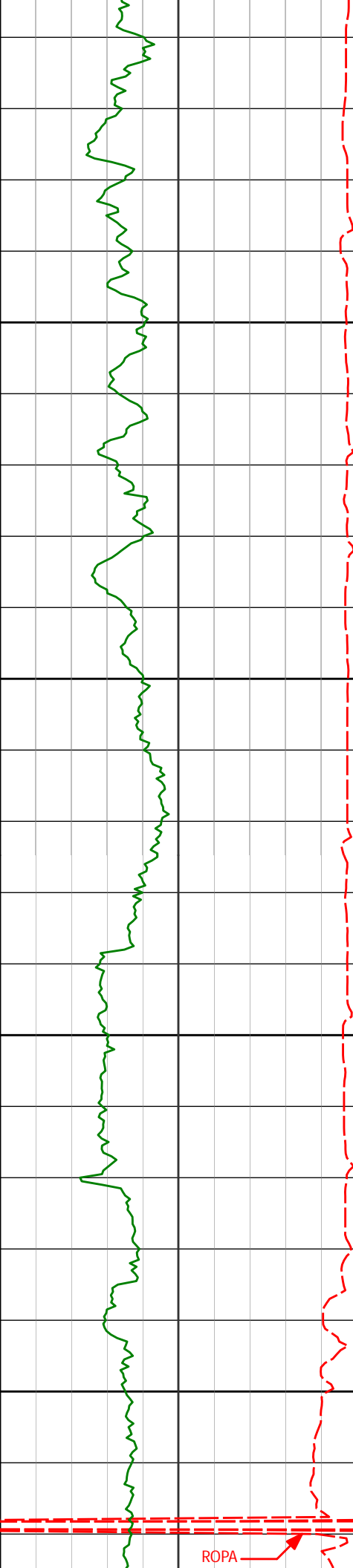
64.18°

176.74°

7536.00'

190.96'

7700



7736' 70.55° 175.65° 7552.93' 231.48'

7750

7779' 76.95° 174.42° 7564.95' 272.60'

7800

7822' 83.57° 172.58° 7572.22' 314.71'

7841' 86.15° 171.47° 7573.93' 333.46'

7850

Casing Shoe @ 7874' MD

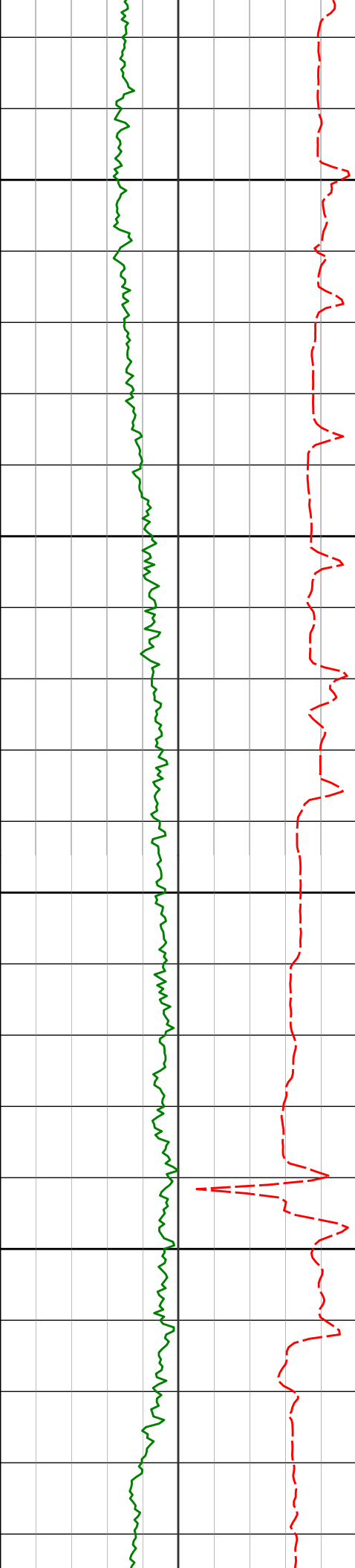
TD Build Section @ 7885' MD

Run 300

7900

7902' 91.14° 172.93° 7575.37' 393.90'

ROPA



7950

8000

8050

8100

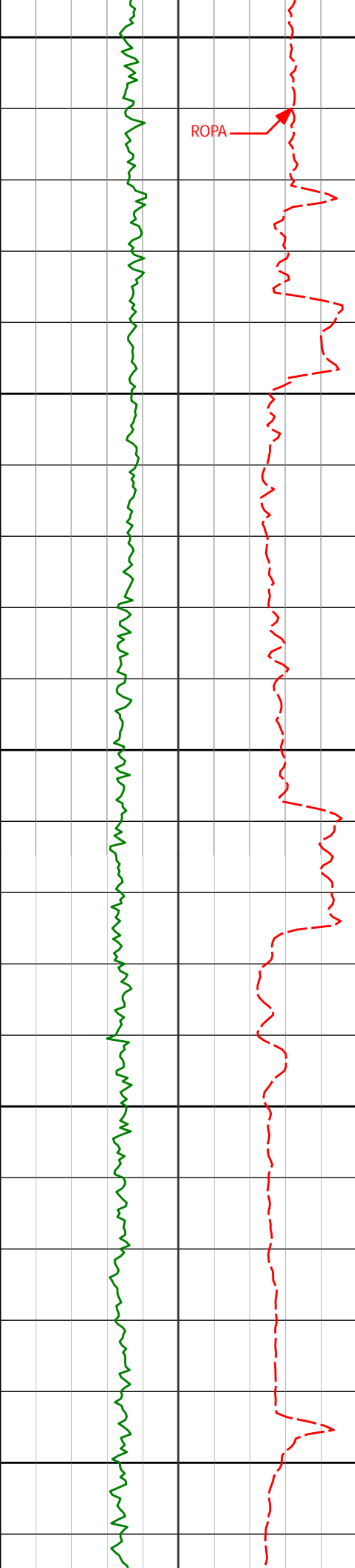
8038'

90.80°

176.40°

7573.07'

529.34'



8150

8200

8250

8300

8350

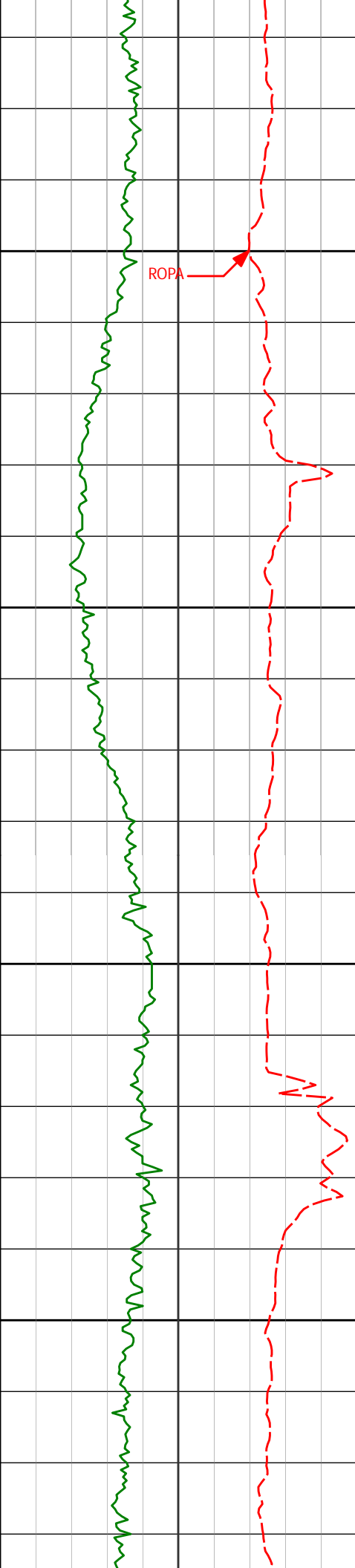
8210'

90.15°

178.25°

7571.64'

701.18'



8381'

91.57°

181.10°

7569.07'

872.14'

8400

ROPA

8450

8500

8550

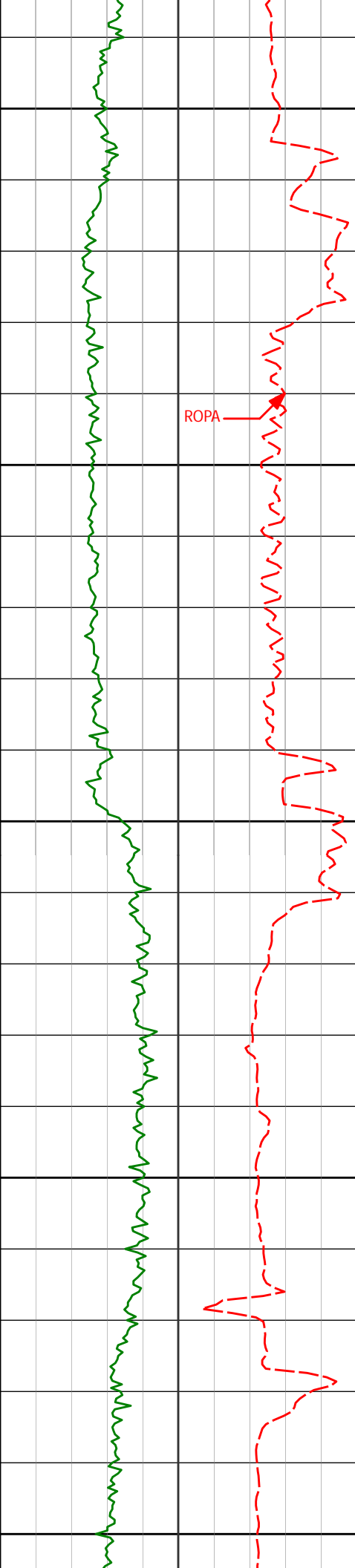
8553'

91.66°

181.64°

7564.23'

1044.00'



8600

8650

8700

8750

8800

ROPA

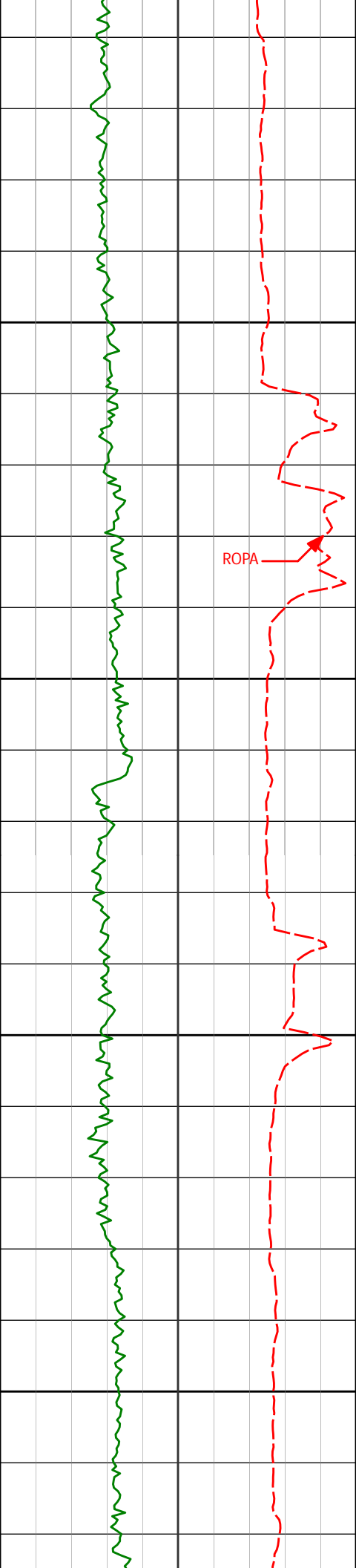
8724'

90.89°

180.33°

7560.42'

1214.91'



8850

ROPA

8900

8950

9000

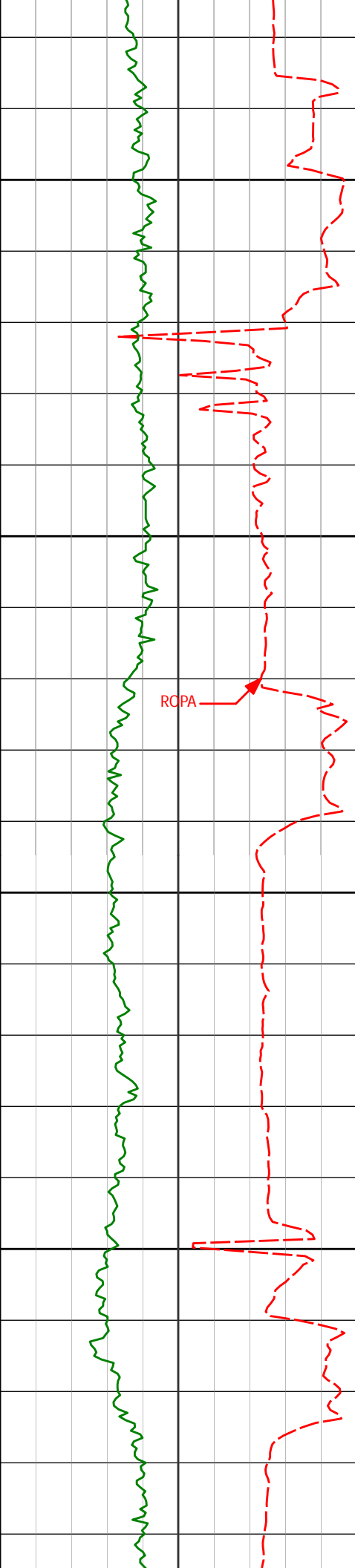
8896'

90.77°

179.72°

7557.93'

1386.88'



9050

9066'

91.54°

179.18°

7554.50'

1556.85'

9100

RCPA

9150

9200

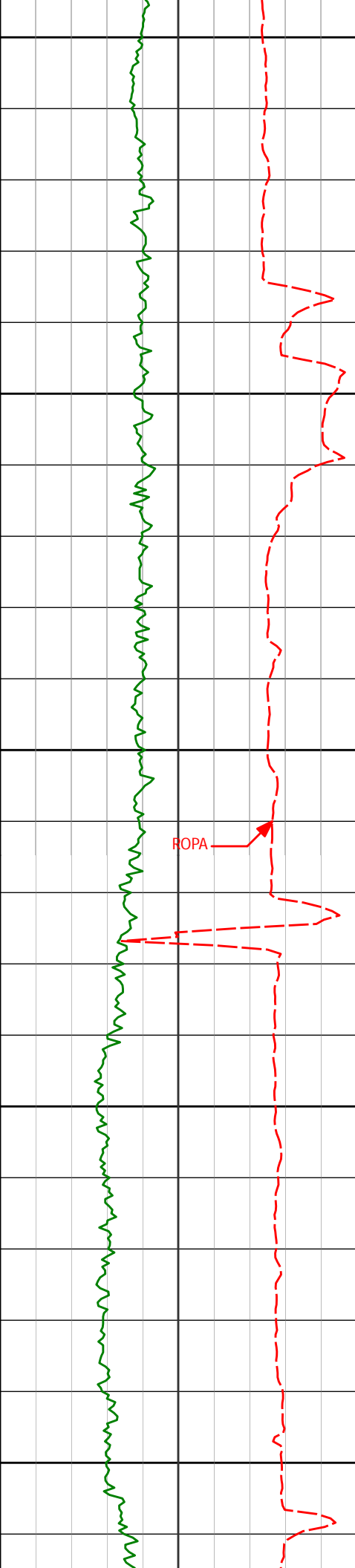
9237'

90.37°

179.59°

7551.65'

1727.82'



9250

9300

9350

9400

9450

ROPA

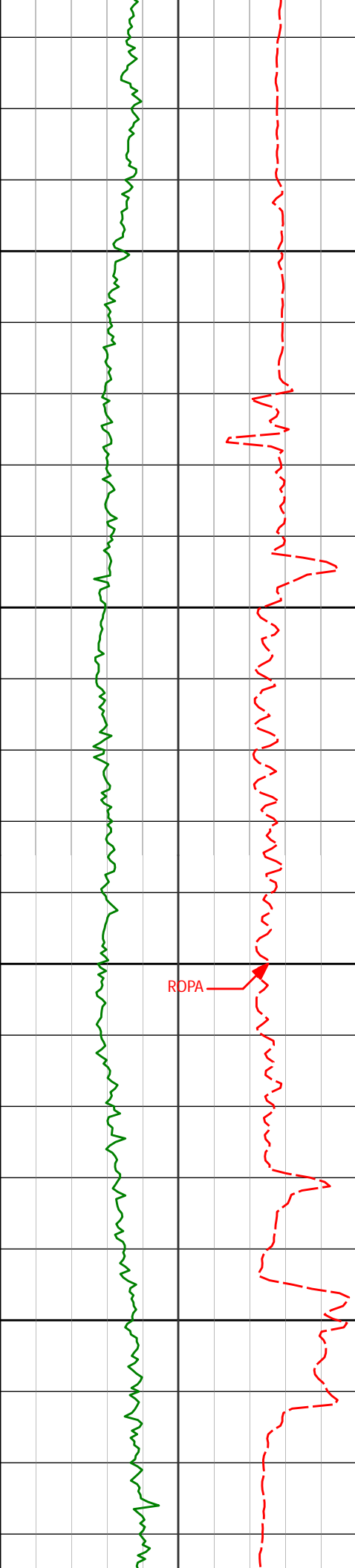
9408'

89.85°

179.51°

7551.32'

1898.82'



9500

9550

9580'

90.31°

180.06°

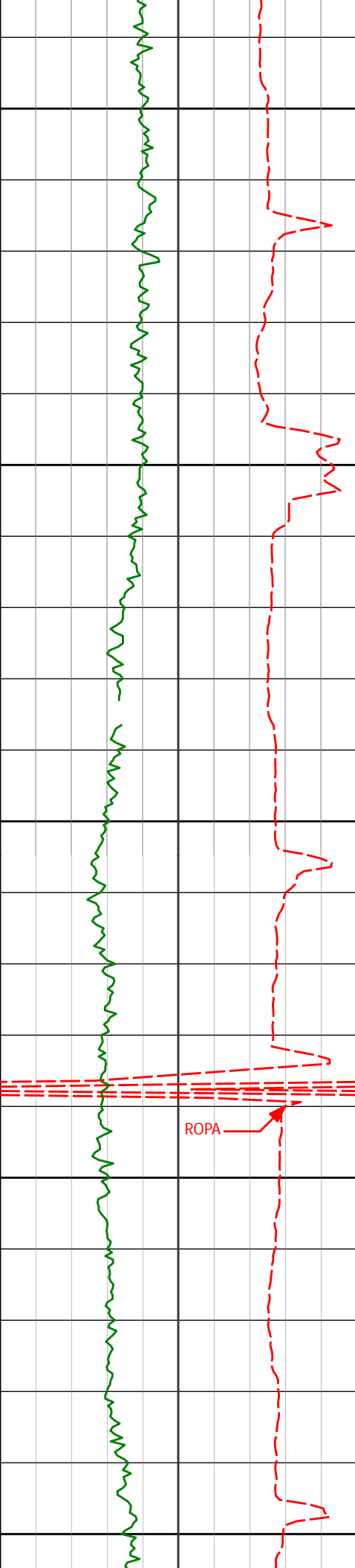
7551.08'

2070.81'

9600

ROPA

9650



9700

9750

9800

9850

9900

9757'

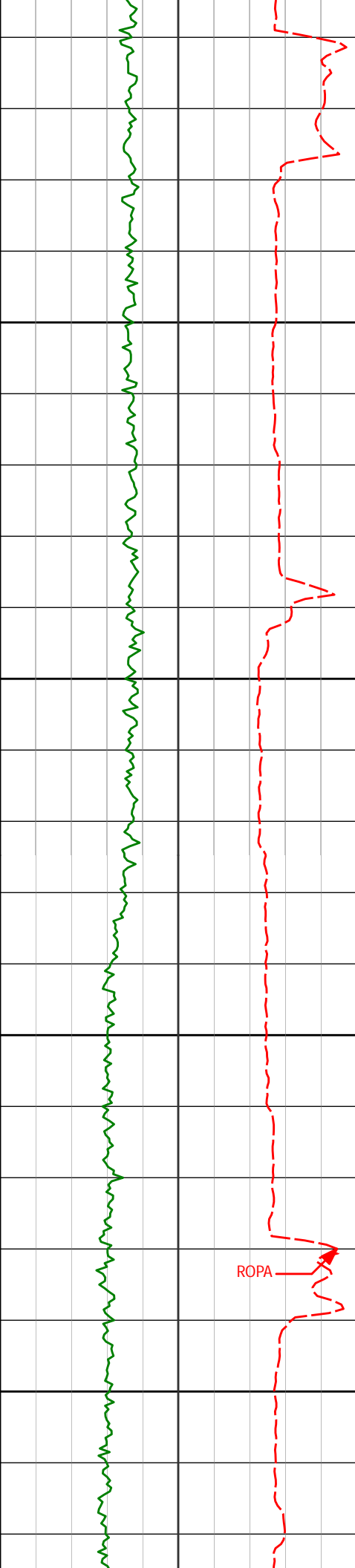
88.83°

180.33°

7552.41'

2247.80'

ROPA



9940'

89.94°

179.28°

7554.38'

2430.78'

9950

10000

10050

10100

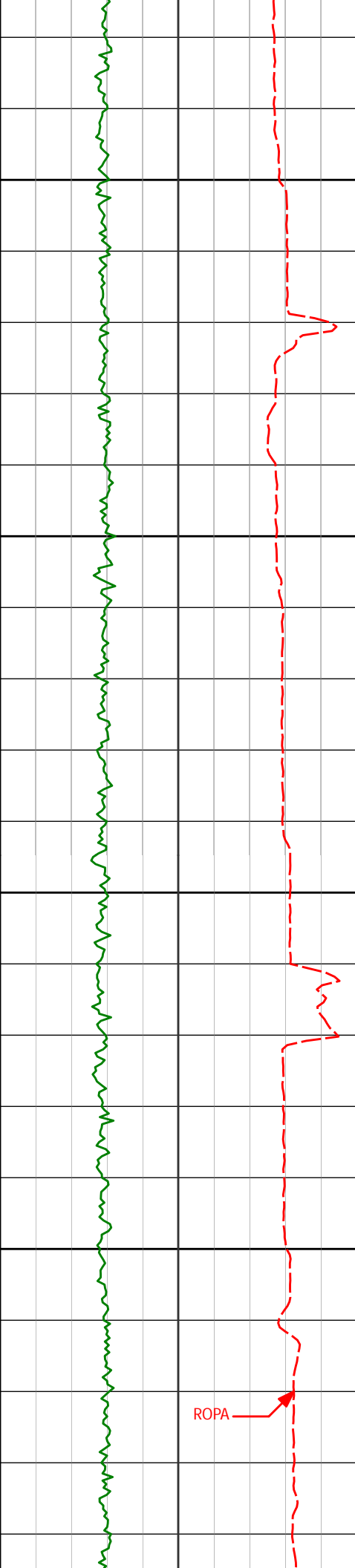
10122'

89.88°

179.86°

7554.66'

2612.78'



10150

10200

10250

10300

10305'

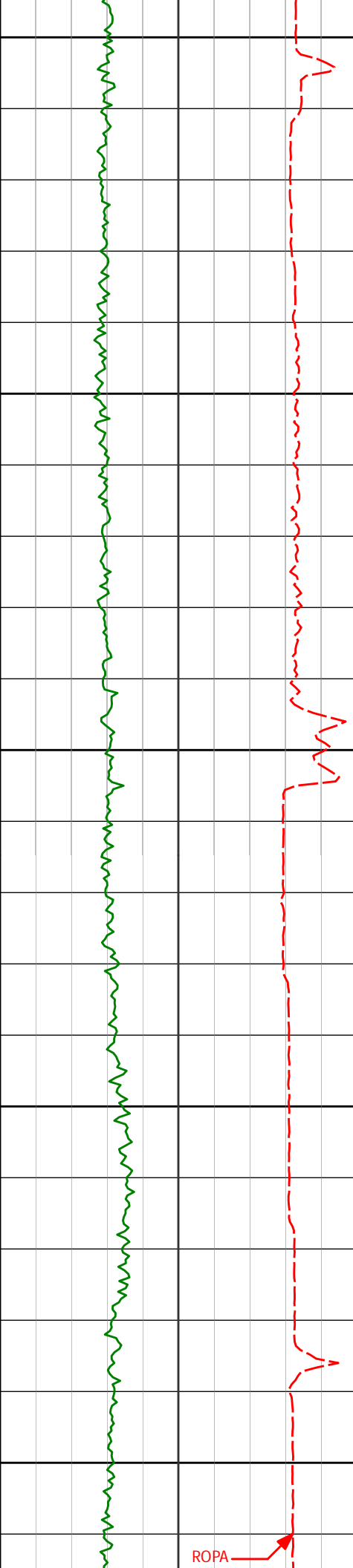
89.94°

178.90°

7554.95'

2795.77'

ROPA



10350

10400

10450

10500

10550

10487'

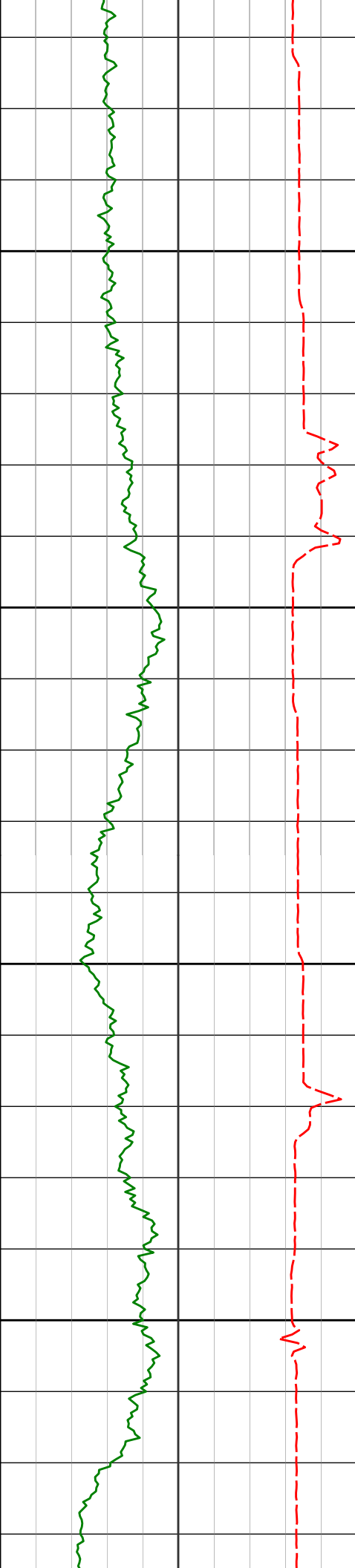
90.03°

178.95°

7555.00'

2977.76'

ROPA



10600

10650

10700

10750

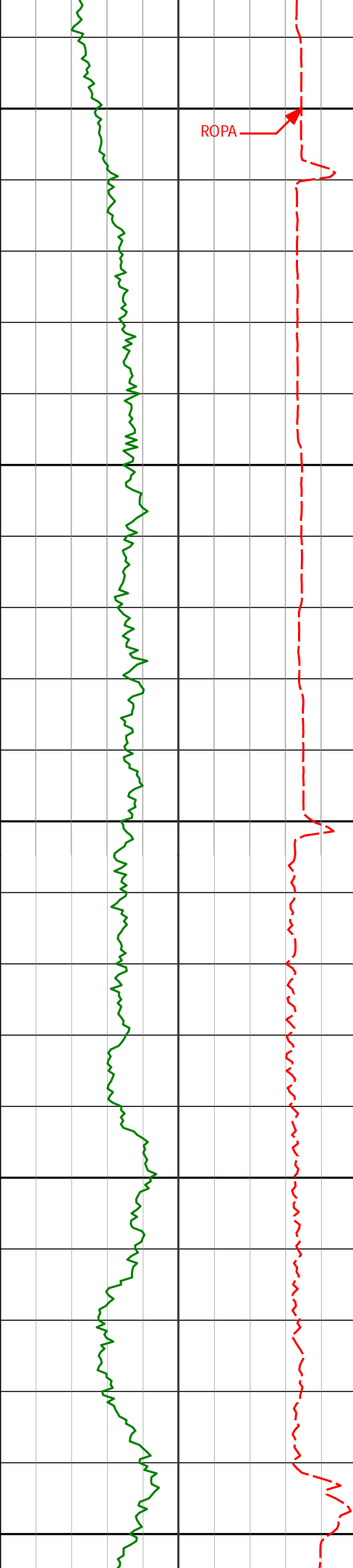
10670'

89.69°

180.22°

7555.44'

3160.75'



10800

10850

10900

10950

11000

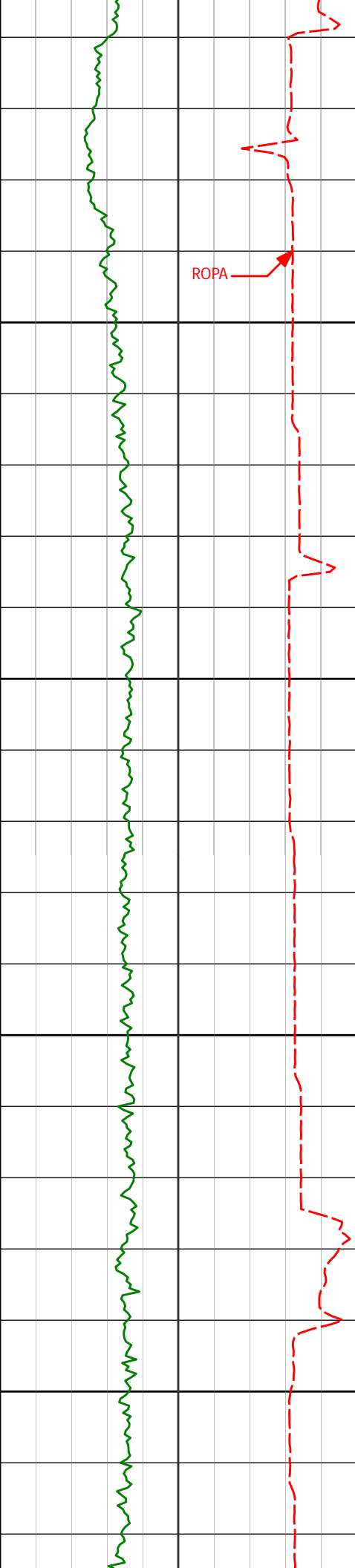
10852'

89.85°

180.67°

7556.17'

3342.74'



11035'

90.25°

180.01°

7556.02'

3525.72'

11050

11100

11150

11200

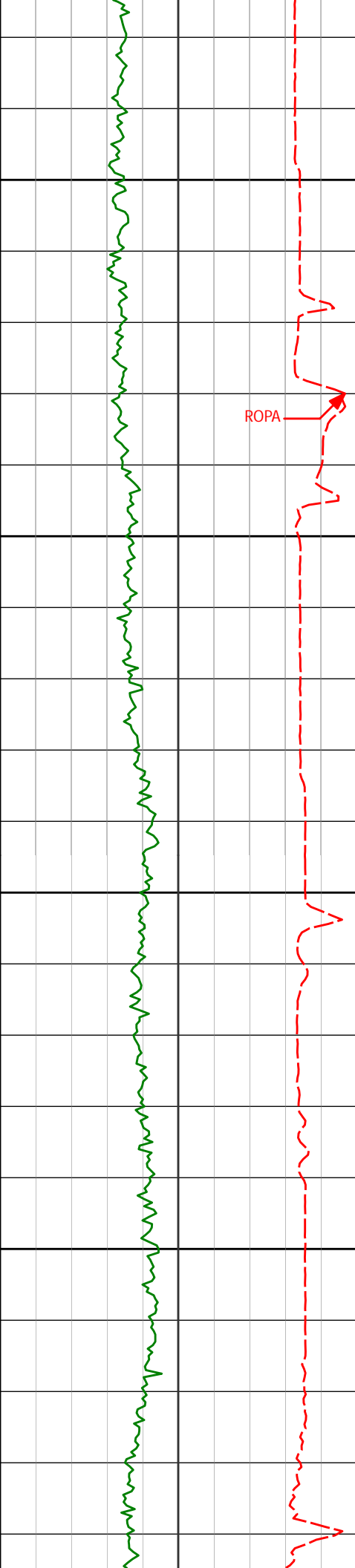
11219'

90.55°

180.57°

7554.73'

3709.71'



11250

11300

11350

11400

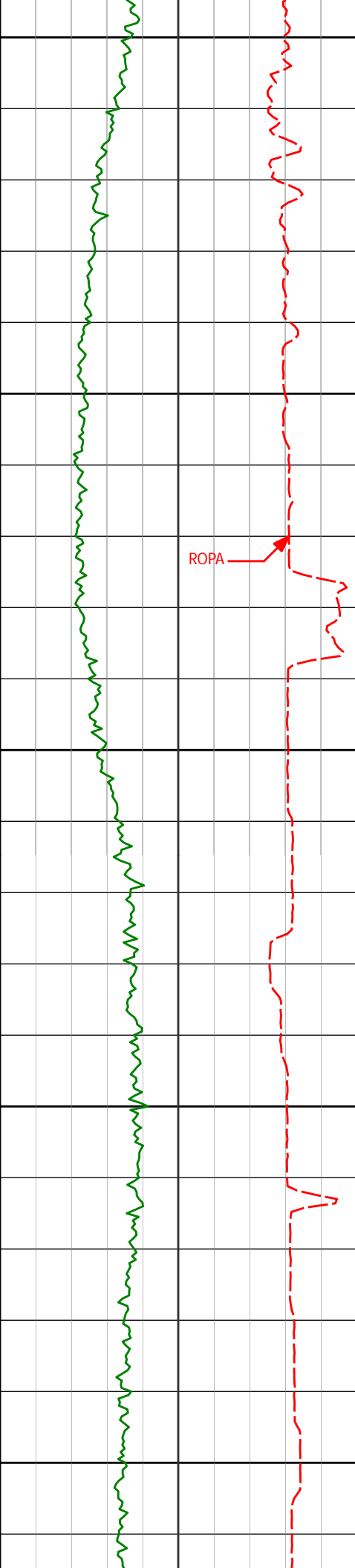
11390'

89.75°

179.26°

7554.28'

3880.70'



11450

11500

11550

11600

11650

ROPA

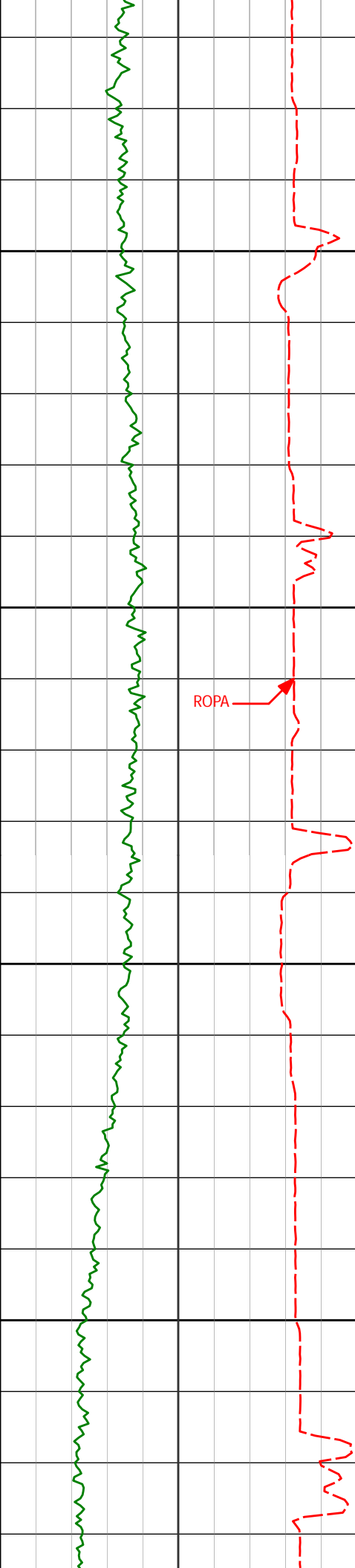
11562'

89.41°

179.53°

7555.54'

4052.69'



11700

11733'

90.12°

179.98°

7556.25'

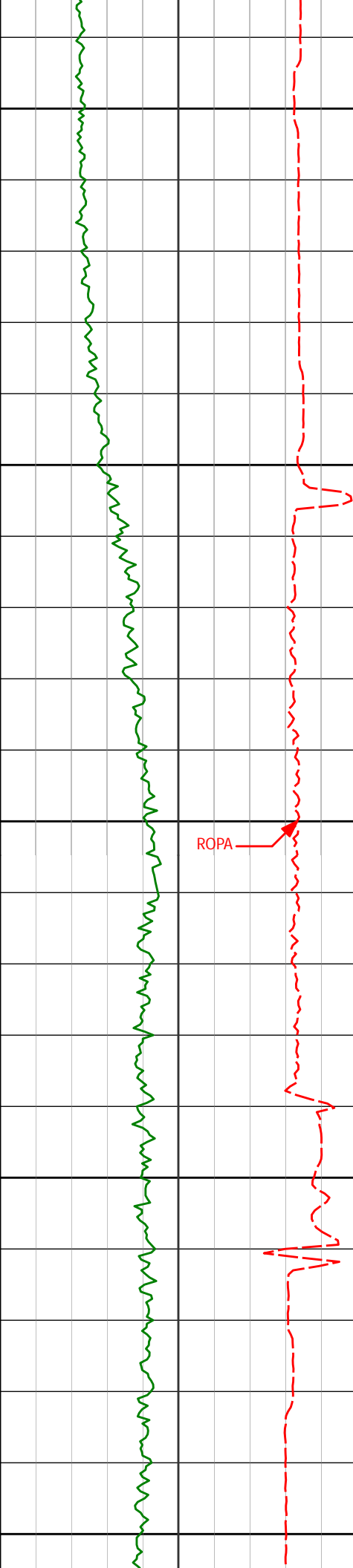
4223.69'

11750

ROPA

11800

11850



11900

11905'

90.15°

180.78°

7555.84'

4395.67'

11950

12000

ROPA

12050

12076'

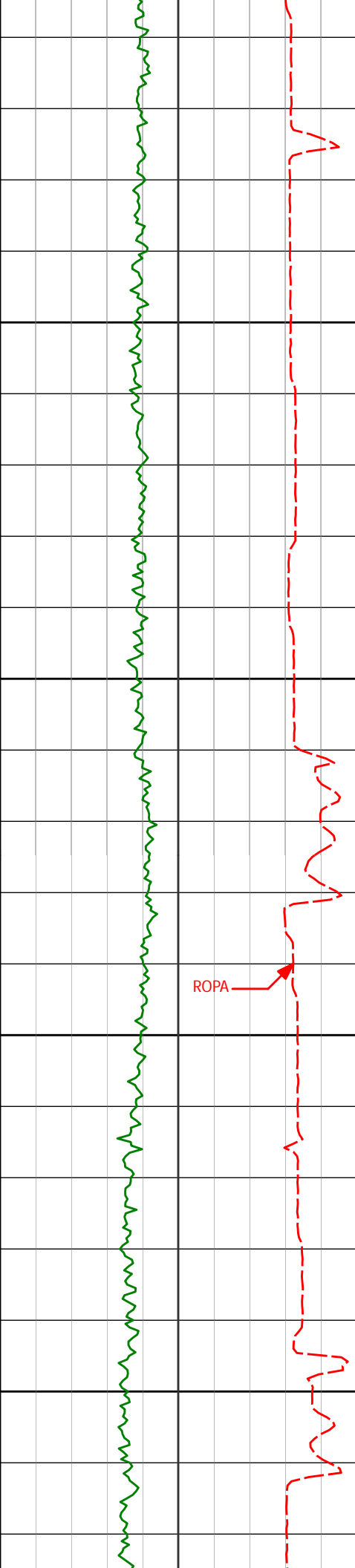
89.97°

180.34°

7555.66'

4566.65'

12100



12150

12200

12250

12300

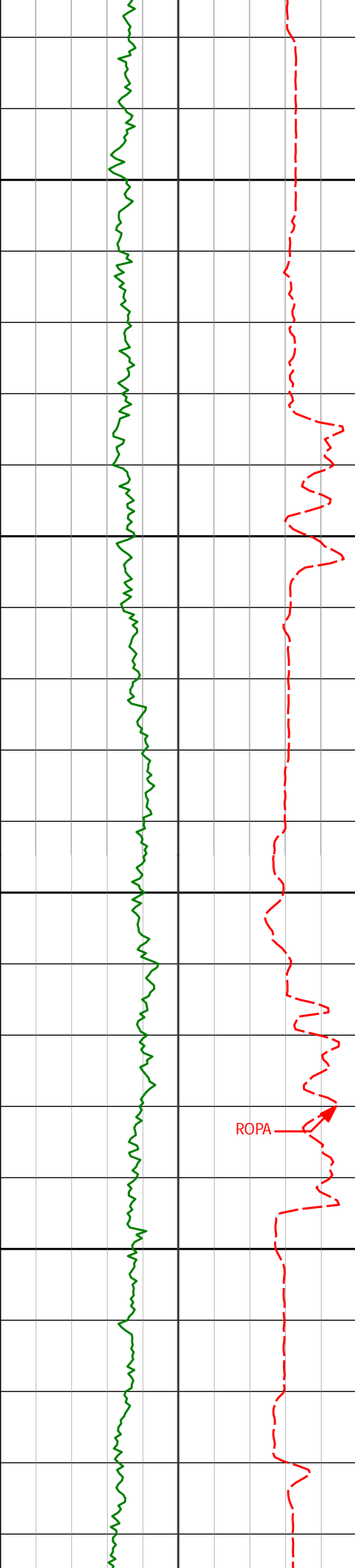
12248'

90.62°

179.52°

7554.78'

4738.65'



12350

12400

12450

12500

12419'

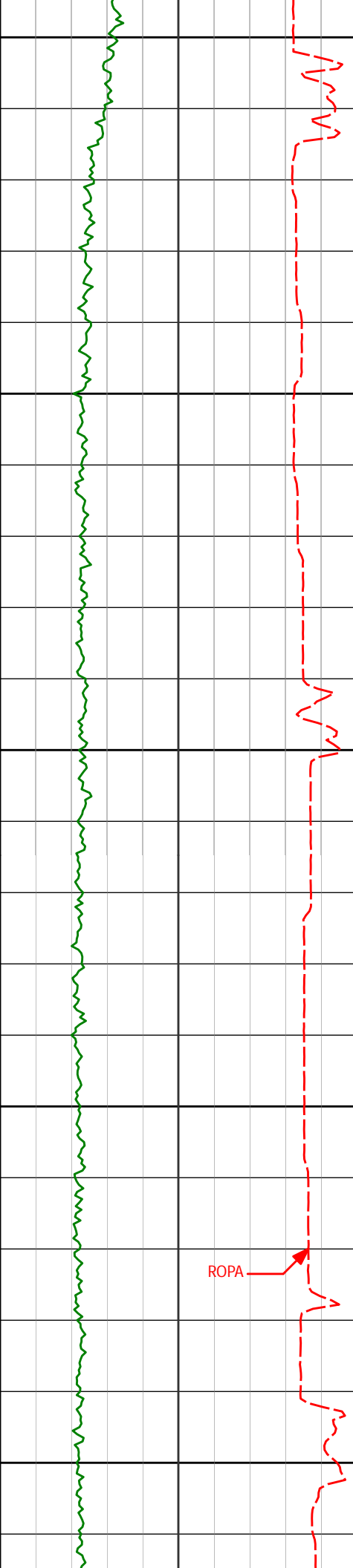
89.32°

179.71°

7554.87'

4909.64'

ROPA



12550

12590'

90.03°

178.30°

7555.83'

5080.62'

12600

12650

12700

ROPA

12750

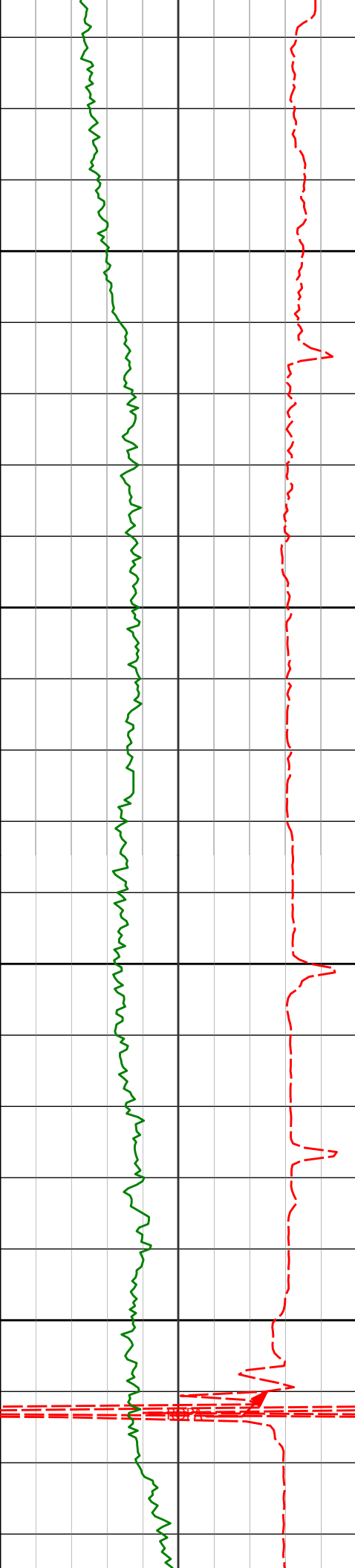
12762'

89.48°

179.03°

7556.57'

5252.59'



12800

12850

12900

12933'

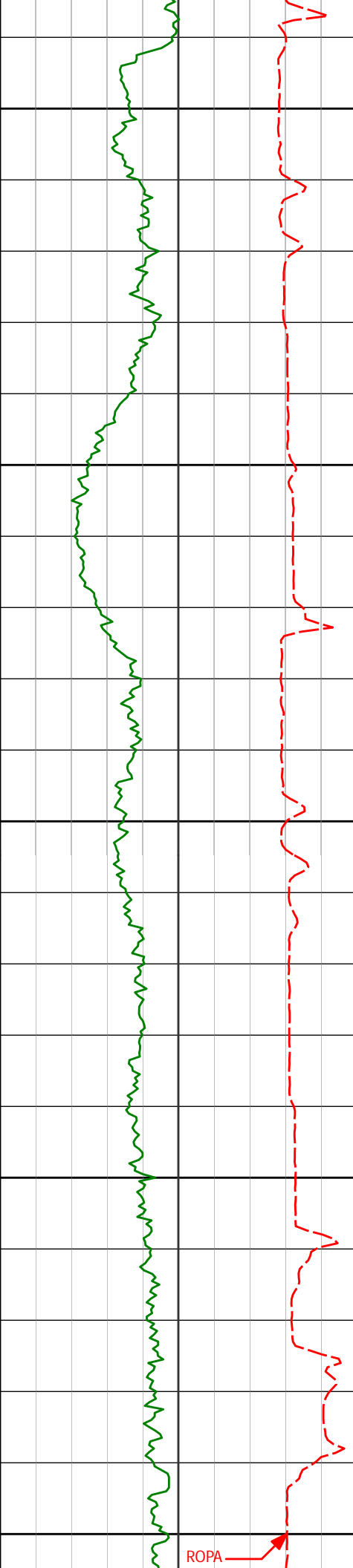
12950

89.72°

179.86°

7557.76'

5423.59'



13000

13050

13100

13150

13200

13105'

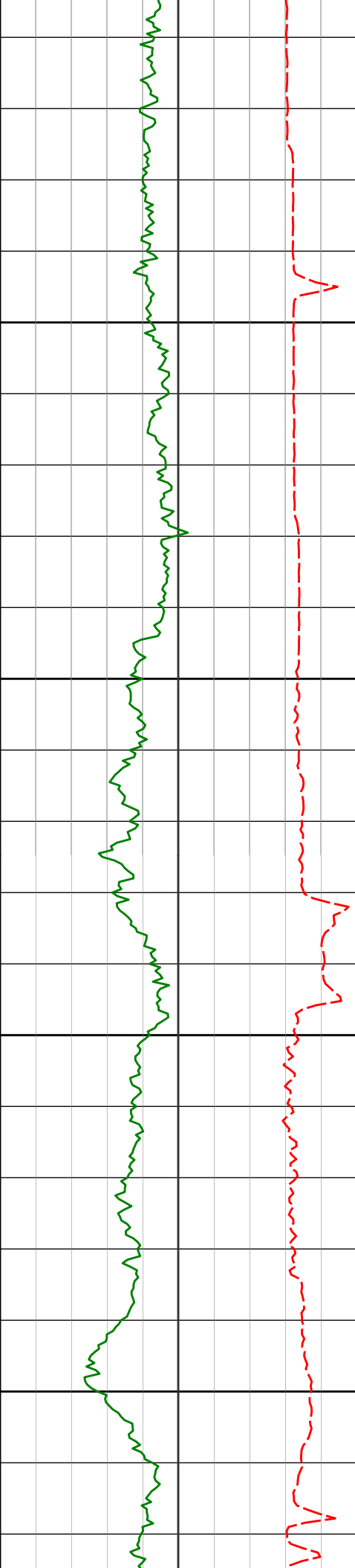
90.31'

180.08'

1557.12'

5595.58'

ROPA



13250

13300

13350

13400

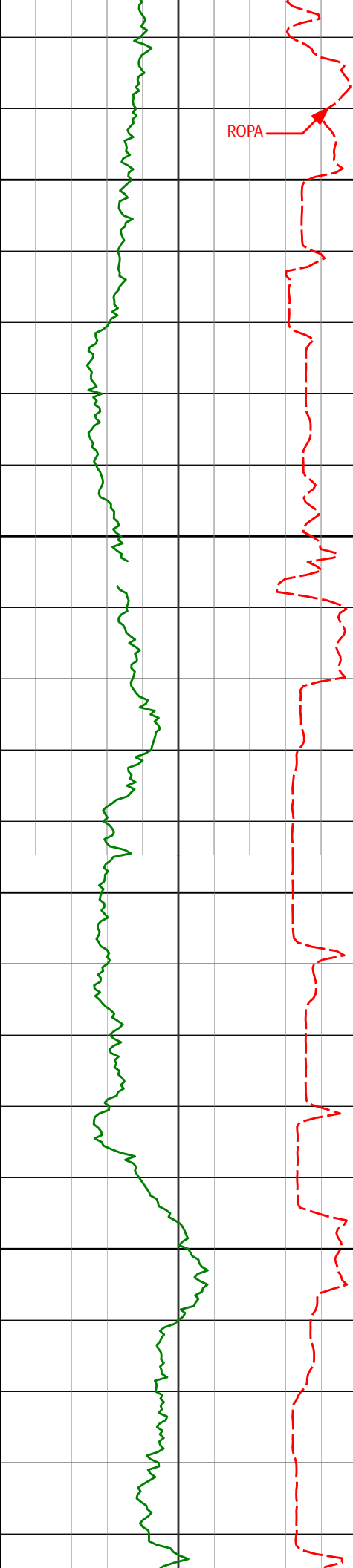
13276'

89.17°

178.20°

7558.50'

5766.56'



ROPA

13450

13500

13550

13600

13447'

90.74°

180.54°

7558.63'

5937.54'

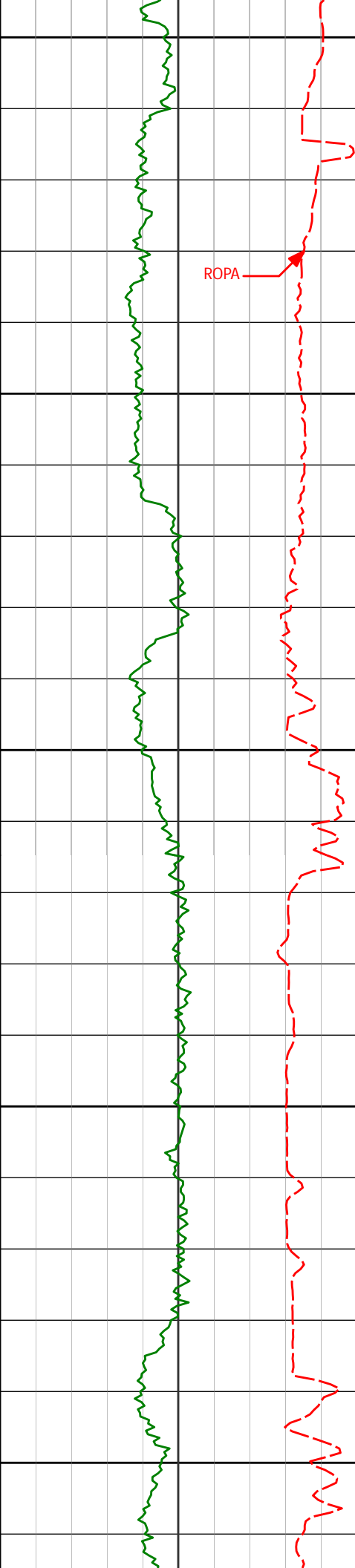
13619'

89.97°

180.14°

7557.56'

6109.53'



13650

13700

13750

13800

13850

ROPA

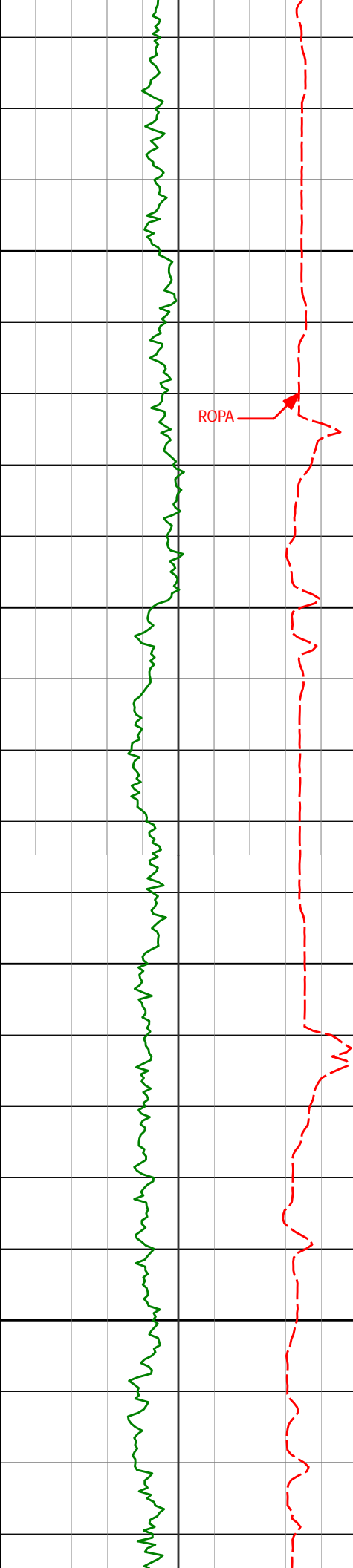
13790'

90.52°

179.88°

7556.83'

6280.52'



13900

13950

14000

14050

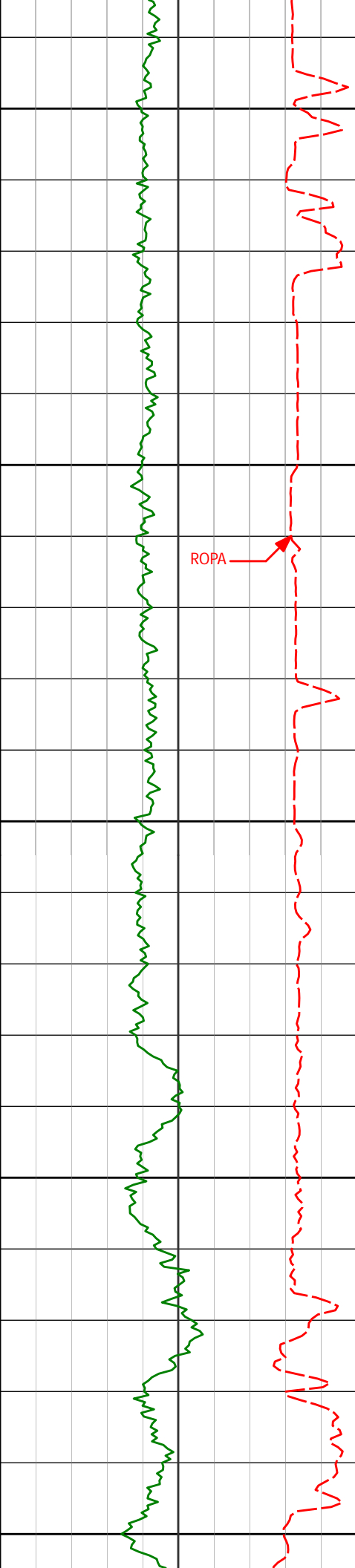
13962'

89.91°

180.21°

7556.19'

6452.52'



14100

14133'

90.31°

180.26°

7555.86'

6623.51'

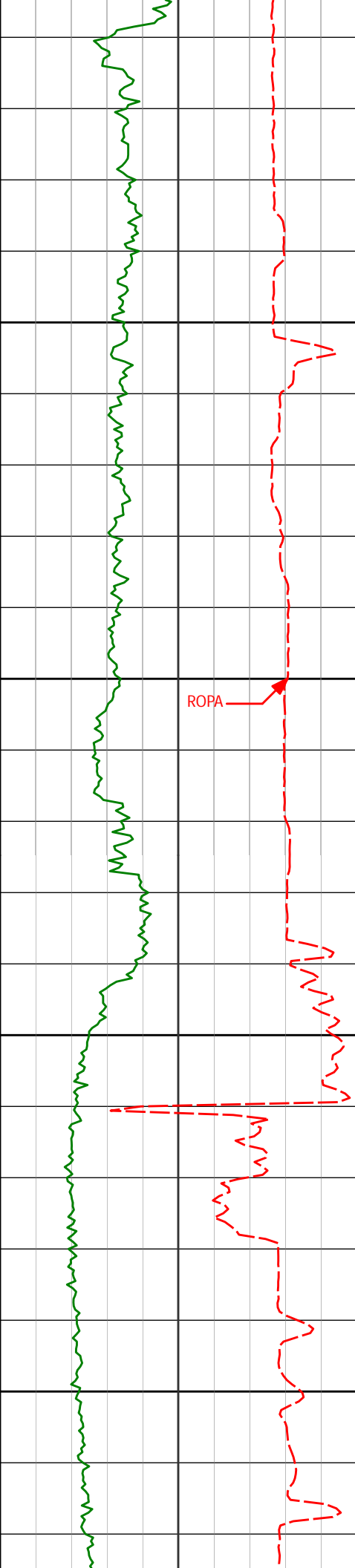
14150

ROPA

14200

14250

14300



14350

14400

14450

14500

ROPA

14476'

89.72°

179.52°

7555.81'

6966.50'

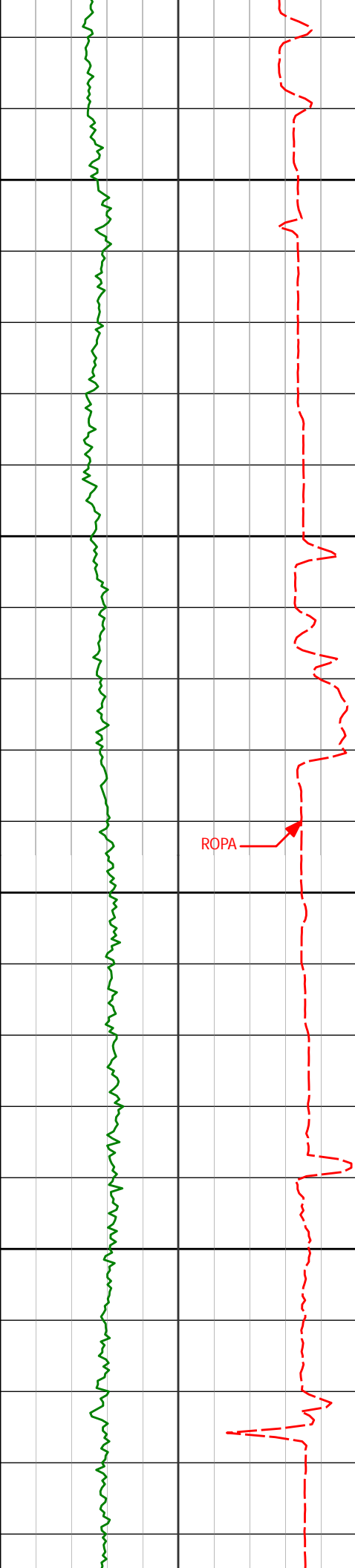
14305

90.00

180.01

7555.39

6795.50



14550

14600

14650

14700

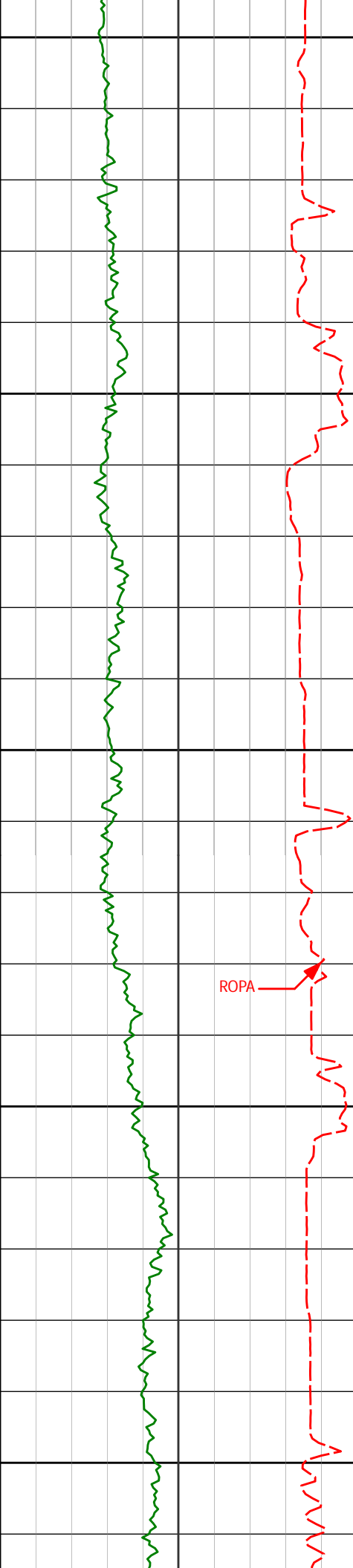
14647'

89.69°

180.29°

7556.69'

7137.49'



14750

14800

14850

14900

14950

14818'

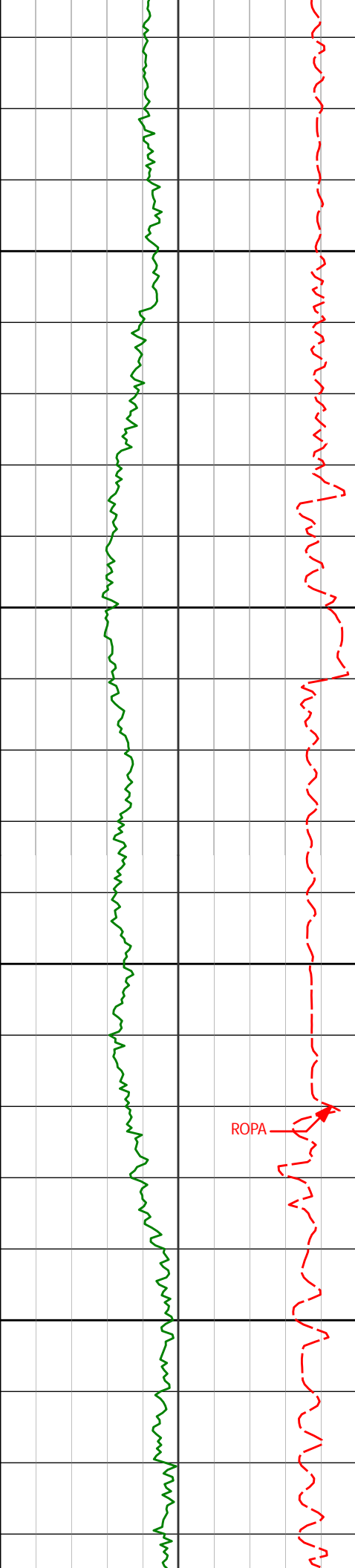
90.06°

180.25°

7557.07'

7308.48'

ROPA



15000

15050

15100

15150

ROPA

14989'

90.34°

180.11°

7556.47'

7479.48'

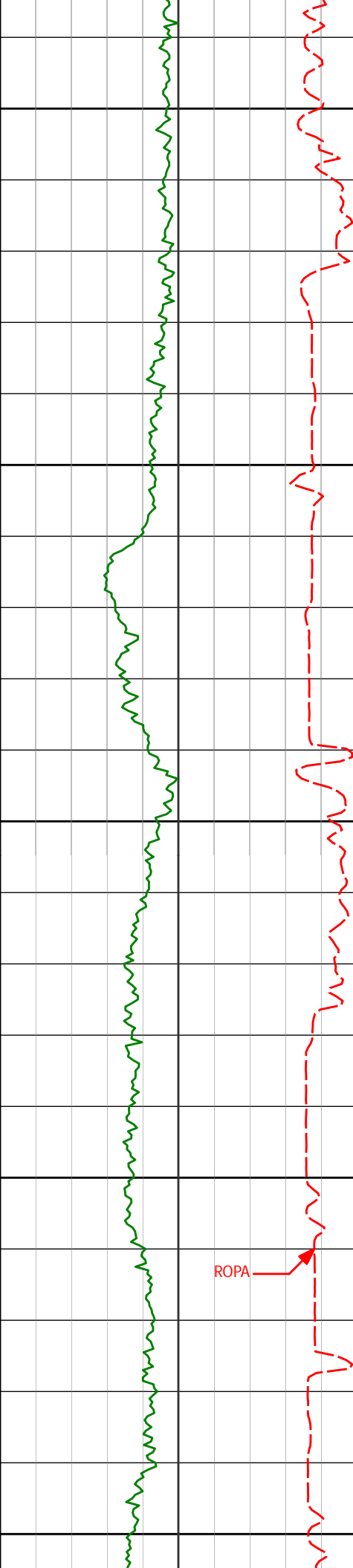
15160'

90.65°

179.24°

7554.99'

7650.47'



15200

15250

15300

15331'

88.74°

176.49°

7555.90'

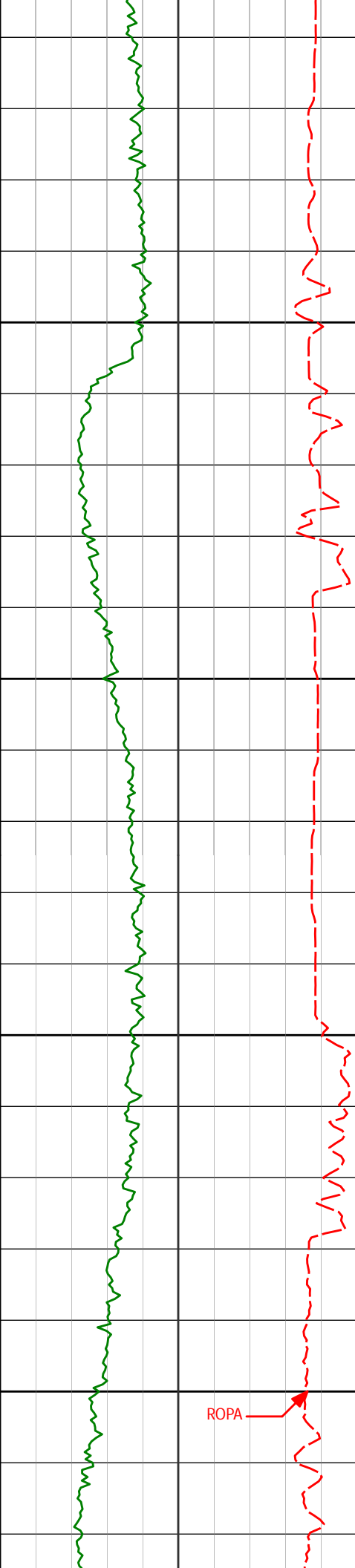
7821.36'

15350

ROPA



15400



15450

15500

15550

15600

15502'

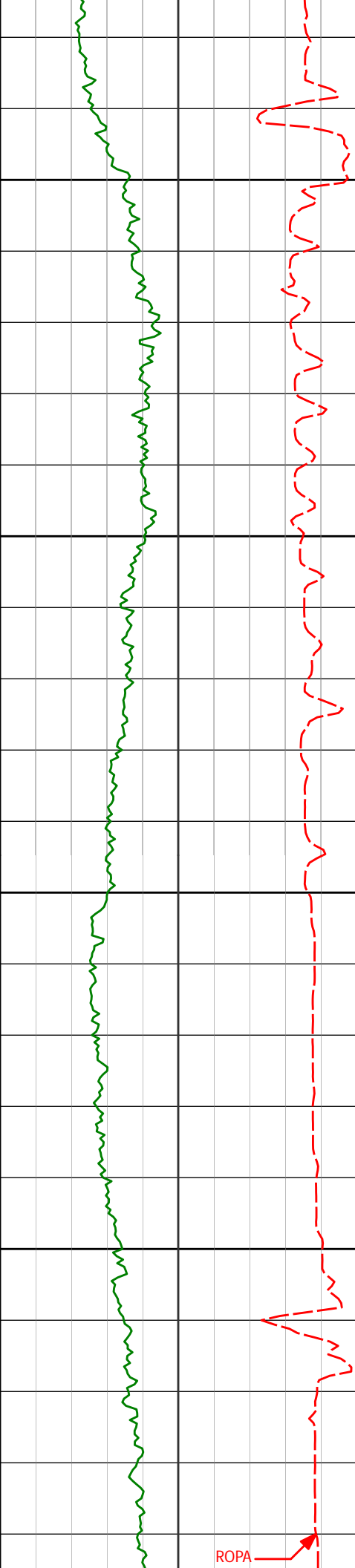
89.57°

176.04°

7558.42'

7992.03'

ROPA



15650

15674'

89.94°

177.75°

7559.16'

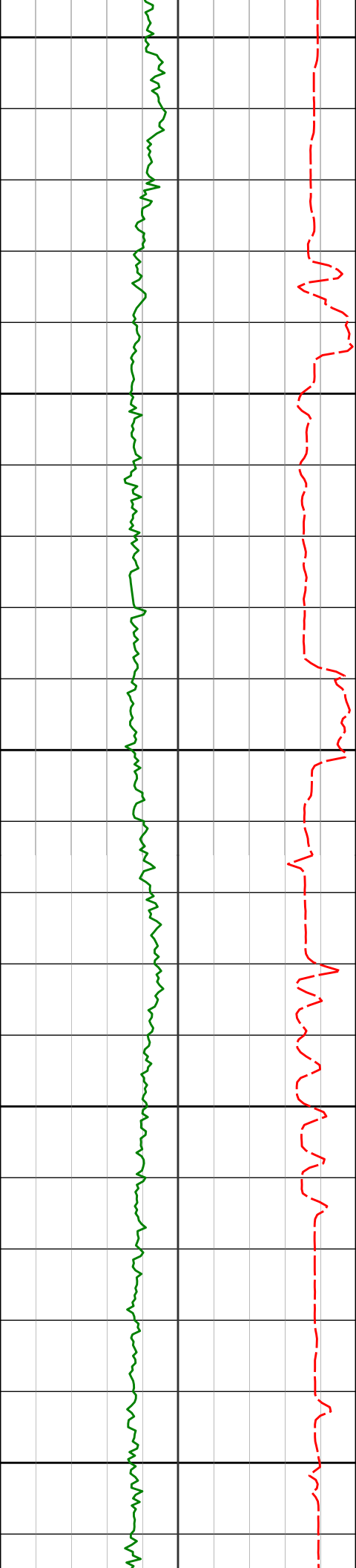
8163.82'

15700

15750

15800

ROPA



15850

15900

15950

16000

16050

16017'

90.25°

178.68°

7555.10'

8506.67'

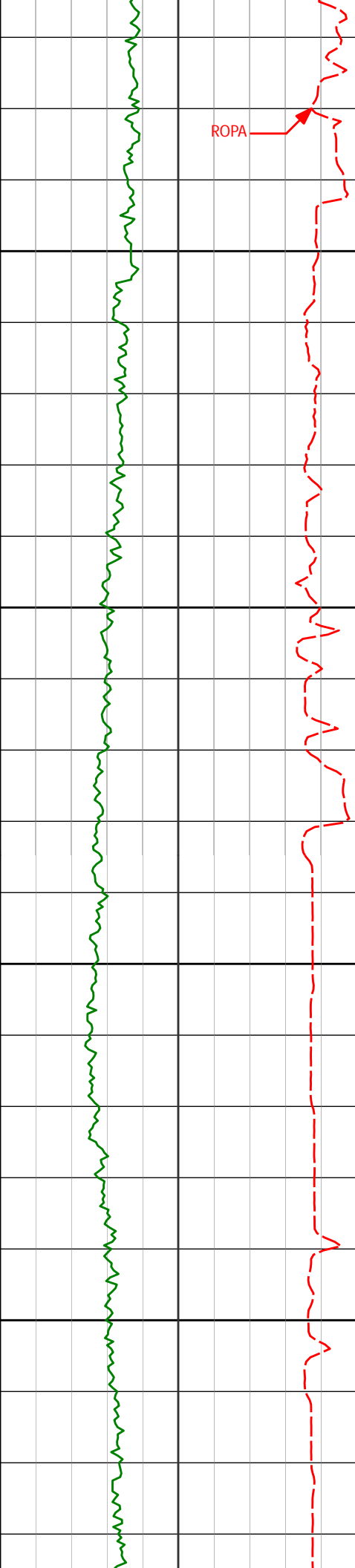
15845

91.26

178.16

7557.37

8534.73



ROPA

16100

16150

16188'

89.66°

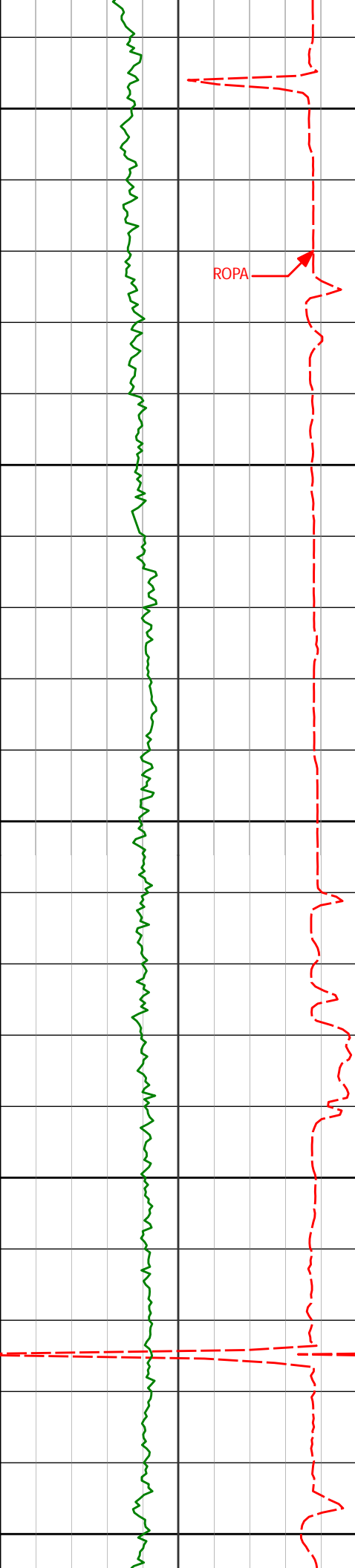
178.91°

7555.24'

8677.65'

16200

16250



16300

16350

16400

16450

16500

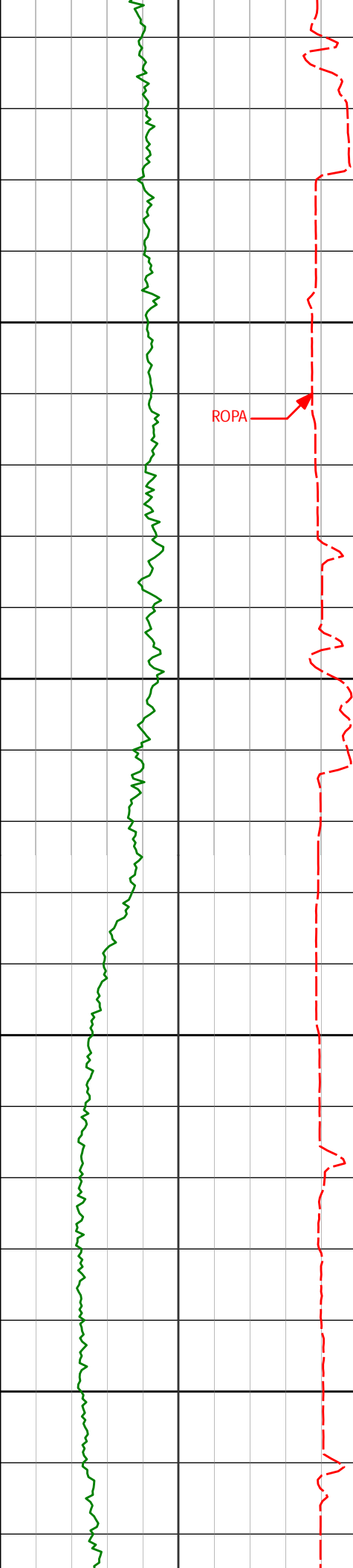
16360'

90.12°

178.86°

7555.57'

8849.63'



16531'

89.82°

180.12°

7555.66'

9020.63'

16550

ROPA

16600

16650

16700

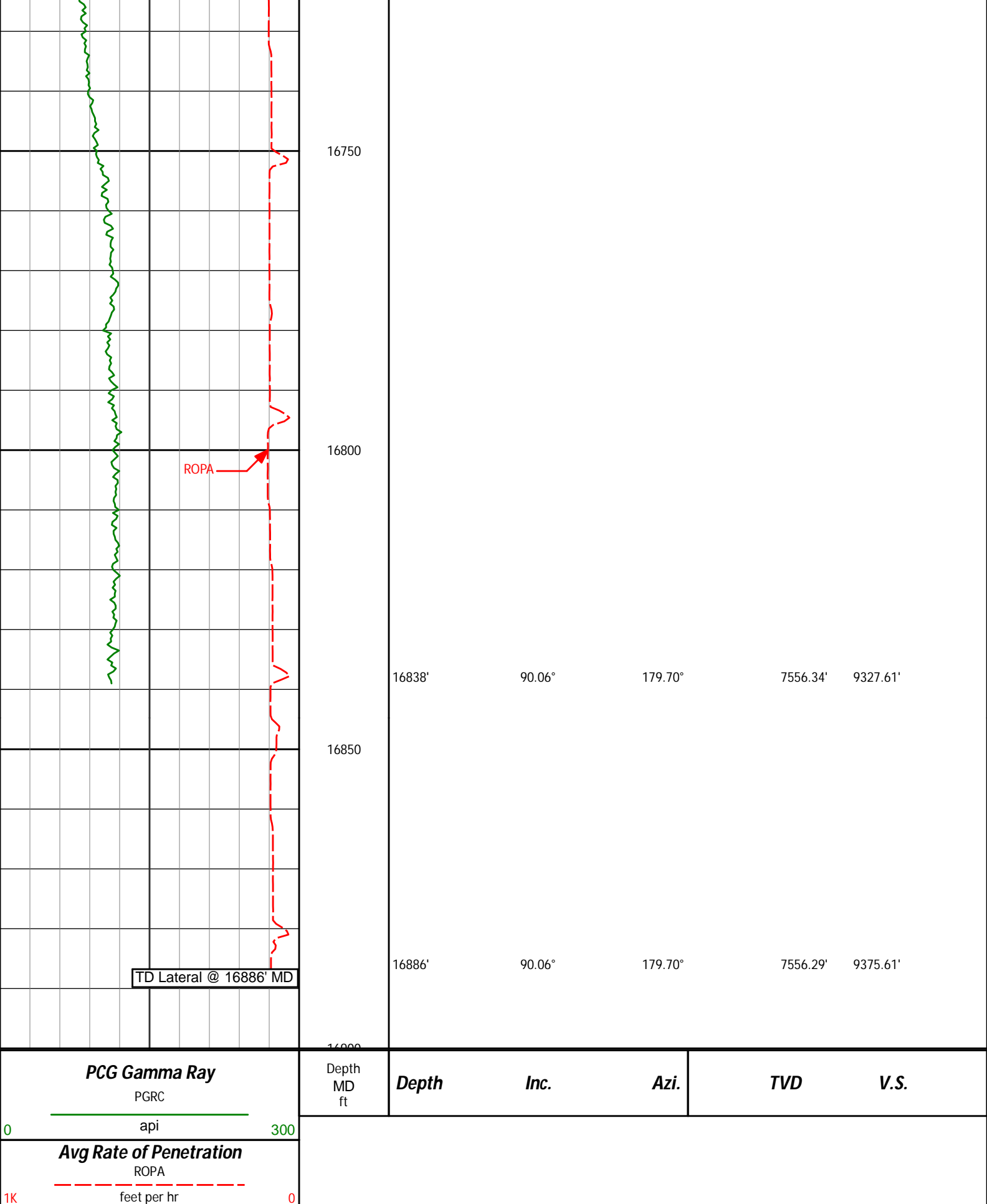
16703'

89.82°

180.49°

7556.20'

9192.62'



8896.00	90.77	179.72	7557.93	1384.44 S	442.20 E	1386.88	0.36
9066.00	91.54	179.18	7554.50	1554.39 S	443.84 E	1556.85	0.55
9237.00	90.37	179.59	7551.65	1725.35 S	445.67 E	1727.82	0.72
9408.00	89.85	179.51	7551.32	1896.35 S	447.01 E	1898.82	0.31
9580.00	90.31	180.06	7551.08	2068.35 S	447.66 E	2070.81	0.42
9757.00	88.83	180.33	7552.41	2245.34 S	447.06 E	2247.80	0.85
9940.00	89.94	179.28	7554.38	2428.32 S	447.68 E	2430.78	0.83
10122.00	89.88	179.86	7554.66	2610.31 S	449.05 E	2612.78	0.32
10305.00	89.94	178.90	7554.95	2793.30 S	451.03 E	2795.77	0.53
10487.00	90.03	178.95	7555.00	2975.27 S	454.44 E	2977.76	0.06
10670.00	89.69	180.22	7555.44	3158.26 S	455.77 E	3160.75	0.72
10852.00	89.85	180.67	7556.17	3340.25 S	454.35 E	3342.74	0.26
11035.00	90.25	180.01	7556.02	3523.25 S	453.27 E	3525.72	0.42
11219.00	90.55	180.57	7554.73	3707.24 S	452.34 E	3709.71	0.35
11390.00	89.75	179.26	7554.28	3878.23 S	452.59 E	3880.70	0.90
11562.00	89.41	179.53	7555.54	4050.22 S	454.41 E	4052.69	0.25
11733.00	90.12	179.98	7556.25	4221.21 S	455.14 E	4223.69	0.49
11905.00	90.15	180.78	7555.84	4393.21 S	454.00 E	4395.67	0.47
12076.00	89.97	180.34	7555.66	4564.20 S	452.32 E	4566.65	0.28
12248.00	90.62	179.52	7554.78	4736.19 S	452.54 E	4738.65	0.61
12419.00	89.32	179.71	7554.87	4907.19 S	453.68 E	4909.64	0.77
12590.00	90.03	178.30	7555.83	5078.15 S	456.65 E	5080.62	0.92
12762.00	89.48	179.03	7556.57	5250.10 S	460.66 E	5252.59	0.53
12933.00	89.72	179.86	7557.76	5421.09 S	462.32 E	5423.59	0.51
13105.00	90.31	180.08	7557.72	5593.09 S	462.41 E	5595.58	0.37
13276.00	89.17	178.20	7558.50	5764.06 S	464.97 E	5766.56	1.29
13447.00	90.74	180.54	7558.63	5935.03 S	466.85 E	5937.54	1.65
13619.00	89.97	180.14	7557.56	6107.02 S	465.83 E	6109.53	0.50
13790.00	90.52	179.88	7556.83	6278.02 S	465.80 E	6280.52	0.36
13962.00	89.91	180.21	7556.19	6450.01 S	465.67 E	6452.52	0.40
14133.00	90.31	180.26	7555.86	6621.01 S	464.97 E	6623.51	0.24
14305.00	90.00	180.01	7555.39	6793.01 S	464.56 E	6795.50	0.23
14476.00	89.72	179.52	7555.81	6964.01 S	465.26 E	6966.50	0.33
14647.00	89.69	180.29	7556.69	7135.00 S	465.55 E	7137.49	0.45
14818.00	90.06	180.25	7557.07	7306.00 S	464.74 E	7308.48	0.22
14989.00	90.34	180.11	7556.47	7477.00 S	464.20 E	7479.48	0.18
15160.00	90.65	179.24	7554.99	7647.99 S	465.17 E	7650.47	0.54
15331.00	88.74	176.49	7555.90	7818.84 S	471.54 E	7821.36	1.96
15502.00	89.57	176.04	7558.42	7989.46 S	482.68 E	7992.03	0.55
15674.00	89.94	177.75	7559.16	8161.20 S	492.00 E	8163.82	1.02
15845.00	91.26	178.16	7557.37	8332.08 S	498.10 E	8334.73	0.81
16017.00	90.25	178.68	7555.10	8503.99 S	502.84 E	8506.67	0.66
16188.00	89.66	178.91	7555.24	8674.96 S	506.44 E	8677.65	0.37
16360.00	90.12	178.86	7555.57	8846.92 S	509.78 E	8849.63	0.27
16531.00	89.82	180.12	7555.66	9017.91 S	511.31 E	9020.63	0.76
16703.00	89.82	180.49	7556.20	9189.91 S	510.39 E	9192.62	0.22
16838.00	90.06	179.70	7556.34	9324.91 S	510.17 E	9327.61	0.61
16886.00	90.06	179.70	7556.29	9372.91 S	510.42 E	9375.61	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 179.68 DEGREES (TRUE)
A TOTAL CORRECTION OF 8.58 DEG FROM MAGNETIC NORTH TO TRUE NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 16886.00 FEET
IS 9386.79 FEET ALONG 176.88 DEGREES (TRUE)**

Directional Surveys tied onto Gyro's @ 983' MD. Final Survey is a projection to the bit at TD.