PCG Pressure Case Gamma Ray
PCD Pressure Case Directional

HALLIBURTON | Sperry Drilling

Company : **Noble Energy Inc**
Rig : **PD 829**
Well : **Hunt LF18-62HN**
Field : **Wattenberg**
Country : **USA**
API Number : **05123663**

Country	: **USA**
Field	: **Wattenberg**
Location	: **Lat: 40° 39' 13.67" North** **Long: 104° 7' 33.61" West**
Well	: **Hunt LF18-62HN**
Company	: **Noble Energy Inc**
Rig	: **PD 829**

LOCATION

Latitude : **40° 39' 13.67" North**
Longitude : **104° 7' 33.61" West**
UTM Easting = **3,381,224.547 ft**
UTM Northing = **1,483,974.353 ft**

Other Services
Directional Drilling

Elev. KB **N/A**
DF **4956.00 ft**
GL **4940.00 ft**
WD **N/A**

Permanent Datum : **Ground Level** Elevation : **4940.00 ft**
Log Measured From : **Drill Floor** **16.00 ft** Above Permanent Datum
Drilling Measured From : **Drill Floor**

MD LOG

Depth Logged : **630.00 ft** To **10,765.00 ft**
Date Logged : **07-Apr-13** To **17-Apr-13**
Total Depth MD : **10,765.00 ft** TVD: **6,492.09 ft**
Spud Date : **07-Apr-13**

Unit No. : **11703725**
Plot Type : **Final**
Plot Date : **17-Apr-13**

Job No. :**CA-XX-0900215180**

Borehole Record (MD)

Run No.	Size	From	To
02	8.750 in	630.00 ft	750.00 ft
03	8.750 in	750.00 ft	7,010.00 ft
04	6.125 in	7,010.00 ft	10765.00 ft

Casing Record (MD)

Run No.	Size	Weight	From	To
	9.625 in	36.00 lbpf	SURFACE	623.00 ft
	7.000 in	26.00 lbpf	SURFACE	7,000.00 ft

Borehole Record (MD)

Run No.	Size	From	To

WELL INFORMATION

MWD Run Number	100	200	300		
Date run completed	09-Apr-13	12-Apr-13	17-Apr-13		
Rig Bit Number	02	03	04		
Bit Size (in)	8.750	8.750	6.125		
Tool Nominal OD (in)	6.750	6.750	4.750		
Log Start Depth (MD, ft)	623.00	750.00	7,010.00		
Log End Depth (MD, ft)	750.00	7,010.00	10,765.00		
Drill or Wipe	Drill	Drill	Drill		
Drill/Wipe Start Date and Time	08-Apr-13 20:15	09-Apr-13 04:40	14-Apr-13 03:30		
Drill/Wipe End Date and Time	08-Apr-13 22:13	12-Apr-13 00:30	16-Apr-13 23:10		
Min Inc (deg) @ Depth (MD, ft)	0 @ 623.00	.18 @ 750.00	81.59 @ 7,025.00		
Max Inc (deg) @ Depth (MD, ft)	.18 @ 700.00	75.49 @ 6,960.00	93.95 @ 9,983.00		
Bit TFA(in2) / Bit Type	.84 / PDC	.84 / PDC	.46 / PDC		
Flow Rate (gpm)	500.00	520.00	270.00		
Max AV (fpm) / CV (fpm) @ MWD	0 / 0	282.2 / 121.2	313.6 / 264.9		
Fluid Type	Fresh Water Gel	Fresh Water Gel	Fresh Water Gel		
Density (ppg) / Viscosity (spqt)	8.70 / 38.00	10.50 / 42.00	9.45 / 38.00		
Filtrate CL (ppm)	650.00	800.00	1,000.00		
pH / Fluid Loss (mptm)	9.00 / 0	9.40 / 6	9.50 / 6		
PV (cP) / YP (lhf2)	10 / 12.00	16 / 8.00	9 / 6.00		
% Solids / % Sand	3.8 / 0.1	9.0 / 0.2	5.5 / .25		
% Oil / Oil:Water Ratio	NA / NA	NA / NA	NA / NA		
Rm @ Measured Temp (degF)	NA @ NA	NA @ NA	NA @ NA		
Rmf @ Measured Temp (degF)	NA @ NA	NA @ NA	NA @ NA		
Rmc @ Measured Temp (degF)	NA @ NA	NA @ NA	NA @ NA		

Max Tool Temp (degF) / Source	70.02 / PCM	149.14 / PCM	196.50 / PCM		
Rm @ Max Tool Temp (degF)	NA @ 70.02	NA @ 149.14	NA @ 196.50		
Lead MWD Engineer	Scott Trowbridge	Scott Trowbridge	Scott Trowbridge		
Customer Representative	Kevin Campbell	JW Irwin	JW Irwin		

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM	PCM		
Software Version	5.76	5.76	5.76		
Sub Serial Number	11404279	11404279	12134698		
Insert Serial Number	11227539	11680798	11400936		
Date and Time Initialized	08-Apr-13 07:26	09-Apr-13 00:43	12-Apr-13 08:20		
Date and Time Read	09-Apr-13 03:00	12-Apr-13 11:18	17-Apr-13 16:06		
ECMB SW Version	N/A	N/A	N/A		

Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC		
Distance From Bit (ft)	50.00	50.00	65.00		
Software Version	6.21	6.21	6.21		
Sub Serial Number	11404279	11404279	12134698		
Sonde Serial Number	11638536	11478019	11638536		
Sensor ID Number	N/A	N/A	N/A		
Toolface Offset (deg)	122.85	121.95	104.59		

Gamma Ray Sensor Information

Tool Type	PCG	PCG	PCG		
Distance From Bit (ft)	56.32	56.32	57.96		
Recorded Sample Period (sec)	15	15	15		
Software Version	8.15	8.15	8.15		
Sub Serial Number	11404279	11404279	12134698		
Insert/Sonde Serial Number	11680941	11579775	11120598		

REMARKS

1. All depths are measured bit 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" for water based fluids and the "Bingham Plastic" model for oil and synthetic based fluids.

4. All data is stored data unless otherwise specified.

5. The following smoothing parameters have been applied to the data:

PCG GR XHI-Range (Gamma Ray Cor)
Interval Resolution: 1
Interval Distance: 1
Gap Fill: 3

ROPA (Average Rate of Penetration)
Interval Resoulution: 1
Interval Distance: 1
Gap Fill: 3

6. INSITE Version 7.4.20

6. INSITE Version 7.4.20

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HALLIBURTON

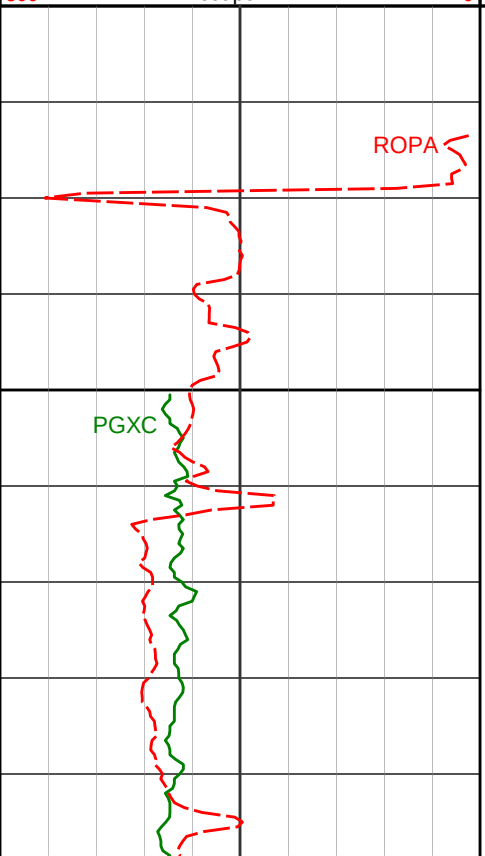
Sperry Drilling Services

MD Detail Log 1:240

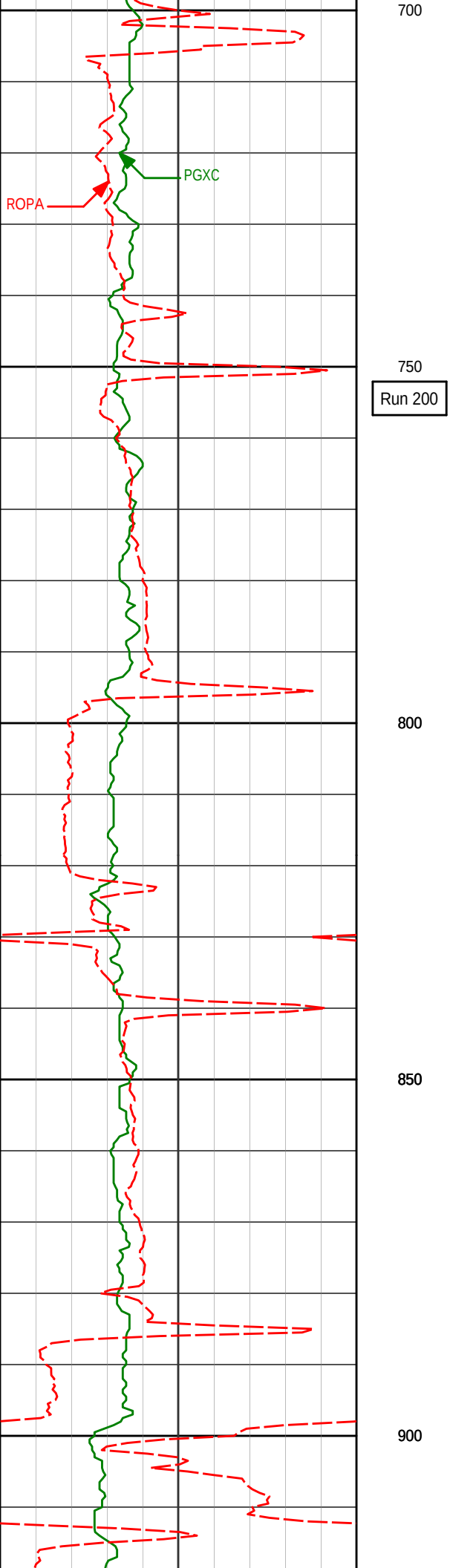
Noble Energy
Hunt LF18-62HN
PD 829
Sec 19-T8N-R60W

PCG Gamma Ray
PGRC
0 api 300

Avg Rate of Penetration
ROPA
500 feet per hr 0



Depth ft	Depth	Inc.	Azi.	TVD	V.S.
Run 100	623'	0.00°	0.00°	623.00'	0.00'
650					



700

700' 0.18° 107.21° 700.00' -0.12'

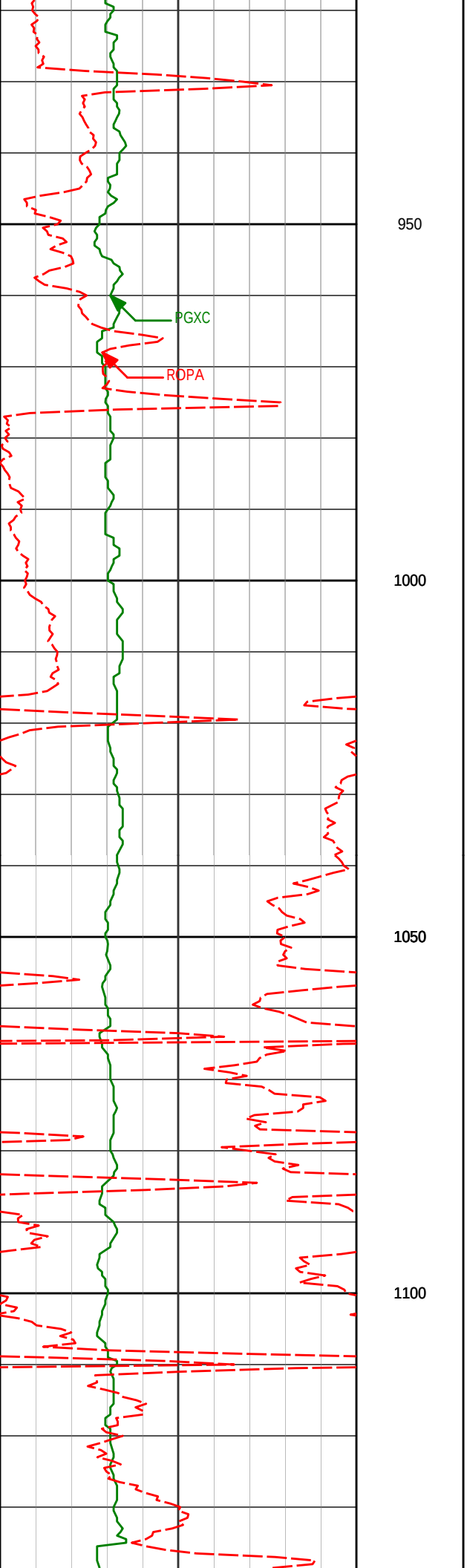
750

Run 200

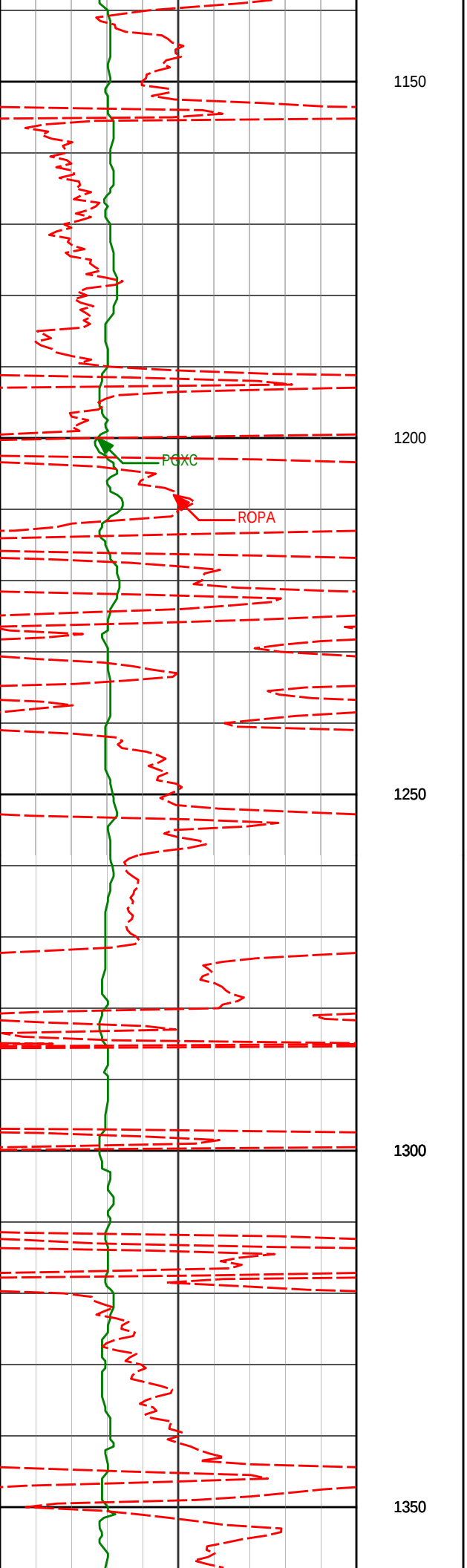
800

850

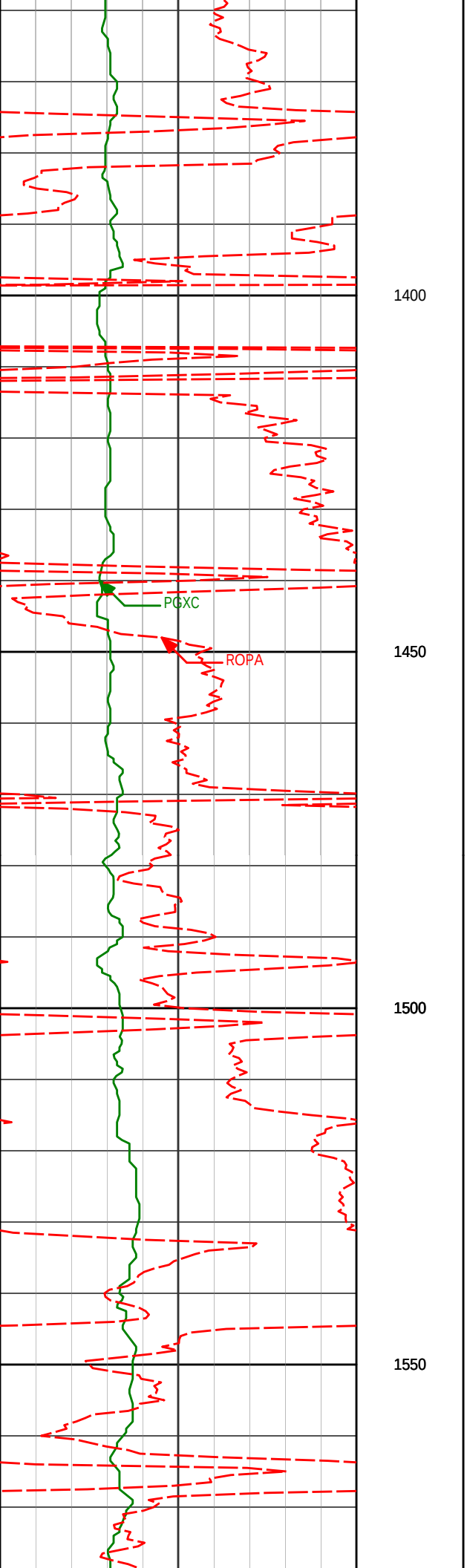
900



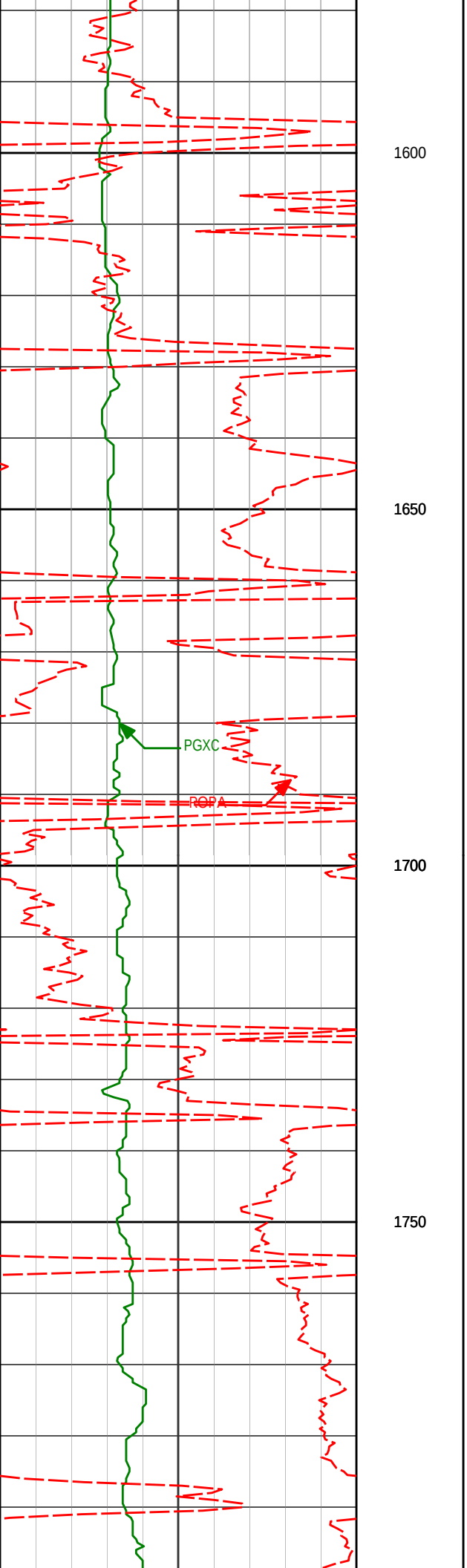
969' 0.25° 188.50° 969.00' -0.59'



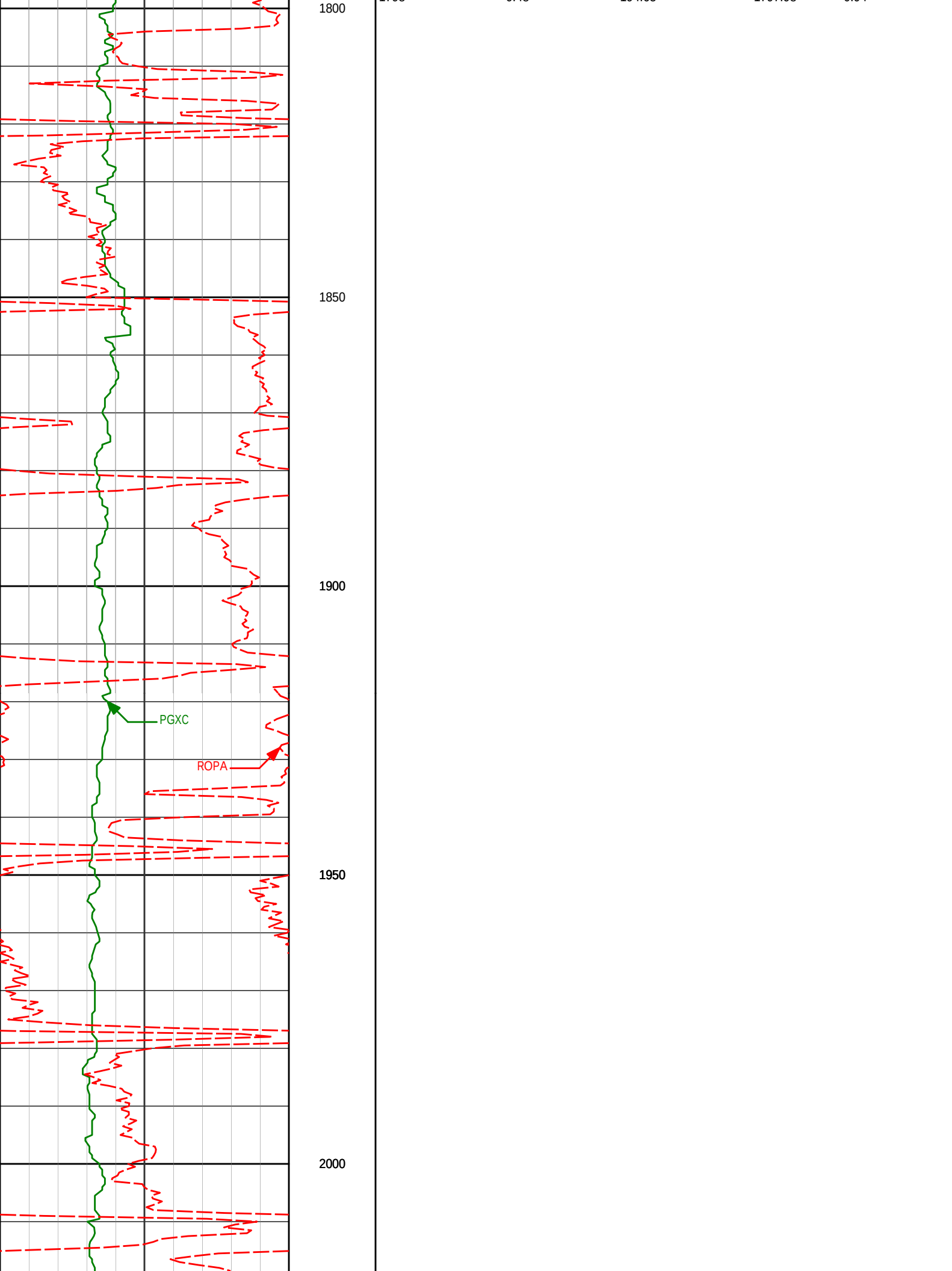
1232'	0.46°	197.63°	1231.99'	-0.55'

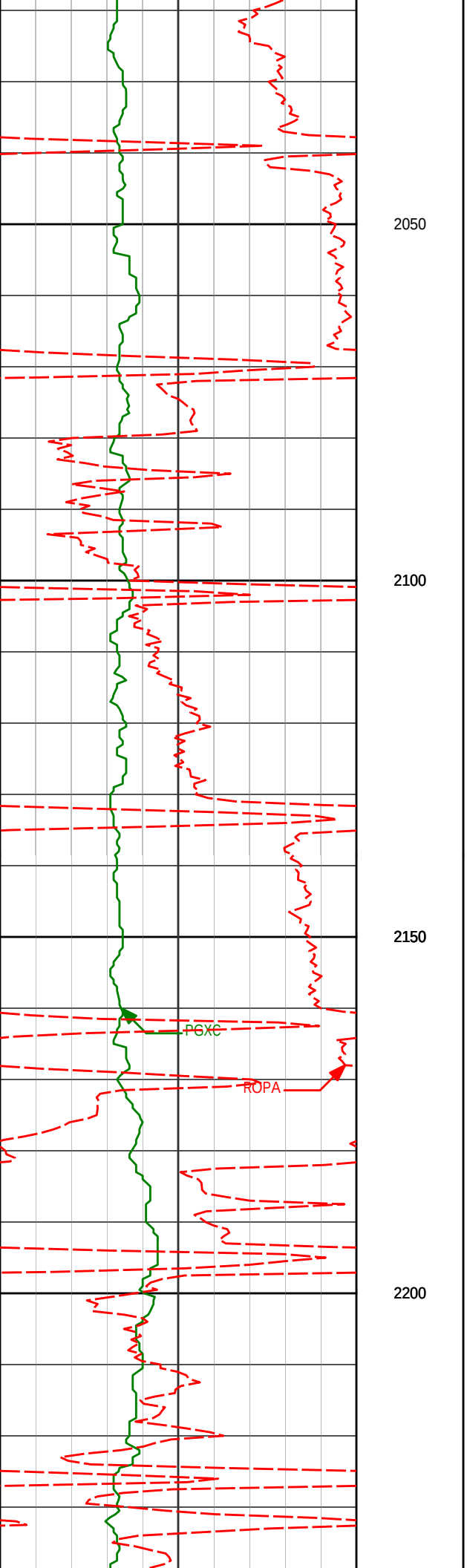


1515'	0.38°	177.27°	1514.99'	-0.71'

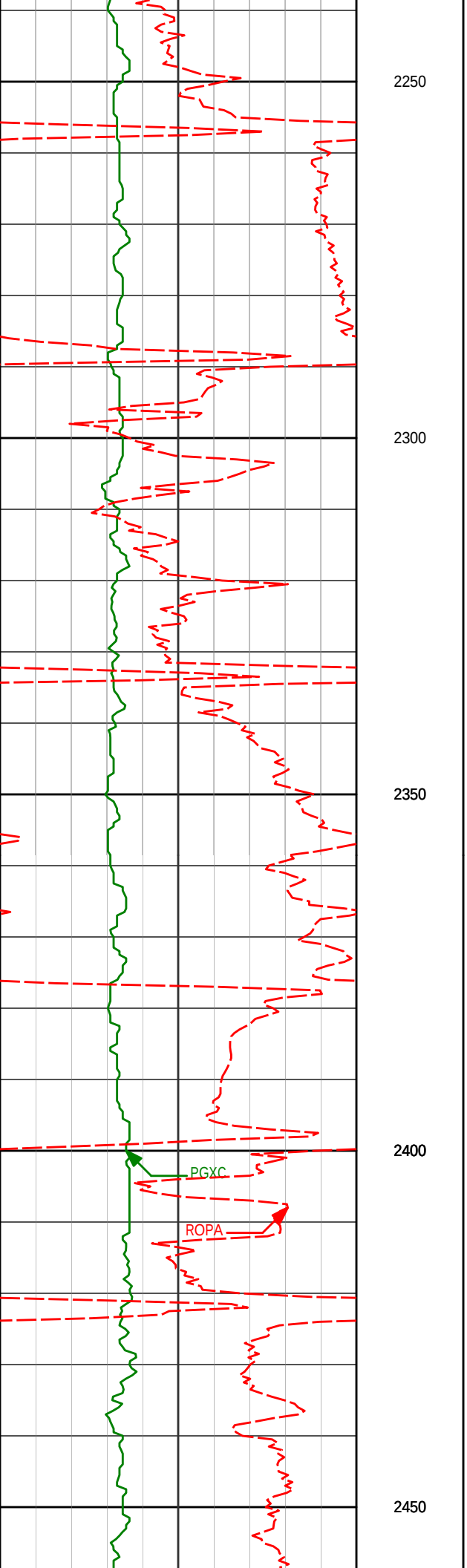


1798' 0.48° 194.65° 1797.98' -0.94'

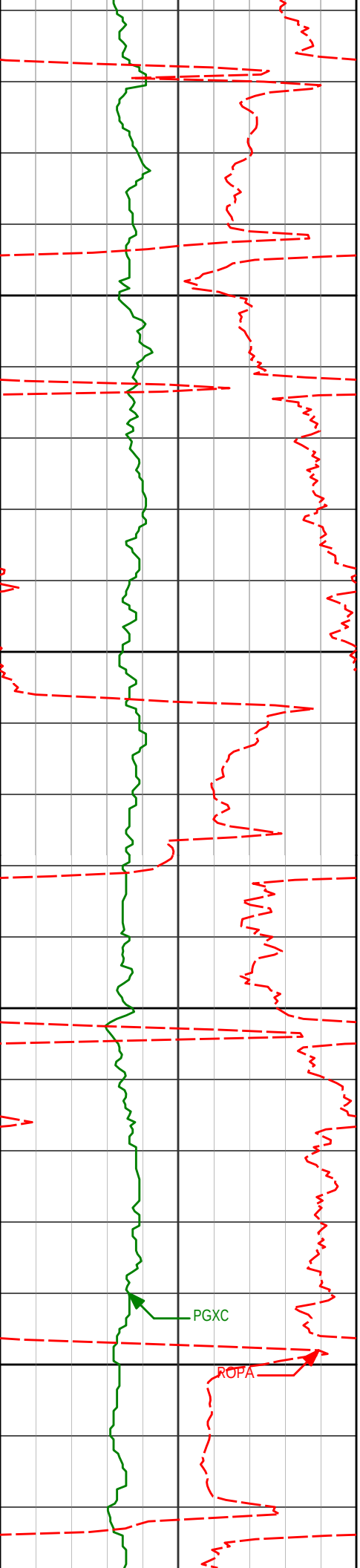

1800
1850
1900
1950
2000
PGXC
ROPA



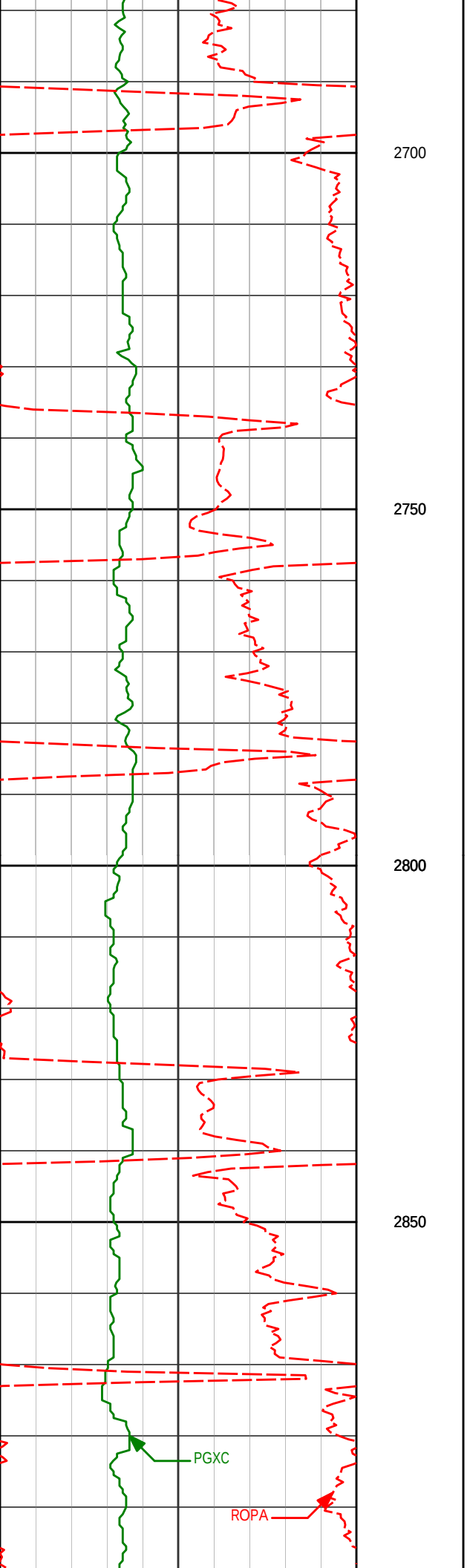
2080'	0.34°	112.89°	2079.97'	-1.74'



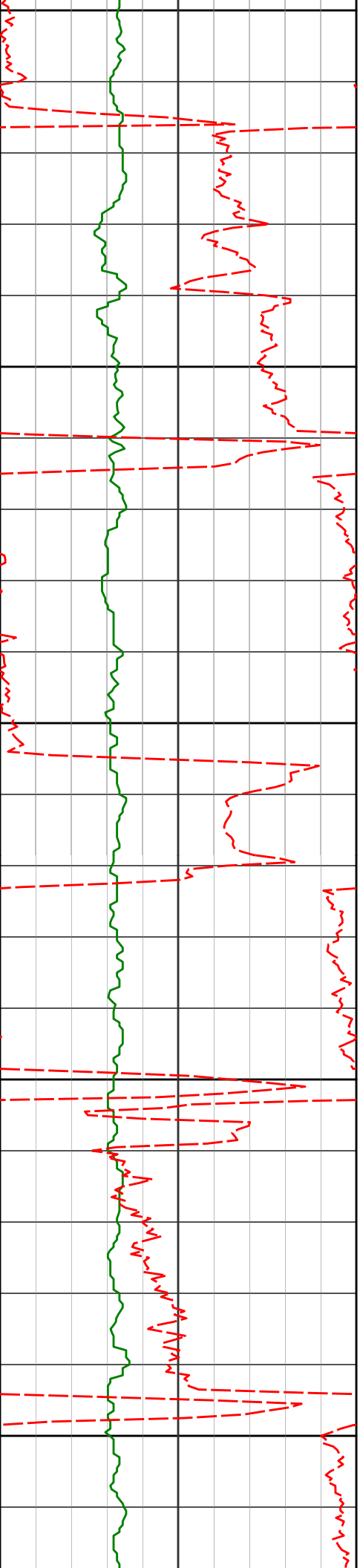
2327'	0.44°	111.78°	2326.97'	-3.40'
2417'	2.79°	25.99°	2416.93'	-4.23'



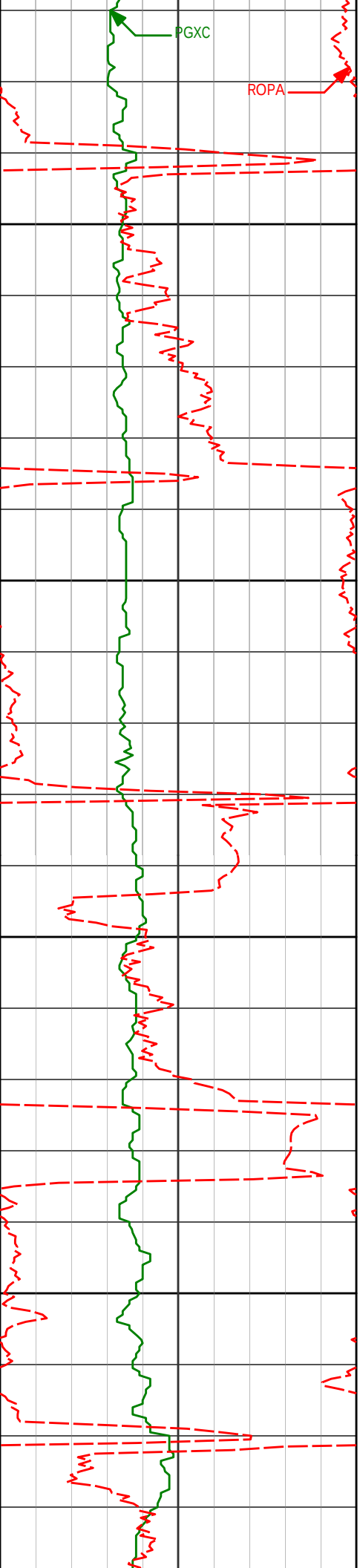
2506'	5.50°	18.05°	2505.69'	-5.09'
2596'	7.63°	23.74°	2595.10'	-6.58'



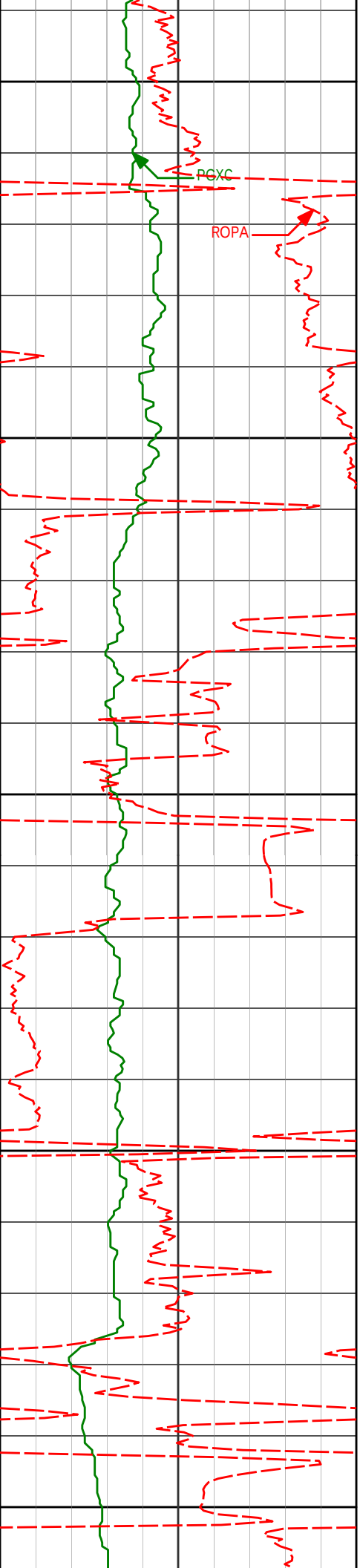
2686'	10.75°	23.11°	2683.93'	-9.16'
2775'	13.80°	18.98°	2770.89'	-11.71'
2865'	14.39°	10.21°	2858.18'	-12.28'



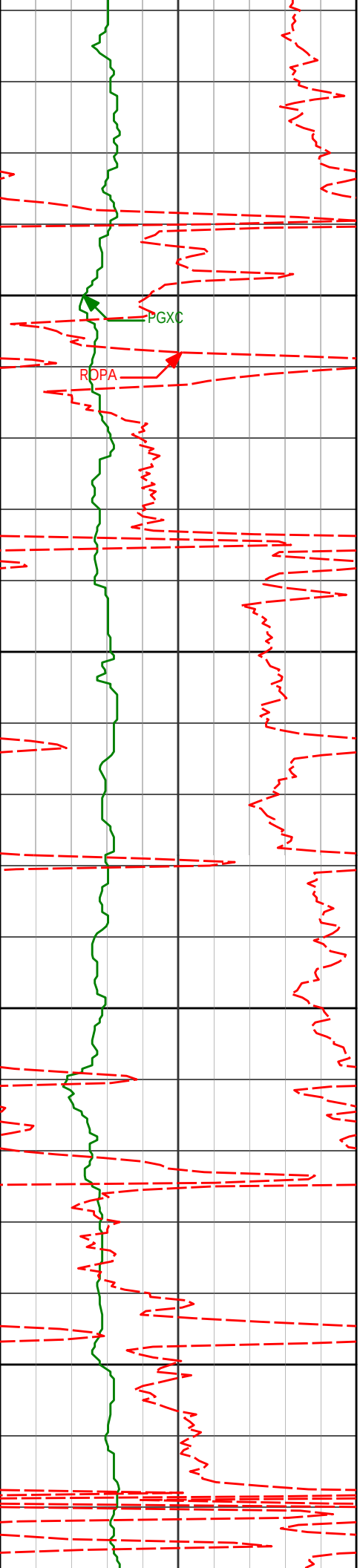
2955'	15.27°	9.89°	2945.19'	-11.08'
3044'	13.11°	5.28°	3031.47'	-9.07'



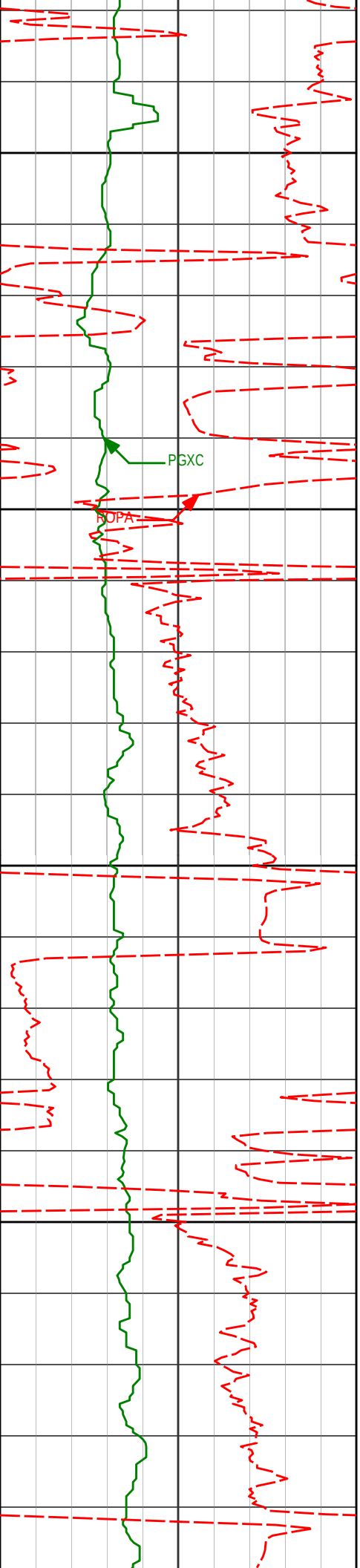
3134'	12.76°	5.24°	3119.18'	-6.35'
3224'	12.96°	2.65°	3206.92'	-3.18'
3313'	10.46°	7.74°	3294.07'	-0.64'



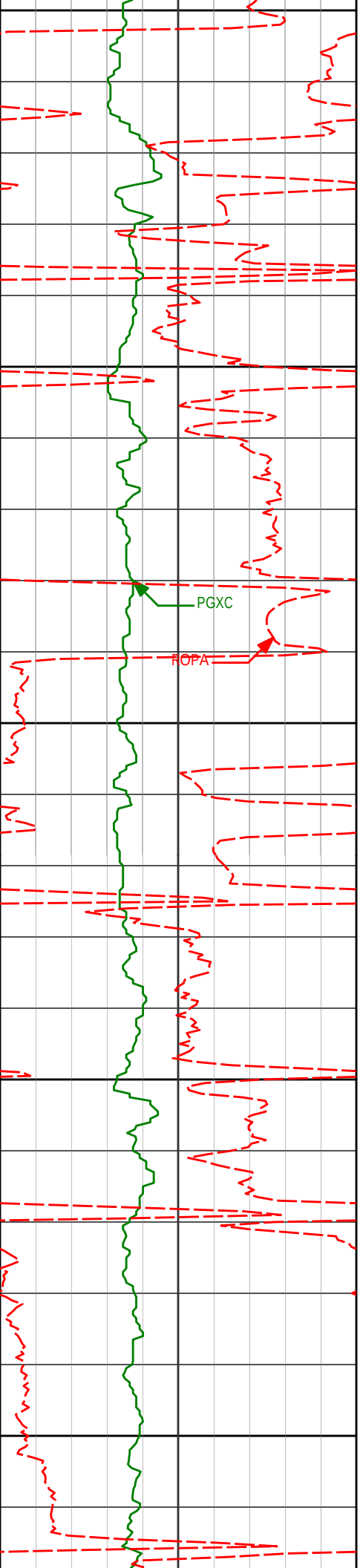
3403'	8.99°	2.75°	3382.77'	1.37'
3493'	10.19°	14.49°	3471.52'	2.42'



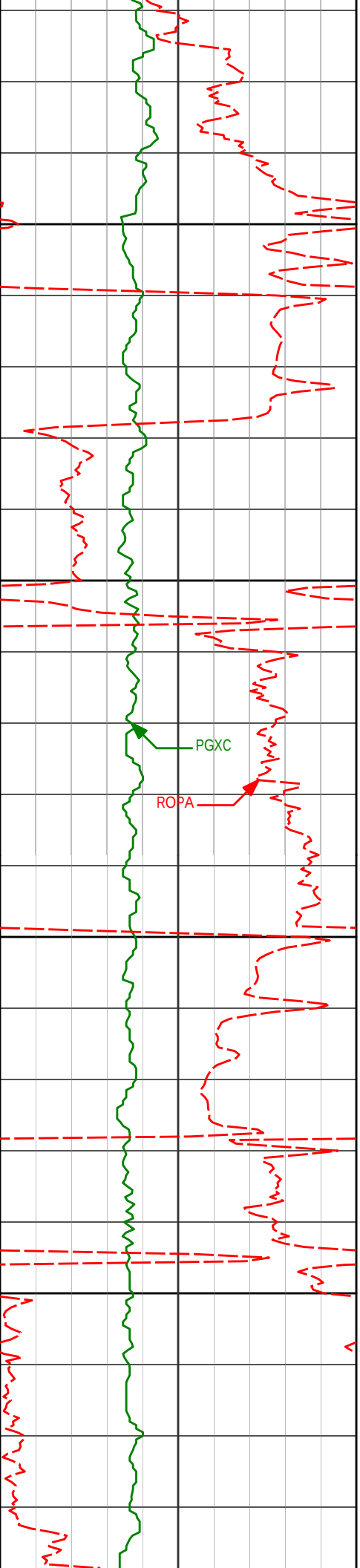
3582'	11.63°	15.75°	3558.91'	1.80'
3672'	12.83°	16.20°	3646.87'	0.81'
3762'	13.68°	16.94°	3734.47'	-0.47'



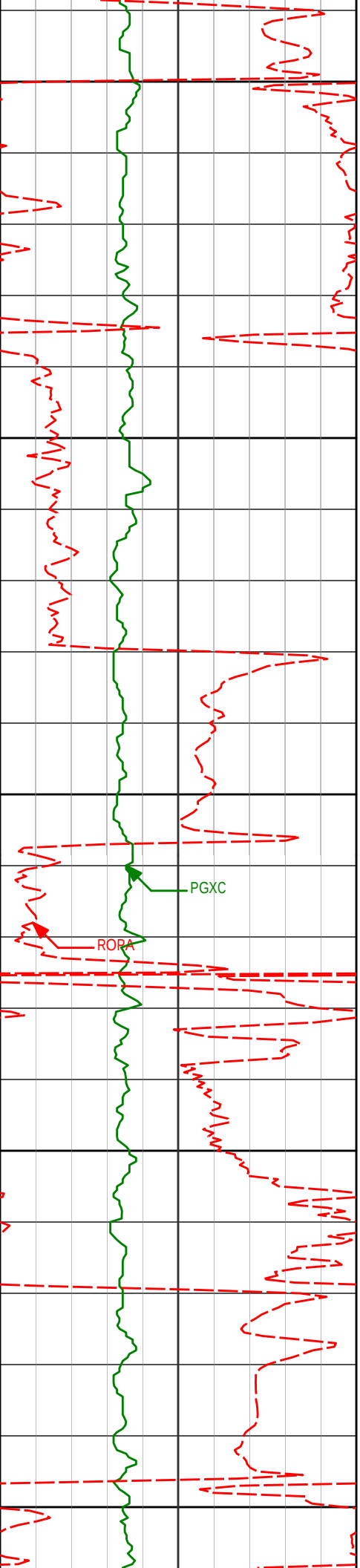
3851'	15.28°	17.11°	3820.64'	-2.02'
3941'	14.23°	14.46°	3907.67'	-3.14'



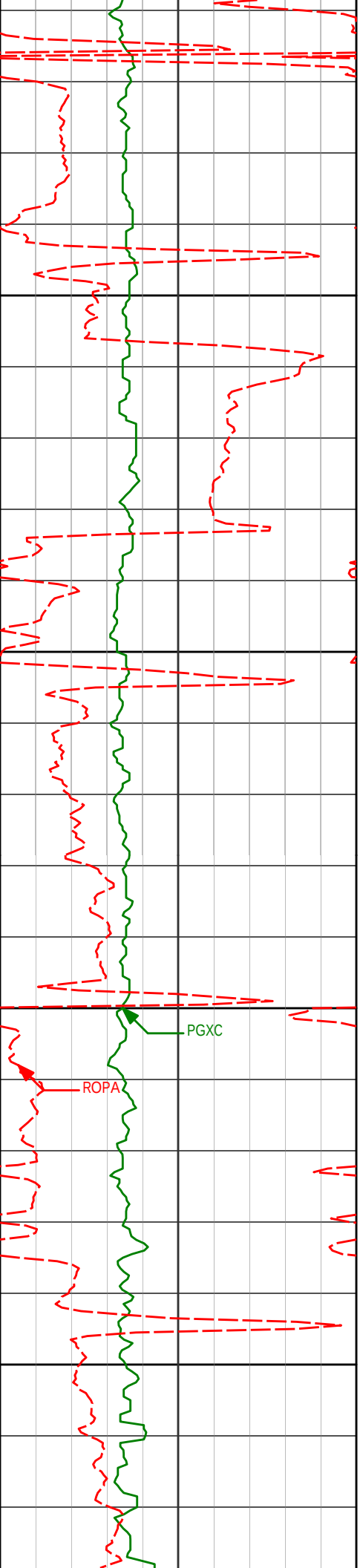
4030'	14.16°	8.46°	3993.96'	-2.54'
4120'	10.99°	9.06°	4081.79'	-1.07'
4210'	8.74°	12.41°	4170.46'	-0.40'



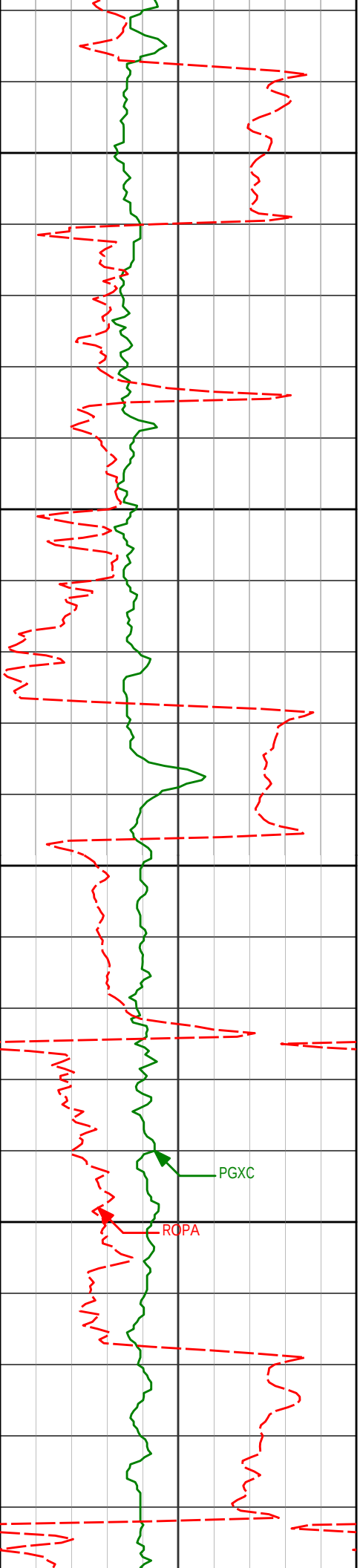
4250					
4300	4299'	8.67°	5.79°	4258.44'	0.52'
4350					
	4389'	10.71°	1.16°	4347.15'	3.09'
4400					



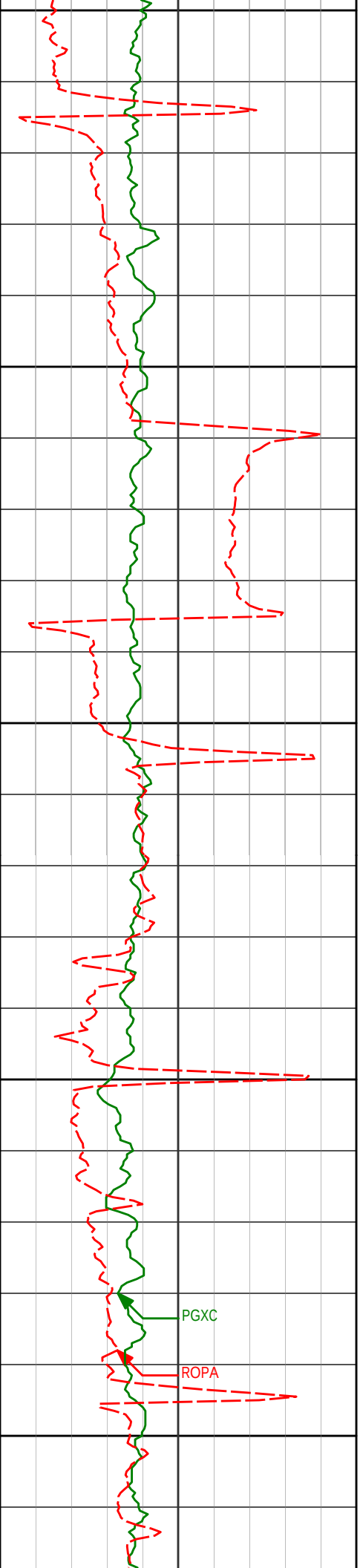
4479'	9.72°	0.86°	4435.72'	6.41'
4569'	11.37°	15.07°	4524.21'	7.70'
4658'	12.37°	10.40°	4611.31'	7.83'



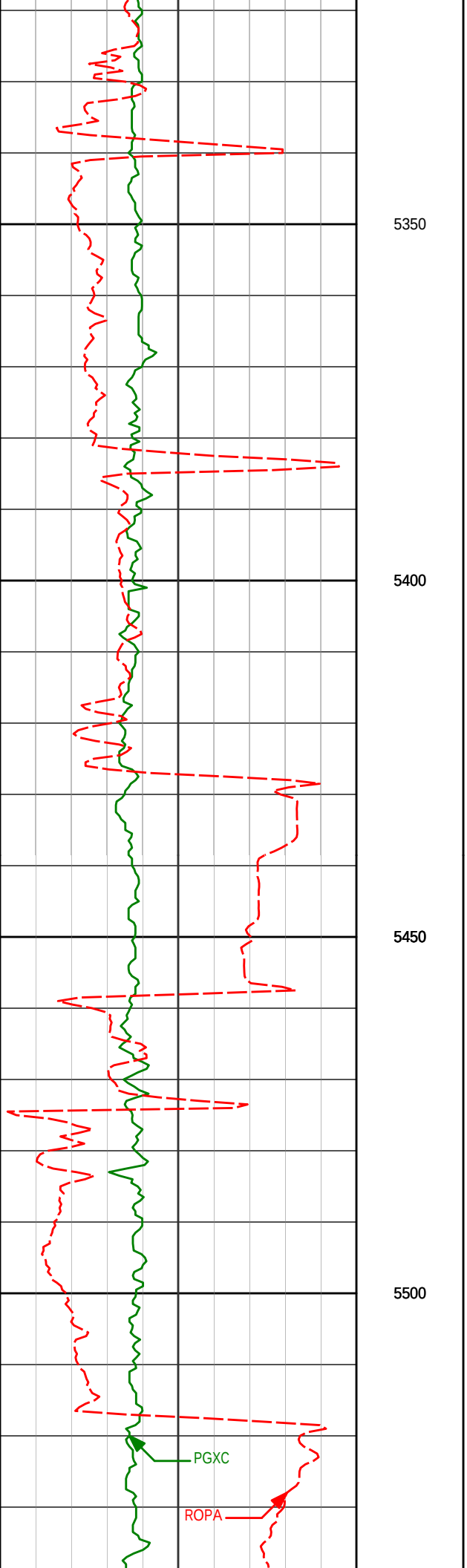
4748'	14.56°	2.97°	4698.83'	10.24'
4838'	13.34°	2.41°	4786.18'	14.13'



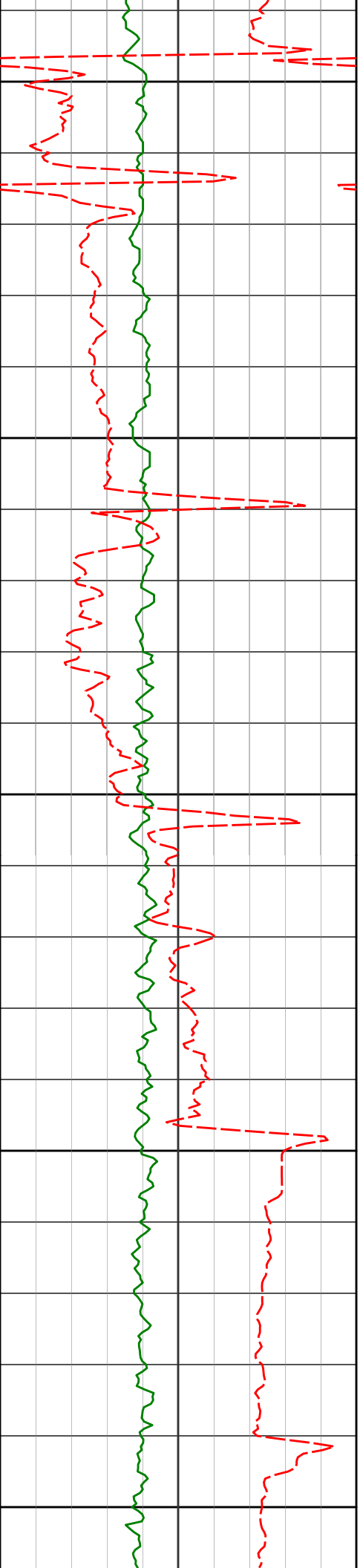
4928'	14.20°	7.78°	4873.59'	17.06'
5018'	14.86°	4.89°	4960.72'	19.70'



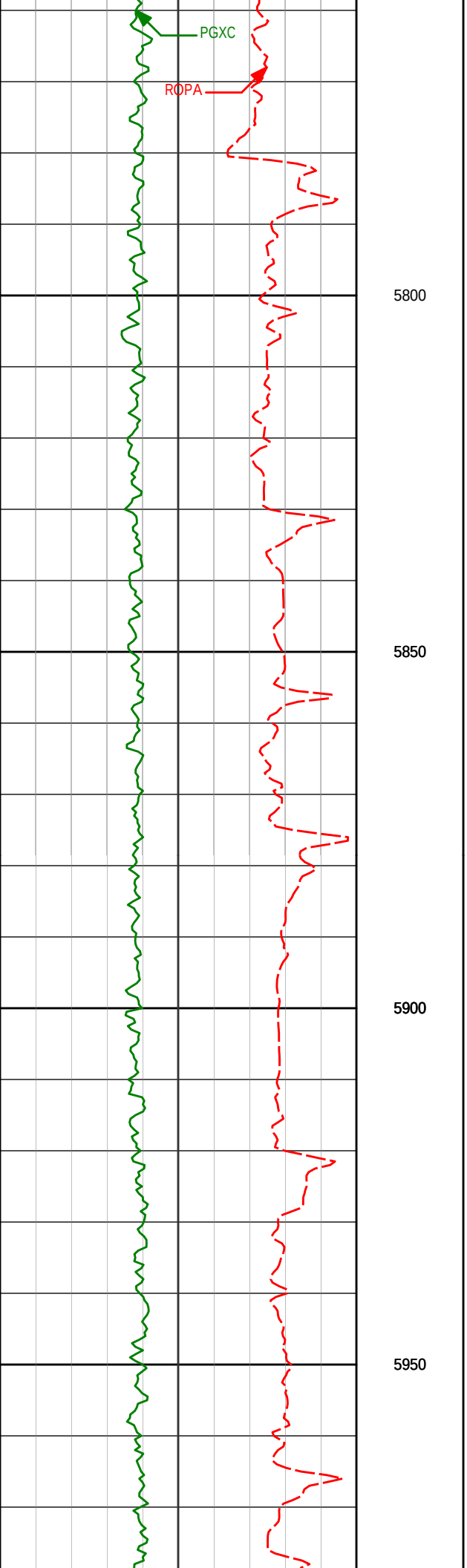
5107'	14.37°	1.92°	5046.84'	23.44'
5197'	16.27°	6.91°	5133.64'	26.94'
5287'	14.84°	7.46°	5220.34'	29.40'



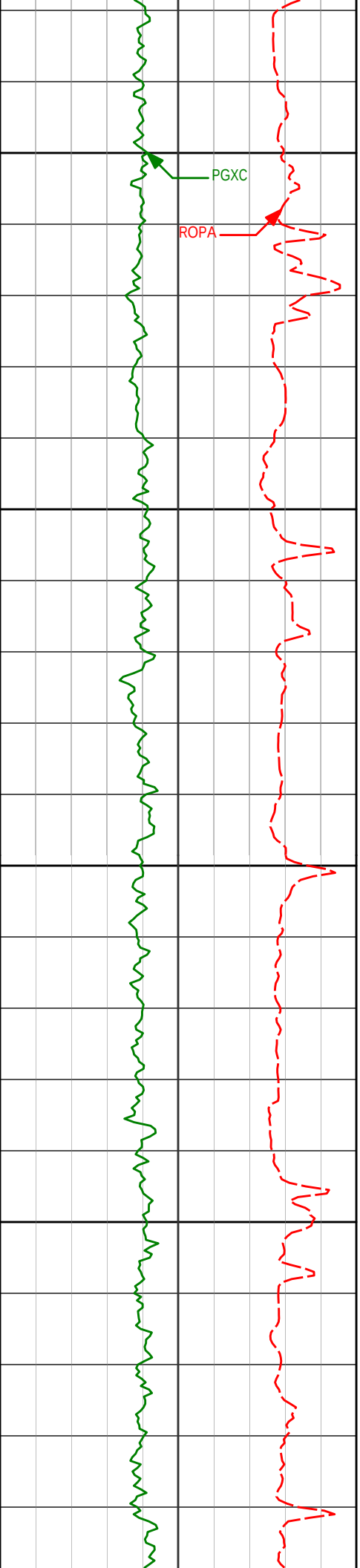
5377'	12.69°	8.14°	5307.75'	31.37'
5467'	13.47°	359.46°	5395.42'	34.67'



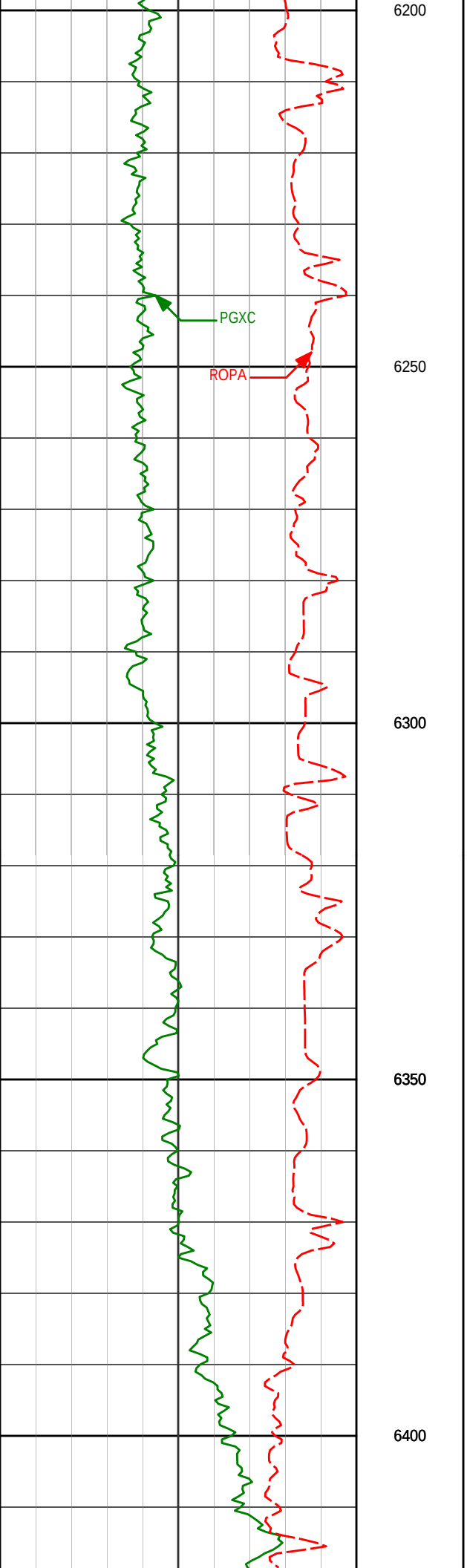
5557'	15.18°	0.49°	5482.62'	39.68'
5646'	12.93°	1.55°	5568.95'	44.20'
5691'	12.13°	1.47°	5612.88'	46.15'
5736'	15.24°	1.68°	5656.60'	48.26'



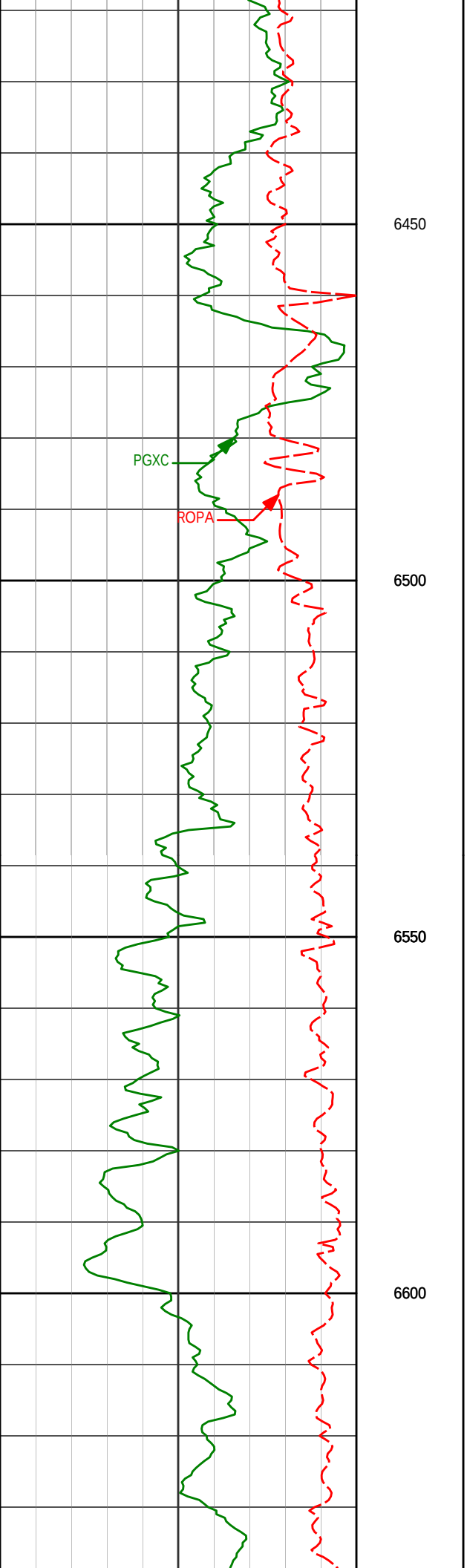
5781'	17.34°	3.41°	5699.79'	50.54'
5826'	20.89°	3.65°	5742.30'	52.97'
5871'	24.91°	3.90°	5783.75'	55.79'
5915'	28.38°	2.38°	5823.07'	59.19'
5960'	32.46°	0.90°	5861.87'	63.71'



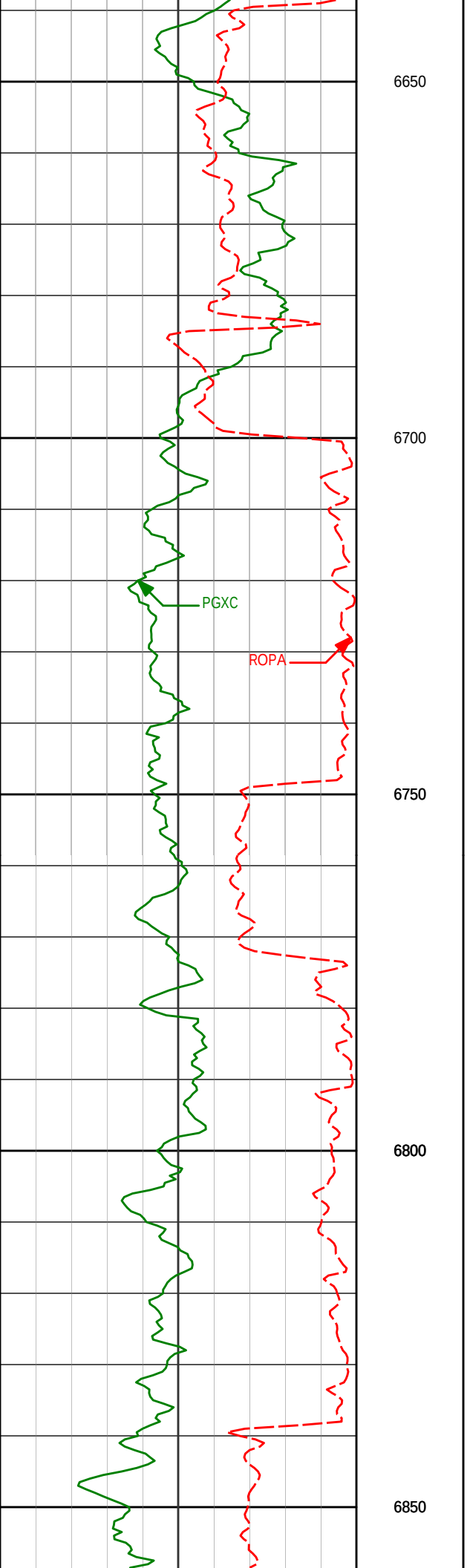
6005'	36.27°	357.60°	5899.01'	69.79'
6050'	38.50°	351.70°	5934.77'	78.43'
6095'	39.23°	343.16°	5969.84'	90.62'
6139'	42.37°	335.99°	6003.16'	106.49'
6184'	45.03°	331.03°	6035.70'	126.29'



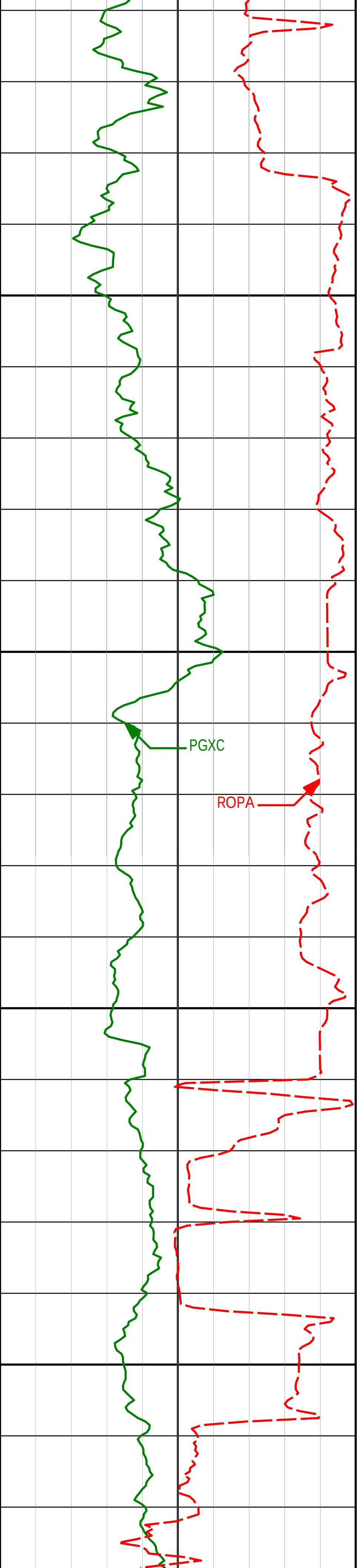
6229'	45.72°	324.39°	6067.33'	149.04'
6274'	46.29°	316.93°	6098.61'	174.65'
6319'	46.51°	309.09°	6129.66'	202.84'
6363'	48.47°	302.65°	6159.41'	232.70'
6408'	52.17°	296.95°	6188.16'	265.85'



6450	6453'	57.08°	292.20°	6214.21'	301.78'
	6498'	61.70°	287.52°	6237.13'	340.21'
6500					
	6543'	65.50°	280.92°	6257.15'	380.47'
6550					
	6588'	67.40°	274.67°	6275.14'	421.52'
6600					
	6633'	69.36°	268.27°	6291.73'	462.48'



6677'	70.28°	267.38°	6306.91'	502.33'
6722'	69.73°	269.74°	6322.30'	543.27'
6767'	71.34°	271.18°	6337.30'	584.68'
6812'	67.15°	272.69°	6353.24'	625.96'
6857'	65.49°	273.68°	6371.31'	666.56'



6900

6950

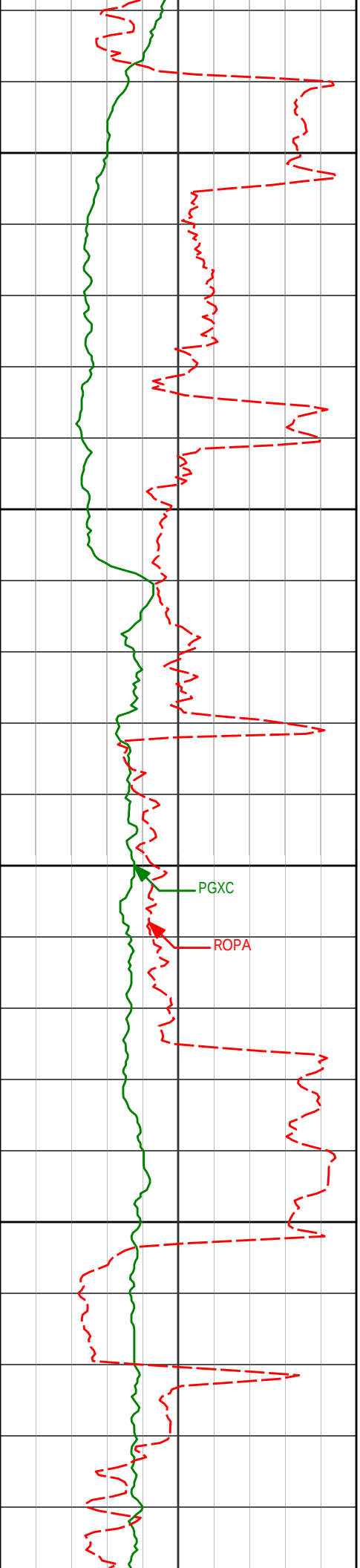
7000

7" casing shoe at 7000ft MD

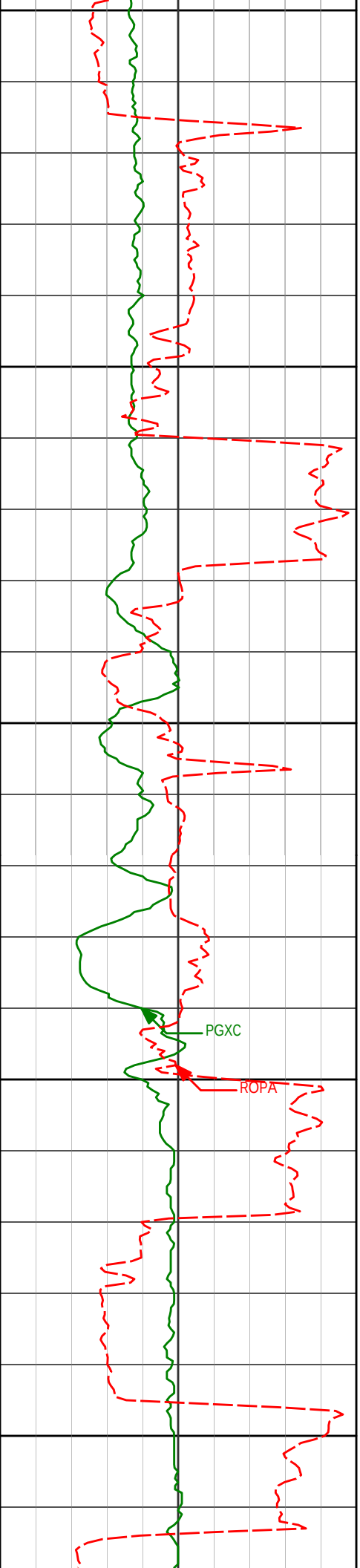
Run 300

7050

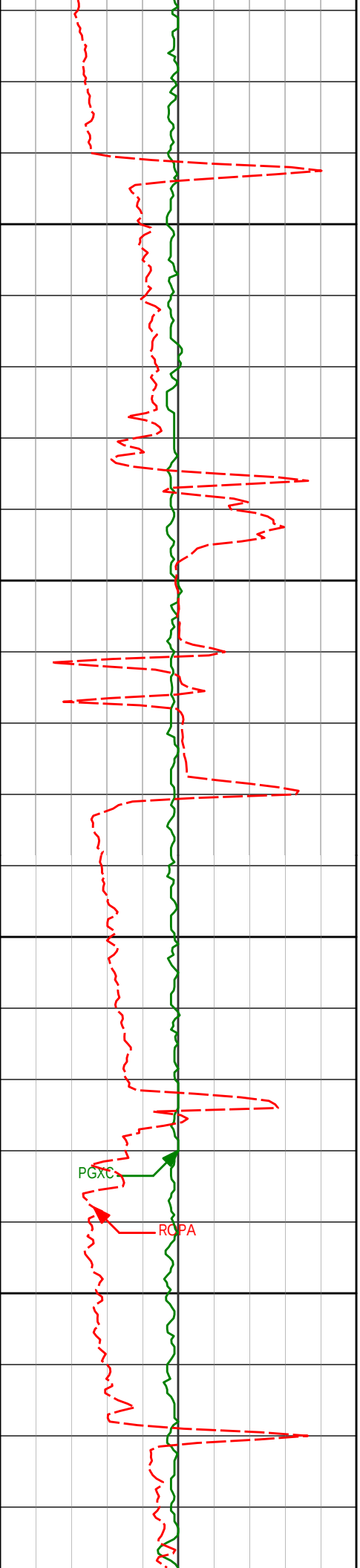
6902'	67.23°	275.88°	6389.36'	707.35'
6946'	72.64°	276.66°	6404.45'	748.38'
6960'	75.49°	276.38°	6408.29'	761.75'
7025'	81.59°	277.12°	6421.21'	825.05'
7070'	83.02°	275.68°	6427.23'	869.34'



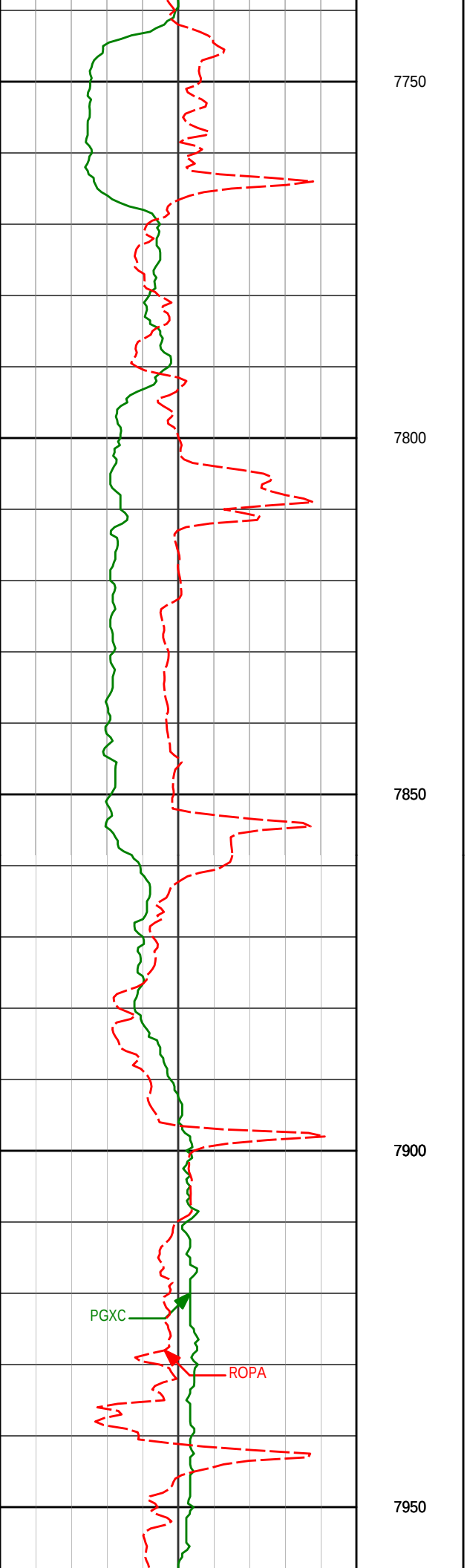
7115'	85.31°	275.03°	6431.81'	913.70'
7159'	87.44°	275.24°	6434.59'	957.19'
7204'	87.41°	274.62°	6436.61'	1001.70'
7249'	86.88°	273.63°	6438.85'	1046.10'
7294'	85.34°	271.00°	6441.91'	1090.21'



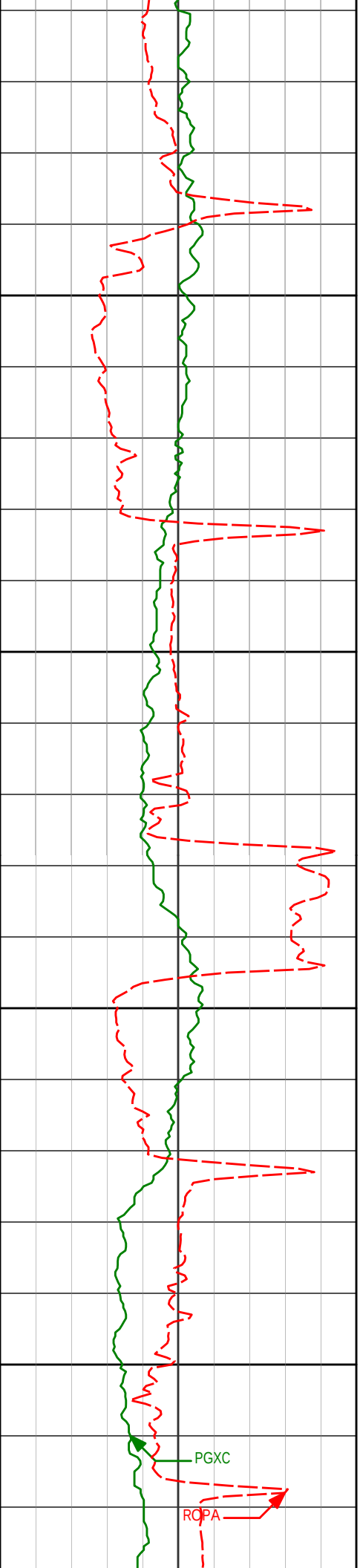
7339'	88.18°	272.57°	6444.45'	1134.27'
7384'	89.60°	271.95°	6445.32'	1178.47'
7429'	89.17°	271.19°	6445.81'	1222.57'
7473'	88.21°	266.97°	6446.81'	1265.25'
7518'	88.06°	264.64°	6448.28'	1308.21'



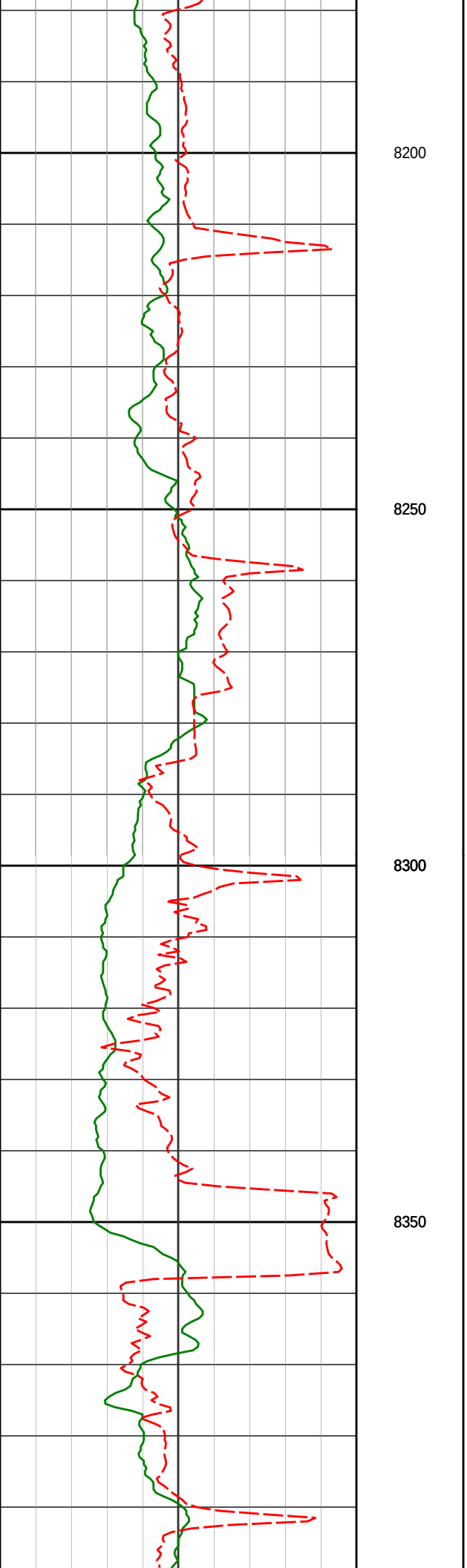
7563'	88.06°	265.32°	6449.80'	1350.97'
7608'	88.55°	266.32°	6451.13'	1393.93'
7653'	89.04°	267.25°	6452.08'	1437.13'
7698'	89.11°	267.68°	6452.80'	1480.47'



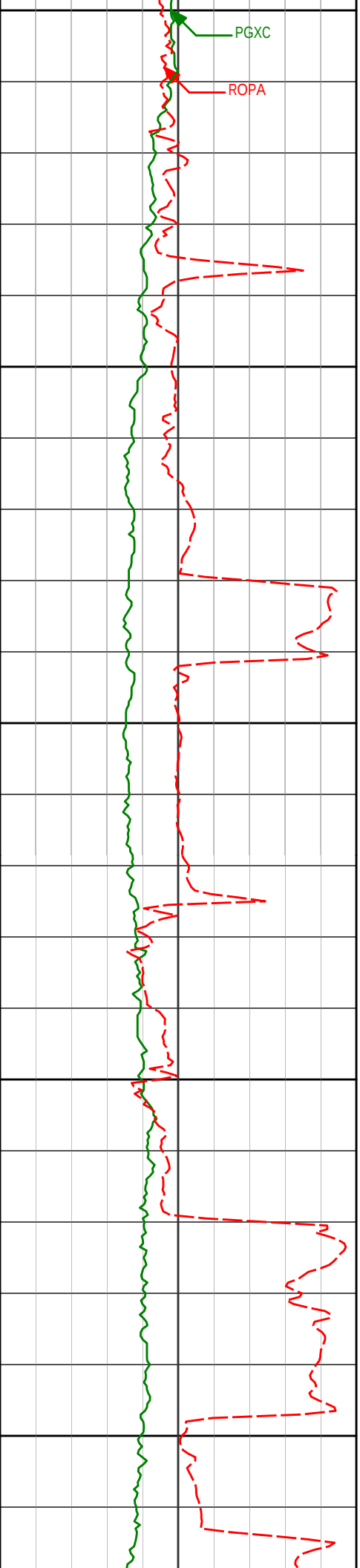
7742'	89.35°	267.74°	6453.40'	1522.90'
7787'	88.83°	266.48°	6454.11'	1566.17'
7832'	89.38°	266.59°	6454.81'	1609.31'
7922'	90.37°	266.68°	6455.00'	1695.65'



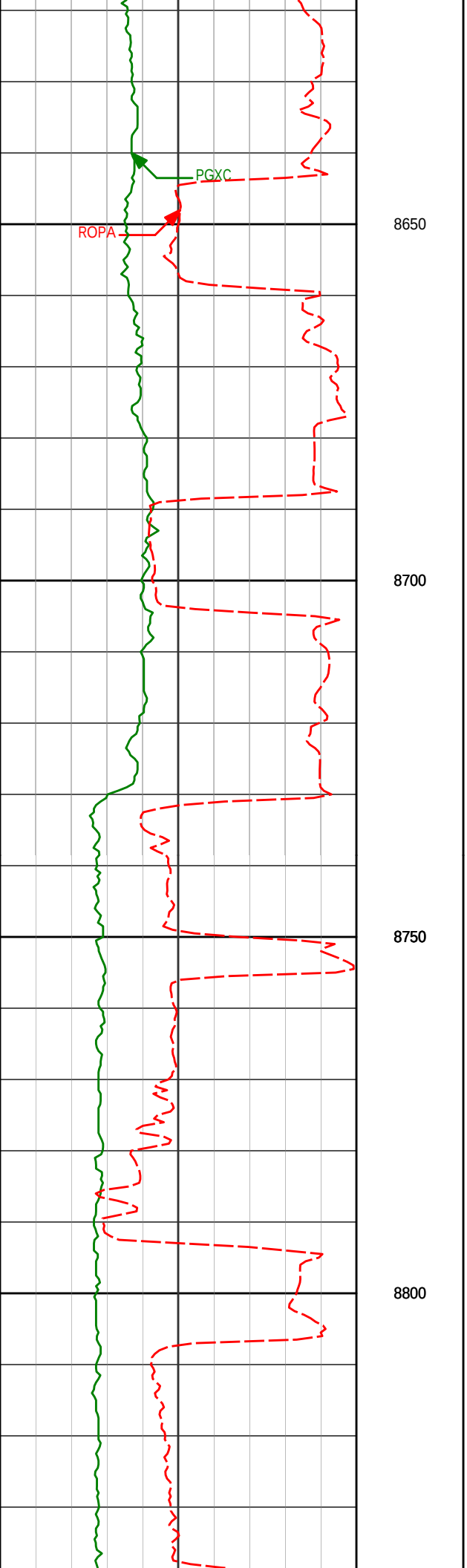
8011'	91.02°	268.17°	6453.93'	1781.36'
8101'	88.71°	266.36°	6454.15'	1867.97'



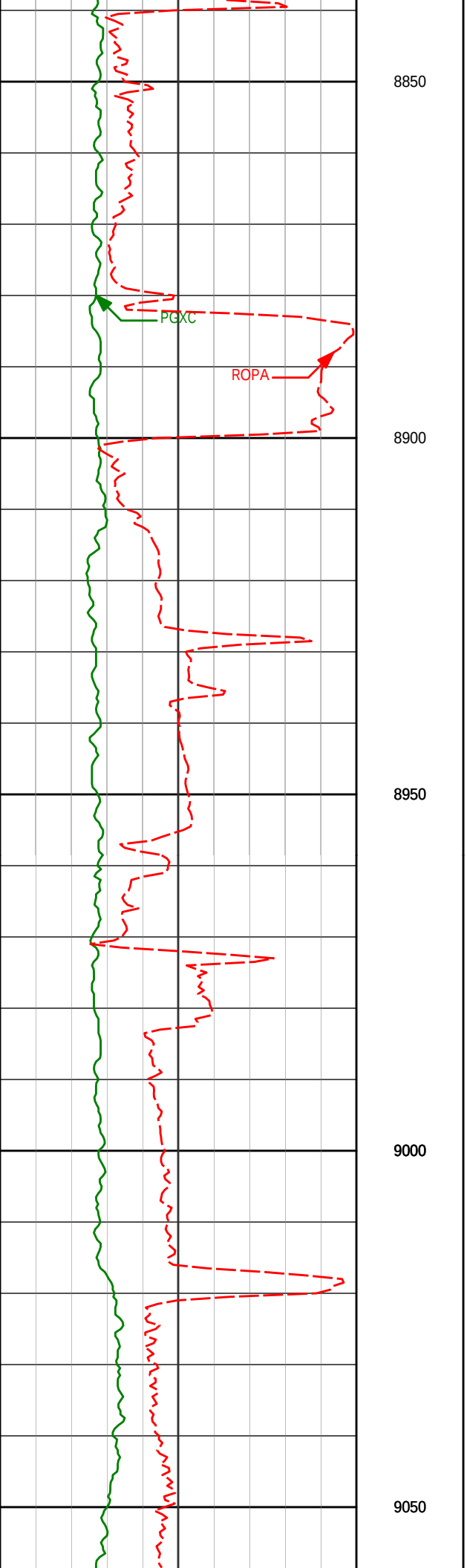
8190'	88.43°	265.26°	6456.37'	1952.95'
8280'	88.71°	264.81°	6458.62'	2038.52'
8370'	89.97°	264.84°	6459.67'	2124.01'



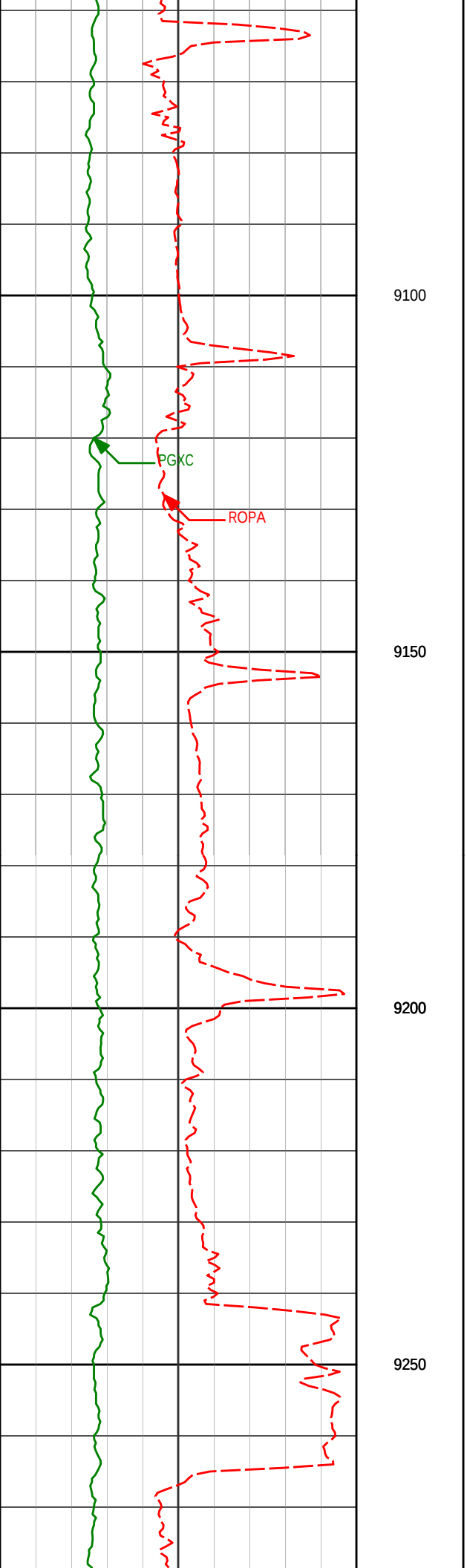
8459'	90.40°	263.72°	6459.38'	2208.28'
8549'	89.23°	263.14°	6459.67'	2293.06'



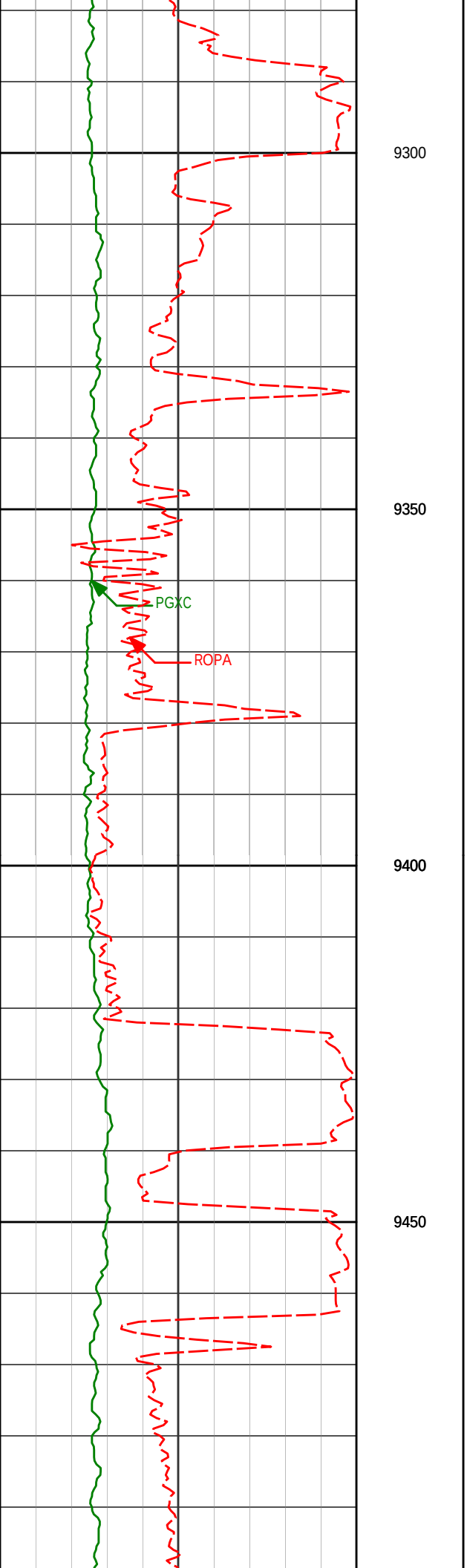
8638'	88.92°	267.23°	6461.10'	2377.75'
8728'	89.29°	271.86°	6462.51'	2465.24'
8817'	88.00°	270.58°	6464.62'	2552.32'



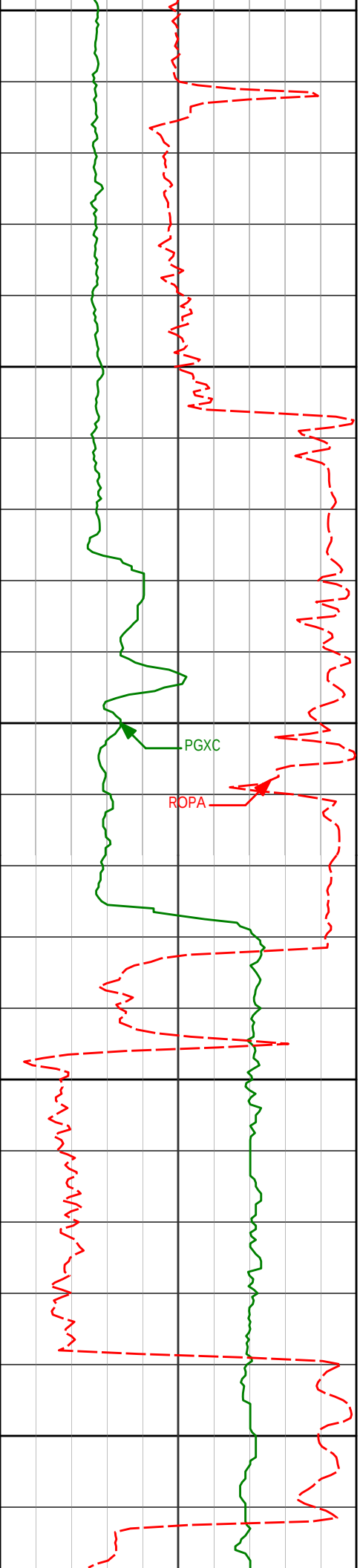
8907'	89.48°	272.04°	6466.60'	2640.42'
8997'	90.06°	272.30°	6466.96'	2728.81'



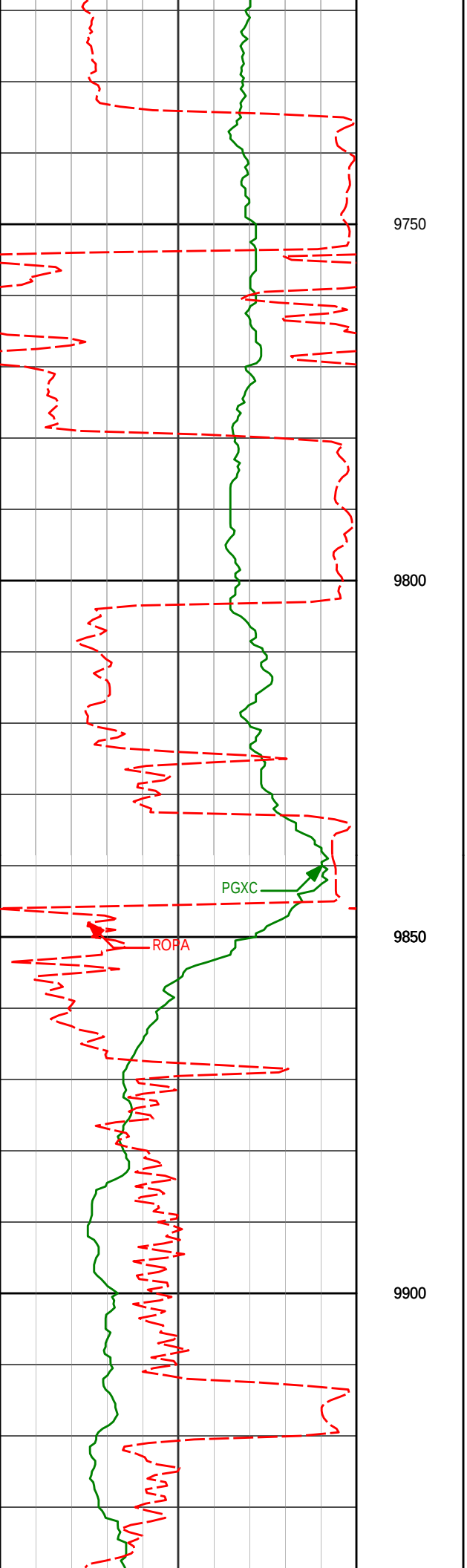
9086'	90.15°	272.13°	6466.80'	2816.23'
9176'	88.80°	270.50°	6467.62'	2904.34'
9265'	89.14°	269.02°	6469.22'	2990.95'



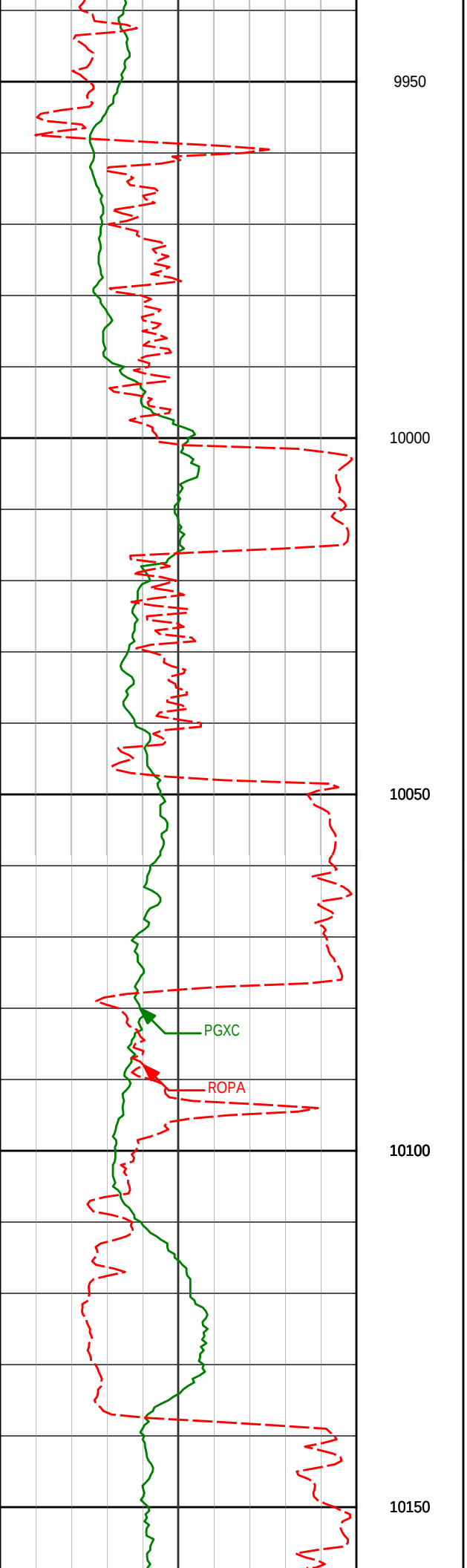
9355'	89.08°	266.20°	6470.63'	3077.69'
9445'	89.94°	268.53°	6471.40'	3164.33'



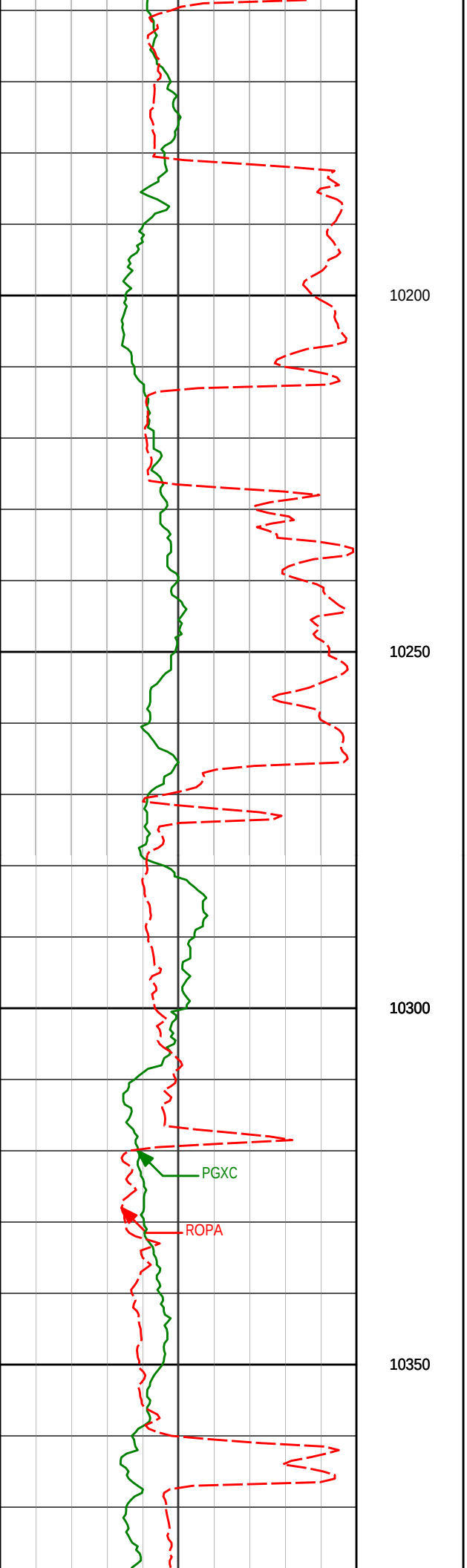
9535'	88.43°	267.25°	6472.69'	3251.20'
9624'	88.95°	267.90°	6474.72'	3336.96'
9714'	88.18°	267.15°	6476.97'	3423.65'



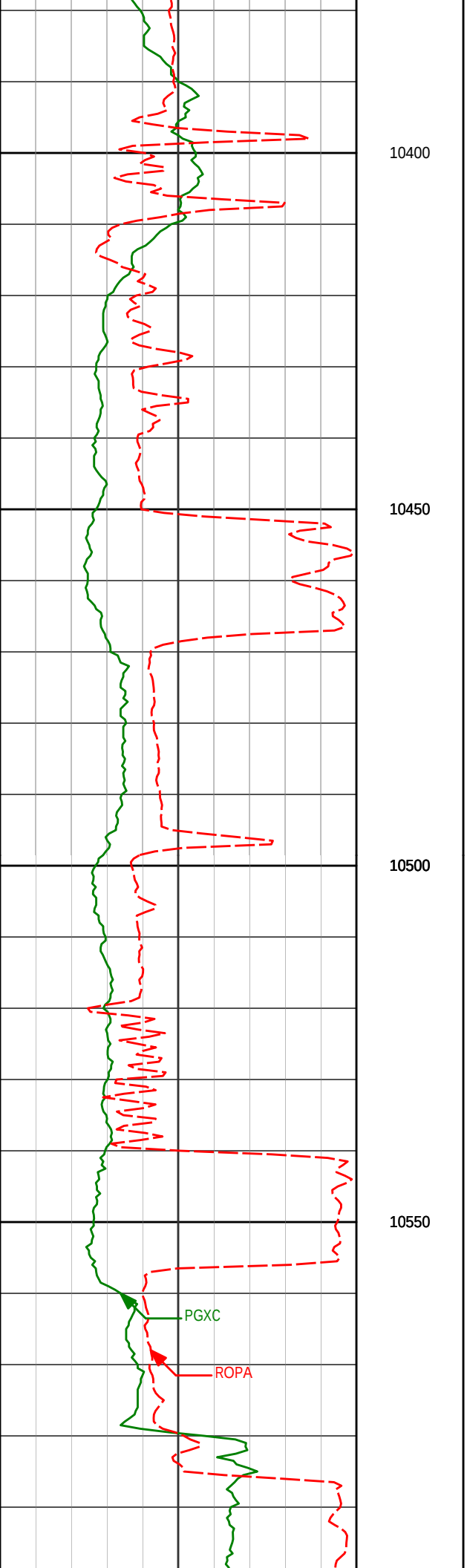
9803'	91.69°	267.71°	6477.07'	3509.36'
9893'	93.79°	267.36°	6472.76'	3595.98'



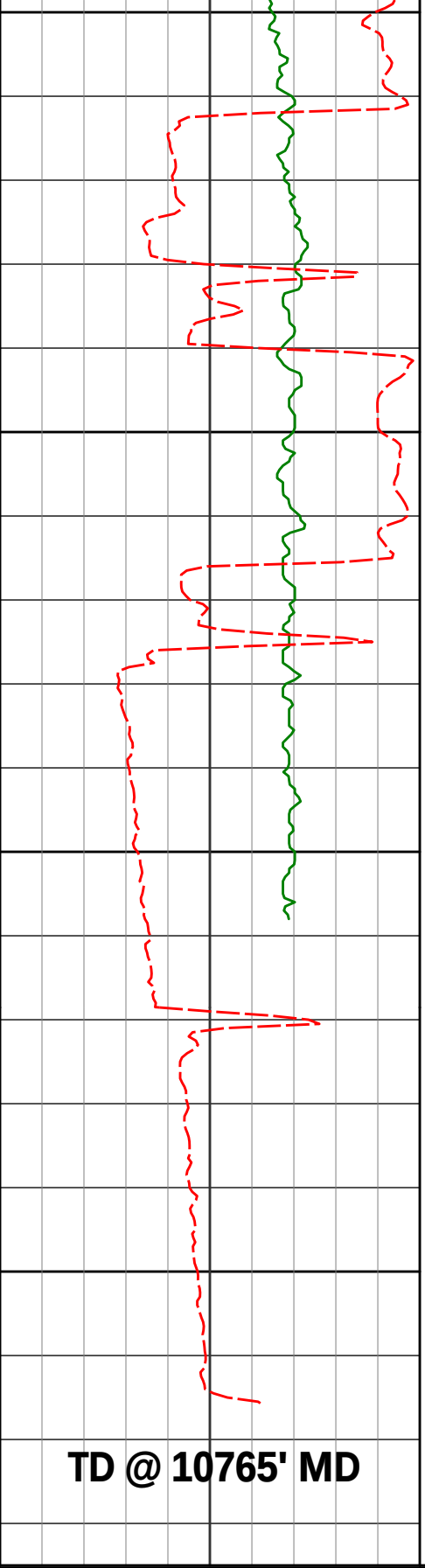
9983'	93.95°	265.30°	6466.69'	3681.99'
10072'	91.45°	266.93°	6462.50'	3767.04'



10162'	91.26°	267.81°	6460.37'	3853.67'
10251'	86.55°	270.36°	6462.07'	3940.00'
10341'	85.74°	270.64°	6468.13'	4027.66'



10431'	85.06°	270.26°	6475.34'	4115.21'
10520'	85.34°	269.42°	6482.79'	4201.56'



Depth ft	Depth	Inc.	Azi.	TVD	V.S.
10600					
	10610'	87.50°	269.78°	6488.41'	4288.92'
10650					
10700	10700'	89.11°	271.40°	6491.08'	4376.77'
10750					
	10765'	89.11°	271.40°	6492.09'	4440.42'

Avg Rate of Penetration
ROPA
500 feet per hr 0

PCG Gamma Ray
PGRC
0 api 300

HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy Inc
Hunt LF18-62HN
Wattenberg
Weld Colorado
USA
CA-XX-0900215180
Tie in @ 623'
Final Survey is a projection to bit at TD

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
623.00	0.00	0.00	623.00	0.00 N	0.00 E	0.00	TIE-IN
700.00	0.18	107.21	700.00	0.04 S	0.12 E	-0.12	0.23
969.00	0.25	188.50	969.00	0.74 S	0.43 E	-0.59	0.11
1232.00	0.46	197.63	1231.99	2.30 S	0.03 E	-0.55	0.08
1515.00	0.38	177.27	1514.99	4.31 S	0.26 W	-0.71	0.06
1798.00	0.48	194.65	1797.98	6.40 S	0.52 W	-0.94	0.06
2080.00	0.34	112.89	2079.97	7.88 S	0.04 W	-1.74	0.20
2327.00	0.44	111.78	2326.97	8.52 S	1.52 E	-3.40	0.04
2417.00	2.79	25.99	2416.93	6.67 S	2.80 E	-4.23	3.10
2506.00	5.50	18.05	2505.69	0.67 S	5.07 E	-5.09	3.11
2596.00	7.63	23.74	2595.10	8.90 N	8.81 E	-6.58	2.47
2686.00	10.75	23.11	2683.93	22.10 N	14.52 E	-9.16	3.47
2775.00	13.80	18.98	2770.89	39.77 N	21.23 E	-11.71	3.56
2865.00	14.39	10.21	2858.18	60.94 N	26.70 E	-12.28	2.46
2955.00	15.27	9.89	2945.19	83.62 N	30.72 E	-11.08	0.98
3044.00	13.11	5.28	3031.47	105.22 N	33.66 E	-9.07	2.73
3134.00	12.76	5.24	3119.18	125.29 N	35.51 E	-6.35	0.39
3224.00	12.96	2.65	3206.92	145.27 N	36.88 E	-3.18	0.68
3313.00	10.46	7.74	3294.07	163.25 N	38.43 E	-0.64	3.04
3403.00	8.99	2.75	3382.77	178.36 N	39.87 E	1.37	1.88
3493.00	10.19	14.49	3471.52	193.10 N	42.20 E	2.42	2.55
3582.00	11.63	15.75	3558.91	209.35 N	46.61 E	1.80	1.63
3672.00	12.83	16.20	3646.87	227.68 N	51.86 E	0.81	1.35
3762.00	13.68	16.94	3734.47	247.46 N	57.74 E	-0.47	0.96
3851.00	15.28	17.11	3820.64	268.73 N	64.26 E	-2.02	1.79
3941.00	14.23	14.46	3907.67	290.77 N	70.51 E	-3.14	1.39
4030.00	14.16	8.46	3993.96	312.13 N	74.84 E	-2.54	1.66
4120.00	10.99	9.06	4081.79	331.49 N	77.81 E	-1.07	3.52
4210.00	8.74	12.41	4170.46	346.64 N	80.63 E	-0.40	2.59
4299.00	8.67	5.79	4258.44	359.92 N	82.76 E	0.52	1.13
4389.00	10.71	1.16	4347.15	375.03 N	83.62 E	3.09	2.43
4479.00	9.72	0.86	4435.72	390.99 N	83.90 E	6.41	1.10
4569.00	11.37	15.07	4524.21	407.17 N	86.32 E	7.70	3.41
4658.00	12.37	10.40	4611.31	425.02 N	90.33 E	7.83	1.56
4748.00	14.56	2.97	4698.83	445.81 N	92.65 E	10.24	3.10
4838.00	13.34	2.41	4786.18	467.48 N	93.68 E	14.13	1.37
4928.00	14.20	7.78	4873.59	488.79 N	95.61 E	17.06	1.71
5018.00	14.86	4.89	4960.72	511.23 N	98.09 E	19.70	1.09
5107.00	14.37	1.92	5046.84	533.63 N	99.43 E	23.44	1.01
5197.00	16.27	6.91	5133.64	557.31 N	101.32 E	26.94	2.58
5287.00	14.84	7.46	5220.34	581.27 N	104.33 E	29.40	1.60
5377.00	12.69	8.14	5307.75	602.48 N	107.23 E	31.37	2.40
5467.00	13.47	359.46	5395.42	622.75 N	108.53 E	34.67	2.35
5557.00	15.18	0.49	5482.62	645.01 N	108.53 E	39.68	1.93
5646.00	12.93	1.55	5568.95	666.62 N	108.90 E	44.20	2.55
5691.00	12.13	1.47	5612.88	676.38 N	109.16 E	46.15	1.77
5736.00	15.24	1.68	5656.60	687.02 N	109.45 E	48.26	6.92
5781.00	17.34	3.41	5699.79	699.62 N	110.03 E	50.54	4.78
5826.00	20.89	3.65	5742.30	714.33 N	110.94 E	52.97	7.90
5871.00	24.91	3.90	5783.75	731.79 N	112.09 E	55.79	8.93
5915.00	28.38	2.38	5823.07	751.49 N	113.16 E	59.19	8.06
5960.00	32.46	0.90	5861.87	774.26 N	113.79 E	63.71	9.21
6005.00	36.27	357.60	5899.01	799.65 N	113.42 E	69.79	9.42
6050.00	38.50	351.70	5934.77	826.82 N	110.84 E	78.43	9.38
6095.00	39.23	343.16	5969.84	854.32 N	104.69 E	90.62	12.01

6139.00	42.37	335.99	6003.16	881.20 N	94.62 E	106.49	12.81
6184.00	45.03	331.03	6035.70	908.99 N	80.73 E	126.29	9.64
6229.00	45.72	324.39	6067.33	936.03 N	63.64 E	149.04	10.61
6274.00	46.29	316.93	6098.61	961.03 N	43.14 E	174.65	11.99
6319.00	46.51	309.09	6129.66	983.22 N	19.34 E	202.84	12.62
6363.00	48.47	302.65	6159.41	1002.19 N	6.93 W	232.70	11.68
6408.00	52.17	296.95	6188.16	1019.34 N	36.98 W	265.85	12.76
6453.00	57.08	292.20	6214.21	1034.55 N	70.34 W	301.78	13.88
6498.00	61.70	287.52	6237.13	1047.66 N	106.75 W	340.21	13.64
6543.00	65.50	280.92	6257.15	1057.51 N	145.80 W	380.47	15.60
6588.00	67.40	274.67	6275.14	1063.09 N	186.64 W	421.52	13.41
6633.00	69.36	268.27	6291.73	1064.15 N	228.43 W	462.48	13.92
6677.00	70.28	267.38	6306.91	1062.58 N	269.70 W	502.33	2.82
6722.00	69.73	269.74	6322.30	1061.51 N	311.97 W	543.27	5.08
6767.00	71.34	271.18	6337.30	1061.86 N	354.40 W	584.68	4.68
6812.00	67.15	272.69	6353.24	1063.27 N	396.44 W	625.96	9.83
6857.00	65.49	273.68	6371.31	1065.56 N	437.59 W	666.56	4.20
6902.00	67.23	275.88	6389.36	1069.00 N	478.66 W	707.35	5.92
6946.00	72.64	276.66	6404.45	1073.51 N	519.73 W	748.38	12.41
6960.00	75.49	276.38	6408.29	1075.04 N	533.10 W	761.75	20.45
7025.00	81.59	277.12	6421.21	1082.53 N	596.33 W	825.05	9.44
7070.00	83.02	275.68	6427.23	1087.50 N	640.65 W	869.34	4.49
7115.00	85.31	275.03	6431.81	1091.67 N	685.22 W	913.70	5.30
7159.00	87.44	275.24	6434.59	1095.60 N	728.95 W	957.19	4.87
7204.00	87.41	274.62	6436.61	1099.46 N	773.74 W	1001.70	1.36
7249.00	86.88	273.63	6438.85	1102.70 N	818.56 W	1046.10	2.49
7294.00	85.34	271.00	6441.91	1104.52 N	863.42 W	1090.21	6.78
7339.00	88.18	272.57	6444.45	1105.92 N	908.32 W	1134.27	7.22
7384.00	89.60	271.95	6445.32	1107.69 N	953.27 W	1178.47	3.45
7429.00	89.17	271.19	6445.81	1108.92 N	998.25 W	1222.57	1.94
7473.00	88.21	266.97	6446.81	1108.22 N	1042.23 W	1265.25	9.82
7518.00	88.06	264.64	6448.28	1104.93 N	1087.08 W	1308.21	5.20
7563.00	88.06	265.32	6449.80	1100.99 N	1131.88 W	1350.97	1.53
7608.00	88.55	266.32	6451.13	1097.71 N	1176.74 W	1393.93	2.46
7653.00	89.04	267.25	6452.08	1095.19 N	1221.66 W	1437.13	2.36
7698.00	89.11	267.68	6452.80	1093.20 N	1266.61 W	1480.47	0.96
7742.00	89.35	267.74	6453.40	1091.45 N	1310.57 W	1522.90	0.57
7787.00	88.83	266.48	6454.11	1089.18 N	1355.51 W	1566.17	3.02
7832.00	89.38	266.59	6454.81	1086.46 N	1400.42 W	1609.31	1.26
7922.00	90.37	266.68	6455.00	1081.18 N	1490.26 W	1695.65	1.10
8011.00	91.02	268.17	6453.93	1077.18 N	1579.16 W	1781.36	1.82
8101.00	88.71	266.36	6454.15	1072.88 N	1669.05 W	1867.97	3.26
8190.00	88.43	265.26	6456.37	1066.38 N	1757.78 W	1952.95	1.27
8280.00	88.71	264.81	6458.62	1058.60 N	1847.42 W	2038.52	0.59
8370.00	89.97	264.84	6459.67	1050.48 N	1937.04 W	2124.01	1.40
8459.00	90.40	263.72	6459.38	1041.60 N	2025.60 W	2208.28	1.34
8549.00	89.23	263.14	6459.67	1031.30 N	2115.00 W	2293.06	1.45
8638.00	88.92	267.23	6461.10	1023.83 N	2203.66 W	2377.75	4.62
8728.00	89.29	271.86	6462.51	1023.12 N	2293.62 W	2465.24	5.15
8817.00	88.00	270.58	6464.62	1025.01 N	2382.57 W	2552.32	2.04
8907.00	89.48	272.04	6466.60	1027.07 N	2472.52 W	2640.42	2.30
8997.00	90.06	272.30	6466.96	1030.47 N	2562.45 W	2728.81	0.72
9086.00	90.15	272.13	6466.80	1033.91 N	2651.39 W	2816.23	0.22
9176.00	88.80	270.50	6467.62	1035.98 N	2741.35 W	2904.34	2.35
9265.00	89.14	269.02	6469.22	1035.60 N	2830.34 W	2990.95	1.70
9355.00	89.08	266.20	6470.63	1031.85 N	2920.24 W	3077.69	3.14
9445.00	89.94	268.53	6471.40	1027.70 N	3010.13 W	3164.33	2.76
9535.00	88.43	267.25	6472.69	1024.39 N	3100.06 W	3251.20	2.20
9624.00	88.95	267.90	6474.72	1020.62 N	3188.95 W	3336.96	0.94
9714.00	88.18	267.15	6476.97	1016.74 N	3278.84 W	3423.65	1.20
9803.00	91.69	267.71	6477.07	1012.75 N	3367.74 W	3509.36	4.00
9893.00	93.79	267.36	6472.76	1008.88 N	3457.55 W	3595.98	2.36
9983.00	93.95	265.30	6466.69	1003.14 N	3547.15 W	3681.99	2.29
10072.00	91.45	266.93	6462.50	997.12 N	3635.84 W	3767.04	3.35
10162.00	91.26	267.81	6460.37	992.99 N	3725.72 W	3853.67	1.00
10251.00	86.55	270.36	6462.07	991.57 N	3814.66 W	3940.00	6.03
10341.00	85.74	270.64	6468.13	992.36 N	3904.45 W	4027.66	0.95
10431.00	85.06	270.26	6475.34	993.07 N	3994.16 W	4115.21	0.87
10520.00	85.34	269.42	6482.79	992.81 N	4082.84 W	4201.56	0.99
10610.00	87.50	269.78	6488.41	992.19 N	4172.66 W	4288.92	2.44
10700.00	89.11	271.40	6491.08	993.11 N	4262.61 W	4376.77	2.53
10765.00	89.11	271.40	6492.09	994.70 N	4327.58 W	4440.42	0.01

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 283.03 DEGREES (GRID)
A TOTAL CORRECTION OF 7.46 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED

HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 10765.00 FEET
IS 4440.43 FEET ALONG 282.94 DEGREES (GRID)

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