HALLIBURTON | Sperry Drilling

PCG Pressure Case Gamma
PCG Pressure Case Directional

Powered by INSITE™

1 : 600 / 1 : 240

Country : **USA**
Field : **Wattenburg**
Location : **Lat: 40° 42' 44.89" North**
Long: 103° 57' 25.45" West
Well : **Haley LC27-715**
Company : **Noble Energy**
Rig : **H&P 343**

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Rig : **H&P 343**
Well : **Haley LC27-715**
Field : **Wattenburg**
Country : **USA**
API Number : **05-123-40597**

LOCATION
Latitude : **40° 42' 44.89" North**
Longitude : **103° 57' 25.45" West**
UTM Easting = **3,427,719.660 ft**
UTM Northing = **1,506,117.920 ft**

Other Services
Directional Drilling

Permanent Datum : **Ground Level** Elevation : **4814.00 ft**
Log Measured From : **Drill Floor** **24.00 ft** Above Permanent Datum
Drilling Measured From : **Drill Floor**

TVD LOG

Elev. KB **N/A**
DF **4838.00 ft**
GL **4814.00 ft**
WD **N/A**

Depth Logged : **641.99 ft** To **5,969.33 ft**
Date Logged : **07-May-15** To **11-May-15**
Total Depth MD : **6,342.00 ft** TVD : **5,969.33 ft**
Spud Date : **06-May-15**

Unit No. : **11610115** Job No. : **CA-XX-0902279448**
Plot Type : **Final**
Plot Date : **12-May-15**

Run No.	Borehole Record (TVD)			Size	Casing Record (TVD)		
	Size	From	To		Weight	From	To
0100	8.750 in	641.99 ft	5,969.33 ft	9.625 in	36.60 lbpf	SURFACE	631.99 ft

WELL INFORMATION

MWD Run Number	100
Date run completed	09-May-15
Rig Bit Number	2
Bit Size (in)	8.750
Tool Nominal OD (in)	6.750
Log Start Depth (MD, ft)	642.00
Log End Depth (MD, ft)	6,342.00
Drill or Wipe	Drill
Drill/Wipe Start Date and Time	08-May-15 00:45
Drill/Wipe End Date and Time	09-May-15 03:55
Min Inc (deg) @ Depth (MD, ft)	0.24 @ 1,491.00
Max Inc (deg) @ Depth (MD, ft)	79.56 @ 6,288.00
Bit TFA(in2) / Bit Type	0.98 / PDC
Flow Rate (gpm)	599.17
Max AV (fpm) / CV (fpm) @ MWD	414.0 / 0.0
Fluid Type	Native/Spud Mud
Density (ppg) / Viscosity (spqt)	10.20 / 46.00
Filtrate CL (ppm)	2,500.00
pH / Fluid Loss (mptm)	9.30 / 0
PV (cP) / YP (lhf2)	15 / 15.00
% Solids / % Sand	10.7 / 0.15
% Oil / Oil:Water Ratio	N/A / N/A
Rm @ Measured Temp (degF)	N/A @ N/A
Rmf @ Measured Temp (degF)	N/A @ N/A
Rmc @ Measured Temp (degF)	N/A @ N/A

Max Tool Temp (degF) / Source	160.83 / PCM				
Rm @ Max Tool Temp (degF)	N/A @ 160.83				
Lead MWD Engineer	Bradley West				
Customer Representative	Johnny Sanchez				

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM				
Software Version	5.93				
Sub Serial Number	246470				
Insert Serial Number	11680708				
Date and Time Initialized	07-May-15 08:49				
Date and Time Read	09-May-15 08:13				
ECMB SW Version	N/A				

Directional Sensor Information

Tool Type	PCDC				
Distance From Bit (ft)	54.00				
Software Version	6.21				
Sub Serial Number	246470				
Sonde Serial Number	11833212				
Sensor ID Number	N/A				
Toolface Offset (deg)	7.70				

Gamma Ray Sensor Information

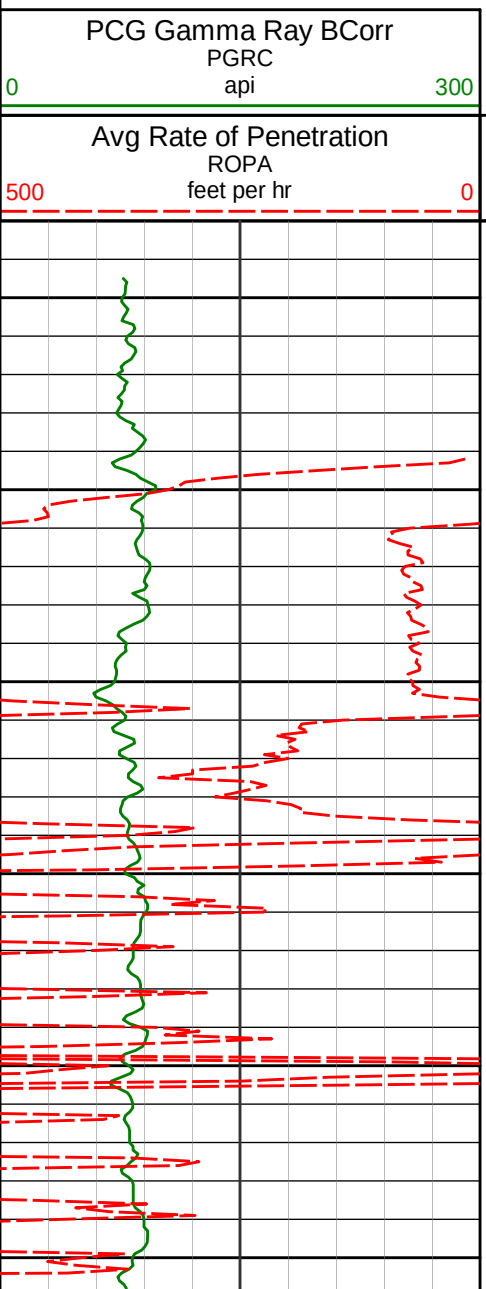
Tool Type	PCG				
Distance From Bit (ft)	47.43				
Recorded Sample Period (sec)	10				
Software Version	8.15				
Sub Serial Number	246470				
Insert/Sonde Serial Number	11579761				

REMARKS

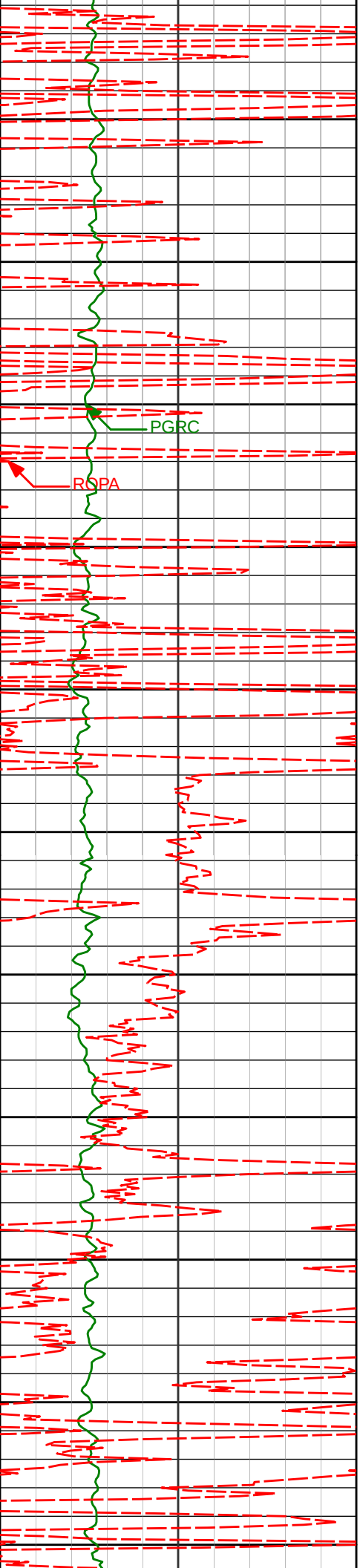
1. All depths are true vertical bit depths. Referenced to the Driller's pipe tally and are measured from the Drill Floor, unless otherwise specified.
2. No depth corrections have been made for pipe stretch or compression.
3. Critical annular velocities are calculated using the "Power Law" model for water 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: V8.1.10

WARRANTY

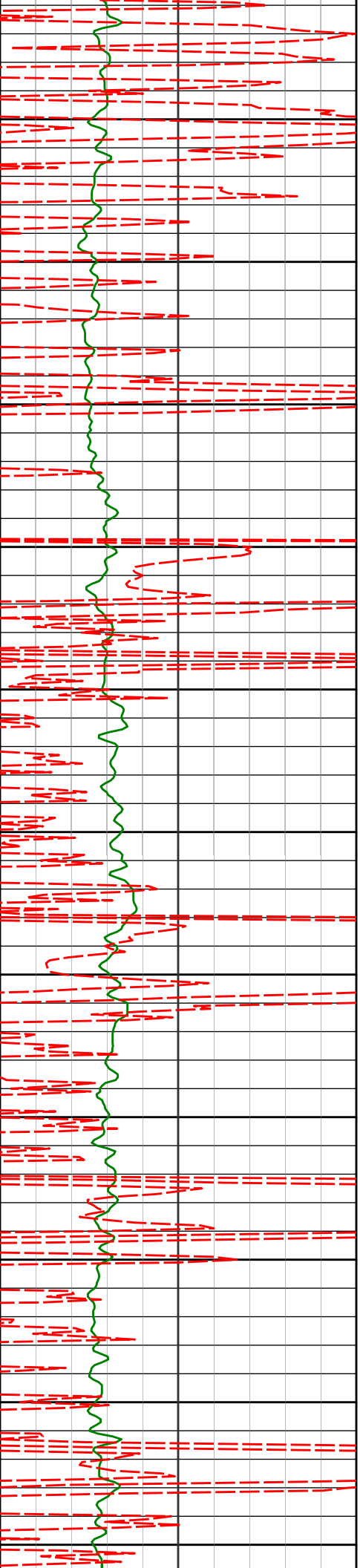
TVD Detail 1:600 Scale



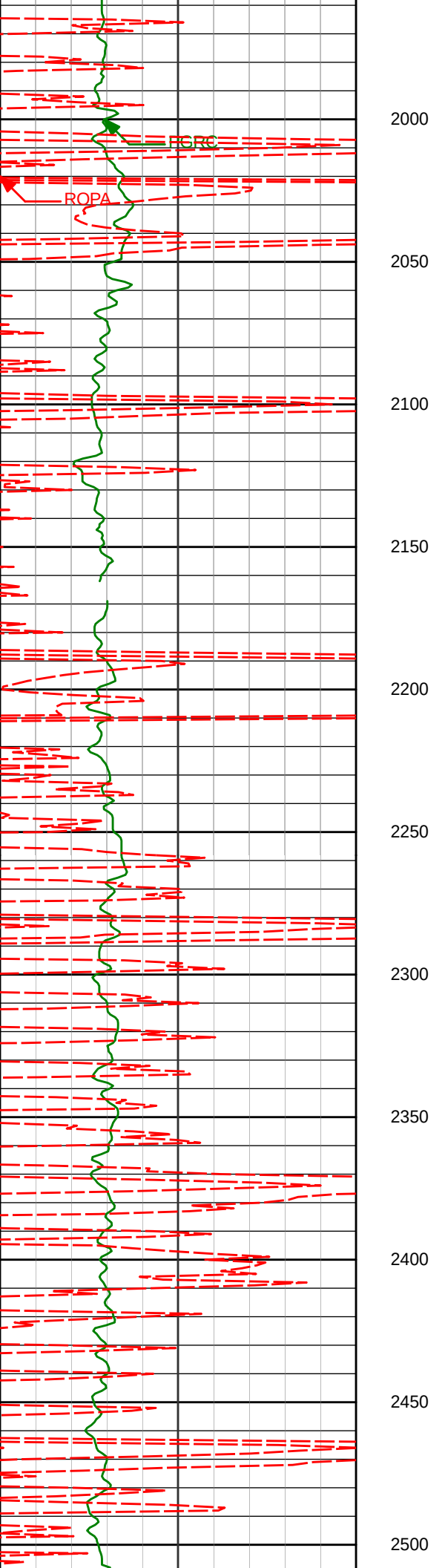
Depth TVD ft	Depth	Inc	Azi	TVD	V.S.	Temp
600						69.20°F
	Casing Shoe @ 632'					72.00°F
	Run 100					
650						
	682'	0.57°	344.60°	681.99'	3.24'	72.46°F
700						
						73.51°F
	745'	0.54°	332.66°	744.99'	3.80'	
750						
800						
						73.98°F
	841'	0.26°	320.63°	840.98'	4.35'	
850						
						73.98°F



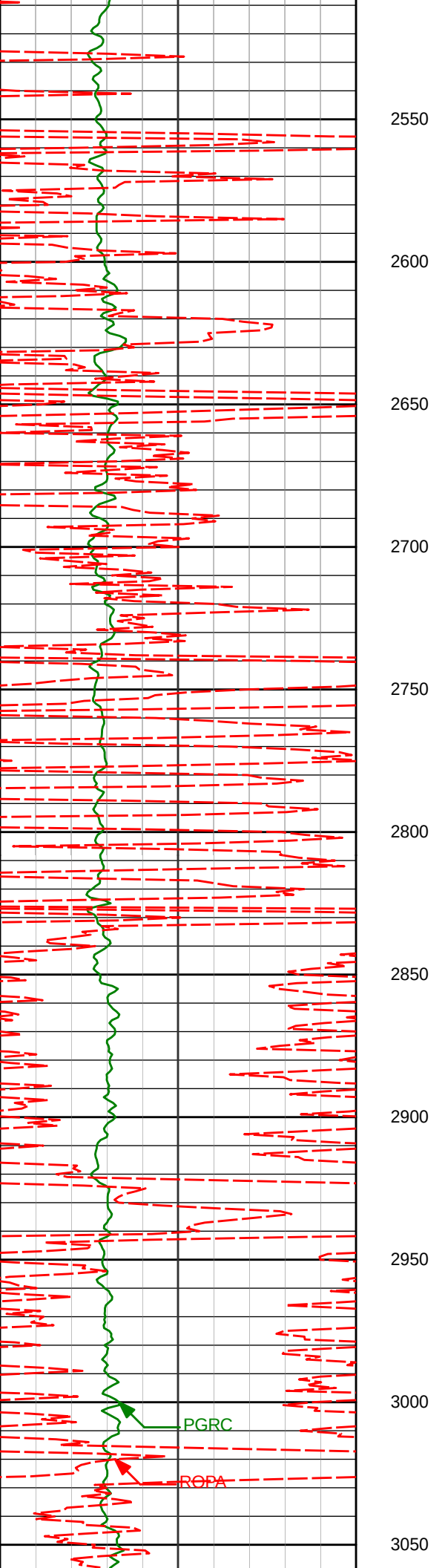
900						75.97°F
950						75.97°F
1000						77.99°F
	1030'	0.56°	16.94°	1029.98'	5.57'	77.99°F
1050						
1100						77.99°F
	1123'	0.53°	51.49°	1122.97'	6.29'	78.74°F
1150						
1200						80.01°F
	1215'	0.44°	51.33°	1214.97'	6.81'	80.01°F
1250						
1300						80.01°F
1350						82.02°F
1400	1399'	0.53°	43.41°	1398.96'	7.92'	82.02°F



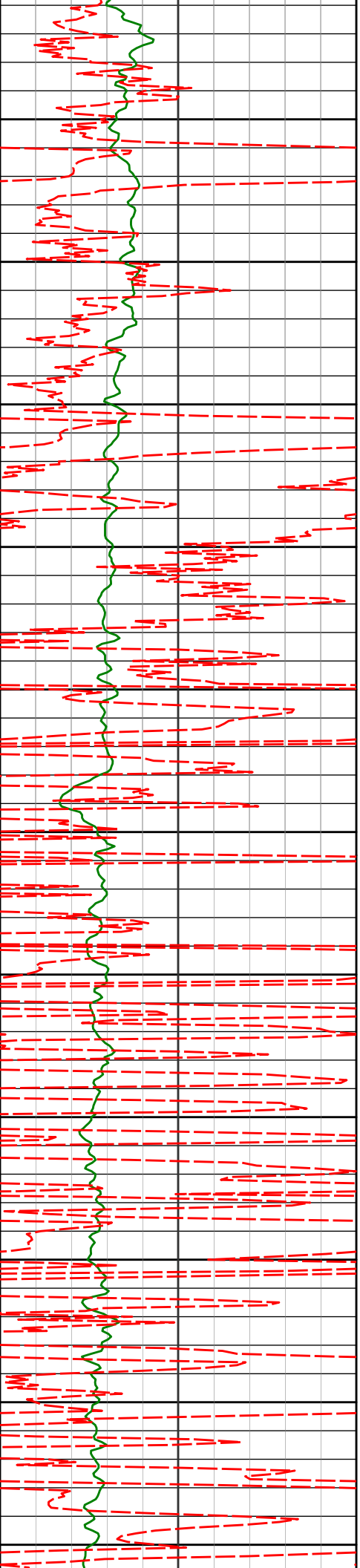
					82.02°F
1491'	0.24°	356.38°	1490.96'	8.43'	82.02°F
					84.06°F
1584'	0.78°	326.97°	1583.96'	9.13'	84.06°F
					85.36°F
1676'	1.35°	69.45°	1675.95'	10.07'	87.03°F
					88.14°F
1770'	4.58°	93.11°	1769.81'	10.48'	88.14°F
					88.14°F
1862'	6.26°	91.61°	1861.40'	10.55'	89.21°F
					90.19°F
1955'	7.07°	87.32°	1953.77'	11.18'	90.19°F



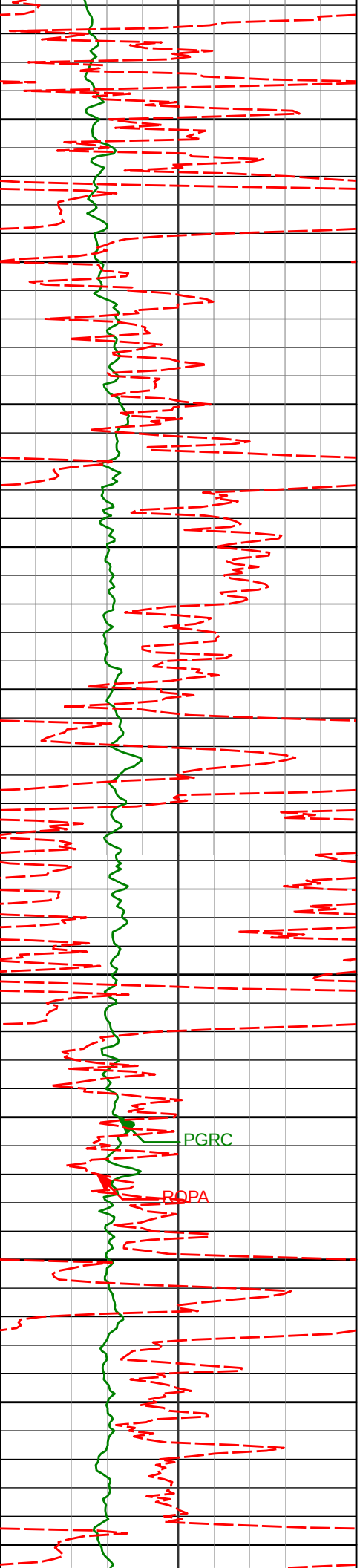
					90.19°F
					90.19°F
2047'	8.61°	77.25°	2044.91'	13.55'	
					90.19°F
					90.68°F
2141'	8.71°	76.08°	2137.84'	17.46'	
					92.26°F
					92.26°F
2235'	10.09°	85.22°	2230.58'	20.56'	
					94.33°F
					94.33°F
2326'	10.04°	85.04°	2320.18'	22.66'	
					96.42°F
					96.42°F
2418'	9.91°	84.45°	2410.79'	24.87'	
					96.42°F



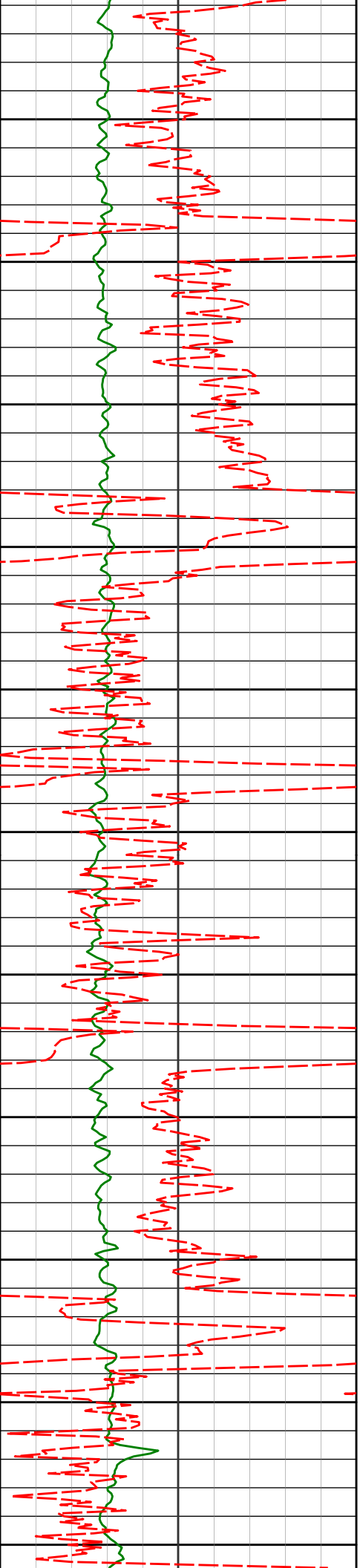
					96.42°F
					98.51°F
2605'	10.30°	83.93°	2594.89'	29.72'	
					98.51°F
					100.29°F
2697'	10.55°	84.20°	2685.37'	32.22'	
					100.62°F
					100.62°F
2790'	10.08°	79.92°	2776.87'	35.28'	
					102.72°F
					104.11°F
2884'	10.47°	79.30°	2869.36'	39.08'	
					104.83°F
					105.59°F
2979'	9.45°	74.88°	2962.93'	43.47'	
					106.97°F
					106.97°F
3074'	9.46°	73.97°	3056.64'	48.36'	



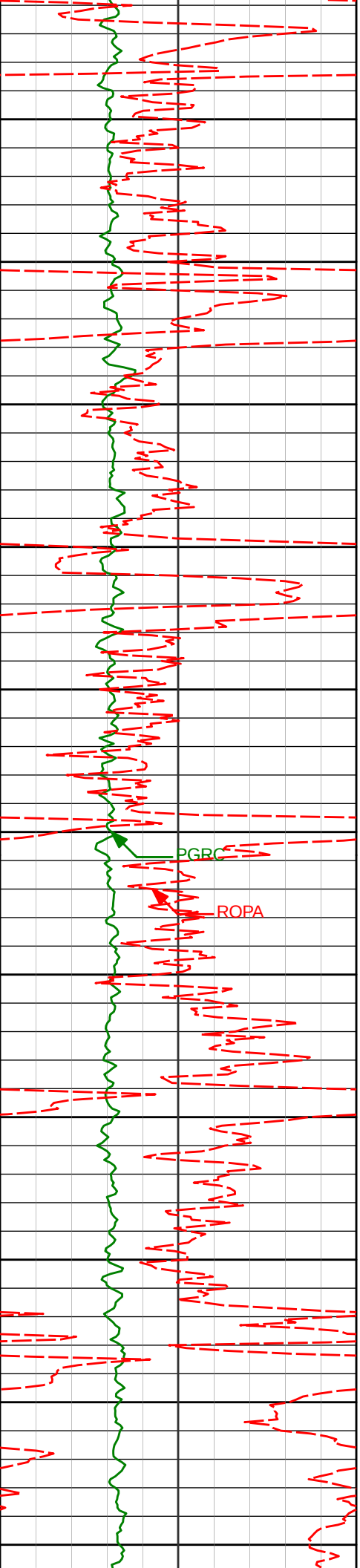
					106.97°F
					107.20°F
3169'	8.97°	73.76°	3150.41'	53.27'	109.23°F
					111.24°F
3264'	8.79°	74.44°	3244.27'	57.95'	111.24°F
					111.24°F
3359'	9.05°	80.68°	3338.13'	61.78'	111.24°F
					111.24°F
3454'	9.43°	81.44°	3431.89'	64.86'	111.24°F
					111.24°F
3550'	9.65°	80.26°	3526.57'	68.13'	113.40°F
					113.40°F
					113.40°F



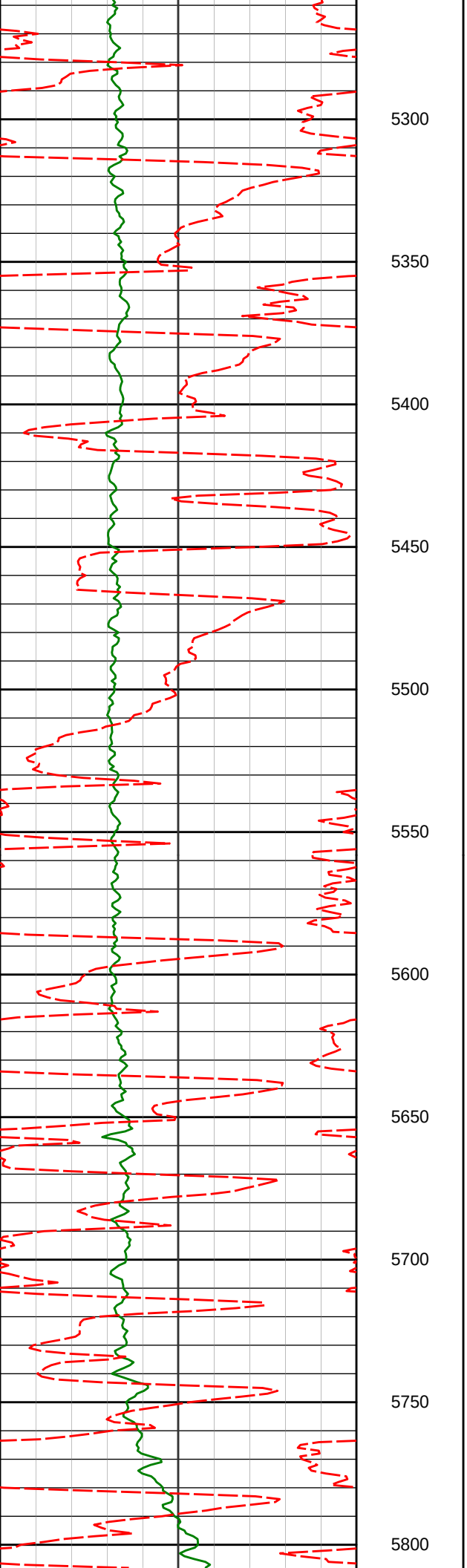
3645'	8.37°	78.59°	3620.39'	71.53'	
					115.56°F
					115.56°F
3740'	8.67°	78.27°	3714.34'	75.00'	
					117.12°F
					117.73°F
3835'	9.19°	78.08°	3808.19'	78.70'	
					117.73°F
					119.07°F
3929'	8.33°	82.72°	3901.10'	81.77'	
					119.91°F
					120.89°F
4025'	7.53°	86.50°	3996.18'	83.66'	
					121.85°F
					120.50°F
4119'	9.15°	86.14°	4089.18'	85.17'	
					122.11°F
					122.69°F



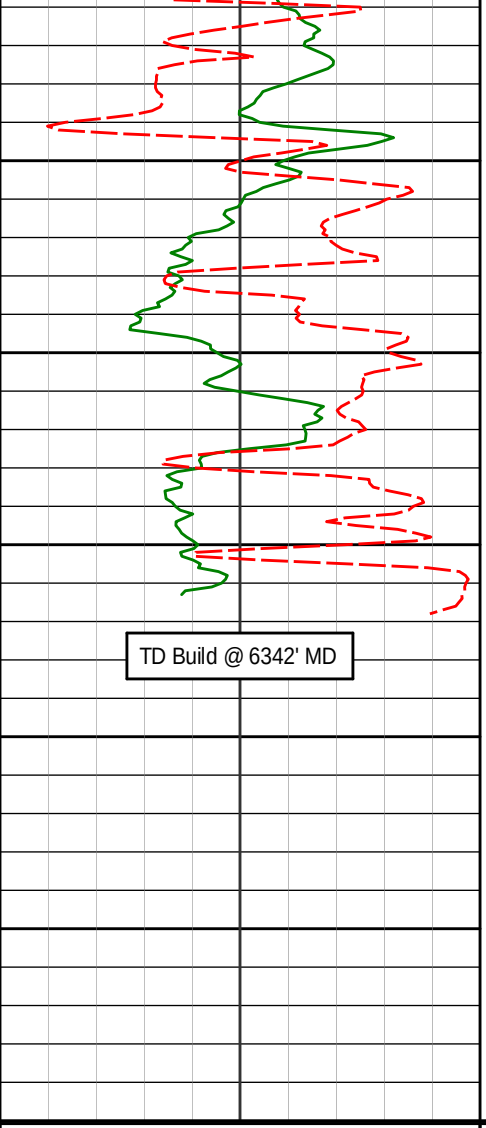
4214'	8.09°	86.76°	4183.11'	86.73'	124.30°F
					124.30°F
4309'	7.76°	85.97°	4277.20'	88.17'	125.22°F
					124.71°F
4404'	9.15°	87.39°	4371.16'	89.62'	126.66°F
					128.59°F
4499'	8.82°	83.67°	4465.00'	91.47'	128.73°F
					128.73°F
4594'	8.75°	82.67°	4558.88'	93.87'	130.85°F
					130.96°F
4689'	7.13°	85.03°	4652.97'	95.91'	131.60°F
					131.58°F



4750	4784'	4.12°	93.36°	4747.50'	96.66'	133.20°F
4800						133.20°F
						133.20°F
4850	4879'	1.89°	125.00°	4842.37'	95.79'	
						132.05°F
4900						130.96°F
	4974'	0.46°	63.27°	4937.35'	95.14'	
4950						132.56°F
5000						133.20°F
	5069'	0.34°	119.78°	5032.35'	95.20'	
5050						133.91°F
						135.45°F
5100						
	5164'	0.72°	95.92°	5127.35'	95.04'	135.45°F
5150						
						135.45°F
5200						
	5259'	1.35°	104.01°	5222.33'	94.78'	136.34°F
5250						



					136.41°F
5354'	0.99°	355.06°	5317.32'	95.38'	135.45°F
					136.20°F
5449'	11.74°	357.16°	5411.59'	105.84'	137.95°F
					140.14°F
5544'	21.36°	353.00°	5502.56'	132.58'	142.17°F
					144.31°F
5638'	27.26°	350.37°	5588.19'	170.52'	146.12°F
					146.90°F
5733'	34.68°	351.70°	5669.58'	218.37'	148.23°F
					149.26°F
5828'	42.76°	354.71°	5743.65'	276.95'	149.65°F
					134.07°F



Depth	Inc	Azi	TVD	V.S.	Temp
5923'	48.43°	359.67°	5810.11'	344.45'	
6018'	57.27°	358.93°	5867.43'	419.96'	154.02°F
6113'	66.28°	358.10°	5912.31'	503.35'	156.27°F
6208'	75.12°	357.62°	5943.68'	592.60'	157.09°F
6288'	79.56°	357.55°	5961.21'	670.32'	

Avg Rate of Penetration
ROPA
500 feet per hr 0

PCG Gamma Ray BCorr
PGRC
0 api 300

Depth
TVD
ft

5850
5900
5950
6000
6050
6100

TVD Detail 1:240 Scale

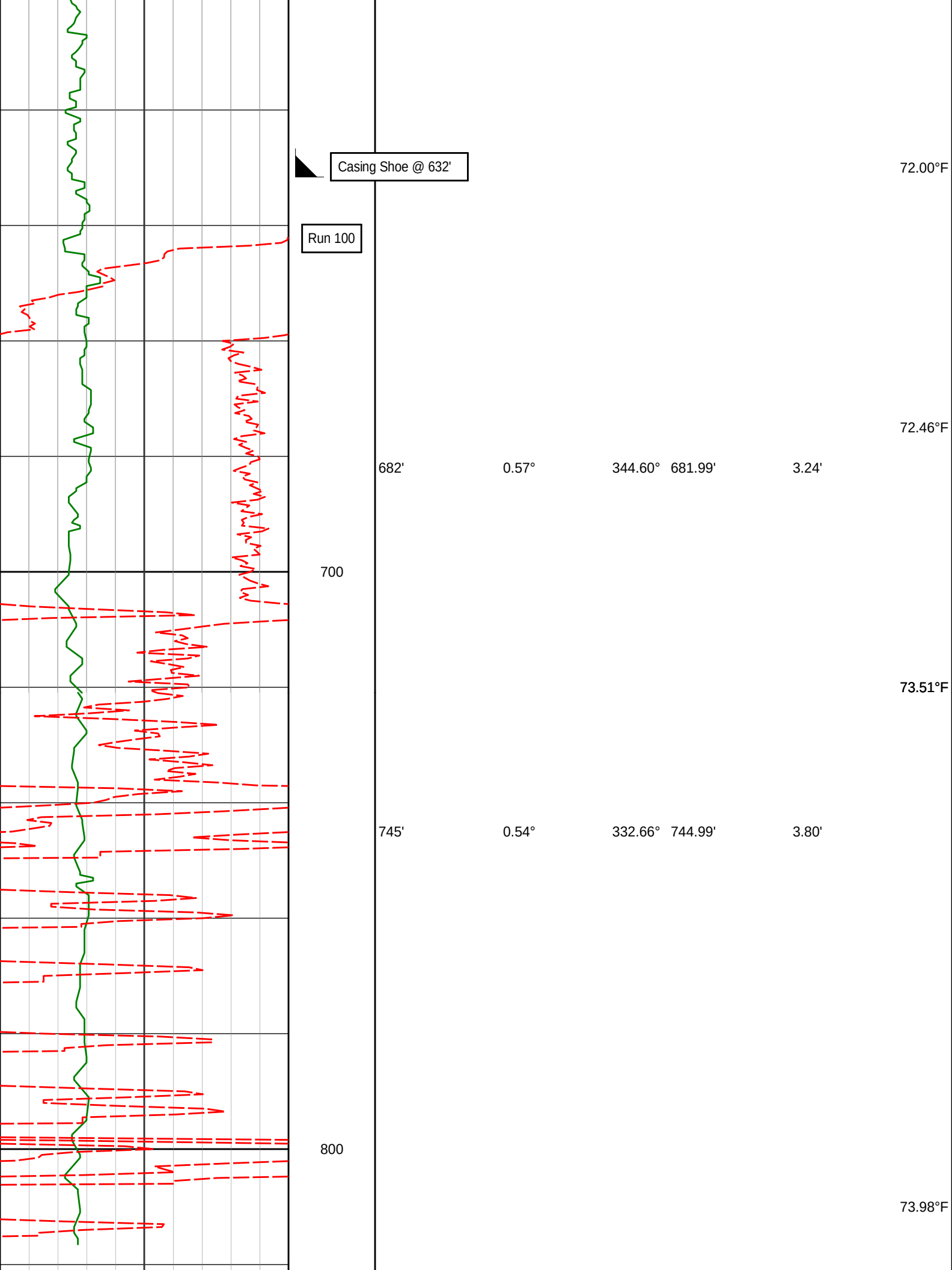
PCG Gamma Ray BCorr
PGRC
0 api 300

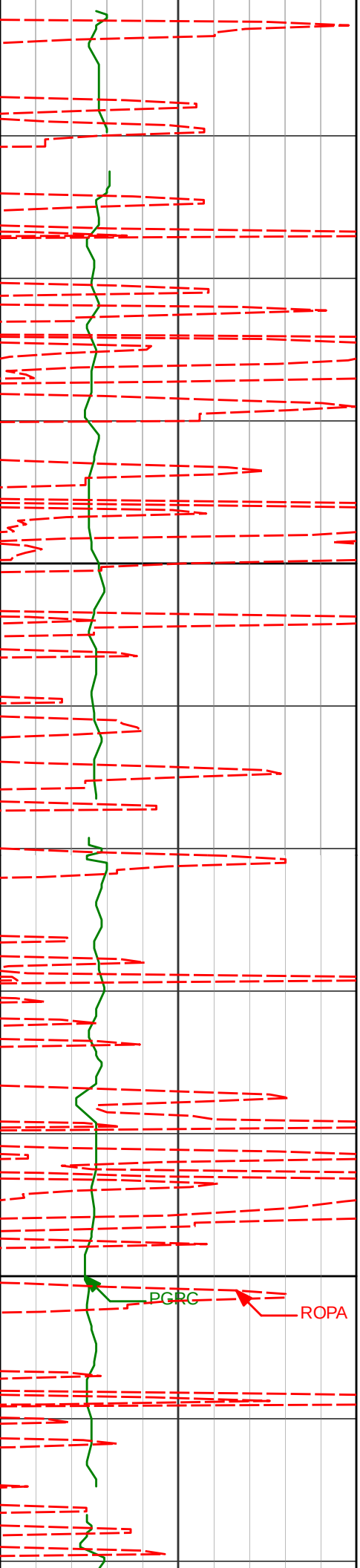
Avg Rate of Penetration
ROPA
500 feet per hr 0

Depth
TVD
ft

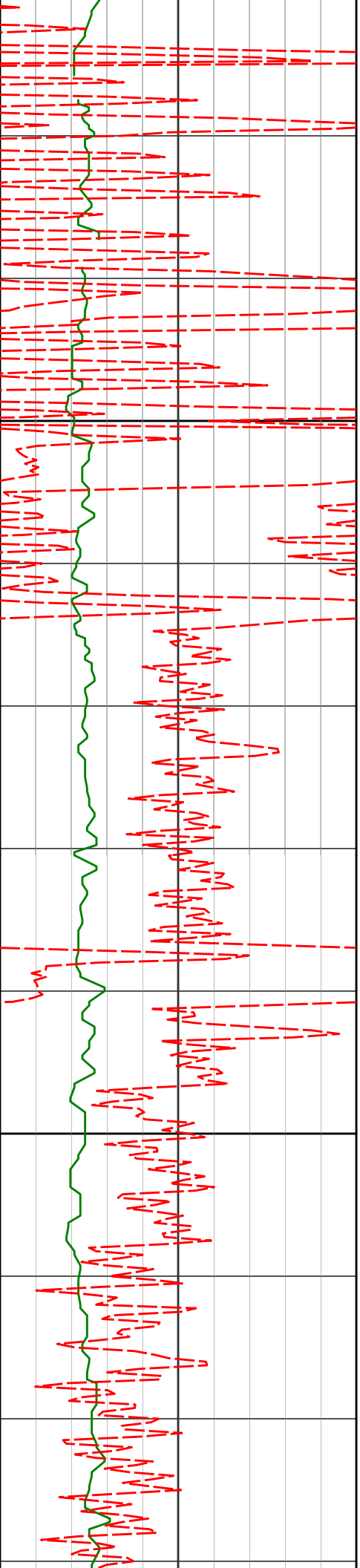
Depth Inc Azi TVD V.S. Temp

600

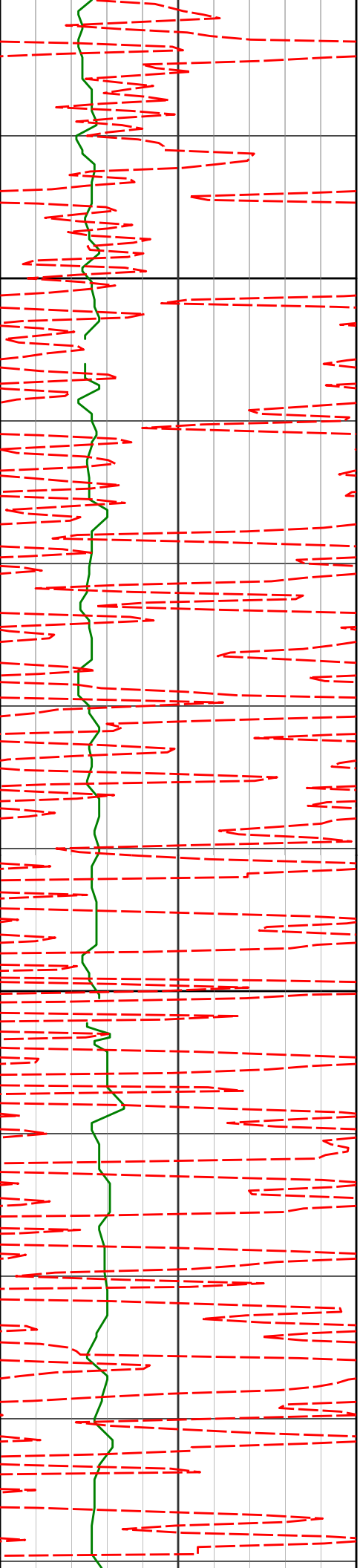

Casing Shoe @ 632'
72.00°F
Run 100
72.46°F
682'
0.57°
344.60°
681.99'
3.24'
700
73.51°F
745'
0.54°
332.66°
744.99'
3.80'
800
73.98°F



841'	0.26°	320.63°	840.98'	4.35'	
					73.98°F
900					75.97°F
					75.97°F
					77.99°F
1000					
1030'	0.56°	16.94°	1029.98'	5.57'	
					77.99°F



1100					77.99°F
	1123'	0.53°	51.49°	1122.97'	6.29'
					78.74°F
					80.01°F
1200					
	1215'	0.44°	51.33°	1214.97'	6.81'
					80.01°F
					80.01°F



1300

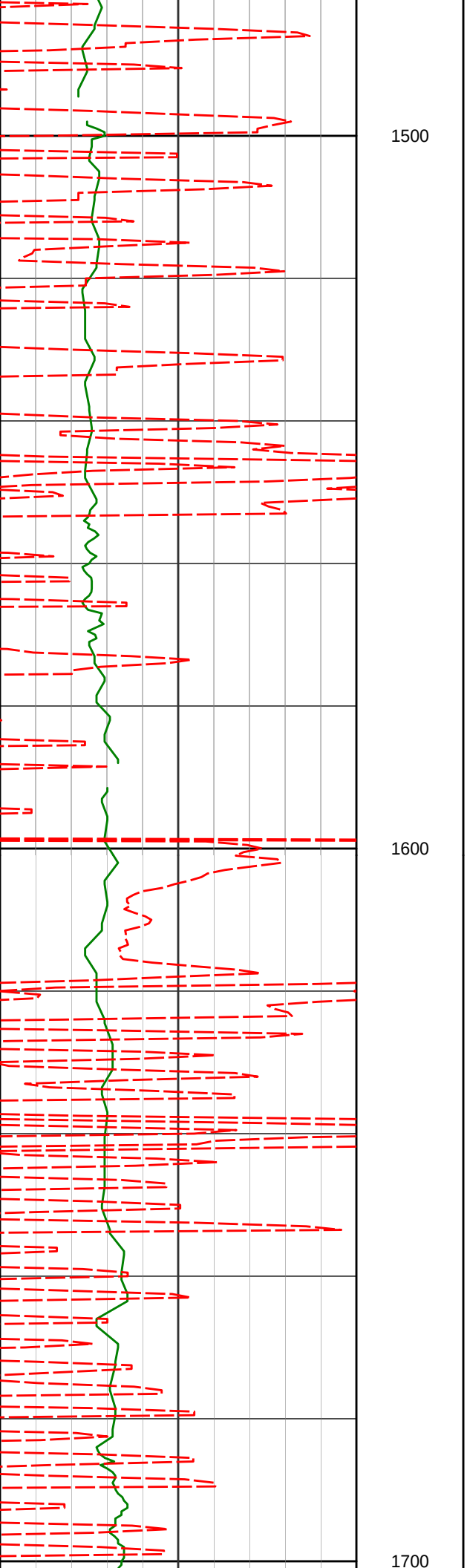
82.02°F

82.02°F

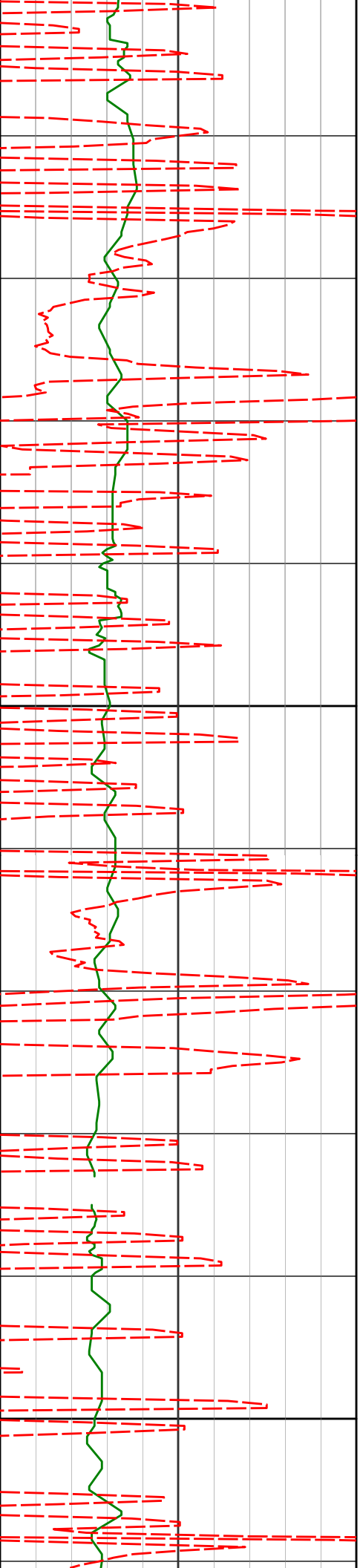
1400

1399' 0.53° 43.41° 1398.96' 7.92'

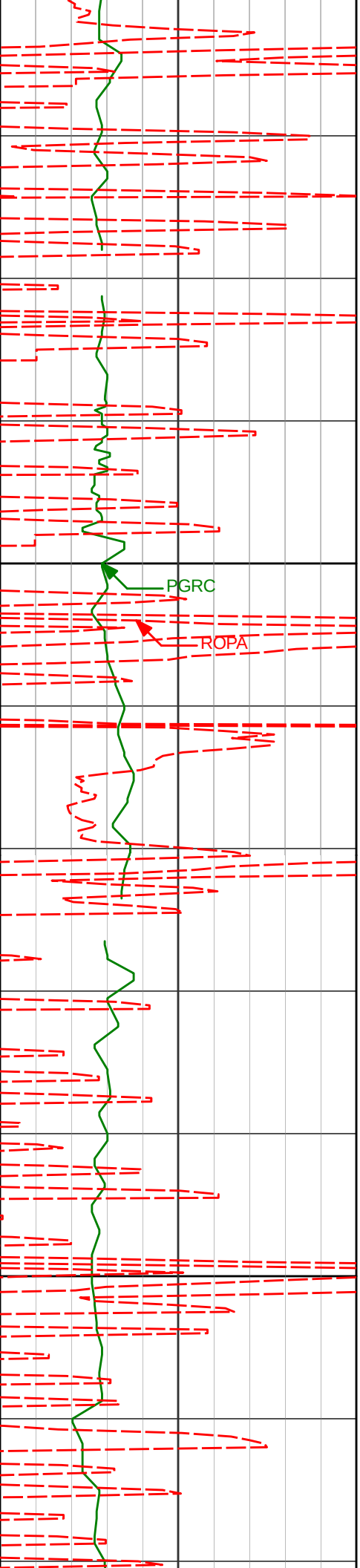
82.02°F



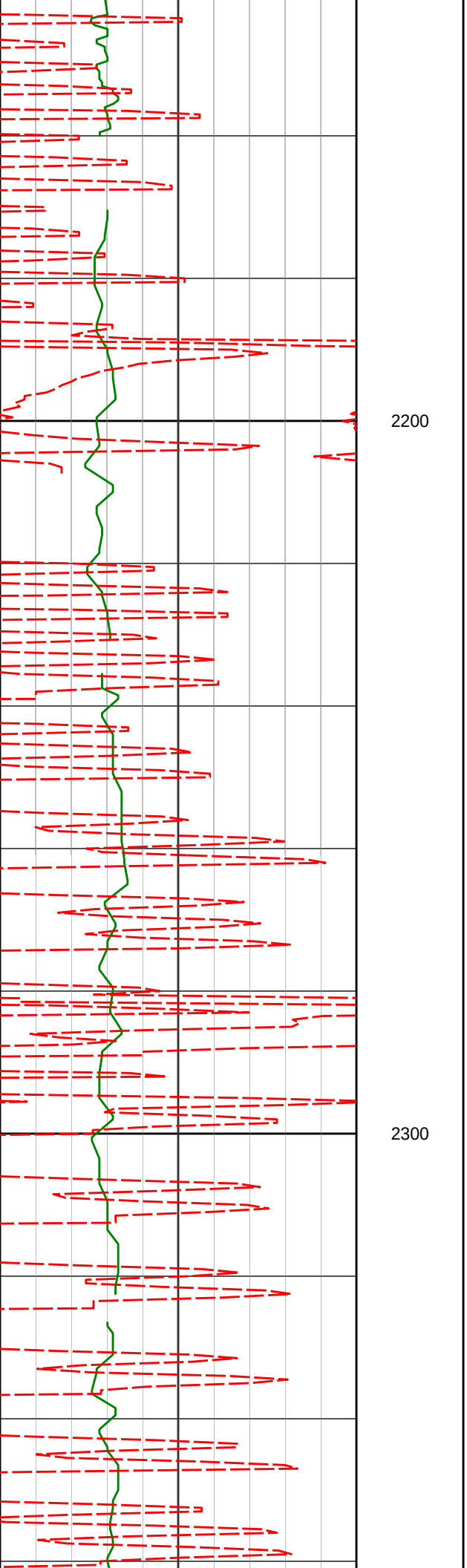
					82.02°F
1491'	0.24°	356.38°	1490.96'	8.43'	
					84.06°F
					84.06°F
1584'	0.78°	326.97°	1583.96'	9.13'	
					85.36°F
					87.03°F
1676'	1.35°	69.45°	1675.95'	10.07'	



					88.14°F
					88.14°F
1770'	4.58°	93.11°	1769.81'	10.48'	
1800					88.14°F
					89.21°F
1862'	6.26°	91.61°	1861.40'	10.55'	
					90.19°F
1900					



					90.19°F
1955'	7.07°	87.32°	1953.77'	11.18'	
					90.19°F
2000					
					90.19°F
2047'	8.61°	77.25°	2044.91'	13.55'	
					90.19°F
2100					
					90.68°F
2141'	8.71°	76.08°	2137.84'	17.46'	



92.26°F

92.26°F

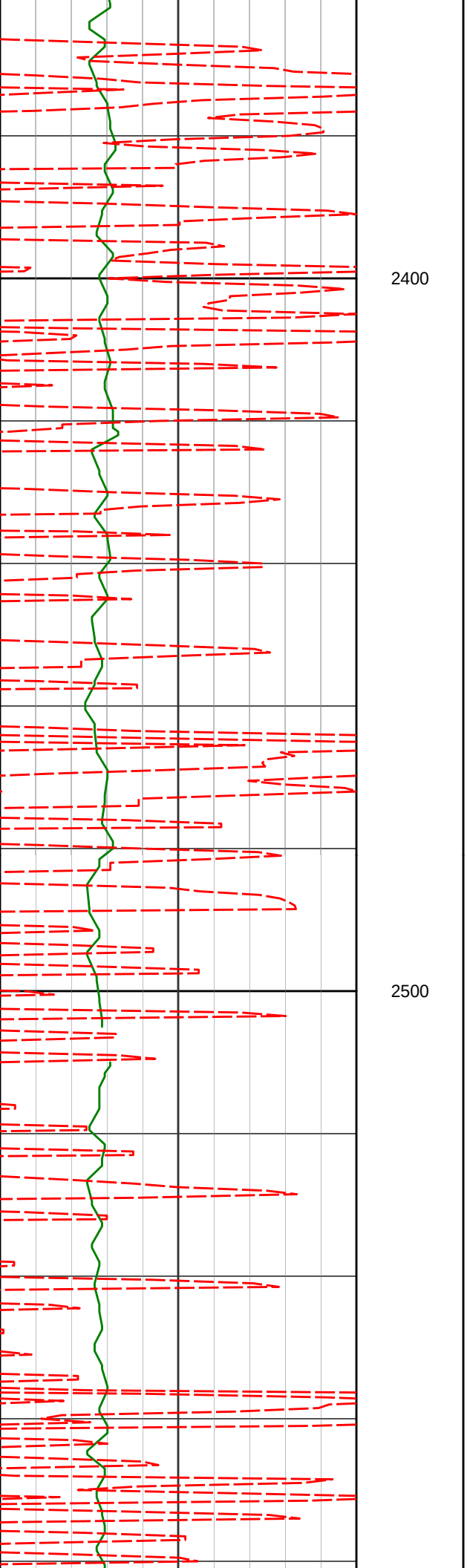
2235'	10.09°	85.22°	2230.58'	20.56'

94.33°F

94.33°F

2326'	10.04°	85.04°	2320.18'	22.66'

96.42°F



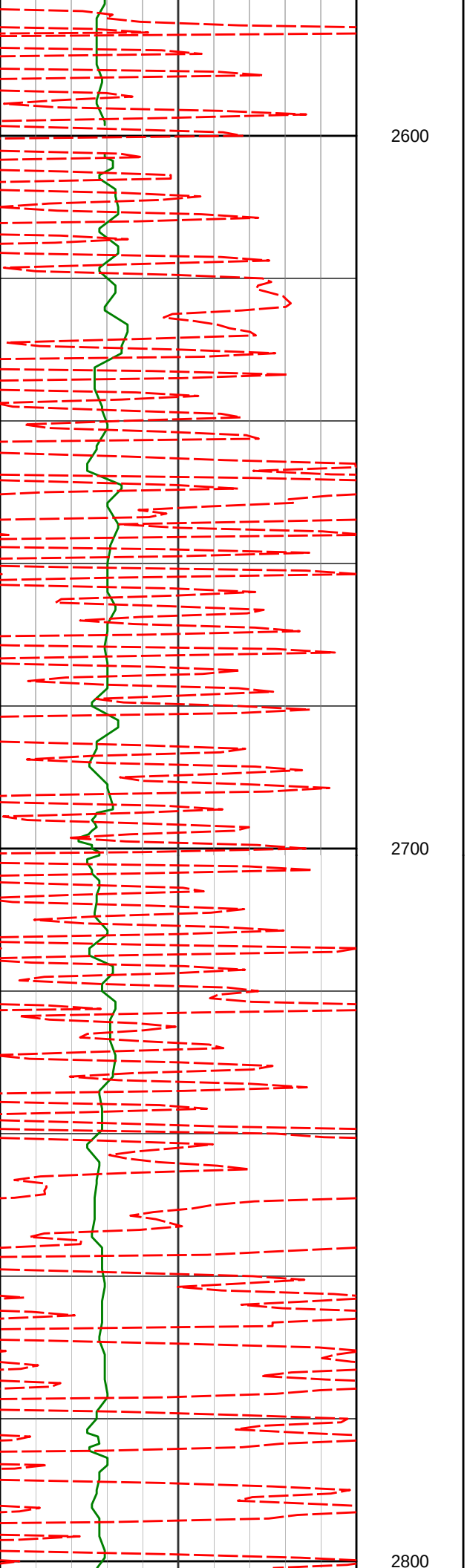
96.42°F

2418' 9.91° 84.45° 2410.79' 24.87'

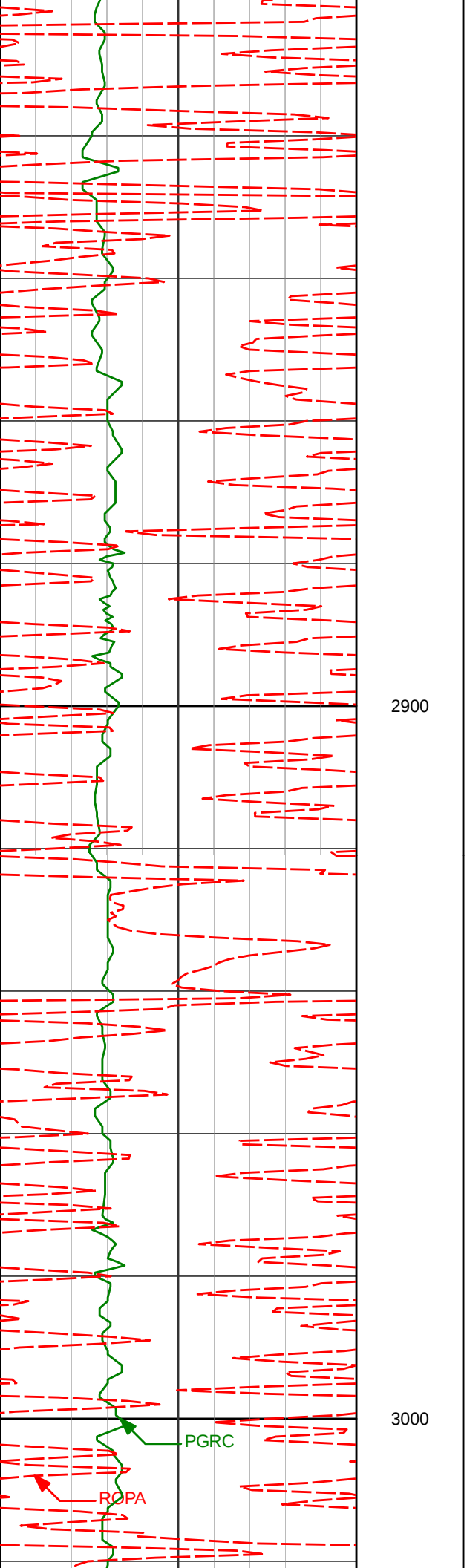
96.42°F

96.42°F

98.51°F



2605'	10.30°	83.93°	2594.89'	29.72'	98.51°F
					100.29°F
2697'	10.55°	84.20°	2685.37'	32.22'	100.62°F
					100.62°F
2790'	10.08°	79.92°	2776.87'	35.28'	102.72°F



2884'	10.47°	79.30°	2869.36'	39.08'	
2979'	9.45°	74.88°	2962.93'	43.47'	

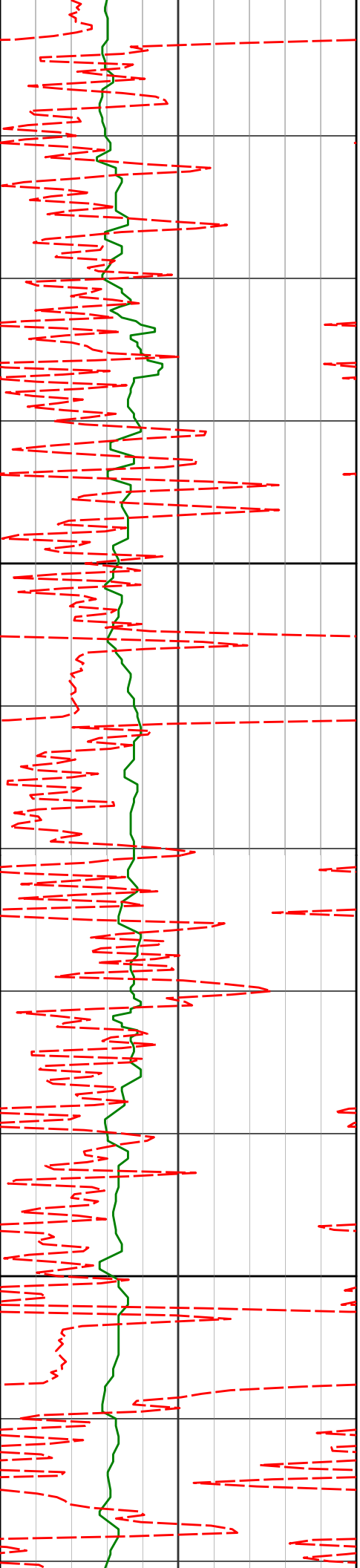
104.11°F

104.83°F

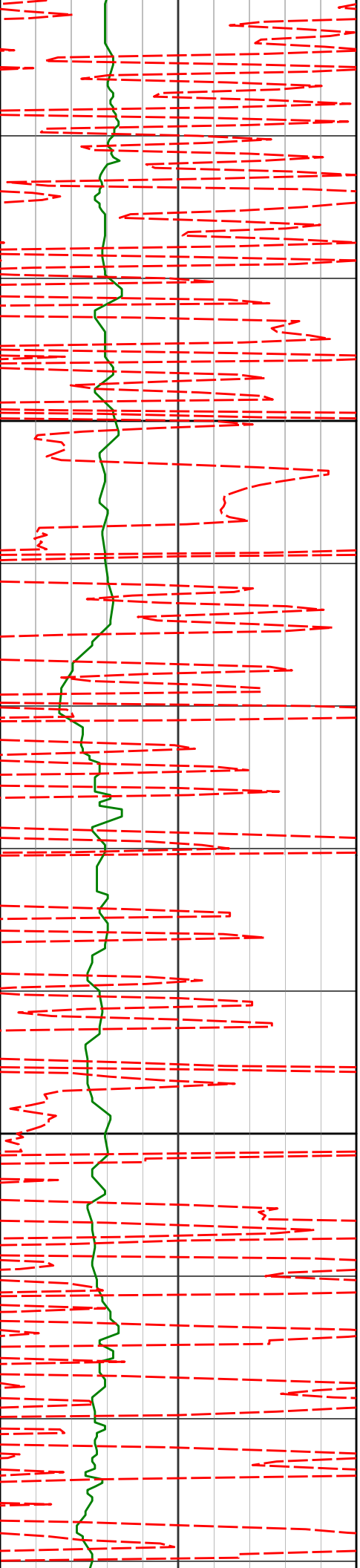
105.59°F

106.97°F

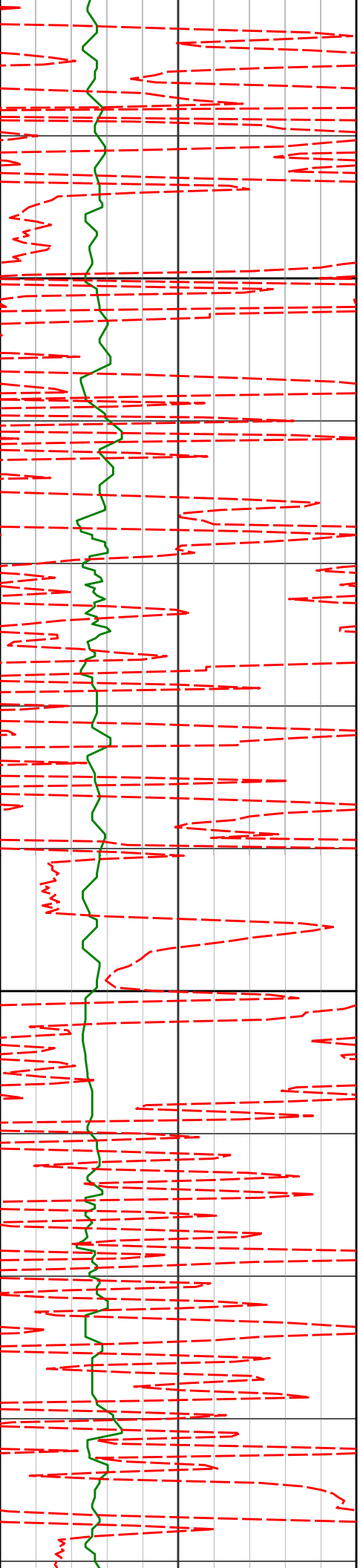
106.97°F



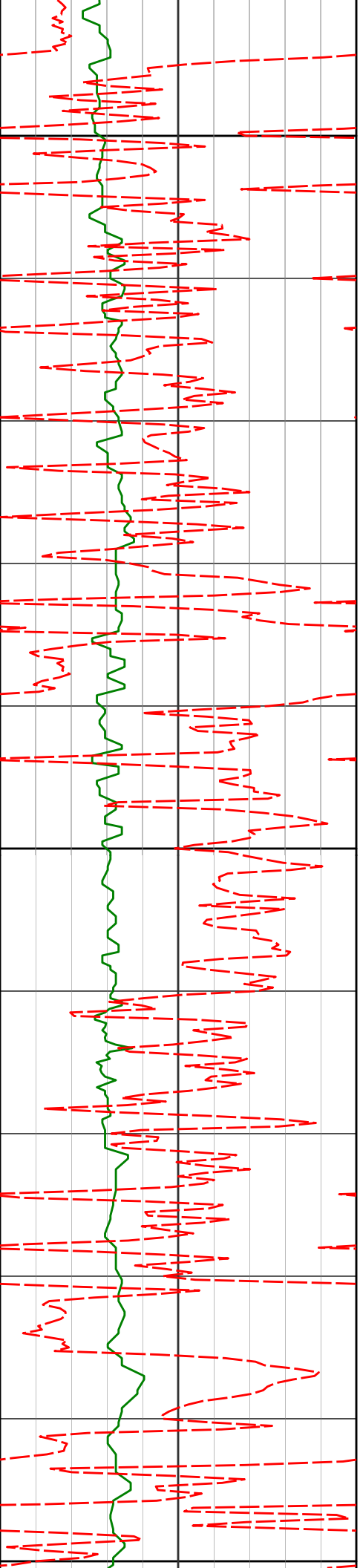
3074'	9.46°	73.97°	3056.64'	48.36'	106.97°F
					107.20°F
3169'	8.97°	73.76°	3150.41'	53.27'	109.23°F
					111.24°F
					111.24°F



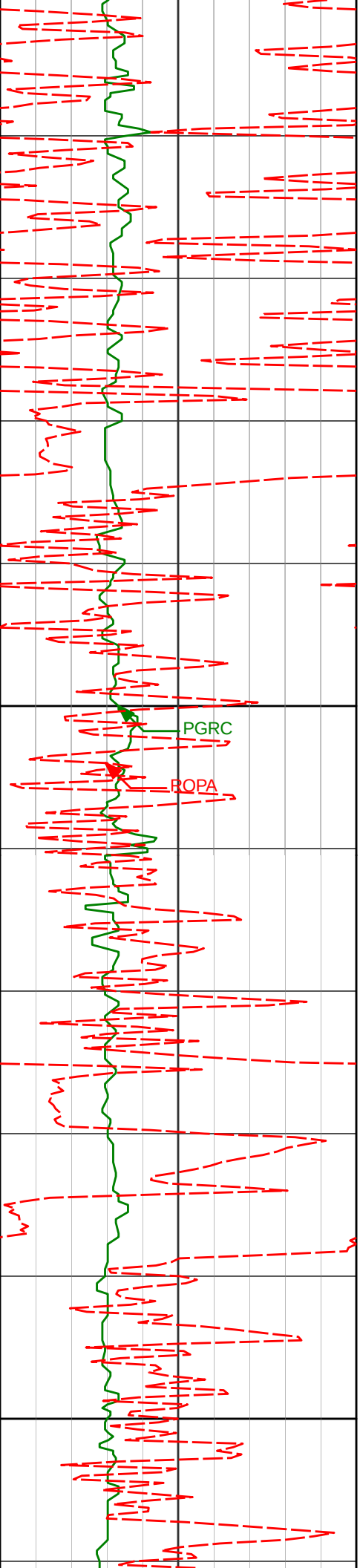
3264'	8.79°	74.44°	3244.27'	57.95'	
					111.24°F
3359'	9.05°	80.68°	3338.13'	61.78'	
					111.24°F
					111.24°F
3454'	9.43°	81.44°	3431.89'	64.86'	
					111.24°F



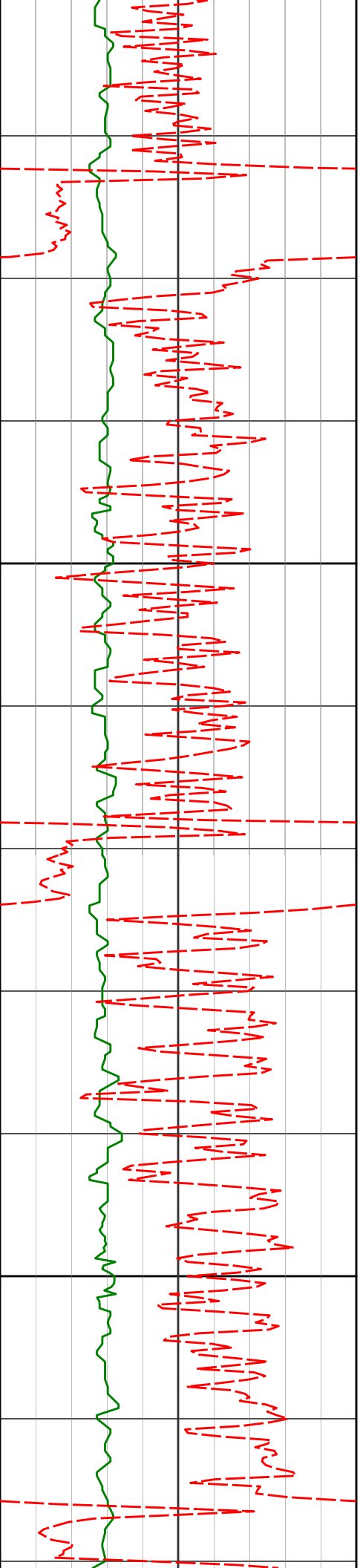
3500					111.24°F
					113.40°F
	3550'	9.65°	80.26°	3526.57'	68.13'
					113.40°F
3600					113.40°F
	3645'	8.37°	78.59°	3620.39'	71.53'
					115.56°F



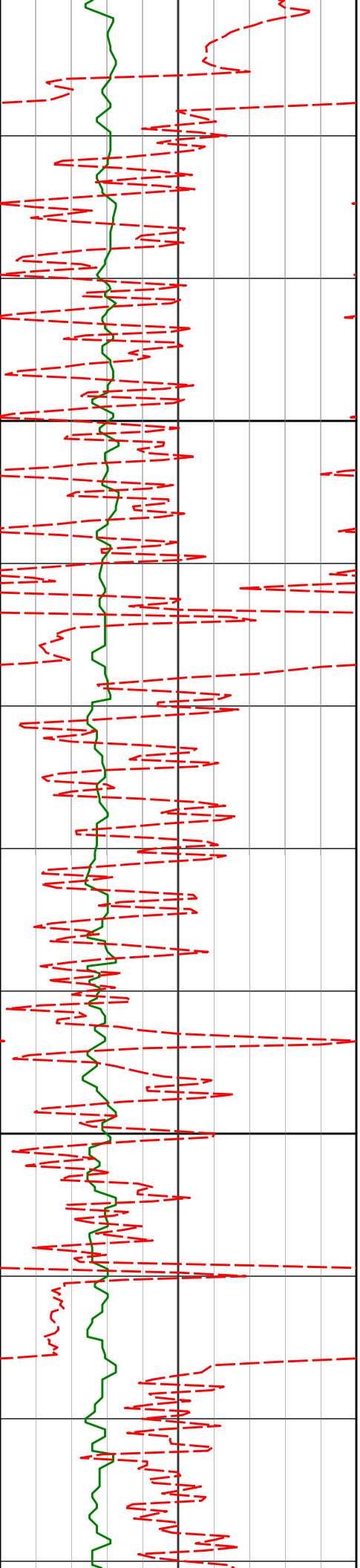
					115.56°F
3740'	8.67°	78.27°	3714.34'	75.00'	
					117.12°F
					117.73°F
3835'	9.19°	78.08°	3808.19'	78.70'	
					117.73°F
					119.07°F



3929		8.33	82.72	3901.10	81.77
					119.91°F
					120.89°F
4025'		7.53°	86.50°	3996.18'	83.66'
4000					
					121.85°F
					120.50°F
4119'		9.15°	86.14°	4089.18'	85.17'
					122.11°F
4100					



					122.69°F
4214'	8.09°	86.76°	4183.11'	86.73'	124.30°F
					124.30°F
4309'	7.76°	85.97°	4277.20'	88.17'	125.22°F
					124.71°F



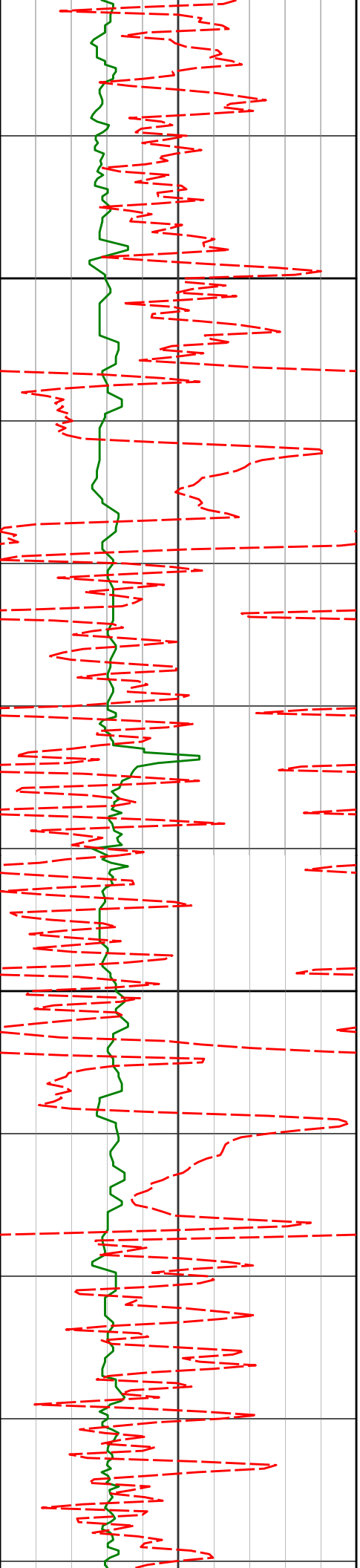
4404'	9.15°	87.39°	4371.16'	89.62'	126.66°F
4499'	8.82°	83.67°	4465.00'	91.47'	128.73°F
4594'	8.75°	82.67°	4558.88'	93.87'	130.85°F

4400

128.59°F

4500

128.73°F



130.96°F

131.60°F

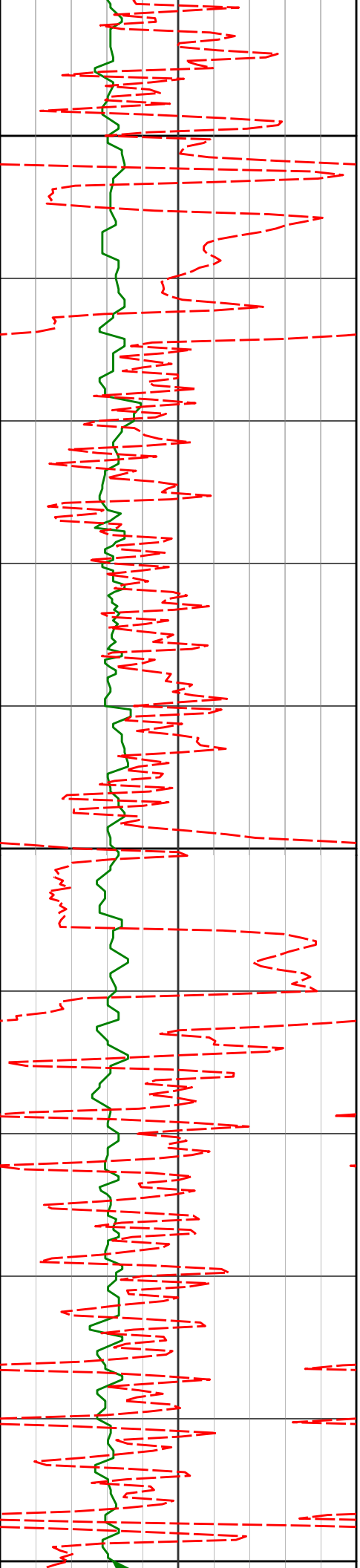
4689'	7.13°	85.03°	4652.97'	95.91'

131.58°F

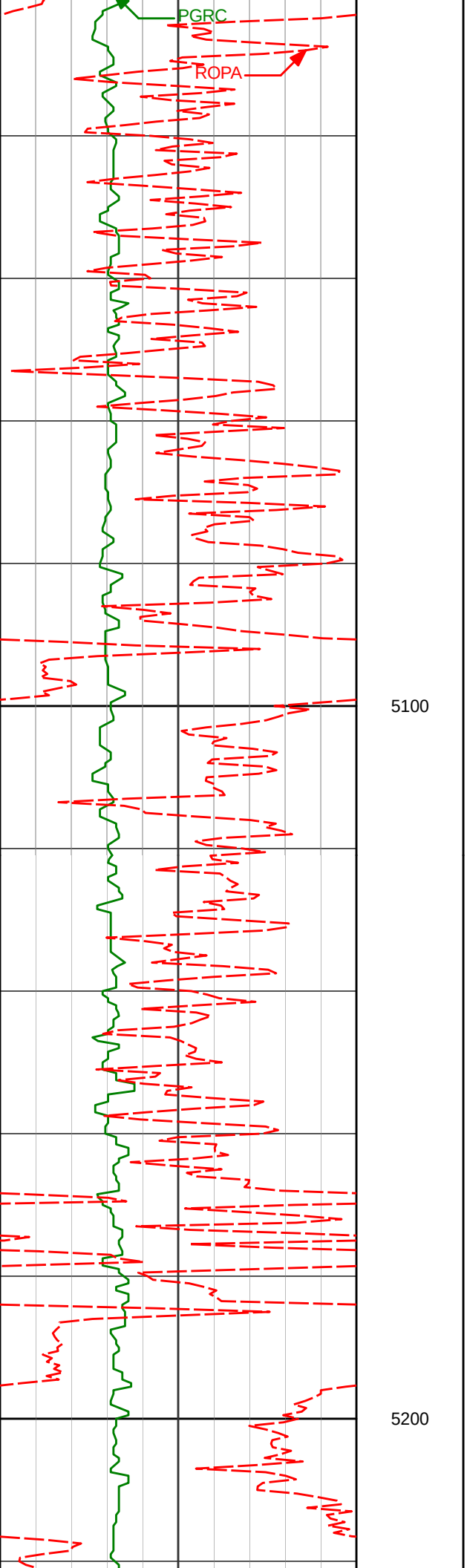
133.20°F

4784'	4.12°	93.36°	4747.50'	96.66'

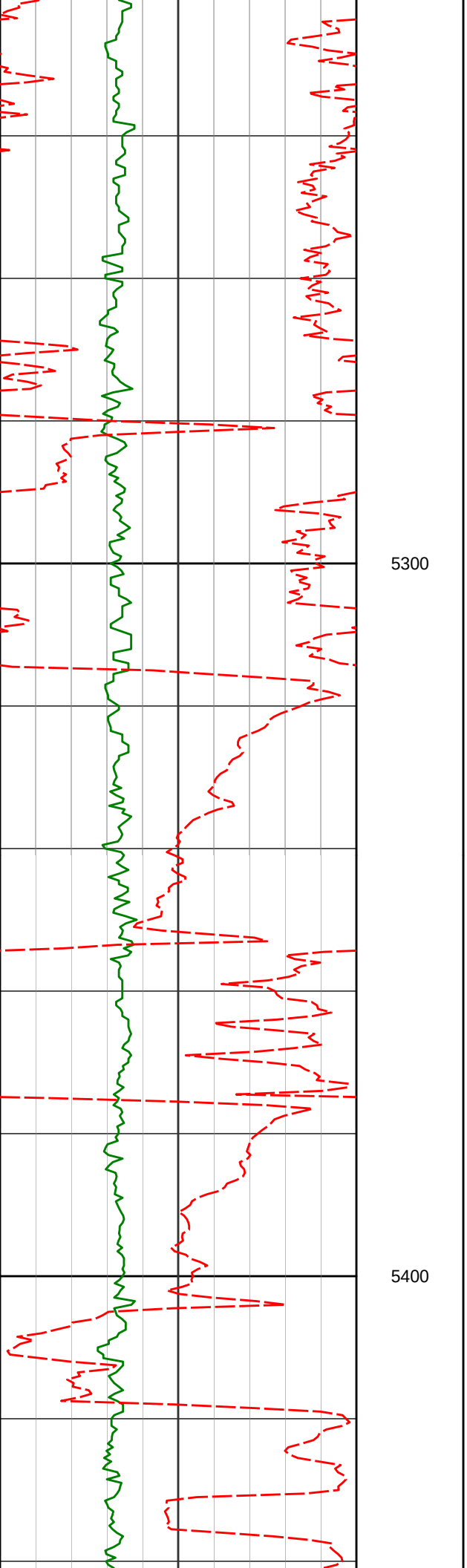
133.20°F



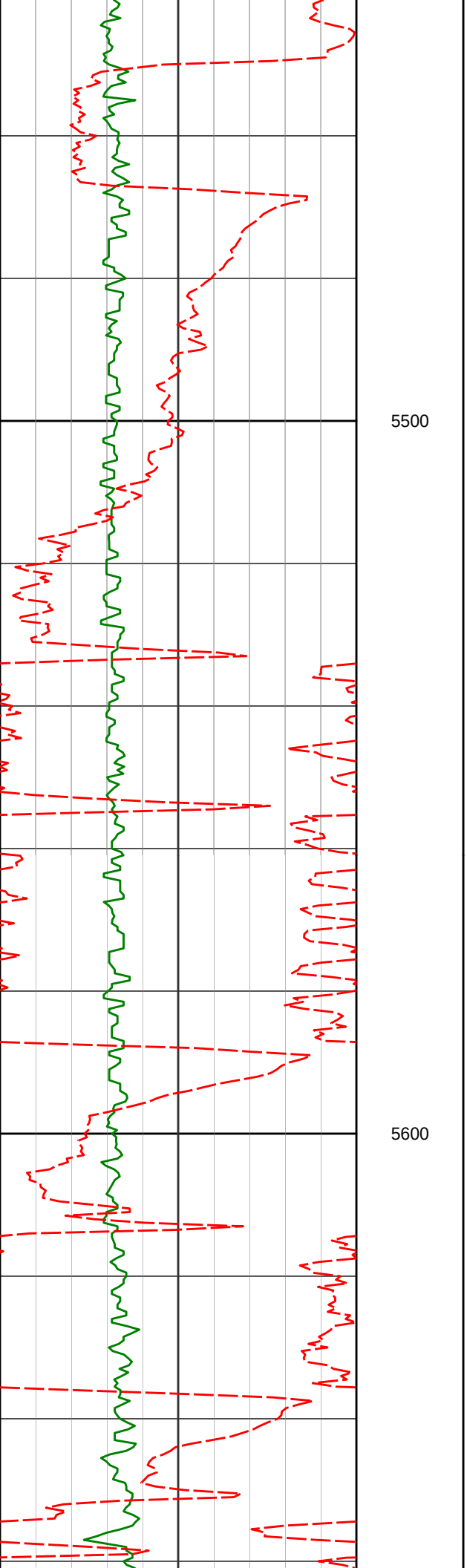
					133.20°F
4879'	1.89°	125.00°	4842.37'	95.79'	
					132.05°F
					130.96°F
4974'	0.46°	63.27°	4937.35'	95.14'	
					132.56°F
					133.20°F



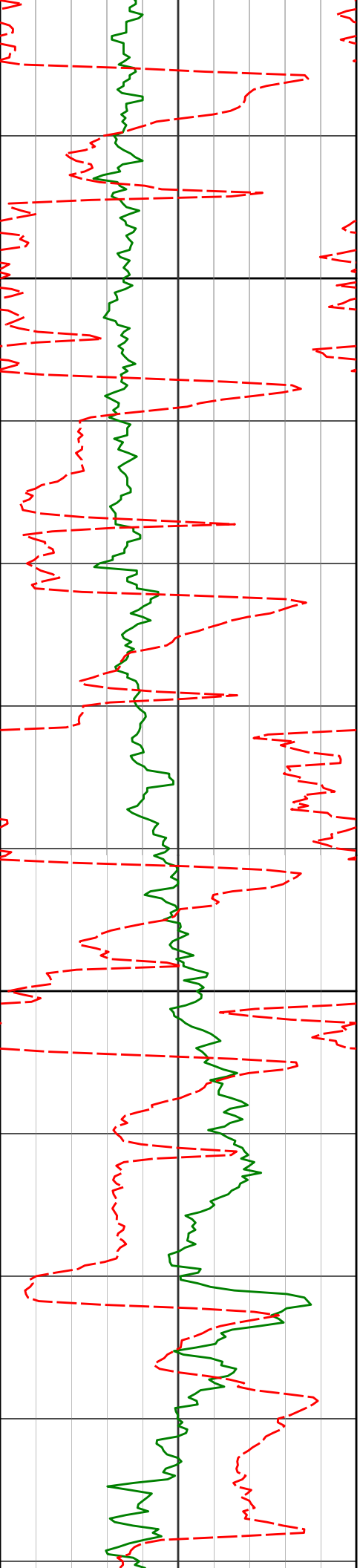
5069'	0.34°	119.78°	5032.35'	95.20'	133.91°F
					135.45°F
5164'	0.72°	95.92°	5127.35'	95.04'	135.45°F
					135.45°F
					136.34°F



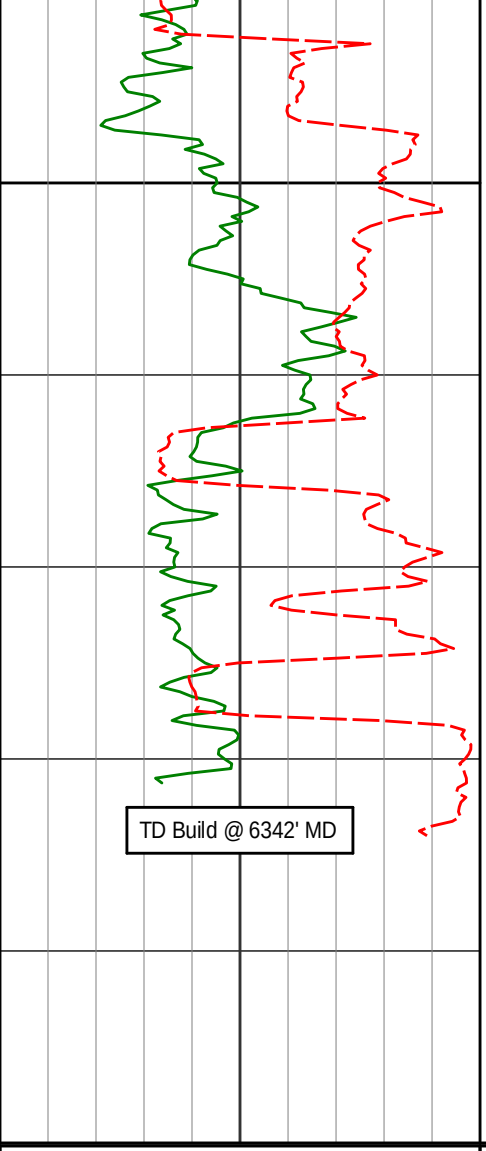
5259'	1.35°	104.01°	5222.33'	94.78'
				136.41°F
				135.45°F
5354'	0.99°	355.06°	5317.32'	95.38'
				136.20°F
				137.95°F
5449'	11.74°	357.16°	5411.59'	105.84'



	140.14°F				
	142.17°F				
5544'	21.36°	353.00°	5502.56'	132.58'	
	144.31°F				
	146.12°F				
5638'	27.26°	350.37°	5588.19'	170.52'	
	146.90°F				



5733'	34.68°	351.70°	5669.58'	218.37'	148.23°F
					149.26°F
5828'	42.76°	354.71°	5743.65'	276.95'	
					149.65°F
5923'	48.43°	359.67°	5810.11'	344.45'	134.07°F
					154.02°F
6018'	57.27°	358.93°	5867.43'	419.96'	



Depth	Inc	Azi	TVD	V.S.	Temp
					156.27°F
6113'	66.28°	358.10°	5912.31'	503.35'	
					157.09°F
6208'	75.12°	357.62°	5943.68'	592.60'	
6288'	79.56°	357.55°	5961.21'	670.32'	

Avg Rate of Penetration
ROPA
500 feet per hr 0

PCG Gamma Ray BCorr
PGRC
0 api 300

5900

6000

Depth
TVD
ft

HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
Haley LC27-715
Wattenburg
Weld Colorado
USA
CA-XX-0902279448

Measured Depth (feet)	*Inclination (degrees)*	*Direction (degrees)*	*Vertical Depth (feet)*	*Latitude (feet)*	*Departure (feet)*	*Vertical Section (feet)*	*Dogleg (deg/100ft)*
0.00	0.00	0.00	0.00	0.00 N	0.00 E	0.00	TIE-IN
682.00	0.57	344.60	681.99	3.29 N	0.91 W	3.24	0.08
745.00	0.54	332.66	744.99	3.85 N	1.13 W	3.80	0.19
841.00	0.26	320.63	840.98	4.43 N	1.47 W	4.35	0.30
1030.00	0.56	16.94	1029.98	5.64 N	1.48 W	5.57	0.25
1123.00	0.53	51.49	1122.97	6.35 N	1.01 W	6.29	0.35
1215.00	0.44	51.33	1214.97	6.83 N	0.40 W	6.81	0.10

1399.00	0.53	43.41	1398.96	7.89 N	0.73 E	7.92	0.06
1491.00	0.24	356.38	1490.96	8.39 N	1.01 E	8.43	0.44
1584.00	0.78	326.97	1583.96	9.11 N	0.65 E	9.13	0.63
1676.00	1.35	69.45	1675.95	10.02 N	1.32 E	10.07	1.84
1770.00	4.58	93.11	1769.81	10.20 N	6.10 E	10.48	3.61
1862.00	6.26	91.61	1861.40	9.86 N	14.78 E	10.55	1.83
1955.00	7.07	87.32	1953.77	9.99 N	25.56 E	11.18	1.02
2047.00	8.61	77.25	2044.91	11.77 N	37.94 E	13.55	2.24
2141.00	8.71	76.08	2137.84	15.04 N	51.71 E	17.46	0.21
2235.00	10.09	85.22	2230.58	17.43 N	66.82 E	20.56	2.17
2326.00	10.04	85.04	2320.18	18.78 N	82.68 E	22.66	0.07
2418.00	9.91	84.45	2410.79	20.25 N	98.55 E	24.87	0.18
2605.00	10.30	83.93	2594.89	23.57 N	131.18 E	29.72	0.21
2697.00	10.55	84.20	2685.37	25.29 N	147.74 E	32.22	0.28
2790.00	10.08	79.92	2776.87	27.58 N	164.22 E	35.28	0.97
2884.00	10.47	79.30	2869.36	30.60 N	180.71 E	39.08	0.44
2979.00	9.45	74.88	2962.93	34.24 N	196.73 E	43.47	1.34
3074.00	9.46	73.97	3056.64	38.43 N	211.76 E	48.36	0.16
3169.00	8.97	73.76	3150.41	42.66 N	226.37 E	53.27	0.52
3264.00	8.79	74.44	3244.27	46.67 N	240.47 E	57.95	0.22
3359.00	9.05	80.68	3338.13	49.83 N	254.84 E	61.78	1.05
3454.00	9.43	81.44	3431.89	52.20 N	269.91 E	64.86	0.42
3550.00	9.65	80.26	3526.57	54.73 N	285.62 E	68.13	0.30
3645.00	8.37	78.59	3620.39	57.45 N	300.25 E	71.53	1.38
3740.00	8.67	78.27	3714.34	60.27 N	314.04 E	75.00	0.32
3835.00	9.19	78.08	3808.19	63.30 N	328.47 E	78.70	0.55
3929.00	8.33	82.72	3901.10	65.71 N	342.57 E	81.77	1.19
4025.00	7.53	86.50	3996.18	66.97 N	355.74 E	83.66	0.99
4119.00	9.15	86.14	4089.18	67.85 N	369.34 E	85.17	1.73
4214.00	8.09	86.76	4183.11	68.74 N	383.55 E	86.73	1.12
4309.00	7.76	85.97	4277.20	69.57 N	396.63 E	88.17	0.36
4404.00	9.15	87.39	4371.16	70.36 N	410.58 E	89.62	1.47
4499.00	8.82	83.67	4465.00	71.51 N	425.36 E	91.47	0.71
4594.00	8.75	82.67	4558.88	73.23 N	439.76 E	93.87	0.18
4689.00	7.13	85.03	4652.97	74.67 N	452.81 E	95.91	1.73
4784.00	4.12	93.36	4747.50	74.98 N	462.09 E	96.66	3.28
4879.00	1.89	125.00	4842.37	73.88 N	466.78 E	95.79	2.84
4974.00	0.46	63.27	4937.35	73.16 N	468.40 E	95.14	1.81
5069.00	0.34	119.78	5032.35	73.19 N	468.99 E	95.20	0.42
5164.00	0.72	95.92	5127.35	72.98 N	469.83 E	95.04	0.45
5259.00	1.35	104.01	5222.33	72.65 N	471.51 E	94.78	0.69
5354.00	0.99	355.06	5317.32	73.20 N	472.53 E	95.38	2.02
5449.00	11.74	357.16	5411.59	83.70 N	471.98 E	105.84	11.31
5544.00	21.36	353.00	5502.56	110.59 N	469.39 E	132.58	10.20
5638.00	27.26	350.37	5588.19	148.84 N	463.70 E	170.52	6.38
5733.00	34.68	351.70	5669.58	197.10 N	456.15 E	218.37	7.85
5828.00	42.76	354.71	5743.65	256.07 N	449.26 E	276.95	8.73
5923.00	48.43	359.67	5810.11	323.79 N	446.08 E	344.45	7.03
6018.00	57.27	358.93	5867.43	399.43 N	445.13 E	419.96	9.32
6113.00	66.28	358.10	5912.31	483.02 N	442.94 E	503.35	9.52
6208.00	75.12	357.62	5943.68	572.53 N	439.59 E	592.60	9.31
6288.00	79.56	357.55	5961.21	650.49 N	436.30 E	670.32	5.56
6420.00	88.31	356.48	5975.15	781.45 N	429.46 E	800.81	6.67
6513.00	89.97	356.43	5976.55	874.26 N	423.71 E	893.24	1.79
6606.00	92.22	356.89	5974.77	967.07 N	418.30 E	985.70	2.47
6698.00	92.59	358.48	5970.91	1058.92 N	414.59 E	1077.27	1.78
6791.00	91.94	359.42	5967.24	1151.83 N	412.88 E	1170.00	1.22
6884.00	91.60	358.99	5964.36	1244.77 N	411.59 E	1262.78	0.59
6976.00	92.00	358.16	5961.47	1336.70 N	409.31 E	1354.49	1.00
7070.00	91.36	358.20	5958.71	1430.61 N	406.32 E	1448.16	0.69
7162.00	91.08	359.67	5956.76	1522.57 N	404.61 E	1539.94	1.63
7255.00	90.06	358.90	5955.83	1615.56 N	403.45 E	1632.77	1.38
7349.00	90.68	359.59	5955.22	1709.54 N	402.21 E	1726.59	0.99
7440.00	91.14	359.91	5953.78	1800.53 N	401.81 E	1817.46	0.62
7533.00	89.69	0.10	5953.11	1893.53 N	401.82 E	1910.35	1.57
7626.00	89.08	0.05	5954.11	1986.52 N	401.94 E	2003.25	0.66
7719.00	88.74	358.48	5955.88	2079.49 N	400.75 E	2096.06	1.73
7811.00	89.48	358.18	5957.32	2171.44 N	398.07 E	2187.78	0.87
7904.00	90.31	358.31	5957.49	2264.40 N	395.22 E	2280.50	0.90
7999.00	90.03	358.42	5957.21	2359.36 N	392.51 E	2375.23	0.31
8094.00	89.97	358.29	5957.21	2454.32 N	389.78 E	2469.96	0.15
8189.00	90.99	357.70	5956.42	2549.26 N	386.46 E	2564.63	1.24
8284.00	90.68	358.04	5955.03	2644.18 N	382.93 E	2659.28	0.49
8379.00	90.77	357.44	5953.83	2739.10 N	379.18 E	2753.92	0.64

8473.00	90.89	356.78	5952.47	2832.97 N	374.44 E	2847.46	0.71
8568.00	90.74	357.88	5951.11	2927.85 N	370.02 E	2942.03	1.16
8663.00	90.52	357.91	5950.07	3022.78 N	366.53 E	3036.69	0.23
8758.00	90.59	357.19	5949.15	3117.69 N	362.47 E	3131.31	0.76
8853.00	89.78	356.07	5948.84	3212.52 N	356.89 E	3225.77	1.45
8948.00	91.45	358.57	5947.82	3307.40 N	352.44 E	3320.34	3.16
9043.00	92.00	358.89	5944.96	3402.34 N	350.34 E	3415.06	0.67
9138.00	92.53	358.19	5941.20	3497.23 N	347.92 E	3509.74	0.92
9233.00	93.05	357.29	5936.58	3592.04 N	344.18 E	3604.27	1.10
9327.00	90.74	357.97	5933.47	3685.91 N	340.29 E	3697.84	2.57
9422.00	91.11	359.05	5931.94	3780.86 N	337.82 E	3792.58	1.19
9516.00	88.06	359.00	5932.62	3874.83 N	336.22 E	3886.37	3.25
9611.00	87.53	358.92	5936.27	3969.75 N	334.50 E	3981.10	0.56
9706.00	88.49	357.81	5939.57	4064.65 N	331.79 E	4075.76	1.54
9801.00	88.86	357.48	5941.77	4159.54 N	327.88 E	4170.37	0.52
9895.00	88.52	357.41	5943.92	4253.42 N	323.69 E	4263.95	0.37
9990.00	90.18	356.86	5944.99	4348.29 N	318.94 E	4358.49	1.84
10084.00	90.86	357.25	5944.14	4442.17 N	314.11 E	4452.03	0.84
10179.00	91.32	357.19	5942.33	4537.04 N	309.50 E	4546.58	0.49
10273.00	92.00	356.76	5939.60	4630.86 N	304.55 E	4640.07	0.85
10368.00	90.83	356.91	5937.25	4725.69 N	299.31 E	4734.54	1.24
10463.00	90.15	357.71	5936.43	4820.58 N	294.85 E	4829.12	1.10
10558.00	89.85	357.22	5936.43	4915.49 N	290.65 E	4923.72	0.60
10652.00	89.60	357.13	5936.88	5009.37 N	286.02 E	5017.28	0.28
10747.00	90.37	357.14	5936.91	5104.25 N	281.28 E	5111.84	0.81
10842.00	90.65	356.17	5936.07	5199.09 N	275.74 E	5206.30	1.06
10937.00	90.74	356.65	5934.92	5293.89 N	269.79 E	5300.72	0.51
11032.00	90.28	357.27	5934.07	5388.75 N	264.75 E	5395.24	0.81
11127.00	90.28	357.39	5933.61	5483.65 N	260.33 E	5489.83	0.13
11222.00	90.22	357.76	5933.20	5578.56 N	256.31 E	5584.44	0.39
11284.00	90.31	358.49	5932.92	5640.53 N	254.28 E	5646.25	1.18
11352.00	90.31	358.49	5932.55	5708.50 N	252.48 E	5714.06	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 2.70 DEGREES (GRID)
A TOTAL CORRECTION OF 7.11 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED

HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 11352.00 FEET
IS 5714.09 FEET ALONG 2.53 DEGREES (GRID)

Final survey is a straight line projection to TD.

Date Printed:11 May 2015