PCG Pressure Case Gamma
PCD Pressure Case Directional

HALLIBURTON | Sperry Drilling

Company : **Noble Energy**
Rig : **H&P 343**
Well : **Bronco State AF10-64-1HN**
Field : **Wattenberg**
Country : **USA**
API Number : **05-123-36580**

Country : **USA**
Field : **Wattenberg**
Location : **Lat: 40° 24' 42.59" North**
Long: 104° 18' 3.24" West
Well : **Bronco State AF10-64-1HN**
Company : **Noble Energy**
Rig : **H&P 343**

LOCATION

Latitude : **40° 24' 42.59" North**
Longitude : **104° 18' 3.24" West**
UTM Easting = **3,333,893.31 ft**
UTM Northing = **1,395,127.79 ft**

Other Services
Directional Drilling

Elev. KB **NA**
DF **4670.00 ft**
GL **4646.00 ft**
WD **NA**

Permanent Datum : **Ground Level** Elevation : **4646.00 ft**
Log Measured From : **Drill Floor** **24.00 ft** Above Permanent Datum
Drilling Measured From : **Drill Floor**

TVD LOG

Depth Logged : **598.00 ft** To **6,390.63 ft**
Date Logged : **20-Mar-13** To **27-Mar-13**
Total Depth MD : **10,705.00 ft** TVD : **6,390.63 ft**
Spud Date : **20-Mar-13**

Unit No. : **11610115**
Plot Type : **Final**
Plot Date : **27-Mar-13**

Job No. :**CA-XX-090020615 9**

Borehole Record (TVD)

Run No.	Size	From	To
2	8.750 in	598.00 ft	1,895.93 ft
3	8.750 in	1,895.93 ft	6,076.14 ft
4	8.750 in	6,076.14 ft	6,366.77 ft

Borehole Record (TVD)

Run No.	Size	From	To

Casing Record (TVD)

Size	Weight	From	To
9.625 in	36.00 lbpf	SURFACE	587.00 ft
7.000 in	26.00 lbpf	SURFACE	6,366.31 ft

WELL INFORMATION

MWD Run Number	100	200	300		
Date run completed	22-Mar-13	23-Mar-13	24-Mar-13		
Rig Bit Number	2	3	4		
Bit Size (in)	8.750	8.750	8.750		
Tool Nominal OD (in)	6.750	6.750	6.750		
Log Start Depth (TVD, ft)	598.00	1,896.92	6,075.28		
Log End Depth (TVD, ft)	1,896.92	6,075.28	6,366.77		
Drill or Wipe	Drill	Drill	Drill		
Drill/Wipe Start Date and Time	21-Mar-13 17:30	22-Mar-13 05:10	23-Mar-13 23:00		
Drill/Wipe End Date and Time	21-Mar-13 21:15	23-Mar-13 06:45	24-Mar-13 16:00		
Min Inc (deg) @ Depth (TVD, ft)	.18 @ 717.00	.34 @ 5,240.80	34.09 @ 6,109.93		
Max Inc (deg) @ Depth (TVD, ft)	1.05 @ 1,744.94	29.86 @ 6,069.23	85.57 @ 6,363.27		
Bit TFA(in2) / Bit Type	.86 / PDC	.86 / PDC	.86 / PDC		
Flow Rate (gpm)	593.75	597.10	494.00		
Max AV (fpm) / CV (fpm) @ MWD	427.6 / NA	417.4 / NA	342.6 / NA		
Fluid Type	Fresh Water Gel	Fresh Water Gel	Fresh Water Gel		
Density (ppg) / Viscosity (spqt)	8.60 / 28.00	8.70 / 27.00	10.48 / 35.00		
Filtrate CL (ppm)	2,300.00	2,300.00	2,100.00		
pH / Fluid Loss (mptm)	11.60 / 48	8.30 / 23	9.30 / 8		
PV (cP) / YP (lhf2)	3 / 4.00	3 / 2.00	11 / 14.00		
% Solids / % Sand	1.80 / 0.25	2.50 / 0.20	10.20 / 0.20		
% Oil / Oil:Water Ratio	0 / 0:95	0 / 0:95	0 / 0:95		
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	95.30 / PCM	145.90 / PCM	154.30 / PCM		
Rm @ Max Tool Temp (degF)	NA @ NA	NA @ NA	NA @ NA		
Lead MWD Engineer	Gary Eifert	Gary Eifert	Gary Eifert		
Customer Representative	Johnny Sanchez	Johnny Sanchez	Johnny Sanchez		

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM	PCM		
Software Version	5.76	5.76	5.76		
Sub Serial Number	11404284	11404284	11404284		
Insert Serial Number	11680747	11680747	11680747		
Date and Time Initialized	20-Mar-13 15:03	20-Mar-13 15:03	20-Mar-13 15:03		
Date and Time Read	25-Mar-13 11:06	25-Mar-13 11:17	25-Mar-13 11:24		
ECMB SW Version	N/A	N/A	N/A		

Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC		
Distance From Bit (ft)	57.00	54.00	58.00		
Software Version	6.21	6.21	6.21		
Sub Serial Number	11404284	11404284	11404284		
Sonde Serial Number	11638501	11638501	11638501		
Sensor ID Number	N/A	N/A	N/A		
Toolface Offset (deg)	186.59	327.27	15.43		

Gamma Ray Sensor Information

Tool Type	PCG	PCG	PCG		
Distance From Bit (ft)	50.00	47.63	50.94		
Recorded Sample Period (sec)	10	10	10		
Software Version	8.15	8.15	8.15		
Sub Serial Number	11404284	11404284	11404284		
Insert/Sonde Serial Number	11293345	11293345	11293345		

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 annual 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
6. The depth used for the tie in survey is the shoe depth of the surface casing and assumes an inclination and azimuth of zero.
7. INSITE version 7.4.01

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

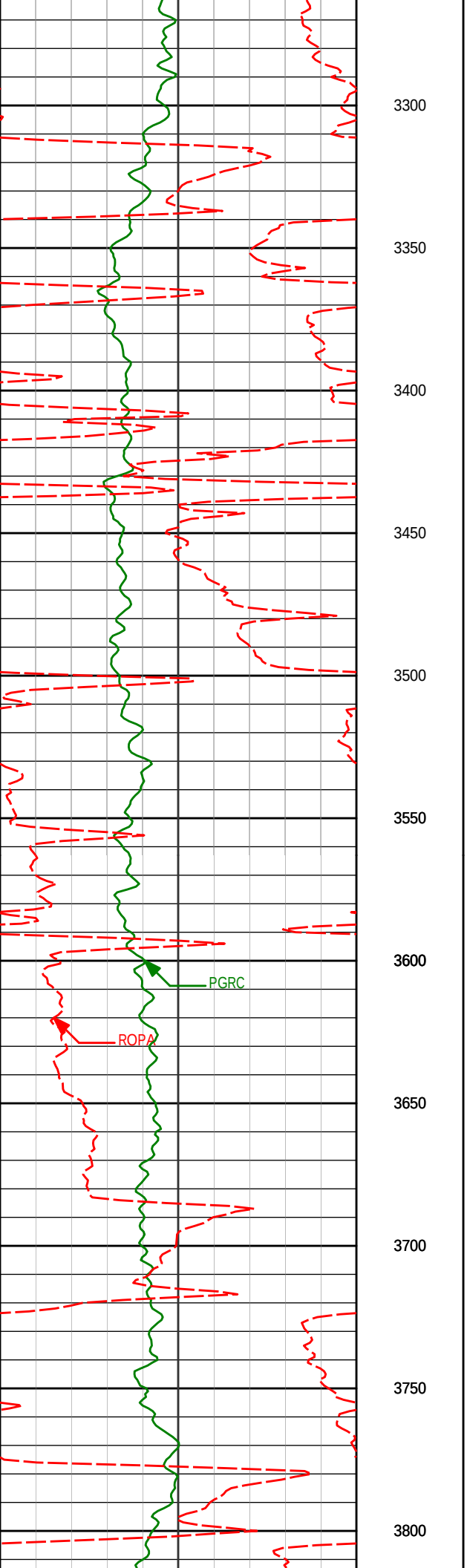
TVD Main Log 1:600

Noble Energy
Bronco State AF10-64-1HN
H&P 343
T5N-R62W

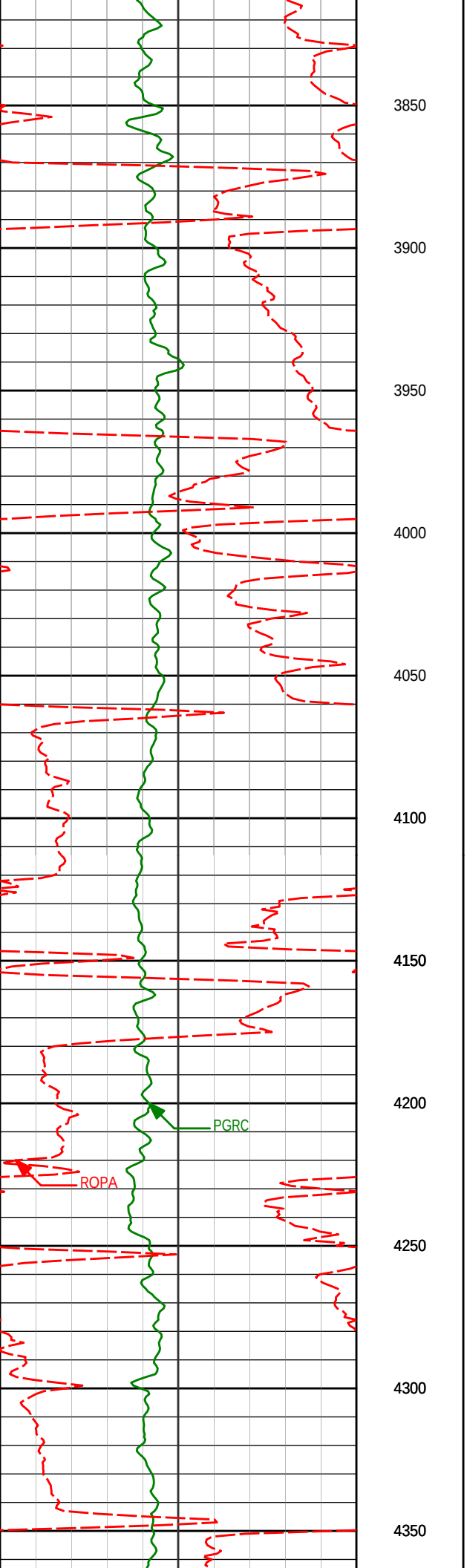
PCG Gamma Ray
PGRC
0 api 300

Avg Rate of Penetration
ROPA
500 feet per hr 0

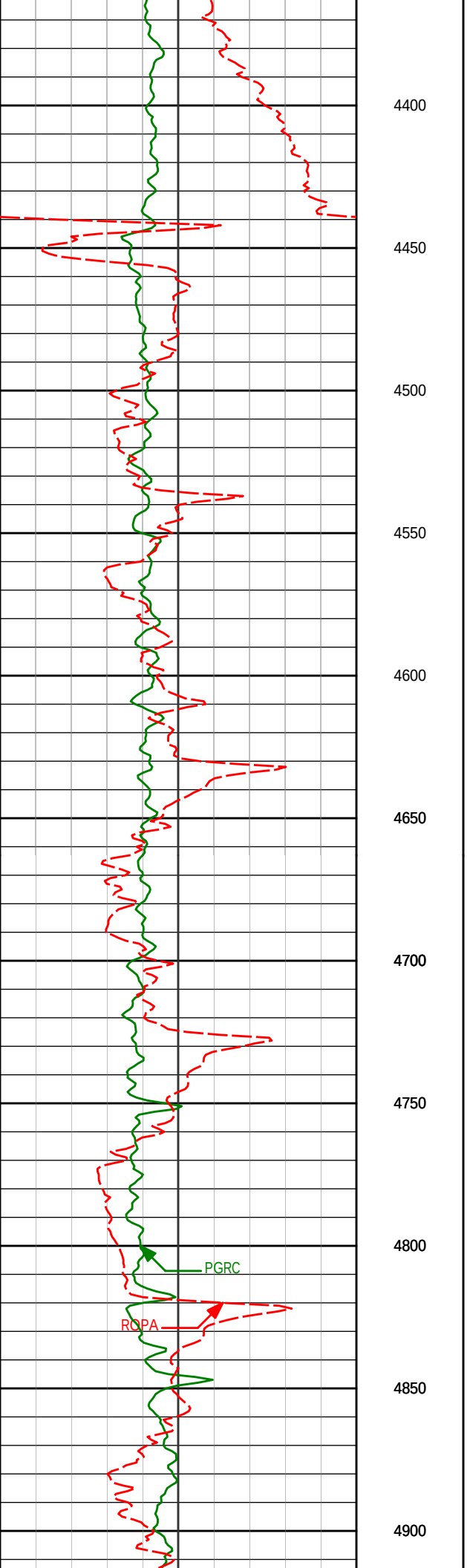
Depth ft	***Depth***	***Inc.***	***Azi.***	***TVD***	***V.S.***
	3072'	3.41°	91.91°	3071.55'	-13.51'
	3167'	5.95°	98.45°	3166.22'	-21.19'
	3262'	8.33°	87.64°	3260.48'	-32.93'



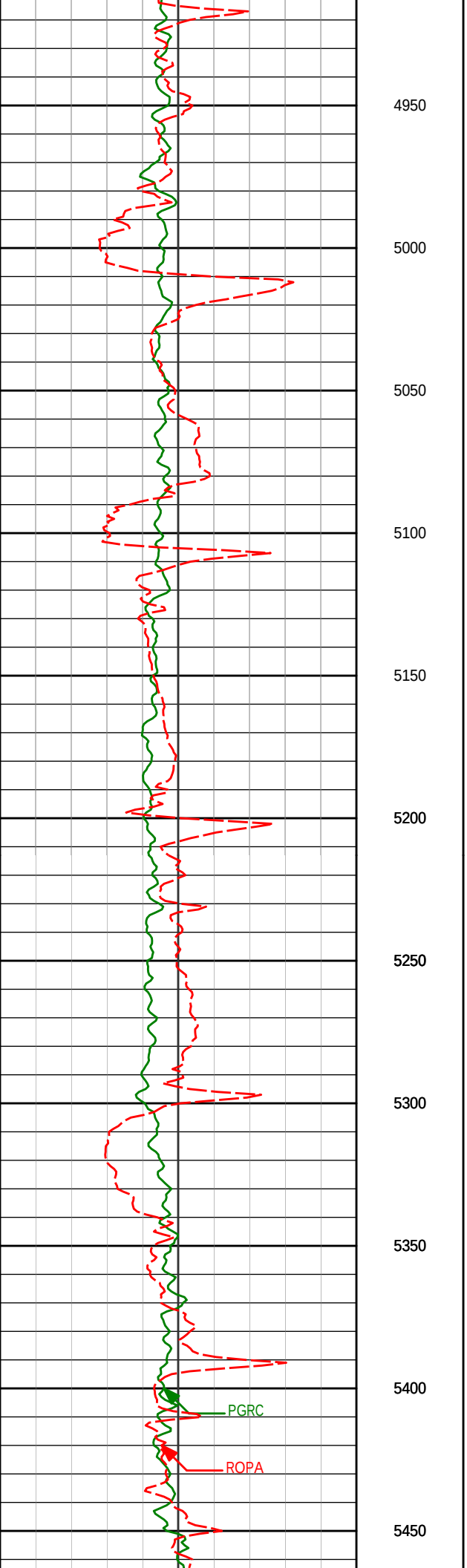
3357'	10.81°	88.76°	3354.15'	-48.72'
3452'	12.19°	88.75°	3447.24'	-67.66'
3547'	13.58°	90.94°	3539.85'	-88.84'
3642'	14.51°	90.95°	3632.01'	-111.88'
3737'	11.84°	79.02°	3724.51'	-133.39'



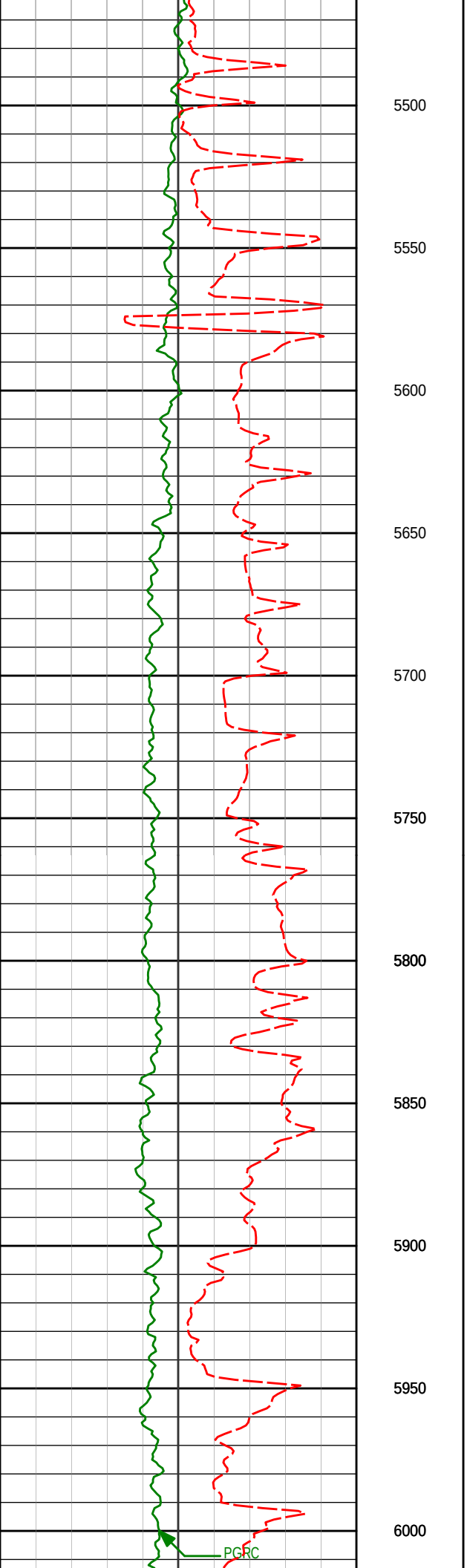
3832'	8.30°	74.61°	3818.04'	-149.65'
3927'	6.01°	76.05°	3912.29'	-161.15'
4022'	2.66°	84.05°	4007.01'	-168.20'
4117'	2.03°	83.50°	4101.93'	-172.06'
4212'	0.48°	32.33°	4196.90'	-173.95'
4307'	1.06°	333.50°	4291.90'	-173.80'



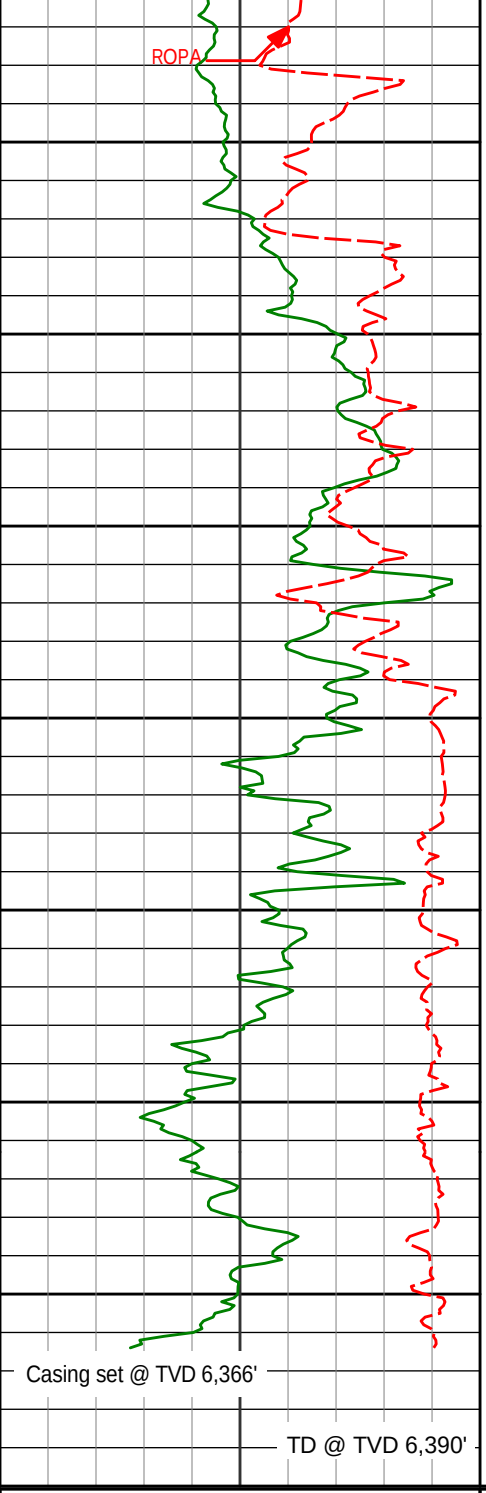
4402'	1.26°	332.27°	4386.88'	-172.96'
4497'	0.95°	344.39°	4481.86'	-172.30'
4592'	0.98°	358.95°	4576.85'	-172.10'
4687'	0.81°	342.30°	4671.83'	-171.91'
4782'	1.00°	353.15°	4766.82'	-171.64'
4877'	0.77°	355.56°	4861.81'	-171.52'



4972'	0.47°	16.61°	4956.81'	-171.61'
5067'	0.42°	288.41°	5051.80'	-171.40'
5162'	0.51°	272.48°	5146.80'	-170.65'
5256'	0.34°	194.89°	5240.80'	-170.16'
5351'	0.73°	188.23°	5335.79'	-169.98'
5446'	1.16°	195.13°	5430.78'	-169.61'



5541'	1.43°	203.68°	5525.76'	-168.84'
5589'	3.41°	248.33°	5573.71'	-167.25'
5636'	7.28°	258.30°	5620.50'	-163.02'
5684'	9.49°	263.45°	5667.99'	-156.08'
5731'	11.45°	266.09°	5714.20'	-147.56'
5779'	14.36°	263.91°	5760.98'	-136.87'
5826'	16.56°	266.95°	5806.28'	-124.36'
5921'	20.24°	272.41°	5896.41'	-94.42'
5969'	21.80°	271.49°	5941.22'	-77.23'
6016'	24.13°	271.18°	5984.49'	-58.91'



Depth	Inc.	Azi.	TVD	V.S.
6064'	26.70°	269.95°	6027.84'	-38.32'
6111'	29.86°	269.31°	6069.23'	-16.06'
6159'	34.09°	269.05°	6109.93'	9.36'
6206'	38.82°	269.00°	6147.73'	37.28'
6254'	40.87°	271.19°	6184.58'	68.02'
6301'	45.45°	271.01°	6218.86'	100.13'
6349'	51.86°	271.25°	6250.55'	136.12'
6396'	57.71°	270.27°	6277.64'	174.48'
6444'	64.12°	267.75°	6300.96'	216.40'
6491'	68.80°	268.01°	6319.73'	259.47'
6539'	73.22°	268.90°	6335.35'	304.84'
6586'	76.41°	269.90°	6347.66'	350.19'
6634'	79.81°	270.65°	6357.55'	397.14'
6679'	85.57°	269.94°	6363.27'	441.74'

Avg Rate of Penetration
ROPA
500 feet per hr 0

PCG Gamma Ray
PGRC
0 api 300

Depth
ft

6050
<Run 300>
6100
6150
6200
6250
6300
6350
6400

HALLIBURTON
Sperry Drilling Services

TVD Detail Log 1:240

Noble Energy
Bronco State AF10-64-1HN
H&P 343
T5N-R62W

PCG Gamma Ray

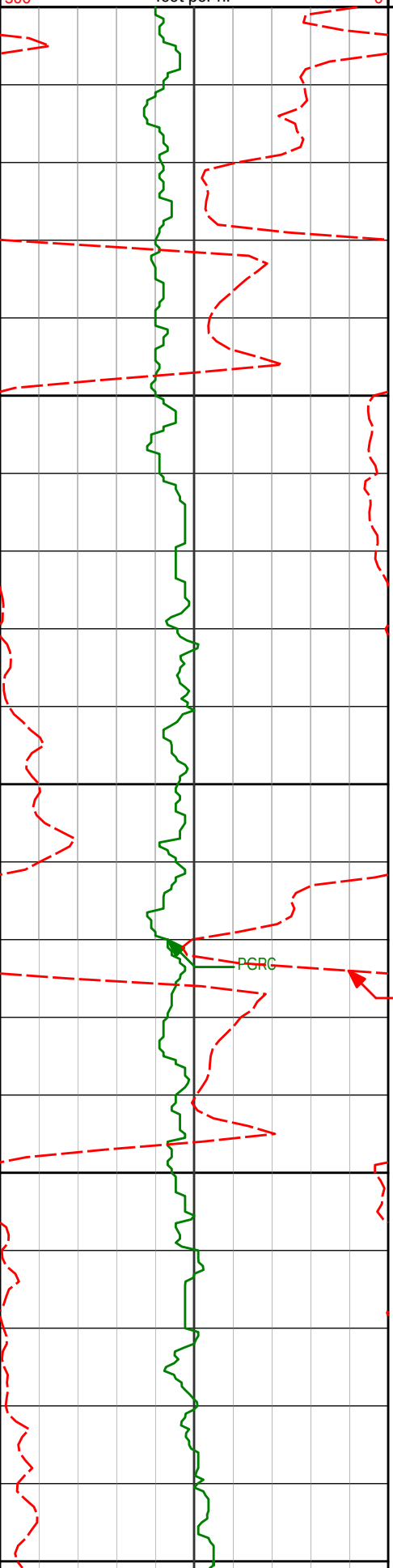
PGRC

0 api 300

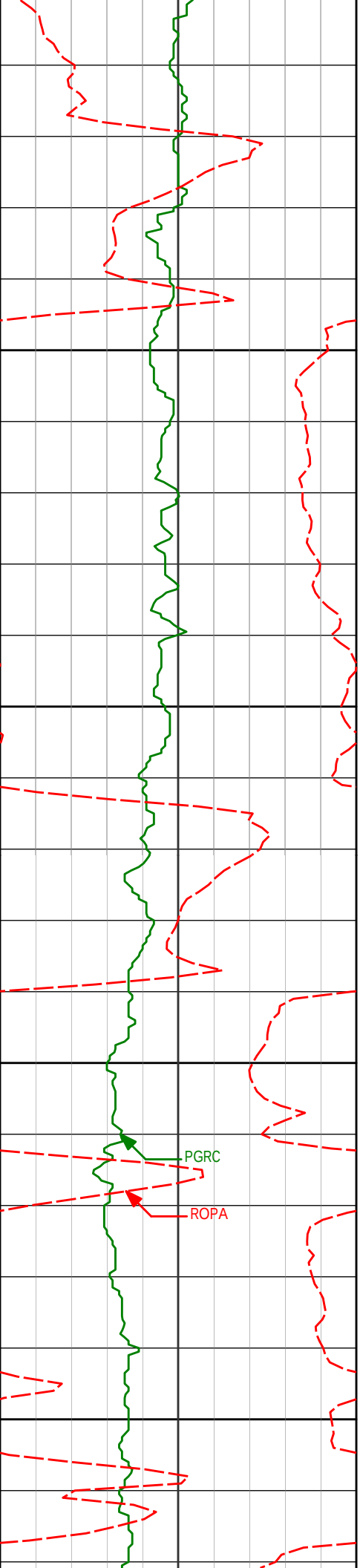
Avg Rate of Penetration

ROPA

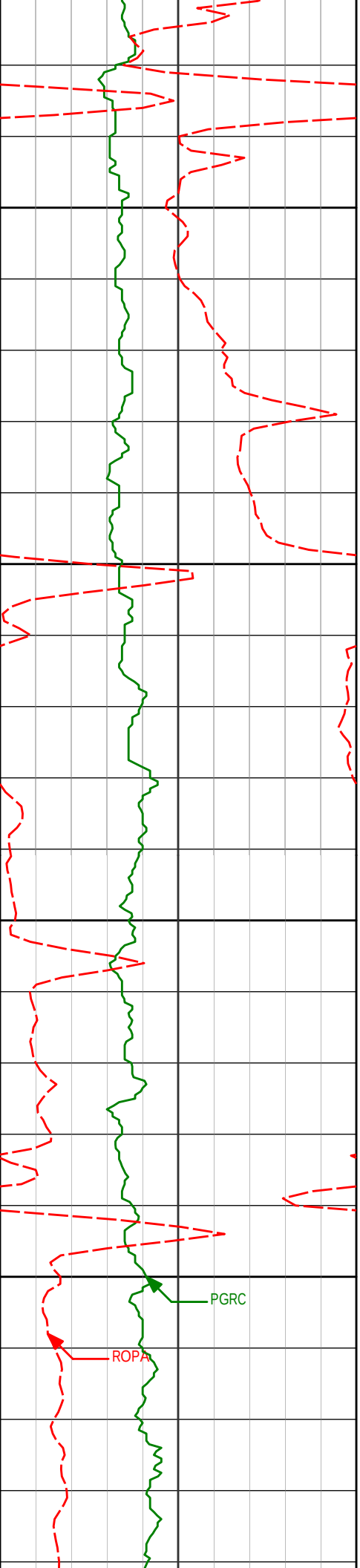
500 feet per hr 0



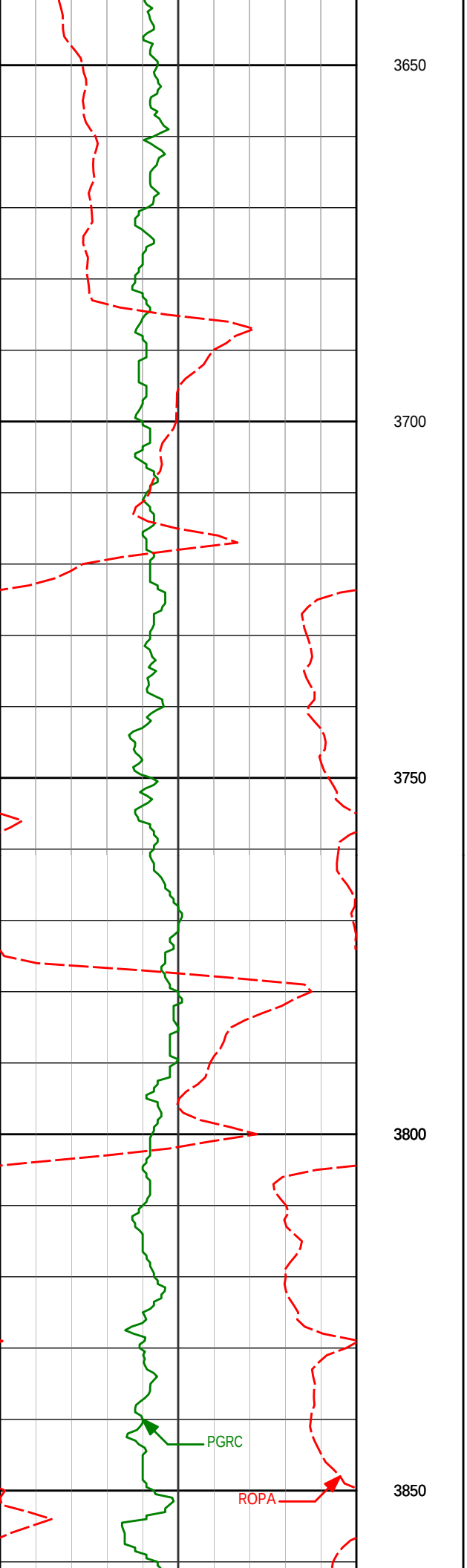
Depth ft	Depth	Inc.	Azi.	TVD	V.S.
	3072'	3.41°	91.91°	3071.55'	-13.51'
	3167'	5.95°	98.45°	3166.22'	-21.19'



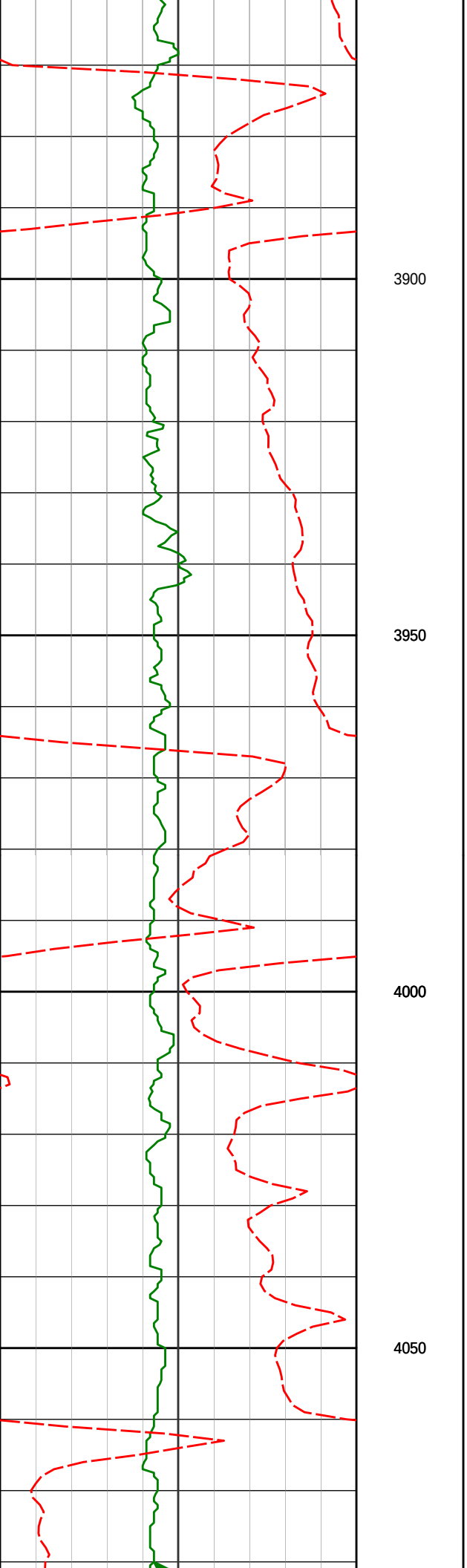
3262'	8.33°	87.64°	3260.48'	-32.93'
3357'	10.81°	88.76°	3354.15'	-48.72'



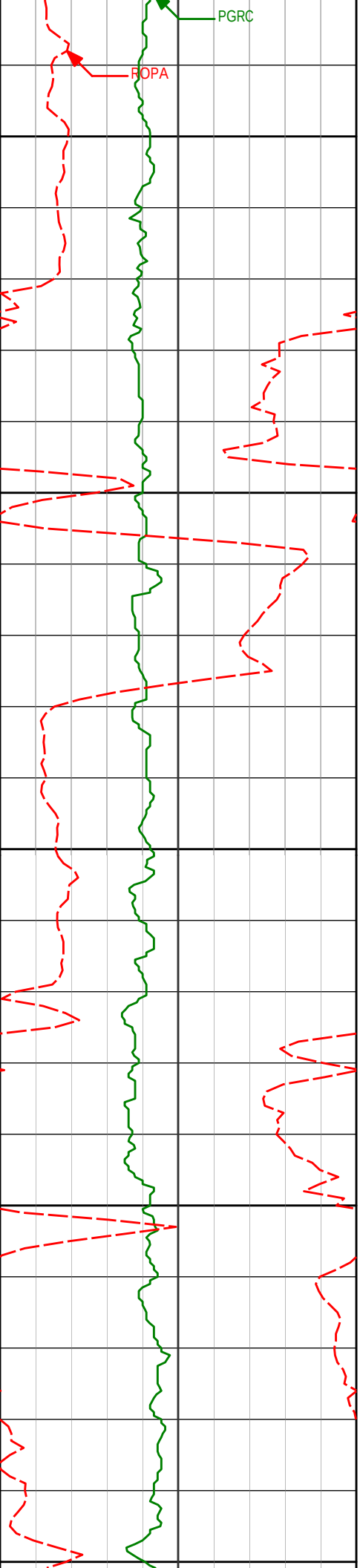
3452'	12.19°	88.75°	3447.24'	-67.66'
3547'	13.58°	90.94°	3539.85'	-88.84'
3642'	14.51°	90.95°	3632.01'	-111.88'



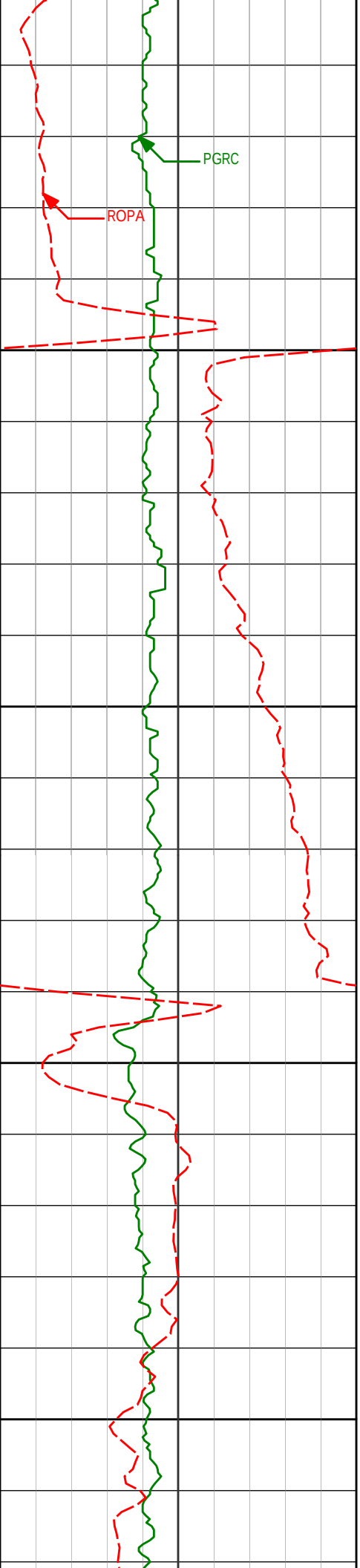
3737'	11.84°	79.02°	3724.51'	-133.39'
3832'	8.30°	74.61°	3818.04'	-149.65'



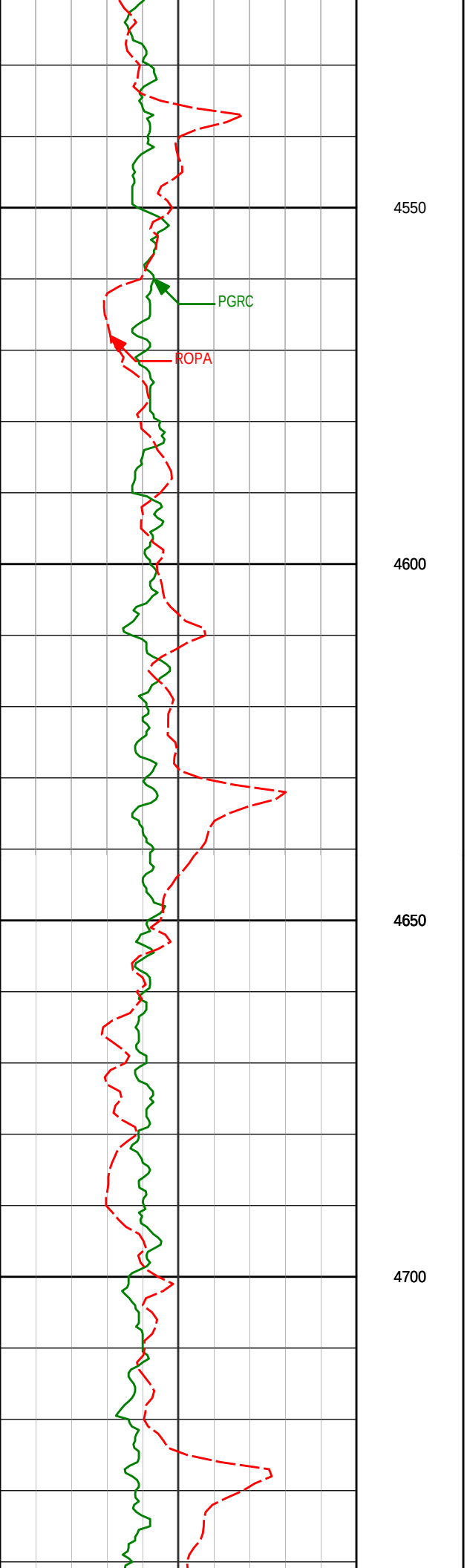
3927'	6.01°	76.05°	3912.29'	-161.15'
4022'	2.66°	84.05°	4007.01'	-168.20'



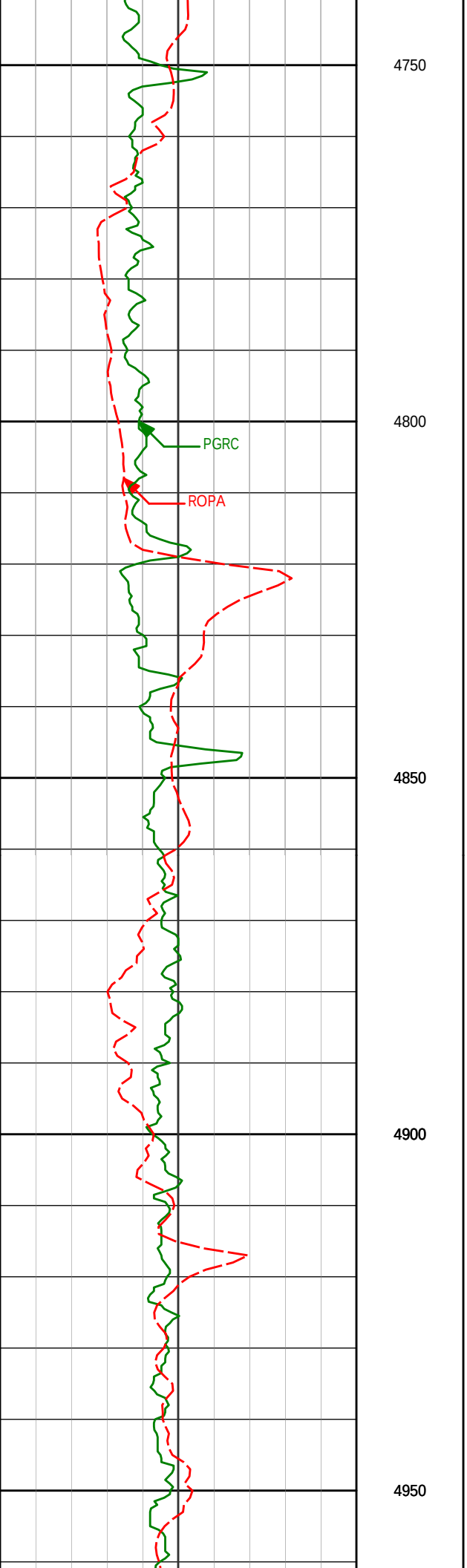
4117'	2.03°	83.50°	4101.93'	-172.06'
4212'	0.48°	32.33°	4196.90'	-173.95'
4307'	1.06°	333.50°	4291.90'	-173.80'



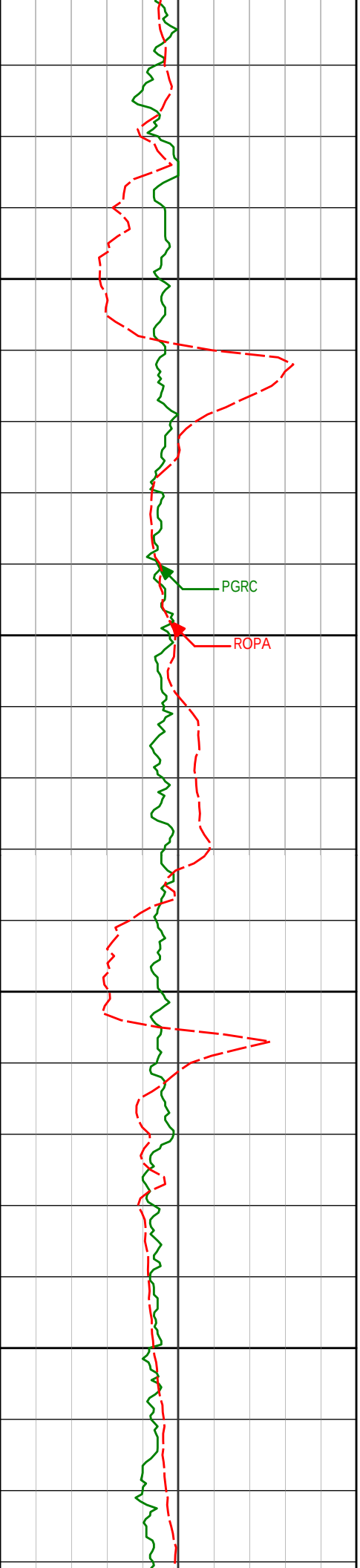
4402'	1.26°	332.27°	4386.88'	-172.96'
4497'	0.95°	344.39°	4481.86'	-172.30'



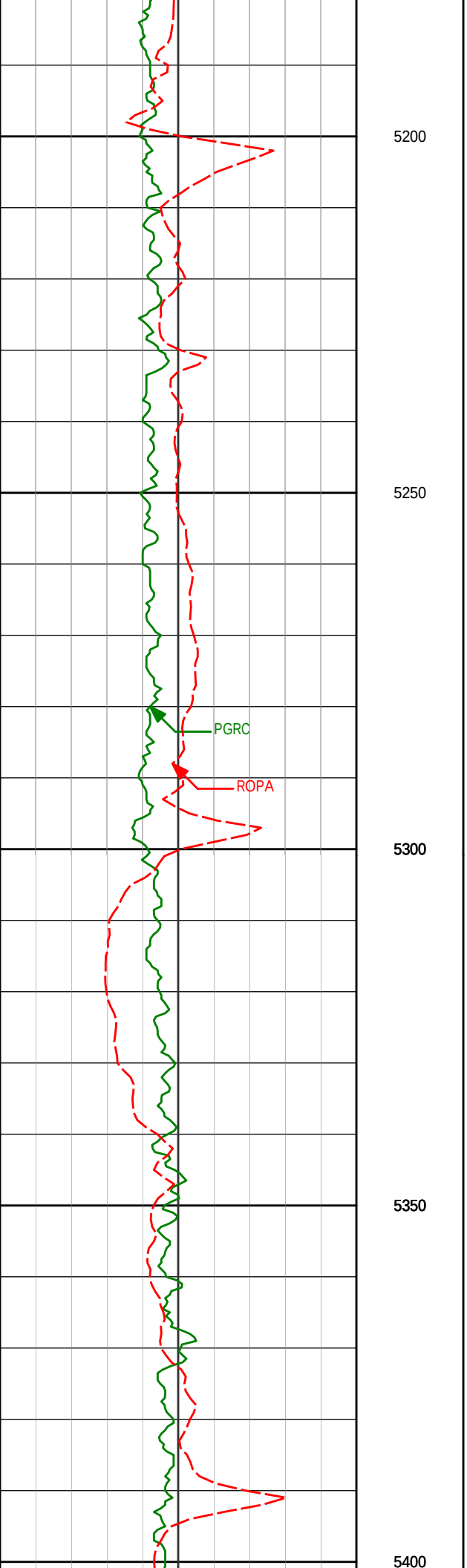
4592'	0.98°	358.95°	4576.85'	-172.10'
4687'	0.81°	342.30°	4671.83'	-171.91'



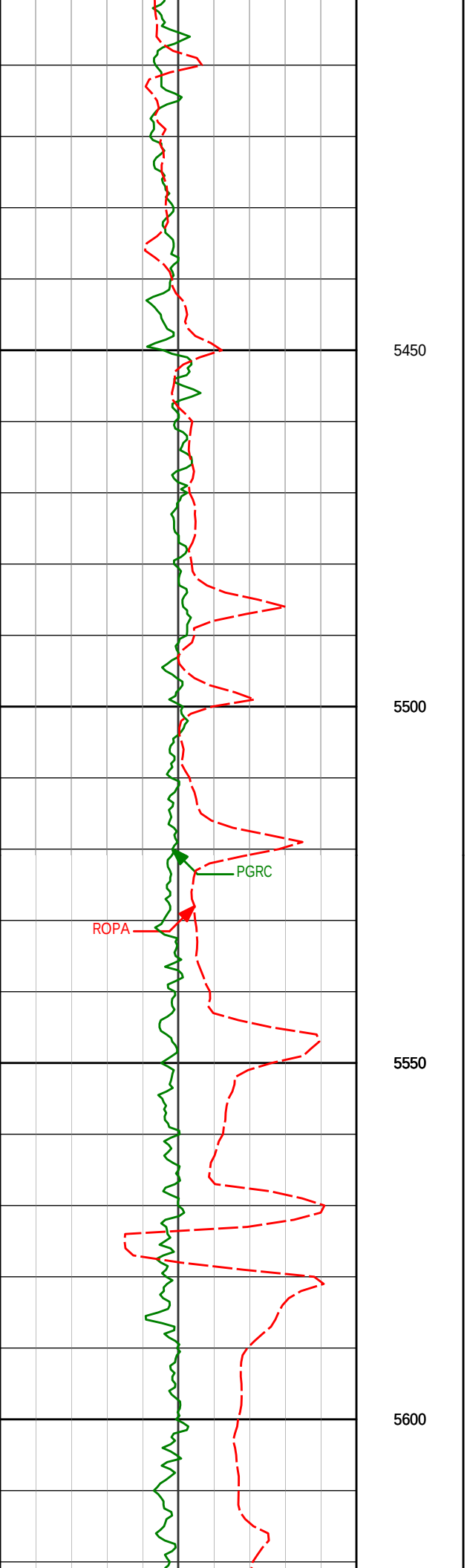
4782'	1.00°	353.15°	4766.82'	-171.64'
4877'	0.77°	355.56°	4861.81'	-171.52'
4972'	0.47°	16.61°	4956.81'	-171.61'



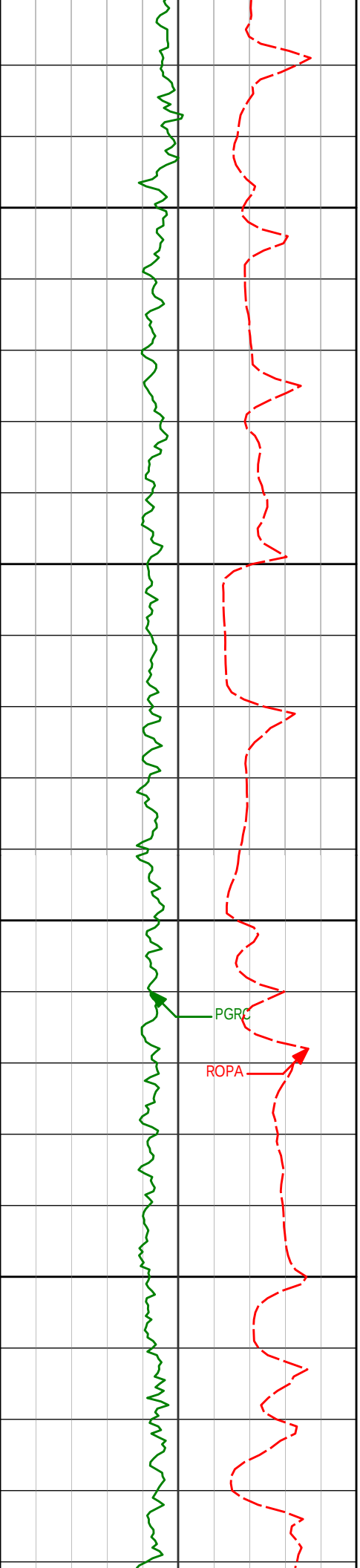
5000					
5050	5067'	0.42°	288.41°	5051.80'	-171.40'
5100					
5150	5162'	0.51°	272.48°	5146.80'	-170.65'



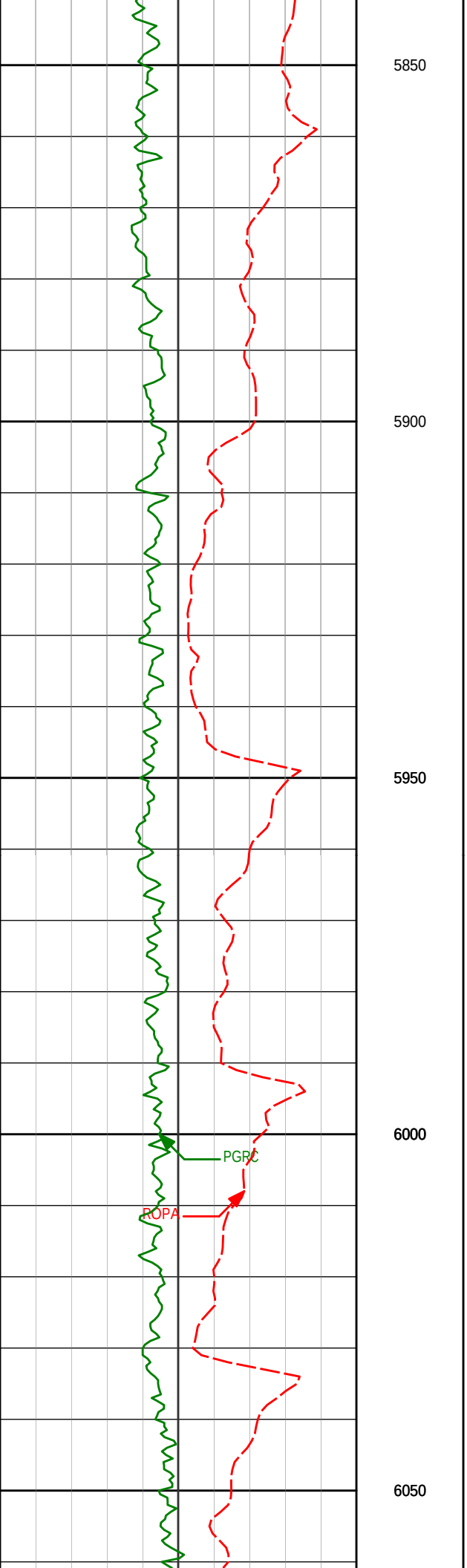
5256'	0.34°	194.89°	5240.80'	-170.16'
5351'	0.73°	188.23°	5335.79'	-169.98'



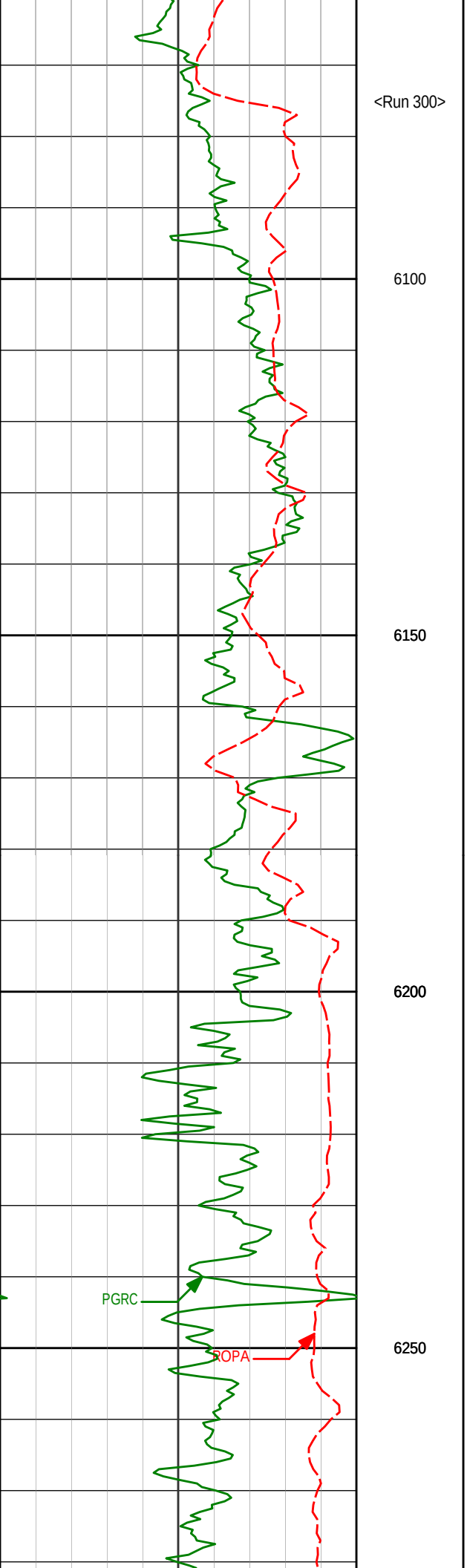
5446'	1.16°	195.13°	5430.78'	-169.61'
5541'	1.43°	203.68°	5525.76'	-168.84'
5589'	3.41°	248.33°	5573.71'	-167.25'
5636'	7.28°	258.30°	5620.50'	-163.02'



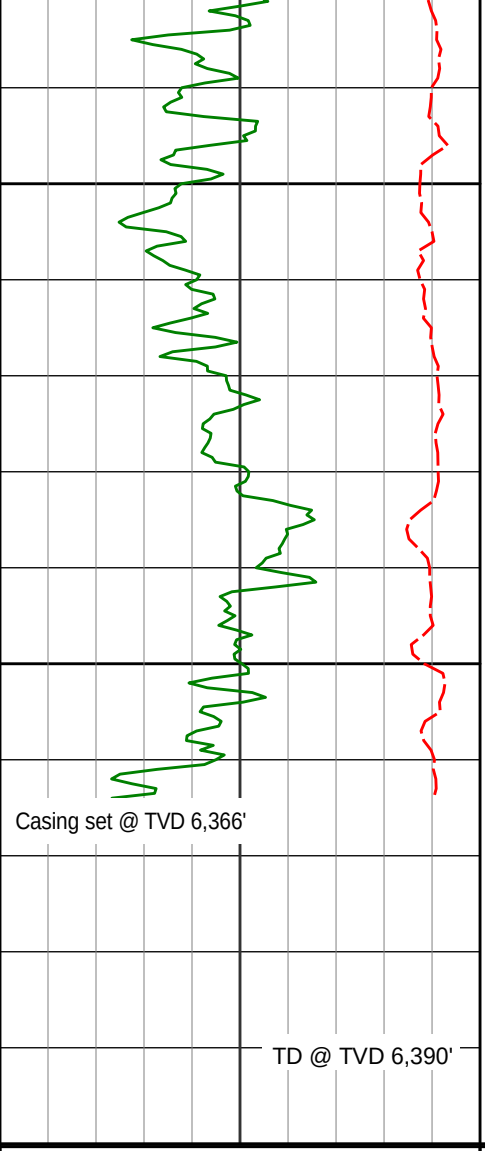
5684'	9.49°	263.45°	5667.99'	-156.08'
5731'	11.45°	266.09°	5714.20'	-147.56'
5779'	14.36°	263.91°	5760.98'	-136.87'
5826'	16.56°	266.95°	5806.28'	-124.36'



5921'	20.24°	272.41°	5896.41'	-94.42'
5969'	21.80°	271.49°	5941.22'	-77.23'
6016'	24.13°	271.18°	5984.49'	-58.91'
6064'	26.70°	269.95°	6027.84'	-38.32'



6111'	29.86°	269.31°	6069.23'	-16.06'
6159'	34.09°	269.05°	6109.93'	9.36'
6206'	38.82°	269.00°	6147.73'	37.28'
6254'	40.87°	271.19°	6184.58'	68.02'
6301'	45.45°	271.01°	6218.86'	100.13'
6349'	51.86°	271.25°	6250.55'	136.12'
6396'	57.71°	270.27°	6277.64'	174.48'



Depth	Inc.	Azi.	TVD	V.S.
6444'	64.12°	267.75°	6300.96'	216.40'
6491'	68.80°	268.01°	6319.73'	259.47'
6539'	73.22°	268.90°	6335.35'	304.84'
6586'	76.41°	269.90°	6347.66'	350.19'
6634'	79.81°	270.65°	6357.55'	397.14'
6679'	85.57°	269.94°	6363.27'	441.74'

6300
6350
6400
Depth
ft

Avg Rate of Penetration
ROPA
500 feet per hr 0

PCG Gamma Ray
PGRC
0 api 300

INSITE

HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
Bronco State AF10-64-1HN
Wattenberg
Weld Colorado
USA
CA-XX-0900206159

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
587.00	0.00	0.00	587.00	0.00 N	0.00 E	0.00	0.00
654.00	0.32	227.41	654.00	0.13 S	0.14 W	0.14	0.48
717.00	0.18	272.43	717.00	0.24 S	0.37 W	0.38	0.37
810.00	0.65	202.62	810.00	0.72 S	0.72 W	0.74	0.66
904.00	0.86	198.42	903.99	1.88 S	1.15 W	1.19	0.23
997.00	0.70	199.28	996.98	3.08 S	1.56 W	1.62	0.17
1089.00	0.70	201.33	1088.97	4.13 S	1.95 W	2.03	0.03

1183.00	0.50	227.62	1182.97	4.94 S	2.46 W	2.56	0.35
1276.00	0.60	218.77	1275.96	5.59 S	3.06 W	3.18	0.14
1460.00	0.61	220.60	1459.95	7.08 S	4.30 W	4.45	0.01
1555.00	0.50	183.16	1554.95	7.88 S	4.65 W	4.82	0.39
1650.00	0.37	176.32	1649.95	8.61 S	4.66 W	4.84	0.15
1745.00	1.05	197.47	1744.94	9.74 S	4.90 W	5.10	0.75
1852.00	0.62	213.73	1851.93	11.15 S	5.51 W	5.74	0.46
1946.00	0.64	187.67	1945.92	12.09 S	5.86 W	6.11	0.30
2039.00	0.85	143.74	2038.92	13.16 S	5.53 W	5.80	0.63
2225.00	0.82	136.57	2224.90	15.23 S	3.80 W	4.11	0.06
2318.00	1.37	128.60	2317.88	16.41 S	2.47 W	2.81	0.61
2410.00	1.74	121.22	2409.84	17.82 S	0.41 W	0.78	0.46
2502.00	2.03	64.00	2501.80	17.83 S	2.24 E	-1.87	1.98
2597.00	1.54	49.47	2596.76	16.27 S	4.72 E	-4.38	0.70
2692.00	1.11	48.55	2691.73	14.83 S	6.38 E	-6.07	0.45
2787.00	1.39	25.52	2786.71	13.18 S	7.57 E	-7.30	0.60
2882.00	1.64	7.88	2881.68	10.79 S	8.25 E	-8.03	0.55
2977.00	1.71	58.58	2976.64	8.71 S	9.65 E	-9.47	1.51
3072.00	3.41	91.91	3071.55	8.07 S	13.68 E	-13.51	2.31
3167.00	5.95	98.45	3166.22	8.88 S	21.38 E	-21.19	2.73
3262.00	8.33	87.64	3260.48	9.33 S	33.13 E	-32.93	2.87
3357.00	10.81	88.76	3354.15	8.85 S	48.92 E	-48.72	2.61
3452.00	12.19	88.75	3447.24	8.44 S	67.85 E	-67.66	1.45
3547.00	13.58	90.94	3539.85	8.40 S	89.03 E	-88.84	1.55
3642.00	14.51	90.95	3632.01	8.78 S	112.09 E	-111.88	0.98
3737.00	11.84	79.02	3724.51	7.13 S	133.57 E	-133.39	4.00
3832.00	8.30	74.61	3818.04	3.45 S	149.75 E	-149.65	3.81
3927.00	6.01	76.05	3912.29	0.43 S	161.19 E	-161.15	2.41
4022.00	2.66	84.05	4007.01	1.00 N	168.21 E	-168.20	3.58
4117.00	2.03	83.50	4101.93	1.42 N	172.07 E	-172.06	0.67
4212.00	0.48	32.33	4196.90	1.94 N	173.95 E	-173.95	1.86
4307.00	1.06	333.50	4291.90	3.06 N	173.77 E	-173.80	0.96
4402.00	1.26	332.27	4386.88	4.77 N	172.90 E	-172.96	0.21
4497.00	0.95	344.39	4481.86	6.45 N	172.20 E	-172.30	0.40
4592.00	0.98	358.95	4576.85	8.02 N	171.97 E	-172.10	0.26
4687.00	0.81	342.30	4671.83	9.47 N	171.76 E	-171.91	0.33
4782.00	1.00	353.15	4766.82	10.93 N	171.45 E	-171.64	0.27
4877.00	0.77	355.56	4861.81	12.40 N	171.30 E	-171.52	0.24
4972.00	0.47	16.61	4956.81	13.41 N	171.37 E	-171.61	0.40
5067.00	0.42	288.41	5051.80	13.89 N	171.15 E	-171.40	0.65
5162.00	0.51	272.48	5146.80	14.02 N	170.40 E	-170.65	0.16
5256.00	0.34	194.89	5240.80	13.77 N	169.91 E	-170.16	0.58
5351.00	0.73	188.23	5335.79	12.90 N	169.75 E	-169.98	0.42
5446.00	1.16	195.13	5430.78	11.37 N	169.41 E	-169.61	0.46
5541.00	1.43	203.68	5525.76	9.35 N	168.68 E	-168.84	0.35
5589.00	3.41	248.33	5573.71	8.28 N	167.12 E	-167.25	5.40
5636.00	7.28	258.30	5620.50	7.16 N	162.90 E	-163.02	8.45
5684.00	9.49	263.45	5667.99	6.09 N	155.99 E	-156.08	4.86
5731.00	11.45	266.09	5714.20	5.33 N	147.48 E	-147.56	4.30
5779.00	14.36	263.91	5760.98	4.37 N	136.81 E	-136.87	6.14
5826.00	16.56	266.95	5806.28	3.40 N	124.32 E	-124.36	4.98
5921.00	20.24	272.41	5896.41	3.37 N	94.37 E	-94.42	4.27
5969.00	21.80	271.49	5941.22	3.95 N	77.16 E	-77.23	3.33
6016.00	24.13	271.18	5984.49	4.37 N	58.83 E	-58.91	4.95
6064.00	26.70	269.95	6027.84	4.57 N	38.23 E	-38.32	5.48
6111.00	29.86	269.31	6069.23	4.42 N	15.97 E	-16.06	6.76
6159.00	34.09	269.05	6109.93	4.05 N	9.44 W	9.36	8.82
6206.00	38.82	269.00	6147.73	3.57 N	37.36 W	37.28	10.06
6254.00	40.87	271.19	6184.58	3.63 N	68.11 W	68.02	5.17
6301.00	45.45	271.01	6218.86	4.24 N	100.24 W	100.13	9.75
6349.00	51.86	271.25	6250.55	4.96 N	136.25 W	136.12	13.36
6396.00	57.71	270.27	6277.64	5.45 N	174.63 W	174.48	12.57
6444.00	64.12	267.75	6300.96	4.70 N	216.54 W	216.40	14.11
6491.00	68.80	268.01	6319.73	3.11 N	259.59 W	259.47	9.97
6539.00	73.22	268.90	6335.35	1.89 N	304.95 W	304.84	9.38
6586.00	76.41	269.90	6347.66	1.41 N	350.30 W	350.19	7.09
6634.00	79.81	270.65	6357.55	1.64 N	397.26 W	397.14	7.25
6679.00	85.57	269.94	6363.27	1.87 N	441.88 W	441.74	12.90
6803.00	89.69	268.94	6368.39	0.65 N	565.74 W	565.60	3.42
6897.00	89.17	267.86	6369.33	1.97 S	659.69 W	659.59	1.27
6990.00	90.96	268.56	6369.23	4.88 S	752.64 W	752.58	2.07
7083.00	91.91	268.92	6366.90	6.92 S	845.59 W	845.55	1.10
7176.00	90.52	268.25	6364.93	9.22 S	938.54 W	938.53	1.66
7269.00	89.26	268.09	6365.11	12.18 S	1031.49 W	1031.52	1.37
7362.00	88.64	267.85	6366.81	15.47 S	1124.41 W	1124.49	0.72

7456.00	90.46	268.30	6367.55	18.63 S	1218.35 W	1218.48	2.00
7549.00	90.40	268.40	6366.85	21.31 S	1311.31 W	1311.47	0.12
7642.00	88.80	268.15	6367.50	24.11 S	1404.27 W	1404.46	1.75
7734.00	89.75	268.02	6368.66	27.19 S	1496.21 W	1496.45	1.05
7828.00	89.81	267.83	6369.02	30.59 S	1590.14 W	1590.44	0.21
7921.00	89.78	270.62	6369.34	31.85 S	1683.12 W	1683.42	3.00
8014.00	88.58	268.74	6370.67	32.38 S	1776.11 W	1776.40	2.40
8106.00	88.61	267.91	6372.92	35.07 S	1868.04 W	1868.37	0.90
8199.00	89.51	267.73	6374.45	38.61 S	1960.96 W	1961.34	0.98
8293.00	90.93	267.51	6374.09	42.52 S	2054.88 W	2055.31	1.53
8388.00	90.28	268.02	6373.10	46.22 S	2149.80 W	2150.29	0.87
8483.00	88.55	268.37	6374.07	49.21 S	2244.74 W	2245.28	1.85
8578.00	87.97	268.77	6376.96	51.58 S	2339.67 W	2340.23	0.74
8673.00	88.09	269.32	6380.23	53.17 S	2434.60 W	2435.18	0.59
8768.00	88.49	269.27	6383.07	54.35 S	2529.55 W	2530.13	0.43
8863.00	91.08	269.69	6383.43	55.21 S	2624.53 W	2625.11	2.76
8958.00	90.74	270.11	6381.92	55.37 S	2719.52 W	2720.08	0.57
9053.00	89.48	269.06	6381.74	56.06 S	2814.52 W	2815.07	1.73
9148.00	89.75	268.36	6382.38	58.20 S	2909.49 W	2910.07	0.79
9243.00	90.71	267.88	6382.00	61.31 S	3004.44 W	3005.06	1.13
9338.00	90.12	267.18	6381.31	65.41 S	3099.34 W	3100.03	0.96
9433.00	89.01	268.52	6382.02	68.97 S	3194.27 W	3195.01	1.83
9528.00	89.51	268.12	6383.25	71.75 S	3289.22 W	3290.00	0.67
9623.00	90.06	267.50	6383.61	75.37 S	3384.15 W	3384.99	0.88
9718.00	90.15	268.12	6383.43	78.99 S	3479.08 W	3479.97	0.66
9812.00	89.38	269.06	6383.81	81.30 S	3573.05 W	3573.97	1.29
9908.00	89.97	268.53	6384.35	83.32 S	3669.03 W	3669.97	0.82
10003.00	90.74	268.76	6383.76	85.56 S	3764.00 W	3764.96	0.85
10097.00	90.80	269.37	6382.50	87.10 S	3857.98 W	3858.95	0.66
10192.00	89.11	269.66	6382.57	87.90 S	3952.97 W	3953.94	1.81
10287.00	88.52	268.27	6384.54	89.61 S	4047.93 W	4048.92	1.59
10382.00	89.51	268.12	6386.18	92.60 S	4142.87 W	4143.90	1.05
10477.00	89.38	266.87	6387.10	96.76 S	4237.77 W	4238.87	1.32
10572.00	88.74	265.73	6388.65	102.89 S	4332.56 W	4333.76	1.38
10640.00	89.29	265.43	6389.82	108.13 S	4400.35 W	4401.64	0.93
10705.00	89.29	265.43	6390.63	113.30 S	4465.13 W	4466.52	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 CLOSURE OF 268.55 DEGREES (GRID)
A TOTAL CORRECTION OF 7.66 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED

HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 10705.00 FEET
IS 4466.57 FEET ALONG 268.55 DEGREES (GRID)

Date Printed:27 March 2013