HALLIBURTON | Sperry Drilling

PCGK - Pressure Case Gamma
PCDC - Pressure Case Directional

Powered by INSITE™

1 : 240

Country : USA
Field : Wattenberg
Location : Lat: 40° 9' 29.29" North Long: 104° 52' 44.12" West
Well : Butterball 29C-15HZ
Company : Anadarko Petroleum Corp.
Rig : Xtreme 22

Company : **Anadarko Petroleum Corp.**
Rig : **Xtreme 22**
Well : **Butterball 29C-15HZ**
Field : **Wattenberg**
Country : **USA**
API Number : **00051233790800**

LOCATION
Latitude : **40° 9' 29.29" North**
Longitude : **104° 52' 44.12" West**
UTM Easting = **3,173,592.283 ft**
UTM Northing = **1,301,060.120 ft**

Other Services
Directional Drilling

Permanent Datum : **Ground Level**
Elevation : **4935.00 ft**
Log Measured From : **Drill Floor** **16.00 ft** Above Permanent Datum
Drilling Measured From : **Drill Floor**

TVD LOG

Elev. KB **4951.00 ft**
DF **4952.00 ft**
GL **4935.00 ft**
WD **N/A**

Depth Logged : **991.99 ft** To **7,503.68 ft**
Date Logged : **13-Oct-13** To **16-Oct-13**
Total Depth MD : **7,983.00 ft** TVD : **7,503.68 ft**
Spud Date : **12-Oct-13**

Unit No. : **11610117**
Job No. : **CA-XX-0900754404**
Plot Type : **Final**
Plot Date : **17-Oct-13**

Run No.	Borehole Record (TVD) Size	From	To
100	8.750 in	991.99 ft	7,503.51 ft

Run No.	Borehole Record (TVD) Size	From	To

Casing Record (TVD) Size	Weight	From	To
9.650	36.00	0.00	1033.00

WELL INFORMATION

MWD Run Number	100
Date run completed	16-Oct-13
Rig Bit Number	100
Bit Size (in)	8.750
Tool Nominal OD (in)	6.750
Log Start Depth (MD, ft)	992.00
Log End Depth (MD, ft)	7,948.00
Drill or Wipe	Drill
Drill/Wipe Start Date and Time	13-Oct-13 17:53
Drill/Wipe End Date and Time	16-Oct-13 17:53
Min Inc (deg) @ Depth (MD, ft)	0.34 @ 6,900.00
Max Inc (deg) @ Depth (MD, ft)	86.11 @ 7,900.00
Bit TFA(in2) / Bit Type	PDC / 1.04
Flow Rate (gpm)	574.08
Max AV (fpm) / CV (fpm) @ MWD	N/A / N/A
Fluid Type	Native/Spud Mud
Density (ppg) / Viscosity (spqt)	8.30 / 27.00
Filtrate CL (ppm)	1,200.00
pH / Fluid Loss (mptm)	8.90 / 0
PV (cP) / YP (lhf2)	15 / 1.00
% Solids / % Sand	1.5 / .03
% Oil / Oil:Water Ratio	1.5 / 91
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	177.64 / PCM				
Rm @ Max Tool Temp (degF)	N/A @ 177.64				
Lead MWD Engineer	Reuben Edgington				
Customer Representative	Dave Cornett				

SENSOR INFORMATION

Directional Sensor Information

Tool Type	PCDC				
Distance From Bit (ft)	48.00				
Software Version	6.21				
Sub Serial Number	11404261				
Sonde Serial Number	11297555				
Sensor ID Number	N/A				
Toolface Offset (deg)	207.01				

Gamma Ray Sensor Information

Tool Type	PCG				
Distance From Bit (ft)	51.18				
Recorded Sample Period (sec)	10				
Software Version	8.15				
Sub Serial Number	11404261				
Insert/Sonde Serial Number	12035849				

Pulser Controller Sensor Information

Tool Type	PCM				
Software Version	5.76				
PIC Software Version	1.40				
Sub/HOC Serial Number	11404261				
Insert/Probe/Module SN	11400901				
Battery Serial Number	N/A				
Valve Insert SN	N/A				
DC Insert Serial Number	N/A				
Choke Size (32nd)	N/A				
Driver Current (amps)	N/A				
Driver SMI Current (amps)	N/A				
Boot Strap Version	4,130.00				

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 correction have been made for pipe stretch or compression.

3.Critical annular velocities are calculated using the "power law" model for water based fluides.

4. Run 100 were drilled with directional data only.

5. All data presented is recorded data unless otherwise specified.

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

PCGR (Corrected Gamma Ray):
Interval Resolution: 0.5 ft
Interval Distance: 0.6 ft
Gap Fill: 3.0 ft

Insite version: 8.0.0

Insite version: 8.0.0

WARRANTY

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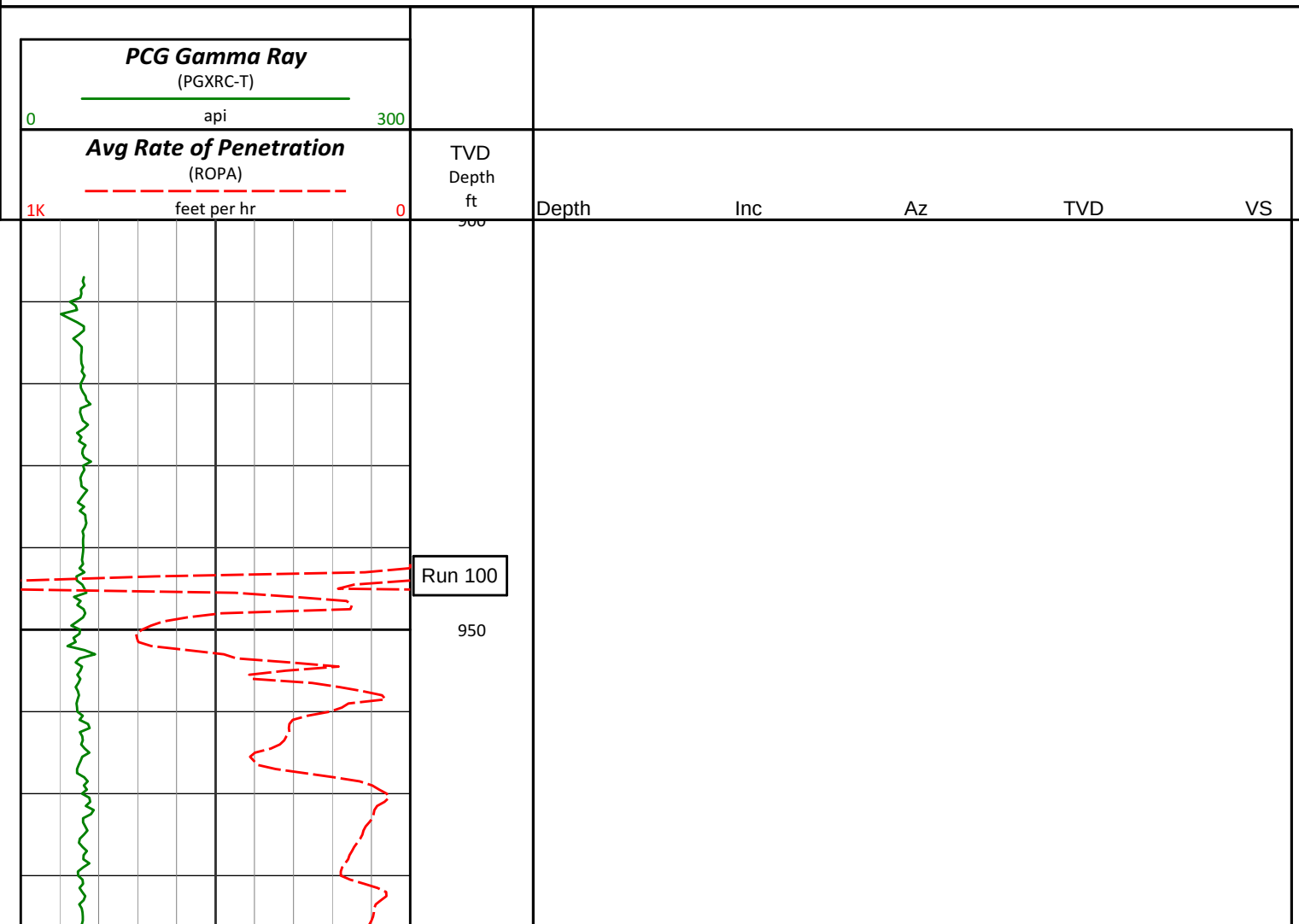
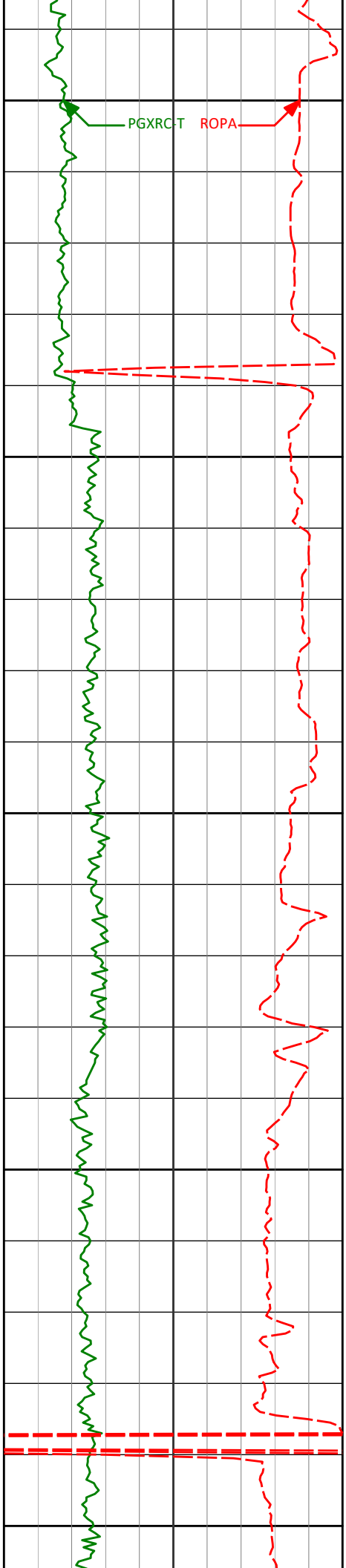
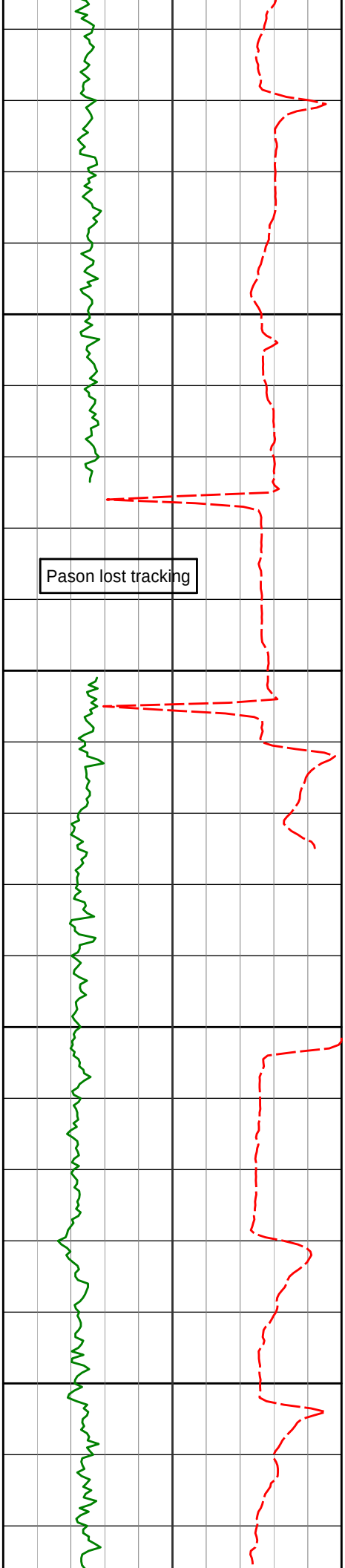
HALLIBURTON
Sperry Drilling Services
TVD Detail Log 1:240

Anadarko
Butterball 29C-15HZ
Xtreme 22
T2N-R67W

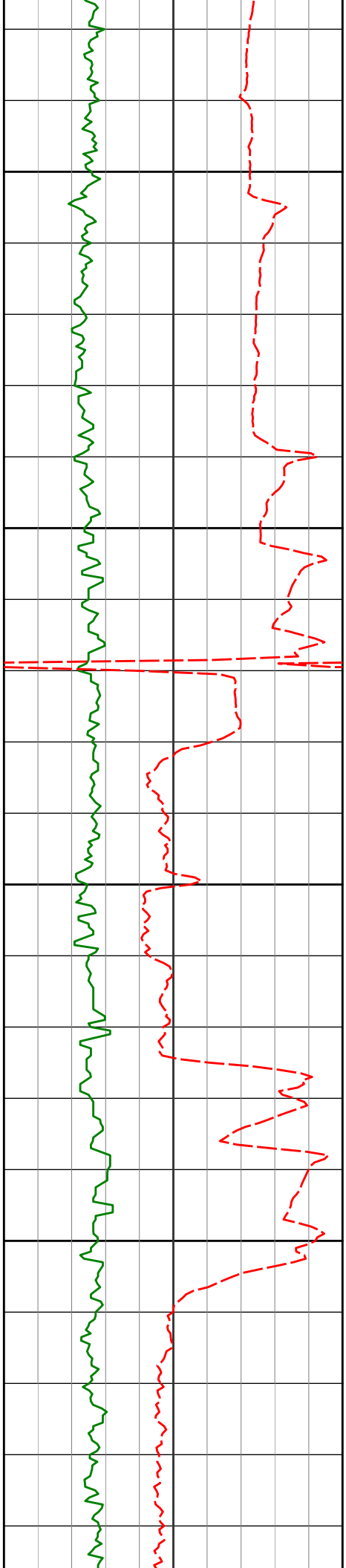




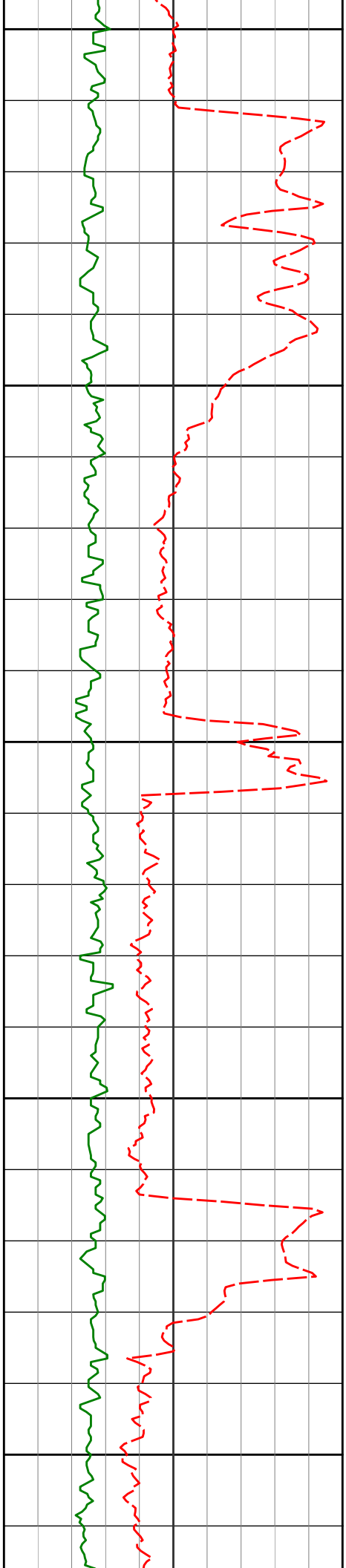
1083	0.82	273.66	1082.98	-1.29
1174	0.99	274.20	1173.97	-1.39



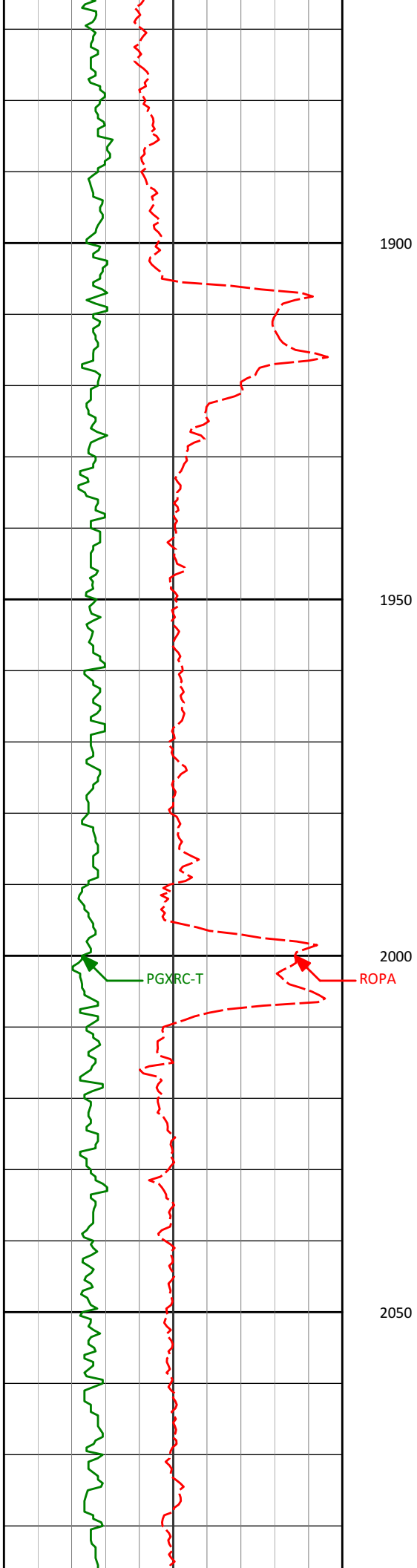
1266	1.10	275.90	1265.95	-1.54
1359	1.13	206.86	1358.94	-0.82



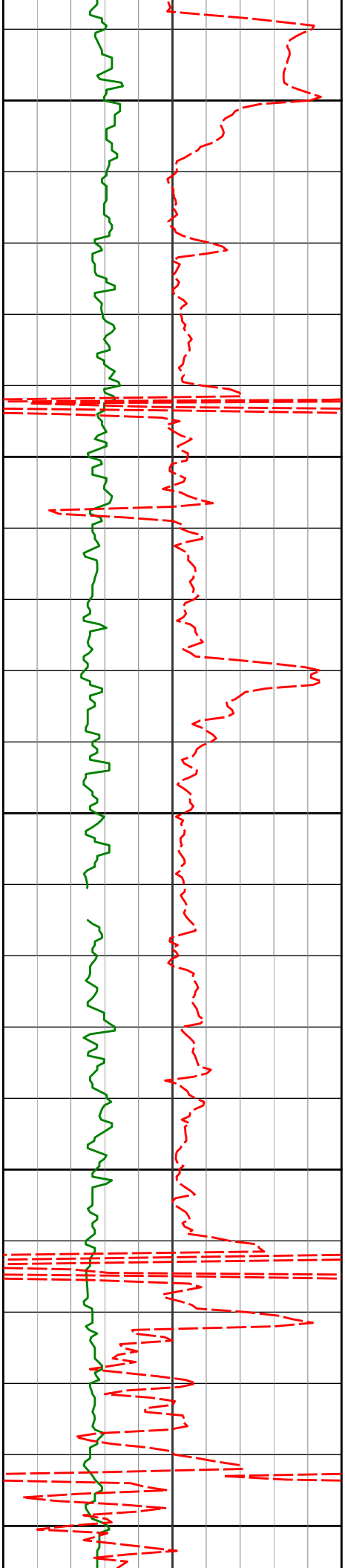
1444	1.44	210.42	1443.92	0.85
1530	1.74	249.04	1529.89	2.25
1615	3.02	272.46	1614.81	2.61



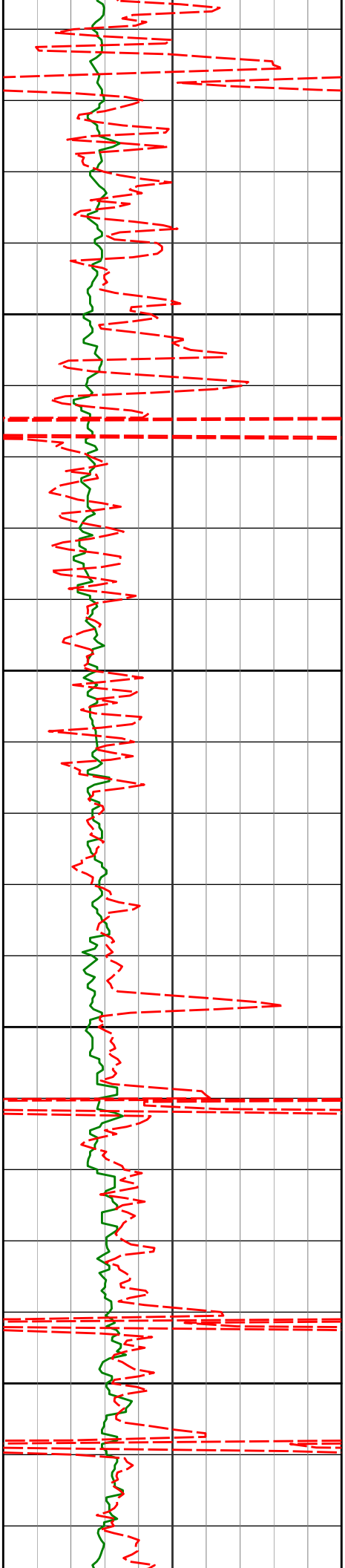
1701	4.87	282.99	1700.61	1.68
1860	7.86	279.75	1858.61	-1.72



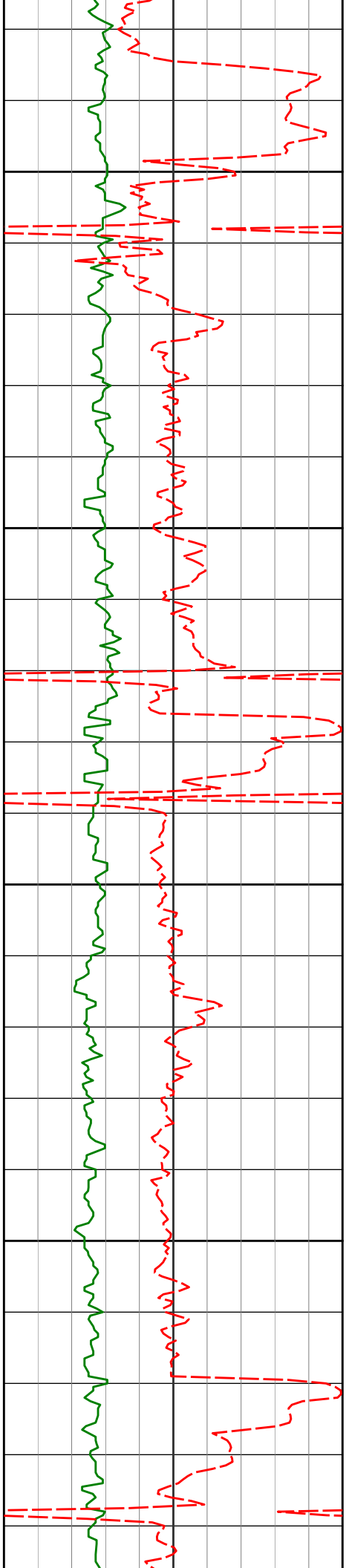
1952	9.51	283.93	1949.55	-4.65
2044	10.36	277.98	2040.17	-7.66



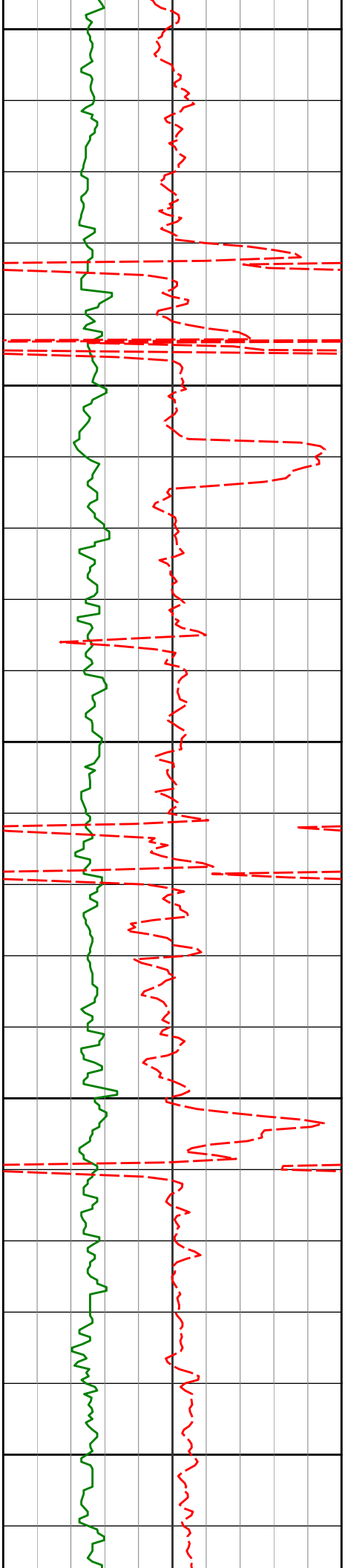
2137	11.07	266.70	2131.56	-8.36
2228	10.67	265.08	2220.93	-7.18



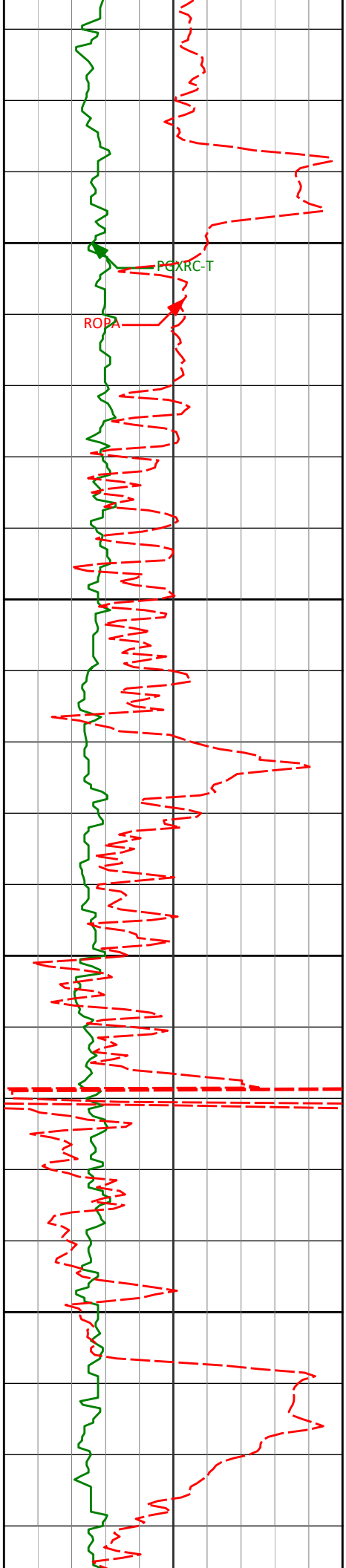
2320	10.36	266.97	2311.39	-6.06
2413	9.85	267.65	2402.94	-5.33
2505	9.18	266.99	2493.68	-4.66



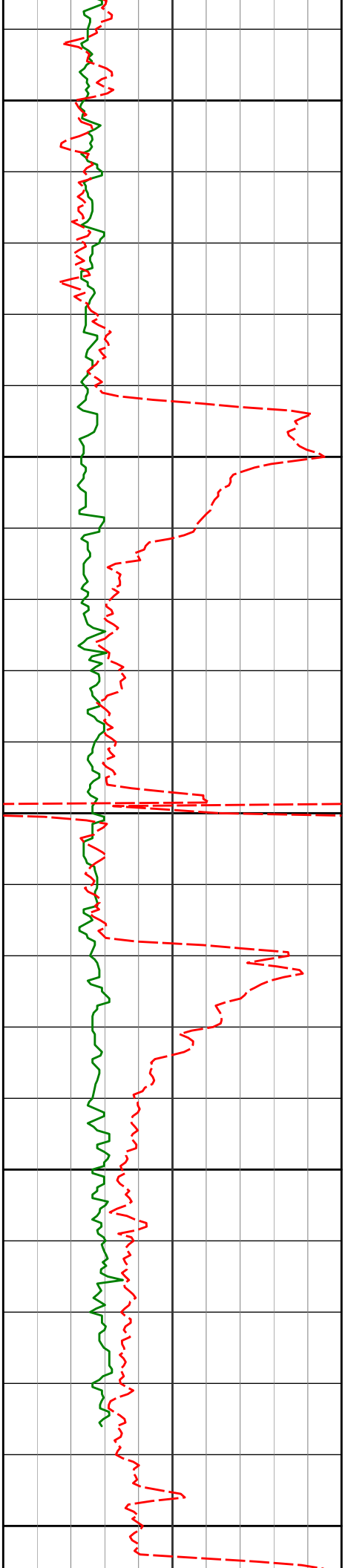
2597	10.07	266.86	2584.38	-3.87
2689	9.84	268.51	2675.00	-3.27



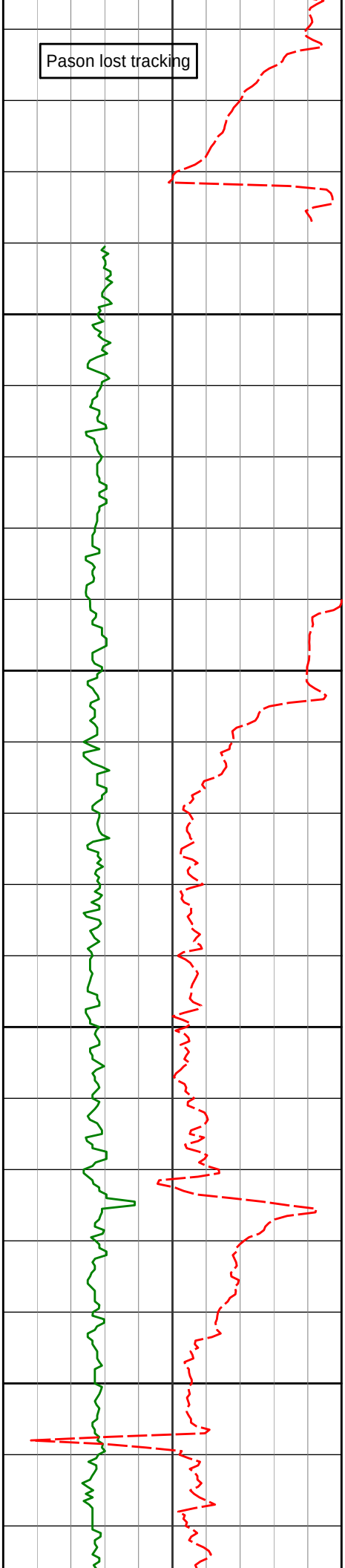
2781	9.90	269.24	2765.63	-3.00
2873	9.83	270.30	2856.27	-2.96
2959	9.37	270.10	2941.07	-3.02



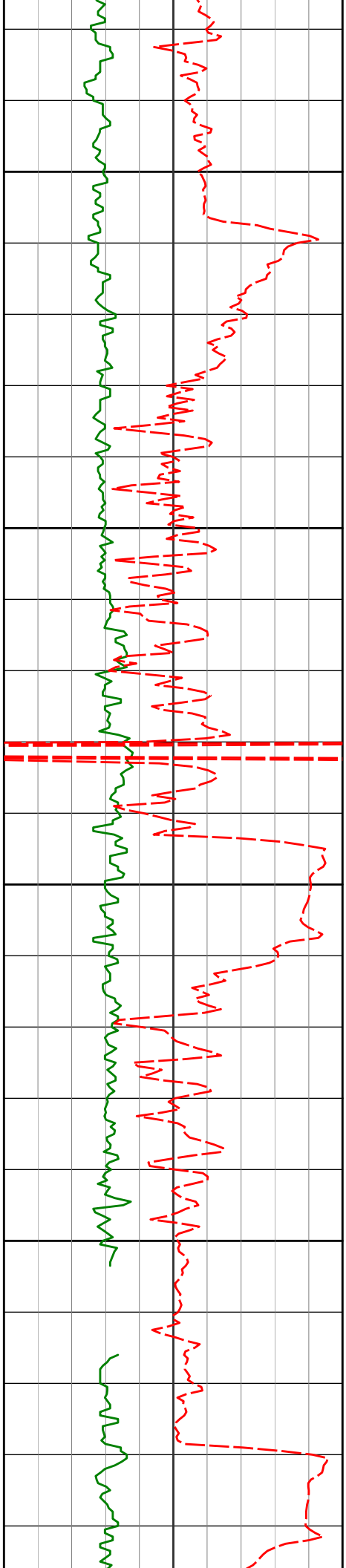
3045	10.20	266.40	3025.82	-2.60
3130	9.69	265.85	3109.54	-1.64



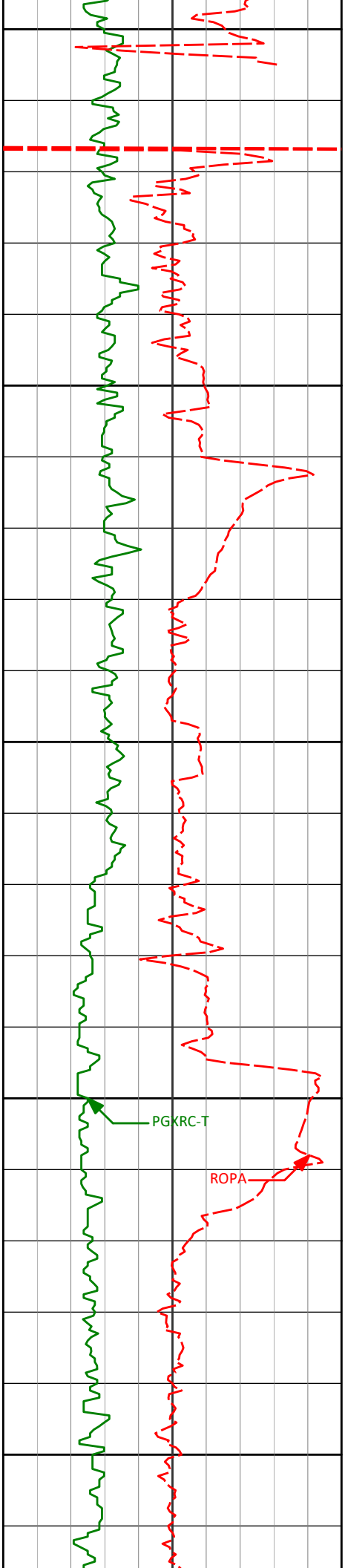
3215	9.97	269.39	3193.29	-1.08
3301	10.25	270.77	3277.96	-1.15
3387	9.50	271.72	3362.68	-1.50



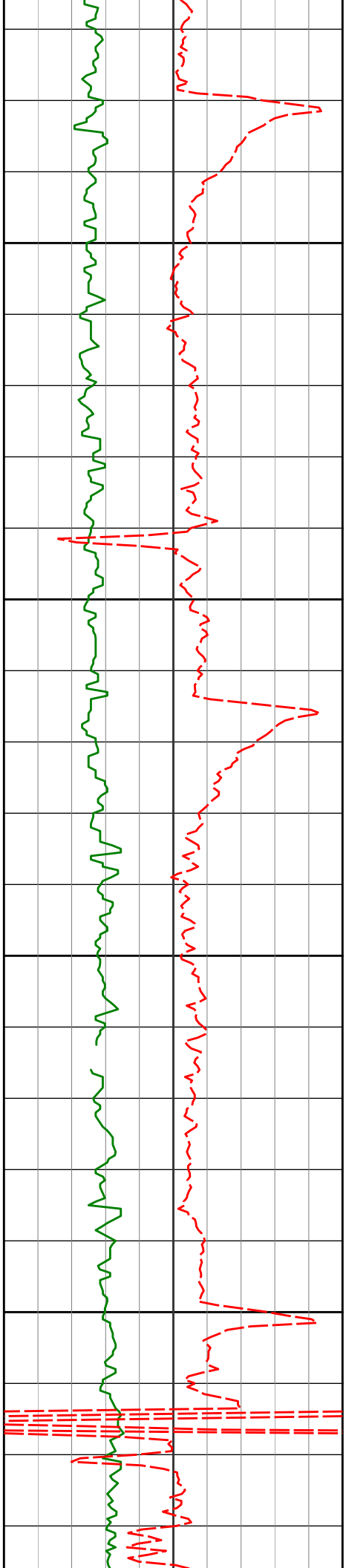
3472	9.79	273.13	3446.48	-2.14
3558	11.36	268.74	3531.02	-2.40
3643	10.56	265.55	3614.47	-1.65



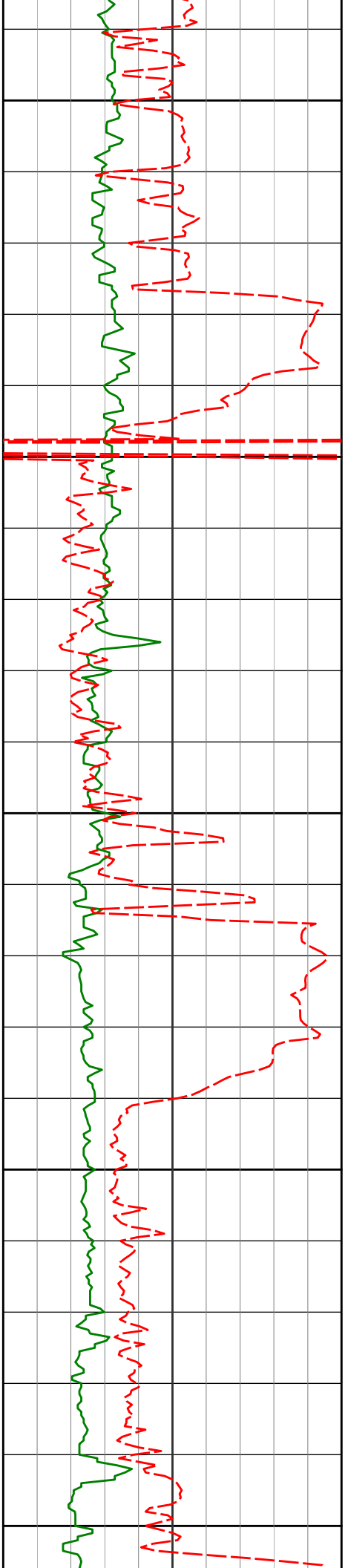
3729	9.66	264.48	3699.13	-0.38
3815	9.42	270.27	3783.95	0.24



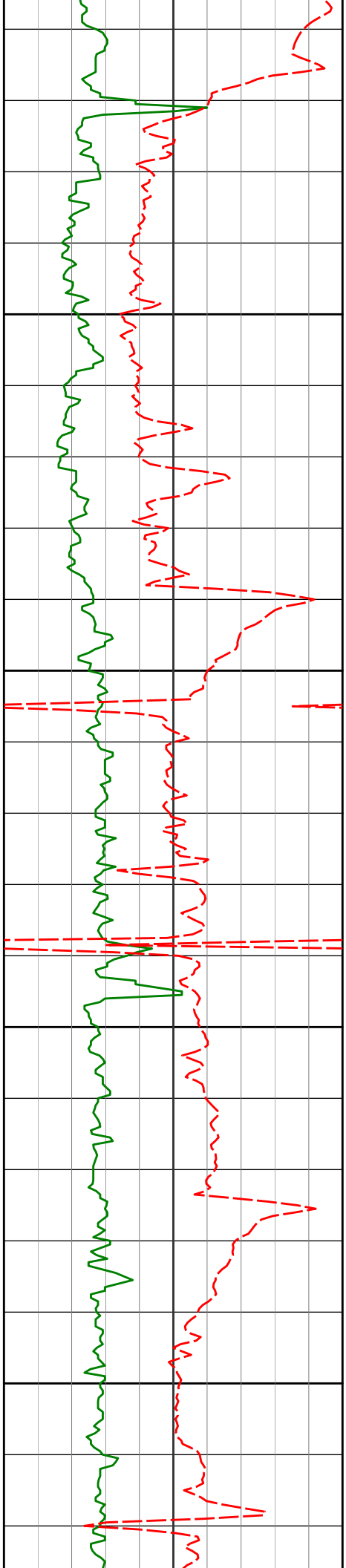
3900	10.14	277.38	3867.71	-0.79
3986	9.23	277.71	3952.49	-2.73
4071	10.04	274.13	4036.29	-4.21



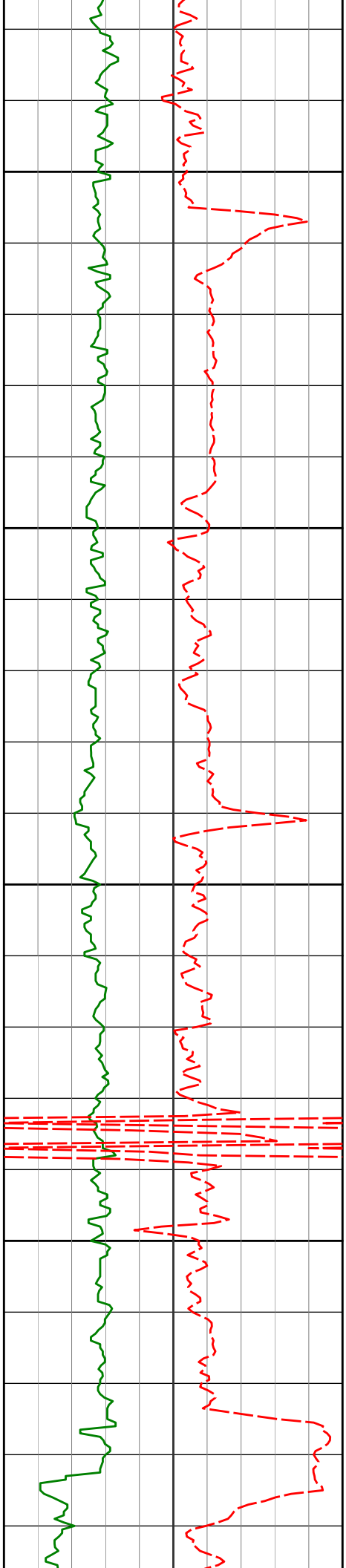
4157	9.83	273.42	4121.00	-5.23
4243	9.51	273.02	4205.78	-6.08



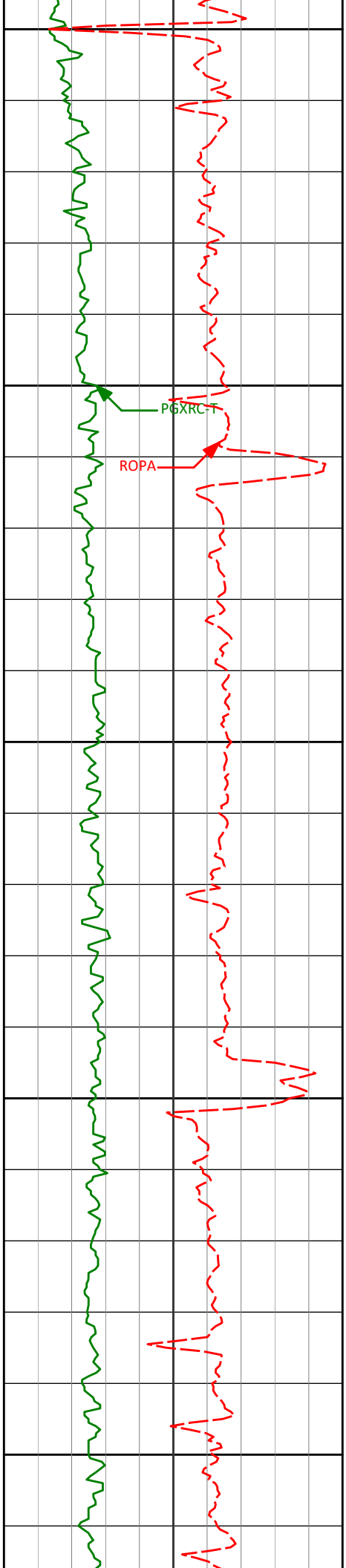
4329	8.53	273.16	4290.71	-6.84
4414	9.02	272.96	4374.72	-7.56
4500	9.83	274.61	4459.55	-8.53



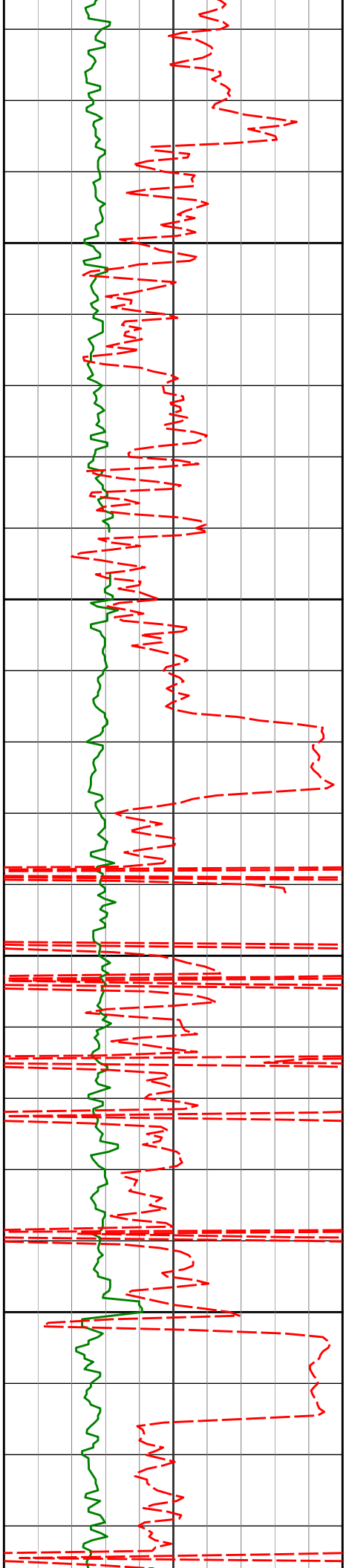
4586	10.87	273.63	4544.15	-9.68
4671	10.60	273.84	4627.67	-10.75
4757	10.70	273.56	4712.19	-11.82



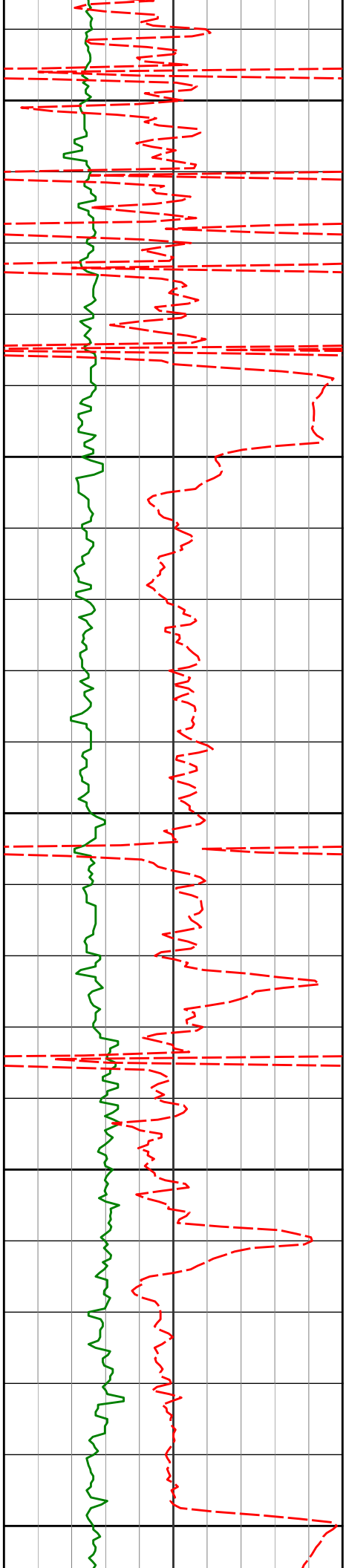
4843	10.07	273.10	4796.78	-12.76
4928	9.79	274.66	4880.50	-13.79



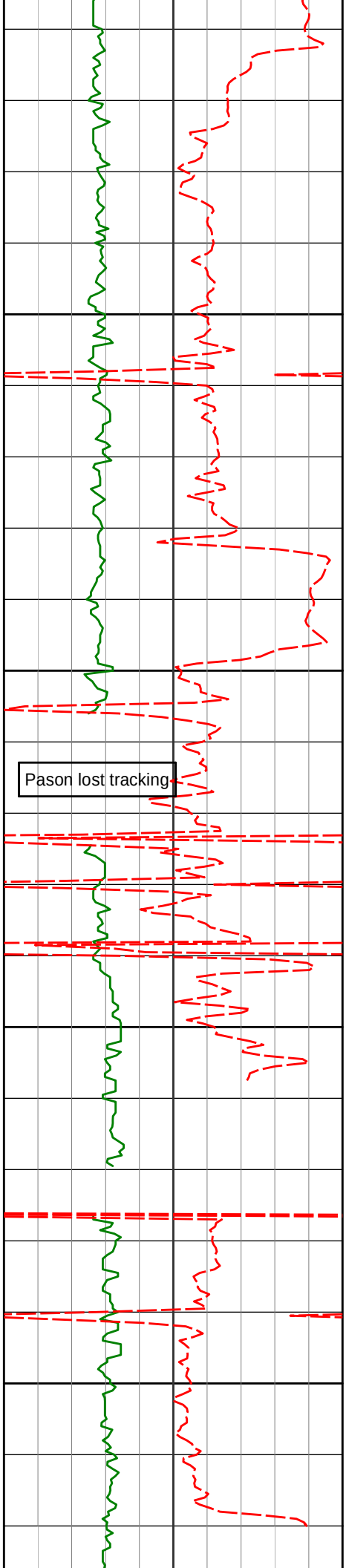
5014	10.40	269.35	4965.17	-14.34
5100	10.45	268.66	5049.75	-14.11
5186	9.89	268.01	5134.40	-13.71



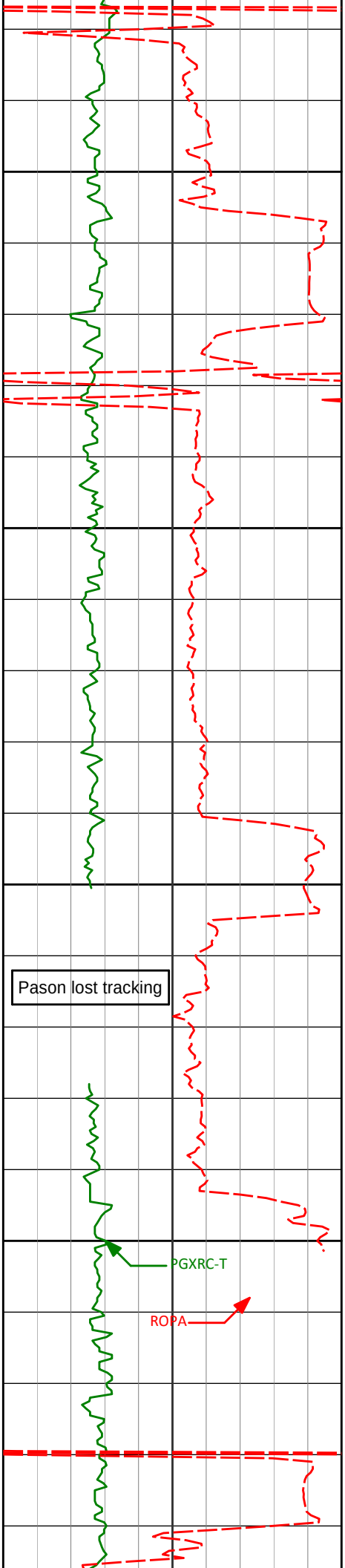
5271	8.94	268.24	5218.26	-13.29
5357	8.82	265.67	5303.23	-12.60



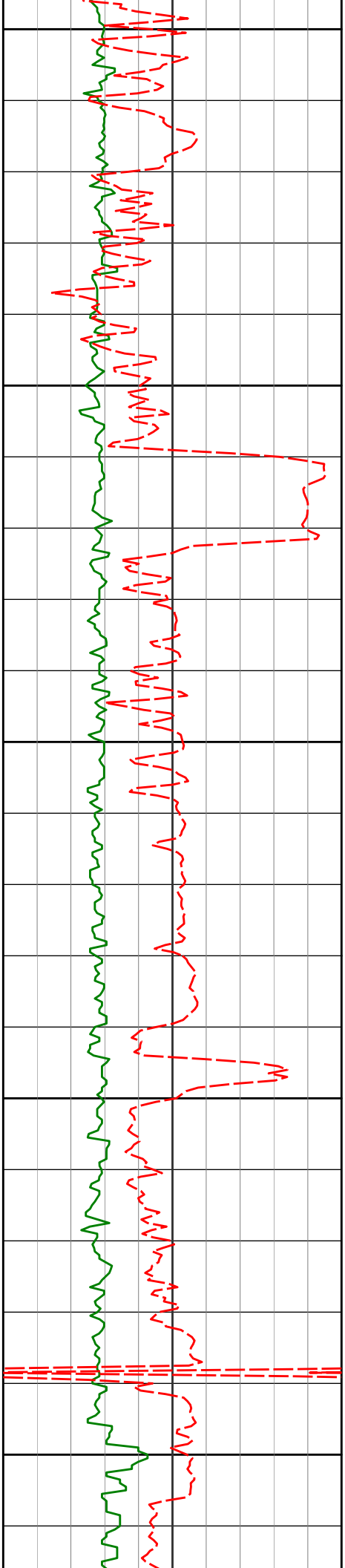
5443	9.59	265.87	5388.12	-11.61
5528	10.35	265.58	5471.83	-10.54
5614	8.95	264.21	5556.61	-9.31



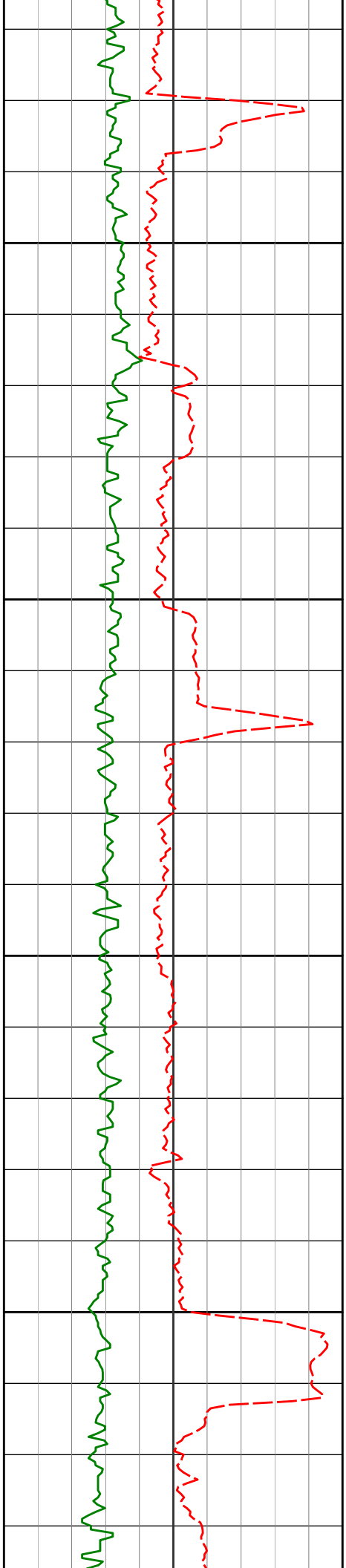
5700	9.47	266.37	5641.51	-8.22
5785	10.58	268.57	5725.21	-7.62
5871	9.43	265.52	5809.90	-6.91



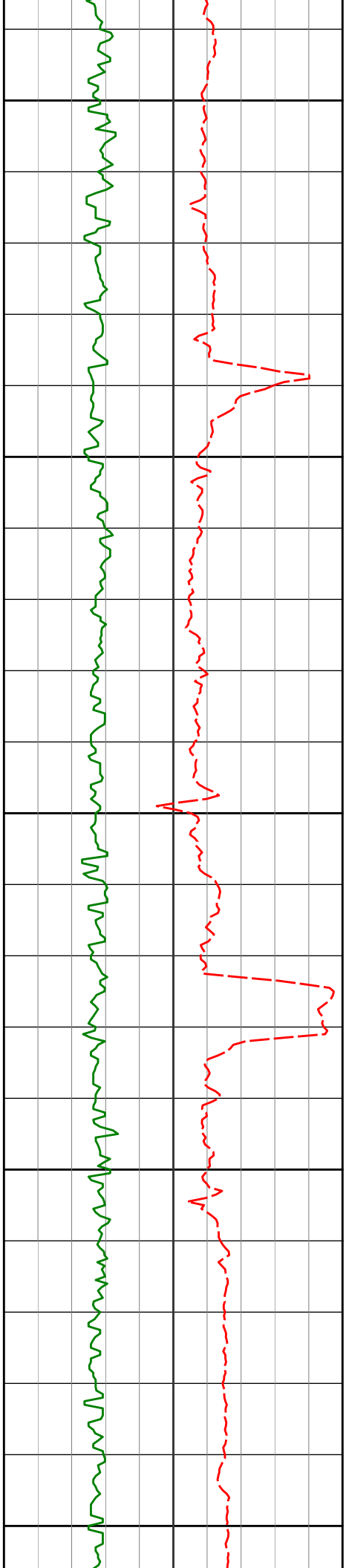
5957	10.08	262.82	5894.65	-5.46
6042	9.33	268.69	5978.44	-4.41



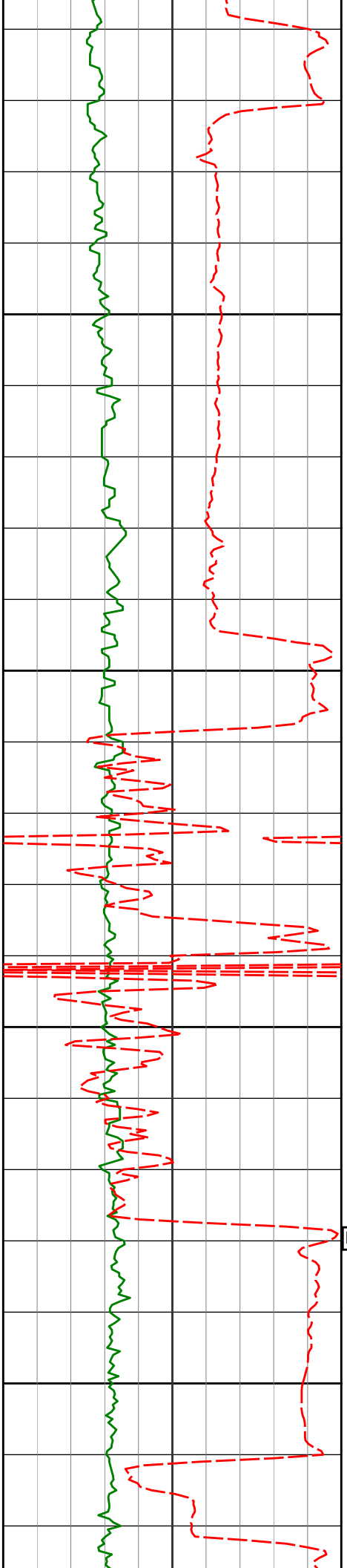
6128	9.39	271.89	6063.29	-4.51
6214	9.24	272.26	6148.16	-5.05
6300	7.89	271.89	6233.20	-5.55



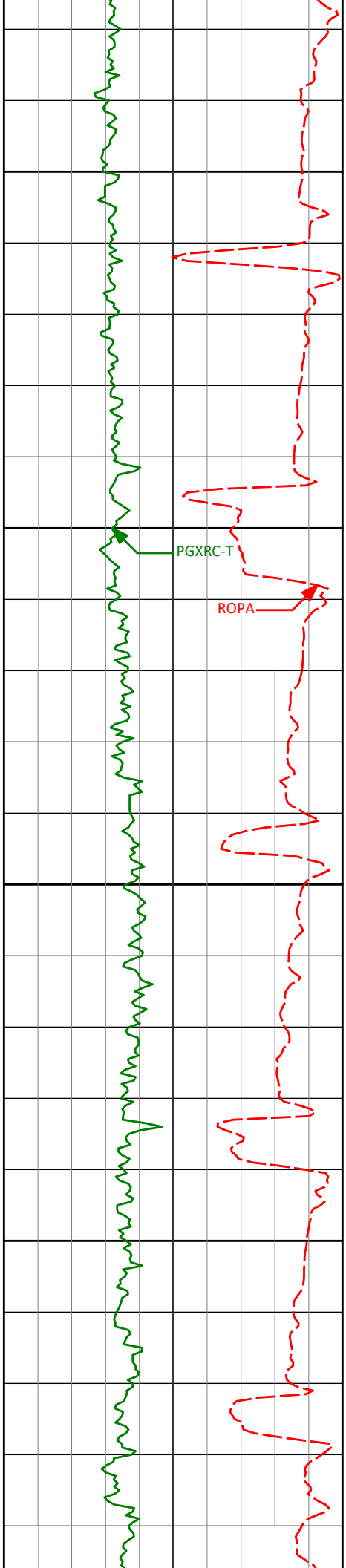
6386	6.75	270.40	6318.50	-5.80
6471	5.66	268.74	6403.00	-5.77



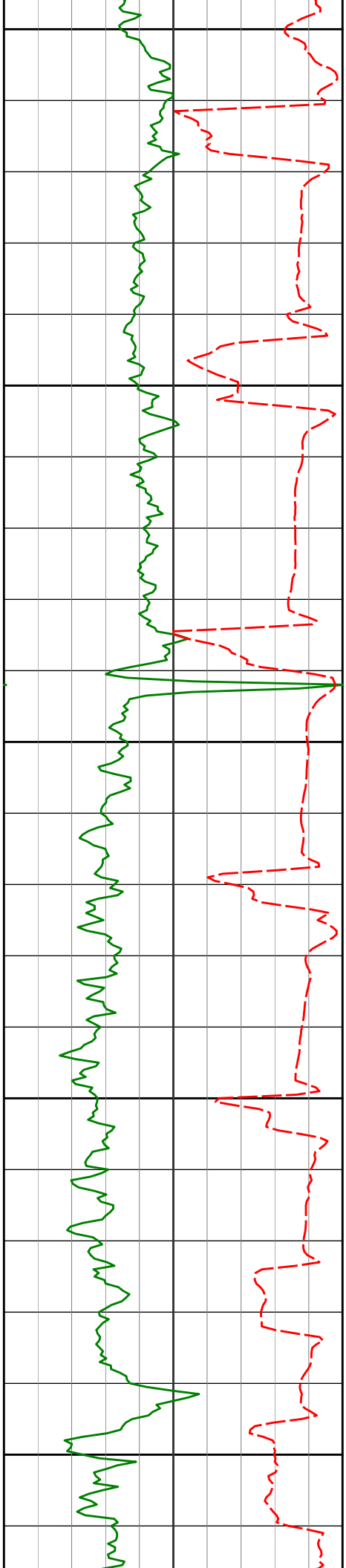
6557	5.01	281.64	6488.63	-6.45
6643	4.39	281.81	6574.34	-7.89
6728	3.22	275.01	6659.15	-8.78



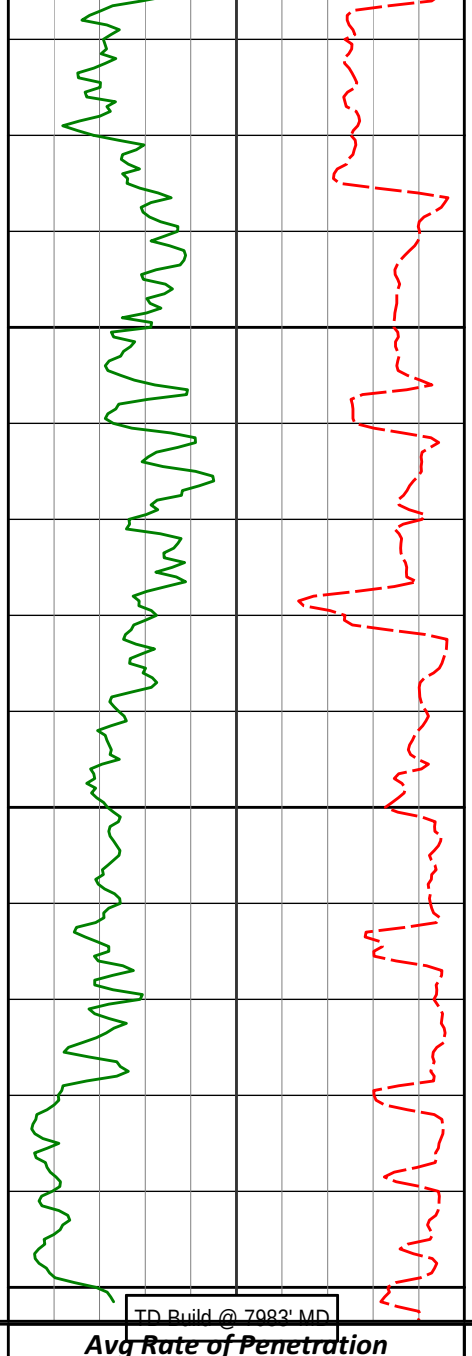
6814	1.85	261.29	6745.06	-8.78
6900	0.34	229.43	6831.05	-8.41
6943	0.52	194.43	6874.05	-8.14
6986	4.32	181.10	6917.00	-6.33



7029	8.14	186.92	6959.74	-1.69
7072	12.06	185.19	7002.06	5.81
7114	15.92	188.13	7042.81	15.89
7157	20.27	184.31	7083.68	29.16
7200	25.30	180.38	7123.31	45.78



7243	27.49	177.23	7161.83	64.89
7286	31.04	178.06	7199.33	85.89
7329	35.69	181.51	7235.24	109.52
7371	40.07	183.91	7268.38	135.27
7414	45.31	183.98	7299.98	164.34
7457	49.58	183.20	7329.05	195.95
7500	51.54	181.22	7356.37	229.13



7400

7450

7500

TVD
Depth
ft

Depth	Inc	Az	TVD	VS
7543	52.56	179.22	7382.82	263.03
7586	57.47	178.29	7407.46	298.24
7629	61.62	180.07	7429.25	335.29
7672	65.51	181.06	7448.39	373.79
7714	69.47	180.48	7464.47	412.57
7757	73.34	179.62	7478.18	453.32
7800	77.98	179.17	7488.83	494.97
7843	82.98	178.84	7495.94	537.36
7900	86.11	178.54	7501.35	594.08

HALLIBURTON

DIRECTIONAL SURVEY REPORT

Anadarko Petroleum Corp.
Butterball 29C-15HZ
Wattenberg
Weld Colorado
USA
CA-XX-0900754404

Measured Depth (feet)	*Inclination (degrees)*	*Direction (degrees)*	*Vertical Depth (feet)*	*Latitude (feet)*	*Departure (feet)*	*Vertical Section (feet)*	*Dogleg (deg/100ft)*

926.00	0.46	258.52	925.99	1.34 N	1.58 W	-1.34	TIE-IN
1083.00	0.82	273.74	1082.98	1.29 N	3.32 W	-1.29	0.25
1174.00	0.99	274.28	1173.97	1.39 N	4.75 W	-1.39	0.19
1266.00	1.10	275.98	1265.95	1.54 N	6.42 W	-1.54	0.12
1359.00	1.13	206.94	1358.94	0.82 N	7.73 W	-0.82	1.36
1444.00	1.44	210.49	1443.92	0.85 S	8.65 W	0.85	0.38
1530.00	1.74	249.13	1529.89	2.25 S	10.42 W	2.25	1.27
1615.00	3.02	272.56	1614.81	2.61 S	13.86 W	2.61	1.86
1701.00	4.87	283.10	1700.61	1.68 S	19.68 W	1.68	2.30
1860.00	7.86	279.89	1858.61	1.72 N	36.97 W	-1.72	1.89
1952.00	9.51	284.07	1949.55	4.65 N	50.54 W	-4.65	1.92
2044.00	10.36	278.13	2040.17	7.66 N	66.10 W	-7.66	1.45
2137.00	11.07	266.86	2131.56	8.36 N	83.29 W	-8.36	2.37
2228.00	10.67	265.23	2220.93	7.18 N	100.41 W	-7.18	0.55
2320.00	10.36	267.13	2311.39	6.06 N	117.16 W	-6.06	0.51
2413.00	9.85	267.79	2402.94	5.33 N	133.46 W	-5.33	0.56
2505.00	9.18	267.13	2493.68	4.66 N	148.66 W	-4.66	0.74
2597.00	10.07	267.01	2584.38	3.87 N	164.02 W	-3.87	0.97
2689.00	9.84	268.66	2675.00	3.27 N	179.91 W	-3.27	0.40
2781.00	9.90	269.38	2765.63	3.00 N	195.68 W	-3.00	0.15
2873.00	9.83	270.30	2856.27	2.96 N	211.44 W	-2.96	0.19
2959.00	9.37	270.25	2941.07	3.02 N	225.78 W	-3.02	0.53
3045.00	10.20	266.55	3025.82	2.60 N	240.38 W	-2.60	1.21
3130.00	9.69	265.99	3109.54	1.64 N	255.03 W	-1.64	0.61
3215.00	9.97	269.53	3193.29	1.08 N	269.52 W	-1.08	0.78
3301.00	10.25	270.92	3277.96	1.15 N	284.62 W	-1.15	0.43
3387.00	9.50	271.86	3362.68	1.50 N	299.36 W	-1.50	0.89
3472.00	9.79	273.28	3446.48	2.14 N	313.59 W	-2.14	0.44
3558.00	11.36	268.90	3531.02	2.40 N	329.36 W	-2.40	2.05
3643.00	10.56	265.70	3614.47	1.65 N	345.50 W	-1.65	1.18
3729.00	9.66	264.63	3699.13	0.38 N	360.54 W	-0.38	1.07
3815.00	9.42	270.42	3783.95	0.24 S	374.76 W	0.24	1.15
3900.00	10.14	277.53	3867.71	0.79 N	389.13 W	-0.79	1.65
3986.00	9.23	277.86	3952.49	2.73 N	403.47 W	-2.73	1.06
4071.00	10.04	274.28	4036.29	4.21 N	417.61 W	-4.21	1.18
4157.00	9.83	273.57	4121.00	5.23 N	432.42 W	-5.23	0.28
4243.00	9.51	273.16	4205.78	6.08 N	446.84 W	-6.08	0.38
4329.00	8.53	273.30	4290.71	6.84 N	460.30 W	-6.84	1.14
4414.00	9.02	273.10	4374.72	7.56 N	473.24 W	-7.56	0.58
4500.00	9.83	274.76	4459.55	8.53 N	487.29 W	-8.53	0.99
4586.00	10.87	273.78	4544.15	9.68 N	502.70 W	-9.68	1.23
4671.00	10.60	273.99	4627.67	10.75 N	518.50 W	-10.75	0.32
4757.00	10.70	273.72	4712.19	11.82 N	534.35 W	-11.82	0.13
4843.00	10.07	273.25	4796.78	12.76 N	549.83 W	-12.76	0.74
4928.00	9.79	274.81	4880.50	13.79 N	564.45 W	-13.79	0.46
5014.00	10.40	269.50	4965.17	14.34 N	579.50 W	-14.34	1.29
5100.00	10.45	268.82	5049.75	14.11 N	595.06 W	-14.11	0.15
5186.00	9.89	268.16	5134.40	13.71 N	610.24 W	-13.71	0.67
5271.00	8.94	268.38	5218.26	13.29 N	624.13 W	-13.29	1.12
5357.00	8.82	265.67	5303.23	12.60 N	637.39 W	-12.60	0.51
5443.00	9.59	266.01	5388.12	11.60 N	651.11 W	-11.61	0.90
5528.00	10.35	265.73	5471.83	10.54 N	665.79 W	-10.54	0.90
5614.00	8.95	264.35	5556.61	9.31 N	680.15 W	-9.31	1.65
5700.00	9.47	266.51	5641.51	8.22 N	693.87 W	-8.22	0.73
5785.00	10.58	268.72	5725.21	7.62 N	708.65 W	-7.62	1.38
5871.00	9.43	265.67	5809.90	6.91 N	723.57 W	-6.91	1.47
5957.00	10.08	262.97	5894.65	5.46 N	738.06 W	-5.46	0.92
6042.00	9.33	268.83	5978.44	4.41 N	752.33 W	-4.41	1.46
6128.00	9.39	272.03	6063.29	4.51 N	766.32 W	-4.51	0.61
6214.00	9.24	272.40	6148.16	5.05 N	780.22 W	-5.05	0.19
6300.00	7.89	272.02	6233.20	5.55 N	793.02 W	-5.55	1.57
6386.00	6.75	270.53	6318.50	5.80 N	803.98 W	-5.80	1.34
6471.00	5.66	268.86	6403.00	5.77 N	813.16 W	-5.77	1.30
6557.00	5.01	281.75	6488.63	6.45 N	821.08 W	-6.45	1.58
6643.00	4.39	281.91	6574.34	7.89 N	827.98 W	-7.89	0.72
6728.00	3.22	275.11	6659.15	8.78 N	833.54 W	-8.78	1.47
6814.00	1.85	261.38	6745.06	8.78 N	837.32 W	-8.78	1.73
6900.00	0.34	229.51	6831.05	8.41 N	838.88 W	-8.41	1.83
6943.00	0.52	194.51	6874.05	8.14 N	839.03 W	-8.14	0.72
6986.00	4.32	181.17	6917.00	6.33 N	839.11 W	-6.33	8.87
7029.00	8.14	186.99	6959.74	1.69 N	839.51 W	-1.69	8.99
7072.00	12.06	185.25	7002.06	5.81 S	840.30 W	5.81	9.14

7114.00	15.92	188.20	7042.81	15.89 S	841.52 W	15.89	9.34
7157.00	20.27	184.37	7083.68	29.16 S	842.93 W	29.16	10.48
7200.00	25.30	180.43	7123.31	45.78 S	843.57 W	45.78	12.22
7243.00	27.49	177.27	7161.83	64.89 S	843.16 W	64.89	6.05
7286.00	31.04	178.09	7199.33	85.89 S	842.32 W	85.89	8.31
7329.00	35.69	181.55	7235.24	109.52 S	842.29 W	109.52	11.68
7371.00	40.07	183.96	7268.38	135.27 S	843.55 W	135.27	11.01
7414.00	45.31	184.03	7299.98	164.34 S	845.59 W	164.34	12.19
7457.00	49.58	183.24	7329.05	195.95 S	847.59 W	195.95	10.02
7500.00	51.54	181.26	7356.37	229.13 S	848.88 W	229.13	5.78
7543.00	52.56	179.24	7382.82	263.03 S	849.03 W	263.03	4.40
7586.00	57.47	178.31	7407.46	298.24 S	848.26 W	298.24	11.56
7629.00	61.62	180.10	7429.25	335.29 S	847.76 W	335.29	10.30
7672.00	65.51	181.10	7448.39	373.79 S	848.17 W	373.79	9.28
7714.00	69.47	180.51	7464.47	412.58 S	848.71 W	412.57	9.52
7757.00	73.34	179.65	7478.18	453.32 S	848.77 W	453.32	9.20
7800.00	77.98	179.20	7488.83	494.97 S	848.35 W	494.97	10.84
7843.00	82.98	178.87	7495.94	537.36 S	847.63 W	537.36	11.65
7900.00	86.11	178.58	7501.35	594.08 S	846.37 W	594.08	5.51

CALCULATION BASED ON MINIMUM CURVATURE METHOD

SURVEY COORDINATES RELATIVE TO WELL SYSTEM REFERENCE POINT
TVD VALUES GIVEN RELATIVE TO DRILLING MEASUREMENT POINT

VERTICAL SECTION RELATIVE TO WELL HEAD
VERTICAL SECTION IS COMPUTED ALONG A DIRECTION OF 180.00 DEGREES (TRUE)
A TOTAL CORRECTION OF 8.63 DEG FROM MAGNETIC NORTH TO TRUE NORTH HAS BEEN APPLIED

HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 7900.00 FEET
IS 1034.05 FEET ALONG 234.93 DEGREES (TRUE)

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