



1 : 240 / 1 : 600

[illegible]

MWD Run Number	100	300	400		
Date run completed	01-Mar-13	04-Mar-13	05-Mar-13		
Rig Bit Number	2	4	5		
Bit Size (in)	8.75	8.75	8.75		
Tool Nominal OD (in)	6.75	6.75	6.75		
Log Start Depth (MD, ft)	647	1,892	6,258		
Log End Depth (MD, ft)	1,421	6,258	7,379		
Drill or Wipe	Drill	Drill	Drill		
Drill/Wipe Start Date and Time	01-Mar-13 15:55	03-Mar-13 12:59	04-Mar-13 16:38		
Drill/Wipe End Date and Time	01-Mar-13 22:09	04-Mar-13 07:30	05-Mar-13 10:25		
Min Inc (deg) @ Depth (MD, ft)	.91 @ 716	.15 @ 6,200	.41 @ 6,259		
Max Inc (deg) @ Depth (MD, ft)	1.11 @ 993	13.20 @ 3,830	80.71 @ 7,324		
Bit TFA(in2) / Bit Type	.75 / PDC	.75 / PDC	.86 / PDC		
Flow Rate (gpm)	483.33	583.36	578.94		
Max AV (fpm) / CV (fpm) @ MWD	458.4 /	N/A / N/A	N/A / N/A		
Fluid Type	Fresh Water Gel	Fresh Water Gel	Fresh Water Gel		
Density (ppg) / Viscosity (spqt)	8.6 / 60	8.6 / 32	9.1 / 35		
Filtrate CL (ppm)	1,950	1,800	2,550		
pH / Fluid Loss (mptm)	8.4 / 8.4	9.9 / 9.9	9 / 9		
PV (cP) / YP (lbf2)	60 / 1	5 / 3	8 / 8		
% Solids / % Sand	2 / .15	1.7 / 0.1	4.8 / 10		
% Oil / Oil:Water Ratio	N/A / N/A	N/A / N/A	N/A / N/A		
Rm @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		
Rmf @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		
Rmc @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A		
Max Tool Temp (deg F) @ S	68.9 / PDM	115.3 / PDM	127 / PDM		

Max Tool Temp (degF) / Source	82.6 / PCM	145.9 / PCM	167 / PCM		
Rm @ Max Tool Temp (degF)	N/A @ 82.6	N/A @ 145.9	N/A @ 167		
Lead MWD Engineer	Robert Barnes	Robert Barnes	Robert Barnes		
Customer Representative	Roger Foster	Roger Foster	Roger Foster		

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM	PCM		
Software Version	5.76	5.76	5.76		
Sub Serial Number	11964411	11964411	11964411		
Insert Serial Number	11680788	11680788	11680788		
Date and Time Initialized	27-Feb-13 16:41	02-Mar-13 00:15	02-Mar-13 00:15		
Date and Time Read	01-Mar-13 23:15	05-Mar-13 17:43	05-Mar-13 17:57		
ECMB SW Version	N/A	N/A	N/A		

Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC		
Distance From Bit (ft)	58	58	55		
Software Version	6.21	6.21	6.21		
Sub Serial Number	11964411	11964411	11964411		
Sonde Serial Number	11297583	11297583	11297583		
Sensor ID Number	N/A	N/A	N/A		
Toolface Offset (deg)	166.80	159.94	251.25		

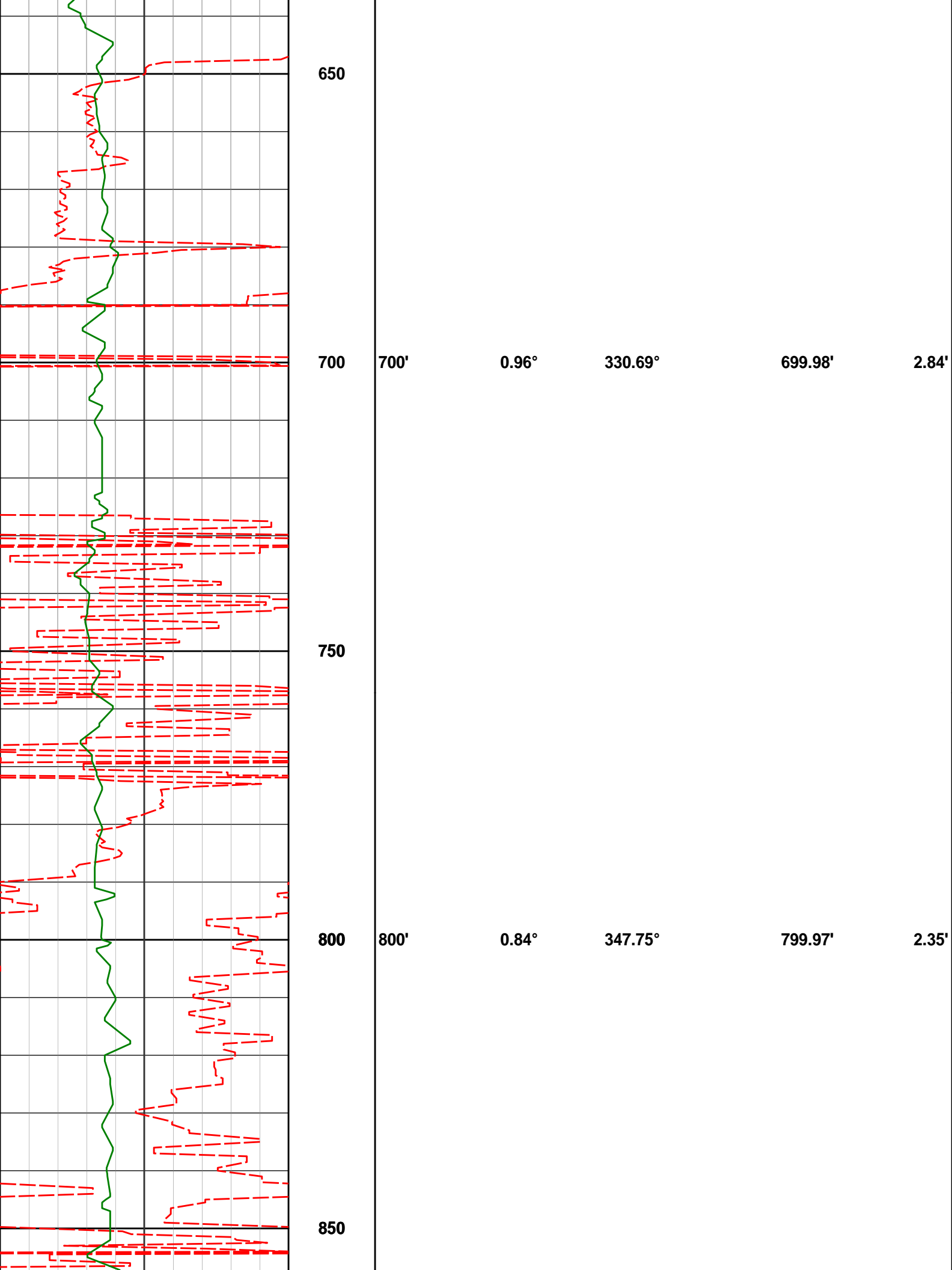
Gamma Ray Sensor Information

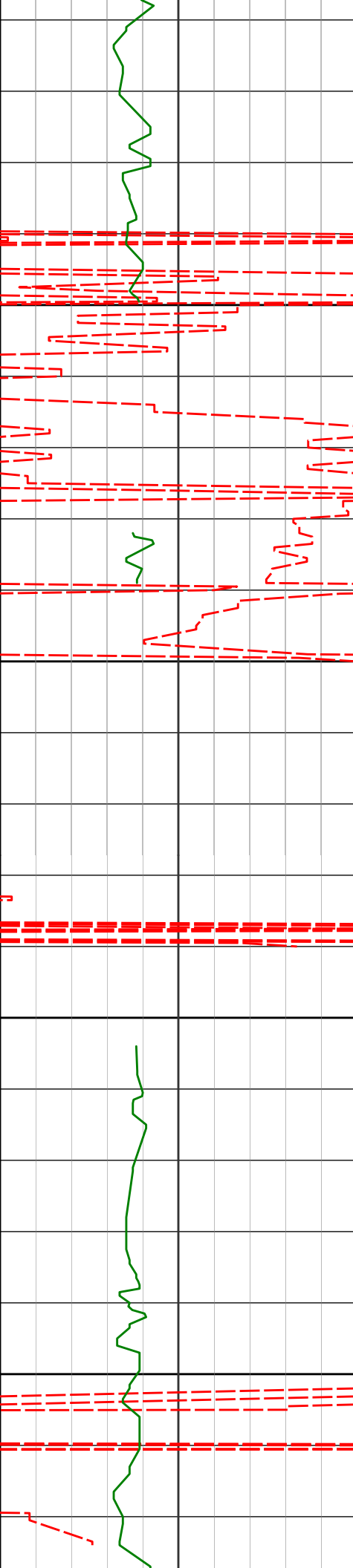
Tool Type	PCG	PCG	PCG		
Distance From Bit (ft)	50.89	50.89	48.36		
Recorded Sample Period (sec)	10	10	10		
Software Version	8.15	8.15	8.15		
Sub Serial Number	11964411	11964411	11964411		
Insert/Sonde Serial Number	11680938	11680938	11680938		

REMARKS

1. All depths are calibrated to driller's pipe tally and are measured depth from the Drill Floor.
2. No depth corrections have been made for pipe stretch or compression.
3. Run 200 was drilled without MWD. Surveys are from wireline gyro.
4. Critical annular velocities are calculated using the "Power Law" model for water based fluids and the "Brigham Plastic" model for oil and synthetic based fluids.
5. All data presented is recorded data unless otherwise specified.
6. The following smoothing parameters have been applied to the data:
PGRC (Gamma CG):
Interval Resolution: 0.5 ft
Interval Distance: 0.6 ft
ROPA (Average Rate Of Penetration):
Interval Resolution: 0.5 ft
Interval Distance: 1.2 ft

7. Insite Version 7.4.1





900

950

1000

1050

900'

1000'

1.06°

1.00°

328.33°

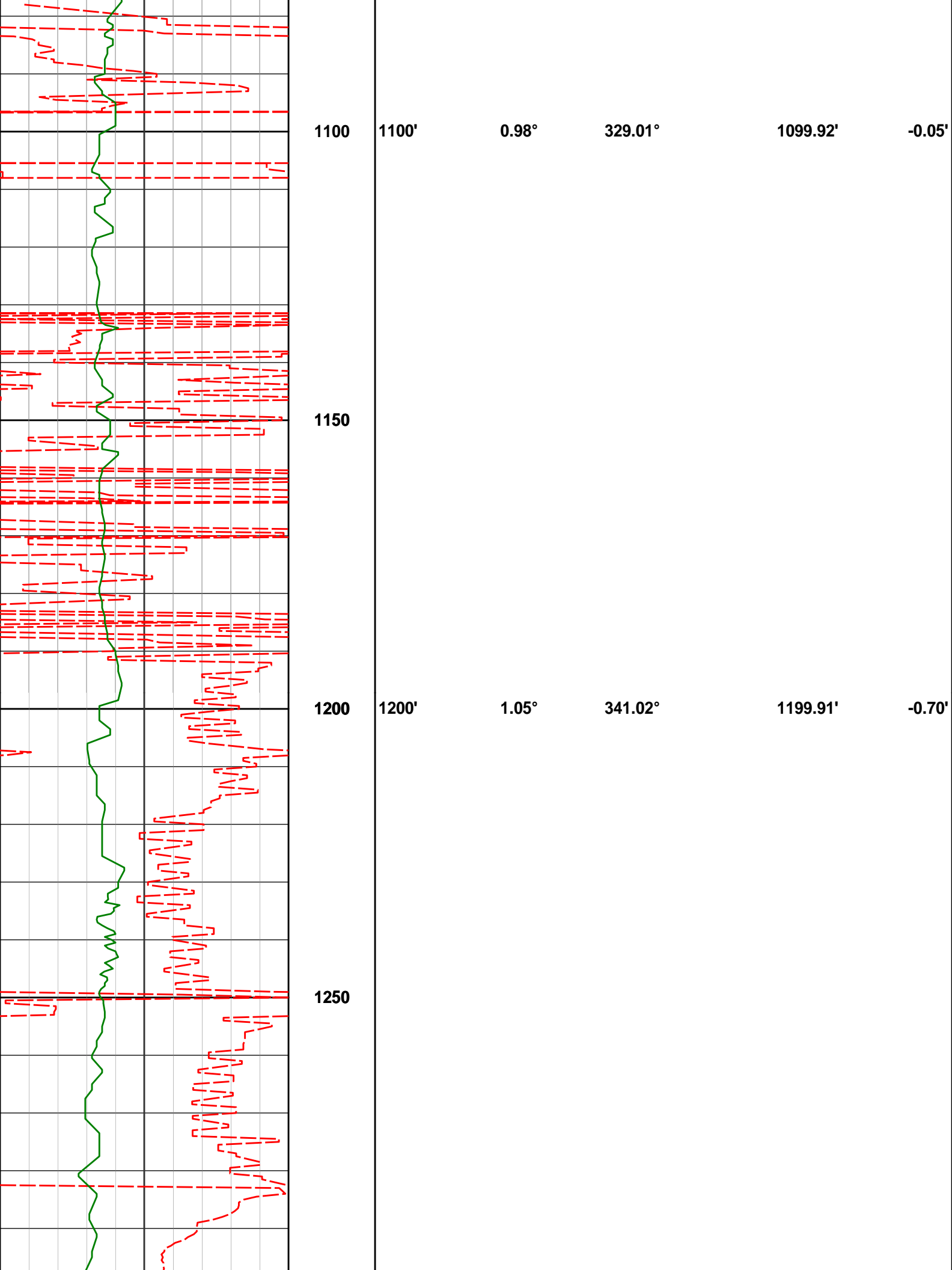
322.21°

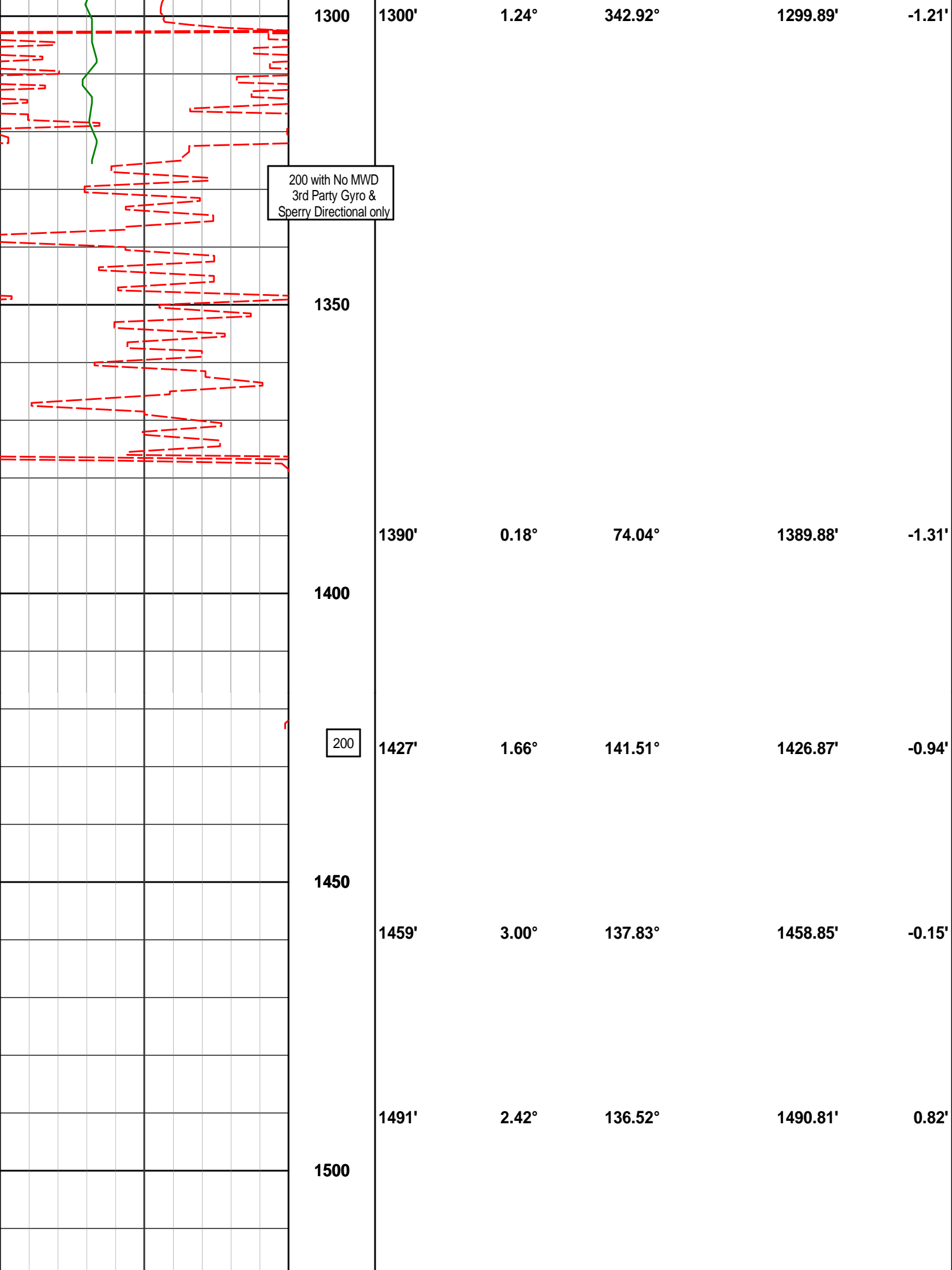
899.95'

999.94'

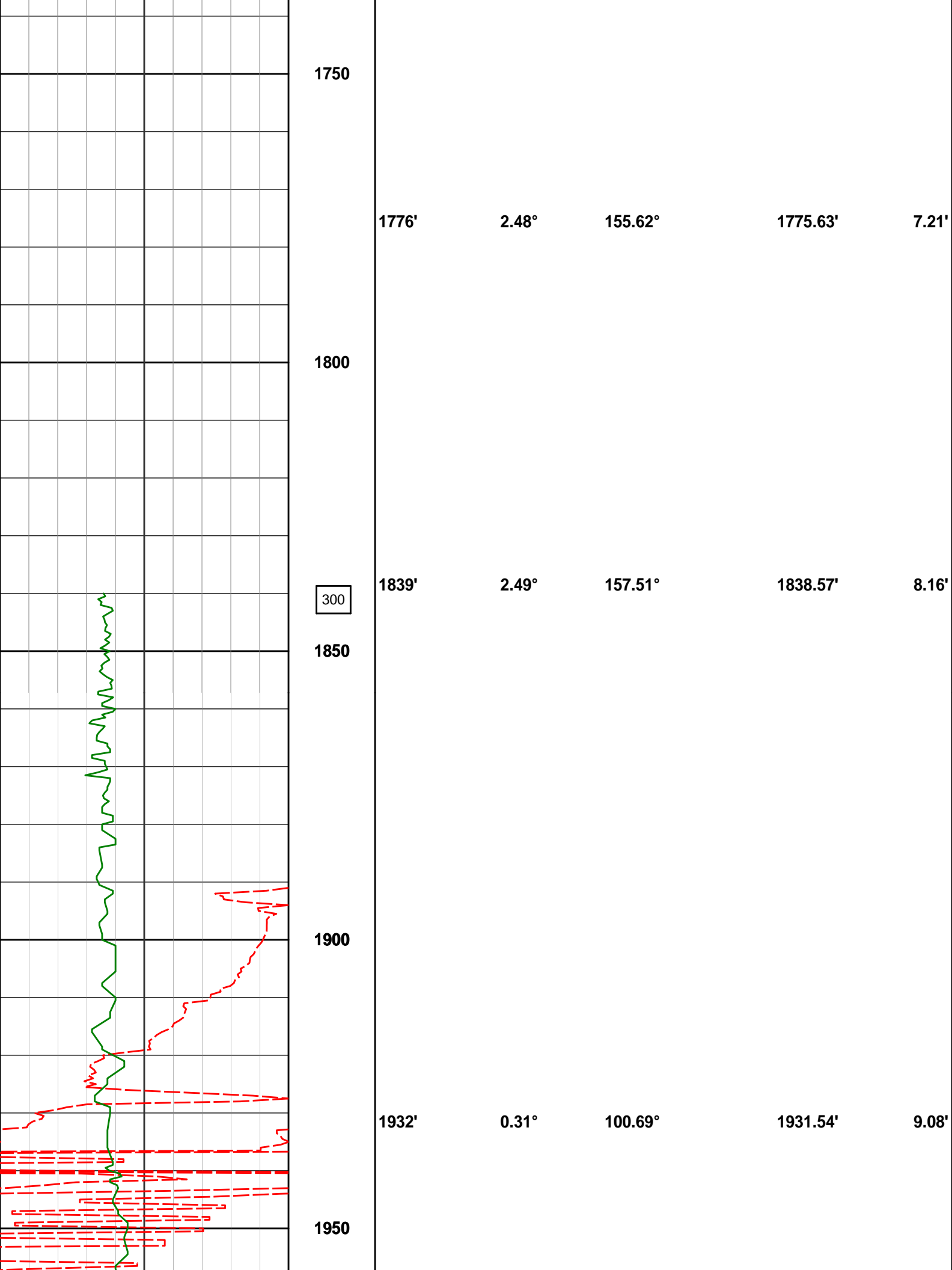
1.79'

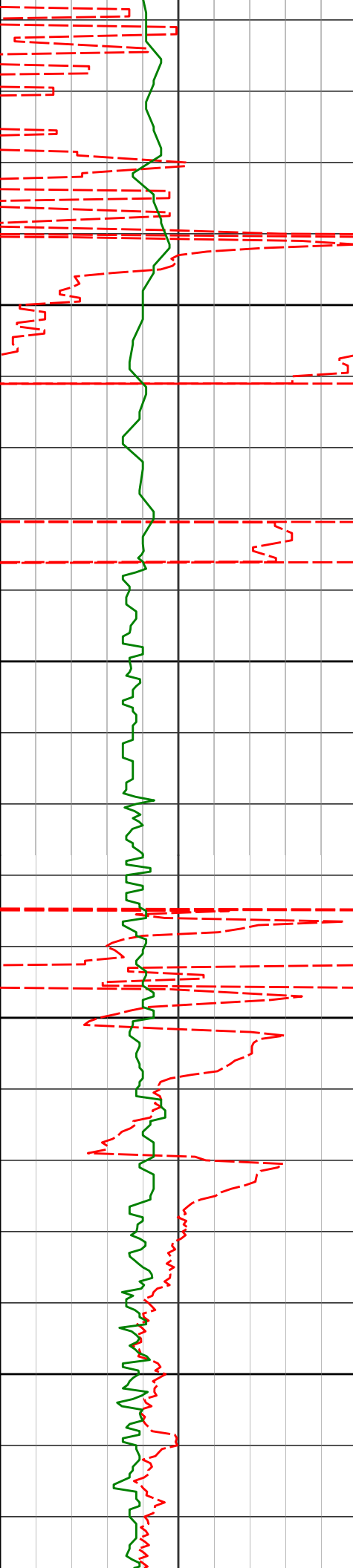
0.85'





[illegible]





2000

2050

2100

2150

2027'

0.19°

215.33°

2026.54'

9.24'

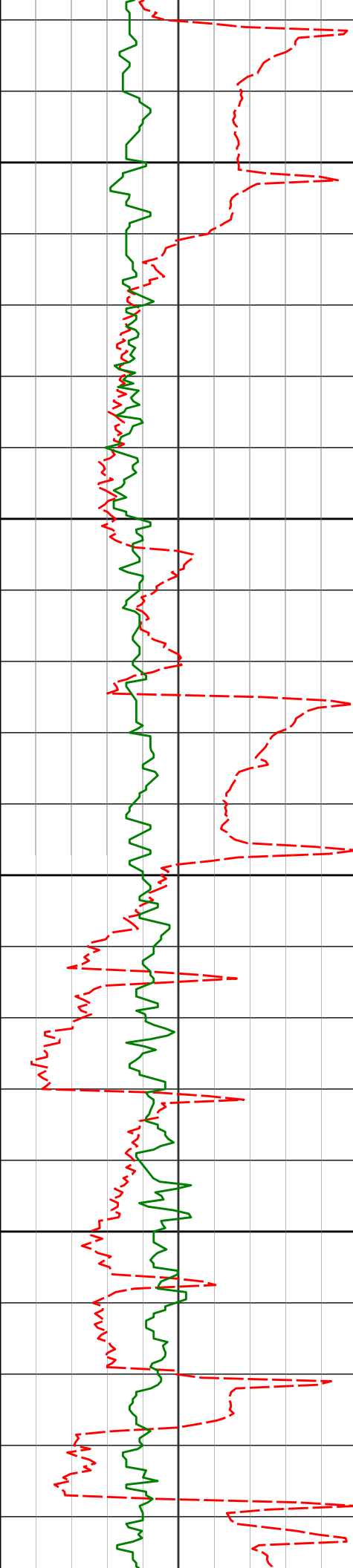
2122'

0.52°

232.41°

2121.54'

8.79'



2200

2250

2300

2350

2217'

1.79°

287.86°

2216.52'

7.05'

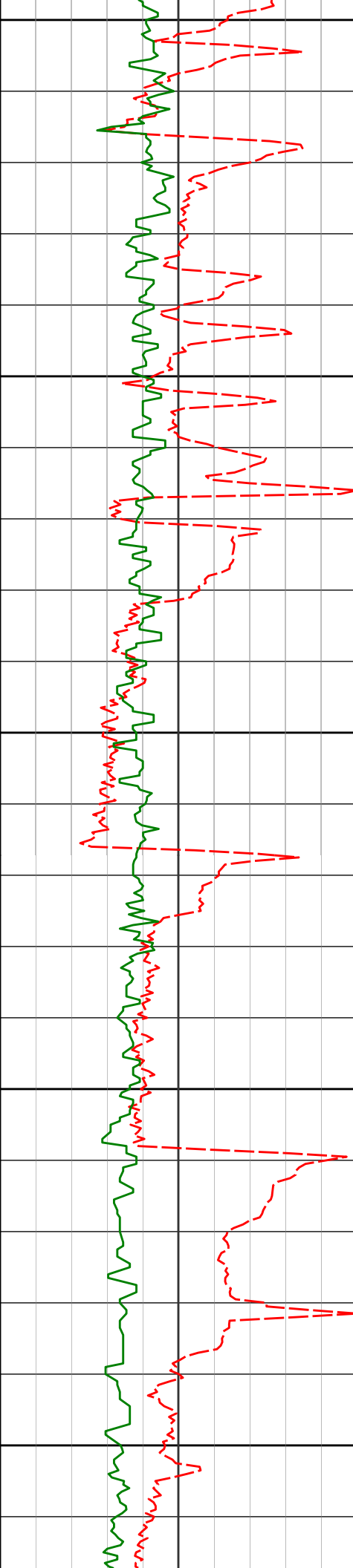
2312'

3.71°

311.26°

2311.41'

3.47'



2400

2407'

4.20°

311.09°

2406.18'

-1.23'

2450

2500

2502'

4.09°

310.96°

2500.93'

-6.17'

2550

2600

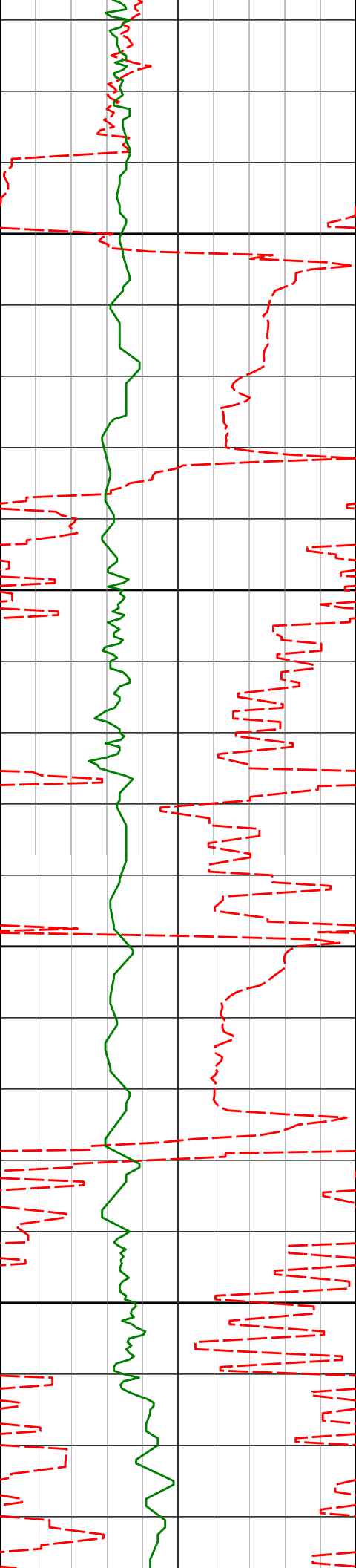
2597'

5.75°

316.15°

2595.58'

-11.72'



2650

2700

2750

2800

2692'

7.69°

311.26°

2689.92'

-19.39'

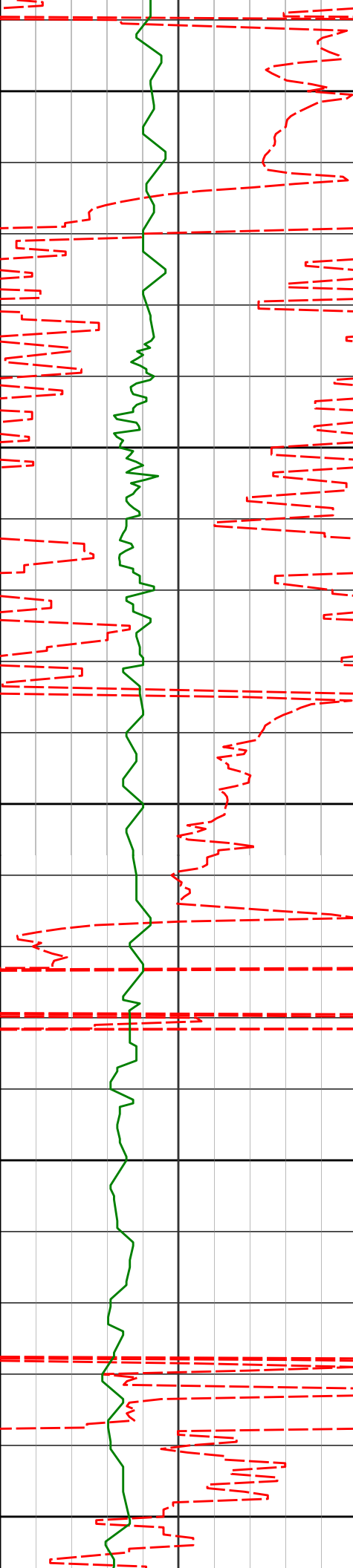
2787'

10.04°

315.90°

2783.78'

-29.38'



2850

2881'

10.47°

319.12°

2876.28'

-40.01'

2900

2950

2976'

12.77°

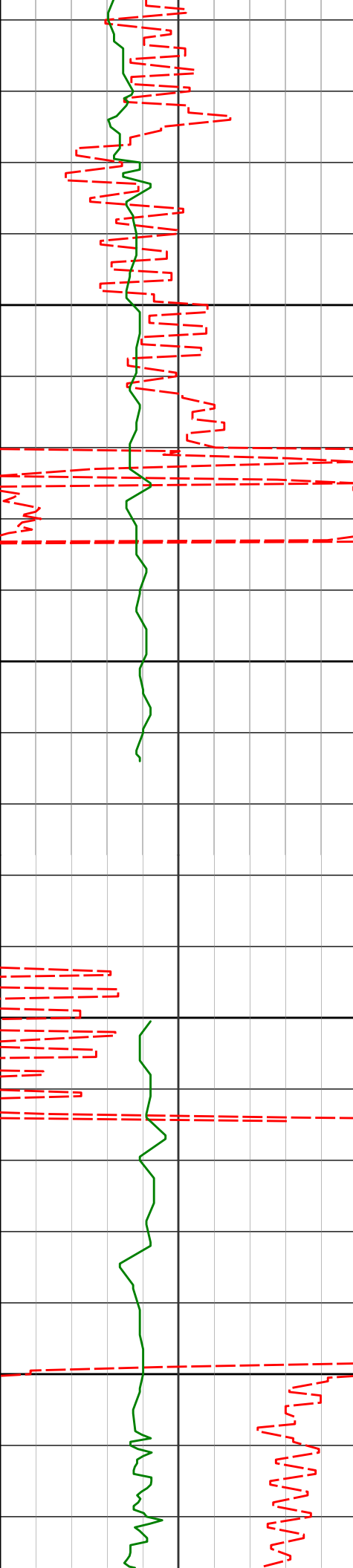
322.50°

2969.33'

-51.26'

3000

3050



3100

3150

3200

3250

3071'

12.61°

321.77°

3062.01'

-63.19'

3166'

11.22°

320.24°

3154.96'

-74.70'

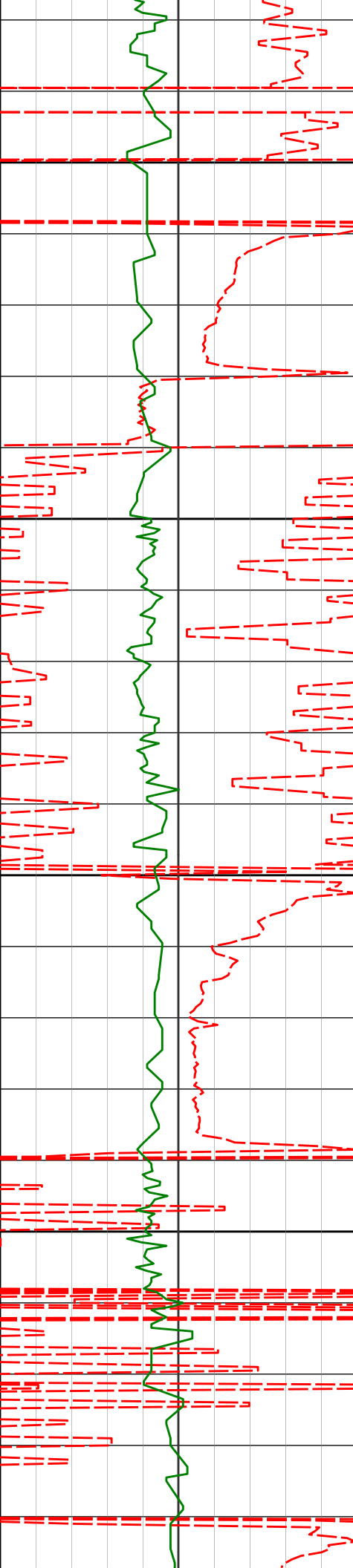
3261'

11.20°

318.83°

3248.15'

-85.93'



3300

3350

3400

3450

3356'

10.66°

319.92°

3341.42'

-96.93'

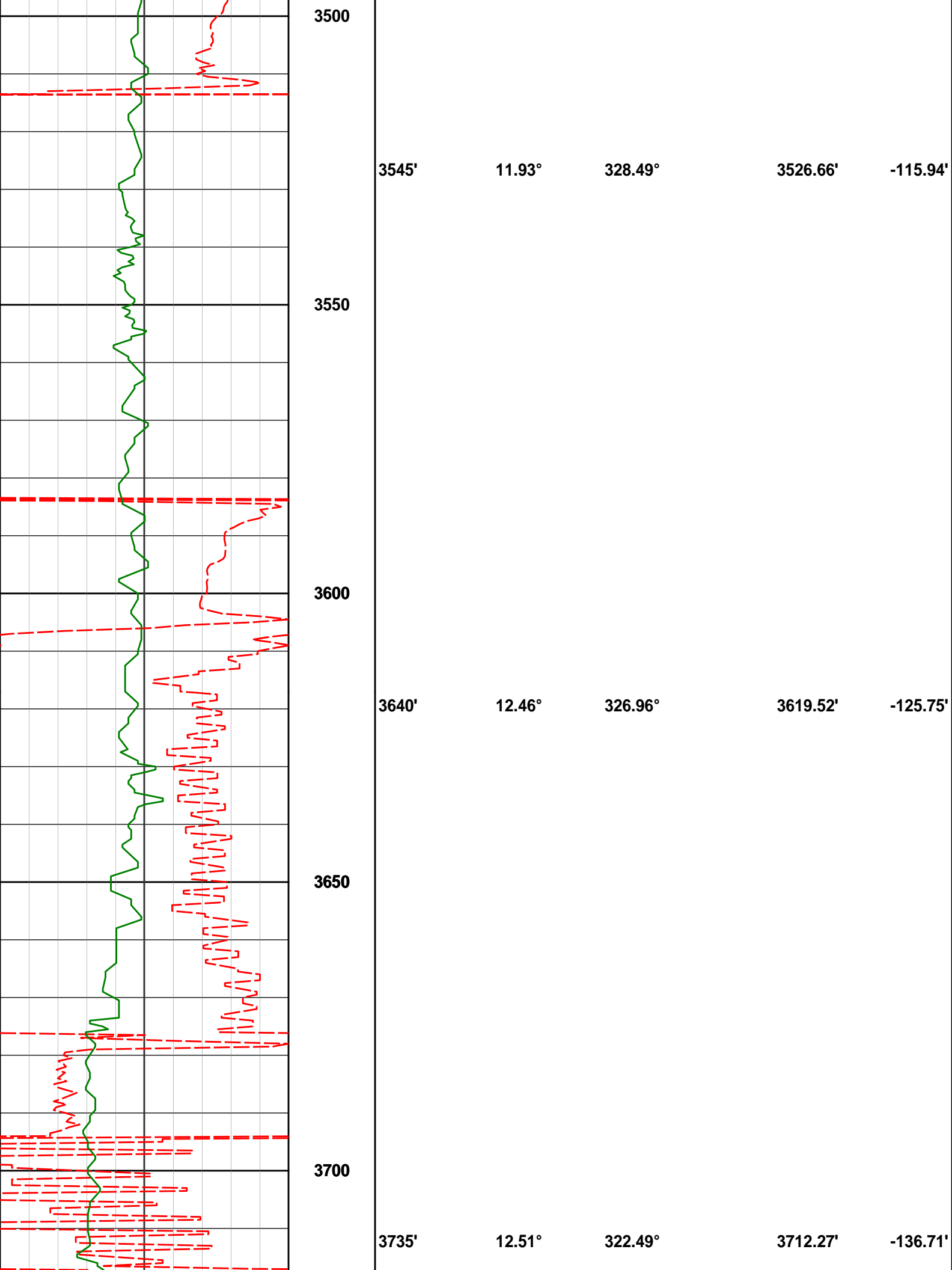
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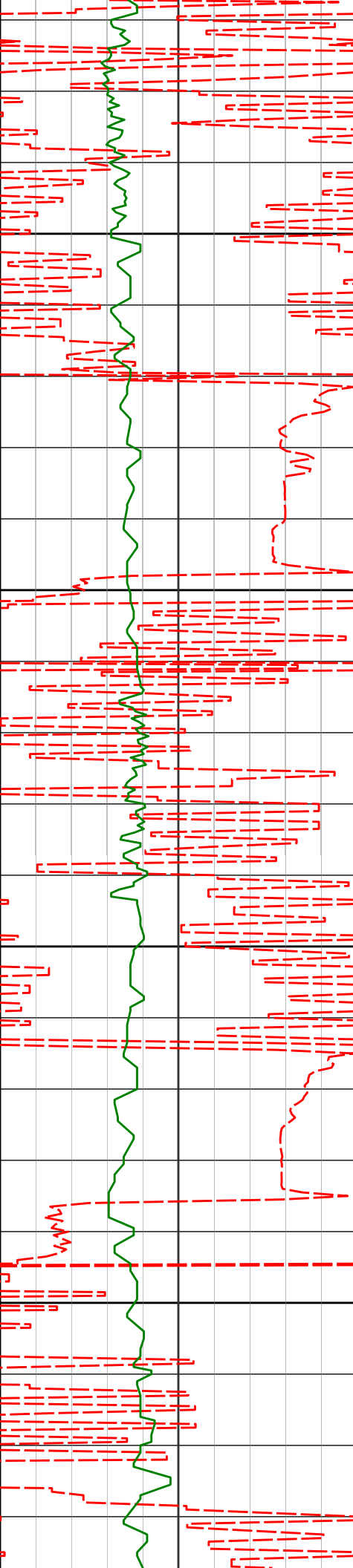
11.61°

328.49°

3434.64'

-106.79'





3750

3800

3850

3900

3830'

13.20°

330.39°

3804.90'

-147.39'

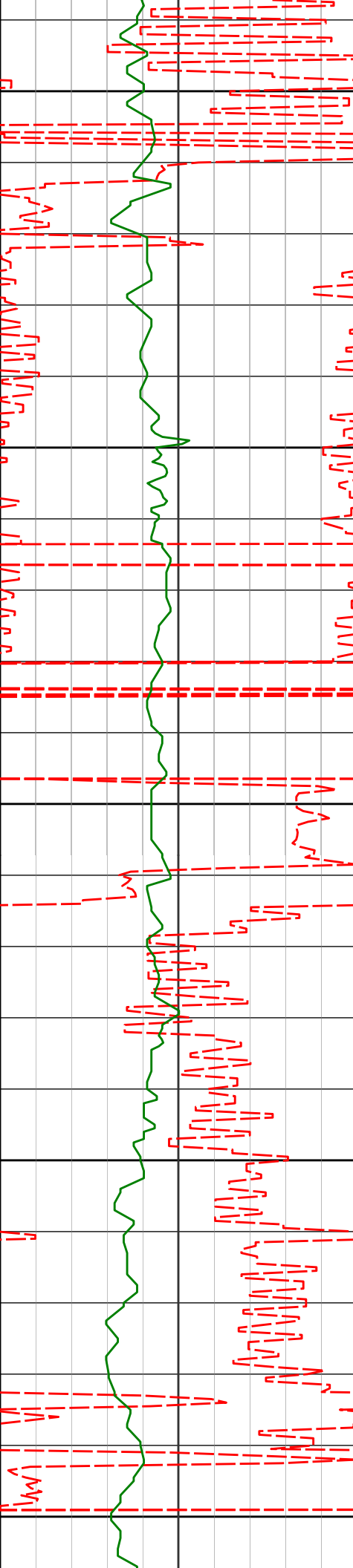
3924'

13.16°

338.94°

3896.43'

-155.52'



3950

4019'

12.61°

338.59°

3989.04'

-162.14'

4000

4050

4114'

10.90°

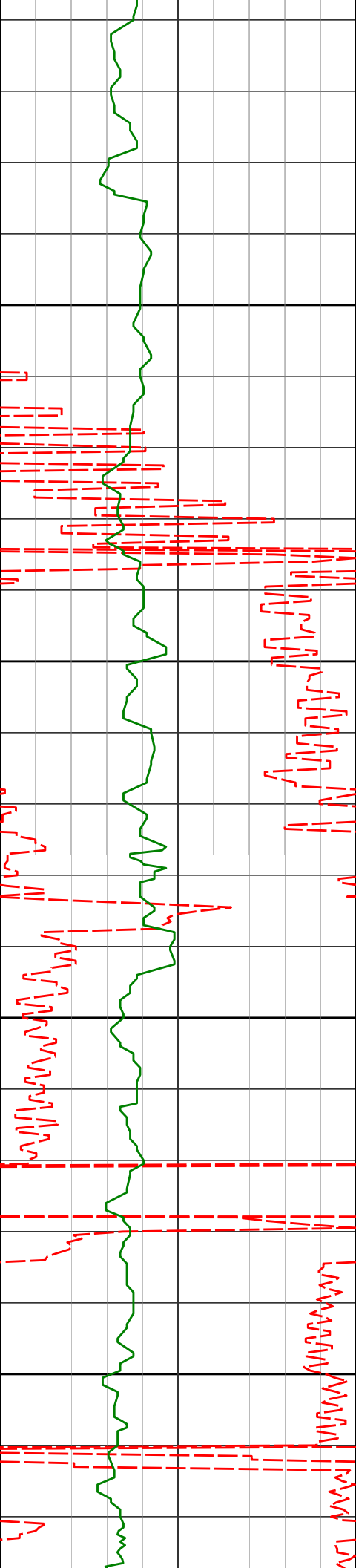
335.29°

4082.05'

-168.74'

4100

4150



4200

4250

4300

4350

4209'

10.10°

334.81°

4175.45'

-175.20'

4303'

9.38°

334.89°

4268.10'

-181.20'

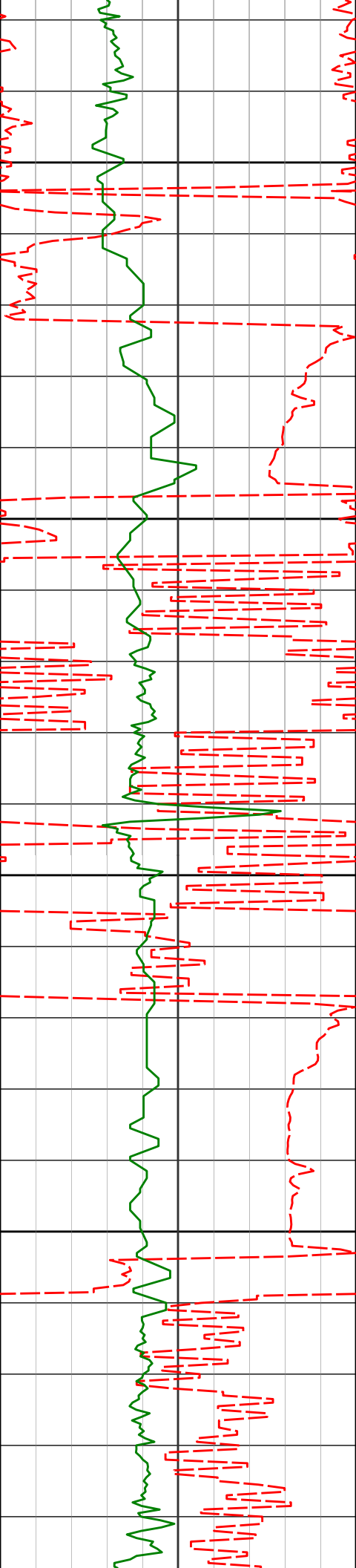
4398'

9.10°

333.24°

4361.86'

-187.14'



4400

4450

4500

4550

4493'

7.06°

330.44°

4455.92'

-192.77'

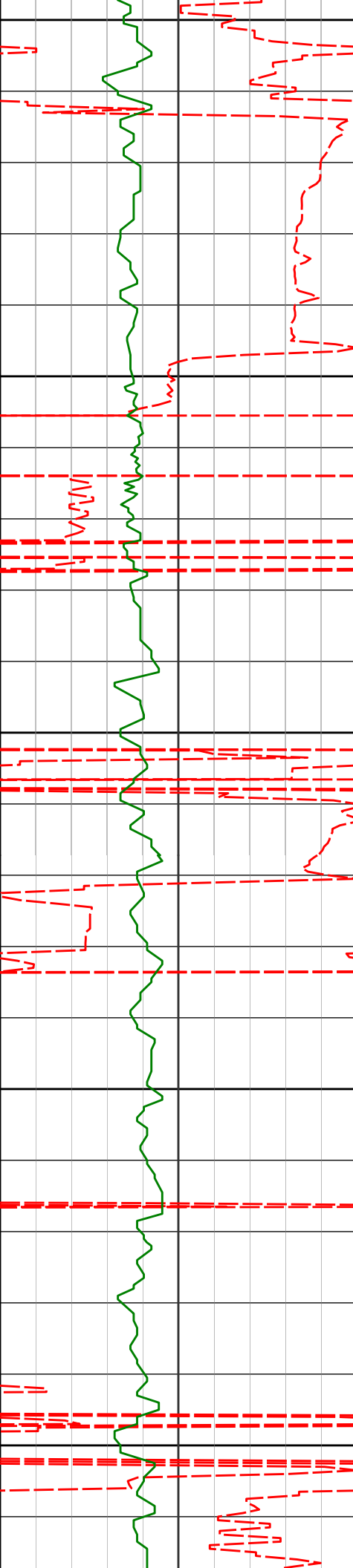
4588'

4.16°

323.33°

4550.45'

-197.30'



4600

4683'

1.39°

295.92°

4645.33'

-200.22'

4650

4700

4750

4800

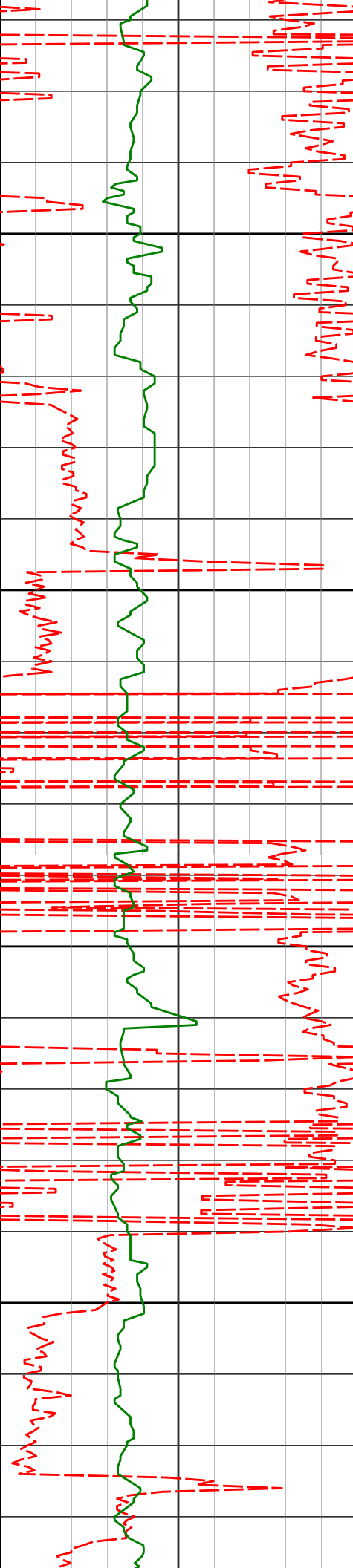
4777'

0.80°

250.78°

4739.32'

-201.85'



4850

4900

4950

5000

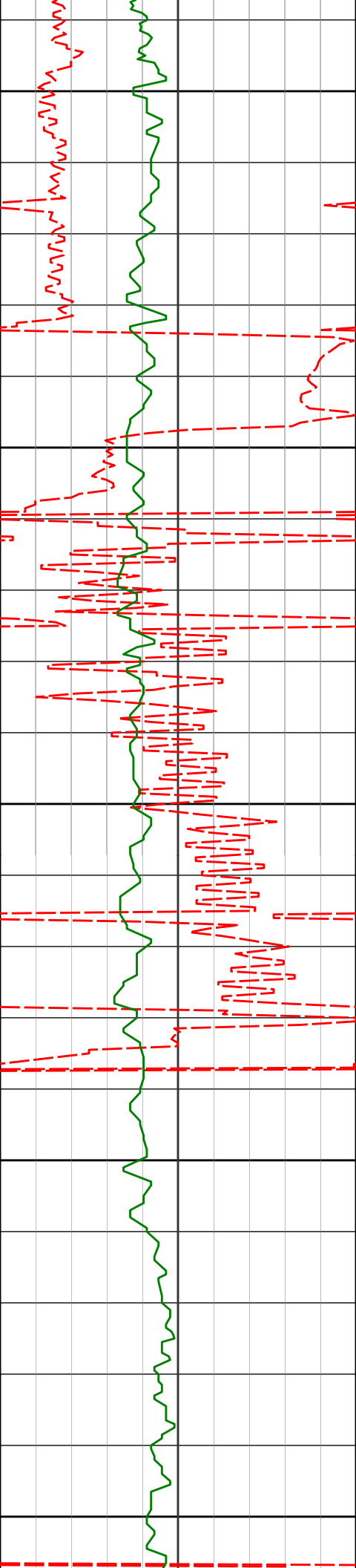
5062'

1.23°

267.96°

5024.27'

-206.82'



5050

5100

5150

5200

5250

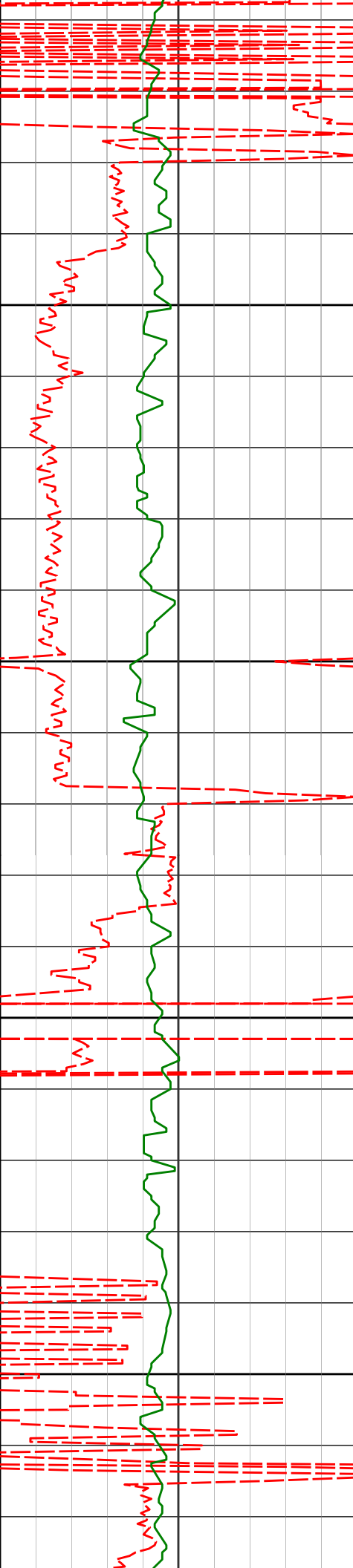
5157'

0.50°

232.49°

5119.26'

-208.18'



5300

5350

5400

5450

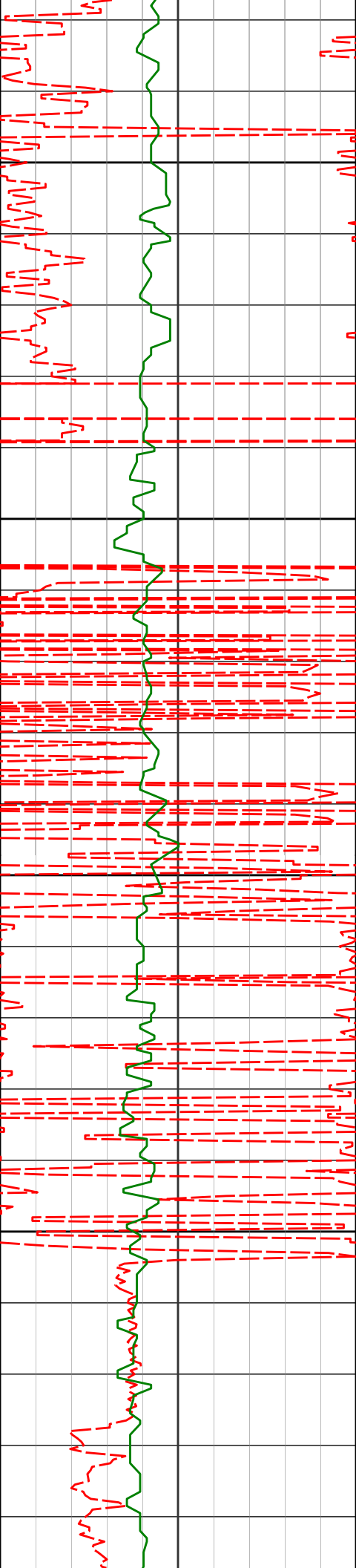
5441'

0.65°

276.04°

5403.25'

-210.80'



5500

5550

5600

5650

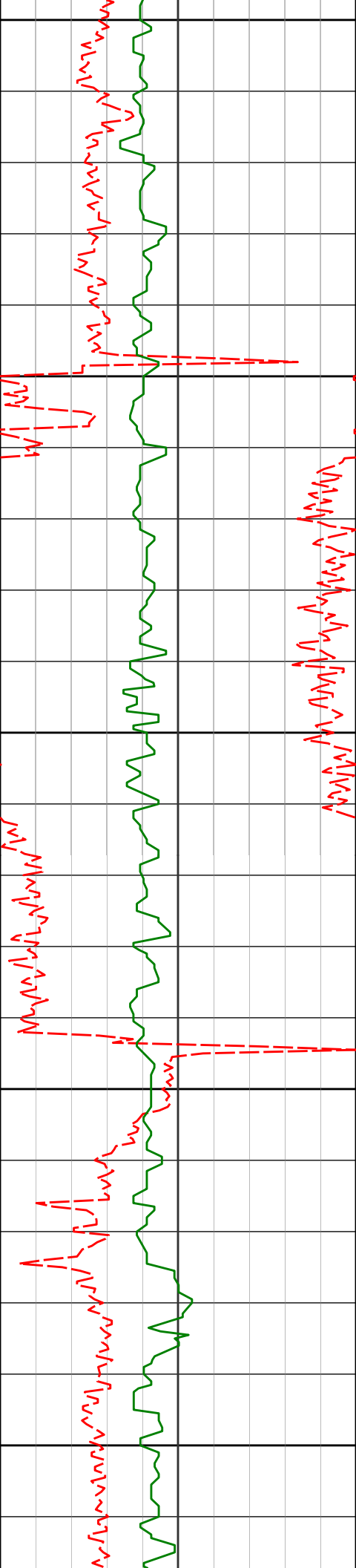
5725'

0.68°

337.81°

5687.23'

-212.94'



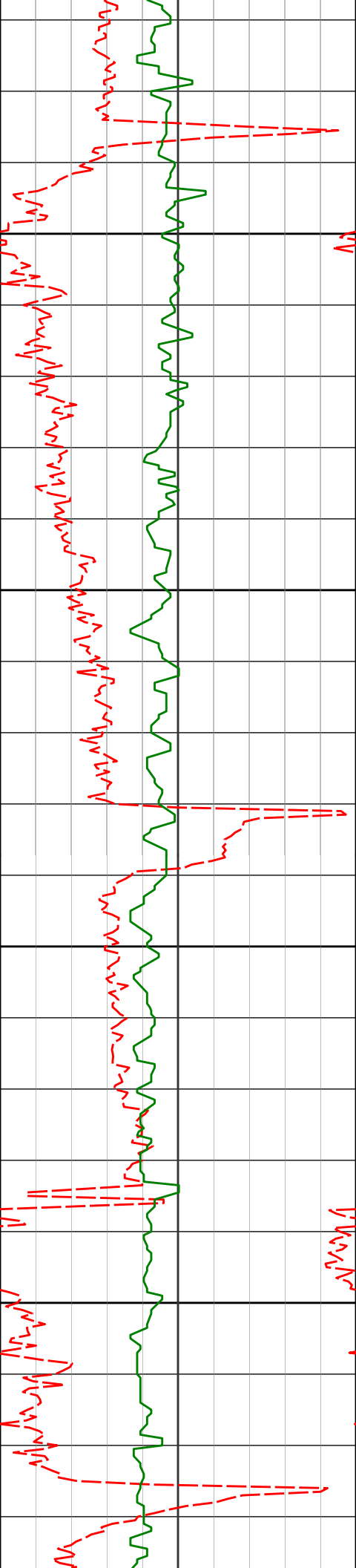
5700

5750

5800

5850

5900



5950

6000

6050

6100

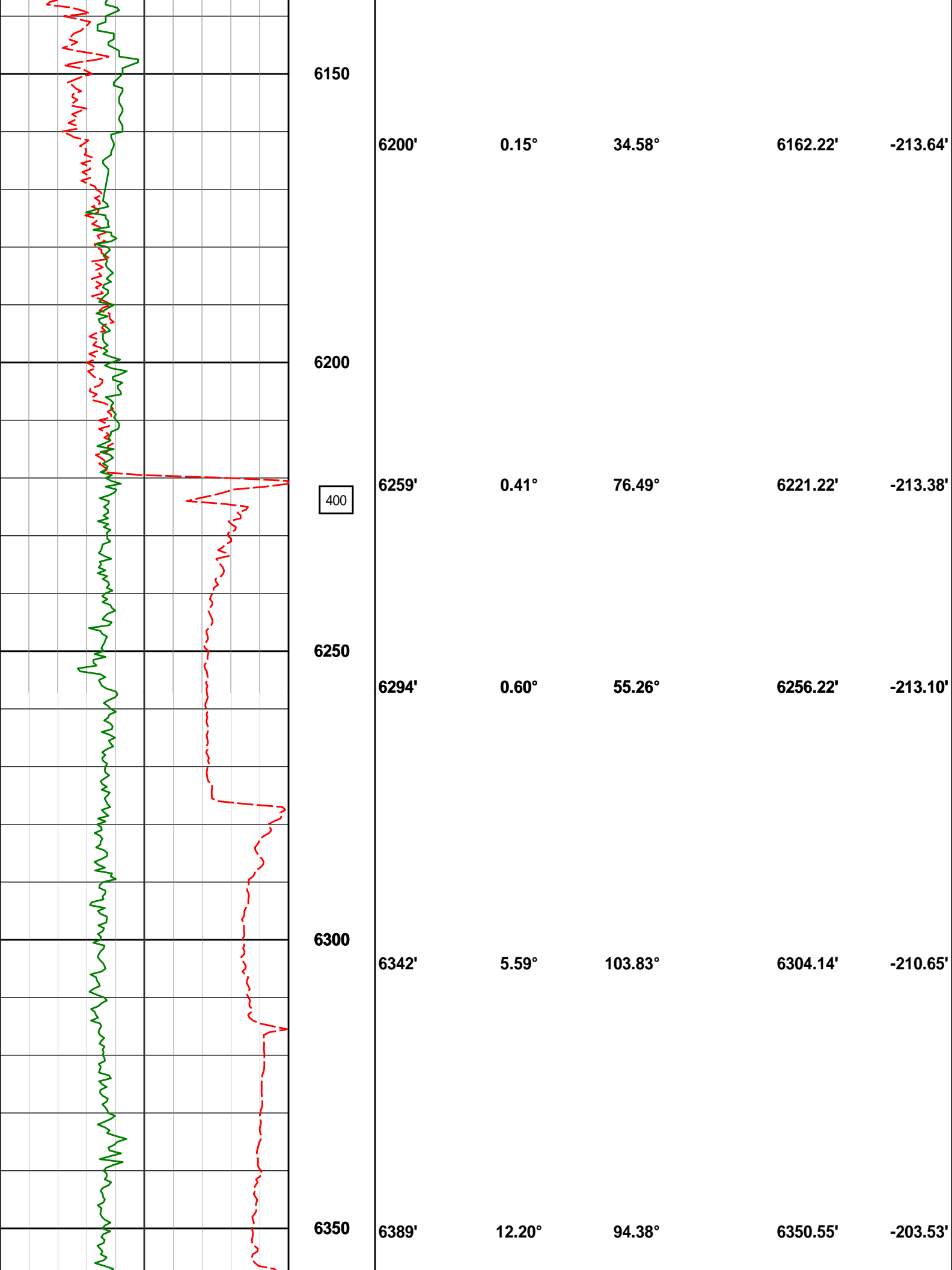
6010'

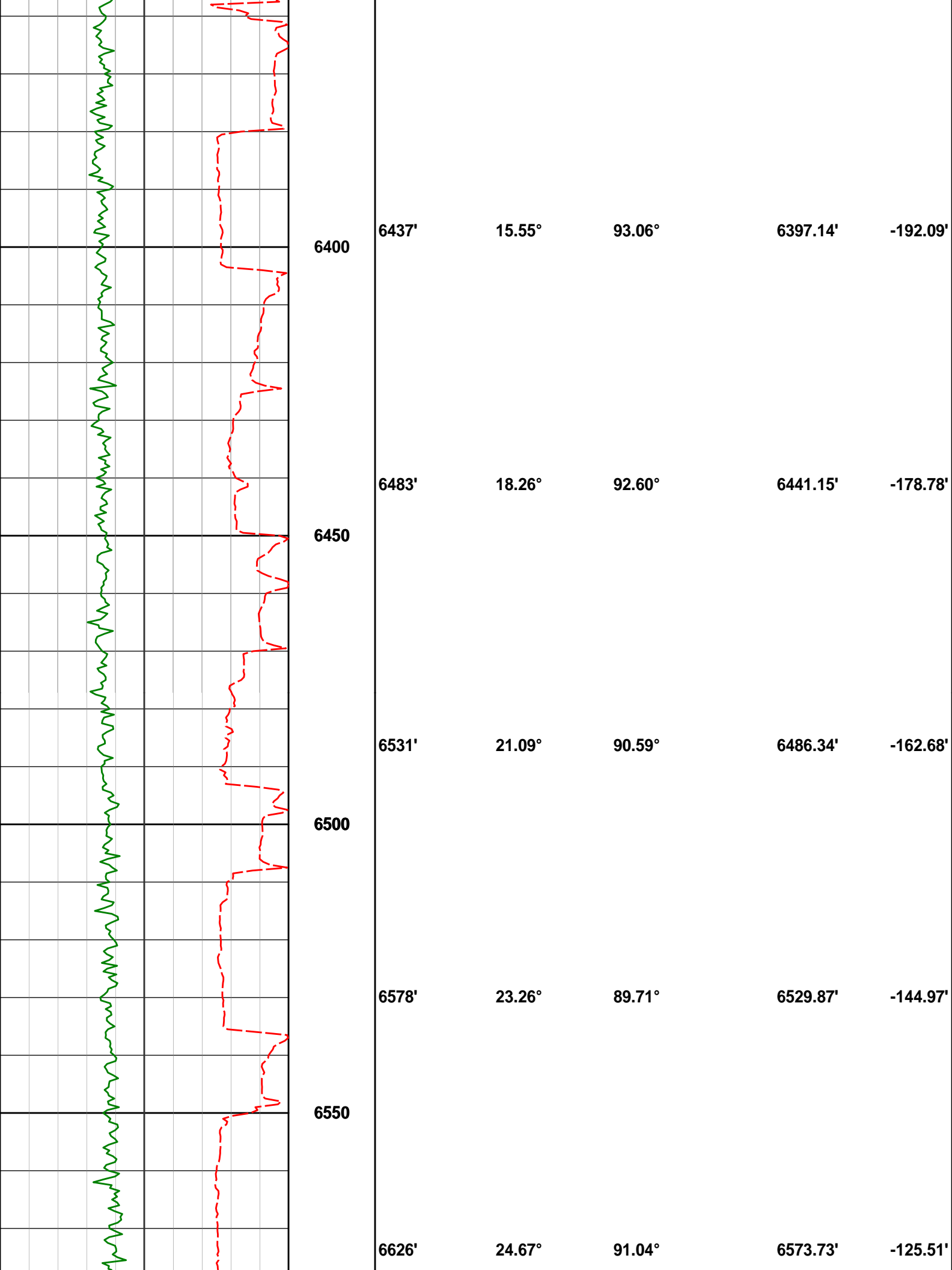
0.21°

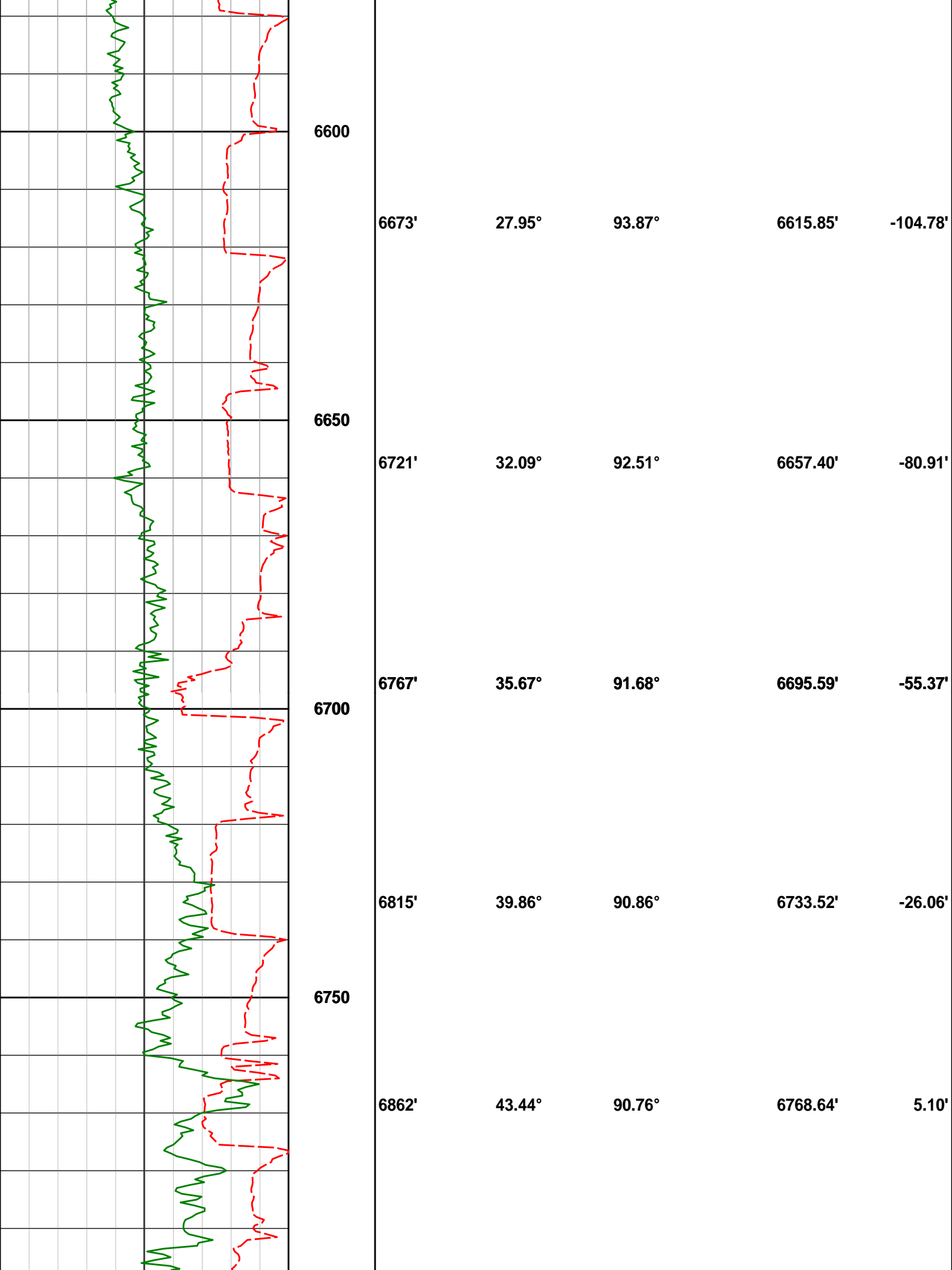
336.60°

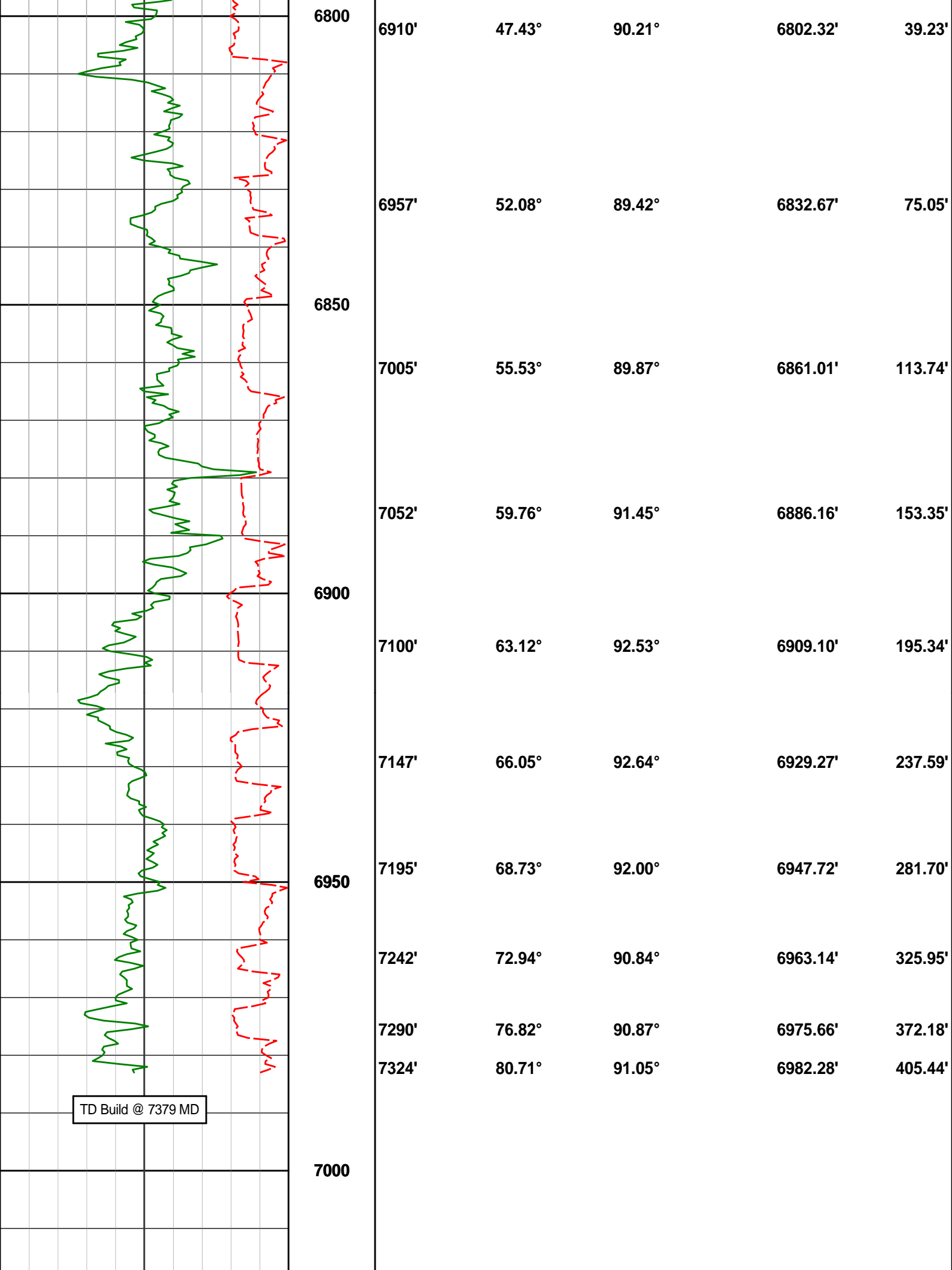
5972.23'

-213.68'









TD Build @ 7379 MD

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
100.00	0.29	107.99	100.00	0.08 S	0.24 E	0.23	0.29
200.00	0.29	80.13	200.00	0.11 S	0.73 E	0.72	0.14
300.00	0.40	77.48	300.00	0.01 N	1.32 E	1.32	0.11
400.00	0.28	90.79	399.99	0.08 N	1.90 E	1.91	0.15
500.00	0.44	76.34	499.99	0.17 N	2.52 E	2.52	0.18
600.00	0.67	12.65	599.99	0.83 N	3.02 E	3.06	0.62
700.00	0.96	330.69	699.98	2.14 N	2.74 E	2.84	0.64
800.00	0.84	347.75	799.97	3.58 N	2.17 E	2.35	0.29
900.00	1.06	328.33	899.95	5.09 N	1.53 E	1.79	0.39
1000.00	1.00	322.21	999.94	6.57 N	0.51 E	0.85	0.13
1100.00	0.98	329.01	1099.92	7.98 N	0.47 W	-0.05	0.12
1200.00	1.05	341.02	1199.91	9.58 N	1.20 W	-0.70	0.23
1300.00	1.24	342.92	1299.89	11.49 N	1.82 W	-1.21	0.19
1390.00	0.18	74.04	1389.88	12.46 N	1.97 W	-1.31	1.40
1427.00	1.66	141.51	1426.87	12.05 N	1.58 W	-0.94	4.32
1459.00	3.00	137.83	1458.85	11.07 N	0.73 W	-0.15	4.22
1491.00	2.42	136.52	1490.81	9.96 N	0.30 E	0.82	1.84
1522.00	2.07	130.07	1521.79	9.12 N	1.18 E	1.65	1.39
1554.00	2.09	135.02	1553.77	8.34 N	2.03 E	2.47	0.56
1586.00	2.14	130.87	1585.74	7.54 N	2.89 E	3.29	0.51
1617.00	1.99	133.18	1616.72	6.79 N	3.72 E	4.07	0.54
1649.00	1.92	136.21	1648.71	6.02 N	4.50 E	4.81	0.39
1712.00	1.71	137.42	1711.67	4.57 N	5.87 E	6.10	0.35
1776.00	2.48	155.62	1775.63	2.61 N	7.08 E	7.21	1.58
1839.00	2.49	157.51	1838.57	0.10 N	8.17 E	8.16	0.13
1932.00	0.31	100.69	1931.54	1.82 S	9.19 E	9.08	2.52
2027.00	0.19	215.33	2026.54	1.99 S	9.36 E	9.24	0.44
2122.00	0.52	232.41	2121.54	2.38 S	8.93 E	8.79	0.36
2217.00	1.79	287.86	2216.52	2.19 S	7.18 E	7.05	1.64
2312.00	3.71	311.26	2311.41	0.29 N	3.46 E	3.47	2.30
2407.00	4.20	311.09	2406.18	4.61 N	1.47 W	-1.23	0.52
2502.00	4.09	310.96	2500.93	9.11 N	6.66 W	-6.17	0.11
2597.00	5.75	316.15	2595.58	14.77 N	12.52 W	-11.72	1.81
2692.00	7.69	311.26	2689.92	22.40 N	20.59 W	-19.39	2.12

2787.00	10.04	315.90	2783.78	32.53 N	31.13 W	-29.38	2.59
2881.00	10.47	319.12	2876.28	44.88 N	42.43 W	-40.01	0.77
2976.00	12.77	322.50	2969.33	59.74 N	54.47 W	-51.26	2.52
3071.00	12.61	321.77	3062.01	76.21 N	67.28 W	-63.19	0.24
3166.00	11.22	320.24	3154.96	91.47 N	79.61 W	-74.70	1.50
3261.00	11.20	318.83	3248.15	105.52 N	91.60 W	-85.93	0.29
3356.00	10.66	319.92	3341.42	119.19 N	103.33 W	-96.93	0.61
3451.00	11.61	328.49	3434.64	134.06 N	113.99 W	-106.79	2.01
3545.00	11.93	328.49	3526.66	150.41 N	124.01 W	-115.94	0.34
3640.00	12.46	326.96	3619.52	167.38 N	134.73 W	-125.75	0.65
3735.00	12.51	322.49	3712.27	184.13 N	146.58 W	-136.71	1.02
3830.00	13.20	330.39	3804.90	201.72 N	158.21 W	-147.39	1.99
3924.00	13.16	338.94	3896.43	221.04 N	167.36 W	-155.52	2.07
4019.00	12.61	338.59	3989.04	240.79 N	175.03 W	-162.14	0.58
4114.00	10.90	335.29	4082.05	258.60 N	182.57 W	-168.74	1.94
4209.00	10.10	334.81	4175.45	274.30 N	189.87 W	-175.20	0.84
4303.00	9.38	334.89	4268.10	288.69 N	196.63 W	-181.20	0.77
4398.00	9.10	333.24	4361.86	302.42 N	203.30 W	-187.14	0.40
4493.00	7.06	330.44	4455.92	314.21 N	209.56 W	-192.77	2.19
4588.00	4.16	323.33	4550.45	322.05 N	214.50 W	-197.30	3.13
4683.00	1.39	295.92	4645.33	325.32 N	217.60 W	-200.22	3.16
4777.00	0.80	250.78	4739.32	325.60 N	219.25 W	-201.85	1.06
5062.00	1.23	267.96	5024.27	324.84 N	224.18 W	-206.82	0.18
5157.00	0.50	232.49	5119.26	324.55 N	225.53 W	-208.18	0.92
5441.00	0.65	276.04	5403.25	323.96 N	228.12 W	-210.80	0.16
5725.00	0.68	337.81	5687.23	325.68 N	230.36 W	-212.94	0.24
6010.00	0.21	336.60	5972.23	327.72 N	231.20 W	-213.68	0.17
6200.00	0.15	34.58	6162.22	328.24 N	231.19 W	-213.64	0.10
6259.00	0.41	76.49	6221.22	328.36 N	230.94 W	-213.38	0.54
6294.00	0.60	55.26	6256.22	328.49 N	230.67 W	-213.10	0.74
6342.00	5.59	103.83	6304.14	328.07 N	228.19 W	-210.65	10.86
6389.00	12.20	94.38	6350.55	327.15 N	221.01 W	-203.53	14.37
6437.00	15.55	93.06	6397.14	326.42 N	209.52 W	-192.09	7.01
6483.00	18.26	92.60	6441.15	325.76 N	196.16 W	-178.78	5.90
6531.00	21.09	90.59	6486.34	325.33 N	180.01 W	-162.68	6.05
6578.00	23.26	89.71	6529.87	325.29 N	162.27 W	-144.97	4.67
6626.00	24.67	91.04	6573.73	325.15 N	142.78 W	-125.51	3.15
6673.00	27.95	93.87	6615.85	324.23 N	121.97 W	-104.78	7.48
6721.00	32.09	92.51	6657.40	322.91 N	98.00 W	-80.91	8.73
6767.00	35.67	91.68	6695.59	321.98 N	72.38 W	-55.37	7.85
6815.00	39.86	90.86	6733.52	321.34 N	42.99 W	-26.06	8.78
6862.00	43.44	90.76	6768.64	320.90 N	11.77 W	5.10	7.62
6910.00	47.43	90.21	6802.32	320.62 N	22.42 E	39.23	8.36
6957.00	52.08	89.42	6832.67	320.74 N	58.29 E	75.05	9.97
7005.00	55.53	89.87	6861.01	320.98 N	97.02 E	113.74	7.23
7052.00	59.76	91.45	6886.16	320.51 N	136.71 E	153.35	9.43
7100.00	63.12	92.53	6909.10	319.03 N	178.83 E	195.34	7.28
7147.00	66.05	92.64	6929.27	317.12 N	221.24 E	237.59	6.24
7195.00	68.73	92.00	6947.72	315.33 N	265.51 E	281.70	5.71
7242.00	72.94	90.84	6963.14	314.23 N	309.88 E	325.95	9.26
7290.00	76.82	90.87	6975.66	313.54 N	356.21 E	372.18	8.08
7324.00	80.71	91.05	6982.28	312.98 N	389.54 E	405.44	11.45

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 51.22 DEGREES (GRID)
A TOTAL CORRECTION OF 8.10 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 7324.00 FEET
IS 499.70 FEET ALONG 51.22 DEGREES (GRID)**