



1 : 240

WELL INFORMATION					
MWD Run Number	100	200			
Date run completed	24-Mar-13	25-Mar-13			
Rig Bit Number	2	3			
Bit Size (in)	8.750	8.750			
Tool Nominal OD (in)	6.750	6.750			
Log Start Depth (MD, ft)	844.00	5,930.00			
Log End Depth (MD, ft)	5,930.00	7,057.00			
Drill or Wipe	Drill	Drill			
Drill/Wipe Start Date and Time	23-Mar-13 06:45	24-Mar-13 11:30			
Drill/Wipe End Date and Time	23-Mar-13 23:00	25-Mar-13 01:00			
Min Inc (deg) @ Depth (MD, ft)	.65 @ 1,196.00	.56 @ 5,930.00			
Max Inc (deg) @ Depth (MD, ft)	13.63 @ 2,614.00	82.08 @ 7,002.00			
Bit TFA(in2) / Bit Type	.75 / PDC	.86 / PDC			
Flow Rate (gpm)	552.00	516.00			
Max AV (fpm) / CV (fpm) @ MWD	409.5 / 409.5	405.9 / 405.9			
Fluid Type	Fresh Water Gel	Fresh Water Gel			
Density (ppg) / Viscosity (spqt)	8.80 / 28.00	9.35 / 39.00			
Filtrate CL (ppm)	1,400.00	1,200.00			
pH / Fluid Loss (mptm)	8.50 / N/A	10.40 / N/A			
PV (cP) / YP (Ihf2)	3 / 2.00	16 / 8.00			
% Solids / % Sand	3.2 / 0.30	8.7 / 0.30			
% Oil / Oil:Water Ratio	N/A / N/A	N/A / N/A			
Rm @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			
Rmf @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			
Rmc @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A			
Max Tool Temp (deg F) @ S	141.78 / PDC	151.22 / PDC			

Max Tool Temp (degF) / Source	141.70 / PCM	154.20 / PCM			
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A			
Lead MWD Engineer	Robert Ley	Robert Ley			
Customer Representative	Charles Collver	Charles Collver			

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.76	5.76			
Sub Serial Number	11303513	11303513			
Insert Serial Number	11227512	11227512			
Date and Time Initialized	22-Mar-13 14:08	01-Jan-70 00:00			
Date and Time Read	25-Mar-13 08:00	25-Mar-13 07:53			
ECMB SW Version	N/A	N/A			

Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	57.00	55.00			
Software Version	6.21	6.21			
Sub Serial Number	11303513	11303513			
Sonde Serial Number	11833053	11833053			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	172.82	103.93			

Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	49.42	48.30			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	11303513	11303513			
Insert/Sonde Serial Number	11579843	11579843			

REMARKS

1. All depths are true vertical depths and are calibrated to the driller' pipe tally and are measured from the drill floor.
2. No depth corrections have been made for pipe stretch or compression.
3. All data presented is recorded (memory data) unless otherwise stated.
4. The Following smoothing parameters have been applied to the data"

PGRC (Gamma Ray):

Interval Resolution: 0.5 feet
Coercion Distance: 0.6 feet
Gap Fill: 3.0 feet

ROPA (Rate of Penetration):

Interval Resolution: 0.5 feet
Coercion Distance: 1.2 feet

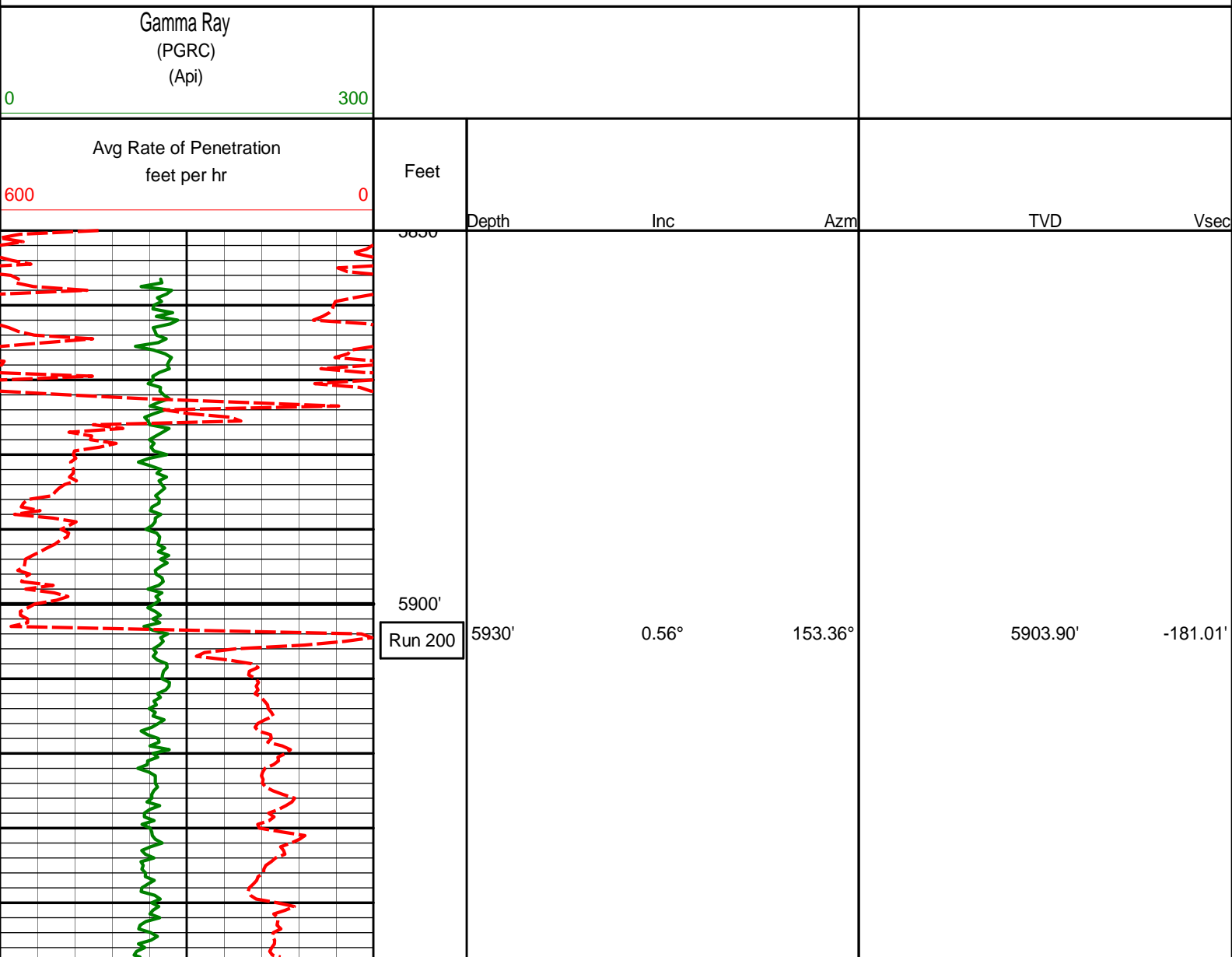
5. Gamma Data from the depths of (5893 - 5899) and ROP Data from the depths of (6614-6620) are missing due to a power outage on the rig.

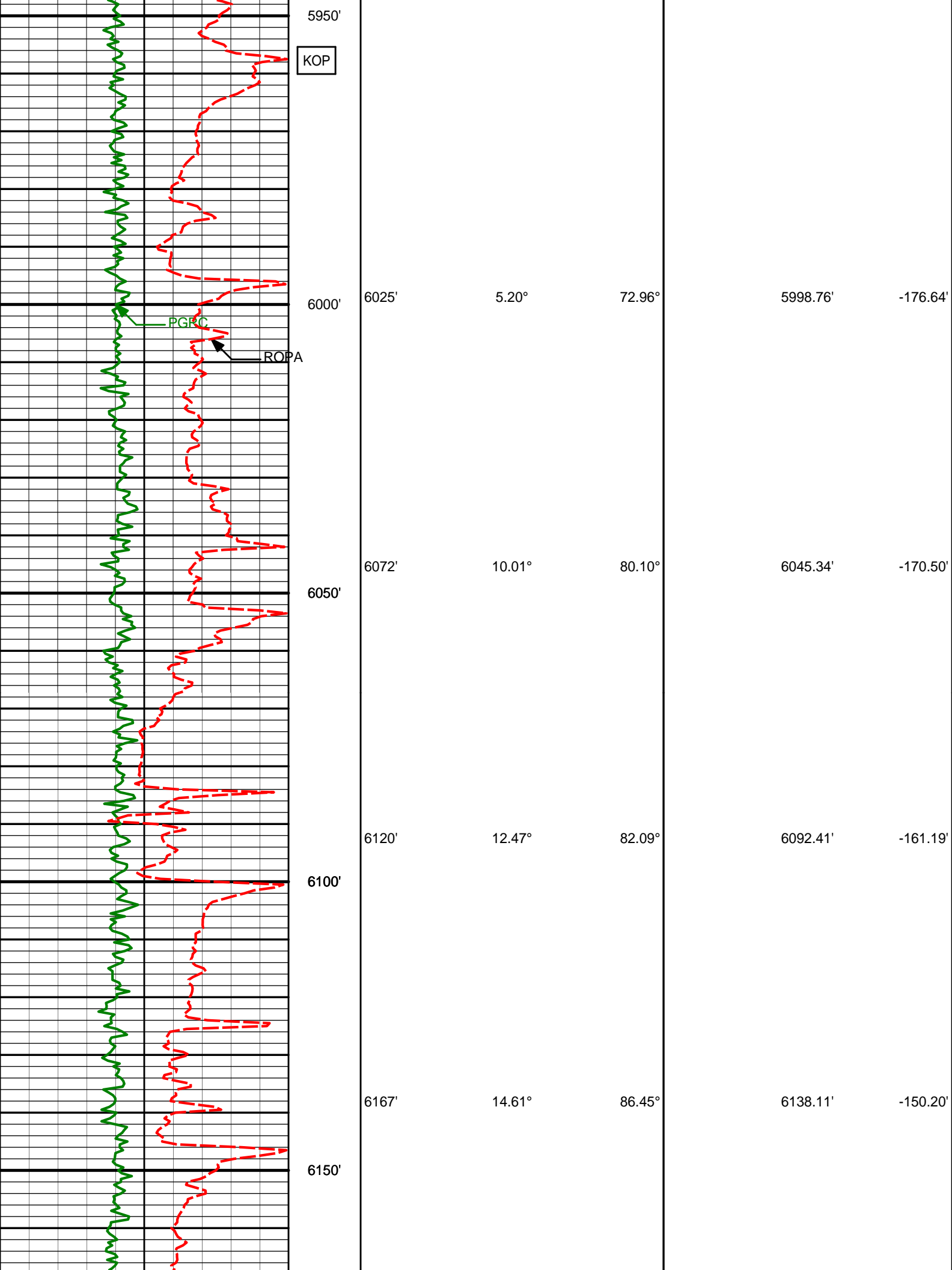
WARRANTY

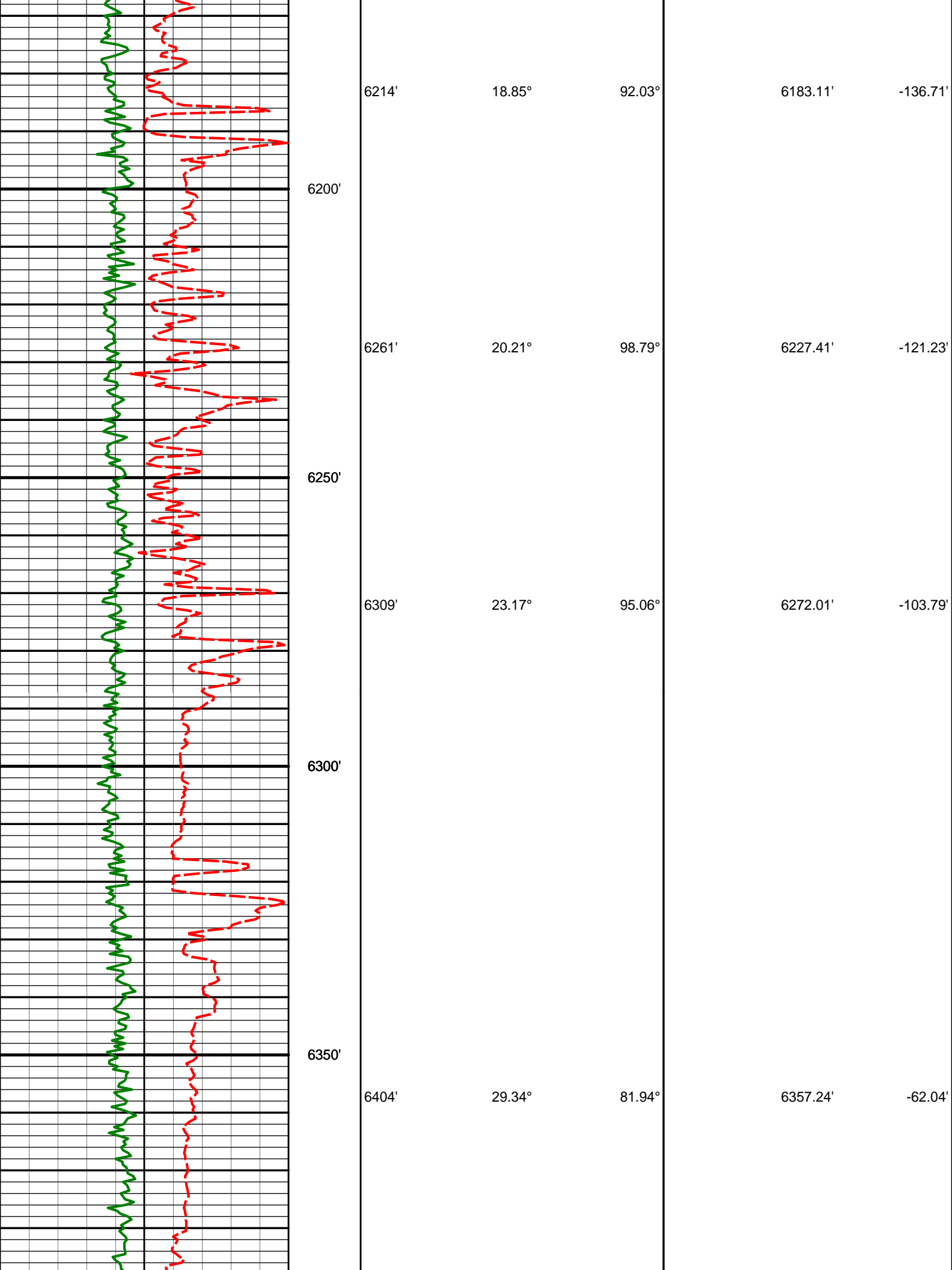
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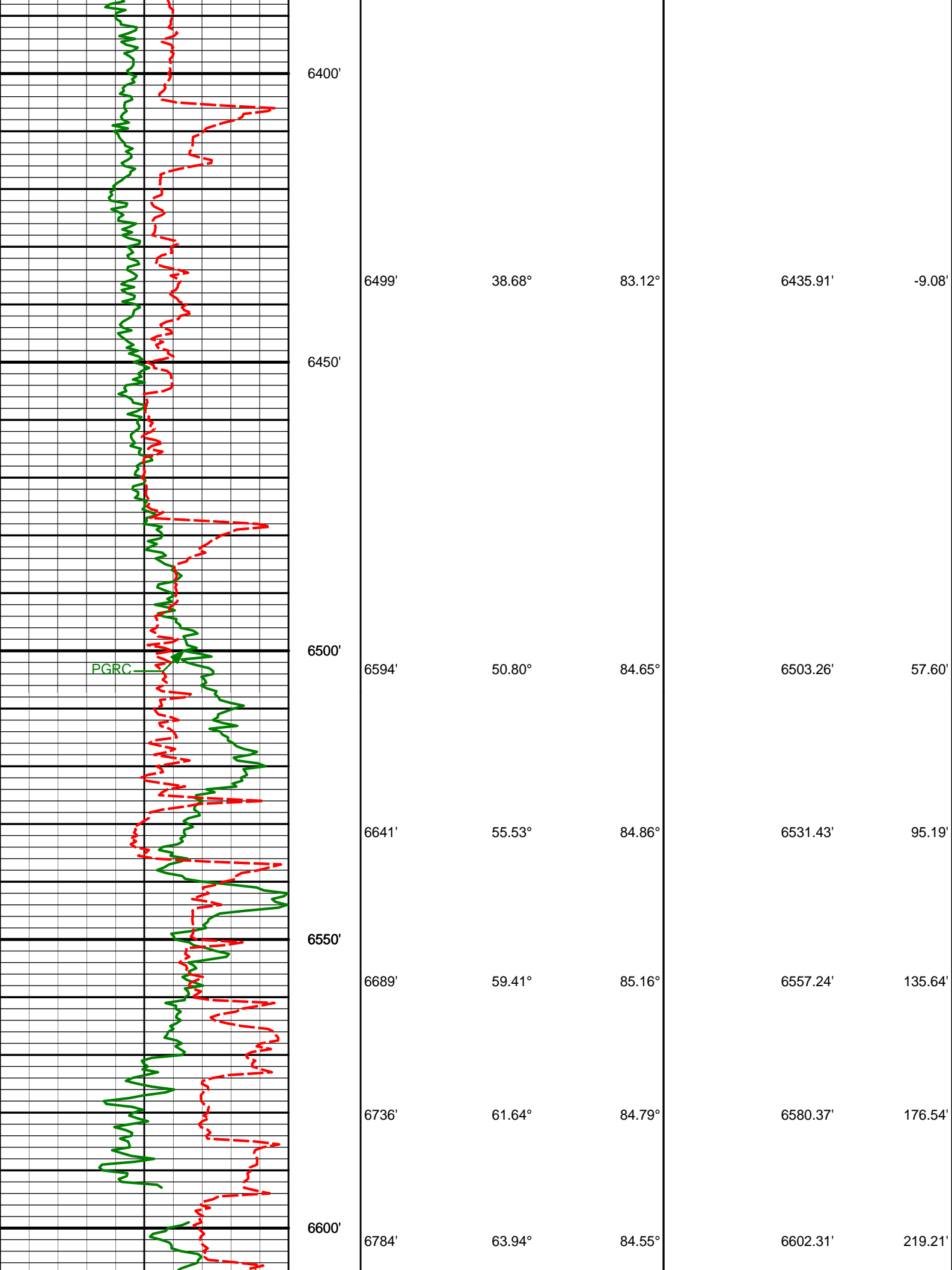
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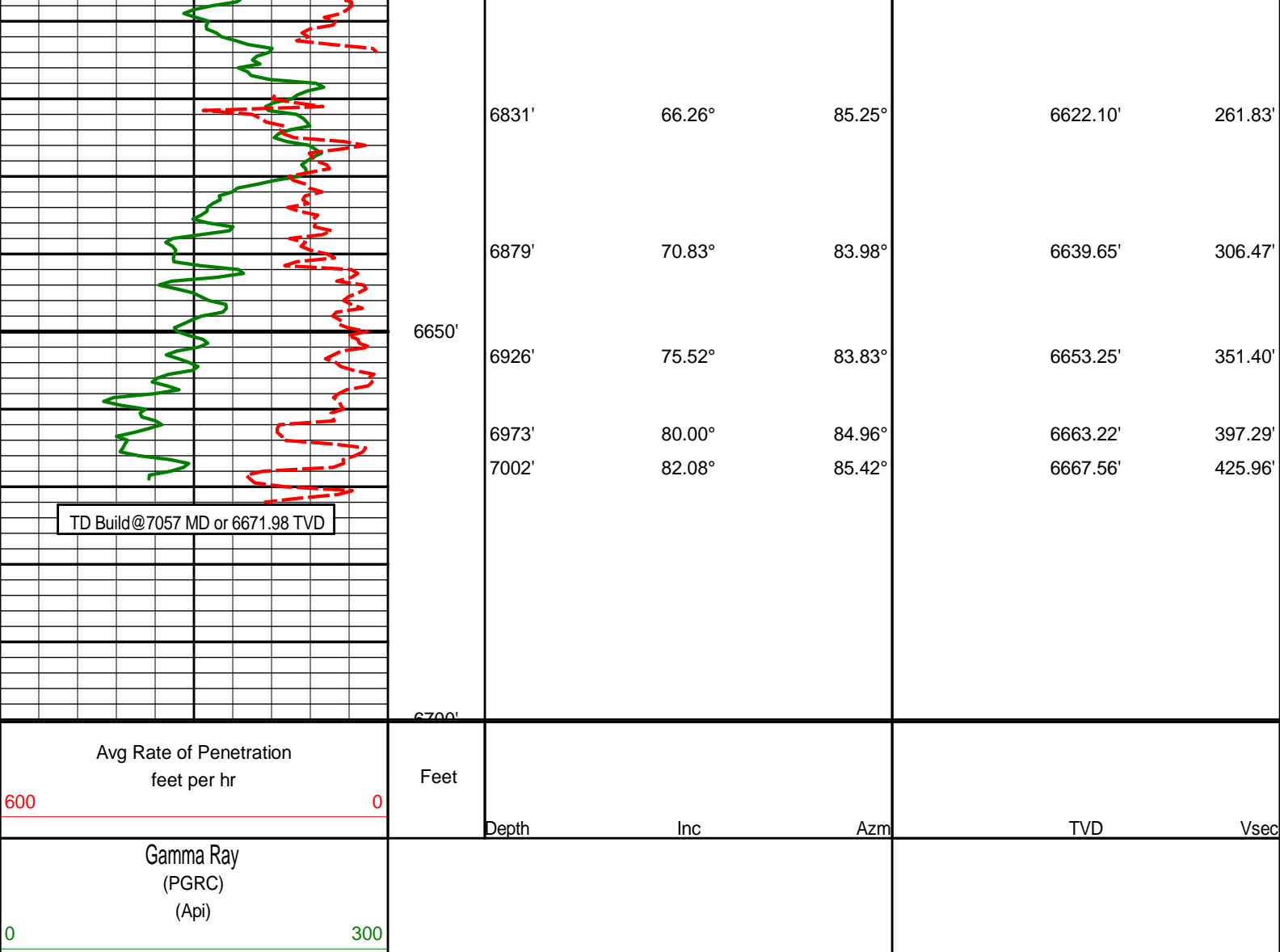
TVD Detail Log 1:240











HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
Sievers LE17-62HN
Wattenberg
Weld Colorado
USA
CA-XX-0900206163

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
844.00	0.00	0.00	844.00	0.00 N	0.00 E	0.00	TIE-IN
1010.00	0.66	345.51	1010.00	0.93 N	0.24 W	-0.18	0.40
1103.00	0.68	319.46	1102.99	1.87 N	0.73 W	-0.61	0.33
1196.00	0.65	315.05	1195.98	2.66 N	1.46 W	-1.29	0.06
1289.00	0.99	328.09	1288.97	3.72 N	2.26 W	-2.02	0.41
1382.00	1.29	326.22	1381.96	5.27 N	3.27 W	-2.93	0.33
1475.00	1.25	335.48	1474.93	7.07 N	4.27 W	-3.82	0.23
1665.00	1.26	341.70	1664.89	10.93 N	5.79 W	-5.08	0.07
1760.00	3.77	333.98	1759.79	14.72 N	7.48 W	-6.53	2.66
1854.00	6.10	321.71	1853.44	21.42 N	11.93 W	-10.55	2.71
1949.00	7.94	315.11	1947.72	30.03 N	19.69 W	-17.75	2.11
2044.00	10.83	314.72	2041.44	40.96 N	30.67 W	-28.01	3.04
2139.00	11.69	315.96	2134.61	54.16 N	43.70 W	-40.17	0.94
2234.00	13.43	316.18	2227.34	69.03 N	58.03 W	-53.53	1.84
2329.00	11.20	313.09	2320.14	83.30 N	72.40 W	-66.97	2.44

2424.00	12.23	319.72	2413.17	97.28 N	85.65 W	-79.30	1.78
2519.00	12.45	314.45	2505.98	112.13 N	99.47 W	-92.15	1.21
2614.00	13.63	314.14	2598.52	127.10 N	114.81 W	-106.51	1.25
2709.00	12.76	312.17	2691.02	141.94 N	130.62 W	-121.35	1.03
2804.00	11.58	307.42	2783.88	154.78 N	145.97 W	-135.85	1.63
2899.00	11.24	307.40	2877.01	166.19 N	160.89 W	-150.02	0.36
2994.00	8.30	312.15	2970.62	176.42 N	173.33 W	-161.78	3.20
3089.00	6.80	316.16	3064.79	185.07 N	182.31 W	-170.19	1.67
3184.00	5.00	312.65	3159.29	191.94 N	189.25 W	-176.69	1.93
3279.00	3.43	309.30	3254.03	196.54 N	194.50 W	-181.63	1.68
3374.00	2.62	289.02	3348.90	199.05 N	198.74 W	-185.71	1.40
3469.00	0.84	22.42	3443.86	200.40 N	200.53 W	-187.40	2.94
3753.00	1.82	125.39	3727.81	199.71 N	196.05 W	-182.98	0.76
4038.00	2.22	121.39	4012.63	194.21 N	187.65 W	-174.94	0.15
4133.00	1.28	140.59	4107.58	192.43 N	185.40 W	-172.81	1.15
4418.00	1.71	166.02	4392.49	185.84 N	182.34 W	-170.18	0.27
4702.00	1.95	175.96	4676.35	176.90 N	180.98 W	-169.38	0.14
4987.00	3.27	213.42	4961.06	165.27 N	185.12 W	-174.25	0.73
5082.00	0.68	240.99	5056.00	162.73 N	187.11 W	-176.40	2.83
5366.00	1.35	203.78	5339.96	158.84 N	189.94 W	-179.48	0.32
5556.00	0.68	197.82	5529.92	155.71 N	191.19 W	-180.92	0.36
5841.00	0.70	164.50	5814.90	152.42 N	191.24 W	-181.18	0.14
5873.00	0.75	174.57	5846.90	152.02 N	191.17 W	-181.13	0.42
5930.00	0.56	153.36	5903.90	151.41 N	191.01 W	-181.01	0.53
6025.00	5.20	72.96	5998.76	152.26 N	186.68 W	-176.64	5.41
6072.00	10.01	80.10	6045.34	153.58 N	180.62 W	-170.50	10.42
6120.00	12.47	82.09	6092.41	155.01 N	171.37 W	-161.19	5.17
6167.00	14.61	86.45	6138.11	156.08 N	160.43 W	-150.20	5.04
6214.00	18.85	92.03	6183.11	156.18 N	146.92 W	-136.71	9.65
6261.00	20.21	98.79	6227.41	154.67 N	131.31 W	-121.23	5.60
6309.00	23.17	95.06	6272.01	152.57 N	113.71 W	-103.79	6.80
6404.00	29.34	81.94	6357.24	154.19 N	71.98 W	-62.04	8.88
6499.00	38.68	83.12	6435.91	161.02 N	19.34 W	-9.08	9.86
6594.00	50.80	84.65	6503.26	168.04 N	47.03 E	57.60	12.80
6641.00	55.53	84.86	6531.43	171.47 N	84.48 E	95.19	10.07
6689.00	59.41	85.16	6557.24	174.99 N	124.79 E	135.64	8.10
6736.00	61.64	84.79	6580.37	178.57 N	165.54 E	176.54	4.80
6784.00	63.94	84.55	6602.31	182.54 N	208.04 E	219.21	4.81
6831.00	66.26	85.25	6622.10	186.33 N	250.50 E	261.83	5.13
6879.00	70.83	83.98	6639.65	190.53 N	294.96 E	306.47	9.82
6926.00	75.52	83.83	6653.25	195.30 N	339.69 E	351.40	9.99
6973.00	80.00	84.96	6663.22	199.78 N	385.38 E	397.29	9.81

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 86.36 DEGREES (GRID)
A TOTAL CORRECTION OF 7.60 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 6973.00 FEET
IS 434.09 FEET ALONG 62.60 DEGREES (GRID)**