



**1:600 / 1:240**

WELL INFORMATION					
MWD Run Number	100	200			
Date run completed	05-Nov-15	06-Nov-15			
Rig Bit Number	2	3			
Bit Size (in)	8.750	8.750			
Tool Nominal OD (in)	6.750	6.750			
Log Start Depth (TVD, ft)	844.99	6,715.80			
Log End Depth (TVD, ft)	6,715.80	7,008.81			
Drill or Wipe	Drill	Drill			
Drill/Wipe Start Date and Time	04-Nov-15 10:00	05-Nov-15 13:30			
Drill/Wipe End Date and Time	05-Nov-15 06:00	05-Nov-15 22:00			
Min Inc (deg) @ Depth (TVD, ft)	0.22 @ 4,261.53	37.94 @ 6,782.10			
Max Inc (deg) @ Depth (TVD, ft)	25.67 @ 6,701.51	84.29 @ 7,004.67			
Bit TFA(in2) / Bit Type	1.04 / PDC	0.98 / PDC			
Flow Rate (gpm)	586.61	519.38			
Max AV (fpm) / CV (fpm) @ MWD	N/A / N/A	N/A / N/A			
Fluid Type	Fresh Water Gel	Fresh Water Gel			
Density (ppg) / Viscosity (spqt)	8.60 / 29.00	9.20 / 36.00			
Filtrate CL (ppm)	1,500.00	1,500.00			
pH / Fluid Loss (mptm)	7.40 / 20	9.20 / 8			
PV (cP) / YP (lhf2)	1 / 4.00	10 / 7.00			
% Solids / % Sand	6.9 / 0.30	6.90 / 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 (degF) / Source	171.20 / PCM	175.40 / PCM			
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A			
Lead MWD Engineer	Paul Kock	Paul Kock			
Customer Representative	Dave Nielsen	Dave Nielsen			

## SENSOR INFORMATION

### Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.93	5.93			
Sub Serial Number	11619287	11619287			
Insert Serial Number	11680789	11680789			
Date and Time Initialized	04-Nov-15 00:11	04-Nov-15 00:11			
Date and Time Read	06-Nov-15 12:00	06-Nov-15 12:07			
ECMB SW Version	N/A	N/A			

### Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	55.00	55.00			
Software Version	6.21	6.21			
Sub Serial Number	11619287	11619287			
Sonde Serial Number	10993516	10993516			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	264.70	314.70			

### Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	43.27	42.66			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	11619287	11619287			
Insert/Sonde Serial Number	11681042	11681042			

## REMARKS

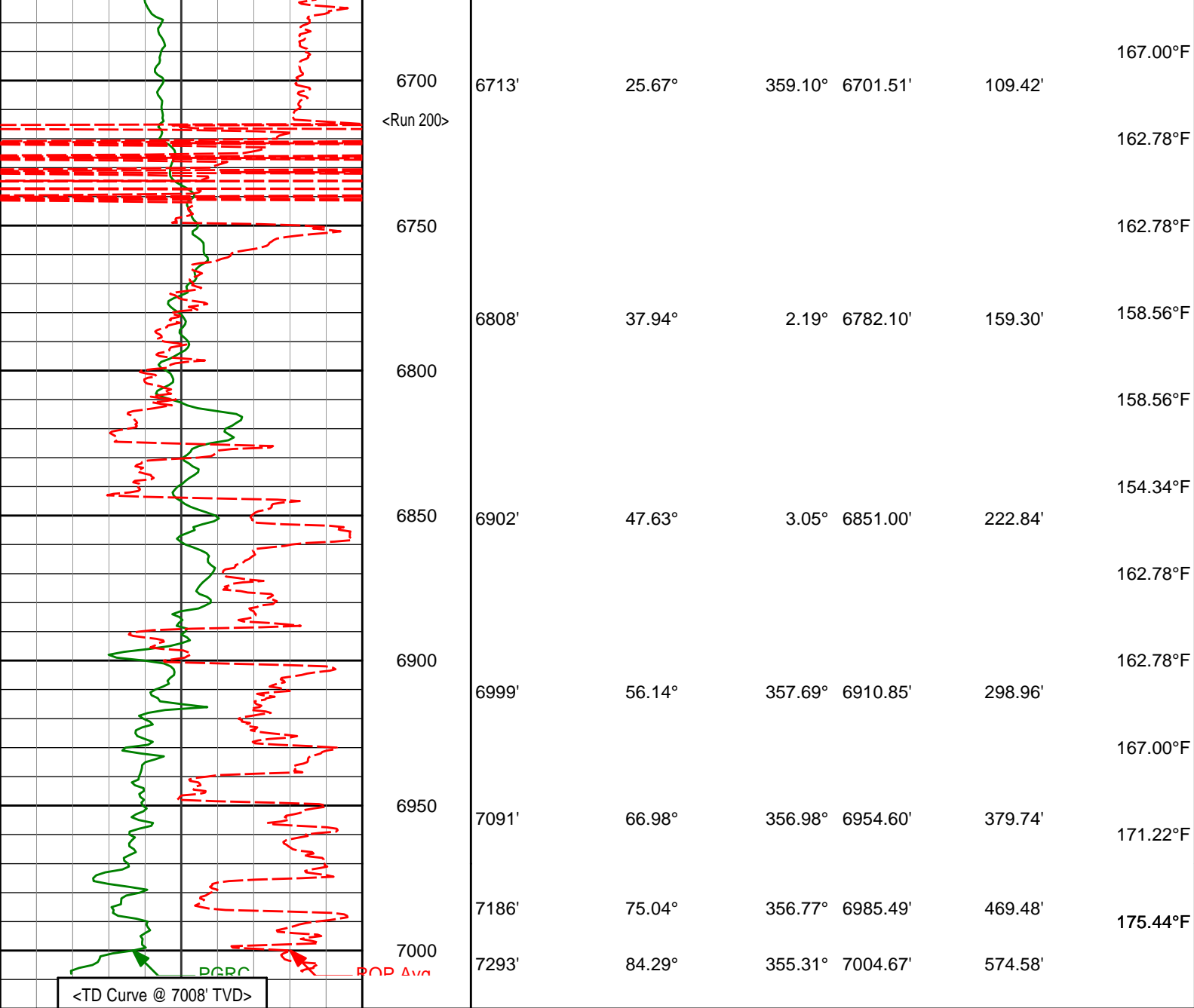
1. All depths are calibrated to the driller's pipe tally and are measured from the Rig drill floor.
2. No depth corrections have been made for pipe stretch or compression.
3. All data presented is recorded (memory data) unless otherwise stated.
  - ROPA: Average Rate of Penetration is real time data.
  - PGRC: Smooth Pressure Case Gamma Ray Borehole corrected is recorded data.
4. The following smoothing parameters have been applied to the data:
  - All ROP in logs - 0.5 ft interval, 1.2 ft coercion distance.
  - Gamma in 2" (1:600) logs - 1 ft interval, 3 ft coercion distance.
  - Gamma in 5" (1:240) logs - 0.5 ft interval, 0.6 ft coercion distance.
5. INSITE version 8.3.0.
6. Gamma presented realtime from 845 ft. MD to 7305 ft. MD.

## WARRANTY

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# TVD Detail 1:600 Scale

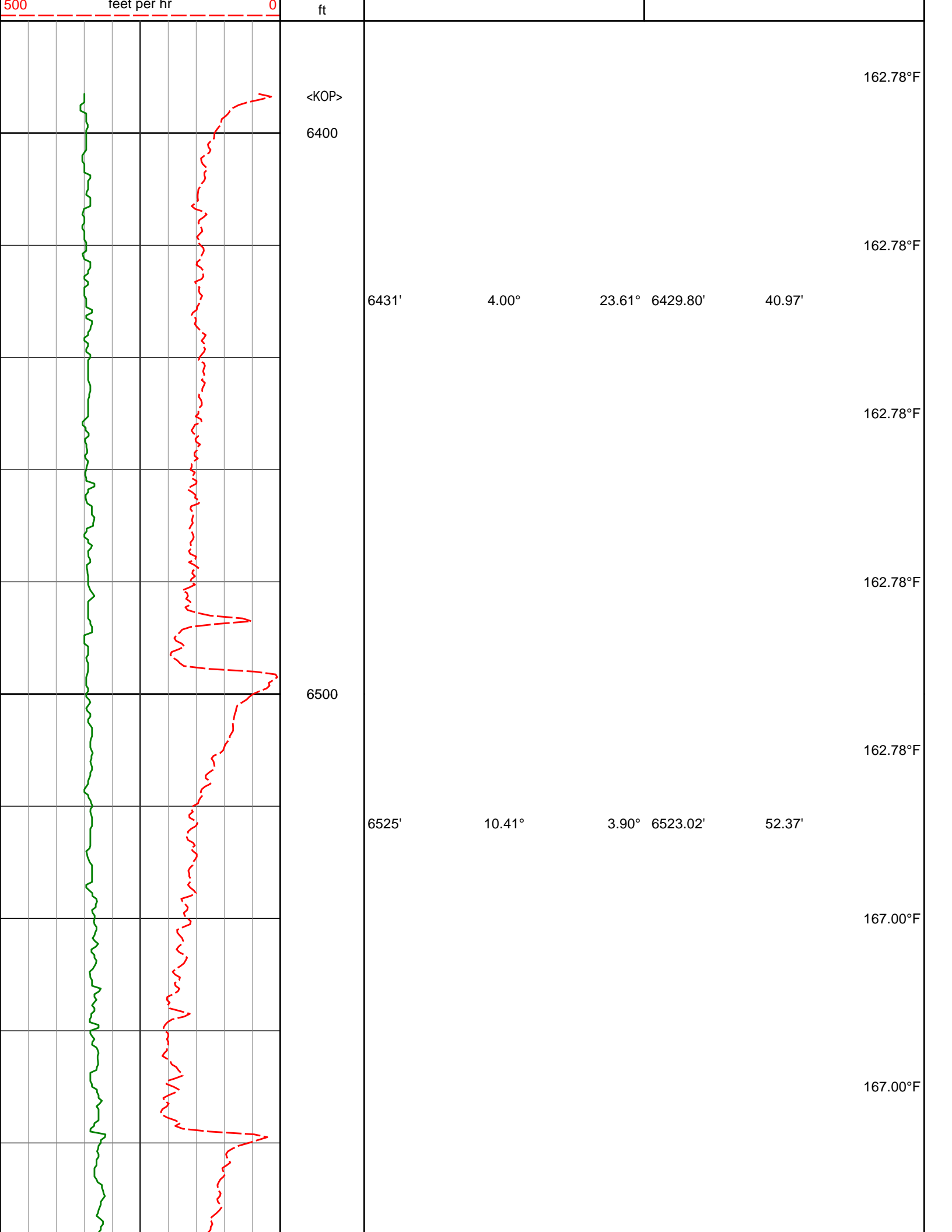
Gamma CG Cor PGR api							
Avg Rate of Penetration ROP Avg feet per hr		Depth TVD ft	Inc	Azi	TVD	V.S.	Temp
0 300							
500 0							
		<KOP> 6400					162.78°F
		6431'	4.00°	23.61°	6429.80'	40.97'	162.78°F
		6450					162.78°F
		6500					162.78°F
		6525'	10.41°	3.90°	6523.02'	52.37'	162.78°F
		6550					167.00°F
		6600					167.00°F
		6619'	17.53°	3.44°	6614.18'	74.92'	167.00°F
		6650					171.22°F
							167.00°F

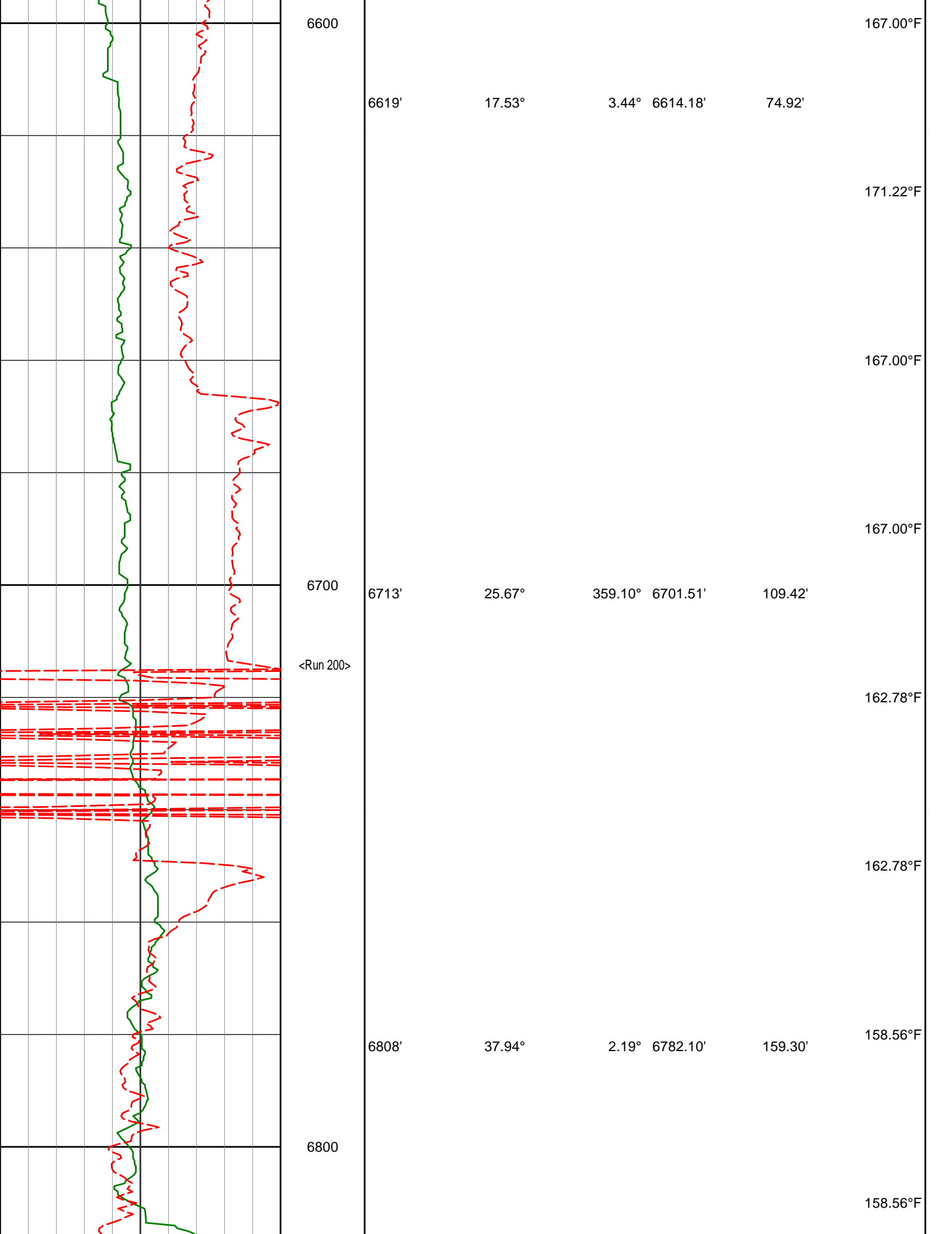


Avg Rate of Penetration ROP Avg feet per hr		Depth TVD ft	Depth	Inc	Azi	TVD	V.S.	Temp
5000								
Gamma CG Cor PGRC api								
0300								

TVD Detail 1:240 Scale

Gamma Ray Cor PGRC api								
0		300						
Avg Rate of Penetration ROP Avg feet per hr		Depth TVD	Depth	Inc	Azi	TVD	V.S.	Temp
500								







DIRECTIONAL SURVEY REPORT

Noble Energy  
Moser H22-776  
Wattenberg  
Weld Colorado  
USA  
CA-XX-0902771573

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
250.00	0.11	345.62	250.00	0.23 N	0.06 W	0.23	0.04
500.00	0.23	345.62	500.00	0.95 N	0.24 W	0.96	0.05
845.00	0.39	345.62	844.99	2.76 N	0.71 W	2.79	0.05
917.00	0.42	345.62	916.99	3.25 N	0.83 W	3.28	0.04
1011.00	0.31	19.55	1010.99	3.82 N	0.83 W	3.85	0.25
1106.00	0.35	307.08	1105.99	4.24 N	0.98 W	4.28	0.41
1198.00	0.66	327.35	1197.99	4.86 N	1.49 W	4.92	0.39
1289.00	0.94	12.10	1288.98	6.03 N	1.62 W	6.09	0.72
1381.00	0.97	15.39	1380.96	7.51 N	1.26 W	7.56	0.07
1473.00	0.99	9.57	1472.95	9.04 N	0.92 W	9.07	0.11
1565.00	1.10	10.89	1564.94	10.70 N	0.62 W	10.72	0.12
1656.00	1.08	11.49	1655.92	12.41 N	0.28 W	12.41	0.03
1748.00	1.09	22.99	1747.90	14.07 N	0.23 E	14.05	0.24
1839.00	1.08	13.73	1838.89	15.70 N	0.78 E	15.65	0.19
1930.00	0.95	356.92	1929.87	17.28 N	0.94 E	17.23	0.35
2022.00	1.07	324.93	2021.86	18.74 N	0.40 E	18.71	0.62
2113.00	1.03	307.79	2112.84	19.94 N	0.73 W	19.95	0.35
2205.00	0.81	326.74	2204.83	20.99 N	1.74 W	21.05	0.41
2297.00	0.80	329.55	2296.82	22.09 N	2.43 W	22.17	0.05
2389.00	0.30	321.03	2388.82	22.84 N	2.91 W	22.94	0.54
2480.00	0.62	276.38	2479.82	23.08 N	3.55 W	23.21	0.51
2571.00	0.25	192.13	2570.81	22.94 N	4.09 W	23.08	0.71
2663.00	1.03	200.42	2662.81	21.96 N	4.42 W	22.12	0.85
2754.00	0.87	217.99	2753.79	20.65 N	5.13 W	20.84	0.37
2845.00	0.82	226.28	2844.78	19.66 N	6.02 W	19.88	0.15
2936.00	0.96	246.03	2935.77	18.90 N	7.18 W	19.17	0.37
3031.00	1.07	247.57	3030.76	18.24 N	8.73 W	18.58	0.12
3126.00	1.07	263.68	3125.74	17.80 N	10.43 W	18.21	0.32
3220.00	0.79	266.24	3219.73	17.67 N	11.94 W	18.13	0.30
3315.00	0.40	241.06	3314.72	17.46 N	12.88 W	17.97	0.48
3409.00	0.34	204.62	3408.72	17.05 N	13.29 W	17.57	0.25
3504.00	1.18	338.53	3503.72	17.70 N	13.76 W	18.24	1.51
3598.00	2.08	323.15	3597.68	19.97 N	15.14 W	20.56	1.06
3693.00	2.23	326.21	3692.61	22.88 N	17.20 W	23.55	0.19
3788.00	0.46	229.87	3787.59	24.17 N	18.52 W	24.89	2.44
3883.00	0.90	269.42	3882.58	23.92 N	19.55 W	24.68	0.65
3977.00	1.16	269.07	3976.57	23.90 N	21.24 W	24.73	0.28
4072.00	1.37	128.99	4071.56	23.16 N	21.32 W	24.00	2.51
4167.00	0.78	118.85	4166.54	22.14 N	19.87 W	22.92	0.65
4262.00	0.22	123.37	4261.53	21.72 N	19.15 W	22.47	0.59
4546.00	0.22	318.01	4545.53	21.83 N	19.06 W	22.58	0.16
4640.00	0.77	10.04	4639.53	22.59 N	19.07 W	23.34	0.70
4829.00	1.45	352.69	4828.49	26.22 N	19.16 W	26.97	0.40
4923.00	2.70	0.56	4922.43	29.61 N	19.29 W	30.36	1.36
5017.00	1.71	354.47	5016.36	33.22 N	19.40 W	33.97	1.08
5112.00	1.50	82.53	5111.33	34.79 N	18.30 W	35.50	2.35
5300.00	0.62	228.05	5299.32	34.43 N	16.62 W	35.07	1.09
5394.00	0.49	350.60	5393.31	34.48 N	17.06 W	35.14	1.04
5489.00	0.77	303.66	5488.31	35.23 N	17.66 W	35.92	0.60
5677.00	1.97	133.24	5676.28	33.72 N	16.36 W	34.35	1.45
5772.00	2.16	91.36	5771.22	32.56 N	13.38 W	33.07	1.57
5866.00	2.15	78.69	5865.16	32.87 N	9.87 W	33.24	0.51
5960.00	2.30	77.28	5959.09	33.63 N	6.30 W	33.86	0.17
6055.00	2.22	52.56	6054.04	35.22 N	2.25 W	35.24	1.22



6055.00	2.38	53.56	6054.01	35.22 N	2.85 W	35.31	1.02
6149.00	1.83	53.68	6147.95	37.27 N	0.07 W	37.24	0.59
6337.00	1.23	105.08	6335.89	38.52 N	4.29 E	38.32	0.76
6431.00	4.00	23.61	6429.80	41.27 N	6.57 E	40.97	4.26
6525.00	10.41	3.90	6523.02	52.75 N	8.46 E	52.37	7.21
6619.00	17.53	3.44	6614.18	75.38 N	9.89 E	74.92	7.57
6713.00	25.67	359.10	6701.51	109.93 N	10.42 E	109.42	8.83
6808.00	37.94	2.19	6782.10	159.88 N	11.22 E	159.30	13.02
6902.00	47.63	3.05	6851.00	223.59 N	14.17 E	222.84	10.33
6999.00	56.14	357.69	6910.85	299.79 N	14.45 E	298.96	9.78
7091.00	66.98	356.98	6954.60	380.47 N	10.67 E	379.74	11.81
7186.00	75.04	356.77	6985.49	470.09 N	5.78 E	469.48	8.48
7293.00	84.29	355.31	7004.67	574.99 N	1.51 W	574.58	8.75

**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 357.70 DEGREES (GRID)**  
**A TOTAL CORRECTION OF 7.91 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**  
  
**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.**  
**HORIZONTAL DISPLACEMENT(CLOSURE) AT 7293.00 FEET**  
**IS 574.99 FEET ALONG 359.85 DEGREES (GRID)**  
  
 Surveys at 250 ft, 500 ft and 845 ft are interpolated between surface and first survey at 917 ft.