

[illegible]

WELL INFORMATION

MWD Run Number	100				
Date run completed	18-Jan-15				
Rig Bit Number	2				
Bit Size (in)	8.750				
Tool Nominal OD (in)	6.750				
Log Start Depth (MD, ft)	702.00				
Log End Depth (MD, ft)	7,108.00				
Drill or Wipe	Drill				
Drill/Wipe Start Date and Time	17-Jan-15 07:45				
Drill/Wipe End Date and Time	18-Jan-15 14:55				
Min Inc (deg) @ Depth (MD, ft)	0.66 @ 726.00				
Max Inc (deg) @ Depth (MD, ft)	77.39 @ 7,050.00				
Bit TFA(in2) / Bit Type	1.05 / PDC				
Flow Rate (gpm)	629.82				
Max AV (fpm) / CV (fpm) @ MWD	N/A / N/A				
Fluid Type	Polymer				
Density (ppg) / Viscosity (spqt)	9.50 / 34.00				
Filtrate CL (ppm)	1,500.00				
pH / Fluid Loss (mptm)	8.30 / 10				
PV (cP) / YP (lbf2)	7 / 5.00				
% Solids / % Sand	6.8 / 1.00				
% Oil / Oil:Water Ratio	N/A / N/A				
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 (in) Temp (degF)	172.75 / 180.00				

Max Tool Temp (degF) / Source	172.78 / PCM				
Rm @ Max Tool Temp (degF)	N/A @ N/A				
Lead MWD Engineer	Henry Schmeidler				
Customer Representative	Derek Dupee				

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM				
Software Version	5.93				
Sub Serial Number	11404272				
Insert Serial Number	11680742				
Date and Time Initialized	17-Jan-15 01:02				
Date and Time Read	19-Jan-15 01:04				
ECMB SW Version	N/A				

Directional Sensor Information

Tool Type	PCDC				
Distance From Bit (ft)	55.90				
Software Version	6.21				
Sub Serial Number	11404272				
Sonde Serial Number	11638470				
Sensor ID Number	N/A				
Toolface Offset (deg)	15.54				

Gamma Ray Sensor Information

Tool Type	PCG				
Distance From Bit (ft)	50.20				
Recorded Sample Period (sec)	10				
Software Version	8.15				
Sub Serial Number	11404272				
Insert/Sonde Serial Number	11121362				

REMARKS

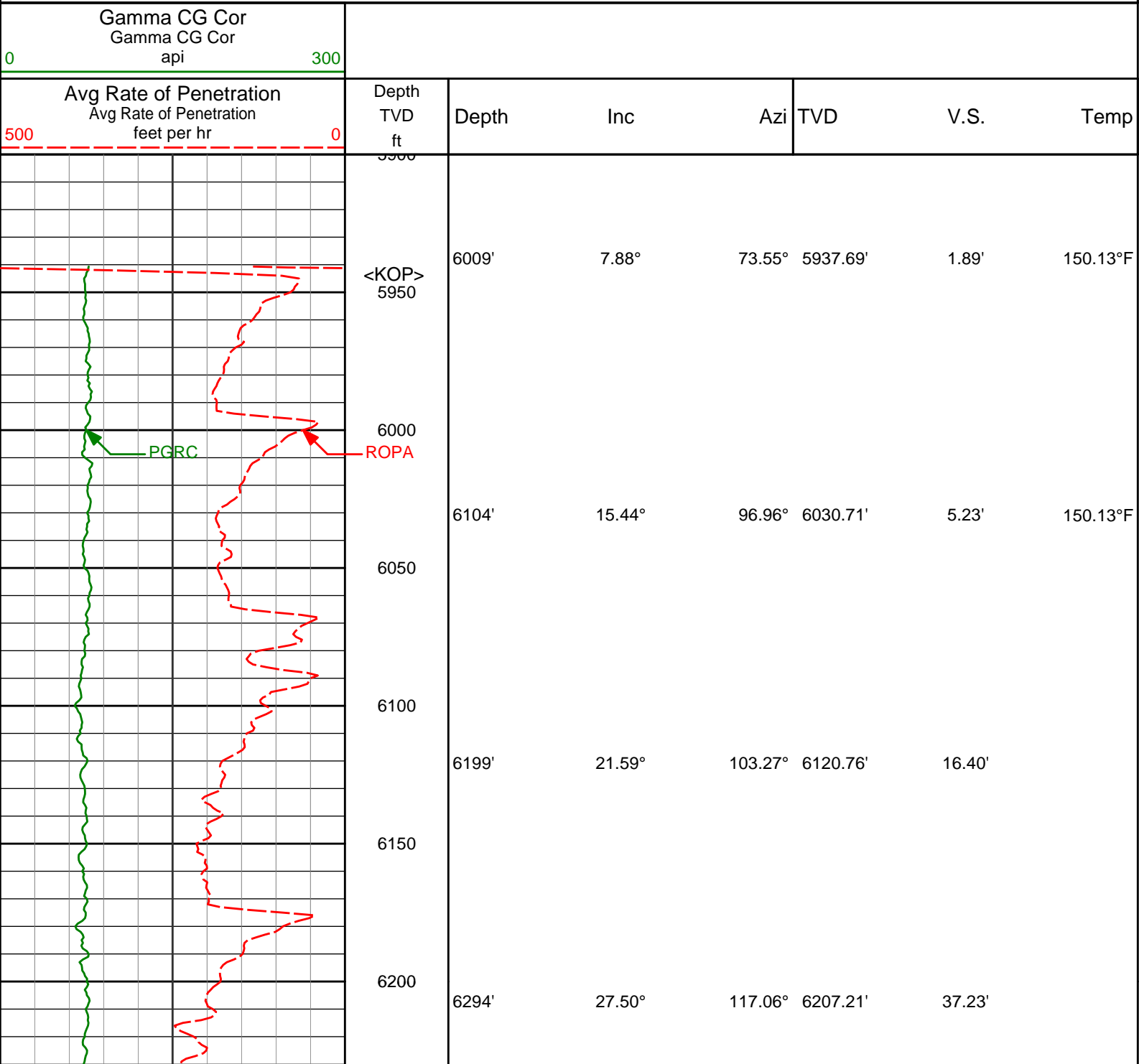
1. All depths are calibrated to the driller's pipe tally and are measured from the Rig drill floor.
2. No depth corrections have been made for pipe stretch or compression.
3. All data presented is recorded (memory data) unless otherwise stated.
 - ROPA: Average Rate of Penetration is real time data.
 - PGRC: Smooth Pressure Case Gamma Ray Borehole corrected is recorded data.
4. The following smoothing parameters have been applied to the data:
 - All 2" (1:600) logs - 1 ft. interval, 3 ft. coercion distance.
 - All 5" (1:240) logs - .5 ft. interval, .6 ft. coercion distance.
5. INSITE version 8.1.1

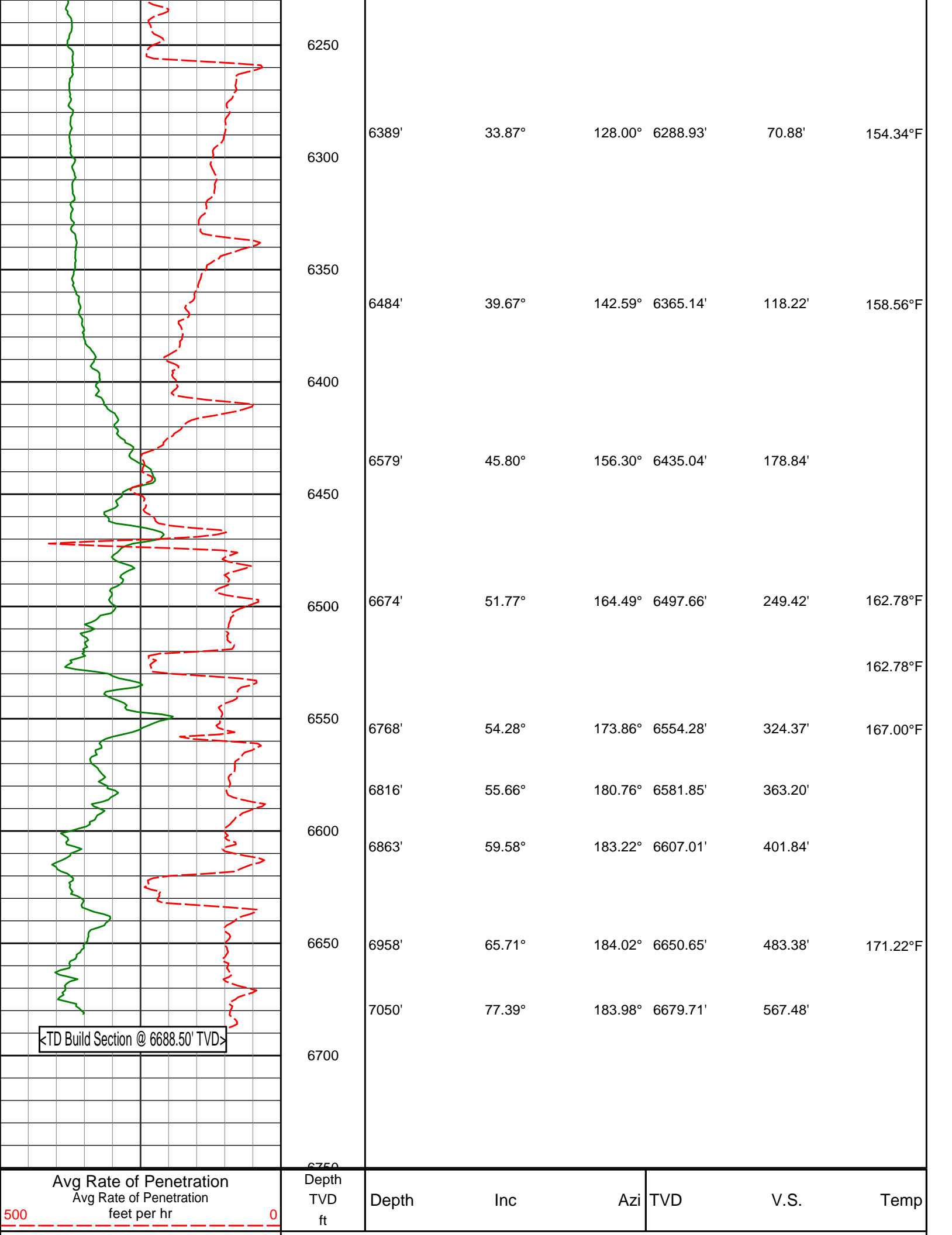
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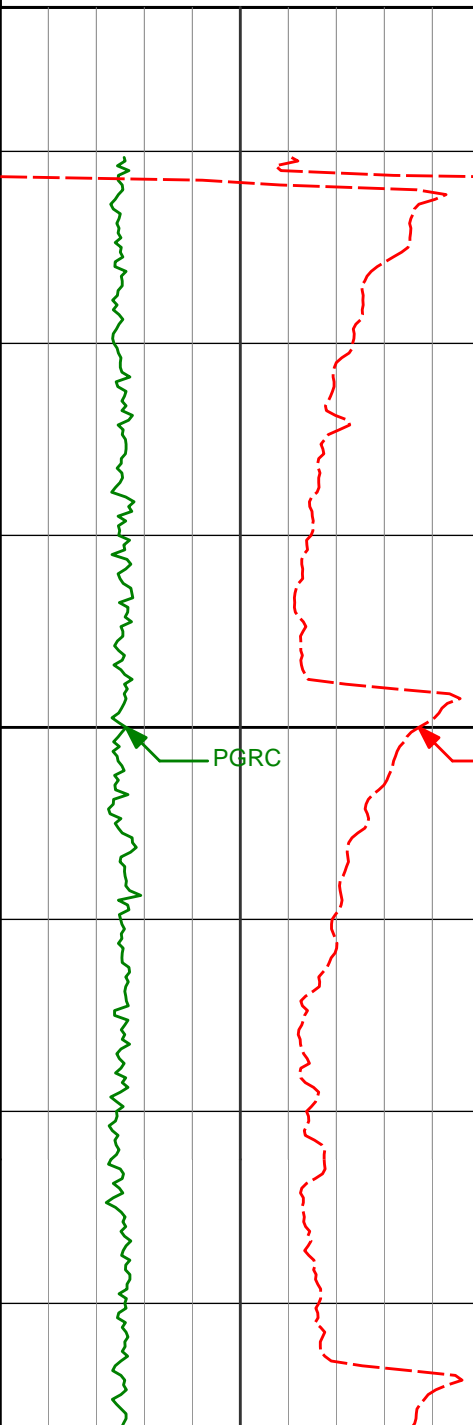
TVD Detail 1:600 Scale

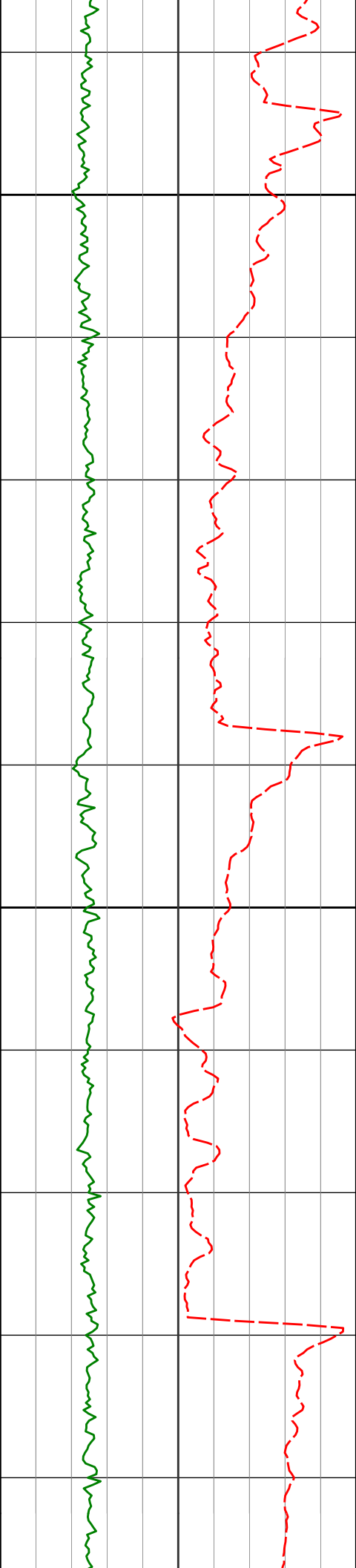




Gamma CG Cor Gamma CG Cor api	0	300
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TVD Detail 1:240 Scale

Gamma CG Cor Gamma CG Cor api								
0	300							
Avg Rate of Penetration Avg Rate of Penetration feet per hr		Depth TVD ft	Depth	Inc	Azi	TVD	V.S.	Temp
500	0							
		<KOP>	6009'	7.88°	73.55°	5937.69'	1.89'	150.13°F
		6000						
PGRC		ROPA						
			6104'	15.44°	96.96°	6030.71'	5.23'	150.13°F



6100

6200

6199'

21.59°

103.27°

6120.76'

16.40'

6294'

27.50°

117.06°

6207.21'

37.23'

6389'

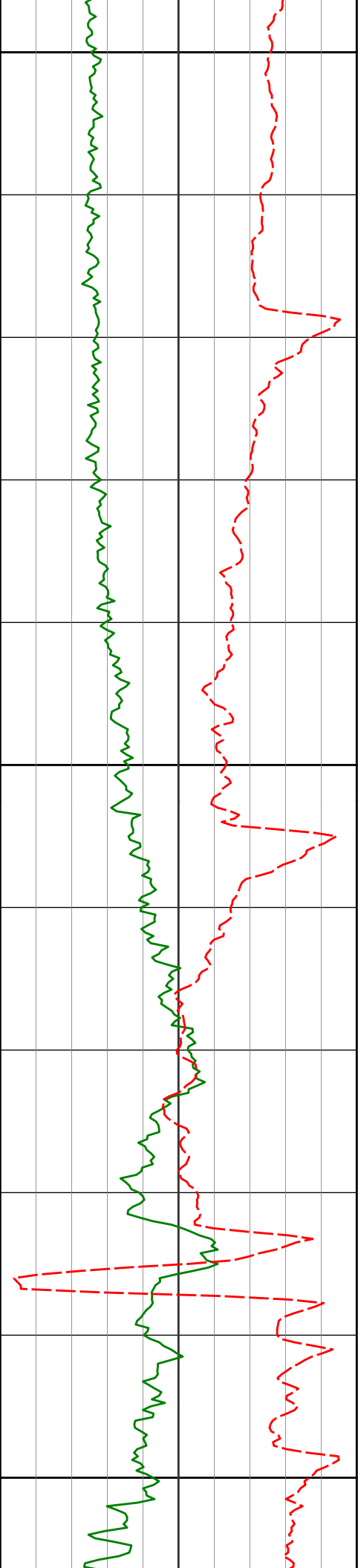
33.87°

128.00°

6288.93'

70.88'

154.34°F



6300

6400

6500

6484'

39.67°

142.59°

6365.14'

118.22'

158.56°F

6579'

45.80°

156.30°

6435.04'

178.84'

6674'

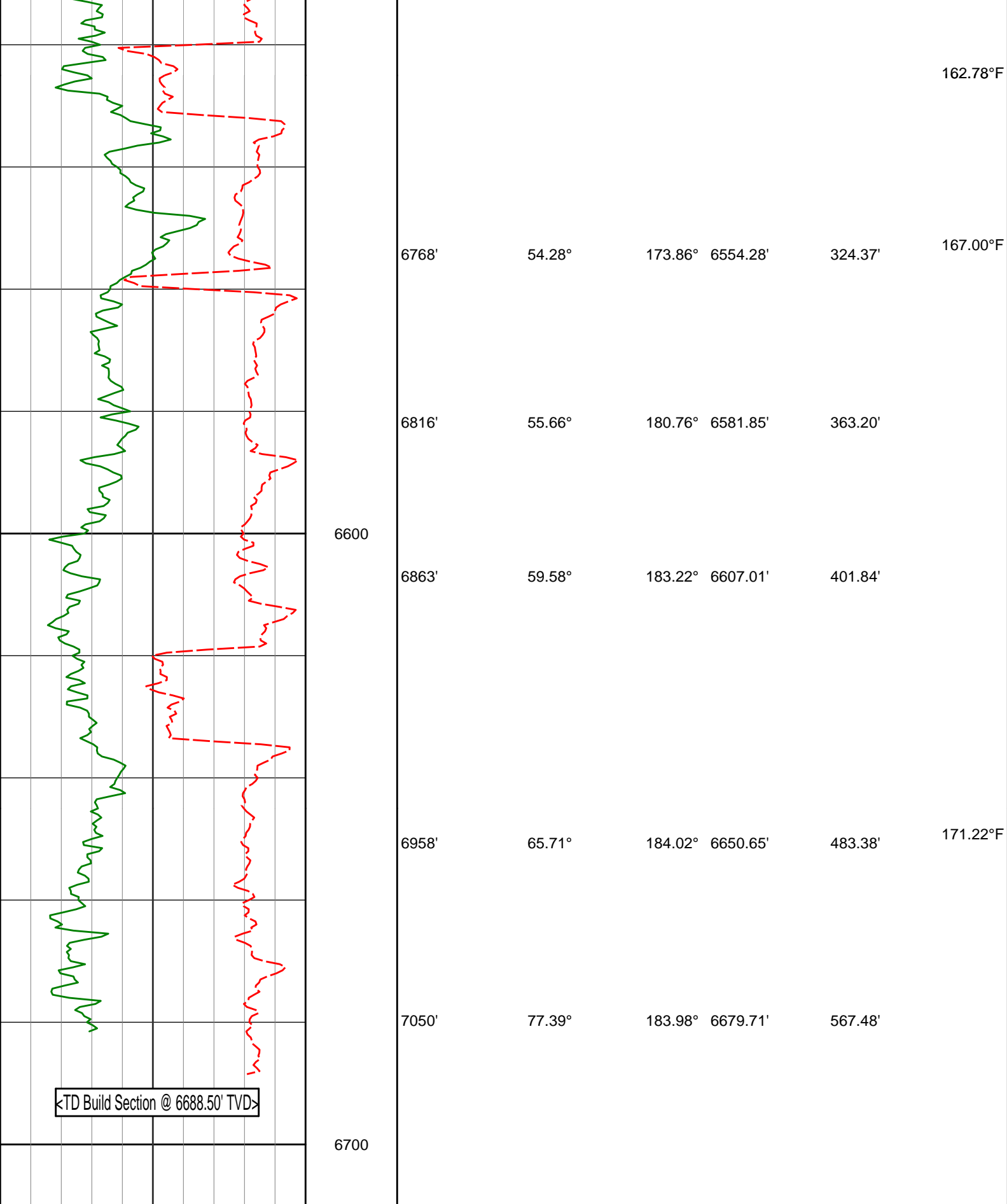
51.77°

164.49°

6497.66'

249.42'

162.78°F



<TD Build Section @ 6688.50' TVD>

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

HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
Crow Creek AA01-766
Wattenberg
Weld Colorado
USA
CA-XX-0901834393

<i>Measured Depth (feet)</i>	<i>Inclination (degrees)</i>	<i>Direction (degrees)</i>	<i>Vertical Depth (feet)</i>	<i>Latitude (feet)</i>	<i>Departure (feet)</i>	<i>Vertical Section (feet)</i>	<i>Dogleg (deg/100ft)</i>
0.00	0.00	0.00	0.00	0.00 N	0.00 E	0.00	TIE-IN
318.00	0.03	74.07	318.00	0.02 N	0.08 E	-0.01	0.01
726.00	0.66	23.96	725.99	2.21 N	1.14 E	-1.95	0.16
820.00	0.77	13.30	819.98	3.32 N	1.51 E	-2.97	0.18
914.00	0.77	21.55	913.97	4.53 N	1.89 E	-4.08	0.12
1008.00	0.69	30.39	1007.97	5.61 N	2.41 E	-5.04	0.15
1100.00	0.84	27.83	1099.96	6.68 N	3.00 E	-5.98	0.17
1192.00	0.97	36.45	1191.95	7.91 N	3.78 E	-7.03	0.21
1285.00	2.02	70.75	1284.92	9.09 N	5.80 E	-7.79	1.44
1377.00	3.55	77.84	1376.80	10.22 N	10.12 E	-8.07	1.70
1469.00	6.17	88.42	1468.47	10.96 N	17.84 E	-7.30	2.99
1563.00	8.26	88.41	1561.72	11.29 N	29.64 E	-5.34	2.23
1746.00	9.66	89.13	1742.48	11.88 N	58.14 E	-0.42	0.77
1840.00	8.84	87.38	1835.26	12.33 N	73.24 E	2.06	0.92
1933.00	10.21	87.01	1926.97	13.09 N	88.61 E	4.29	1.47
2028.00	9.85	86.53	2020.52	14.02 N	105.13 E	6.57	0.39
2122.00	9.27	87.36	2113.22	14.86 N	120.71 E	8.77	0.64
2217.00	10.55	86.57	2206.80	15.73 N	137.03 E	11.07	1.35
2312.00	10.02	87.35	2300.27	16.63 N	153.96 E	13.46	0.57
2407.00	8.59	87.66	2394.02	17.30 N	169.31 E	15.76	1.50
2501.00	7.46	87.65	2487.10	17.84 N	182.43 E	17.77	1.20
2596.00	9.37	79.01	2581.07	19.57 N	196.18 E	18.74	2.40
2691.00	10.26	75.83	2674.68	23.11 N	211.98 E	18.31	1.10
2786.00	12.22	78.67	2767.86	27.16 N	230.04 E	17.84	2.15
2881.00	11.66	78.37	2860.80	31.07 N	249.31 E	17.73	0.59
2976.00	10.97	76.96	2953.95	35.05 N	267.52 E	17.35	0.79
3070.00	10.95	76.04	3046.24	39.22 N	284.90 E	16.61	0.19
3165.00	10.13	76.59	3139.64	43.33 N	301.78 E	15.84	0.87
3259.00	9.40	75.59	3232.27	47.16 N	317.25 E	15.08	0.79
3354.00	8.48	75.45	3326.12	50.85 N	331.55 E	14.22	0.97
3449.00	9.23	76.33	3419.98	54.41 N	345.74 E	13.47	0.80
3544.00	11.03	72.52	3513.50	58.95 N	361.82 E	12.13	2.02
3639.00	10.16	71.64	3606.88	64.32 N	378.45 E	10.08	0.93
3733.00	10.98	70.51	3699.28	69.92 N	394.75 E	7.74	0.89
3828.00	11.81	71.59	3792.41	76.00 N	412.51 E	5.20	0.91
3923.00	12.90	71.64	3885.20	82.42 N	431.80 E	2.64	1.14
4018.00	13.71	71.08	3977.65	89.41 N	452.52 E	-0.21	0.87
4113.00	13.08	69.62	4070.07	96.80 N	473.25 E	-3.46	0.76
4207.00	12.35	68.12	4161.76	104.25 N	492.54 E	-7.04	0.85
4302.00	12.38	76.79	4254.57	110.37 N	511.88 E	-9.30	1.95
4397.00	10.04	73.65	4347.75	115.02 N	529.74 E	-10.41	2.54
4492.00	11.56	85.31	4441.08	118.13 N	547.17 E	-10.09	2.79
4587.00	10.27	86.08	4534.36	119.49 N	565.11 E	-7.95	1.36
4682.00	9.43	82.04	4627.96	121.15 N	581.26 E	-6.45	1.15
4871.00	9.13	88.84	4814.49	123.59 N	611.58 E	-2.99	0.60
4966.00	7.88	98.49	4908.45	122.78 N	625.56 E	0.50	1.99
5061.00	9.63	95.27	5002.34	121.09 N	639.91 E	4.94	1.92
5156.00	9.06	97.25	5096.08	119.42 N	655.25 E	9.55	0.69
5251.00	8.37	89.53	5189.98	118.53 N	669.59 E	13.19	1.43
5345.00	8.66	75.13	5282.96	120.40 N	683.28 E	14.00	2.28
5535.00	8.61	71.98	5470.80	128.47 N	710.63 E	11.37	0.25
5630.00	9.76	68.09	5564.59	133.68 N	724.86 E	9.02	1.37
5725.00	11.24	73.44	5658.00	139.32 N	741.21 E	6.64	1.86
5819.00	10.02	74.58	5750.38	144.10 N	757.87 E	5.17	1.32

5914.00	10.30	71.87	5843.89	148.94 N	773.91 E	3.52	0.58
6009.00	7.88	73.55	5937.69	153.43 N	788.23 E	1.89	2.57
6104.00	15.44	96.96	6030.71	153.74 N	807.06 E	5.23	9.24
6199.00	21.59	103.27	6120.76	148.19 N	836.66 E	16.40	6.80
6294.00	27.50	117.06	6207.21	134.18 N	873.26 E	37.23	8.63
6389.00	33.87	128.00	6288.93	107.86 N	913.73 E	70.88	8.89
6484.00	39.67	142.59	6365.14	67.36 N	953.12 E	118.22	11.00
6579.00	45.80	156.30	6435.04	11.92 N	985.33 E	178.84	11.70
6674.00	51.77	164.49	6497.66	55.34 S	1009.04 E	249.42	9.02
6768.00	54.28	173.86	6554.28	128.97 S	1023.02 E	324.37	8.39
6816.00	55.66	180.76	6581.85	168.19 S	1024.84 E	363.20	12.12
6863.00	59.58	183.22	6607.01	207.85 S	1023.45 E	401.84	9.43
6958.00	65.71	184.02	6650.65	292.02 S	1018.10 E	483.38	6.50
7050.00	77.39	183.98	6679.71	378.92 S	1012.03 E	567.48	12.70
7108.00	85.16	183.00	6688.50	436.10 S	1008.55 E	622.90	13.50

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 168.85 DEGREES (GRID)
A TOTAL CORRECTION OF 7.57 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 7108.00 FEET
IS 1098.80 FEET ALONG 113.38 DEGREES (GRID)**

**Surface survey at 318' have had the azimuth corrected to grid north, but was not taken by Halliburton.
Tie-in point is 0' MD.**

Last survey is a projection to bit from 7050' to 7108' MD.