



1 : 600 / 1 : 240

[illegible]

WELL INFORMATION

MWD Run Number	100				
Date run completed	21-Mar-15				
Rig Bit Number	2				
Bit Size (in)	8.750				
Tool Nominal OD (in)	6.750				
Log Start Depth (TVD, ft)	923.98				
Log End Depth (TVD, ft)	6,710.72				
Drill or Wipe	Drill				
Drill/Wipe Start Date and Time	20-Mar-15 17:00				
Drill/Wipe End Date and Time	21-Mar-15 18:30				
Min Inc (deg) @ Depth (TVD, ft)	0.33 @ 1,386.97				
Max Inc (deg) @ Depth (TVD, ft)	82.22 @ 6,705.52				
Bit TFA(in2) / Bit Type	0.86 / PDC				
Flow Rate (gpm)	577.96				
Max AV (fpm) / CV (fpm) @ MWD	N/A / N/A				
Fluid Type	Native/Spud Mud				
Density (ppg) / Viscosity (spqt)	9.60 / 42.00				
Filtrate CL (ppm)	1,500.00				
pH / Fluid Loss (mptm)	9.50 / 6				
PV (cP) / YP (lhf2)	14 / 11.00				
% Solids / % Sand	10.00 / 0.30				
% 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 (degF) / Source	183.90 / PCM				
Rm @ Max Tool Temp (degF)	N/A @ N/A				
Lead MWD Engineer	Paul Kock				
Customer Representative	Charles Collver				

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM				
Software Version	5.93				
Sub Serial Number	246473				
Insert Serial Number	11620280				
Date and Time Initialized	20-Mar-15 01:30				
Date and Time Read	22-Mar-15 01:12				
ECMB SW Version	N/A				

Directional Sensor Information

Tool Type	PCDC				
Distance From Bit (ft)	49.14				
Software Version	6.21				
Sub Serial Number	246473				
Sonde Serial Number	11638576				
Sensor ID Number	N/A				
Toolface Offset (deg)	13.50				

Gamma Ray Sensor Information

Tool Type	PCG				
Distance From Bit (ft)	39.02				
Recorded Sample Period (sec)	10				
Software Version	8.15				
Sub Serial Number	246473				
Insert/Sonde Serial Number	11681014				

REMARKS

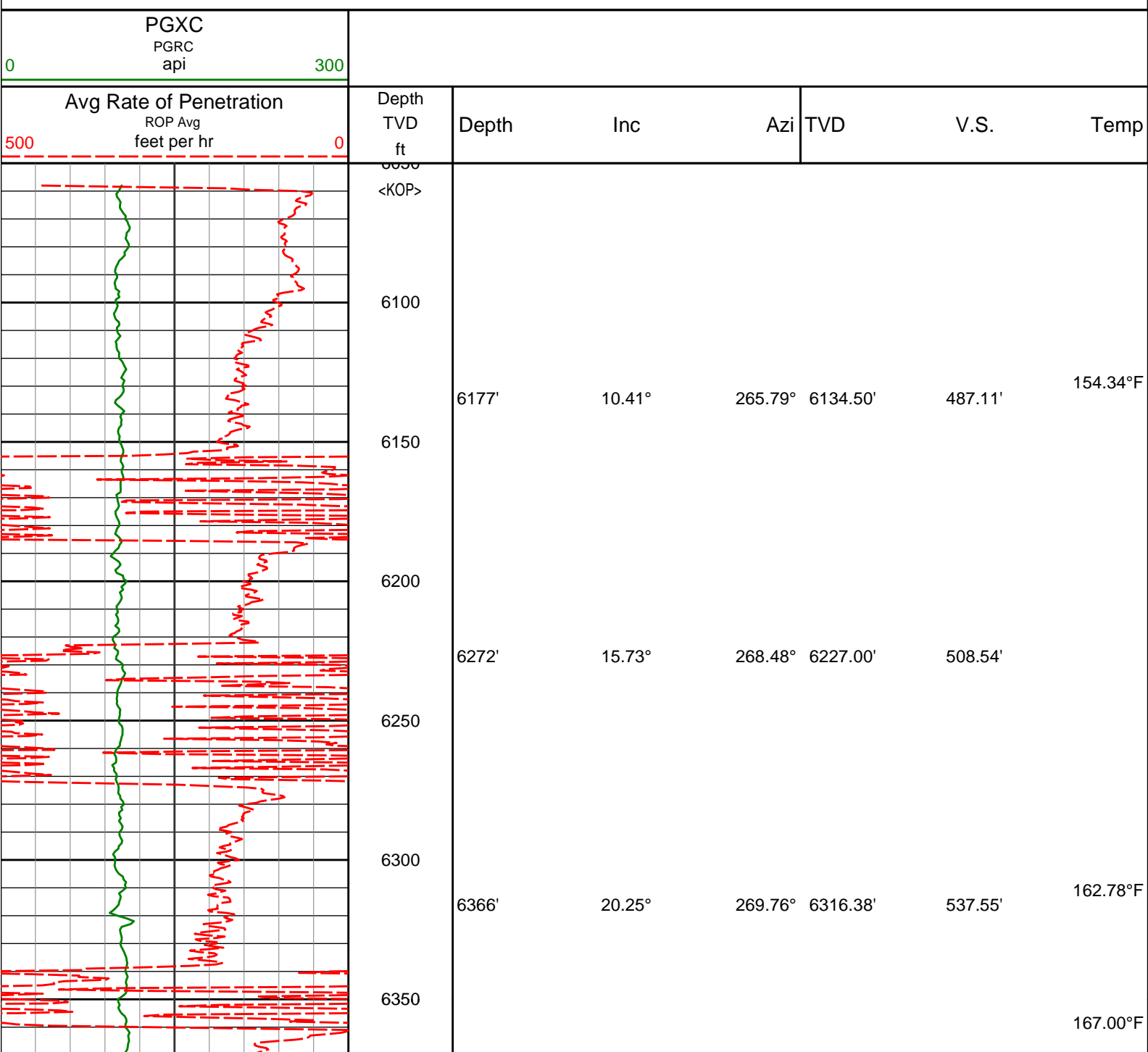
1. All depths are calibrated to the driller's pipe tally and are measured from the Rig drill floor.
2. No depth corrections have been made for pipe stretch or compression.
3. All data presented is recorded (memory data) unless otherwise stated.
 - ROPA: Average Rate of Penetration is real time data.
 - 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 8.1.10.

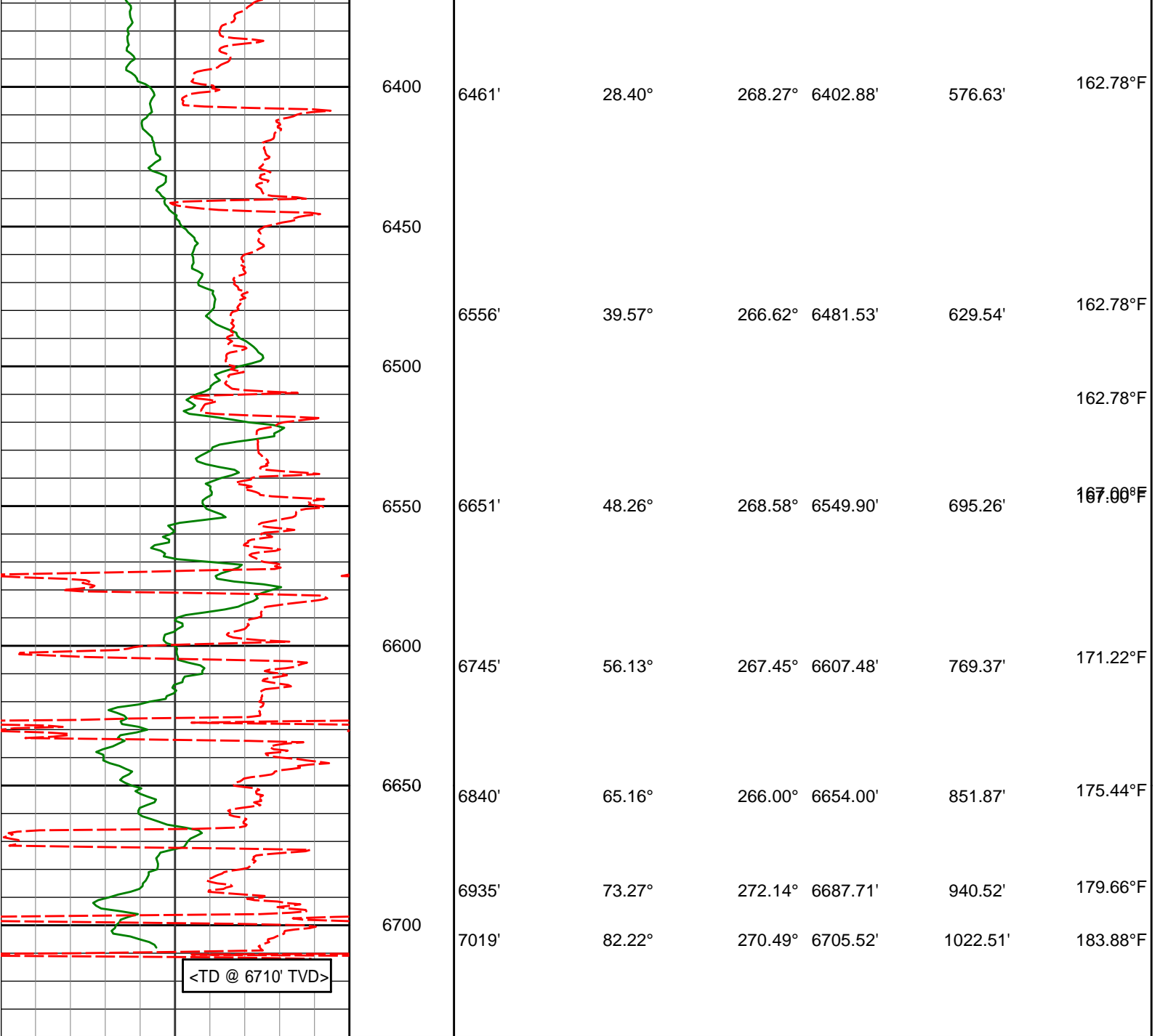
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TVD Detail 1:600 Scale

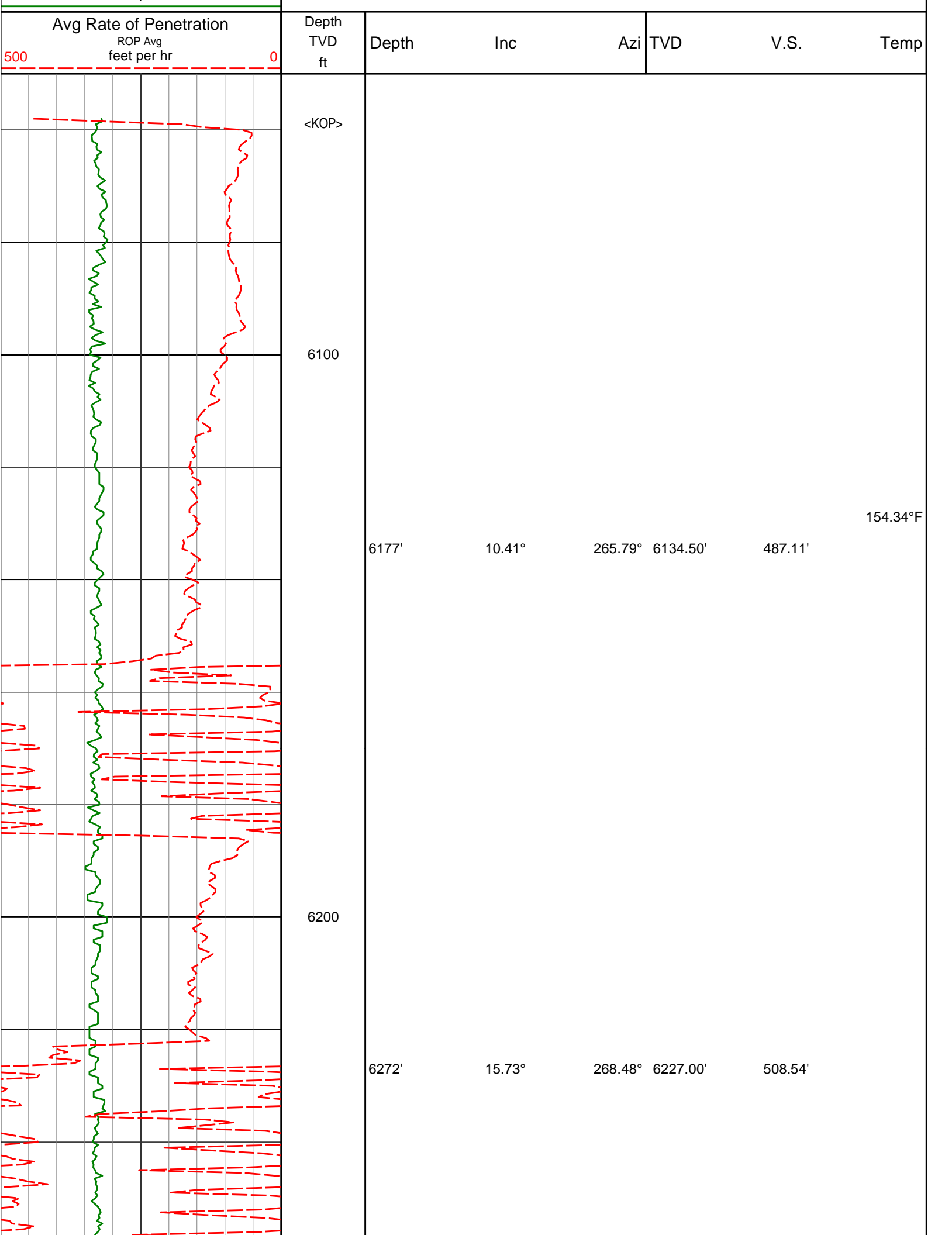


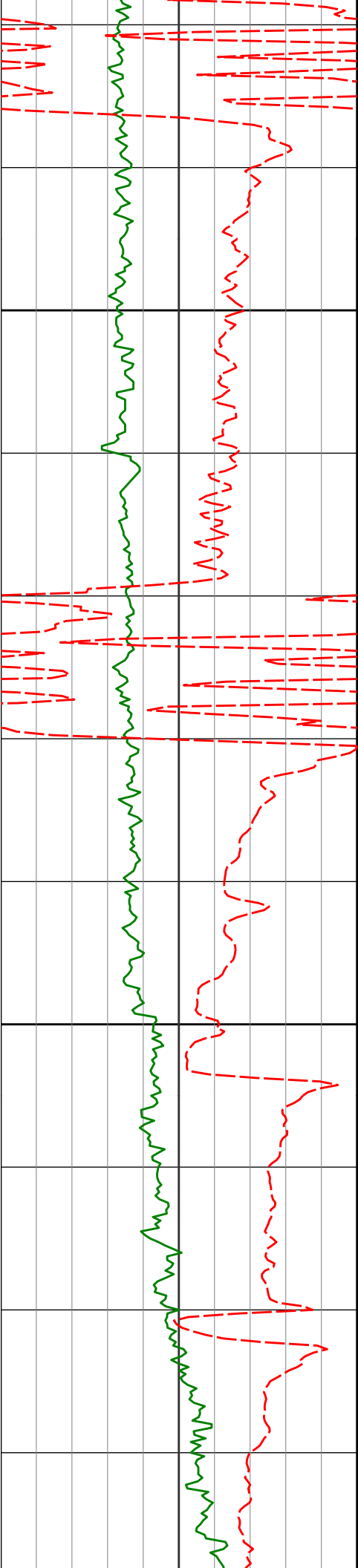


Avg Rate of Penetration ROP Avg feet per hr		Depth TVD ft	Depth	Inc	Azi	TVD	V.S.	Temp
500		0						
PGXC PGRC api		0						
		300						

TVD Detail 1:240 Scale

Gamma Ray Cor PGRC api		0						
		300						





6300

6366'

20.25°

269.76°

6316.38'

537.55'

162.78°F

6400

6461'

28.40°

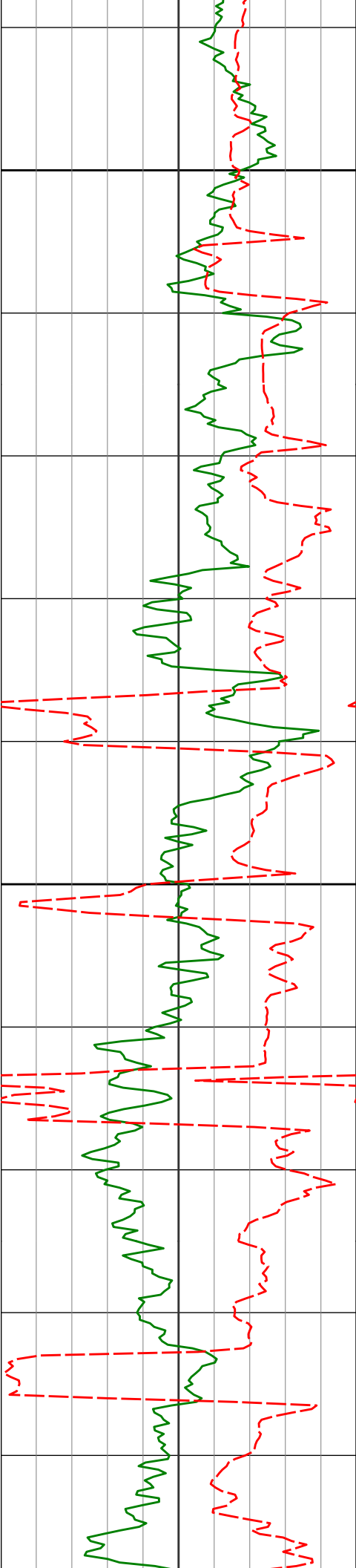
268.27°

6402.88'

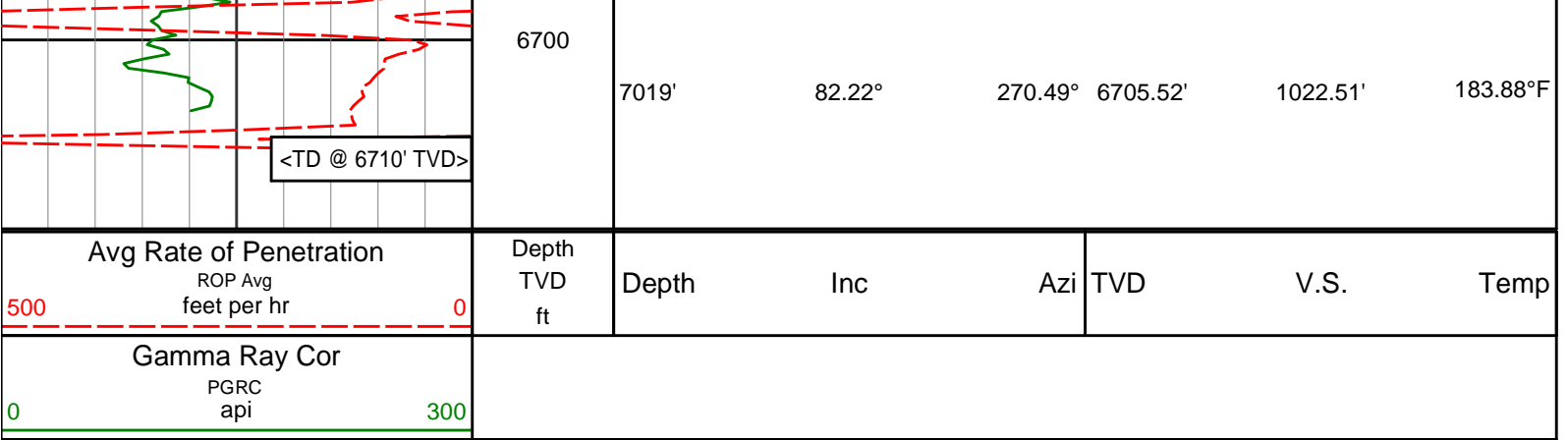
576.63'

162.78°F

167.00°F



6500	6556'	39.57°	266.62°	6481.53'	629.54'	162.78°F
						162.78°F
6600	6651'	48.26°	268.58°	6549.90'	695.26'	167.00°F
						167.00°F
6700	6745'	56.13°	267.45°	6607.48'	769.37'	171.22°F
	6840'	65.16°	266.00°	6654.00'	851.87'	175.44°F
	6935'	73.27°	272.14°	6687.71'	940.52'	179.66°F



HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
Colt A13-633
Wattenberg
Weld Colorado
USA
CA-XX-0902118572

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
255.00	0.30	217.63	255.00	0.53 S	0.41 W	0.40	0.12
504.00	0.60	220.03	503.99	2.04 S	1.64 W	1.61	0.12
747.00	0.20	229.33	746.98	3.29 S	2.78 W	2.73	0.17
1015.00	0.54	252.25	1014.98	3.98 S	4.34 W	4.28	0.14
1110.00	0.37	238.71	1109.98	4.28 S	5.03 W	4.96	0.21
1294.00	0.55	226.95	1293.97	5.19 S	6.18 W	6.10	0.11
1387.00	0.33	214.28	1386.97	5.72 S	6.66 W	6.57	0.26
1480.00	0.46	189.06	1479.96	6.31 S	6.87 W	6.77	0.23
1572.00	2.85	327.04	1571.93	4.75 S	8.17 W	8.10	3.49
1664.00	4.98	318.18	1663.71	0.14 N	12.08 W	12.08	2.40
1756.00	7.23	317.54	1755.18	7.39 N	18.65 W	18.76	2.45
1941.00	8.97	312.66	1938.33	25.75 N	37.12 W	37.51	1.01
2033.00	8.38	313.15	2029.28	35.20 N	47.28 W	47.82	0.65
2126.00	8.20	306.47	2121.31	43.78 N	57.56 W	58.23	1.05
2311.00	8.15	297.88	2304.44	57.75 N	79.76 W	80.64	0.66
2402.00	7.41	295.48	2394.60	63.29 N	90.76 W	91.72	0.89
2587.00	8.14	300.16	2577.90	75.01 N	112.86 W	114.00	0.52
2679.00	7.92	297.20	2669.00	81.17 N	124.13 W	125.36	0.51
2772.00	8.07	294.32	2761.09	86.79 N	135.77 W	137.09	0.46
2863.00	9.44	306.70	2851.04	93.88 N	147.58 W	149.00	2.55
3051.00	9.46	303.46	3036.49	111.62 N	172.83 W	174.52	0.28
3240.00	9.04	298.53	3223.03	127.27 N	198.83 W	200.76	0.47
3334.00	8.62	295.32	3315.92	133.81 N	211.69 W	213.72	0.69
3429.00	8.16	302.37	3409.91	140.47 N	223.82 W	225.95	1.19
3524.00	8.96	305.71	3503.85	148.39 N	235.52 W	237.77	0.99
3619.00	9.14	304.46	3597.67	156.98 N	247.75 W	250.13	0.28
3714.00	9.34	305.26	3691.43	165.70 N	260.26 W	262.78	0.25
3904.00	10.09	302.78	3878.71	183.61 N	286.85 W	289.63	0.45
3999.00	9.58	300.00	3972.31	192.07 N	300.69 W	303.60	0.73
4094.00	9.52	300.58	4066.00	200.02 N	314.30 W	317.33	0.12
4188.00	9.96	310.78	4158.65	209.28 N	327.15 W	330.32	1.89
4283.00	9.95	310.70	4252.22	220.00 N	339.59 W	342.93	0.02
4378.00	9.83	309.75	4345.80	230.54 N	352.05 W	355.55	0.21
4473.00	9.62	308.60	4439.44	240.68 N	364.49 W	368.14	0.30
4568.00	8.90	309.09	4533.20	250.26 N	376.40 W	380.19	0.76
4663.00	8.46	307.86	4627.11	259.19 N	387.62 W	391.55	0.50
4758.00	8.22	306.99	4721.11	267.56 N	398.56 W	402.62	0.29
4947.00	7.10	305.78	4908.42	282.52 N	418.83 W	423.12	0.60

5042.00	7.28	305.74	5002.67	289.47 N	428.48 W	432.87	0.19
5137.00	6.69	302.04	5096.97	295.92 N	438.05 W	442.54	0.78
5232.00	6.27	300.46	5191.36	301.49 N	447.21 W	451.79	0.48
5326.00	5.58	298.67	5284.86	306.28 N	455.65 W	460.30	0.76
5420.00	4.41	313.07	5378.50	310.94 N	462.30 W	467.02	1.82
5515.00	2.78	320.01	5473.31	315.20 N	466.45 W	471.23	1.77
5610.00	1.37	344.03	5568.25	318.06 N	468.24 W	473.07	1.71
5704.00	1.61	344.46	5662.22	320.41 N	468.90 W	473.77	0.26
5799.00	1.16	338.72	5757.19	322.59 N	469.61 W	474.51	0.50
5893.00	2.69	340.00	5851.13	325.55 N	470.71 W	475.65	1.63
5988.00	1.39	332.20	5946.07	328.67 N	472.01 W	477.00	1.40
6082.00	1.09	327.38	6040.05	330.43 N	473.02 W	478.04	0.34
6177.00	10.41	265.78	6134.50	330.56 N	482.09 W	487.11	10.46
6272.00	15.73	268.47	6227.00	329.58 N	503.54 W	508.54	5.64
6366.00	20.25	269.75	6316.38	329.17 N	532.56 W	537.55	4.83
6461.00	28.40	268.24	6402.88	328.40 N	571.65 W	576.63	8.60
6556.00	39.57	266.66	6481.53	325.94 N	624.61 W	629.54	11.79
6651.00	48.26	268.54	6549.90	323.27 N	690.37 W	695.26	9.25
6745.00	56.13	267.38	6607.48	320.59 N	764.54 W	769.37	8.43
6840.00	65.16	266.15	6654.00	315.88 N	847.12 W	851.87	9.57
6935.00	73.27	272.38	6687.71	314.87 N	935.80 W	940.52	10.51
7019.00	82.22	271.83	6705.52	317.88 N	1017.74 W	1022.51	10.67
7070.00	86.08	270.00	6710.72	318.68 N	1068.46 W	1073.23	8.37

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 270.88 DEGREES (GRID)
A TOTAL CORRECTION OF 7.43 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 7070.00 FEET
IS 1114.97 FEET ALONG 286.61 DEGREES (GRID)**

Surface surveys at 255 ft, 504 ft and 747 ft have had azimuths corrected to grid north, but were not taken by Halliburton.

Last survey is a projection from 7019 ft MD to TD at 7070 ft MD.