



1 : 600 / 1 : 240

WELL INFORMATION					
MWD Run Number	100				
Date run completed	11-Nov-15				
Rig Bit Number	2				
Bit Size (in)	8.750				
Tool Nominal OD (in)	6.750				
Log Start Depth (TVD, ft)	841.99				
Log End Depth (TVD, ft)	7,020.03				
Drill or Wipe	Drill				
Drill/Wipe Start Date and Time	09-Nov-15 21:15				
Drill/Wipe End Date and Time	11-Nov-15 05:00				
Min Inc (deg) @ Depth (TVD, ft)	0.47 @ 6,009.86				
Max Inc (deg) @ Depth (TVD, ft)	88.00 @ 7,020.03				
Bit TFA(in2) / Bit Type	0.91 / PDC				
Flow Rate (gpm)	568.28				
Max AV (fpm) / CV (fpm) @ MWD	550.0 / 400.0				
Fluid Type	Native/Spud Mud				
Density (ppg) / Viscosity (spqt)	9.90 / 40.00				
Filtrate CL (ppm)	2,500.00				
pH / Fluid Loss (mptm)	8.30 / 9				
PV (cP) / YP (lhf2)	11 / 8.00				
% Solids / % Sand	8.00 / 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) @ Depth (ft)	477.04 / PDCM				

Max Tool Temp (degF) / Source	177.64 / PCM				
Rm @ Max Tool Temp (degF)	N/A @ N/A				
Lead MWD Engineer	Adam Sampson				
Customer Representative	Dave Neilsen				

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM				
Software Version	5.93				
Sub Serial Number	10907009				
Insert Serial Number	11145605				
Date and Time Initialized	09-Nov-15 13:17				
Date and Time Read	11-Nov-15 16:40				
ECMB SW Version	N/A				

Directional Sensor Information

Tool Type	PCDC				
Distance From Bit (ft)	54.00				
Software Version	6.33				
Sub Serial Number	10907009				
Sonde Serial Number	11297584				
Sensor ID Number	N/A				
Toolface Offset (deg)	285.60				

Gamma Ray Sensor Information

Tool Type	PCG				
Distance From Bit (ft)	41.76				
Recorded Sample Period (sec)	10				
Software Version	8.15				
Sub Serial Number	10907009				
Insert/Sonde Serial Number	11681042				

REMARKS

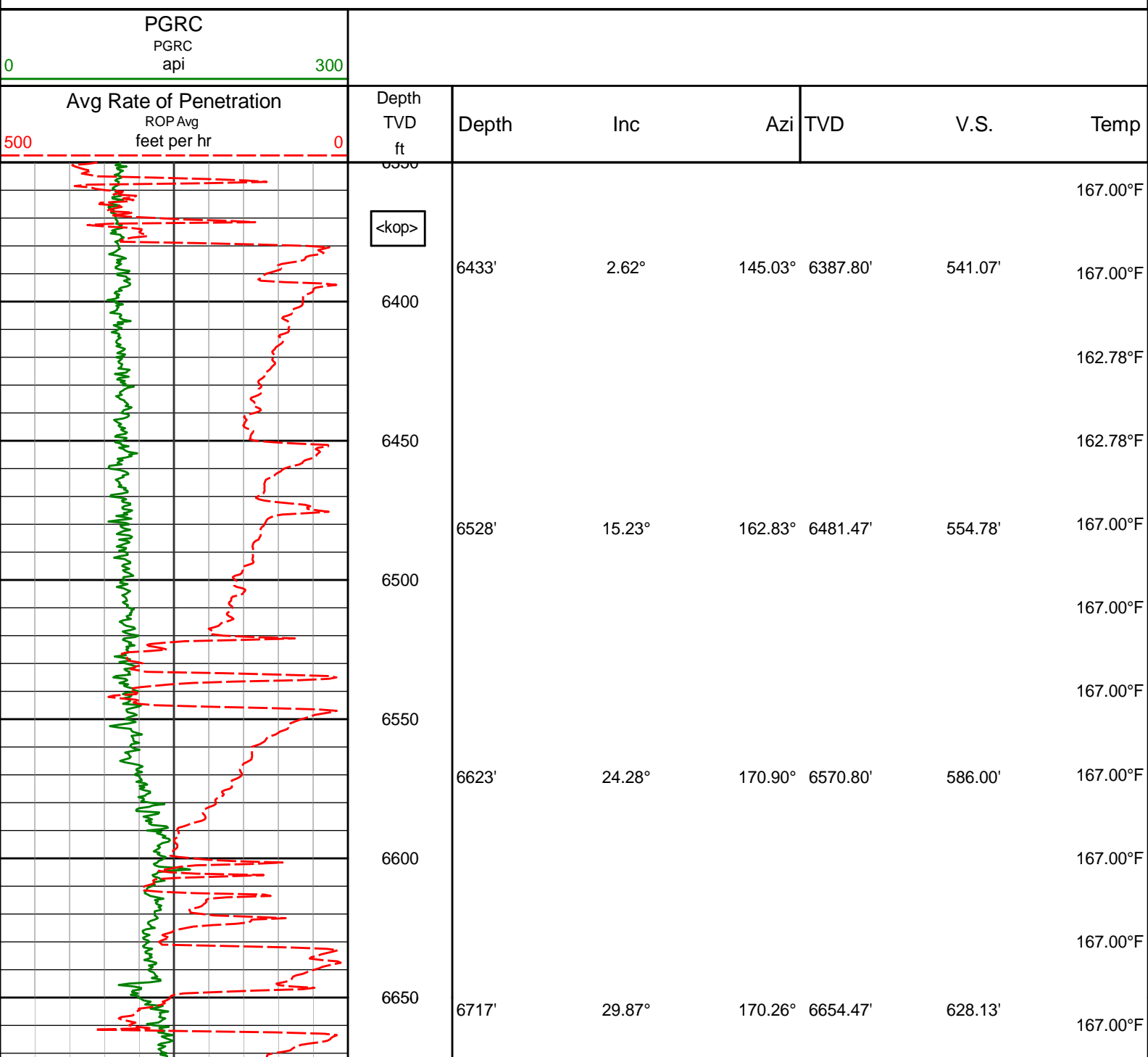
1. All depths are calibrated to the driller's pipe tally and are measured from the Rig drill floor.
2. No depth corrections have been made for pipe stretch or compression.
3. All data presented is recorded (memory data) unless otherwise stated.
 - ROPA: Average Rate of Penetration is real time data.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

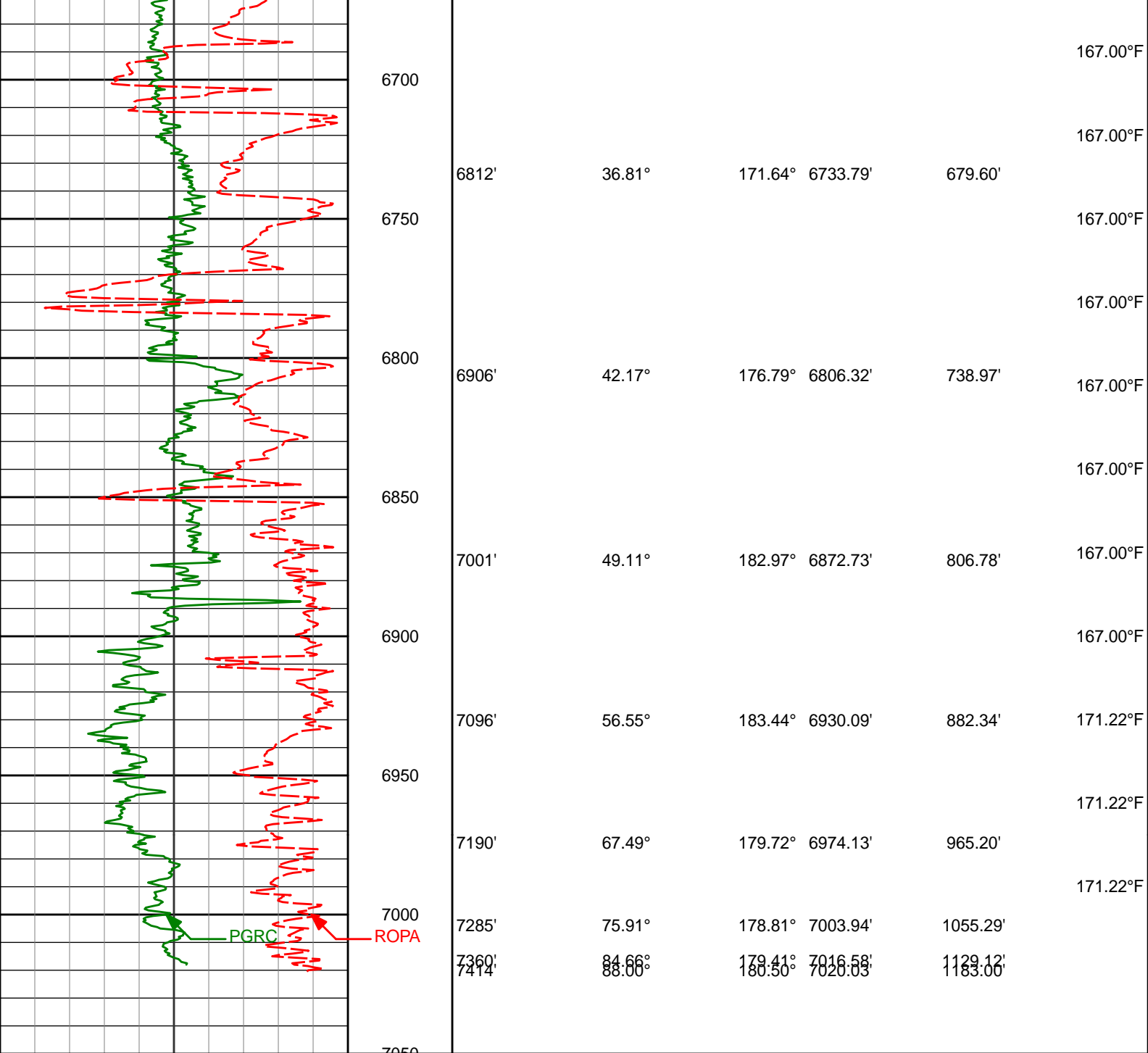
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TVD Detail 1:600 Scale

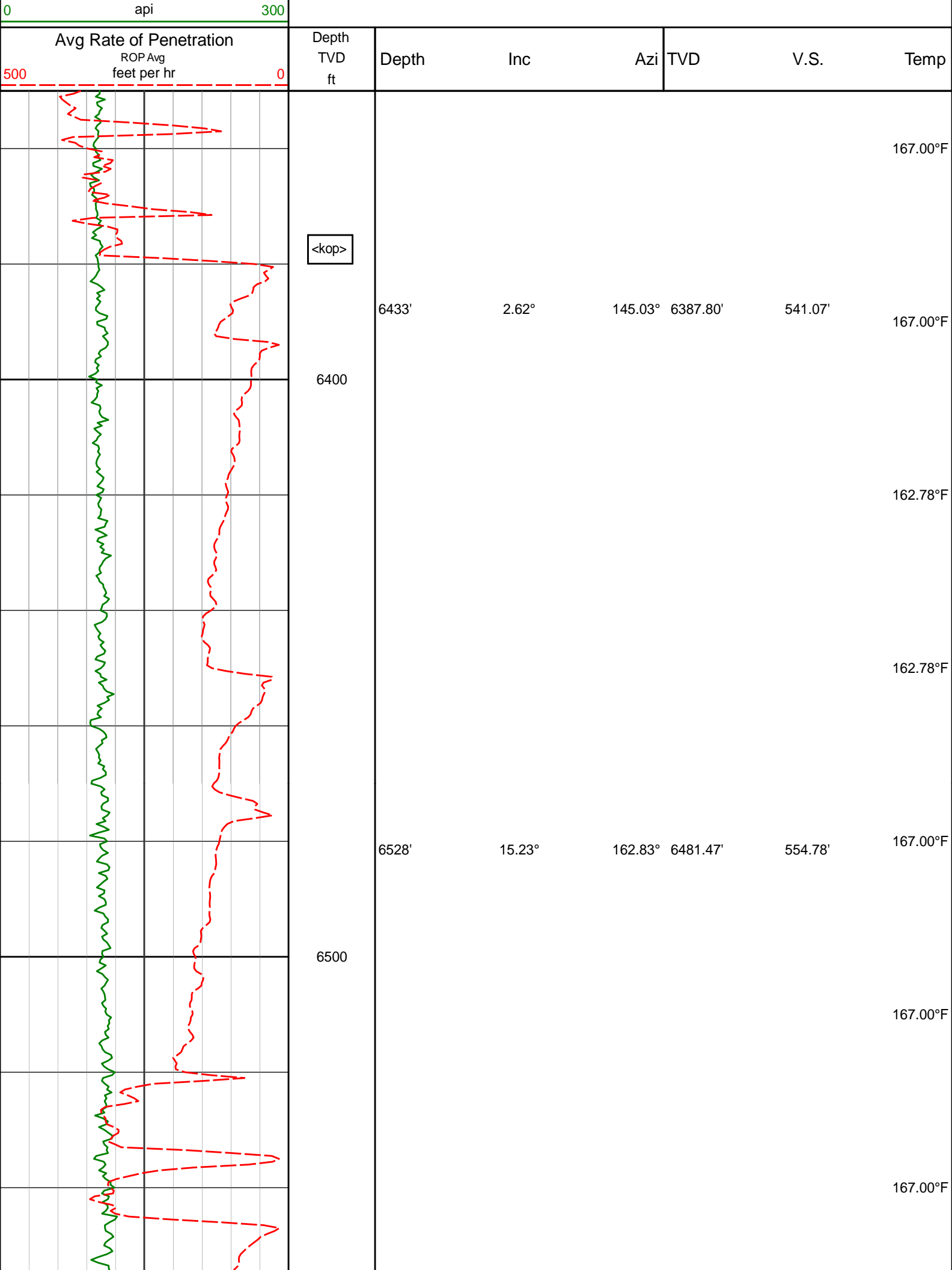


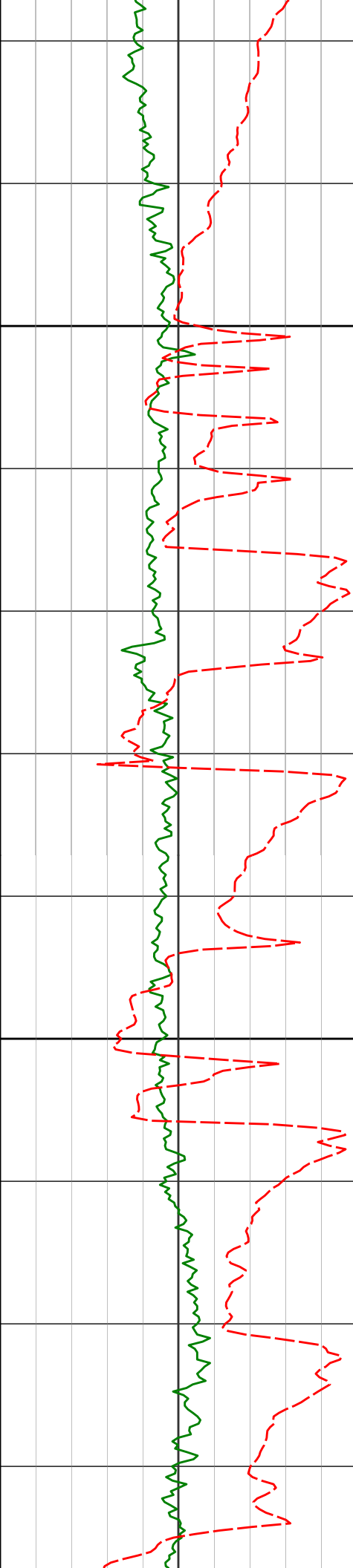


Avg Rate of Penetration ROP Avg feet per hr		Depth TVD ft	Depth	Inc	Azi	TVD	V.S.	Temp
500		0						
PGRC PGRC api								
0		300						

TVD Detail 1:240 Scale

PGRC PGRC	
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6600

6700

6623'

24.28°

170.90° 6570.80'

586.00'

167.00°F

6717'

29.87°

170.26° 6654.47'

628.13'

167.00°F

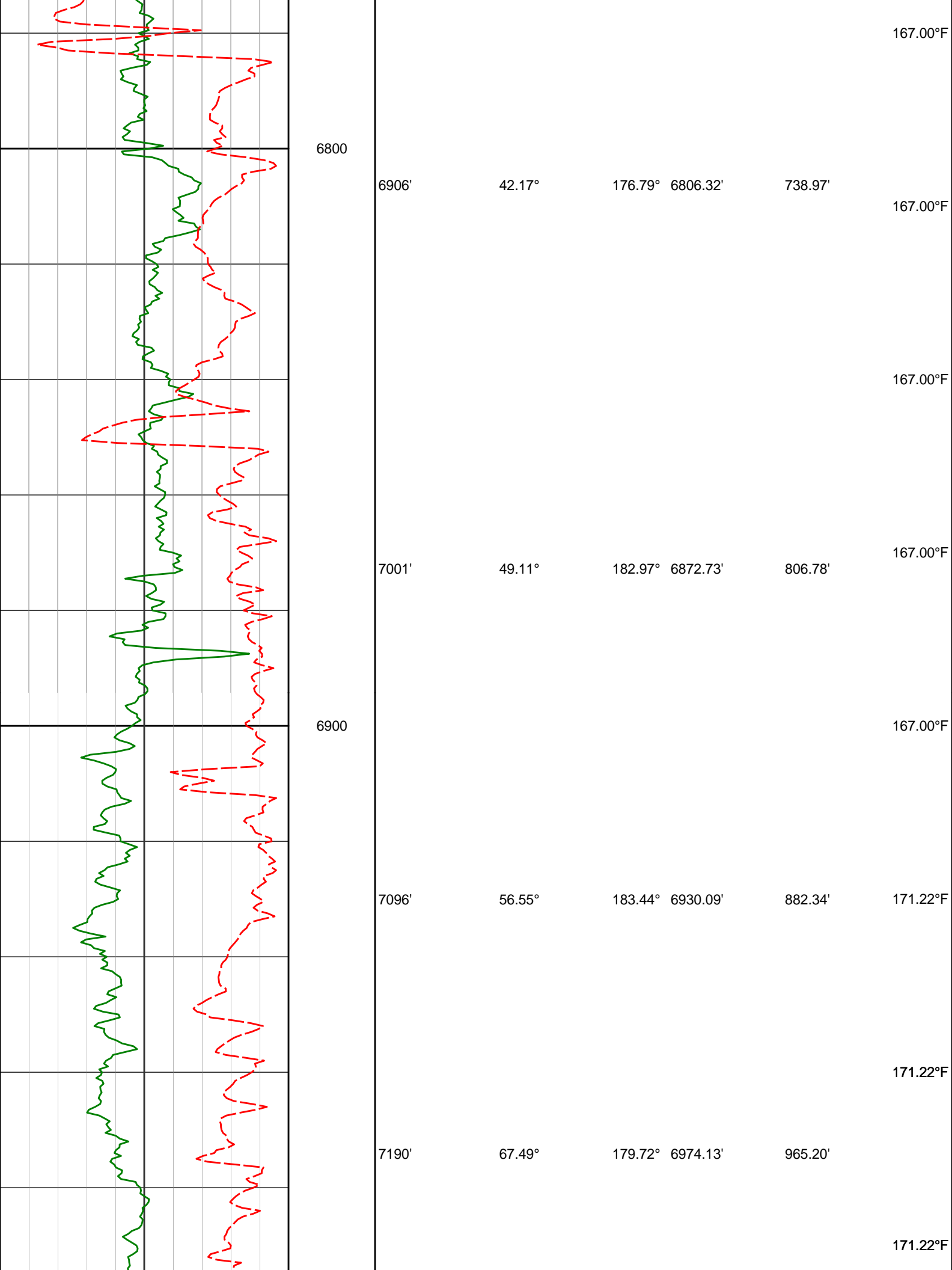
6812'

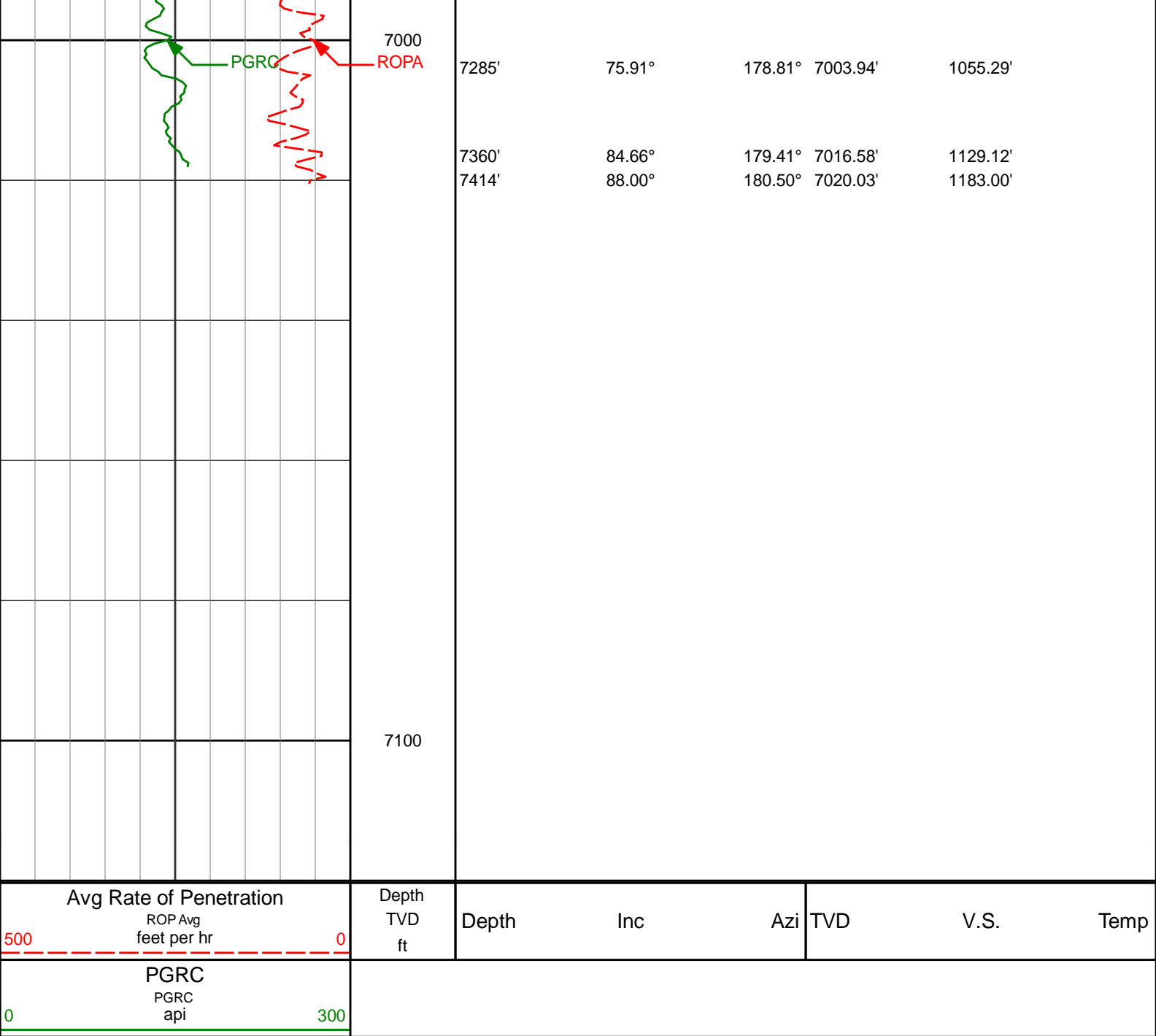
36.81°

171.64° 6733.79'

679.60'

167.00°F





DIRECTIONAL SURVEY REPORT

Noble Energy
Moser H34-778
Wattenberg
Weld Colorado
USA
CA-XX-0902771574

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	0.16	30.75	250.00	0.30 N	0.18 E	-0.30	0.06
500.00	0.32	30.75	500.00	1.20 N	0.71 E	-1.21	0.06
842.00	0.54	30.75	841.99	3.41 N	2.03 E	-3.42	0.06
1010.00	0.65	30.75	1009.98	4.91 N	2.92 E	-4.93	0.07
1105.00	0.65	41.77	1104.97	5.77 N	3.55 E	-5.80	0.13
1197.00	0.69	6.76	1196.97	6.71 N	3.97 E	-6.75	0.44
1289.00	2.35	209.56	1288.95	5.62 N	3.10 E	-5.65	3.26
1380.00	4.57	197.17	1379.78	0.53 N	1.11 E	-0.54	2.56
1472.00	8.21	190.77	1471.98	0.22 S	1.22 E	-0.11	6.88

1472.00	6.64	193.77	1471.33	8.13 S	1.23 W	8.14	2.28
1564.00	8.22	184.09	1562.56	19.86 S	2.97 W	19.88	2.19
1747.00	8.26	185.65	1743.67	45.99 S	5.20 W	46.03	0.12
1839.00	9.99	193.21	1834.51	60.33 S	7.67 W	60.39	2.28
1930.00	10.72	194.74	1924.02	76.19 S	11.63 W	76.29	0.86
2021.00	10.59	201.51	2013.46	92.16 S	16.85 W	92.31	1.38
2205.00	9.64	196.81	2194.60	122.64 S	27.50 W	122.87	0.69
2296.00	10.27	201.45	2284.23	137.48 S	32.67 W	137.76	1.12
2388.00	9.44	202.01	2374.87	152.11 S	38.50 W	152.44	0.92
2480.00	8.44	196.36	2465.76	165.58 S	43.22 W	165.95	1.44
2571.00	9.00	204.24	2555.71	178.47 S	48.03 W	178.89	1.45
2662.00	10.06	209.50	2645.45	191.89 S	54.87 W	192.36	1.51
2845.00	11.28	209.27	2825.28	221.41 S	71.49 W	222.03	0.66
2936.00	10.86	209.13	2914.59	236.66 S	80.02 W	237.35	0.46
3125.00	8.92	203.43	3100.78	265.66 S	94.51 W	266.48	1.15
3220.00	10.52	200.02	3194.41	280.57 S	100.41 W	281.43	1.79
3314.00	9.29	196.44	3287.01	295.90 S	105.49 W	296.81	1.46
3409.00	8.30	192.41	3380.89	309.96 S	109.13 W	310.90	1.23
3504.00	9.38	190.86	3474.76	324.26 S	112.07 W	325.23	1.16
3598.00	7.66	186.41	3567.72	338.01 S	114.21 W	338.99	1.96
3693.00	8.55	189.67	3661.78	351.26 S	116.10 W	352.26	1.06
3787.00	8.89	197.54	3754.69	365.08 S	119.46 W	366.11	1.32
3882.00	10.82	212.79	3848.30	379.58 S	126.51 W	380.67	3.40
3975.00	10.69	211.95	3939.67	394.23 S	135.80 W	395.40	0.22
4070.00	10.43	212.53	4033.06	408.96 S	145.08 W	410.21	0.30
4164.00	9.86	208.53	4125.59	423.21 S	153.50 W	424.53	0.96
4259.00	9.76	208.12	4219.20	437.46 S	161.18 W	438.85	0.13
4447.00	7.73	207.20	4405.00	462.77 S	174.48 W	464.27	1.08
4542.00	6.89	207.73	4499.23	473.49 S	180.05 W	475.04	0.89
4637.00	6.20	209.88	4593.61	482.98 S	185.26 W	484.58	0.77
4731.00	5.44	210.66	4687.13	491.21 S	190.06 W	492.85	0.81
4825.00	5.08	205.27	4780.73	498.81 S	194.11 W	500.49	0.65
4920.00	4.24	201.94	4875.42	505.87 S	197.21 W	507.57	0.93
5014.00	2.93	186.07	4969.23	511.47 S	198.76 W	513.19	1.73
5108.00	2.31	186.49	5063.14	515.74 S	199.23 W	517.46	0.66
5204.00	2.01	190.44	5159.07	519.31 S	199.76 W	521.04	0.35
5299.00	1.48	185.67	5254.02	522.17 S	200.18 W	523.90	0.57
5393.00	0.92	187.21	5348.00	524.13 S	200.39 W	525.85	0.60
5582.00	0.88	144.48	5536.98	526.80 S	199.74 W	528.53	0.35
5677.00	1.28	141.32	5631.96	528.22 S	198.66 W	529.94	0.43
5771.00	1.51	175.05	5725.94	530.28 S	197.89 W	531.98	0.89
5866.00	2.19	176.47	5820.89	533.33 S	197.68 W	535.04	0.72
5960.00	0.79	82.21	5914.86	535.03 S	196.92 W	536.73	2.53
6055.00	0.47	115.93	6009.86	535.12 S	195.92 W	536.80	0.51
6149.00	0.47	184.11	6103.85	535.67 S	195.60 W	537.36	0.56
6339.00	0.62	140.54	6293.85	537.25 S	195.00 W	538.93	0.23
6433.00	2.62	145.03	6387.80	539.40 S	193.44 W	541.07	2.13
6528.00	15.23	162.83	6481.47	553.16 S	188.49 W	554.78	13.43
6623.00	24.28	170.90	6570.80	584.44 S	181.70 W	586.00	9.93
6717.00	29.87	170.26	6654.47	626.63 S	174.68 W	628.13	5.95
6812.00	36.81	171.64	6733.79	678.17 S	166.53 W	679.60	7.34
6906.00	42.17	176.79	6806.32	737.59 S	160.66 W	738.97	6.68
7001.00	49.11	182.97	6872.73	805.41 S	160.73 W	806.78	8.65
7096.00	56.55	183.44	6930.09	880.94 S	164.98 W	882.34	7.84
7190.00	67.49	179.72	6974.13	963.78 S	167.12 W	965.20	12.15
7285.00	75.91	178.81	7003.94	1053.88 S	165.95 W	1055.29	8.91
7360.00	84.66	179.41	7016.58	1127.72 S	164.80 W	1129.12	11.70
7414.00	88.00	180.50	7020.03	1181.61 S	164.76 W	1183.00	6.50

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 180.50 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 7414.00 FEET
IS 1193.04 FEET ALONG 187.94 DEGREES (GRID)

final survey is a projection to td