

PCGC: Pressure Case Gamma
PCDC: Pressure Case Directional



1 : 600 / 1 : 240

[illegible]

WELL INFORMATION

MWD Run Number	100	200			
Date run completed	01-Mar-13	02-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 (TVD, ft)	633.00	5,880.38			
Log End Depth (TVD, ft)	5,880.38	6,612.00			
Drill or Wipe	Drill	Drill			
Drill/Wipe Start Date and Time	28-Feb-13 23:30	02-Mar-13 04:15			
Drill/Wipe End Date and Time	01-Mar-13 19:30	02-Mar-13 18:00			
Min Inc (deg) @ Depth (TVD, ft)	.14 @ 3,652.53	10.35 @ 5,897.10			
Max Inc (deg) @ Depth (TVD, ft)	10.73 @ 5,637.42	83.04 @ 6,607.31			
Bit TFA(in2) / Bit Type	.75 / PDC	.75 / PDC			
Flow Rate (gpm)	590.22	585.98			
Max AV (fpm) / CV (fpm) @ MWD	N/A / N/A	N/A / N/A			
Fluid Type	Native/Spud Mud	Fresh Water Gel			
Density (ppg) / Viscosity (spqt)	8.70 / 31.00	10.50 / 37.00			
Filtrate CL (ppm)	1,600.00	1,600.00			
pH / Fluid Loss (mptm)	9.40 / 12	9.30 / 9			
PV (cP) / YP (lbf2)	4 / 4.00	13 / 13.00			
% Solids / % Sand	2.6 / 0.50	6.5 / 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) @ Depth (ft)	145.00 / 100M	170.70 / 100M			

Max Tool Temp (degF) / Source	145.90 / PCM	172.78 / PCM			
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A			
Lead MWD Engineer	Henry Schmeidler	Henry Schmeidler			
Customer Representative	Dave Nielsen	Dave Nielsen			

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.76	5.76			
Sub Serial Number	11341344	11341344			
Insert Serial Number	11400850	11400850			
Date and Time Initialized	28-Feb-13 06:49	28-Feb-13 06:49			
Date and Time Read	03-Mar-13 00:06	01-Jan-70 00:00			
ECMB SW Version	N/A	N/A			

Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	55.31	52.16			
Software Version	6.21	6.21			
Sub Serial Number	11341344	11341344			
Sonde Serial Number	11062118	11062118			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	268.93	38.88			

Gamma Ray Sensor Information

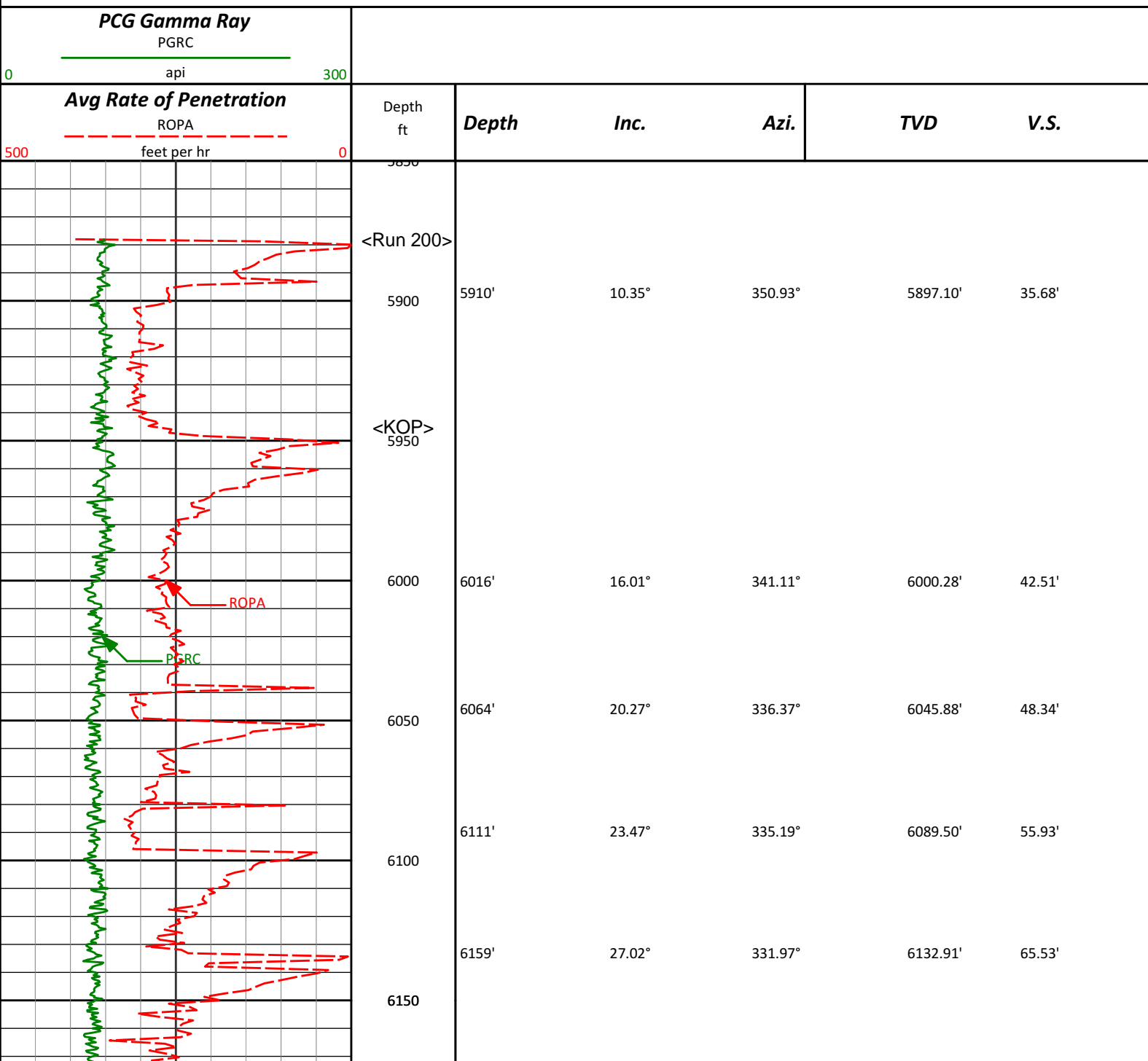
Tool Type	PCG	PCG			
Distance From Bit (ft)	50.31	47.16			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	11341344	11341344			
Insert/Sonde Serial Number	11680985	11680985			

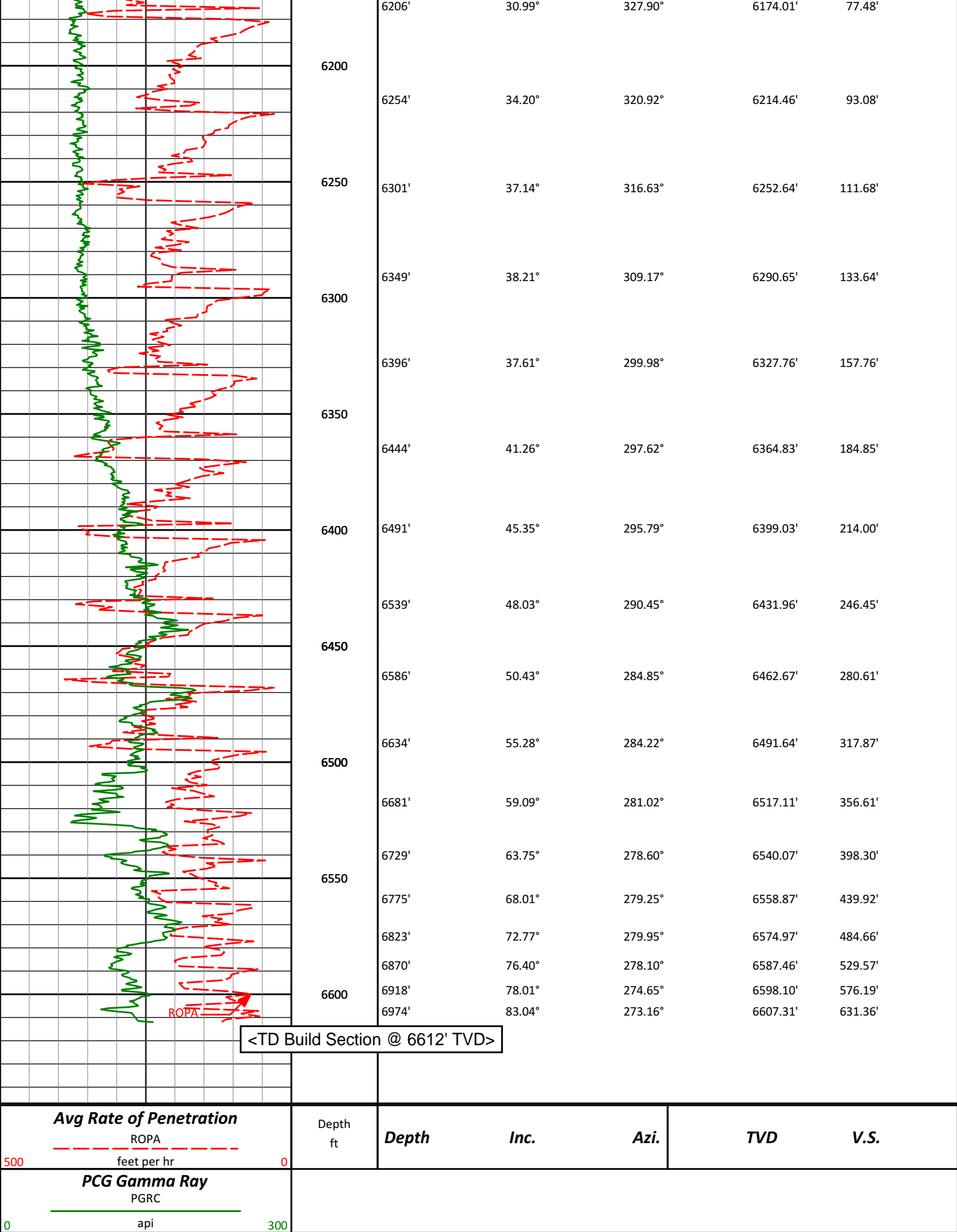
REMARKS

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 7.4.2

WARRANTY

HALLIBURTON WILL USE ITS BEST EFFORTS TO FURNISH CUSTOMERS WITH ACCURATE INFORMATION AND INTERPRETATIONS THAT ARE PART OF, AND INCIDENT TO, THE SERVICES PROVIDED. HOWEVER, HALLIBURTON CANNOT AND DOES NOT WARRANT THE ACCURACY OR CORRECTNESS OF SUCH INFORMATION AND INTERPRETATIONS UNDER NO CIRCUMSTANCES.





<TD Build Section @ 6612' TVD>

Avg Rate of Penetration

ROPA

feet per hr

PCG Gamma Ray

PGRC

api

Depth
ft

Depth

Inc.

Azi.

TVD

V.S.

HALLIBURTON

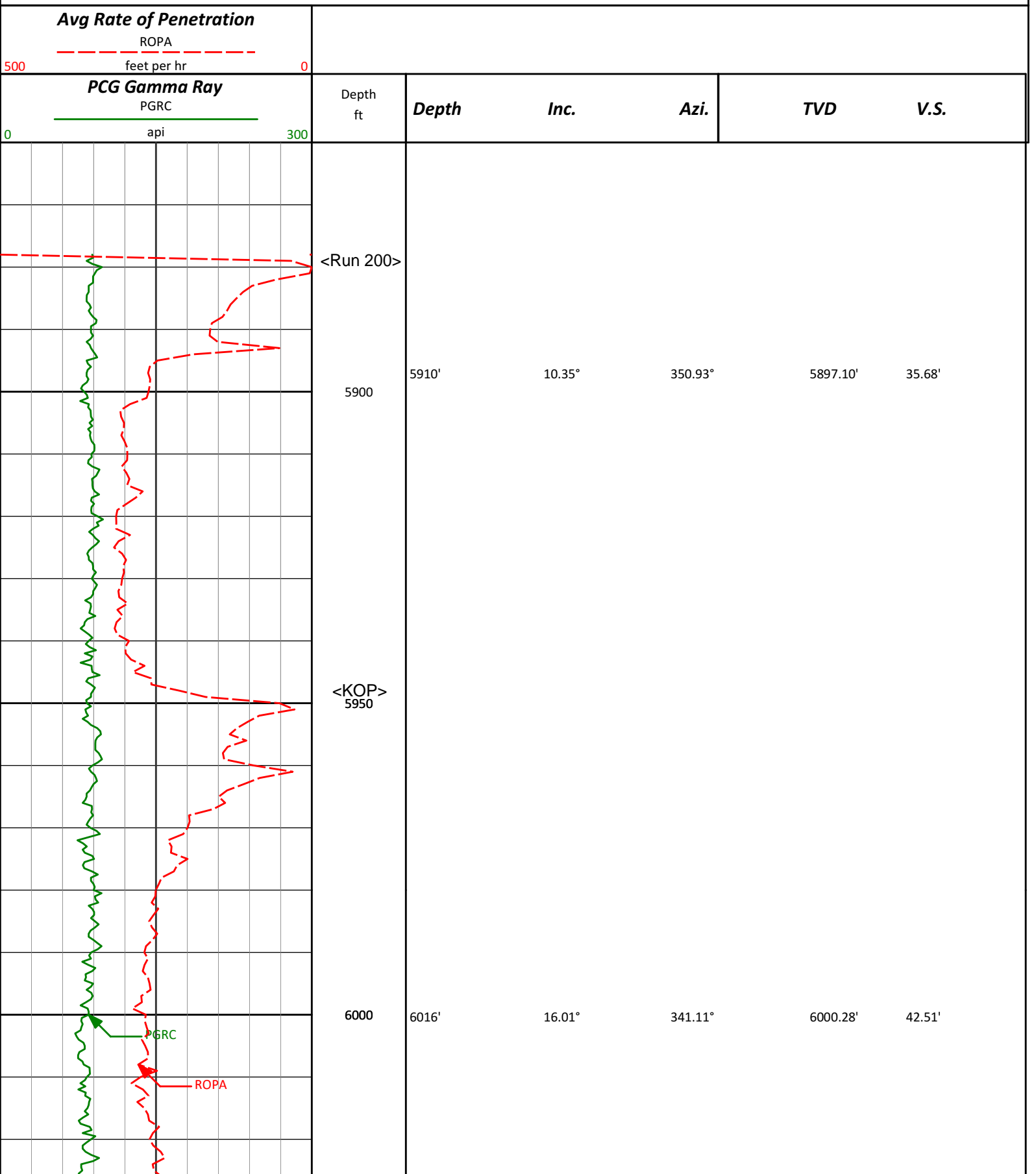
TVD Detail Log 1:240

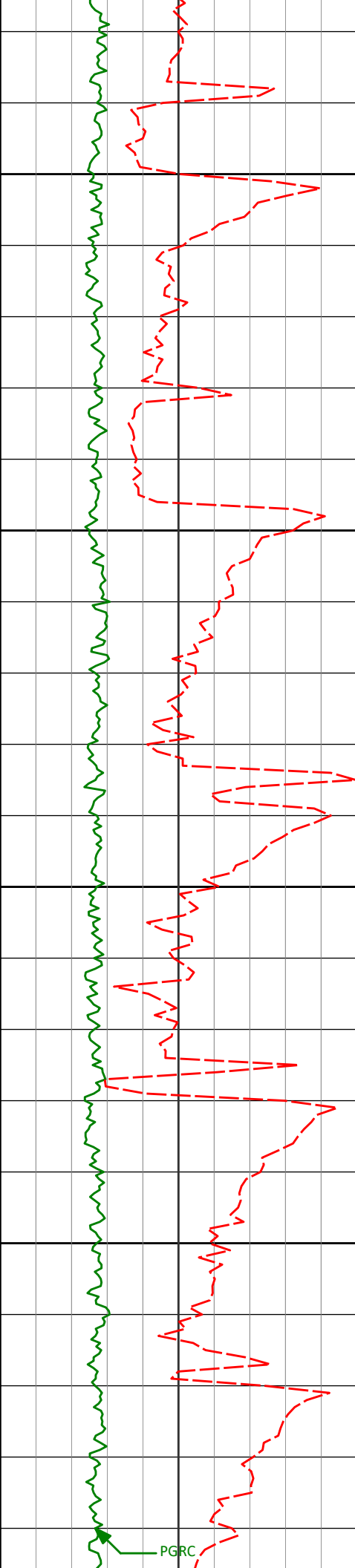
Noble Energy, Inc

Lucci State B03-69-HNL

H&P 315

T5N R64W





6050

6064'

20.27°

336.37°

6045.88'

48.34'

6100

6111'

23.47°

335.19°

6089.50'

55.93'

6150

6159'

27.02°

331.97°

6132.91'

65.53'

6200

6206'

30.99°

327.90°

6174.01'

77.48'

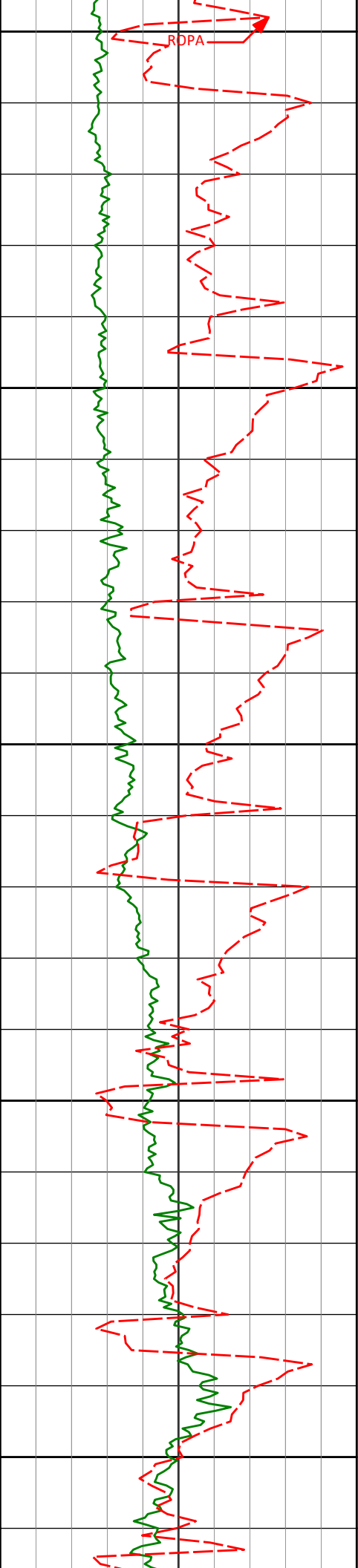
6254'

34.20°

320.92°

6214.46'

93.08'



6250

6301'

37.14°

316.63°

6252.64'

111.68'

6349'

38.21°

309.17°

6290.65'

133.64'

6300

6396'

37.61°

299.98°

6327.76'

157.76'

6350

6444'

41.26°

297.62°

6364.83'

184.85'

6400

6491'

45.35°

295.79°

6399.03'

214.00'

6539'

48.03°

290.45°

6431.96'

246.45'

6450

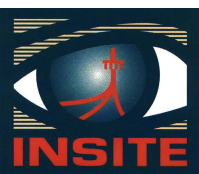
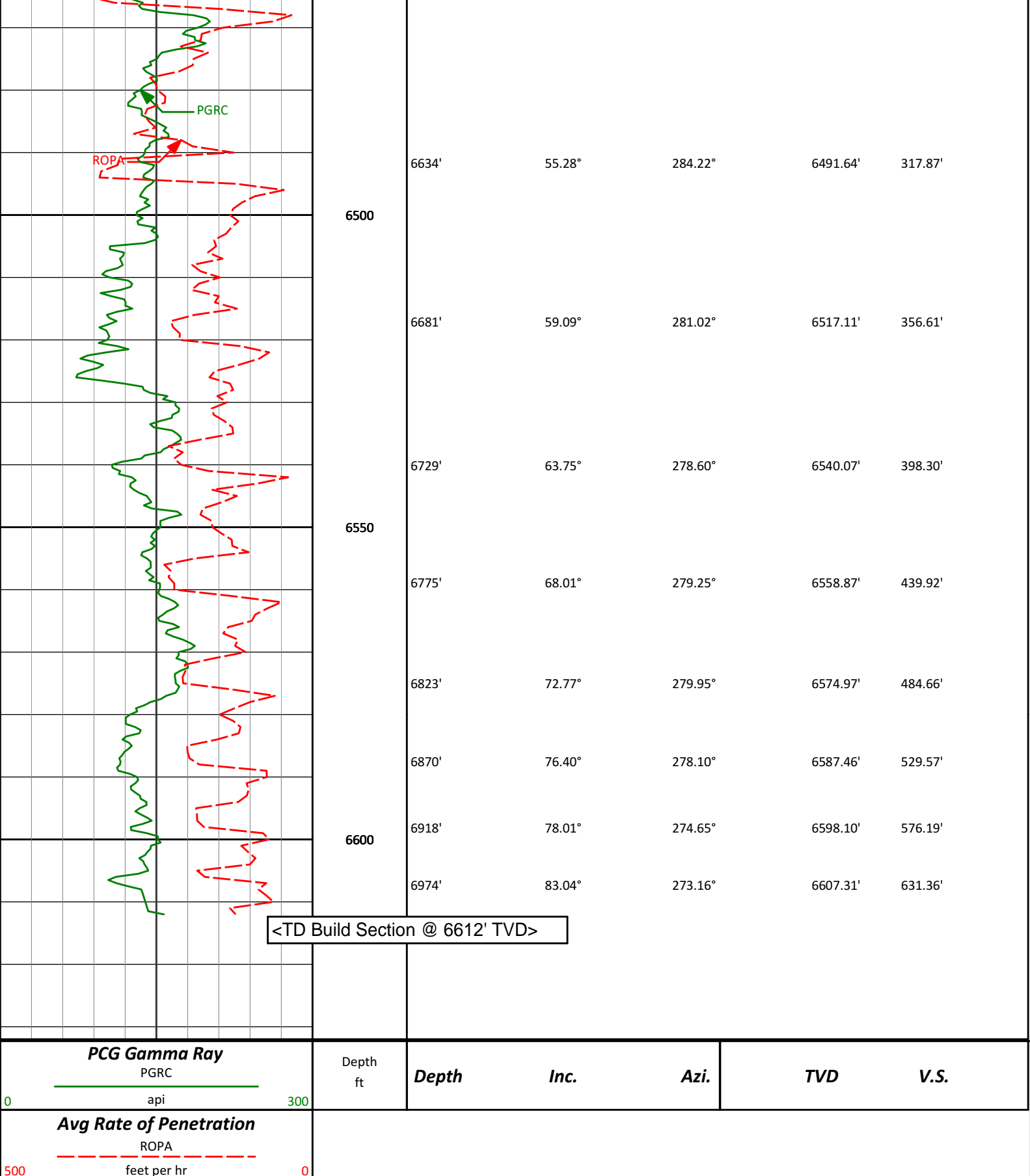
6586'

50.43°

284.85°

6462.67'

280.61'



HALLIBURTON

DIRECTIONAL SURVEY REPORT

Noble Energy
Lucci State B03-69-HNL
Wattenberg

Wattenberg
Weld Colorado
USA
CA-XX-0900166419
Survey depth 633 ft created to tie surveys onto bottom of the surface casing shoe.
Last survey is a projection from 6974 ft MD to TD at 7028 ft MD.

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
633.00	0.00	0.00	633.00	0.00 N	0.00 E	0.00	TIE-IN
720.00	0.51	157.30	720.00	0.36 S	0.15 E	-0.16	0.59
997.00	0.50	194.21	996.99	2.67 S	0.33 E	-0.40	0.12
1280.00	0.51	135.40	1279.98	4.76 S	0.91 E	-1.03	0.18
1565.00	0.65	136.78	1564.96	6.84 S	2.91 E	-3.08	0.05
1850.00	1.52	144.64	1849.91	11.10 S	6.20 E	-6.48	0.31
1945.00	0.67	212.07	1944.90	12.60 S	6.64 E	-6.95	1.48
2040.00	1.21	273.01	2039.88	13.02 S	5.34 E	-5.67	1.12
2135.00	0.98	283.02	2134.87	12.78 S	3.55 E	-3.87	0.31
2419.00	1.02	307.60	2418.83	10.69 S	0.82 W	0.55	0.15
2704.00	0.70	287.59	2703.79	8.62 S	4.49 W	4.27	0.15
2988.00	1.64	247.71	2987.74	9.64 S	9.91 W	9.66	0.42
3083.00	1.39	274.22	3082.70	10.07 S	12.31 W	12.05	0.77
3178.00	0.87	286.10	3177.68	9.78 S	14.16 W	13.90	0.60
3463.00	2.31	245.93	3462.57	11.53 S	21.48 W	21.18	0.61
3558.00	1.01	263.91	3557.53	12.39 S	24.06 W	23.74	1.46
3653.00	0.14	302.14	3652.53	12.42 S	24.99 W	24.67	0.95
3748.00	1.59	42.35	3747.52	11.39 S	24.20 W	23.90	1.71
3843.00	1.35	31.24	3842.48	9.46 S	22.73 W	22.49	0.39
4127.00	1.44	342.56	4126.41	3.19 S	22.07 W	21.98	0.41
4412.00	2.06	337.01	4411.28	4.94 N	25.14 W	25.26	0.22
4697.00	2.79	329.77	4696.02	15.64 N	30.63 W	31.02	0.28
4792.00	3.22	352.70	4790.89	20.29 N	32.13 W	32.64	1.33
4887.00	3.81	358.10	4885.71	26.09 N	32.58 W	33.23	0.71
4982.00	5.72	359.11	4980.38	33.98 N	32.75 W	33.60	2.01
5077.00	6.83	0.64	5074.81	44.36 N	32.77 W	33.88	1.18
5172.00	7.32	358.01	5169.09	56.06 N	32.91 W	34.32	0.62
5267.00	7.45	4.99	5263.30	68.24 N	32.59 W	34.30	0.95
5362.00	9.31	5.17	5357.28	82.03 N	31.36 W	33.42	1.96
5456.00	8.98	1.74	5450.09	96.93 N	30.45 W	32.89	0.68
5551.00	9.34	7.59	5543.88	111.99 N	29.21 W	32.03	1.05
5646.00	10.73	3.33	5637.42	128.46 N	27.68 W	30.92	1.66
5741.00	10.32	358.57	5730.83	145.79 N	27.37 W	31.05	1.01
5836.00	10.30	350.04	5824.30	162.67 N	29.06 W	33.16	1.61
5910.00	10.35	350.93	5897.10	175.75 N	31.25 W	35.68	0.23
6016.00	16.01	341.11	6000.28	199.00 N	37.49 W	42.51	5.72
6064.00	20.27	336.37	6045.88	212.89 N	42.97 W	48.34	9.39
6111.00	23.47	335.19	6089.50	228.85 N	50.16 W	55.93	6.87
6159.00	27.02	331.97	6132.91	247.16 N	59.30 W	65.53	7.93
6206.00	30.99	327.90	6174.01	266.84 N	70.75 W	77.48	9.43
6254.00	34.20	320.92	6214.46	287.79 N	85.83 W	93.08	10.29
6301.00	37.14	316.63	6252.64	308.37 N	103.91 W	111.68	8.21
6349.00	38.21	309.17	6290.65	328.29 N	125.38 W	133.64	9.75
6396.00	37.61	299.98	6327.76	344.65 N	149.09 W	157.76	12.07
6444.00	41.26	297.62	6364.83	359.31 N	175.81 W	184.85	8.22
6491.00	45.35	295.79	6399.03	373.78 N	204.61 W	214.00	9.10
6539.00	48.03	290.45	6431.96	387.45 N	236.72 W	246.45	9.83
6586.00	50.43	284.85	6462.67	398.20 N	270.62 W	280.61	10.37
6634.00	55.28	284.22	6491.64	407.79 N	307.65 W	317.87	10.16
6681.00	59.09	281.02	6517.11	416.40 N	346.18 W	356.61	9.92
6729.00	63.75	278.60	6540.07	423.56 N	387.71 W	398.30	10.67
6775.00	68.01	279.25	6558.87	430.07 N	429.17 W	439.92	9.35
6823.00	72.77	279.95	6574.97	437.62 N	473.74 W	484.66	10.01
6870.00	76.40	278.10	6587.46	444.72 N	518.48 W	529.57	8.60
6918.00	78.01	274.65	6598.10	449.91 N	564.99 W	576.19	7.77
6974.00	83.04	273.16	6607.31	453.66 N	620.08 W	631.36	9.36
7028.00	87.00	273.00	6612.00	456.55 N	673.79 W	685.12	7.34

CALCULATION BASED ON MINIMUM CURVATURE METHOD

SURVEY COORDINATES RELATIVE TO WELL SYSTEM REFERENCE POINT

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 271.45 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 7028.00 FEET
IS 813.90 FEET ALONG 304.12 DEGREES (GRID)

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