

PCGK: Pressure Case Gamma
PCDC: Pressure Case Directional

1 : 600 / 1 : 240

Country : USA		<div>Company : Noble Energy</div> <div>Rig : H&P 315</div> <div>Well : SLW Ranch B01-68-1HN</div> <div>Field : Wattenberg</div> <div>Country : USA</div> <div>API Number : 05-123-36320</div>			
Field : Wattenberg					
Location : Lat: 40°25' 55.09" North Long: 104°29' 22.06" West					
Well : SLW Ranch B01-68-1HN					
Company : Noble Energy					
Rig : H&P 315		LOCATION			
Latitude : 40°25' 55.09" North Longitude : 104°29' 22.06" West UTM Easting = 3,281,306.73 ft UTM Northing = 1,401,809.70 ft					
Permanent Datum : Ground Level		Elevation : 4613.00 ft		Other Services	
Log Measured From : Drill Floor		24.00 ft Above Permanent Datum		Directional Drilling	
Drilling Measured From : Drill Floor		TVD LOG		KB N/A DF 4637.00 ft GL 4613.00 ft WD N/A	
Depth Logged : 631.00 ft To 6,714.39 ft		Unit No. : 11610113		Job No. : CA-XX-0900071985	
Date Logged : 02-Jan-13 To 03-Jan-13		Plot Type : Final			
Total Depth MD : 7,085.00 ft TVD : 6,714.39 ft		Plot Date : 05-Jan-13			
Spud Date : 01-Jan-13					
Borehole Record (TVD)		Borehole Record (TVD)			
Run No.	Size From To	Run No.	Size From To		
2	8.750 in 631.00 ft 6,021.01 ft				
3	8.750 in 6,021.01 ft 6,714.39 ft				
		Casing Record (TVD)			
		Size Weight From To			
		7.000 in 26.00 lbpf SURFACE 6,713.50 ft			

WELL INFORMATION

MWD Run Number	100	200		
Date run completed	03-Jan-13	04-Jan-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)	631.00	6,021.01		
Log End Depth (TVD, ft)	6,021.01	6,714.39		
Drill or Wipe	Drill	Drill		
Drill/Wipe Start Date and Time	01-Jan-13 07:25	03-Jan-13 10:40		
Drill/Wipe End Date and Time	03-Jan-13 00:45	03-Jan-13 23:45		
Min Inc (deg) @ Depth (TVD, ft)	.02 @ 811.00	1.17 @ 6,027.01		
Max Inc (deg) @ Depth (TVD, ft)	12.36 @ 2,869.84	80.73 @ 6,707.72		
Bit TFA(in2) / Bit Type	.75 / PDC	.75 / PDC		
Flow Rate (gpm)	596.51	595.00		
Max AV (fpm) / CV (fpm) @ MWD	N/A / N/A	N/A / N/A		
Fluid Type		Fresh Water Gel		
Density (ppg) / Viscosity (spqt)	9.80 / 28.00	10.50 / 37.00		
Filtrate CL (ppm)	1,300.00	1,300.00		
pH / Fluid Loss (mptm)	9.30 / 0	9.20 / 0		
PV (cP) / YP (Ihf2)	3 / 2.00	11 / 11.00		
% Solids / % Sand	2.6 / .25	12.30 / 0.20		
% 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	170.37 / PCM	170.37 / PCM			
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A			
Lead MWD Engineer	Paul Kock	Paul Kock			
Customer Representative	Martin Suarez	Dave Nielsen			

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.76	5.76			
Sub Serial Number	11341343	11341343			
Insert Serial Number	10997267	10997267			
Date and Time Initialized	01-Jan-13 22:00	01-Jan-13 22:00			
Date and Time Read	04-Jan-13 05:36	04-Jan-13 05:44			
ECMB SW Version	N/A	N/A			

Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	54.92	52.51			
Software Version	6.21	6.21			
Sub Serial Number	11341343	11341343			
Sonde Serial Number	11833052	11833052			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	168.67	25.56			

Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	49.82	47.41			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	11341343	11341343			
Insert/Sonde Serial Number	11121379	11121379			

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 7.3.5

WARRANTY

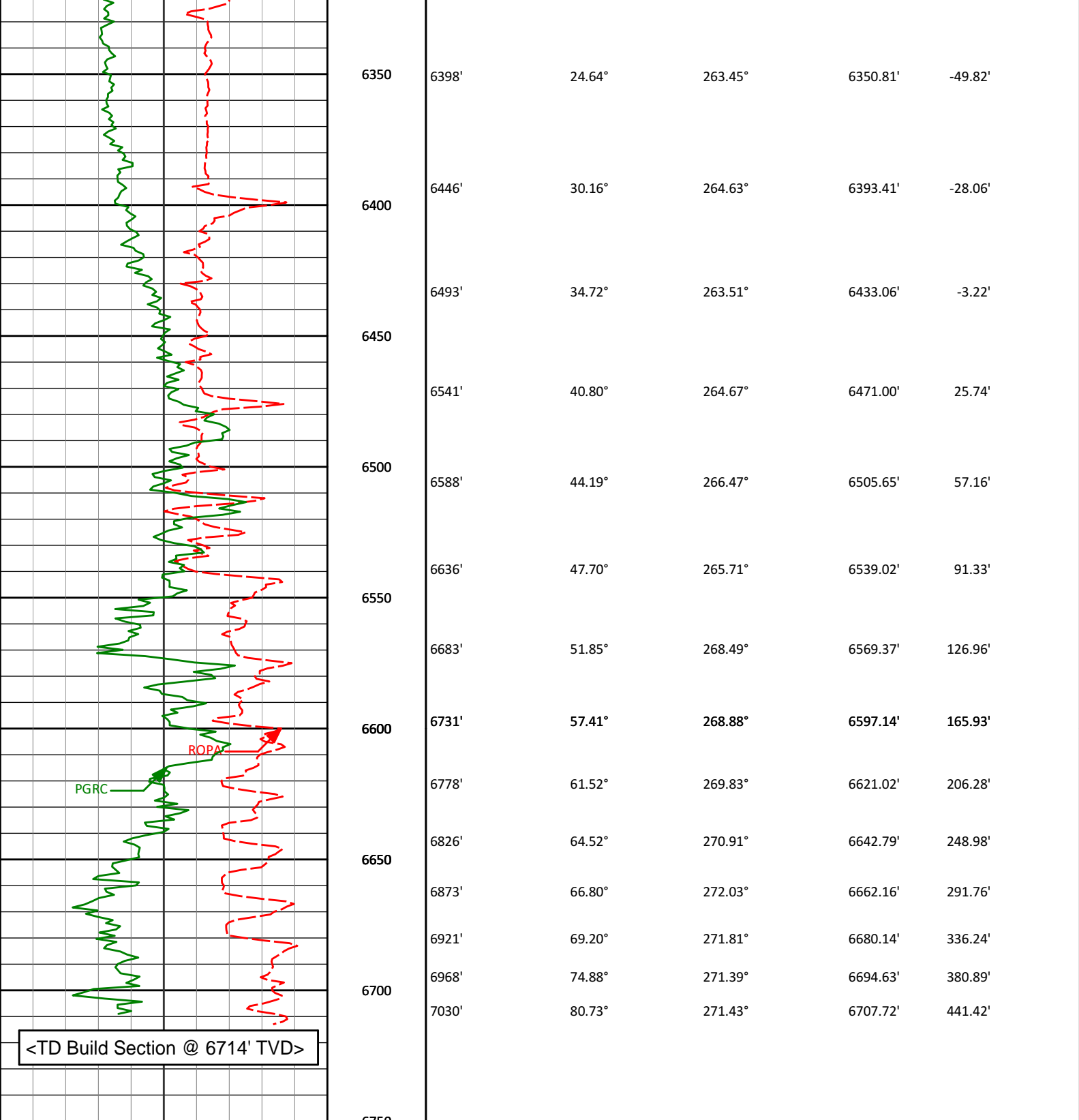
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Sperry Drilling Services
TVD Main Log 1:600

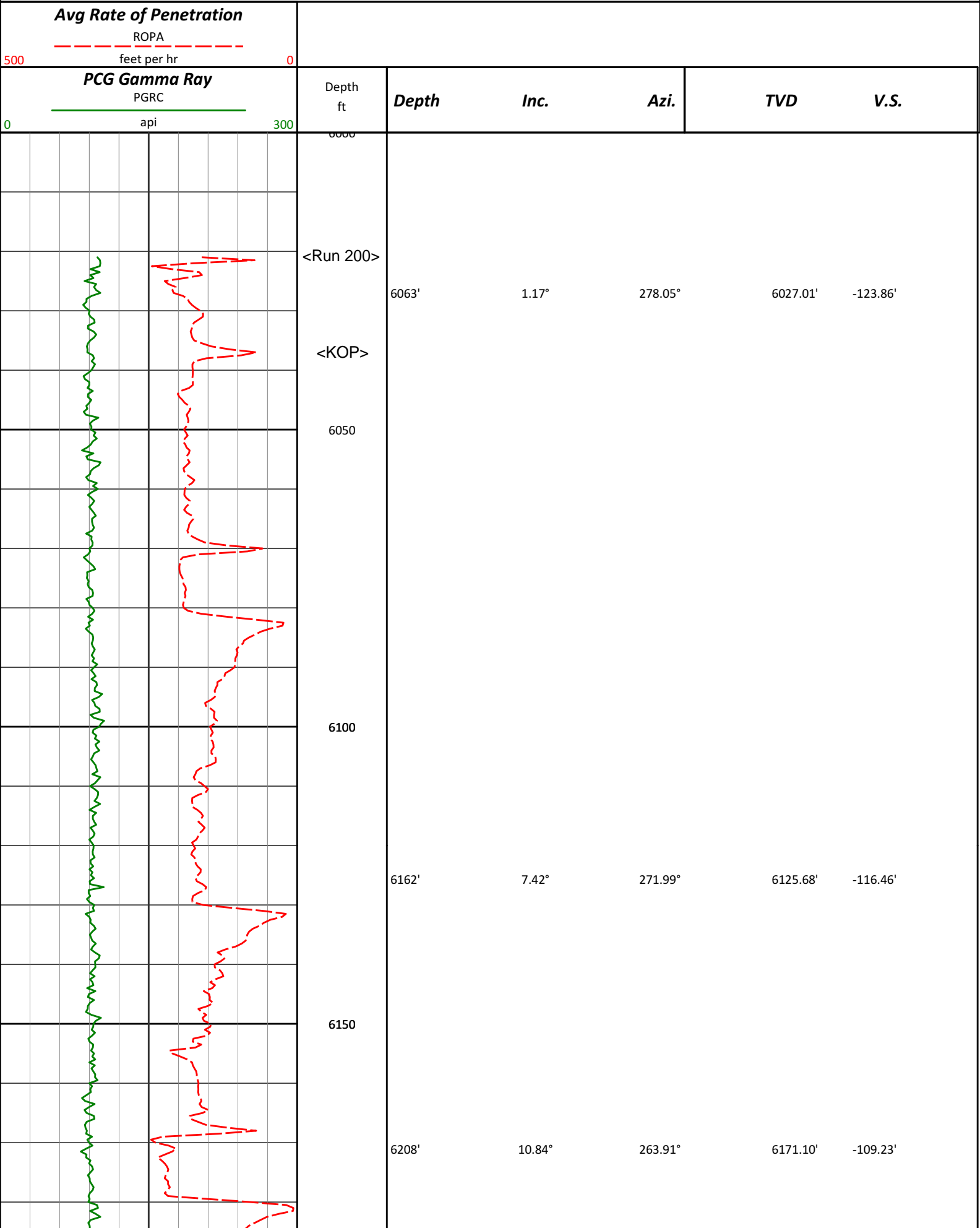
Noble Energy, Inc
SLW Ranch B01-68-1HN
H&P 315
T5N R64W

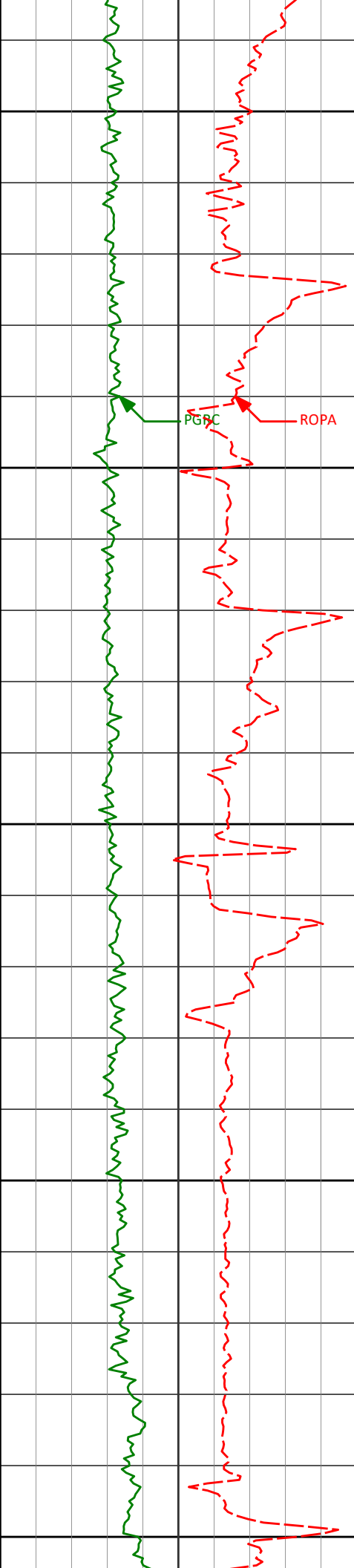
PCG Gamma Ray PGRC 0 300 api						
Avg Rate of Penetration ROPA 500 0 feet per hr		Depth ft	Depth	Inc.	Azi.	TVD V.S.
		<Run 200>	6063'	1.17°	278.05°	6027.01' -123.86'
		6050				
		<KOP>				
		6100				
		6162'		7.42°	271.99°	6125.68' -116.46'
		6150				
		6208'		10.84°	263.91°	6171.10' -109.23'
		6200				
		6256'		15.34°	264.03°	6217.84' -98.52'
		6250				
		6303'		19.61°	265.02°	6262.66' -84.60'
		6300				
		6351'		21.59°	262.95°	6307.59' -67.96'

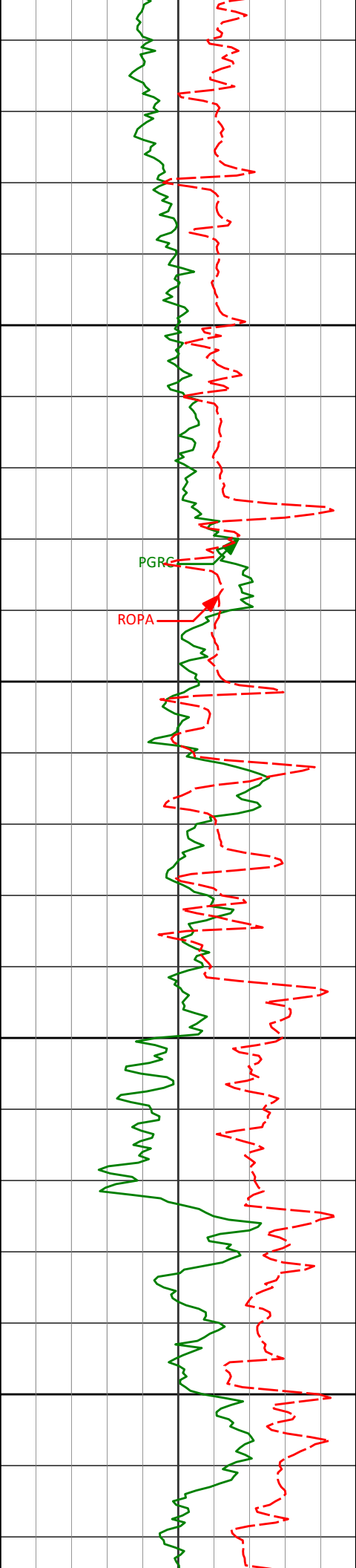


<TD Build Section @ 6714' TVD>

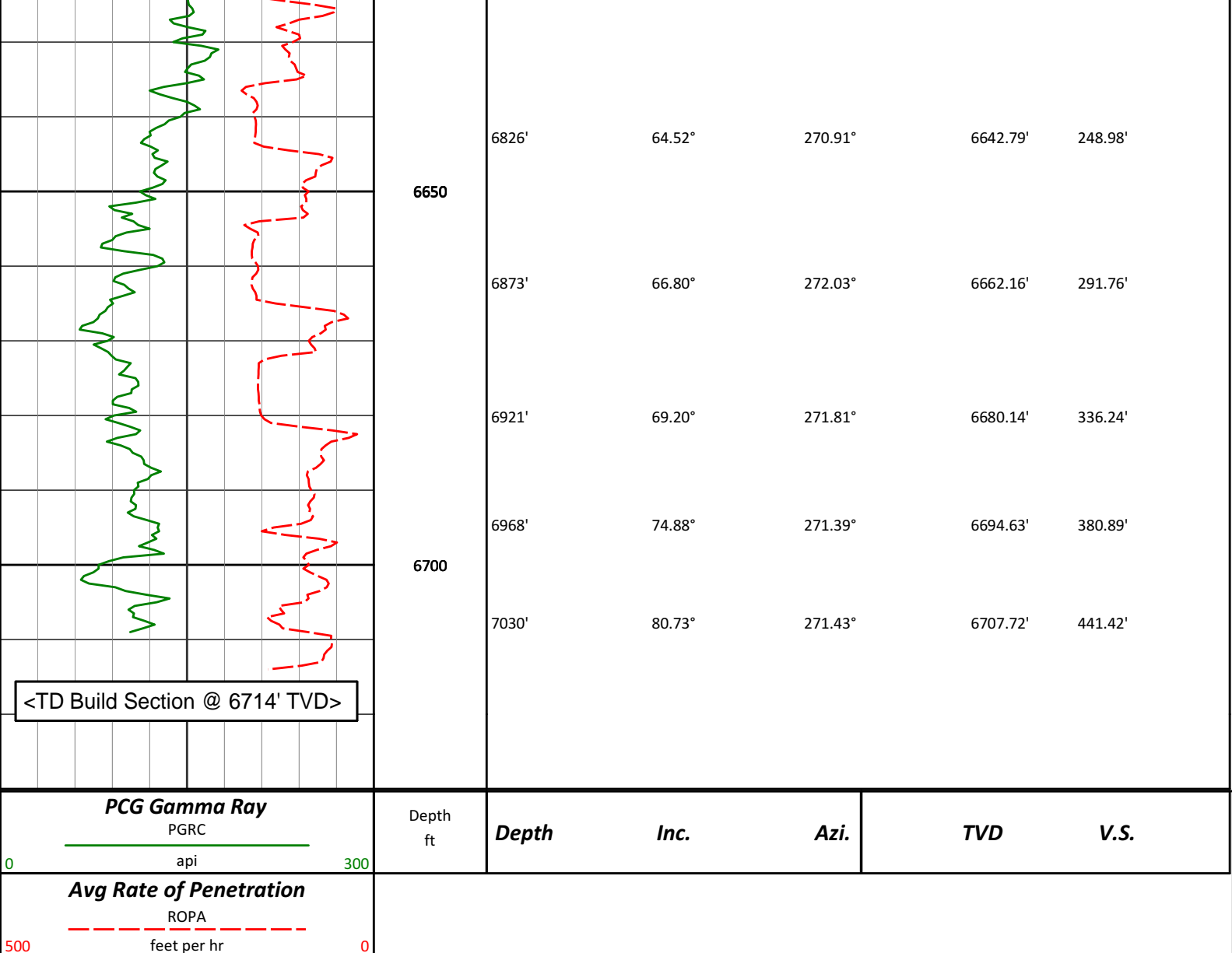
<div><div>Avg Rate of Penetration</div><div>ROPA</div><div>feet per hr</div></div>		Depth ft	Depth	Inc.	Azi.	TVD	V.S.
<div><div>PCG Gamma Ray</div><div>PGRC</div><div>api</div></div>							







6450	6493'	34.72°	263.51°	6433.06'	-3.22'
	6541'	40.80°	264.67°	6471.00'	25.74'
6500	6588'	44.19°	266.47°	6505.65'	57.16'
	6636'	47.70°	265.71°	6539.02'	91.33'
6550	6683'	51.85°	268.49°	6569.37'	126.96'
	6731'	57.41°	268.88°	6597.14'	165.93'
6600	6778'	61.52°	269.83°	6621.02'	206.28'



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DIRECTIONAL SURVEY REPORT

Noble Energy
SLW Ranch B01-68-1HN
Wattenberg
Weld Colorado
USA
CA-XX-0900071985

Survey depth 621 ft created to tie surveys onto bottom of the surface casing shoe.

Last survey is a projection from 7030 ft MD to TD at 7085 ft MD.

Measured Depth (feet)	Inclination (degrees)	Direction (degrees)	Vertical Depth (feet)	Latitude (feet)	Departure (feet)	Vertical Section (feet)	Dogleg (deg/100ft)
621.00	0.00	0.00	621.00	0.00 N	0.00 E	0.00	TIE-IN
718.00	0.06	28.38	718.00	0.05 N	0.02 E	-0.02	0.06
811.00	0.02	338.05	811.00	0.11 N	0.04 E	-0.04	0.06
903.00	1.48	134.18	902.99	0.70 S	0.89 E	-0.93	1.62
996.00	0.32	60.24	995.98	1.41 S	1.97 E	-2.06	1.53
1089.00	1.17	70.95	1088.97	0.97 S	3.10 E	-3.15	0.91
1182.00	0.98	61.00	1181.95	0.27 S	4.69 E	-4.69	0.29
1275.00	0.74	80.85	1274.94	0.21 N	5.97 E	-5.95	0.40
1368.00	1.05	81.49	1367.93	0.43 N	7.41 E	-7.36	0.33

1463.00	1.10	82.30	1462.92	0.68 N	9.17 E	-9.10	0.06
1558.00	2.76	65.88	1557.86	1.73 N	12.16 E	-12.01	1.82
1653.00	4.54	81.73	1652.66	3.21 N	17.96 E	-17.71	2.14
1748.00	5.66	76.35	1747.29	4.85 N	26.23 E	-25.85	1.28
1843.00	6.61	53.67	1841.76	9.20 N	35.19 E	-34.51	2.72
1938.00	7.62	48.12	1936.02	16.65 N	44.29 E	-43.09	1.28
2033.00	8.62	41.15	2030.07	26.22 N	53.67 E	-51.81	1.47
2128.00	9.04	32.71	2123.95	37.86 N	62.39 E	-59.74	1.43
2223.00	9.40	30.91	2217.72	50.80 N	70.41 E	-66.89	0.49
2318.00	10.23	19.51	2311.34	65.41 N	77.21 E	-72.71	2.22
2413.00	10.04	11.52	2404.86	81.48 N	81.68 E	-76.10	1.49
2508.00	9.69	9.10	2498.46	97.48 N	84.60 E	-77.95	0.57
2603.00	10.40	11.49	2592.00	113.78 N	87.57 E	-79.84	0.87
2698.00	12.16	11.51	2685.16	131.99 N	91.28 E	-82.33	1.85
2793.00	12.30	11.32	2778.01	151.72 N	95.26 E	-85.00	0.15
2887.00	12.36	14.08	2869.84	171.30 N	99.68 E	-88.10	0.63
2983.00	12.30	12.18	2963.62	191.26 N	104.33 E	-91.43	0.43
3078.00	11.84	13.58	3056.52	210.63 N	108.76 E	-94.56	0.58
3173.00	10.80	11.43	3149.67	228.82 N	112.81 E	-97.40	1.18
3268.00	10.23	12.62	3243.08	245.78 N	116.41 E	-99.87	0.64
3363.00	10.02	18.89	3336.60	261.82 N	120.93 E	-103.31	1.18
3458.00	9.59	19.59	3430.22	277.10 N	126.26 E	-107.62	0.46
3553.00	9.34	20.59	3523.92	291.78 N	131.63 E	-112.00	0.32
3648.00	9.69	12.04	3617.62	306.82 N	136.01 E	-115.38	1.53
3743.00	10.33	14.13	3711.17	322.91 N	139.76 E	-118.05	0.77
3838.00	9.13	11.33	3804.80	338.56 N	143.32 E	-120.57	1.36
3933.00	8.86	11.94	3898.63	353.10 N	146.31 E	-122.59	0.31
4028.00	6.03	7.87	3992.82	365.20 N	148.51 E	-123.98	3.02
4123.00	4.87	7.92	4087.39	374.14 N	149.75 E	-124.62	1.22
4218.00	3.60	2.22	4182.13	381.11 N	150.42 E	-124.83	1.41
4313.00	0.20	171.39	4277.07	383.93 N	150.56 E	-124.78	3.99
4408.00	0.44	265.36	4372.07	383.73 N	150.22 E	-124.46	0.52
4693.00	0.26	146.81	4657.07	383.10 N	149.51 E	-123.79	0.21
4978.00	0.74	19.84	4942.06	384.28 N	150.49 E	-124.69	0.32
5262.00	1.00	333.57	5226.03	388.23 N	150.01 E	-123.95	0.26
5357.00	0.71	72.05	5321.03	389.15 N	150.20 E	-124.08	1.38
5452.00	0.32	136.74	5416.02	389.14 N	150.94 E	-124.82	0.68
5737.00	0.10	73.82	5701.02	388.62 N	151.73 E	-125.64	0.10
5927.00	0.23	282.50	5891.02	388.75 N	151.51 E	-125.41	0.17
6000.00	0.71	249.12	5964.02	388.62 N	150.94 E	-124.86	0.73
6063.00	1.17	278.05	6027.01	388.57 N	149.94 E	-123.86	1.02
6162.00	7.42	271.99	6125.68	388.93 N	142.55 E	-116.46	6.32
6208.00	10.84	263.91	6171.10	388.58 N	135.28 E	-109.23	7.93
6256.00	15.34	264.03	6217.84	387.44 N	124.47 E	-98.52	9.36
6303.00	19.61	265.02	6262.66	386.10 N	110.43 E	-84.60	9.12
6351.00	21.59	262.95	6307.59	384.32 N	93.63 E	-67.96	4.39
6398.00	24.64	263.45	6350.81	382.14 N	75.31 E	-49.82	6.51
6446.00	30.16	264.63	6393.41	379.87 N	53.35 E	-28.06	11.54
6493.00	34.72	263.51	6433.06	377.25 N	28.29 E	-3.22	9.79
6541.00	40.80	264.67	6471.00	374.25 N	0.94 W	25.74	12.77
6588.00	44.19	266.47	6505.65	371.81 N	32.59 W	57.16	7.65
6636.00	47.70	265.71	6539.02	369.45 N	66.99 W	91.33	7.40
6683.00	51.85	268.49	6569.37	367.66 N	102.82 W	126.96	9.92
6731.00	57.41	268.88	6597.14	366.77 N	141.94 W	165.93	11.60
6778.00	61.52	269.83	6621.02	366.32 N	182.41 W	206.28	8.92
6826.00	64.52	270.91	6642.79	366.60 N	225.17 W	248.98	6.56
6873.00	66.80	272.03	6662.16	367.70 N	267.98 W	291.76	5.31
6921.00	69.20	271.81	6680.14	369.19 N	312.46 W	336.24	5.02
6968.00	74.88	271.39	6694.63	370.44 N	357.13 W	380.89	12.11
7030.00	80.73	271.43	6707.72	371.93 N	417.69 W	441.42	9.44
7085.00	85.34	270.70	6714.39	372.94 N	472.26 W	495.93	8.48

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 CLOSURE OF 308.30 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 7085.00 FEET
IS 601.76 FEET ALONG 308.30 DEGREES (GRID)

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