

PCGC: Pressure Case Gamma
PCDC: Pressure Case Directional

[illegible]

WELL INFORMATION

MWD Run Number	100	200			
Date run completed	18-Sep-13	19-Sep-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)	603.98	5,010.56			
Log End Depth (TVD, ft)	5,010.56	5,707.49			
Drill or Wipe	Drill	Drill			
Drill/Wipe Start Date and Time	17-Sep-13 08:00	18-Sep-13 11:30			
Drill/Wipe End Date and Time	18-Sep-13 00:30	19-Sep-13 01:00			
Min Inc (deg) @ Depth (TVD, ft)	.10 @ 1,178.97	.62 @ 5,023.56			
Max Inc (deg) @ Depth (TVD, ft)	10.78 @ 2,685.03	79.17 @ 5,699.61			
Bit TFA(in2) / Bit Type	.75 / PDC	.75 / PDC			
Flow Rate (gpm)	568.38	595.00			
Max AV (fpm) / CV (fpm) @ MWD	N/A / N/A	N/A / N/A			
Fluid Type	Fresh Water Gel	Fresh Water Gel			
Density (ppg) / Viscosity (spqt)	9.20 / 36.00	10.50 / 40.00			
Filtrate CL (ppm)	1,600.00	1,600.00			
pH / Fluid Loss (mptm)	8.90 / 0	8.80 / 0			
PV (cP) / YP (lbf2)	10 / 11.00	13 / 12.00			
% Solids / % Sand	5.20 / 0.25	8.9 / .25			
% 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 (in) / Tool C	125.45 / DOM	122.22 / DOM			

Max Tool Temp (degF) / Source	135.45 / PCM	163.20 / PCM			
Rm @ Max Tool Temp (degF)	N/A @ N/A	N/A @ N/A			
Lead MWD Engineer	Paul Kock	Paul Kock			
Customer Representative	Bryant Dear	Bryant Dear			

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM			
Software Version	5.84	5.84			
Sub Serial Number	11341322	11303516			
Insert Serial Number	12001059	12001059			
Date and Time Initialized	16-Sep-13 13:59	18-Sep-13 05:37			
Date and Time Read	18-Sep-13 05:02	19-Sep-13 07:53			
ECMB SW Version	N/A	N/A			

Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	54.57	52.44			
Software Version	6.21	6.21			
Sub Serial Number	11341322	11303516			
Sonde Serial Number	11062040	11062040			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	135.77	247.10			

Gamma Ray Sensor Information

Tool Type	PCG	PCG			
Distance From Bit (ft)	49.57	47.44			
Recorded Sample Period (sec)	10	10			
Software Version	8.15	8.15			
Sub Serial Number	11341322	11303516			
Insert/Sonde Serial Number	12071284	12071284			

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 7.4.20

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Sperry Drilling Services

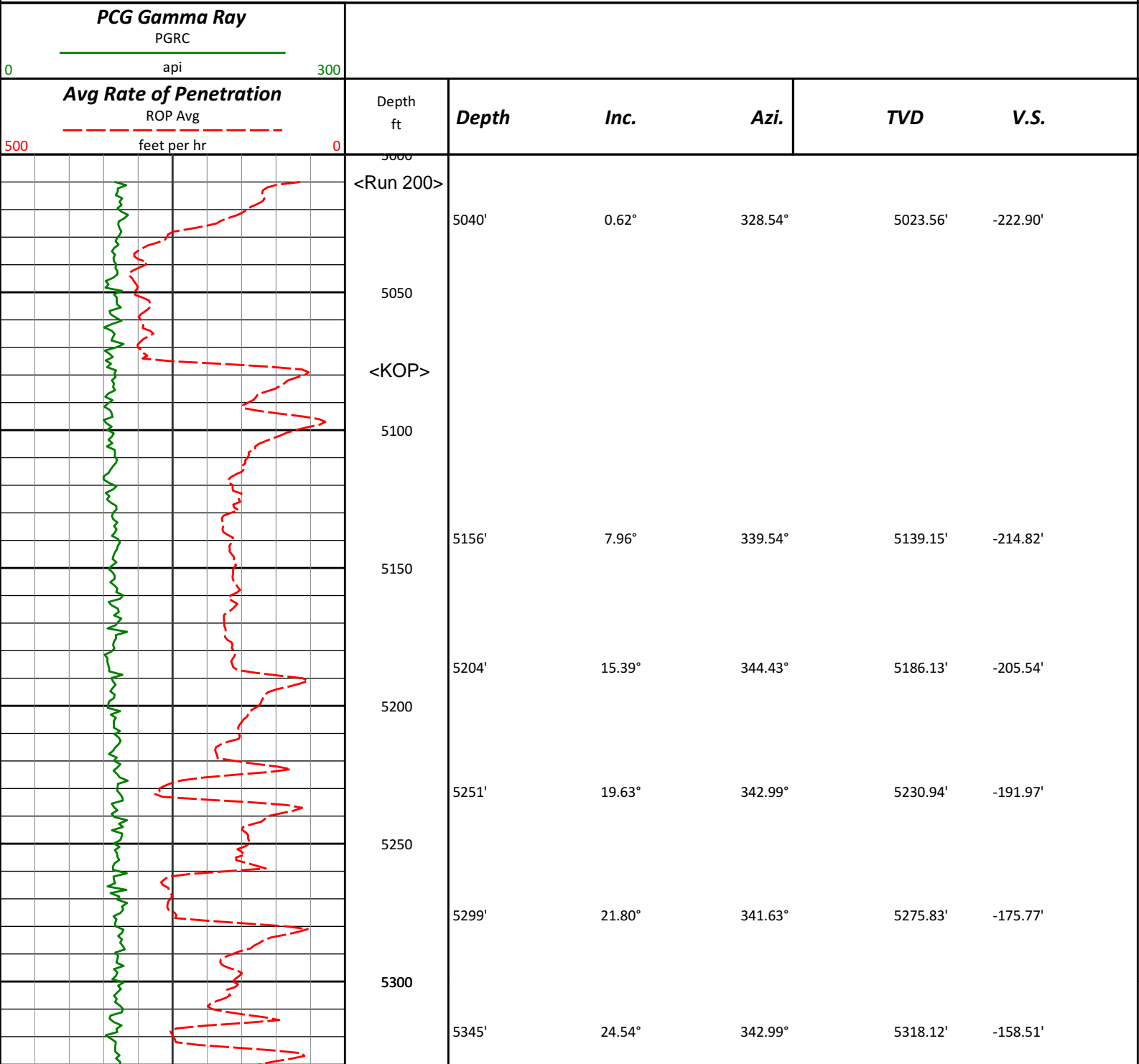
TVD Detail Log 1:600

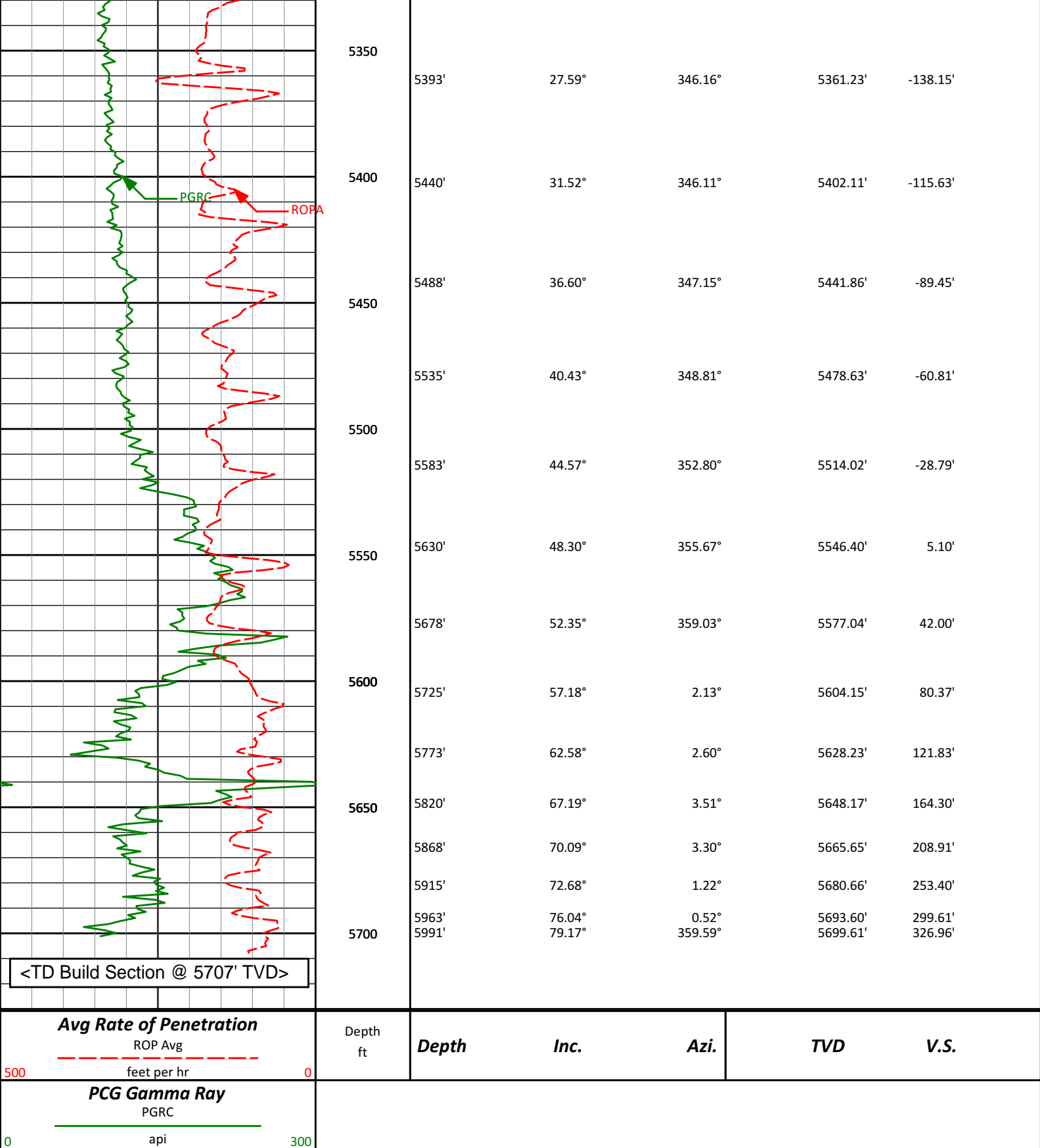
Noble Energy, Inc

Fiscus Federal LD23-78HN

H&P 315

T9N R58W

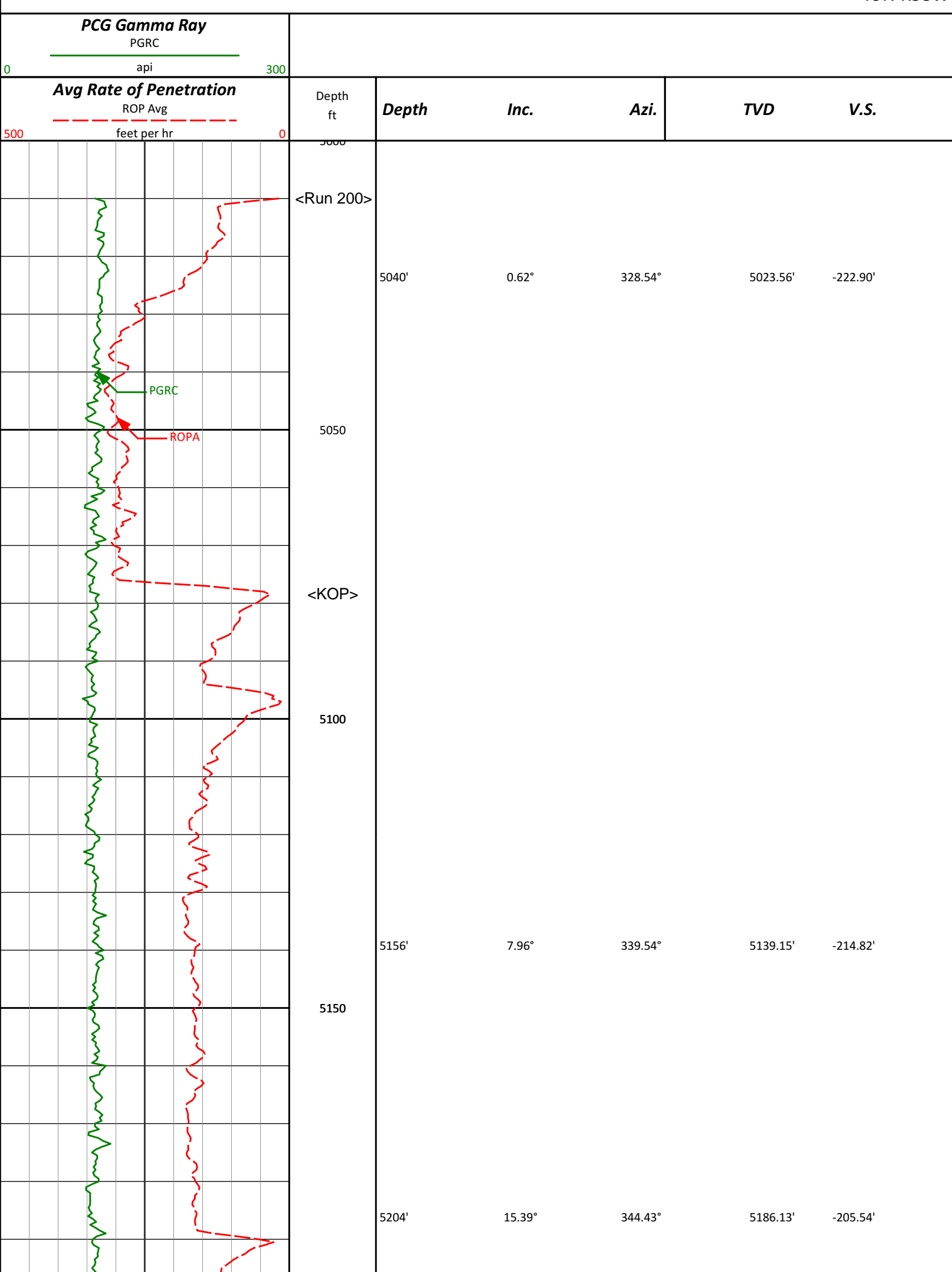


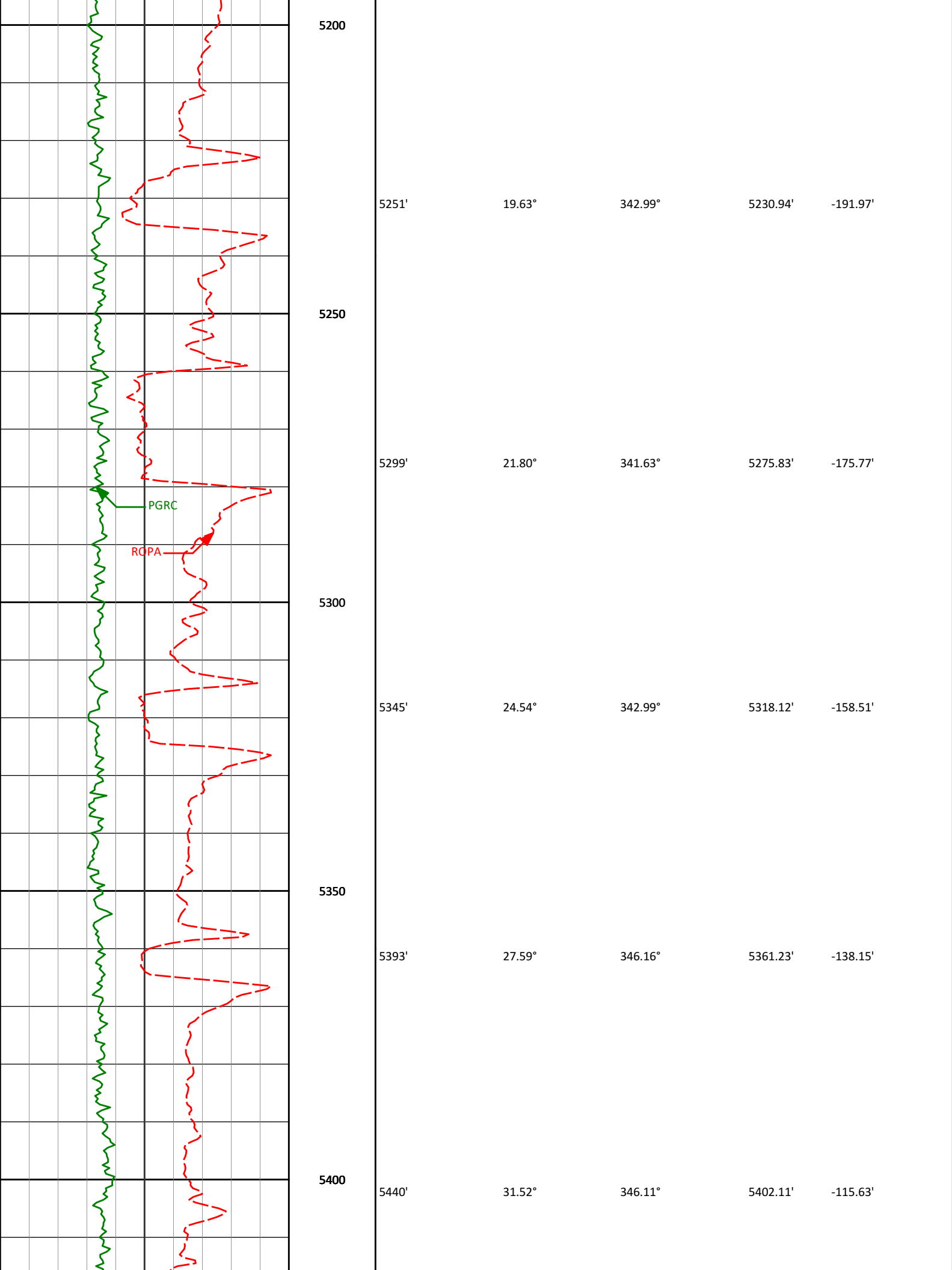


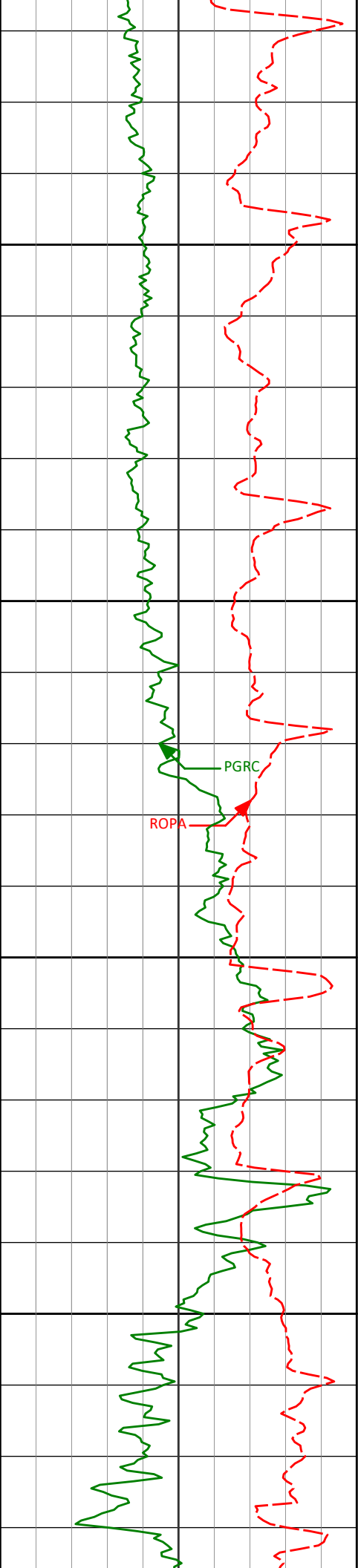
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Sperry Drilling Services

TVD Detail Log 1:240







5450

5488'

36.60°

347.15°

5441.86'

-89.45'

5535'

40.43°

348.81°

5478.63'

-60.81'

5500

5583'

44.57°

352.80°

5514.02'

-28.79'

5550

5630'

48.30°

355.67°

5546.40'

5.10'

5678'

52.35°

359.03°

5577.04'

42.00'

5600

5725'

57.18°

2.13°

5604.15'

80.37'

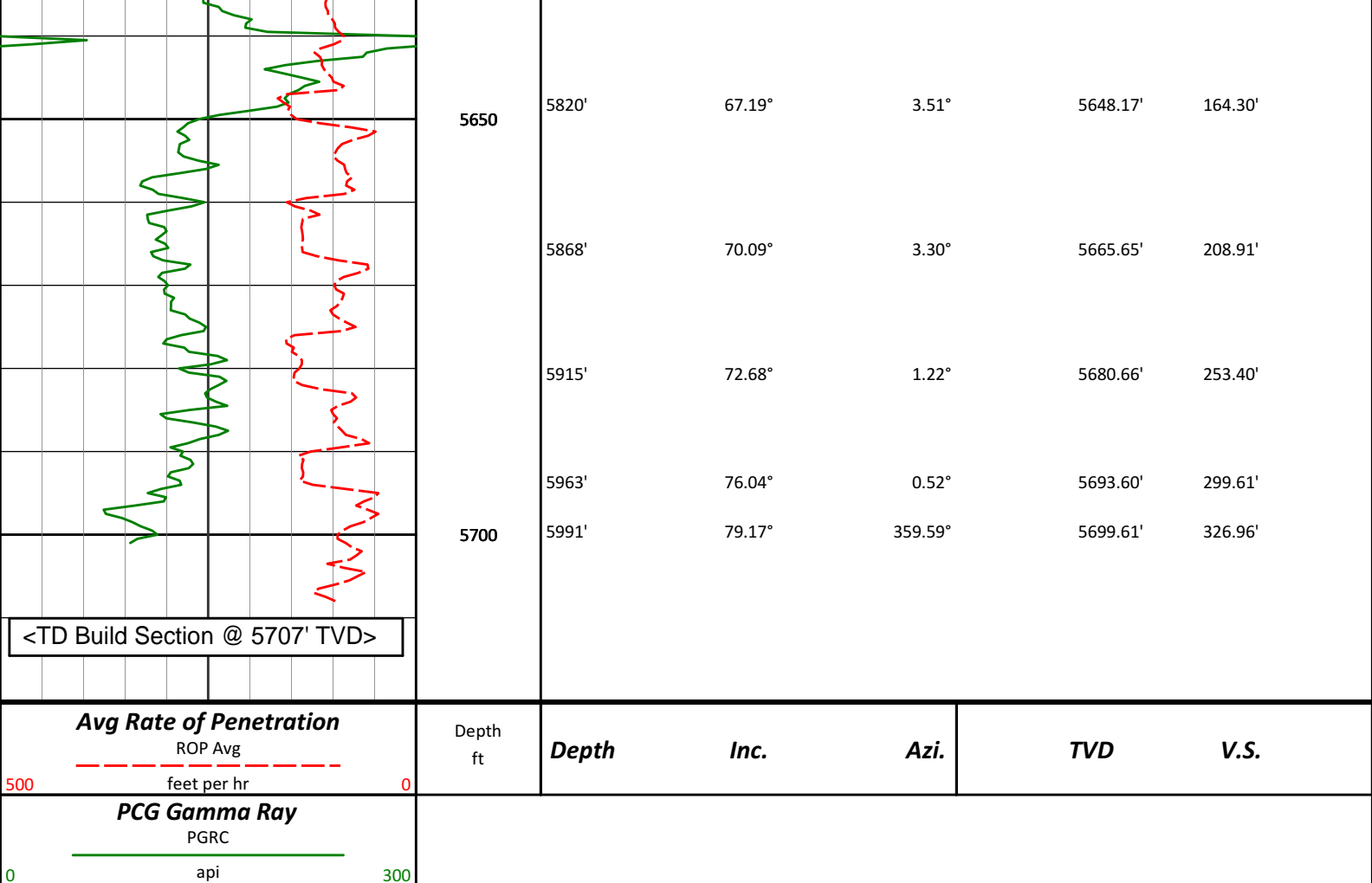
5773'

62.58°

2.60°

5628.23'

121.83'



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DIRECTIONAL SURVEY REPORT

Noble Energy
Fiscus Federal LD23-78HN
Wildcat
Weld Colorado
USA
CA-XX-0900735955

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
244.00	0.80	202.93	243.99	1.57 S	0.66 W	-1.57	0.33
556.00	0.30	253.63	555.98	3.81 S	2.30 W	-3.80	0.21
718.00	0.38	212.12	717.98	4.38 S	2.99 W	-4.37	0.16
811.00	0.36	348.64	810.97	4.36 S	3.21 W	-4.34	0.74
903.00	0.53	246.33	902.97	4.24 S	3.65 W	-4.23	0.76
994.00	0.31	165.53	993.97	4.65 S	3.98 W	-4.63	0.62
1087.00	0.48	119.62	1086.97	5.08 S	3.57 W	-5.07	0.37
1179.00	0.10	278.27	1178.97	5.26 S	3.32 W	-5.25	0.62
1273.00	0.74	240.09	1272.97	5.55 S	3.93 W	-5.54	0.71
1366.00	0.28	356.19	1365.96	5.63 S	4.46 W	-5.61	0.97
1458.00	0.37	291.43	1457.96	5.29 S	4.76 W	-5.28	0.39
1553.00	0.49	42.39	1552.96	4.88 S	4.77 W	-4.87	0.75
1648.00	0.36	354.06	1647.96	4.29 S	4.53 W	-4.27	0.38
1743.00	0.77	119.62	1742.95	4.31 S	4.00 W	-4.29	1.08
1838.00	0.56	168.71	1837.95	5.08 S	3.35 W	-5.06	0.62
1933.00	0.26	158.24	1932.95	5.73 S	3.18 W	-5.72	0.32
2027.00	1.73	147.02	2026.93	7.12 S	2.33 W	-7.11	1.56
2122.00	3.49	170.01	2121.83	11.16 S	1.05 W	-11.16	2.12
2217.00	5.54	165.22	2216.53	18.44 S	0.61 E	-18.45	2.10

2217.00	5.34	163.32	2216.33	18.44 S	0.61 E	-16.43	2.19
2312.00	6.39	159.42	2311.02	27.83 S	3.63 E	-27.84	1.11
2407.00	7.94	163.14	2405.27	39.06 S	7.39 E	-39.09	1.70
2501.00	9.60	162.61	2498.17	52.75 S	11.62 E	-52.80	1.77
2596.00	10.66	162.38	2591.69	68.68 S	16.64 E	-68.75	1.12
2691.00	10.78	161.74	2685.03	85.49 S	22.09 E	-85.57	0.18
2786.00	10.58	162.61	2778.39	102.24 S	27.47 E	-102.35	0.27
2881.00	9.90	156.32	2871.88	118.05 S	33.36 E	-118.17	1.37
2976.00	8.58	163.22	2965.65	132.31 S	38.69 E	-132.46	1.82
3071.00	7.90	164.13	3059.66	145.37 S	42.52 E	-145.53	0.73
3166.00	8.06	164.33	3153.75	158.05 S	46.10 E	-158.23	0.17
3260.00	8.34	163.25	3246.78	170.92 S	49.84 E	-171.11	0.34
3355.00	6.89	162.46	3340.94	182.96 S	53.55 E	-183.16	1.53
3450.00	5.63	161.69	3435.38	192.81 S	56.73 E	-193.03	1.33
3545.00	3.67	159.93	3530.06	200.08 S	59.23 E	-200.31	2.07
3640.00	4.50	175.42	3624.82	206.65 S	60.57 E	-206.88	1.45
3735.00	6.60	173.65	3719.37	215.80 S	61.48 E	-216.03	2.22
3830.00	4.06	149.80	3813.96	224.13 S	63.77 E	-224.38	3.49
3925.00	1.34	155.37	3908.85	228.05 S	65.93 E	-228.30	2.88
4020.00	0.32	168.76	4003.84	229.32 S	66.44 E	-229.57	1.08
4305.00	1.20	80.33	4288.81	229.60 S	69.54 E	-229.87	0.43
4400.00	1.57	103.14	4383.79	229.73 S	71.78 E	-230.00	0.69
4495.00	2.06	109.18	4478.74	230.58 S	74.65 E	-230.87	0.56
4590.00	2.17	80.21	4573.68	230.84 S	78.04 E	-231.14	1.12
4685.00	1.49	324.19	4668.65	229.53 S	79.09 E	-229.84	3.29
4780.00	1.60	327.80	4763.62	227.41 S	77.67 E	-227.71	0.15
4875.00	1.53	341.12	4858.58	225.10 S	76.55 E	-225.39	0.39
4968.00	0.77	331.52	4951.56	223.37 S	75.85 E	-223.66	0.84
5040.00	0.62	328.54	5023.56	222.61 S	75.42 E	-222.90	0.22
5156.00	7.96	339.54	5139.15	214.54 S	72.28 E	-214.82	6.34
5204.00	15.39	344.43	5186.13	205.28 S	69.40 E	-205.54	15.60
5251.00	19.63	342.99	5230.94	191.72 S	65.42 E	-191.97	9.08
5299.00	21.80	341.63	5275.83	175.54 S	60.25 E	-175.77	4.62
5345.00	24.54	342.99	5318.12	158.30 S	54.76 E	-158.51	6.08
5393.00	27.59	346.16	5361.23	137.97 S	49.18 E	-138.15	6.98
5440.00	31.52	346.11	5402.11	115.46 S	43.62 E	-115.63	8.36
5488.00	36.60	347.15	5441.86	89.31 S	37.43 E	-89.45	10.65
5535.00	40.43	348.81	5478.63	60.69 S	31.35 E	-60.81	8.43
5583.00	44.57	352.80	5514.02	28.69 S	26.22 E	-28.79	10.29
5630.00	48.30	355.67	5546.40	5.19 N	22.82 E	5.10	9.09
5678.00	52.35	359.03	5577.04	42.08 N	21.15 E	42.00	10.01
5725.00	57.18	2.13	5604.15	80.45 N	21.57 E	80.37	11.60
5773.00	62.58	2.60	5628.23	121.92 N	23.28 E	121.83	11.28
5820.00	67.19	3.51	5648.17	164.40 N	25.56 E	164.30	9.95
5868.00	70.09	3.30	5665.65	209.02 N	28.21 E	208.91	6.06
5915.00	72.68	1.22	5680.66	253.52 N	29.96 E	253.40	6.91
5963.00	76.04	0.52	5693.60	299.73 N	30.66 E	299.61	7.15
5991.00	79.17	359.59	5699.61	327.08 N	30.68 E	326.96	11.63
6045.00	84.04	0.79	5707.49	380.48 N	30.86 E	380.36	9.29

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 359.78 DEGREES (GRID)
A TOTAL CORRECTION OF 7.03 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 6045.00 FEET
IS 381.73 FEET ALONG 4.64 DEGREES (GRID)**

Surface surveys at 244 ft and 556 ft have had azimuths corrected to grid north, but were not taken by Halliburton.

Last survey is a projection from 5991 ft MD to TD at 6045 ft MD.