

1 : 240

WELL INFORMATION					
MWD Run Number	100	200	300	400	500
Date run completed	30-Aug-12	05-Sep-12	06-Sep-12	09-Sep-12	12-Sep-12
Rig Bit Number	1	2	3	4	5
Bit Size (in)	12.250	8.750	8.750	6.125	6.125
Tool Nominal OD (in)	6.750	6.750	6.750	4.750	4.750
Log Start Depth (MD, ft)	80.00	909.00	7,583.50	7,773.00	7,872.00
Log End Depth (MD, ft)	909.00	7,583.00	7,773.00	7,872.00	11,879.00
Drill or Wipe	Drill	Drill	Drill	Drill	Drill
Drill/Wipe Start Date and Time	30-Aug-12 03:15	02-Sep-12 02:20	06-Sep-12 04:15	08-Sep-12 17:55	09-Sep-12 15:35
Drill/Wipe End Date and Time	30-Aug-12 09:35	05-Sep-12 14:30	06-Sep-12 13:45	08-Sep-12 22:15	12-Sep-12 05:00
Min Inc (deg) @ Depth (MD, ft)	.25 @ 440.00	.47 @ 996.00	67.95 @ 7,556.00	89.07 @ 7,779.00	88.76 @ 10,848.00
Max Inc (deg) @ Depth (MD, ft)	.74 @ 851.00	64.80 @ 7,524.00	86.88 @ 7,725.00	89.63 @ 7,810.00	91.54 @ 11,227.00
Bit TFA(in2) / Bit Type	.97 / PDC	.98 / PDC	.98 / PDC	.98 / PDC	.98 / PDC
Flow Rate (gpm)	700.00	540.00	498.00	287.20	292.00
Max AV (fpm) / CV (fpm) @ MWD	450.0 / 400.0	418.0 / 403.0	425.0 / 390.0	426.0 / 600.0	470.0 / 350.0
Fluid Type	Native/Spud Mud	Fresh Water Gel	Polymer	Polymer	Polymer
Density (ppg) / Viscosity (spqt)	8.40 / 27.00	9.00 / 39.00	10.10 / 40.00	10.30 / 42.00	9.70 / 37.00
Filtrate CL (ppm)	350.00	500.00	550.00	500.00	500.00
pH / Fluid Loss (mptm)	8.50 / 0	8.50 / 8	8.50 / 8	8.40 / 8	8.90 / 7
PV (cP) / YP (Ibf2)	1 / 2.00	12 / 12.00	13 / 40.00	17 / 13.00	12 / 9.00
% Solids / % Sand	.38 / .05	6 / .03	8 / .4	9.7 / .05	7.2 / .05
% Oil / Oil:Water Ratio	N/A / N/A	N/A / N/A	N/A / N/A	N/A / N/A	N/A / N/A
Rm @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A	N/A @ N/A	N/A @ N/A
Rmf @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A	N/A @ N/A	N/A @ N/A
Rmc @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A	N/A @ N/A	N/A @ N/A
Mud Temp (in) @ Depth (MD, ft)	22.54 / PDC	177.24 / PDC	122.55 / PDC	224.44 / N/A	222.52 / N/A

Max Tool Temp (degF) / Source	98.51 / PCM	177.64 / PCM	182.55 / PCM	201.41 / HCIM	222.59 / HCIM
Rm @ Max Tool Temp (degF)	N/A @ 98.51	N/A @ 177.64	N/A @ 182.55	N/A @ 201.41	N/A @ 222.59
Lead MWD Engineer	Forest Gibson	Joshua Huckleby	Joshua Huckleby	Joshua Huckleby	Joshua Huckleby
Customer Representative	William LaForce	Bill LaForce	William LaForce	William LaForce	William LaForce

SENSOR INFORMATION

Downhole Processor Information

Tool Type	PCM	PCM	PCM	HCIM	HCIM
Software Version	5.76	5.76	5.76	88.47	88.47
Sub Serial Number	11341329	11341329	11341329	11679286	11679286
Insert Serial Number	11145600	11620311	11145600	11532386	11532386
Date and Time Initialized	30-Aug-12 00:43	30-Aug-12 19:05	05-Sep-12 17:22	08-Sep-12 07:12	09-Sep-12 07:03
Date and Time Read	30-Aug-12 13:04	06-Sep-12 00:20	06-Sep-12 22:55	09-Sep-12 05:10	12-Sep-12 22:35
ECMB SW Version	N/A	N/A	N/A	N/A	N/A

Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC	PCDC	PCDC
Distance From Bit (ft)	58.00	47.90	46.75	41.23	41.23
Software Version	6.21	6.21	6.21	6.21	6.21
Sub Serial Number	11341329	11341329	11341329	11991619	11991619
Sonde Serial Number	11638603	11733235	400837	11062103	300473
Sensor ID Number	N/A	N/A	N/A	N/A	N/A
Toolface Offset (deg)	2.22	28.25	14.17	87.12	154.07

Gamma Ray Sensor Information

Tool Type		PCG	PCG	PCG	PCG
Distance From Bit (ft)		52.80	51.36	46.13	46.13
Recorded Sample Period (sec)		15	15	10	10
Software Version		8.15	8.15	8.15	8.15
Sub Serial Number		11341329	11341329	11991619	11991619
Insert/Sonde Serial Number		11680942	11293350	11579828	11579828

Density Sensor Information

Tool Type				ALD	ALD
Distance From Bit (ft)				55.78	55.78
Recorded Sample Period (sec)				10	10
Software Version				3.04	3.04
Sub Serial Number				178125	178125
Insert Serial Number				11536789	11536789
Sensor ID Number				32767	32767
Source Serial Number				39383B	39383B
Pin Orientation				Up	Up
Stabilizer Blade O.D. (in)				5.75	5.75
DPA Offset				115.20	115.20

Pulser Controller Sensor Information

Tool Type	PCM	PCM	PCM	PCM	PCM
Software Version	5.76	5.76	5.76	8.04	8.04
PIC Software Version	1.40	1.40	1.40		
Sub/HOC Serial Number	11341329	11341329	11341329	11633655	11633655
Insert/Probe/Module SN	11145600	11620311	11145600	11227484	11227484
Battery Serial Number	N/A	N/A	N/A	N/A	N/A
Valve Insert SN	N/A	N/A	N/A	N/A	N/A
DC Insert Serial Number	N/A	N/A	N/A	N/A	N/A

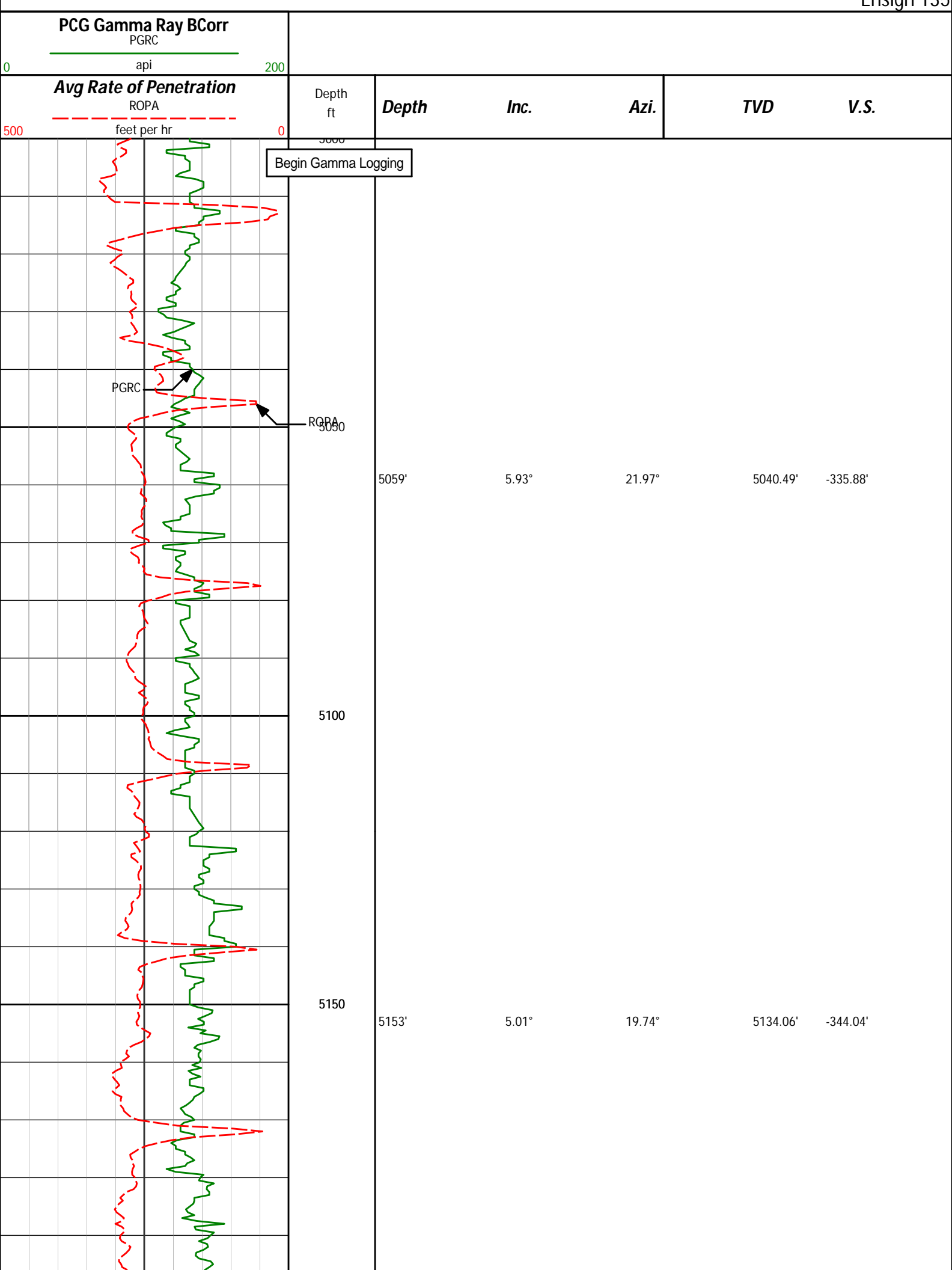
Choke Size (32nd)	N/A	N/A	N/A	N/A	N/A
Driver Current (amps)	N/A	N/A	N/A	N/A	N/A
Driver SMI Current (amps)	N/A	N/A	N/A	N/A	N/A
Boot Strap Version	4,130.00	4,130.00	4,130.00		

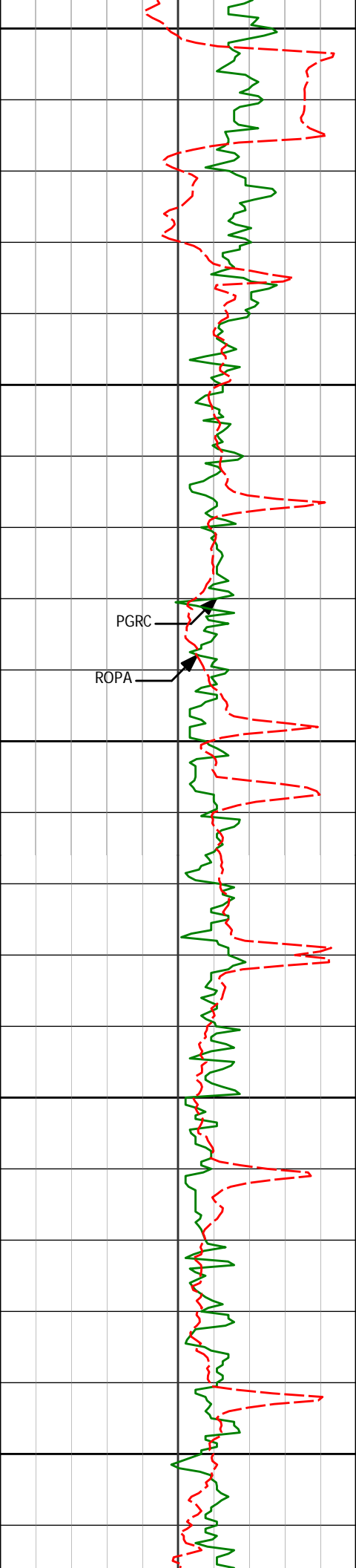
DDSr-HCIM Sensor Information					
Tool Type				DDSr-HCIM	DDSr-HCIM
Distance From Bit (ft)				0	0
Recorded Sample Period (sec)				12	12
Software Version				20.49	20.49
Sub Serial Number				11679286	11679286
Insert Serial Number				11565094	11565094
Sensor ID Number				8110	8110

REMARKS
<div>1. All depths are calibrated to the driller's pipe tally and are measured from the drill floor.</div> <div>2. No depth corrections have been made for pipe stretch or compression.</div> <div>3. All data presented is recorded (memory data) unless otherwise stated.</div> <div>4. All data was logged while drilling unless otherwise stated.</div> <div>5. The following smoothing parameters have been applied to the data: <div>ROP: 0.5 ft interval, 1.2 ft coercion distance</div> <div>All other curves: 0.5 ft interval, 0.6 ft coercion distance.</div> </div> <div>6. Gap in Gamma Ray curve from 7646 to 7684 due to Insite Processing error caused by surface generator problems.</div> <div>Insite 7.4.01</div>

WARRANTY
<div>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 SHOULD ANY SUCH INFORMATION OR INTERPRETATION BE RELIED UPON AS THE SOLE BASIS FOR ANY DRILLING, COMPLETION, PRODUCTION, OR FINANCIAL DECISION OR ANY PROCEDURE INVOLVING ANY RISK TO THE SAFETY OF ANY DRILLING VENTURE, DRILLING RIG OR ITS CREW OR ANY OTHER THIRD PARTY. THE CUSTOMER HAS FULL RESPONSIBILITY FOR ALL DRILLING, COMPLETION AND PRODUCTION OPERATION. HALLIBURTON MAKES NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESSED OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, WITH RESPECT TO THE SERVICES RENDERED. IN NO EVENT WILL HALLIBURTON BE LIABLE FOR FAILURE TO OBTAIN ANY PARTICULAR RESULTS OR FOR ANY DAMAGES, INCLUDING, BUT NOT LIMITED TO, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES, RESULTING FROM THE USE OF ANY INFORMATION OR INTERPRETATION PROVIDED BY HALLIBURTON.</div>

<div> <div>HALLIBURTON</div> <div>Sperry Drilling Services</div> <div>MD Detail Log 1:240</div> <div> <div>Encanna</div> <div>Echeverria 2B-2H</div> <div>Ensign 13B</div> </div> </div>
--





5200

5250

5300

5350

5400

5248'

6.82°

21.52°

5228.55'

-352.97'

PGRC

ROPA

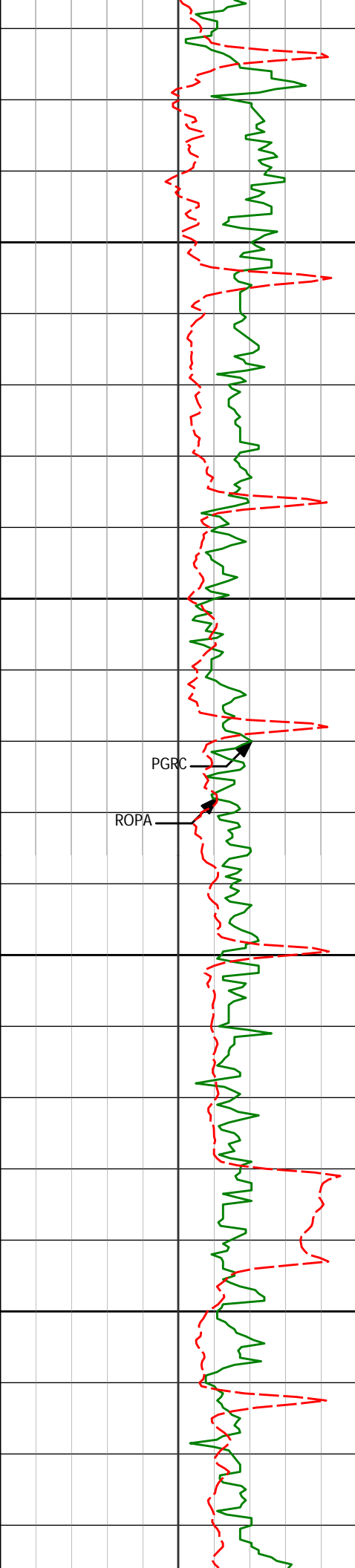
5343'

6.52°

21.24°

5322.91'

-362.99'



5438'

5.84°

19.38°

5417.36'

-372.35'

5450

5500

PGRC

ROPA

5533'

5.00°

18.54°

5511.93'

-380.65'

5550

5600

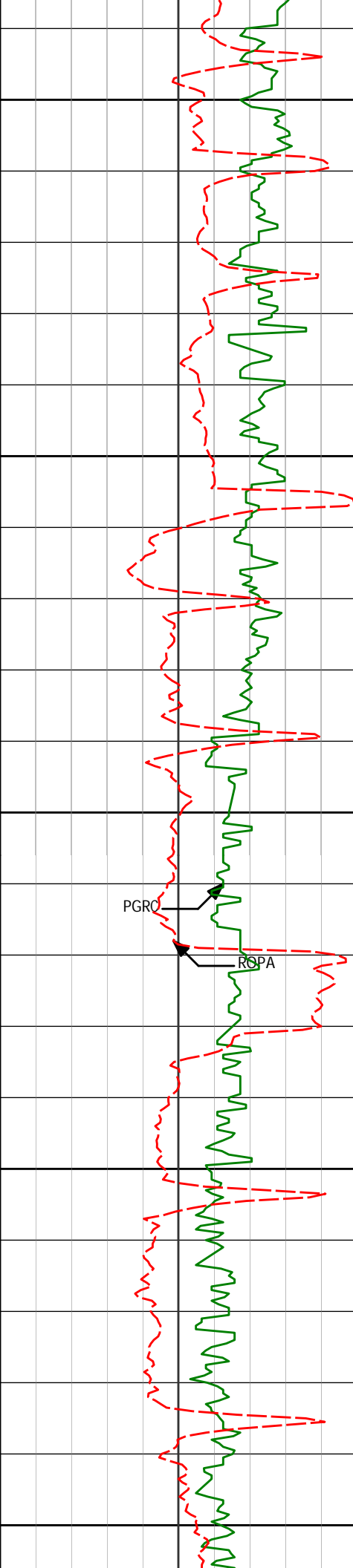
5628'

6.33°

17.42°

5606.46'

-389.38'



5650

5700

5750

5800

5850

5723'

5.75°

15.62°

5700.94'

-398.77'

PGRO

ROPA

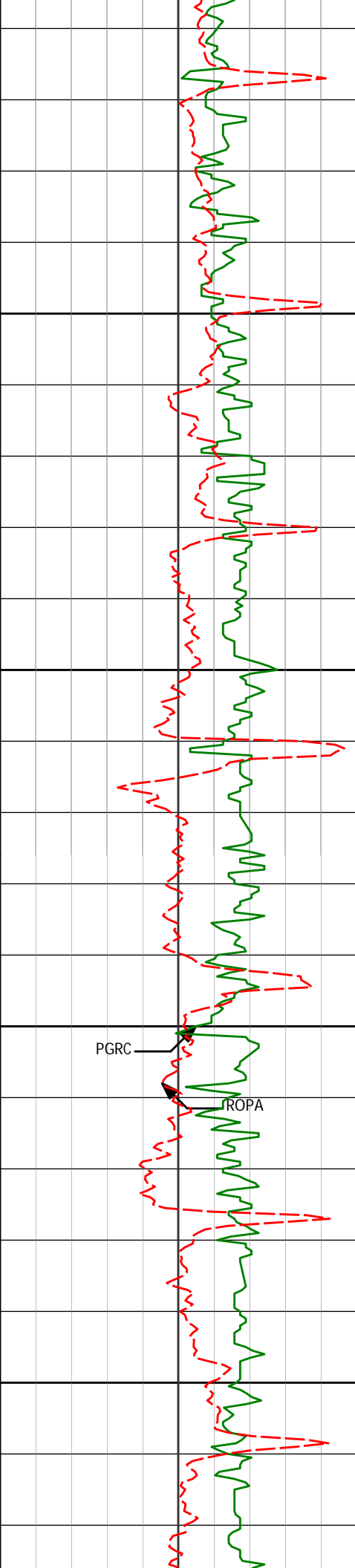
5817'

5.88°

22.56°

5794.46'

-407.55'



5900

5912'

5.15°

21.14°

5889.02'

-415.80'

5950

6000

PGRC

6007'

4.93°

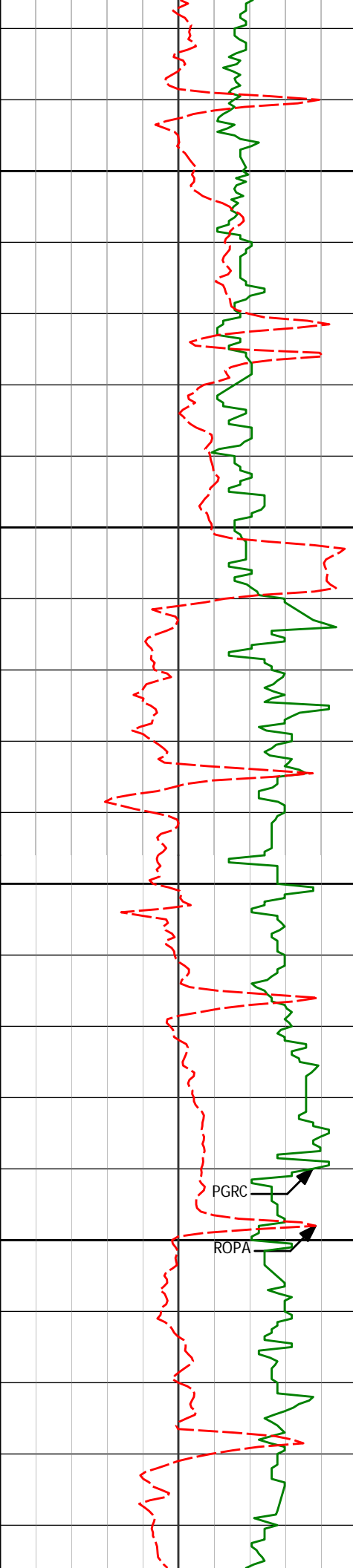
19.78°

5983.65'

-423.43'

ROPA

6050



6100

6150

6200

6250

6102'

6196'

6291'

4.21°

4.72°

3.97°

24.80°

17.39°

14.09°

6078.35'

6172.06'

6266.79'

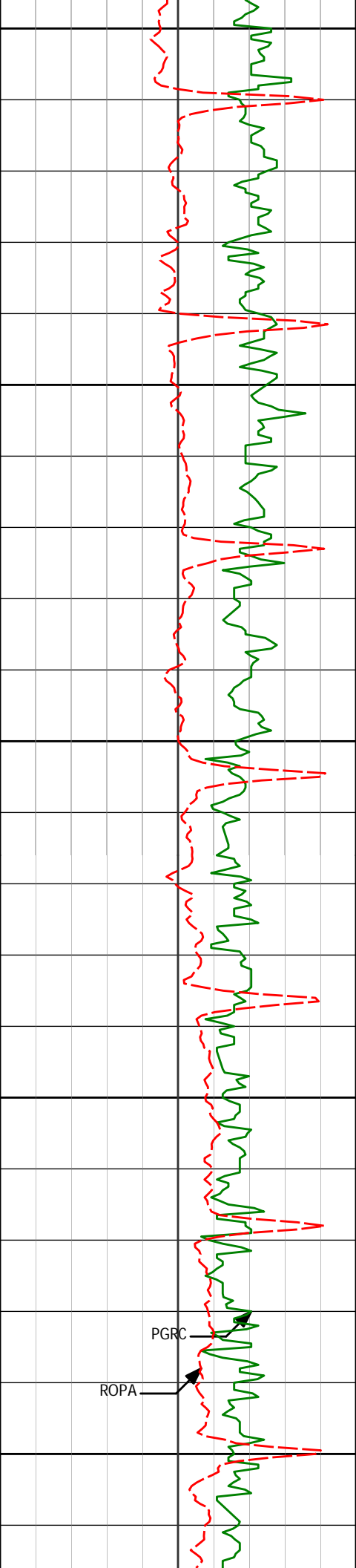
-430.25'

-436.90'

-443.69'

PGRC

ROPA



6300

6350

6400

6450

6500

6386'

3.21°

6.65°

6361.60'

-449.45'

6481'

2.42°

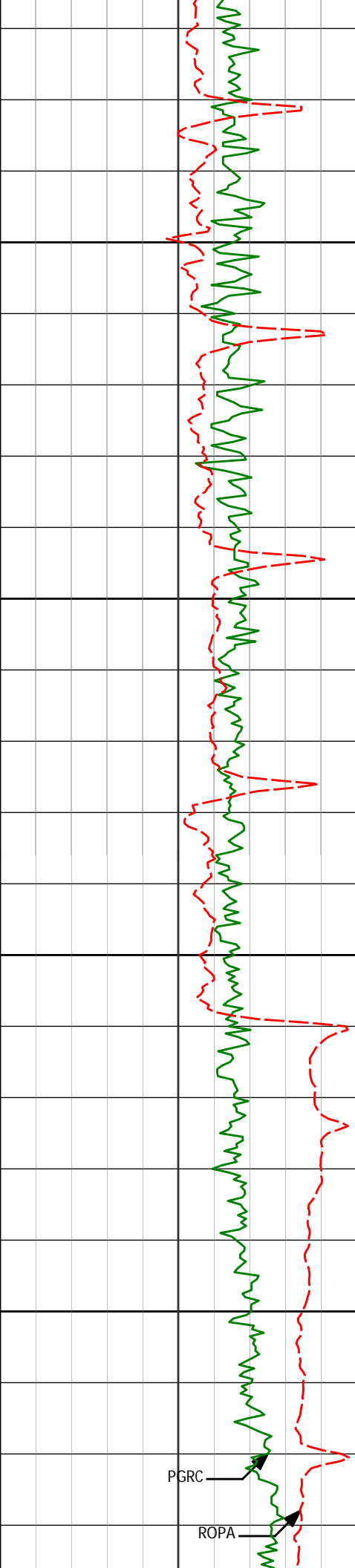
11.06°

6456.48'

-454.02'

PGRC

ROPA



6550

6576'

1.93°

13.97°

6551.42'

-457.49'

6600

6607'

1.95°

13.05°

6582.40'

-458.49'

6650

6671'

0.80°

147.76°

6646.39'

-459.15'

6700

6702'

4.86°

178.96°

6677.34'

-457.64'

PGRC

ROPA

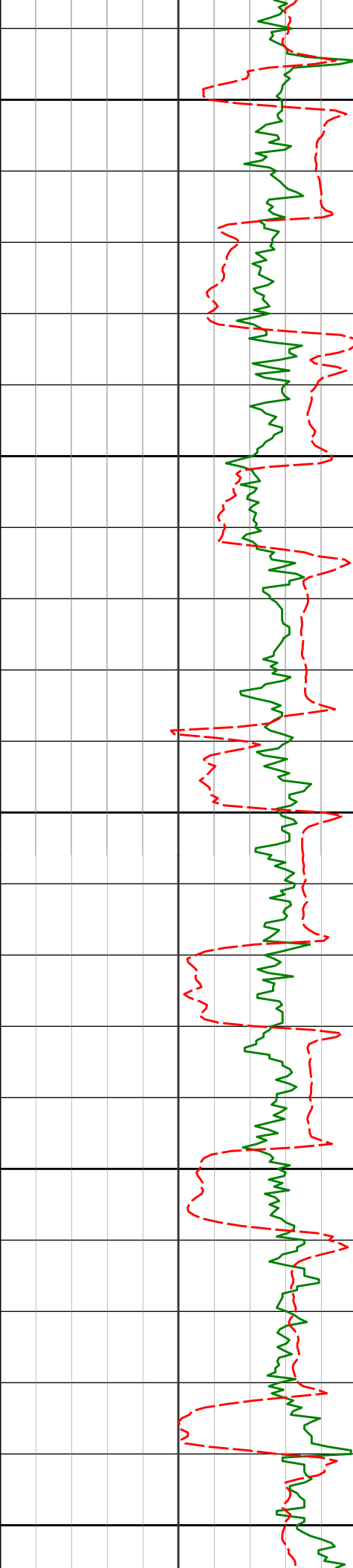
6734'

8.85°

175.74°

6709.11'

-453.83'



6750

6765'

11.61°

178.79°

6739.61'

-448.33'

6800

6797'

13.54°

177.86°

6770.84'

-441.36'

6850

6829'

15.85°

177.24°

6801.80'

-433.25'

6860'

17.72°

178.55°

6831.47'

-424.30'

6900

6892'

19.88°

179.59°

6861.76'

-414.00'

6922'

21.86°

178.39°

6889.80'

-403.32'

6950

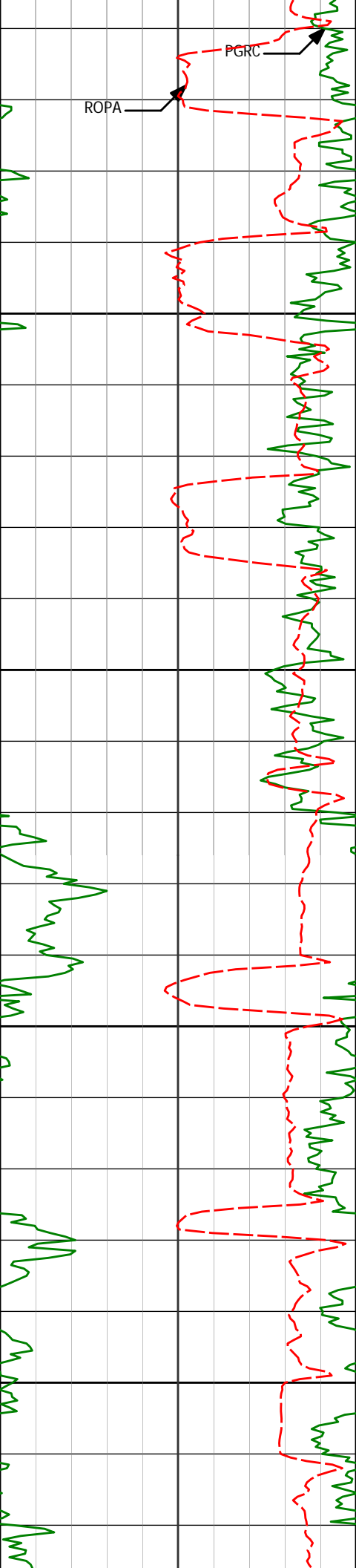
6955'

24.06°

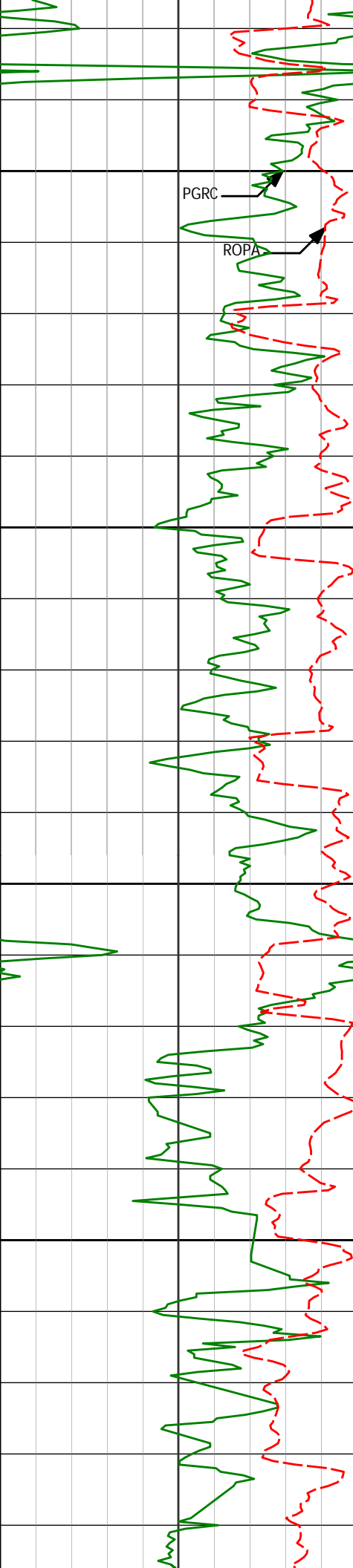
179.13°

6920.18'

-390.46'



6987'	25.81°	178.67°	6949.20'	-376.98'
7018'	27.34°	178.20°	6976.92'	-363.12'
7050'	28.69°	180.64°	7005.17'	-348.11'
7081'	31.65°	182.27°	7031.97'	-332.59'
7113'	34.69°	183.32°	7058.75'	-315.19'
7145'	37.12°	183.94°	7084.67'	-296.57'
7176'	39.87°	182.54°	7109.10'	-277.64'



7200

7208'

40.67°

183.26°

7133.69'

-257.32'

7239'

42.62°

183.46°

7156.86'

-236.86'

7250

7271'

44.14°

184.62°

7180.12'

-215.08'

7300

7303'

46.01°

184.74°

7202.72'

-192.65'

7334'

48.08°

184.87°

7223.84'

-170.20'

7350

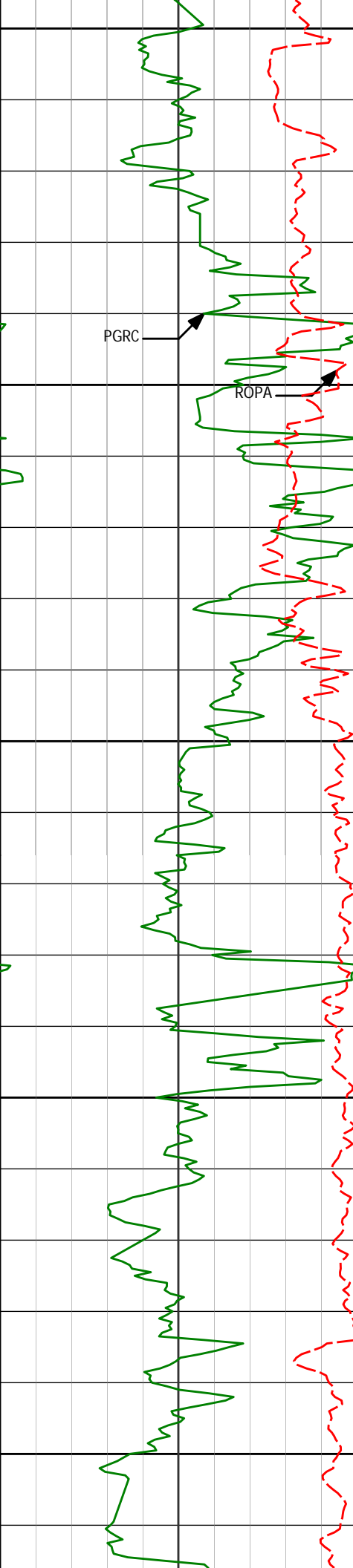
7366'

50.88°

184.34°

7244.63'

-146.11'

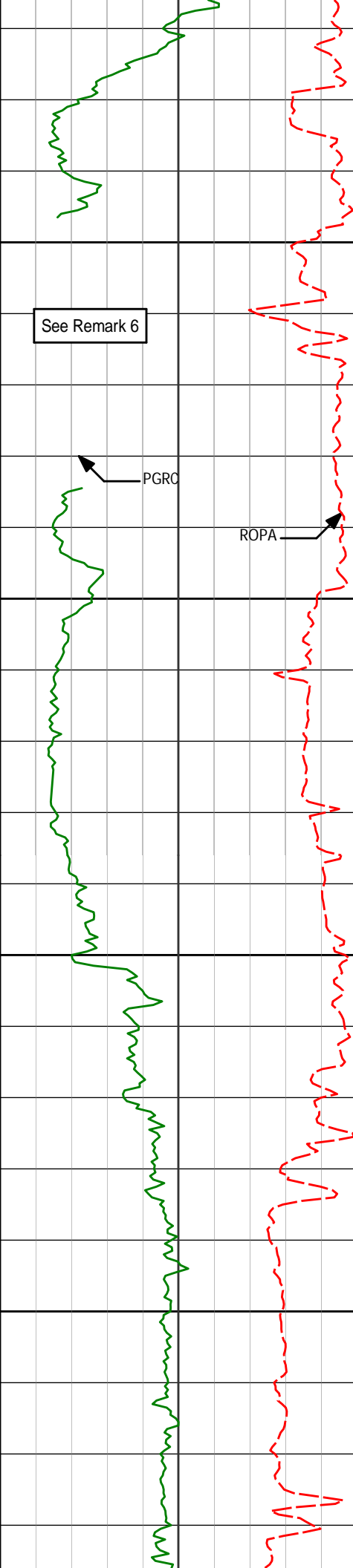


PGRC

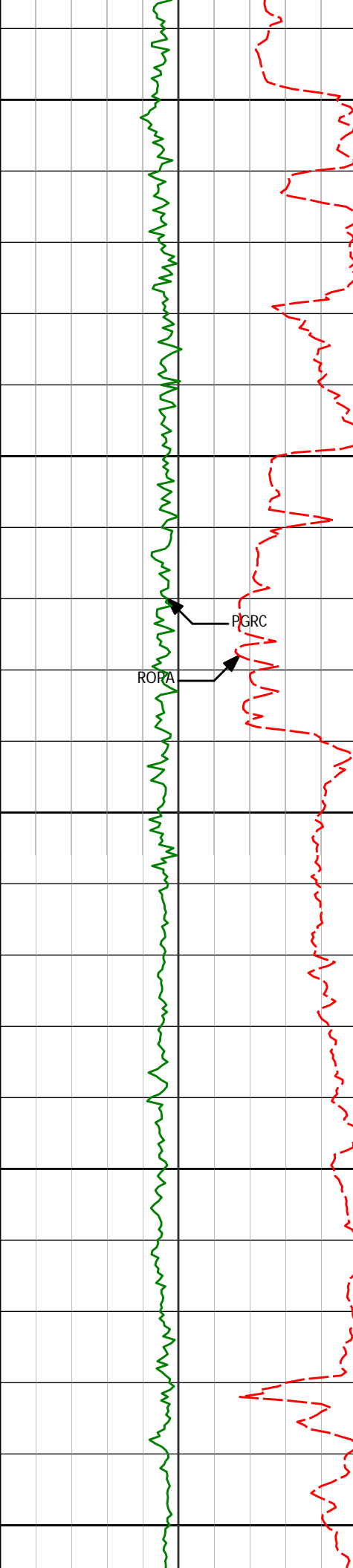
ROPA

Run 300

7400	7397'	54.12°	183.71°	7263.49'	-121.73'
	7429'	57.10°	181.28°	7281.57'	-95.47'
	7461'	60.52°	181.46°	7298.14'	-68.20'
	7492'	62.75°	182.96°	7312.87'	-41.05'
7500					
	7524'	64.80°	183.56°	7327.01'	-12.55'
	7556'	67.95°	184.33°	7339.83'	16.52'
7550					
	7588'	72.61°	185.69°	7350.62'	46.31'
7600					



7619'	77.41°	185.57°	7358.63'	75.87'
7650				
7651'	80.24°	185.36°	7364.83'	106.88'
7683'	83.89°	185.45°	7369.25'	138.19'
7700				
7714'	86.26°	186.10°	7371.91'	168.68'
7725'	86.88°	185.77°	7372.57'	179.51'
7750 7" Intermediate Casing				
Run 400				
7779'	89.07°	185.36°	7374.48'	232.81'
7800				
7810'	89.63°	185.56°	7374.83'	263.43'



Run 500

7850

7855'

89.13°

184.89°

7375.31'

307.91'

7900

7907'

89.20°

183.76°

7376.07'

359.43'

7950

7952'

89.69°

183.64°

7376.50'

404.08'

8000

8002'

90.00°

183.24°

7376.64'

453.71'

8050

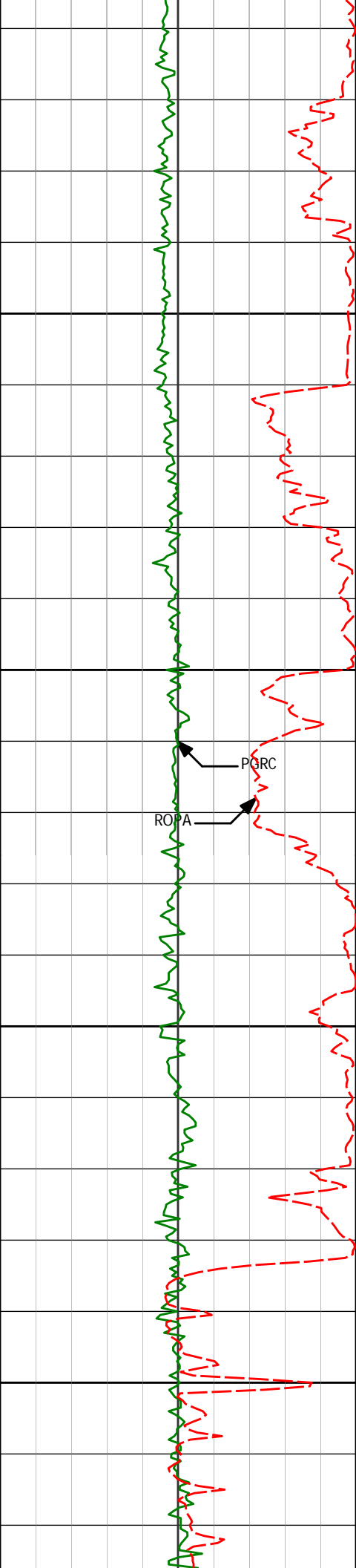
8047'

89.63°

181.68°

7376.79'

498.47'



8100

8097'

89.51°

180.20°

7377.16'

548.32'

8150

8142'

88.83°

179.09°

7377.82'

593.25'

8200

8191'

89.07°

178.29°

7378.72'

642.21'

8250

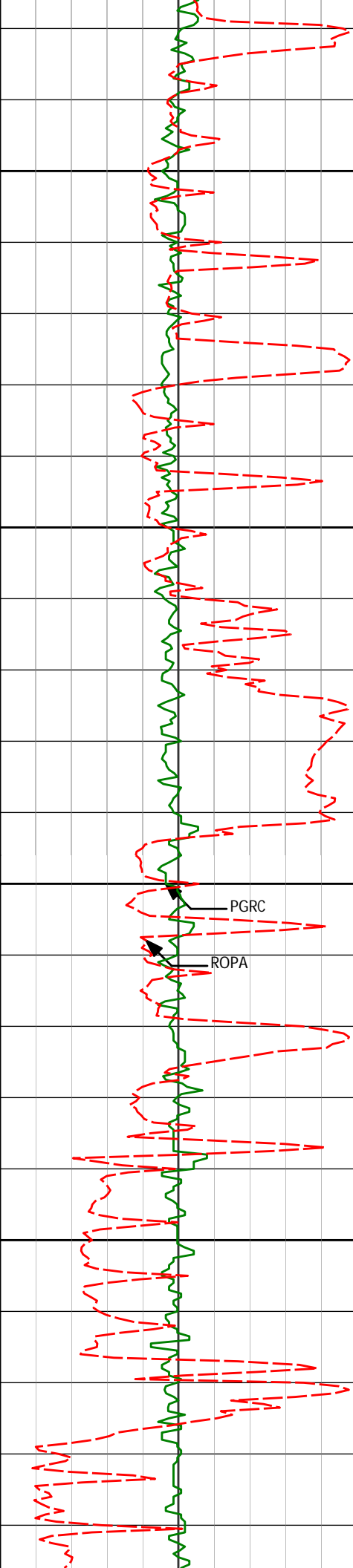
8236'

90.12°

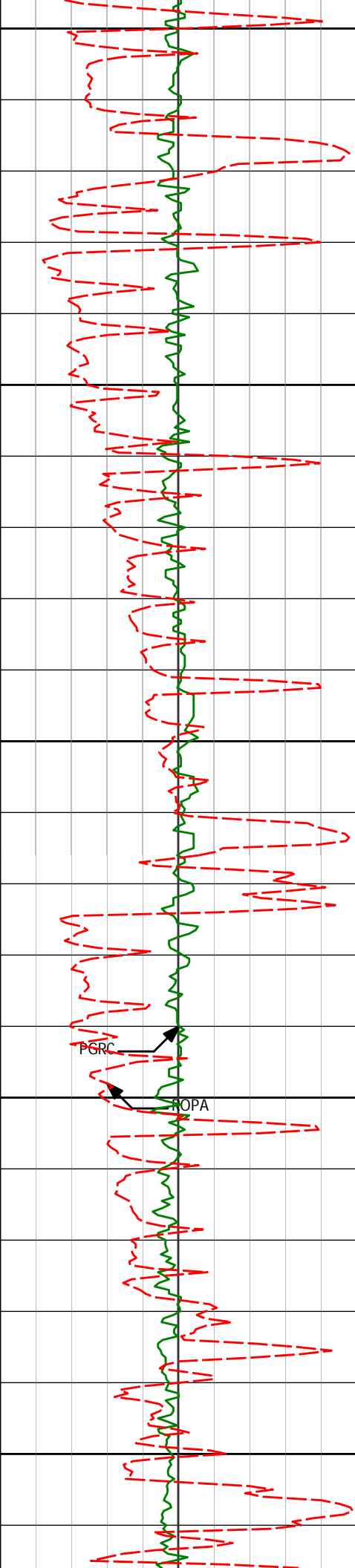
178.36°

7379.03'

687.19'



8286'	90.74°	178.00°	7378.66'	737.16'
8300				
8331'	91.05°	177.65°	7377.95'	782.15'
8350				
8381'	90.25°	177.74°	7377.39'	832.13'
8400				
8426'	89.38°	177.09°	7377.53'	877.13'
8450				
8476'	89.57°	176.84°	7377.99'	927.12'



8500

8550

8571'

90.25°

177.31°

7378.14'

1022.12'

8600

8650

8666'

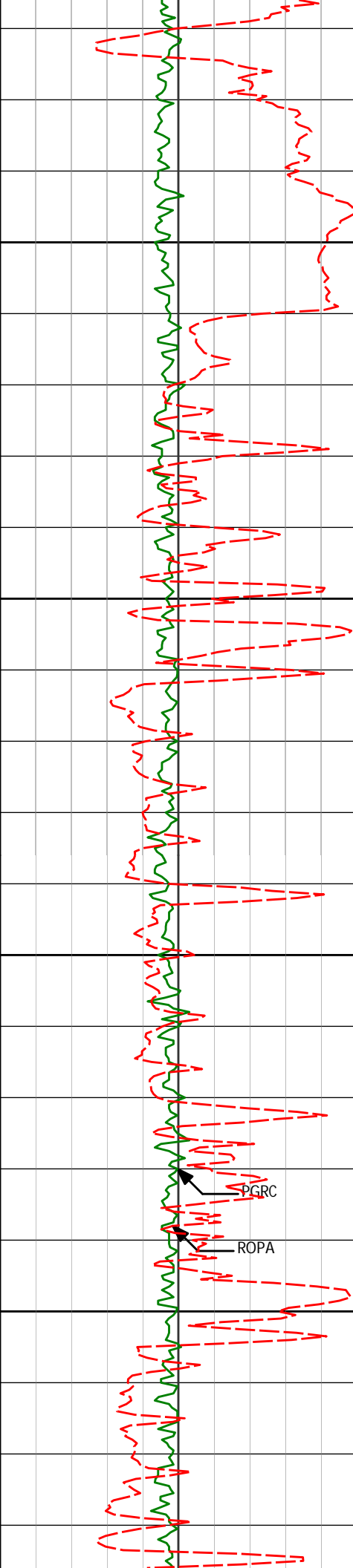
90.80°

177.26°

7377.27'

1117.11'

8700



8750

8761'

89.75°

177.28°

7376.81'

1212.10'

8800

8850

8855'

89.63°

177.02°

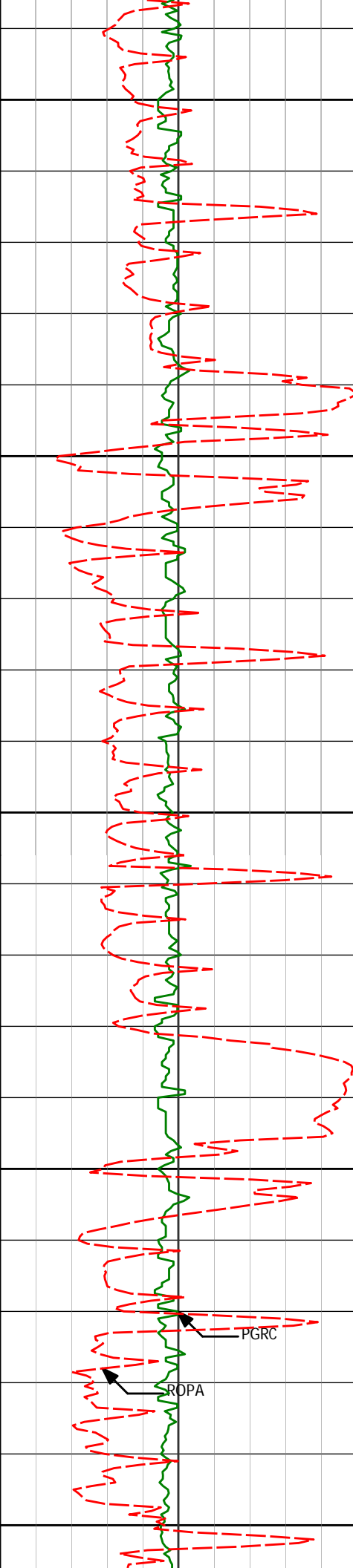
7377.32'

1306.09'

PGRC

ROPA

8900



8950

8950'

89.57°

176.33°

7377.99'

1401.09'

9000

9050

9045'

89.44°

175.57°

7378.81'

1496.08'

9100

9150

9140'

89.14°

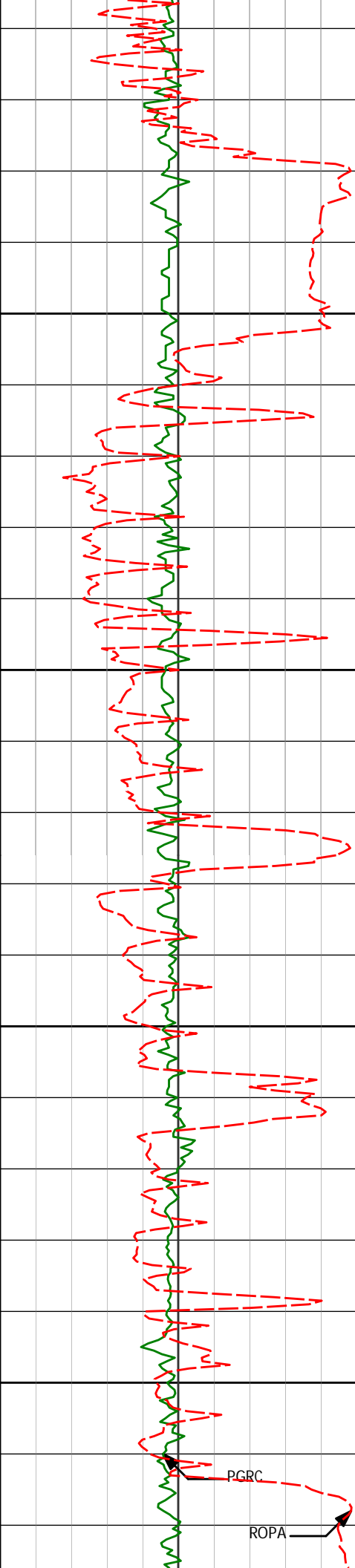
175.45°

7379.99'

1591.05'

PGRC

ROPA



9200

9235'

90.31°

175.72°

7380.45'

1686.04'

9250

9300

9330'

90.00°

174.99°

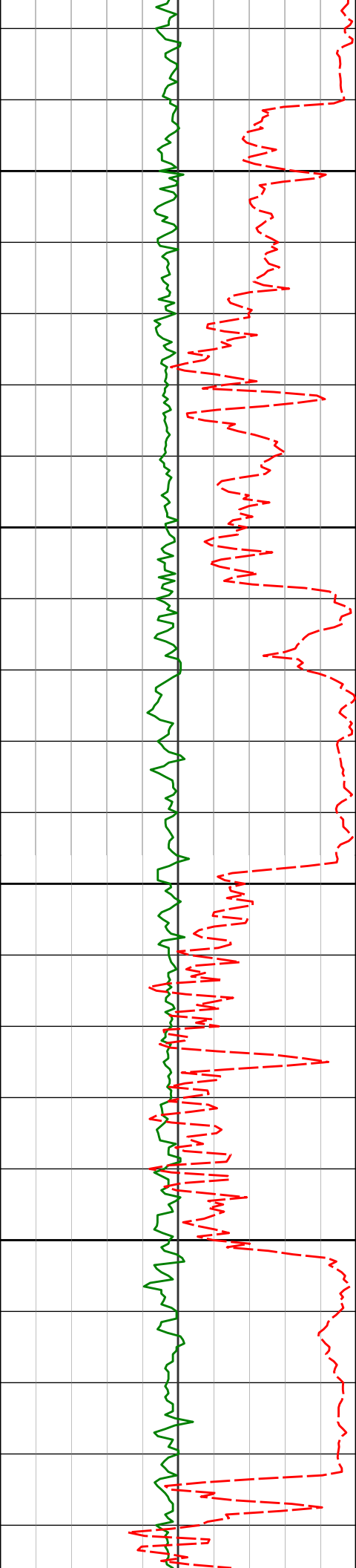
7380.19'

1781.02'

9350

PGRC

ROPA



9400

9425'

90.31°

175.35°

7379.93'

1875.99'

9450

9500

9519'

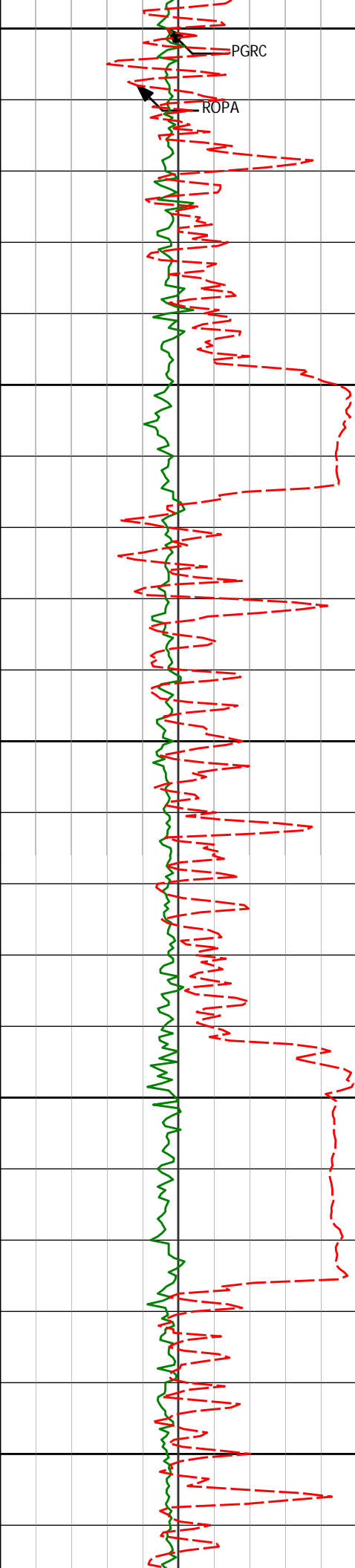
89.88°

175.81°

7379.78'

1969.97'

9550



9600

9614'

90.68°

176.18°

7379.32'

2064.97'

9650

9700

9709'

89.44°

175.21°

7379.22'

2159.95'

9750

9800

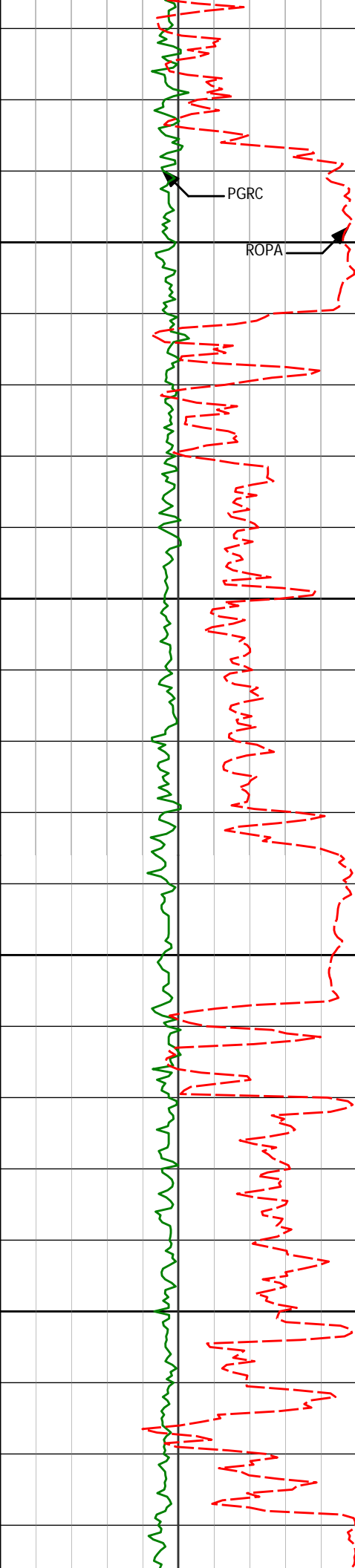
9804'

90.49°

175.91°

7379.27'

2254.94'



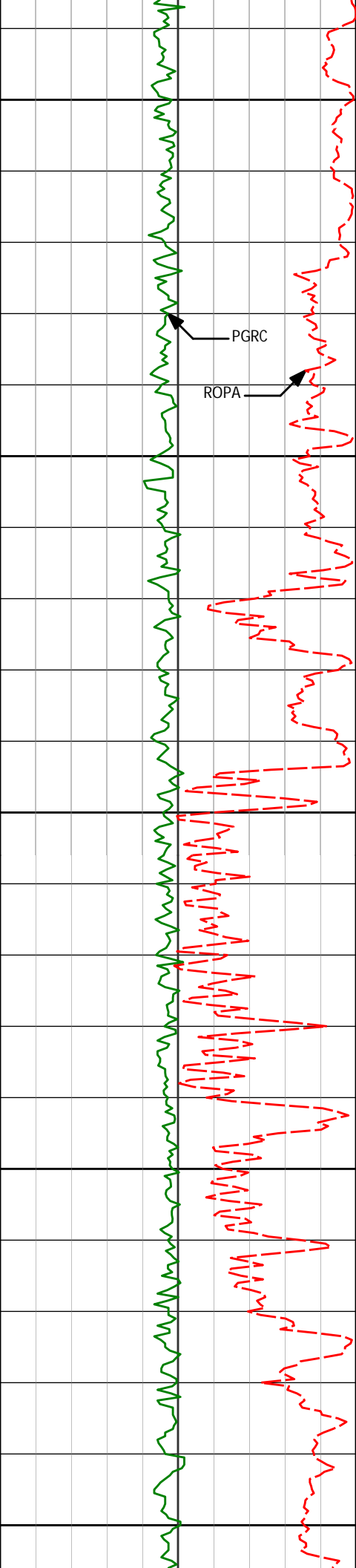
9850

9900

9950

10000

9899'	90.80°	175.33°	7378.20'	2349.92'
9994'	88.95°	175.80°	7378.40'	2444.90'



10050

10089'

90.43°

176.69°

7378.91'

2539.89'

10100

10150

10184'

91.17°

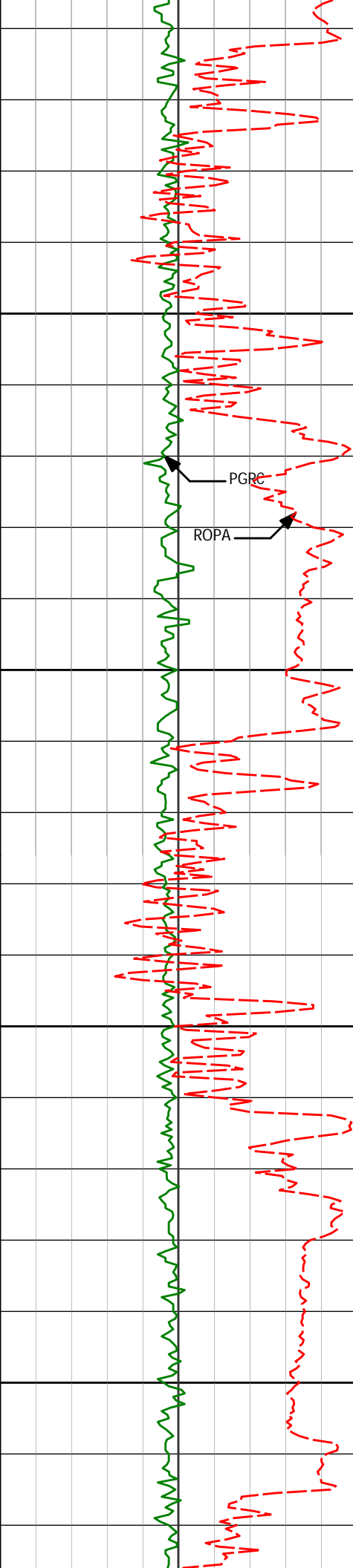
176.42°

7377.58'

2634.88'

10200

10250



10279'

89.20°

177.54°

7377.28'

2729.87'

10300

PGRC

ROPA

10350

10373'

89.38°

179.21°

7378.44'

2823.82'

10400

10450

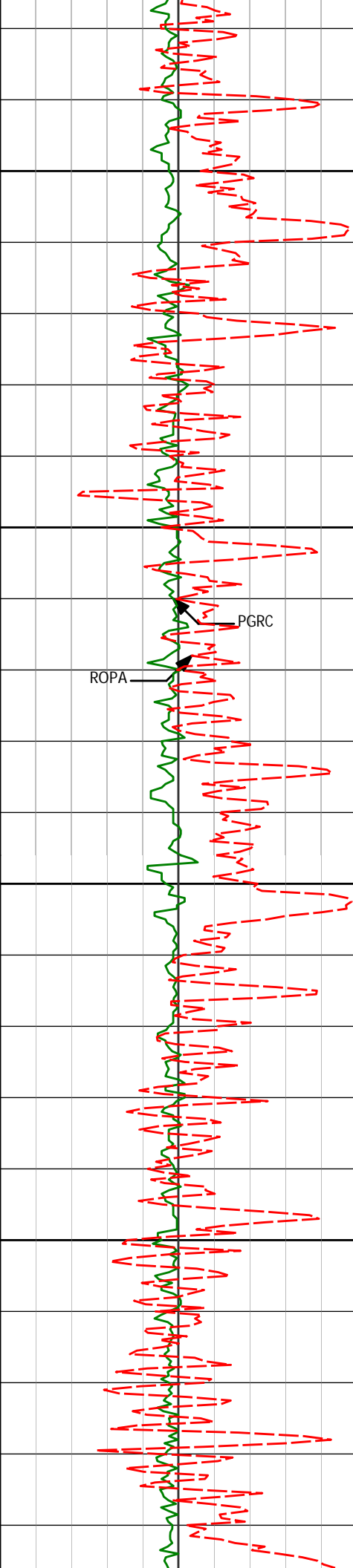
10468'

90.99°

181.10°

7378.14'

2918.62'



10500

10550

10563'

91.11°

180.29°

7376.39'

3013.35'

ROPA

PGRC

10600

10650

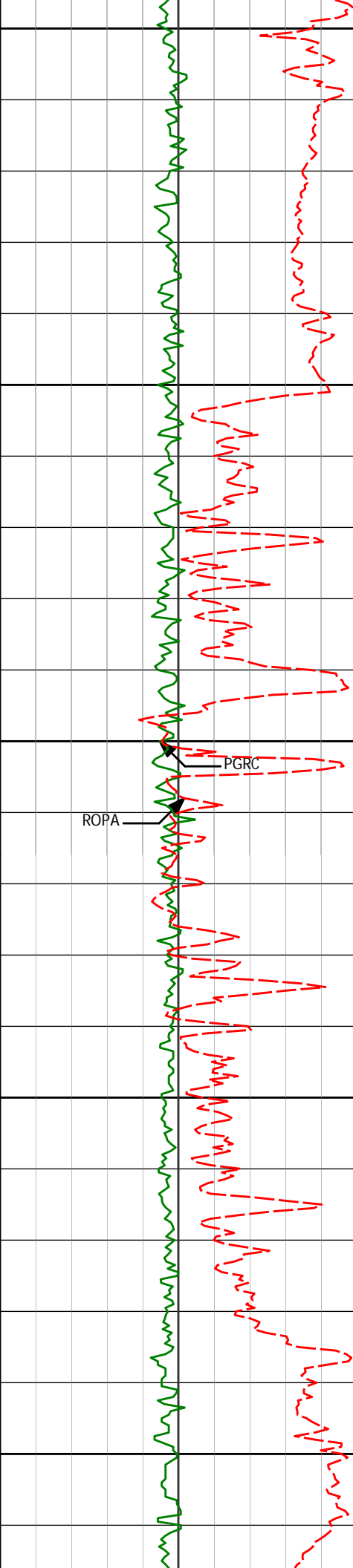
10658'

89.19°

178.54°

7376.14'

3108.23'



10700

10750

10800

10850

10900

10753'

91.49°

180.62°

7375.57'

3203.08'

ROPA

PGRC

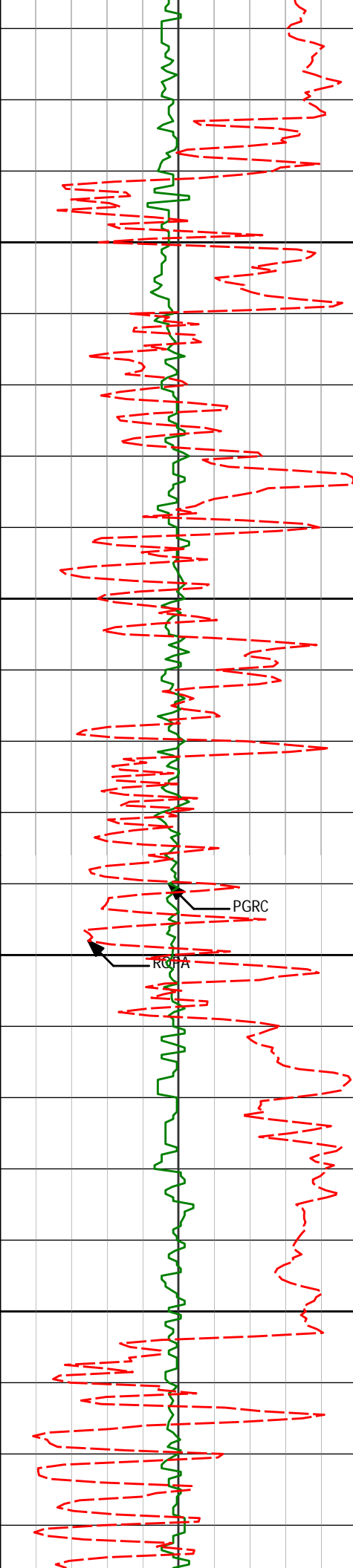
10848'

88.76°

177.94°

7375.37'

3297.96'



10950

11000

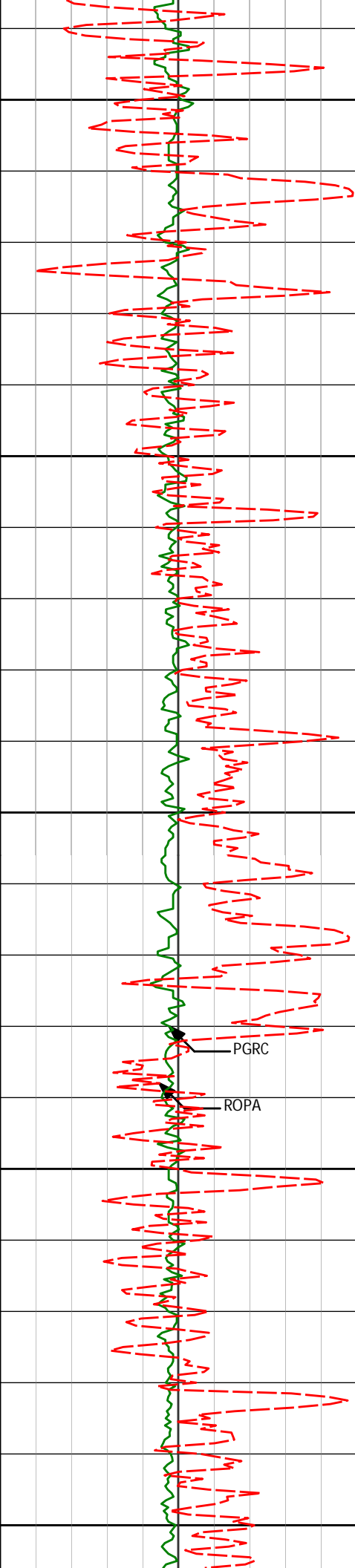
11050

11100

10943'	90.12°	178.85°	7376.29'	3392.90'
--------	--------	---------	----------	----------

11037'	89.51°	178.50°	7376.59'	3486.83'
--------	--------	---------	----------	----------

11132'	90.99°	179.80°	7376.18'	3581.73'
--------	--------	---------	----------	----------



11150

11200

11250

11300

11350

11227'

91.54°

179.66°

7374.08'

3676.56'

PGRC

ROPA

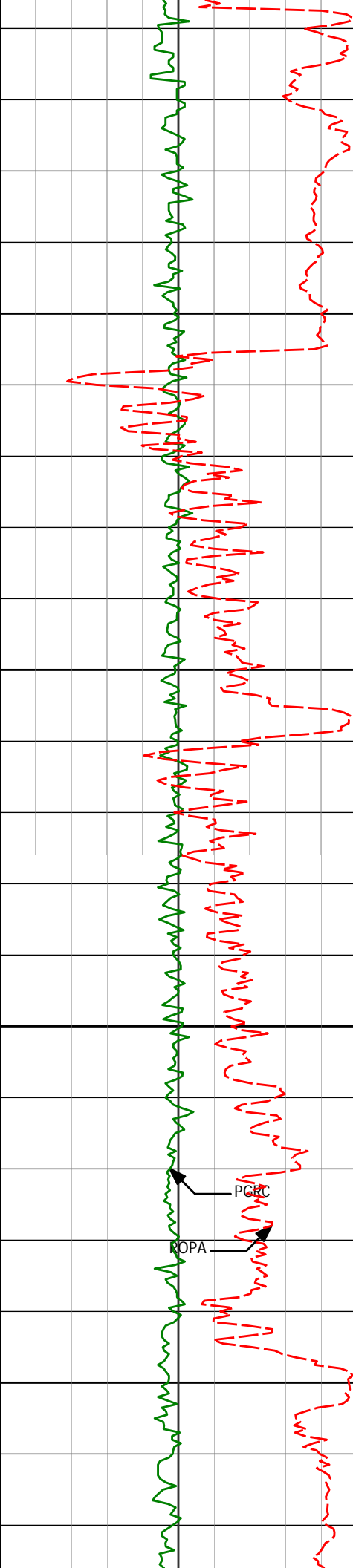
11322'

88.83°

177.08°

7373.78'

3771.49'



11400

11417'

89.94°

179.10°

7374.80'

3866.45'

11450

11500

11511'

90.25°

178.21°

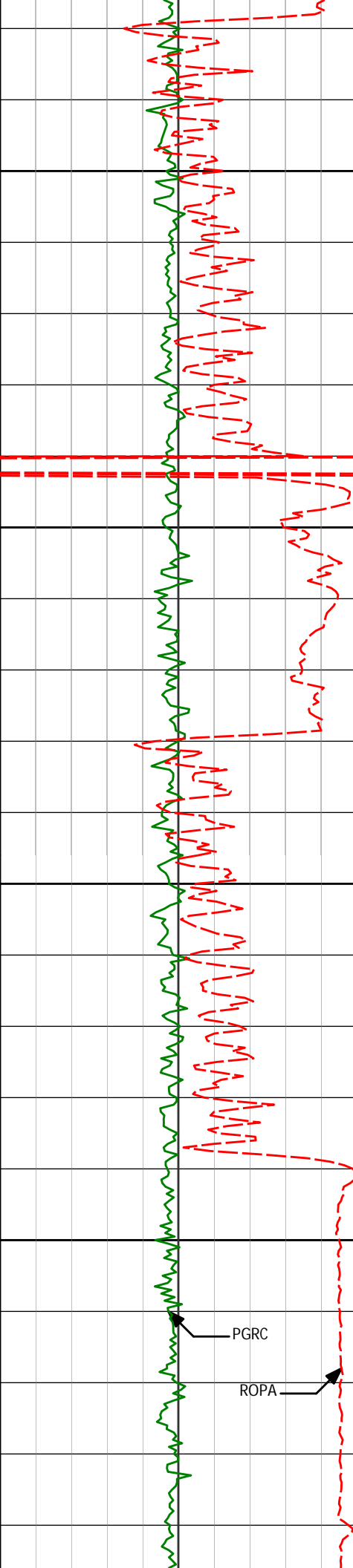
7374.65'

3960.38'

11550

PGRC

POPA



11600

11606'

90.49°

179.13°

7374.03'

4055.32'

11650

11700

11701'

89.88°

180.49°

7373.73'

4150.16'

11750

PGRC

ROPA

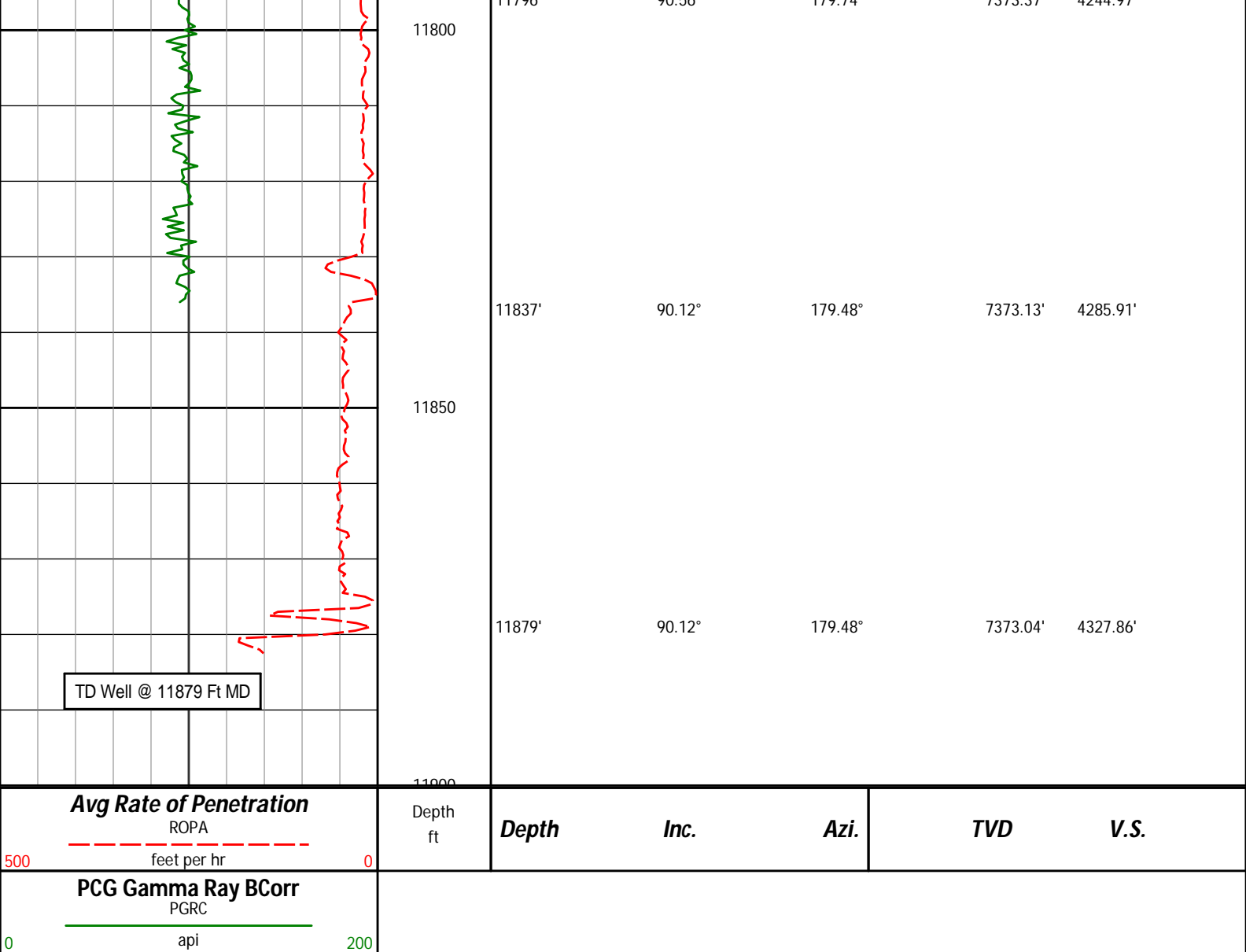
11706'

90.56°

179.74°

7372.27'

4244.97'



HALLIBURTON

DIRECTIONAL SURVEY REPORT

EnCana Oil Gas USA
Echeverria 2B-2H
Denver-Julesburg
Weld County Colorado
USA
CA-XX-0009420503

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
164.00	0.29	60.52	164.00	0.20 N	0.36 E	-0.18	0.18
256.00	0.37	32.45	256.00	0.57 N	0.73 E	-0.53	0.20
348.00	0.38	350.24	348.00	1.12 N	0.84 E	-1.07	0.29
440.00	0.25	15.68	439.99	1.62 N	0.84 E	-1.57	0.20
532.00	0.30	334.41	531.99	2.03 N	0.79 E	-1.98	0.22
624.00	0.47	323.29	623.99	2.56 N	0.46 E	-2.52	0.20
716.00	0.29	317.08	715.99	3.03 N	0.08 E	-3.02	0.20
808.00	0.64	304.80	807.99	3.49 N	0.50 W	-3.52	0.39
851.00	0.74	307.82	850.98	3.80 N	0.92 W	-3.85	0.26
996.00	0.47	327.73	995.98	4.88 N	1.98 W	-4.99	0.23
1088.00	0.76	352.85	1087.97	5.80 N	2.25 W	-5.93	0.43
1150.00	0.56	334.69	1149.97	6.48 N	2.43 W	-6.62	0.47
1180.00	1.08	348.00	1179.96	6.80 N	2.55 W	-7.02	1.84

1180.00	1.08	348.00	1179.96	6.89 N	2.35 W	-7.03	1.84
1211.00	1.73	45.23	1210.95	7.50 N	2.28 W	-7.63	4.71
1242.00	3.50	56.42	1241.92	8.36 N	1.16 W	-8.41	5.91
1272.00	4.83	47.12	1271.84	9.72 N	0.52 E	-9.67	4.96
1303.00	5.32	39.85	1302.72	11.71 N	2.40 E	-11.55	2.61
1334.00	5.57	30.20	1333.58	14.12 N	4.08 E	-13.84	3.06
1364.00	5.67	22.08	1363.44	16.75 N	5.37 E	-16.39	2.67
1456.00	5.17	14.11	1455.03	24.98 N	8.09 E	-24.45	0.98
1551.00	5.31	24.94	1549.63	33.12 N	10.98 E	-32.40	1.05
1645.00	4.59	25.33	1643.28	40.47 N	14.43 E	-39.52	0.77
1740.00	5.82	31.74	1737.89	48.00 N	18.59 E	-46.79	1.43
1835.00	5.59	28.08	1832.42	56.17 N	23.30 E	-54.67	0.45
1930.00	5.50	22.17	1926.97	64.47 N	27.19 E	-62.72	0.61
2025.00	4.82	22.63	2021.59	72.37 N	30.45 E	-70.41	0.72
2119.00	5.82	22.68	2115.18	80.42 N	33.81 E	-78.24	1.07
2214.00	5.03	18.71	2209.76	88.81 N	37.00 E	-86.42	0.93
2309.00	5.52	31.98	2304.36	96.63 N	40.76 E	-94.00	1.38
2404.00	6.11	35.15	2398.87	104.64 N	46.09 E	-101.67	0.70
2499.00	5.05	36.39	2493.42	112.14 N	51.48 E	-108.84	1.12
2594.00	6.33	26.87	2587.95	120.18 N	56.33 E	-116.57	1.67
2688.00	6.15	21.91	2681.39	129.48 N	60.56 E	-125.60	0.60
2783.00	6.02	18.57	2775.86	138.93 N	64.04 E	-134.82	0.40
2878.00	5.74	13.41	2870.36	148.27 N	66.73 E	-143.99	0.63
2973.00	5.17	21.67	2964.93	156.87 N	69.41 E	-152.41	1.02
3068.00	6.38	24.04	3059.44	165.68 N	73.15 E	-160.98	1.30
3163.00	6.04	19.26	3153.89	175.22 N	76.95 E	-170.27	0.65
3258.00	5.27	10.79	3248.43	184.22 N	79.41 E	-179.10	1.19
3352.00	5.58	19.56	3342.01	192.76 N	81.75 E	-187.49	0.94
3447.00	5.30	23.07	3436.58	201.15 N	85.01 E	-195.67	0.45
3542.00	6.11	33.86	3531.11	209.39 N	89.55 E	-203.62	1.41
3637.00	4.91	30.53	3625.67	217.09 N	94.43 E	-211.01	1.31
3732.00	5.46	21.97	3720.28	224.78 N	98.19 E	-218.47	1.00
3827.00	5.13	18.05	3814.88	233.02 N	101.20 E	-226.50	0.51
3921.00	6.00	25.51	3908.43	241.45 N	104.62 E	-234.72	1.20
4016.00	5.80	25.37	4002.93	250.27 N	108.81 E	-243.27	0.22
4111.00	5.75	24.67	4097.45	258.93 N	112.85 E	-251.67	0.09
4206.00	5.68	23.73	4191.98	267.55 N	116.73 E	-260.04	0.12
4301.00	4.65	19.03	4286.59	275.49 N	119.87 E	-267.78	1.17
4395.00	5.74	29.64	4380.20	283.18 N	123.44 E	-275.24	1.54
4490.00	5.50	29.12	4474.75	291.29 N	128.00 E	-283.05	0.26
4585.00	5.34	27.32	4569.32	299.19 N	132.25 E	-290.69	0.24
4680.00	5.06	27.72	4663.93	306.83 N	136.23 E	-298.08	0.31
4775.00	6.84	24.97	4758.42	315.67 N	140.56 E	-306.64	1.91
4869.00	6.88	24.53	4851.74	325.87 N	145.27 E	-316.54	0.07
4964.00	6.73	23.94	4946.07	336.14 N	149.89 E	-326.51	0.18
5059.00	5.93	21.97	5040.49	345.77 N	153.98 E	-335.88	0.87
5153.00	5.01	19.74	5134.06	354.14 N	157.19 E	-344.04	1.01
5248.00	6.82	21.52	5228.55	363.29 N	160.66 E	-352.97	1.92
5343.00	6.52	21.24	5322.91	373.58 N	164.68 E	-362.99	0.32
5438.00	5.84	19.38	5417.36	383.17 N	168.24 E	-372.35	0.75
5533.00	5.00	18.54	5511.93	391.66 N	171.17 E	-380.65	0.89
5628.00	6.33	17.42	5606.46	400.58 N	174.05 E	-389.38	1.40
5723.00	5.75	15.62	5700.94	410.16 N	176.90 E	-398.77	0.65
5817.00	5.88	22.56	5794.46	419.14 N	180.01 E	-407.55	0.76
5912.00	5.15	21.14	5889.02	427.61 N	183.42 E	-415.80	0.78
6007.00	4.93	19.78	5983.65	435.43 N	186.34 E	-423.43	0.26
6102.00	4.21	24.80	6078.35	442.44 N	189.18 E	-430.25	0.87
6196.00	4.72	17.39	6172.06	449.26 N	191.78 E	-436.90	0.82
6291.00	3.97	14.09	6266.79	456.18 N	193.75 E	-443.69	0.83
6386.00	3.21	6.65	6361.60	462.02 N	194.86 E	-449.45	0.93
6481.00	2.42	11.06	6456.48	466.63 N	195.55 E	-454.02	0.87
6576.00	1.93	13.97	6551.42	470.15 N	196.33 E	-457.49	0.53
6607.00	1.95	13.05	6582.40	471.18 N	196.57 E	-458.49	0.13
6671.00	0.80	147.76	6646.39	471.86 N	197.06 E	-459.15	4.03
6702.00	4.86	178.96	6677.34	470.36 N	197.19 E	-457.64	13.53
6734.00	8.85	175.74	6709.11	466.55 N	197.40 E	-453.83	12.52
6765.00	11.61	178.79	6739.61	461.06 N	197.65 E	-448.33	9.07
6797.00	13.54	177.86	6770.84	454.09 N	197.85 E	-441.36	6.07
6829.00	15.85	177.24	6801.80	445.98 N	198.20 E	-433.25	7.23
6860.00	17.72	178.55	6831.47	437.04 N	198.53 E	-424.30	6.17
6892.00	19.88	179.59	6861.76	426.73 N	198.69 E	-414.00	6.80
6922.00	21.86	178.39	6889.80	416.04 N	198.88 E	-403.32	6.76
6955.00	24.06	179.13	6920.18	403.18 N	199.16 E	-390.46	6.73
6987.00	25.81	178.67	6949.20	389.69 N	199.42 E	-376.98	5.51
7018.00	27.34	178.20	6976.92	375.82 N	199.80 E	-363.12	4.98

7050.00	28.69	180.64	7005.17	360.80 N	199.94 E	-348.11	5.53
7081.00	31.65	182.27	7031.97	345.23 N	199.54 E	-332.59	9.90
7113.00	34.69	183.32	7058.75	327.74 N	198.68 E	-315.19	9.66
7145.00	37.12	183.94	7084.67	309.02 N	197.49 E	-296.57	7.68
7176.00	38.87	183.54	7109.10	289.98 N	196.24 E	-277.64	5.70
7208.00	40.67	183.26	7133.69	269.54 N	195.03 E	-257.32	5.65
7239.00	42.62	183.46	7156.86	248.98 N	193.82 E	-236.86	6.32
7271.00	44.14	184.62	7180.12	227.06 N	192.27 E	-215.08	5.35
7303.00	46.01	184.74	7202.72	204.48 N	190.42 E	-192.65	5.86
7334.00	48.08	184.87	7223.84	181.87 N	188.52 E	-170.20	6.69
7366.00	50.88	184.34	7244.63	157.62 N	186.57 E	-146.11	8.83
7397.00	54.12	183.71	7263.49	133.09 N	184.85 E	-121.73	10.57
7429.00	57.10	181.28	7281.57	106.72 N	183.71 E	-95.47	11.22
7461.00	60.52	181.46	7298.14	79.36 N	183.05 E	-68.20	10.70
7492.00	62.75	182.96	7312.87	52.10 N	181.99 E	-41.05	8.36
7524.00	64.80	183.56	7327.01	23.44 N	180.36 E	-12.55	6.63
7556.00	67.95	184.33	7339.83	5.80 S	178.34 E	16.52	10.09
7588.00	72.61	185.69	7350.62	35.80 S	175.70 E	46.31	15.10
7619.00	77.41	185.57	7358.63	65.59 S	172.77 E	75.87	15.49
7651.00	80.24	185.36	7364.83	96.84 S	169.78 E	106.88	8.87
7683.00	83.89	185.45	7369.25	128.39 S	166.79 E	138.19	11.38
7714.00	86.26	186.10	7371.91	159.11 S	163.69 E	168.68	7.95
7725.00	86.88	185.77	7372.57	170.04 S	162.55 E	179.51	6.36
7779.00	89.07	185.36	7374.48	223.74 S	157.32 E	232.81	4.13
7810.00	89.63	185.56	7374.83	254.60 S	154.37 E	263.43	1.91
7855.00	89.13	184.89	7375.31	299.41 S	150.27 E	307.91	1.85
7907.00	89.20	183.76	7376.07	351.26 S	146.35 E	359.43	2.18
7952.00	89.69	183.64	7376.50	396.16 S	143.44 E	404.08	1.12
8002.00	90.00	183.24	7376.64	446.07 S	140.44 E	453.71	1.01
8047.00	89.63	181.68	7376.79	491.03 S	138.51 E	498.47	3.56
8097.00	89.51	180.20	7377.16	541.02 S	137.69 E	548.32	2.97
8142.00	88.83	179.09	7377.82	586.01 S	137.97 E	593.25	2.89
8191.00	89.07	178.29	7378.72	634.99 S	139.09 E	642.21	1.69
8236.00	90.12	178.36	7379.03	679.97 S	140.41 E	687.19	2.34
8286.00	90.74	178.00	7378.66	729.94 S	141.99 E	737.16	1.43
8331.00	91.05	177.65	7377.95	774.90 S	143.70 E	782.15	1.04
8381.00	90.25	177.74	7377.39	824.86 S	145.71 E	832.13	1.62
8426.00	89.38	177.09	7377.53	869.81 S	147.74 E	877.13	2.41
8476.00	89.57	176.84	7377.99	919.74 S	150.39 E	927.12	0.62
8571.00	90.25	177.31	7378.14	1014.62 S	155.24 E	1022.12	0.87
8666.00	90.80	177.26	7377.27	1109.51 S	159.74 E	1117.11	0.59
8761.00	89.75	177.28	7376.81	1204.39 S	164.27 E	1212.10	1.11
8855.00	89.63	177.02	7377.32	1298.28 S	168.94 E	1306.09	0.31
8950.00	89.57	176.33	7377.99	1393.11 S	174.45 E	1401.09	0.73
9045.00	89.44	175.57	7378.81	1487.87 S	181.17 E	1496.08	0.81
9140.00	89.14	175.45	7379.99	1582.57 S	188.61 E	1591.05	0.35
9235.00	90.31	175.72	7380.45	1677.29 S	195.92 E	1686.04	1.27
9330.00	90.00	174.99	7380.19	1771.98 S	203.61 E	1781.02	0.83
9425.00	90.31	175.35	7379.93	1866.64 S	211.60 E	1875.99	0.50
9519.00	89.88	175.81	7379.78	1960.36 S	218.85 E	1969.97	0.67
9614.00	90.68	176.18	7379.32	2055.12 S	225.49 E	2064.97	0.93
9709.00	89.44	175.21	7379.22	2149.85 S	232.62 E	2159.95	1.65
9804.00	90.49	175.91	7379.27	2244.57 S	239.97 E	2254.94	1.33
9899.00	90.80	175.33	7378.20	2339.28 S	247.22 E	2349.92	0.70
9994.00	88.95	175.80	7378.40	2433.99 S	254.57 E	2444.90	2.01
10089.00	90.43	176.69	7378.91	2528.78 S	260.79 E	2539.89	1.82
10184.00	91.17	176.42	7377.58	2623.60 S	266.50 E	2634.88	0.83
10279.00	89.20	177.54	7377.28	2718.46 S	271.50 E	2729.87	2.39
10373.00	89.38	179.21	7378.44	2812.41 S	274.16 E	2823.82	1.79
10468.00	90.99	181.10	7378.14	2907.41 S	273.90 E	2918.62	2.61
10563.00	91.11	180.29	7376.39	3002.38 S	272.74 E	3013.35	0.86
10658.00	89.19	178.54	7376.14	3097.37 S	273.71 E	3108.23	2.74
10753.00	91.49	180.62	7375.57	3192.35 S	274.41 E	3203.08	3.25
10848.00	88.76	177.94	7375.37	3287.33 S	275.61 E	3297.96	4.02
10943.00	90.12	178.85	7376.29	3382.28 S	278.27 E	3392.90	1.73
11037.00	89.51	178.50	7376.59	3476.26 S	280.44 E	3486.83	0.76
11132.00	90.99	179.80	7376.18	3571.24 S	281.84 E	3581.73	2.08
11227.00	91.54	179.66	7374.08	3666.22 S	282.29 E	3676.56	0.60
11322.00	88.83	177.08	7373.78	3761.16 S	284.99 E	3771.49	3.94
11417.00	89.94	179.10	7374.80	3856.10 S	286.16 E	3866.45	2.42
11511.00	90.25	178.21	7374.65	3950.07 S	290.37 E	3960.38	1.00
11606.00	90.49	179.13	7374.03	4045.04 S	292.58 E	4055.32	1.00
11701.00	89.88	180.49	7373.73	4140.04 S	292.89 E	4150.16	1.58
11796.00	90.56	179.74	7373.37	4235.03 S	292.69 E	4244.97	1.07
11891.00	90.12	178.12	7373.22	4329.22 S	292.87 E	4339.91	1.84

11837.00	90.12	179.48	7373.13	4276.03 S	292.97 E	4285.91	1.24
11879.00	90.12	179.48	7373.04	4318.03 S	293.35 E	4327.86	0.01

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 176.11 DEGREES (GRID)
A TOTAL CORRECTION OF 8.38 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.
HORIZONTAL DISPLACEMENT(CLOSURE) AT 11879.00 FEET
IS 4327.98 FEET ALONG 176.11 DEGREES (GRID)**

Final survey at 11879 ft is a projection to TD.

Date Printed:13 September 2012