



Rmc @ Measured Temp (degF)	N/A @ N/A	N/A @ N/A	N/A @ N/A	N/A @ N/A	
Max Tool Temp (degF) / Source	57.30 / PCM	144.54 / PCM	145.00 / PCM	116.00 / PCM	
Rm @ Max Tool Temp (degF)	N/A @ 57.30	N/A @ N/A	N/A @ 145.00	N/A @ 116.00	
Lead MWD Engineer	Aaron Ashu	Aaron Ashu	Aaron Ashu	Aaron Ashu	
Customer Representative	Clayton Carmack	Clayton Carmack	Clayton Carmack	Clayton Carmack	

## SENSOR INFORMATION

### Downhole Processor Information

Tool Type	PCM	PCM	PCM	PCM	
Software Version	5.28	5.28	5.28	5.28	
Sub Serial Number	11341316	11341316	11232127	11232127	
Insert Serial Number	11619991	11619991	11680900	11680900	
Date and Time Initialized	18-Feb-13 19:07	04-Mar-13 14:44	07-Mar-13 23:02	07-Mar-13 23:02	
Date and Time Read	20-Feb-13 10:43	07-Mar-13 18:50	11-Mar-13 20:01	11-Mar-13 20:08	
ECMB SW Version	N/A	N/A	N/A	N/A	

### Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC	PCDC	
Distance From Bit (ft)	60.63	51.99	49.97	50.92	
Software Version	6.21	6.21	6.21	6.21	
Sub Serial Number	11341316	11341316	11232127	11232127	
Sonde Serial Number	11478088	11833032	11833032	11833032	
Sensor ID Number	N/A	N/A	N/A	N/A	
Toolface Offset (deg)	329.77	162.42	130.70	274.85	

### Gamma Ray Sensor Information

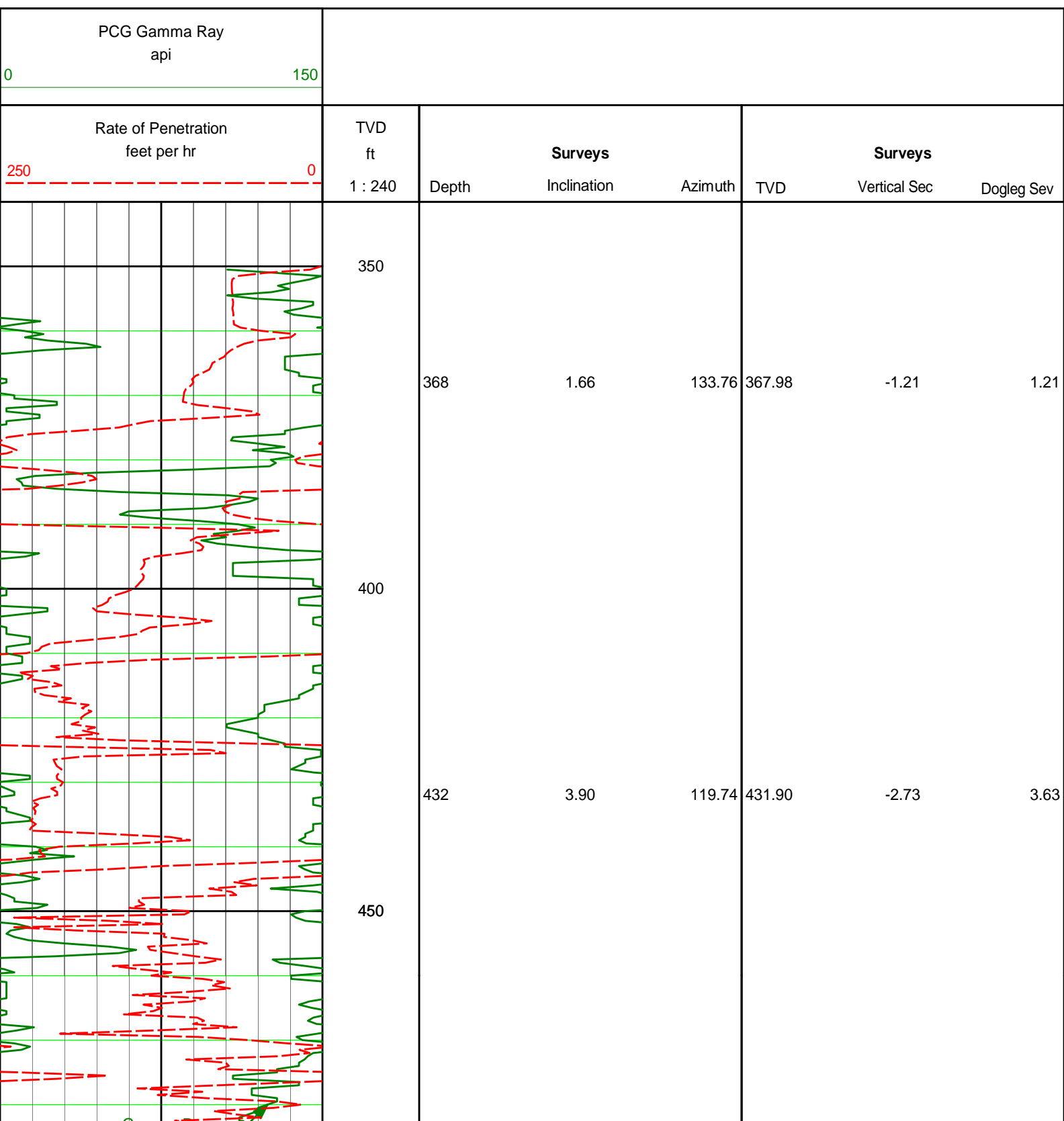
Tool Type	N/A	PCG	PCG	PCG	
Distance From Bit (ft)	N/A	46.93	44.89	45.84	
Recorded Sample Period (sec)	N/A	10	10	10	
Software Version	N/A	8.15	8.15	8.15	
Sub Serial Number	N/A	11341316	11232127	11232127	
Insert/Sonde Serial Number	N/A	11681039	11681039	11681039	

## REMARKS

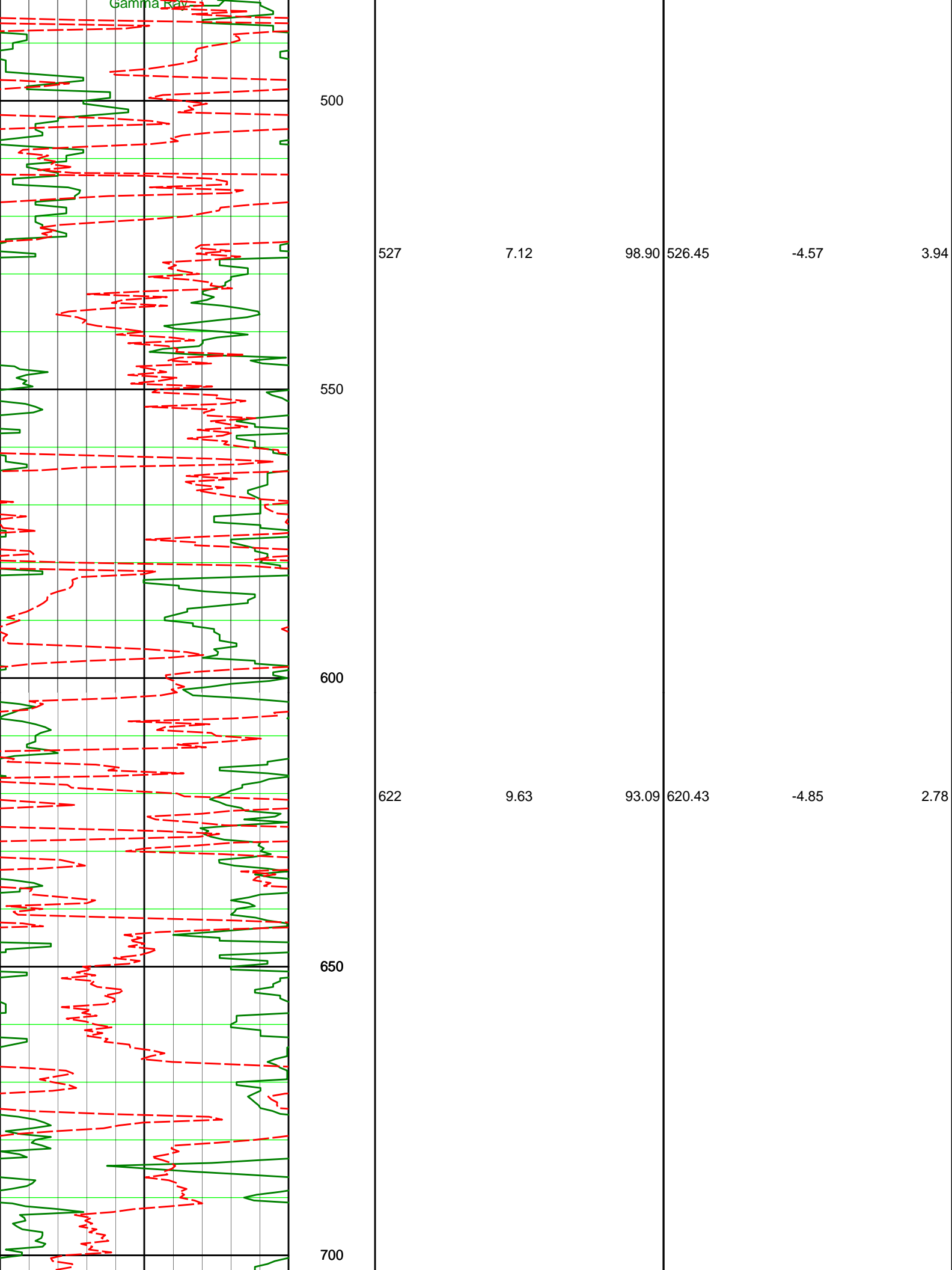
1. All depths are calibrated to the driller's pipe tally and are measured from the rotary table.
2. No depth corrections have been made for pipe stretch or compression.
3. All data presented is recorded (memory data) unless otherwise stated.
4. Run 100 was directional only, no gamma available for this run.
5. The following smoothing parameters have been applied to the data:
  - ROP: 1.0 ft interval, 3.0 ft coercion distance.
  - GAMMA: 0.5 ft interval, 0.6 ft coercion distance.

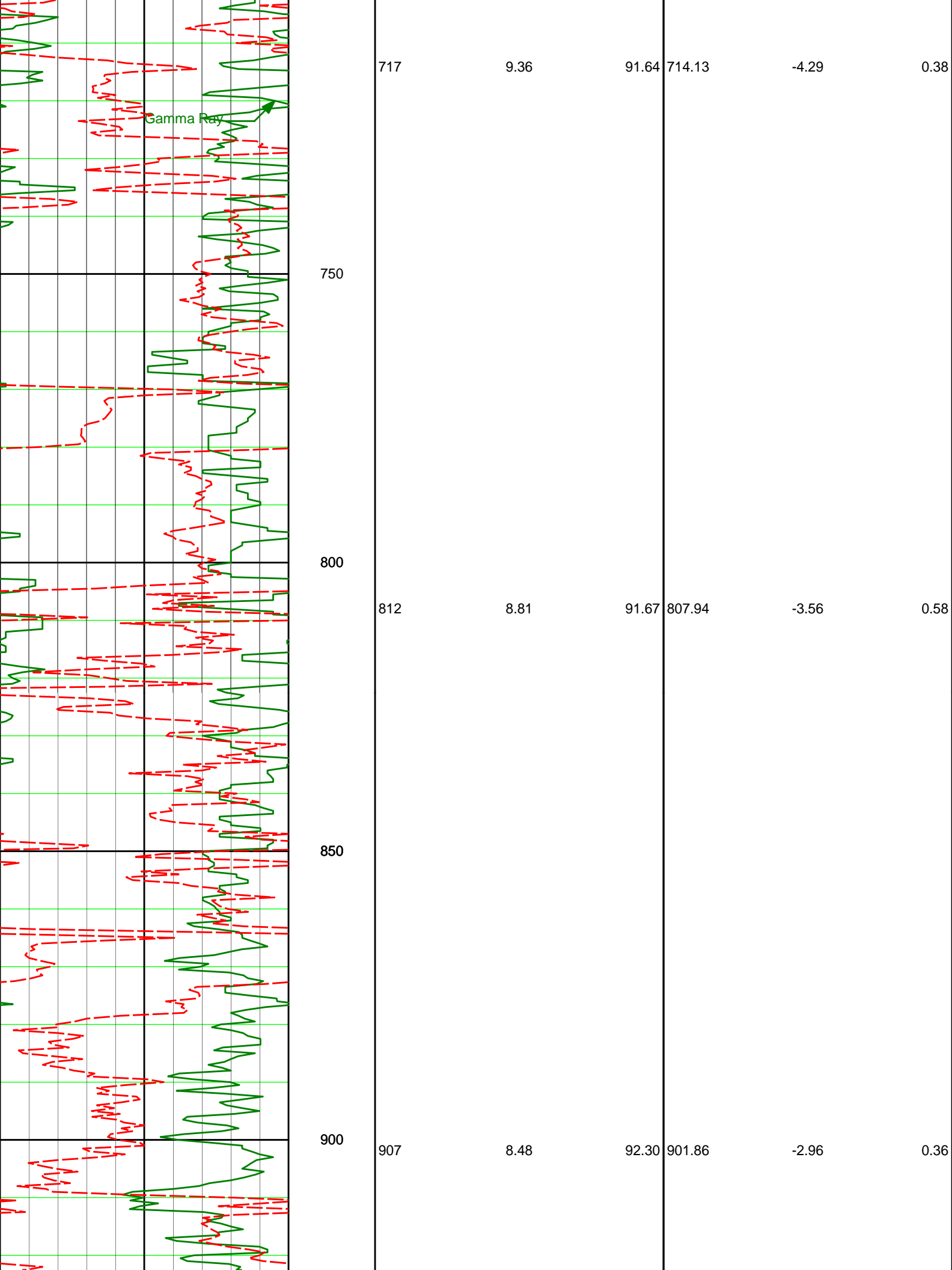
# WARRANTY

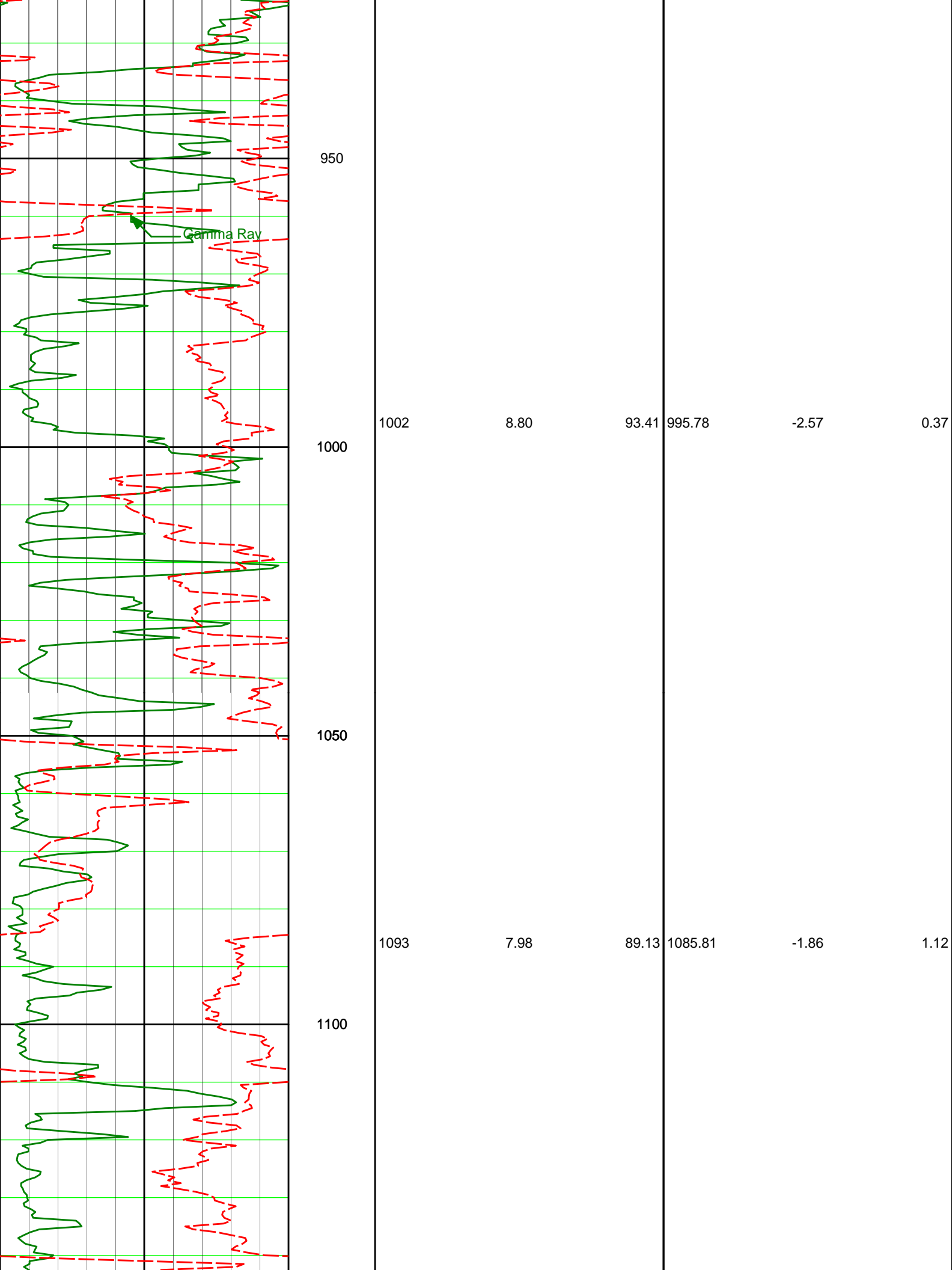
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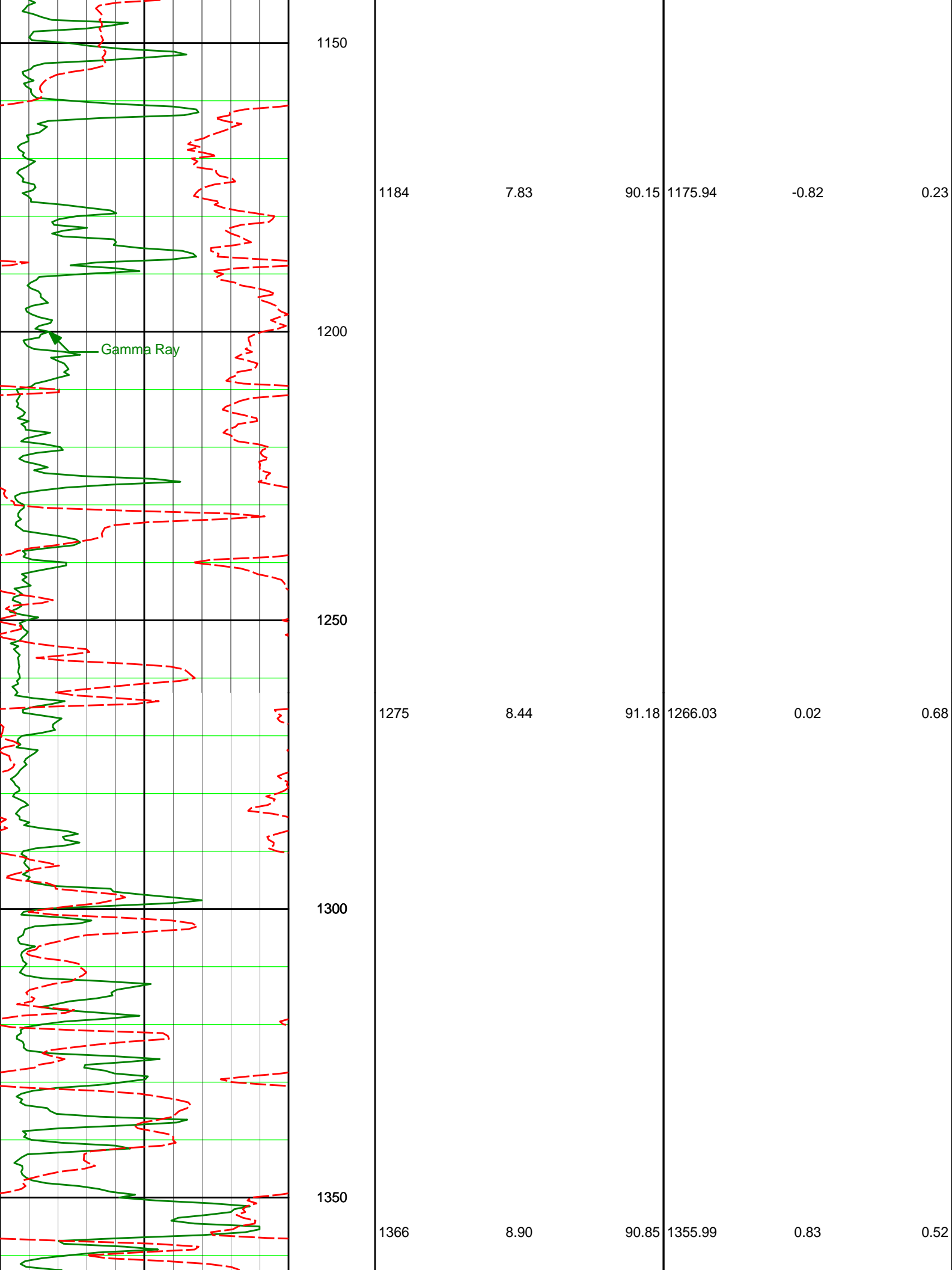


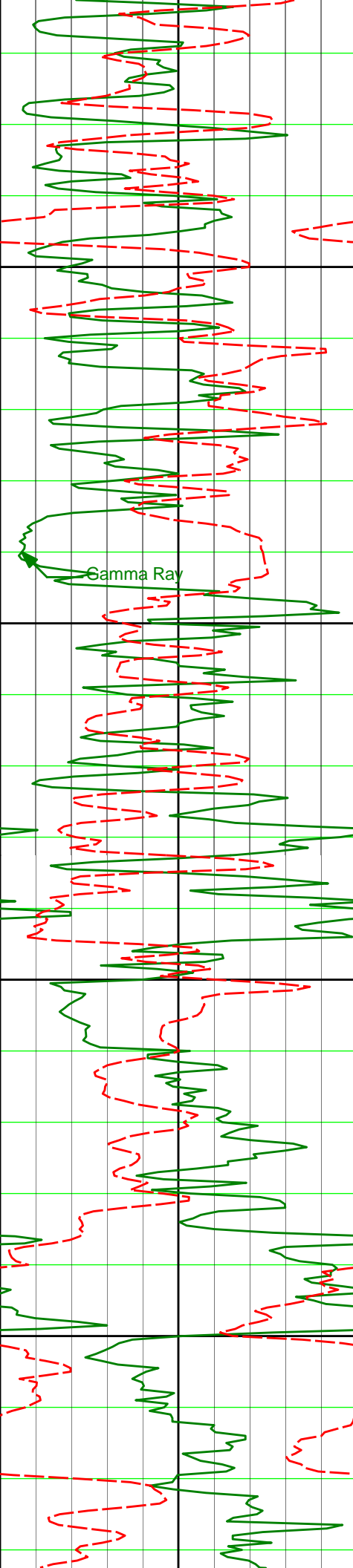
Gamma Ray











1400

1450

1500

1550

1457

8.28

80.61

1445.97

2.84

1.81

1548

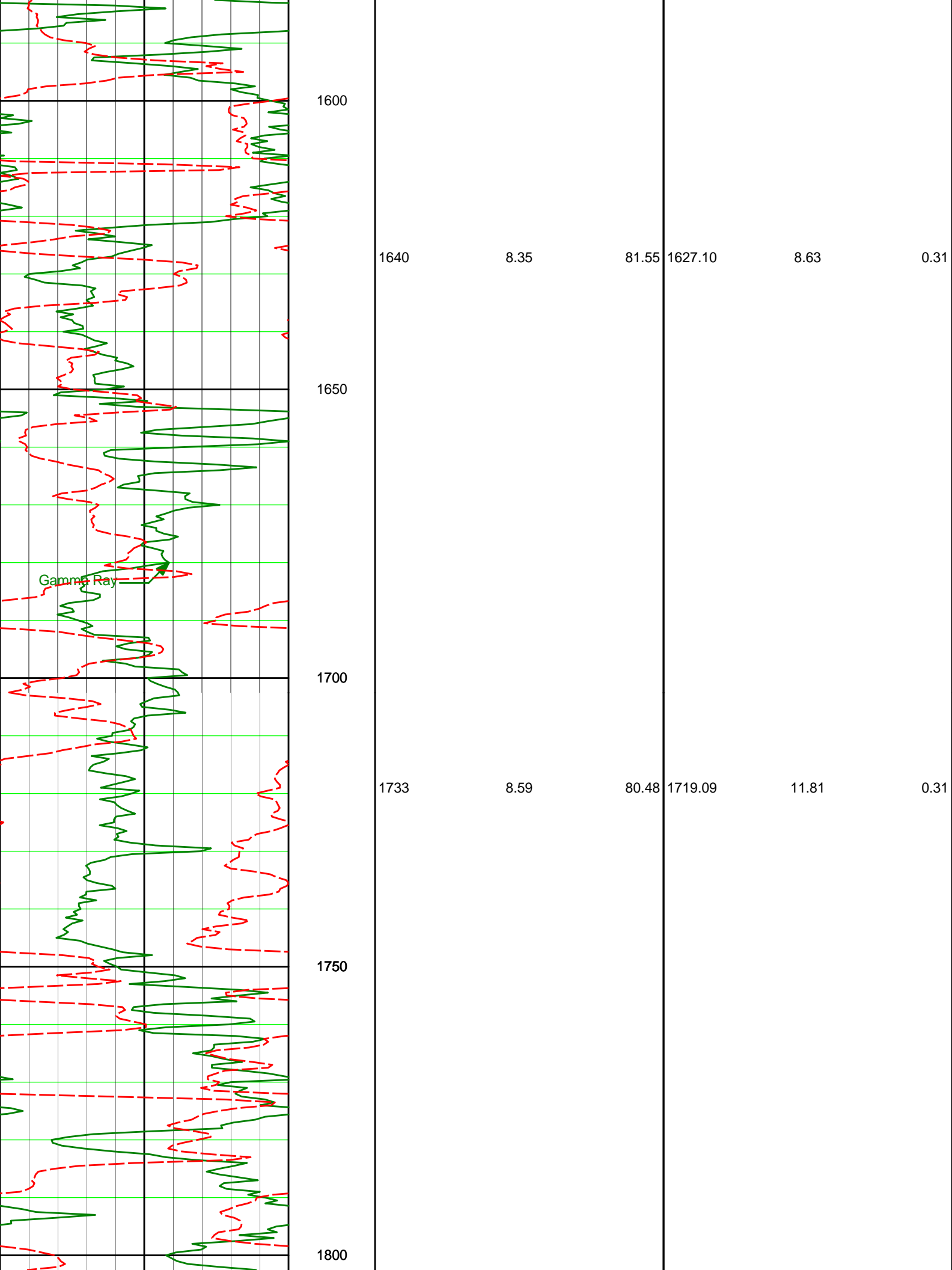
8.08

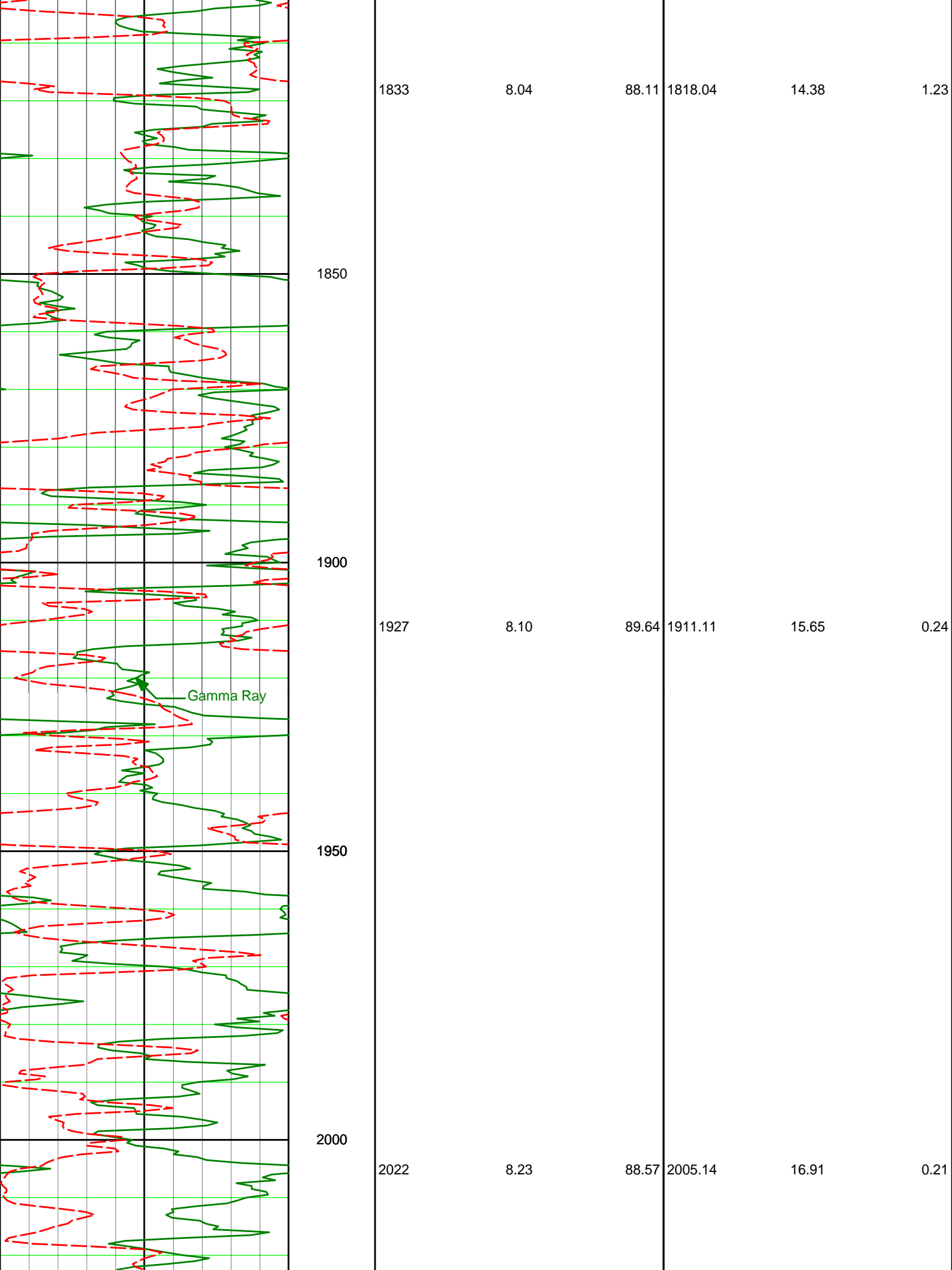
82.10

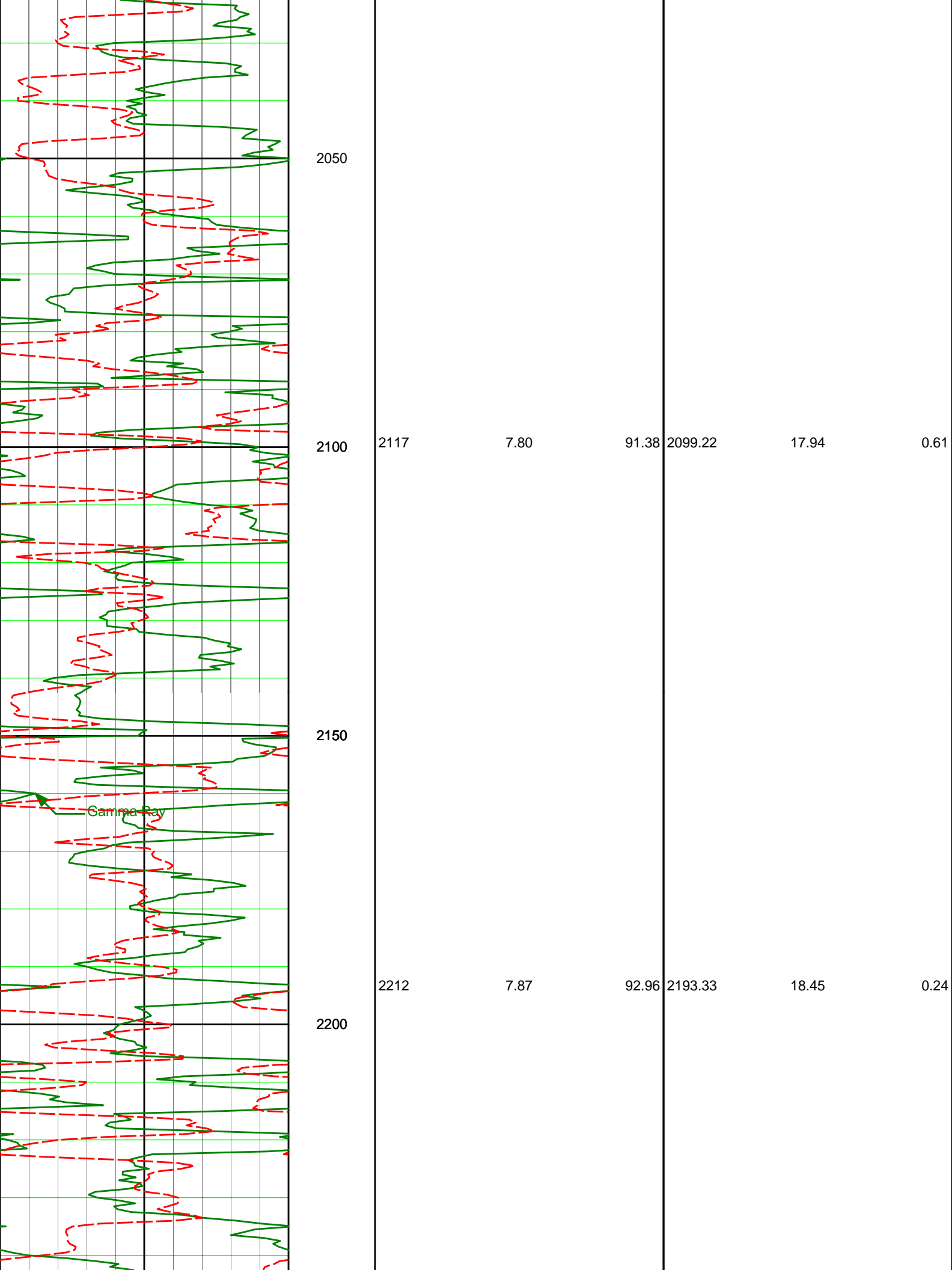
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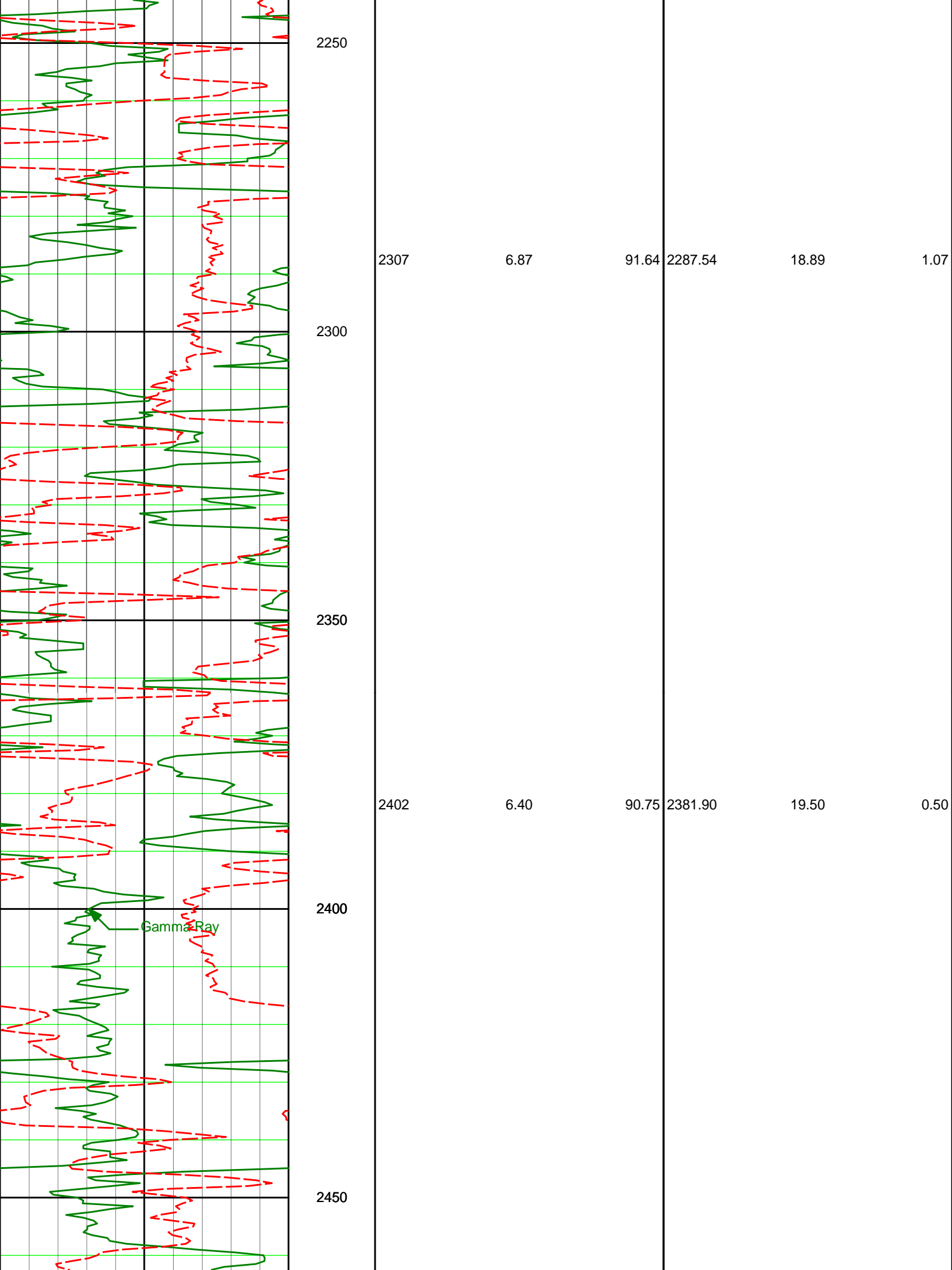
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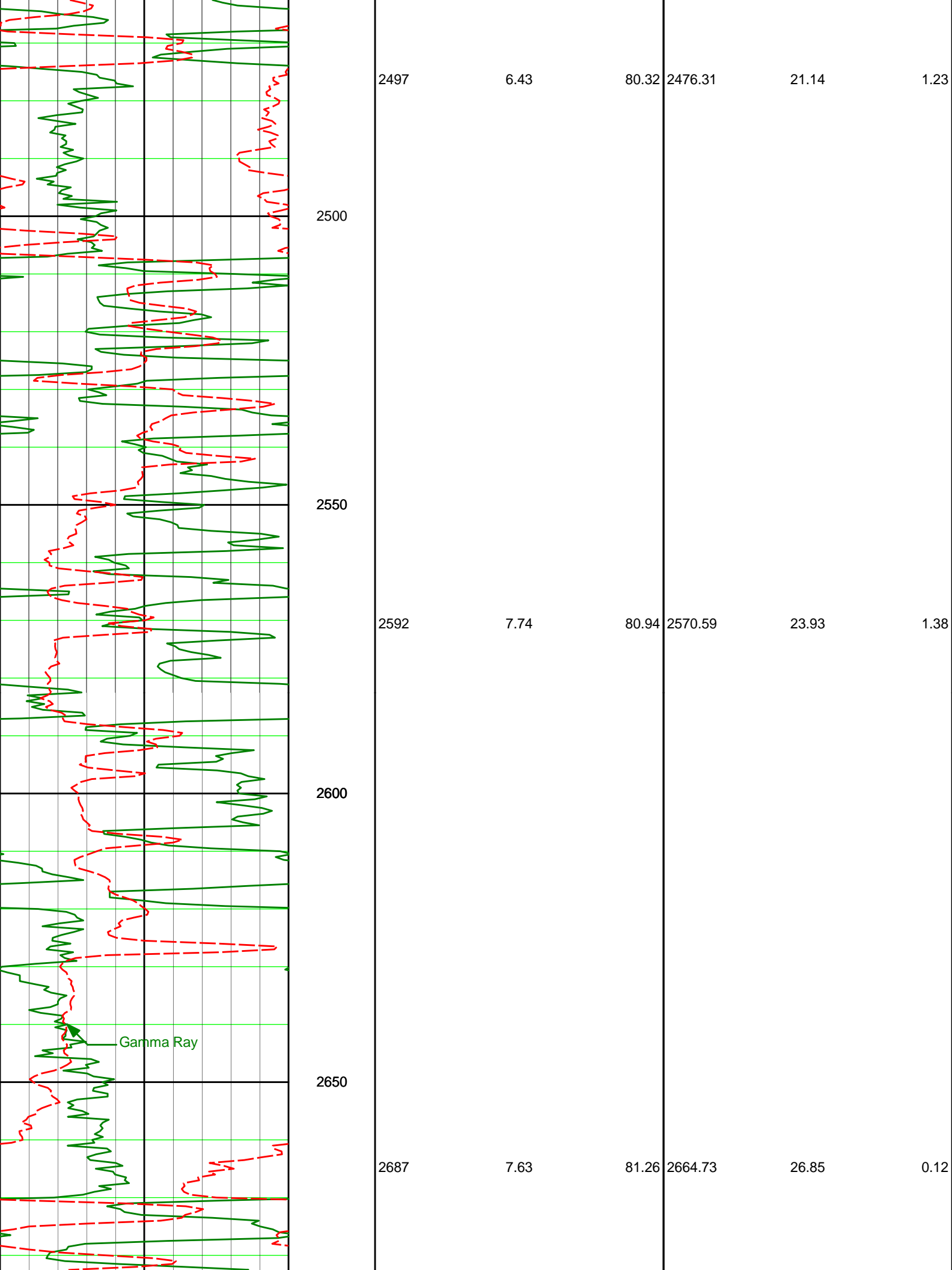
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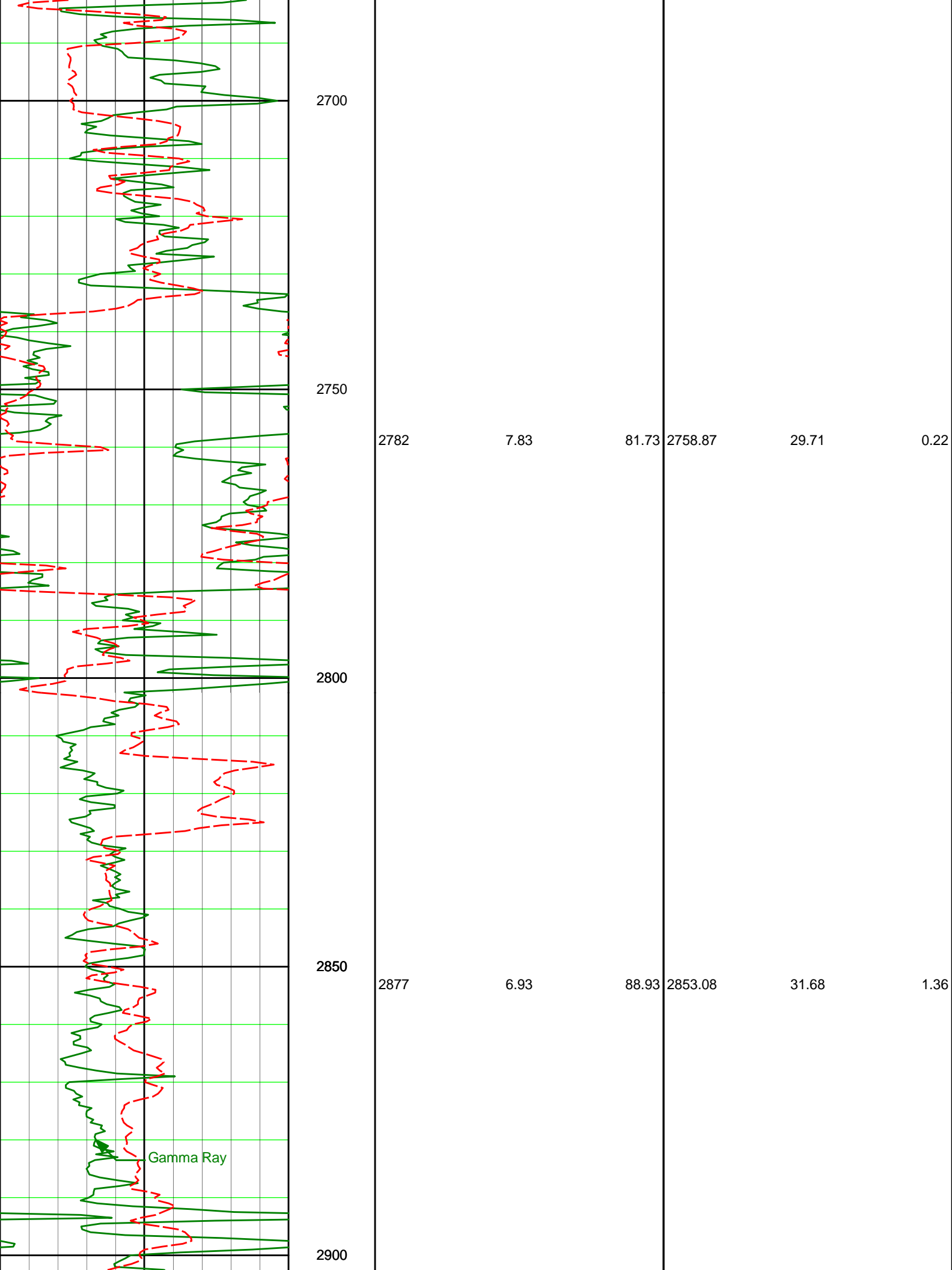












2700

2750

2800

2850

2900

2782

7.83

81.73

2758.87

29.71

0.22

2877

6.93

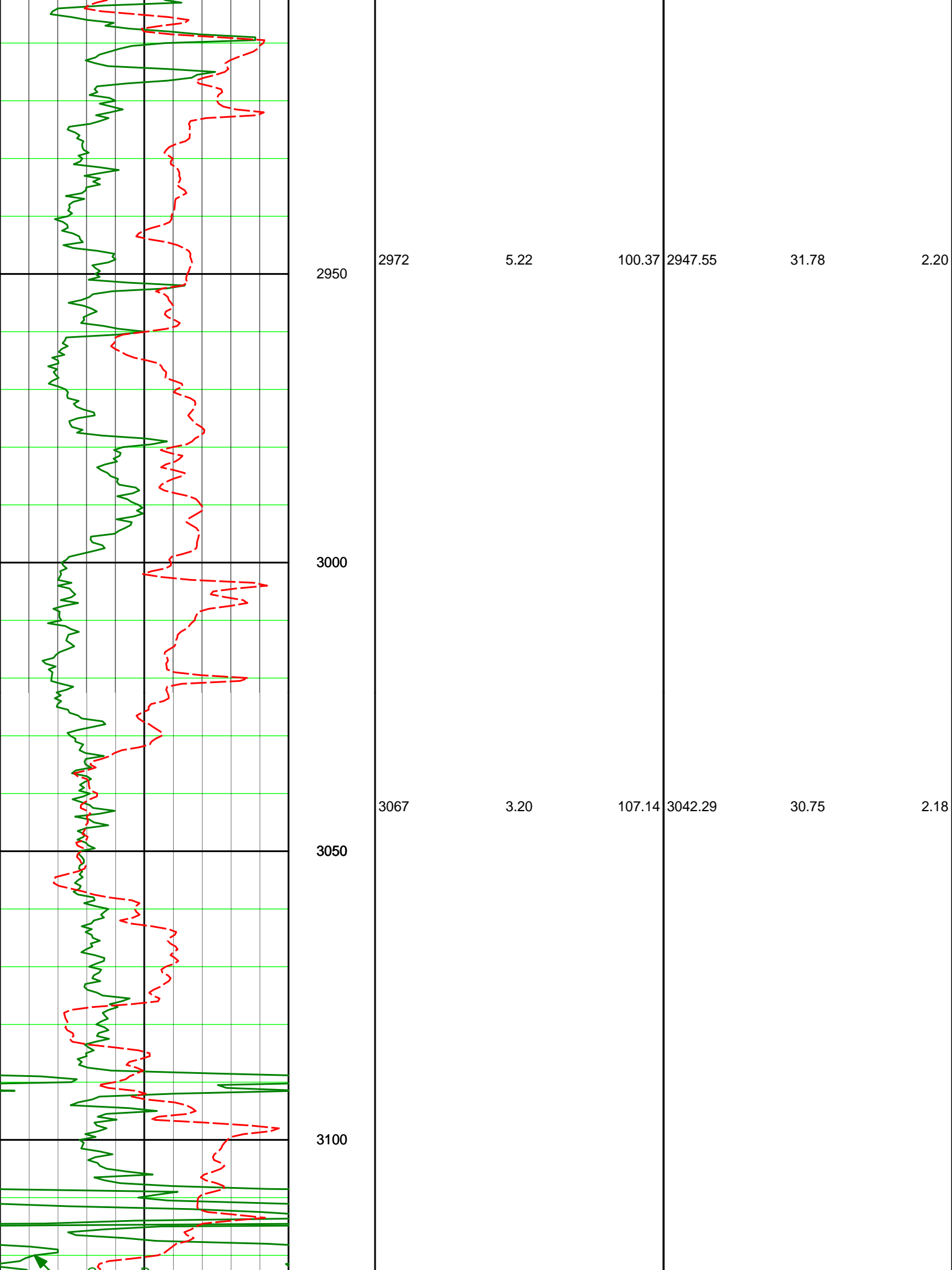
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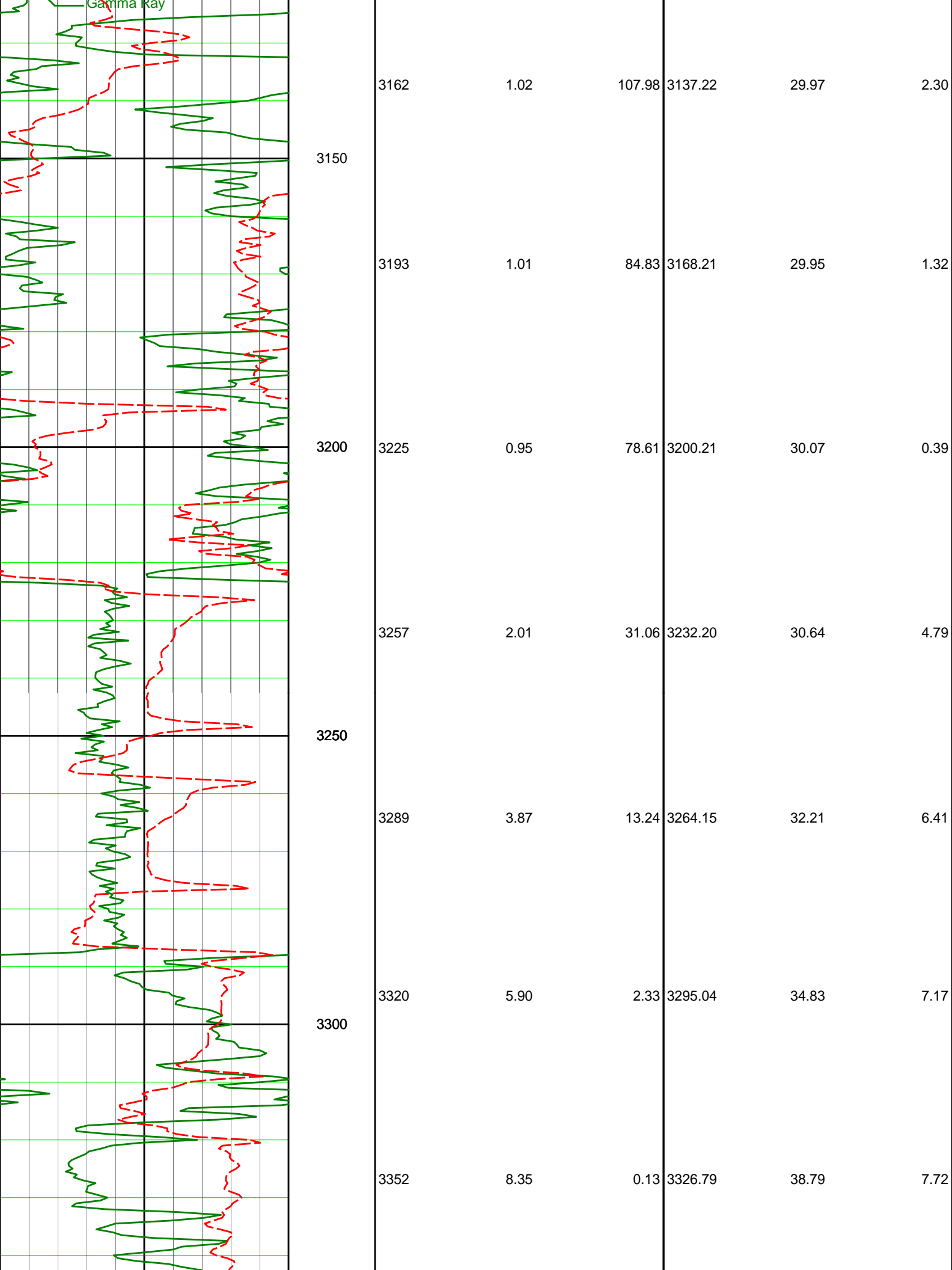
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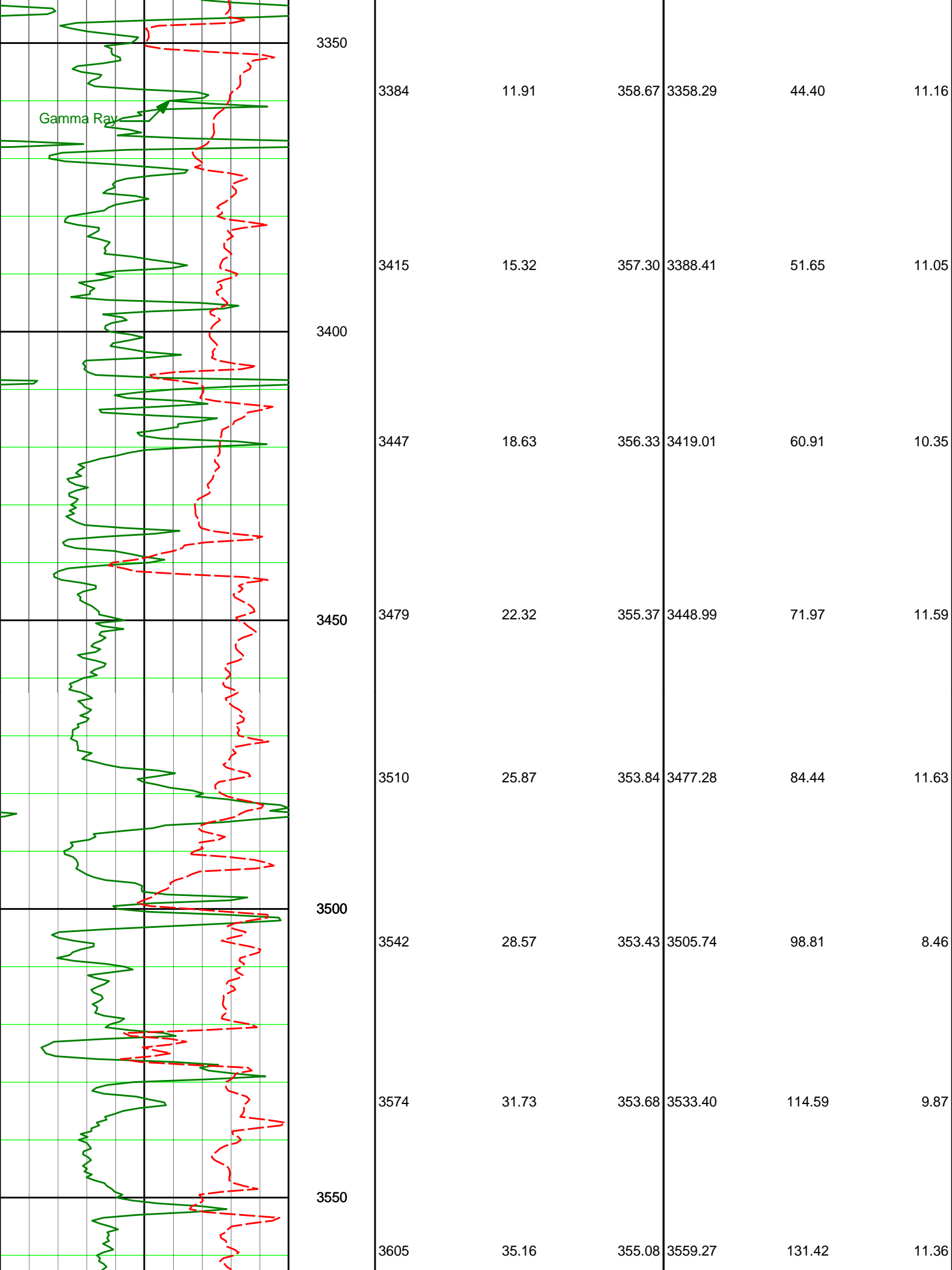
31.68

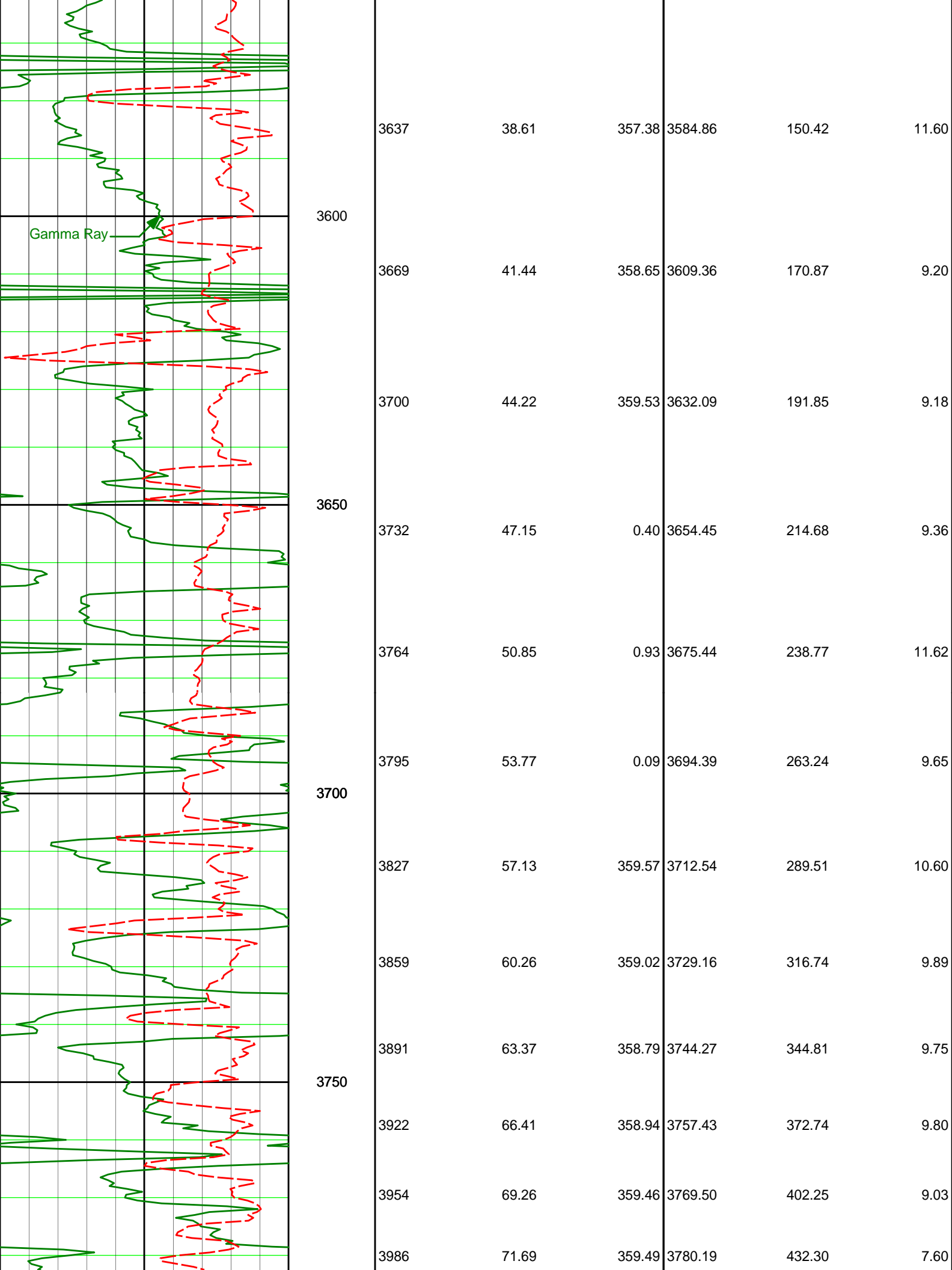
1.36

Gamma Ray









		4017	74.05	359.72	3789.32	461.82	7.64
	3800	4049	75.20	0.79	3797.81	492.59	4.83
		4081	77.06	1.25	3805.48	523.60	5.97
		4112	80.59	1.13	3811.48	553.96	11.40
		4207	87.91	0.25	3821.00	648.22	7.75
		5170	88.37	358.84	3824.47	1608.53	2.02
		5261	88.25	358.22	3827.16	1699.01	0.70
		5350	88.58	358.09	3829.67	1789.50	0.86
		8130	90.46	359.22	3806.92	4558.78	0.01
		2850					
Rate of Penetration feet per hr 		TVD ft 1 : 240	<b>Surveys</b> Depth      Inclination      Azimuth			<b>Surveys</b> TVD      Vertical Sec      Dogleg Sev	
PCG Gamma Ray api 							



# HALLIBURTON

## DIRECTIONAL SURVEY REPORT

Shell Exploration Production  
 Young Trust 2309 35-1H  
 Wildcat  
 Reno Co Kansas  
 USA  
 OK-XX-0900034106

Surveys from 141' MD to 8130' MD provided by Halliburton Sperry Drilling Services.  
 Final Survey @ 8130' MD is a projection to the bit.

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
141.00	0.14	121.22	141.00	0.09 S	0.15 E	-0.08	0.10
171.00	0.28	79.43	171.00	0.09 S	0.25 E	-0.07	0.68
232.00	0.69	100.38	232.00	0.13 S	0.76 E	-0.07	0.71
286.00	0.71	119.06	285.99	0.35 S	1.37 E	-0.25	0.42
368.00	1.66	133.76	367.98	1.42 S	2.67 E	-1.21	1.21
432.00	3.90	119.74	431.90	3.14 S	5.23 E	-2.73	3.63
527.00	7.12	98.90	526.45	5.66 S	13.86 E	-4.57	3.94
622.00	9.63	93.09	620.43	6.99 S	27.61 E	-4.85	2.78
717.00	9.36	91.64	714.13	7.64 S	43.26 E	-4.29	0.38
812.00	8.81	91.67	807.94	8.08 S	58.25 E	-3.56	0.58
907.00	8.48	92.30	901.86	8.57 S	72.53 E	-2.96	0.36
1002.00	8.80	93.41	995.78	9.29 S	86.78 E	-2.57	0.37
1093.00	7.98	89.13	1085.81	9.60 S	100.05 E	-1.86	1.12
1184.00	7.83	90.15	1175.94	9.52 S	112.57 E	-0.82	0.23
1275.00	8.44	91.18	1266.03	9.68 S	125.44 E	0.02	0.68
1366.00	8.90	90.85	1355.99	9.92 S	139.16 E	0.83	0.52
1457.00	8.28	80.61	1445.97	8.96 S	152.66 E	2.84	1.81
1548.00	8.08	82.10	1536.05	7.01 S	165.45 E	5.76	0.32
1640.00	8.35	81.55	1627.10	5.14 S	178.47 E	8.63	0.31

1733.00	8.59	80.48	1719.09	2.99 S	192.01 E	11.81	0.31
1833.00	8.04	88.11	1818.04	1.53 S	206.37 E	14.38	1.23
1927.00	8.10	89.64	1911.11	1.27 S	219.56 E	15.65	0.24
2022.00	8.23	88.57	2005.14	1.06 S	233.05 E	16.91	0.21
2117.00	7.80	91.38	2099.22	1.04 S	246.30 E	17.94	0.61
2212.00	7.87	92.96	2193.33	1.53 S	259.25 E	18.45	0.24
2307.00	6.87	91.64	2287.54	2.03 S	271.43 E	18.89	1.07
2402.00	6.40	90.75	2381.90	2.27 S	282.40 E	19.50	0.50
2497.00	6.43	80.32	2476.31	1.44 S	292.94 E	21.14	1.23
2592.00	7.74	80.94	2570.59	0.46 N	304.50 E	23.93	1.38
2687.00	7.63	81.26	2664.73	2.43 N	317.05 E	26.85	0.12
2782.00	7.83	81.73	2758.87	4.32 N	329.70 E	29.71	0.22
2877.00	6.93	88.93	2853.08	5.35 N	341.83 E	31.68	1.36
2972.00	5.22	100.37	2947.55	4.68 N	351.82 E	31.78	2.20
3067.00	3.20	107.14	3042.29	3.12 N	358.61 E	30.75	2.18
3162.00	1.02	107.98	3137.22	2.08 N	361.95 E	29.97	2.30
3193.00	1.01	84.83	3168.21	2.02 N	362.49 E	29.95	1.32
3225.00	0.95	78.61	3200.21	2.10 N	363.03 E	30.07	0.39
3257.00	2.01	31.06	3232.20	2.63 N	363.58 E	30.64	4.79
3289.00	3.87	13.24	3264.15	4.16 N	364.12 E	32.21	6.41
3320.00	5.90	2.33	3295.04	6.77 N	364.42 E	34.83	7.17
3352.00	8.35	0.13	3326.79	10.73 N	364.49 E	38.79	7.72
3384.00	11.91	358.67	3358.29	16.36 N	364.42 E	44.40	11.16
3415.00	15.32	357.30	3388.41	23.65 N	364.16 E	51.65	11.05
3447.00	18.63	356.33	3419.01	32.98 N	363.63 E	60.91	10.35
3479.00	22.32	355.37	3448.99	44.14 N	362.81 E	71.97	11.59
3510.00	25.87	353.84	3477.28	56.74 N	361.61 E	84.44	11.63
3542.00	28.57	353.43	3505.74	71.28 N	359.98 E	98.81	8.46
3574.00	31.73	353.68	3533.40	87.25 N	358.18 E	114.59	9.87
3605.00	35.16	355.08	3559.27	104.25 N	356.52 E	131.42	11.36
3637.00	38.61	357.38	3584.86	123.41 N	355.27 E	150.42	11.60
3669.00	41.44	358.65	3609.36	143.98 N	354.56 E	170.87	9.20
3700.00	44.22	359.53	3632.09	165.04 N	354.23 E	191.85	9.18
3732.00	47.15	0.40	3654.45	187.94 N	354.23 E	214.68	9.36
3764.00	50.85	0.93	3675.44	212.08 N	354.51 E	238.77	11.62
3795.00	53.77	0.09	3694.39	236.61 N	354.73 E	263.24	9.65
3827.00	57.13	359.57	3712.54	262.96 N	354.64 E	289.51	10.60
3859.00	60.26	359.02	3729.16	290.29 N	354.31 E	316.74	9.89
3891.00	63.37	358.79	3744.27	318.49 N	353.77 E	344.81	9.75
3922.00	66.41	358.94	3757.43	346.55 N	353.21 E	372.74	9.80
3954.00	69.26	359.46	3769.50	376.18 N	352.80 E	402.25	9.03
3986.00	71.69	359.49	3780.19	406.34 N	352.52 E	432.30	7.60
4017.00	74.05	359.72	3789.32	435.96 N	352.32 E	461.82	7.64
4049.00	75.20	0.79	3797.81	466.81 N	352.46 E	492.59	4.83
4081.00	77.06	1.25	3805.48	497.87 N	353.01 E	523.60	5.97
4112.00	80.59	1.13	3811.48	528.28 N	353.65 E	553.96	11.40
4207.00	87.91	0.25	3821.00	622.73 N	354.78 E	648.22	7.75
4293.00	89.17	359.69	3823.19	708.70 N	354.74 E	733.93	1.61
4325.00	89.08	359.38	3823.68	740.69 N	354.48 E	765.81	0.99
4420.00	91.08	0.25	3823.55	835.68 N	354.17 E	860.49	2.29
4515.00	91.79	0.98	3821.18	930.65 N	355.19 E	955.25	1.08
4609.00	90.15	1.27	3819.58	1024.61 N	357.03 E	1049.08	1.77
4704.00	90.40	1.00	3819.13	1119.59 N	358.90 E	1143.92	0.38
4798.00	89.20	0.40	3819.46	1213.58 N	360.04 E	1237.72	1.43
4893.00	88.46	0.33	3821.40	1308.56 N	360.65 E	1332.46	0.78
4988.00	89.63	0.22	3822.98	1403.55 N	361.10 E	1427.20	1.24
5079.00	90.06	359.56	3823.22	1494.54 N	360.93 E	1517.92	0.86
5170.00	88.37	358.84	3824.47	1585.52 N	359.66 E	1608.53	2.02
5261.00	88.25	358.22	3827.16	1676.45 N	357.33 E	1699.01	0.70
5352.00	88.58	358.92	3829.67	1767.39 N	355.06 E	1789.50	0.86
5442.00	89.26	0.21	3831.37	1857.37 N	354.38 E	1879.16	1.62
5533.00	90.55	1.19	3831.52	1948.36 N	355.50 E	1969.96	1.78
5625.00	90.18	0.36	3830.92	2040.35 N	356.74 E	2061.77	0.99
5717.00	90.46	0.46	3830.41	2132.34 N	357.40 E	2153.54	0.32
5811.00	90.98	359.67	3829.22	2226.33 N	357.50 E	2247.26	1.01
5905.00	90.99	359.55	3827.60	2320.32 N	356.86 E	2340.92	0.13
6000.00	90.09	0.36	3826.71	2415.31 N	356.78 E	2435.63	1.28
6095.00	89.60	0.53	3826.97	2510.31 N	357.52 E	2530.40	0.55
6190.00	89.85	0.10	3827.43	2605.31 N	358.05 E	2625.15	0.52
6285.00	89.94	359.92	3827.60	2700.31 N	358.06 E	2719.87	0.22
6380.00	91.51	359.96	3826.40	2795.30 N	357.96 E	2814.57	1.65
6475.00	91.45	359.71	3823.95	2890.26 N	357.69 E	2909.23	0.27
6570.00	92.22	359.25	3820.91	2985.21 N	356.83 E	3003.83	0.94
6665.00	91.91	359.37	3817.49	3080.14 N	355.68 E	3098.39	0.35

6760.00	91.17	359.35	3814.94	3175.10 N	354.62 E	3192.99	0.78
6855.00	89.97	0.11	3813.99	3270.09 N	354.18 E	3287.66	1.50
6950.00	90.68	359.96	3813.46	3365.09 N	354.24 E	3382.38	0.76
7045.00	90.03	0.94	3812.87	3460.08 N	354.99 E	3477.15	1.23
7140.00	89.29	0.18	3813.43	3555.08 N	355.91 E	3571.93	1.12
7236.00	89.75	0.48	3814.23	3651.07 N	356.46 E	3667.68	0.57
7331.00	90.06	0.14	3814.38	3746.07 N	356.97 E	3762.44	0.48
7426.00	89.85	0.49	3814.46	3841.07 N	357.49 E	3857.19	0.43
7521.00	90.37	0.04	3814.28	3936.07 N	357.94 E	3951.94	0.72
7616.00	89.63	359.87	3814.28	4031.06 N	357.87 E	4046.66	0.80
7711.00	91.14	359.31	3813.64	4126.06 N	357.19 E	4141.31	1.70
7806.00	92.24	359.84	3810.84	4221.01 N	356.49 E	4235.93	1.29
7901.00	90.61	0.13	3808.47	4315.98 N	356.46 E	4330.61	1.74
7996.00	90.18	359.62	3807.81	4410.98 N	356.26 E	4425.31	0.70
8076.00	90.46	359.22	3807.36	4490.97 N	355.45 E	4505.01	0.62
8130.00	90.46	359.22	3806.92	4544.96 N	354.71 E	4558.78	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 DIRECTION OF 4.42 DEGREES (GRID)  
A TOTAL CORRECTION OF 4.62 DEG FROM MAGNETIC NORTH TO GRID NORTH HAS BEEN APPLIED**

**HORIZONTAL DISPLACEMENT IS RELATIVE TO THE WELL HEAD.  
HORIZONTAL DISPLACEMENT(CLOSURE) AT 8130.00 FEET  
IS 4558.78 FEET ALONG 4.46 DEGREES (GRID)**