

Company : NOBLE ENERGY INC
Well : WELLS RANCH AE19-649
Field : WATTENBERG

Date : 24-Jan-2015
Time : 13:02



A Schlumberger Company

GAMMA-RAY

2" = 100'
FEET TVD

COMPANY : NOBLE ENERGY INC
WELL : WELLS RANCH AE19-649
FIELD : WATTENBERG
COUNTY : WELD
STATE : CO
COUNTRY : USA
API No. : 05-123-39635

COMPANY : NOBLE ENERGY INC
WELL : WELLS RANCH AE19-649
FIELD : WATTENBERG
COUNTY : WELD
STATE : CO
COUNTRY : USA
API WELL No. : 05-123-39635

WELL LOCATION

LAT:40°28'10"N LON:104°21'21"
X:3,318,318 Y:1,416,002 NAD83
SEC:24 TWP:6N RANGE:63W

OTHER SERVICES

DIRECTIONAL
ROP

DEPTH REF. : ROTARY TABLE
ELEVATION : 30.00 ft (ROTARY TABLE - GROUND LEVEL)
ALTITUDE : 4786.00 ft (GROUND LEVEL - MEAN SEA LEVEL)

BOREHOLE RECORD

DEVIATION RECORD

HOLE SIZE in	FROM ft	TO ft	INCLINATION deg	FROM ft	TO ft
8 3/4	720	6992	00-13	720	5138
6 1/8	6992	11772	13-00	5138	6000
			00-90	6000	7123
			90+/-3	7123	11772

CASING RECORD

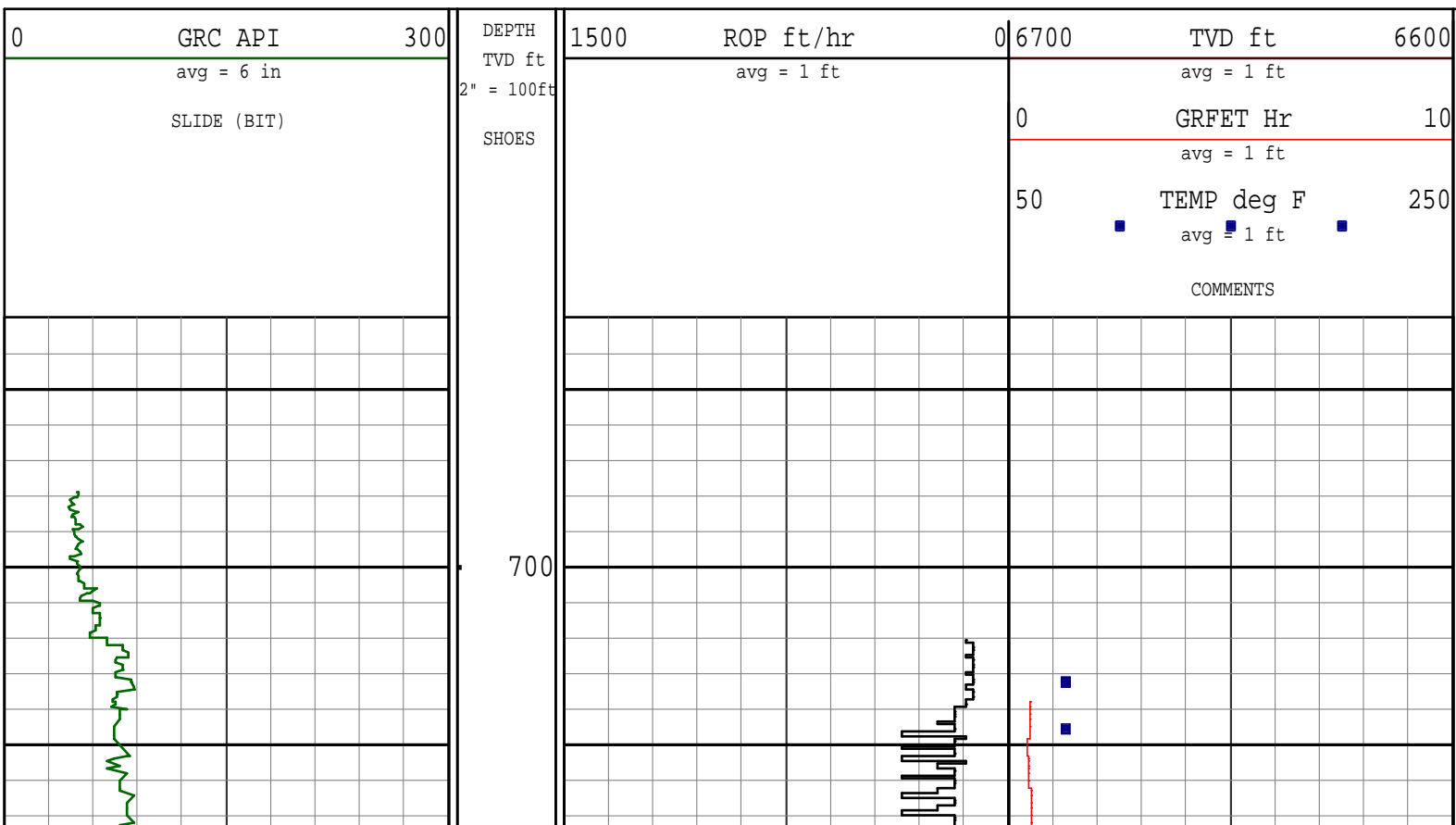
CASING SIZE in	FROM ft	TO ft
9 5/8	0	710
7	0	6987

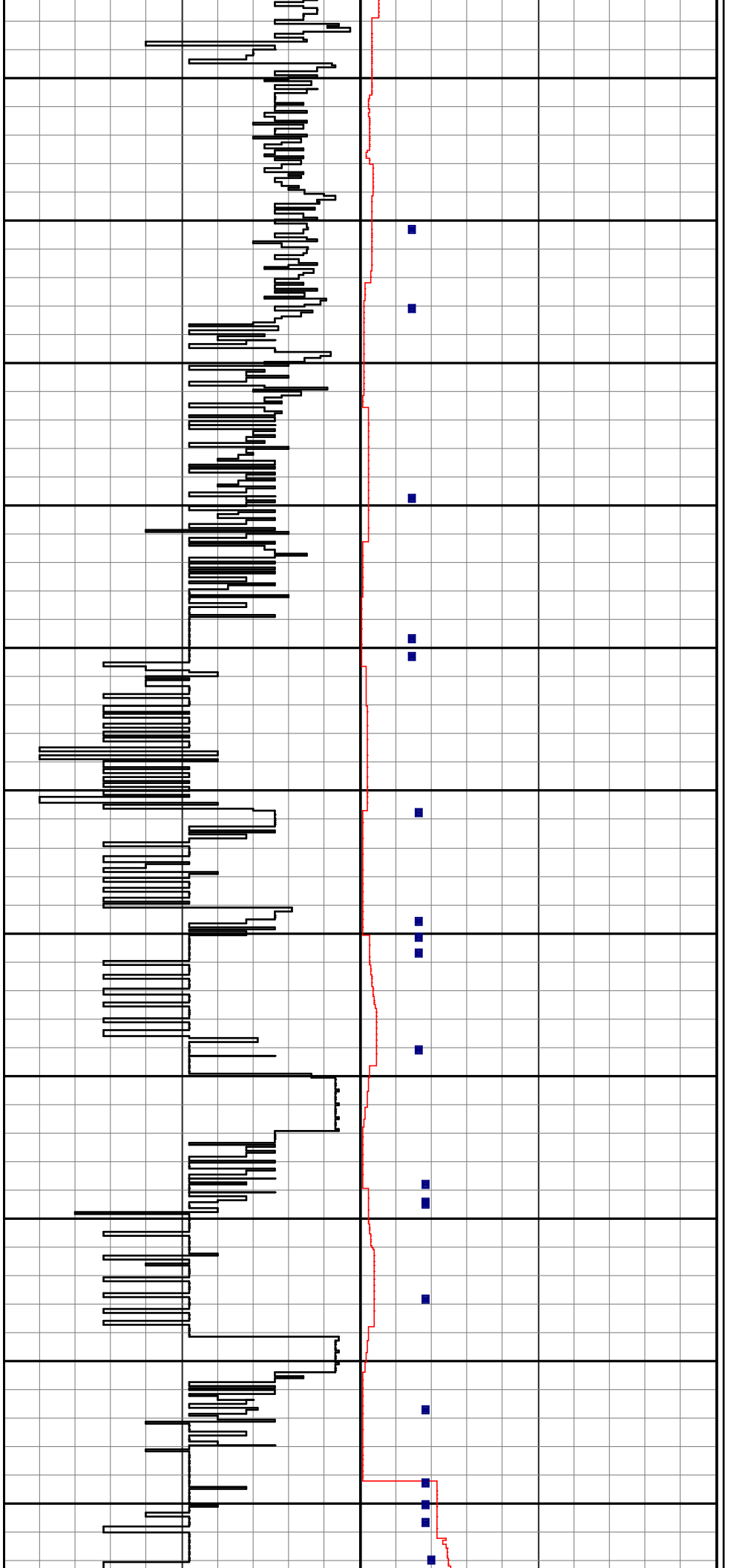
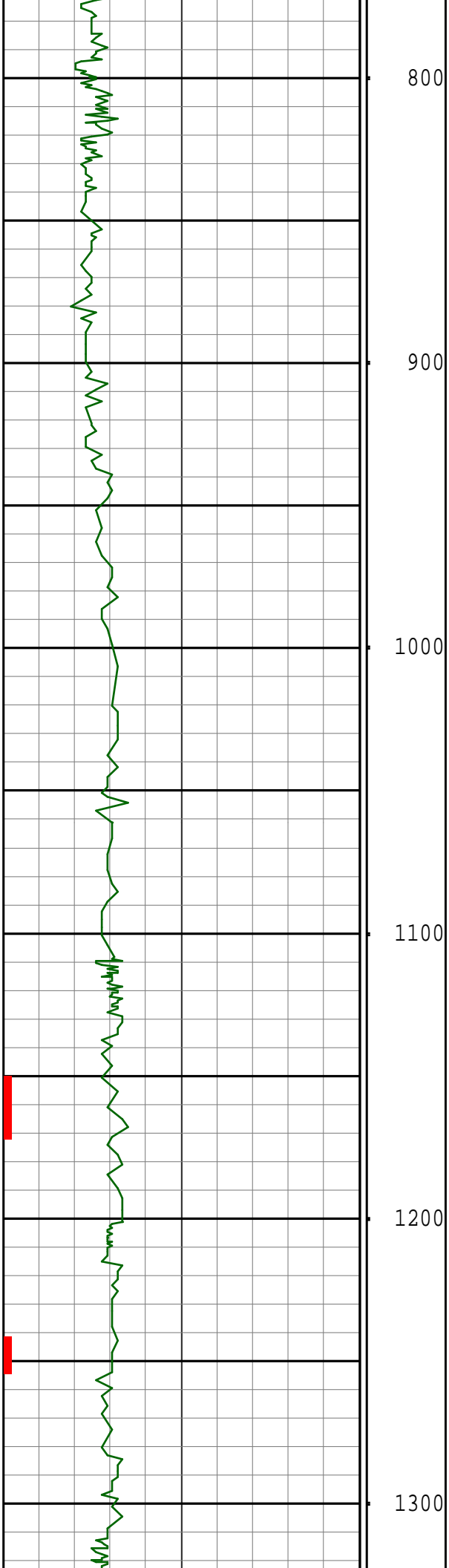
DRILLING Co.: HELMERICH & PAYNE, INC
RIG : 330
LMD UNIT No.: TRAILER DISTRICT : COMMERCE CTY
SPUD DATE : 18-JAN-15
LMD START DATE : 18-JAN-15 DEPTH : 680 ft
LMD END DATE : 24-JAN-15 DEPTH : 11772 ft
TOTAL DEPTH : 11772 ft

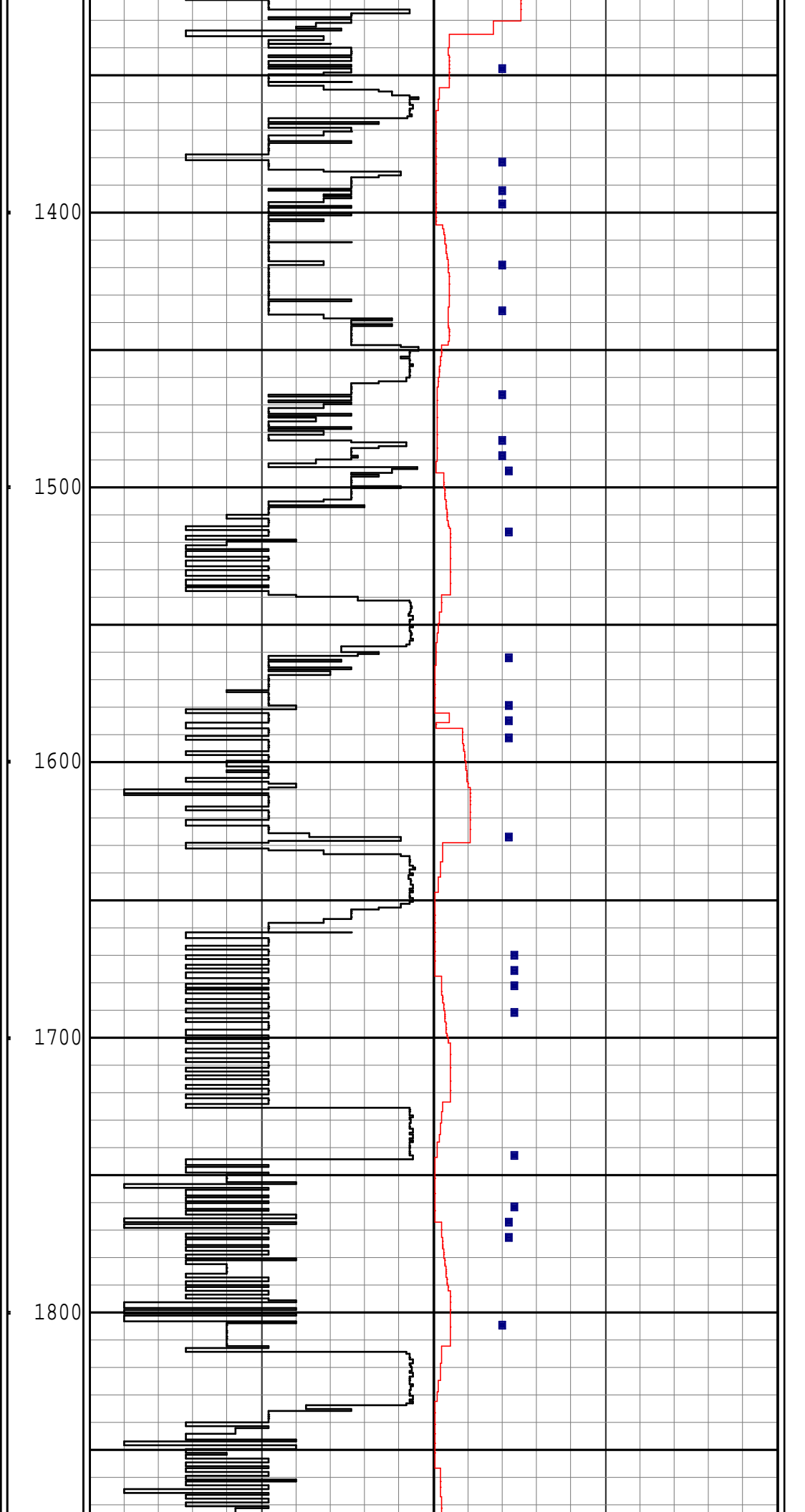
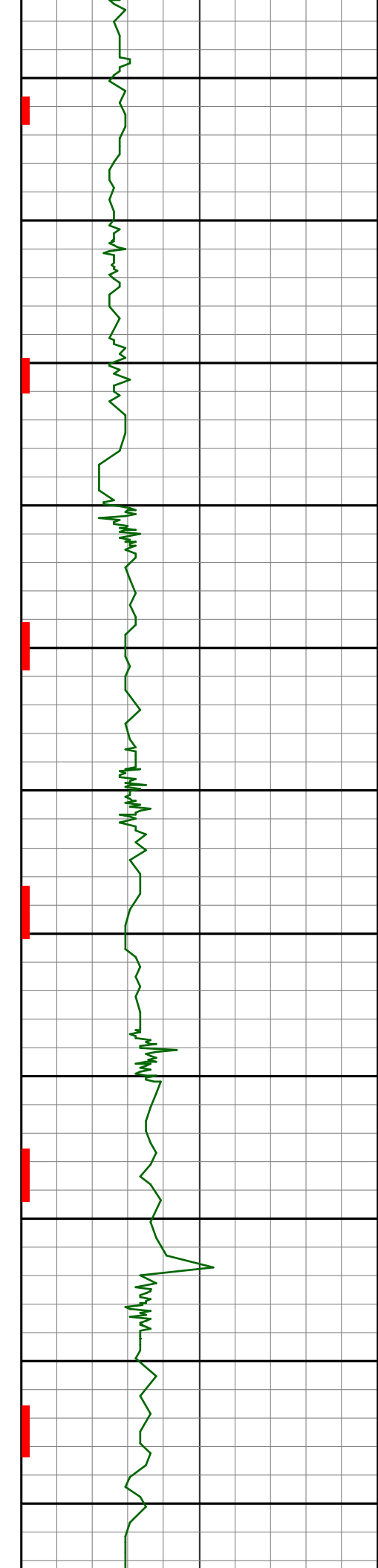
RUN DATA

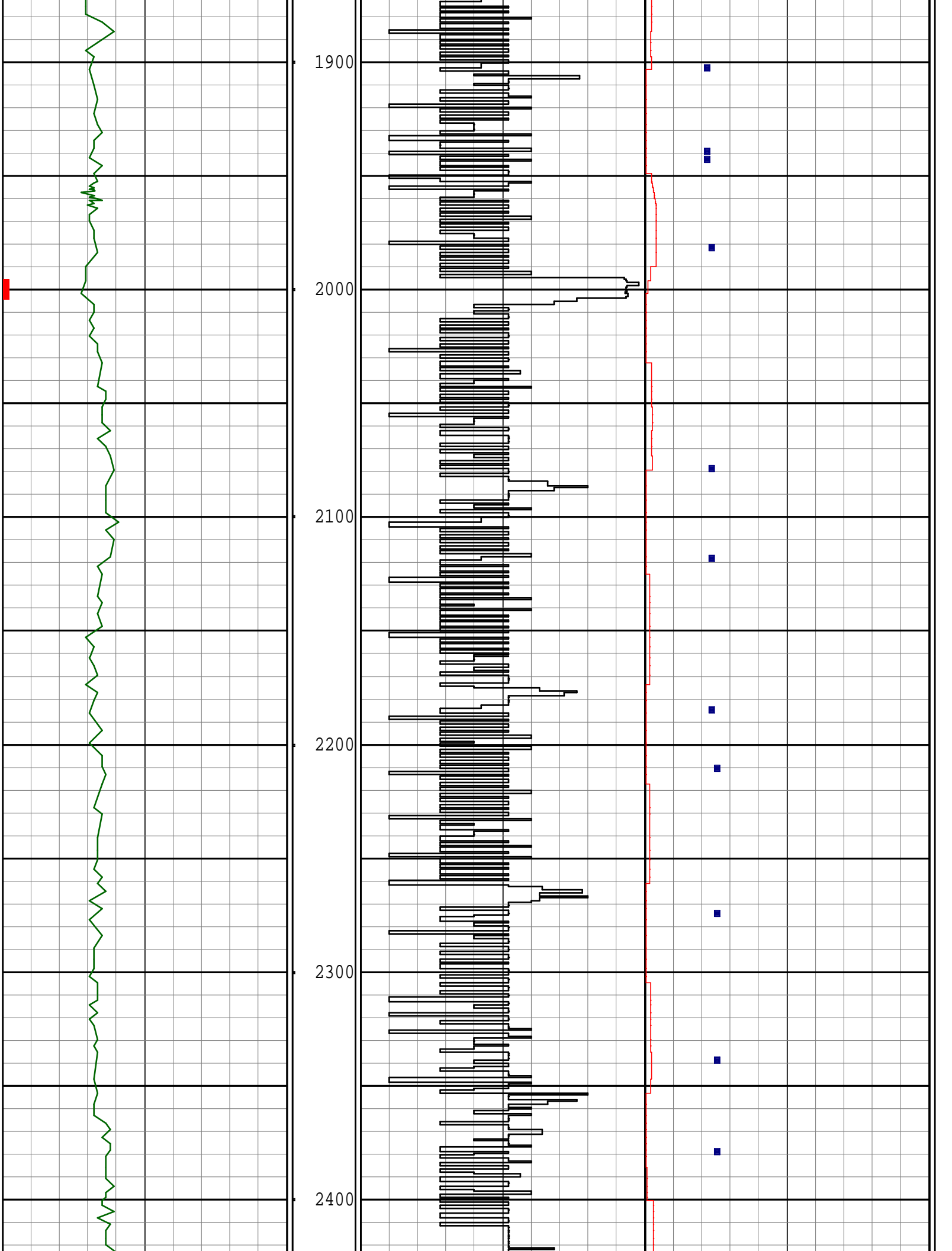
RUN NUMBER	1	3	4			
START DATE	18-JAN-15	20-JAN-15	22-JAN-15			
START TIME	06:15	04:45	03:30			
END DATE	19-JAN-15	21-JAN-15	24-JAN-15			
END TIME	23:00	05:30	12:00			
DEPTH IN ft	720	6158	6992			
DEPTH OUT ft	6158	6992	11772			
LOG TOP ft	720	6115	6952			
LOG BOTTOM ft	6115	6952	11730			
HOLE SIZE in	8 3/4	8 3/4	6 1/8			
MUD DATA @ ft	1450	6500	8693			
MUD TYPE	WATER BASED	WATER BASED	WATER BASED			
DENSITY lb/gal	8.40	10.90	9.70			
VISCOSITY s/qt	28	42	38			
pH	8.2	8.4	8.8			
FLUID LOSS cm3/30	0.0	0.0	0.0			
SALINITY ppm	2000	2000	2200			
Rm ohmm @ deg F	@	@	@			
Rmf ohmm @ deg F	@	@	@			

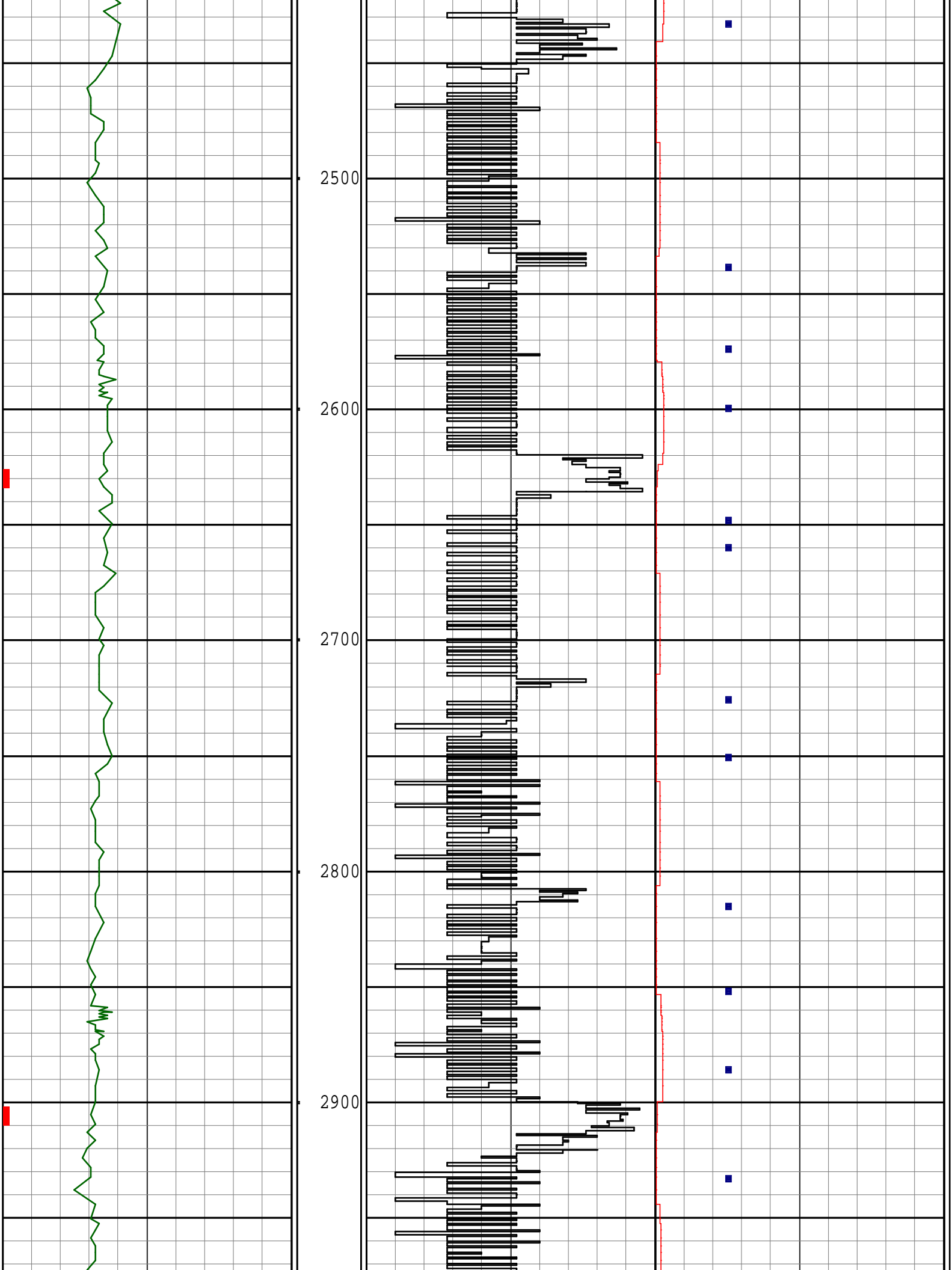
REMARKS
NOBLE ENERGY INC. AFE #: 200461
PATHFINDER JOB #: 15CC00125
ALL LOGGING DATA IS TRANSMITTED ONLY UNLESS STATED OTHERWISE.
ALL REFERENCES TO LOG TOP, LOG BOTTOM, OR LOGGING TOOL DEPTH REFER TO THE GAMMA-RAY SENSOR UNLESS STATED OTHERWISE.
ALL ANNOTATIONS IN THE DEPTH TRACK ARE REFERENCED TO BIT DEPTH.
LOGGED THROUGH CASING.
THIRD PARTY DEPTH TRACKING SERVICES PROVIDED BY PASON.
RUN #1: 6 3/4 HDS-1R/GAMMA LOGGING RUN.
RUN #3: 6 3/4 HDS-1R/GAMMA LOGGING RUN.
RUN #4: 4 3/4 HDS-1R/GAMMA LOGGING RUN.
NOTICE - All interpretations are opinions based on inferences from electrical or other measurements and we do not guarantee the accuracy or correctness of any interpretations. We shall not, except in the case of gross or willful negligence on our part, be liable or responsible for loss, costs, damages or expenses incurred or sustained by anyone as a result of any interpretations made by one of our officers, agents or employees. These interpretations are also subject to our General Terms and Conditions as set out in our current Price Schedule.
PATHFINDER - A Schlumberger Company
Version No : RX5 V6.05B Release 20Jun2014
Plot Time : 24-Jan-2015 13:00

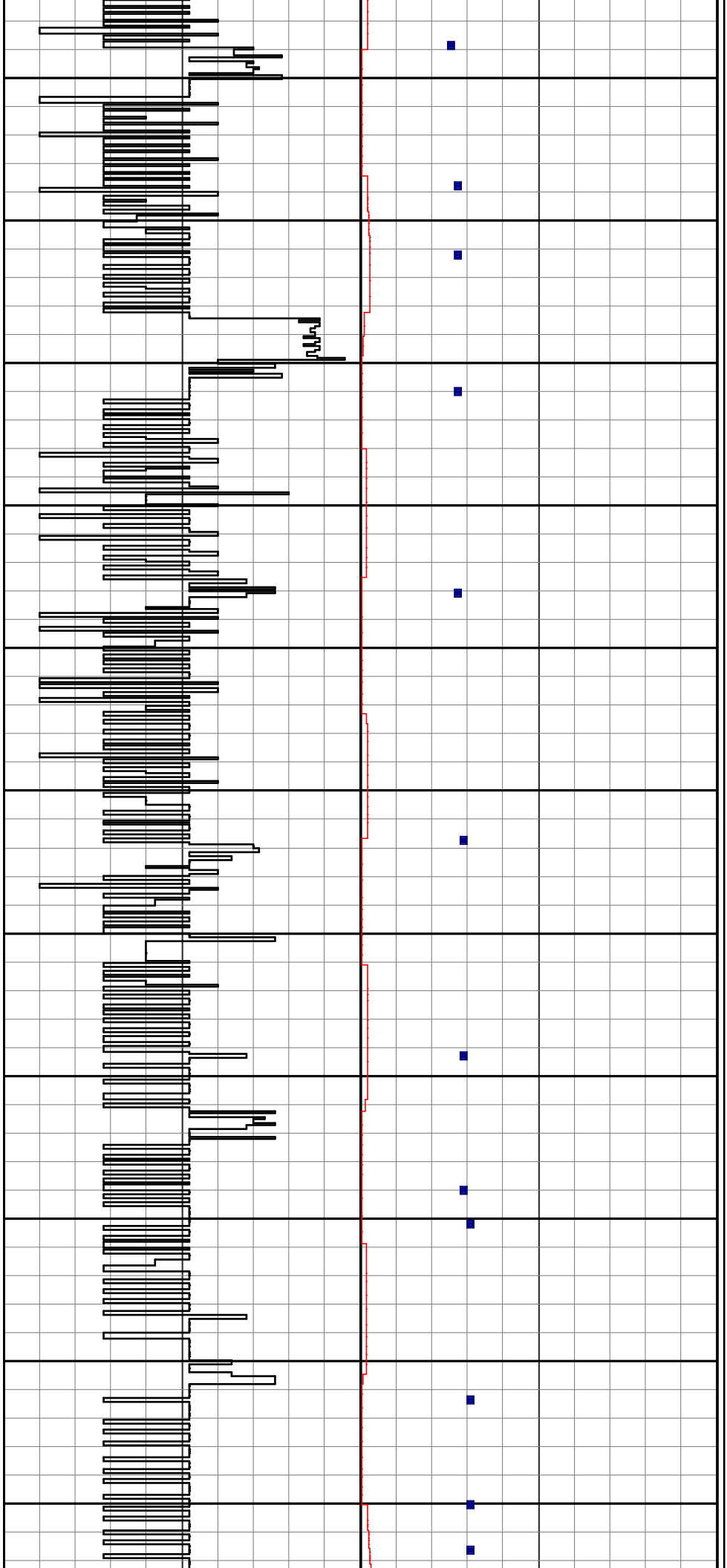
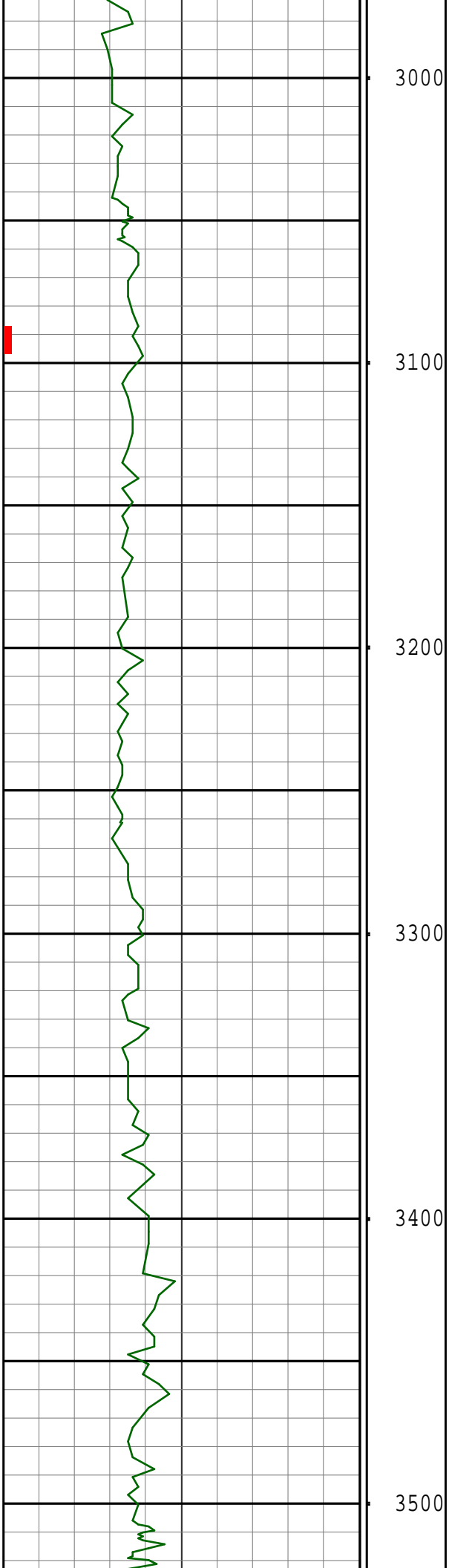


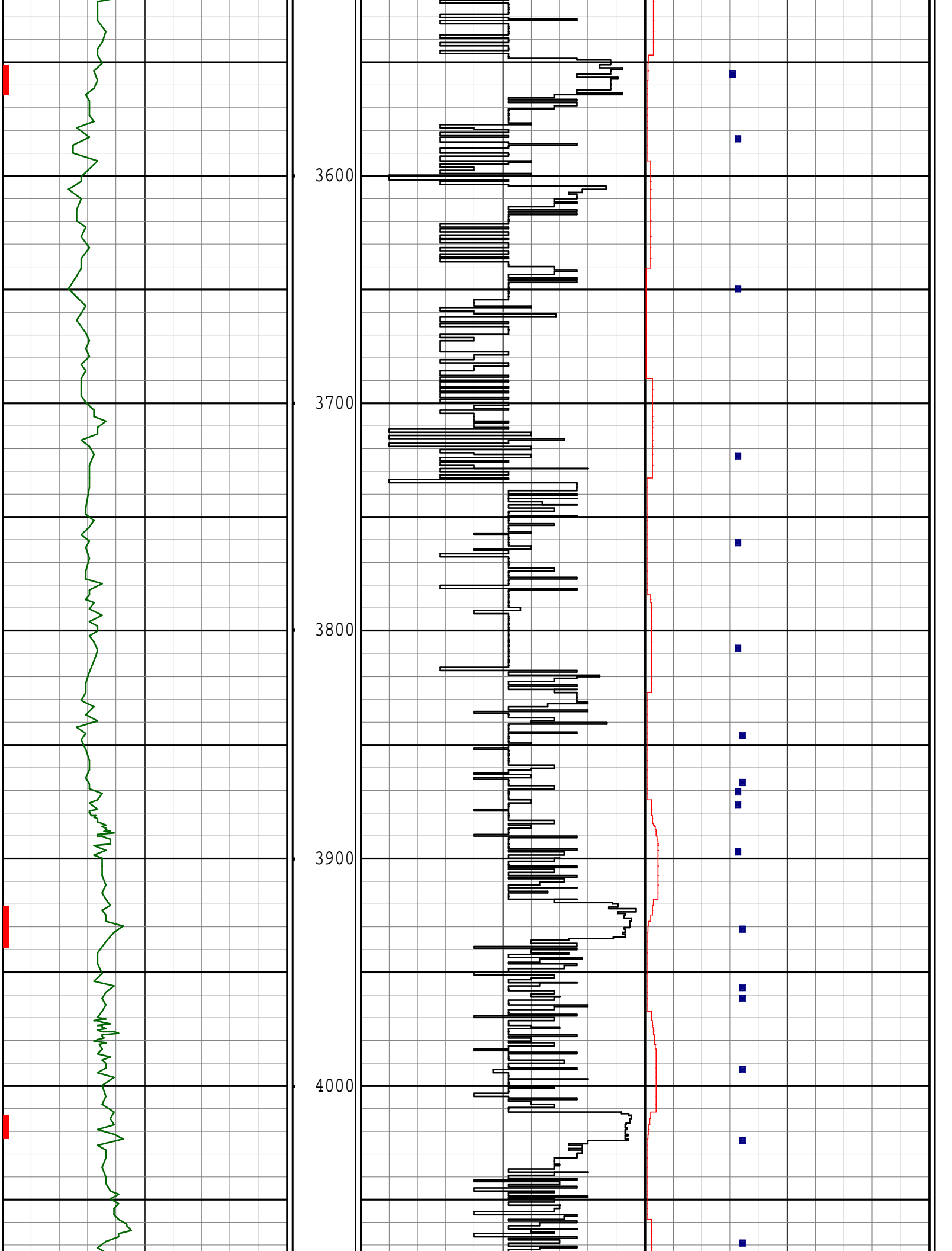


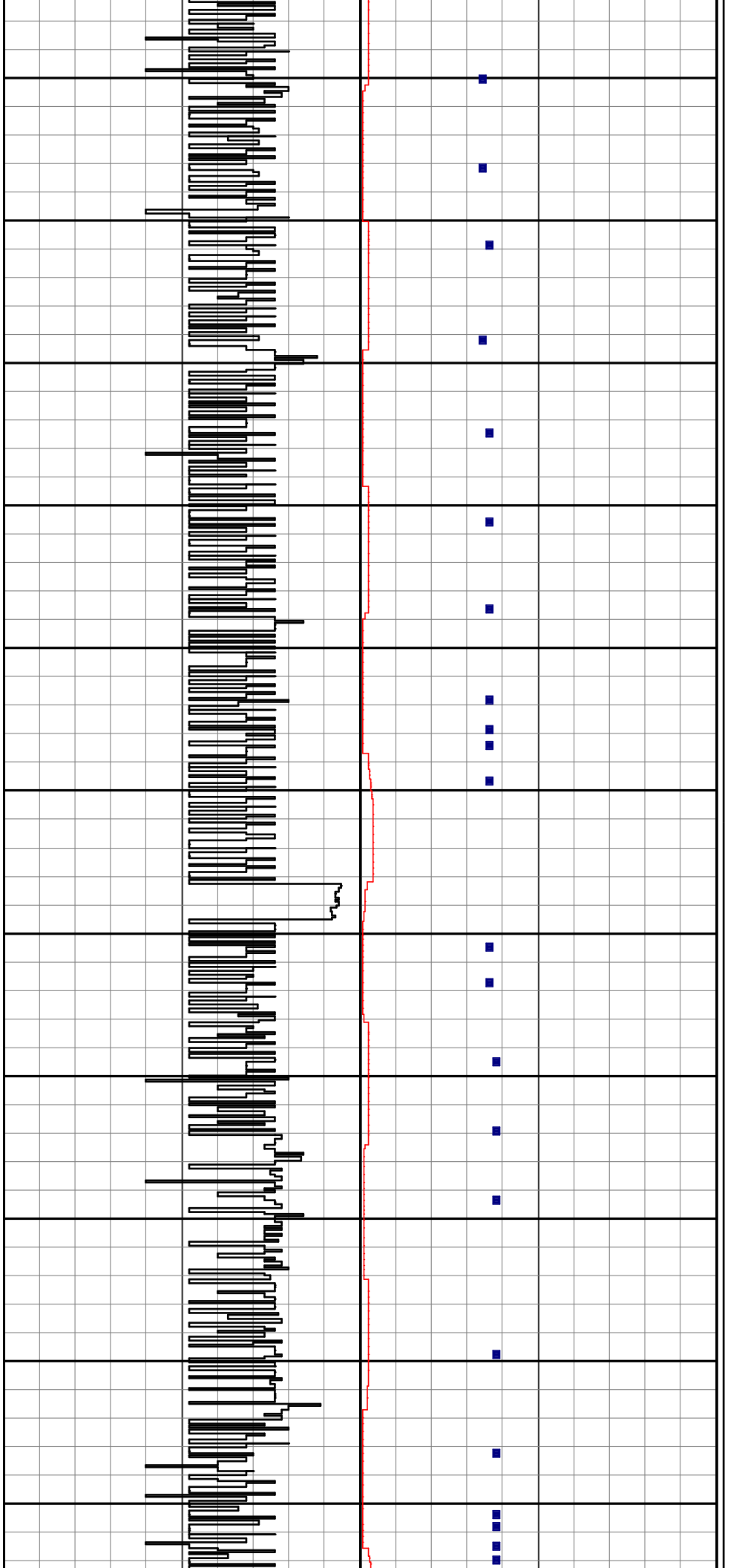
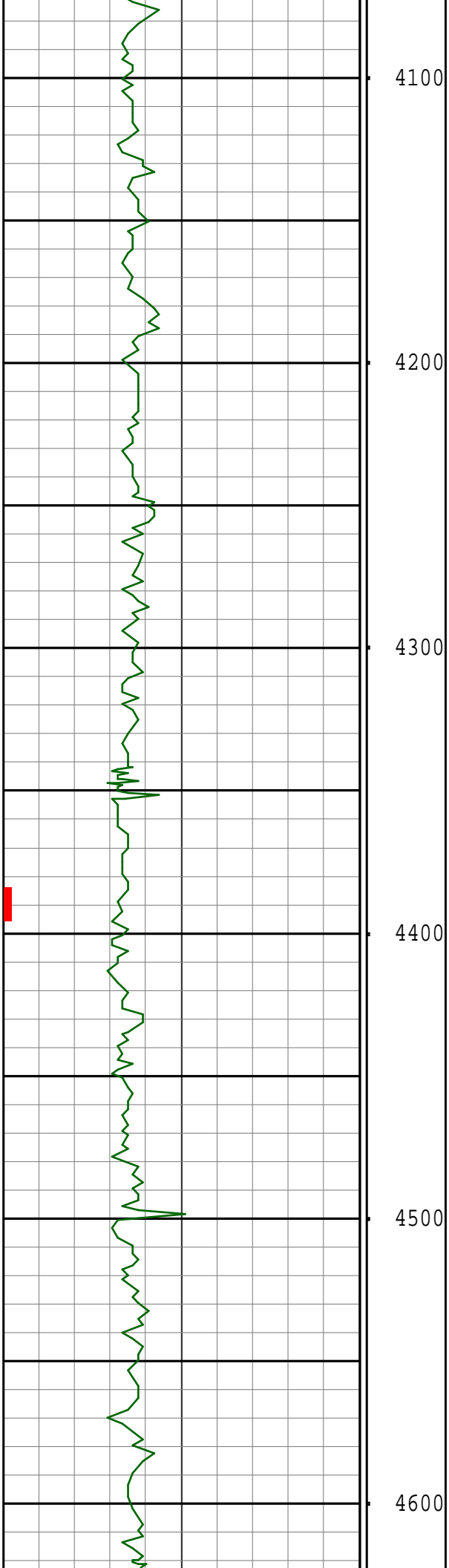


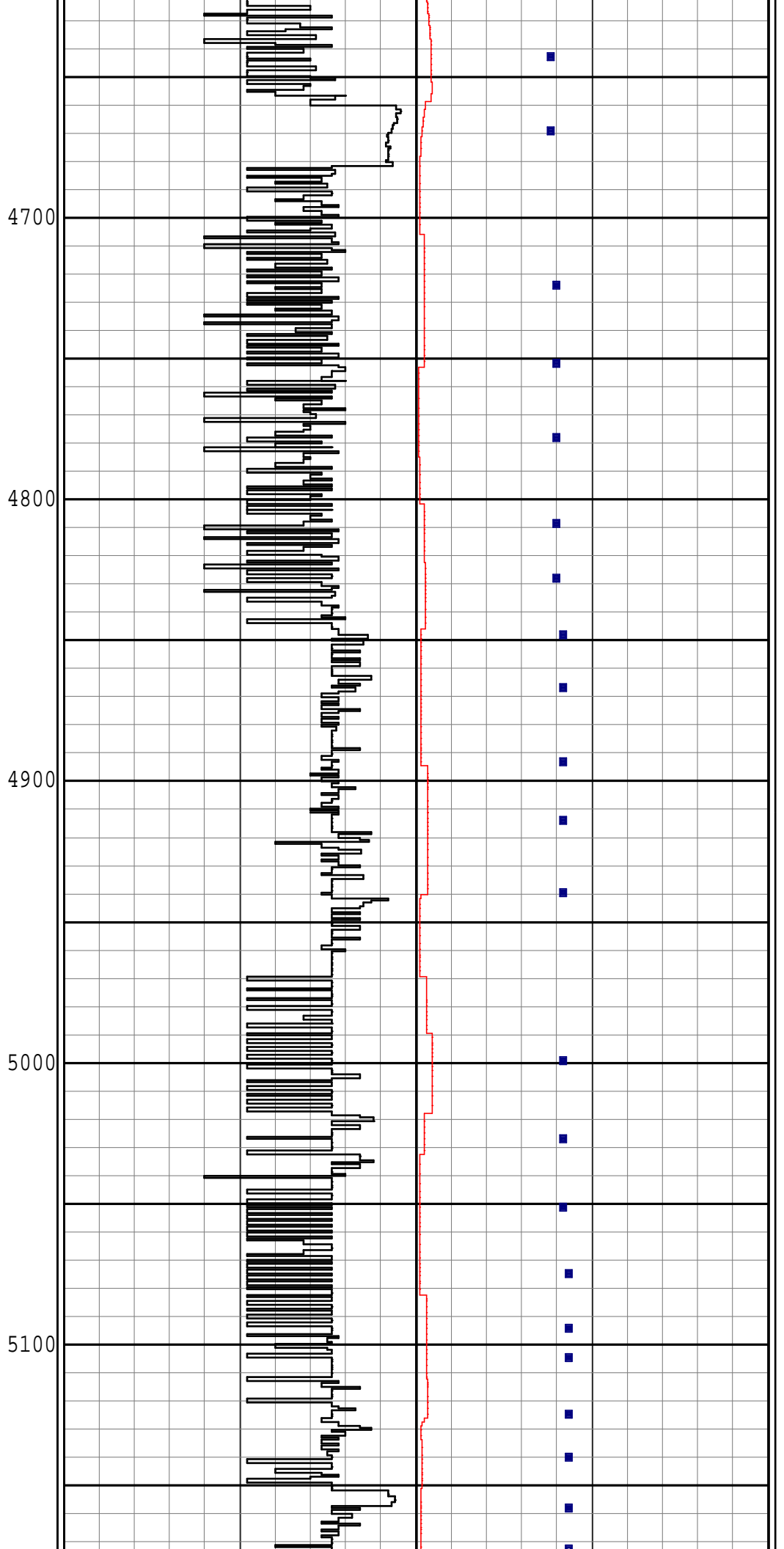
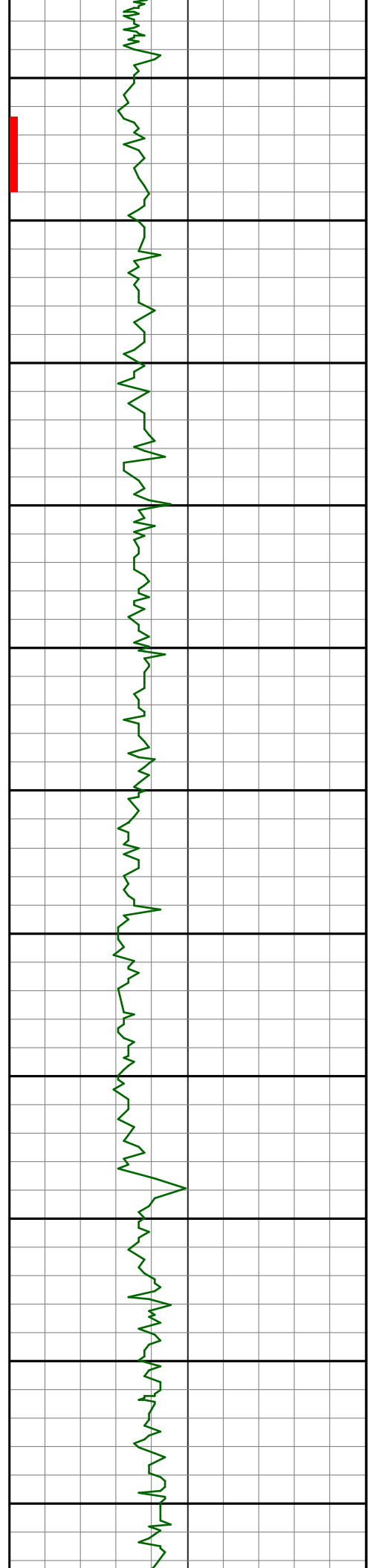


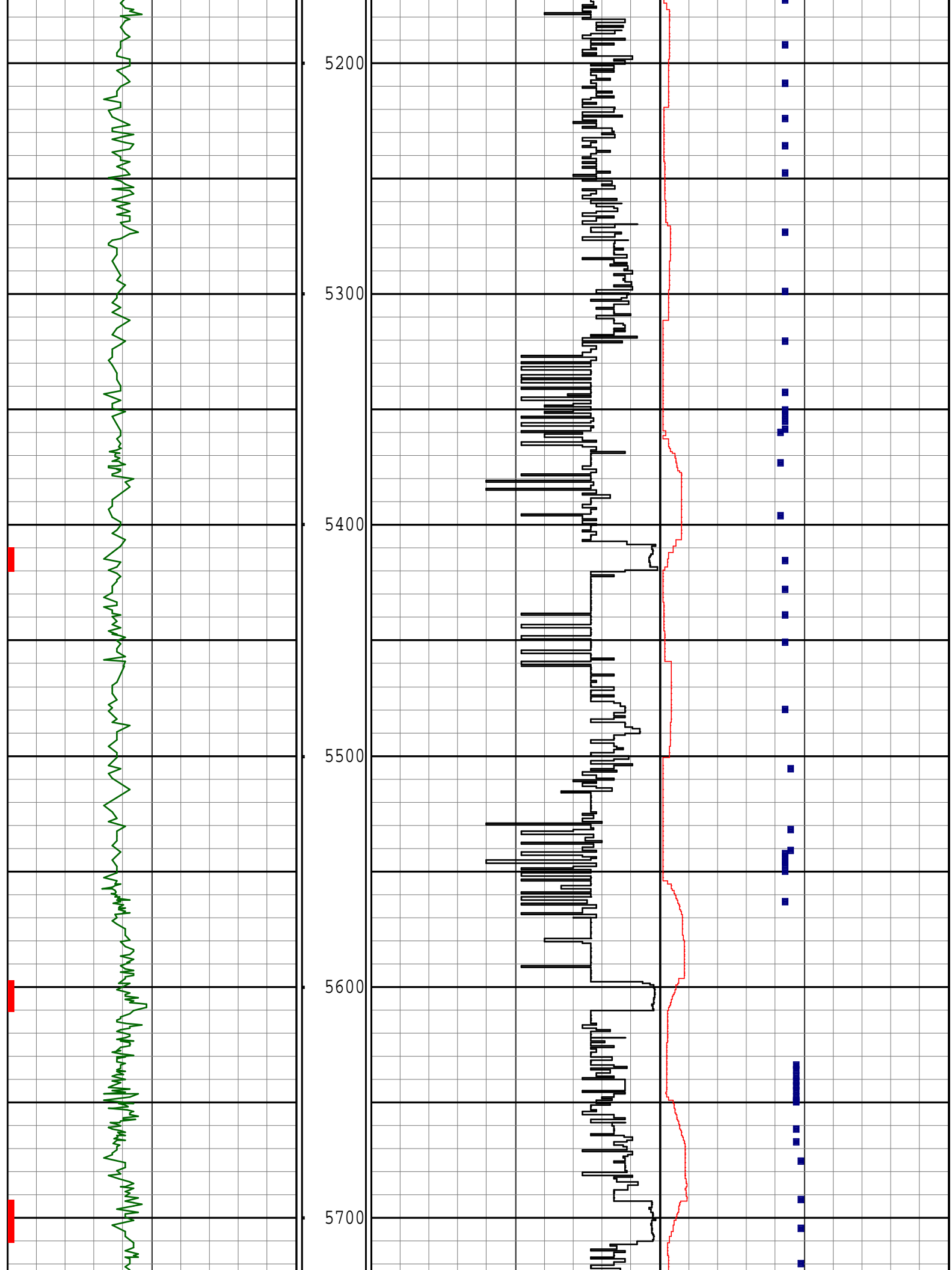


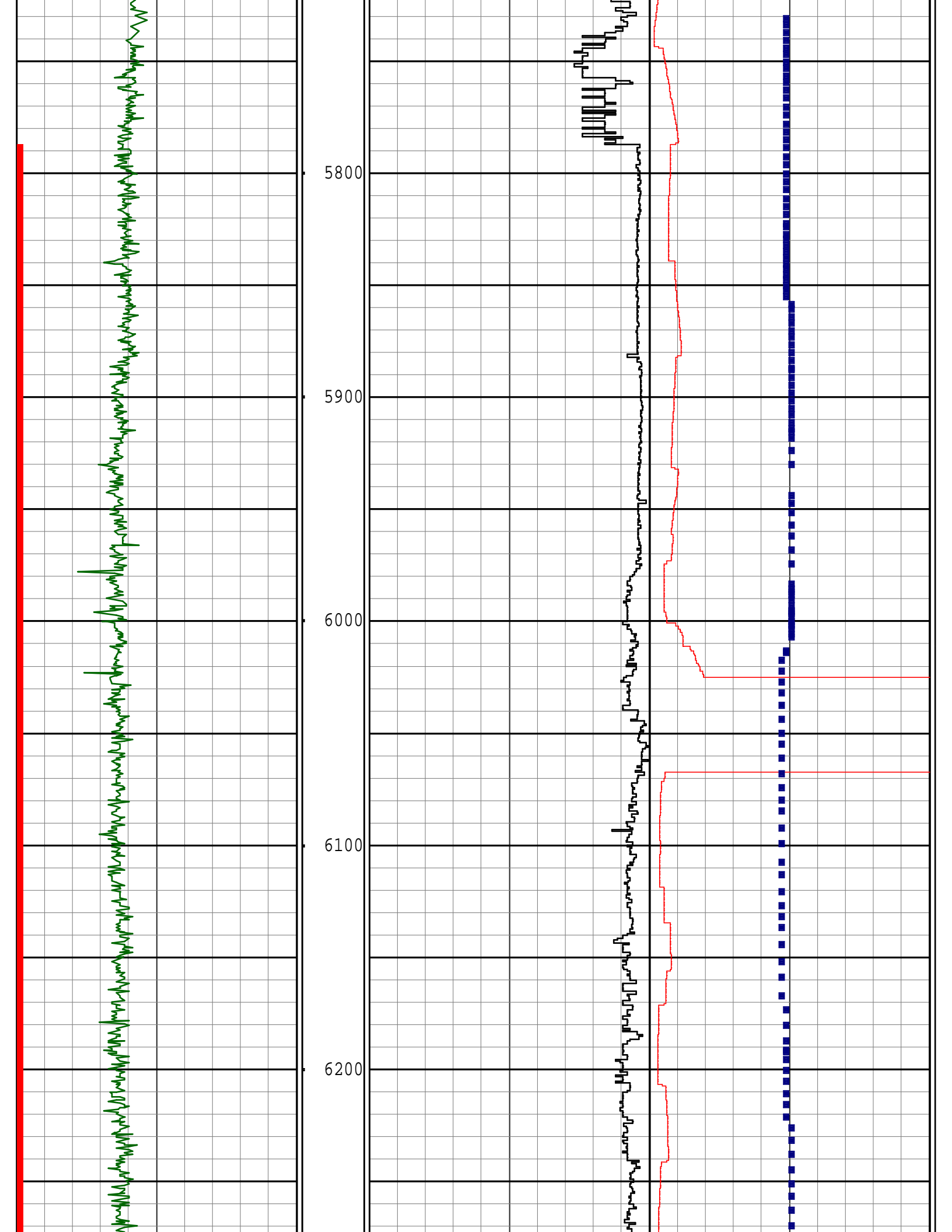


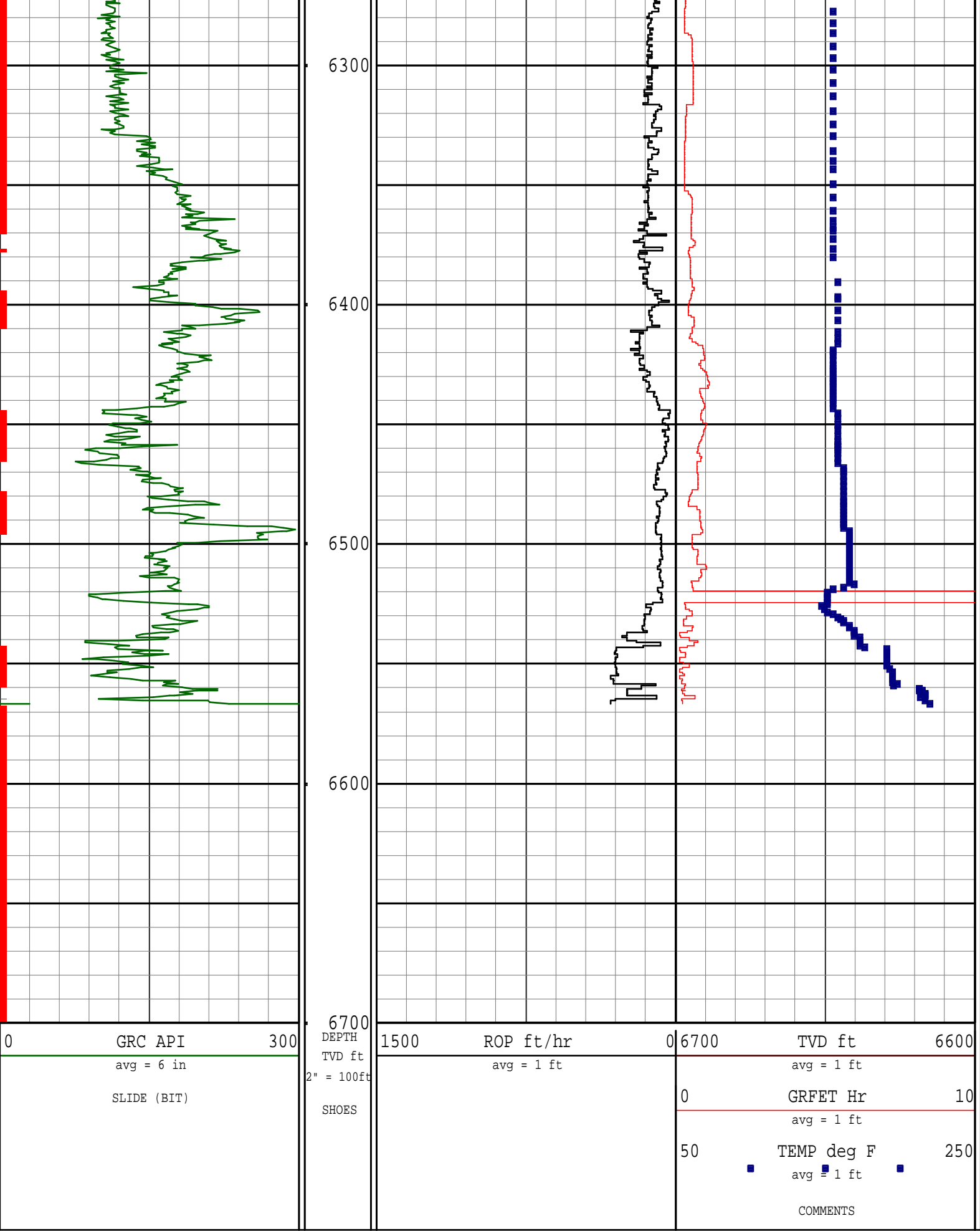












Survey Report

Vertical Section Plane: 276.80° Total Correction: 7.38° East to Grid

Calculation Method: Minimum Curvature						Survey Reference: Wellhead					
North Aligned to: Grid North						Well: WELLS RANCH AE19-649					
30' ROTARY TABLE TO GROUND LEVEL						WATTENBERG					
Measured Depth (ft)	Inclination (deg)	Azimuth (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	Rect Co-ord North (ft)	Rect Co-ord East (ft)	Closure Distance (ft)	Closure Direction (deg)	Dog-leg Severity (dg/hft)	Temp (deg F)
TIED - IN TO SURFACE											
0.00	0.00	0.00	0.00		0.00	0.00 N	0.00 E	0.00	0.00		
376.00	0.10	326.20	376.00	376.00	0.21	0.27 N	0.18 W	0.33	326.20	0.03	
710.00	0.60	252.40	709.99	334.00	2.00	0.01 S	2.01 W	2.01	269.60	0.17	
THE FOLLOWING ARE PATHFINDER MWD SURVEYS											
813.00	0.62	232.22	812.99	103.00	2.88	0.52 S	2.97 W	3.01	260.09	0.21	75.72
906.00	0.79	234.57	905.98	93.00	3.72	1.20 S	3.89 W	4.07	252.86	0.19	79.34
1000.00	0.70	245.33	999.97	94.00	4.69	1.81 S	4.94 W	5.26	249.83	0.18	79.34
1090.00	0.97	247.05	1089.96	90.00	5.82	2.34 S	6.14 W	6.57	249.13	0.30	82.95
1183.00	2.64	305.15	1182.92	93.00	8.39	1.41 S	8.61 W	8.73	260.68	2.45	86.57
1297.00	3.87	324.27	1296.74	114.00	13.30	3.22 N	13.01 W	13.40	283.91	1.43	86.57
1390.00	4.75	337.92	1389.47	93.00	17.28	9.34 N	16.29 W	18.77	299.82	1.45	90.18
1482.00	5.98	343.13	1481.07	92.00	21.04	17.45 N	19.11 W	25.88	312.41	1.44	90.18
1573.00	8.00	350.20	1571.39	91.00	24.75	28.23 N	21.56 W	35.52	322.63	2.41	93.80
1666.00	10.02	351.11	1663.24	93.00	28.79	42.60 N	23.92 W	48.86	330.69	2.18	93.80
1759.00	12.05	348.30	1754.52	93.00	34.06	60.10 N	27.14 W	65.95	335.70	2.26	97.41
1853.00	14.68	346.19	1845.96	94.00	41.37	81.28 N	31.97 W	87.34	338.53	2.84	90.18
1944.00	15.04	346.51	1933.92	91.00	49.52	103.96 N	37.48 W	110.51	340.18	0.41	93.80
2037.00	14.07	341.75	2023.94	93.00	58.49	126.43 N	43.83 W	133.81	340.88	1.66	97.41
2130.00	13.89	342.49	2114.18	93.00	67.87	147.81 N	50.73 W	156.28	341.06	0.27	97.41
2316.00	14.33	342.53	2294.57	186.00	86.53	191.06 N	64.36 W	201.61	341.38	0.24	101.02
2410.00	14.07	342.81	2385.70	94.00	95.95	213.07 N	71.23 W	224.66	341.52	0.29	101.02
2502.00	14.25	342.80	2474.90	92.00	105.11	234.57 N	77.88 W	247.16	341.63	0.20	101.02
2596.00	14.60	342.38	2565.94	94.00	114.71	256.92 N	84.89 W	270.58	341.72	0.39	101.02
2691.00	13.98	336.67	2658.00	95.00	125.42	278.87 N	93.06 W	293.98	341.55	1.62	101.02
2786.00	14.25	336.16	2750.13	95.00	137.14	300.10 N	102.33 W	317.06	341.17	0.31	101.02
2881.00	14.42	336.79	2842.18	95.00	149.01	321.66 N	111.71 W	340.51	340.85	0.24	101.02
2976.00	13.54	332.33	2934.36	95.00	161.23	342.39 N	121.54 W	363.32	340.46	1.46	101.02
3070.00	13.54	330.96	3025.75	94.00	173.90	361.75 N	131.99 W	385.08	339.95	0.34	101.02
3165.00	12.05	336.96	3118.40	95.00	185.34	380.60 N	141.27 W	405.97	339.64	2.10	104.64
3260.00	12.05	337.86	3211.30	95.00	195.08	398.91 N	148.89 W	425.79	339.53	0.20	108.25
3354.00	11.70	338.91	3303.29	94.00	204.28	416.89 N	156.02 W	445.13	339.48	0.44	108.25
3449.00	10.90	339.33	3396.45	95.00	212.93	434.28 N	162.65 W	463.75	339.47	0.85	111.87
3545.00	10.29	338.97	3490.81	96.00	221.12	450.78 N	168.94 W	481.40	339.46	0.64	111.87
3640.00	11.52	341.62	3584.09	95.00	229.12	467.70 N	174.97 W	499.36	339.49	1.40	111.87
3734.00	12.31	343.03	3676.07	94.00	237.15	486.19 N	180.86 W	518.74	339.60	0.90	115.48
3829.00	13.19	342.88	3768.73	95.00	245.63	506.24 N	187.00 W	539.67	339.73	0.93	115.48
3924.00	13.89	342.81	3861.08	95.00	254.66	527.49 N	193.56 W	561.88	339.85	0.74	119.09
4019.00	13.98	337.37	3953.29	95.00	264.93	548.98 N	201.35 W	584.74	339.86	1.38	119.09
4114.00	12.22	340.51	4045.82	95.00	275.03	569.05 N	209.12 W	606.26	339.82	2.00	119.09
4209.00	11.70	340.29	4138.75	95.00	283.78	587.60 N	215.72 W	625.94	339.84	0.55	122.71
4303.00	10.99	340.92	4230.92	94.00	291.94	605.04 N	221.87 W	644.43	339.86	0.77	122.71
4397.00	10.20	339.47	4323.31	94.00	299.68	621.30 N	227.71 W	661.71	339.87	0.89	122.71
4492.00	11.08	342.17	4416.68	95.00	307.34	637.87 N	233.46 W	679.25	339.90	1.06	122.71
4586.00	10.38	342.42	4509.04	94.00	314.60	654.54 N	238.78 W	696.73	339.96	0.75	126.32
4681.00	9.50	343.90	4602.61	95.00	321.19	670.23 N	243.54 W	713.11	340.03	0.96	126.32
4775.00	10.64	345.28	4695.16	94.00	327.39	686.08 N	247.90 W	729.49	340.13	1.24	129.94
4869.00	10.20	342.81	4787.61	94.00	333.96	702.42 N	252.56 W	746.45	340.22	0.67	129.94
4963.00	10.02	342.81	4880.15	94.00	340.66	718.18 N	257.44 W	762.93	340.28	0.19	133.55
5057.00	9.50	342.01	4972.79	94.00	347.24	733.37 N	262.25 W	778.85	340.32	0.57	133.55
5152.00	8.62	340.99	5066.60	95.00	353.63	747.56 N	266.99 W	793.81	340.35	0.94	137.17
5246.00	7.74	340.10	5159.65	94.00	359.54	760.17 N	271.44 W	807.18	340.35	0.95	137.17
5341.00	6.42	345.77	5253.92	95.00	364.32	771.34 N	274.93 W	818.87	340.38	1.57	137.17
5436.00	6.16	342.75	5348.35	95.00	368.30	781.35 N	277.74 W	829.25	340.43	0.44	137.17
5530.00	4.75	342.70	5441.92	94.00	371.95	789.89 N	280.40 W	838.18	340.46	1.50	137.17
5625.00	4.04	346.11	5536.64	95.00	374.74	796.89 N	282.37 W	845.44	340.49	0.80	140.78
5719.00	2.73	350.46	5630.48	94.00	376.54	802.31 N	283.53 W	850.94	340.54	1.42	144.39
5814.00	1.41	358.65	5725.41	95.00	377.34	805.71 N	283.94 W	854.28	340.59	1.42	148.01
5908.00	2.81	306.33	5819.35	94.00	379.51	808.24 N	285.82 W	857.29	340.52	2.39	148.01
6003.00	6.77	277.55	5914.01	95.00	387.14	810.35 N	293.25 W	861.78	340.11	4.75	151.62
6098.00	9.41	270.23	6008.06	95.00	400.45	811.12 N	306.57 W	867.12	339.30	2.98	151.62
6195.00	14.25	271.77	6102.97	97.00	420.24	811.52 N	326.45 W	874.72	338.09	5.00	144.39
6289.00	23.92	276.99	6191.71	94.00	450.89	814.20 N	357.00 W	889.03	336.32	10.44	148.01
6384.00	35.79	273.24	6273.96	95.00	498.05	818.13 N	404.02 W	912.45	333.72	12.64	151.62
6478.00	50.21	273.16	6342.53	94.00	561.86	821.69 N	467.86 W	945.56	330.34	15.34	155.24
6573.00	59.79	276.36	6396.96	95.00	639.53	828.27 N	545.30 W	991.65	326.64	10.45	158.85
6668.00	63.22	276.68	6442.28	95.00	723.01	837.75 N	628.23 W	1047.14	323.13	3.62	155.24
6762.00	70.17	269.14	6479.49	94.00	808.99	841.98 N	714.33 W	1104.17	319.69	10.43	162.46
6857.00	77.65	262.44	6505.83	95.00	898.45	835.19 N	805.23 W	1160.14	316.05	10.38	166.08
6934.00	83.19	263.58	6518.64	77.00	972.16	825.96 N	880.56 W	1207.31	313.17	7.34	169.69
7024.00	85.91	264.95	6527.19	90.00	1059.61	817.01 N	969.69 W	1267.99	310.12	3.38	148.01

Survey Report					
Vertical Section Plane: 276.80°			Total Correction: 7.38° East to Grid		
Calculation Method: Minimum Curvature			Survey Reference: Wellhead		
North Aligned to: Grid North			Well: WELLS RANCH AE19-649		

30' ROTARY TABLE TO GROUND LEVEL						WATTENBERG					
Measured Depth (ft)	Inclination (deg)	Azimuth (deg)	TVD (ft)	Course Length (ft)	Vertical Section (ft)	Rect Co-ord North (ft)	Rect Co-ord East (ft)	Closure Distance (ft)	Closure Direction (deg)	Dog-leg Severity (dg/hft)	Temp (deg F)
7117.00	85.91	263.60	6533.82	93.00	1150.16	807.76 N	1061.99 W	1334.28	307.26	1.45	166.08
7210.00	86.61	263.90	6539.88	93.00	1240.57	797.65 N	1154.24 W	1403.04	304.65	0.82	173.31
7303.00	88.81	266.73	6543.60	93.00	1331.62	790.07 N	1246.84 W	1476.08	302.36	3.85	176.92
7397.00	91.89	269.40	6543.03	94.00	1424.50	786.89 N	1340.77 W	1554.62	300.41	4.34	180.54
7490.00	92.07	270.91	6539.81	93.00	1516.82	787.14 N	1433.71 W	1635.58	298.77	1.63	184.15
7582.00	90.40	269.57	6537.83	92.00	1608.19	787.53 N	1525.68 W	1716.94	297.30	2.33	184.15
7676.00	86.79	269.37	6540.14	94.00	1701.38	786.66 N	1619.63 W	1800.57	295.91	3.85	184.15
7771.00	86.97	268.01	6545.31	95.00	1795.29	784.49 N	1714.46 W	1885.42	294.59	1.44	191.38
7866.00	87.32	268.63	6550.04	95.00	1889.13	781.71 N	1809.31 W	1970.95	293.37	0.75	191.38
7961.00	87.93	267.40	6553.97	95.00	1982.94	778.42 N	1904.16 W	2057.13	292.23	1.44	194.99
8055.00	88.29	267.35	6557.08	94.00	2075.62	774.12 N	1998.01 W	2142.74	291.18	0.39	198.61
8150.00	88.72	266.98	6559.55	95.00	2169.24	769.42 N	2092.86 W	2229.82	290.19	0.60	198.61
8245.00	91.36	268.06	6559.49	95.00	2262.99	765.31 N	2187.77 W	2317.76	289.28	3.00	198.61
8339.00	91.80	267.74	6556.90	94.00	2355.83	761.87 N	2281.67 W	2405.50	288.46	0.58	198.61
8434.00	90.40	269.49	6555.07	95.00	2449.83	759.57 N	2376.62 W	2495.05	287.72	2.36	198.61
8528.00	90.48	268.37	6554.35	94.00	2542.94	757.82 N	2470.60 W	2584.21	287.05	1.19	202.22
8622.00	91.80	268.27	6552.48	94.00	2635.90	755.06 N	2564.53 W	2673.38	286.41	1.41	202.22
8717.00	91.28	269.41	6549.93	95.00	2729.95	753.14 N	2659.48 W	2764.06	285.81	1.32	202.22
8812.00	88.99	269.86	6549.70	95.00	2824.20	752.53 N	2754.47 W	2855.42	285.28	2.46	202.22
8906.00	90.57	270.05	6550.06	94.00	2917.52	752.46 N	2848.47 W	2946.18	284.80	1.69	205.83
9000.00	91.98	269.39	6547.97	94.00	3010.78	752.00 N	2942.44 W	3037.01	284.34	1.66	205.83
9095.00	91.01	269.74	6545.49	95.00	3104.99	751.28 N	3037.40 W	3128.94	283.89	1.09	205.83
9189.00	89.43	269.73	6545.13	94.00	3198.27	750.85 N	3131.40 W	3220.16	283.48	1.68	202.22
9284.00	90.84	269.76	6544.91	95.00	3292.55	750.42 N	3226.39 W	3312.51	283.09	1.48	205.83
9378.00	89.16	270.25	6544.91	94.00	3385.89	750.43 N	3320.39 W	3404.14	282.74	1.86	205.83
9472.00	87.58	271.23	6547.58	94.00	3479.32	751.64 N	3414.34 W	3496.10	282.42	1.98	202.22
9566.00	87.67	270.02	6551.48	94.00	3572.69	752.67 N	3508.25 W	3588.08	282.11	1.29	205.83
9661.00	88.29	270.33	6554.83	95.00	3667.00	752.96 N	3603.19 W	3681.02	281.80	0.73	205.83
9755.00	89.43	270.44	6556.70	94.00	3760.39	753.59 N	3697.17 W	3773.19	281.52	1.22	209.45
9849.00	89.87	270.14	6557.27	94.00	3853.78	754.07 N	3791.17 W	3865.43	281.25	0.57	209.45
9943.00	90.22	269.95	6557.20	94.00	3947.13	754.14 N	3885.17 W	3957.68	280.98	0.42	209.45
10037.00	89.52	268.93	6557.41	94.00	4040.35	753.22 N	3979.16 W	4049.82	280.72	1.32	209.45
10132.00	89.43	268.22	6558.28	95.00	4134.37	750.86 N	4074.13 W	4142.74	280.44	0.75	213.06
10226.00	89.52	267.68	6559.14	94.00	4227.25	747.50 N	4168.06 W	4234.56	280.17	0.58	213.06
10320.00	89.69	267.02	6559.79	94.00	4319.97	743.15 N	4261.96 W	4326.26	279.89	0.72	213.06
10415.00	90.22	267.06	6559.86	95.00	4413.59	738.24 N	4356.83 W	4418.93	279.62	0.56	216.68
10509.00	89.16	267.82	6560.37	94.00	4506.34	734.05 N	4450.73 W	4510.86	279.37	1.39	213.06
10603.00	89.16	268.06	6561.75	94.00	4599.21	730.67 N	4544.66 W	4603.02	279.13	0.25	216.68
10698.00	89.43	267.20	6562.92	95.00	4692.99	726.74 N	4639.57 W	4696.15	278.90	0.95	216.68
10792.00	89.08	266.98	6564.14	94.00	4785.63	721.97 N	4733.44 W	4788.19	278.67	0.44	216.68
10887.00	89.60	268.01	6565.24	95.00	4879.37	717.82 N	4828.35 W	4881.41	278.46	1.21	216.68
10981.00	89.43	267.95	6566.03	94.00	4972.26	714.50 N	4922.28 W	4973.87	278.26	0.19	220.29
11076.00	89.08	267.39	6567.27	95.00	5066.05	710.64 N	5017.20 W	5067.27	278.06	0.70	220.29
11170.00	90.75	266.95	6567.41	94.00	5158.72	706.00 N	5111.08 W	5159.61	277.86	1.84	220.29
11265.00	90.40	266.77	6566.45	95.00	5252.29	700.80 N	5205.93 W	5252.89	277.67	0.41	220.29
11359.00	90.13	265.32	6566.02	94.00	5344.63	694.31 N	5299.70 W	5344.99	277.46	1.57	216.68
11454.00	91.28	264.95	6564.85	95.00	5437.66	686.26 N	5394.35 W	5437.83	277.25	1.27	220.29
11548.00	90.48	267.38	6563.41	94.00	5530.03	679.97 N	5488.12 W	5530.09	277.06	2.72	220.29
11644.00	90.48	267.27	6562.60	96.00	5624.71	675.49 N	5584.01 W	5624.72	276.90	0.12	223.91
11711.00	91.54	267.25	6561.42	67.00	5690.78	672.29 N	5650.93 W	5690.78	276.78	1.58	223.91
STRAIGHT LINE PROJECTION TO BIT AT 11772'MD											
11772.00	91.54	267.25	6559.78	61.00	5750.91	669.36 N	5711.83 W	5750.92	276.68	0.00	

BOTTOM HOLE ASSEMBLY RECORD										
RUN #1		ft	RUN #3		ft	RUN #4		ft		
8 3/4" PDC BIT		0.70	8 3/4" PDC BIT		0.70	6 1/8" PDC BIT		0.56		
1.75° MUD MOTOR		26.43	2.25° MUD MOTOR		24.48	1.5° MUD MOTOR		26.81		
NM FLOAT SUB		2.93	NM FLOAT SUB		2.93	NM FLOAT SUB		2.66		
SUB MULESHOE		2.66	SUB MULESHOE		2.66	SUB MULESHOE		3.05		
HDS-1R (DIR/GR)		30.62	HDS-1R (DIR/GR)		30.62	HDS-1R (DIR/GR)		30.03		
NM FLEX DC		31.05	NM FLEX DC		31.05	NM DC		30.73		
NM FLEX DC		31.07	NM FLEX DC		31.07	NM FLOAT SUB		1.78		
FILTER SUB		3.23	FILTER SUB		3.23	NM DC		30.85		
DRILL PIPE		1040.06	DRILL PIPE		1040.06	FILTER SUB		3.10		
XOVER SUB		3.20	XOVER SUB		3.20	XOVER SUB		3.78		
HWDP		1392.51	HWDP		1392.19	HWDP		31.55		
						REAMER		8.52		
						DRILL PIPE		2179.05		
						AGITATOR		11.55		
						SHOUL SUB		11.14		

				SHOCK SUB	11.14		
				DRILL PIPE	3875.91		
				HWDP	1392.91		
=====		=====		=====			
TOTAL BHA LENGTH	2564.46	TOTAL BHA LENGTH	2562.19	TOTAL BHA LENGTH	7643.98		
SENSOR OFFSETS:		SENSOR OFFSETS:		SENSOR OFFSETS:			
=====		=====		=====			
DIRECTIONAL	60.00	DIRECTIONAL	56.45	DIRECTIONAL	58.70		
GAMMA-RAY	42.60	GAMMA-RAY	39.05	GAMMA-RAY	41.30		



A Schlumberger Company

GAMMA-RAY

2" = 100'

FEET TVD