



Build & Lateral

Job #:

185174

Well ID:

16190981

Scale:

5" = 100 ft

Type:

MD

Well Site Information

Oil Company Crestone Peak Resources

Surface Location S4-T1N-R65W

Well Name Ruegge 3E-4H-N165

API 05-123-4656500

Field DJ Wattenburg

State Colorado

Country USA

Surface Coordinates

Well Type Horizontal

Latitude 40° 4' 31 N

Longitude 104° 40' 16 W

N / S Coordinates 1,271,336.81 us/ft

E / W Coordinates 3,231,991.72 us/ft

Azimuth Reference True North

Grid Convergence 0.54°

MWD Engineers

Lead Hand Bob Stahlecker

Second Hand Adrian Loma

Perm Datum Ground Elevation 4,916.00 ft

Log depth measured from KB is 23.00 ft above perm datum. KB = 4,939.00 ft

Total Depth 12,202.44 ft Spud Date Jun/03/2018 End Date Jun/06/2018

(MD) Log Interval Start Depth 2,453.46 ft End Depth 12,202.44 ft

Bore Hole Record

Hole Size	From	To
-----------	------	----

13.50 in	0.00 ft	2,515.00 ft
----------	---------	-------------

8.50 in	2,515.00 ft	12,202.44 ft
---------	-------------	--------------

--	--	--

--	--	--

--	--	--

Casing Record

Type	Size	WGT	From	To
------	------	-----	------	----

LT&C	9.63 in	40.00 lbs/ft	0.00 ft	2,515.00 ft
------	---------	--------------	---------	-------------

LT&C	5.50 in	20.00 lbs/ft	0.00 ft	12,202.44 ft
------	---------	--------------	---------	--------------

--	--	--	--	--

--	--	--	--	--

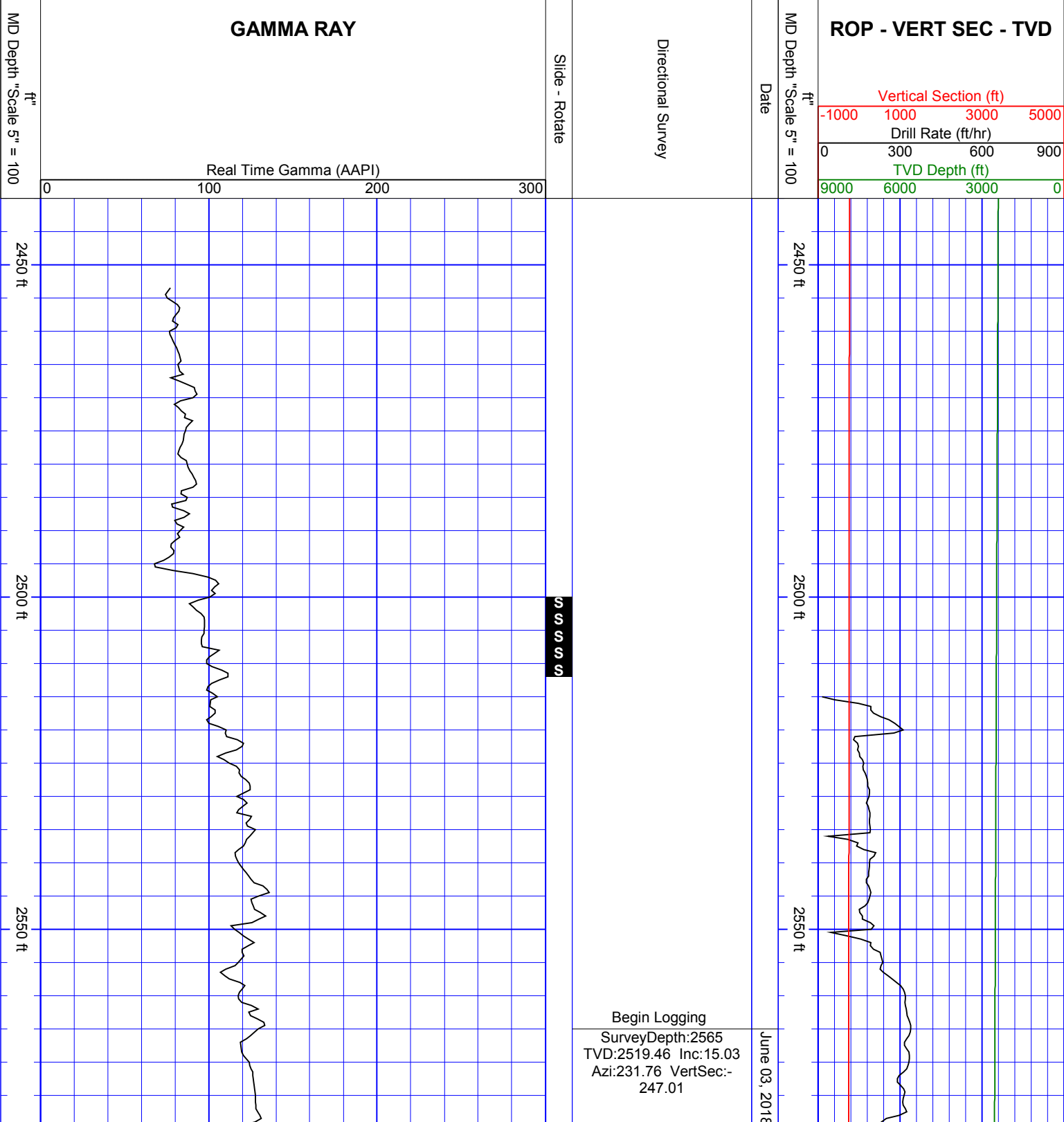
--	--	--	--	--

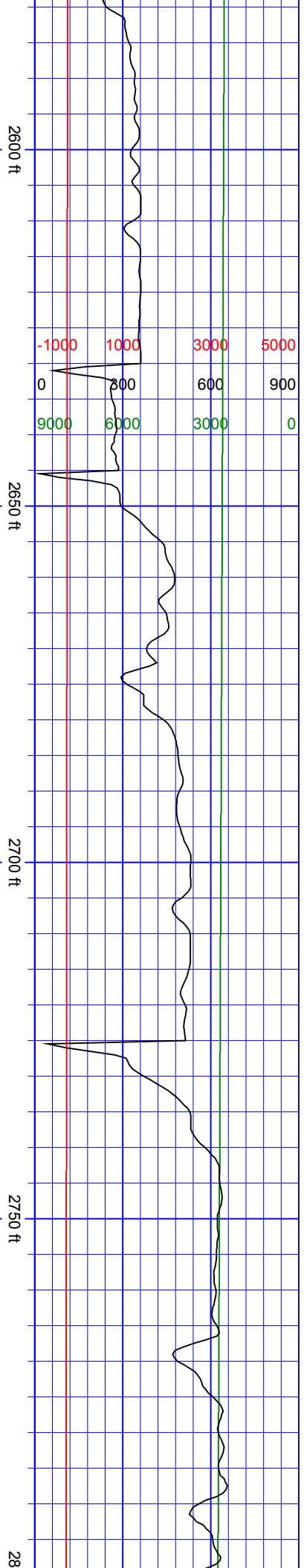
Run Data

Bit Run Number	1				
Start Date & Time	Jun/03/2018 02:30:00				
End Date & Time	Jun/05/2018 12:00:00				
Run Hours	57.50				
Depth In	2,515.00 ft				
Depth Out	12,202.44 ft				
Total Gamma Correction	6.04				
Gamma to Bit	61.55 ft				
Resistivity to Bit	-				
Mud Type	Oil Based Mud				
Density	9.80 ppg				
Viscosity	39.00 sec/qt				
PH	-				
Fluid Loss	16.80 cc				
K+ ppm	-				
CL- ppm	232,506.00 ppm				
Max Mud Temp	251.00 °F				
Mud Report Depth	8,960.00 ft				

Remarks

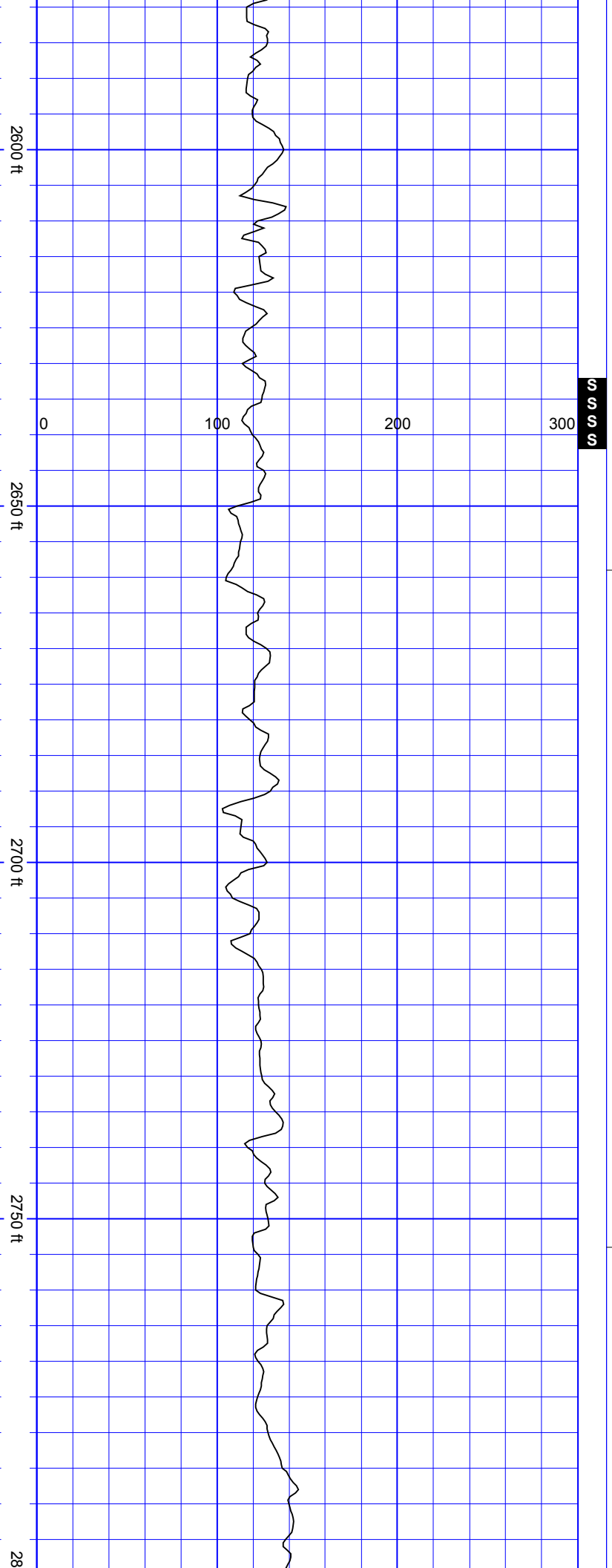
Interpretations of this data by Cathedral Energy Services will be of best judgment as to correctness. Cathedral Energy Services cannot and does not guarantee the accuracy or correctness of interpretations or any surveys derived therefrom. Cathedral Energy Services makes no warranties of performance, results, fitness or suitability for any particular purposes with respect to the goods being furnished under the terms and conditions. Cathedral Energy Services warrants that the equipment furnished will conform to Cathedral Energy Services published specifications in effect at the time and be in good working order.

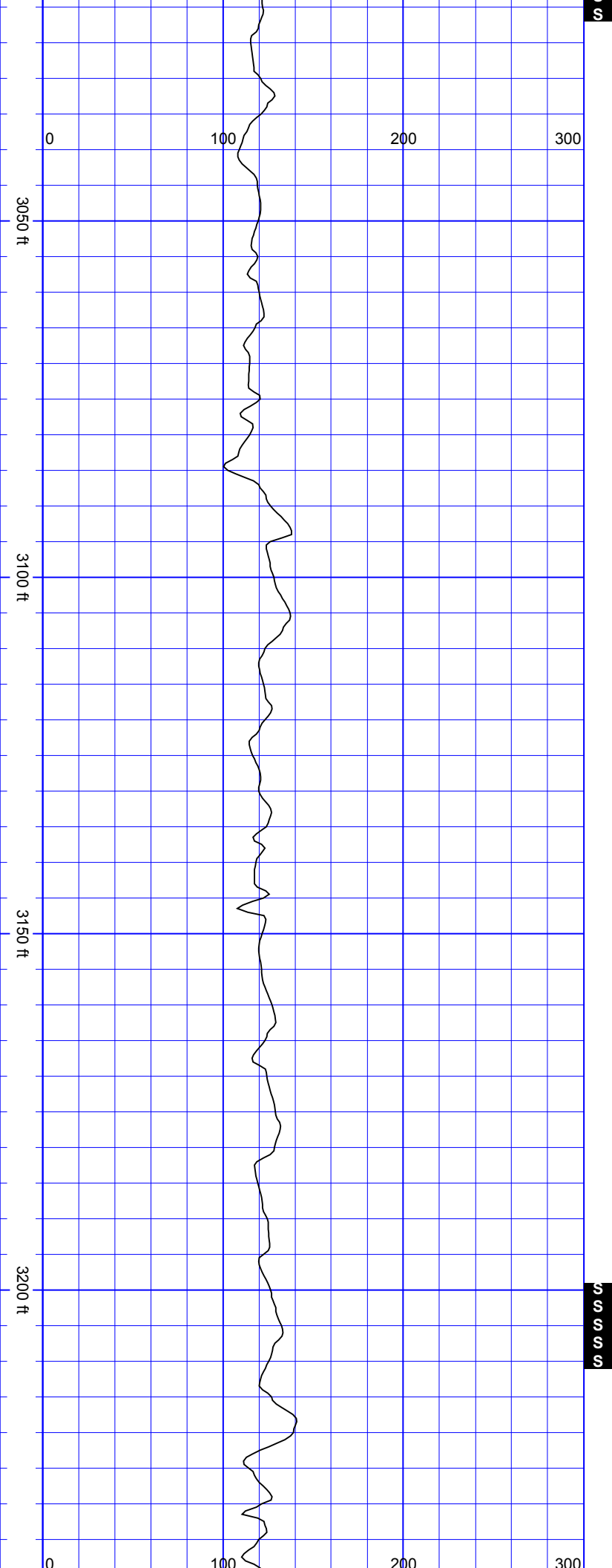




SurveyDepth:2659
TVD:2610.03 Inc:16
Azi:231.85 VertSec:-
262.26

SurveyDepth:2754
TVD:2701.76 Inc:14.15
Azi:230.89 VertSec:-
277.39



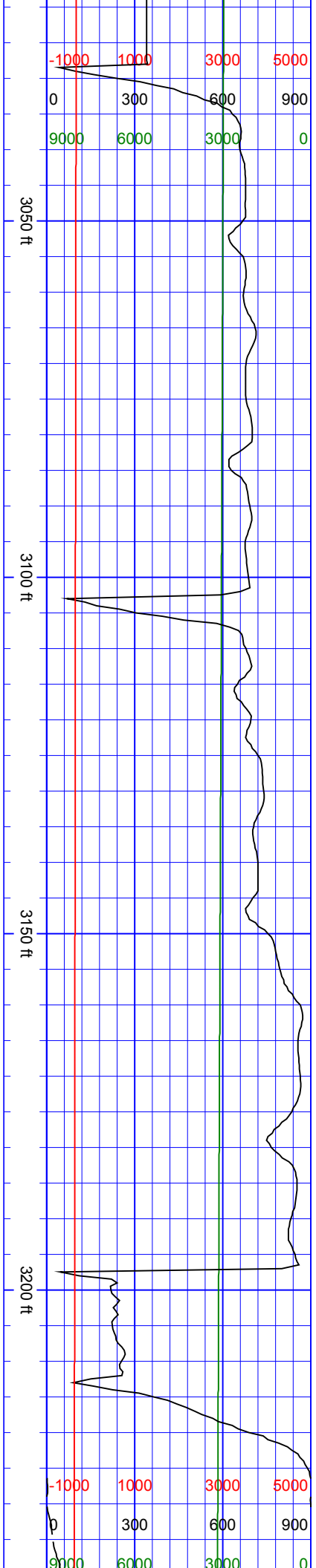


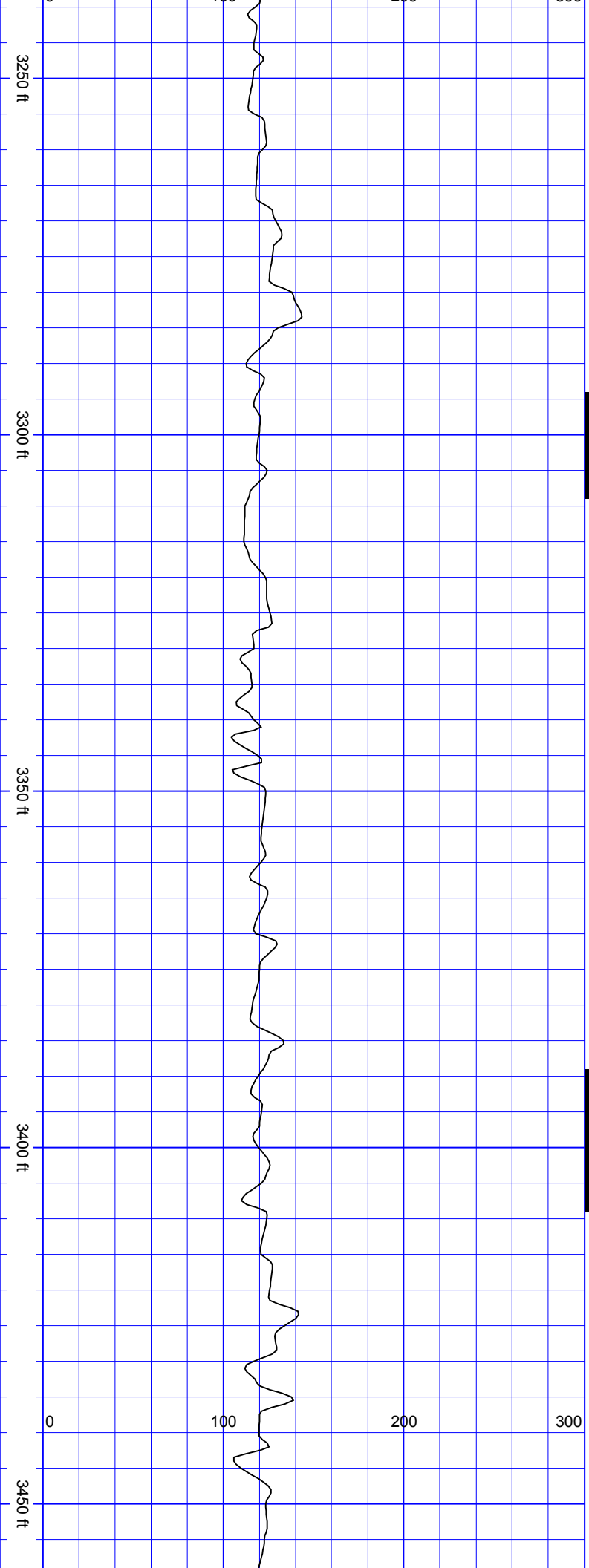
SurveyDepth:3037
TVD:2975 Inc:16.92
Azi:222.1 VertSec:-328.63

SurveyDepth:3132
TVD:3066.27 Inc:15.29
Azi:221.31 VertSec:-348.04

S S S S S

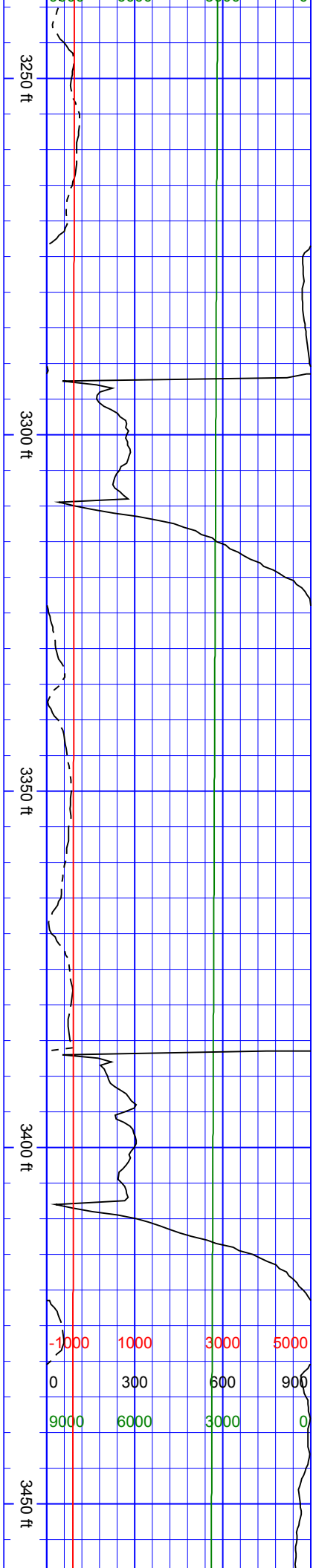
SurveyDepth:3227
TVD:3158.23 Inc:13.76
Azi:224.91 VertSec:-365.21

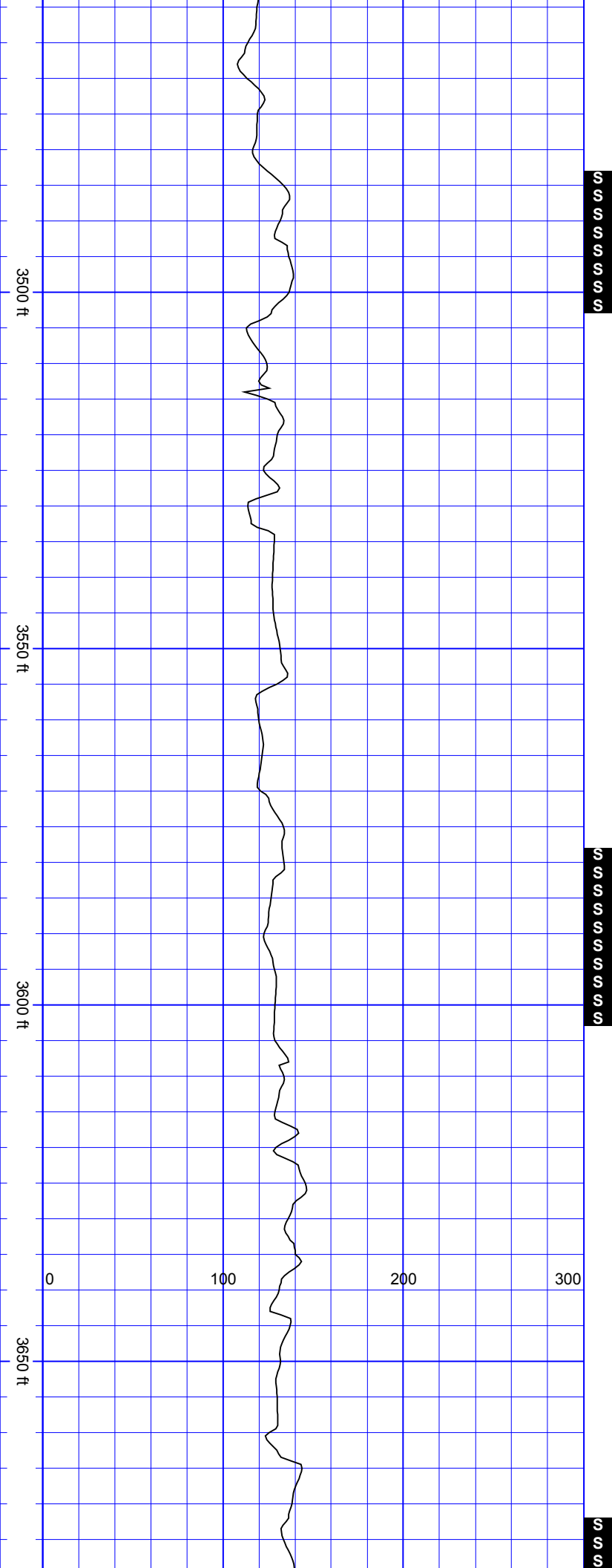




SurveyDepth:3322
TVD:3250.46 Inc:14.02
Azi:230.01 VertSec:-
380.36

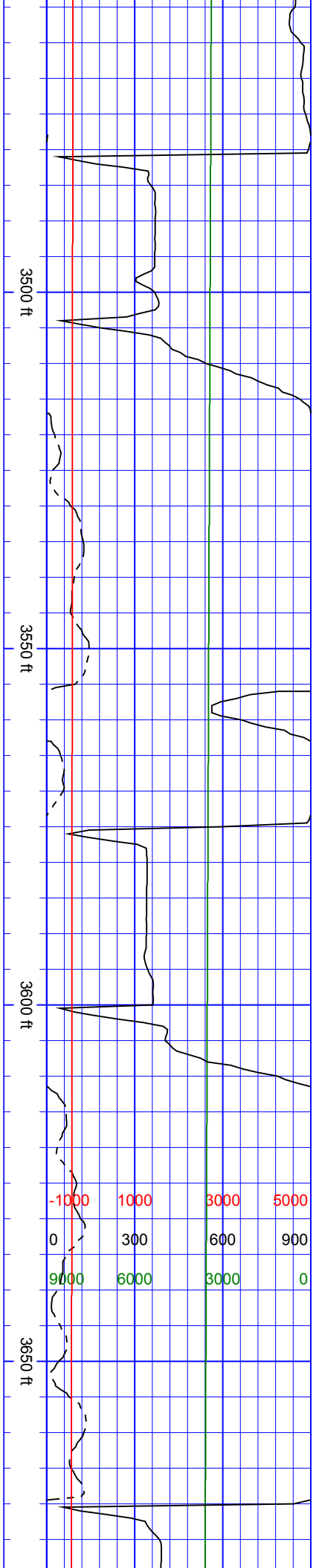
SurveyDepth:3416
TVD:3341.57 Inc:14.5
Azi:235.9 VertSec:-394

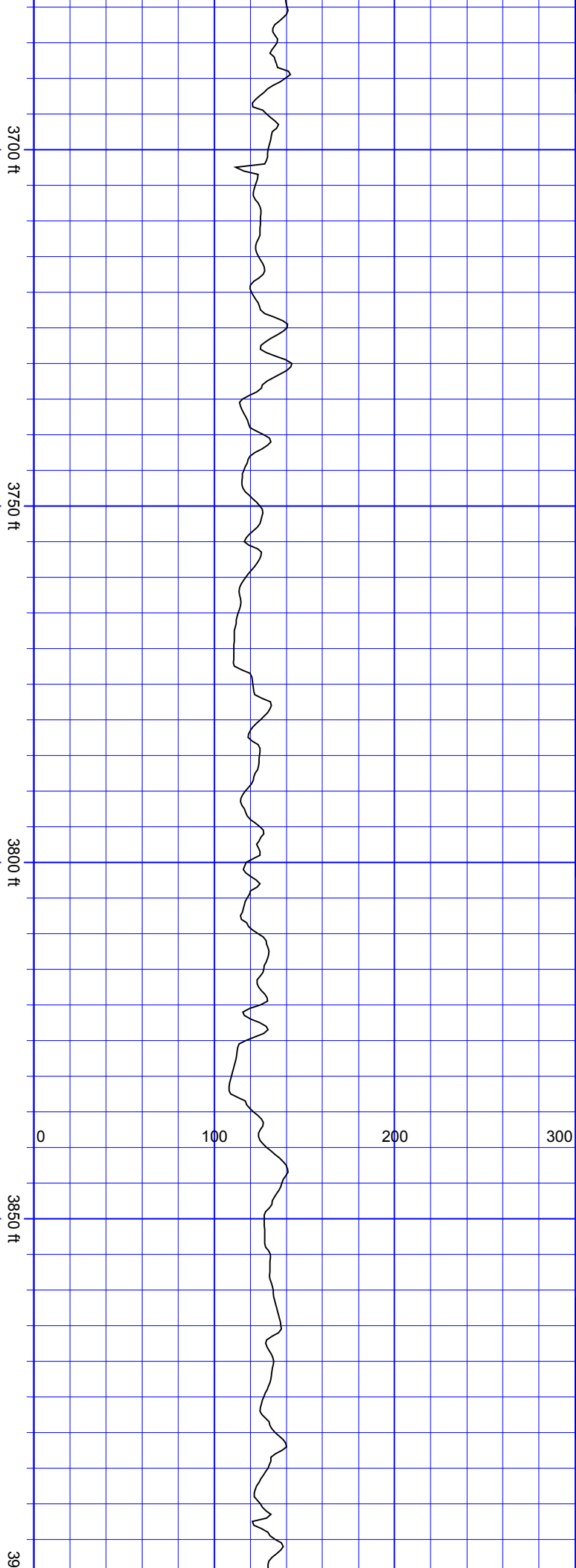




SurveyDepth:3511
TVD:3433.19 Inc:16.13
Azi:234.49 VertSec:-
408.03

SurveyDepth:3605
TVD:3523.94 Inc:14.06
Azi:231.85 VertSec:-
422.38

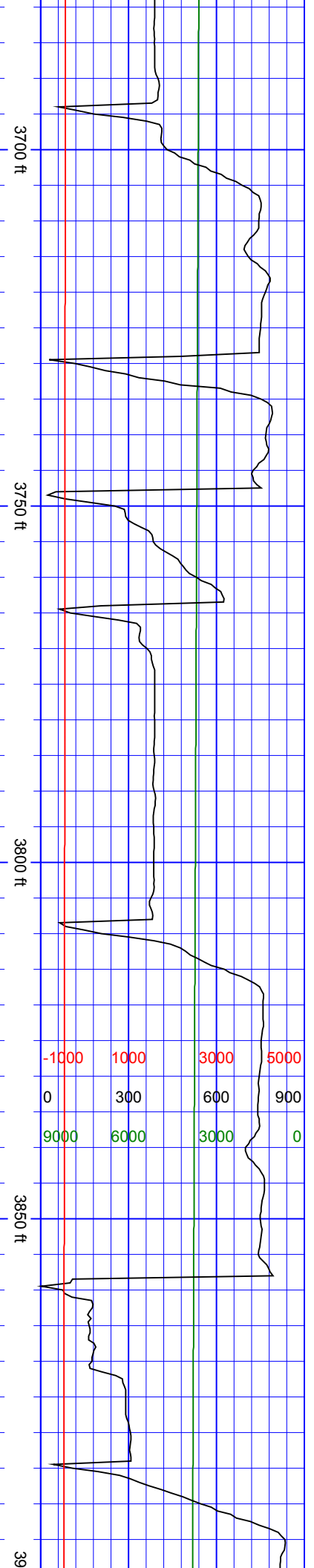


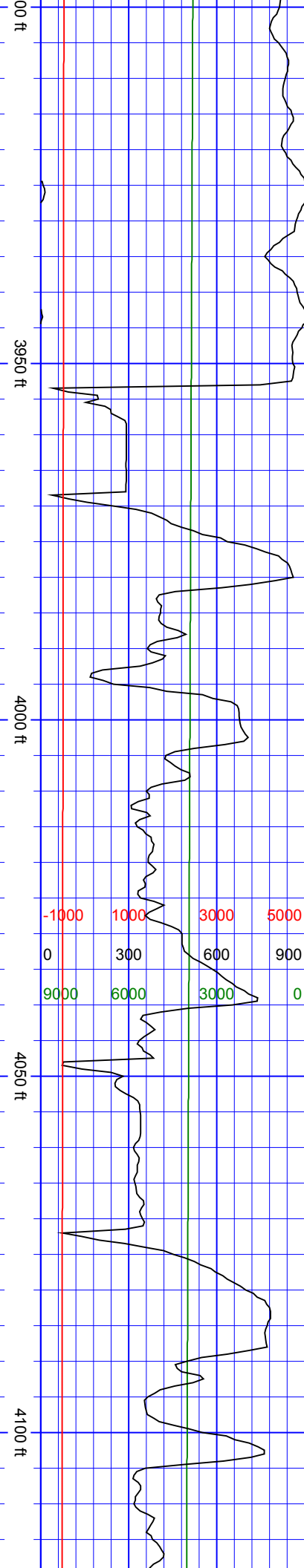


SurveyDepth:3700
TVD:3616.18 Inc:13.71
Azi:240.55 VertSec:-
434.77

SurveyDepth:3794
TVD:3707.14 Inc:15.56
Azi:230.8 VertSec:-
447.93

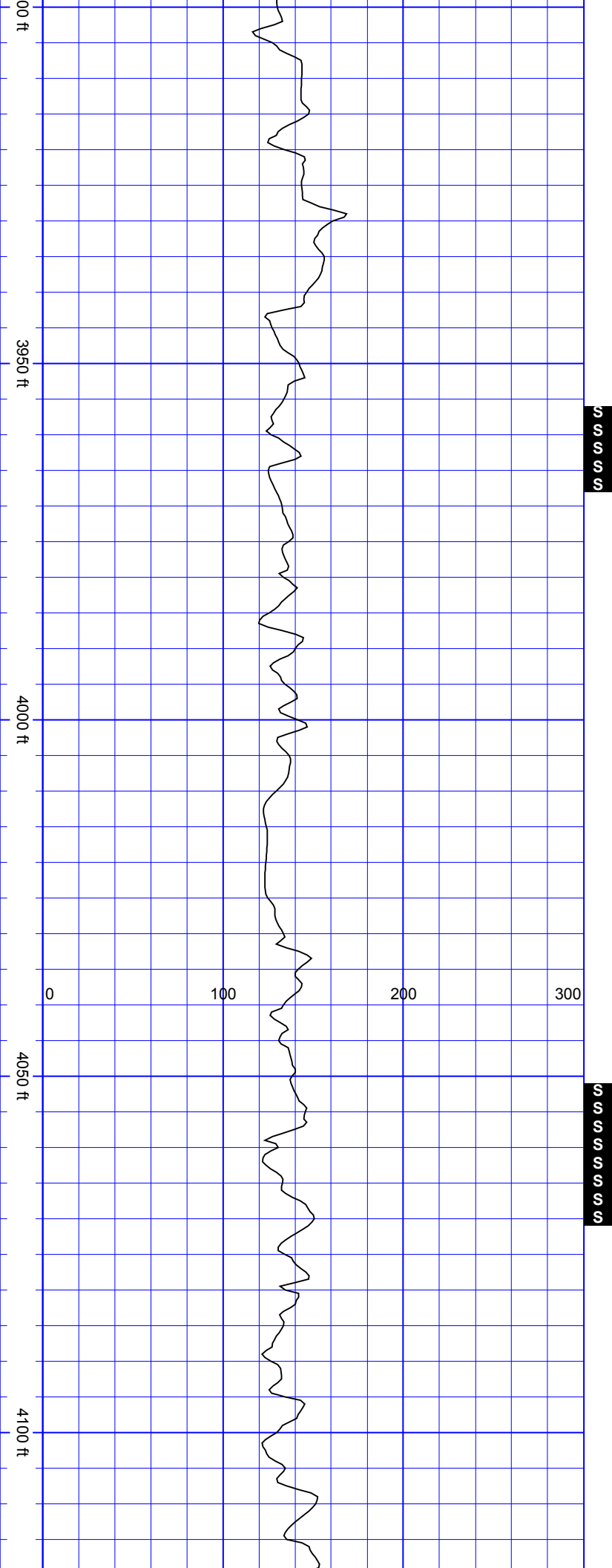
SurveyDepth:3889
TVD:3798.47 Inc:16.52
Azi:218.4 VertSec:-466.3

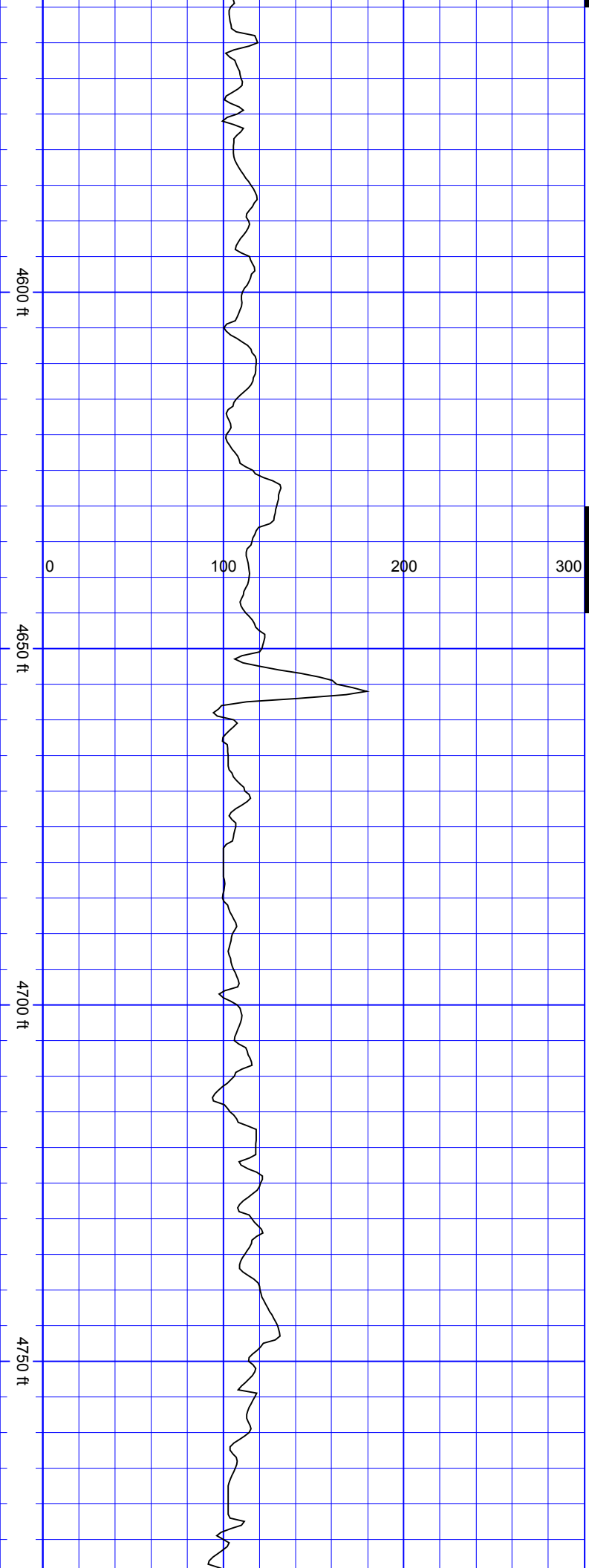




SurveyDepth:3984
TVD:3889.82 Inc:15.34
Azi:219.72 VertSec:-
486.31

SurveyDepth:4079
TVD:3981.37 Inc:15.65
Azi:225.61 VertSec:-
504.69

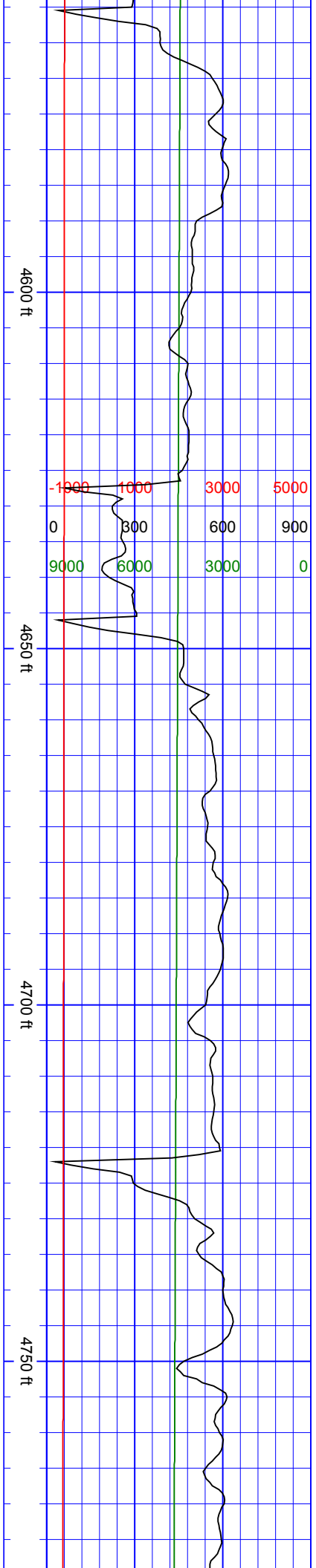


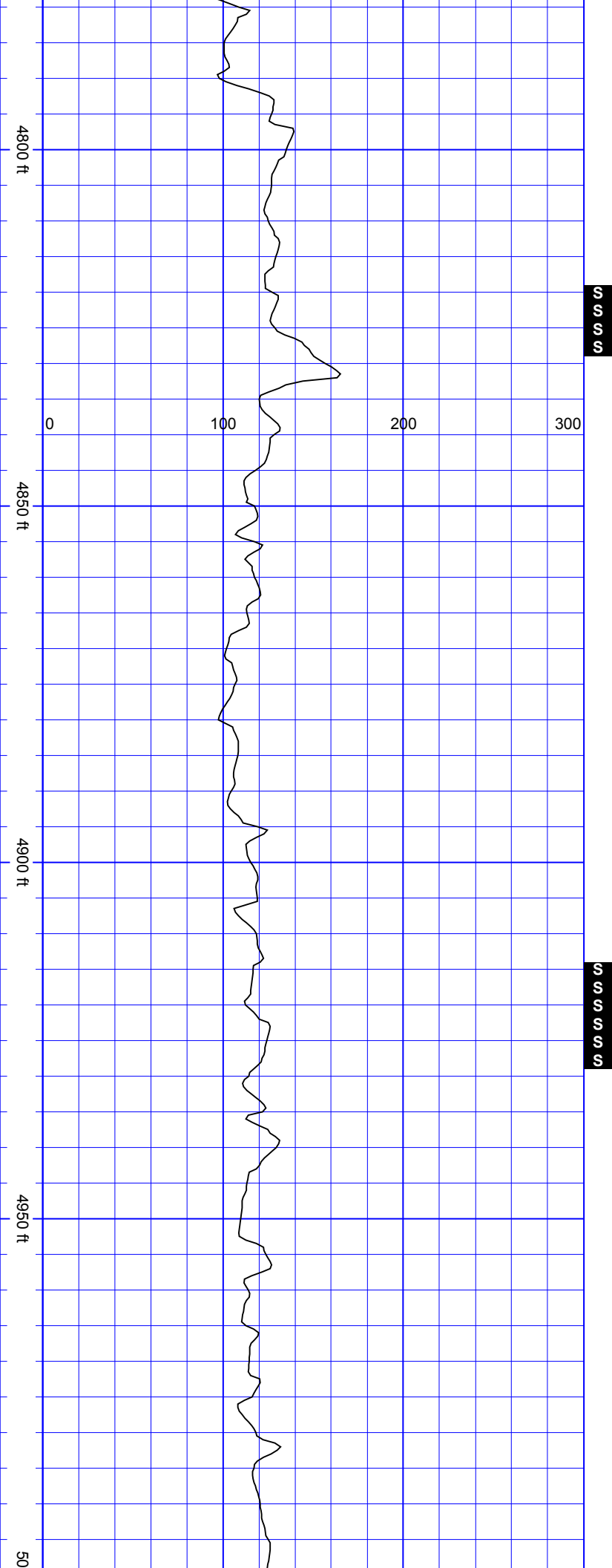


SurveyDepth:4563
TVD:4445.8 Inc:17.01
Azi:240.2 VertSec:-588.42

SurveyDepth:4657
TVD:4535.41 Inc:18.19
Azi:232.99 VertSec:-603.74

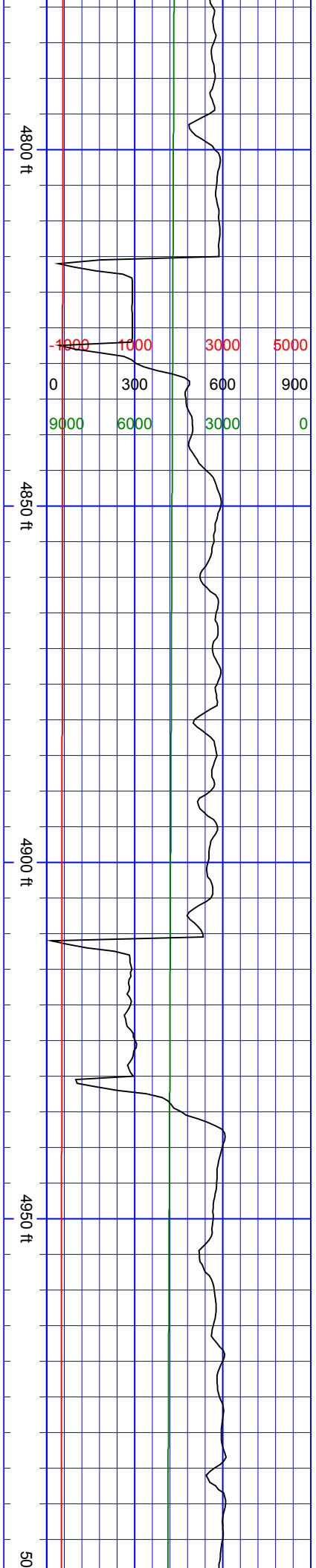
SurveyDepth:4752
TVD:4626.17 Inc:16.13
Azi:231.41 VertSec:-620.57

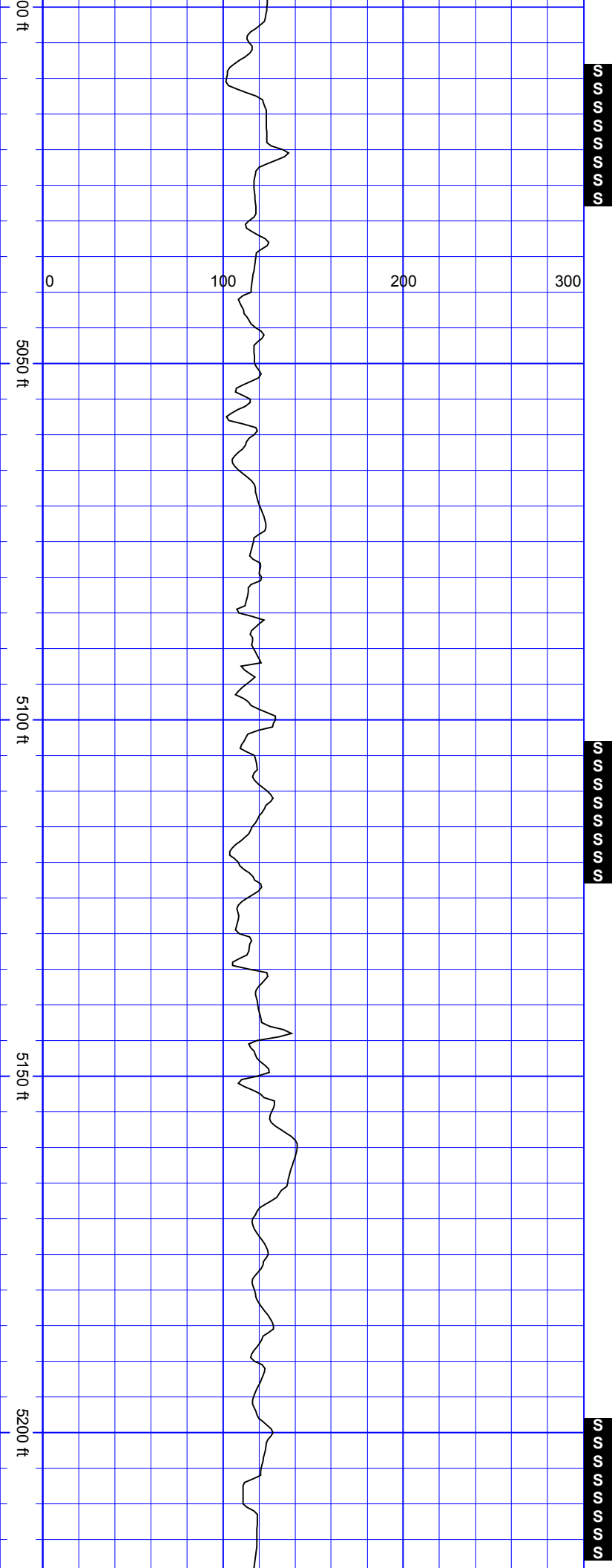




SurveyDepth:4847
TVD:4717.79 Inc:14.55
Azi:226.32 VertSec:-
636.77

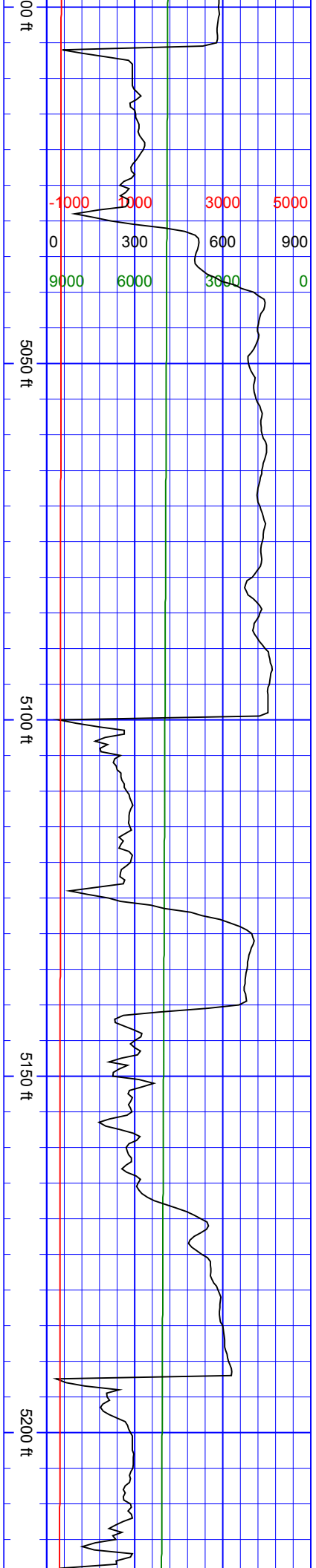
SurveyDepth:4941
TVD:4808.61 Inc:15.38
Azi:220.95 VertSec:-
654.09

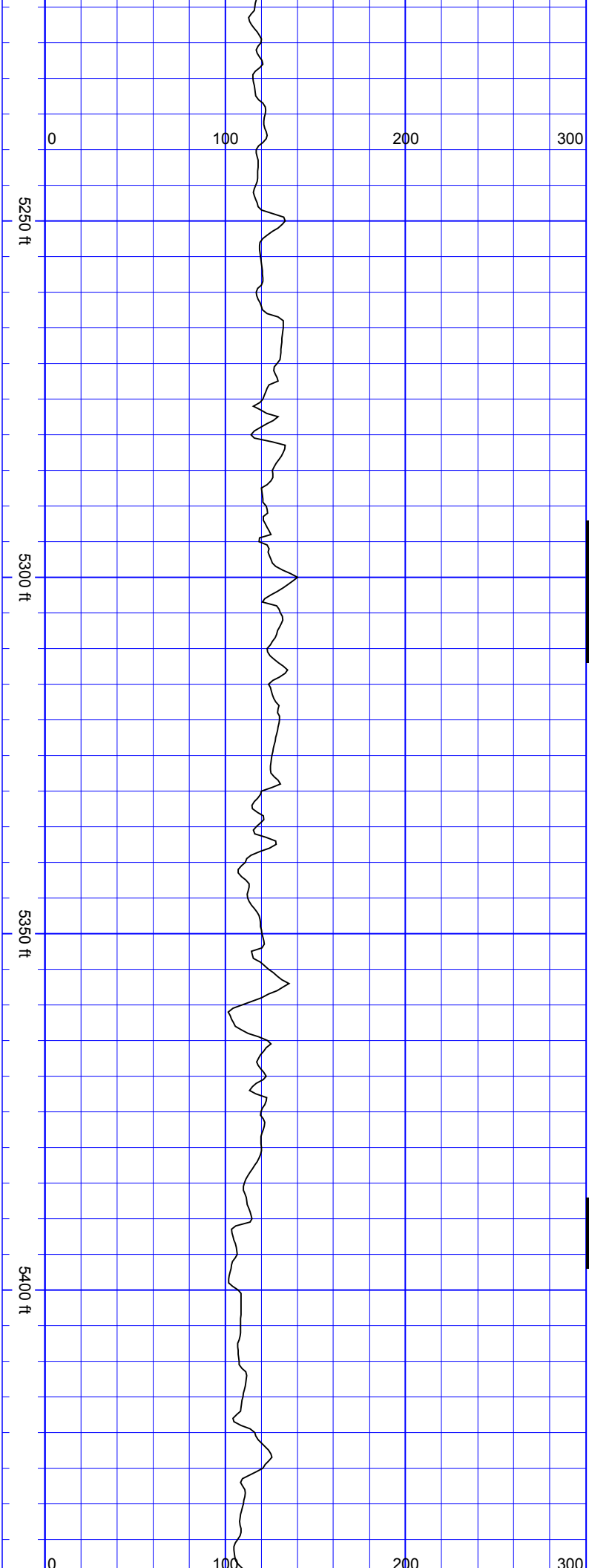




SurveyDepth:5036
TVD:4900.42 Inc:14.41
Azi:229.57 VertSec:-
671.02

SurveyDepth:5131
TVD:4992.39 Inc:14.63
Azi:232.64 VertSec:-
685.69

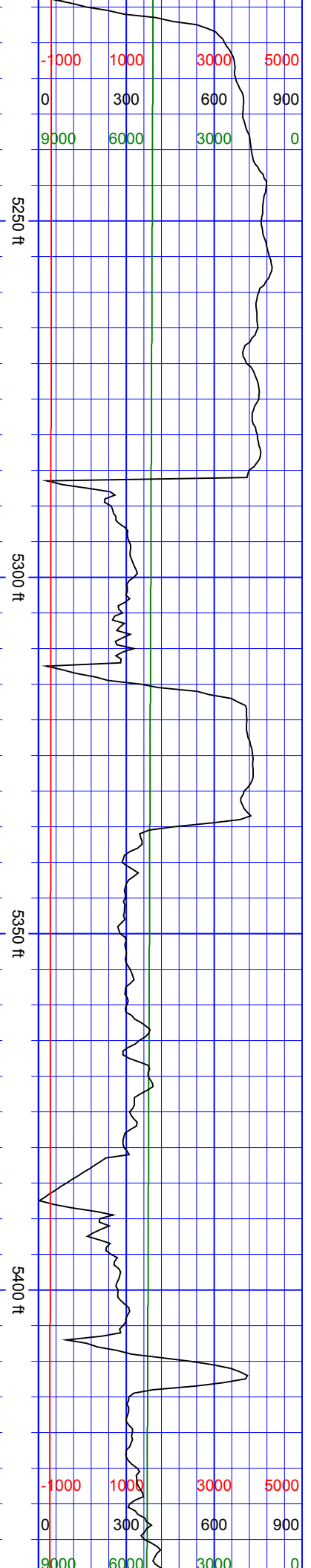


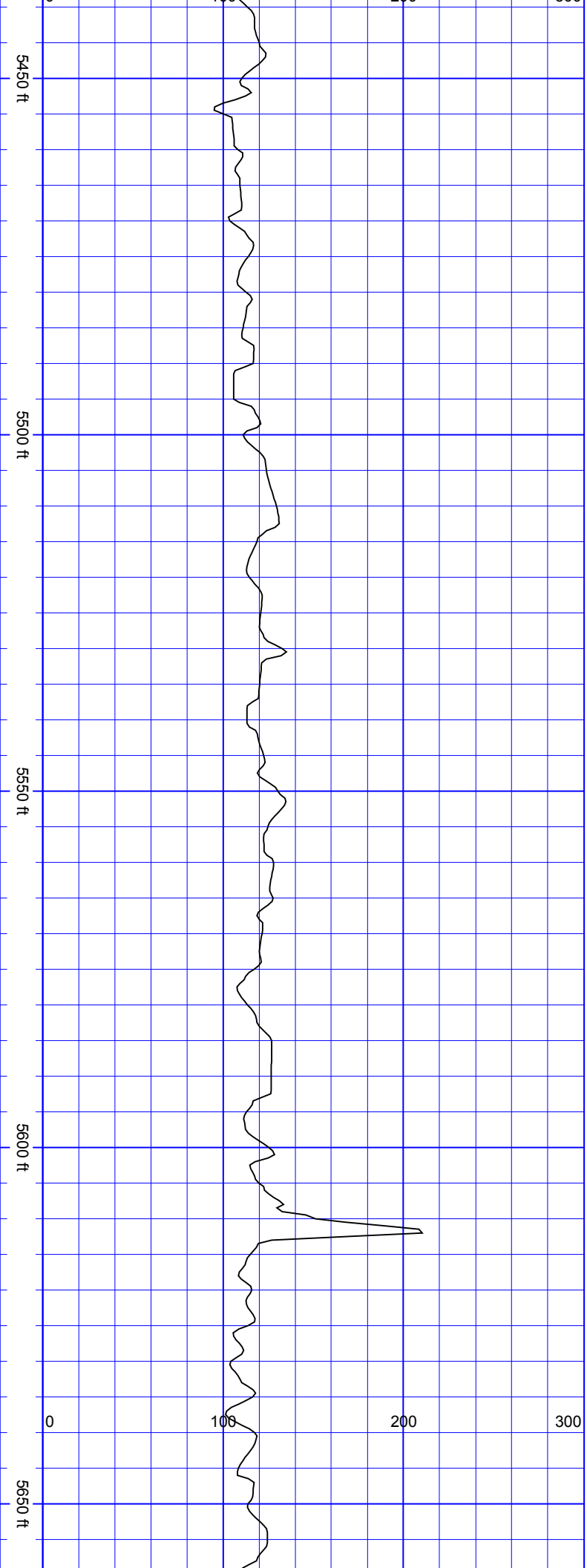


SurveyDepth:5225
TVD:5083.32 Inc:14.77
Azi:235.19 VertSec:-
699.45

SurveyDepth:5320
TVD:5175.01 Inc:15.56
Azi:228.16 VertSec:-
714.58

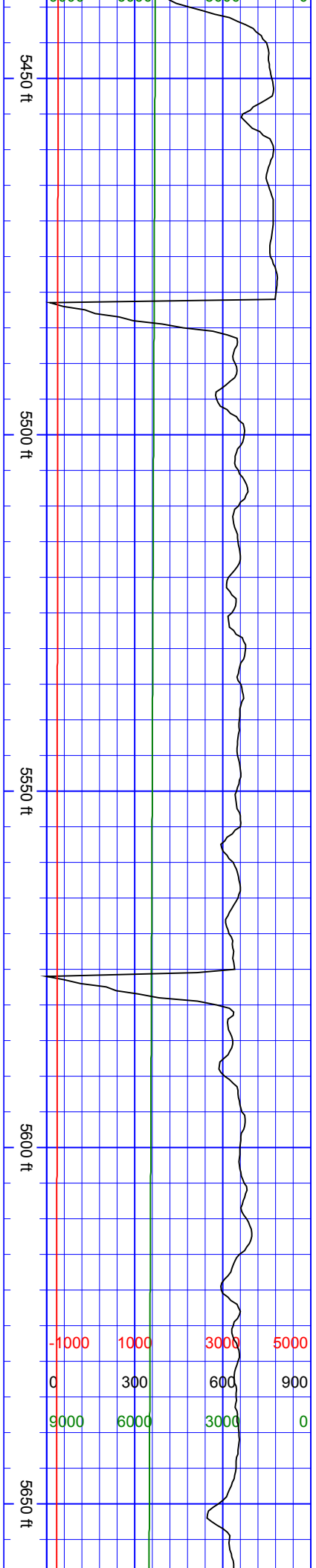
SurveyDepth:5415
TVD:5266.28 Inc:16.66
Azi:230.01 VertSec:-
731.54

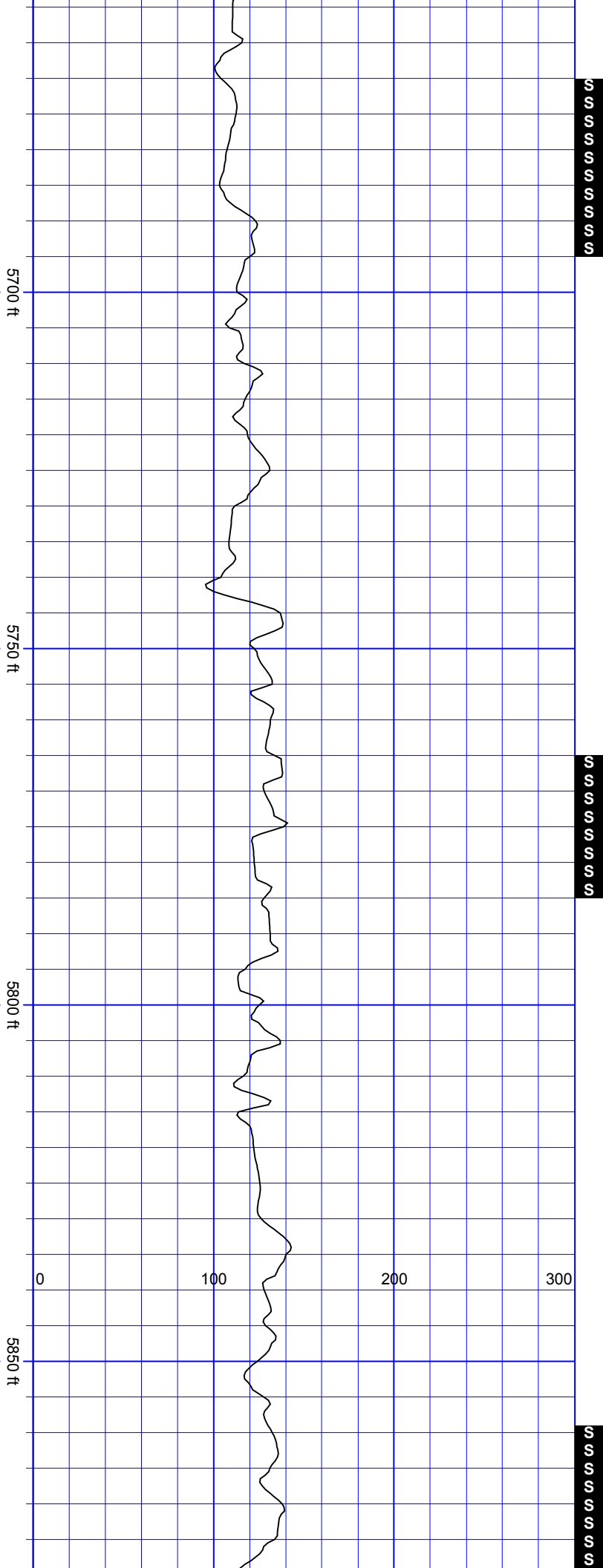




SurveyDepth:5509
TVD:5356.66 Inc:15.25
Azi:229.83 VertSec:-
747.88

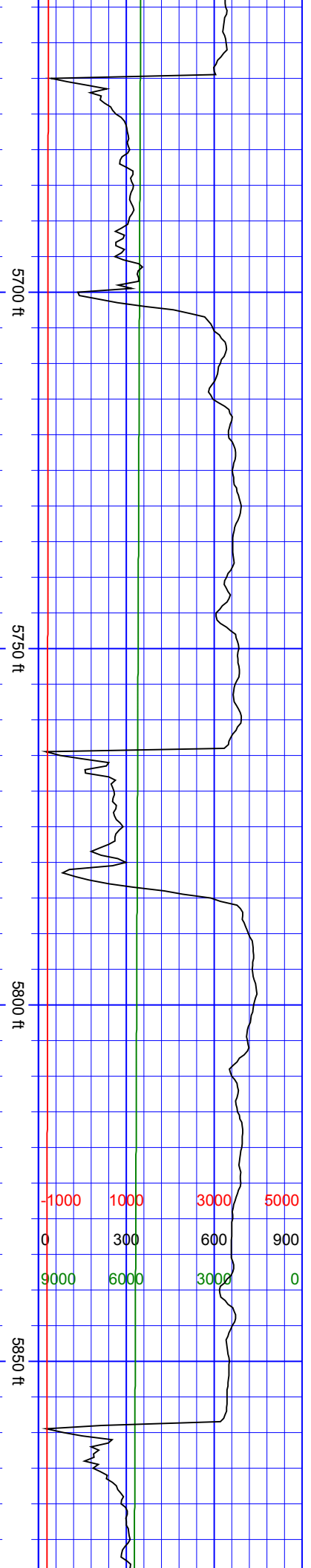
SurveyDepth:5603
TVD:5447.9 Inc:12.52
Azi:231.06 VertSec:-762

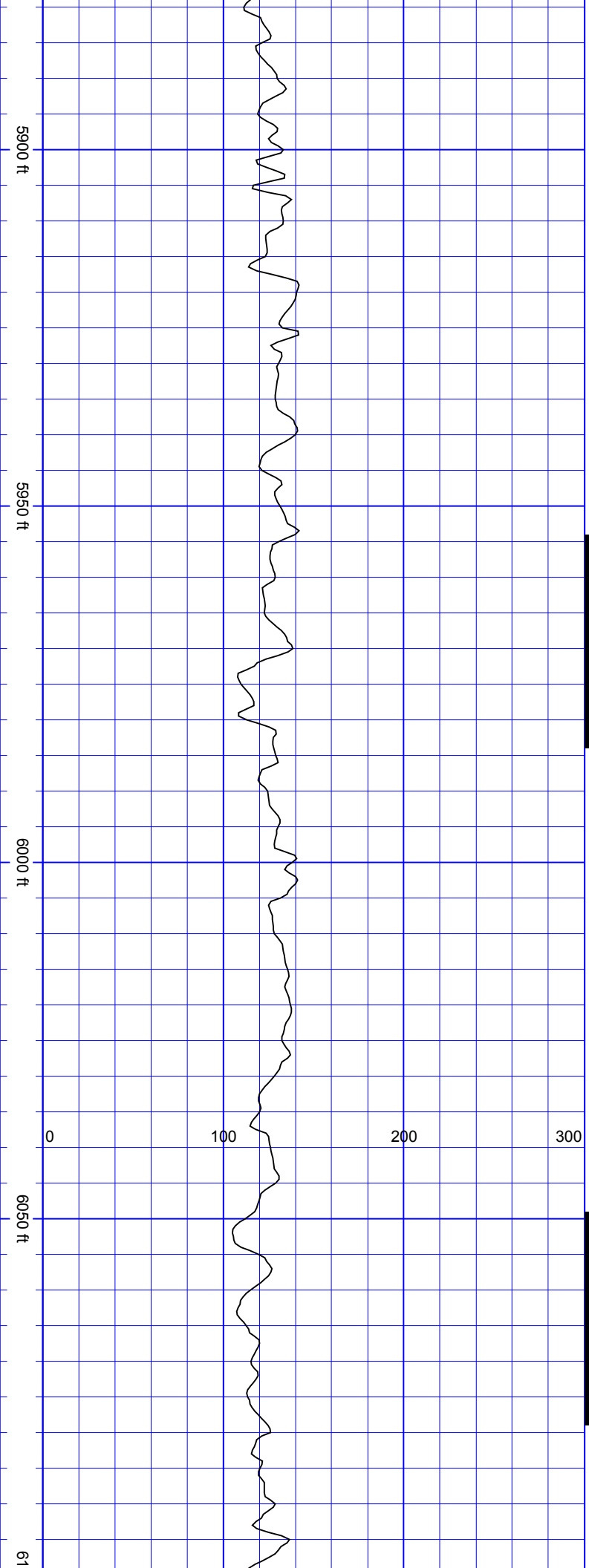




SurveyDepth:5698
TVD:5540.34 Inc:14.15
Azi:228.51 VertSec:-
775.92

SurveyDepth:5792
TVD:5631.65 Inc:13.32
Azi:227.55 VertSec:-
790.6

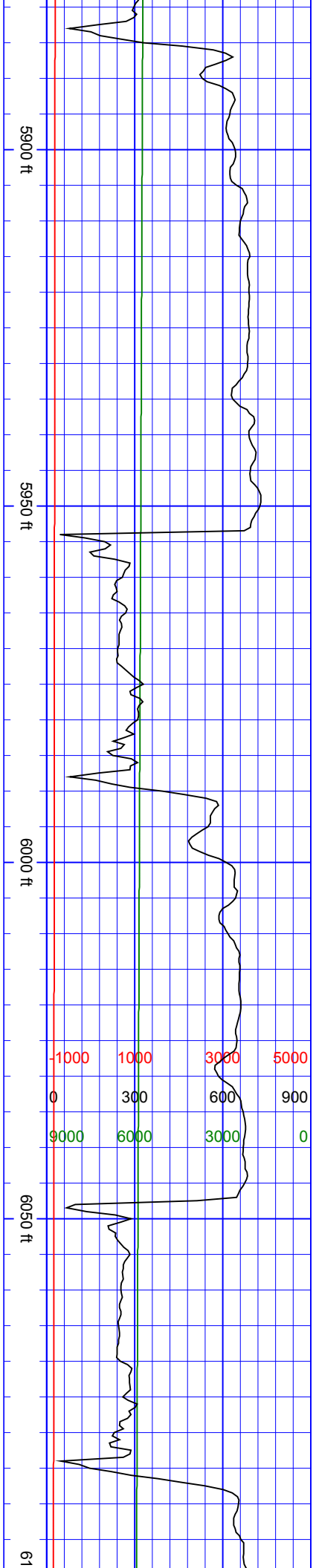


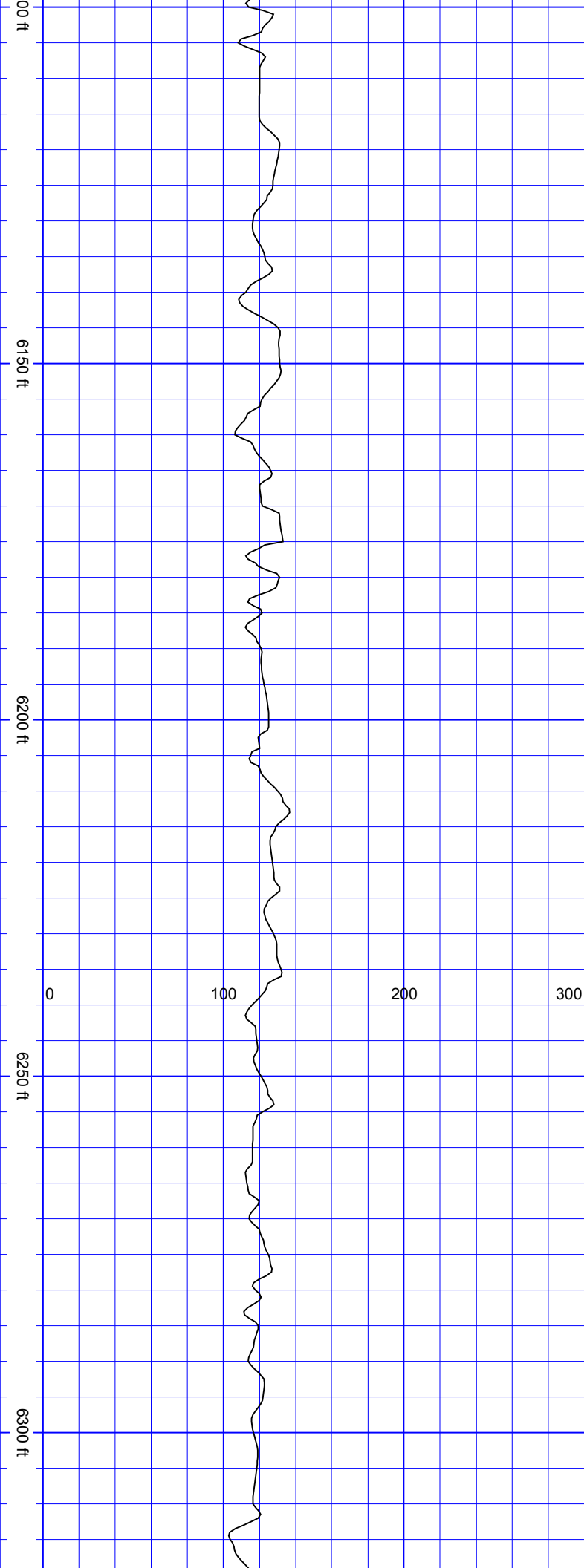


SurveyDepth:5887
TVD:5724.13 Inc:13.14
Azi:225.26 VertSec:-
805.35

SurveyDepth:5982
TVD:5816.53 Inc:13.76
Azi:222.62 VertSec:-
821.04

SurveyDepth:6076
TVD:5907.65 Inc:14.72
Azi:230.8 VertSec:-
836.57



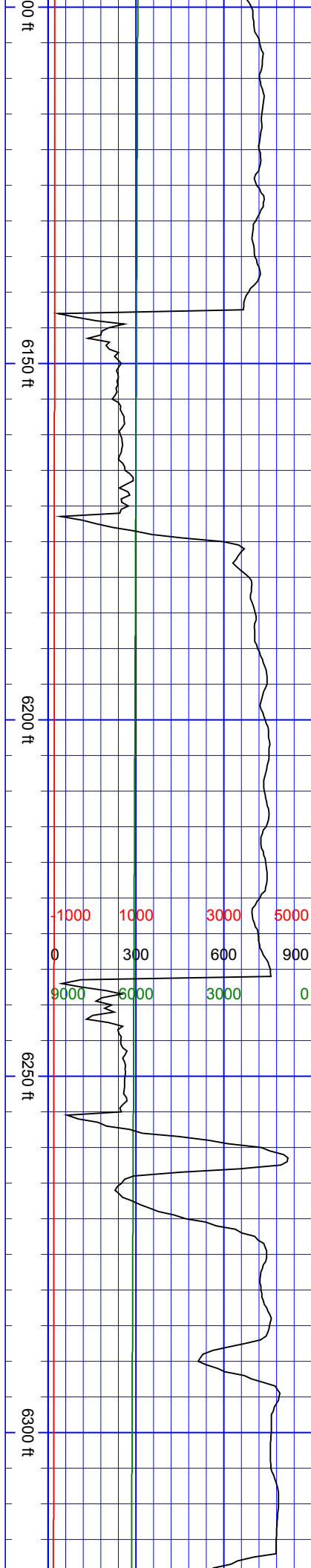


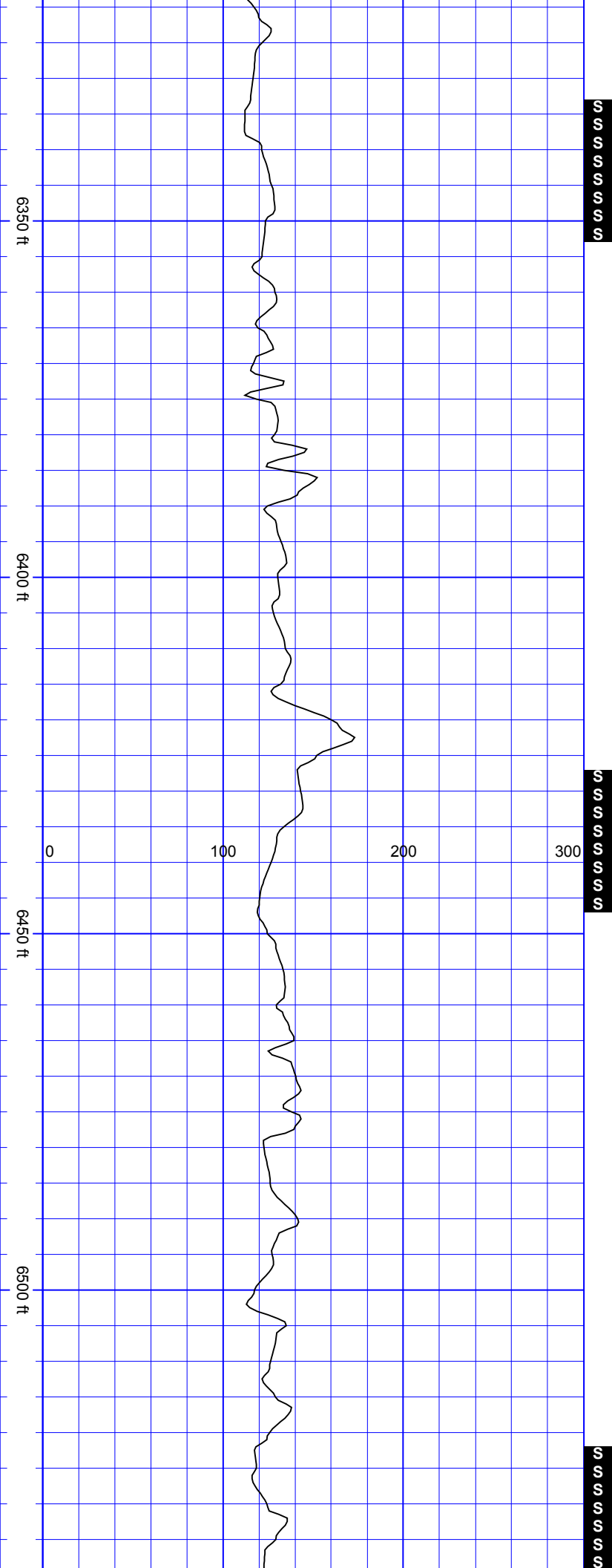
S S S S S S S S S

SurveyDepth:6171
TVD:5999.41 Inc:15.29
Azi:236.51 VertSec:-
850.82

SSSSS

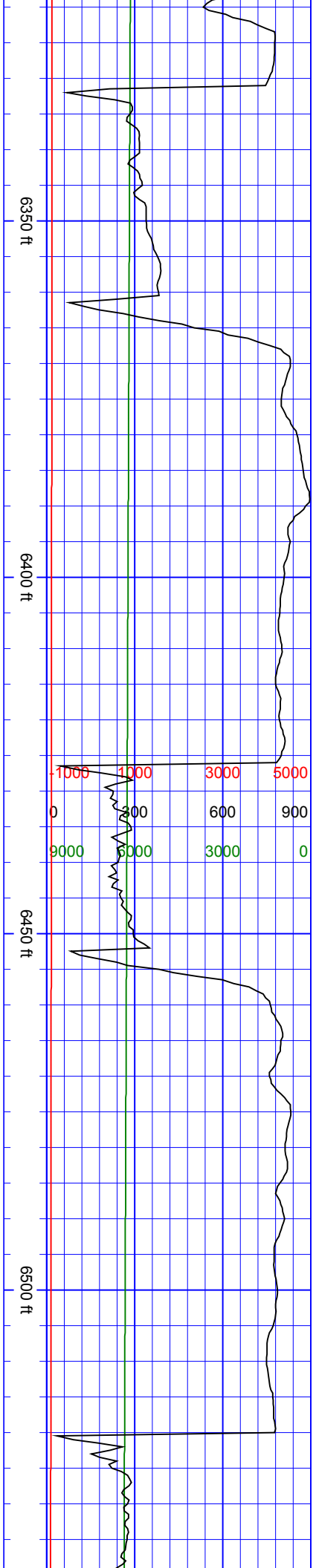
SurveyDepth:6266
TVD:6091.31 Inc:14.06
Azi:236.25 VertSec:-
863.85

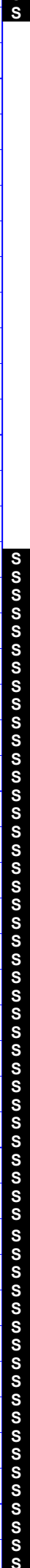
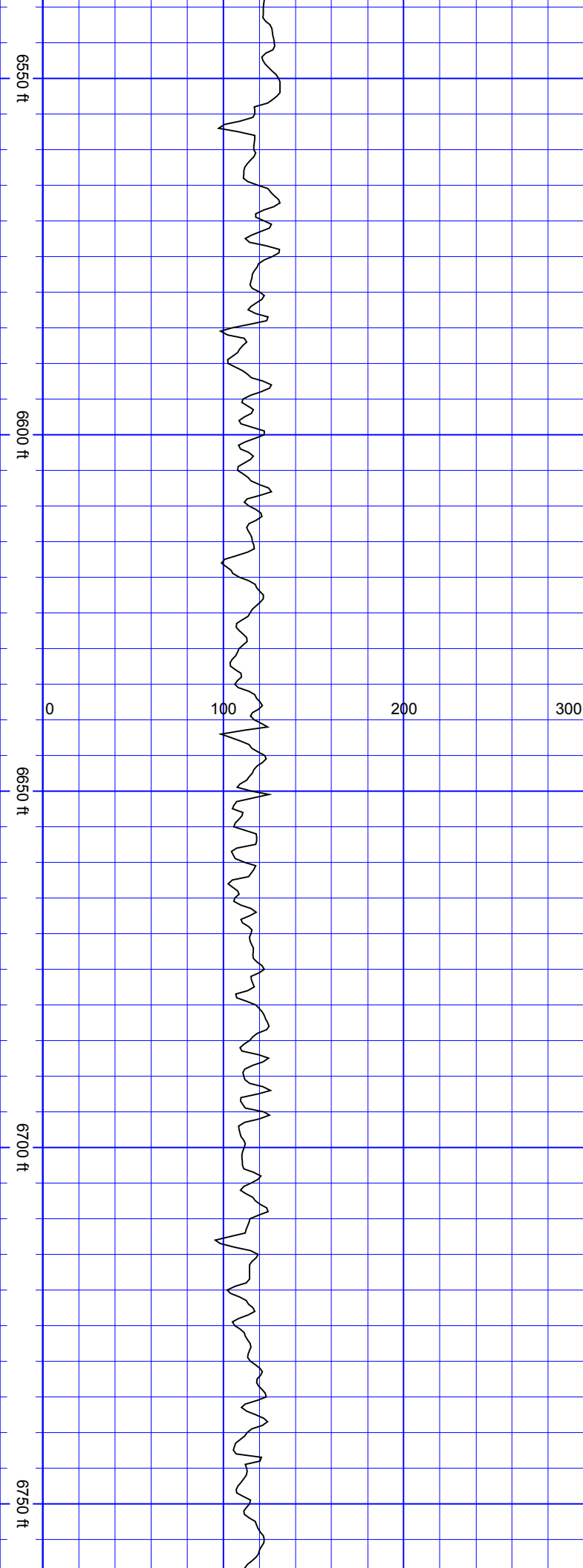




SurveyDepth:6360
TVD:6182.43 Inc:14.41
Azi:233.35 VertSec:-
876.9

SurveyDepth:6455
TVD:6274.54 Inc:13.93
Azi:227.28 VertSec:-
891.45

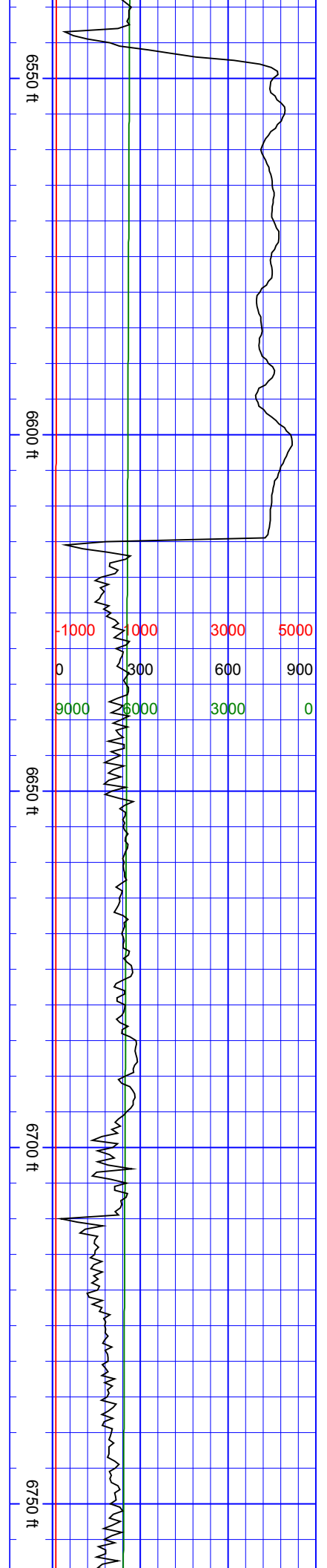


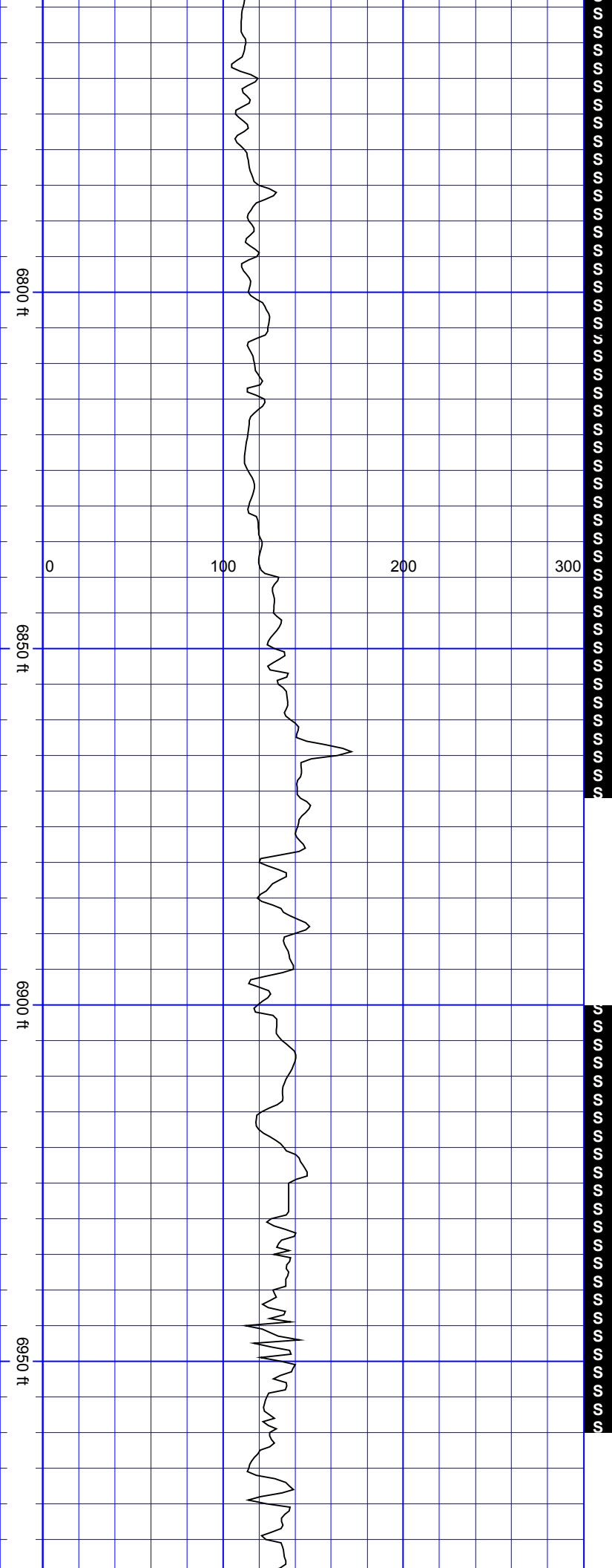


SurveyDepth:6549
TVD:6365.84 Inc:13.58
Azi:226.23 VertSec:-
906.52

SurveyDepth:6644
TVD:6458.55 Inc:11.82
Azi:242.4 VertSec:-918.5

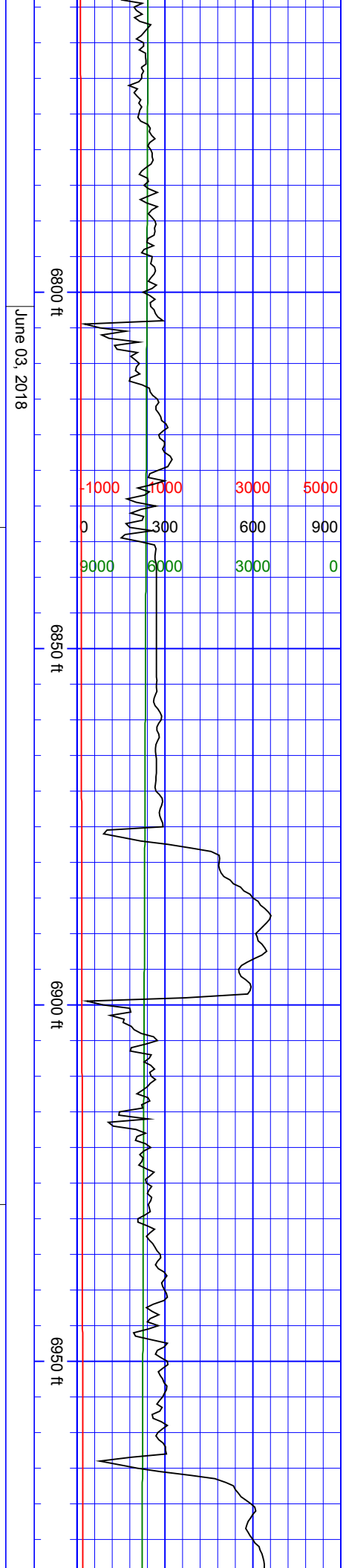
SurveyDepth:6739
TVD:6550.77 Inc:17.1
Azi:286.52 VertSec:-
918.71

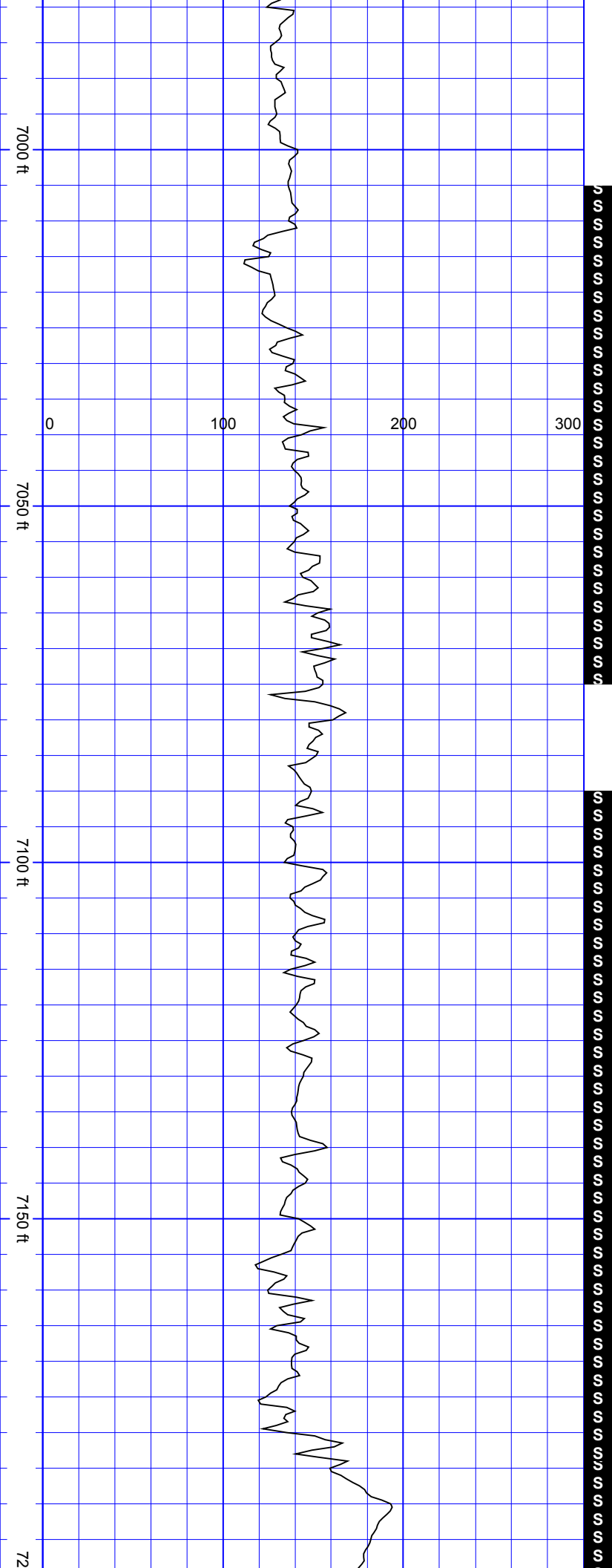




SurveyDepth:6833
TVD:6639.93 Inc:20.48
Azi:315.17 VertSec:-902.72

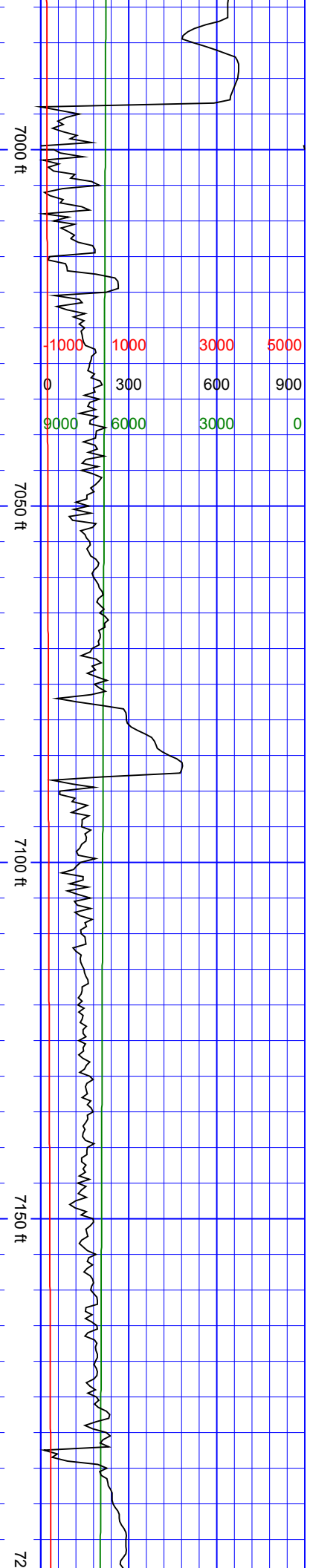
SurveyDepth:6928
TVD:6727.29 Inc:25.71
Azi:314.91 VertSec:-875.98

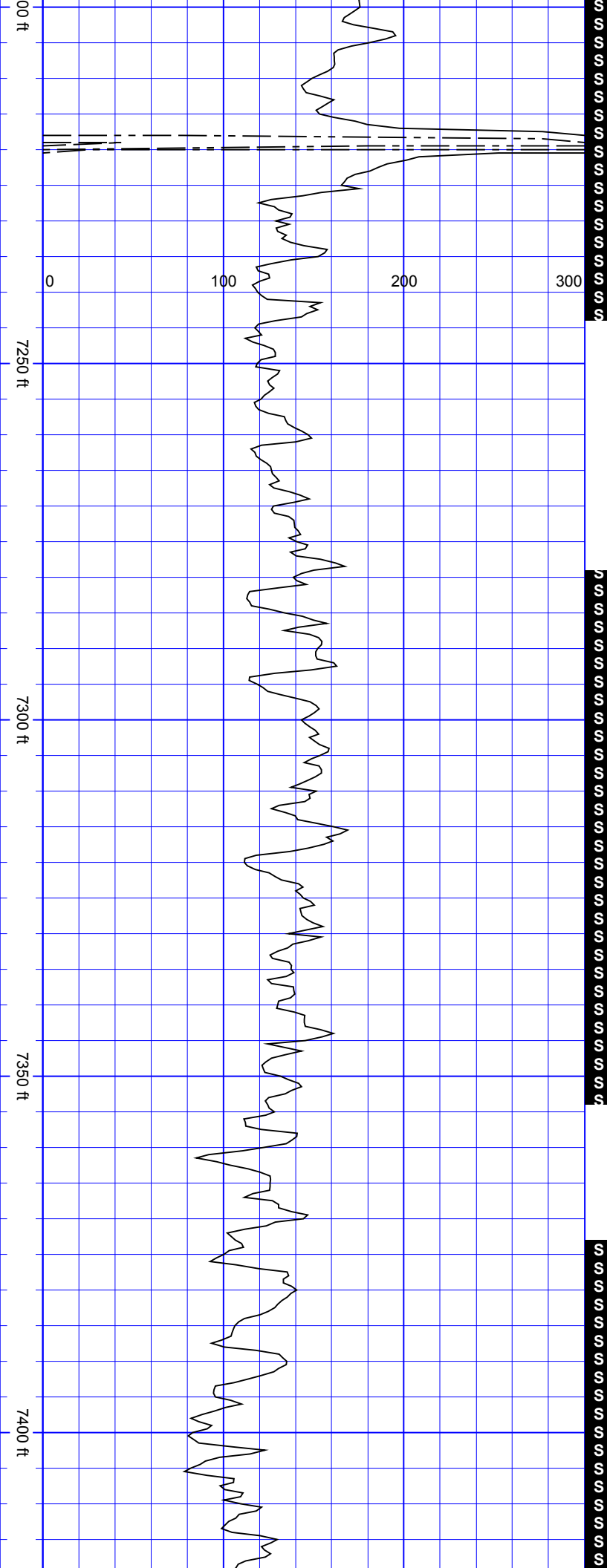




SurveyDepth:7023
TVD:6812.65 Inc:26.37
Azi:318.34 VertSec:-
845.25

SurveyDepth:7117
TVD:6894.36 Inc:32.96
Azi:330.47 VertSec:-
806.95

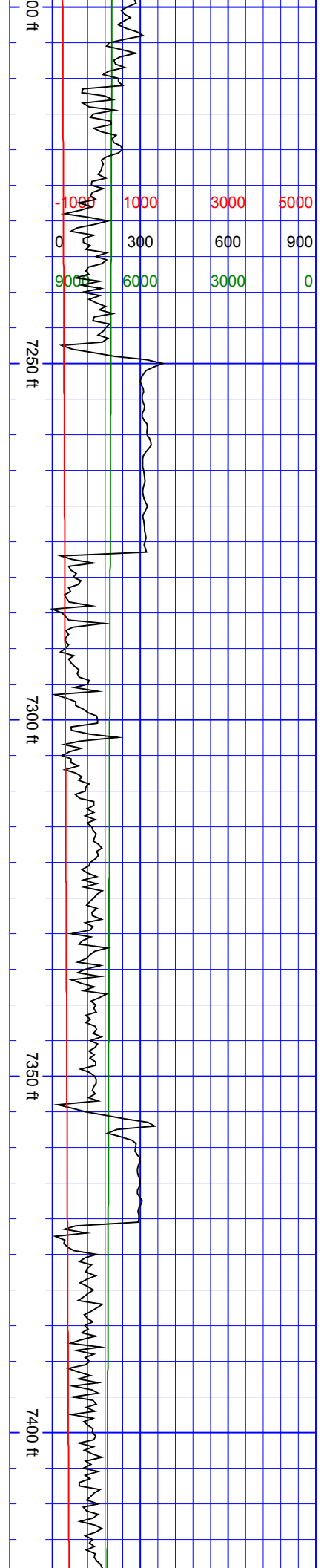




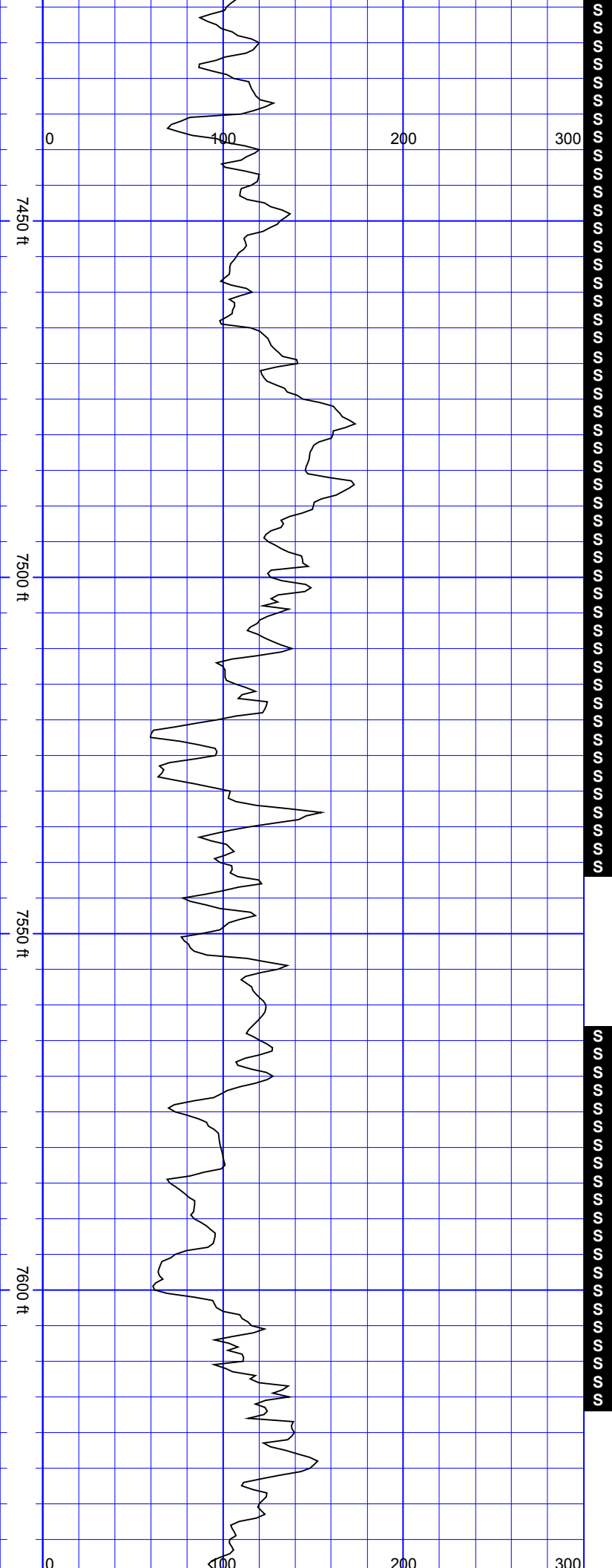
SurveyDepth:7212
TVD:6971.04 Inc:39.46
Azi:340.48 VertSec:-
755.58

SurveyDepth:7306
TVD:7042.52 Inc:41.53
Azi:340.05 VertSec:-
697.83

SurveyDepth:7401
TVD:7109.68 Inc:48.52
Azi:348.22 VertSec:-633

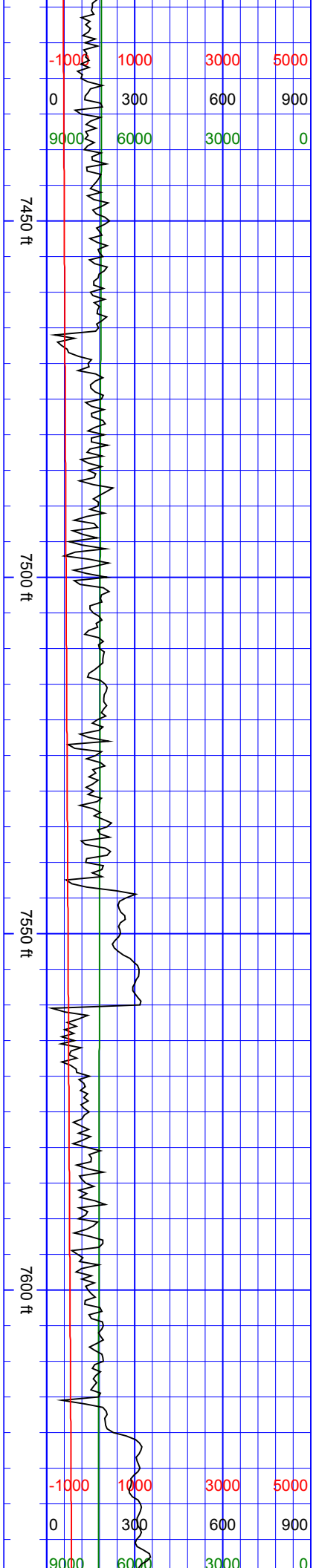


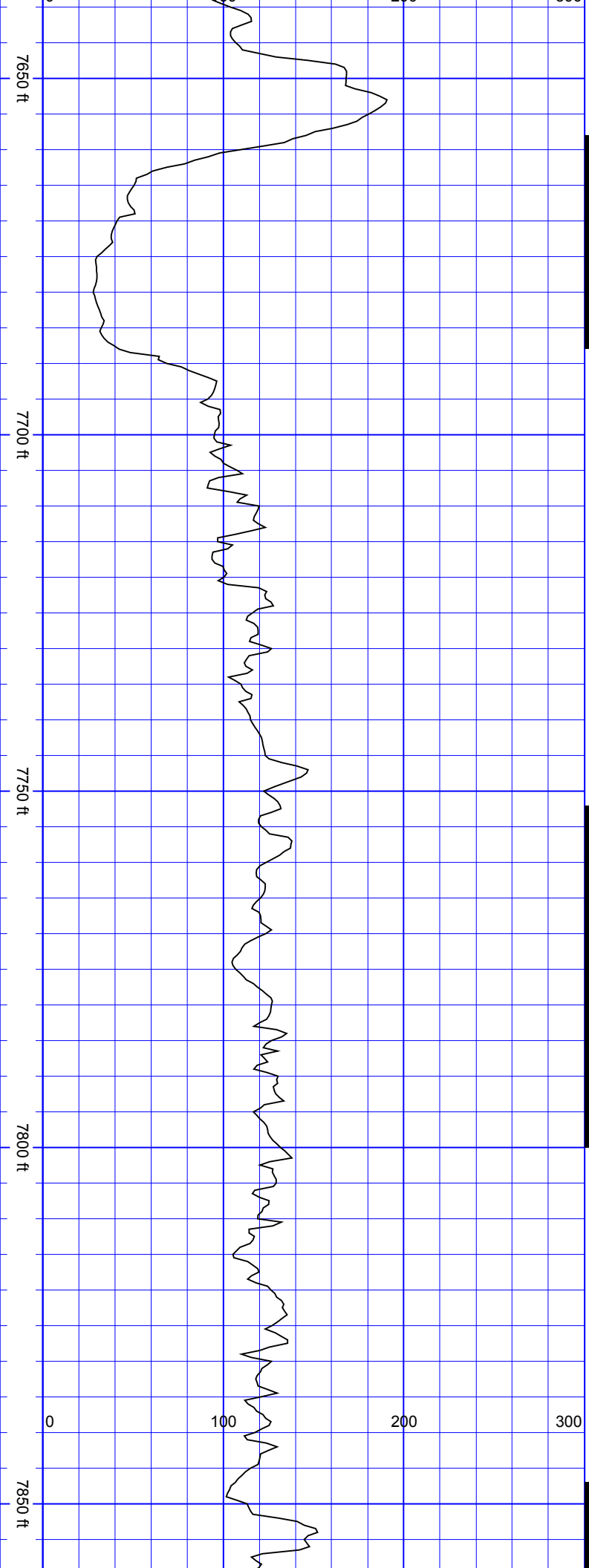
-1000	1000	3000	5000
0	300	600	900
900	6000	3000	0



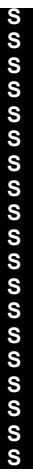
SurveyDepth:7496
TVD:7167.06 Inc:57.17
Azi:356.31 VertSec:-
557.98

SurveyDepth:7591
TVD:7211.73 Inc:66.67
Azi:357.54 VertSec:-
474.32

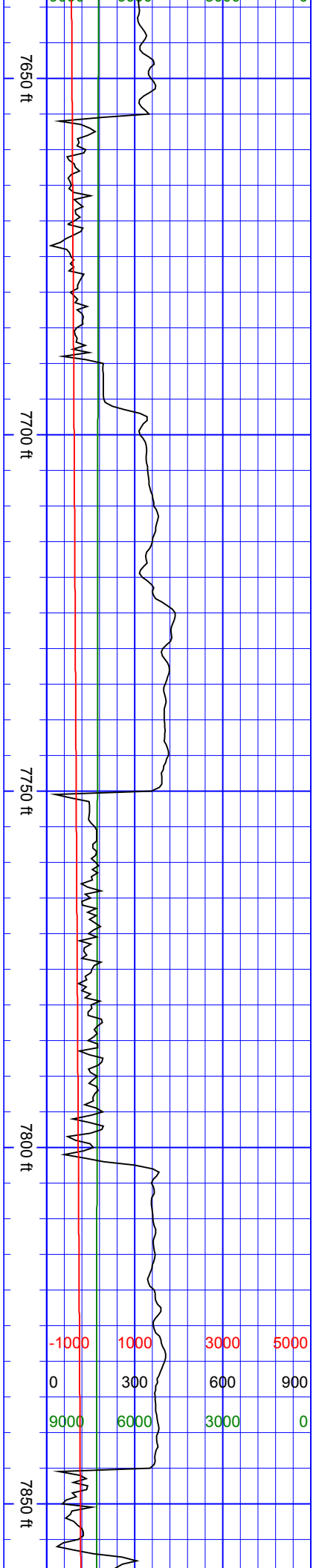
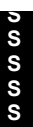


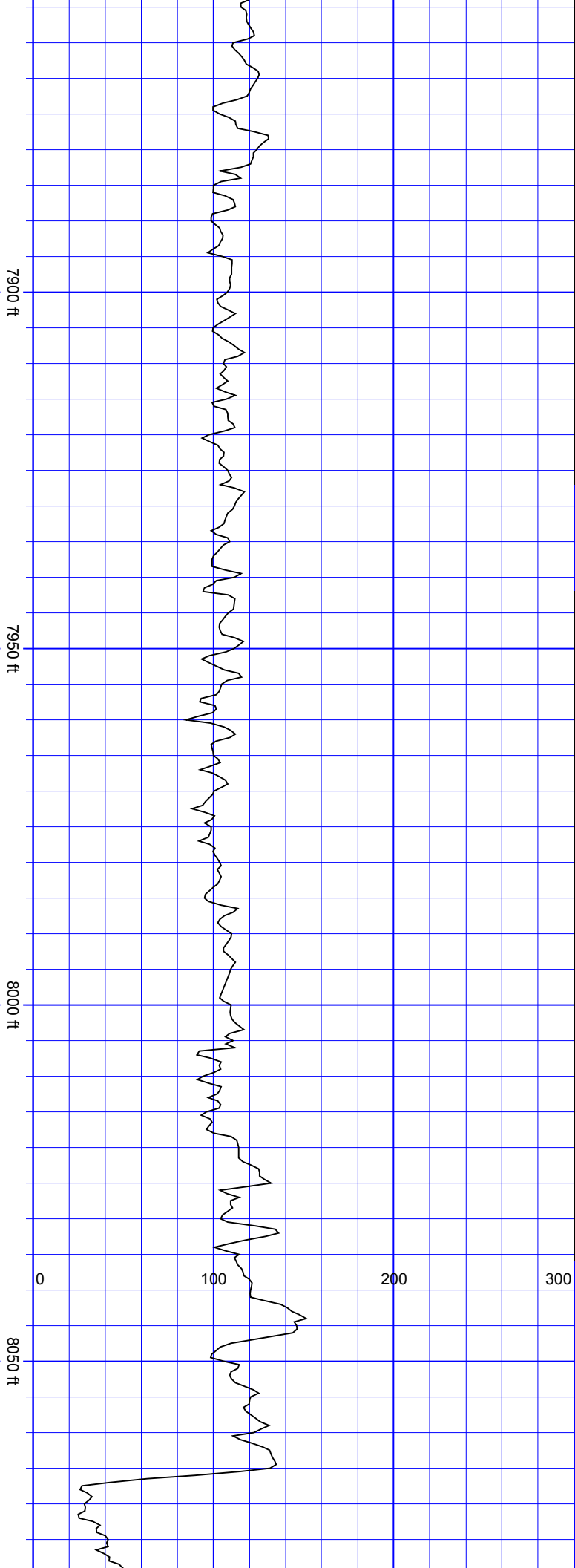


SurveyDepth:7685
TVD:7244.8 Inc:72.11
Azi:358.85 VertSec:-386.38



SurveyDepth:7780
TVD:7273.48 Inc:72.77
Azi:2.81 VertSec:-295.87

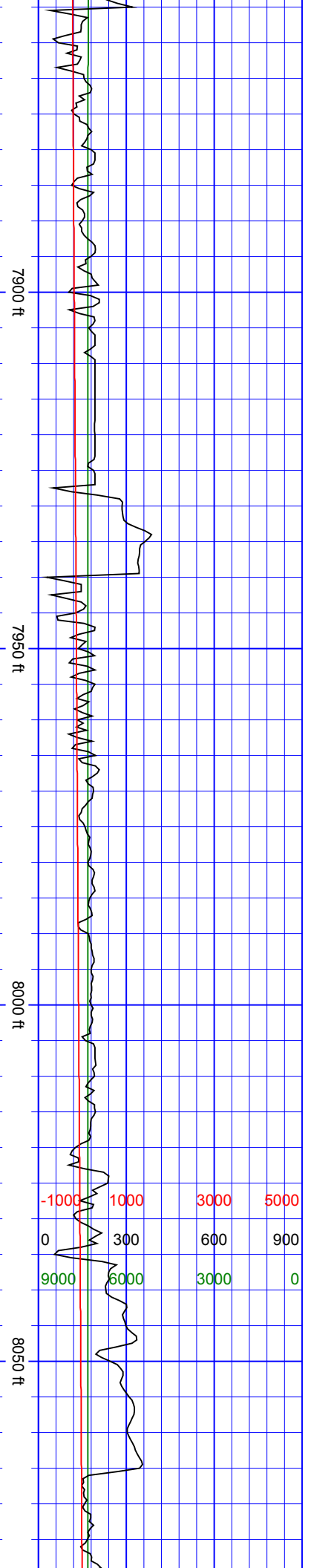


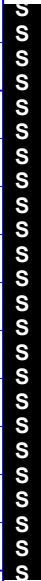
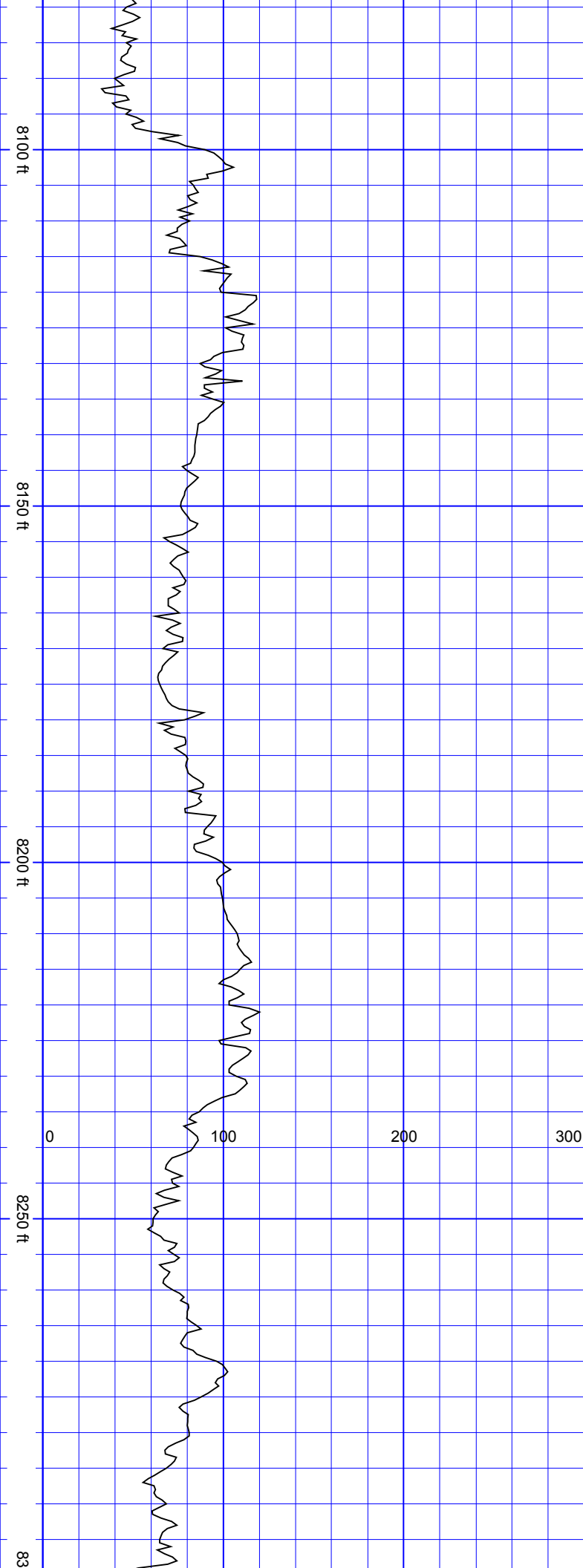


SurveyDepth:7875
TVD:7299.06 Inc:75.98
Azi:1.32 VertSec:-204.51

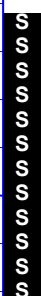
SurveyDepth:7969
TVD:7311.9 Inc:88.29
Azi:358.77 VertSec:-
111.59

SurveyDepth:8064
TVD:7306.59 Inc:98.13
Azi:1.05 VertSec:-16.87

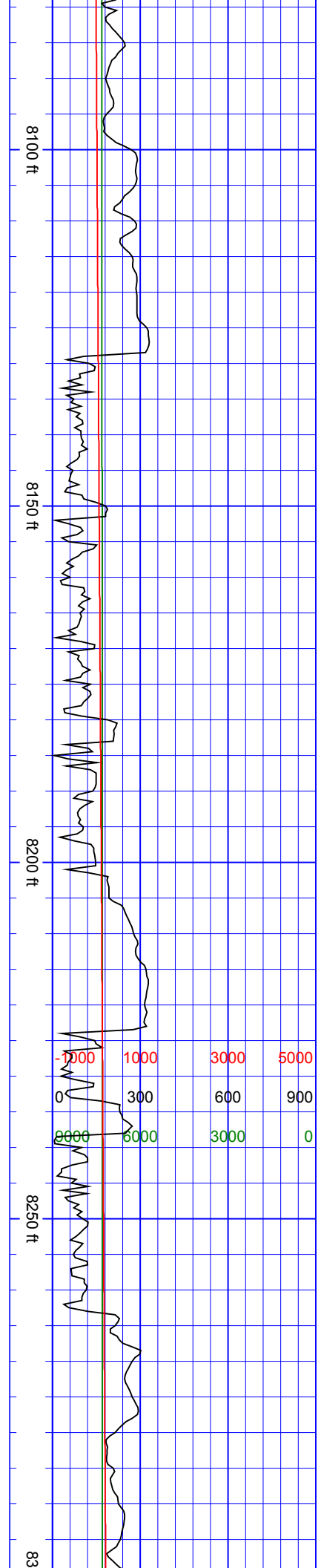


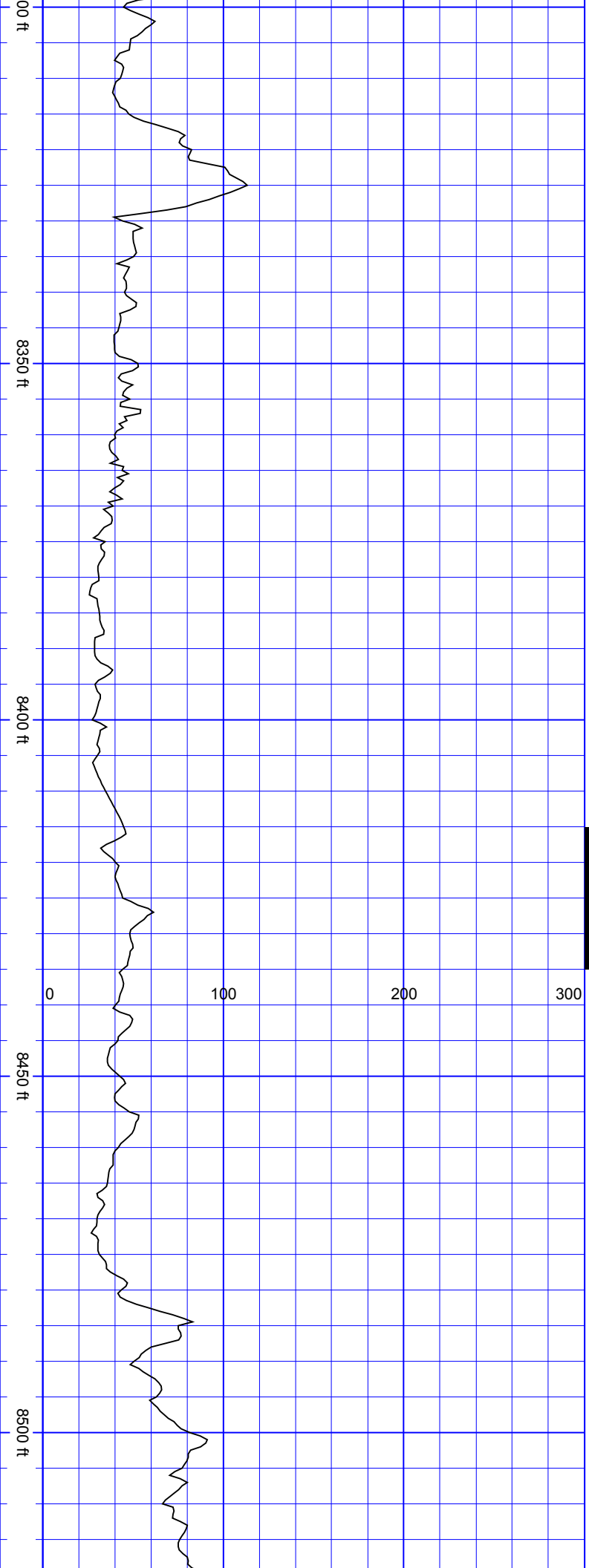


SurveyDepth:8159
TVD:7295.69 Inc:95.05
Azi:0.17 VertSec:77.46



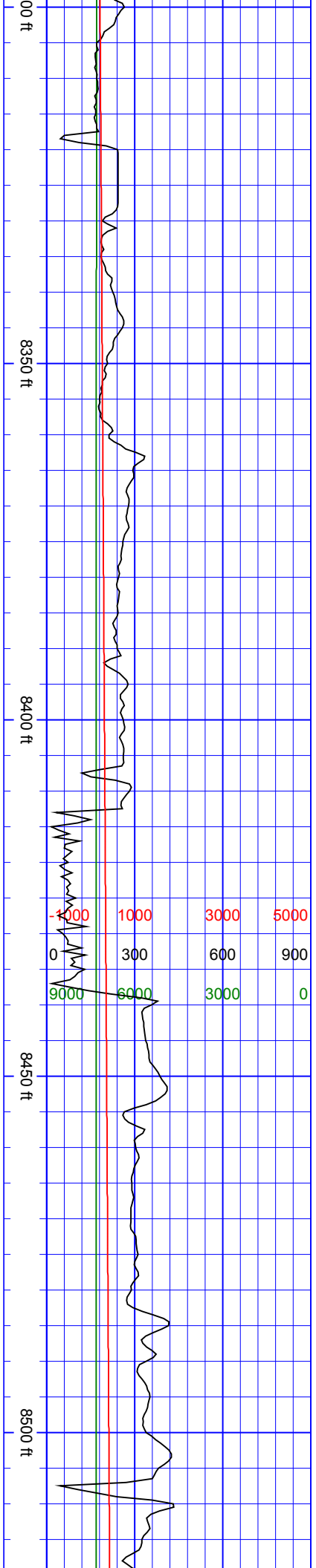
SurveyDepth:8253
TVD:7293.06 Inc:88.15
Azi:4.39 VertSec:171.2





SurveyDepth:8348
TVD:7297.87 Inc:86.05
Azi:4.48 VertSec:265.67

SurveyDepth:8443
TVD:7304.96 Inc:85.39
Azi:1.05 VertSec:360.21



8550 ft

8600 ft

8650 ft

8700 ft

0 100 200 300

SurveyDepth:8538
TVD:7313.36 Inc:84.46
Azi:1.67 VertSec:454.76

SurveyDepth:8633
TVD:7320.79 Inc:86.57
Azi:0.08 VertSec:549.42

SurveyDepth:8727
TVD:7322.99 Inc:90.75
Azi:358.94
VertSec:643.37



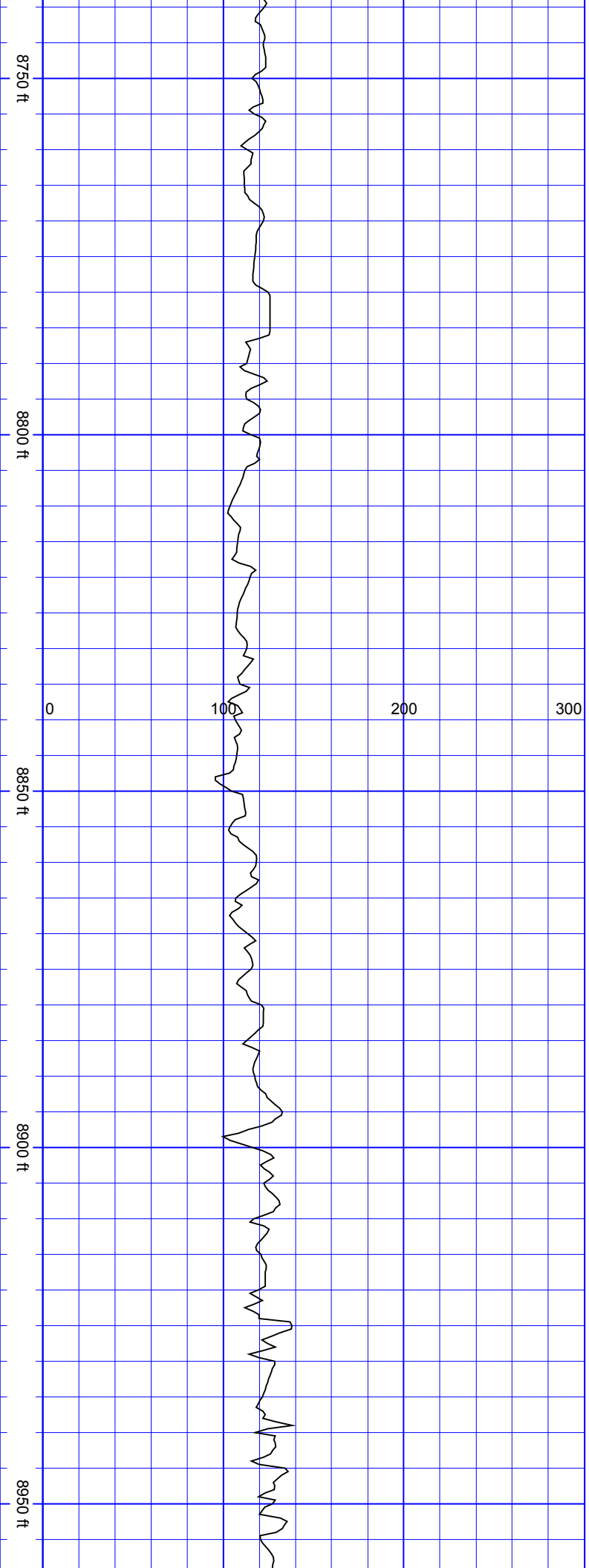
8550 ft

8600 ft

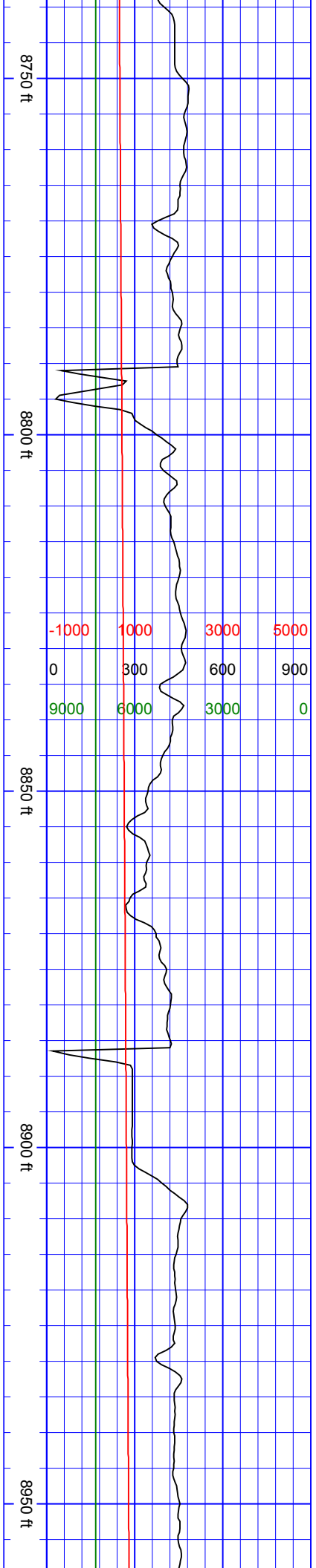
8650 ft

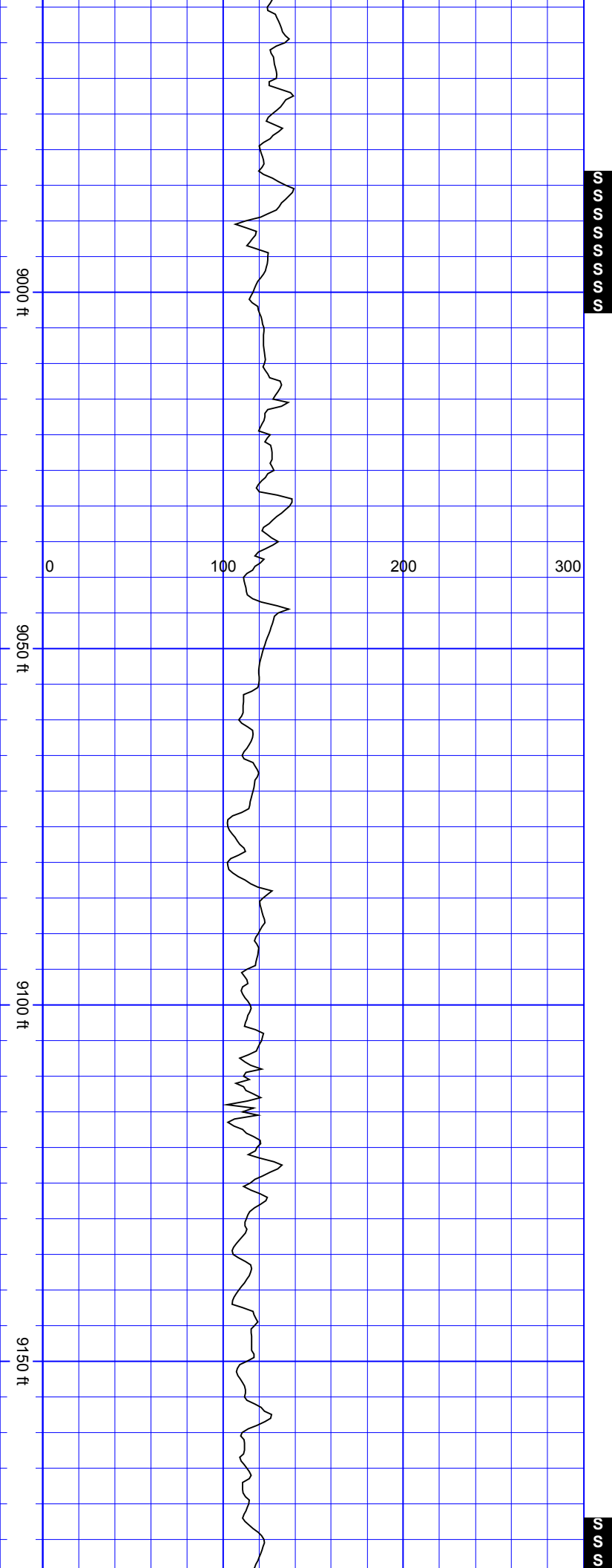
8700 ft

-1000	1000	3000	5000
0	300	600	900
9000	6000	3000	0



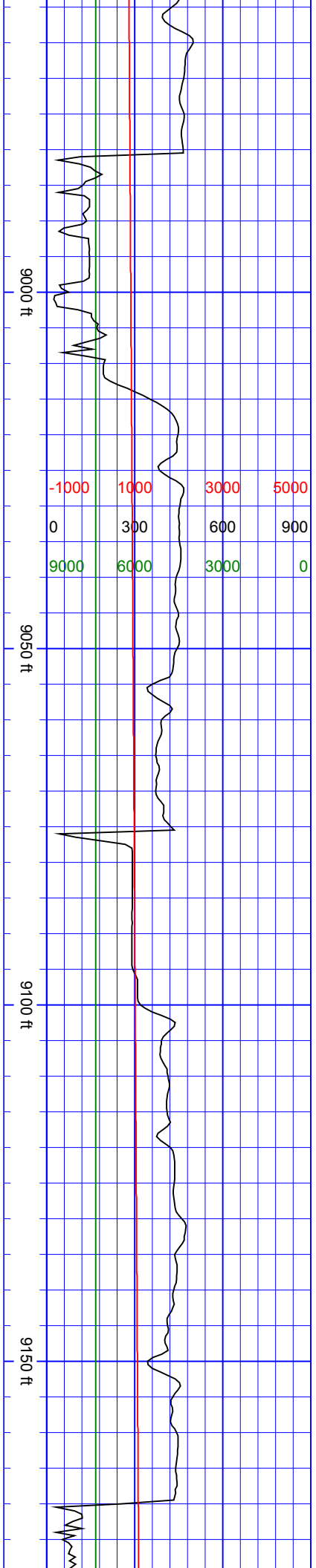
SurveyDepth:8822 TVD:7321.82 Inc:90.66 Azi:358.68 VertSec:738.36	SurveyDepth:8916 TVD:7321.28 Inc:90 Azi:358.77 VertSec:832.36
---	--

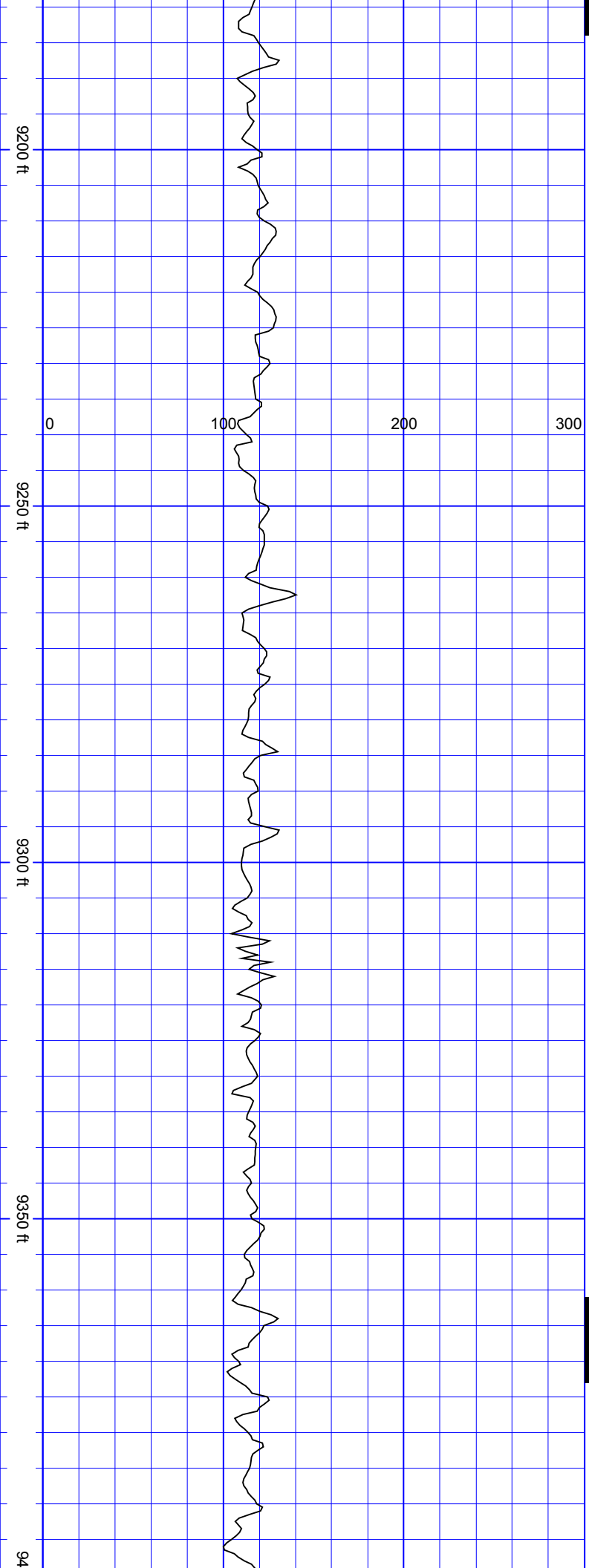




SurveyDepth:9011
TVD:7319.79 Inc:91.8
Azi:0.26 VertSec:927.34

SurveyDepth:9105
TVD:7316.25 Inc:92.51
Azi:359.56
VertSec:1021.26



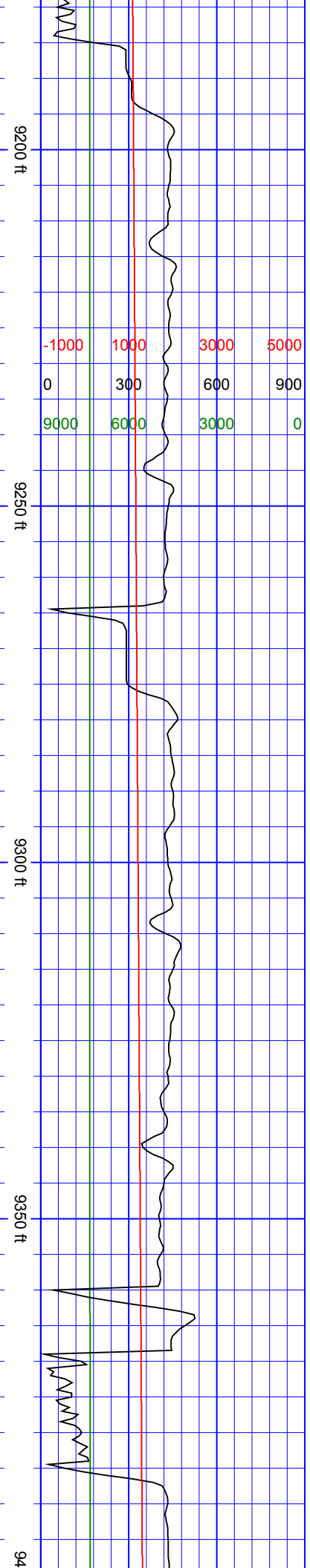


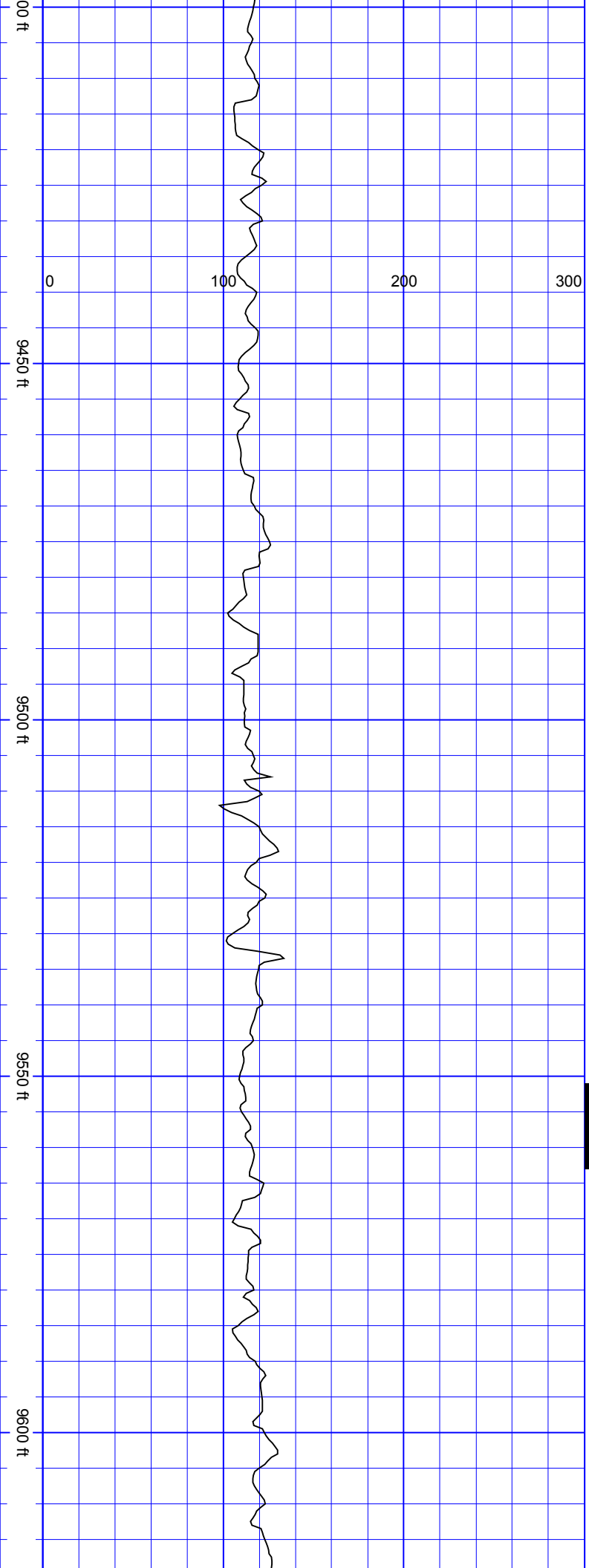
SurveyDepth:9200
TVD:7314.1 Inc:90.09
Azi:0.52
VertSec:1116.22

SurveyDepth:9294
TVD:7314.17 Inc:89.82
Azi:0.17 VertSec:1210.2

SurveyDepth:9389
TVD:7313.27 Inc:91.27
Azi:0.35
VertSec:1305.17

SSSS

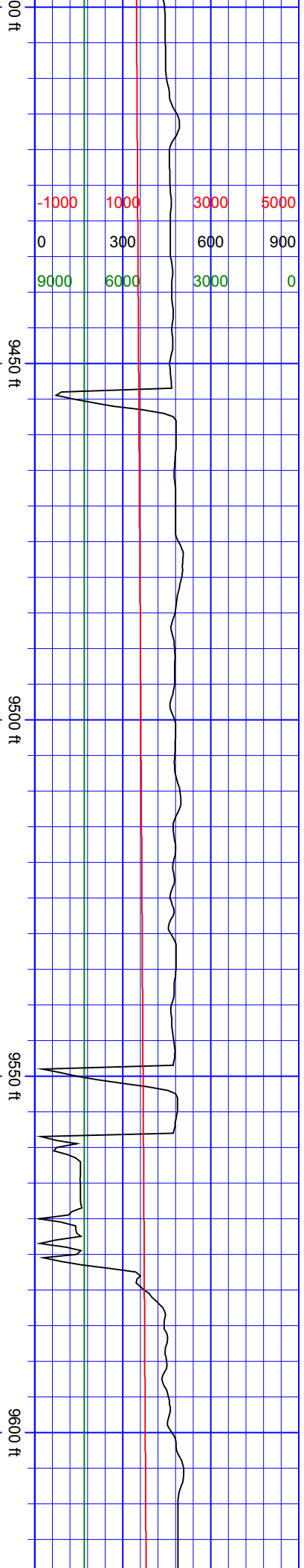


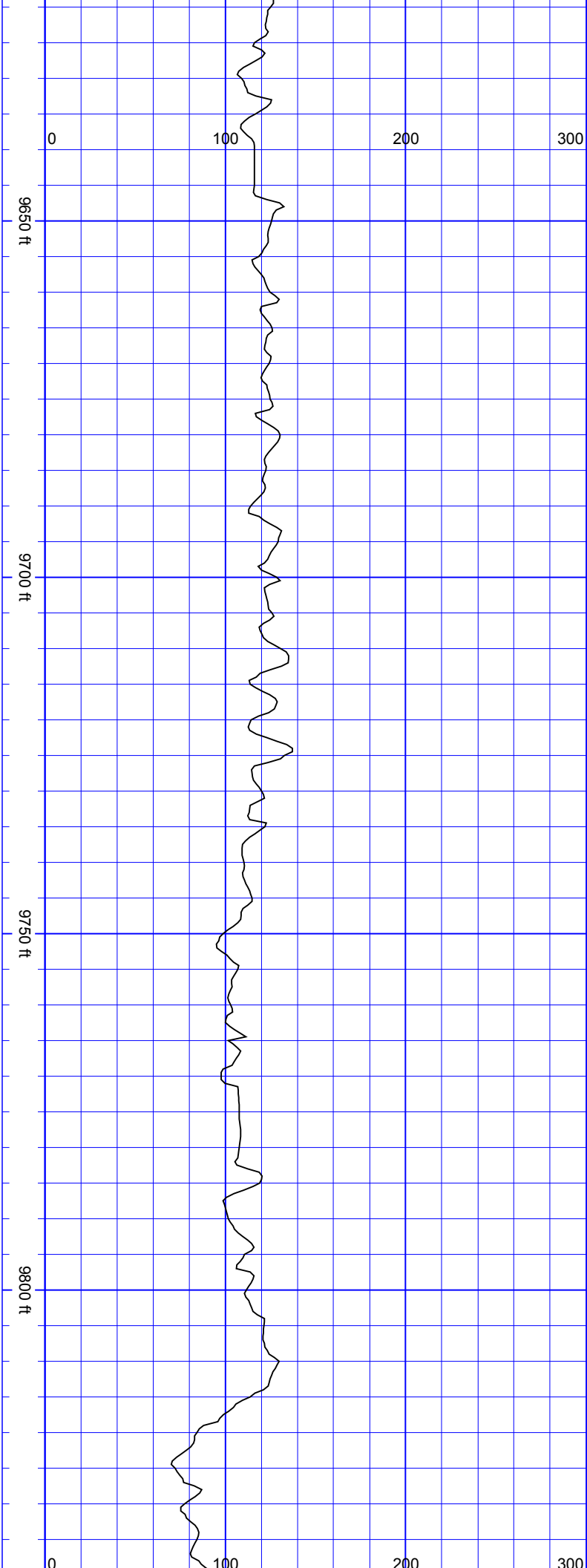


SurveyDepth:9484
TVD:7311.2 Inc:91.23
Azi:359.82
VertSec:1400.14

S
S
S
S
S

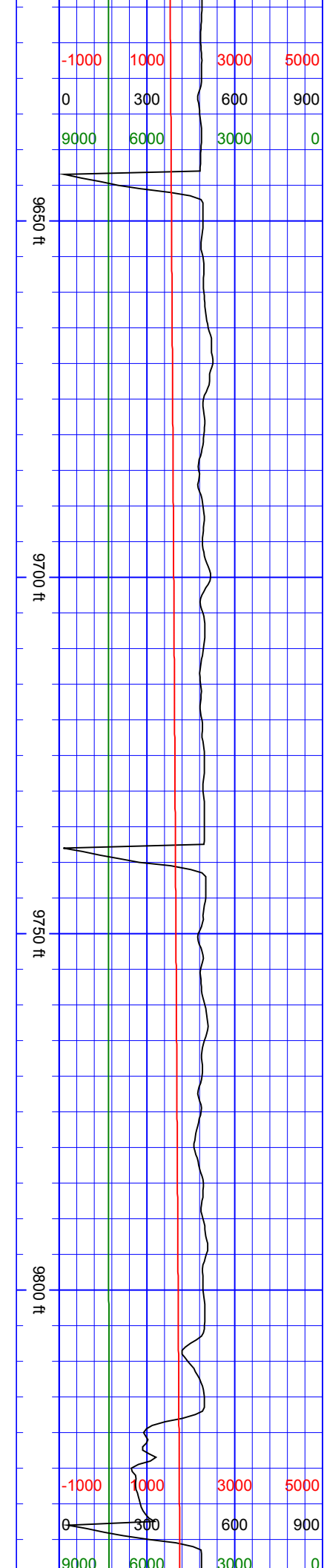
SurveyDepth:9579
TVD:7307.91 Inc:92.73
Azi:1.14
VertSec:1495.05

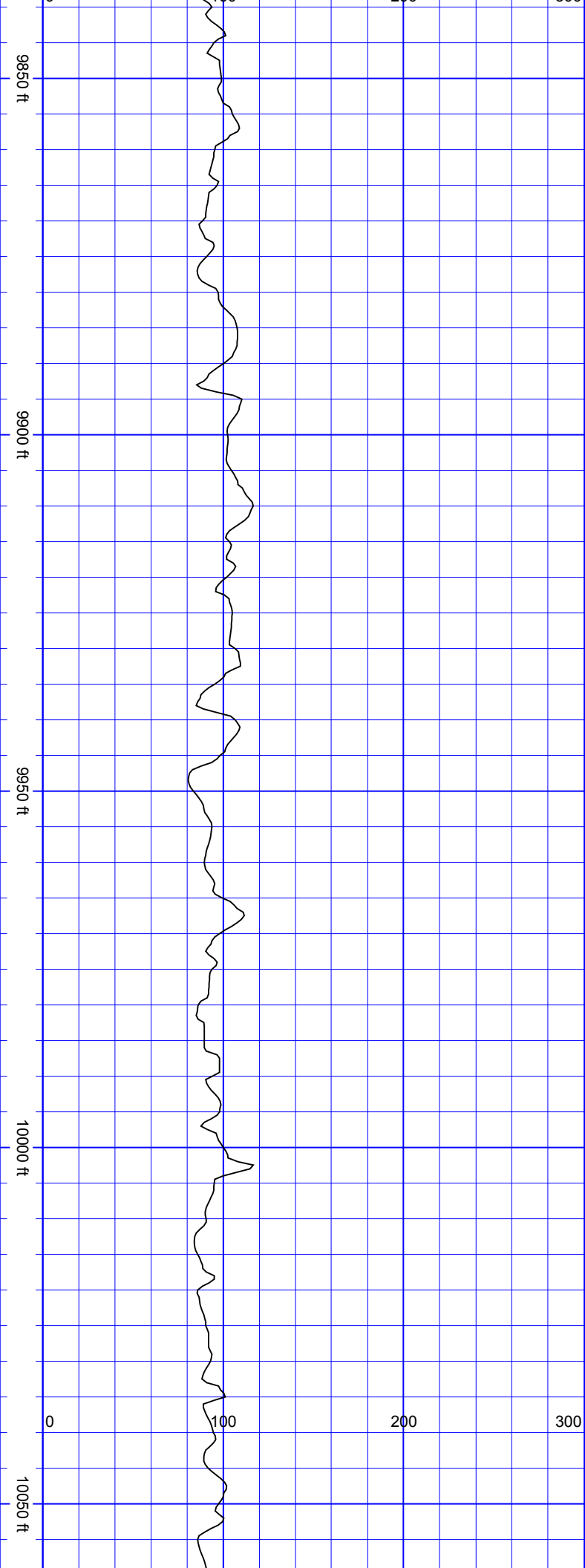




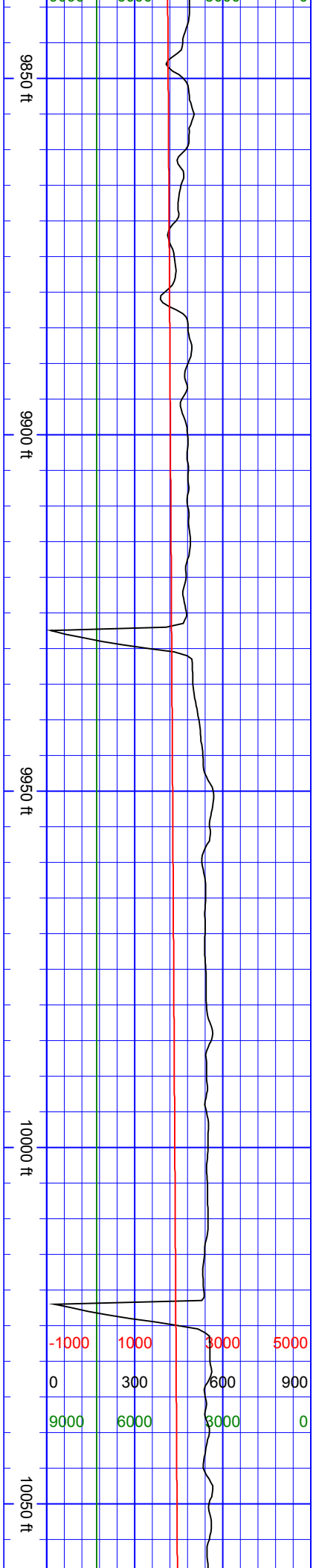
SurveyDepth:9673
TVD:7303.3 Inc:92.9
Azi:0.61
VertSec:1588.89

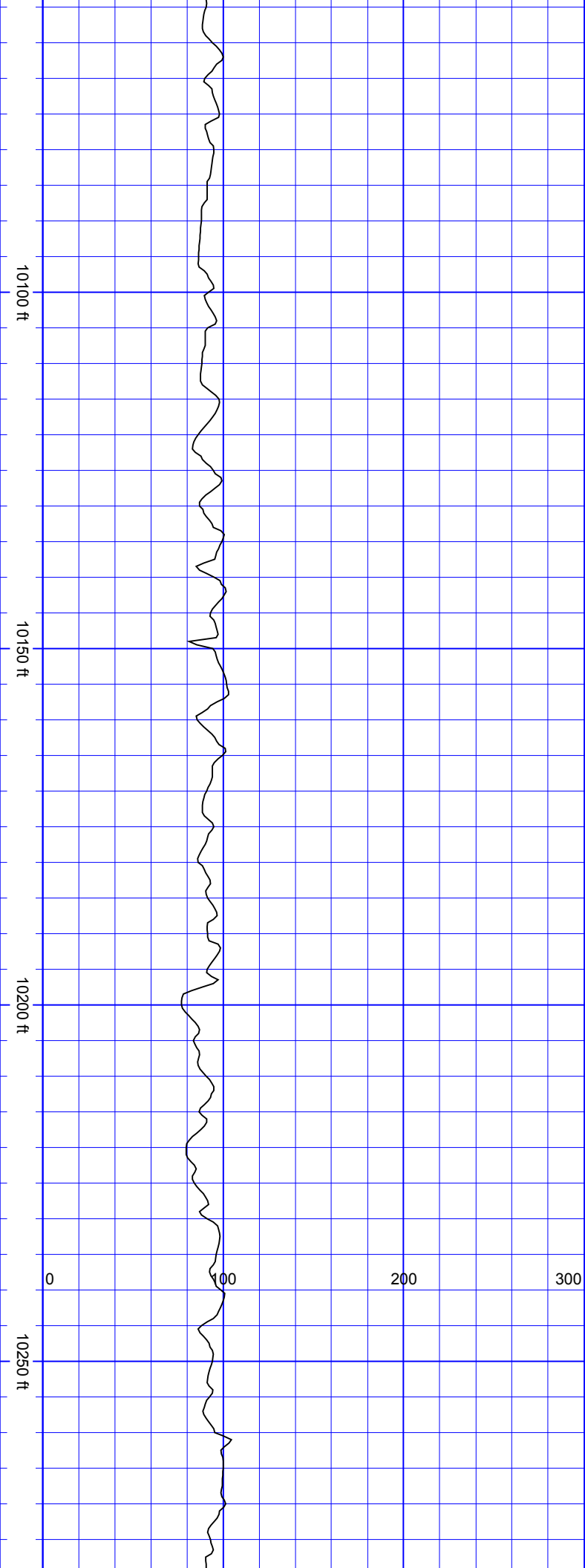
SurveyDepth:9768
TVD:7298.78 Inc:92.55
Azi:0.26
VertSec:1683.76





SurveyDepth:9863 TVD:7294.59 Inc:92.51 Azi:0.61 VertSec:1778.65
SurveyDepth:9958 TVD:7290.79 Inc:92.07 Azi:0.08 VertSec:1873.55
SurveyDepth:10052 TVD:7287.9 Inc:91.45 Azi:359.47

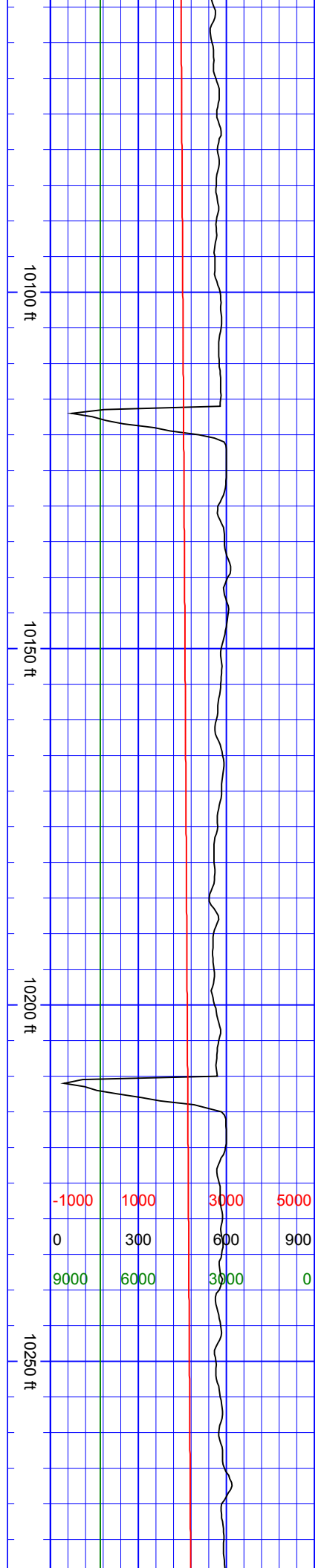


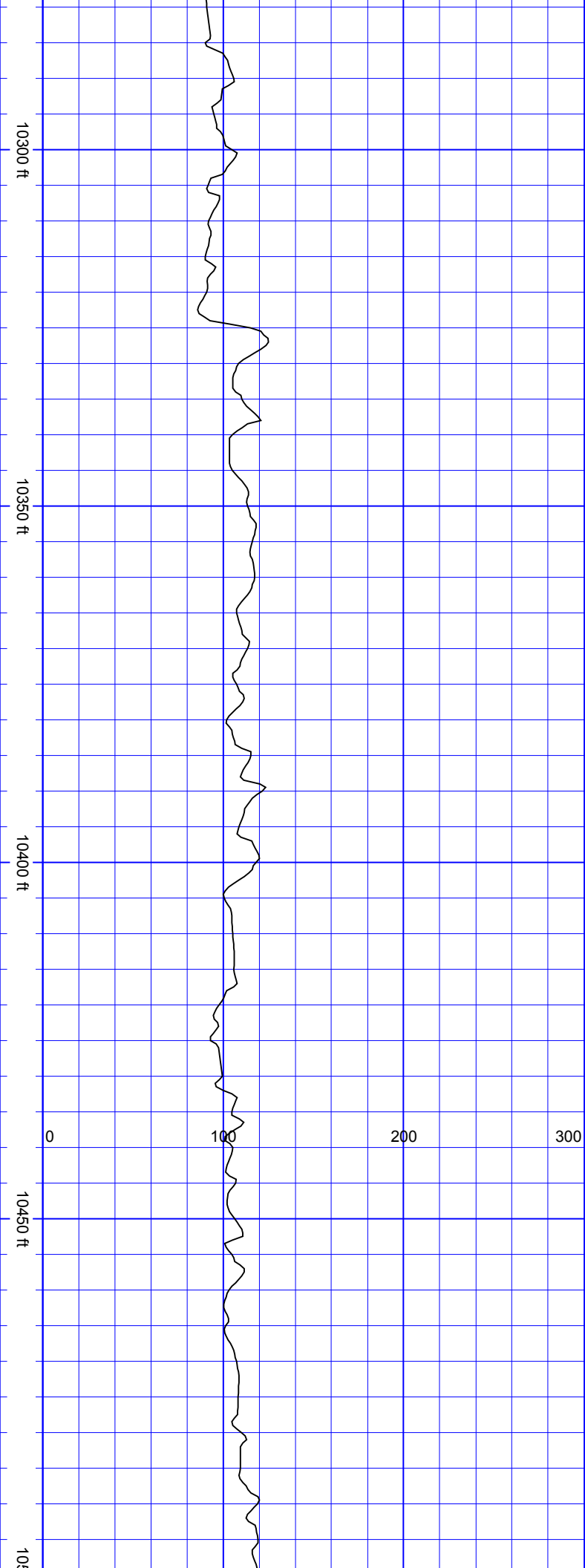


VertSec:1967.5

SurveyDepth:10147
TVD:7285.86 Inc:91.01
Azi:359.65
VertSec:2062.48

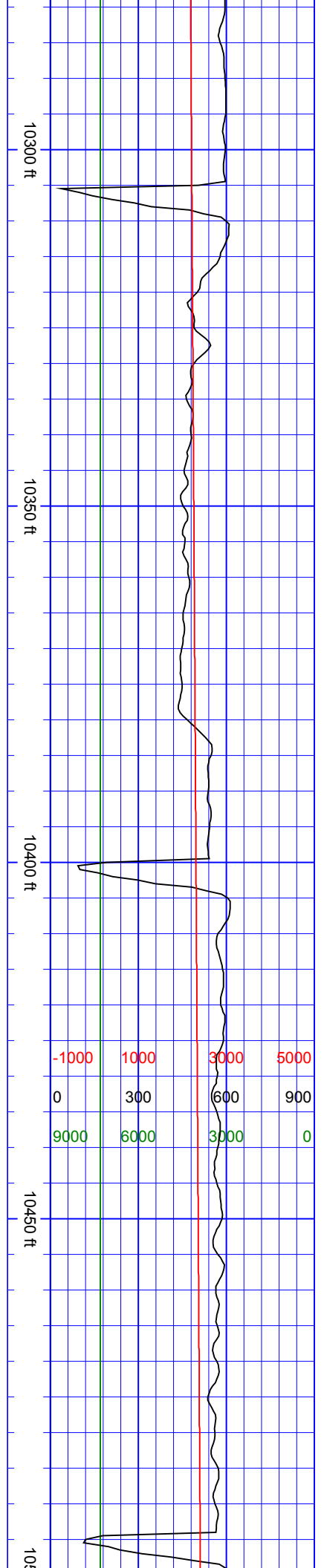
SurveyDepth:10241
TVD:7284.78 Inc:90.31
Azi:358.77
VertSec:2156.47

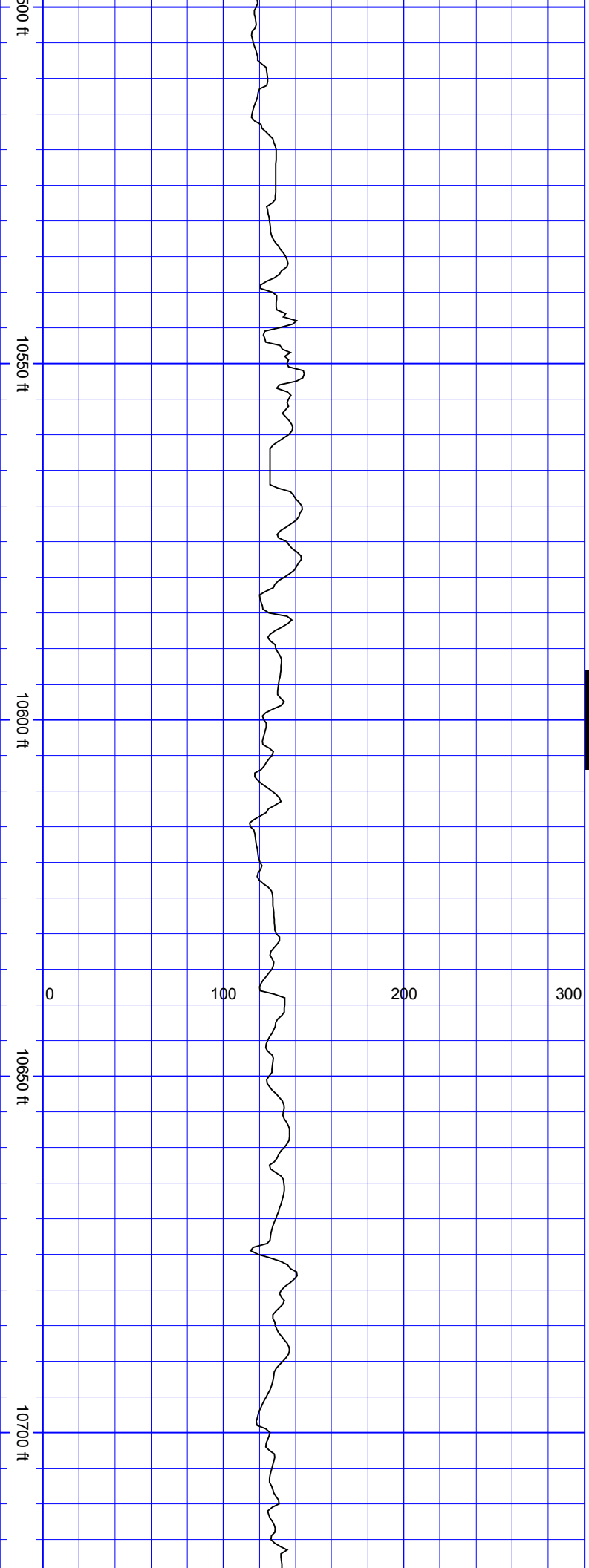




SurveyDepth:10336
TVD:7284.74 Inc:89.74
Azi:358.41
VertSec:2251.46

SurveyDepth:10430
TVD:7285.71 Inc:89.08
Azi:358.33
VertSec:2345.45



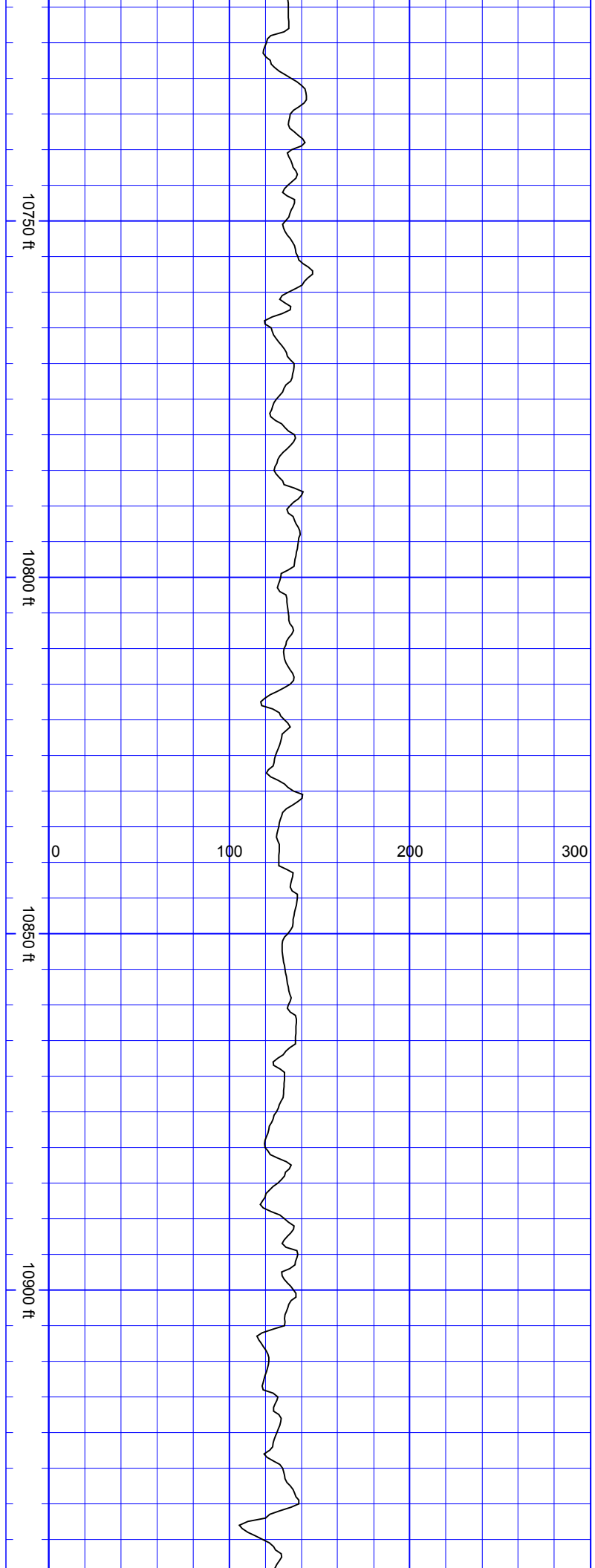


SurveyDepth:10526
TVD:7287.58 Inc:88.68
Azi:357.89
VertSec:2441.41

SurveyDepth:10620
TVD:7288.95 Inc:89.65
Azi:359.65
VertSec:2535.4

SurveyDepth:10715
TVD:7289.54 Inc:89.65

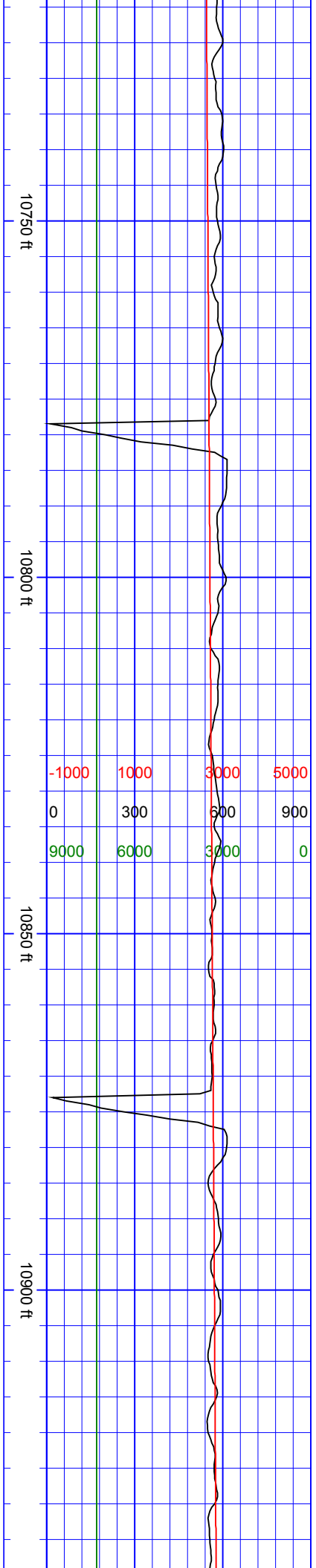


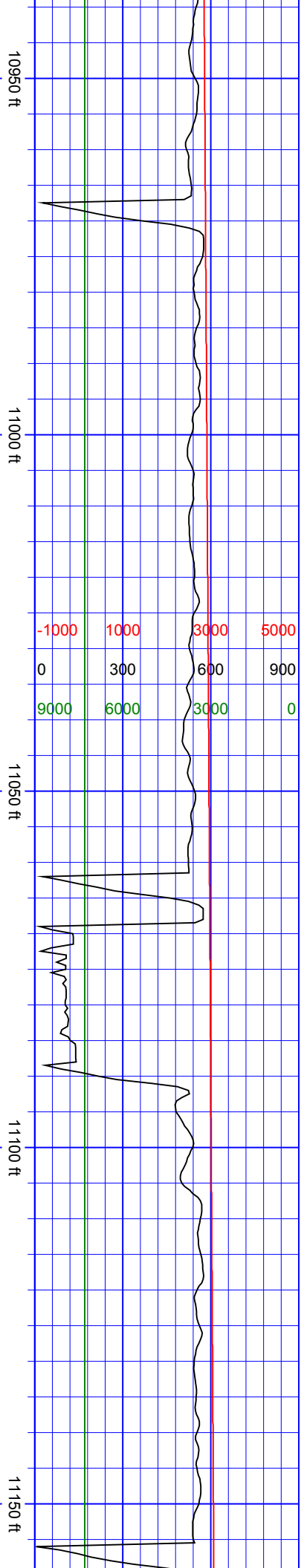


TVD:7289.34 Inc:89.33
Azi:0.08
VertSec:2630.39

SurveyDepth:10810
TVD:7290.37 Inc:89.34
Azi:360 VertSec:2725.37

SurveyDepth:10904
TVD:7291.82 Inc:88.9
Azi:0.44
VertSec:2819.34



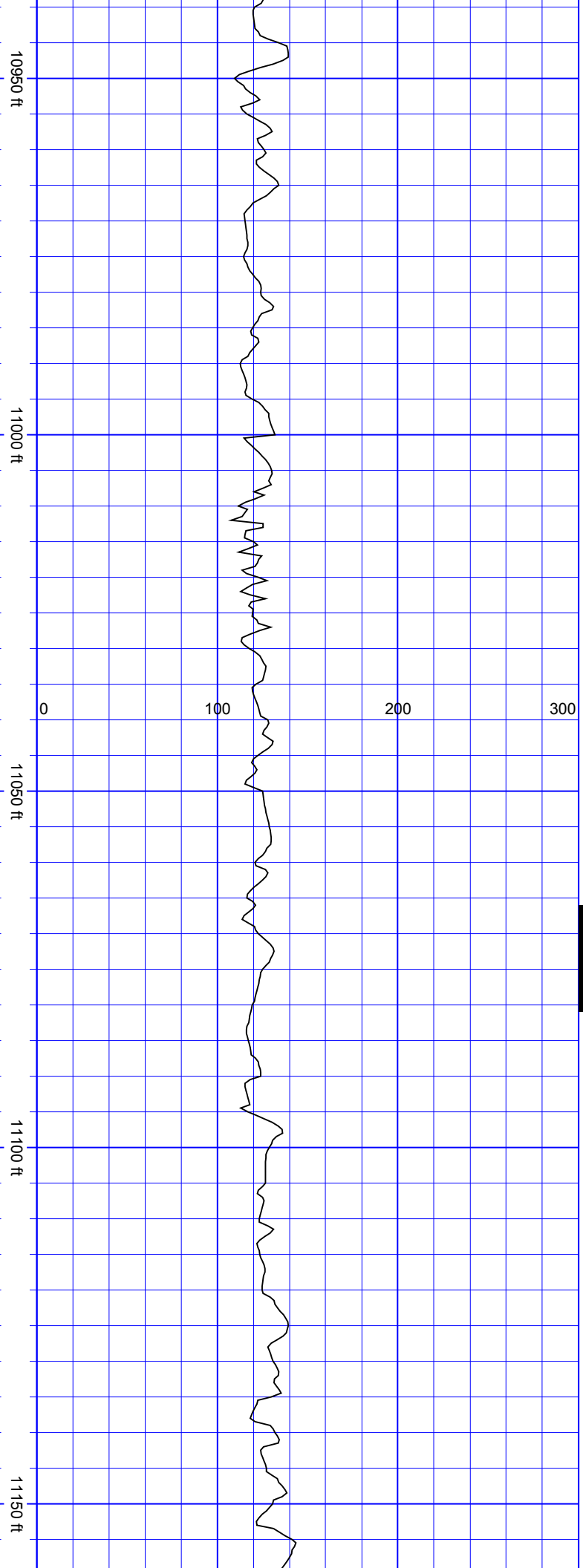


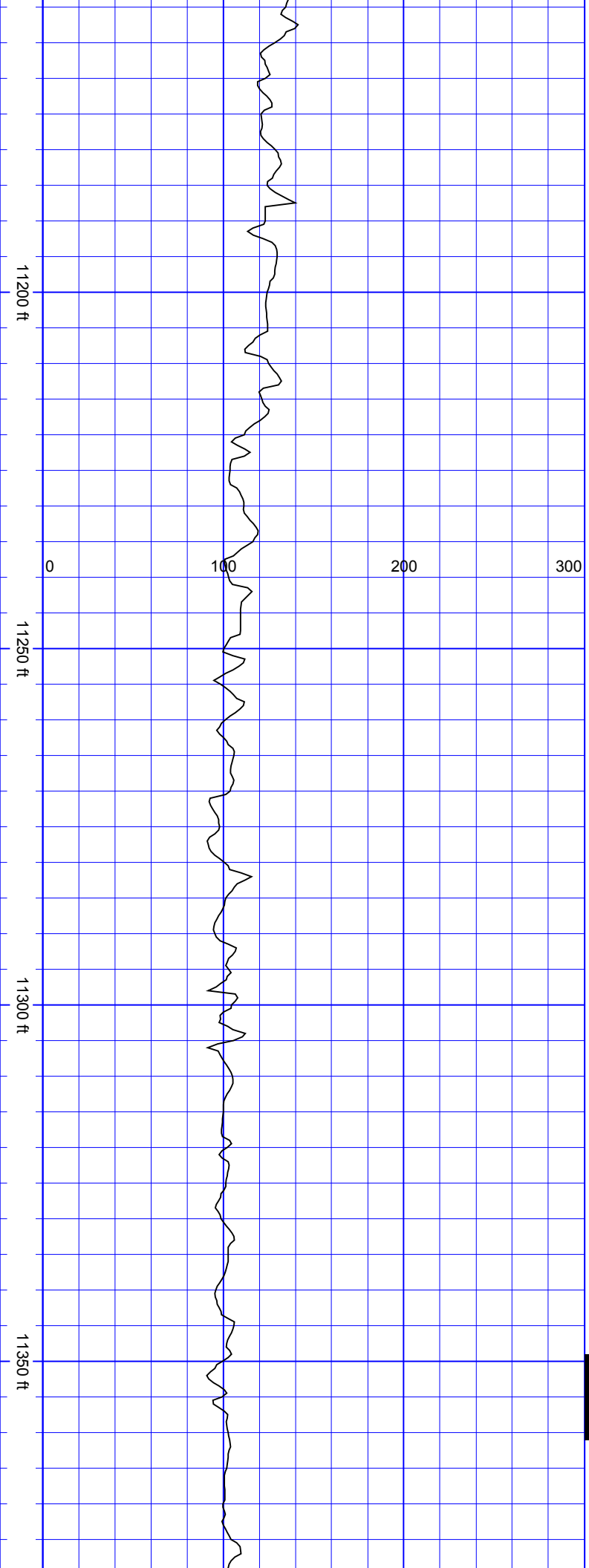
June 04, 2018

SurveyDepth:10999
TVD:7293.67 Inc:88.86
Azi:0.96
VertSec:2914.29

SurveyDepth:11093
TVD:7294.5 Inc:90.13
Azi:358.5
VertSec:3008.27

SSSSSS



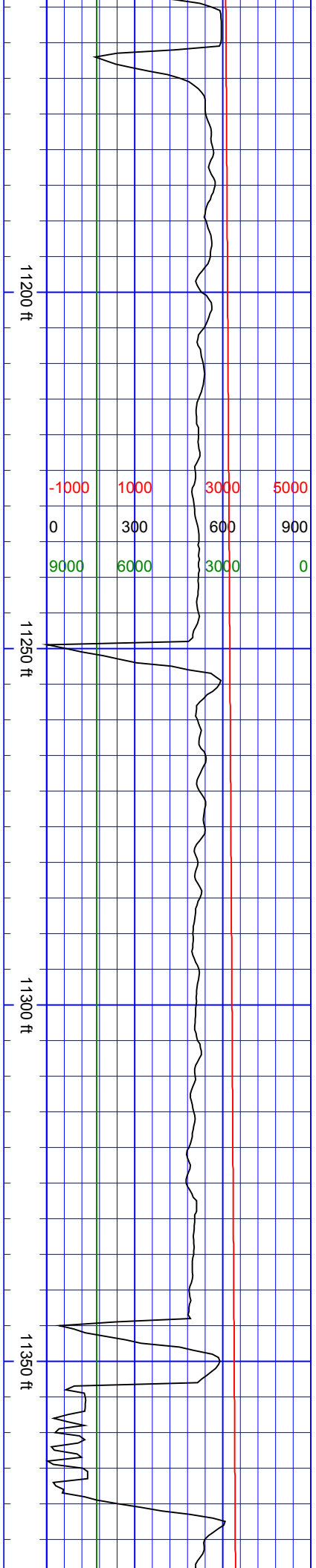


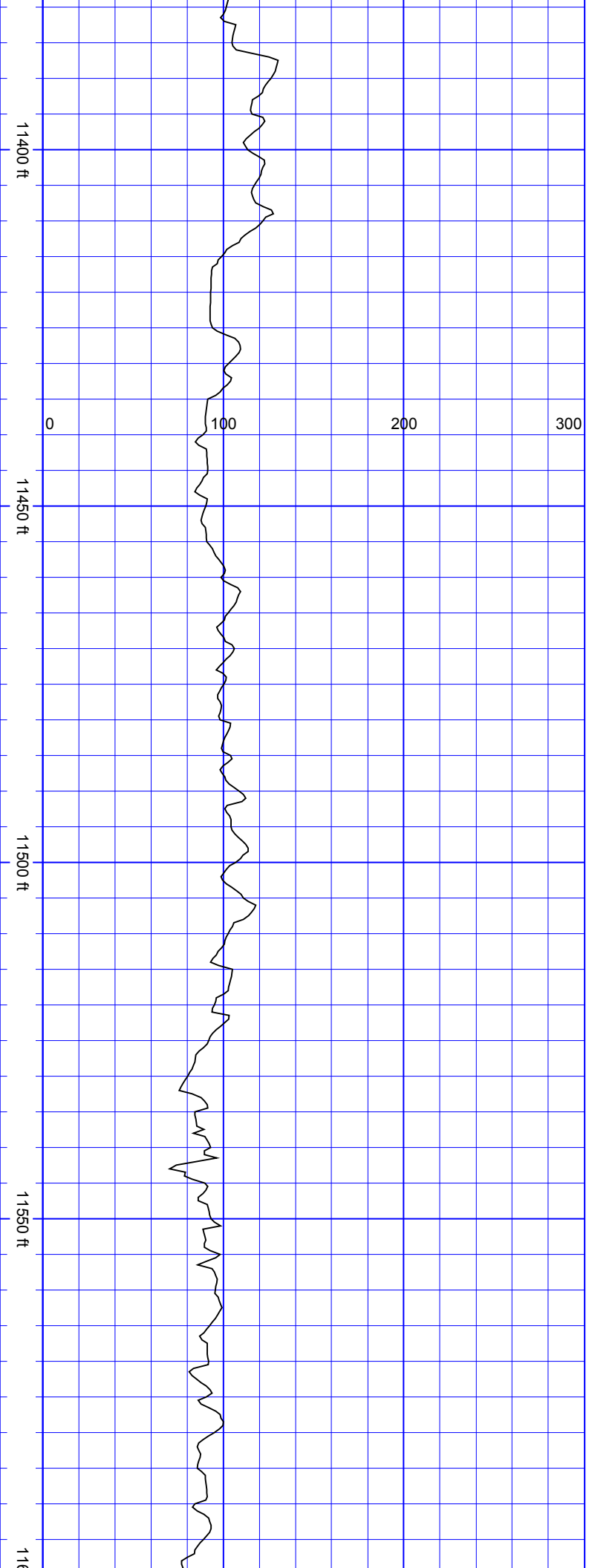
SurveyDepth:11187
TVD:7294.11 Inc:90.35
Azi:358.06
VertSec:3102.26

SurveyDepth:11282
TVD:7293.89 Inc:89.91
Azi:357.54
VertSec:3197.23

S
S
S
S
S

SurveyDepth:11377

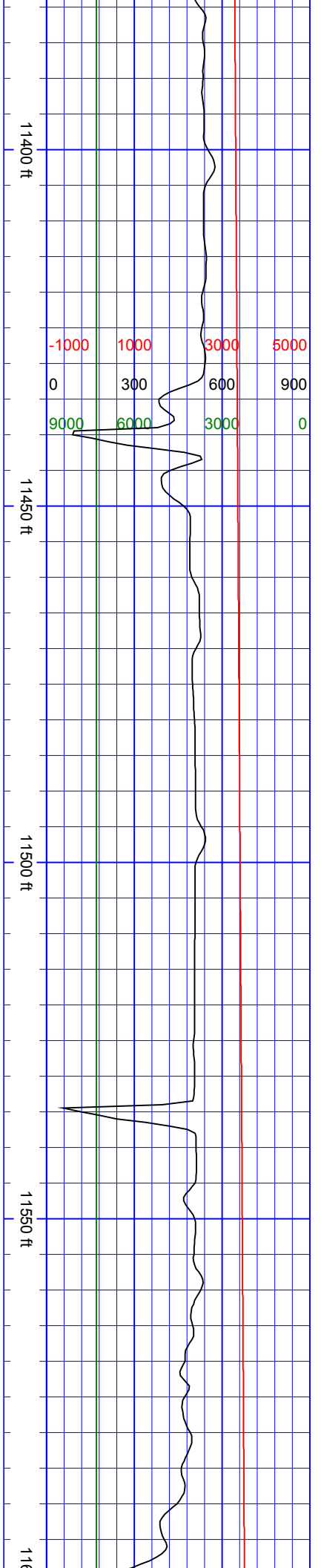


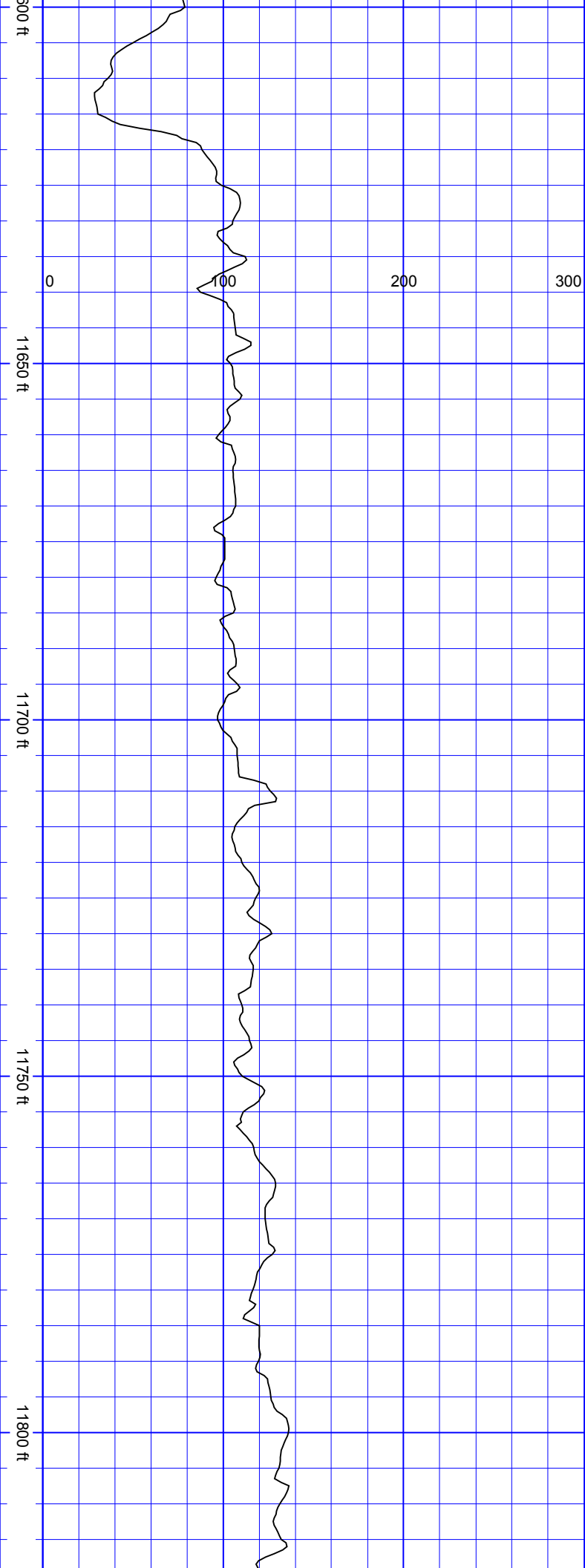


TVD:7292.84 Inc:91.36
Azi:357.01
VertSec:3292.17

SurveyDepth:11471
TVD:7290.1 Inc:91.98
Azi:357.89
VertSec:3386.09

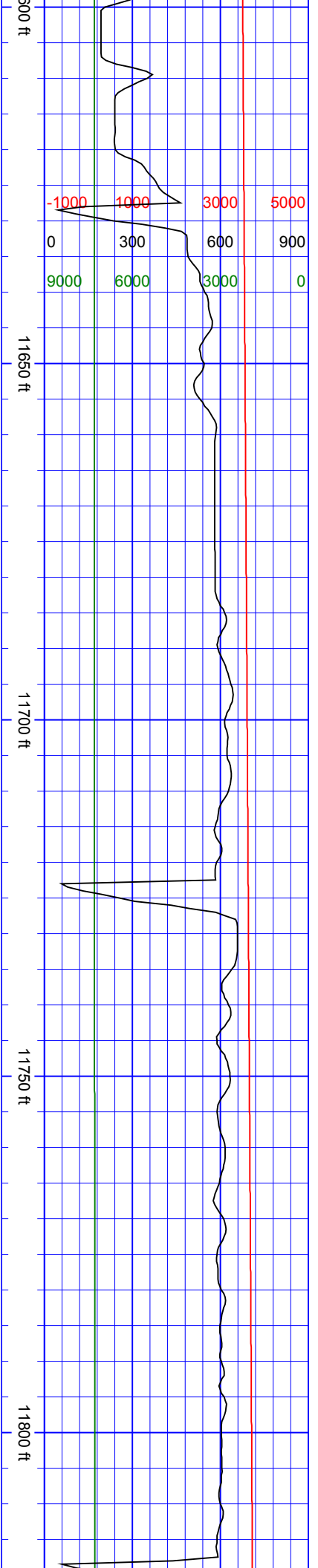
SurveyDepth:11566
TVD:7286.86 Inc:91.93
Azi:357.18 VertSec:3481

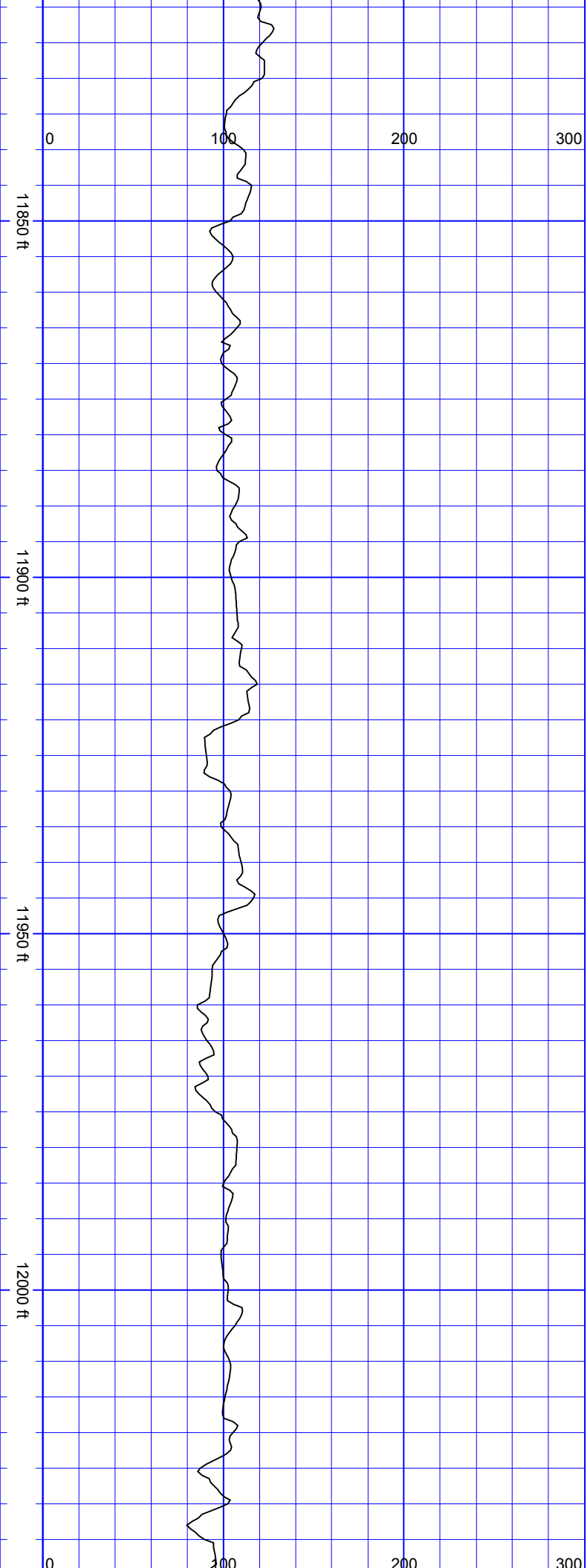




SurveyDepth:11660
TVD:7283.87 Inc:91.71
Azi:357.18
VertSec:3574.89

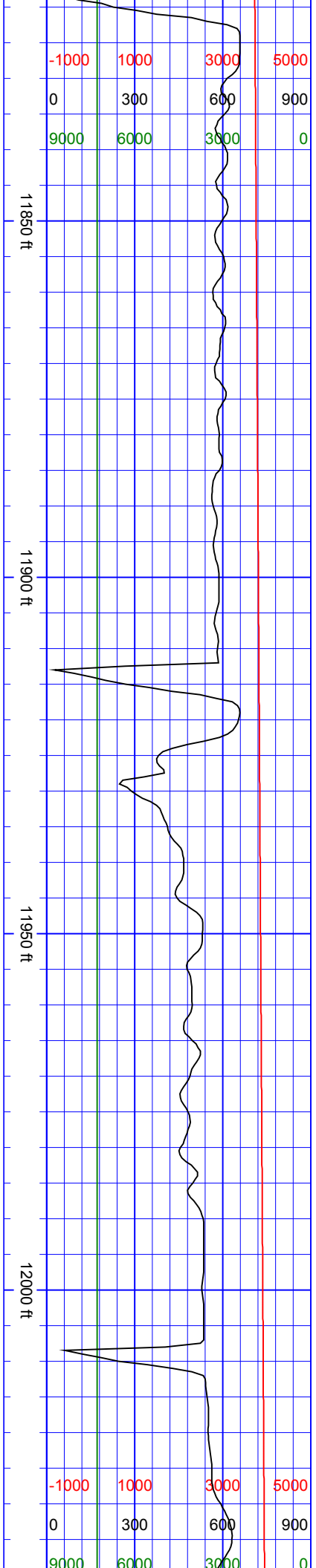
SurveyDepth:11756
TVD:7280.97 Inc:91.76
Azi:357.18
VertSec:3670.79

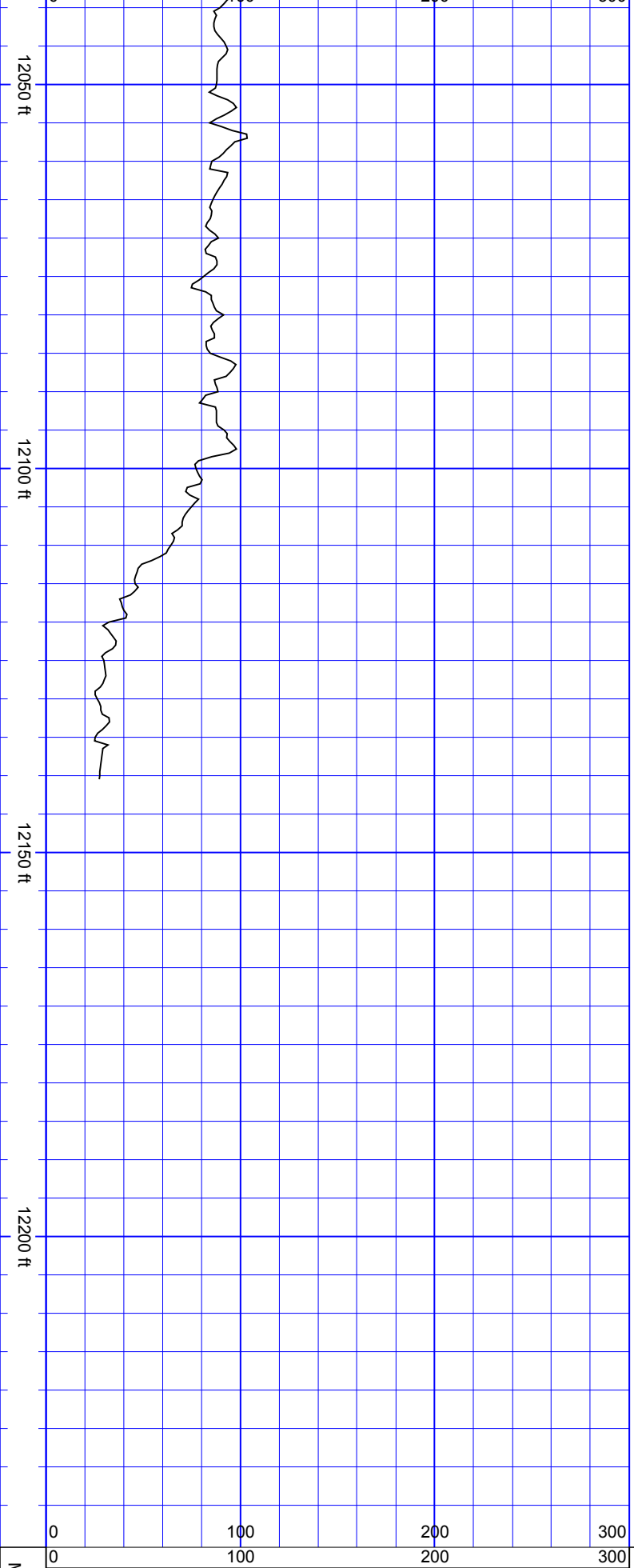




SurveyDepth:11850
TVD:7278.19 Inc:91.63
Azi:357.27
VertSec:3764.7

SurveyDepth:11945
TVD:7275.63 Inc:91.45
Azi:356.74
VertSec:3859.6





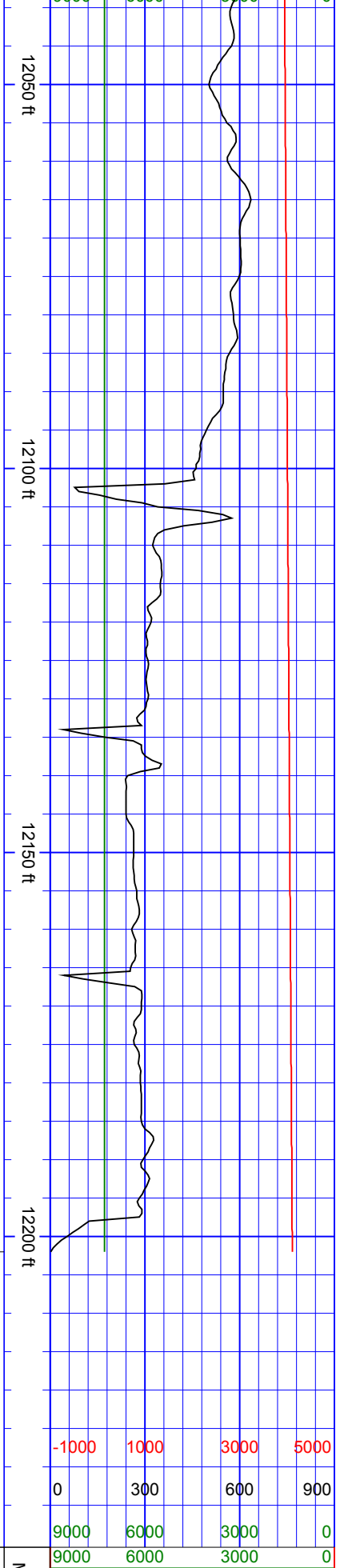
SurveyDepth:12040
TVD:7273.16 Inc:91.54
Azi:357.71
VertSec:3954.51

SurveyDepth:12135
TVD:7270.97 Inc:91.1
Azi:356.92
VertSec:4049.43

Extrapolation To Bit
SurveyDepth:12202
TVD:7269.68 Inc:91.1
Azi:356.92
VertSec:4116.37

Slide - Rot

Directional S



-1000	1000	3000	5000
0	300	600	900
9000	6000	3000	0
9000	6000	3000	0
TVD Depth (ft)			
0	300	600	900
Drill Rate (ft/hr)			
-1000	1000	3000	5000
Vertical Section (ft)			

June 05, 2018

Date

MD Depth "Scale" ft"

3.5" = 100	GAMMA RAY	ate	urvey	3.5" = 100	ROP - VERT SEC - TVD
------------	-----------	-----	-------	------------	----------------------