Multi-Finger Caliper

Company	SOUTHERN CALIFORNIA GAS CO
Well	PORTER 44
Field	ALISO CANYON
County	LOS ANGELES
State	CALIFORNIA

Location: API # :

1720.78' S. & 2994.52' W.
FROM STATION 84

SEC 28 TWP 3N RGE 16W

Other Services: NONE

Permanent Datum	GL	Elevation	2393.5
Log Measured From	KB		
Drilling Measured From	KB		

Elevation
K.B. 2204.5
D.F. 2203
G.L. 2393.5

Date	25-FEB-16
Run Number	1
Service Order	US106146J
Depth Driller	8100
Depth Logger	7639
Bottom Logged Interval	7639
Top Log Interval	0
Type Fluid	3% KCL
Density / Viscosity	8.5 LBS/GAL
Max. Recorded Temp.	N/A
Estimated Cement Top	N/A
Time Well Ready	06:30
Time Logger on Bottom	08:00
Equipment Number	4353
Location	OKLAHOMA CITY
Recorded By	MATT WOOD
Witnessed By	ROGER LEFLER

Borehole Record				Tubing Record			
Run Number	Bit	From	To	Size	Weight	From	To
				7	23#	SURFACE	6798'
				7"	26#	6798'	7805'

Casing Record	Size	Wgt/Ft	Top	Bottom
Surface String				
Prot. String				
Production String				
Liner				

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In making interpretations of logs, our employees will give the customer the benefit of their best judgement. But since all interpetations are opinions based on inferences from electrical or other measurements, we cannot, and we do not guarantee the accuracy or correctness of any interpretation. We shall not be liable or responsible for any loss, cost, damages, or expenses whatsoever incurred or sustained by the customer resulting from any interpretation made by any of our employees.

Comments

LOG CORRELATED TO DRESSER ATLAS CBL, 10-JAN-1973
INLINE CENTRALIZERS RAN

Client: Southern California Gas		
Well: Porter 44	Top Depth: 16	Date: 25-Feb-2016
Country: Los Angeles	Bottom Depth: 7639	Tool Size: 3.125in
Analyst: B. Harbstreit	# Fingers: 56F	Tool Type: Image Caliper
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The casing parameters used for the following analysis:
7.0", 23lb, 16.8 – 6800 FT consisted of grades J55, N80 and S95
7.0", 26lb, 6800 – 7634.9 FT grade N80

Joint #95- Showed severe circumferential damage that extended axially from 3998 – 4003 FT with a magnitude of damage reporting 100%. It is our opinion tha body wall penetration has occurred and integrity has been lost within this joint body.

Joint #20 – reported a feature with a signature associated with wear at 783 FT at 22.4% DOP

The bottom connection of joint #102 appears to be mechanical hardware and resembles that of a DV-Tool

Joints #149 and #150 – shows in our opinion deformation/ovality. Deformation and ovality will report higher magnitudes of %DOP, however we attribute the re %DOP as the actual magnitude of out of roundness and we attribute no actual metal loss to these types of features. We leave what is reported for %DOP in the r an identifier to the operator that deformation/ovality has occurred.

Joint #157 – reporting actual pitting, %DOP = 23.7%

Joint #158 – again same type of signature associated with wear, reported 27.4% DOP

DOP = Depth Of Penetration

DISCLAIMER:
These results were generated semi-automatically, using EPIDOTE - MIPS analysis software. The data was acquired using HotWell casing inspection tools. Hot accepts no responsibility for the accuracy of the results that are presented.

All interpretations are opinions, based on inferences from electrical or other measurements and we cannot and do not guarantee the accuracy or correctness of a interpretation, and we shall not, except in the case of gross or willful negligence on our part, be liable or responsible for any loss, costs, damages or expenses in sustained by anyone resulting from any interpretations made by any of our officers, agents or employees. These interpretations are also subject to our general te conditions.

Client: Southern California Gas
Well: Porter 44
Date: 25-Feb-2016
Analyst: B. Harbstreit
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Top Depth: 16
Bottom Depth: 7639
Fingers: 56F
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Field: Aliso Canyon
Country: Los Angeles
Tool Size: 3.125in
Tool Type: Image Caliper
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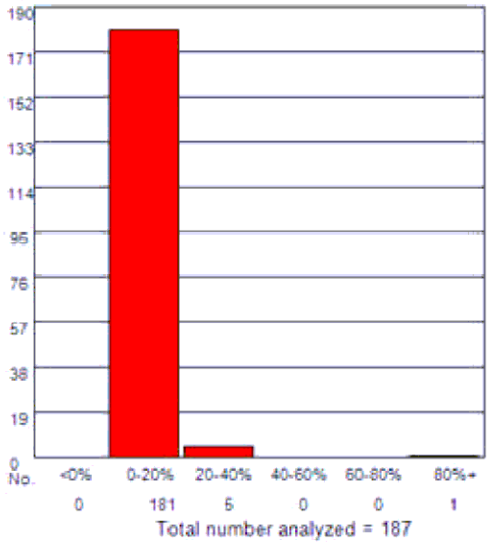

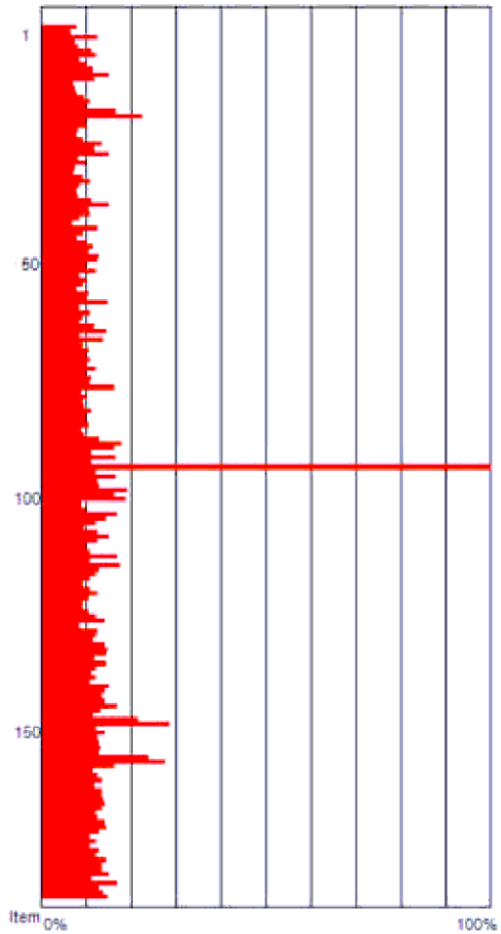

%Penetration

Client: Southern California Gas
Well: Porter 44
Date: 25-Feb-2016
Analyst: B. Harbstreit
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Top Depth: 16
Bottom Depth: 7639
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Field: Aliso Canyon
Country: Los Angeles
Tool Size: 3.125in
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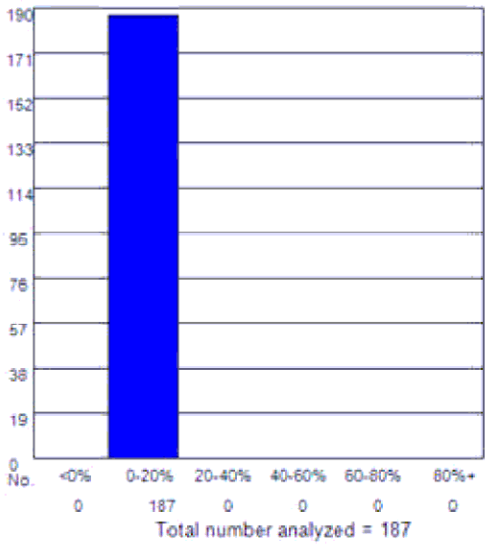

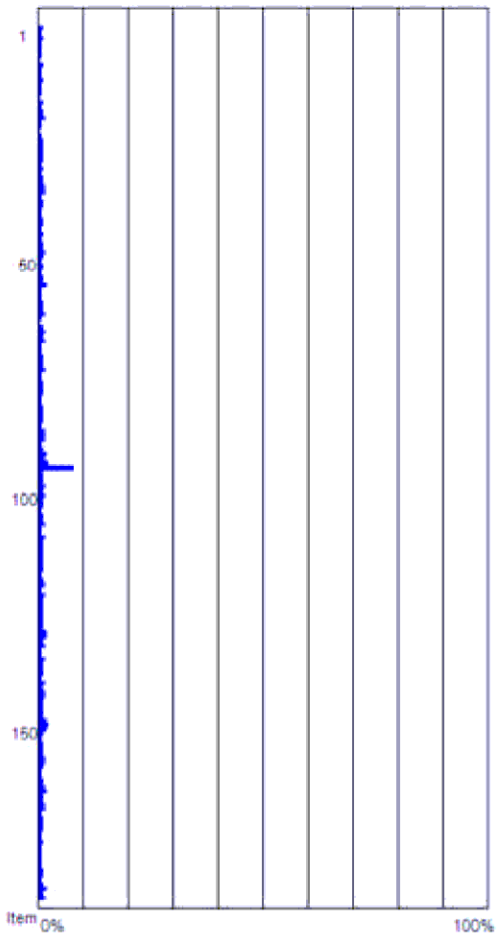

Maximum Projection

Client: Southern California Gas		Field: Aliso Canyon
Well: Porter 44	Top Depth: 16	Country: Los Angeles
Date: 25-Feb-2016	Bottom Depth: 7639	Tool Size: 3.125in
Analyst: B. Harbstreit	# Fingers: 56F	Tool Type: Image Caliper
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Penetration Tally

Extended Joint Body Penetration - MIPS JointAnalysisX v2.48 - Joint statistics based on joint Median ID; Graded on Max Pen %

Less than 0	From 0 to 20	From 20 to 40	From 40 to 60	From 60 to 80	Greater than 80
Null	Class I	Class II	Class III	Class IV	Class V

Pipe grading based on Max Percentage Penetration

Client: Southern California Gas
Well: Porter 44
Date: 25-Feb-2016
Analyst: B. Harbstreit
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Top Depth: 16
Bottom Depth: 7639
Fingers: 56F
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Field: Aliso Cany
Country: Los Ang
Tool Size: 3.125i
Tool Type: Image
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Item Number	Top Body	Body Length	NomID At Max Pen	Mean Median Ins	Max Pen Ins	Max Pen %	Max Loss %	Min Diam Ins
1	16.861	1.633	6.366	6.362	6.412	7.900	2.286	6.315
2	19.294	8.781	6.366	6.387	6.427	6.555	1.375	6.367
3	28.459	41.592	6.366	6.384	6.462	12.663	3.734	6.317
4	70.434	42.898	6.366	6.395	6.440	7.451	0.909	6.355
5	113.759	41.052	6.366	6.395	6.444	8.066	1.939	6.358
6	155.194	41.152	6.366	6.395	6.463	11.205	1.595	6.355
7	196.729	42.941	6.366	6.391	6.465	12.181	1.936	6.363
8	240.053	43.793	6.366	6.389	6.440	8.341	0.914	6.355
9	284.201	42.401	6.366	6.380	6.442	10.039	1.379	6.338
10	327.000	43.012	6.366	6.381	6.453	11.610	1.158	6.348
11	370.395	43.963	6.366	6.394	6.486	15.199	1.045	6.355
12	414.619	42.728	6.366	6.381	6.454	11.745	1.045	6.323
13	458.147	43.130	6.366	6.389	6.433	7.145	1.001	6.355
14	501.660	42.217	6.366	6.388	6.434	7.529	1.907	6.343
15	544.288	42.103	6.366	6.387	6.435	7.759	0.979	6.352
16	586.732	42.075	6.366	6.382	6.440	9.341	0.987	6.347
17	629.176	43.864	6.366	6.388	6.454	10.814	1.125	6.330
18	673.409	38.184	6.366	6.411	6.468	9.693	1.865	6.363
19	711.990	42.983	6.366	6.421	6.516	16.339	2.575	6.354

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Top Depth: 16
Bottom Depth: 7639
Fingers: 56F
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Field:
Count
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Comments
Class I
Class I
Class I
Class I
Class I
Class I
Class I
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Class I
Class I
Class I

Item Number	Top Body	Body Length	NomID At Max Pen	Mean Median Ins	Max Pen Ins	Max Pen %	Max Loss %	Min Diam Ins
20	755.343	36.338	6.366	6.398	6.533	22.371	1.851	6.331
21	792.036	42.004	6.366	6.378	6.439	9.812	1.626	6.339
22	834.451	42.217	6.366	6.409	6.470	10.276	1.933	6.361
23	877.037	41.507	6.366	6.374	6.426	8.308	1.101	6.342
24	918.970	42.614	6.366	6.408	6.454	7.756	1.076	6.365
25	961.981	42.912	6.366	6.392	6.449	9.309	1.024	6.345
26	1005.320	44.176	6.366	6.404	6.484	13.462	1.582	6.350
27	1049.922	43.154	6.366	6.433	6.500	11.848	1.823	6.376
28	1093.473	42.912	6.366	6.409	6.500	15.326	1.770	6.357
29	1136.798	41.961	6.366	6.395	6.444	8.026	1.640	6.347
30	1179.185	43.438	6.366	6.401	6.461	9.968	1.431	6.353
31	1223.077	44.332	6.366	6.414	6.457	7.346	1.319	6.377
32	1267.807	42.856	6.366	6.393	6.436	7.112	0.882	6.349
33	1311.060	43.537	6.366	6.389	6.446	9.263	2.042	6.346
34	1354.981	43.111	6.366	6.397	6.461	10.686	2.005	6.351
35	1398.518	44.247	6.366	6.412	6.462	8.532	1.184	6.362
36	1443.177	43.196	6.366	6.391	6.440	7.996	1.145	6.339
37	1486.785	42.344	6.366	6.407	6.456	8.296	1.112	6.375
38	1529.541	43.424	6.366	6.417	6.483	11.307	0.602	6.374
39	1573.334	42.344	6.366	6.398	6.490	15.261	1.016	6.358

Aliso Canyon
try: Los Angeles
Size: 3.125in
Type: Image Caliper

Client: Southern California Gas
Well: Porter 44
Date: 25-Feb-2016
Analyst: B. Harbstreit
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Top Depth: 16
Bottom Depth: 7639
Fingers: 56F
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Comments
Class II
Class I
Class I
Class I
Class I
Class I
Class I
Class I
Class I
Class I
Class I
Class I
Class I
Class I
Class I
Class I
Class I
Class I
Class I

Item Number	Top Body	Body Length	NomID At Max Pen	Mean Median Ins	Max Pen Ins	Max Pen %	Max Loss %	M
40	1616.090	40.896	6.366	6.386	6.450	10.439	1.420	
41	1657.384	41.549	6.366	6.397	6.463	10.919	1.190	
42	1699.302	43.537	6.366	6.405	6.456	8.639	1.317	
43	1743.166	43.182	6.366	6.401	6.442	6.793	1.106	
44	1786.732	43.125	6.366	6.379	6.456	12.357	1.323	
45	1830.240	42.912	6.366	6.410	6.463	9.009	1.865	
46	1873.508	42.359	6.366	6.379	6.428	7.831	0.952	
47	1916.236	42.202	6.366	6.408	6.469	10.274	2.263	
48	1958.864	43.793	6.366	6.406	6.475	11.614	2.559	
49	2003.054	42.458	6.366	6.383	6.449	10.634	0.862	
50	2045.839	42.941	6.366	6.401	6.478	12.798	1.179	
51	2089.135	43.088	6.366	6.409	6.484	12.650	1.627	
52	2133.023	43.115	6.366	6.415	6.473	9.851	1.378	
53	2176.536	43.977	6.366	6.408	6.480	12.124	1.662	
54	2220.911	43.040	6.366	6.396	6.447	8.451	1.817	
55	2264.306	40.811	6.366	6.409	6.468	10.019	1.706	
56	2305.486	42.898	6.366	6.401	6.456	9.128	0.616	
57	2348.782	41.336	6.366	6.398	6.444	7.699	2.105	
58	2390.501	42.288	6.366	6.405	6.467	10.365	2.224	
59	2433.144	40.541	6.366	6.419	6.478	10.085	1.258	

Field: Aliso Canyon
Country: Los Angeles
Tool Size: 3.125in
Tool Type: Image Caliper
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Client: Southern California Gas
Well: Porter 44
Date: 25-Feb-2016
Analyst: B. Harbstreit
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Top Depth: 16
Bottom Depth: 763
Fingers: 56F
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Min Diam Ins	Comments
6.346	Class I
6.354	Class I
6.345	Class I
6.339	Class I
6.346	Class I
6.349	Class I
6.345	Class I
6.337	Class I
6.345	Class I
6.329	Class I
6.355	Class I
6.351	Class I
6.362	Class I
6.362	Class I
6.335	Class I
6.337	Class I
6.306	Class I
6.341	Class I
6.349	Class I
6.382	Class I

Item Number	Top Body	Body Length	NomID At Max Pen	Mean Median Ins	Max Pen Ins	Max Pen %	M
60	2474.026	43.267	6.366	6.405	6.494	14.917	
61	2517.691	41.649	6.366	6.415	6.464	8.336	
62	2559.765	41.947	6.366	6.402	6.467	10.827	
63	2602.053	42.543	6.366	6.393	6.448	9.105	
64	2644.994	42.827	6.366	6.379	6.432	8.601	
65	2688.219	44.446	6.366	6.414	6.484	11.922	
66	2733.034	42.501	6.366	6.393	6.480	14.345	
67	2775.932	43.253	6.366	6.409	6.459	8.418	
68	2819.583	42.430	6.366	6.392	6.477	13.947	
69	2862.396	42.714	6.366	6.394	6.450	9.281	
70	2905.521	42.714	6.366	6.380	6.444	10.392	
71	2948.632	42.969	6.366	6.416	6.474	9.939	
72	2991.999	42.373	6.366	6.411	6.475	10.919	
73	3034.798	43.168	6.366	6.413	6.472	10.033	
74	3078.364	42.742	6.366	6.415	6.487	12.299	
75	3121.475	42.103	6.366	6.404	6.462	9.806	
76	3163.947	43.693	6.366	6.423	6.487	11.019	
77	3208.024	43.367	6.366	6.437	6.497	10.682	
78	3251.760	43.523	6.366	6.392	6.491	16.261	
79	3295.638	43.367	6.366	6.396	6.450	8.915	

Field: Aliso Canyon
Country: Los Angeles
Tool Size: 3.125in
Tool Type: Image Caliper
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Client: Southern California Gas
Well: Porter 44
Date: 25-Feb-2016
Analyst: B. Harbstreit
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ax Loss %	Min Diam Ins	Comments
2.297	6.342	Class I
1.621	6.356	Class I
1.359	6.334	Class I
1.178	6.349	Class I
1.028	6.343	Class I
1.244	6.379	Class I
1.554	6.338	Class I
1.303	6.366	Class I
1.558	6.338	Class I
1.274	6.358	Class I
1.648	6.346	Class I
2.592	6.344	Class I
2.276	6.348	Class I
2.096	6.333	Class I
2.042	6.333	Class I
1.872	6.354	Class I
2.048	6.364	Class I
1.890	6.388	Class I
10.032	6.350	Class I
1.285	6.351	Class I

Item Number	Top Body	Body Length	NomID At Max Pen	Mean Median Ins	Max Pen Ins	Ma
80	3339.431	43.267	6.366	6.413	6.473	
81	3383.025	43.182	6.366	6.406	6.461	
82	3426.590	43.438	6.366	6.410	6.466	
83	3470.454	41.492	6.366	6.408	6.474	
84	3512.330	41.535	6.366	6.417	6.474	
85	3554.234	41.819	6.366	6.396	6.455	
86	3596.806	42.160	6.366	6.385	6.450	
87	3639.335	42.728	6.366	6.411	6.463	
88	3682.432	43.807	6.366	6.424	6.478	
89	3726.622	44.148	6.366	6.425	6.500	
90	3771.139	43.566	6.366	6.387	6.497	
91	3815.088	40.129	6.366	6.416	6.510	
92	3855.586	41.535	6.366	6.388	6.457	
93	3897.434	42.614	6.366	6.409	6.507	
94	3940.417	42.436	6.366	6.405	6.471	
95	3983.746	42.667	6.366	6.446	8.934	
96	4026.838	42.486	6.366	6.394	6.468	
97	4069.694	41.942	6.366	6.377	6.479	
98	4112.408	42.657	6.366	6.396	6.472	
99	4155.434	41.052	6.366	6.390	6.468	

epth: 16
Depth: 7639
ers: 56F

Field: Aliso Canyon
Country: Los Angeles
Tool Size: 3.125in
Tool Type: Image Caliper
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BAKER HUGHES

Client: Southern California Gas
Well: Porter 44
Date: 25-Feb-2016
Analyst: B. Harbstreit
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x Pen %	Max Loss %	Min Diam Ins	Comments
10.202	1.501	6.368	Class I
9.322	1.983	6.353	Class I
9.511	1.930	6.350	Class I
11.118	2.282	6.339	Class I
9.772	2.218	6.350	Class I
9.698	1.879	6.340	Class I
10.508	1.088	6.349	Class I
8.767	1.982	6.334	Class I
9.356	2.706	6.332	Class I
12.983	2.124	6.346	Class I
17.929	7.600	6.326	Class I
16.129	7.860	6.347	Class I
11.268	1.466	6.313	Class I
16.640	1.747	6.314	Class I
11.152	2.035	6.276	Class I
100.000	100.000	6.077	Class V
12.148	1.141	6.342	Class I
16.342	2.270	6.321	Class I
12.634	1.722	6.335	Class I
12.818	2.074	6.307	Class I

Item Number	Top Body	Body Length	NomID At Max Pen	Mean Median Ins	Max I
100	4196.841	43.253	6.366	6.397	
101	4240.463	41.084	6.366	6.404	
102	4284.497	44.205	6.366	6.421	
103	4329.100	42.898	6.366	6.388	
104	4372.634	40.777	6.366	6.384	
105	4414.211	42.234	6.366	6.379	
106	4456.871	43.543	6.366	6.404	
107	4501.587	37.105	6.366	6.396	
108	4539.047	35.954	6.366	6.391	
109	4575.384	42.614	6.366	6.401	
110	4618.453	45.696	6.366	6.377	
111	4665.057	45.639	6.366	6.413	
112	4711.562	38.312	6.366	6.387	
113	4750.698	38.289	6.366	6.389	
114	4789.961	45.454	6.366	6.384	
115	4836.380	45.422	6.366	6.388	
116	4883.077	44.874	6.366	6.395	
117	4929.481	45.065	6.366	6.394	
118	4975.821	45.384	6.366	6.377	
119	5022.672	43.266	6.366	6.385	

Top Depth: 16
Bottom Depth: 7639
Fingers: 56F
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Field: Aliso Canyon
Country: Los Angeles
Tool Size: 3.125in
Tool Type: Image Caliper
.

Client: Southern California Gas
Well: Porter 44
Date: 25-Feb-2016
Analyst: B. Harbstreit
.

Pen Ins	Max Pen %	Max Loss %	Min Diam Ins	Comments
6.512	19.027	6.390	6.328	Class I
6.500	16.131	1.793	6.319	Class I
6.531	18.968	1.103	6.362	Class I
6.443	8.997	1.626	6.337	Class I
6.445	9.890	1.501	6.348	Class I
6.483	16.792	9.920	6.330	Class I
6.490	14.435	1.690	6.347	Class I
6.469	12.114	1.671	6.350	Class I
6.449	9.576	1.760	6.334	Class I
6.475	12.420	1.204	6.346	Class I
6.471	15.090	4.514	6.309	Class I
6.487	12.665	2.954	6.352	Class I
6.447	9.715	1.371	6.326	Class I
6.455	10.782	1.936	6.324	Class I
6.488	16.919	1.935	6.322	Class I
6.454	10.731	2.499	6.334	Class I
6.501	17.507	3.347	6.342	Class I
6.472	12.877	3.076	6.339	Class I
6.453	12.192	2.258	6.325	Class I
6.451	10.726	0.822	6.340	Class I

Item Number	Top Body	Body Length	NomID At Max Pen	Media
120	5066.293	43.409	6.366	
121	5110.071	41.933	6.366	
122	5152.373	43.835	6.366	
123	5196.606	44.176	6.366	
124	5241.180	43.892	6.366	
125	5285.399	42.969	6.366	
126	5328.751	44.020	6.366	
127	5373.183	44.020	6.366	
128	5417.586	43.693	6.366	
129	5461.677	41.464	6.366	
130	5503.496	44.900	6.366	
131	5548.780	43.196	6.366	
132	5592.360	43.594	6.366	
133	5636.323	43.608	6.366	
134	5680.315	42.927	6.366	
135	5723.653	42.188	6.366	
136	5766.196	43.452	6.366	
137	5810.032	43.296	6.366	
138	5853.711	42.188	6.366	
139	5896.268	43.594	6.366	

Top Depth: 16
Bottom Depth: 7639
Fingers: 56F
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Field: Aliso Canyon
Country: Los Angeles
Tool Size: 3.125in
Tool Type: Image Caliper
.

Client: Southern Calif
Well: Porter 44
Date: 25-Feb-2016
Analyst: B. Harbstreit
.

Mean an Ins	Max Pen Ins	Max Pen %	Max Loss %	Min Diam Ins	Comments
6.373	6.431	9.257	1.278	6.327	Class I
6.389	6.455	10.761	1.353	6.338	Class I
6.379	6.456	12.377	1.305	6.327	Class I
6.387	6.452	10.618	0.968	6.329	Class I
6.381	6.437	9.022	1.001	6.331	Class I
6.374	6.431	9.049	1.368	6.326	Class I
6.398	6.462	10.558	1.005	6.345	Class I
6.384	6.460	12.302	1.363	6.329	Class I
6.392	6.479	14.309	1.288	6.342	Class I
6.359	6.413	8.404	1.804	6.312	Class I
6.388	6.464	12.350	1.285	6.322	Class I
6.371	6.448	12.231	1.434	6.311	Class I
6.385	6.456	11.590	0.976	6.319	Class I
6.392	6.478	14.145	1.117	6.338	Class I
6.384	6.476	14.914	1.162	6.345	Class I
6.384	6.473	14.446	1.080	6.339	Class I
6.382	6.456	11.982	1.074	6.330	Class I
6.384	6.473	14.485	1.148	6.331	Class I
6.380	6.455	12.163	0.807	6.324	Class I
6.384	6.453	11.206	1.119	6.333	Class I

Item Number	Top Body	Body Length	NomI Max
140	5940.246	40.754	6.
141	5981.397	43.253	6.
142	6025.020	42.898	6.
143	6068.287	42.103	6.
144	6110.802	44.162	6.
145	6155.319	44.006	6.
146	6199.651	43.665	6.
147	6243.728	43.892	6.
148	6288.004	43.764	6.
149	6332.137	43.992	6.
150	6376.512	45.057	6.
151	6421.910	42.912	6.
152	6465.149	43.779	6.
153	6509.282	43.338	6.
154	6553.018	38.979	6.
155	6592.381	35.003	6.
156	6627.753	42.728	6.
157	6670.850	43.154	6.
158	6714.373	42.288	6.
159	6757.016	43.466	6.

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Top Depth: 16
Bottom Depth: 7639
Fingers: 56F
.

Field: Aliso Canyon
Country: Los Angeles
Tool Size: 3.125in
Tool Type: Image Caliper
.

BAKER HUGHES

Client: So
Well: Port
Date: 25-
Analyst: B
.

D At Pen	Mean Median Ins	Max Pen Ins	Max Pen %	Max Loss %	Min Diam Ins	Comments
.366	6.371	6.447	12.046	1.338	6.326	Class I
.366	6.383	6.449	10.717	1.158	6.314	Class I
.366	6.374	6.468	15.011	1.980	6.313	Class I
.366	6.387	6.474	14.235	1.631	6.322	Class I
.366	6.394	6.477	13.646	1.482	6.322	Class I
.366	6.388	6.474	14.058	1.197	6.329	Class I
.366	6.378	6.482	16.730	1.600	6.322	Class I
.366	6.410	6.487	13.004	0.589	6.350	Class I
.366	6.381	6.452	11.447	1.439	6.323	Class I
.366	6.382	6.514	21.385	3.618	6.283	Class II
.366	6.399	6.571	28.644	3.394	6.265	Class II
.366	6.396	6.470	12.181	1.247	6.319	Class I
.366	6.387	6.474	14.206	1.280	6.336	Class I
.366	6.370	6.450	12.658	2.130	6.328	Class I
.366	6.364	6.445	12.678	2.996	6.302	Class I
.366	6.392	6.473	13.311	1.344	6.334	Class I
.366	6.383	6.462	12.833	1.021	6.329	Class I
.366	6.388	6.533	23.721	1.647	6.301	Class II
.366	6.377	6.548	27.400	3.281	6.303	Class II
.366	6.389	6.487	16.041	1.664	6.315	Class I

Item Number	Top Body	Body Leng
160	6800.879	29.6
161	6831.764	29.9
162	6862.962	30.0
163	6894.230	29.5
164	6924.831	26.4
165	6952.834	29.4
166	6984.195	27.0
167	7011.664	29.7
168	7043.219	29.7
169	7074.087	29.6
170	7104.901	30.4
171	7135.687	30.3
172	7167.353	30.5
173	7199.232	29.1
174	7229.677	26.9
175	7257.764	29.5
176	7288.564	27.4
177	7317.504	30.9
178	7348.829	29.9
179	7380.296	30.2

uthern California Gas
er 44
Feb-2016
. Harbstreit

Top Depth: 16
Bottom Depth: 7639
Fingers: 56F
.

Field: Aliso Canyon
Country: Los Angeles
Tool Size: 3.125in
Tool Type: Image Caliper
.

gth	NomID At Max Pen	Mean Median Ins	Max Pen Ins	Max Pen %	Max Loss %	Min Diam Ins	Comments
34	6.276	6.284	6.366	11.402	1.354	6.242	Class I
82	6.276	6.284	6.373	12.453	1.264	6.231	Class I
82	6.276	6.285	6.381	13.390	1.575	6.215	Class I
79	6.276	6.284	6.368	11.778	2.161	6.210	Class I
73	6.276	6.305	6.400	13.652	1.135	6.218	Class I
49	6.276	6.285	6.382	13.563	1.966	6.221	Class I
86	6.276	6.307	6.402	13.731	0.757	6.251	Class I
70	6.276	6.285	6.386	14.150	2.459	6.209	Class I
67	6.276	6.287	6.383	13.503	2.800	6.197	Class I
87	6.276	6.276	6.365	12.324	1.474	6.231	Class I
59	6.276	6.286	6.376	12.591	1.247	6.226	Class I
63	6.276	6.287	6.387	14.038	1.472	6.234	Class I
67	6.276	6.285	6.390	14.643	1.780	6.232	Class I
57	6.276	6.286	6.377	12.714	1.112	6.236	Class I
94	6.276	6.287	6.364	10.780	1.207	6.246	Class I
86	6.276	6.287	6.374	12.194	1.041	6.242	Class I
06	6.276	6.278	6.356	10.859	1.975	6.230	Class I
13	6.276	6.286	6.377	12.734	0.955	6.240	Class I
90	6.276	6.285	6.371	12.010	1.356	6.238	Class I
03	6.276	6.280	6.383	14.359	1.668	6.229	Class I

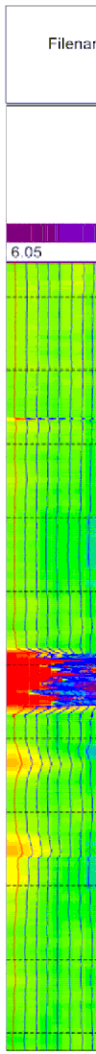
Item Number	Top Body
180	7411.820
181	7442.861
182	7474.059
183	7500.726
184	7527.252
185	7558.449
186	7590.712
187	7623.246

Client: Southern California Gas
Well: Porter 44
Date: 25-Feb-2016
Analyst: B. Harbstreit
.

Top Depth: 16
Bottom Depth: 7639
Fingers: 56F
.

Field: Aliso Canyon
Country: Los Angeles
Tool Size: 3.125in
Tool Type: Image Caliper
.

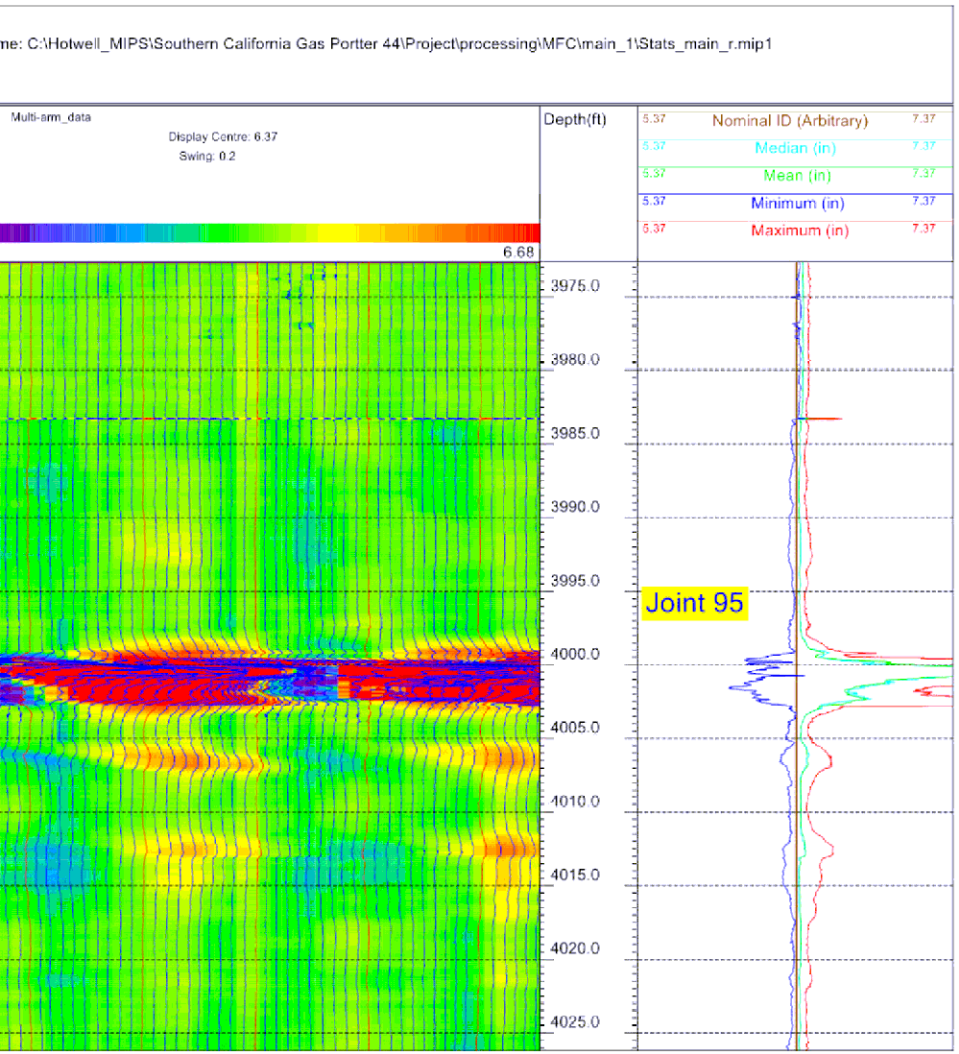
y	Body Length	NomID At Max Pen	Mean Median Ins	Max Pen Ins	Max Pen %	Max Loss %	Min Diam Ins	Comments
0	29.785	6.276	6.285	6.381	13.388	1.573	6.233	Class I
1	29.977	6.276	6.283	6.379	13.369	2.411	6.220	Class I
9	25.296	6.276	6.279	6.388	15.117	2.881	6.204	Class I
6	25.145	6.276	6.283	6.363	11.182	1.197	6.229	Class I
2	30.814	6.276	6.286	6.407	16.905	2.385	6.217	Class I
9	31.851	6.276	6.279	6.372	12.879	2.749	6.182	Class I
2	31.879	6.276	6.286	6.385	13.836	1.894	6.217	Class I
6	11.658	6.276	6.284	6.390	14.748	2.810	6.199	Class I



Client: Southern California Gas
Well: Porter 44
Date: 25-Feb-2016
Analyst: B. Harbstreit
.

Top Depth: 16
Bottom Depth: 7639
Fingers: 56F
.

Field: Aliso Canyon
Country: Los Angeles
Tool Size: 3.125in
Tool Type: Image Caliper
.

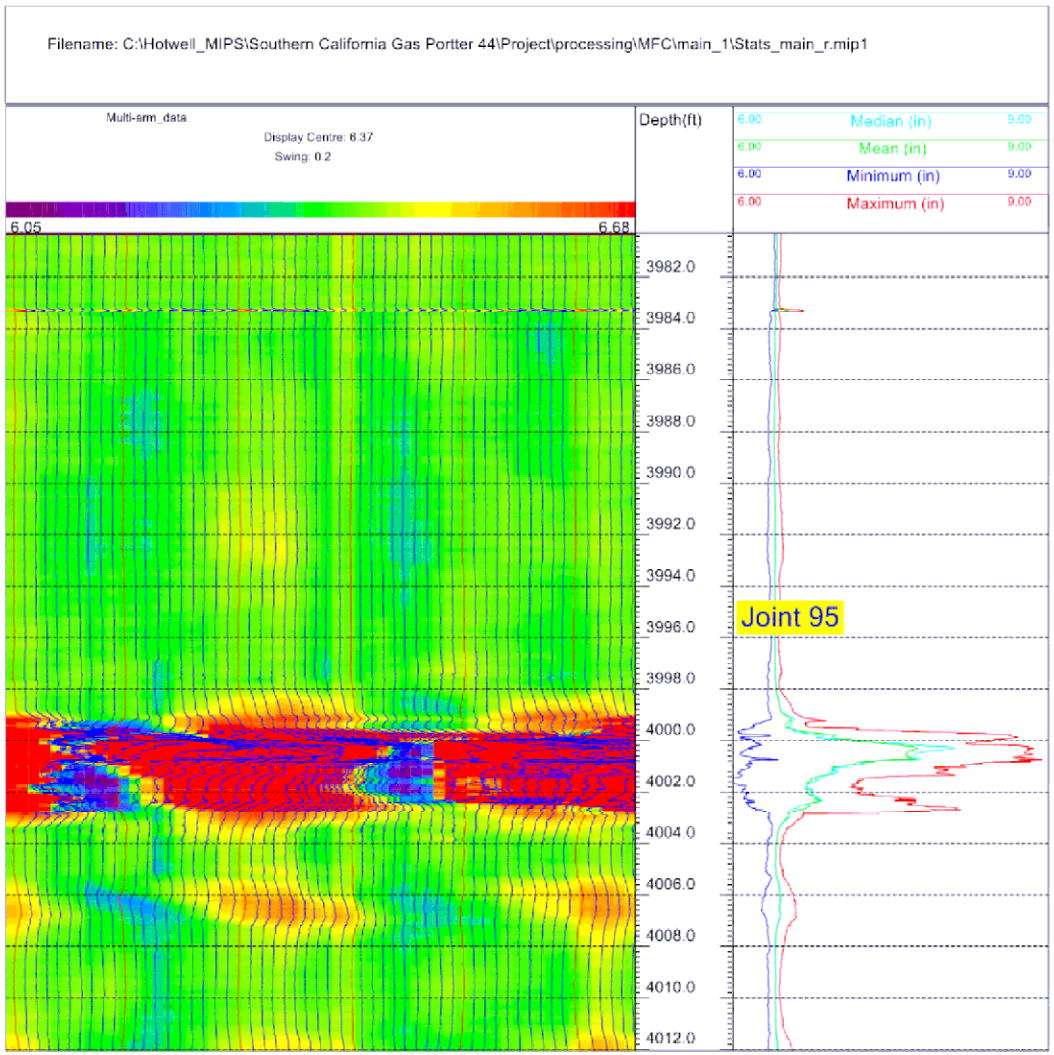


Joint #95 - Severe Circumferential Damage - Total Body Wall Penetration

Client: Southern California Gas
Well: Porter 44
Date: 25-Feb-2016
Analyst: B. Harbstreit
.

Top Depth: 16
Bottom Depth: 7639
Fingers: 56F
.

Field: Aliso Canyon
Country: Los Angeles
Tool Size: 3.125in
Tool Type: Image Caliper
.



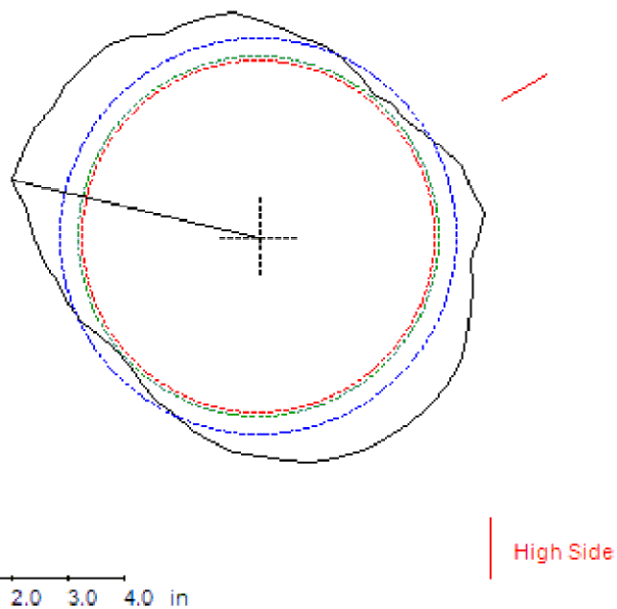
Joint #95 - Expanded Scale

Client: Southern California Gas
Well: Porter 44
Date: 25-Feb-2016
Analyst: B. Harbstreit
.

Top Depth: 16
Bottom Depth: 7639
Fingers: 56F
.

Field: Aliso Canyon
Country: Los Angeles
Tool Size: 3.125in
Tool Type: Image Caliper
.

Stats_main_r.mip1
Depth: 4000.753 (ft)
Arm Number: 45
Arm Value: 8.934 in



Drift ID: 6.241 in
Nominal ID: 6.366 in
Outer Diameter: 7 in

Radii*2:
Maximum: 8.934 in
Minimum: 6.421 in
Mean:7.681 in

Cross well diameters:
Maximum: 8.555 in
Direction arm: 21

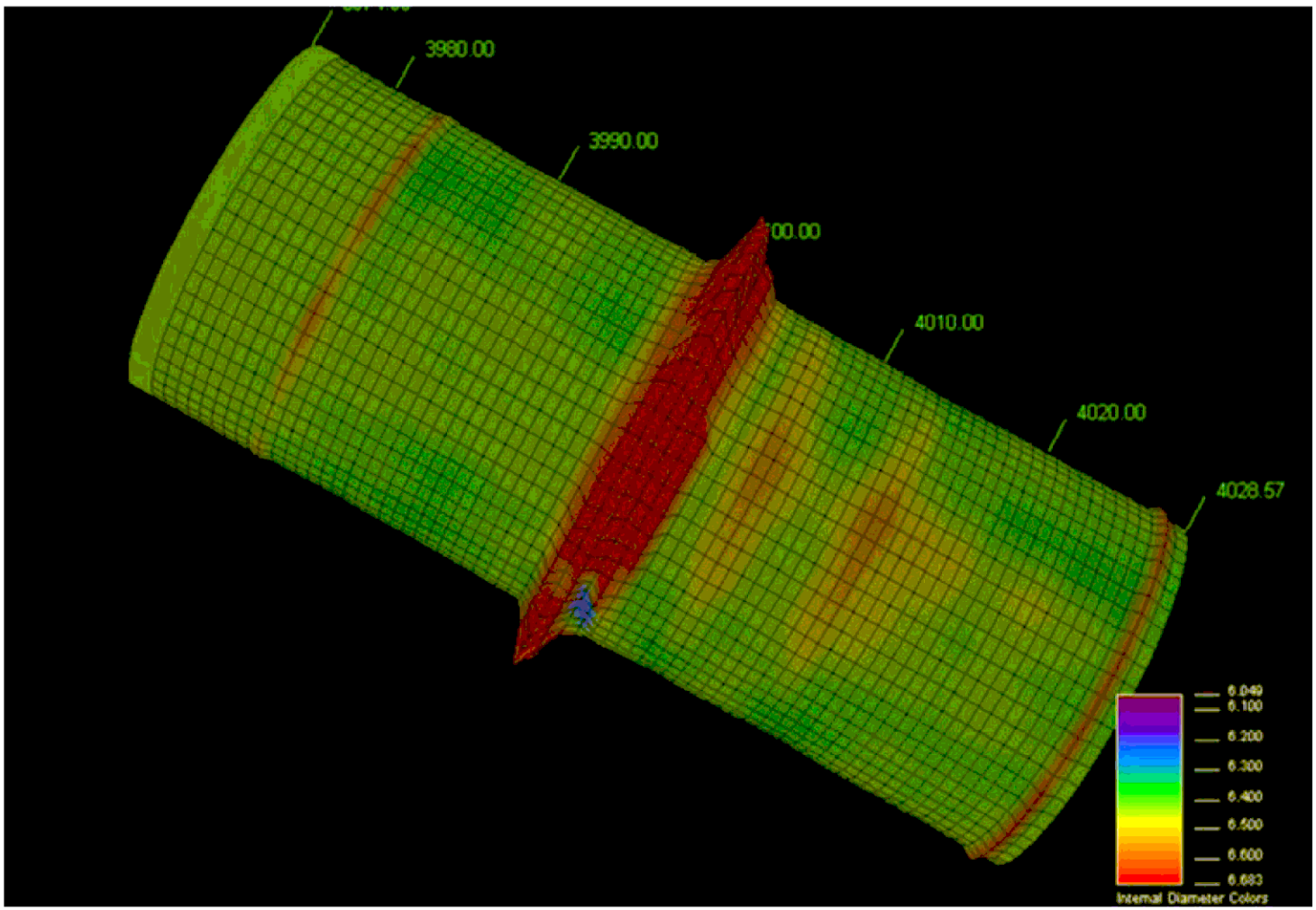
Minimum: 6.525 in
Direction arm: 7

Max Penetration Joint #95 8.934ins 100%
based on joint Median ID

Client: Southern California Gas
Well: Porter 44
Date: 25-Feb-2016
Analyst: B. Harbstreit
.

Top Depth: 16
Bottom Depth: 7639
Fingers: 56F
.

Field: Aliso Canyon
Country: Los Angeles
Tool Size: 3.125in
Tool Type: Image Caliper
.

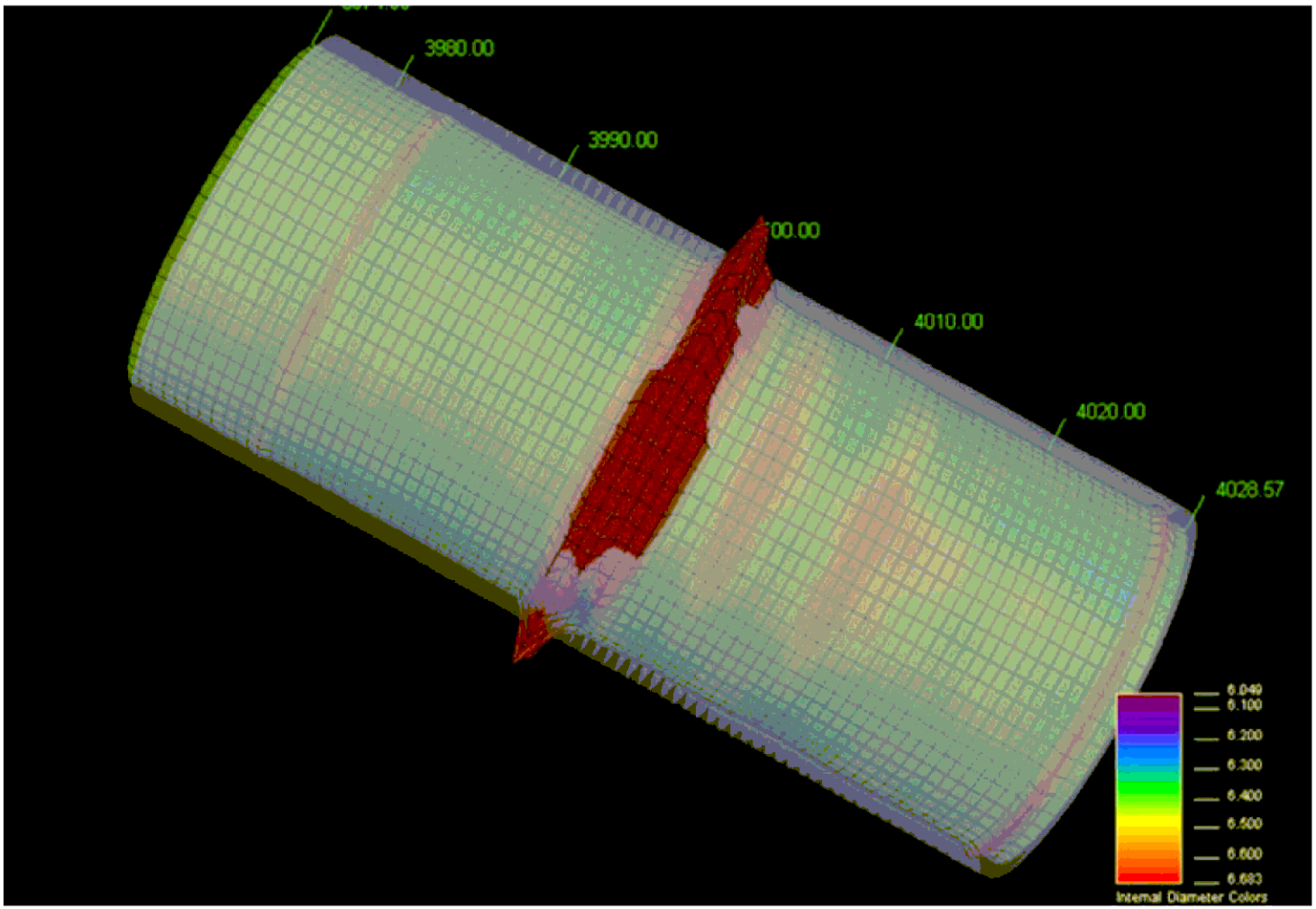


Joint #95 - View 1

Client: Southern California Gas
Well: Porter 44
Date: 25-Feb-2016
Analyst: B. Harbstreit
.

Top Depth: 16
Bottom Depth: 7639
Fingers: 56F
.

Field: Aliso Canyon
Country: Los Angeles
Tool Size: 3.125in
Tool Type: Image Caliper
.

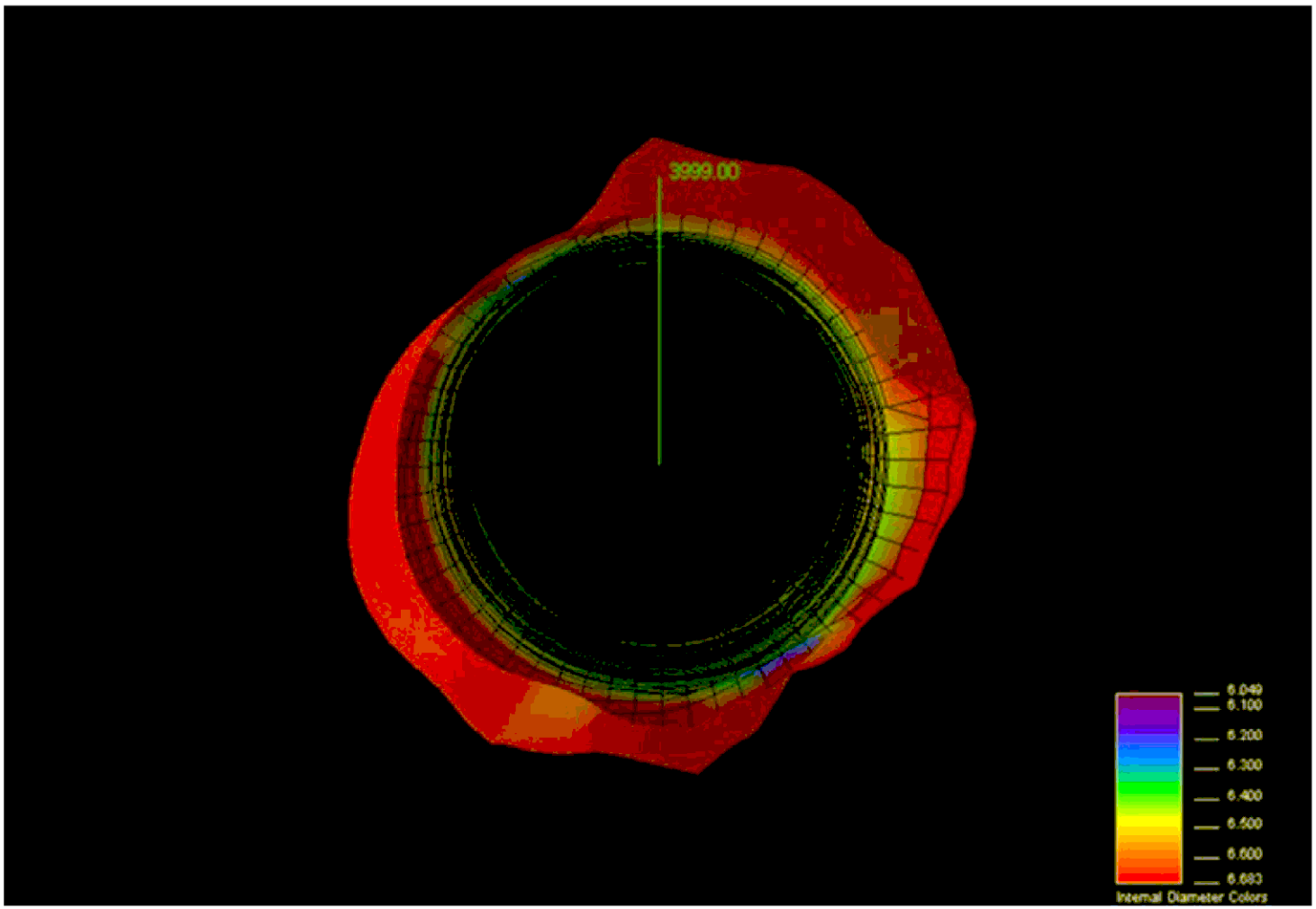


Joint #95 - View 2 - Simulated OD

Client: Southern California Gas
Well: Porter 44
Date: 25-Feb-2016
Analyst: B. Harbstreit
.

Top Depth: 16
Bottom Depth: 7639
Fingers: 56F
.

Field: Aliso Canyon
Country: Los Angeles
Tool Size: 3.125in
Tool Type: Image Caliper
.



Joint #95 - View 3

Client: Southern California Gas		
Well: Porter 44	Top Depth: 16	Date: 25-Feb-2
Country: Los Angeles	Bottom Depth: 7639	Tool Size: 3.12
Analyst: B. Harbstreit	# Fingers: 56F	Tool Type: Ima
.	.	.

Definition of terms in MIPS Pipe analysis report

Pipe dimensions

Item (no.) In 'pipe-by-pipe' analysis this represents the sequential pipe section number, selected during pipe end detection and editing, and indexed from the bottom up.
Top Body (ft/m) Processed measured depth in m/ft of top of the pipe section.
Bottom Body (ft/m) Processed measured depth in m/ft of bottom of the pipe section.
Body Length (ft/m) Length in m/ft of the pipe section.

Maximum penetration

Maximum penetration [Max.Pen] (ins or mm) Twice radius in inches or mm at maximum penetration of the pipe wall in the pipe s (Expressed as a diameter - twice radius - for comparison with Nominal and Drift Ids).
Maximum penetration % [Max.Pen (%)] Maximum penetration of the wall in the pipe section, expressed as a percentage relative t maximum penetration point.
Maximum penetration depth [Max.Pen depth] Depth in m/ft of the maximum wall penetration in the pipe section.

Wall Loss

Maximum loss % [Max.Loss (%)] The maximum value of metal loss in the pipe, expressed as the percentage areal loss of wall relati sampled depth in the pipe the loss is calculated as:
Percentage wall loss = $(100/n)\ \Sigma\ (Si_2\text{-}ID_2)/(OD_2\text{-}ID_2)$, where n is the number of caliper arms, Si is twice the radius measured by caliper arm i, ID is the Nominal ID of the pipe.

Restrictions

Minimum radial restriction [Min Res (ins or mm)] Smallest arm reading in inches or mm in the pipe section, (expressed as twice ra
Maximum projection [Max Proj (ins or mm)]. Largest projection into the well bore from the pipe wall in ins or mm based on Nomi
Maximum projection % [Max Proj (%)]. Largest projection into the well bore from the pipe wall as a %age of Nominal ID.

ndius for comparison with Nominal and Drift Ids).
nal ID.

ive to the outer diameter and nominal diameters. For each

to the difference between Nominal ID and OD at the

ection.

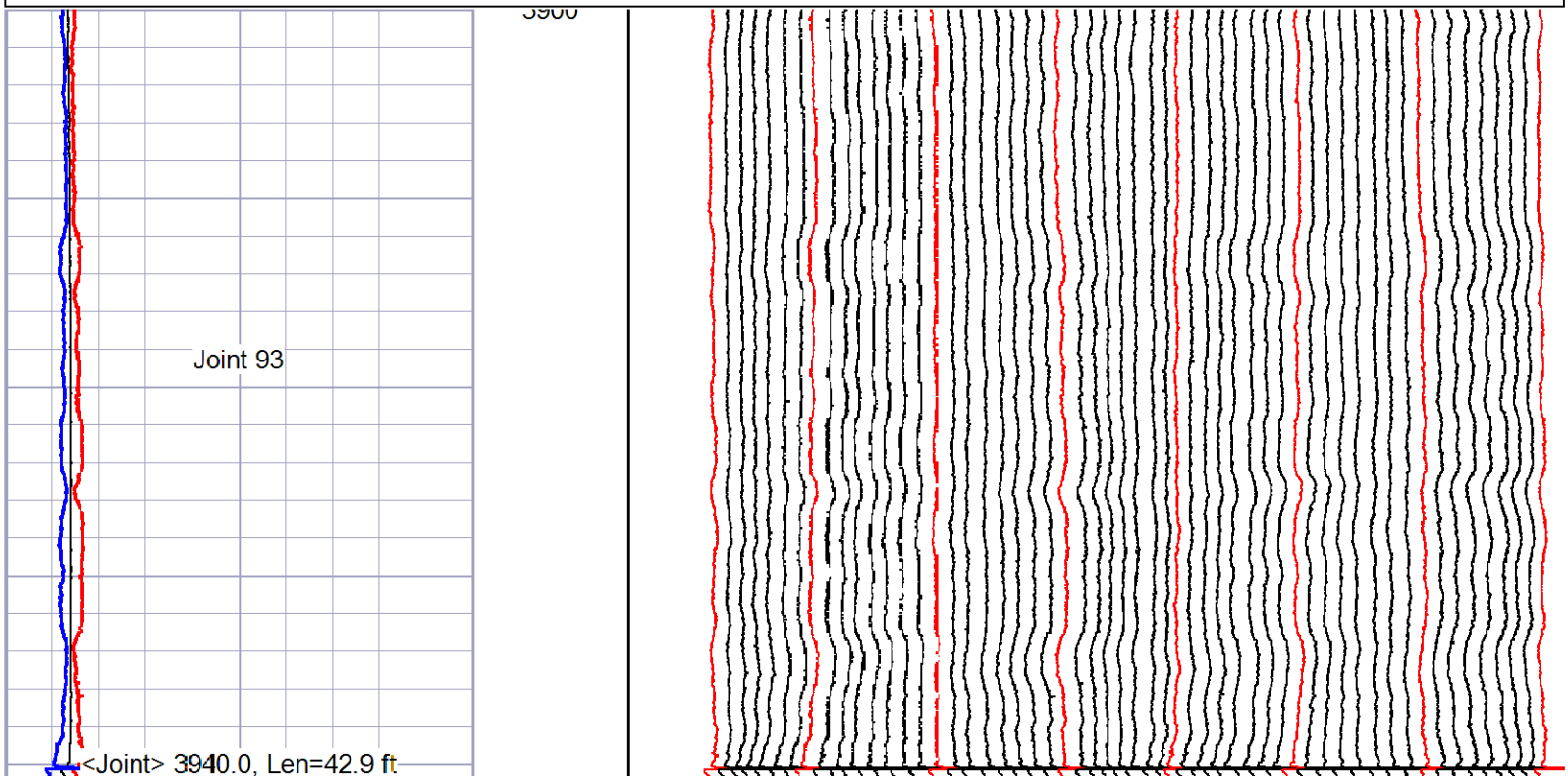
2016
.5in
ge Caliper

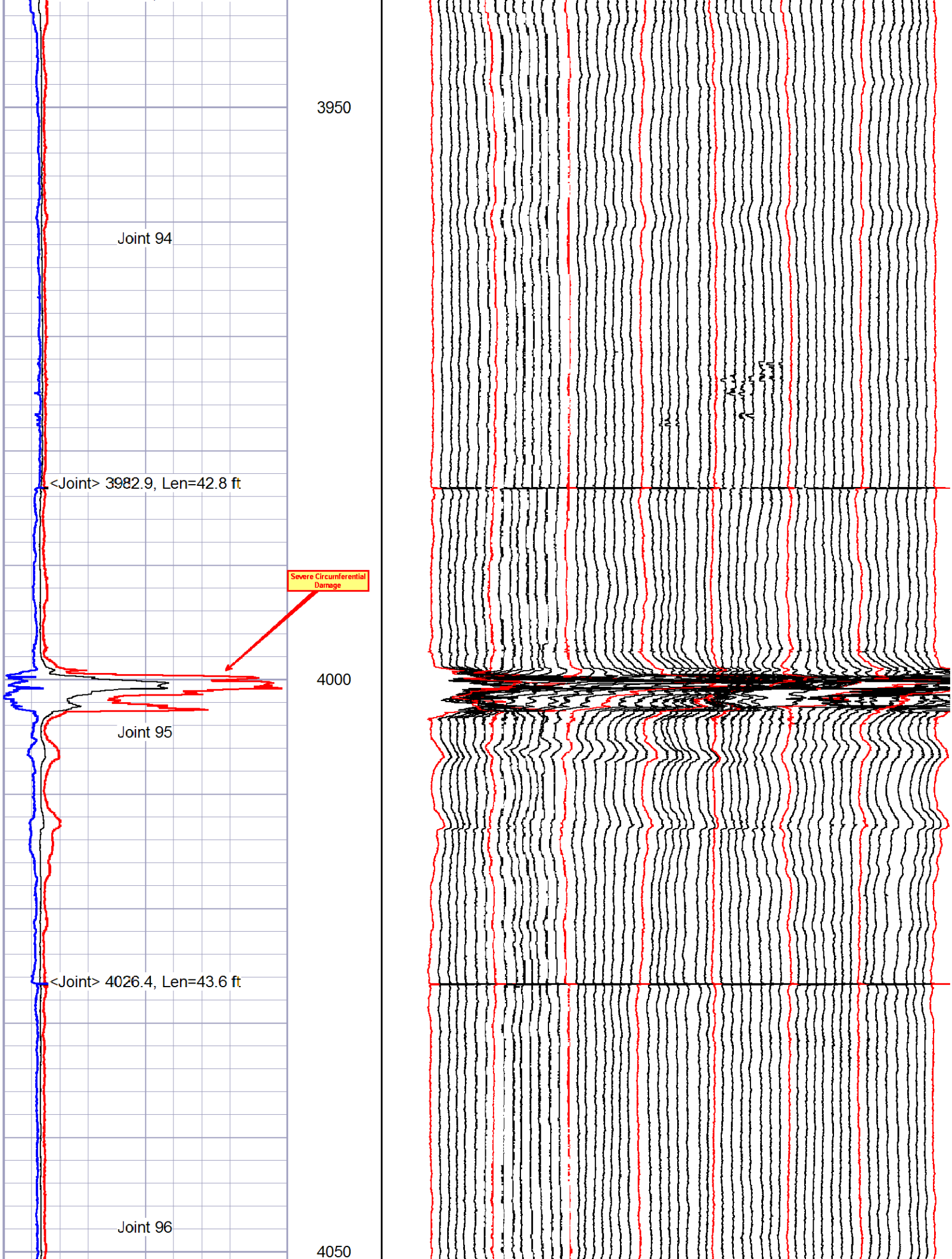
Main Section

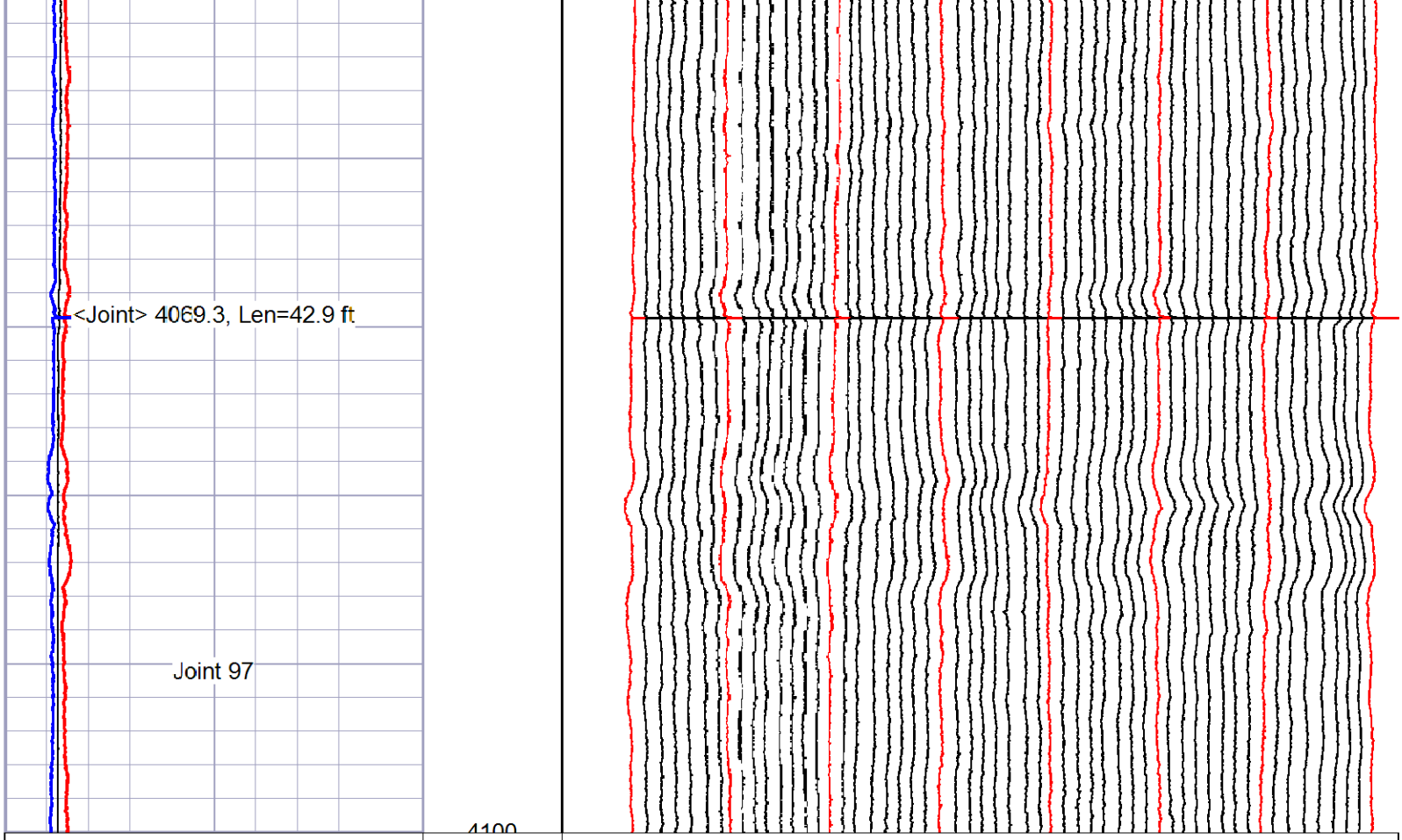
Expanded Scale Over Anomaly

Database File	c:\hotwell_mips\southern california gas portter 44\project\main_proc.db
Dataset Pathname	main_proc
Presentation Format	5f_23_2lb
Dataset Creation	Thu Feb 25 23:26:33 2016
Charted by	Depth in Feet scaled 1:120

6	Maximum ID (in)	9		2.933	56 FINGER TRACE (in)	6.033
6	Average - ID (in)	9				
6	Minimum - ID (in)	9				
	PTANN					




3950
Joint 94
<Joint> 3982.9, Len=42.8 ft
Severe Circumferential Damage
4000
Joint 95
<Joint> 4026.4, Len=43.6 ft
Joint 96
4050



6	Maximum ID (in)	9		2.933	56 FINGER TRACE (in)	6.033
6	Average - ID (in)	9				
6	Minimum - ID (in)	9				
	PTANN					

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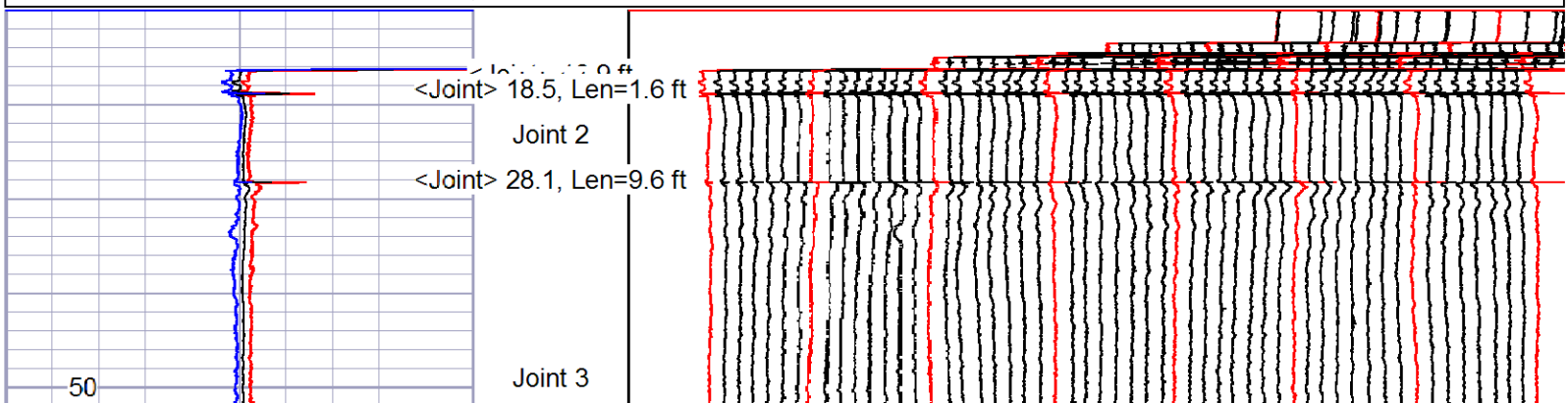
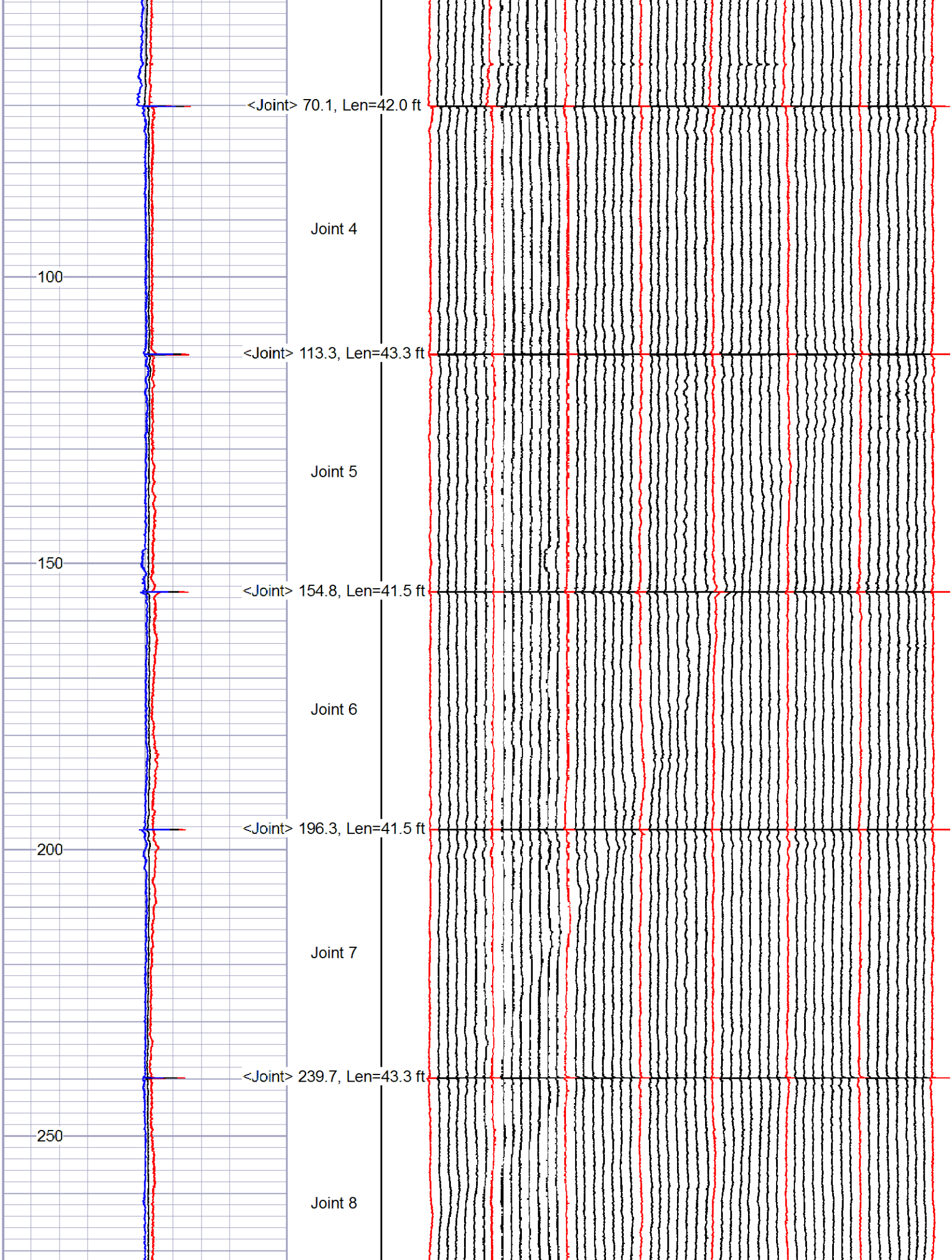
Main Section

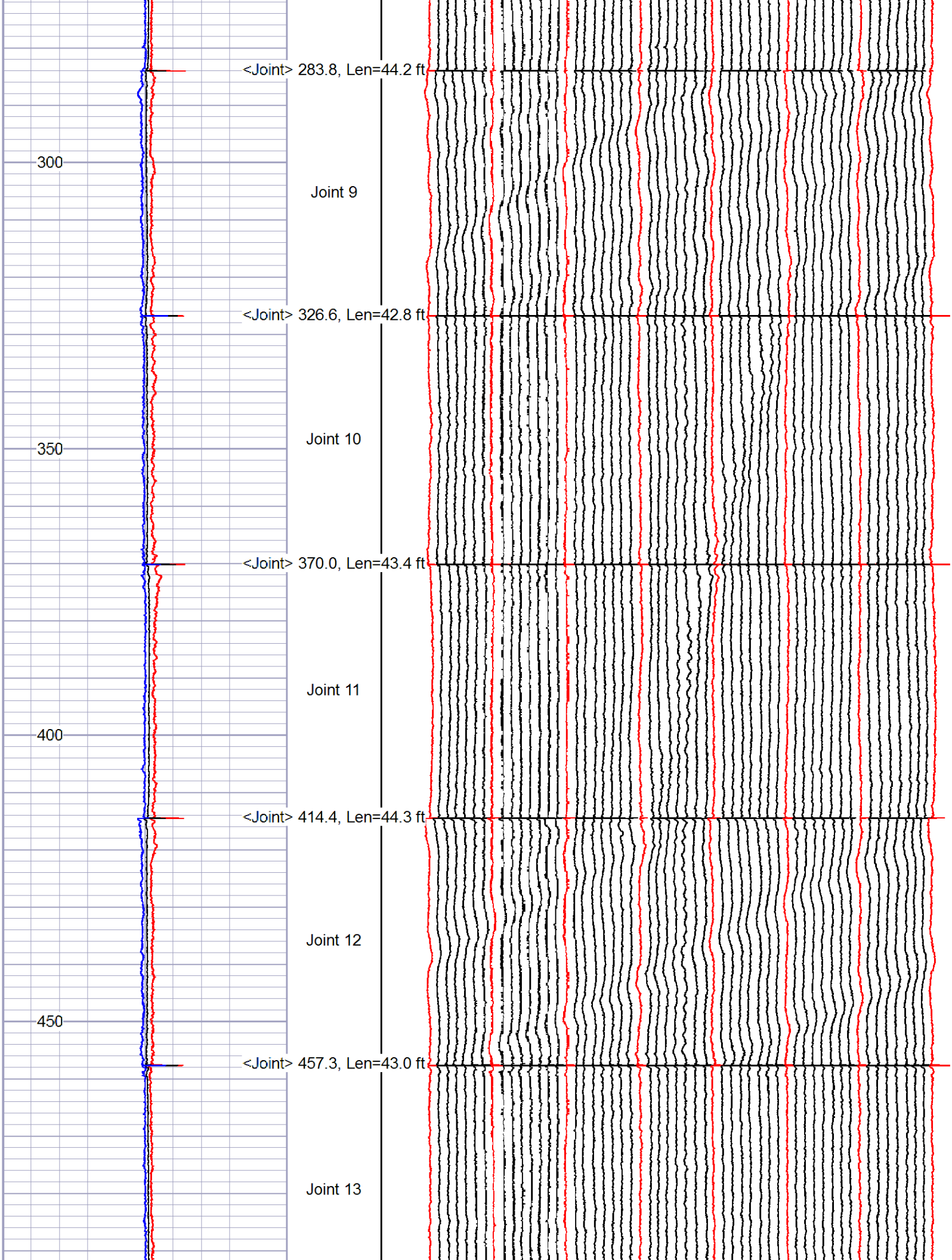
Expanded Scale Over Anomaly

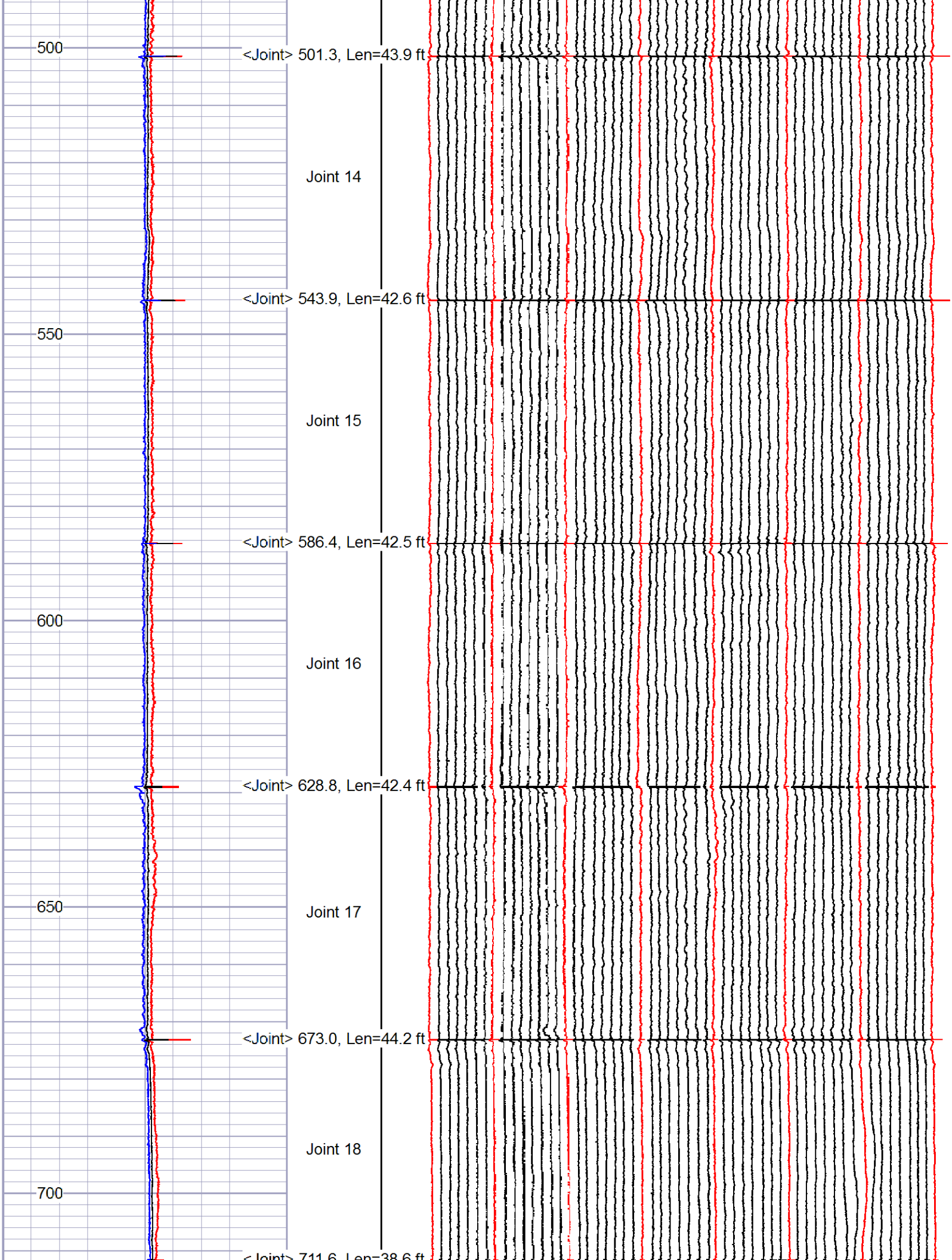
Database File	c:\hotwell_mips\southern california gas portter 44\project\main_proc.db
Dataset Pathname	main_proc
Presentation Format	5f_23_2lb
Dataset Creation	Thu Feb 25 23:26:33 2016
Charted by	Depth in Feet scaled 1:240

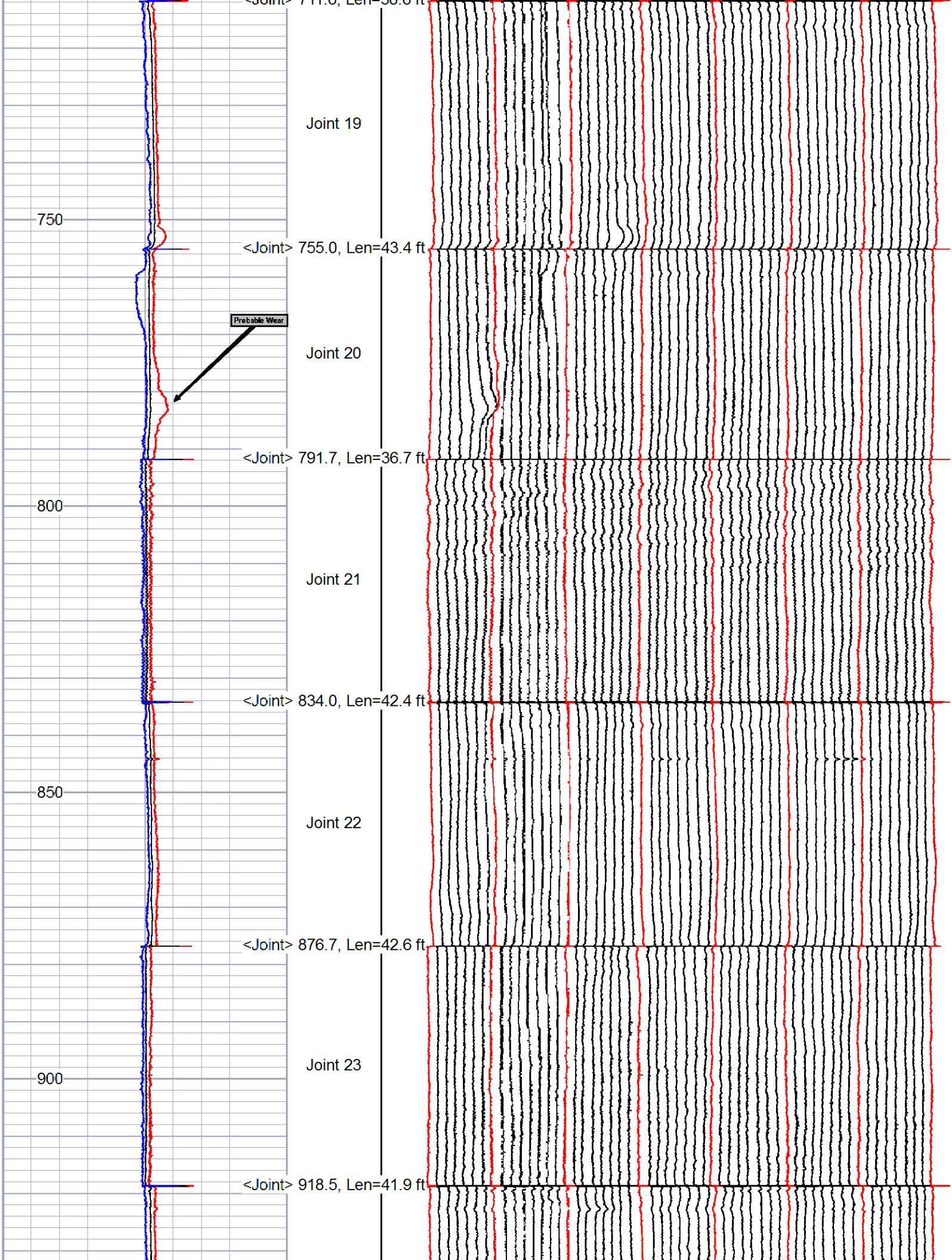
5.366	Maximum ID (in)	7.366	PTANN	2.933	56 FINGER TRACE (in)	6.033
5.366	Average - ID (in)	7.366				
5.366	Minimum - ID (in)	7.366				

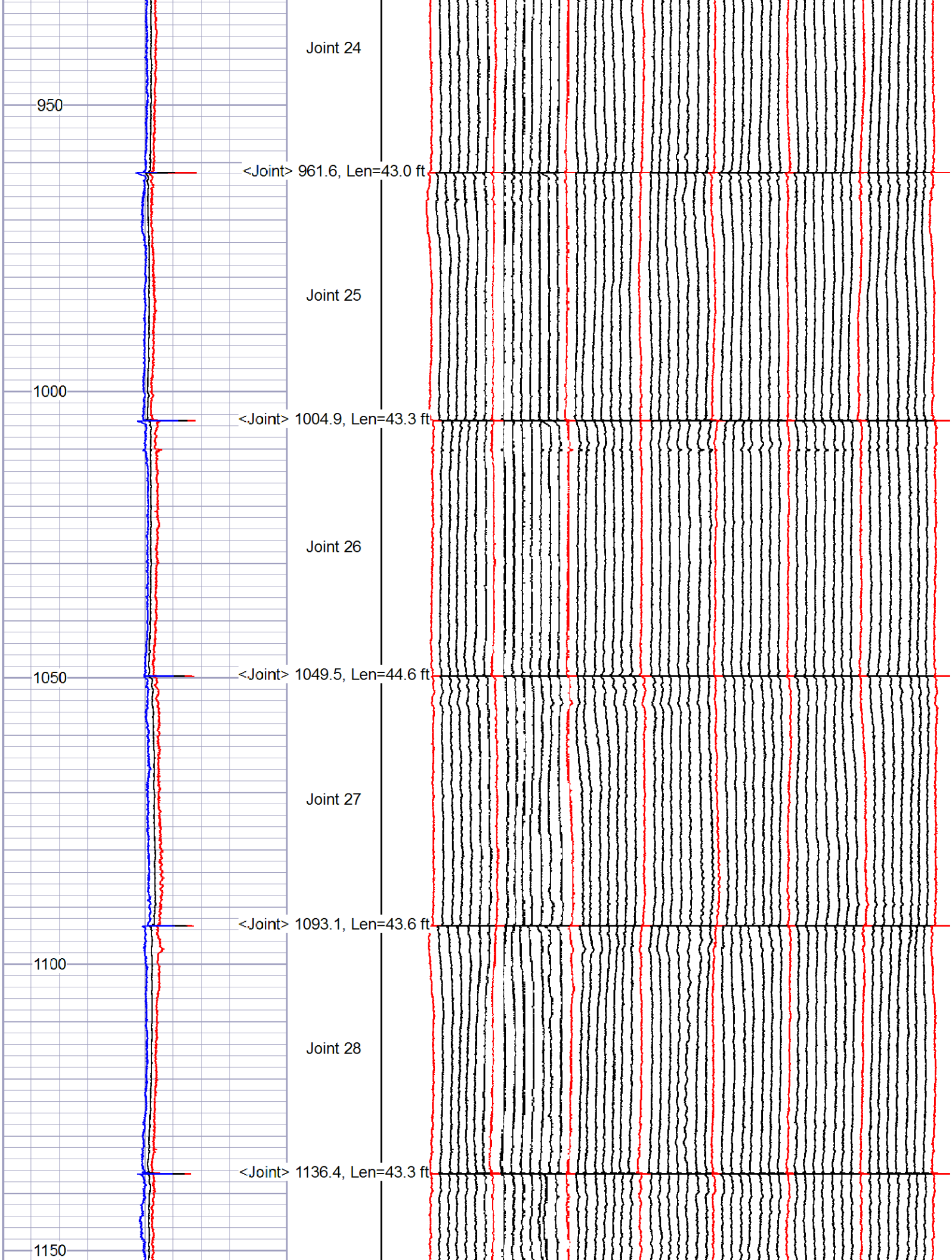


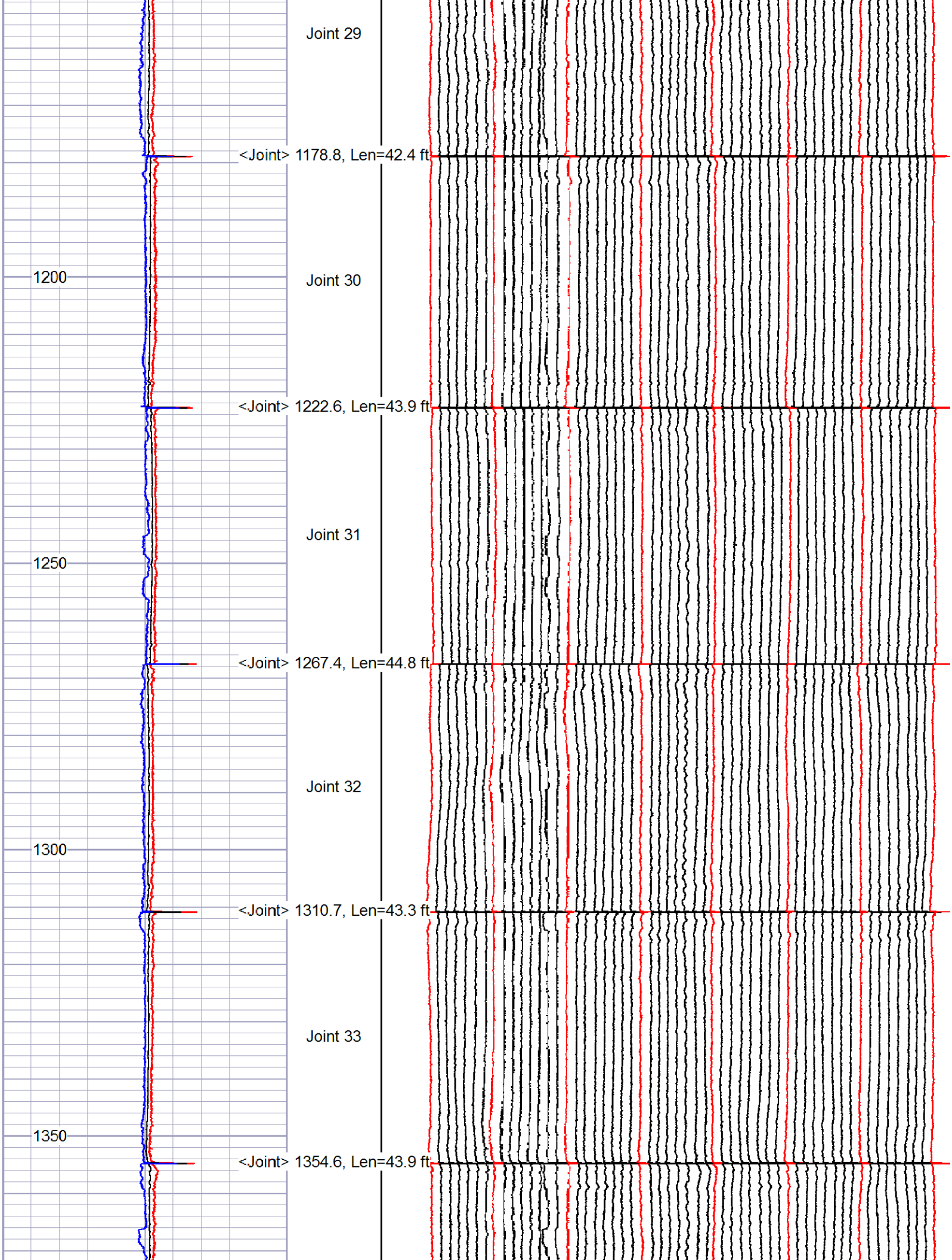

<Joint> 70.1, Len=42.0 ft
Joint 4
100
<Joint> 113.3, Len=43.3 ft
Joint 5
150
<Joint> 154.8, Len=41.5 ft
Joint 6
<Joint> 196.3, Len=41.5 ft
200
Joint 7
<Joint> 239.7, Len=43.3 ft
250
Joint 8

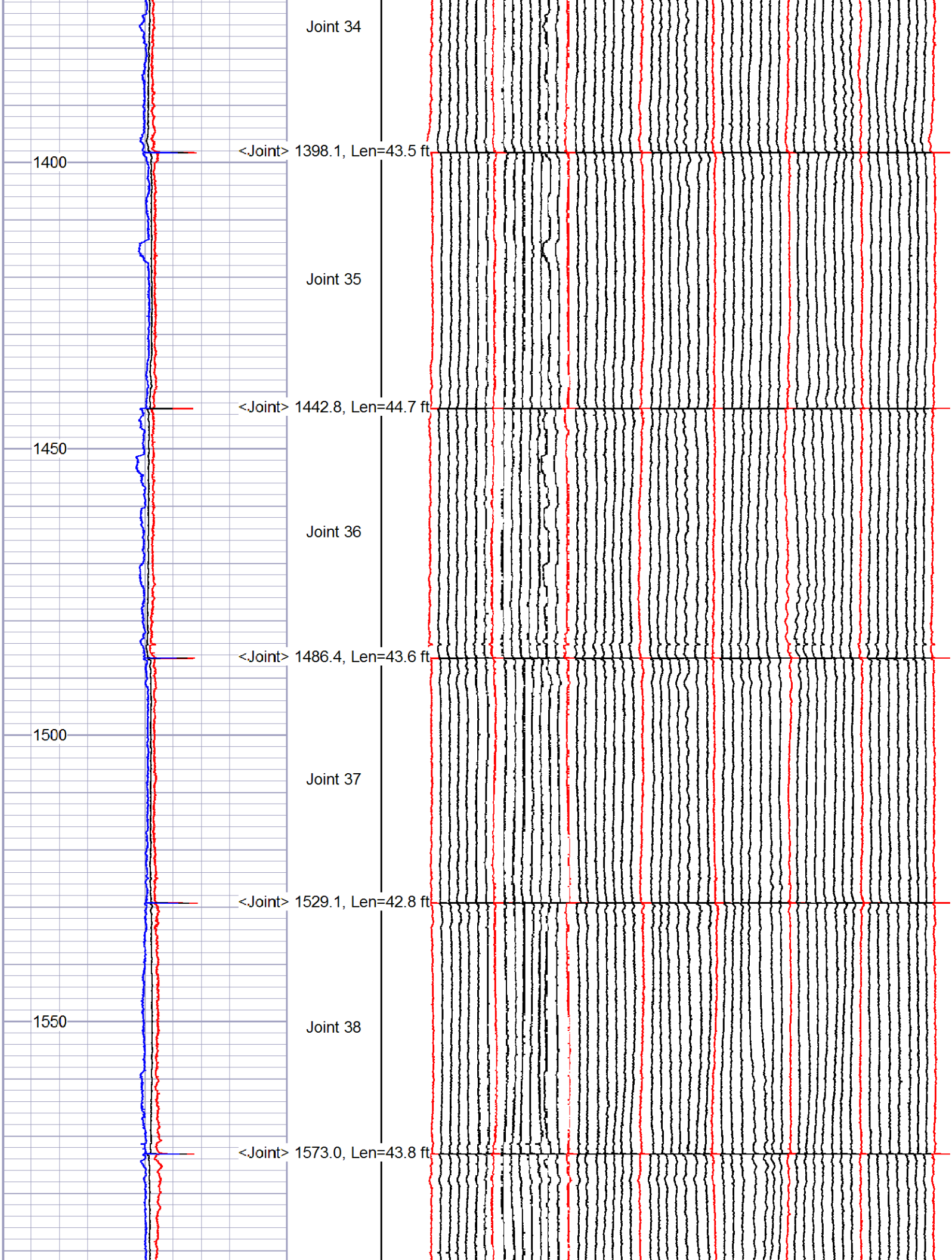

<Joint> 283.8, Len=44.2 ft
300
Joint 9
<Joint> 326.6, Len=42.8 ft
350
Joint 10
<Joint> 370.0, Len=43.4 ft
Joint 11
400
<Joint> 414.4, Len=44.3 ft
Joint 12
450
<Joint> 457.3, Len=43.0 ft
Joint 13

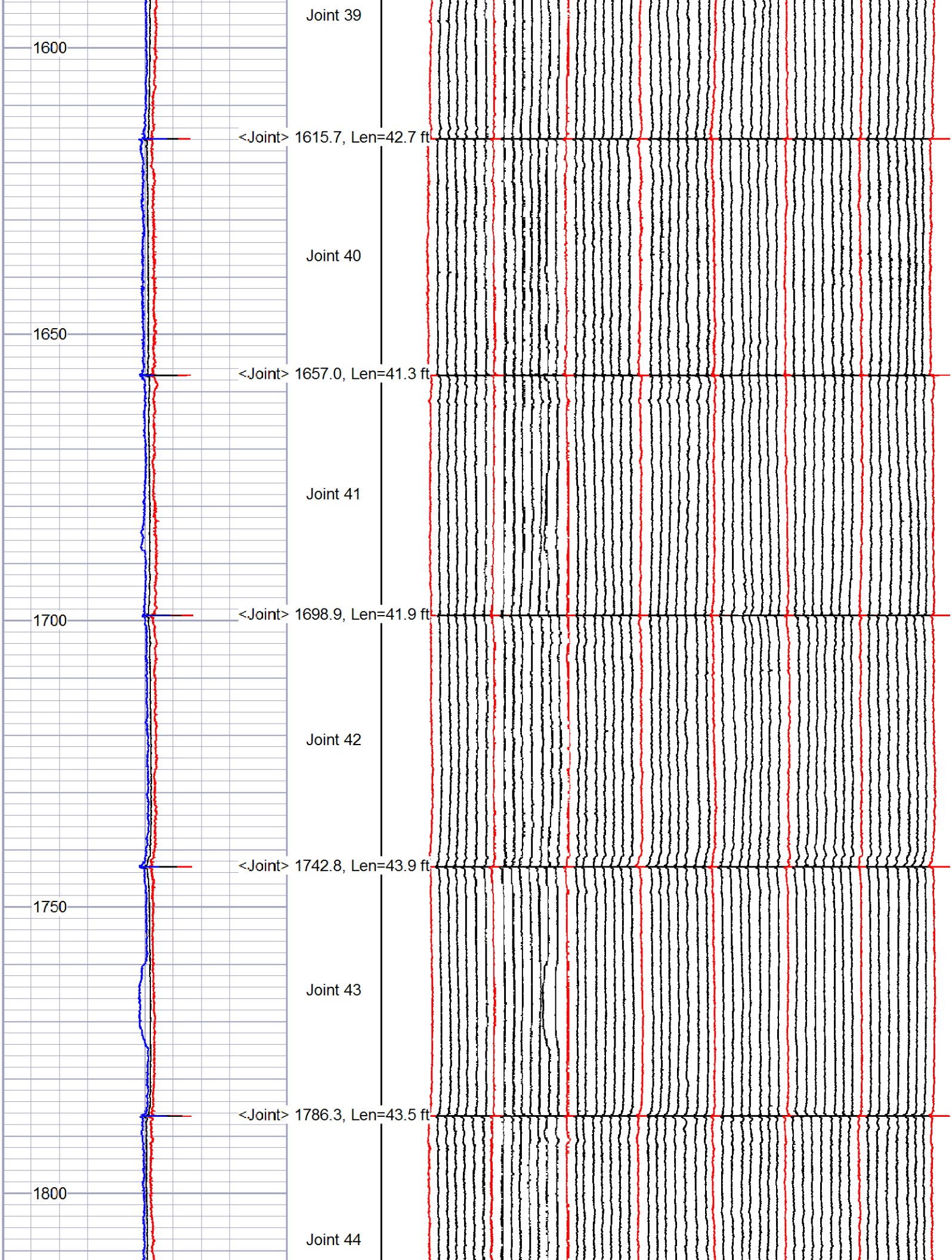

500
<Joint> 501.3, Len=43.9 ft
Joint 14
<Joint> 543.9, Len=42.6 ft
550
Joint 15
<Joint> 586.4, Len=42.5 ft
600
Joint 16
<Joint> 628.8, Len=42.4 ft
650
Joint 17
<Joint> 673.0, Len=44.2 ft
Joint 18
700
<Joint> 711.6, Len=38.6 ft

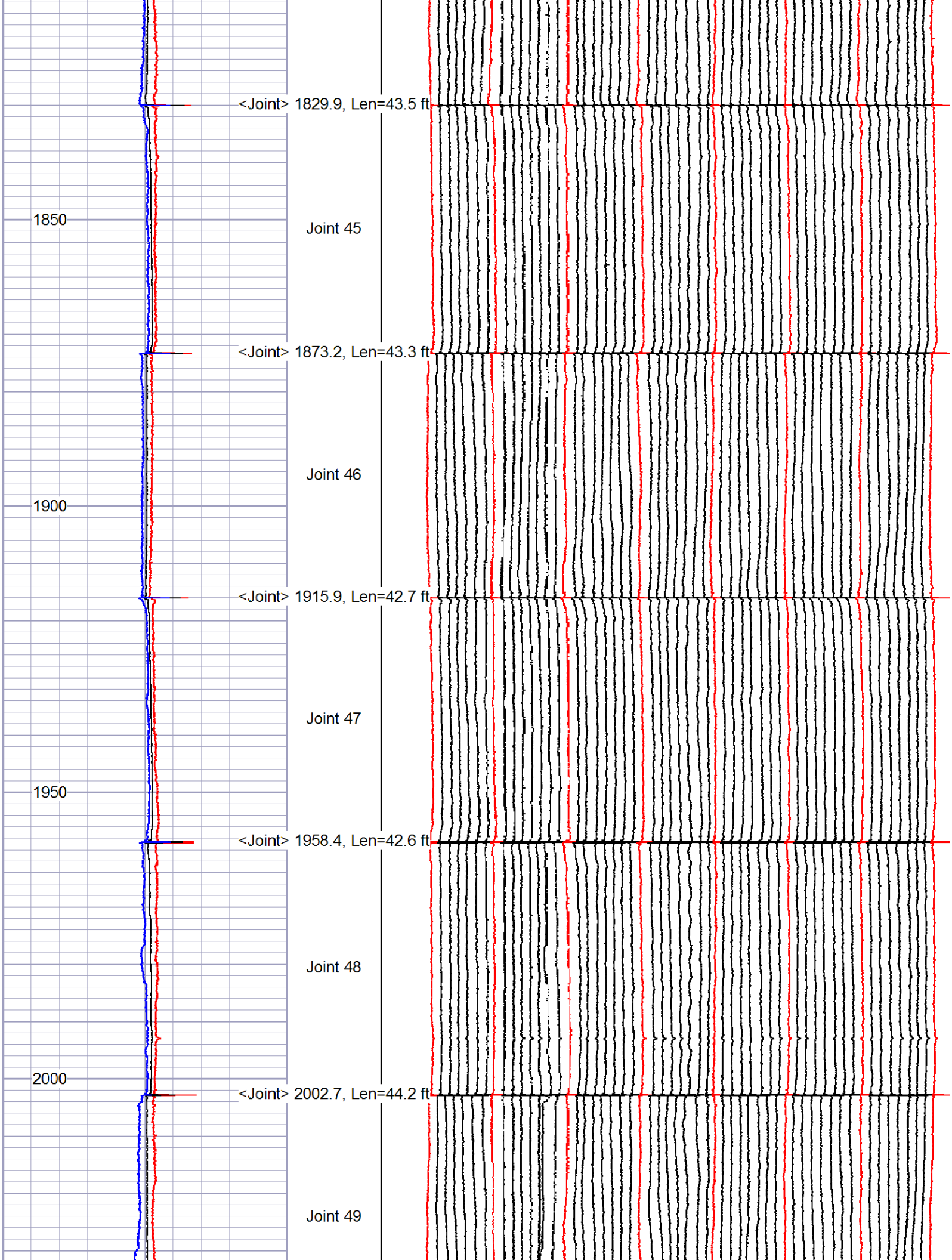

Joint 19
750
<Joint> 755.0, Len=43.4 ft
Probable Wear
Joint 20
<Joint> 791.7, Len=36.7 ft
800
Joint 21
<Joint> 834.0, Len=42.4 ft
850
Joint 22
<Joint> 876.7, Len=42.6 ft
Joint 23
900
<Joint> 918.5, Len=41.9 ft

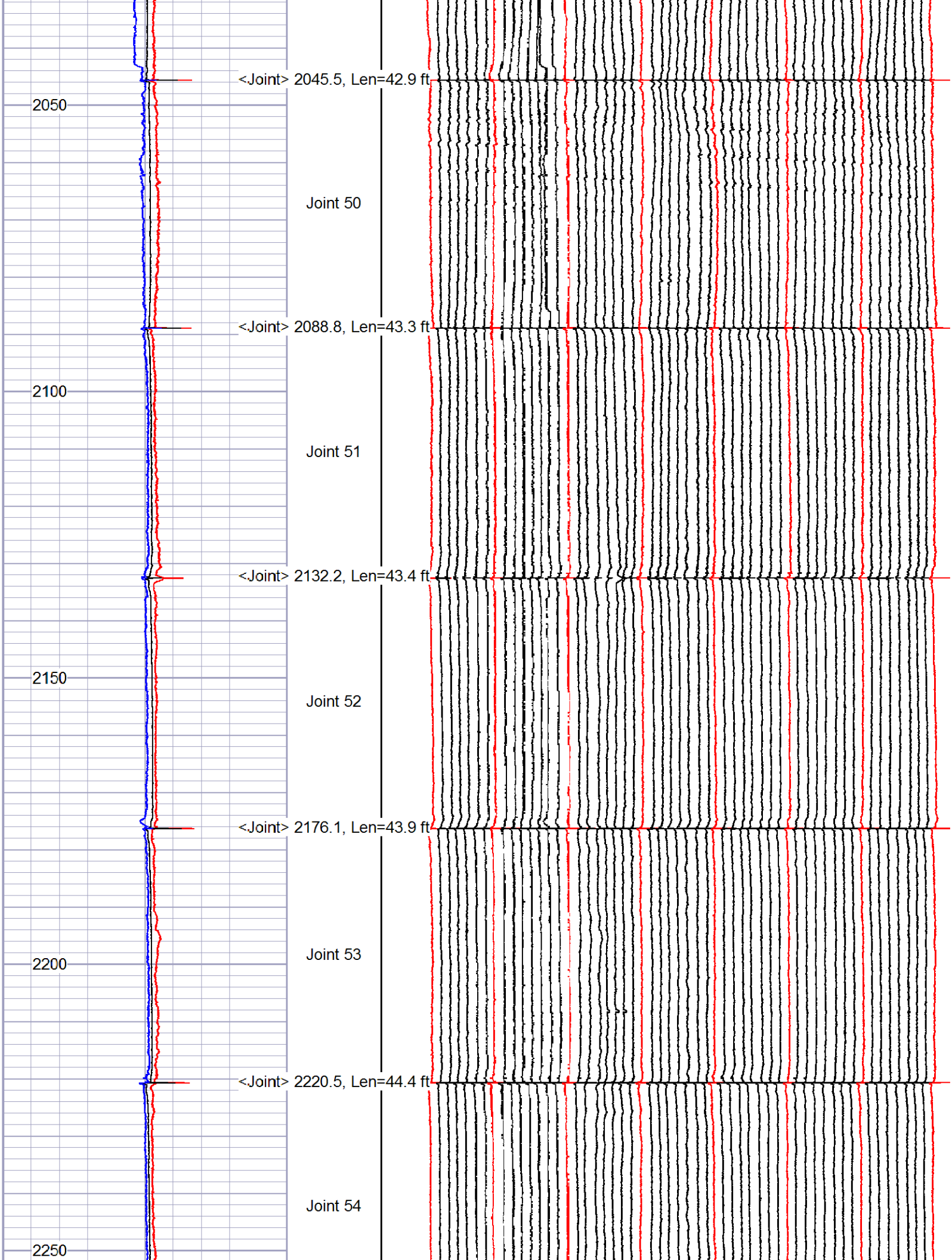

Joint 24
950
<Joint> 961.6, Len=43.0 ft
Joint 25
1000
<Joint> 1004.9, Len=43.3 ft
Joint 26
1050
<Joint> 1049.5, Len=44.6 ft
Joint 27
<Joint> 1093.1, Len=43.6 ft
1100
Joint 28
<Joint> 1136.4, Len=43.3 ft
1150

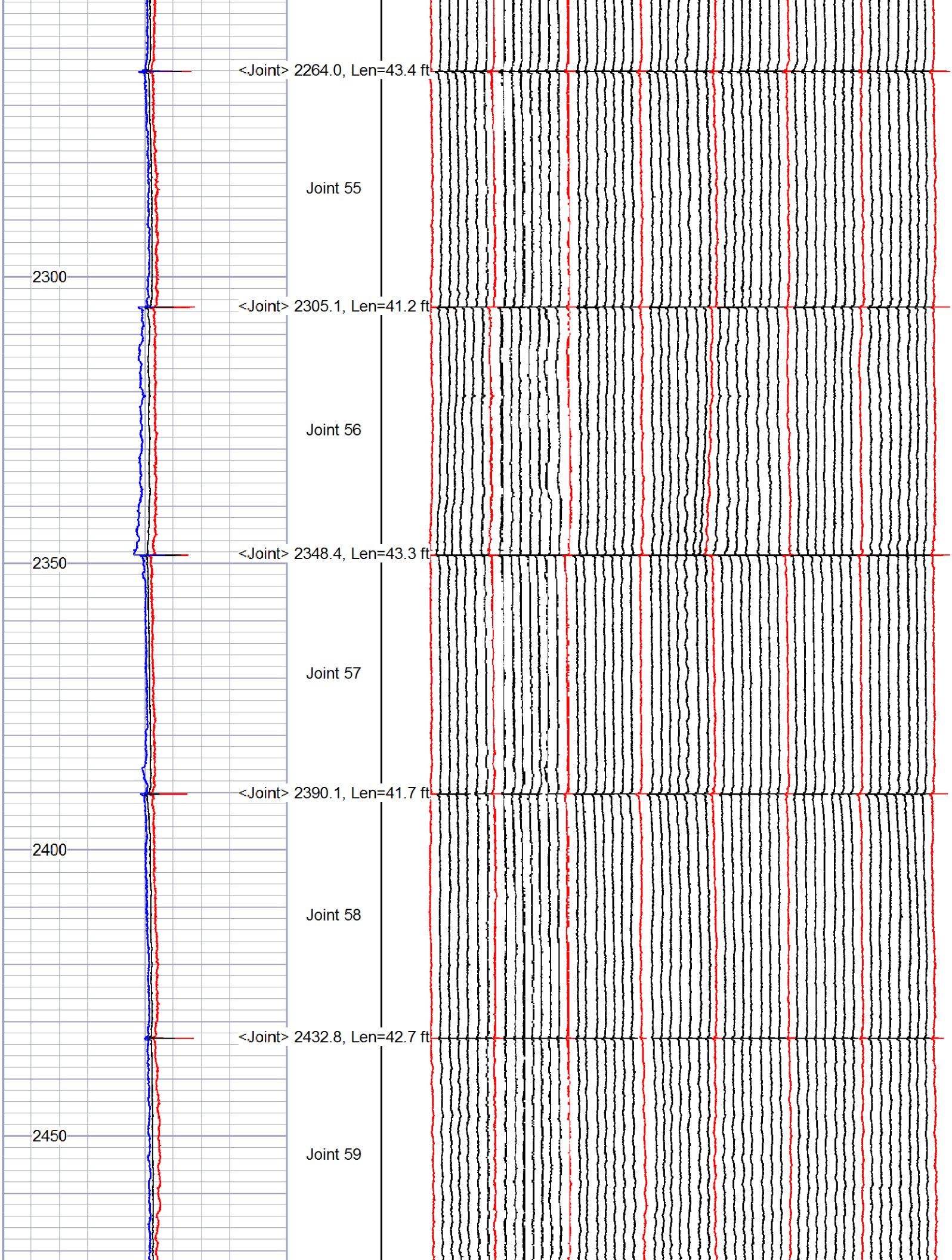

Joint 29
<Joint> 1178.8, Len=42.4 ft
1200
Joint 30
<Joint> 1222.6, Len=43.9 ft
Joint 31
1250
<Joint> 1267.4, Len=44.8 ft
Joint 32
1300
<Joint> 1310.7, Len=43.3 ft
Joint 33
1350
<Joint> 1354.6, Len=43.9 ft

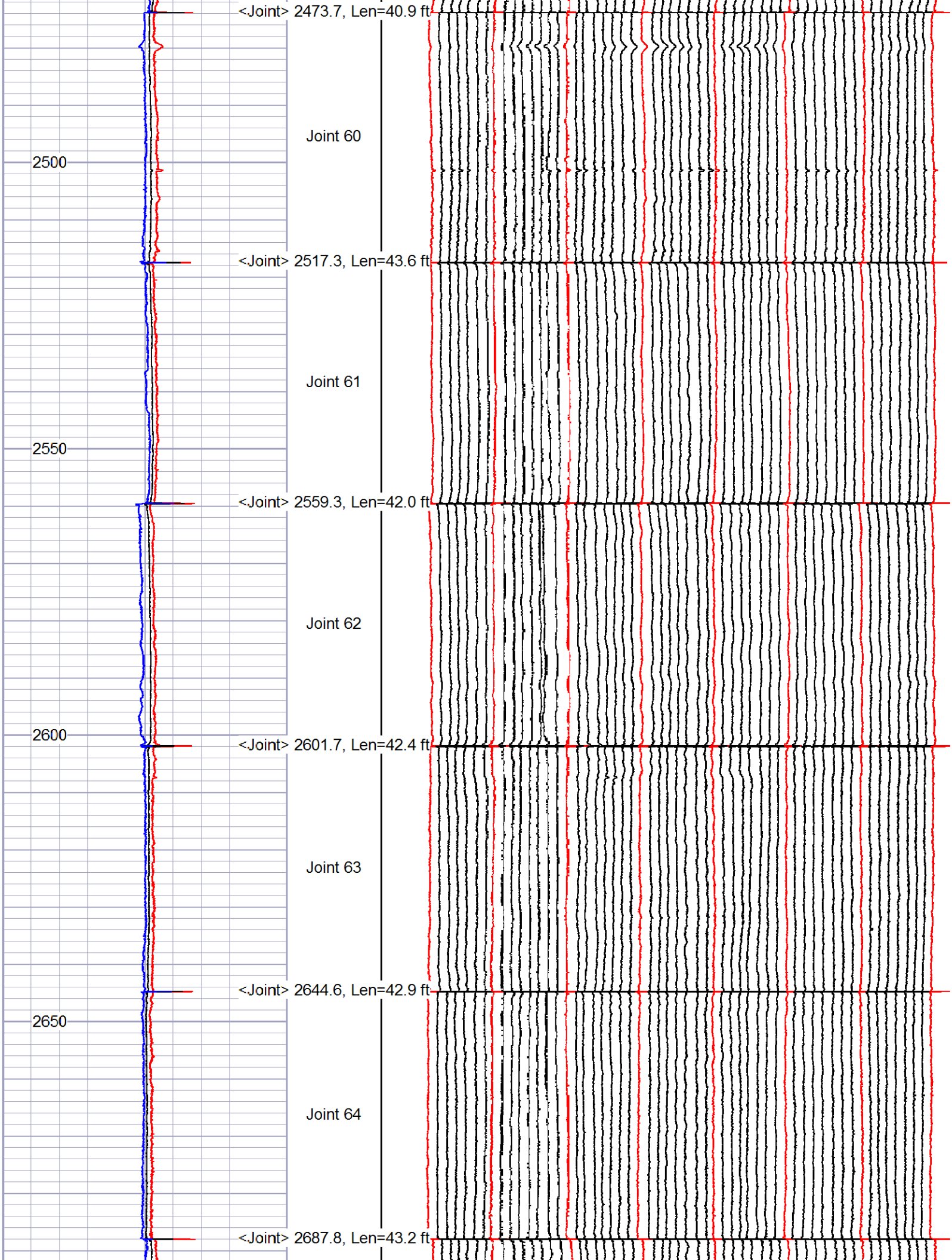

Joint 34
<Joint> 1398.1, Len=43.5 ft
1400
Joint 35
<Joint> 1442.8, Len=44.7 ft
1450
Joint 36
<Joint> 1486.4, Len=43.6 ft
1500
Joint 37
<Joint> 1529.1, Len=42.8 ft
1550
Joint 38
<Joint> 1573.0, Len=43.8 ft

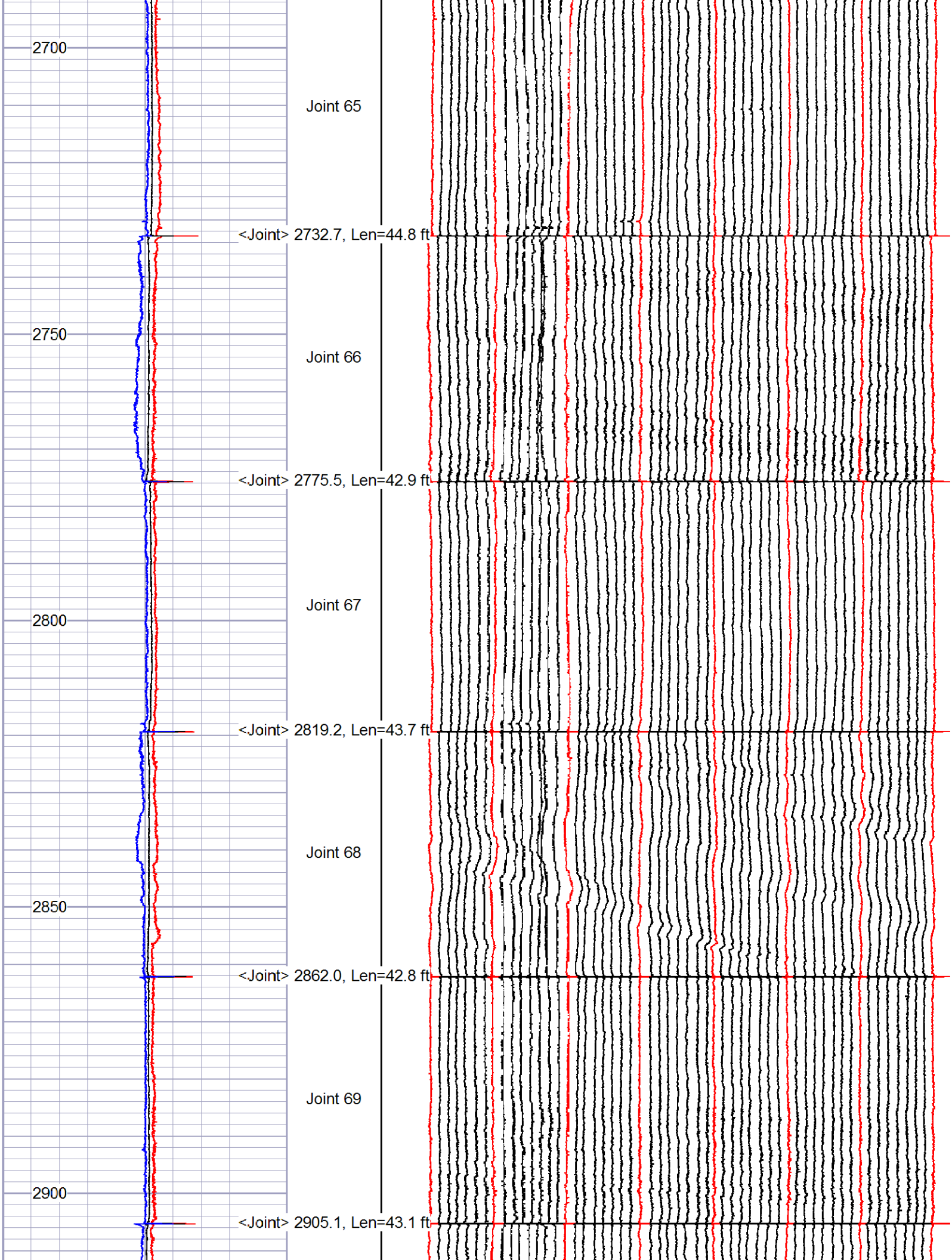

Joint 39
1600
<Joint> 1615.7, Len=42.7 ft
Joint 40
1650
<Joint> 1657.0, Len=41.3 ft
Joint 41
1700
<Joint> 1698.9, Len=41.9 ft
Joint 42
<Joint> 1742.8, Len=43.9 ft
1750
Joint 43
<Joint> 1786.3, Len=43.5 ft
1800
Joint 44

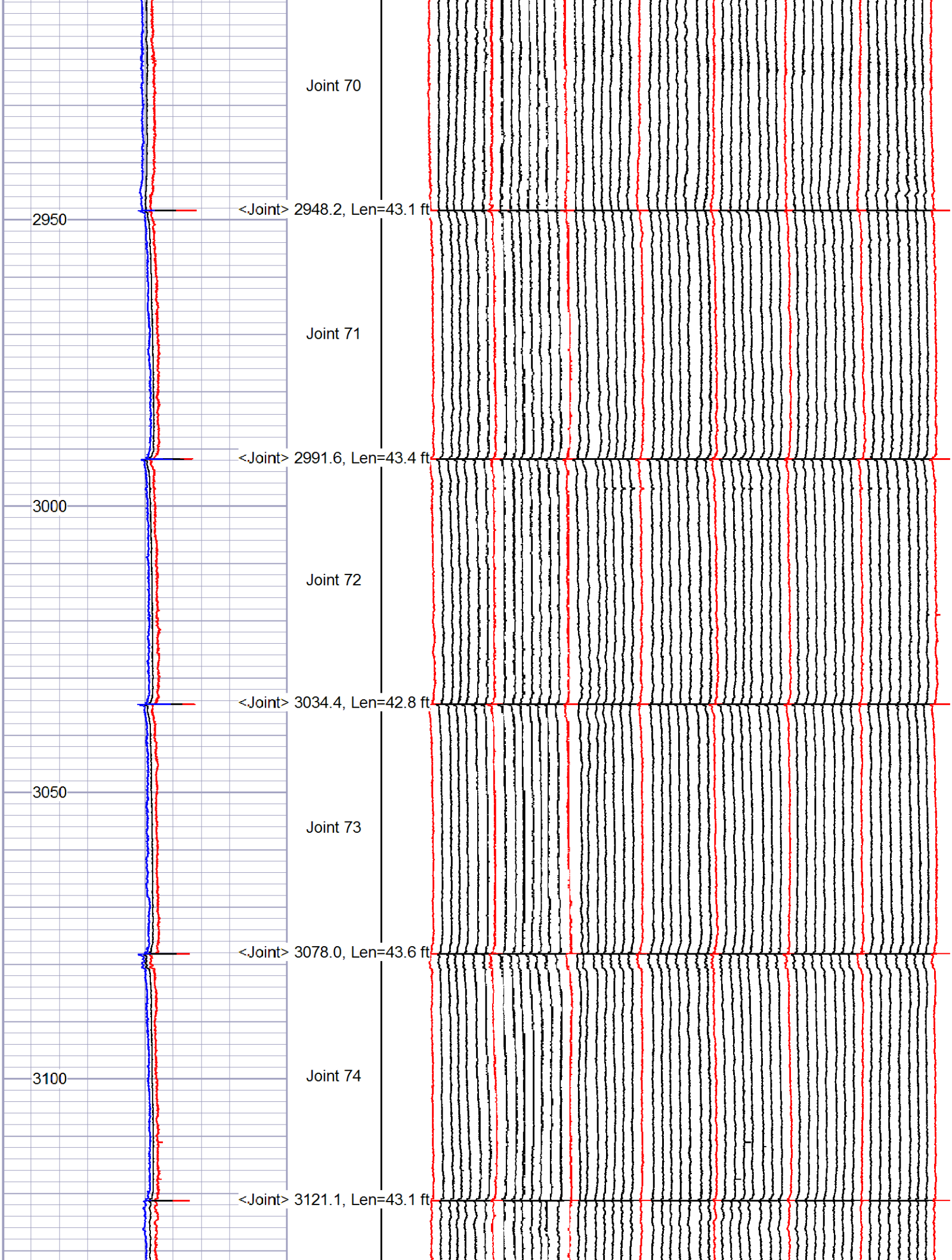

<Joint> 1829.9, Len=43.5 ft
1850
Joint 45
<Joint> 1873.2, Len=43.3 ft
Joint 46
1900
<Joint> 1915.9, Len=42.7 ft
Joint 47
1950
<Joint> 1958.4, Len=42.6 ft
Joint 48
2000
<Joint> 2002.7, Len=44.2 ft
Joint 49

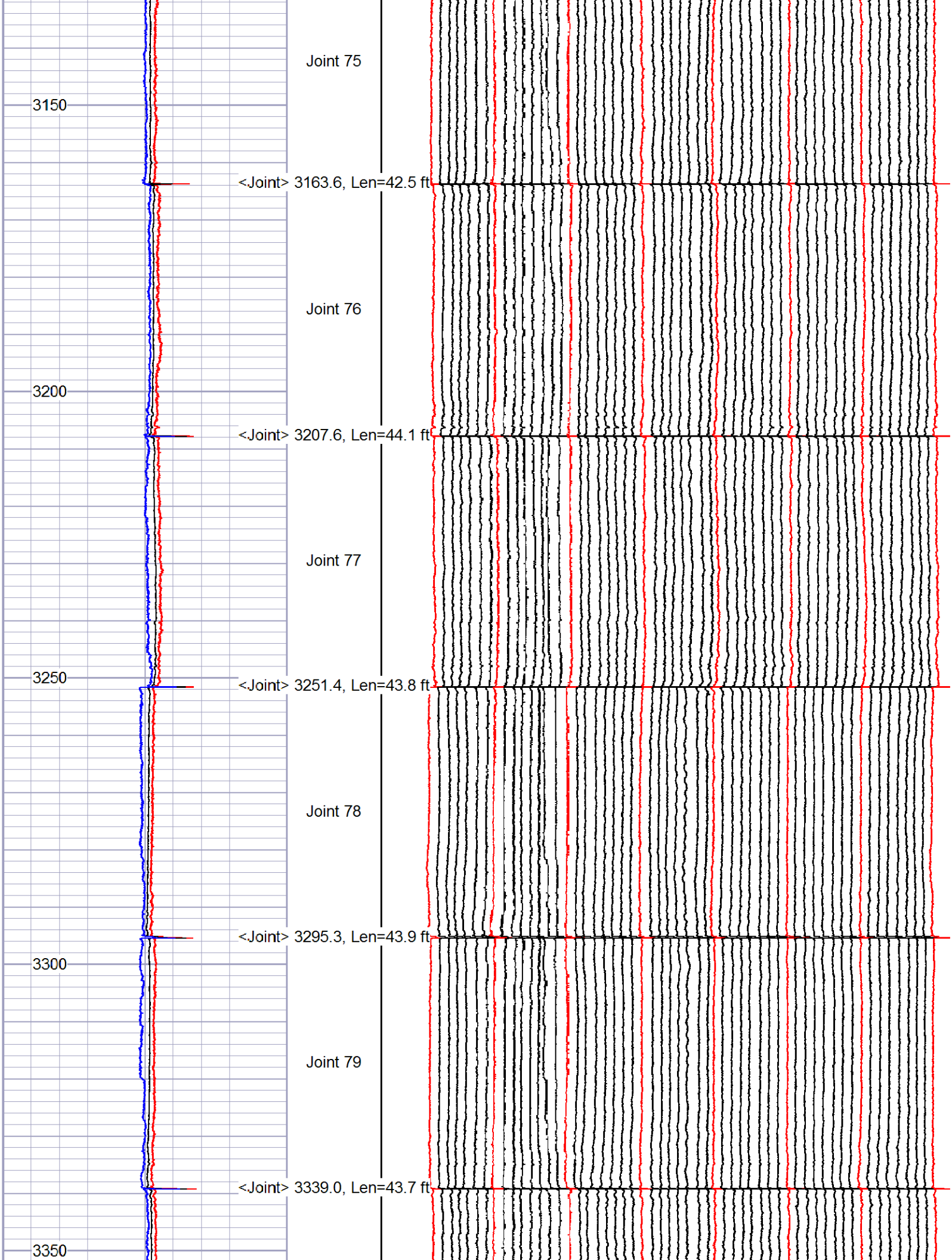

<Joint> 2045.5, Len=42.9 ft
2050
Joint 50
<Joint> 2088.8, Len=43.3 ft
2100
Joint 51
<Joint> 2132.2, Len=43.4 ft
2150
Joint 52
<Joint> 2176.1, Len=43.9 ft
2200
Joint 53
<Joint> 2220.5, Len=44.4 ft
Joint 54
2250

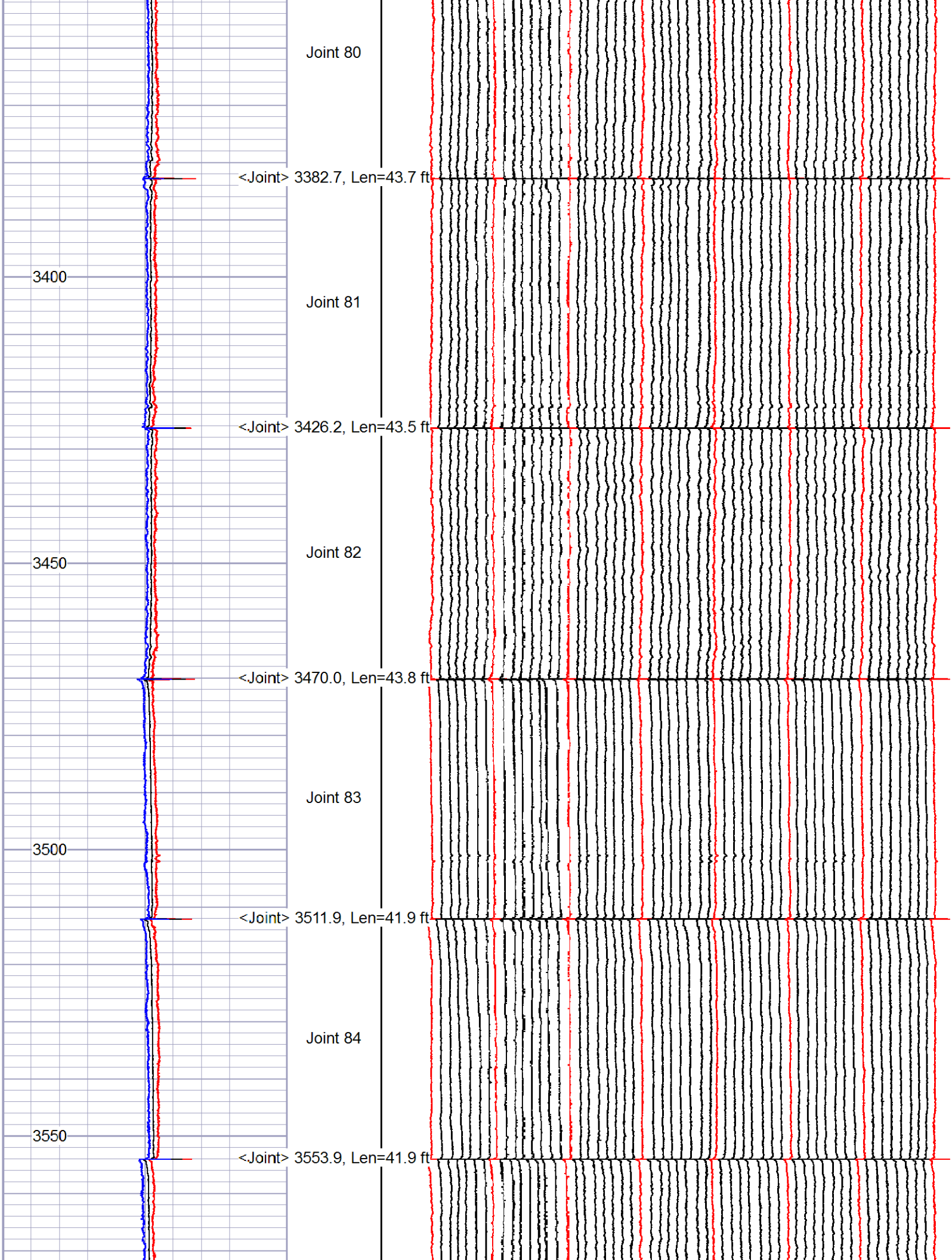

<Joint> 2264.0, Len=43.4 ft
Joint 55
2300
<Joint> 2305.1, Len=41.2 ft
Joint 56
2350
<Joint> 2348.4, Len=43.3 ft
Joint 57
<Joint> 2390.1, Len=41.7 ft
2400
Joint 58
<Joint> 2432.8, Len=42.7 ft
2450
Joint 59

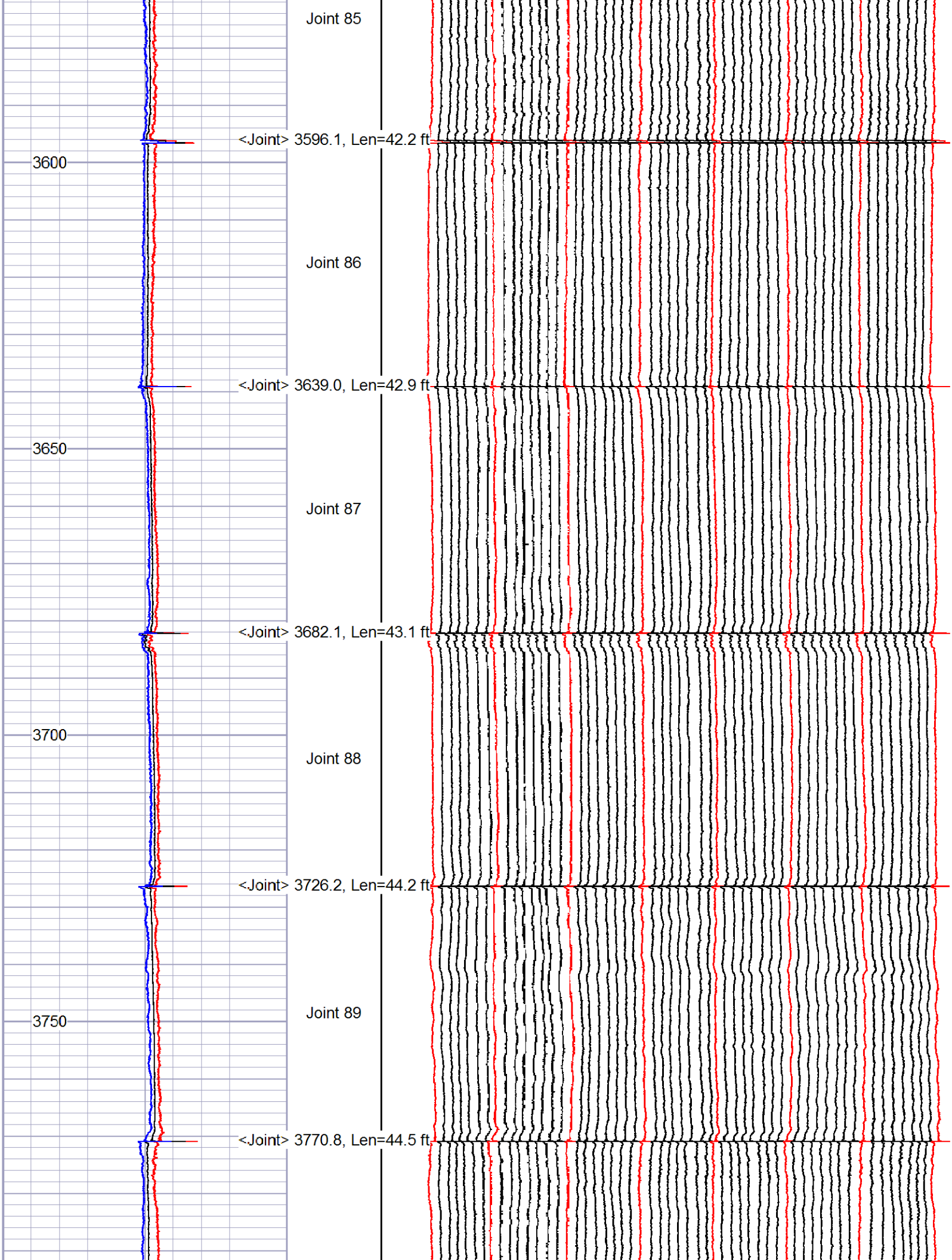

<Joint> 2473.7, Len=40.9 ft
Joint 60
2500
<Joint> 2517.3, Len=43.6 ft
Joint 61
2550
<Joint> 2559.3, Len=42.0 ft
Joint 62
2600
<Joint> 2601.7, Len=42.4 ft
Joint 63
<Joint> 2644.6, Len=42.9 ft
2650
Joint 64
<Joint> 2687.8, Len=43.2 ft

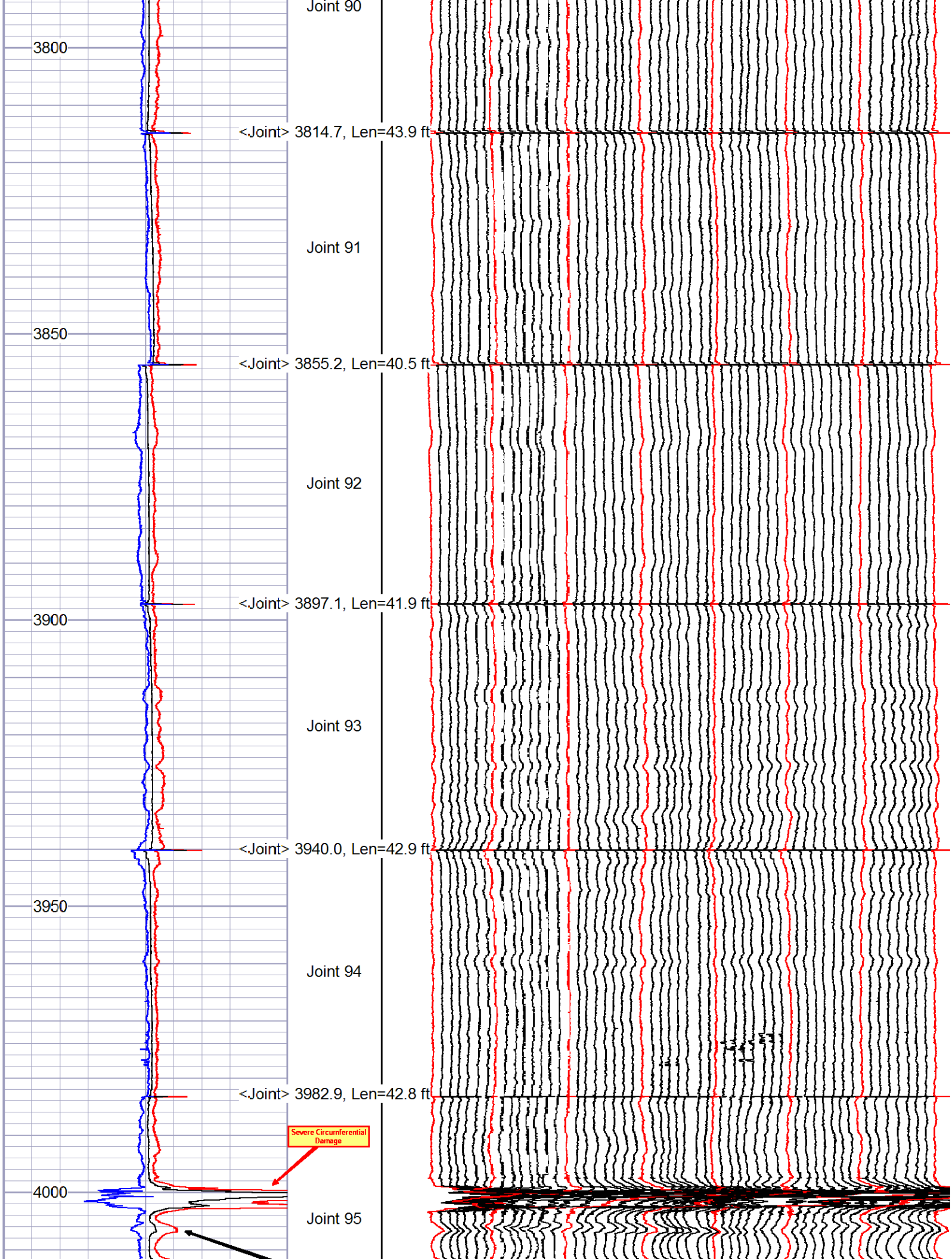

2700
Joint 65
<Joint> 2732.7, Len=44.8 ft
2750
Joint 66
<Joint> 2775.5, Len=42.9 ft
2800
Joint 67
<Joint> 2819.2, Len=43.7 ft
Joint 68
2850
<Joint> 2862.0, Len=42.8 ft
Joint 69
2900
<Joint> 2905.1, Len=43.1 ft

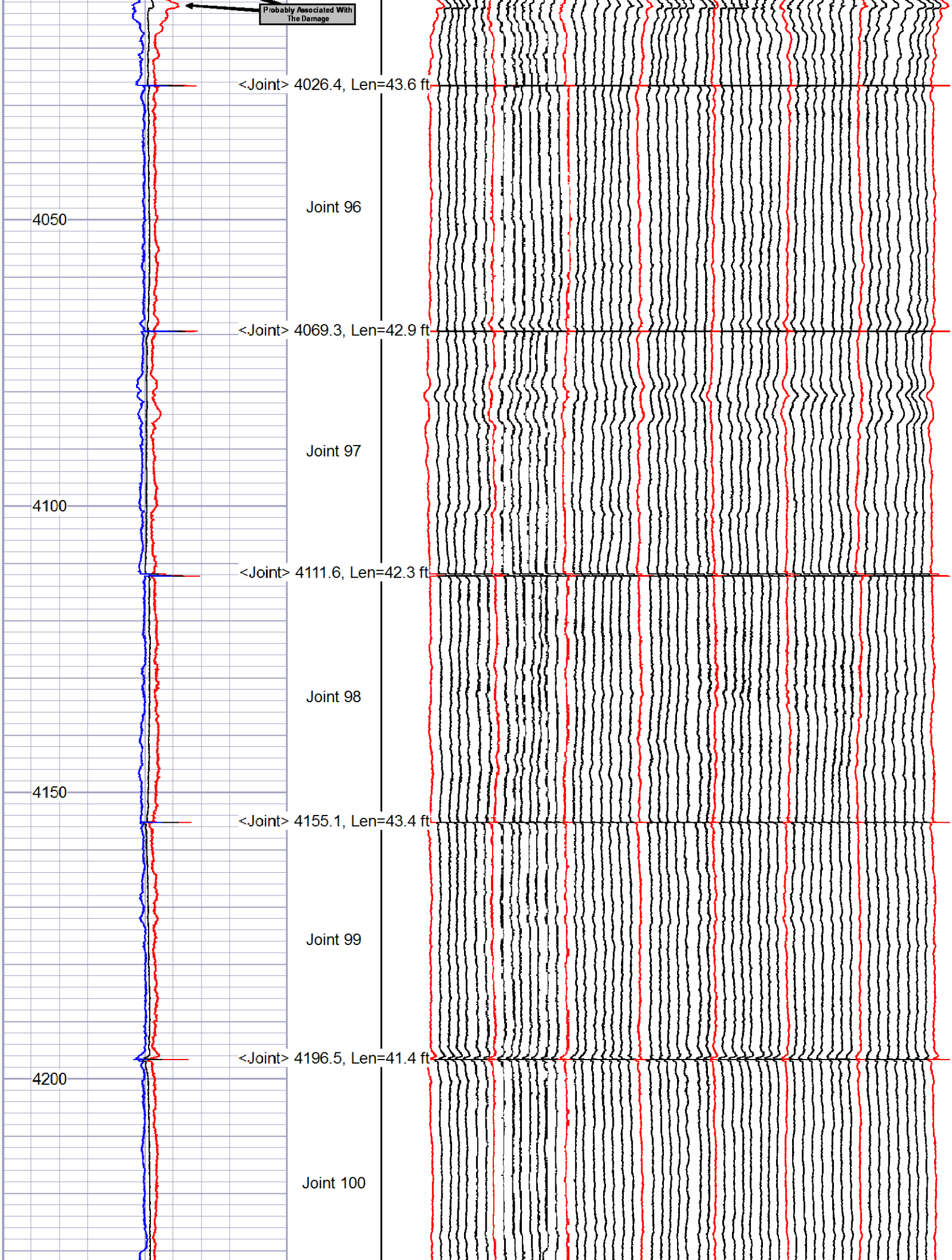

Joint 70
<Joint> 2948.2, Len=43.1 ft
2950
Joint 71
<Joint> 2991.6, Len=43.4 ft
3000
Joint 72
<Joint> 3034.4, Len=42.8 ft
3050
Joint 73
<Joint> 3078.0, Len=43.6 ft
3100
Joint 74
<Joint> 3121.1, Len=43.1 ft

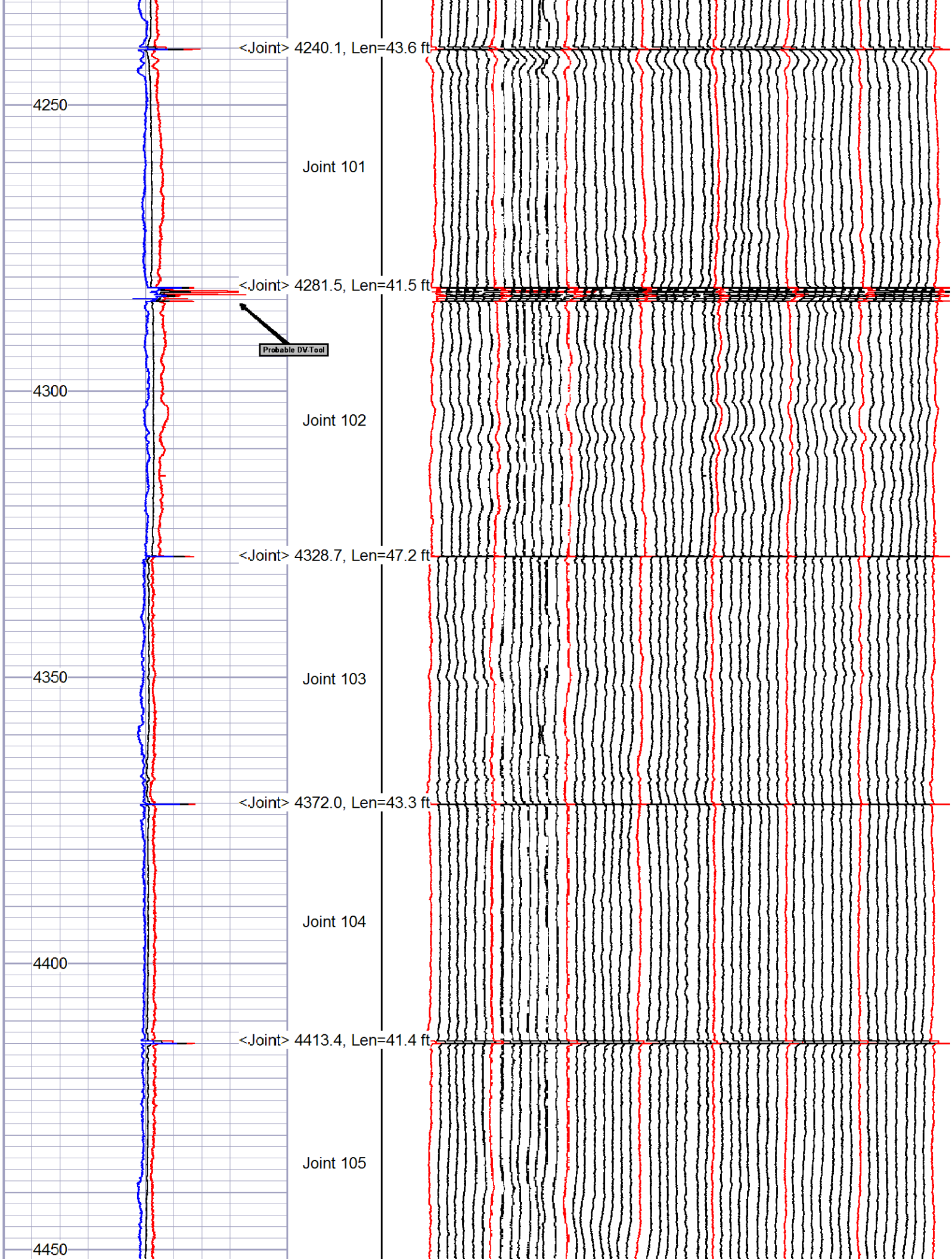

Joint 75
3150
<Joint> 3163.6, Len=42.5 ft
Joint 76
3200
<Joint> 3207.6, Len=44.1 ft
Joint 77
3250
<Joint> 3251.4, Len=43.8 ft
Joint 78
<Joint> 3295.3, Len=43.9 ft
3300
Joint 79
<Joint> 3339.0, Len=43.7 ft
3350

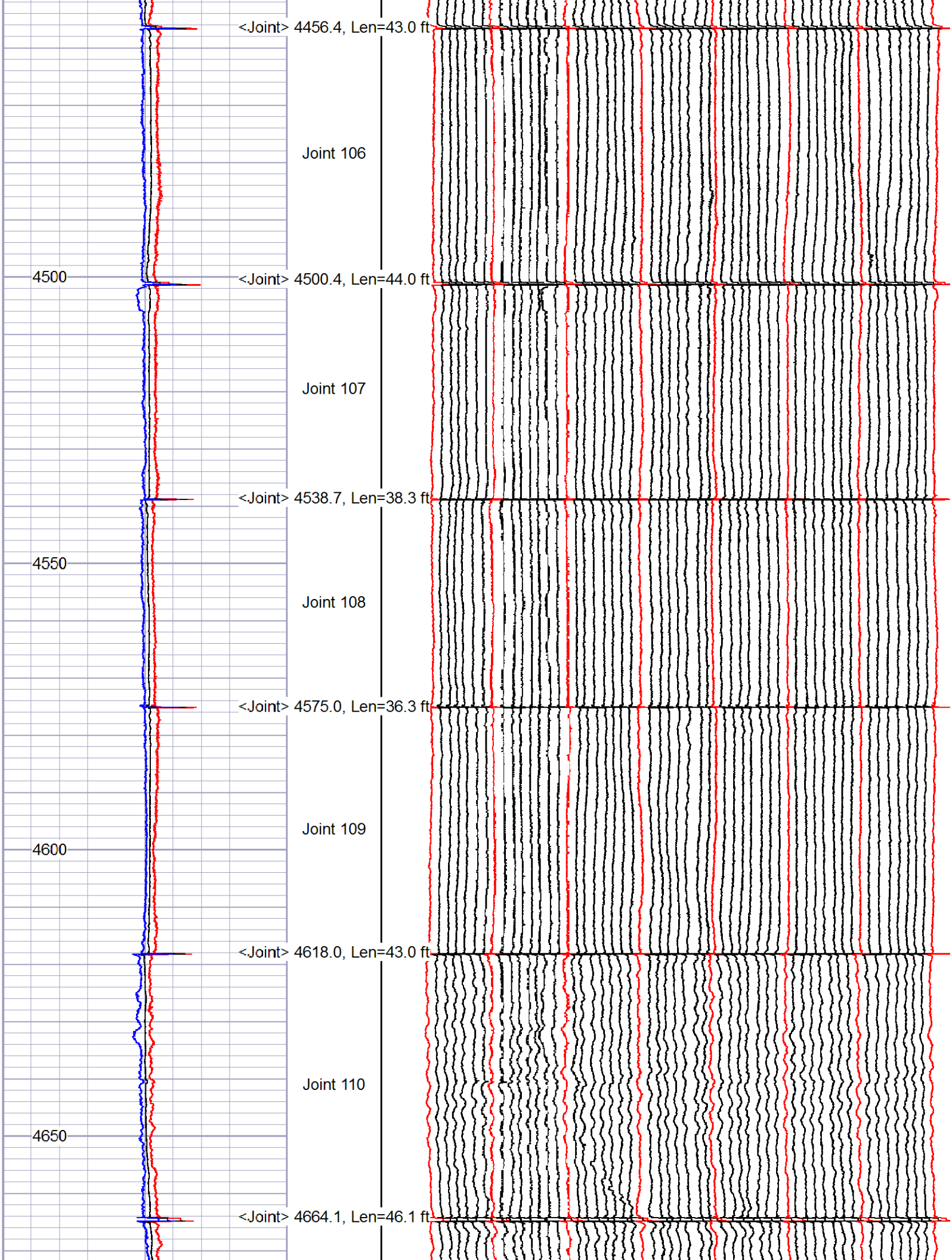

Joint 80
<Joint> 3382.7, Len=43.7 ft
3400
Joint 81
<Joint> 3426.2, Len=43.5 ft
3450
Joint 82
<Joint> 3470.0, Len=43.8 ft
Joint 83
3500
<Joint> 3511.9, Len=41.9 ft
Joint 84
3550
<Joint> 3553.9, Len=41.9 ft

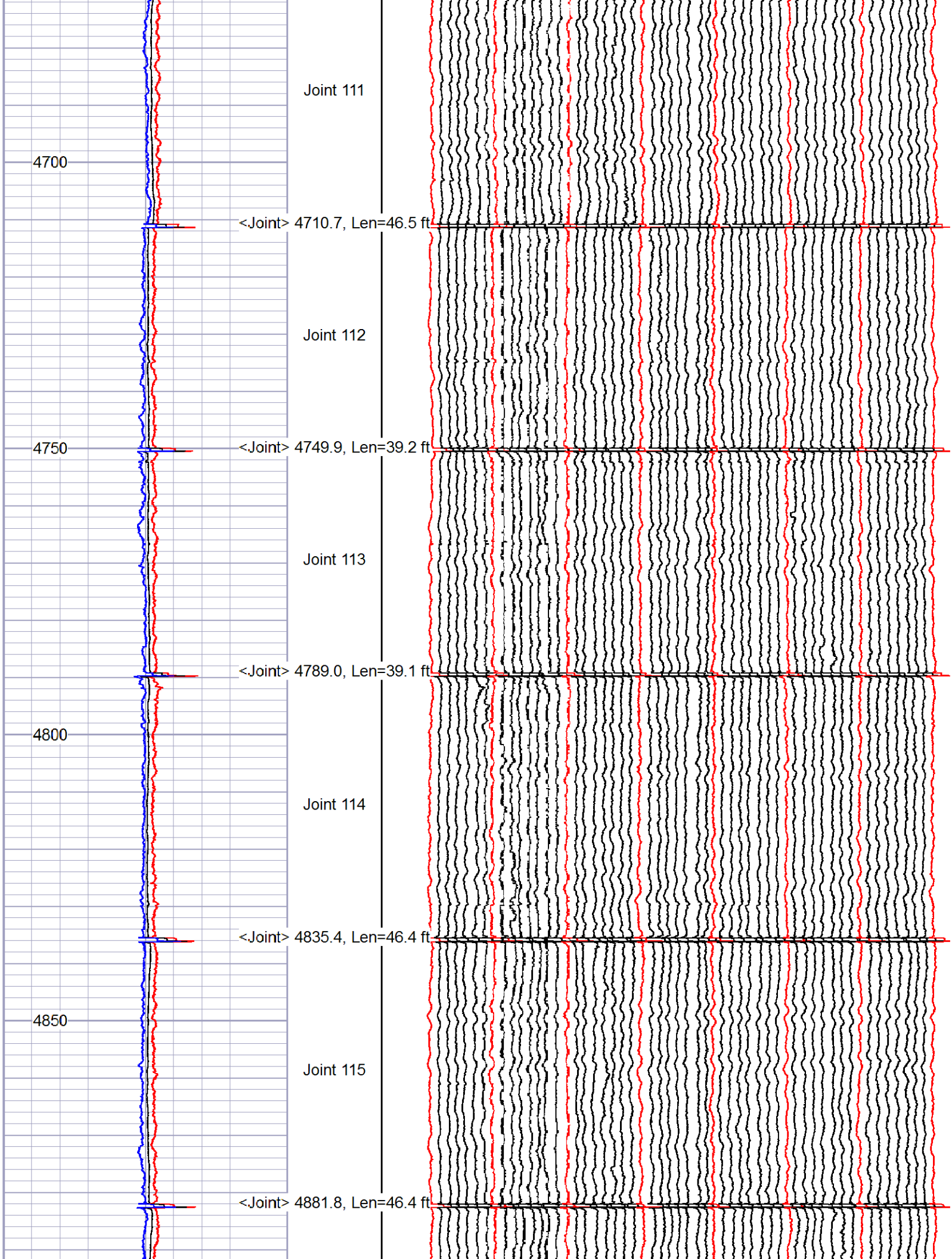

Joint 85
<Joint> 3596.1, Len=42.2 ft
3600
Joint 86
<Joint> 3639.0, Len=42.9 ft
3650
Joint 87
<Joint> 3682.1, Len=43.1 ft
3700
Joint 88
<Joint> 3726.2, Len=44.2 ft
3750
Joint 89
<Joint> 3770.8, Len=44.5 ft

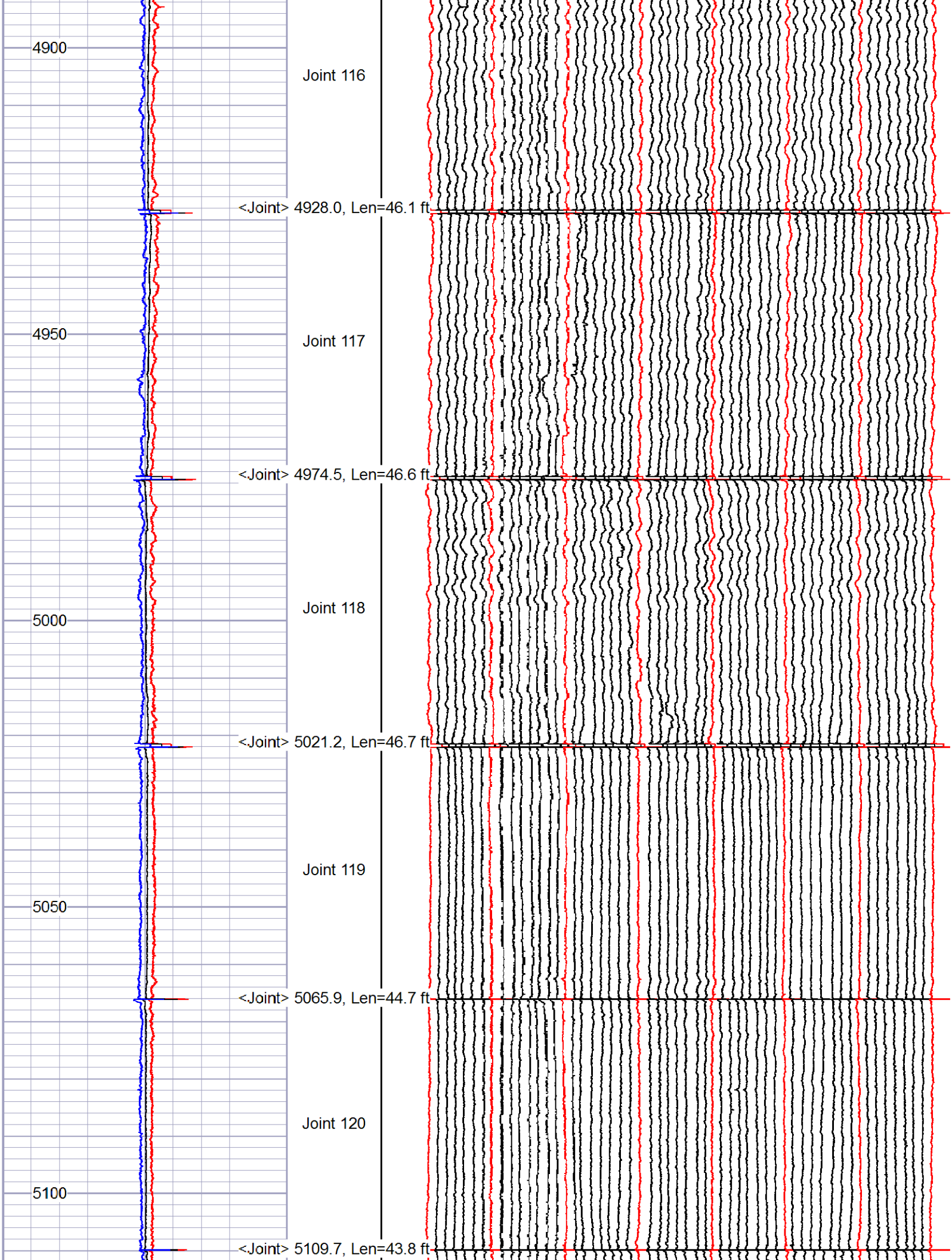

Joint 90
3800
<Joint> 3814.7, Len=43.9 ft
Joint 91
3850
<Joint> 3855.2, Len=40.5 ft
Joint 92
<Joint> 3897.1, Len=41.9 ft
3900
Joint 93
<Joint> 3940.0, Len=42.9 ft
3950
Joint 94
<Joint> 3982.9, Len=42.8 ft
Severe Circumferential Damage
4000
Joint 95

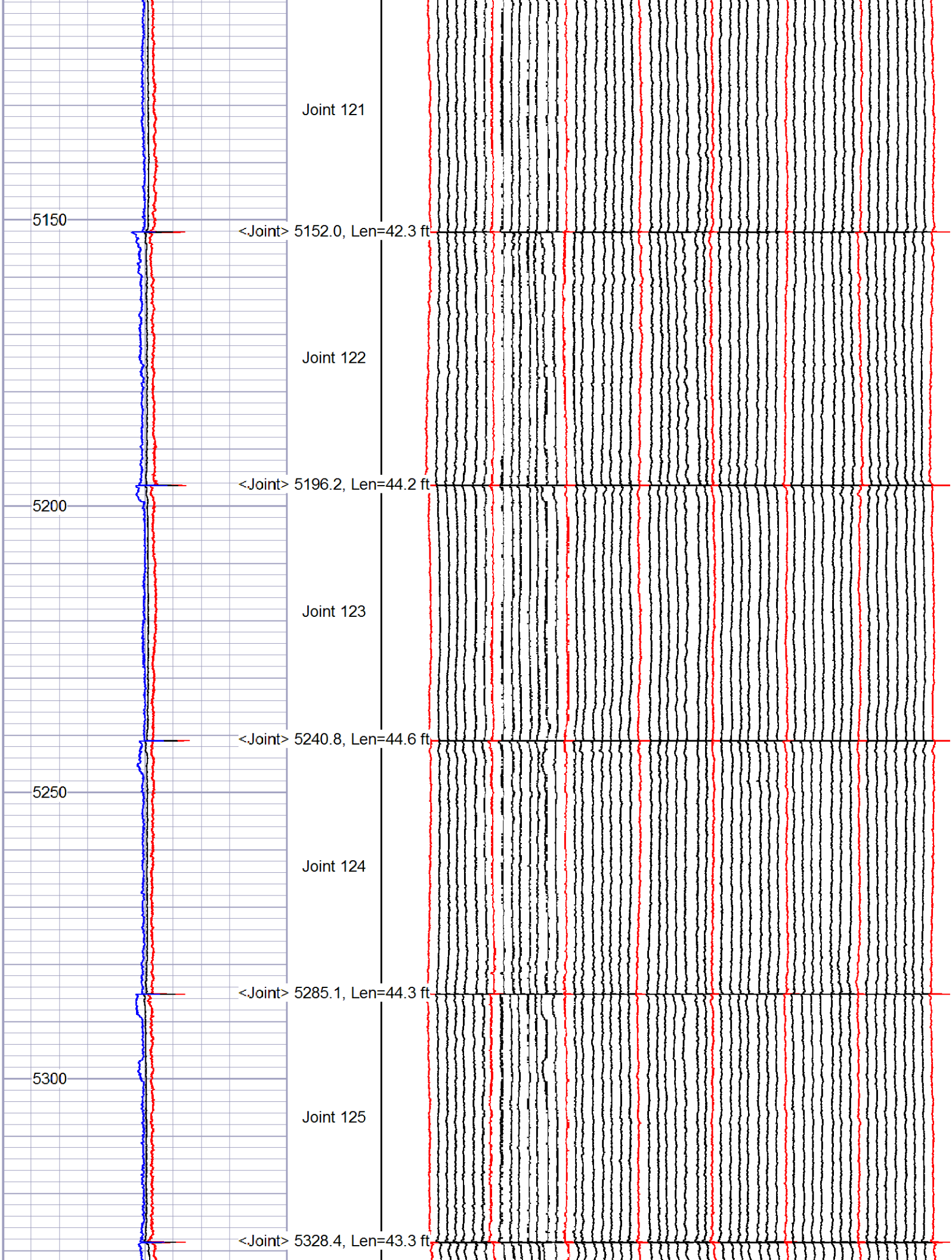

Probably Associated With The Damage
<Joint> 4026.4, Len=43.6 ft
Joint 96
4050
<Joint> 4069.3, Len=42.9 ft
Joint 97
4100
<Joint> 4111.6, Len=42.3 ft
Joint 98
4150
<Joint> 4155.1, Len=43.4 ft
Joint 99
<Joint> 4196.5, Len=41.4 ft
4200
Joint 100

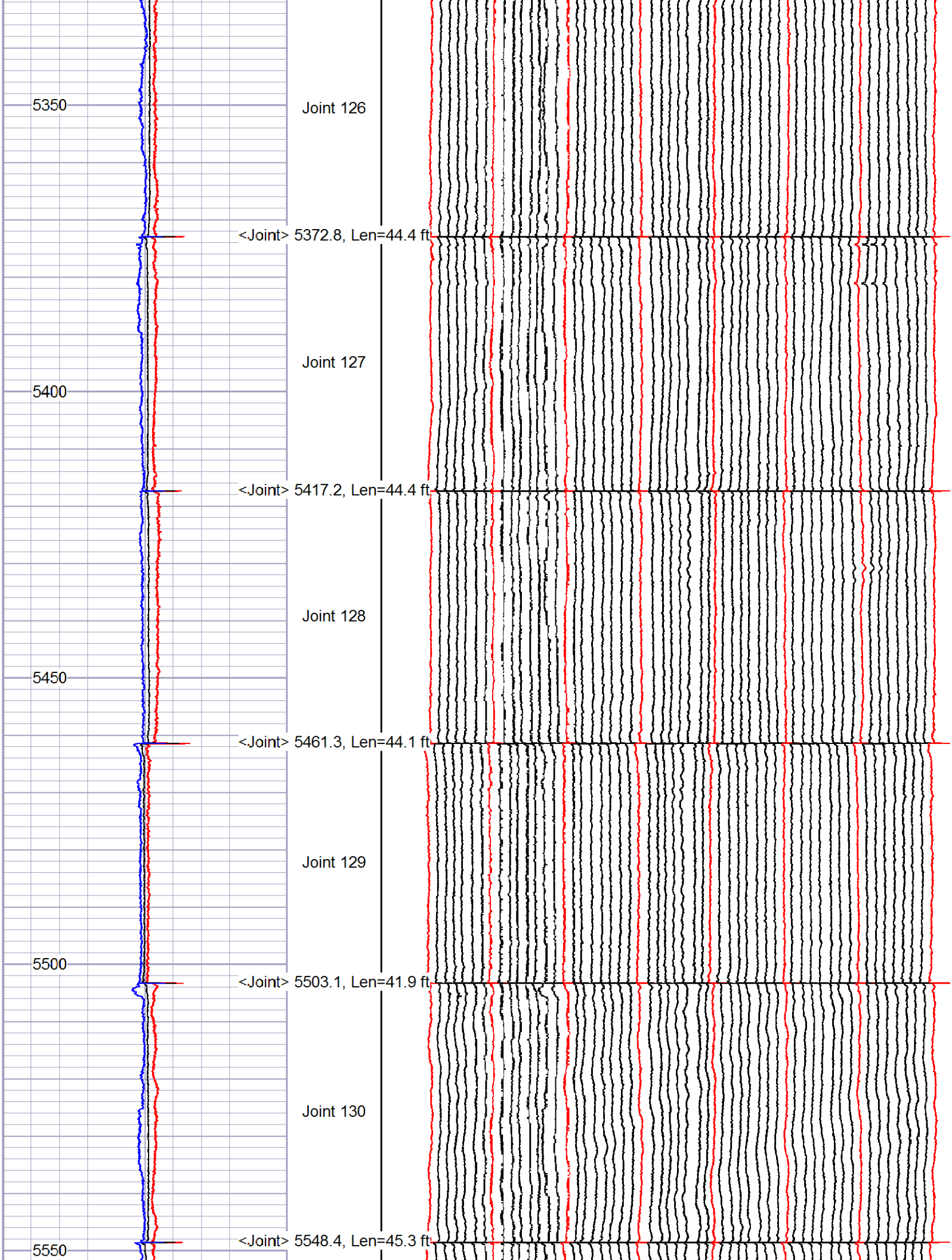

<Joint> 4240.1, Len=43.6 ft
4250
Joint 101
<Joint> 4281.5, Len=41.5 ft
Probable DV-Tool
4300
Joint 102
<Joint> 4328.7, Len=47.2 ft
4350
Joint 103
<Joint> 4372.0, Len=43.3 ft
Joint 104
4400
<Joint> 4413.4, Len=41.4 ft
Joint 105
4450

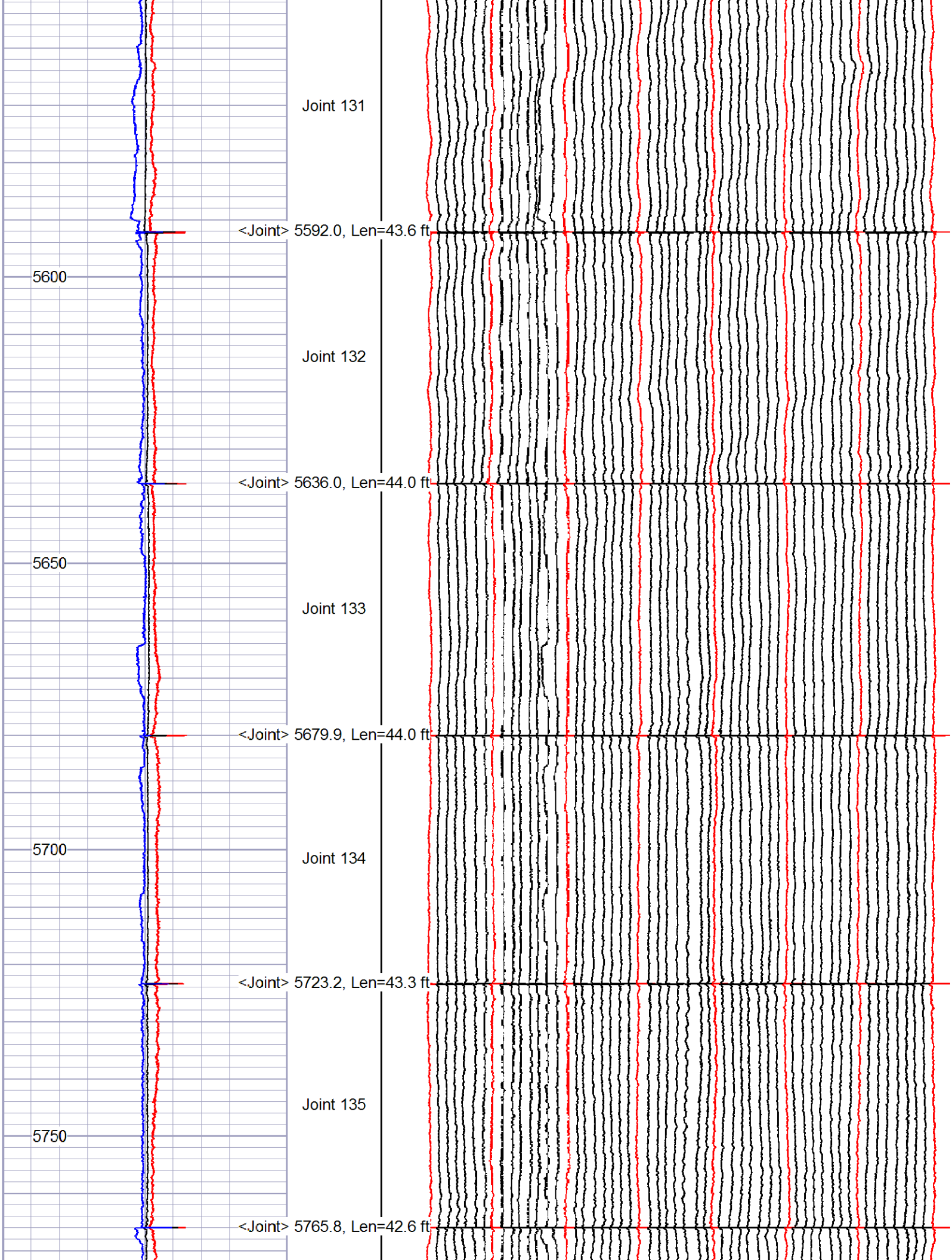

<Joint> 4456.4, Len=43.0 ft
Joint 106
4500
<Joint> 4500.4, Len=44.0 ft
Joint 107
<Joint> 4538.7, Len=38.3 ft
4550
Joint 108
<Joint> 4575.0, Len=36.3 ft
Joint 109
4600
<Joint> 4618.0, Len=43.0 ft
Joint 110
4650
<Joint> 4664.1, Len=46.1 ft

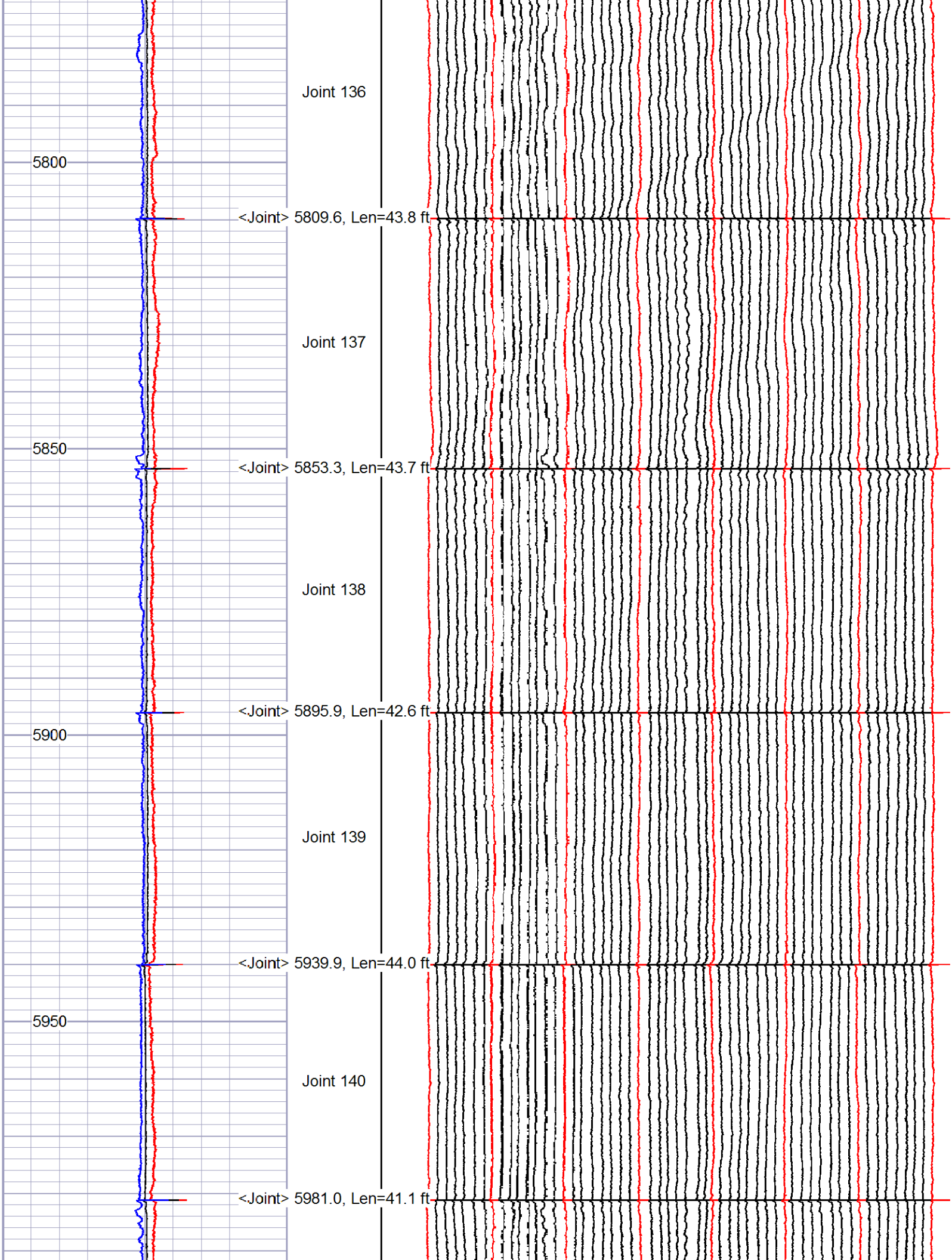

Joint 111
4700
<Joint> 4710.7, Len=46.5 ft
Joint 112
4750
<Joint> 4749.9, Len=39.2 ft
Joint 113
<Joint> 4789.0, Len=39.1 ft
4800
Joint 114
<Joint> 4835.4, Len=46.4 ft
4850
Joint 115
<Joint> 4881.8, Len=46.4 ft

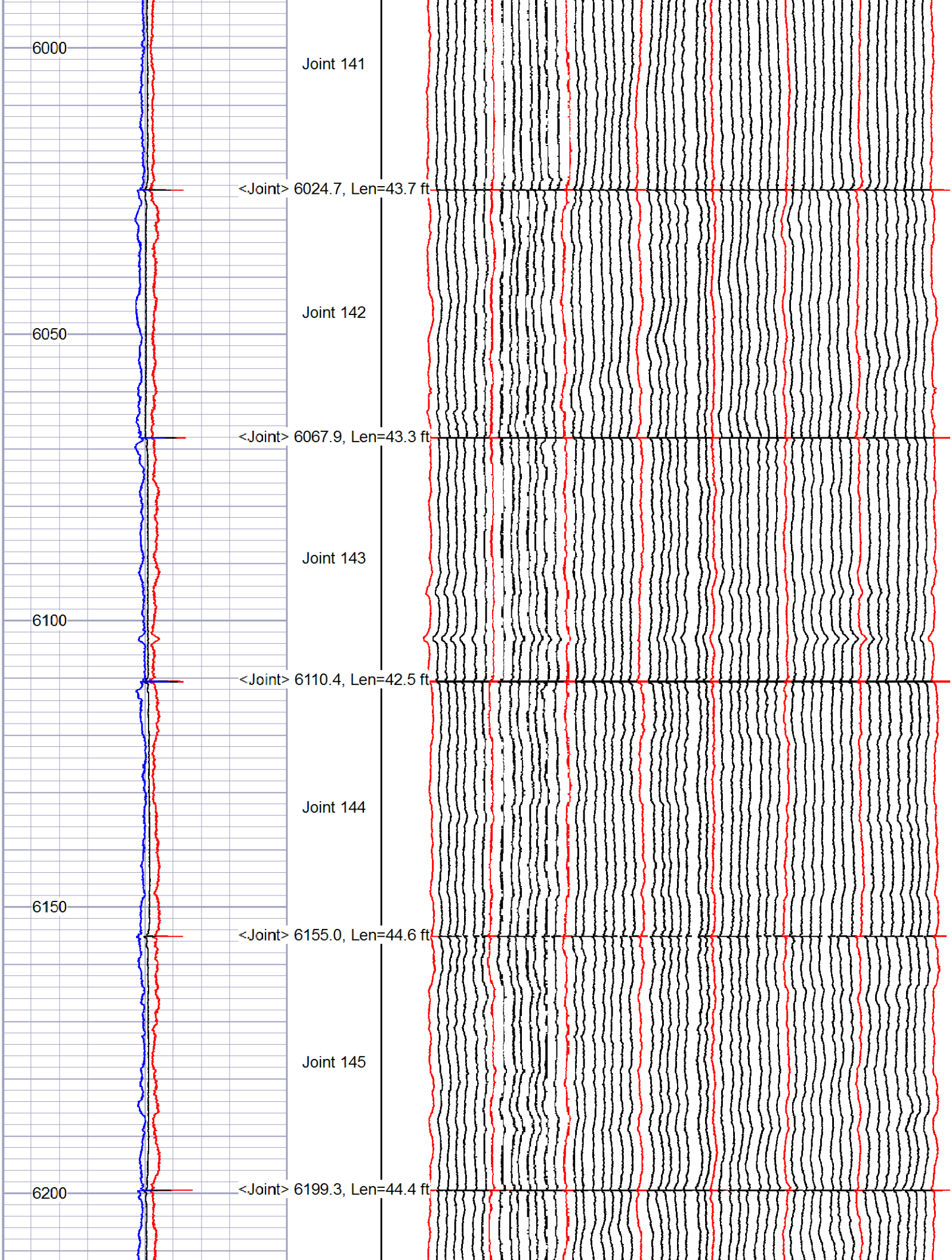

4900
Joint 116
<Joint> 4928.0, Len=46.1 ft
4950
Joint 117
<Joint> 4974.5, Len=46.6 ft
5000
Joint 118
<Joint> 5021.2, Len=46.7 ft
5050
Joint 119
<Joint> 5065.9, Len=44.7 ft
Joint 120
5100
<Joint> 5109.7, Len=43.8 ft

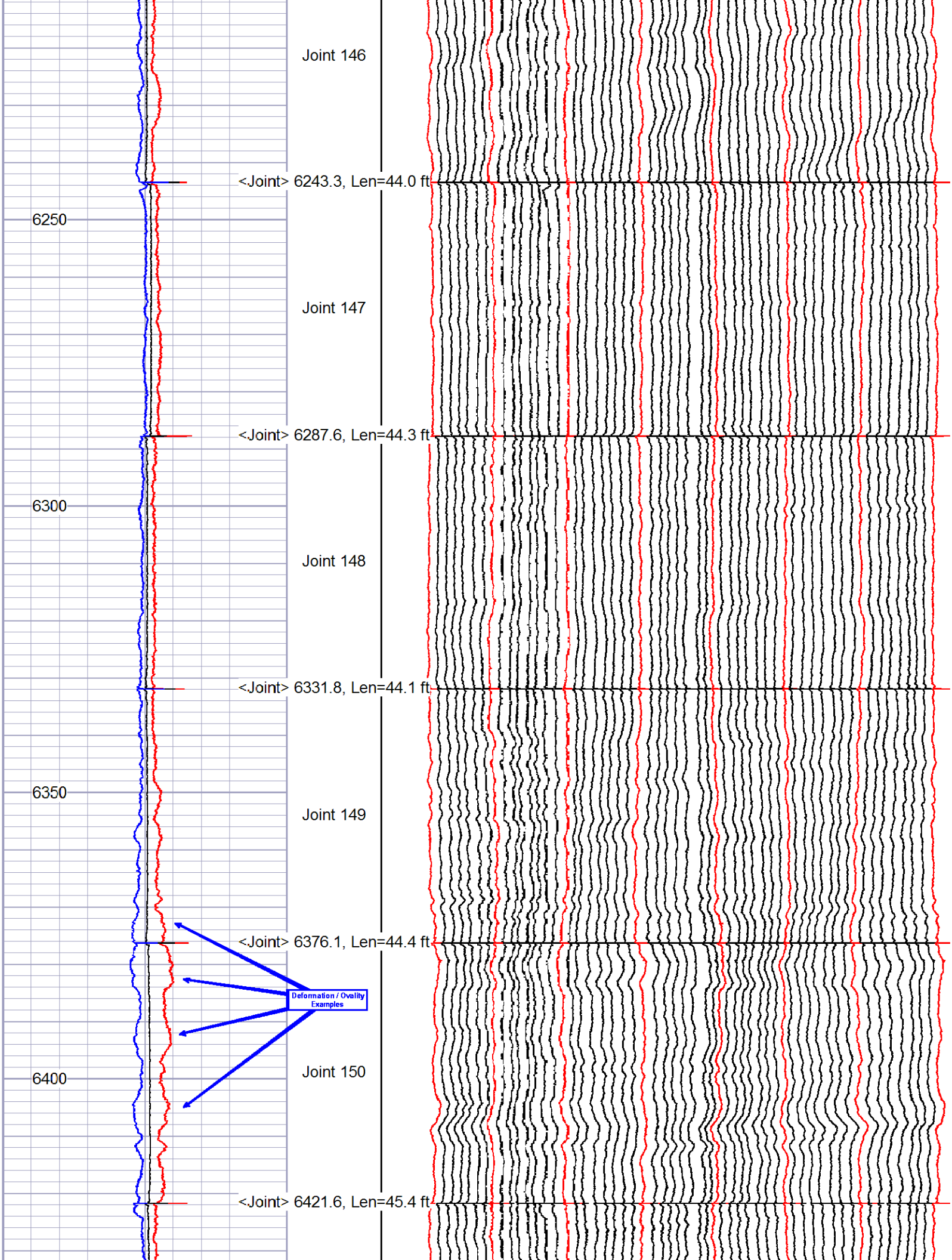

Joint 121
5150
<Joint> 5152.0, Len=42.3 ft
Joint 122
<Joint> 5196.2, Len=44.2 ft
5200
Joint 123
<Joint> 5240.8, Len=44.6 ft
5250
Joint 124
<Joint> 5285.1, Len=44.3 ft
5300
Joint 125
<Joint> 5328.4, Len=43.3 ft

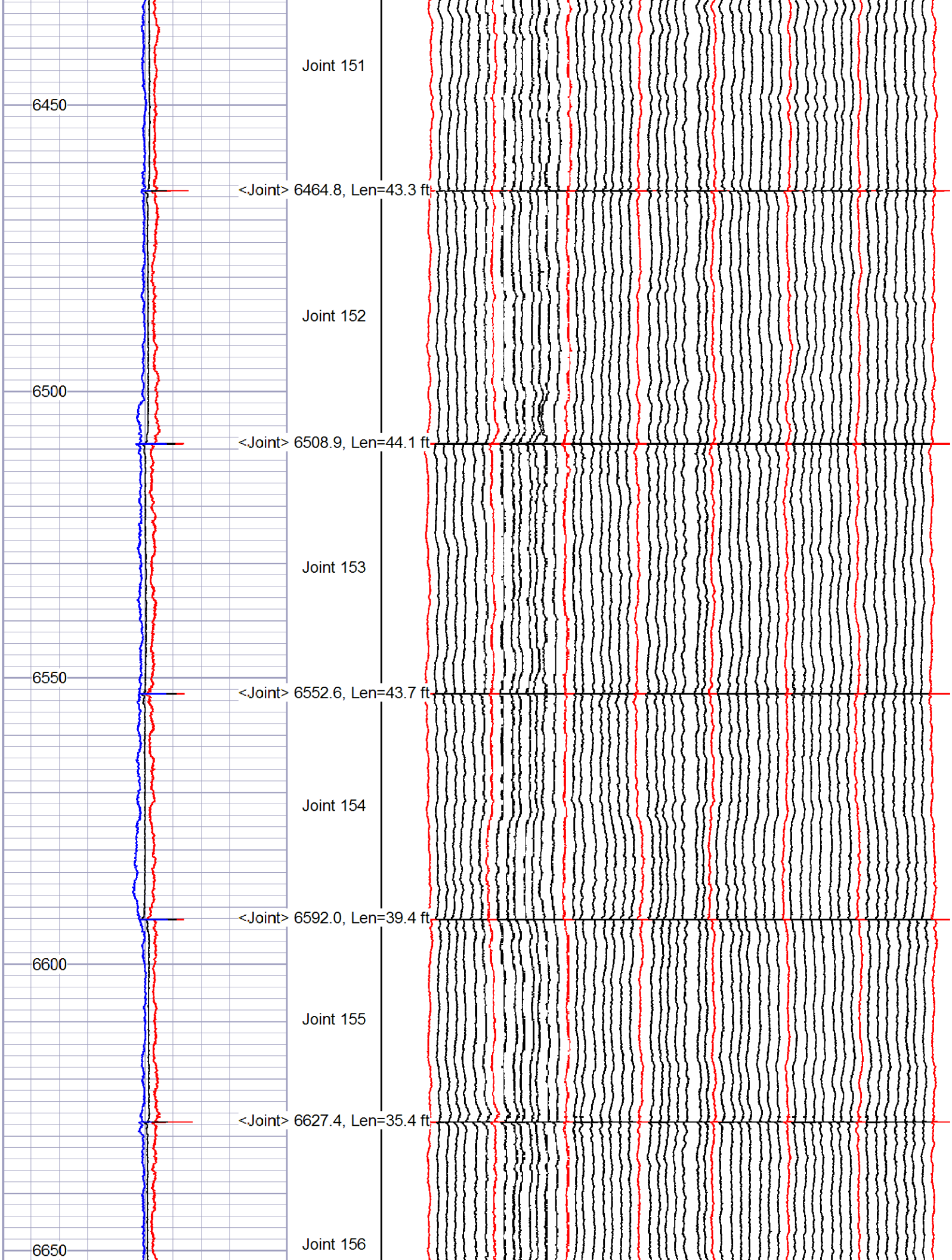

5350
Joint 126
<Joint> 5372.8, Len=44.4 ft
5400
Joint 127
<Joint> 5417.2, Len=44.4 ft
5450
Joint 128
<Joint> 5461.3, Len=44.1 ft
5500
Joint 129
<Joint> 5503.1, Len=41.9 ft
Joint 130
<Joint> 5548.4, Len=45.3 ft
5550

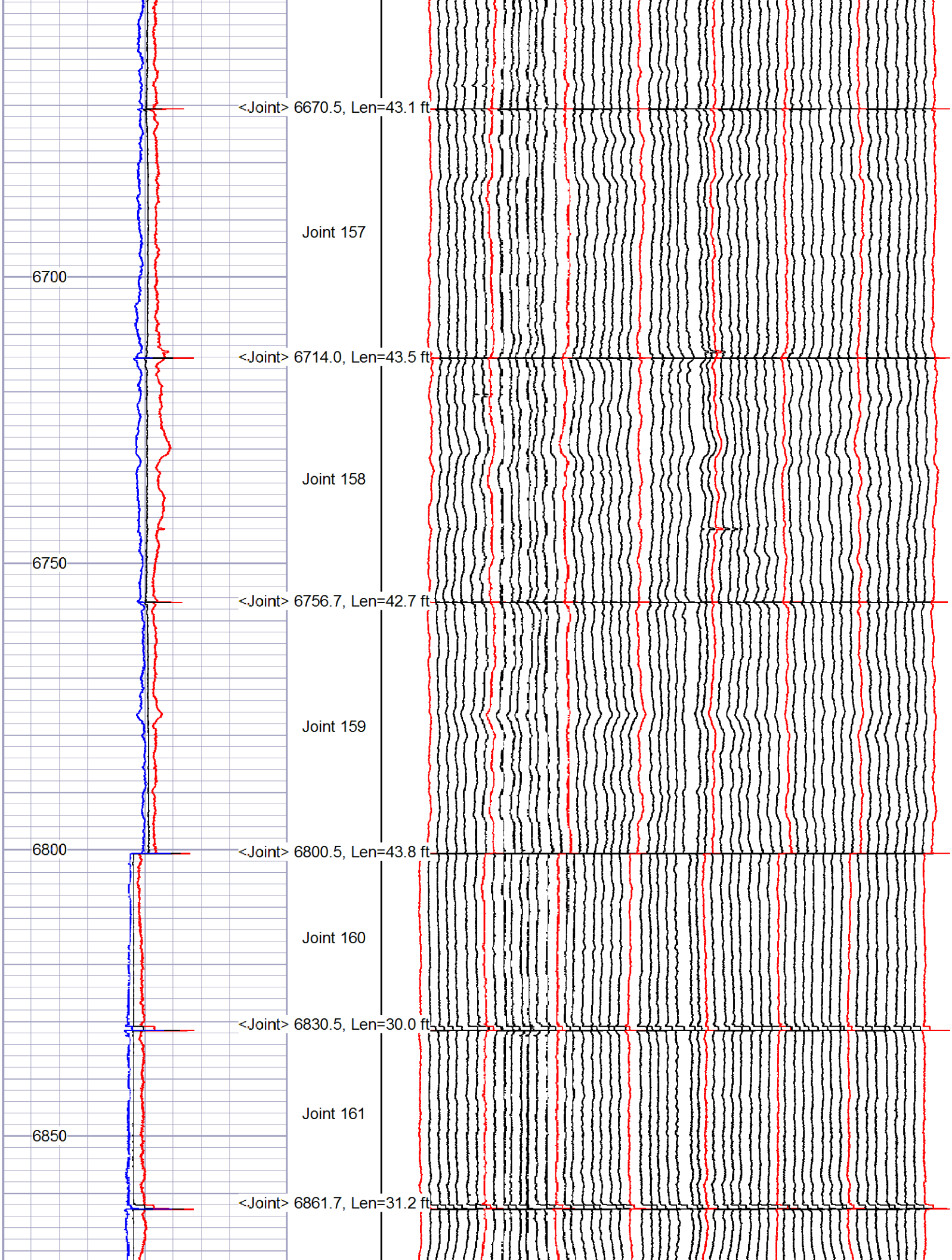

Joint 131
<Joint> 5592.0, Len=43.6 ft
5600
Joint 132
<Joint> 5636.0, Len=44.0 ft
5650
Joint 133
<Joint> 5679.9, Len=44.0 ft
5700
Joint 134
<Joint> 5723.2, Len=43.3 ft
Joint 135
5750
<Joint> 5765.8, Len=42.6 ft

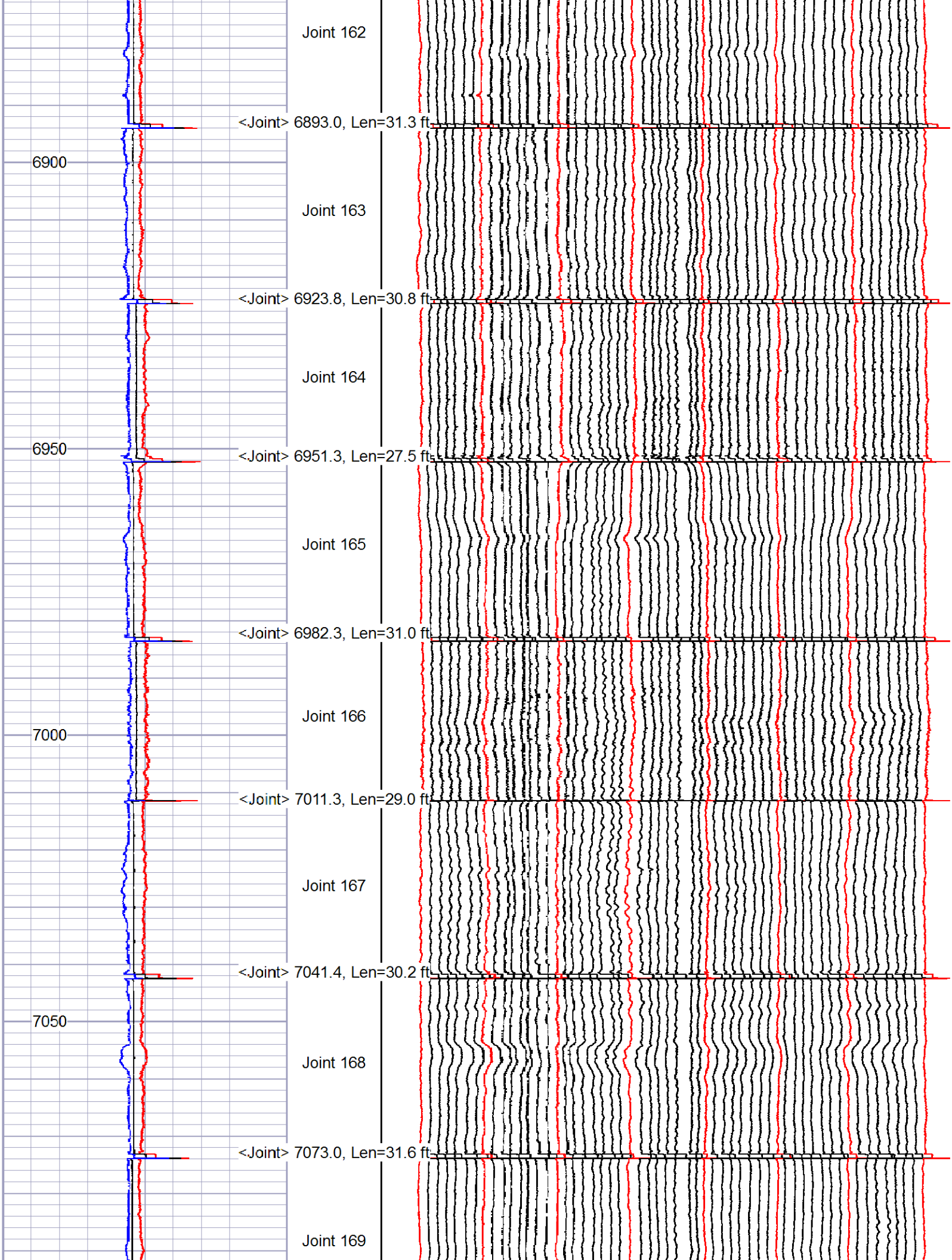

Joint 136
5800
<Joint> 5809.6, Len=43.8 ft
Joint 137
5850
<Joint> 5853.3, Len=43.7 ft
Joint 138
<Joint> 5895.9, Len=42.6 ft
5900
Joint 139
<Joint> 5939.9, Len=44.0 ft
5950
Joint 140
<Joint> 5981.0, Len=41.1 ft

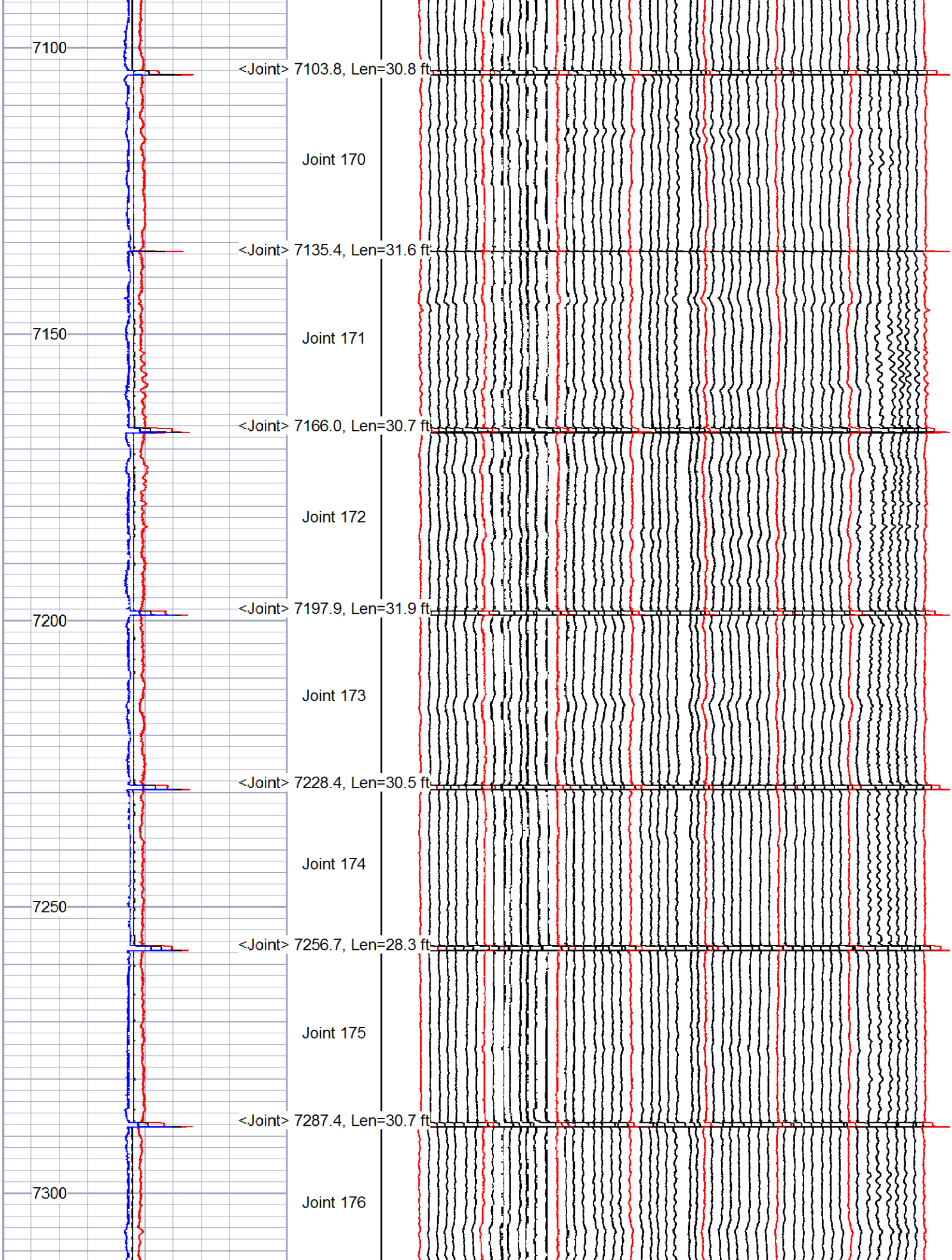

6000
Joint 141
<Joint> 6024.7, Len=43.7 ft
6050
Joint 142
<Joint> 6067.9, Len=43.3 ft
Joint 143
6100
<Joint> 6110.4, Len=42.5 ft
Joint 144
6150
<Joint> 6155.0, Len=44.6 ft
Joint 145
6200
<Joint> 6199.3, Len=44.4 ft

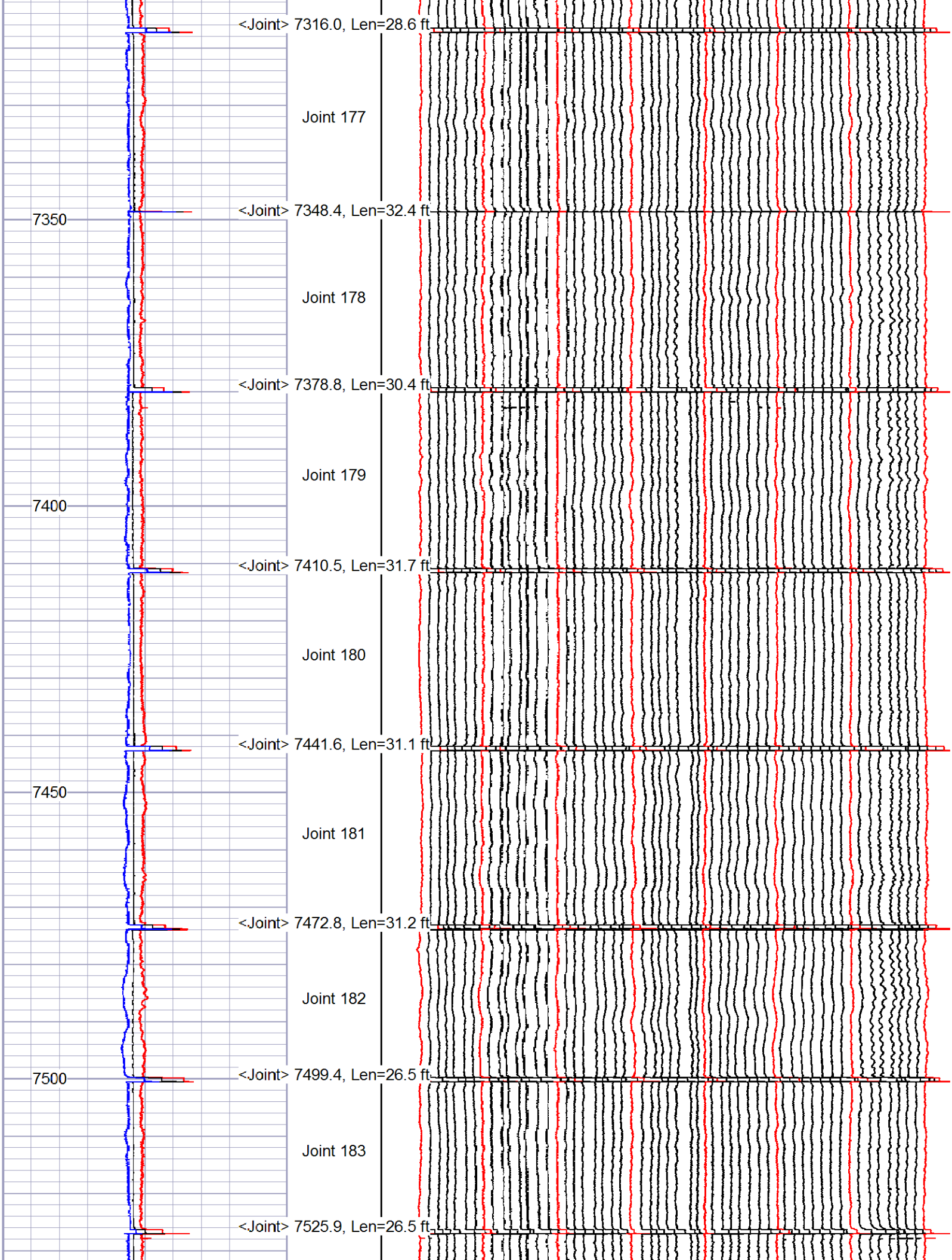

Joint 146
<Joint> 6243.3, Len=44.0 ft
6250
Joint 147
<Joint> 6287.6, Len=44.3 ft
6300
Joint 148
<Joint> 6331.8, Len=44.1 ft
6350
Joint 149
<Joint> 6376.1, Len=44.4 ft
Deformation / Ovality Examples
6400
Joint 150
<Joint> 6421.6, Len=45.4 ft

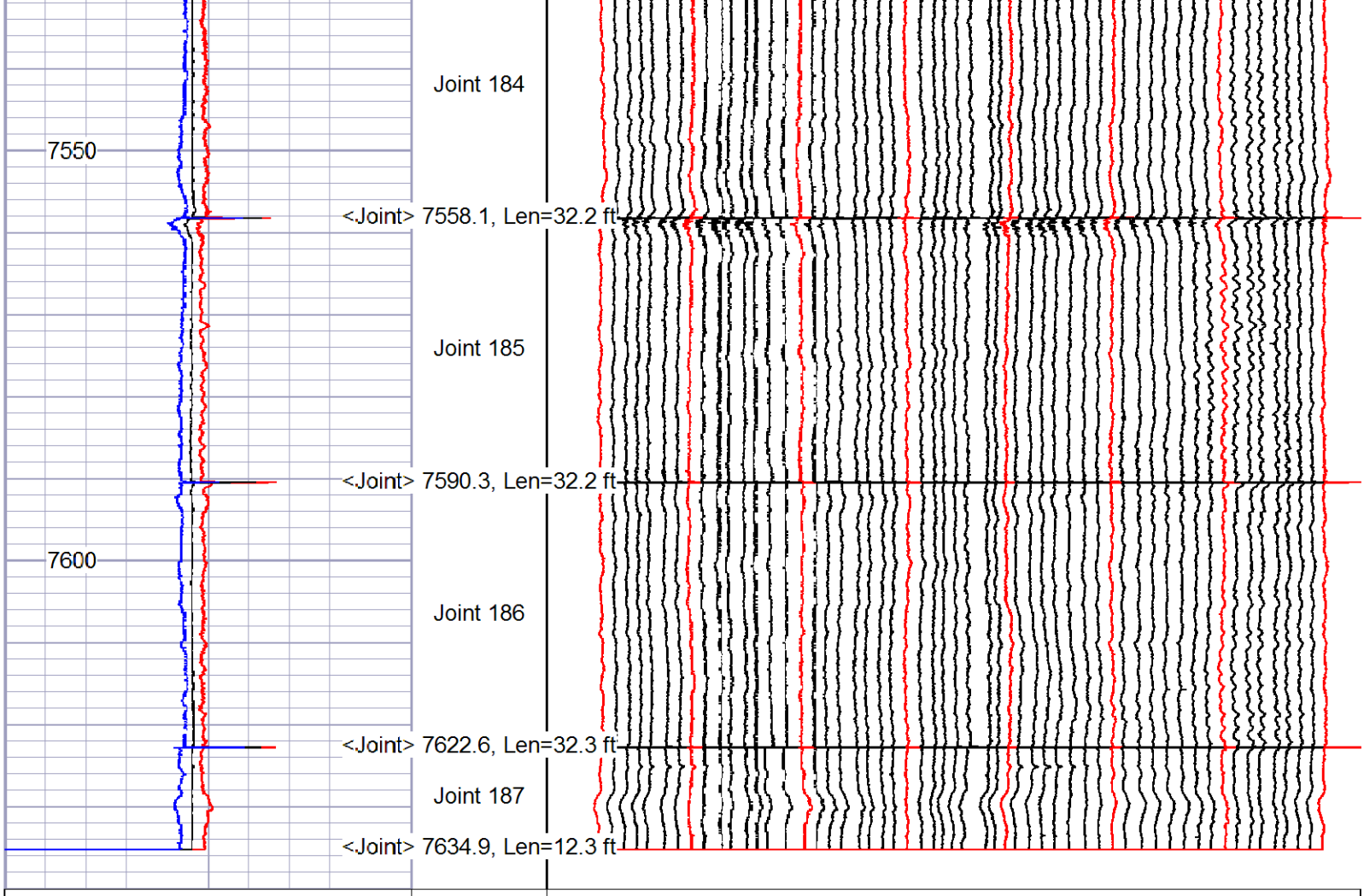

Joint 151
6450
<Joint> 6464.8, Len=43.3 ft
Joint 152
6500
<Joint> 6508.9, Len=44.1 ft
Joint 153
6550
<Joint> 6552.6, Len=43.7 ft
Joint 154
<Joint> 6592.0, Len=39.4 ft
6600
Joint 155
<Joint> 6627.4, Len=35.4 ft
6650
Joint 156


<Joint> 6670.5, Len=43.1 ft
Joint 157
6700
<Joint> 6714.0, Len=43.5 ft
Joint 158
6750
<Joint> 6756.7, Len=42.7 ft
Joint 159
6800
<Joint> 6800.5, Len=43.8 ft
Joint 160
<Joint> 6830.5, Len=30.0 ft
Joint 161
6850
<Joint> 6861.7, Len=31.2 ft


Joint 162
<Joint> 6893.0, Len=31.3 ft
6900
Joint 163
<Joint> 6923.8, Len=30.8 ft
Joint 164
6950
<Joint> 6951.3, Len=27.5 ft
Joint 165
<Joint> 6982.3, Len=31.0 ft
Joint 166
7000
<Joint> 7011.3, Len=29.0 ft
Joint 167
<Joint> 7041.4, Len=30.2 ft
7050
Joint 168
<Joint> 7073.0, Len=31.6 ft
Joint 169


7100
<Joint> 7103.8, Len=30.8 ft
Joint 170
<Joint> 7135.4, Len=31.6 ft
7150
Joint 171
<Joint> 7166.0, Len=30.7 ft
Joint 172
<Joint> 7197.9, Len=31.9 ft
7200
Joint 173
<Joint> 7228.4, Len=30.5 ft
Joint 174
7250
<Joint> 7256.7, Len=28.3 ft
Joint 175
<Joint> 7287.4, Len=30.7 ft
7300
Joint 176


<Joint> 7316.0, Len=28.6 ft
Joint 177
7350
<Joint> 7348.4, Len=32.4 ft
Joint 178
<Joint> 7378.8, Len=30.4 ft
Joint 179
7400
<Joint> 7410.5, Len=31.7 ft
Joint 180
<Joint> 7441.6, Len=31.1 ft
7450
Joint 181
<Joint> 7472.8, Len=31.2 ft
Joint 182
7500
<Joint> 7499.4, Len=26.5 ft
Joint 183
<Joint> 7525.9, Len=26.5 ft



5.366	Maximum ID (in)	7.366	PTANN	2.933	56 FINGER TRACE (in)	6.033
5.366	Average - ID (in)	7.366				
5.366	Minimum - ID (in)	7.366				