Q-Borehole Survey Report

Schlumberger

Survey type:

Company: International Ocean Discovery Program

Well: Expedition 356, Site U1462 C

Field: Indonesian Throughflow

Country:

Run: 1

Date: 10-Sep-2015

Recorded by: K. Swain

Witnessed by: M. Gurnis, Z. Mateo, E. Garrett

Introduction

This was a Vertical Seismic Profile Zero Offset (VSP-ZO) survey conducted from the JOIDES Resolution during IODP Expedition 356 on 11 Sep 2015. IODP provided the dual gun array which was lowered by crane and supported by floating buoy on the port side of the ship.

Survey Results: Zero Offset VSP

The first day of seismic surveying produced 27 good stacks of data from 245 total shots. Some of the stacks had 2 to 3 stacked shots if that is all that could be acquired due to inability to achieve proper anchoring. A good portion of these stacks are 5 stacked good shots. The caliper extension was utilized to help obtain the best data since the hole size was trending to 17 inches or larger. The caliper was 21 inches maximum and worked up to about 205mbrf.

Recommendations and Conclusion

Seismic stations were recorded at all planned depths, but the vast majority of those stations suffered from high-amplitude (as compared to seismic signals) noise. This will have to be filtered during post-acquisition processing that could not be done on the rig.

Well Information

Well Type	Vertical, Drilled during EXP356 RCB cored hole
Rig / Platform Type	DP Drill Ship
Well Reference Azimuth (Magnetic, True, or Grid North)	True North

Elevation Information

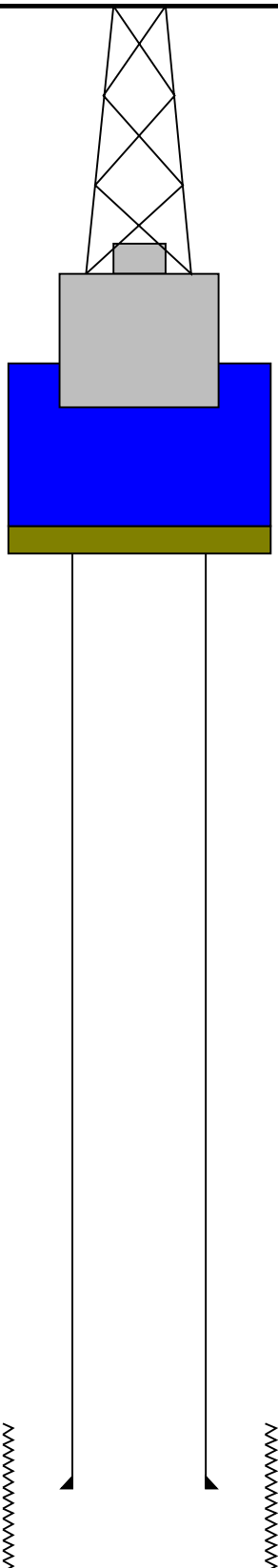
Water Depth	87m
Water Temperature	23deg C
Water Salinity	Not Measured
Weathered Zone Depth	-
Elevation Depth	Referenced to MSL

Sea Condition

Sea Condition	Moderate
Wave Height	1.8m
High Tide Level	-
High Tide Time	-
Low Tide Level	-
Low Tide Time	-

Velocity Information

Weathered Velocity	-
Elevation Velocity	-

Production String	(in) OD	(in) ID	(M) MD	Well Schematic	(M) MD	(in) OD	(in) ID	Casing String
Kelly Bushing Elevation			−98					
Derrick Floor Elevation			−98					
Mean Sea Level			−87					
						4.1		
					0	4.1		Sea Floor
					187	9.875		Open Hole
					1048			Total Depth

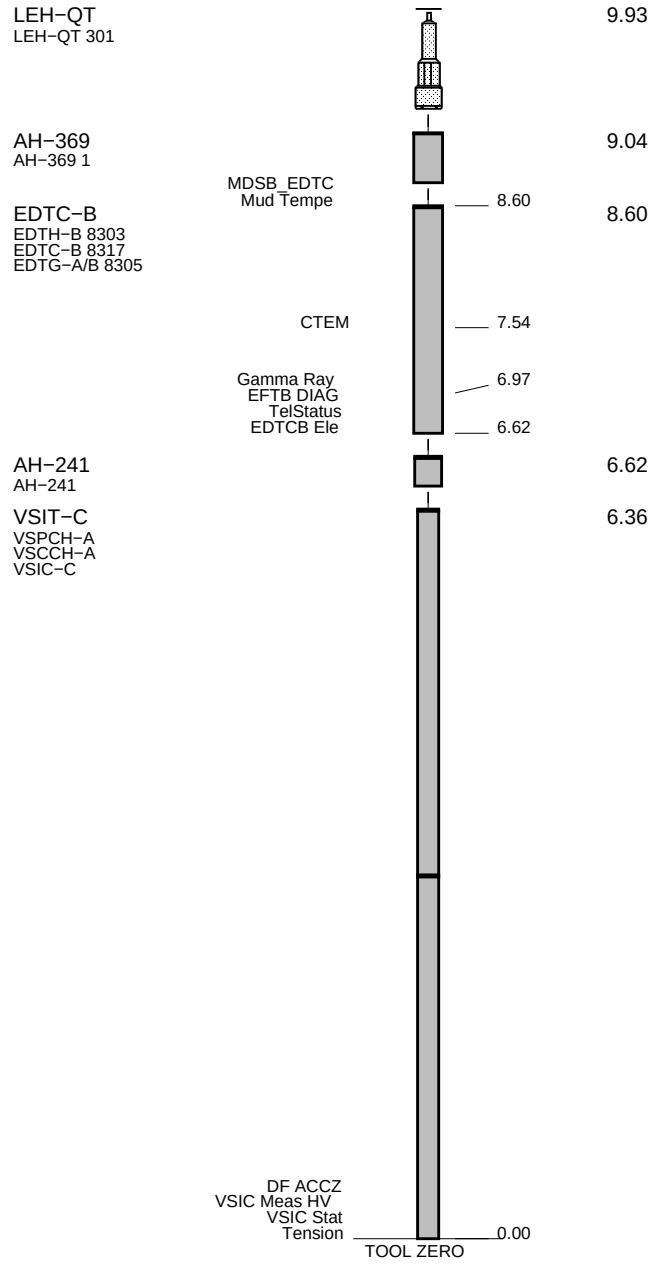
Downhole Equipment Information

Tool Type	VSI – Single Shuttle Configuration
Surface Equipment	2 x GI Gun (250 in^3 @ 2000 PSI)
Combined Tool	LEHQT-EDTCB-VSI
Number of Shuttles	1
Nominal Receiver Spacing	N/A
Gimbaled (Y/N)	Y
Downhole Geophone Type	GAC-D
Sensitivity	0.54
Natural Frequency	20.0
Damping Factor	5.74
DC Resistance	1500
Receiver #1	VSIS-P 8008
Receiver #2	n/a

SURFACE EQUIPMENT

WSAM
WITM (EDTS)−A

DOWNHOLE EQUIPMENT



MAXIMUM STRING DIAMETER 3.63 IN
MEASUREMENTS RELATIVE TO TOOL ZERO
ALL LENGTHS IN METERS

VSP

General Information

Survey Type	Offset VSP
Surface Recording Length	500.0 ms
Suface Sampling Rate	1.0 ms
Downhole Recording Length	3000.0 ms
Downhole Sampling Rate	1.0 ms
Top of Survey	204.7 m
Bottom of Survey	874.4 m
Number of Shots	245
Number of Downhole Traces	245
Number of Downhole Traces used for Processing	96

Shot Summary Listing (1/1)

Measured Depth [m]	Tool Number	Stack Number	Relative Bearing [deg]	Caliper [in]	Anchoring force [kg]	Shot number
204.7	1	34	-26.0	19.1	173.2	255, 256, 257, 258, 259
222.0	1	33	-15.2	17.8	919.8	248, 249, 250, 251, 252, 253, 254
232.8	1	32	-25.7	15.6	834.9	240, 241, 242, 243, 244
250.0	1	31	-11.4	21.2	916.9	234, 235, 237, 238, 239
275.0	1	30	-2.3	21.3	1062.2	222, 224, 227, 228, 229
299.8	1	29	3.8	21.2	1058.1	213, 218
324.8	1	28	-8.4	21.2	1047.2	197, 200, 201, 203, 208
400.0	1	25	-3.6	21.1	1026.5	187, 189, 191, 192
425.0	1	24	-6.3	21.2	1016.2	176, 178, 179, 180, 183
451.0	1	23	-6.9	21.2	1035.1	165, 166, 167, 170, 171
500.0	1	21	-23.5	21.0	1197.4	159, 160, 161, 162, 163
525.0	1	20	-14.4	19.4	996.2	152, 154, 156, 157
550.0	1	19	-0.2	18.6	880.9	144, 145, 146, 149
575.0	1	18	0.0	19.3	924.1	127, 132, 133, 134, 135
599.7	1	17	11.0	18.5	1077.8	117, 122, 125, 126
625.0	1	16	6.8	20.3	928.4	114, 115
650.0	1	15	-8.7	18.4	632.8	104, 106, 107, 108, 110
675.0	1	14	-7.2	17.2	834.6	94, 95, 96, 97
701.1	1	13	-12.3	17.0	893.5	80, 81, 85
723.8	1	12	-12.1	16.1	737.2	71
749.9	1	11	-19.3	15.6	949.9	65
770.1	1	10	-19.2	15.2	921.2	58
790.1	1	9	-19.3	14.8	948.1	47
819.9	1	7	-18.9	14.7	965.4	37
828.0	1	6	-19.4	14.4	933.2	33
850.1	1	4	-20.0	14.9	933.9	28
874.4	1	2	-19.0	11.2	918.2	18, 19, 20, 21, 23

Observer's Note (1/5)

Well depth[m]	Time	Shot Type	Shot#	Stack#	Source	Remarks
1.1	05:07:37	ENLO	1			
1.1	05:08:01	ENHI	2			
1.1	05:08:10	ETHD	3			
1.1	05:08:24	DRNG	4			
1.1	05:08:38	GA02	5			
1.1	05:08:48	GA04	6			
1.1	05:08:58	GA08	7			
1.1	05:09:08	GA16	8			
1.1	05:09:18	GA32	9			
1.1	05:09:33	XTLK	10			
1.1	05:09:51	XTLK	11			
1.1	05:10:10	XTLK	12			
1.1	05:10:28	EIMP	13			
874.4	08:03:02	SHOT	14	2	A	
874.4	08:05:39	SHOT	15	2	A	
874.4	08:06:49	SHOT	16	2	A	
874.4	08:07:39	SHOT	17	2	A	
874.4	08:09:18	SHOT	18	2	A	ok
874.4	08:09:37	SHOT	19	2	A	ok
874.4	08:11:05	SHOT	20	2	A	ok
874.4	08:11:52	SHOT	21	2	A	ok
874.4	08:13:33	SHOT	22	2	A	bad
874.4	08:14:59	SHOT	23	2	A	ok
874.4	08:16:45	SHOT	24	2	A	not stacked
851.1	08:25:58	SHOT	25	3	A	bad
851.1	08:26:27	SHOT	26	3	A	bad
851.1	08:27:23	SHOT	27	3	A	
850.1	08:31:25	SHOT	28	4	A	ok
850.1	08:31:55	SHOT	29	4	A	bad
848.0	08:36:50	SHOT	30	5	A	bad
848.0	08:37:21	SHOT	31	5	A	
848.0	08:38:48	SHOT	32	5	A	bad
828.0	08:45:50	SHOT	33	6	A	ok
828.0	08:46:08	SHOT	34	6	A	bad
828.0	08:46:53	SHOT	35	6	A	bad
828.0	08:47:45	SHOT	36	6	A	bad
819.9	08:55:02	SHOT	37	7	A	maybe
819.9	08:56:04	SHOT	38	7	A	bad
819.9	08:56:48	SHOT	39	7	A	bad
800.1	09:04:23	SHOT	40	8	A	bad
800.1	09:04:45	SHOT	41	8	A	bad
800.1	09:05:23	SHOT	42	8	A	bad
800.1	09:05:41	SHOT	43	8	A	bad
800.1	09:06:39	SHOT	44	8	A	bad
790.1	09:11:34	SHOT	45	9	A	bad
790.1	09:12:02	SHOT	46	9	A	ok
790.1	09:12:48	SHOT	47	9	A	ok
790.1	09:13:06	SHOT	48	9	A	maybe
790.1	09:13:34	SHOT	49	9	A	bad
790.1	09:14:37	SHOT	50	9	A	bad
770.1	09:21:12	SHOT	51	10	A	
770.1	09:21:37	SHOT	52	10	A	
770.1	09:22:23	SHOT	53	10	A	
770.1	09:22:42	SHOT	54	10	A	good
770.1	09:23:21	SHOT	55	10	A	
770.1	09:23:39	SHOT	56	10	A	
770.1	09:24:41	SHOT	57	10	A	
770.1	09:25:47	SHOT	58	10	A	ok
770.1	09:26:18	SHOT	59	10	A	

Observer's Note (2/5)

Well depth[m]	Time	Shot Type	Shot#	Stack#	Source	Remarks
770.1	09:26:36	SHOT	60	10	A	
770.1	09:27:06	SHOT	61	10	A	
749.9	09:32:05	SHOT	62	11	A	ok
749.9	09:32:56	SHOT	63	11	A	
749.9	09:34:02	SHOT	64	11	A	
749.9	09:34:58	SHOT	65	11	A	ok
749.9	09:36:08	SHOT	66	11	A	bad
749.9	09:37:00	SHOT	67	11	A	bad
723.8	09:43:57	SHOT	68	12	A	ok
723.8	09:44:15	SHOT	69	12	A	ok
723.8	09:44:34	SHOT	70	12	A	bad
723.8	09:45:43	SHOT	71	12	A	ok
723.8	09:46:28	SHOT	72	12	A	bad
723.8	09:46:46	SHOT	73	12	A	bad
701.1	09:52:38	SHOT	74	13	A	
701.1	09:52:57	SHOT	75	13	A	
701.1	09:53:16	SHOT	76	13	A	
701.1	09:54:20	SHOT	77	13	A	
701.1	09:54:56	SHOT	78	13	A	
701.1	09:55:24	SHOT	79	13	A	
701.1	09:55:53	SHOT	80	13	A	ok
701.1	09:56:34	SHOT	81	13	A	ok
701.1	09:56:54	SHOT	82	13	A	
701.1	09:57:12	SHOT	83	13	A	
701.1	09:57:30	SHOT	84	13	A	
701.1	09:57:48	SHOT	85	13	A	ok
675.0	10:04:12	SHOT	86	14	A	
675.0	10:04:30	SHOT	87	14	A	
675.0	10:04:56	SHOT	88	14	A	
675.0	10:05:26	SHOT	89	14	A	ok
675.0	10:06:05	SHOT	90	14	A	
675.0	10:06:29	SHOT	91	14	A	
675.0	10:06:47	SHOT	92	14	A	
675.0	10:07:49	SHOT	93	14	A	
675.0	10:08:52	SHOT	94	14	A	ok
675.0	10:09:42	SHOT	95	14	A	ok
675.0	10:10:14	SHOT	96	14	A	ok
675.0	10:10:42	SHOT	97	14	A	ok
650.0	10:16:45	SHOT	98	15	A	
650.0	10:17:04	SHOT	99	15	A	ok
650.0	10:17:27	SHOT	100	15	A	
650.0	10:17:50	SHOT	101	15	A	
650.0	10:18:19	SHOT	102	15	A	
650.0	10:18:51	SHOT	103	15	A	
650.0	10:19:47	SHOT	104	15	A	ok
650.0	10:20:12	SHOT	105	15	A	
650.0	10:20:47	SHOT	106	15	A	ok
650.0	10:21:21	SHOT	107	15	A	ok
650.0	10:22:17	SHOT	108	15	A	ok
650.0	10:22:51	SHOT	109	15	A	
650.0	10:23:11	SHOT	110	15	A	ok
625.0	10:31:28	SHOT	111	16	A	ok
625.0	10:31:49	SHOT	112	16	A	ok
625.0	10:32:07	SHOT	113	16	A	ok
625.0	10:32:25	SHOT	114	16	A	ok
625.0	10:34:35	SHOT	115	16	A	ok
599.7	10:40:09	SHOT	116	17	A	
599.7	10:40:27	SHOT	117	17	A	ok
599.7	10:40:45	SHOT	118	17	A	

Observer's Note (3/5)

Well depth[m]	Time	Shot Type	Shot#	Stack#	Source	Remarks
599.7	10:41:08	SHOT	119	17	A	
599.7	10:41:51	SHOT	120	17	A	
599.7	10:43:05	SHOT	121	17	A	ok
599.7	10:43:24	SHOT	122	17	A	ok
599.7	10:44:04	SHOT	123	17	A	
599.7	10:44:22	SHOT	124	17	A	
599.7	10:44:40	SHOT	125	17	A	ok
599.7	10:45:27	SHOT	126	17	A	ok
575.0	10:52:26	SHOT	127	18	A	ok
575.0	10:52:44	SHOT	128	18	A	bad
575.0	10:53:15	SHOT	129	18	A	
575.0	10:53:41	SHOT	130	18	A	
575.0	10:54:03	SHOT	131	18	A	
575.0	10:54:46	SHOT	132	18	A	ok
575.0	10:55:04	SHOT	133	18	A	ok
575.0	10:55:23	SHOT	134	18	A	ok
575.0	10:56:00	SHOT	135	18	A	ok
550.0	11:04:10	SHOT	136	19	A	ok
550.0	11:05:08	SHOT	137	19	A	
550.0	11:05:46	SHOT	138	19	A	
550.0	11:06:07	SHOT	139	19	A	
550.0	11:06:40	SHOT	140	19	A	
550.0	11:06:58	SHOT	141	19	A	
550.0	11:07:24	SHOT	142	19	A	
550.0	11:07:42	SHOT	143	19	A	bad
550.0	11:08:09	SHOT	144	19	A	ok
550.0	11:09:40	SHOT	145	19	A	ok
550.0	11:09:58	SHOT	146	19	A	ok
550.0	11:10:25	SHOT	147	19	A	
550.0	11:10:43	SHOT	148	19	A	bad
550.0	11:11:28	SHOT	149	19	A	ok
525.0	11:22:40	SHOT	150	20	A	
525.0	11:23:03	SHOT	151	20	A	
525.0	11:23:38	SHOT	152	20	A	ok
525.0	11:24:06	SHOT	153	20	A	
525.0	11:24:26	SHOT	154	20	A	ok
525.0	11:24:44	SHOT	155	20	A	ok
525.0	11:25:04	SHOT	156	20	A	ok
525.0	11:25:36	SHOT	157	20	A	ok
500.0	11:33:13	SHOT	158	21	A	
500.0	11:33:38	SHOT	159	21	A	ok
500.0	11:34:02	SHOT	160	21	A	ok'
500.0	11:34:20	SHOT	161	21	A	ok
500.0	11:34:50	SHOT	162	21	A	ok
500.0	11:35:24	SHOT	163	21	A	ok
474.8	11:44:04	SHOT	164	22	A	
451.0	11:49:45	SHOT	165	23	A	ok
451.0	11:50:14	SHOT	166	23	A	ok
451.0	11:50:32	SHOT	167	23	A	ok
451.0	11:50:54	SHOT	168	23	A	bad
451.0	11:51:12	SHOT	169	23	A	baqd
451.0	11:51:30	SHOT	170	23	A	ok
451.0	11:51:58	SHOT	171	23	A	ok
425.0	11:57:58	SHOT	172	24	A	
425.0	11:58:36	SHOT	173	24	A	
425.0	11:58:54	SHOT	174	24	A	
425.0	11:59:12	SHOT	175	24	A	
425.0	11:59:44	SHOT	176	24	A	ok
425.0	12:00:18	SHOT	177	24	A	

Observer's Note (4/5)

Well depth[m]	Time	Shot Type	Shot#	Stack#	Source	Remarks
425.0	12:01:02	SHOT	178	24	A	ok
425.0	12:01:20	SHOT	179	24	A	ok
425.0	12:02:09	SHOT	180	24	A	ok
425.0	12:02:28	SHOT	181	24	A	
425.0	12:02:46	SHOT	182	24	A	
425.0	12:03:04	SHOT	183	24	A	ok
400.0	12:09:51	SHOT	184	25	A	
400.0	12:10:09	SHOT	185	25	A	
400.0	12:10:29	SHOT	186	25	A	
400.0	12:10:55	SHOT	187	25	A	ok
400.0	12:11:43	SHOT	189	25	A	ok
400.0	12:12:04	SHOT	190	25	A	ok
400.0	12:12:29	SHOT	191	25	A	ok
400.0	12:13:00	SHOT	192	25	A	ok
350.1	12:27:48	SHOT	193	27	A	
350.1	12:29:03	SHOT	194	27	A	
324.8	12:36:14	SHOT	195	28	A	
324.8	12:36:38	SHOT	196	28	A	
324.8	12:36:59	SHOT	197	28	A	ok
324.8	12:37:21	SHOT	198	28	A	
324.8	12:37:39	SHOT	199	28	A	
324.8	12:38:05	SHOT	200	28	A	ok
324.8	12:38:36	SHOT	201	28	A	ok
324.8	12:39:11	SHOT	202	28	A	
324.8	12:39:37	SHOT	203	28	A	ok
324.8	12:39:56	SHOT	204	28	A	bad
324.8	12:40:14	SHOT	205	28	A	bad
324.8	12:40:45	SHOT	206	28	A	
324.8	12:41:03	SHOT	207	28	A	
324.8	12:41:22	SHOT	208	28	A	ok
299.8	12:48:38	SHOT	209	29	A	
299.8	12:49:25	SHOT	210	29	A	
299.8	12:49:45	SHOT	211	29	A	
299.8	12:50:25	SHOT	212	29	A	
299.8	12:50:45	SHOT	213	29	A	
299.8	12:51:03	SHOT	214	29	A	
299.8	12:51:56	SHOT	215	29	A	
299.8	12:52:14	SHOT	216	29	A	
299.8	12:52:48	SHOT	217	29	A	
299.8	12:53:07	SHOT	218	29	A	
299.8	12:53:28	SHOT	219	29	A	
299.8	12:53:46	SHOT	220	29	A	
299.8	12:54:18	SHOT	221	29	A	
275.0	13:01:21	SHOT	222	30	A	ok
275.0	13:01:39	SHOT	223	30	A	
275.0	13:01:57	SHOT	224	30	A	ok
275.0	13:02:20	SHOT	225	30	A	
275.0	13:02:38	SHOT	226	30	A	
275.0	13:03:06	SHOT	227	30	A	ok
275.0	13:03:24	SHOT	228	30	A	ok
275.0	13:04:01	SHOT	229	30	A	ok
250.0	13:11:43	SHOT	230	31	A	
250.0	13:12:01	SHOT	231	31	A	
250.0	13:12:19	SHOT	232	31	A	
250.0	13:12:38	SHOT	233	31	A	
250.0	13:12:58	SHOT	234	31	A	ok
250.0	13:13:37	SHOT	235	31	A	ok
250.0	13:13:55	SHOT	236	31	A	small
250.0	13:14:31	SHOT	237	31	A	ok

Observer's Note (5/5)

Well depth[m]	Time	Shot Type	Shot#	Stack#	Source	Remarks
250.0	13:14:49	SHOT	238	31	A	ok
250.0	13:15:07	SHOT	239	31	A	ok
232.8	13:21:28	SHOT	240	32	A	ok
232.8	13:21:47	SHOT	241	32	A	ok
232.8	13:22:05	SHOT	242	32	A	ok
232.8	13:22:23	SHOT	243	32	A	ok
232.8	13:22:41	SHOT	244	32	A	ok
222.0	13:29:07	SHOT	245	33	A	ok
222.0	13:29:28	SHOT	246	33	A	bad
222.0	13:29:50	SHOT	247	33	A	bad
222.0	13:30:24	SHOT	248	33	A	ok
222.0	13:30:59	SHOT	249	33	A	ok
222.0	13:31:42	SHOT	250	33	A	ok
222.0	13:32:00	SHOT	251	33	A	ok
222.0	13:32:25	SHOT	252	33	A	ok
222.0	13:32:48	SHOT	253	33	A	ok
222.0	13:33:06	SHOT	254	33	A	ok
204.7	13:39:39	SHOT	255	34	A	ok
204.7	13:39:57	SHOT	256	34	A	ok
204.7	13:40:25	SHOT	257	34	A	ok
204.7	13:40:48	SHOT	258	34	A	ok
204.7	13:41:06	SHOT	259	34	A	ok

Source Configuration (Air Gun)

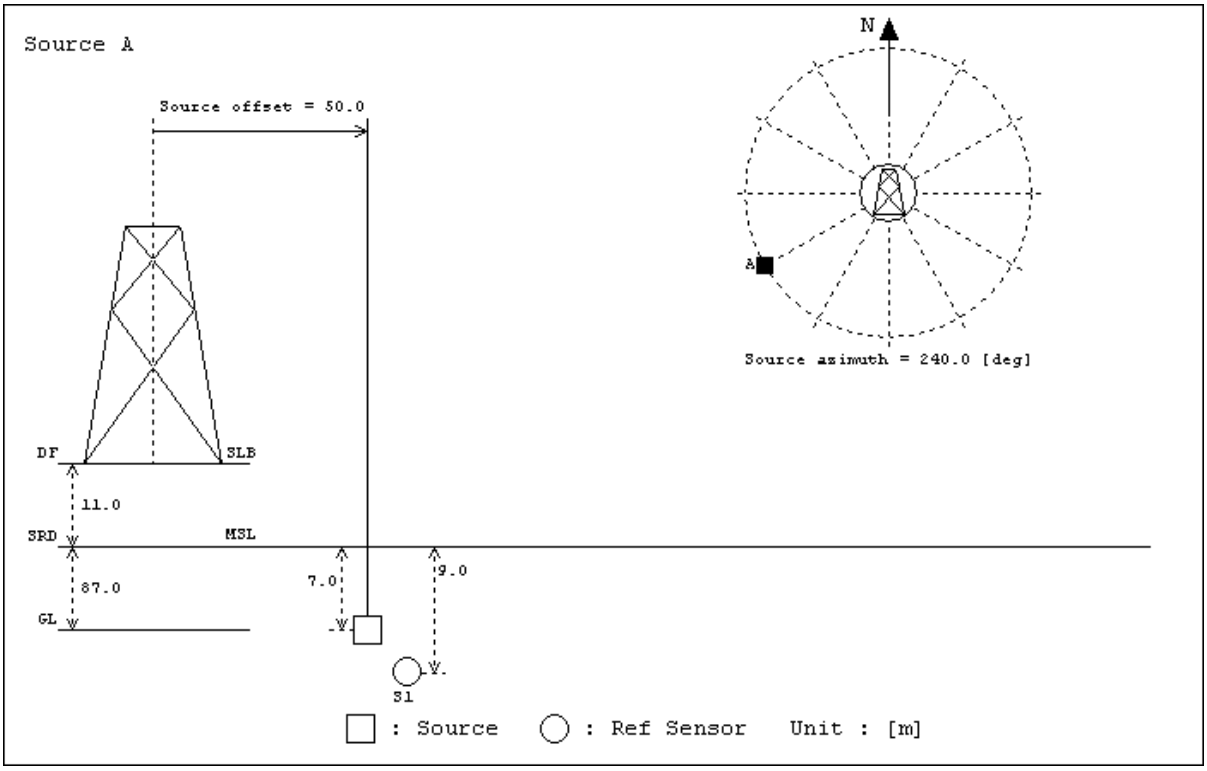
Source Location (Rig, Boat, Pit, Borehole)	Rig (Crane #3, Aft Port Side)
Source Group ID (A, B, C, …)	A
Source Offset (for fixed offset)	50m
Source Azimuth (for fixed offset)	240 deg
Source Depth from Surface	7m
Source Depth from Logging Zero	18m

Gun Controller Type	WSI
Gun Controller Model Name	WSI-A
Gun Controller Serial Number	854
Gun Type	GI-250
Gun Serial Number(s)	-
Gun Configuration (3 Gun Cluster, Gun Array, etc.)	2-Gun Horizontal Array
Gun Chamber Volumes	250 cu. in.
Gun Pit/Borehole Information	-
Compressor Type	Rig Air
Compressor Flow Rate	-
Air Regulator Pressure	2000 PSI

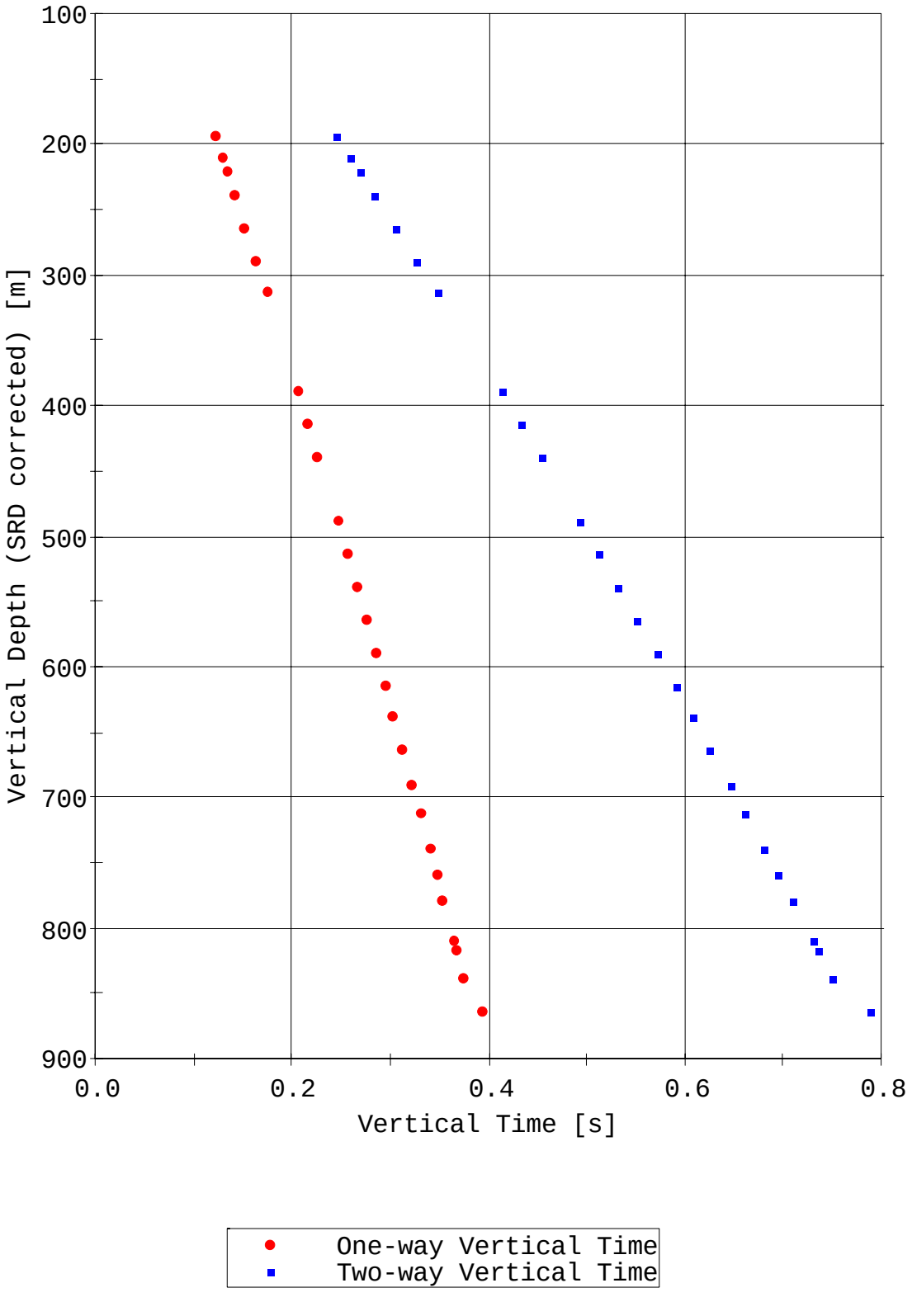
Surface Sensor Configuration

Number of Surface Reference Sensors	1
Surface Recording Length	500 ms
Surface Sampling Rate	1 ms
Sensor Type (S1)	MP-24H Hydrophone
Sensor Depth from Surface (S1)	9m below MSL / 2m below gun array
Sensor Depth from Logging Zero (S1)	21m
Sensor Offset from Source (S1)	50m

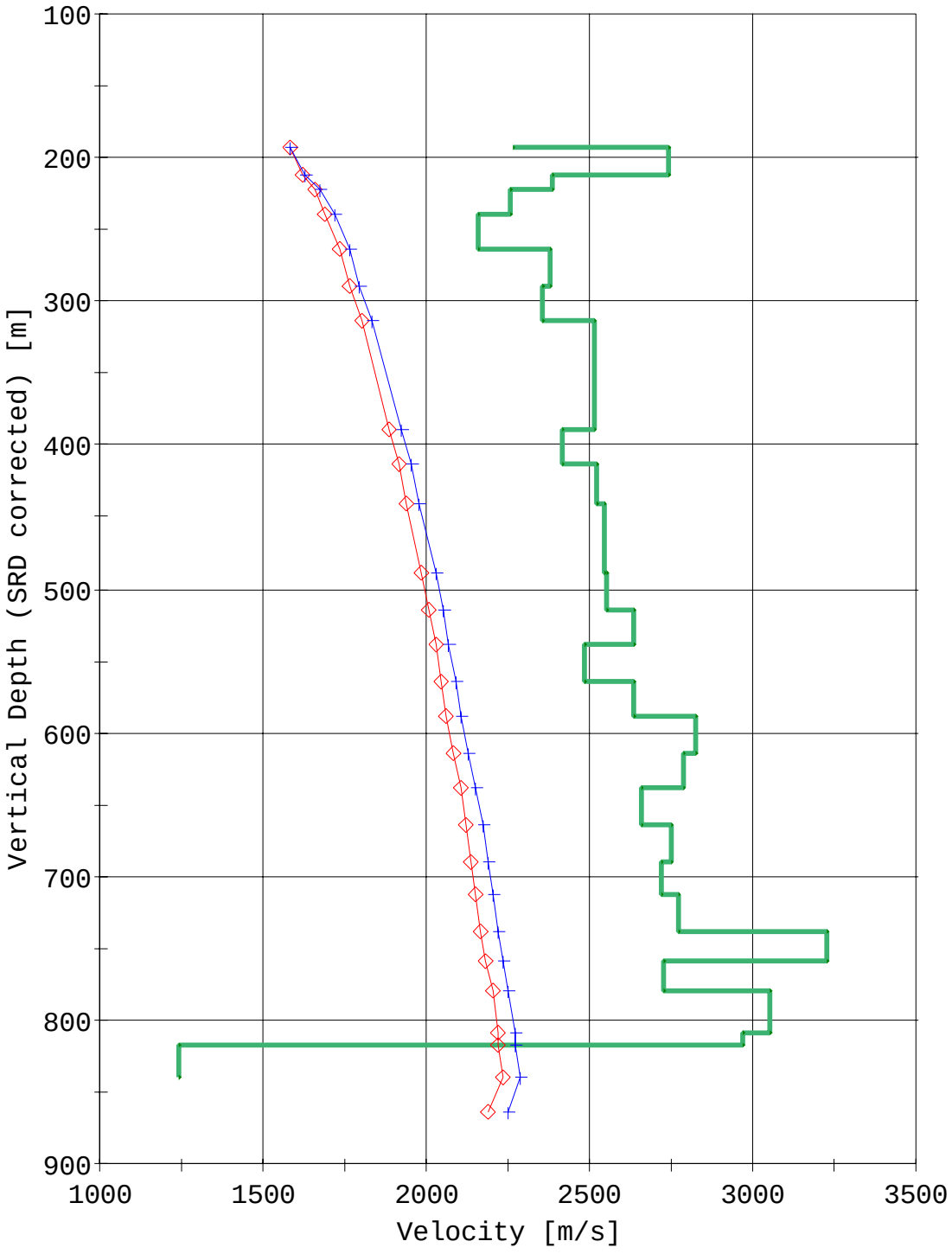
Source Geometry Sketch



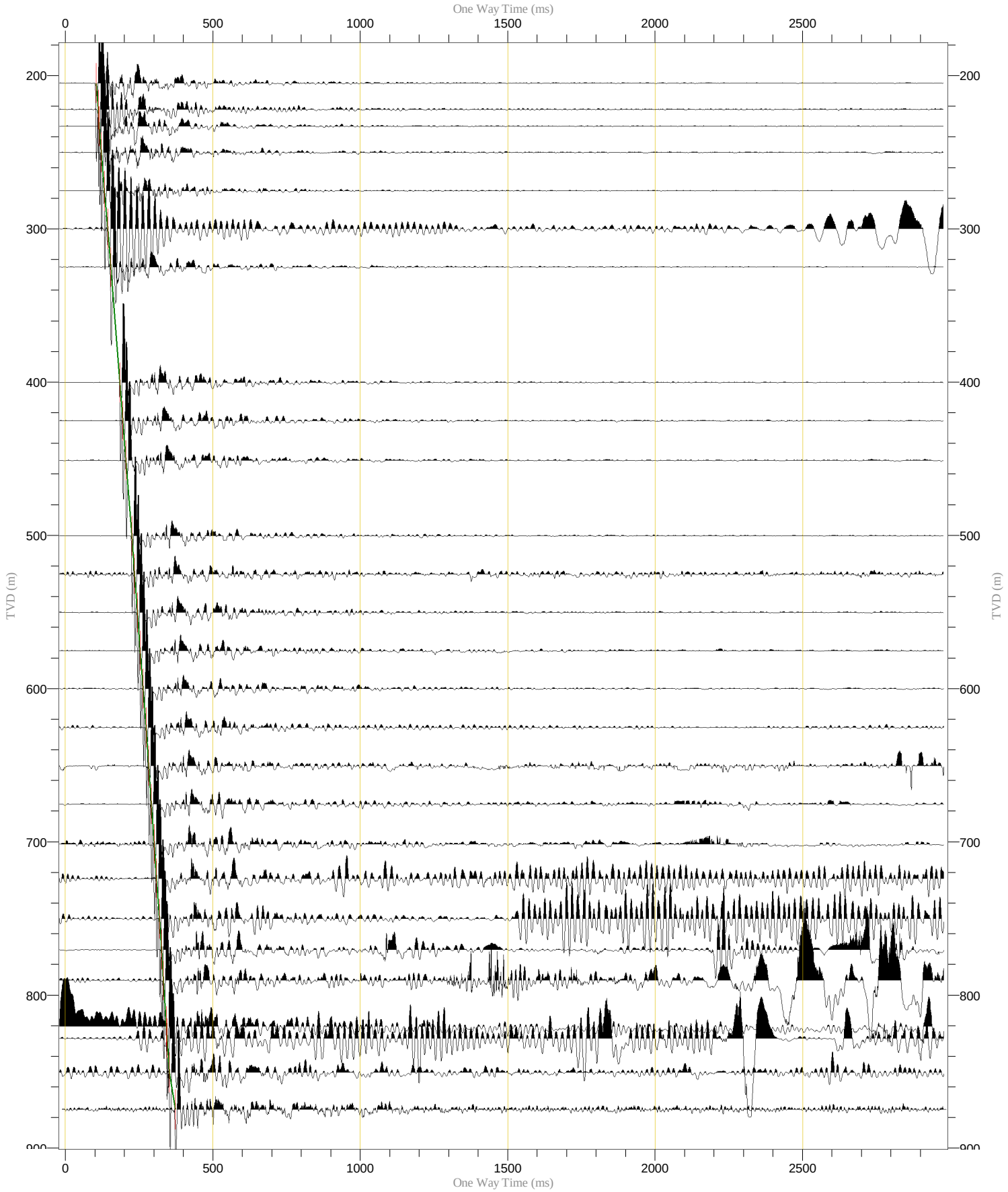
Time Depth Plot



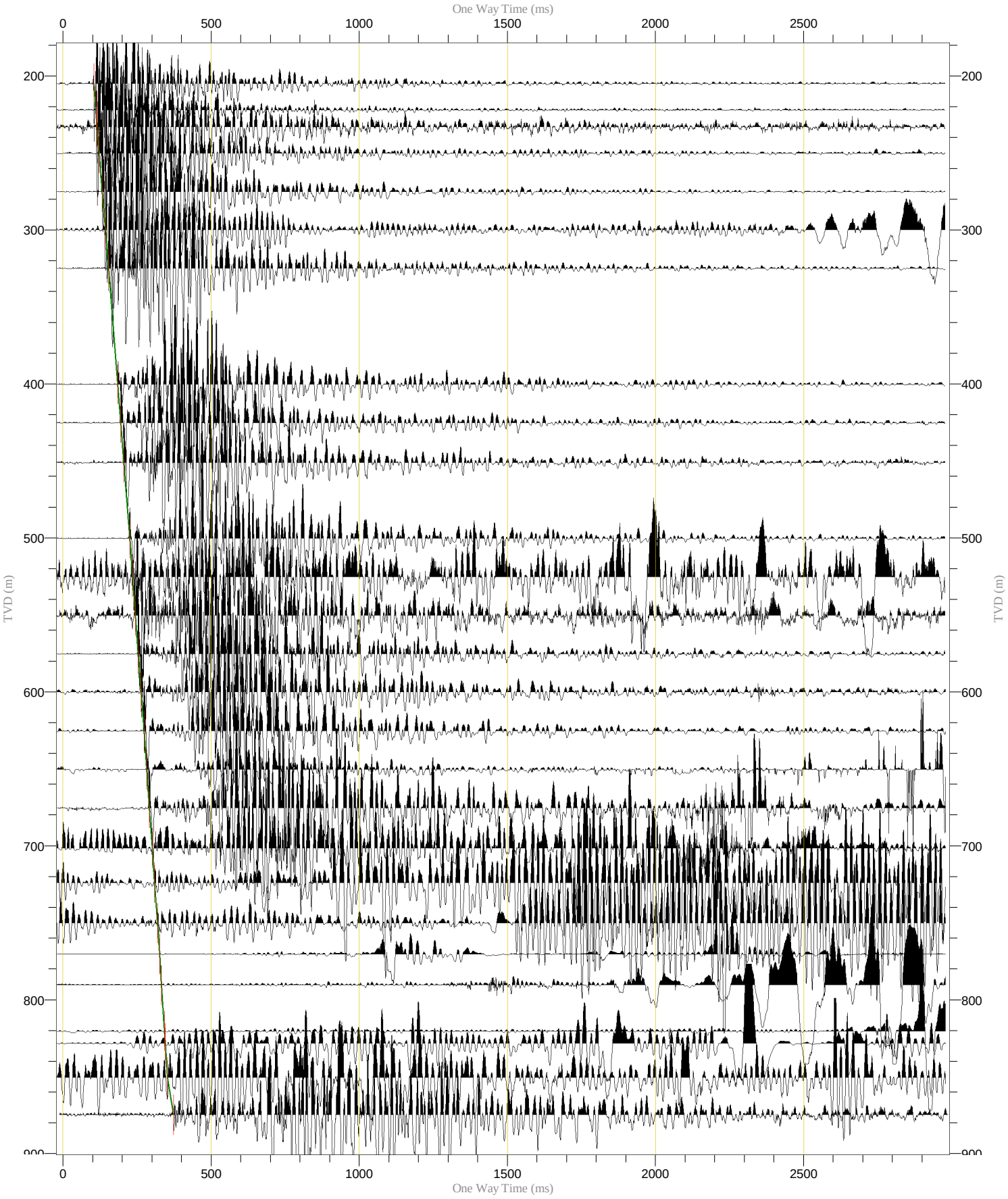
Velocity Plot



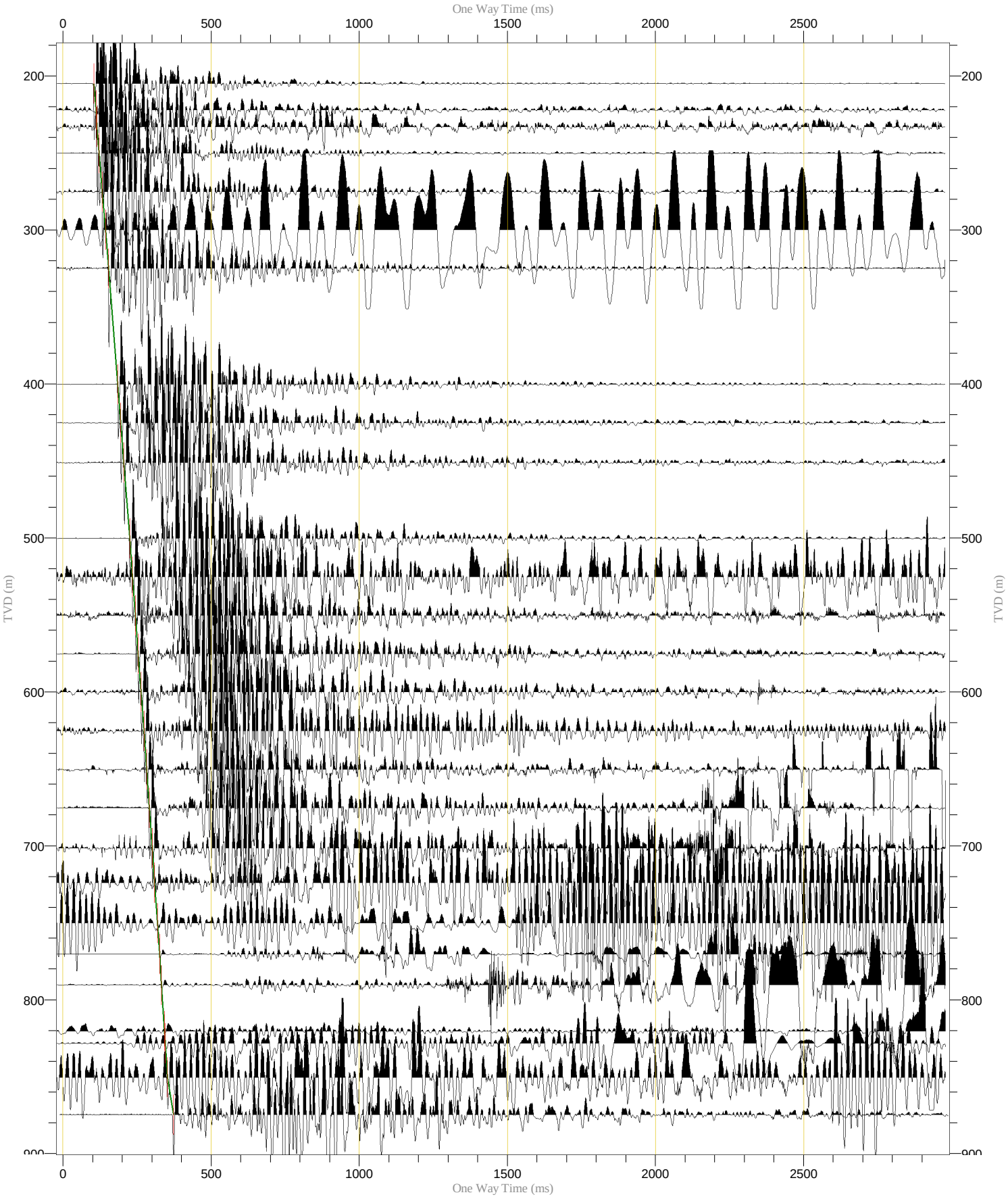
Raw Stack (Z)	Normalization Trace by Trace (250%) Polarity Normal One Way Time (ms) Scaling 5.8 cm/sec, 1/3320	



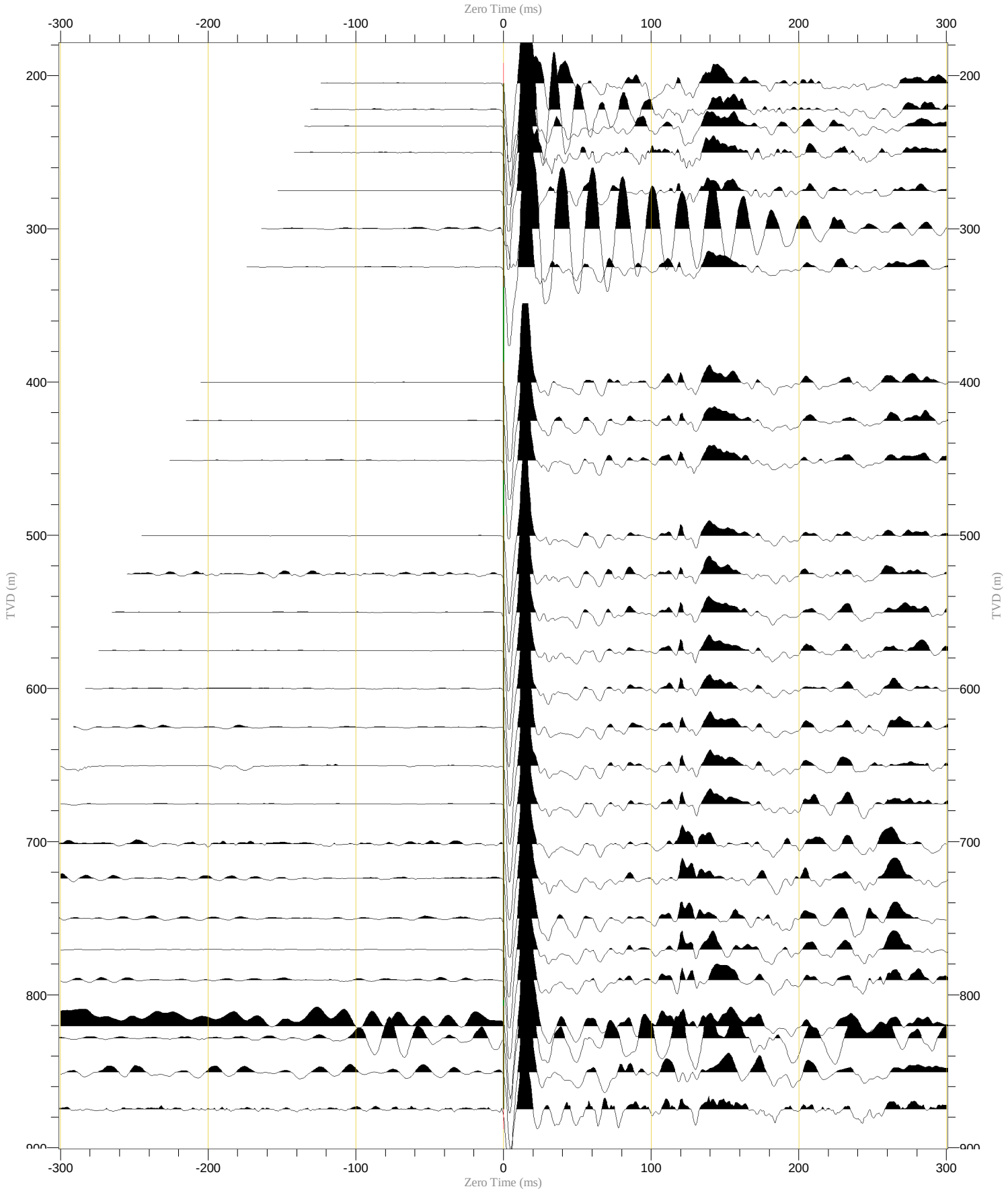
Raw Stack (X)	Normalization Trace by Trace (250%) Polarity Normal One Way Time (ms) Scaling 5.8 cm/sec, 1/3320	

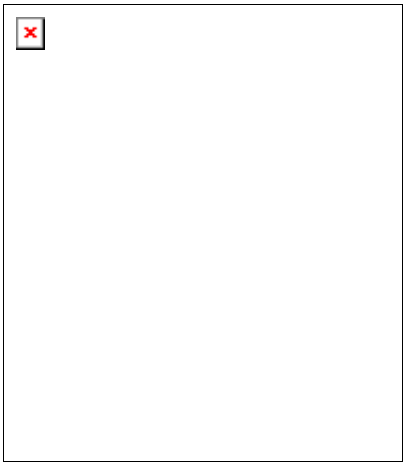


Raw Stack (Y)	Normalization Trace by Trace (250%) Polarity Normal One Way Time (ms) Scaling 5.8 cm/sec, 1/3320	

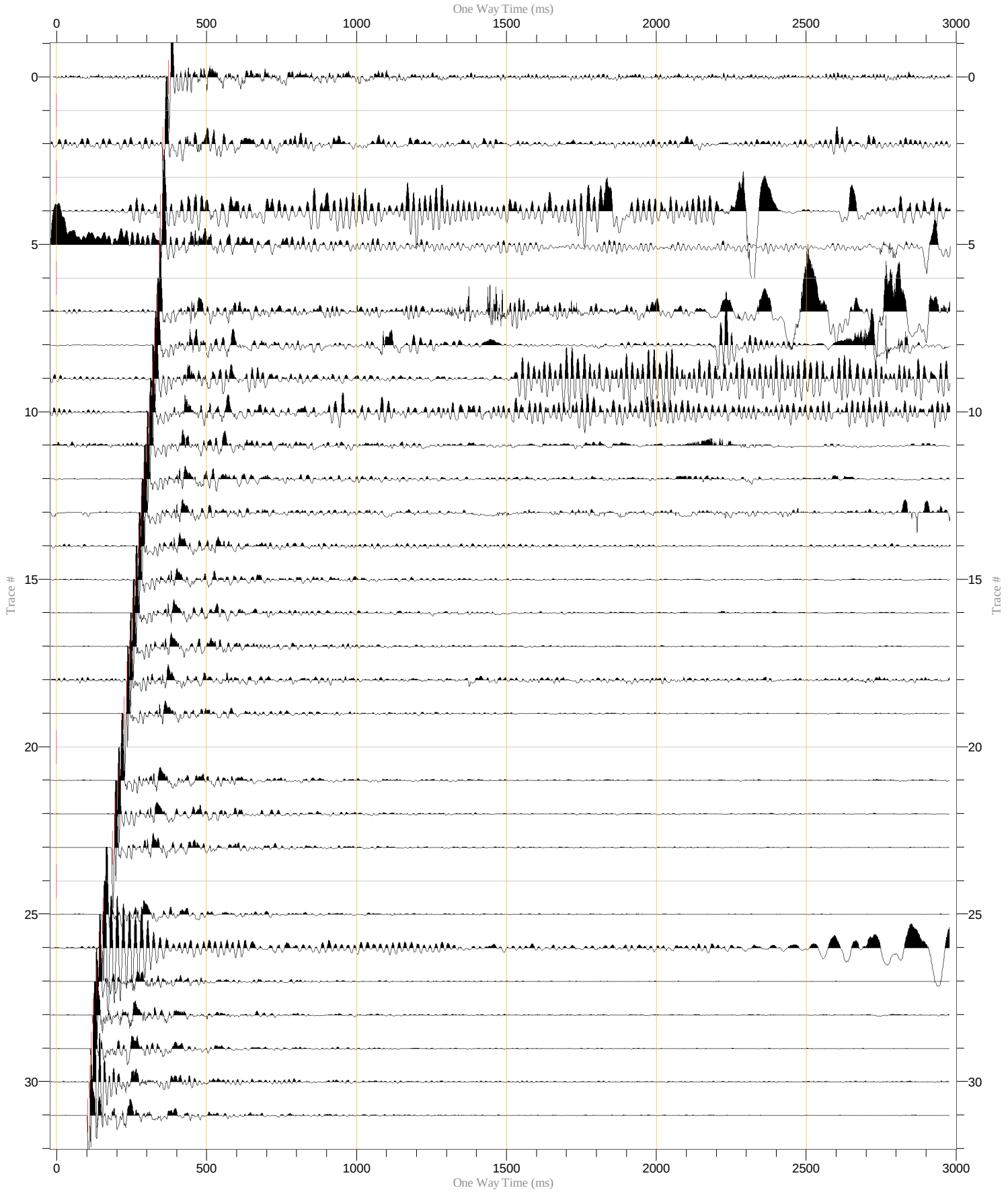


Raw Stack (Z) (Magnified)	Normalization Trace by Trace (250%) Polarity Normal Zero Time (ms) Scaling 29.0 cm/sec, 1/3320	

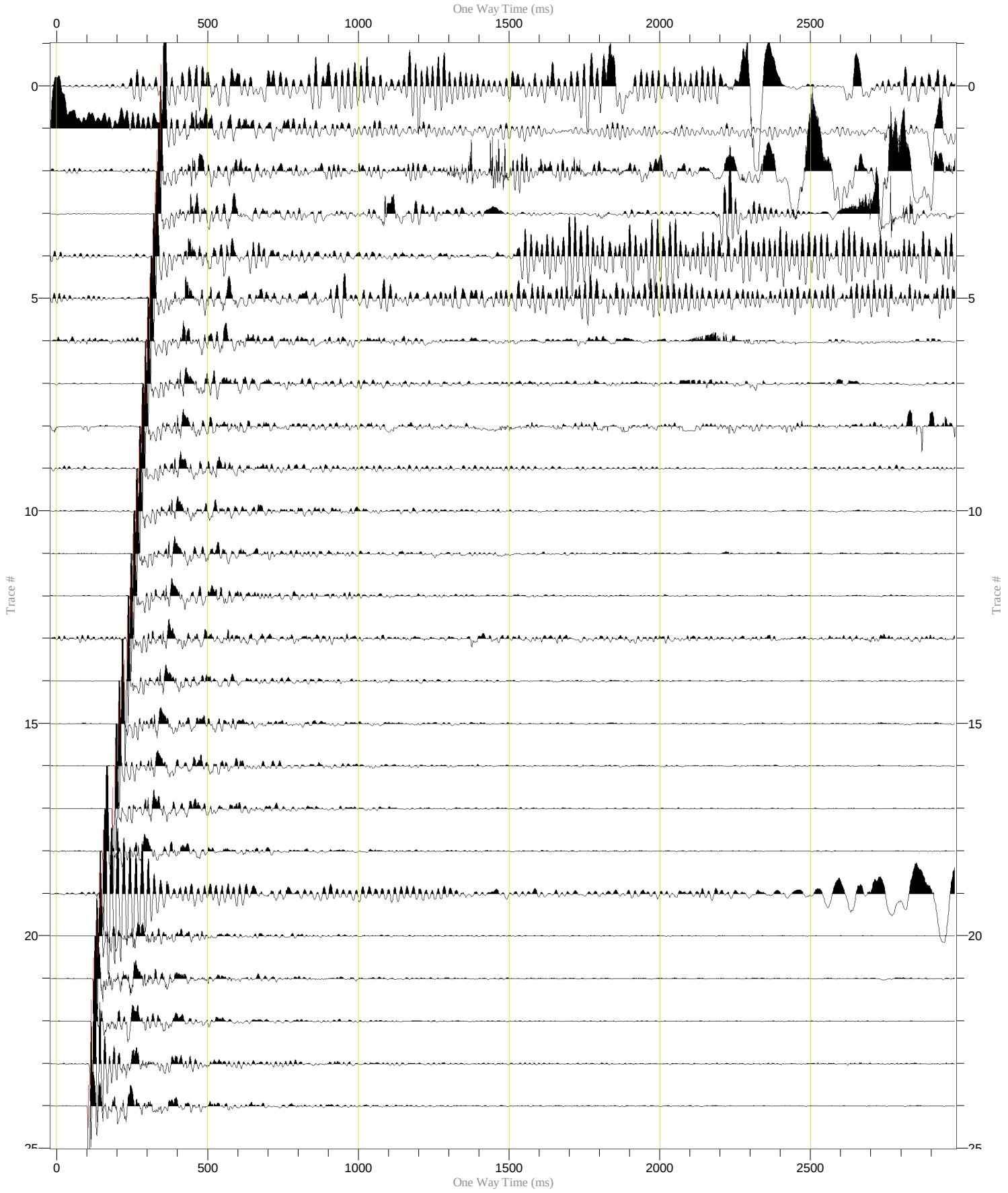


Process Flow	Parameter
	**[LoadLdf]** Input 1: VSI_001_A_geo_wavefield_z.ldf **[Frequency2]** Process all samples Apply FZ **[BPFilter]** Phase: Zero Band Width: 5.0 - 90.0Hz **[GenVelfil]** Apply internal Normalization/Denormalization Median Filter 9 Traces **[WaveDecon]** Waveshape Deconvolution Design Filter trace Input start at TRANSIT_TIME wavelet: 8.0 - 85.0 Hz zero-phase Polarity: Positive **[BPFilter1]** Phase: Zero Band Width: 8.0 - 85.0Hz **[TVG(TAR)]** Travel time exponent = 1.50 **[GenVelfil1]** Median Filter 7 Traces **[Corridor]** Window Start: TRANSIT_TIME - 0.000 (s) Window End: TRANSIT_TIME - -0.200 (s) (Deepest 5 traces remain) Mean Stack BPF 5.0 - 90.0Hz **[Frequency1]** Process all samples Apply FK **[Frequency]** Process all samples Apply FK

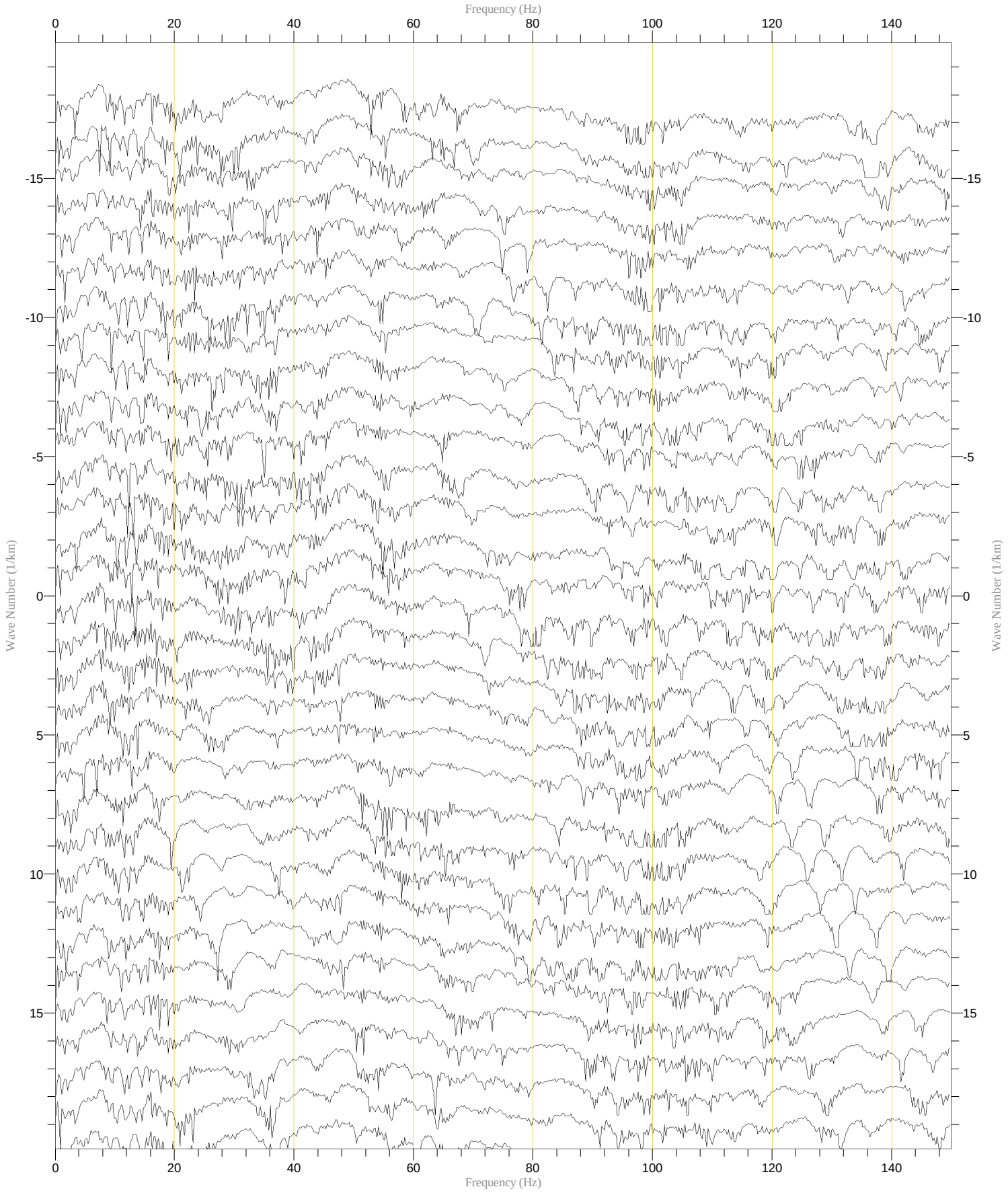
FileLoadLdf(Output 1)	Normalization Trace by Trace (250%) Polarity Normal One Way Time (ms) Scaling 5.90 cm/sec, 1.52/cm	



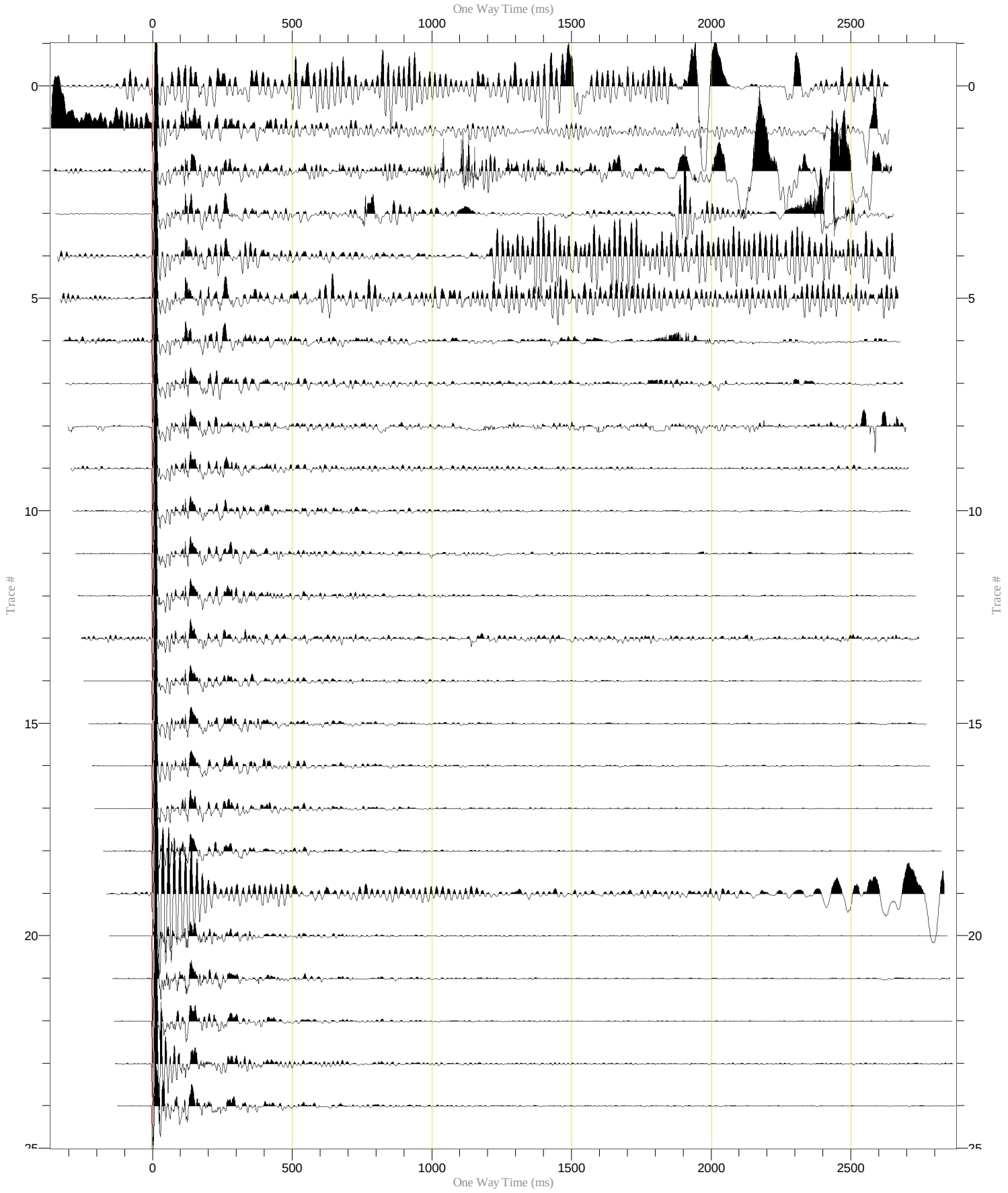
Trace Range Set Manual(Output 1)	Normalization Trace by Trace (250%) Polarity Normal One Way Time (ms) Scaling 5.93 cm/sec, 1.20/cm	



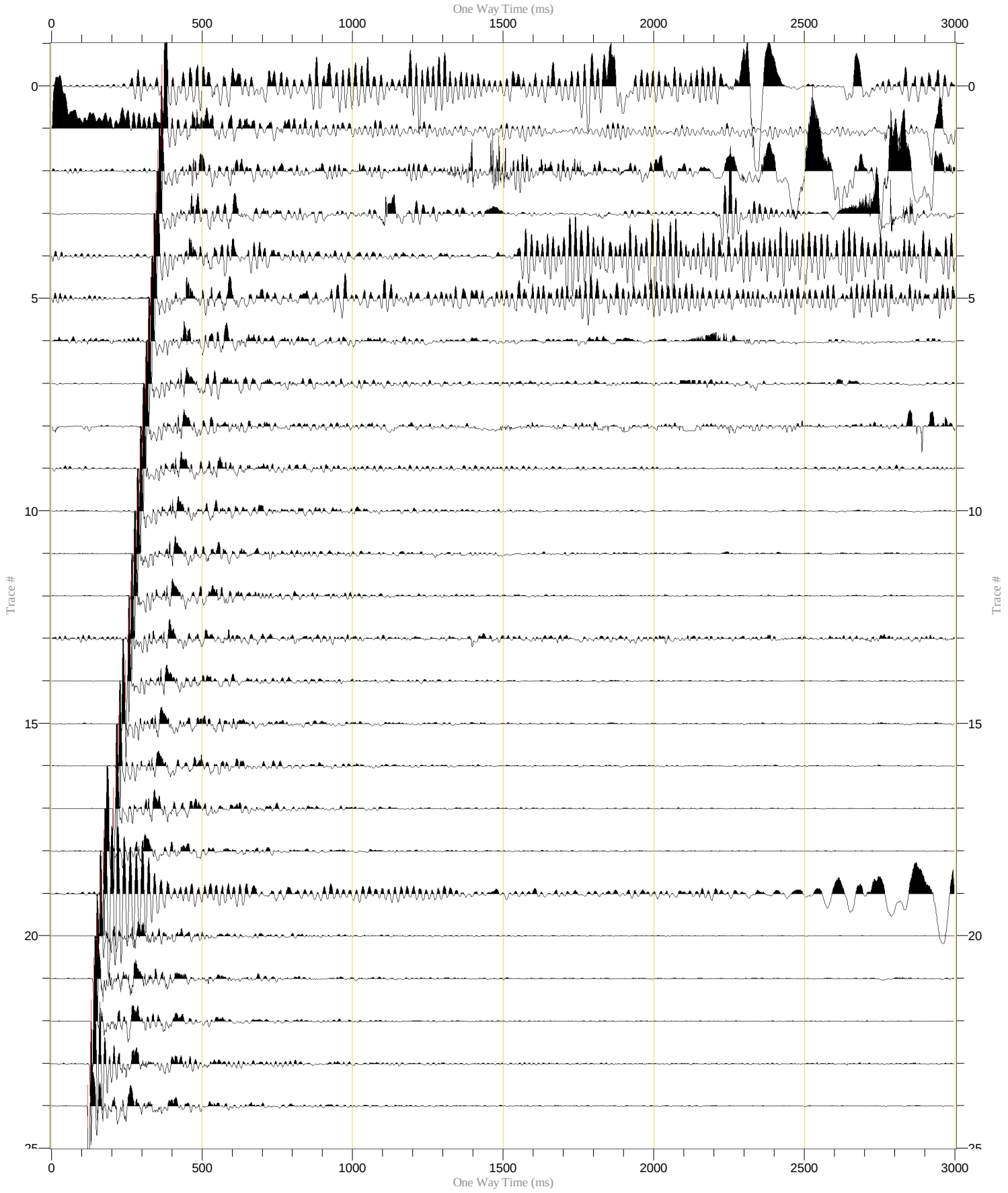
Spectral Analyser1(Amplitude) Apply FK	Normalization Trace by Trace (250%) Polarity Normal Frequency (Hz) Scaling 0.12 cm/Hz, 1.83(1/km)/cm



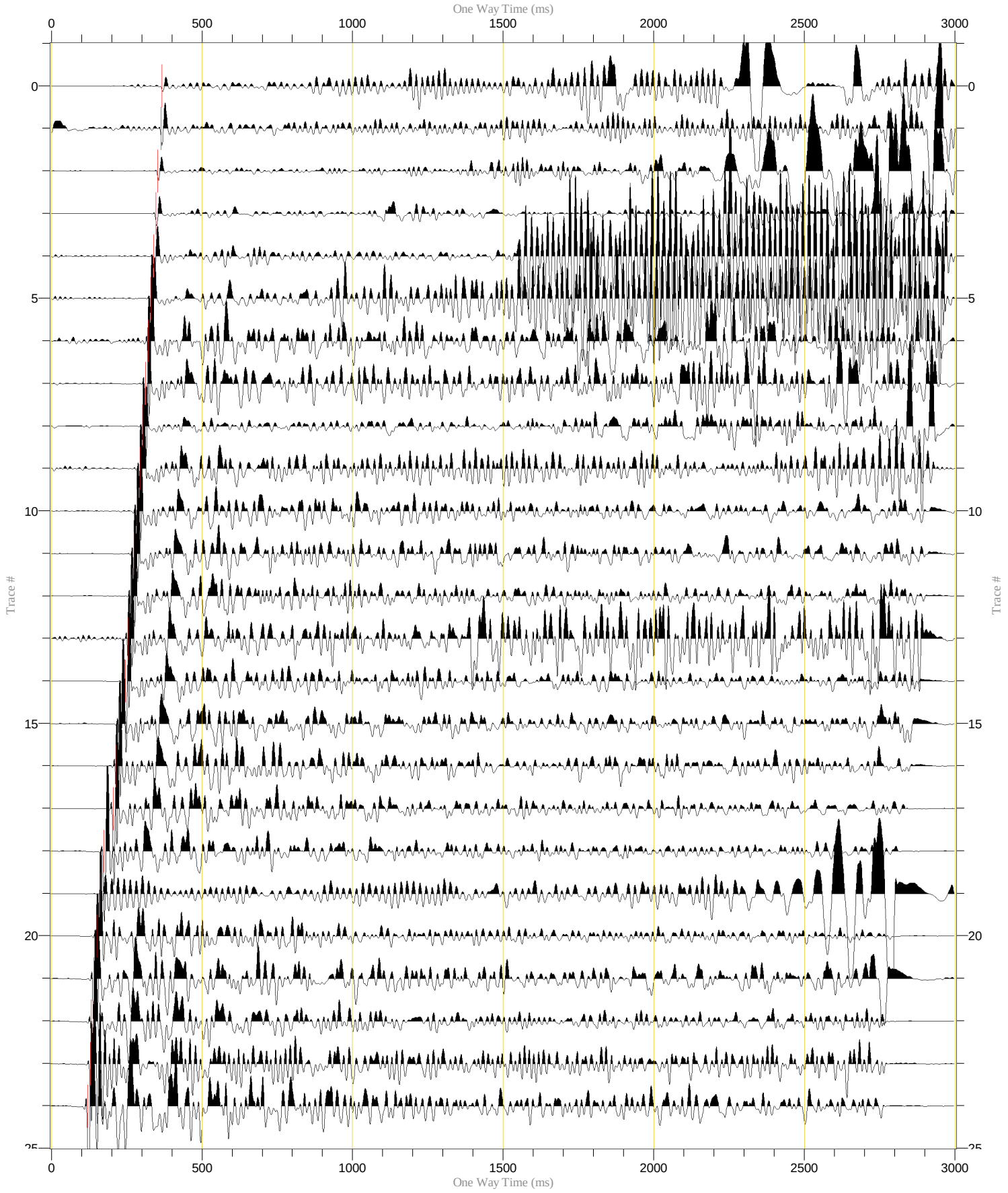
Shift1(Output 1)	Normalization Trace by Trace (250%) Polarity Normal One Way Time (ms) Scaling 5.49 cm/sec, 1.20/cm	



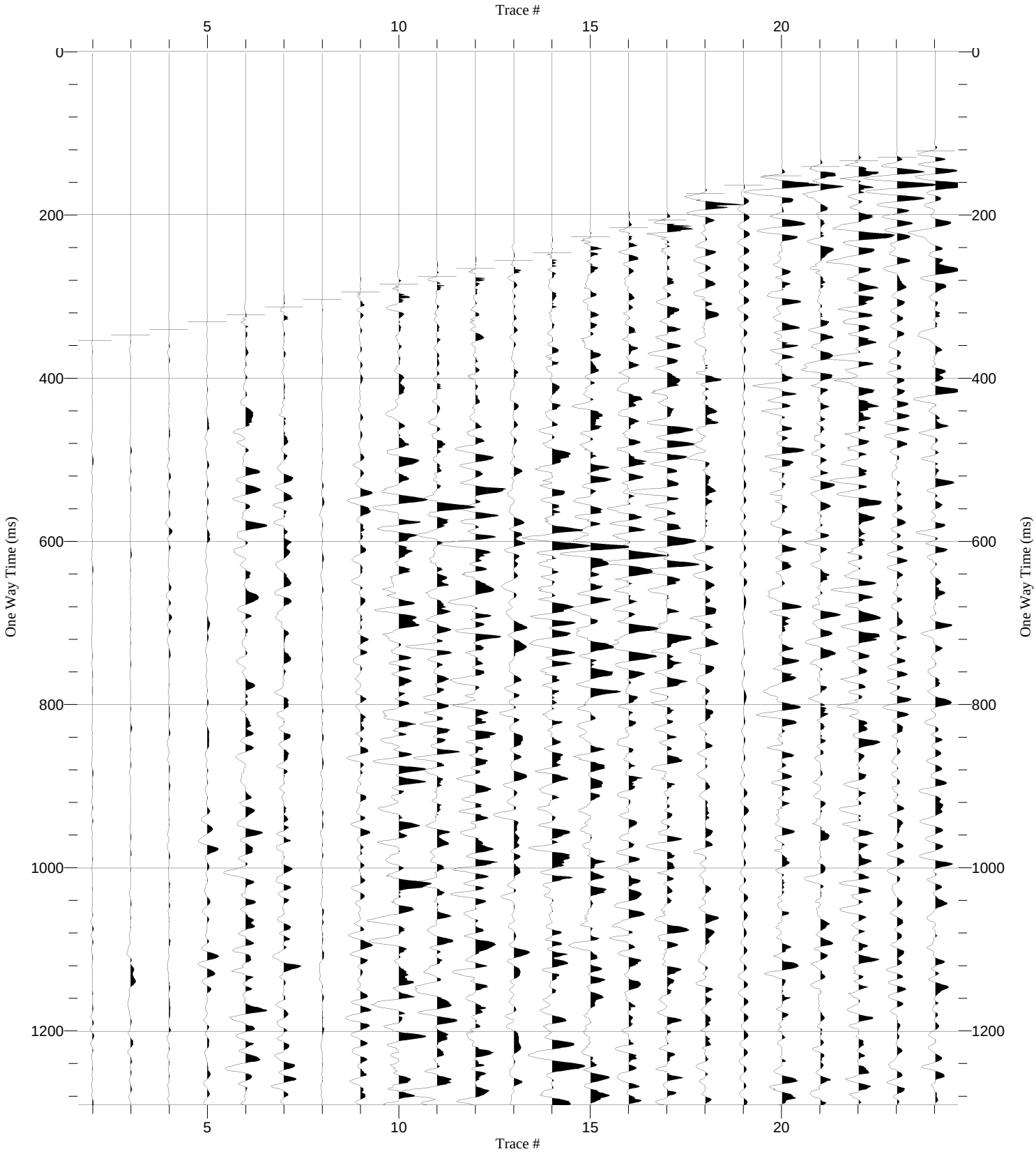
Shift(Output 1)	Normalization Trace by Trace (250%) Polarity Normal One Way Time (ms) Scaling 5.92 cm/sec, 1.20/cm	



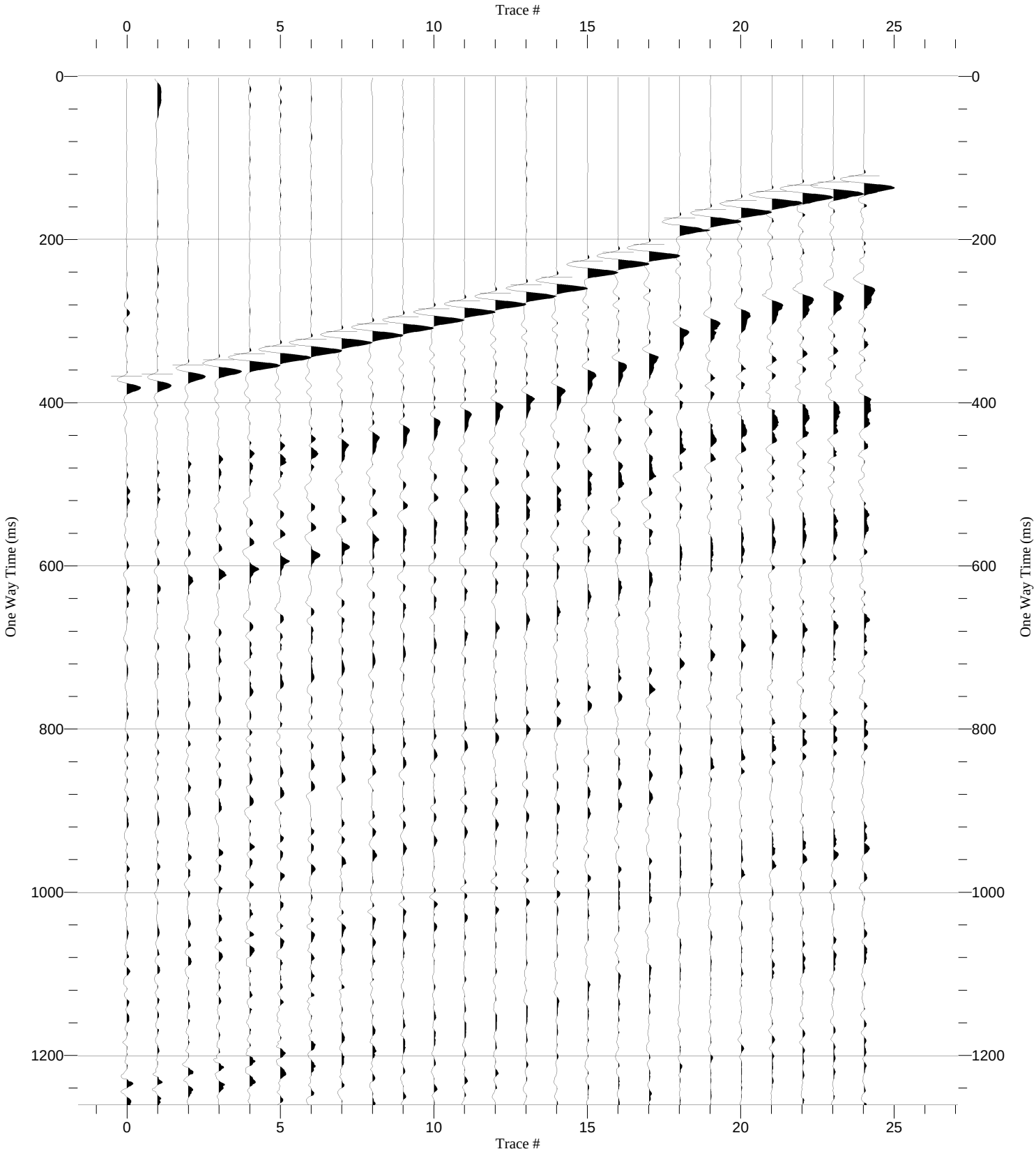
BPF1(Output 1) Travel time exponent = 1.20 BPF 5.0 - 90.0Hz	Normalization Trace by Trace (250%) Polarity Normal One Way Time (ms) Scaling 5.92 cm/sec, 1.20/cm



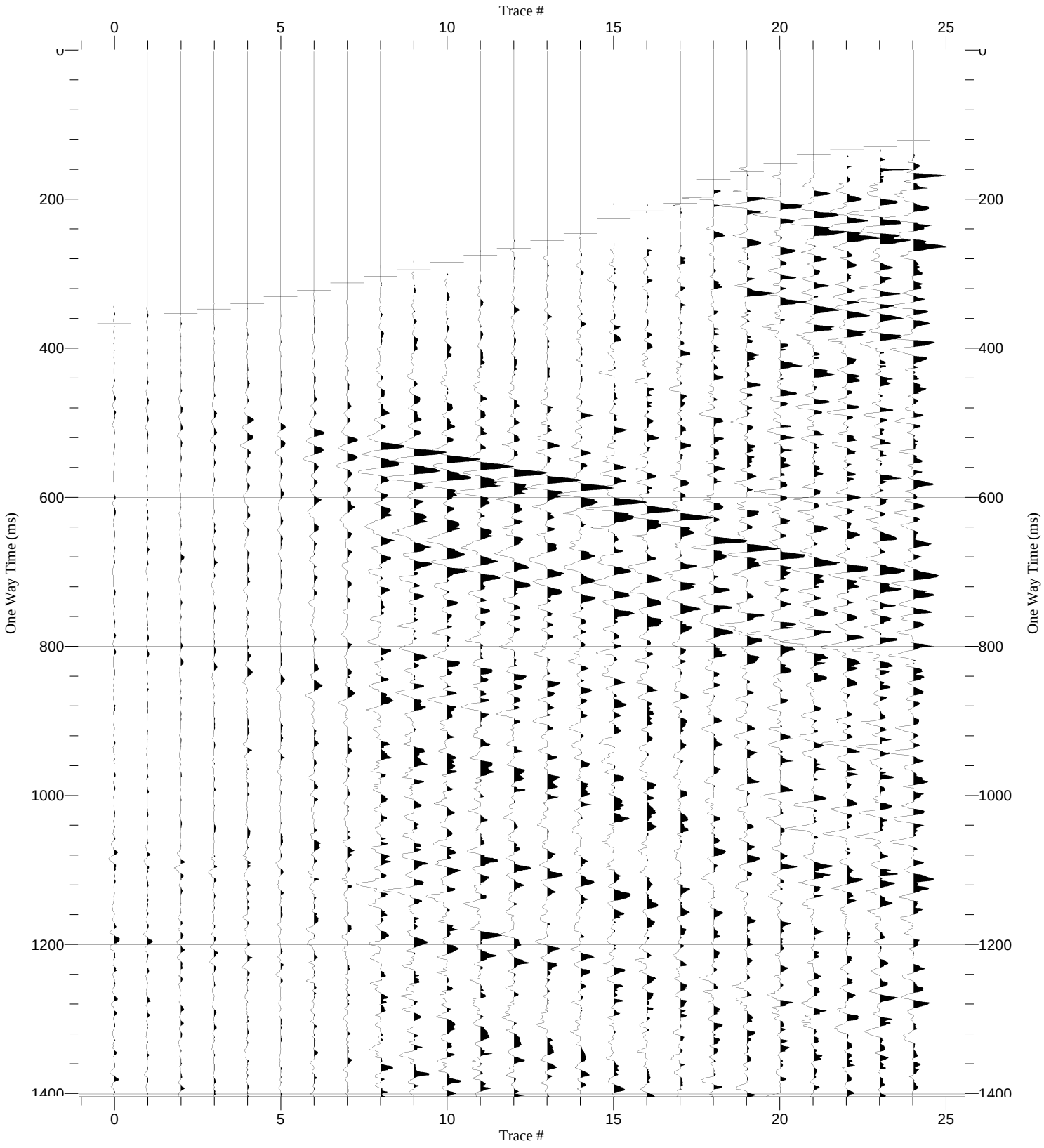
Mean/Median Generalized Velocity Filter(Residual) Travel time exponent = 1.20 BPF 5.0 - 90.0Hz Median Filter 7 Traces	Normalization Trace by Trace (100%) Polarity Normal One Way Time (ms) Scaling 15.48 cm/sec, 1.38/cm	



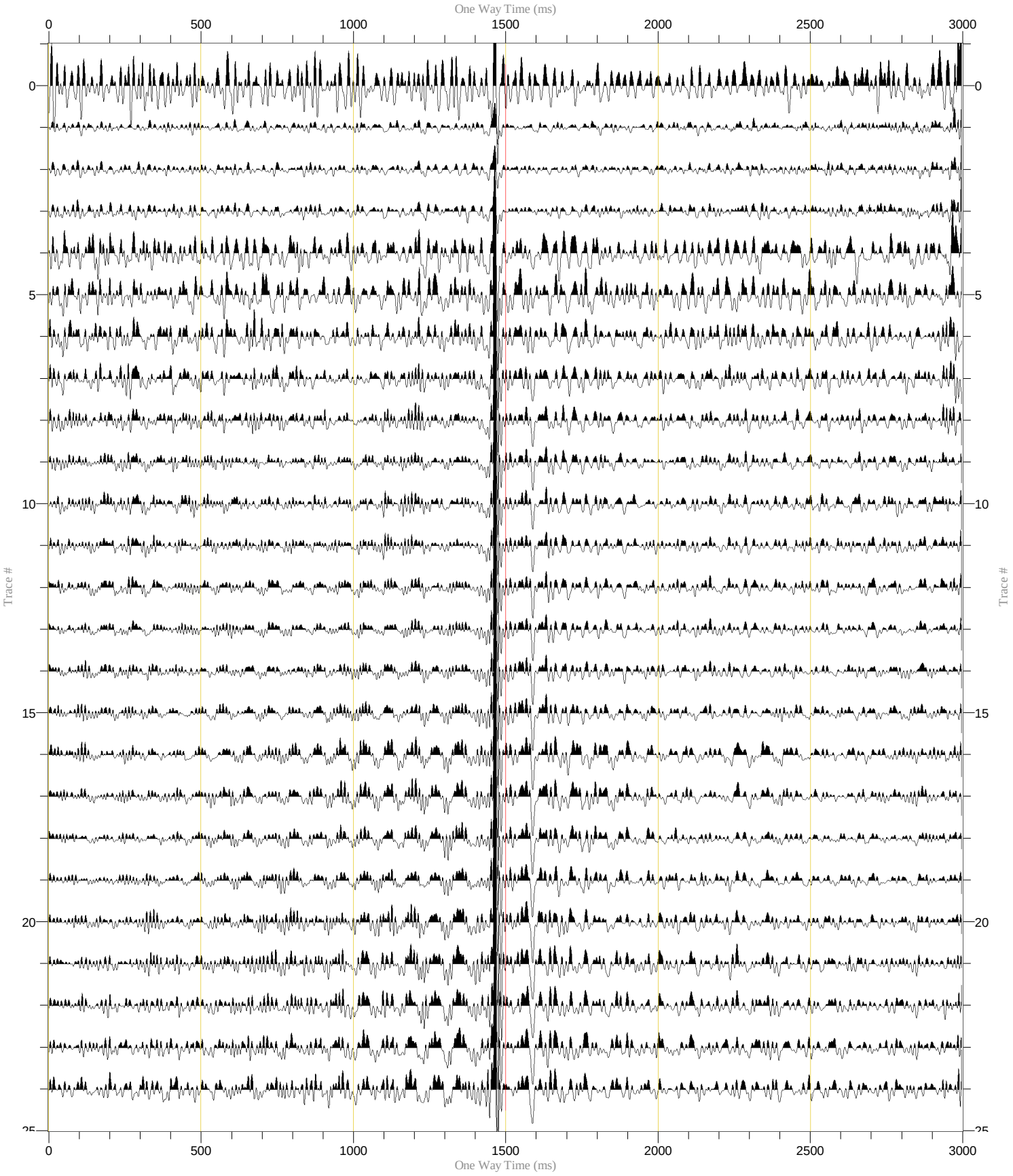
Mean/Median Generalized Velocity Filter(Enhanced) Travel time exponent = 1.20 BPF 5.0 - 90.0Hz Median Filter 7 Traces	Normalization Trace by Trace (100%) Polarity Normal One Way Time (ms) Scaling 15.48 cm/sec, 1.72/cm	



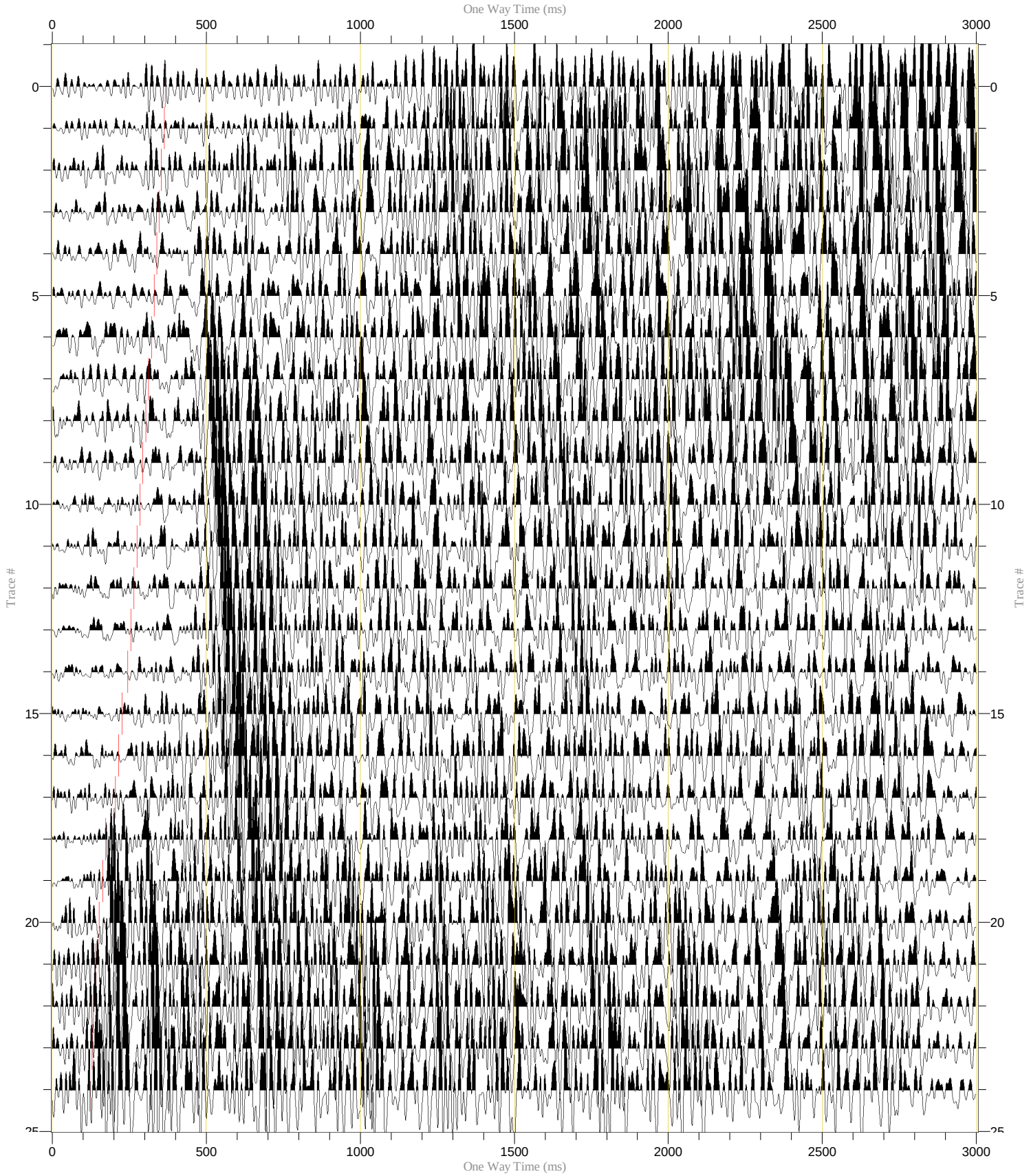
Mean/Median Generalized Velocity Filter1(Enhanced) Travel time exponent = 1.20 BPF 5.0 - 90.0Hz Median Filter 7 Traces Median Filter 7 Traces	Normalization Trace by Trace (100%) Polarity Normal One Way Time (ms) Scaling 14.04 cm/sec, 1.60/cm	



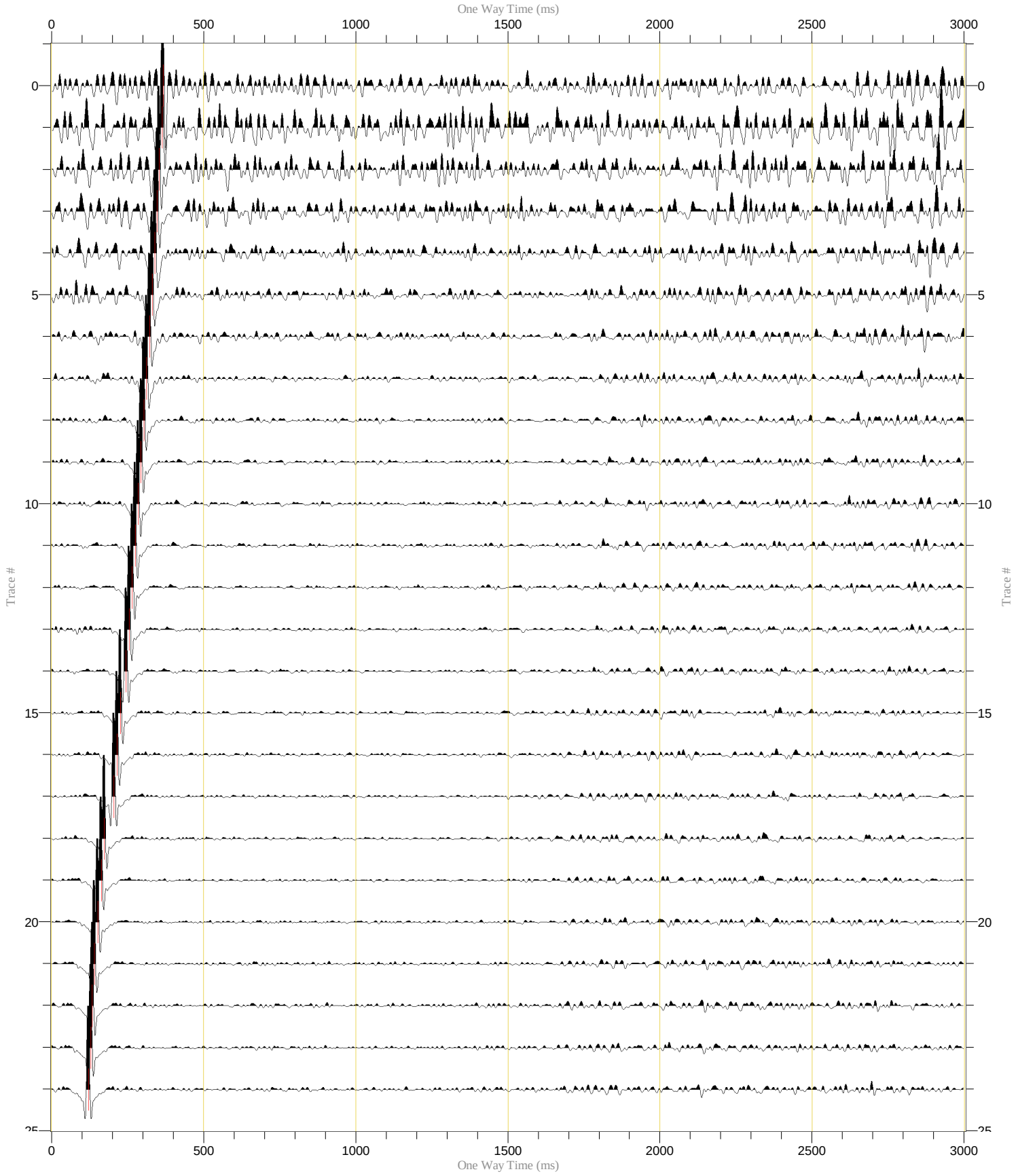
Waveshaping deconvolution(Operator) Travel time exponent = 1.20 BPF 5.0 - 90.0Hz Median Filter 7 Traces Waveshape Decon.(wavelet: 8.0 - 70.0 Hz zero-phase)	Normalization Trace by Trace (250%) Polarity Normal One Way Time (ms) Scaling 5.93 cm/sec, 1.23/cm	



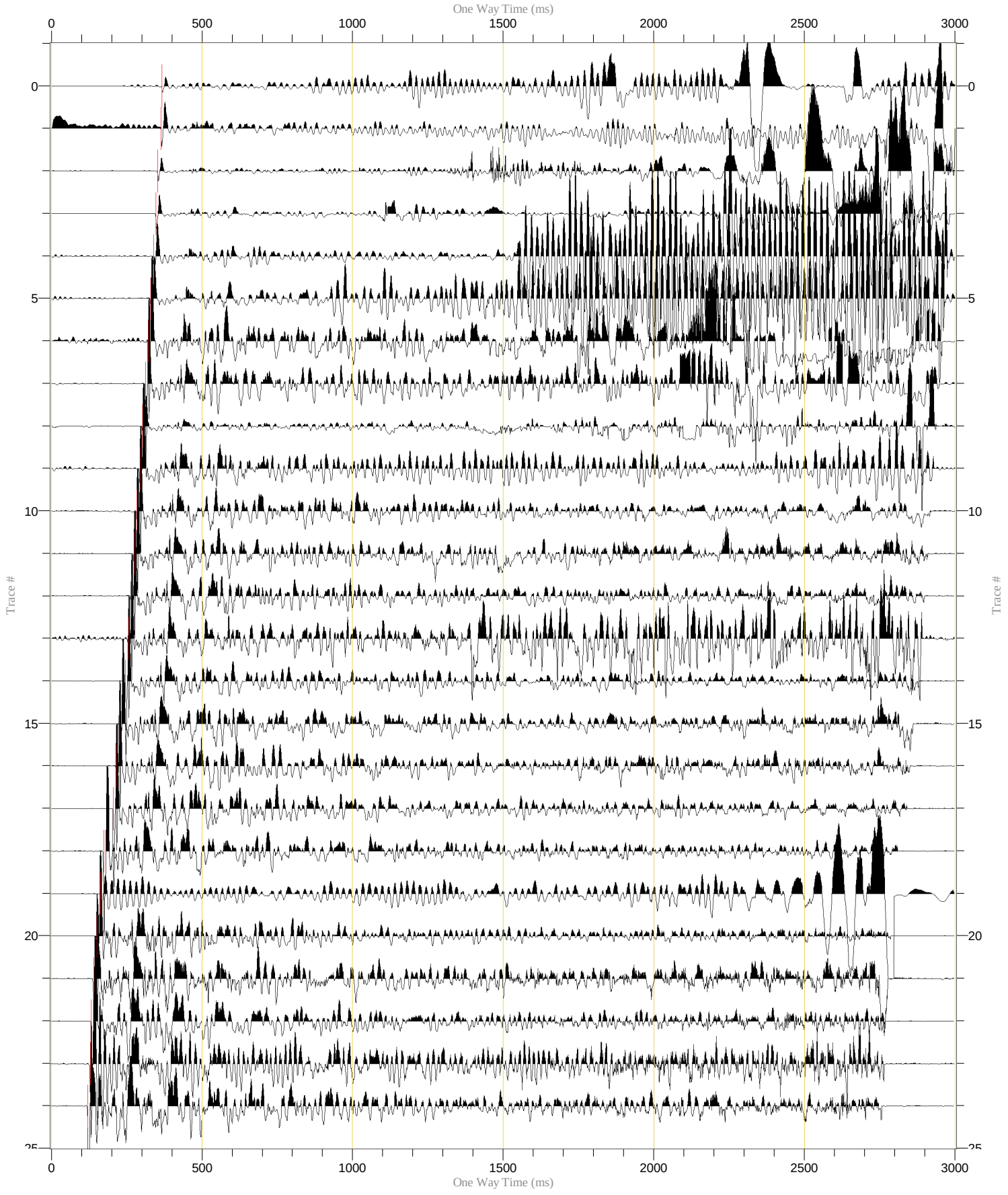
Waveshaping deconvolution(Up Output) Travel time exponent = 1.20 BPF 5.0 - 90.0Hz Median Filter 7 Traces Median Filter 7 Traces Waveshape Decon.(wavelet: 8.0 - 70.0 Hz zero-phase)	Normalization Trace by Trace (250%) Polarity Normal One Way Time (ms) Scaling 5.92 cm/sec, 1.24/cm	



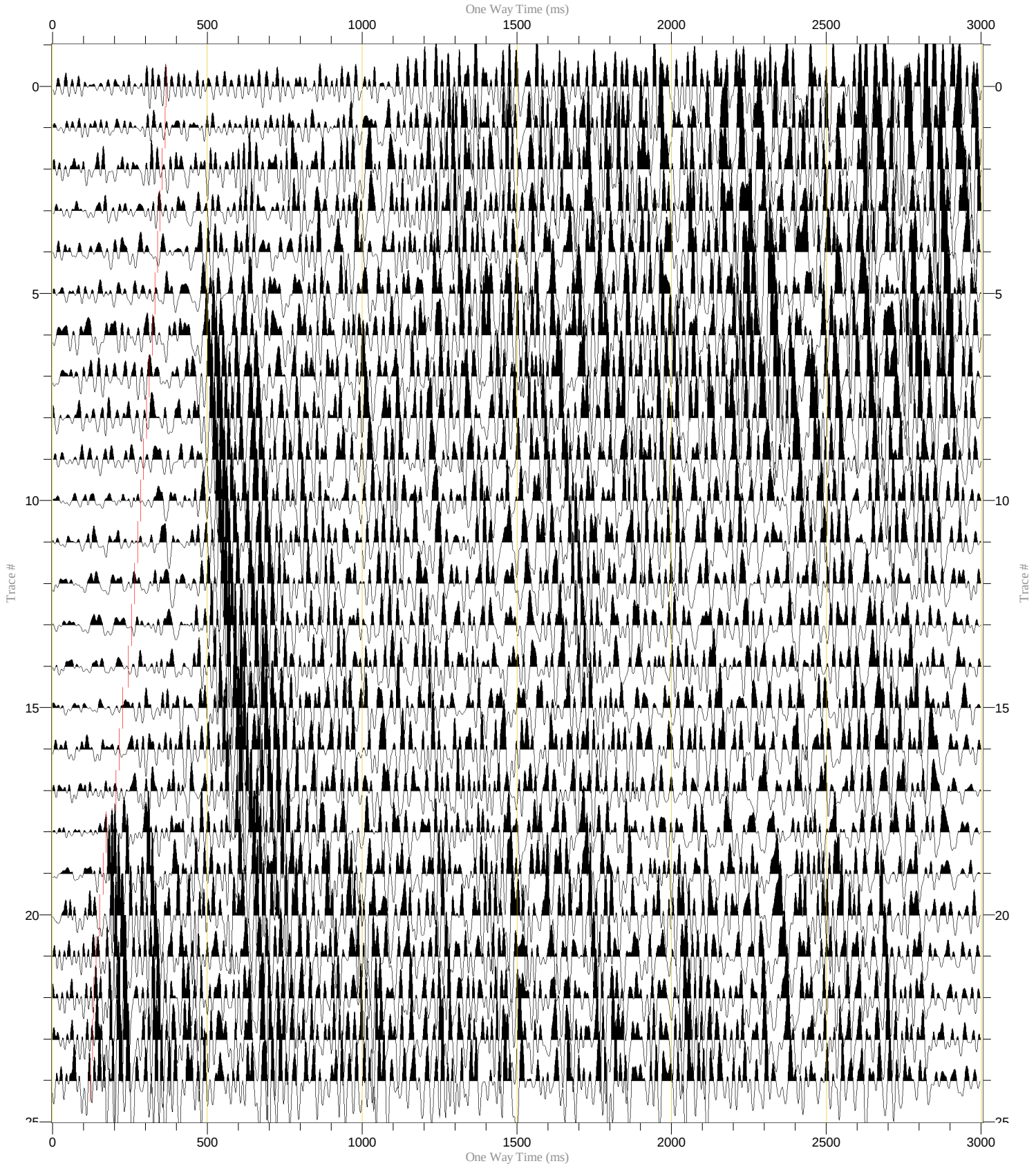
Waveshaping deconvolution(Down Output) Travel time exponent = 1.20 BPF 5.0 - 90.0Hz Median Filter 7 Traces Waveshape Decon.(wavelet: 8.0 - 70.0 Hz zero-phase)	Normalization Trace by Trace (250%) Polarity Normal One Way Time (ms) Scaling 5.92 cm/sec, 1.23/cm	



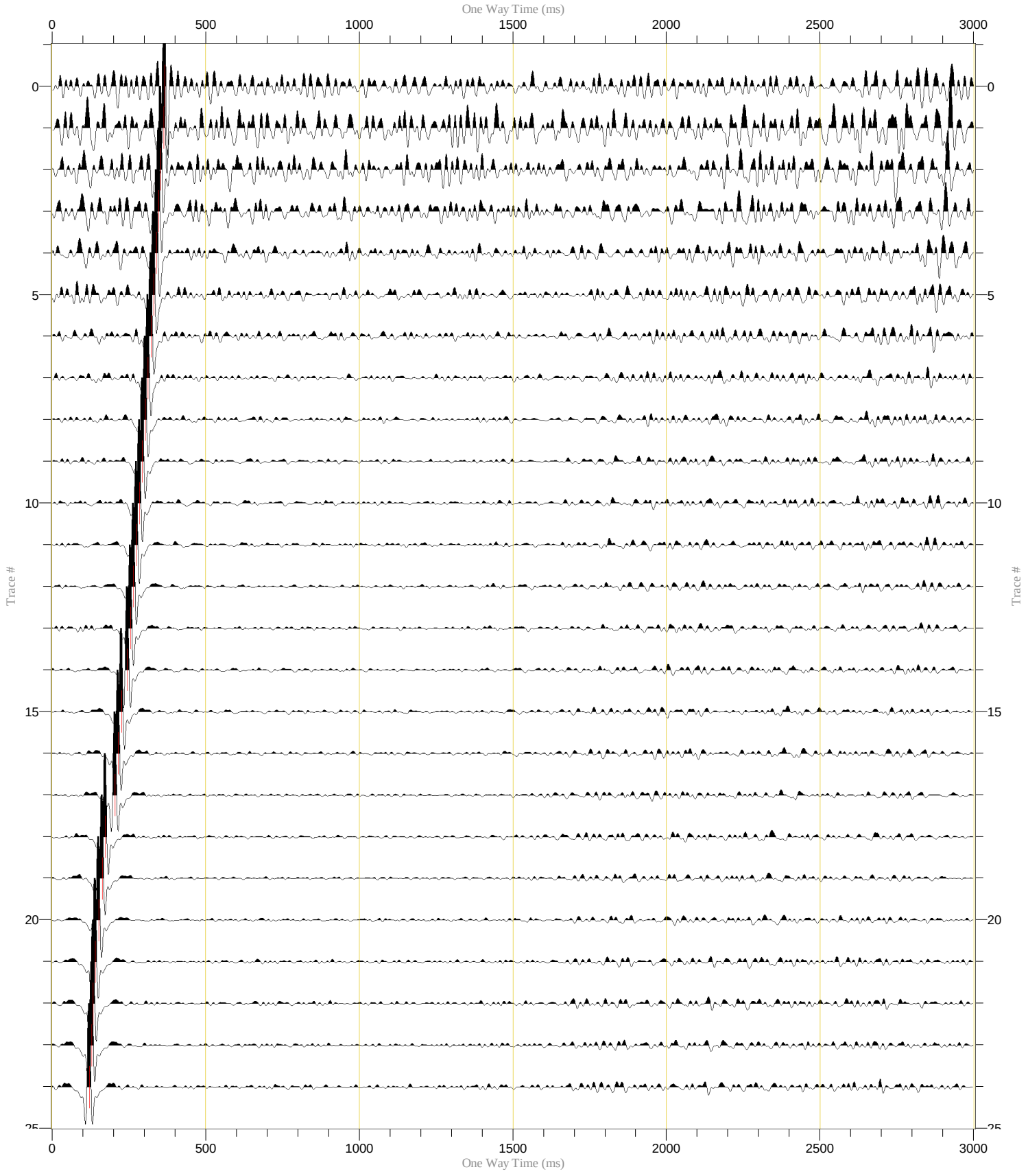
Time-Varying Gain(Output 1) Travel time exponent = 1.20	Normalization Trace by Trace (250%) Polarity Normal One Way Time (ms) Scaling 5.92 cm/sec, 1.20/cm



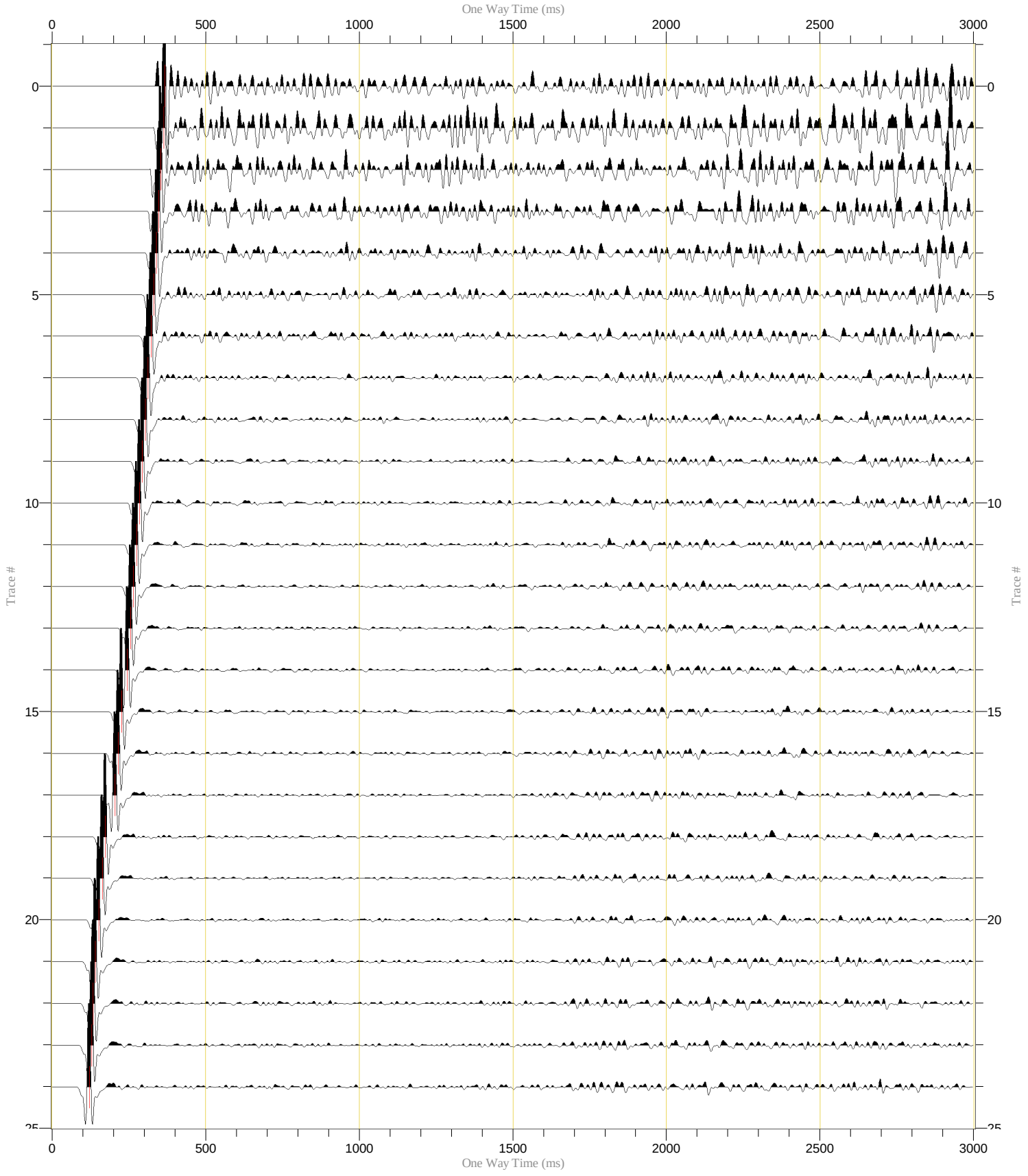
BPF3(Output 2) Travel time exponent = 1.20 BPF 5.0 - 90.0Hz Median Filter 7 Traces Median Filter 7 Traces Waveshape Decon.(wavelet: 8.0 - 70.0 Hz zero-phase) BPF 8.0 - 70.0Hz	Normalization Trace by Trace (250%) Polarity Normal One Way Time (ms) Scaling 5.92 cm/sec, 1.26/cm	



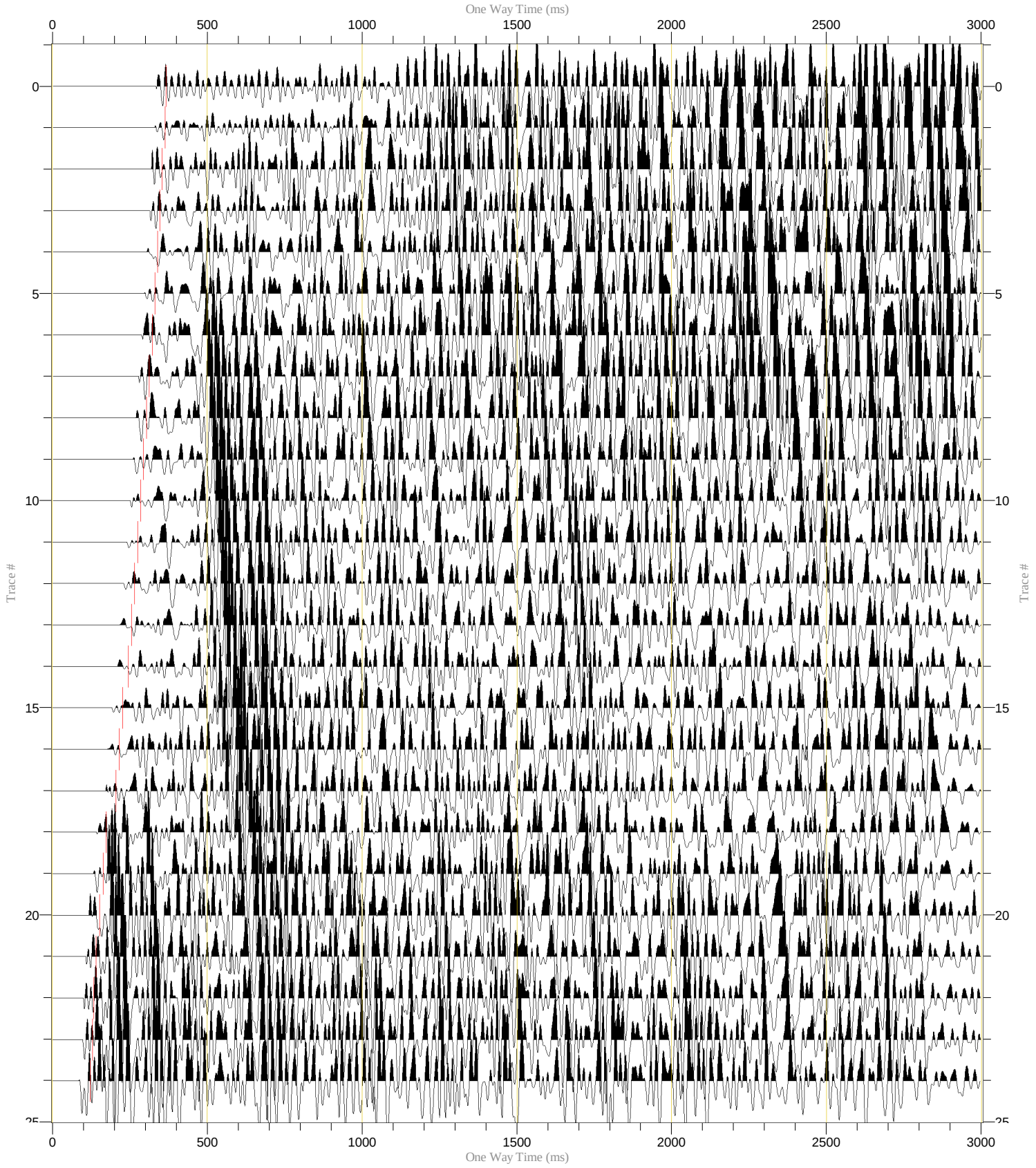
BPF3(Output 1) Travel time exponent = 1.20 BPF 5.0 - 90.0Hz Median Filter 7 Traces Waveshape Decon.(wavelet: 8.0 - 70.0 Hz zero-phase) BPF 8.0 - 70.0Hz	Normalization Trace by Trace (250%) Polarity Normal One Way Time (ms) Scaling 5.92 cm/sec, 1.24/cm	



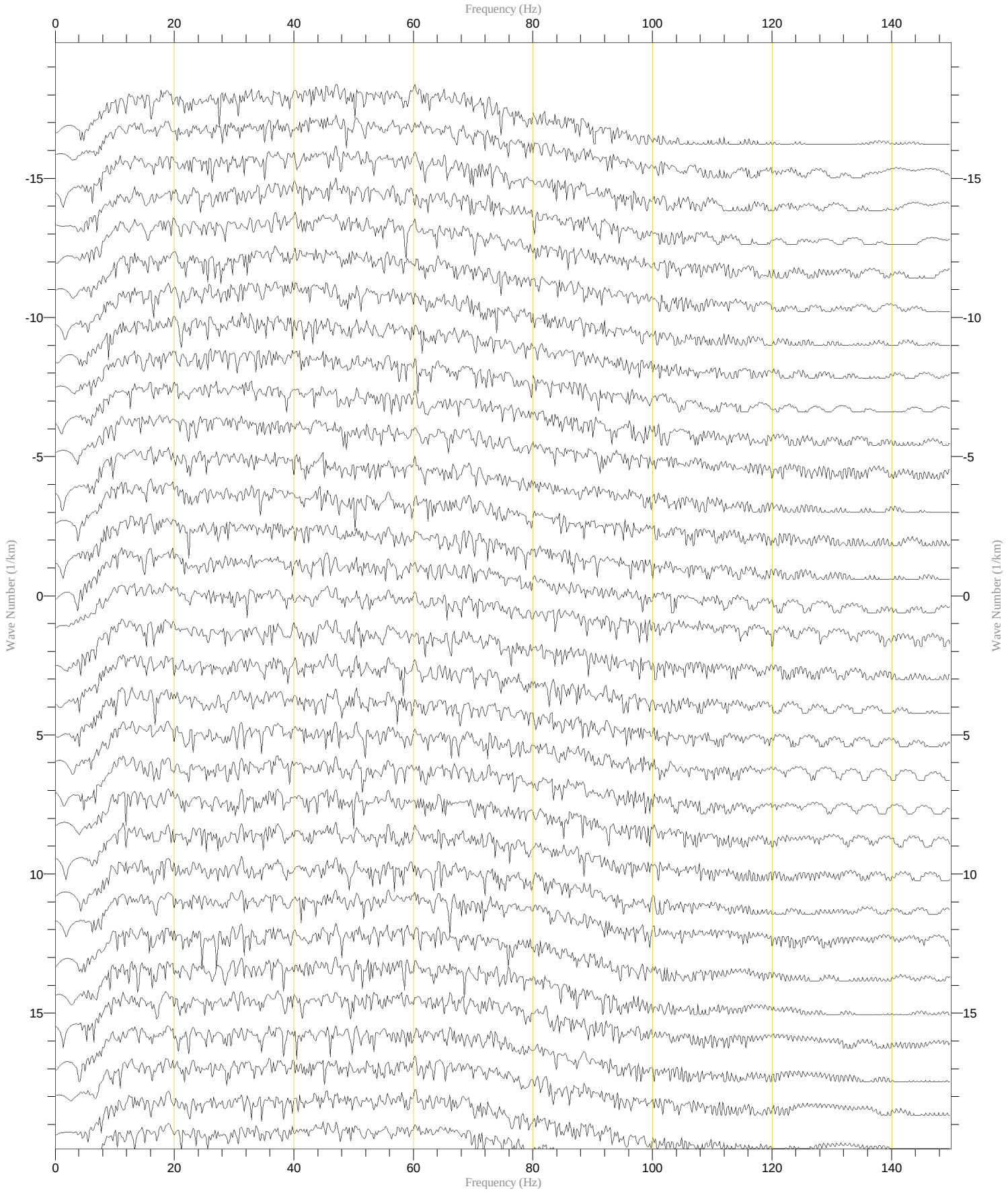
Mute(Output 1) Travel time exponent = 1.20 BPF 5.0 - 90.0Hz Median Filter 7 Traces Waveshape Decon.(wavelet: 8.0 - 70.0 Hz zero-phase) BPF 8.0 - 70.0Hz	Normalization Trace by Trace (250%) Polarity Normal One Way Time (ms) Scaling 5.92 cm/sec, 1.24/cm	



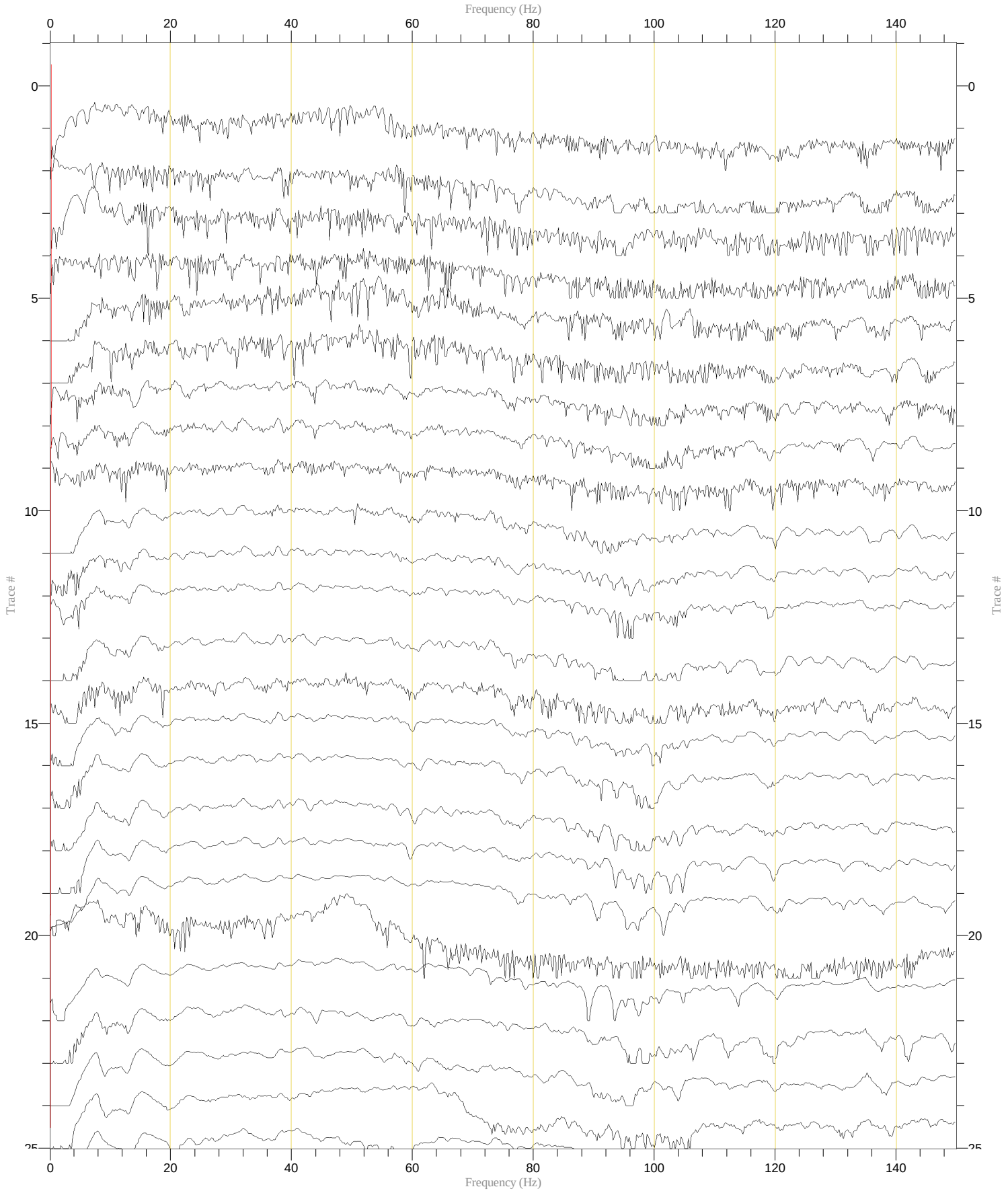
Mute(Output 2) Travel time exponent = 1.20 BPF 5.0 - 90.0Hz Median Filter 7 Traces Median Filter 7 Traces Waveshape Decon.(wavelet: 8.0 - 70.0 Hz zero-phase) BPF 8.0 - 70.0Hz	Normalization Trace by Trace (250%) Polarity Normal One Way Time (ms) Scaling 5.92 cm/sec, 1.26/cm	



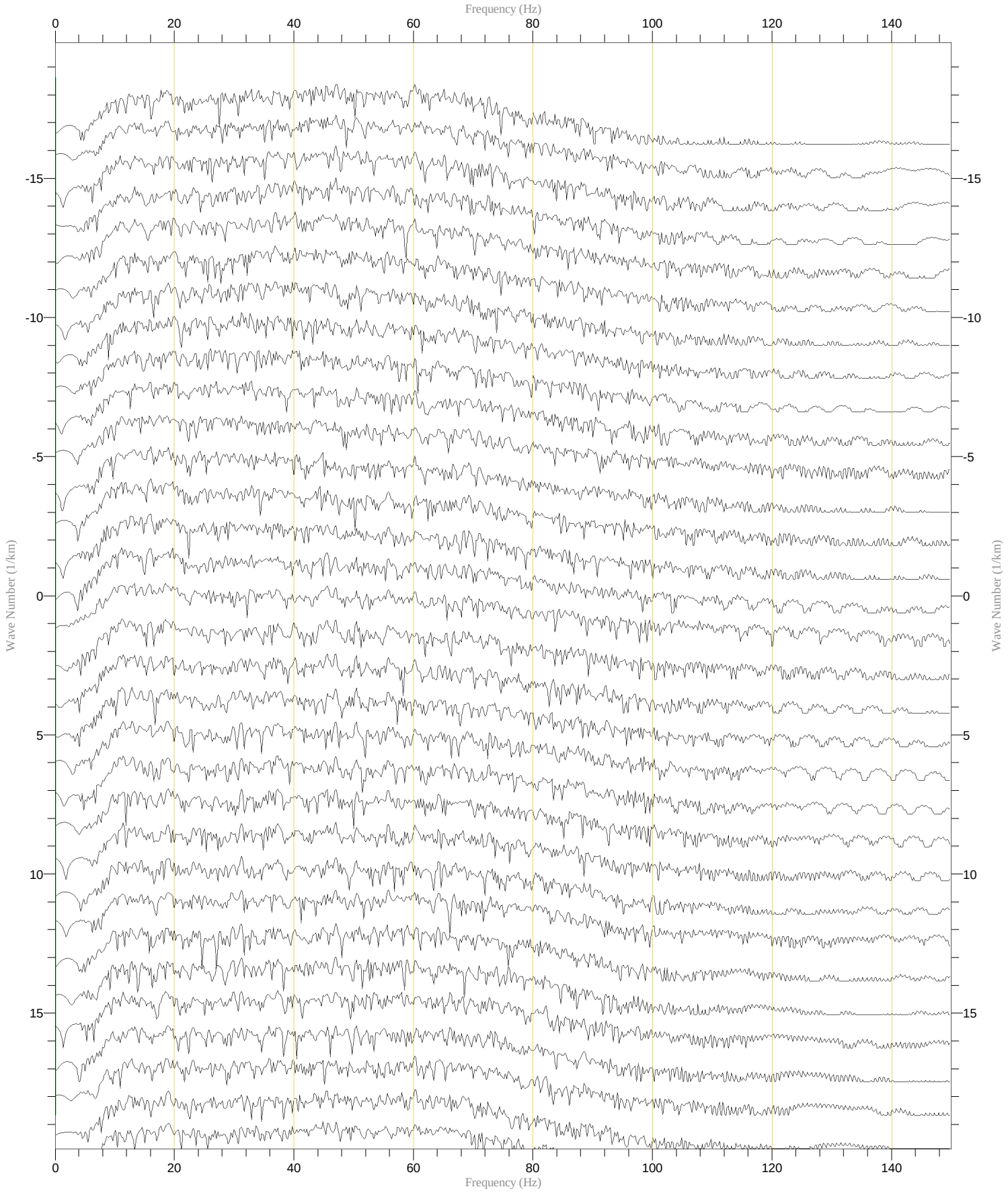
Spectral Analyser2(Amplitude) Apply FK	Normalization Trace by Trace (250%) Polarity Normal Frequency (Hz) Scaling 0.12 cm/Hz, 1.83(1/km)/cm



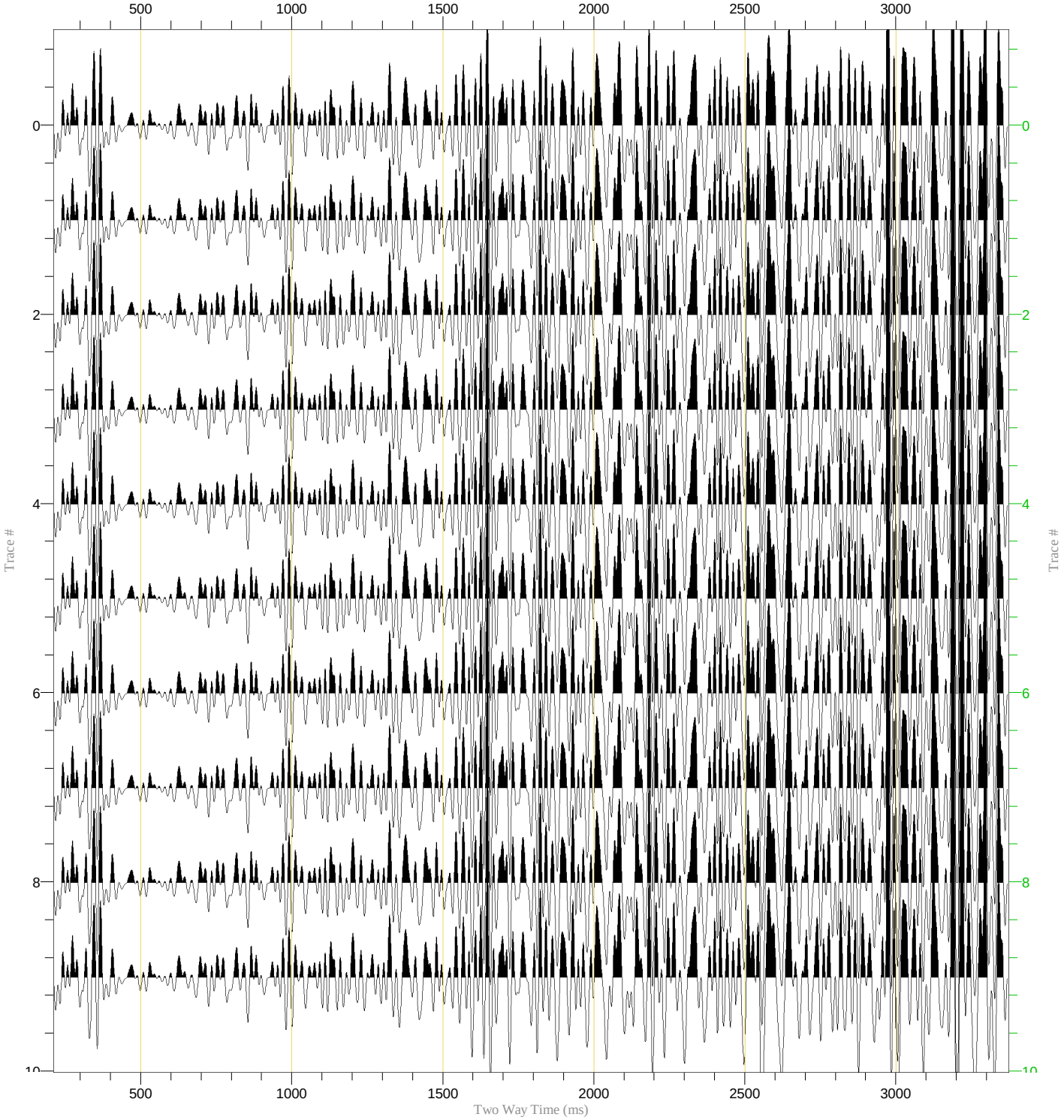
Spectral Analyser(Amplitude) Apply FZ	Normalization Trace by Trace (250%) Polarity Normal Frequency (Hz) Scaling 0.12 cm/Hz, 1.20/cm



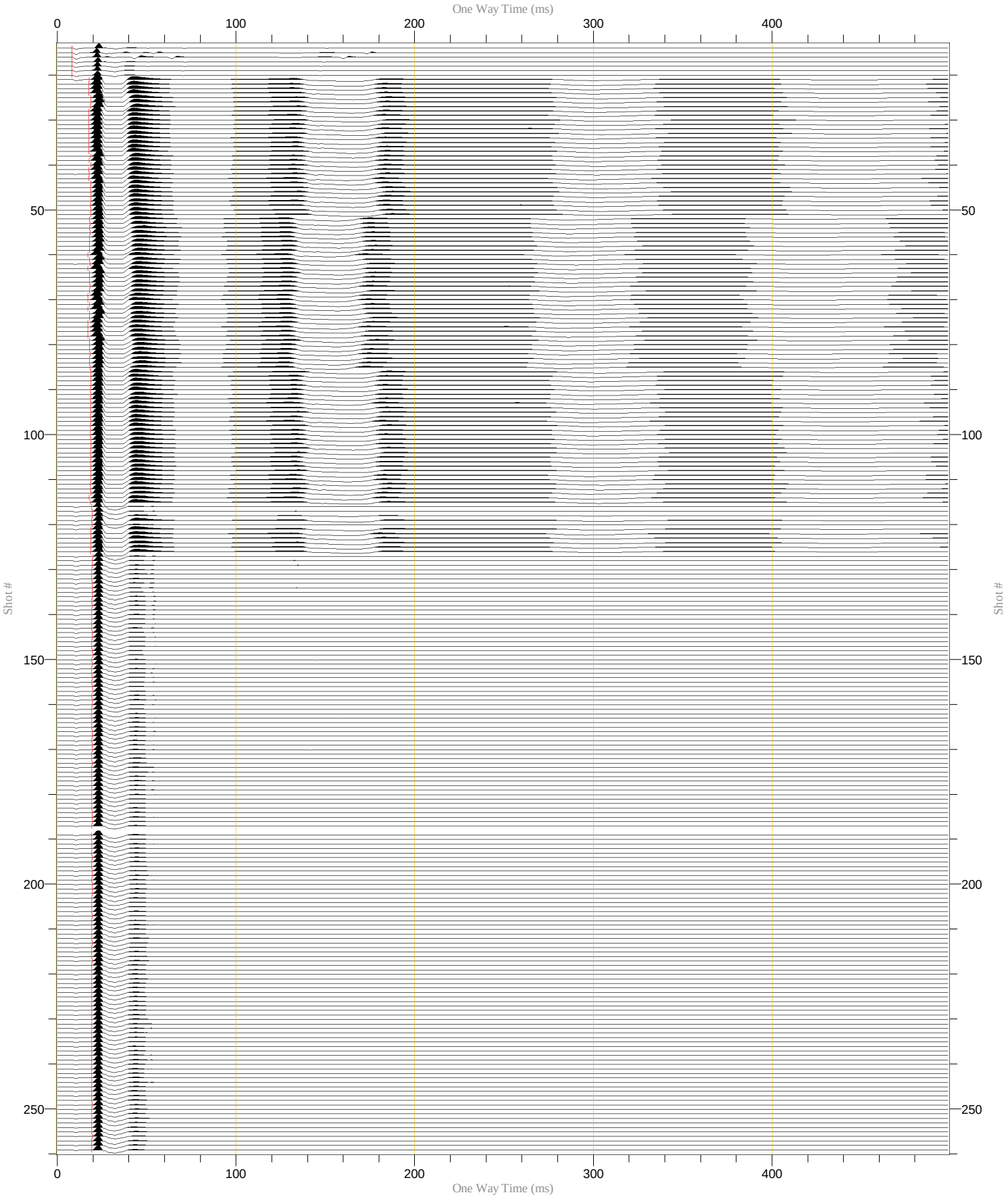
Spectral Analyser2(Amplitude) Apply FK	Normalization Trace by Trace (250%) Polarity Normal Frequency (Hz) Scaling 0.12 cm/Hz, 1.83(1/km)/cm



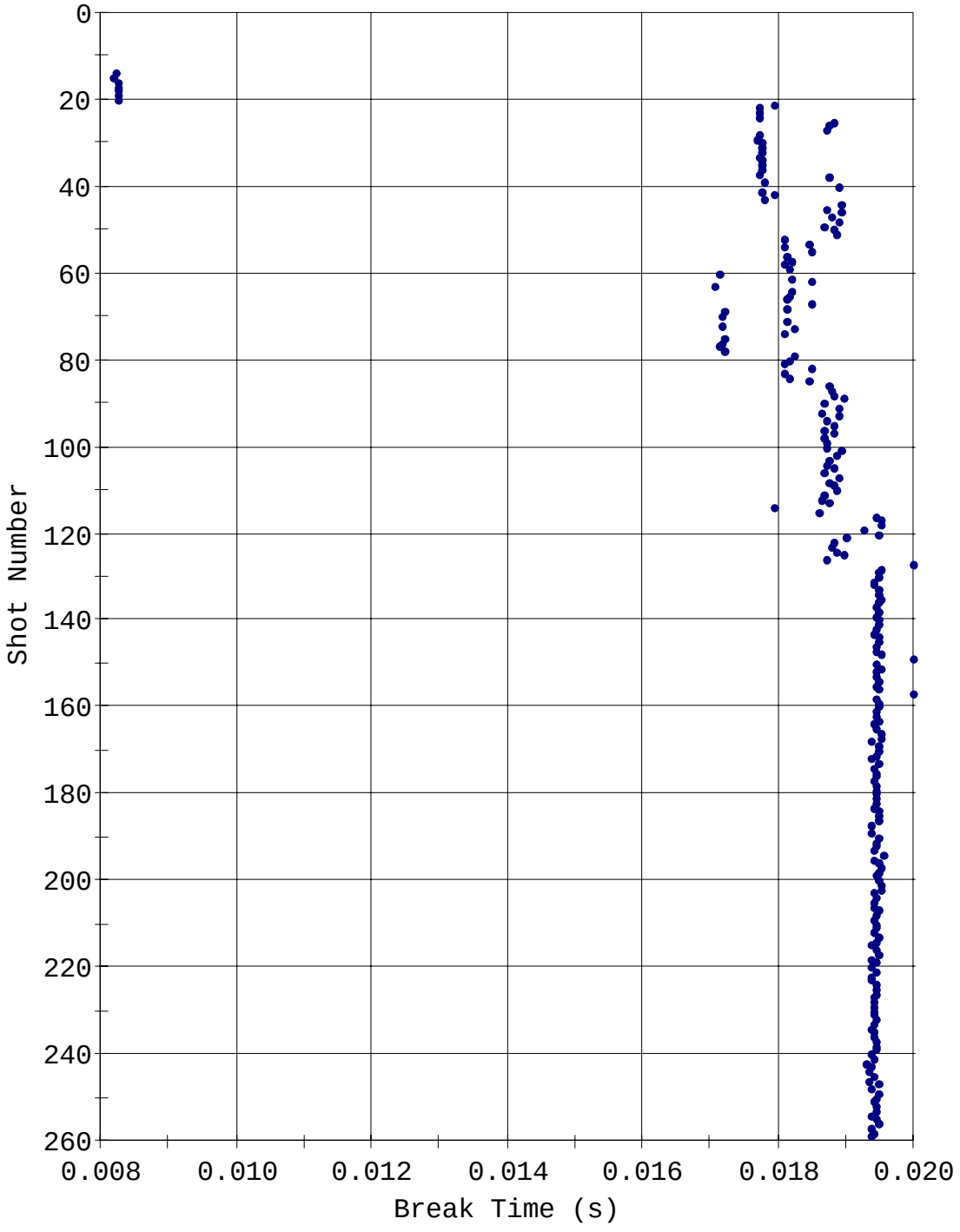
Corridor stack2(Output) Travel time exponent = 1.20 BPF 5.0 - 90.0Hz Median Filter 7 Traces Median Filter 7 Traces Waveshape Decon.(wavelet: 8.0 - 70.0 Hz zero-phase) BPF 8.0 - 70.0Hz Corridor Stack (Mean): BPF 8.0 - 70.0Hz	Normalization Trace by Trace (250%) Polarity Normal Two Way Time (ms) Scaling 5.32 cm/sec, 0.60/cm	



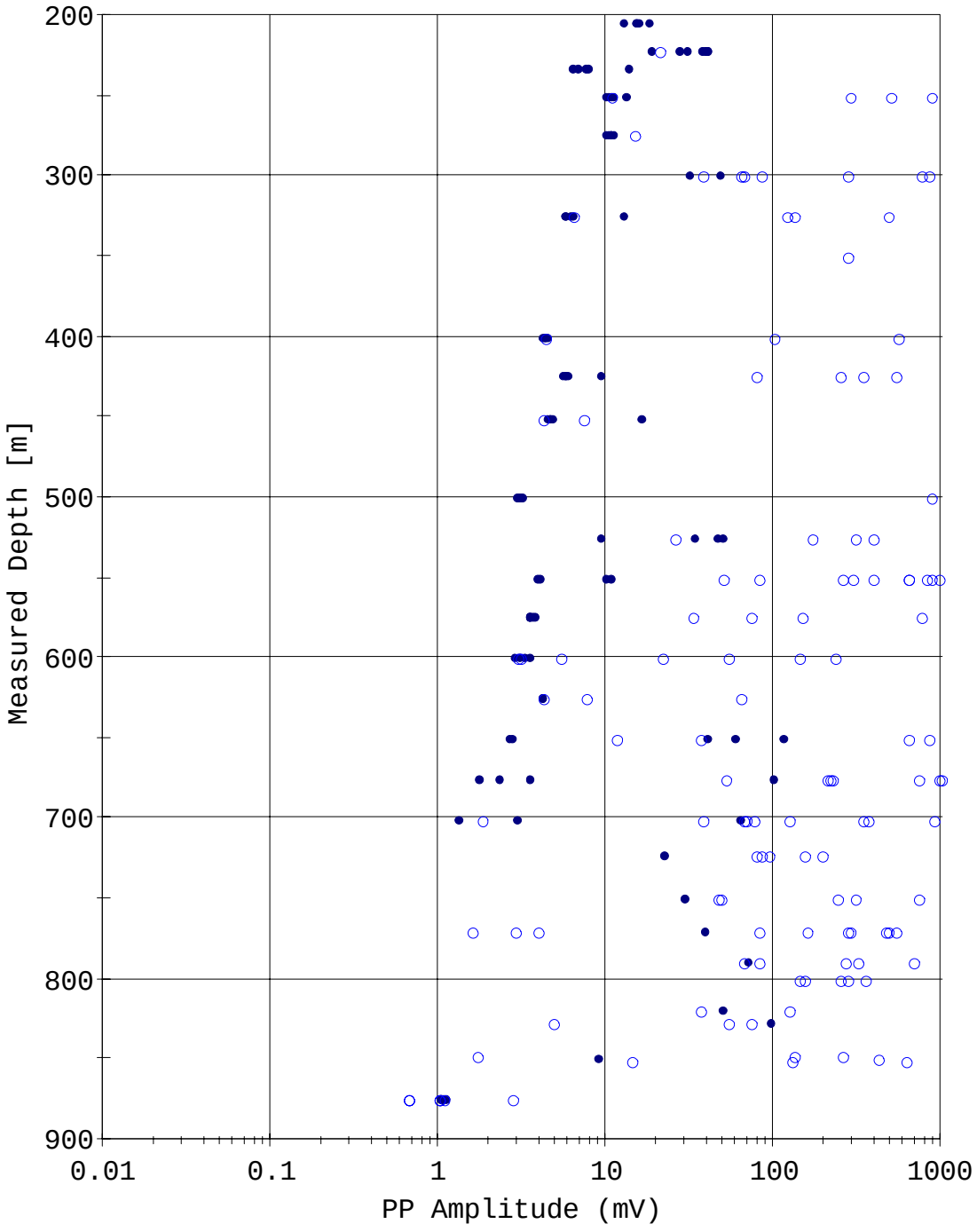
Source Sensor Signature	Normalization Trace by Trace (100%) Polarity Normal One Way Time (ms) Scaling 34.99 cm/sec, 11.37/cm	



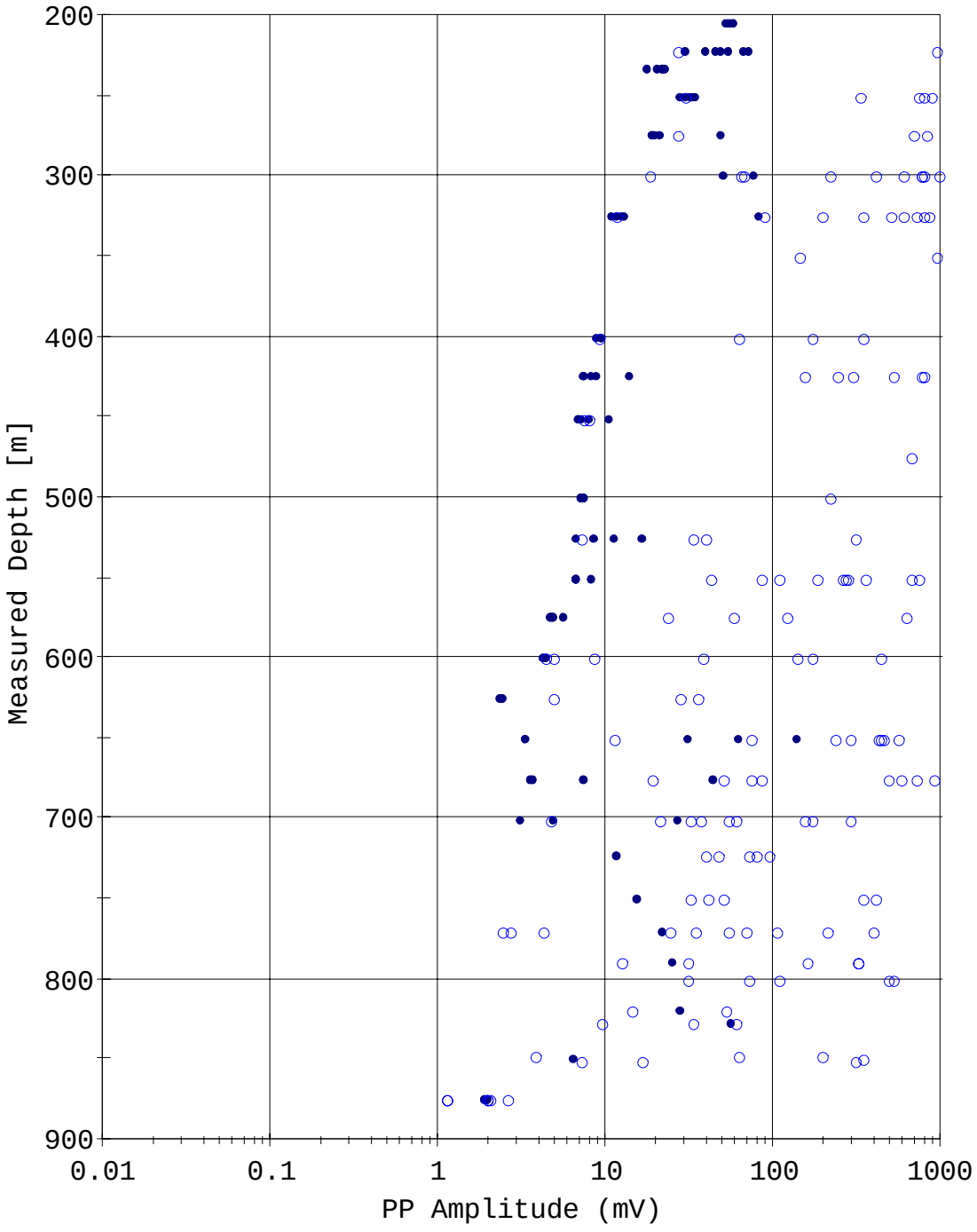
Surface Sensor QC Plot Page



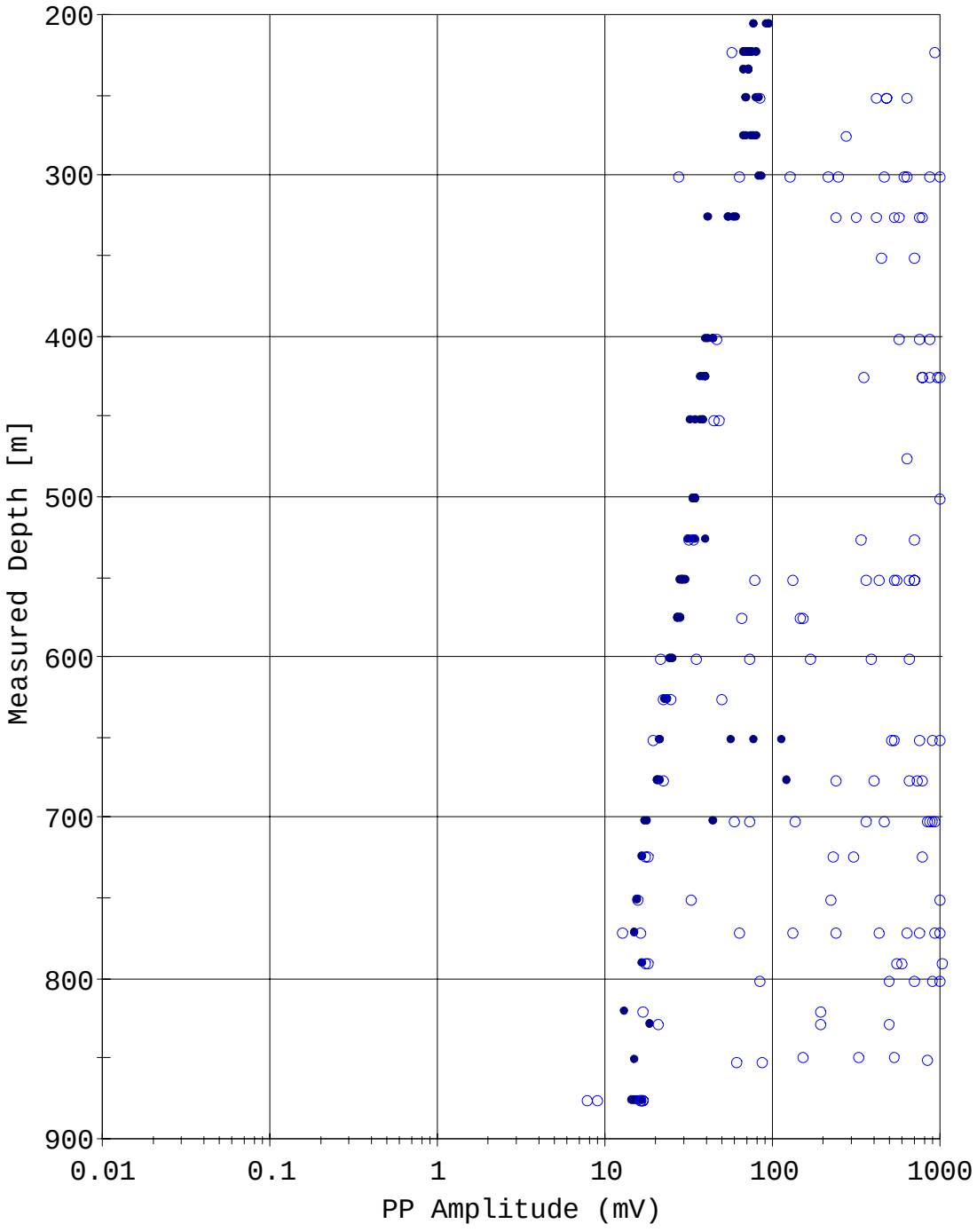
Peak To Peak Plot (X)



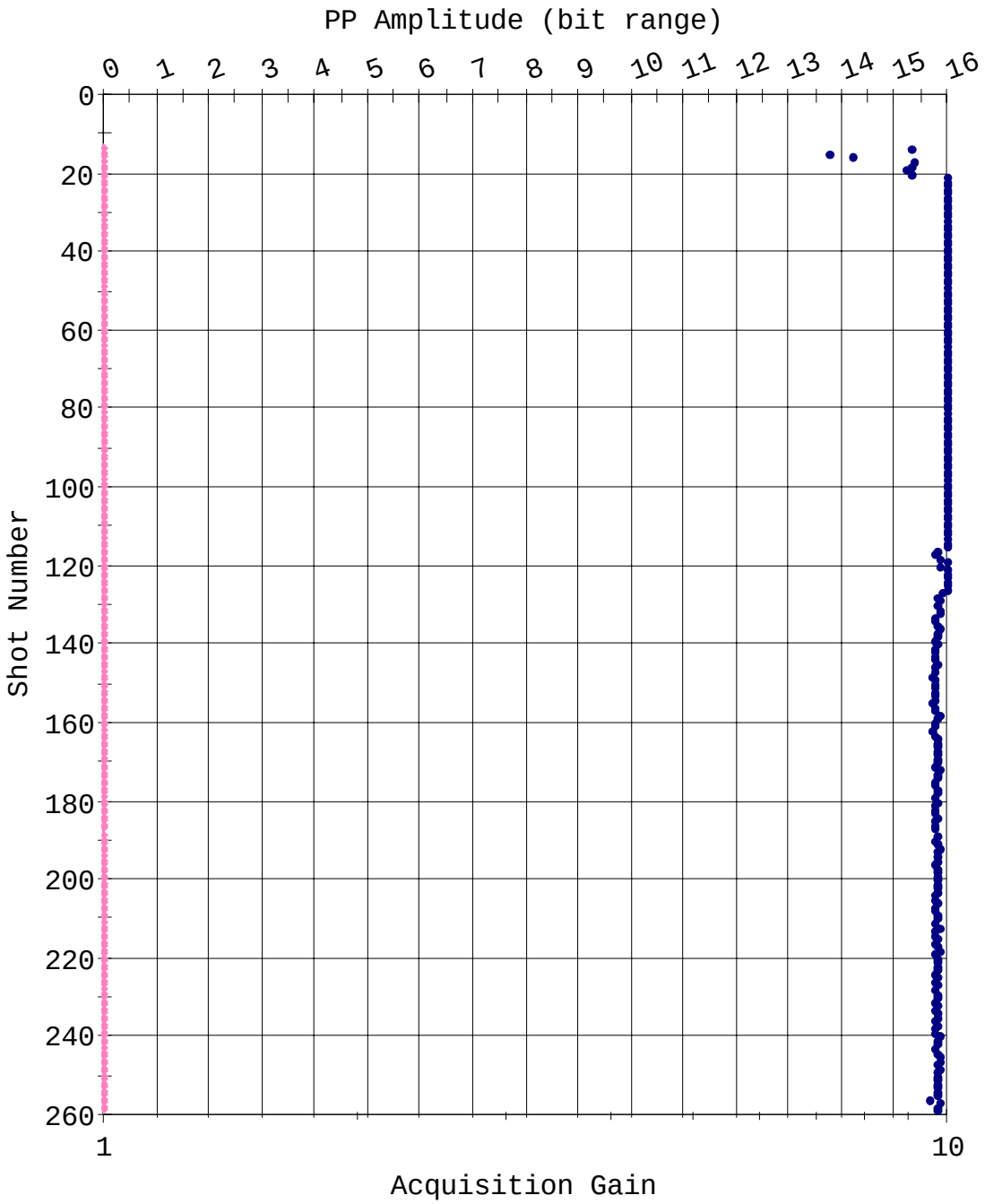
Peak To Peak Plot (Y)



Peak To Peak Plot (Z)

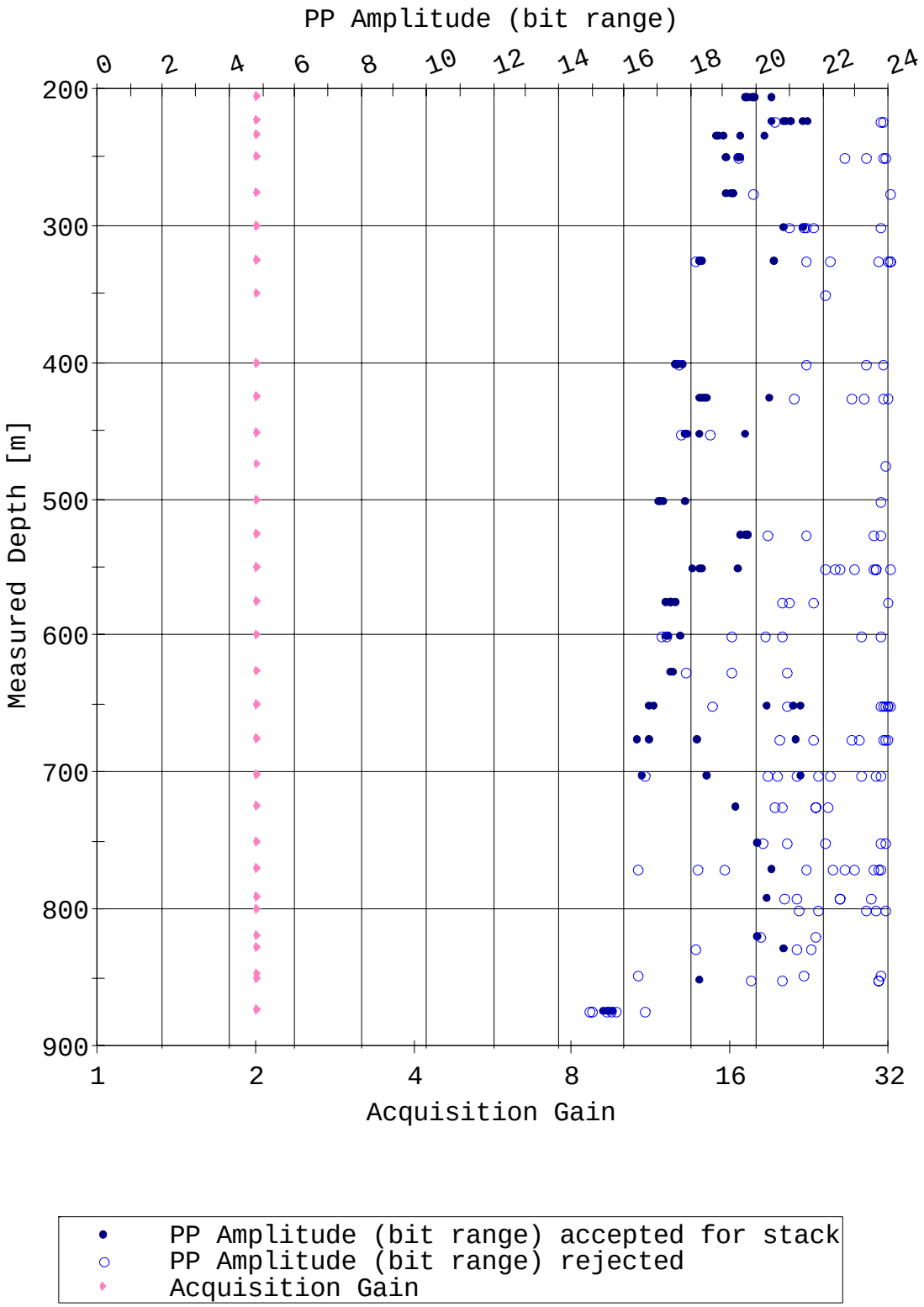


Amplitude QC Plot (Surface)

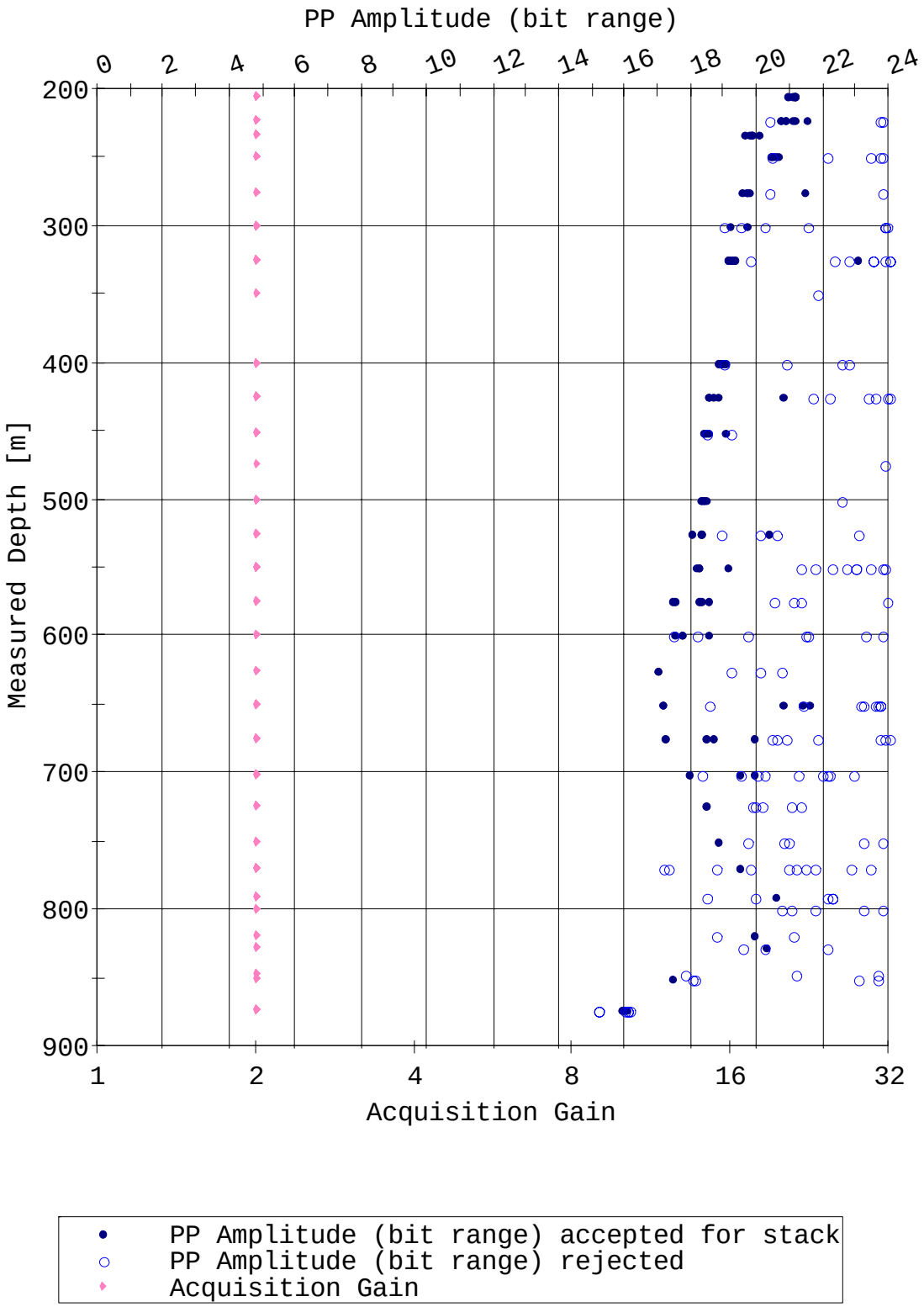


PP Amplitude (bit range) accepted for stack
PP Amplitude (bit range) rejected
Acquisition Gain

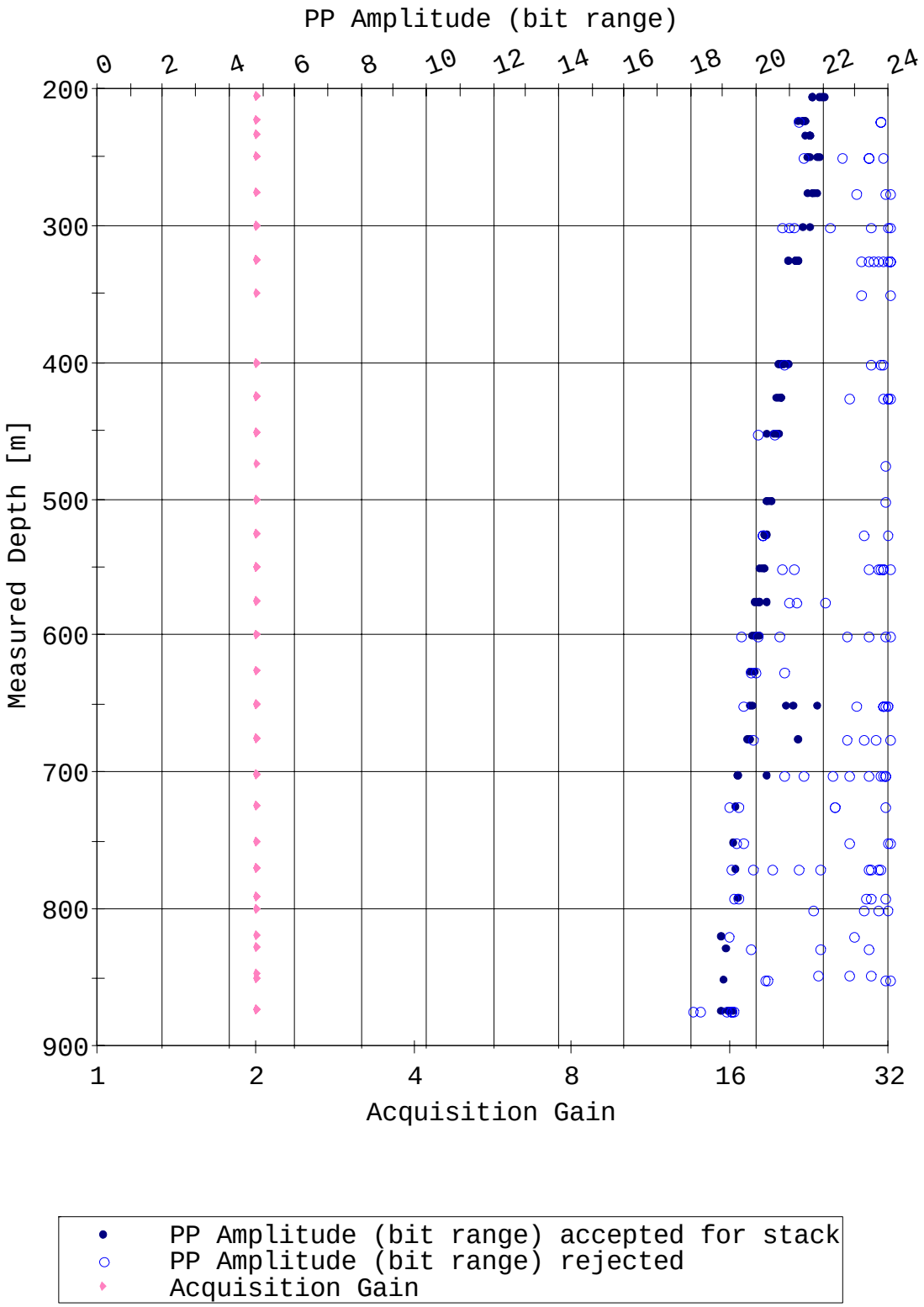
Amplitude QC Plot (X)



Amplitude QC Plot (Y)



Amplitude QC Plot (Z)



VSI Seismic Evaluation Report

ELECTRICAL NOISE LOW TEST

2015/09/11 05:07:37

Shot No: 1 | **Station Depth: 1.07 m**

Evaluation Item	Shuttle	Channel	Value	Unit	Lower Limit	Upper Limit	Result
DC Offset	1	X	-25.4671	milli V	-100.0000	100.0000	PASS
RMS Noise Level	1	X	0.1240	micro V	-	0.5000	PASS
Noise Peak	1	X	0.4602	micro V	-	2.0000	PASS
DC Offset	1	Y	-25.2628	milli V	-100.0000	100.0000	PASS
RMS Noise Level	1	Y	0.1221	micro V	-	0.5000	PASS
Noise Peak	1	Y	0.4798	micro V	-	2.0000	PASS
DC Offset	1	Z	-25.3649	milli V	-100.0000	100.0000	PASS
RMS Noise Level	1	Z	0.1199	micro V	-	0.5000	PASS
Noise Peak	1	Z	0.4297	micro V	-	2.0000	PASS

ELECTRICAL NOISE HIGH TEST

2015/09/11 05:08:01

Shot No: 2 | **Station Depth: 1.07 m**

Evaluation Item	Shuttle	Channel	Value	Unit	Lower Limit	Upper Limit	Result
DC Offset	1	X	-25.4146	milli V	-100.0000	100.0000	PASS
RMS Noise Level	1	X	0.1197	micro V	-	0.5000	PASS
Noise Peak	1	X	0.4152	micro V	-	2.0000	PASS
DC Offset	1	Y	-24.9241	milli V	-100.0000	100.0000	PASS
RMS Noise Level	1	Y	0.1219	micro V	-	0.5000	PASS
Noise Peak	1	Y	0.3888	micro V	-	2.0000	PASS
DC Offset	1	Z	-24.8556	milli V	-100.0000	100.0000	PASS
RMS Noise Level	1	Z	0.1179	micro V	-	0.5000	PASS
Noise Peak	1	Z	0.4106	micro V	-	2.0000	PASS

ELECTRICAL DISTORTION TEST

2015/09/11 05:08:10

Shot No: 3 | **Station Depth: 1.07 m**

Evaluation Item	Shuttle	Channel	Value	Unit	Lower Limit	Upper Limit	Result
Total Harmonic Distortion	1	X	-103.2345	dB	-	-90.0000	PASS
Total Harmonic Distortion	1	Y	-110.0418	dB	-	-90.0000	PASS
Total Harmonic Distortion	1	Z	-108.7933	dB	-	-90.0000	PASS

SYSTEM DYNAMIC RANGE TEST

2015/09/11 05:08:24

Shot No: 4 | **Station Depth: 1.07 m**

Evaluation Item	Shuttle	Channel	Value	Unit	Lower Limit	Upper Limit	Result
System Dynamic Range	1	X	106.4067	dB	103.0000	-	PASS
System Dynamic Range	1	Y	106.4415	dB	103.0000	-	PASS
System Dynamic Range	1	Z	106.3955	dB	103.0000	-	PASS

AMPLIFIER GAIN 2 TEST

2015/09/11 05:08:38

Shot No: 5 | **Station Depth: 1.07 m**

Evaluation Item	Shuttle	Channel	Value	Unit	Lower Limit	Upper Limit	Result
Gain Accuracy	1	X	0.1421	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	1	X	0.0000	dB	-0.5000	0.5000	PASS
Gain Accuracy	1	Y	0.1462	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	1	Y	0.0000	dB	-0.5000	0.5000	PASS
Gain Accuracy	1	Z	0.1461	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	1	Z	0.0000	dB	-0.5000	0.5000	PASS

AMPLIFIER GAIN 4 TEST

2015/09/11 05:08:48

Shot No: 6 | **Station Depth: 1.07 m**

Evaluation Item	Shuttle	Channel	Value	Unit	Lower Limit	Upper Limit	Result
Gain Accuracy	1	X	0.1387	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	1	X	0.0034	dB	-0.5000	0.5000	PASS

Gain Accuracy	1	Y	0.1457	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	1	Y	0.0004	dB	-0.5000	0.5000	PASS
Gain Accuracy	1	Z	0.1442	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	1	Z	0.0019	dB	-0.5000	0.5000	PASS

AMPLIFIER GAIN 8 TEST

2015/09/11 05:08:58

Shot No: 7 **Station Depth: 1.07 m**

Evaluation Item	Shuttle	Channel	Value	Unit	Lower Limit	Upper Limit	Result
Gain Accuracy	1	X	0.1393	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	1	X	0.0028	dB	-0.5000	0.5000	PASS
Gain Accuracy	1	Y	0.1457	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	1	Y	0.0004	dB	-0.5000	0.5000	PASS
Gain Accuracy	1	Z	0.1458	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	1	Z	0.0003	dB	-0.5000	0.5000	PASS

AMPLIFIER GAIN 16 TEST

2015/09/11 05:09:08

Shot No: 8 **Station Depth: 1.07 m**

Evaluation Item	Shuttle	Channel	Value	Unit	Lower Limit	Upper Limit	Result
Gain Accuracy	1	X	0.1362	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	1	X	0.0059	dB	-0.5000	0.5000	PASS
Gain Accuracy	1	Y	0.1419	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	1	Y	0.0043	dB	-0.5000	0.5000	PASS
Gain Accuracy	1	Z	0.1405	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	1	Z	0.0056	dB	-0.5000	0.5000	PASS

AMPLIFIER GAIN 32 TEST

2015/09/11 05:09:18

Shot No: 9 **Station Depth: 1.07 m**

Evaluation Item	Shuttle	Channel	Value	Unit	Lower Limit	Upper Limit	Result
Gain Accuracy	1	X	0.1372	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	1	X	0.0049	dB	-0.5000	0.5000	PASS
Gain Accuracy	1	Y	0.1449	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	1	Y	0.0013	dB	-0.5000	0.5000	PASS
Gain Accuracy	1	Z	0.1391	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	1	Z	0.0071	dB	-0.5000	0.5000	PASS

CROSS TALK X TEST

2015/09/11 05:09:33

Shot No: 10 **Station Depth: 1.07 m**

Evaluation Item	Shuttle	Channel	Value	Unit	Lower Limit	Upper Limit	Result
Cross Talk X-Y	1	-	-100.3900	dB	-	-90.0000	PASS
Cross Talk X-Z	1	-	-98.9621	dB	-	-90.0000	PASS

CROSS TALK Y TEST

2015/09/11 05:09:51

Shot No: 11 **Station Depth: 1.07 m**

Evaluation Item	Shuttle	Channel	Value	Unit	Lower Limit	Upper Limit	Result
Cross Talk Y-Z	1	-	-98.5890	dB	-	-90.0000	PASS
Cross Talk Y-X	1	-	-99.7866	dB	-	-90.0000	PASS

CROSS TALK Z TEST

2015/09/11 05:10:10

Shot No: 12 **Station Depth: 1.07 m**

Evaluation Item	Shuttle	Channel	Value	Unit	Lower Limit	Upper Limit	Result
Cross Talk Z-X	1	-	-97.1272	dB	-	-90.0000	PASS
Cross Talk Z-Y	1	-	-97.0043	dB	-	-90.0000	PASS

IMPULSE RESPONSE TEST

2015/09/11 05:10:28

Shot No: 13 **Station Depth: 1.07 m**

Evaluation Item	Shuttle	Channel	Value	Unit	Lower Limit	Upper Limit	Result

Amplitude (0.3Hz)	1	X	-1.6266	dB	-5.0000	-	PASS
Amplitude (400Hz)	1	X	-3.5719	dB	-5.0000	-	PASS
Impulse Amplitude	1	X	573.7043	milli V	-	-	-
Phase Diff. at 0.3Hz from X1	1	X	0.0000	degree	-	-	-
Amplitude (0.3Hz)	1	Y	-1.5565	dB	-5.0000	-	PASS
Amplitude (400Hz)	1	Y	-3.5672	dB	-5.0000	-	PASS
Impulse Amplitude	1	Y	574.2880	milli V	-	-	-
Phase Diff. at 0.3Hz from X1	1	Y	-0.5555	degree	-	-	-
Amplitude (0.3Hz)	1	Z	-1.6624	dB	-5.0000	-	PASS
Amplitude (400Hz)	1	Z	-3.5701	dB	-5.0000	-	PASS
Impulse Amplitude	1	Z	574.1744	milli V	-	-	-
Phase Diff. at 0.3Hz from X1	1	Z	0.2335	degree	-	-	-

Company: International Ocean Discovery Program | Well: Expedition 356, Site U1462 C

Output DLIS Files

DEFAULT	VSIT_019LUP	FN:28	PRODUCER	11−Sep−2015 07:43
BACKUP	VSIT_019LUP	FN:29	PRODUCER	11−Sep−2015 07:43

OP System Version: 19C0−187

VSIT−C	19C0−187	EDTC−B	SKK−5169−EDTCB

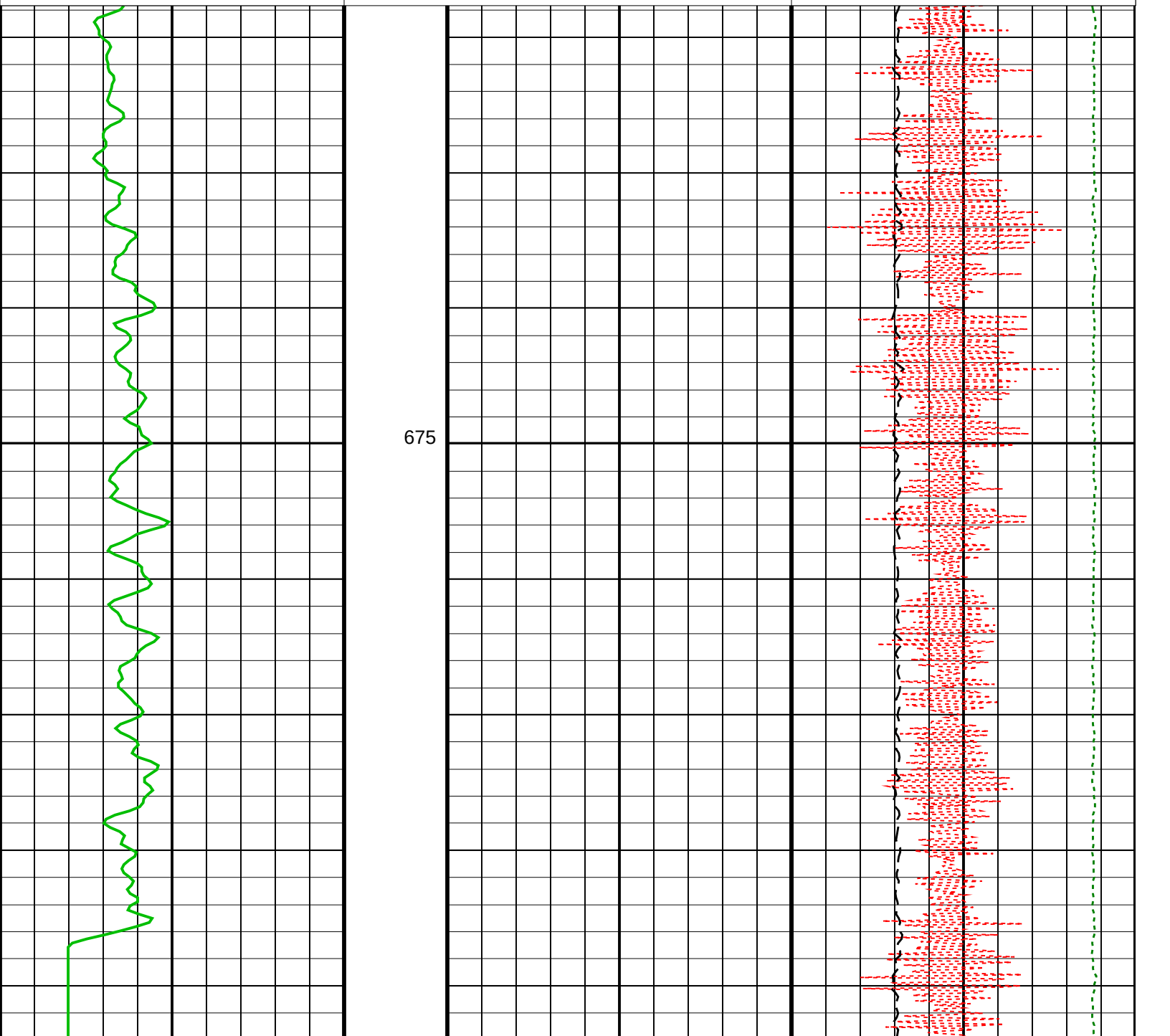
Tension (TENS)
10000 (LBF) 0

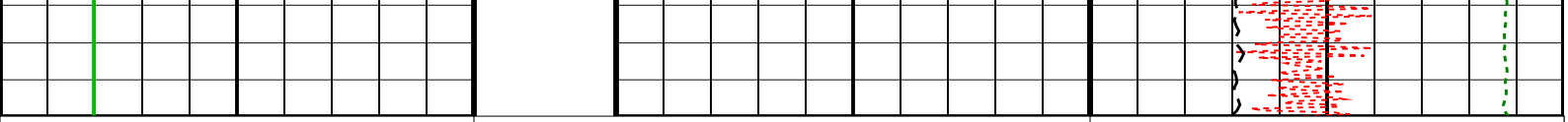
Calibrated Downhole Force (CDF)
−200 (LBF) 1800

Gamma Ray (GR_EDTC)
0 (GAPI) 100

Tie In

EDTC Z−Axis Accelerometer (AZ_EDTC)
8 (M/S2) 12





Gamma Ray (GR_EDTC)		
0	(GAPI)	100

EDTC Z−Axis Accelerometer (AZ_EDTC)		
8	(M/S2)	12

Calibrated Downhole Force (CDF)		
−200	(LBF)	1800

Tension (TENS)		
10000	(LBF)	0

Format: CORRELATION_EDTCB **Vertical Scale: 1:200** **Graphics File Created: 11−Sep−2015 07:43**

OP System Version: 19C0−187

VSIT−C	19C0−187	EDTC−B	SKK−5169−EDTCB

Output DLIS Files

DEFAULT	VSIT_019LUP	FN:28	PRODUCER	11−Sep−2015 07:43
BACKUP	VSIT_019LUP	FN:29	PRODUCER	11−Sep−2015 07:43

Calibration and Check Summary

Measurement	Nominal	Master	Before	After	Change	Limit	Units
Enhanced DTS Cartridge Wellsite Calibration − EDTC Accelerometer Calibration							
Before: 10−Sep−2015 23:00							
EDTC Z−Axis Acceleration	9.810	N/A	9.820	N/A	N/A	N/A	M/S2
Enhanced DTS Cartridge Wellsite Calibration − Detector Calibration							
Before: Calibration out of date 5−Aug−2015 7:56							
Gamma Ray (Jig − Bkg)	152.3	N/A	152.3	N/A	N/A	13.85	GAPI
Gamma Ray (Calibrated)	164.0	N/A	164.0	N/A	N/A	15.00	GAPI

Enhanced DTS Cartridge / Equipment Identification

Primary Equipment:		
EDTC Gamma Ray Detector	EDTG − A/B	8305
Enhanced DTS Cartridge	EDTC − B	8317
Auxiliary Equipment:		
EDTC Housing	EDTH − B	8303

Enhanced DTS Cartridge Wellsite Calibration

EDTC Accelerometer Calibration

Phase	EDTC Z−Axis Acceleration M/S2	Value
Before		9.820

9.610 (Minimum) 9.810 (Nominal) 10.01 (Maximum)

Before: 10−Sep−2015 23:00

Enhanced DTS Cartridge Wellsite Calibration

Detector Calibration

Phase	Gamma Ray Background GAPI	Value	Phase	Gamma Ray (Jig − Bkg) GAPI	Value	Phase	Gamma Ray (Calibrated) GAPI	Value
Before		9.594	Before		152.3	Before		164.0

0 (Minimum) 30.00 (Nominal) 120.0 (Maximum)

138.5 (Minimum) 152.3 (Nominal) 166.2 (Maximum)

149.0 (Minimum) 164.0 (Nominal) 179.0 (Maximum)

Before: Calibration out of date 5−Aug−2015 7:56