Q-Borehole Survey Report

Schlumberger

Survey type:	Verticle Seismic Profile
Company:	International Ocean Discovery Program
Well:	Expedition 374, Site U1521A
Field:	Ross Sea W. Antarctic Ice Sheet History
Country:	
Run:	1
Date:	20-Jan-2018

Recorded by: K. Swain

Witnessed by: Z. Mateo, J. Gales, L. De Santis

Well Information

Company	**International Ocean Discovery Program**
Well	**Expedition 374, Site U1521A**
Field	**Ross Sea W. Antarctic Ice Sheet History**
Country	
State	Southern
Logging Date	20-Jan-2018
Run Number	1
Service Order	
Well Head (Latitude)	S 75.6839
Well Head (Longitude)	W 179.67179
Well Head (X Coordinate)	0.0 UTM
Well Head (Y Coordinate)	0.0 UTM
Total Depth - Driller	1223.0 m
Total Depth - Logger	1221.0 m
Maximum Hole Deviation	8.9 deg
Azimuth of Maximum Deviation	
Program Version	19C0-187
Bit Size	9.875 in
Recorded by	K. Swain
Witnessed by	Z. Mateo, J. Gales, L. De Santis

Elevation Information

Permanent Datum	Sea Floor
Elevation Permanent Datum	-573.0 m
Above Permanent Datum	573.0 m
Drilling Measured From	Rig Floor
Derrick Floor	0.0 m
Ground Level	-573.0 m
Kelly Bush	0.0 m
Log Measured From	Rig Floor
Elevation Log Zero	0.0 m

Depth Corrected Information

Water Velocity	1450.0 m/s
Seismic Reference Datum	0.0 m

Remarks

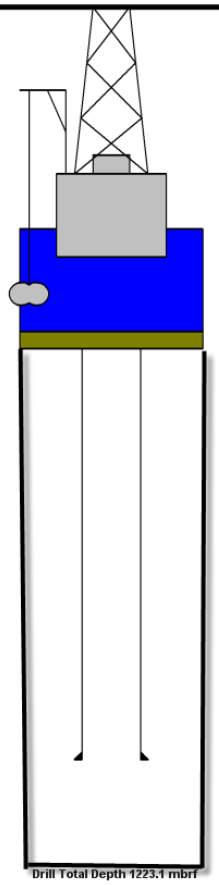
Hole drilled with RCB bottom hole assembly (BHA) at 9-7/8" BS
Bit dropped using Mechanical Bit Release (MBR) prior to logging.
Drilled TD was 1223mbrf.
Drill pipe set at 632mbrf.
Fluid type was Sepeolite mud weighted with Barite to a density of ppg (g/cc)
Depth recorded from drill floor; logs presented as-logged without depth corrections or shifts, as per client instructions.
All logs presented in wireline measured depth below rig floor (MDBRF).
Caliper opened during upward passes; closed inside pipe.
AHC used from TD then switched off to facilitate pipe entry.
10.5 lb/gal mud pumped in hole prior to logging.
Caliper closed prior to entering pipe with logging head.

Well Sketch

Client: **IODP**
Well: **Exp 374, U1521 A**
Field:
State:
Country: **Ross Sea W. Antarctic Ice Sheet**

Rig Name: **JOIDES Resolution**
Reference Datum: Mean Sea Level
Elevation: 0.0 m

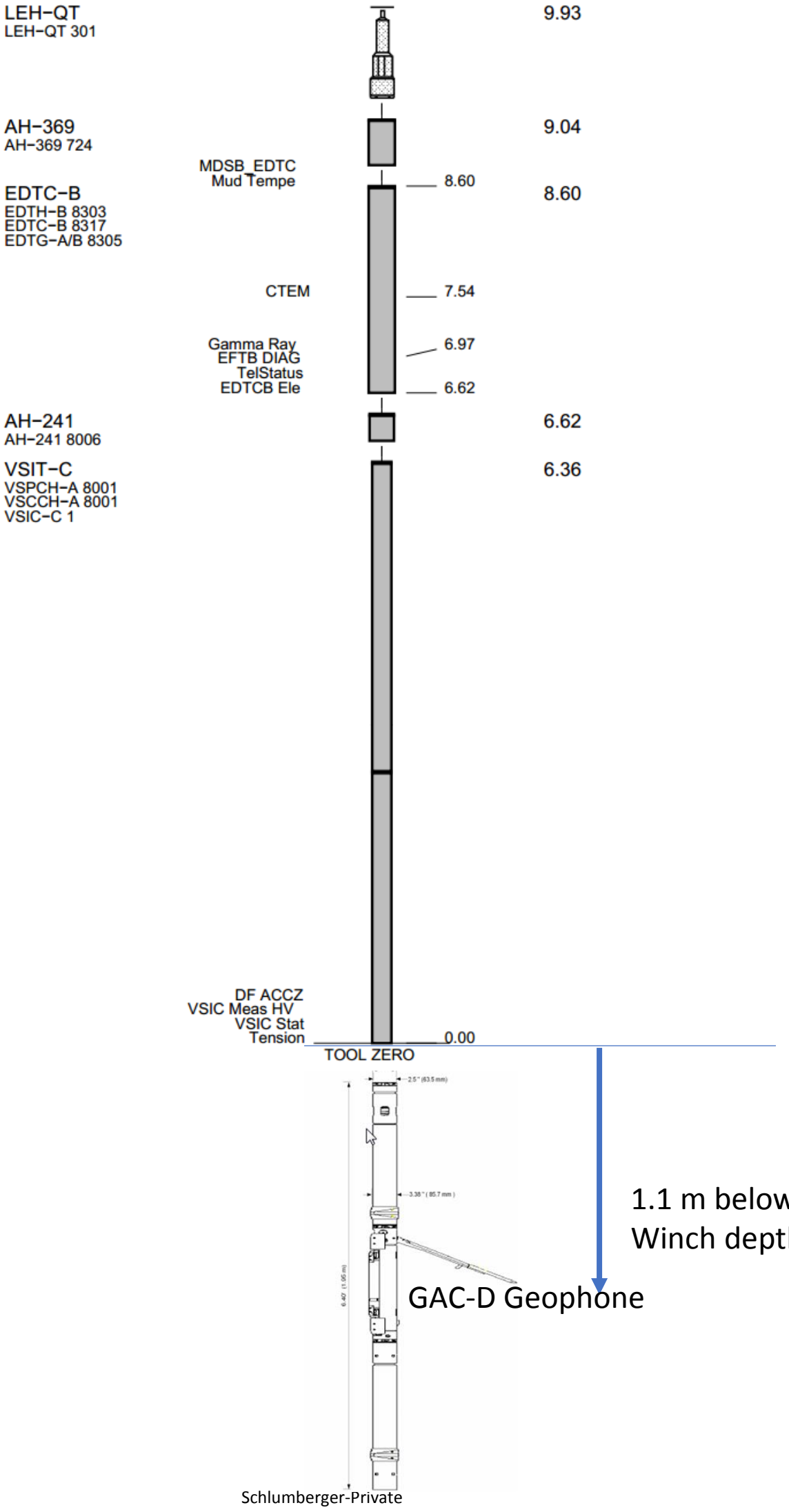
Production String	(in) OD	(in) ID	(m) MD	Well Schematic	(m) MD	(in) OD	(in) ID	Casing String
Kelly Bushing Elevation			0					
Derrick Floor Elevation			0					
Mean Sea Level			11					
Seismic Gun depth below MSL			18					
					573			Sea Bed
					632.1	4.125		Drill Pipe
Driller's Depths				Drill Total Depth 1223.1 mbrf	**1223**	**9.875**		**Total Depth**



SURFACE EQUIPMENT

WSAM 808
WITM (EDTS)-A 1

DOWNHOLE EQUIPMENT



Well Information

Well Type	Open Hole
Rig / Platform Type	Drill ship
Well Reference Azimuth (Magnetic, True, or Grid North)	True

Elevation Information

Water Depth	562 m below mean sea level
Water Temperature	1 deg C
Water Salinity	n/a
Weathered Zone Depth	n/a
Elevation Depth	n/a

Sea Condition

Sea Condition	calm
Wave Height	calm
High Tide Level	
High Tide Time	
Low Tide Level	
Low Tide Time	

Velocity Information

Weathered Velocity	
Elevation Velocity	

Job Summary:

This survey was conducted as a fixed offset (zero offset) vertical seismic profile from a drill ship using 2 client provide air guns suspended by crane #3 (aft) on port side. Primary objective was to collect a vertical seismic profile including checkshot transit time data in open hole without casing. A VSI tool single shuttle was conveyed with wireline through drill pipe with the pipe being set at 632m below rig floor and 59 m below sea floor. The survey conducted levels from total depth TD to within reasonable distance from the drill pipe without causing concern for safety of the equipment.

The job resulted in 16 stacked wave forms at 16 different depth with most of these data stacked with 5 shots but some are less than 5 shots as it was not possible to obtain 5 shots at every level due to noise from tool movement or other sources that could not be corrected. Survey levels provided by L. De Santis and B. Romans with some levels obtained as the next best depth.

Downhole Equipment Information

Tool Type	VSI single shuttle
Surface Equipment	WSI
Combined Tool	EDTC-B
Number of Shuttles	1
Nominal Receiver Spacing	1.1m below tool zero
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-PC 8006
Receiver #2	
Receiver #3	
Receiver #4	
Receiver #5	
Receiver #6	
Receiver #7	
Receiver #8	

VSP

General Information

Survey Type	Zero Offset VSP
Surface Recording Length	500.0 ms
Suface Sampling Rate	1.0 ms
Downhole Recording Length	5000.0 ms
Downhole Sampling Rate	1.0 ms
Top of Survey	662.8 m
Bottom of Survey	1221.2 m
Number of Shots	96
Number of Downhole Traces	96
Number of Downhole Traces used for Processing	71

Stack Summary Listing (1/1) from VSI_001_A-IODP_Dual_Airgun_geo_wavefield_z.ldf

Stack Number	Measured Depth [m]	True Vertical Depth [m]	Measured Time [s]	One-way Vertical Time [s]	Two-way Vertical Time [s]	Interval Velocity [m/s]	Average Velocity [m/s]	RMS Velocity [m/s]
	0	0	0	0	0			
						1482.0		
18	703.0	692.0	0.4618	0.4669	0.9338		1482.0	1482.0
						1411.0		
17	718.0	707.0	0.4725	0.4776	0.9551		1480.4	1480.5
						1673.8		
16	770.0	759.0	0.5034	0.5086	1.0172		1492.2	1493.0
						1833.0		
14	811.0	800.0	0.5258	0.5310	1.0620		1506.6	1508.9
						1988.3		
13	869.9	858.9	0.5553	0.5606	1.1213		1532.1	1538.0
						2272.0		
12	898.0	887.0	0.5676	0.5730	1.1459		1548.0	1557.4
						2351.1		
11	923.0	912.0	0.5782	0.5836	1.1672		1562.6	1575.5
						2208.3		
10	953.0	942.0	0.5918	0.5972	1.1944		1577.3	1592.7
						2314.5		
9	994.0	983.0	0.6094	0.6149	1.2298		1598.6	1618.0
						2380.9		
8	1031.0	1020.0	0.6249	0.6305	1.2609		1617.8	1641.0
						2198.6		
7	1053.0	1042.0	0.6349	0.6405	1.2809		1626.9	1651.2
						2187.4		
6	1073.0	1062.0	0.6441	0.6496	1.2992		1634.8	1659.9
						2134.2		
5	1102.9	1091.9	0.6581	0.6636	1.3272		1645.3	1671.3
						2296.5		
4	1140.9	1129.9	0.6746	0.6802	1.3603		1661.2	1689.3
						2736.2		
3	1193.0	1182.0	0.6936	0.6992	1.3984		1690.5	1726.2
						2585.3		
2	1221.2	1210.2	0.7045	0.7101	1.4202		1704.2	1742.6

Shot Summary Listing (1/1)

Measured Depth [m]	Tool Number	Stack Number	Relative Bearing [deg]	Caliper [in]	Anchoring force [kg]	Shot number
703.0	1	18	12.3	13.1	854.8	101, 103, 104, 105, 106
718.0	1	17	-5.2	13.3	855.0	96
770.0	1	16	-10.7	13.3	682.0	91, 92, 93
811.0	1	14	-5.5	13.2	833.6	79, 81, 82, 83, 86
869.9	1	13	-7.2	11.2	746.5	74, 75, 76, 77, 78
898.0	1	12	-2.9	11.8	747.4	66, 68, 69, 70, 71
923.0	1	11	2.4	11.1	844.5	62, 64
953.0	1	10	6.4	11.1	794.8	57, 58, 59, 60, 61
994.0	1	9	0.9	11.2	806.0	51, 52, 53, 54, 55
1031.0	1	8	2.1	10.9	891.6	46, 47, 48, 49, 50
1053.0	1	7	2.3	11.0	855.9	41, 42, 43, 44, 45
1073.0	1	6	1.0	11.0	911.0	36, 37, 38, 39, 40
1102.9	1	5	0.3	10.7	813.7	31, 32, 33, 34, 35
1140.9	1	4	2.5	11.0	916.7	26, 27, 28, 29, 30
1193.0	1	3	-3.8	10.8	893.4	21, 22, 23, 24, 25
1221.2	1	2	1.6	10.0	813.1	15, 16, 17, 19, 20

Observer's Note (1/2)

Well depth [m]	Time	Shot Type	Shot#	Stack#	Source	Remarks
1.1	11:20:54	ENLO	1			Surface check
1.1	11:21:18	ENHI	2			
1.1	11:21:27	ETHD	3			
1.1	11:21:41	DRNG	4			
1.1	11:21:55	GA02	5			
1.1	11:22:05	GA04	6			
1.1	11:22:15	GA08	7			
1.1	11:22:25	GA16	8			
1.1	11:22:35	GA32	9			
1.1	11:22:50	XTLK	10			
1.1	11:23:08	XTLK	11			
1.1	11:23:27	XTLK	12			
1.1	11:23:45	EIMP	13			
1221.2	13:09:39	SHOT	14	2	A-IODP_Dual_Airgun	
1221.2	13:13:48	SHOT	15	2	A-IODP_Dual_Airgun	great
1221.2	13:14:42	SHOT	16	2	A-IODP_Dual_Airgun	great
1221.2	13:15:41	SHOT	17	2	A-IODP_Dual_Airgun	great
1221.2	13:16:51	SHOT	18	2	A-IODP_Dual_Airgun	
1221.2	13:19:27	SHOT	19	2	A-IODP_Dual_Airgun	great
1221.2	13:19:49	SHOT	20	2	A-IODP_Dual_Airgun	great
1193.0	13:35:35	SHOT	21	3	A-IODP_Dual_Airgun	Z ok
1193.0	13:35:53	SHOT	22	3	A-IODP_Dual_Airgun	Z ok
1193.0	13:36:48	SHOT	23	3	A-IODP_Dual_Airgun	Z ok
1193.0	13:37:22	SHOT	24	3	A-IODP_Dual_Airgun	Z ok
1193.0	13:37:47	SHOT	25	3	A-IODP_Dual_Airgun	Zok
1140.9	13:48:19	SHOT	26	4	A-IODP_Dual_Airgun	good z
1140.9	13:48:38	SHOT	27	4	A-IODP_Dual_Airgun	good
1140.9	13:49:14	SHOT	28	4	A-IODP_Dual_Airgun	good z
1140.9	13:49:55	SHOT	29	4	A-IODP_Dual_Airgun	good z
1140.9	13:51:47	SHOT	30	4	A-IODP_Dual_Airgun	good z
1102.9	13:58:00	SHOT	31	5	A-IODP_Dual_Airgun	
1102.9	13:58:26	SHOT	32	5	A-IODP_Dual_Airgun	
1102.9	13:59:04	SHOT	33	5	A-IODP_Dual_Airgun	
1102.9	13:59:22	SHOT	34	5	A-IODP_Dual_Airgun	
1102.9	13:59:40	SHOT	35	5	A-IODP_Dual_Airgun	
1073.0	14:05:50	SHOT	36	6	A-IODP_Dual_Airgun	
1073.0	14:06:28	SHOT	37	6	A-IODP_Dual_Airgun	
					A-	

1073.0	14:06:48	SHOT	38	6	IODP_Dual_Airgun	
1073.0	14:07:09	SHOT	39	6	A-IODP_Dual_Airgun	
1073.0	14:07:27	SHOT	40	6	A-IODP_Dual_Airgun	good
1053.0	14:14:21	SHOT	41	7	A-IODP_Dual_Airgun	
1053.0	14:14:39	SHOT	42	7	A-IODP_Dual_Airgun	
1053.0	14:14:57	SHOT	43	7	A-IODP_Dual_Airgun	
1053.0	14:15:17	SHOT	44	7	A-IODP_Dual_Airgun	
1053.0	14:15:39	SHOT	45	7	A-IODP_Dual_Airgun	
1031.0	14:21:25	SHOT	46	8	A-IODP_Dual_Airgun	
1031.0	14:21:44	SHOT	47	8	A-IODP_Dual_Airgun	
1031.0	14:22:02	SHOT	48	8	A-IODP_Dual_Airgun	
1031.0	14:22:20	SHOT	49	8	A-IODP_Dual_Airgun	
1031.0	14:22:38	SHOT	50	8	A-IODP_Dual_Airgun	
994.0	14:28:23	SHOT	51	9	A-IODP_Dual_Airgun	
994.0	14:28:41	SHOT	52	9	A-IODP_Dual_Airgun	
994.0	14:28:59	SHOT	53	9	A-IODP_Dual_Airgun	
994.0	14:29:17	SHOT	54	9	A-IODP_Dual_Airgun	
994.0	14:29:47	SHOT	55	9	A-IODP_Dual_Airgun	
994.0	14:30:20	SHOT	56	9	A-IODP_Dual_Airgun	
953.0	14:36:43	SHOT	57	10	A-IODP_Dual_Airgun	
953.0	14:37:01	SHOT	58	10	A-IODP_Dual_Airgun	
953.0	14:37:24	SHOT	59	10	A-IODP_Dual_Airgun	

Observer's Note (2/2)

Well depth[m]	Time	Shot Type	Shot#	Stack#	Source	Remarks
953.0	14:37:42	SHOT	60	10	A-IODP_Dual_Airgun	
953.0	14:38:00	SHOT	61	10	A-IODP_Dual_Airgun	
923.0	14:42:58	SHOT	62	11	A-IODP_Dual_Airgun	
923.0	14:43:16	SHOT	63	11	A-IODP_Dual_Airgun	
923.0	14:43:34	SHOT	64	11	A-IODP_Dual_Airgun	
923.0	14:43:57	SHOT	65	11	A-IODP_Dual_Airgun	
898.0	14:49:39	SHOT	66	12	A-IODP_Dual_Airgun	
898.0	14:49:57	SHOT	67	12	A-IODP_Dual_Airgun	
898.0	14:50:27	SHOT	68	12	A-IODP_Dual_Airgun	

898.0	14:50:45	SHOT	69	12	A-IODP_Dual_Airgun	
898.0	14:51:04	SHOT	70	12	A-IODP_Dual_Airgun	
898.0	14:51:22	SHOT	71	12	A-IODP_Dual_Airgun	
869.9	14:56:49	SHOT	72	13	A-IODP_Dual_Airgun	
869.9	14:57:07	SHOT	73	13	A-IODP_Dual_Airgun	
869.9	14:57:25	SHOT	74	13	A-IODP_Dual_Airgun	
869.9	14:57:44	SHOT	75	13	A-IODP_Dual_Airgun	
869.9	14:58:03	SHOT	76	13	A-IODP_Dual_Airgun	
869.9	14:58:22	SHOT	77	13	A-IODP_Dual_Airgun	
869.9	14:58:40	SHOT	78	13	A-IODP_Dual_Airgun	
811.0	15:09:17	SHOT	79	14	A-IODP_Dual_Airgun	
811.0	15:09:36	SHOT	80	14	A-IODP_Dual_Airgun	
811.0	15:09:54	SHOT	81	14	A-IODP_Dual_Airgun	
811.0	15:10:12	SHOT	82	14	A-IODP_Dual_Airgun	
811.0	15:10:31	SHOT	83	14	A-IODP_Dual_Airgun	
811.0	15:10:57	SHOT	84	14	A-IODP_Dual_Airgun	
811.0	15:11:43	SHOT	85	14	A-IODP_Dual_Airgun	
811.0	15:12:02	SHOT	86	14	A-IODP_Dual_Airgun	
781.0	15:18:30	SHOT	87	15	A-IODP_Dual_Airgun	
781.0	15:18:48	SHOT	88	15	A-IODP_Dual_Airgun	
781.0	15:19:06	SHOT	89	15	A-IODP_Dual_Airgun	
770.0	15:26:16	SHOT	90	16	A-IODP_Dual_Airgun	
770.0	15:26:34	SHOT	91	16	A-IODP_Dual_Airgun	
770.0	15:26:52	SHOT	92	16	A-IODP_Dual_Airgun	
770.0	15:27:10	SHOT	93	16	A-IODP_Dual_Airgun	
770.0	15:27:28	SHOT	94	16	A-IODP_Dual_Airgun	
770.0	15:27:55	SHOT	95	16	A-IODP_Dual_Airgun	
718.0	15:35:29	SHOT	96	17	A-IODP_Dual_Airgun	
718.0	15:35:47	SHOT	97	17	A-IODP_Dual_Airgun	
718.0	15:36:10	SHOT	98	17	A-IODP_Dual_Airgun	
718.0	15:36:28	SHOT	99	17	A-IODP_Dual_Airgun	
718.0	15:36:46	SHOT	100	17	A-IODP_Dual_Airgun	
703.0	15:43:00	SHOT	101	18	A-IODP_Dual_Airgun	

703.0	15:43:18	SHOT	102	18	A-IODP_Dual_Airgun	
703.0	15:43:36	SHOT	103	18	A-IODP_Dual_Airgun	
703.0	15:43:54	SHOT	104	18	A-IODP_Dual_Airgun	
703.0	15:44:12	SHOT	105	18	A-IODP_Dual_Airgun	
703.0	15:44:30	SHOT	106	18	A-IODP_Dual_Airgun	
662.8	15:54:06	SHOT	107	19	A-IODP_Dual_Airgun	
662.8	15:54:50	SHOT	108	19	A-IODP_Dual_Airgun	
662.8	15:55:08	SHOT	109	19	A-IODP_Dual_Airgun	

Source Configuration (Air Gun)

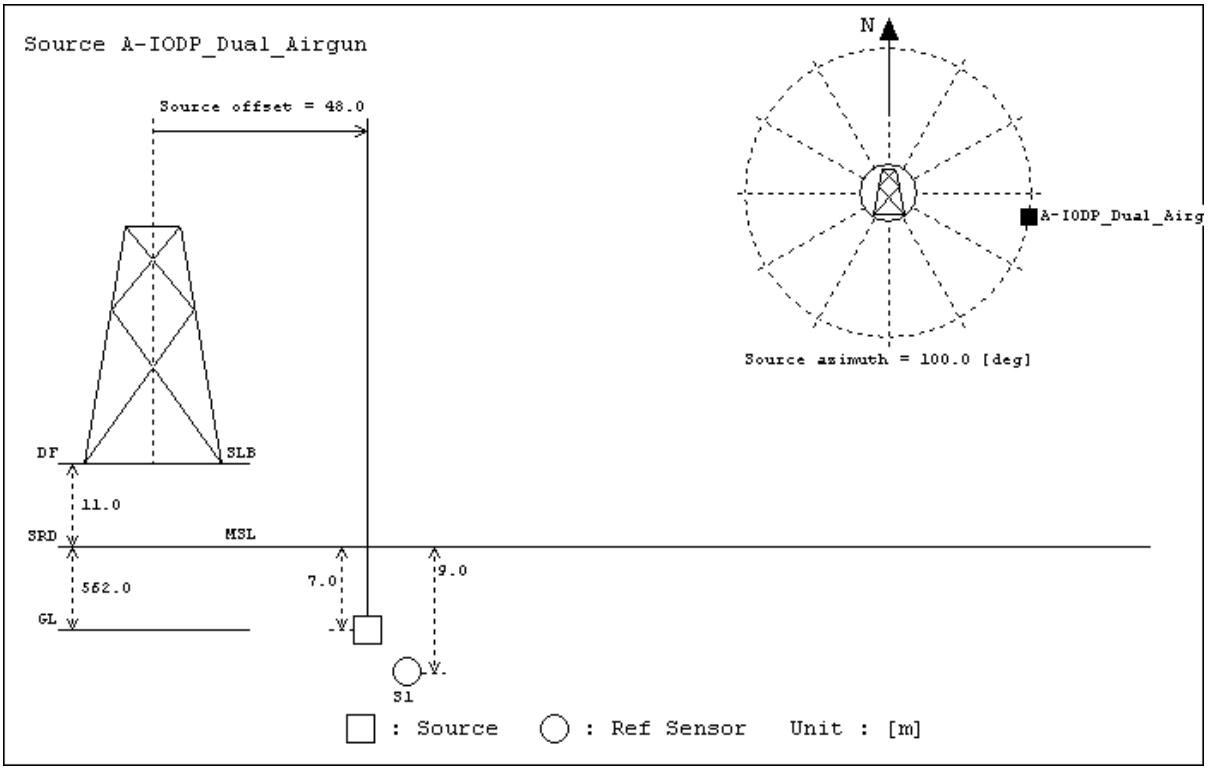
Source Location (Rig, Boat, Pit, Borehole)	Crane #3 (port side aft)
Source Group ID (A, B, C, …)	A IODP Dual Air gun
Source Offset (for fixed offset)	48m
Source Azimuth (for fixed offset)	100 deg (235ship heading + 225 gun angle)
Source Depth from Surface	7m
Source Depth from Logging Zero	18m

Gun Controller Type	WSI
Gun Controller Model Name	WSI-A
Gun Controller Serial Number	864
Gun Type	G-Gun
Gun Serial Number(s)	N/A-IODP
Gun Configuration (3 Gun Cluster, Gun Array, etc.)	2 Gun horizontal cluster
Gun Chamber Volumes	250 cubic inch per gun
Gun Pit/Borehole Information	Offshore air guns in sea
Compressor Type	Rig air
Compressor Flow Rate	n/a
Air Regulator Pressure	1750 psi

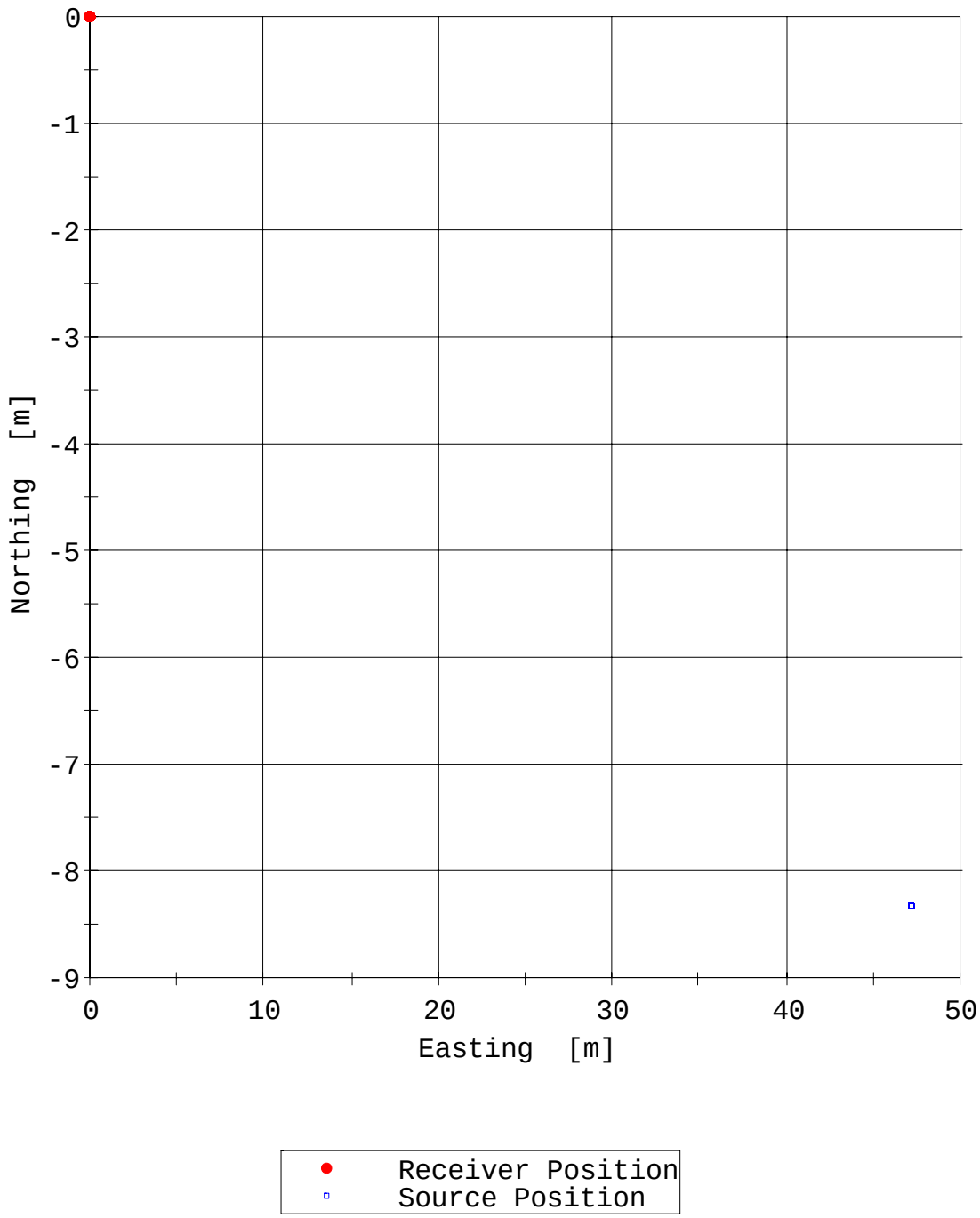
Surface Sensor Configuration

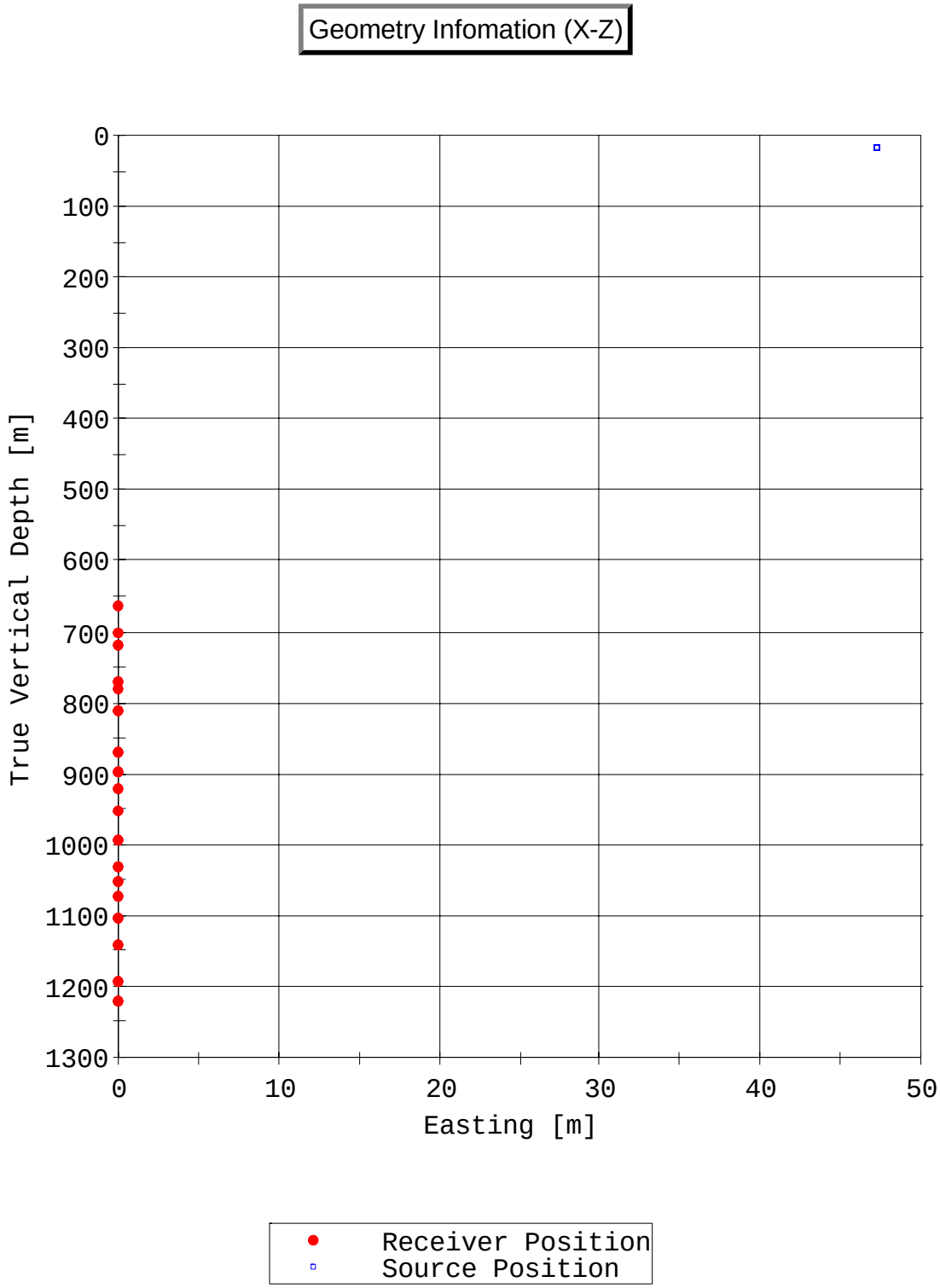
Number of Surface Reference Sensors	1
Surface Recording Length	500ms
Surface Sampling Rate	1ms
Sensor Type (S1)	MP24-H
Sensor Type (S2)	
Sensor Type (S3)	
Sensor Depth from Surface (S1)	9m
Sensor Depth from Surface (S2)	
Sensor Depth from Surface (S3)	
Sensor Depth from Logging Zero (S1)	20m
Sensor Depth from Logging Zero (S2)	
Sensor Depth from Logging Zero (S2)	
Sensor Offset from Source (S1)	0
Sensor Offset from Source (S2)	
Sensor Offset from Source (S3)	

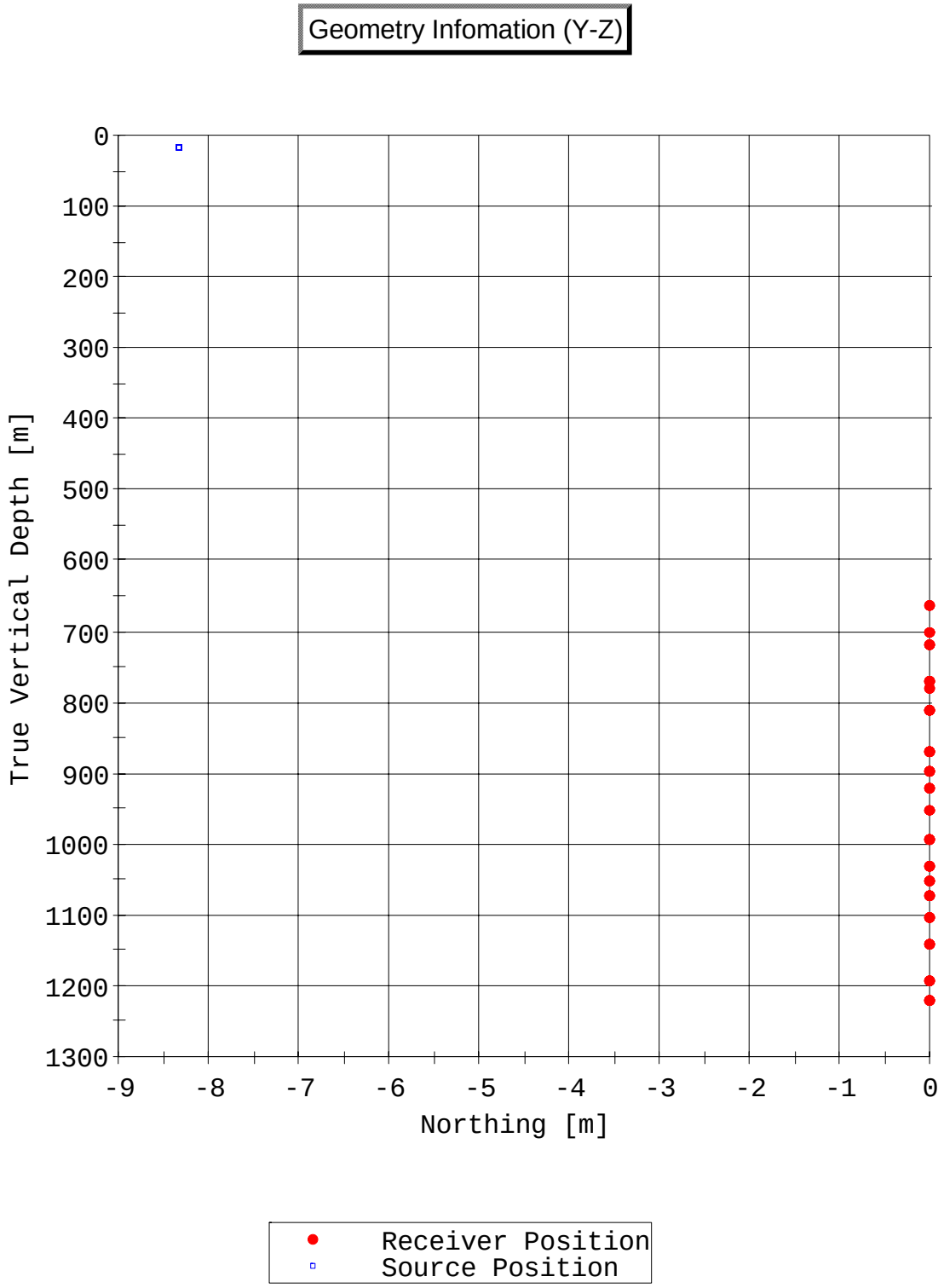
Source Geometry Sketch

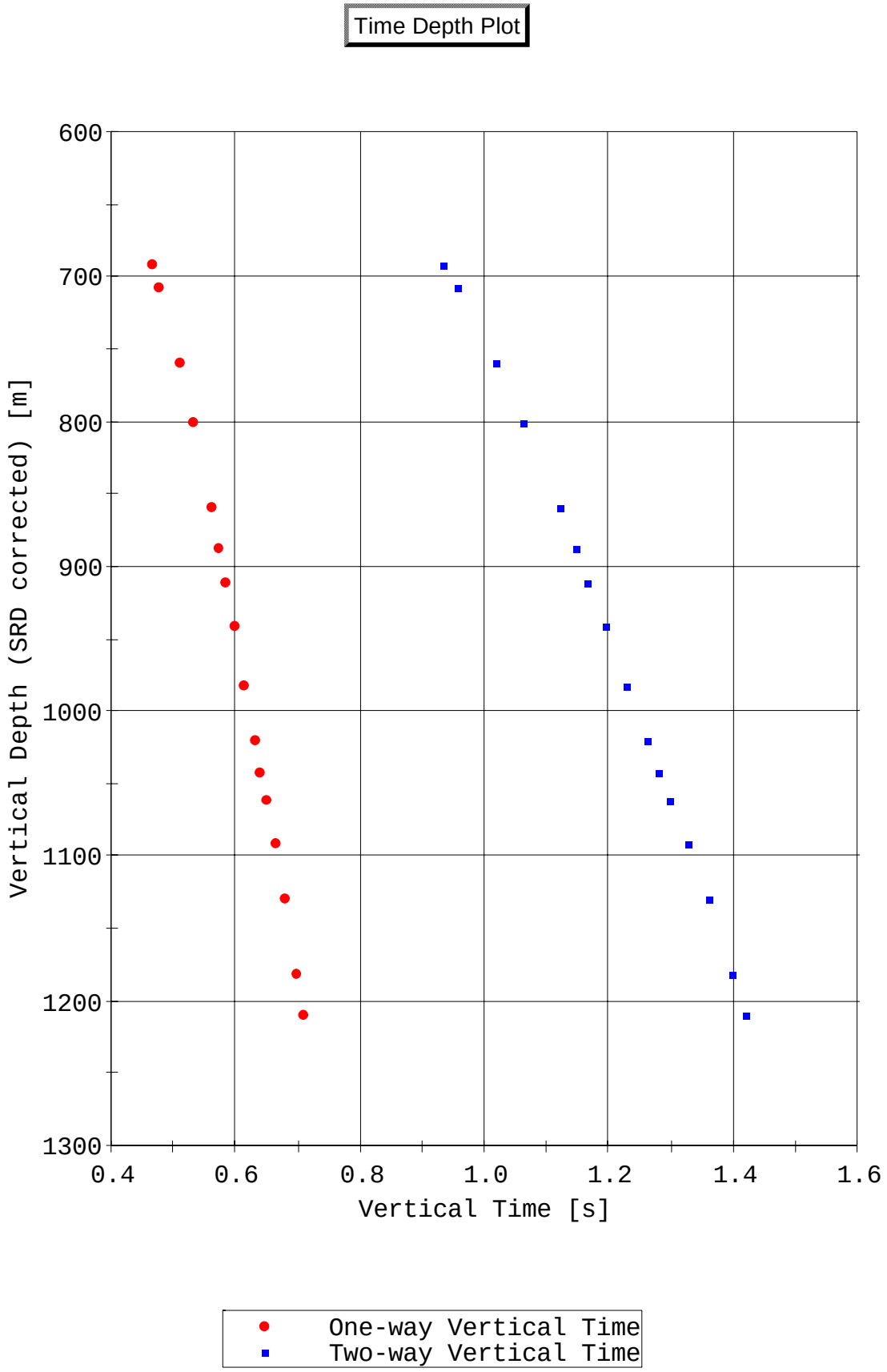


Geometry Infomation (X-Y)

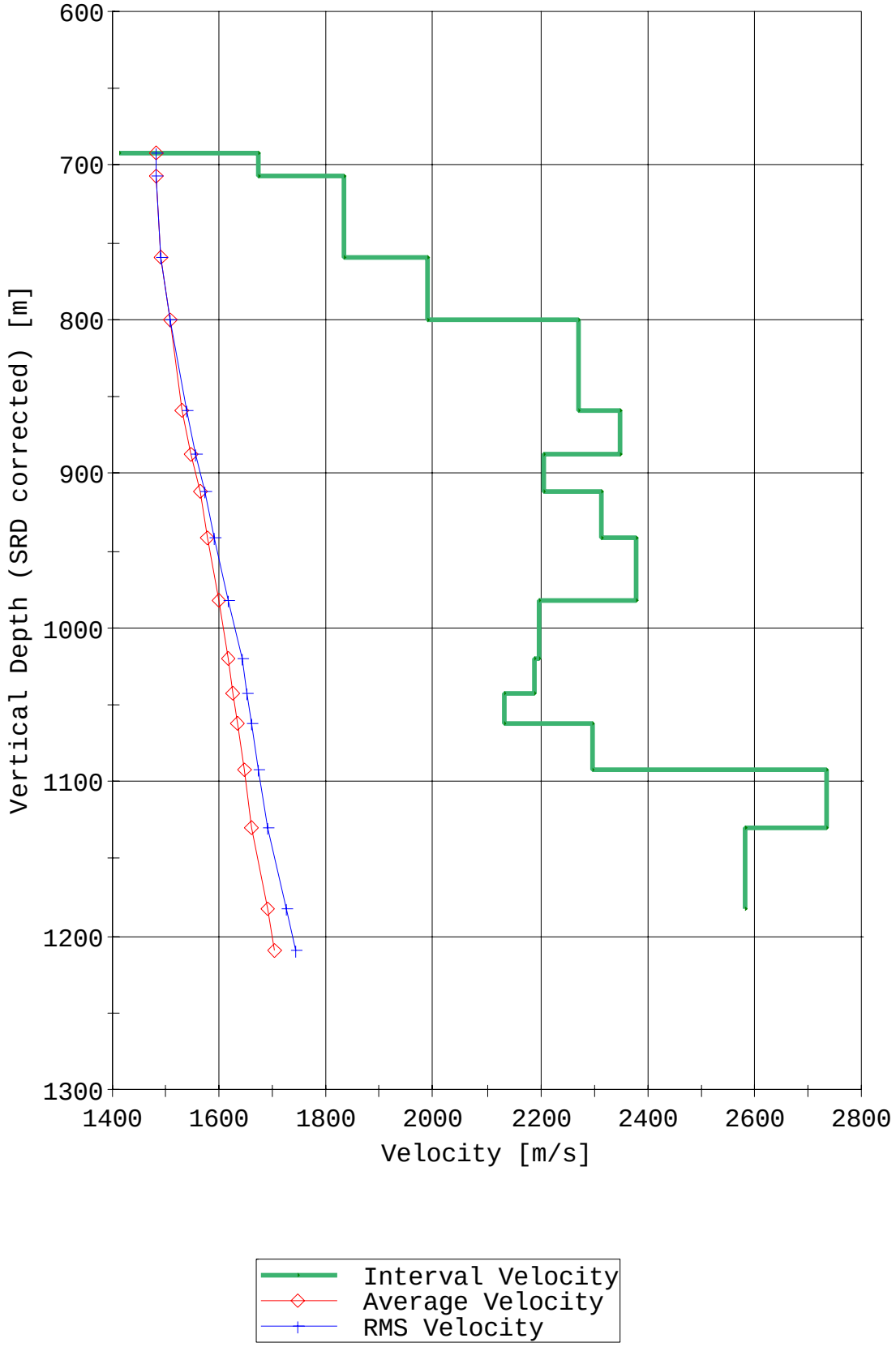


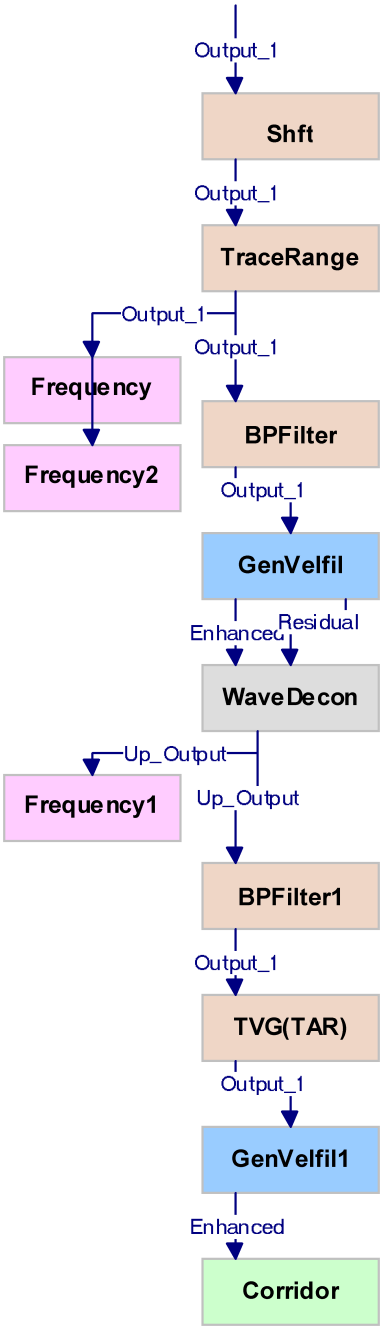

Geometry Infomation (X-Z)
True Vertical Depth [m]
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
0
10
20
30
40
50
Easting [m]
Receiver Position
Source Position


Geometry Infomation (Y-Z)
True Vertical Depth [m]
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
-9
-8
-7
-6
-5
-4
-3
-2
-1
0
Northing [m]
Receiver Position
Source Position


Time Depth Plot
Vertical Depth (SRD corrected) [m]
600
700
800
900
1000
1100
1200
1300
0.4
0.6
0.8
1.0
1.2
1.4
1.6
Vertical Time [s]
One-way Vertical Time
Two-way Vertical Time

Velocity Plot

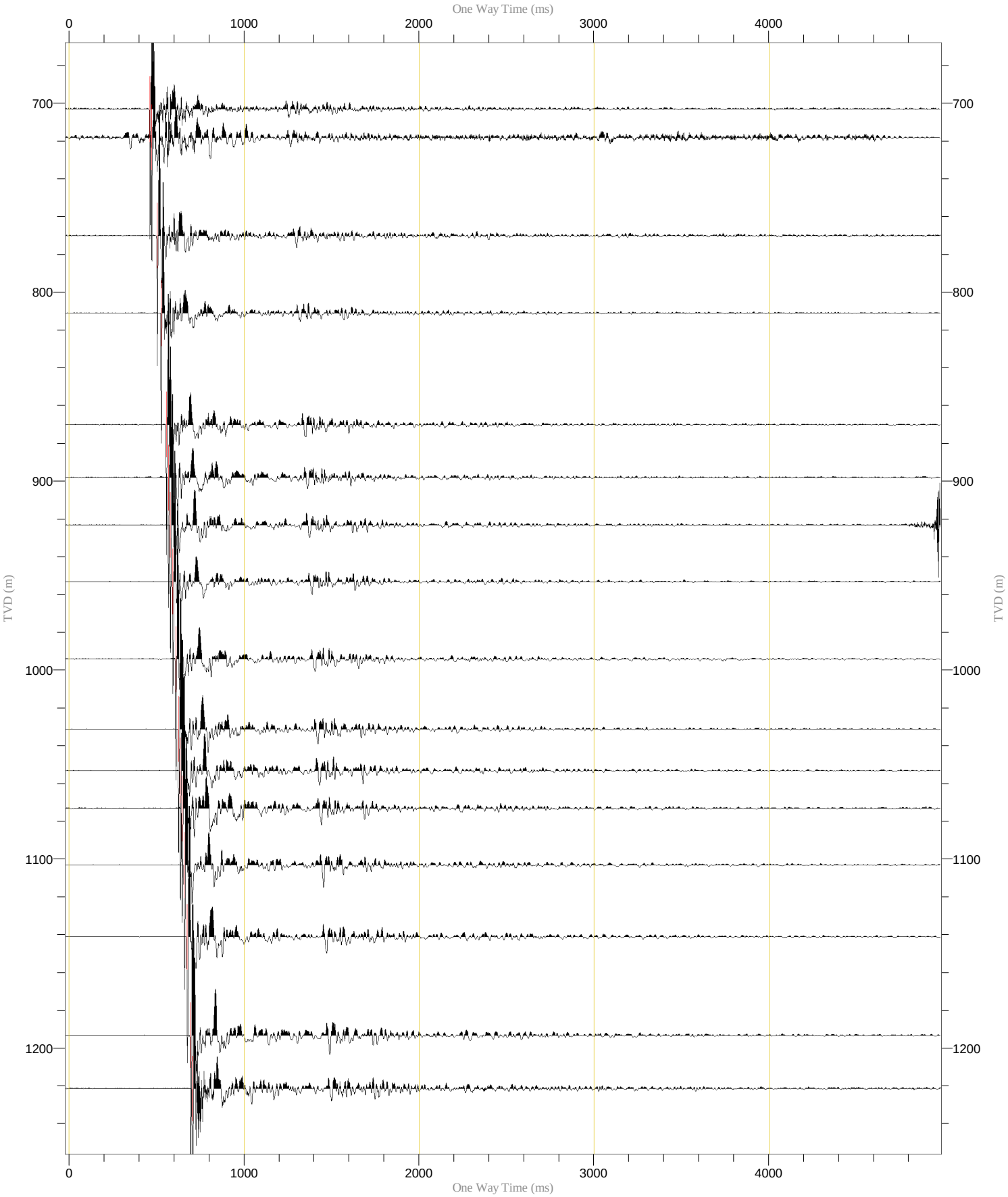


Process Flow	Parameter
	**[LoadLdf]** Input 1: VSI_001_A-IODP_Dual_Airgun_geo_wavefield_z.ldf **[Frequency2]** Process all samples Apply FZ **[BPFilter]** Phase: Zero Band Width: 5.0 - 90.0Hz **[GenVelfil]** Apply internal Normalization/Denormalization Median Filter 9 Traces **[WaveDecon]** Waveshape 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

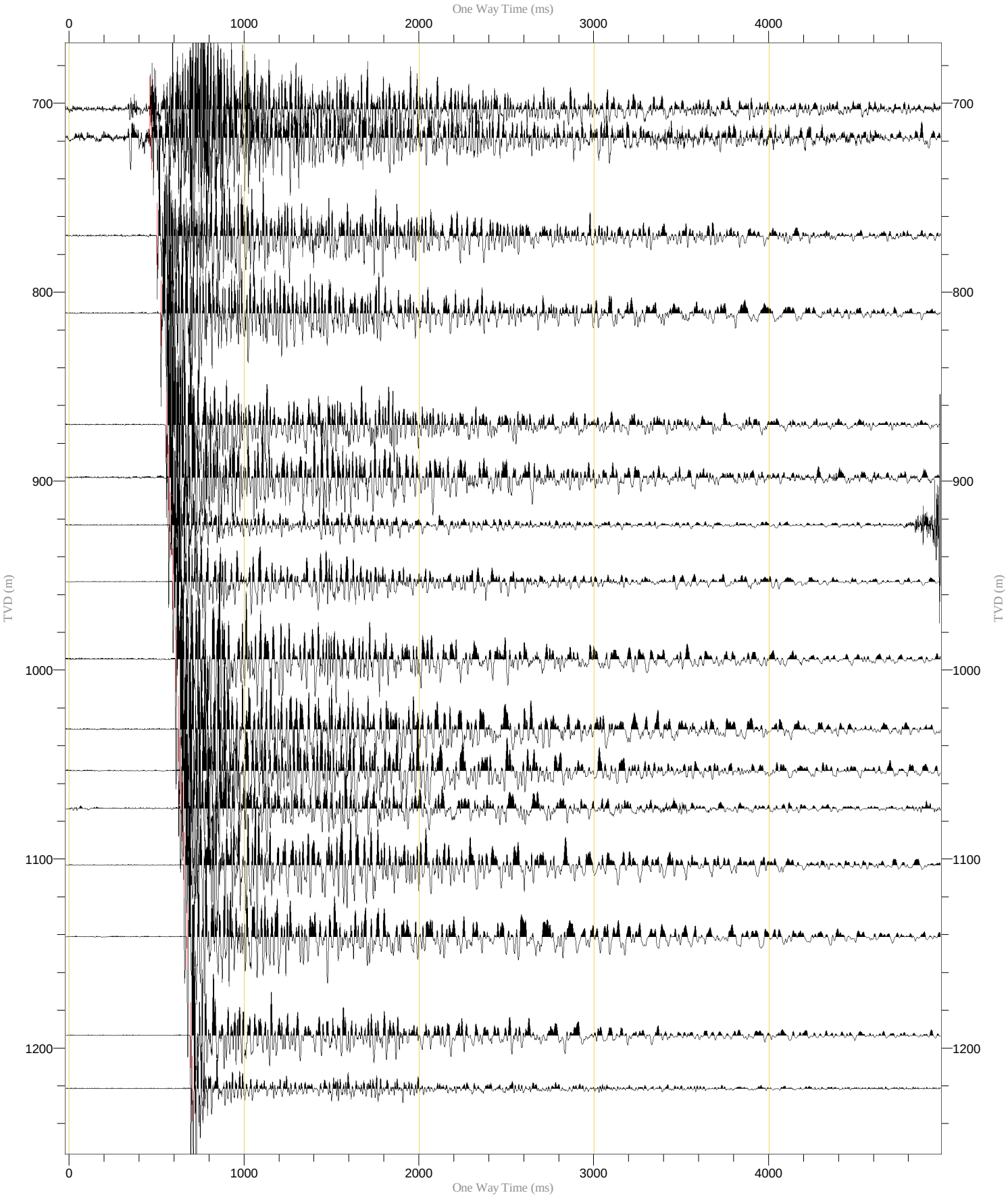
```
[LoadLdf]

FileLoadLdf Parameters
    Input 1:  VSI_001_A-IODP_Dual_Airgun_geo_wavefield_z.ldf

[Shft]

Shift Parameters
    Shift: +  TT_SRD to TT Difference -  0 s
     Update selected headers

[TraceRange]

Trace Range Set Manual Parameters
    Trace Range Set Parameters
        Remove Bad Trace

[Frequency2]

Spectral Analyser Parameters
    Process all samples
    Depth/Offset header =  CABLE_LENGTH
    Output is Frequency Domain
    Compute Amplitude spectrum  in dB

[BPFilter]

BPF Parameters
    Butterworth Filter,  Zero Phase
    Charasteristic:  5.000 Hz  to  90.000 Hz  Order  3

[GenVelfil]

Mean/Median Generalized Velocity Filter Parameters
    Align events using times of  TRANSIT_TIME x 1.000
    Compute both enhanced and residual output
    Apply internal Normalization/Denormalization based on RMS of time window
       From  TRANSIT_TIME  -  0.020 s
       Windown length =  0.500 s
    Median Stacking
     Stacking window (traces):  9
    Stacking window (samples):  1
    Source and receiver coordinates Parameters
        Source Offset:   SOURCE_LINE_POSITION_RHO
        Source Depth:    SOURCE_LINE_POSITION_Z
        Receiver Offset: RECEIVER_LINE_POSITION_RHO
        Receiver Depth:  RECEIVER_LINE_POSITION_Z

[WaveDecon]

Waveshaping deconvolution Parameters
    Design Filter trace by trace
    Filter input start at TRANSIT_TIME  -  0.080 s
    Filter input window: 1.000 s
    Filter Length is filter input window
    Desired wavelet created by filtered unit impulse from   8.000 Hz  to  85.000 Hz  , zero-phase
    Positive wavelet polarity
    Wavelet delay time = Filter Length / 2
    White noise (%): 5.000
    Waveshaping optimization Parameters

[BPFilter1]

BPF Parameters
    Butterworth Filter,  Zero Phase
    Charasteristic:  8.000 Hz  to  85.000 Hz  Order  3

[TVG(TAR)]

Time-Varying Gain Parameters
```

```
    Window start at  TRANSIT_TIME - 0.000000
    Window length = 4.999000
    Travel time exponent = 1.500000
    Exponential Weighting = 0.000000

[GenVelfil1]

Mean/Median Generalized Velocity Filter Parameters
    Align events using times of  TRANSIT_TIME x -1.000
    Compute both enhanced and residual output
    Median Stacking
     Stacking window (traces):  7
    Stacking window (samples):  1
    Source and receiver coordinates Parameters
        Source Offset:   SOURCE_LINE_POSITION_RHO
        Source Depth:    SOURCE_LINE_POSITION_Z
        Receiver Offset: RECEIVER_LINE_POSITION_RHO
        Receiver Depth:  RECEIVER_LINE_POSITION_Z

[Corridor]

Corridor stack Parameters
    Mute before  TRANSIT_TIME  -  0 s
    Mute after  TRANSIT_TIME  -  -0.200 s
        All traces except the deepest (traces):  5
        Depth header:  RECEIVER_POSITION_Z
    Mean stack
    Apply +TT with  TRANSIT_TIME
    Replicate corridor stack x  10
    Apply BPF on resulting corridor stack
    BPF Parameters
        Butterworth Filter,  Zero Phase
        Charasteristic:  5.000 Hz  to  90.000 Hz  Order  3

[Frequency1]

Spectral Analyser Parameters
    Process all samples
    Depth/Offset header =  CABLE_LENGTH
    Output is FK Domain
    Compute Amplitude spectrum  in dB

[Frequency]

Spectral Analyser Parameters
    Process all samples
    Depth/Offset header =  CABLE_LENGTH
    Output is FK Domain
    Compute Amplitude spectrum  in dB
```

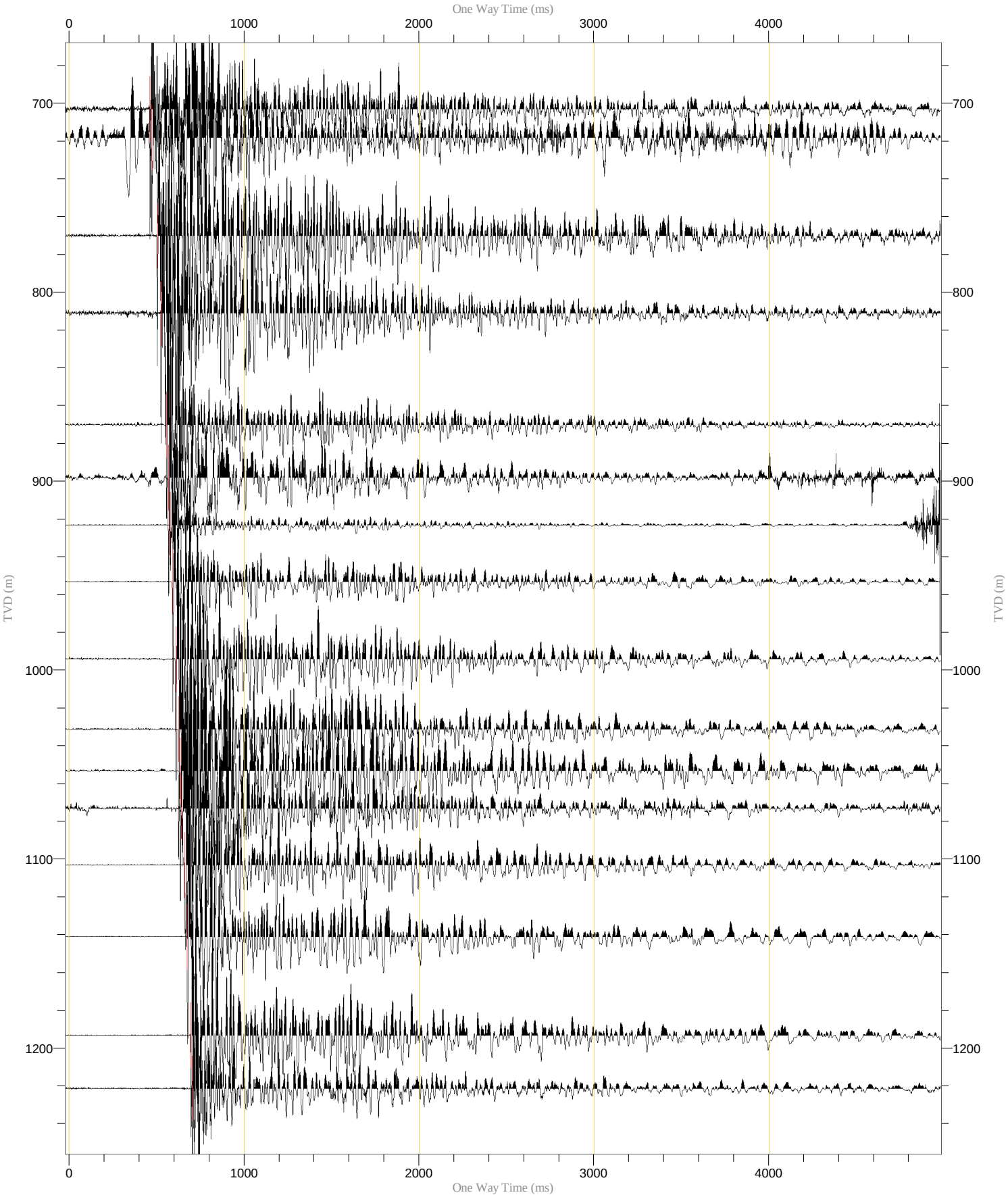
Raw Stack (Z)	Normalization Trace by Trace (250%) Polarity Normal One Way Time (ms) Scaling 3.4 cm/sec, 1/2700	



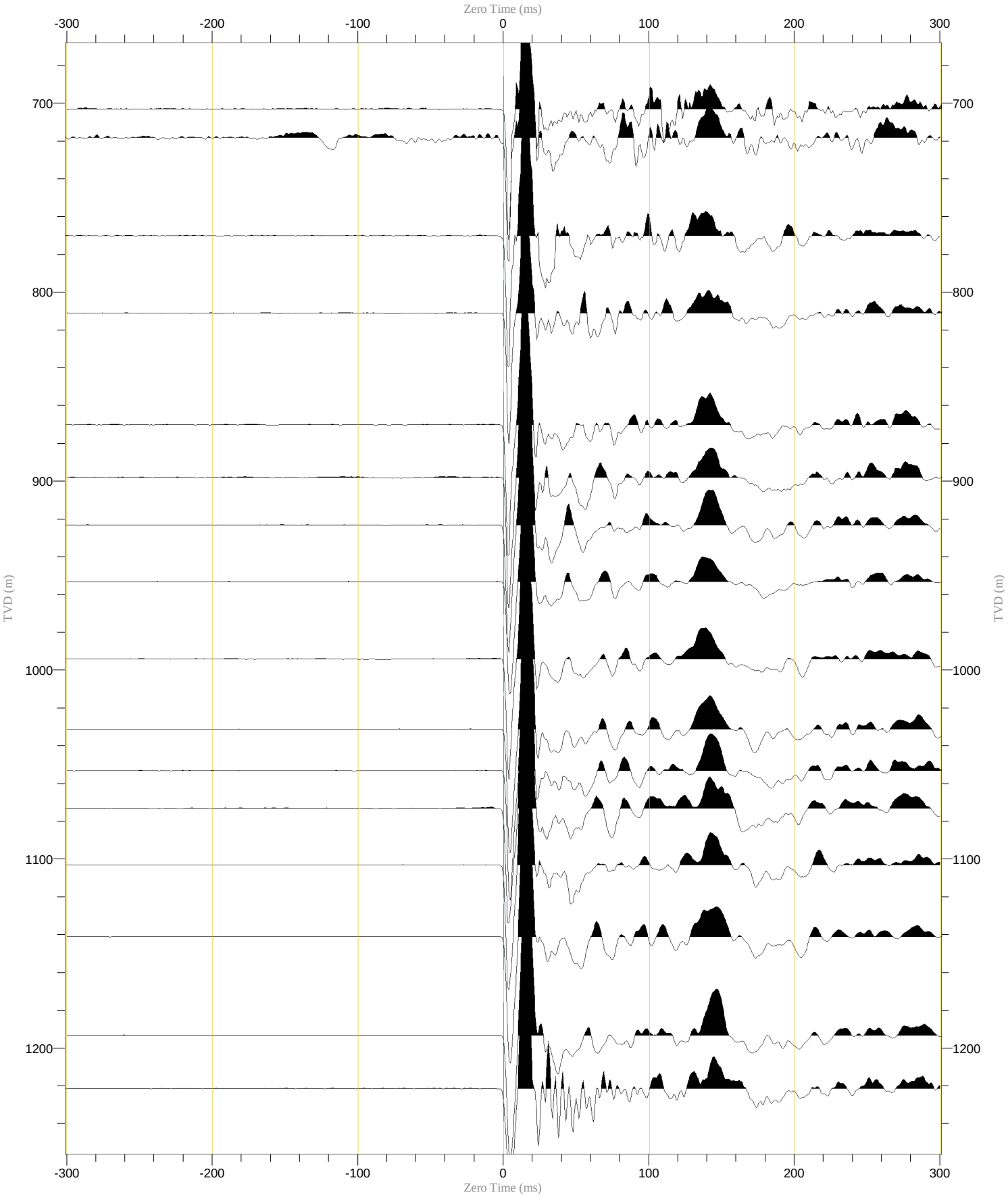
Raw Stack (X)	Normalization Trace by Trace (250%) Polarity Normal One Way Time (ms) Scaling 3.4 cm/sec, 1/2700	



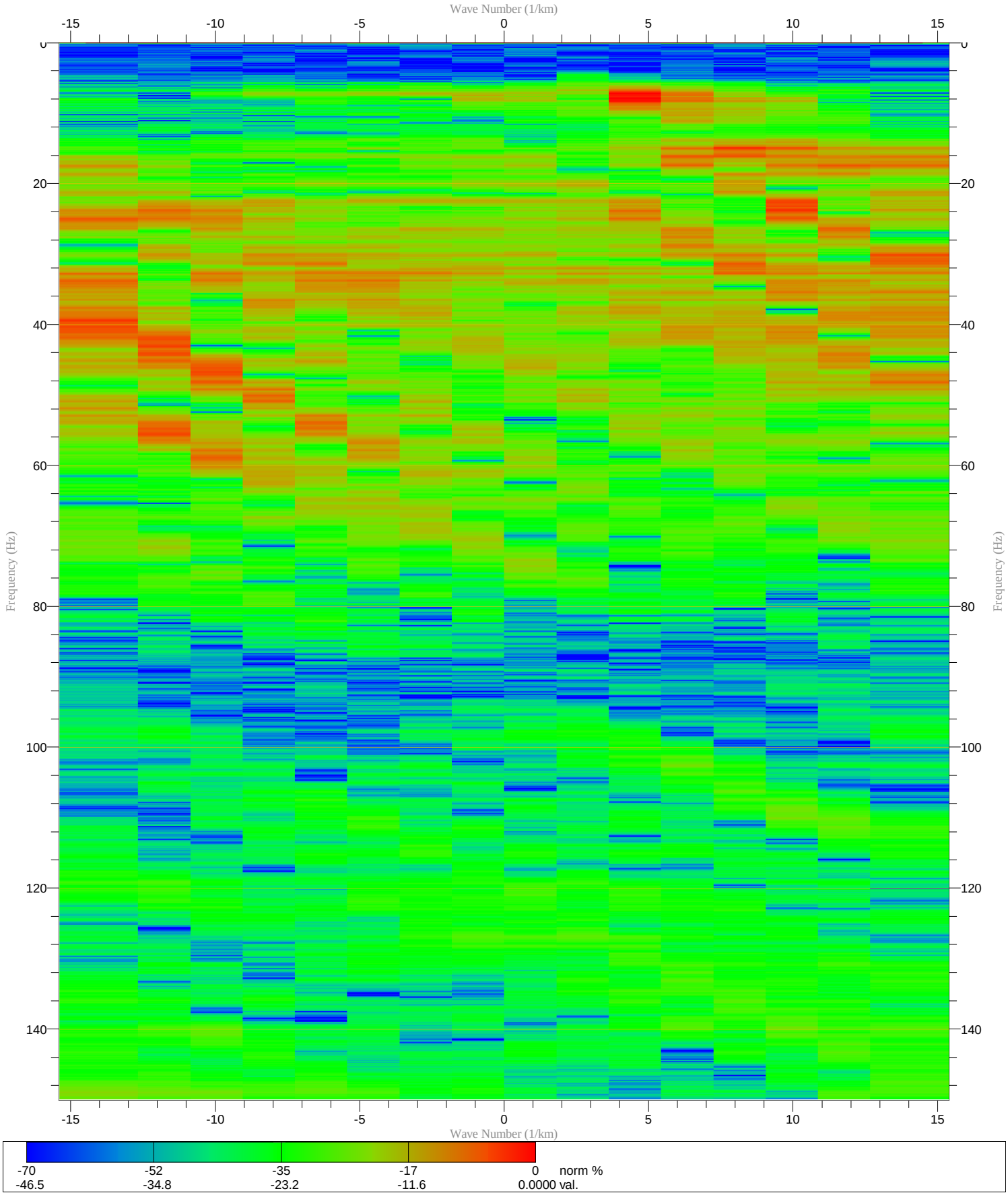
Raw Stack (Y)	Normalization Trace by Trace (250%) Polarity Normal One Way Time (ms) Scaling 3.4 cm/sec, 1/2700	



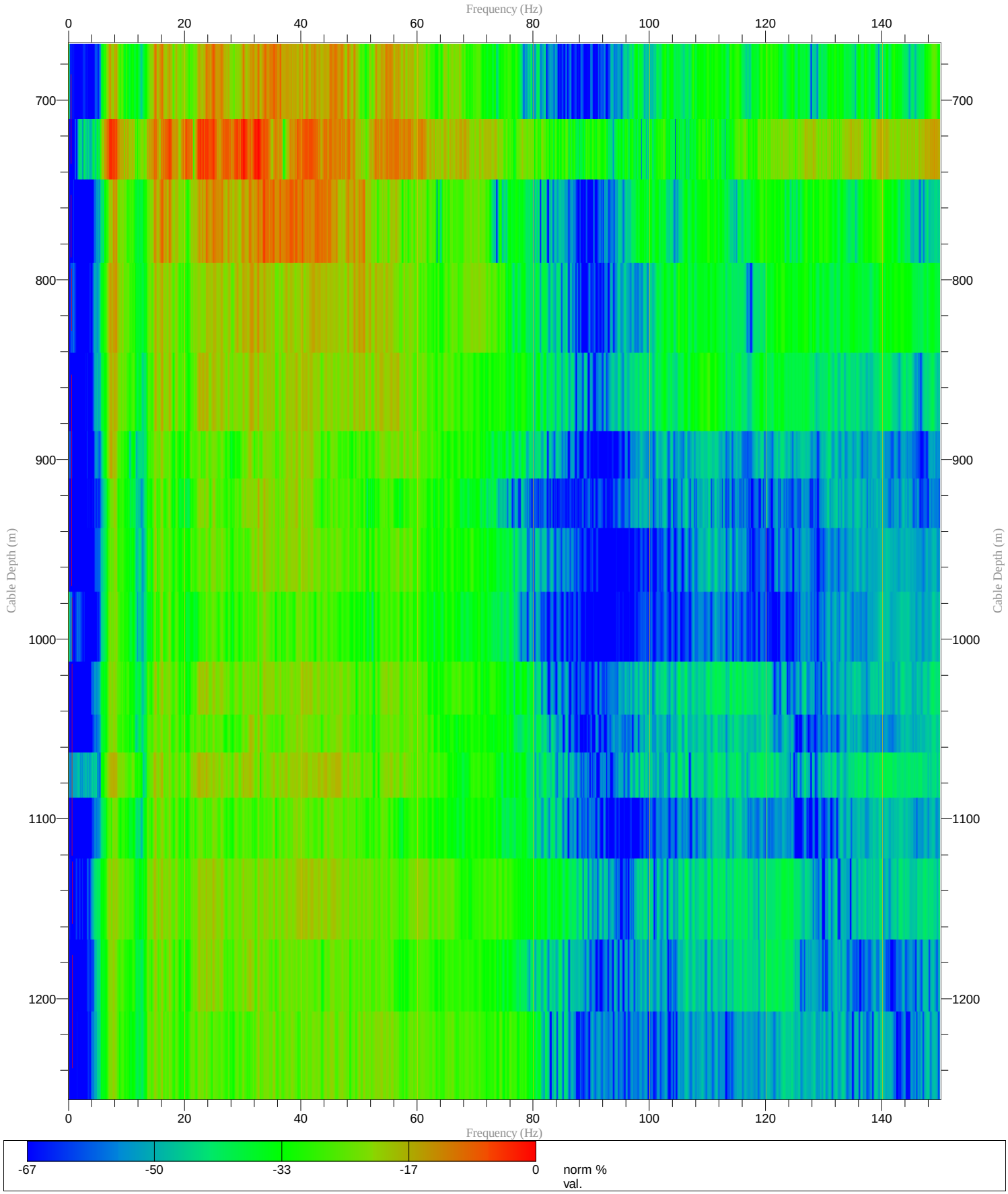
Raw Stack (Z) (Magnified)	Normalization Trace by Trace (250%) Polarity Normal Zero Time (ms) Scaling 28.5 cm/sec, 1/2700	



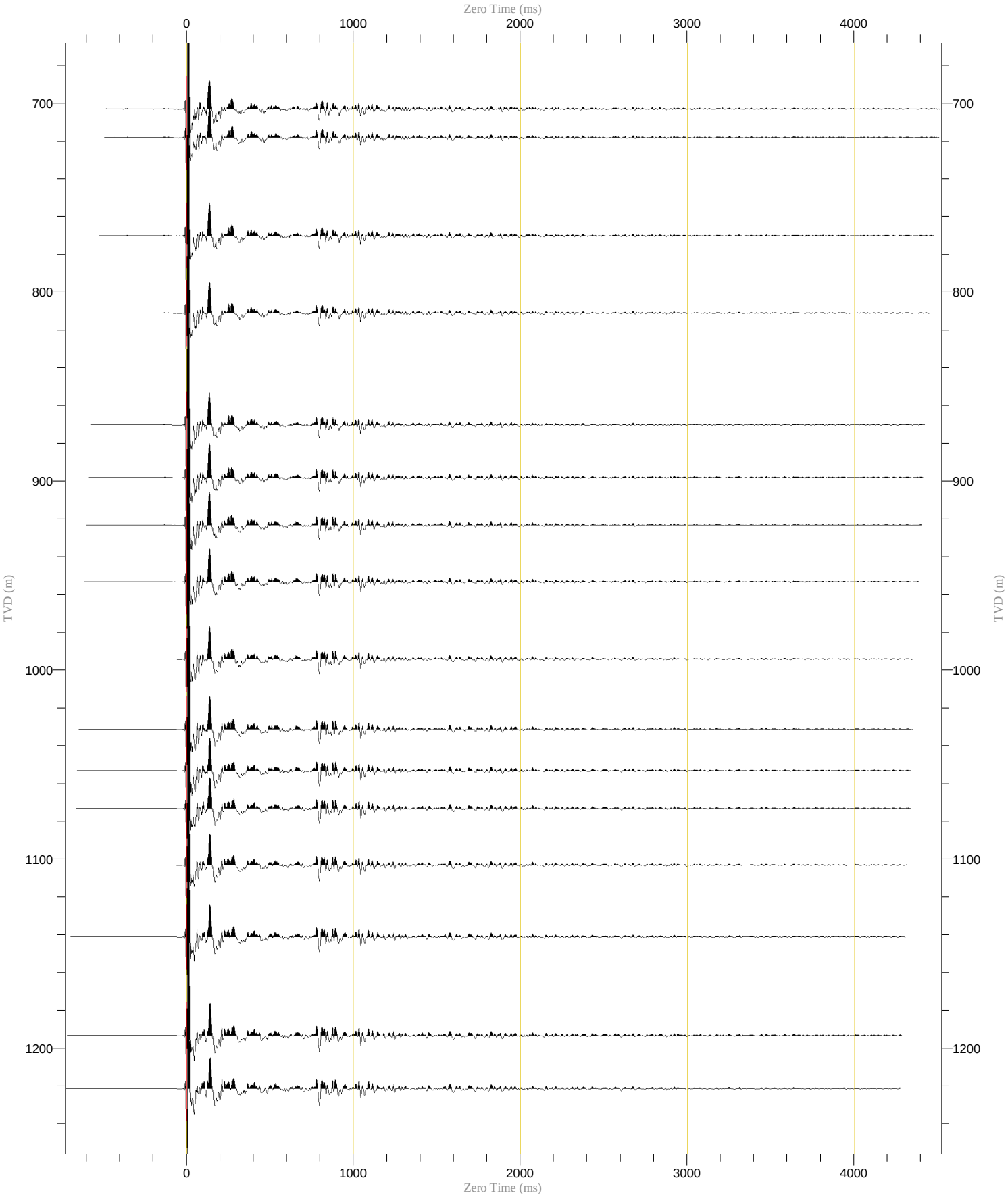
VSP Raw Stack (Z) FK Apply FK	Normalization First Trace in Gather (100%) Polarity Normal Frequency (Hz) Scaling 0.14 cm/Hz, 1.76(1/km)/cm	



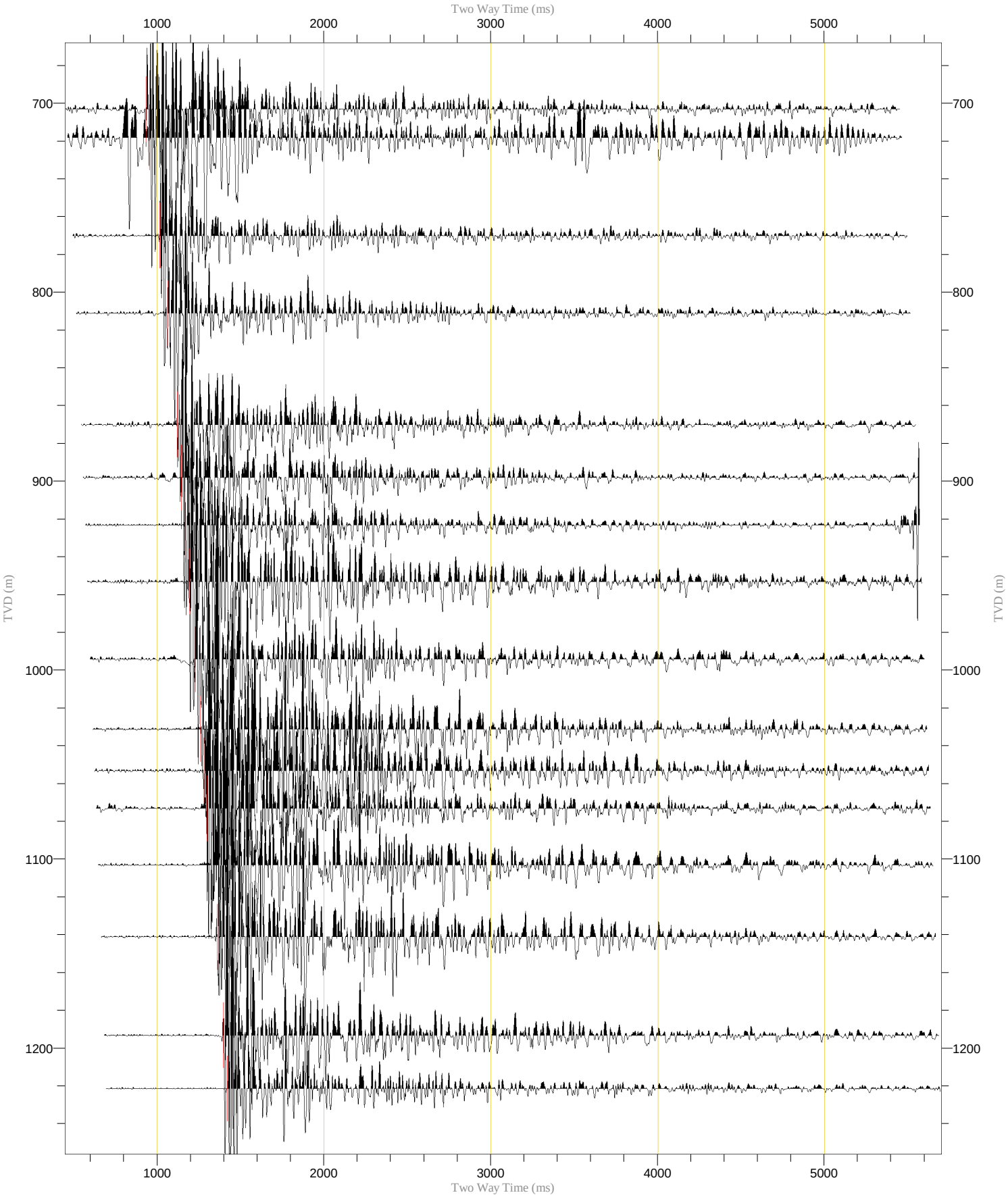
VSP Raw Stack (Z) FZ Apply FZ	Normalization Trace by Trace (100%) Polarity Normal Frequency (Hz) Scaling 0.1 cm/Hz, 1/2710	



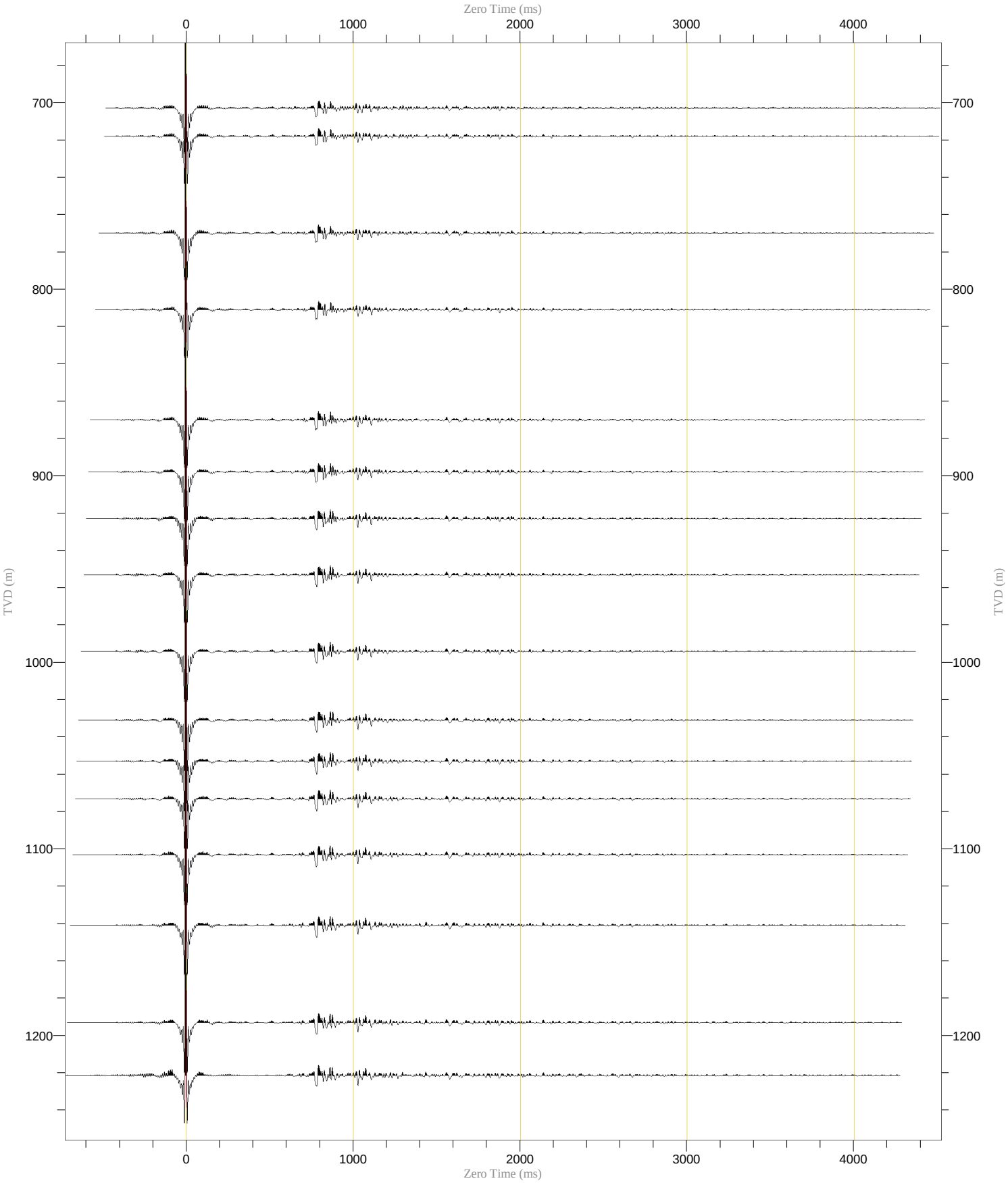
VSP Downgoing BPF 5.0 - 90.0Hz Median Filter 9 Traces	Normalization Trace by Trace (250%) Polarity Normal Zero Time (ms) Scaling 3.3 cm/sec, 1/2700	



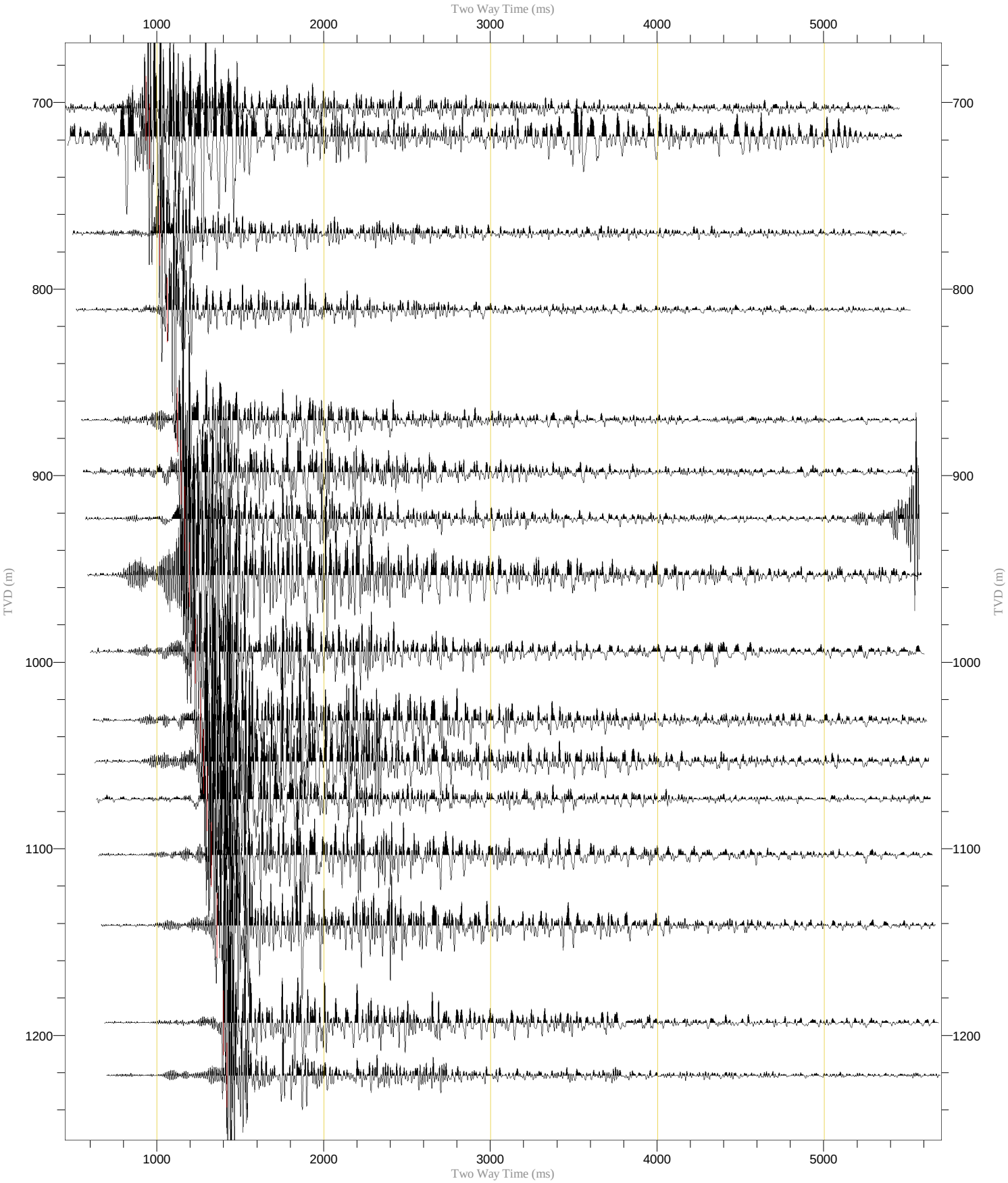
VSP Upgoing BPF 5.0 - 90.0Hz Median Filter 9 Traces	Normalization Trace by Trace (250%) Polarity Normal Two Way Time (ms) Scaling 3.3 cm/sec, 1/2700	



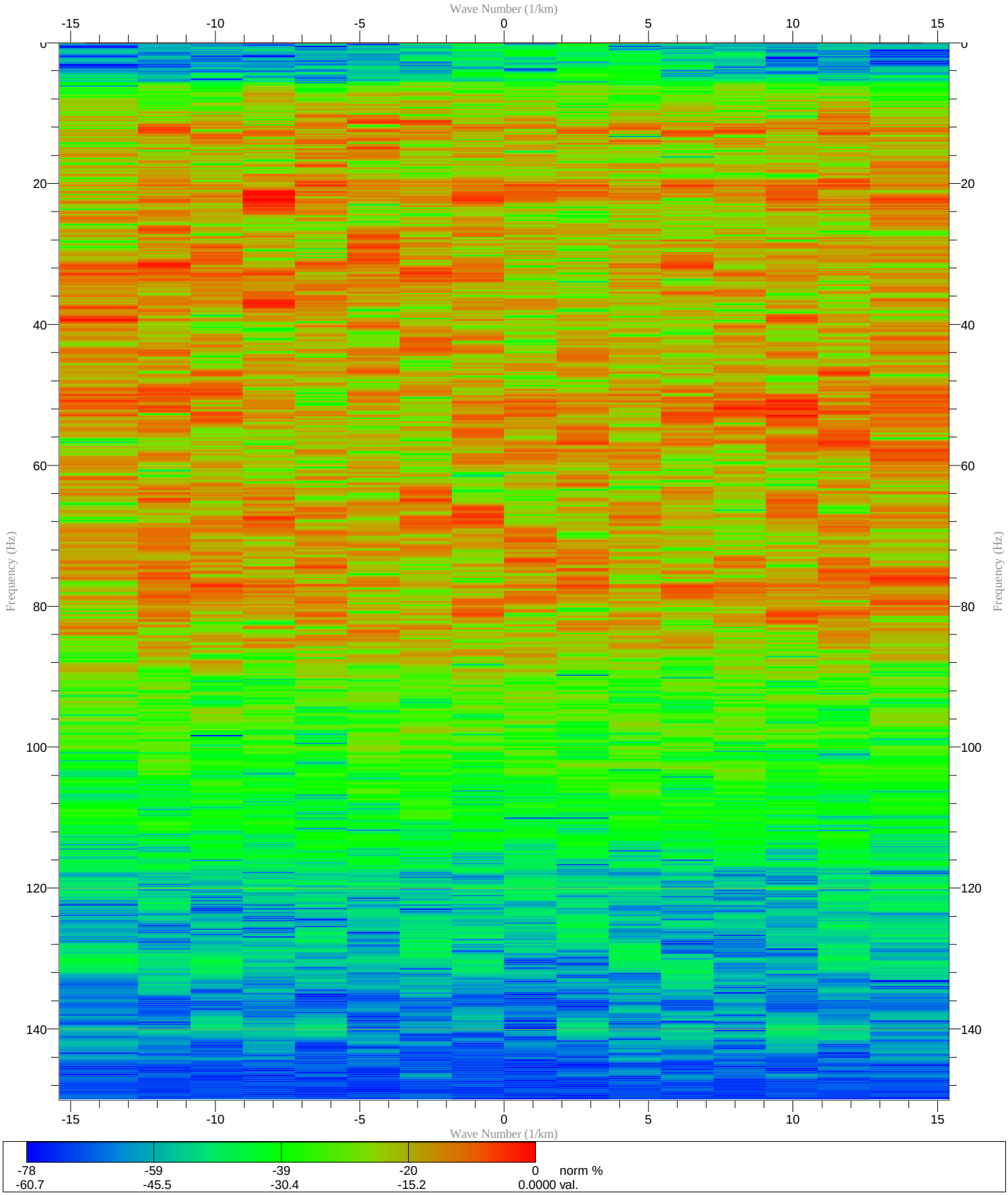
VSP Waveshape decon downgoing BPF 5.0 - 90.0Hz Median Filter 9 Traces Waveshape Decon.(wavelet: 8.0 - 85.0 Hz zero-phase)	Normalization Trace by Trace (250%) Polarity Normal Zero Time (ms) Scaling 3.3 cm/sec, 1/2740	



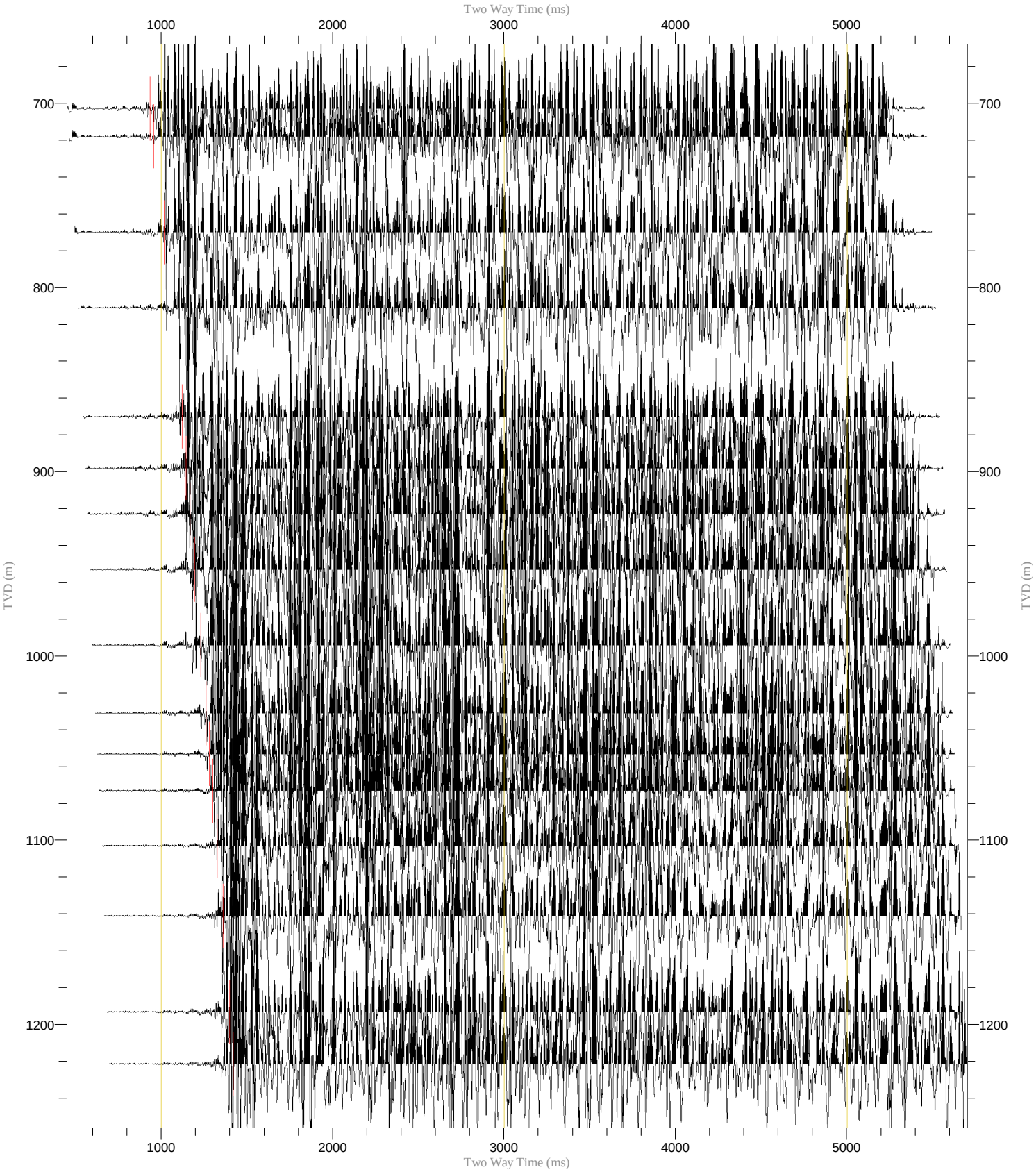
VSP Waveshape decon upgoing BPF 5.0 - 90.0Hz Median Filter 9 Traces Waveshape Decon.(wavelet: 8.0 - 85.0 Hz zero-phase)	Normalization Trace by Trace (250%) Polarity Normal Two Way Time (ms) Scaling 3.3 cm/sec, 1/2740	



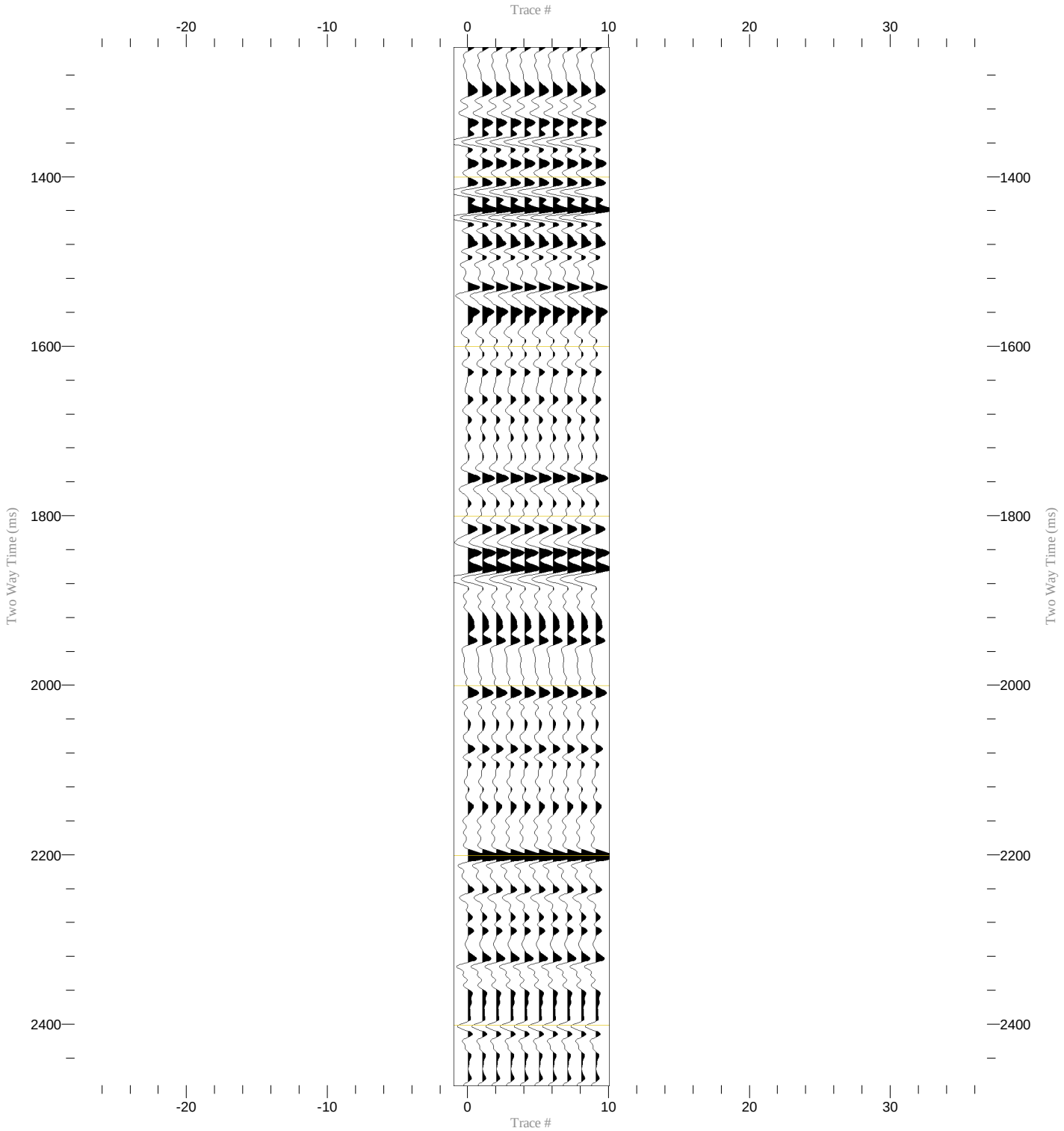
VSP Waveshape decon upgoing FK Apply FK	Normalization First Trace in Gather (100%) Polarity Normal Frequency (Hz) Scaling 0.14 cm/Hz, 1.76(1/km)/cm	



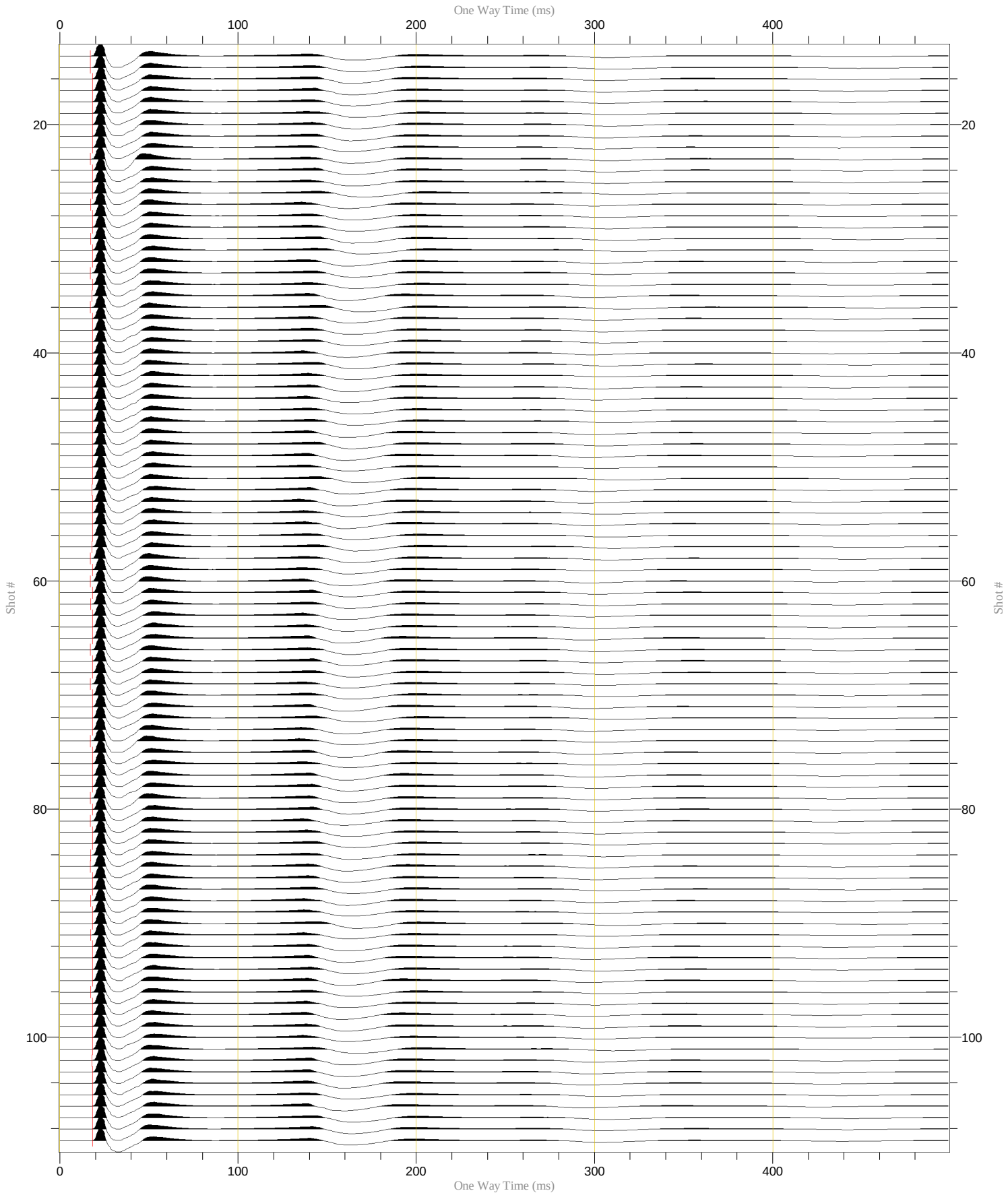
VSP Corridor Stack (Input) BPF 5.0 - 90.0Hz Median Filter 9 Traces Waveshape Decon.(wavelet: 8.0 - 85.0 Hz zero-phase) BPF 8.0 - 85.0Hz Travel time exponent = 1.50 Median Filter 7 Traces	Normalization Trace by Trace (250%) Polarity Normal Two Way Time (ms) Scaling 3.3 cm/sec, 1/2850	



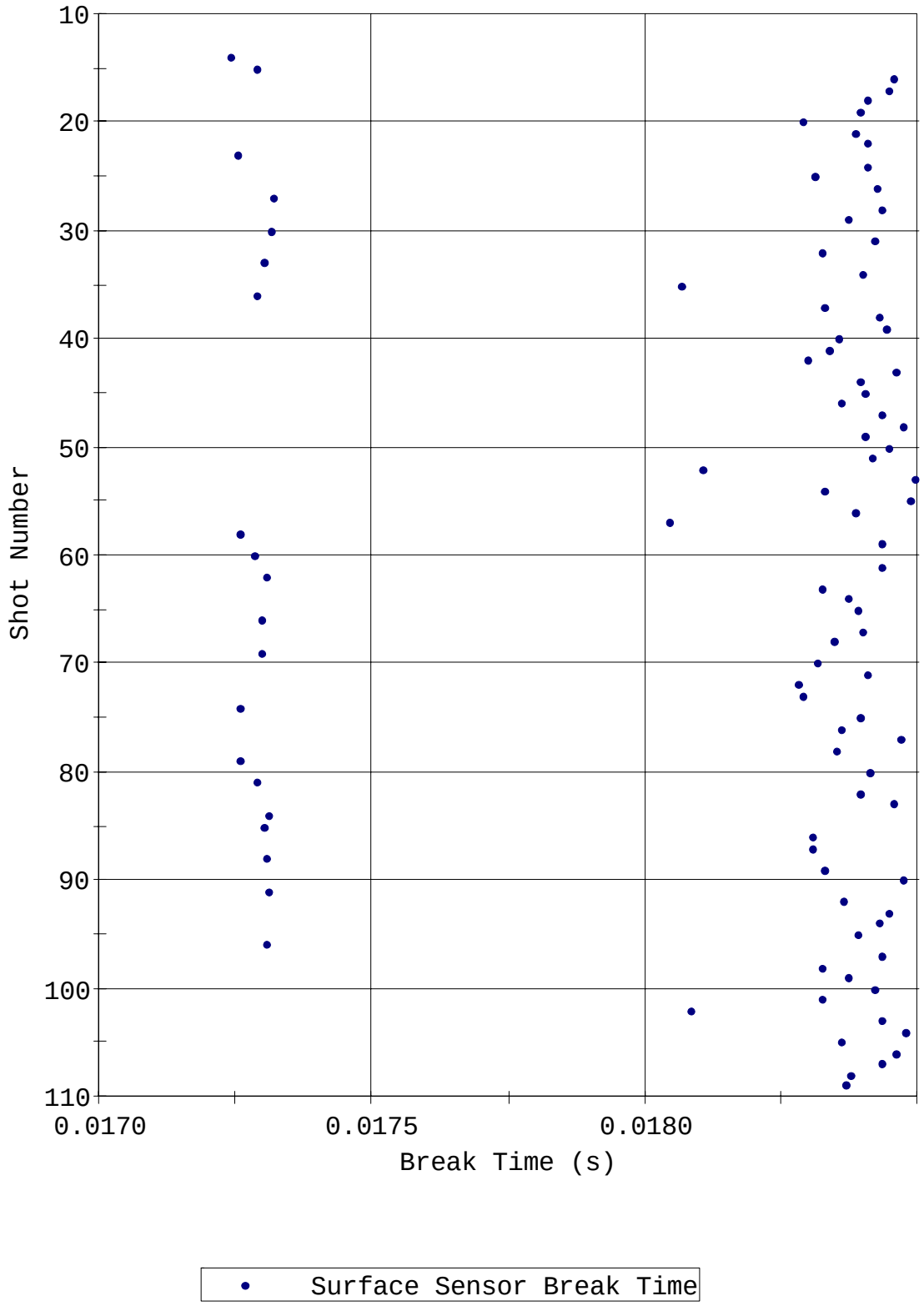
VSP Corridor Stack (output) BPF 5.0 - 90.0Hz Median Filter 9 Traces Waveshape Decon.(wavelet: 8.0 - 85.0 Hz zero-phase) BPF 8.0 - 85.0Hz Travel time exponent = 1.50 Median Filter 7 Traces Corridor Stack (Mean): BPF 5.0 - 90.0Hz	Normalization Trace by Trace (250%) Polarity Normal Two Way Time (ms) Scaling 15.00 cm/sec, 4.01/cm	



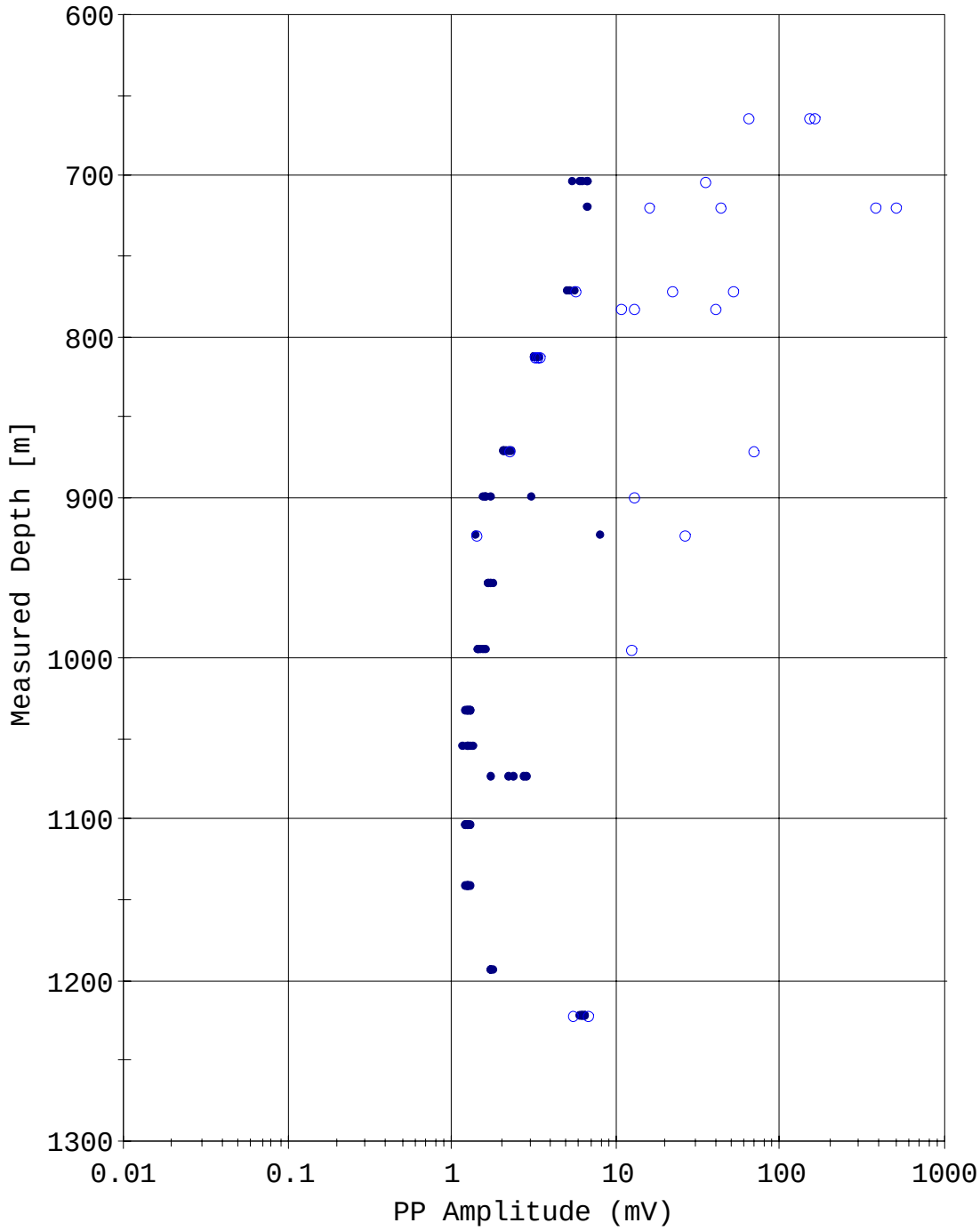
Source Sensor Signature	Normalization Trace by Trace (100%) Polarity Normal One Way Time (ms) Scaling 34.99 cm/sec, 4.46/cm	



Surface Sensor QC Plot Page

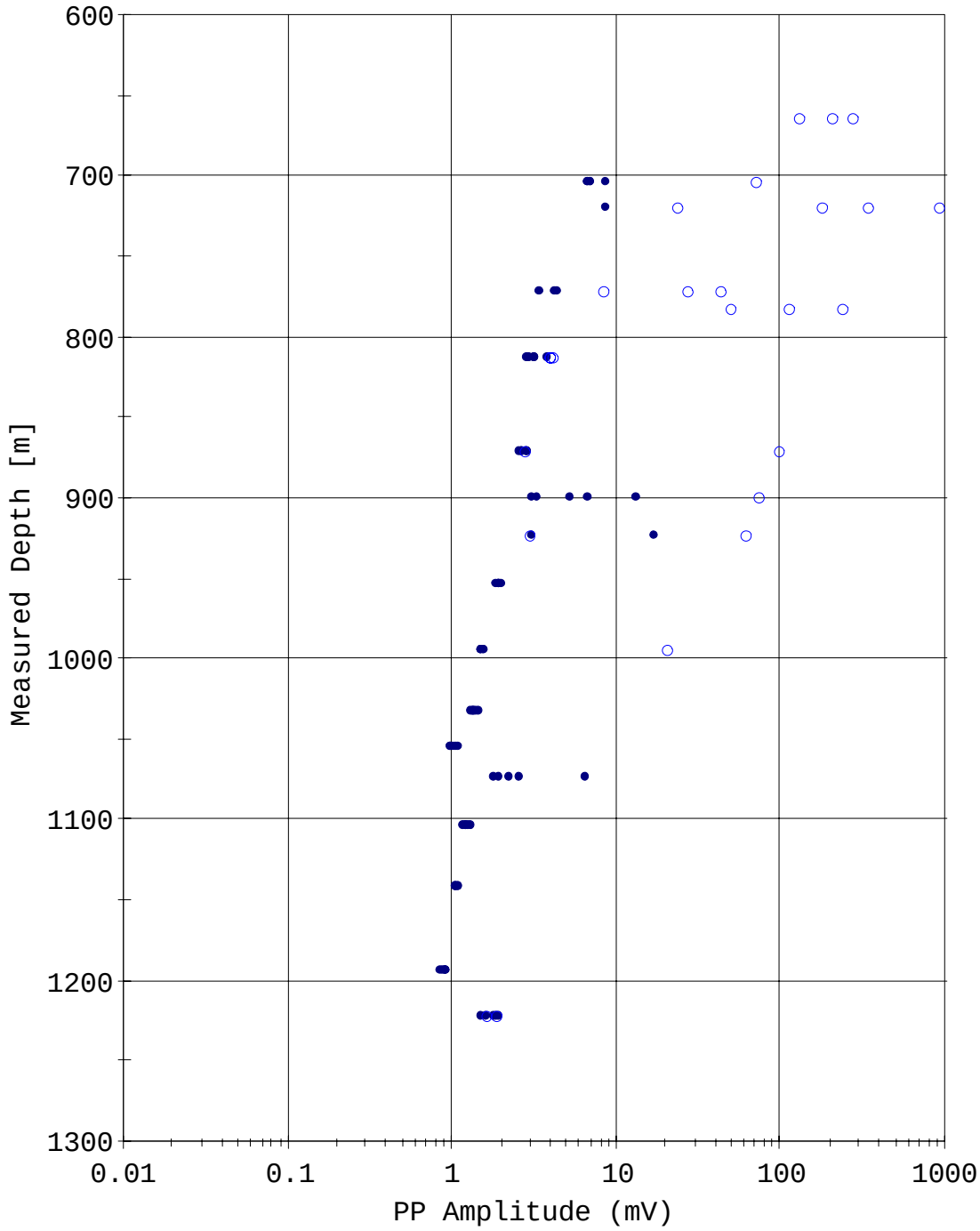


Peak To Peak Plot (X)



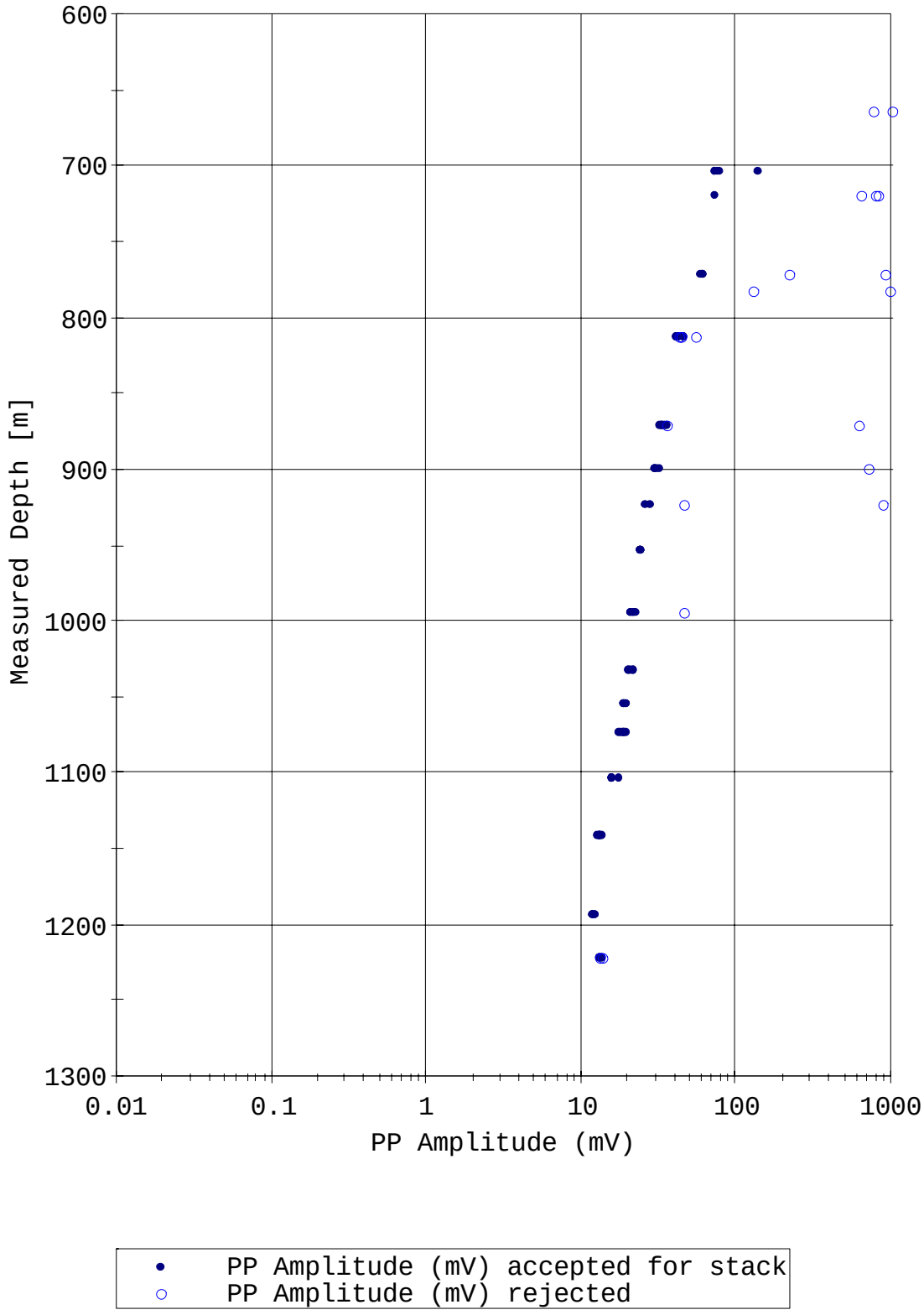
PP Amplitude (mV) accepted for stack
PP Amplitude (mV) rejected

Peak To Peak Plot (Y)

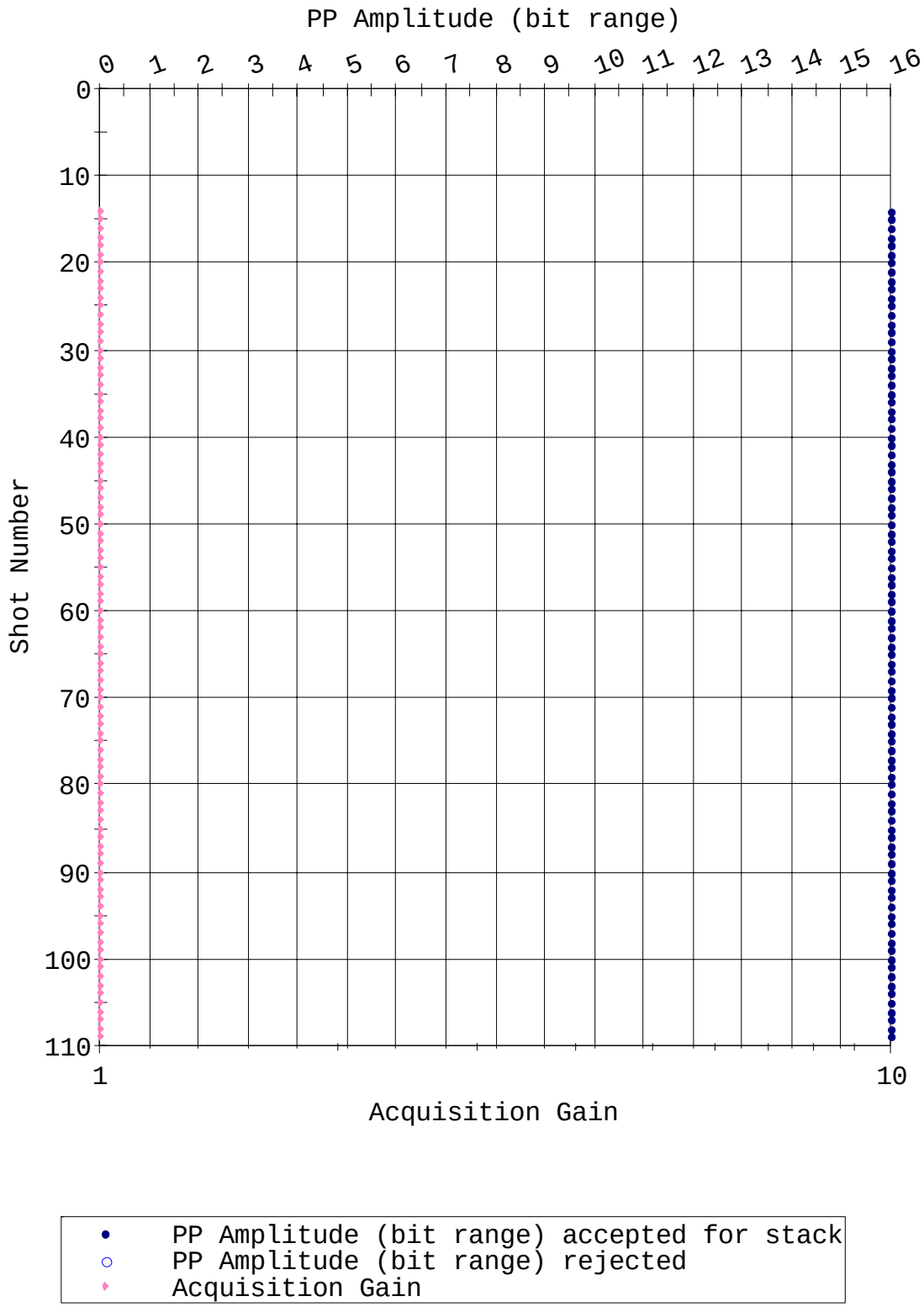


PP Amplitude (mV) accepted for stack
PP Amplitude (mV) rejected

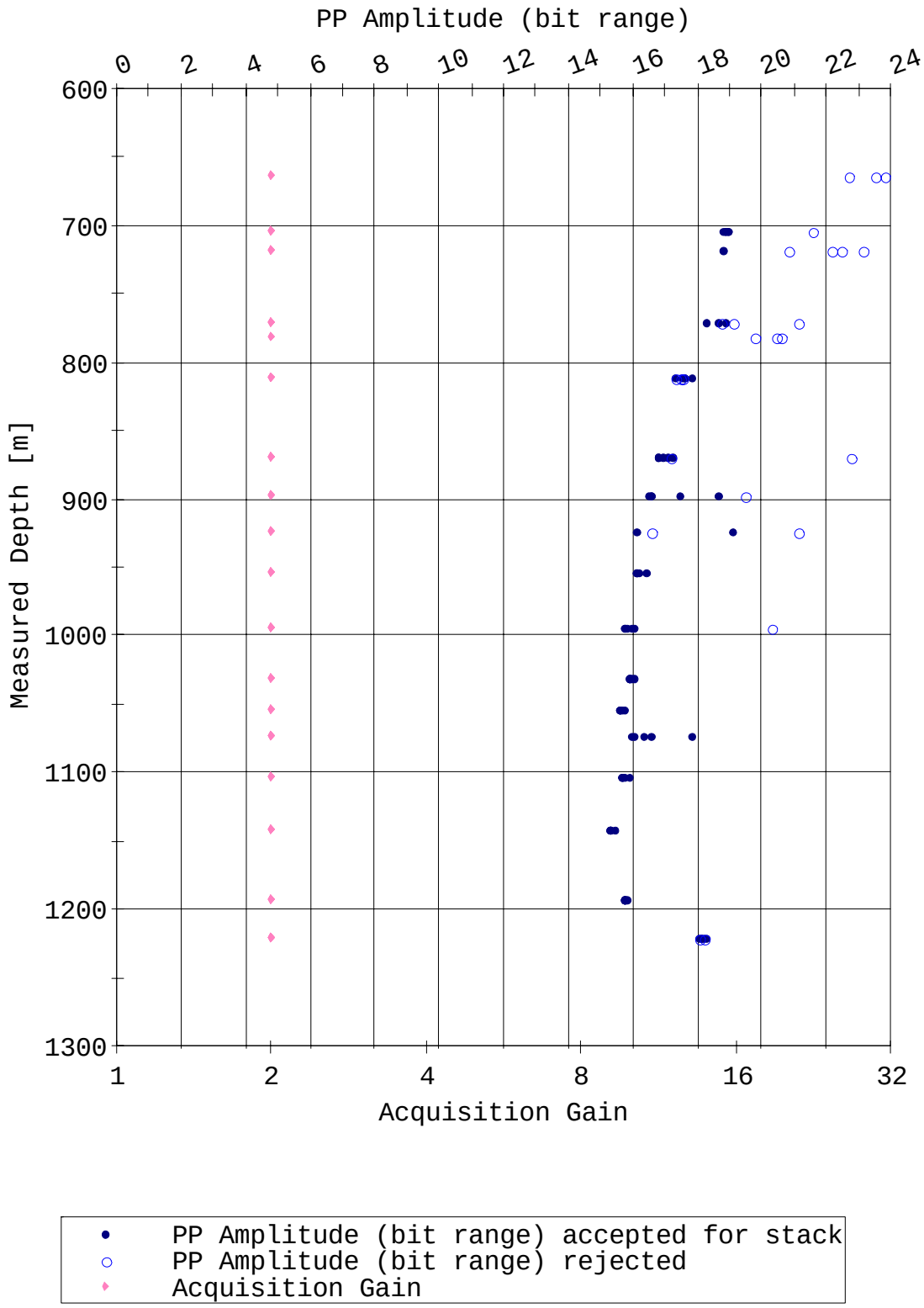
Peak To Peak Plot (Z)



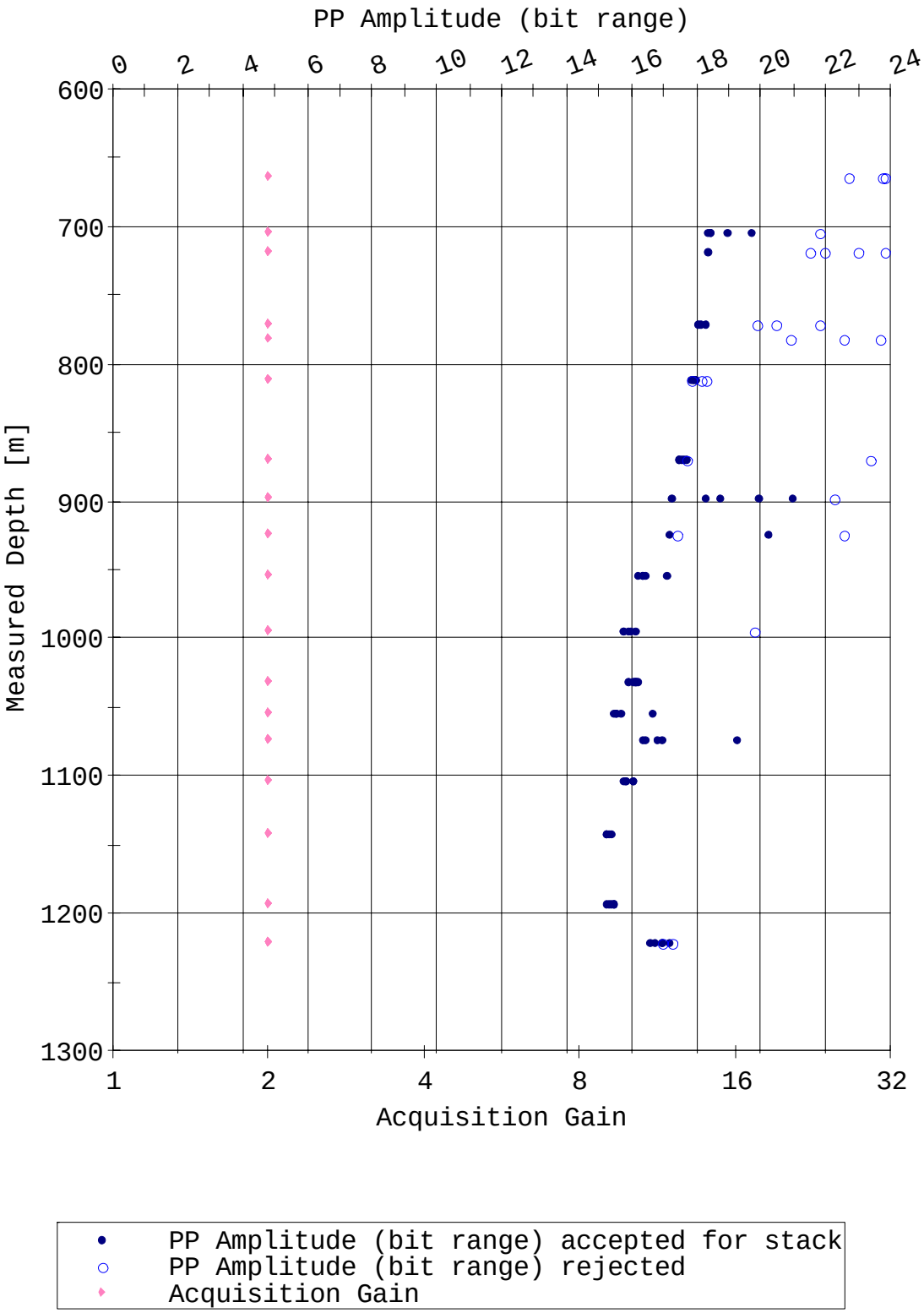
Amplitude QC Plot (Surface)



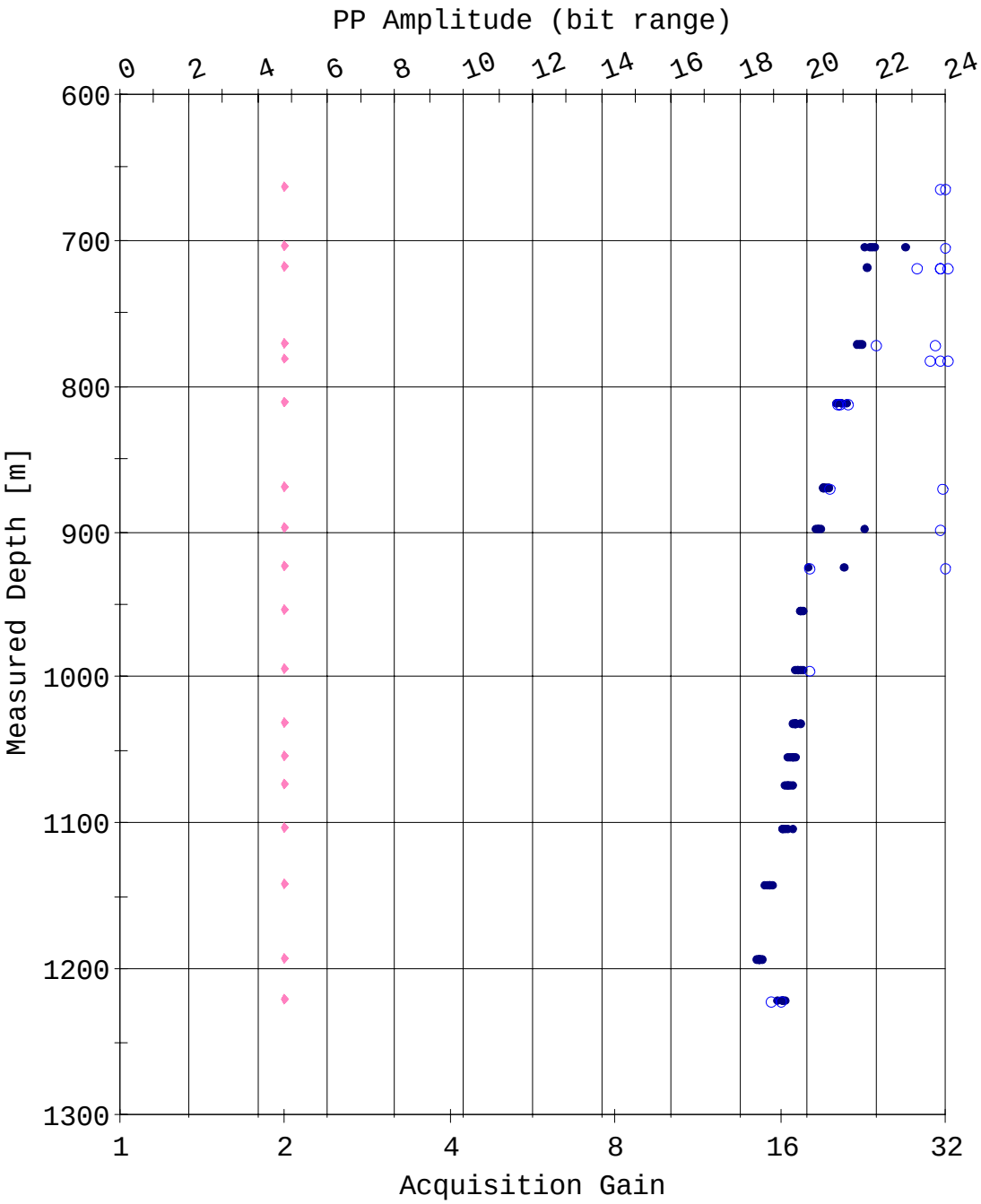
Amplitude QC Plot (X)



Amplitude QC Plot (Y)



Amplitude QC Plot (Z)



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

VSI Seismic Evaluation Report

ELECTRICAL NOISE LOW TEST

2018/01/21 11:20:54

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

Evaluation Item	Shuttle	Channel	Value	Unit	Lower Limit	Upper Limit	Result
DC Offset	1	X	-25.4824	milli V	-100.0000	100.0000	PASS
RMS Noise Level	1	X	0.1156	micro V	-	0.5000	PASS
Noise Peak	1	X	0.4439	micro V	-	2.0000	PASS
DC Offset	1	Y	-25.2808	milli V	-100.0000	100.0000	PASS
RMS Noise Level	1	Y	0.1178	micro V	-	0.5000	PASS
Noise Peak	1	Y	0.4944	micro V	-	2.0000	PASS
DC Offset	1	Z	-25.3841	milli V	-100.0000	100.0000	PASS
RMS Noise Level	1	Z	0.1159	micro V	-	0.5000	PASS
Noise Peak	1	Z	0.4397	micro V	-	2.0000	PASS

ELECTRICAL NOISE HIGH TEST

2018/01/21 11:21:18

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

Evaluation Item	Shuttle	Channel	Value	Unit	Lower Limit	Upper Limit	Result
DC Offset	1	X	-25.4690	milli V	-100.0000	100.0000	PASS
RMS Noise Level	1	X	0.1187	micro V	-	0.5000	PASS
Noise Peak	1	X	0.3961	micro V	-	2.0000	PASS
DC Offset	1	Y	-24.9939	milli V	-100.0000	100.0000	PASS
RMS Noise Level	1	Y	0.1183	micro V	-	0.5000	PASS
Noise Peak	1	Y	0.4040	micro V	-	2.0000	PASS
DC Offset	1	Z	-24.9222	milli V	-100.0000	100.0000	PASS
RMS Noise Level	1	Z	0.1151	micro V	-	0.5000	PASS
Noise Peak	1	Z	0.4362	micro V	-	2.0000	PASS

ELECTRICAL DISTORTION TEST

2018/01/21 11:21:27

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

Evaluation Item	Shuttle	Channel	Value	Unit	Lower Limit	Upper Limit	Result
Total Harmonic Distortion	1	X	-101.6369	dB	-	-90.0000	PASS
Total Harmonic Distortion	1	Y	-106.6074	dB	-	-90.0000	PASS
Total Harmonic Distortion	1	Z	-106.0688	dB	-	-90.0000	PASS

SYSTEM DYNAMIC RANGE TEST

2018/01/21 11:21:41

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

Evaluation Item	Shuttle	Channel	Value	Unit	Lower Limit	Upper Limit	Result
System Dynamic Range	1	X	106.7767	dB	103.0000	-	PASS
System Dynamic Range	1	Y	106.5766	dB	103.0000	-	PASS
System Dynamic Range	1	Z	106.8280	dB	103.0000	-	PASS

AMPLIFIER GAIN 2 TEST

2018/01/21 11:21:55

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

Evaluation Item	Shuttle	Channel	Value	Unit	Lower Limit	Upper Limit	Result
Gain Accuracy	1	X	0.1487	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	1	X	0.0000	dB	-0.5000	0.5000	PASS
Gain Accuracy	1	Y	0.1528	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	1	Y	0.0000	dB	-0.5000	0.5000	PASS
Gain Accuracy	1	Z	0.1520	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	1	Z	0.0000	dB	-0.5000	0.5000	PASS

AMPLIFIER GAIN 4 TEST

2018/01/21 11:22:05

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

Evaluation Item	Shuttle	Channel	Value	Unit	Lower Limit	Upper Limit	Result
Gain Accuracy	1	X	0.1453	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	1	X	0.0034	dB	-0.5000	0.5000	PASS

Gain Accuracy	1	Y	0.1524	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	1	Y	0.0004	dB	-0.5000	0.5000	PASS
Gain Accuracy	1	Z	0.1501	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	1	Z	0.0019	dB	-0.5000	0.5000	PASS

AMPLIFIER GAIN 8 TEST

2018/01/21 11:22:15

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

Evaluation Item	Shuttle	Channel	Value	Unit	Lower Limit	Upper Limit	Result
Gain Accuracy	1	X	0.1460	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	1	X	0.0027	dB	-0.5000	0.5000	PASS
Gain Accuracy	1	Y	0.1524	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	1	Y	0.0004	dB	-0.5000	0.5000	PASS
Gain Accuracy	1	Z	0.1518	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	1	Z	0.0002	dB	-0.5000	0.5000	PASS

AMPLIFIER GAIN 16 TEST

2018/01/21 11:22:25

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

Evaluation Item	Shuttle	Channel	Value	Unit	Lower Limit	Upper Limit	Result
Gain Accuracy	1	X	0.1430	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	1	X	0.0058	dB	-0.5000	0.5000	PASS
Gain Accuracy	1	Y	0.1485	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	1	Y	0.0043	dB	-0.5000	0.5000	PASS
Gain Accuracy	1	Z	0.1465	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	1	Z	0.0055	dB	-0.5000	0.5000	PASS

AMPLIFIER GAIN 32 TEST

2018/01/21 11:22:35

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

Evaluation Item	Shuttle	Channel	Value	Unit	Lower Limit	Upper Limit	Result
Gain Accuracy	1	X	0.1438	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	1	X	0.0050	dB	-0.5000	0.5000	PASS
Gain Accuracy	1	Y	0.1517	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	1	Y	0.0011	dB	-0.5000	0.5000	PASS
Gain Accuracy	1	Z	0.1447	dB	-0.5000	0.5000	PASS
Gain Step Accuracy	1	Z	0.0073	dB	-0.5000	0.5000	PASS

CROSS TALK X TEST

2018/01/21 11:22:50

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

Evaluation Item	Shuttle	Channel	Value	Unit	Lower Limit	Upper Limit	Result
Cross Talk X-Y	1	-	-100.4487	dB	-	-90.0000	PASS
Cross Talk X-Z	1	-	-99.1850	dB	-	-90.0000	PASS

CROSS TALK Y TEST

2018/01/21 11:23:08

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

Evaluation Item	Shuttle	Channel	Value	Unit	Lower Limit	Upper Limit	Result
Cross Talk Y-Z	1	-	-98.6077	dB	-	-90.0000	PASS
Cross Talk Y-X	1	-	-100.1926	dB	-	-90.0000	PASS

CROSS TALK Z TEST

2018/01/21 11:23:27

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

Evaluation Item	Shuttle	Channel	Value	Unit	Lower Limit	Upper Limit	Result
Cross Talk Z-X	1	-	-97.2358	dB	-	-90.0000	PASS
Cross Talk Z-Y	1	-	-97.2847	dB	-	-90.0000	PASS

IMPULSE RESPONSE TEST

2018/01/21 11:23:45

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

Evaluation Item	Shuttle	Channel	Value	Unit	Lower Limit	Upper Limit	Result

Amplitude (0.3Hz)	1	X	-1.6858	dB	-5.0000	-	PASS
Amplitude (400Hz)	1	X	-3.5775	dB	-5.0000	-	PASS
Impulse Amplitude	1	X	573.5998	milli V	-	-	-
Phase Diff. at 0.3Hz from X1	1	X	0.0000	degree	-	-	-
Amplitude (0.3Hz)	1	Y	-1.6047	dB	-5.0000	-	PASS
Amplitude (400Hz)	1	Y	-3.5793	dB	-5.0000	-	PASS
Impulse Amplitude	1	Y	574.1653	milli V	-	-	-
Phase Diff. at 0.3Hz from X1	1	Y	-0.8054	degree	-	-	-
Amplitude (0.3Hz)	1	Z	-1.7315	dB	-5.0000	-	PASS
Amplitude (400Hz)	1	Z	-3.5764	dB	-5.0000	-	PASS
Impulse Amplitude	1	Z	574.0207	milli V	-	-	-
Phase Diff. at 0.3Hz from X1	1	Z	1.6234	degree	-	-	-

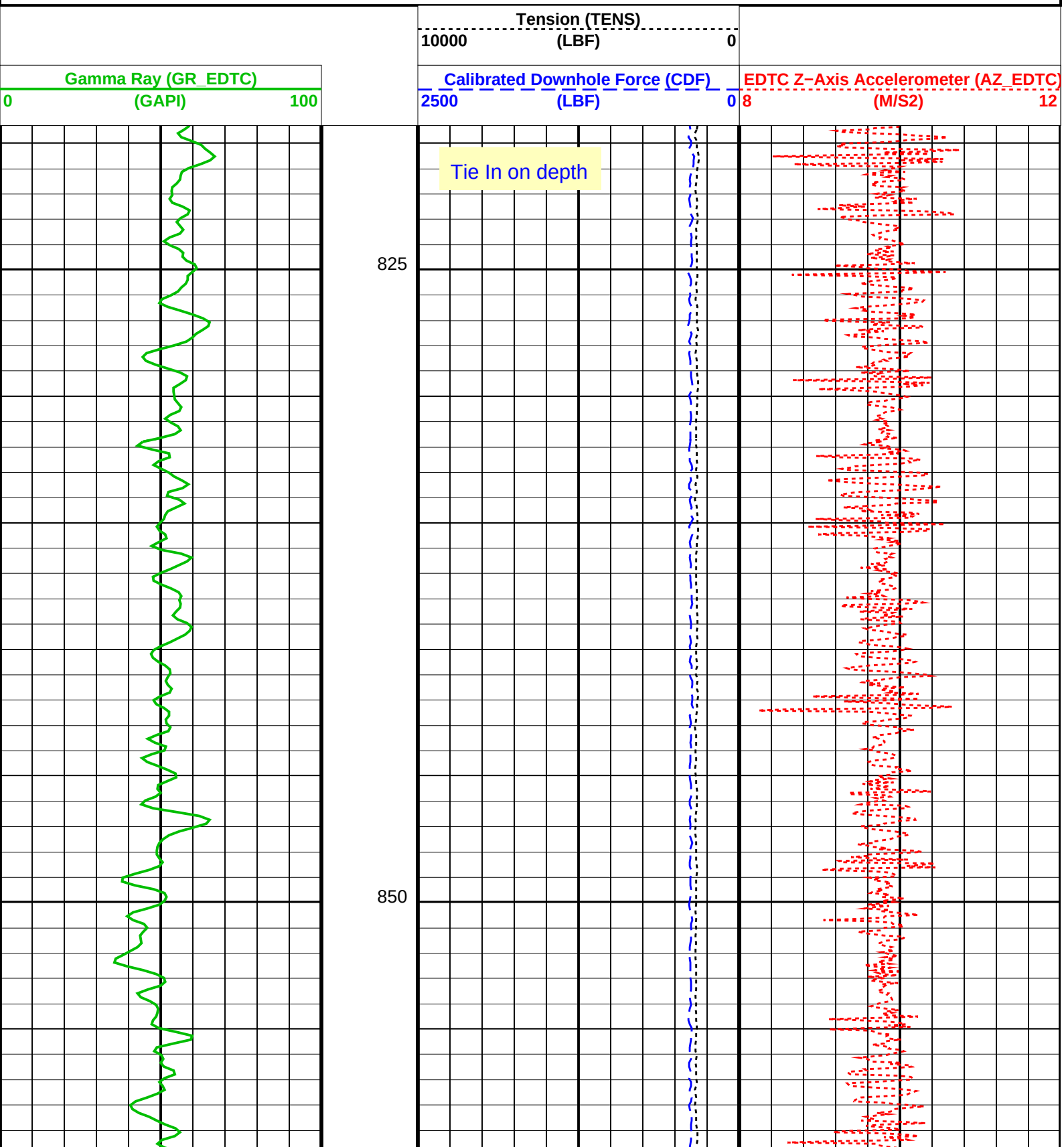
Company: International Ocean Discovery Program | Well: Expedition 374, Site U1521A

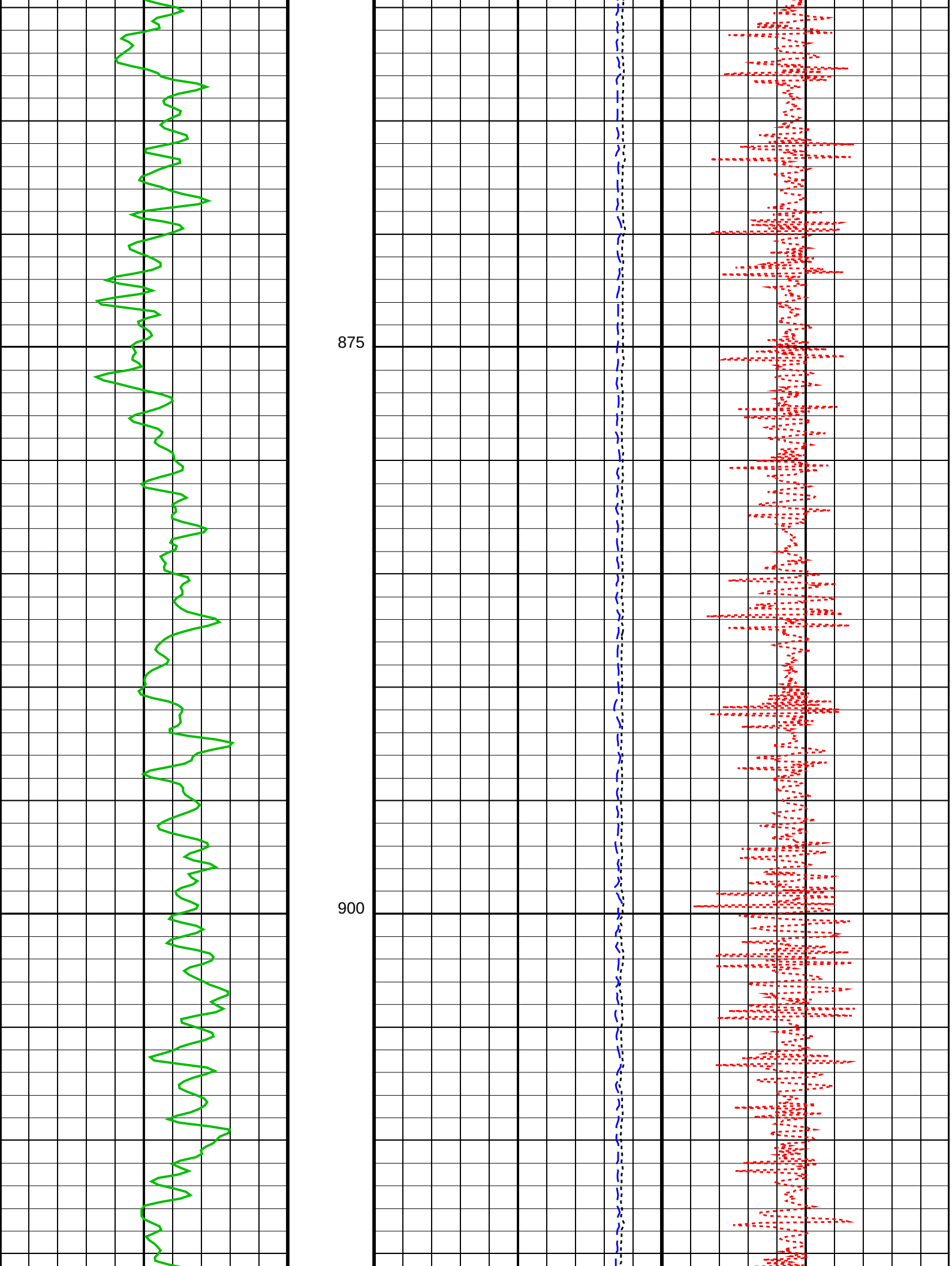
Output DLIS Files

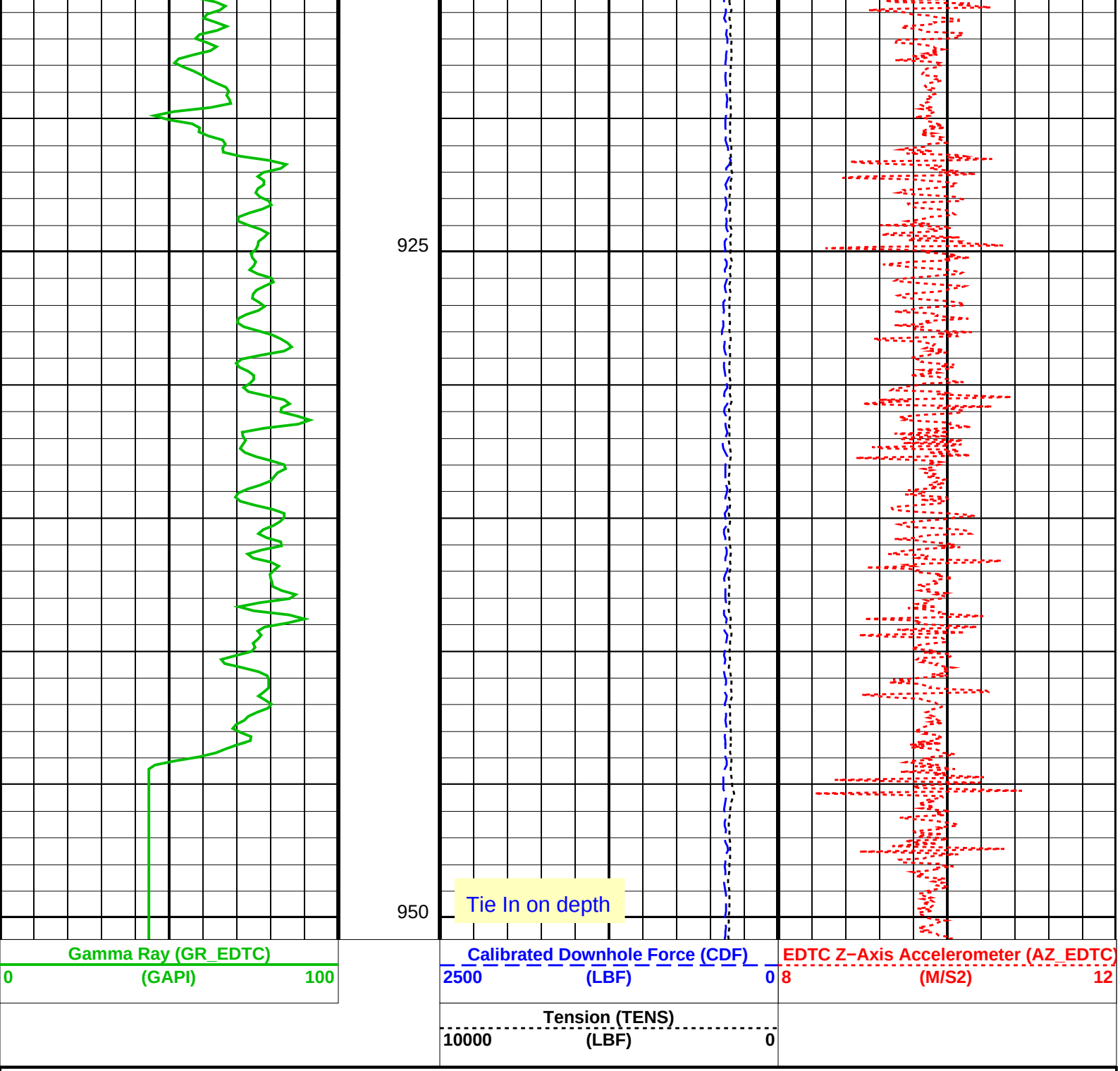
DEFAULT	VSIT_034LUP	FN:59	PRODUCER	21−Jan−2018 12:32
BACKUP	VSIT_034LUP	FN:60	PRODUCER	21−Jan−2018 12:32

OP System Version: 19C0−187

VSIT−C	19C0−187	EDTC−B	SKK−5169−EDTCB




875
900



Format: CORRELATION **Vertical Scale: 1:200** **Graphics File Created: 21−Jan−2018 12:32**

OP System Version: 19C0−187

VSIT−C	19C0−187	EDTC−B	SKK−5169−EDTCB

Output DLIS Files

DEFAULT	VSIT_034LUP	FN:59	PRODUCER	21−Jan−2018 12:32
BACKUP	VSIT_034LUP	FN:60	PRODUCER	21−Jan−2018 12:32