

**WesternGeco**

## **PROCESSING REPORT**

**For the**

**2008 2D MULTI-VINTAGE REPROCESSING  
VIC/P44, OTWAY BASIN  
VICTORIA**

**For**



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# 1 INTRODUCTION

This report details seismic data processing of 814km of 2D data from 3 vintages of acquisition recorded between 1980 and 2007. The data was acquired in the Otway Basin area, offshore Victoria, Australia in permit VIC/P44.

The 2008 processing detailed in this report was carried out in an attempt to improve the data quality at the target zones through adoption of a high resolution processing sequence. Attenuation of multiple energy present in the target zone and throughout the time section was also critical, therefore waterlayer demultiple (DWD), surface related multiple elimination (SRME) and high resolution radon demultiple were utilised.

Test and production processing was performed in Melbourne, using standalone Dell 670 workstations running Western's Omega<sup>®</sup> Seismic Processing system software. Field data was received in stages between November 2007 and January 2008. Tests were performed to determine processing parameters between November 2007 and February 2008.

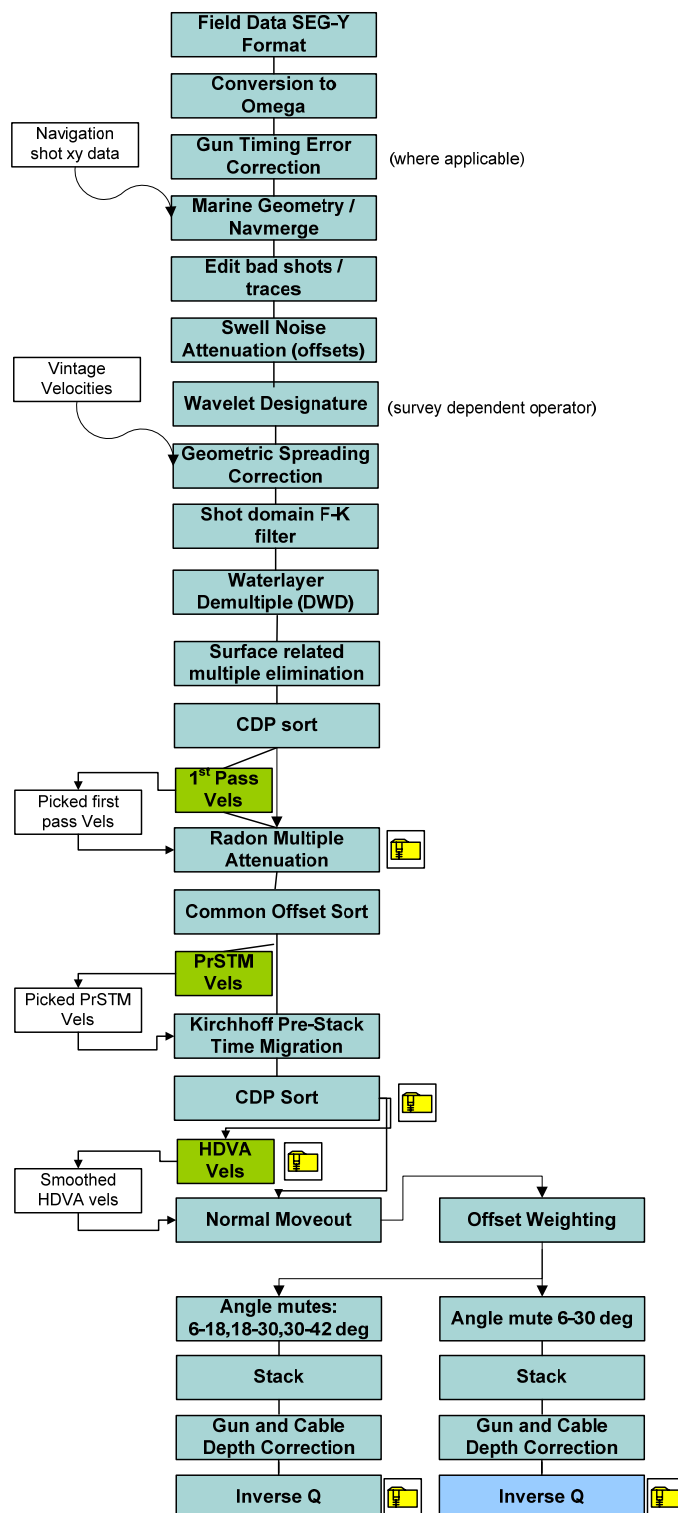
The project was co-ordinated for BHPBilliton Petroleum Pty. Ltd. by Mr. John Thornton and Mr Mark Stanley. Test and production processing was performed at WesternGeco by Mr. Michael Hartley.

Figure 1: Locality Map: Otway Basin, offshore Victoria.



## 2 Processing Summary

### PROCESSING FLOW DIAGRAM



### 3 ACQUISITION SUMMARY

Three vintages were reprocessed as part of the 2008 Otway Basin 2D reprocessing project. Acquisition information for each vintage is detailed below.

**OE80A 2D** survey field data was collected during November to December 1980 by **GSI** with the M/V Eugene McDermott. The following parameters were utilised for data collection:

<b>OE80A</b>	<b>429.1 km processed</b>
<b>Streamers</b>	
▪ Length	2400 metres
▪ Number of Groups:	96
▪ Depth	12 metres
▪ Group Interval:	25.0 metres
▪ Nominal near offset:	Variable: 200-320m
<b>Energy Source</b>	
▪ Type:	Airgun
▪ Total Volume:	2000 cu.in
▪ Operation Pressure:	1800 psi
▪ Depth:	6 metres
▪ Shotpoint Interval:	25 metres
▪ Gun Delay:	-51.2 ms
<b>Instrumentation</b>	
▪ Recording System:	DFSIV
▪ Recording Format:	SEG-B 1600BPI
▪ Low Cut Filter:	8 Hz (18 dB/Octave)
▪ High Cut Filter:	90 Hz (72 dB/Octave)
▪ Sample Interval:	4 ms
▪ Record Length:	5000 ms
<b>Navigation Systems</b>	
▪ Primary:	MAXIRAN
▪ Secondary:	MAXIRAN
<b>Data Sampling</b>	
▪ Nominal Fold:	48

**OH91** survey field data was collected from March to May 1991 by **Western Geophysical** with the M/V Western Odyssey. The following parameters were utilised for data collection:

<b>OH91</b>	<b>333.7 km processed</b>
<b>Streamers</b>	
▪ Length	3200 metres
▪ Number of Groups:	240
▪ Depth	10 metres
▪ Group Interval:	13.33 metres
▪ Nominal near offset:	188 metres
<b>Energy Source</b>	
▪ Type:	Airgun
▪ Total Volume:	2250 cu.in
▪ Operation Pressure:	1950 psi

▪ Depth:	6 metres
▪ Shotpoint Interval:	26.66 metres
▪ Gun Delay:	0 ms
<b>Instrumentation</b>	
▪ Recording System:	LRS 16A
▪ Recording Format:	SEGD 8024 / 6250bpi
▪ Low Cut Filter:	6Hz(18dB/octave)
▪ High Cut Filter:	188Hz(156dB/octave)
▪ Sample Interval:	2 ms
▪ Record Length:	6000 ms
<b>Navigation Systems</b>	
▪ Primary:	MAXIRAN
▪ Secondary:	TRBL 4000DL GPS
<b>Data Sampling</b>	
▪ Nominal Fold:	60

**HOT07A** survey field data was collected during May to June 2007 by WesternGeco with the M/V Western Trident, and using a conventional towed streamer technique. The acquisition configuration was for 3D data (8 streamers, 2 sources) as a 3D project for Santos was acquired in the same block prior to recording of the BHPBP data. For the 2D data processed as part of this project, a single source and single (central) cable were used for acquisition. The following parameters were utilised for data collection:

<b>HOT07A</b>	<b>51.7 km processed</b>
<b>Streamers</b>	
▪ Length	5000 metres
▪ Number of Groups:	400
▪ Depth	8/10 metres (HOT07A-05 recorded at 10m cable depth)
▪ Group Interval:	12.5 metres
▪ Nominal near offset:	250 metres
<b>Energy Source</b>	
▪ Type:	Airgun
▪ Total Volume:	3147 cu.in
▪ Operation Pressure:	2000 psi
▪ Depth:	7 metres
▪ Shotpoint Interval:	26.66 metres
▪ Gun Delay:	0 ms
<b>Instrumentation</b>	
▪ Recording System:	WesternGeco TRIACQ 5
▪ Recording Format:	SEG-D
▪ Low Cut Filter:	2Hz(12dB/Oct)
▪ High Cut Filter:	206Hz(264dB/Oct)
▪ Sample Interval:	2 ms
▪ Record Length:	6000 ms
<b>Navigation Systems</b>	
▪ Primary:	CNAV
▪ Secondary:	VERIPOS
<b>Data Sampling</b>	
▪ Nominal Fold:	60
▪ Nominal Fold:	24

## 4 PERSONNEL

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### 4.1 Geophysical Staffing and Organisation

WesternGeco		
<b>Mr. Michael Hartley</b>	Geophysical Consultant	Client liaison in testing and Parameter selection. Co-ordination production processing and report writing. Weekly reporting to clients

BHPBilliton Petroleum		
<b>Mr. Mark Stanley</b>	Geophysical Applications Australia/Asia Exploration	Overall technical control
<b>Mr. John Thornton</b>	Geophysical Consultant	Contract Administration



## 5 TEST PROCESSING SEQUENCE

Initial parameter testing was performed on the newly acquired HOT07A 2D data. Chosen parameters were then verified on OH91 and OE80A vintage data, with adjustments and/or additions to the processing flow being made as required. Line HOT07A-01 was used for initial testing.

### 5.1 Swell Noise Attenuation (SWATT)

Inspection of raw shots records and selected trace gathers showed that the field data was affected by swell noise, and that some form of noise attenuation was required.

Swell noise and anomalous low frequency noise was attenuated by applying SWATT in the multiple domains. SWATT removes anomalous amplitudes within a user specified frequency band. Anomalous amplitudes are defined as amplitudes that exceed a maximum deviation from the median amplitude within a window. SWATT was tested as a multi-pass process in the offset and shot domains.

The following parameter combinations were tested on selected offsets.

Test #	No. of passes	Bandwidth (Hz)	Threshold %	Filt len (trcs)
<b>1 (offsets)</b>	1 x offset	0-10 inc 2	200,300,400,500	21
<b>2 (offsets + shots)</b>	1 x offset, 1 x shot	0-10 inc 2	200,300,400,500	21
<b>3 (offsets)</b>	2 x offset	0-10 inc 2	200,300,400,500	21
<b>4 (offsets + shots)</b>	2 x offset, 2 x shot	0-10 inc 2	200,300,400,500	21
<b>5 (offsets)</b>	1 x offset	0-20 inc 2	200,300,400,500	21
<b>6 (offsets + shots)</b>	1 x offset, 1 x shot	0-20 inc 2	200,300,400,500	21
<b>7 (offsets)</b>	2 x offset	0-20 inc 2	200,300,400,500	21
<b>8 (offsets + shots)</b>	2 x offset, 2 x shot	0-20 inc 2	200,300,400,500	21

QC displays and segy output after each stage of SWATT were generated. These included shot records, difference shot records, stacks and difference stacks. Conclusions reached as a result of the above testing included:

1. Qc attribute displays before and after shot and receiver domain SWATT indicated that amplitude variations in the recording system were possibly being smeared by shot domain SWATT.
2. The amplitude ratio of noise to primary energy is such that a time variant application of SWATT threshold percentages is required. 400% threshold in the shallow section down to 200% threshold at the end of data is preferred.
3. An analysis bandwidth of 0-20 Hz is insufficient to detect all swell noise (qc displays indicate that higher frequency random noise remains in the data after SWATT application).

Subsequent to the testing outlined above, further testing was confined to running multiple passes of SWATT in the offset domain. Separate passes of SWATT were designed to target different frequency bandwidths to isolate noise from data.

Test #	No. of passes	Bandwidth (Hz)	Threshold %	Filt len (trcs)
<b>9 (offsets)</b>	2 x offset	0-10 inc 2	Time variant	21

<b>10 (offsets)</b>	2 x offset	0-50 inc 5	Time variant	21
<b>11 (offsets)</b>	2 x offset	0-80 inc 5	Time variant	21
<b>12 (offsets)</b>	2 x offset	0-100 inc 10	Time variant	21
<b>13 (offsets)</b>	2 x offset	0-125 inc 10	Time variant	21
<b>14 (offsets)</b>	4 x offset	0-10 inc 2, 0-100 inc 10	Time variant	21
<b>15 (offsets)</b>	4 x offset	0-10 inc 2, 0-125 inc 10	Time variant	21

Conclusions reached as a result of the above testing included:

- Multiple passes of SWATT in the offset domain are better than a single pass.
- A combination of passes targeting noise within different frequency bandwidths is preferable to targeting noise within a single bandwidth.

Subsequent to the testing outlined above, the following parameters were selected for production on **HOT07A** data.

Pass 1 and 2: Offset domain SWATT:

<b>Input data</b>	Common offset gathers
<b>Frequency Bands</b>	0-10 Hz
<b>Band increment</b>	2 Hz
<b>Application start time</b>	Waterbottom time
<b>Analysis window length</b>	800ms
<b>Window overlap</b>	25%
<b>Window start</b>	Offset dependent, relative to wptime
<b>Filter length</b>	21 traces
<b>Threshold</b>	0s+400%, 1s+350%, 2.5s+200%, EOD + 200%

Pass 3 and 4: Offset domain SWATT:

<b>Input data</b>	Common offset gathers
<b>Frequency Bands</b>	0-125 Hz
<b>Band increment</b>	10 Hz
<b>Application start time</b>	Waterbottom time
<b>Analysis window length</b>	800ms
<b>Window overlap</b>	25%
<b>Window start</b>	Offset dependent, relative to wptime
<b>Filter length</b>	21 traces
<b>Threshold</b>	0s+500%, 1s+500%, 4s+200%, EOD + 200%

These parameters were verified on each vintage prior to commencement of SWATT production. OH91 and OE80A data do not contain the same level of swell noise as HOT07A data, and it was evident at this stage that some attenuation of primary energy was occurring on these vintages. Consequently higher SWATT threshold percentages were tested on these vintages and qc products regenerated. In all cases assessed the result was improved, so the parameters selected for production were adjusted accordingly. Subsequent to further SWATT testing on **OH91** and **OE80A** data, the following parameters were selected for production on these vintages.

Pass 1 and 2: Offset domain SWATT:

<b>Input data</b>	Common offset gathers
<b>Frequency Bands</b>	0-20 Hz
<b>Band increment</b>	2 Hz
<b>Application start time</b>	Waterbottom time +500ms

<b>Analysis window length</b>	800ms
<b>Window overlap</b>	25%
<b>Window start</b>	Offset dependent, relative to wptime
<b>Filter length</b>	21 traces
<b>Threshold</b>	0s+1000%, 1.5s+800%, 2s+600%, 4s+300%, EOD + 300%

Pass 3 and 4: Offset domain SWATT:

<b>Input data</b>	Common offset gathers
<b>Frequency Bands</b>	0-125 Hz
<b>Band increment</b>	10 Hz
<b>Application start time</b>	Waterbottom time + 500ms
<b>Analysis window length</b>	800ms
<b>Window overlap</b>	25%
<b>Window start</b>	Offset dependent, relative to wptime
<b>Filter length</b>	21 traces
<b>Threshold</b>	0s+1000%, 1.5s+800%, 2s+600%, 4s+300%, EOD + 300%

## 5.2 Wavelet Designature

The purpose of the waterbottom designature process is to deterministically derive an operator that will shape the amplitude spectra of the embedded source wavelet (including gun and cable notches) to the amplitude spectra of a specified “ideal” zero phase wavelet. The frequency/amplitude characteristics of the embedded wavelet are determined by analysing the data in this case rather than using a farfield signature.

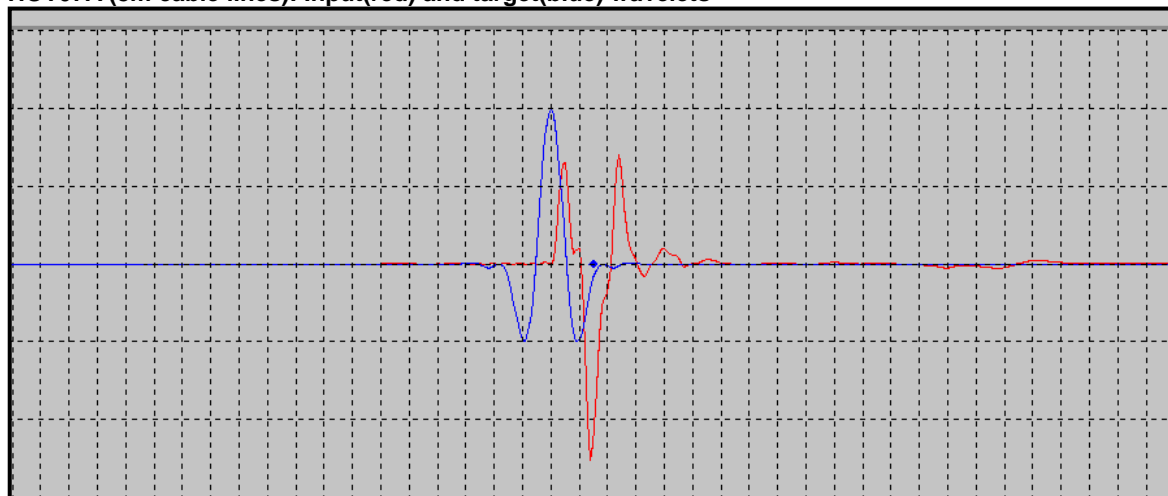
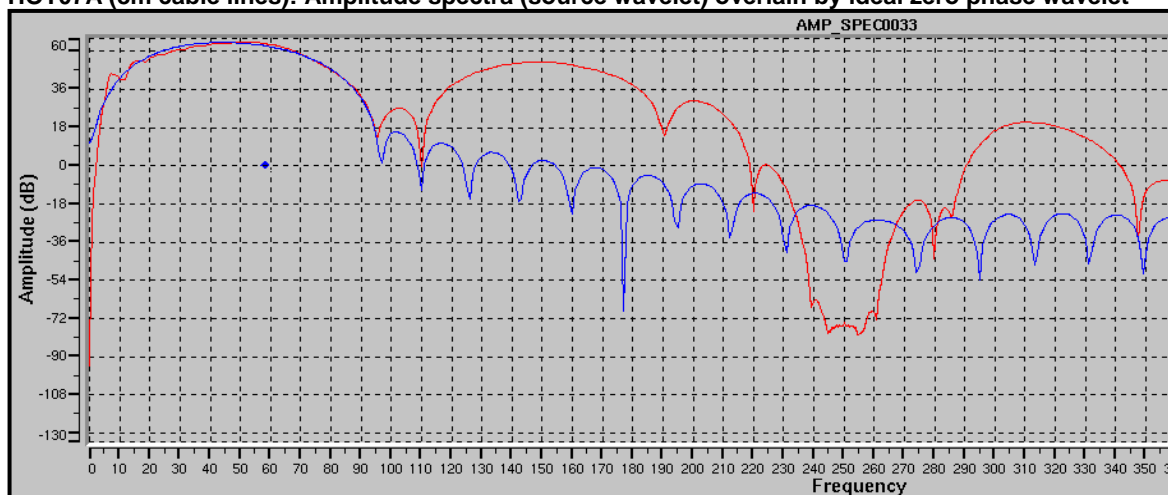
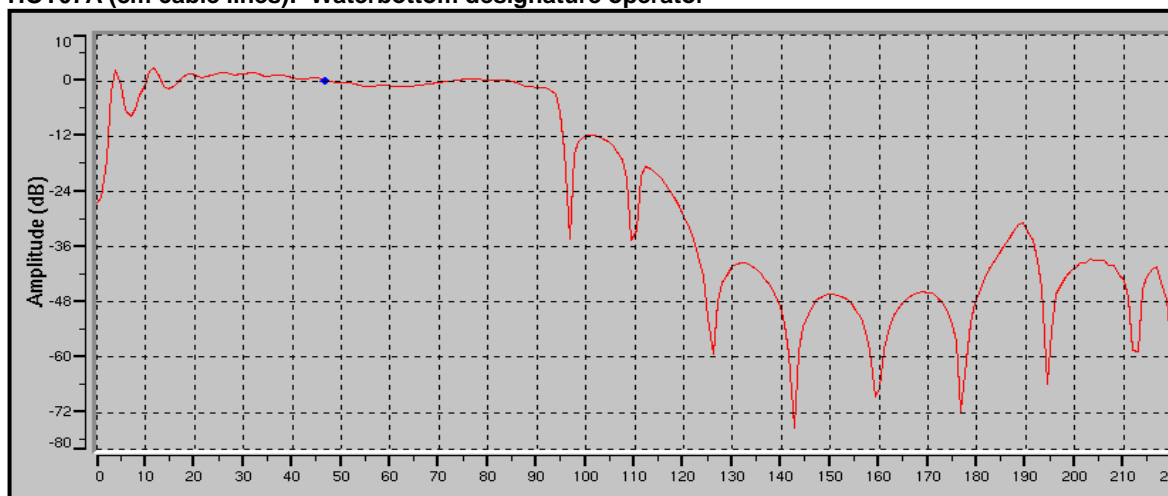
For HOT07A data the source signature was obtained from the Labella operations report, and was used as basis for designature testing. Cable ghosts for 8m and 10m cable depths (one line HOT07A-05 was acquired at 10m) were added to the source signature to generate input wavelets for designature operator generation.

For OH91A and OE80A data, 2 deep water lines which were not included in the 2008 processing were provided by BHPBP for wavelet extraction (2008 processing data was from a shallower waterbottom area and did not provide sufficient waterbottom rugosity to cancel out geology through flattening and stacking the near traces). The data derived wavelets were generated by first break picking the waterbottom time of the near 10 traces. Traces were then flattened on the basis of the picked waterbottom times, and then stacked into a single output trace to produce the final data derived wavelet.

The amplitude spectra of the “ideal” zero phase wavelets was determined by trial and error, using the amplitude spectra of the data derived wavelets as a guide. For HOT07A data, an initial wavelet was generated from a zero phase filtered spike trace using a nominal 20Hz(10dB/oct) - 70Hz(30dB/oct) band pass filter. The amplitude spectra of the ideal and data derived wavelets were then overlain and differences in slopes/bandwidths noted. Subsequent ideal wavelets were generated with appropriate adjustments until the amplitude spectra of the ideal and data derived wavelets matched as closely as possible.

The ideal wavelet that most closely matched the HOT07A testline source wavelet (8m cable depth) was a wavelet of bandwidth 29Hz(9dB/oct) - 65Hz(25dB/oct). The ideal wavelet was designed to match the amplitude spectrum of a data derived wavelet up to the cable notch (“conventional” design).

The data derived wavelets were then shaped to the ideal wavelet to produce a deterministic designature operator. The operators were generated at a 1ms sample, and data was subsampled to 1ms prior to designature application and resampled to 3ms after application.

**HOT07A (8m cable lines): Input(red) and target(blue) wavelets****HOT07A (8m cable lines): Amplitude spectra (source wavelet) overlain by ideal zero phase wavelet****HOT07A (8m cable lines): Waterbottom designator operator**

Stack datasets before and after waterbottom designator were generated for the testlines. Inspection of the waterbottom designator operator wavelets, stack and shot qc displays showed that conventional waterbottom designator was effective in removing reverberations from the testline data.

The test sequence described above was repeated for all vintages within the survey area to determine production processing parameters. A summary of the test results for each vintage is detailed below.

<b>SURVEY</b>	<b>Design design</b>	<b>Target wavelet</b>
<b>HOT07A (8m cable)</b>	Conventional	26Hz(9dB/oct) – 65Hz(25dB/oct)
<b>HOT07A (10m cable)</b>	Conventional	26Hz(9dB/oct) – 60Hz(40dB/oct)
<b>OH91A</b>	Conventional	24Hz(9dB/oct) – 60Hz(35dB/oct)
<b>OE80A</b>	Conventional	18Hz(11dB/oct) – 47Hz(29dB/oct)

### 5.3 F-K Filter Linear Noise Attenuation

Testing of linear noise attenuation was restricted to F-K filter testing, as Radon or 3D FXY linear noise attenuation was not required by the client. Applying F-K filter prior to SRME has also been proved on recent surveys to be helpful with respect to multiple modelling within the surface multiple prediction stage of SRME. Sorting of the input data into back-to-back shots prior to F-K filter has also proved beneficial on recent surveys, so this approach was also adopted for parameter verification tests.

The following standard settings were used as a basis for F-K filter testing.

<b>Filter design</b>	Dip pass after NMO using vintage velocities
<b>Data domain</b>	Shot records sorted back to back
<b>Removable AGC</b>	300ms
<b>Application cutoff</b>	F-K filter not applied below 2Hz (18dB/octave)

The following velocity filter settings were tested:

<b>Test #</b>	<b>Pass zone</b>	<b>Taper Zone</b>
<b>1</b>	-3000m/s to + 3000m/s (50% amplitude)	-1500m/s to + 1500m/s (cosine square taper)
<b>2</b>	-4000m/s to + 4000m/s (50% amplitude)	-2000m/s to + 2000m/s (cosine square taper)
<b>3</b>	-5000m/s to + 5000m/s (50% amplitude)	-2500m/s to + 2500m/s (cosine square taper)

Assessment of stack and shot data before and after F-K filter application shows that the process is effective in removing linear noise, and also has the added benefit of removing remnant low frequency swell noise. Sorting the shots in a back-to-back manner improves the F-K filter results when compared to conventional shot domain F-K filter. The main area of improvement is the removal of F-K transform artefacts on near traces of shot gathers, and the consequent removal of low frequency background noise in the shallow stack section. F-K filter parameters to be utilised in production processing are as follows:

<b>Filter domain</b>	Shot domain – F-K filter performed on back-to-back sorted shot records
<b>Filter design</b>	Dip pass after NMO using vintage velocities
<b>Pass zone</b>	-5000m/s to + 5000m/s (50% amplitude)
<b>Taper zone</b>	-2500m/s to + 2500m/s (cosine square taper)
<b>Removable AGC</b>	300ms
<b>Application cutoff</b>	F-K filter not applied below 2Hz (18dB/octave)

## 5.4 Water Layer Demultiple (DWD)

DWD models water-layer reverberations using a wavefield extrapolation method. The model is then adaptively subtracted from the data. DWD is well-suited to shallow water environments, where the water bottom is flat and has high reflectivity. As such, it is ideal in preconditioning data for SRME when the pre-critical water bottom reflection is not recorded.

Water layer demultiple (DWD) was tested on line HOT07A-01. An accurate waterbottom time for DWD processing was generated by picking wbtimes on autocorrelations of select P0 traces extracted from radon transformed shot records (data is too shallow to accurately pick waterbottom from stack or NTG data). Cosine bell smoothing of the waterbottom pick time over 0, 11, 21 and 51 picked waterbottom times was tested and the 21 trace smoothing function was chosen as optimal.

The multiple model generated by DWD is adaptively subtracted from the input data using a least squares subtraction algorithm. The following adaptive subtraction tests were run:

### DWD least squares subtraction tests:

Test #	Win length(ms)	Win length olap	Win width (trcs)	Win width olap	Filter type	Filt length (samples)
1	1000	500	100	50	1D	21
2	1000	500	200	100	1D	21
3	500	250	100	50	1D	21
1	1000	500	100	50	2D	21
1	500	250	100	50	2D	21

A window of 1000ms x 100 traces was chosen as optimal for effective multiple attenuation without damaging primary events. 2D adaptive subtraction gave good results but improvement was considered marginal and did not justify extra expense and time.

The following adaptive subtraction parameters were selected for production processing.

Adaptive subtraction domain	Offset
Adaptive filter window length	1000 ms (overlap 500ms)
Adaptive filter window width	100 traces (overlap 50 traces)
Adaptive filter length	63ms (21 samples at 3ms)
No. of passes:	1

## 5.5 Surface Related Multiple Elimination (SRME)

Surface related multiples were predicted from their constituent primary events using wavefield inversion based on the Kirchhoff integral. Waterbottom times were used as timing information for the generating primary event. Input data was interpolated and extrapolated to a dataset with uniform station spacing and offset distribution (to zero offset) – a requirement for multiple prediction. Spherical divergence corrections were removed prior to multiple model generation. Modelled multiple datasets were stacked as a qc product and compared to stacked input data.

Modelled multiples were then adaptively subtracted from seismic data using a least squares adaptive filtering technique. Filtered model datasets (ie – multiple models after adaptive subtraction) and datasets with multiples removed were stacked as a qc product and compared to pre-SRME stack data.



SRME was run as a multi-pass process, with each pass designed to model successive orders of interbed multiples. Four passes of SRME were run on initial tests, however there was negligible multiple attenuation from the second pass onwards, so subsequent testing was limited to two passes. As DWD had been run prior to SRME, the waterbottom event was removed from the data input to the multiple modelling process.

SRME testing concentrated on finding the optimal adaptive subtraction settings. Parameter settings that affect the result include the length and width of the window used for matching filter calculation, the matching filter length and the number of passes of adaptive subtraction. In general, longer windows and shorter matching filter lengths give the most conservative results and are least likely to attack primary energy. All adaptive subtraction testing was performed in the offset domain.

The following least squares subtraction parameters were tested:

#### SRME least squares subtraction tests:

Test #	Win length(ms)	Win length olap	Win width (trcs)	Win width olap	Filter type	Filt length (samples)
1	1000	500	100	50	1D	21
2	1000	500	200	100	1D	21
3	500	250	100	50	1D	21

Analysis of stacks before and after SRME using the above testing regime indicated that a temporal window of 1000ms was effective in removing multiples, while at the same time preserving primary events. The following SRME parameters were therefore chosen for production processing.

Adaptive subtraction domain	Offset
Adaptive filt window length	1000 ms (overlap 500ms)
Adaptive filt window width	100 traces (overlap 50 traces)
Adaptive filter length	93ms (31 samples at 3ms)
No. of passes:	1

## 5.6 Radon Demultiple

Weighted least squares (WLS) radon parabolic noise attenuation is the preferred choice for residual multiple removal. Tests included pre and post radon stacks, cmp gathers and velocity semblance displays. CMP gathers were 100% NMO corrected before radon transform, then velocity mutes were applied to radon transformed records (along with maximum moveout definition limits). Further tests were also run with NMO applied using scaled velocities before radon transform and no velocity mute applied to transform records – these tests were carried out because there was some leakage of primary data on the initial radon demultiple tests in buried channel areas. A mild outer trace mute was applied in the radon transform branch prior to demultiple to protect against low frequency wraparound of stretched events.

Data was extrapolated to zero offset prior to radon demultiple in an effort to reduce the effect of radon domain impulse responses on near traces after demultiple. Data was also interpolated to a smaller trace spacing within CMP gathers (2:1 interpolation) prior to radon demultiple application. Initial testing was carried out using the following parameters:

Trace Interpolation	1:2 cdp domain f-x interpolation after 100% NMO
Trace Extrapolation	extrapolate to zero offset prior to radon
Pre radon mute	Mild outer trace mute prior to transform only
Application time	Pass 0-EOD

<b>Removable AGC:</b>	300ms
<b>Radon moveout range</b>	-1000 to 6000ms at max offset
<b>P traces</b>	1104
<b>Maximum frequency</b>	Nyquist

Testing concentrated on moveout correction percentages prior to radon transform, and definition of the maximum moveout for signal with the radon transform as detailed below:

<b>Parameter</b>	<b>Testing</b>
Velocity scaling	90%, 92%, 94%, 96% of SRME velocity field
Max moveout for signal	50, 100, 150, 200, 250, 300ms at far offset

Subsequent to the radon demultiple tests detailed above, the process was selected for production. The parameters detailed in the following table were utilised for production.

<b>Velocity Scaling:</b>	0s+90% 0.75s+90% 1.0s+92% EOD+92%
<b>Application start time</b>	0
<b>Application end time</b>	0 to EOD
<b>Removable AGC:</b>	300ms
<b>Radon moveout range</b>	-1000 to 6000ms at max offset
<b>Defined signal moveout range</b>	0ms: -1000 to 250ms at max offset 500ms: -1000 to 250ms at max offset 1000ms: -1000 to 200ms at max offset 2000ms: -1000 to 150ms at max offset 3000ms: -1000 to 100ms at max offset 4500ms: -1000 to 100ms at max offset
<b>Maximum frequency</b>	Nyquist (166Hz)

## 5.7 Mute

NMO CMP gathers with angle mute overlays and angle stacks were generated as test products for HOT07A data – tests are detailed in the following table.

<b>Test #</b>	<b>Product</b>	<b>Angle range deg)</b>
1	NMO CMP gathers (angle overlay)	0 to 48 deg in 6 deg increments
2	Angle stack	0 to 6 degrees
3	Angle stack	6 to 12 degrees
4	Angle stack	12 to 18 degrees
5	Angle stack	18 to 24 degrees
6	Angle stack	24 to 30 degrees
7	Angle stack	30 to 36 degrees
8	Angle stack	36 to 42 degrees
9	Angle stack	42 to 48 degrees

Assessment of the above tests resulted in the selection of mutes for three angle stack products and one “standard” stack product as follows (the outside angle mute is in effect only beyond the first two near offset traces to preserve the shallow section for stacking):

<b>Product</b>	<b>Survey</b>	<b>Stack</b>	<b>Angle range deg)</b>
1	ALL	Standard stack	6 to 30 degree angle mute
2	ALL	Angle stack (“near”)	6 to 18 degree angle mute
3	ALL	Angle stack (“far”)	18 to 30 degree angle mute
4	ALL	Angle stack (“vfar”)	30 to 42 degree angle mute



## 5.8 Deabsorption (inverse Q)

Determination of a Q value (a measure of the absorption strength of a material) was carried out by amplitude analysis of shallow and deep data for all three vintages, and running Q test panels and determining the best value by visual inspection. Phase and amplitude inverse Q application, a reference frequency of 250Hz and a gain level of 24dB were used for initial testing at the request of BHPBP. The following Q values were tested (a Q value of approximately 160 was the value determined from amplitude analysis of the three vintages).

Test #	Application	Q value	Reference frequency (Hz)	Gain level (dB)
1	Phase + Amp	120	250	24
2	Phase + Amp	160	250	24
3	Phase + Amp	180	250	24
4	Phase + Amp	240	250	24
5	Phase + Amp	300	250	24

Q test stacks were generated using the parameters detailed in the above table. Inverse Q was applied from the water bottom time in all cases. Analysis of stacks before and after inverse Q using the above testing regime indicated that a Q value of 160 produced the best results, providing improved event resolution in the target zone.

<b>Mode</b>	Phase and Amplitude
<b>Q value</b>	160
<b>Gain limit</b>	24dB
<b>Reference frequency</b>	250Hz

## 6 PRODUCTION PROCESSING SEQUENCE

### 6.1 Polarity

Recording polarity was maintained throughout the processing sequence.

### 6.2 Reformat to Internal Processing Format

Field data in SEG-Y format was converted to WesternGeco Omega format. Full word, 32 bit floating-point data at hydrophone amplitude was maintained.

### 6.3 Recording Delay Corrections

Recording delay corrections were applied where applicable on a survey dependent basis. The magnitudes of the static shifts applied to various vintages are detailed below.

Vintage	Recording delay correction
HOT07A	0ms
OH91A	0ms
OE80A	-51.2ms

### 6.4 Field Data Edits

Records and traces flagged as bad in the Observer's logs were edited from the processing sequence.

### 6.5 Marine Geometry

Nominal 2D geometry information was created for seismic data using the following parameters:

Acquisition	HOT07A	OH91A	OE80A
Acquisition contractor	WesternGeco	Western Geophysical	G.S.I
Shot spacing(m)	25.0	26.66	25.0
Channel spacing(m)	12.5	13.33	25.0
CMP spacing(m)	6.25	6.66	12.5
Number of channels	400	240	96
Nominal CMP fold	100	60	48
Gun depth(m)	7	6	6
Cable depth(m)	8/10	10	12
Near Offset(m)	250	188	220-311
Record length(sec)	6	6	5
Sample rate(msec)	2	2	4
Recording Delay	0	0	-51.2

## 6.6 Navigation Merge

True source xy co-ordinates were merged with seismic data based on line and shotpoint information (receiver coordinates were not available for loading to trace headers).

## 6.7 Data Integrity Q.C.

Near trace gathers and selected shot records were output and displayed.

## 6.8 Waterbottom Digitising / Header Merge.

Near trace gathers were stacked after application of a constant 1500m/s NMO and output to SEG-Y. They were then loaded into OmegaVu interpretation software where waterbottom profiles were picked on a semi-automatic basis following the first zero crossing (-/+). Picked waterbottom times were then exported and merged into trace headers for later use in spatially variant, depth dependent processes.

## 6.9 Amplitude Recovery

To correct for loss of amplitude with time, the inverse of the amplitude decay factor (A) was applied to the data where  $A = 1/(T*(V^2))$ , T being 2 way time and V being RMS velocity. Vintage velocities from the previous reprocessing were used for this geometric spreading correction where available. Where vintage velocities were not available, regional velocity functions based on waterbottom time were used.

## 6.10 Sort To Common Offset Order

Data was sorted into offset order in preparation for Swell noise attenuation (SWATT)

## 6.11 Normal Moveout (NMO)

Normal moveout corrections were applied using vintage velocities.

## 6.12 Swell Noise Attenuation (SWATT)

Swell noise and anomalous low frequency noise was attenuated by applying SWATT in the offset domain. SWATT removes anomalous amplitudes within a user specified frequency band. Anomalous amplitudes are defined as amplitudes that exceed a maximum deviation from the median amplitude within a window. Threshold percentages were chosen on a survey dependent basis.

**HOT07A:** Pass 1 and 2: Offset domain SWATT:

<b>Input data</b>	Common offset gathers
<b>Frequency Bands</b>	0-10 Hz
<b>Band increment</b>	2 Hz
<b>Application start time</b>	Waterbottom time
<b>Analysis window length</b>	800ms
<b>Window overlap</b>	25%
<b>Window start</b>	Offset dependent, relative to wptime
<b>Filter length</b>	21 traces

Threshold	0s+400%, 1s+350%, 2.5s+200%, EOD + 200%
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**HOT07A:** Pass 3 and 4: Offset domain SWATT:

Input data	Common offset gathers
Frequency Bands	0-125 Hz
Band increment	10 Hz
Application start time	Waterbottom time
Analysis window length	800ms
Window overlap	25%
Window start	Offset dependent, relative to wptime
Filter length	21 traces
Threshold	0s+500%, 1s+500%, 4s+200%, EOD + 200%

**OH91A and OE80A:** Pass 1 and 2: Offset domain SWATT:

Input data	Common offset gathers
Frequency Bands	0-20 Hz
Band increment	2 Hz
Application start time	Waterbottom time +500ms
Analysis window length	800ms
Window overlap	25%
Window start	Offset dependent, relative to wptime
Filter length	21 traces
Threshold	0s+1000%, 1.5s+800%, 2s+600%, 4s+300%, EOD + 300%

**OH91A and OE80A:** Pass 3 and 4: Offset domain SWATT:

Input data	Common offset gathers
Frequency Bands	0-125 Hz
Band increment	10 Hz
Application start time	Waterbottom time + 500ms
Analysis window length	800ms
Window overlap	25%
Window start	Offset dependent, relative to wptime
Filter length	21 traces
Threshold	0s+1000%, 1.5s+800%, 2s+600%, 4s+300%, EOD + 300%

## 6.13 Inverse Normal Moveout (NMO)

Inverse normal moveout corrections were applied using vintage velocities.

## 6.14 Sort To Shot Order

Data was sorted into common shot order in preparation for waterbottom designature.

## 6.15 Resample

The data was subsampled from the recording sample rate (2 or 4 ms) to 1ms prior to waterbottom designature. Frequencies up to 85% of the nyquist frequency were retained during the supersampling process.

## 6.16 Wavelet Designature

An “ideal” zero phase wavelet was generated from a zero phase filtered spike trace for each of the vintages processed. This ideal wavelet was designed to match the amplitude spectrum of a source wavelet up to the cable notch (“conventional” design). A data derived or field recorded source wavelet was then shaped to this “ideal” wavelet to produce a deterministic designature operator (see testing section for a description of how the data derived wavelet was generated). The operator was generated at a 1ms sample rate, and data was subsampled to 1ms prior to designature application and resampled to 3ms after application.

A summary of waterbottom designature production parameters used for each vintage is detailed below.

SURVEY	Desig design	Target wavelet
HOT07A (8m cable)	Conventional	26Hz(9dB/oct) – 65Hz(25dB/oct)
HOT07A (10m cable)	Conventional	26Hz(9dB/oct) – 60Hz(40dB/oct)
OH91A	Conventional	24Hz(9dB/oct) – 60Hz(35dB/oct)
OE80A	Conventional	18Hz(11dB/oct) – 47Hz(29dB/oct)

The waterbottom designature process involves shaping the wavelet from minimum phase to zero phase, which results in an apparent time shift at the water bottom. Time shifts differ for each survey dependent on the source wavelet amplitude spectrum. Apparent time shifts resulting from waterbottom designature for each data vintage are summarised below.

SURVEY	Apparent time shift (ms)
HOT07A	-15
OH91A	-15
OE80A	-22

## 6.17 Resample

The data was resampled from 1ms to 3ms subsequent to waterbottom designature. A zero phase anti-alias filter with a high cut of 125Hz (0.75 Nyquist) and a slope of 36 dB/oct was applied prior to resample.

## 6.18 Trace Interpolation (OE80A vintage only)

Some of the reprocessed vintages were recorded with large group intervals which are spatially aliased in multichannel processes. Consequently shot records were interpolated to a smaller trace interval prior to F-K filter using frequency domain interpolation for selected vintages. Normal moveout using vintage velocities was applied before interpolation to reduce hyperbolic curvature. The table below details interpolation factors applied to the various vintages.

SURVEY	Interpolation	Interpolation factor
HOT07A	NO	N/A (retain 12.5m trace interval)
OH91A	NO	N/A (retain 13.33m trace interval)
OE80A	YES	2 to 1 (from 25.0m to 12.5m trace interval)

## 6.19 Shot Domain F-K Linear Noise Attenuation

Direct arrival energy was attenuated by applying velocity filtering to source records in the F-K domain. Filtering was applied after application of normal moveout using a regional velocity field derived from previously interpreted velocities. Shots were sorted in a back-to-back manner (ie - adjacent shots were combined and sorted in a split spread manner such that near traces from consecutive shots are adjacent). This approach results in removal of F-K transform artefacts on near traces of shot gathers, and the consequent removal of low frequency background noise in the shallow stack section. The filter applied to the data is outlined below:

<b>Filter domain</b>	Shot domain – F-K filter performed on back-to-back sorted shot records
<b>Filter design</b>	Dip pass after NMO using vintage velocities
<b>Pass zone</b>	-5000m/s to + 5000m/s (50% amplitude)
<b>Taper zone</b>	-2500m/s to + 2500m/s (cosine square taper)
<b>Removable AGC</b>	500ms
<b>Application cutoff</b>	F-K filter not applied below 2Hz (18dB/octave)

## 6.20 Shot Extrapolation

Shot records were extrapolated to zero offset after NMO application in preparation for SRME – a requirement for this process.

## 6.21 Water Layer Demultiple (DWD)

DWD models water-layer reverberations using a wavefield extrapolation method. The model is then adaptively subtracted from the data. DWD is well-suited to shallow water environments, where the water bottom is flat and has high reflectivity. As such, it is ideal in preconditioning data for SRME when the pre-critical water bottom reflection is not recorded.

Waterlayer multiples were modelled using DWD. Modelled multiples were then adaptively subtracted from seismic data in the common offset domain using a least squares adaptive filtering technique. The following adaptive subtraction parameters were selected for production processing.

<b>Adaptive filter window length</b>	1000 ms (overlap 500ms)
<b>Adaptive filter window width</b>	100 traces (overlap 50 traces)
<b>Adaptive filter length</b>	63ms (21 samples at 3ms)
<b>No. of passes:</b>	1

## 6.22 Surface Related Multiple Elimination (SRME)

Surface related multiples were predicted from their constituent primary events using wavefield inversion based on the Kirchhoff integral. Waterbottom times were used as timing information for the generating primary event. Data was interpolated internally to SRME to the highest common shot and detector factor (for example, if the shot interval is 25m and the detector interval is 12.5m, the shot interval will be interpolated to 12.5m prior to integral evaluation). Modelled multiples were then adaptively subtracted from seismic data in the common offset domain using a least squares adaptive filtering technique. Interpolated and

extrapolated traces are not output from the multiple modelling process. The following adaptive subtraction parameters were therefore selected for production processing.

<b>No. of multiple modeling passes:</b>	2
<b>No. of final adaptive subtraction passes:</b>	1
<b>Adaptive filter window length</b>	1000 ms (overlap 500ms)
<b>Adaptive filter window width</b>	100 traces (overlap 50 traces)
<b>Adaptive filter length</b>	45ms (15 samples at 3ms)

## 6.23 Sort To CMP Order

Data was sorted into CMP order in preparation for subsequent processing.

## 6.24 Velocity Analyses

Post SRME velocity analyses were run at a 1000m increment using the following parameters. All velocity analyses were performed with WesternGeco's Interactive Velocity Processing (INVA). Traces selected for velocity analyses were cmp sorted, and past processing velocities were used as the central function. QC stacks with NMO corrections using picked 1<sup>st</sup> pass velocities were generated.

<b>No. of MVF panels</b>	15
<b>Panel separation</b>	2%
<b>Stack traces per MVF</b>	15
<b>INVA displays</b>	Gathers, MVF's, semblances, stacks, horizons

## 6.25 Sort to Shot Order

Data was sorted into shot order in preparation for subsequent processing.

## 6.26 Shot Extrapolation

Shot records were extrapolated to zero offset after NMO application in preparation for radon multiple attenuation.

## 6.27 Sort To CMP Order

Data was sorted into CMP order in preparation for subsequent processing.

## 6.28 Trace Interpolation

To avoid spatial aliasing within the radon transform, CMP records were interpolated to a smaller trace interval prior to radon demultiple using frequency domain interpolation. Normal moveout using 1<sup>st</sup> pass velocities was applied before interpolation to reduce hyperbolic curvature. The table below details interpolation factors applied to the various vintages.

SURVEY	Interpolation	Interpolation factor
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<b>HOT07A</b>	YES	2 to 1 (from 50.0m to 25.0m trace interval)
<b>OH91</b>	YES	2 to 1 (from 53.3m to 26.6m trace interval)
<b>OE80A</b>	YES	2 to 1 (from 50.0m to 25.0m trace interval)

## 6.29 Radon Multiple Attenuation

Radon demultiple was applied after NMO corrections using 100% of the first pass velocity field velocity field, and a velocity mute internal to the radon transform using a scaled first pass velocity field. The following parameters were used in the process:

<b>Velocity Scaling:</b>	0s+90% 0.75s+90% 1.0s+92% EOD+92%
<b>Application start time</b>	0
<b>Application end time</b>	0 to EOD
<b>Removable AGC:</b>	300ms
<b>Radon moveout range</b>	-1000 to 6000ms at max offset
<b>Defined signal moveout range</b>	0ms: -1000 to 250ms at max offset 500ms: -1000 to 250ms at max offset 1000ms: -1000 to 200ms at max offset 2000ms: -1000 to 150ms at max offset 3000ms: -1000 to 100ms at max offset 4500ms: -1000 to 100ms at max offset
<b>Maximum frequency</b>	Nyquist (125Hz)

Interpolated and extrapolated traces were rejected on completion of the Radon demultiple process.

## 6.30 Sort To Common Offset Order

Data was sorted into offset order in preparation for pre stack time migration.

## 6.31 Time Variant Filter

The following zero phase time variant filter was applied relative to waterbottom time (filter times are adjusted by the waterbottom time prior to filter application).

Time(ms)	Low freq.	Low slope	High freq.	High slope
0	OUT	OUT	110	72
1000	OUT	OUT	100	72
2000	OUT	OUT	90	72
2600	OUT	OUT	83	72
4000	OUT	OUT	65	72
5000	OUT	OUT	55	72
EOD	OUT	OUT	45	72

## 6.32 Pre Stack Time Migration (For PrSTM Vel Analyses)

A pass of targeted PrSTM was run for generation of PrSTM velocity analyses. The PrSTM program accounts for geometric spreading, which was therefore removed before running



production PrSTM. The data was migrated using the first pass velocity field smoothed with a 4km running average filter. The following parameters were utilized.

Input Vel smoothing	Time (ms)	Radius (m)
	0	2000
	EOD	2000
Input Vel percentage	Time (ms)	Percentage
	0	100
	EOD	100
Input velocities	Smoothed post-SRME pass	
Implementation	Curved ray algorithm	
Half aperture	3000 m	
Dip limits	60 degrees	

### 6.33 Velocity Analyses

Velocity analyses were run at a 500m increment using the following parameters. All velocity analyses were performed with WesternGeco's Interactive Velocity Processing (INVA). The post-SRME pass of velocities were used as the central function.

No. of MVF panels	15
Panel separation	2%
Stack traces per MVF	15
INVA displays	Gathers, MVF's, semblances, stacks, horizons

### 6.34 Pre Stack Time Migration

Production PrSTM data was migrated using the 2<sup>nd</sup> pass (targeted PrSTM) velocity field smoothed with a 4km running average filter. The PrSTM program accounts for geometric spreading, which was therefore removed before running production PrSTM. The following parameters were utilized.

Input Vel smoothing	Time (ms)	Radius (m)
	0	2000
	EOD	2000
Input Vel percentage	Time (ms)	Percentage
	0	100
	EOD	100
Input velocities	Smoothed first pass	
Implementation	Curved ray algorithm	
Half aperture	3000 m	
Dip limits	60 degrees	

### 6.35 Sort To CDP Order

Data was sorted into CDP order in preparation for subsequent processing.

### 6.36 HDVA Velocity Analyses

High density velocity analyses were run at a vintage dependent increment of approximately 50m using PrSTM cmp gathers as input. Semblances were generated for each location, then semblance data was sorted into isovelocity gathers and smoothed in a time variant manner (this process has the effect of removing spurious semblance peaks without smearing the semblance data). Data was then sorted back into semblance gathers and a Toldi autopicking routine was used to pick peak semblances using the second pass velocities as a guide function.

Velocity control	2 <sup>nd</sup> pass (targeted PrSTM) velocity field
Deviation from model	Unconstrained (not tied to guide function)
Blend factor	Unconstrained (not tied to previous velocity model)
Analysis increment (HOT07A)	50m (every 8 <sup>th</sup> cdp)
Analysis increment (OH91A)	53m (every 8 <sup>th</sup> cdp)
Analysis increment (OE80A)	50m (every 4 <sup>th</sup> cdp)

### 6.37 Normal Moveout (NMO)

Normal moveout corrections were applied using HDVA velocities time variably smoothed with a 50% trim mean filter. The smoothing parameters used are detailed below.

Time (ms)	Smoothing extent (m)
0	2000
250	200
1000	500
2000	1000
3000	2000
5000	4000

### 6.38 Offset Weighting

An offset weighting function was applied prior to stack in order to balance the amplitudes across offsets. The following table summarises the applied weighting functions:

Vintage	Acquisition group interval	Weighting (x = offset in metres)
HOT07A	12.5m	$0.0004x + 1$
OH91A	13.33m	$0.0004x + 1$
WAS76	25.0m	$0.0004x + 1$

### 6.39 Mute

Pre stack muting was applied to NMO corrected CMPS using angle ranges to define inner and outer mutes. The velocity field used for angle mute generation was a spatially (5000m) and temporally (500ms) smoothed version of the PrSTM velocity field. Mutes were applied as follows:

Product	Survey	Stack	Angle range deg)
1	ALL	Standard stack	6 to 30 degree angle mute
2	ALL	Angle stack ("near")	6 to 18 degree angle mute
3	ALL	Angle stack ("far")	18 to 30 degree angle mute
4	ALL	Angle stack ("vfar")	30 to 42 degree angle mute

## 6.40 Stack

NMO corrected, muted data was stacked to produce final pre stack time migrated stacks. Four stack products were produced:

1. Standard Stack (6-30 degrees)
2. Angle Stack #1 (6-18 degrees)
3. Angle Stack #2 (18-30 degrees)
4. Angle Stack #3 (30-42 degrees)

Vintage	Normalisation	Nominal CMP fold
HOT07A	1/N	100
OH91A	1/N	60
OE80A	1/N	48

## 6.41 Source And Streamer Depth Correction

A survey dependent bulk static shift was applied to correct for gun depth and streamer depth.

Vintage	Static correction (ms)
HOT07A	10.00 (HOT07A-01 to 04) / 11.3 (HOT07A-05)
OH91A	10.66
OE80A	12.00

## 6.42 Exponential Gain

An exponential gain of 8dB/sec was applied to stack products. The gain function was applied from the water bottom (WB) to WB+4000 ms, after which gain was held constant to the end of data.

## 6.43 De-Absorption (Inverse Q)

Inverse Q filter was applied to stack products using the parameters detailed below.

Mode	Phase and Amplitude
Q value	160
Gain limit	24dB
Reference frequency	250Hz

## 6.44 Exponential Gain

An exponential gain of -4dB/sec was applied to stack products after inverse Q application. The gain function was applied from the water bottom (WB) to WB+3000 ms, after which gain was held constant to the end of data.

## 6.45 Stack archiving

The following final stack products were generated for archiving:

No.	Archive Product
1	standard stack
2	standard stack + inverse Q
3	Angle stack #1 (6-18 degrees)
4	Angle stack #1 (6-18 degrees) + inverse Q
5	Angle stack #1 (18-30 degrees)
6	Angle stack #1 (18-30 degrees) + inverse Q
7	Angle stack #1 (30-42 degrees)
8	Angle stack #1 (30-42 degrees) + inverse Q

## 7 APPENDICES

### 7.1 Line Summary: permit VIC/P44

Survey	Line	Direction	First SP	Last SP	Kms
HOT07A	HOT07A-01	36.0	1000	1400	10.03
HOT07A	HOT07A-02	36.0	1000	1401	10.05
HOT07A	HOT07A-03	216.0	1304	900	10.13
HOT07A	HOT07A-04	279.0	1275	900	9.40
HOT07A	HOT07A-05	270.0	1384	900	12.13
OH91A	HE94-143	215.0	1565	939	16.72
OH91A	HE94-144	216.0	1670	939	19.52
OH91A	HE94-145	35.0	1000	1721	19.25
OH91A	HE94-146	36.0	1000	1761	20.31
OH91A	HE94-147	35.0	1000	1816	21.78
OH91A	HE94-148	216.0	1755	967	21.03
OH91A	HE94-149	35.0	1066	1901	22.29
OH91A	HE94-150	216.0	1680	1016	17.73
OH91A	HE94-151	215.0	1619	980	17.06
OH91A	HE94-152	216.0	1602	998	16.13
OH91A	HE94-156	305.0	1700	939	20.31
OH91A	HE94-157	125.0	1000	1571	15.25
OH91A	HE94-159	305.0	1545	939	16.18
OH91A	HE94-160	305.0	1550	939	16.32
OH91A	HE94-161	125.0	1000	1666	17.78
OH91A	HE94-162	125.0	1000	1820	21.89
OH91A	HE94-163	305.0	1606	939	17.81
OH91A	HE94-164	305.0	1550	939	16.32
OE80A	OE80A-1015	305.0	2902	2374	13.23
OE80A	OE80A-1017	305.0	2514	3539	25.65
OE80A	OE80A-1019	125.0	2290	2746	11.43
OE80A	OE80A-1021	125.0	4085	4746	16.55
OE80A	OE80A-1023	305.0	2852	2123	18.25
OE80A	OE80A-1025	305.0	2902	2356	13.68
OE80A	OE80A-1026	216.0	2825	2376	11.25
OE80A	OE80A-1027	125.0	2200	2745	13.65
OE80A	OE80A-1028	035.0	2320	2870	13.78
OE80A	OE80A-1029	305.0	2830	3442	15.33
OE80A	OE80A-1030	215.0	2906	2260	16.18
OE80A	OE80A-1031	125.0	2300	3440	28.53
OE80A	OE80A-1032	036.0	2210	2960	18.78
OE80A	OE80A-1033	305.0	3610	2530	27.03
OE80A	OE80A-1034	216.0	2970	2185	19.65
OE80A	OE80A-1035	125.0	2380	3280	22.53
OE80A	OE80A-1036	035.0	2190	2980	19.78
OE80A	OE80A-1037C	125.0	4120	4850	18.28
OE80A	OE80A-1038	036.0	2990	2190	20.03

Survey	Line	Direction	First SP	Last SP	Kms
OE80A	OE80A-1039	305.0	3010	2455	13.90
OE80A	OE80A-1040A	036.0	2195	3180	24.65
OE80A	OE80A-1042	036.0	2195	3157	24.08
OE80A	OE80A-1056	036.0	2285	3200	22.90
Total km					814.5

## 7.2 Shotpoint / CMP Relationship

Line Number	SP range	SP/CMP Relationship	SP =	CDP	SP =	CDP
HOT07A-01	1000 – 1400	$CDP = (SP - 1000) * 4 + 420$	1000	420	1250	1420
HOT07A-02	1000 – 1401	$CDP = (SP - 1000) * 4 + 420$	1000	420	1250	1420
HOT07A-03	1304 – 900	$CDP = (1304 - SP) * 4 + 420$	1304	420	1054	1420
HOT07A-04	1275 – 900	$CDP = (1275 - SP) * 4 + 420$	1275	420	1025	1420
HOT07A-05	1384 – 900	$CDP = (1384 - SP) * 4 + 420$	1384	420	1134	1420
Line Number	SP range	SP/CMP Relationship	SP =	CDP	SP =	CDP
OH91-143	1565 – 939	$CDP = (1569 - SP) * 4 + 254$	1569	254	1319	1254
OH91-144	1670 – 939	$CDP = (1670 - SP) * 4 + 254$	1670	254	1420	1254
OH91-145	1000 – 1721	$CDP = (SP - 1000) * 4 + 254$	1000	254	1250	1254
OH91-146	1000 – 1761	$CDP = (SP - 1000) * 4 + 254$	1000	254	1250	1254
OH91-147	1000 – 1816	$CDP = (SP - 1000) * 4 + 254$	1000	254	1250	1254
OH91-148	1755 – 967	$CDP = (1755 - SP) * 4 + 254$	1755	254	1505	1254
OH91-149	1066 – 1901	$CDP = (SP - 1066) * 4 + 254$	1066	254	1316	1254
OH91-150	1680 – 1016	$CDP = (1680 - SP) * 4 + 254$	1680	254	1430	1254
OH91-151	1619 – 980	$CDP = (1619 - SP) * 4 + 254$	1619	254	1369	1254
OH91-152	1602 – 998	$CDP = (1602 - SP) * 4 + 254$	1602	254	1352	1254
OH91-156	1700 – 939	$CDP = (1700 - SP) * 4 + 254$	1700	254	1450	1254
OH91-157	1000 – 1571	$CDP = (SP - 1000) * 4 + 254$	1000	254	1250	1254
OH91-159	1545 – 939	$CDP = (1545 - SP) * 4 + 254$	1545	254	1295	1254
OH91-160	1550 – 939	$CDP = (1550 - SP) * 4 + 254$	1550	254	1300	1254
OH91-161	1000 – 1666	$CDP = (SP - 1000) * 4 + 254$	1000	254	1250	1254
OH91-162	1000 – 1820	$CDP = (SP - 1000) * 4 + 254$	1000	254	1250	1254
OH91-163	1606 – 939	$CDP = (1606 - SP) * 4 + 254$	1606	254	1356	1254
OH91-164	1550 – 939	$CDP = (1550 - SP) * 4 + 254$	1550	254	1300	1254
Line Number	SP range	SP/CMP Relationship	SP =	CDP	SP =	CDP
OE80A-1015	2902 – 2374	$CDP = (2902 - SP) * 2 + 105$	2902	105	2402	1105
OE80A-1017	2514 – 3539	$CDP = (SP - 2514) * 2 + 105$	2514	105	3014	1105
OE80A-1019	2290 – 2746	$CDP = (SP - 2290) * 2 + 105$	2290	105	2790	1105
OE80A-1021	4085 – 4746	$CDP = (SP - 4085) * 2 + 105$	4085	105	4585	1105
OE80A-1023	2852 - 2123	$CDP = (2852 - SP) * 2 + 105$	2852	105	2352	1105
OE80A-1025	2902 – 2356	$CDP = (2902 - SP) * 2 + 105$	2902	105	2402	1105
OE80A-1026	2825 – 2376	$CDP = (2825 - SP) * 2 + 105$	2825	105	2325	1105
OE80A-1027	2200 - 2745	$CDP = (SP - 2200) * 2 + 105$	2200	105	2700	1105
OE80A-1028	2320 – 2870	$CDP = (SP - 2320) * 2 + 105$	2320	105	2820	1105
OE80A-1029	2830 – 3442	$CDP = (SP - 2830) * 2 + 105$	2830	105	3330	1105
OE80A-1030	2906 – 2260	$CDP = (2906 - SP) * 2 + 105$	2906	105	2406	1105
OE80A-1031	2300 – 3440	$CDP = (SP - 2300) * 2 + 105$	2300	105	2800	1105
OE80A-1032	2210 – 2960	$CDP = (SP - 2210) * 2 + 105$	2210	105	2710	1105
OE80A-1033	3610 – 2530	$CDP = (3610 - SP) * 2 + 105$	3610	105	3110	1105

Line Number	SP range	SP/CDP Relationship	SP =	CDP	SP =	CDP
OE80A-1034	2970 – 2185	$CDP = (2970 - SP) * 2 + 105$	2970	105	2470	1105
OE80A-1035	2380 – 3280	$CDP = (SP - 2380) * 2 + 105$	2380	105	2880	1105
OE80A-1036	2190 – 2980	$CDP = (SP - 2190) * 2 + 105$	2190	105	2690	1105
OE80A-1037	4120 – 4850	$CDP = (SP - 4120) * 2 + 105$	4120	105	4620	1105
OE80A-1038	2990 – 2190	$CDP = (2990 - SP) * 2 + 105$	2990	105	2490	1105
OE80A-1039	3010 – 2455	$CDP = (3010 - SP) * 2 + 105$	3010	105	2510	1105
OE80A-1040	2195 – 3180	$CDP = (SP - 2195) * 2 + 105$	2195	105	2695	1105
OE80A-1042	2195 – 3157	$CDP = (SP - 2195) * 2 + 105$	2195	105	2695	1105
OE80A-1056	2285 – 3200	$CDP = (SP - 2285) * 2 + 105$	2285	105	2785	1105

### 7.3 Waterbottom designature operator points

HOT07A (8m cable depth) designature operator (shape ddwave to 26Hz(9dB/oct) – 65Hz(25dB/oct))					
Time(ms)	Amplitude				<a href="#">(click here for text file)</a>
-500	-1.53E-04	1.21E-04	-1.88E-05	-6.17E-05	-8.61E-06
-495	4.09E-05	2.62E-05	-5.01E-05	-7.23E-05	-2.41E-05
-490	-2.49E-05	-5.68E-05	-3.37E-05	1.62E-06	6.13E-06
-485	4.42E-06	-1.54E-05	-4.83E-05	-5.43E-05	-5.52E-05
-480	-7.26E-05	-6.51E-05	-2.78E-05	-5.71E-06	-6.69E-06
-475	-1.46E-05	-2.70E-05	-4.02E-05	-5.43E-05	-7.21E-05
-470	-8.12E-05	-6.69E-05	-4.02E-05	-2.45E-05	-2.45E-05
-465	-2.53E-05	-2.17E-05	-2.62E-05	-4.26E-05	-6.13E-05
-460	-7.27E-05	-7.11E-05	-6.00E-05	-4.99E-05	-4.00E-05
-455	-2.17E-05	-2.25E-06	2.80E-06	-9.28E-06	-3.13E-05
-450	-5.59E-05	-7.47E-05	-8.06E-05	-7.06E-05	-4.31E-05
-445	-3.23E-06	3.34E-05	4.98E-05	4.05E-05	9.78E-06
-440	-3.31E-05	-7.23E-05	-8.89E-05	-7.28E-05	-2.76E-05
-435	3.13E-05	8.30E-05	1.08E-04	9.86E-05	5.72E-05
-430	-1.31E-06	-5.22E-05	-7.03E-05	-4.63E-05	1.06E-05
-425	8.00E-05	1.39E-04	1.69E-04	1.58E-04	1.12E-04
-420	4.95E-05	-2.05E-07	-1.37E-05	1.39E-05	7.06E-05
-415	1.37E-04	1.94E-04	2.24E-04	2.18E-04	1.82E-04
-410	1.32E-04	9.43E-05	8.51E-05	1.06E-04	1.47E-04
-405	1.96E-04	2.41E-04	2.73E-04	2.85E-04	2.77E-04
-400	2.56E-04	2.34E-04	2.22E-04	2.22E-04	2.33E-04
-395	2.53E-04	2.84E-04	3.25E-04	3.69E-04	4.04E-04
-390	4.20E-04	4.12E-04	3.85E-04	3.51E-04	3.23E-04
-385	3.13E-04	3.34E-04	3.93E-04	4.78E-04	5.62E-04
-380	6.13E-04	6.10E-04	5.60E-04	4.86E-04	4.18E-04
-375	3.85E-04	4.08E-04	4.91E-04	6.14E-04	7.38E-04
-370	8.12E-04	8.08E-04	7.33E-04	6.24E-04	5.28E-04
-365	4.86E-04	5.18E-04	6.22E-04	7.68E-04	9.09E-04
-360	9.92E-04	9.84E-04	8.94E-04	7.70E-04	6.66E-04
-355	6.29E-04	6.70E-04	7.78E-04	9.19E-04	1.05E-03
-350	1.13E-03	1.12E-03	1.04E-03	9.33E-04	8.43E-04
-345	8.14E-04	8.52E-04	9.37E-04	1.04E-03	1.14E-03
-340	1.21E-03	1.22E-03	1.19E-03	1.12E-03	1.06E-03
-335	1.03E-03	1.04E-03	1.07E-03	1.12E-03	1.17E-03
-330	1.23E-03	1.29E-03	1.33E-03	1.33E-03	1.30E-03
-325	1.25E-03	1.20E-03	1.16E-03	1.13E-03	1.15E-03

-320	1.22E-03	1.34E-03	1.46E-03	1.53E-03	1.52E-03
-315	1.44E-03	1.31E-03	1.19E-03	1.10E-03	1.09E-03
-310	1.19E-03	1.37E-03	1.56E-03	1.69E-03	1.69E-03
-305	1.56E-03	1.35E-03	1.16E-03	1.03E-03	1.02E-03
-300	1.15E-03	1.37E-03	1.60E-03	1.75E-03	1.74E-03
-295	1.58E-03	1.32E-03	1.09E-03	9.51E-04	9.54E-04
-290	1.09E-03	1.31E-03	1.54E-03	1.68E-03	1.66E-03
-285	1.49E-03	1.23E-03	1.00E-03	8.75E-04	8.80E-04
-280	9.91E-04	1.16E-03	1.33E-03	1.44E-03	1.43E-03
-275	1.31E-03	1.11E-03	9.17E-04	8.01E-04	7.76E-04
-270	8.15E-04	8.83E-04	9.60E-04	1.03E-03	1.07E-03
-265	1.04E-03	9.54E-04	8.28E-04	7.05E-04	6.05E-04
-260	5.23E-04	4.59E-04	4.38E-04	4.88E-04	6.02E-04
-255	7.18E-04	7.65E-04	7.04E-04	5.46E-04	3.29E-04
-250	9.62E-05	-9.98E-05	-1.91E-04	-1.28E-04	7.98E-05
-245	3.37E-04	5.10E-04	4.95E-04	2.78E-04	-7.47E-05
-240	-4.52E-04	-7.44E-04	-8.62E-04	-7.63E-04	-4.73E-04
-235	-1.15E-04	1.39E-04	1.43E-04	-1.35E-04	-5.96E-04
-230	-1.07E-03	-1.40E-03	-1.51E-03	-1.38E-03	-1.05E-03
-225	-6.67E-04	-3.95E-04	-3.93E-04	-6.96E-04	-1.19E-03
-220	-1.68E-03	-2.00E-03	-2.09E-03	-1.95E-03	-1.67E-03
-215	-1.35E-03	-1.12E-03	-1.12E-03	-1.37E-03	-1.79E-03
-210	-2.21E-03	-2.49E-03	-2.58E-03	-2.51E-03	-2.36E-03
-205	-2.18E-03	-2.03E-03	-1.99E-03	-2.09E-03	-2.32E-03
-200	-2.60E-03	-2.84E-03	-3.00E-03	-3.08E-03	-3.12E-03
-195	-3.12E-03	-3.04E-03	-2.90E-03	-2.77E-03	-2.74E-03
-190	-2.85E-03	-3.09E-03	-3.38E-03	-3.68E-03	-3.94E-03
-185	-4.09E-03	-4.04E-03	-3.75E-03	-3.34E-03	-3.03E-03
-180	-3.00E-03	-3.26E-03	-3.73E-03	-4.27E-03	-4.73E-03
-175	-4.97E-03	-4.87E-03	-4.41E-03	-3.77E-03	-3.25E-03
-170	-3.11E-03	-3.41E-03	-4.05E-03	-4.77E-03	-5.35E-03
-165	-5.59E-03	-5.40E-03	-4.81E-03	-4.06E-03	-3.44E-03
-160	-3.23E-03	-3.55E-03	-4.26E-03	-5.07E-03	-5.65E-03
-155	-5.81E-03	-5.54E-03	-4.95E-03	-4.23E-03	-3.63E-03
-150	-3.37E-03	-3.62E-03	-4.26E-03	-4.98E-03	-5.46E-03
-145	-5.54E-03	-5.29E-03	-4.84E-03	-4.30E-03	-3.79E-03
-140	-3.48E-03	-3.54E-03	-3.92E-03	-4.38E-03	-4.68E-03
-135	-4.77E-03	-4.70E-03	-4.52E-03	-4.23E-03	-3.84E-03
-130	-3.45E-03	-3.19E-03	-3.11E-03	-3.17E-03	-3.33E-03
-125	-3.57E-03	-3.83E-03	-3.97E-03	-3.93E-03	-3.65E-03
-120	-3.12E-03	-2.42E-03	-1.75E-03	-1.40E-03	-1.54E-03
-115	-2.06E-03	-2.66E-03	-3.10E-03	-3.28E-03	-3.07E-03
-110	-2.32E-03	-1.09E-03	1.21E-04	7.39E-04	5.31E-04
-105	-2.33E-04	-1.09E-03	-1.78E-03	-2.14E-03	-1.90E-03
-100	-8.16E-04	8.26E-04	2.30E-03	2.99E-03	2.80E-03
-95	1.99E-03	9.60E-04	5.57E-05	-3.37E-04	1.24E-04
-90	1.46E-03	3.16E-03	4.55E-03	5.28E-03	5.32E-03
-85	4.66E-03	3.54E-03	2.59E-03	2.41E-03	3.10E-03
-80	4.33E-03	5.66E-03	6.81E-03	7.69E-03	8.11E-03
-75	7.72E-03	6.75E-03	6.10E-03	6.22E-03	6.80E-03
-70	7.52E-03	8.28E-03	9.21E-03	1.03E-02	1.11E-02
-65	1.12E-02	1.08E-02	1.06E-02	1.08E-02	1.09E-02
-60	1.08E-02	1.11E-02	1.20E-02	1.31E-02	1.43E-02



-55	1.54E-02	1.58E-02	1.60E-02	1.60E-02	1.52E-02
-50	1.43E-02	1.45E-02	1.51E-02	1.62E-02	1.83E-02
-45	2.02E-02	2.13E-02	2.20E-02	2.14E-02	1.95E-02
-40	1.83E-02	1.82E-02	1.88E-02	2.03E-02	2.24E-02
-35	2.46E-02	2.74E-02	3.02E-02	3.07E-02	2.81E-02
-30	2.34E-02	1.78E-02	1.32E-02	1.16E-02	1.38E-02
-25	2.06E-02	3.09E-02	4.10E-02	4.49E-02	3.70E-02
-20	1.44E-02	-2.17E-02	-6.68E-02	-1.13E-01	-1.52E-01
-15	-1.75E-01	-1.75E-01	-1.52E-01	-1.11E-01	-6.02E-02
-10	-1.07E-02	2.89E-02	5.28E-02	5.93E-02	5.12E-02
-5	3.40E-02	1.51E-02	1.39E-03	-3.90E-03	-8.96E-04
0	8.68E-03	2.13E-02	3.26E-02	3.99E-02	4.13E-02
5	3.58E-02	2.56E-02	1.36E-02	1.76E-03	-7.25E-03
10	-1.12E-02	-1.06E-02	-6.11E-03	1.55E-03	9.46E-03
15	1.51E-02	1.74E-02	1.53E-02	9.15E-03	2.29E-03
20	-2.83E-03	-5.54E-03	-5.38E-03	-2.93E-03	6.54E-04
25	4.99E-03	8.53E-03	9.08E-03	6.64E-03	2.88E-03
30	-5.78E-04	-2.63E-03	-3.27E-03	-2.72E-03	-6.32E-04
35	2.70E-03	5.88E-03	7.37E-03	6.41E-03	3.58E-03
40	3.11E-04	-2.55E-03	-4.52E-03	-5.03E-03	-3.88E-03
45	-1.41E-03	1.52E-03	3.54E-03	3.48E-03	1.21E-03
50	-2.52E-03	-6.46E-03	-9.34E-03	-1.04E-02	-9.62E-03
55	-7.21E-03	-3.81E-03	-5.82E-04	1.03E-03	6.65E-05
60	-3.14E-03	-7.16E-03	-1.05E-02	-1.22E-02	-1.22E-02
65	-1.06E-02	-7.98E-03	-5.06E-03	-3.29E-03	-3.79E-03
70	-6.48E-03	-1.01E-02	-1.33E-02	-1.49E-02	-1.49E-02
75	-1.34E-02	-1.08E-02	-7.78E-03	-5.51E-03	-5.00E-03
80	-6.48E-03	-9.22E-03	-1.20E-02	-1.37E-02	-1.40E-02
85	-1.29E-02	-1.08E-02	-8.25E-03	-5.85E-03	-4.41E-03
90	-4.49E-03	-5.95E-03	-7.98E-03	-9.57E-03	-1.01E-02
95	-9.43E-03	-7.87E-03	-5.64E-03	-3.06E-03	-7.58E-04
100	5.04E-04	3.12E-04	-1.02E-03	-2.63E-03	-3.69E-03
105	-3.85E-03	-3.04E-03	-1.31E-03	1.23E-03	4.06E-03
110	6.28E-03	7.07E-03	6.21E-03	4.26E-03	2.09E-03
115	4.48E-04	-2.66E-04	1.73E-04	1.81E-03	4.31E-03
120	6.88E-03	8.52E-03	8.63E-03	7.33E-03	5.34E-03
125	3.50E-03	2.37E-03	2.22E-03	3.07E-03	4.70E-03
130	6.53E-03	7.69E-03	7.46E-03	5.71E-03	3.01E-03
135	2.43E-04	-1.90E-03	-3.11E-03	-3.33E-03	-2.69E-03
140	-1.53E-03	-4.52E-04	-1.14E-04	-8.22E-04	-2.29E-03
145	-3.83E-03	-4.84E-03	-5.05E-03	-4.49E-03	-3.34E-03
150	-1.82E-03	-3.32E-04	6.18E-04	6.66E-04	-1.32E-04
155	-1.31E-03	-2.30E-03	-2.75E-03	-2.61E-03	-2.00E-03
160	-1.03E-03	1.05E-04	1.07E-03	1.47E-03	1.10E-03
165	1.57E-04	-9.20E-04	-1.72E-03	-2.05E-03	-1.92E-03
170	-1.33E-03	-3.44E-04	8.25E-04	1.77E-03	2.10E-03
175	1.70E-03	8.33E-04	-8.15E-05	-7.10E-04	-8.97E-04
180	-5.76E-04	2.71E-04	1.52E-03	2.79E-03	3.62E-03
185	3.67E-03	3.02E-03	2.05E-03	1.20E-03	7.55E-04
190	8.52E-04	1.52E-03	2.66E-03	3.97E-03	4.97E-03
195	5.26E-03	4.75E-03	3.73E-03	2.68E-03	1.97E-03
200	1.80E-03	2.17E-03	3.01E-03	4.08E-03	5.01E-03
205	5.39E-03	5.03E-03	4.10E-03	3.01E-03	2.19E-03

210	1.84E-03	1.97E-03	2.51E-03	3.29E-03	4.06E-03
215	4.49E-03	4.35E-03	3.65E-03	2.69E-03	1.84E-03
220	1.32E-03	1.18E-03	1.37E-03	1.80E-03	2.34E-03
225	2.77E-03	2.84E-03	2.45E-03	1.70E-03	8.80E-04
230	2.24E-04	-1.60E-04	-2.69E-04	-1.23E-04	2.42E-04
235	7.04E-04	1.04E-03	1.04E-03	6.38E-04	-1.10E-05
240	-6.81E-04	-1.20E-03	-1.48E-03	-1.49E-03	-1.22E-03
245	-7.25E-04	-1.89E-04	1.24E-04	3.37E-05	-4.35E-04
250	-1.08E-03	-1.67E-03	-2.05E-03	-2.12E-03	-1.87E-03
255	-1.32E-03	-6.21E-04	-4.70E-05	1.60E-04	-7.09E-05
260	-5.93E-04	-1.15E-03	-1.51E-03	-1.57E-03	-1.29E-03
265	-7.12E-04	4.06E-05	7.43E-04	1.15E-03	1.12E-03
270	7.43E-04	2.52E-04	-1.09E-04	-1.98E-04	1.00E-05
275	4.74E-04	1.10E-03	1.72E-03	2.13E-03	2.18E-03
280	1.86E-03	1.36E-03	8.85E-04	6.03E-04	5.52E-04
285	7.05E-04	1.00E-03	1.36E-03	1.64E-03	1.70E-03
290	1.47E-03	1.03E-03	5.51E-04	1.83E-04	-9.71E-06
295	-3.29E-05	9.03E-05	3.28E-04	6.04E-04	7.95E-04
300	7.86E-04	5.56E-04	1.93E-04	-1.70E-04	-4.38E-04
305	-5.72E-04	-5.62E-04	-4.02E-04	-1.25E-04	1.72E-04
310	3.45E-04	2.97E-04	3.68E-05	-3.29E-04	-6.77E-04
315	-9.19E-04	-1.01E-03	-9.31E-04	-6.85E-04	-3.52E-04
320	-7.58E-05	1.90E-06	-1.70E-04	-5.20E-04	-9.10E-04
325	-1.22E-03	-1.36E-03	-1.32E-03	-1.10E-03	-7.65E-04
330	-4.34E-04	-2.59E-04	-3.27E-04	-6.05E-04	-9.68E-04
335	-1.27E-03	-1.42E-03	-1.40E-03	-1.20E-03	-8.89E-04
340	-5.52E-04	-3.16E-04	-2.81E-04	-4.51E-04	-7.33E-04
345	-9.94E-04	-1.14E-03	-1.13E-03	-9.83E-04	-7.36E-04
350	-4.46E-04	-2.00E-04	-8.47E-05	-1.39E-04	-3.17E-04
355	-5.20E-04	-6.54E-04	-6.81E-04	-6.04E-04	-4.45E-04
360	-2.28E-04	8.38E-08	1.70E-04	2.23E-04	1.51E-04
365	9.12E-06	-1.27E-04	-2.04E-04	-2.08E-04	-1.40E-04
370	-1.11E-06	1.92E-04	3.89E-04	5.19E-04	5.32E-04
375	4.33E-04	2.79E-04	1.34E-04	3.75E-05	1.23E-05
380	7.08E-05	2.12E-04	4.01E-04	5.65E-04	6.28E-04
385	5.59E-04	3.89E-04	1.87E-04	1.89E-05	-7.47E-05
390	-7.42E-05	2.27E-05	1.90E-04	3.63E-04	4.59E-04
395	4.24E-04	2.68E-04	5.55E-05	-1.37E-04	-2.55E-04
400	-2.78E-04	-2.06E-04	-6.17E-05	1.03E-04	2.18E-04
405	2.24E-04	1.13E-04	-6.69E-05	-2.41E-04	-3.51E-04
410	-3.74E-04	-3.15E-04	-1.95E-04	-4.88E-05	7.36E-05
415	1.23E-04	7.74E-05	-3.68E-05	-1.63E-04	-2.46E-04
420	-2.63E-04	-2.17E-04	-1.24E-04	-4.49E-06	1.16E-04
425	2.02E-04	2.25E-04	1.84E-04	1.12E-04	5.14E-05
430	2.82E-05	4.49E-05	9.36E-05	1.69E-04	2.62E-04
435	3.53E-04	4.11E-04	4.14E-04	3.69E-04	3.02E-04
440	2.43E-04	2.06E-04	1.96E-04	2.18E-04	2.74E-04
445	3.52E-04	4.23E-04	4.55E-04	4.33E-04	3.68E-04
450	2.88E-04	2.19E-04	1.80E-04	1.80E-04	2.23E-04
455	2.98E-04	3.80E-04	4.36E-04	4.37E-04	3.82E-04
460	2.94E-04	2.12E-04	1.62E-04	1.54E-04	1.88E-04
465	2.53E-04	3.31E-04	3.91E-04	4.03E-04	3.56E-04
470	2.72E-04	1.90E-04	1.40E-04	1.28E-04	1.50E-04

475	1.97E-04	2.55E-04	3.01E-04	3.10E-04	2.69E-04
480	1.99E-04	1.35E-04	9.22E-05	7.38E-05	8.61E-05
485	1.18E-04	1.52E-04	1.77E-04	1.75E-04	1.43E-04
490	1.07E-04	7.44E-05	3.43E-05	1.01E-05	2.68E-05
495	5.90E-05	6.97E-05	5.21E-05	4.19E-05	8.32E-05
500	3.53E-05				

HOT07A (10m cable depth) designature operator (shape ddwave to 26Hz(9dB/oct) – 60Hz(40dB/oct))					
Time(ms)	Amplitude				<a href="#">(click here for text file)</a>
-500	2.54E-05	-1.42E-04	6.07E-05	7.35E-05	1.82E-05
-495	3.57E-05	7.16E-05	2.90E-05	-8.08E-05	-1.31E-04
-490	-6.77E-05	1.38E-05	5.48E-05	9.16E-05	1.27E-04
-485	1.21E-04	5.99E-05	-3.28E-05	-9.70E-05	-9.14E-05
-480	-4.53E-05	7.38E-06	7.11E-05	1.34E-04	1.57E-04
-475	1.17E-04	2.71E-05	-5.58E-05	-6.93E-05	-1.51E-05
-470	6.56E-05	1.44E-04	1.88E-04	1.65E-04	7.81E-05
-465	-3.06E-05	-1.03E-04	-8.74E-05	1.53E-05	1.48E-04
-460	2.56E-04	3.06E-04	2.82E-04	1.78E-04	3.41E-05
-455	-8.89E-05	-1.34E-04	-7.46E-05	6.88E-05	2.35E-04
-450	3.60E-04	3.95E-04	3.23E-04	1.70E-04	1.57E-05
-445	-5.62E-05	-8.84E-06	1.29E-04	2.86E-04	3.83E-04
-440	3.78E-04	2.80E-04	1.39E-04	2.65E-05	7.94E-06
-435	1.03E-04	2.73E-04	4.46E-04	5.50E-04	5.38E-04
-430	4.10E-04	2.10E-04	1.93E-05	-7.31E-05	-8.76E-06
-425	1.99E-04	4.67E-04	6.81E-04	7.50E-04	6.46E-04
-420	4.21E-04	1.82E-04	4.40E-05	7.00E-05	2.44E-04
-415	4.76E-04	6.56E-04	7.09E-04	6.26E-04	4.57E-04
-410	2.91E-04	2.11E-04	2.66E-04	4.42E-04	6.69E-04
-405	8.45E-04	8.85E-04	7.57E-04	5.09E-04	2.46E-04
-400	9.89E-05	1.54E-04	4.11E-04	7.68E-04	1.07E-03
-395	1.19E-03	1.07E-03	7.73E-04	4.45E-04	2.29E-04
-390	2.17E-04	4.07E-04	7.07E-04	9.86E-04	1.13E-03
-385	1.10E-03	9.09E-04	6.69E-04	4.93E-04	4.71E-04
-380	6.28E-04	9.01E-04	1.16E-03	1.28E-03	1.18E-03
-375	9.00E-04	5.69E-04	3.57E-04	3.84E-04	6.65E-04
-370	1.09E-03	1.46E-03	1.63E-03	1.51E-03	1.17E-03
-365	7.61E-04	4.53E-04	3.78E-04	5.58E-04	9.18E-04
-360	1.31E-03	1.57E-03	1.61E-03	1.41E-03	1.08E-03
-355	7.69E-04	6.33E-04	7.46E-04	1.05E-03	1.41E-03
-350	1.62E-03	1.58E-03	1.29E-03	9.01E-04	6.14E-04
-345	5.87E-04	8.49E-04	1.29E-03	1.72E-03	1.95E-03
-340	1.86E-03	1.50E-03	1.02E-03	6.06E-04	4.36E-04
-335	5.81E-04	9.86E-04	1.49E-03	1.89E-03	2.01E-03
-330	1.80E-03	1.36E-03	8.96E-04	6.22E-04	6.66E-04
-325	9.95E-04	1.44E-03	1.76E-03	1.79E-03	1.53E-03
-320	1.10E-03	7.39E-04	6.19E-04	8.08E-04	1.23E-03
-315	1.68E-03	1.97E-03	1.95E-03	1.61E-03	1.07E-03
-310	5.43E-04	2.55E-04	3.38E-04	7.74E-04	1.39E-03
-305	1.93E-03	2.13E-03	1.91E-03	1.36E-03	7.28E-04
-300	2.99E-04	2.52E-04	5.79E-04	1.09E-03	1.53E-03
-295	1.68E-03	1.48E-03	1.04E-03	5.87E-04	3.28E-04
-290	3.83E-04	7.21E-04	1.19E-03	1.56E-03	1.64E-03
-285	1.35E-03	7.71E-04	1.30E-04	-2.91E-04	-2.90E-04

-280	1.58E-04	8.66E-04	1.52E-03	1.81E-03	1.58E-03
-275	9.31E-04	1.43E-04	-4.46E-04	-6.03E-04	-3.12E-04
-270	2.56E-04	8.14E-04	1.11E-03	1.02E-03	6.03E-04
-265	4.14E-05	-4.04E-04	-5.44E-04	-3.24E-04	1.39E-04
-260	6.13E-04	8.31E-04	6.33E-04	4.27E-05	-7.00E-04
-255	-1.26E-03	-1.35E-03	-9.22E-04	-1.59E-04	5.78E-04
-250	9.40E-04	7.34E-04	3.21E-05	-8.79E-04	-1.62E-03
-245	-1.92E-03	-1.69E-03	-1.09E-03	-3.90E-04	9.51E-05
-240	1.66E-04	-2.18E-04	-8.95E-04	-1.57E-03	-1.95E-03
-235	-1.87E-03	-1.41E-03	-8.13E-04	-4.26E-04	-4.96E-04
-230	-1.05E-03	-1.85E-03	-2.53E-03	-2.74E-03	-2.37E-03
-225	-1.60E-03	-8.08E-04	-3.74E-04	-5.14E-04	-1.20E-03
-220	-2.17E-03	-3.06E-03	-3.52E-03	-3.39E-03	-2.75E-03
-215	-1.89E-03	-1.18E-03	-9.18E-04	-1.25E-03	-2.03E-03
-210	-2.96E-03	-3.59E-03	-3.67E-03	-3.19E-03	-2.46E-03
-205	-1.88E-03	-1.78E-03	-2.23E-03	-3.03E-03	-3.79E-03
-200	-4.13E-03	-3.88E-03	-3.17E-03	-2.34E-03	-1.82E-03
-195	-1.83E-03	-2.42E-03	-3.38E-03	-4.39E-03	-5.03E-03
-190	-5.02E-03	-4.33E-03	-3.29E-03	-2.31E-03	-1.86E-03
-185	-2.12E-03	-3.00E-03	-4.13E-03	-5.02E-03	-5.25E-03
-180	-4.76E-03	-3.87E-03	-3.08E-03	-2.76E-03	-3.03E-03
-175	-3.74E-03	-4.53E-03	-5.03E-03	-4.99E-03	-4.41E-03
-170	-3.55E-03	-2.85E-03	-2.66E-03	-3.08E-03	-3.98E-03
-165	-5.05E-03	-5.84E-03	-5.96E-03	-5.26E-03	-4.00E-03
-160	-2.74E-03	-2.07E-03	-2.28E-03	-3.22E-03	-4.48E-03
-155	-5.53E-03	-5.93E-03	-5.48E-03	-4.44E-03	-3.36E-03
-150	-2.73E-03	-2.76E-03	-3.32E-03	-4.09E-03	-4.75E-03
-145	-4.98E-03	-4.62E-03	-3.75E-03	-2.78E-03	-2.25E-03
-140	-2.45E-03	-3.27E-03	-4.33E-03	-5.19E-03	-5.41E-03
-135	-4.74E-03	-3.33E-03	-1.78E-03	-8.65E-04	-9.68E-04
-130	-1.95E-03	-3.28E-03	-4.38E-03	-4.87E-03	-4.55E-03
-125	-3.47E-03	-2.02E-03	-9.12E-04	-6.15E-04	-1.04E-03
-120	-1.80E-03	-2.61E-03	-3.13E-03	-3.01E-03	-2.17E-03
-115	-9.40E-04	7.00E-05	2.49E-04	-4.85E-04	-1.59E-03
-110	-2.41E-03	-2.59E-03	-2.00E-03	-6.27E-04	1.11E-03
-105	2.36E-03	2.49E-03	1.53E-03	1.69E-04	-9.60E-04
-100	-1.50E-03	-1.27E-03	-1.64E-04	1.48E-03	3.11E-03
-95	4.06E-03	3.87E-03	2.79E-03	1.74E-03	1.17E-03
-90	1.10E-03	1.73E-03	3.23E-03	4.78E-03	5.37E-03
-85	4.92E-03	3.93E-03	2.91E-03	2.66E-03	3.52E-03
-80	4.82E-03	6.17E-03	7.73E-03	8.56E-03	7.75E-03
-75	6.29E-03	5.10E-03	4.44E-03	4.67E-03	5.90E-03
-70	7.68E-03	9.62E-03	1.12E-02	1.15E-02	1.03E-02
-65	8.57E-03	7.66E-03	7.85E-03	8.49E-03	9.97E-03
-60	1.19E-02	1.29E-02	1.31E-02	1.25E-02	1.11E-02
-55	1.06E-02	1.14E-02	1.28E-02	1.41E-02	1.56E-02
-50	1.66E-02	1.64E-02	1.55E-02	1.40E-02	1.29E-02
-45	1.30E-02	1.42E-02	1.62E-02	1.90E-02	2.25E-02
-40	2.65E-02	2.93E-02	2.91E-02	2.56E-02	2.00E-02
-35	1.25E-02	5.27E-03	1.28E-03	9.44E-04	4.69E-03
-30	1.30E-02	2.38E-02	3.52E-02	4.64E-02	5.50E-02
-25	5.70E-02	5.09E-02	3.62E-02	1.31E-02	-1.67E-02
-20	-4.97E-02	-8.20E-02	-1.10E-01	-1.30E-01	-1.38E-01

-15	-1.34E-01	-1.17E-01	-9.02E-02	-5.64E-02	-2.15E-02
-10	9.86E-03	3.52E-02	5.22E-02	5.97E-02	5.88E-02
-5	5.12E-02	3.86E-02	2.42E-02	1.10E-02	6.56E-04
0	-4.85E-03	-4.50E-03	-1.28E-04	6.38E-03	1.37E-02
5	1.99E-02	2.36E-02	2.39E-02	2.00E-02	1.31E-02
10	5.07E-03	-2.41E-03	-7.46E-03	-9.35E-03	-8.10E-03
15	-3.80E-03	1.79E-03	6.36E-03	9.60E-03	1.19E-02
20	1.23E-02	1.08E-02	7.89E-03	3.33E-03	-1.59E-03
25	-4.69E-03	-5.89E-03	-5.93E-03	-4.44E-03	-2.09E-03
30	-3.60E-04	1.23E-03	3.40E-03	6.25E-03	9.17E-03
35	1.07E-02	9.48E-03	5.22E-03	-6.06E-04	-5.61E-03
40	-8.73E-03	-9.76E-03	-8.08E-03	-4.38E-03	-2.99E-04
45	3.41E-03	6.22E-03	6.99E-03	5.58E-03	2.08E-03
50	-3.02E-03	-8.05E-03	-1.11E-02	-1.16E-02	-1.03E-02
55	-8.39E-03	-6.58E-03	-5.00E-03	-3.42E-03	-1.62E-03
60	2.48E-04	1.53E-03	1.28E-03	-1.15E-03	-5.48E-03
65	-1.04E-02	-1.43E-02	-1.63E-02	-1.63E-02	-1.45E-02
70	-1.13E-02	-7.16E-03	-3.03E-03	-1.88E-04	3.75E-04
75	-1.66E-03	-5.81E-03	-1.07E-02	-1.47E-02	-1.65E-02
80	-1.58E-02	-1.34E-02	-1.07E-02	-8.55E-03	-6.91E-03
85	-5.42E-03	-3.99E-03	-2.95E-03	-2.75E-03	-3.71E-03
90	-5.73E-03	-8.26E-03	-1.05E-02	-1.19E-02	-1.20E-02
95	-1.09E-02	-8.57E-03	-5.28E-03	-1.30E-03	2.55E-03
100	5.02E-03	5.10E-03	2.68E-03	-1.30E-03	-5.19E-03
105	-7.49E-03	-7.47E-03	-5.39E-03	-2.17E-03	1.06E-03
110	3.61E-03	5.32E-03	6.32E-03	6.63E-03	6.11E-03
115	4.69E-03	2.65E-03	5.52E-04	-1.05E-03	-1.89E-03
120	-1.98E-03	-1.43E-03	-2.10E-04	1.79E-03	4.56E-03
125	7.69E-03	1.03E-02	1.12E-02	9.75E-03	6.11E-03
130	1.40E-03	-2.80E-03	-5.31E-03	-5.74E-03	-4.54E-03
135	-2.52E-03	-4.38E-04	1.19E-03	2.09E-03	2.10E-03
140	1.14E-03	-6.82E-04	-2.97E-03	-5.10E-03	-6.47E-03
145	-6.85E-03	-6.44E-03	-5.66E-03	-4.78E-03	-3.70E-03
150	-2.13E-03	1.41E-05	2.31E-03	3.93E-03	4.04E-03
155	2.36E-03	-6.63E-04	-3.96E-03	-6.40E-03	-7.25E-03
160	-6.44E-03	-4.37E-03	-1.68E-03	1.05E-03	3.27E-03
165	4.51E-03	4.41E-03	2.95E-03	5.57E-04	-1.97E-03
170	-3.80E-03	-4.43E-03	-3.96E-03	-2.87E-03	-1.71E-03
175	-7.29E-04	2.36E-04	1.46E-03	2.96E-03	4.34E-03
180	4.96E-03	4.36E-03	2.59E-03	1.97E-04	-2.01E-03
185	-3.33E-03	-3.42E-03	-2.31E-03	-2.75E-04	2.30E-03
190	4.91E-03	6.94E-03	7.80E-03	7.12E-03	5.07E-03
195	2.35E-03	-5.60E-05	-1.35E-03	-1.29E-03	-2.02E-04
200	1.26E-03	2.56E-03	3.54E-03	4.30E-03	5.03E-03
205	5.68E-03	5.97E-03	5.58E-03	4.42E-03	2.74E-03
210	9.99E-04	-3.61E-04	-1.05E-03	-9.50E-04	-6.62E-05
215	1.52E-03	3.56E-03	5.60E-03	6.96E-03	7.06E-03
220	5.67E-03	3.16E-03	3.69E-04	-1.74E-03	-2.58E-03
225	-2.12E-03	-8.31E-04	6.63E-04	1.92E-03	2.77E-03
230	3.27E-03	3.44E-03	3.25E-03	2.62E-03	1.58E-03
235	3.16E-04	-8.97E-04	-1.83E-03	-2.37E-03	-2.52E-03
240	-2.25E-03	-1.49E-03	-1.88E-04	1.48E-03	3.04E-03
245	3.87E-03	3.49E-03	1.87E-03	-4.85E-04	-2.75E-03

250	-4.17E-03	-4.37E-03	-3.48E-03	-1.96E-03	-3.09E-04
255	1.10E-03	2.07E-03	2.51E-03	2.39E-03	1.73E-03
260	7.04E-04	-3.94E-04	-1.25E-03	-1.67E-03	-1.69E-03
265	-1.45E-03	-1.09E-03	-5.84E-04	2.17E-04	1.39E-03
270	2.78E-03	3.95E-03	4.39E-03	3.81E-03	2.33E-03
275	4.79E-04	-1.08E-03	-1.84E-03	-1.64E-03	-6.41E-04
280	8.02E-04	2.32E-03	3.58E-03	4.32E-03	4.37E-03
285	3.69E-03	2.44E-03	9.99E-04	-1.92E-04	-8.22E-04
290	-8.59E-04	-5.16E-04	-8.18E-05	2.86E-04	6.34E-04
295	1.12E-03	1.80E-03	2.52E-03	2.95E-03	2.77E-03
300	1.88E-03	5.13E-04	-9.19E-04	-1.97E-03	-2.38E-03
305	-2.08E-03	-1.21E-03	3.49E-05	1.36E-03	2.45E-03
310	2.97E-03	2.74E-03	1.75E-03	3.15E-04	-1.08E-03
315	-1.99E-03	-2.19E-03	-1.81E-03	-1.14E-03	-5.05E-04
320	-3.73E-05	3.10E-04	6.49E-04	1.00E-03	1.25E-03
325	1.21E-03	7.61E-04	-4.06E-05	-9.89E-04	-1.83E-03
330	-2.34E-03	-2.43E-03	-2.08E-03	-1.31E-03	-2.50E-04
335	8.77E-04	1.75E-03	2.04E-03	1.58E-03	4.85E-04
340	-8.70E-04	-2.00E-03	-2.53E-03	-2.39E-03	-1.75E-03
345	-9.24E-04	-1.90E-04	3.41E-04	6.83E-04	8.80E-04
350	9.34E-04	8.06E-04	4.71E-04	-2.25E-05	-5.62E-04
355	-1.02E-03	-1.33E-03	-1.44E-03	-1.34E-03	-9.82E-04
360	-3.46E-04	5.08E-04	1.38E-03	1.98E-03	2.03E-03
365	1.45E-03	4.18E-04	-6.93E-04	-1.48E-03	-1.72E-03
370	-1.39E-03	-7.07E-04	8.81E-05	7.84E-04	1.27E-03
375	1.51E-03	1.49E-03	1.23E-03	7.89E-04	2.74E-04
380	-1.81E-04	-4.75E-04	-5.92E-04	-5.89E-04	-5.26E-04
385	-4.00E-04	-1.53E-04	2.71E-04	8.31E-04	1.36E-03
390	1.62E-03	1.43E-03	8.07E-04	-6.81E-05	-8.92E-04
395	-1.40E-03	-1.46E-03	-1.13E-03	-5.55E-04	1.01E-04
400	6.79E-04	1.06E-03	1.16E-03	9.45E-04	4.82E-04
405	-9.45E-05	-6.07E-04	-9.11E-04	-9.62E-04	-8.26E-04
410	-6.27E-04	-4.56E-04	-3.11E-04	-1.26E-04	1.51E-04
415	4.82E-04	7.40E-04	7.84E-04	5.46E-04	7.52E-05
420	-4.78E-04	-9.30E-04	-1.14E-03	-1.07E-03	-7.43E-04
425	-2.55E-04	2.88E-04	7.69E-04	1.07E-03	1.09E-03
430	8.12E-04	3.30E-04	-1.80E-04	-5.38E-04	-6.45E-04
435	-5.19E-04	-2.61E-04	8.81E-06	2.14E-04	3.46E-04
440	4.49E-04	5.64E-04	6.70E-04	6.99E-04	5.97E-04
445	3.68E-04	7.44E-05	-1.96E-04	-3.81E-04	-4.51E-04
450	-3.81E-04	-1.66E-04	1.51E-04	4.97E-04	7.87E-04
455	9.28E-04	8.53E-04	5.66E-04	1.54E-04	-2.31E-04
460	-4.44E-04	-4.30E-04	-2.58E-04	-3.10E-05	1.85E-04
465	3.54E-04	4.52E-04	4.80E-04	4.56E-04	3.93E-04
470	3.07E-04	1.95E-04	5.44E-05	-6.84E-05	-1.20E-04
475	-1.17E-04	-1.05E-04	-8.07E-05	-5.12E-06	1.48E-04
480	3.34E-04	4.49E-04	4.45E-04	3.52E-04	1.95E-04
485	-1.60E-05	-2.20E-04	-3.28E-04	-2.74E-04	-1.06E-04
490	2.77E-05	7.98E-05	1.58E-04	2.71E-04	2.73E-04
495	1.18E-04	-3.53E-05	-3.36E-05	-8.21E-06	-2.26E-04
500	-1.42E-04				

OH91A designation operator (shape ddwave to 24Hz(9dB/oct) – 60Hz(35dB/oct))					
Time(ms)	Amplitude			<a href="#">(click here for text file)</a>	
-500	-1.01E-04	-2.76E-05	9.94E-06	1.15E-05	1.00E-05
-495	1.76E-05	1.90E-05	9.90E-07	-2.98E-05	-5.64E-05
-490	-7.08E-05	-7.74E-05	-8.05E-05	-7.61E-05	-5.85E-05
-485	-3.20E-05	-1.06E-05	-6.60E-06	-2.08E-05	-4.54E-05
-480	-7.32E-05	-1.02E-04	-1.30E-04	-1.54E-04	-1.69E-04
-475	-1.70E-04	-1.58E-04	-1.37E-04	-1.14E-04	-9.52E-05
-470	-8.92E-05	-1.02E-04	-1.32E-04	-1.75E-04	-2.22E-04
-465	-2.64E-04	-2.96E-04	-3.13E-04	-3.12E-04	-2.94E-04
-460	-2.64E-04	-2.33E-04	-2.13E-04	-2.13E-04	-2.35E-04
-455	-2.79E-04	-3.35E-04	-3.96E-04	-4.48E-04	-4.84E-04
-450	-4.99E-04	-4.92E-04	-4.66E-04	-4.32E-04	-3.98E-04
-445	-3.79E-04	-3.83E-04	-4.13E-04	-4.67E-04	-5.35E-04
-440	-6.05E-04	-6.64E-04	-7.04E-04	-7.18E-04	-7.05E-04
-435	-6.71E-04	-6.28E-04	-5.89E-04	-5.68E-04	-5.75E-04
-430	-6.12E-04	-6.76E-04	-7.54E-04	-8.34E-04	-8.99E-04
-425	-9.39E-04	-9.47E-04	-9.24E-04	-8.79E-04	-8.24E-04
-420	-7.78E-04	-7.56E-04	-7.66E-04	-8.10E-04	-8.82E-04
-415	-9.69E-04	-1.05E-03	-1.12E-03	-1.16E-03	-1.15E-03
-410	-1.12E-03	-1.06E-03	-9.93E-04	-9.39E-04	-9.11E-04
-405	-9.22E-04	-9.70E-04	-1.05E-03	-1.14E-03	-1.23E-03
-400	-1.29E-03	-1.32E-03	-1.30E-03	-1.25E-03	-1.18E-03
-395	-1.09E-03	-1.03E-03	-9.94E-04	-1.00E-03	-1.05E-03
-390	-1.14E-03	-1.23E-03	-1.32E-03	-1.37E-03	-1.39E-03
-385	-1.36E-03	-1.28E-03	-1.19E-03	-1.09E-03	-1.01E-03
-380	-9.66E-04	-9.72E-04	-1.02E-03	-1.11E-03	-1.20E-03
-375	-1.28E-03	-1.33E-03	-1.33E-03	-1.28E-03	-1.18E-03
-370	-1.06E-03	-9.38E-04	-8.44E-04	-7.94E-04	-7.95E-04
-365	-8.45E-04	-9.27E-04	-1.02E-03	-1.10E-03	-1.13E-03
-360	-1.11E-03	-1.03E-03	-9.11E-04	-7.65E-04	-6.26E-04
-355	-5.17E-04	-4.59E-04	-4.57E-04	-5.06E-04	-5.89E-04
-350	-6.81E-04	-7.51E-04	-7.74E-04	-7.35E-04	-6.33E-04
-345	-4.85E-04	-3.16E-04	-1.58E-04	-3.72E-05	2.68E-05
-340	2.89E-05	-2.32E-05	-1.11E-04	-2.04E-04	-2.70E-04
-335	-2.82E-04	-2.26E-04	-1.02E-04	7.15E-05	2.61E-04
-330	4.33E-04	5.60E-04	6.24E-04	6.21E-04	5.61E-04
-325	4.65E-04	3.66E-04	3.01E-04	2.96E-04	3.67E-04
-320	5.08E-04	6.98E-04	9.03E-04	1.09E-03	1.22E-03
-315	1.27E-03	1.26E-03	1.18E-03	1.07E-03	9.57E-04
-310	8.85E-04	8.83E-04	9.63E-04	1.12E-03	1.32E-03
-305	1.54E-03	1.72E-03	1.84E-03	1.88E-03	1.85E-03
-300	1.74E-03	1.61E-03	1.48E-03	1.40E-03	1.40E-03
-295	1.48E-03	1.64E-03	1.85E-03	2.06E-03	2.24E-03
-290	2.35E-03	2.37E-03	2.30E-03	2.17E-03	2.00E-03
-285	1.84E-03	1.74E-03	1.73E-03	1.81E-03	1.97E-03
-280	2.17E-03	2.39E-03	2.55E-03	2.64E-03	2.62E-03
-275	2.51E-03	2.33E-03	2.13E-03	1.94E-03	1.82E-03
-270	1.79E-03	1.86E-03	2.01E-03	2.21E-03	2.41E-03
-265	2.56E-03	2.61E-03	2.56E-03	2.41E-03	2.18E-03
-260	1.93E-03	1.70E-03	1.55E-03	1.50E-03	1.56E-03
-255	1.70E-03	1.89E-03	2.07E-03	2.19E-03	2.22E-03
-250	2.13E-03	1.93E-03	1.64E-03	1.34E-03	1.07E-03

-245	8.86E-04	8.24E-04	8.75E-04	1.01E-03	1.19E-03
-240	1.36E-03	1.45E-03	1.44E-03	1.30E-03	1.04E-03
-235	7.14E-04	3.73E-04	7.96E-05	-1.18E-04	-1.94E-04
-230	-1.51E-04	-1.79E-05	1.56E-04	3.12E-04	3.94E-04
-225	3.58E-04	1.84E-04	-1.13E-04	-4.85E-04	-8.64E-04
-220	-1.18E-03	-1.39E-03	-1.46E-03	-1.40E-03	-1.25E-03
-215	-1.06E-03	-8.96E-04	-8.16E-04	-8.73E-04	-1.08E-03
-210	-1.42E-03	-1.83E-03	-2.23E-03	-2.54E-03	-2.74E-03
-205	-2.79E-03	-2.71E-03	-2.53E-03	-2.32E-03	-2.12E-03
-200	-2.03E-03	-2.10E-03	-2.32E-03	-2.68E-03	-3.10E-03
-195	-3.49E-03	-3.80E-03	-3.96E-03	-3.98E-03	-3.86E-03
-190	-3.64E-03	-3.36E-03	-3.13E-03	-3.01E-03	-3.07E-03
-185	-3.30E-03	-3.66E-03	-4.07E-03	-4.44E-03	-4.70E-03
-180	-4.82E-03	-4.78E-03	-4.58E-03	-4.29E-03	-3.95E-03
-175	-3.66E-03	-3.51E-03	-3.53E-03	-3.74E-03	-4.08E-03
-170	-4.47E-03	-4.81E-03	-5.02E-03	-5.07E-03	-4.94E-03
-165	-4.65E-03	-4.25E-03	-3.82E-03	-3.45E-03	-3.25E-03
-160	-3.25E-03	-3.42E-03	-3.73E-03	-4.07E-03	-4.35E-03
-155	-4.50E-03	-4.46E-03	-4.21E-03	-3.80E-03	-3.29E-03
-150	-2.77E-03	-2.34E-03	-2.07E-03	-2.01E-03	-2.15E-03
-145	-2.41E-03	-2.70E-03	-2.92E-03	-3.00E-03	-2.87E-03
-140	-2.52E-03	-1.98E-03	-1.35E-03	-7.28E-04	-2.25E-04
-135	8.63E-05	1.81E-04	8.28E-05	-1.47E-04	-4.13E-04
-130	-6.06E-04	-6.22E-04	-3.96E-04	7.01E-05	7.17E-04
-125	1.44E-03	2.12E-03	2.67E-03	3.00E-03	3.09E-03
-120	2.98E-03	2.75E-03	2.50E-03	2.34E-03	2.36E-03
-115	2.62E-03	3.14E-03	3.87E-03	4.68E-03	5.40E-03
-110	5.93E-03	6.22E-03	6.27E-03	6.12E-03	5.83E-03
-105	5.51E-03	5.29E-03	5.29E-03	5.59E-03	6.14E-03
-100	6.88E-03	7.66E-03	8.34E-03	8.79E-03	8.97E-03
-95	8.89E-03	8.61E-03	8.20E-03	7.76E-03	7.42E-03
-90	7.33E-03	7.55E-03	8.07E-03	8.74E-03	9.41E-03
-85	9.92E-03	1.02E-02	1.02E-02	9.91E-03	9.39E-03
-80	8.73E-03	8.03E-03	7.46E-03	7.15E-03	7.20E-03
-75	7.58E-03	8.13E-03	8.62E-03	8.86E-03	8.77E-03
-70	8.39E-03	7.75E-03	6.89E-03	5.82E-03	4.71E-03
-65	3.78E-03	3.20E-03	3.02E-03	3.12E-03	3.29E-03
-60	3.36E-03	3.17E-03	2.61E-03	1.67E-03	4.86E-04
-55	-8.37E-04	-2.28E-03	-3.87E-03	-5.48E-03	-6.77E-03
-50	-7.45E-03	-7.64E-03	-7.80E-03	-8.36E-03	-9.34E-03
-45	-1.05E-02	-1.19E-02	-1.37E-02	-1.60E-02	-1.85E-02
-40	-2.05E-02	-2.23E-02	-2.49E-02	-2.86E-02	-3.22E-02
-35	-3.29E-02	-2.91E-02	-2.19E-02	-1.50E-02	-1.23E-02
-30	-1.56E-02	-2.39E-02	-3.51E-02	-4.71E-02	-5.83E-02
-25	-6.65E-02	-6.95E-02	-6.47E-02	-5.09E-02	-2.81E-02
-20	1.86E-03	3.58E-02	6.97E-02	9.94E-02	1.22E-01
-15	1.34E-01	1.36E-01	1.25E-01	1.04E-01	7.39E-02
-10	3.96E-02	6.25E-03	-2.16E-02	-4.12E-02	-5.15E-02
-5	-5.27E-02	-4.65E-02	-3.49E-02	-2.11E-02	-7.89E-03
0	2.11E-03	7.28E-03	7.05E-03	2.07E-03	-5.95E-03
5	-1.46E-02	-2.19E-02	-2.64E-02	-2.80E-02	-2.67E-02
10	-2.26E-02	-1.59E-02	-7.88E-03	-4.81E-04	4.38E-03
15	6.02E-03	5.03E-03	2.32E-03	-1.51E-03	-5.89E-03



20	-9.73E-03	-1.17E-02	-1.12E-02	-9.24E-03	-7.42E-03
25	-6.28E-03	-4.77E-03	-1.60E-03	3.05E-03	7.11E-03
30	8.12E-03	5.15E-03	-4.92E-04	-6.23E-03	-9.82E-03
35	-1.03E-02	-8.10E-03	-4.38E-03	-5.20E-04	2.60E-03
40	4.62E-03	5.34E-03	4.52E-03	2.10E-03	-1.40E-03
45	-4.79E-03	-6.67E-03	-6.14E-03	-3.30E-03	8.56E-04
50	5.11E-03	8.60E-03	1.10E-02	1.25E-02	1.28E-02
55	1.19E-02	9.54E-03	6.00E-03	2.00E-03	-1.40E-03
60	-3.28E-03	-3.24E-03	-1.45E-03	1.47E-03	4.83E-03
65	8.03E-03	1.06E-02	1.21E-02	1.21E-02	1.05E-02
70	7.50E-03	3.91E-03	6.75E-04	-1.44E-03	-2.20E-03
75	-1.86E-03	-9.89E-04	-1.16E-04	4.15E-04	4.64E-04
80	9.54E-06	-9.06E-04	-2.15E-03	-3.42E-03	-4.30E-03
85	-4.35E-03	-3.29E-03	-1.19E-03	1.58E-03	4.43E-03
90	6.81E-03	8.27E-03	8.58E-03	7.68E-03	5.63E-03
95	2.67E-03	-7.66E-04	-4.07E-03	-6.63E-03	-8.04E-03
100	-8.22E-03	-7.43E-03	-6.04E-03	-4.50E-03	-3.18E-03
105	-2.38E-03	-2.29E-03	-2.89E-03	-3.94E-03	-5.00E-03
110	-5.57E-03	-5.31E-03	-4.11E-03	-2.14E-03	2.65E-04
115	2.68E-03	4.74E-03	6.15E-03	6.77E-03	6.54E-03
120	5.57E-03	4.09E-03	2.47E-03	1.16E-03	5.29E-04
125	7.56E-04	1.75E-03	3.19E-03	4.68E-03	5.84E-03
130	6.40E-03	6.23E-03	5.33E-03	3.86E-03	2.12E-03
135	4.92E-04	-6.53E-04	-1.08E-03	-7.33E-04	2.09E-04
140	1.45E-03	2.62E-03	3.42E-03	3.62E-03	3.11E-03
145	1.93E-03	2.49E-04	-1.62E-03	-3.29E-03	-4.42E-03
150	-4.75E-03	-4.27E-03	-3.12E-03	-1.57E-03	2.32E-05
155	1.35E-03	2.15E-03	2.28E-03	1.73E-03	6.47E-04
160	-7.10E-04	-2.02E-03	-2.97E-03	-3.38E-03	-3.19E-03
165	-2.50E-03	-1.53E-03	-5.61E-04	1.45E-04	4.05E-04
170	1.62E-04	-5.01E-04	-1.39E-03	-2.25E-03	-2.88E-03
175	-3.15E-03	-3.05E-03	-2.64E-03	-2.03E-03	-1.39E-03
180	-8.77E-04	-6.90E-04	-9.70E-04	-1.73E-03	-2.81E-03
185	-3.92E-03	-4.71E-03	-4.93E-03	-4.46E-03	-3.34E-03
190	-1.68E-03	3.08E-04	2.37E-03	4.19E-03	5.45E-03
195	5.91E-03	5.52E-03	4.44E-03	2.96E-03	1.45E-03
200	1.90E-04	-6.06E-04	-8.39E-04	-5.05E-04	2.90E-04
205	1.34E-03	2.35E-03	3.04E-03	3.21E-03	2.81E-03
210	1.93E-03	7.65E-04	-4.51E-04	-1.50E-03	-2.23E-03
215	-2.54E-03	-2.44E-03	-2.01E-03	-1.43E-03	-8.69E-04
220	-5.19E-04	-4.80E-04	-7.57E-04	-1.25E-03	-1.80E-03
225	-2.24E-03	-2.44E-03	-2.35E-03	-2.00E-03	-1.45E-03
230	-8.22E-04	-2.63E-04	9.16E-05	1.48E-04	-1.13E-04
235	-6.25E-04	-1.25E-03	-1.84E-03	-2.22E-03	-2.27E-03
240	-1.93E-03	-1.20E-03	-1.79E-04	9.27E-04	1.87E-03
245	2.43E-03	2.46E-03	1.96E-03	1.03E-03	-1.01E-04
250	-1.21E-03	-2.06E-03	-2.50E-03	-2.44E-03	-1.90E-03
255	-1.00E-03	4.70E-05	1.03E-03	1.73E-03	2.03E-03
260	1.90E-03	1.38E-03	6.20E-04	-1.94E-04	-8.75E-04
265	-1.27E-03	-1.30E-03	-9.50E-04	-3.04E-04	4.98E-04
270	1.28E-03	1.87E-03	2.14E-03	2.04E-03	1.61E-03
275	9.58E-04	2.58E-04	-3.23E-04	-6.48E-04	-6.48E-04
280	-3.34E-04	2.01E-04	8.14E-04	1.34E-03	1.64E-03

285	1.63E-03	1.29E-03	6.86E-04	-4.21E-05	-7.37E-04
290	-1.25E-03	-1.47E-03	-1.37E-03	-9.69E-04	-3.66E-04
295	3.11E-04	9.18E-04	1.33E-03	1.44E-03	1.25E-03
300	7.96E-04	1.82E-04	-4.46E-04	-9.41E-04	-1.19E-03
305	-1.14E-03	-8.18E-04	-3.02E-04	2.75E-04	7.72E-04
310	1.07E-03	1.11E-03	8.64E-04	4.02E-04	-1.76E-04
315	-7.38E-04	-1.16E-03	-1.34E-03	-1.25E-03	-9.04E-04
320	-4.00E-04	1.46E-04	6.13E-04	9.05E-04	9.71E-04
325	8.10E-04	4.71E-04	4.31E-05	-3.65E-04	-6.47E-04
330	-7.22E-04	-5.61E-04	-1.94E-04	2.98E-04	8.02E-04
335	1.20E-03	1.42E-03	1.40E-03	1.18E-03	7.92E-04
340	3.42E-04	-6.96E-05	-3.45E-04	-4.20E-04	-2.74E-04
345	5.51E-05	4.85E-04	9.10E-04	1.22E-03	1.36E-03
350	1.27E-03	9.86E-04	5.59E-04	7.46E-05	-3.70E-04
355	-6.87E-04	-8.14E-04	-7.36E-04	-4.85E-04	-1.37E-04
360	2.15E-04	4.81E-04	5.98E-04	5.38E-04	3.17E-04
365	-1.44E-05	-3.81E-04	-6.97E-04	-8.89E-04	-9.11E-04
370	-7.58E-04	-4.68E-04	-1.11E-04	2.25E-04	4.65E-04
375	5.56E-04	4.85E-04	2.71E-04	-3.01E-05	-3.47E-04
380	-6.00E-04	-7.28E-04	-6.99E-04	-5.19E-04	-2.33E-04
385	9.13E-05	3.79E-04	5.62E-04	5.98E-04	4.77E-04
390	2.23E-04	-1.05E-04	-4.35E-04	-6.93E-04	-8.21E-04
395	-7.90E-04	-6.08E-04	-3.19E-04	1.20E-05	3.11E-04
400	5.18E-04	5.92E-04	5.26E-04	3.39E-04	8.04E-05
405	-1.84E-04	-3.88E-04	-4.82E-04	-4.45E-04	-2.89E-04
410	-5.14E-05	2.14E-04	4.49E-04	6.00E-04	6.37E-04
415	5.55E-04	3.77E-04	1.48E-04	-7.97E-05	-2.54E-04
420	-3.37E-04	-3.10E-04	-1.88E-04	-6.32E-06	1.82E-04
425	3.26E-04	3.91E-04	3.60E-04	2.38E-04	4.81E-05
430	-1.67E-04	-3.57E-04	-4.79E-04	-5.05E-04	-4.34E-04
435	-2.86E-04	-1.01E-04	7.44E-05	2.01E-04	2.53E-04
440	2.18E-04	1.03E-04	-6.82E-05	-2.59E-04	-4.23E-04
445	-5.18E-04	-5.18E-04	-4.27E-04	-2.66E-04	-7.37E-05
450	1.12E-04	2.55E-04	3.29E-04	3.20E-04	2.32E-04
455	8.92E-05	-7.58E-05	-2.23E-04	-3.16E-04	-3.26E-04
460	-2.54E-04	-1.24E-04	1.88E-05	1.38E-04	2.17E-04
465	2.54E-04	2.45E-04	1.83E-04	7.68E-05	-4.31E-05
470	-1.35E-04	-1.71E-04	-1.53E-04	-9.44E-05	-1.13E-05
475	7.99E-05	1.54E-04	1.89E-04	1.86E-04	1.67E-04
480	1.48E-04	1.11E-04	3.15E-05	-7.13E-05	-1.30E-04
485	-9.09E-05	1.93E-05	1.19E-04	1.59E-04	1.73E-04
490	2.09E-04	2.45E-04	2.01E-04	6.51E-05	-5.86E-05
495	-6.46E-05	-1.01E-05	-7.02E-05	-2.52E-04	-1.80E-04
500	7.03E-04				

OE80A designation operator (shape ddwave to 18Hz(11dB/oct) – 47Hz(29dB/oct))					
Time(ms)	Amplitude			<a href="#">(click here for text file)</a>	
-500	-7.81E-04	-7.59E-05	2.77E-04	3.67E-04	2.94E-04
-495	1.50E-04	4.08E-06	-1.02E-04	-1.53E-04	-1.54E-04
-490	-1.17E-04	-6.02E-05	4.39E-06	6.65E-05	1.20E-04
-485	1.60E-04	1.86E-04	1.98E-04	2.00E-04	1.97E-04
-480	1.92E-04	1.89E-04	1.88E-04	1.88E-04	1.88E-04

-475	1.89E-04	1.94E-04	2.10E-04	2.43E-04	2.98E-04
-470	3.71E-04	4.57E-04	5.42E-04	6.14E-04	6.60E-04
-465	6.77E-04	6.67E-04	6.37E-04	6.01E-04	5.72E-04
-460	5.62E-04	5.80E-04	6.28E-04	7.03E-04	8.00E-04
-455	9.08E-04	1.02E-03	1.11E-03	1.19E-03	1.24E-03
-450	1.27E-03	1.27E-03	1.25E-03	1.22E-03	1.20E-03
-445	1.18E-03	1.19E-03	1.23E-03	1.29E-03	1.39E-03
-440	1.50E-03	1.62E-03	1.75E-03	1.85E-03	1.93E-03
-435	1.98E-03	1.99E-03	1.96E-03	1.92E-03	1.86E-03
-430	1.82E-03	1.79E-03	1.80E-03	1.85E-03	1.93E-03
-425	2.04E-03	2.17E-03	2.30E-03	2.42E-03	2.51E-03
-420	2.56E-03	2.56E-03	2.53E-03	2.46E-03	2.38E-03
-415	2.29E-03	2.22E-03	2.17E-03	2.17E-03	2.21E-03
-410	2.29E-03	2.40E-03	2.53E-03	2.65E-03	2.74E-03
-405	2.79E-03	2.79E-03	2.74E-03	2.65E-03	2.52E-03
-400	2.37E-03	2.23E-03	2.12E-03	2.05E-03	2.03E-03
-395	2.06E-03	2.14E-03	2.24E-03	2.35E-03	2.44E-03
-390	2.49E-03	2.49E-03	2.43E-03	2.30E-03	2.13E-03
-385	1.93E-03	1.72E-03	1.53E-03	1.38E-03	1.28E-03
-380	1.25E-03	1.27E-03	1.34E-03	1.43E-03	1.52E-03
-375	1.58E-03	1.59E-03	1.53E-03	1.40E-03	1.21E-03
-370	9.59E-04	6.86E-04	4.18E-04	1.82E-04	3.47E-06
-365	-1.03E-04	-1.34E-04	-9.81E-05	-1.60E-05	8.37E-05
-360	1.69E-04	2.09E-04	1.81E-04	7.07E-05	-1.22E-04
-355	-3.83E-04	-6.89E-04	-1.01E-03	-1.31E-03	-1.56E-03
-350	-1.73E-03	-1.81E-03	-1.80E-03	-1.73E-03	-1.61E-03
-345	-1.47E-03	-1.37E-03	-1.32E-03	-1.37E-03	-1.51E-03
-340	-1.74E-03	-2.04E-03	-2.38E-03	-2.72E-03	-3.01E-03
-335	-3.24E-03	-3.36E-03	-3.37E-03	-3.28E-03	-3.12E-03
-330	-2.91E-03	-2.71E-03	-2.56E-03	-2.50E-03	-2.53E-03
-325	-2.68E-03	-2.93E-03	-3.24E-03	-3.58E-03	-3.90E-03
-320	-4.14E-03	-4.29E-03	-4.31E-03	-4.21E-03	-4.01E-03
-315	-3.72E-03	-3.41E-03	-3.12E-03	-2.90E-03	-2.78E-03
-310	-2.79E-03	-2.93E-03	-3.17E-03	-3.48E-03	-3.80E-03
-305	-4.08E-03	-4.25E-03	-4.29E-03	-4.18E-03	-3.92E-03
-300	-3.56E-03	-3.13E-03	-2.69E-03	-2.30E-03	-2.00E-03
-295	-1.85E-03	-1.84E-03	-1.98E-03	-2.22E-03	-2.52E-03
-290	-2.81E-03	-3.02E-03	-3.10E-03	-3.02E-03	-2.77E-03
-285	-2.36E-03	-1.83E-03	-1.25E-03	-6.92E-04	-2.15E-04
-280	1.19E-04	2.80E-04	2.62E-04	9.21E-05	-1.79E-04
-275	-4.85E-04	-7.50E-04	-9.06E-04	-9.02E-04	-7.07E-04
-270	-3.22E-04	2.23E-04	8.72E-04	1.55E-03	2.19E-03
-265	2.70E-03	3.03E-03	3.15E-03	3.07E-03	2.81E-03
-260	2.45E-03	2.07E-03	1.76E-03	1.61E-03	1.66E-03
-255	1.94E-03	2.44E-03	3.10E-03	3.85E-03	4.59E-03
-250	5.23E-03	5.68E-03	5.90E-03	5.87E-03	5.60E-03
-245	5.17E-03	4.67E-03	4.19E-03	3.82E-03	3.65E-03
-240	3.73E-03	4.05E-03	4.60E-03	5.30E-03	6.05E-03
-235	6.77E-03	7.33E-03	7.65E-03	7.70E-03	7.45E-03
-230	6.96E-03	6.30E-03	5.59E-03	4.92E-03	4.43E-03
-225	4.19E-03	4.24E-03	4.59E-03	5.18E-03	5.92E-03
-220	6.68E-03	7.33E-03	7.75E-03	7.86E-03	7.63E-03
-215	7.08E-03	6.28E-03	5.34E-03	4.38E-03	3.55E-03

-210	2.96E-03	2.69E-03	2.77E-03	3.16E-03	3.79E-03
-205	4.53E-03	5.24E-03	5.78E-03	6.02E-03	5.90E-03
-200	5.39E-03	4.53E-03	3.43E-03	2.20E-03	1.03E-03
-195	5.27E-05	-5.94E-04	-8.41E-04	-6.83E-04	-1.80E-04
-190	5.54E-04	1.36E-03	2.07E-03	2.53E-03	2.61E-03
-185	2.24E-03	1.44E-03	2.78E-04	-1.11E-03	-2.55E-03
-180	-3.85E-03	-4.84E-03	-5.42E-03	-5.51E-03	-5.15E-03
-175	-4.43E-03	-3.49E-03	-2.54E-03	-1.77E-03	-1.35E-03
-170	-1.40E-03	-1.96E-03	-2.99E-03	-4.38E-03	-5.95E-03
-165	-7.50E-03	-8.80E-03	-9.69E-03	-1.00E-02	-9.81E-03
-160	-9.07E-03	-7.96E-03	-6.70E-03	-5.50E-03	-4.60E-03
-155	-4.16E-03	-4.29E-03	-4.99E-03	-6.20E-03	-7.75E-03
-150	-9.40E-03	-1.09E-02	-1.21E-02	-1.26E-02	-1.26E-02
-145	-1.18E-02	-1.06E-02	-8.99E-03	-7.31E-03	-5.80E-03
-140	-4.71E-03	-4.20E-03	-4.37E-03	-5.18E-03	-6.52E-03
-135	-8.16E-03	-9.83E-03	-1.12E-02	-1.21E-02	-1.23E-02
-130	-1.17E-02	-1.03E-02	-8.40E-03	-6.18E-03	-3.97E-03
-125	-2.09E-03	-8.10E-04	-3.10E-04	-6.42E-04	-1.72E-03
-120	-3.31E-03	-5.12E-03	-6.77E-03	-7.94E-03	-8.37E-03
-115	-7.92E-03	-6.61E-03	-4.57E-03	-2.05E-03	6.30E-04
-110	3.14E-03	5.16E-03	6.44E-03	6.82E-03	6.29E-03
-105	4.98E-03	3.16E-03	1.19E-03	-5.56E-04	-1.72E-03
-100	-2.03E-03	-1.32E-03	4.22E-04	3.07E-03	6.33E-03
-95	9.76E-03	1.28E-02	1.50E-02	1.60E-02	1.56E-02
-90	1.39E-02	1.15E-02	8.76E-03	6.39E-03	4.76E-03
-85	4.10E-03	4.43E-03	5.68E-03	7.73E-03	1.04E-02
-80	1.35E-02	1.65E-02	1.92E-02	2.09E-02	2.13E-02
-75	2.02E-02	1.78E-02	1.45E-02	1.10E-02	7.78E-03
-70	5.39E-03	4.05E-03	3.82E-03	4.64E-03	6.38E-03
-65	8.85E-03	1.18E-02	1.49E-02	1.76E-02	1.93E-02
-60	1.93E-02	1.73E-02	1.30E-02	6.66E-03	-1.00E-03
-55	-8.98E-03	-1.62E-02	-2.15E-02	-2.44E-02	-2.46E-02
-50	-2.22E-02	-1.77E-02	-1.20E-02	-6.19E-03	-1.38E-03
-45	1.26E-03	8.14E-04	-3.31E-03	-1.12E-02	-2.25E-02
-40	-3.63E-02	-5.13E-02	-6.60E-02	-7.88E-02	-8.80E-02
-35	-9.23E-02	-9.08E-02	-8.29E-02	-6.89E-02	-4.97E-02
-30	-2.65E-02	-1.12E-03	2.43E-02	4.78E-02	6.73E-02
-25	8.16E-02	8.95E-02	9.08E-02	8.59E-02	7.56E-02
-20	6.14E-02	4.50E-02	2.79E-02	1.19E-02	-1.67E-03
-15	-1.19E-02	-1.84E-02	-2.10E-02	-2.04E-02	-1.72E-02
-10	-1.24E-02	-7.07E-03	-1.98E-03	2.15E-03	4.81E-03
-5	5.71E-03	4.77E-03	2.13E-03	-1.78E-03	-6.32E-03
0	-1.07E-02	-1.41E-02	-1.61E-02	-1.64E-02	-1.51E-02
5	-1.26E-02	-9.56E-03	-6.39E-03	-3.47E-03	-1.03E-03
10	7.62E-04	1.77E-03	1.88E-03	1.04E-03	-6.25E-04
15	-2.83E-03	-5.13E-03	-7.07E-03	-8.29E-03	-8.64E-03
20	-8.20E-03	-7.27E-03	-6.18E-03	-5.23E-03	-4.56E-03
25	-4.13E-03	-3.80E-03	-3.40E-03	-2.84E-03	-2.20E-03
30	-1.67E-03	-1.43E-03	-1.64E-03	-2.25E-03	-3.10E-03
35	-3.94E-03	-4.57E-03	-4.84E-03	-4.75E-03	-4.37E-03
40	-3.82E-03	-3.24E-03	-2.77E-03	-2.55E-03	-2.66E-03
45	-3.13E-03	-3.85E-03	-4.66E-03	-5.33E-03	-5.66E-03
50	-5.51E-03	-4.86E-03	-3.79E-03	-2.43E-03	-9.57E-04

55	4.59E-04	1.66E-03	2.52E-03	2.97E-03	2.97E-03
60	2.55E-03	1.76E-03	7.18E-04	-4.39E-04	-1.56E-03
65	-2.48E-03	-3.06E-03	-3.19E-03	-2.81E-03	-1.94E-03
70	-6.37E-04	9.51E-04	2.65E-03	4.26E-03	5.61E-03
75	6.53E-03	6.95E-03	6.84E-03	6.24E-03	5.28E-03
80	4.10E-03	2.85E-03	1.70E-03	7.65E-04	1.25E-04
85	-1.89E-04	-1.96E-04	3.91E-05	4.23E-04	8.43E-04
90	1.19E-03	1.36E-03	1.30E-03	9.64E-04	3.77E-04
95	-4.09E-04	-1.31E-03	-2.21E-03	-3.00E-03	-3.59E-03
100	-3.89E-03	-3.89E-03	-3.57E-03	-2.99E-03	-2.23E-03
105	-1.38E-03	-5.63E-04	1.40E-04	6.50E-04	9.21E-04
110	9.43E-04	7.38E-04	3.55E-04	-1.40E-04	-6.71E-04
115	-1.17E-03	-1.58E-03	-1.85E-03	-1.98E-03	-1.95E-03
120	-1.80E-03	-1.55E-03	-1.25E-03	-9.32E-04	-6.29E-04
125	-3.68E-04	-1.62E-04	-1.24E-05	9.09E-05	1.64E-04
130	2.24E-04	2.88E-04	3.67E-04	4.61E-04	5.62E-04
135	6.56E-04	7.19E-04	7.29E-04	6.63E-04	5.07E-04
140	2.55E-04	-8.79E-05	-5.07E-04	-9.76E-04	-1.46E-03
145	-1.94E-03	-2.37E-03	-2.74E-03	-3.03E-03	-3.23E-03
150	-3.36E-03	-3.42E-03	-3.44E-03	-3.44E-03	-3.43E-03
155	-3.43E-03	-3.45E-03	-3.48E-03	-3.52E-03	-3.54E-03
160	-3.53E-03	-3.46E-03	-3.33E-03	-3.11E-03	-2.80E-03
165	-2.40E-03	-1.94E-03	-1.41E-03	-8.50E-04	-2.83E-04
170	2.64E-04	7.66E-04	1.20E-03	1.56E-03	1.84E-03
175	2.02E-03	2.13E-03	2.17E-03	2.15E-03	2.08E-03
180	1.99E-03	1.87E-03	1.73E-03	1.59E-03	1.43E-03
185	1.28E-03	1.12E-03	9.67E-04	8.29E-04	7.14E-04
190	6.31E-04	5.89E-04	5.94E-04	6.47E-04	7.43E-04
195	8.76E-04	1.03E-03	1.19E-03	1.34E-03	1.46E-03
200	1.54E-03	1.56E-03	1.51E-03	1.39E-03	1.20E-03
205	9.33E-04	6.00E-04	2.11E-04	-2.21E-04	-6.78E-04
210	-1.14E-03	-1.59E-03	-2.00E-03	-2.36E-03	-2.64E-03
215	-2.85E-03	-2.98E-03	-3.02E-03	-2.99E-03	-2.88E-03
220	-2.72E-03	-2.51E-03	-2.26E-03	-1.99E-03	-1.70E-03
225	-1.40E-03	-1.10E-03	-7.89E-04	-4.85E-04	-1.86E-04
230	1.04E-04	3.83E-04	6.48E-04	8.98E-04	1.13E-03
235	1.34E-03	1.53E-03	1.68E-03	1.81E-03	1.89E-03
240	1.94E-03	1.95E-03	1.91E-03	1.83E-03	1.73E-03
245	1.60E-03	1.47E-03	1.33E-03	1.21E-03	1.11E-03
250	1.03E-03	9.78E-04	9.50E-04	9.40E-04	9.44E-04
255	9.54E-04	9.64E-04	9.69E-04	9.66E-04	9.51E-04
260	9.24E-04	8.85E-04	8.37E-04	7.84E-04	7.32E-04
265	6.86E-04	6.51E-04	6.31E-04	6.28E-04	6.41E-04
270	6.69E-04	7.08E-04	7.52E-04	7.95E-04	8.30E-04
275	8.51E-04	8.52E-04	8.30E-04	7.86E-04	7.20E-04
280	6.39E-04	5.46E-04	4.50E-04	3.57E-04	2.70E-04
285	1.93E-04	1.27E-04	7.12E-05	2.22E-05	-2.31E-05
290	-6.85E-05	-1.17E-04	-1.72E-04	-2.34E-04	-3.01E-04
295	-3.72E-04	-4.43E-04	-5.09E-04	-5.66E-04	-6.10E-04
300	-6.39E-04	-6.53E-04	-6.53E-04	-6.43E-04	-6.26E-04
305	-6.08E-04	-5.94E-04	-5.88E-04	-5.93E-04	-6.11E-04
310	-6.39E-04	-6.74E-04	-7.13E-04	-7.49E-04	-7.76E-04
315	-7.89E-04	-7.86E-04	-7.64E-04	-7.24E-04	-6.68E-04

320	-6.02E-04	-5.30E-04	-4.57E-04	-3.88E-04	-3.27E-04
325	-2.75E-04	-2.32E-04	-1.98E-04	-1.69E-04	-1.43E-04
330	-1.17E-04	-8.83E-05	-5.60E-05	-1.99E-05	1.82E-05
335	5.55E-05	8.81E-05	1.12E-04	1.22E-04	1.17E-04
340	9.31E-05	5.18E-05	-5.46E-06	-7.49E-05	-1.52E-04
345	-2.30E-04	-3.04E-04	-3.69E-04	-4.21E-04	-4.58E-04
350	-4.79E-04	-4.87E-04	-4.83E-04	-4.72E-04	-4.58E-04
355	-4.45E-04	-4.35E-04	-4.31E-04	-4.33E-04	-4.39E-04
360	-4.48E-04	-4.58E-04	-4.64E-04	-4.65E-04	-4.58E-04
365	-4.42E-04	-4.19E-04	-3.88E-04	-3.51E-04	-3.13E-04
370	-2.74E-04	-2.39E-04	-2.08E-04	-1.84E-04	-1.65E-04
375	-1.51E-04	-1.40E-04	-1.30E-04	-1.18E-04	-1.02E-04
380	-8.08E-05	-5.25E-05	-1.78E-05	2.24E-05	6.60E-05
385	1.11E-04	1.54E-04	1.94E-04	2.28E-04	2.55E-04
390	2.74E-04	2.87E-04	2.95E-04	2.98E-04	2.98E-04
395	2.96E-04	2.94E-04	2.92E-04	2.90E-04	2.88E-04
400	2.83E-04	2.77E-04	2.66E-04	2.50E-04	2.28E-04
405	2.01E-04	1.69E-04	1.34E-04	9.72E-05	6.14E-05
410	2.88E-05	1.73E-06	-1.82E-05	-2.97E-05	-3.24E-05
415	-2.67E-05	-1.34E-05	5.97E-06	2.98E-05	5.65E-05
420	8.45E-05	1.13E-04	1.41E-04	1.69E-04	1.96E-04
425	2.24E-04	2.52E-04	2.80E-04	3.09E-04	3.39E-04
430	3.69E-04	3.99E-04	4.29E-04	4.58E-04	4.83E-04
435	5.06E-04	5.23E-04	5.36E-04	5.43E-04	5.44E-04
440	5.41E-04	5.36E-04	5.29E-04	5.23E-04	5.19E-04
445	5.18E-04	5.20E-04	5.25E-04	5.30E-04	5.37E-04
450	5.42E-04	5.46E-04	5.47E-04	5.46E-04	5.42E-04
455	5.34E-04	5.24E-04	5.10E-04	4.93E-04	4.73E-04
460	4.51E-04	4.27E-04	4.04E-04	3.82E-04	3.64E-04
465	3.49E-04	3.38E-04	3.27E-04	3.14E-04	2.96E-04
470	2.71E-04	2.39E-04	2.02E-04	1.65E-04	1.32E-04
475	1.07E-04	9.25E-05	8.56E-05	8.38E-05	8.31E-05
480	8.07E-05	7.54E-05	6.78E-05	5.98E-05	5.37E-05
485	5.13E-05	5.36E-05	6.05E-05	7.08E-05	8.19E-05
490	8.99E-05	8.98E-05	7.69E-05	4.90E-05	9.20E-06
495	-3.19E-05	-5.62E-05	-4.10E-05	3.45E-05	1.81E-04
500	3.90E-04				

## 7.4 Processing Dispositions

### 7.4.1 Velocities (BHPBP copies)

No.	Contents	Files	Media	Format
1	1 <sup>st</sup> , 2 <sup>nd</sup> , 3 <sup>rd</sup> Pass Vels (BHPBP copy)	*SRMEVELS.bhp, *PSTMVELS.bhp, *HDVAVELS.bhp (raw picks)	DVD-ROM	WGeco ASCII
Q54676	HDVA Vels (BHPBP copy) (1 of 1)	*HDVAVELS_RAW_VINT.sgy *HDVAVELS_RMSVELTRIMSMTH_VRMS.sgy *HDVAVELS_INTVELTRIMSMTH_VINT.sgy	3590E	SEG-Y

### 7.4.2 Velocities (SANTOS copies)

No.	Contents	Files	Media	Format
2	1 <sup>st</sup> , 2 <sup>nd</sup> , 3 <sup>rd</sup> Pass Vels (BHPBP copy)	*SRMEVELS.bhp, *PSTMVELS.bhp, *HDVAVELS.bhp (raw picks)	DVD-ROM	WGeco ASCII
DL1920	HDVA Vels (BHPBP copy) (1 of 1)	*HDVAVELS_RAW_VINT.sgy *HDVAVELS_RMSVELTRIMSMTH_VRMS.sgy *HDVAVELS_INTVELTRIMSMTH_VINT.sgy	DLT	SEG-Y

### 7.4.3 Velocities (Government copies)

No.	Contents	Files	Media	Format
3	1 <sup>st</sup> , 2 <sup>nd</sup> , 3 <sup>rd</sup> Pass Vels (Govt copy)	*SRMEVELS.bhp, *PSTMVELS.bhp, *HDVAVELS.bhp (raw picks)	DVD-ROM	WGeco ASCII
Q09446	HDVA Vels (Govt copy) (1 of 1)	*HDVAVELS_RMSVELTRIMSMTH_VRMS.sgy	3590	SEG-Y

### 7.4.4 Final Processing Report / support files

CD No.	File	Media	Format
6	Final report Otway2D reprocessing 2008.doc	CD-ROM	MSWord
	Waterbottom designation operator points		ASCII text
	Shotpoint-CDP relationships		MSWord

### 7.4.5 CGM files

DVD No.	File	Media	Format
4	Cgm format final stack film files (HOT07A vintage)	DVD-ROM	CGM
5	Cgm format final stack film files (OH91 / OE80A vintages)	DVD-ROM	CGM

### 7.4.6 PrSTM NMO CMP gathers (BHPBP copy on 20GB 3590E tapes)

No.	Line	File on tape	Media	Format
Q54669	OE80A-1015	1 of 23	3590E	SEG-Y
	OE80A-1017	2 of 23	3590E	SEG-Y
	OE80A-1019	3 of 23	3590E	SEG-Y
	OE80A-1021	4 of 23	3590E	SEG-Y
	OE80A-1023	5 of 23	3590E	SEG-Y
	OE80A-1025	6 of 23	3590E	SEG-Y
	OE80A-1026	7 of 23	3590E	SEG-Y
	OE80A-1027	8 of 23	3590E	SEG-Y
	OE80A-1028	9 of 23	3590E	SEG-Y

No.	Line	File on tape	Media	Format
	OE80A-1029	10 of 23	3590E	SEG-Y
	OE80A-1030	11 of 23	3590E	SEG-Y
	OE80A-1031	12 of 23	3590E	SEG-Y
	OE80A-1032	13 of 23	3590E	SEG-Y
	OE80A-1033	14 of 23	3590E	SEG-Y
	OE80A-1034	15 of 23	3590E	SEG-Y
	OE80A-1035	16 of 23	3590E	SEG-Y
	OE80A-1036	17 of 23	3590E	SEG-Y
	OE80A-1037	18 of 23	3590E	SEG-Y
	OE80A-1038	19 of 23	3590E	SEG-Y
	OE80A-1039	20 of 23	3590E	SEG-Y
	OE80A-1040	21 of 23	3590E	SEG-Y
	OE80A-1042	22 of 23	3590E	SEG-Y
	OE80A-1056	23 of 23	3590E	SEG-Y
Q54670	OH91-143	1 of 11	3590E	SEG-Y
	OH91-144	2 of 11	3590E	SEG-Y
	OH91-145	3 of 11	3590E	SEG-Y
	OH91-146	4 of 11	3590E	SEG-Y
	OH91-147	5 of 11	3590E	SEG-Y
	OH91-148	6 of 11	3590E	SEG-Y
	OH91-149	7 of 11	3590E	SEG-Y
	OH91-150	8 of 11	3590E	SEG-Y
	OH91-151	9 of 11	3590E	SEG-Y
	OH91-152	10 of 11	3590E	SEG-Y
	OH91-156	11 of 11	3590E	SEG-Y
Q54671	OH91-157	1 of 12	3590E	SEG-Y
	OH91-159	2 of 12	3590E	SEG-Y
	OH91-160	3 of 12	3590E	SEG-Y
	OH91-161	4 of 12	3590E	SEG-Y
	OH91-162	5 of 12	3590E	SEG-Y
	OH91-163	6 of 12	3590E	SEG-Y
	OH91-164	7 of 12	3590E	SEG-Y
	HOT07A-01	8 of 12	3590E	SEG-Y
	HOT07A-02	9 of 12	3590E	SEG-Y
	HOT07A-03	10 of 12	3590E	SEG-Y
	HOT07A-04	11 of 12	3590E	SEG-Y
	HOT07A-05	12 of 12	3590E	SEG-Y

#### 7.4.7 PrSTM NMO CMP gathers (SANTOS copy on 35gB DLT tapes)

No.	Line	File on tape	Media	Format
DL1915	HOT07A-01	1 of 28	DLT	SEG-Y
	HOT07A-02	2 of 28	DLT	SEG-Y
	HOT07A-03	3 of 28	DLT	SEG-Y
	HOT07A-04	4 of 28	DLT	SEG-Y
	HOT07A-05	5 of 28	DLT	SEG-Y
	OE80A-1015	6 of 28	DLT	SEG-Y
	OE80A-1017	7 of 28	DLT	SEG-Y
	OE80A-1019	8 of 28	DLT	SEG-Y



No.	Line	File on tape	Media	Format
	OE80A-1021	9 of 28	DLT	SEG-Y
	OE80A-1023	10 of 28	DLT	SEG-Y
	OE80A-1025	11 of 28	DLT	SEG-Y
	OE80A-1026	12 of 28	DLT	SEG-Y
	OE80A-1027	13 of 28	DLT	SEG-Y
	OE80A-1028	14 of 28	DLT	SEG-Y
	OE80A-1029	15 of 28	DLT	SEG-Y
	OE80A-1030	16 of 28	DLT	SEG-Y
	OE80A-1031	17 of 28	DLT	SEG-Y
	OE80A-1032	18 of 28	DLT	SEG-Y
	OE80A-1033	19 of 28	DLT	SEG-Y
	OE80A-1034	20 of 28	DLT	SEG-Y
	OE80A-1035	21 of 28	DLT	SEG-Y
	OE80A-1036	22 of 28	DLT	SEG-Y
	OE80A-1037	23 of 28	DLT	SEG-Y
	OE80A-1038	24 of 28	DLT	SEG-Y
	OE80A-1039	25 of 28	DLT	SEG-Y
	OE80A-1040	26 of 28	DLT	SEG-Y
	OE80A-1042	27 of 28	DLT	SEG-Y
	OE80A-1056	28 of 28	DLT	SEG-Y
DL1916	OH91-143	1 of 18	DLT	SEG-Y
	OH91-144	2 of 18	DLT	SEG-Y
	OH91-145	3 of 18	DLT	SEG-Y
	OH91-146	4 of 18	DLT	SEG-Y
	OH91-147	5 of 18	DLT	SEG-Y
	OH91-148	6 of 18	DLT	SEG-Y
	OH91-149	7 of 18	DLT	SEG-Y
	OH91-150	8 of 18	DLT	SEG-Y
	OH91-151	9 of 18	DLT	SEG-Y
	OH91-152	10 of 18	DLT	SEG-Y
	OH91-156	11 of 18	DLT	SEG-Y
	OH91-157	12 of 18	DLT	SEG-Y
	OH91-159	13 of 18	DLT	SEG-Y
	OH91-160	14 of 18	DLT	SEG-Y
	OH91-161	15 of 18	DLT	SEG-Y
	OH91-162	16 of 18	DLT	SEG-Y
	OH91-163	17 of 18	DLT	SEG-Y
	OH91-164	18 of 18	DLT	SEG-Y

#### 7.4.8 Radon Demultiple CMP gathers (BHPBP copy on 20gB 3590E tapes)

No.	Line	File on tape	Media	Format
Q54672	OE80A-1015	1 of 23	3590E	SEG-Y
	OE80A-1017	2 of 23	3590E	SEG-Y
	OE80A-1019	3 of 23	3590E	SEG-Y
	OE80A-1021	4 of 23	3590E	SEG-Y
	OE80A-1023	5 of 23	3590E	SEG-Y
	OE80A-1025	6 of 23	3590E	SEG-Y
	OE80A-1026	7 of 23	3590E	SEG-Y

No.	Line	File on tape	Media	Format
	OE80A-1027	8 of 23	3590E	SEG-Y
	OE80A-1028	9 of 23	3590E	SEG-Y
	OE80A-1029	10 of 23	3590E	SEG-Y
	OE80A-1030	11 of 23	3590E	SEG-Y
	OE80A-1031	12 of 23	3590E	SEG-Y
	OE80A-1032	13 of 23	3590E	SEG-Y
	OE80A-1033	14 of 23	3590E	SEG-Y
	OE80A-1034	15 of 23	3590E	SEG-Y
	OE80A-1035	16 of 23	3590E	SEG-Y
	OE80A-1036	17 of 23	3590E	SEG-Y
	OE80A-1037	18 of 23	3590E	SEG-Y
	OE80A-1038	19 of 23	3590E	SEG-Y
	OE80A-1039	20 of 23	3590E	SEG-Y
	OE80A-1040	21 of 23	3590E	SEG-Y
	OE80A-1042	22 of 23	3590E	SEG-Y
	OE80A-1056	23 of 23	3590E	SEG-Y
Q54673	OH91-143	1 of 11	3590E	SEG-Y
	OH91-144	2 of 11	3590E	SEG-Y
	OH91-145	3 of 11	3590E	SEG-Y
	OH91-146	4 of 11	3590E	SEG-Y
	OH91-147	5 of 11	3590E	SEG-Y
	OH91-148	6 of 11	3590E	SEG-Y
	OH91-149	7 of 11	3590E	SEG-Y
	OH91-150	8 of 11	3590E	SEG-Y
	OH91-151	9 of 11	3590E	SEG-Y
	OH91-152	10 of 11	3590E	SEG-Y
	OH91-156	11 of 11	3590E	SEG-Y
Q54674	OH91-157	1 of 12	3590E	SEG-Y
	OH91-159	2 of 12	3590E	SEG-Y
	OH91-160	3 of 12	3590E	SEG-Y
	OH91-161	4 of 12	3590E	SEG-Y
	OH91-162	5 of 12	3590E	SEG-Y
	OH91-163	6 of 12	3590E	SEG-Y
	OH91-164	7 of 12	3590E	SEG-Y
	HOT07A-01	8 of 12	3590E	SEG-Y
	HOT07A-02	9 of 12	3590E	SEG-Y
	HOT07A-03	10 of 12	3590E	SEG-Y
	HOT07A-04	11 of 12	3590E	SEG-Y
	HOT07A-05	12 of 12	3590E	SEG-Y

#### 7.4.9 Radon Demultiple CMP gathers (SANTOS copy on 35gB DLT tapes)

No.	Line	File on tape	Media	Format
DL1917	HOT07A-01	1 of 28	DLT	SEG-Y
	HOT07A-02	2 of 28	DLT	SEG-Y
	HOT07A-03	3 of 28	DLT	SEG-Y
	HOT07A-04	4 of 28	DLT	SEG-Y
	HOT07A-05	5 of 28	DLT	SEG-Y
	OE80A-1015	6 of 28	DLT	SEG-Y

<b>No.</b>	<b>Line</b>	<b>File on tape</b>	<b>Media</b>	<b>Format</b>
	OE80A-1017	7 of 28	DLT	SEG-Y
	OE80A-1019	8 of 28	DLT	SEG-Y
	OE80A-1021	9 of 28	DLT	SEG-Y
	OE80A-1023	10 of 28	DLT	SEG-Y
	OE80A-1025	11 of 28	DLT	SEG-Y
	OE80A-1026	12 of 28	DLT	SEG-Y
	OE80A-1027	13 of 28	DLT	SEG-Y
	OE80A-1028	14 of 28	DLT	SEG-Y
	OE80A-1029	15 of 28	DLT	SEG-Y
	OE80A-1030	16 of 28	DLT	SEG-Y
	OE80A-1031	17 of 28	DLT	SEG-Y
	OE80A-1032	18 of 28	DLT	SEG-Y
	OE80A-1033	19 of 28	DLT	SEG-Y
	OE80A-1034	20 of 28	DLT	SEG-Y
	OE80A-1035	21 of 28	DLT	SEG-Y
	OE80A-1036	22 of 28	DLT	SEG-Y
	OE80A-1037	23 of 28	DLT	SEG-Y
	OE80A-1038	24 of 28	DLT	SEG-Y
	OE80A-1039	25 of 28	DLT	SEG-Y
	OE80A-1040	26 of 28	DLT	SEG-Y
	OE80A-1042	27 of 28	DLT	SEG-Y
	OE80A-1056	28 of 28	DLT	SEG-Y
DL1918	OH91-143	1 of 18	DLT	SEG-Y
	OH91-144	2 of 18	DLT	SEG-Y
	OH91-145	3 of 18	DLT	SEG-Y
	OH91-146	4 of 18	DLT	SEG-Y
	OH91-147	5 of 18	DLT	SEG-Y
	OH91-148	6 of 18	DLT	SEG-Y
	OH91-149	7 of 18	DLT	SEG-Y
	OH91-150	8 of 18	DLT	SEG-Y
	OH91-151	9 of 18	DLT	SEG-Y
	OH91-152	10 of 18	DLT	SEG-Y
	OH91-156	11 of 18	DLT	SEG-Y
	OH91-157	12 of 18	DLT	SEG-Y
	OH91-159	13 of 18	DLT	SEG-Y
	OH91-160	14 of 18	DLT	SEG-Y
	OH91-161	15 of 18	DLT	SEG-Y
	OH91-162	16 of 18	DLT	SEG-Y
	OH91-163	17 of 18	DLT	SEG-Y
	OH91-164	18 of 18	DLT	SEG-Y

#### 7.4.10 Final Stacks (BHPBP copy on 20gB 3590E tapes)

No.	Contents	Files	Media	Format
Q54675	Final stacks  Vintages: HOT07A, OE80A, OH91A	*FINAL_ANGLESTK_6TO30DEG.sgy *FINAL_ANGLESTK_6TO30DEG_INVERSEQ.sgy *FINAL_ANGLESTK_6TO18DEG.sgy *FINAL_ANGLESTK_6TO18DEG_INVERSEQ.sgy *FINAL_ANGLESTK_18TO30DEG.sgy *FINAL_ANGLESTK_18TO30DEG_INVERSEQ.sgy *FINAL_ANGLESTK_30TO42DEG.sgy *FINAL_ANGLESTK_30TO42DEG_INVERSEQ.sgy	3590E	SEG-Y

#### 7.4.11 Final Stacks (SANTOS copy on 35gB DLT tapes)

No.	Contents	Files	Media	Format
DL1919	Final stacks  Vintages: HOT07A, OE80A, OH91A	*FINAL_ANGLESTK_6TO30DEG.sgy *FINAL_ANGLESTK_6TO30DEG_INVERSEQ.sgy *FINAL_ANGLESTK_6TO18DEG.sgy *FINAL_ANGLESTK_6TO18DEG_INVERSEQ.sgy *FINAL_ANGLESTK_18TO30DEG.sgy *FINAL_ANGLESTK_18TO30DEG_INVERSEQ.sgy *FINAL_ANGLESTK_30TO42DEG.sgy *FINAL_ANGLESTK_30TO42DEG_INVERSEQ.sgy	DLT	SEG-Y

#### 7.4.12 Final Stacks (Government copy on 10gB 3590 tapes)

No.	Contents	Files	Media	Format
Q09445	Final stacks (BHPBP)  Vintages: HOT07A, OE80A, OH91A	*FINAL_ANGLESTK_6TO30DEG.sgy *FINAL_ANGLESTK_6TO30DEG_INVERSEQ.sgy	3590	SEG-Y

## 7.5 EBCDIC Headers and SEG Y Byte Locations

### 7.5.1 Radon CMP gathers: SEG Y byte locations

bytes 9-12	Line number
bytes 13-16	Trace number
bytes 17-20	Shotpoint number
bytes 21-24	CDP number
bytes 25-28	Trace in CDP
bytes 29-30	Data trace type
bytes 31-32	Stack word
bytes 37-40	Offset (m)
bytes 45-48	Waterbottom depth midpt x 10
bytes 49-52	Source depth (m)
bytes 53-56	X coordinate midpt (m) x 10
bytes 57-60	Y coordinate midpt (m) x 10
bytes 73-76	X coordinate midpt (m)
bytes 77-80	Y coordinate midpt (m)
bytes 115-116	Number of samples
bytes 117-118	Sample rate (microsecs)
bytes 137-138	Waterbottom time midpt x 10

### 7.5.2 Radon CMP gathers: EBCDIC header

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*** SEG Y EBCDIC HEADER ***

C 1 CLIENT: BHPBILLITON.          CONTRACTOR: WESTERNGECO
C 2 SURVEY: HOT07A 2D REPROCESSING 2008   AREA: OTWAY BASIN
C 3 LINE: HOT07A-01      PROCESS: RADON DEMULTIPLE CMP GATHER ARCHIVE
C 4 DATE: 6th April 2008
C 5
C 6 PROCESSING SEQUENCE:
C 7 REFORMAT: REC.LENGTH 6000ms.  SAMPLE RATE 2ms
C 8 RECORDING DELAY: 0ms
C 9 MARINE GEOMETRY: 400 CHANNEL. SPINT 25.0M. GPINT 12.50M.
C10 LOAD DIGITIZED WATERBOTTOM HORIZON AND SHOTPOINT XYS TO TRACE HEADERS
C11 LOW CUT FILTER: 3HZ (18dB/Oct)
C12 SPHERICAL DIVERGENCE CORRECTION USING PAST PROCESSING VELOCITY FIELD
C13 TRACE EDITS FROM OBSERVERS LOGS
C14 OFFSET DOMAIN SWATT: 2 PASSES: 0-20Hz inc 2HZ; TV THRESH; 21 TRACE FILTER
C15 OFFSET DOMAIN SWATT: 2 PASSES: 0-125Hz inc 10HZ; TV THRESH; 21 TRACE FILTER
C16 WBDESIG: SHAPE SOURCE WVLT TO ZEROPHASE TARGET WVLT / RESAMPLE TO 3MS
C17 NMO F-K FILTER: SHOT DOMAIN: +/-5000m/s (COSINE TAPER 2000m/s).  RAGC 500ms
C18 EXTRAPOLATION TO ZERO OFFSET
C19 WATERLAYER DEMULTIPLE (DWD)
C20 SHOT INTERP TO 12.50m (INTERNAL TO SRME)
C21 MULTIPASS SRME: MODEL + REMOVE SURFACE MULTIPLES (2 PASSES)
C22 REJECT INTERPOLATED AND EXTRAPOLATED TRACES
C23 CMP SORT / FIRST PASS VELOCITY ANALYSES AT 1KM INTERVAL
C24 SHOT SORT / EXTRAP TO ZERO OFFSET / CMP SORT / 2:1 TRACE INTERP WITHIN CMPS
C25 HIGH RESOLUTION RADON DML: TV% STACKVEL NMO CORRECTION PRIOR TO DML
C26 RADON DML (cont): RAGC 300MS. MOVEOUT -500to1500MS. SIGNAL -500to50ms
C27 REJECT EXTRAPOLATED AND INTERPOLATED TRACES
C28 GUN+CABLE CORR: +10.0MS
C29
C30
C31
C32
C33

```

C34  
C35  
C36 TRACE HEADER BYTE LOCATION INFO:  
C37  
C38 LINE: BYTE 9-12. SHOTPOINT AT SOURCE: BYTE 17-20 CDP: BYTE 21-24.  
C39 WBOTTOM TIME x 10: BYTE 137-138 WBOTTOM DEPTH x 10: BYTE 45-48  
C40 XCORD MIDPT x 10: BYTE 73-76. YCORD MIDPT x 10: BYTE 77-80

### 7.5.3 PrSTM CMP gathers: SEGY byte locations

bytes 9-12	Line number
bytes 13-16	Trace number
bytes 17-20	Shotpoint number
bytes 21-24	CDP number
bytes 25-28	Trace in CDP
bytes 29-30	Data trace type
bytes 31-32	Stack word
bytes 37-40	Offset (m)
bytes 45-48	Waterbottom depth midpt x 10
bytes 49-52	Source depth (m)
bytes 53-56	X coordinate midpt (m) x 10
bytes 57-60	Y coordinate midpt (m) x 10
bytes 73-76	X coordinate midpt (m)
bytes 77-80	Y coordinate midpt (m)
bytes 115-116	Number of samples
bytes 117-118	Sample rate (microsecs)
bytes 137-138	Waterbottom time midpt x 10
bytes 185-188	Offset weighting factor

### 7.5.4 PrSTM CMP gathers: EBCDIC header

```

*** SEGY EBCDIC HEADER ***

C 1 CLIENT: BHPBILLITON.          CONTRACTOR: WESTERNGECO
C 2 SURVEY: HOT07A 2D REPROCESSING 2008   AREA: OTWAY BASIN
C 3 LINE: HOT07A-01      PROCESS: FINAL CMP GATHER ARCHIVE
C 4 DATE: 6th April 2008
C 5
C 6 PROCESSING SEQUENCE:
C 7 REFORMAT: REC.LENGTH 6000ms.  SAMPLE RATE 2ms
C 8 RECORDING DELAY: 0ms
C 9 MARINE GEOMETRY: 400 CHANNEL. SPINT 25.0M. GPINT 12.50M.
C10 LOAD DIGITIZED WATERBOTTOM HORIZON AND SHOTPOINT XYS TO TRACE HEADERS
C11 LOW CUT FILTER: 3HZ (18dB/Oct)
C12 SPHERICAL DIVERGENCE CORRECTION USING PAST PROCESSING VELOCITY FIELD
C13 TRACE EDITS FROM OBSERVERS LOGS
C14 OFFSET DOMAIN SWATT: 2 PASSES: 0-20Hz inc 2HZ; TV THRESH; 21 TRACE FILTER
C15 OFFSET DOMAIN SWATT: 2 PASSES: 0-125Hz inc 10HZ; TV THRESH; 21 TRACE FILTER
C16 WBDESIG: SHAPE SOURCE WVLT TO ZEROPHASE TARGET WVLT / RESAMPLE TO 3MS
C17 NMO F-K FILTER: SHOT DOMAIN: +/-5000m/s (COSINE TAPER 2000m/s).  RAGC 500ms
C18 EXTRAPOLATION TO ZERO OFFSET
C19 WATERLAYER DEMULTIPLE (DWD)
C20 SHOT INTERP TO 12.50m (INTERNAL TO SRME)
C21 MULTIPASS SRME: MODEL + REMOVE SURFACE MULTIPLES (2 PASSES)
C22 REJECT INTERPOLATED AND EXTRAPOLATED TRACES
C23 CMP SORT / FIRST PASS VELOCITY ANALYSES AT 1KM INTERVAL
C24 SHOT SORT / EXTRAP TO ZERO OFFSET / CMP SORT / 2:1 TRACE INTERP WITHIN CMPS
C25 HIGH RESOLUTION RADON DML: TV% STACKVEL NMO CORRECTION PRIOR TO DML
C26 RADON DML (cont): RAGC 300MS. MOVEOUT -500to1500MS. SIGNAL -500to50ms
C27 REJECT EXTRAPOLATED AND INTERPOLATED TRACES
C28 SORT TO COMMON OFFSET ORDER

```

```

C29 HIGHCUT FILT(PRE PSTM): 0s+125Hz 1s+115Hz 2s+105Hz 2.6s+96Hz 4s+80Hz 5s+70Hz
C30 TARGETED PRE STACK TIME MIGRATION VELOCITY ANALYSES: 0.5KM ANALYSIS INTERVAL
C31 PRESTK TIME MIGRN: 4KM VELSMTH. CURVED RAY. 3000M HALF APER. 60 DEG MAXDIPS
C32 SORT TO CDPS / HDVA VELOCITY ANALYSES: 50M ANALYSIS INTERVAL
C33 NMO: APPLIED USING TIME VARIANT TRIM MEAN SMOOTHED HDVA VELOCITIES
C34 OFFSET WEIGHTING / GUN+CABLE CORR: +10.0MS
C35 EXPGAIN 8dB/sec FROM WBT to WBT + 3000MS
C36 TRACE HEADER BYTE LOCATION INFO:
C37 LINE: BYTE 9-12. SHOTPOINT AT SOURCE: BYTE 17-20 CDP: BYTE 21-24.
C38 OFFSET WEIGHT: BYTE 185-188
C39 WBOTTOM TIME x 10: BYTE 137-138 WBOTTOM DEPTH x 10: BYTE 45-48
C40 XCORD MIDPT x 10: BYTE 73-76. YCORD MIDPT x 10: BYTE 77-80

```

### 7.5.5 Final Stack: SEG Y byte locations

bytes 9-12	Line number
bytes 17-20	Shotpoint number
bytes 21-24	CDP number
bytes 29-30	Data trace type
bytes 31-32	Stack word
bytes 45-48	Waterbottom depth midpt x 10
bytes 49-52	Source depth (m)
bytes 53-56	X coordinate midpt (m) x 10
bytes 57-60	Y coordinate midpt (m) x 10
bytes 73-76	X coordinate midpt (m) x 10
bytes 87-80	Y coordinate midpt (m) x 10
bytes 115-116	Number of samples
bytes 117-118	Sample rate (microsecs)
bytes 137-138	Waterbottom time midpt x 10

### 7.5.6 Final Stack: EBCDIC header

```

*** SEGY EBCDIC HEADER ***

C 1 CLIENT: BHPBILLITON. CONTRACTOR: WESTERNGECO
C 2 SURVEY: OTWAY BASIN 2D PROCESSING 2008 PERMIT: VIC/P44
C 3 PROCESS: FINAL RAW PrSTM ANGLESTACK (30 to 42 DEG): INVERSEQ
C 4 DATE: 16th February 2008; LINE: HOT07A-01
C 5
C 6 PROCESSING SEQUENCE:
C 7 REFORMAT: REC.LENGTH 6000ms. SAMPLE RATE 2ms
C 8 RECORDING DELAY: 0ms
C 9 MARINE GEOMETRY: 400 CHANNEL. SPINT 25.0M. GPINT 12.50M.
C10 LOAD DIGITIZED WATERBOTTOM HORIZON AND SHOTPOINT XYZ TO TRACE HEADERS
C11 LOW CUT FILTER: 3HZ (18dB/Oct)
C12 SPHERICAL DIVERGENCE CORRECTION USING PAST PROCESSING VELOCITY FIELD
C13 TRACE EDITS FROM OBSERVERS LOGS
C14 OFFSET DOMAIN SWATT: 2 PASSES: 0-20Hz inc 2HZ; TV THRESH; 21 TRACE FILTER
C15 OFFSET DOMAIN SWATT: 2 PASSES: 0-125Hz inc 10HZ; TV THRESH; 21 TRACE FILTER
C16 WBDESIG: SHAPE SOURCE WVLTO TO ZEROPHASE TARGET WVLTO / RESAMPLE TO 3MS
C17 NMO F-K FILTER: SHOT DOMAIN: +/-5000m/s (COSINE TAPER 2000m/s). RAGC 500ms
C18 EXTRAPOLATION TO ZERO OFFSET
C19 WATERLAYER DEMULTIPLE (DWD)
C20 SHOT INTERP TO 12.50m (INTERNAL TO SRME)
C21 MULTIPASS SRME: MODEL + REMOVE SURFACE MULTIPLES (2 PASSES)
C22 REJECT INTERPOLATED AND EXTRAPOLATED TRACES
C23 CMP SORT / FIRST PASS VELOCITY ANALYSES AT 1KM INTERVAL
C24 SHOT SORT / EXTRAP TO ZERO OFFSET / CMP SORT / 2:1 TRACE INTERP WITHIN CMPS
C25 HIGH RESOLUTION RADON DML: TV% STACKVEL NMO CORRECTION PRIOR TO DML
C26 RADON DML (cont): RAGC 300MS. MOVEOUT -500to1500MS. SIGNAL -500to500ms
C27 REJECT EXTRAPOLATED AND INTERPOLATED TRACES

```

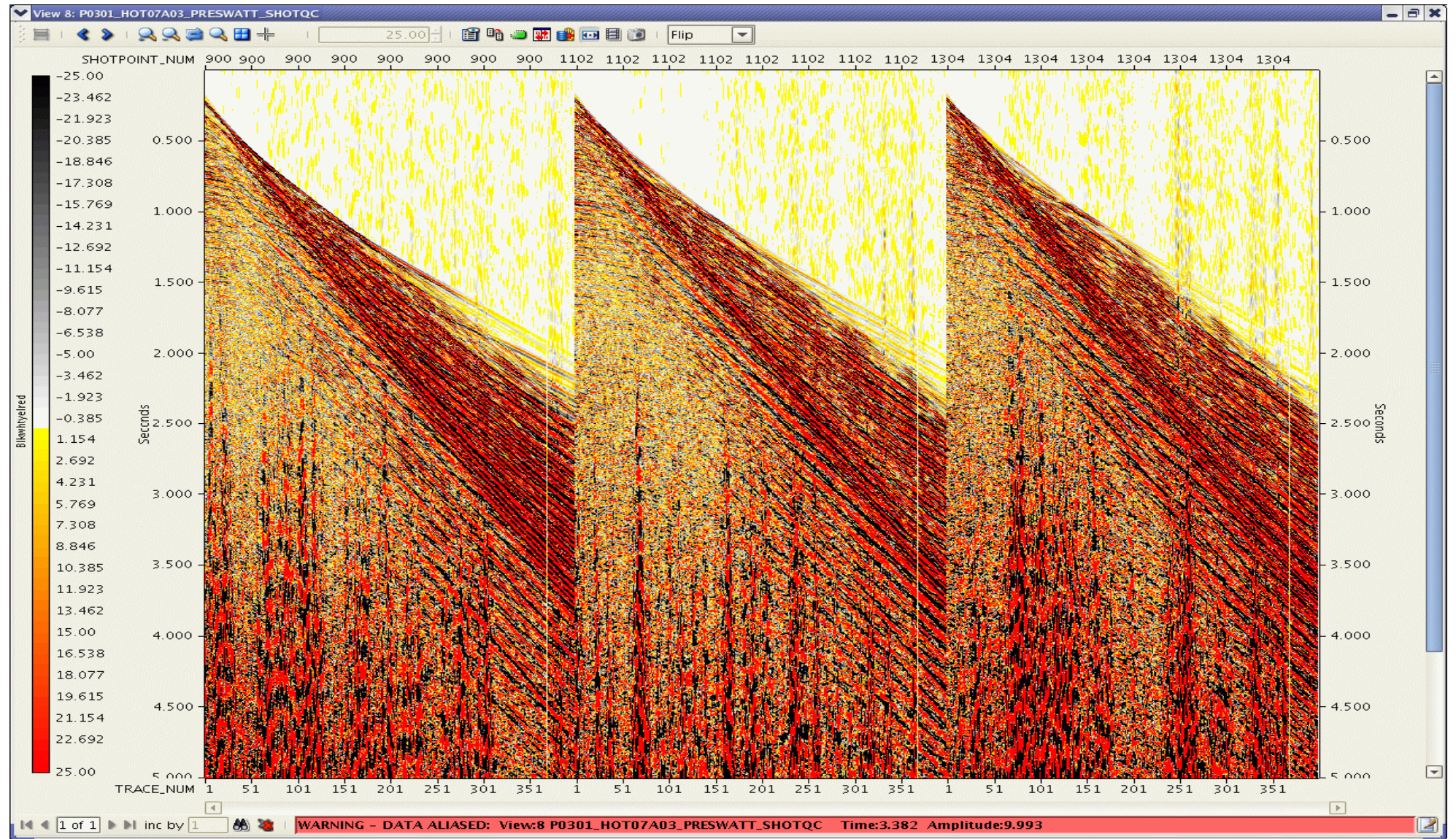
```
C28 SORT TO COMMON OFFSET ORDER
C29 HIGHCUT FILT(PRE PSTM): 0s+125Hz 1s+115Hz 2s+105Hz 2.6s+96Hz 4s+80Hz 5s+70Hz
C30 TARGETED PRE STACK TIME MIGRATION VELOCITY ANALYSES: 0.5KM ANALYSIS INTERVAL
C31 PRESTK TIME MIGRN: 4KM VELSMTH. CURVED RAY. 3000M HALF APER. 60 DEG MAXDIPS
C32 SORT TO CDPS / HDVA VELOCITY ANALYSES: 50M ANALYSIS INTERVAL
C33 NMO: APPLIED USING TIME VARIANT TRIM MEAN SMOOTHED HDVA VELOCITIES
C34 OFFSET WEIGHTING / ANGLE MUTE / STACK / GUN+CABLE CORR: +12MS
C35 PHASE+AMP INVERSE Q=160 / EXPGAIN 4dB/sec FROM WBT to WBT + 3000MS
C36
C37 TRACE HEADER BYTE LOCATION INFO:
C38 LINE: BYTE 9-12.      SHOTPOINT AT SOURCE: BYTE 17-20      CDP: BYTE 21-24.
C39 WBOTTOM TIME x 10: BYTE 137-138  WBOTTOM DEPTH x 10: BYTE 45-48
C40 XCORD MIDPT x 10: BYTE 53-56.    YCORD MIDPT x 10: BYTE 57-60
```

## 7.6 Enclosures

HOT07A vintage production qc plots are provided as an example of data comparisons at each stage of the processing flow:

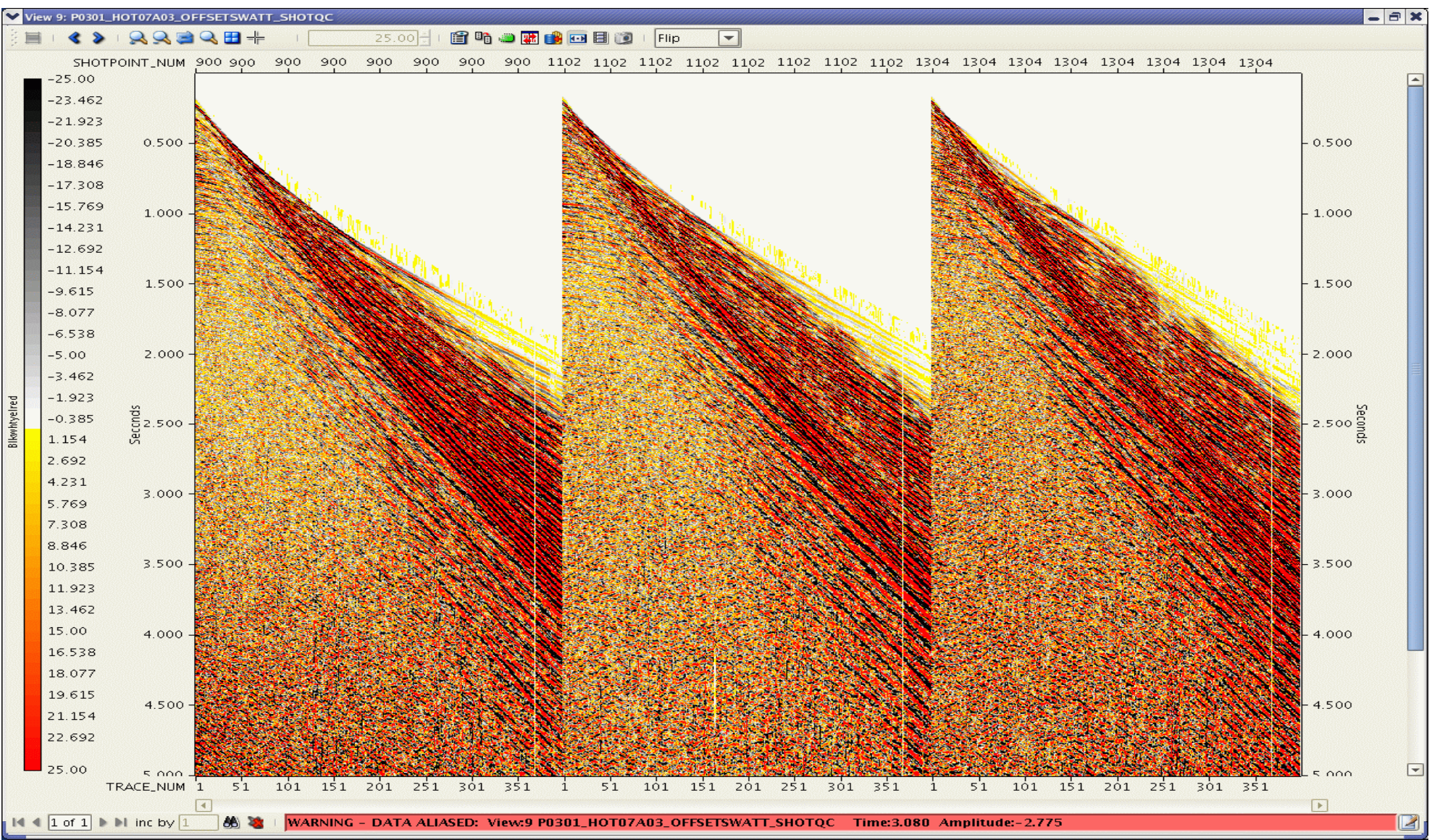


### 7.6.1 HOT07A-03: Raw shot records



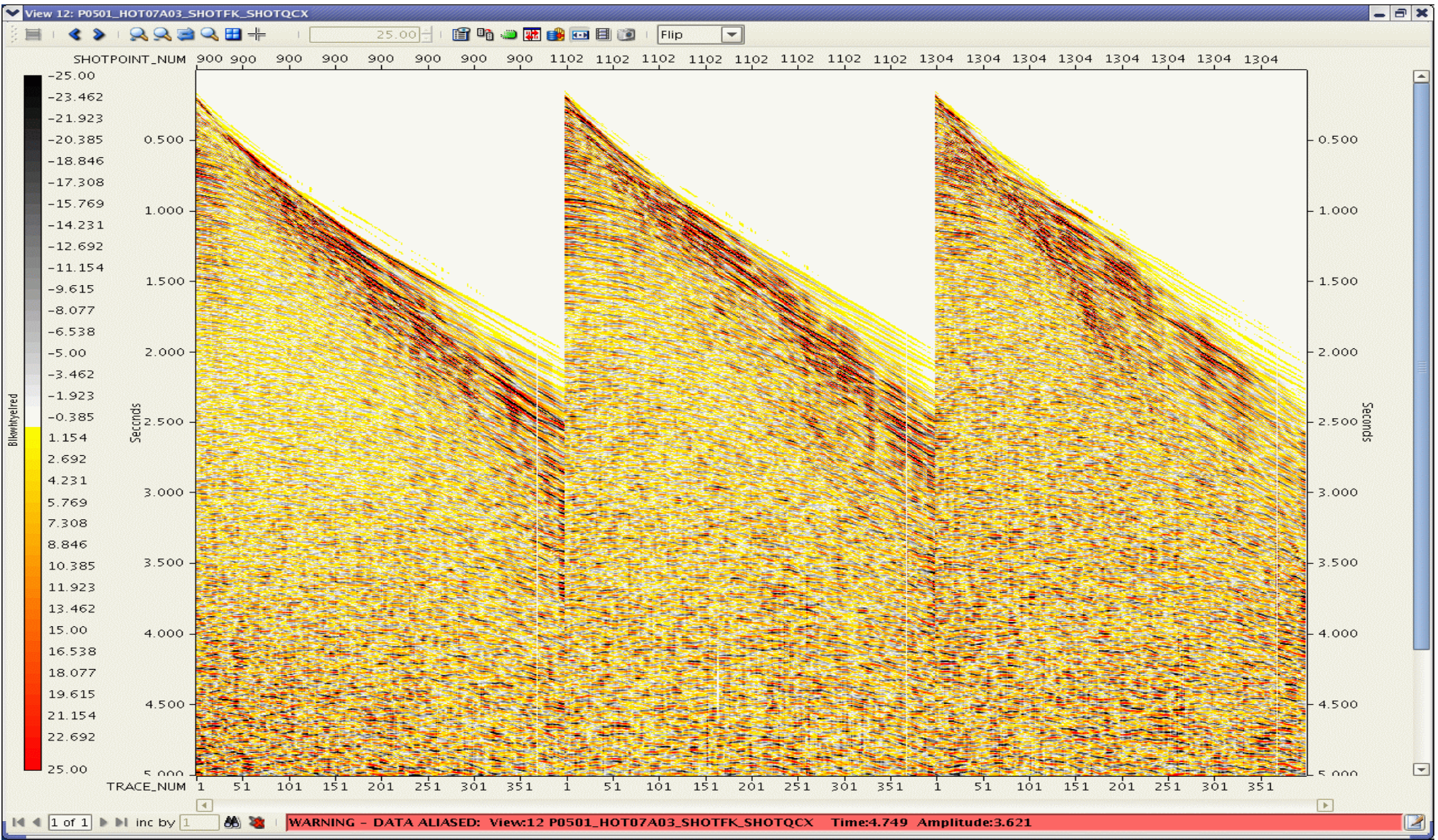


# 7.6.2 HOT07A-03: Swell Noise Attenuation (SWATT) shot records



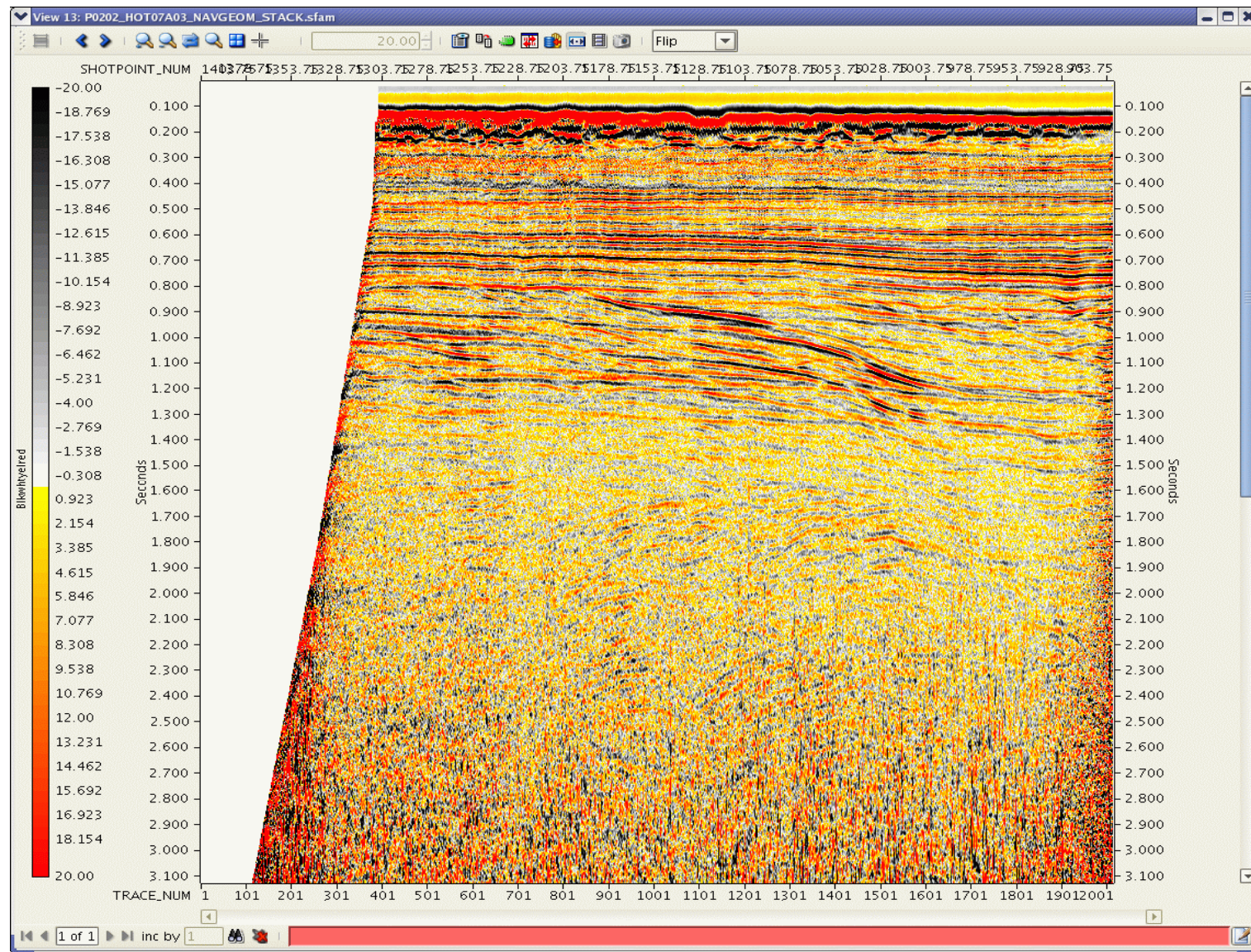


### 7.6.3 HOT07A-03: Shot F-K filter shot records



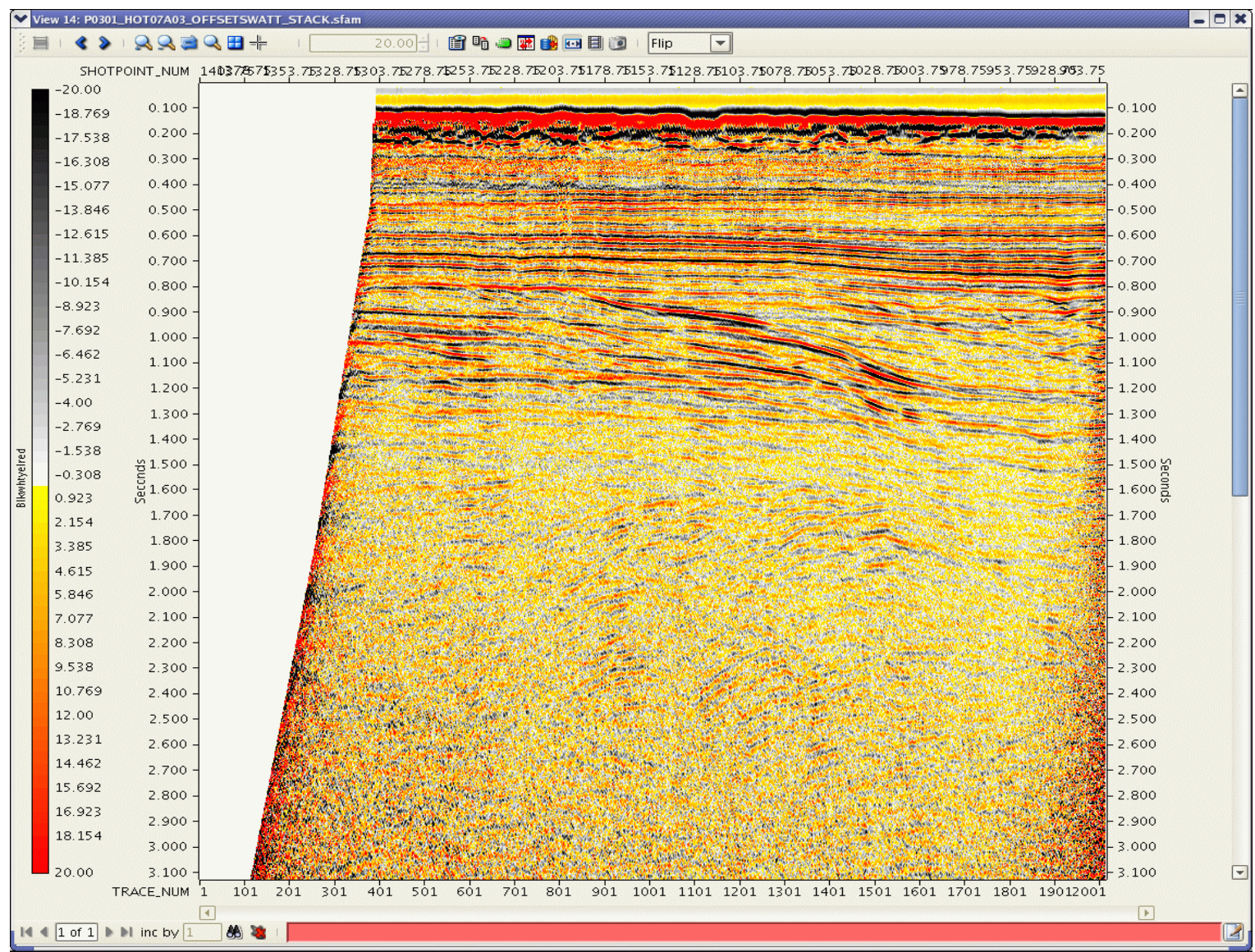


#### 7.6.4 HOT07A-03: Raw stack



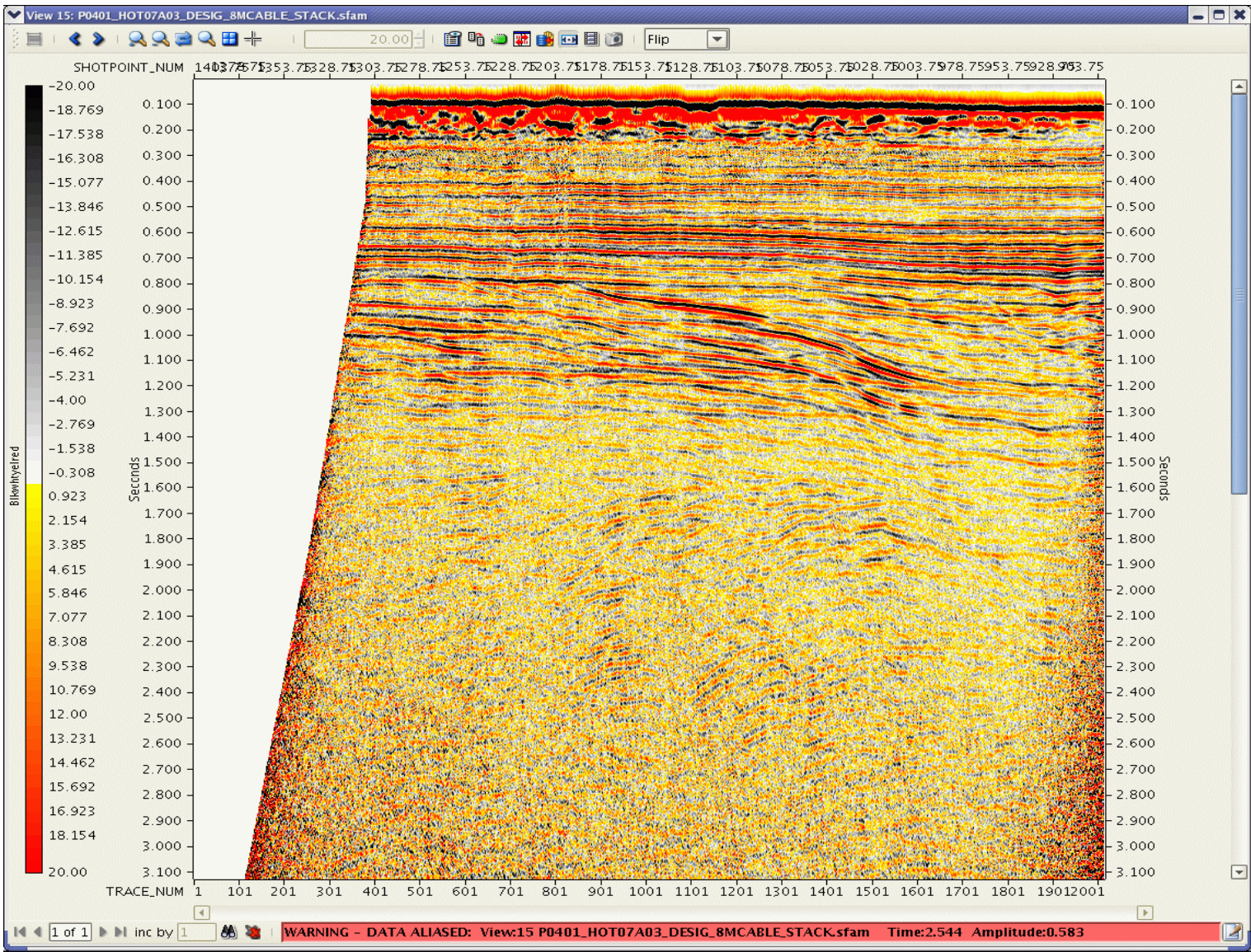


# 7.6.5 HOT07A-03: Swell Noise Attenuation (SWATT) stack



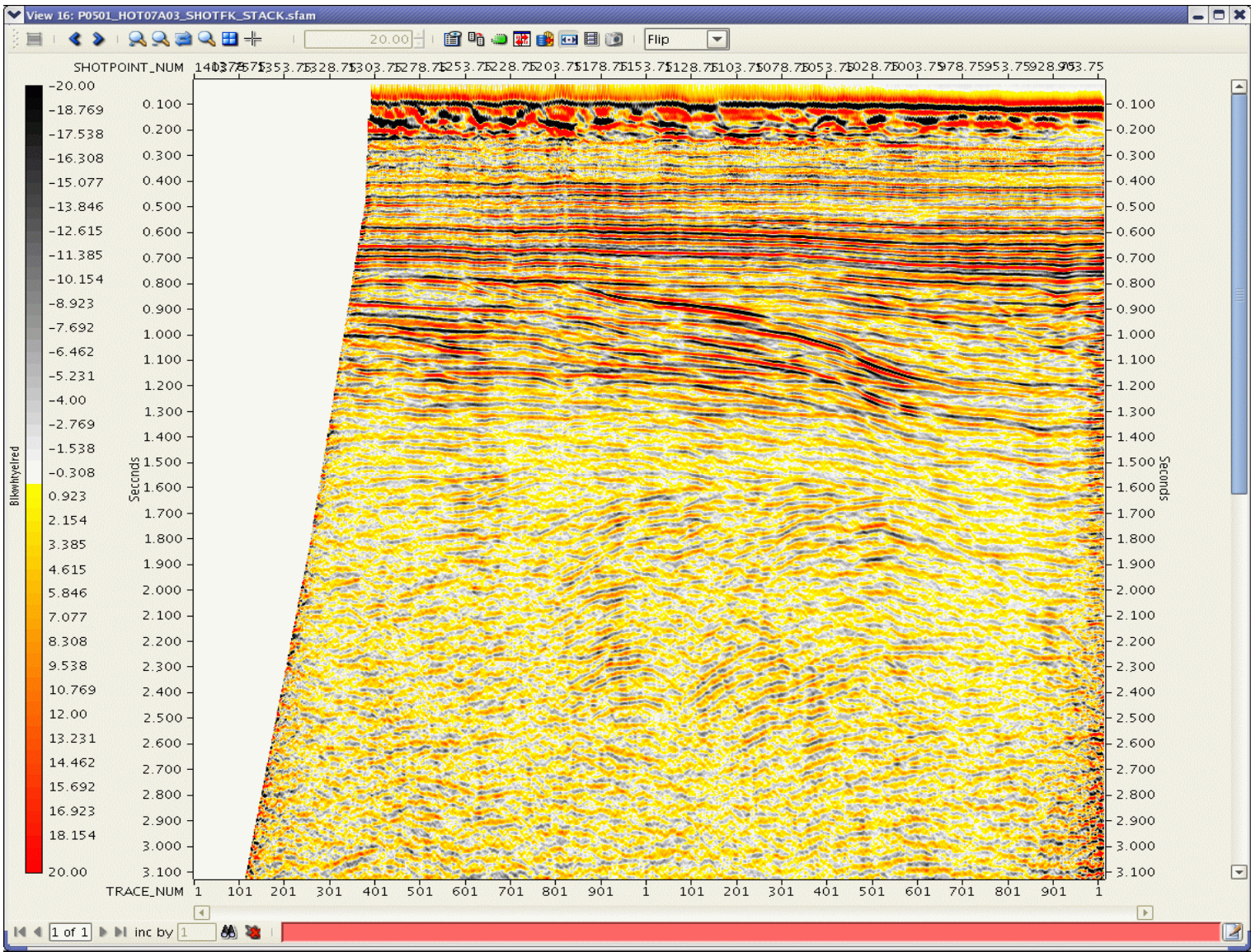


### 7.6.6 HOT07A-03: Waterbottom Designature Stack



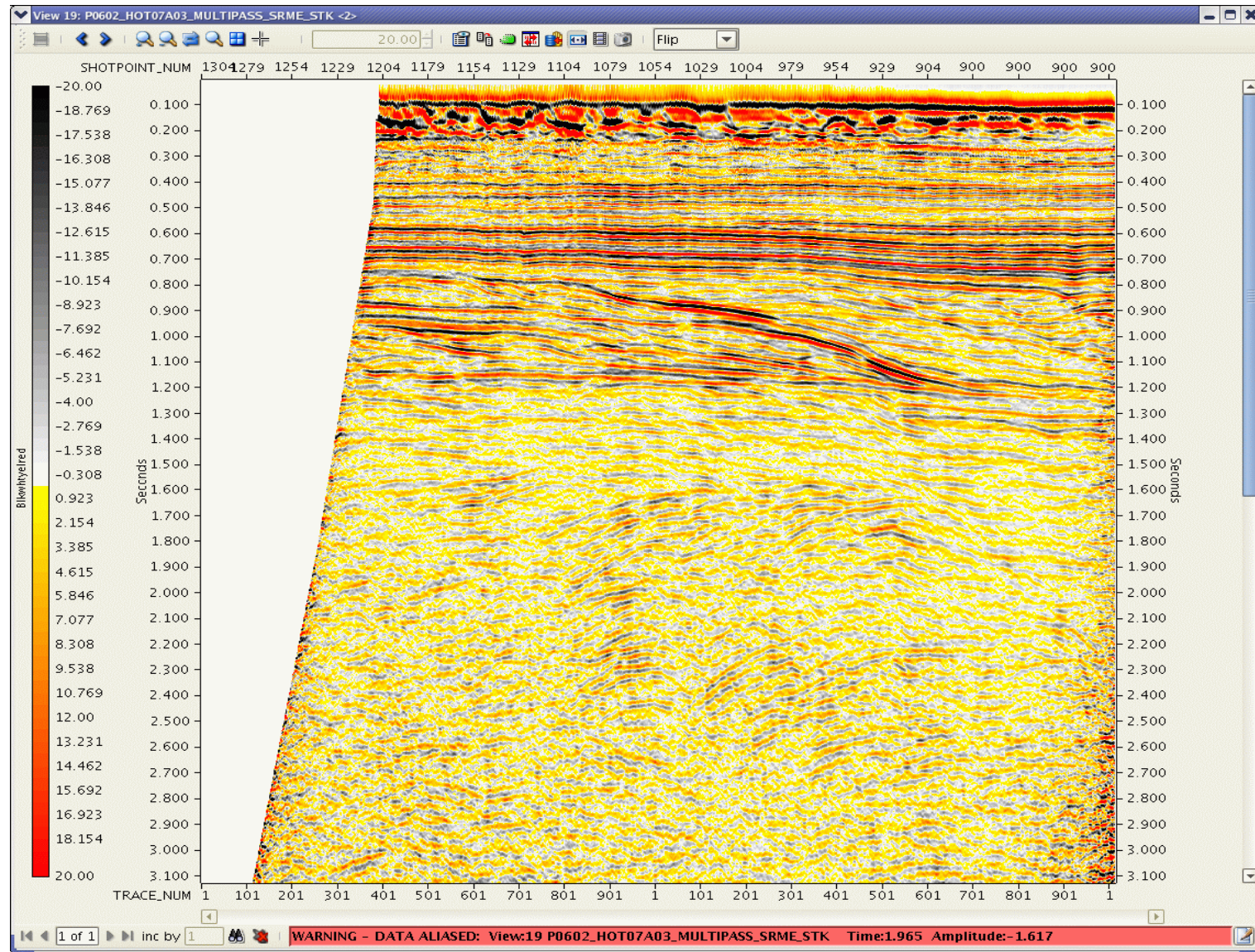


# 7.6.7 HOT07A-03: F-K filter Stack



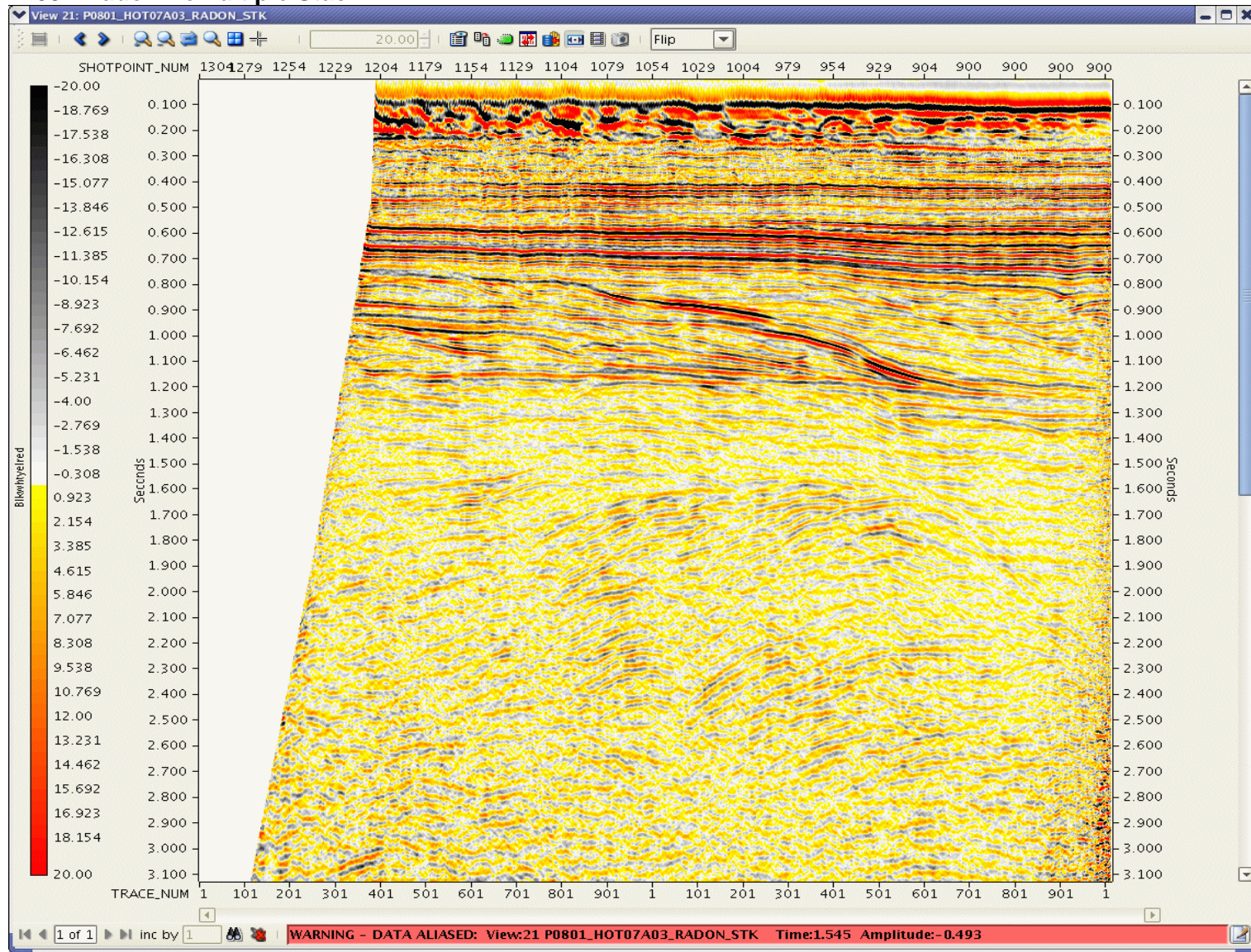


## 7.6.8 HOT07A-03: DWD+SRME Stack



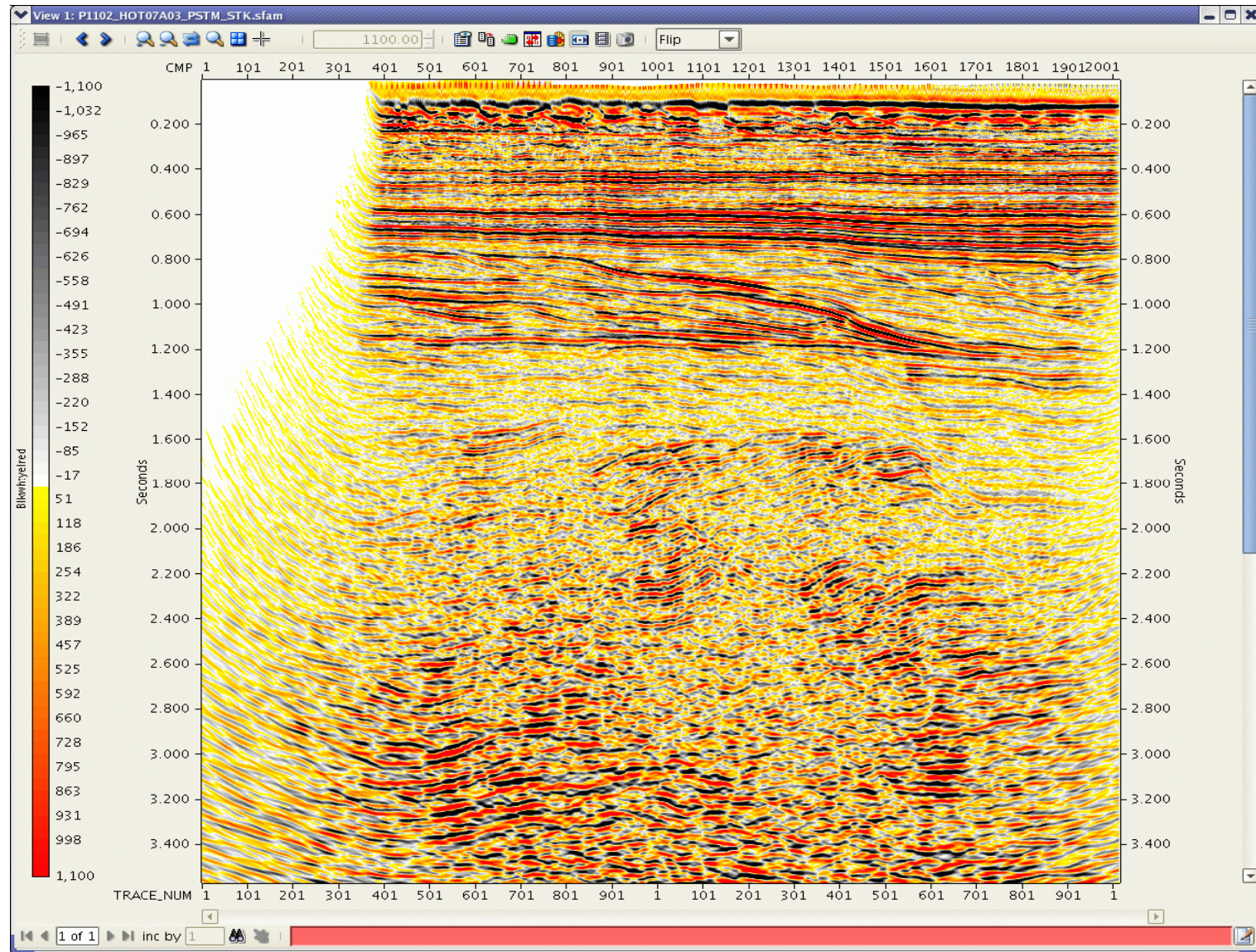


## 7.6.9 HOT07A-03: Radon Demultiple Stack



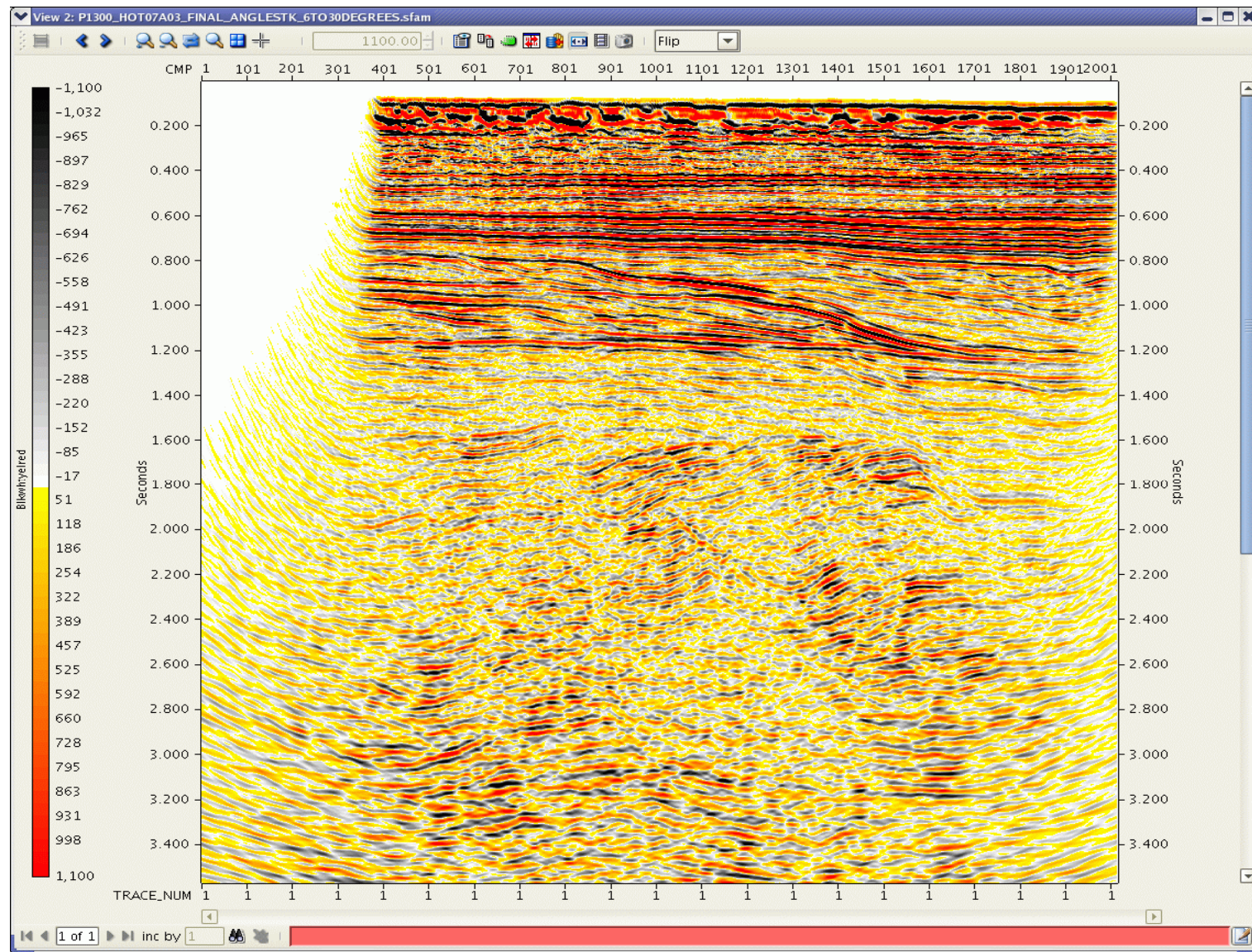


## 7.6.10 HOT07A-03: PrSTM Stack





### 7.6.11 HOT07A-03: Final Stack





#### 7.6.12 HOT07A-03: Final Stack (inverse Q)

