



Test 13: Pre-stack AGC

Test Line 2009-GEL-01

Discussion:

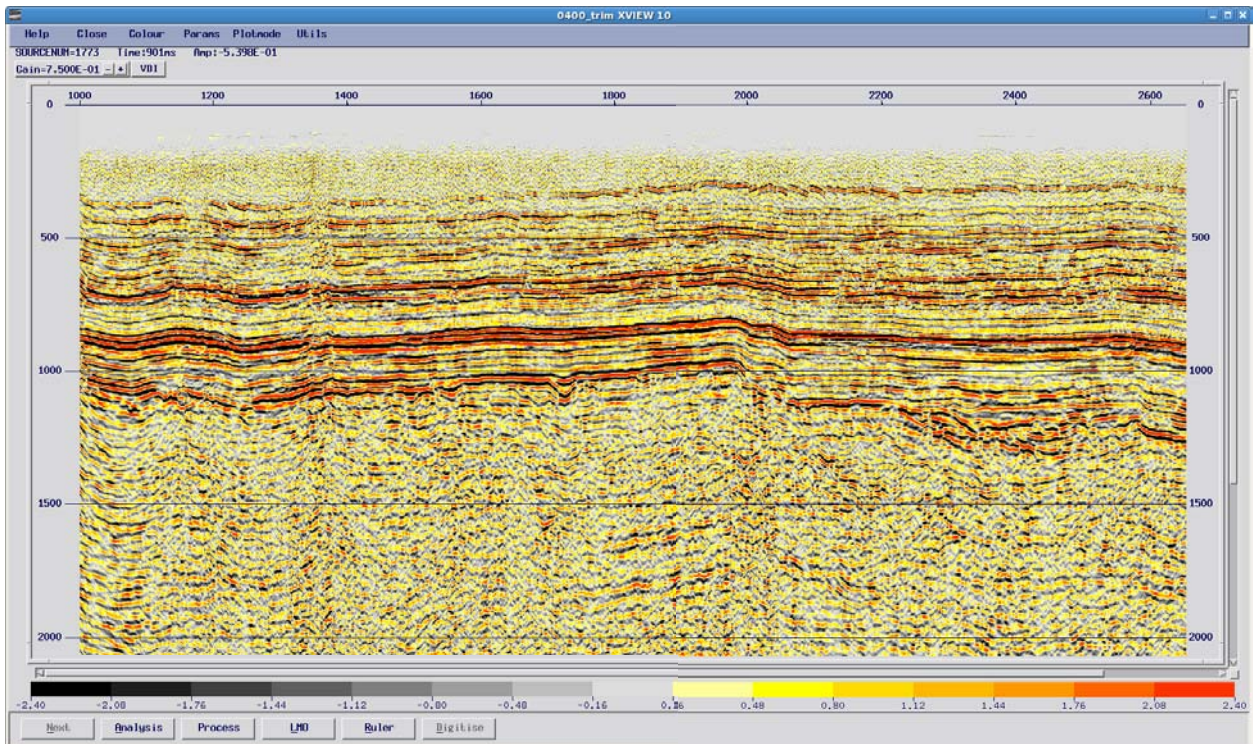
Pre-stack AGC is carried out to improve the balance between amplitudes at different times. Displayed here are stacks of migrated gathers have been carried out using various values of AGC operator length.

Comment:

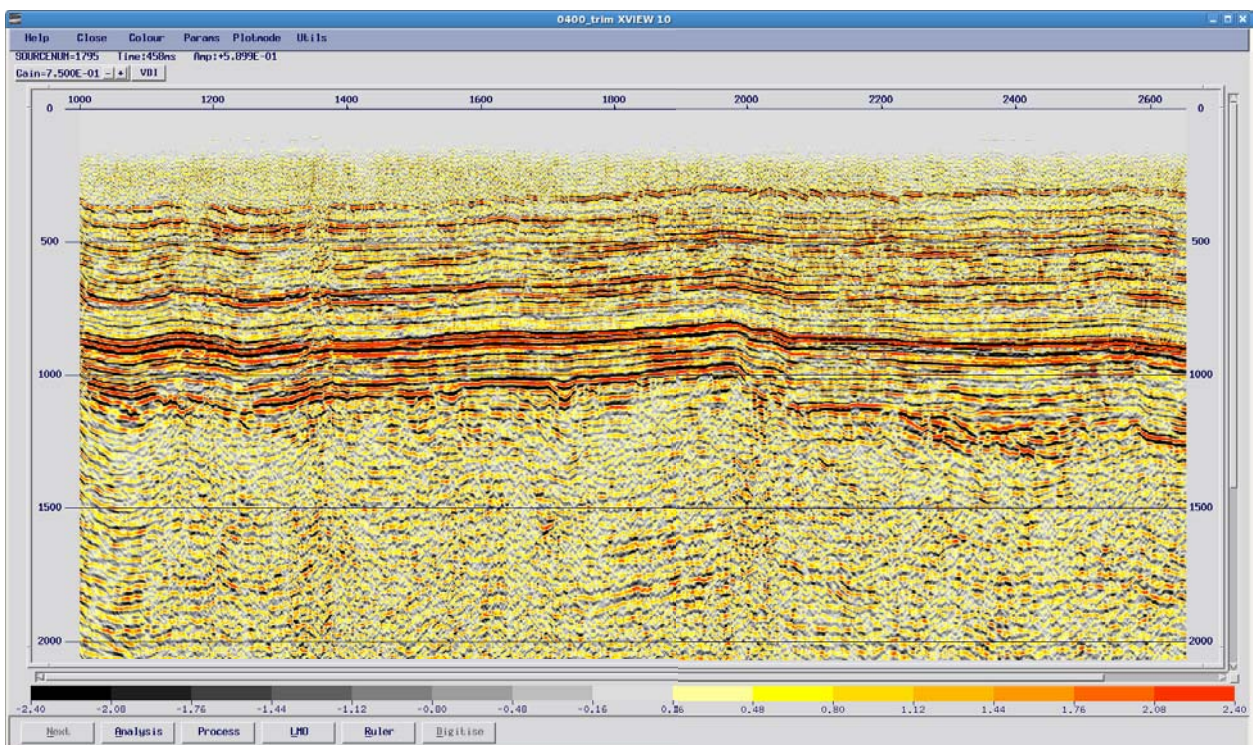
I recommend a 500 ms pre-stack AGC.

Processing flow for stacks in Test 13

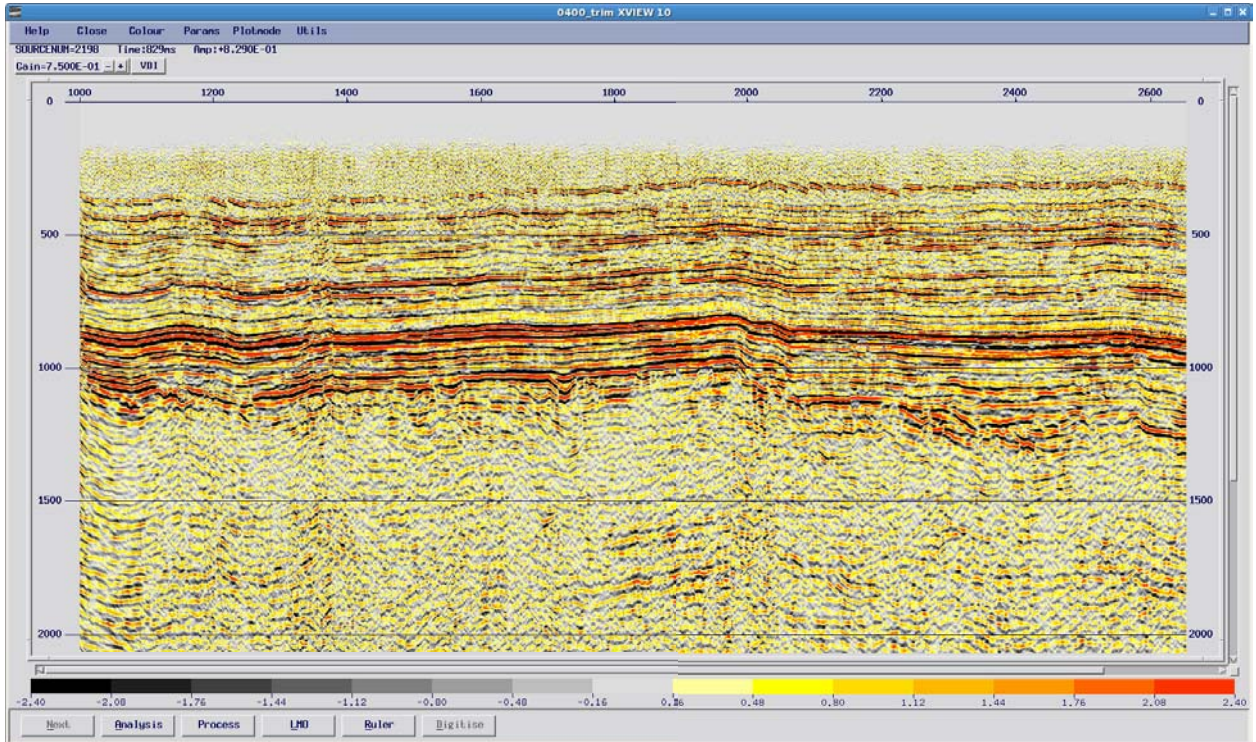
- Reformat SEG-Y data to Claritas internal format
- Resample to 2 ms
- Minimum phasing filter
- Spherical divergence correction, $G(T)=V^2T^{1.4}$
- AGC, 500 ms operator
- F-K filter, with cut-velocities
- Remove AGC
- Coherent noise attenuation and air blast attenuation
- Surface consistent spiking deconvolution
- Spectral whitening
- Residual statics application
- PreSTM, smoothed 2nd pass velocities
- Reverse NMO on 2nd pass velocities
- NMO, 3rd pass velocities (20% stretch mute)
- F-K filter
- Inner mute
- CDP trim statics, 8 ms max shift
- AGC, various operator lengths
- Stack
- Spectral whitening
- Bandpass filter
- Trace balance
- Shift to final datum



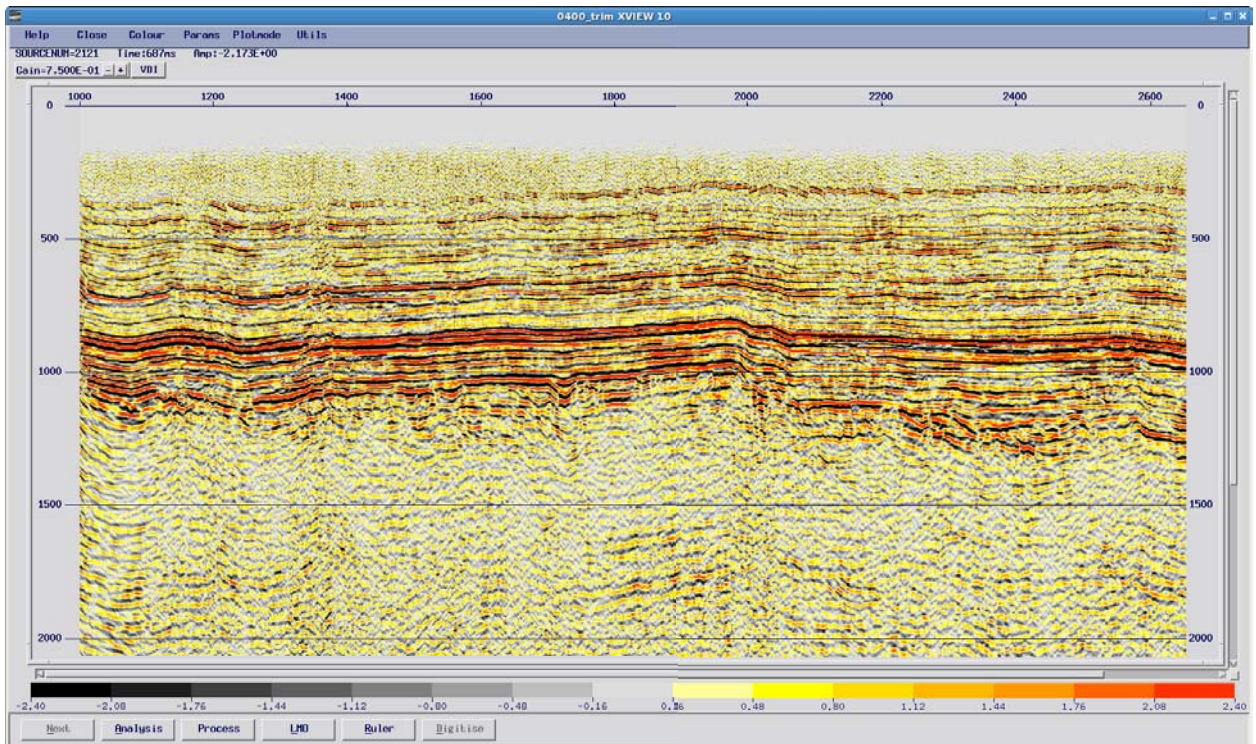
250 ms AGC (2009-GEL-01)



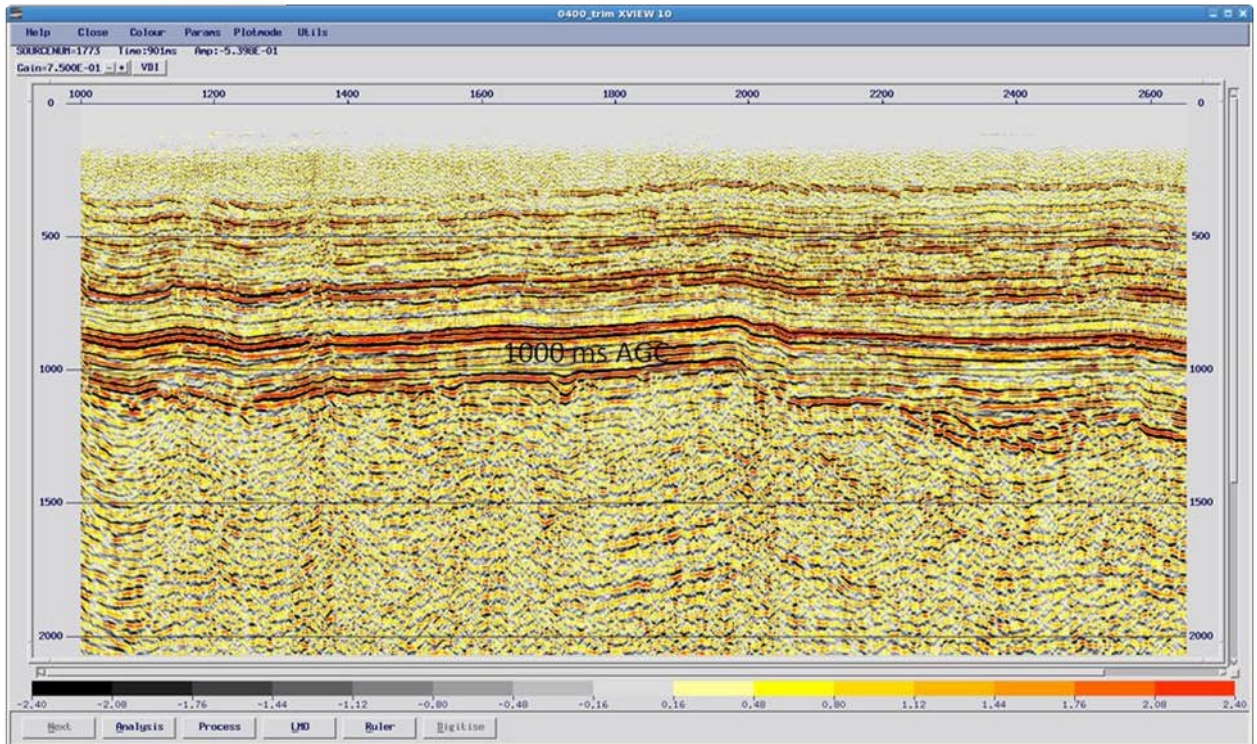
500 ms AGC (2009-GEL-01)



750 ms AGC (2009-GEL-01)



1000 ms AGC (2009-GEL-01)



500 ms AGC (2009-GEL-01)



Test 14: CDP trim

Test Line 2009-GEL-01

Discussion:

A final alignment within CDP gathers is carried out by CDP trim statics.

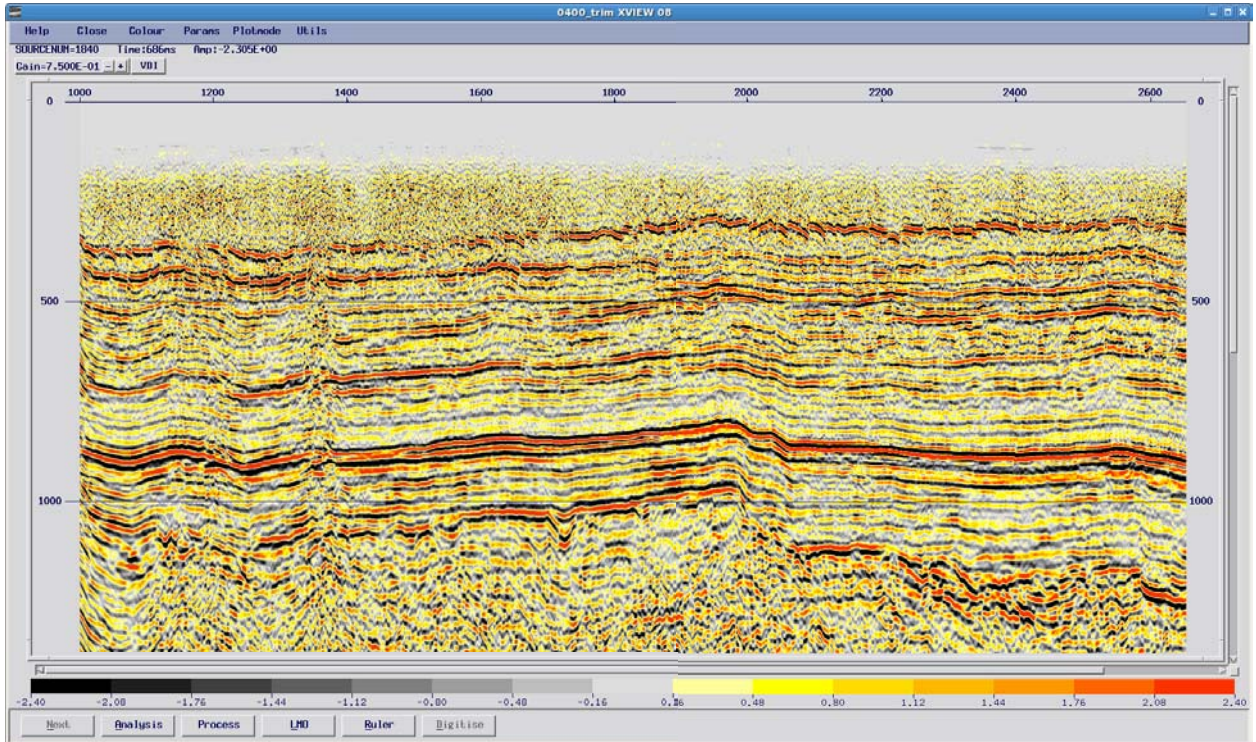
CDP trim statics are calculated and applied on post-NMO data after mute application. The main control on the strength of the statics is the maximum shift. A maximum shift that is too low will be ineffective: a maximum shift that is too high can cause misleading alignments to occur.

Comment:

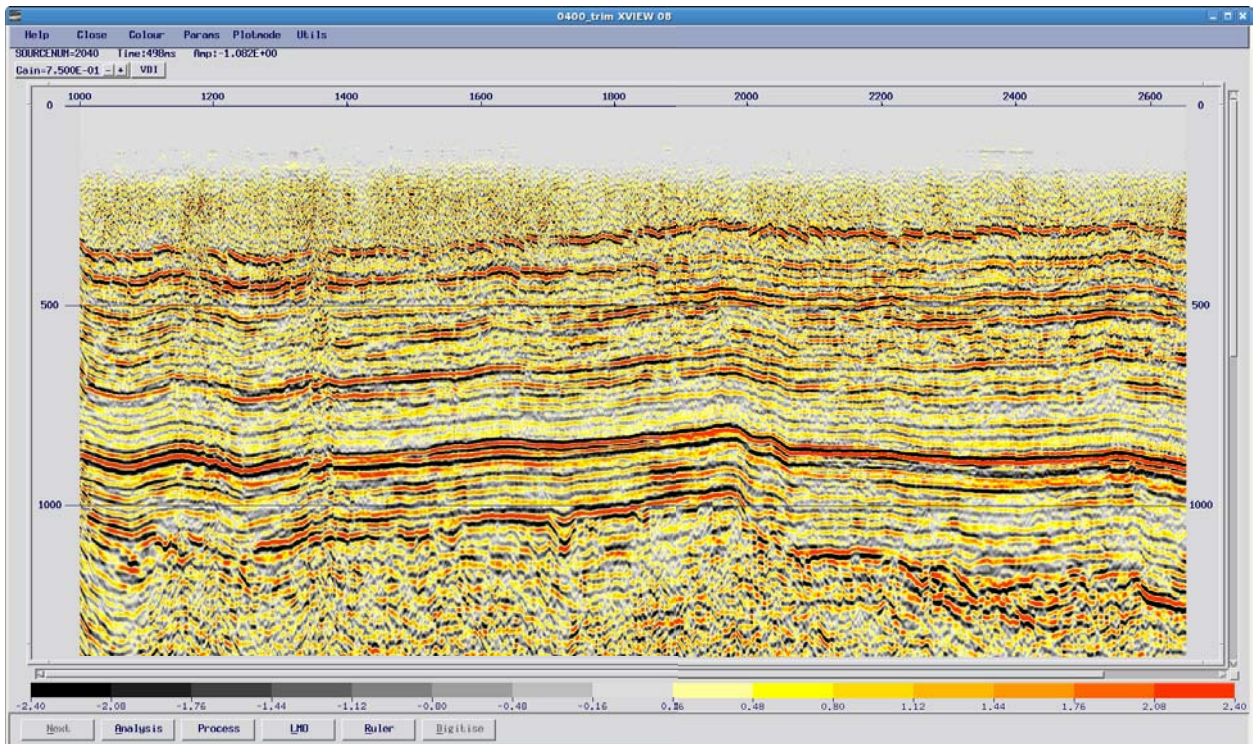
I am recommending an 8 ms maximum shift as an effective but safe option.

Processing flow for stacks in Test 14

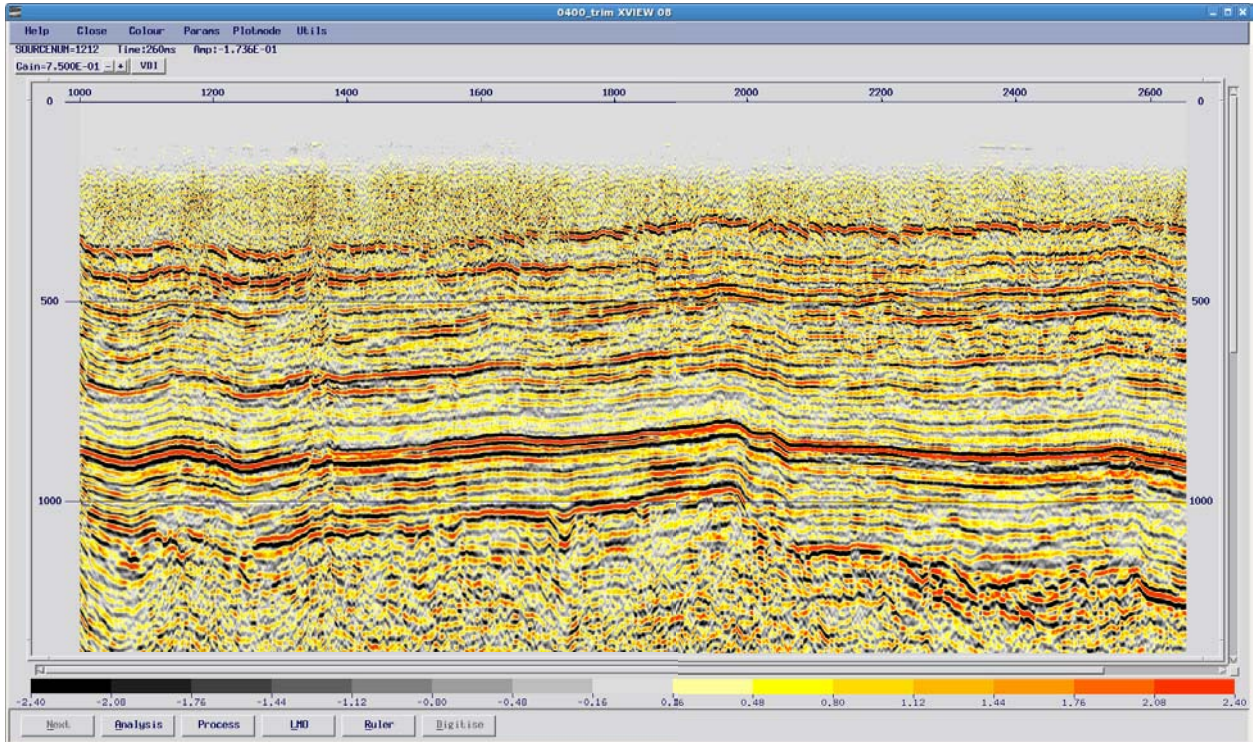
- Reformat SEG-Y data to Claritas internal format
- Resample to 2 ms
- Minimum phasing filter
- Spherical divergence correction, $G(T)=V^2T^{1.4}$
- AGC, 500 ms operator
- F-K filter
- Remove AGC
- Coherent noise attenuation and air blast attenuation
- Surface consistent spiking deconvolution
- Spectral whitening
- Residual statics application
- PreSTM, smoothed 2nd pass velocities
- Reverse NMO on 2nd pass velocities
- NMO, 3rd pass velocities (20% stretch mute)
- F-K filter
- Inner mute
- **CDP trim statics, various maximum shift values as shown**
- AGC, 500 ms operator
- Stack
- Spectral whitening
- Bandpass filter
- AGC, 500 ms operator
- Shift to final datum



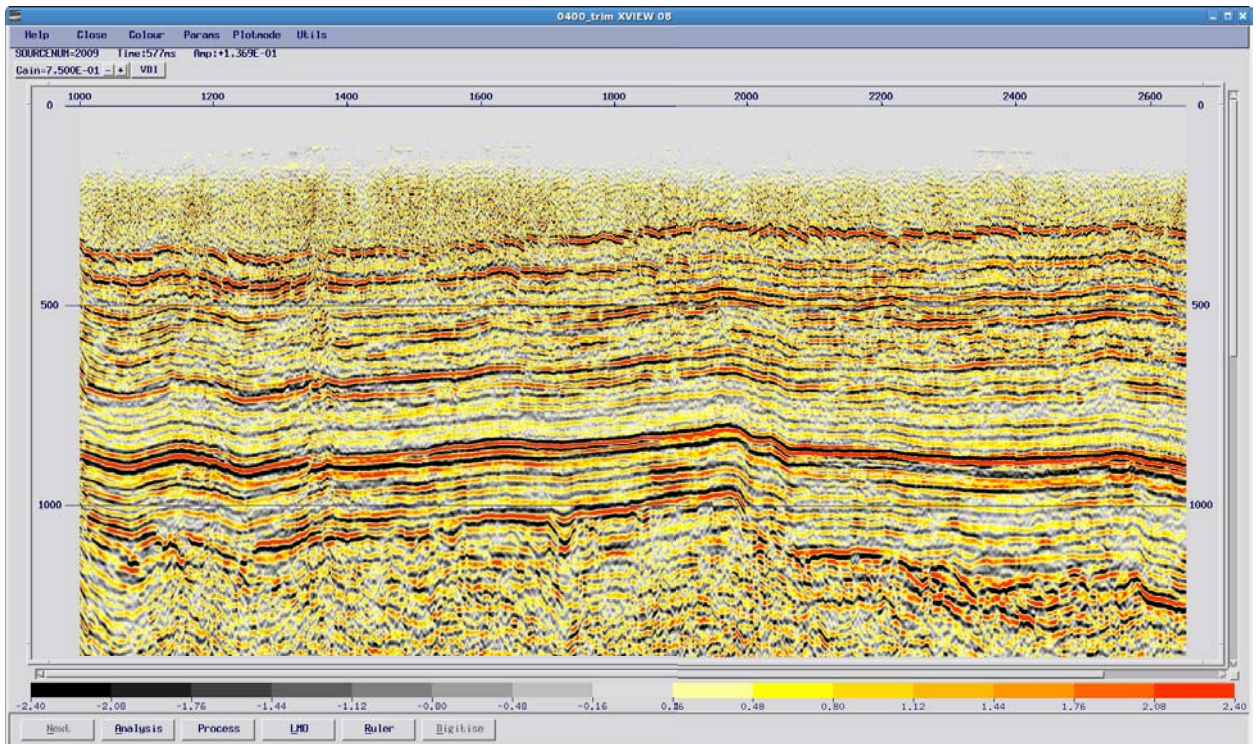
No CDP trim (**2009-GEL-01**)



CDP trim, 4ms maximum shift (**2009-GEL-01**)



CDP trim, 8ms maximum shift (**2009-GEL-01**)



CDP trim, 12ms maximum shift (**2009-GEL-01**)



Test 15: Post-stack AGC

Test Line 2009-GEL-01

Discussion:

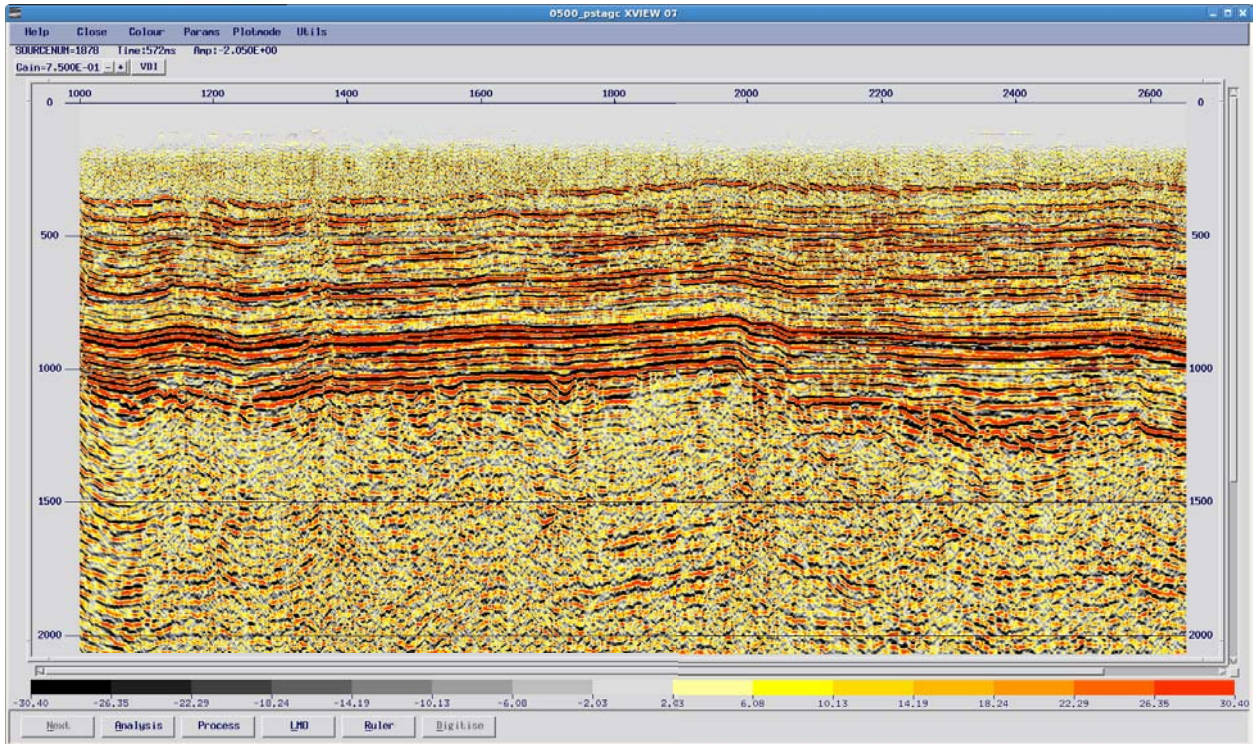
A final post-stack amplitude balance is carried out to improve the balance between amplitudes at different times. In this case, AGC is tested using various operator lengths, and a trace-by-trace RMS amplitude balance is also tested.

Comment:

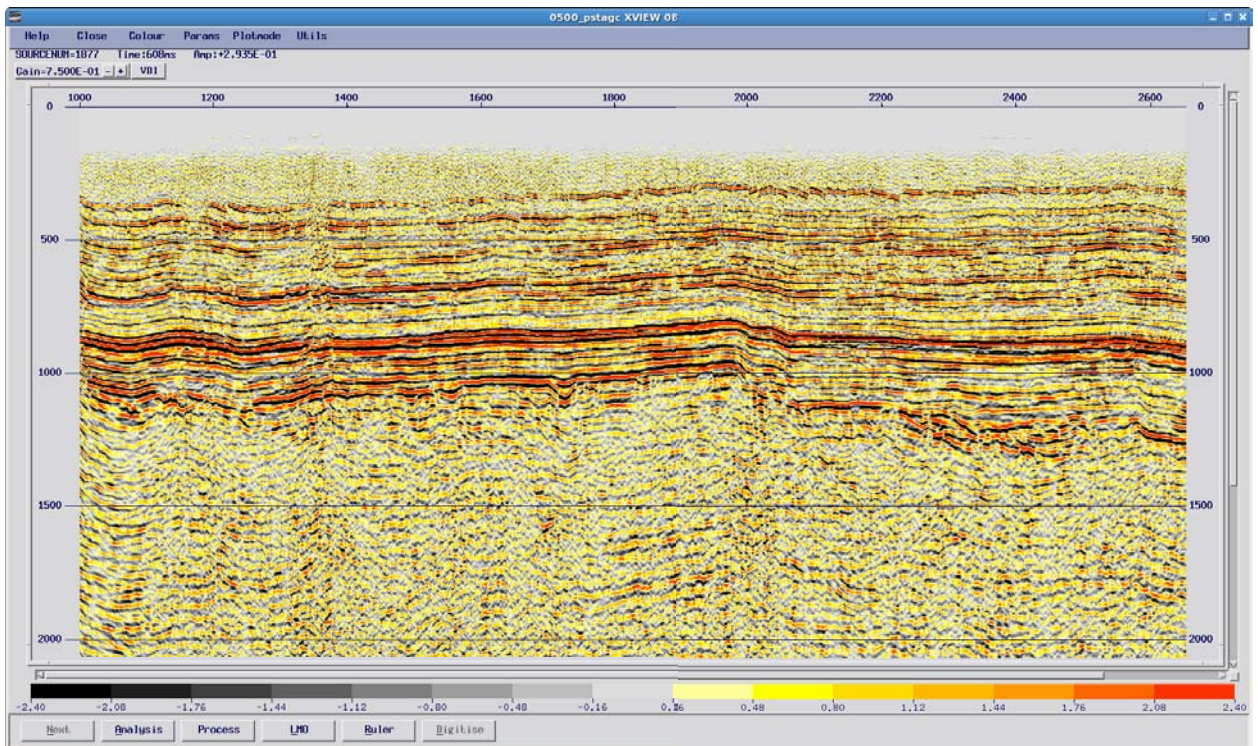
A trace balance would appear to be most useful for this dataset.

Processing flow for stacks in Test 15

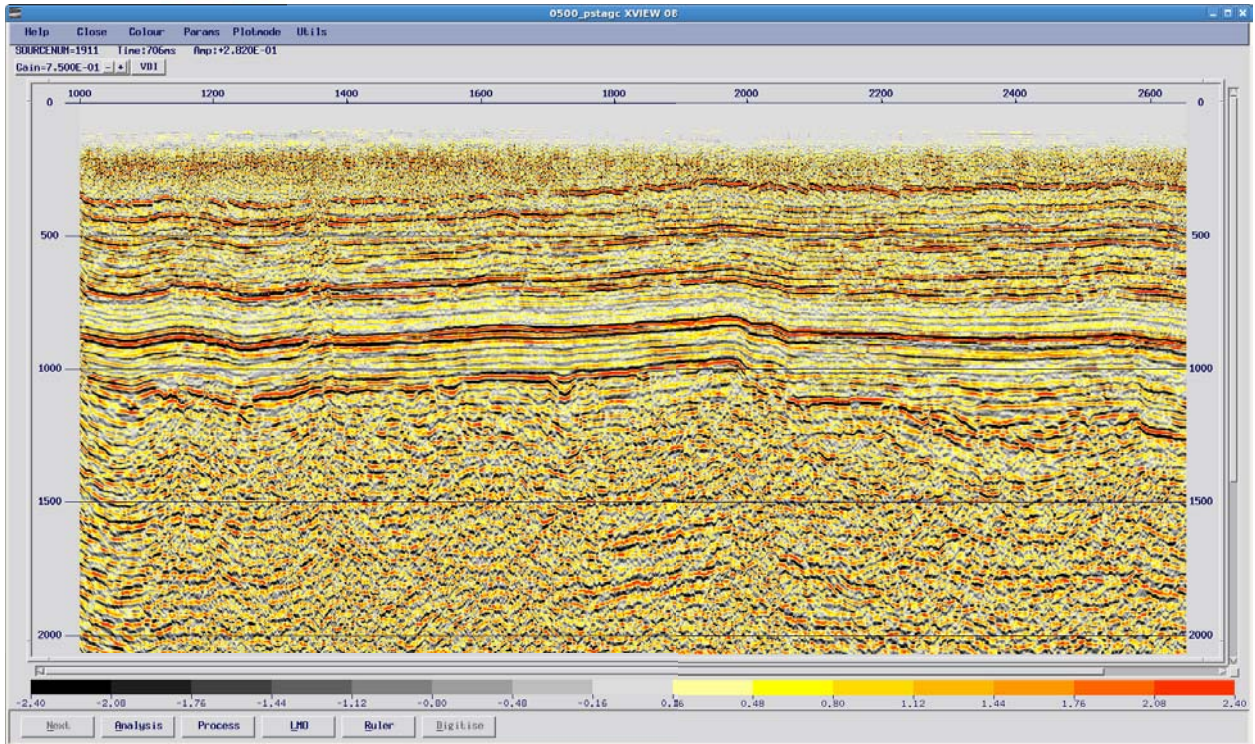
- Reformat SEG-Y data to Claritas internal format
- Resample to 2 ms
- Minimum phasing filter
- Spherical divergence correction, $G(T)=V^2T^{1.4}$
- AGC, 500 ms operator
- F-K filter
- Remove AGC
- Coherent noise attenuation and air blast attenuation
- Surface consistent spiking deconvolution
- Spectral whitening
- Residual statics application
- PreSTM, smoothed 2nd pass velocities
- Reverse NMO on 2nd pass velocities
- NMO, 3rd pass velocities (20% stretch mute)
- F-K filter
- Inner mute
- CDP trim statics, 8 ms max shift
- AGC, 500 ms operator
- Stack
- Spectral whitening
- Bandpass filter
- **Balance/AGC as shown**
- Shift to final datum



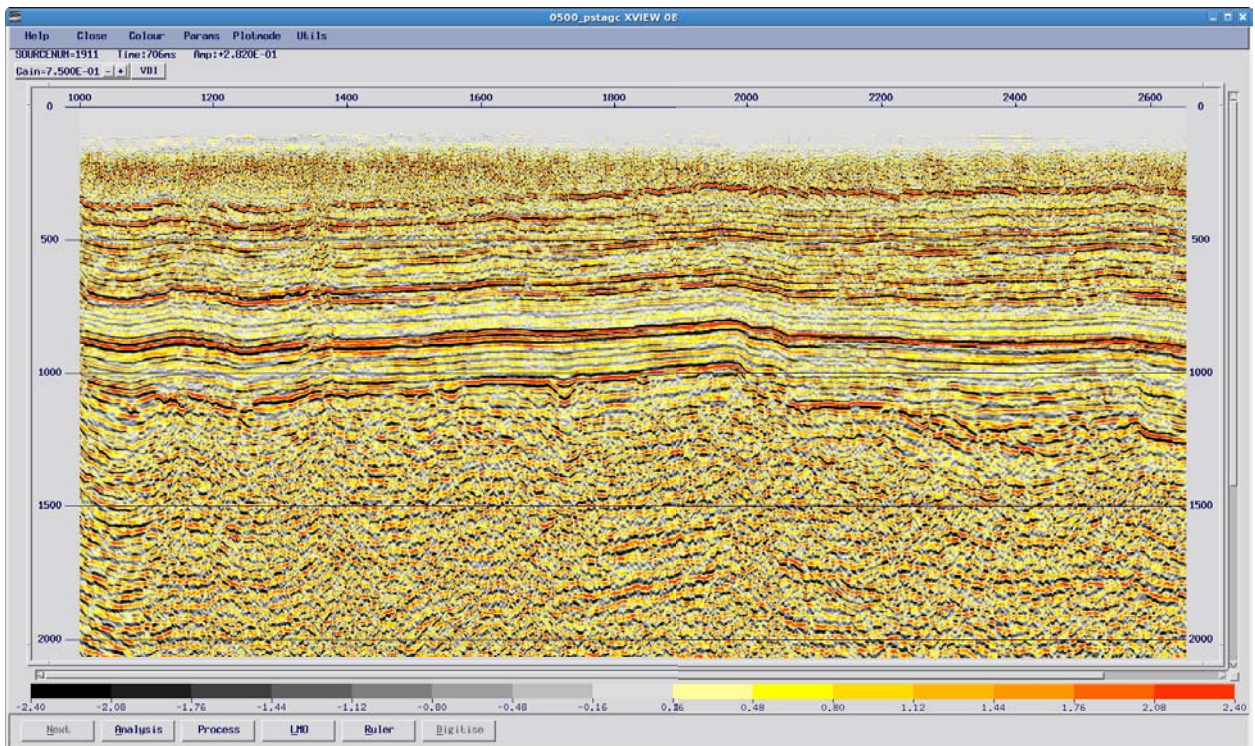
No post-stack gain (2009-GEL-01)



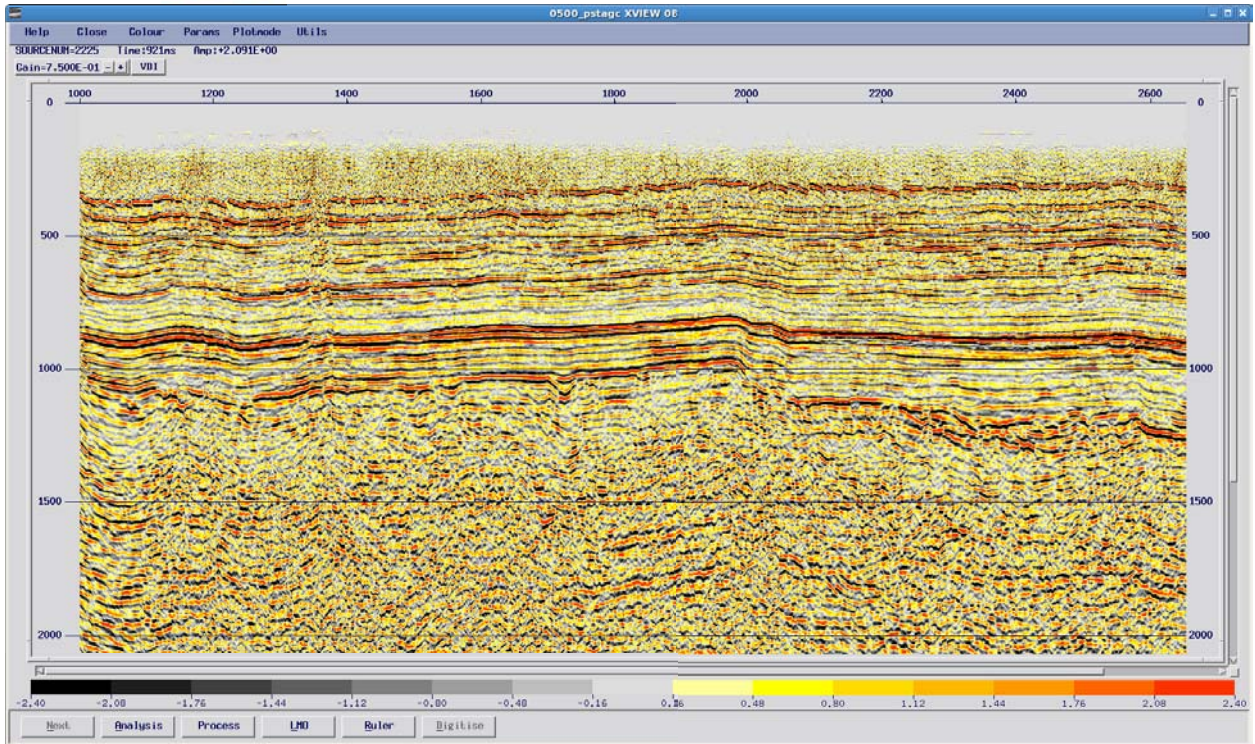
Post-stack trace balance (2009-GEL-01)



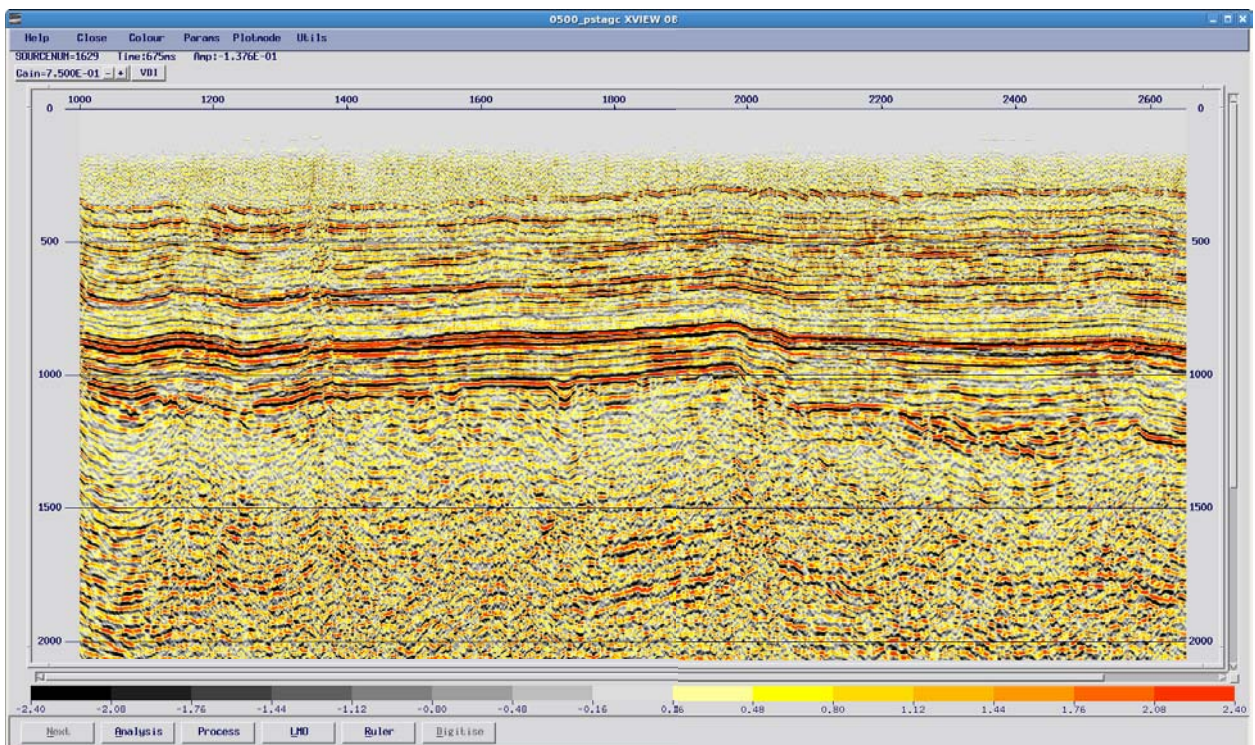
Post-stack AGC, 250 ms operator (2009-GEL-01)



Post-stack AGC, 250 ms operator (2009-GEL-01)



Post-stack AGC, 500 ms operator (2009-GEL-01)



Post-stack AGC, 1000 ms operator (2009-GEL-01)



Test 16: Post-stack bandpass filter and spectral whitening

Test Line 2009-GEL-1

Discussion:

Narrow bandpass filters are applied to the migrated stack in order to gain information about the dominant data frequencies at different times. This information will be used to fine tune the final time-varying bandpass filter. The effect of spectral whitening is also displayed.

Comment:

It is recommended that the following time-varying bandpass parameters be used:

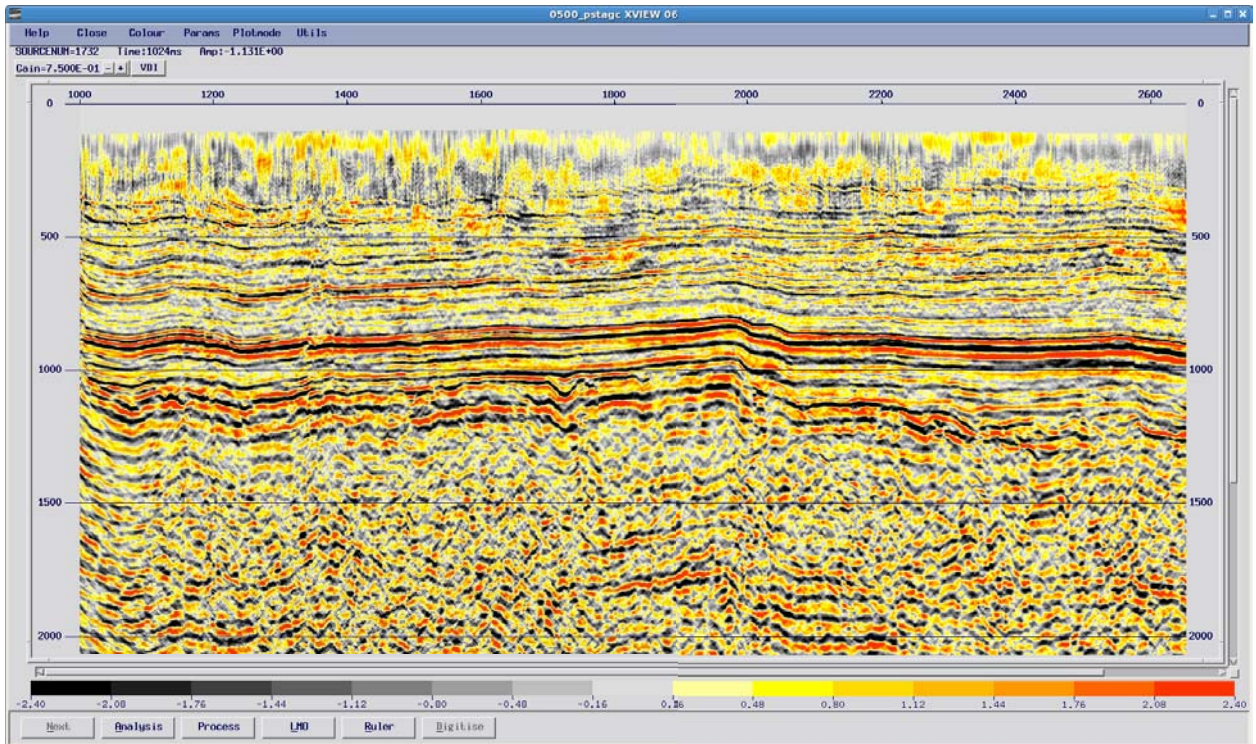
0-1200 ms 15-70 Hz

1500-3000 ms 20-60 Hz

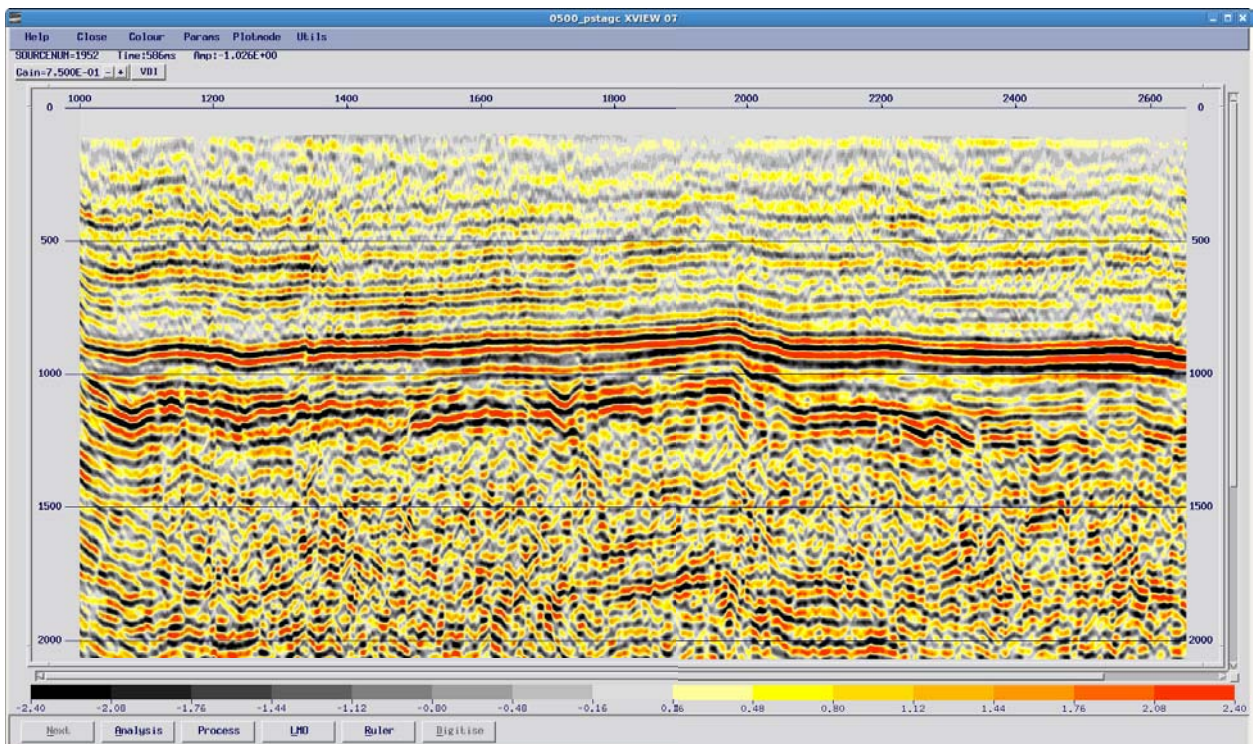
It is also recommended that spectral whitening be used.

Processing flow for stacks in Test 16

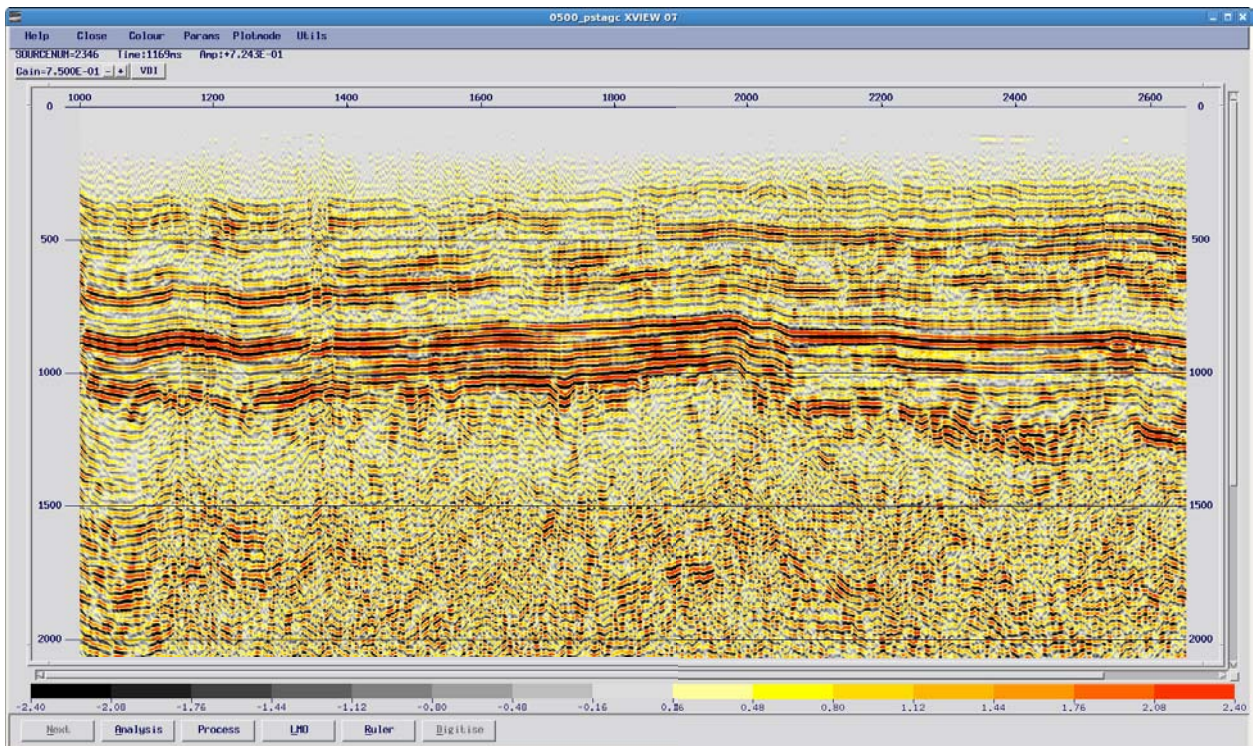
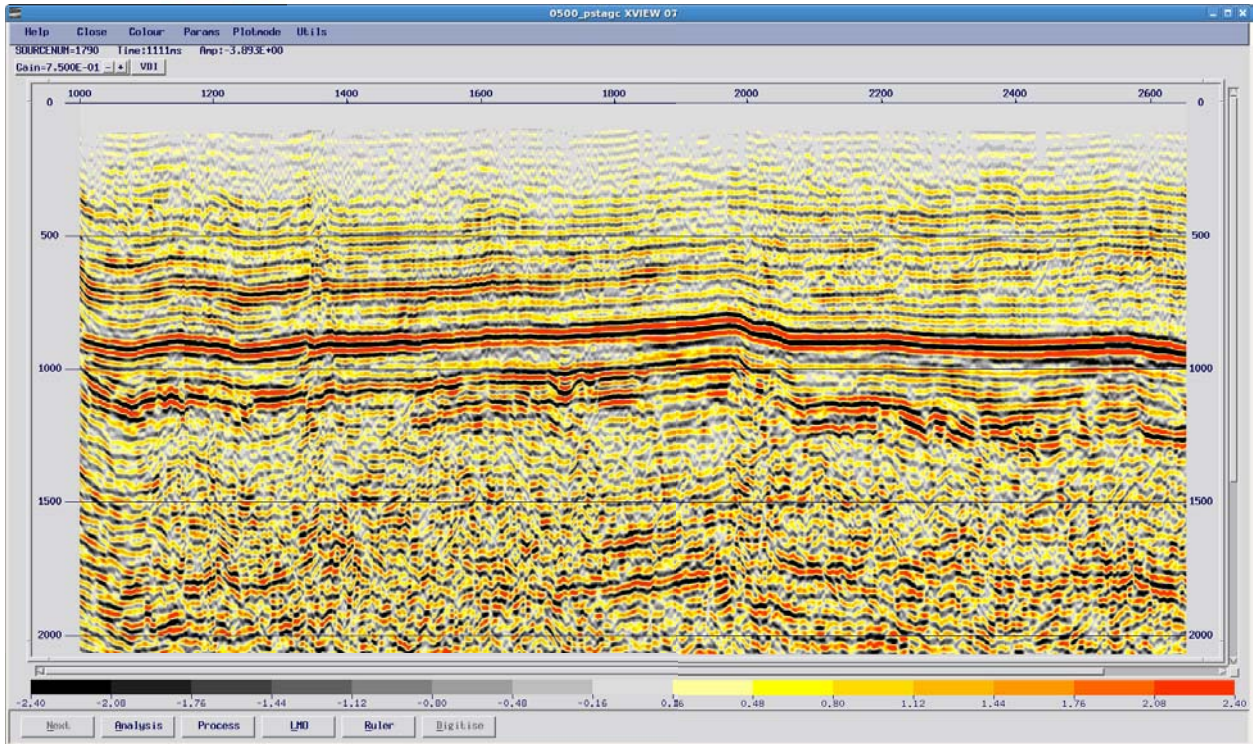
- Reformat SEG-Y data to Claritas internal format
- Resample to 2 ms
- Minimum phasing filter
- Spherical divergence correction, $G(T)=V^2T^{1.4}$
- AGC, 500 ms operator
- F-K filter, with cut-velocities
- Remove AGC
- Coherent noise attenuation and air blast attenuation
- Surface consistent spiking deconvolution
- Spectral whitening
- Residual statics application
- PreSTM, smoothed 2nd pass velocities
- Reverse NMO on 2nd pass velocities
- NMO, 3rd pass velocities (20% stretch mute)
- F-K filter
- Inner mute
- CDP trim statics, 8 ms max shift
- AGC, 500 ms operator
- Stack
- **Spectral whitening, if shown**
- **Bandpass filter, as shown**
- AGC, 500 ms operator
- Shift to final datum

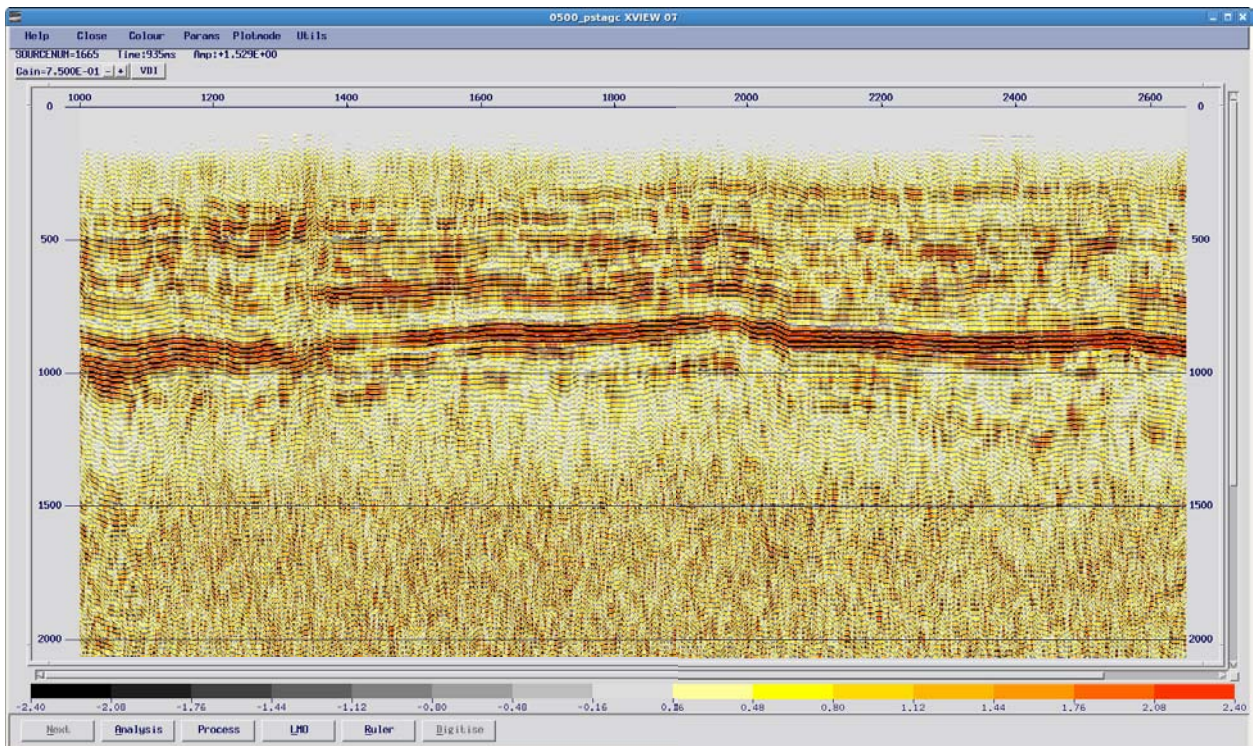
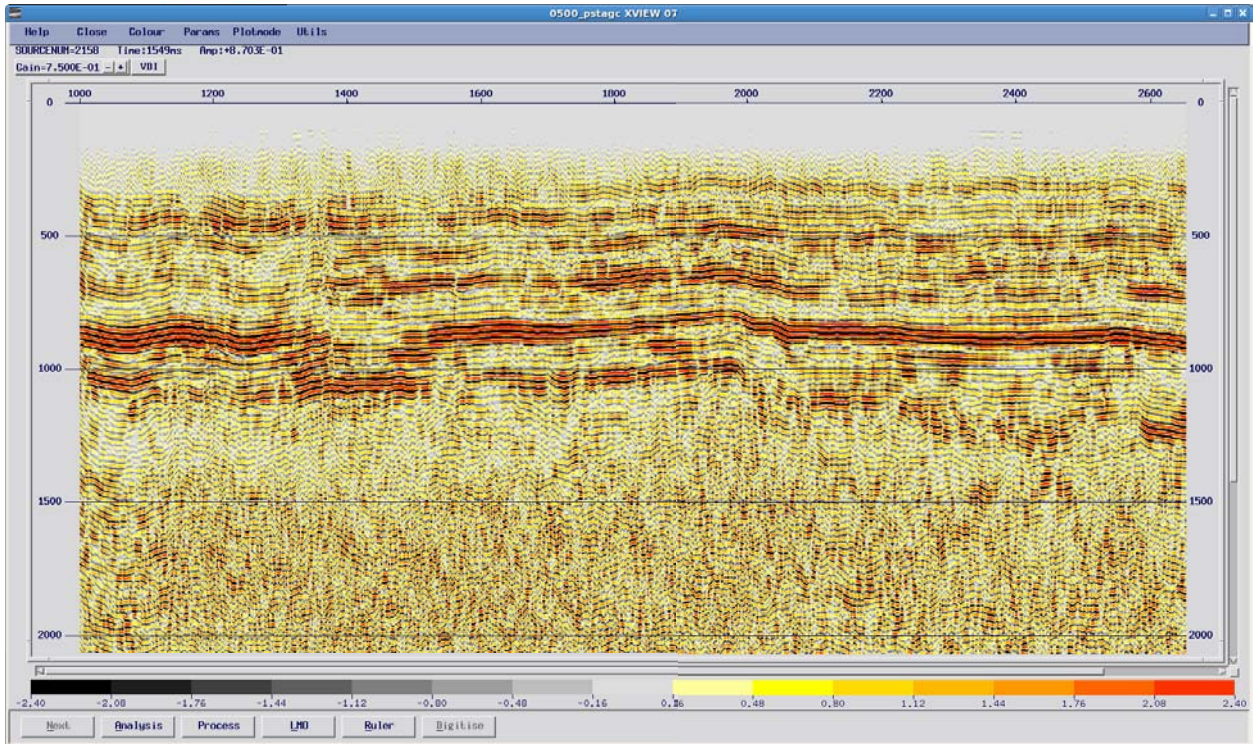


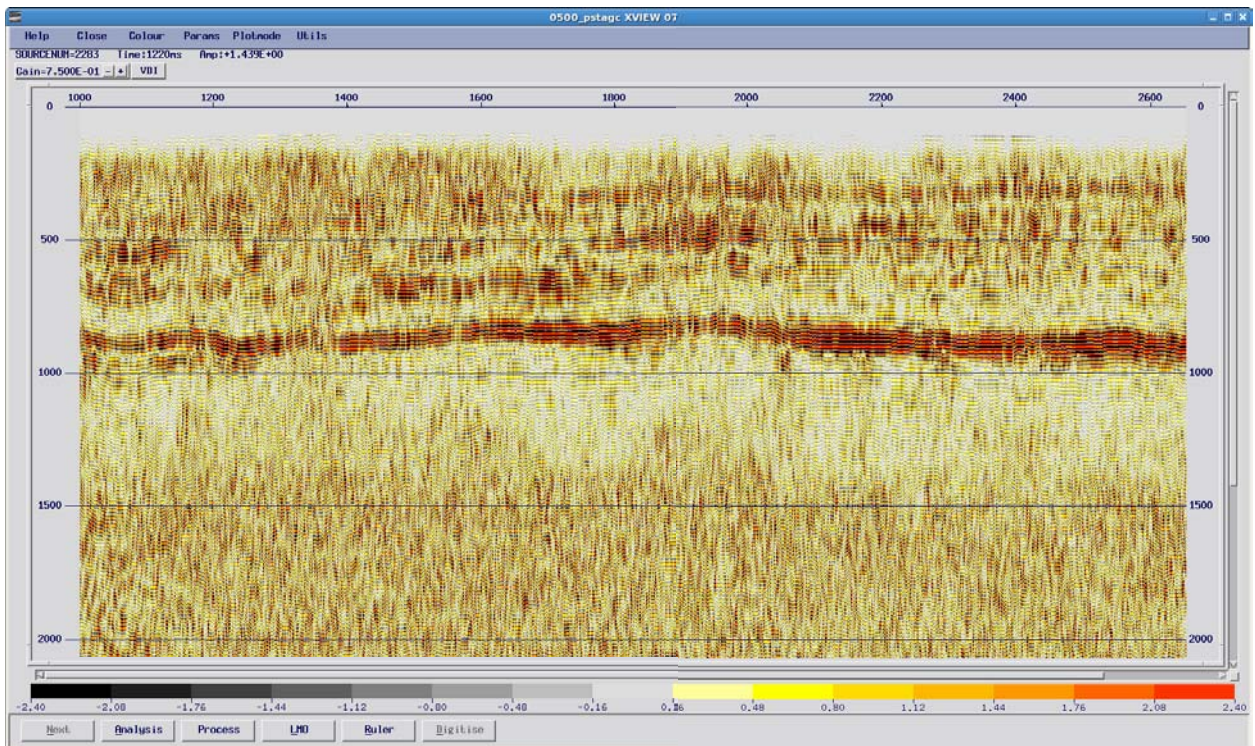
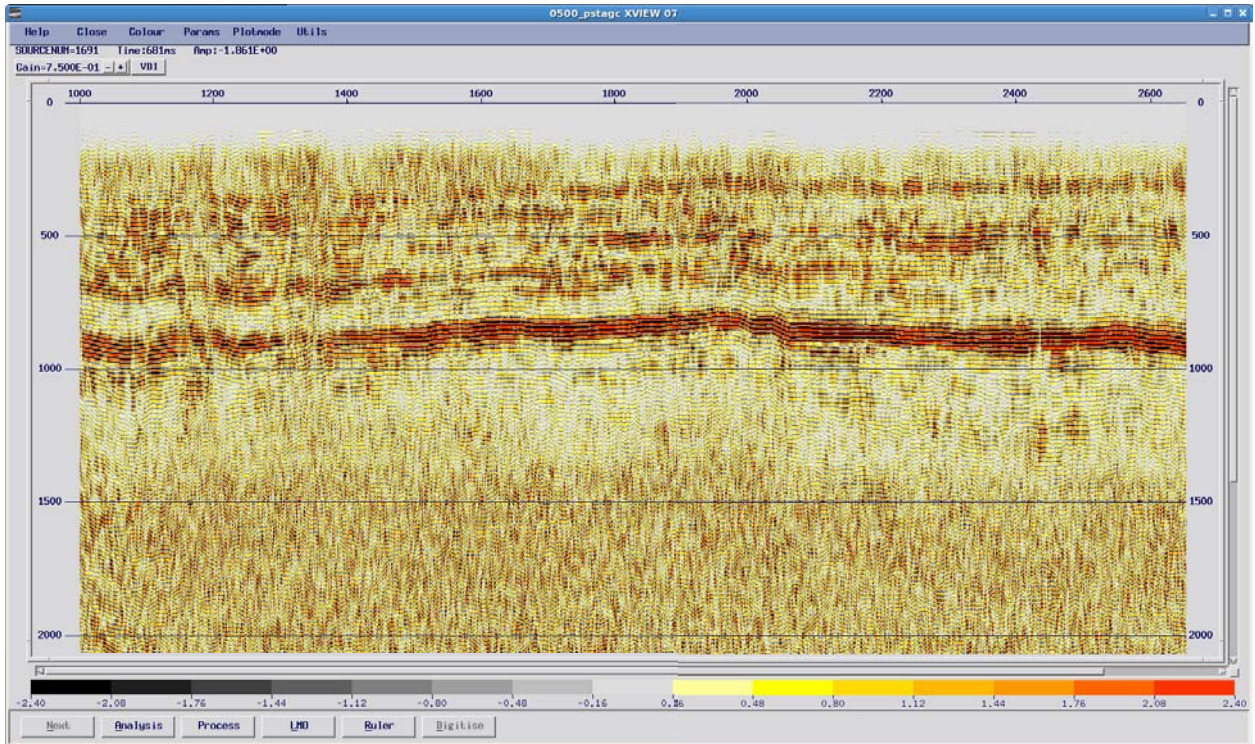
No bandpass (2009-GEL-01)

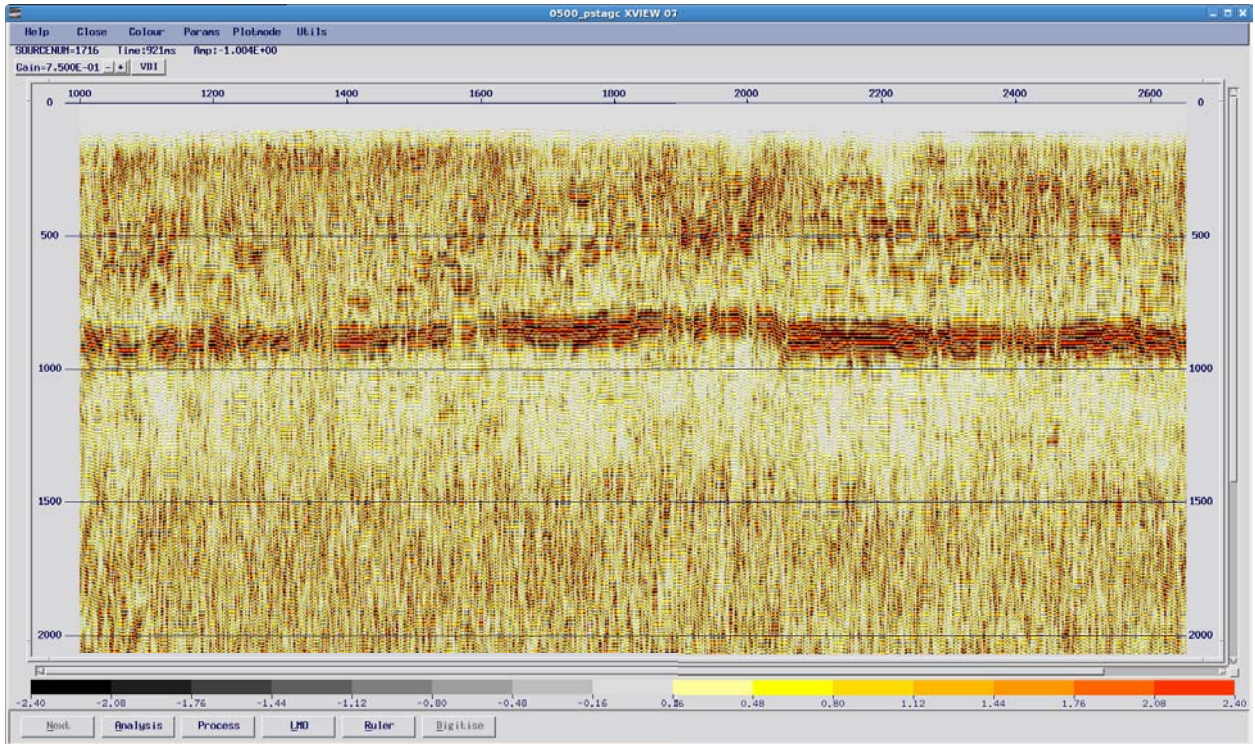


10 – 20 Hz bandpass (2009-GEL-01)

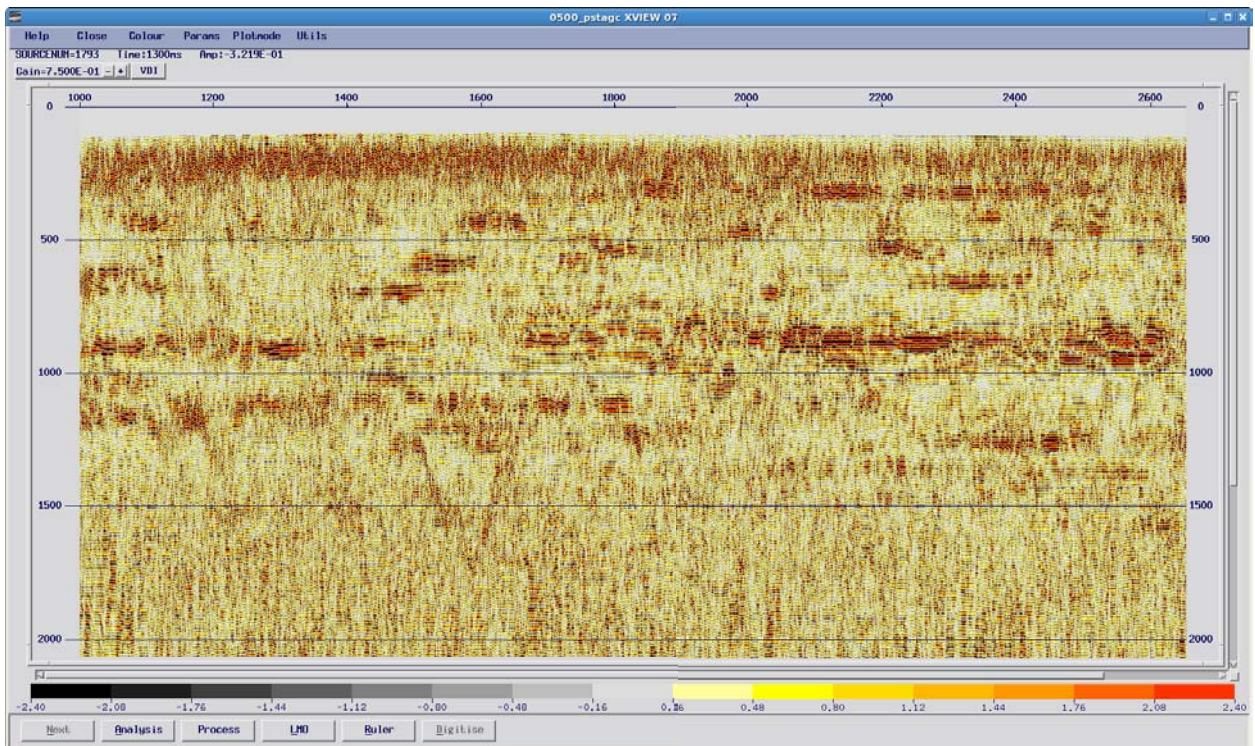




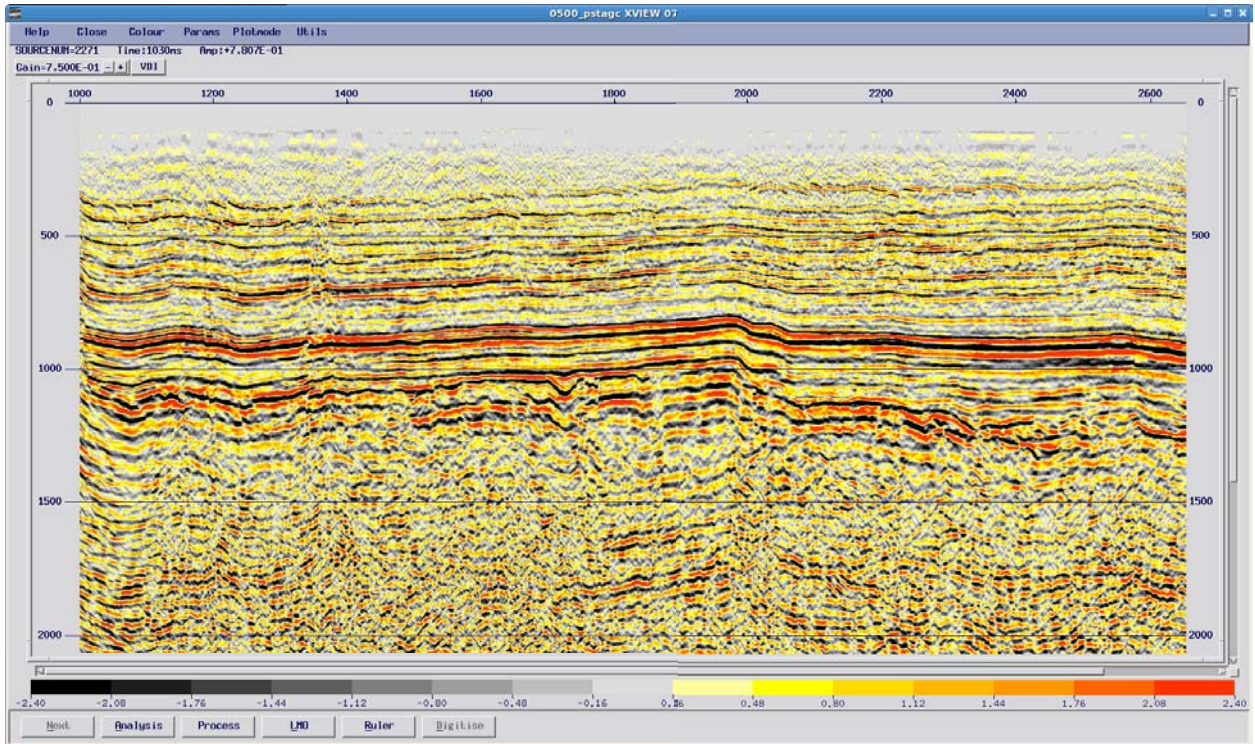




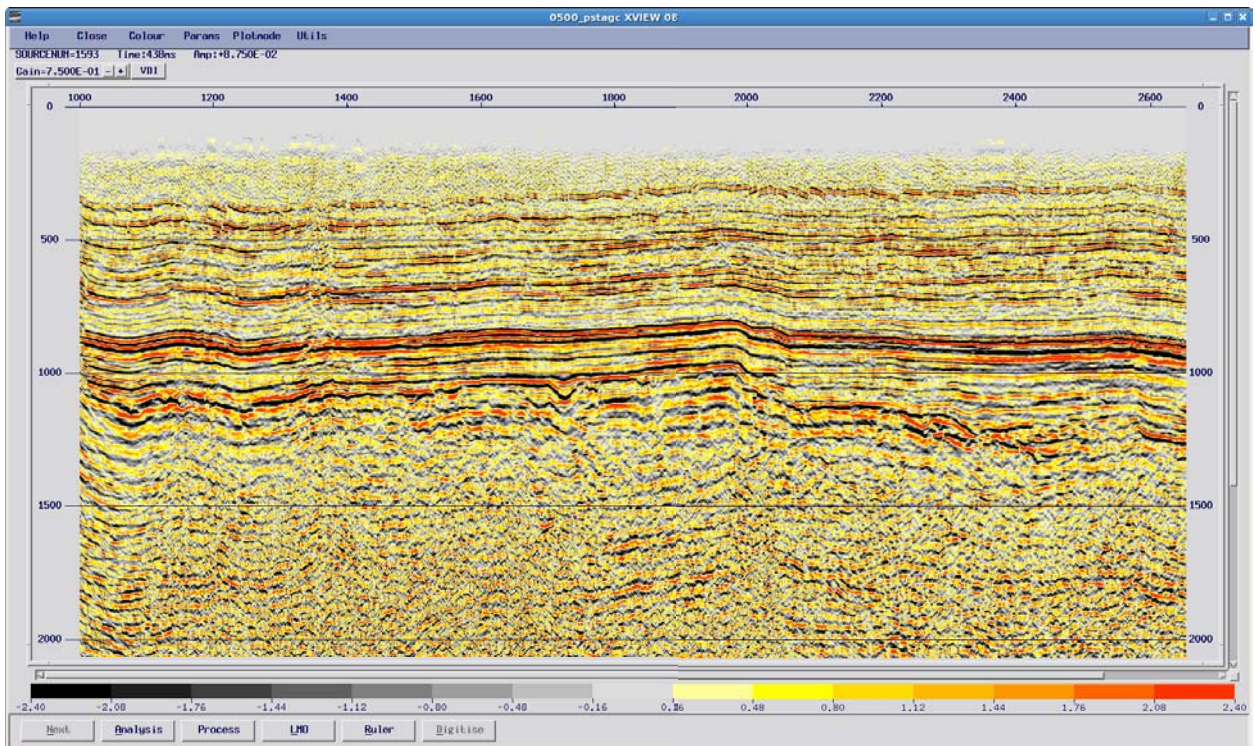
80 - 90 Hz bandpass (2009-GEL-01)



90 - 100 Hz bandpass (2009-GEL-01)



Time varying bandpass: 0-1200 ms 15-70 Hz, 1500-3000 ms 20-60 Hz (**2009-GEL-01**)



Time varying bandpass with spectral whitening (**2009-GEL-01**)

Appendix C – Deliverables

Two sets of a volume of DVDs (serial numbers DVD-09003 to DVD-09013) were created and delivered to the client's representative.

The contents were as follows:

Raw field data of all lines (SEG-Y format)

Migrated CDP gathers of all lines (SEG-Y format)

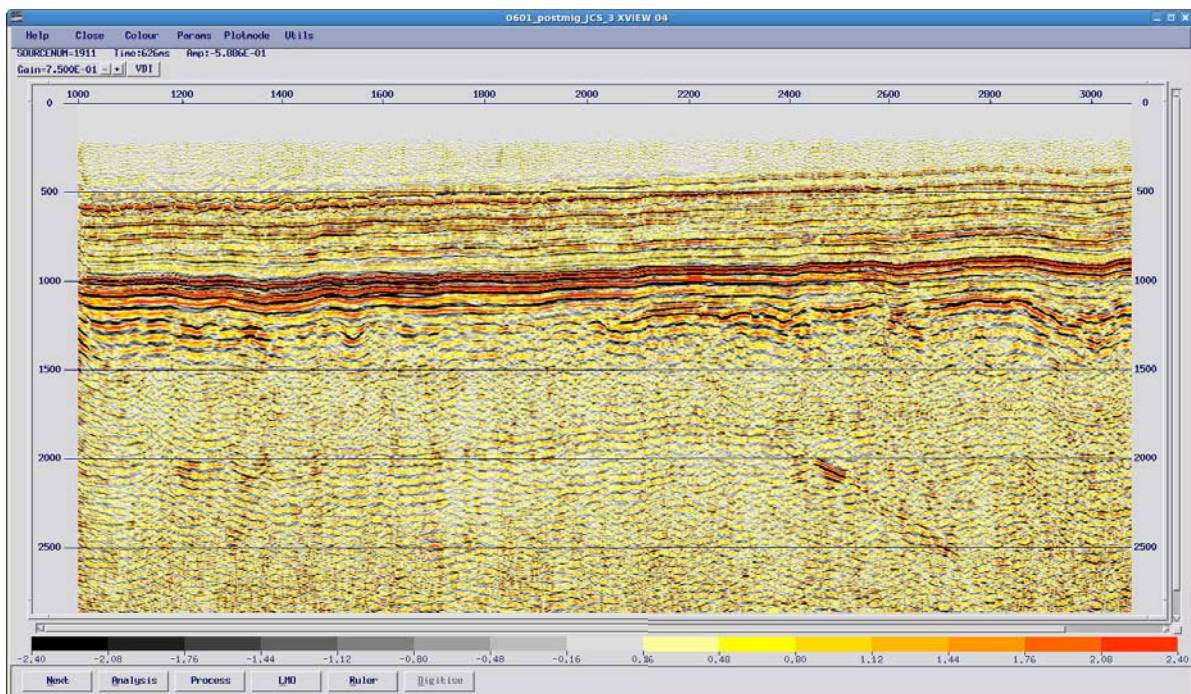
Filtered migrated stacks of all lines, with radon-demultiple applied (SEG-Y format)

Filtered migrated stacks of all lines, without radon-demultiple applied (SEG-Y format)

Filtered non-migrated stacks (2nd pass velocities) of all lines (SEG-Y format)

Final stacking velocities of all lines at floating datum (ASCII format)

Appendix D - Data Example



Line 2009-GEL-03

Filtered migrated stack at final datum (Radon-demultiple version)



Appendix E – Polarity and phase

The processing sequence for this project has not altered the polarity of the data as received by Quantum Geoservices. A minimum-phase mimicking operator was applied early in processing.

Appendix F - Contacts and Personnel

Contacts

Galilee Energy Ltd

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Fortitude Valley
Queensland 4006, Australia

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Milton, Queensland 4064
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Quantum Geoservices Pte Ltd

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(65) 6493 5300
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Personnel

Daryn Voss – Senior Geophysicist
Peter Spraggon – Client representative