ACQUISITION PARAMETERS

Dual Source: Clustered airgun arrays - 3900 cubic inches
Source Interval: 50m per subsurface line
Streamer Length: 6000m x 8
Number of Channels: 480 per streamer / 3840 per shot
Group Interval: 12.5m
Record Length: 9100ms
Sample Interval: 2ms
Multiplicity: 60 fold at 6.25m bin interval
Recorded Bin Size: 6.25x25m
Recording Instrument: Sercel Seal 24 bit digital
Cable Type: Sercel Sentinel Solid
Cable Depth: 8 meters +/-1 meter
Filters: Low cut: out High cut: 200 Hz (370 dB/octave)
Gun Depth: 6 meters +/-1 meter
Shooting Direction: East-West & North-South
Acquired By: M/V Fugro Seisquest

PRE – PROCESSING by CGGVeritas; Jakarta, Indonesia

- Input SEGD data
- Merge navigation with seismic trace headers (on vessel)
- Output navigation merge shot ordered tapes (SEGY)
- Apply start of data (SOD) correction
- Low cut filter
- Debubble and convert to zero phase
- Low-cut filter
- Resample from 2ms to 4ms
- Swell and spike noise attenuation
- Shallow water de-multiple (WB < 300ms)
- Tau-P Linear noise attenuation
- Apply tidal statics
- 3D surface related multiple elimination (SRME)
- Receiver motion correction
- Output shot ordered 3D SRME tapes (SEGY)
- Velocity analysis 1x1km

TIME MIGRATION and POST STACK PROCESSING by TGS; Houston, TX USA
Processing complete: January 2012

- Sort, stack and post-stack migration (using initial velocities)
- Pre-stack shot interpolation
- Anti-alias K-filter and trace drop to 25m group
- Intra-gather trace interpolation
- High resolution Radon de-multiple
- Output Radon CDP gathers (SEGY)
- Cold water static analysis (subject to testing)
- Residual multiple attenuation
- Sort to offset and F-Kx-Ky data regularization to 60 fold
- Pre-migration conditioning (Radon & SMELT)
- 3D F-X-Y Deconvolution (offset domain)
- Spherical divergence correction
- Inverse Q filter (phase only)
- Output CDP gathers (SEGY)
- Kirchhoff pre-stack curved ray migration velocity analysis 1x1km
- Output migrated gathers (SEGY) – 12.5x25m; 60 fold
- Automatic velocity picking update (every CDP location, 2nd and high order)
- Velocity verification 250x250m
- Output 3D velocity trace volume (SEGY)
- High resolution Radon de-multiple
- Output migrated gathers with NMO & Radon (SEGY) – 12.5x25m; 60 fold
- Trim statics
- Mute and stack
- Output raw migration – 12.5x25m (SEGY)
- Output raw angle stacks* – 12.5x25m (SEGY)
- 3D Tau-P Decon, 3D F-K Power and 3D Wrapscale
- Output processed migration – 12.5x25m (SEGY)
- 3D F-K Power and 3D Wrapscale
- Output processed angle stacks* – 12.5x25m (SEGY)
  * (near 5-19º, mid 17-31º, far 29-43º)

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TIME DELIVERABLES

- Raw field data – shot ordered
- Field data with navigation in the trace headers – shot ordered, unedited at 2ms
- 3D SRME / shot ordered – 6.25x25m, 60 fold (Phase 1)
- 3D SWD / shot ordered – 6.25x25m, 60 fold (Phase 2)
- Radon CDP gathers without NMO – 12.5x25m, 60 fold
- Pre-stack time migrated CDP gathers without NMO – 12.5x25m, 60 fold
- Pre-stack time migrated CDP gathers with NMO & Radon – 12.5x25m, 60 fold
- Raw migration – 12.5x25m
- Processed migration - 12.5x25m
- Raw Angle stacks (Near, Mid, and Far) – 12.5x25m
- Processed Angle stacks (Near, Mid, and Far) – 12.5x25m
- 3D migration RMS velocity trace volume (SEGY) (MVLTRCVOLRMS)
- Migration Velocities - 1000x1000m (ASCII) (MIGVEL)
- 3D stacking velocity trace volume (SEGY) (SVELTRCVOL)
- Stacking velocities in time and RMS - 500x500m (ASCII) (STKVEL)
- Stacking velocity eta values - interpolated -12.5x25m (SEGY) (ETAINTERP)
- Processed source-receiver navigation (UKOOA)
- Post stack navigation – bin center (UKOOA)
- Workstation-ready tapes available in SMT, Landmark, and GeoQuest
DEPTH MIGRATION and POST STACK PROCESSING by TGS; Houston, TX USA

Processing complete: January 2012

- Initial model building using time stacking velocities
- Kirchhoff depth migration – 25x25x10m
- 1st tomography iteration – semblance calculation/picking, dip estimation, velocity inversion
- Kirchhoff depth migration – 50x50x10m
- Derive epsilon and delta
- 2nd tomography iteration update anisotropy velocity (VTI)
- Kirchhoff depth migration – 50x50x10m
- Verify epsilon and delta – 50x50x10m
- 3rd tomography iteration – semblance calculation/picking, dip estimation, velocity inversion
- Kirchhoff depth migration – 50x50x10m
- 4th tomography iteration – semblance calculation/picking, dip estimation, velocity inversion
- Output final migration velocities, 12.5x25x5m, 12000m depth, 5m depth step
- Output final epsilon and delta fields, 12.5x25x5, 12000m depth, 5m depth step
- Final Kirchhoff depth migration – 12.5x25x5m
- Depth to time conversion
- High resolution radon de-multiple
- Time to depth conversion
- Output Kirchhoff depth gathers, 12.5x25x5m, 60 fold, 12000m depth, 5m depth step
- Residual moveout correction
- Output Kirchhoff depth gathers with RMO, 12.5x25x5m, 60 fold, 12000m depth, 5m depth step
- Stack and output SEGY Kirchhoff raw stack – 12.5x25x5m
- Stack and output SEGY Kirchhoff raw angle stacks *
- Post stack processing (noise removal and gain)
- Output SEGY Kirchhoff processed stack – 12.5x25x5m
- Output SEGY Kirchhoff processed angle stacks *
  * (near 5-19º, mid 17-31º, far 29-43º)

DEPTH DELIVERABLES

- Kirchhoff pre-stack depth migrated - raw stack (in depth) – 12.5x25x5m; 12000m depth
- Kirchhoff pre-stack depth migrated - raw angle stacks (in depth; near, mid, far) – 12.5x25x5m; 12000m depth
- Kirchhoff pre-stack depth migrated - processed stack (in depth) – 12.5x25x5m; 12000m depth
- Kirchhoff pre-stack depth migrated - processed angle stacks (in depth; near, mid, far) – 12.5x25x5m; 12000m depth
- Kirchhoff pre-stack depth migrated - processed stack converted to time – 12.5x25x5m
- Kirchhoff PSDM gathers with residual NMO (in depth) – 12.5x25x5m; 60 fold, 12000m depth
- Kirchhoff PSDM gathers without residual NMO (in depth) – 12.5x25x5m; 60 fold, 12000m depth
- Final velocity volume - unsmoothed (interval velocities in depth) - 12.5x25x5m (SEGY) (MIGVELSYD)
- Final Anisotropy Epsilon Field - 12.5x25x5m (SEGY) (EPSILONFLD)
- Final Anisotropy Delta Field - 12.5x25x5m (SEGY) (DELTAFLD)
- Interpreted water bottom (WB) horizon (ASCII)

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