DATA PROCESSING REPORT

MOSAIC OIL N.L.

MOS2005 2D SEISMIC SURVEY
& ASSOCIATED SEISMIC REPROCESSING

BAINBILLA & MYALL BLOCKS
PERMIT ATP 471P, SE QUEENSLAND

Date Processed:	***January - April 2006***
Date Compiled:	***7 June 2006***
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Velseis Processing Pty Ltd
ABN 30 058 427 204

Integrated Seismic Technologies

Disclaimer

This report has been prepared in good faith and with all due care and diligence. It is based on the seismic and other geophysical data presented and referred to, in combination with the author's experience with the seismic technique, and as tempered by the geological and stratigraphic evidence presented in various forms and through discussions with client representatives.

As such, the report represents a collation of opinions, conclusions and recommendations, the majority of which remain untested at the time of preparation. In the light of these facts it must be clearly understood that Velseis Processing Pty. Ltd., its proprietors and employees cannot take responsibility for any consequences arising from this report.

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Introduction

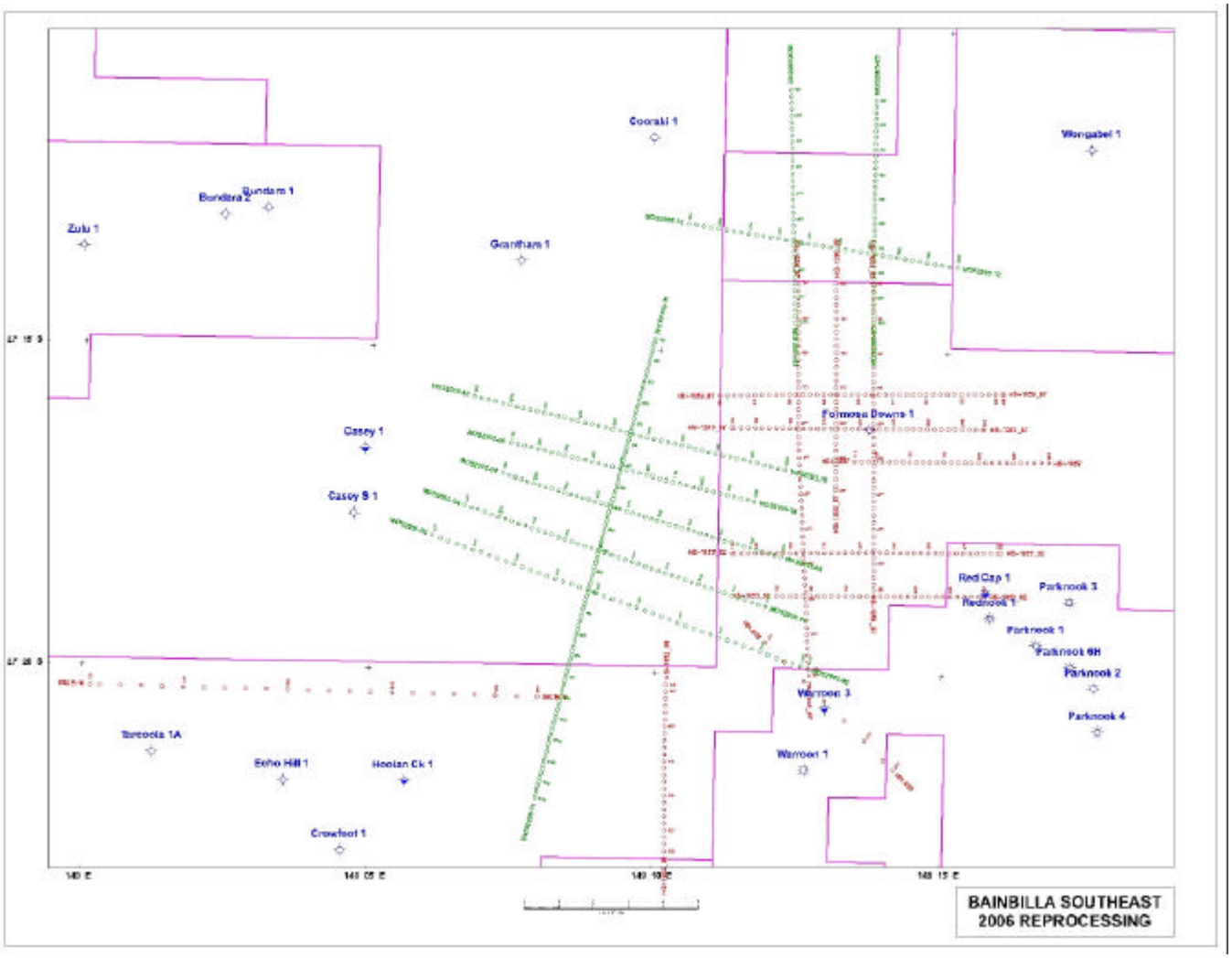
Velseis Processing Pty. Ltd. processed approximately 161.14 km of 2D land seismic data for Mosaic Oil N.L. from January 2006 to April 2006. The data consisted of the newly acquired MOS2005 survey and older lines from the area.

Line summary for processed lines

Line Name	Group Interval	Shot Interval	First SP	Last SP	Length (km)
MOS2005					
MOS2005-01	12.5	100	380	1190	10.13
MOS2005-02	12.5	100	100	1016	11.45
MOS2005-03	12.5	100	100	635	6.69
MOS2005-04	12.5	100	100	829	9.11
MOS2005-05	12.5	100	100	609	6.36
MOS2005-06	12.5	100	100	767	8.34
MOS2005-08	12.5	100	100	675	7.19
MOS2005-10	12.5	100	100	833	9.16
MOS2005-12	12.5	100	100	725	7.81
				Total	76.24
Repro					
86-CE-10	30	150	110	540	10.24
HSI-1052	40	160	100	236	5.28
HSI-1053	40	160	100	252	7.36
HSI-1055	40	160	108	308	12.48
HSI-1056	40	160	244	380	10.56
HSI-1057	40	160	100	256	7.36
HSI-1058	40	160	100	336	6.72
HSI-1059	40	160	100	344	10.23
HSI-1201	40	160	100	232	5.28
HSI-1202	40	160	100	248	5.92
HSI-1203	40	160	108	292	7.36
HSI-609	40	160	105	181	3.04
				Total	84.9

Only half of line HSI-1 056 was processed as data from one field tape was missing.
Processing of line HSI-1 060 was cancelled when all the field data could not be found.

Survey Map


Coorah 1
Wongabel 1
Bundarra 1
Bondara 2
Zulu 1
Grantham 1
Formosa Downs 1
Casey 1
Casey S 1
Red Cap 1
Parknook 3
Parknook 1
Parknook 6H
Parknook 2
Parknook 4
Warroon 3
Warroon 1
Tarcoola 1A
Echo Hill 1
Hooton Ck 1
Crowfoot 1
148 E
148 05 E
148 10 E
148 15 E
BAINBILLA SOUTHEAST
2006 REPROCESSING

Acquisition Parameters

Vintage	Acq. Company	Date	Sample Rate (ms)	Record Length (s)	Group Int (m)	Shot Int (m)	No. of Groups	Fold	Near Offset (m)	Far Offset (m)	Shot Depth (m)
MOS2005	Velseis	2006	2	3	12.5	100	240	15	6.25	1487	30-50
HSI-1000	GES Pty Ltd	1980	2	2	40	160	96	12	20	1900	35
HSI-1200	GES Pty Ltd	1981	2	2	40	160	96	12	20	1900	35
86-CE-10	GES Pty Ltd	1986	2	3	30	150	120	12	30	1800	48
HSI-609	GES Pty Ltd	1979	2	3	40	40	48	24	280	1880	0

NB: HSI-1000 and HSI-1200 refers to a series of lines. All data was dynamite except HSI-609 which was recorded with Geoflex.

Processing Sequence

The processing sequence was tailored to the specific properties of each vintage.

Reformat

Input is reformatted to ProMAX internal data format.

Trace Edit

Remove bad or noisy traces from shot records interactively.

Geometry

Assign geometry information to trace headers. Information assigned to each trace includes source, receiver and CDP location along with offsets and CDP fold.

Survey coordinates are referenced to AGD 94.

Static Computation

Statics were calculated from uphole times and hole depths. This was considered appropriate, as the shots were deeper than the weathering surface. However for the HSI-1 000 and 1200 series lines, the hole depths were assumed to be a constant 35 metres as annotated on the sidelabels of previously processed sections. OB logs with accurate hole depths were not available.

In all cases, a replacement velocity of 1800 m/s was used. The final datum was set to 244m. For geoflex data, first breaks were picked on a refractor corresponding to the base of weathering. Statics were calculated with a single layer refraction method. The statics were then tied at the intersection with lines that had deep production shotholes.

Gain Recovery

An exponential gain of 2dB/sec was applied.

Surface Consistent Amplitudes

Surface consistent amplitude correction was calculated. The time gate used for this process had the following parameters.

Offset (m)	Time gate (ms)
154	791-1407
1427	1059-1551
1852	1151-1599

Gated Surface Consistent Deconvolution

Surface consistent spiking deconvolution was applied using two gates, and an operator length of 80ms.

Spectral Whitening

Spectral Whitening was applied with 5 frequency panels, and a frequency range of 15-140Hz.

Velocity Analysis (1st Pass)

Velocities were picked using the ProMAX interactive velocity picking package (IVA). IVA uses velocity spectra, moved out gathers and stacked panels to assist in a careful interpretation of stacking velocities. As the velocity function is altered, revised gathers and stacks are produced until optimized stacking velocities are achieved.

Velocities were picked at intervals of 1 km. Each panel consisted of 11 CDPs stacked using 31 constant velocity functions.

Residual Static Calculation and Application

Surface consistent residual statics were calculated and applied using Maximum Power Autostatics.

Pilot or reference traces were formed for a 1200 ms time gate following structure by flattening all traces along the autostatics horizon smashing 11 CDPs.

These traces are summed to form a single pilot trace. Each trace from the active CDP is time shifted relative to the pilot trace and summed with it. The power of the stack is measured for each time shift. This shift-power trace is then summed with other traces having the same shot and receiver in their respective domains.

After the shift spectra has been calculated for the entire line and summed in the Receiver/Shot domains, time shifts are picked at the maximum of the power shift spectra and stored as Static Values.

The pilot stack is updated and the process repeated for a number of iterations.

In this case, calculations were conducted for at least 5 iterations or until the RMS of the change in the computed statics was less than .05.

Velocity Analysis (2nd Pass)

Velocities were picked using the ProMAX interactive velocity picking package (IVA). IVA uses velocity spectra, moved out gathers and stacked panels to assist in a careful interpretation of stacking velocities. As the velocity function is altered, revised gathers and stacks are produced until optimized stacking velocities are achieved.

Velocities were picked at intervals of 0.5 km. Each panel consisted of 11 CDPs stacked using 31 constant velocity functions.

Residual Static Calculation and Application (2nd Pass)

Surface consistent residual statics were calculated and applied using Maximum Power Autostatics.

Pilot or reference traces were formed for a 1200 ms time gate following structure by flattening all traces along the autostatics horizon over 11 CDPs.

These traces are summed to form a single pilot trace. Each trace from the active CDP is time shifted relative to the pilot trace and summed with it. The power of the stack is measured for each time shift. This shift-power trace is then summed with other traces having the same shot and receiver in their respective domains.

After the shift spectra has been calculated for the entire line and summed in the Receiver/Shot domains, time shifts are picked at the maximum of the power shift spectra and stored as Static Values.

The pilot stack is updated and the process repeated for a number of iterations.

In this case, calculations were conducted for at least 5 iterations or until the RMS of the change in the computed statics was less than .05.

Normal Moveout

An NMO correction was applied to the data using 2nd pass velocities. A 20% stretch mute was used to remove first break arrivals.

Dynamic corrections are applied to the data using the following formula.

$$TX_2 = T0_2 + X^2/V^2$$

TX = time at offset X T0
= time at zero offset X =
offset of the trace V =
velocity at time T

CDP Trim Statics

Trim statics application is the process of aligning traces within a gather by correlating them with a pilot trace, then applying appropriate shifts to each trace. Traces with a required shift greater than a pre-set maximum value are not shifted. Maximum allowable shift was 8 ms.

Gain

An AGC with a 1000ms operator length was applied after move out.

CDP Stack

Add traces within a common midpoint gather. The post stack trace was scaled by the square root of the sum of fold for each sample in the trace.

Pre-migration FX Deconvolution

Prior to migration, FX deconvolution was applied to reduce the level of noise. A horizontal window of ten traces and a time window of 500ms were used.

Note that a separate processing stream without this step was also carried out, and the unfiltered version of the resulting migrated stack is included with the digital output of this project.

Steep Dip Explicit Time Migration

Steep Dip Explicit Time Migration was applied using a velocity scale of 97.5%, and a maximum dip of 50 degrees.

Spectral Whitening

Spectral Whitening was applied using 3 frequency panels and an output spectrum of 10/15-120-140 Hz

FX Deconvolution

Random noise was removed by filtering in the FX domain. A horizontal window of 10 traces and time window of 500 ms were used.

Final Bandpass Filter

An Ormsby zero phase bandpass filter was applied to the data to remove high and low frequency noise. The following time variant filter was used on all lines exceept HSI-609 (Geoflex)

Time	Bandpass Parameters (Hz)
600	15-20-100-120
800	15-20-90-120

HSI-609

Time	Bandpass Parameters (Hz)
600	15-20-70-90
800	15-20-60-80

Display

Migrated and final stacks are displayed at a spacing of ten CDPs per second, and a vertical scale of 19.05 cm per second. Displayed with the traces are Shotpoint and CDP annotation, velocity information and fold.

Archiving

A CD CPCD-672) has been produced, containing the following for all lines of this survey:

IN SEGY FORMAT:

Unfiltered Final Stacks
Filtered Final Stacks
Unfiltered Migrated Stacks (with no pre-migration FX Deconvolution)
Unfiltered Migrated Stacks (with pre-m ig ration FX Deconvol ution)
Filtered Migrated Stacks (with pre-migration FX Deconvolution)

IN CGM FORMAT:

Filtered Migrated Stacks (with pre-migration FX Deconvolution) IN

ASCII FORMAT:

Stacking Velocities
Shot and Receiver Statics

IN PDF Format

Report

A DVD (DVD-267) contains the deconvolved CDP gathers for each of the lines in SEGY format. All statics have been applied to these gathers, and NMO has not been applied.

Appendix

These data were processed by Velseis Processing Pty. Ltd., Brisbane, Australia.

Velseis Processing utilizes ProMAX 2D/3D processing software. This is a totally interactive system allowing the user to view data processing at each stage, producing a final result of the highest quality.

The software executes on a quad processor Sparc 20 Sun workstation and a 24 node, dual CPU/node linux cluster. Data is viewed via X terminals networked to the main system, each terminal has a high definition monitor to enable accurate representation of the digital data in pixel form.

The overall efficiency of the system enabled processing to be completed within the allotted time frame.

Plots were generated via a 300 dpi laser plotter. This was used to generate paper plots for QC purposes as well as the ability to provide final filmed copies.

Velseis Processing is committed to offering a premium product, the software development undertaken by ProMAX resulting in processing algorithms which are state of the art.