INVESTIGATOR 3D / 2D MARINE SEISMIC SURVEY

PERMITS VIC/P43 and T/30P, VICTORIA AND TASMANIA

SEISMIC DATA PROCESSING REPORT

FOR

WOODSIDE ENERGY LTD.

SUBMITTED BY

VERITAS DGC ASIA PACIFIC LTD.

UNIT 06-01 UNION BUILDING

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SINGAPORE 577177

VERITAS

Geophysical Integrity

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1. INTRODUCTION

The Investigator 3D and 2D seismic surveys were acquired by Baker Hughes – Western Geophysical using the M/V Western Pride between 5th December 1999 and 5th April 2000. The 3D survey consists of approximately 41,442.35 CDP kilometres of prime lines and 16360.2 CDP kilometres of infill, covering an area of approximately 986.4938 sq. kilometres. The 2D data consists of 106.625 kilometres data acquired at the Southern edge of the 3D block.

1.1 Survey Location

The Investigator 3D seismic survey is located in Bass Strait, VIC/P 43 and T/30P, offshore Australia.

1.1.1 Geodetic Parameters

Local Datum	AGD84
Spheroid	Australian National Spheroid
Semi-major Axis	6378160.000
1/flattening	298.25
Satellite Datum	WGS84
Spheroid	WGS 84
Semi-major Axis	6378137.000
1/flattening	298.257224

Datum Shift

Shift Parameters from WGS84 to Local Datum

Dx = +116.0	Rx = -0.23	arc sec*
Dy = +50.47	Ry = -0.39	arc sec*
Dz = +141.69	Rz = -0.344	arc sec*
Scale factor = -0.0983	*as entered in Spectra	

Mapping Projection	AMG ZONE 54 (UTM)
Origin of Latitude	000° 00’ 00.00’’ N
Origin of Longitude	141° 00’ 00.00’’ E
False Northing	10,000,000.0 m
False Easting	500,000.0 m
Central Meridian	141° 00’ 00.00’’ E
Scale factor at CM	0.9996
Grid Units	Metres
Vertical Datum	Mean Sea Level

1.1.2 Binning Parameters

Binning Systems

Online real-time binning	Spectra	Ver 7.6.5
Post line binning	Reflex	Ver 1.7.2

Binning Grid

Map Grid Origin Easting	643880.97	(bin centre)
Map Grid Origin Northing	5647960.68	(bin centre)
Map Grid Bearing (°)	009.00°	(In-line axis)

	In-line	X-line
Bin Grid Extent (m)	53587.5	27475
Bin Number at Origin	801	978
Bin Number Increment	1	1
Bin Dimensions (m)	12.5	25

Apply scale factor: No (using mapping grid distances)

Nominal Offset Distribution

Minimum Offset (m)	125
Maximum Offset (m)	4675
Offset Increment (m)	50

Coverage Groups	Near Offset (m)	Far Offset (m)
Nears	125	1225
Near Mids	1275	2375
Far Mids	2425	3525
Fars	3575	4675

1.1.3 Survey Co-ordinates

Data on Bin Tape

Inline (After Interpolation)	Crossline	Easting	Northing
132	414	670499.930	5643909.002
132	3272	676088.551	5679194.168
536	3508	671562.207	5682897.842
538	4426	673332.600	5694235.477
1064	4675	667325.451	5698338.213
1880	4675	657251.030	5699933.845
1880	414	648918.940	5647327.095

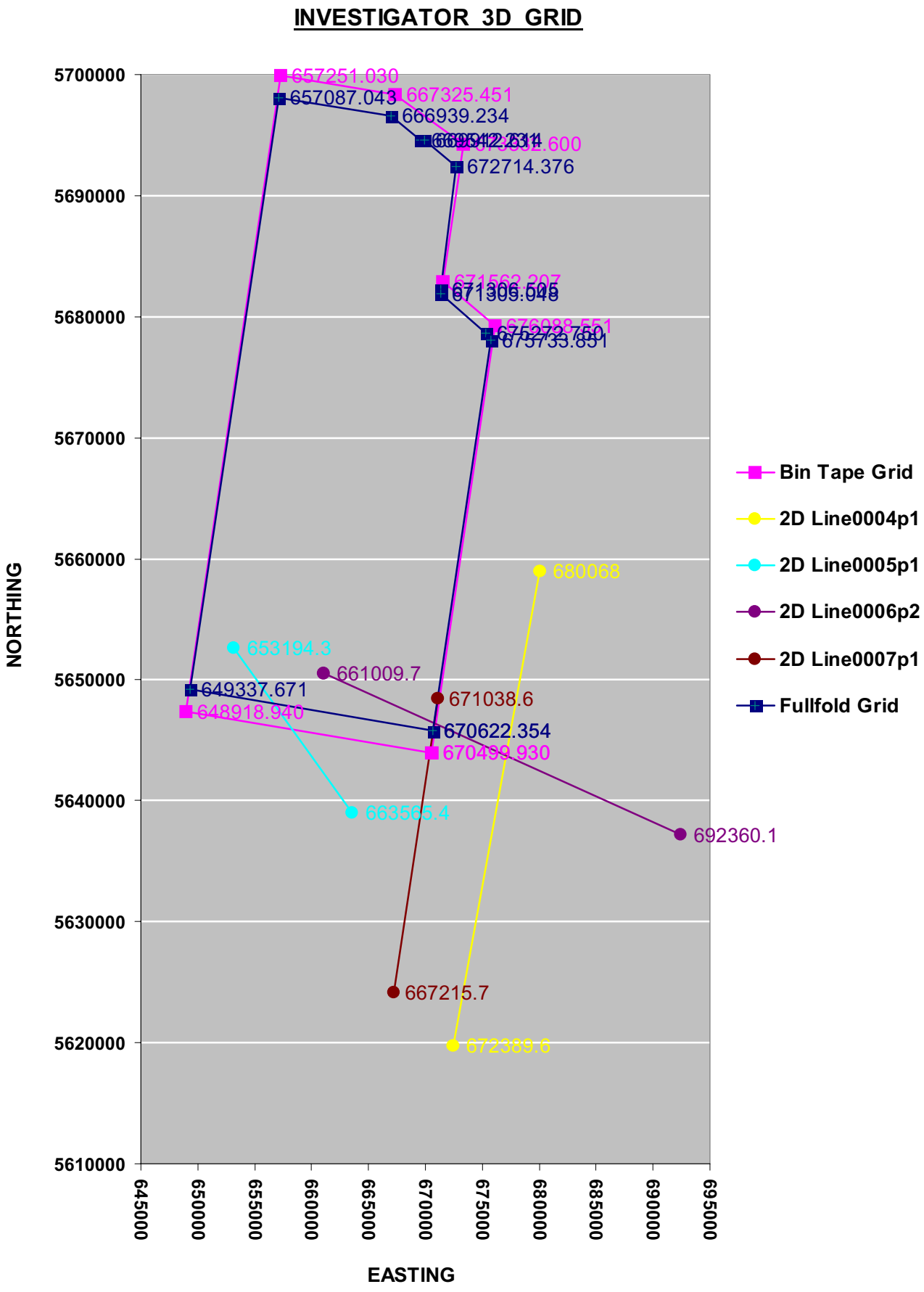
Full Fold Grid

Inline (After Interpolation)	Crossline	Easting	Northing
146	565	670622.354	5645800.639
1870	565	649337.671	5649171.802
1870	4528	657087.043	5698099.413
1072	4528	666939.234	5696538.979
842	4407	669542.231	5694595.352
812	4407	669912.614	5694536.689
564	4274	672714.376	5692409.710
548	3453	671306.505	5682242.272
544	3427	671305.048	5681913.451
190	3221	675272.750	5678677.931
146	3179	675733.851	5678073.356

Investigator 2D Data

Line	SP.	CDP	Easting	Northing
WOOINV0004P1	910.5	2002	672389.6	5619764
WOOINV0004P1	2507	5195	680068.0	5658928
WOOINV0005P1	2506.5	5172	653194.3	5652662
WOOINV0005P1	1820	6545	663565.4	5638991
WOOINV0006P2	2476.5	5232	692360.1	5637191
WOOINV0006P2	1114	7957	661009.7	5650509
WOOINV0007P1	1891.5	6402	671038.6	5648479
WOOINV0007P1	909	8367	667215.7	5624217

1.1.4 Survey Map



1.2 Survey Size

The 3D survey consisted of 875 subsurface lines. A total of 57802.55 sail-line kms of data (including infill data) were processed. The total full fold CMP kilometres for the prospect amounted to 39,459. 75 kilometres (986.4938 square kilometres).

Prime Data	40,542.95	CMP kilometres
Reshoot Data	899.40	CMP kilometres
Infill Data	16,360.20	CMP kilometres

The 2D data recorded at the Southern edge of the 3D block consisted of four 2D lines with a total of 106.625 kilometres data.

1.3 Acquisition

The Investigator 3D seismic survey was acquired by Baker Hughes, Western Geophysical using the M/V Western Pride, Party 140 between 5th December 1999 and 4th April 2000. It was recorded using dual sources and 6/8 streamers. The subsurface line spacing was 25 m metres, the shot spacing was 25 metres (per source, flip-flop recording) and the group interval was 12.5 metres. There were 368 groups per streamer resulting in a nominal CDP bin fold of 92.

The Investigator 2D seismic survey was acquired by Baker Hughes, Western Geophysical using the M/V Western Pride, Party 140 using the M/V Western Pride, between 4th April 2000 and 5th April 2000. The shot spacing was 25 metres and the group interval was 12.5 metres. There were 368 groups per streamer resulting in a nominal CDP bin fold of 92.

1.4 Processing Contractor/Centre, Start/Finish

The data was processed by Veritas DGC Asia Pacific Ltd in their Singapore processing centre. Processing started on 1st April 2000, and was completed on 26th September 2000. The final migration volume was delivered to Woodside on the 24th August 2000. The near and far migration volumes were delivered to Woodside on 13th September 2000. The 2D data & 3D CMP archive tapes were shipped to Woodside on 26th September 2000.

1.5 Processing Objectives

The prime objective of the Investigator 3D processing project was to achieve the best possible quality within the allowed time constraints. The processing sequence and parameters were established by Veritas DGC in collaboration with Woodside Energy Ltd.

1.6 Processing Location(s)

Both the test and production processing were performed at Veritas DGC's Singapore office. This work began on 1st April 2000and was completed on 26th September 2000.

1.7 Key Personnel – Contractor and Woodside Energy Ltd.

Contractor Personnel (Veritas DGC Singapore):

Peter Whiting	-	Regional Processing Manager, responsible for technical accuracy and throughput
Christine Chan	-	Senior Processing Supervisor, responsible for project management and processing schedule
Dolly Tan	-	Processing Supervisor, responsible for project organisation and QC
Peter Lwin	-	Team Leader, responsible for organisation of processing team and co-ordination of tasks
Corinna Yee	-	Senior Geophysicist
June Tan	-	Geophysicist
Peter Ho	-	Geophysicist
Dave Heather	-	Programming Manager, provided systems and software support.

Woodside Personnel:

Robert Eliott Lockhart	-	Overall Project Supervision

2. ACQUISITION SUMMARY

2.1 Acquisition Parameters

2.1.1 Investigator 3D Data

The Investigator 3D seismic survey was acquired with a line orientation of N-S (7.8/187.8 degrees) using a dual source, 6/8 streamer configuration. The cable separation was 100 metres and the source separation was 50.0 metres giving an initial subsurface CDP line spacing of 25.0 metres.

The original group interval was 12.5 meters and shotpoint interval was 25.0 metres (12.5 metres flip-flop). The number of channels per streamer was 368 and that gave a nominal CDP bin fold coverage of 92.

Acquisition	
Recorded by	Baker Hughes – Western Geophysical
Recording vessel	M/V Western Pride Party 140
Date recorded	5th December 1999 – 4th April 2000
Energy Source	
Energy Source Type	Tuned Air Gun Array
Air Gun Type	Sleeve Gun II
Number of arrays	2
Array Separation	50.0 m
Pop Interval	12.5 m on alternate array
Pressure	2000 (± 150) P.S.I.
Volume	2250 CU.IN.
Source Output	74.1 bar-m (peak to trough 3-128 Hz) 40.7 bar-m (0to peak)
Bubble ratio	17.3:1
Gun depth	5 m(± 0.5 m)
Gun Depth Monitoring	SSS OCM (Ver 1.7 with Y2K patch)
Gun Synchronisation	± 1 msec
Gun Synch. System	SSS OCM (Ver 1.7 with Y2K patch)
Number of Sub-Arrays	3 per array, 6 total
Sub Array Separation	6 m
Sub Array Length	15.1 m
Number Of Guns per Array	24
Near field hydrophone	1 phone per gun element (6 per sub array)
Source Positioning	Input/Output Pro2000 Acoustics, POSTNET rGPS and Fanbeam laser reflective headbuoys

Streamer

Streamer Type	Thompson Marconi Sonar Solid Streamer
Number of streamers	6 / 8
Group Length	17.55 m
Nominal Group Interval	12.5 m
Streamer Length	4600 m
Streamer Depth	6.0 m ± 1.0 m
Streamer Separation	100 m inter-cable, 500 m total spread
Number of Groups	368 per cable, 2208 total seismic
Nominal Section Length	100 m (46 sections pr streamer)
Number of Groups per Module	16 (group interval 12.5 m)
Number of Groups per Section	8 (group interval 12.5 m)
Streamer Sensitivity	14 V/Bar
Hydrophone type	Piezo-electric Ceramic
Number of Hydrophones per Group	14 (group interval 12.5 m)

	Near Group	Far Group
Trace numbering in SEG-D data	1	368
Trace numbering in P1/90 data	Cable#1 = 1	Cable # 1 = 368
	Cable#2 = 369	Cable # 2 = 736
	Cable#3 = 737	Cable # 3 = 1104
	Cable#4 = 1105	Cable # 4 = 1472
	Cable#5 = 1473	Cable # 5 = 1840
	Cable#6 = 1841	Cable # 6 = 2208

Compasses / Levellers	Input/Output Pro2000 Combined Compass/Birds
Streamer Positioning	Input/Output Pro2000 Acoustics, Input/Output Pro2000 Compasses, POSNET remote rGPS targets on each tailbuoy

Recording instrument

Recording System	I/O Systems MSX
System Version	Version 2.0
Tape Interface System	Western Geophysicals CRS (Continuos Recording System)
System Version	3.0.2
MSX Record length	4.5 Binary Seconds (4608 msec)
CRS Record length	4.5 Binary Seconds (4608 msec)
Sample rate	2 msec
Time break	Co-incident with digital start
Low Cut Filter	2 Hz @ 12 dB/Oct
High Cut Filter	206 Hz @ 264 dB/Oct

Recorded data format	8058 SEG-D DMX
Trace polarity	positive pressure = negative number on tape = negative pulse on plot
Recording media type	3M 3590 cartridge tapes
Maximum Number of Files per Cartridge	400 (1 file contains 2944 channels at 4068 msec length + auxiliaries)
Number of Channels	2208 seismic + 104 auxiliaries
Channel set 1 – 6	Seismic data (368 channels each)
Channel set 7 – 12	Waterbreaks (4 channels each)
Channel set 13	Recording System Start (1 channel)
Channel set 14	Combined Timebreak (1 channel)
Channel set 15-18	Array Timebreak (1 channel each)
Channel set 19 – 27	Spare (1 channel each)
Channel set 28	Sample Count (1 channel)
Channel set 29 – 27	Gun Signature (64 channels at 512 msec)
Real Time Data QC	SeisView
Camera Recorder	Enhanced Visualisation Processor (EVP)

<u>Vessel Positioning</u>

Primary System	Racal Multifix Differential GPS Vers 2.10
Secondary System	Fugro MRdGPS Differential GPS Ver 2.04.01
QC System	QPS Muliref Differential GPS Ver 2.42
Other System	Posnet Differential GPS Ver 1.57

2.1.2 Investigator 2D Data

The 2D data was acquired using single source / single streamer configuration. The group interval was 12.5 meters and shotpoint interval was 25 metres. The number of channels was 368 and that gave a nominal CDP bin fold coverage of 92.

Acquisition

Recorded by	Baker Hughes – Western Geophysical
Recording vessel	M/V Western Pride Party 140
Date recorded	4th April 2000 – 5th April 2000

Energy Source

Energy Source Type	Tuned Air Gun Array
Air Gun Type	Sleeve Gun II
Number of arrays	1
Pop Interval	25 m
Pressure	2000 (± 150) p.s.i.
Volume	2250 cu.in.
Source Output	74.1 bar-m (peak to trough 3-128 Hz) 40.7 bar-m (0to peak)
Bubble ratio	17.3:1
Gun depth	5 m(± 0.5 m)
Gun Depth Monitoring	SSS OCM (Ver 1.7 with Y2K patch)
Gun Synchronisation	± 1 msec
Gun Synch. System	SSS OCM (Ver 1.7 with Y2K patch)
Number of Sub-Arrays	3 per array
Sub Array Separation	6 m
Sub Array Length	15.1 m
Number Of Guns per Array	24
Near field hydrophone	1 phone per gun element (6 per sub array)
Source Positioning	Input/Output Pro2000 Acoustics, POSTNET rGPS and Fanbeam laser reflective headbuoys

Streamer

Streamer Type	Thompson Marconi Sonar Solid Streamer
Number of streamers	1
Group Length	17.55 m
Nominal Group Interval	12.5 m
Streamer Length	4600 m
Streamer Depth	6.0 m ± 1.0 m
Number of Groups	368
Number of Groups per Module	16 (group interval 12.5 m)
Number of Groups per Section	8 (group interval 12.5 m)
Streamer Sensitivity	14 V/Bar
Hydrophone type	Piezo-electric Ceramic
Number of Hydrophones per Group	14 (group interval 12.5 m)

	Near Group	Far Group
Trace numbering in SEG-D data	1	368
Trace numbering in P1/90 data	Cable#1 = 1	Cable # 1 = 368
Compasses / Levellers	Input/Output Pro2000 Combined Compass/Birds	
Streamer Positioning	Input/Output Pro2000 Acoustics, Input/Output Pro2000 Compasses, POSNET remote rGPS targets on each tailbuoy	

Recording instrument

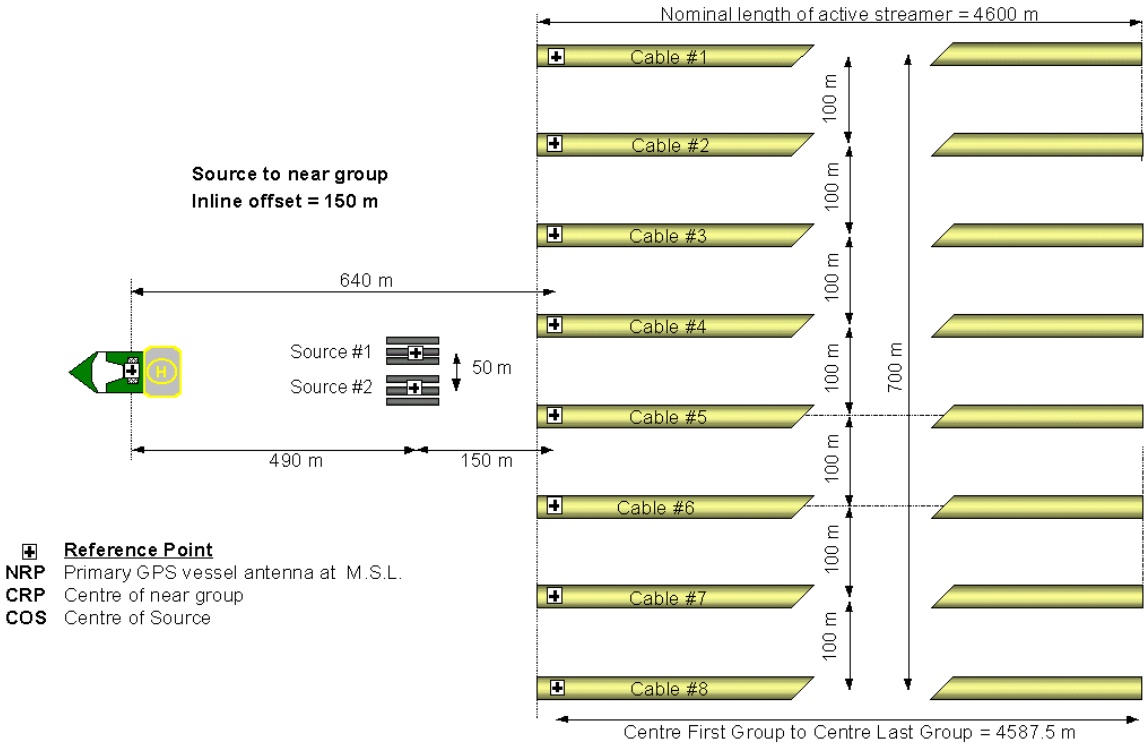
Recording System	I/O Systems MSX
System Version	Version 2.0
Tape Interface System	Western Geophysicals CRS (Continuos Recording System)
System Version	3.0.2
MSX Record length	6.0 Binary Seconds (6144 msec)
CRS Record length	6.0 Binary Seconds (6144 msec)
Sample rate	2 msec
Time break	Co-incident with digital start
Low Cut Filter	2 Hz @ 12 dB/Oct
High Cut Filter	206 Hz @ 264 dB/Oct
Recorded data format	8058 SEG-D DMX
Trace polarity	positive pressure = negative number on tape = negative pulse on plot
Recording media type	3M 3590 cartridge tapes
Number of Channels	368 seismic + 16 auxiliaries
Channel set 1	Seismic data (368 channels)
Channel set 2	Waterbreaks (4 channels)
Channel set 4	Recording System Start (1 channel)
Channel set 5	Combined Timebreak (1 channel)
Channel set 6-9	Array Timebreak (1 channel each)
Channel set 10 – 17	Spare (1 channel each)
Channel set 18	Sample Count (1 channel)
Channel set 19	Gun Signature (64 channels at 512 msec)
Real Time Data QC	SeisView
Camera Recorder	Enhanced Visualisation Processor (EVP)

Vessel Positioning

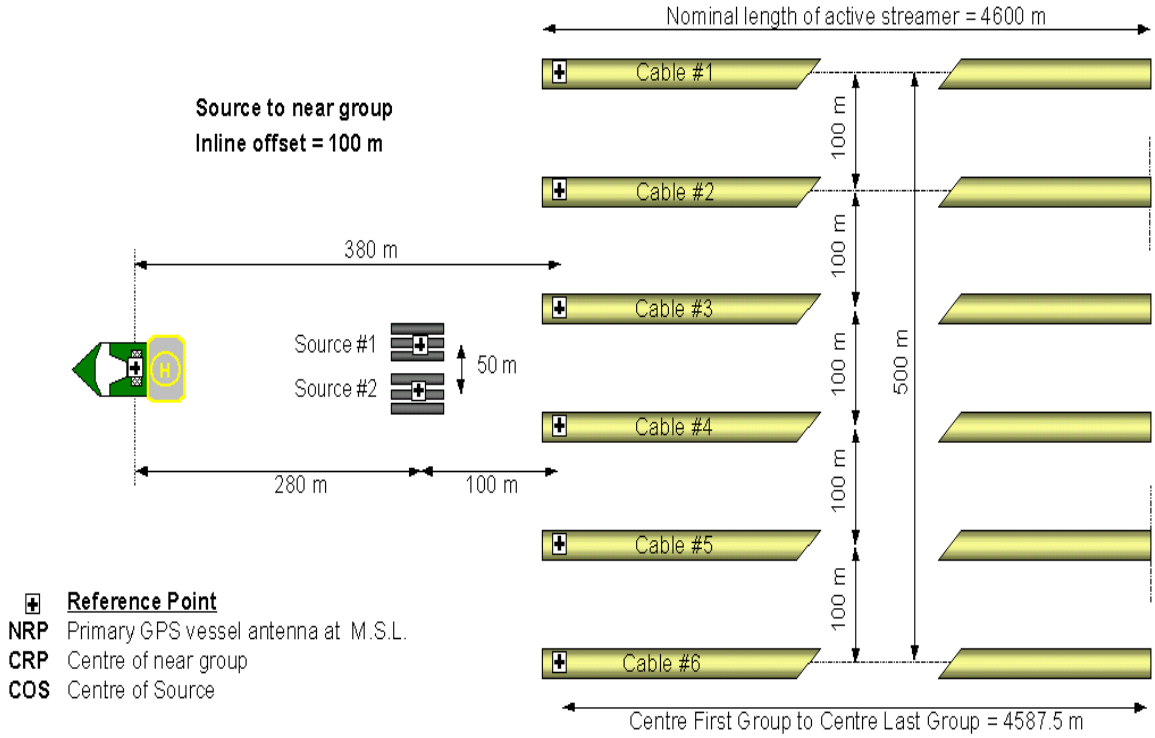
System #1	Racal Multifix Differential GPS
System #2	Fugro MRdGPS Differential GPS
QC System	QPS Muliref Differential GPS

2.2 *Nominal Configuration*

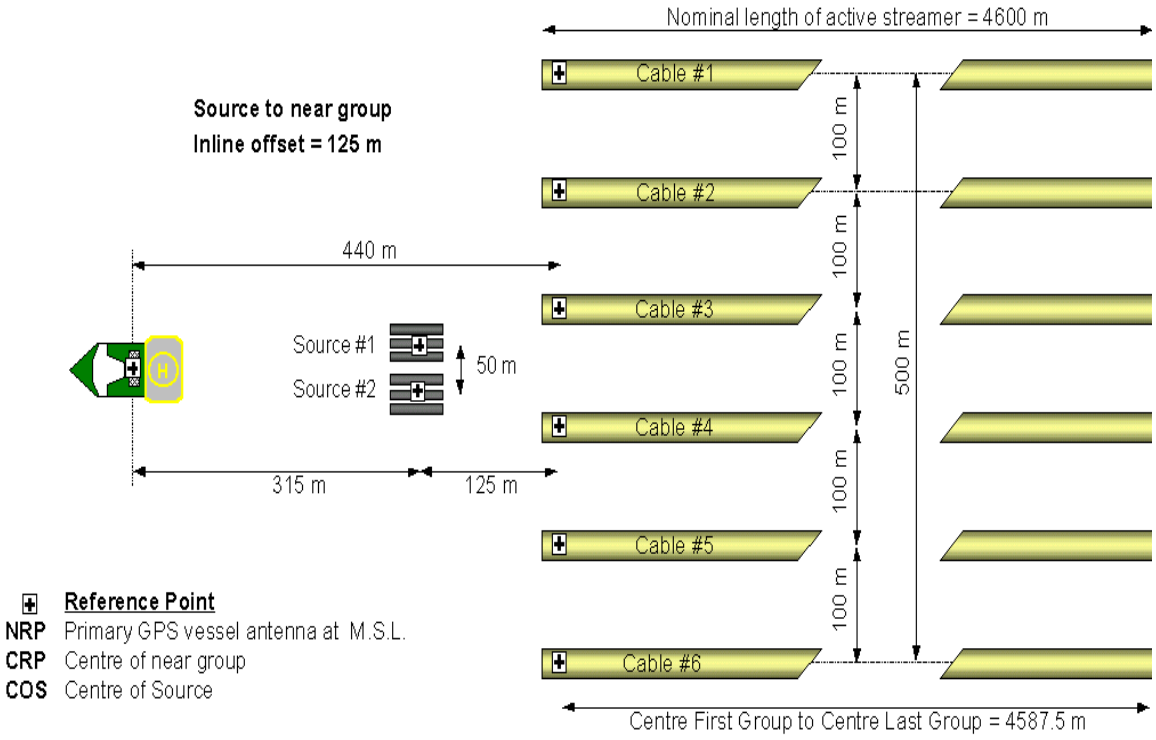
2.2.1 Investigator 3D Data Sequence 001 – 008: 8 Cable / Dual Source



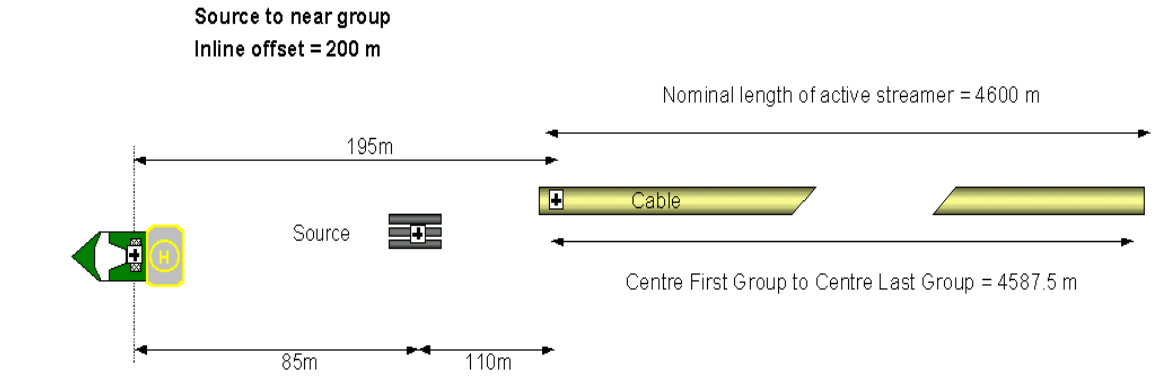
2.2.2 Investigator 3D Data Sequence 009 – 080: 6 Cable / Dual Source



2.2.3 Investigator 3D Data Sequence 081 – 147: 6 Cable / Dual Source

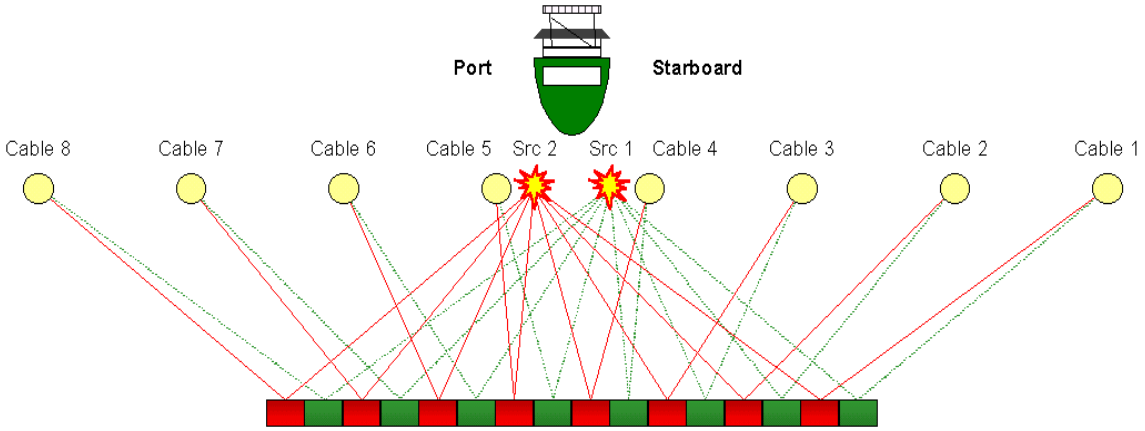


2.2.4 Investigator 2D Data – Single Cable / Single Source



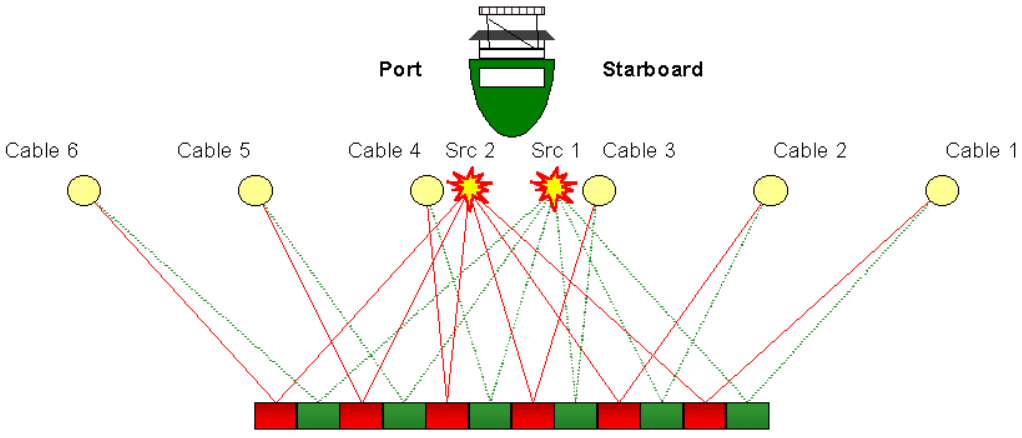
2.3 Nominal CMP Coverage

2.3.1 Investigator 3D Data Sequence 001 – 008: 8 Cable / Dual Source



Acquired CMP line — Diagram shows vessel from astern (pointing in to page)
Acquired CMP line — Cell width = 25 m
Source — Cell Length = 6.25 m (12.5 m for coverage displays)
Streamer — Shotpoint Interval = 12.5 m Flip Flop (25 m per CMP Line)
Raypath from stbd source (1) — Nominal Fold = 92
Raypath from port source (2)

2.3.2 Investigator 3D Data Sequence 009 – 147: 6 Cable / Dual Source



Acquired CMP line — Diagram shows vessel from astern (pointing in to page)
Acquired CMP line — Cell width = 25 m
Source — Cell Length = 6.25 m (12.5 m for coverage displays)
Streamer — Shotpoint Interval = 12.5 m Flip Flop (25 m per CMP Line)
Raypath from stbd source (1) — Nominal Fold = 92
Raypath from port source (2)

2.3.3 Investigator 2D Data – Single Cable / Single Source

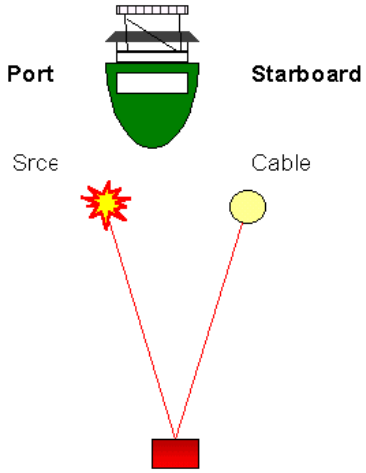


Diagram shows vessel from astern (pointing in to page)

Acquired CMP line

Source

Streamer

Raypath from source

Shotpoint Interval = 25 m

3. PROCESSING SUMMARY

3.1 Investigator 3D Data

3.1.1 Investigator 3D Processing Flow - Brief Summary

The data supplied to Veritas DGC was in SEG-D format code 8058 on 3590 tapes. The following is a brief summary of the processing applied to these data.

1. Reformat from SEG-D format to Veritas DGC's Internal Format
2. Shot and trace editing
3. Resample from 2 msec to 4 msec with a minimum-phase anti-alias filter (100Hz@72dB/oct)
4. Minimum phase Butterworth low cut filter 4Hz (18dB/Oct)
5. Seismic/navigation merge
6. First velocity analyses (2.0 x 2.0 km grid) with the following applied:
   i.) Shot domain FK filtering: 1500 m/sec, ± 8.33 msec/trace
   ii.) Deconvolution: 7 trace average
7. Tidal statics correction
8. Spherical divergence correction (TV^2) in offset dependent mode
9. Second Pass velocity analyses (1.0 x 1.0 km grid) the following applied:
   i.) Normal moveout correction using first pass velocities picked from item 6
   ii.) Shot domain FK filtering: 2500 m/sec, ± 5.0 msec/trace
   iii.) Deconvolution: 7 trace average
   iv.) PMULT – Radon demultiple
10. Normal moveout correction using second pass velocities picked from item 9
11. Shot domain FK filtering: 2500 m/sec, ± 5.0 msec/trace
12. Reverse normal moveout correction using second pass velocities picked from item 9
13. WEMA
14. Normal moveout correction using second pass velocities picked from item 9
15. Adjacent trace summation. Group interval 12.5 m to 25 m
16. Receiver domain FK filtering: 2500 m/sec, ± 10 msec/trace
17. Reverse normal moveout correction using second pass velocities picked from item 9
18. Transform to Tau-P domain
19. Predictive Deconvolution in Tau-P domain (36ms +200ms)
20. Transform to X-T domain
21. 3D Binning into 12.5 x 25 m grid to achieve 92 fold bin gathers
22. Zero Phasing filter application (filter provided by Woodside)
23. Normal moveout correction using second pass velocities picked from item 9
24. FLOOD – Fold Levelling For Optimum Offset Distribution
25. 3D Kirchhoff DMO
26. Reverse normal moveout correction using second pass velocities picked from item 9
27. Third pass velocity analyses (0.5 x 0.5 km grid)
28. Normal moveout correction using third pass velocities picked from item 27
29. Outer trace mute
30. Pre-stack scaling - 2000 msec AGC
31. Stack (1/fold normalisation) - Three volumes: Full, Near and Far offset Stacks.
32. FX interpolation in crossline direction from 25 m to 12.5 m
33. One Pass 3D OMEGA-X migration - Three volumes: Full, Near and Far offsets.
34. Q Compensation (10dB boost)
35. Time variant filter
36. Multi-gate scaling
37. Source and cable static correction: +7.275 msec

3.1.2 Investigator 3D Stack Grid

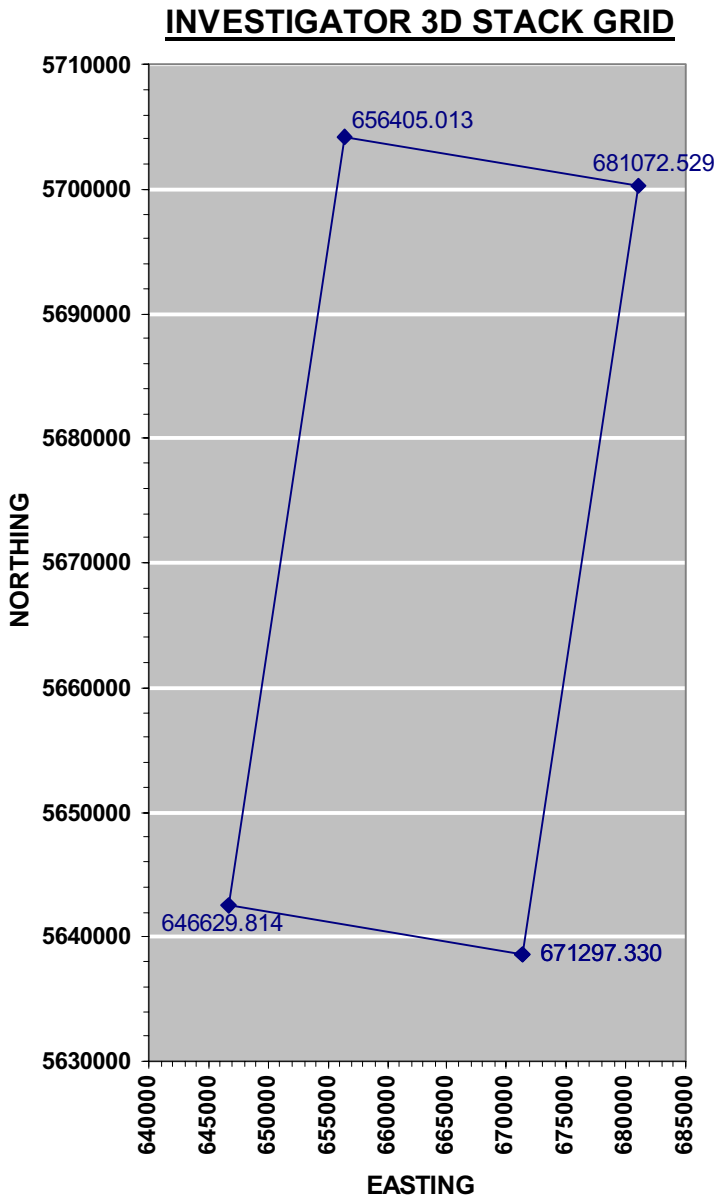
Crossline (CDP) Spacing : 12.5 m
Crossline (CDP) Increment : 1.0
Inline Spacing : 25 m
Inline Increment : 2.0

Inline (After Interpolation)	Crossline	Easting	Northing
2	1	671297.330	5638555.854
2	5000	681072.529	5700274.030
2000	5000	656405.013	5704180.980
2000	1	646629.814	5642462.805

Processing and Onboard numbering relationship:

Onboard inlines = 2121 – (Processing inlines after interpolation divide by 2)

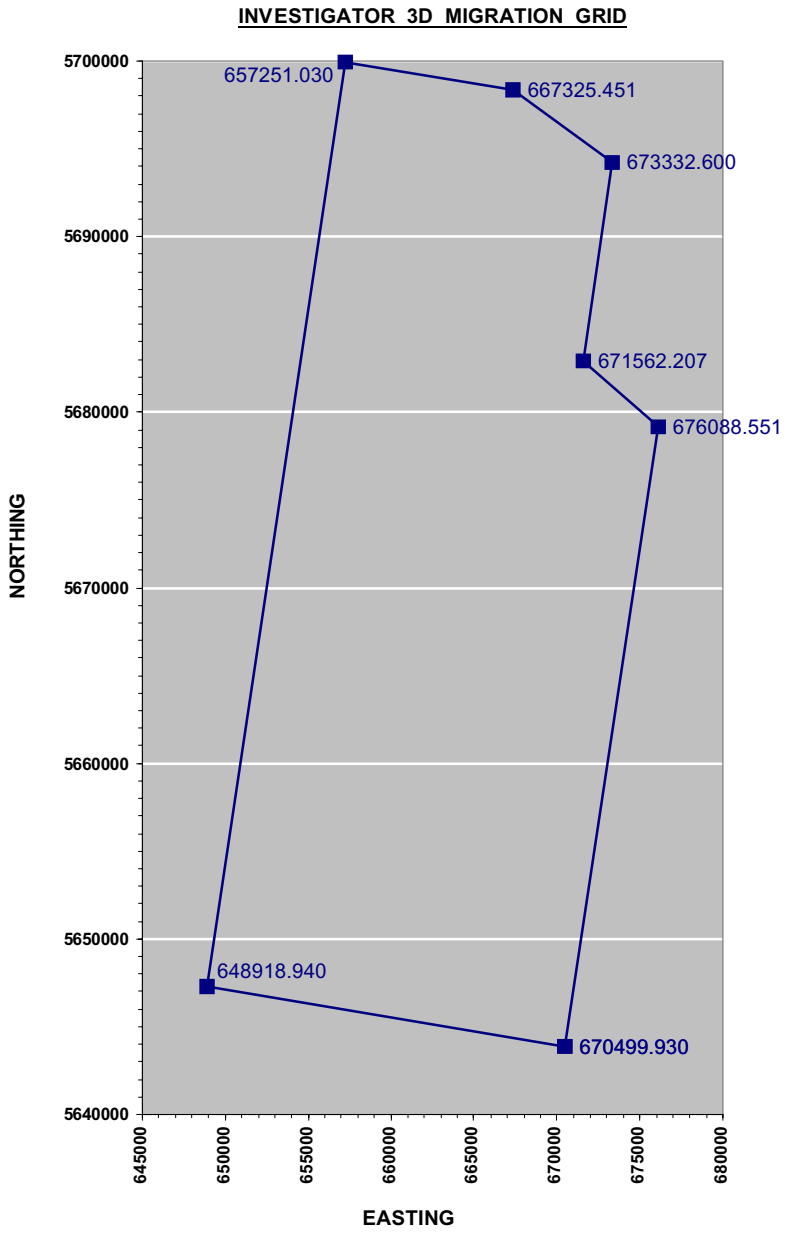
Onboard crosslines = Processing crosslines + 400



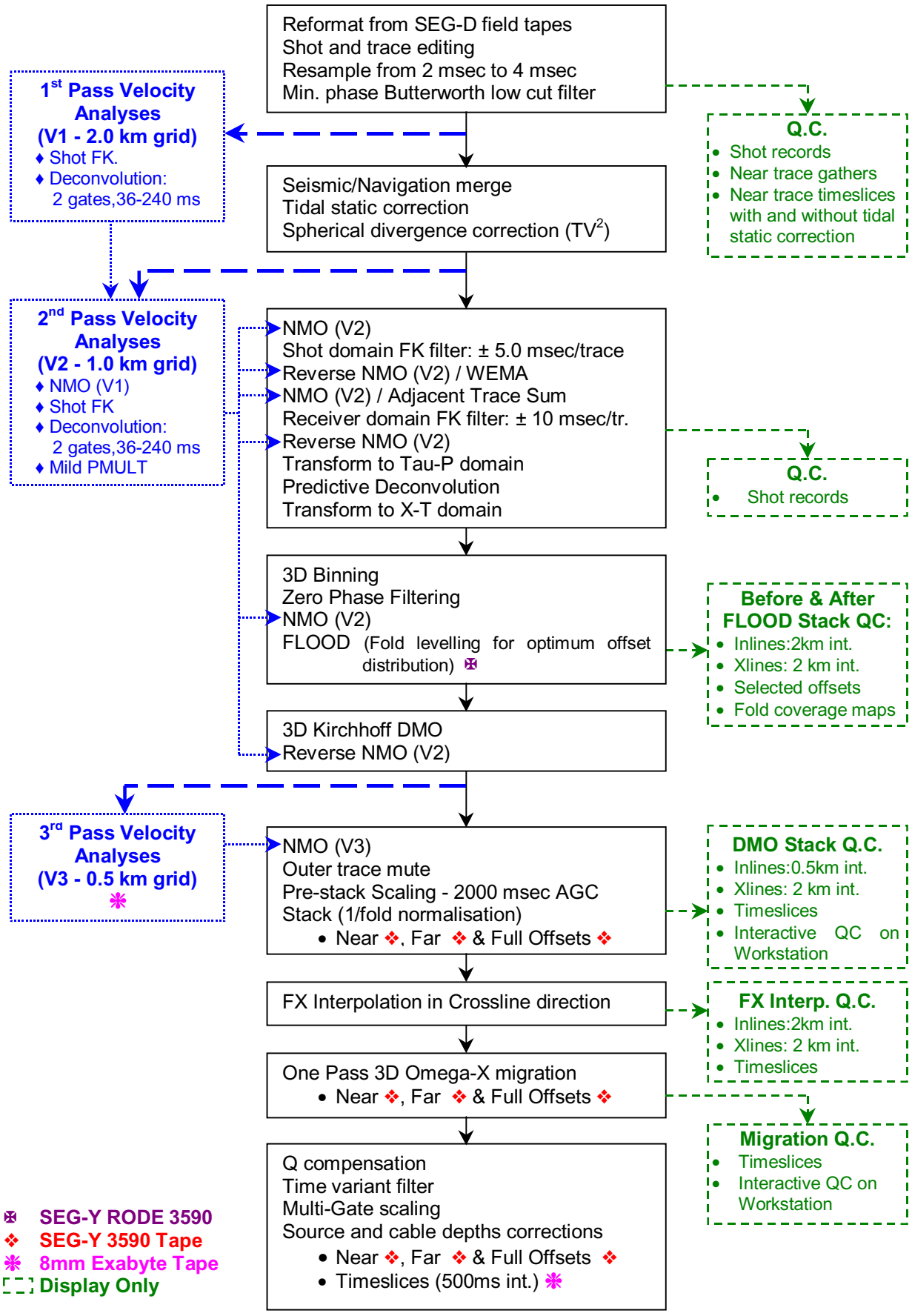
3.1.3 Investigator 3D Migration Grid

Crossline (CDP) Spacing : 12.5 m
Crossline (CDP) Increment : 1.0
Inline Spacing : 12.5 m
Inline Increment : 1.0

Inline (After Interpolation)	Crossline	Easting	Northing
132	414	670499.930	5643909.002
132	3272	676088.551	5679194.168
536	3508	671562.207	5682897.842
538	4426	673332.600	5694235.477
1064	4675	667325.451	5698338.213
1880	4675	657251.030	5699933.845
1880	414	648918.940	5647327.095



3.1.4 Investigator 3D Processing Flow Chart



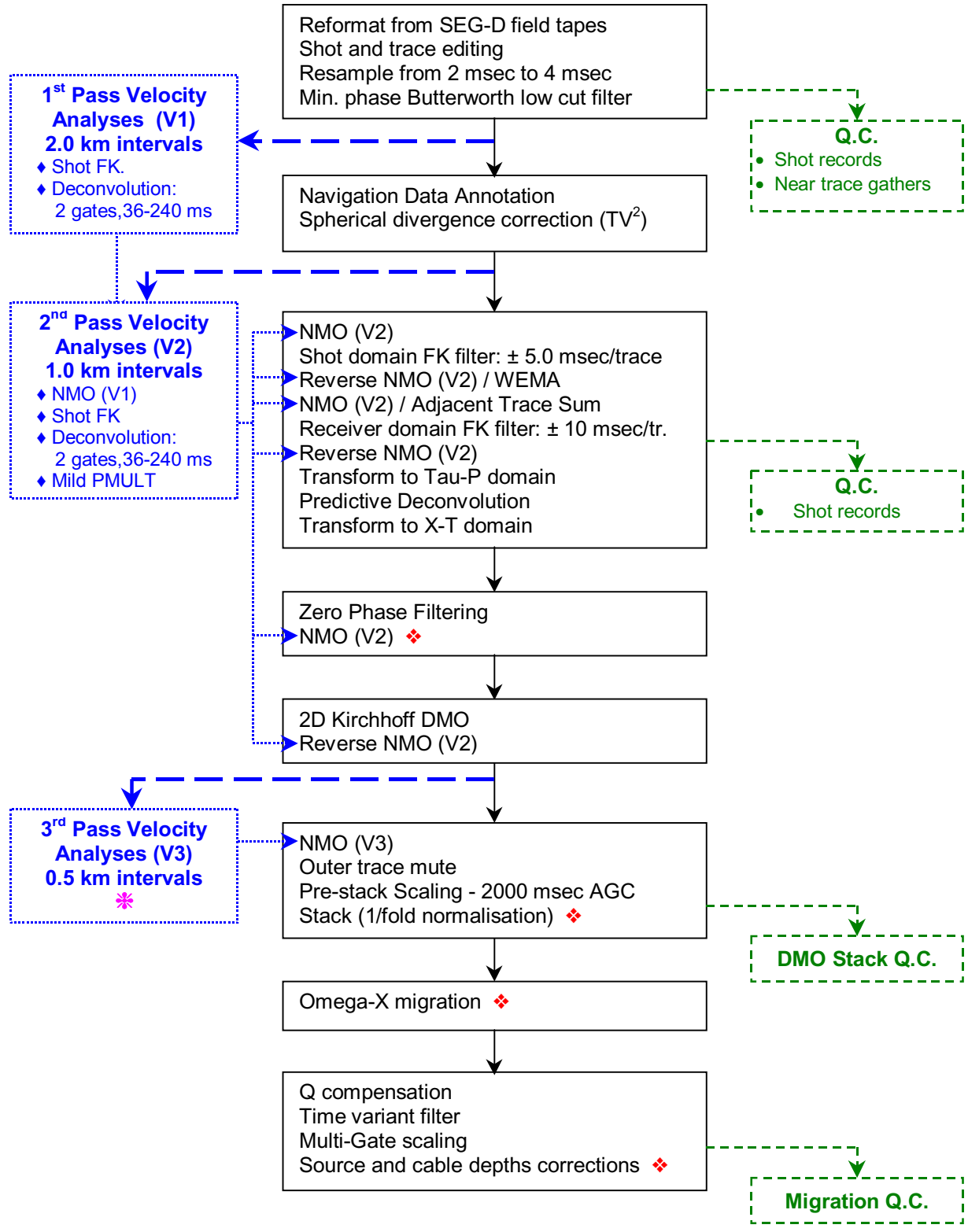
3.2 Investigator 2D Data

3.2.1 Investigator 2D Processing Flow - Brief Summary

The data supplied to Veritas DGC was in SEG-D format code 8058 on 3590 tapes. The following is a brief summary of the processing applied to these data.

1. Reformat from SEG-D format to Veritas DGC's Internal Format
2. Shot and trace editing
3. Resample from 2 msec to 4 msec with a minimum-phase anti-alias filter (100Hz@72dB/oct)
4. Minimum phase Butterworth low cut filter 4Hz (18dB/Oct)
5. Navigation data annotation
6. First velocity analyses with the following applied:
    v.) Shot domain FK filtering: 1500 m/sec, ± 8.33 msec/trace
    vi.) Deconvolution: 7 trace average
7. Spherical divergence correction (TV^2) in offset dependent mode using one velocity function derived from first pass velocities picked from item 6
8. Second Pass velocity analyses the following applied:
    vii.) Normal moveout correction using first pass velocities picked from item 6
    viii.) Shot domain FK filtering: 2500 m/sec, ± 5.0 msec/trace
    ix.) Deconvolution: 7 trace average
    x.) PMULT – Radon demultiple
9. Normal moveout correction using first pass velocities picked from item 8
10. Shot domain FK filtering: 2500 m/sec, ± 5.0 msec/trace
11. Reverse normal moveout correction using first pass velocities picked from item 8
12. WEMA
13. Normal moveout correction using first pass velocities picked from item 8
14. Adjacent trace summation. Group interval 12.5 m to 25 m
15. Receiver domain FK filtering: 2500 m/sec, ± 10 msec/trace
16. Reverse normal moveout correction using second pass velocities picked from item 8
17. Transform to Tau-P domain
18. Predictive Deconvolution in Tau-P domain (36ms + 200ms)
19. Transform to X-T domain
20. Zero Phasing filter application (filter provided by Woodside)
21. Normal moveout correction using second pass velocities picked from item 8
22. 2D Kirchhoff DMO
23. Reverse normal moveout correction using second pass velocities picked from item 9
24. Third pass velocity analyses
25. Normal moveout correction using third pass velocities picked from item 24
26. Outer trace mute
27. Pre-stack scaling - 2000 msec AGC
28. Stack (1/fold normalisation)
29. OMEGA-X migration
30. Q Compensation (10dB boost)
31. Time variant filter
32. Multi-gate scaling
33. Source and cable static correction: +7.275 msec

3.2.2 Investigator 2D Processing Flow Chart



❖ SEG-Y 3590 Tape
❋ 8mm Exabyte Tape
Display Only

4. PERSONNEL AND EQUIPMENT

4.1 Geophysical Staffing And Organisation

Peter Whiting was the overall project manager and technical geophysicist for this project.

Christine Chan and Dolly Tan were the project supervisors and both played very important roles. Christine Chan was responsible for project management and processing schedule. Dolly Tan had control of the accuracy and progress of the project throughout its duration. Peter Lwin led the production processing team.

Singapore Centre

4.2 Computer Hardware Description

This survey was processed in Veritas DGC's Singapore processing centre. Listed below are the hardware inventory of the Singapore processing centre.

4.2.1 NEC SX-5 / 6 Supercomputer In Singapore

PROCESSORS	6 CPU'S (@ 8 Gigaflops/CPU)
REAL MEMORY	32 Gigabytes
DISKS	12 Terabytes RAID disk
TAPE SYSTEMS	3590 tape system
NETWORK	HIPPI plus high speed network

4.2.2 Hardware Inventory For Singapore Processing Centre

HEWLETT PACKARD EXEMPLAR V2200

PROCESSORS	14 PA-RISC 8200 CPU'S
REAL MEMORY	16 Gigabytes
DISKS	2.257 Terabytes of Ultra SCSI Disk RAID 5
TAPES	8 IBM Magstar 3590 Cartridge Drives

2 X HEWLETT PACKARD KITTYHAWK K460 (TWO SYSTEMS)

PROCESSORS	4 PA-RISC 8000 CPU'S
REAL MEMORY	4 Gigabytes
DISKS	810 Gigabytes of Ultra SCSI RAID disk
TAPES	4 IBM Magstar 3590 cartridge drives
	2 X 3480 cartridge drives
	1 X 3490E cartridge drive
	1 X Exabyte drive
	1 X Dual 8705 Cybernetics 8mm drive

3 X HEWLETT PACKARD KITTYHAWK K460 (THREE SYSTEMS)

PROCESSORS	4 PA-RISC 8000 CPU'S
REAL MEMORY	4 Gigabytes
DISKS	880 Gigabytes of Fast/Wide SCSI RAID
TAPES	4 IBM Magstar 3590 cartridge drives
	2 X 3480 cartridge drives
	1 X 3490E cartridge drive
	1 X Exabyte drive

SUN ULTRA 2 MODEL 2200

PROCESSORS	2 X 200 MHz ULTRA SPARC II
REAL MEMORY	0.5 Gigabyte
DISKS	4.2 Gigabytes Internal, 100 Gigabytes External Disk, Ultra SCSI-2 disk
TAPES	2 X 3590 IBM Magstar Tape Drives
	1 X Exabyte drive
	2 X Fujitsu Round Drives 9 track M2436
	200 IPS Density Format PE (1600) GCR (6250)

3 X HEWLETT PACKARD C180 SERVERS (THREE SYSTEMS)

PROCESSORS	1 PA-RISC 8200 CPU's
REAL MEMORY	500 Megabytes
DISKS	62 Gigabytes of Fast/Wide SCSI lRAID 5
TAPES	2 X 3480 cartridge drives
	2 X 3590 Dual Ported

PERIPHERALS

PLOTTERS	2 X OYO GS-636-2 36" thermal plotter
	1 X OYO GS-6x42 42" thermal film plotter
	1 X HP750C Design Jet Plotter with SDI-HP Jet server plot software
PRINTERS	Various laser printers – Epson/NEC/HP
	1 X Ammonia printer
DIGITIZERS	1 Calcomp 9500 flatbed digitizing system
TAPES	1 X Dual 8705 Cybernetics 8mm drive

ANCILLARY EQUIPMENT

TAPE CLEANER	2 X 3590 Tape Cleaners

WORKSTATIONS

2 Hewlett Packard C360 PA 8500 Dual Head Workstations with 1.5 Gigabytes of Memory and 180 Gigabytes of RAID 5 disk

1 Hewlett Packard C360 PA 8500 Dual Head Workstation with 1.5 Gigabytes of Memory and 36 Gigabytes External Disk

9 Hewlett Packard 9000 series 712/60 Graphic Workstations with 32-64 Megabytes of memory, 1 Gigabyte local disk

2 Hewlett Packard 9000 series 712/60 dual head Graphics Workstations with 64 Megabytes of memory

1 Hewlett Packard 9000 series 735 dual head Graphics Workstations with 400 Megabytes of memory and 10 Gigabytes local disk

6 Hewlett Packard X-Terminals

28 Dell Pentium/Pentium Pro P.C.'s with X emulation

7 x HP Vectra Pentium Pro 200 Hi-Res. PC's with X emulation

POWER SYSTEMS

U.P.S.	Data Power 3-Phase UPS, Model: DP3220 (220 KVA)

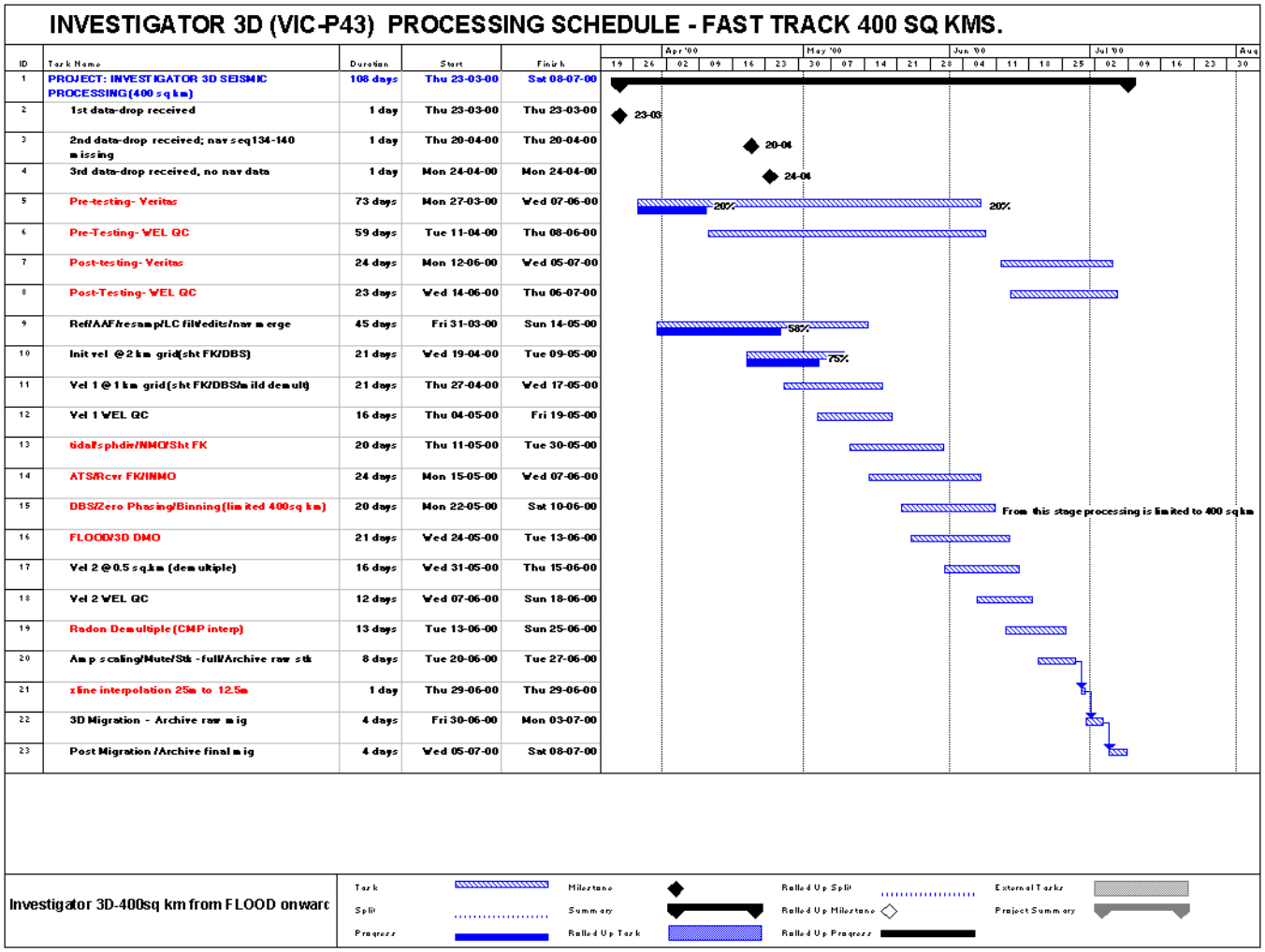
5. PROJECT MANAGEMENT

5.1 Project Plan

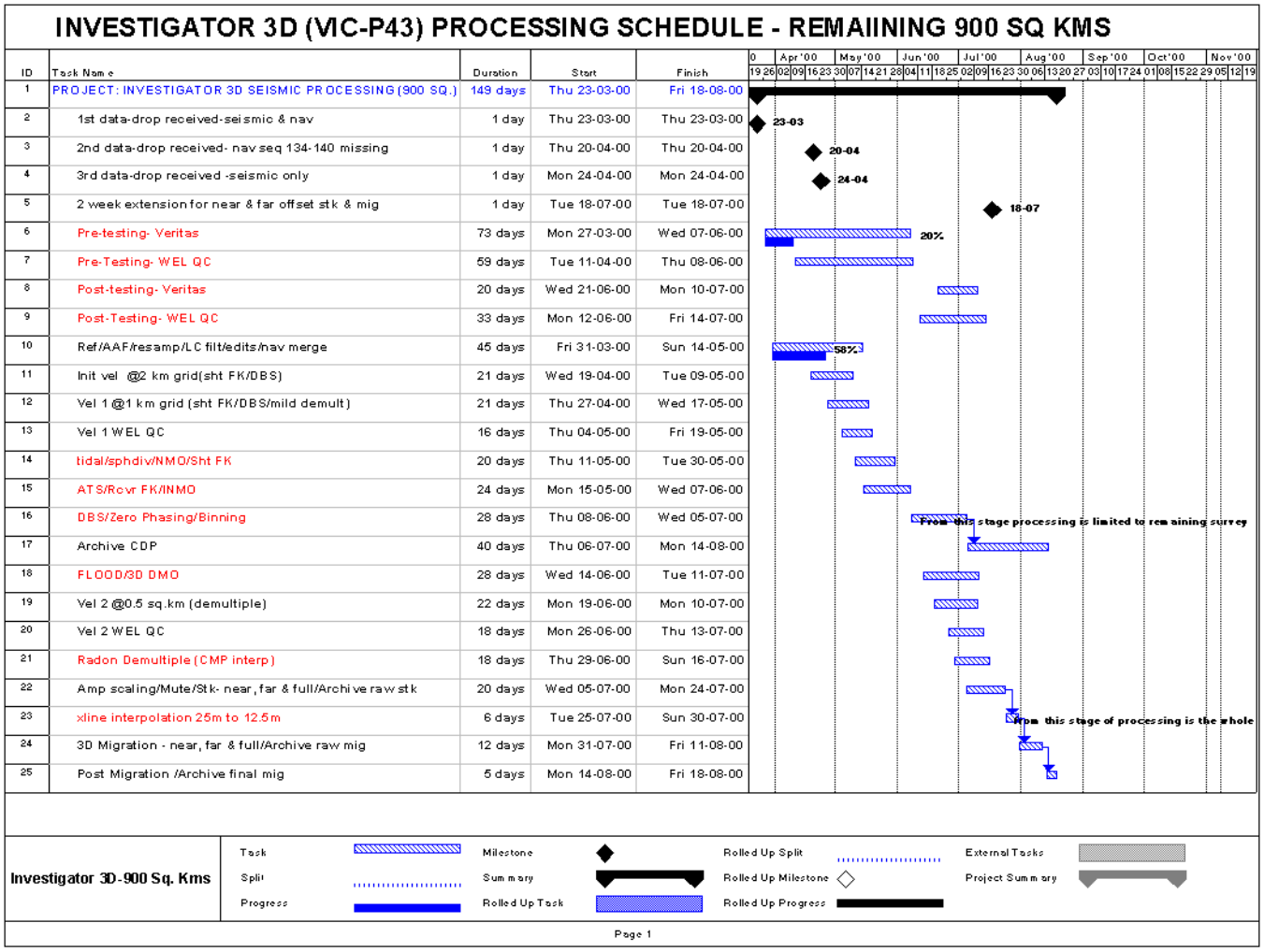
5.1.1 Project Plan Adjustment Register

Investigator 3D Project Plan Adjustment Register.						
S/N.	**Ref: Fax**	**Date**	**Start**	**Finish**	**Duration**	**Description**
5.1.2	Email / Gantt	26-Apr-00	23-Mar-00	08-Jul-00	108	Original project plan for 400 Sq. Kms of Fast Track Data
5.1.3	Email /Gantt	26-Apr-00	23-Mar-00	18-Jul-00	149	Original project plan for remaining 900 Sq. Kms of 3D Data.
5.1.4	Email /Gantt	31-May-00	23-Mar-00	07-Sep-00	169	WEMA before ATS was confirmed on 30th May 2000evening. Hence the 2 Weeks T/A for WEMA and the 2 weeks delay on pre-processing decision were adjusted.
5.1.5	Email /Gantt	13-Sep-00	23-Mar-99	07-Sep-00	169	Final Project Plan

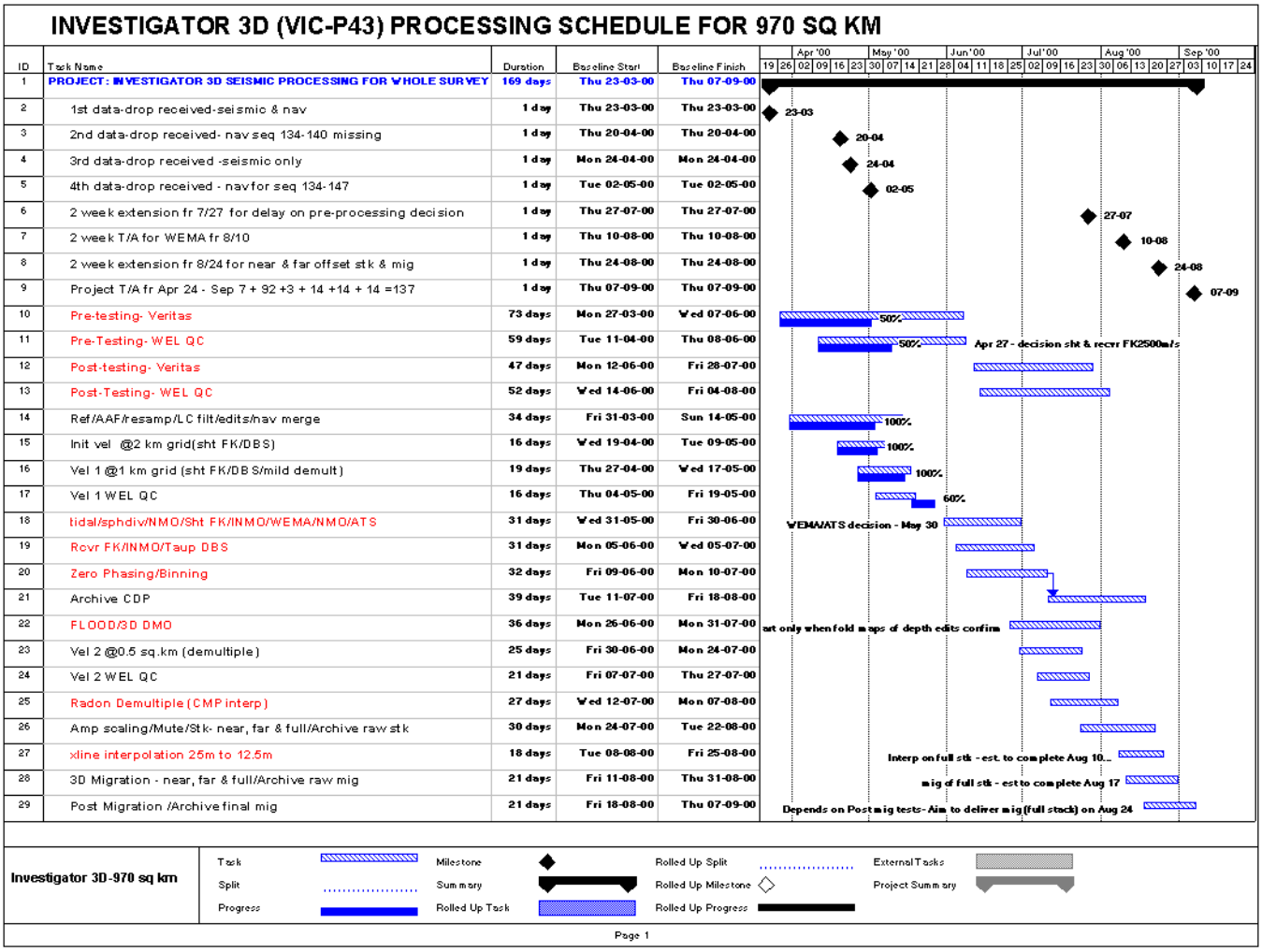
5.1.2 Investigator 3D Original Project Plan - Fast Track 400 Sq. Kms



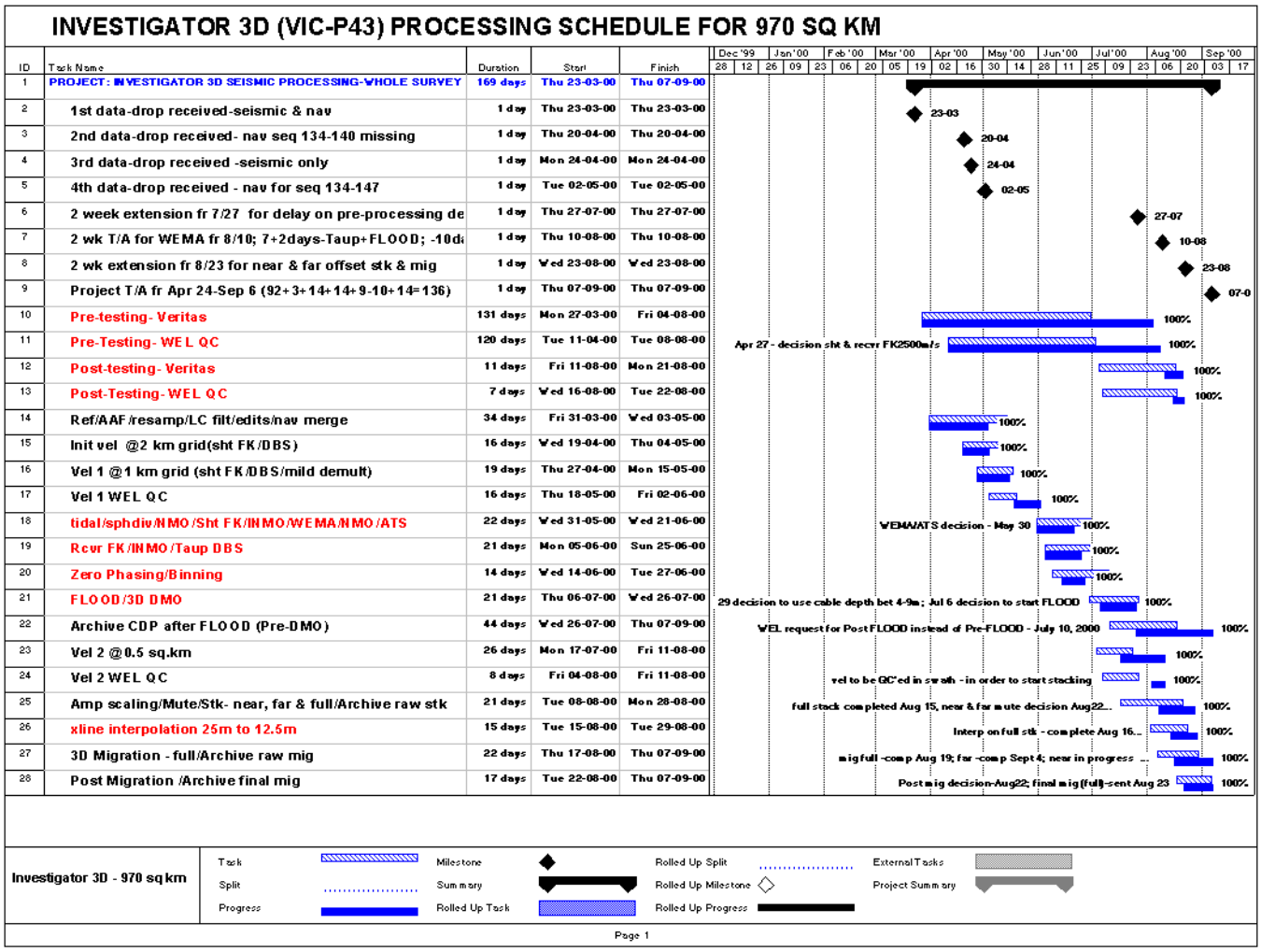
5.1.3 Investigator 3D Original Project Plan - Remaining 900 Sq. Kms



5.1.4 Investigator 3D Project Plan Revision No. 1



5.1.5 Investigator 3D Final Project Plan



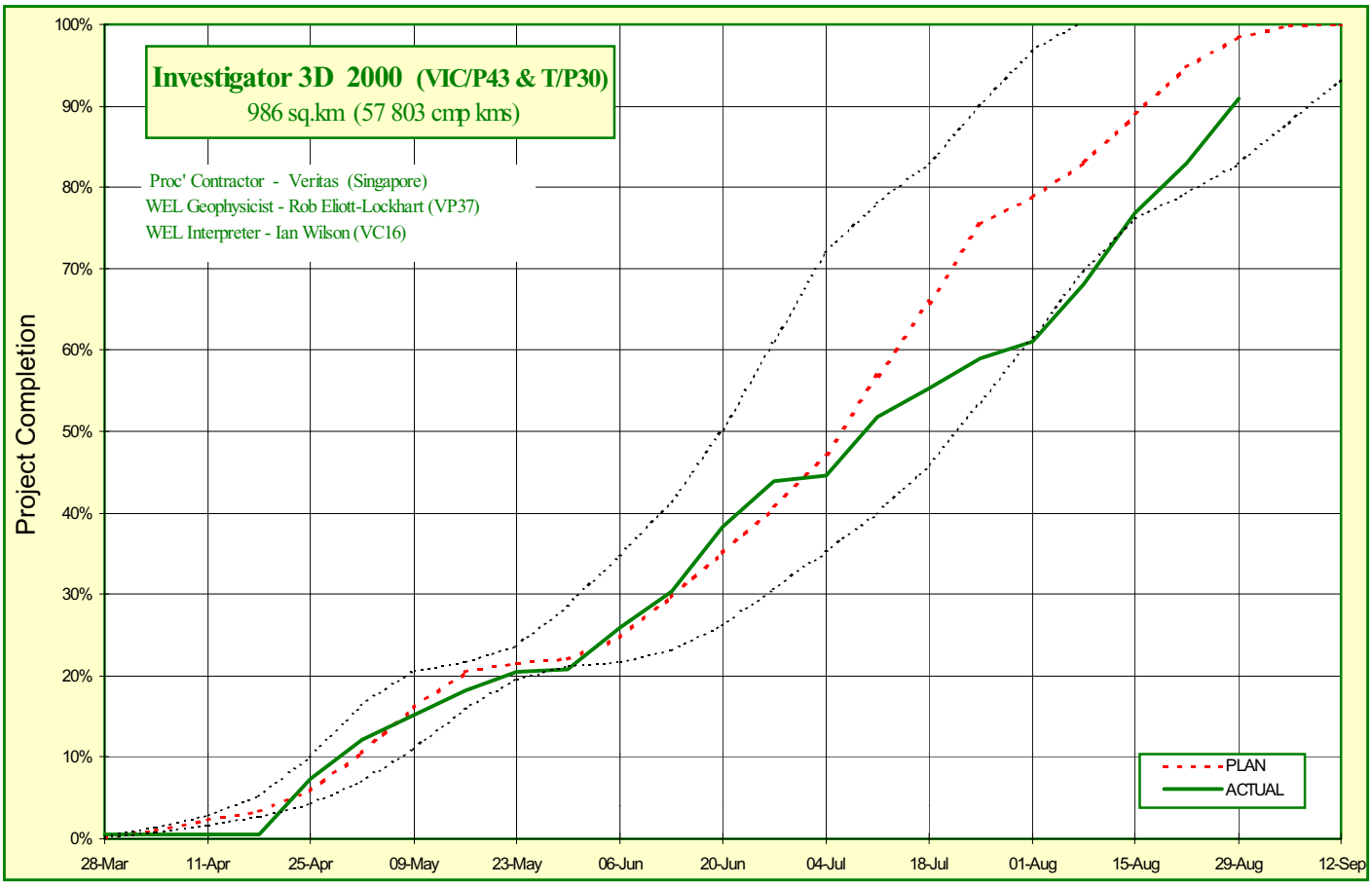
5.2 Reporting Procedures

Project meetings were held on a daily basis for the purpose of monitoring progress and planning the project's future requirements.

Microsoft Project files were used internally to monitor the progress of the project, usage of resources, and to flag upcoming tasks. The main plots considered here were Gantt charts and resource usage graphs. These Microsoft Project files were updated twice weekly.

A spreadsheet was the official status reporting format. Every Wednesday, the kilometres processed in the previous week were entered for each of the defined stages. This created a summary report and an overall plan versus actual graph. These figures and graphs were transmitted to Woodside Energy Ltd. via a combination of telephone and Email every Wednesday morning.

5.3 Project Statistics



Project INVESTIGATOR 3D (VIC-P43) Processing - Weekly Status Report

Veritas DGC Asia Pacific Ltd Project Manager - Christine Chan

Actual Progress Record

	Processing Step	Total kms	Actual Start	Actual Finish	wk 11 31-May	wk 12 07-Jun	wk 13 14-Jun	wk 14 21-Jun	wk 15 28-Jun	wk 16 05-Jul	wk 17 12-Jul	wk 18 19-Jul	wk 19 26-Jul	wk 20 02-Aug	wk 21 09-Aug	wk 22 16-Aug	wk 23 23-Aug	wk 24 30-Aug	wk 25 06-Sep	wk 26 13-Sep	Weight	completed (accum*) Kms	% of total	
1	Pre-testing- Veritas	57,802.55	27-Mar	04-Aug				0.00	5,780.00	5,780.00				11,561.00	5,780.42						5%	57,802.55	100%	5%
2	Pre-Testing- WCL QC	57,802.55	17-Apr	08-Aug	17,340.60			0.00	0.00	0.00				11,560.69	5,780.00	11,560.76					1%	57,802.55	100%	1%
3	Post-testing- Veritas	986.00	11-Aug	21-Aug				0.00	0.00	0.00						394.40	591.60				3%	986.00	100%	3%
4	Post-testing- WCL QC	986.00	16-Aug	22-Aug				0.00	0.00	0.00						295.80	690.20				1%	986.00	100%	1%
5	Reforms/DAA/Resamp/LLL final/datel/nav merge	57,802.55	31-Mar	03-May																	5%	57,802.55	100%	5%
6	Init vel @2 km grid(sht FK/DBS)	57,802.55	19-Apr	04-May																	4%	57,802.55	100%	4%
7	Vel 1 @1 km grid(sht FK/DBSmild demult)	57,802.55	27-Apr	15-May																	7%	57,802.55	100%	7%
8	Vel 1 WCL QC	57,802.55	18-May	02-Jun	0.00	23,121.02															2%	57,802.55	100%	2%
9	tidal/sphdiv/NMO/Sht FK/INMO/WCMA/NMO/ATS	57,802.55	31-May	21-Jun	0.00	24,855.00	21,387.00	11,560.55		0.00											8%	57,802.55	100%	8%
10	Revr FK/INMO/Tau-p DBS	57,802.55	05-Jun	25-Jun		6,358.55	10,982.00	28,901.49	11,560.51	0.00											8%	57,802.55	100%	8%
11	Zero Phasing/Binning	57,802.55	14-Jun	27-Jun				23,121.00	34,681.55	0.00											6%	57,802.55	100%	6%
13	FLOOD/3D DMO	986.00	06-Jul	26-Jul						0.00	591.60	197.20	197.20								12%	986.00	100%	12%
12	Archive CDP after FLOOD (Pre-DMO)	986.00	26-Jul	07-Sep						0.00			0.00	49.30		0.00			739.50	197.20	2%	986.00	100%	2%
14	Vels 2 @ 0.5 sq km	986.00	17-Jul	11-Aug								98.60	98.60	147.90	522.58	118.32					12%	986.00	100%	12%
15	Vels 2 WCL QC	986.00	04-Aug	11-Aug											69.00	917.00					2%	986.00	100%	2%
16	Amp scaling/Muts/ Stk- nostr, tar's full/Archive raw stk	2,958.00	09-Aug	28-Aug											0.00	986.00		1,972.00			7%	2,958.00	100%	7%
17	xline interpolation25m to 12.5m (3 volumes)	2,958.00	15-Aug	29-Aug												986.00		1,972.00			4%	2,958.00	100%	4%
18	3D Migration - 3 volumes/Archive raw mig	2,958.00	17-Aug	07-Sep													986.00	256.00	1,124.00	592.00	8%	2,958.00	100%	8%
19	Post Migration /Archive final mig (3 volumes)	2,958.00	22-Aug	09-Sep													986.00		197.00	1,775.00	3%	2,958.00	100%	3%
																					100%		100%	

NB: Kms reported under each week represent progress in the 7 days prior to that date.
Total Proj (1%) represents the weighted sum of all the Processing Steps % completed values.
Steps 1 to 2; 5 to 11 total kilometers = sailline km, steps 3 to 4, 12 to 20 total kilometers = total sq. km

Total Proj

6. TESTING

Listed below are the processing tests performed on the following lines selected from the Investigator 3D seismic survey unless indicated otherwise.

- Sail line 1642P1, Gun 1–Cable 6 data (Inline 480)
- Sail line 1762P1, Gun 1–Cable 3 data (Inline 359)
- Sail line 1942I1, Gun 1–Cable 3 data (Inline 179)

All test displays were plotted at a consistent scale and accurately annotated. Test products included paper sections and SEG-Y format on disk. The SEG-Y Disk files were transferred to Woodside's FTP site for review.

6.1 Pre-Stack Testing

6.1.1 Anti-Alias Filter Tests

- Resample to 4 msec sample rate with anti-alias filter
- Raw shot at 2 msec sample rate
- Resample to 4 msec sample rate ; anti-alias filter 90 Hz
- Resample to 4 msec sample rate ; anti-alias filter 100 Hz
- Resample to 4 msec sample rate ; anti-alias filter 110 Hz

Decision: 100 Hz (Slope 72 dB/Oct) Anti-alias filter was selected for production

6.1.2 Minimum Phase Low Cut Filter Tests

The selected shot records resample to 4 msec with 90 Hz anti-alias filter were filtered with the following low cut parameters.

- No low cut filter applied
- Low cut filter at 3 Hz (18dB/Oct)
- Low cut filter at 4 Hz (18dB/Oct)
- Low cut filter at 5 Hz (18dB/Oct)
- Low cut filter at 6 Hz (18dB/Oct)

Decision: 4 Hz (Slope 18 dB/Oct) Low cut filter was selected for production

6.1.3 Spherical Divergence Tests

The input to the spherical divergence tests were processed through a processing sequence comprising: Resample and 4Hz low cut filter. The regional velocity function used for the spherical divergence correction was provided by Woodside.

- No Spherical divergence applied
- TV^2 spherical divergence applied

The following regional velocity function was used for the spherical divergence correction:

Time (msec)	Velocity (m/sec)
0	1512
171	1952
265	2090
368	2275
470	2405
642	2554
813	2668
993	2725
1121	2767
1258	2753
1395	2779
1592	2902
1792	3068
2006	3220
2380	3550
2722	3975
3190	4473
3710	4805
4240	5143
4600	5260

6.1.4 FK Filter Test

The input to the Shot FK filter tests were processed through a processing sequence comprising: Resample, minimum phase Butterworth low cut filter, spherical divergence. Shot records and stacks were produced.

NMO velocities	:	1x1 km picked velocities
Adjacent trace sum (ATS)	:	2:1 adjacent trace summing
DBS parameters	:	7 trace average, 36 msec gap with total operator length of 240 msec, 1 design gate

(I.) Shot Record and Spectra displays

- No FK filter
- NMO + Shot FK filter 2250 m/sec
- NMO + Shot FK filter 2500 m/sec
- NMO + Shot FK filter 2750 m/sec

(II.) Stack displays

- NMO + Shot FK filter 2500 m/sec + DBS + Stack
- NMO + Shot FK filter 2750 m/sec + DBS + Stack
- ATS + DBS + DMO + Stack (No FK filter)
- NMO + Shot FK 2500 m/sec + ATS + Receiver FK 2500 m/sec + DBS + Stack
- NMO + Shot FK 2500 m/sec + ATS + Receiver FK 2500 m/sec + DBS + DMO + Stack

(III.) With Omega-X Migration

The following were conducted on the following 3 test lines:

Line 1642P1, Inline 480
Line 1762P1, Inline 359
Line 1942I1, Inline 179

- ATS + DBS + DMO + Stack + Omega-X Migration (No FK filter)
- Shot FK 2500 m/sec + ATS + DBS + DMO + Stack + Omega-X Migration
- Shot FK 2500 m/sec + ATS + Receiver FK 2500 m/sec + DBS + DMO + Stack + Omega-X Migration

(IV.) Additional FK filter tests conducted on the 3 test lines.

- Shot FK filter 2000 m/sec (shot records)
- Shot FK filter 2000 m/sec + ATS + DBS + Stack
- Shot FK filter 2000 m/sec + ATS + DBS + DMO +Stack
- Shot FK filter 2000 m/sec + ATS + Receiver FK filter 2000 m/sec DBS + Stack
- Shot FK filter 2000 m/sec + ATS + Receiver FK filter 2000 m/sec DBS + DMO + Stack

(V.) Swell noise tests with and without another low cut filter conducted on line 1762P1 only

- 4 Hz low cut filter + ATS + DBS + Stack
- 4 Hz low cut filter + 5 Hz low cut filter + ATS + DBS + Stack
- 4 Hz low cut filter + Shot FK filter 2500 m/sec + ATS + DBS + Stack
- 4 Hz low cut filter + 5 Hz low cut filter + Shot FK filter + ATS + DBS + Stack

Decision: Both Shot and Receiver FK filter 2500 m/sec were selected for production.

6.1.5 WEMA Tests

The following WEMA tests were conducted on the 3 test lines:

- Shot FK filter 2500 m/sec + ATS shot records
- Shot FK filter 2500 m/sec + WEMA + ATS shot records
- Shot FK filter 2500 m/sec + ATS + WEMA shot records
- Shot FK filter 2500 m/sec + WEMA + ATS + Stack
- Shot FK filter 2500 m/sec + ATS + WEMA + Stack

Decision: It was decided to run further WEMA tests in conjunction with DBS and was eventually selected to be used prior to ATS in production processing.

6.1.6 Deconvolution Before Stack (DBS) Tests

Stacks were produced with the following DBS parameters.

(I.) DBS Tests conducted on 3D data:

- Shot FK 2500 m/sec + ATS + WEMA + Receiver FK 2500 m/sec + Stack (No DBS)
- Shot FK 2500 m/sec + ATS + WEMA + Receiver FK 2500 m/sec + 36 msec gap DBS + Stack – Line 1762P1 only
- Shot FK 2500 m/sec + ATS + WEMA + Receiver FK 2500 m/sec + 36ms gap Tau-P DECON + Stack
- Shot FK 2500 m/sec + ATS + Receiver FK 2500 m/sec + Stack
- Shot FK 2500 m/sec + ATS + Receiver FK 2500 m/sec + 24 msec gap, total operator length 212 msec DBS + Stack
- Shot FK 2500 m/sec + ATS + Receiver FK 2500 m/sec + 36 msec gap, total operator length 200 msec DBS + Stack
- Shot FK 2500 m/sec + ATS + Receiver FK 2500 m/sec + 48 msec gap, total operator length 188 msec DBS + Stack (See ➸)
- Shot FK 2500 m/sec + ATS + Receiver FK 2500 m/sec + 36 msec gap, total operator length 200 msec Tau-P DECON + Stack (See ➸)

➸: This test was also conducted on the following 2 additional test lines:
Line 1264P1, Northern end 10 km data from source 2 cable 4.
Line 1426P1, Southern end 10 km data from source 2 cable 1.

Apart from the above DBS tests, Woodside has requested to run a series of follow-up tests regarding the Swell noise problems as follows:

- No FK, without swell noise attenuation
- With FK, without swell noise attenuation
- No FK + swell noise attenuation
- With FK + swell noise attenuation

The following additional test were conducted on the following 5 test lines to confirm the final selection of production DBS parameters:

Line 1942I1, Inline 179
Line 1762P1, Inline 359
Line 1642P1, Inline 480
Line 1462P1, Inline 691
Line 1246P1, Inline 875

- Shot FK 2500 m/sec + WEMA + ATS + Receiver FK 2500 m/sec + 36 msec gap, total operator length 200 msec Tau-P DECON + Stack

(II.) DBS Tests conducted on 2D data:
Line W00INV0004P1 was tested with the DBS tests as per the 3D data as follows:

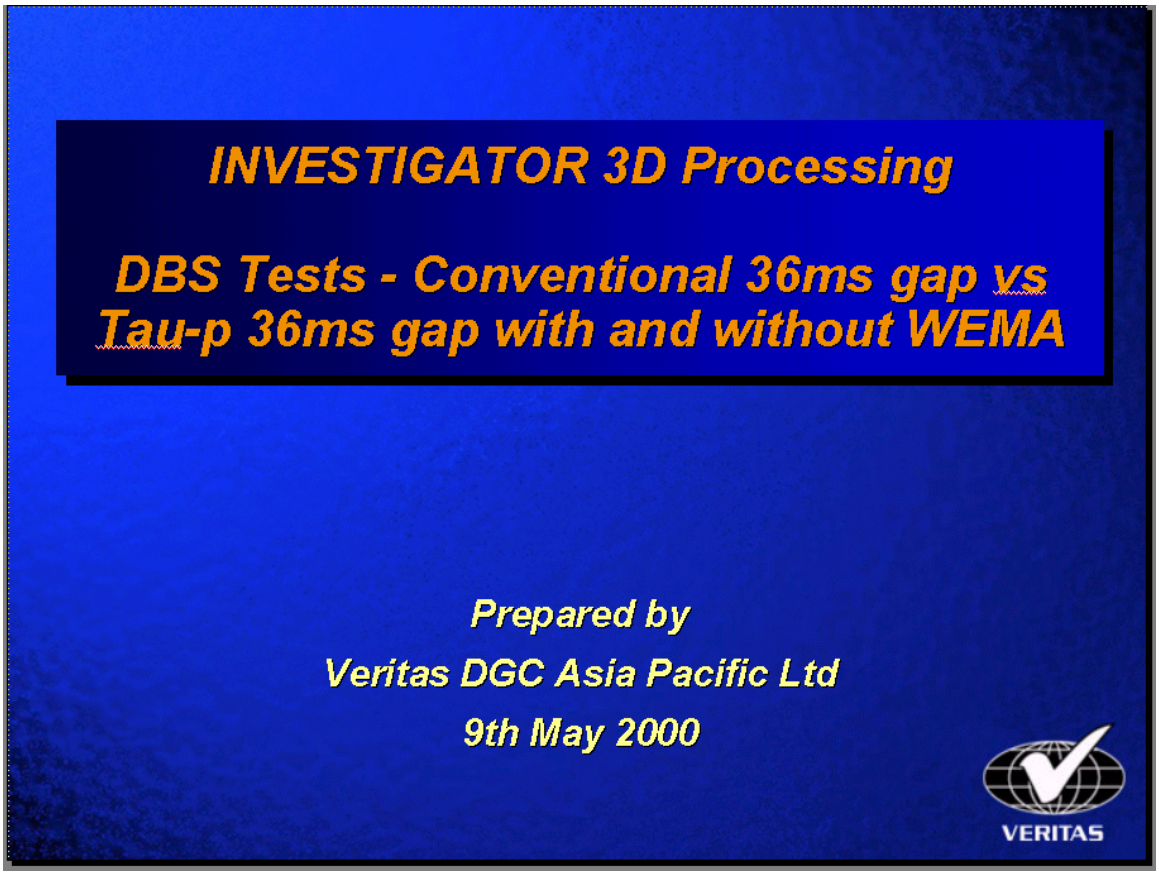
- Shot FK 2500 m/sec + WEMA + ATS + Receiver FK 2500 m/sec + Tau-P DECON
- Shot FK 2500 m/sec + ATS + WEMA + Receiver FK 2500 m/sec + Tau-P DECON
- Shot FK 2500 m/sec + ATS + Receiver FK 2500 m/sec + Tau-P DECON
- Shot FK 2500 m/sec + WEMA + ATS + Receiver FK 2500 m/sec + 36 msec gap, 7 trace average DBS

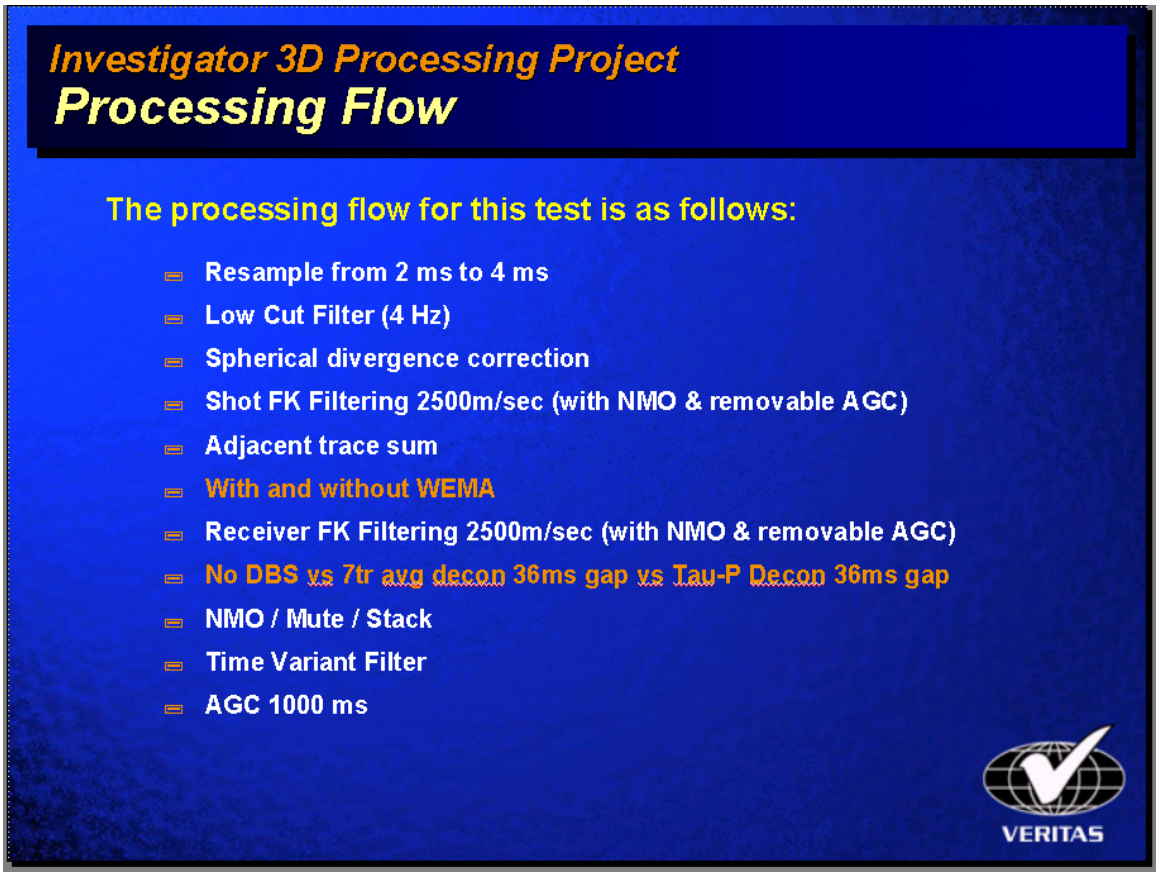
Decision: The final DBS parameters confirmed for both 3D and 2D data as follows:

- Pre-processing as decided
- NMO
- Shot FK filter 2500 m/sec
- WEMA
- 2:1 Adjacent trace sum
- Receiver FK filter 2500 m/sec
- Tau-P DECON

  Tau-P transform : -400 to 667
  DBS : 36 msec gap, total operator length 236 msec
  Inverse Tau-P transform

(III) DBS Tests in PowerPoint file submitted to Woodside

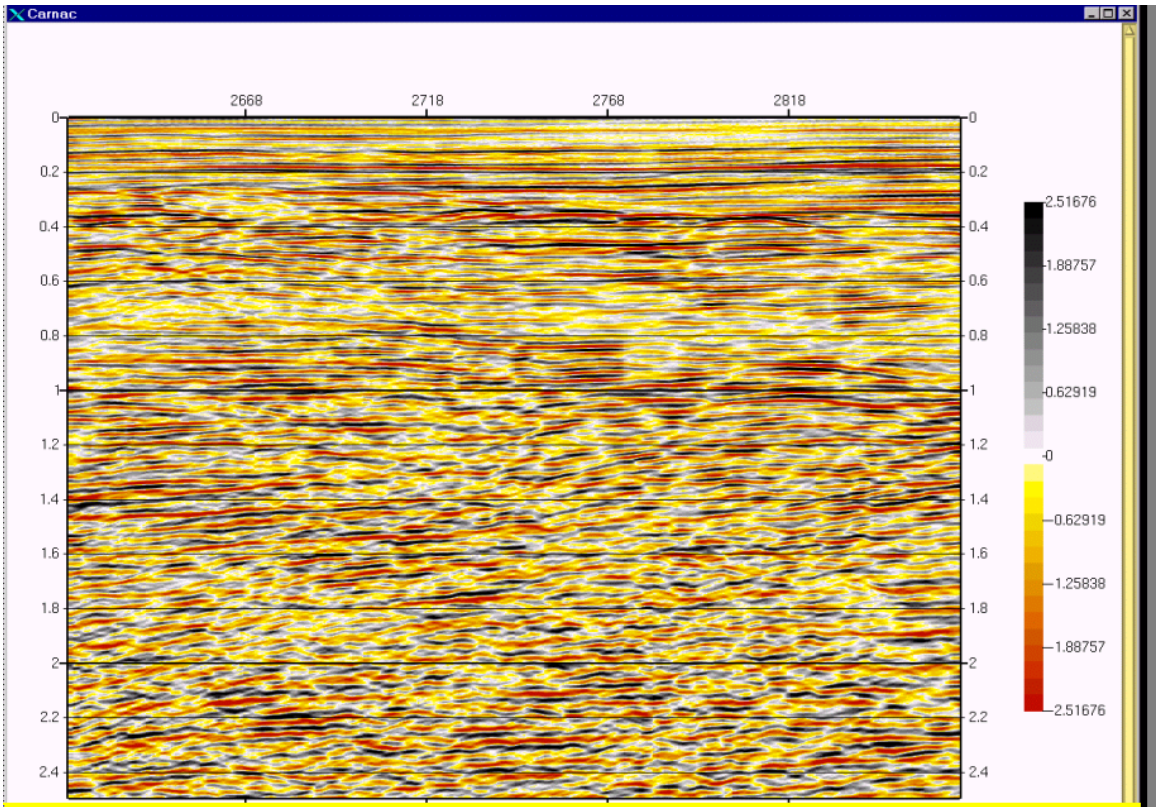




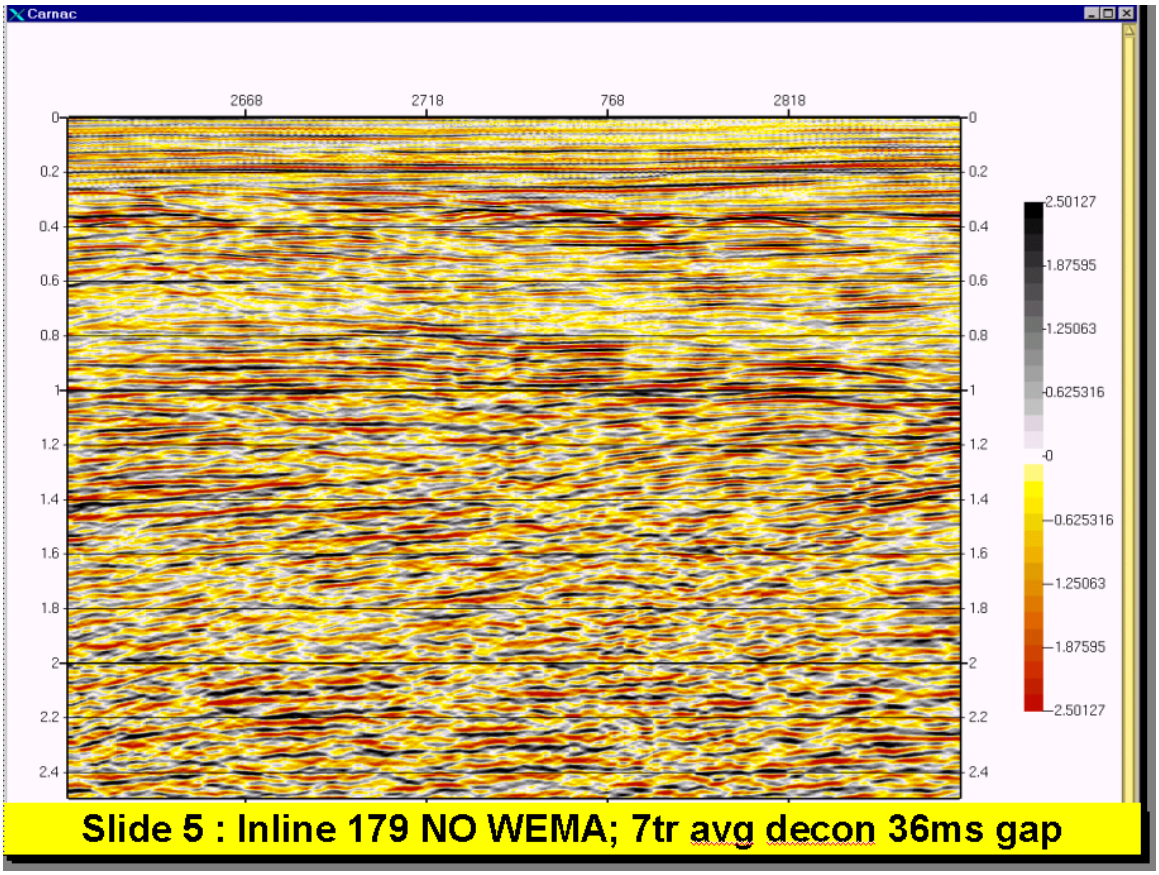
DISPLAY -LINE-1942i1
inline 179
xline2620-2870
Time Range: 500-3000 msec

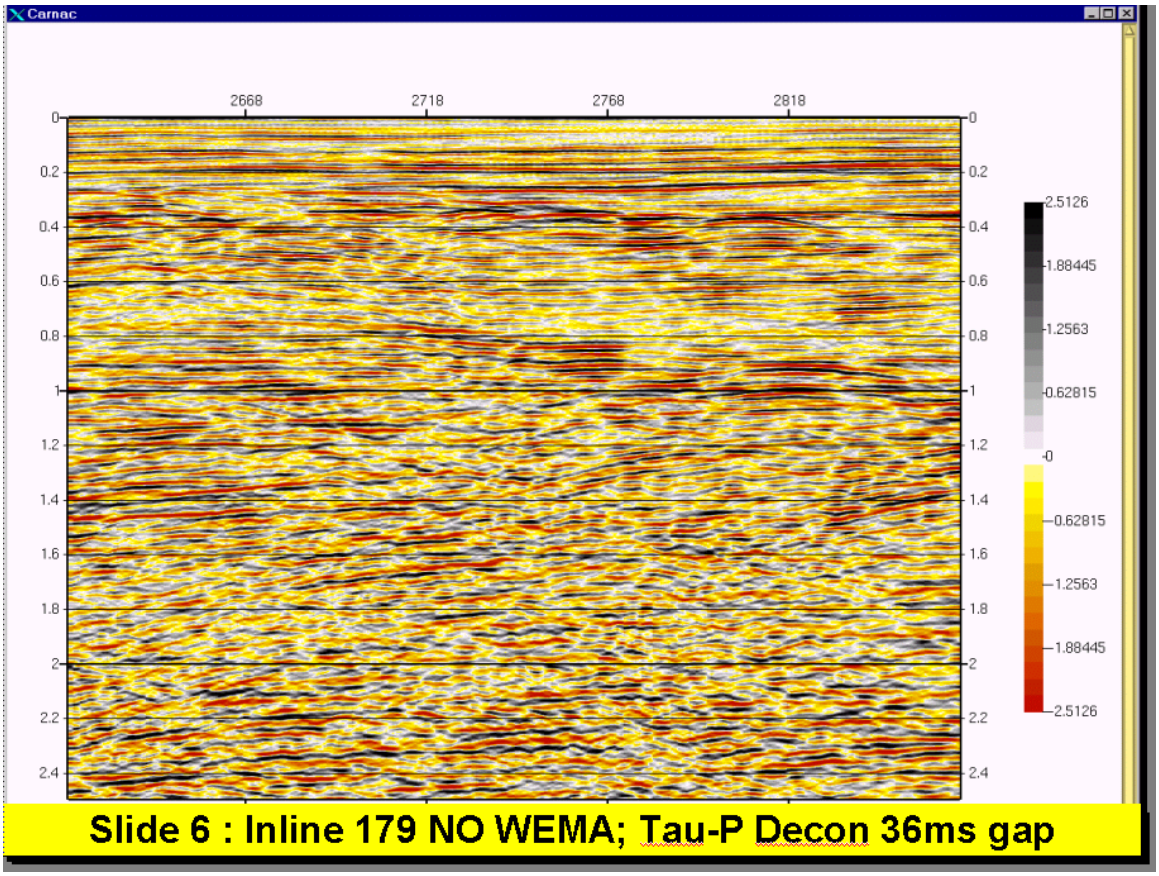
- Slide 4 - no WEMA, no DBS
- Slide 5 - no WEMA, 7 tr avg 36ms gap decon
- Slide 6 - no WEMA, 36ms gap Tau-p decon
- Slide 7 - WEMA, no DBS
- Slide 8 - WEMA, 7tr avg 36ms gap decon
- Slide 9 - WEMA, 36ms gap Tau-p decon
- Slide 10 - Production WEMA, 36ms gap Tau-p decon (revised WEMA parameters for shallow data)

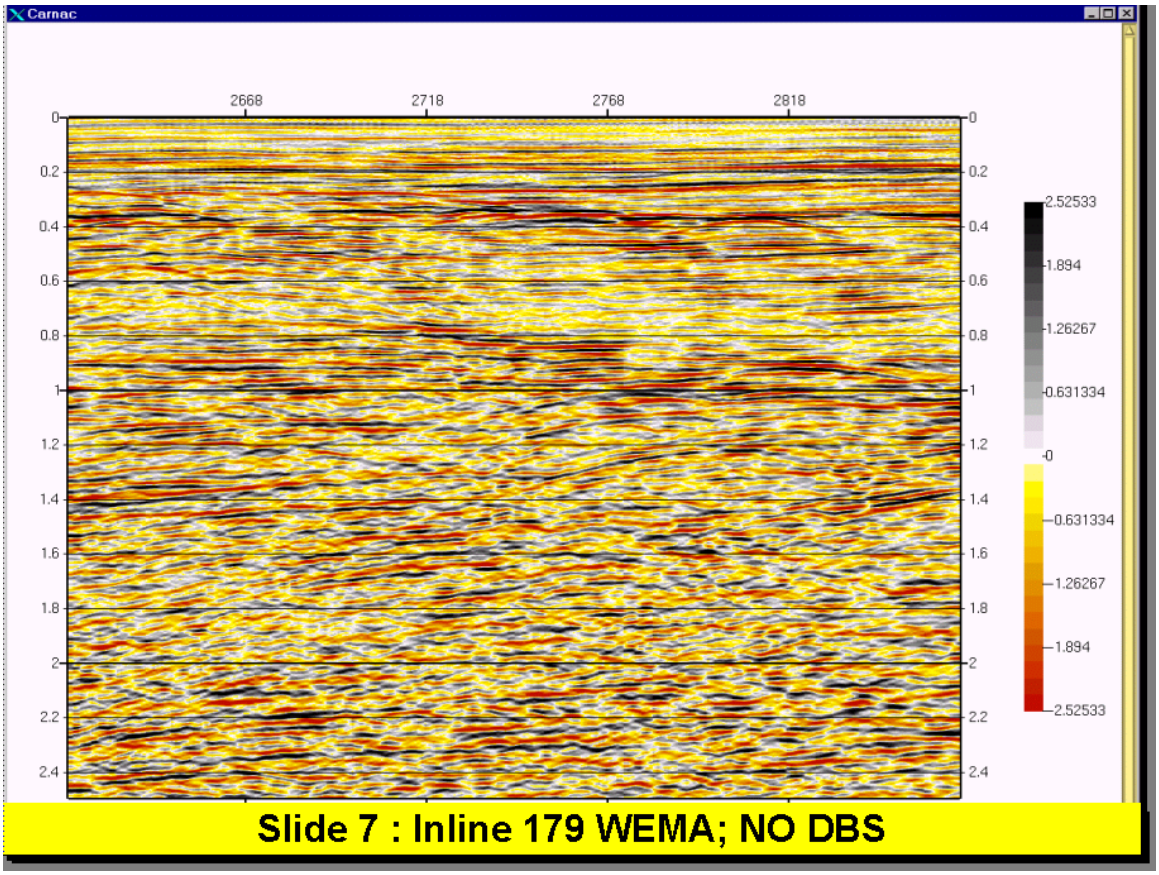
VERITAS

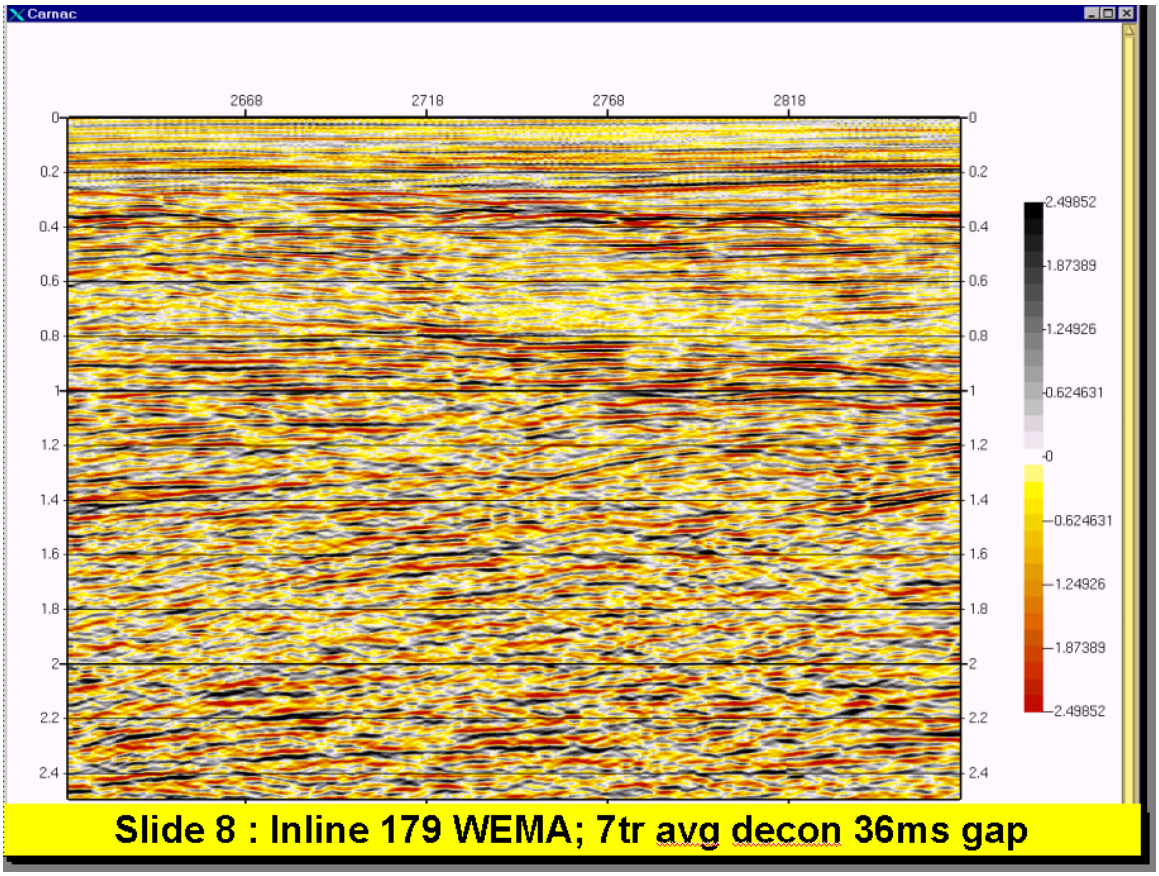


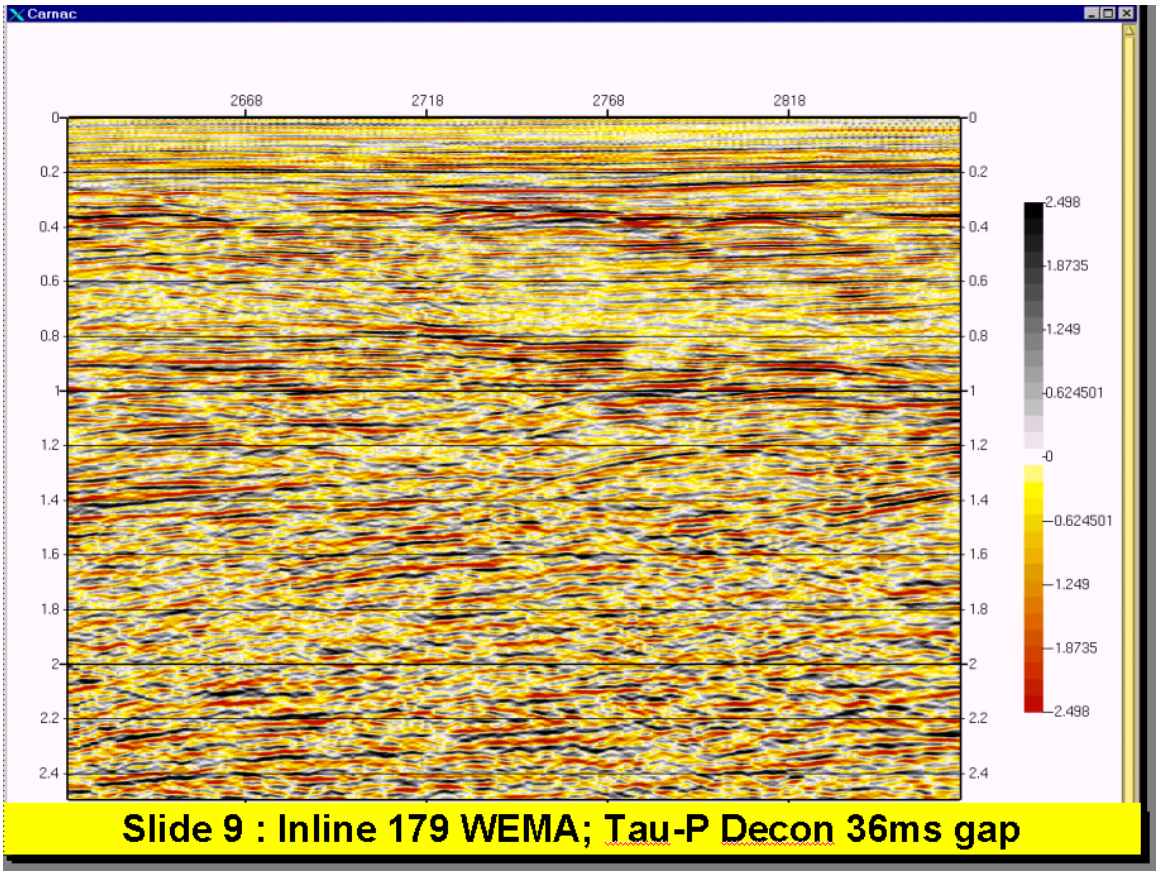
Slide 4 : Inline 179 NO WEMA & NO DBS


Carnac
2668
2718
768
2818
2.50127
1.87595
1.25063
0.625316
-0
0.625316
1.25063
1.87595
2.50127
Slide 5 : Inline 179 NO WEMA; 7tr avg decon 36ms gap

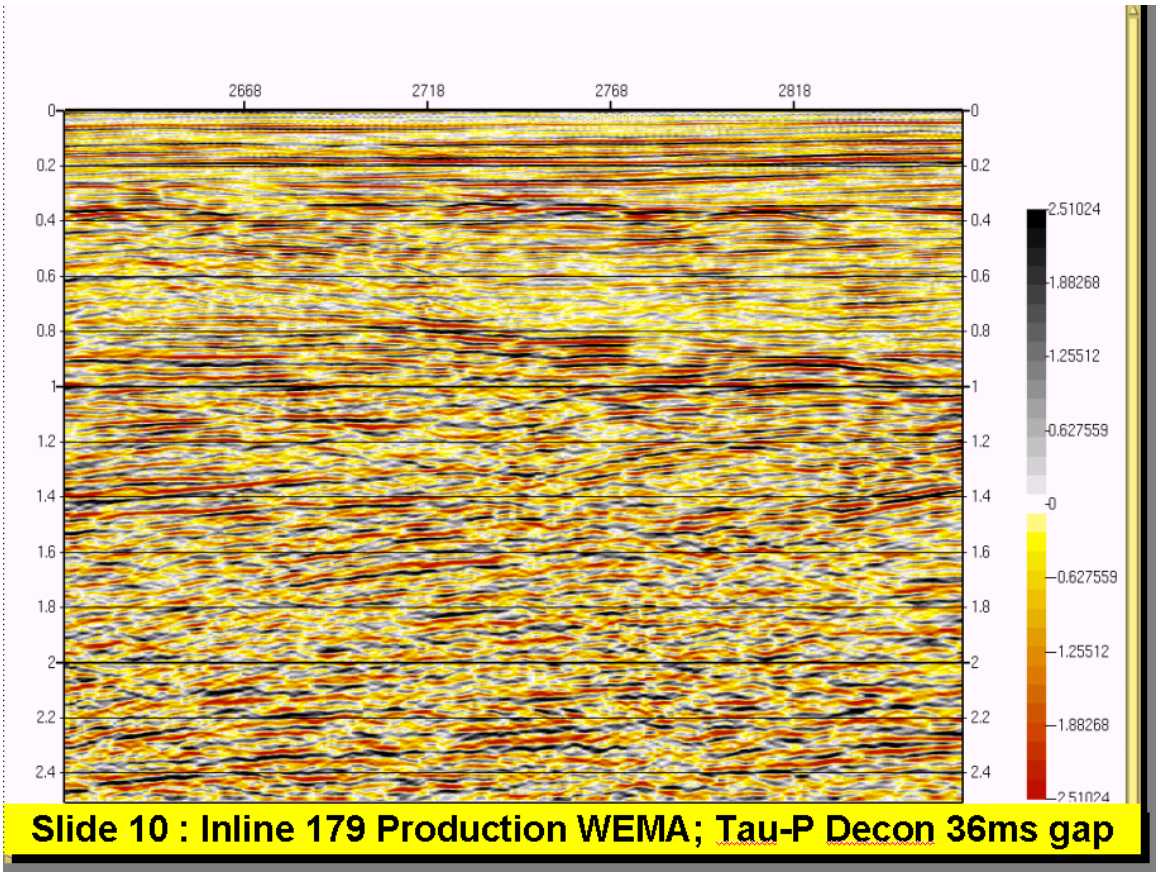

Carnac
2668
2718
2768
2818
2.5126
1.88445
1.2563
0.62815
-0
0.62815
1.2563
1.88445
2.5126
Slide 6 : Inline 179 NO WEMA; Tau-P Decon 36ms gap


Carnac
2668
2718
2768
2818
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
2.2
2.4
2.52533
1.894
1.26267
0.631334
-0
-0.631334
-1.26267
-1.894
-2.52533
Slide 7 : Inline 179 WEMA; NO DBS


Carnac
2668
2718
2768
2818
0
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
2.2
2.4
2.49852
1.87389
1.24926
0.624631
-0
-0.624631
-1.24926
-1.87389
-2.49852
Slide 8 : Inline 179 WEMA; 7tr avg decon 36ms gap



Slide 9 : Inline 179 WEMA; Tau-P Decon 36ms gap



Slide 10 : Inline 179 Production WEMA; Tau-P Decon 36ms gap

6.1.7 Flex-Binning Tests

The 3D navigation data were loaded to produce the bin coverage maps with and without flex-binning. The flex-binning parameters provided by Woodside: 1, 1, 2, 3 was used. The survey was divide into two swaths and 20 colour bin plots and CGM files were FTP'ed to Woodside.

(A). Bin Coverage Maps without flex-binning

1.) All Offsets
2.) First Quarter Offset
3.) Second Quarter Offsets
4.) Third Quarter Offsets
5.) Fourth Quarter Offsets

(B). Bin Coverage Maps with flex-binning of 1, 1, 2, 3

1.)	All Offsets	(1, 1, 2, 3 Bin)
2.)	First Quarter Offset	(1 Bin)
3.)	Second Quarter Offsets	(1 Bin)
4.)	Third Quarter Offsets	(2 Bins)
5.)	Fourth Quarter Offsets	(3 Bins)

6.1.8 Tidal Statics Application Tests

Tidal static information was provided by Woodside. Near trace cube timeslices at times 400, 600, 800 and 1000 msec were generated to QC the tidal static application process.

Decision: It was observed that application of tidal statics had successfully resolved breaks in the data and hence was selected for production.

6.1.9 FLOOD – Fold Levelling For Optimum Offset Distribution Tests

(A). Tests requested by Woodside

1.) No Flex standard edits (From Observer's Logs) all offsets and quartiles 1-4
2.) With Flex standard edits (From Observer's Logs) all offsets and quartiles 1-4
3.) No Flex all edits (From Observer's Logs and including depth edits) all offsets and quartiles 1-4
4.) Fold coverage maps with the following depths edited
    4–1. Shallower than 4 meters and deeper than 8.0 meters
    4–2. Shallower than 4 meters and deeper than 8.5 meters
    4–3. Shallower than 4 meters and deeper than 9.0 meters
    4–4. Shallower than 4 meters and deeper than 9.5 meters

(B). Fold coverage maps and CGM files produced as per WEL's request (A) above.

1.) No Flex standard edits (From Observer's Logs)

1–a.	All Offset range				
1–b.	First Quarter Offsets	(Offsets	125	–	1225m)
1–c.	Second Quarter Offsets	(Offsets	1275	–	2375m)
1–d.	Third Quarter Offsets	(Offsets	2425	–	3525m)
1–e.	Fourth Quarter Offsets	(Offsets	3575	–	4675m)

2.) No Flex all edits (From Observer's Logs and including depth edits)

Cable depth data shallower than 4.5 m and deeper than 7.5 m were removed

2–a. All Offset range
2–b. First Quarter Offsets (Offsets 125 – 1225m)
2–c. Second Quarter Offsets (Offsets 1275 – 2375m)
2–d. Third Quarter Offsets (Offsets 2425 – 3525m)
2–e. Fourth Quarter Offsets (Offsets 3575 – 4675m)

3.) Fold coverage maps and CGM files with the depths edited as per request (A).4 above for inlines 701 – 800.

3–a. Shallower than 4 meters and deeper than 8.0 meters
3–b. Shallower than 4 meters and deeper than 8.5 meters
3–c. Shallower than 4 meters and deeper than 9.0 meters
3–d. Shallower than 4 meters and deeper than 9.5 meters
5 plots each: All offsets + Quartiles 1-4

(C). Inline and Crossline stacks before and after FLOOD

The following displays were produced before and after FLOOD:

1.) Stacks of Inlines 630 and 640
2.) Stacks of crosslines 1000, 1600, 2000, 3000 and 4000
3.) NMO gathers of crossline 3000
4.) Fold coverage maps and CGM files before and after FLOOD for Inlines 610 - 645 ; Crosslines: 400 - 4700

4–a. All Offset range
4–b. First Quarter Offsets (Offsets 125 – 1225m)
4–c. Second Quarter Offsets (Offsets 1275 – 2375m)
4–d. Third Quarter Offsets (Offsets 2425 – 3525m)
4–e. Fourth Quarter Offsets (Offsets 3575 – 4675m)

(D). Final Fold coverage maps before FLOOD

1.) All Offsets
2.) First Quarter Offsets (Offsets 125 – 1225m)
3.) Second Quarter Offsets (Offsets 1275 – 2375m)
4.) Third Quarter Offsets (Offsets 2425 – 3525m)
5.) Fourth Quarter Offsets (Offsets 3575 – 4675m)

(E). Final Fold coverage maps after FLOOD

1.) All Offsets
2.) First Quarter Offsets (Offsets 125 – 1225m)
3.) Second Quarter Offsets (Offsets 1275 – 2375m)
4.) Third Quarter Offsets (Offsets 2425 – 3525m)
5.) Fourth Quarter Offsets (Offsets 3575 – 4675m)

Decision: To use all traces between 4.0 meters and 9.0 metes of cable depths for FLOOD process.

6.1.10 Mute Tests

Stack tests with the following mute tests were conducted.

(A). Incident Angle Mute Tests

The input to the following tests were 18 DMO CDP equally spaced gathers from all over the survey and the 1.0 x 1.0 km velocity field were used for NMO correction.

- Incident angle 20 degree
- Incident angle 25 degree
- Incident angle 30 degree
- Incident angle 35 degree
- Incident angle 40 degree
- Incident angle 5 degree
- Outer Trace Mute parameters provided by Woodside:

Offset (m)	Time(msec)
325	0
326	370
1175	1000
4675	3500

± 10% of the above mute parameters were marked on the DMO CDP gathers for Q.C.

(B). Outer trace mute with and without 2000 msec AGC Tests

The following mute tests were run on Inlines 89 and 881, Crosslines 771 and 3971.

- Stack with mute parameters provided by Woodside
- Stack with minus 10% of mute parameters provided by Woodside
- Stack with plus 10% of mute parameters provided by Woodside
- Stack with mute parameters provided by Woodside with no pre-stack scaling

Decision: The final production mute parameters were:

- Pre-stack scaling of 2000 msec AGC
- Outer mute parameters

Offset (m)	Time(msec)
325	0
326	370
1175	1000
4675	3500

6.2 Post Stack Testing

6.2.1 Crossline Interpolation Tests

Stacks and CGM files of crosslines 1251, 2691 and 3811 before and after interpolation were produced and sent to Woodside for review.

6.3 Post Migration Testing

6.3.1 Q-Compensation Tests

Q-compensation tests were conducted on inline 934 and crossline 2691:

- No Q-Compensation
- Phase only
- Phase + Amplitude compensation, Qlimit = 10dB, Q = 136
- Phase + Amplitude compensation, Qlimit = 15dB, Q = 136
- Phase + Amplitude compensation, Qlimit = 20dB, Q = 136
- Phase + Amplitude compensation, Qlimit = 8dB, Q = 136

Decision: Q-compensation of both phase and amplitude with Q=136 and a maximum amplitude boost of 10dB was selected for production.

6.3.2 Filter Test

The following filter test panels were conducted on Inline 934 ; crosslines 1011-1510

(A). Low cut filter tests

Filter (Hz)

- Out – 4 Hz
- Out – 6 Hz
- Out – 8 Hz
- Out – 10 Hz

(B). High cut filter tests

Filter (Hz)

- 50 Hz – Out
- 60 Hz – Out
- 70 Hz – Out
- 80 Hz – Out
- 90 Hz – Out
- 100 Hz – Out
- Time variant filter as follows

Time (msec)	Filter (Hz/dB per Octave)
0	4/18 – 100/80
1000	4/18 – 90/80
2000	4/18 – 80/72
3000	4/18 – 70/72
4600	4/18 – 65/72

Decision: The final time variant filter parameters selected for production as follows:

Time (msec)	Filter (Hz/dB per Octave)
0	7/18 – 95/72
800	7/18 – 90/72
1400	7/18 – 85/72
2200	7/18 – 70/72
3200	7/18 – 60/72
4600	7/18 – 55/72

6.3.3 Scaling Test

Scaling tests conducted on inline 934 were:

- 1000 msec AGC
- 1500 msec AGC
- Multi-Gate Trace Equalisation

Time Gate (msec)
0 – 1000
500 – 1500
1000 – 2000
1500 – 2500
2000 – 3000
2500 – 3500
3000 – 4000
3500 – 4600

Decision: The Multi-Gate Trace Equalisation was selected for production .

7. PRODUCTION PROCESSING

7.1 Comprehensive Process And Parameter Descriptions

1. REFORMAT

The field data recorded on 3590 tapes in SEG-D format were reformatted and converted to Veritas DGC's internal format.

2. SHOT AND TRACE EDITING

Any bad records or portions of records with anomalous amplitudes and excessively noisy traces were edited. This editing was performed on the basis of comments in the observer's logs and QC notes from the field crew.

3. RESAMPLE FROM 2 MSEC TO 4 MSEC WITH A MINIMUM-PHASE ANTI-ALIAS FILTER

The field data was resample from 2 msec to 4 msec with a minimum-phase anti-alias filter to avoid temporal aliasing. See Appendix C1 for the spectra and listing of the minimum phase anti-alias filter used before resampling.

4. MINIMUM PHASE BUTTERWORTH LOW CUT FILTER 4HZ (18DB/OCT)

Minimum phase Butterworth low cut filter 4Hz (18dB/Oct). See Appendix C2 for the spectra of the minimum phase Butterworth filter.

5. SEISMIC/NAVIGATION MERGE (APPLIED TO 3D DATA ONLY)

The 3D navigation data comprising the receiver and source x-y co-ordinate information and spread definitions were recorded in P190 UKOOA format. Maps of the receiver and shot locations were produced before the co-ordinate information were merged with the seismic data. The 3D navigation data is matched with the seismic (based primarily on navigation time and channel) and all the required information written to the trace header. Bin dimensions: 6.25 m (inline) X 25 m (crossline). This process is repeated with bin dimensions of 12.5 m (inline) X 25 m (crossline) after the application of adjacent trace summation.

6. FIRST VELOCITY ANALYSES (2.0 X 2.0 KM GRID)

They were performed at 2.0 km intervals using Veritas DGC's interactive DIVAN software (part of the TANGO processing system). The screen display consisted of the central gather, a stack panel for each of the velocity functions in the fan, and a velocity window showing coloured semblance contours and stack amplitude picks. Iso-velocity contour displays were also available for display.

21 CDPs were used in the mini-stacks together with 15 velocity trial functions. The interpreted velocity field was used to derive the average velocity function for the spherical divergence correction process.

The following processing were applied to velocity lines at 2.0 x 2.0 km intervals:

(I). Spherical Divergence Correction

The following averaged regional velocity function provided by Woodside was used together with Ursin's offset dependent formula:

Time (msec)	Velocity (m/sec)
0	1512
171	1952
265	2090
368	2275
470	2405
642	2554
813	2668
993	2725
1121	2767
1258	2753
1395	2779
1592	2902
1792	3068
2006	3220
2380	3550
2722	3975
3190	4473
3710	4805
4240	5143
4600	5260

(II). Shot domain FK filtering

Shot domain FK filtering with 1500 m/sec (± 8.33 msec/trace) cut-off velocity (at 40dB down), 50% cosine tapering, 8Hz low frequency protection and 0-200 msec water bottom protection.

(III). Deconvolution: 7 trace average

Type	:	7-trace average
Operator length	:	204 msec
Gap length	:	36 msec
White Noise	:	1.0%
Design gate near offset	:	300 – 3600, 2600 – 4400 msec
Design gate far offset	:	0 – 4600, 0 – 4600 msec

7. TIDAL STATICS CORRECTION (APPLIED TO 3D DATA ONLY)

Tidal static corrections were applied to the data to compensate for tidal variation. Tidal information from the period of data acquisition were provided by Mobil. One static value was computed every 10 minutes per sail line using the following formula:

2*(tidal height in meters at the time of recording) * (-1) / 1.512

8. SPHERICAL DIVERGENCE CORRECTION (TV^2)

This is a correction for amplitude losses due to the spherical spreading of the wavefront as it passes downward through the earth and is reflected back. These losses were compensated by application of a gain function defined as TV^2 where T is the two-way travel time and V is the RMS velocity. For this project, the following averaged regional velocity function derived from first pass velocities picked from item 6 was used together with Ursin's offset dependent formula:

Time (msec)	Velocity (m/sec)
0	1500
125	1500
225	1770
350	1920
500	2020
850	2200
1100	2300
1450	2550
1800	2900
2250	3400
2730	3980
3150	4380
3570	4700
4600	5260

9. SECOND PASS VELOCITY ANALYSES (1.0 X 1.0 KM GRID)

They were performed in the same manner as the first pass velocity analyses (please refer to description in item 6 above) at 1.0x1.0 km grid. The interpreted velocity functions were used for NMO the data prior to running shot FK filtering.

The following processing were applied to velocity lines at 1.0 x 1.0 km intervals:

(I). Normal moveout correction

To minimise the effect of the F-K filter on the shallow, far offset data, NMO correction was performed prior to the process. The velocity functions derived from first pass velocities picked from item 6 were used for the correction.

(II). Shot domain FK filtering: 2500 m/sec, ± 5.0 msec/trace

Shot domain FK filtering with 2500 m/sec (± 5.0 msec/trace) cut-off velocity (at 40dB down), 50% cosine tapering, 8Hz low frequency protection and water bottom + 300 msec protection.

(III). Deconvolution: 7 trace average

Type	:	7-trace average
Operator length	:	204 msec
Gap length	:	36 msec
White Noise	:	1.0%
Design gate near offset	:	300 – 3600, 2600 – 4400 msec
Design gate far offset	:	0 – 4600, 0 – 4600 msec

(IV). PMULT – Radon demultiple

Prior to the radon transform a normal moveout (NMO) correction using 100% of the first pass velocities were applied to the data (this NMO correction was removed after multiple attenuation).

Velocity	:	100 % of 2.0 x 2.0 km velocities picked from item 6
Transform range	:	–200 to 2000 msec
Subtraction ranges	:	300 to 2000 msec.
Start time	:	water bottom + 300 msec
No. of P traces	:	374

10. NORMAL MOVEOUT CORRECTION

The stacking velocity functions derived from the second pass velocity analyses were used to compute the normal move-out (NMO) corrections to be applied to the traces in the final CDP gathers.

NMO correction was performed assuming that the energy travelled in a straight ray-path and utilised the following equation:

$$TT = \sqrt{(T_0^2 + X^2 / V_{rms}^2)}$$

TT = Total recorded travel time in seconds

X = Offset

T_0 = Time of reflector at zero offset in seconds

V = RMS velocity

Velocity-time knee points were honoured on adjacent control points prior to interpolation of the temporal velocity field. Then the space variant velocity function was derived by linear interpolation between control points.

11. SHOT DOMAIN FK FILTERING

The purpose of this process is to remove undesirable linear noise trains which were observed on the shot records. These noise trains affect not just the overall signal-to-noise ratios but also continuity of events.

The F-K filter was designed such that the data would be untouched at K=0 and ramped down to the desired cut-off velocity (at -40 dB) using 50% cosine tapering. A F-K filter with velocity cuts of ± 2500 m/sec (± 5.0 msec/trace), 8Hz low frequency protection and 0-300 msec water bottom protection was selected.

12. REVERSE NORMAL MOVEOUT CORRECTION

The normal moveout correction as applied in item 10 was reversed.

13. WEMA - WAVE EQUATION MULTIPLE ATTENUATION

WEMA simulates the water bottom multiples that are generated over a flat sea-floor using either shot records or CDP gathers. It subtracts these predicted multiples from the original data and outputs the residual.

Matching filter length : 56 msec
Matching filter length designed window : 500 msec

14. NORMAL MOVEOUT CORRECTION

The second pass velocities interpreted from item 9 were used to compute the normal moveout (NMO) corrections to be applied to the traces.

15. ADJACENT TRACE SUMMATION. GROUP INTERVAL 12.5 M TO 25 M

Two adjacent trace summation with full NMO correction using second pass velocities picked from item 9. Effective group interval increased from 12.5 m to 25 m.

16. RECEIVER DOMAIN FK FILTERING: 2500 M/SEC, ± 10 MSEC/TRACE

Receiver domain FK filtering with 2500 m/sec (± 10.0 msec/trace) cut-off velocity (at 50dB down), 50% cosine tapering, 8Hz low frequency protection and water bottom + 300 msec protection.

17. REVERSE NORMAL MOVEOUT CORRECTION

The normal moveout correction as applied in item 14 was reversed.

18. TRANSFORM TO TAU-P DOMAIN

Low dips cut-off : –400 microseconds per meter
High dips cut-off: 667 microseconds per meter

19. PREDICTIVE DECONVOLUTION IN TAU-P DOMAIN

This process was performed using the Wiener-Levinson algorithm to design filters which effectively extract the predictable signal from the total data spectrum. The algorithm assumes that the input wavelets are minimum phase, the input reflectivity spectrum is white and the wavelet is stationary across the inverse filter design windows.

For this project the selected parameters were:

Type	:	predictive
Gap length	:	36 msec
Filter length	:	200 msec
Total operator length	:	236 msec
White noise	:	1.0%

Ray parameter	Design gate (msec)
-400	250 – 4600
0	200 – 4600
470	50 – 3300
667	20 – 2800

20. TRANSFORM TO X-T DOMAIN

21. 3D BINNING (APPLIED TO 3D DATA ONLY)

Binned into 12.5 x 25 m grid to achieve 92 fold bin gathers

22. ZERO PHASING FILTER APPLICATION (FILTER PROVIDED BY WOODSIDE)

Zero phasing filter application (filter provided by Woodside). See Appendix C3 for the spectra and listing of the zero phase filter.

23. NORMAL MOVEOUT CORRECTION

The second pass velocities interpreted from item 9 were used to compute the normal moveout (NMO) corrections to be applied to the traces.

24. FLOOD – FOLD LEVELLING FOR OPTIMUM OFFSET DISTRIBUTION

Although the CDP fold coverage maps showed the coverage to be uniformly 9200%, the offset distribution was not regular. Some bins had duplicate offsets while others were missing that offset altogether. FLOOD was performed to achieve better offset distribution within CDP bins (FLOOD is an acronym for **F**old **L**evelling for **O**ptimum **O**ffset **D**istribution). FLOOD uses dip-dependent interpolation to supply missing traces, instead of copying.

The process was performed over 92 common offset planes, comprising offsets 125 m to 4675m at increments of 50m. Trace interpolation was performed in the F-X domain in crossline direction to interpolate missing data. Gaps of a maximum width of three traces were interpolated. Gaps greater than three traces, are not interpolated.

Fold Coverage Plots Before FLOOD generated:

1. Offset range	:	125	-	1225	(First 23 offsets)
2. Offset range	:	1275	-	2375	(Second 23 offsets)
3. Offset range	:	2524	-	3525	(Third 23 offsets)
4. Offset range	:	3575	-	4675	(Fourth 23 offsets)
5. Offset range	:	125	-	4675	(All 92 offsets)

Fold Coverage Plots After FLOOD generated:

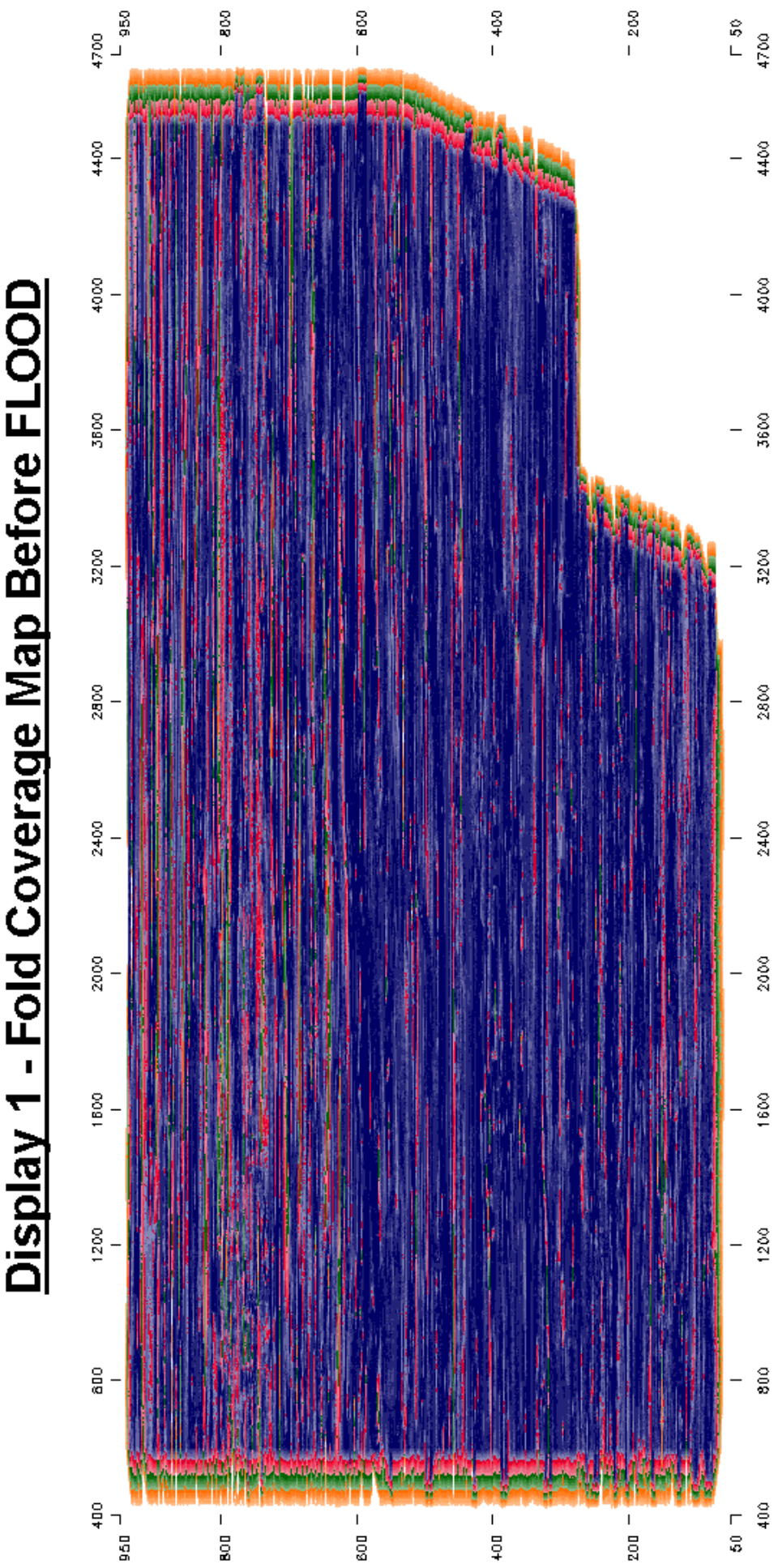
1. Offset range	:	125	-	1225	(First 23 offsets)
2. Offset range	:	1275	-	2375	(Second 23 offsets)
3. Offset range	:	2524	-	3525	(Third 23 offsets)
4. Offset range	:	3575	-	4675	(Fourth 23 offsets)
5. Offset range	:	125	-	4675	(All 92 offsets)

FLOOD is applied to 3D data only.

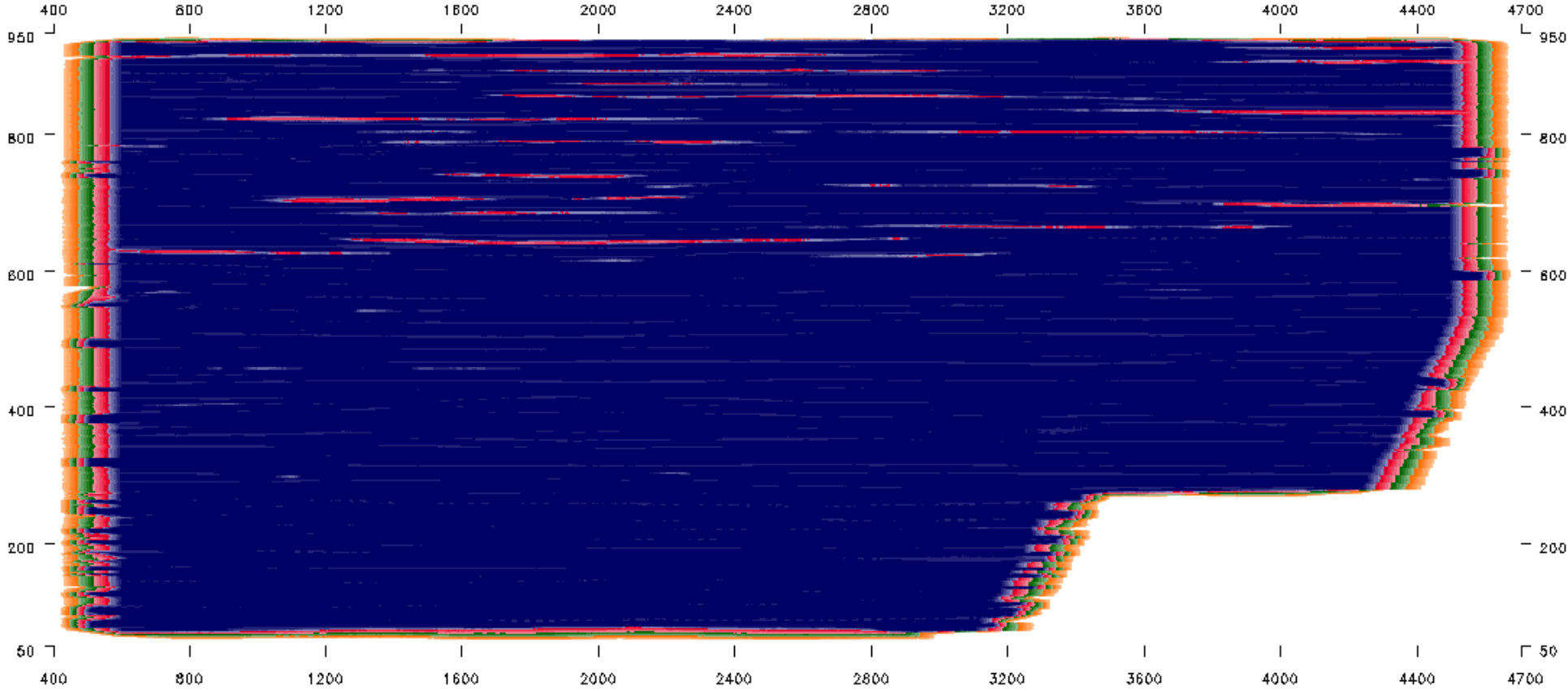
Display 1 shows the fold coverage map before FLOOD

Display 2 shows the fold coverage map after FLOOD

Display 1 - Fold Coverage Map Before FLOOD



Display 2 - Fold Coverage Map After FLOOD



25. KIRCHHOFF DMO

DMO was performed using a Kirchhoff algorithm in the common offset domain. DMO, or partial migration before stack, can improve the quality of a seismic section in one or more of the following ways:

i) it attenuates steeply dipping noise by altering the apparent stacking velocity to its actual propagation velocity.
ii) it alters the normal move-out of dipping events to dip-independent move-out. Thus horizons with conflicting dips in the same area of x-t will stack with the same velocity.
iii) it removes the effect of reflection point dispersal for non-zero offset traces. Thus lateral resolution is enhanced over common depth point stacking.
iv) it provides a good estimate of the migration velocity field. Stacking velocities analysed after DMO are true RMS velocities as seen along the normal incidence ray
v) it results in a true "zero-offset" section. Thus any post stack imaging process (either time or depth migration) will yield better results.

Anti-alias filter option was used.
Dip limit in inline direction : 12 msec/trace
Dip limit in crossline direction : 24 msec/trace

26. REVERSE NORMAL MOVEOUT CORRECTION USING SECOND PASS VELOCITIES PICKED FROM ITEM 9

The normal moveout correction as applied in item 23 was reversed.

27. THIRD PASS VELOCITY ANALYSES (0.45 X 0.5 KM GRID)

They were performed in the same manner as the first pass velocity analyses (please refer to description in item 6 above) at 0.45x0.5 km grid. This grid was bounded by Inlines 71 – 935 (incrementing 18), The crossline ranges varied according to the length of the inlines. The minimum crossline was from 611 to a maximum of 4571 incrementing by 40. The interpreted velocity functions were used for NMO and Stack.

28. NORMAL MOVEOUT CORRECTION

The third pass velocities interpreted from item 27 were used to compute the normal moveout (NMO) corrections to be applied to the traces.

29. OUTER TRACE MUTE

A front-end (outer trace) mute (or ramp) was applied to the shallow and far offset data to remove any undesirable, excessive stretching after NMO application. As the start time of the mute is from zero time it will also remove non-compressional background noise recorded above the first breaks.

Offset (m)	Time(msec)
325	0
326	370
1175	1000
4675	3500

30. PRE-STACK SCALING - 2000 MSEC AGC

In order to equalise amplitudes both in time and offset across each CDP, scaling using automatic gain control [AGC] was performed. AGC is a trace-by-trace data dependent sliding-gate scaling routine that is used to produce well-modulated data.

Over a gate, of user specified length, the average amplitude level of all non-zero samples was calculated and compared with a reference mean (1 for this project). Scalars were computed to bring the measured amplitude level inline with the reference level. The gate is then slid down the trace, sample by sample, computing a new scalar at each gate centre. The scalars are held constant from the gate centre of the first gate up to the first sample, and from the gate centre of the final gate down to the last sample.

For this project, AGC with a gate-length of 2000 msec was used.

31. STACK (1/FOLD NORMALISATION)

Stack is the summation of traces within each CDP producing a single stacked trace for each input gather record. The stack was normalised and mute zone compensated to account for the smaller number of live traces in the mute zone and for uneven fold of coverage. This amplitude compensation was done using a 1/fold function. Three volume of stack datasets were generated, Full volume, Near and Far Stacks.

32. FX INTERPOLATION IN CROSSLINE DIRECTION (3D DATA ONLY)

F-X trace interpolation in crossline direction was performed to achieve output bin size of 12.5x12.5.

33. ONE PASS 3D OMEGA-X MIGRATION

The one pass 3D Omega-X migration was performed on all 3 stack volumes.

Layer thickness	:	20 msec
Migration velocities	:	100% of smoothed third pass 3D velocity field at 0.5 Sq km grid picked from item 27.
Inline smoothing diameter	:	2000 m
Crossline smoothing diameter	:	2000 m
Time smoothing interval	:	200 msec

34. Q COMPENSATION

Q-Compensation of both phase and amplitude with Q=136 and a maximum boost of 10 dB was used. The Q-Compensation was performed on all 3 stack volumes.

35. TIME VARIANT FILTER

The purpose of this process is to remove any unwanted noise that lies outside the frequency range in which an acceptable signal to noise ratio exists. The stacked data were filtered with a series of zero phase bandpass filters. The following time variant filters were used:

Time (msec)	Filter (Hz/dB per Octave)
0	7/18 – 95/72
800	7/18 – 90/72
1400	7/18 – 85/72
2200	7/18 – 70/72
3200	7/18 – 60/72
4600	7/18 – 55/72

36. MULTI-GATE SCALING

The aim of this process is to scale the data to improve the appearance of the final section by increasing the amplitudes of the weak areas relative to strong amplitude areas. This has to be done giving due consideration to:

i) not destroying amplitude relationships between events so severely as to remove all character from the section.
ii) not boosting the noise level so as to mask any signal.

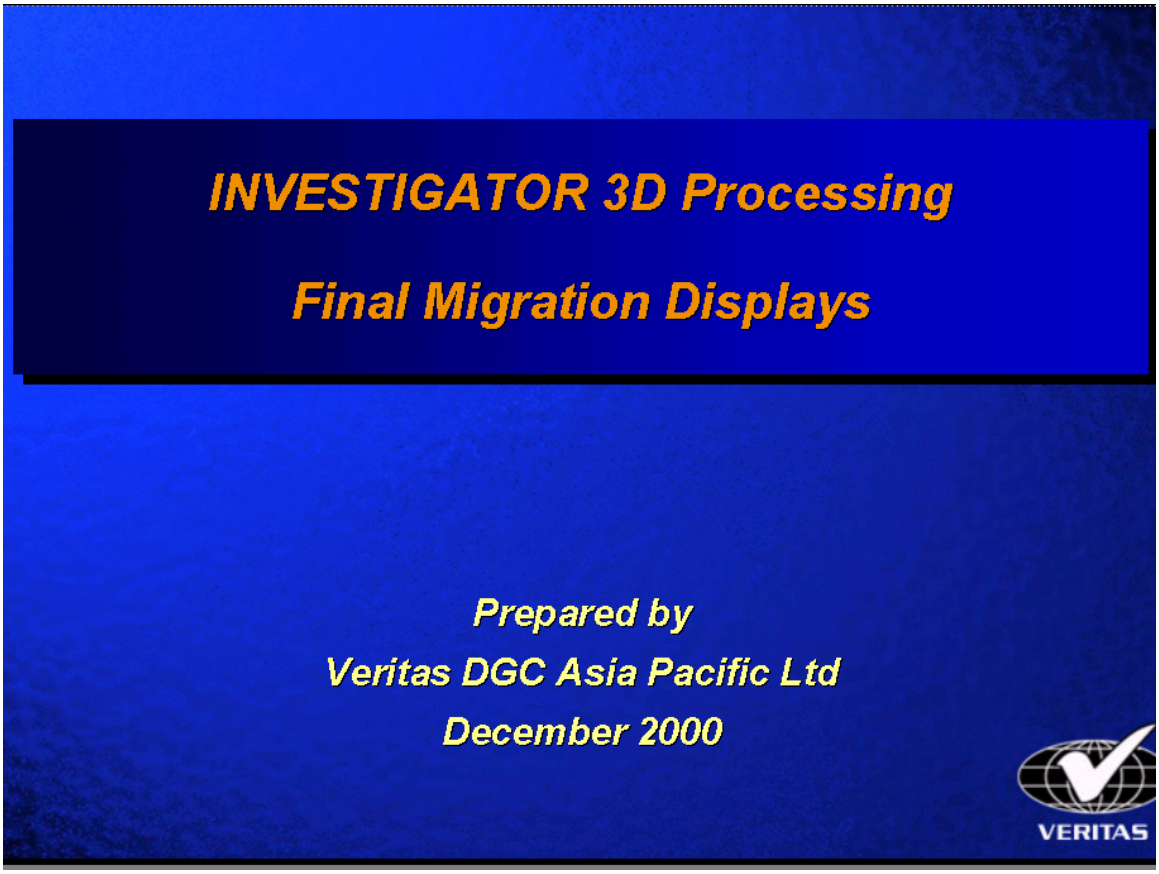
For this project, the multi-gate trace scaling was used:

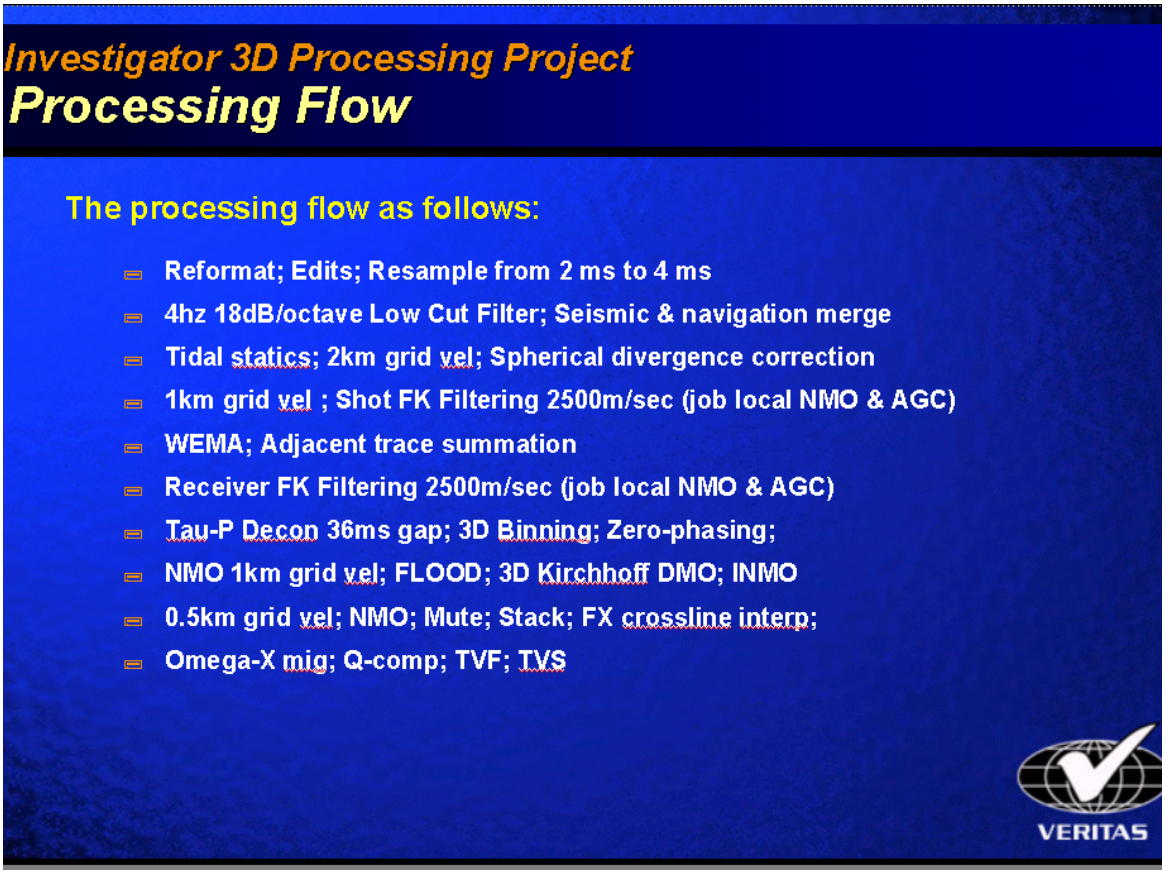
Time Gate (msec)
0 – 1000
500 – 1500
1000 – 2000
1500 – 2500
2000 – 3000
2500 – 3500
3000 – 4000
3500 – 4600

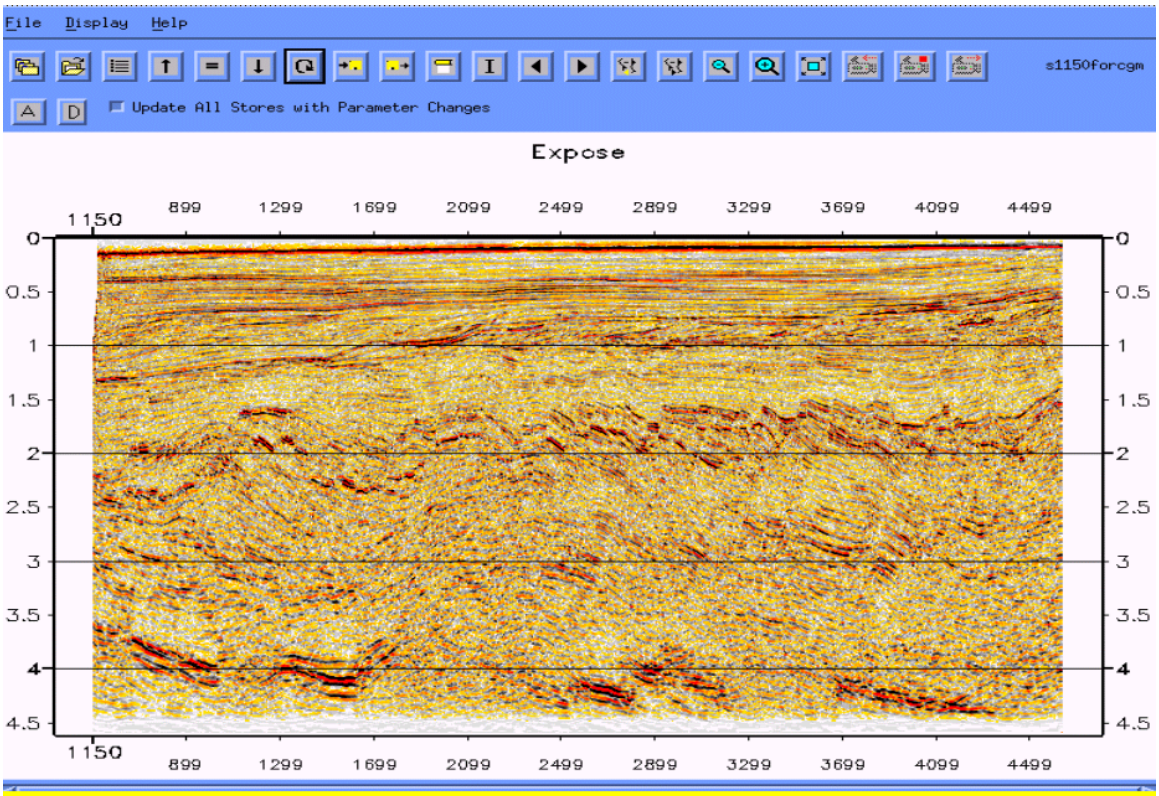
37. SOURCE AND CABLE STATIC CORRECTION: +7.275 MSEC

A total of +7.275 msec source and streamer static correction was applied to mean sea level (MSL) datum.

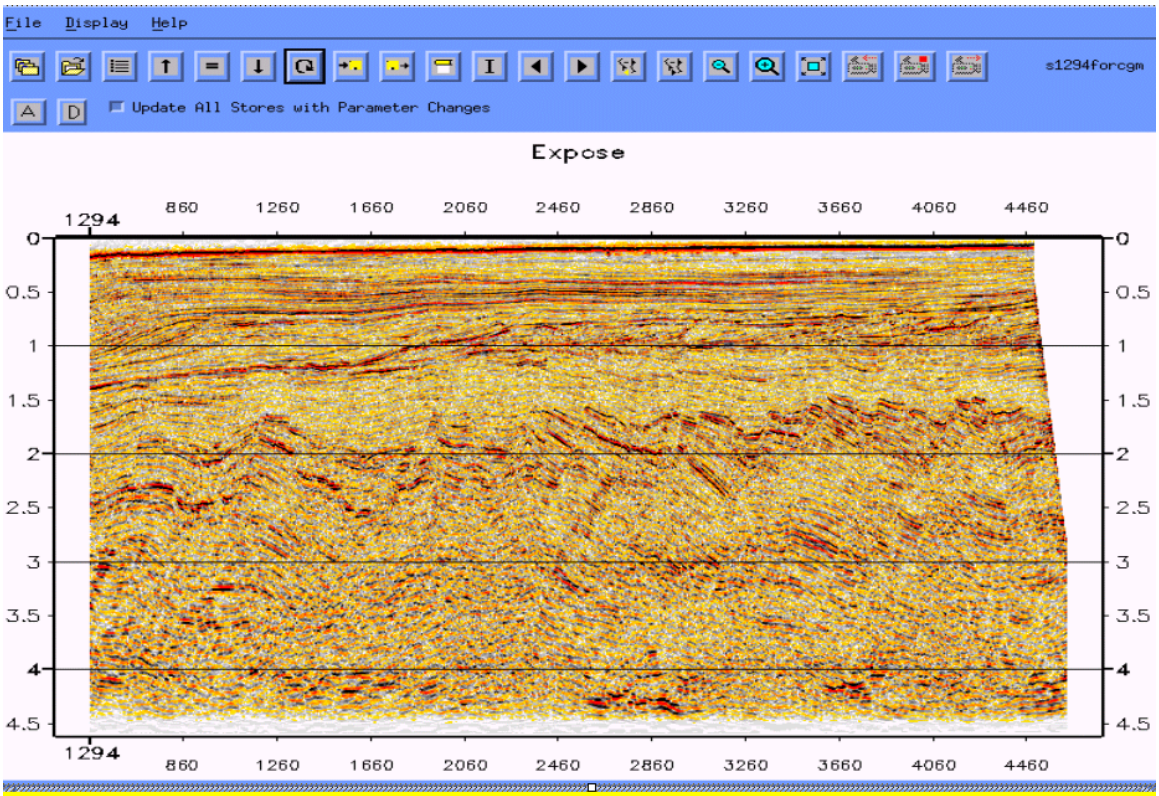
8. FINAL MIGRATION DISPLAYS



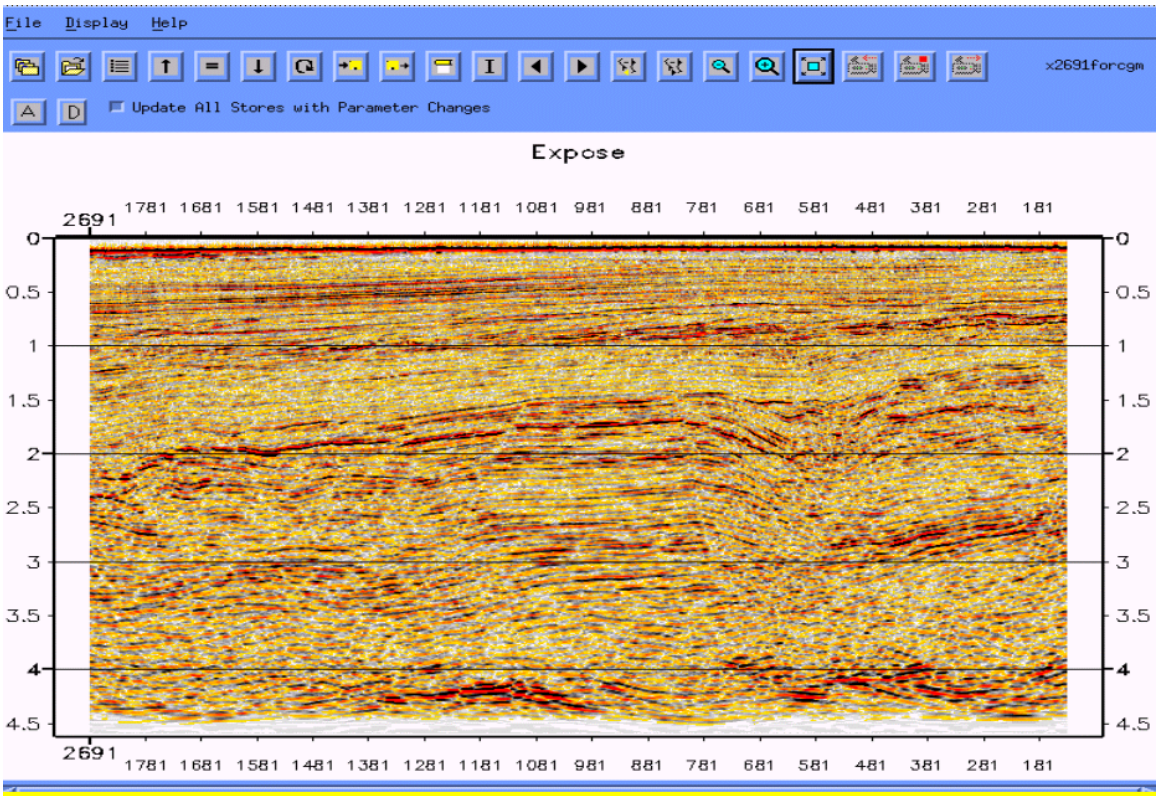




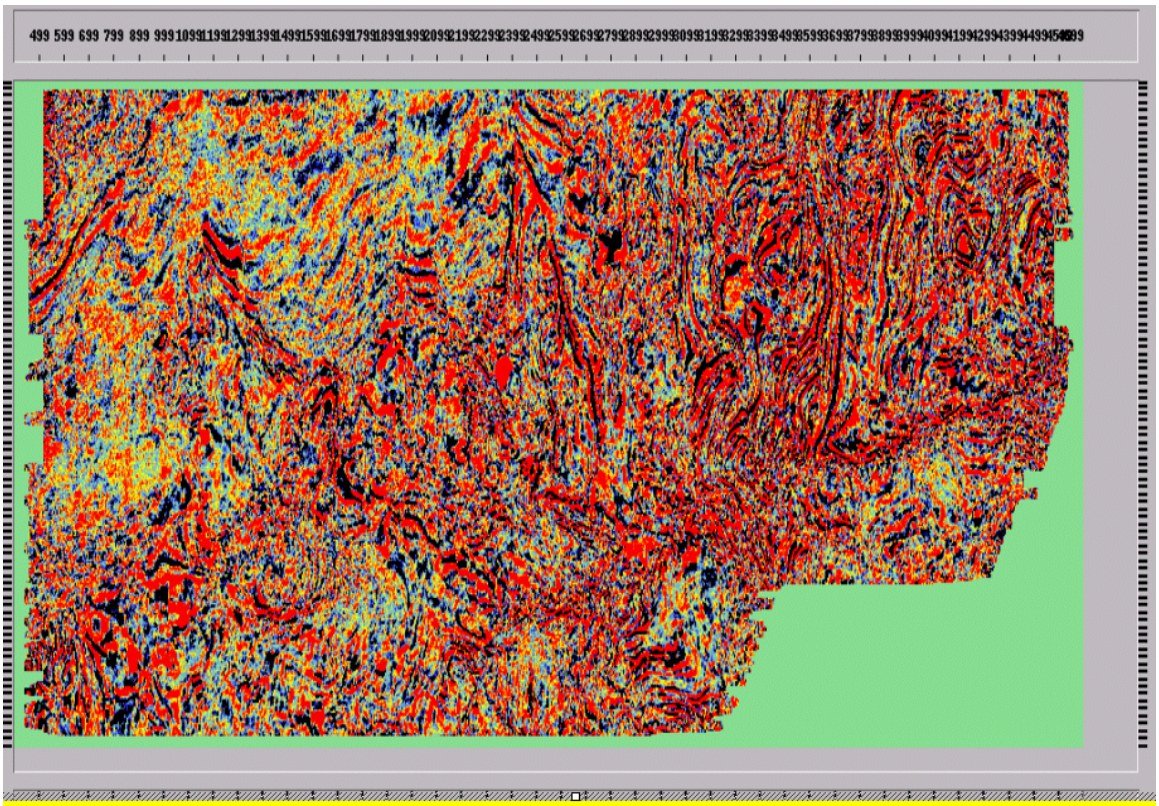
Final Migration - inline 1150



Final Migration - inline 1294



Final Migration - crossline 2691



Final Migration - Timeslice 1800 msec

9. VELOCITY ANALYSIS

9.1 Summary Of Volume And Distribution

The velocity analyses were performed in three passes.

The first pass velocity analyses were performed on a 2km x 2km grid. An average velocity function was derived for spherical divergence correction.

The second pass velocity analyses were performed on a 1 km x 1 km grid. The interpreted velocity functions were used for NMO the data prior to running shot FK filtering.

The third pass velocity analyses were performed on a 0.45 km x 0.5 km regular grid. This grid was bounded by inlines 71 – 935, incrementing by 18. The crossline ranges varied according to the length of the inlines. The minimum crossline was 611 to a maximum of 4571 incrementing by 40. This velocity field was used for final NMO and stack.

The third pass velocities, converted to the final migration grid, were archived to an Exabyte tape. Hence, the velocity lines numbers on the Exabyte tape were 142 to 1870.

9.2 Type Of Velocity Analysis And Parameters

All three passes of velocity analyses were picked using Veritas DGC interactive DIVAN software (part of the TANGO processing system). The screen display consisted of the central gather, a stack panel for each of the velocity functions in the fan, and a velocity window showing coloured semblance contours and stack amplitude picks. Inline and crossline iso-velocity contour displays were also available for display. 21 CDP's were used in the mini-stacks for both initial and first pass velocity analyses, 15 CDP's were used in the mini-stacks for the final pass velocity analyses, and 15 velocity functions were used in the fan.

The second pass velocity analyses gathers at 1.0 x 1.0 km grid were converted to IVP (Interactive Velocity Processing) format and loaded onto the workstation in Woodside's office. The velocity picks were QC'ed by Woodside's interpreter using Western Geophysical's velocity analysis/picking system.

The third pass velocities at 0.45 x 0.5 km grid were QC'ed by Woodside's interpreter in Veritas DGC's Perth processing centre using interactive DIVAN software.

10. QUALITY CONTROL

10.1 Procedures / Methods

Quality control procedures were conducted at every phase of this processing project. The following is a summary of the QC steps taken on a regular basis for each of the major processing phases.

Reformat from SEGD format
- Display of every 250th shot gather
- Near trace display

Seismic/navigation merge
- Check of navigation matching statistics
- Display of cable plot diagrams
- Near trace time slices (with and without tidal statics)

First pass velocity analysis
- Stack displays of velocity lines

Pre processing
- Stack displays of all first pass velocity inlines at 2 km interval

Second pass velocity analysis
- Display of stacks of the of the velocity inlines at 1.0 km interval
- Display of inline and iso-velocity
- Time slices of the velocity field

Third pass velocity analysis
- Display of stacks of the of the velocity inlines at 0.5 km interval
- Display of inline and iso-velocity
- Time slices of the velocity field

FLOOD / 3D DMO
- Colour hardcopies of the fold coverage maps (before FLOOD) of selected offset ranges
- Colour hardcopies of the fold coverage maps (after FLOOD) of selected offset ranges
- Display of stacks of inlines at 2 km intervals
- Displays of stacks of crosslines at 2 km intervals

3D DMO
- Display of stacks of inlines at 0.5 km intervals
- Displays of stacks of crosslines at 2 km intervals
- Display of 3D Stack timeslices
- Interactive QC of the entire 3D DMO stack volume

FX Interpolation in Crossline Direction

- Stack displays of inlines at 2 km intervals
- Stack display of crosslines at 2 km intervals
- Display of 3D Stack timeslices

3D Migration

- Interactive QC of the smoothed migration velocity field
- Display of inlines and crosslines on a 2 km grid after migration
- Display of Migration timeslices
- Interactive QC of the entire 3D Migration volume

APPENDIX A - FIELD DATA LINE LIST

A1 Investigator 3D Data Line List

S/N.	SEQ.	LINE NAME	DATE RECEIVED	DIR.	SHOTS PROCESSED	NO. OF SHOTS	NO. OF CMP KMS	NO. OF INFILL KMS
1	141	W00INV1186P1	24-Apr	7.9	1001 - 5073	4072	610.80	0.00
2	139	W00INV1198I1	19-Apr	7.9	1001 - 5073	4072	610.80	610.80
3	137	W00INV1198P1	19-Apr	7.9	1001 - 5073	4072	610.80	0.00
4	135	W00INV1210P1	19-Apr	7.9	1001 - 5073	4072	610.80	0.00
5	133	W00INV1222P1	19-Apr	7.9	1001 - 5073	4072	610.80	0.00
6	131	W00INV1234P1	19-Apr	7.9	1001 - 5073	4072	610.80	0.00
7	129	W00INV1246P1	19-Apr	7.9	1001 - 5073	4072	610.80	0.00
8	127	W00INV1258P1	19-Apr	7.9	1001 - 5073	4072	610.80	0.00
9	125	W00INV1270I1	19-Apr	7.9	1001 - 5073	4072	610.80	610.80
10	123	W00INV1270P1	19-Apr	7.9	1001 - 5073	4072	610.80	0.00
11	121	W00INV1282P1	19-Apr	7.9	1001 - 5073	4072	610.80	0.00
12	119	W00INV1294P1	19-Apr	7.9	1001 - 5073	4072	610.80	0.00
13	117	W00INV1306P1	19-Apr	7.9	1001 - 5073	4072	610.80	0.00
14	115	W00INV1318P1	19-Apr	7.9	1001 - 5073	4072	610.80	0.00
15	113	W00INV1330P1	19-Apr	7.9	1001 - 5073	4072	610.80	0.00
16	147	W00INV1342I1	24-Apr	187.8	4889 - 1770	3119	467.85	467.85
17	142	W00INV1342P1	24-Apr	7.9	1001 - 5073	4072	610.80	0.00
18	144	W00INV1354P1	24-Apr	7.9	1001 - 5073	4072	610.80	0.00
19	146	W00INV1366I1	24-Apr	7.9	1001 - 5073	4072	610.80	610.80
20	145	W00INV1366P1	24-Apr	187.8	4889 - 817	4072	610.80	0.00
21	143	W00INV1378P1	24-Apr	187.8	4889 - 817	4072	610.80	0.00
22	140	W00INV1390P1	19-Apr	187.8	4889 - 817	4072	610.80	0.00
23	138	W00INV1402P1	19-Apr	187.8	4889 - 817	4072	610.80	0.00
24	136	W00INV1414I1	19-Apr	187.8	4889 - 817	4072	610.80	610.80
25	134	W00INV1414P1	19-Apr	187.8	4889 - 817	4072	610.80	0.00
26	132	W00INV1426P1	19-Apr	187.8	4889 - 817	4072	610.80	0.00
27	130	W00INV1438P2	19-Apr	187.8	4889 - 817	4072	610.80	0.00
28	126	W00INV1450P1	19-Apr	187.8	4889 - 817	4072	610.80	0.00
29	124	W00INV1462I1	19-Apr	187.8	4889 - 817	4072	610.80	610.80
30	122	W00INV1462P1	19-Apr	187.8	4889 - 817	4072	610.80	0.00
31	120	W00INV1474P1	19-Apr	187.8	4889 - 817	4072	610.80	0.00
32	118	W00INV1486I1	19-Apr	187.8	4889 - 817	4072	610.80	610.80
33	116	W00INV1486P2	19-Apr	187.8	4889 - 817	4072	610.80	0.00
34	90	W00INV1498P1	19-Apr	187.8	4889 - 817	4072	610.80	0.00
35	87	W00INV1510P1	19-Apr	7.8	1001 - 5073	4072	610.80	0.00
36	106	W00INV1522I2	19-Apr	7.8	1500 - 5073	3573	535.95	535.95
37	85	W00INV1522P1	19-Apr	7.8	1001 - 5073	4072	610.80	0.00
38	98	W00INV1534I3	19-Apr	7.8	1001 - 2931	1930	289.50	289.50
39	107	W00INV1534I6	19-Apr	187.8	4889 - 817	4072	610.80	610.80
40	82	W00INV1534P1	19-Apr	7.8	1001 - 5073	4072	610.80	0.00

S/N.	SEQ.	LINE NAME	DATE RECEIVED	DIR.	SHOTS PROCESSED	NO. OF SHOTS	NO. OF CMP KMS	NO. OF INFILL KMS
41	80	W00INV1546P1	23-Mar	7.8	1001 - 5073	4072	610.80	0.00
42	77	W00INV1558P1	23-Mar	7.8	1001 - 2782	1781	267.15	0.00
43	78	W00INV1558P2	23-Mar	7.8	2773 - 5073	2300	345.00	0.00
44	75	W00INV1570I1	23-Mar	7.8	1001 - 5073	4072	610.80	610.80
45	109	W00INV1570I2	19-Apr	187.8	3030 - 817	2213	331.95	331.95
46	71	W00INV1570P1	23-Mar	7.8	1850 - 5072	3222	483.30	0.00
47	73	W00INV1570P2	23-Mar	7.8	1001 - 1859	858	128.70	0.00
48	67	W00INV1582P1	23-Mar	7.8	1001 - 2500	1499	224.85	0.00
49	69	W00INV1582P2	23-Mar	7.8	2491 - 5072	2581	387.15	0.00
50	65	W00INV1594I1	23-Mar	7.8	1001 - 5060	4059	608.85	608.85
51	63	W00INV1594P1	23-Mar	7.8	1001 - 5060	4059	608.85	0.00
52	92	W00INV1606I1	19-Apr	187.8	3830 - 817	3013	451.95	451.95
53	61	W00INV1606P3	23-Mar	7.8	1001 - 5048	4047	607.05	0.00
54	53	W00INV1618P1	23-Mar	7.8	1001 - 5036	4035	605.25	0.00
55	51	W00INV1630P1	23-Mar	7.8	1001 - 5024	4023	603.45	0.00
56	108	W00INV1642I1	19-Apr	7.8	1140 - 4130	2990	448.50	448.50
57	48	W00INV1642P1	23-Mar	7.8	1001 - 5012	4011	601.65	0.00
58	46	W00INV1654P1	23-Mar	7.8	1001 - 5000	3999	599.85	0.00
59	44	W00INV1666P1	23-Mar	7.8	1001 - 4988	3987	598.05	0.00
60	89	W00INV1678P1	19-Apr	7.8	1001 - 4976	3975	596.25	0.00
61	100	W00INV1690I1	19-Apr	187.8	4780 - 817	3963	594.45	594.45
62	111	W00INV1690I3	19-Apr	7.8	3180 - 4964	1784	267.60	0.00
63	91	W00INV1690P1	19-Apr	7.8	1001 - 4964	3963	594.45	0.00
64	94	W00INV1702I2	19-Apr	187.8	4768 - 817	3951	592.65	592.65
65	88	W00INV1702P1	19-Apr	187.8	4768 - 817	3951	592.65	0.00
66	86	W00INV1714I2	19-Apr	187.8	4757 - 817	3940	591.00	591.00
67	81	W00INV1714P1	19-Apr	187.8	4757 - 817	3940	591.00	0.00
68	79	W00INV1726P1	23-Mar	187.8	4745 - 817	3928	589.20	0.00
69	104	W00INV1738I1	19-Apr	7.8	1001 - 4917	3916	587.40	587.40
70	76	W00INV1738P1	23-Mar	187.8	4733 - 817	3916	587.40	0.00
71	70	W00INV1750I1	23-Mar	187.8	4721 - 3250	1471	220.65	220.65
72	72	W00INV1750I2	23-Mar	187.8	3259 - 817	2442	366.30	366.30
73	66	W00INV1750P1	23-Mar	187.8	4721 - 817	3904	585.60	0.00
74	64	W00INV1762P1	23-Mar	187.8	4709 - 818	3891	583.65	0.00
75	62	W00INV1774P1	23-Mar	187.8	4697 - 817	3880	582.00	0.00
76	59	W00INV1786P1	23-Mar	187.8	4685 - 1874	2811	421.65	0.00
77	68	W00INV1786P2	23-Mar	187.8	1883 - 1200	683	102.45	0.00
78	74	W00INV1786P3	23-Mar	187.8	1900 - 817	1083	162.45	0.00
79	95	W00INV1798I1	19-Apr	0	1001 - 4530	3529	529.35	529.35
80	54	W00INV1798P1	23-Mar	187.8	4673 - 1650	3023	453.45	0.00
81	60	W00INV1798P2	23-Mar	187.8	1659 - 817	842	126.30	0.00
82	52	W00INV1810P1	23-Mar	187.7	4661 - 817	3844	576.60	0.00
83	105	W00INV1822I1	19-Apr	187.7	4600 - 768	3832	574.80	574.80
84	49	W00INV1822P1	23-Mar	187.7	4649 - 2665	1984	297.60	0.00
85	50	W00INV1822P2	23-Mar	187.7	2675 - 817	1858	278.70	0.00
86	47	W00INV1834I1	23-Mar	187.7	4637 - 817	3820	573.00	573.00

S/N.	SEQ.	LINE NAME	DATE RECEIVED	DIR.	SHOTS PROCESSED	NO. OF SHOTS	NO. OF CMP KMS	NO. OF INFILL KMS
87	45	W00INV1834P1	23-Mar	187.7	4637 - 817	3820	573.00	0.00
88	57	W00INV1846I2	23-Mar	187.8	2700 - 817	1883	282.45	282.45
89	103	W00INV1846I4	19-Apr	187.8	3680 - 1151	2529	379.35	379.35
90	112	W00INV1846I5	19-Apr	187.8	3714 - 2300	1414	212.10	212.10
91	28	W00INV1846P1	23-Mar	7.8	1001 - 3898	2897	434.55	0.00
92	25	W00INV1858P1	23-Mar	187.8	3701 - 817	2884	432.60	0.00
93	23	W00INV1870I1	23-Mar	187.7	3688 - 817	2871	430.65	430.65
94	20	W00INV1870P1	23-Mar	7.8	1001 - 3872	2871	430.65	0.00
95	19	W00INV1882P1	23-Mar	187.7	3675 - 818	2857	428.55	0.00
96	17	W00INV1894I1	23-Mar	187.7	3663 - 817	2846	426.90	426.90
97	42	W00INV1894I2	23-Mar	187.7	3663 - 1839	1824	273.60	273.60
98	43	W00INV1894I3	23-Mar	187.7	1848 - 817	1031	154.65	154.65
99	14	W00INV1894P1	23-Mar	7.8	1001 - 3848	2847	427.05	0.00
100	40	W00INV1906R4	23-Mar	187.7	3650 - 817	2833	424.95	0.00
101	41	W00INV1918I1	23-Mar	7.8	1001 - 3821	2820	423.00	423.00
102	34	W00INV1918R3	23-Mar	7.8	1001 - 3821	2820	423.00	0.00
103	36	W00INV1930R1	23-Mar	187.7	1923 - 1877	46	6.90	0.00
104	3	W00INV1936P1	23-Mar	187.7	3617 - 817	2800	560.00	0.00
105	24	W00INV1942I1	23-Mar	7.8	1125 - 3796	2671	400.65	400.65
106	4	W00INV1952P1	23-Mar	7.8	1001 - 3784	2783	556.60	0.00
107	10	W00INV1954P1	23-Mar	187.7	3599 - 817	2782	417.30	0.00
108	16	W00INV1966P1	23-Mar	7.8	1001 - 3770	2769	415.35	0.00
109	27	W00INV1978I1	23-Mar	187.7	3573 - 817	2756	413.40	413.40
110	26	W00INV1978P1	23-Mar	7.8	1001 - 3757	2756	413.40	0.00
111	21	W00INV1990P1	23-Mar	187.7	3561 - 2040	1521	228.15	0.00
112	30	W00INV2002I1	23-Mar	7.8	1001 - 2179	1178	176.70	176.70
113	18	W00INV2002P1	23-Mar	7.8	1001 - 3732	2731	409.65	0.00
114	15	W00INV2014P1	23-Mar	187.7	3536 - 817	2719	407.85	0.00
115	33	W00INV2026I2	23-Mar	187.7	1350 - 817	533	79.95	79.95
116	11	W00INV2026P2	23-Mar	7.8	1001 - 3706	2705	405.75	0.00
117	5	W00INV2032P1	23-Mar	187.7	3515 - 817	2698	539.60	0.00
118	35	W00INV2038I1	23-Mar	187.7	3420 - 3045	375	56.25	56.25
119	2	W00INV2048P1	23-Mar	7.7	1001 - 3395	2394	478.80	0.00
120	22	W00INV2048R1	23-Mar	7.7	3386 - 3683	297	44.55	0.00
					TOTAL CMP KM RECEIVED :		**57802.55**	**16360.20**

A2 Investigator 2D Data Line List

S/N.	SEQ.	LINE	DIR.	SHOTS PROCESSED	KMS
1	149	W00INV0004P1	9.8	1001 - 2508	37.675
2	152	W00INV0005P1	141.6	2415 - 1820	14.875
3	151	W00INV0006P2	291.8	2386 - 1114	31.800
4	150	W00INV0007P1	187.7	1801 - 909	22.300
				TOTAL :	**106.650**

APPENDIX B - DELIVERABLE ITEMS

B0 Investigator 3D And 2D Seismic Processing Deliverable List

NO.	DATA TYPE NAMES	FORMAT	TAPE TYPE	TAPE NUMBERS.
INVESTIGATOR 3D DATA				
B1.	Mig Final	SEG-Y	3590	GV5428 to GV5431
B2.	Mig Final Nears	SEG-Y	3590	GV5438 to GV5441
B3.	Mig Final fars	SEG-Y	3590	GV5446 to GV5449
B4.	Mig Raw	SEG-Y	3590	GV4924 to GV4927
B5.	Mig Raw Nears	SEG-Y	3590	GV5434 to GV5437
B6.	Mig Raw Fars	SEG-Y	3590	GV5442 to GV5445
B7.	Stk Raw	SEG-Y	3590	GV4922 to GV4923
B8.	Stk Raw Nears	SEG-Y	3590	GV5450 to GV5451
B9.	Stk Raw Fars	SEG-Y	3590	GV5452 to GV5453
B10.	CMP	SEG-Y	RODE 3590	GV3227,GV3229, GV3330 to GV 3399, GV4903 to GV4921
B11.	Vels Stk and Vels Mig	SEG-Y	Exabyte	EXA_VEL_INVG
B12.	UKOOA Bin Center Co-ordinates	ASCII	Exabyte	EXA_INVG_BIN
INVESTIGATOR 2D DATA				
B13.	Mig Final	SEG-Y	3590	GV5456
B14.	Mig Raw	SEG-Y	3590	GV5455
B15.	Stk Raw	SEG-Y	3590	GV5454
B16.	2D CMP	SEG-Y	3590	GV5457
B17.	Vels Stk and Vels Mig	SEG-Y	Exabyte	EXA_VEL_INVG-2D
INVESTIGATOR CGM FILES (3D / 2D DATA)				
B18.	CGM Files (3D / 2D)	TAR	3590	INVG-CGM-01, 02

B1 SEG-Y Archive Of The Final Migrated Volume

The Mig Final volumes were archived to 3590 cartridges in SEG-Y format.

B1.1 Mig Final SEG-Y Tape Headers

SEG-Y Trace Header for Mig Final, tape no: GV4929

Value	Bytes	Item
1	001 - 004	Trace number within line. Starts with 1 per data set
1	005 - 008	Trace number within a tape. Starts with 1 on each tape
0	009 - 012	0
0	013 - 016	0
854	017 - 020	Shot Point Number
5510459	021 - 024	CMP-number
0	025 - 028	0
1	029 - 030	Trace status code (1=seismic data, 2=dead, 3=dummy)
21	031 - 032	Number of vertically summed traces (stack or substack fold)
0	033 - 034	Number of horizontally stacked traces (number of traces summed-fold)
0	035 - 036	0
0	037 - 040	0
0	041 - 044	0
0	045 - 046	0
2	047-048	Interpolated Trace 1 = real 2 = interpolated
5	049 - 050	Source depth [m]
5510459	051 - 054	Processing CMP Number
0	055 - 056	0
0	057 -060	0
0	061 - 064	0
0	065 - 068	0
1	069 - 070	1 if depth in (m), 10 if depth in (dm), 100 if depth in (cm),
1	071 - 072	1 if coordinates in (m), 10 if units in (dm), 100 if units in (cm),
665415	073 - 076	Bin Centre x coordinates (CMP X)
5645284	077 - 080	Bin Centre y coordinates (CMP Y)
0	081 - 084	0
0	085 - 088	0
1	089 - 090	Coordinate units: 1 = metric [m], 2 = seconds of arc, 3 = Imperial [ft]
1512	091 - 092	Water velocity [m/s] used in processing at the bin location
0	093 - 094	Replacement velocity [m/s]. (reef replacement)
6	095 - 096	Streamer depth [m]
0	097 - 098	0
3307	099 - 100	Source depth correction [microseconds] SHTDEP
3968	101 - 102	Group depth correction [microseconds] RECDEP
0	103 - 104	0
4600	105 - 106	T max [ms]
0	107 - 108	Total Gun / Recorder delay time if any (if none = 0)
0	109 - 110	Time of first sample of trace [ms]
256	111 - 112	Start time of mute or time of first live sample on trace in [ms]
276	113 - 114	End time of mute or time of full on sample in [ms] .
		(End-Start = the mute ramp)

Value	Bytes	Item
1151	115 - 116	Number of samples in this trace
4000	117 - 118	Sample interval for this trace (in micro seconds)
0	119 - 120	0
0	121 - 122	0
0	123 - 124	0
665415	125 - 128	Bin Centre x coordinates (CMP X)
5645284	129 - 132	Bin Centre y coordinates (CMP Y)
0	133 - 134	0
2	135 - 136	Seismic datum flag (1 = floating datum, 2 = flat Reference datum,
		3 = acquisition datum)
0	137 - 138	Bulk shift static in [microseconds] which has been applied to avoid losing
		seismic data above t=0 [s]. (BULKSH)
0	139 - 140	0
100	141 - 142	Cut-off frequency of anti-alias filter in [Hz] (-3 dB point) [processing]
12	143 - 144	Order of the slope of the anti-alias filter [processing]
0	145 - 146	Notch filter frequency. Normally = 0 [processing]
0	147 - 148	Notch filter slope. Normally = 0 [processing]
4	149 - 150	Cut-off frequency of low-cut filter in [Hz] (-3 dB point) [processing]
0	151 - 152	Cut-off frequency of high-cut filter in [Hz] (-3 dB point) [processing]
3	153 - 154	Order of the slope of the low-cut filter [processing]
0	155 - 156	Order of the slope of the high-cut filter [processing]
0	157 - 158	0
0	159 - 160	0
0	161 - 162	0
0	163 - 164	0
0	165 - 166	0
0	167 - 168	0
0	169 - 170	0
0	171 - 172	0
0	173 - 174	0
0	175 - 176	0
0	177 - 180	Residual CMP static (in microseconds)
0	181 - 182	0
1	183 - 184	Vintage (1=new data, 2=reprocessing)
551	185 - 188	CMP inline number (LLLLLL)
459	189 - 192	CMP crossline number (XXXXXX)
0	193 - 196	0
0	197 - 200	0
0	201 - 204	0
0	205 - 208	0
0	209 - 212	0
96	213 - 216	CMP water depth (units see bytes 69-72)
0	217 - 220	POSNMO (floating datum) static (in microseconds)
0	221 - 224	0
0	225 - 228	0
0	229 - 232	0
0	233 - 236	0
0	237 - 240	Floating datum water depth (optional, units see bytes 69 - 71)

B1.2 Mig Final SEG-Y Tape Log

CLIENT : WOODSIDE ENERGY LTD
AREA : INVESTIGATOR 3D
PROCESS : MIG FINAL
FORMAT : WEL SEG-Y VERSION M.09
TAPE TYPE : 3590 CARTRIDGE
DATA LENGTH : 4600 MSEC
SAMPLE RATE : 4 MSEC

NO.	TAPE ID	INLINE RANGES
1	GV4928	132 – 550
2	GV4929	551 – 1000
3	GV4930	1001 – 1450
4	GV4931	1451 – 1880

Investigator 3D Migration Grid:

Crossline (CDP) Spacing : 12.5 m
Crossline (CDP) Increment : 1.0
Inline Spacing : 12.5 m
Inline Increment : 1.0

Inline (After Interpolation)	Crossline	Easting	Northing
132	414	670499.930	5643909.002
132	3272	676088.551	5679194.168
536	3508	671562.207	5682897.842
538	4426	673332.600	5694235.477
1064	4675	667325.451	5698338.213
1880	4675	657251.030	5699933.845
1880	414	648918.940	5647327.095

B2 SEG-Y Archive Of The Final Migrated Nears Volume

The Mig Final Nears volumes were archived to 3590 cartridges in SEG-Y format.

B2.1 Mig Final Nears SEG-Y Tape Headers

SEG-Y Trace Header for Mig Final Nears, tape no: GV5439

Value	Bytes	Item
1	001 - 004	Trace number within line. Starts with 1 per data set
1	005 - 008	Trace number within a tape. Starts with 1 on each tape
0	009 - 012	0
0	013 - 016	0
965	017 - 020	Shot Point Number
5510570	021 - 024	CMP-number
0	025 - 028	0
1	029 - 030	Trace status code (1=seismic data, 2=dead, 3=dummy)
41	031 - 032	Number of vertically summed traces (stack or substack fold)
0	033 - 034	Number of horizontally stacked traces (number of traces summed-fold)
0	035 - 036	0
0	037 - 040	0
0	041 - 044	0
0	045 - 046	0
2	047-048	Interpolated Trace 1 = real 2 = interpolated
5	049 - 050	Source depth [m]
5510570	051 - 054	Processing CMP Number
0	055 - 056	0
0	057 -060	0
0	061 - 064	0
0	065 - 068	0
1	069 - 070	1 if depth in (m), 10 if depth in (dm), 100 if depth in (cm),
1	071 - 072	1 if coordinates in (m), 10 if units in (dm), 100 if units in (cm),
665632	073 - 076	Bin Centre x coordinates (CMP X)
5646655	077 - 080	Bin Centre y coordinates (CMP Y)
0	081 - 084	0
0	085 - 088	0
1	089 - 090	Coordinate units: 1 = metric [m], 2 = seconds of arc, 3 = Imperial [ft]
1512	091 - 092	Water velocity [m/s] used in processing at the bin location
0	093 - 094	Replacement velocity [m/s]. (reef replacement)
6	095 - 096	Streamer depth [m]
0	097 - 098	0
3307	099 - 100	Source depth correction [microseconds] SHTDEP
3968	101 - 102	Group depth correction [microseconds] RECDEP
0	103 - 104	0
4600	105 - 106	T max [ms]
0	107 - 108	Total Gun / Recorder delay time if any (if none = 0)
0	109 - 110	Time of first sample of trace [ms]
532	111 - 112	Start time of mute or time of first live sample on trace in [ms]
552	113 - 114	End time of mute or time of full on sample in [ms] .
		(End-Start = the mute ramp)

Value	Bytes	Item
1151	115 - 116	Number of samples in this trace
4000	117 - 118	Sample interval for this trace (in micro seconds)
0	119 - 120	0
0	121 - 122	0
0	123 - 124	0
665632	125 - 128	Bin Centre x coordinates (CMP X)
5646655	129 - 132	Bin Centre y coordinates (CMP Y)
0	133 - 134	0
2	135 - 136	Seismic datum flag (1 = floating datum, 2 = flat Reference datum,
		3 = acquisition datum)
0	137 - 138	Bulk shift static in [microseconds] which has been applied to avoid losing
		seismic data above t=0 [s]. (BULKSH)
0	139 - 140	0
100	141 - 142	Cut-off frequency of anti-alias filter in [Hz] (-3 dB point) [processing]
12	143 - 144	Order of the slope of the anti-alias filter [processing]
0	145 - 146	Notch filter frequency. Normally = 0 [processing]
0	147 - 148	Notch filter slope. Normally = 0 [processing]
4	149 - 150	Cut-off frequency of low-cut filter in [Hz] (-3 dB point) [processing]
0	151 - 152	Cut-off frequency of high-cut filter in [Hz] (-3 dB point) [processing]
3	153 - 154	Order of the slope of the low-cut filter [processing]
0	155 - 156	Order of the slope of the high-cut filter [processing]
0	157 - 158	0
0	159 - 160	0
0	161 - 162	0
0	163 - 164	0
0	165 - 166	0
0	167 - 168	0
0	169 - 170	0
0	171 - 172	0
0	173 - 174	0
0	175 - 176	0
0	177 - 180	Residual CMP static (in microseconds)
0	181 - 182	0
1	183 - 184	Vintage (1=new data, 2=reprocessing)
551	185 - 188	CMP inline number (LLLLLL)
570	189 - 192	CMP crossline number (XXXXXX)
0	193 - 196	0
0	197 - 200	0
0	201 - 204	0
0	205 - 208	0
0	209 - 212	0
95	213 - 216	CMP water depth (units see bytes 69-72)
0	217 - 220	POSNMO (floating datum) static (in microseconds)
0	221 - 224	0
0	225 - 228	0
0	229 - 232	0
0	233 - 236	0
0	237 - 240	Floating datum water depth (optional, units see bytes 69 - 71)

B2.2 Mig Final SEG-Y Tape Log

CLIENT : WOODSIDE ENERGY LTD
AREA : INVESTIGATOR 3D
PROCESS : MIG FINAL NEARS
FORMAT : WEL SEG-Y VERSION M.09
TAPE TYPE : 3590 CARTRIDGE
DATA LENGTH : 4600 MSEC
SAMPLE RATE : 4 MSEC

NO.	TAPE ID	INLINE RANGES
1	GV5438	132 – 550
2	GV5439	551 – 1000
3	GV5440	1001 – 1450
4	GV5441	1451 – 1880

Investigator 3D Migration Grid:

Crossline (CDP) Spacing : 12.5 m
Crossline (CDP) Increment : 1.0
Inline Spacing : 12.5 m
Inline Increment : 1.0

Inline (After Interpolation)	Crossline	Easting	Northing
132	414	670499.930	5643909.002
132	3272	676088.551	5679194.168
536	3508	671562.207	5682897.842
538	4426	673332.600	5694235.477
1064	4675	667325.451	5698338.213
1880	4675	657251.030	5699933.845
1880	414	648918.940	5647327.095

B3 SEG-Y Archive Of The Final Migrated Fars Volume

The Mig Final Fars volumes were archived to 3590 cartridges in SEG-Y format.

B3.1 Mig Final Fars SEG-Y Tape Headers

SEG-Y Trace Header for Mig Final Fars, tape no: GV5447

Value	Bytes	Item
1	001 - 004	Trace number within line. Starts with 1 per data set
1	005 - 008	Trace number within a tape. Starts with 1 on each tape
0	009 - 012	0
0	013 - 016	0
965	017 - 020	Shot Point Number
5510570	021 - 024	CMP-number
0	025 - 028	0
1	029 - 030	Trace status code (1=seismic data, 2=dead, 3=dummy)
73	031 - 032	Number of vertically summed traces (stack or substack fold)
0	033 - 034	Number of horizontally stacked traces (number of traces summed-fold)
0	035 - 036	0
0	037 - 040	0
0	041 - 044	0
0	045 - 046	0
2	047-048	Interpolated Trace 1 = real 2 = interpolated
5	049 - 050	Source depth [m]
5510570	051 - 054	Processing CMP Number
0	055 - 056	0
0	057 -060	0
0	061 - 064	0
0	065 - 068	0
1	069 - 070	1 if depth in (m), 10 if depth in (dm), 100 if depth in (cm),
1	071 - 072	1 if coordinates in (m), 10 if units in (dm), 100 if units in (cm),
665632	073 - 076	Bin Centre x coordinates (CMP X)
5646655	077 - 080	Bin Centre y coordinates (CMP Y)
0	081 - 084	0
0	085 - 088	0
1	089 - 090	Coordinate units: 1 = metric [m], 2 = seconds of arc, 3 = Imperial [ft]
1512	091 - 092	Water velocity [m/s] used in processing at the bin location
0	093 - 094	Replacement velocity [m/s]. (reef replacement)
6	095 - 096	Streamer depth [m]
0	097 - 098	0
3307	099 - 100	Source depth correction [microseconds] SHTDEP
3968	101 - 102	Group depth correction [microseconds] RECDEP
0	103 - 104	0
4600	105 - 106	T max [ms]
0	107 - 108	Total Gun / Recorder delay time if any (if none = 0)
0	109 - 110	Time of first sample of trace [ms]
188	111 - 112	Start time of mute or time of first live sample on trace in [ms]
208	113 - 114	End time of mute or time of full on sample in [ms] .
		(End-Start = the mute ramp)

Value	Bytes	Item
1151	115 - 116	Number of samples in this trace
4000	117 - 118	Sample interval for this trace (in micro seconds)
0	119 - 120	0
0	121 - 122	0
0	123 - 124	0
665632	125 - 128	Bin Centre x coordinates (CMP X)
5646655	129 - 132	Bin Centre y coordinates (CMP Y)
0	133 - 134	0
2	135 - 136	Seismic datum flag (1 = floating datum, 2 = flat Reference datum,
		3 = acquisition datum)
0	137 - 138	Bulk shift static in [microseconds] which has been applied to avoid losing
		seismic data above t=0 [s]. (BULKSH)
0	139 - 140	0
100	141 - 142	Cut-off frequency of anti-alias filter in [Hz] (-3 dB point) [processing]
12	143 - 144	Order of the slope of the anti-alias filter [processing]
0	145 - 146	Notch filter frequency. Normally = 0 [processing]
0	147 - 148	Notch filter slope. Normally = 0 [processing]
4	149 - 150	Cut-off frequency of low-cut filter in [Hz] (-3 dB point) [processing]
0	151 - 152	Cut-off frequency of high-cut filter in [Hz] (-3 dB point) [processing]
3	153 - 154	Order of the slope of the low-cut filter [processing]
0	155 - 156	Order of the slope of the high-cut filter [processing]
0	157 - 158	0
0	159 - 160	0
0	161 - 162	0
0	163 - 164	0
0	165 - 166	0
0	167 - 168	0
0	169 - 170	0
0	171 - 172	0
0	173 - 174	0
0	175 - 176	0
0	177 - 180	Residual CMP static (in microseconds)
0	181 - 182	0
1	183 - 184	Vintage (1=new data, 2=reprocessing)
551	185 - 188	CMP inline number (LLLLLL)
570	189 - 192	CMP crossline number (XXXXXX)
0	193 - 196	0
0	197 - 200	0
0	201 - 204	0
0	205 - 208	0
0	209 - 212	0
95	213 - 216	CMP water depth (units see bytes 69-72)
0	217 - 220	POSNMO (floating datum) static (in microseconds)
0	221 - 224	0
0	225 - 228	0
0	229 - 232	0
0	233 - 236	0
0	237 - 240	Floating datum water depth (optional, units see bytes 69 - 71)

B3.2 Mig Final SEG-Y Tape Log

CLIENT : WOODSIDE ENERGY LTD
AREA : INVESTIGATOR 3D
PROCESS : MIG FINAL FARS
FORMAT : WEL SEG-Y VERSION M.09
TAPE TYPE : 3590 CARTRIDGE
DATA LENGTH : 4600 MSEC
SAMPLE RATE : 4 MSEC

NO.	TAPE ID	INLINE RANGES
1	GV5446	132 – 550
2	GV5447	551 – 1000
3	GV5448	1001 – 1450
4	GV5449	1451 – 1880

Investigator 3D Migration Grid:

Crossline (CDP) Spacing : 12.5 m
Crossline (CDP) Increment : 1.0
Inline Spacing : 12.5 m
Inline Increment : 1.0

Inline (After Interpolation)	Crossline	Easting	Northing
132	414	670499.930	5643909.002
132	3272	676088.551	5679194.168
536	3508	671562.207	5682897.842
538	4426	673332.600	5694235.477
1064	4675	667325.451	5698338.213
1880	4675	657251.030	5699933.845
1880	414	648918.940	5647327.095

B4 SEG-Y Archive Of The Raw Migrated Volume

The Mig Raw volumes were archived to 3590 cartridges in SEG-Y format.

B4.1 Mig Raw SEG-Y Tape Headers

SEG-Y Trace Header for Mig Raw, tape no: GV4925

Value	Bytes	Item
1	001 - 004	Trace number within line. Starts with 1 per data set
1	005 - 008	Trace number within a tape. Starts with 1 on each tape
0	009 - 012	0
0	013 - 016	0
854	017 - 020	Shot Point Number
5510459	021 - 024	CMP-number
0	025 - 028	0
1	029 - 030	Trace status code (1=seismic data, 2=dead, 3=dummy)
21	031 - 032	Number of vertically summed traces (stack or substack fold)
0	033 - 034	Number of horizontally stacked traces (number of traces summed-fold)
0	035 - 036	0
0	037 - 040	0
0	041 - 044	0
0	045 - 046	0
2	047-048	Interpolated Trace 1 = real 2 = interpolated
5	049 - 050	Source depth [m]
5510459	051 - 054	Processing CMP Number
0	055 - 056	0
0	057 -060	0
0	061 - 064	0
0	065 - 068	0
1	069 - 070	1 if depth in (m), 10 if depth in (dm), 100 if depth in (cm),
1	071 - 072	1 if coordinates in (m), 10 if units in (dm), 100 if units in (cm),
665415	073 - 076	Bin Centre x coordinates (CMP X)
5645284	077 - 080	Bin Centre y coordinates (CMP Y)
0	081 - 084	0
0	085 - 088	0
1	089 - 090	Coordinate units: 1 = metric [m], 2 = seconds of arc, 3 = Imperial [ft]
1512	091 - 092	Water velocity [m/s] used in processing at the bin location
0	093 - 094	Replacement velocity [m/s]. (reef replacement)
6	095 - 096	Streamer depth [m]
0	097 - 098	0
3307	099 - 100	Source depth correction [microseconds] SHTDEP
3968	101 - 102	Group depth correction [microseconds] RECDEP
0	103 - 104	0
4600	105 - 106	T max [ms]
0	107 - 108	Total Gun / Recorder delay time if any (if none = 0)
0	109 - 110	Time of first sample of trace [ms]
256	111 - 112	Start time of mute or time of first live sample on trace in [ms]
276	113 - 114	End time of mute or time of full on sample in [ms] .
		(End-Start = the mute ramp)

Value	Bytes	Item
1151	115 - 116	Number of samples in this trace
4000	117 - 118	Sample interval for this trace (in micro seconds)
0	119 - 120	0
0	121 - 122	0
0	123 - 124	0
665415	125 - 128	Bin Centre x coordinates (CMP X)
5645284	129 - 132	Bin Centre y coordinates (CMP Y)
0	133 - 134	0
2	135 - 136	Seismic datum flag (1 = floating datum, 2 = flat Reference datum,
		3 = acquisition datum)
0	137 - 138	Bulk shift static in [microseconds] which has been applied to avoid losing
		seismic data above t=0 [s]. (BULKSH)
0	139 - 140	0
100	141 - 142	Cut-off frequency of anti-alias filter in [Hz] (-3 dB point) [processing]
12	143 - 144	Order of the slope of the anti-alias filter [processing]
0	145 - 146	Notch filter frequency. Normally = 0 [processing]
0	147 - 148	Notch filter slope. Normally = 0 [processing]
4	149 - 150	Cut-off frequency of low-cut filter in [Hz] (-3 dB point) [processing]
0	151 - 152	Cut-off frequency of high-cut filter in [Hz] (-3 dB point) [processing]
3	153 - 154	Order of the slope of the low-cut filter [processing]
0	155 - 156	Order of the slope of the high-cut filter [processing]
0	157 - 158	0
0	159 - 160	0
0	161 - 162	0
0	163 - 164	0
0	165 - 166	0
0	167 - 168	0
0	169 - 170	0
0	171 - 172	0
0	173 - 174	0
0	175 - 176	0
0	177 - 180	Residual CMP static (in microseconds)
0	181 - 182	0
1	183 - 184	Vintage (1=new data, 2=reprocessing)
551	185 - 188	CMP inline number (LLLLLL)
459	189 - 192	CMP crossline number (XXXXXX)
0	193 - 196	0
0	197 - 200	0
0	201 - 204	0
0	205 - 208	0
0	209 - 212	0
96	213 - 216	CMP water depth (units see bytes 69-72)
0	217 - 220	POSNMO (floating datum) static (in microseconds)
0	221 - 224	0
0	225 - 228	0
0	229 - 232	0
0	233 - 236	0
0	237 - 240	Floating datum water depth (optional, units see bytes 69 - 71)

B4.2 Mig Raw SEG-Y Tape Log

CLIENT : WOODSIDE ENERGY LTD
AREA : INVESTIGATOR 3D
PROCESS : MIG RAW
FORMAT : WEL SEG-Y VERSION M.09
TAPE TYPE : 3590 CARTRIDGE
DATA LENGTH : 4600 MSEC
SAMPLE RATE : 4 MSEC

NO.	TAPE ID	INLINE RANGES
1	GV4924	132 – 550
2	GV4925	551 – 1000
3	GV4926	1001 – 1450
4	GV4927	1451 – 1880

Investigator 3D Migration Grid:

Crossline (CDP) Spacing : 12.5 m
Crossline (CDP) Increment : 1.0
Inline Spacing : 12.5 m
Inline Increment : 1.0

Inline (After Interpolation)	Crossline	Easting	Northing
132	414	670499.930	5643909.002
132	3272	676088.551	5679194.168
536	3508	671562.207	5682897.842
538	4426	673332.600	5694235.477
1064	4675	667325.451	5698338.213
1880	4675	657251.030	5699933.845
1880	414	648918.940	5647327.095

B5 SEG-Y Archive Of The Raw Migrated Nears Volume

The Mig Raw Nears volumes were archived to 3590 cartridges in SEG-Y format.

B5.1 Mig Raw Nears SEG-Y Tape Headers

SEG-Y Trace Header for Mig Raw Nears, tape no: GV5435

Value	Bytes	Item
1	001 - 004	Trace number within line. Starts with 1 per data set
1	005 - 008	Trace number within a tape. Starts with 1 on each tape
0	009 - 012	0
0	013 - 016	0
965	017 - 020	Shot Point Number
5510570	021 - 024	CMP-number
0	025 - 028	0
1	029 - 030	Trace status code (1=seismic data, 2=dead, 3=dummy)
41	031 - 032	Number of vertically summed traces (stack or substack fold)
0	033 - 034	Number of horizontally stacked traces (number of traces summed-fold)
0	035 - 036	0
0	037 - 040	0
0	041 - 044	0
0	045 - 046	0
2	047-048	Interpolated Trace 1 = real 2 = interpolated
5	049 - 050	Source depth [m]
5510570	051 - 054	Processing CMP Number
0	055 - 056	0
0	057 -060	0
0	061 - 064	0
0	065 - 068	0
1	069 - 070	1 if depth in (m), 10 if depth in (dm), 100 if depth in (cm),
1	071 - 072	1 if coordinates in (m), 10 if units in (dm), 100 if units in (cm),
665632	073 - 076	Bin Centre x coordinates (CMP X)
5646655	077 - 080	Bin Centre y coordinates (CMP Y)
0	081 - 084	0
0	085 - 088	0
1	089 - 090	Coordinate units: 1 = metric [m], 2 = seconds of arc, 3 = Imperial [ft]
1512	091 - 092	Water velocity [m/s] used in processing at the bin location
0	093 - 094	Replacement velocity [m/s]. (reef replacement)
6	095 - 096	Streamer depth [m]
0	097 - 098	0
3307	099 - 100	Source depth correction [microseconds] SHTDEP
3968	101 - 102	Group depth correction [microseconds] RECDEP
0	103 - 104	0
4600	105 - 106	T max [ms]
0	107 - 108	Total Gun / Recorder delay time if any (if none = 0)
0	109 - 110	Time of first sample of trace [ms]
532	111 - 112	Start time of mute or time of first live sample on trace in [ms]
552	113 - 114	End time of mute or time of full on sample in [ms] .
		(End-Start = the mute ramp)

Value	Bytes	Item
1151	115 - 116	Number of samples in this trace
4000	117 - 118	Sample interval for this trace (in micro seconds)
0	119 - 120	0
0	121 - 122	0
0	123 - 124	0
665632	125 - 128	Bin Centre x coordinates (CMP X)
5646655	129 - 132	Bin Centre y coordinates (CMP Y)
0	133 - 134	0
2	135 - 136	Seismic datum flag (1 = floating datum, 2 = flat Reference datum,
		3 = acquisition datum)
0	137 - 138	Bulk shift static in [microseconds] which has been applied to avoid losing
		seismic data above t=0 [s]. (BULKSH)
0	139 - 140	0
100	141 - 142	Cut-off frequency of anti-alias filter in [Hz] (-3 dB point) [processing]
12	143 - 144	Order of the slope of the anti-alias filter [processing]
0	145 - 146	Notch filter frequency. Normally = 0 [processing]
0	147 - 148	Notch filter slope. Normally = 0 [processing]
4	149 - 150	Cut-off frequency of low-cut filter in [Hz] (-3 dB point) [processing]
0	151 - 152	Cut-off frequency of high-cut filter in [Hz] (-3 dB point) [processing]
3	153 - 154	Order of the slope of the low-cut filter [processing]
0	155 - 156	Order of the slope of the high-cut filter [processing]
0	157 - 158	0
0	159 - 160	0
0	161 - 162	0
0	163 - 164	0
0	165 - 166	0
0	167 - 168	0
0	169 - 170	0
0	171 - 172	0
0	173 - 174	0
0	175 - 176	0
0	177 - 180	Residual CMP static (in microseconds)
0	181 - 182	0
1	183 - 184	Vintage (1=new data, 2=reprocessing)
551	185 - 188	CMP inline number (LLLLLL)
570	189 - 192	CMP crossline number (XXXXXX)
0	193 - 196	0
0	197 - 200	0
0	201 - 204	0
0	205 - 208	0
0	209 - 212	0
95	213 - 216	CMP water depth (units see bytes 69-72)
0	217 - 220	POSNMO (floating datum) static (in microseconds)
0	221 - 224	0
0	225 - 228	0
0	229 - 232	0
0	233 - 236	0
0	237 - 240	Floating datum water depth (optional, units see bytes 69 - 71)

B5.2 Mig Raw Nears SEG-Y Tape Log

CLIENT : WOODSIDE ENERGY LTD
AREA : INVESTIGATOR 3D
PROCESS : MIG RAW NEARS
FORMAT : WEL SEG-Y VERSION M.09
TAPE TYPE : 3590 CARTRIDGE
DATA LENGTH : 4600 MSEC
SAMPLE RATE : 4 MSEC

NO.	TAPE ID	INLINE RANGES
1	GV5434	132 – 550
2	GV5435	551 – 1000
3	GV5436	1001 – 1450
4	GV5437	1451 – 1880

Investigator 3D Migration Grid:

Crossline (CDP) Spacing : 12.5 m
Crossline (CDP) Increment : 1.0
Inline Spacing : 12.5 m
Inline Increment : 1.0

Inline (After Interpolation)	Crossline	Easting	Northing
132	414	670499.930	5643909.002
132	3272	676088.551	5679194.168
536	3508	671562.207	5682897.842
538	4426	673332.600	5694235.477
1064	4675	667325.451	5698338.213
1880	4675	657251.030	5699933.845
1880	414	648918.940	5647327.095

B6 SEG-Y Archive Of The Raw Migrated Fars Volume

The Mig Raw Fars volumes were archived to 3590 cartridges in SEG-Y format.

B6.1 Mig Raw Fars SEG-Y Tape Headers

SEG-Y Trace Header for Mig Raw Fars, tape no: GV5443

Value	Bytes	Item
1	001 - 004	Trace number within line. Starts with 1 per data set
1	005 - 008	Trace number within a tape. Starts with 1 on each tape
0	009 - 012	0
0	013 - 016	0
965	017 - 020	Shot Point Number
5510570	021 - 024	CMP-number
0	025 - 028	0
1	029 - 030	Trace status code (1=seismic data, 2=dead, 3=dummy)
73	031 - 032	Number of vertically summed traces (stack or substack fold)
0	033 - 034	Number of horizontally stacked traces (number of traces summed-fold)
0	035 - 036	0
0	037 - 040	0
0	041 - 044	0
0	045 - 046	0
2	047-048	Interpolated Trace 1 = real 2 = interpolated
5	049 - 050	Source depth [m]
5510570	051 - 054	Processing CMP Number
0	055 - 056	0
0	057 -060	0
0	061 - 064	0
0	065 - 068	0
1	069 - 070	1 if depth in (m), 10 if depth in (dm), 100 if depth in (cm),
1	071 - 072	1 if coordinates in (m), 10 if units in (dm), 100 if units in (cm),
665632	073 - 076	Bin Centre x coordinates (CMP X)
5646655	077 - 080	Bin Centre y coordinates (CMP Y)
0	081 - 084	0
0	085 - 088	0
1	089 - 090	Coordinate units: 1 = metric [m], 2 = seconds of arc, 3 = Imperial [ft]
1512	091 - 092	Water velocity [m/s] used in processing at the bin location
0	093 - 094	Replacement velocity [m/s]. (reef replacement)
6	095 - 096	Streamer depth [m]
0	097 - 098	0
3307	099 - 100	Source depth correction [microseconds] SHTDEP
3968	101 - 102	Group depth correction [microseconds] RECDEP
0	103 - 104	0
4600	105 - 106	T max [ms]
0	107 - 108	Total Gun / Recorder delay time if any (if none = 0)
0	109 - 110	Time of first sample of trace [ms]
188	111 - 112	Start time of mute or time of first live sample on trace in [ms]
208	113 - 114	End time of mute or time of full on sample in [ms] .
		(End-Start = the mute ramp)

Value	Bytes	Item
1151	115 - 116	Number of samples in this trace
4000	117 - 118	Sample interval for this trace (in micro seconds)
0	119 - 120	0
0	121 - 122	0
0	123 - 124	0
665632	125 - 128	Bin Centre x coordinates (CMP X)
5646655	129 - 132	Bin Centre y coordinates (CMP Y)
0	133 - 134	0
2	135 - 136	Seismic datum flag (1 = floating datum, 2 = flat Reference datum,
		3 = acquisition datum)
0	137 - 138	Bulk shift static in [microseconds] which has been applied to avoid losing
		seismic data above t=0 [s]. (BULKSH)
0	139 - 140	0
100	141 - 142	Cut-off frequency of anti-alias filter in [Hz] (-3 dB point) [processing]
12	143 - 144	Order of the slope of the anti-alias filter [processing]
0	145 - 146	Notch filter frequency. Normally = 0 [processing]
0	147 - 148	Notch filter slope. Normally = 0 [processing]
4	149 - 150	Cut-off frequency of low-cut filter in [Hz] (-3 dB point) [processing]
0	151 - 152	Cut-off frequency of high-cut filter in [Hz] (-3 dB point) [processing]
3	153 - 154	Order of the slope of the low-cut filter [processing]
0	155 - 156	Order of the slope of the high-cut filter [processing]
0	157 - 158	0
0	159 - 160	0
0	161 - 162	0
0	163 - 164	0
0	165 - 166	0
0	167 - 168	0
0	169 - 170	0
0	171 - 172	0
0	173 - 174	0
0	175 - 176	0
0	177 - 180	Residual CMP static (in microseconds)
0	181 - 182	0
1	183 - 184	Vintage (1=new data, 2=reprocessing)
551	185 - 188	CMP inline number (LLLLLL)
570	189 - 192	CMP crossline number (XXXXXX)
0	193 - 196	0
0	197 - 200	0
0	201 - 204	0
0	205 - 208	0
0	209 - 212	0
95	213 - 216	CMP water depth (units see bytes 69-72)
0	217 - 220	POSNMO (floating datum) static (in microseconds)
0	221 - 224	0
0	225 - 228	0
0	229 - 232	0
0	233 - 236	0
0	237 - 240	Floating datum water depth (optional, units see bytes 69 - 71)

B6.2 Mig Raw Fars SEG-Y Tape Log

CLIENT : WOODSIDE ENERGY LTD
AREA : INVESTIGATOR 3D
PROCESS : MIG RAW FARS
FORMAT : WEL SEG-Y VERSION M.09
TAPE TYPE : 3590 CARTRIDGE
DATA LENGTH : 4600 MSEC
SAMPLE RATE : 4 MSEC

NO.	TAPE ID	INLINE RANGES
1	GV5442	132 – 550
2	GV5443	551 – 1000
3	GV5444	1001 – 1450
4	GV5445	1451 – 1880

Investigator 3D Migration Grid:

Crossline (CDP) Spacing : 12.5 m
Crossline (CDP) Increment : 1.0
Inline Spacing : 12.5 m
Inline Increment : 1.0

Inline (After Interpolation)	Crossline	Easting	Northing
132	414	670499.930	5643909.002
132	3272	676088.551	5679194.168
536	3508	671562.207	5682897.842
538	4426	673332.600	5694235.477
1064	4675	667325.451	5698338.213
1880	4675	657251.030	5699933.845
1880	414	648918.940	5647327.095

B7 SEG-Y Archive Of The Raw Stack Volume

The Stk Raw volume were archived to 3590 cartridges in SEG-Y format.

B7.1 Stk Raw SEG-Y Tape Headers

SEG-Y Trace Header for Stk Raw, tape no: GV4922

Value	Bytes	Item
1	001 - 004	Trace number within line. Starts with 1 per data set
1	005 - 008	Trace number within a tape. Starts with 1 on each tape
0	009 - 012	0
0	013 - 016	0
951	017 - 020	Shot Point Number
1320556	021 - 024	CMP-number
0	025 - 028	0
1	029 - 030	Trace status code (1=seismic data, 2=dead, 3=dummy)
1	031 - 032	Number of vertically summed traces (stack or substack fold)
0	033 - 034	Number of horizontally stacked traces (number of traces summed-fold)
0	035 - 036	0
0	037 - 040	0
0	041 - 044	0
0	045 - 046	0
1	047-048	Interpolated Trace 1 = real 2 = interpolated
5	049 - 050	Source depth [m]
1320556	051 - 054	Processing CMP Number
0	055 - 056	0
0	057 -060	0
0	061 - 064	0
0	065 - 068	0
1	069 - 070	1 if depth in (m), 10 if depth in (dm), 100 if depth in (cm),
1	071 - 072	1 if coordinates in (m), 10 if units in (dm), 100 if units in (cm),
670778	073 - 076	Bin Centre x coordinates (CMP X)
5645662	077 - 080	Bin Centre y coordinates (CMP Y)
0	081 - 084	0
0	085 - 088	0
1	089 - 090	Coordinate units: 1 = metric [m], 2 = seconds of arc, 3 = Imperial [ft]
1512	091 - 092	Water velocity [m/s] used in processing at the bin location
0	093 - 094	Replacement velocity [m/s]. (reef replacement)
6	095 - 096	Streamer depth [m]
0	097 - 098	0
3307	099 - 100	Source depth correction [microseconds] SHTDEP
3968	101 - 102	Group depth correction [microseconds] RECDEP
0	103 - 104	0
4600	105 - 106	T max [ms]
0	107 - 108	Total Gun / Recorder delay time if any (if none = 0)
0	109 - 110	Time of first sample of trace [ms]
1064	111 - 112	Start time of mute or time of first live sample on trace in [ms]
1084	113 - 114	End time of mute or time of full on sample in [ms] .
		(End-Start = the mute ramp)

Value	Bytes	Item
1151	115 - 116	Number of samples in this trace
4000	117 - 118	Sample interval for this trace (in micro seconds)
0	119 - 120	0
0	121 - 122	0
0	123 - 124	0
670778	125 - 128	Bin Centre x coordinates (CMP X)
5645662	129 - 132	Bin Centre y coordinates (CMP Y)
0	133 - 134	0
2	135 - 136	Seismic datum flag (1 = floating datum, 2 = flat Reference datum,
		3 = acquisition datum)
0	137 - 138	Bulk shift static in [microseconds] which has been applied to avoid losing
		seismic data above t=0 [s]. (BULKSH)
0	139 - 140	0
100	141 - 142	Cut-off frequency of anti-alias filter in [Hz] (-3 dB point) [processing]
12	143 - 144	Order of the slope of the anti-alias filter [processing]
0	145 - 146	Notch filter frequency. Normally = 0 [processing]
0	147 - 148	Notch filter slope. Normally = 0 [processing]
4	149 - 150	Cut-off frequency of low-cut filter in [Hz] (-3 dB point) [processing]
0	151 - 152	Cut-off frequency of high-cut filter in [Hz] (-3 dB point) [processing]
3	153 - 154	Order of the slope of the low-cut filter [processing]
0	155 - 156	Order of the slope of the high-cut filter [processing]
0	157 - 158	0
0	159 - 160	0
0	161 - 162	0
0	163 - 164	0
0	165 - 166	0
0	167 - 168	0
0	169 - 170	0
0	171 - 172	0
0	173 - 174	0
0	175 - 176	0
0	177 - 180	Residual CMP static (in microseconds)
0	181 - 182	0
1	183 - 184	Vintage (1=new data, 2=reprocessing)
132	185 - 188	CMP inline number (LLLLLL)
556	189 - 192	CMP crossline number (XXXXXX)
0	193 - 196	0
0	197 - 200	0
0	201 - 204	0
0	205 - 208	0
0	209 - 212	0
90	213 - 216	CMP water depth (units see bytes 69-72)
0	217 - 220	POSNMO (floating datum) static (in microseconds)
0	221 - 224	0
0	225 - 228	0
0	229 - 232	0
0	233 - 236	0
0	237 - 240	Floating datum water depth (optional, units see bytes 69 - 71)

B7.2 Stk Raw SEG-Y Tape Log

CLIENT : WOODSIDE ENERGY LTD
AREA : INVESTIGATOR 3D
PROCESS : STK RAW
FORMAT : WEL SEG-Y VERSION M.09
TAPE TYPE : 3590 CARTRIDGE
DATA LENGTH : 4600 MSEC
SAMPLE RATE : 4 MSEC

NO.	TAPE ID	INLINE RANGES
1	GV4922	132 – 1100
2	GV4923	1102 – 1880

Investigator 3D Stack Grid:

Crossline (CDP) Spacing : 12.5 m
Crossline (CDP) Increment : 1.0
Inline Spacing : 25 m
Inline Increment : 2.0

Inline (After Interpolation)	Crossline	Easting	Northing
2	1	671297.330	5638555.854
2	5000	681072.529	5700274.030
2000	5000	656405.013	5704180.980
2000	1	646629.814	5642462.805

Processing and Onboard numbering relationship:

Onboard inlines = 2121 – (Processing inlines after interpolation divide by 2)

Onboard crosslines = Processing crosslines + 400

B8 SEG-Y Archive Of The Raw Stack Nears Volume

The Stk Raw Nears volume were archived to 3590 cartridges in SEG-Y format.

B8.1 Stk Raw Nears SEG-Y Tape Headers

SEG-Y Trace Header for Stk Raw Nears, tape no: GV5450

Value	Bytes	Item
1	001 - 004	Trace number within line. Starts with 1 per data set
1	005 - 008	Trace number within a tape. Starts with 1 on each tape
0	009 - 012	0
0	013 - 016	0
951	017 - 020	Shot Point Number
1320556	021 - 024	CMP-number
0	025 - 028	0
1	029 - 030	Trace status code (1=seismic data, 2=dead, 3=dummy)
1	031 - 032	Number of vertically summed traces (stack or substack fold)
0	033 - 034	Number of horizontally stacked traces (number of traces summed-fold)
0	035 - 036	0
0	037 - 040	0
0	041 - 044	0
0	045 - 046	0
1	047-048	Interpolated Trace 1 = real 2 = interpolated
5	049 - 050	Source depth [m]
1320556	051 - 054	Processing CMP Number
0	055 - 056	0
0	057 -060	0
0	061 - 064	0
0	065 - 068	0
1	069 - 070	1 if depth in (m), 10 if depth in (dm), 100 if depth in (cm),
1	071 - 072	1 if coordinates in (m), 10 if units in (dm), 100 if units in (cm),
670778	073 - 076	Bin Centre x coordinates (CMP X)
5645662	077 - 080	Bin Centre y coordinates (CMP Y)
0	081 - 084	0
0	085 - 088	0
1	089 - 090	Coordinate units: 1 = metric [m], 2 = seconds of arc, 3 = Imperial [ft]
1512	091 - 092	Water velocity [m/s] used in processing at the bin location
0	093 - 094	Replacement velocity [m/s]. (reef replacement)
6	095 - 096	Streamer depth [m]
0	097 - 098	0
3307	099 - 100	Source depth correction [microseconds] SHTDEP
3968	101 - 102	Group depth correction [microseconds] RECDEP
0	103 - 104	0
4600	105 - 106	T max [ms]
0	107 - 108	Total Gun / Recorder delay time if any (if none = 0)
0	109 - 110	Time of first sample of trace [ms]
1944	111 - 112	Start time of mute or time of first live sample on trace in [ms]
1964	113 - 114	End time of mute or time of full on sample in [ms] .
		(End-Start = the mute ramp)

Value	Bytes	Item
1151	115 - 116	Number of samples in this trace
4000	117 - 118	Sample interval for this trace (in micro seconds)
0	119 - 120	0
0	121 - 122	0
0	123 - 124	0
670778	125 - 128	Bin Centre x coordinates (CMP X)
5645662	129 - 132	Bin Centre y coordinates (CMP Y)
0	133 - 134	0
2	135 - 136	Seismic datum flag (1 = floating datum, 2 = flat Reference datum,
		3 = acquisition datum)
0	137 - 138	Bulk shift static in [microseconds] which has been applied to avoid losing
		seismic data above t=0 [s]. (BULKSH)
0	139 - 140	0
100	141 - 142	Cut-off frequency of anti-alias filter in [Hz] (-3 dB point) [processing]
12	143 - 144	Order of the slope of the anti-alias filter [processing]
0	145 - 146	Notch filter frequency. Normally = 0 [processing]
0	147 - 148	Notch filter slope. Normally = 0 [processing]
4	149 - 150	Cut-off frequency of low-cut filter in [Hz] (-3 dB point) [processing]
0	151 - 152	Cut-off frequency of high-cut filter in [Hz] (-3 dB point) [processing]
3	153 - 154	Order of the slope of the low-cut filter [processing]
0	155 - 156	Order of the slope of the high-cut filter [processing]
0	157 - 158	0
0	159 - 160	0
0	161 - 162	0
0	163 - 164	0
0	165 - 166	0
0	167 - 168	0
0	169 - 170	0
0	171 - 172	0
0	173 - 174	0
0	175 - 176	0
0	177 - 180	Residual CMP static (in microseconds)
0	181 - 182	0
1	183 - 184	Vintage (1=new data, 2=reprocessing)
132	185 - 188	CMP inline number (LLLLLL)
556	189 - 192	CMP crossline number (XXXXXX)
0	193 - 196	0
0	197 - 200	0
0	201 - 204	0
0	205 - 208	0
0	209 - 212	0
90	213 - 216	CMP water depth (units see bytes 69-72)
0	217 - 220	POSNMO (floating datum) static (in microseconds)
0	221 - 224	0
0	225 - 228	0
0	229 - 232	0
0	233 - 236	0
0	237 - 240	Floating datum water depth (optional, units see bytes 69 - 71)

B8.2 Stk Raw Nears SEG-Y Tape Log

CLIENT : WOODSIDE ENERGY LTD
AREA : INVESTIGATOR 3D
PROCESS : STK RAW NEARS
FORMAT : WEL SEG-Y VERSION M.09
TAPE TYPE : 3590 CARTRIDGE
DATA LENGTH : 4600 MSEC
SAMPLE RATE : 4 MSEC

NO.	TAPE ID	INLINE RANGES
1	GV5450	132 – 1100
2	GV5451	1102 – 1880

Investigator 3D Stack Grid:

Crossline (CDP) Spacing : 12.5 m
Crossline (CDP) Increment : 1.0
Inline Spacing : 25 m
Inline Increment : 2.0

Inline (After Interpolation)	Crossline	Easting	Northing
2	1	671297.330	5638555.854
2	5000	681072.529	5700274.030
2000	5000	656405.013	5704180.980
2000	1	646629.814	5642462.805

Processing and Onboard numbering relationship:

Onboard inlines = 2121 – (Processing inlines after interpolation divide by 2)

Onboard crosslines = Processing crosslines + 400

B9 SEG-Y Archive Of The Raw Stack Fars Volume

The Stk Raw Fars volume was archived to 3590 cartridges in SEG-Y format.

B9.1 Stk Raw Fars SEG-Y Tape Headers

SEG-Y Trace Header for Stk Raw Fars, tape no: GV5452

Value	Bytes	Item
1	001 - 004	Trace number within line. Starts with 1 per data set
1	005 - 008	Trace number within a tape. Starts with 1 on each tape
0	009 - 012	0
0	013 - 016	0
951	017 - 020	Shot Point Number
1320556	021 - 024	CMP-number
0	025 - 028	0
1	029 - 030	Trace status code (1=seismic data, 2=dead, 3=dummy)
1	031 - 032	Number of vertically summed traces (stack or substack fold)
0	033 - 034	Number of horizontally stacked traces (number of traces summed-fold)
0	035 - 036	0
0	037 - 040	0
0	041 - 044	0
0	045 - 046	0
1	047-048	Interpolated Trace 1 = real 2 = interpolated
5	049 - 050	Source depth [m]
1320556	051 - 054	Processing CMP Number
0	055 - 056	0
0	057 -060	0
0	061 - 064	0
0	065 - 068	0
1	069 - 070	1 if depth in (m), 10 if depth in (dm), 100 if depth in (cm),
1	071 - 072	1 if coordinates in (m), 10 if units in (dm), 100 if units in (cm),
670778	073 - 076	Bin Centre x coordinates (CMP X)
5645662	077 - 080	Bin Centre y coordinates (CMP Y)
0	081 - 084	0
0	085 - 088	0
1	089 - 090	Coordinate units: 1 = metric [m], 2 = seconds of arc, 3 = Imperial [ft]
1512	091 - 092	Water velocity [m/s] used in processing at the bin location
0	093 - 094	Replacement velocity [m/s]. (reef replacement)
6	095 - 096	Streamer depth [m]
0	097 - 098	0
3307	099 - 100	Source depth correction [microseconds] SHTDEP
3968	101 - 102	Group depth correction [microseconds] RECDEP
0	103 - 104	0
4600	105 - 106	T max [ms]
0	107 - 108	Total Gun / Recorder delay time if any (if none = 0)
0	109 - 110	Time of first sample of trace [ms]
1064	111 - 112	Start time of mute or time of first live sample on trace in [ms]
1084	113 - 114	End time of mute or time of full on sample in [ms] .
		(End-Start = the mute ramp)

Value	Bytes	Item
1151	115 - 116	Number of samples in this trace
4000	117 - 118	Sample interval for this trace (in micro seconds)
0	119 - 120	0
0	121 - 122	0
0	123 - 124	0
670778	125 - 128	Bin Centre x coordinates (CMP X)
5645662	129 - 132	Bin Centre y coordinates (CMP Y)
0	133 - 134	0
2	135 - 136	Seismic datum flag (1 = floating datum, 2 = flat Reference datum,
		3 = acquisition datum)
0	137 - 138	Bulk shift static in [microseconds] which has been applied to avoid losing
		seismic data above t=0 [s]. (BULKSH)
0	139 - 140	0
100	141 - 142	Cut-off frequency of anti-alias filter in [Hz] (-3 dB point) [processing]
12	143 - 144	Order of the slope of the anti-alias filter [processing]
0	145 - 146	Notch filter frequency. Normally = 0 [processing]
0	147 - 148	Notch filter slope. Normally = 0 [processing]
4	149 - 150	Cut-off frequency of low-cut filter in [Hz] (-3 dB point) [processing]
0	151 - 152	Cut-off frequency of high-cut filter in [Hz] (-3 dB point) [processing]
3	153 - 154	Order of the slope of the low-cut filter [processing]
0	155 - 156	Order of the slope of the high-cut filter [processing]
0	157 - 158	0
0	159 - 160	0
0	161 - 162	0
0	163 - 164	0
0	165 - 166	0
0	167 - 168	0
0	169 - 170	0
0	171 - 172	0
0	173 - 174	0
0	175 - 176	0
0	177 - 180	Residual CMP static (in microseconds)
0	181 - 182	0
1	183 - 184	Vintage (1=new data, 2=reprocessing)
132	185 - 188	CMP inline number (LLLLLL)
556	189 - 192	CMP crossline number (XXXXXX)
0	193 - 196	0
0	197 - 200	0
0	201 - 204	0
0	205 - 208	0
0	209 - 212	0
90	213 - 216	CMP water depth (units see bytes 69-72)
0	217 - 220	POSNMO (floating datum) static (in microseconds)
0	221 - 224	0
0	225 - 228	0
0	229 - 232	0
0	233 - 236	0
0	237 - 240	Floating datum water depth (optional, units see bytes 69 - 71)

B9.2 Stk Raw Fars SEG-Y Tape Log

CLIENT : WOODSIDE ENERGY LTD
AREA : INVESTIGATOR 3D
PROCESS : STK RAW FARS
FORMAT : WEL SEG-Y VERSION M.09
TAPE TYPE : 3590 CARTRIDGE
DATA LENGTH : 4600 MSEC
SAMPLE RATE : 4 MSEC

NO.	TAPE ID	INLINE RANGES
1	GV5452	132 – 1100
2	GV5453	1102 – 1880

Investigator 3D Stack Grid:

Crossline (CDP) Spacing : 12.5 m
Crossline (CDP) Increment : 1.0
Inline Spacing : 25 m
Inline Increment : 2.0

Inline (After Interpolation)	Crossline	Easting	Northing
2	1	671297.330	5638555.854
2	5000	681072.529	5700274.030
2000	5000	656405.013	5704180.980
2000	1	646629.814	5642462.805

Processing and Onboard numbering relationship:

Onboard inlines = 2121 – (Processing inlines after interpolation divide by 2)

Onboard crosslines = Processing crosslines + 400

B10 SEG-Y Archive Of CMP Gathers

The CMP gathers were archived to RODE 3590 cartridges in SEG-Y format.

B10.1 CMP Gathers SEG-Y Tape Header

TAPE HEADERS OF CMP TAPE NO:GV3248

Value	Bytes	Item
1	001 - 004	Trace number within line. Starts with 1 per data set
1	005 - 008	Trace number within a tape. Starts with 1 on each tape
120	009 - 012	Original field record number (file number on the original field tape)
1103	013 - 016	Original field trace number within a field record (channel no.)
1002	017 - 020	Shot Point No.
3820419	021 - 024	CMP-number
1	025 - 028	Trace sequence within CDP
1	029 - 030	Trace identification code 1= seismic data, 2= edit flag (redundancy frm flex)
1	031 - 032	Number of vertically summed traces (stack or substack fold)
2	033 - 034	Number of horizontally stacked traces (number of traces summed)
1	035 - 036	Data use: 1 = production data, 2 = flex data
4692	037 - 040	True shot receiver distance in [m] (offset)
0	041 - 044	Original Tape Number
0	045 - 046	0
1	047 - 048	Interpolated Trace 1 = real 2 = interpolated
5	049 - 050	Source depth [m]
3820419	051 - 054	Processing CMP number
3	055 - 056	Receiver cable number - same as acquisition
0	057 - 058	0
2	059 - 060	Shot location - same as acquisition
104	061 - 064	Water depth at shot in [m]
103	065 - 068	Water depth at receiver in [m] (optional)
1	069 - 070	1 if depth in (m), 10 if depth in (dm), 100 if depth in (cm),
1	071 - 072	1 if coordinates in (m), 10 if units in (dm), 100 if units in (cm),
667628	073 - 076	Shot x coordinates (units as per bytes 71-72)
5646804	077 - 080	Shot y coordinates (units as per bytes 71-72)
667212	081 - 084	Receiver x coordinates (units as per bytes 71-72)
5642130	085 - 088	Receiver y coordinates (units as per bytes 71-72)
1	089 - 090	Coordinate units: 1 = metric [m], 2 = seconds of arc, 3 = Imperial [ft]
1512	091 - 092	Water velocity [m/s] used in processing at the bin location
0	093 - 094	Replacement velocity [m/s]. (reef replacement)
6	095 - 096	Streamer depth [m]
0	097 - 098	0
3307	099 - 100	Source depth correction [microseconds] SHTDEP
3968	101 - 102	Group depth correction [microseconds] RECDEP
0	103 - 104	0
4600	105 - 106	T max [ms]
0	107 - 108	Total Gun / Recorder delay time if any (if none = 0)
0	109 - 110	Time of first sample of trace (ms)
2144	111 - 112	Start time of mute or time of first live sample on trace in [ms]
2164	113 - 114	End time of mute or time of full on sample in [ms] .
		End-Start = the mute ramp length

Value	Bytes	Item
1151	115 - 116	Number of samples in this trace
4000	117 - 118	Sample interval in micro seconds for this trace
0	119 - 120	Gain type of field instrument
0	121 - 122	Instrument gain constant
0	123 - 124	Instrument early or initial gain in [dB]
667423	125 - 128	Bin Centre x coordinates (CMP X)
5644460	129 - 132	Bin Centre y coordinates (CMP Y)
0	133 - 134	Pre_nmo or differential static in [microseconds] (PRENMO)
3	135 - 136	Seismic datum flag: 1 = data at floating datum, 2 = data at a flat
		reference datum, 3 = acquisition datum (raw / no statics applied)
0	137 - 138	Bulk shift static in [microseconds] which has been applied to avoid losing
		seismic data above t=0 [s]. (BULKSH)
0	139 - 140	0
100	141 - 142	Cut-off frequency of anti-alias filter in [Hz] (-3 dB point) processing
12	143 - 144	Order of the slope of the anti-alias filter processing
0	145 - 146	Notch filter frequency. Normally = 0
0	147 - 148	Notch filter slope. Normally = 0
4	149 - 150	Cut-off frequency of low-cut filter in [Hz] (-3 dB point) processing
0	151 - 152	Cut-off frequency of high-cut filter in [Hz] (-3 dB point) processing
3	153 - 154	Order of the slope of the low-cut filter processing
0	155 - 156	Order of the slope of the high-cut filter processing
2000	157 - 158	Year data recorded (four digits)
28	159 - 160	Julian day of the year of recording
14	161 - 162	Hour of day of recording using 24 hour clock (hh)
47	163 - 164	Minute of hour of recording (mm)
18	165 - 166	Second of minute of recording (ss)
2	167 - 168	Time basis code: 1 = local, 2 = GMT, 3 = other
-161	169 - 172	Pre_nmo or differential static in [microseconds] (PRENMO)
0	173 - 174	Residual receiver static RECSTA (in microseconds)
0	175 - 176	Residual shot static SHTSTA (in microseconds)
0	177 - 180	Residual CMP static (in microseconds)
0	181 - 182	Flexed sum weighting value (multiply by 1000)
1	183 - 184	Vintage (OPTIONAL) 1= original,2=reprocessing
382	185 - 188	CMP inline number (LLLLLL)
419	189 - 192	CMP crossline number (XXXXXX)
667420	193 - 196	Natural CMP (mid x coordinates (xsht/2 + xrec/2)
5644467	197 - 200	Natural CMP (mid y coordinates) (ysht/2 + yrec/2)
0	201 - 204	Shot scalar (multiply by 1000)
0	205 - 208	Receiver scalar (multiply by 1000)
-161	209 - 212	Tidal statics (in microseconds for total trace) TIDSTA
103	213 - 216	CMP water depth (units see bytes 69-72)
0	217 - 220	POSNMO (floating datum) static (in microseconds)
7113	221 - 224	Total statics (in microseconds) = Tidal statics+Source depth static+Group depth static
0	225 - 228	Shot statics SHTFLD (in microseconds) Reef replacement static
0	229 - 232	Receiver statics RECFLD (in microseconds) Reef replacement static
201918	233 - 236	Sail line, prefix with Prime =10,Reshoot =20 or Infill = 30)
0	237 - 240	Floating datum water depth (optional, units see bytes 69 - 71)
NOTE: GATHERS ARE WITHOUT SOURCE & CABLE DEPTH CORRECTIONS, TIDAL STATICS REMOVED PRIOR TO SEGY OUTPUT		

B10.2 CMP Gathers SEG-Y Tape Log

CLIENT : WOODSIDE ENERGY LTD
AREA : INVESTIGATOR 3D
PROCESS : CMP GATHERS
FORMAT : WEL SEG-Y VERSION M.09
TAPE TYPE : RODE 3590 CARTRIDGE
DATA LENGTH : 4600 MSEC
SAMPLE RATE : 4 MSEC

S/N.	Tape No.	First Inline	Last Inline	First Crossline	Last Crossline	Mbytes on Tape	No. of Rode	No. of Traces
1	GV3227	132	152	556	3283	7439.12	11	1610339
2	GV3229	154	164	420	3283	6728.1	12	1456426
3	GV3230	166	176	416	3234	6871.61	12	1487491
4	GV3231	178	188	417	3285	6808.85	12	1473905
5	GV3232	190	200	417	3308	7043.21	12	1524638
6	GV3233	202	212	415	3330	7117.05	12	1540622
7	GV3234	214	224	414	3333	7038.5	12	1523618
8	GV3235	226	236	419	3334	7007.34	12	1516873
9	GV3236	238	248	420	3316	6914.02	12	1496671
10	GV3237	250	260	417	3355	7108.13	12	1538691
11	GV3238	262	272	416	3358	7022.94	12	1520250
12	GV3239	274	284	448	3358	7062.15	12	1528736
13	GV3240	286	296	419	3370	6975.77	12	1510038
14	GV3241	298	308	419	3381	7089.88	12	1534740
15	GV3242	310	320	418	3382	7155.74	12	1548996
16	GV3243	322	332	417	3396	7237.28	12	1566648
17	GV3244	334	344	416	3397	7106.66	12	1538372
18	GV3245	346	356	420	3397	7123.88	12	1542099
19	GV3246	358	368	417	3419	7143.22	12	1546286
20	GV3247	370	380	415	3420	7283.83	12	1576724
21	GV3248	382	392	419	3421	7139.87	12	1545561
22	GV3249	394	404	418	3432	7258.31	12	1571199
23	GV3250	406	416	417	3447	7398.66	12	1601580
24	GV3251	418	428	416	3448	7344.61	12	1589882
25	GV3252	430	440	419	3449	7319.91	12	1584534
26	GV3253	442	452	417	3419	7215.25	12	1561879
27	GV3254	454	464	417	3444	7242.44	12	1567765
28	GV3255	466	476	417	3472	7263.86	12	1572400
29	GV3256	478	488	418	3472	7377.15	12	1596925
30	GV3257	490	500	417	3472	7515.98	12	1626978
31	GV3258	502	512	416	3471	7397.87	12	1601411
32	GV3259	514	524	416	3483	7310.85	12	1582573
33	GV3260	526	536	417	3498	7512.86	12	1626302
34	GV3261	538	546	419	4204	6428.49	10	1391569
35	GV3262	548	556	419	4279	7203.08	10	1559244
36	GV3263	558	566	416	4419	7933.97	10	1717459

S/N.	Tape No.	First Inline	Last Inline	First Crossline	Last Crossline	Mbytes on Tape	No. of Rode	No. of Traces
37	GV3264	568	576	417	4431	8065.39	10	1745908
38	GV3265	578	586	417	4431	8092.93	10	1751869
39	GV3266	588	596	417	4431	8085.79	10	1750324
40	GV3267	598	606	417	4443	8092.44	10	1751763
41	GV3268	608	616	416	4443	8059.01	10	1744526
42	GV3269	618	626	417	4455	8161.52	10	1766716
43	GV3270	628	636	416	4455	8153.74	10	1765032
44	GV3271	638	646	416	4454	8257.59	10	1787512
45	GV3272	648	656	416	4467	8244.24	10	1784623
46	GV3273	658	666	417	4468	8196.89	10	1774374
47	GV3274	668	676	418	4426	8180.78	10	1770885
48	GV3275	678	686	418	4501	8178.12	10	1770311
49	GV3276	688	696	420	4503	8212.97	10	1777855
50	GV3277	698	706	417	4504	8222.64	10	1779948
51	GV3278	708	716	416	4477	8216.07	10	1778526
52	GV3279	718	726	417	4472	8211.94	10	1777631
53	GV3280	728	736	417	4501	8234.68	10	1782554
54	GV3281	738	746	417	4500	8265.53	10	1789231
55	GV3282	748	756	416	4499	8258.45	10	1787699
56	GV3283	758	766	417	4538	8400.26	10	1818396
57	GV3284	768	776	415	4539	8426.18	10	1824007
58	GV3285	778	786	416	4539	8426.06	10	1823981
59	GV3286	788	796	417	4517	8361.97	10	1810108
60	GV3287	798	806	417	4550	8342.25	10	1805840
61	GV3288	808	816	417	4550	8285.04	10	1793455
62	GV3289	818	826	417	4550	8338.15	10	1804951
63	GV3290	828	836	417	4550	8326.13	10	1802350
64	GV3291	838	846	417	4550	8370.58	10	1811971
65	GV3292	848	856	417	4563	8435.82	10	1826094
66	GV3293	858	866	417	4564	8462.81	10	1831936
67	GV3294	868	876	419	4574	8422.06	10	1823116
68	GV3295	878	886	419	4576	8383.42	10	1814752
69	GV3296	888	896	419	4587	8440.46	10	1827098
70	GV3297	898	906	419	4588	8395.69	10	1817408
71	GV3298	908	916	418	4599	8413.62	10	1821289
72	GV3299	918	926	419	4600	8418.95	10	1822443
73	GV3300	928	936	419	4601	8409.27	10	1820346
74	GV3301	938	946	419	4611	8414.68	10	1821517
75	GV3302	948	956	419	4611	8496.98	10	1839334
76	GV3303	958	964	419	4623	6783.32	8	1468379
77	GV3304	966	972	419	4623	6799.1	8	1471795
78	GV3305	974	980	419	4634	6813.8	8	1474976
79	GV3306	982	988	417	4635	6902.37	8	1494149
80	GV3307	990	996	417	4635	6920.93	8	1498168
81	GV3308	998	1004	417	4647	6898.25	8	1493257
82	GV3309	1006	1012	420	4648	6820.53	8	1476434

S/N.	Tape No.	First Inline	Last Inline	First Crossline	Last Crossline	Mbytes on Tape	No. of Rode	No. of Traces
83	GV3310	1014	1020	419	4659	6778.33	8	1467299
84	GV3311	1022	1028	418	4660	6847.62	8	1482298
85	GV3312	1030	1036	419	4662	6875.33	8	1488297
86	GV3313	1038	1044	419	4662	6861.04	8	1485202
87	GV3314	1046	1052	419	4660	6855.04	8	1483905
88	GV3315	1054	1060	419	4660	6833.9	8	1479328
89	GV3316	1062	1068	419	4671	6847.97	8	1482374
90	GV3317	1070	1076	420	4672	6894.98	8	1492549
91	GV3318	1078	1084	419	4673	6877.52	8	1488771
92	GV3319	1086	1092	419	4673	6853.59	8	1483591
93	GV3320	1094	1100	417	4672	6928.86	8	1499883
94	GV3321	1102	1108	417	4673	6942.86	8	1502915
95	GV3322	1110	1116	416	4673	6935.14	8	1501244
96	GV3323	1118	1124	416	4674	6890.87	8	1491661
97	GV3324	1126	1132	416	4674	6824.47	8	1477287
98	GV3325	1134	1140	416	4673	6890.43	8	1491565
99	GV3326	1142	1148	446	4673	6859.18	8	1484801
100	GV3327	1150	1156	482	4673	6848.46	8	1482479
101	GV3328	1158	1164	419	4674	6870.74	8	1487302
102	GV3329	1166	1172	419	4674	6865.24	8	1486111
103	GV3330	1174	1180	419	4672	6960.1	8	1506646
104	GV3331	1182	1188	419	4672	6964.45	8	1507587
105	GV3332	1190	1196	440	4673	6940.51	8	1502406
106	GV3333	1198	1204	419	4674	6951.57	8	1504801
107	GV3334	1206	1212	418	4673	6875.21	8	1488271
108	GV3335	1214	1220	419	4673	6887.29	8	1490886
109	GV3336	1222	1228	420	4673	6904.6	8	1494632
110	GV3337	1230	1236	417	4673	6839	8	1480432
111	GV3338	1238	1244	417	4669	6825.7	8	1477553
112	GV3339	1246	1252	417	4670	6717.37	8	1454102
113	GV3340	1254	1260	417	4671	6584.54	8	1425349
114	GV3341	1262	1268	416	4672	6808.82	8	1473899
115	GV3342	1270	1276	417	4672	6833.31	8	1479201
116	GV3343	1278	1284	417	4640	6736.38	8	1458218
117	GV3344	1286	1292	417	4672	6407.93	8	1387119
118	GV3345	1294	1300	418	4671	6613.64	8	1431649
119	GV3346	1302	1308	417	4672	6850.91	8	1483011
120	GV3347	1310	1316	417	4671	6865.18	8	1486099
121	GV3348	1318	1324	417	4672	6891.91	8	1491886
122	GV3349	1326	1332	417	4671	6704.92	8	1451407
123	GV3350	1334	1340	417	4672	6656.34	8	1440891
124	GV3351	1342	1348	417	4672	6848.81	8	1482556
125	GV3352	1350	1356	417	4672	6859.2	8	1484804
126	GV3353	1358	1364	416	4653	6897.02	8	1492991
127	GV3354	1366	1372	417	4671	6685.62	8	1447230
128	GV3355	1374	1380	416	4671	6717.1	8	1454044

S/N.	Tape No.	First Inline	Last Inline	First Crossline	Last Crossline	Mbytes on Tape	No. of Rode	No. of Traces
129	GV3356	1382	1388	416	4672	6869.36	8	1487004
130	GV3357	1390	1396	417	4670	6566.04	8	1421344
131	GV3358	1398	1404	416	4670	6551.47	8	1418191
132	GV3359	1406	1412	416	4671	6619.56	8	1432930
133	GV3360	1414	1420	417	4672	6635.69	8	1436422
134	GV3361	1422	1428	417	4668	6847.09	8	1482183
135	GV3362	1430	1436	417	4668	6858.31	8	1484611
136	GV3363	1438	1444	417	4671	6873.61	8	1487925
137	GV3364	1446	1452	418	4671	6756.23	8	1462515
138	GV3365	1454	1460	416	4672	6781.32	8	1467947
139	GV3366	1462	1468	417	4670	6850.53	8	1482928
140	GV3367	1470	1476	417	4672	6848.47	8	1482481
141	GV3368	1478	1484	417	4673	6822.91	8	1476948
142	GV3369	1486	1492	417	4673	6932.9	8	1500758
143	GV3370	1494	1500	419	4673	6943.56	8	1503067
144	GV3371	1502	1508	422	4671	6908.22	8	1495417
145	GV3372	1510	1516	417	4671	6895.2	8	1492597
146	GV3373	1518	1524	417	4673	6868.81	8	1486885
147	GV3374	1526	1532	418	4673	6867.03	8	1486499
148	GV3375	1534	1540	420	4673	6927.16	8	1499515
149	GV3376	1542	1548	419	4673	6896.85	8	1492955
150	GV3377	1550	1556	419	4673	6954.28	8	1505386
151	GV3378	1558	1564	418	4673	6976.13	8	1510116
152	GV3379	1566	1572	419	4673	6796.65	8	1471264
153	GV3380	1574	1580	419	4673	6782.53	8	1468208
154	GV3381	1582	1588	419	4673	6676.61	8	1445279
155	GV3382	1590	1596	419	4670	6814.61	8	1475153
156	GV3383	1598	1604	419	4673	6863.94	8	1485830
157	GV3384	1606	1612	418	4673	6470.61	8	1400688
158	GV3385	1614	1620	420	4673	6706.68	8	1451788
159	GV3386	1622	1628	419	4673	6877.72	8	1488813
160	GV3387	1630	1636	419	4673	6793.64	8	1470613
161	GV3388	1638	1644	419	4673	6781.32	8	1467946
162	GV3389	1646	1652	418	4674	6343.07	8	1373078
163	GV3390	1654	1660	419	4673	6789.32	8	1469678
164	GV3391	1662	1668	419	4673	6574.68	8	1423215
165	GV3392	1670	1676	420	4673	6562.27	8	1420528
166	GV3393	1678	1684	420	4673	6840.22	8	1480696
167	GV3394	1686	1692	418	4673	6866.09	8	1486296
168	GV3395	1694	1700	419	4673	6887.7	8	1490973
169	GV3396	1702	1708	419	4673	6862.2	8	1485453
170	GV3397	1710	1716	419	4673	6328.39	8	1369900
171	GV3398	1718	1724	418	4672	6613.78	8	1431679
172	GV3399	1726	1732	418	4673	6822.54	8	1476868
173	GV4903	1734	1740	419	4673	6817.03	8	1475677
174	GV4904	1742	1748	419	4674	6851.54	8	1483147

S/N.	Tape No.	First Inline	Last Inline	First Crossline	Last Crossline	Mbytes on Tape	No. of Rode	No. of Traces
175	GV4905	1750	1756	418	4673	6700.18	8	1450382
176	GV4906	1758	1764	419	4673	6847.32	8	1482233
177	GV4907	1766	1772	419	4673	6861.73	8	1485353
178	GV4908	1774	1780	420	4673	6795.88	8	1471098
179	GV4909	1782	1788	419	4673	6695.51	8	1449370
180	GV4910	1790	1796	419	4673	6484.17	8	1403622
181	GV4911	1798	1804	420	4673	6862.41	8	1485499
182	GV4912	1806	1812	419	4672	6826.83	8	1477798
183	GV4913	1814	1820	420	4673	6531.15	8	1413791
184	GV4914	1822	1828	432	4674	6784.54	8	1468644
185	GV4915	1830	1836	476	4673	6275.22	8	1358391
186	GV4916	1838	1844	420	4673	6481.31	8	1403003
187	GV4917	1846	1852	419	4673	6878.84	8	1489055
188	GV4918	1854	1860	419	4673	6619.32	8	1432878
189	GV4919	1862	1868	419	4674	6844.3	8	1481580
190	GV4920	1870	1876	423	4661	6532.6	8	1414105
191	GV4921	1878	1880	490	4618	2590.7	4	560806

B10.3 CMP Gathers RODE Files Log

CLIENT : WOODSIDE ENERGY LTD
AREA : INVESTIGATOR 3D
PROCESS : CMP GATHERS
FORMAT : WEL SEG-Y VERSION M.09
TAPE TYPE : RODE 3590 CARTRIDGE
DATA LENGTH : 4600 MSEC
SAMPLE RATE : 4 MSEC

VDGC and WEL numbering relationship:

WEL inlines = 2121 – (VDGC inlines after interpolation divide by 2)

3D Line Number	Tape Number	Tape Number	First RODE file Number for Line	Last RODE file Number for Line
132	GV3227	GV3227	1	1
134			2	2
136			3	3
138			4	4
140			5	5
142			6	6
144			7	7
146			8	8
148			9	9
150			10	10
152			11	11
154	GV3229	GV3229	1	2
156			3	4
158			5	6
160			7	8
162			9	10
164			11	12
166	GV3230	GV3230	1	2
168			3	4
170			5	6
172			7	8
174			9	10
176			11	12
178	GV3231	GV3231	1	2
180			3	4
182			5	6
184			7	8
186			9	10
188			11	12
190	GV3232	GV3232	1	2
192			3	4
194			5	6
196			7	8
198			9	10
200			11	12

3D Line Number	Tape Number	Tape Number	First RODE file Number for Line	Last RODE file Number for Line
202	GV3233	GV3233	1	2
204			3	4
206			5	6
208			7	8
210			9	10
212			11	12
214	GV3234	GV3234	1	2
216			3	4
218			5	6
220			7	8
222			9	10
224			11	12
226	GV3235	GV3235	1	2
228			3	4
230			5	6
232			7	8
234			9	10
236			11	12
238	GV3236	GV3236	1	2
240			3	4
242			5	6
244			7	8
246			9	10
248			11	12
250	GV3237	GV3237	1	2
252			3	4
254			5	6
256			7	8
258			9	10
260			11	12
262	GV3238	GV3238	1	2
264			3	4
266			5	6
268			7	8
270			9	10
272			11	12
274	GV3239	GV3239	1	2
276			3	4
278			5	6
280			7	8
282			9	10
284			11	12
286	GV3240	GV3240	1	2
288			3	4
290			5	6
292			7	8
294			9	10
296			11	12

3D Line Number	Tape Number	Tape Number	First RODE file Number for Line	Last RODE file Number for Line
298	GV3241	GV3241	1	2
300			3	4
302			5	6
304			7	8
306			9	10
308			11	12
310	GV3242	GV3242	1	2
312			3	4
314			5	6
316			7	8
318			9	10
320			11	12
322	GV3243	GV3243	1	2
324			3	4
326			5	6
328			7	8
330			9	10
332			11	12
334	GV3244	GV3244	1	2
336			3	4
338			5	6
340			7	8
342			9	10
344			11	12
346	GV3245	GV3245	1	2
348			3	4
350			5	6
352			7	8
354			9	10
356			11	12
358	GV3246	GV3246	1	2
360			3	4
362			5	6
364			7	8
366			9	10
368			11	12
370	GV3247	GV3247	1	2
372			3	4
374			5	6
376			7	8
378			9	10
380			11	12
382	GV3248	GV3248	1	2
384			3	4
386			5	6
388			7	8
390			9	10
392			11	12

3D Line Number	Tape Number	Tape Number	First RODE file Number for Line	Last RODE file Number for Line
394	GV3249	GV3249	1	2
396			3	4
398			5	6
400			7	8
402			9	10
404			11	12
406	GV3250	GV3250	1	2
408			3	4
410			5	6
412			7	8
414			9	10
416			11	12
418	GV3251	GV3251	1	2
420			3	4
422			5	6
424			7	8
426			9	10
428			11	12
430	GV3252	GV3252	1	2
432			3	4
434			5	6
436			7	8
438			9	10
440			11	12
442	GV3253	GV3253	1	2
444			3	4
446			5	6
448			7	8
450			9	10
452			11	12
454	GV3254	GV3254	1	2
456			3	4
458			5	6
460			7	8
462			9	10
464			11	12
466	GV3255	GV3255	1	2
468			3	4
470			5	6
472			7	8
474			9	10
476			11	12
478	GV3256	GV3256	1	2
480			3	4
482			5	6
484			7	8
486			9	10
488			11	12

3D Line Number	Tape Number	Tape Number	First RODE file Number for Line	Last RODE file Number for Line
490	GV3257	GV3257	1	2
492			3	4
494			5	6
496			7	8
498			9	10
500			11	12
502	GV3258	GV3258	1	2
504			3	4
506			5	6
508			7	8
510			9	10
512			11	12
514	GV3259	GV3259	1	2
516			3	4
518			5	6
520			7	8
522			9	10
524			11	12
526	GV3260	GV3260	1	2
528			3	4
530			5	6
532			7	8
534			9	10
536			11	12
538	GV3261	GV3261	1	2
540			3	4
542			5	6
544			7	8
546			9	10
548	GV3262	GV3262	1	2
550			3	4
552			5	6
554			7	8
556			9	10
558	GV3263	GV3263	1	2
560			3	4
562			5	6
564			7	8
566			9	10
568	GV3264	GV3264	1	2
570			3	4
572			5	6
574			7	8
576			9	10
578	GV3265	GV3265	1	2
580			3	4
582			5	6
584			7	8
586			9	10

3D Line Number	Tape Number	Tape Number	First RODE file Number for Line	Last RODE file Number for Line
588	GV3266	GV3266	1	2
590			3	4
592			5	6
594			7	8
596			9	10
598	GV3267	GV3267	1	2
600			3	4
602			5	6
604			7	8
606			9	10
608	GV3268	GV3268	1	2
610			3	4
612			5	6
614			7	8
616			9	10
618	GV3269	GV3269	1	2
620			3	4
622			5	6
624			7	8
626			9	10
628	GV3270	GV3270	1	2
630			3	4
632			5	6
634			7	8
636			9	10
638	GV3271	GV3271	1	2
640			3	4
642			5	6
644			7	8
646			9	10
648	GV3272	GV3272	1	2
650			3	4
652			5	6
654			7	8
656			9	10
658	GV3273	GV3273	1	2
660			3	4
662			5	6
664			7	8
666			9	10
668	GV3274	GV3274	1	2
670			3	4
672			5	6
674			7	8
676			9	10

3D Line Number	Tape Number	Tape Number	First RODE file Number for Line	Last RODE file Number for Line
678	GV3275	GV3275	1	2
680			3	4
682			5	6
684			7	8
686			9	10
688	GV3276	GV3276	1	2
690			3	4
692			5	6
694			7	8
696			9	10
698	GV3277	GV3277	1	2
700			3	4
702			5	6
704			7	8
706			9	10
708	GV3278	GV3278	1	2
710			3	4
712			5	6
714			7	8
716			9	10
718	GV3279	GV3279	1	2
720			3	4
722			5	6
724			7	8
726			9	10
728	GV3280	GV3280	1	2
730			3	4
732			5	6
734			7	8
736			9	10
738	GV3281	GV3281	1	2
740			3	4
742			5	6
744			7	8
746			9	10
748	GV3282	GV3282	1	2
750			3	4
752			5	6
754			7	8
756			9	10
758	GV3283	GV3283	1	2
760			3	4
762			5	6
764			7	8
766			9	10

3D Line Number	Tape Number	Tape Number	First RODE file Number for Line	Last RODE file Number for Line
768	GV3284	GV3284	1	2
770			3	4
772			5	6
774			7	8
776			9	10
778	GV3285	GV3285	1	2
780			3	4
782			5	6
784			7	8
786			9	10
788	GV3286	GV3286	1	2
790			3	4
792			5	6
794			7	8
796			9	10
798	GV3287	GV3287	1	2
800			3	4
802			5	6
804			7	8
806			9	10
808	GV3288	GV3288	1	2
810			3	4
812			5	6
814			7	8
816			9	10
818	GV3289	GV3289	1	2
820			3	4
822			5	6
824			7	8
826			9	10
828	GV3290	GV3290	1	2
830			3	4
832			5	6
834			7	8
836			9	10
838	GV3291	GV3291	1	2
840			3	4
842			5	6
844			7	8
846			9	10
848	GV3292	GV3292	1	2
850			3	4
852			5	6
854			7	8
856			9	10

3D Line Number	Tape Number	Tape Number	First RODE file Number for Line	Last RODE file Number for Line
858	GV3293	GV3293	1	2
860			3	4
862			5	6
864			7	8
866			9	10
868	GV3294	GV3294	1	2
870			3	4
872			5	6
874			7	8
876			9	10
878	GV3295	GV3295	1	2
880			3	4
882			5	6
884			7	8
886			9	10
888	GV3296	GV3296	1	2
890			3	4
892			5	6
894			7	8
896			9	10
898	GV3297	GV3297	1	2
900			3	4
902			5	6
904			7	8
906			9	10
908	GV3298	GV3298	1	2
910			3	4
912			5	6
914			7	8
916			9	10
918	GV3299	GV3299	1	2
920			3	4
922			5	6
924			7	8
926			9	10
928	GV3300	GV3300	1	2
930			3	4
932			5	6
934			7	8
936			9	10
938	GV3301	GV3301	1	2
940			3	4
942			5	6
944			7	8
946			9	10

3D Line Number	Tape Number	Tape Number	First RODE file Number for Line	Last RODE file Number for Line
948	GV3302	GV3302	1	2
950			3	4
952			5	6
954			7	8
956			9	10
958	GV3303	GV3303	1	2
960			3	4
962			5	6
964			7	8
966	GV3304	GV3304	1	2
968			3	4
970			5	6
972			7	8
974	GV3305	GV3305	1	2
976			3	4
978			5	6
980			7	8
982	GV3306	GV3306	1	2
984			3	4
986			5	6
988			7	8
990	GV3307	GV3307	1	2
992			3	4
994			5	6
996			7	8
998	GV3308	GV3308	1	2
1000			3	4
1002			5	6
1004			7	8
1006	GV3309	GV3309	1	2
1008			3	4
1010			5	6
1012			7	8
1014	GV3310	GV3310	1	2
1016			3	4
1018			5	6
1020			7	8
1022	GV3311	GV3311	1	2
1024			3	4
1026			5	6
1028			7	8
1030	GV3312	GV3312	1	2
1032			3	4
1034			5	6
1036			7	8

3D Line Number	Tape Number	Tape Number	First RODE file Number for Line	Last RODE file Number for Line
1038	GV3313	GV3313	1	2
1040			3	4
1042			5	6
1044			7	8
1046	GV3314	GV3314	1	2
1048			3	4
1050			5	6
1052			7	8
1054	GV3315	GV3315	1	2
1056			3	4
1058			5	6
1060			7	8
1062	GV3316	GV3316	1	2
1064			3	4
1066			5	6
1068			7	8
1070	GV3317	GV3317	1	2
1072			3	4
1074			5	6
1076			7	8
1078	GV3318	GV3318	1	2
1080			3	4
1082			5	6
1084			7	8
1086	GV3319	GV3319	1	2
1088			3	4
1090			5	6
1092			7	8
1094	GV3320	GV3320	1	2
1096			3	4
1098			5	6
1100			7	8
1102	GV3321	GV3321	1	2
1104			3	4
1106			5	6
1108			7	8
1110	GV3322	GV3322	1	2
1112			3	4
1114			5	6
1116			7	8
1118	GV3323	GV3323	1	2
1120			3	4
1122			5	6
1124			7	8
1126	GV3324	GV3324	1	2
1128			3	4
1130			5	6
1132			7	8

3D Line Number	Tape Number	Tape Number	First RODE file Number for Line	Last RODE file Number for Line
1134	GV3325	GV3325	1	2
1136			3	4
1138			5	6
1140			7	8
1142	GV3326	GV3326	1	2
1144			3	4
1146			5	6
1148			7	8
1150	GV3327	GV3327	1	2
1152			3	4
1154			5	6
1156			7	8
1158	GV3328	GV3328	1	2
1160			3	4
1162			5	6
1164			7	8
1166	GV3329	GV3329	1	2
1168			3	4
1170			5	6
1172			7	8
1174	GV3330	GV3330	1	2
1176			3	4
1178			5	6
1180			7	8
1182	GV3331	GV3331	1	2
1184			3	4
1186			5	6
1188			7	8
1190	GV3332	GV3332	1	2
1192			3	4
1194			5	6
1196			7	8
1198	GV3333	GV3333	1	2
1200			3	4
1202			5	6
1204			7	8
1206	GV3334	GV3334	1	2
1208			3	4
1210			5	6
1212			7	8
1214	GV3335	GV3335	1	2
1216			3	4
1218			5	6
1220			7	8

3D Line Number	Tape Number	Tape Number	First RODE file Number for Line	Last RODE file Number for Line
1222	GV3336	GV3336	1	2
1224			3	4
1226			5	6
1228			7	8
1230	GV3337	GV3337	1	2
1232			3	4
1234			5	6
1236			7	8
1238	GV3338	GV3338	1	2
1240			3	4
1242			5	6
1244			7	8
1246	GV3339	GV3339	1	2
1248			3	4
1250			5	6
1252			7	8
1254	GV3340	GV3340	1	2
1256			3	4
1258			5	6
1260			7	8
1262	GV3341	GV3341	1	2
1264			3	4
1266			5	6
1268			7	8
1270	GV3342	GV3342	1	2
1272			3	4
1274			5	6
1276			7	8
1278	GV3343	GV3343	1	2
1280			3	4
1282			5	6
1284			7	8
1286	GV3344	GV3344	1	2
1288			3	4
1290			5	6
1292			7	8
1294	GV3345	GV3345	1	2
1296			3	4
1298			5	6
1300			7	8
1302	GV3346	GV3346	1	2
1304			3	4
1306			5	6
1308			7	8

3D Line Number	Tape Number	Tape Number	First RODE file Number for Line	Last RODE file Number for Line
1310	GV3347	GV3347	1	2
1312			3	4
1314			5	6
1316			7	8
1318	GV3348	GV3348	1	2
1320			3	4
1322			5	6
1324			7	8
1326	GV3349	GV3349	1	2
1328			3	4
1330			5	6
1332			7	8
1334	GV3350	GV3350	1	2
1336			3	4
1338			5	6
1340			7	8
1342	GV3351	GV3351	1	2
1344			3	4
1346			5	6
1348			7	8
1350	GV3352	GV3352	1	2
1352			3	4
1354			5	6
1356			7	8
1358	GV3353	GV3353	1	2
1360			3	4
1362			5	6
1364			7	8
1366	GV3354	GV3354	1	2
1368			3	4
1370			5	6
1372			7	8
1374	GV3355	GV3355	1	2
1376			3	4
1378			5	6
1380			7	8
1382	GV3356	GV3356	1	2
1384			3	4
1386			5	6
1388			7	8
1390	GV3357	GV3357	1	2
1392			3	4
1394			5	6
1396			7	8

3D Line Number	Tape Number	Tape Number	First RODE file Number for Line	Last RODE file Number for Line
1398	GV3358	GV3358	1	2
1400			3	4
1402			5	6
1404			7	8
1406	GV3359	GV3359	1	2
1408			3	4
1410			5	6
1412			7	8
1414	GV3360	GV3360	1	2
1416			3	4
1418			5	6
1420			7	8
1422	GV3361	GV3361	1	2
1424			3	4
1426			5	6
1428			7	8
1430	GV3362	GV3362	1	2
1432			3	4
1434			5	6
1436			7	8
1438	GV3363	GV3363	1	2
1440			3	4
1442			5	6
1444			7	8
1446	GV3364	GV3364	1	2
1448			3	4
1450			5	6
1452			7	8
1454	GV3365	GV3365	1	2
1456			3	4
1458			5	6
1460			7	8
1462	GV3366	GV3366	1	2
1464			3	4
1466			5	6
1468			7	8
1470	GV3367	GV3367	1	2
1472			3	4
1474			5	6
1476			7	8
1478	GV3368	GV3368	1	2
1480			3	4
1482			5	6
1484			7	8

3D Line Number	Tape Number	Tape Number	First RODE file Number for Line	Last RODE file Number for Line
1486	GV3369	GV3369	1	2
1488			3	4
1490			5	6
1492			7	8
1494	GV3370	GV3370	1	2
1496			3	4
1498			5	6
1500			7	8
1502	GV3371	GV3371	1	2
1504			3	4
1506			5	6
1508			7	8
1510	GV3372	GV3372	1	2
1512			3	4
1514			5	6
1516			7	8
1518	GV3373	GV3373	1	2
1520			3	4
1522			5	6
1524			7	8
1526	GV3374	GV3374	1	2
1528			3	4
1530			5	6
1532			7	8
1534	GV3375	GV3375	1	2
1536			3	4
1538			5	6
1540			7	8
1542	GV3376	GV3376	1	2
1544			3	4
1546			5	6
1548			7	8
1550	GV3377	GV3377	1	2
1552			3	4
1554			5	6
1556			7	8
1558	GV3378	GV3378	1	2
1560			3	4
1562			5	6
1564			7	8
1566	GV3379	GV3379	1	2
1568			3	4
1570			5	6
1572			7	8

3D Line Number	Tape Number	Tape Number	First RODE file Number for Line	Last RODE file Number for Line
1574	GV3380	GV3380	1	2
1576			3	4
1578			5	6
1580			7	8
1582	GV3381	GV3381	1	2
1584			3	4
1586			5	6
1588			7	8
1590	GV3382	GV3382	1	2
1592			3	4
1594			5	6
1596			7	8
1598	GV3383	GV3383	1	2
1600			3	4
1602			5	6
1604			7	8
1606	GV3384	GV3384	1	2
1608			3	4
1610			5	6
1612			7	8
1614	GV3385	GV3385	1	2
1616			3	4
1618			5	6
1620			7	8
1622	GV3386	GV3386	1	2
1624			3	4
1626			5	6
1628			7	8
1630	GV3387	GV3387	1	2
1632			3	4
1634			5	6
1636			7	8
1638	GV3388	GV3388	1	2
1640			3	4
1642			5	6
1644			7	8
1646	GV3389	GV3389	1	2
1648			3	4
1650			5	6
1652			7	8
1654	GV3390	GV3390	1	2
1656			3	4
1658			5	6
1660			7	8

3D Line Number	Tape Number	Tape Number	First RODE file Number for Line	Last RODE file Number for Line
1662	GV3391	GV3391	1	2
1664			3	4
1666			5	6
1668			7	8
1670	GV3392	GV3392	1	2
1672			3	4
1674			5	6
1676			7	8
1678	GV3393	GV3393	1	2
1680			3	4
1682			5	6
1684			7	8
1686	GV3394	GV3394	1	2
1688			3	4
1690			5	6
1692			7	8
1694	GV3395	GV3395	1	2
1696			3	4
1698			5	6
1700			7	8
1702	GV3396	GV3396	1	2
1704			3	4
1706			5	6
1708			7	8
1710	GV3397	GV3397	1	2
1712			3	4
1714			5	6
1716			7	8
1718	GV3398	GV3398	1	2
1720			3	4
1722			5	6
1724			7	8
1726	GV3399	GV3399	1	2
1728			3	4
1730			5	6
1732			7	8
1734	GV4903	GV4903	1	2
1736			3	4
1738			5	6
1740			7	8
1742	GV4904	GV4904	1	2
1744			3	4
1746			5	6
1748			7	8

3D Line Number	Tape Number	Tape Number	First RODE file Number for Line	Last RODE file Number for Line
1750	GV4905	GV4905	1	2
1752			3	4
1754			5	6
1756			7	8
1758	GV4906	GV4906	1	2
1760			3	4
1762			5	6
1764			7	8
1766	GV4907	GV4907	1	2
1768			3	4
1770			5	6
1772			7	8
1774	GV4908	GV4908	1	2
1776			3	4
1778			5	6
1780			7	8
1782	GV4909	GV4909	1	2
1784			3	4
1786			5	6
1788			7	8
1790	GV4910	GV4910	1	2
1792			3	4
1794			5	6
1796			7	8
1798	GV4911	GV4911	1	2
1800			3	4
1802			5	6
1804			7	8
1806	GV4912	GV4912	1	2
1808			3	4
1810			5	6
1812			7	8
1814	GV4913	GV4913	1	2
1816			3	4
1818			5	6
1820			7	8
1822	GV4914	GV4914	1	2
1824			3	4
1826			5	6
1828			7	8
1830	GV4915	GV4915	1	2
1832			3	4
1834			5	6
1836			7	8

3D Line Number	Tape Number	Tape Number	First RODE file Number for Line	Last RODE file Number for Line
1838	GV4916	GV4916	1	2
1840			3	4
1842			5	6
1844			7	8
1846	GV4917	GV4917	1	2
1848			3	4
1850			5	6
1852			7	8
1854	GV4918	GV4918	1	2
1856			3	4
1858			5	6
1860			7	8
1862	GV4919	GV4919	1	2
1864			3	4
1866			5	6
1868			7	8
1870	GV4920	GV4920	1	2
1872			3	4
1874			5	6
1876			7	8
1878	GV4921	GV4921	1	2
1880			3	4

B11 Final Stacking And Migration Velocities Archives

CLIENT : WOODSIDE ENERGY LTD
AREA : INVESTIGATOR 3D
PROCESS : VELS STK AND VELS MIG
FORMAT : WOODSIDE FORMAT
TAPE TYPE : EXABYTE TAPE HI DENSITY
TAPE ID. : EXA_VEL_INVG

NO.	VELOCITY	FILE NAME	INLINE	BYTES	NO. VELOCITIES
1	Vels Stk	stkvel.woodsd	142 – 1870	1842876	4426
2	Vels Mig	migvel.woodsd	142 – 1870	3656094	4900
Note : Velocity Smoothing parameter : 100% Vels Stk, 5 points, 2000m radius					

EXAMPLE FOR FILE NAME: stkvel.woodsd

```
CONT       INVESTIGATOR 3D
PERMIT     VIC/P43
CONTRACTOR  Veritas DGC Singapore
DATE PROCESSED      August 2000
VELOCITY TYPE STACKING VEL 0.5x0.5 KM
INLINE RANGE 142 - 1870
CROSSLINE 611 - 4571
SL/IL REL  SL =2121-(INLINE NO./2)
SP/XL REL  SP =XLINE NO. + 400
COM1
SPNT   1420611      611    670761   5646361          142    0
VELF   1420611  0 0 1530   118 1530   243 1748   362 1929   524 2095
VELF              646 2204   782 2270   921 2348 1039 2438 1202 2523
VELF             1374 2609 1608 2754 1791 2875 1981 3029 2177 3209
VELF             2319 3350 2553 3543 2743 3694 2956 3869 3183 4016
```

EXAMPLE FOR FILE NAME: migvel.woodsd

```
CONT       INVESTIGATOR 3D
PERMIT     VIC/P43
CONTRACTOR  Veritas DGC Singapore
DATE PROCESSED      August 2000
VELOCITY TYPE MIGRATON VEL 0.5x0.5 KM
 5 POINTS (2000 KM) SMOOTHING
INLINE RANGE 142 - 1870
CROSSLINE RANGE 611 - 4571
SL/IL REL  SL =2121-(INLINE NO./2)
SP/XL REL  SP =XLINE NO. + 400
COM1
SPNT   1420611      611    670761   5646361          142    0
VELF   1420611 0  0 1529   100 1529   200 1678   300 1848   400 1984
VELF              500 2076   600 2160   700 2227   800 2284   900 2352
VELF             1000 2418 1100 2479 1200 2537 1300 2592 1400 2649
VELF             1500 2706 1600 2762 1700 2824 1800 2890 1900 2969
VELF             2000 3049 2100 3131 2200 3216 2300 3301 2400 3387
VELF             2500 3472 2600 3555 2700 3637 2800 3717 2900 3794
VELF             3000 3868 3100 3938 3200 4004 3300 4067 3400 4127
VELF             3500 4183 3600 4237 3700 4289 3800 4339 3900 4388
VELF             4000 4435 4100 4480 4200 4522 4300 4561 4400 4599
VELF             4500 4635 4600 4669
```

B12 Migration Bin Centre Co-ordinates In UKOOA Format

CLIENT : WOODSIDE ENERGY LTD
AREA : INVESTIGATOR 3D
PROCESS : BIN CENTRE CO-ORDINATES FOR MIGRATION DATA
FORMAT : UKOOA FORMAT (UNIX TAR ASCII)
TAPE TYPE : EXABYTE TAPE
TAPE ID. : EXA_INVG_BIN

NO.	FILE NAME	INLINE	BYTES
1	invgmigbin_uko	132 – 1880	549242402

HEADER EXTRACTED FROM FILE = invgmigbin_uko

```
H0100 SURVEY & AREA NAME       INVESTIGATOR  3D        19991216
H0101 GENERAL SURVEY DETAILS   WOODSIDE : INVESTIGATOR (JOB 1999-035D-EH)
H0102 VESSEL DETAILS          WESTERN PRIDE P-140      1
H0103 SOURCE DETAILS           ARRAY 2250 CU.IN.       1  1
H0103 SOURCE DETAILS           ARRAY 2250 CU.IN.       1  2
H0104 STREAMER DETAILS                                 1     1  1
H0104 STREAMER DETAILS                                 1     2  2
H0104 STREAMER DETAILS                                 1     3  3
H0104 STREAMER DETAILS                                 1     4  4
H0104 STREAMER DETAILS                                 1     5  0
H0104 STREAMER DETAILS                                 1     6  6
H0200 DATE OF SURVEY          27 MARCH 2000
H0201 POSTPLOT DATE           27 MARCH 2000
H0202 TAPE VERSION           UKOOA-P1/1990 (WESTERN VERSION 01.01)
H0300 CLIENT NAME            WOODSIDE ENERGY LTD
H0400 GEOPHYSICAL CONTRACTOR   WESTERN GEOPHYSICAL
H0500 POSITIONING CONTRACTOR   RACAL & FUGRO
H0600 PROCESSING CONTRACTOR    WESTERN GEOPHYSICAL
H0700 POSITIONING SYSTEM       SPECTRA INTEGRATED NAVIGATION SYSTEM
H0800 COORDINATE LOCATION      REFER TO H2600 CARDS
H0900 POSITION OFFSETS                        REFER TO H2600 CARDS
H1000 CLOCK TIME             GMT + 0 HOURS
H1100 RECEIVER GROUPS PER SHOT    0
H1400 GEODETIC DATUM AS SURVEYEDAGD84      AUSTRALIAN N 6378160.000 298.2500000
H1401 TRANSFORMATION PARAMETERS -116.0 -50.5 141.7  .230  .390  .344  .0983000
H1500 GEODETIC DATUM AS PLOTTED AGD84      AUSTRALIAN N 6378160.000 298.2500000
H1501 TRANSFORMATION PARAMETERS -116.0 -50.5 141.7  .230  .390  .344  .0983000
H1600 DATUM SHIFTS                            .0     .0     .0  .000  .000  .000  .0000000
H1700 VERTICAL DATUM          MEAN SEA LEVEL
H1800 PROJECTION TYPE          002UNIVERSAL TRANSVERSE MERCATOR
H1900 UTM ZONE                 54S
H2000 GRID UNITS               1METRES              1.000000000000
H2001 HEIGHT UNITS             1METRES              1.000000000000
H2002 ANGULAR UNITS            1DEGREES
H2200 CENTRAL MERIDIAN         141 0  .000E
H2301 GRID ORIGIN                        0 0  .000N141    0    .000E
H2302 GRID COORDINATES AT ORIGIN  500000.00E10000000.00N
H2401 SCALE FACTOR                       .9996000000
H2402 SCALE FACTOR DEFINED AT       0 0  .000N141    0    .000E
H2600 ***************************************************************************
H2600 Q00101    WOODSIDE ENERGY LTD
H2600 Q00102             INVESTIGATOR  3D        19991216
H2600 Q00103  1  140                WESTERN PRIDE
H2600 Q00502  1  6  2     8    903     5083    991   5078   8705213   8709300
H2600 Q00503     8705125   8709305
H2600 ***************************************************************************
H2600
H2600 DATUM ROTATION PARAMETERS ARE EXPRESSED IN POSITION VECTOR SENSE
H2600 DEPTH DATA IS DRAFT AND TIDE CORRECTED WITH VELOCITY OF 1514 M/S USED.
```

```
H2600
H2600 ****************** SURVEY CONFIGURATION PARAMETERS **********************
H2600
H2600 NUMBER OF VESSELS                    1
H2600
H2600 VESSEL 1
H2600 NUMBER OF ENERGY SOURCES         2
H2600 NUMBER OF STREAMER CABLES        6
H2600 NUMBER OF ACTIVE TAILBUOYS       5
H2600
H2600 ************* POSITION RECORD LOCATION DESCRIPTIONS *********************
H2600
H2600 RECORD TYPE: A          VESSEL ANTENNA POSITION
H2600 OFFSETS APPLIED ALONG    PROCESSED GYRCOMPASS HEADING
H2600 ANTENNA FORE/AFT OFFSET          .00
H2600 ANTENNA STBD/PORT OFFSET         .00
H2600
H2600 RECORD TYPE: E                ECHO SOUNDER POSITION
H2600 OFFSETS APPLIED ALONG    PROCESSED GYRCOMPASS HEADING
H2600 ECHO SOUNDER FORE/AFT OFFS    10.71
H2600 ECHO SOUNDER STBD/PORT OFF     1.59
H2600
H2600 RECORD TYPE: R          HYDROPHONE GROUP POSITIONS
H2600
H2600 RECORD TYPE: S          CENTRE OF FIRING ENERGY SOURCE ARRAY
H2600 RECORD TYPE: Z          CENTRE OF ENERGY SOURCE ARRAY
H2600
H2600 RECORD TYPE: T          TAILBUOY POSITION
H2600
H2600 RECORD TYPE: V          VESSEL SYSTEM REFERENCE POSITION
H2600
H2600 RECORD TYPE: W          WESTERN EXTENSION RECORD
H2600
QS132         11   414392014.32S1425842.07E 670499.95643909.0   .0
QS132         11   415392013.92S1425842.14E 670501.95643921.3   .0
QS132         11   416392013.52S1425842.21E 670503.85643933.7   .0
QS132         11   417392013.12S1425842.28E 670505.85643946.0   .0
QS132         11   418392012.72S1425842.35E 670507.85643958.4   .0
QS132         11   419392012.32S1425842.42E 670509.75643970.7   .0
QS132         11   420392011.91S1425842.49E 670511.75643983.1   .0
QS132         11   421392011.51S1425842.56E 670513.65643995.4   .0
QS132         11   422392011.11S1425842.63E 670515.65644007.8   .0
QS132         11   423392010.71S1425842.70E 670517.55644020.1   .0
QS132         11   424392010.31S1425842.77E 670519.55644032.5   .0
QS132         11   4253920  9.91S1425842.84E 670521.45644044.8   .0
QS132         11   4263920  9.50S1425842.91E 670523.45644057.2   .0
QS132         11   4273920  9.10S1425842.98E 670525.35644069.5   .0
QS132         11   4283920  8.70S1425843.05E 670527.35644081.8   .0
QS132         11   4293920  8.30S1425843.12E 670529.35644094.2   .0
QS132         11   4303920  7.90S1425843.19E 670531.25644106.5   .0
QS132         11   4313920  7.50S1425843.26E 670533.25644118.9   .0
```

B13 SEG-Y Archive Of The Final Migrated 2D Data

The Mig Final data were archived to 3590 cartridges in SEG-Y format.

B13.1 Mig Final SEG-Y Tape Headers

SEG-Y Trace Header for Mig Final, tape no: GV5456

Value	Bytes	Item
1	001 - 004	Trace number within line. Starts with 1 per data set
1	005 - 008	Trace number within a tape. Starts with 1 on each tape
0	009 - 012	0
0	013 - 016	0
910.5	017 - 020	Shot Point Number
2002	021 - 024	CMP-number
0	025 - 028	0
1	029 - 030	Trace status code (1=seismic data, 2=dead, 3=dummy)
1	031 - 032	Number of vertically summed traces (stack or substack fold)
1	033 - 034	Number of horizontally stacked traces (number of traces summed-fold)
0	035 - 036	0
0	037 - 040	0
0	041 - 044	0
910	045 - 046	Shot Point Number
1	047 - 048	Interpolated Trace 1 = real 2 = interpolated
5	049 - 050	Source depth [m]
0	051 - 054	0
0	055 - 056	0
0	057 -060	0
0	061 - 064	0
0	065 - 068	0
1	069 - 070	1 if depth in (m), 10 if depth in (dm), 100 if depth in (cm),
1	071 - 072	1 if coordinates in (m), 10 if units in (dm), 100 if units in (cm),
672390	073 - 076	CMP x coordinate (CMP X)
5619764	077 - 080	CMP y coordinate (CMP Y)
0	081 - 084	0
0	085 - 088	0
1	089 - 090	Coordinate units: 1 = metric [m], 2 = seconds of arc, 3 = Imperial [ft]
1512	091 - 092	Water velocity [m/s] used in processing at the bin location
0	093 - 094	Replacement velocity [m/s]. (reef replacement)
6	095 - 096	Streamer depth [m]
0	097 - 098	0
3307	099 - 100	Source depth correction [microseconds] SHTDEP
3968	101 - 102	Group depth correction [microseconds] RECDEP
0	103 - 104	0
6000	105 - 106	T max [ms]
0	107 - 108	Total Gun / Recorder delay time if any (if none = 0)
0	109 - 110	Time of first sample of trace [ms]
3460	111 - 112	Start time of mute or time of first live sample on trace in [ms]
3480	113 - 114	End time of mute or time of full on sample in [ms] .
		(End-Start = the mute ramp)

Value	Bytes	Item
1501	115 - 116	Number of samples in this trace
4000	117 - 118	Sample interval for this trace (in micro seconds)
0	119 - 120	0
0	121 - 122	0
0	123 - 124	0
672390	125 - 128	CMP x coordinate (CMP X)
5619764	129 - 132	CMP y coordinate (CMP Y)
0	133 - 134	0
2	135 - 136	Seismic datum flag (1 = floating datum, 2 = flat Reference datum,
		3 = acquisition datum)
0	137 - 138	Bulk shift static in [microseconds] which has been applied to avoid losing
		seismic data above t=0 [s]. (BULKSH)
0	139 - 140	0
100	141 - 142	Cut-off frequency of anti-alias filter in [Hz] (-3 dB point) [processing]
12	143 - 144	Order of the slope of the anti-alias filter [processing]
0	145 - 146	Notch filter frequency. Normally = 0 [processing]
0	147 - 148	Notch filter slope. Normally = 0 [processing]
4	149 - 150	Cut-off frequency of low-cut filter in [Hz] (-3 dB point) [processing]
0	151 - 152	Cut-off frequency of high-cut filter in [Hz] (-3 dB point) [processing]
3	153 - 154	Order of the slope of the low-cut filter [processing]
0	155 - 156	Order of the slope of the high-cut filter [processing]
0	157 - 158	0
0	159 - 160	0
0	161 - 162	0
0	163 - 164	0
0	165 - 166	0
0	167 - 168	0
0	169 - 170	0
0	171 - 172	0
0	173 - 174	0
0	175 - 176	0
0	177 - 180	Residual CMP static (in microseconds)
0	181 - 182	0
1	183 - 184	Vintage (1=new data, 2=reprocessing)
4	185 - 188	Line number
910	189 - 192	Shot Point number as integer value
0	193 - 196	0
0	197 - 200	0
0	201 - 204	0
0	205 - 208	0
0	209 - 212	0
225	213 - 216	CMP water depth (units see bytes 69-72)
0	217 - 220	POSNMO (floating datum) static (in microseconds)
0	221 - 224	Total statics (in microseconds) TOTSTA
0	225 - 228	0
0	229 - 232	0
0	233 - 234	0
1	235 - 236	Line archive number (1=1st line archived on tape,2=2nd line, N=Nth line)
0	237 - 240	Floating datum water depth (optional, units see bytes 69-71)

B13.2 Mig Final SEG-Y Tape Log

CLIENT : WOODSIDE ENERGY LTD
AREA : INVESTIGATOR 2D
PROCESS : MIG FINAL
FORMAT : WEL SEG-Y VERSION M.09
TAPE TYPE : 3590 CARTRIDGE
DATA LENGTH : 6000 MSEC
SAMPLE RATE : 4 MSEC
TAPE ID : GV5456

LINE NO.	SHOTPOINTS	CDP	ARCHIVE NO.
W00INV0004P1	1002 – 2507	2002 - 5195	1
W00INV0005P1	2415 – 1820	5172 - 6545	2
W00INV0006P2	2385 – 1114	5232 - 7957	3
W00INV0007P1	1800 – 909	6402 - 8367	4

B14 SEG-Y Archive Of The Raw Migrated 2D Data

The Mig Raw data were archived to 3590 cartridges in SEG-Y format.

B14.1 Mig Raw SEG-Y Tape Headers

SEG-Y Trace Header for Mig Raw, tape no: GV5455

Value	Bytes	Item
1	001 - 004	Trace number within line. Starts with 1 per data set
1	005 - 008	Trace number within a tape. Starts with 1 on each tape
0	009 - 012	0
0	013 - 016	0
910.5	017 - 020	Shot Point Number
2002	021 - 024	CMP-number
0	025 - 028	0
1	029 - 030	Trace status code (1=seismic data, 2=dead, 3=dummy)
1	031 - 032	Number of vertically summed traces (stack or substack fold)
1	033 - 034	Number of horizontally stacked traces (number of traces summed-fold)
0	035 - 036	0
0	037 - 040	0
0	041 - 044	0
910	045 - 046	Shot Point Number
1	047 - 048	Interpolated Trace 1 = real 2 = interpolated
5	049 - 050	Source depth [m]
0	051 - 054	0
0	055 - 056	0
0	057 -060	0
0	061 - 064	0
0	065 - 068	0
1	069 - 070	1 if depth in (m), 10 if depth in (dm), 100 if depth in (cm),
1	071 - 072	1 if coordinates in (m), 10 if units in (dm), 100 if units in (cm),
672390	073 - 076	CMP x coordinate (CMP X)
5619764	077 - 080	CMP y coordinate (CMP Y)
0	081 - 084	0
0	085 - 088	0
1	089 - 090	Coordinate units: 1 = metric [m], 2 = seconds of arc, 3 = Imperial [ft]
1512	091 - 092	Water velocity [m/s] used in processing at the bin location
0	093 - 094	Replacement velocity [m/s]. (reef replacement)
6	095 - 096	Streamer depth [m]
0	097 - 098	0
3307	099 - 100	Source depth correction [microseconds] SHTDEP
3968	101 - 102	Group depth correction [microseconds] RECDEP
0	103 - 104	0
6000	105 - 106	T max [ms]
0	107 - 108	Total Gun / Recorder delay time if any (if none = 0)
0	109 - 110	Time of first sample of trace [ms]
3460	111 - 112	Start time of mute or time of first live sample on trace in [ms]
3480	113 - 114	End time of mute or time of full on sample in [ms] .
		(End-Start = the mute ramp)

Value	Bytes	Item
1501	115 - 116	Number of samples in this trace
4000	117 - 118	Sample interval for this trace (in micro seconds)
0	119 - 120	0
0	121 - 122	0
0	123 - 124	0
672390	125 - 128	CMP x coordinate (CMP X)
5619764	129 - 132	CMP y coordinate (CMP Y)
0	133 - 134	0
2	135 - 136	Seismic datum flag (1 = floating datum, 2 = flat Reference datum,
		3 = acquisition datum)
0	137 - 138	Bulk shift static in [microseconds] which has been applied to avoid losing
		seismic data above t=0 [s]. (BULKSH)
0	139 - 140	0
100	141 - 142	Cut-off frequency of anti-alias filter in [Hz] (-3 dB point) [processing]
12	143 - 144	Order of the slope of the anti-alias filter [processing]
0	145 - 146	Notch filter frequency. Normally = 0 [processing]
0	147 - 148	Notch filter slope. Normally = 0 [processing]
4	149 - 150	Cut-off frequency of low-cut filter in [Hz] (-3 dB point) [processing]
0	151 - 152	Cut-off frequency of high-cut filter in [Hz] (-3 dB point) [processing]
3	153 - 154	Order of the slope of the low-cut filter [processing]
0	155 - 156	Order of the slope of the high-cut filter [processing]
0	157 - 158	0
0	159 - 160	0
0	161 - 162	0
0	163 - 164	0
0	165 - 166	0
0	167 - 168	0
0	169 - 170	0
0	171 - 172	0
0	173 - 174	0
0	175 - 176	0
0	177 - 180	Residual CMP static (in microseconds)
0	181 - 182	0
1	183 - 184	Vintage (1=new data, 2=reprocessing)
4	185 - 188	Line number
910	189 - 192	Shot Point number as integer value
0	193 - 196	0
0	197 - 200	0
0	201 - 204	0
0	205 - 208	0
0	209 - 212	0
225	213 - 216	CMP water depth (units see bytes 69-72)
0	217 - 220	POSNMO (floating datum) static (in microseconds)
0	221 - 224	Total statics (in microseconds) TOTSTA
0	225 - 228	0
0	229 - 232	0
0	233 - 234	0
1	235 - 236	Line archive number (1=1st line archived on tape,2=2nd line, N=Nth line)
0	237 - 240	Floating datum water depth (optional, units see bytes 69-71)

B14.2 Mig Raw SEG-Y Tape Log

CLIENT : WOODSIDE ENERGY LTD
AREA : INVESTIGATOR 2D
PROCESS : MIG RAW
FORMAT : WEL SEG-Y VERSION M.09
TAPE TYPE : 3590 CARTRIDGE
DATA LENGTH : 6000 MSEC
SAMPLE RATE : 4 MSEC
TAPE ID : GV5455

LINE NO.	SHOTPOINTS	CDP	ARCHIVE NO.
W00INV0004P1	1002 – 2507	2002 - 5195	1
W00INV0005P1	2415 – 1820	5172 - 6545	2
W00INV0006P2	2385 – 1114	5232 - 7957	3
W00INV0007P1	1800 – 909	6402 - 8367	4

B15 SEG-Y Archive Of The Raw Stack 2D Data

The Stk Raw data were archived to 3590 cartridges in SEG-Y format.

B15.1 Stk Raw SEG-Y Tape Headers

SEG-Y Trace Header for Stk Raw, tape no: GV5454

Value	Bytes	Item
1	001 - 004	Trace number within line. Starts with 1 per data set
1	005 - 008	Trace number within a tape. Starts with 1 on each tape
0	009 - 012	0
0	013 - 016	0
910.5	017 - 020	Shot Point Number
2002	021 - 024	CMP-number
0	025 - 028	0
1	029 - 030	Trace status code (1=seismic data, 2=dead, 3=dummy)
1	031 - 032	Number of vertically summed traces (stack or substack fold)
1	033 - 034	Number of horizontally stacked traces (number of traces summed-fold)
0	035 - 036	0
0	037 - 040	0
0	041 - 044	0
910	045 - 046	Shot Point Number
1	047 - 048	Interpolated Trace 1 = real 2 = interpolated
5	049 - 050	Source depth [m]
0	051 - 054	0
0	055 - 056	0
0	057 -060	0
0	061 - 064	0
0	065 - 068	0
1	069 - 070	1 if depth in (m), 10 if depth in (dm), 100 if depth in (cm),
1	071 - 072	1 if coordinates in (m), 10 if units in (dm), 100 if units in (cm),
672390	073 - 076	CMP x coordinate (CMP X)
5619764	077 - 080	CMP y coordinate (CMP Y)
0	081 - 084	0
0	085 - 088	0
1	089 - 090	Coordinate units: 1 = metric [m], 2 = seconds of arc, 3 = Imperial [ft]
1512	091 - 092	Water velocity [m/s] used in processing at the bin location
0	093 - 094	Replacement velocity [m/s]. (reef replacement)
6	095 - 096	Streamer depth [m]
0	097 - 098	0
3307	099 - 100	Source depth correction [microseconds] SHTDEP
3968	101 - 102	Group depth correction [microseconds] RECDEP
0	103 - 104	0
6000	105 - 106	T max [ms]
0	107 - 108	Total Gun / Recorder delay time if any (if none = 0)
0	109 - 110	Time of first sample of trace [ms]
3460	111 - 112	Start time of mute or time of first live sample on trace in [ms]
3480	113 - 114	End time of mute or time of full on sample in [ms] .
		(End-Start = the mute ramp)

Value	Bytes	Item
1501	115 - 116	Number of samples in this trace
4000	117 - 118	Sample interval for this trace (in micro seconds)
0	119 - 120	0
0	121 - 122	0
0	123 - 124	0
672390	125 - 128	CMP x coordinate (CMP X)
5619764	129 - 132	CMP y coordinate (CMP Y)
0	133 - 134	0
2	135 - 136	Seismic datum flag (1 = floating datum, 2 = flat Reference datum,
		3 = acquisition datum)
0	137 - 138	Bulk shift static in [microseconds] which has been applied to avoid losing
		seismic data above t=0 [s]. (BULKSH)
0	139 - 140	0
100	141 - 142	Cut-off frequency of anti-alias filter in [Hz] (-3 dB point) [processing]
12	143 - 144	Order of the slope of the anti-alias filter [processing]
0	145 - 146	Notch filter frequency. Normally = 0 [processing]
0	147 - 148	Notch filter slope. Normally = 0 [processing]
4	149 - 150	Cut-off frequency of low-cut filter in [Hz] (-3 dB point) [processing]
0	151 - 152	Cut-off frequency of high-cut filter in [Hz] (-3 dB point) [processing]
3	153 - 154	Order of the slope of the low-cut filter [processing]
0	155 - 156	Order of the slope of the high-cut filter [processing]
0	157 - 158	0
0	159 - 160	0
0	161 - 162	0
0	163 - 164	0
0	165 - 166	0
0	167 - 168	0
0	169 - 170	0
0	171 - 172	0
0	173 - 174	0
0	175 - 176	0
0	177 - 180	Residual CMP static (in microseconds)
0	181 - 182	0
1	183 - 184	Vintage (1=new data, 2=reprocessing)
4	185 - 188	Line number
910	189 - 192	Shot Point number as integer value
0	193 - 196	0
0	197 - 200	0
0	201 - 204	0
0	205 - 208	0
0	209 - 212	0
225	213 - 216	CMP water depth (units see bytes 69-72)
0	217 - 220	POSNMO (floating datum) static (in microseconds)
0	221 - 224	Total statics (in microseconds) TOTSTA
0	225 - 228	0
0	229 - 232	0
0	233 - 234	0
1	235 - 236	Line archive number (1=1st line archived on tape,2=2nd line, N=Nth line)
0	237 - 240	Floating datum water depth (optional, units see bytes 69-71)

B15.2 Stk Raw SEG-Y Tape Log

CLIENT : WOODSIDE ENERGY LTD
AREA : INVESTIGATOR 2D
PROCESS : STK RAW
FORMAT : WEL SEG-Y VERSION M.09
TAPE TYPE : 3590 CARTRIDGE
DATA LENGTH : 6000 MSEC
SAMPLE RATE : 4 MSEC
TAPE ID : GV5454

LINE NO.	SHOTPOINTS	CDP	ARCHIVE NO.
W00INV0004P1	1002 – 2507	2002 - 5195	1
W00INV0005P1	2415 – 1820	5172 - 6545	2
W00INV0006P2	2385 – 1114	5232 - 7957	3
W00INV0007P1	1800 – 909	6402 - 8367	4

B16 SEG-Y Archive Of The 2D CMP Data

The CMP data were archived to 3590 cartridges in SEG-Y format.

B16.1 2D CMP SEG-Y Tape Headers

SEG-Y Trace Header for 2D CMP, tape no: GV5457

Value	Bytes	Item
1	001 - 004	Trace number within line. Starts with 1 per data set
1	005 - 008	Trace number within a tape. Starts with 1 on each tape
187	009 - 012	Original field record number (file number on the original field tape)
367	013 - 016	Original field trace number within a field record (channel no.)
1002	017 - 020	Shot Point No.
2002	021 - 024	CMP-number
1	025 - 028	Trace sequence within CDP
1	029 - 030	Trace status code (1=seismic data, 2=dead, 3=dummy)
1	031 - 032	Number of vertically summed traces (stack or substack fold)
2	033 - 034	Number of horizontally stacked traces (number of traces summed)
0	035 - 036	0
4770	037 - 040	True shot receiver distance in [m] (offset)
31426	041 - 044	Original Tape Number
1002	045 - 046	Shot Point number as integer value
1	047 - 048	Interpolated Trace 1 = real 2 = interpolated
5	049 - 050	Source depth [m]
0	051 - 054	0
0	055 - 056	0
0	057 - 058	0
0	059 - 060	0
177	061 - 064	Water depth at shot in [m]
226	065 - 068	Water depth at receiver in [m] (optional)
1	069 - 070	1 if depth in (m), 10 if depth in (dm), 100 if depth in (cm),
71	071 - 072	1 if coordinates in (m), 10 if units in (dm), 100 if units in (cm),
672849	073 - 076	Shot x coordinates (units as per bytes 71-72)
5622106	077 - 080	Shot y coordinates (units as per bytes 71-72)
671930	081 - 084	Receiver x coordinates (units as per bytes 71-72)
56717421	085 - 088	Receiver y coordinates (units as per bytes 71-72)
1	089 - 090	Coordinate units: 1 = metric [m], 2 = seconds of arc, 3 = Imperial [ft]
1512	091 - 092	Water velocity [m/s] used in processing at the bin location
0	093 - 094	Replacement velocity [m/s]. (reef replacement)
6	095 - 096	Streamer depth [m]
0	097 - 098	0
3307	099 - 100	Source depth correction [microseconds] SHTDEP
3968	101 - 102	Group depth correction [microseconds] RECDEP
0	103 - 104	0
6000	105 - 106	T max [ms]
0	107 - 108	Total Gun / Recorder delay time if any (if none = 0)
0	109 - 110	Time of first sample of trace (ms)
1936	111 - 112	Start time of mute or time of first live sample on trace in [ms]
1956	113 - 114	End time of mute or time of full on sample in [ms] .
		End-Start = the mute ramp length

Value	Bytes	Item
1501	115 - 116	Number of samples in this trace
4000	117 - 118	Sample interval in micro seconds for this trace
0	119 - 120	Gain type of field instrument
0	121 - 122	Instrument gain constant
0	123 - 124	Instrument early or initial gain in [dB]
672390	125 - 128	Bin Centre x coordinates (CMP X)
5619764	129 - 132	Bin Centre y coordinates (CMP Y)
0	133 - 134	0
3	135 - 136	Seismic datum flag: 1 = data at floating datum, 2 = data at a flat
		reference datum, 3 = acquisition datum (raw / no statics applied)
0	137 - 138	Bulk shift static in [microseconds] which has been applied to avoid losing
		seismic data above t=0 [s]. (BULKSH)
0	139 - 140	0
100	141 - 142	Cut-off frequency of anti-alias filter in [Hz] (-3 dB point) processing
12	143 - 144	Order of the slope of the anti-alias filter processing
0	145 - 146	Notch filter frequency. Normally = 0
0	147 - 148	Notch filter slope. Normally = 0
4	149 - 150	Cut-off frequency of low-cut filter in [Hz] (-3 dB point) processing
0	151 - 152	Cut-off frequency of high-cut filter in [Hz] (-3 dB point) processing
3	153 - 154	Order of the slope of the low-cut filter processing
0	155 - 156	Order of the slope of the high-cut filter processing
2000	157 - 158	Year data recorded (four digits)
95	159 - 160	Julian day of the year of recording
4	161 - 162	Hour of day of recording using 24 hour clock (hh)
33	163 - 164	Minute of hour of recording (mm)
51	165 - 166	Second of minute of recording (ss)
2	167 - 168	Time basis code: 1 = local, 2 = GMT, 3 = other
0	169 - 172	Pre_nmo or differential static in [microseconds] (PRENMO)
0	173 - 174	Residual receiver static RECSTA (in microseconds)
0	175 - 176	Residual shot static SHTSTA (in microseconds)
0	177 - 180	Residual CMP static (in microseconds)
0	181 - 182	0
1	183 - 184	Vintage (OPTIONAL) 1= original,2=reprocessing
4	185 - 188	Line number
1002	189 - 192	Shot Point number as integer value
672390	193 - 196	Natural CMP (mid x coordinates (xsht/2 + xrec/2)
5619763	197 - 200	Natural CMP (mid y coordinates) (ysht/2 + yrec/2)
1000	201 - 204	Shot scalar (multiply by 1000)
1000	205 - 208	Receiver scalar (multiply by 1000)
0	209 - 212	Tidal statics (in microseconds for total trace) TIDSTA
177	213 - 216	CMP water depth (units see bytes 69-72)
0	217 - 220	POSNMO (floating datum) static (in microseconds)
7275	221 - 224	Total statics (in microseconds) = Tidal statics+Source depth static+Group depth static
0	225 - 228	Shot statics SHTFLD (in microseconds) Reef replacement static
0	229 - 232	Receiver statics RECFLD (in microseconds) Reef replacement static
0	233 - 234	0
1	235 - 236	Line archive number (1=1st line archived on tape, 2=2nd line, N=Nth line)
0	237 - 240	Floating datum water depth (optional, units see bytes 69 - 71)
PS : SOURCE & CABLE DEPTH CORRECTIONS ARE NOT APPLIED ON CMP GATHERS		

B16.2 2D CMP SEG-Y Tape Log

CLIENT : WOODSIDE ENERGY LTD
AREA : INVESTIGATOR 2D
PROCESS : CMP
FORMAT : WEL SEG-Y VERSION M.09
TAPE TYPE : 3590 CARTRIDGE
DATA LENGTH : 6000 MSEC
SAMPLE RATE : 4 MSEC
TAPE ID : GV5457

LINE NO.	SHOTPOINTS	CDP	ARCHIVE NO.
W00INV0004P1	1002 – 2507	2002 - 5195	1
W00INV0005P1	2415 – 1820	5172 - 6545	2
W00INV0006P2	2385 – 1114	5232 - 7957	3
W00INV0007P1	1800 – 909	6402 - 8367	4

B17 Final Stacking And Migration 2D Velocities Archives

CLIENT : WOODSIDE ENERGY LTD
AREA : INVESTIGATOR 2D
PROCESS : VELS STK AND VELS MIG
FORMAT : WOODSIDE FORMAT
TAPE TYPE : EXABYTE TAPE HI DENSITY
TAPE ID. : EXA_INVG_VEL-2D

NO.	VELOCITY	FILE NAME	LINE NO.	BYTES	NO. VELOCITIES
1	Vels Stk	04stkvel.woodsd	W00INV0004P1	30691	70
2	Vels Stk	05stkvel.woodsd	W00INV0005P1	10187	24
3	Vels Stk	06stkvel.woodsd	W00INV0006P2	25933	61
4	Vels Stk	07stkvel.woodsd	W00INV0007P1	18122	43
5	Vels Mig	04migvel.woodsd	W00INV0004P1	30691	70
6	Vels Mig	05migvel.woodsd	W00INV0005P1	10187	24
7	Vels Mig	06migvel.woodsd	W00INV0006P2	25933	61
8	Vels Mig	07migvel.woodsd	W00INV0007P1	18122	43
Note : Velocity Smoothing parameter : 100% Vels Stk, 5 points, 2000m radius					

EXAMPLE FOR FILE NAME: 04stkvel.woodsd

```
CONT      INVESTIGATOR 2D
LINE    W00INV0004P1
AREA    BASS STRAITS, VICTORIA, AUSTRALIA.
INFO
COM1      STACKING VELOCITIES - 0.5 KM GRID
COM2
PNMO
SPNT     2231     1025    672945   5622569        4
VELF    2231 0 216 1530   310 1618   395 1676   475 1771   550 1851
VELF             628 1946   716 2001   818 2080   986 2203 1171 2295
VELF            1280 2383 1489 2569 1700 2685 1876 2810 2066 2932
VELF            2184 3025 2358 3103 2507 3190 2636 3312 2842 3497
VELF            3064 3672 3398 3889 3727 4109 3994 4261 4232 4410
VELF            4596 4609 4991 4752 5419 4891 5989 5077
```

EXAMPLE FOR FILE NAME: 04migvel.woodsd

```
CONT      INVESTIGATOR 2D
LINE    W00INV0004P1
AREA    BASS STRAITS, VICTORIA, AUSTRALIA.
INFO
COM1      MIG-VELOCITIES - 0.5 KM GRID (5 PTS SMOOTHING)
COM2
PNMO
SPNT     2231     1025    672945   5622569        4
VELF    2231 0 216 1544   310 1628   395 1688   475 1779   550 1864
VELF             628 1948   716 2016   818 2095   986 2205 1171 2297
VELF            1280 2380 1489 2560 1700 2678 1876 2796 2066 2915
VELF            2184 2996 2358 3092 2507 3191 2636 3307 2842 3492
VELF            3064 3668 3398 3890 3727 4105 3994 4263 4232 4409
VELF            4596 4600 4991 4748 5419 4888 5989 5072
```

B18 Final Migration CGM Files (3D / 2D)

CLIENT : WOODSIDE ENERGY LTD
AREA : INVESTIGATOR 3D / 2D
PROCESS : FINA; MIGRATION
DATA LENGTH : 4.6 SEC / 6 SEC
SAMPLE RATE : 4 MSEC
FORMAT : TAR
TAPE TYPE : 3590
TAPE ID. : INVG-CGM-01, INVG-CGM-02

FINAL MIGRATION - INLINE (3D DATA)

NO.	INLINE	FILE NAME	BYTES	BLOCKS	PLOT DIMENSIONS IN INCHES		DISPLAY RANGE	
					XSIZE	YSIZE	MIN XL	MAX XL
1	142	s142cgm	18523068	36178	68.7	24.6	515	3060
2	286	s286cgm	19451638	37992	74.9	24.6	458	3318
3	430	s430cgm	19799690	38672	76.7	24.6	457	3408
4	574	s574cgm	22498166	43942	95.8	24.6	456	4380
5	718	s718cgm	22861436	44652	97.0	24.6	459	4440
6	862	s862cgm	23272794	45455	99.2	24.6	438	4531
7	1006	s1006cgm	23198486	45310	100.3	24.6	459	4607
8	1150	s1150cgm	22927724	44781	100.0	24.6	500	4634
9	1294	s1294cgm	23317310	45542	100.7	24.6	460	4632
10	1438	s1438cgm	23454638	45810	100.8	24.6	456	4631
11	1582	s1582cgm	23427858	45758	100.8	24.6	458	4634
12	1726	s1726cgm	23328260	45564	100.7	24.6	458	4628
13	1870	s1870cgm	23496046	45891	100.8	24.6	459	4633

FINAL MIGRATION - CROSSLINE (3D DATA)

NO.	CROSS LINE	FILE NAME	BYTES	BLOCKS	PLOT DIMENSIONS IN INCHES		DISPLAY RANGE	
					XSIZE	YSIZE	MIN XL	MAX XL
1	611	x611cgm	16338454	31912	53	24.6	132	1880
2	771	x771cgm	16324398	31884	53	24.6	132	1880
3	931	x931cgm	16353174	31940	53	24.6	132	1880
4	1091	x1091cgm	16323646	31883	53	24.6	132	1880
5	1251	x1251cgm	16343882	31922	53	24.6	132	1880
6	1411	x1411cgm	16366282	31966	53	24.6	132	1880
7	1571	x1571cgm	16353086	31940	53	24.6	132	1880
8	1731	x1731cgm	16346982	31928	53	24.6	132	1880
9	1891	x1891cgm	16327490	31890	53	24.6	132	1880
10	2051	x2051cgm	16351746	31938	53	24.6	132	1880
11	2211	x2211cgm	16365942	31965	53	24.6	132	1880
12	2371	x2371cgm	16378346	31989	53	24.6	132	1880
13	2531	x2531cgm	16375178	31983	53	24.6	132	1880
14	2691	x2691cgm	16353298	31941	53	24.6	132	1880
15	2851	x2851cgm	16370226	31974	53	24.6	132	1880
16	3011	x3011cgm	16418766	32068	52.8	24.6	141	1880
17	3171	x3171cgm	16072506	31392	50.5	24.6	260	1880
18	3331	x3331cgm	15200928	29690	45.3	24.6	525	1880
19	3491	x3491cgm	15113434	29519	44.9	24.6	542	1880
20	3651	x3651cgm	15101684	29496	44.9	24.6	545	1880
21	3811	x3811cgm	15080160	29454	44.9	24.6	545	1880
22	3971	x3971cgm	15108630	29510	44.9	24.6	544	1880
23	4131	x4131cgm	15078672	29451	44.8	24.6	549	1880
24	4291	x4291cgm	14935586	29172	44.6	24.6	561	1880
25	4451	x4451cgm	14075148	27491	38.6	24.6	864	1880

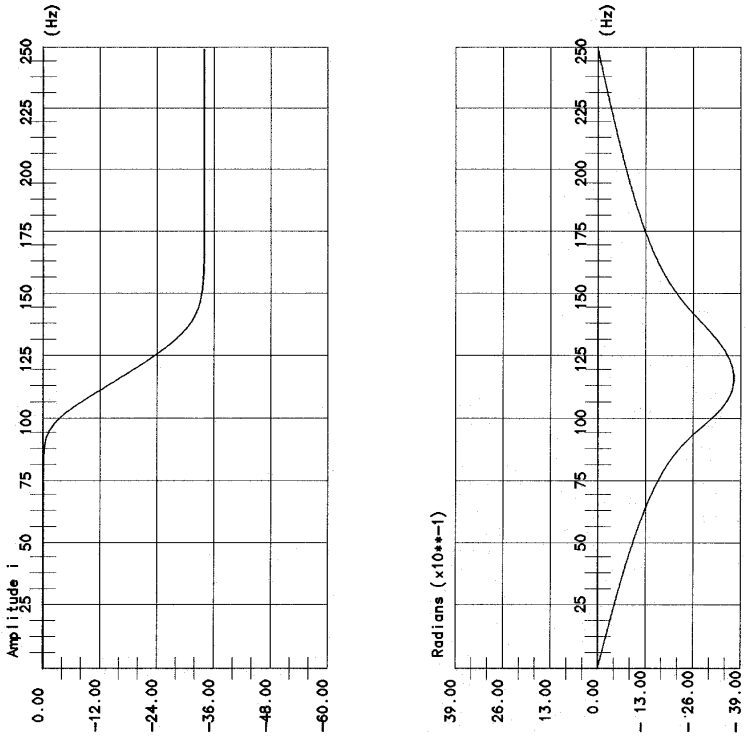
FINAL MIGRATION (2D DATA)

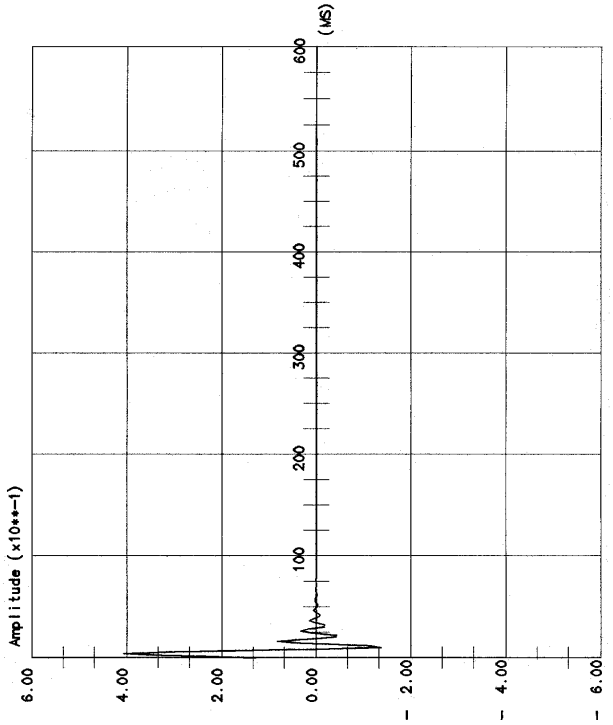
NO.	INLINE	FILE NAME	BYTES	BLOCKS	PLOT DIMENSIONS IN INCHES		DISPLAY RANGE	
					XSIZE	YSIZE	MIN XL	MAX XL
1	4	004cgm	23084464	45087	80.9	30	2002	5195
2	5	005cgm	16108850	31463	45.1	30	5172	6545
3	6	006cgm	21320198	41642	71.7	30	5232	7957
4	7	007cgm	18466436	36068	56.7	30	6402	8367

APPENDIX C - DETAILS OF CRITICAL PROCESSES

C1 Minimum Phase Anti-alias Filter For Resample

C1.1 The Spectra Of The Minimum Phase Anti-Alias Filter For Resample (100 Hz / 72 dB/Oct)





C1.2 Listing Of Minimum Phase Anti-Alias Filter For Resample

Number of samples : 257
Scaling factor to be applied : 1.0000
Time sample increment : 2.0000 msec
Time of first sample : 0.0000 msec

100 Hz ; 72 dB/Oct	
Time (msec)	**Value**
0	1.2790515E-01
2	3.1227651E-01
4	4.0562749E-01
6	2.8105256E-01
8	2.7000021E-02
10	-1.3647218E-01
12	-1.0191500E-01
14	2.6137436E-02
16	8.2183801E-02
18	2.8519297E-02
20	-4.0664475E-02
22	-4.2119756E-02
24	5.5898433E-03
26	3.2790706E-02
28	1.3790835E-02
30	-1.5909374E-02
32	-1.8459950E-02
34	1.4123167E-03
36	1.4004388E-02
38	6.5596751E-03
40	-6.5169903E-03
42	-8.2442164E-03
44	2.2680307E-04
46	6.0566287E-03
48	3.1163294E-03
50	-2.6732630E-03
52	-3.6919387E-03
54	-7.4437914E-05
56	2.6188702E-03
58	1.4724879E-03
60	-1.0885514E-03
62	-1.6504241E-03
64	-1.1013653E-04
66	1.1291702E-03
68	6.9119089E-04
70	-4.3882011E-04
72	-7.3564221E-04
74	-8.2509228E-05

Time (msec)	Value
76	4.8519493E-04
78	3.2233811E-04
80	-1.7484462E-04
82	-3.2693867E-04
84	-5.1215957E-05
86	2.0774746E-04
88	1.4946125E-04
90	-6.8658752E-05
92	-1.4486673E-04
94	-2.9043937E-05
96	8.8612367E-05
98	6.8937268E-05
100	-2.6474627E-05
102	-6.4001688E-05
104	-1.5607673E-05
106	3.7647529E-05
108	3.1644704E-05
110	-9.9685267E-06
112	-2.8194449E-05
114	-8.0984082E-06
116	1.5918815E-05
118	1.4460432E-05
120	-3.6280712E-06
122	-1.2380938E-05
124	-4.0963355E-06
126	6.6978760E-06
128	6.5790227E-06
130	-1.2604164E-06
132	-5.4211018E-06
134	-2.0268997E-06
136	2.8107509E-06
138	2.9868650E-06
140	-4.0477440E-07
142	-2.3712660E-06
144	-9.9394879E-07
146	1.1690844E-06
148	1.3487162E-06
150	-1.1191266E-07
152	-1.0319244E-06
154	-4.7822903E-07
156	4.8392741E-07
158	6.0728746E-07
160	-1.9336898E-08
162	-4.5069822E-07
164	-2.3398829E-07
166	1.9628577E-07
168	2.7450466E-07

Time (msec)	Value
170	7.6027789E-09
172	-1.9145909E-07
174	-1.0691658E-07
176	8.0109508E-08
178	1.1970752E-07
180	6.5700410E-09
182	-8.2848956E-08
184	-4.8129746E-08
186	3.5977767E-08
188	5.5128805E-08
190	3.6826169E-09
192	-3.8525794E-08
194	-2.6761999E-08
196	7.1073072E-09
198	1.8203016E-08
200	2.8495355E-09
202	-1.2995367E-08
204	-1.1193309E-08
206	1.1172099E-09
208	6.9117214E-09
210	3.8655847E-09
212	7.1932649E-10
214	5.1999227E-10
216	1.0091776E-09
218	1.2174318E-09
220	4.8872834E-10
222	-7.8991214E-10
224	3.1914738E-10
226	3.4888126E-09
228	2.6082356E-09
230	-2.2642841E-09
232	-2.8911327E-09
234	7.3228507E-10
236	2.6406530E-10
238	-2.1511037E-09
240	4.9873100E-10
242	1.4878815E-09
244	-4.3241832E-09
246	-3.7993404E-09
248	6.5279373E-09
250	8.3995628E-09
252	5.5585930E-10
254	3.9452237E-09
256	1.8608761E-08
258	2.2861043E-08
260	1.0063615E-08
262	-4.5379069E-09

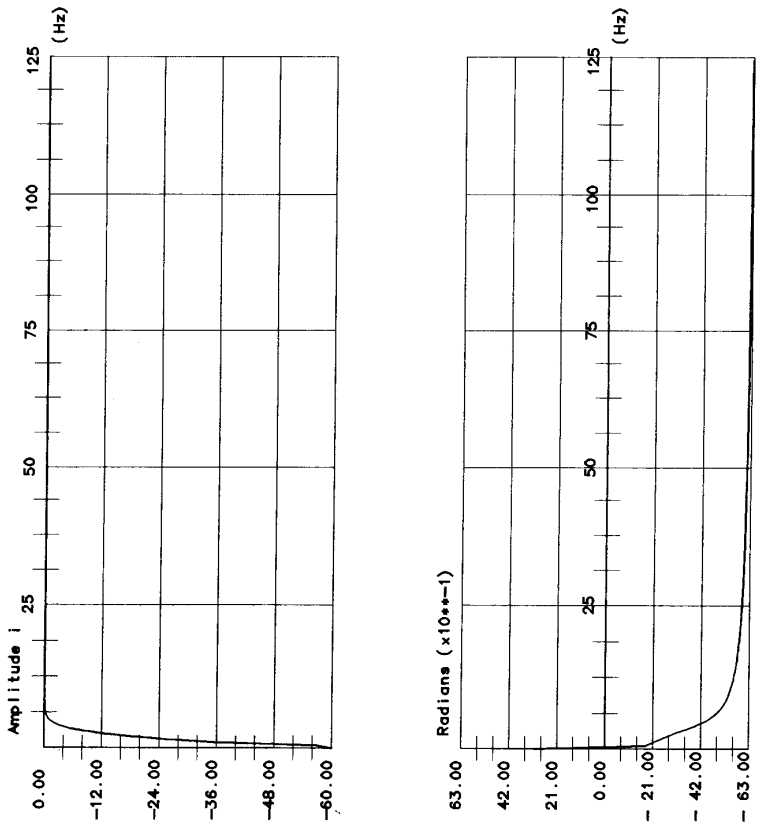
Time (msec)	Value
264	-7.3489055E-09
266	-1.0780088E-09
268	3.6847116E-09
270	2.3948907E-09
272	-1.0900663E-09
274	-2.0162823E-09
276	-2.9148869E-10
278	1.1549286E-09
280	7.6950807E-10
282	-3.7050538E-10
284	-6.9578110E-10
286	-1.0737498E-10
288	4.1330128E-10
290	2.8575448E-10
292	-1.3117227E-10
294	-2.6275224E-10
296	-4.6893541E-11
298	1.5521397E-10
300	1.1425241E-10
302	-4.6807596E-11
304	-1.0296919E-10
306	-2.2298424E-11
308	5.9694062E-11
310	4.6745968E-11
312	-1.6339520E-11
314	-4.1299401E-11
316	-1.0222681E-11
318	2.3141737E-11
320	1.9624158E-11
322	-5.9774993E-12
324	-1.6766566E-11
326	-4.9987692E-12
328	9.2102862E-12
330	8.2192777E-12
332	-1.9198610E-12
334	-6.9662626E-12
336	-2.2391847E-12
338	3.5383959E-12
340	3.5894978E-12
342	-7.0781689E-13
344	-2.7796669E-12
346	-1.1159946E-12
348	1.4787109E-12
350	1.4720204E-12
352	-1.4773988E-13
354	-1.2156516E-12
356	-4.5115902E-13

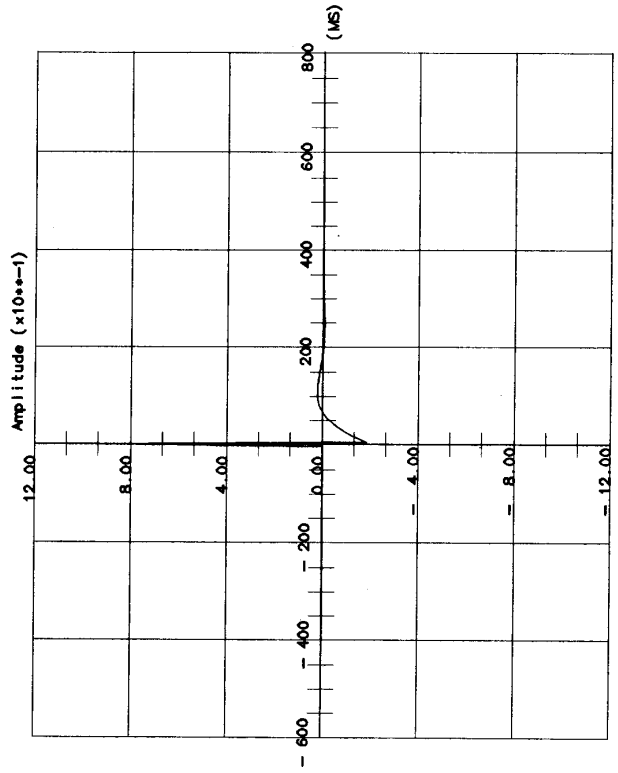
Time (msec)	Value
358	5.2013287E-13
360	6.9001174E-13
362	-8.8565053E-14
364	-4.4665682E-13
366	-2.5789272E-13
368	2.5642729E-13
370	2.4198184E-13
372	2.5720733E-14
374	-2.2964145E-13
376	-7.4027427E-14
378	5.7992700E-14
380	1.4712355E-13
382	-2.3390696E-14
384	-6.1458095E-14
386	-6.7356270E-14
388	5.4000925E-14
390	3.0840839E-14
392	2.3696783E-14
394	-5.4419597E-14
396	-9.7886219E-16
398	-6.6005123E-15
400	4.0982056E-14
402	-1.5414878E-14
404	1.4610597E-15
406	-2.6293863E-14
408	2.3076987E-14
410	-7.4810280E-15
412	1.6146433E-14
414	-1.7536506E-14
416	7.4704189E-15
418	-1.1906880E-14
420	1.7807966E-14
422	-1.0950569E-14
424	8.4728401E-15
426	-1.3241326E-14
428	1.3454082E-14
430	-1.0479799E-14
432	1.0799291E-14
434	-1.0245354E-14
436	8.7687426E-15
438	-9.7499659E-15
440	1.0959435E-14
442	-8.8929430E-15
444	8.3807481E-15
446	-1.0396202E-14
448	1.1284559E-14
450	-1.0545245E-14

Time (msec)	Value
452	7.9414853E-15
454	-6.1534093E-15
456	6.4140409E-15
458	-8.4313405E-15
460	8.9798706E-15
462	-7.2616312E-15
464	5.0922316E-15
466	-4.4254964E-15
468	5.2830419E-15
470	-4.9567572E-15
472	4.1509243E-15
474	-4.2417547E-15
476	4.8998095E-15
478	-5.3215967E-15
480	4.5874864E-15
482	-3.0869940E-15
484	2.7252559E-15
486	-3.3723842E-15
488	3.4471647E-15
490	-2.3006840E-15
492	5.3681724E-16
494	-5.3320968E-16
496	2.1925511E-15
498	-3.3082547E-15
500	2.1287170E-15
502	-7.1701005E-16
504	1.3878946E-15
506	-1.9316372E-15
508	1.4945829E-15
510	-1.1163147E-17
512	6.1453717E-18

C2 Minimum Phase Butterworth Low Cut Filter (4 Hz;18 dB/Oct)

C2.1 The Spectra Of The Minimum Phase Butterworth Low Cur Filter





C2.2 Listing of Minimum Phase Butterworth Low Cur Filter

4 Hz/18 dB/Oct	
Time (msec)	**Value**
-400	0.0000000E+00
-396	0.0000000E+00
-392	0.0000000E+00
-388	0.0000000E+00
-384	0.0000000E+00
-380	0.0000000E+00
-376	0.0000000E+00
-372	0.0000000E+00
-368	0.0000000E+00
-364	0.0000000E+00
-360	0.0000000E+00
-356	0.0000000E+00
-352	0.0000000E+00
-348	0.0000000E+00
-344	0.0000000E+00
-340	0.0000000E+00
-336	0.0000000E+00
-332	0.0000000E+00
-328	0.0000000E+00
-324	0.0000000E+00
-320	0.0000000E+00
-316	0.0000000E+00
-312	0.0000000E+00
-308	0.0000000E+00
-304	0.0000000E+00
-300	0.0000000E+00
-296	0.0000000E+00
-292	0.0000000E+00
-288	0.0000000E+00
-284	0.0000000E+00
-280	0.0000000E+00
-276	0.0000000E+00
-272	0.0000000E+00
-268	0.0000000E+00
-264	0.0000000E+00
-260	0.0000000E+00
-256	0.0000000E+00
-252	0.0000000E+00
-248	0.0000000E+00
-244	0.0000000E+00
-240	0.0000000E+00

Time (msec)	Value
-236	0.0000000E+00
-232	0.0000000E+00
-228	0.0000000E+00
-224	0.0000000E+00
-220	0.0000000E+00
-216	0.0000000E+00
-212	0.0000000E+00
-208	0.0000000E+00
-204	0.0000000E+00
-200	0.0000000E+00
-196	0.0000000E+00
-192	0.0000000E+00
-188	0.0000000E+00
-184	0.0000000E+00
-180	0.0000000E+00
-176	0.0000000E+00
-172	0.0000000E+00
-168	0.0000000E+00
-164	0.0000000E+00
-160	0.0000000E+00
-156	0.0000000E+00
-152	0.0000000E+00
-148	0.0000000E+00
-144	0.0000000E+00
-140	0.0000000E+00
-136	0.0000000E+00
-132	0.0000000E+00
-128	0.0000000E+00
-124	0.0000000E+00
-120	0.0000000E+00
-116	0.0000000E+00
-112	0.0000000E+00
-108	0.0000000E+00
-104	0.0000000E+00
-100	0.0000000E+00
-96	0.0000000E+00
-92	0.0000000E+00
-88	0.0000000E+00
-84	0.0000000E+00
-80	0.0000000E+00
-76	0.0000000E+00
-72	0.0000000E+00
-68	0.0000000E+00

Time (msec)	Value
-64	0.0000000E+00
-60	0.0000000E+00
-56	0.0000000E+00
-52	0.0000000E+00
-48	0.0000000E+00
-44	0.0000000E+00
-40	0.0000000E+00
-36	0.0000000E+00
-32	0.0000000E+00
-28	0.0000000E+00
-24	0.0000000E+00
-20	0.0000000E+00
-16	0.0000000E+00
-12	0.0000000E+00
-8	0.0000000E+00
-4	0.0000000E+00
0	9.0431863E-01
4	-1.8174823E-01
8	-1.6302826E-01
12	-1.4532468E-01
16	-1.2863444E-01
20	-1.1295231E-01
24	-9.8270491E-02
28	-8.4578246E-02
32	-7.1861759E-02
36	-6.0104031E-02
40	-4.9284857E-02
44	-3.9380953E-02
48	-3.0366046E-02
52	-2.2211097E-02
56	-1.4884518E-02
60	-8.3524315E-03
64	-2.5789768E-03
68	2.4733965E-03
72	6.8436163E-03
76	1.0571667E-02
80	1.3698275E-02
84	1.6264603E-02
88	1.8311948E-02
92	1.9881461E-02
96	2.1013880E-02
100	2.1749277E-02
104	2.2126831E-02

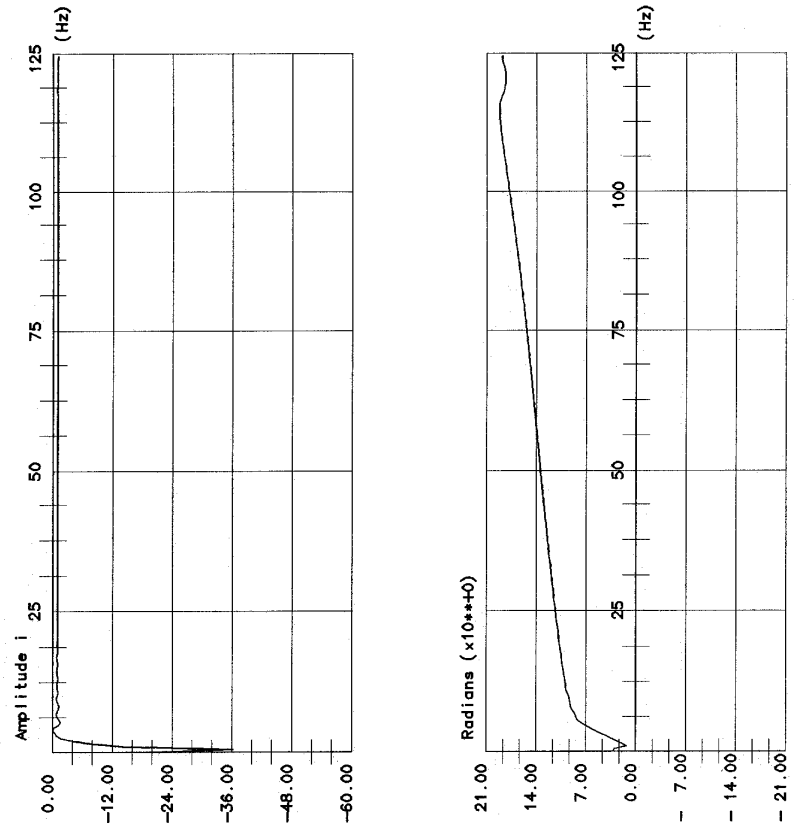
Time (msec)	Value
108	2.2184623E-02
112	2.1959450E-02
116	2.1486664E-02
120	2.0800026E-02
124	1.9931601E-02
128	1.8911650E-02
132	1.7768569E-02
136	1.6528830E-02
140	1.5216947E-02
144	1.3855464E-02
148	1.2464957E-02
152	1.1064054E-02
156	9.6694576E-03
160	8.2960082E-03
164	6.9567268E-03
168	5.6628832E-03
172	4.4240775E-03
176	3.2483174E-03
180	2.1421104E-03
184	1.1105560E-03
188	1.5743908E-04
192	-7.1466260E-04
196	-1.5042875E-03
200	-2.2109826E-03
204	-2.8352079E-03
208	-3.3782364E-03
212	-3.8420586E-03
216	-4.2292876E-03
220	-4.5430725E-03
224	-4.7870101E-03
228	-4.9650632E-03
232	-5.0814850E-03
236	-5.1407465E-03
240	-5.1474692E-03
244	-5.1063648E-03
248	-5.0221779E-03
252	-4.8996350E-03
256	-4.7433991E-03
260	-4.5580287E-03
264	-4.3479423E-03
268	-4.1173883E-03
272	-3.8704188E-03
276	-3.6108673E-03

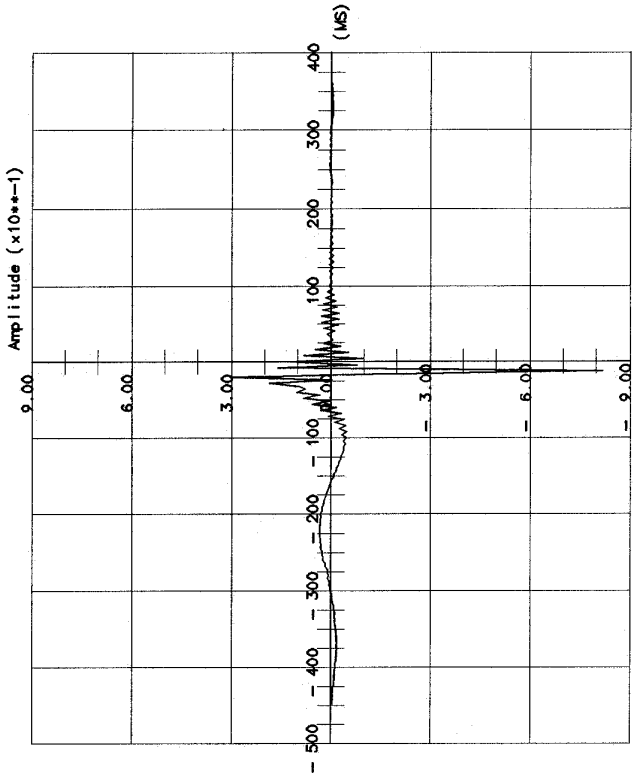
Time (msec)	Value
280	-3.3423330E-03
284	-3.0681677E-03
288	-2.7914646E-03
292	-2.5150541E-03
296	-2.2414993E-03
300	-1.9730981E-03
304	-1.7118847E-03
308	-1.4596353E-03
312	-1.2178745E-03
316	-9.8788459E-04
320	-7.7071611E-04
324	-5.6719908E-04
328	-3.7795620E-04
332	-2.0341652E-04
336	-4.3828826E-05
340	1.0072305E-04
344	2.3030586E-04
348	3.4512178E-04
352	4.4549440E-04
356	5.3185323E-04
360	6.0472044E-04
364	6.6469662E-04
368	7.1244780E-04
372	7.4869290E-04
376	7.7419187E-04
380	7.8973436E-04
384	7.9612969E-04
388	7.9419703E-04
392	7.8475673E-04
396	7.6862244E-04
400	7.4659381E-04
404	7.1945030E-04
408	6.8794569E-04
412	6.5280317E-04
416	6.1471161E-04
420	5.7432201E-04
424	5.3224491E-04
428	4.8904872E-04
432	4.4525779E-04
436	4.0135198E-04
440	3.5776626E-04
444	3.1489067E-04
448	2.7307108E-04

Time (msec)	Value
452	2.3261005E-04
456	1.9376790E-04
460	1.5676454E-04
464	1.2178094E-04
468	8.8961380E-05
472	5.8415455E-05
476	3.0220257E-05
480	4.4228896E-06
484	-1.8957140E-05
488	-3.9925522E-05
492	-5.8510617E-05
496	-7.4761039E-05
500	-8.8743269E-05
504	-1.0053926E-04
508	-1.1024422E-04
512	-1.1796437E-04
516	-1.2381488E-04
520	-1.2791797E-04
524	-1.3040093E-04
528	-1.3139455E-04
532	-1.3103143E-04
536	-1.2944455E-04
540	-1.2676600E-04
544	-1.2312570E-04
548	-1.1865048E-04
552	-1.1346304E-04
556	-1.0768124E-04
560	-1.0141738E-04
564	-9.4777686E-05
568	-8.7861845E-05
572	-8.0762678E-05
576	-7.3565920E-05
580	-6.6350040E-05
584	-5.9186212E-05
588	-5.2138301E-05
592	-4.5262957E-05
596	-3.8609767E-05
600	-3.2221429E-05

C3 Zero-Phasing Filter Supplied by Woodside

C3.1 The Spectra Of The Zero Phasing Filter





C3.2 Listing Of Zero Phasing Filter

Number of samples : 203
Scaling factor to be applied : 1.0000
Time sample increment : 4.0000 msec
Time of first sample : -444.0000 msec

Time(msec)	Value
-444	-2.9362999E-03
-440	-2.2980000E-03
-436	-3.5816000E-03
-432	-3.4204000E-03
-428	-5.3094998E-03
-424	-5.5535999E-03
-420	-7.6241000E-03
-416	-7.6481001E-03
-412	-9.5288996E-03
-408	-9.3997000E-03
-404	-1.1265000E-02
-400	-1.1051000E-02
-396	-1.2913000E-02
-392	-1.2749000E-02
-388	-1.4699000E-02
-384	-1.4496000E-02
-380	-1.6217001E-02
-376	-1.5719000E-02
-372	-1.7092001E-02
-368	-1.6333001E-02
-364	-1.7323000E-02
-360	-1.6182000E-02
-356	-1.6652999E-02
-352	-1.4978000E-02
-348	-1.4881000E-02
-344	-1.2886000E-02
-340	-1.2696000E-02
-336	-1.0951000E-02
-332	-1.1219000E-02
-328	-9.8436000E-03
-324	-1.0292000E-02
-320	-8.4063997E-03
-316	-8.2088001E-03
-312	-5.2439999E-03
-308	-4.5901001E-03
-304	-1.4365000E-03
-300	-1.0224000E-03
-296	1.9494999E-03
-292	2.2166001E-03
-288	5.8610002E-03

Time(msec)	Value
-284	5.5697998E-03
-280	9.2542004E-03
-276	7.0082000E-03
-272	1.1044000E-02
-268	1.0757000E-02
-264	1.7382000E-02
-260	1.7782999E-02
-256	2.4481000E-02
-252	2.2569999E-02
-248	2.7639000E-02
-244	2.7284000E-02
-240	3.0650999E-02
-236	3.0432999E-02
-232	3.2839000E-02
-228	3.2506000E-02
-224	3.3702001E-02
-220	3.3794999E-02
-216	3.3231001E-02
-212	3.4040999E-02
-208	3.1923998E-02
-204	3.2976002E-02
-200	2.9956000E-02
-196	3.0517001E-02
-192	2.7100001E-02
-188	2.6704000E-02
-184	2.3164000E-02
-180	2.1608001E-02
-176	1.8182000E-02
-172	1.5400000E-02
-168	1.2424000E-02
-164	8.3697997E-03
-160	6.0318001E-03
-156	7.0020999E-04
-152	-9.9529000E-04
-148	-7.3890998E-03
-144	-8.4533999E-03
-140	-1.5498000E-02
-136	-1.6246000E-02
-132	-2.3415999E-02
-128	-2.4272000E-02
-124	-3.0441999E-02
-120	-3.1716000E-02
-116	-3.5459001E-02
-112	-3.8026001E-02
-108	-3.7909999E-02
-104	-4.2955998E-02
-100	-3.7220001E-02

Time(msec)	Value
-96	-4.6119001E-02
-92	-3.2772999E-02
-88	-4.7031999E-02
-84	-2.3943000E-02
-80	-4.5097001E-02
-76	-1.0302000E-02
-72	-3.9629001E-02
-68	8.1944000E-03
-64	-2.9848000E-02
-60	3.1053999E-02
-56	-1.4957000E-02
-52	5.7062000E-02
-48	5.8141002E-03
-44	8.3221003E-02
-40	3.5066001E-02
-36	1.0261000E-01
-32	7.7244997E-02
-28	9.8764002E-02
-24	1.8493000E-01
-20	-7.0141000E-04
-16	3.0361000E-01
-12	-1.7906000E-01
-8	-8.1633002E-01
-4	1.5968999E-01
0	-7.7587001E-02
4	1.2326000E-01
8	-9.8071001E-02
12	8.0987997E-02
16	-5.1137000E-02
20	4.7221001E-02
24	-2.7104000E-02
28	2.0628000E-02
32	-5.1084999E-03
36	1.1917000E-03
40	1.0665000E-02
44	-1.1976000E-02
48	2.1218000E-02
52	-1.9774999E-02
56	2.6755000E-02
60	-2.2976000E-02
64	2.8039001E-02
68	-2.2520000E-02
72	2.6033999E-02
76	-1.9459000E-02
80	2.1823000E-02
84	-1.4818000E-02
88	1.6457999E-02

Time(msec)	Value
92	-9.5100999E-03
96	1.0778000E-02
100	-4.3796999E-03
104	5.3273002E-03
108	-2.0090000E-04
112	3.0439001E-04
116	2.5470001E-03
120	-3.7833001E-03
124	4.2535001E-03
128	-6.3959998E-03
132	5.0629000E-03
136	-7.7228001E-03
140	4.9823001E-03
144	-7.9407999E-03
148	4.3135001E-03
152	-7.2614001E-03
156	3.2062000E-03
160	-6.0701999E-03
164	1.8951000E-03
168	-4.6167001E-03
172	7.5130002E-04
176	-2.9787000E-03
180	-1.0690000E-04
184	-1.2371000E-03
188	-8.2290999E-04
192	4.0702999E-04
196	-1.5218999E-03
200	1.4485000E-03
204	-2.0125001E-03
208	1.4726000E-03
212	-2.1098999E-03
216	7.6323003E-04
220	-2.2499000E-03
224	1.6245000E-04
228	-2.6602000E-03
232	-3.0146999E-04
236	-2.1472999E-03
240	-1.9116000E-03
244	2.6231000E-04
248	7.4242998E-04
252	4.6452000E-03
256	2.6552000E-03
260	5.3296001E-03
264	5.0536002E-04
268	4.6533998E-03
272	1.4071001E-04
276	4.6430002E-03

Time(msec)	Value
280	-7.2659000E-06
284	3.7270000E-03
288	-1.3843999E-04
292	3.2710000E-03
296	4.2358000E-04
300	2.9629001E-03
304	3.1271001E-04
308	1.1485000E-03
312	-1.3749000E-03
316	-1.6135999E-03
320	-3.1512000E-03
324	-3.4947000E-03
328	-3.7751000E-03
332	-4.0181000E-03
336	-3.5502999E-03
340	-3.8425999E-03
344	-3.1611000E-03
348	-3.4228000E-03
352	-2.6725000E-03
356	-2.6813999E-03
360	-1.9807999E-03
364	-1.6364000E-03

TRANSCRIPTION AND RESAMPLE

The process of converting and/or demultiplexing the field data into Veritas DGC's internal trace sequential format. A minimum phase anti-alias filter is used to avoid temporal aliasing when resampling. This filter has a simple high cut form.

TRUE AMPLITUDE RECOVERY

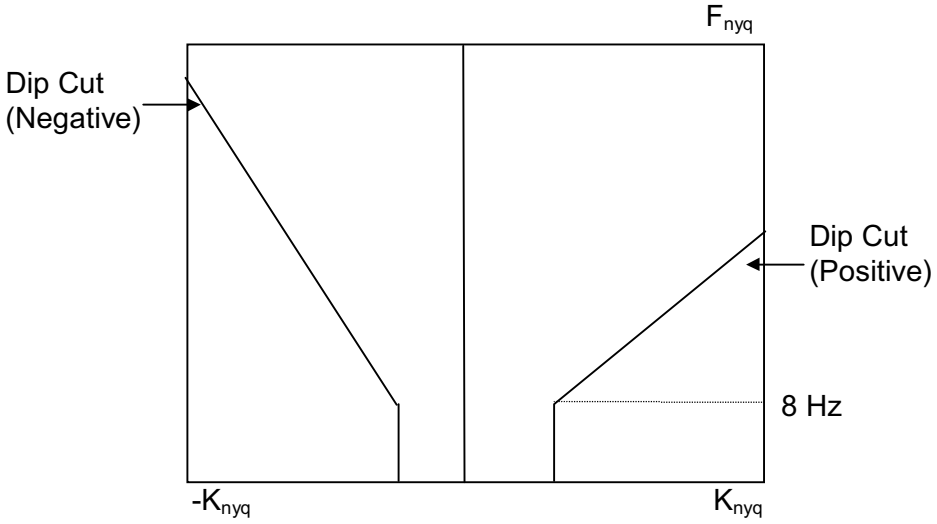
This is a correction for amplitude losses which are due to the spherical spreading of the wavefront. Thus, as the amplitude of the recorded trace varies inversely with the radius of the advancing wavefront, each trace is multiplied by a function Velocity (V) and Time (T) (eg: V^2T, VT, VT^2), where V is the seismic wave velocity and T is the two-way time. An additional exponential or linear gain correction may also be applied.

SHOT AND STREAMER DEPTH STATIC CORRECTIONS

Simple static corrections are made to compensate for the depths of the sources and receivers and shift the seismic data to a sea level datum. These statics are usually so small that the point of application is not significant.

SHOT DOMAIN FK VELOCITY FILTER

FK velocity filtering can be applied as either a two-dimensional T-X convolution of in the FK domain. The default attenuation at the specified dip value is 40 dB (for Cosine tapering). Low frequencies are protected by the use of "chimney" (see diagram) starting at a default value of 8 Hz.



There are two options for the construction of the filters:

(a) Cosine Tapering

A cosine shaped taper begins at a given percentage of the distance between K=0 and the Dip cut. 100% cosine tapers begin to taper at K=0 and, for example, 25% cosine tapers begin to taper at 75% of the distance from K=0 to the dip cut. The default value for attenuation at the dip cut is -40 dB.

(b) Cut / Slope Parameterisation (The "Power" option)

Here the Dip Cut value is specifies and a dB/octave roll-off for the attenuation past that point.

WAVE EQUATION MULTIPLE ATTENUATION - WEMA

WEMA uses the known water depths and the wave-equation to convert the recorded shot gather (or CDP gather) into an estimate of all the multiple energy that has at least one "bounce" within the water layer.

WEMA proceeds by subtracting this multiple estimate from the original gather using windowed, trace dependant cross-equalisation filters.

The process assumes a single constant water depth for each gather and is therefore mainly effective in areas without rapid water depth fluctuations.

SPIKING AND PREDICTIVE DECONVOLUTION

Veritas DGC's implementation of spiking and predictive deconvolutions follow the conventional Weiner - Levinson theory. Optimum minimum phase squared error filters are computed over a given design window for a given filter length. Multiple filters can be computed and applied in a time variant manner.

There are options for standard single trace deconvolution or filter computations using running averaged autocorrelations (averaging distance specified in metres), or also based on a whole shot averaged autocorrelation (ie. One deconvolution filter per shot).

The aim of the spiking deconvolution is to whiten the wavelet spectrum and increase resolution. Predictive Deconvolution uses autocorrelations to predict and subtract features like multiple reflections.

MULTIPLE ATTENUATION BASED ON MOVEOUT DIFFERENCES

For multiple attenuation based on moveout difference between primary and multiple reflections, the critical step is to determine the primary and multiple velocities. Usually the multiple velocity is specified as a time variant percentage of the primary velocities.

(a) ZMULT

The CDP gather is moveout corrected using the multiple velocity. This forces primary energy to be over corrected and multiples to be either flattened or undercorrected. The moveout corrected gather is transformed to the FK domain where primaries will be in the negative K quadrant and multiples in the positive K quadrant. The positive quadrant is then simply zeroed and the data is inverse transformed back to the T-X domain. The original moveout correction is then removed and CDP gathers with attenuated multiples is the result.

(b) PMULT

PMULT decomposes the moveout corrected CDP gather into parabolic Radon domain (ie, parabolic curvature versus zero offset time). Parabolic curvature is specified in terms of differential moveout (far offset time - near offset time).

A curvature range is specified for the transform and then a subset of this range is specified for either preservation or subtraction. Usually, the multiple range is specified for subtraction. In this mode the multiple range is inverse transformed to the T-X domain and subtracted from the original gather.

Other important parameters used in PMULT are the number of curvature samples (p traces) used in the transform and / or the maximum frequency used to automatically compute the number of p traces.

DIP MOVEOUT CORRECTION (DMO)

The aim of DMO is to convert all the data recorded at the non-zero offsets to appear as if it were recorded at zero offset. Veritas DGC has two DMO algorithms, FK DMO (after Hale) and Kirchhoff DMO. Both algorithms operate on common offset planes or volumes, and both have a time variant velocity option. These algorithms can be applied in 2D of full 3D models. The only user parameters of importance is the dip limit and the option of anti-aliasing filters in Kirchhoff DMO.

FLOOD – FOLD LEVELLING FOR OPTIMUM OFFSET DISTRIBUTION

(Pre-stack Interpolation in 3D MOVES Processing)

In TREX procedures, correcting borrowed traces for a change in midpoint requires a structural or bin moveout term in NMO. This, in turn, depends on supplying a picked dip field. Commonly, this is not done so that an artificial stepping effect occurs for those borrowed traces with dipping data. This stepping results in migration swing artifacts and weakened migrated signal because borrowing without bin moveout is being used. FLOOD uses dip-dependent interpolation to supply missing traces, instead of copying.

To provide missing pre-stack traces is a formidable task in 3D due to high dimensionality since each trace depends on 4 coordinates (2 shot and 2 receiver) and time. The FLOOD approach is to apply DMO based on the actual trace position (not the borrowed one) for each separate BOG (Binned Offset Group) , having first eliminated duplicated traces. This DMO'ed data set will have noisy output traces in bins for which there is no primary coverage. We remove and re-interpolate traces in those bins. Since we apply interpolation after DMO, azimuth is summed over so that it is no longer a variable. This reduces the dimensionality of the problem to 2 coordinates and time. However, in practice, we simplify further by interpolating in the crossline direction only, that is, 1 spatial coordinate and time.

N.M.O CORRECTION

The NMO is performed assuming that the energy travels in a straight ray path and utilizes the following equation:

$$TT = \sqrt{(T0^2 + X^2 / V_{rms}^2)}$$

where: TT = Total recorded travel time in seconds
X = Offset
T0 = Time of reflector at zero offset in seconds
V_{rms} = RMS velocity

Velocity-time knee points are honoured on adjacent control points prior to interpolation of the temporal velocity field. The space variant velocity function is then derived by linear interpolation between control points.

COMMON DEPTH POINT STACK

Stack is the summation of traces within each CDP producing a single stacked trace for each input gather record. The stack is normalised and mute zone compensated to account for the smaller number of live traces in the mute zone and for uneven fold of coverage. This recovery scaling is usually 1/n or $1/\sqrt{n}$, where n is the number of live traces at that two - way time value.

ZERO OFFSET TIME MIGRATION

Veritas DGC has the following range of time migration algorithms:

STOLT or FK Migration

Very efficient but inaccurate in the presence of velocity variations.

PSPS (Phase Shift plus STOLT)

An extension of STOLT where the migration is performed in a series of constant velocity time strips, A phase-shift is used to move to the bottom of each strip. Stolt migration is used within each strip. PSPS migration accurately copes with vertical variations but has no response to lateral velocity variations.

Kirchhoff Migration

The conventional non-recursive Kirchhoff summation algorithm. The migration is based on local RMS velocities and has a somewhat weak response for both temporal and spatial velocity variations.

FD Migration

Finite Difference migration is performed in the T-X domain using an approximate form of the wave equation. This is a recursive migration that steps down through the data in small time steps. It copes well with vertical velocity variations and lateral velocity variations (not too rapid) but is dip limited to 45^{o}. The dip limitation is due to the approximation of the wave equation. The finite difference solution creates some noise through frequency dispersion.

Omega-X Migration

This is essentially the application of the FD migration in the frequency domain. In this domain the solution is achieved more accurately. There is less noise through frequency dispersion and a steeper dip response.

Phase Shift Migration

Phase-shift migration is a recursive FK domain migration that accurately migrates in the presence of vertical velocity variations. It has no response to lateral velocity variations. It is sometimes called Gazdag migration after its originator (see Gazdag, 1978). Phase shift migration is often considered to be the best possible migration when no lateral velocity variations exist.

PSPI

Phase shift plus interpolation (PSPI) is Gazdag's modification to Phase-shift migration so that it can cope with lateral velocity variations. Each recursive time step is migrated (using the phase-shift algorithm) for a range of constant velocities and a variable velocity response is obtained by interpolation of these results.

When lateral velocity variations exist, PSPI migration is probably the best available time migration.

Explicit Migration

Explicit migration is a new algorithm (effectively an upgrade to omega-x migration) capable of migrating dips up to 70 degrees. In testing, the steep dip response of this algorithm has been better that PSPI migration. The essence of the explicit technique are the filters used to perform the downward continuation. These filters are computed using the Parks - McClellan algorithm (also known as the Remez exchange algorithm).

TAU-P FILTER

This technique is based on a rolling Tau-p transform. A number of traces around a centre trace are transformed to the Tau-p domain where coherent events are easily recognised. A coherent event trace is created for each centre trace and these are weighted by adding back a percentage of the original trace.

The important parameters are the range of dips to be transformed, the dips increment within the transform (no p traces), the number of traces to use around each centre trace and the percentage addback of the original traces (can be time variant).

TIME VARIANT BAND PASS FILTER

These filters are usually defined by a low high frequency and a low and high rolloff slope in dB / Octave.

TRACE EQUALISATION

Options include:

- scaling functions - exponential linear
- whole trace balancing
- windowed balance - allows for window overlap. Arbitrary window sizes
- AGC - Automatic Gain Control - can be referenced to top, centre or bottom of window
- Time - variant AGC - window size can vary within time
- Running true-amplitude balancing, (RUNTRAMP) - traces are balanced to a spatially smooth amplitude trend.