BHP

CONAN-1, VIC/P31

WELL COMPLETION REPORT
BASIC DATA - VOLUME TWO

BHP Petroleum

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CONAN-1, VIC/P31

WELL COMPLETION REPORT

BASIC DATA

VOLUME TWO

Well Seismic Processing Report &
Analogue Site Survey Report

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71582.WCR

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Schlumberger

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BHP PETROLEUM

WELL SEISMIC PROCESSING REPORT

Zero Offset VSP and Geogram

CONAN-1

FIELD : WILDCAT

COUNTRY : AUSTRALIA

COORDINATES : 038 52' 14.95" S
: 142 46' 52.22" E

LOCATION : VICTORIA

DATE OF SURVEY : 02 AUG 1995

REFERENCE NO. : SYJ.561137/561138

INTERVAL : 1955 - 600 M

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1. Introduction

Two vertical seismic profile was recorded with the Combinable Seismic Imager tool (CSI) at the *Conan-1* well. The data was processed using the conventional zero offset processing chain using only the vertical component.

2. Data Acquisition

The data was acquired in a single logging run using the three component Combinable Seismic Imager tool (CSI). An array of three sleeve air guns were used as the source. The gun was positioned 5 meters below mean sea level . Recording was made on the Schlumberger Maxis 500 Unit using DLIS format .

Table 1. Survey Parameters

Elevation of KB	25.3 M
Elevation of DF	25.0 M
Elevation of GL	- 70.0 M
Total Depth	1355 M
Energy Source	3 X 150 cu in. airguns
Source Offset	50 M
Source Depth	5 M below MSL
Reference Sensor	Hydrophone
Hydrophone Offset	50 M
Hydrophone Depth	10 M below MSL
Source & Hyd. Azimuth	92.4 Degr.

3. Sonic Calibration Processing

3.1 Sonic Calibration

A 'drift' curve is obtained using the sonic log and the vertical check level times. The term 'drift' is defined as the seismic time (from check shots) minus the sonic time (from integration of edited sonic). Commonly the word 'drift' is used to identify the above difference, or to identify the gradient of drift versus increasing depth, or to identify a difference of drift between two levels.

The gradient of drift, that is the slope of the drift curve, can be negative or positive.

$$\frac{\Delta dr\ if t}{\Delta depth} < 0$$

For a negative drift the sonic time is greater than the seismic time over a certain section of the log.

For a positive drift $\frac{\Delta drift}{\Delta depth} > 0$, the sonic time is less than the seismic time over a certain section of the log.

The drift curve, between two levels, is then an indication of the error on the integrated sonic or an indication of the amount of correction required on the sonic to have the TTI of the corrected sonic match the check shot times.

Two methods of correction to the sonic log are used.

1. Uniform or block shift. This method applies a uniform correction to all the sonic values over the interval. This uniform correction is applied in the case of positive drift and is the average correction represented by the drift curve gradient expressed in μsec/ft .

2. ΔT Minimum. In the case of negative drift a second method is used, called ΔT minimum. This applies a differential correction to the sonic log, where it is assumed that the greatest amount of transit time error is caused by the lower velocity sections of the log. Over a given interval the method will correct only Δt values which are higher than a threshold, the Δt_{min} . Values of Δt which are lower than the threshold are not corrected. The correction is a reduction of the excess of Δt over Δt_{min}, $\Delta t - \Delta t_{min}$.

$\Delta t - \Delta t_{min}$ is reduced through multiplication by a reduction coefficient which remains constant over the interval. This reduction coefficient, named G, can be defined as:

$$G = 1 + \frac{drift}{\int (\Delta t - \Delta t_{min}) dZ}$$

Where drift is the drift over the interval to be corrected and the value $\int (\Delta t - \Delta t_{min}) dZ$ is the time difference between the integrals of the two curves Δ t and Δt_{min}. only over the intervals where $\Delta t > \Delta t_{min}$.

Hence the corrected sonic: $\Delta t = G(\Delta t - \Delta t_{min}) + \Delta t_{min}$.

3.2 Open Hole Logs

The sonic log has been recorded from 1955.0 to 600.0 metres below DF. This sonic log has been edited to alleviate cycle skipping and spiky data. The density log has also been edited to take into account bad hole condition.

The gamma ray and caliper logs are included as correlation curves.

3.3 Correction to Datum and Velocity Modelling

The sonic calibration processing has been referenced to mean sea level which the seismic reference datum . Static corrections are applied to correct for source offset and source depth. This involves using a water velocity of 1524 m/sec.

3.4 Sonic Calibration Results

The top of the sonic log (1211.0 metres below DF) is chosen as the origin for the calibration drift curve.

The drift curve is the correction imposed upon the sonic log. The adjusted sonic curve is considered to be the best result using the available data. A list of shifts used on the sonic data is given below.

Table 2: Sonic Drift

Depth Interval (metres below KB)	Block Shift µsec/mt	Δt_{min} µsec/mt	Equiv Block shift µsec/mt
0 - 1211	0.00	-	0.00
1211 - 1955	8.06	-	8.06

4. Synthetic Seismogram Processing

GEOGRAM plots were generated using 25, 35, and 45 Hz zero phase ricker wavelets.

The presentations include both normal and reverse polarity on a time scale of 10 cm/sec.

GEOGRAM processing produces synthetic seismic traces based on reflection coefficients generated form sonic and density measurements in the well-bore. The steps in the processing chain are the following:

Depth to time conversion
Reflection coefficient generation
Attenuation coefficient calculation
Convolution
Output

4.1 Depth to Time Conversion

Open hole logs are recorded from the bottom to top with a depth index. This data is converted to a two-way time index and flipped to read form the top to bottom in order to match the seismic section.

4.2 Primary Reflection Coefficients

Sonic and density data are averaged over chosen time intervals (normally 2 or 4 millisecs). Reflection coefficients are then computed using:

$$R = \frac{\rho_2.v_2 - \rho_1.v_1}{\rho_2.v_2 + \rho_1.v_1}$$

where:

ρ_1 = density of the layer above the reflection interface
ρ_2 = density of the layer below the reflection interface
v_1 = compressional wave velocity of the layer above the reflection interface
v_2 = compressional wave velocity of the layer below the reflection interface

This computation is done for each time interval to generate a set of primary reflection coefficients without transmission losses.

4.3 Primaries with Transmission Loss

Transmission loss on two-way attenuation coefficients is computed using:

$$A_n = (1 - R_1^2).(1 - R_2^2).(1 - R_3^2)...(1 - R_n^2)$$

A set of primary reflection coefficients with transmission loss is generated using:

$$Primary_n = R_n.A_{n-1}$$

4.4 Primaries plus Multiples

Multiples are computed from these input reflection coefficients using the transform technique from the top of the well to obtain the impulse response of the earth. The transform outputs primaries plus multiples.

4.5 Multiples Only

By subtracting previously calculated primaries form the above result we obtain multiples only.

4.6 Wavelet

A theoretical wavelet is chosen to use for convolution with the reflection coefficients previoulsy generated. Choices available include:

Klauder wavelet
Ricker zero phase wavelet
Ricker minimum phase wavelet
Butterworth wavelet
User defined wavelet

Time variant Butterworth filtering can be applied after convolution.

4.7 Polarity Convention

An increase in acoustic impedance gives a positive reflection coefficient, is written to tape as a negative number and is displayed as a white trough under normal polarity. Polarity conventions are displayed in figure 1.

4.8 Convolution

The standard procedure of convolving the wavelet with reflection coefficients; the output is the synthetic seismogram.

5. VSP Processing

The vertical component of the VSP data was processed using the conventional zero offset vertical incident processing chain. The following subsections describe the main aspects of the processing chain.

5.1 Stacking

After splicing, reordering and selecting the raw shots, a median stack was performed on the vertical and horizontal component data. The surface sensor (hydrophone) breaks are used as the zero time for stacking. The break time of each trace is recomputed after stacking.

The data quality is fairly good with the vertical component stacks displaying a consistent signature and a high signal to noise ratio, as seen on Plot 1.

5.2 Spherical Divergence Correction and Bandpass Filter

A bandpass filter of 5-100 hertz bandwidth was applied and time varying gain function of the exponential form :

$$GAIN(T) = \left(\frac{T}{T_o}\right)^{\alpha}$$

where T is the recorded time, T_o is the first break time and $\alpha = 1.0$

Trace equalisation was applied by normalising the RMS amplitude of the first break to correct for transmission losses of the direct wave. A normalisation window of 100 millisecs was used (see plot 2).

5.3 Velocity filter

The downgoing coherent energy is estimated using a three levels median velocity filter. The filter array is moved down one level after each computation and the process is repeated level by level over the entire dataset. As a result, the deepest and shallowest levels are lost because of edge effects.

The residual wavefield is obtained by subtracting the downgoing coherent energy from the total wavefield. The residual wavefield is dominated by reflected compressional events (plot 3).

The upgoing wavefield is enhanced by making a median stack of the upgoing aligned traces using a 5 levels filter. The data is now displayed in two way time (plot 3).

5.4 Waveshaping Deconvolution

The waveshaping deconvolution operator is a double sided operator and is designed trace by trace opening 20 ms before the first break with a window length of 1000 ms. The desired outputs were chosen to be zero phase with a band width of 7-75 Hz. Once the design is made upon the downgoing wavefield, it is applied to the downgoing and subtracted wavefield at the same level. The upgoing compressional wavefield is enhanced in an exactly analogous manner to before.

The trace by trace deconvolution is applied in order to collapse the multiple sequence of shear arrivals, diffractions or out of plane reflections. The result of waveshaping deconvolution on the upgoing wavefield is shown in Plot 4.

A corridor stack was computed on the data after zero phase waveshaping deconvolution by defining a constant 150 ms timing window along the time depth curve and stacking the data onto a single trace. This trace under normal circumstances should satisfy the assumption of one dimensionality and provide the best seismic representation of the borehole. This is displayed on Plot 5 .

5.5 VSP Acoustic Impedance Inversion

The zero phase waveshaping should permit a better interpretation of acoustic contrast, hence the data used for the inversion has been taken from the VSP after zero phase waveshaping deconvolution.

The inversion technique is based on entropy minimisation of the reflection coefficient series. In other words, the algorithm chooses the sparsest sequences of reflection coefficients as the preferred solution. The low frequency trend is extracted from the time depth curve such that the inversion technique is achieved without any input from the logged data.

It is important to point out that the acoustic impedance inversion is obtained without any input from the logged data. The quality of the inversion can be assessed by the similarity of the match between the logged impedance and inverted impedance.

Plots 6 and 7 are composite displays of the VSP data, inverted impedance, logged impedance and synthetic seismograms. These displays are a guide to the tie between the geograms and corridor stack.

There is a fairly good tie between the synthetic seismogram and VSP. There are some subtle variations on the Amplitude of the events. The VSP provides a measure of the earth filter effect whilst the synthetic makes some very basic assumptions to approximate the earth filter effect.

A Summary of Geophysical Listings

Five geophysical data listings are appended to this report. Following is a brief description of the format of each listing.

A1 Geophysical Airgun Report

1. Level number: the level number starting from the top level (includes any imposed shots).

2. Measured depth from KB: *dkb*, the depth in metres from kelly bushing.

3. Vertical depth form SRD: *dsrd*, the depth in metres from seismic reference datum.

4. Observed travel time HYD to GEO: *tim*0, the transit time picked form the stacked data by subtracting the surface sensor first break time from the downhole sensor first break time.

5. Vertical travel time SRC to GEO: *timv*, is corrected for source to hydrophone distance and for source offset.

6. Vertical travel time SRD to GEO: *shtm*, is *timv* corrected for the vertical distance between source and datum.

7. Average velocity SRD to GEO: the average seismic velocity from datum to the corresponding checkshot level, $\frac{\text{dsrd}}{\text{shtm}}$.

8. Delta depth between shots: $\Delta depth$, the vertical distance between each level.

9. Delta time between shots: $\Delta time$, the difference in vertical travel time (*shtm*),between each level.

10. Interval velocity between shots: the average seismic velocity between each level, $\frac{\Delta depth}{\Delta time}$.

A2 Drift Computation Report

1. Level number: the level number starting from the top level (includes any imposed shots).

2. Vertical depth from KB: the depth in metres from kelly bushing

3. Vertical depth from SRD: the depth in metres from seismic reference datum.

4. Vertical travel time SRD to GEO: the calculated vertical travel time from datum to downhole geophone (see column 7, Geophysical Airgun Report).

5.Integrated raw sonic time: the raw sonic log is integrated from top to bottom and listed at each level. An initial value at the top of the sonic log is set equal to the checkshot time at that level. This may be an imposed shot if a shot was not taken at the top of the sonic.

6. Computed drift at level: the checkshot time minus the integrated raw sonic time.

7. Computed blk-shft correction: the drift gradient between any two checkshot levels
$\left(\frac{\Delta \text{ drift}}{\Delta \text{ depth}}\right)$.

A3 Sonic Adjustment Parameter Report

1. Knee number: the knee number starting from the highest knee. (The first knees listed will generally be at SRD and the top of sonic. The drift imposed at these knees will normally be zero.)

2. Vertical depth from KB: the depth in metres from kelly bushing

3. Vertical depth from SRD: the depth in metres from seismic reference datum.

4. Drift at knee: the value of drift imposed at each knee.

5. Blockshift used: the change in drift divided by the change in depth between any two levels.

6. Delta-T minimum used: see section 4 of report for an explanation of Δt_{min}.

7. reduction factor: see section 4 of report.

8. Equivalent blockshift: the gradient of the imposed drift curve.

A4 Velocity Report

1. Level number: the level number starting from the top level (includes any imposed shots).

2. Vertical depth from KB: the depth in metres form kelly bushing.

3. Vertical depth from SRD: the depth in metres from seismic reference datum.

4. Vertical travel time SRD to GEOPH: the vertical travel time from SRD to downhole geophone (see column 7, Geophysical Airgun Report)

5. Integrated adjusted sonic time: the adjusted sonic log is integrated from top to bottom. An initial value at the top of the sonic is set equal the checkshot time at that level. (the adjusted sonic log is the drift corrected sonic log.)

6. Drift=shot time-raw sonic: the check shot time minus the raw integrated sonic time.

7. Residual=shot time-adj sonic: the check shot time minus the adjusted integrated sonic time. This is the difference between calculated drift and the imposed drift.

8. Adjusted interval velocity: the interval velocity calculated from the integrated adjusted sonic time at each level.

A5 Time Converted Velocity Report

the data in this listing has been resampled in time.

1. Two way travel time from SRD: this is the index for the data in this listing. The first value is at SRD (0 millisecs) and the sampling rate is 2 millisecs.

2. Measured depth from KB: the depth from KB at each corresponding value of two way time.

3. Vertical depth from SRD: the vertical depth from SRD at each corresponding value of two way time.

4. Average velocity SRD to GEO: the vertical depth from SRD divided by half the two way time.

5. RMS velocity: the root mean square velocity from datum to the corresponding value of two way time.

$$v_{rms} = \sqrt{\Sigma_1^n v_i^2 t_i / \Sigma^n{}_1 t_i}$$

where v_i is the velocity between each 2 millisecs interval.

6. First normal moveout: the correction time in millisecs to be applied to the two way travel time for a specified moveout distance (default = 1000 M).

$$\Delta t = \sqrt{t^2 + \left(\frac{X}{v_{rms}}\right)^2} - t$$

where:

Δt = normal moveout (secs)
X = moveout distance (metres)
t = two way time (secs)
v_{rms} = rms velocity (metres / sec)

7. Second normal moveout: the correction time in millisecs to be applied to the two way travel tome for a specified moveout distance (default = 1500 M).

8. Third normal moveout: the correction time in millisecs to be applied to the two way travel time for a specified moveout distance (default = 2000 M)

9. Interval velocity: the velocity between each sampled depth. Typically, the sampling rate is 2 millisecs two way time, (1 millisec one way time) therefore the interval velocity will be equal to the depth increment divided by 0.002. It is equivalent to column 9 from the Velocity Report.

VSP PLOTS

Plot 1	Stacked Data
Plot 2	Amplitude Recovery
Plot 3	Velocity Filter
Plot 4	Waveshaping Deconvolution Zero Phase
Plot 5	Waveshaping Deconvolution - Corridor Stack
Plot 6	VSP and Geogram Composite - normal polarity 20 cm/sec
Plot 7	VSP and Geogram Composite - reverse polarity 20 cm/sec

GEOGRAM PLOTS

Drift Corrected Sonic

Seismic Calibration Log

25 hz zero phase Geogram 10 cm/sec

35 hz zero phase Geogram 10 cm/sec

45 hz zero phase Geogram 10 cm/sec

VSP/SEISMIC

VSP Phase Matching to Surface Seismic and Synthetic amplitude study of cemented sands at Conan #1

Part 1) VSP Phase Matching to Surface Seismic

Well: Conan #1 Seismic line: OH94-246 R95

A VSP (or synthetic seismogram) should be a better representation of the subsurface reflectivity at the borehole, so it is reasonable to use this information to calculate and apply a phase and static correction to the surface seismic data. This is the MATCH processing and the method assumes that the VSP follows the convolution model so that the two traces (VSP and surface seismic trace) share the same underlying reflectivity series at the well location.

The matching filter is based on the following relationships for the two traces:

$$S(t) = W_S(t) * R(x,t) + N_S(x,t)$$

$$V(t) = W_u(t) * R(t) + N_u(t)$$

where

$S(t)$ = Surface seismic trace at well trajectory

$V(t)$ = VSP or synthetic trace

$R(t)$ = Reflectivity series along well

$W_S(t)$ = Surface seismic wavelet

$N_S(t)$ = Surface seismic noise term

$W_u(t)$ = VSP or Synthetic wavelet

$N_u(t)$ = VSP noise term

The matching filter function h (t) is defined as :

$$W_u(t) = h(t) * W_s(t)$$

The differences between the traces are assumed to come from a spatially invariant disparity in the wavelet W, and/or a spatially variable noise term. After rearranging the above equations:

$$V(t) = h(t) * S(t) + Error$$

Where *Error* denotes the error due to noise :

FILTER CALCULATION

The procedure for computing a matching filter is handled in three stages.

- Gross time shift correction
- Time gate selection
- Filter computation

Computation of the gross time shift

A gross correlation function C (t) of the VSP V (t) and the surface seismic trace corresponding to the well S (t) is computed as :

$$C(t) = \int_{t1}^{t2} S(t)\, V(t + \tau)\, dt$$

Picking the maxima of the envelope of the cross-correlation will yield an accurate gross time shift accounting for a linear phase distortion.

Time gate selection

To allow for non-stationary wavelets or time variant phase rotation , time zones can be defined. These are selected using well logs and cover approximately the same section of stratigraphy on each line. However designing a time variant filter is a delicate operation and one should keep in mind that fixed time gates are more often useed in the upstream seismic processing sequence. In

most cases, it is better to use a single time gate, and use sub-windows only in tests to verify the stability of the filter parameters.

Filter Computation

The matching filters are designed on the spectra of the time window segment inside a specific timegate . There are four filter calculation methods.

- (a) **Spectral Division** : filter matches both amplitude and phase spectrum. It uses white noise or colored noise for prewhitening the spectrum of the original trace.

- (b) **All Pass filter** : matches only the phase spectrum. It is equivalent to a Spectral Division filter with infinite white noise.

- (c) **Phase rotation filter** : applies a bulk phase rotation. The rotation angle is a weighted average phase difference in the selected frequency bandwidth.

- (d) **Do nothing:** filter does not change any spectral characteristics. It exists to apply only time shifts.

Generally the Surface Seismic data and the VSP data is matched using the **Phase Rotation** filter, as this provides a softer match which extrapolates away from the well more reliably. Using the Spectral Division or All Pass filters tend to force the Surface Seismic data to match the VSP or synthetic.

Results for Conan #1 VSP and Seismic Line OH94-246 R95

The Conan #1 VSP was matched to Seismic Line OH94-246 to provide a phase rotation and static shift . The following results depict the quality of the calculation.

-TABLE -1 Filter Calculation Summary

Seismic Line	Reference Well	TIME ZONE 1		
		Interval Msec	Time Shift Msec	Phase Rotation Deg
OH94-246	Conan-1	1145 1515	-11	-40

-Figure -1 Power spectra of VSP and Surface Seismic trace at the Conan -1 well. The reference trace refers to the VSP and the original refers to the Seismic trace.

-Figure -2 Vsp and seismic correlation at Conan-1. The cross correlation evelopes and phase trace within the envelope are depicted before and after the static (-11 msec) and phase rotation (-40 deg) has been applied. Note the slight character change of the seismic trace due to the -40 deg phase rotation. This can be studied in detail when comparing figures 2 and 3.

-Figure -3 Vsp and seismic correlation at Conan-1. In this case only a static shift was applied (-11 msec) .

-Plot-1 Montage plot. Borehole seismic data with logs (time indexed , with associated depth scale) along with seismic line before and after static and phase correction.

-Plot-2 Montage plot. Borehole seismic data with logs (time indexed , with associated depth scale) along with seismic line before and after static correction only.

Part 2) Synthetic Seismogram study of cemented sands at Conan #1

In an effort to determine whether the cemented sands in the time interval 1330 to 1365 msec create an amplitude effect, synthetic modelling was done at Conan-1.

In this section synthetics are studied over the sand zone utilizing the original drift corrected sonic and density logs. Four Zero Phase Ricker wavelets are convolved to the reflictivity series produced from the logs which include the cemented sands. **Plot 3** depicts these results at central frequencies 25 , 30 , 35 and 45 hz. Note the character of the resultant RC series and synthetics at the interval 1330 - 1365 msec.

Subsequently , the three cemented sand spikes where edited out of the density and sonic logs. The RC series and synthetics are then recomputed and results displayed on **Plot 4.** In this case the RC series in the zone of interest has changed substatially as expected but the synthetics show slight changes in amplitude. The trough at ~ 1360 msec (normal polarity) is sharper and of higher amplitude with the cemented sands (plot 3) , but on the other hand the convolution process has had the effect of decreasing the amplitudes of the peaks on either side of the tough. Note the variations in the synthetics with different frequencies. The seismic compares to the 30 hz Ricker wavelet. Arguably, the variations are slight and must be studied in detail especially at the surface seismic frequency.

In addition to studying the amplitude affects caused by the cemented sands in standard synthetics, NMO corrected synthetic CMP gathers have also been produced. Both the with/without cemented sand scenarios are depicted in figures 4 a,b and 5 a,b. In these cases the shear velocity is calculated using a Vp/Vs ratio of 2.3 in shale and 1.7 in sand.

Figures 4 a & b show (in colour and b/w) the amplitude with offset variations caused by the cemented sands in the target interval. Here the amplitudes increase with offset due to the cemented sands and assuming the above Vp/Vs ratios. We must keep in mind that the reflection and transmission coefficients at an interface are governed by the Zoepritz equations and depend on Vp, Vs and Rhob. As we move towards the 1500m offset we note the increases in amplitude associated with the cemented sand spikes.

In **Figures 5 a & b,** the cemented sands have been removed and assuming the same Vp/Vs ratio as above we actually obtain a slight decrease in amplitude with offset (at the furthest offsets) . Figures 4 and 5 are displayed in reverse polarity hence as we exit the target sand the resultant convolution process results in a peak. In the scenario without the cemented zones the wavelet is also broader.

Summary of plots and figures:

Plot 3 , Synthetics at 25, 30, 35, 45, Hz zero phase Ricker- with cemented sands

Plot 4 , Synthetics at 25, 30, 35, 45, Hz zero phase Ricker- without cemented sands

Figure 4a , NMO corrected synthetic CMP gathers- with cemented sands . Amplitude variations in colour.

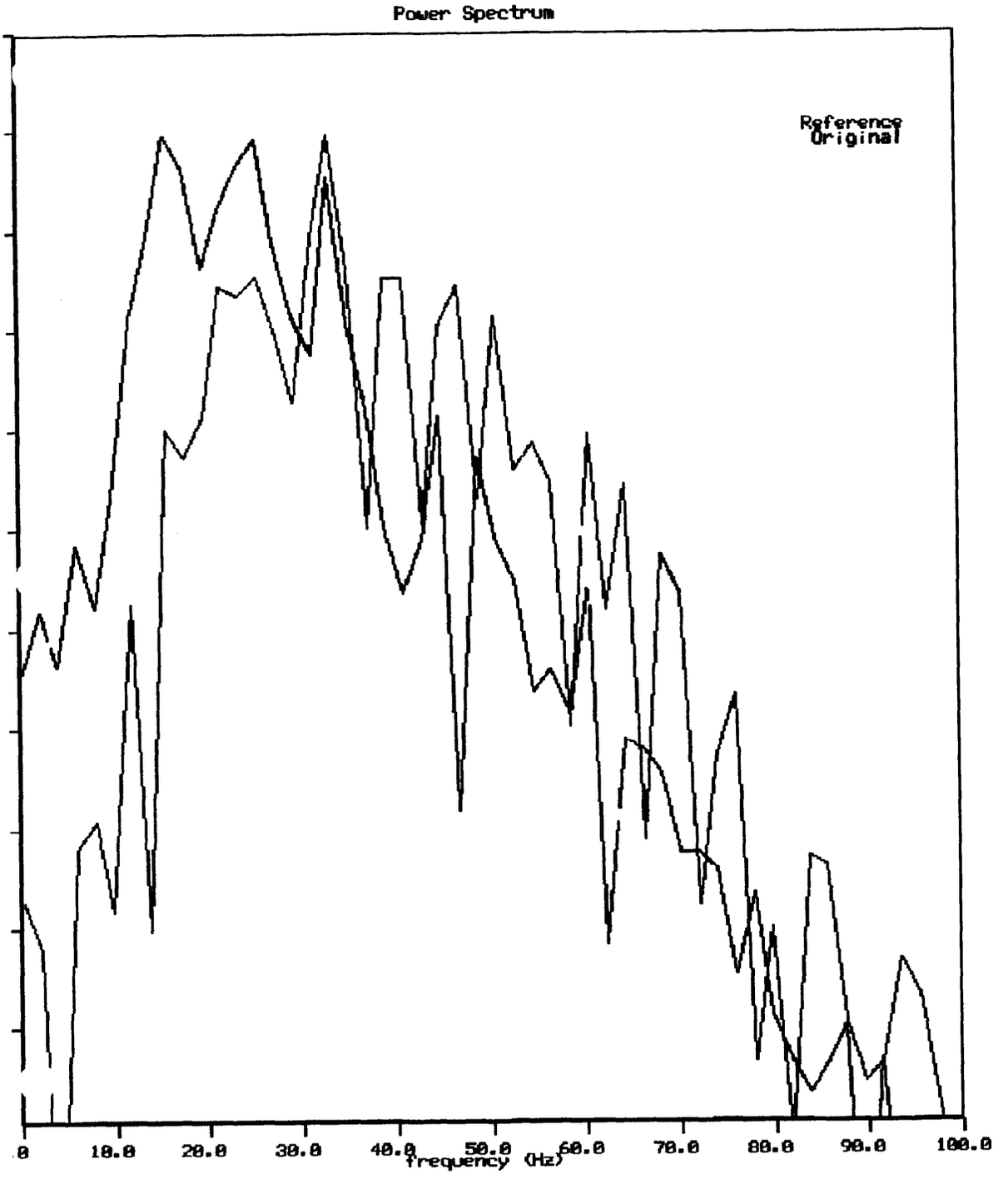
Figure 4b , NMO corrected synthetic CMP gathers- with cemented sands . Amplitude variations in B/W.

Figure 5a , NMO corrected synthetic CMP gathers- without cemented sands . Amplitude variations in colour.

Figure 5b , NMO corrected synthetic CMP gathers- without cemented sands . Amplitude variations in B/W.

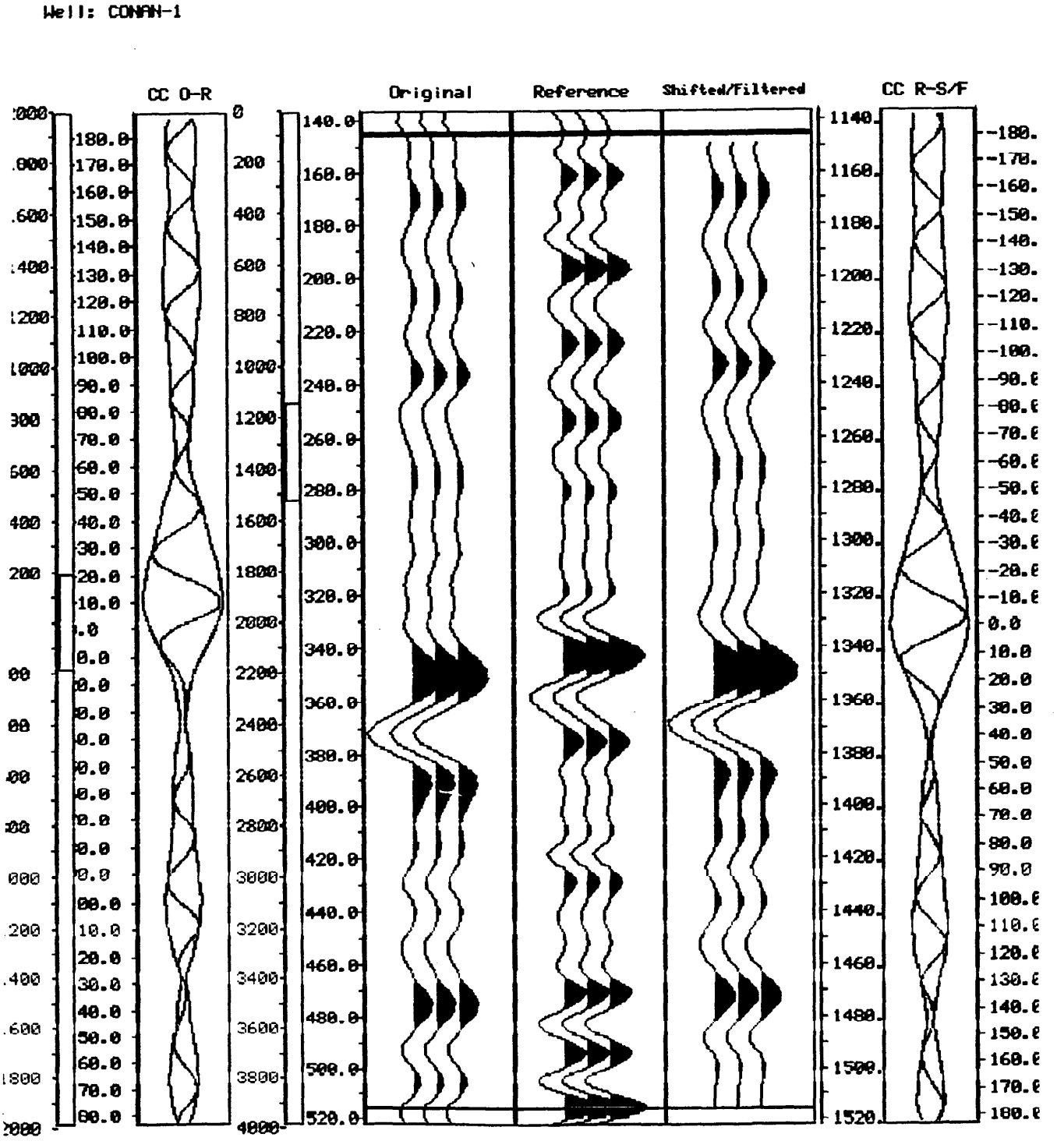
Power Spectrum VSP and well trace Conan-1

-Figure -1



VSP and Seismic well trace correlation Conan-1

-Figure -2



Static Shift calculation. Conan-1

-Figure -3

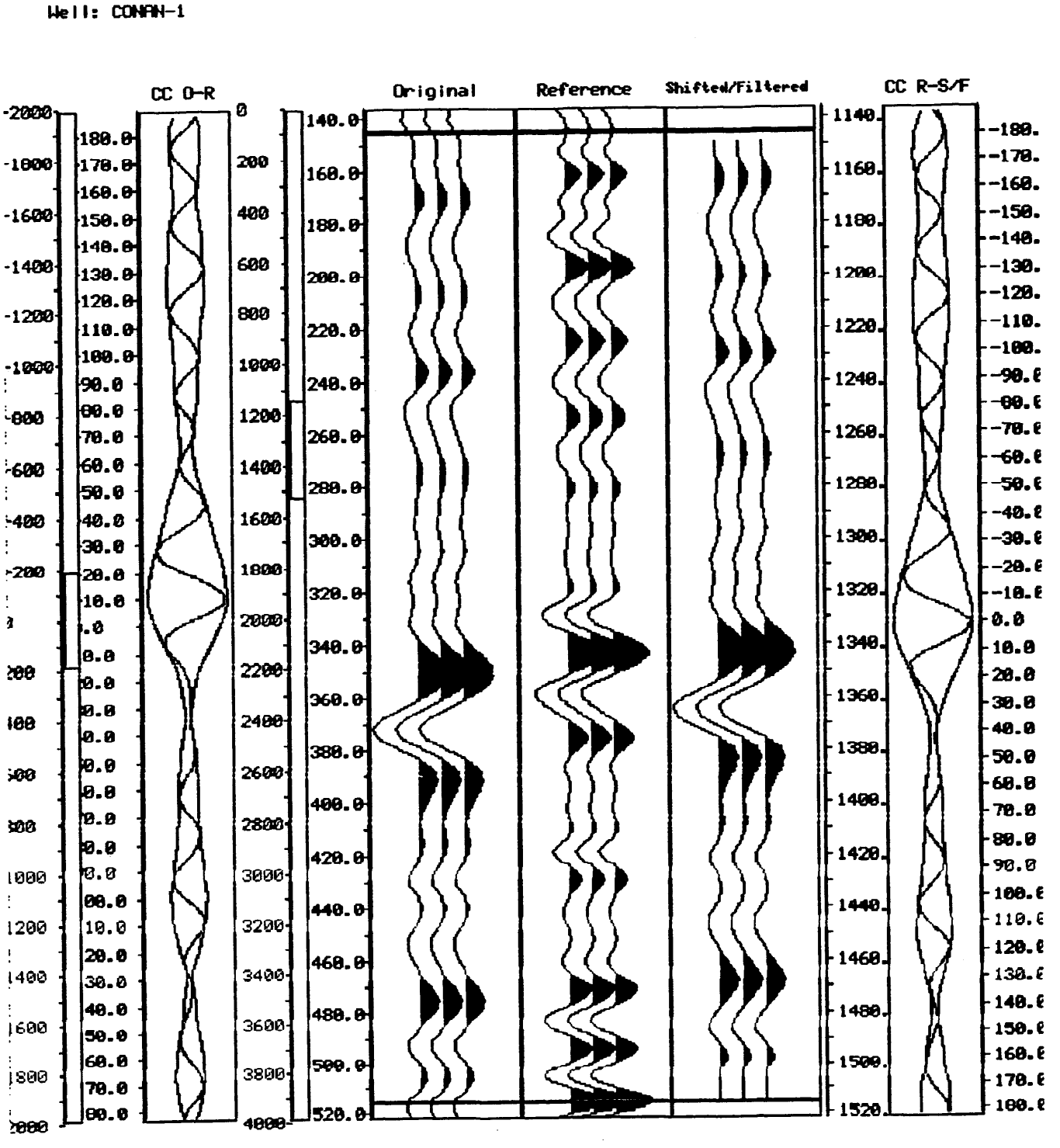


Figure 4a , NMO corrected synthetic CMP gathers- with cemented sands . Amplitude variations in colour.

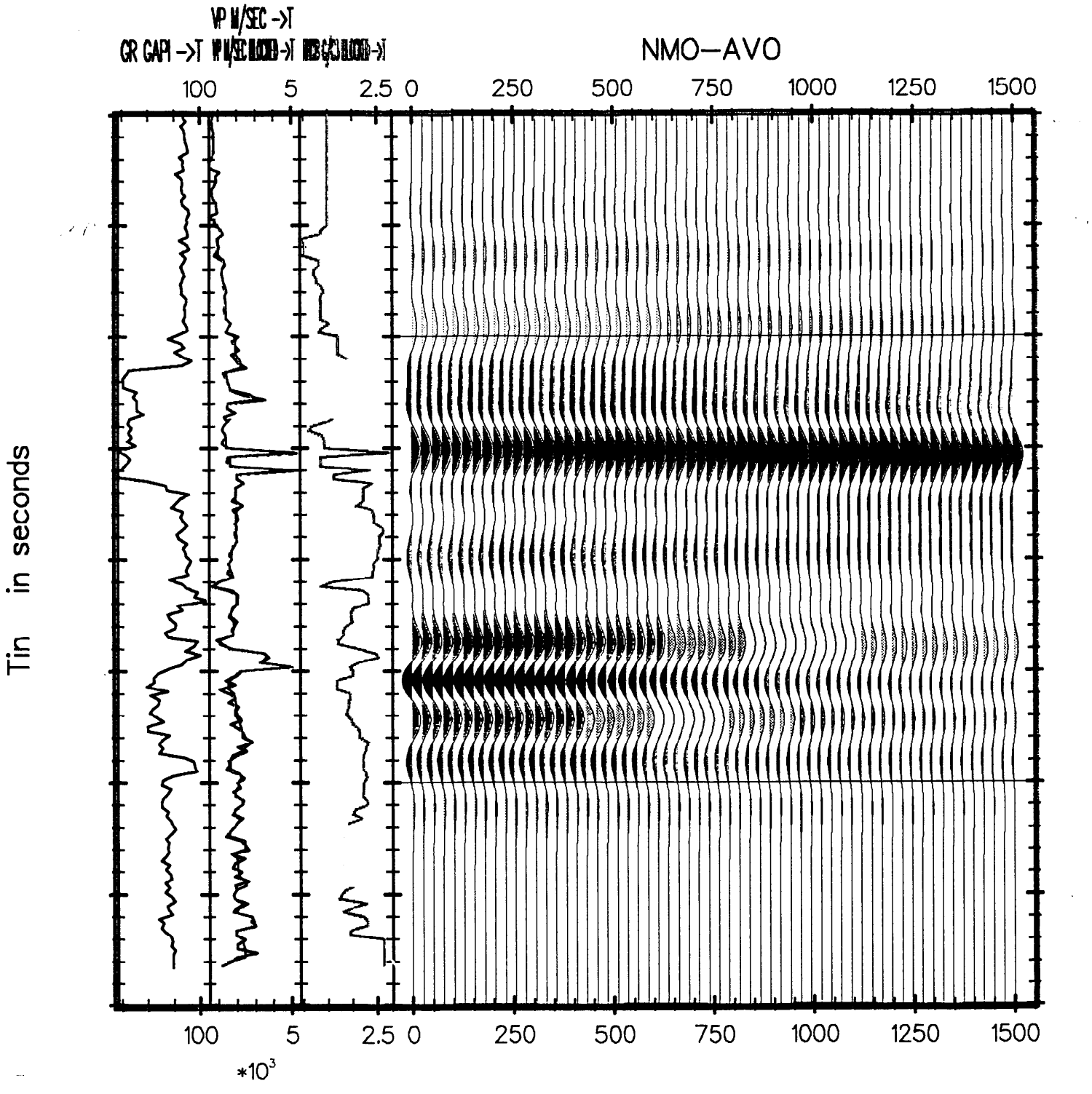


Figure 4b , NMO corrected synthetic CMP gathers- with cemented sands . Amplitude variations in B/W.

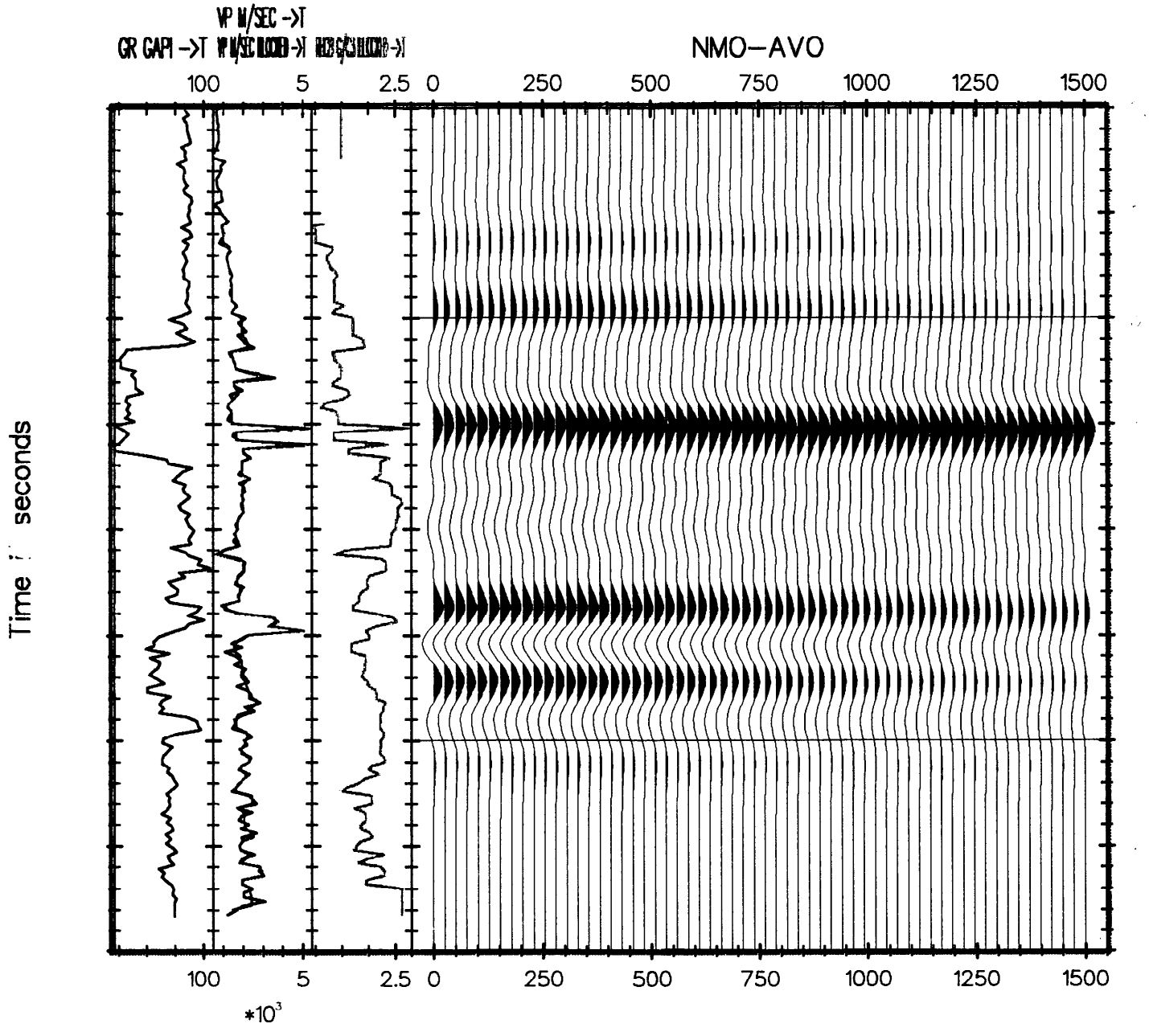


Figure 5a , NMO corrected synthetic CMP gathers- without cemented sands . Amplitude variations in colour.

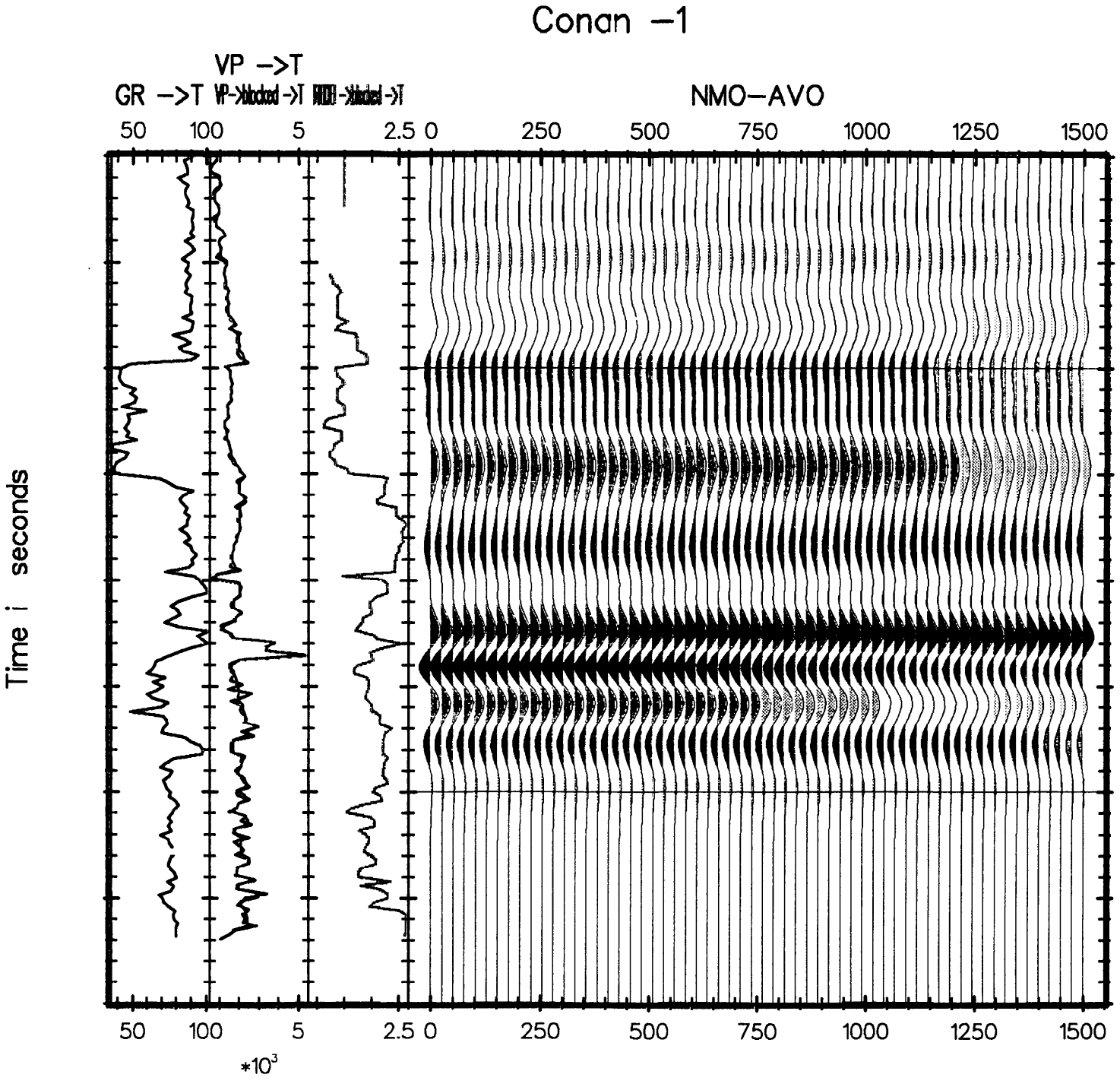
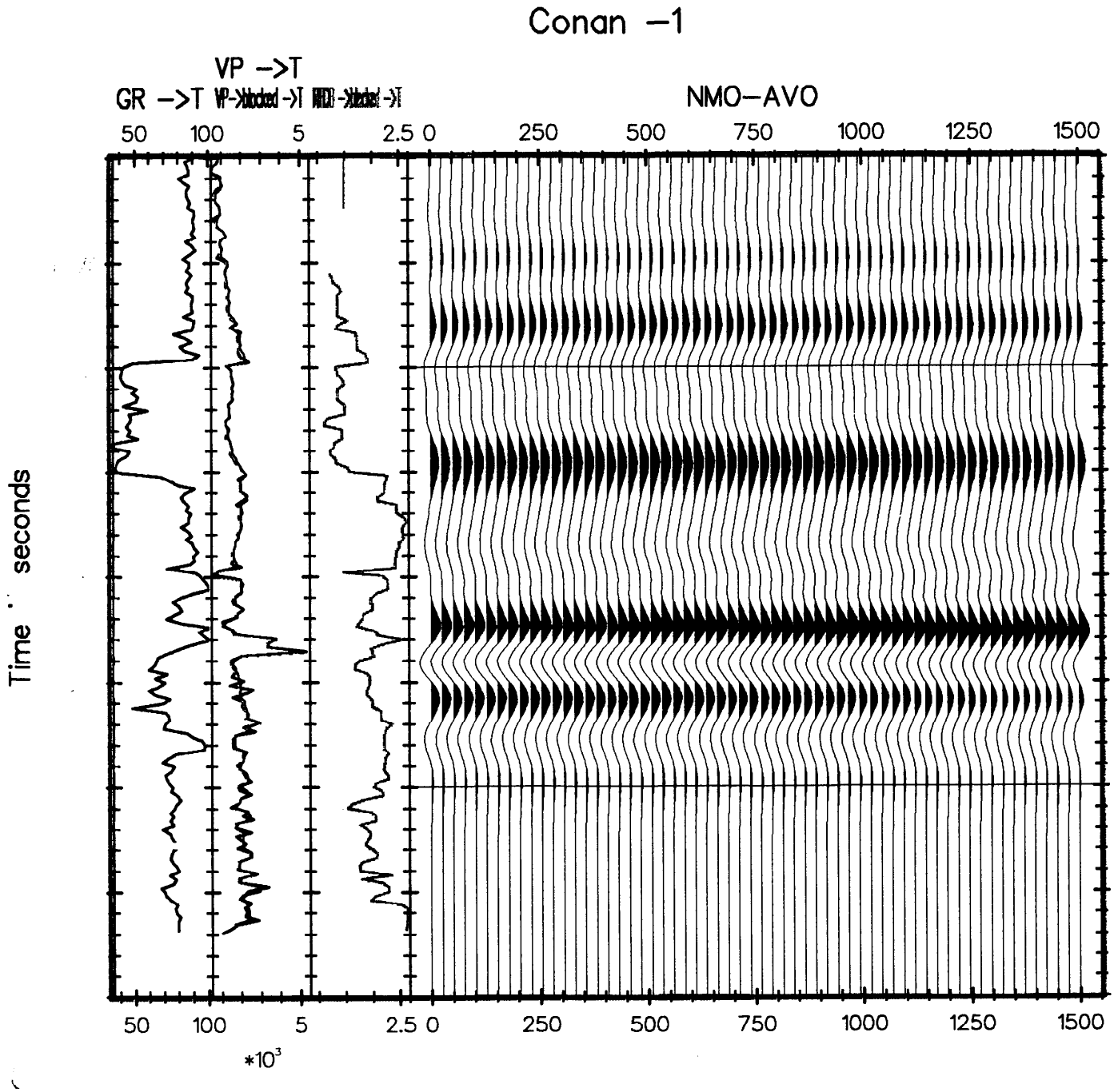
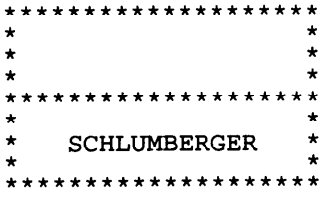


Figure 5b , NMO corrected synthetic CMP gathers- without cemented sands . Amplitude variations in B/W.



SHOTS

ANALYST: S.TCHERKASHNEV 6-AUG-95 15:30:19 PROGRAM: GSHOT 007.E08



GEOPHYSICAL AIRGUN REPORT

COMPANY : BHP PETROLEUM

WELL : CONAN-1

FIELD : WILDCAT

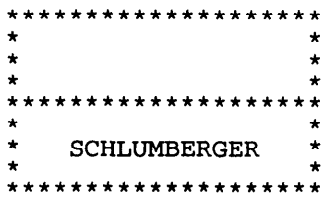
STATE : VICTORIA

COUNTRY : AUSTRALIA

REFERENCE: SYJ-561137/561138

LOGGED : 2-08-1995

ANALYST: S.TCHERKASHNEV 6-AUG-95 15:30:19 PROGRAM: GSHOT 007.E08



GEOPHYSICAL AIRGUN REPORT

COMPANY : BHP PETROLEUM
WELL : CONAN-1
FIELD : WILDCAT
STATE : VICTORIA
COUNTRY : AUSTRALIA
REFERENCE: SYJ-561137/561138
LOGGED : 2-08-1995

LONG DEFINITIONS

GLOBAL

KB - Elevation of the KELLY-BUSHING Above MSL or MWL
SRD - Elevation of the Seismic Reference Datum Above MSL or MWL
EKB - Elevation of Kelly Bushing
VELHYD - VELOCITY OF THE MEDIUM BETWEEN THE SOURCE AND THE HYDROPHONE
VELSUR - VELOCITY OF THE MEDIUM BETWEEN THE SOURCE AND THE SRD

MATRIX

GUNELZ - SOURCE ELEVATION ABOVE SRD (ONE FOR THE WHOLE JOB; OR ONE PER SHOT)
GUNEWZ - SOURCE DISTANCE FROM THE BOREHOLE AXIS IN EW DIRECTION (CF. GUNELZ)
GUNNSZ - SOURCE DISTANCE FROM THE BOREHOLE AXIS IN NS DIRECTION (CF. GUNELZ)
HYDELZ - HYDROPHONE ELEVATION ABOVE SRD (CF. GUNELZ)
HYDEWZ - HYDROPHONE DISTANCE FROM THE BOREH AXIS IN EW DIRECTION (CF GUNELZ)
HYDNSZ - HYDROPHONE DISTANCE FROM THE BOREH AXIS IN NS DIRECTION (CF GUNELZ)
TRTHYD - TRAVEL TIME FROM THE HYDROPHONE TO THE SOURCE
TRTSRD - TRAVEL TIME FROM THE SOURCE TO THE SRD
DEVWEL - DEVIATED WELL DATA PER SHOT : MEAS. DEPTH, VERT. DEPTH, EW, NS

SAMPLED

SHOT.GSH - Shot number
DKB.GSH - Measured Depth from Kelly-Bushing
DSRD.GSH - Depth from SRD
TIMO.GSH - Tie In Memorized Output
TIMV.GSH - Vertical Travel Time from the Source to the Geophone
SHTM.GSH - Shot time (WST)
AVGV.GSH - Average Seismic Velocity
DELZ.GSH - Depth Interval between Successive Shots
DELT.GSH - Travel Time Interval between Successive Shots
INTV.GSH - Internal Velocity, Average

(GLOBAL PARAMETERS)		(VALUE)	
ELEV OF KB AB. MSL (WST)	KB	: 25.3000	M
ELEV OF SRD AB. MSL(WST)	SRD	: 0	M
Elevation of Kelly Bushi	EKB	: 25.3000	M
VEL SOURCE-HYDRO(WST)	VELHYD	: 1524.00	M/S
VEL SOURCE-SRD (WST)	VELSUR	: 1524.00	M/S

(MATRIX PARAMETERS)

	SOURCE ELV M	SOURCE EW M	SOURCE NS M	HYDRO ELEV M	HYDRO EW M	HYDRO NS M
1	-5.0	50.0	-2.1	-10.0	50.0	-2.1

COMPANY : BHP PETROLEUM WELL : CONAN-1 PAGE

	TRT HYD-SC MS	TRT SC-SRD MS
1	3.28	3.28

	MD @ KB M	VD @ KB M	VD @ SRD M	E-W COORD M	N-S COORD M
1	95.3	95.3	70.0	0	0
2	650.0	650.0	624.7	0	0
3	700.0	700.0	674.7	0	0
4	750.0	750.0	724.7	0	0
5	800.0	800.0	774.7	0	0
6	850.0	850.0	824.7	0	0
7	900.0	900.0	874.7	0	0
8	950.0	950.0	924.7	0	0
9	1000.0	1000.0	974.7	0	0
10	1050.1	1050.1	1024.8	0	0
11	1100.0	1100.0	1074.7	0	0
12	1150.1	1150.1	1124.8	0	0
13	1195.0	1195.0	1169.7	0	0
14	1211.0	1211.0	1185.7	0	0
15	1220.0	1220.0	1194.7	0	0
16	1240.0	1240.0	1214.7	0	0
17	1260.0	1260.0	1234.7	0	0
18	1280.0	1280.0	1254.7	0	0
19	1300.0	1300.0	1274.7	0	0
20	1320.0	1320.0	1294.7	0	0
21	1330.0	1330.0	1304.7	0	0
22	1357.0	1357.0	1331.7	0	0
23	1380.0	1380.0	1354.7	0	0
24	1401.0	1401.0	1375.7	0	0
25	1419.0	1419.0	1393.7	0	0
26	1440.5	1440.5	1415.2	0	0
27	1460.0	1460.0	1434.7	0	0
28	1479.0	1479.0	1453.7	0	0
29	1500.0	1500.0	1474.7	0	0
30	1508.0	1508.0	1482.7	0	0
31	1520.0	1520.0	1494.7	0	0
32	1540.0	1540.0	1514.7	0	0
33	1561.0	1561.0	1535.7	0	0
34	1581.0	1581.0	1555.7	0	0
35	1600.0	1600.0	1574.7	0	0
36	1620.0	1620.0	1594.7	0	0
37	1642.0	1642.0	1616.7	0	0
38	1660.0	1660.0	1634.7	0	0
39	1679.0	1679.0	1653.7	0	0
40	1700.0	1700.0	1674.7	0	0

41	1720.0	1720.0	1694.7	0	0
42	1740.0	1740.0	1714.7	0	0
43	1760.0	1760.0	1734.7	0	0
44	1765.0	1765.0	1739.7	0	0
45	1780.0	1780.0	1754.7	0	0
46	1800.1	1800.1	1774.8	0	0
47	1820.0	1820.0	1794.7	0	0
48	1840.0	1840.0	1814.7	0	0
49	1860.0	1860.0	1834.7	0	0
50	1880.0	1880.0	1854.7	0	0
51	1900.0	1900.0	1874.7	0	0
52	1920.0	1920.0	1894.7	0	0
53	1940.0	1940.0	1914.7	0	0
54	1955.0	1955.0	1929.7	0	0

LEVEL NUMBER	MEASUR DEPTH FROM KB M	VERTIC DEPTH FROM SRD M	OBSERV TRAVEL TIME HYD/GEO MS	VERTIC TRAVEL TIME SRC/GEO MS	VERTIC TRAVEL TIME SRD/GEO MS	AVERAGE VELOC SRD/GEO M/S	DELTA DEPTH BETWEEN SHOTS M	DELTA TIME BETWEEN SHOTS MS	INTERV VELOC BETWEEN SHOTS M/S
1	95.3	70.0	50.53	42.65	45.93	1524			
							554.7	234.93	2361
2	650.0	624.7	275.20	277.58	280.86	2224	50.0	24.26	2061
3	700.0	674.7	299.40	301.84	305.12	2211	50.0	20.96	2385
4	750.0	724.7	320.30	322.80	326.08	2222	50.0	16.76	2983
5	800.0	774.7	337.00	339.57	342.85	2260	50.0	24.74	2021
6	850.0	824.7	361.70	364.30	367.58	2244	50.0	15.75	3175
7	900.0	874.7	377.40	380.05	383.33	2282	50.0	18.24	2741
8	950.0	924.7	395.60	398.29	401.57	2303	50.0	18.13	2757
9	1000.0	974.7	413.70	416.43	419.71	2322	50.1	19.03	2633
10	1050.1	1024.8	432.70	435.46	438.74	2336	49.9	17.33	2880
11	1100.0	1074.7	450.00	452.79	456.07	2356	50.1	17.43	2875
12	1150.1	1124.8	467.40	470.21	473.49	2376	44.9	15.02	2989
13	1195.0	1169.7	482.40	485.23	488.51	2394	16.0	5.51	2905
14	1211.0	1185.7	487.90	490.74	494.02	2400	9.0	3.40	2644
15	1220.0	1194.7	491.30	494.14	497.43	2402	20.0	6.21	3221
16	1240.0	1214.7	497.50	500.35	503.63	2412	20.0	6.81	2938
17	1260.0	1234.7	504.30	507.16	510.44	2419	20.0	8.31	2408
18	1280.0	1254.7	512.60	515.47	518.75	2419	20.0	5.91	3385
19	1300.0	1274.7	518.50	521.38	524.66	2430	20.0	7.51	2664
20	1320.0	1294.7	526.00	528.88	532.16	2433	10.0	3.50	2854
21	1330.0	1304.7	529.50	532.39	535.67	2436	27.0	9.41	2870
22	1357.0	1331.7	538.90	541.80	545.08	2443	23.0	8.11	2837
23	1380.0	1354.7	547.00	549.90	553.18	2449	21.0	7.71	2725
24	1401.0	1375.7	554.70	557.61	560.89	2453			

LEVEL NUMBER	MEASUR DEPTH FROM KB M	VERTIC DEPTH FROM SRD M	OBSERV TRAVEL TIME HYD/GEO MS	VERTIC TRAVEL TIME SRC/GEO MS	VERTIC TRAVEL TIME SRD/GEO MS	AVERAGE VELOC SRD/GEO M/S	DELTA DEPTH BETWEEN SHOTS M	DELTA TIME BETWEEN SHOTS MS	INTERV VELOC BETWEEN SHOTS M/S
							18.0	5.21	3457
25	1419.0	1393.7	559.90	562.82	566.10	2462	21.5	8.01	2685
26	1440.5	1415.2	567.90	570.82	574.10	2465	19.5	6.41	3044
27	1460.0	1434.7	574.30	577.23	580.51	2471	19.0	7.11	2674
28	1479.0	1453.7	581.40	584.33	587.61	2474	21.0	7.21	2914
29	1500.0	1474.7	588.60	591.54	594.82	2479	8.0	2.90	2757
30	1508.0	1482.7	591.50	594.44	597.72	2481	12.0	4.40	2725
31	1520.0	1494.7	595.90	598.84	602.12	2482	20.0	6.41	3122
32	1540.0	1514.7	602.30	605.25	608.53	2489	21.0	8.10	2591
33	1561.0	1535.7	610.40	613.35	616.63	2490	20.0	6.90	2897
34	1581.0	1555.7	617.30	620.26	623.54	2495	19.0	6.80	2792
35	1600.0	1574.7	624.10	627.06	630.34	2498	20.0	7.10	2815
36	1620.0	1594.7	631.20	634.17	637.45	2502	22.0	6.61	3331
37	1642.0	1616.7	637.80	640.77	644.05	2510	18.0	6.00	2998
38	1660.0	1634.7	643.80	646.78	650.06	2515	19.0	7.00	2713
39	1679.0	1653.7	650.80	653.78	657.06	2517	21.0	7.00	2998
40	1700.0	1674.7	657.80	660.78	664.07	2522	20.0	5.20	3843
41	1720.0	1694.7	663.00	665.99	669.27	2532	20.0	6.00	3331
42	1740.0	1714.7	669.00	671.99	675.27	2539	20.0	6.00	3331
43	1760.0	1734.7	675.00	678.00	681.28	2546	5.0	1.00	4994
44	1765.0	1739.7	676.00	679.00	682.28	2550	15.0	4.50	3331
45	1780.0	1754.7	680.50	683.50	686.78	2555	20.1	6.00	3348
46	1800.1	1774.8	686.50	689.51	692.79	2562	19.9	5.30	3752
47	1820.0	1794.7	691.80	694.81	698.09	2571	20.0	6.00	3331
48	1840.0	1814.7	697.80	700.81	704.09	2577			

LEVEL NUMBER	MEASUR DEPTH FROM KB M	VERTIC DEPTH FROM SRD M	OBSERV TRAVEL TIME HYD/GEO MS	VERTIC TRAVEL TIME SRC/GEO MS	VERTIC TRAVEL TIME SRD/GEO MS	AVERAGE VELOC SRD/GEO M/S	DELTA DEPTH BETWEEN SHOTS M	DELTA TIME BETWEEN SHOTS MS	INTERV VELOC BETWEEN SHOTS M/S
							20.0	6.40	3123
49	1860.0	1834.7	704.20	707.22	710.50	2582	20.0	5.20	3843
50	1880.0	1854.7	709.40	712.42	715.70	2591	20.0	5.40	3701
51	1900.0	1874.7	714.80	717.82	721.11	2600	20.0	5.30	3771
52	1920.0	1894.7	720.10	723.13	726.41	2608	20.0	5.50	3634
53	1940.0	1914.7	725.60	728.63	731.91	2616	15.0	4.60	3259
54	1955.0	1929.7	730.20	733.23	736.51	2620			

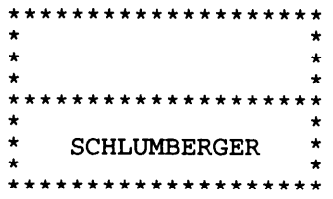
DRIFT

ANALYST: S.TCHERKASHNEV 6-AUG-95 15:31:08 PROGRAM: GDRIFT 007.E09

DRIFT COMPUTATION REPORT

COMPANY : BHP PETROLEUM
WELL : CONAN-1
FIELD : WILDCAT
STATE : VICTORIA
COUNTRY : AUSTRALIA
REFERENCE: SYJ-561137/561138
LOGGED : 2-08-1995

ANALYST: S.TCHERKASHNEV 6-AUG-95 15:31:08 PROGRAM: GDRIFT 007.E09



DRIFT COMPUTATION REPORT

COMPANY : BHP PETROLEUM
WELL : CONAN-1
FIELD : WILDCAT
STATE : VICTORIA
COUNTRY : AUSTRALIA
REFERENCE: SYJ-561137/561138
LOGGED : 2-08-1995

LONG DEFINITIONS

GLOBAL

KB - Elevation of the KELLY-BUSHING Above MSL or MWL
SRD - Elevation of the Seismic Reference Datum Above MSL or MWL
EKB - Elevation of Kelly Bushing
XSTART - TOP OF ZONE PROCESSED BY WST
XSTOP - BOTTOM OF ZONE PROCESSED BY WST
UNFDEN - UNIFORM DENSITY VALUE
GAD001 - RAW SONIC CHANNEL NAME USED FOR WST SONIC ADJUSTMENT

ZONE

LOFDEN - LAYER OPTION FLAG FOR DENSITY : -1=NONE; 0=UNIFORM; 1=UNIFORM+LAYER
LAYDEN - USER SUPPLIED DENSITY DATA

SAMPLED

SHOT - Shot number
DKB - Measured Depth from Kelly-Bushing
DSRD - Depth from SRD
SHTM - Shot time (WST)
RAWS - Raw Sonic (WST)
SHDR - Drift at Shot or Knee
BLSH - Block Shift between Shots or Knee

(GLOBAL PARAMETERS)		(VALUE)	
ELEV OF KB AB. MSL (WST)	KB	: 25.3000	M
ELEV OF SRD AB. MSL(WST)	SRD	: 0	M
Elevation of Kelly Bushi	EKB	: 25.3000	M
TOP OF ZONE PROCD (WST)	XSTART	: 0	M
BOT OF ZONE PROCD (WST)	XSTOP	: 0	M
UNIFORM DENSITY VALUE	UNFDEN	: 2.30000	G/C3
RAW SONIC CH NAME (WST)	GAD001	: DT.EDI.ATT.002.FLP.*	

(ZONED PARAMETERS)		(VALUE)		(LIMITS)		
LAYER OPTION FLAG DENS	LOFDEN	: 1.000000		30479.7	-	0
USER SUPPLIED DENSITY DA	LAYDEN	: 0	G/C3	0	-	0

LEVEL NUMBER	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	VERTICAL TRAVEL TIME SRD/GEO MS	INTEGRATED RAW SONIC TIME MS	COMPUTED DRIFT AT LEVEL MS	COMPUTED BLK-SHFT CORRECTION US/M
1	95.3	70.0	45.93	45.93	0	0
2	650.0	624.7	280.86	280.86	0	0
3	700.0	674.7	305.12	305.12	0	0
4	750.0	724.7	326.08	326.08	0	0
5	800.0	774.7	342.85	342.85	0	0
6	850.0	824.7	367.58	367.58	0	0
7	900.0	874.7	383.33	383.33	0	0
8	950.0	924.7	401.57	401.57	0	0
9	1000.0	974.7	419.71	419.71	0	0
10	1050.1	1024.8	438.74	438.74	0	0
11	1100.0	1074.7	456.07	456.07	0	0
12	1150.1	1124.8	473.49	473.49	0	0
13	1195.0	1169.7	488.51	488.51	0	0
14	1211.0	1185.7	494.02	494.02	0	0
15	1220.0	1194.7	497.43	497.06	.37	40.93
16	1240.0	1214.7	503.63	503.79	-.16	-26.42
17	1260.0	1234.7	510.44	510.47	-.03	6.47
18	1280.0	1254.7	518.75	517.45	1.30	66.48
19	1300.0	1274.7	524.66	524.40	.26	-52.02
20	1320.0	1294.7	532.16	531.43	.73	23.70
21	1330.0	1304.7	535.67	534.85	.81	8.23
22	1357.0	1331.7	545.08	544.15	.92	4.06
23	1380.0	1354.7	553.18	551.78	1.40	20.68
24	1401.0	1375.7	560.89	558.93	1.96	26.85

LEVEL NUMBER	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	VERTICAL TRAVEL TIME SRD/GEO MS	INTEGRATED RAW SONIC TIME MS	COMPUTED DRIFT AT LEVEL MS	COMPUTED BLK-SHFT CORRECTION US/M
25	1419.0	1393.7	566.10	565.05	1.05	-50.74
26	1440.5	1415.2	574.10	572.40	1.70	30.18
27	1460.0	1434.7	580.51	579.07	1.44	-13.26
28	1479.0	1453.7	587.61	585.66	1.95	26.91
29	1500.0	1474.7	594.82	592.72	2.10	6.94
30	1508.0	1482.7	597.72	595.39	2.33	28.77
31	1520.0	1494.7	602.12	599.52	2.60	22.74
32	1540.0	1514.7	608.53	606.29	2.24	-17.87
33	1561.0	1535.7	616.63	613.60	3.03	37.54
34	1581.0	1555.7	623.54	620.47	3.07	1.95
35	1600.0	1574.7	630.34	626.98	3.36	15.18
36	1620.0	1594.7	637.45	633.87	3.57	10.77
37	1642.0	1616.7	644.05	641.29	2.77	-36.79
38	1660.0	1634.7	650.06	647.37	2.69	-4.13
39	1679.0	1653.7	657.06	653.53	3.53	44.12
40	1700.0	1674.7	664.07	659.94	4.13	28.40
41	1720.0	1694.7	669.27	665.60	3.67	-22.91
42	1740.0	1714.7	675.27	671.39	3.89	11.00
43	1760.0	1734.7	681.28	676.85	4.43	26.90
44	1765.0	1739.7	682.28	678.21	4.07	-70.73
45	1780.0	1754.7	686.78	682.34	4.44	24.56
46	1800.1	1774.8	692.79	688.07	4.71	13.67
47	1820.0	1794.7	698.09	693.82	4.28	-22.09
48	1840.0	1814.7	704.09	699.04	5.05	38.77

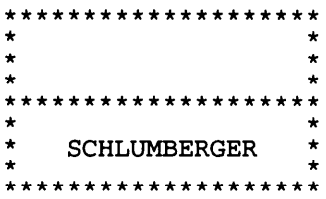
LEVEL NUMBER	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	VERTICAL TRAVEL TIME SRD/GEO MS	INTEGRATED RAW SONIC TIME MS	COMPUTED DRIFT AT LEVEL MS	COMPUTED BLK-SHFT CORRECTION US/M
49	1860.0	1834.7	710.50	704.69	5.80	37.70
50	1880.0	1854.7	715.70	710.14	5.56	-12.16
51	1900.0	1874.7	721.11	715.63	5.48	-4.30
52	1920.0	1894.7	726.41	721.10	5.31	-8.14
53	1940.0	1914.7	731.91	726.41	5.50	9.55
54	1955.0	1929.7	736.51	730.53	5.98	31.74

ANALYST: S.TCHERKASHNEV 6-AUG-95 15:32:06 PROGRAM: GADJST 008.E08

SONIC ADJUSTMENT PARAMETER REPORT

COMPANY : BHP PETROLEUM
WELL : CONAN-1
FIELD : WILDCAT
STATE : VICTORIA
COUNTRY : AUSTRALIA
REFERENCE: SYJ-561137/561138
LOGGED : 2-08-1995

ANALYST: S.TCHERKASHNEV 6-AUG-95 15:32:06 PROGRAM: GADJST 008.E08



SONIC ADJUSTMENT PARAMETER REPORT

COMPANY : BHP PETROLEUM
WELL : CONAN-1
FIELD : WILDCAT
STATE : VICTORIA
COUNTRY : AUSTRALIA
REFERENCE: SYJ-561137/561138
LOGGED : 2-08-1995

LONG DEFINITIONS

GLOBAL
SRCDRF - ORIGIN OF ADJUSTMENT DATA
CONADJ - CONSTANT ADJUSTMENT TO AUTOMATIC DELTA-T MINIMUM = 7.5 US/F
UNERTH - UNIFORM EARTH VELOCITY (GTRFRM)

ZONE
ZDRIFT - USER DRIFT AT BOTTOM OF THE ZONE
ADJOPZ - TYPE OF ADJUSTMNENT IN THE DRIFT ZONE : 0=DELTA-T MIN, 1=BLOCKSHIFT
ADJUSZ - DELTA-T MINIMUM USED FOR ADJUSTMENT IN THE DRIFT ZONE
LOFVEL - LAYER OPTION FLAG FOR VELOCITY: -1=NONE; 0=UNIFORM; 1=UNIFORM+LAYER
LAYVEL - USER SUPPLIED VELOCITY DATA

SAMPLED
SHOT - Shot number
VDKB - Vertical Depth Relative to KB
DSRD - Depth from SRD
KNEE - Knee
BLSH - Block Shift between Shots or Knee
DTMI - Value of Delta-T Minimum used
COEF - Delta-T MIN Coefficient used in the Drift Zone
DRGR - Gradient of Drift Curve

(GLOBAL PARAMETERS)		(VALUE)	
ORIG OF ADJ DATA (WST)	SRCDRF	: 2.00000	
CONS SONIC ADJST (WST)	CONADJ	: 24.6063	US/M
UNIFORM EARTH VELOCITY	UNERTH	: 1524.00	M/S

(ZONED PARAMETERS)		(VALUE)		(LIMITS)	
USER DRIFT ZONE (WST)	ZDRIFT	: 6.000000	MS	1955.00	- 1211.00
		0		1211.00	0
ADJUSMNT MODE (WST)	ADJOPZ	:-999.2500		30479.7	- 0
USER DELTA-T MIN (WST)	ADJUSZ	:-999.2500	US/M	30479.7	- 0
LAYER OPTION FLAG VELOC	LOFVEL	: 0		30479.7	- 0
USER VELOC (WST)	LAYVEL	: 2905.000	M/S	1211.00	- 1195.00
		2989.000		1195.00	1150.10
		2875.000		1150.10	1100.00
		2880.000		1100.00	1050.10
		2633.000		1050.10	1000.00
		2757.000		1000.00	950.000
		2741.000		950.000	900.000
		3175.000		900.000	850.000
		2021.000		850.000	800.000
		2983.000		800.000	750.000
		2385.000		750.000	700.000
		2061.000		700.000	650.000
		2361.000		650.000	95.3000
		1524.000		95.3000	0

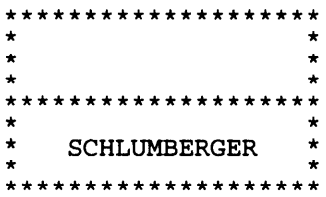
KNEE NUMBER	VERTICAL DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	DRIFT AT KNEE MS	BLOCKSHIFT USED US/M	DELTA-T MINIMUM USED US/M	REDUCTION FACTOR G	EQUIVALENT BLOCKSHIFT US/M
2	1211.0	1185.7	0	0			0
3	1955.0	1929.7	6.00	8.06			8.06

ANALYST: S.TCHERKASHNEV 6-AUG-95 15:32:13 PROGRAM: GADJST 008.E08

VELOCITY REPORT

COMPANY : BHP PETROLEUM
WELL : CONAN-1
FIELD : WILDCAT
STATE : VICTORIA
COUNTRY : AUSTRALIA
REFERENCE: SYJ-561137/561138
LOGGED : 2-08-1995

ANALYST: S.TCHERKASHNEV 6-AUG-95 15:32:13 PROGRAM: GADJST 008.E08



VELOCITY REPORT

COMPANY : BHP PETROLEUM
WELL : CONAN-1
FIELD : WILDCAT
STATE : VICTORIA
COUNTRY : AUSTRALIA
REFERENCE: SYJ-561137/561138
LOGGED : 2-08-1995

LONG DEFINITIONS

GLOBAL

KB - Elevation of the KELLY-BUSHING Above MSL or MWL
SRD - Elevation of the Seismic Reference Datum Above MSL or MWL
EKB - Elevation of Kelly Bushing
UNERTH - UNIFORM EARTH VELOCITY (GTRFRM)

ZONE

LOFVEL - LAYER OPTION FLAG FOR VELOCITY: -1=NONE; 0=UNIFORM; 1=UNIFORM+LAYER
LAYVEL - USER SUPPLIED VELOCITY DATA

SAMPLED

SHOT - Shot number
DKB - Measured Depth from Kelly-Bushing
DSRD - Depth from SRD
SHTM - Shot time (WST)
ADJS - Adjusted Sonic Travel Time
SHDR - Drift at Shot or Knee
REST - Residual Travel Time at Knee
INTV - Internal Velocity, Average

(GLOBAL PARAMETERS)		(VALUE)	
ELEV OF KB AB. MSL (WST)	KB	25.3000	M
ELEV OF SRD AB. MSL(WST)	SRD	0	M
Elevation of Kelly Bushi	EKB	25.3000	M
UNIFORM EARTH VELOCITY	UNERTH	1524.00	M/S

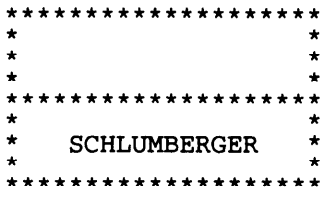
(ZONED PARAMETERS)		(VALUE)		(LIMITS)		
LAYER OPTION FLAG VELOC	LOFVEL	0		30479.7	-	0
USER VELOC (WST)	LAYVEL	2905.000	M/S	1211.00	-	1195.00
		2989.000		1195.00		1150.10
		2875.000		1150.10		1100.00
		2880.000		1100.00		1050.10
		2633.000		1050.10		1000.00
		2757.000		1000.00		950.000
		2741.000		950.000		900.000
		3175.000		900.000		850.000
		2021.000		850.000		800.000
		2983.000		800.000		750.000
		2385.000		750.000		700.000
		2061.000		700.000		650.000
		2361.000		650.000		95.3000
		1524.000		95.3000		0

LEVEL NUMBER	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	VERTICAL TRAVEL TIME SRD/GEOPH MS	INTEGRATED ADJUSTED SONIC TIME MS	DRIFT = SHOT TIME - RAW SON MS	RESIDUAL = SHOT TIME - ADJ SON MS	ADJUSTED INTERVAL VELOCITY M/S
1	95.3	70.0	45.93	45.93	0	0	1524
2	650.0	624.7	280.86	280.86	0	0	2361
3	700.0	674.7	305.12	305.12	0	0	2061
4	750.0	724.7	326.08	326.08	0	0	2386
5	800.0	774.7	342.85	342.85	0	0	2981
6	850.0	824.7	367.58	367.58	0	.01	2022
7	900.0	874.7	383.33	383.33	0	0	3174
8	950.0	924.7	401.57	401.57	0	0	2741
9	1000.0	974.7	419.71	419.71	0	0	2757
10	1050.1	1024.8	438.74	438.73	0	0	2633
11	1100.0	1074.7	456.07	456.06	0	0	2880
12	1150.1	1124.8	473.49	473.49	0	.01	2875
13	1195.0	1169.7	488.51	488.51	0	0	2989
14	1211.0	1185.7	494.02	494.02	0	0	2905
15	1220.0	1194.7	497.43	497.12	.37	.30	2898
16	1240.0	1214.7	503.63	504.02	-.16	-.39	2899
17	1260.0	1234.7	510.44	510.86	-.03	-.42	2924
18	1280.0	1254.7	518.75	518.00	1.30	.75	2801
19	1300.0	1274.7	524.66	525.11	.26	-.46	2813
20	1320.0	1294.7	532.16	532.31	.73	-.14	2781
21	1330.0	1304.7	535.67	535.81	.81	-.14	2855
22	1357.0	1331.7	545.08	545.32	.92	-.24	2838
23	1380.0	1354.7	553.18	553.14	1.40	.04	2940
24	1401.0	1375.7	560.89	560.45	1.96	.44	2872

LEVEL NUMBER	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	VERTICAL TRAVEL TIME SRD/GEOPH MS	INTEGRATED ADJUSTED SONIC TIME MS	DRIFT = SHOT TIME - RAW SON MS	RESIDUAL = SHOT TIME - ADJ SON MS	ADJUSTED INTERVAL VELOCITY M/S
25	1419.0	1393.7	566.10	566.72	1.05	-.62	2874
26	1440.5	1415.2	574.10	574.25	1.70	-.15	2854
27	1460.0	1434.7	580.51	581.07	1.44	-.56	2858
28	1479.0	1453.7	587.61	587.82	1.95	-.20	2817
29	1500.0	1474.7	594.82	595.05	2.10	-.23	2905
30	1508.0	1482.7	597.72	597.78	2.33	-.06	2923
31	1520.0	1494.7	602.12	602.01	2.60	.11	2838
32	1540.0	1514.7	608.53	608.93	2.24	-.40	2890
33	1561.0	1535.7	616.63	616.42	3.03	.22	2805
34	1581.0	1555.7	623.54	623.45	3.07	.09	2846
35	1600.0	1574.7	630.34	630.12	3.36	.23	2848
36	1620.0	1594.7	637.45	637.17	3.57	.28	2836
37	1642.0	1616.7	644.05	644.76	2.77	-.70	2899
38	1660.0	1634.7	650.06	650.98	2.69	-.92	2892
39	1679.0	1653.7	657.06	657.30	3.53	-.23	3008
40	1700.0	1674.7	664.07	663.87	4.13	.19	3193
41	1720.0	1694.7	669.27	669.70	3.67	-.43	3434
42	1740.0	1714.7	675.27	675.64	3.89	-.37	3362
43	1760.0	1734.7	681.28	681.26	4.43	.02	3560
44	1765.0	1739.7	682.28	682.66	4.07	-.38	3578
45	1780.0	1754.7	686.78	686.92	4.44	-.13	3524
46	1800.1	1774.8	692.79	692.81	4.71	-.02	3413
47	1820.0	1794.7	698.09	698.71	4.28	-.62	3369
48	1840.0	1814.7	704.09	704.10	5.05	-.01	3710

LEVEL NUMBER	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	VERTICAL TRAVEL TIME SRD/GEOPH MS	INTEGRATED ADJUSTED SONIC TIME MS	DRIFT = SHOT TIME - RAW SON MS	RESIDUAL = SHOT TIME - ADJ SON MS	ADJUSTED INTERVAL VELOCITY M/S
49	1860.0	1834.7	710.50	709.91	5.80	.59	3446
50	1880.0	1854.7	715.70	715.52	5.56	.18	3564
51	1900.0	1874.7	721.11	721.17	5.48	-.07	3538
52	1920.0	1894.7	726.41	726.79	5.31	-.39	3558
53	1940.0	1914.7	731.91	732.27	5.50	-.36	3651
54	1955.0	1929.7	736.51	736.52	5.98	-.01	3529

ANALYST: S.TCHERKASHNEV 6-AUG-95 15:33:37 PROGRAM: GTRFRM 001.E13



TIME CONVERTED VELOCITY REPORT

COMPANY : BHP PETROLEUM

WELL : CONAN-1

FIELD : WILDCAT

STATE : VICTORIA

COUNTRY : AUSTRALIA

REFERENCE: SYJ-561137/561138

LOGGED : 2-08-1995

TIME / DEPTH

ANALYST: S.TCHERKASHNEV 6-AUG-95 15:33:37 PROGRAM: GTRFRM 001.E13

TIME CONVERTED VELOCITY REPORT

COMPANY : BHP PETROLEUM
WELL : CONAN-1
FIELD : WILDCAT
STATE : VICTORIA
COUNTRY : AUSTRALIA
REFERENCE: SYJ-561137/561138
LOGGED : 2-08-1995

LONG DEFINITIONS

GLOBAL

KB - Elevation of the KELLY-BUSHING Above MSL or MWL
SRD - Elevation of the Seismic Reference Datum Above MSL or MWL
GL - Elevation of Users Reference (Generally Ground Level) Above SRD
UNERTH - UNIFORM EARTH VELOCITY (GTRFRM)
UNFDEN - UNIFORM DENSITY VALUE

MATRIX

MVODIS - MOVE-OUT DISTANCE FROM BOREHOLE

ZONE

LOFVEL - LAYER OPTION FLAG FOR VELOCITY: -1=NONE; 0=UNIFORM; 1=UNIFORM+LAYER
LAYVEL - USER SUPPLIED VELOCITY DATA
LOFDEN - LAYER OPTION FLAG FOR DENSITY : -1=NONE; 0=UNIFORM; 1=UNIFORM+LAYER
LAYDEN - USER SUPPLIED DENSITY DATA

SAMPLED

TWOT - Two Way Travel Time (Relative to the Seismic Reference)
DKB - Measured Depth from Kelly-Bushing
DSRD - Depth from SRD
AVGV - Average Seismic Velocity
RMSV - Root Mean Square Velocity (Seismic)
MVOT - Normal Move-Out
MVOT - Normal Move-Out
MVOT - Normal Move-Out
INTV - Internal Velocity, Average

(GLOBAL PARAMETERS)		(VALUE)	
ELEV OF KB AB. MSL (WST)	KB :	25.3000	M
ELEV OF SRD AB. MSL(WST)	SRD :	0	M
ELEV OF GL AB. SRD(WST)	GL :	0	M
UNIFORM EARTH VELOCITY	UNERTH :	1524.00	M/S
UNIFORM DENSITY VALUE	UNFDEN :	2.30000	G/C3

(MATRIX PARAMETERS)

	MVOUT DIST M
1	1000.0
2	1500.0
3	2000.0

(ZONED PARAMETERS)		(VALUE)		(LIMITS)
LAYER OPTION FLAG VELOC	LOFVEL	: 0		30479.7 - 0
USER VELOC (WST)	LAYVEL	: 2905.000	M/S	1211.00 - 1195.00
		2989.000		1195.00 1150.10
		2875.000		1150.10 1100.00
		2880.000		1100.00 1050.10
		2633.000		1050.10 1000.00
		2757.000		1000.00 950.000
		2741.000		950.000 900.000
		3175.000		900.000 850.000
		2021.000		850.000 800.000
		2983.000		800.000 750.000
		2385.000		750.000 700.000
		2061.000		700.000 650.000
		2361.000		650.000 95.3000
		1524.000		95.3000 0
LAYER OPTION FLAG DENS	LOFDEN	:-1.000000		30479.7 - 0
USER SUPPLIED DENSITY DA	LAYDEN	: 0	G/C3	0 - 0

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
0	25.3	0						1524
2.00	26.8	1.5	1524	1524	654.17	982.25	1310.34	1524
4.00	28.3	3.0	1524	1524	652.18	980.26	1308.34	1524
6.00	29.9	4.6	1524	1524	650.20	978.27	1306.35	1524
8.00	31.4	6.1	1524	1524	648.22	976.28	1304.36	1524
10.00	32.9	7.6	1524	1524	646.24	974.30	1302.37	1524
12.00	34.4	9.1	1524	1524	644.28	972.32	1300.39	1524
14.00	36.0	10.7	1524	1524	642.32	970.35	1298.41	1524
16.00	37.5	12.2	1524	1524	640.36	968.38	1296.43	1524
18.00	39.0	13.7	1524	1524	638.41	966.42	1294.46	1524
20.00	40.5	15.2	1524	1524	636.47	964.46	1292.49	1524
22.00	42.1	16.8	1524	1524	634.54	962.50	1290.52	1524
24.00	43.6	18.3	1524	1524	632.61	960.54	1288.56	1524
26.00	45.1	19.8	1524	1524	630.68	958.60	1286.59	1524
28.00	46.6	21.3	1524	1524	628.77	956.65	1284.63	1524
30.00	48.2	22.9	1524	1524	626.85	954.71	1282.68	1524
32.00	49.7	24.4	1524	1524	624.95	952.77	1280.73	1524
34.00	51.2	25.9	1524	1524	623.05	950.84	1278.78	1524
36.00	52.7	27.4	1524	1524	621.15	948.91	1276.83	1524
38.00	54.3	29.0	1524	1524	619.27	946.99	1274.89	1524
40.00	55.8	30.5	1524	1524	617.39	945.06	1272.95	1524
42.00	57.3	32.0	1524	1524	615.51	943.15	1271.01	1524
44.00	58.8	33.5	1524	1524	613.64	941.24	1269.07	1524
46.00	60.4	35.1	1524	1524	611.78	939.33	1267.14	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
48.00	61.9	36.6	1524	1524	609.92	937.42	1265.21	1524
50.00	63.4	38.1	1524	1524	608.07	935.52	1263.29	1524
52.00	64.9	39.6	1524	1524	606.23	933.62	1261.37	1524
54.00	66.4	41.1	1524	1524	604.39	931.73	1259.45	1524
56.00	68.0	42.7	1524	1524	602.55	929.84	1257.53	1524
58.00	69.5	44.2	1524	1524	600.73	927.96	1255.62	1524
60.00	71.0	45.7	1524	1524	598.91	926.08	1253.71	1524
62.00	72.5	47.2	1524	1524	597.09	924.20	1251.80	1524
64.00	74.1	48.8	1524	1524	595.28	922.33	1249.90	1524
66.00	75.6	50.3	1524	1524	593.48	920.46	1247.99	1524
68.00	77.1	51.8	1524	1524	591.68	918.60	1246.10	1524
70.00	78.6	53.3	1524	1524	589.89	916.74	1244.20	1524
72.00	80.2	54.9	1524	1524	588.11	914.88	1242.31	1524
74.00	81.7	56.4	1524	1524	586.33	913.03	1240.42	1524
76.00	83.2	57.9	1524	1524	584.55	911.18	1238.53	1524
78.00	84.7	59.4	1524	1524	582.79	909.34	1236.65	1524
80.00	86.3	61.0	1524	1524	581.03	907.50	1234.77	1524
82.00	87.8	62.5	1524	1524	579.27	905.66	1232.90	1524
84.00	89.3	64.0	1524	1524	577.52	903.83	1231.02	1524
86.00	90.8	65.5	1524	1524	575.78	902.00	1229.15	1524
88.00	92.4	67.1	1524	1524	574.04	900.18	1227.28	1524
90.00	93.9	68.6	1524	1524	572.31	898.36	1225.42	1608
92.00	95.5	70.2	1526	1526	569.79	895.34	1221.95	2361
94.00	97.8	72.5	1544	1548	558.66	879.33	1201.12	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
96.00	100.2	74.9	1561	1570	548.31	864.48	1181.84	2361
98.00	102.6	77.3	1577	1590	538.65	850.67	1163.93	2361
100.00	104.9	79.6	1593	1609	529.60	837.76	1147.23	2361
102.00	107.3	82.0	1608	1627	521.10	825.66	1131.61	2361
104.00	109.7	84.4	1622	1644	513.08	814.29	1116.94	2361
106.00	112.0	86.7	1636	1660	505.50	803.57	1103.15	2361
108.00	114.4	89.1	1650	1676	498.32	793.43	1090.13	2361
110.00	116.7	91.4	1663	1691	491.50	783.83	1077.82	2361
112.00	119.1	93.8	1675	1705	485.01	774.71	1066.15	2361
114.00	121.5	96.2	1687	1719	478.81	766.03	1055.06	2361
116.00	123.8	98.5	1699	1732	472.89	757.76	1044.51	2361
118.00	126.2	100.9	1710	1745	467.21	749.85	1034.44	2361
120.00	128.5	103.2	1721	1757	461.77	742.28	1024.83	2361
122.00	130.9	105.6	1731	1768	456.54	735.03	1015.63	2361
124.00	133.3	108.0	1741	1779	451.51	728.07	1006.81	2361
126.00	135.6	110.3	1751	1790	446.67	721.37	998.35	2361
128.00	138.0	112.7	1761	1800	441.99	714.92	990.21	2361
130.00	140.3	115.0	1770	1810	437.47	708.71	982.39	2361
132.00	142.7	117.4	1779	1820	433.10	702.71	974.84	2361
134.00	145.1	119.8	1788	1829	428.87	696.91	967.56	2361
136.00	147.4	122.1	1796	1838	424.77	691.30	960.53	2361
138.00	149.8	124.5	1804	1847	420.80	685.87	953.73	2361
140.00	152.2	126.9	1812	1855	416.93	680.60	947.15	2361
142.00	154.5	129.2	1820	1863	413.18	675.49	940.77	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
144.00	156.9	131.6	1827	1871	409.53	670.53	934.59	2361
146.00	159.2	133.9	1835	1879	405.97	665.70	928.59	2361
148.00	161.6	136.3	1842	1886	402.51	661.01	922.75	2361
150.00	164.0	138.7	1849	1893	399.13	656.44	917.08	2361
152.00	166.3	141.0	1856	1900	395.83	651.98	911.56	2361
154.00	168.7	143.4	1862	1907	392.61	647.64	906.19	2361
156.00	171.0	145.7	1869	1913	389.47	643.40	900.95	2361
158.00	173.4	148.1	1875	1920	386.40	639.26	895.84	2361
160.00	175.8	150.5	1881	1926	383.39	635.22	890.86	2361
162.00	178.1	152.8	1887	1932	380.45	631.26	885.99	2361
164.00	180.5	155.2	1893	1937	377.57	627.39	881.23	2361
166.00	182.9	157.6	1898	1943	374.75	623.61	876.58	2361
168.00	185.2	159.9	1904	1949	371.99	619.90	872.03	2361
170.00	187.6	162.3	1909	1954	369.28	616.27	867.58	2361
172.00	189.9	164.6	1914	1959	366.62	612.71	863.22	2361
174.00	192.3	167.0	1919	1964	364.01	609.21	858.95	2361
176.00	194.7	169.4	1925	1969	361.45	605.79	854.76	2361
178.00	197.0	171.7	1929	1974	358.93	602.42	850.65	2361
180.00	199.4	174.1	1934	1979	356.46	599.12	846.62	2361
182.00	201.7	176.4	1939	1983	354.03	595.87	842.67	2361
184.00	204.1	178.8	1943	1988	351.64	592.68	838.78	2361
186.00	206.5	181.2	1948	1992	349.29	589.55	834.97	2361
188.00	208.8	183.5	1952	1997	346.98	586.46	831.22	2361
190.00	211.2	185.9	1957	2001	344.71	583.43	827.53	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
192.00	213.5	188.2	1961	2005	342.47	580.44	823.90	2361
194.00	215.9	190.6	1965	2009	340.27	577.50	820.33	2361
196.00	218.3	193.0	1969	2013	338.10	574.60	816.82	2361
198.00	220.6	195.3	1973	2017	335.96	571.75	813.37	2361
200.00	223.0	197.7	1977	2020	333.86	568.94	809.96	2361
202.00	225.4	200.1	1981	2024	331.78	566.16	806.61	2361
204.00	227.7	202.4	1984	2028	329.74	563.43	803.30	2361
206.00	230.1	204.8	1988	2031	327.72	560.74	800.04	2361
208.00	232.4	207.1	1992	2034	325.73	558.08	796.83	2361
210.00	234.8	209.5	1995	2038	323.77	555.45	793.66	2361
212.00	237.2	211.9	1999	2041	321.83	552.87	790.54	2361
214.00	239.5	214.2	2002	2044	319.92	550.31	787.45	2361
216.00	241.9	216.6	2005	2047	318.04	547.79	784.41	2361
218.00	244.2	218.9	2009	2051	316.18	545.29	781.40	2361
220.00	246.6	221.3	2012	2054	314.34	542.83	778.43	2361
222.00	249.0	223.7	2015	2057	312.52	540.40	775.50	2361
224.00	251.3	226.0	2018	2060	310.73	538.00	772.61	2361
226.00	253.7	228.4	2021	2062	308.96	535.62	769.74	2361
228.00	256.0	230.7	2024	2065	307.21	533.27	766.92	2361
230.00	258.4	233.1	2027	2068	305.49	530.95	764.12	2361
232.00	260.8	235.5	2030	2071	303.78	528.66	761.36	2361
234.00	263.1	237.8	2033	2073	302.09	526.39	758.62	2361
236.00	265.5	240.2	2036	2076	300.42	524.14	755.92	2361
238.00	267.9	242.6	2038	2078	298.77	521.92	753.25	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
240.00	270.2	244.9	2041	2081	297.14	519.72	750.60	2361
242.00	272.6	247.3	2044	2083	295.53	517.54	747.98	2361
244.00	274.9	249.6	2046	2086	293.94	515.39	745.39	2361
246.00	277.3	252.0	2049	2088	292.36	513.26	742.82	2361
248.00	279.7	254.4	2051	2091	290.80	511.15	740.29	2361
250.00	282.0	256.7	2054	2093	289.26	509.06	737.77	2361
252.00	284.4	259.1	2056	2095	287.73	506.99	735.28	2361
254.00	286.7	261.4	2059	2097	286.22	504.94	732.81	2361
256.00	289.1	263.8	2061	2100	284.72	502.91	730.37	2361
258.00	291.5	266.2	2063	2102	283.25	500.90	727.95	2361
260.00	293.8	268.5	2066	2104	281.78	498.90	725.55	2361
262.00	296.2	270.9	2068	2106	280.33	496.93	723.17	2361
264.00	298.5	273.2	2070	2108	278.90	494.97	720.82	2361
266.00	300.9	275.6	2072	2110	277.48	493.03	718.48	2361
268.00	303.3	278.0	2074	2112	276.07	491.11	716.17	2361
270.00	305.6	280.3	2077	2114	274.68	489.21	713.87	2361
272.00	308.0	282.7	2079	2116	273.30	487.32	711.60	2361
274.00	310.4	285.1	2081	2118	271.94	485.45	709.34	2361
276.00	312.7	287.4	2083	2120	270.58	483.59	707.10	2361
278.00	315.1	289.8	2085	2121	269.24	481.75	704.88	2361
280.00	317.4	292.1	2087	2123	267.92	479.92	702.68	2361
282.00	319.8	294.5	2089	2125	266.60	478.11	700.50	2361
284.00	322.2	296.9	2091	2127	265.30	476.32	698.33	2361
286.00	324.5	299.2	2092	2129	264.01	474.54	696.18	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
288.00	326.9	301.6	2094	2130	262.74	472.77	694.04	2361
290.00	329.2	303.9	2096	2132	261.47	471.02	691.93	2361
292.00	331.6	306.3	2098	2134	260.22	469.28	689.82	2361
294.00	334.0	308.7	2100	2135	258.97	467.55	687.74	2361
296.00	336.3	311.0	2102	2137	257.74	465.84	685.67	2361
298.00	338.7	313.4	2103	2138	256.52	464.14	683.61	2361
300.00	341.0	315.7	2105	2140	255.31	462.45	681.57	2361
302.00	343.4	318.1	2107	2141	254.11	460.78	679.54	2361
304.00	345.8	320.5	2108	2143	252.92	459.12	677.53	2361
306.00	348.1	322.8	2110	2145	251.74	457.47	675.53	2361
308.00	350.5	325.2	2112	2146	250.58	455.83	673.55	2361
310.00	352.9	327.6	2113	2147	249.42	454.21	671.58	2361
312.00	355.2	329.9	2115	2149	248.27	452.59	669.62	2361
314.00	357.6	332.3	2116	2150	247.13	450.99	667.68	2361
316.00	359.9	334.6	2118	2152	246.00	449.40	665.75	2361
318.00	362.3	337.0	2119	2153	244.88	447.82	663.83	2361
320.00	364.7	339.4	2121	2154	243.77	446.25	661.92	2361
322.00	367.0	341.7	2122	2156	242.67	444.70	660.03	2361
324.00	369.4	344.1	2124	2157	241.58	443.15	658.15	2361
326.00	371.7	346.4	2125	2158	240.50	441.62	656.28	2361
328.00	374.1	348.8	2127	2160	239.43	440.09	654.42	2361
330.00	376.5	351.2	2128	2161	238.36	438.58	652.57	2361
332.00	378.8	353.5	2130	2162	237.31	437.07	650.74	2361
334.00	381.2	355.9	2131	2164	236.26	435.58	648.91	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
336.00	383.5	358.2	2132	2165	235.22	434.09	647.10	2361
338.00	385.9	360.6	2134	2166	234.19	432.62	645.30	2361
340.00	388.3	363.0	2135	2167	233.17	431.15	643.51	2361
342.00	390.6	365.3	2136	2168	232.16	429.70	641.73	2361
344.00	393.0	367.7	2138	2170	231.15	428.25	639.96	2361
346.00	395.4	370.1	2139	2171	230.15	426.82	638.20	2361
348.00	397.7	372.4	2140	2172	229.16	425.39	636.45	2361
350.00	400.1	374.8	2142	2173	228.18	423.97	634.72	2361
352.00	402.4	377.1	2143	2174	227.20	422.56	632.99	2361
354.00	404.8	379.5	2144	2175	226.24	421.16	631.27	2361
356.00	407.2	381.9	2145	2176	225.28	419.77	629.56	2361
358.00	409.5	384.2	2146	2177	224.33	418.39	627.86	2361
360.00	411.9	386.6	2148	2178	223.38	417.01	626.17	2361
362.00	414.2	388.9	2149	2179	222.44	415.65	624.49	2361
364.00	416.6	391.3	2150	2180	221.51	414.29	622.82	2361
366.00	419.0	393.7	2151	2181	220.59	412.94	621.16	2361
368.00	421.3	396.0	2152	2183	219.67	411.60	619.50	2361
370.00	423.7	398.4	2153	2184	218.76	410.27	617.86	2361
372.00	426.0	400.7	2155	2185	217.86	408.94	616.23	2361
374.00	428.4	403.1	2156	2185	216.96	407.63	614.60	2361
376.00	430.8	405.5	2157	2186	216.08	406.32	612.98	2361
378.00	433.1	407.8	2158	2187	215.19	405.02	611.37	2361
380.00	435.5	410.2	2159	2188	214.32	403.73	609.77	2361
382.00	437.9	412.6	2160	2189	213.45	402.44	608.18	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
384.00	440.2	414.9	2161	2190	212.58	401.16	606.59	2361
386.00	442.6	417.3	2162	2191	211.73	399.89	605.02	2361
388.00	444.9	419.6	2163	2192	210.88	398.63	603.45	2361
390.00	447.3	422.0	2164	2193	210.03	397.37	601.89	2361
392.00	449.7	424.4	2165	2194	209.19	396.13	600.34	2361
394.00	452.0	426.7	2166	2195	208.36	394.88	598.79	2361
396.00	454.4	429.1	2167	2196	207.53	393.65	597.26	2361
398.00	456.7	431.4	2168	2196	206.71	392.42	595.73	2361
400.00	459.1	433.8	2169	2197	205.90	391.20	594.21	2361
402.00	461.5	436.2	2170	2198	205.09	389.99	592.69	2361
404.00	463.8	438.5	2171	2199	204.29	388.78	591.19	2361
406.00	466.2	440.9	2172	2200	203.49	387.58	589.69	2361
408.00	468.6	443.3	2173	2201	202.70	386.39	588.20	2361
410.00	470.9	445.6	2174	2201	201.91	385.20	586.71	2361
412.00	473.3	448.0	2175	2202	201.13	384.03	585.23	2361
414.00	475.6	450.3	2176	2203	200.35	382.85	583.76	2361
416.00	478.0	452.7	2176	2204	199.58	381.69	582.30	2361
418.00	480.4	455.1	2177	2205	198.82	380.53	580.84	2361
420.00	482.7	457.4	2178	2205	198.06	379.37	579.40	2361
422.00	485.1	459.8	2179	2206	197.31	378.22	577.95	2361
424.00	487.4	462.1	2180	2207	196.56	377.08	576.52	2361
426.00	489.8	464.5	2181	2208	195.81	375.95	575.09	2361
428.00	492.2	466.9	2182	2208	195.07	374.82	573.67	2361
430.00	494.5	469.2	2182	2209	194.34	373.70	572.25	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
432.00	496.9	471.6	2183	2210	193.61	372.58	570.84	2361
434.00	499.2	473.9	2184	2211	192.89	371.47	569.44	2361
436.00	501.6	476.3	2185	2211	192.17	370.36	568.04	2361
438.00	504.0	478.7	2186	2212	191.46	369.26	566.65	2361
440.00	506.3	481.0	2186	2213	190.75	368.17	565.27	2361
442.00	508.7	483.4	2187	2213	190.04	367.08	563.89	2361
444.00	511.1	485.8	2188	2214	189.34	366.00	562.52	2361
446.00	513.4	488.1	2189	2215	188.65	364.93	561.15	2361
448.00	515.8	490.5	2190	2215	187.96	363.86	559.79	2361
450.00	518.1	492.8	2190	2216	187.27	362.79	558.44	2361
452.00	520.5	495.2	2191	2217	186.59	361.73	557.09	2361
454.00	522.9	497.6	2192	2217	185.91	360.68	555.75	2361
456.00	525.2	499.9	2193	2218	185.24	359.63	554.42	2361
458.00	527.6	502.3	2193	2219	184.57	358.59	553.09	2361
460.00	529.9	504.6	2194	2219	183.91	357.55	551.76	2361
462.00	532.3	507.0	2195	2220	183.25	356.52	550.45	2361
464.00	534.7	509.4	2196	2221	182.59	355.49	549.13	2361
466.00	537.0	511.7	2196	2221	181.94	354.47	547.83	2361
468.00	539.4	514.1	2197	2222	181.29	353.45	546.53	2361
470.00	541.7	516.4	2198	2223	180.65	352.44	545.23	2361
472.00	544.1	518.8	2198	2223	180.01	351.43	543.94	2361
474.00	546.5	521.2	2199	2224	179.38	350.43	542.66	2361
476.00	548.8	523.5	2200	2224	178.75	349.44	541.38	2361
478.00	551.2	525.9	2200	2225	178.12	348.45	540.11	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
480.00	553.6	528.3	2201	2225	177.50	347.46	538.84	2361
482.00	555.9	530.6	2202	2226	176.88	346.48	537.57	2361
484.00	558.3	533.0	2202	2227	176.27	345.50	536.32	2361
486.00	560.6	535.3	2203	2227	175.66	344.53	535.07	2361
488.00	563.0	537.7	2204	2228	175.05	343.57	533.82	2361
490.00	565.4	540.1	2204	2228	174.45	342.60	532.58	2361
492.00	567.7	542.4	2205	2229	173.85	341.65	531.34	2361
494.00	570.1	544.8	2206	2229	173.25	340.69	530.11	2361
496.00	572.4	547.1	2206	2230	172.66	339.75	528.88	2361
498.00	574.8	549.5	2207	2231	172.07	338.80	527.66	2361
500.00	577.2	551.9	2207	2231	171.49	337.87	526.45	2361
502.00	579.5	554.2	2208	2232	170.91	336.93	525.23	2361
504.00	581.9	556.6	2209	2232	170.33	336.00	524.03	2361
506.00	584.2	558.9	2209	2233	169.76	335.08	522.83	2361
508.00	586.6	561.3	2210	2233	169.19	334.16	521.63	2361
510.00	589.0	563.7	2210	2234	168.62	333.24	520.44	2361
512.00	591.3	566.0	2211	2234	168.06	332.33	519.25	2361
514.00	593.7	568.4	2212	2235	167.50	331.42	518.07	2361
516.00	596.1	570.8	2212	2235	166.94	330.52	516.89	2361
518.00	598.4	573.1	2213	2236	166.39	329.62	515.72	2361
520.00	600.8	575.5	2213	2236	165.84	328.73	514.55	2361
522.00	603.1	577.8	2214	2237	165.29	327.84	513.39	2361
524.00	605.5	580.2	2214	2237	164.75	326.96	512.23	2361
526.00	607.9	582.6	2215	2238	164.21	326.07	511.08	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
528.00	610.2	584.9	2216	2238	163.67	325.20	509.93	2361
530.00	612.6	587.3	2216	2239	163.14	324.32	508.78	2361
532.00	614.9	589.6	2217	2239	162.61	323.46	507.64	2361
534.00	617.3	592.0	2217	2240	162.08	322.59	506.51	2361
536.00	619.7	594.4	2218	2240	161.56	321.73	505.37	2361
538.00	622.0	596.7	2218	2241	161.04	320.87	504.25	2361
540.00	624.4	599.1	2219	2241	160.52	320.02	503.12	2361
542.00	626.7	601.4	2219	2241	160.00	319.17	502.01	2361
544.00	629.1	603.8	2220	2242	159.49	318.33	500.89	2361
546.00	631.5	606.2	2220	2242	158.98	317.49	499.78	2361
548.00	633.8	608.5	2221	2243	158.48	316.65	498.68	2361
550.00	636.2	610.9	2221	2243	157.98	315.82	497.58	2361
552.00	638.6	613.3	2222	2244	157.48	314.99	496.48	2361
554.00	640.9	615.6	2222	2244	156.98	314.16	495.39	2361
556.00	643.3	618.0	2223	2245	156.48	313.34	494.30	2361
558.00	645.6	620.3	2223	2245	155.99	312.53	493.22	2361
560.00	648.0	622.7	2224	2245	155.50	311.71	492.14	2314
562.00	650.3	625.0	2224	2246	155.04	310.94	491.12	2061
564.00	652.4	627.1	2224	2245	154.69	310.37	490.40	2061
566.00	654.4	629.1	2223	2244	154.33	309.81	489.68	2061
568.00	656.5	631.2	2223	2244	153.98	309.24	488.96	2061
570.00	658.6	633.3	2222	2243	153.63	308.68	488.24	2061
572.00	660.6	635.3	2221	2243	153.28	308.11	487.52	2061
574.00	662.7	637.4	2221	2242	152.94	307.55	486.81	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
576.00	664.7	639.4	2220	2241	152.59	306.99	486.09	2061
578.00	666.8	641.5	2220	2241	152.24	306.43	485.38	2061
580.00	668.9	643.6	2219	2240	151.90	305.88	484.67	2061
582.00	670.9	645.6	2219	2240	151.56	305.32	483.96	2061
584.00	673.0	647.7	2218	2239	151.22	304.77	483.25	2061
586.00	675.0	649.7	2218	2238	150.88	304.21	482.54	2061
588.00	677.1	651.8	2217	2238	150.54	303.66	481.83	2061
590.00	679.2	653.9	2216	2237	150.20	303.11	481.12	2061
592.00	681.2	655.9	2216	2237	149.87	302.56	480.41	2061
594.00	683.3	658.0	2215	2236	149.53	302.02	479.71	2061
596.00	685.3	660.0	2215	2235	149.20	301.47	479.00	2061
598.00	687.4	662.1	2214	2235	148.87	300.92	478.30	2061
600.00	689.5	664.2	2214	2234	148.54	300.38	477.60	2061
602.00	691.5	666.2	2213	2234	148.21	299.84	476.90	2061
604.00	693.6	668.3	2213	2233	147.88	299.30	476.20	2061
606.00	695.7	670.4	2212	2233	147.55	298.76	475.50	2061
608.00	697.7	672.4	2212	2232	147.22	298.22	474.80	2061
610.00	699.8	674.5	2211	2232	146.90	297.69	474.11	2061
612.00	702.1	676.8	2212	2232	146.46	296.94	473.10	2353
614.00	704.5	679.2	2212	2233	146.02	296.17	472.06	2385
616.00	706.9	681.6	2213	2233	145.57	295.41	471.02	2385
618.00	709.3	684.0	2214	2234	145.13	294.65	469.98	2385
620.00	711.7	686.4	2214	2234	144.69	293.89	468.96	2385
622.00	714.1	688.8	2215	2235	144.26	293.14	467.93	2385

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
624.00	716.4	691.1	2215	2235	143.82	292.39	466.91	2385
626.00	718.8	693.5	2216	2236	143.39	291.65	465.89	2385
628.00	721.2	695.9	2216	2236	142.96	290.90	464.88	2385
630.00	723.6	698.3	2217	2237	142.54	290.16	463.87	2385
632.00	726.0	700.7	2217	2237	142.11	289.43	462.86	2385
634.00	728.4	703.1	2218	2238	141.69	288.70	461.86	2385
636.00	730.7	705.4	2218	2238	141.27	287.97	460.86	2385
638.00	733.1	707.8	2219	2238	140.85	287.24	459.87	2385
640.00	735.5	710.2	2219	2239	140.44	286.52	458.88	2385
642.00	737.9	712.6	2220	2239	140.03	285.80	457.89	2385
644.00	740.3	715.0	2220	2240	139.62	285.08	456.91	2385
646.00	742.7	717.4	2221	2240	139.21	284.37	455.93	2385
648.00	745.1	719.8	2221	2241	138.80	283.66	454.96	2385
650.00	747.4	722.1	2222	2241	138.40	282.96	453.98	2385
652.00	749.8	724.5	2222	2242	138.00	282.25	453.02	2950
654.00	752.8	727.5	2225	2244	137.37	281.12	451.39	2983
656.00	755.8	730.5	2227	2247	136.73	279.96	449.74	2983
658.00	758.7	733.4	2229	2249	136.10	278.81	448.10	2983
660.00	761.7	736.4	2232	2252	135.47	277.68	446.47	2983
662.00	764.7	739.4	2234	2255	134.85	276.55	444.86	2983
664.00	767.7	742.4	2236	2257	134.23	275.43	443.25	2983
666.00	770.7	745.4	2238	2260	133.62	274.32	441.66	2983
668.00	773.7	748.4	2241	2262	133.02	273.22	440.08	2983
670.00	776.6	751.3	2243	2265	132.42	272.12	438.51	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
672.00	779.6	754.3	2245	2267	131.82	271.04	436.96	2983
674.00	782.6	757.3	2247	2270	131.24	269.96	435.41	2983
676.00	785.6	760.3	2249	2272	130.65	268.90	433.88	2983
678.00	788.6	763.3	2252	2274	130.07	267.84	432.35	2983
680.00	791.6	766.3	2254	2277	129.50	266.79	430.84	2983
682.00	794.5	769.2	2256	2279	128.93	265.74	429.34	2983
684.00	797.5	772.2	2258	2282	128.37	264.71	427.85	2803
686.00	800.3	775.0	2260	2283	127.88	263.82	426.57	2021
688.00	802.3	777.0	2259	2283	127.64	263.40	426.02	2021
690.00	804.4	779.1	2258	2282	127.40	262.99	425.47	2021
692.00	806.4	781.1	2257	2281	127.16	262.58	424.92	2021
694.00	808.4	783.1	2257	2281	126.93	262.17	424.38	2021
696.00	810.4	785.1	2256	2280	126.69	261.77	423.83	2021
698.00	812.5	787.2	2255	2279	126.45	261.36	423.28	2021
700.00	814.5	789.2	2255	2278	126.22	260.95	422.74	2021
702.00	816.5	791.2	2254	2278	125.98	260.55	422.20	2021
704.00	818.5	793.2	2253	2277	125.75	260.14	421.65	2021
706.00	820.5	795.2	2253	2276	125.52	259.74	421.11	2021
708.00	822.6	797.3	2252	2276	125.29	259.34	420.57	2021
710.00	824.6	799.3	2251	2275	125.05	258.94	420.03	2021
712.00	826.6	801.3	2251	2274	124.82	258.53	419.49	2021
714.00	828.6	803.3	2250	2274	124.59	258.13	418.95	2021
716.00	830.6	805.3	2250	2273	124.37	257.74	418.41	2021
718.00	832.7	807.4	2249	2272	124.14	257.34	417.87	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
720.00	834.7	809.4	2248	2272	123.91	256.94	417.34	2021
722.00	836.7	811.4	2248	2271	123.68	256.54	416.80	2021
724.00	838.7	813.4	2247	2270	123.46	256.15	416.26	2021
726.00	840.8	815.5	2246	2270	123.23	255.75	415.73	2021
728.00	842.8	817.5	2246	2269	123.01	255.36	415.20	2021
730.00	844.8	819.5	2245	2268	122.78	254.97	414.66	2021
732.00	846.8	821.5	2245	2268	122.56	254.58	414.13	2021
734.00	848.8	823.5	2244	2267	122.34	254.18	413.60	2546
736.00	851.4	826.1	2245	2268	121.97	253.51	412.64	3175
738.00	854.6	829.3	2247	2271	121.39	252.43	411.04	3175
740.00	857.7	832.4	2250	2274	120.82	251.36	409.46	3175
742.00	860.9	835.6	2252	2277	120.26	250.29	407.89	3175
744.00	864.1	838.8	2255	2280	119.70	249.23	406.33	3175
746.00	867.3	842.0	2257	2282	119.14	248.18	404.79	3175
748.00	870.4	845.1	2260	2285	118.59	247.15	403.26	3175
750.00	873.6	848.3	2262	2288	118.04	246.11	401.73	3175
752.00	876.8	851.5	2265	2291	117.50	245.09	400.22	3175
754.00	880.0	854.7	2267	2294	116.97	244.08	398.73	3175
756.00	883.1	857.8	2269	2297	116.43	243.07	397.24	3175
758.00	886.3	861.0	2272	2299	115.91	242.08	395.76	3175
760.00	889.5	864.2	2274	2302	115.39	241.09	394.30	3175
762.00	892.7	867.4	2277	2305	114.87	240.11	392.84	3175
764.00	895.8	870.5	2279	2307	114.36	239.13	391.40	3175
766.00	899.0	873.7	2281	2310	113.85	238.17	389.97	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
768.00	901.9	876.6	2283	2312	113.44	237.40	388.84	2867
770.00	904.6	879.3	2284	2313	113.07	236.71	387.83	2741
772.00	907.4	882.1	2285	2314	112.71	236.02	386.82	2741
774.00	910.1	884.8	2286	2315	112.34	235.34	385.82	2741
776.00	912.8	887.5	2287	2317	111.98	234.66	384.82	2741
778.00	915.6	890.3	2289	2318	111.62	233.98	383.83	2741
780.00	918.3	893.0	2290	2319	111.26	233.31	382.85	2741
782.00	921.1	895.8	2291	2320	110.91	232.64	381.86	2741
784.00	923.8	898.5	2292	2321	110.56	231.97	380.89	2741
786.00	926.5	901.2	2293	2323	110.21	231.31	379.91	2741
788.00	929.3	904.0	2294	2324	109.86	230.65	378.95	2741
790.00	932.0	906.7	2296	2325	109.51	230.00	377.98	2741
792.00	934.8	909.5	2297	2326	109.17	229.35	377.03	2741
794.00	937.5	912.2	2298	2327	108.83	228.70	376.07	2741
796.00	940.2	914.9	2299	2328	108.49	228.06	375.12	2741
798.00	943.0	917.7	2300	2329	108.15	227.42	374.18	2741
800.00	945.7	920.4	2301	2330	107.81	226.78	373.24	2741
802.00	948.5	923.2	2302	2332	107.48	226.15	372.30	2749
804.00	951.2	925.9	2303	2333	107.14	225.51	371.37	2757
806.00	954.0	928.7	2304	2334	106.81	224.88	370.43	2757
808.00	956.7	931.4	2306	2335	106.48	224.25	369.50	2757
810.00	959.5	934.2	2307	2336	106.15	223.62	368.57	2757
812.00	962.2	936.9	2308	2337	105.82	222.99	367.64	2757
814.00	965.0	939.7	2309	2338	105.50	222.37	366.72	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
816.00	967.8	942.5	2310	2340	105.17	221.76	365.81	2757
818.00	970.5	945.2	2311	2341	104.85	221.14	364.89	2757
820.00	973.3	948.0	2312	2342	104.53	220.53	363.99	2757
822.00	976.0	950.7	2313	2343	104.21	219.92	363.08	2757
824.00	978.8	953.5	2314	2344	103.90	219.32	362.19	2757
826.00	981.5	956.2	2315	2345	103.58	218.72	361.29	2757
828.00	984.3	959.0	2316	2346	103.27	218.12	360.40	2757
830.00	987.1	961.8	2317	2347	102.96	217.52	359.52	2757
832.00	989.8	964.5	2319	2348	102.65	216.93	358.63	2757
834.00	992.6	967.3	2320	2349	102.34	216.34	357.76	2757
836.00	995.3	970.0	2321	2350	102.04	215.75	356.88	2757
838.00	998.1	972.8	2322	2351	101.73	215.17	356.01	2714
840.00	1000.8	975.5	2323	2352	101.44	214.61	355.18	2633
842.00	1003.4	978.1	2323	2353	101.17	214.09	354.40	2633
844.00	1006.1	980.8	2324	2354	100.90	213.57	353.63	2633
846.00	1008.7	983.4	2325	2354	100.63	213.05	352.86	2633
848.00	1011.3	986.0	2326	2355	100.36	212.54	352.10	2633
850.00	1014.0	988.7	2326	2356	100.09	212.03	351.34	2633
852.00	1016.6	991.3	2327	2357	99.83	211.52	350.58	2633
854.00	1019.2	993.9	2328	2357	99.56	211.01	349.82	2633
856.00	1021.9	996.6	2328	2358	99.30	210.50	349.07	2633
858.00	1024.5	999.2	2329	2359	99.04	210.00	348.32	2633
860.00	1027.1	1001.8	2330	2359	98.78	209.50	347.57	2633
862.00	1029.8	1004.5	2331	2360	98.52	209.00	346.83	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
864.00	1032.4	1007.1	2331	2361	98.26	208.51	346.09	2633
866.00	1035.0	1009.7	2332	2361	98.01	208.01	345.35	2633
868.00	1037.7	1012.4	2333	2362	97.75	207.52	344.62	2633
870.00	1040.3	1015.0	2333	2363	97.50	207.03	343.88	2633
872.00	1042.9	1017.6	2334	2363	97.25	206.54	343.15	2633
874.00	1045.6	1020.3	2335	2364	96.99	206.06	342.43	2633
876.00	1048.2	1022.9	2335	2365	96.75	205.57	341.70	2707
878.00	1050.9	1025.6	2336	2365	96.48	205.06	340.94	2880
880.00	1053.8	1028.5	2337	2367	96.18	204.48	340.06	2880
882.00	1056.7	1031.4	2339	2368	95.89	203.91	339.18	2880
884.00	1059.5	1034.2	2340	2369	95.59	203.33	338.31	2880
886.00	1062.4	1037.1	2341	2371	95.30	202.76	337.45	2880
888.00	1065.3	1040.0	2342	2372	95.01	202.19	336.58	2880
890.00	1068.2	1042.9	2344	2373	94.72	201.63	335.73	2880
892.00	1071.1	1045.8	2345	2374	94.43	201.06	334.87	2880
894.00	1073.9	1048.6	2346	2376	94.15	200.50	334.02	2880
896.00	1076.8	1051.5	2347	2377	93.86	199.95	333.18	2880
898.00	1079.7	1054.4	2348	2378	93.58	199.40	332.34	2880
900.00	1082.6	1057.3	2350	2379	93.30	198.85	331.50	2880
902.00	1085.5	1060.2	2351	2380	93.02	198.30	330.67	2880
904.00	1088.3	1063.0	2352	2382	92.75	197.75	329.84	2880
906.00	1091.2	1065.9	2353	2383	92.47	197.21	329.02	2880
908.00	1094.1	1068.8	2354	2384	92.20	196.67	328.20	2880
910.00	1097.0	1071.7	2355	2385	91.92	196.14	327.38	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
912.00	1099.9	1074.6	2356	2387	91.65	195.60	326.57	2880
914.00	1102.7	1077.4	2358	2388	91.38	195.08	325.76	2875
916.00	1105.6	1080.3	2359	2389	91.12	194.55	324.96	2875
918.00	1108.5	1083.2	2360	2390	90.85	194.03	324.16	2875
920.00	1111.4	1086.1	2361	2391	90.59	193.51	323.36	2875
922.00	1114.2	1088.9	2362	2392	90.33	192.99	322.57	2875
924.00	1117.1	1091.8	2363	2394	90.07	192.48	321.79	2875
926.00	1120.0	1094.7	2364	2395	89.81	191.96	321.00	2875
928.00	1122.9	1097.6	2365	2396	89.55	191.45	320.22	2875
930.00	1125.7	1100.4	2367	2397	89.29	190.95	319.45	2875
932.00	1128.6	1103.3	2368	2398	89.04	190.44	318.68	2875
934.00	1131.5	1106.2	2369	2399	88.78	189.94	317.91	2875
936.00	1134.4	1109.1	2370	2400	88.53	189.44	317.14	2875
938.00	1137.2	1111.9	2371	2401	88.28	188.95	316.38	2875
940.00	1140.1	1114.8	2372	2403	88.03	188.45	315.62	2875
942.00	1143.0	1117.7	2373	2404	87.78	187.96	314.87	2875
944.00	1145.9	1120.6	2374	2405	87.54	187.47	314.12	2875
946.00	1148.7	1123.4	2375	2406	87.29	186.99	313.37	2938
948.00	1151.7	1126.4	2376	2407	87.04	186.48	312.59	2989
950.00	1154.7	1129.4	2378	2408	86.77	185.96	311.78	2989
952.00	1157.6	1132.3	2379	2410	86.51	185.43	310.98	2989
954.00	1160.6	1135.3	2380	2411	86.25	184.92	310.18	2989
956.00	1163.6	1138.3	2381	2413	85.99	184.40	309.38	2989
958.00	1166.6	1141.3	2383	2414	85.74	183.89	308.59	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
960.00	1169.6	1144.3	2384	2415	85.48	183.38	307.81	2989
962.00	1172.6	1147.3	2385	2417	85.23	182.88	307.02	2989
964.00	1175.6	1150.3	2386	2418	84.98	182.37	306.24	2989
966.00	1178.6	1153.3	2388	2419	84.73	181.87	305.47	2989
968.00	1181.6	1156.3	2389	2421	84.48	181.37	304.70	2989
970.00	1184.5	1159.2	2390	2422	84.23	180.88	303.93	2989
972.00	1187.5	1162.2	2391	2423	83.98	180.39	303.16	2989
974.00	1190.5	1165.2	2393	2424	83.74	179.90	302.40	2989
976.00	1193.5	1168.2	2394	2426	83.49	179.41	301.65	2946
978.00	1196.5	1171.2	2395	2427	83.26	178.94	300.92	2905
980.00	1199.4	1174.1	2396	2428	83.03	178.48	300.21	2905
982.00	1202.3	1177.0	2397	2429	82.81	178.03	299.51	2905
984.00	1205.2	1179.9	2398	2430	82.58	177.58	298.81	2905
986.00	1208.1	1182.8	2399	2431	82.36	177.13	298.12	2905
988.00	1211.0	1185.7	2400	2432	82.14	176.69	297.43	2807
990.00	1213.8	1188.5	2401	2433	81.93	176.28	296.79	2944
992.00	1216.7	1191.4	2402	2434	81.70	175.82	296.08	2937
994.00	1219.7	1194.4	2403	2435	81.48	175.37	295.39	2933
996.00	1222.6	1197.3	2404	2436	81.26	174.93	294.69	2955
998.00	1225.6	1200.3	2405	2438	81.03	174.47	293.99	2894
1000.00	1228.5	1203.2	2406	2439	80.82	174.05	293.32	2872
1002.00	1231.3	1206.0	2407	2439	80.61	173.63	292.67	2821
1004.00	1234.1	1208.8	2408	2440	80.41	173.22	292.04	2817
1006.00	1237.0	1211.7	2409	2441	80.21	172.82	291.42	

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
1008.00	1240.0	1214.7	2410	2442	79.98	172.37	290.71	3004
1010.00	1242.9	1217.6	2411	2443	79.77	171.94	290.04	2928
1012.00	1245.8	1220.5	2412	2444	79.56	171.52	289.39	2885
1014.00	1248.8	1223.5	2413	2446	79.34	171.08	288.70	2987
1016.00	1251.7	1226.4	2414	2447	79.13	170.65	288.02	2957
1018.00	1254.6	1229.3	2415	2448	78.93	170.24	287.39	2869
1020.00	1257.5	1232.2	2416	2449	78.72	169.83	286.74	2916
1022.00	1260.4	1235.1	2417	2450	78.52	169.41	286.09	2923
1024.00	1263.3	1238.0	2418	2450	78.33	169.03	285.50	2817
1026.00	1265.9	1240.6	2418	2451	78.16	168.68	284.96	2688
1028.00	1268.6	1243.3	2419	2451	77.99	168.35	284.45	2635
1030.00	1271.4	1246.1	2420	2452	77.81	167.98	283.87	2794
1032.00	1274.1	1248.8	2420	2453	77.63	167.63	283.31	2746
1034.00	1277.1	1251.8	2421	2454	77.43	167.21	282.67	2951
1036.00	1280.0	1254.7	2422	2455	77.22	166.80	282.02	2959
1038.00	1282.8	1257.5	2423	2455	77.04	166.43	281.43	2820
1040.00	1285.7	1260.4	2424	2456	76.86	166.06	280.86	2807
1042.00	1288.4	1263.1	2424	2457	76.68	165.70	280.29	2794
1044.00	1291.2	1265.9	2425	2458	76.50	165.34	279.73	2795
1046.00	1294.0	1268.7	2426	2458	76.32	164.98	279.17	2787
1048.00	1296.9	1271.6	2427	2459	76.14	164.61	278.59	2838
1050.00	1299.7	1274.4	2427	2460	75.96	164.24	278.01	2853
1052.00	1302.5	1277.2	2428	2460	75.78	163.88	277.45	2796
1054.00	1305.3	1280.0	2429	2461	75.61	163.53	276.90	2792

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
1056.00	1308.1	1282.8	2430	2462	75.43	163.17	276.33	2832
1058.00	1310.9	1285.6	2430	2462	75.26	162.83	275.80	2757
1060.00	1313.6	1288.3	2431	2463	75.09	162.49	275.27	2745
1062.00	1316.4	1291.1	2431	2464	74.93	162.15	274.74	2770
1064.00	1319.2	1293.9	2432	2464	74.76	161.81	274.21	2758
1066.00	1322.0	1296.7	2433	2465	74.58	161.45	273.64	2869
1068.00	1324.8	1299.5	2434	2466	74.41	161.10	273.09	2809
1070.00	1327.7	1302.4	2434	2467	74.23	160.74	272.52	2877
1072.00	1330.6	1305.3	2435	2467	74.06	160.39	271.96	2844
1074.00	1333.4	1308.1	2436	2468	73.88	160.03	271.41	2849
1076.00	1336.3	1311.0	2437	2469	73.71	159.67	270.84	2885
1078.00	1339.2	1313.9	2438	2470	73.52	159.30	270.25	2938
1080.00	1342.0	1316.7	2438	2471	73.36	158.97	269.73	2776
1082.00	1344.8	1319.5	2439	2471	73.20	158.64	269.21	2786
1084.00	1347.6	1322.3	2440	2472	73.04	158.31	268.69	2787
1086.00	1350.4	1325.1	2440	2472	72.88	157.98	268.18	2782
1088.00	1353.2	1327.9	2441	2473	72.71	157.65	267.65	2817
1090.00	1356.1	1330.8	2442	2474	72.54	157.30	267.10	2878
1092.00	1359.1	1333.8	2443	2475	72.35	156.92	266.49	3017
1094.00	1362.1	1336.8	2444	2476	72.16	156.53	265.87	3049
1096.00	1365.1	1339.8	2445	2477	71.99	156.17	265.30	2941
1098.00	1368.1	1342.8	2446	2478	71.80	155.78	264.69	3039
1100.00	1371.1	1345.8	2447	2479	71.63	155.42	264.12	2951
1102.00	1373.9	1348.6	2448	2480	71.46	155.09	263.59	2869

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
1104.00	1376.8	1351.5	2448	2481	71.30	154.76	263.07	2847
1106.00	1379.6	1354.3	2449	2481	71.14	154.43	262.54	2853
1108.00	1382.4	1357.1	2450	2482	70.98	154.11	262.05	2790
1110.00	1385.2	1359.9	2450	2482	70.83	153.80	261.56	2774
1112.00	1388.0	1362.7	2451	2483	70.67	153.48	261.04	2850
1114.00	1391.0	1365.7	2452	2484	70.50	153.12	260.47	2988
1116.00	1394.0	1368.7	2453	2485	70.33	152.78	259.93	2937
1118.00	1396.8	1371.5	2454	2486	70.17	152.45	259.41	2865
1120.00	1399.7	1374.4	2454	2487	70.01	152.12	258.89	2887
1122.00	1402.6	1377.3	2455	2487	69.86	151.80	258.37	2881
1124.00	1405.5	1380.2	2456	2488	69.70	151.47	257.85	2883
1126.00	1408.3	1383.0	2456	2489	69.55	151.17	257.37	2812
1128.00	1411.1	1385.8	2457	2489	69.40	150.86	256.88	2814
1130.00	1414.0	1388.7	2458	2490	69.24	150.55	256.38	2848
1132.00	1417.0	1391.7	2459	2491	69.08	150.20	255.83	3002
1134.00	1419.9	1394.6	2460	2492	68.92	149.88	255.32	2886
1136.00	1422.7	1397.4	2460	2492	68.77	149.57	254.83	2837
1138.00	1425.5	1400.2	2461	2493	68.62	149.27	254.35	2821
1140.00	1428.4	1403.1	2462	2494	68.47	148.95	253.84	2899
1142.00	1431.3	1406.0	2462	2495	68.32	148.64	253.34	2899
1144.00	1434.2	1408.9	2463	2495	68.17	148.33	252.85	2858
1146.00	1437.0	1411.7	2464	2496	68.02	148.03	252.38	2822
1148.00	1439.8	1414.5	2464	2496	67.88	147.74	251.91	2814
1150.00	1442.6	1417.3	2465	2497	67.74	147.44	251.43	2831

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
1152.00	1445.5	1420.2	2466	2498	67.59	147.15	250.97	2822
1154.00	1448.4	1423.1	2466	2498	67.44	146.84	250.47	2909
1156.00	1451.3	1426.0	2467	2499	67.29	146.52	249.97	2920
1158.00	1454.2	1428.9	2468	2500	67.14	146.22	249.48	2884
1160.00	1457.0	1431.7	2468	2501	67.00	145.93	249.02	2818
1162.00	1459.8	1434.5	2469	2501	66.86	145.64	248.55	2847
1164.00	1462.6	1437.3	2470	2502	66.73	145.36	248.11	2777
1166.00	1465.4	1440.1	2470	2502	66.60	145.09	247.68	2742
1168.00	1468.1	1442.8	2470	2502	66.47	144.83	247.26	2720
1170.00	1470.9	1445.6	2471	2503	66.33	144.54	246.80	2850
1172.00	1473.8	1448.5	2472	2504	66.18	144.24	246.32	2909
1174.00	1476.7	1451.4	2473	2504	66.04	143.95	245.86	2842
1176.00	1479.6	1454.3	2473	2505	65.90	143.66	245.39	2890
1178.00	1482.4	1457.1	2474	2506	65.76	143.37	244.93	2850
1180.00	1485.2	1459.9	2474	2506	65.63	143.09	244.48	2827
1182.00	1488.1	1462.8	2475	2507	65.49	142.81	244.04	2829
1184.00	1491.0	1465.7	2476	2508	65.34	142.50	243.54	2973
1186.00	1494.0	1468.7	2477	2509	65.20	142.21	243.06	2931
1188.00	1496.9	1471.6	2477	2509	65.06	141.91	242.58	2948
1190.00	1499.9	1474.6	2478	2510	64.91	141.60	242.09	2981
1192.00	1502.9	1477.6	2479	2511	64.76	141.29	241.59	3014
1194.00	1505.8	1480.5	2480	2512	64.62	141.01	241.14	2864
1196.00	1508.6	1483.3	2481	2512	64.49	140.73	240.69	2867
1198.00	1511.5	1486.2	2481	2513	64.36	140.46	240.25	2849

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
1200.00	1514.4	1489.1	2482	2514	64.22	140.18	239.81	2874
1202.00	1517.2	1491.9	2482	2514	64.09	139.91	239.37	2838
1204.00	1520.0	1494.7	2483	2515	63.97	139.65	238.95	2796
1206.00	1522.8	1497.5	2483	2515	63.84	139.39	238.54	2798
1208.00	1525.6	1500.3	2484	2516	63.72	139.14	238.14	2755
1210.00	1528.5	1503.2	2485	2517	63.58	138.85	237.66	2986
1212.00	1531.5	1506.2	2486	2517	63.44	138.55	237.19	2974
1214.00	1534.4	1509.1	2486	2518	63.31	138.28	236.75	2884
1216.00	1537.3	1512.0	2487	2519	63.18	138.01	236.32	2867
1218.00	1540.2	1514.9	2488	2519	63.04	137.73	235.85	2972
1220.00	1543.1	1517.8	2488	2520	62.91	137.46	235.42	2868
1222.00	1546.0	1520.7	2489	2521	62.78	137.19	235.00	2872
1224.00	1548.8	1523.5	2489	2521	62.66	136.94	234.59	2797
1226.00	1551.5	1526.2	2490	2521	62.55	136.71	234.21	2730
1228.00	1554.3	1529.0	2490	2522	62.43	136.46	233.81	2797
1230.00	1557.1	1531.8	2491	2522	62.31	136.22	233.42	2753
1232.00	1559.8	1534.5	2491	2523	62.20	135.98	233.04	2730
1234.00	1562.7	1537.4	2492	2523	62.07	135.71	232.60	2933
1236.00	1565.4	1540.1	2492	2524	61.96	135.48	232.23	2717
1238.00	1568.2	1542.9	2493	2524	61.84	135.23	231.84	2803
1240.00	1571.0	1545.7	2493	2525	61.73	135.00	231.46	2754
1242.00	1573.9	1548.6	2494	2525	61.60	134.73	231.03	2898
1244.00	1576.8	1551.5	2494	2526	61.48	134.47	230.61	2897
1246.00	1579.7	1554.4	2495	2527	61.35	134.21	230.18	2931

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
1248.00	1582.7	1557.4	2496	2527	61.22	133.94	229.75	2945
1250.00	1585.5	1560.2	2496	2528	61.10	133.70	229.35	2833
1252.00	1588.4	1563.1	2497	2528	60.98	133.44	228.94	2873
1254.00	1591.2	1565.9	2497	2529	60.87	133.20	228.55	2820
1256.00	1594.0	1568.7	2498	2529	60.75	132.96	228.16	2819
1258.00	1596.8	1571.5	2498	2530	60.64	132.72	227.77	2825
1260.00	1599.7	1574.4	2499	2530	60.52	132.47	227.37	2870
1262.00	1602.5	1577.2	2500	2531	60.40	132.23	226.99	2814
1264.00	1605.4	1580.1	2500	2531	60.29	131.99	226.59	2848
1266.00	1608.2	1582.9	2501	2532	60.18	131.76	226.21	2813
1268.00	1611.1	1585.8	2501	2533	60.06	131.51	225.81	2883
1270.00	1613.9	1588.6	2502	2533	59.95	131.28	225.43	2812
1272.00	1616.8	1591.5	2502	2534	59.83	131.03	225.04	2880
1274.00	1619.6	1594.3	2503	2534	59.72	130.80	224.66	2829
1276.00	1622.5	1597.2	2503	2535	59.60	130.55	224.26	2891
1278.00	1625.4	1600.1	2504	2535	59.48	130.30	223.86	2913
1280.00	1628.3	1603.0	2505	2536	59.36	130.06	223.45	2919
1282.00	1631.2	1605.9	2505	2537	59.25	129.82	223.06	2875
1284.00	1634.0	1608.7	2506	2537	59.14	129.58	222.68	2858
1286.00	1636.9	1611.6	2506	2538	59.02	129.34	222.29	2907
1288.00	1639.8	1614.5	2507	2538	58.91	129.10	221.90	2881
1290.00	1642.7	1617.4	2508	2539	58.79	128.86	221.51	2906
1292.00	1645.5	1620.2	2508	2539	58.68	128.64	221.14	2810
1294.00	1648.4	1623.1	2509	2540	58.58	128.41	220.77	2846

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
1296.00	1651.4	1626.1	2509	2541	58.46	128.15	220.36	2978
1298.00	1654.3	1629.0	2510	2541	58.34	127.92	219.98	2888
1300.00	1657.1	1631.8	2511	2542	58.23	127.69	219.60	2873
1302.00	1660.1	1634.8	2511	2542	58.12	127.44	219.20	2968
1304.00	1663.0	1637.7	2512	2543	58.00	127.20	218.81	2931
1306.00	1665.9	1640.6	2512	2544	57.89	126.97	218.43	2909
1308.00	1669.0	1643.7	2513	2545	57.76	126.70	217.99	3093
1310.00	1672.0	1646.7	2514	2545	57.65	126.46	217.59	2989
1312.00	1675.1	1649.8	2515	2546	57.53	126.20	217.17	3041
1314.00	1678.1	1652.8	2516	2547	57.41	125.95	216.76	3038
1316.00	1681.3	1656.0	2517	2548	57.27	125.67	216.31	3183
1318.00	1684.4	1659.1	2518	2549	57.15	125.40	215.87	3124
1320.00	1687.6	1662.3	2519	2550	57.02	125.13	215.43	3159
1322.00	1690.8	1665.5	2520	2551	56.89	124.85	214.97	3221
1324.00	1694.0	1668.7	2521	2552	56.75	124.57	214.51	3227
1326.00	1697.2	1671.9	2522	2553	56.62	124.30	214.06	3194
1328.00	1700.5	1675.2	2523	2555	56.49	124.02	213.59	3264
1330.00	1703.8	1678.5	2524	2556	56.35	123.72	213.11	3317
1332.00	1707.3	1682.0	2525	2558	56.20	123.40	212.58	3476
1334.00	1710.8	1685.5	2527	2559	56.05	123.08	212.05	3494
1336.00	1714.2	1688.9	2528	2561	55.90	122.77	211.54	3440
1338.00	1717.8	1692.5	2530	2563	55.74	122.42	210.97	3631
1340.00	1721.0	1695.7	2531	2564	55.61	122.16	210.53	3209
1342.00	1724.3	1699.0	2532	2565	55.48	121.88	210.07	3276

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
1344.00	1727.7	1702.4	2533	2566	55.34	121.59	209.59	3359
1346.00	1731.3	1706.0	2535	2568	55.18	121.24	209.02	3678
1348.00	1734.7	1709.4	2536	2570	55.04	120.95	208.53	3397
1350.00	1738.0	1712.7	2537	2571	54.92	120.68	208.10	3246
1352.00	1741.2	1715.9	2538	2572	54.80	120.43	207.68	3160
1354.00	1744.3	1719.0	2539	2573	54.68	120.18	207.26	3184
1356.00	1747.5	1722.2	2540	2574	54.56	119.92	206.85	3186
1358.00	1751.7	1726.4	2542	2577	54.36	119.49	206.13	4136
1360.00	1755.0	1729.7	2544	2578	54.23	119.22	205.69	3300
1362.00	1759.1	1733.8	2546	2581	54.03	118.80	204.98	4144
1364.00	1762.7	1737.4	2548	2583	53.88	118.48	204.46	3603
1366.00	1766.2	1740.9	2549	2585	53.74	118.18	203.95	3526
1368.00	1769.7	1744.4	2550	2586	53.60	117.88	203.47	3486
1370.00	1773.3	1748.0	2552	2588	53.45	117.57	202.95	3603
1372.00	1776.8	1751.5	2553	2589	53.31	117.28	202.46	3496
1374.00	1780.3	1755.0	2555	2591	53.17	116.98	201.97	3526
1376.00	1783.9	1758.6	2556	2593	53.04	116.68	201.48	3522
1378.00	1787.3	1762.0	2557	2594	52.90	116.40	201.01	3466
1380.00	1790.7	1765.4	2559	2595	52.78	116.13	200.56	3395
1382.00	1794.1	1768.8	2560	2597	52.65	115.87	200.13	3348
1384.00	1797.4	1772.1	2561	2598	52.53	115.61	199.70	3321
1386.00	1800.8	1775.5	2562	2599	52.41	115.35	199.27	3372
1388.00	1803.7	1778.4	2563	2600	52.31	115.14	198.93	2975
1390.00	1807.3	1782.0	2564	2601	52.18	114.86	198.46	3533

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
1392.00	1810.8	1785.5	2565	2603	52.04	114.57	197.98	3523
1394.00	1814.1	1788.8	2566	2604	51.92	114.32	197.56	3335
1396.00	1817.6	1792.3	2568	2606	51.79	114.04	197.11	3490
1398.00	1821.0	1795.7	2569	2607	51.67	113.78	196.67	3398
1400.00	1824.1	1798.8	2570	2608	51.57	113.56	196.32	3112
1402.00	1827.6	1802.3	2571	2609	51.45	113.30	195.87	3443
1404.00	1831.9	1806.6	2573	2612	51.25	112.88	195.18	4314
1406.00	1836.3	1811.0	2576	2616	51.05	112.44	194.45	4423
1408.00	1839.7	1814.4	2577	2617	50.93	112.19	194.03	3387
1410.00	1843.0	1817.7	2578	2618	50.82	111.95	193.64	3303
1412.00	1846.3	1821.0	2579	2619	50.71	111.72	193.24	3309
1414.00	1849.7	1824.4	2581	2621	50.59	111.46	192.82	3414
1416.00	1853.3	1828.0	2582	2622	50.45	111.18	192.35	3625
1418.00	1856.8	1831.5	2583	2624	50.33	110.92	191.92	3461
1420.00	1860.4	1835.1	2585	2625	50.21	110.65	191.47	3571
1422.00	1864.1	1838.8	2586	2627	50.07	110.36	190.98	3692
1424.00	1867.8	1842.5	2588	2629	49.93	110.06	190.48	3771
1426.00	1871.4	1846.1	2589	2630	49.81	109.79	190.04	3530
1428.00	1874.7	1849.4	2590	2631	49.70	109.57	189.66	3301
1430.00	1878.2	1852.9	2591	2633	49.58	109.31	189.24	3493
1432.00	1881.8	1856.5	2593	2634	49.46	109.04	188.79	3591
1434.00	1885.2	1859.9	2594	2636	49.34	108.80	188.38	3453
1436.00	1888.8	1863.5	2595	2637	49.21	108.53	187.93	3613
1438.00	1892.4	1867.1	2597	2639	49.09	108.27	187.50	3550

TWO-WAY TRAVEL TIME FROM SRD MS	MEASURED DEPTH FROM KB M	VERTICAL DEPTH FROM SRD M	AVERAGE VELOCITY SRD/GEO M/S	RMS VELOCITY M/S	FIRST NORMAL MOVEOUT MS	SECOND NORMAL MOVEOUT MS	THIRD NORMAL MOVEOUT MS	INTERVAL VELOCITY M/S
1440.00	1896.0	1870.7	2598	2641	48.97	108.00	187.05	3636
1442.00	1899.5	1874.2	2599	2642	48.85	107.76	186.65	3450
1444.00	1902.9	1877.6	2601	2643	48.74	107.52	186.26	3413
1446.00	1906.6	1881.3	2602	2645	48.61	107.25	185.79	3717
1448.00	1910.0	1884.7	2603	2646	48.51	107.01	185.40	3416
1450.00	1913.6	1888.3	2605	2648	48.39	106.76	184.98	3574
1452.00	1917.1	1891.8	2606	2649	48.27	106.51	184.56	3550
1454.00	1920.7	1895.4	2607	2651	48.15	106.25	184.13	3620
1456.00	1924.3	1899.0	2609	2652	48.03	105.99	183.70	3594
1458.00	1927.8	1902.5	2610	2653	47.92	105.76	183.32	3443
1460.00	1931.5	1906.2	2611	2655	47.80	105.50	182.87	3694
1462.00	1935.3	1910.0	2613	2657	47.67	105.21	182.39	3841
1464.00	1939.1	1913.8	2614	2659	47.54	104.94	181.93	3772
1466.00	1942.7	1917.4	2616	2660	47.42	104.69	181.52	3570
1468.00	1946.3	1921.0	2617	2662	47.31	104.44	181.10	3632
1470.00	1950.0	1924.7	2619	2664	47.18	104.17	180.66	3739
1472.00	1953.4	1928.1	2620	2665	47.08	103.96	180.30	3381

PE600557

This is an enclosure indicator page.
The enclosure PE600557 is enclosed within the container PE900648 at this location in this document.

The enclosure PE600557 has the following characteristics:

ITEM_BARCODE	= PE600557
CONTAINER_BARCODE	= PE900648
NAME	= Conan 1 Drift Corrected Sonic
BASIN	= Otway
PERMIT	= VIC/P31
TYPE	= WELL
SUBTYPE	= WELL_LOG
DESCRIPTION	= Drift Corrected Sonic
REMARKS	=
DATE_CREATED	=
DATE_RECEIVED	=
W_NO	= W1140
WELL_NAME	= CONAN-1
CONTRACTOR	= Schlumberger
CLIENT_OP_CO	= BHP

(Inserted by DNRE - Vic Govt Mines Dept)

PE600558

This is an enclosure indicator page.
The enclosure PE600558 is enclosed within the container PE900648 at this location in this document.

The enclosure PE600558 has the following characteristics:

ITEM_BARCODE	= PE600558
CONTAINER_BARCODE	= PE900648
NAME	= Conan 1 Seismic Calibration log
BASIN	= Otway
PERMIT	= VIC/P31
TYPE	= WELL
SUBTYPE	= WELL_LOG
DESCRIPTION	= Seismic Calibration log
REMARKS	=
DATE_CREATED	=
DATE_RECEIVED	=
W_NO	= W1140
WELL_NAME	= CONAN-1
CONTRACTOR	= Schlumberger
CLIENT_OP_CO	= BHP

(Inserted by DNRE - Vic Govt Mines Dept)

PE600559

This is an enclosure indicator page.
The enclosure PE600559 is enclosed within the container PE900648 at this location in this document.

The enclosure PE600559 has the following characteristics:

ITEM_BARCODE	= PE600559
CONTAINER_BARCODE	= PE900648
NAME	= Conan 1 Log Interpretation 1:200 Enclosure 1
BASIN	= Otway
PERMIT	= VIC/P31
TYPE	= WELL
SUBTYPE	= WELL_LOG
DESCRIPTION	= Log Interpretation
REMARKS	=
DATE_CREATED	=
DATE_RECEIVED	=
W_NO	= W1140
WELL_NAME	= CONAN-1
CONTRACTOR	= BHP
CLIENT_OP_CO	= BHP

(Inserted by DNRE - Vic Govt Mines Dept)

PE900656

This is an enclosure indicator page.
The enclosure PE900656 is enclosed within the container PE900648 at this location in this document.

The enclosure PE900656 has the following characteristics:

ITEM_BARCODE	PE900656
CONTAINER_BARCODE	PE900648
NAME	Conan 1 Geogram (synthetic seismogram) 25Hz
BASIN	Otway
PERMIT	VIC/P31
TYPE	WELL
SUBTYPE	SYNTH_SEISMOGRAPH
DESCRIPTION	Conan 1 Geogram (synthetic seismogram) 25Hz
REMARKS	
DATE_CREATED	7/08/95
DATE_RECEIVED	
W_NO	W1140
WELL_NAME	CONAN - 1
CONTRACTOR	Schlumberger
CLIENT_OP_CO	BHP

(Inserted by DNRE - Vic Govt Mines Dept)

PE900657

This is an enclosure indicator page.
The enclosure PE900657 is enclosed within the container PE900648 at this location in this document.

The enclosure PE900657 has the following characteristics:

ITEM_BARCODE	= PE900657
CONTAINER_BARCODE	= PE900648
NAME	= Conan 1 Geogram (synthetic seismogram) 35Hz
BASIN	= Otway
PERMIT	= VIC/P31
TYPE	= WELL
SUBTYPE	= SYNTH_SEISMOGRAPH
DESCRIPTION	= Conan 1 Geogram (synthetic seismogram) 35Hz
REMARKS	=
DATE_CREATED	= 7/08/95
DATE_RECEIVED	=
W_NO	= W1140
WELL_NAME	= CONAN - 1
CONTRACTOR	= Schlumberger
CLIENT_OP_CO	= BHP

(Inserted by DNRE - Vic Govt Mines Dept)

PE900658

This is an enclosure indicator page.
The enclosure PE900658 is enclosed within the container PE900648 at this location in this document.

The enclosure PE900658 has the following characteristics:

ITEM_BARCODE	= PE900658
CONTAINER_BARCODE	= PE900648
NAME	= Conan 1 Geogram (synthetic seismogram) 45Hz
BASIN	= Otway
PERMIT	= VIC/P31
TYPE	= WELL
SUBTYPE	= SYNTH_SEISMOGRAPH
DESCRIPTION	= Conan 1 Geogram (synthetic seismogram) 45Hz
REMARKS	=
DATE_CREATED	= 7/08/95
DATE_RECEIVED	=
W_NO	= W1140
WELL_NAME	= CONAN - 1
CONTRACTOR	= Schlumberger
CLIENT_OP_CO	= BHP

(Inserted by DNRE - Vic Govt Mines Dept)

PE900649

This is an enclosure indicator page.
The enclosure PE900649 is enclosed within the container PE900648 at this location in this document.

The enclosure PE900649 has the following characteristics:

ITEM_BARCODE	= PE900649
CONTAINER_BARCODE	= PE900648
NAME	= Vertical Seismic Profile Plot 1
BASIN	= Otway
PERMIT	= VIC/P31
TYPE	= WELL
SUBTYPE	= SYNTH_SEISMOGRAPH
DESCRIPTION	= Conan 1 Vertical Seismic Profile (Stacked Data) Plot 1
REMARKS	=
DATE_CREATED	= 7/08/95
DATE_RECEIVED	=
W_NO	= W1140
WELL_NAME	= CONAN - 1
CONTRACTOR	= Schlumberger
CLIENT_OP_CO	= BHP

(Inserted by DNRE - Vic Govt Mines Dept)

PE900650

This is an enclosure indicator page.
The enclosure PE900650 is enclosed within the container PE900648 at this location in this document.

The enclosure PE900650 has the following characteristics:

ITEM_BARCODE	= PE900650
CONTAINER_BARCODE	= PE900648
NAME	= Vertical Seismic Profile Plot 2
BASIN	= Otway
PERMIT	= VIC/P31
TYPE	= WELL
SUBTYPE	= SYNTH_SEISMOGRAPH
DESCRIPTION	= Conan 1 Vertical Seismic Profile (Amplitude Recovery) Plot 2
REMARKS	=
DATE_CREATED	= 7/08/95
DATE_RECEIVED	=
W_NO	= W1140
WELL_NAME	= CONAN - 1
CONTRACTOR	= Schlumberger
CLIENT_OP_CO	= BHP

(Inserted by DNRE - Vic Govt Mines Dept)

PE900651

This is an enclosure indicator page.
The enclosure PE900651 is enclosed within the container PE900648 at this location in this document.

The enclosure PE900651 has the following characteristics:

ITEM_BARCODE	= PE900651
CONTAINER_BARCODE	= PE900648
NAME	= Vertical Seismic Profile Plot 3
BASIN	= Otway
PERMIT	= VIC/P31
TYPE	= WELL
SUBTYPE	= SYNTH_SEISMOGRAPH
DESCRIPTION	= Conan 1 Vertical Seismic Profile (Velocity Filtering) Plot 3
REMARKS	=
DATE_CREATED	= 7/08/95
DATE_RECEIVED	=
W_NO	= W1140
WELL_NAME	= CONAN - 1
CONTRACTOR	= Schlumberger
CLIENT_OP_CO	= BHP

(Inserted by DNRE - Vic Govt Mines Dept)

PE900652

This is an enclosure indicator page.
The enclosure PE900652 is enclosed within the container PE900648 at this location in this document.

The enclosure PE900652 has the following characteristics:

ITEM_BARCODE	= PE900652
CONTAINER_BARCODE	= PE900648
NAME	= Vertical Seismic Profile Plot 4
BASIN	= Otway
PERMIT	= VIC/P31
TYPE	= WELL
SUBTYPE	= SYNTH_SEISMOGRAPH
DESCRIPTION	= Conan 1 Vertical Seismic Profile (Waveshaping Deconvolution) Plot 4
REMARKS	=
DATE_CREATED	= 7/08/95
DATE_RECEIVED	=
W_NO	= W1140
WELL_NAME	= CONAN - 1
CONTRACTOR	= Schlumberger
CLIENT_OP_CO	= BHP

(Inserted by DNRE - Vic Govt Mines Dept)

PE900653

This is an enclosure indicator page.
The enclosure PE900653 is enclosed within the container PE900648 at this location in this document.

The enclosure PE900653 has the following characteristics:

ITEM_BARCODE	= PE900653
CONTAINER_BARCODE	= PE900648
NAME	= Vertical Seismic Profile Plot 5
BASIN	= Otway
PERMIT	= VIC/P31
TYPE	= WELL
SUBTYPE	= SYNTH_SEISMOGRAPH
DESCRIPTION	= Conan 1 Vertical Seismic Profile (Waveshaping And Corridor Stack) Plot 5
REMARKS	=
DATE_CREATED	= 7/08/95
DATE_RECEIVED	=
W_NO	= W1140
WELL_NAME	= CONAN - 1
CONTRACTOR	= Schlumberger
CLIENT_OP_CO	= BHP

(Inserted by DNRE - Vic Govt Mines Dept)

PE900654

This is an enclosure indicator page.
The enclosure PE900654 is enclosed within the container PE900648 at this location in this document.

The enclosure PE900654 has the following characteristics:

ITEM_BARCODE	= PE900654
CONTAINER_BARCODE	= PE900648
NAME	= Vertical Seismic Profile Plot 6
BASIN	= Otway
PERMIT	= VIC/P31
TYPE	= WELL
SUBTYPE	= SYNTH_SEISMOGRAPH
DESCRIPTION	= Conan 1 Vertical Seismic Profile (VSP & Geogram Composite) Plot 6
REMARKS	=
DATE_CREATED	= 7/08/95
DATE_RECEIVED	=
W_NO	= W1140
WELL_NAME	= CONAN - 1
CONTRACTOR	= Schlumberger
CLIENT_OP_CO	= BHP

(Inserted by DNRE - Vic Govt Mines Dept)

PE900655

This is an enclosure indicator page.
The enclosure PE900655 is enclosed within the container PE900648 at this location in this document.

The enclosure PE900655 has the following characteristics:

ITEM_BARCODE	PE900655
CONTAINER_BARCODE	PE900648
NAME	Vertical Seismic Profile Plot 7
BASIN	Otway
PERMIT	VIC/P31
TYPE	WELL
SUBTYPE	SYNTH_SEISMOGRAPH
DESCRIPTION	Conan 1 Vertical Seismic Profile (VSP & Geogram Composite) Plot 7
REMARKS	
DATE_CREATED	7/08/95
DATE_RECEIVED	
W_NO	W1140
WELL_NAME	CONAN - 1
CONTRACTOR	Schlumberger
CLIENT_OP_CO	BHP

(Inserted by DNRE - Vic Govt Mines Dept)

PE900644

This is an enclosure indicator page.
The enclosure PE900644 is enclosed within the container PE900648 at this location in this document.

The enclosure PE900644 has the following characteristics:

ITEM_BARCODE	= PE900644
CONTAINER_BARCODE	= PE900648
NAME	= Conan 1 Synthetics Plot 3
BASIN	= Otway
PERMIT	= VIC/P31
TYPE	= WELL
SUBTYPE	= SYNTH_SEISMOGRAPH
DESCRIPTION	= Conan 1 Synthetics Plot 3
REMARKS	=
DATE_CREATED	= 7/08/95
DATE_RECEIVED	=
W_NO	= W1140
WELL_NAME	= CONAN - 1
CONTRACTOR	= BHP
CLIENT_OP_CO	= BHP

(Inserted by DNRE - Vic Govt Mines Dept)

PE900645

This is an enclosure indicator page.
The enclosure PE900645 is enclosed within the container PE900648 at this location in this document.

The enclosure PE900645 has the following characteristics:

ITEM_BARCODE	= PE900645
CONTAINER_BARCODE	= PE900648
NAME	= Conan 1 Synthetics Plot 4
BASIN	= Otway
PERMIT	= VIC/P31
TYPE	= WELL
SUBTYPE	= SYNTH_SEISMOGRAPH
DESCRIPTION	= Conan 1 Synthetics Plot 4
REMARKS	=
DATE_CREATED	= 7/08/95
DATE_RECEIVED	=
W_NO	= W1140
WELL_NAME	= CONAN - 1
CONTRACTOR	= BHP
CLIENT_OP_CO	= BHP

(Inserted by DNRE - Vic Govt Mines Dept)

PE900646

This is an enclosure indicator page.
The enclosure PE900646 is enclosed within the container PE900648 at this location in this document.

The enclosure PE900646 has the following characteristics:

ITEM_BARCODE	= PE900646
CONTAINER_BARCODE	= PE900648
NAME	= Conan 1 Montage line OH94 - 264 (Seismic Line) Plot 2
BASIN	= Otway
PERMIT	= VIC/P31
TYPE	= WELL
SUBTYPE	= SYNTH_SEISMOGRAPH
DESCRIPTION	= Conan 1 Montage line OH94 - 264 (Seismic Line) Plot 2
REMARKS	=
DATE_CREATED	= 7/08/95
DATE_RECEIVED	=
W_NO	= W1140
WELL_NAME	= CONAN - 1
CONTRACTOR	= BHP
CLIENT_OP_CO	= BHP

(Inserted by DNRE - Vic Govt Mines Dept)

PE900647

This is an enclosure indicator page.
The enclosure PE900647 is enclosed within the container PE900648 at this location in this document.

The enclosure PE900647 has the following characteristics:

ITEM_BARCODE	= PE900647
CONTAINER_BARCODE	= PE900648
NAME	= Conan 1 Montage line OH94 - 264 Plot 1
BASIN	= Otway
PERMIT	= VIC/P31
TYPE	= WELL
SUBTYPE	= SYNTH_SEISMOGRAPH
DESCRIPTION	= Conan 1 Montage line OH94 - 264 Plot 1
REMARKS	=
DATE_CREATED	= 7/08/95
DATE_RECEIVED	=
W_NO	= W1140
WELL_NAME	= CONAN - 1
CONTRACTOR	= BHP
CLIENT_OP_CO	= BHP

(Inserted by DNRE - Vic Govt Mines Dept)

FUGRO SURVEY PTY LTD ACN 009 172 990

REPORT FOR

CONAN SITE SURVEY

PERMIT VIC/P31

OTWAY BASIN, VICTORIA

Prepared for : BHP PETROLEUM PTY LTD
PETROLEUM PLAZA
120 COLLINS STREET
MELBOURNE VIC 3000

Prepared by : FUGRO SURVEY PTY LTD
18 PROWSE STREET
WEST PERTH WA 6005

Checked by: GTM **Approved by:** P.K. **Date: 23rd June 1995**

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FIGURES

APPENDICES

DRAWINGS

1.0 SITE SUMMARY

Fugro Survey Pty Ltd conducted a geophysical survey at the Conan location in the Otway Basin in May 1995.

The seabed is gently undulating within the site with a minimum depth of 66.9m and a maximum of 76.0m (depths reduced to Lowest Astronomical Tide).

The proposed Conan-1 location is located on a seabed which comprises a thin unconsolidated fine to coarse sediment overlying a calcarenite layer. Water depth at location is approximately 70.1m. The slope of the seabed at location is negligible.

A gentle ridge oriented northwest to southeast lies near the northeast boundary of the site. The western flank of the ridge slopes gently to the southwest boundary. The maximum gradient within the site is found on this flank and is less than 2° to the horizontal.

Superficial sediments across the site range in thickness from very thin to absent.

There are considerable areas where anchoring will be problematic due to the absence of superficial sediments. Consequently the optimum fluke penetration is unlikely to be obtained, and the anchoring capacity will be limited to the weight of the anchor and the frictional forces between the anchor and the seafloor.

2.0 INTRODUCTION

Fugro Survey Pty Ltd was contracted by BHP Petroleum Pty Ltd to conduct a bathymetric, sidescan sonar, shallow seismic profiling and seabed sampling survey at the proposed Conan location in Permit VIC/P31 of the Otway Basin (see Figure 1).

Survey operations in the above area were carried out between 17th May 1995 and 20th May 1995.

At the time of the survey the proposed Conan site was given as an area bounded by:

	(UTM, CM 141° East)		(AGD 84)	
Point	**Easting**	**Northing**	**Latitude**	**Longitude**
1	653 999	5 699 705	38°50'16.31"	142°46'27.62"
2	659 263.16	5 695 892.05	38°52'16.57"	142°50'09.04"
3	656 623.43	5 692 247.63	38°54'16.45"	142°48'22.55"
4	651 359.26	5 696 060.58	38°52'16.13"	142°44'41.06"

Following the survey a proposed drilling location was given as :

654 528.74m East	5 696 042.00m North (UTM, Cm 141° East)
38°52' 14.75" South	142°46'52.54' East

The above coordinates cover a rectangular area of 6.5km by 4.5km.

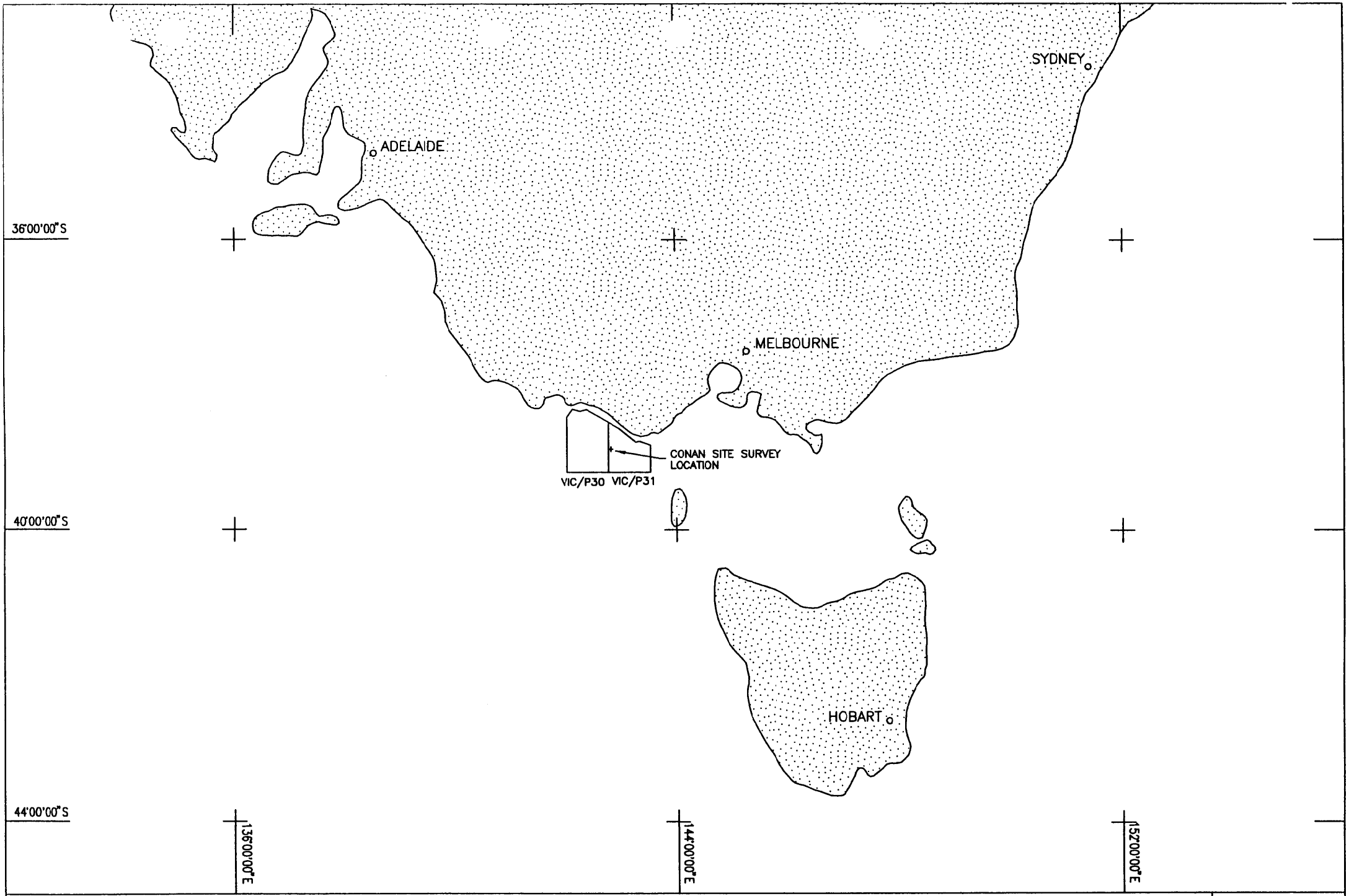
Lines were surveyed at one hundred metre spacing in an 36°/216° direction, with cross lines in a 126°/306° direction surveyed every 500 metres.

The survey was conducted from the survey vessel MRV "Ngerin" using Fugro Survey's "Starfix II" Wide Area Differential GPS System for positioning and PCNav software system for navigation.

The echo sounder system used was an Atlas Deso 25 with TSS 333B heave compensator. The sidescan sonar system was an EG&G 260 and an EG&G Uniboom boomer system was used for sub-bottom profiling.

Seabed samples were obtained with an Van Veen grab sampler.

This report details results of the survey.



LOCATION DIAGRAM

FIGURE 1

3.0 OPERATIONS SUMMARY

3.1 Chronology of Events

11/5/95 : Personnel and equipment arrive in Adelaide.

12/5/95 : Mobilising vessel with survey equipment.

13/5/95 : Complete mobilisation of equipment. Equipment wet tested before departure. Commence transit to Sophia Jane-1 location.

14/5/95 : Continue transit to Sophia Jane-1 location. Divert to anchorage at Robe as weather too rough to commence survey.

15/5/95 : At anchorage at Robe due to weather conditions. Transit to Sophia Jane-1. Deploy and calibrate all survey equipment. Commence survey operations and continue running lines.

16/5/95 : Complete running lines. Undertake seabed sampling. Commence transit to Victoria for BHP site surveys.

17/5/95 : Continue transit to Conan location. Arrive at location, deploy and calibrate all equipment. Commence running lines at Conan location.

18/5/95 : Running lines at Conan location.

19/5/95 : Running lines at Conan location. Transit to Lydia location. Commence running lines at Lydia.

20/5/95	:	Complete running lines at Lydia. Undertake seabed sampling at Lydia. Transit to Conan. Undertake seabed sampling at Conan. Rerun five lines at Conan due to previous problems with heave compensator. Transit to Champion. Commence running lines at Champion location.
21/5/95	:	Running lines at Champion location.
22/5/95	:	Complete running lines at Champion. Undertake seabed sampling. Commence transit to Adelaide.
23/5/95	:	Continue transit to Adelaide.
24/5/95	:	Complete transit to Adelaide. Demobilise all equipment.

For further information see Appendix A - Daily Operations Reports.

3.2 Geodetic Parameters

The following geodetic parameters were used.

DGPS data is in terms of:

Datum	:	**WGS84**
Reference Spheroid	:	World Geodetic Spheroid 1984
Semi-major axis	:	6 378 137m
Semi-minor axis	:	6 356 752.31m
Flattening l/f	:	1/298.257223563
Eccentricity^2	:	0.00669438

The proposed drilling location co-ordinates and all charting is in terms of:

Datum	:	**AGD 1984**
Reference Spheroid	:	Australian National Spheroid
Semi-major axis	:	6 378 160m
Semi-minor axis	:	6 356 774.719m
Flattening l/f	:	1/298.25
Eccentricity^2	:	0.006694542
Projection	:	**Universal Transverse Mercator**
False Eastings	:	500,000m
False Northings	:	10,000,000m
Latitude of Origin	:	0.0 degrees
Longitude of C.M.	:	141° East
Scale Factor on C.M.	:	0.999600
Units	:	Metres

Datum Transformation

In order to convert co-ordinates from WGS 84 to AGD 84 the following seven parameter transformation shift was used:-

x shift (metres)	=	+116.0000	Rotation x (secs)	=	+0.2300
y shift (metres)	=	+50.4700	Rotation y (secs)	=	+0.3900
z shift (metres)	=	-141.6900	Rotation z (secs)	=	+0.3440
Scale (ppm)	=	-0.0983			

3.3 Calibration of Equipment

3.3.1 Gyro Compass Calibration

The SG Brown gyro compass was calibrated between 0815 hrs and 0900 hrs on the 13th May 1995, whilst the Ngerin was moored alongside the jetty at the South Australia Research and Development Institute yard in Adelaide.

The GPS antenna was placed at either end of the jetty and approximately 15 minutes of data was logged at each point.

A mean coordinate for each point was obtained and a bearing calculated. Headings for the vessel were calculated, and compared to the logged gyro data as follows:

Description	Easting	Northing
Point 1	821 996.3	6142 060.2
Point 2	821 950.1	6142 064.9

Calculated Bearing	286.20
Grid Convergence	-2.00
Azimuth	284.20
Observed Gyro	285.00
Gyro Correction	-0.80

Details of the gyro calibration can be found in Appendix C.

3.3.2 Echo Sounder Calibration

The Atlas Deso 25 Echo Sounder was calibrated using velocity probe results and bar check.

Upon arrival at location on the 17th May 1995, a bar check and sound velocity profile were undertaken in the following manner.

A metal disc was lowered by chain to a position directly beneath the echo sounder transducer, to an accurately measured depth of 5m. The 'draft' reading on the echo sounder was then adjusted, so that the observed sounder output coincided with the bar depth. As a result of this the draft in the echo sounder was set at 3.17 metres.

An SVP-16 profiler was slowly lowered to the seabed. Data including depth, temperature and sound velocity was recorded in the SVP-16. Upon recovery of the profiler the data was downloaded and input into a program which provided a graphical presentation of the velocity profile and a mean value for the velocity of sound. The mean velocity of sound at location was found to be $1507ms^{-1}$ and this value was set in the Deso 25.

A printout of velocity probe readings, together with a graphical presentation are given in Appendix D.

A further bar check and sound velocity profile was undertaken at the commencement of the Champion site survey on 20th May 1995, which confirmed that there was little change in the draft and sound velocity readings.

3.3.3 Sidescan Sonar Calibration

The EG&G 260 sidescan sonar system was calibrated during mobilisation on the 13th May 1995 using a series of inbuilt tests which confirm printing resolution and verify the accuracy of slant range and speed processing.

3.3.4 Boomer Calibration

The boomer sub-bottom profiler system was run together with echo sounder and sidescan sonar during mobilisation, to demonstrate the absence of interference on the recorded data, between the different systems.

3.4 Operational Procedures

The Starfix II DGPS System generated wide area differentially corrected position updates at a one second interval to PCNav. Corrections were used from two stations, Adelaide and Melbourne. Station descriptions for these stations are contained in Appendix B.

PCNav was interfaced to the Starfix II, Gyro and echo sounder, for navigation and data logging, and to the sidescan sonar recorder and boomer recorder via a fix box and TSS Annotator such that all data could be referenced to the positional data.

The echo sounder was operated at dual 210kHz and 33kHz frequencies, at 20m record scale. The 33kHz data was digitised and logged to PCNav at a rate of 10 soundings per second.

The sidescan sonar was operated at 150m range and 200m range for crosslines, with the recorder providing true scale records (slant range corrected) of the seabed.

The tow cable length varied from 140-160m for the surveyed lines. A fish altitude of between 15 and 30m above the seabed was maintained at all times.

The boomer system was operated at 200J power output, with data filtered between 700Hz and 3000Hz. The paper records were printed at 250 milliseconds (approximately 100m) scale.

Seabed sampling was carried out by lowering the Van Veen grab sampler to the seafloor with the ship's winch. Recovered samples were visually classified.

A vessel offset diagram is given in Appendix E.

Survey logs and geophysical logs are given in Appendix F and G respectively. A job configuration printout is given in Appendix H.

3.5 Safety Procedures

Fugro Survey safety procedures were rigidly adhered to during the survey.

A ship's muster was held during mobilisation to site as was a safety meeting to ensure all personnel were familiar with these procedures.

Minutes of meetings are contained in Appendix I.

3.6 Data Reduction

Echo sounding data were reduced to Lowest Astronomical Tide (LAT) using 10 minute predictions generated from the Australian National Tide Tables published data for Port Campbell.

Reduced bathymetry was plotted along with contours on Drawing No's 11075-01 and 11075-02.

All sidescan sonar records were examined to identify and delineate significant sonar targets and to interpret seabed features. Seabed features are plotted on Drawing No's 11075-03 and 11075-04.

Boomer data were examined to measure the thickness and extent of the superficial deposit within the surveyed area.

Grab sampling results were used to verify the sidescan sonar and sub-bottom profiling interpretations.

4.0 RESULTS

4.1 Bathymetry

Water depths were reduced to Lowest Astronomical Tide (LAT) using Australian National Tide Tables tidal predictions for Port Campbell in Victoria. LAT is 0.63m below Mean Sea Level at Port Campbell.

The seabed is gently undulating. A gentle ridge oriented northwest to southeast lies near the northeast boundary of the site. Orientation of the ridge axis is parallel to the striking trend of the underlying geology. The western flank of the ridge slopes towards the southwest boundary.

The maximum gradient for the site lies along this flank and is less than 2° to the horizontal.

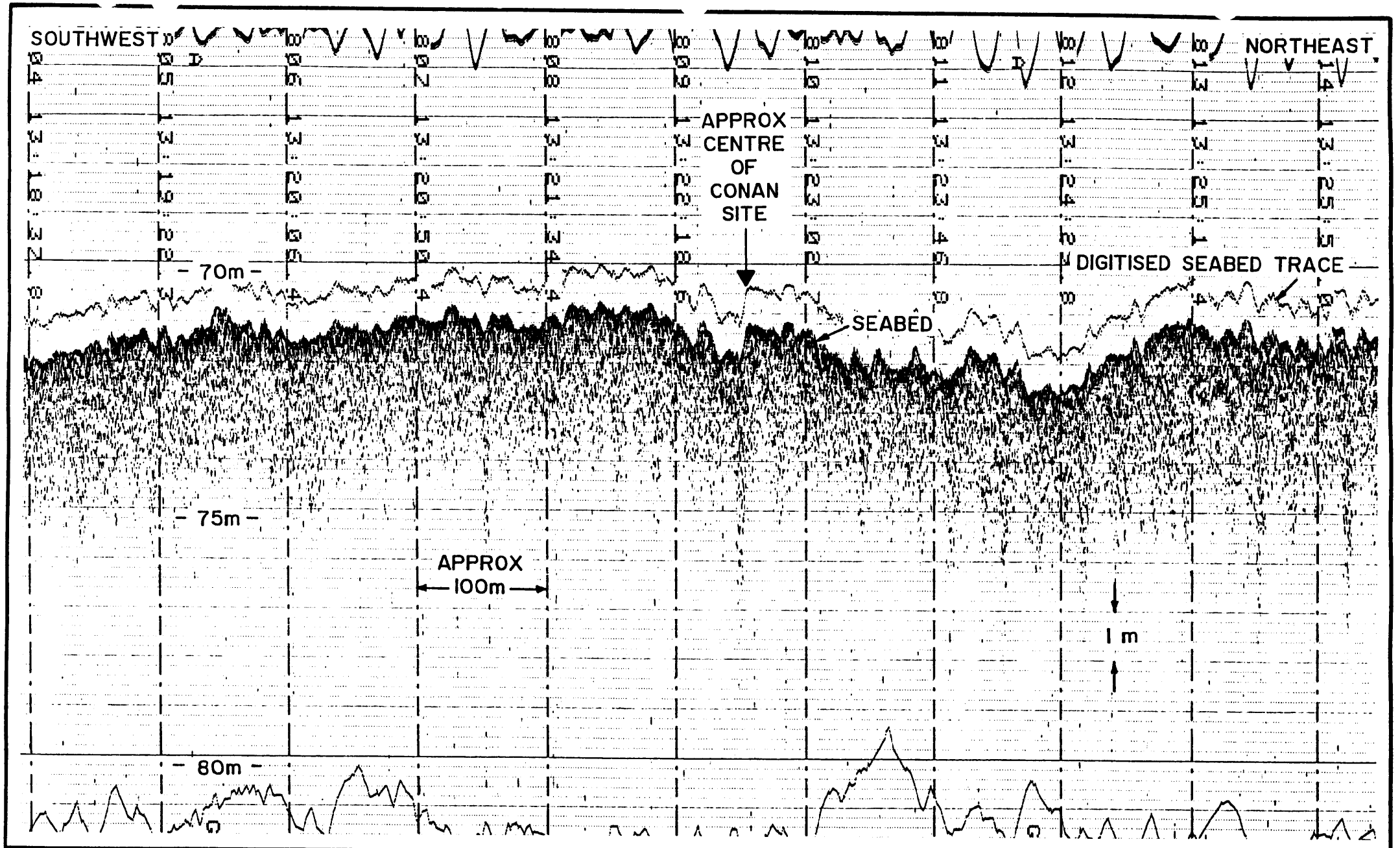
Generally, the site increases in depth from the northeast boundary to the southwest boundary with a minimum depth of 66.9m and a maximum of 76.0m.

The minimum depth is found along the top of the ridge, and the maximum depth is found near the southern corner of the site. A trough exists where the maximum depth is located along its axial plane which is oriented east-west.

At the proposed location, the water depth is approximately 70.1m with negligible gradient.

Figure 2, illustrates an example of an echo sounder record.

Charts 11075-01 and 11075-02, present bathymetric soundings with contours at 1.0m intervals.



EXAMPLE OF ECHO SOUNDER DATA - LINE CO-33

FIGURE 2

4.2 Seabed Features

Charts 11075-03 and 11075-04, present the seabed features within the surveyed site.

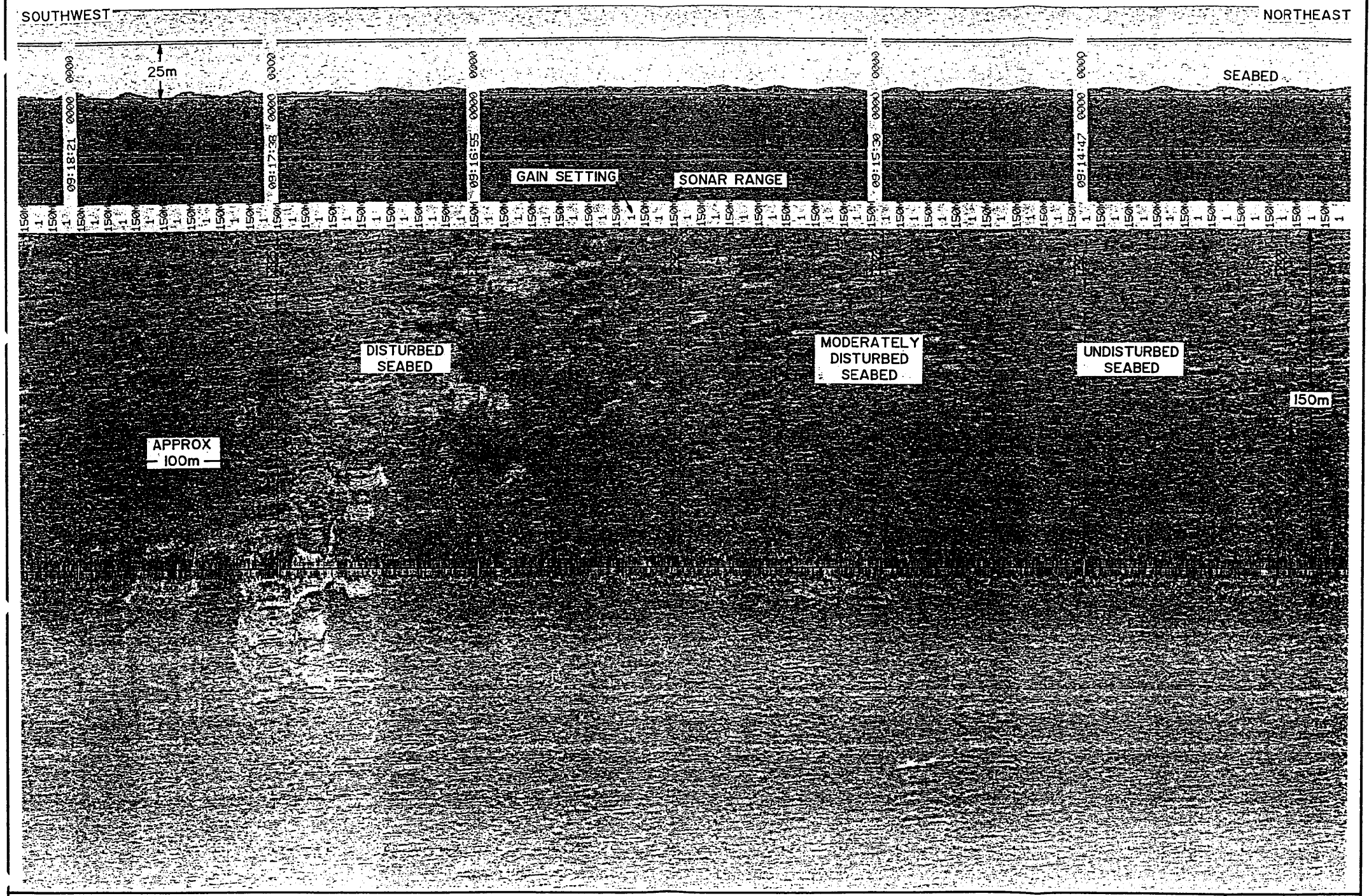
Sonar records indicate that the surveyed seafloor varies from low to high reflectivity. Figure 3, illustrates an example of a sidescan sonar record.

Within the surveyed area, the seabed has been classified into three zones in accordance to their subjection to erosional activity by seabottom currents.

Areas showing intermittent high to low reflectivity are attributed to predominant scouring effects of the thin superficial sediment. Figure 3, illustrates this area as "disturbed" seabed. The high reflections here are attributed to "disturbed" sediments with their surfaces orthogonal to the sidescan fish transducer. Occasionally, the highly reflective seabed surface may be generated by the exposure of a firmer layer (through scouring activity) underlying the superficial sediment. Low reflectivities here are most likely generated by the deposition of very fine sediments, trapped within the scoured depressions. Also, the scoured depressions can generate acoustic shadows due to their relief.

Moderately disturbed seabed exhibit a high to moderate intermittent reflectivity. In Figure 3, this area is illustrated as "moderately disturbed" seabed. Scouring action here is not as severe and predominant. Acoustic shadows are not as prevalent here due to the less severe scouring activity. Generally these areas have a more consistent high reflectivity throughout.

The third classification of seabed within the site is a seabed with little to no erosional activity prevalent. This area exhibits a smooth and even moderate reflectivity and is illustrated in Figure 3 as "undisturbed" seabed.



EXAMPLE OF SONAR DATA - LINE CO-14

FIGURE 3

The surveyed area comprises mainly "disturbed" to "moderately disturbed" seabed.

On the seabed features chart, these erosional features are delineated approximately due to their gradual transitional boundaries between each other.

The general trend of these erosional features appear to be oriented northwest to southeast.

At the proposed location, the seabed comprises a fine to coarse sediment overlying a calcarenite layer.

4.3 Shallow Geology

Boomer sub-bottom records show two to three major reflecting surface horizons throughout the site. These records also show that the beds are gradually dipping apparently from northeast to southwest. The apparent strike of these dipping beds are oriented approximately northwest to southeast which appear to be in the same orientation as the trend of the erosional features.

The continuity of the major reflectors are intermittent throughout the site. This is most likely caused by the variable degrees of cementation throughout the site. Areas where cementation is strong correlates with poor signal penetration.

Generally, seismic signal penetration is poor along the southwest boundary of the site. This region of poor signal penetration in some areas extend to nearly 2km into the site from the southwest boundary. Seismic penetration within this area improves from the southern corner to the western corner of the site. This suggests that the degree of cementation is relatively strong along the southwest boundary and increases in strength towards the southern corner of the site.

Outside the area of strong cementation, seismic penetration improves. Within this area, the seismic reflectors are intermittently continuous and variable in strength. This is most likely due to the strengths of cementation within each layer. Strong cementation is indicated by the continuity of the reflectors and vice versa.

No isopach chart of the superficial sediments was compiled due to the very thin or absent nature of the superficial layer overlying a layer of calcarenite.

Figure 4, illustrates an example of boomer sub-bottom profiler data showing three major reflectors which can almost be mapped throughout the site. The superficial unit is not evident on this record.

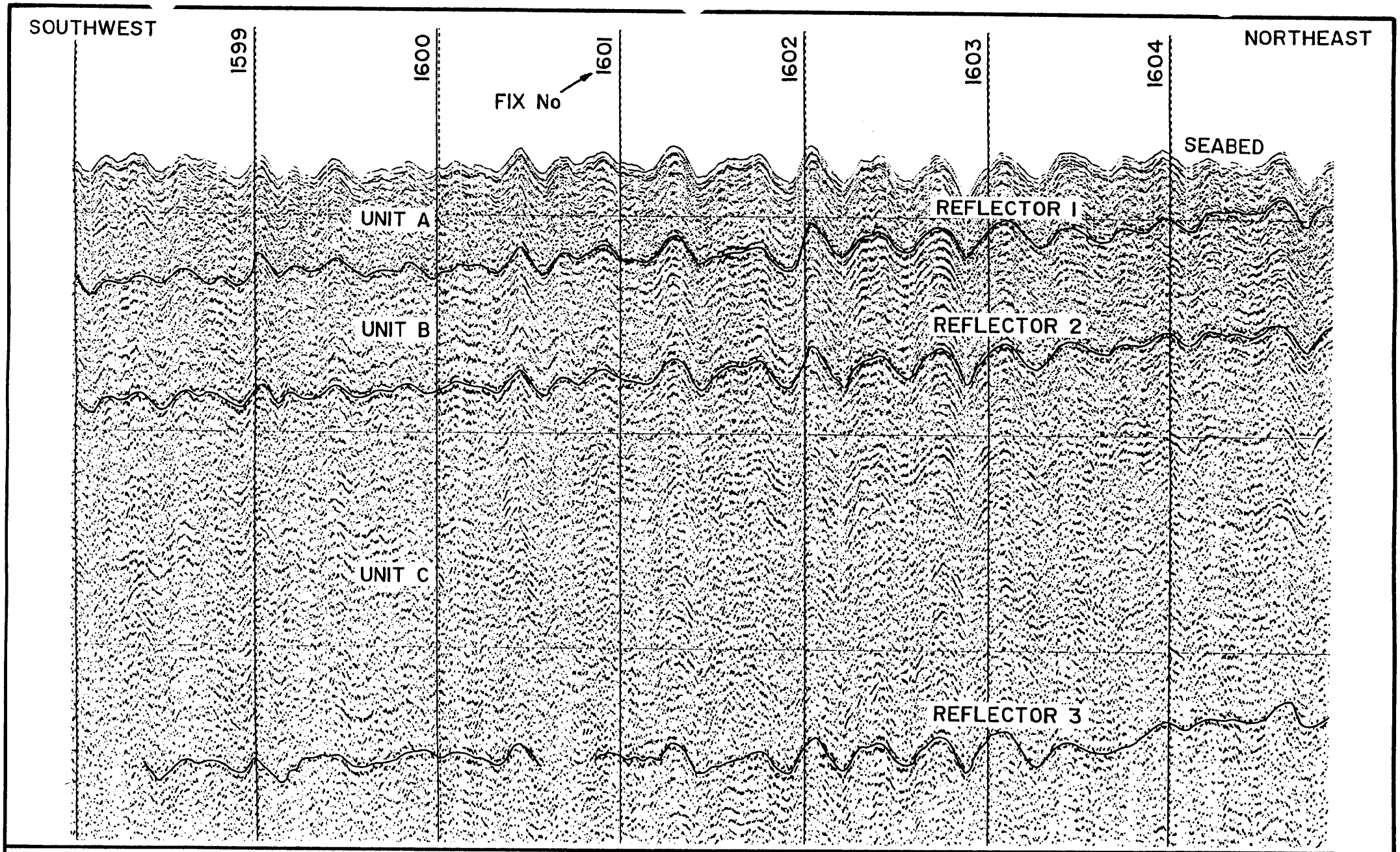
Reflector 1 marks the base of Unit A which appears to be fairly uniform with poor evidence of layering within the unit. This may suggest that Unit A is a moderately cemented layer of fine sediments throughout.

Unit B underlies Unit A and its base is delineated by Reflector 2. It's seismic character comprises parallel to sub-parallel reflectors and it is expected that this unit comprises a consolidated fine to medium grained sediment.

Unit C, is the thickest of the three units and its base is delineated by Reflector 3. The seismic character for this unit appears to be moderately chaotic and suggests a moderately cemented fine to coarse grained sediment.

Near the proposed drill location, the approximate depths to the major reflectors from the seabed are calculated using an average interbed velocity of 1750 m/s and are tabulated below:

Reflector No	Depth Below Seabed (m)
1	16.5
2	40.7
3	53.4



EXAMPLE OF SUB-BOTTOM PROFILER DATA - LINE CO-65

FIGURE 4

Grab sampling results showed poor recovery of superficial sediments in the northwestern half of the site. Evidence of flora in the samples could suggest a thin sediment overlying a layer of calcarenite.

Better recoveries of superficial sediments were obtained in the southeastern half of the site. A grab sample was taken near the base of a trough near the southern corner of the site and another along the eastern flank of the gentle ridge.

4.4 Guide Base Stability

Based on interpretation of the boomer and sidescan data, no problems are expected with guide base stability at location.

4.5 Anchoring Conditions

Boomer records, sidescan records and grab sampler results indicate that the surveyed area has a limited supply of superficial sediments. This will limit the anchor holding capacity within the site.

The distribution of the superficial sediments are sparse and more common toward the southeastern half of the site. Anchoring capacity within the southeastern portion of the surveyed area is expected to be more favourable than the northwestern portion.

4.6 Grab Sampling

Five locations were programmed for the survey area.

Sampling results are tabulated below

Sample	Easting (m)	Northing (m)	Description
No 1	656 428	5 692 878	Minor fine grained sand, and moderate fine to coarse fragments of shell and fine to medium fragments of coral.
No 2	657 842	5 696 174	Abundant fine grained sand and fine to coarse fragments of shell and coral.
No 3	654 838	5 696 790	Trace fine grained sand and fine to coarse fragments of shell and coral. Some marine flora were observed.
No 4	652 829	5 696 746	Trace fine grained sand and fine to coarse fragments of shell and coral with marine flora.
No 5	653 758	5 698 387	Trace fine grained sand and fine to coarse shell and coral fragments with marine flora.

APPENDIX A

DAILY OPERATIONS REPORTS

DAILY OPERATIONS REPORT (HYDRO)

CLIENT SAGASCO/BHP	JOB No. HY11074/5	DATE 11/5/95
LOCATION ADELAIDE	VESSEL MRV 'NGERIN'	

FROM	TO	SUMMARY OF OPERATIONS
1130	1300	ALL PERSONNEL ARRIVE IN ADELAIDE
1300	1430	TRANSFER TO MOTEL THEN SARDIE YARD
1430	1730	CHECKOUT VESSEL AND EQUIPMENT WHICH
		HAS ARRIVED, TRACE EQUIPMENT WHICH HAS
		NOT ARRIVED

EQUIPMENT	NUMBER	EQUIPMENT	NUMBER	PERSONNEL	TITLE
				G. MOORE	SURVEYOR/PC
				G. ROSS	SURVEYOR
				L. ETHERIDGE	ENGINEER
				H. CAMPIGLI	ENGINEER
				D. KHOO	GEOPHYSICIST
CONSUMABLES					
VEHICLE	1 x HIRE CARS				
ACCOMMODATION	5 x MOTEL ROOM				

AUTHORISED CONTRACT CHANGES/COMMENTS

PARTY CHIEFS SIGNATURE	CLIENT REPRESENTATIVES SIGNATURE	DOR
Greg J Moore	W. Edmonds.	4784

DAILY OPERATIONS REPORT (HYDRO)

CLIENT SAGASCO /BHP	JOB No. HY 11074/5	DATE 12/5/95
LOCATION ADELAIDE	VESSEL MRV `NGERIN	

FROM	TO	SUMMARY OF OPERATIONS
0800	2100	MOBILISING VESSEL WITH ALL EQUIPMENT

EQUIPMENT	NUMBER	EQUIPMENT	NUMBER	PERSONNEL	TITLE
				AS PER 11/5/95	
				+ B. EDMONDS	BHP CLIENT REP
CONSUMABLES					
VEHICLE	1 X HIRE CAR				
ACCOMMODATION					

AUTHORISED CONTRACT CHANGES/COMMENTS

PARTY CHIEFS SIGNATURE	CLIENT REPRESENTATIVES SIGNATURE	DOR
Greg J Moore	W. Edmonds.	4785

DAILY OPERATIONS REPORT (HYDRO)

CLIENT ~~BHP~~/SAGASCO/BHP	JOB No. HY 11074/5	DATE 13/5/95
LOCATION ADELAIDE – TRANSIT	VESSEL MRV 'NGERIN'	

FROM	TO	SUMMARY OF OPERATIONS
0730	2000	CONTINUE MOBILISATION - PREPARE FOR
		TRANSIT – ALL EQUIPMENT MOBILISED AND
		TESTED
2000	2400	TRANSIT TO 'SOPHIA JANE' SITE

EQUIPMENT	NUMBER	EQUIPMENT	NUMBER	PERSONNEL	TITLE
STARFIX II POSITIONING SYSTEM			x2	G. MOORE	SURVEYOR/PC
PCNAV NAVIGATION SYSTEM			x2	G. ROSS	SURVEYOR
EG&G SIDE SCAN SONAR SYSTEM			x2	L. ETHERIDGE	ENGINEER
GEOPULSE BOOMER SYSTEM			x1	H. CAMPIGLI	ENGINEER
EG&G BOOMER SYSTEM			x1	D. KHOO	GEOPHYSICIST
DESO 20 & 25 ECHO SOUNDER			x1	B. EDMONDS	BHP CLIENT REP
HEAVE COMPENSATOR (TSS 333)			x1		
DROP CORER & GRAB SAMPLER			x1		
CONSUMABLES					
VEHICLE	1x HIRE CAR				
ACCOMMODATION					

AUTHORISED CONTRACT CHANGES/COMMENTS

PARTY CHIEFS SIGNATURE	CLIENT REPRESENTATIVES SIGNATURE	DOR
Greg J Moore	W. Edmonds	4786

DAILY OPERATIONS REPORT (HYDRO)

CLIENT	SAGASCO	JOB No.	HY 11074	DATE	14/5/95
LOCATION	IN TRANSIT – ROBE	VESSEL	MRV 'NGERIN'		

FROM	TO	SUMMARY OF OPERATIONS
0000	1700	TRANSIT TO ~~SARAH~~ SOPHIA JANE LOCATION
1700	1830	TRANSIT TO ROBE FOR SHELTER
1830	2400	WEATHER STANDBY – AT ANCHOR AT ROBE

EQUIPMENT	NUMBER	EQUIPMENT	NUMBER	PERSONNEL	TITLE
AS PER 13/5/95				AS PER 13/5/95	
CONSUMABLES					
VEHICLE					
ACCOMMODATION					

AUTHORISED CONTRACT CHANGES/COMMENTS

PARTY CHIEFS SIGNATURE	CLIENT REPRESENTATIVES SIGNATURE	DOR
Greg J Moore	W. Edwards.	4787

DAILY OPERATIONS REPORT (HYDRO)

CLIENT	JOB No.	DATE
SAGASCO	HY/11074	15/5/95
LOCATION ROBE – SOPHIA JANE	VESSEL MRV 'NGERIN'	

FROM	TO	SUMMARY OF OPERATIONS
0000	0530	WEATHER STANDBY – AT ANCHOR AT ROBE
0530	0700	TRANSIT TO SOPHIA JANE
0700	1030	DEPLOY & CALIBRATE ALL EQUIPMENT
1030	2400	RUNNING LINES AT SOPHIA JANE SITE

EQUIPMENT	NUMBER	EQUIPMENT	NUMBER	PERSONNEL	TITLE
AS PER 13/5/95				AS PER 13/5/95	
CONSUMABLES					
VEHICLE					
ACCOMMODATION					

AUTHORISED CONTRACT CHANGES/COMMENTS

PARTY CHIEFS SIGNATURE	CLIENT REPRESENTATIVES SIGNATURE	DOR
Greg T Moore	W. Edmunds.	4788

DAILY OPERATIONS REPORT (HYDRO)

CLIENT BAGASCO / BHP	JOB No. HY11074/5	DATE 16/5/95
LOCATION SOPHIA JANE – TRANSIT	VESSEL MRV NGERIN	

FROM	TO	SUMMARY OF OPERATIONS
0000	0200	RUNNING LINES AT SOPHIA JANE LOCATION
0200	0500	SEABED SAMPLING AT SOPHIA JANE
0500	2400	TRANSIT TO CONAN LOCATION

EQUIPMENT	NUMBER	EQUIPMENT	NUMBER	PERSONNEL	TITLE
AS PER 13/5/95				AS PER 13/5/95	
CONSUMABLES					
VEHICLE					
ACCOMMODATION					

AUTHORISED CONTRACT CHANGES/COMMENTS

PARTY CHIEFS SIGNATURE	CLIENT REPRESENTATIVES SIGNATURE	DOR
Greg J Moore	W. Edmund.	4789

DAILY OPERATIONS REPORT (HYDRO)

CLIENT BHP	JOB No. HY11075	DATE 17/5/95
LOCATION TRANSIT – CONAN	VESSEL MR V'NGERIN	

FROM	TO	SUMMARY OF OPERATIONS
0000	0100	CONTINUE TRANSIT TO CONAN LOCATION
0100	0300	DEPLOY & CALIBRATE ALL EQUIPMENT
0300	2400	RUNNING LINES AT CONAN LOCATION

EQUIPMENT	NUMBER	EQUIPMENT	NUMBER	PERSONNEL	TITLE
AS PER 13/5/95				AS PER 13/5/95	
CONSUMABLES					
VEHICLE					
ACCOMMODATION					

AUTHORISED CONTRACT CHANGES/COMMENTS

PARTY CHIEFS SIGNATURE	CLIENT REPRESENTATIVES SIGNATURE	DOR
Greg J Moore	W. Edmonds.	4790

DAILY OPERATIONS REPORT (HYDRO)

CLIENT BHP	JOB No. HY 11075	DATE 18/5/95
LOCATION CONAN	VESSEL MRV 'NGERIN'	

FROM	TO	SUMMARY OF OPERATIONS
0000	2400	RUNNING LINES AT CONAN LOCATION

EQUIPMENT	NUMBER	EQUIPMENT	NUMBER	PERSONNEL	TITLE
STARFIX II	POSITIONING SYSTEM		x2	G. MOORE	SURVEYOR/PC
PCNAV NAVIGATION SYSTEM			x2	G. ROSS	SURVEYOR
EG&G SIDE SCAN SONAR SYSTEM			x2	L. ETHERIDGE	ENGINEER
GEOPULSE BOOMER SYSTEM			x1	H. CAMPIGLI	ENGINEER
EG&G BOOMER SYSTEM			x1	D. KHOO	GEOPHYSICIST
DESO 20 & 25 ECHO SOUNDER			x1	B. EDMONDS	BHP CLIENT REP
HEAVE COMPENSATOR (TSS337)			x1		
SVP-16 VELOCITY PROFILER			x1		
~~CONSUMABLES~~ DROP CORER & GRAB SAMPLER			x1		
VEHICLE					
ACCOMMODATION					

AUTHORISED CONTRACT CHANGES/COMMENTS

PARTY CHIEFS SIGNATURE	CLIENT REPRESENTATIVES SIGNATURE	DOR
Greg J Moore	N. Edmonds,	4101

DAILY OPERATIONS REPORT (HYDRO)

CLIENT BHP	JOB No. HY 11075	DATE 19/5/95
LOCATION CONAN – LYDIA	VESSEL MRV 'NGERIN'	

FROM	TO	SUMMARY OF OPERATIONS
0000	0500	RUNNING LINES AT CONAN
0500	0600	TRANSIT TO LYDIA
0600	2400	RUNNING LINES AT LYDIA

EQUIPMENT	NUMBER	EQUIPMENT	NUMBER	PERSONNEL	TITLE
AS PER 18/5/95				AS PER 18/5/95	
CONSUMABLES					
VEHICLE					
ACCOMMODATION					

AUTHORISED CONTRACT CHANGES/COMMENTS

PARTY CHIEFS SIGNATURE	CLIENT REPRESENTATIVES SIGNATURE	DOR
Greg T Moore	W. Edmunds.	4102

DAILY OPERATIONS REPORT (HYDRO)

CLIENT BHP	JOB No. HY 11075	DATE 20/5/95
LOCATION LYDIA - CONAN-CHAMP	VESSEL MRV NGERIN	

FROM	TO	SUMMARY OF OPERATIONS
0000	1130	RUNNING LINES AT LYDIA
1130	1330	SEABED SAMPLING AT LYDIA
1330	1430	TRANSIT TO CONAN
1430	1700	SEABED SAMPLING AT CONAN
1700	1930	ECHO SOUNDER REruns - DUE TO PROBLEMS
		WITH HEAVE COMPENSATOR
1930	2200	TRANSIT TO CHAMPION
2200	2300	DEPLOY EQUIPMENT
2300	2400	RUNNING LINES AT CHAMPION

EQUIPMENT	NUMBER	EQUIPMENT	NUMBER	PERSONNEL	TITLE
AS PER 18/5/95				AS PER 18/5/95	
CONSUMABLES					
VEHICLE					
ACCOMMODATION					

AUTHORISED CONTRACT CHANGES/COMMENTS

PARTY CHIEFS SIGNATURE	CLIENT REPRESENTATIVES SIGNATURE	DOR
Greg J Moore	W. Edmond.	4103

DAILY OPERATIONS REPORT (HYDRO)

CLIENT BHP	JOB No. HY11075	DATE 21/5/95
LOCATION CHAMPION	VESSEL MRV 'NGERIN'	

FROM	TO	SUMMARY OF OPERATIONS
0900	2400	RUNNING LINES AT CHAMPION LOCATION

EQUIPMENT	NUMBER	EQUIPMENT	NUMBER	PERSONNEL	TITLE
AS PER 18/5/95				AS PER 18/5/95	
CONSUMABLES					
VEHICLE					
ACCOMMODATION					

AUTHORISED CONTRACT CHANGES/COMMENTS

PARTY CHIEFS SIGNATURE	CLIENT REPRESENTATIVES SIGNATURE	DOR
Greg J Moore	N. Edmunds.	4104

DAILY OPERATIONS REPORT (HYDRO)

CLIENT BHP	JOB No. HY 11075	DATE 22/5/95
LOCATION CHAMPION - TRANSIT	VESSEL	

FROM	TO	SUMMARY OF OPERATIONS
0000	1500	RUNNING LINES AT CHAMPION
1500	1700	SEABED SAMPLING AT CHAMPION
1700	2400	TRANSIT TO ADELAIDE

EQUIPMENT	NUMBER	EQUIPMENT	NUMBER	PERSONNEL	TITLE
AS PER	18/5/95			AS PER 18/5/95	
CONSUMABLES					
VEHICLE					
ACCOMMODATION					

AUTHORISED CONTRACT CHANGES/COMMENTS

PARTY CHIEFS SIGNATURE	CLIENT REPRESENTATIVES SIGNATURE	DOR
Greg J Moore	M. Edmonds.	4105

DAILY OPERATIONS REPORT (HYDRO)

CLIENT BHP	JOB No. HY11075	DATE 23/5/95
LOCATION TRANSIT	VESSEL	

FROM	TO	SUMMARY OF OPERATIONS
0000	2400	TRANSIT TO ADELAIDE

EQUIPMENT	NUMBER	EQUIPMENT	NUMBER	PERSONNEL	TITLE
AS PER	18/5/95			AS PER 18/5/95	
CONSUMABLES					
VEHICLE					
ACCOMMODATION					

AUTHORISED CONTRACT CHANGES/COMMENTS

PARTY CHIEFS SIGNATURE	CLIENT REPRESENTATIVES SIGNATURE	DOR
Greg J Moore	W. Edmonds.	4106

DAILY OPERATIONS REPORT (HYDRO)

CLIENT BHP	JOB No. HY 11075	DATE 24/5/95
LOCATION TRANSIT - ADELAIDE	VESSEL MRV NGERIN	

FROM	TO	SUMMARY OF OPERATIONS
0000	0800	TRANSIT TO ADELAIDE
0800		ALONGSIDE AT SARDI - DEMOBB ACTIVITIES

EQUIPMENT	NUMBER	EQUIPMENT	NUMBER	PERSONNEL	TITLE
AS PER	18/5/95			AS PER 18/5/95	
CONSUMABLES					
VEHICLE					
ACCOMMODATION					

AUTHORISED CONTRACT CHANGES/COMMENTS

PARTY CHIEFS SIGNATURE	CLIENT REPRESENTATIVES SIGNATURE	DOR
Greg J Moore	W. Edmunds.	4107

APPENDIX B

STATION DESCRIPTIONS

Date : 14/11/94

SURVEY STATION DESCRIPTION

STARFIX Ref. No.

Station Name ADELAIDE DGPS	Latitude 34° 56' 31.5274" S Longitude 138° 36' 25.4674" E
Nearest Town Adelaide	Spheroid WGS 84 Datum
County/State South Australia	Grid System Zone C.M.
Country Australia	Grid Co-ordinates
Map Sheet	Ell. Height of Point 52.410 Units : metres Datum :
Occupiable ? GPS only	Estimated Accuracy Position :

Source
Fugro Surveys Australia STARFIX GPS campaign
Date of Source

Method of Fix
GPS static baselines from PORT STANVAC and HENLEY

Surveyed by	Entered by	Date
Fugro Surveys, Perth	J. Beekman	14/11/94

Description of Mark
Phase centre of GPS antenna

Photo Ref. :

Astronomic Bearings to	Description	Distance	Deg.	Min.	Sec.

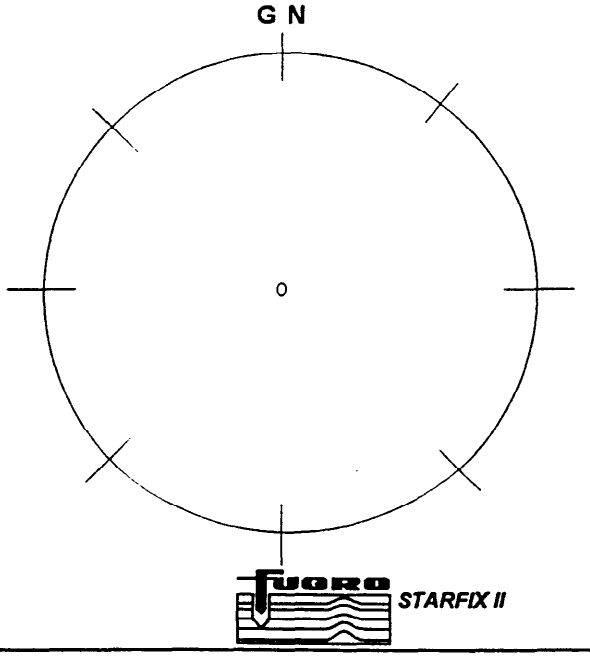
PERMISSION and ACCESS

Owner/Agent
AUSLIG
7 Unley Road
Parksida, SA 5061

Contact
Trevor Forgan
Tel: 08 213 2082
Fax: 08 213 2377

Other
After Hours
Peter Rumbold
Tel: 08 271 0103

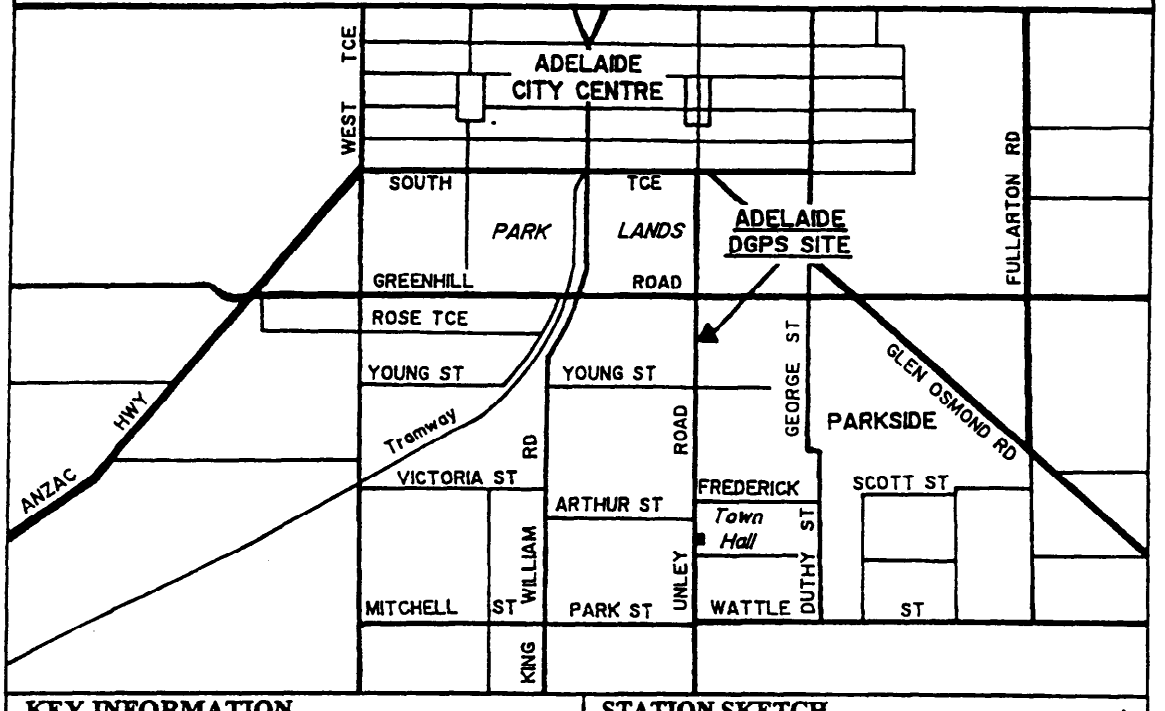
VISIBILITY :



SURVEY STATION DESCRIPTION

SITE & ACCESS PLAN
Scale : NTS

Station Name : ADELAIDE DGPS



KEY INFORMATION

B - boat access

C - nearest camping

F - fuel

H - helicopter landing

M - mains power

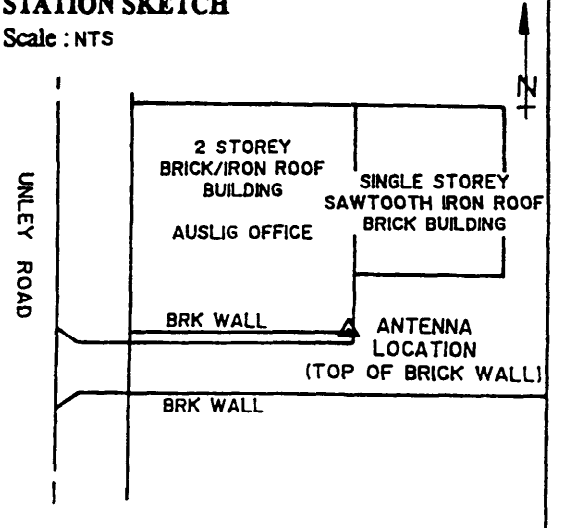
P - nearest parking

R - reference object

S - shops

T - telephone

STATION SKETCH
Scale : NTS



ACCESS THROUGH AUSLIG OFFICE
ON TO SINGLE STOREY ROOF
THEN UP LADDER TO TOP
OF 2 STOREY SECTION

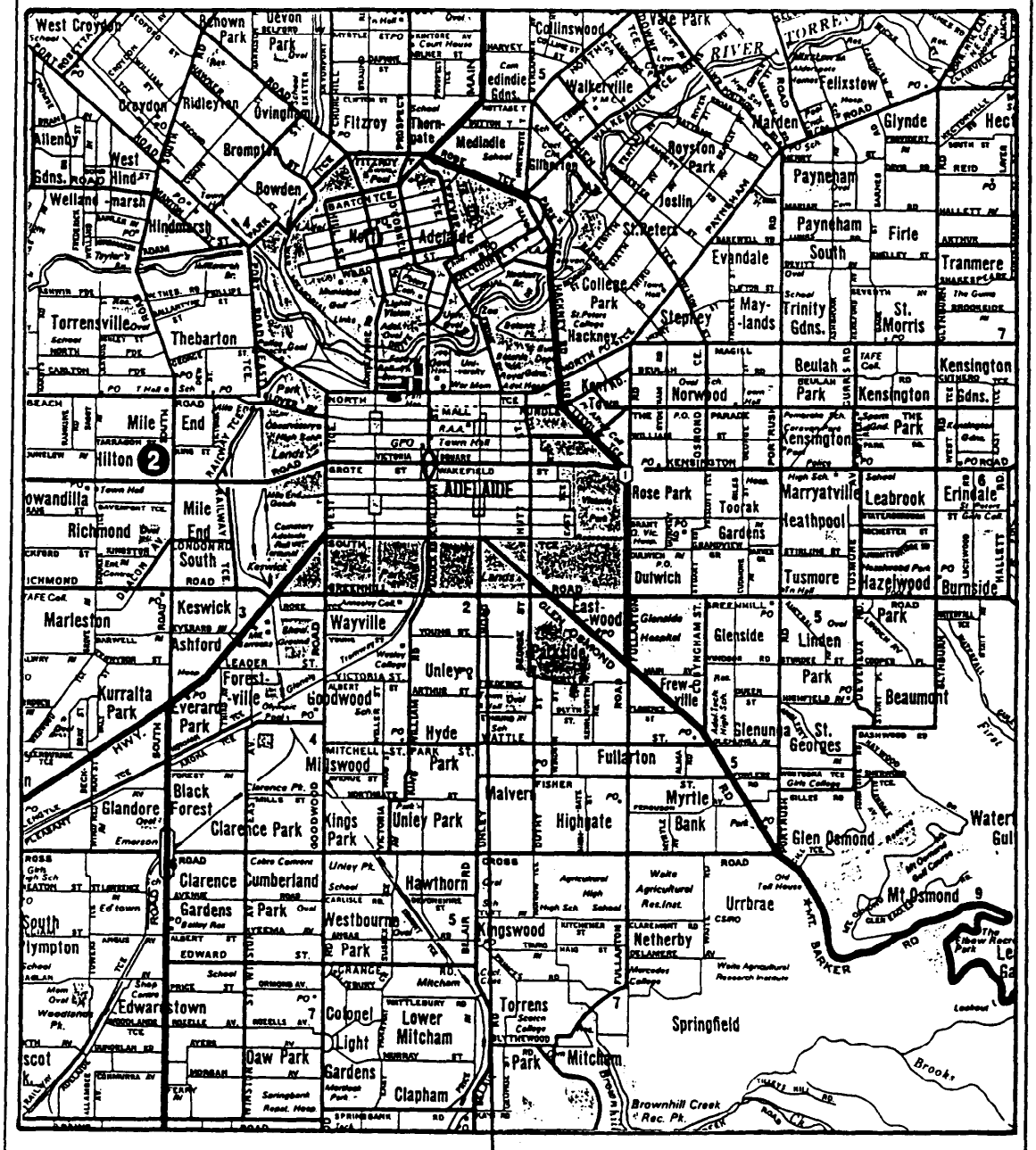
Route from :

General Information

Fugro STARFIX II

SURVEY STATION DESCRIPTION

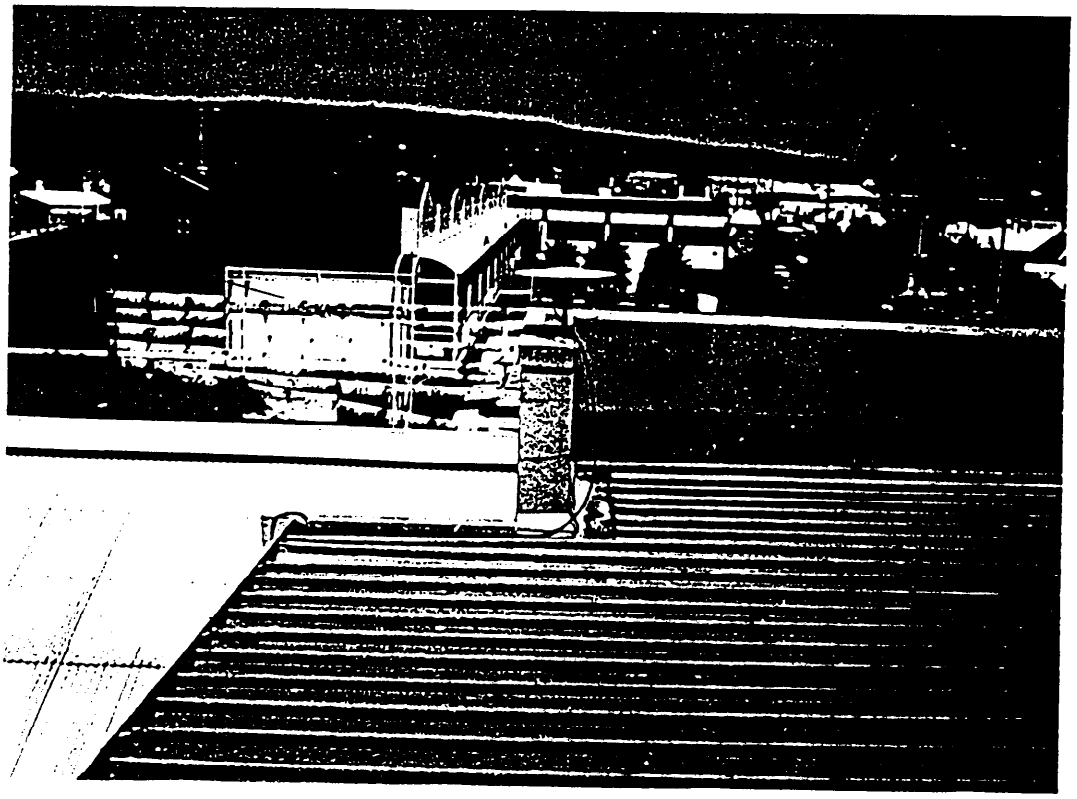
PHOTOGRAPHS & MAPS Station name :



ADELAIDE
DGPS SITE

FUGRO STARFIX II

PHOTOGRAPHS & MAPS Station name :



ADELAIDE
ANTENNA
LOCATION

FUGRO STARFIX II

Date : 14/11/94

SURVEY STATION DESCRIPTION

STARFIX Ref. No.

Station Name MELBOURNE DGPS	Latitude 38° 27' 53.3667" S Longitude 144° 54' 56.8863" E
Nearest Town Rosebud	Spheroid WGS 84 Datum
County/State Victoria	Grid System Zone C.M.
Country Australia	Grid Co-ordinates
Map Sheet	Ell. Height of Point 145.367 Units : metres Datum :
Occupiable ? GPS only	Estimated Accuracy Position : Level :
Source Fugro Survey Australia STARFIX GPS campaign Date of Source	
Method of Fix Static GPS baselines from CAPE SCHANCK and ARTHUR'S SEAT	
Surveyed by Fugro Surveys Entered by J. Beekman Date 14/11/94	
Description of Mark Phase centre of GPS antenna Photo Ref. :	

Astronomic Bearings to	Description	Distance	Deg.	Min.	Sec.

PERMISSION and ACCESS

Owner/Agent

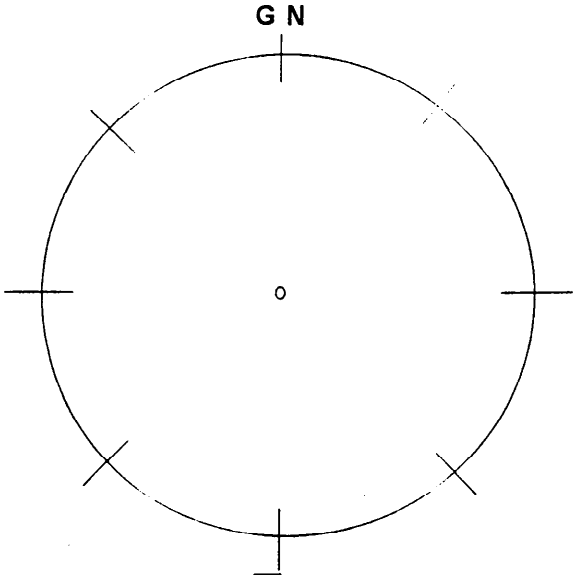
Telstra MS & RS
Melbourne Radio
Boneo Road
Cape Schanck via Rosebud
Victoria, 3939

Contact

Mike Greenwood
Tel: 059 886 213
Fax: 059 886 555

Other

VISIBILITY :



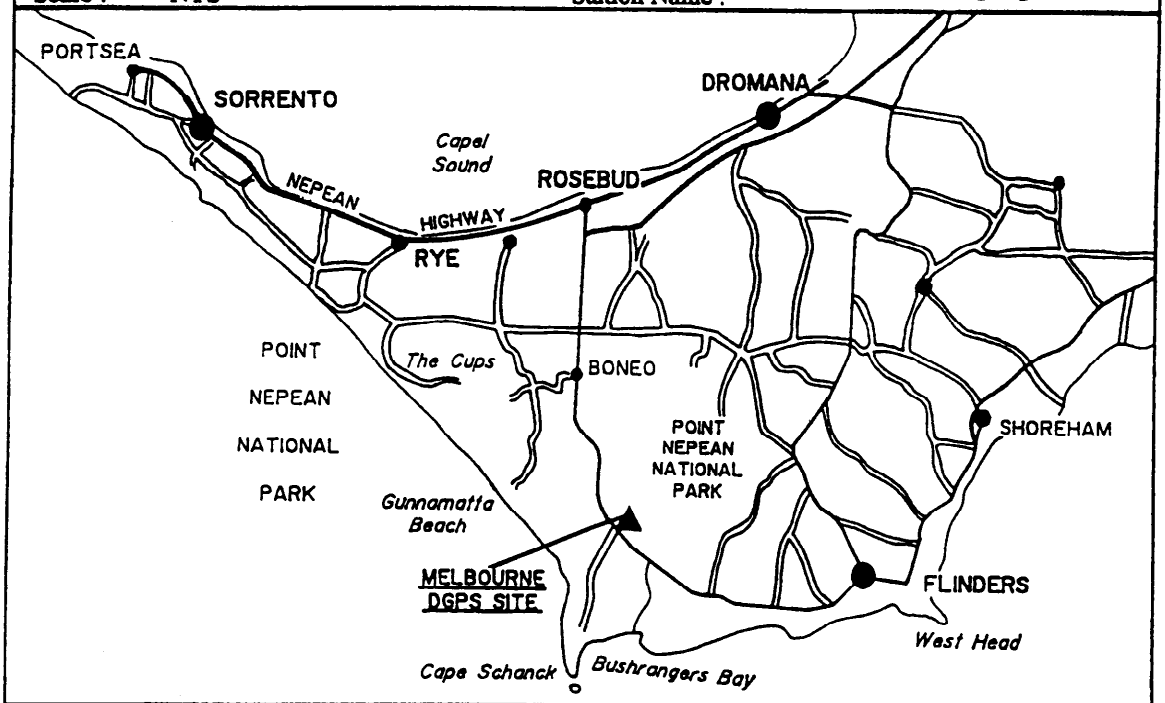
Fugro STARFIX II

SURVEY STATION DESCRIPTION

SITE & ACCESS PLAN

Scale : NTS

Station Name : MELBOURNE DGPS



KEY INFORMATION

B - boat access

C - nearest camping

F - fuel

H - helicopter landing

M - mains power

P - nearest parking

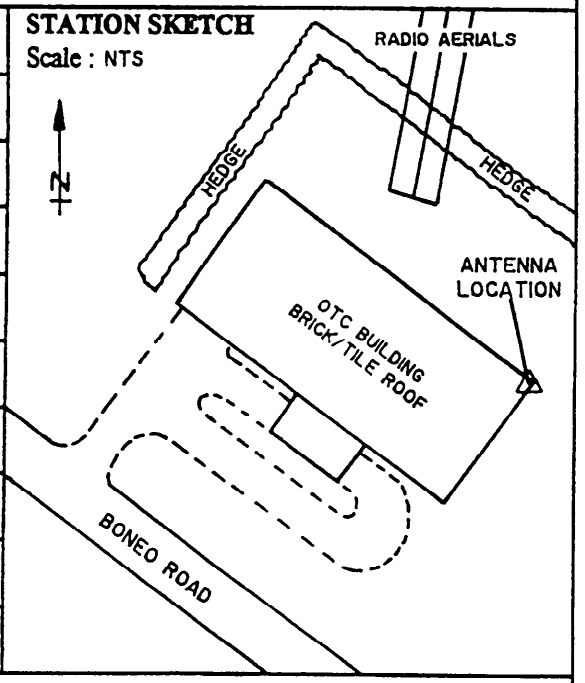
R - reference object

S - shops

T - telephone

STATION SKETCH

Scale : NTS

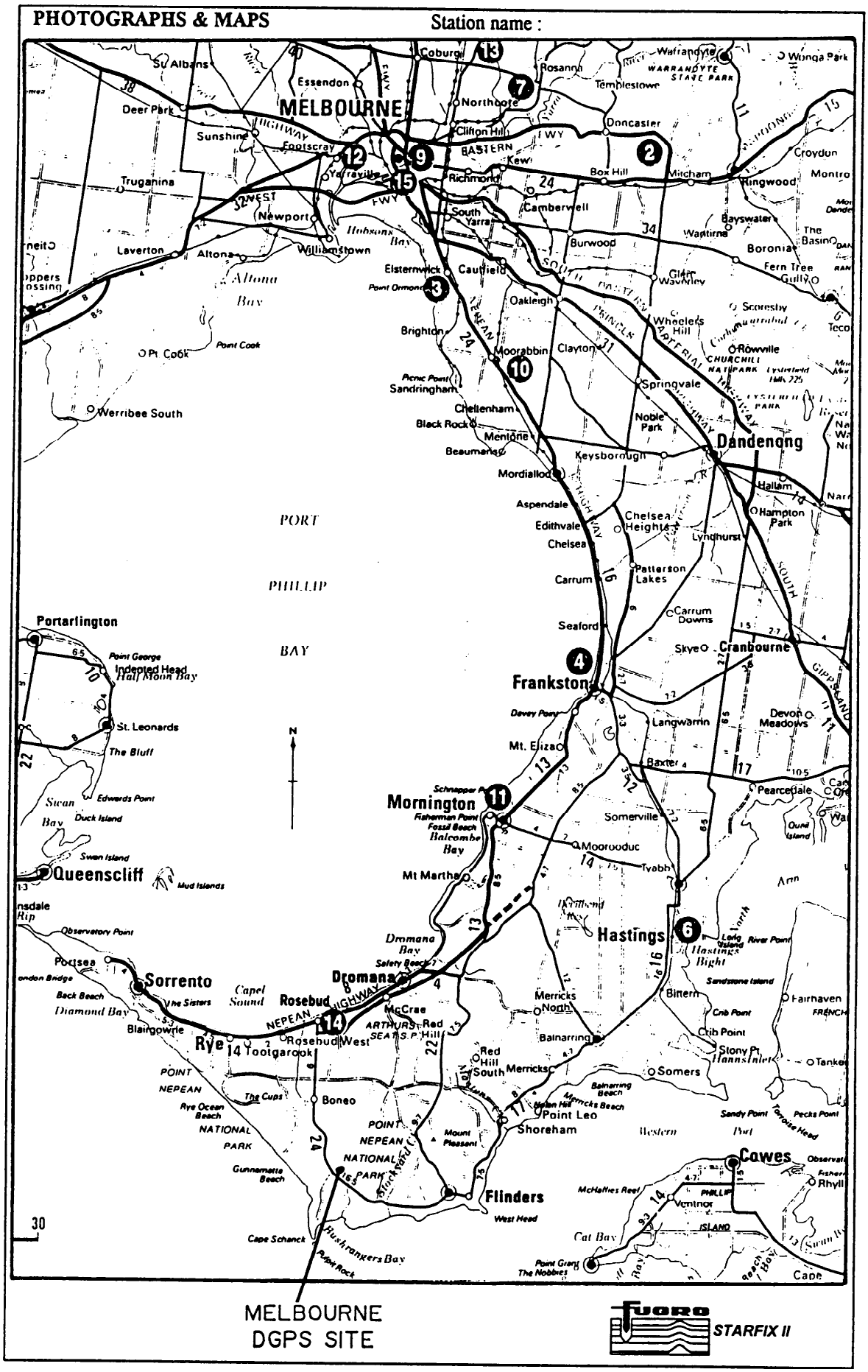


Route from :

General Information

Fugro STARFIX II

PHOTOGRAPHS & MAPS Station name :



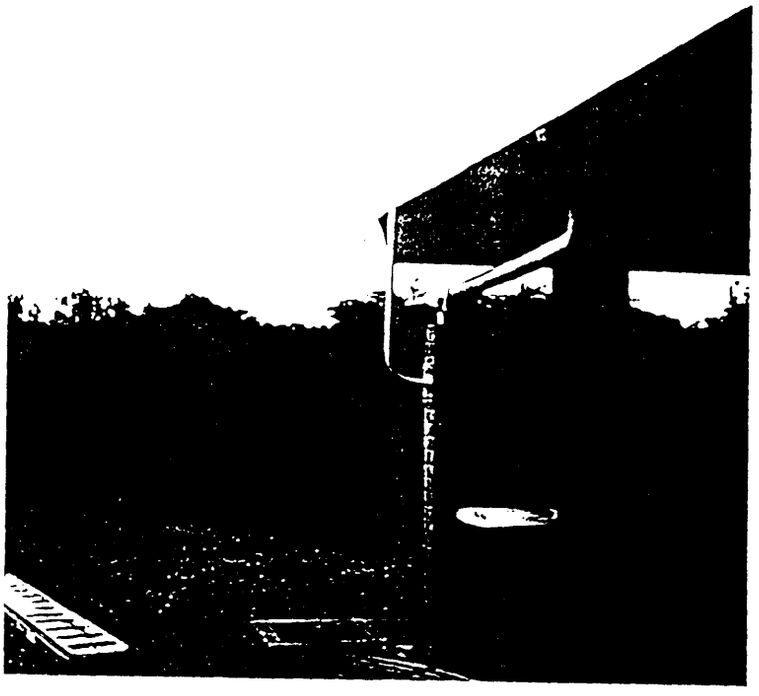
MELBOURNE DGPS SITE

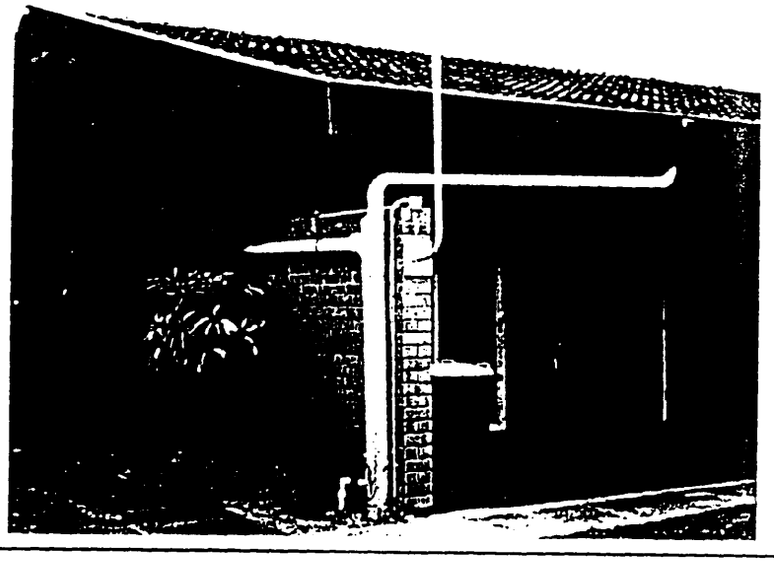
STARFIX II

PHOTOGRAPHS & MAPS

Station name :

MELBOURNE
ANTENNA
LOCATION





FUGRO STARFIX II

APPENDIX C

GYRO CALIBRATION

GYRO CALIBRATION

13 May 1995 08:15:47 Start Logging :- POINT 1

Time	Fix	Easting	Northing	Gyro
08:15:46.32	136	821966.2	6142059.8	284.7
08:16:16.37	137	821966.1	6142059.9	284.7
08:16:46.36	138	821966.1	6142059.9	284.7
08:17:16.35	139	821966.0	6142060.0	284.7
08:17:46.34	140	821965.8	6142059.6	284.9
08:18:16.33	141	821965.7	6142059.6	284.7
08:18:46.37	142	821965.8	6142059.7	284.7
08:19:16.36	143	821965.8	6142059.8	284.7
08:19:46.35	144	821965.8	6142060.0	284.9
08:20:16.34	145	821965.9	6142060.0	284.9
08:20:46.33	146	821966.0	6142060.4	284.9
08:21:16.32	147	821966.2	6142060.4	284.7
08:21:46.36	148	821966.1	6142060.2	284.7
08:22:16.35	149	821966.4	6142060.3	284.7
08:22:46.34	150	821966.3	6142060.3	284.7
08:23:16.33	151	821966.6	6142060.6	284.7
08:23:46.32	152	821966.5	6142060.4	284.7
08:24:16.36	153	821966.5	6142060.2	284.7
08:24:46.35	154	821966.5	6142060.0	284.7
08:25:16.34	155	821966.7	6142060.4	284.7
08:25:46.33	156	821966.5	6142060.5	284.7
08:26:16.32	157	821966.4	6142060.4	284.7
08:26:46.36	158	821966.2	6142060.2	284.7
08:27:16.35	159	821966.0	6142060.2	284.7
08:27:46.34	160	821966.0	6142060.4	284.7
08:28:16.33	161	821966.0	6142060.2	284.9
08:28:46.32	162	821966.0	6142060.7	284.9
08:29:16.37	163	821966.2	6142060.3	284.9
08:29:46.35	164	821967.3	6142059.2	284.9
08:30:16.34	165	821966.2	6142060.0	284.9
08:30:46.33	166	821966.6	6142060.2	285.0
08:31:16.32	167	821966.3	6142060.0	285.2
08:31:46.37	168	821965.4	6142060.4	284.9
08:32:16.36	169	821966.3	6142060.4	284.9
08:32:46.35	170	821966.4	6142060.4	285.0
08:33:16.33	171	821966.4	6142060.1	285.0
08:33:46.32	172	821966.4	6142060.2	285.0
08:34:16.37	173	821966.3	6142060.2	284.9
08:34:46.36	174	821966.3	6142060.3	284.9
08:35:16.35	175	821966.2	6142060.5	285.0
08:35:46.34	176	821966.0	6142060.6	285.0
08:36:16.33	177	821966.5	6142060.6	284.9
08:36:46.37	178	821966.5	6142060.7	285.2
08:37:16.36	179	821966.5	6142060.6	285.0
08:37:46.35	180	821966.6	6142060.4	285.0
08:38:16.34	181	821967.1	6142060.7	285.0
08:38:46.33	182	821967.1	6142060.4	285.2
08:38:56.27	183	821966.9	6142060.2	285.0

13 May 1995 08:38:57 End Logging :-

Mean of entries POINT 1 821966.3 6142060.2 284.9

13 May 1995 08:46:22 Start Logging :- POINT 2

Time	Fix	Easting	Northing	Gyro
08:46:21.71	186	821949.3	6142064.1	285.2
08:46:51.76	187	821949.2	6142064.1	284.9
08:47:21.75	188	821949.3	6142064.3	284.9
08:47:51.74	189	821949.2	6142064.3	284.9
08:48:21.73	190	821949.2	6142064.5	284.9
08:48:51.72	191	821948.9	6142065.0	284.9
08:49:21.71	192	821949.2	6142065.2	285.0
08:49:51.75	193	821948.9	6142065.7	285.0
08:50:21.74	194	821949.1	6142065.7	284.9
08:50:51.73	195	821949.5	6142065.6	285.2
08:51:21.72	196	821949.5	6142065.4	285.5
08:51:51.71	197	821949.8	6142065.2	285.5
08:52:21.75	198	821950.0	6142064.9	285.2
08:52:51.74	199	821950.1	6142064.8	285.0
08:53:21.73	200	821950.1	6142064.6	285.2
08:53:51.72	201	821950.1	6142064.6	286.0
08:54:21.71	202	821950.5	6142064.4	286.0
08:54:51.75	203	821950.6	6142064.0	286.2
08:55:21.74	204	821950.8	6142063.8	286.0
08:55:51.73	205	821950.2	6142064.1	285.2
08:56:21.72	206	821950.3	6142064.5	285.4
08:56:51.71	207	821950.2	6142064.6	284.9
08:57:21.75	208	821950.6	6142065.0	285.2
08:57:51.74	209	821950.6	6142064.8	285.0
08:58:21.73	210	821951.0	6142066.6	285.0
08:58:51.72	211	821951.1	6142066.4	285.2
08:59:21.71	212	821951.5	6142065.5	285.4
08:59:51.76	213	821951.1	6142065.5	285.0
09:00:21.74	214	821950.8	6142064.4	285.4
09:00:51.73	215	821950.3	6142064.3	285.2
09:01:21.72	216	821950.7	6142065.7	285.2

09:10:17 End Logging :-

Mean of entries POINT 2	821950.1	6142064.9	285.2
Mean of entries POINT 1 & 2			285.0

GRID BEARING POINT 1 TO 2	286.2
CONVERGENCE	-2.0

AZIMUTH POINT 1 TO 2	284.2
GYRO READING	285.0

CORRECTION	-0.8

APPENDIX D

VELOCITY PROBE RESULTS

CONAN AND LYDIA SITE SURVEYS
AML SOUND VELOCITY PROFILER S/N:03037
DATE:950517 TIME:0120
DEPTH OFFSET (M):-0001.5
DEPTH (M) VELOCITY (M/S) TEMP (C)

0001.8,	1506.0,	0014.5
0002.1,	1506.0,	0014.5
0003.6,	1506.0,	0014.5
0005.1,	1506.0,	0014.4
0006.4,	1506.5,	0014.4
0008.2,	1506.5,	0014.4
0009.5,	1506.5,	0014.4
0010.8,	1506.5,	0014.4
0012.1,	1506.5,	0014.4
0013.4,	1506.5,	0014.4
0015.3,	1506.5,	0014.5
0016.4,	1506.5,	0014.5
0017.6,	1506.5,	0014.4
0018.8,	1506.5,	0014.5
0019.9,	1506.5,	0014.5
0021.5,	1506.5,	0014.5
0022.6,	1506.5,	0014.5
0024.2,	1506.5,	0014.5
0026.5,	1506.5,	0014.5
0027.6,	1506.5,	0014.5
0028.8,	1506.3,	0014.4
0030.2,	1506.5,	0014.5
0031.6,	1506.5,	0014.4
0032.8,	1506.5,	0014.4
0034.3,	1506.5,	0014.4
0035.5,	1506.5,	0014.4
0037.2,	1506.5,	0014.4
0038.9,	1506.8,	0014.4
0040.2,	1506.8,	0014.4
0041.3,	1506.8,	0014.4
0042.2,	1507.1,	0014.4
0042.7,	1507.1,	0014.4
0044.7,	1507.1,	0014.4
0045.8,	1507.1,	0014.4
0047.4,	1507.3,	0014.4
0048.7,	1507.1,	0014.4
0050.3,	1507.1,	0014.4
0051.5,	1507.3,	0014.4
0052.6,	1507.1,	0014.4
0053.8,	1507.1,	0014.4
0055.6,	1507.1,	0014.4
0056.8,	1507.1,	0014.4
0058.2,	1507.3,	0014.4
0059.6,	1507.3,	0014.4
0060.6,	1507.1,	0014.4
0061.6,	1507.1,	0014.4
0063.0,	1507.1,	0014.4
0064.7,	1507.1,	0014.4
0065.7,	1507.1,	0014.4
0066.8,	1507.3,	0014.4
0068.3,	1507.1,	0014.4
0070.0,	1507.1,	0014.4

```
0071.7, 1507.3, 0014.4
0072.9, 1507.1, 0014.4
0074.2, 1507.1, 0014.4
0076.1, 1507.1, 0014.4
0077.1, 1507.1, 0014.4
```

DEPTH

Min : 1.8
Max : 77.1

▲ 75.3

TEMPERATURE

Min : 14.4
Max : 14.5

▲ 0.1

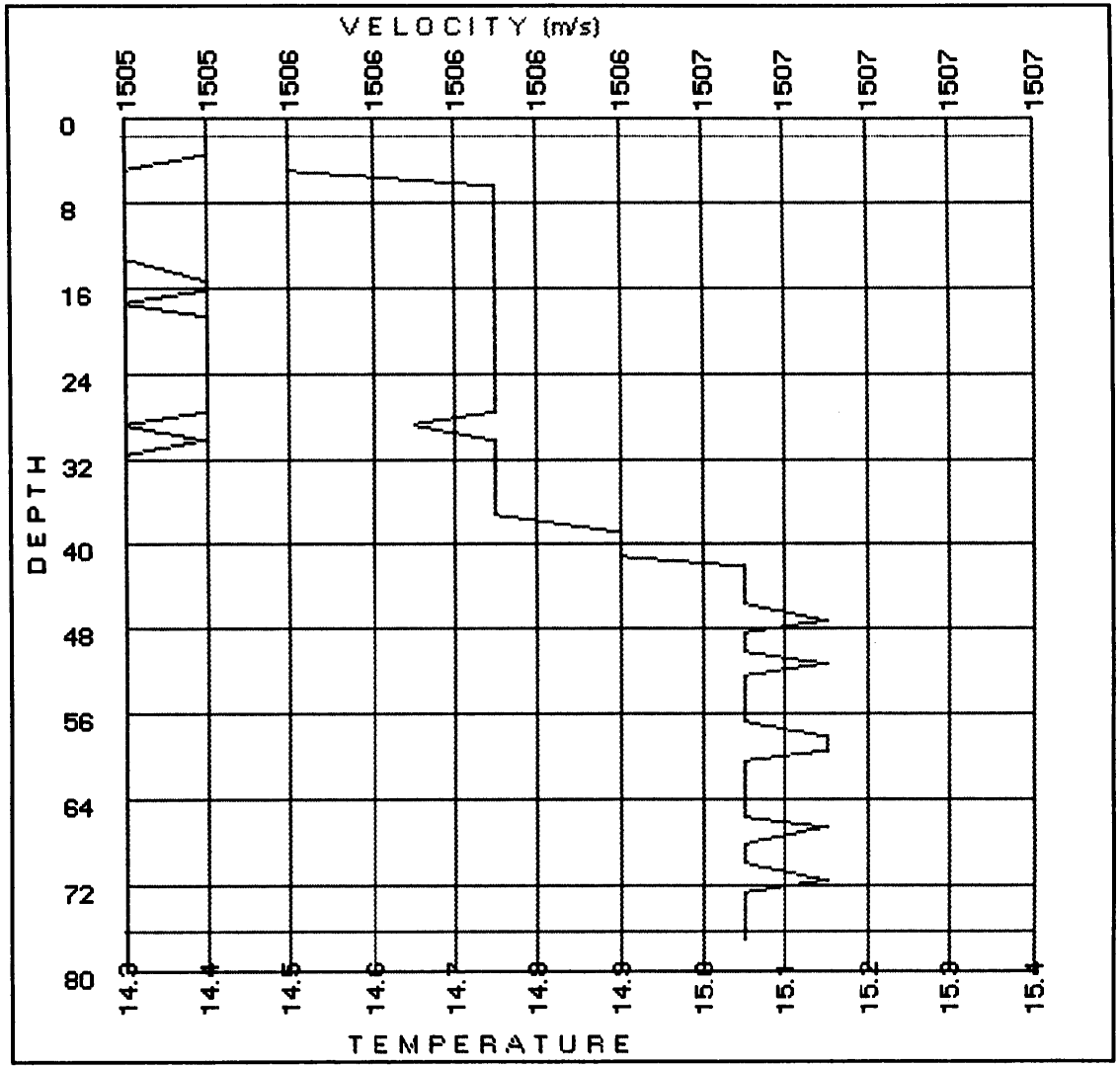
VELOCITY

Min : 1506.0
Max : 1507.3

▲ 1.3

AVERAGE VELOCITY

1506.79 m/sec



CHAMPION SITE SURVEY
AML SOUND VELOCITY PROFILER S/N:03037
DATE:950520 TIME:1200
DEPTH OFFSET (M):-0001.4
DEPTH (M) VELOCITY (M/S) TEMP (C)
0002.0, 1505.7, 0014.5
0002.6, 1505.7, 0014.4
0003.6, 1505.7, 0014.4
0005.2, 1506.5, 0014.4
0006.8, 1507.3, 0014.4
0007.5, 1507.1, 0014.4
0008.3, 1506.3, 0014.4
0009.1, 1507.9, 0014.4
0009.7, 1507.9, 0014.4
0014.2, 1506.8, 0014.4
0019.0, 1506.8, 0014.4
0019.9, 1507.1, 0014.4
0022.8, 1507.3, 0014.4
0023.4, 1506.8, 0014.4
0024.1, 1506.3, 0014.4
0025.3, 1506.8, 0014.4
0026.6, 1507.9, 0014.4
0028.9, 1506.3, 0014.4
0030.5, 1506.5, 0014.4
0032.8, 1506.8, 0014.3
0035.0, 1507.1, 0014.3
0035.5, 1507.1, 0014.3
0036.8, 1507.1, 0014.3
0038.1, 1506.5, 0014.3
0039.2, 1506.5, 0014.3
0040.6, 1506.5, 0014.3
0041.9, 1507.1, 0014.3
0043.3, 1506.5, 0014.3
0045.6, 1506.5, 0014.3
0046.8, 1506.5, 0014.3
0047.9, 1506.5, 0014.3
0049.3, 1506.5, 0014.3
0050.6, 1506.5, 0014.3
0052.1, 1506.5, 0014.3
0053.6, 1506.5, 0014.2
0055.1, 1507.3, 0014.3
0056.9, 1506.5, 0014.2
0058.1, 1506.5, 0014.2
0059.4, 1506.8, 0014.2
0060.7, 1506.5, 0014.2

DEPTH

Min : 2.0
Max : 60.7

▲ 58.7

TEMPERATURE

Min : 14.2
Max : 14.5

▲ 0.3

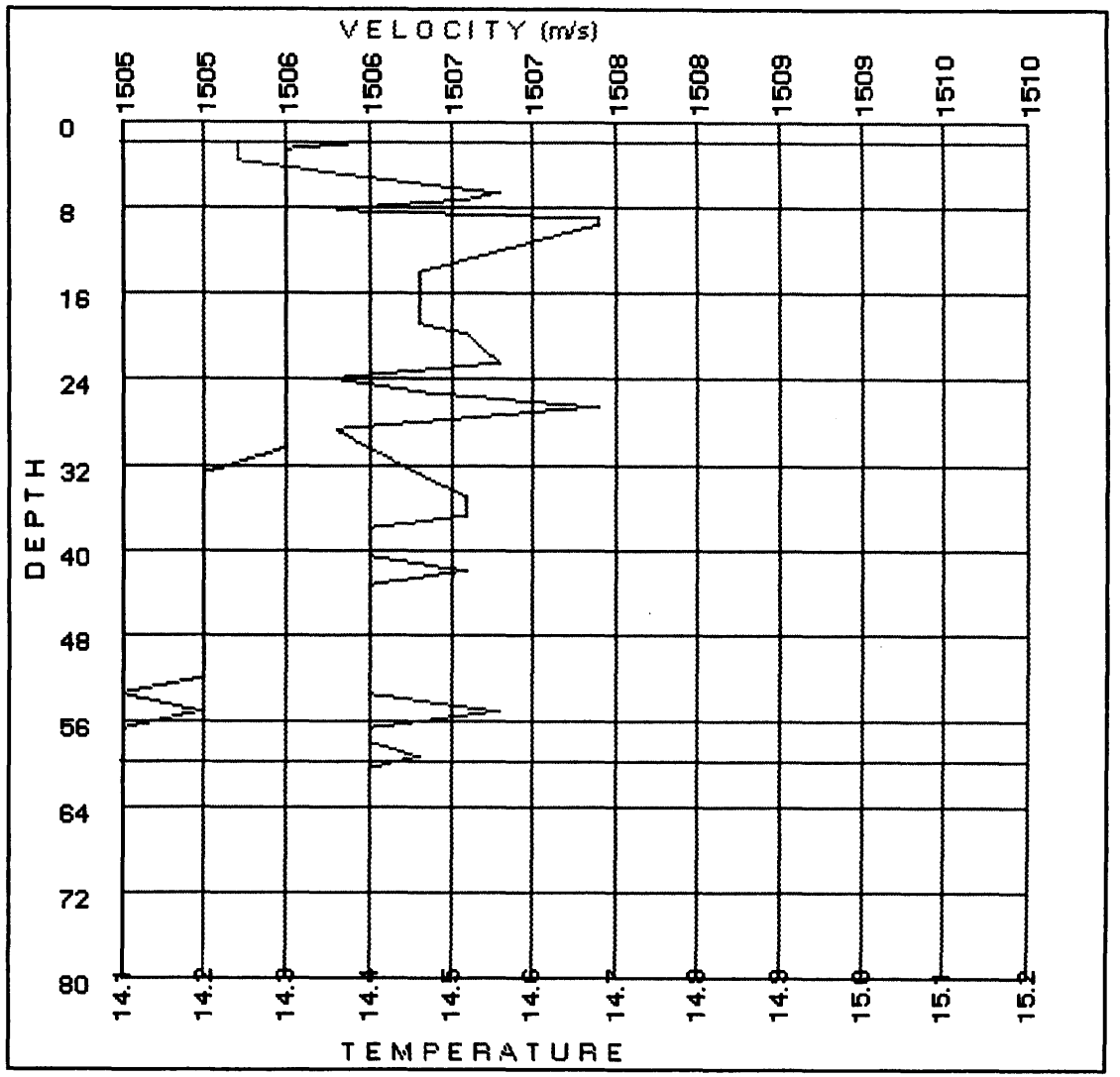
VELOCITY

Min : 1505.7
Max : 1507.9

▲ 2.2

AVERAGE VELOCITY

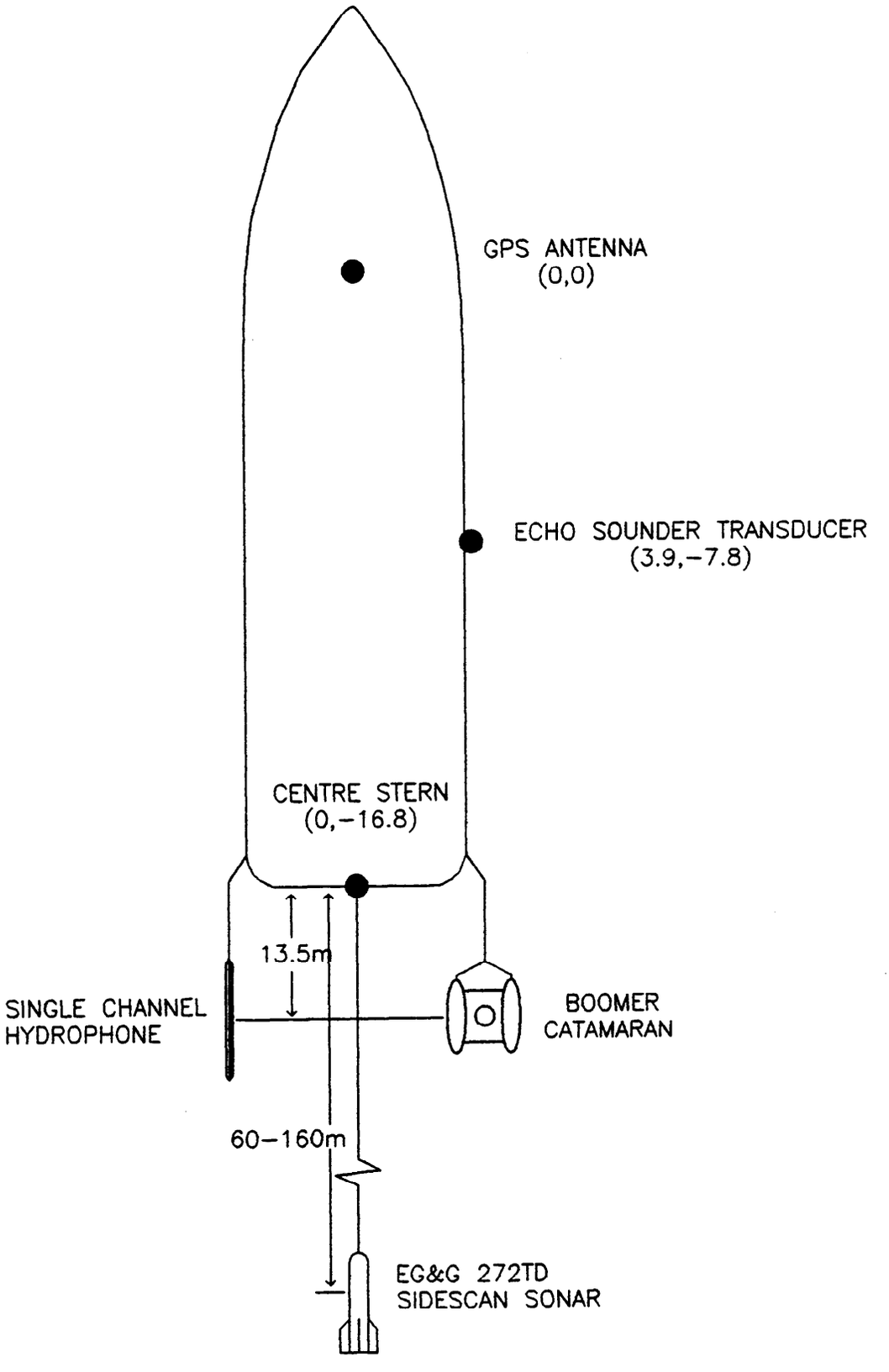
1506.78 m/sec



APPENDIX E

VESSEL OFFSET DIAGRAM

MRV NGERIN



VESSEL OFFSET DIAGRAM

APPENDIX E

APPENDIX F

SURVEY LOGS

3641

FUGRO SURVEY PTY LTD

SURVEY LOG RUN

CLIENT: B.H.P. JOB NO: HT.1075. LOCATION: CONAN

DATE	RUN NO.	START TIME	END TIME	START FIX	END FIX	RPM/ SPEED	DISC. NO.	ECHO ROLL NO.	DIRECTION	HEAVE ON/ OFF	COMMENTS
17-5-4	CO ϕ1	0257	0330	1	49	4.4	137-02	1	36°	ON	Echo Sounder, SSS, Boomer.
	CO ϕ3	0336	0408	50	98	4.5	137-02	1	216°	ON.	" " "
	CO ϕ5	0416	0449	99	147	4.7	137-03	1	36°	ON	" " "
	CO ϕ7	0455	0528	148	195	4.6	137-03	1	216	ON	" " "
	CO ϕ9	0533	0607	196	243	4.7	137-04	1	36°	ON	" " "
	CO 11	0612	0646	244	291	4.8	137-04	1	216°	ON	" " "
	CO 13	0653	0726	292	340	4.7	137-05	1	36	ON	" " "
	CO 15	0731	0804	342	391	4.7	137-05	1	216	ON	" " "
	CO 17	0808	0843	392	441	4.5	137-06	1	36	ON	" " "
	CO 19	0847	0919	442	490	4.6	137-06	1	216	ON	" " "
	CO 21	0923	0955	491	539	4.7	137-07	1	36	ON	" " "
	CO 23	0959	1034	540	588	4.6	137-07/08	1	216	ON	" " "
	CO 25	1038	1112	589	637	4.7	137-08	1	36	ON	" " "
	CO 27	1116	1148	638	686	4.6	137-08/09	1	216	ON	" " "
	CO 29	1152	1227	687	736	4.6	137-09	1	36	ON	" " "
	CO 31	1231	1301	737	785	4.6	137-09/10	1	216	ON	" " "
	CO 33	1306	1341	786	834	4.6	137-10	1	36	ON	" " "
	CO 35	1345	1416	835	883	4.6	137-10/11/12	1	216	ON	" " "
	CO 37	1420	1454	884	932	4.6	137-11	2	36°	ON	" " "

FUGRO

FUGRO SURVEY PTY LTD

3644

SURVEY LOG RUN

CLIENT: BHP JOB NO: HY11075 LOCATION: CONAN STE SURVEY (OTWAY BASIN)

DATE	RUN NO.	START TIME	END TIME	START FIX	END FIX	RPM/ SPEED	DISC. NO.	ECHO ROLL NO.	DIRECTION	HEAVE ON/ OFF	COMMENTS
17/5	C039	1458	1531	933	981	4·7	137-11/12	2	216	ON	E/S, S3S, BOOMER
	C041	1534	1609	982	1030	4·5	137-12	2	36	ON	" " "
	C043	1613	1645	1031	1079	4·6	137-13	2	216	ON	" " " ↓HR
	C045	1650	1723	1080	1128	4·6	137-13/14	2	36	ON	" " "
	C047	1728	1800	1129	1177	4·5	137-14	2	216	ON	" " " NAV CRASH AT END OF LINE
	C049	1813	1846	1178	1226	4·5	137-14/15	2	36	ON	" " "
	C051	1850	1923	1227	1275	4·6	137-15	2	216	ON	" " "
	C053	1927	1959	1276	1324	4·6	137-15/16	2	36	ON	" " "
	C055	2003	2035	1325	1373	4·8	137-16	2	216	ON	" " "
	C057	2039	2111	1374	1422	4·3	137-16/17	2	36	ON	" " "
	C059	2115	2148	1423	1471	4·5	137-17	2	216	ON	" " "
	C061	2151	2223	1472	1520	4·6	137-17/18	2	36	ON	" " "
	C063	2227	2303	1521	1571	4·5	137-18	2	216	ON	" " "
	C065	2307	2340	1572	1620	4·6	137-18	2	36	ON	" " "
18/5	C066	0002	0037	1621	1669	4·7	138-01	2	216	ON	" " "
	C064	0044	0115	1670	1717	4·5	138-01	2	36	ON	" " "
	C062	0119	0153	1718	1767	4·5	138-02	2	216	ON	" " "
	C060	0157	0232	1768	1817	4·4	138-02/03	2	36	ON	" " "
	C058	0236	0310	1818	1867	4·5	138-03	2	216	ON	" " "

CONA 1 / PE900648 / P 157

3646

FUGRO SURVEY PTY LTD

SURVEY LOG RUN

CLIENT: BHP JOB NO: HY 1/075 LOCATION: CONAN (OTWAY BASIN)

DATE	RUN NO.	START TIME	END TIME	START FIX	END FIX	RPM/ SPEED	DISC. NO.	ECHO ROLL NO.	DIRECTION	HEAVE ON/ OFF	COMMENTS
18-5-95	C018	1530	1603	2802	2850	4.7	138-13/14	4	216	ON	E/S, SSS, Boomer
	C016	1608	1643	2851	2901	4.7	138-14	5	36	ON	" " "
	C014	1646	1720	2902	2950	4.6	138-14/15	5	216	ON	" " "
	C012	1724	1757	2951	2999	4-6	138-15	5	36	ON	" " "
	C010	1827	1859	3000	3047	4.6	138-15/16	5	216	ON	" " "
	CO Ø8	1902	1934	3048	3096	4.7	138-16	5	36	ON	" " "
	CO Ø6	1937	2009	3097	3145	4.6	138-16/17	5	216	ON	" " "
	CO Ø4	2011	2043	3146	3195	4.5	138-17	5	36	ON	" " "
	CO Ø2	2047	2119	3196	3244	4.6	138-17/18	5	216	ON	" " "
	CO-X09	2127	2213	3245	3313	4.6	138-18	5	126	ON	" " "
	CO-X08	2219	2306	3314	3371	4.6	138-18	5	306	ON	" " "
	CO-X07	2314	0001	3372	3439	4.6	138-18/139-01	5	126	ON	" " "
19-5-95	CO X06	0007	0057	3440	3508	4.6	139-01	5	306	ON	" " "
	CO X05	0102	0153	3509	3577	4.4	139 01/02	5	126	ON	" " "
	CO X04	0200	0247	3578	3646	4.8	139-02/03	5	306	ON	" " " Nav dropped out intermittently.
	CO X03	0254	0344	3647	3715	4.5	139-03/04	5	126	ON	" " " Abnormal heave applied to Deso
	CO X02	0352	0441	3716	3774	4.6	139 04	6	306	ON	" " " Nav - crash - manual fixes on this
	Rerun							6			Restart + log last 2 km O.K
	CO 22	0506	0540	3775	3823	4.6	139 04/05	6	216	ON	" " "

CONA 1/PE 900648/P 158

3645

FUGRO SURVEY PTY LTD

SURVEY LOG RUN

CLIENT: B.H.P. JOB NO: HY 11079 LOCATION: Conan (Otway Basin)

DATE	RUN NO.	START TIME	END TIME	START FIX	END FIX	RPM/ SPEED	DISC. NO.	ECHO ROLL NO.	DIRECTION	HEAVE ON/ OFF	COMMENTS
18-5	Co 56	0316	0351	1868	1917	4.6	138.03/04	4	36	ON	Echo Sounder, S.S.S, Boomer
	Co 54	0356	0431	1918	1966	4.7	138.04	4	216	ON	" " "
	Co 52	0436	0510	1967	2015	4.6	138.04/05	4	36	ON	" " "
	Co 50	0515	0549	2016	2064	4.8	138.05	4	216	ON	" " "
	Co 48	0554	0629	2065	2113	4.5	138.05/06	4	36	ON	" " "
	Co 46	0632	0706	2114	2162	4.6	138.06	4	216	ON	" " "
	Co 44	0710	0743	2163	2212	4.7	138.06/07	4	36	ON	" " "
	Co 42	0747	0820	2213	2262	4.8	138.07	4	215	ON	" " "
	Co 40	0824	0857	2263	2311	4.6	138.07/08	4	36	ON	" " "
	Co 38	0900	0934	2312	2361	4.7	138.08	4	216	ON	" " "
	Co 36	0939	1013	2362	2410	4.7	138.08/09	4	36	ON	" " "
	Co 34	1018	1053	2411	2459	4.5	138.09	4	216	ON	" " "
	Co 32	1056	1130	2460	2508	4.6	138.10	4	36	ON	" " "
	Co 30	1133	1207	2509	2557	4.6	138.10/11	4	216	ON	" " " (Check heave, no he
	Co 28	1211	1245	2558	2606	4.5	138.11	4	36	OFF	" (No heave) " " irregular heave applie 2541 - hc unplugged.
	Co 26	1249	1320	2607	2652	4.5	138.11/12	4	216	ON	" " "
	Co 24	1336	1408	2653	2701	4.5	138.12	4	36	ON/OFF	" " "
	Co 22	1412	1444	2702	2752	4.5	138.12/13	4	216	ON/OFF	" " "
	Co 20	1451	1526	2753	2801	4.5	138.13	4	36		" " "

FUGRO

FUGRO SURVEY PTY LTD

3650

SURVEY LOG RUN

CLIENT: BHP JOB NO: HY 11075 LOCATION: CONAN

DATE	RUN NO.	START TIME	END TIME	START FIX	END FIX	RPM/ SPEED	DISC. NO.	ECHO ROLL NO.	DIRECTION	HEAVE ON/ OFF	COMMENTS
30/5	C024	1703	1731	2213	2259	5·4	140_12		216	ON	E/S RERUNS HC SHORT PERIOD
	C026	1735	1802	2260	2305	5·5	140_12		36	ON	HC MEDIUM PERIOD
	C028	1806	1832	2306	2351	5·5	140_12/13		216	ON	
	C030	1836	1904	2352	2397	5·2	140_13		36	ON	

APPENDIX G

GEOPHYSICAL LOGS

(21)

GEOPHYSICAL RUN LOG

CLIENT: BHP JOB NO.: HY 110 75 LOCATION: CONAN VESSEL: M/V NEERIN

CONA 1 / PE900648 / P161

DATE	RUN NO.	START TIME	END TIME	START FIX	END FIX	DIRECTION	RECORD QUALITY - INDICATE VARIATIONS/CABLE OUT/FILTER SETTINGS ETC. SYSTEM NO. 1 SMS-260	ROLL	SYSTEM NO. 2 BOOMER	ROLL	E/S OPERATOR ROLL
17-5-95	co39	1458	1530	933	981	216°	CABLE @ 140M	2		2	2
	co41	1535	1609	982	1030	036°		3		2	2
	co43	1613	1645	1031	1079	216°		3		2	2
	co45	1650	1728	1080	1128	036°		3		2	2
	co47	1728	1759	1129	1177	216°		3		2	2
	co49	1812	1845	1178	1226	036°		3		2	2
	co51	1850	1923	1227	1275	216°		3		2	2
	co53	1926	1959	1276	1324	036		3		2	2
	co55	2003	2034	1325	1373	216°		3		2	2
	co57	2038	2111	1374	1422	036		3		2	3
	co59	2115	2146	1423	1471	216		3		2	3
	co61	2151	2222	1472	1520	036		3		2	3
	co63	2227	2305	1521	1571	216		3		2	3
	co65	2307	2340	1572	1620	036		3		2	3
18-5-95	co66	0002	0036	1621	1669	216		4		2	3
	co64	0044	0114	1670	1717	036°		4		2	3
	co62	0118	0153	1718	1767	216°		4		2	3
	co60	0157	0231	1768	1817	036°		4		3	3
	co58	0235	0310	1818	1867	216°		4		3	3

CONA 1 / PE900648 / P 162

GEOPHYSICAL RUN LOG

CLIENT: BHP. JOB NO.: HY11075 LOCATION: CONAN VESSEL: M/V NGERIN

DATE	RUN NO.	START TIME	END TIME	START FIX	END FIX	DIRECTION	RECORD QUALITY - INDICATE VARIATIONS/CABLE OUT/FILTER SETTINGS ETC. SYSTEM NO. 1 SMS-260	ROLL	SYSTEM NO. 2 BOOMER	ROLL	E/S OPERATOR
17.5.95	C001	0257	0330	01	49	036°	CABLE @ 100M	1	CAT 12M H'PHONE 15M.	1	1
"	C003	0335.	0407	50	98	216°	-	1		1	1
"	C005	0416	0448	99	147	036°	CABLE @ 120M	1		1	1
"	C007	0454	0527	148.	195	216°	CABLE @ 140M	1		1	1
"	C009	0533	0607	196	243	036°		1		1	1
	C011	0611	0645	244	291	216		1		1	1
	C013	0650	0725	292	341	036		1		2	1
	C015	0730	0804	342	391	216	CHAN: 11XS	1		1	1
	C017	0807	0841	392	441	036		2		1	1
	C019	0847	0919	442	490	216		2		1	1
	C021	0922	0955	491	539	036		2		1	1
	C023	0954	1033	540	588	216		2		2	1
	C025	1038	1111	589	637	036		2		2	1
	C027	1116	1148	638	686	216		2		2	1
	C029	1152	1229	687	736	036°		2		2	1
	C031	1234	1301	737	785	216°		2		2	1
	C033	1306	1341	786	834	036°		2		2	1
	C035	1345	1416	835	883	216°		2		2	2
	C037	1420	1454	884	932	036°		2		2	2

GEOPHYSICAL RUN LOG

(3)

CLIENT: BHP JOB NO.: HY 11075 LOCATION: CONAN SITE SURVEY VESSEL: M/V NGERIN

DATE	RUN NO.	START TIME	END TIME	START FIX	END FIX	DIRECTION	RECORD QUALITY - INDICATE VARIATIONS/CABLE OUT/FILTER SETTINGS ETC. SYSTEM NO. 1 SMS - 260	ROLL	SYSTEM NO. 2 BOOMER.	ROLL	E/S OPERATOR ROLL
18.5.95	C056	0315.	0350	1868	1917	036°	CABLE @ 140M.	4		3	3
"	C054	0355	0430	1918	1966	216°		4		3	3
"	C052	0435	0509	1967	2015	036°		4		3	4
"	C050	0515.	0549	2016	2064	216°		4		3	4
"	C048	0554	0628	2065	2113	036°		4		3	4
"	C046	0632	0705	2114	2162	216°		4		3	4.
"	C044	0710	0743	2163	2212	036		4		3	4
"	C042	0744	1819	2213	2262	216		5		3	4
"	C040	0824	0857	2263	2311	036		5		3	4
"	C038	0903	0934	2312	2361	216		5		3	4
"	C036	0939	1013	2362	2410	036		5		3	4
"	C034	1017	1051	2411	2459	216		5		3	4
"	C032	1056	1129	2460	2508	036		5		3	4
"	C030	1133	1207	2509	2557	216		5		3	4
"	C028	1212	1244	2558	2606	036		5		4	4
"	C026	1249	1320	2607	2654	216°		5		4	4
"	C024	1335	1408	2653	2701	036°		5		4	4
"	C022	1411	1444	2702	2752	216°		5		4	4
"	C020	1457	1526	2753	2801	036°		5		4	4

CONA 1 /PE900648 /Pi64

GEOPHYSICAL RUN LOG

(4)

CLIENT: BHP JOB NO.: HY 11075 LOCATION: CONAN SITE SURVEY VESSEL: M/V NGERIN

DATE	RUN NO.	START TIME	END TIME	START FIX	END FIX	DIRECTION	RECORD QUALITY - INDICATE VARIATIONS/CABLE OUT/FILTER SETTINGS ETC. SYSTEM NO. 1 SMS-260	ROLL	SYSTEM NO. 2 BOOMER	ROLL	E/S OPERATOR ROLL
18-5-95	C018	1530	1603	2802	2850	216°	CABLE @ 140M	6		4	4
"	C016	1608	1643	2851	2900	036°		6		4	5
"	C014	1646	1720	2907	2950	216°		6		4	5
"	C012	1724	1757	2957	2999	036°		6		4	5
"	C010	1827	1858	3000	3047	216°		6		4	5
"	C008	1902	1934	3048	3096	036°		6		4	5
"	C006	1937	2008	3097	3145	216°		6		4	5
"	C004	2011	2043	3146	3195	036°		6		4	5
"	C002	2042	2118	3196	3244	216°		6		4	5
"	COX09	2127	2212	3245	3313	036°	FIX 03	6		4	5
"	COX08	2219	2310	3314	3371	306		6		4	5
	COX07	2318		3371	3434	126	change to 200m	6		4	5
	COX06		0056	3446	3506	306		7		4	5
	COX05	0101	0153	3509	3577	126	FIX 03 !	7		4	5
	COX04	0200	0247	3578	3646	306		7		4	5
	COX03	0253	0347	3647	3715	126	Near-corp Tos Lost Pos	7		4	5
	COX02	0352	0440	3716	3774	306		7		4	6
	C022	0506	0540	3775	3823	216°		7		4	6
					END	SURVEY.					

GEOPHYSICAL RUN LOG

Echo Sounder Records

CLIENT: B.H.P. JOB NO.: A411075 LOCATION: CONAN VESSEL: MCLELLAN

DATE	RUN NO.	START TIME	END TIME	START FIX	END FIX	DIRECTION	RECORD QUALITY - INDICATE VARIATIONS/CABLE OUT/FILTER SETTINGS ETC.				OPERATOR
							SYSTEM NO. 1	ROLL	SYSTEM NO. 2	ROLL	
20-595	C024	1703	1731	2213	225	216		7			
	C026	1735	1802	2260	2305	36		7			
	C028	1805	1832	2306	2351	216		7			
	C030	1836	1904	2352		36		7			

APPENDIX H

JOB CONFIGURATION PRINT-OUT

16 May 1995 15:56:53 *** FUGRO SURVEY PCNAV SETUP FOR V 3.01 ***

Header :	Location	: CONAN	Vessel	:	MRV NGERIN
	Client	: B.H.P.	Job Number	:	HY11075
	Setup By	: GTM/GR	On	:	16 May 1995
	Filter	: 4	Simulator On	:	No
	Printer On	: Yes	Twin Display	:	Yes
	Time Offset	: 9.5			
Files :	Runline	: CONAN	Centre Line	:	
	Database	:	Vessel	:	NGERIN
	WayPoint	: CON	Anchor	:	
Logging:	Directory	: C:\PCNAV\DATA\	Fix Only	:	No
	Nav 1. Pos	: Yes	O/T 1	:	Yes
	Raw	: Yes	O/T 2	:	Yes
	Nav. 2 Pos	: No	O/T 3	:	Yes
	Raw	: Yes	O/T 4	:	No
	Nav. 3 Pos	: No			
	Raw	: Yes			
	Combined	: No			
Fixing :	Mode	: Distance	Fix Int	:	100
	Start Fix	: 1	Fix Output 1	:	1
			Fix Output 2	:	x 2
Geodesy:	Projection	: Transverse Mercator	(False East	:	500000
	C. Merid.	: 141	North	:	10000000
	Lat. Origin	: 0	Scale Factor	:	.9996
	Spheroid	: ANS	Eccen2	:	0.0066945419
	S.M.A.	: 6378160.000	Flattening	:	298.250000000
Geod 2 :	Parameters	: From WGS84	D Scale	:	-0.0983
	DX	: 116.0000	RX	:	0.2300
	DY	: 50.4700	RY	:	0.3900
	DZ	: -141.6900	RZ	:	0.3440
Nav In Use		: 1			
Nav. 1 :	System	: Trimble 4000S	Interface	:	Serial
	X Offset	: 0.00	Type	:	Lat-Long
	Y Offset	: 0.00	Propagation	:	1
	Ant. Height	: 17.10	Gates	:	10.09999.0
Echo 1 :	System	: Deso 25/22 Low	Interface	:	Serial
	X Offset	: 0.00	Mode	:	High Res
	Y Offset	: 0.00	Vel. Sound	:	1530
	Tx. Depth	: 0.00			
Gyro :	System	: SG Brown 1000A	Interface	:	Serial
	Correction	: -.8	Mode	:	Auto

Offsets:	Name	X	Y
	E/S	3.9	-7.8
	C/S	0.0	-16.8

Offsets/Targets:

O/T 1	Trimble 4000S
O/T 2	E/S
O/T 3	C/S
O/T 4	Disabled

APPENDIX I

SAFETY MINUTES

SAFETY MEETING
MRV NGERIN SAGASCO/BHP HY11074/5
MONDAY 15th MAY 0920 HOURS

PERSONNEL PRESENT : B. EDMONDS B.H.P. L. ETHERIDGE FUGRO SURVEY
G. MOORE FUGRO SURVEY H. CAMPIGLI "
G. ROSS " D. KHOO "
SHIPS CREW PRESENT

ALARMS SOUNDED ALL PERSONNEL REPORTED TO MESS
FOLLOWING POINTS WERE DISCUSSED:-

1 EXPLANATION OF ALARM SIGNALS: SEVEN SHORT & ONE LONG BLAST ALL PERSONNEL TO MUSTER STATION. CONTINUOUS BLAST FOR FIRE.

2 MUSTER STATION LOCATION: MUSTER STATION BEHIND THE BRIDGE.

3 LIFE RAFTS: TWO 20 MAN LIFERAFTS LOCATED EITHER SIDE OF BRIDGE.

4 LIFE JACKET LOCATIONS: LIFEJACKETS IN ALL CABINS AND WORK AREAS EXTRAS IN BRIDGE ISLAND.

5 PROCEDURES TO FOLLOW WHEN ALARM SOUNDS: GET LIFEJACKET AND MAKE YOUR WAY TO THE BRIDGE. FOLLOW INSTRUCTIONS FROM MASTER OR MATE.

6 PROCEDURES FOR LIFERAFT DEPLOYMENT AND ABANDON SHIP: CREW LAUNCH LIFE RAFTS ON INSTRUCTION FROM MASTER. FOLLOW INSTRUCTIONS FOR BOARDING LIFERAFT.

7 LOCATION OF FIRE EXTINGUISHERSE EXPLAINED.

8 LOCATION OF LIFERINGS AND SAFETY VESTSEXPLAINED.

9 MAN OVERBOARD PROCEDURE: IMMEDIATELY THROW LIFERINGS, NOTIFY BRIDGE AND KEEP A VISUAL CONTACT.

10 ALCOHOL AND DRUG POLICY: ALCOHOL AND DRUG CONSUMPTION PROHIBITED.

SIGNED Greg J Moore

FUGRO PARTY CHIEF

SAFETY MEETING
MRV NGERIN SAGASCO/BHP HY11074/5
MONDAY 15th MAY 0925 HOURS

PERSONNEL PRESENT : B. EDMONDS B.H.P. L. ETHERIDGE FUGRO SURVEY
G. MOORE FUGRO SURVEY H. CAMPIGLI "
G. ROSS " D. KHOO "
SHIPS CREW PRESENT

Greg Moore was nominated as the safety officer on board.

1. All personnel working on the back deck must wear safety boots, bouyancy vests while working over the side of the vessel and deploying equipment over the stern. Hard hats must be worn during coring operations. Harness, gloves, safety glasses and ear plugs are available if required.

2. Equipment that will be used and the necessary manning requirements.

2.1 Echo Sounder, Deployment of pole, minimum of 2 people.

2.2 Deployment of SVP16, minimum of 2 people, one of those must be ships crew to operate ships winch.

2.3 Side Scan Sonar deployment, minimum of 2 people

2.4 Deployment of Boomer and Hydrophone pole, minimum of 2 people.

2.5 Coring and Grab Sampling, ships crew to operate winch mud to be washed from deck, minimum of 2 people on the deck.

3 A copy of Fugro Survey's Safety Manual is in the mess and all personnel should read this.

4. Potential incidents.

4.1 1 person to give instructions to the winch operaters. Non essential personnel to remain behind the winch.

4.2 All personnel shall stay clear of the Bang Boxes and thick black cabling with the exception of Harry Campigli and Laurie Etheridge.

4.3 Be aware of blocks, cables, and bights in ropes while on deck.

4.4 Bridge must be informed of the operations being carried out on the deck and deployment of equipment.

4.5 Must have a minimum of 2 people on the deck at night.

5 Non smoking signs to be observed in all areas including mess, bridge, survey room and cabins.

6 Client Rep. stated that B.H.P.'s policy is safety is highest priority.

Signed Greg Moore
Fugro Party Chief

DRAWINGS

PE900659

This is an enclosure indicator page.
The enclosure PE900659 is enclosed within the container PE900648 at this location in this document.

The enclosure PE900659 has the following characteristics:

ITEM_BARCODE	= PE900659
CONTAINER_BARCODE	= PE900648
NAME	= Conan 1 Seabed Features Map Sheet 1 of 2
BASIN	= Otway
PERMIT	= VIC/P31
TYPE	= WELL
SUBTYPE	= DIAGRAM
DESCRIPTION	= Conan 1 Site Survey, Seabed Features Map Sheet 1 of 2
REMARKS	=
DATE_CREATED	= *
DATE_RECEIVED	=
W_NO	= W1140
WELL_NAME	= CONAN - 1
CONTRACTOR	= BHP
CLIENT_OP_CO	= BHP

(Inserted by DNRE - Vic Govt Mines Dept)

PE900660

This is an enclosure indicator page.
The enclosure PE900660 is enclosed within the container PE900648 at this location in this document.

The enclosure PE900660 has the following characteristics:

ITEM_BARCODE	= PE900660
CONTAINER_BARCODE	= PE900648
NAME	= Conan 1 Seabed Features Map Sheet 2 of 2
BASIN	= Otway
PERMIT	= VIC/P31
TYPE	= WELL
SUBTYPE	= DIAGRAM
DESCRIPTION	= Conan 1 Site Survey, Seabed Features Map Sheet 2 of 2
REMARKS	=
DATE_CREATED	= *
DATE_RECEIVED	=
W_NO	= W1140
WELL_NAME	= CONAN - 1
CONTRACTOR	= BHP
CLIENT_OP_CO	= BHP

(Inserted by DNRE - Vic Govt Mines Dept)