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Simon-Horizon Australia Pty Ltd

SEISMIC DATA PROCESSING REPORT

FOR

PACIFIC OIL AND GAS PTY. LTD.

**1990 JINKA SEISMIC SURVEY
GEORGINA BASIN**

**1990 BUNDEY SEISMIC SURVEY
GEORGINA BASIN**

**1990 GEORGINA RIVER SEISMIC SURVEY
GEORGINA BASIN**

LOCATION : NORTHERN TERRITORY

**COMPILED BY : SIMON-HORIZON AUSTRALIA
PTY. LTD.**

OCTOBER 1991

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1. INTRODUCTION

The Field Survey was undertaken by GEOSYSTEMS PTY.LTD. in August/September 1990

The lines recorded in the whole survey comprised of :

Georgina Basin

J90-195	19.7 km
J90-197	19.5 km
J90-199	16.6 km
J90-201	29.5 km
J90-203	17.0 km
J90-210	16.9 km
J90-214	18.9 km
J90-216	20.0 km
J90-218	27.0 km
B90-100	10.0 km
B90-101	10.0 km
G90-300	22.5 km
G90-301	12.5 km
G90-307	12.5 km

For a total of 252.6 kilometres.

Processing was conducted by Simon-Horizon Australia, at their Perth office. Final filming was completed by March 1990.

ACQUISITION PARAMETERS - Jinka/Bundey/Georgina River

Source	Vibroseis
Source pattern	4 Vibrators in line 54m (12m Pad to Pad)
Sweep Frequency (Jinka / Bundey)	7 Varisweeps per VP 10 - 56 Hz 24 - 66 Hz 20 - 66 Hz 10 - 60 Hz
Sweep Frequency (Georgina River)	4 Varisweeps per VP 10 - 60 Hz 24 - 70 Hz 20 - 72 Hz 10 - 66 Hz
Sweep Emphasis	linear - 250 msec taper
Sweep Length	6.0 Seconds
VP Interval	24 metres
Number of data channels	360
Spread configuration offsets	2154 - 6 - VP - 6 - 2154 m
Group interval	12 m
Geophone configuration	6 geophones in line over 10m
Geophone type	MARK L21A (10 Hz)
Recording instrument	GEOCOR IV (16 SIGN-BIT)
Record length	4 seconds (correlated)
Sample period	2 msec
Tape format	Geosystems (correlated) 1600 bpi
COVERAGE	9000 %
Polarity	Upward movement of geophone recorded with negative value on tape.

FIELD DATA SUPPORT MATERIAL

The following support information was provided

- a) Observers Reports.
- b) Vibrator Parameter Reports.
- c) Receiver Parameter Reports.
- d) Elevations listing.
- e) Intersection Diagrams.
- g) Uphole plots.

DATA PROCESSING PARAMETERS

- 1) DEMULTIPLEX Transcribe Geosystems format field tapes to HORIZON'S internal format
Resample from 2 to 4 msec sample period.
- 2) GAIN RECOVERY 0.0t + 10.0Log(t) (Georgina River)
1.0t + 10.0Log(t) (Jinka/Bundey)
- 3) DISPLAY Display of shot records for quality control monitoring and for edit of noise contaminated traces.
- 5) LINE GEOMETRY CREATION
- 6) FK FILTER Lozenge type FK filter applied to attenuate ground roll.
- 7) CDP SORT Reorder traces from common shot record gathers into common depth point gathers.
- 8) DECONVOLUTION Predictive Deconvolution. 20 msec gap 120 msec operator, 1% white noise.

Design windows (Jinka/Bundey/Georgina River)
100-1500 msec @ near offset
500-2000 msec @ far offset
- 9) STATICS - (1) The mean datum static is calculated for each CDP, and the relative static (the difference between the CDP mean static and the individual traces' total static) applied.

- 10) RESIDUAL STATICS Surface consistent solution where the maximum allowable shift was +/- 20 msec. NMO corrections were performed using velocities chosen from preliminary CVS velocity analyses performed at 2.0 Km intervals Kmintervals.
- 11) DIP MOVEOUT Kirchoff summation implementation on 31 equal migration offset ranges.
- 12) VELOCITY ANALYSES CVS velocity analyses were performed over 21 cdp's at approximately 1.0 Km intervals. The velocity functions are referenced to surface.
- 13) NMO CORRECTIONS
- 14) MUTE Each line has its own mute/mutes.
- 15) SCALING 800msec AGC.
- 16) STATICS - (2) The cdp mean static was applied, correcting from floating datum to datum.

(Jinka/Bundey) DATUM: 400 m above sea level. New time origin of -100 msec.

(Georgina River) DATUM: 140 m above sea level. New time origin of -200 msec.
- 17) RESIDUAL STATICS A CDP trim solution calculated on a 7 trace pilot with a maximum allowable shift of +/- 12 msec.
- 18) STACK CDP stack using a square root compensation.

4. DATA PROCESSING TESTS

Mute tests were conducted on each line

J90-199	FK TRIALS
J90-199	DECON BEFORE STACK TRIALS
J90-199	PRE-STACK FILTER TRIALS
J90-199	POST STACK SCALING TRIALS
J90-199	MIGRATION TRIALS OF 100% TO 85% VELOCITIES

5. STATICS COMPUTATION

Refraction breaks were picked by hand from the production breaks and statics derived using the Gardner/Layat method (see below). Breaks were picked in both the forward and reverse directions, and intercept times converted to one way statics. The refraction statics were compared with the uphole statics and differences computed at each uphole location.

A difference profile was then produced by linear interpolation. Final uphole "calibrated" statics were derived by combining the difference and refraction profiles.

GARDNER/LAYAT WEATHERING STATICS METHOD

The weathering statics method used has its development in the procedures established by Gardner and Layat. Trace by trace shot and receiver corrections are derived by establishing a continuous intercept curve from refraction breaks picked from the acquired data.

Intercept time is essentially the difference between the actual travel time of the refracted wave and the time if the wave had travelled a straight line between shot and receiver at the subweathering velocity, or $I = T - X/V_m$. With the redundancy in multi-fold coverage, intercept curves are developed which are the accumulated differences of the variations in time between traces encountering the velocity marker at the base of marker velocity, as described in the above equation. These curves are possible errors in the estimation of the marker velocity.

Intercept times are reduced to one way statics by the equation $S = Kt$, where $K = 1/2 \cos \theta (V_w/V_c - 1)$, resulting in a profile which gives a static at every surface position.

Details on the theoretical background for the method may be found in the paper "Modified Gardner Delay Time and Constant Distance Correlation Interpretation" by C. Layat, printed in the S.E.G. publication "Seismic Refraction Prospecting".

6. FINAL DISPLAY

Final display were produced on films using a GEOSPACE 6400 plotter.

DISPLAY SCALES

FINAL STACK	1:12000	50.8	tr/in and	5.0 in/sec
MIGRATED STACK	1:12000	50.8	tr/in and	5.0 in/sec
	1:12000	50.8	tr/in and	10.0 in/sec
	1:48000	101.6	tr/in and	5.0 in/sec

APPENDIX A
-----LIST OF FIELD TAPES

LINE	TAPES	VP RANGE
J90-195	90A358 - 90A380	100 - 1740
J90-197	90A311 - 90A333	1722 - 100
J90-199	90A291 - 90A310	100 - 1486
J90-201	90A413 - 90A451	2558 - 100
J90-203	90A501 - 90A522	1518 - 100
J90-210	90A523 - 90A543	100 - 1504
J90-214	90A452 - 90A474	1676 - 100
J90-216	90A334 - 90A357	100 - 1766
J90-218	90A381 - 90A412	2350 - 100
B90-100	90A475 - 90A488	934 - 100
B90-101	90A489 - 90A500	934 - 100
G90-300	90A559 - 90A585	2016 - 120
G90-301	90A544 - 90A558	1142 - 100
G90-307	90A586 - 90A601	100 - 1142

APPENDIX B

PURCHASE TAPES

Three archive tapes were produced containing the Raw Stacks and the Migration Stacks. There is a description block separating each data set which contains the line number and a description of the data which follows.

All tapes were produced in SEG Y 32 bit IBM Floating Point format.

The time of first sample is -200 msec. for Georgina River Survey.

The time of first sample is -100 msec. for Jinka Survey.

Reel number JK-300 -	Raw Stack Archive of lines: J90-195,197,199,201,203,210 214,216 and 218
Reel number JK-400 - lines:	Migrated Stack Archive of J90-195,197,199,201,203,210 214,216 and 218
Reel number B-500 -	Raw and Migrated Stack Archive of lines: B90-100 B90-101 G90-300 G90-301 G90-307

A velocity tape was also created for Georgina Basin.

APPENDIX C

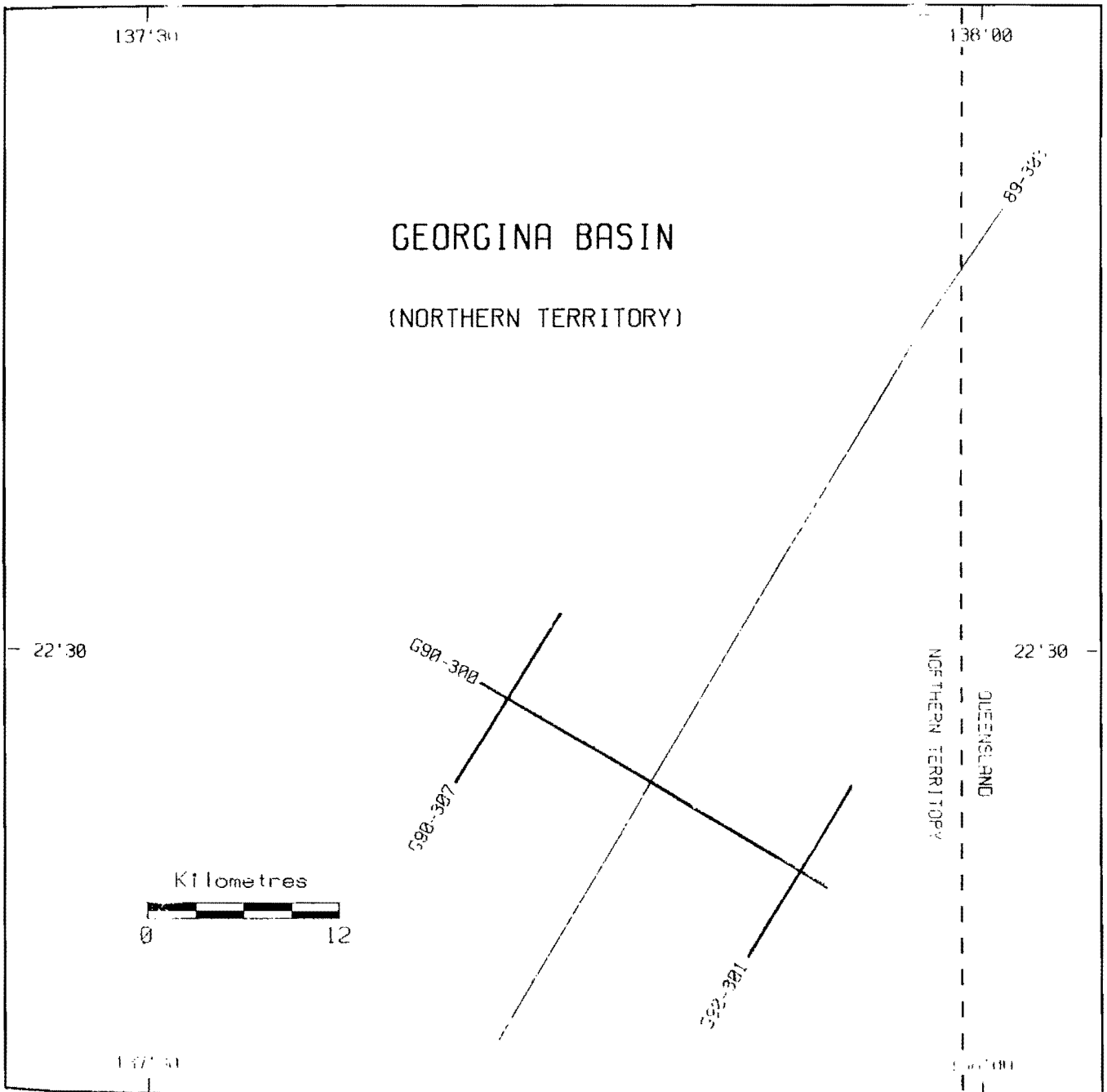
DATA DISPOSAL

DATA	DISPOSAL	DATE
Field Tapes	Encom Technology 24 Queen Parade, North Fitzroy, Victoria 3065	29/07/91
Archive Tapes	Pacific Oil And Gas 826 Whitehorse Road Boxhill Victoria 3128	04/06/91
Film Display	Pacific Oil And Gas 826 Whitehorse Road Boxhill Victoria 3128	01/10/91
Shot Record Display	Pacific Oil And Gas 826 Whitehorse Road Boxhill Victoria 3128	01/10/91
Observer's Logs Uphole Plots	Pacific Oil And Gas 826 Whitehorse Road Boxhill Victoria 3128	01/10/91

NOTE: Velocity analyses displays were destroyed after
 velocity tape was created

APPENDIX D

LINE LOCATION MAP



APPENDIX D

LINE LOCATION MAP

