BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

RECORD

Record 1983/13

Central Eromanga Basin
seismic survey, Queensland, 1981:

Operational Report

by

M.J. Sexton and F.J. Taylor

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CONTENTS

ABSTRACT

The Bureau of Mineral Resources conducted a seismic survey in the central Eromanga Basin in Queensland from July to early November 1981. This survey was a continuation of the work undertaken in 1980 to investigate the structure, stratigraphy, geological and tectonic evolution, and petroleum potential of the area.

The survey obtained 438 km of 6-fold CDP seismic reflection data, in the Quilpie Trough and over the Cooper and Thomson Synclines. Gravity observations were made at 500 m intervals along the traverses across the Quilpie Trough.

The seismic data which are of fair to good quality, will be used in detailed stratigraphic and structural studies of the sedimentary basins.

This report presents operational information on the survey and reduced scale copies of the seismic sections. Large scale copies may be obtained from the Copy Service, Government Printer (Production), PO Box E84, Queen Victoria Terrace ACT 2600.

Interpretation of the data will be published at a later date.

INTRODUCTION

The Bureau of Mineral Resources, Geology and Geophysics (BMR) conducted a seismic survey in the central part of the Eromanga Basin from July to early November 1981.

The seismic survey was part of the multidisciplinary, geoscientific research project on the "Central Eromanga Basin" (Harrison and others, 1980) and was a continuation of the seismic program commenced in 1980 (Wake-Dyster and Pinchin, 1981). The project aims to gain knowledge of the structure, stratigraphy and lithology of the Eromanga and underlying sedimentary basins in order to study the geology and tectonic evolution of the area, and to provide basic information to assist in the exploration of the area for petroleum.

The objectives of the 1981 BMR seismic survey (Mathur and Sexton, 1981) were to complete the traverses which could not be finished in the 1980 field season and to record along additional traverses across the Quilpie Trough, the southern part of the Adavale Basin, and the Thomson Syncline.

Six seismic traverses totalling 438 km of mainly 6-fold CDP reflection coverage were recorded (Figure 1). These included Traverses 7,9,10,12 and extensions of Traverses 5 and 6 which were commenced in 1980. Traverse 11 of the original proposal was omitted from the survey owing to lack of time and suitable drilling bits. Gravity measurements were taken along Traverses 9 and 10 in the Quilpie Trough and an expanding reflection spread (Musgrave, 1962) was recorded along Traverse 9.

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Other BMR investigations in the area in 1981 included a carborne magnetic survey along Traverses 1,6,8 and 9 and a detailed deep crustal refraction survey along Traverse 9 and on a long north/south line from Barcaldine to Thargomindah.

This report presents details of operations and preliminary results of the seismic reflection survey only. Operational statistics, spread and recording parameters, and personnel and equipment are listed in Appendices 1 to 3. Reduced scale copies of the processed seismic sections and expanding reflection spread are also included (Figures 2 to 9).

Note: Copies of the sections at a scale of 10 cm/s are available from the copy service, Government Printer (Production), PO Box E84 Queen Victoria Terrace ACT 2600. (Attention - Mrs Missins).

FIELD OPERATIONS

General

The survey area lies in southwestern Queensland near the towns of Quilpie, Windorah and Jundah and is covered by the 1:250 000 map sheets of QUILPIE, CANTERBURY, WINDORAH and JUNDAH. Access is good with a sealed bitumen road between Quilpie and Windorah and good quality access roads elsewhere.

Operations during 1981 were hampered by the effects of an extremely wet season before the survey began. Many of the proposed traverses were under water at the start of the survey and the clearing, surveying, drilling and recording teams had to be moved around more frequently than for normal operations as areas progressively dried out. Traverses 9 and 10 in the Quilpie area were predominantly along main roads and work was able to commence on these two lines. On completion of all the dry sections of these traverses, a start was made on Traverse 7 near Windorah. However, the eastern part of the line only could be done as the area around Cooper Creek was still under water. Operations were then moved further north and Traverses 6,5 and 12 were done in that order. By mid-October the survey area had dried out completely and an attempt was made to complete

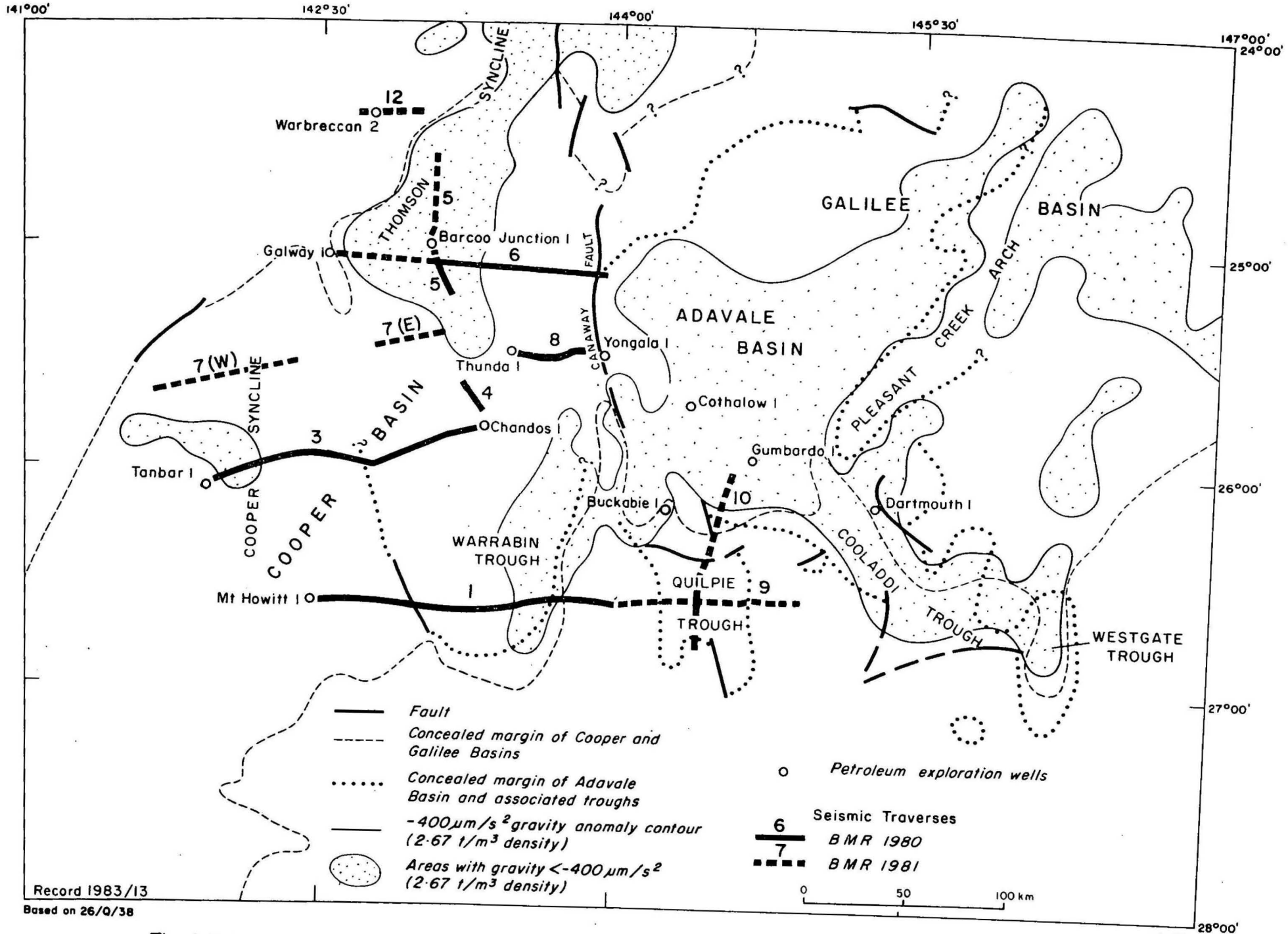

Fig. 1 Seismic traverses, main structural units and gravity low areas

Traverse 7. The western portion was recorded, but the difficult section around Cooper Creek was ommitted as bulldozing funds had run out. A small section of Traverse 10 that had been left earlier because of boggy conditions was finished on the party's return to Quilpie. Overall, only 2 days were lost due to these wet conditions. However, progress was slower than expected because of the necessity to move the various teams more frequently than planned initially.

Bulldozing

For the first weeks of the survey, a local bulldozer was hired for clearing heavy vegetation, construction of creek crossings and access tracks. Later, a contract bulldozer and grader became available and these were used for most of the survey. After bulldozing funds were exhausted, a bulldozer made available by Delhi Petroleum Pty Ltd was used to clear approximately 30 km of Traverse 7. Apart from the boggy conditions initially, there were few problems in clearing the traverses. However, the time and effort required to construct crossings of the Bulloo and Thomson Rivers eventually resulted in funds running out before the completion of Traverse 7.

Surveying:

Surveying was done by the Queensland Branch of the Australian Survey Office. Traverses were flagged for the bulldozer driver, pegged at 83 1/3 m intervals, levelled and then traversed with a theodolite and tellurometer to obtain accurate shotpoint and geophone locations.

The surveyors provided Australian Map Grid (AMG) co-ordinates for traverse bends and endpoints, elevations referenced to the Australian Height Datum (AHD) and latitudes and longitudes of all shotpoints.

Drilling:

Four drilling rigs were used from July to mid-October, and five from then until the end of the survey. One of the rigs spent considerable time down with mechanical problems, slowing the overall drilling rate accordingly. Rock bits and a percussion hammer were

used to drill through hard layers of silcrete found on parts of Traverses 6, 7, 9 and 10, and circulating drilling mud was necessary on Traverses 6 and 7 to prevent holes from collapsing. Drilling was good on Traverse 12.

A shot-hole depth of 40 m was chosen so that the charges would be below the base of the weathered layer. In some places this could not be obtained due to collapsing holes and charges were fired at about 25 m depths. Most of these shots were still below the weathering.

Seismic Recording:

Recording progressed very well for the entire survey. No faults occurred with the DFS IV system, and the use of geophones in sets of 16 (cf. 2 sets of 8 per string used in previous surveys) speeded up production significantly. Minor delays, due to inclement weather and strong winds, were encountered on 4 days. The spread and recording parameters are listed in Appendix 2, and the recording equipment in Appendix 3. Charge sizes for the survey ranged from 8.4 kg to 20 kg, averaging approximately 11.9 kg. All reflection shots were recorded to 20s record length in attempts to record deep crustal reflections.

In addition to the CDP reflection recording, an expanding reflection spread (Musgrave, 1962) was shot with a maximum shot-to-geophone offset of 20 km centred on SP 9333 on Traverse 9. Table 1 lists the shotpoints and spread configurations used. This type of spread can be very useful in determining the average velocity to reflectors and could provide information to aid the processing of the CDP reflection data to 20s. Furthermore, the shooting procedure is simple and can be readily incorporated into the routine recording program.

Gravity:

Gravity measurements were taken at 500 m intervals along Traverses 9 and 10 using a Worden gravity meter and making loop closures every ten stations. Operational details for the gravity survey are presented in Appendix 4.

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SEISMIC DATA PROCESSING

Processing of the seismic data was done under contract by Geophysical Service International (GSI) in Sydney.

Static corrections, including elevation and weathering corrections were calculated in the field using the uphole method. An elevation datum of 183 m above mean sea-level and a replacement velocity of 2000 ms^{-1} was used for all traverses. Initial stacking velocity functions to correct for move-out were calculated from the field records using the T^2-X^2 method. Trace edits, bend-point co-ordinates and shooting irregularities were coded in the field and sent to GSI who used the field information to produce preliminary "brute stack" sections.

The final processing sequence applied is shown in Table 2; further processes such as migration are being applied to some sections. All lines have been processed to 4 s, and most will later be processed to at least 16 s to display deep crustal reflection data.

The expanding reflection spread has been processed at BMR using the in-house seismic processing system. A preliminary display of this spread is shown in Figure 2.

PRELIMINARY RESULTS

Data quality is generally fair to good (Figures 3 to 9) but in some areas where a hole could not be drilled or the charge failed to detonate, the CDP coverage fell below 6-fold and the reflection quality deteriorated. In a few areas a deeper weathered layer than normal resulted in charges being placed in the weathering, with less seismic energy resulting in poorer reflections. Also the high velocity silcrete layers near the surface acted as wave-guides in some places causing no reflected signals to return to the surface at large offets. In such areas and in areas of shallow section (e.g. eastern end of Traverse 9) a shorter geophone station spacing (e.g. 41 2/3 m)would have been more appropriate.

Synthetic seismograms have been made using information from sonic logs in the Galway 1, Buckabie 1 and Gumbardo 1, exploration wells to which the seismic traverses have been tied (Figures 10 to 12). The smoothed

sonic logs have proved to be useful in correlating stratigraphic units between wells, and the synthetic seismic traces have enabled precise identification of the reflecting horizons to be made.

The seismic sections (Figures 2 to 9) in conjunction with a network of re-processed single-fold data (Sexton and others, 1983) are being used to interpret the limits, structures, and lithologies of the Quilpie Trough and Thomson Syncline. These interpretations will be discussed in future publications.

The gravity data have been reduced to Bouguer gravity values and incorporated into the gravity data-base for the southwestern Queensland region. These data will allow better quality gravity maps of the area to be produced and aid in the future interpretations of the gravity field.

Interpretations of the expanding reflection spread havebeen hampered by computer problems and degradation of some of the copied tapes. When these problems are overcome, the interpretation of these data will continue.

REFERENCES

HARRISON, P.L., MATHUR, S?P., MOSS, F.J., PINCHIN, J., & SENIOR, B.R., 1980 - Central Eromanga Basin Project, Program Proposals, 1980-1982. Bureau of Mineral Resources, Australia, Record 1980/32. (unpublished)

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MUSGRAVE, A.W., 1962 - Applications of the Expanding Reflection Spread: Geophysics, Vol.27, No.6, Pt II, pp 981-993.

SEXTON, M.J., WAKE-DYSTER, K.D., GARDNER, D., & JOHNSTONE, D.W., 1983 - Central Eromanga Basin, Seismic Reprocessing, 1981: Operational Report. Bureau of Mineral Resources, Australia, Record 1983/10 (unpublished).

WAKE-DYSTER, K.D., & PINCHIN, J., 1981 - Central Eromanga Basin seismic survey, Queensland, 1980: Operational Report: Bureau of Mineral Resources, Australia, Record 1981/22 (unpublished).

APPENDIX 1

Operational Statistics

Shot-hole drilling commenced		02/07/81
Recording commenced		30/07/81
Shot-hole drilling completed		04/11/81
Recording completed		06/11/81
Total length of traverses (subsurface)		438 km
Number of recording days worked		55
Recording days lost		19
- Due to camp shifts	8	
Due to adverse weather	4	
Due to equipment breakdowns	2	
Due to no recording line	3	
Due to other shooting (expanding spread)	2	
Multiplicity of production shots		6-fold
Total number of shots		1252
Average number of production shots/recording day		22.8
Average surface coverage/recording day		8.0 km
Maximum number of production shots/recording day		41
Total Explosives used (including expanded spread)		15808 kg Anzite Blue
Total Detonators used (including expanded spread)		1299
Average charge/production shot		11.9 kg
Total number of rig days worked		264
Rig days lost		103
Due to campshifts (8 days)	36	
Due to adverse weather	13	
Due to equipment breakdowns and maintenance	45	
Due to waiting for bulldozed line	9	

APPENDIX 2

Spread and recording parameters

Production shooting spread

Spread length and type	2000-0-1916
Numbers of channels	48
Geophone station interval	83 1/3 m
Multiplicity	6-fold CDP
Number of geophones/trace	16
Geophone pattern	in-line
Geophone spacing in line	5½ m

DFS IV instrument settings

Recording mode	Digital
Format	SEG-B
Number of input channels	48 data, 4 auxiliary
Tape	9 track, 1600 bpi PE, ½ in
Record length	20 s
Sample rate	2 ms
Gain constant	42 dB
Input filters, production	lo cut : 8 Hz, 36 dB/oct;
	hi cut :124 hz, 72 dB/oct
Notch filter	out
Reproduce module settings, production	
Defloat mode : galvo level	15
high-cut	90 Hz
lo-cut	12 Hz
AGC mode : galvo level	15
hi-cut	90 Hz
lo-cut	12 Hz
Trip sensitivity	36 dB
Trip delay	1.0 s

APPENDIX 3

PERSONNEL AND EQUIPMENT, 1981 SURVEY

PERSONNEL

Geophysical Branch

Party Leader	F.J. Taylor (July-August)
	O. Dixon (GSA) (August-November)
Party Manager	J.A. Sommerville (July-September)
	W.J. Cox (September-November)
Geophysicists	K.D. Wake-Dyster (July-September)
	M.J. Sexton (September-November)
Technical Officers (Engineering)	D. Gardner (July-November)
	K. Butterfield (July-August)
Technical Officers (Science)	G. Price
Field Assistants	R.D.E. Cherry
	D.W. Johnstone
	L.O. Rickardsson
	A.C. Takken
Mechanic	D.K. McIntyre
Wages hands	10

Petroleum Exploration Branch

Toolpusher	E.H. Cherry
Drillers & Assistants	T. Shanahan
	L. Keast
	E. Lodwick (October-November)
	Richard Clark
	D. Eaton
	B. Watler
	G. Ferrie
	Rod Clark
	M. Kolstand
Wages Mechanic	T. Johnson

Australian Survey Office

1 Surveyor, 2 Technical Officers, 4 Chainmen

EQUIPMENT

Recording system	TI DFS IV	
Camera	SIE ERC-IOC; SIE TRO-6	
Switch gear	I/O Rota-long	
Radio firing unit	I/O RFU	
Cables	539 m, 48 ch.	- 18
Geophones	GSC, 20D, 8 Hz	- 1280
Transceivers	Codan 6924	- 6
	Phillips FM 828	- 8
Gravity meter	Worden W169	

Vehicles

Recording truck	1 x International D1610 3 ton 4 x 4
Workshop truck	1 x International D1610 3 ton 4 x 4
Flat-top trucks	2 x International D 1610 3 ton 4 x 4
Water tankers	2 x International D1610 3 ton 4 x 4
Drilling rigs	4 x Mayhew 1000/Mack 6 x 8 trucks

Drill water tankers	4 x Mack R875, 6 x 6, 1900 gallon
Shooting truck	1 x Landrover LWB, 4 x 4, Tray-top
Personnel carriers	3 x Landrover LWB, 4 x 4, S/W
Geophone carriers	3 x International D1310, 30 cwt. 4 x 4
Stores truck	1 x International D1310, 30 cwt, 4 x 4
Pre-loading truck	1 x Landrover LWB, 4 x 4, Tray-top
Office caravan	1 x 4 wheel
Kitchen van	2 x 4 wheel
Ablutions van	2 x 4 wheel
Stores trailers	3 x 4 wheel
Generator trailer	1 x 4 wheel
Drill trailer	1 x 4 wheel, 6 tonne
Drill mechanics trailer	1 x 4 wheel

APPENDIX 4

Operational details, gravity survey

1. The survey commenced on 10 November and was completed on 18 November 1981.

2. 250 new stations were read.

3. Worden W169 (C.F.O.10112) was used.

4. The survey was tied to the following base station:

Station	Value
6491058	978008.29 - Quilpie Airport

5. All stations were seismic shot-point locations and levels were optically obtained to Third-Order standard.

6. The Survey Number in the BMR filing system is 8113.

TABLE 1

EXPANDING SPREAD - SHOTPOINTS AND SPREAD CONFIGURATIONS

Shot No.	Shot Point Number	Spread Configuration	
		Trace 48	Trace 1
1	9241	9401	9448
2	9264	9378	9425
3	9287	9355	9402
4	9310	9332	9379
5	9333	9309	9356
6	9356	9286	9333
7	9379	9263	9310
8	9402	9240	9287
9	9425	9217	9264
10	9448	9194	9241
11	9218	9424	9471

All records 35 seconds in length

TABLE 2

PROCESSING SEQUENCE FOR THE SEISMIC SECTIONS

1. Line file map computation
2. Crooked line file production
3. 6-fold CDP gather
4. True Amplitude Recovery
5. Time variant scaling
6. Brute stack with field statics and field NMO
7. Velscans - pass 1
8. Residual static computations
9. Velscans - pass 2
10. NMO and static corrections
11. 6-fold CDP stack
12. Time variant deconvolution
13. Time variant filter
14. Time variant scaling
15. Display

BMR LAND EXPERIMENTAL
EROMANGA BASIN 1981
TRAVERSE 9 EXPANDED SPREAD

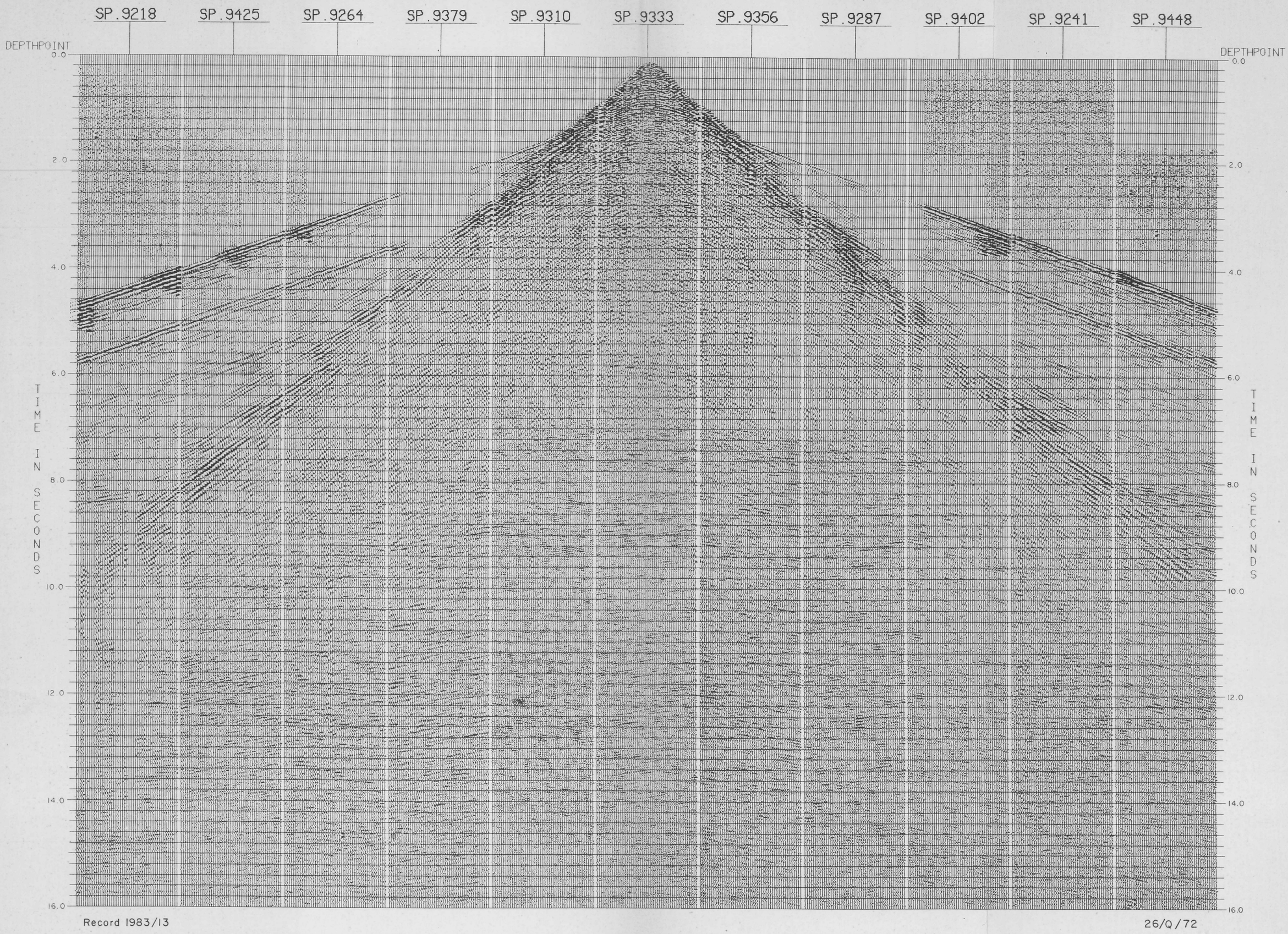


Fig. 2 : Expanding reflection spread

BUREAU OF MINERAL RESOURCES

EROMANGA BASIN, QLD.

TRAVERSE 1X AND 9

SP. 9876-2756

FIELD RECORDING PARAMETERS

SOURCE	DYNAMITE	
	SPACING	333.3 M.
	SHOT ON	TRACE 24
	MULTIPLICITY	6 FOLD
SPREAD	OFFSETS	1917-0-2000 M.
	NO. OF GROUPS	48
	GROUP INTERVAL	83.3 M.
INSTRUMENTS	DFS IV	
	FIELD FORMAT	SEGB 1600BPI
	SAMPLE RATE	2 MSEC.
	RECORD LENGTH	4 SECS.
	FILTERS	12 - 124HZ.

PROGRESSION TOWARDS TRACE 48

RECORDED BY B.M.R.

DATE RECORDED SEPT. 1981

GEOPHYSICAL SERVICE INTERNATIONAL

DIGITAL PROCESSING CENTRE
SYDNEY NSW AUSTRALIA

PROCESSING PARAMETERS

1. LINE FILE COMPUTATION
2. CROOKED LINE FILE PRODUCTION
3. RESAMPLE 2 MSEC TO 4 MSEC
4. TAR (ALPHA = 4.0DB/SEC. T2 = 3.0SEC)
5. TRACE EDIT
6. CDP GATHER
7. TIME VARIANT SCALING : REGULAR SCALERS
   1 X 1000MSEC GATE , 100MSEC START
8. VELOCITY ANALYSIS : RELATIVE STATICS
9. RESIDUAL STATICS COMPUTATION :
   NO RNMO , SMASH=15 , GATES 1-3
10. VELOCITY ANALYSIS : REL + RESIDUAL STATICS
11. NMO CORRECTION
12. STATICS : DATUM= +183M, REP VEL= 2000M/SEC.
13. 6 FOLD CDP STACK (SQRT RECOVERY SCALING)
    RAMP : 0 AT 167M, 300 AT 168M, 1400 AT 2000M
14. TIME VARIANT DECONVOLUTION : 4 x 12 OT OP'S(WHITENING)
15. TIME VARIANT FILTER :
    20-60HZ AT 1.5SEC , 15-40HZ AT 2.5SEC
16. TIME VARIANT SCALING : REGULAR SCALERS
    GATES : 1 X 400, 1 X 600, 2 X 1000MSEC
    START : 500 , 850 , 1300 , 2250 MSEC
17. SINGLE LINE MERGE OF PRODUCTION FILES

DISPLAY

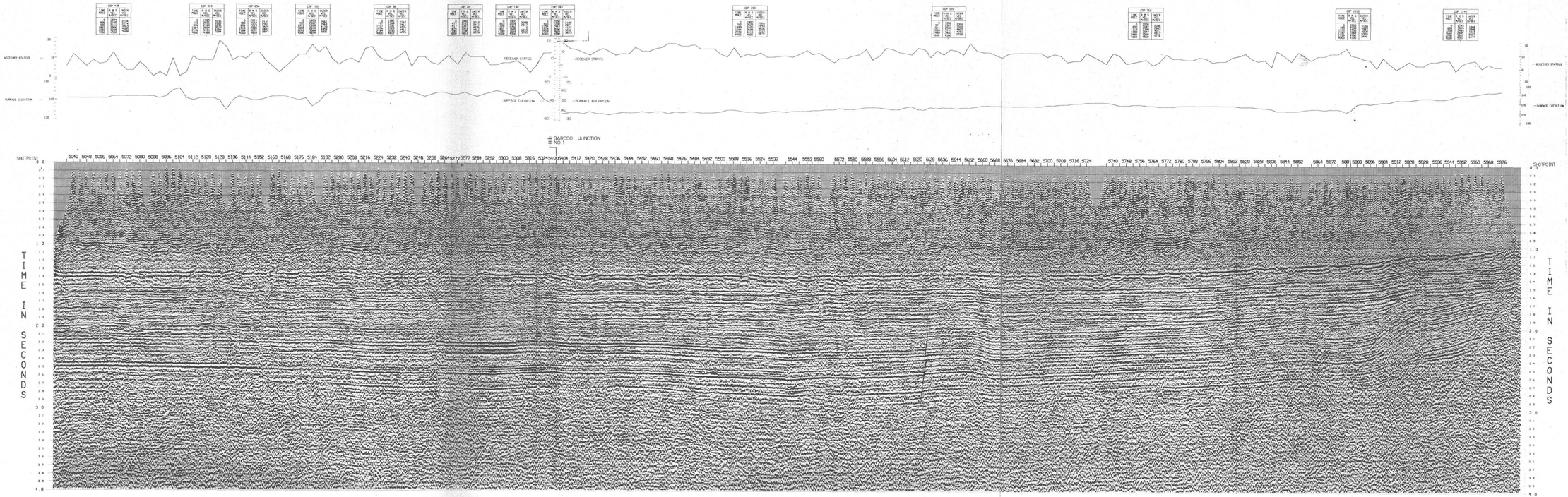
MODE :	WIGGLE TRACE/VAR	5% BIAS
	VERTICAL SCALE	10CM/SEC
	HORIZONTAL SCALE	25 TPI
	TROUGH POLARITY	-VE ON TAPE

DATE PROCESSED FEB. 1982

Q.C. BY MPB

26/Q/73

Fig. 3: Seismic section - Traverse IX and 9



Record 1983/13

Fig. 4: Seismic section – Traverse 5

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EROMANGA BASIN. QLD

TRAVERSE 5

SP.5036-5976

FIELD RECORDING PARAMETERS

SOURCE	DYNAMITE	
	SPACING	333.3 M
	SHOT DEPTH	TRACE 25
	MULTIPLICITY	6 FOLD
SPREAD	OFFSETS	1917-0-2000 M.
	NO. OF GROUPS	48
	GROUP INTERVAL	83.3 M.
INSTRUMENTS	DFS IV	
	FIELD FORMAT	SEGB 1600BPI
	SAMPLE RATE	2 MSEC.
	RECORD LENGTH	20 SECS
	FILTERS	12-124 HZ
PROGRESSION	TOWARDS TRACE 1	
RECORDED BY	BMR	

DATE RECORDED AUG. 1981

GEOPHYSICAL SERVICE INTERNATIONAL
DIGITAL PROCESSING CENTRE
SYDNEY NSW AUSTRALIA
PROCESSING PARAMETERS

1. LINE FILE COMPUTATION
2. CROOKED LINE FILE PRODUCTION
3. RESAMPLE 2 MSEC TO 4 MSEC
4. TAR (ALPHA=4.0 DB/SEC. T2=3.0 SEC)
5. TRACE EDIT
6. CDP GATHER
7. TIME-VARIANT SCALING:REGULAR SCALERS
   1X1000 MSEC GATE:START TIME 1000MSEC
8. VELOCITY ANALYSIS - RELATIVE STATICS
9. RESIDUAL STATICS COMPUTATION
   NO BAND, SMASH=10, SUP FILE 5
10. VELOCITY ANALYSIS- REL.+RESIDUAL STATICS
11. NMO CORRECTION
12. STATICS-DATUM=189 M, REP VEL=2000 M/SEC
13. 6-FOLD CDP STACK (SQRT RECOVERY SCALING)
    RAMP 0 AT 167M, 300 AT 168M,1400 AT 2000M
14. TIME-VARIANT DECONVOLUTION
    4 X 16 PI OPERATORS(WHITENING)
15. TIME-VARIANT FILTER
    20-50 HZ AT 0.3 SEC; 15-50 HZ AT 1.2 SEC
    15-50 HZ AT 2.0 SEC; 12-40 HZ AT 3.4 SEC
16. TIME-VARIANT SCALING: REGULAR SCALERS
    GATES 1000,1400,1900,2400,3000 MSEC
    START 500,800,1200,1800,2800 MSEC
17. SINGLE LINE MERGE OF PRODUCTION FILES

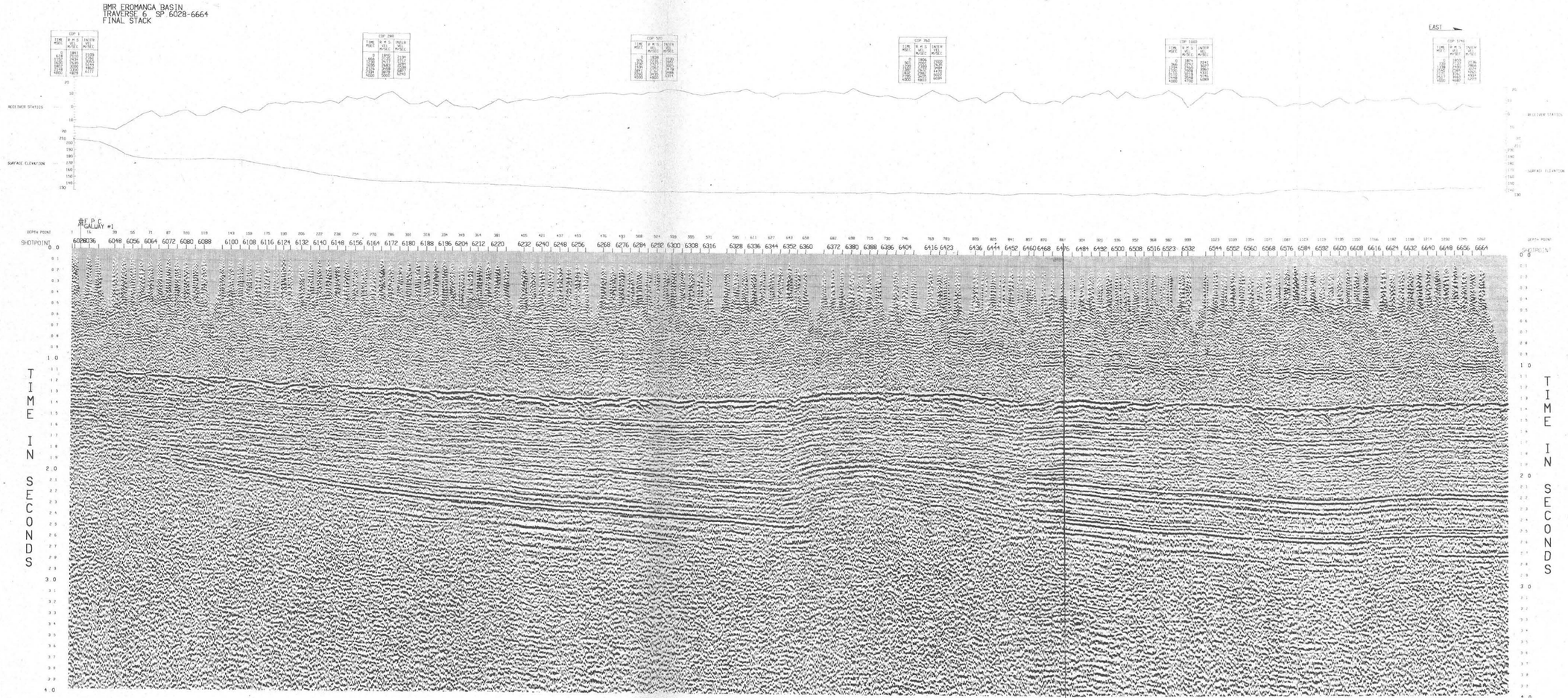
DISPLAY

MODE :	WIGGLE TRACE/VAR	5% BIAS
	VERTICAL SCALE	12CM/SEC
	HORIZONTAL SCALE	25 TPI
	TROUGH POLARITY	-VE ON TAPE

DATE PROCESSED MAR. 1982

Q.C. BY [illegible]

26/Q/74



BUREAU OF MINERAL RESOURCES

EROMANGA BASIN, QLD

TRAVERSE 6

SP 6028-6664

FIELD RECORDING PARAMETERS

SOURCE	DYNAMITE	
	SPACING	333.3 M.
	SHOT ON	TRACE 25
	MULTIPLICITY	6 FOLD
SPREAD	OFFSETS	1917-0-2000 M.
	NO. OF GROUPS	48
	GROUP INTERVAL	83.3 M.
INSTRUMENTS	DFS IV	
	FIELD FORMAT	SEGB 1600BPI
	SAMPLE RATE	2 MSEC.
	RECORD LENGTH	20 SECS
	FILTERS	12-124 HZ

PROGRESSION TOWARDS TRACE 1

RECORDED BY BMR

DATE RECORDED SEPT. 1981

GEOPHYSICAL SERVICE INTERNATIONAL
DIGITAL PROCESSING CENTRE
SYDNEY NSW AUSTRALIA
PROCESSING PARAMETERS

1. LINE FILE COMPUTATION
2. CROOKED LINE FILE PRODUCTION
3. RESAMPLE 2 MSEC TO 4 MSEC
4. TAR (ALPHA=4.0 DB/SEC. 12=3.0 SEC)
5. TRACE EDIT
6. CDP GATHER
7. TIME-VARIANT SCALING REGULAR SCALERS
   1X1000 MSEC GATE. START TIME 100MSEC
8. VELOCITY ANALYSIS - RELATIVE STATICS
9. RESIDUAL STATICS COMPUTATION
   NO RMMO SMASH-23 STOP FILE 4
10. VELOCITY ANALYSIS- REL +RESIDUAL STATICS
11. NMO CORRECTION
12. STATICS-DATUM -183 M. REP VEL 2000 M/SEC
13. 6-FOLD CDP STACK (SQRT RECOVERY SCALING)
    RAMP 0 AT 167M, 300 AT 168M, 1400 AT 2000M
14. TIME-VARIANT DECONVOLUTION
    4 X 12 PT OPERATORS(WHITENING)
15. TIME-VARIANT FILTER
    20-50 HZ AT 0.9 SEC, 15-50 HZ AT 1.2 SEC
    15-50 HZ AT 2.0 SEC, 12-40 HZ AT 2.4 SEC
16. TIME-VARIANT SCALING REGULAR SCALERS
    GATES 1X400, 1X600, 2X1000 MSEC
    START 500, 850, 1300, 2250 MSEC

DISPLAY

MODE: WIGGLE TRACE/VAR 100% BIAS
VERTICAL SCALE 10CM/SEC
HORIZONTAL SCALE 25 TPI
TROUGH POLARITY -VE ON TAPE

DATE PROCESSED NOV. 1981

Q.C. BY

26/Q/75

Record 1983/13

Fig. 5: Seismic section – Traverse 6

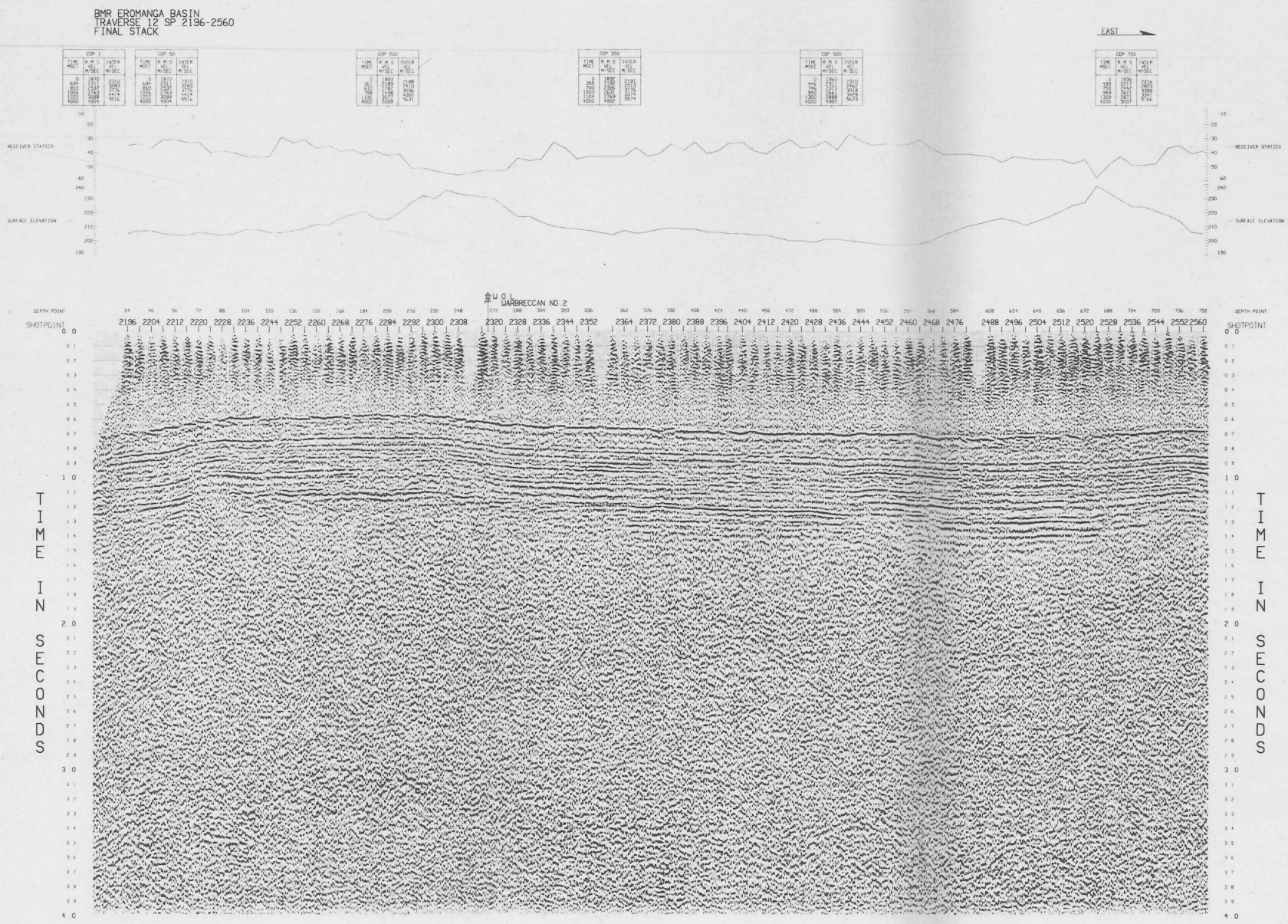


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Fig. 6: Seismic section - Traverse 12

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EROMANGA BASIN, QLD

TRAVERSE 12

SP.2196-2560

FIELD RECORDING PARAMETERS

SOURCE	DYNAMITE	
	SPACING	333.3 M.
	SHOT ON	TRACE 25
	MULTIPLICITY	6 FOLD
SPREAD	OFFSETS	1917-0-2000 M.
	NO. OF GROUPS	48
	GROUP INTERVAL	83.3 M.
INSTRUMENTS	DFS IV	
	FIELD FORMAT	SEGB 1600BPI
	SAMPLE RATE	2 MSEC
	RECORD LENGTH	20 SECS
	FILTERS	12-124 HZ.
PROGRESSION	TOWARDS TRACE 1	
RECORDED BY BMR		

DATE RECORDED OCT. 1981

GEOPHYSICAL SERVICE INTERNATIONAL
DIGITAL PROCESSING CENTRE
SYDNEY NSW AUSTRALIA
PROCESSING PARAMETERS

1. LINE FILE COMPUTATION
2. CROOKED LINE FILE PRODUCTION
3. RESAMPLE 2 MSEC TO 4 MSEC
4. TAR (ALPHA=4.0 DB/SEC, T2=3.0 SEC)
5. TRACE EDIT
6. CDP GATHER
7. TIME-VARIANT SCALING:REGULAR SCALERS
   1X1000 MSEC GATE.START TIME 100MSEC
8. VELOCITY ANALYSIS - RELATIVE STATICS
9. RESIDUAL STATICS COMPUTATION
   NO RNMO, SMASH=15, STCP FILE 5
10. VELOCITY ANALYSIS- REL.+RESIDUAL STATICS
11. NMO CORRECTION
12. STATICS-DATUM:+183 M, REP.VEL.2000 M/SEC
13. 6-FOLD CDP STACK (SQRT RECOVERY SCALING)
    RAMP 0 AT 167M.300 AT 168M.1400 AT 2000M
14. TIME-VARIANT DECONVOLUTION:
    4 X 12 PT OPERATORS(WHITENING)
15. TIME-VARIANT FILTER.
    20-50 HZ AT 0.4 SEC.15-50 HZ AT 0.5 SEC
    15-50 HZ AT 1.2 SEC.12-40 HZ AT 1.5 SEC
16. TIME-VARIANT SCALING: REGULAR SCALERS
    GATES 1X400,1X600,2X1000 MSEC
    START 500,850,1300,2250 MSEC

DISPLAY

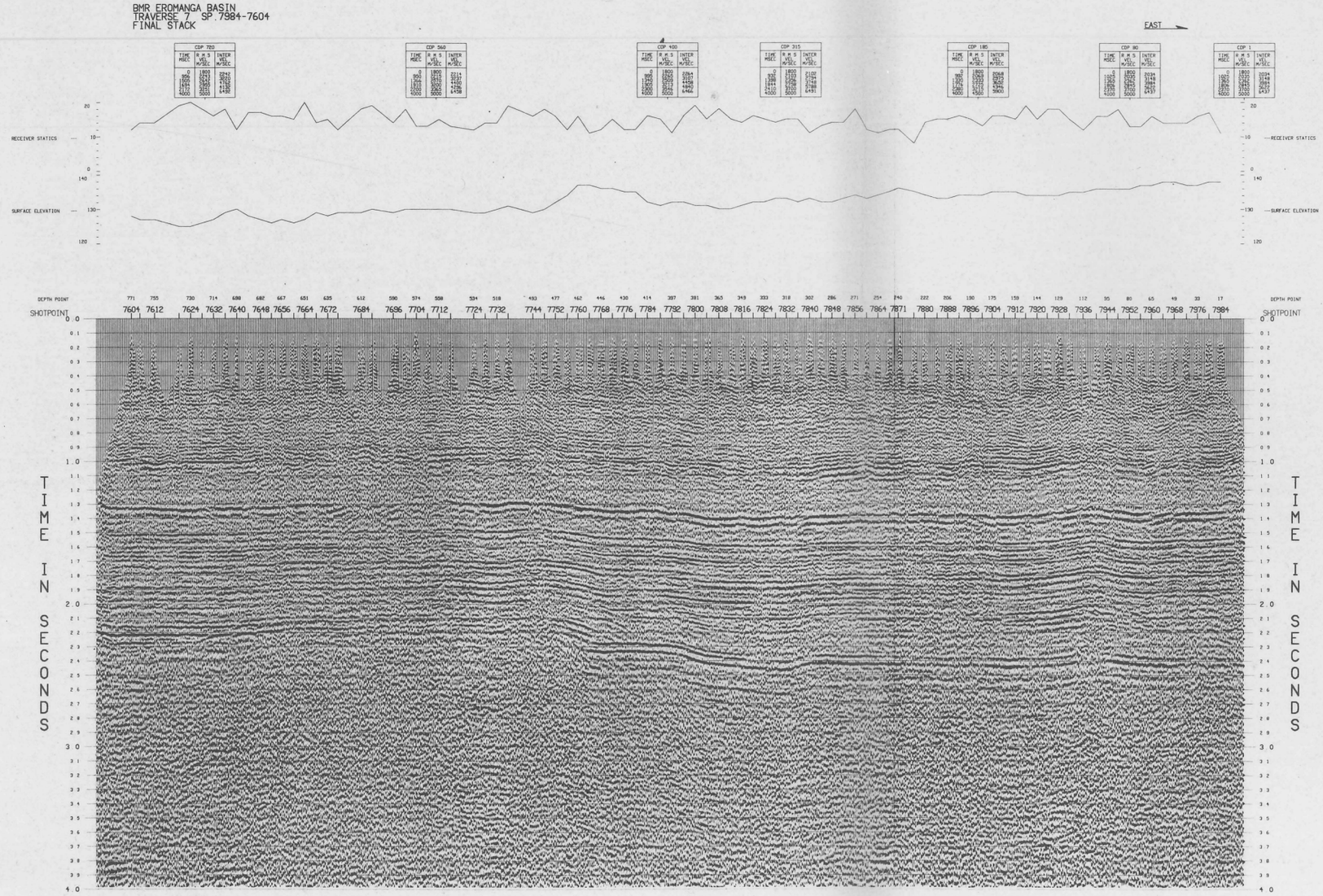
MODE :	WIGGLE TRACE/VAR	5% BIAS
	VERTICAL SCALE	10CM/SEC
	HORIZONTAL SCALE	25 TPI
	TROUGH POLARITY	-VE ON TAPE

DATE PROCESSED JAN. 1982

Q.C BY MPK

26/Q/76

BMR EROMANGA BASIN
TRAVERSE 7 SP.7984-7604
FINAL STACK



Record 1983/13

Fig. 7: Seismic section – Traverse 7

BUREAU OF MINERAL RESOURCES

EROMANGA BASIN, QLD

TRAVERSE 7

SP.7984-7604

FIELD RECORDING PARAMETERS

SOURCE	DYNAMITE	
	SPACING	333.3 M.
	SHOT ON	TRACE 24
	MULTIPLICITY	6 FOLD
SPREAD	OFFSETS	1917-0-2000 M.
	NO. OF GROUPS	48
	GROUP INTERVAL	83.3 M.
INSTRUMENTS	DFS IV	
	FIELD FORMAT	SEGB 1600BPI
	SAMPLE RATE	2 MSEC
	RECORD LENGTH	20 SECS
	FILTERS	12-124 HZ.

PROGRESSION TOWARDS TRACE 48

RECORDED BY BMR

DATE RECORDED SEPT. 1981

GEOPHYSICAL SERVICE INTERNATIONAL
DIGITAL PROCESSING CENTRE
SYDNEY NSW AUSTRALIA
PROCESSING PARAMETERS

1. LINE FILE COMPUTATION
2. CROOKED LINE FILE PRODUCTION
3. RESAMPLE 2 MSEC TO 4 MSEC
4. TAR (ALPHA=4.0 DB/SEC, T2=3.0 SEC)
5. TRACE EDIT
6. CDP GATHER
7. TIME-VARIANT SCALING:REGULAR SCALERS
   1X1000 MSEC GATE.START TIME 100MSEC
8. VELOCITY ANALYSIS - RELATIVE STATICS
9. RESIDUAL STATICS COMPUTATION
   NO RNMO SMASH=15, GATES 1-3
10. VELOCITY ANALYSIS- REL.+RESIDUAL STATICS
11. NMO CORRECTION
12. STATICS-DATUM:+183 M. REP VEL:2000 M/SEC
13. 6-FOLD CDP STACK (SQRT RECOVERY SCALING)
    RAMP:0 AT 167M.300 AT 168M.1400 AT 2000M
14. TIME-VARIANT DECONVOLUTION:
    4 X 12 PT OPERATORS(WHITENING)
15. TIME-VARIANT FILTER:
    20-50 HZ AT 0.0 TO 0.9 SECS
    15-50 HZ AT 1.2 TO 2.0 SECS
    12-40 HZ AT 2.4 TO 4.0 SECS
16. TIME-VARIANT SCALING: REGULAR SCALERS
    GATES 1X400,1X600,2X1000 MSEC

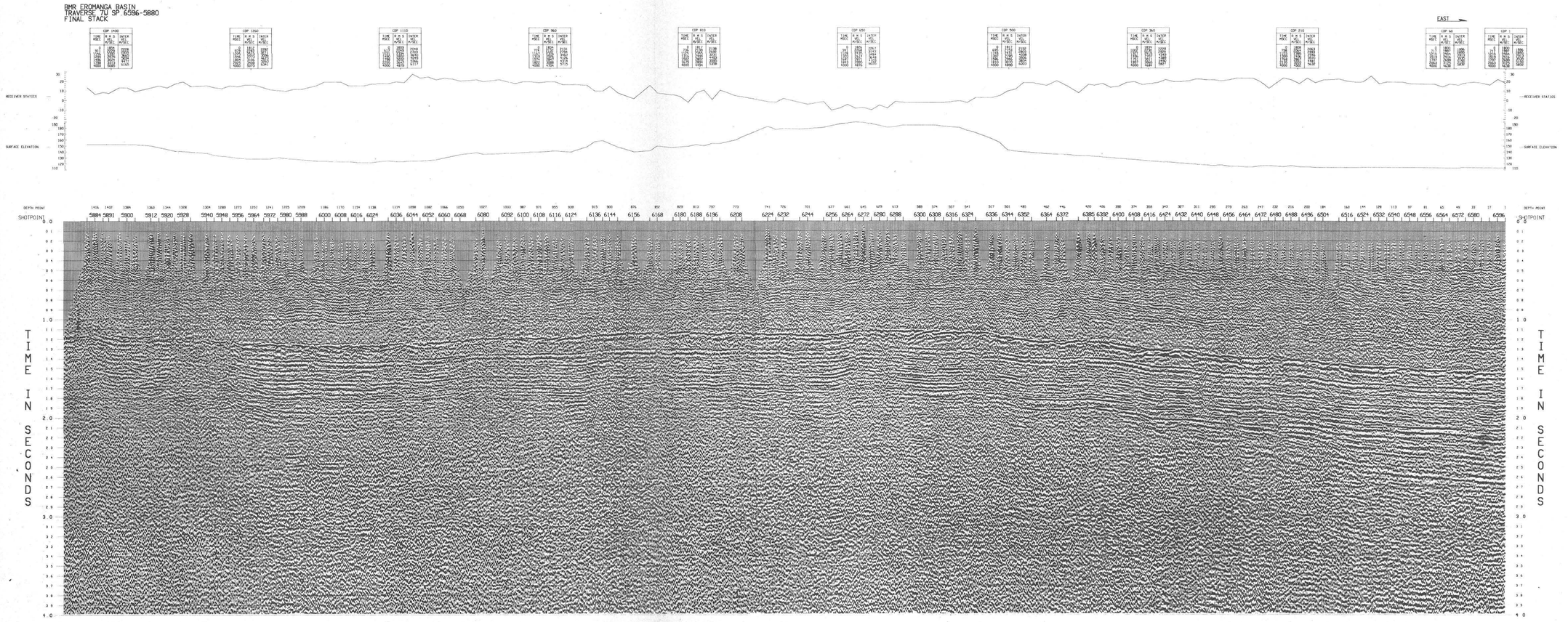
DISPLAY

MODE :	WIGGLE TRACE/VAR 5 % BIAS
VERTICAL SCALE	10CM/SEC
HORIZONTAL SCALE	25 TPI
TROUGH POLARITY	-VE ON TAPE

DATE PROCESSED FEB. 1982

Q.C. BY M.B.S.

26/Q/77



Record 1983/13

Fig. 8: Seismic section – Traverse 7W

BUREAU OF MINERAL RESOURCES

EROMANGA BASIN, QLD

TRAVERSE 7W

SP.6596-5880

FIELD RECORDING PARAMETERS

SOURCE	DYNAMITE	
	SPACING	223.3 M.
	SHOT ON	TRACE 25
	MULTIPLICITY	6 FOLD
SPREAD	OFFSETS	1917-0-2000 M.
	NO. OF GROUPS	48
	GROUP INTERVAL	83.3 M.
INSTRUMENTS	DFS IV	
	FIELD FORMAT	SEGB 1600BPI
	SAMPLE RATE	2 MSEC
	RECORD LENGTH	20 SECS
	FILTERS	12-124 HZ
PROGRESSION	TOWARDS TRACE 1	
RECORDED BY BMR		

DATE RECORDED AUG. 1981

GEOPHYSICAL SERVICE INTERNATIONAL
DIGITAL PROCESSING CENTRE
SYDNEY NSW AUSTRALIA
PROCESSING PARAMETERS

1. LINE FILE COMPUTATION
2. CROOKED LINE FILE PRODUCTION
3. RESAMPLE 2 MSEC TO 4 MSEC
4. TAR (ALPHA=4.0 DB/SEC. T2=3.0 SEC)
5. TRACE EDIT
6. CDP GATHER
7. TIME-VARIANT SCALING:REGULAR SCALERS
   1X1000 MSEC GATE START TIME 1000MSEC
8. VELOCITY ANALYSIS - RELATIVE STATICS
9. RESIDUAL STATICS COMPUTATION
   NO.RWMO. SMASH=15. STCP FILE 15
10. VELOCITY ANALYSIS- REL.+RESIDUAL STATICS
11. NMO CORRECTION
12. STATICS-DATUM +183 M. REP.VEL.2000 M/SEC
13. 6-FOLD CDP STACK (SQRT RECOVERY SCALING)
    RAMP.0 AT 167M.300 AT 168M.1400 AT 2000M
14. TIME-VARIANT DECONVOLUTION
    4 X 1/2 PT OPERATORS(WHITENING)
15. TIME-VARIANT FILTER:
    20-50 HZ AT 0.0 - 0.0 SEC
    12-50 HZ AT 1.0 - 2.0 SEC
    12-40 HZ AT 2.4 - 5.0 SEC
16. TIME-VARIANT SCALING: REGULAR SCALERS
    GATES 1X400, 1X600, 2X1000 MSEC
    START 500.850.1300.2250 MSEC

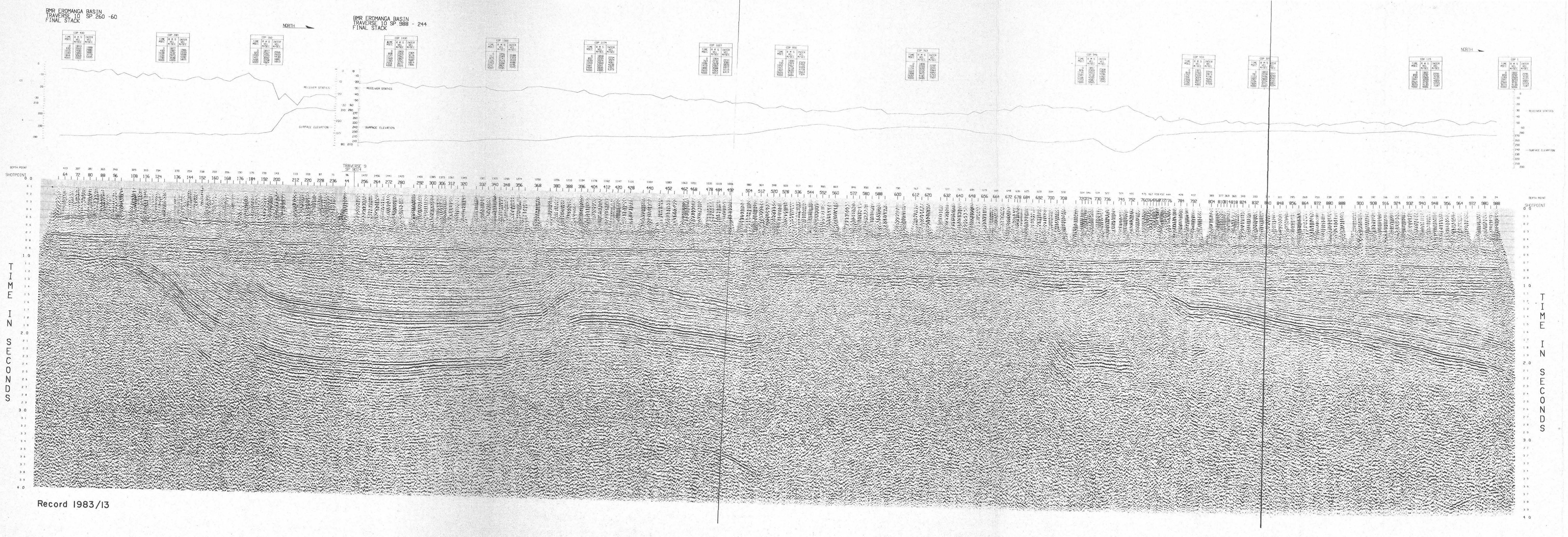
DISPLAY

MODE : WIGGLE TRACE/VAR 5% BIAS
VERTICAL SCALE 10CM/SEC
HORIZONTAL SCALE 25 TPI
TROUGH POLARITY -VE ON TAPE

DATE PROCESSED MARCH 1982

Q.C. BY

26/Q/78



Record 1983/13

BUREAU OF MINERAL RESOURCES

EROMANGA BASIN, QLD

TRAVERSE 10

SP. 988 -60

FIELD RECORDING PARAMETERS

SOURCE	DYNAMITE	
	SPACING	333.3 M.
	SHOT ON	TRACE 25
	MULTIPLICITY	6 FOLD
SPREAD	OFFSETS	1917-0-2000 M.
	NO. OF GROUPS	48
	GROUP INTERVAL	83.3 M.
INSTRUMENTS	DFS IV	
	FIELD FORMAT	SEGB 1600BPI
	SAMPLE RATE	2 MSEC
	RECORD LENGTH	20 SECS
	FILTERS	12-124 HZ.

PROGRESSION TOWARDS TRACE 1

RECORDED BY BMR

DATE RECORDED SEPT./NOV. 1981

GEOPHYSICAL SERVICE INTERNATIONAL

DIGITAL PROCESSING CENTRE
SYDNEY NSW AUSTRALIA

PROCESSING PARAMETERS

1. LINE FILE COMPUTATION
2. CROOKED LINE FILE PRODUCTION
3. RESAMPLE 2 MSEC TO 4 MSEC
4. TAR (ALPHA=4.0 DB/SEC. T2=3.0 SEC)
5. TRACE EDIT
6. CDP GATHER
7. TIME-VARIANT SCALING:REGULAR SCALERS
   1X1000 MSEC GATE.START TIME 100MSEC
8. VELOCITY ANALYSIS - RELATIVE STATICS
9. RESIDUAL STATICS COMPUTATION
   NO RNMO. SMASH=15. STCP FILE 5
10. VELOCITY ANALYSIS- REL.+RESIDUAL STATICS
11. NMO CORRECTION
12. STATICS-DATUM:+183 M. REP.VEL:2000 M/SEC
13. 6-FOLD CDP STACK (SQRT RECOVERY SCALING)
    RAMP:0 AT 167M.300 AT 168M.1400 AT 2000M
14. TIME-VARIANT DECONVOLUTION:
    4 X 12 PT OPERATORS(WHITENING)
15. TIME-VARIANT FILTER:
    20-60 HZ AT 1.5 SEC.15-40 HZ AT 2.5 SEC
16. TIME-VARIANT SCALING: REGULAR SCALERS
    GATES 1X400.1X600.2X1000 MSEC
    START 500.850.1300.2250 MSEC

DISPLAY

MODE :	WIGGLE TRACE/VAR	5% BIAS
	VERTICAL SCALE	10CM/SEC
	HORIZONTAL SCALE	25 TPI
	TROUGH POLARITY	-VE ON TAPE

DATE PROCESSED DEC. 1981

Q.C. BY MPB

26/Q/79

Fig. 9: Seismic section - Traverse 10

... GALWAY #1 ...

SYNTHETIC SEISMØGRAM

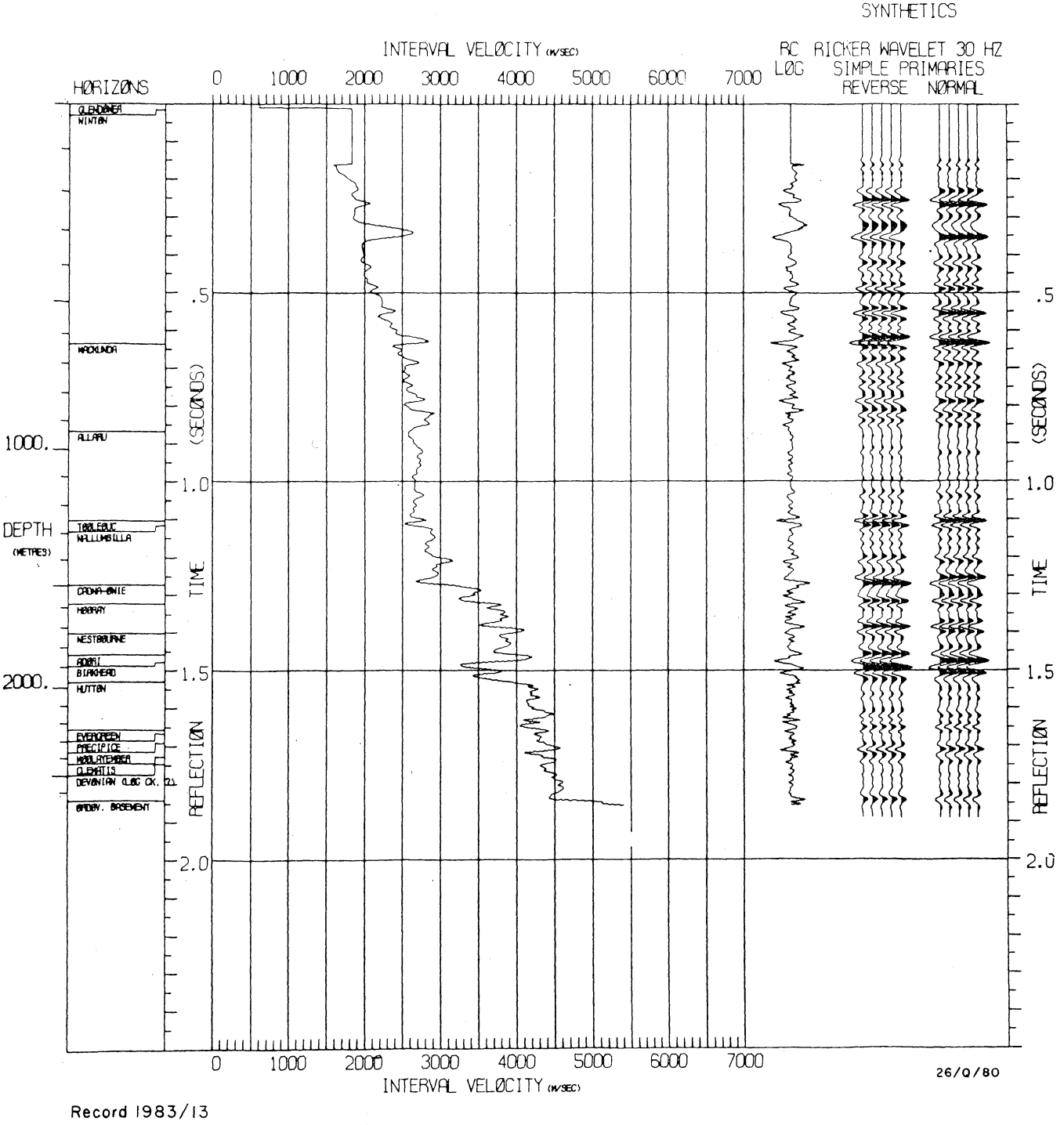
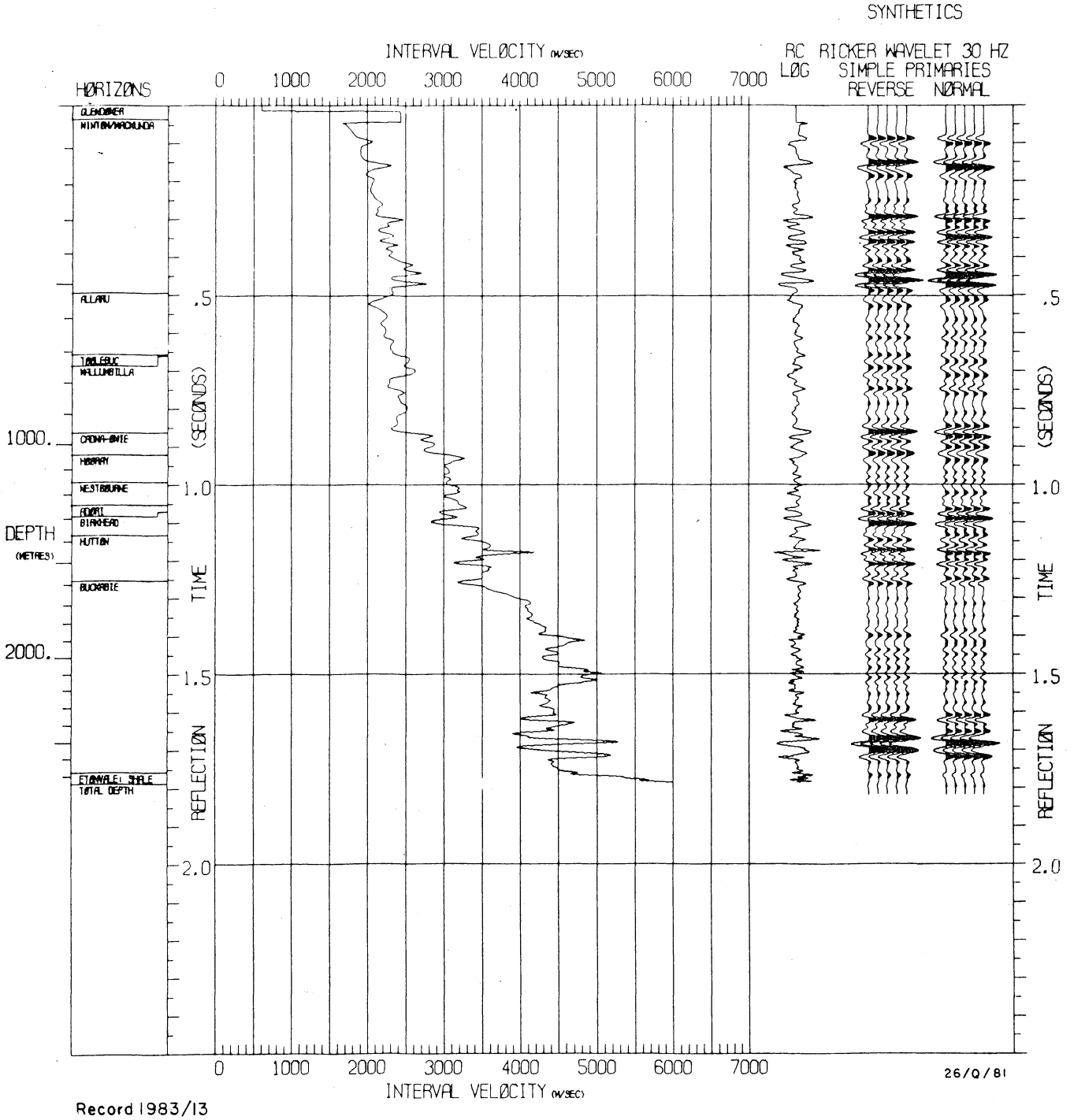


Fig. 10: Synthetic seismogram Galway 1

... BUCKABIE #1 ...

SYNTHETIC SEISMØGRAM



Record 1983/13

Fig. 11: Synthetic seismogram Buckabie 1

... GUMBARDØ #1 ...

SYNTHETIC SEISMØGRAM

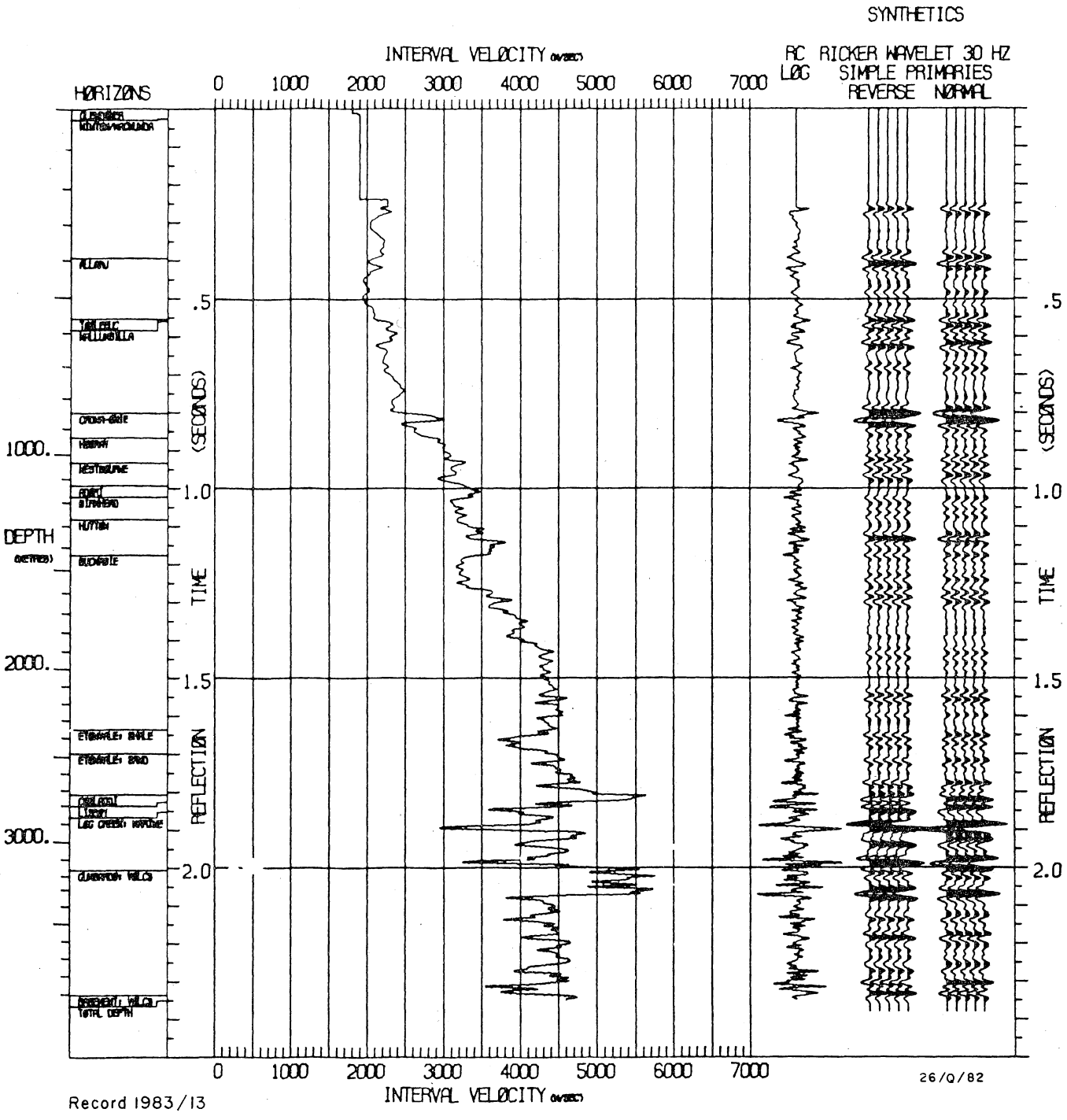


Fig. 12: Synthetic seismogram Gumbardo I