573001
PR
OR -471 A.
MINERAL RESO
21 FEB
TASMANI

AN AUGMENTED REPORT ON

THE PETROLEUM PROSPECTIVITY OF

EPP T/31P

STRAHAN SUB-BASIN
SORELL BASIN

TASMANIA

R A MEANEY
ROMA PETROLEUM NL

FEBRUARY 2001

TABLE OF CONTENTS

573602

Page #

1.0	ABSTRACT		4
2.0	INTRODUCTION		5
3.0	GEOLOGY		5
	3.1	Geological Setting	6
		3.1.1 *Structural Geology*	6
		3.1.2 *Stratigraphy*	7
	3.2	Petroleum Geology	7
		3.2.1 *Source Rocks and Maturity*	8
		3.2.2 *Reservoirs*	9
		3.2.3 *Seals*	9
		3.2.4 *Migration Pathways*	9
4.0	PREVIOUS EXPLORATION		9
	4.1	Geophysical Surveys	10
		4.1.1 *Seismic Surveys*	10
	4.2	Geochemical Surveys	10
	4.3	Drilling	11
		4.3.1 *Exploration Drilling*	11
		4.3.2 *Stratigraphic Drilling*	11
	4.4	Seismic Interpretation	11
		4.4.1 *Previous Seismic Mapping*	12
		4.4.2 *Re-interpretation & Remapping*	12
		4.4.3 *Prospects and Leads*	13
		4.4.4 *Indicative Potential Reserves*	14
5.0	RECOMMENDATIONS		15
6.0	CONCLUSION		15
7.0	BIBLIOGRAPHY		17

LIST OF FIGURES & ENCLOSURES

Figures

Figure 1 Location Map

Figure 2 Regional Setting

Figure 3 Structural Elements & Sediment Thickness Map

Figure 4 Stratigraphic Table for Sorell Basin

Enclosure

Enclosure 1 T/31P Shotpoint Base Map

Enclosure 2 Intra-Cretaceous Seismic Marker TWT Map

Enclosure 3 Near Top Cretaceous Seismic Marker TWT Map

Enclosure 4 Photocopy of Seismic Line MXT90-17

Enclosure 5 Photocopy of Seismic Line MXT90-08

Enclosure 6 Photocopy of Seismic Line MXT90-28

Enclosure 7 Photocopy of Seismic Line MXT90-05

Enclosure 8 Photocopy of Seismic Line MXT90-10

Enclosure 9 Photocopy of Seismic Line MXT90-12

Enclosure 10 Photocopy of Seismic Line MXT90-02

Enclosure 11 Photocopy of Seismic Line MXT90-07

Enclosure 12 Photocopy of Seismic Line MXT90-16

Enclosure 13 Photocopy of Seismic Line MXT90-24

1.0 ABSTRACT

The west coast of Tasmania is fringed by the Cretaceous - Tertiary aged Sorell Basin. This virtually undrilled basin appears, from scientific research, empirical evidence and the very limited drilling, to be highly prospective for oil generation and entrapment.

The basin is fundamentally an analogue of the prolific Gippsland Basin overlying the productive Otway Basin in that channeled Lower Tertiary section unconformably overlies tilted and rotated Cretaceous fault blocks. Some of these faults appear to have significant growth.

The Sorell Basin is essentially an extension of the Otway Basin from which it is separated by a basement high south of King Island. It is composed of four sub-basins namely, from north to south, King Island, Sandy Cape, Strahan and Port Davey. Exploration permit T/31P which is held in equal part by Roma Petroleum NL (Roma) and Guinness Peat plc (Guinness Peat) covers the near shore portion of the Strahan Sub-basin. Whilst the deepest section of the basin, a perceived hydrocarbon generating kitchen, is sited just west of T/31P it is ideally located to have charged structural and stratigraphic traps within the permit as it is connected by short, steep, direct migration pathways to the block. Mature source rocks are almost certain to be present within T/31P particularly in the many structural lows within the permit. Rich Eocene source rocks are known to be present in Deep Sea Drilling Project (DSDP) and Ocean Drilling Project (ODP) bores west and southwest of the permit.

The only exploration well, Cape Sorell 1, drilled within the Strahan Sub-basin is not a valid crestal test. However it should be noted that the well penetrated more than 300 metres of very rich, early mature, source rocks which exhibit a strong marine influence. These source rocks would be well into the oil generating window in the basin depocentre and within the western part of the permit. Of even more significance, free oil was recovered from cuttings and sidewall cores taken from this well, which reached a total depth of 3,528.4 m in the upper Early Cretaceous section. The Cretaceous section thickens markedly to the west, from the location of this well, which is sited on the eastern margin of the basin. An untested Early Cretaceous section is believed to be present within the permit.

Scientific research has established that the sea floor sediments in the Strahan Sub-basin have very high, by world standards, hydrocarbon anomalies. Furthermore these anomalies indicate the presence of wet gas and oil. Stranded oil of a largely marine and Australian origin has been recorded along Tasmania's West Coast.

All the major prerequisites for the generation and entrapment of oil, in commercial quantities, appear to be present in the Strahan Sub-basin namely:

- rich, mature source rocks of a largely marine origin;
- high porosity and high permeability clastic reservoirs;
- sealing units of both a regional and intraformational nature;
- large structural traps;
- a huge area of favourable stratigraphic trapping geometry; and
- short, steep, unhindered migration pathways from the hydrocarbon generative kitchens to the areas of trapping geometry.

2.0 INTRODUCTION

The Sorell Basin, a large passive margin sedimentary basin located off the west coast of Tasmania, was initiated by rifting in the Late Jurassic when the Australian and Antarctic Plates began to separate. This rifting exhibited a sinstral, trans-extensional component and resulted in the formation of a number of deep, generally fault bound, structural depocentres each of which contains a considerable thickness of Cretaceous and Tertiary section. Some of these depocentres are located beneath the Tasmanian continental shelf whilst others are located beneath and down the continental slope.

The Strahan Sub-basin, in particular, has access to a vast area of thick, mature, largely marine Cretaceous-Tertiary source rocks which exhibit evidence of deposition in a restricted, reducing environment. The area is virtually unexplored. There is overwhelming scientific and empirical evidence of the presence of hydrocarbon generation in the Strahan Sub-basin.

Very little systematic exploration has been conducted in the Strahan Sub-basin. The Esso Australia Limited and Broken Hill Proprietary Pty Ltd consortium (Esso-BHP) acquired regional seismic data and drilled several wells off the West Coast of Tasmania in the late 1960's following their widespread exploration programs in the sedimentary basins of south-eastern Australia. That program resulted in the major discoveries of the prolific Gippsland Basin of Victoria. The location of which is shown on Figure 1.

The most recent well drilled off the West Coast of Tasmania, Cape Sorell 1, is the only well located in the Strahan Sub-basin. It encountered an extensive interval of approximately 300m of very rich, early mature, source rocks but more importantly free oil was recovered from cuttings and sidewall cores. This well is not crestal. Recent mapping indicated that it is many kilometres from the crest of structural closure. The Cape Sorell 1 well was drilled by Amoco Australia Petroleum Company Limited (Amoco) in 1982. It is not a valid nor definitive test and unfortunately was sited on the eastern margin of the basin, away from the thicker Cretaceous section. The basin deepens markedly to the west and several thousand metres of additional section to that encountered at Cape Sorell 1 is present.

The most recent exploration conducted in the Strahan Sub-basin in the area of T/31P was that undertaken by Maxus Energy Corporation of Dallas (Maxus). They did extensive studies and reprocessed 1981 vintage seismic data previously acquired by Amoco as well acquiring a new seismic survey in 1990. Mapping of the seismic data from this survey identified three structural prospects of considerable size. The permit was then acquired by Roma and Guinness Peat in 1999, in equal part. Roma has completed a thorough and exhaustive re-evaluation of this highly prospective block, and confirmed the prospects identified by Maxus as well as identifying several others.

3.0 GEOLOGY

The geology of the Strahan Sub-basin of the Sorell Basin appears to be conducive to the generation, entrapment and retention of hydrocarbons. The basin is sited at the southeast end of the Southern Break-Up Margin of Australia, a region which is productive of both oil and gas.

3.1 Geological Setting

The Strahan Sub-basin is located off the West Coast of Tasmania. The Sub-basin lies immediately west of Macquarie Harbour and the township of Strahan and its location is shown on Figure 2. The Sorell Basin is located on the passive rift margin of Southern Australia which was initiated in Late Jurassic - Early Cretaceous time when Australia and Antarctica began to separate. This rifting, which is believed to have a sinstral trans-extensional component, resulted in the formation of four, generally fault bound, depocentres which contain thick piles of Cretaceous - Tertiary sediments, of a largely marine nature.

3.1.1 *Structural Geology*

The Strahan Sub-basin is bound to the east by metasediments of the Tasmanian mainland, to the west by the continent - ocean boundary. The Strahan Sub-basin is separated from the neighbouring Sandy Cape sub-basin to the north by a large basement high. It is similarly separated from adjacent Port Davey Sub-basin to the south by another large basement high.

Extensive extensional faulting has resulted in many areally small but deep depocentres within these sub-basins and under the continental slope off West Tasmania. A vast area of thick Cretaceous-Tertiary section which is known to be mature for hydrocarbon generation, but remains untested, is present in the Strahan Sub-basin. This is shown in Figure 3 which shows sediment thickness in two-way-time. There is at least 7 kms of sedimentary section present in the permit area on the western end of seismic line MXT90-28, as shown on Enclosure 6, the location of which is shown on Enclosure 1. As a generalization two seconds of two-way-time corresponds to about 3.5 kms of section.

The Strahan Sub-basin was initiated by Late Jurassic - Early Cretaceous rifting which began the separation of the Australian and Antarctic Plates. This rifting exhibits a sinstral trans-extensional component and has resulted in the formation of a number of deep structural depocentres, which are generally fault bound and which contain extensive thicknesses of Cretaceous - Tertiary sedimentary rocks. The Strahan Sub-basin is a component of the Sorell Basin which is fundamentally a lateral equivalent of the Otway Basin to the north from which it is separated by a basement high southwest of King Island.

Further epeirogenic uplift occurred in the Middle Cretaceous which is evidenced by a prominent 'breakup' unconformity. Additional normal faulting, with a significant left lateral wrench component, continued through until the Middle Oligocene when separation of the Australian and Antarctic Plates occurred.

Additional uplift occurred in the Paleocene as evidenced by the extensive erosional channeling present, similar to the Marlin Channel of the prolific Gippsland Basin. The large scale compressive tectonics of the Middle Miocene which formed most of the productive structures in the Gippsland Basin to the north is also evident, but not as marked. Significant angular unconformities are also present in the Middle to Late Tertiary section indicating continued tectonics.

The many episodes of structuring is fortuitous as it indicates the presence of long standing traps which would be in place to capture migrating hydrocarbons throughout most of the sub-basin's history. It is believed the generation and migration of oil occurred quite late in the basin, hence the timing of trap formation is probably optimal.

As a result of the extensive rifting and episodes of normal faulting the Strahan Sub-basin has many self contained, deep structural lows and depocentres. The overall effect has been to produce, in the area of T/31P, a barred basin which probably has restricted the circulation of water and created an anoxic reducing environment. Such an environment is ideal for the preservation of rich, unoxidized source rocks with a significant marine influence.

3.1.2 *Stratigraphy*

The Strahan Sub-basin is essentially an analogue of the productive Lower Tertiary section of the Gippsland Basin overlying the hydrocarbon bearing Cretaceous Otway Basin section in that channeled Early Tertiary section overlies tilted Cretaceous aged rotated fault blocks. The stratigraphic nomenclature adopted for the Sorell Basin, and subsequently the Strahan Sub-basin, is that of the Otway Basin of south-west Victoria. A stratigraphic column is included as Figure 4.

The earliest sediments expected to be present are correlatives of the Early Cretaceous Otway Group. These are rift fill sediments of a fluvial-deltaic nature. This unit, which is known to have sourced the soon to be developed Minerva gas field in the offshore section of the Victorian sector of the Otway Basin, was not intersected in the proximal Cape Sorell 1 well. It produces gas in the onshore section of the basin in Victoria and oil in the onshore South Australian sector, Oil has also been recovered from this interval onshore Victoria as well.

This unit is unconformably overlain by Cenomanian to Maastrictian aged marginal marine clastics of the Sherbrook Group, which also hosts hydrocarbons in the onshore sector of the Otway Basin in both Victoria and South Australia, as well as the offshore Minerva gas field. Recoveries of oil have been made from this interval in the onshore Victorian sector of the basin.

The Sherbrook Group is in turn unconformably overlain by the shallow marine clastics of the Paleocene - Early Eocene aged Wangeripp Group which is broadly equivalent to the upper portion of the productive Latrobe Group of the Gippsland Basin. The Wangeripp Group is also heavily channeled in an analogous manner to the Latrobe Group. This unit is in turn unconformably overlain by the Eocene - Oligocene Nirranda Group which is composed of marls and sandstones. The youngest group, the Heytesbury Group, which is composed of shelfal marl and temperate carbonates, unconformably overlies the Nirranda Group.

3.2 Petroleum Geology

Many detailed studies indicate that the Strahan Sub-basin of the Sorell Basin contains rich source rocks with a marked marine influence which have generated oil (reference Armstrong et al 1983 and Amoco 1983.). It is known that three petroleum systems are active on the Southern Margin of Australia namely:

Austral 1 — With Early Cretaceous source rocks. This system is productive in the onshore Otway Basin of South Australia in particular, as well as offshore Victoria.

Austral 2 — With Late Cretaceous source rocks. This system is productive in the onshore sector of the Victorian sector of the Otway Basin.

Austral 3 — With Early Tertiary source rocks. This system is productive and prolific in the Gippsland Basin of Victoria.

There is also much empirical evidence to support the presence of oil in the Strahan Sub-basin. The most convincing evidence is the presence of live, free oil in the Cape Sorell 1 well. This oil was encountered in cuttings and in a sidewall core. Further evidence exists in the existence of stranded bitumens along the West Coast of Tasmania. These strandings which occur along the southern coast of Australia all belong to a single family of oils.

They are aromatic - asphaltic and are rich in sulphur, indicating a marine source rock origin. The perceived origin of these oils is Late Jurassic to Cretaceous marine shales deposited in an anoxic/sulphidic restricted environment. A recent study has indicated that these oils are identical to the oils generated by the Albian age shales of the Toolebuc Formation of the Great Artesian Basin. Hence an Australian origin rather that Indonesian source is responsible for these strandings, those on the west coast of Tasmania in particular. This is a very important determination at it highgrades the Strahan Sub-basin as a potential oil province.

Further empirical evidence is the occurrence of thermogenic hydrocarbons in cores taken from the sea floor on the continental shelf west of the Tasmanian coast. The yields, high by world standards, were highest in the Strahan Sub-basin. They indicate 'wet' gas generation and presumably oil. Rich source rocks of a Tertiary age have been encountered in DSDP and recently drilled ODP bores off the west coast of Tasmania which are discussed further into the report in section 4.3.2.

3.2.1 *Source Rocks and Maturity*

The Sorell Basin, of which the Strahan Sub-basin is a component, is part of the major rifting which commenced in the Late Jurassic and Early Cretaceous and resulted in the separating of Australia from Antarctica.

The resulting grabens were the sites of the accumulation a thick pile of potentially very rich source rocks of a largely marine nature deposited in restricted and barred deopocentres. These shales are known to be in the early oil window at depths of approximately 3,000m in the Cape Sorell 1 well, a marginward location. These rocks are buried an additional several thousand metres in a depocentre approximately 25 kms west of the above mentioned well. Sea floor cores above this depocentre have enormously high thermogenic hydrocarbon counts particularly in the C_4 and C_5 homologues which indicates that liquid petroleum has been generated.

Various studies by Robertson Research and Amoco Production Research Company indicate the presence of very rich, oil prone, source rocks which are in the early oil maturation window at the Cape Sorell 1 location, a shallow proximal position on the edge of the Strahan Sub-basin. These studies indicate Total Organic Content (TOC) values well above average, with a mean value of 4%. Vitrinite Reflectance values (V_{RO}) are all in the early mature region for oil generation and range from 0.46% to 0.54%. Thermal Alteration index (TAI) and Spore Colouration Index (SCI) values are all consistent with the source rocks being in the early mature window. Oil rich lipinitic kerogens have been identified.

These studies indicate that very rich oil prone source rocks are present. These rocks could be expected to have passed through the peak oil generative window in the basin depocentre, west of Cape Sorell 1. Hence large volumes of oil should have been generated and then oil should have migrated eastward into robust structural traps located within T/31P. Several DSDP and ODP bores west and southwest of the permit have encountered rich, mature source rocks. Additional information on source rocks is covered in Section 4.2, Geochemical Surveys.

3.2.2 *Reservoirs*

The presence of good reservoir intervals in the Lower Tertiary and Cretaceous section has been established at Cape Sorell 1. The presence of interbedded reflectors on the seismic data and the myriad of unconformities evident of the seismic sections point to the presence of alternating reservoirs and seals in the deeper untested Early Cretaceous section.

The Eocence/Paleocene section is particularly sandy with excellent quality reservoirs and with porosities up to 30%. Most sandstone units have porosities in the range of 20-30%. The sandstones and conglomerates below 3,000m in the Upper Cretaceous section in Cape Sorell 1 have lesser porosities. However this well was sited in a very proximal location and the sediments are quite poorly sorted and quite angular and have traveled little distance from the provenance, onshore Tasmania. Reservoir quality could be expected to improve with more sediment transport distance away from the 'Tasmanian Craton' which the previously mentioned well is sited quite near to.

In general, good quality reservoirs can be expected within the section, particularly the lower Tertiary and Late Cretaceous portions.

3.2.3 *Seals*

Good seals are known from the Lower Tertiary, a major target of the basin in the Cape Sorell 1 well. Potential sealing intervals are also recognized, within the Cretaceous section a prime target in the basin in particular the Pember Mudstone. It is reasonable to expect that with basinward progression that more finer grained sealing units would be present. The Lower Cretaceous section of the basin has not been penetrated by a well, however interbedded seismic reflectors indicate changing lithologies, presumably sandstones and shales.

3.2.4 *Migration Pathways*

The final requirement for a hydrocarbon accumulation is the presence of a simple, steep, unhindered migration pathway for the hydrocarbons generated in the hydrocarbon kitchen to travel to the robust traps towards the basin margin. This requirement is met in T/31P to a very high degree.

4.0 PREVIOUS EXPLORATION

Hydrocarbon exploration off the West Coast of Tasmania began in 1968 following the Esso - BHP large scale southern basin exploration program which was directed at the Gippsland Basin of Victoria, the Otway Basin of Victoria and South Australia and the Bass Basin of Tasmania. Hydrocarbons have been discovered in all three basins with a world class province being brought in the Gippsland Basin. After success in the Gippsland Basin the consortium undertook a frontier drilling program in the Tasmanian Sector of the Otway Basin and what is now known as the King Island Sub-basin of the Sorell Basin. These wells were generally sited on basement highs with a reduced sedimentary section. They were located on a sparse, regional seismic grid. Since then the only serious exploration in the Strahan Sub-basin was that conducted by Amoco in the early 1980's and some later work conducted by Maxus in the early 1990's. Amoco's Cape Sorell 1 well was also sited on a sparse, poor quality seismic grid. Due to the lack of well control seismic stratigraphy, still in its infancy, was used to select the exploration target. This proved to be inadequate.

The area covered by T/31P has been included in previous permits held by:

- Esso Exploration and Production Australia Ltd;
- Amoco Australia Oil Company; and
- Maxus Energy Corporation.

4.1 Geophysical Surveys

Several geophysical surveys utilizing different methods have been conducted in the area of T/31P. Aeromagnetic surveys as well as gravity surveys have been acquired which are useful in outlining the basin architecture. Of particular interest are seismic surveys some of which have been of a commercial nature whilst several others have been conducted by academic institutions as part of the scientific study of the rifting off of the Australian from the Antarctic Plate.

Most of the academic data has been studied by the exploration companies and is incorporated in their reports. This information is quite useful in the sparsely explored Strahan Sub-basin, particularly the deep water section. It is particularly useful in a determination, however rudimentary, of basin architecture and the location of the depocentres and potential hydrocarbon generating kitchens. Details of previous seismic surveys can be found in Conolly and Galloway (1995).

4.1.1 *Seismic Surveys*

Commercial seismic surveys have been acquired in the area of T/31P by Esso, Amoco and Maxus. These are concentrated in the shallower water section in the east of the permit. All have indicated the presence of large scale structural and stratigraphic traps.

Several seismic surveys, some with associated gravity and coring and geochemical sampling have been conducted in the area of T/31P off the West Coast of Tasmania. Some were regional in nature and extend along the entire coast line. These scientific surveys were conducted by the Bureau of Mineral Resources (BMR) and the Bundesanstalt für Geowissenschaft und Rohstoffe (BGR) of Germany.

4.2 Geochemical Surveys

The previously mentioned research studies have included many geochemical surveys. Several of these indicate that the sea water column and sea floor sediments have enormously high hydrocarbon concentrations.

The geochemical studies directed toward source rock analysis all indicate that the sub-basins off the West Coast of Tasmania have both the capacity to produce, and are currently generating, hydrocarbons. The most encouraging evidence was obtained from:

1 Traces of free oil in the Cape Sorell 1. Excellent source rocks were also recorded in the last 300m of this well in the Strahan Sub-basin in Paleocene and Late Cretaceous rocks below 3,000m. This indicates the source rocks are present and have been elevated to maturation levels.

2 The Total Organic Carbon content of samples from Cape Sorell 1 are very rich. The highest TOC from a sidewall core was 18.6 percent with an average value of 3.45% for 12 samples. The case for cuttings samples was similar, a maximum value of 8.2% with an average value of 4.42 percent.

3 Sea bottom and water column geochemical samples from the Strahan Sub-basin indicate the presence of thermogenic hydrocarbons.

4 Surface samples collected by the R V Sonne cruise a joint BMR-BGR investigation have gas yields and molecular composition indicating the presence of wet, thermogenic hydrocarbons. The highest values were obtained on the upper continental shelf some 25 kms southwest of Cape Sorell 1 near the Tetons Prospect in T/31P. The total C_2 - C_5 readings were high by world standards, more importantly the proportion of C_2 - C_5, indicating the presence of liquids, was also high.

The above summary is modified after Conolly and Galloway (1995) from "Hydrocarbon Prospectivity of the Offshore West Coast of Tasmania" (1995).

4.3 Drilling

Little drilling of either an exploration or stratigraphic nature has been conducted off the West Tasmanian coast in general and in the Strahan Sub-basin in particular. Several DSDP and ODP holes are sited off the West Coast of Tasmania.

4.3.1 *Exploration Drilling*

Just four exploration wells have been drilled off the West Coast of Tasmania. The first three by Esso in the 1970's and the most recent, Cape Sorell 1, by Amoco in 1982. Only one well, the later, is sited in the Strahan Sub-basin.

It is important to note that the Early Cretaceous Section, thought to be present due to strong seismic evidence, is untested in the Strahan Sub-basin and the Late Cretaceous Section is barely tested as the well reached total depth in the uppermost portion of this interval. Cape Sorell 1, due to a less than optimal seismic grid did not test the crest of the Early Tertiary structure, which has an erosional genesis. In summary a valid structural test is yet to be drilled in this sub-basin, which drains a vast area of thick Tertiary and Cretaceous section known to contain rich mature source rocks of a largely marine genesis beneath the continental slope.

4.3.2 *Stratigraphic Drilling*

The fully cored stratigraphic hole, DSDP location 282, is to the west of the block some 128 kms from the proximal Cape Sorell 1 location is sited on the eastern margin of the sub-basin. The results of this scientific drilling is discussed in referenced papers. However it should be noted that this well encountered rich organic Eocene shales, acknowledged source rocks which were early mature for oil generation. These rocks exhibit a marked marine influence.

In a similar vein the recently drilled ODP bore 1168 encountered similar source rocks. The latter bore also established the presence of rich marine source rocks deposited in a restricted barred setting with a strong reducing environment. These rocks have TOC's as high as 5 percent and with maturities that are approaching the oil generating window. This bore is located just 15 kms west of the southwest corner of the permit.

4.4 Seismic Interpretation

Three episodes of modern, post 1980 seismic mapping have been conducted in the area of T/31P, particularly the eastern section.

4.4.1 *Previous Mapping*

The eastern portion of what is now T/31P has been mapped in detail by two previous operators. The first Amoco acquired seismic data in 1981 and drilled the Cape Sorell 1 well in 1983, on this mapping. This is available on open file in Mineral Resources Tasmania in Hobart.

The second operator Maxus acquired additional seismic data, after reprocessing the Amoco data, and mapped the area in the early 1990's. This mapping identified three prospects, Braddon Point, Sloop Point and Trial Harbour as well as two significant leads. Maxus' mapping is also available in the Mineral Resources Tasmania open file section of their library.

4.4.2 *Reinterpretation & Remapping*

Roma Petroleum conducted a re-interpretation of the most modern, post 1990 seismic data within the area of T/31P. The modern seismic coverage of T/31P is shown on Enclosure 1. This attempted reinterpretation turned out to be very time consuming and difficult. This interpretation was conducted on paper sections of the 1990 Maxus Seismic Survey and not on a work station. The reprocessed Amoco data was unusable.

The interpretation proved to be extremely difficult for the following reasons:

1 The lack of a synthetic seismogram or time depth curve.
2 The myriad of interleaved unconformities present.
3 The ubiquitous rotated Cretaceous fault blocks.
4 The severely band limited data.
5 The presence of layered volcanics, near to basement.
6 The many out of plane reflections.

Seismic calibration was rudimentary with events correlated to horizons mapped by Maxus. Calibration will remain a problem until a deep well is drilled which penetrates the full sedimentary section and reaches basement. The check shot data and sonic log were not available to have a synthetic seismogram generated.

The following seven horizons were interpreted:

1 Acoustic Basement Seismic Marker (Blue horizon)
2 Intra-Cretaceous Seismic Marker (Brown horizon)
3 Near Top Cretaceous Seismic Marker (Purple horizon)
4 Lower Tertiary Seismic Marker (Yellow horizon)
5 Upper Tertiary Seismic Marker 1 (Orange horizon)
6 Upper Tertiary Seismic Marker 2 (Pink horizon)

A detailed hand contoured two way time map on Intra-Cretaceous Seismic Marker was prepared. This map which is included as Enclosure 2 shows several robust structures of significant size to warrant evaluation. More importantly it shows a huge stratigraphic trap with basement as the probable base and lateral seal and an Upper Cretaceous mudstone as a seal section as a top seal.

Roma's mapping has defined structures in a similar position to Maxus' Braddon Point and Sloop Point Prospects. More importantly Roma's mapping has also confirmed a huge stratigraphic prospect co-incident with Maxus' Trial Harbour Prospect, also a stratigraphic prospect. Crestal seismic lines over all the prospects identified are attached as Enclosures 3-12. Enclosure 6 shows the location of the Cape Sorell 1 well, which is not crestally sited.

Our mapping has high-lighted two additional prospects Tetons and Table Head to the west of Braddon Point. They are located more basinward and are better sited to entrap hydrocarbons migrating from the basin deep. Several other small structures and leads are also delineated. Braddon Point is the largest and most robust feature and a gas chimney is evident on seismic line MXT90-07 included as Enclosure 11, above a bounding fault to this structure, as such it is the obvious candidate for the next well to be drilled in this basin.

The Sloop Point Prospect in the south of the map area is not as well located as the others as it could be shielded from a hydrocarbon charge. Hence it is not recommended for drilling at this stage.

A map was also prepared on the Near Top Cretaceous Seismic Marker. This map was also hand contoured and then digitized. This horizon coincides with the Base of Pember Mudstone and Top of Timboon Sandstone. As such is maps a seal/reservoir interface. This map which is included as Enclosure 13. It exhibits similar form to the previous map. The Braddon Point and Table Head Structure Prospects are present on this horizon along with the large Trial Harbour stratigraphic trap, as they were on Enclosure 2, the Intra-Cretaceous Seismic Marker map. Several other small prospects are also present. The Sloop Point Prospect at Intra-Cretaceous level is reduced to a nose at this level due to the draping nature of the section. The Tetons Prospect is not present at this level. However significant up-dip potential is recognised at the Cape Sorell Structure. The Cape Sorell 1 well is not crestally sited.

Mapping by Maxus and Roma indicates the presence of structures, some of which are co-incident. However the detail does differ. To resolve this and to more efficiently explore this prospective basin the acquisition of a modern 3D seismic grid situated over the area of the previously acquired Amoco and Maxus grids is warranted. The benefits of such a grid are:

1 Modern, higher resolution seismic recording equipment can be used.
2 The optimal acquisition parameters can be used.
3 The attendant 3D migration will remove out of plane reflections.
4 The denser, lateral sampling will solve the problem of fault correlation.
5 The high resolution data will help with unconformity recognition and correlation across faults.

However drillable locations are present on the Braddon Point and Table Head structural prospect. As well as the huge Trial Bay stratigraphic prospect is seismically delineated.

4.4.3 *Prospects & Leads*

Prospects and leads have been identified on both horizons.

Intra-Cretaceous

Roma's mapping has identified five prospects, namely Braddon Point, Table Head, Tetons and Sloop Point as well as the Trial Harbour stratigraphic trap of significant size to warrant consideration for evaluation by test drilling. A large, well sited lead, Ahrberg Bay, has also been recognized. These five prospects are listed below along with the potential oil reserves they could host. Representative reservoir parameters, used in these calculations are also tabled below.

Top Cretaceous

At this level four large prospects have been identified namely Trial Harbour, Braddon Point, Table Head and Cape Sorell 1. These prospects and the potential reserves they could host are tabled below.

4.4.4 *Indicative Reserves*

Indicative potential in place and potentially recoverable reserves have been calculated for both horizons, using the reservoir parameters tabled below.

Reservoir Parameters

Porosity	18%
Oil Saturation	75%
Formation Volume Factor	$^1/_{1.1}$
Net Effective - Hydrocarbon Column	30m
Recovery Factor	0.3
Trap Geometry Factor	0.8

In Place Oil/km²

$10^3 \times 10^3 \times 0.18 \times {}^1/_{1.1} \times 0.8 \times .75 \times 0.3 \times 10^3$
$= 2.9455 \times 10^6$ m³/km²
$= 2.9455 \times 6.29 \times 10^6$ bbls/km²
$= 18.5269 \times 10^6$ bbls/km²
= *18,530,000 bbls/km²*

Intra-Cretaceous

The potential reserves, both in place and recoverable, that the above five prospects could hold, using the listed and representative reservoir parameters, are detailed below.

Prospect	Aerial Extent (km²)	Potential In Place Reserves (MMBBLS)	Potential Recoverable Reserves (MMBBLS)
Trial Harbor	56.50 km²	1,046.95	314.08
Braddon Point	18.40 km²	340.95	102.29
Sloop Point	15.20 km²	281.66	84.50
Tetons	13.73 km²	254.42	76.33
Table Head	7.54 km²	139.72	41.92
Total Potential Recoverable Reserves			***619.12 MMBBLS***

Top Cretaceous

The potential reserves, both in place and recoverable, that the above three prospects could hold, using the listed and representative reservoir parameters, are detailed below.

Prospect	Aerial Extent (km²)	Potential In Place Reserves (MMBBLS)	Potential Recoverable Reserves (MMBBLS)
Trial Harbor	64.2 km²	1,189.6	356.9
Braddon Point	24.05 km²	445.6	133.7
Table Head	16.35 km²	302.9	90.9
Total Potential Recoverable Reserves			***581.5 MMBBLS***

From the above it is obvious that there exists the possibility of finding significant oil reserves in T/31P. Previous work by Maxus identified a similar total figure for Braddon Point, Trial Harbor and two levels in Sloop Point.

5.0 RECOMMENDATIONS

To more effectively explore T/31P it is recommended that a modern, high resolution 3D seismic grid over the near shore, shallow water section of the permit, essentially the area covered by the Maxus and Amoco grids be acquired. This should result in 'cleaner' data which will be more readily 'interpretable'.

Should a prospect be drilled prior to the recording of any 3D data it is recommended that the Braddon Point Prospect be selected. This is a very robust structure, controlled by major down to the basin normal faults, whilst not mapped, closure seems to persist from the Lower Tertiary through to presumed Lower Cretaceous section. This latter section is untested but correlative section in the adjacent Otway Basin is hydrocarbon productive.

This section will be encountered at a similar depth, 3,000m, as the Upper Cretaceous was in Cape Sorell 1, a more marginward well, due to gravity slumping and rotation of Cretaceous fault blocks. Erosional closure is also present in the Lower Tertiary section, the productive zones in the Gippsland Basin. This structure is present on both horizons.

The Table Head Prospect is present on both horizons but is more robust at the Top of the Cretaceous. It is well sited, basinward of Braddon Point, and is connected by a nose to the basin deep, hence it is ideally sited to trap migrating hydrocarbons. It too should be considered for drilling as it is sited closer to the basin deep than Braddon Point. This prospect is sited on a structural nose adjacent to a steep gradient into the basin proper and the presumed hydrocarbon generating kitchens of the sub-basins located beneath the continental slope.

The smaller but more basinward Tetons Prospect should not be considered for evaluation at this stage as it is not present on the Near Top Cretaceous horizon.

The huge Trial Harbor Prospect, a stratigraphic trap to the north of the map area, sits on basin's edge and is present on both horizons. This prospect is restricted to the Lower Tertiary and uppermost Upper Cretaceous. It and the more marginward Sloop Point structural prospect should be considered for drilling pending the results obtained at the Braddon Point and Table Head locations.

6.0 CONCLUSION

Roma's mapping, whilst restricted to two horizons, has confirmed Maxus' more detailed mapping with co-incident structures located at the Braddon Point, Sloop Point and Trial Harbor locations as delineated by Maxus.

The Roma mapping has identified several other prospects, the Tetons and Table Head Prospects in particular. The latter, in particular, is ideally located to evaluate whether a charge has come out of the basin deep.

Given the results of geochemical analysis of data from Cape Sorell 1 it would appear that the source rocks, in situ at these prospects, would be mature for oil generation.

To assess the oil prospectivity of this basin it is imperative that the Table Head and Braddon Point Prospects are evaluated by drilling. Whilst Braddon Point could be drilled now it is considered that it would be wise to acquire 3D seismic data to more accurately delineate these features to enable the optimal siting of test wells. Additional infill seismic would also more accurately identify the crest of the Table Head feature.

The Strahan Sub-basin appears to have all the requirements for oil generation and entrapment namely:

- Rich, mature, marine source rocks.
- Excellent intervals of sandstone reservoirs.
- Intervals of sealing units, both regional and intraformational.
- Direct, short, unhindered migration pathways from hydrocarbon generative kitchens to the potential traps.

7.0 BIBLIOGRAPHY

A Basic Geochemical Evaluation of Eight Sidewall Cores From The Cape Sorell 1 Well Drilled in Australia, J P Armstrong, MM Alimi, J M Ode, K H King, Robertson Research (Singapore) Private Limited, Report No 1170, January 1983, (unpublished).

A Geohistory Analysis of the Cape Sorell 1 Well Drilled Offshore West Tasmania, G W Hughes, Robertson Research, Report 1019, (unpublished).

AGSO Cruise 147 Report - Tasman Rises Geological Cruise of Rig Seismic Stratigraphy, Tectonic History and Paleoclimate of the Offshore Tasmanian Region, N F Exon, J F Marshall, D C McCorkle, M Alcock, G C H Chaproniere, R Connell, S J Dutton, M Elmes, C Findlay, L Robertson, N Roller, C Samson, S Shafik and G P Whitmore, AGSO, Record 1995/56.

Block T/24P - West Tasmania Australia An Exploration Opportunity, Maxus Energy Corporation 1993, (unpublished).

Cape Sorell No 1 Drilling Prognosis, Amoco Australia Petroleum Company, April 1982.

Cape Sorell No 1 Geological Completion Report Exploration Permit T-12-P Offshore West Tasmania Australia, Amoco Australia Petroleum, Tasmania, Australia, October 1982, (unpublished).

Cape Sorell Strahan Sub-basin West Tasmania, Maxus Energy Corporation (unpublished).

Deep Water Otway Basin: A New Assessment of the Tectonics and Hydrocarbon Prospectivity, A M G Moore, H M J Stagg and M S Novick, APPEA Journal Vol 40 2000.

Hydrocarbon Prospectivity of the Offshore West Coast of Tasmania, J Conolly and M J Galloway, Mineral Resources Tasmania, Record 1995/04.

Ocean Drilling Project, Leg 189 Preliminary Report, Australian Geological Survey Organisation, N Exon.

Review of Biostratigraphic Data From Cape Sorell 1 Sorell Basin, Alan D Partridge, Report for Roma Petroleum NL, December 1999, (unpublished).

Seismic Stratigraphic Study of the T-12-P permit Area Offshore West Tasmania Australia, Amoco Australia Petroleum Company, August 1981 (unpublished).

Sorell Basin Tasmania Australia Release of Offshore Petroleum Exploration Areas in 1998 T98-1 and T98-2, C R Calver, Mineral Resources Tasmania, Record 1998/03.

T31P West Coast Tasmania An Exploration Opportunity in the South Margins of Australia - Oil Province, J Conolly, Report for Roma Petroleum Company Pty Ltd, January 2000, (unpublished).

The Biostratigraphy of the Amoco Australia Petroleum Company Cape Sorell 1 Well Offshore West Tasmania Australia, G W Hughes, W P Seymour, O Varol, Y C Chow, Robertson Research (Singapore) Private Limited, January 1983, (unpublished).

The Tasmanian Gateway between Australia and Antarctica, Preliminary Report Leg 189, Ocean Drilling Program, Texas A&M University, Shipboard Scientific Party, 2000.

The West Tasmanian Margin An Underrated Petroleum Province, K Hinz, J B Wilcox, M Whiticar, H R Kudrass, N F Exon and D A Feary, Second South-Eastern Australia Oil Exploration Symposium, R C Glenie Editor 1985.

573019

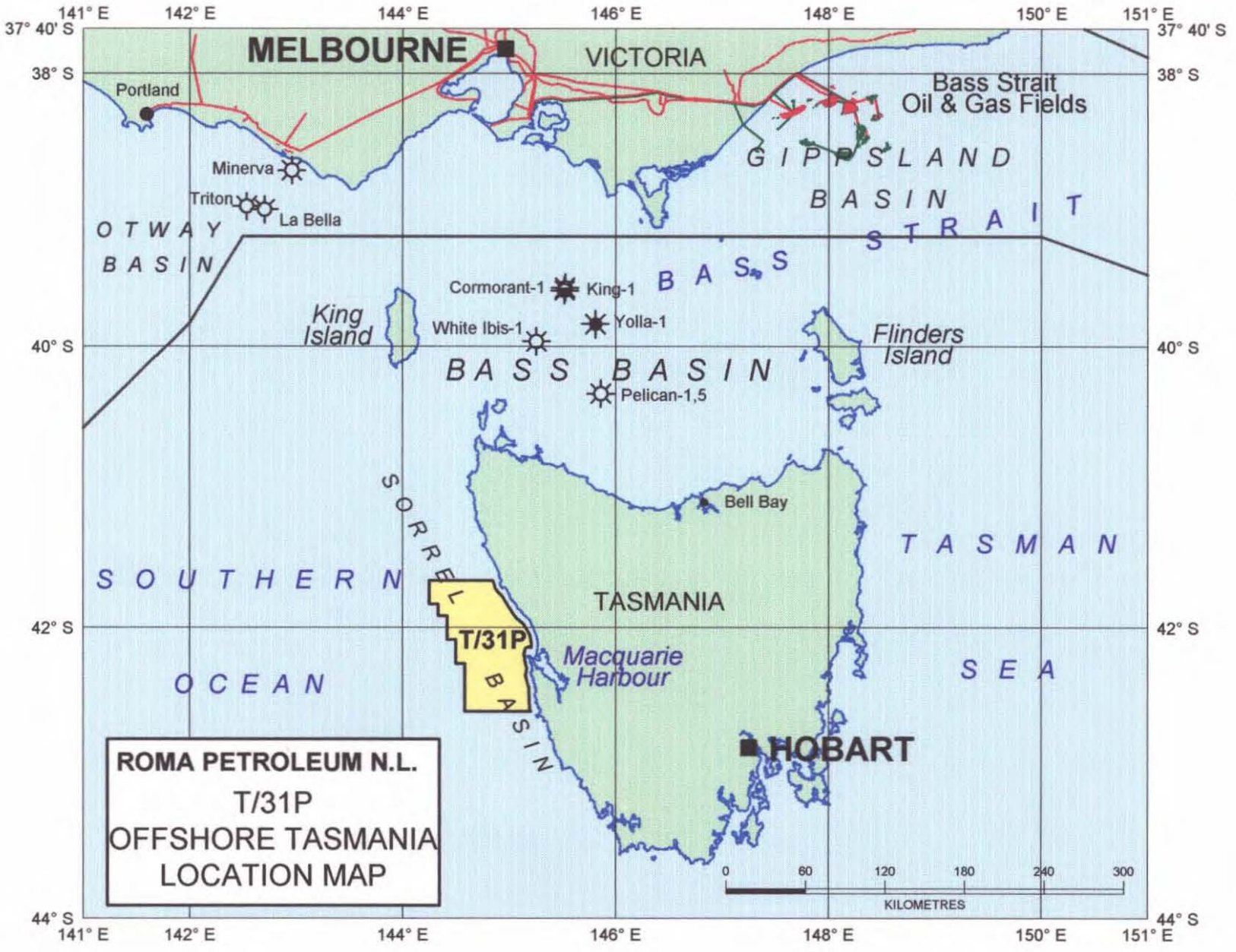
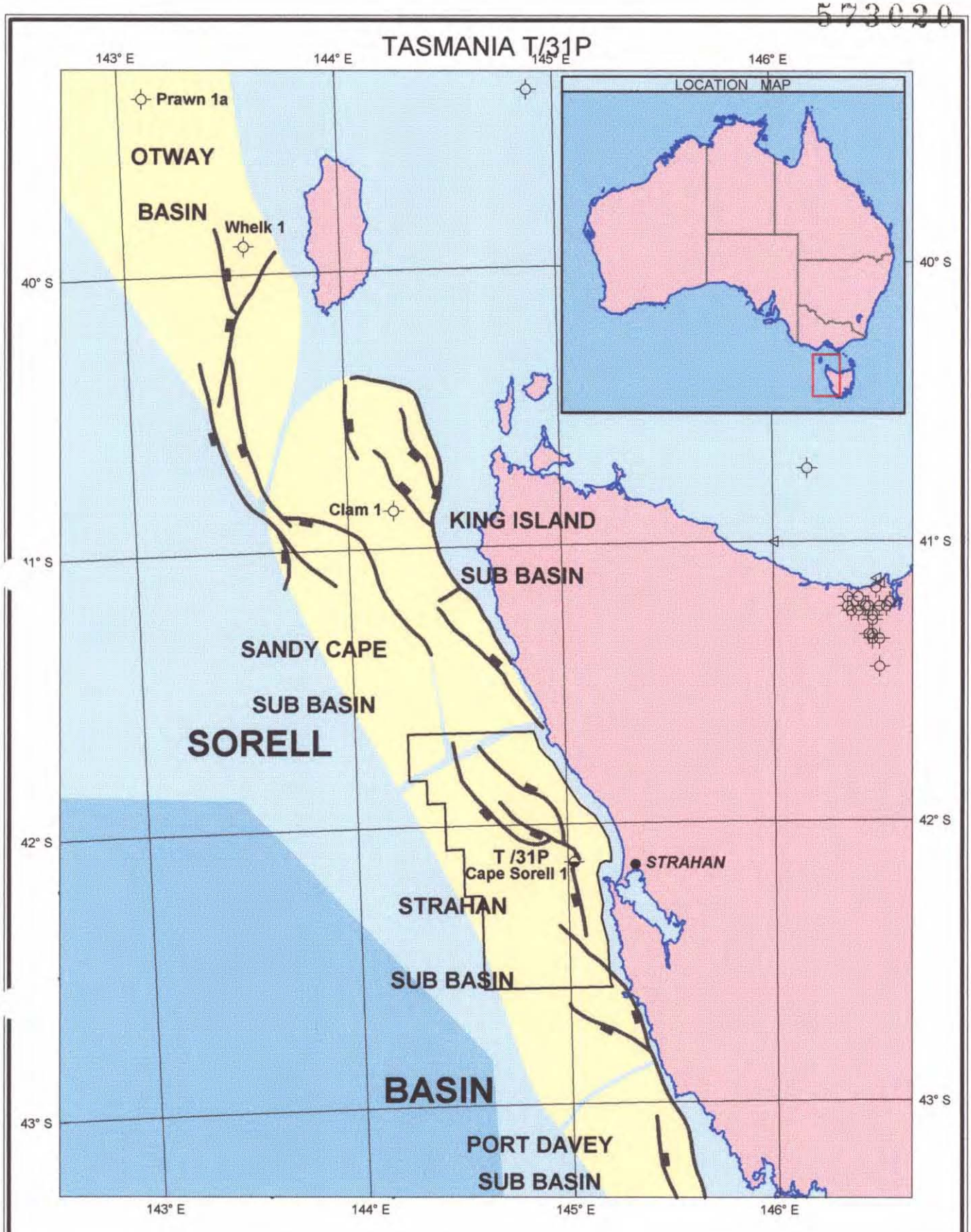


Figure 1

573020



0 20 40 60 80 100
KILOMETRES

5 cm

ROMA PETROLEUM NL

TASMANIA T/31P

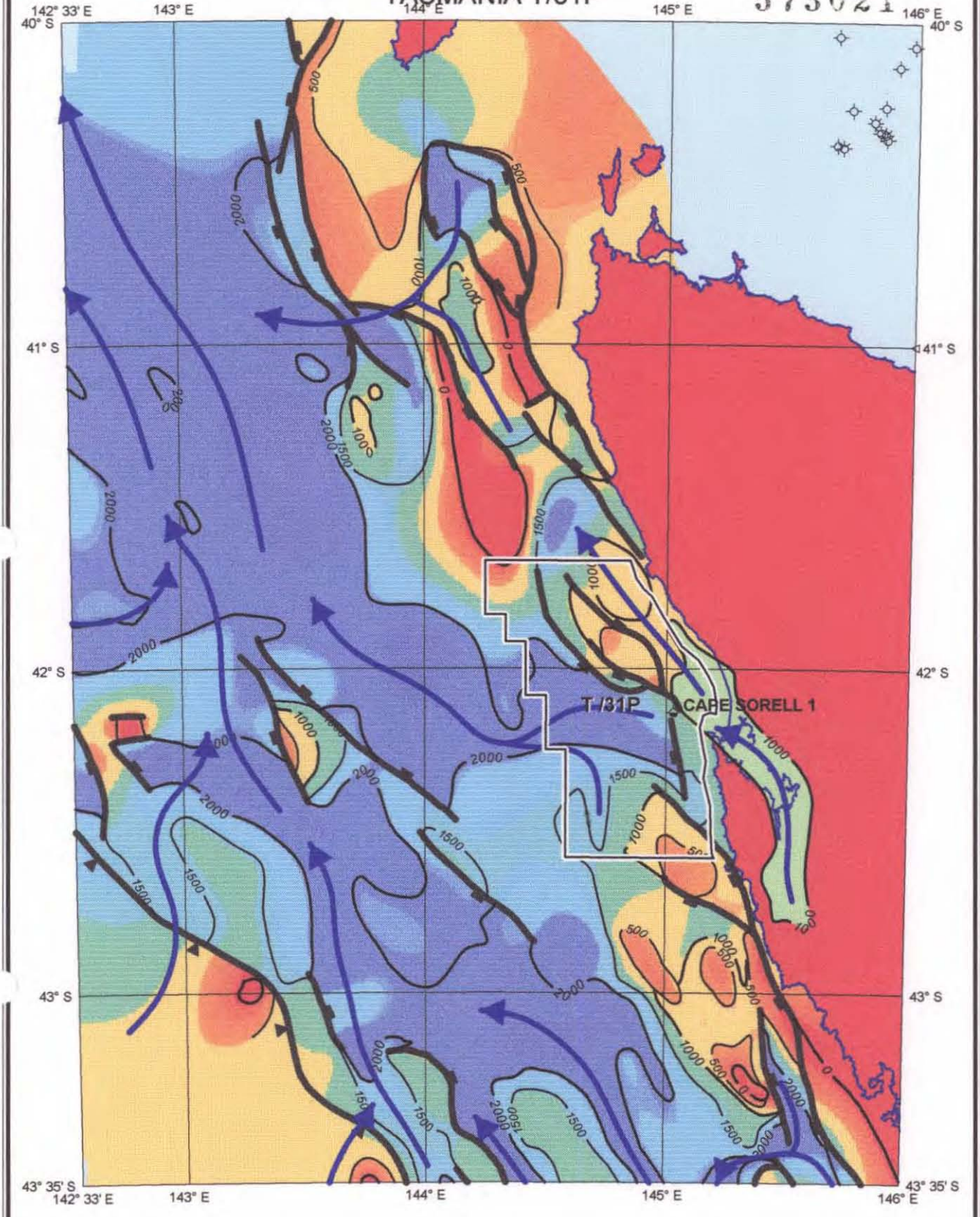
REGIONAL SETTING

(After Conolly & Galloway)

Author: R.A.Meaney	File: LocationMap A4	Date: June 2000
Data: OIL ON FILE	Mapsheet: Structural A4 Grid	Figure 2

573021

TASMANIA T/31P



SEDIMENT THICKNESS
IN TWO-WAY TIME (msec)

- No Sediment
- 100 - 500
- 500 - 1000
- 1000 - 1500
- 1500 - 2000
- > 2000

0 10 20 30 40 50
KILOMETRES

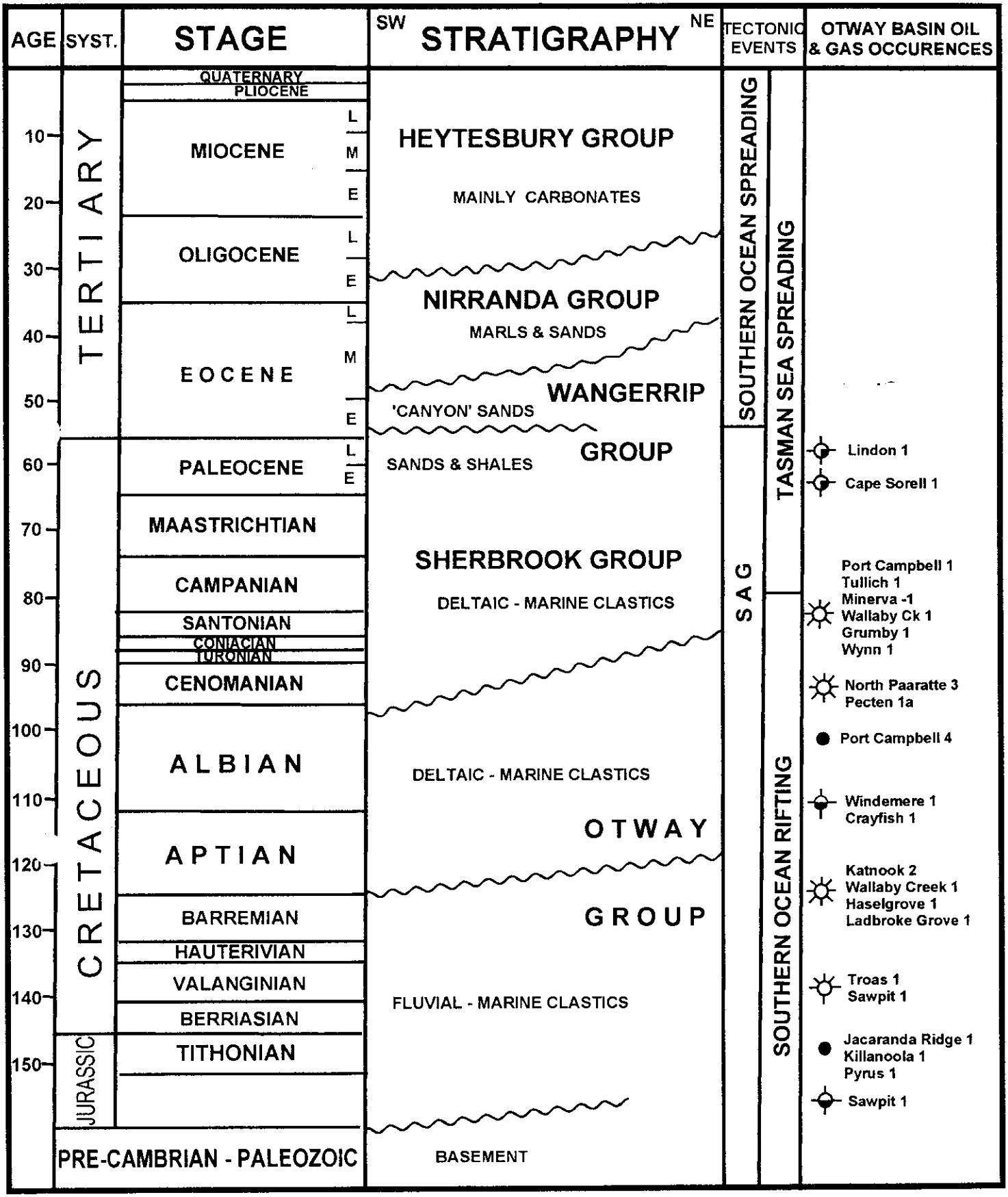
5 cm

ROMA PETROLEUM NL

TASMANIA T/31P
STRUCTURAL ELEMENTS
AND SEDIMENT THICKNESS

Author : J.R.Conolly	File : Sediment_thickness_A4	Date : June 2000
Data : OIL ON FILM	Map Sheet : SedThicknessA4	Figure 3

573022



ROMA PETROLEUM NL
T/31P SORELL BASIN

STRATIGRAPHIC TABLE

(After Conolly & Galloway)

Figure 4

5 cm

TASMANIA T/31P

T 98-2

T/31P

Capesorell 1

41° 35' S
42° S
42° 30' S
42° 38' S
144° 14' E
144° 30' E
145° E
145° 13' E
800 000 mE
850 000 mE
5 350 000 mN
5 300 000 mN

1:100000
0 2 4 6 8 10
KILOMETRES

UNIVERSAL TRANSVERSE MERCATOR PROJECTION
WGS 1984 SPHEROID
CENTRAL MERIDIAN 141° E
Mapsheet datum: "Unknown"

573023

ROMA PETROLEUM NL

TASMANIA T/31P
STRAHAN SUB-BASIN
SORELL BASIN
SHOTPOINT BASEMAP

Author: R.A.Meaney	Mapsheet: T/31P_100k	Date: June 2000
Data: OIL OIL FILE	File: Seismic_base_ENC1.map	Enclosure 1

5 cm

OR-0471A

TASMANIA T/31P

800 000 mE
810 000 mE
820 000 mE
830 000 mE
840 000 mE
42° 9' S
42° 15' S
42° 22' S
144° 34' E
144° 45' E
145° E
145° 10' E
6 340 000 mN
5 330 000 mN
5 320 000 mN
5 310 000 mN

TRIAL HARBOUR
AHRBERG BAY
TETONS
TABLE HEAD
BRADDON POINT
CAPE SORELL UPDIP
SLOOP POINT

1:50000
0 1 2 3 4 5
KILOMETRES
UNIVERSAL TRANSVERSE MERCATOR PROJECTION
WGS 1984 SPHEROID
CENTRAL MERIDIAN 147° E
Rectified datum "Unknown"

ROMA PETROLEUM NL

573624

T/31P
STRAHAN SUB-BASIN
SORELL BASIN, TASMANIA
INTRA-CRETACEOUS SEISMIC MARKER
TIME STRUCTURE MAP

Author: R.A.Meaney	Contour Interval 10m&20m	Date: January 2001
Drawn: GL DB FLS	Plotted: 16/01/01 file:\DRIVER_A_GRID.DGN(ISL)	Enclosure 2

5 cm

OR 0471A

TASMANIA T/31P

800 000 mE
810 000 mE
820 000 mE
830 000 mE
840 000 mE
42° S
42° 15' S
42° 22' S
144° 34' E
144° 45' E
145° E
145° 10' E
5 340 000 mN
5 330 000 mN
5 320 000 mN
5 310 000 mN

TRIAL HARBOUR
CAPE SORELL UPDIP
CAPE SORELL UPDIP
TETONS
BRADDON POINT
T/31P
TABLE HEAD
SLOOP POINT

1:50000
0 1 2 3 4 5
KILOMETRES
UNIVERSAL TRANSVERSE MERCATOR PROJECTION
WGS 1984 SPHEROID
CENTRAL MERIDIAN 147° E
Mapsheet datum "Unknown"

ROMA PETROLEUM NL

573625

T/31P

STRAHAN SUB-BASIN

SORELL BASIN, TASMANIA

NEAR TOP CRETACEOUS SEISMIC MARKER, TIME STRUCTURE MAP

Author: R.A.Meaney	Contour Interval 10m&20m	Date: January 2001
Drawn: GL DB FILE	Map Base: WGS 84 Datum Horizon TOP_K (GEOLTURP1)	Enclosure 3

5 cm

OR.0471A

0357-044

ENC 4

OR-0471A

5 cm

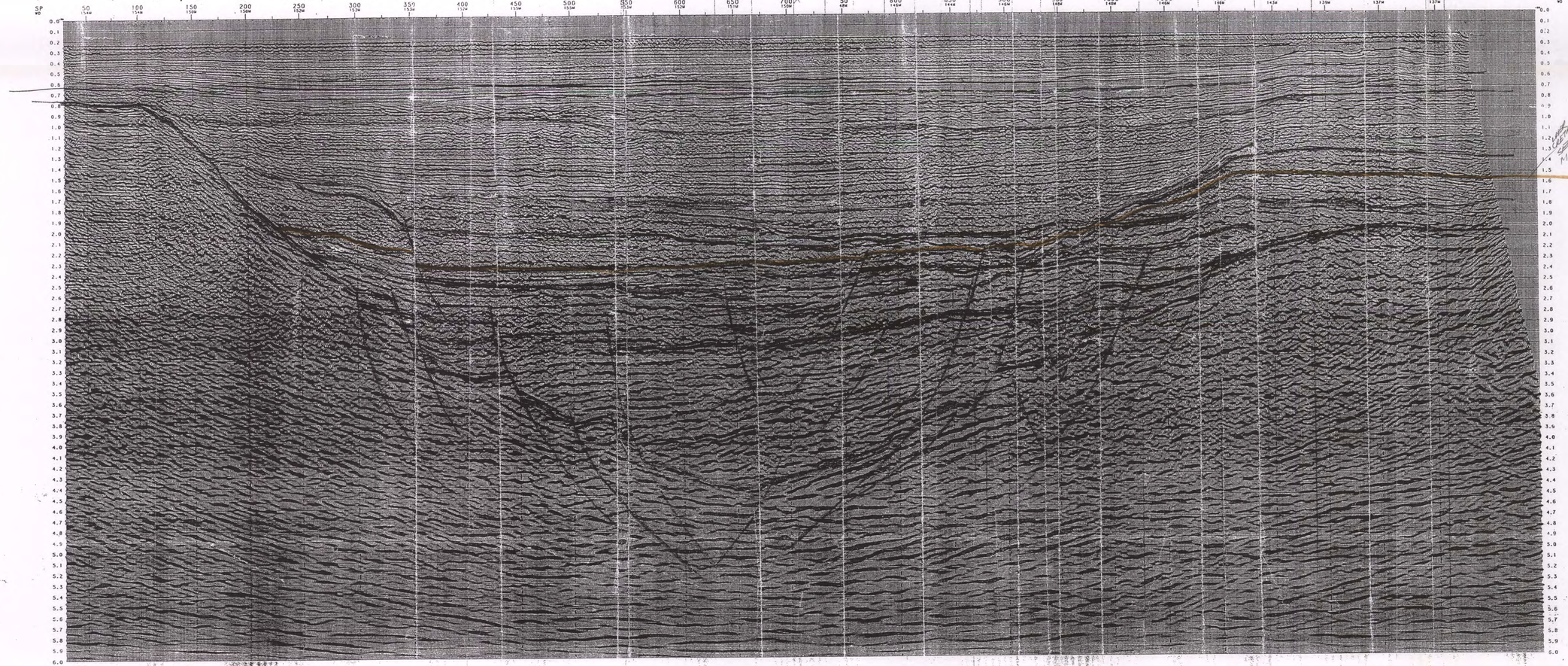
573026

LINE: MXT90-17
SHOT PTS. 1317 - 26
IX7500% TVF
RPF MIGRATION
POSITIVE POLARITY

PSLA-90/37

NORTHWEST

SLOOP POINT
PROSPECT



LINE: MXT90-17
SHOT PTS. 1317 - 26
IX7500% TVF
RPF MIGRATION
POSITIVE POLARITY

MAXUS
ENERGY CORPORATION

AREA: OFFSHORE TASMANIA
PROSPECT: T/24P

DALLAS DIGITAL CENTER: JOB # 5382
PROCESSING DATE: JULY 1991
DATUM PLANE: SEA LEVEL
APPROVED BY: DM/RM

RECORDING INFORMATION:

RECORDED FOR: MAXUS ENERGY CORP.
PUBLICATION BY: WESTERN GEOPHYSICAL
DATE RECORDED: 1990

SOURCE:
ENERGY SOURCE: AIRGUN ARRAY
TOTAL GUN VOLUME: 2190 CU IN
GUN PRESSURE: 2000 PSI
GUN DEPTH: 20 M
SHOTPOINT INTERVAL: 25 M
DISTANCE TO MID POINT: NOT AVAILABLE

INSTRUMENTS:
TYPE: SYDAC 3000
FILTERS: NOTCH 180/121 HZ
RECORDING INTERVAL: 4 MSEC
RECORD LENGTH: 6 SEC
FORMAT: SEG-D 8I6 CHANNEL

CABLE:
TYPE OF CABLE: SYNCHRO
NO. OF CHANNELS: 120
CABLE DEPTH: 10 M
LEAD IN: 100 M
GROUP INTERVAL: 12.5 M
NO. GROUPS RECORDED: 288

WESTERN GEOPHYSICAL

PROCESSING SEQUENCE:

1. SEG-D CONVERT:
PROCESS SAMPLE RATE: 4 MS
PROCESS RECORD LENGTH: 6.144 SEC
NO. OF TRACES PROCESSED: 300

2. PREPROCESSING
DATA EDITING
GEOMETRY DESCRIPTION
SPHERICAL SPREADING CORRECTION

3. VELOCITY ANALYSIS: VELSAMP 4 KM SPACING

4. BEAM STEERING 1-2-1 SUM, NOVT 2

5. DECONVOLUTION:
TYPE: SHOT/OFFSET CONSISTENT
WITH PHASE INVERSE FILTER
OPERATOR LENGTH: 240 MS
NUMBER OF WINDOWS: 1 (SPATIAL VARIANT)
PREWHITENING: 0.1%

6. VELOCITY ANALYSIS: VELSAMP 4 KM SPACING

7. 3600Z OPTIMUM FOLD REDUCTION:
TYPE: EQUAL AMPLITUDE BINS

8. F-K DEMULTIPLE:
TYPE: PASS POS AND ZERO DIPS

9. DIP MOVEOUT CORRECTION
(Common Velocity to Image)

10. VELOCITY ANALYSIS: VELSAMP 4 KM SPACING

11. 3600Z MOVEOUT AND STACK

12. HIGH DIP MIGRATION:
TYPE: RPF
NATURAL METHOD
1600 VELOCITIES

13. BROAD, PRECISITY FILTER

14. TIME VARIANT FILTER:

TIME ZONE	LOW CUT	HIGH CUT
SEC	HZ SLOPE	HZ SLOPE
0-2	6 12	55 12
2-4	6 18	55 18
4-6	6 24	55 12

FILTER TIMES VARY WITH TIME STRUCTURE

15. OBTM= RECEIVER 12 PASS TRACE EQUALIZATION

SURVEY SHOWING AIRGUN

LEGEND
VELOCITY ANALYSIS
INTERSECTIONS
WATER BOTTOM

DISPLAY:

HORIZONTAL SCALE: 10 TRACES PER CENTIMETER
VERTICAL SCALE: 6 CM PER SECOND FOR 3000
PLOTTING DATE:
POLARITY: POSITIVE NUMBER = BLACK PEAK

NOTATIONS:

FIELD POLARITY CONVENTION:
A COMPRESSION PULSE IS A NEGATIVE NUMBER
DATA RECORDED TO SEG-D FORMAT
DATA CORRECTED TO SEA LEVEL (-39 MS TOTAL SHIFT)
PLOTTING EVERY OTHER TRACE

HORIZONTAL SCALE: 1 CM = 250 ft
40 TRACE INTERVALS = 1 KM
2.5 KM

LINE LOCATION MAP

NORTH

MXT90-17
MIGRATED

ENC 5

OR-0671A

PSLA- 90/37.

573027

LINE: MXT90-08
SHOT PTS. 1143 - 25
IX7500% TVF
RPF MIGRATION
POSITIVE POLARITY

LINE: MXT90-08
SHOT PTS. 1143 - 25
IX7500% TVF
RPF MIGRATION
POSITIVE POLARITY

5 cm

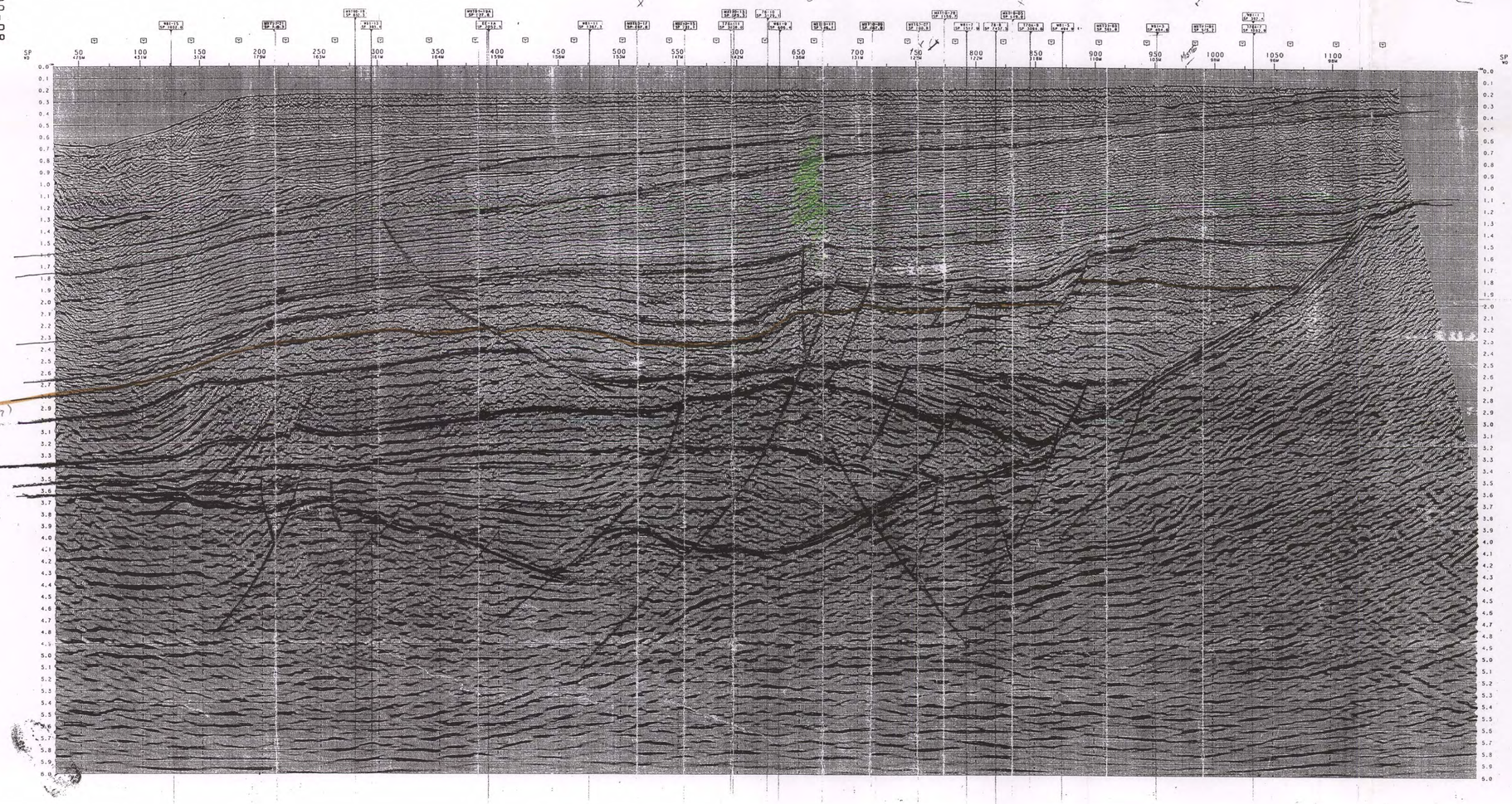
TETONS (WEST)

TETONS (EAST)

GAS CHIMNEY?

Mapped

Upper CRETACEOUS(?) SEISMIC MARKER



SOUTHWEST

MAXUS
ENERGY CORPORATION

AREA: OFFSHORE TASMANIA
PROSPECT: T/24P

DALLAS DIGITAL CENTER:
PROCESSING DATE:
DATUM PLANE:
APPROVED BY:

JOB # 5382
JULY 1991
SEA LEVEL
DW/MM

RECORDING INFORMATION:

PROCESSING SEQUENCE:

1. SEG-D CONVERT:
2. PREPROCESSING:
3. VELOCITY ANALYSIS: VELAMP (40M SPACING)
4. BEAM STEERING: 1-2-1 SUM, MOVE 2
5. DECON-EVOLUTION:
6. VELOCITY ANALYSIS: VELAMP (20M SPACING)
7. 3000Z OPTIMUM FOLD REDUCTION:
8. F-K DEMULTIPLE:
9. DIP MOVEOUT CORRECTION
10. VELOCITY ANALYSIS: VELAMP (10M SPACING)
11. 3000Z MOVEOUT AND STACK
12. HIGH DIP MIGRATION:
13. PREDICTIVE FILTER
14. TIME VARIANT FILTER:
15. GAIN:

LEGEND

DISPLAY:

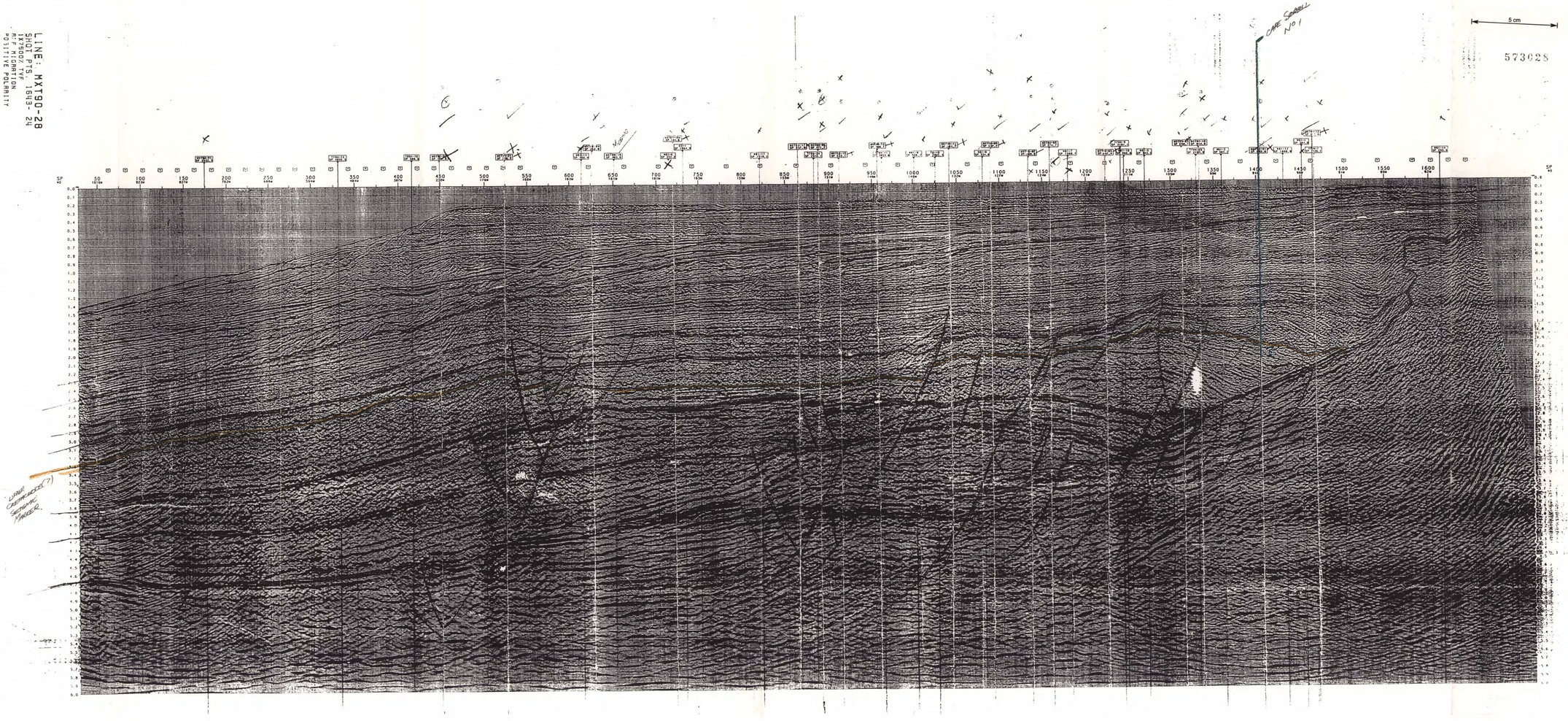
NOTATIONS:

HORIZONTAL SCALE: 1 CM = 250 M
+0 TRACE INTERVALS = 1 KM

LINE LOCATION MAP

MXT90-08
MIGRATED.

LINE: MXT90-28
SHOT PTS. 1643- 24
1X7500% TVF
RPF MIGRATION
POSITIVE POLARITY



0757-GX2

LINE: MXT90-28
SHOT PTS. 1643- 24
1X7500% TVF
RPF MIGRATION
POSITIVE POLARITY

PSLA- 90/37.

CR 04/7A

ENG 6

WEST

MAXUS
ENERGY CORPORATION

AREA: OFFSHORE TASMANIA
PROSPECT: T/24P

DALLAS DIGITAL CENTER
PROCESSING DATE:
DATUM PLANE:
APPARENT DIP:

JOB # 5251
FEBRUARY 1991
SEA LEVEL
DATUM

RECORDING INFORMATION:

WESTERN GEOPHYSICAL

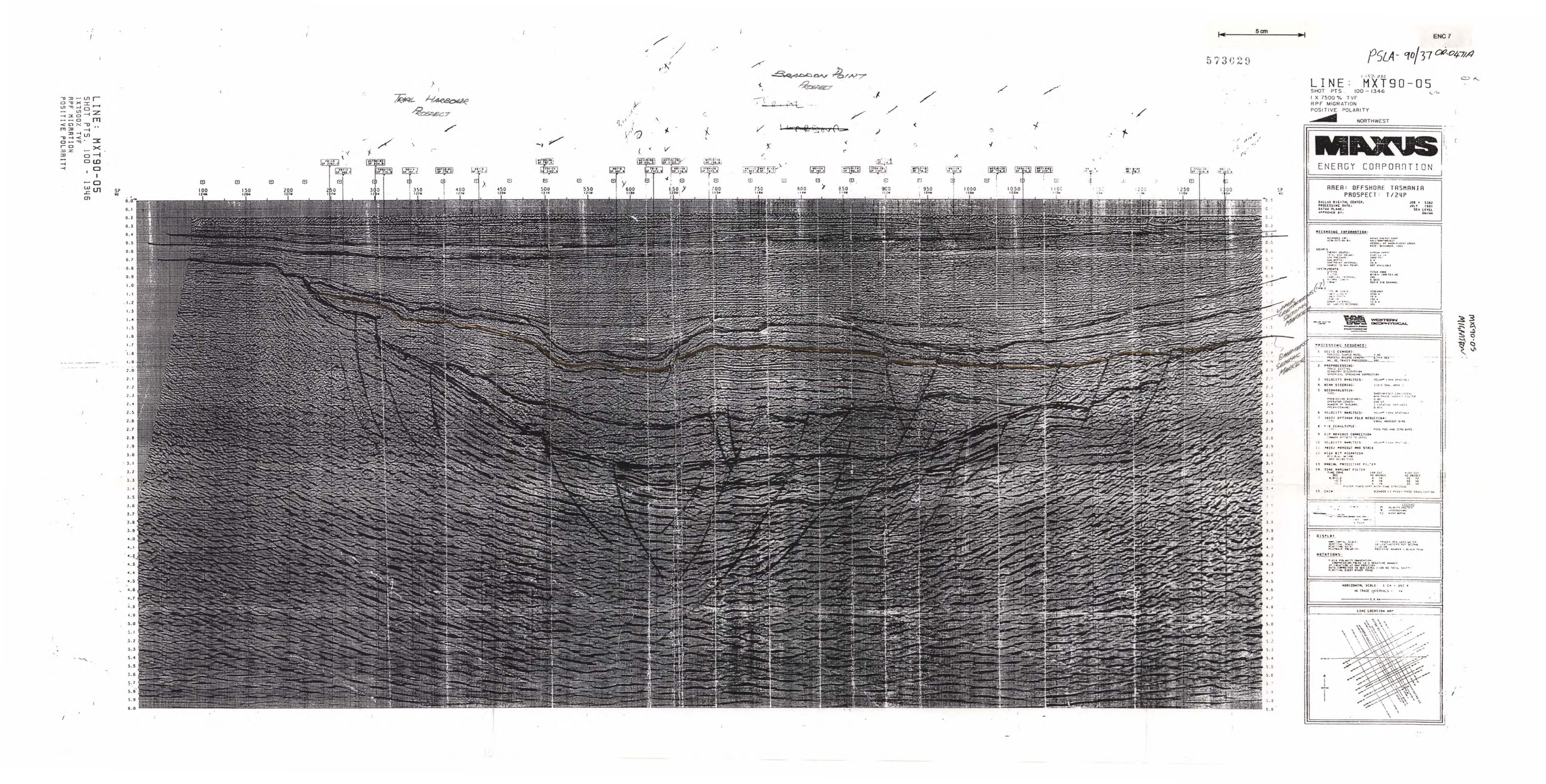
PROCESSING SEQUENCE:

DISPLAY:

DISTRIBUTION:

LINE LOCATION MAP

MXT90-28
MIGRATED.


5 cm
573029
ENC 7
PSLA- 90/37 OR-0471A
LINE: MXT90-05
SHOT PTS 100-1346
1 X 7500 % TVF
RPF MIGRATION
POSITIVE POLARITY
NORTHWEST
TRIAL HARBOUR PROSPECT
BRADDON POINT PROSPECT
MAXUS
ENERGY CORPORATION
AREA: OFFSHORE TASMANIA
PROSPECT: T/24P
WESTERN GEOPHYSICAL
PROCESSING SEQUENCE:
DISPLAY
HORIZONTAL SCALE: 1 CM = 25 CDP
LINE LOCATION MAP
LINE: MXT90-05
SHOT PTS. 100 - 1346
1X7500Z TVF
RPF MIGRATION
POSITIVE POLARITY
MXT90-05 MIGRATED

573030

5 cm

ENC 8

LINE: MXT90-10
SHOT PTS. 100 - 1266
1X7500% TVF
RPF MIGRATION
POSITIVE POLARITY

OR-0471A

PSLA- 90/37.

LINE: MXT90-10
SHOT PTS. 100 - 1266
1X7500% TVF
RPF MIGRATION
POSITIVE POLARITY

SOUTHWEST

TETONIS (WEST)

CMP CHANNEL?

LOWER CRETACEOUS(?) SEISMIC MARKER

MXT90-10
M10090.

MAXUS ENERGY CORPORATION

AREA: OFFSHORE TASMANIA
PROSPECT: T/24P

DALLAS DIGITAL CENTER:
PROCESSING DATE:
DATUM PLANE:
APPROVED BY:

JOB # 5382
JULY, 1991
SEA LEVEL
DWJ/MH

RECORDING INFORMATION:

SOURCE:

INSTRUMENTS:

CABLE:

WESTERN GEOPHYSICAL

PROCESSING SEQUENCE:

1. SEG-D CONVERT
2. PREPROCESSING
3. VELOCITY ANALYSIS — VELOMP 1-KM SPACING
4. BEAM STEERING
5. DECONVOLUTION
6. VELOCITY ANALYSIS — VELOMP 1-KM SPACING
7. 3600' OFFSET FOLD REQUIRED
8. F-X DEMULTIPLE
9. RIP NEAREST CONNECTION
10. VELOCITY ANALYSIS — VELOMP 1-KM SPACING
11. 3600' NOMINAL AND STACK
12. HIGH RIP MIGRATION
13. RADIAL PREDICTIVE FILTER
14. TIME VARIANT FILTER:
15. GAIN:

DISPLAY:

NOTATIONS:

HORIZONTAL SCALE: 1 CM = 250 M
48 TRACE INTERVALS = 1 KM

LINE LOCATION MAP

573031

ENC 9

OR-0471A

5 cm

LINE: MXT90-12
SHOT PTS. 100 - 1170
1X7500% TVF
RPF MIGRATION
POSITIVE POLARITY
PSLA 90/37.

LINE: MXT90-12
SHOT PTS. 100 - 1170
1X7500% TVF
RPF MIGRATION
POSITIVE POLARITY

TABLE HEAD PROSPECT

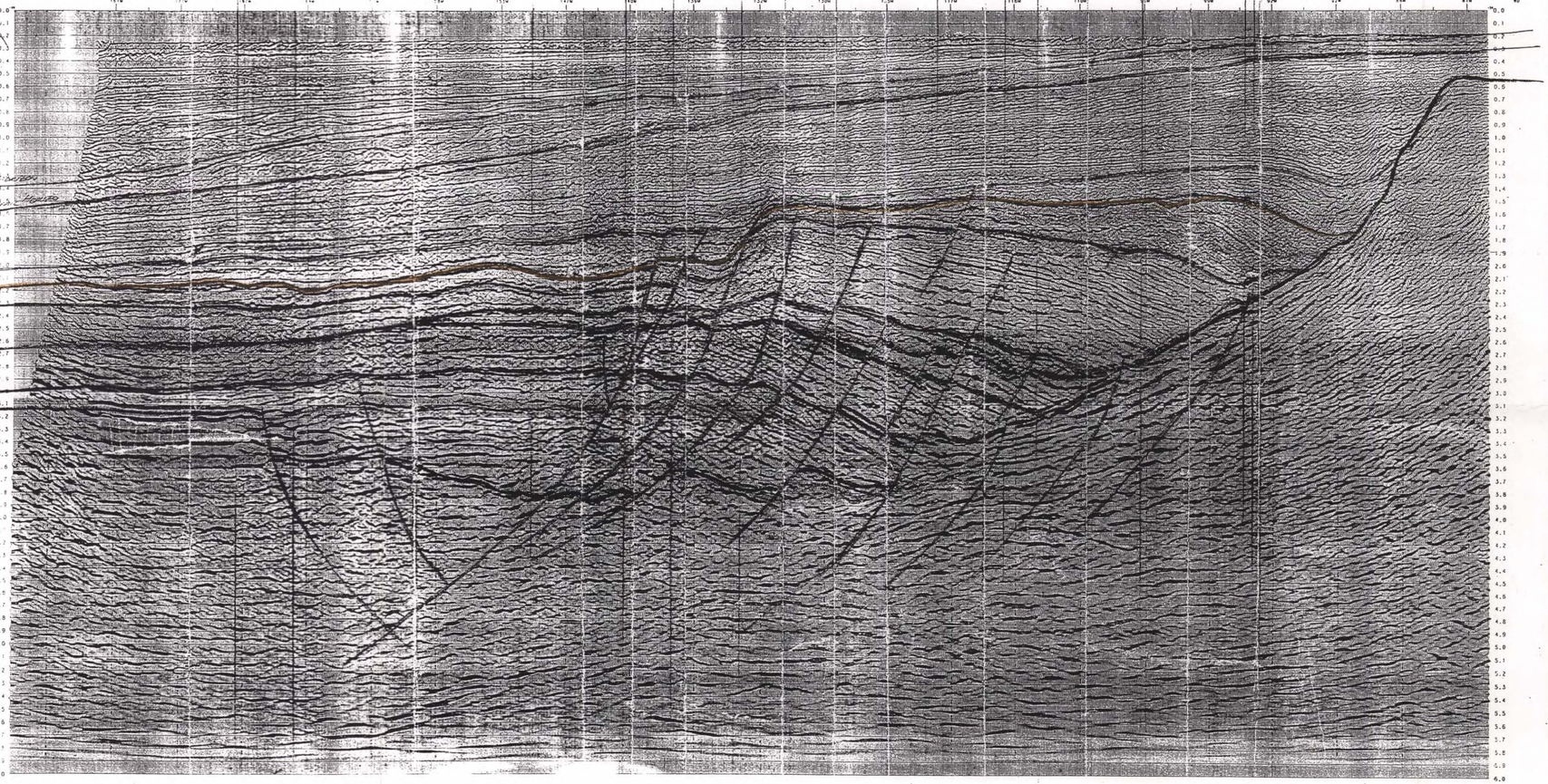
BALLOON POINT PROSPECT

Neogene

Late Cretaceous Seismic Marker

Campanian

Albian



SOUTHWEST

MAXUS
ENERGY CORPORATION

AREA: OFFSHORE TASMANIA
PROSPECT: T/24P

DALLAS DIGITAL CENTER: JOB # 5382
PROCESSING DATE: JULY 1990
DATUM PLANE: SEA LEVEL
APPROVED BY: DeVRM

RECORDING INFORMATION:

RECORDED FOR:	MAXUS ENERGY CORP
ACQUISITION BY:	WESTERN GEOPHYSICAL
	M/V GEOPHYSICIST (1/24P CREW)
	DATES: NOVEMBER, 1989
SOURCE:	
ENERGY SOURCE:	3 AIRGUN ARRAY
TOTAL GUN VOLUME:	2160 CU IN
GUN PRESSURE:	2000 PSI
GUN DEPTHS:	6 M
SHOTPOINT INTERVAL:	25 M
SHOTS/DAY/KM MAX POINT:	40 AVAILABLE
INSTRUMENTS:	
SYSTEM:	SYDAC 1000
FILTER:	NYQUIST: 100/121 HZ
RECORDING INTERVAL:	2 MS
RECORD LENGTH:	6 SECS
FORMAT:	SEG-D 8 DEMUX 8 CHANNEL
CABLE:	
TYPE OF LEAD:	SYNCHRO
NO. OF LEADS:	48
CABLE DEPTH:	18 M
GAIN:	12 DB
GROUP INTERVAL:	12.5 M
NO. GROUPS RECORDED:	600

WESTERN GEOPHYSICAL

PROCESSING SEQUENCE:

1. SEG-D CONVERT:
   - TRACES/RECORD: 4 MS
   - SAMPLE RATE/LENGTH: 6.144 SEC
   - NO. OF TRACES PROCESSED: 300
2. PREPROCESSING:
   - TRACE EDITING
   - GEOMETRY DESCRIPTION
   - SPHERICAL DIVERGING CORRECTION
3. VELOCITY ANALYSIS: VELANH 64HA SPACING
4. BEAM STEERING: 1-2-1 SUM, WIN 2
5. DECONVOLUTION:
   - TYPE: SHOT-INTERFACE CONVOLUTION WITH PHASE INVERSE FILTER
   - PREDICTIVE DISTANCE: 24 MS
   - OPERATOR LENGTH: 240 MS
   - PREWHITENING: 0.1% (STABILITY FUNCTION)
   - PROBABILITY: 0.125
6. VELOCITY ANALYSIS: VELANH 12HA SPACING
7. 3000Z OPTIMUM FOLD REDUCTION:
   - TYPE: EQUAL MOVEOUT DIPS
8. F-K DEMULTIPLE:
   - TYPE: PASS PRS AND ZERO DIPS
9. DIP MOVEOUT CORRECTION (LINEAR MOVEOUT TO ZERO)
10. VELOCITY ANALYSIS VELANH 11HA SPACING
11. 3000Z MOVEOUT AND STACK
12. HIGH DIP MIGRATION:
    - METHOD: RPF(FD)
    - VELOCITY: MIGRATION
13. RADIAL PREDICTIVE FILTER
14. TIME VARIANT FILTER:

TIME (SEC)	LOW CUT HZ DB/OCT	HIGH CUT HZ DB/OCT
0.0-2.2	6 18	55 72
2.2-4.0	6 18	55 72
4.0-	6 18	55 72

FILTER TAPER VARY WITH TIME STRUCTURE

15. GRIM: BLENDED F-X PASS TRACE EQUALIZATION

ENERGY SOURCE: 3 AIRGUN

LEGEND
- VELOCITY ANALYSIS
- INTERPOLATING
- MUTE

DISPLAY:
- HORIZONTAL SCALE: 10 TRACES PER CENTIMETER
- VERTICAL SCALE: 10 CENTIMETERS PER SECOND
- PLOTTER: CALCOMP 1043
- PLEASANCE POLARITY: POSITIVE NUMBER = BLACK PEAK

NOTATIONS:
- F-K/D POLARITY CORRECTION:
- ALL POSITIVE NUMBERS = NEGATIVE MOVEOUT
- ALL NEGATIVE NUMBERS = POSITIVE MOVEOUT
- DATUM CORRECTION: 1-20 MS TOTAL SHIFT

HORIZONTAL SCALE: 1 CM = 250 M
48 TRACE INTERVALS = 1 KM

LINE LOCATION MAP

MXT90-12 MIGRATED

ENC 10

(357-04)

LINE: MXT90-02 OR-0471A

SHOT PTS. 100 - 1265

1X7500% TVF

RPF MIGRATION

POSITIVE POLARITY

PSLA-90/37.

SOUTHWEST

5 cm

573632

TRIAL HARBOUR PROSPECT

TRIAL HARBOUR

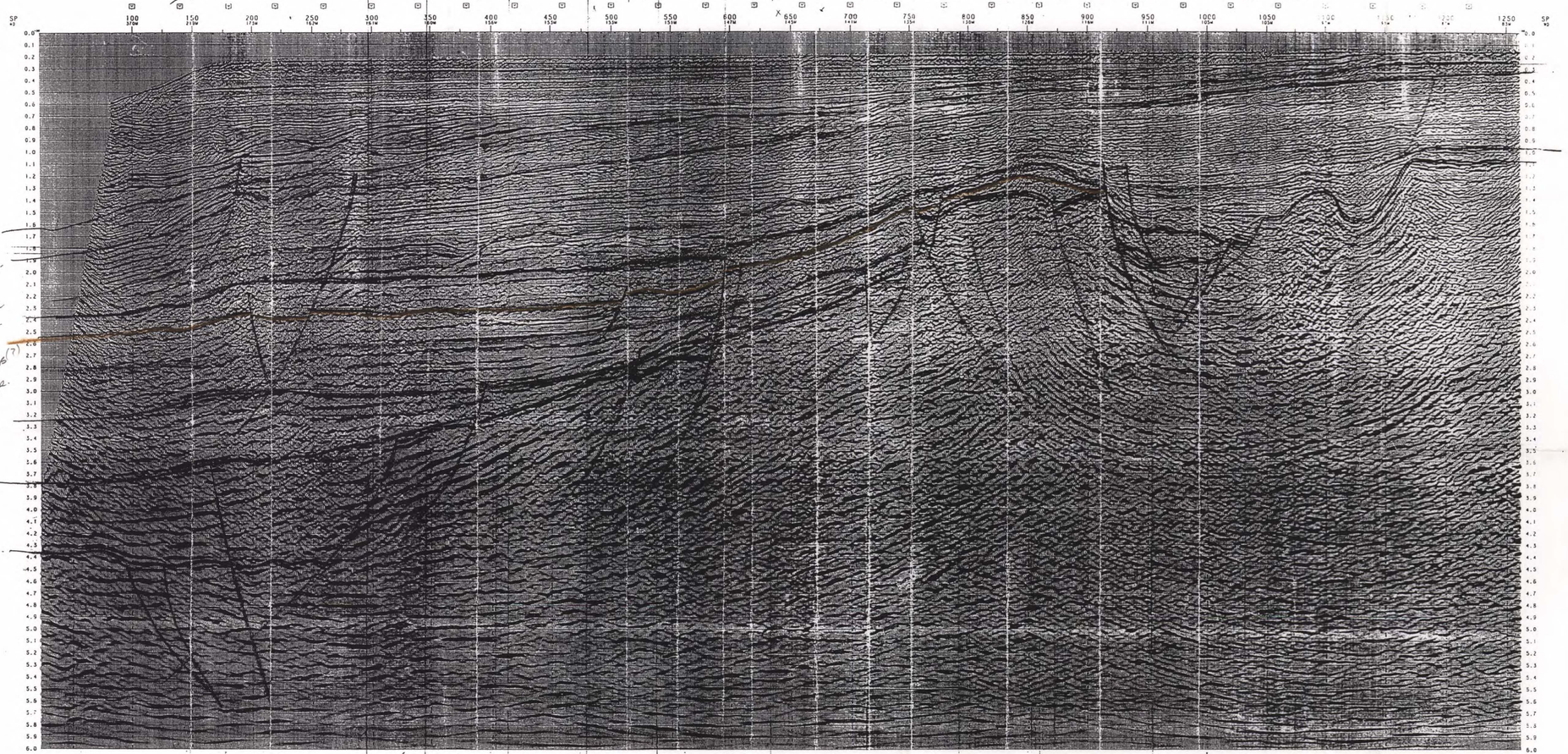
LINE: MXT90-02

SHOT PTS. 100 - 1265

1X7500% TVF

RPF MIGRATION

POSITIVE POLARITY



MAXUS ENERGY CORPORATION

AREA: OFFSHORE TASMANIA
PROSPECT: T/24P

DALLAS DIGITAL CENTER:
PROCESSING DATE:
DATUM PLANE:
APPROVED BY:

JOB # 5387
JULY 1991
SEA LEVEL
DATUM

RECORDING INFORMATION:

PROCESSING SEQUENCE:

1 SEG-B CONVERT:
2 PREPROCESSING:
3 VELOCITY ANALYSIS
4 BEAM STEERING
5 DECON/DECONVOLUTION
6 VELOCITY ANALYSIS
7 3600Z OPTIMUM FOLD REDUCTION:
8 F-K DEMULTIPLE:
9 DIP MOVEOUT CORRECTION
10 VELOCITY ANALYSIS
11 3600Z MOVEOUT AND STACK
12 HIGH DIP MIGRATION
13 RADIAL PREDICTIVE FILTER
14 FINE KORJUMP FILTER
15 GAIN:

LEGEND

DISPLAY:

NOTATIONS:

HORIZONTAL SCALE: 1 CM = 250 M
40 TRACE INTERVALS = 1 KM

LINE LOCATION MAP

MXT90-02
MIGRATED

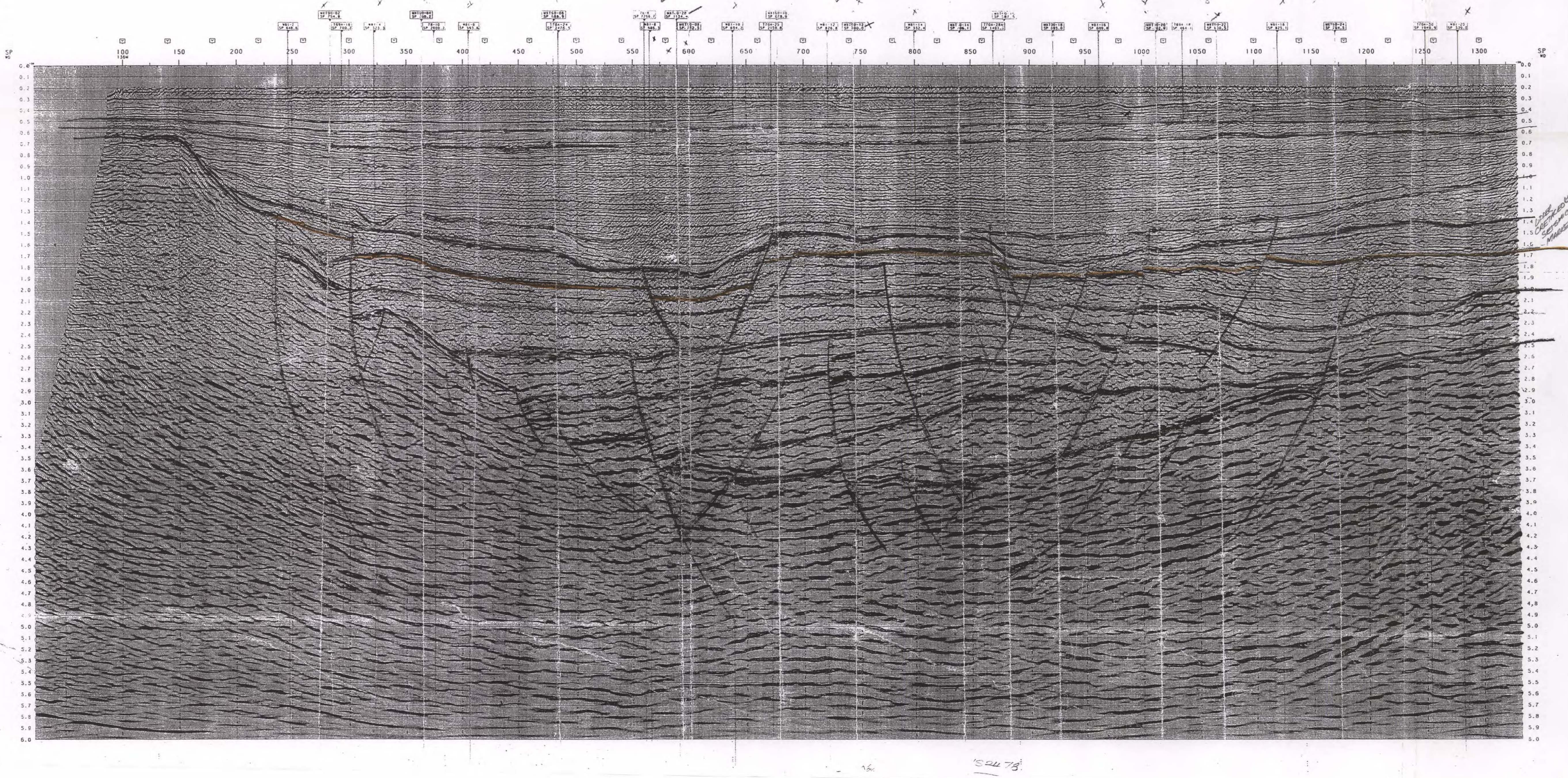
LINE: MXT90-07
SHOT PTS. 100 - 1338
1X7500% TVF
RPF MIGRATION
POSITIVE POLARITY

ENC 11

OR-0471A

PSLA-90/37

573033



LINE: MXT90-07

SHOT PTS. 100 - 1338
1X7500% TVF
RPF MIGRATION
POSITIVE POLARITY

NORTHWEST

MXT90-07 MIGRATION

MAXUS ENERGY CORPORATION

AREA: OFFSHORE TASMANIA
PROSPECT: T/24P

DALLAS DIGITAL CENTER:	JOB # 5382
PROCESSING DATE:	JULY 1991
DATUM PLANE:	SEA LEVEL
APPROVED BY:	DW/HH

RECORDING INFORMATION:

RECORDED FOR:	MAXUS ENERGY CORP
ACQUISITION BY:	HALLIBURTON/GSI
	VESSEL: MV MAGNIFICENT CREEK
	DATE: DECEMBER, 1990
SOURCE:	
ENERGY SOURCE:	AIRGUN ARRAY
TOTAL GUN VOLUME:	2180 CU IN
GUN PRESSURE:	2000 PSI
GUN DEPTH:	8 M
SHOTPOINT INTERVAL:	25 M
SOURCE TO NAV POINT:	NOT AVAILABLE
INSTRUMENTS:	
SYSTEM:	TITAN 1000
FILTER:	8(18)- 180(72) HZ
SAMPLING INTERVAL:	2MS
RECORD LENGTH:	6 SECS
FORMAT:	SEG-D 240 CHANNEL
CABLE:	
TYPE OF CABLE:	STREAMER
CABLE LENGTH:	3750 M
CABLE DEPTH:	10 M
LEAD IN:	150 M
GROUP INTERVAL:	12.5 M
NO. GROUPS RECORDED:	300

WESTERN GEOPHYSICAL

PROCESSING SEQUENCE:

1. SEG-D CONVERT:
   PROCESS SAMPLE RATE: 4 MS
   PROCESS RECORD LENGTH: 6.144 SEC
   NO. OF TRACES PROCESSED: 300
2. PREPROCESSING:
   TRACE EDITING
   GEOMETRY DESCRIPTION
   SPHERICAL SPREADING CORRECTION
3. VELOCITY ANALYSIS: VELAN* (4KM SPACING)
4. BEAM STEERING: 1-2-1 SUM, MOVE 2
5. DECONVOLUTION:
   TYPE: SHOT/OFFSET CONSISTENT MIN PHASE INVERSE FILTER
   PREDICTIVE DISTANCE: 4 MS
   OPERATOR LENGTH: 240 MS
   NUMBER OF WINDOWS: 1 (SPATIAL VARIANT)
   PREWHITENING: 0.01%
6. VELOCITY ANALYSIS: VELAN* (2KM SPACING)
7. 3800% OPTIMUM FOLD REDUCTION:
   TYPE: EQUAL MOVEOUT BINS
8. F-K DEMULTIPLE:
   TYPE: PASS POS AND ZERO DIPS
9. DIP MOVEOUT CORRECTION
   COMMON OFFSETS TO 3800%
10. VELOCITY ANALYSIS: VELAN* (1KM SPACING)
11. 3800% MOVEOUT AND STACK
12. HIGH DIP MIGRATION:
    RESIDUAL METHOD
    100% VELOCITIES
13. RADIAL PREDICTIVE FILTER
14. TIME VARIANT FILTER:

TIME ZONE SEC	LOW CUT HZ DB/OCT	HIGH CUT HZ DB/OCT
0.0-1.2	8 15	70 72
-2.2	6 18	50 36
-3.2	6 18	35 48

FILTER TIMES VARY WITH TIME STRUCTURE

15. GAIN: BLENDED (2 PASS) TRACE EQUALIZATION

LEGEND
VELOCITY ANALYSIS
INTERSECTIONS
WD WATER DEPTHS

136 M — 3750 M — ENERGY SOURCE: AIRGUN

DISPLAY:

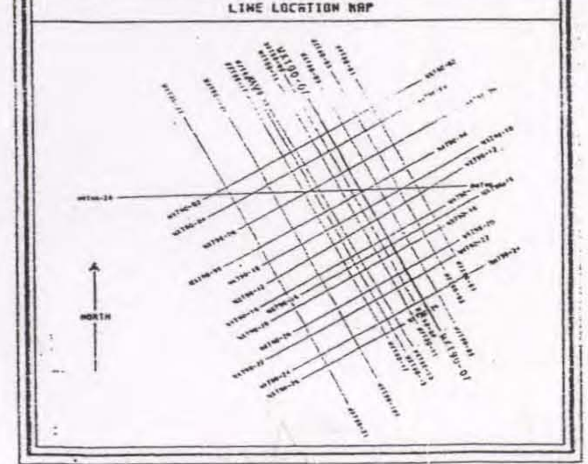
HORIZONTAL SCALE:	10 TRACES PER CENTIMETER
VERTICAL SCALE:	10 CENTIMETERS PER SECOND
PLOTTING GAIN:	- 12 DB
PLAYBACK POLARITY:	POSITIVE NUMBER - BLACK PEAK

NOTATIONS:

FIELD POLARITY CONVENTION:
COMPRESSION PULSE IS A NEGATIVE NUMBER
SP LOCATION AT GUN POSITION
DATA CORRECTED TO SEA LEVEL (-39 MS TOTAL SHIFT)
PLOTTING EVERY OTHER TRACE

HORIZONTAL SCALE: 1 CM = 250 M
40 TRACE INTERVALS = 1 KM
2.0 KM

LINE LOCATION MAP



ENCLOSURE 12
OR-0471A
PSLA-90/37.

0357-645

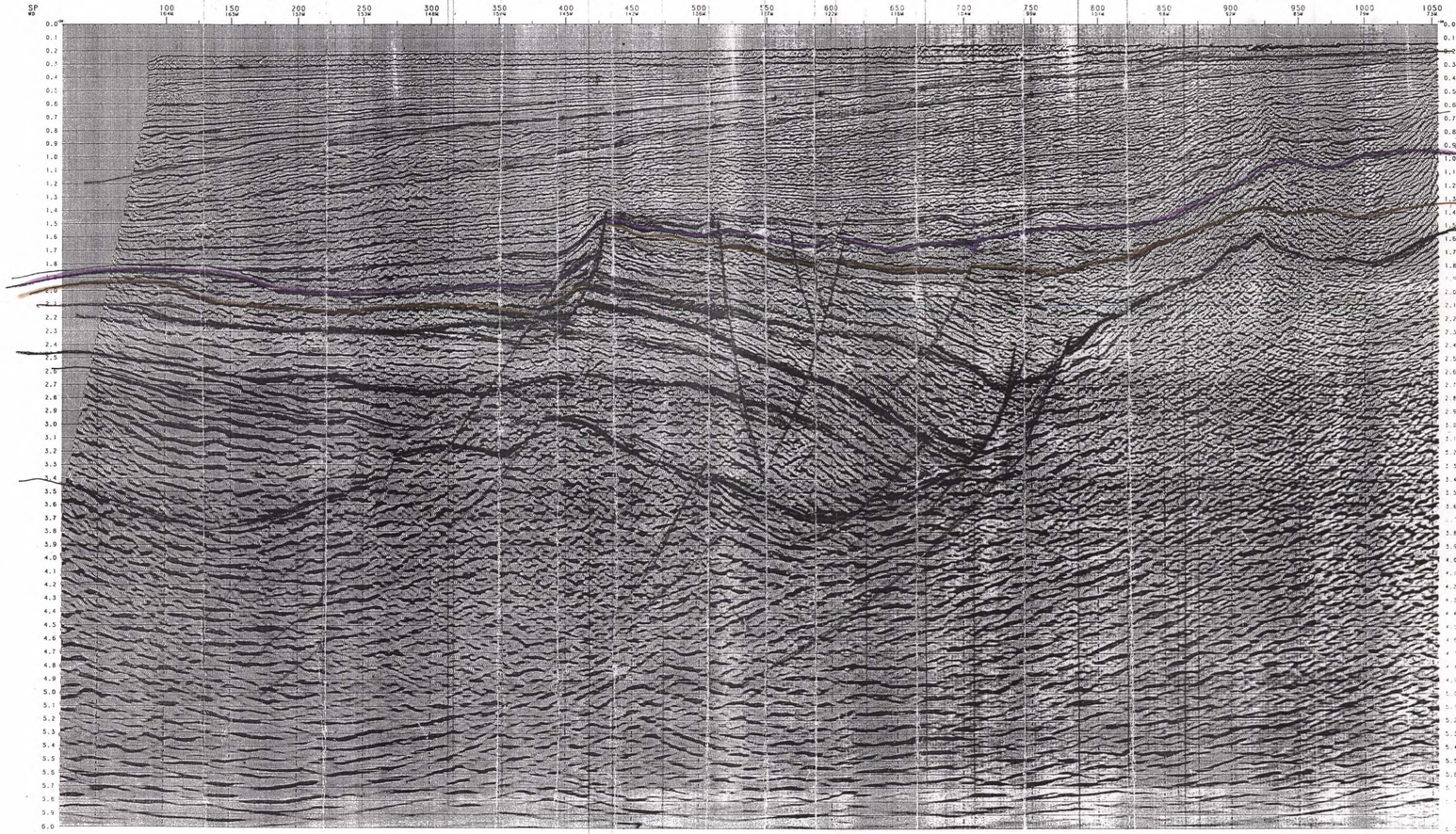
LINE: MXT90-16
SHOT PTS. 100 - 1058
1X7500Z TVF
RPF MIGRATION
POSITIVE POLARITY

LINE: MXT90-16
SHOT PTS. 100 - 1058
1X7500Z TVF
RPF MIGRATION
POSITIVE POLARITY

573034

5 cm

BRADDON POINT PROSPECT



SOUTHWEST

MAXUS
ENERGY CORPORATION

AREA: OFFSHORE TASMANIA
PROSPECT: T/24P

DALLAS DIGITAL CENTER:
PROCESSING DATE:
DATUM PLANE:
APPROVED BY:

JOB # 5382
JULY 1991
TEA LEVEL
Geodetic

RECORDING INFORMATION:

WESTERN GEOPHYSICAL

PROCESSING SEQUENCE:

1. SEG-D CONVERT
2. PREPROCESSING
3. VELOCITY ANALYSIS
4. BEAM STEERING
5. DECONVOLUTION:
6. VELOCITY ANALYSIS:
7. 3600Z OPTIMUM FOLD REJECTION:
8. F-K DEMULTIPLE:
9. DIP MOVEOUT CONNECTION
10. VELOCITY ANALYSIS:
11. 3600Z MOVEOUT AND STACK
12. HIGH DIP MIGRATION:
13. RADIAL PREDICTIVE FILTER
14. TIME VARIANT FILTER:
15. GAIN:

LEGEND

DISPLAY:

MORTIONS:

HORIZONTAL SCALE: 1 CM = 25S =
40 TRACE INTERVALS = 1 KM

LINE LOCATION MAP

MXT90-16
MIGRATED

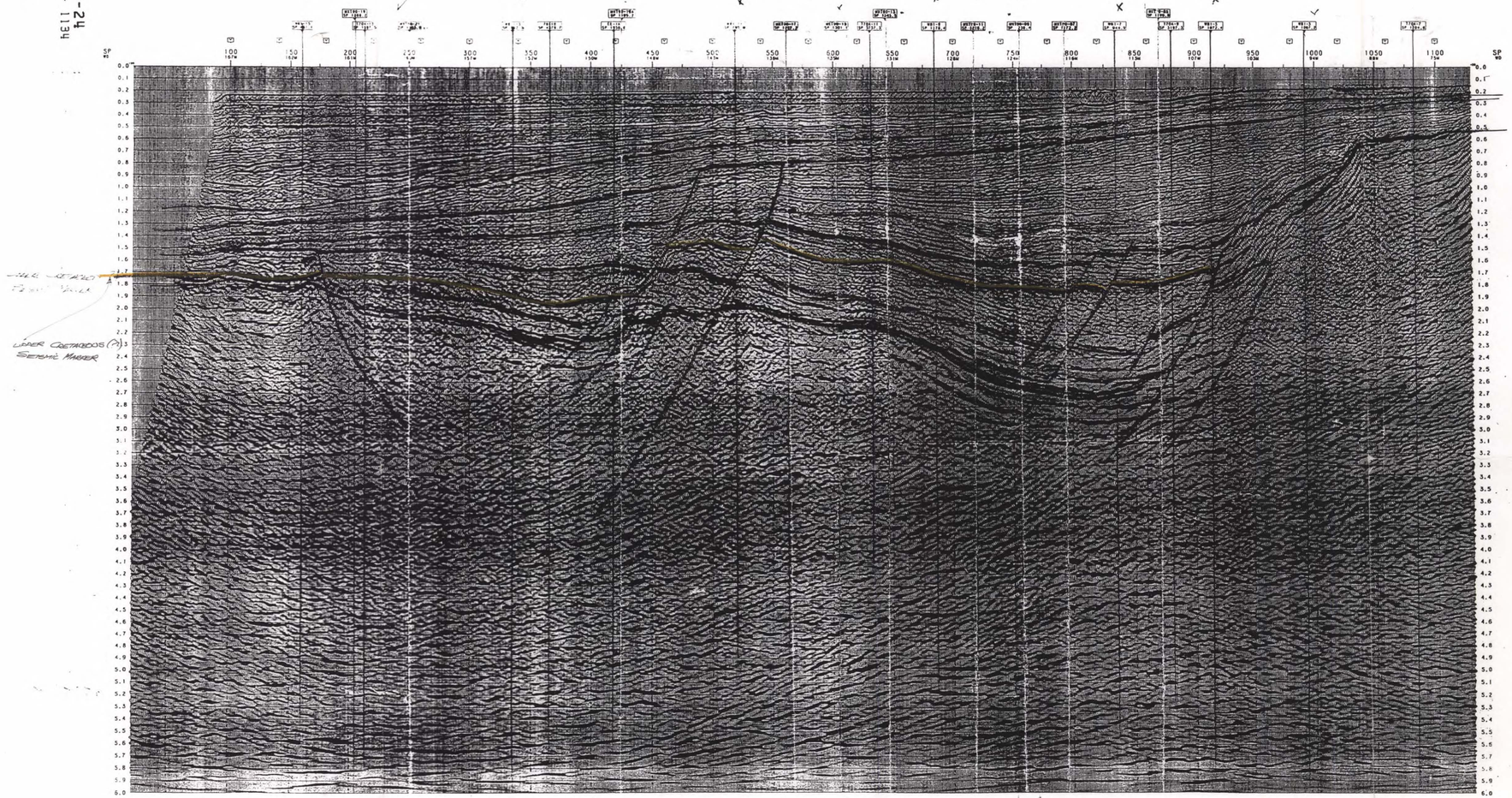
5 cm

573035

PSLA- 90/37. Sy. ENCLOSURE 13
OR-0471A

LINE: MXT90-24
SHOT PTS. 100 - 1134
1X7500% TVF
RPF MIGRATION
POSITIVE POLARITY
SOUTHWEST

SLOOP POINT PROSPECT



LINE: MXT90-24
SHOT PTS. 100 - 1134
1X7500% TVF
RPF MIGRATION
POSITIVE POLARITY

MAXUS
ENERGY CORPORATION

AREA: OFFSHORE TASMANIA
PROSPECT: T/24P

DALLAS DIGITAL CENTER:
PROCESSING DATE:
DATUM PLANE:
APPROVED BY:

JOB # 5382
JULY, 1991
SEA LEVEL
DM/RM

RECORDING INFORMATION:

SOURCE:
INSTRUMENTS:
CABLE:

WESTERN GEOPHYSICAL

PROCESSING SEQUENCE:

1. SEG-B CONVERT:
2. PREPROCESSING:
3. VELOCITY ANALYSIS:
4. DEMO STEERING:
5. DECONVOLUTION:
6. VELOCITY ANALYSIS:
7. 3000Z OFFSHR FOLD REDUCTION
8. P-S DEMULTIPLE:
9. DIP MOVEOUT CORRECTION
10. VELOCITY ANALYSIS:
11. 3000Z MOVEOUT AND STACK
12. HIGH DIP MIGRATION:
13. 5002XL PREDICTIVE FILTER
14. TIME VARIANT FILTER:
15. DEMO:

DISPLAY:

NOTATIONS:

HORIZONTAL SCALE: 1 CM = 250 M
40 TRACE INTERVALS = ½ KM

LINE LOCATION MAP

MXT90-24
MIGRATED