SAGASCO Resources

471002

GWF9107.009-RJS

SAGASCO Resources Limited

60 Hindmarsh Square
GPO Box 2576, Adelaide
South Australia 5001
Telephone 223 4711
Facsimile 223 1851
Interstate prefix 08
International prefix 618

COMMONWEALTH OF AUSTRALIA

PETROLEUM (SUBMERGED LANDS) ACT 1967

APPLICATION FOR THE GRANT OF AN EXPLORATION PERMIT FOR PETROLEUM WITHIN THE AREA ADJACENT TO TASMANIA

IN RESPECT OF THE BLOCKS WITHIN THE AREA IDENTIFIED AS AREA T91-2

IN NOTICE OF INVITATION OF APPLICATIONS FOR EXPLORATION PERMITS RELEASE OF OFFSHORE PETROLEUM EXPLORATION AREAS RELEASE 1 1991

Submitted by:
SAGASCO Resources Ltd
3rd Floor
60 Hindmarsh Square
ADELAIDE SA 5000

OR-361

SAGASCO Resources Limited
A.C.N. 007 845 338
Part of the SAGASCO Holdings Group

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5 Modelling of the Pipipa Deep Seismic Amplitude Anomaly, T91-2, Bass Basin.

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* SECTION E Particulars of the financial resources available to the Applicant and Existing exploration plans and commitments over the next six years.

* SECTION F Assessment and Bidding Agreement.

* NOTE THESE SECTIONS ARE 'CLOSED FILES' NOT INCLUDED HERE

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SECTION A
GRATICULAR DESCRIPTION OF BLOCKS IN RESPECT OF WHICH APPLICATION IS MADE.

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AREA T91-2

MAP SHEET SK-55 (TASMANIA)

Block No.	Block No.	Block No.	Block No.
0090	0091	0092	0095
0096	0163	0164	0165
0166	0167	0168	0235
0236	0237	0238	0239
0240	0241	0242	0307
0308	0309	0310	0311
0312	0313	0314	0379
0380	0381	0382	0383
0384	0385	0386	0451
0452	0453	0454	0455
0456	0457	0458	

Assessed to contain 43 blocks.

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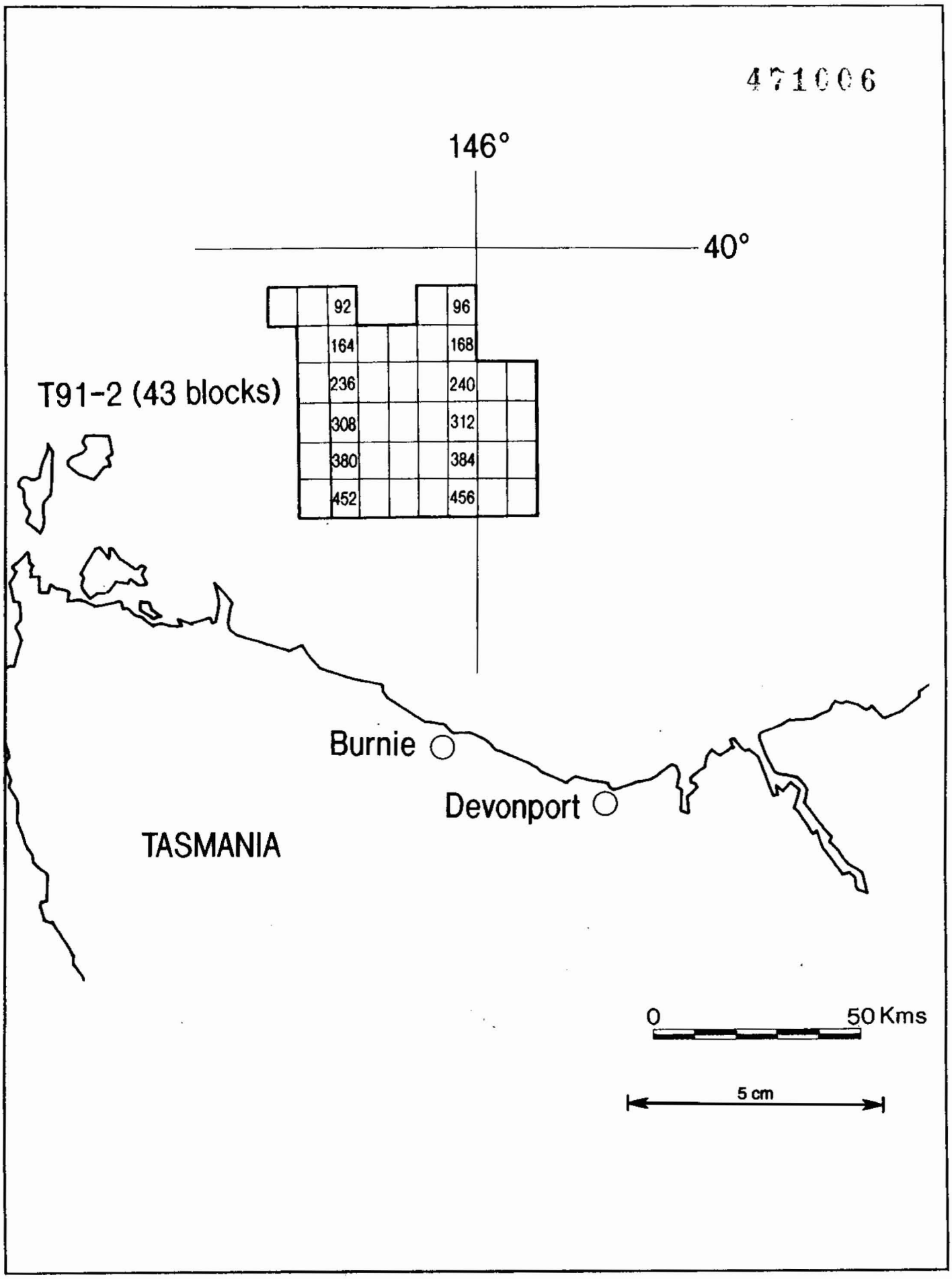

SAGASCO Resources Ltd.

A C N 007 845 338

BASS BASIN - TASMANIA

T91-2 OFFSHORE GAZETTAL AREA

AUTHOR : R.SUTTILL	DRAWN : B.D.W.	DATE : 07/91	SCALE : AS SHOWN	No. : BAS00.8048	FIG :

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SECTION B
MINIMUM GUARANTEED DRY HOLE AND SECONDARY WORK PROGRAM PROPOSED FOR EACH OF THE SIX YEARS OF THE FIRST TERM OF THE PERMIT

This proposal is based upon the technical assessment of T91-2 presented in Section C.

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SECTION B

MINIMUM GUARANTEED DRY HOLE AND SECONDARY WORK PROGRAM PROPOSED FOR EACH OF THE SIX YEARS OF THE FIRST TERM OF THE PERMIT

YEAR	WORK PROGRAM		INDICATIVE EXPENDITURE ($ million)
1	1 Well (Pipipa Deep)		6.5
	500 km Seismic Acquisition and Processing		0.6
	1000 km Seismic Reprocessing		0.1
	Environmental, Geological and Geophysical Studies		0.3
		TOTAL	7.5
2	250 km Seismic Acquisition and Processing		0.3
	Geological, Geophysical and Gas Marketing Studies		0.2
		TOTAL	0.5
3	**1 Well (Penguin/Pipipa North/Pelican Area)		7.0
	Geological and Geophysical Review		0.2
		TOTAL	7.2
4	3D Seismic Acquisition		1.0
5	1 Well		7.0
6	1 Well		7.0
		TOTAL	15.0

** Although we do not discount the possibility of finding oil in T91-2, present evidence strongly suggests that this permit is gas-prone. At this point of time, this bidding consortium can give a firm commitment to drill a well in Year 3, but if unfavourable gas market developments occur in the region in Year 1, Year 2 or Year 3, then it may prove commercially nonsensical to drill this well. Consequently, the nominated Year 3 well is contingent upon favourable Tasmanian, Bass Basin gas market developments in Year 1, Year 2 or Year 3.

If the bid is not acceptable in this form then we wish to amend the Year 3 work program to read:

YEAR	WORK PROGRAM	INDICATIVE EXPENDITURE ($ million)
3	Geological and Geophysical Review	0.2

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SECTION C
TECHNICAL ASSESSMENT
Hydrocarbon Prospectivity of Gazettal Area T91-2, Bass Basin, Offshore Tasmania.

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HYDROCARBON PROSPECTIVITY OF GAZETTAL AREA T91-2, BASS BASIN, OFFSHORE TASMANIA.

SAGASCO Resources Limited

October 1991

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* NOTE NOT INCLUDED HERE.

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4	Petrophysical Analysis, Pipipa 1, T91-2, Bass Basin.
5	Modelling of the Pipipa Deep Seismic Amplitude Anomaly, T91-2, Bass Basin.

INTRODUCTION

The T91-2 gazettal area is located approximately 55 kilometres north of the coastal town of Burnie, in waters of the Bass Strait, offshore Tasmania (Figure 1). The gazetted block is located on the southwestern flank of the Bass Basin. T91-2 comprises 43 five-minute graticular blocks and covers an area of approximately 2810 square kilometres. This report documents the results of a review of the hydrocarbon prospectivity of the area completed by SAGASCO Resources Limited on behalf a Study and Bidding Group comprising SAGASCO Resources Limited, Ampol Exploration Limited, and Bridge Oil Limited,

Water depth within the gazettal area ranges from 50 metres in the south western corner of the area to 80 metres in the northeast (Figure 2).

Special conditions with respect to the protection of the environment have been imposed by the Commonwealth on T91-2. The main areas of concern are the Rocky Cape National Park and the Rocky Cape Marine Region, which is in the process of being proclaimed (Figure 3). The special conditions require that the first exploration well be designated under the provisions of the Environmental Protection (Impact of Proposals) Act 1974 to allow potential environmental impacts from exploration and potential production to be assessed at an early stage. Applications to drill are required to be submitted six months prior to proposed commencement and must include:

(1) a description of the drilling proposal
(2) a description of the likely development plans if drilling is successful
(3) a description of the environment, both in the permit and adjacent to it, which is likely to be affected by drilling and production
(4) a description of the potential impact of drilling and production on the environment
(5) a description of the standards for the protection of the environment intended to be adopted and applied in connection with the drilling of the well and future production
(6) a copy of the operator's approved oil spill contingency plan.

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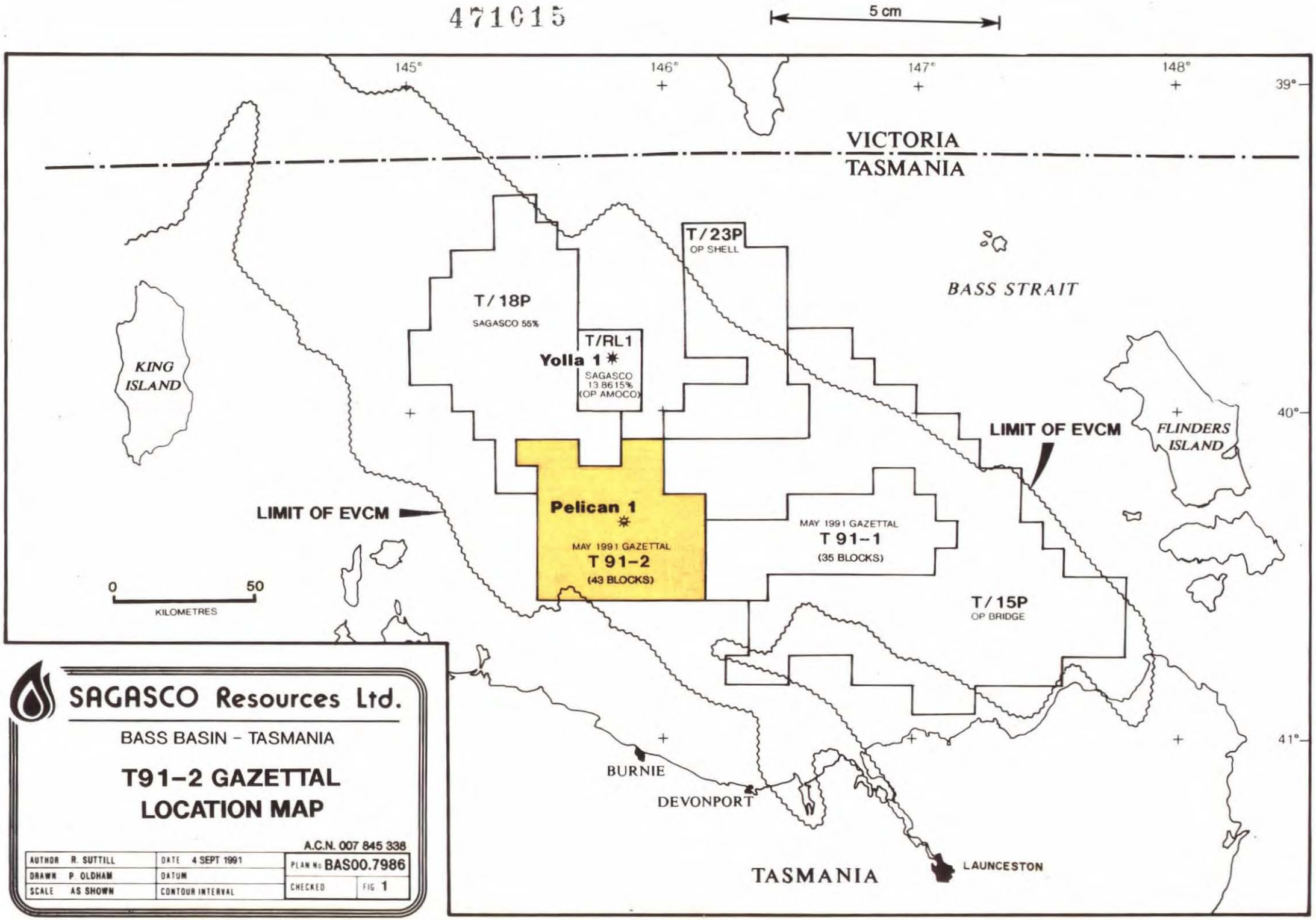

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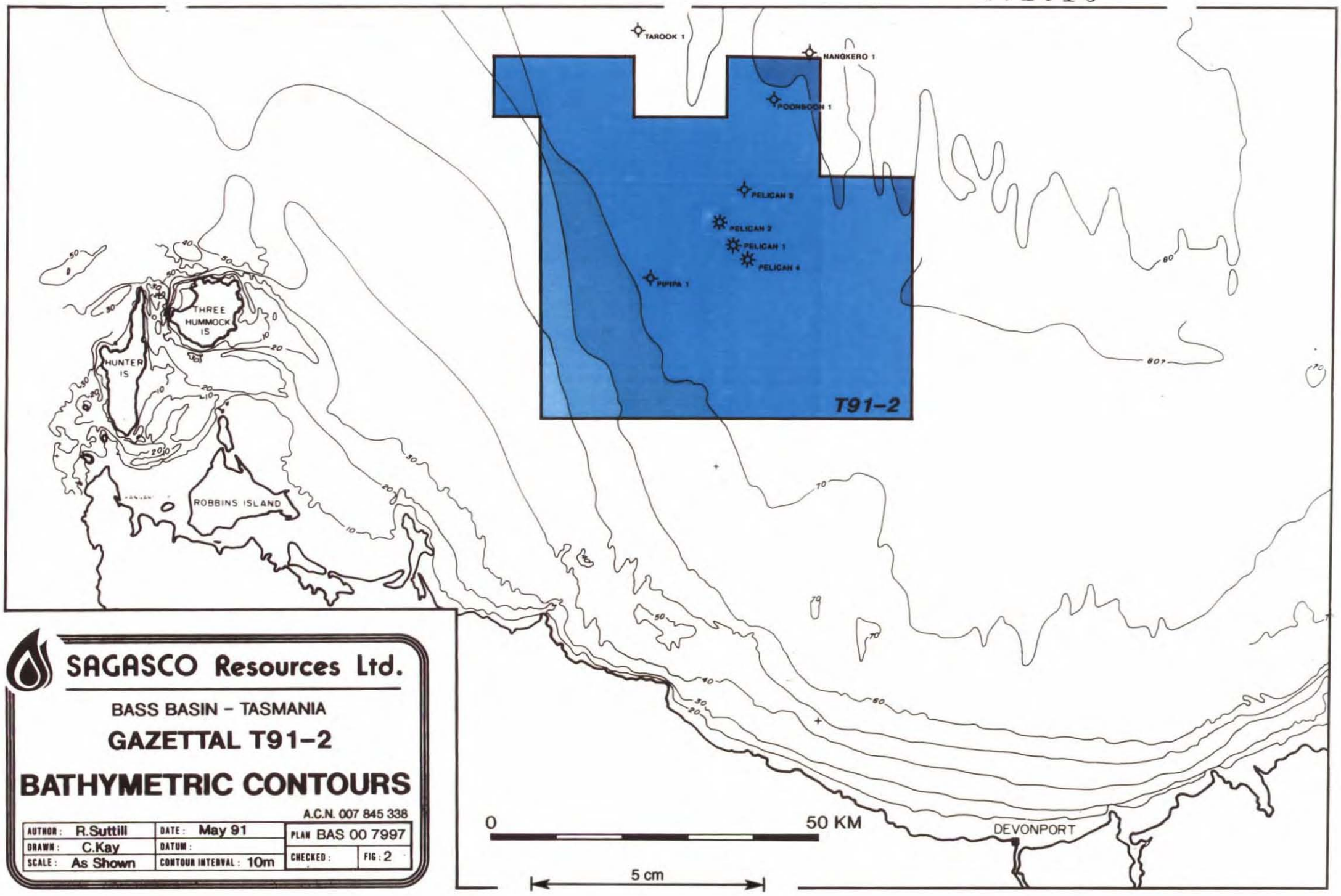
BASS BASIN - TASMANIA

T91-2 GAZETTAL LOCATION MAP

A.C.N. 007 845 338

AUTHOR R. SUTTILL	DATE 4 SEPT 1991	PLAN No BAS00.7986	
DRAWN P. OLDHAM	DATUM		
SCALE AS SHOWN	CONTOUR INTERVAL	CHECKED	FIG 1

471016



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BASS BASIN – TASMANIA

GAZETTAL T91–2

BATHYMETRIC CONTOURS

A.C.N. 007 845 338

AUTHOR: R.Suttill	DATE: May 91	PLAN BAS 00 7997	
DRAWN: C.Kay	DATUM:		
SCALE: As Shown	CONTOUR INTERVAL: 10m	CHECKED:	FIG: 2

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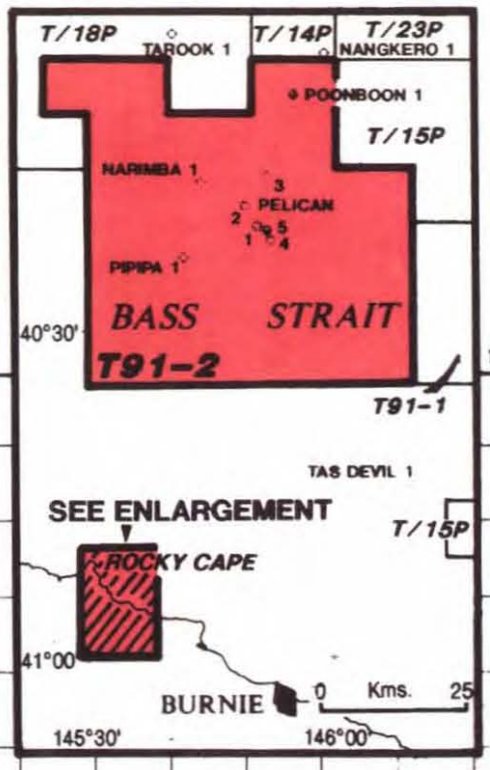
ROCKY CAPE NATIONAL PARK

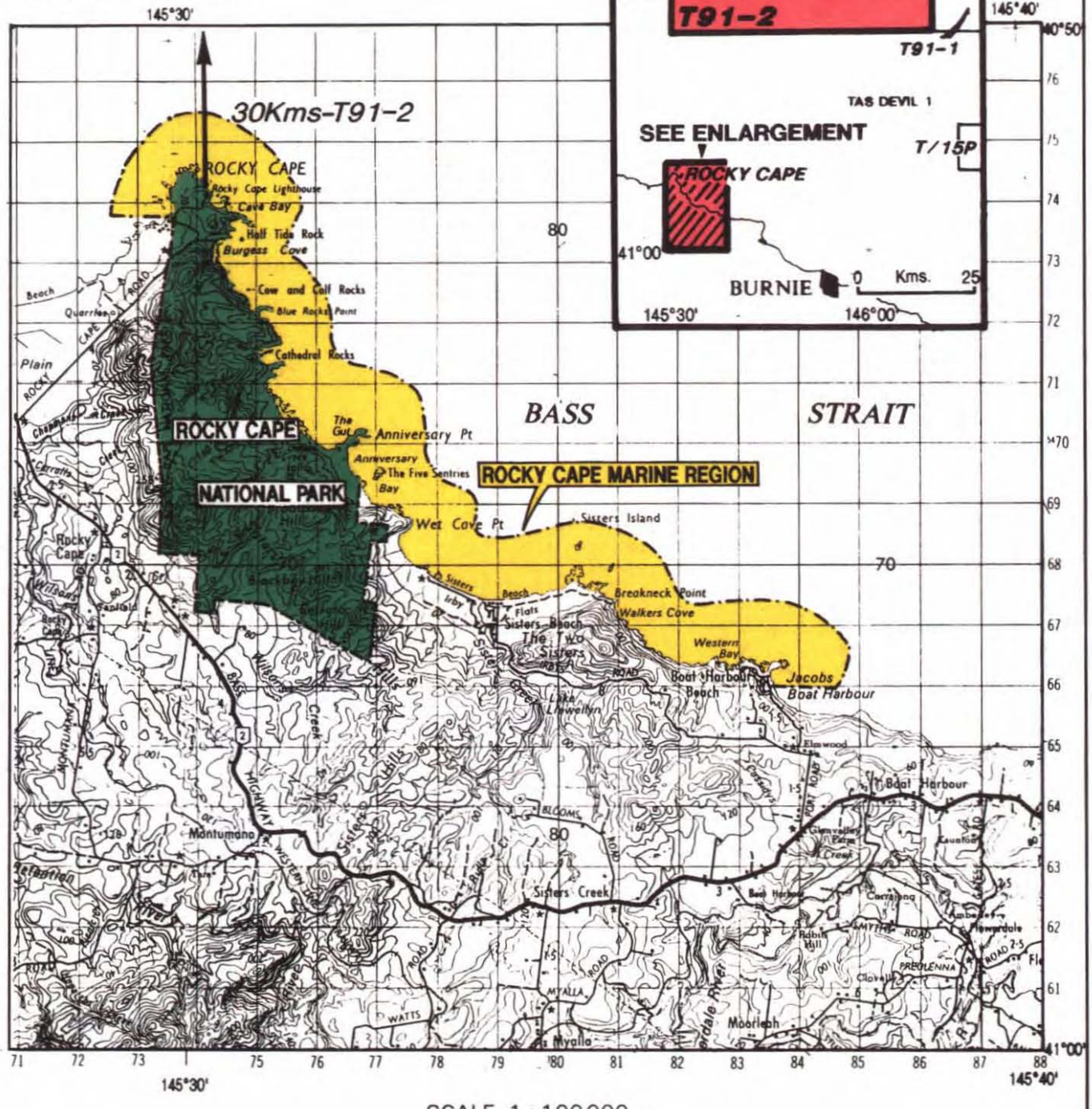
Situated approximately 15 kms north-west of Wynyard, the Park extends from Rocky Cape to Breakneck Point and for approximately 3 kms inland, excluding land at Sisters Beach.

ROCKY CAPE MARINE REGION

About 1600 hectares of seabed and waters, between Jacobs Boat Harbour and Rocky Cape Beach, comprising the area within a line commencing at low water on the western shore of Jacobs Boat Harbour at AMG northing, then due east to a point 1 km from the tip of Shelter Point, then northerly and westerly at a constant distance of 1 km from the nearest point of the shore around Rocky Cape to a point west of Rocky Cape Beach at AMG northing, then due east to that beach, then northerly and easterly via low water to the commencement point.



ENLARGEMENT



SCALE 1 : 100000

0 2 4 6 8 10

Kilometres

5 cm

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BASS BASIN - TASMANIA

T91-2 GAZETTAL – ENVIRONMENTALLY SENSITIVE AREAS

A.C.N. 007 845 338

AUTHOR : R.SUTTILL	DRAWN : B.D.W.	DATE : 07/91	SCALE : AS SHOWN	No. : BAS000.8144	FIG : 3

PREVIOUS EXPLORATION

The central part of the gazettal area previously formed part of Petroleum Exploration Permits EL1/60,T/5,6 held by Esso-BHP, and part of permit T/22P which was explored by a consortium comprising Amoco, SAGASCO Resources Ltd, (formerly SAOG) and Bass Strait Oil & Gas. The southern edge of the gazettal was formerly part of T/16P which was explored by Weaver Oil, Bridge Oil, Peko, Cluff Resources, and Winton Oil NL. The western edge of T91-2 was formerly part of T/18P which was explored by Amoco, SAGASCO Resources Ltd, Bass Strait Oil & Gas and others.

The first seismic data were acquired in 1965 by Hematite. This survey was followed by a further 16 industry surveys, the most recent of which was acquired by Amoco in 1985. A complete list of the surveys is shown below:

Line Designation	Year	Operator
B	1965	Hematite
ES	1966	Esso
EF	1968	Esso
B70A	1970	Esso
B71A	1971	Esso
B72A	1971	Esso
HB73A	1973	Hematite
HB75A	1975	Hematite
HB77A	1977	Hematite
HB80A	1980	Hematite
81BBS	1981	Bass Strait Oil & Gas
81BCS	1981	Cue Minerals
WB81	1981	Weaver
WB82	1982	Weaver
BB85	1985	Bridge
TNK4	1984	Amoco
TQH5	1985	Amoco

In addition to industry seismic surveys, several regional lines acquired by the Bureau of Mineral Resources in 1982 cross the gazettal area. Seismic base maps showing the distribution of these surveys are included as Enclosures 1 to 4.

Twenty-seven offshore exploration and appraisal wells have been drilled in the Bass Basin since drilling commenced in 1965 with the ESSO operated Bass 1. Eight of these wells are located within T91-2. Well Summary and Post Mortem Sheets for each well in T91-2 are included in Appendix 1.

The first well to be drilled in T91-2 was Pelican 1, also operated by ESSO, which resulted in the discovery of gas and condensate charged sandstone reservoirs sealed by intraformational shales within sediments belonging to the lower to middle *M. diversus* palynological zones (early Eocene) of the Eastern View Coal Measures (EVCM). Several of these sands were tested by FIT's which recovered gas and condensate. Pelican 1 reached a total depth of 3124m (10,248 ft) in sediments belonging to the upper *L. balmei* palynological zone (late Palaeocene).

In 1972, three wells were drilled in T91-2 by ESSO. The first of these was Poonboon 1 a wildcat drilled on a large closure over a basement high. Log analysis indicated the presence of gas in a 6 ft (1.8m) sandstone of Palaeocene age. This zone was subsequently tested by two FIT's which recovered 21000cc fresh water with 1.4 cubic feet gas, and 1.1 cubic feet of gas, respectively. Poonboon 1 reached a total depth of 3266m (10,715ft) in sediments belonging to the *T. longus* palynological zone (Late Cretaceous) and was plugged and abandoned.

Pelican 2 was an appraisal of the gas condensate discovery located on a separate fault block of the Pelican structure, 4 kilometres to the northwest of Pelican 1. The well also encountered significant gas and condensate bearing reservoirs belonging to the lower to middle *M. diversus* palynological zones of the early Eocene. FIT's were run and the best test from the "E" sand resulted in a recovery of 37 cubic feet of gas, 750 cc of condensate and 13000 cc of mud. Pelican 2 was drilled to a total depth of 3068m (10,066 ft) in sediments belonging to the lower *M. diversus* palynological zone (early Eocene) and was plugged and abandoned.

Pelican 3 was drilled on the upthrown side of the major fault which forms the northeastern limit of the Pelican half graben, and is considered as a separate structural test independent of the main Pelican structure. As a result of its structurally high position the well encountered a condensed sequence of Eastern View Coal Measures. The lower to middle *M. diversus* palynological zone sequence was considerably thinner than that encountered in Pelican 1 and 2 and no shows were encountered at this stratigraphic level. However, towards the base of the well weak shows of gas were reported during drilling in sandstones belonging to the lower *L. balmei* palynological zone. A series of FIT tests produced minor recoveries of gas at best. A decision was made to case Pelican 3 and an interval of lower

L. balmei sands were tested through perforations. The test produced a flow of 168 BWPD with gas at a rate too small to measure. Pelican 3 reached a total depth of 2902m (9521 ft) in sediments belonging to the lower *L. balmei* palynological zone (early to middle Palaeocene).

In 1973, the wildcat Narimba 1 was drilled by ESSO on a separate culmination structurally deeper, on trend but to the northwest of the Pelican structure. The well was drilled to a total depth of 3353.7m (11,003 ft). Small gas shows were recorded in the lower and middle *M. diversus* palynological zones and subsequently tested by FIT. The tests recovered only small volumes of gas, probably representing solution gas and the well was consequently plugged and abandoned. Current mapping shows that Narimba 1 was drilled outside of significant closure at the key reservoir levels.

Five years elapsed between the drilling of Narimba 1 and the next well Pelican 4, drilled by Hematite in 1979. Pelican 4 was drilled to appraise the southeastern limit of the Pelican structure and is located 3.5 kilometres to the southeast of Pelican 1. Gas shows were encountered in sandstones of the lower and middle *M. diversus* palynological zone. Several of these zones were tested and good gas and condensate recoveries were obtained from two zones at 2739.5m (8988 ft) and 2884.6m (9464 ft). The well was not tested further and was plugged and abandoned.

Pipipa 1 was drilled in 1982, also by Hematite, as the last permit commitment well after the interpretation of seismic data acquired over the prospect in 1980. The well was drilled to test a large closure at the top of the EVCM. Subsequent remapping has shown that Pipipa 1 is a valid structural test at this level. Good oil and gas shows were recorded towards the total depth of the well, but log analysis indicated no moveable hydrocarbons to be present. At a total depth of 2115m (6939 ft) the well was plugged and abandoned. It was not possible to date the sediments at total depth due to the poor preservation of spores resulting from a localised high palaeo-heat flow event, probably a nearby volcanic intrusion which elevated measured vitrinite reflectance values to as high as 2.3%. However, seismic ties to the Pelican Field suggest that total depth in Pipipa 1 was reached in sediments near to the top of the lower to middle *M. diversus* palynological zone. The most prospective *M.diversus* reservoir sequence in T91-2 was therefore not penetrated by Pipipa 1.

A characteristic of the middle *M. diversus* zone in many of the wells drilled in T91-2 is the presence of abnormally pressured shales. A shale pressure study was conducted (Appendix 2), which showed that no abnormally pressured shales are present in Pipipa 1, further suggesting that the *M. diversus* zone sediments were not reached.

The final well to be drilled in T91-2 was Pelican 5, by Amoco, in 1986. The objectives of Pelican 5 were twofold, (i) to establish deliverability characteristics of the lower to middle *M. diversus* palynological zone (Pelican zone) reservoirs by testing through casing, and (ii) to evaluate the abnormally pressured zone beneath the top Palaeocene unconformity for reservoir development and fluid content.

Pelican 5 is located between Pelican 1 and 4, and encountered the EVCM at a comparable structural elevation. Gas and condensate shows were again encountered in sandstones of the lower and middle *M. diversus* zones, and shows continued with an increase in the concentration of heavier hydrocarbons with depth below the top Palaeocene to total depth in the Late Cretaceous at 4267m (14000 ft) still within abnormally pressured sediments. The well was cased and several of the most encouraging zones were tested through perforations. The results of the testing programme were disappointing. A sand at the base of the lower *M.diversus* zone flowed gas at 0.75 MMCFD and recovered a trace of condensate, whilst a sand in the "E" zone of the middle *M. diversus* zone flowed gas at 5.6 MMCFD with 302-441 BCPD and 662-705 BWPD (the water is interpreted to originate from another sandstone via leakage behind casing). All other zones tested are interpreted to be tight. As no commercial flow rates were obtained, the well was plugged and abandoned.

5 cm

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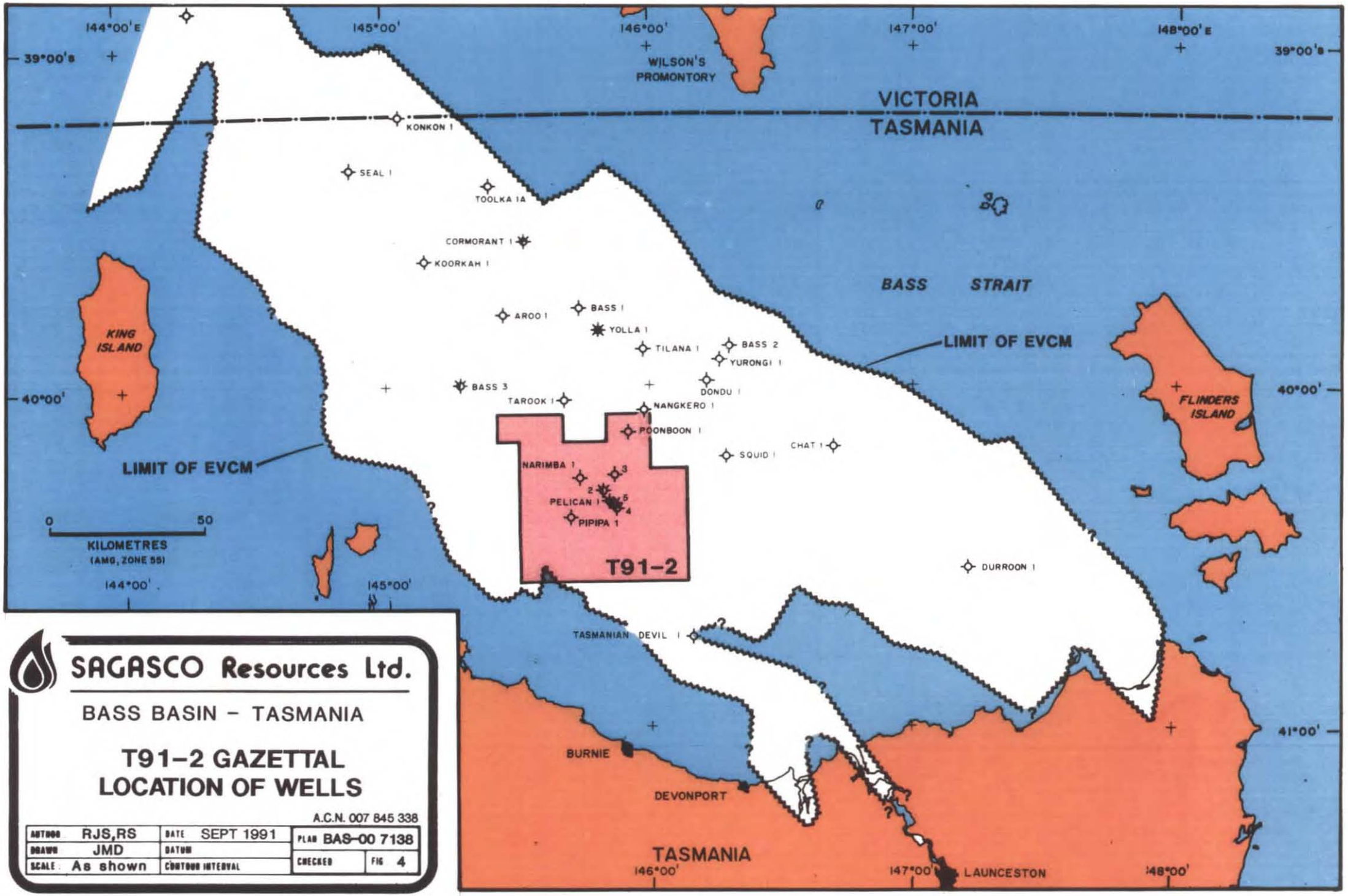

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BASS BASIN – TASMANIA

T91–2 GAZETTAL LOCATION OF WELLS

A.C.N. 007 845 338

AUTHOR RJS,RS	DATE SEPT 1991	PLAN BAS–00 7138	
DRAWN JMD	DATUM		
SCALE As shown	CONTOUR INTERVAL	CHECKED	FIG 4

471023

TECTONIC SETTING

The Bass Basin is one of several basins which developed along the southern continental margin of Australia during the major rift phase that preceded the Australia - Antarctica break up. The southern rift system also resulted in the formation of the Otway, Duntroon and Great Australian Bight Basins.

Three phases of structural evolution are recognised in the Bass Basin, (i) initiation of lithospheric extension during the Early Cretaceous, (ii) a Late Cretaceous to Pliocene thermal subsidence phase, and (iii) a Tertiary compressional phase (Etheridge et al., 1985). Etheridge et al. (1985) also proposed that the Bass Basin is divided into a series of major fault bounded half-grabens offset by a series of orthogonal transfer faults with a consistent right lateral displacement.

The tectonic setting of T91-2 is dominated by the presence of a major half graben referred to as the Pelican Trough which trends northwest to southeast. The Pelican Trough is bounded to the northeast by a major northwest to southeast trending listric normal fault system downthrown to the southwest (Figure 5). A structural section (Figure 6) trending southwest to northeast across T91-2 and two composite regional seismic sections (Enclosures 5 and 6) illustrate the major tectonic elements of the gazetted area. Note that subsidence of the Pelican half graben appears to have been greatest during two periods of structural movement; the first during early EVCM deposition in the Late Cretaceous and then a later episode during the Early Eocene when sediments of the lower to middle *M. diversus* palynological zones were deposited.

Tectonic inversion in the Late Tertiary was responsible for the creation of the large, but complexly faulted Pelican structure.

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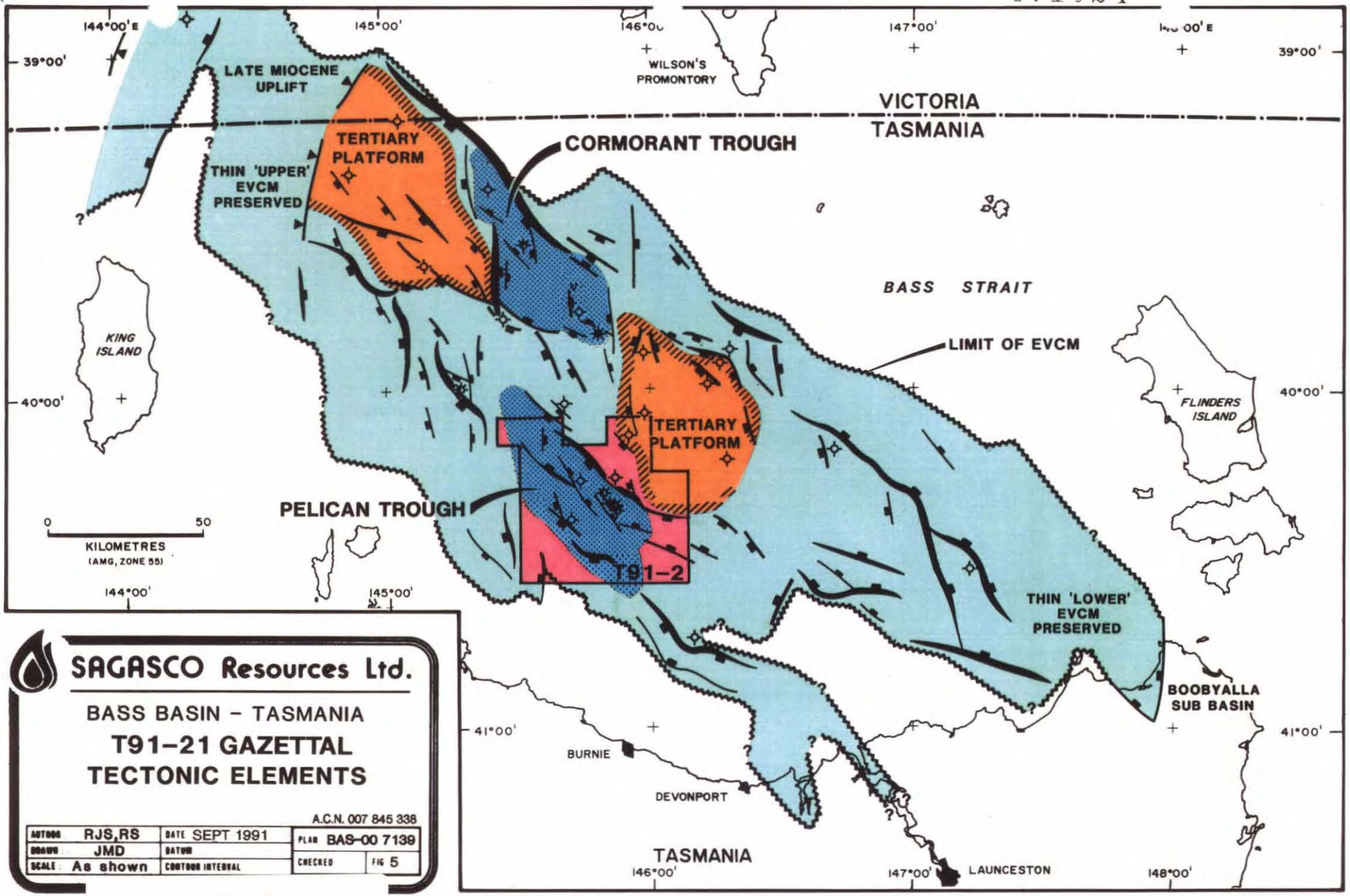

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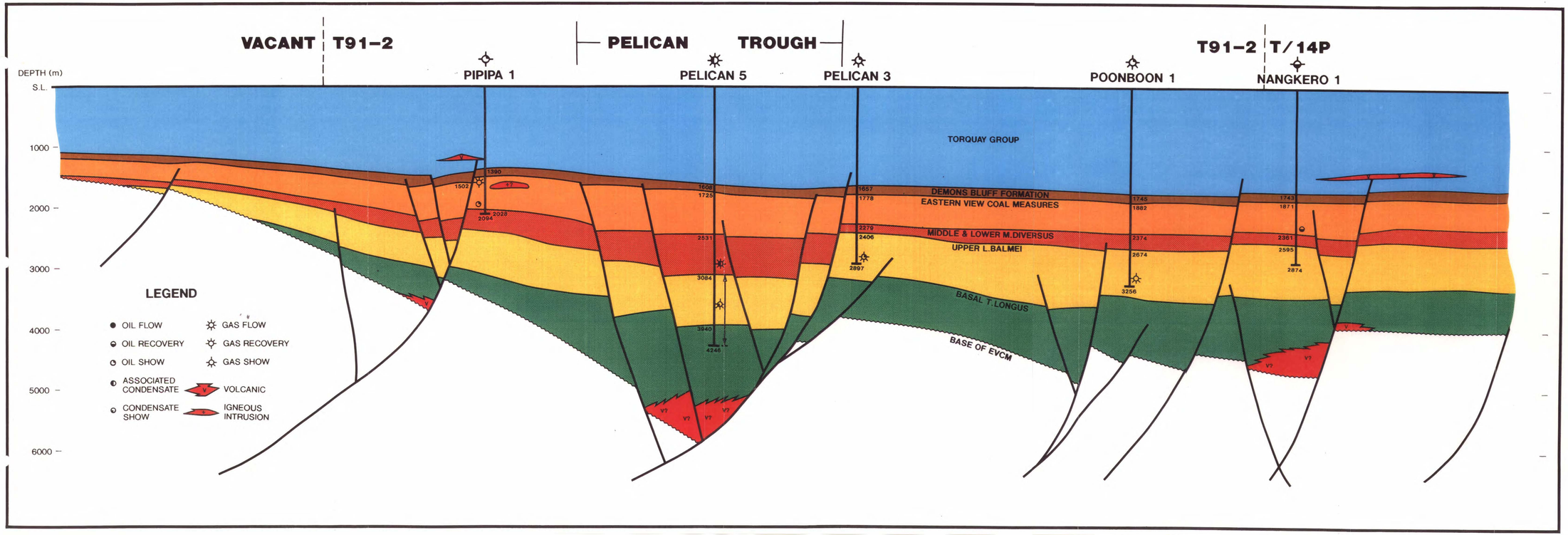
BASS BASIN – TASMANIA

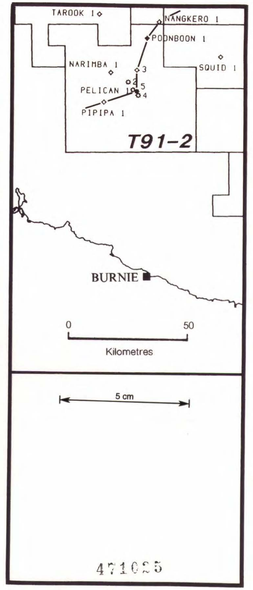
T91–21 GAZETTAL TECTONIC ELEMENTS

A.C.N. 007 845 338

AUTHOR: RJS,RS	DATE: SEPT 1991	PLAN: BAS-00 7139	
DRAWN: JMD	DATUM:	CHECKED	FIG 5
SCALE: As shown	CONTOUR INTERVAL:		

5 cm





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BASS BASIN - TASMANIA

T91-2 GAZETTAL

STRUCTURAL SECTION

A.C.N. 007 845 338

AUTHOR	R.Suttill	DATE	Aug 91
DRAWN	P.Oldham	DATUM	PLAN: BAS00.8153
SCALE	As Shown	CONTOUR INTERVAL	CHECKED

STRATIGRAPHY

The stratigraphic sequence in the Bass Basin includes sediments which range in age from the Early Cretaceous to recent (Figure 7). A structural/stratigraphic section using wireline data illustrates the major stratigraphic units that have been intersected in T91-2 (Enclosure 7). The Early Cretaceous Otway Group contains the oldest sediments which rest unconformably on pre-rift Mesozoic and Palaeozoic rocks. The Otway Group has not been penetrated by wells in T91-2. The nearest control is provided by Durroon 1 located approximately 100km to the east of T91-2 which penetrated an Early Cretaceous sequence of clastic and volcanoclastic fluvial and deltaic sediments comprising sandstones, siltstones, shales and coals. The Otway Group has traditionally been viewed as being less prospective than the overlying Eastern View Coal Measures.

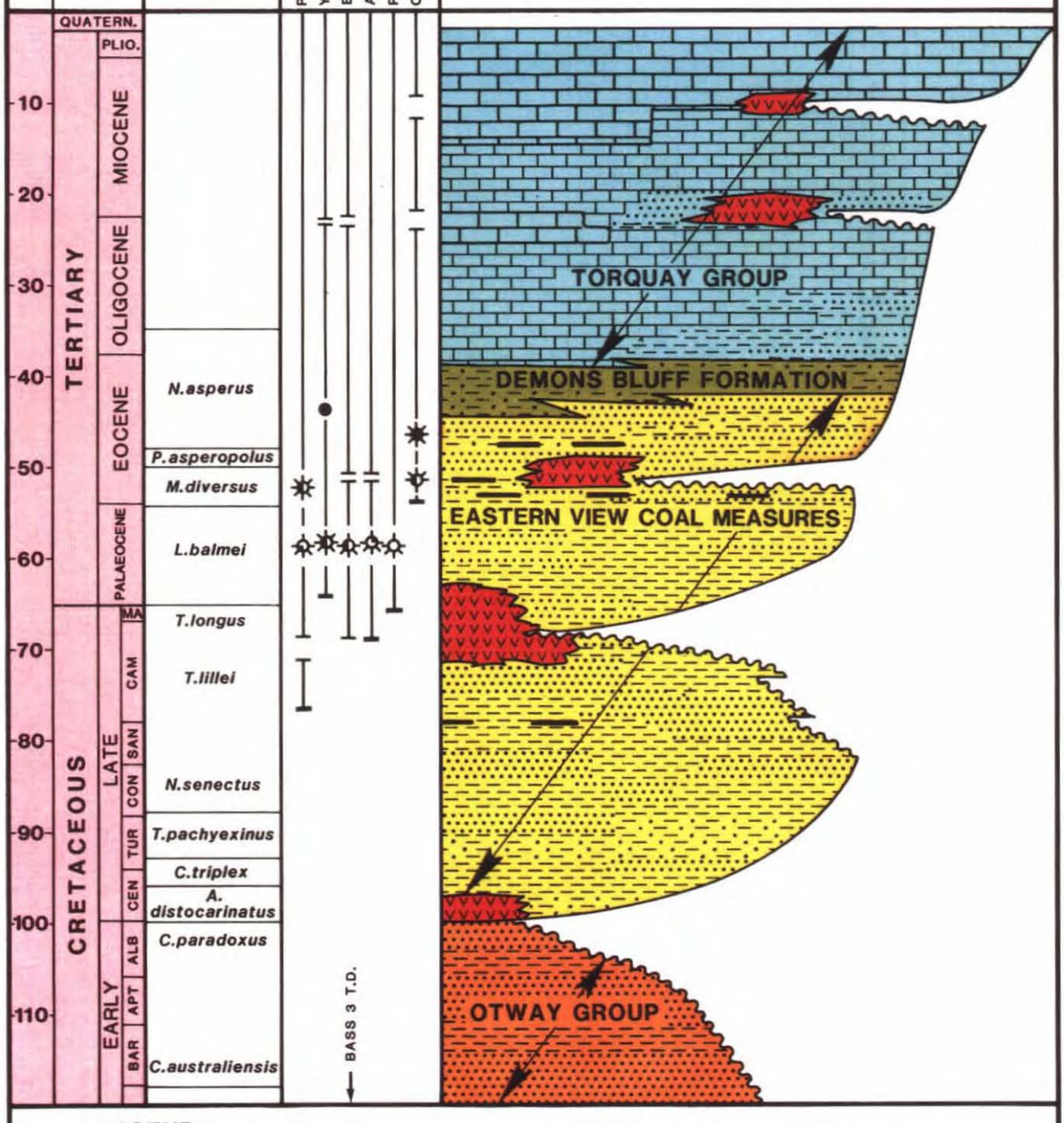
Overlying the Otway Group are the prospective Late Cretaceous to Late Eocene Eastern View Coal Measures (EVCM) which comprise a thick sequence of sandstones, siltstones, shales and coals deposited in predominantly fluvial, deltaic, and lacustrine environments occasionally subjected to marine inundation.

The EVCM are thickest in the centre of the major half grabens, such as the Pelican Trough in T91-2 and the Cormorant Trough to the north in T/18P. Seismic data suggest that the thickness of the EVCM in the centre of the Pelican half graben may exceed 5500m. The thickest drilled sequence is at Pelican 5 where 2507m was penetrated. The EVCM thins markedly towards the basin margins and exhibits both onlap onto basement and erosional truncation following uplift.

A lithological subdivision of the EVCM is possible locally, but is not achievable on a regional scale due to limited well control. Further difficulty is caused by rapid facies variations both between the major half grabens and due to the presence of condensed sequences over structural highs. A three fold stratigraphic subdivision of the EVCM is recognised based on palynological and microfossil assemblages and unconformities recognised as seismic (Figure 7). The unconformities are most apparent over basement highs and near to the basin margins and are not obvious in the centres of major troughs where continuous deposition is likely. Each of the unconformities corresponds to a period of structural movement accompanied by volcanic activity. The earliest major intra-EVCM unconformity occurs at the base of the *T. longus* palynological zone (Late Cretaceous), and the second intra-EVCM unconformity occurs at the base of the upper *M. diversus* palynological zone (Early Eocene).

471027

STRATIGRAPHIC COLUMN



LEGEND:

● OIL FLOW	✲ GAS FLOW	◐ ASSOCIATED CONDENSATE
⊖ OIL RECOVERY	✲ GAS RECOVERY	◔ TRACE CONDENSATE
◔ OIL TRACE	✲ GAS TRACE	

SAGASCO Resources Ltd.

BASS BASIN - TASMANIA

T91-2 GAZETTAL

5 cm

STRATIGRAPHIC COLUMN

ACN 007 845 338

AUTHOR: R.Suttill	DRAWN: J.Dutkiewicz	DATE: July 91	SCALE:	No.: BAS.00 8059	FIG: 7

The lowermost sequence of EVCM sediments is largely unexplored because of its depth of burial. It extends between the major unconformity at the base of the EVCM (usually top Otway Group) to the basal *T. longus* unconformity. The basal *T. longus* unconformity is associated with a period of major tectonic movement including extensional tilted block faulting and subsequent erosion. This sequence has only been partially penetrated within T91-2 by Pelican 5.

The middle sequence of EVCM sediments is bounded by the basal *T. longus* unconformity at its base and an unconformity at the base of the upper *M. diversus* zone. Deposition during the *T. longus* and *L. balmei* zones appears to have been controlled by tectonic subsidence. The unconformity at the base of the upper *M. diversus* zone is difficult to define on seismic data particularly in the centre of the Pelican Trough because limited fault block reactivation has resulted in only a minor angular unconformity. This middle sequence of sediments has been penetrated by all wells in T91-2 with the exception of Pipipa 1, and is considered to contain the most prospective reservoirs for gas and gas/condensate. Known accumulations in this sequence occur in Yolla to the north and in the Pelican Field.

The uppermost sequence of EVCM sediments lies between the base of the upper *M. diversus* unconformity and the top of the formation. Basin sag was the dominant tectonic control on deposition. No oil, gas or condensate recoveries have been made from reservoirs in this sequence in T91-2, but a small oil and gas accumulation has been recorded in Yolla 1 in T/RL1 to the north and significant oil and gas shows were obtained in Cormorant 1 in T/18P.

Conformably overlying the EVCM is the Late Eocene Demon's Bluff Formation. Lithologically this unit consists of a sequence of fine grained carbonaceous shales and sands deposited in a marine environment. The unit has an average thickness over the basin of approximately 120m, but thins towards the basin margins. The Demon's Bluff Formation provides regional top seal to hydrocarbons reservoired in the uppermost sandstones of the EVCM, in Yolla 1.

The Demon's Bluff Formation is overlain by the Oligocene to Pliocene age Torquay Group which consists of a basal sequence of marls and calcareous shales which grade upwards into a sequence of bioclastic limestones. The Torquay Group ranges in thickness from approximately 450m around the basin margins to about 1700m in the Pelican area.

In addition to extrusive igneous rocks associated with the basal and intra EVCM unconformities, intrusive and extrusive igneous rocks of Oligocene to Miocene age have been intersected in a number of wells drilled within the Bass Basin. Seismic data allow the mapping of the extrusive igneous rocks with a high level of confidence, in contrast to intrusive igneous rocks which are difficult to image and identify.

RESERVOIR

Failure of many of the Bass Basin wells particularly those in the Pelican and Cormorant Troughs has been attributed to the lack of good quality (high permeability and porosity) reservoir sandstones within the EVCM.

In an endeavour to predict areas of better reservoir development in the EVCM, detailed facies and petrophysical studies of core material have been completed. The results of this work show that EVCM sandstones were deposited in a wide variety of sedimentary environments including shallow marine, beach, deltaic, lacustrine and fluvial. In general, EVCM sandstones are mineralogically immature and have suffered porosity and permeability reduction due to a range of diagenetic processes. The major processes resulting in porosity and permeability reduction are compaction of ductile grains, alteration of labile volcanic rock fragments, kaolinite cementation, and localised carbonate cementation.

Nevertheless, good quality reservoirs have been encountered in several wells drilled to date, and a number of areas and intervals of better reservoir quality have been delineated. Studies of the upper EVCM immediately below the Demon's Bluff Formation have resulted in the identification of good reservoir development. Unfortunately closures in T91-2 at this level drilled have apparently not received a hydrocarbon charge. Outside T91-2, the Yolla 1 well demonstrated that the upper EVCM reservoirs can have moderate deliverability.

Other good quality sandstones are predicted to occur updip of the *M.diversus* fluvial sandstones encountered by Pelican wells. At Pelican 5 these sandstones have poor to moderate deliverability. The best sands produced gas at 5.6 MMCFD with an associated condensate flow of 441 BCPD. However, on the shallower margins of the Pelican half graben where diagenesis may be less advanced, such as at the Pipipa Deep Prospect and at other leads on trend, improved reservoir can be expected. Further factors which may lead to improved reservoir quality away from Pelican towards the basin margin may be attributable to differences in provenance, and an increase in sediment reworking.

In the Dondu area of T/23P, coarse-grained well sorted clean sandstones are found in stacked upward-coarsening packages within sediments of the *L. balmei* palynological zone. These sandstones are interpreted as shoreface deposits. Wave induced reworking may have played a significant role in improving the mineralogical maturity of these sediments. Sandstones with a similar log signature at Yolla 1 contain gas/condensate and have good deliverability characteristics. Reservoirs cored at Poonboon 1, in the north of T91-2, display similar facies characteristics and reservoir quality, but were not hydrocarbon bearing.

Reservoirs in the *L. balmei* zone may therefore also provide attractive exploration targets in parts of T91-2.

SOURCE POTENTIAL GENERATION AND MIGRATION.

The EVCM are time equivalent with the Latrobe Group in the Gippsland Basin. The greatest source potential in the Bass Basin occurs within the EVCM below the middle *M. diversus* zone. Ubiquitous coals and carbonaceous shales within this package possess very good source rock characteristics with TOC values commonly exceeding 10%. The drilling of Pelican 5 confirmed excellent source potential for wet gas in this zone. As a generalisation, it appears that the Pelican Trough is one of two half grabens (the other is Cormorant Trough) in the Bass Basin which are the main hydrocarbon generative centres.

Maturity studies of wells within the Cormorant and Pelican Troughs indicate that the lowermost EVCM (pre-middle *M diversus*) is the zone of maximum generation of hydrocarbons. A maturity model, using the kinetic method, for the Pelican 5 location in the depocentre of the Pelican half graben is shown in Figure 8. Notice that a significant proportion of the lower EVCM are within the wet gas window. A good fit between the measured maturity values and the calculated maturity curve from Figure 8 is observed in Figure 9.

Maturity maps have been constructed for three stratigraphic levels, top EVCM, top middle *M. diversus* and, top *L. balmei* Figures 10,11 and 12. The presence of high vitrinite reflectance values at Pipipa 1 has not been incorporated in the maturity maps, as the extent of these anomalies is not known, but it is predicted to be on a local rather than regional scale. At the top EVCM the maturity map shows an increase in maturity from less than 0.5% in the southwest to greater than 1.1% in the deepest part of the Pelican Trough. This pattern is repeated at the middle *M. diversus* level, with maturity rising from 0.4% in the southwest to 0.7% in the Pelican Trough. A section showing the present day maturity profile across the Pelican Trough is shown in Figure 13.

Data from Yolla 1 in T/RL1 has shown that some generation of liquid hydrocarbons can occur from resinite source material at maturities as low as 0.4% vitrinite reflectance. The oil recovery from Cormorant 1 and the oil flow from Yolla 1 suggest that the Cormorant Trough may be more oil prone than the Pelican Trough. Alternatively, it may be that early generated oil has been able to migrate to top EVCM closures at Yolla and Cormorant by vertical migration up faults, whereas in T91-2 such conduits do not occur to the structures drilled to date.

Pelican 5 BASS BASIN

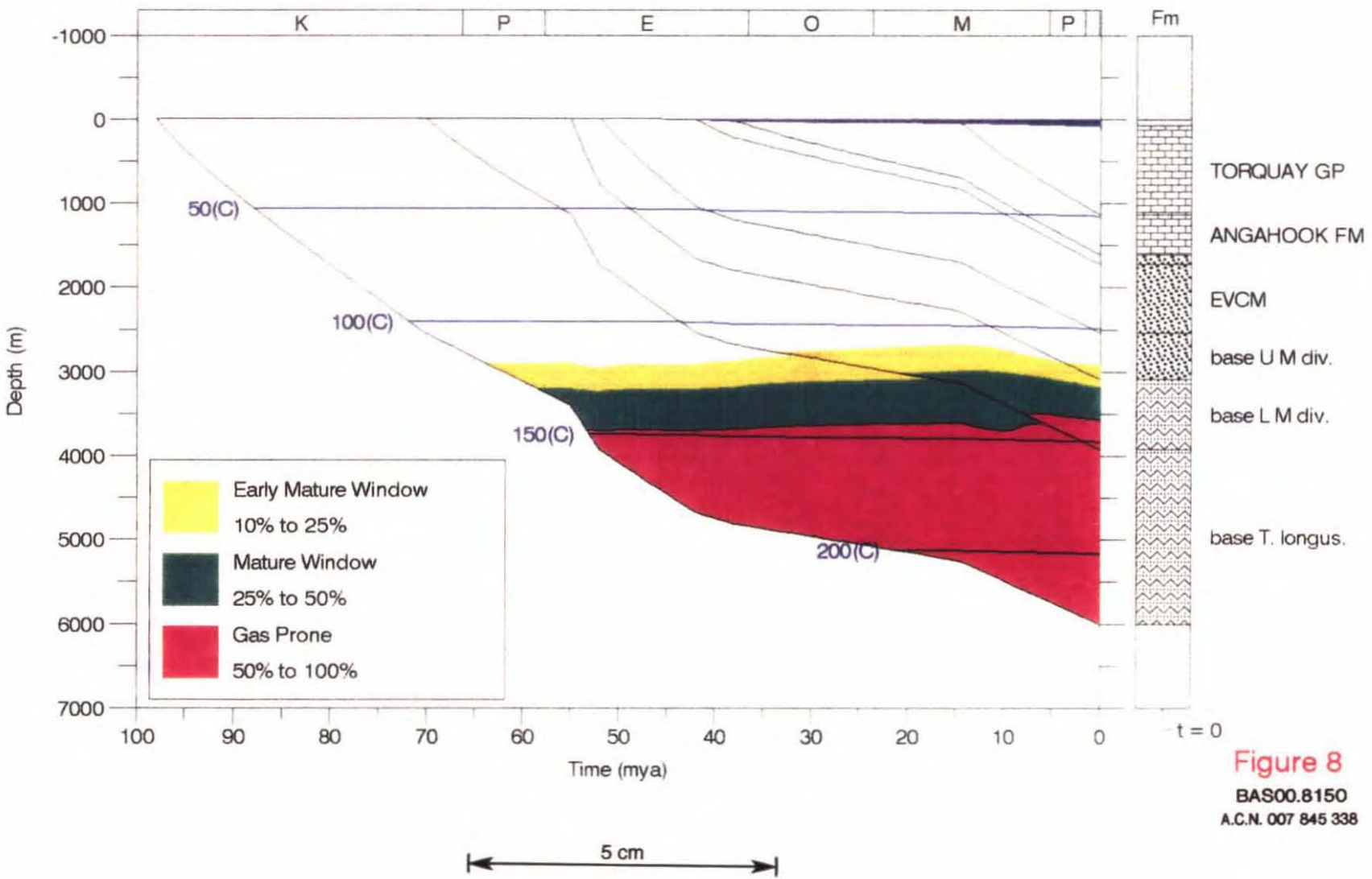


Figure 8

BAS00.8150

A.C.N. 007 845 338

Pelican 5 BASS BASIN

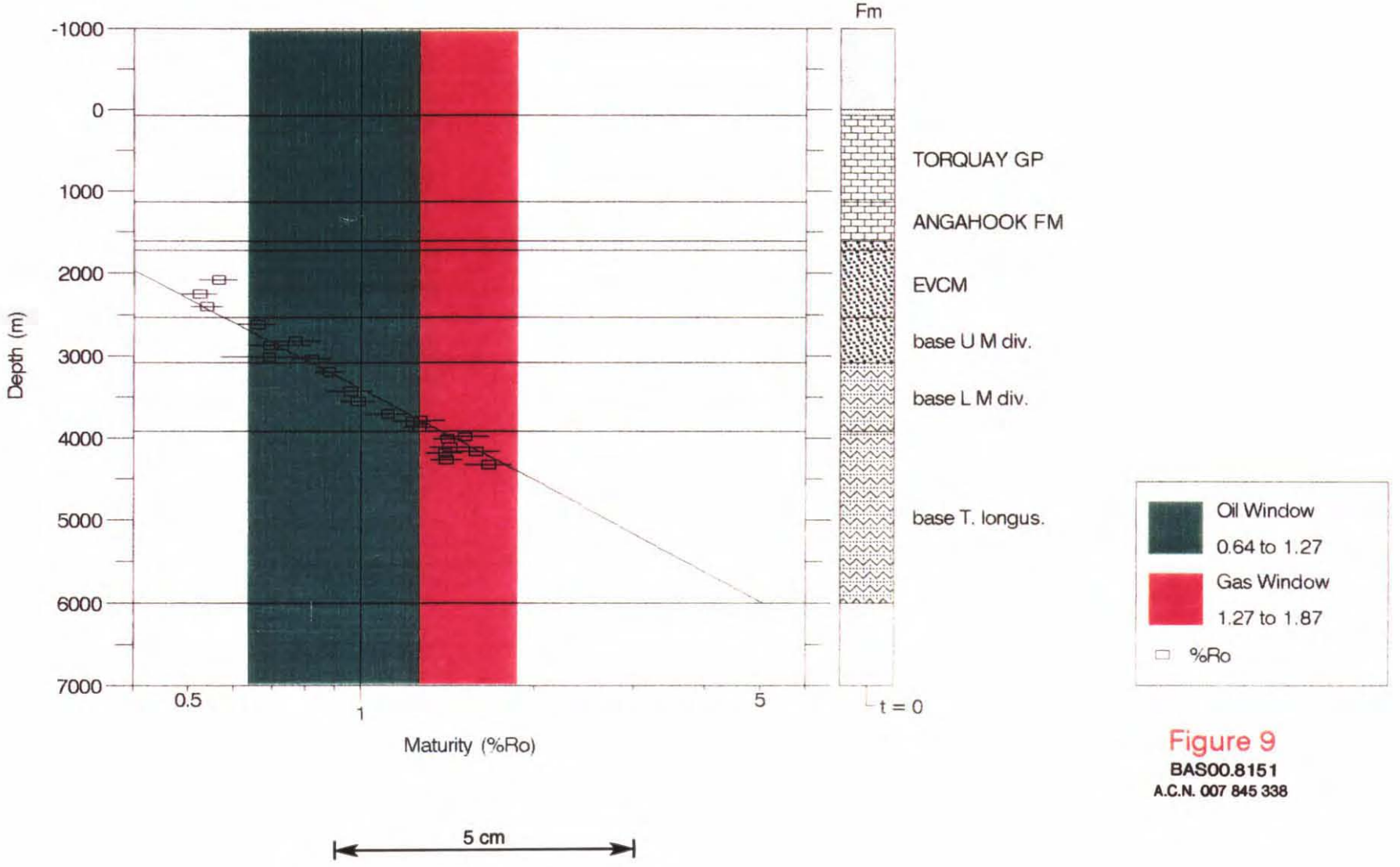
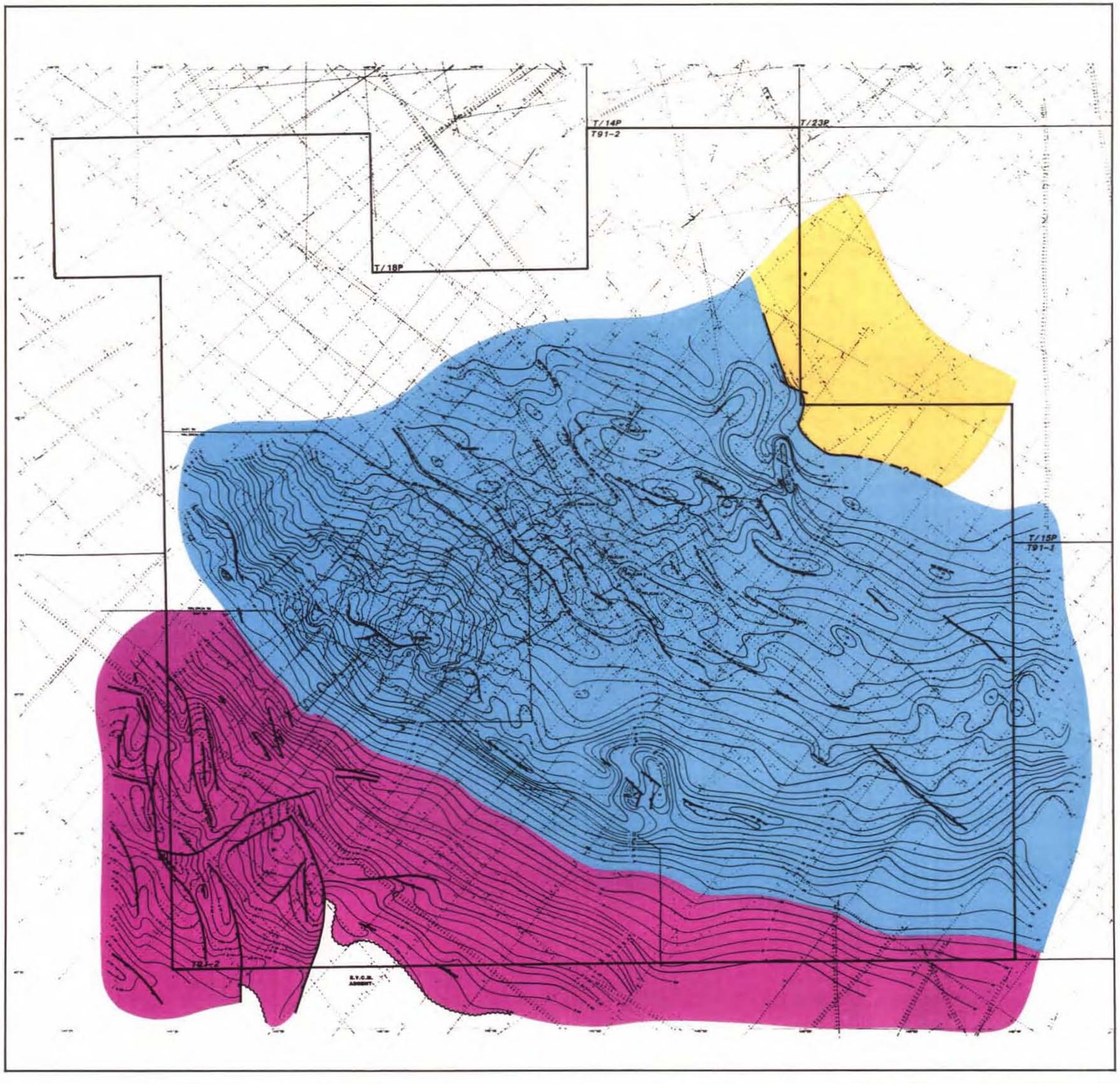
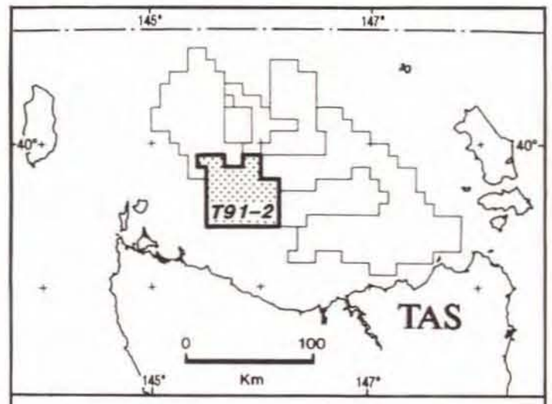


Figure 9

BAS00.8151

A.C.N. 007 845 338





– LEGEND –

VITRINITE REFLECTANCE

0.4%

0.5%

0.6%

5 cm

0 10 20

Kilometres

471035

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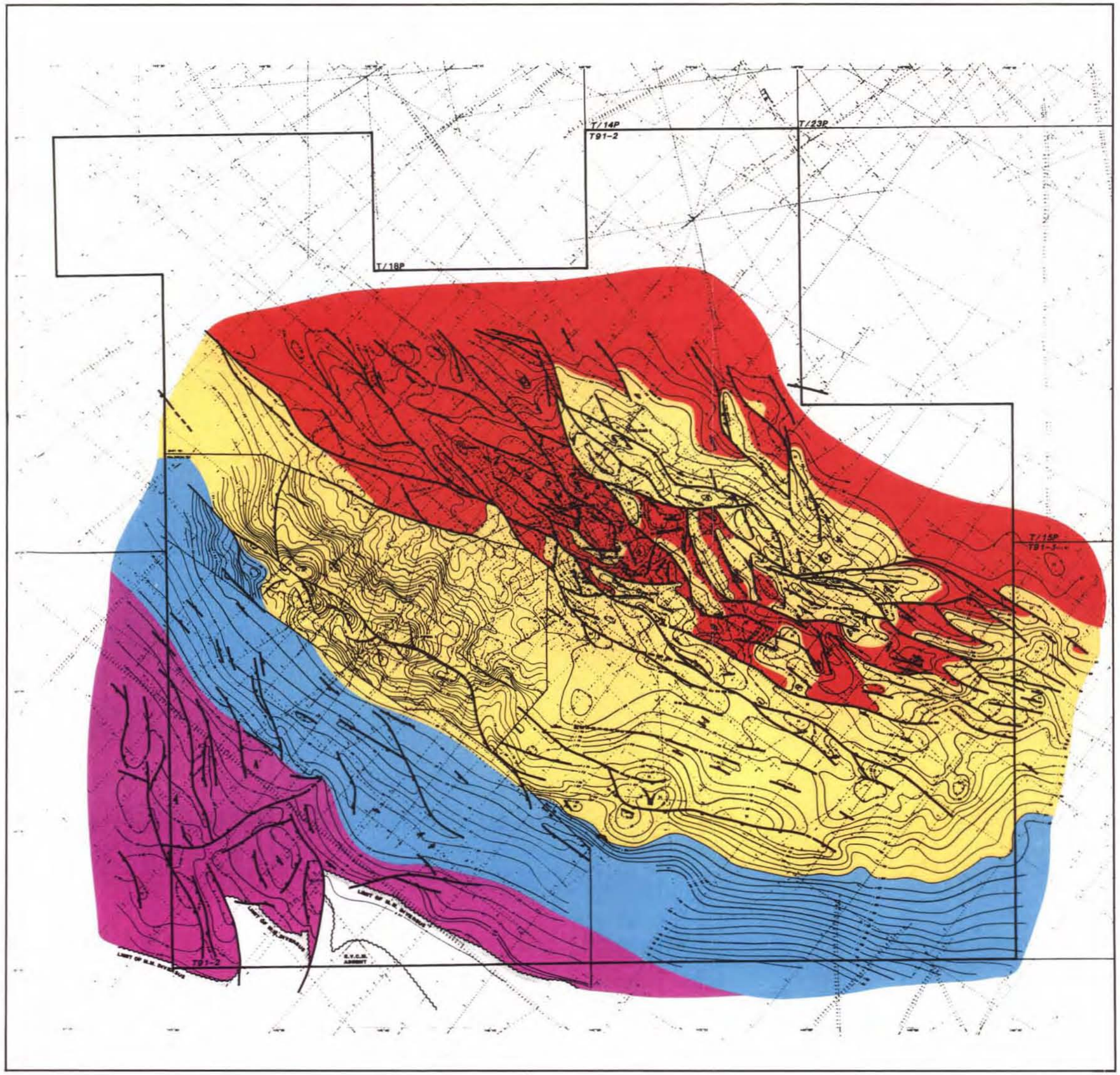
BASS BASIN – TASMANIA

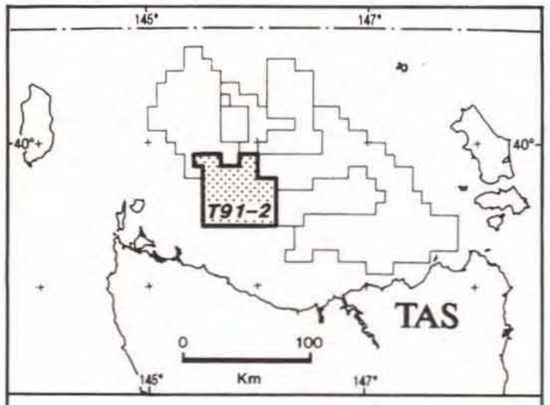
T91–2 GAZETTAL

MATURITY AT TOP EVCM

A.C.N. 007 845 338

AUTHOR	R.Suttill	DATE	Sep 91	BAS000.8146	
DRAWN	CPK/PO	DATUM			
SCALE	As Shown	CONTOUR INTERVAL		CHECKED	FIG 10





– LEGEND –

VITRINITE REFLECTANCE

- 0.4%
- 0.5%
- 0.6%
- 0.7%

5 cm

0 10 20

Kilometres

471036

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A.C.N. 007 845 338

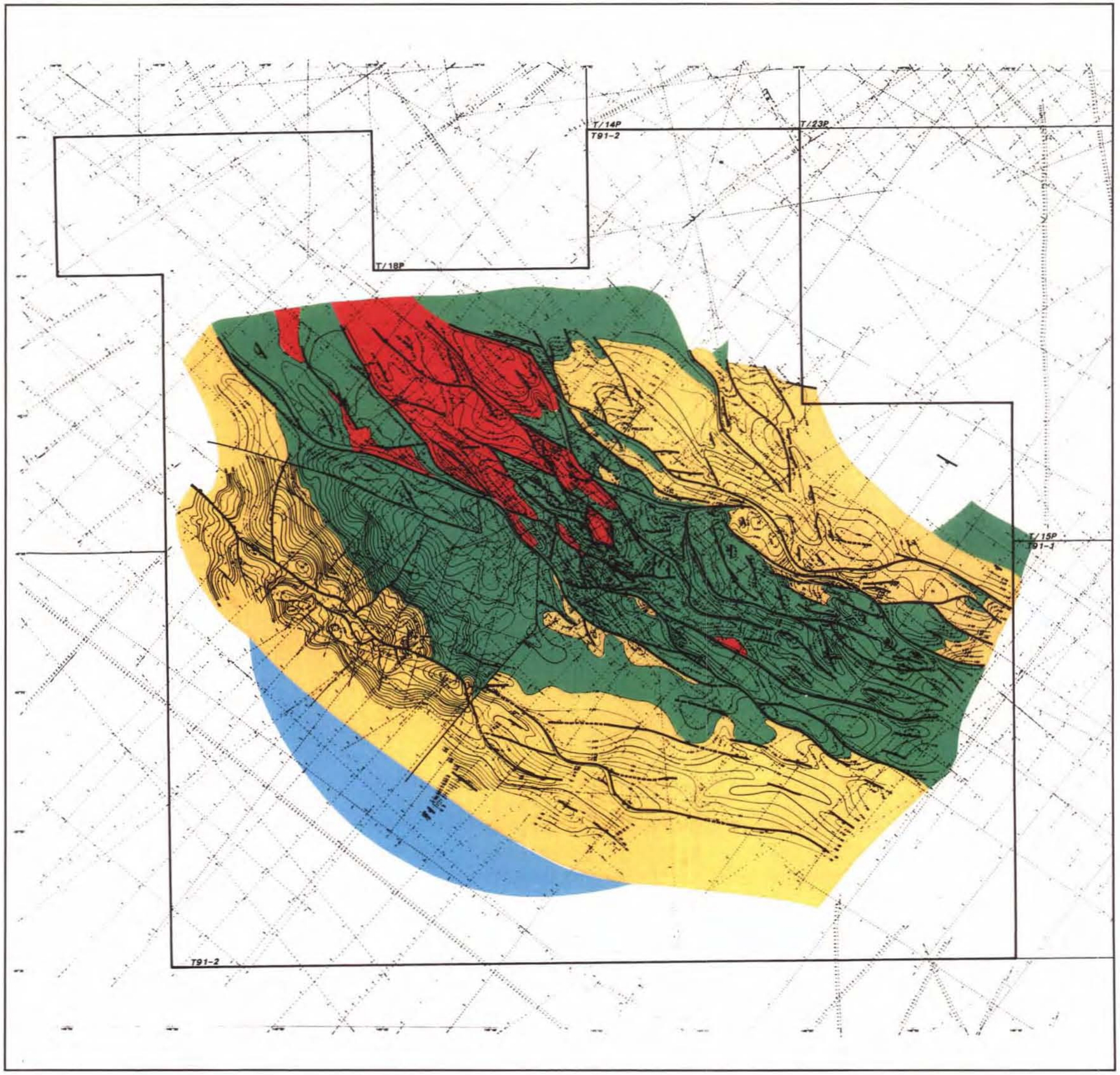
BASS BASIN – TASMANIA

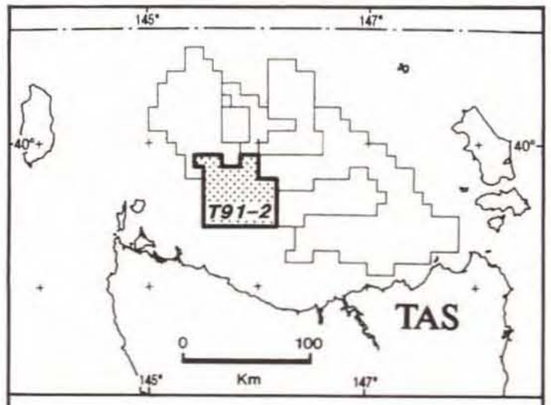
T91–2 GAZETTAL

MATURITY AT TOP M.M.Diversus

A.C.N. 007 845 338

AUTHOR	R.Suttill	DATE	Sep 91	BAS000.8147	
DRAWN	CPK/PO	DATUM		CHECKED	FIG 11
SCALE	As Shown	CONTOUR INTERVAL			





– LEGEND –

VITRINITE REFLECTANCE

- 0.3%
- 0.5%
- 0.7%
- 0.9%
- 1.1%

5 cm

0 10 20

Kilometres

471637

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A.C.N. 007 845 338

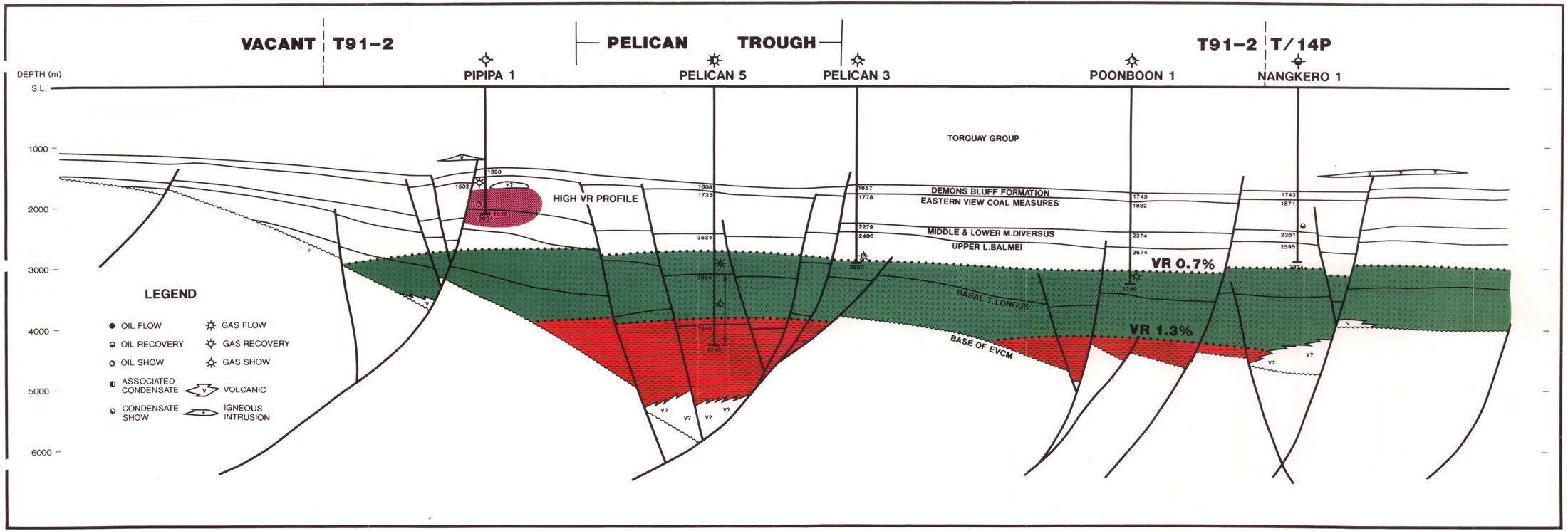
BASS BASIN – TASMANIA

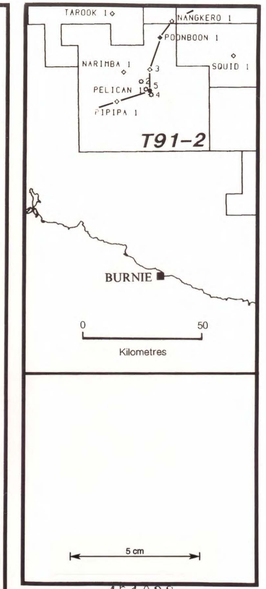
T91–2 GAZETTAL

MATURITY AT TOP L.Balmei

A.C.N. 007 845 338

AUTHOR: R.Suttill	DATE: Sep 91	BAS000.8148	
DRAWN: CPK/PO	DATUM:		
SCALE: As Shown	CONTOUR INTERVAL	CHECKED	FIG: 12





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SAGASCO Resources Ltd.

BASS BASIN - TASMANIA

T91-2 GAZETTAL

STRUCTURE & MATURITY

A.C.N. 007 845 338

AUTHOR	R.Suttill	DATE	Aug 91
DRAWN	P.Oldham	DATUM	
SCALE	As Shown	CONTOUR INTERVAL	
PLAN No.	BAS00.8152		
CHECKED		FIG	13

At Pipipa the presence of oil shows is anomalous as the measured maturities exceed a vitrinite reflectance value of 2.3% (overmature). The present day geothermal gradient is insufficient to account for the high maturities observed in the well. The most probable explanation for the high observed vitrinite reflectance values is the emplacement of an early Miocene igneous intrusion near the well.

With respect to T91-2, there is no doubt that adequate source rocks are developed in the Pelican Trough and that large scale generation of hydrocarbons has occurred. Results to date suggest that much of the Pelican Trough may be gas/condensate prone, but oil recoveries at Yolla and Cormorant in the Cormorant Trough and the presence of encouraging oil shows in Pipipa 1 demonstrate that oil has also been generated.

PELICAN FIELD

The Pelican Field is a sub-economic gas-condensate accumulation located in the central part of T91-2, in water depths of approximately 77m and 65 kilometres from the Tasmanian coastal town of Burnie. The Pelican Field was discovered in 1970 by ESSO with the drilling of Pelican 1. Subsequently, Pelican 2 (ESSO) and 4 (Hematite) were drilled to appraise the field. Pelican 3 as previously mentioned is not considered to be located on the Pelican structure. Pelican 5 (Amoco) was the final well drilled on the structure in 1985, and the only one which was cased and tested through perforations. Further details of the well results were described in the Chapter "Previous Exploration" and are summarised on Enclosure 8.

Structurally, the Pelican Field is located over the deepest part of the Pelican Trough. The Pelican structure is a "collapsed" anticline, which is divided into several compartments by faults. The structural complexity makes mapping using the existing two dimensional seismic difficult.

The hydrocarbon accumulation at Pelican Field is located in reservoirs belonging to the Late Cretaceous, Palaeocene and Early Eocene part of the EVCM. Testing at Pelican 5 has established that only the Early Eocene (lower to middle *M. diversus* reservoirs have enough permeability to produce hydrocarbons at near economic rates (Pelican 5 flowed gas at 5.3 MMCFD with 302-441 BCPD and 662-705 BWPD on a 3/4" choke). The Early Eocene sequence can be correlated between the Pelican Field wells with reasonable confidence, using coal seams and shale beds as marker units. Such a correlation is displayed in Enclosure 8, and it allows subdivision of the Pelican zone into a series of packages A to H. As can be seen from Enclosure 8 this subdivision can be taken further to allow correlation of individual sandstone beds between the wells, also with reasonable confidence. The most laterally continuous and thickest of the sandstones is located in the F unit, and prior to disappointing test results at Pelican 5 this sandstone carried a significant proportion of the reserves that were then being estimated for the field.

Reserve calculations for the Pelican Field are difficult because mapping of the structure at the various reservoir levels is unreliable and only one of the wells on the structure has been subjected to testing through casing. Log analysis of the reservoir zones is also difficult because of the poor resistivity contrast between hydrocarbon and water bearing zones, and because the formation water resistivity varies between reservoirs. An attempt to resolve some of the questions relating to test, core and log data is included as Appendix 3.

Reserve calculations by the former operator (Amoco) indicate in-place reserves around 500 BCF and 37.4 MMSTB of condensate (Proven, Probable and Possible) with recoverable reserves of 175 BCF and 13 MMSTB of condensate. Many fault blocks remain to be tested.

PROSPECTS AND LEADS

Detailed interpretation of existing seismic in T91-2 (Enclosures 9-14) has resulted in the mapping of one prospect which is considered to be drillable and many leads (Leads A, to S, Pipipa North and Penguin) all of which require further seismic work to mature for drilling (Enclosure 15).

The leads and prospects can be categorised into the following five main play types:

Play Type 1. Prospects and leads associated with large fault closures at the middle *M. diversus* and *L. balmei* level, located on the southwestern flank of the Pelican Trough, such as the Pipipa Deep Prospect, the Pipipa North Lead, the Penguin Lead, and Lead G. These structures are ideally located to receive hydrocarbon charge from mature source rocks in the centre of the Pelican Trough. Reservoir quality is predicted to be superior to that recorded in Pelican wells (Appendix 4). The presence of an amplitude anomaly in this interval at Pipipa Deep (Ref. Appendix 5) and possibly at other leads (eg Penguin) may reflect the presence of gas in these prospects. The biggest risk associated with this play type is the dependence on cross fault sealing, and reservoir development.

Reprocessing of seismic data over the Pipipa Deep, Penguin and Pipipa North Leads was conducted to allow seismic attribute mapping. A detailed prospect montage of the Pipipa Deep Prospect is included as Enclosure 16.

Play Type 2. Leads associated with the large inverted Pelican structure. These structures address the gas/condensate charged sequence intersected in the lower to middle *M. diversus* palynological zone in Pelican wells. Individual fault blocks are relatively small but the presence of stacked reservoirs sealed by intraformational shales results in large potential reserve estimates. The complex fault pattern in the central part of the Pelican half graben makes fault correlation difficult. Some of this risk could be reduced by the acquisition of 3D seismic data. Source is considered low risk as there seems to be an abundant gas condensate charge. The major risk is associated with reservoir quality which, as Pelican 5 has shown, is poor. Reservoir quality may be better in shallower fault blocks on the flanks of the Pelican structure.

Play Type 3. Leads which do not address hydrocarbon charge from the Pelican Trough but are dependent on charge from the shallower, smaller and less mature half grabens in the vicinity of the Poonboon 1 and Nangkero 1 wells. Pelican 3 was a test of this play type. Structures are located north of the major northwest to southeast trending bounding fault to the Pelican half graben. Leads O, M and N are in this category.

Closures are mapped at the top EVCM, middle *M. diversus* and *L. balmei* levels. Failure at Pelican 3 is attributed to lack of cross fault sealing due to unfavourable juxtaposition of the reservoir targets in the Early Eocene and Palaeocene against highly porous and permeable sandstones of the upper EVCM. Lead O is located to the southeast and updip of Pelican 3 but is considered high risk because of similar doubts with respect to cross fault sealing. Leads N and M are of lower risk as the fault throws on their closures are insufficient to juxtapose reservoirs against the porous and permeable upper EVCM.

Play Type 4. Leads located along the southwestern edge of the Pelican Trough near the Bass Basin margin. Leads H and I are the largest closures mapped, and are fault dependent. Reservoirs are predicted to have good to excellent quality at these locations due to shallow depth of burial. Intraformational sealing units are not anticipated in the EVCM and therefore, although closure is mapped at the middle *M. diversus* level, it is considered that the top EVCM is the primary target. Onlap, pinchout and unconformity plays may also exist along this margin. Lead J is an example of a closure developed at the pinchout edge of the upper EVCM. Mapping of the prospects is based only on regional seismic data. Prospects are dependent on a relatively long and tortuous hydrocarbon migration route for charge.

Play Type 5. Several untested potentially fault independent closures at the top of the EVCM have been identified in T91-2. This play type has been tested previously at Pelican 3 and Pipipa 1 without success despite the presence of excellent quality reservoirs. The major problem appears to be access to hydrocarbon charge. Shows in wells are either weak or absent (Enclosure 10). One of the largest examples of this play is Lead K, updip of Pelican 4. However, the absence of significant fault penetration to the top EVCM makes it unlikely that vertical hydrocarbon migration has occurred. Other significant closures along the upthrown side of the Pelican half graben bounding fault system are Leads O and C. These are more attractive in that charge to the top EVCM reservoirs up faults may have occurred. Leads O and C are closer to the fault system than Pelican 3. The other significant closure at top EVCM is located at the Penguin Lead where the closure is cut by crestal faults. Failure of Pipipa 1 at the top EVCM casts doubt on whether the upper EVCM will be charged at Penguin Lead.

Reserve calculations for each of the prospects and leads are summarised in the following table and are documented in detail in the Prospect and Lead data sheets that follow.

GWF9107.009-RJS

PROSPECTS AND LEADS - RESERVE SUMMARY

IDENTIFIER	RESERVES				
	TOP EVCM		PELICAN ZONE		NOTES
	STOIIP (MMSTB)	GIP (BCF)	STOIIP (MMSTB)	GIP (BCF)	
Pipipa Deep Prospect	194	-	185	300	10m pay
	-	-	925	1495	50m pay
Pipipa North Lead	-	-	1272	2223	-
Penguin Lead	39.5	44	1232	2023	-
Lead A	-	-	-	1020	-
Lead B	-	-	-	1900	Case 1
	-	-	-	786	Case 2
	-	-	-	179	Case 3
Lead C	29.7	37.8	-	-	-
Lead D	-	-	-	482	Case 1
	-	-	-	206	Case 2
	-	-	-	48	Case 3
Lead E	-	-	-	390	-
Lead F	13.5	17.9	-	-	-
Lead G	10.9	12.8	-	460	-
Lead H	1540	1110	-	-	-
Lead I	381	243	-	-	-
Lead J	40.6	25.4	-	-	-
Lead K	49	66	-	-	-
Lead L	-	-	-	400	-
Lead M	-	-	-	225	-
Lead N	-	-	-	331	-
Lead O	37	51	-	1100	-
Lead P	-	-	-	742	-
Lead Q	-	-	-	202	-
Lead R	-	-	-	157	-
Lead S	-	-	-	382	-

GWF9107.009-RJS

PROSPECT DATA SHEET

IDENTIFIER	:	Pipipa Deep Prospect (see Enclosure 16)
CATEGORY	:	Prospect
LOCATION	:	Seismic Line TNK4-79 SP 900
DESCRIPTION OF TRAP	:	Fault dependent closure on the upthrown side of two major intersecting faults.
PRIMARY OBJECTIVES	:	Early Eocene, Eastern View Coal Measures, M.*M. diversus* to L.*M. diversus* (Pelican Zone) fluvial sandstones.
SECONDARY OBJECTIVES	:	Middle Eocene, Eastern View Coal Measures, U.*M. diversus* fluvial sandstone (oil shows at Pipipa 1). Palaeocene, Eastern View Coal Measures fluvial sandstones (tight gas condensate at Pelican 5).
CLOSURE	:	Area: mid-Pelican zone amplitude anomaly 28 km^2.
DEPTH TO TOP OF RESERVOIR	:	EVCM, M.*M. diversus* : 2120 m EVCM, U.*M. diversus* : 1900 m
TOTAL DEPTH (FORMATION)	:	EVCM, Palaeocene : 2620 m or Otway Group : 3700 m

DESCRIPTION OF RISK ELEMENTS:

SOURCE: Prospect is located on a simple migration route from the depocentre of the Pelican half graben, which contains both gas and oil mature terrigenous sediments. Pelican 5 in the centre of the half graben proved the generative potential of the sequence for gas condensate. Source and migration are considered low risk.

RESERVOIR: Factors in favour of improved reservoir quality in the primary target at Pipipa deep compared to Pelican 5 are; the reservoirs are some 500m updip of Pelican 5 and therefore have been subjected to a lesser amount of burial, the prospect is located closer to the basin edge and may have improved reservoir quality due either to proximal sediment source or to reworking of the reservoir sequence, log evidence from the basal reservoirs at Pipipa 1 suggests improved permeability (mud cake build-up) compared to equivalent reservoirs at Pelican 5. Reservoir is considered low to moderate risk.

SEAL: Top seals are provided by intraformational shales interbedded with the fluvial sandstones. If the amplitude anomaly is an igneous intrusive then it is possible it will provide a top seal, similar to the large intrusive at Yolla 1. Top seal is considered very low risk.

Lateral sealing is dependant on clay smear along fault planes, or on intrusions along the faults. Juxtaposition of shales against reservoirs is not likely to be a major sealing mechanism because of the absence of thick shale units within the EVCM in this part of the basin. Lateral sealing is the major risk at Pipipa Deep and is considered to be moderate to high.

STRUCTURE: Interpretation is based on a 2 km grid of 1980 data and a regional grid of 1984 and 1985 data. This data provides an adequate grid to use to select a well location.

ADDITIONAL WORK REQUIRED:

No additional work is required prior to drilling the Pipipa Deep Prospect (southern culmination). The northern culmination requires approximately 200 km of new seismic data to confirm the trend of the north-south bounding fault.

GWF9107.009-RJS

RESERVE CALCULATION

IDENTIFIER	Pipipa Deep Prospect		
OBJECTIVE	Pelican Zone	Pelican Zone	Upper EVCM
CLOSING CONTOUR (m.secs)	2320	2620	-
CLOSURE (sq km)	28	28	11.2
VERTICAL CLOSURE (m)	-	-	-
GROSS RESERVOIR THICKNESS	10	50	23.6
DEPTH TO TOP RESERVOIR (m)	2120	2120	-
NET/GROSS RATIO (%)	100	100	100
AVERAGE POROSITY (%)	18	18	20
HYDROCARBON SATURATION (%)	70	70	70
OIL-IN-PLACE (MMBBLS)	**185**	**925**	**194**
GAS-IN-PLACE (BCF)	**300**	**1495**	**-**
REC GAS (BCF)	**225**	**1120**	**-**
GAS LIQUIDS (MMSTB)	**30**	**150**	**-**

Notes:

Two scenarios are presented for 10 and 50 metres of pay in the Pelican Zone. The net sand/gross thickness ratio at Pelican 5 is 40% which provides for a total of up to 200 m of gross sand at the Pipipa Deep location.

Gas reserve calculations assume a similar gas composition to Pelican 5, this may not be accurate due to the shallower location at Pipipa Deep.

A simple slab geometric model is used for both the Pelican Zone and Upper EVCM reservoirs because they are relatively thin.

GWF9107.009-RJS

PIPIPA NORTH LEAD

OBJECTIVES	M.*M. diversus* (Pelican Zone)
VERTICAL CLOSURE (Km^2)	39.5 (includes closure at Pipipa Deep)
VERTICAL CLOSURE (m)	275
DEPTH TO RESERVOIR (m)	2010
NET/GROSS RATIO (%)	40
AVERAGE POROSITY (%)	18
HYDROCARBON SAT'N (%)	75
OIL FM VOLUME FACTOR	1.45
STOIIP (MMSTB)	**1272**
GAS EXPANSION FACTOR	214.75
GIIP (BCF) (DRY GAS)	**2223**

GWF9107.009-RJS

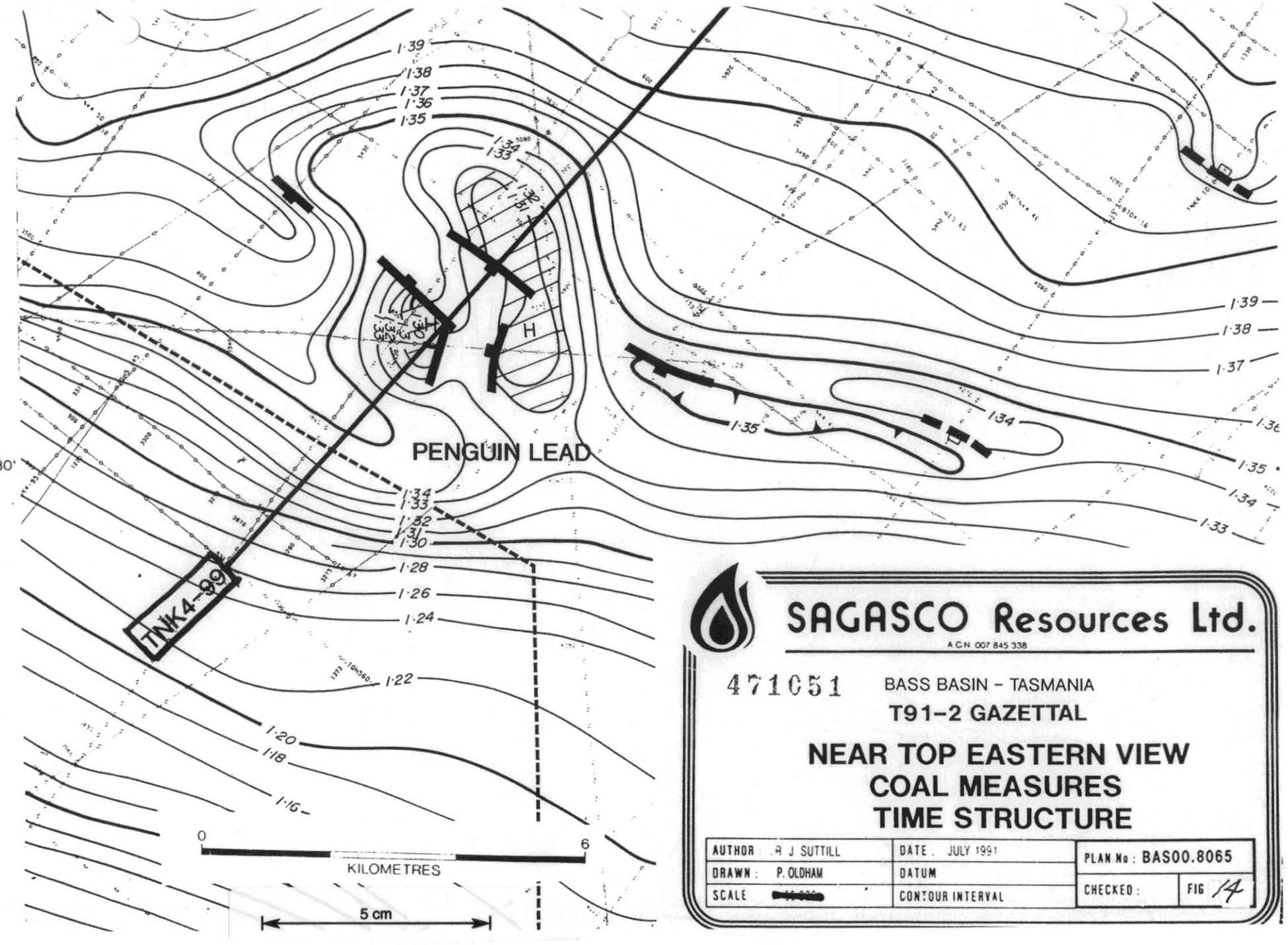
PENGUIN LEAD

OBJECTIVE	TOP EVCM
CLOSURE (Km^2)	4.6
VERTICAL CLOSURE (m)	32
DEPTH TO RESERVOIR (m)	1500
NET/GROSS RATIO (%)	75
AVERAGE PORISITY (%)	20
HYDROCARBON SATURATION (%)	75
OIL FM VOLUME FACTOR	1.32
STOIIP (MMSTB)	**39.5**
GAS EXPANSION FACTOR	151.6
GIIP (BCF) (DRY GAS	**44**

GWF9107.009-RJS

PENGUIN LEAD

OBJECTIVE	M.*M. diversus* (Pelican Zone)
CLOSURE(Km^2)	48
VERTICAL CLOSURE (m)	215
DEPTH TO RESERVOIR (m)	1940
NET/GROSS RATIO (%)	40
AVERAGE PORISITY (%)	18
HYDROCARBON SATURATION (%)	75
OIL FM VOLUME FACTOR	1.43
STOIIP (MMSTB)	**1232**
GAS EXPANSION FACTOR	204.8
GIIP (BCF) (DRY GAS)	**2023**



SAGASCO Resources Ltd.

A.C.N. 007 845 338

471051 BASS BASIN - TASMANIA

T91-2 GAZETTAL

NEAR TOP EASTERN VIEW COAL MEASURES TIME STRUCTURE

AUTHOR : R J SUTTILL	DATE : JULY 1991	PLAN No : BAS00.8065	
DRAWN : P. OLDHAM	DATUM	CHECKED :	FIG 14
SCALE [redacted]	CONTOUR INTERVAL		

0 6
KILOMETRES

5 cm

SAGASCO Resources Ltd.

A.C.N. 007 845 338

471052 BASS BASIN – TASMANIA

T91–2 GAZETTAL

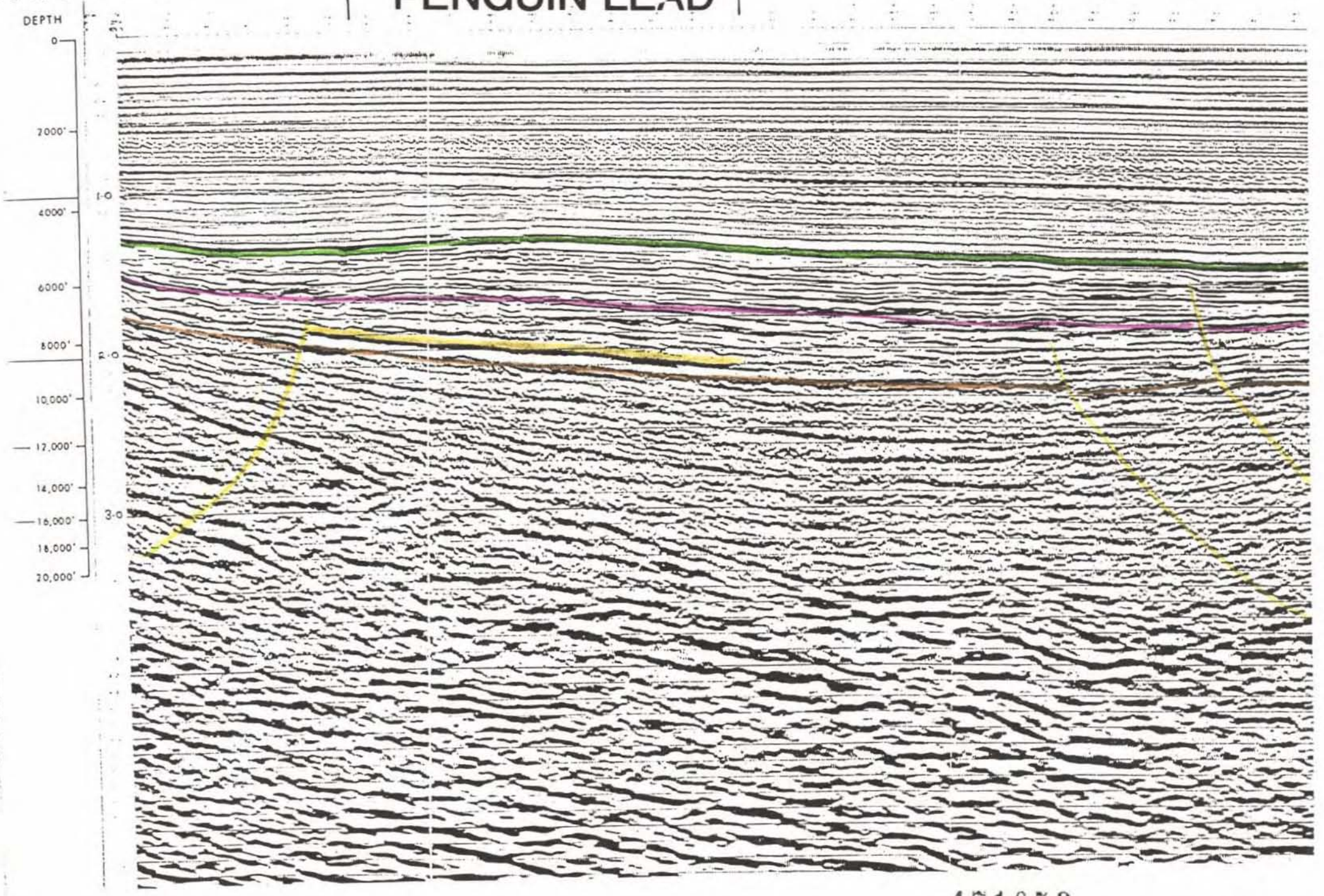
MIDDLE M. DIVERSUS COMPOSITE TIME STRUCTURE

PENGUIN LEAD

AUTHOR: R J SUTTILL	DATE: JULY 1991	PLAN No: BAS00.8067	
DRAWN: P.OLDHAM	DATUM	CHECKED:	FIG: 15
SCALE: [redacted]	CONTOUR INTERVAL		

TNK4-99

PENGUIN LEAD



471053

FIGURE 16

GWF9107.009-RJS

LEAD A

OBJECTIVE	M.*M. diversus*
CLOSURE (Km^2)	6.6
VERTICAL CLOSURE (m)	35
GROSS RESERVOIR THICKNESS (m)	710
DEPTH TO RESERVOIR (m)	2454
NET/GROSS RATIO (%)	24 (Pelican 5)
AVERAGE POROSITY (%)	14 (Av.effective Ø at Pelican 5)
HYDROCARBON SATURATION (%)	75
GAS EXPANSION FACTOR	245 (Pelican 5)
GIIP (TCF)	**1.02**
RECOVERY FACTOR (%)	85
REC. GAS (TCF)	**0.87**
SHRINKAGE FACTOR (%)	70
SALES GAS (TCF)	**0.61**
LIQUIDS FACTOR (BBLS/MMCF)	235 (Pelican 5)
RECOVERABLE LIQUIDS (MMSTB)	**204**

SAGASCO Resources Ltd.

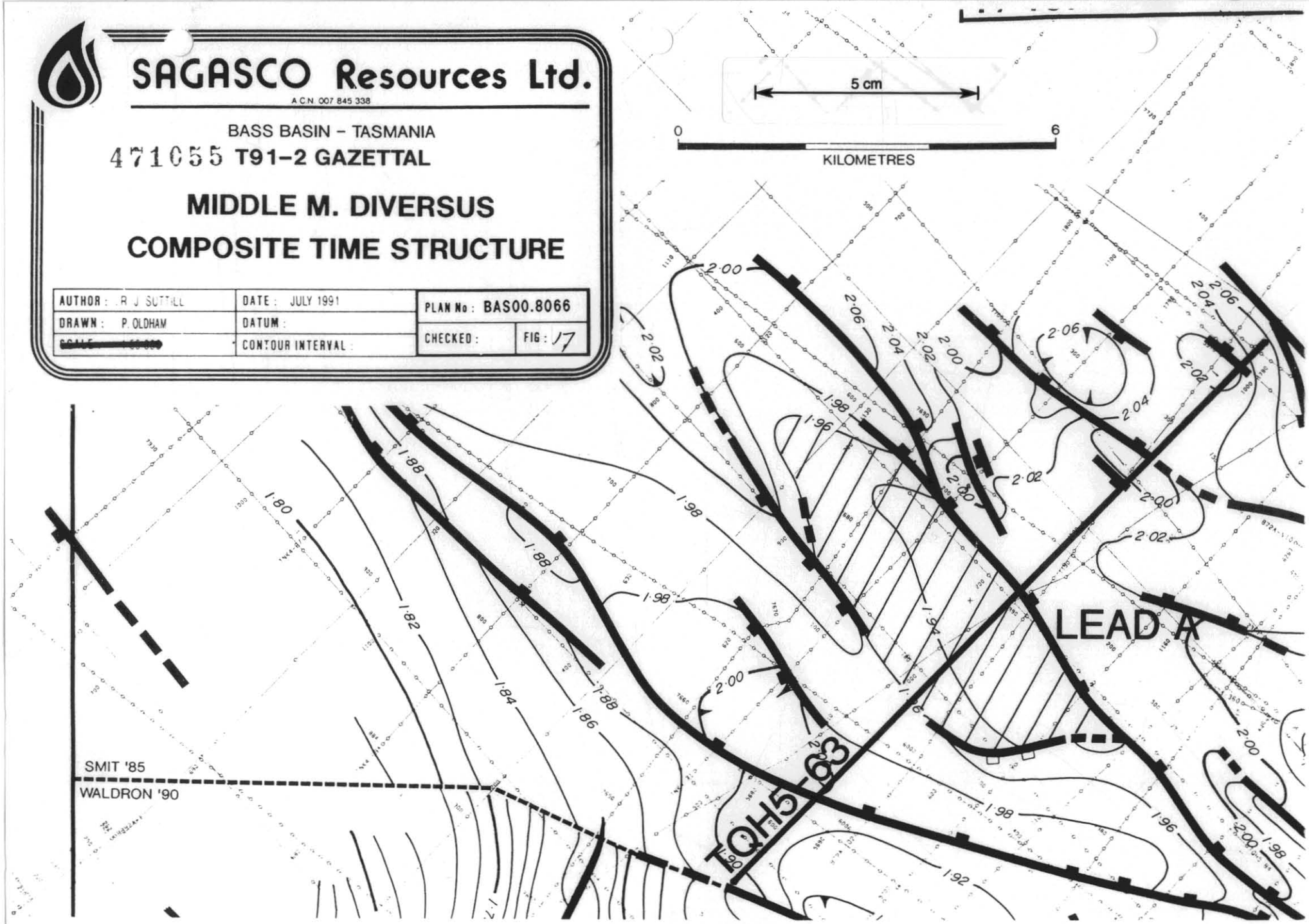
A.C.N. 007 845 338

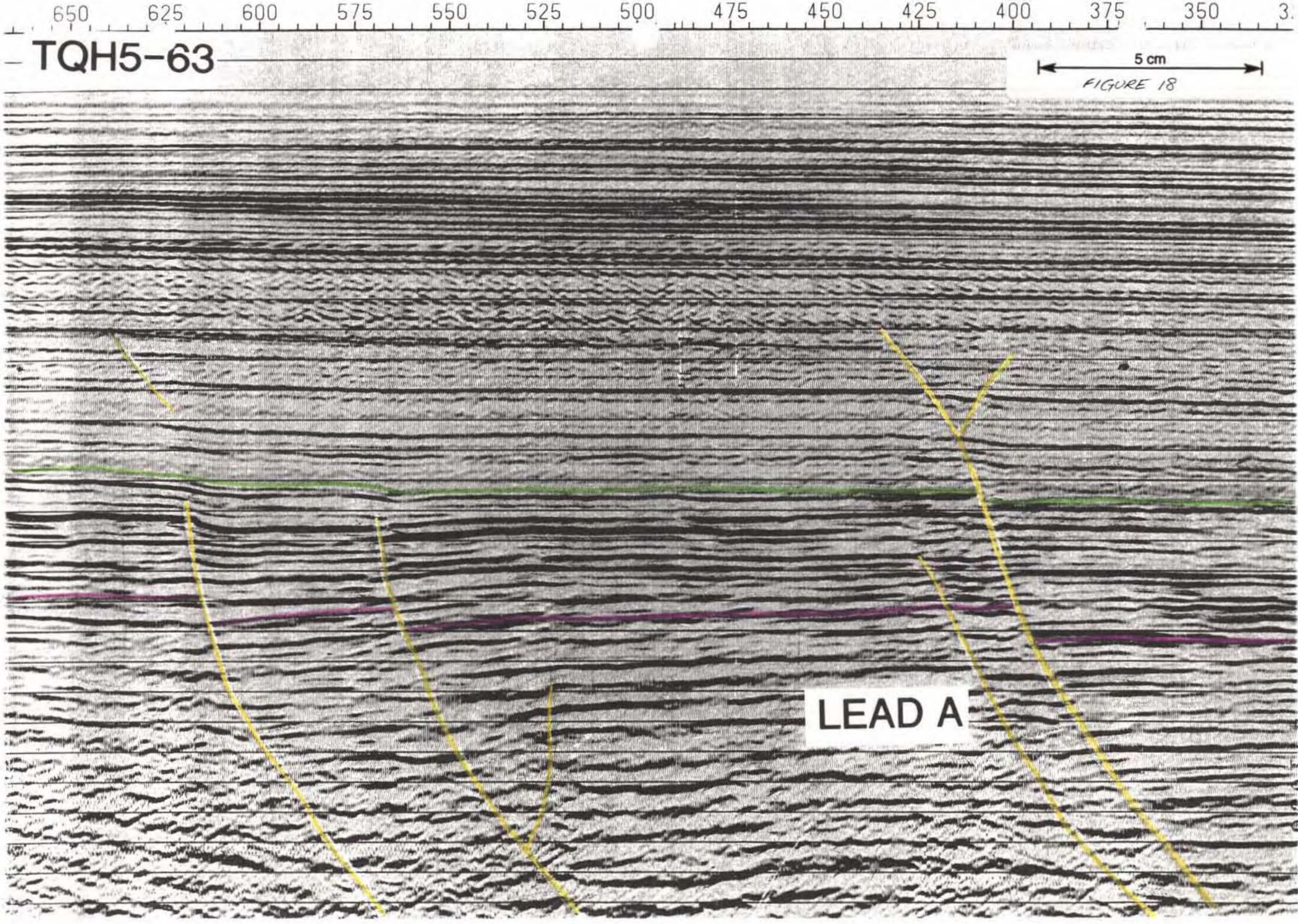
BASS BASIN – TASMANIA

471055 T91–2 GAZETTAL

MIDDLE M. DIVERSUS
COMPOSITE TIME STRUCTURE

AUTHOR : R J SUTTILL	DATE : JULY 1991	PLAN No : BAS00.8066	
DRAWN : P. OLDHAM	DATUM :		
SCALE [redacted]	CONTOUR INTERVAL :	CHECKED :	FIG : 17




650
625
600
575
550
525
500
475
450
425
400
375
350
TQH5-63
5 cm
FIGURE 18
LEAD A

GWF9107.009-RJS

LEAD B Case 1

OBJECTIVE	M.*M. diversus*
CLOSURE (Km^2)	13.2
VERTICAL CLOSURE (m)	200
GROSS RESERVOIR THICKNESS (m)	684
DEPTH TO RESERVOIR (m)	2438
NET/GROSS RATIO (%)	24 (Pelican 5)
AVERAGE POROSITY (%)	14 (Av. effective Ø at Pelican 5)
HYDROCARBON SATURATION (%)	75
GAS EXPANSION FACTOR	245 (Pelican 5)
GIIP (TCF)	**1.9**
RECOVERY FACTOR (%)	85
REC. GAS (TCF)	**1.7**
SHRINKAGE FACTOR (%)	70
SALES GAS (TCF)	**1.2**
LIQUIDS FACTOR (BBLS/MMCF)	235 (Pelican 5)
RECOVERABLE LIQUIDS (MMSTB)	**392**

GWF9107.009-RJS

LEAD B Case 2

OBJECTIVE	M.*M. diversus*
CLOSURE (Km^2)	13.2
VERTICAL CLOSURE (m)	200
DEPTH TO RESERVOIR (m)	2438
PAY (m)	48 (best Pelican well, Pelican 4)
AVERAGE POROSITY (%)	19 (Amoco Pelican Reserves Report)
HYDROCARBON SATURATION (%)	75
GAS EXPANSION FACTOR	245 (Pelican 5)
GIIP (BCF)	**786**
RECOVERY FACTOR (%)	85
REC GAS (BCF)	**668**
SHRINKAGE FACTOR (%)	70
SALES GAS (BCF)	**467**
LIQUIDS FACTOR (BBLS/MMCF)	235 (Pelican 5)
RECOVERABLE LIQUIDS (MMSTB)	**157**

GWF9107.009-RJS

LEAD B Case 3

OBJECTIVE	M.*M. diversus*
CLOSURE (Km^2)	13.2
VERTICAL CLOSURE (m)	200
DEPTH TO RESERVOIR (m)	2438
PAY (m)	15 (Pelican 1)
AVERAGE PORISITY (%)	14
HYDROCARBON SATURATION (%)	75
GAS EXPANSION FACTOR	245 (Pelican 5)
GIIP (BCF)	**179**
RECOVERY FACTOR (%)	85
REC. GAS (BCF)	**151**
SHRINKAGE FACTOR (%)	70
SALES GAS (BCF)	**106**
LIQUIDS FACTOR (BBLS/MMCF)	235 (Pelican 5)
RECOVERABLE LIQUIDS (MMSTB)	**36**

5 cm

SAGASCO Resources Ltd.

A.C.N. 007 845 338

BASS BASIN – TASMANIA

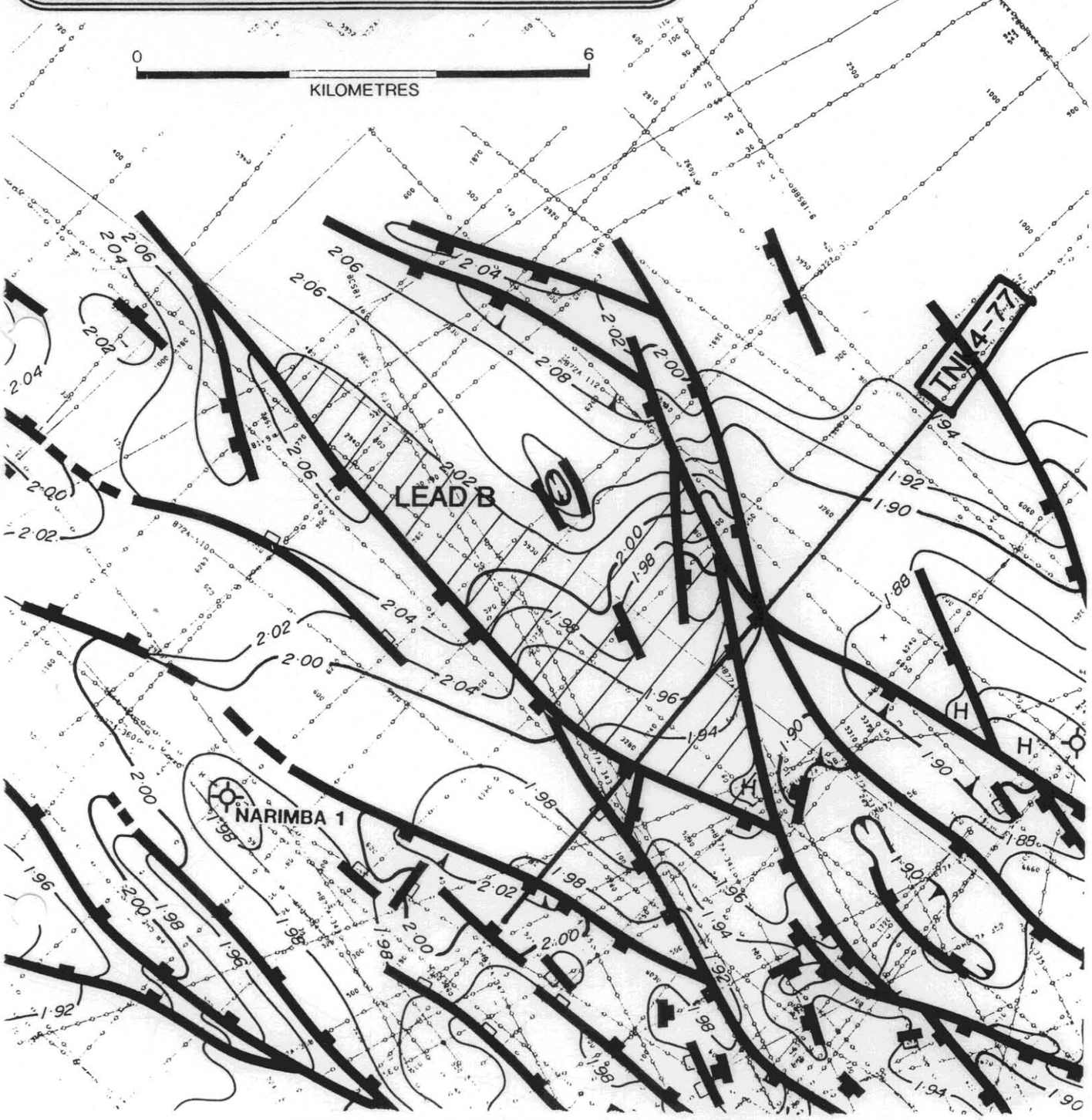
T91–2 GAZETTAL 471060

MIDDLE M. DIVERSUS
COMPOSITE TIME STRUCTURE

AUTHOR : R J. SUTTILL	DATE : JULY 1991	PLAN No : BAS00.8066	
DRAWN : P. OLDHAM	DATUM :	CHECKED :	FIG : 19
SCALE : [redacted]	CONTOUR INTERVAL :		

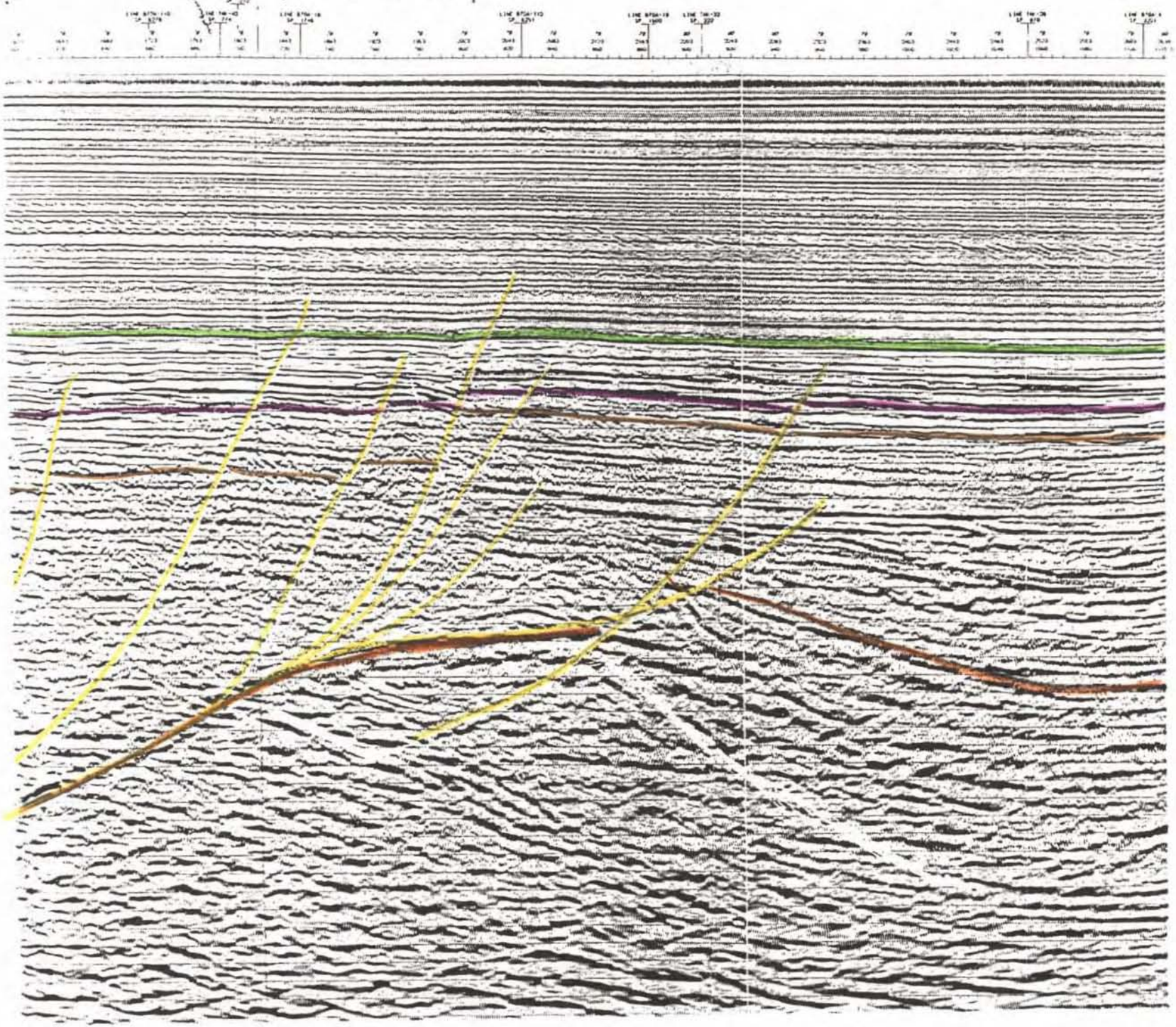
0 6

KILOMETRES



LEAD B

471061



LINE TNK4-77
S.P. 1-1123
N.E.
DIRECTION OF SHOOTING

6000% MIGRATION

AMOCO PRODUCTION CO (INTL)
BASS BASIN
AUSTRALIA

GeoCenter

DATE PROCESSED APR 1989
REEL NUMBER [illegible]
CONTRACT NUMBER [illegible]

FIELD RECORDING

RECORDED BY C.S.I. PARTY 2931 [illegible]
DATE NOV 1984 SYSTEM [illegible]
FORMAT SEGD GAIN [illegible]

ENERGY SOURCE
TYPE AIRGUN 4015 CU IN PRESSURE 1800 PSI
ARRAY 20 GUNS OVER 20M DEPTH 10M

STREAMER
LENGTH 3600M NO TRACES 240
DEPTH 13M GROUP INTERVAL 15M
ARRAY GEOPHOTO OVER

PARAMETERS
RECORDING FOLD 60 S.P. SPACING 30M
SAMPLE INTERVAL 2MS RECORD LENGTH [illegible]
RECORDING FILTER [illegible]

DIGITAL PROCESSING

SEQ	PROCESS	PARAMETERS
1	REFORMAT	[illegible]
2	SUM	[illegible]
3	STATIC	[illegible]
4	CDP SORT	[illegible]
5	EQUALIZATION	[illegible]
6	DECONVOLUTION	[illegible]
7	VELOCITY ANALYSIS	[illegible]
8	F-X FILTER	[illegible]
9	VELOCITY ANALYSIS	[illegible]
10	NMO MUTE	
11	CDP STACK	[illegible]
12	FX MIGRATION	[illegible]
13	FILTER	[illegible]
14	EQUALIZATION	[illegible]

DECON	[illegible]	[illegible]	[illegible]	[illegible]
8	[illegible]	[illegible]	[illegible]	[illegible]

FILTER	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
13	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

SAMPLE RATE 4MS DATUM CORRECTION [illegible]
SCALES HORIZONTAL [illegible] VERTICAL [illegible]
RECORDING POLARITY PRESSURE INCREASE IS [illegible] NUMBER
PROCESSING POLARITY POSITIVE NO GIVES BLACK PEAK

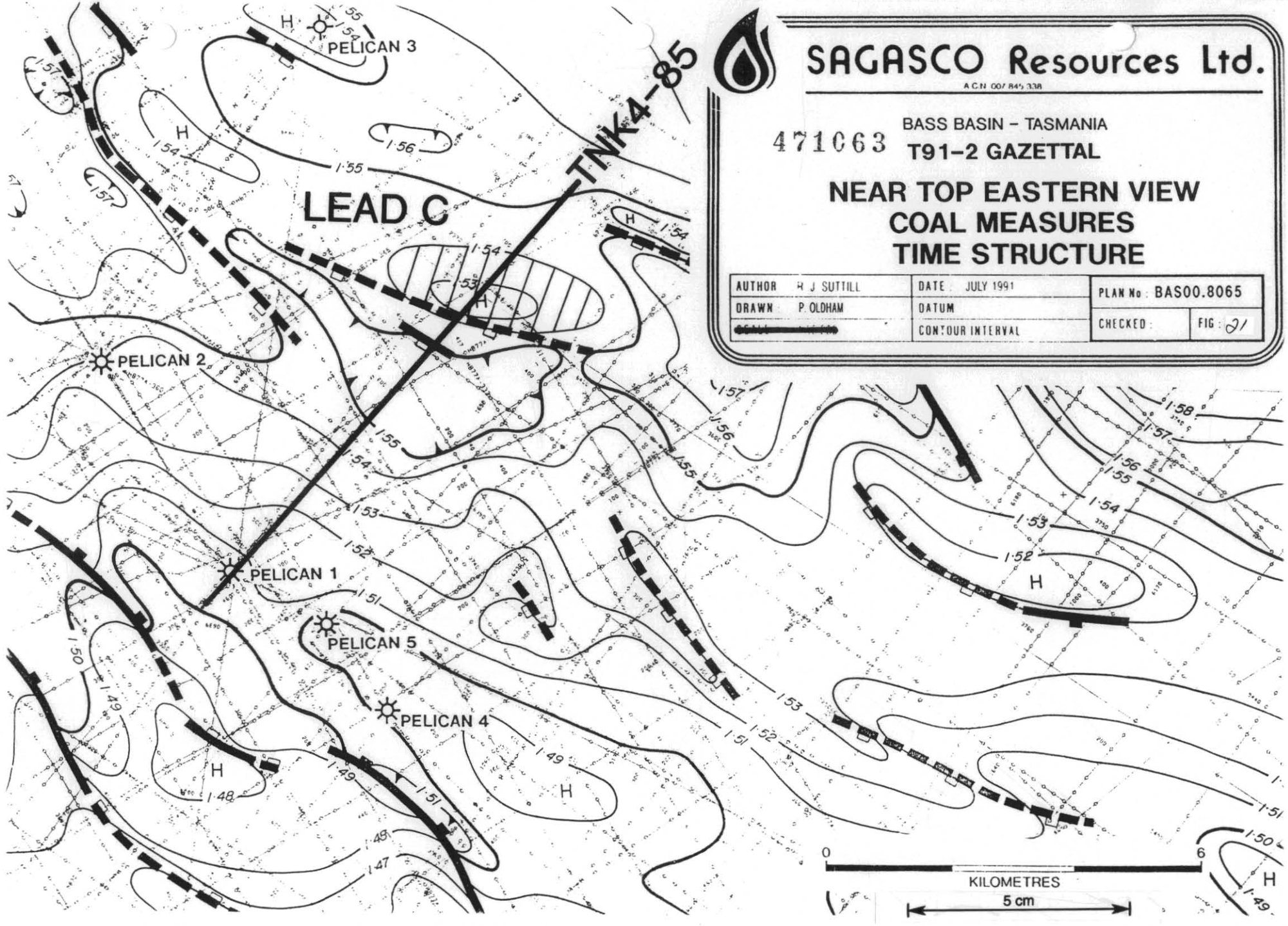
FIGURE 20

5 cm

GWF9107.009-RJS

LEAD C

OBJECTIVE	TOP EVCM
CLOSURE (Km^2)	3.7
VERTICAL CLOSURE (m)	30
DEPTH TO RESERVOIR (m)	1661
NET/GROSS RATIO (%)	75
AVERAGE PORISITY (%)	20
HYDROCARBON SATURATION (%)	75
OIL FM VOLUME FACTOR	1.35
STOIIP (MMSTB)	**29.7**
GAS EXPANSION FACTOR	168
GIIP (BCF) (DRY GAS	**37.8**



SAGASCO Resources Ltd.

A.C.N. 007 845 338

471063

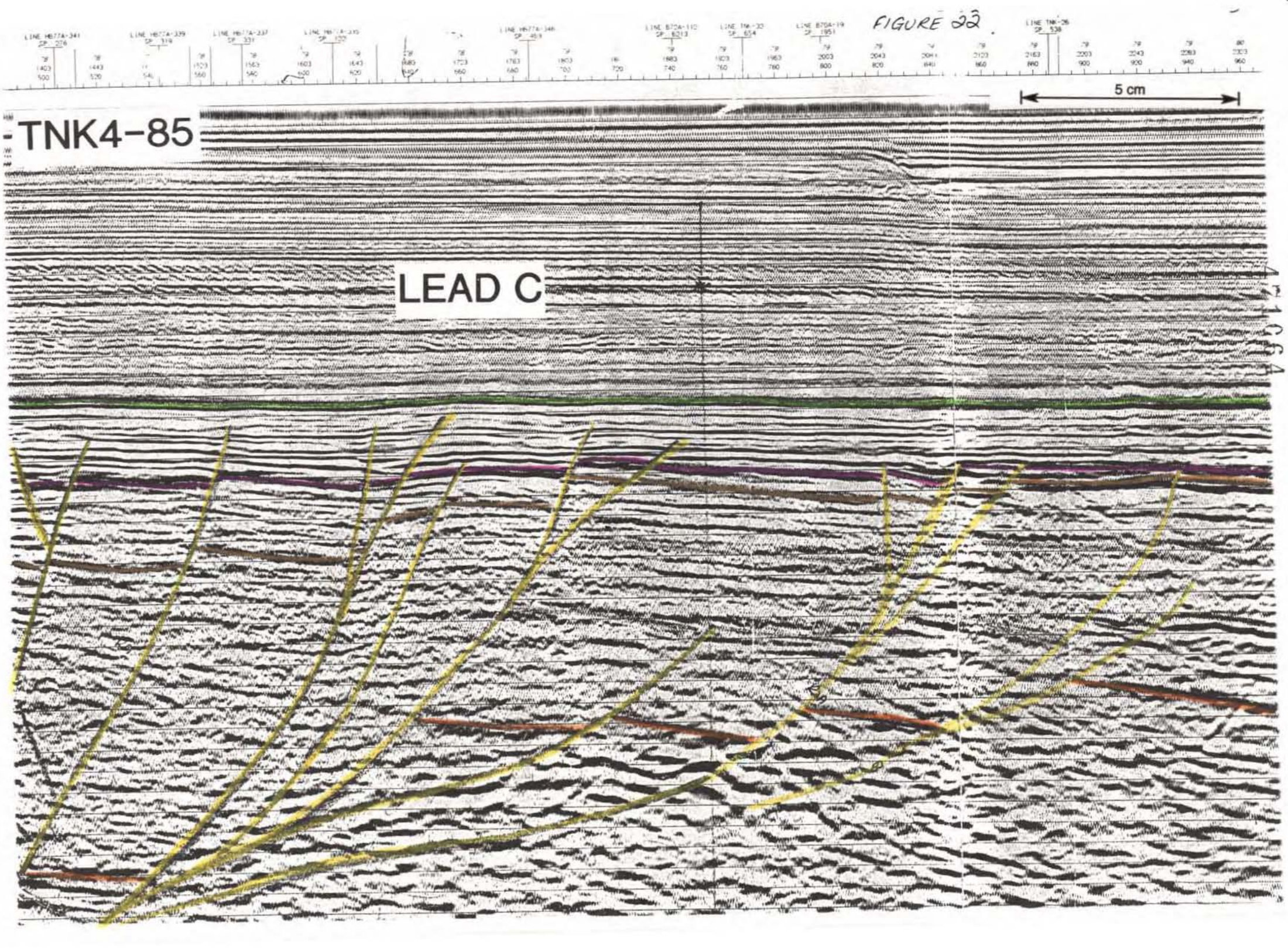
BASS BASIN – TASMANIA

T91–2 GAZETTAL

NEAR TOP EASTERN VIEW COAL MEASURES TIME STRUCTURE

AUTHOR R. J. SUTTILL	DATE JULY 1991	PLAN No. BAS00.8065	
DRAWN P. OLDHAM	DATUM	CHECKED:	FIG: 21
	CONTOUR INTERVAL		

FIGURE 22



GWF9107.009-RJS

LEAD D Case 1

OBJECTIVE	M.*M. diversus*
CLOSURE (Km^2)	3.5
VERTICAL CLOSURE (m)	46
GROSS RESERVOIR THICKNESS (m)	632
DEPTH TO RESERVOIR (m)	2408
NET/GROSS RATIO (%)	24 (Pelican 5)
AVERAGE POROSITY (%)	14 (Av. effective Ø at Pelican 5)
HYDROCARBON SATURATION (%)	75
GAS EXPANSION FACTOR	245 (Pelican 5)
GIIP (BCF)	**482**
RECOVERY FACTOR (%)	85
REC GAS (BCF)	**410**
SHRINKAGE FACTOR (%)	70
SALES GAS (BCF)	**287**
LIQUIDS FACTOR (BBLS/MMCF)	235
RECOVERABLE LIQUIDS (MMSTB)	**96**

GWF9107.009-RJS

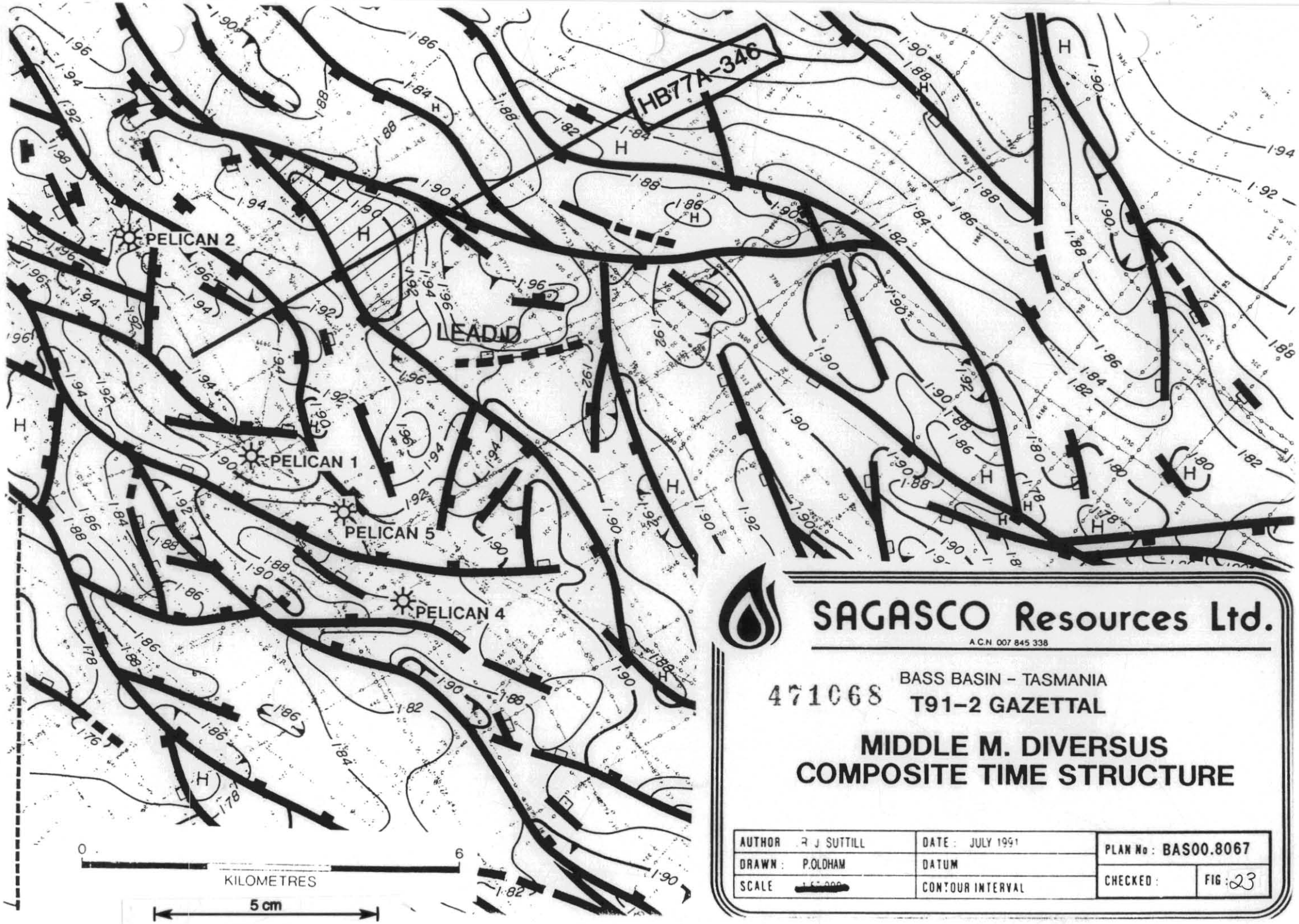
LEAD D Case 2

OBJECTIVE	M.*M. diversus*
CLOSURE (Km^2)	3.5
VERTICAL CLOSURE (m)	46
DEPTH TO RESERVOIR (m)	2408
PAY (m)	48 (Best Pelican well Pelican 4)
AVERAGE POROSITY (%)	19 (Amoco Pelican Reserves Report)
HYDROCARBON SATURATION (%)	75
GAS EXPANSION FACTOR	245 (Pelican 5)
GIIP (BCF)	**206**
RECOVERY FACTOR (%)	85
REC GAS (BCF)	**176**
SHRINKAGE FACTOR	70
SALES GAS (BCF)	**123**
LIQUIDS FACTOR (BBLS/MMCF)	235 (Pelican 5)
RECOVERABLE LIQUIDS	**41**

GWF9107.009-RJS

LEAD D Case 3

OBJECTIVE	M.*M. diversus*
CLOSURE (Km^2)	3.5
VERTICAL CLOSURE (m)	46
DEPTH TO RESERVOIR (m)	2408
PAY (m)	15 (Pelican 1)
AVERAGE POROSITY (%)	14
HYDROCARBON SATURATION (%)	75
GAS EXPANSION FACTOR	245 (Pelican 5)
GIIP (BCF)	**48**
RECOVERY FACTOR (%)	85
REC GAS (BCF)	**41**
SHRINKAGE FACTOR (%)	70
SALES GAS (BCF)	**29**
LIQUIDS FACTOR (BBLS/MMCF)	235 (Pelican 5)
RECOVERABLE LIQUIDS (MMSTB)	**9**



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A.C.N 007 845 338

471068

BASS BASIN – TASMANIA

T91-2 GAZETTAL

MIDDLE M. DIVERSUS COMPOSITE TIME STRUCTURE

AUTHOR R J SUTTILL	DATE : JULY 1991	PLAN No : BAS00.8067	
DRAWN : P.OLDHAM	DATUM	CHECKED :	FIG : 23
SCALE [redacted]	CONTOUR INTERVAL		

HB77A-346

LEAD D

471069

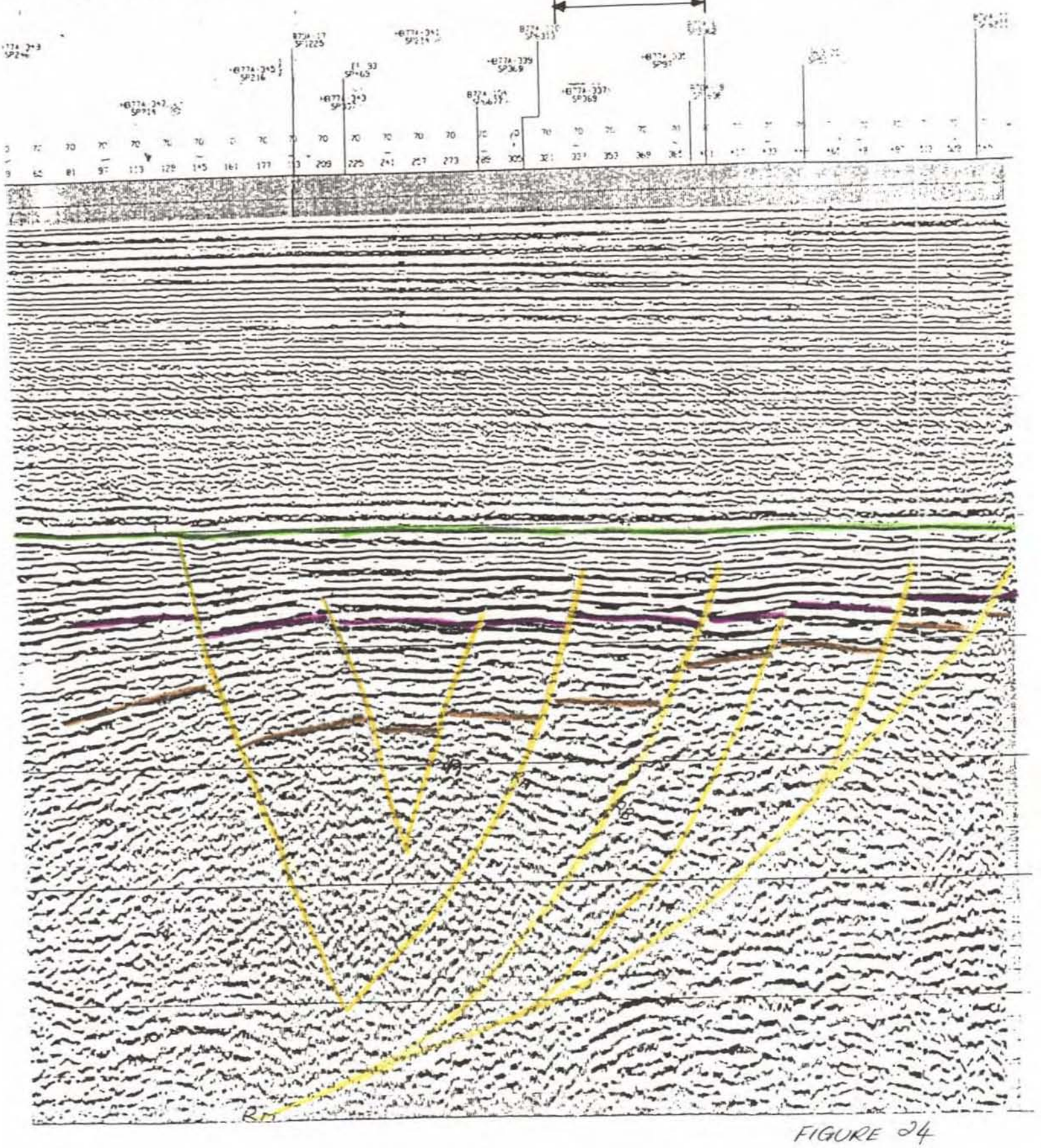


FIGURE 24

5 cm

GWF9107.009-RJS

LEAD E

OBJECTIVE	M.*M. diversus*
CLOSURE (Km^2)	3.2 (two closures)
VERTICAL CLOSURE (m)	63
GROSS RESERVOIR THICKNESS (m)	565
DEPTH TO RESERVOIR (m)	2307
NET/GROSS RATIO (%)	24 (Pelican 5)
AVERAGE POROSITY (%)	14 (Av. effective Ø at Pelican 5)
HYDROCARBON SATURATION (%)	75
GAS EXPANSION FACTOR	245 (Pelican 5)
GIIP (TCF)	**0.39**
RECOVERY FACTOR (%)	85
REC. GAS (TCF)	**0.33**
SHRINKAGE FACTOR (%)	70
SALES GAS (TCF)	**0.23**
LIQUIDS FACTOR (BBLS/MMCF)	235 (Pelican 5)
RECOVERABLE LIQUIDS (MMSTB)	**78**

SAGASCO Resources Ltd.

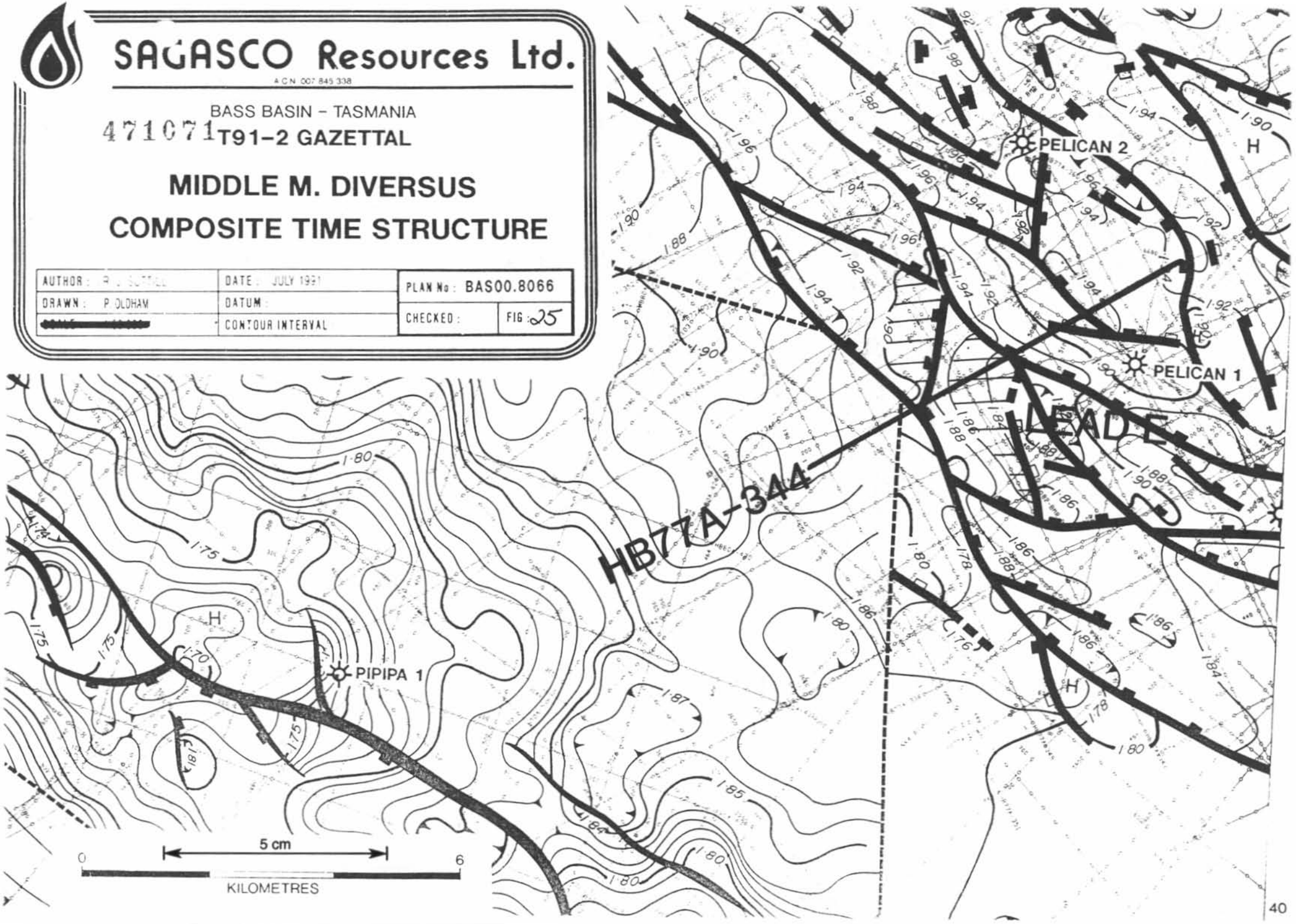
A.C.N. 007 845 338

BASS BASIN – TASMANIA

471071 T91–2 GAZETTAL

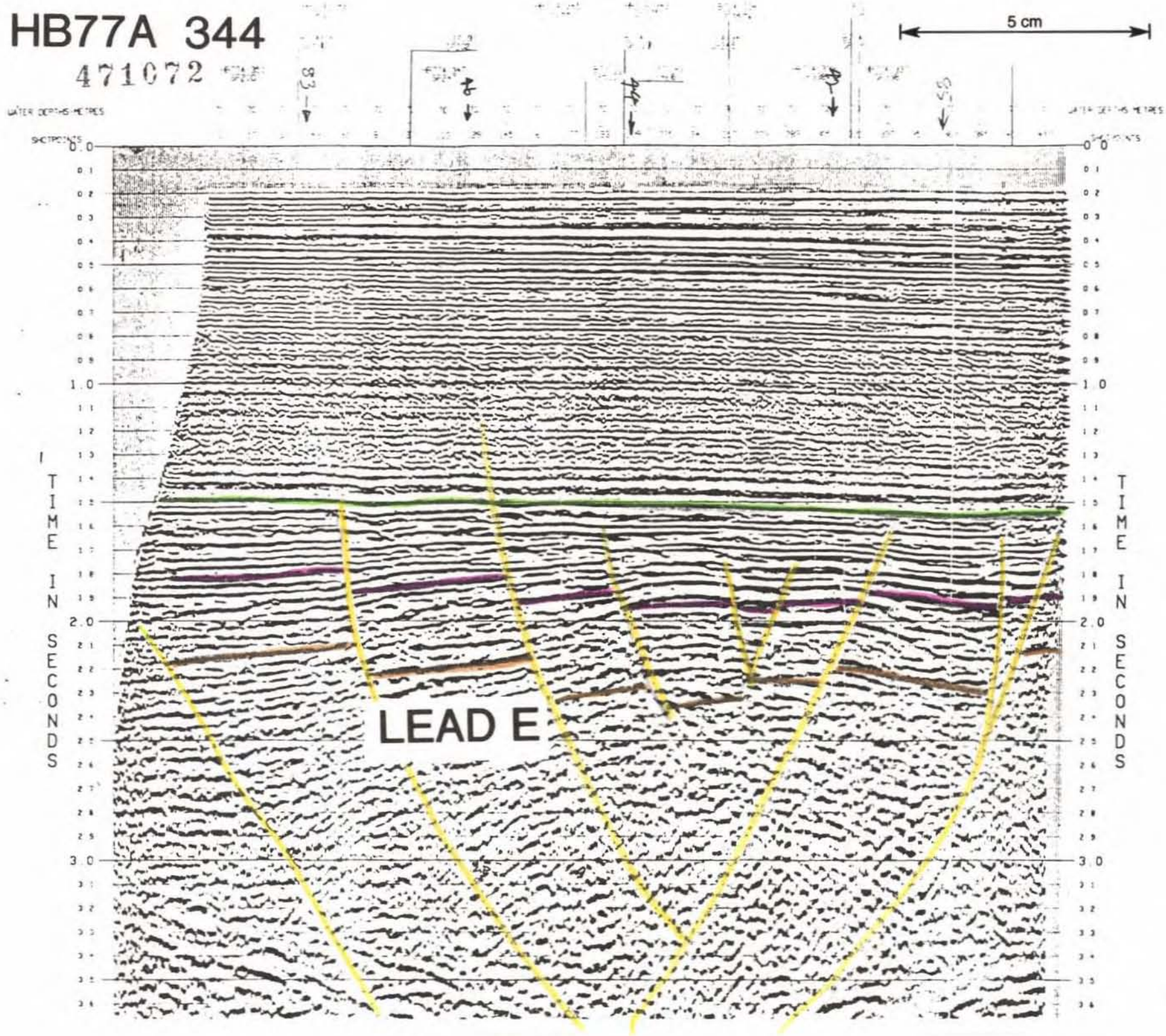
MIDDLE M. DIVERSUS
COMPOSITE TIME STRUCTURE

AUTHOR: R. J. SUTTILL	DATE: JULY 1991	PLAN No: BAS00.8066	
DRAWN: P. OLDHAM	DATUM:	CHECKED:	FIG: 25
[redacted]	CONTOUR INTERVAL		



HB77A 344

471072



FIELD DATA:

Sh... GSI Party 2931 M.V. McDermott
Recorded: 96 trace DFS III 2 systems Seg
Sample Rate: 4 msecs Record Length: 5
Filter: HI 62hz./72db./oct, LO 8hz./18 db./
Gain: I.F.P.
Energy Source: Airgun, 23.77 litres
Source Depth: 8m Streamer Depth: 11
Group Interval: 25m Shot Interval: 25
Streamer: 2400m, 96 groups, towing group 94
Average Offset to centre of group 96: 270

Date: December 8

PROCESSING INFORMATION:

1. True Amplitude Recovery (5db/sec. 0
2. Horizontal Mix 2:1
3. Deconvolution Before Stack - All Sp's — 1 operator/trace, 64 pts. G
4. 48 Fold Common Depthpoint Gather
5. Sealevel Static and Airgun Delay Cor
6. Demultiple
7. Velocity Analysis Discrete Velscans over 9 d.p. centered
8. Normal Moveout Corrections
9. 48 Fold CDP Stack 48 Traces
10. Deconvolution After Stack 1 operator/trace, 100 pts. Whitening
11. Time Variant Filter
12. Display Normal Polarity - 32 traces/ 3.75 ins/se

TIME VARIANT FILTER BANDPASS
FREQUENCY (Hz)

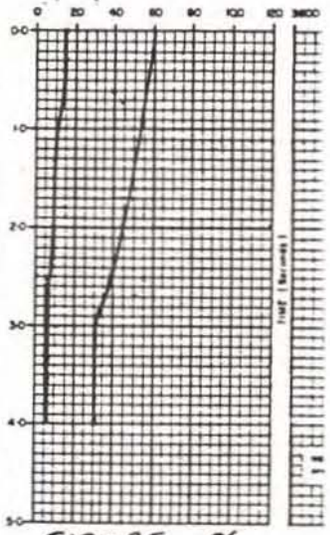


FIGURE 26.

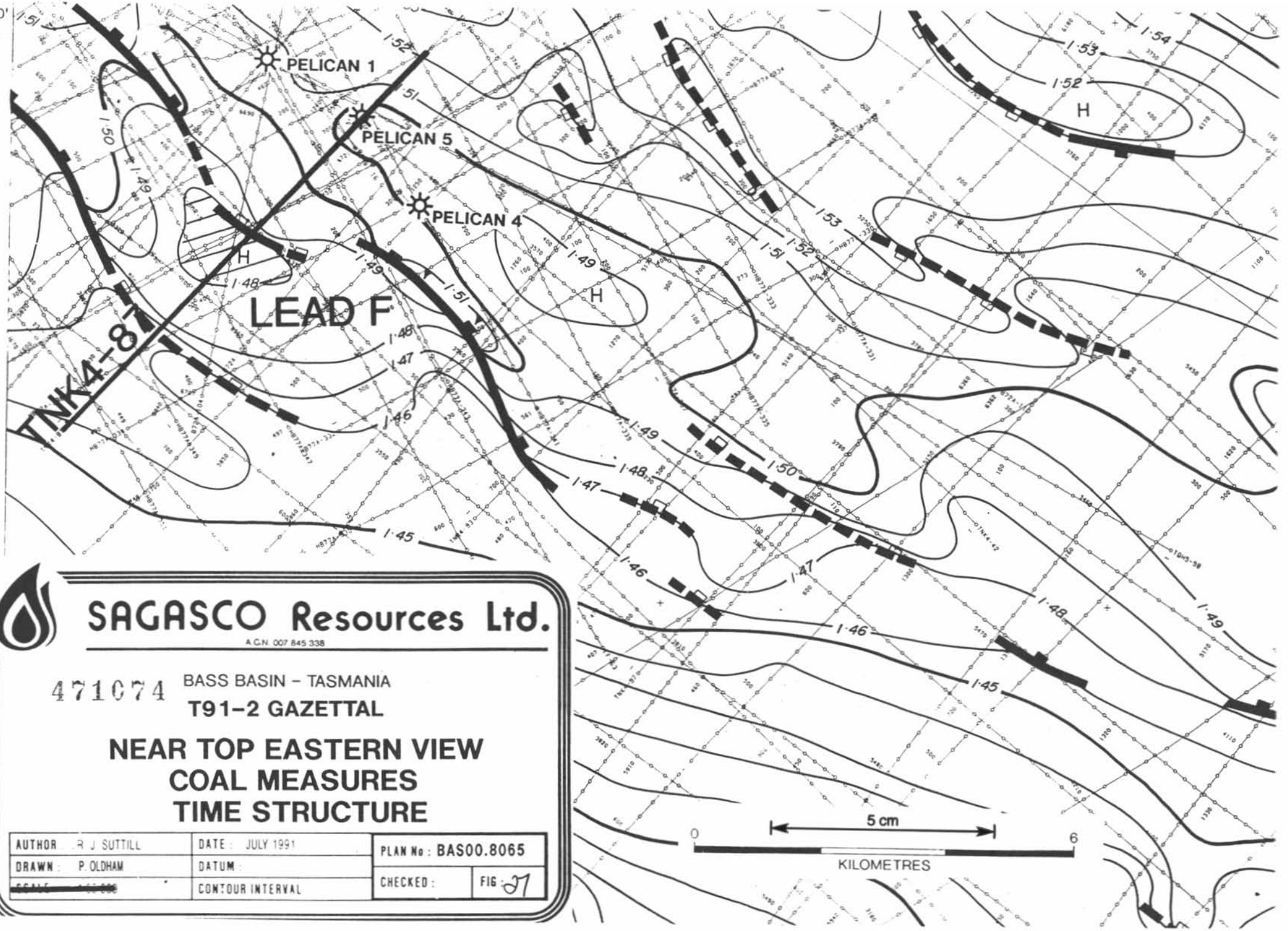
PROCESSED

GEOPHYSICAL SERVICE I

GWF9107.009-RJS

LEAD F

OBJECTIVE	TOP EVCM
CLOSURE ($Km^{2)}$	1.68
VERTICAL CLOSURE (m)	30
DEPTH TO RESERVOIR (m)	1715
NET/GROSS RATIO (%)	75
AVERAGE PORISITY (%)	20
HYDROCARBON SATURATION (%)	75
OIL FM VOLUME FACTOR	1.36
STOIIP (MMSTB)	**13.5**
GAS EXPANSION FACTOR	173.1
GIIP (BCF) (DRY GAS	**17.9**



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A.C.N. 007 845 338

471074

BASS BASIN – TASMANIA

T91–2 GAZETTAL

NEAR TOP EASTERN VIEW COAL MEASURES TIME STRUCTURE

AUTHOR: R J SUTTILL	DATE: JULY 1991	PLAN No: BAS00.8065	
DRAWN: P. OLDHAM	DATUM:		
SCALE: [redacted]	CONTOUR INTERVAL	CHECKED:	FIG: 21

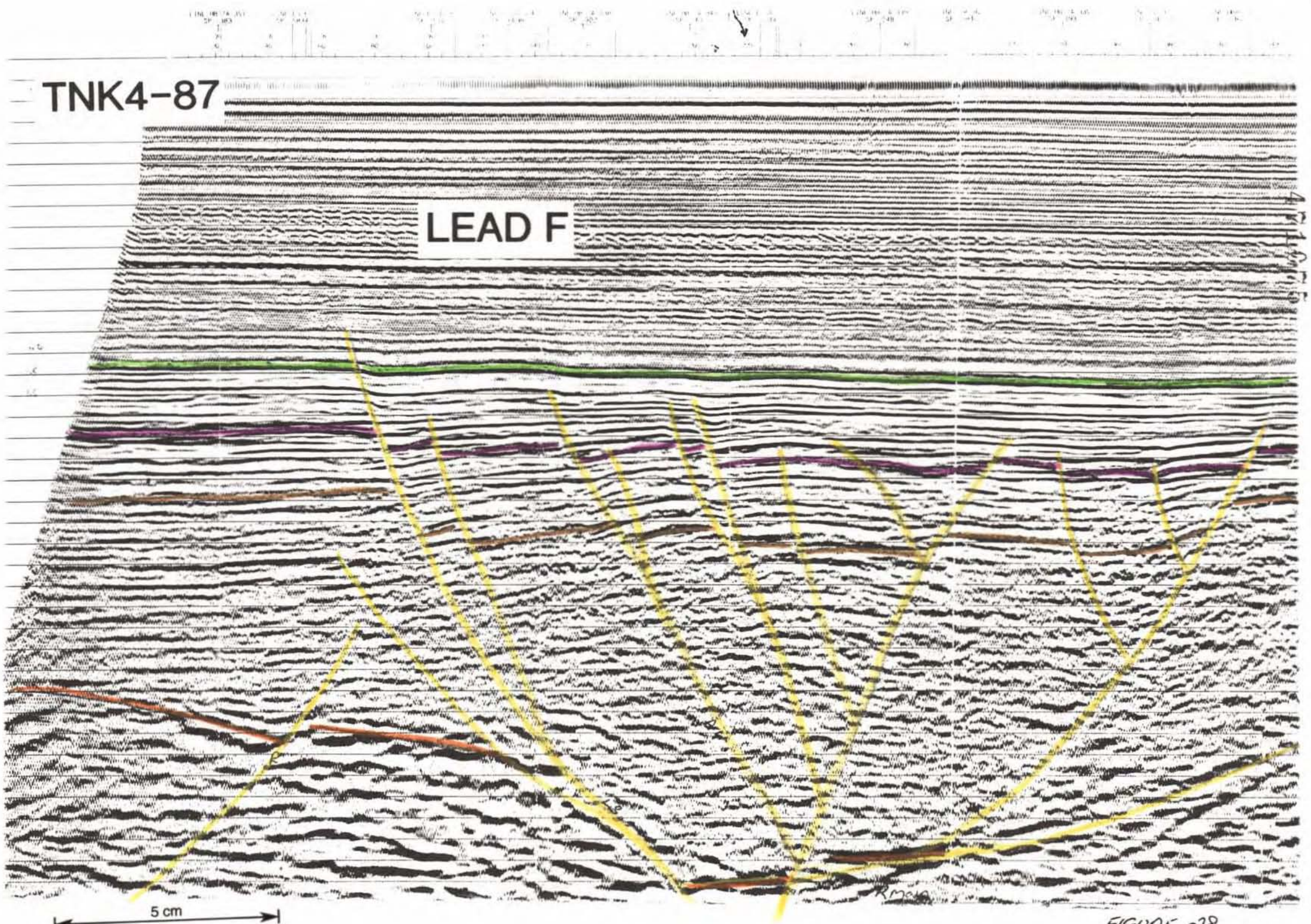


FIGURE 28

GWF9107.009-RJS

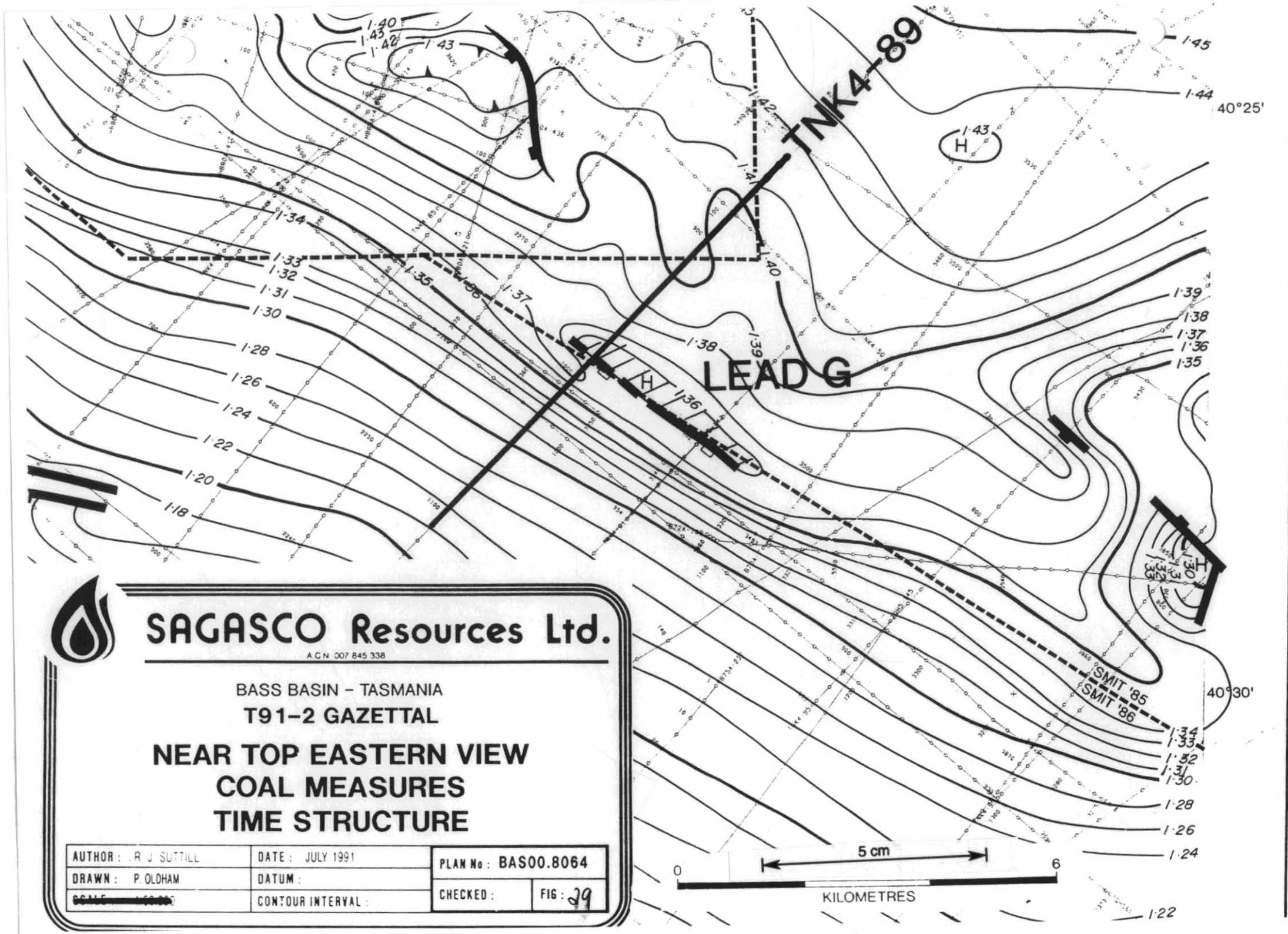
LEAD G

OBJECTIVE	Top EVCM
CLOSURE(Km^2)	1.36
VERTICAL CLOSURE (m)	30
DEPTH TO RESERVOIR (m)	1555
NET/GROSS RATIO (%)	75
AVERAGE PORISITY (%)	20
HYDROCARBON SATURATION (%)	75
OIL FM VOLUME FACTOR	1.33
STOIIP (MMSTB)	**10.9**
GAS EXPANSION FACTOR	157.0
GIIP (BCF) (DRY GAS)	**12.8**

GWF9107.009-RJS

LEAD G

OBJECTIVE	M.*M. diversus*
CLOSURE (Km^2)	3.69
VERTICAL CLOSURE (m)	84
GROSS RESERVOIR THICKNESS (m)	296
DEPTH TO RESERVOIR (m)	2088
NET/GROSS RATIO (%)	40
AVERAGE POROSITY (%)	18
HYDROCARBON SATURATION (%)	75
GAS EXPANSION FACTOR	214
GIIP (TCF)	**0.46**
RECOVERY FACTOR (%)	85
REC. GAS (TCF)	**0.38**
SHRINKAGE FACTOR (%)	70
SALES GAS (TCF)	**0.26**
LIQUIDS FACTOR (BBLS/MMCF)	235 (Pelican 5)
RECOVERABLE LIQUIDS (MMSTB)	**89**



SAGASCO Resources Ltd.

A.C.N. 007 845 338

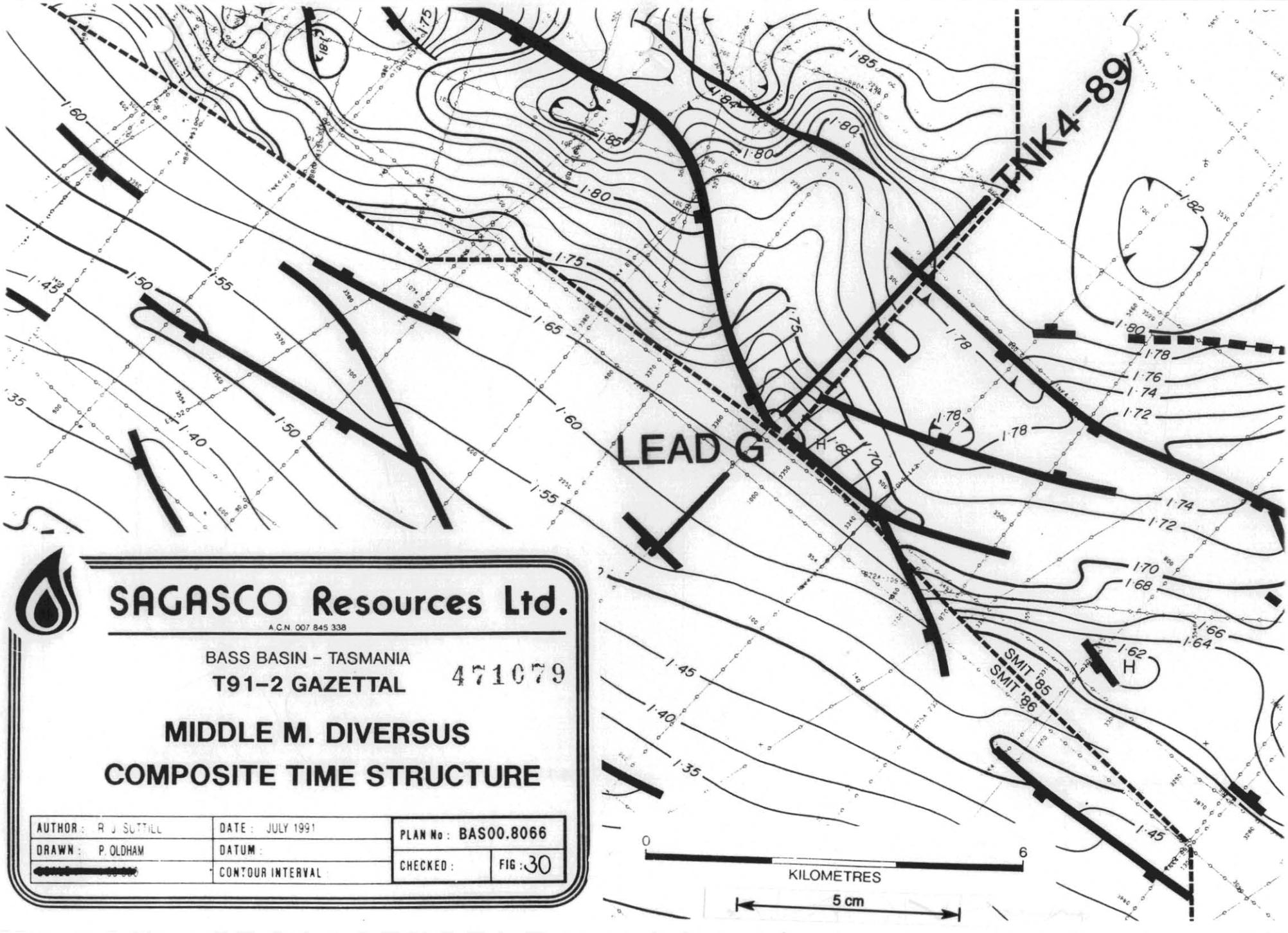
BASS BASIN – TASMANIA

T91–2 GAZETTAL

NEAR TOP EASTERN VIEW COAL MEASURES TIME STRUCTURE

AUTHOR : R J SUTTILL	DATE : JULY 1991	PLAN No : BAS00.8064	
DRAWN : P. OLDHAM	DATUM :		
~~SCALE 1:50,000~~	CONTOUR INTERVAL :	CHECKED :	FIG : 29

A10678



SAGASCO Resources Ltd.

A.C.N. 007 845 338

BASS BASIN – TASMANIA

T91–2 GAZETTAL 471079

MIDDLE M. DIVERSUS
COMPOSITE TIME STRUCTURE

AUTHOR : R. J. SUTTILL	DATE : JULY 1991	PLAN No : BAS00.8066	
DRAWN : P. OLDHAM	DATUM :		
[redacted]	CONTOUR INTERVAL :	CHECKED :	FIG : 30

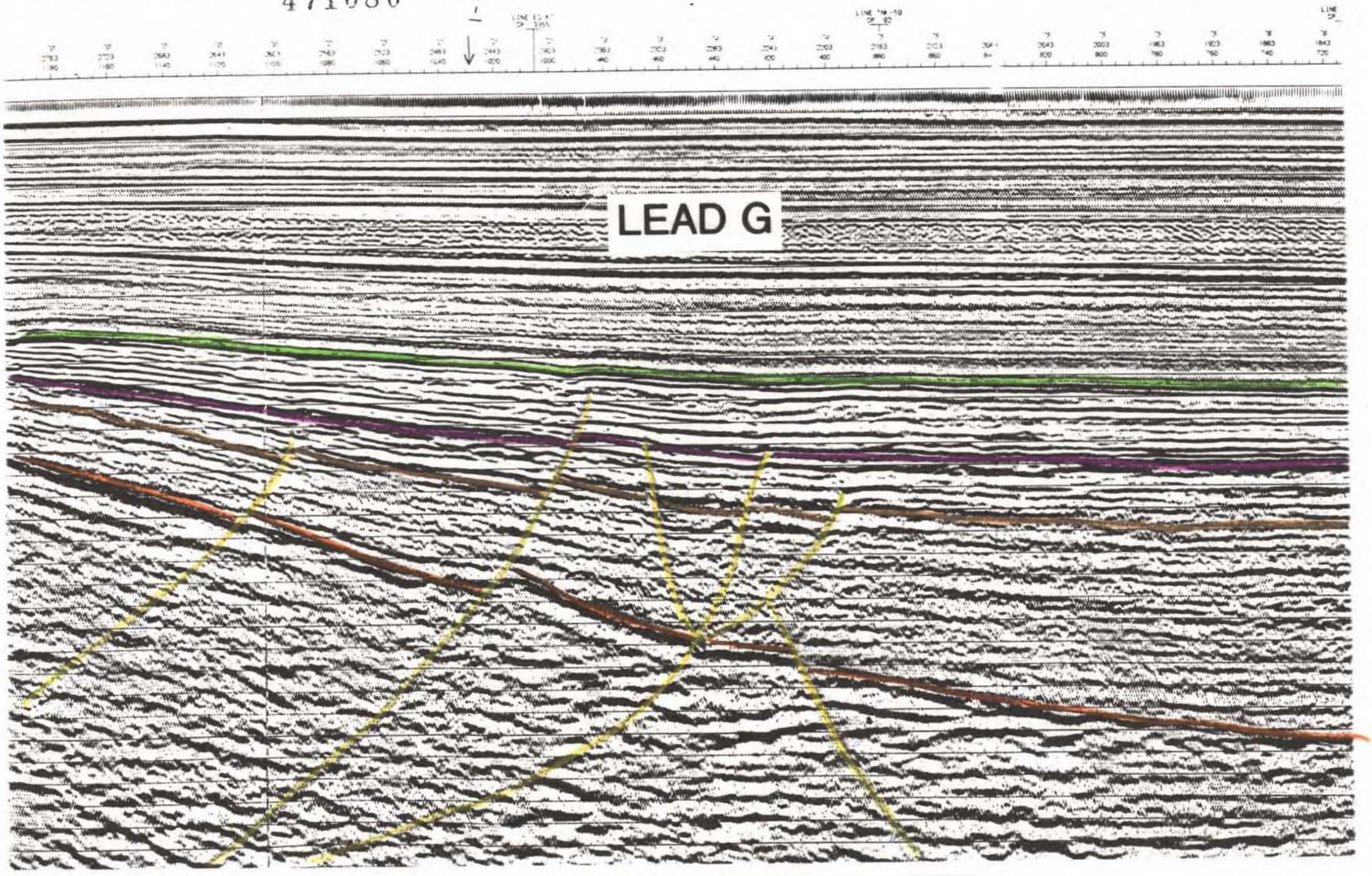
TNK4-89

471080

1-09-SHE

5 cm

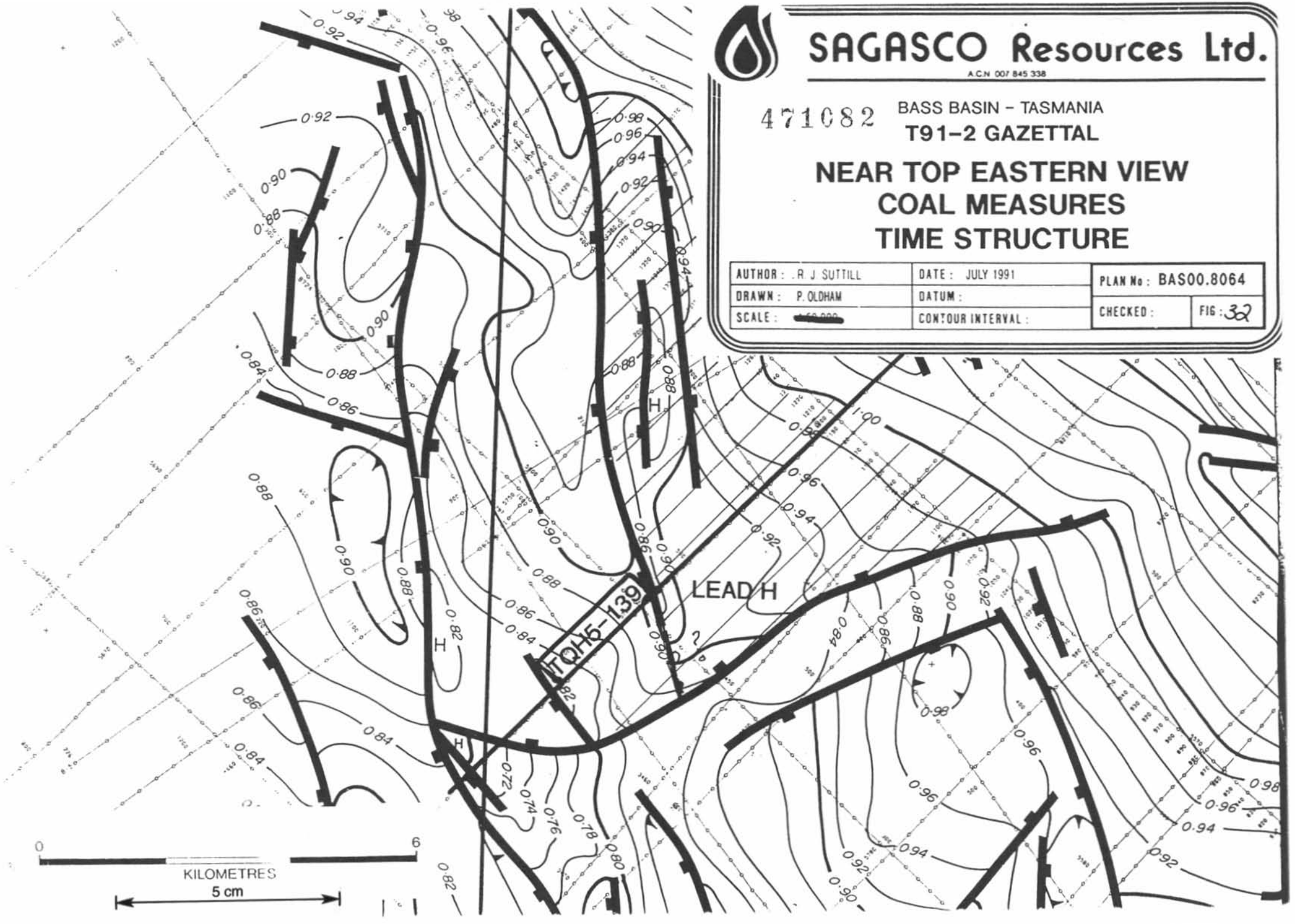
FIGURE 31

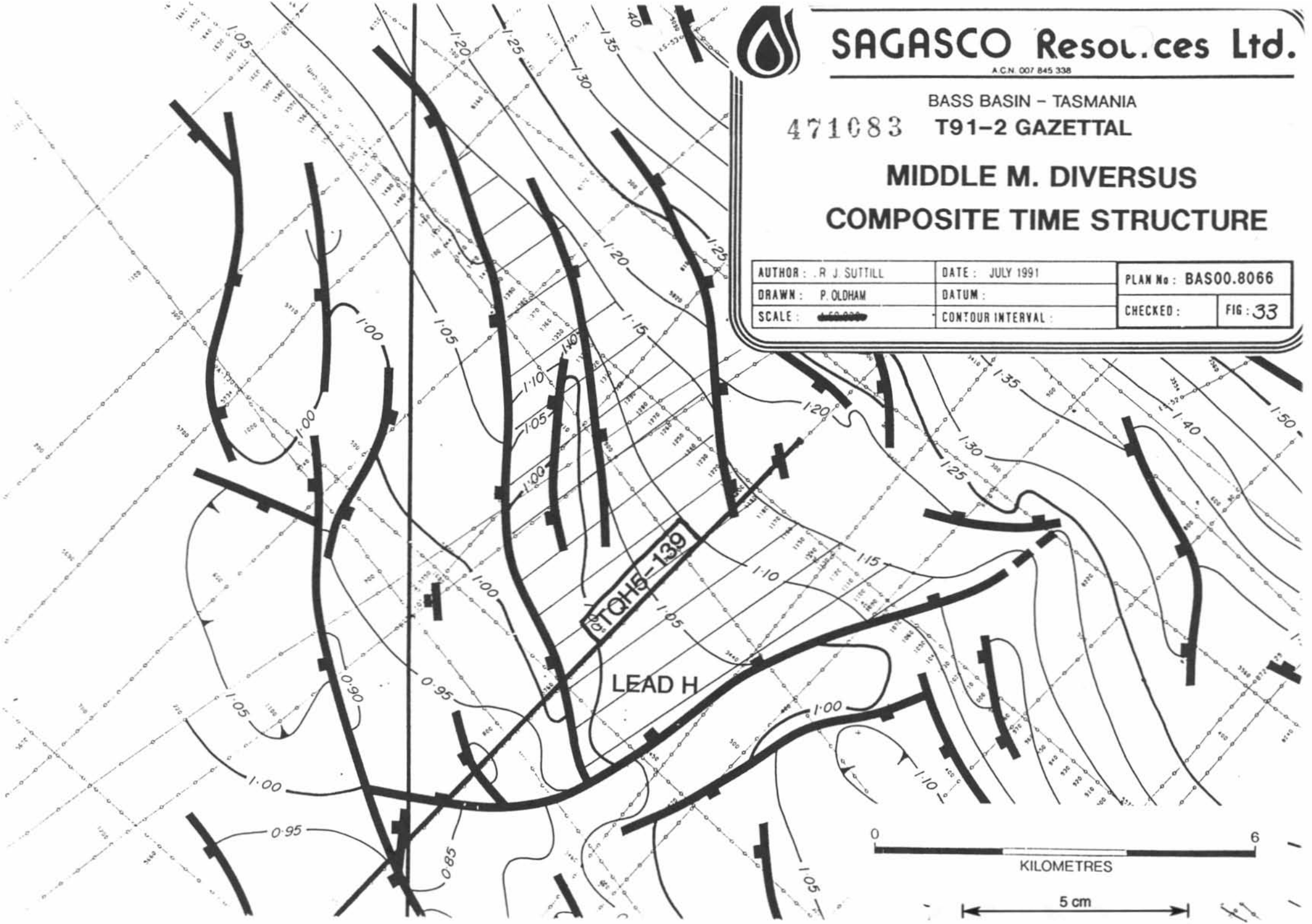


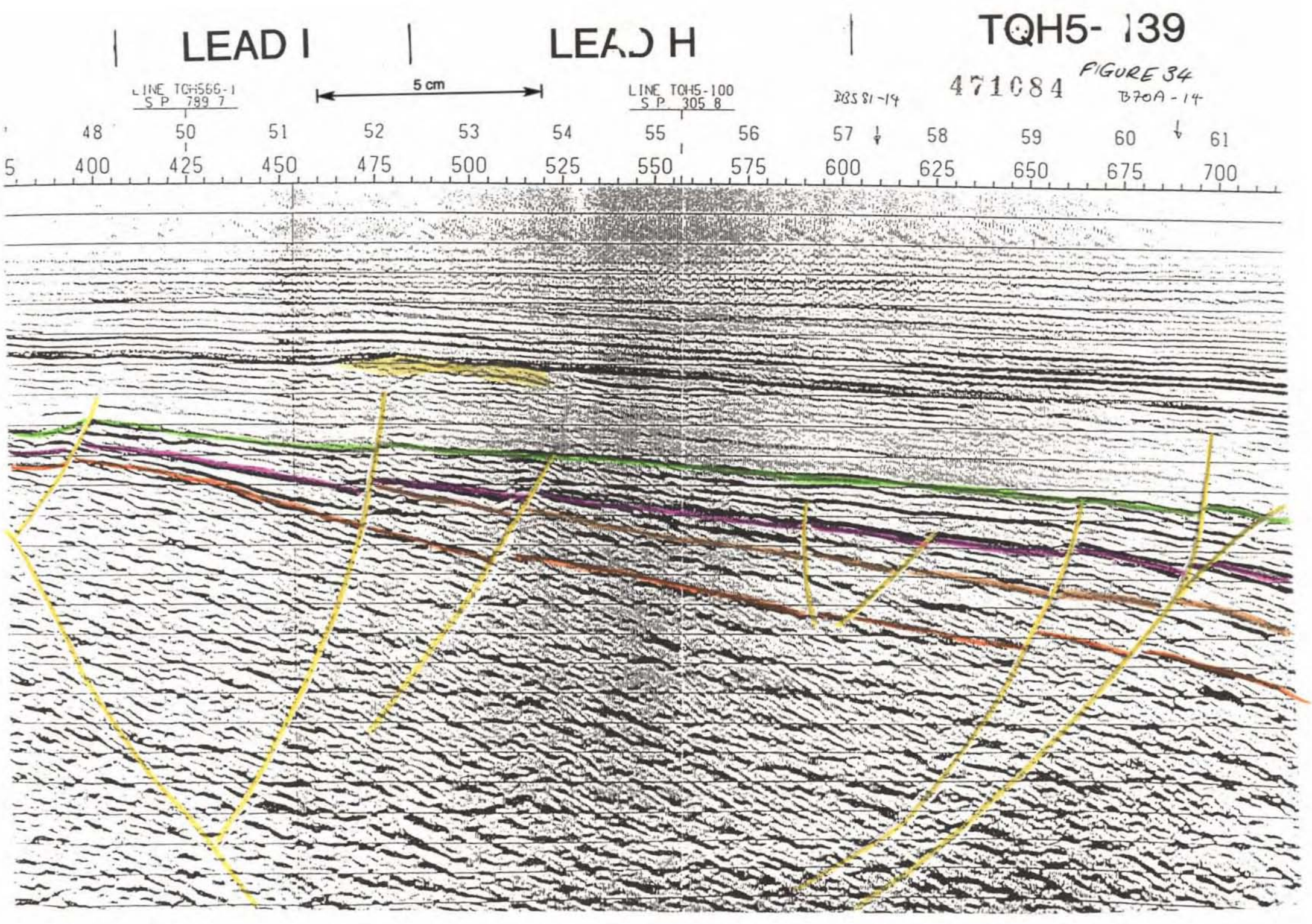
GWF9107.009-RJS

LEAD H

OBJECTIVE	TOP EVCM
CLOSURE (Km^2)	28.4
VERTICAL CLOSURE (m)	167
DEPTH TO RESRVOIR (m)	968
NET/GROSS RATIO (%)	70
AVERAGE POROSITY (%)	24
HYDROCARBON SATURATION (%)	75
OIL FM VOLUME FACTOR	1.22
STOIIP (MMSTB)	**1540**
GAS EXPANSION FACTOR	105.2
GIIP (BCF) (DRY GAS)	**1110**


SAGASCO Resources Ltd.
A.C.N. 007 845 338
471082
BASS BASIN – TASMANIA
T91–2 GAZETTAL
NEAR TOP EASTERN VIEW
COAL MEASURES
TIME STRUCTURE
AUTHOR : R J SUTTILL
DATE : JULY 1991
PLAN No : BAS00.8064
DRAWN : P. OLDHAM
DATUM :
SCALE :
CONTOUR INTERVAL :
CHECKED :
FIG : 32
LEAD H
TQH5-139
0
6
KILOMETRES
5 cm

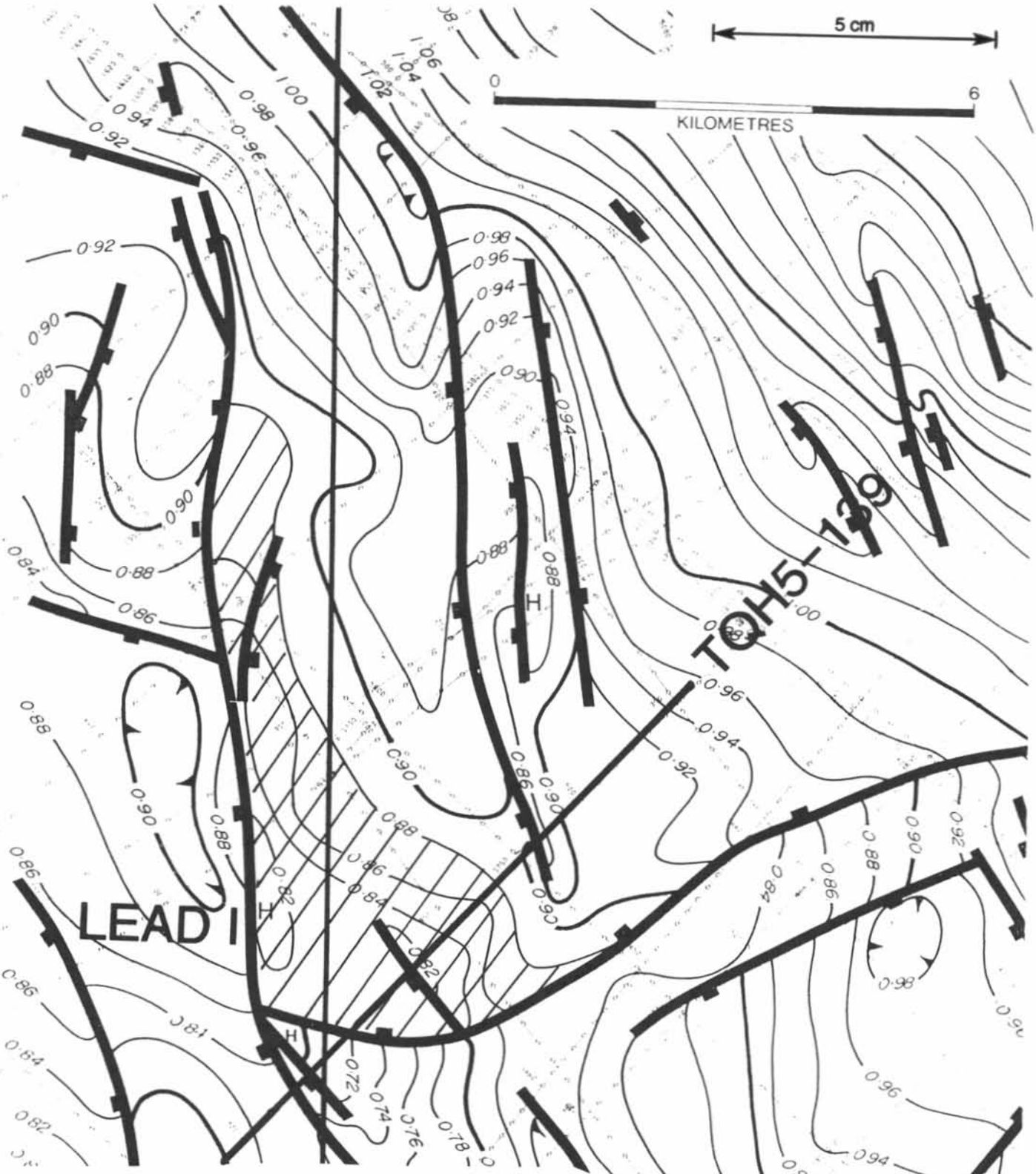

SAGASCO Resources Ltd.
A.C.N. 007 845 338
BASS BASIN – TASMANIA
471083 T91–2 GAZETTAL
MIDDLE M. DIVERSUS
COMPOSITE TIME STRUCTURE
AUTHOR : R J. SUTTILL
DATE : JULY 1991
PLAN No : BAS00.8066
DRAWN : P. OLDHAM
DATUM :
CHECKED :
FIG : 33
SCALE :
CONTOUR INTERVAL :
STQH5-139
LEAD H
0
6
KILOMETRES
5 cm


LEAD I
LEAD H
TQH5- 139
FIGURE 34
471084
LINE TQH566-1
S P 789 7
5 cm
LINE TQH5-100
S P 305 8
DBS 81-14
B70A-14
48 50 51 52 53 54 55 56 57 58 59 60 61
5 400 425 450 475 500 525 550 575 600 625 650 675 700

GWF9107.009-RJS

LEAD I

OBJECTIVE	TOP EVCM
CLOSURE (Km^2)	13.7
VERTICAL CLOSURE (m)	84
DEPTH TO RESERVOIR (m)	907
NET/GROSS RATIO (%)	70
AVERAGE PORISITY (%)	24
HYDROCARBON SATURATION (%)	75
OIL FM VOLUME FACTOR	1.2
STOIIP (MMSTB)	**381**
GAS EXPANSION FACTOR	95
GIIP (BCF) (DRY GAS)	**243**



SAGASCO Resources Ltd.

A.C.N. 007 845 338

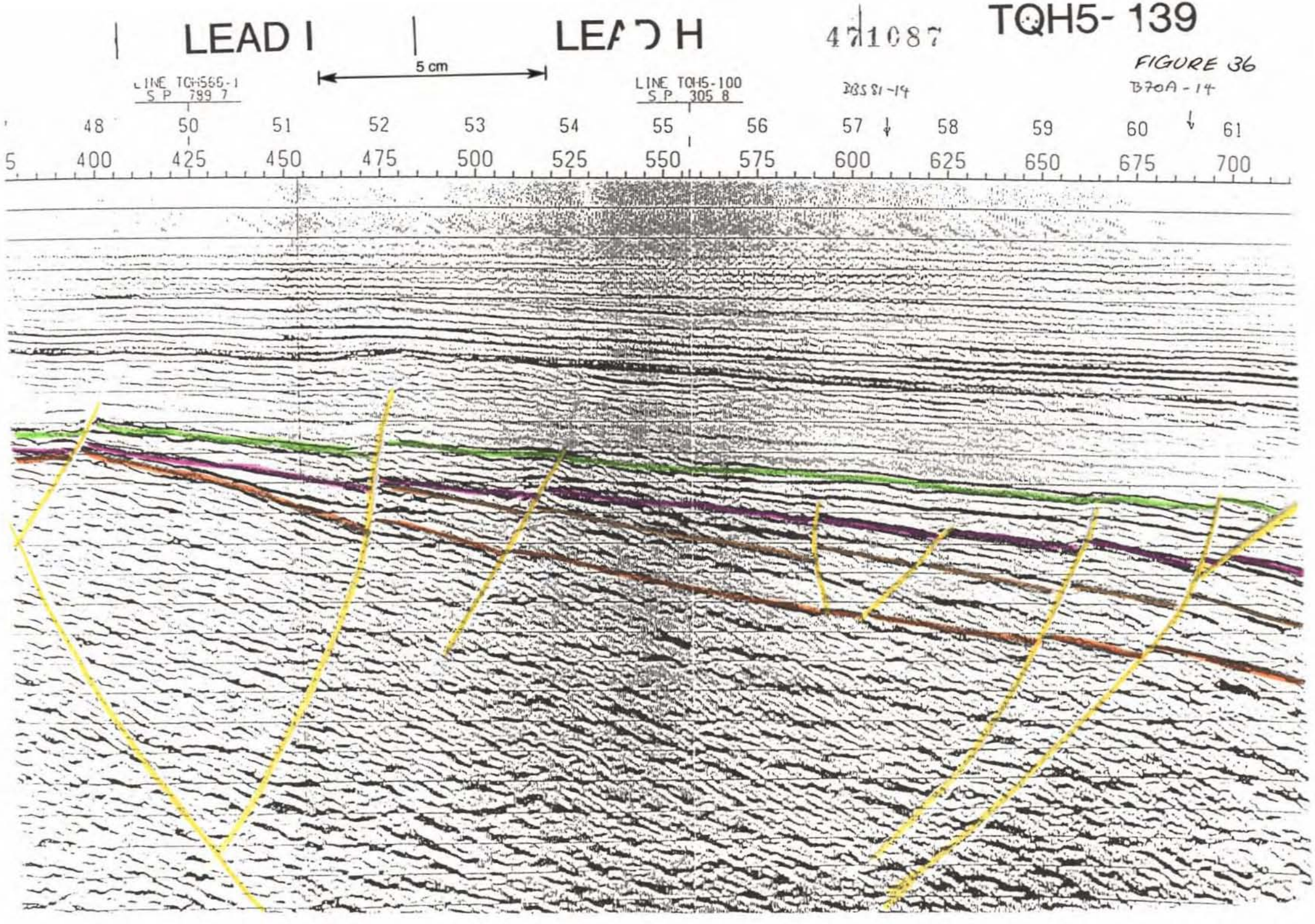
BASS BASIN – TASMANIA

471086

T91-2 GAZETTAL

NEAR TOP EASTERN VIEW COAL MEASURES TIME STRUCTURE

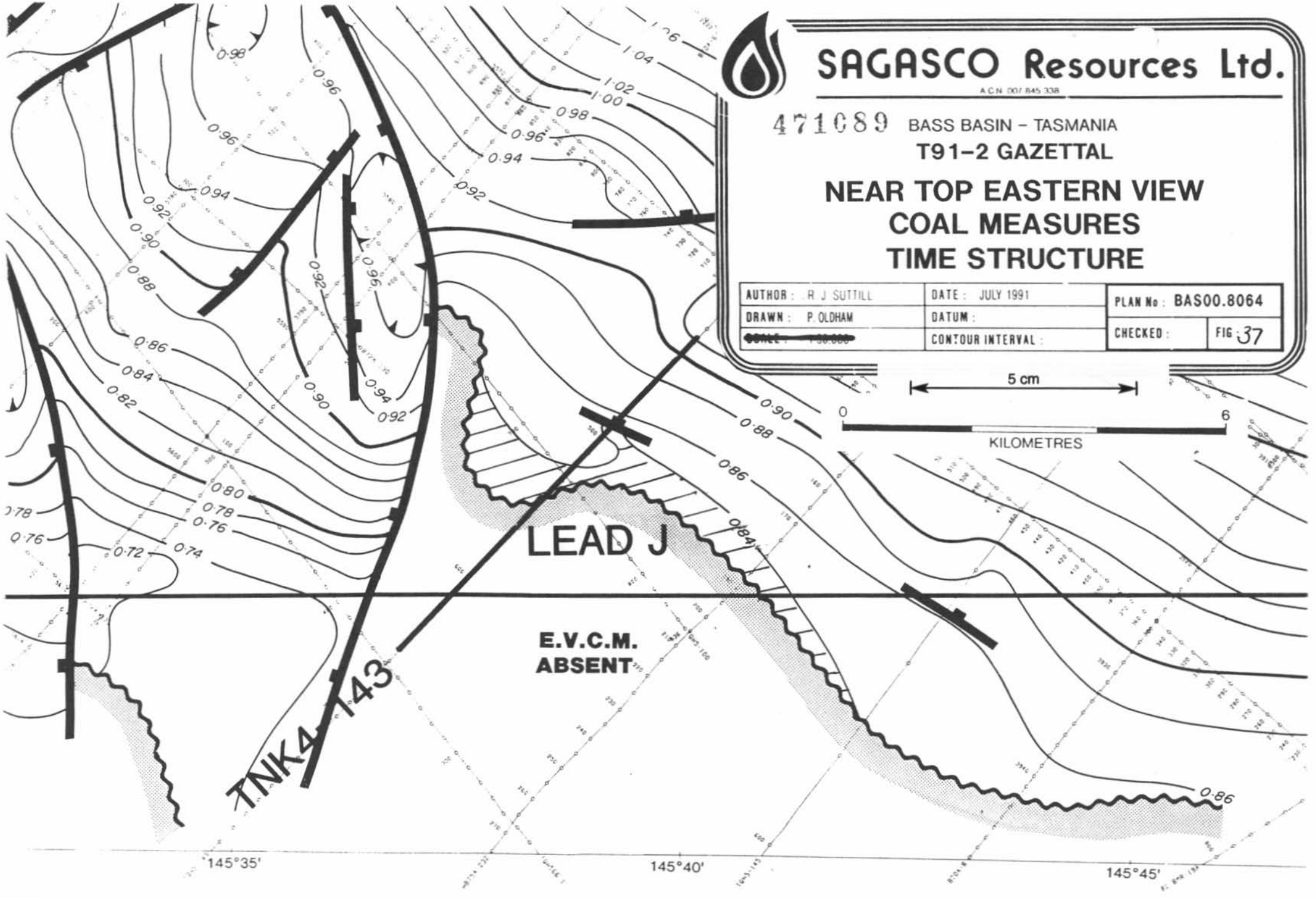
AUTHOR: P. [illegible]	DATE: JULY '99	PLAN No: BAS00.8064	
DRAWN: P. OLDHAM	DATUM	CHECKED:	FIG: 35
SCALE: [illegible]	CONTOUR INTERVAL		


LEAD I
LEAD H
471087
TQH5-139
FIGURE 36
5 cm
LINE TQH566-1
S P 789 7
LINE TQH5-100
S P 305 8
BBS 81-14
B70A-14
48
50
51
52
53
54
55
56
57
58
59
60
61
5
400
425
450
475
500
525
550
575
600
625
650
675
700

GWF9107.009-RJS

LEAD J

OBJECTIVE	TOP EVCM
CLOSURE(Km^2)	4.9
VERTICAL CLOSURE (m)	25
DEPTH TO RESERVOIR (m)	920
NET/GROSS RATIO (%)	70
AVERAGE PORISITY (%)	24
HYDROCARBON SATURATION (%)	75
OIL FM VOLUME FACTOR	1.2
STOIIP (MMSTB)	**40.6**
GAS EXPANSION FACTOR	93
GIIP (BCF) (DRY GAS)	**25.4**

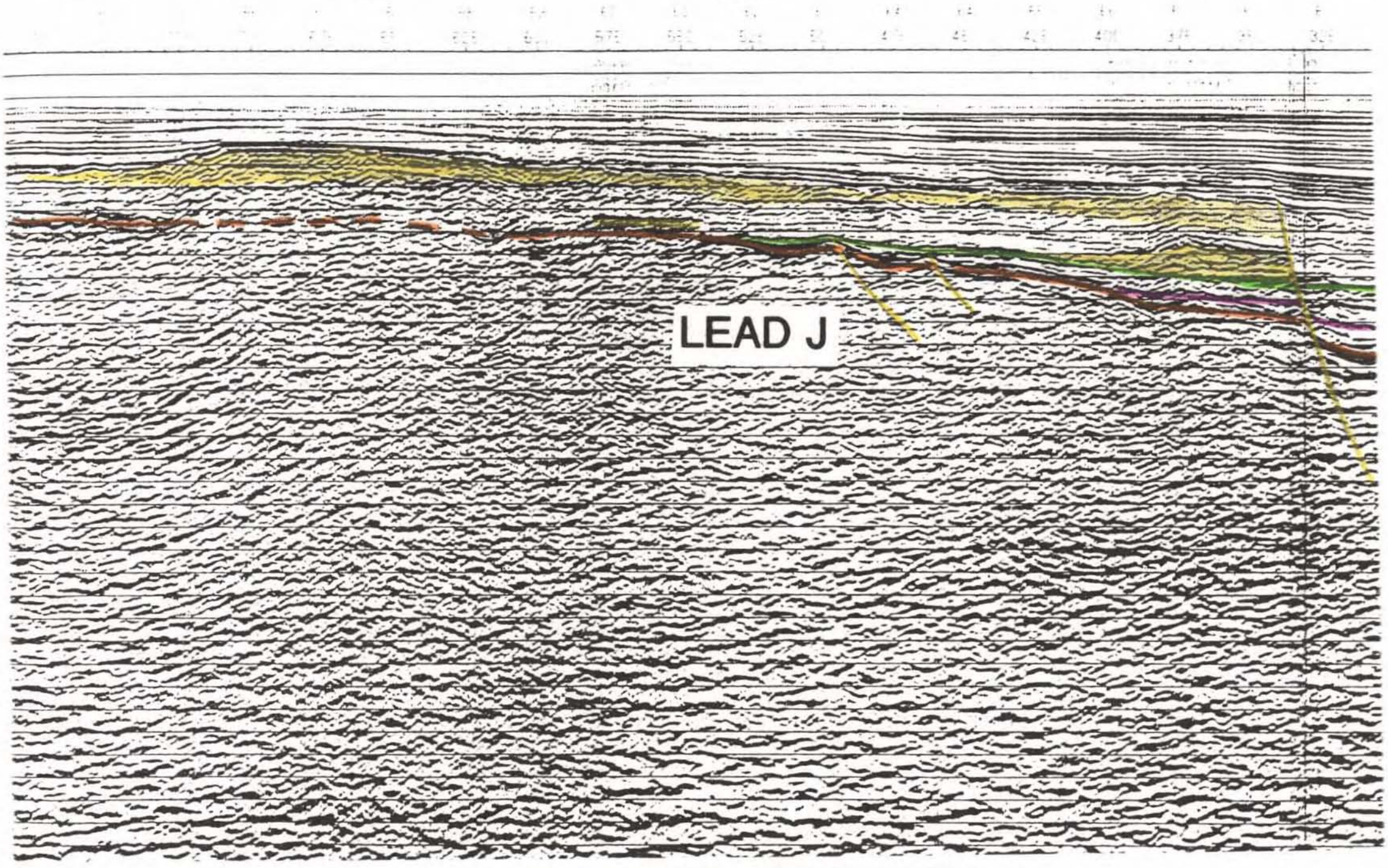

SAGASCO Resources Ltd.
A.C.N. 007 845 338
471089 BASS BASIN – TASMANIA
T91–2 GAZETTAL
NEAR TOP EASTERN VIEW
COAL MEASURES
TIME STRUCTURE
AUTHOR : R J SUTTILL
DRAWN : P. OLDHAM
DATE : JULY 1991
DATUM :
CONTOUR INTERVAL :
PLAN No : BAS00.8064
CHECKED :
FIG : 37
5 cm
0
6
KILOMETRES
LEAD J
E.V.C.M.
ABSENT
TNK4-143
145°35'
145°40'
145°45'

471090

5 cm

TNK4-143

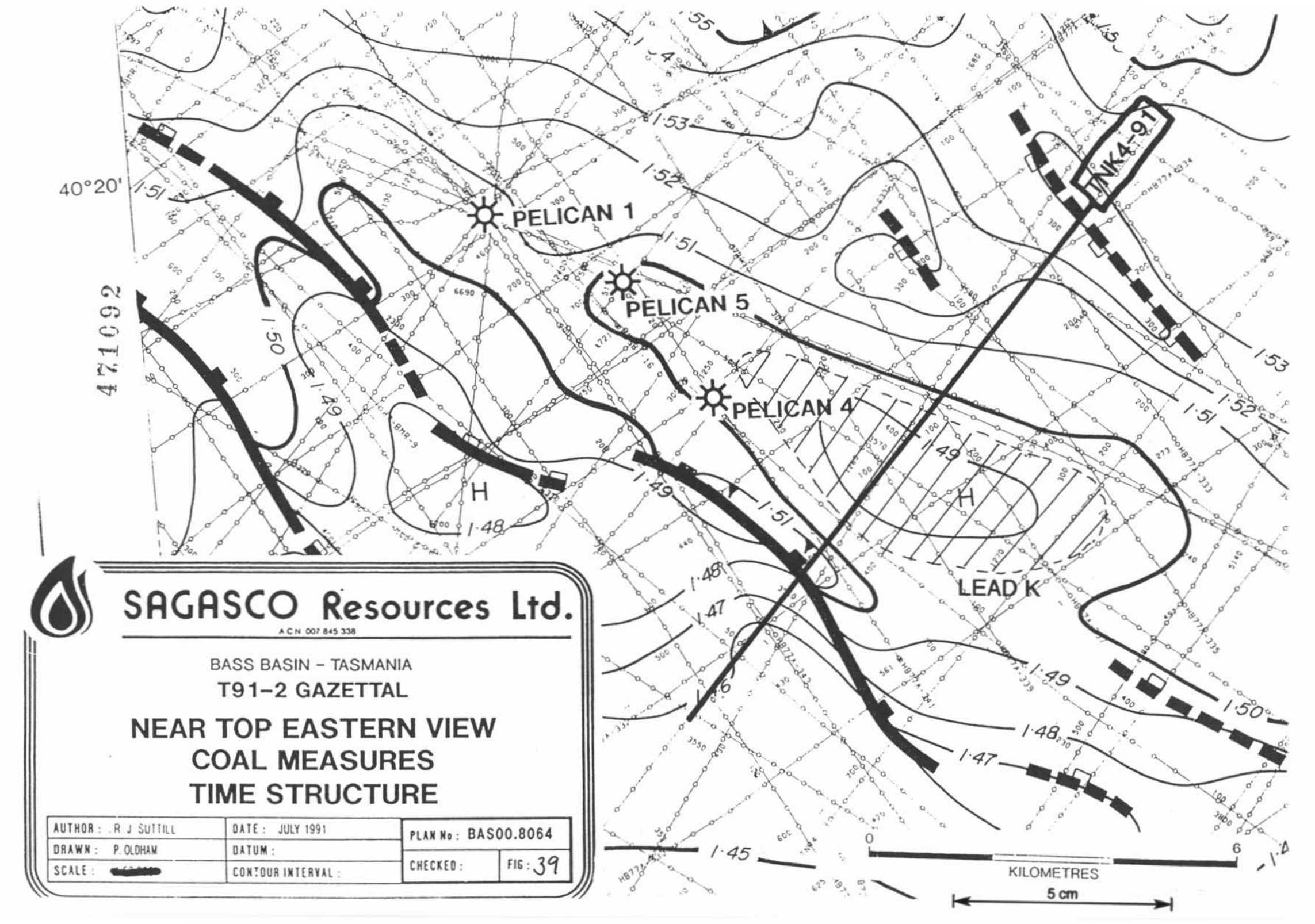
FIGURE 38.



GWF9107.009-RJS

LEAD K

OBJECTIVE	TOP EVCM
CLOSURE (Km^2)	6.6
VERTICAL CLOSURE (m)	24
DEPTH TO RESERVOIR (m)	1744
NET/GROSS RATIO (%)	75
AVERAGE PORISITY (%)	20
HYDROCARBON SATURATION (%)	75
OIL FM VOLUME FACTOR	1.3
STOIIP (MMSTB)	**49**
GAS EXPANSION FACTOR	175.6
GIIP (BCF)(DRYGAS)	**66**



SAGASCO Resources Ltd.

A.C.N. 007 845 338

BASS BASIN – TASMANIA

T91–2 GAZETTAL

NEAR TOP EASTERN VIEW COAL MEASURES TIME STRUCTURE

AUTHOR : R J SUTTILL	DATE : JULY 1991	PLAN No : BAS00.8064	
DRAWN : P. OLDHAM	DATUM :		
SCALE : [redacted]	CONTOUR INTERVAL :	CHECKED :	FIG : 39

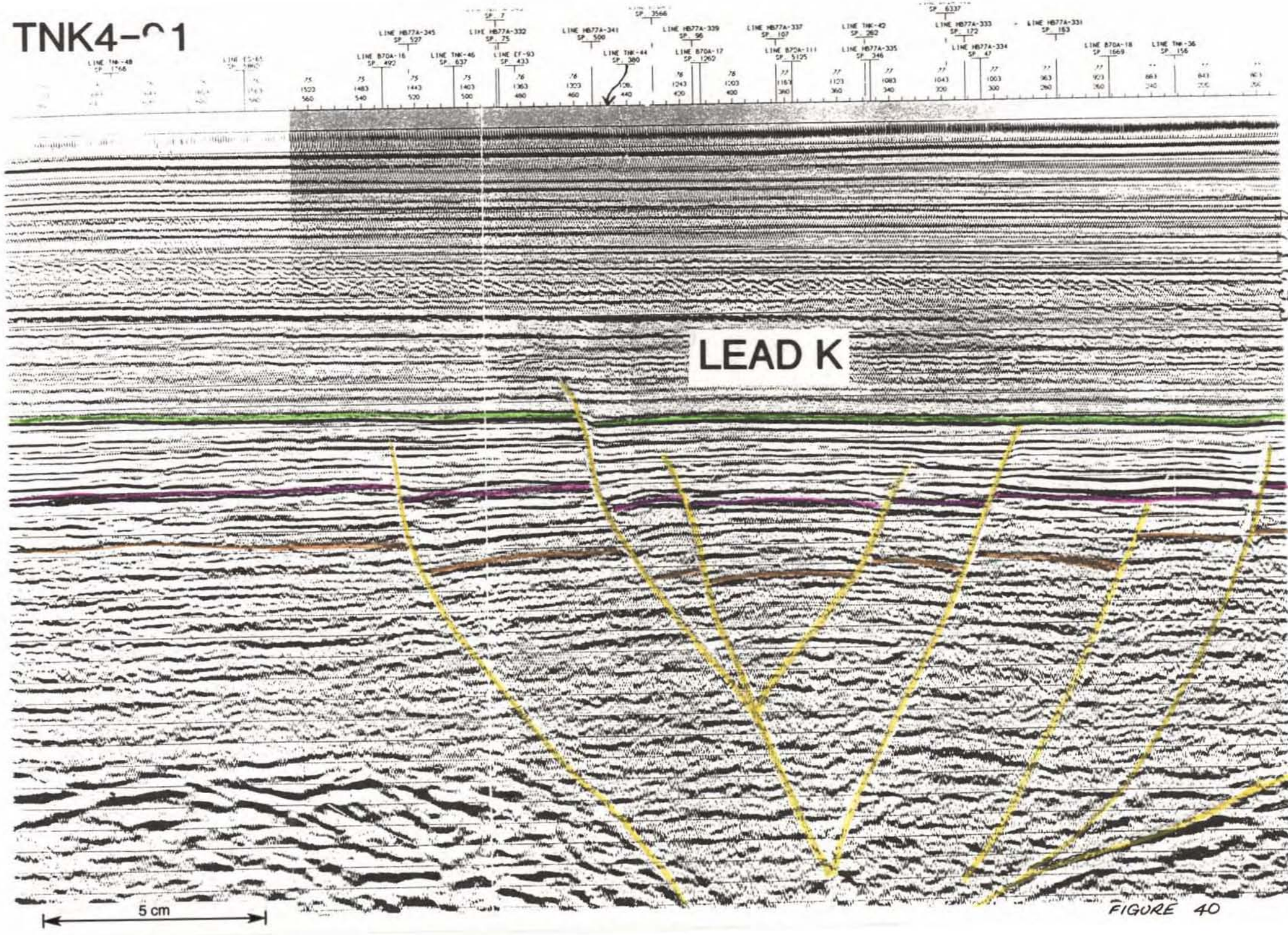
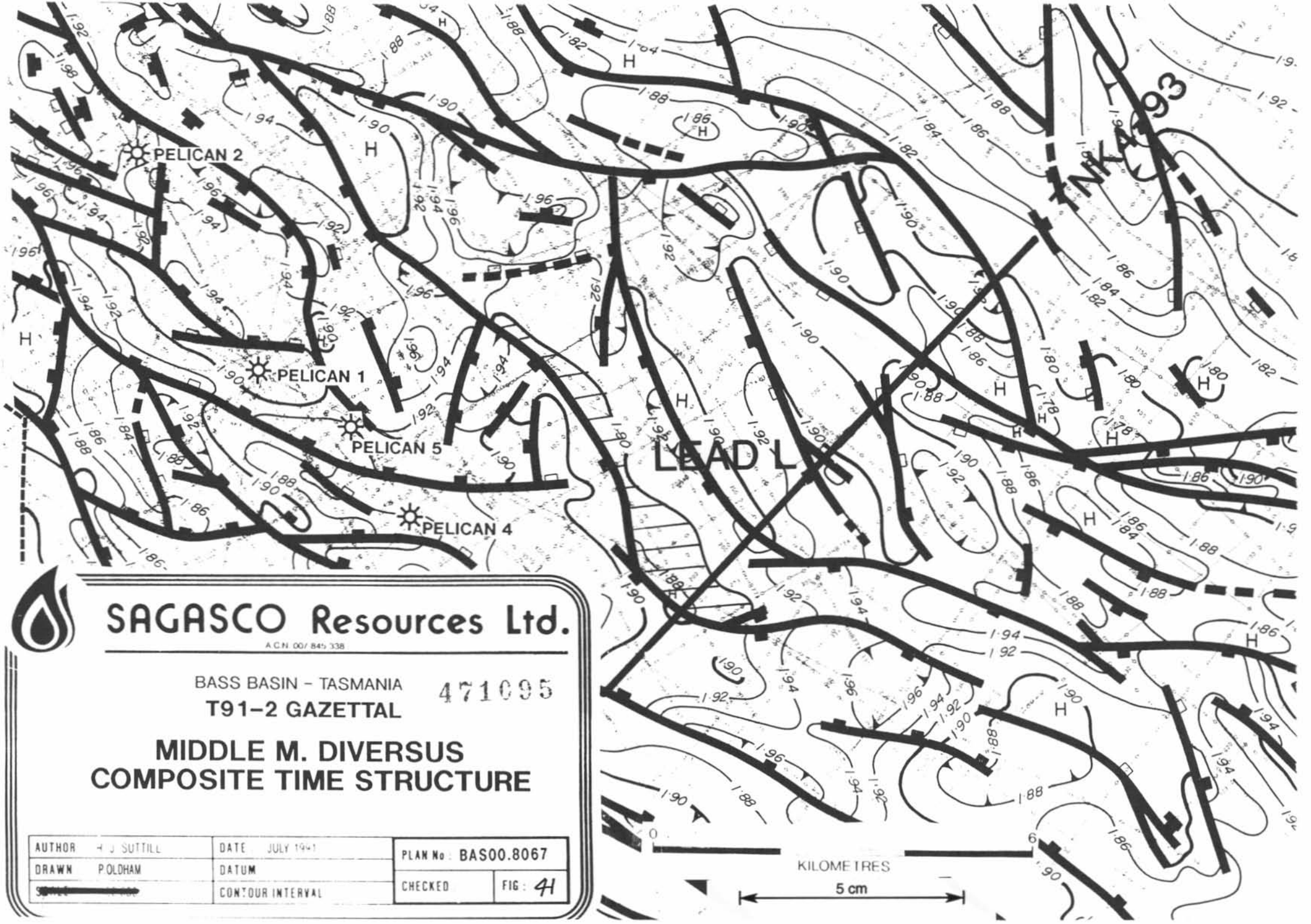


FIGURE 40

GWF9107.009-RJS

LEAD L

OBJECTIVE	M.*M. diversus*
CLOSURE (Km^2)	3.47
VERTICAL CLOSURE (m)	46
GROSS RESERVOIR THICKNESS (m)	533
DEPTH TO RESERVOIR (m)	2377
NET/GROSS RATIO (%)	24 (Pelican 5)
AVERAGE POROSITY (%)	14 (Av. effective Ø at Pelican 5)
HYDROCARBON SATURATION (%)	75
GAS EXPANSION FACTOR	245 (Pelican 5)
GIIP (TCF)	**0.40**
RECOVERY FACTOR (%)	85
REC. GAS (TCF)	**0.34**
SHRINKAGE FACTOR (%)	70
SALES GAS (TCF)	**0.24**
LIQUIDS FACTOR (BBLS/MMCF)	235 (Pelican 5)
RECOVERABLE LIQUIDS (MMSTB)	**81**



SAGASCO Resources Ltd.

A.C.N. 007 845 338

BASS BASIN – TASMANIA

471095

T91–2 GAZETTAL

MIDDLE M. DIVERSUS COMPOSITE TIME STRUCTURE

AUTHOR H. J. SUTTILL	DATE JULY 1991	PLAN No: BAS00.8067	
DRAWN P.OLDHAM	DATUM	CHECKED	FIG: 41
SCALE	CONTOUR INTERVAL		

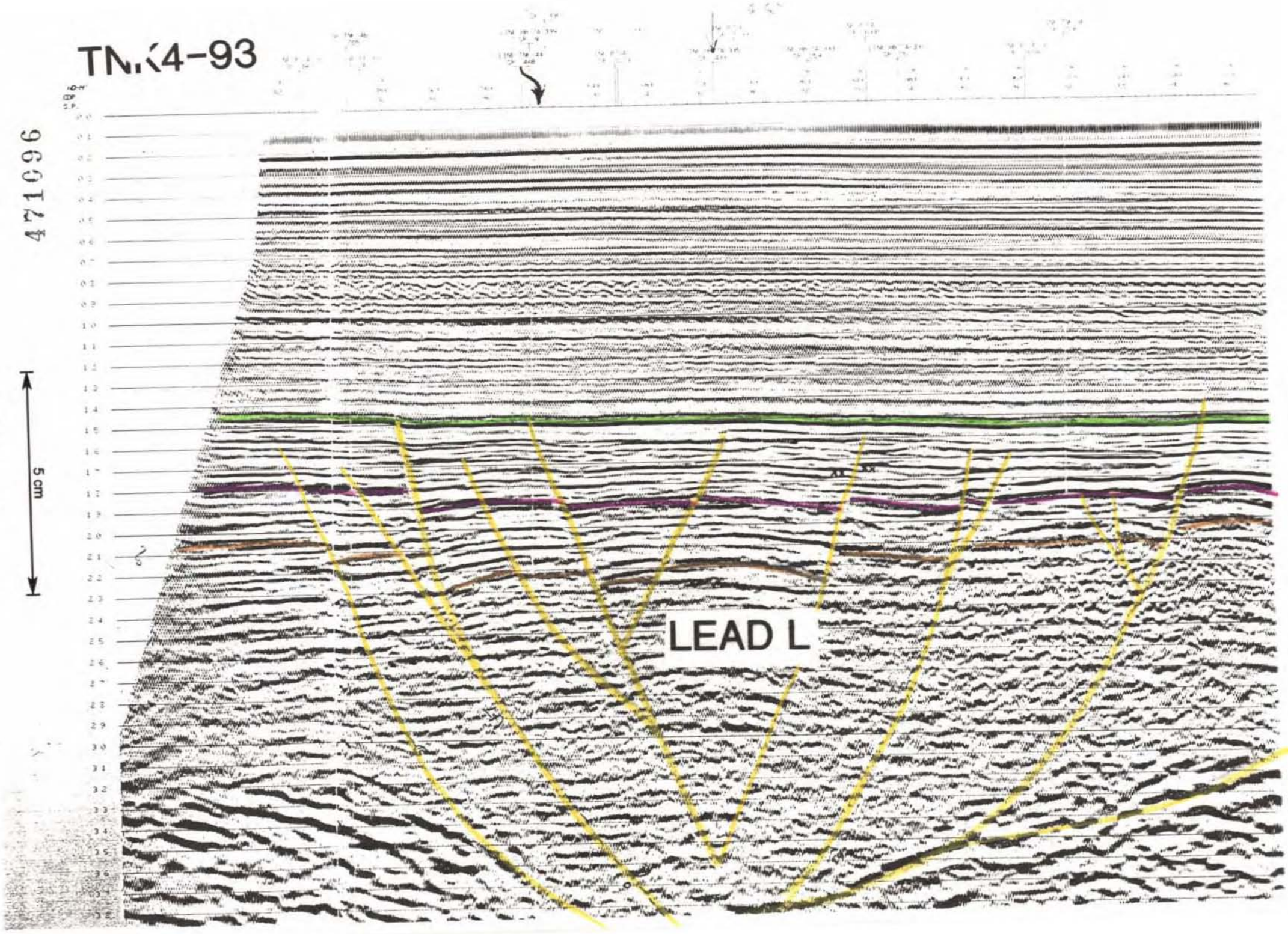


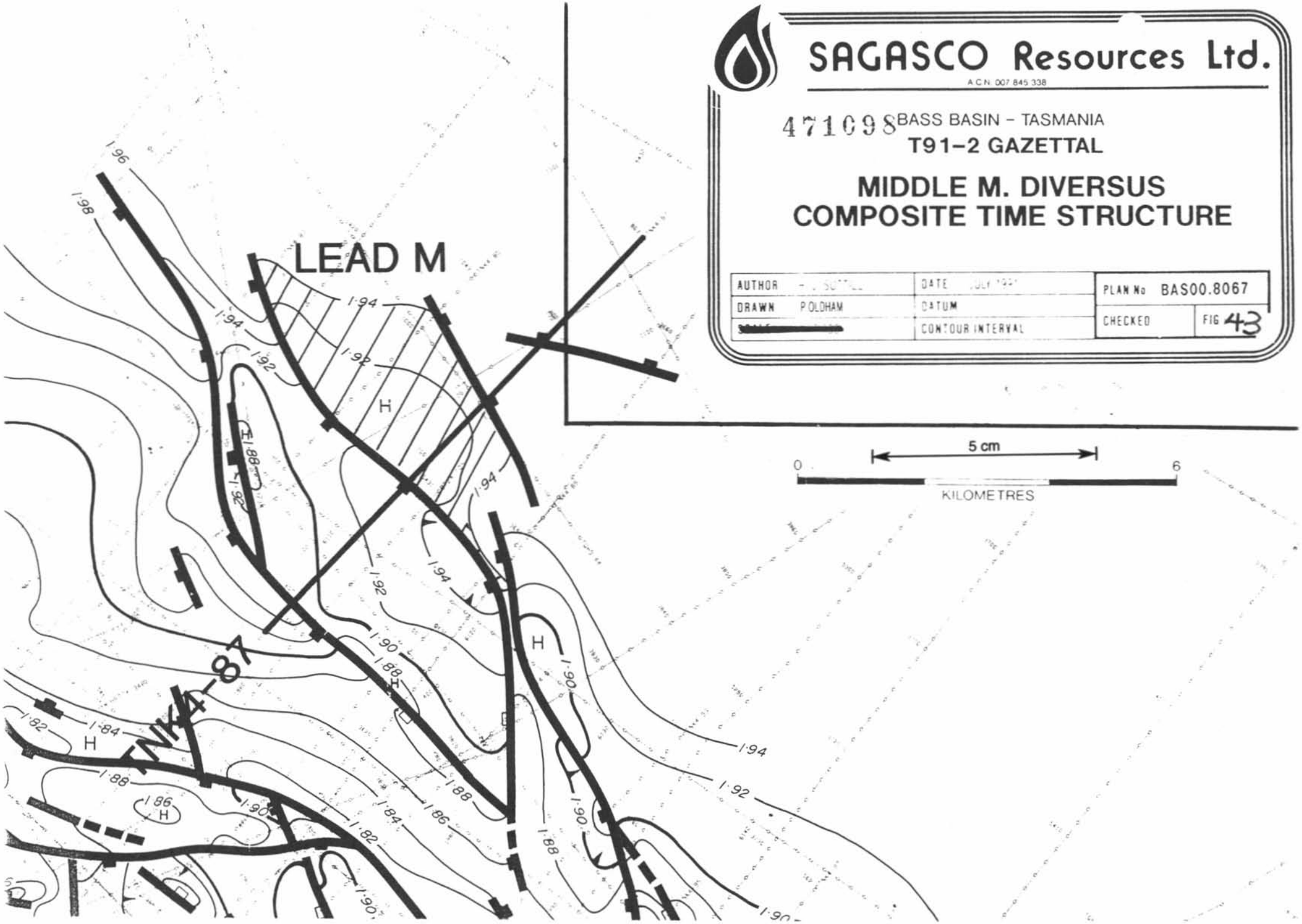
FIGURE 42

471096

GWF9107.009-RJS

LEAD M

OBJECTIVE	M.*M. diversus*
CLOSURE (Km^2)	8.44
VERTICAL CLOSURE (m)	53
GROSS RESERVOIR THICKNESS (m)	107
DEPTH TO RESERVOIR (m)	2438
NET/GROSS RATIO (%)	24 (Pelican 5)
AVERAGE POROSITY (%)	16
HYDROCARBON SATURATION (%)	75
GAS EXPANSION FACTOR	245 (Pelican 5)
GIIP (TCF)	**0.225**
RECOVERY FACTOR (%)	85
REC. GAS (TCF)	**0.191**
SHRINKAGE FACTOR (%)	70
SALES GAS (TCF)	**0.134**
LIQUIDS FACTOR (BBLS/MMCF)	235 (Pelican 5)
RECOVERABLE LIQUIDS (MMSTB)	**45**


SAGASCO Resources Ltd.
A.C.N. 007 845 338
471098
BASS BASIN - TASMANIA
T91-2 GAZETTAL
MIDDLE M. DIVERSUS
COMPOSITE TIME STRUCTURE
AUTHOR
DATE
PLAN No BAS00.8067
DRAWN P.OLDHAM
DATUM
CHECKED
CONTOUR INTERVAL
FIG 43
LEAD M
TNK4-87
5 cm
0
6
KILOMETRES

TNK4-87

471099

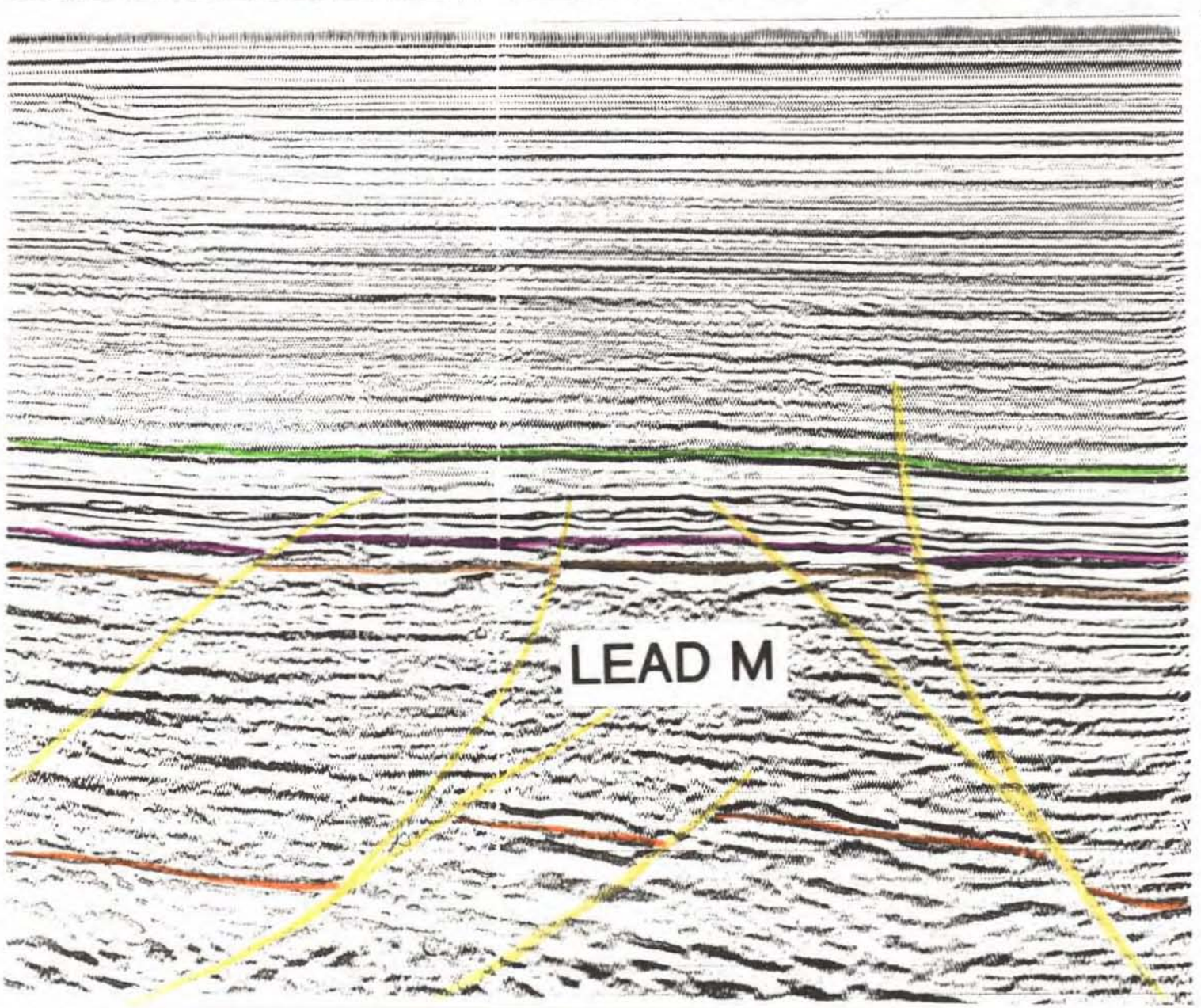
LINE TNK4-87
S.P. 1 863

5 cm

N.E.
DIRECTION OF SHOOTING

TQHS-44

FIGURE 44
6000% MIGRATION



AMOCO PRODUCTION CO (INTL)
BASS BASIN
AUSTRALIA

GeoCenter

DATE PROCESSED APR 1985
REEL NUMBER 9932
CONTRACT NUMBER SK43

FIELD RECORDING

RECORDED BY G S I PART 2931 M/V EUGENE MCDERMOTT II
DATE NOV 1984 SYSTEM TSR 001
FORMAT SEGD GAIN IFP

ENERGY SOURCE

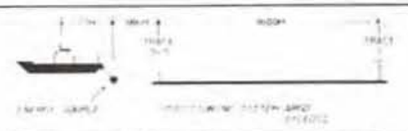
TYPE AIRGUN 4075 CU IN PRESSURE 1900 PSI
ARRAY 20 GUNS OVER 20M DEPTH 10M

STREAMER

LENGTH 7800M NO TRACES 240
DEPTH 10M GROUP INTERVAL 15M
ARRAY GEOPH/TR OVER

PARAMETERS

RECORDING FOLD 60 S.P. SPACING 30M
SAMPLE INTERVAL 2MS RECORD LENGTH 6SECONDS
RECORDING FILTER HI-CUT 128HZ@72DB LO-CUT 8HZ@ 18DB



DIGITAL PROCESSING

SEQ	PROCESS	PARAMETERS
1	REFORMAT	
2	SUM	
3	STATIC	
4	CDP SORT	
5	EQUALIZATION	
6	DECONVOLUTION	
7	VELOCITY ANALYSIS	
8	F-K FILTER	
9	VELOCITY ANALYSIS	
10	NMO MUTE	
11	CDP STACK	
12	FK MIGRATION	
13	FILTER	
14	EQUALIZATION	

GWF9107.009-RJS

LEAD N

OBJECTIVE	M.*M. diversus*
CLOSURE (Km^2)	5.81
VERTICAL CLOSURE (m)	46
GROSS RESERVOIR THICKNESS (m)	229
DEPTH TO RESERVOIR (m)	2423
NET/GROSS RATIO (%)	24 (Pelican 5)
AVERAGE POROSITY (%)	16
HYDROCARBON SATURATION (%)	75
GAS EXPANSION FACTOR	245 (Pelican 5)
GIIP (TCF)	**0.331**
RECOVERY FACTOR (%)	85
REC. GAS (TCF)	**0.282**
SHRINKAGE FACTOR (%)	70
SALES GAS (TCF)	**0.197**
LIQUIDS FACTOR (BBLS/MMCF)	235 (Pelican 5)
RECOVERABLE LIQUIDS (MMSTB)	**66**

471101

SAGASCO Resources Ltd.

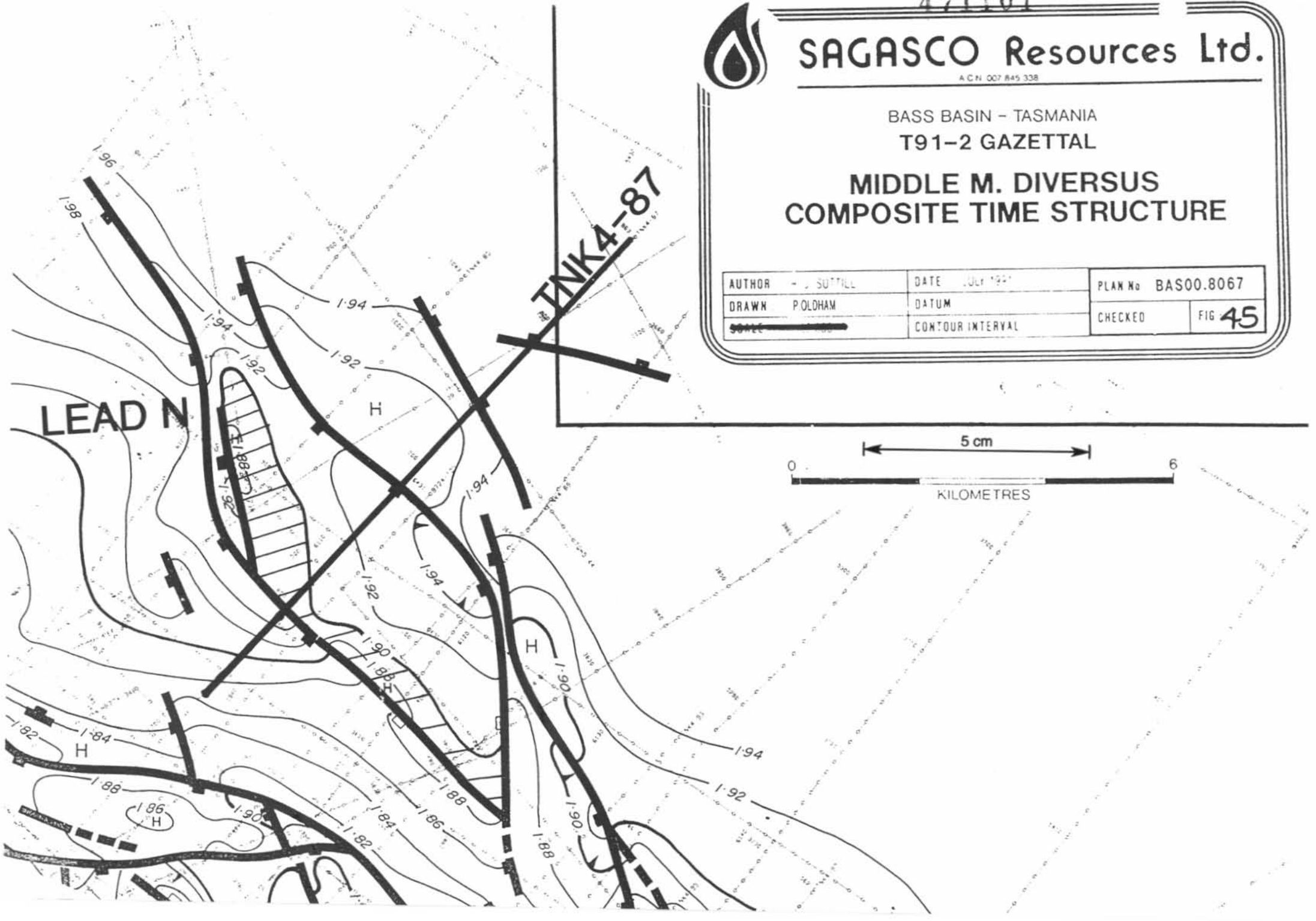
A.C.N. 007 845 338

BASS BASIN - TASMANIA

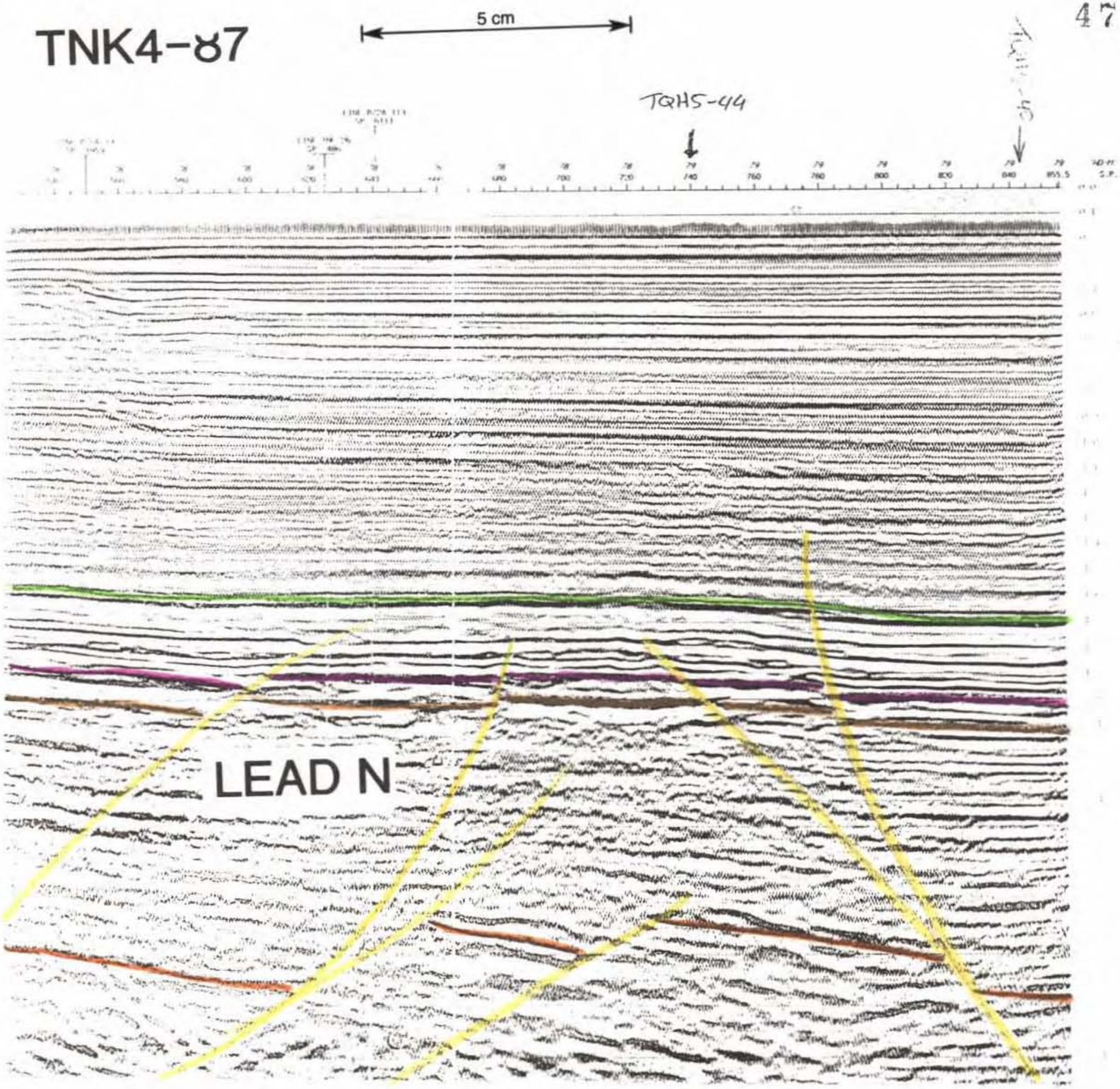
T91-2 GAZETTAL

MIDDLE M. DIVERSUS COMPOSITE TIME STRUCTURE

AUTHOR - J. SUTTILL	DATE July '92	PLAN No	BAS00.8067
DRAWN P.OLDHAM	DATUM	CHECKED	FIG 45
SCALE [redacted]	CONTOUR INTERVAL		



TNK4-87



471102 LINE TNK4-87
S.P. -863

N.E.
DIRECTION OF SHOOTING

FIGURE 46
6000% MIGRATION

AMOCO PRODUCTION CO (INTL)
BASS BASIN
AUSTRALIA

GeoCenter
Houston, Texas

DATE PROCESSED APR 1985
REEL NUMBER 9934
CONTRACT NUMBER 5647

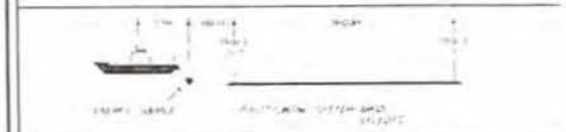
FIELD RECORDING

RECORDED BY G S I PARTY 2931 M V EUGENE MCDERMOTT II
DATE NOV 1984 SYSTEM TSR 001
FORMAT SEGD GAIN 1FP

ENERGY SOURCE
TYPE AIRGUN 4075 CU IN PRESSURE 1900 PSI
ARRAY 20 GUNS OVER 20M DEPTH 10M

STREAMER
LENGTH 3600M NO TRACES 240
DEPTH 13M GROUP INTERVAL 15M
ARRAY GEOPH/TR OVER

PARAMETERS
RECORDING FOLD 60 S P SPACING 30M
SAMPLE INTERVAL 2MS RECORD LENGTH 6SECONDS
RECORDING FILTER HI-CUT 128HZ/72DB LO-CUT 8HZ/8 16DB



DIGITAL PROCESSING

SEQ	PROCESS	PARAMETERS
1	REFORMAT	[illegible]
2	SUM	[illegible]
3	STATIC	[illegible]
4	CDP SORT	[illegible]
5	EQUALIZATION	[illegible]
6	[illegible]	[illegible]
7	[illegible]	[illegible]
8	[illegible]	[illegible]
9	[illegible]	[illegible]
10	[illegible]	[illegible]
11	CDP STACK	[illegible]
12	FF MIGRATION	[illegible]
13	FILTER	[illegible]
14	EQUALIZATION	[illegible]

DECON	[illegible]	[illegible]	[illegible]	[illegible]
6				

GWF9107.009-RJS

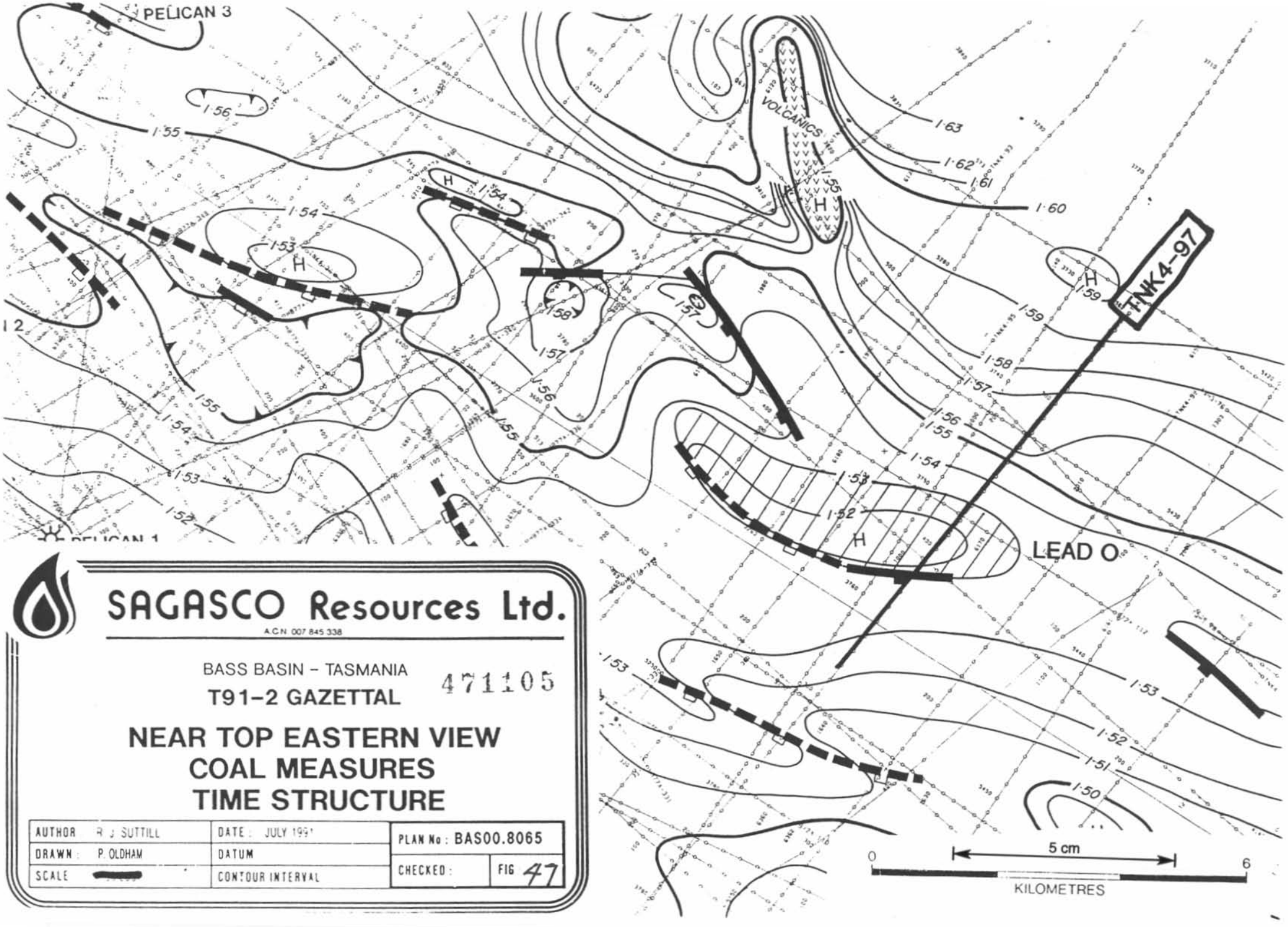
LEAD O

OBJECTIVE	TOP EVCM
CLOSURE (Km^2)	6.7
VERTICAL CLOSURE (m)	31
DEPTH TO RESERVOIR (m)	1783
NET/GROSS RATIO (%)	50
AVERAGE POROSITY (%)	22
HYDROCARBON SATURATION (%)	75
OIL FM VOLUME FACTOR	1.38
STOIIP (MMSTB)	**37**
GAS EXPANSION FACTOR	179.9
GIIP (BCF) (DRY GAS)	**51**

GWF9107.009-RJS

LEAD O

OBJECTIVE	M.*M. diversus*
CLOSURE (Km^2)	19.1
VERTICAL CLOSURE (m)	116
GROSS RESERVOIR THICKNESS (m)	134
DEPTH TO RESERVOIR (m)	2206
NET/GROSS RATIO (%)	40
AVERAGE POROSITY (%)	20
HYDROCARBON SATURATION (%)	75
GAS EXPANSION FACTOR	245 (Pelican 5)
GIIP (TCF)	1.3
RECOVERY FACTOR (%)	85
REC GAS (TCF)	**1.1**
SHRINKAGE FACTOR (%)	70
SALES GAS (TCF)	**0.8**
LIQUIDS FACTOR (BBLS/MMCF)	235
RECOVERABLE LIQUIDS (MMSTB)	**265**



SAGASCO Resources Ltd.

A.C.N. 007 845 338

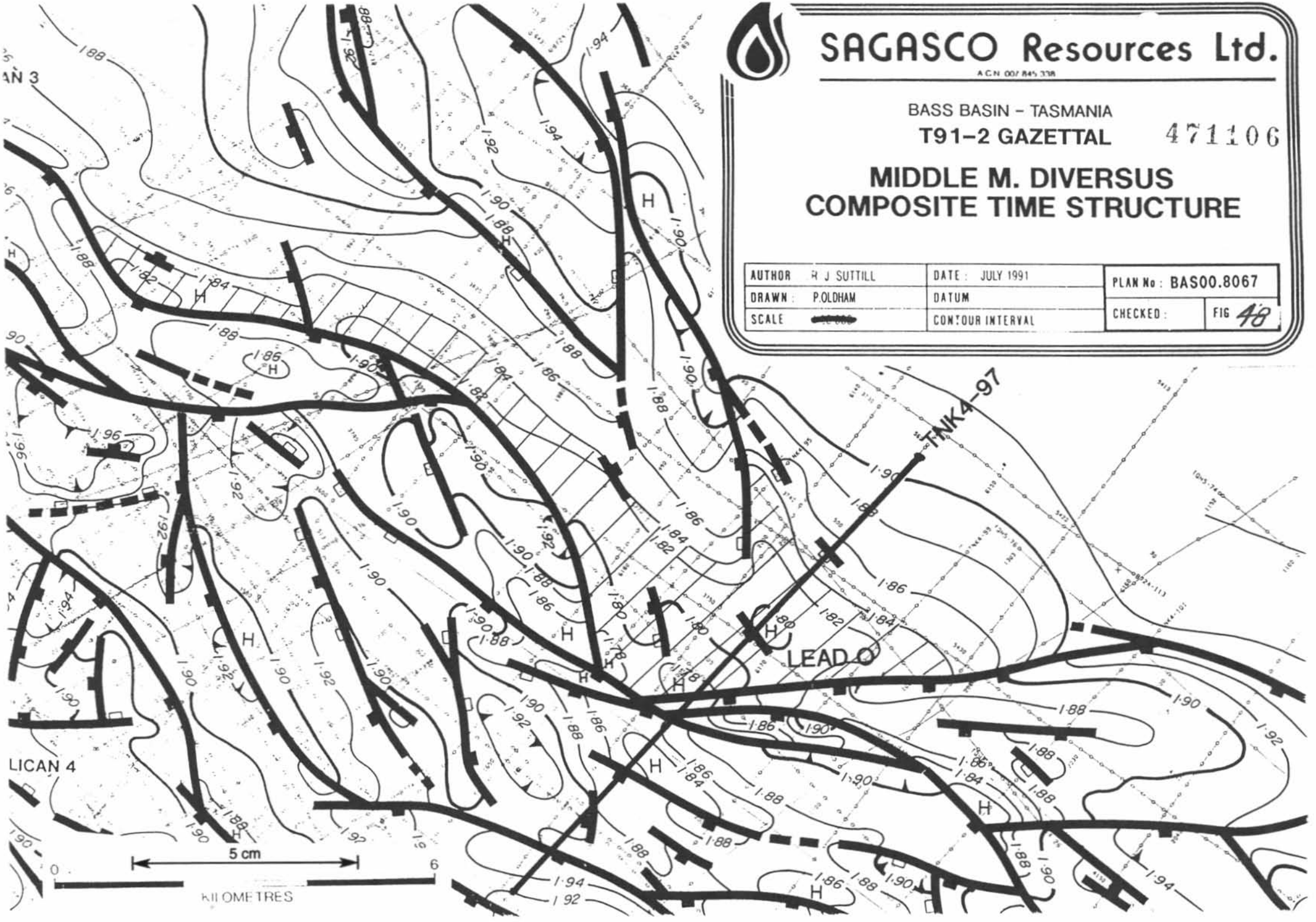
BASS BASIN – TASMANIA

471105

T91–2 GAZETTAL

NEAR TOP EASTERN VIEW COAL MEASURES TIME STRUCTURE

AUTHOR: R. J. SUTTILL	DATE: JULY 1991	PLAN No: BAS00.8065	
DRAWN: P. OLDHAM	DATUM	CHECKED:	FIG 47
SCALE	CONTOUR INTERVAL		


SAGASCO Resources Ltd.
A.C.N. 007 845 338
BASS BASIN - TASMANIA
T91-2 GAZETTAL
471106
MIDDLE M. DIVERSUS
COMPOSITE TIME STRUCTURE
AUTHOR R J SUTTILL
DATE : JULY 1991
PLAN No : BAS00.8067
DRAWN : P.OLDHAM
DATUM
SCALE
CONTOUR INTERVAL
CHECKED :
FIG 48
TANK 4-97
LEAD O
LICAN 4
5 cm
0
6
KILOMETRES

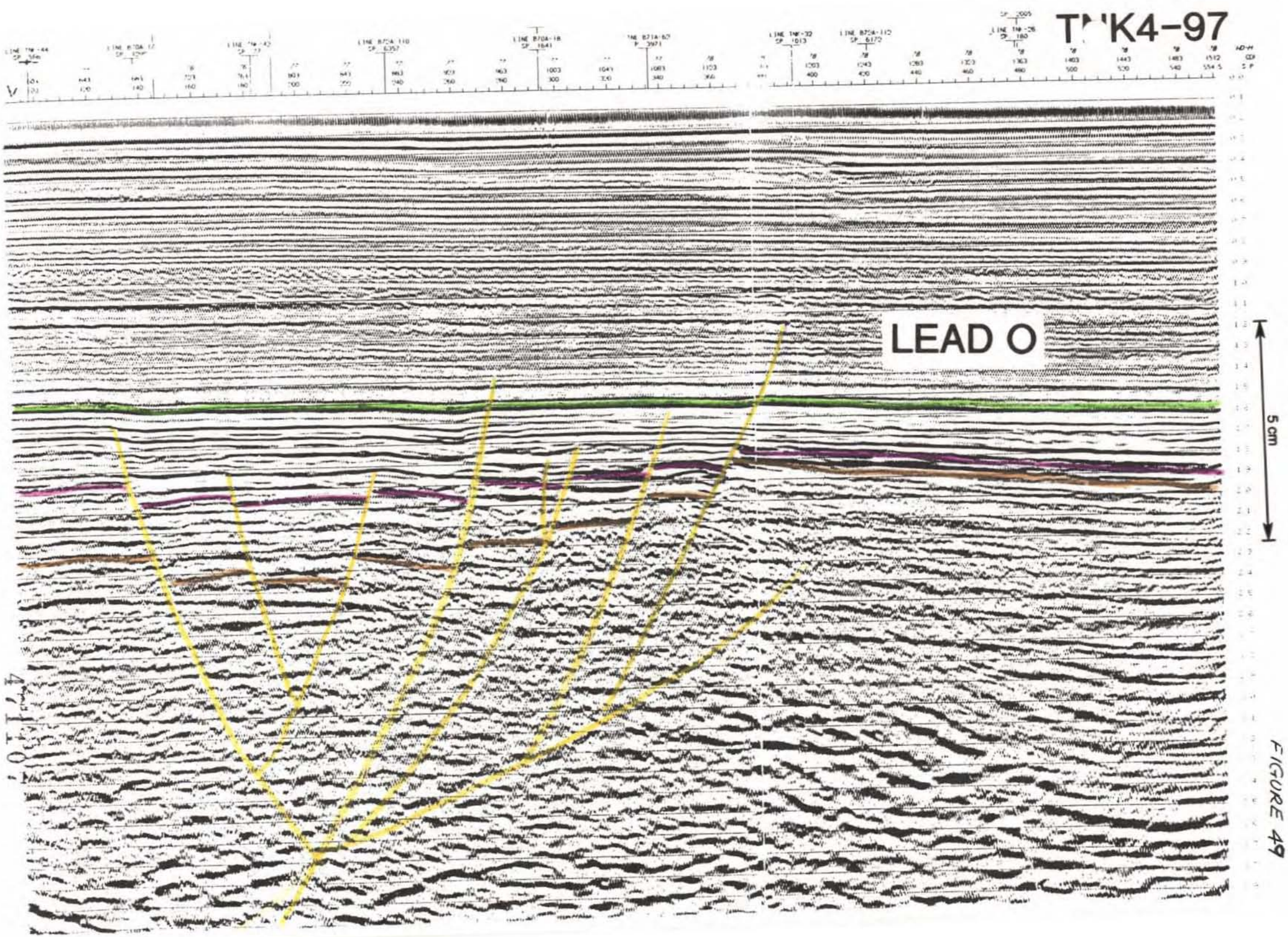
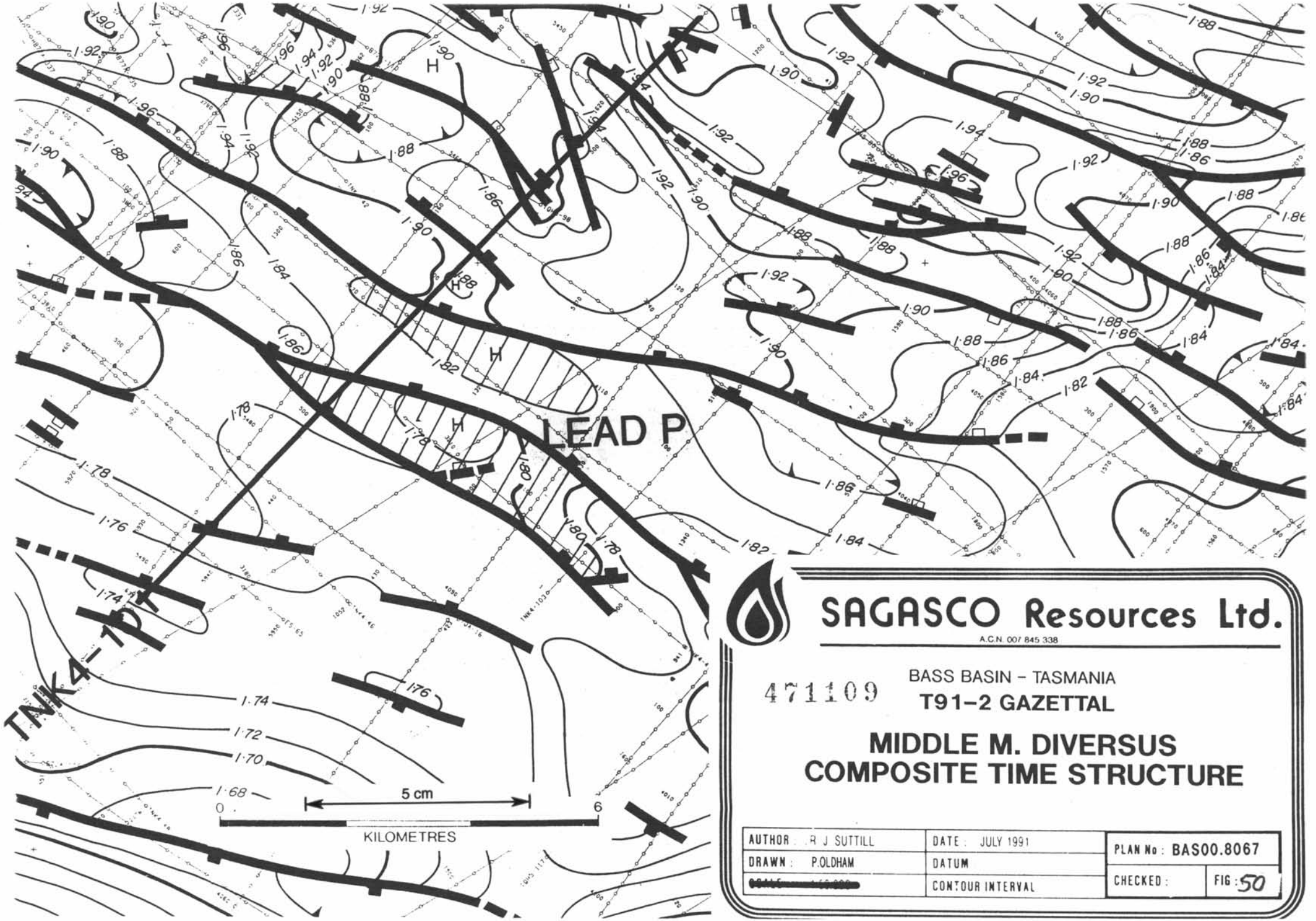


FIGURE 49

GWF9107.009-RJS

LEAD P

OBJECTIVE	M.*M. diversus*
CLOSURE (Km^2)	7.47 (two closures)
VERTICAL CLOSURE (m)	54
GROSS RESERVOIR THICKNESS (m)	732
DEPTH TO RESERVOIR (m)	2202
NET/GROSS RATIO (%)	24 (Pelican 5)
AVERAGE POROSITY (%)	14 (Av. effective Ø at Pelican 5)
HYDROCARBON SATURATION (%)	75
GAS EXPANSION FACTOR	245 (Pelican 5)
GIIP (TCF)	**0.742**
RECOVERY FACTOR (%)	85
REC. GAS (TCF)	**0.630**
SHRINKAGE FACTOR (%)	70
SALES GAS (TCF)	**0.441**
LIQUIDS FACTOR (BBLS/MMCF)	235 (Pelican 5)
RECOVERABLE LIQUIDS (MMSTB)	**148**



SAGASCO Resources Ltd.

A.C.N. 007 845 338

471109

BASS BASIN – TASMANIA

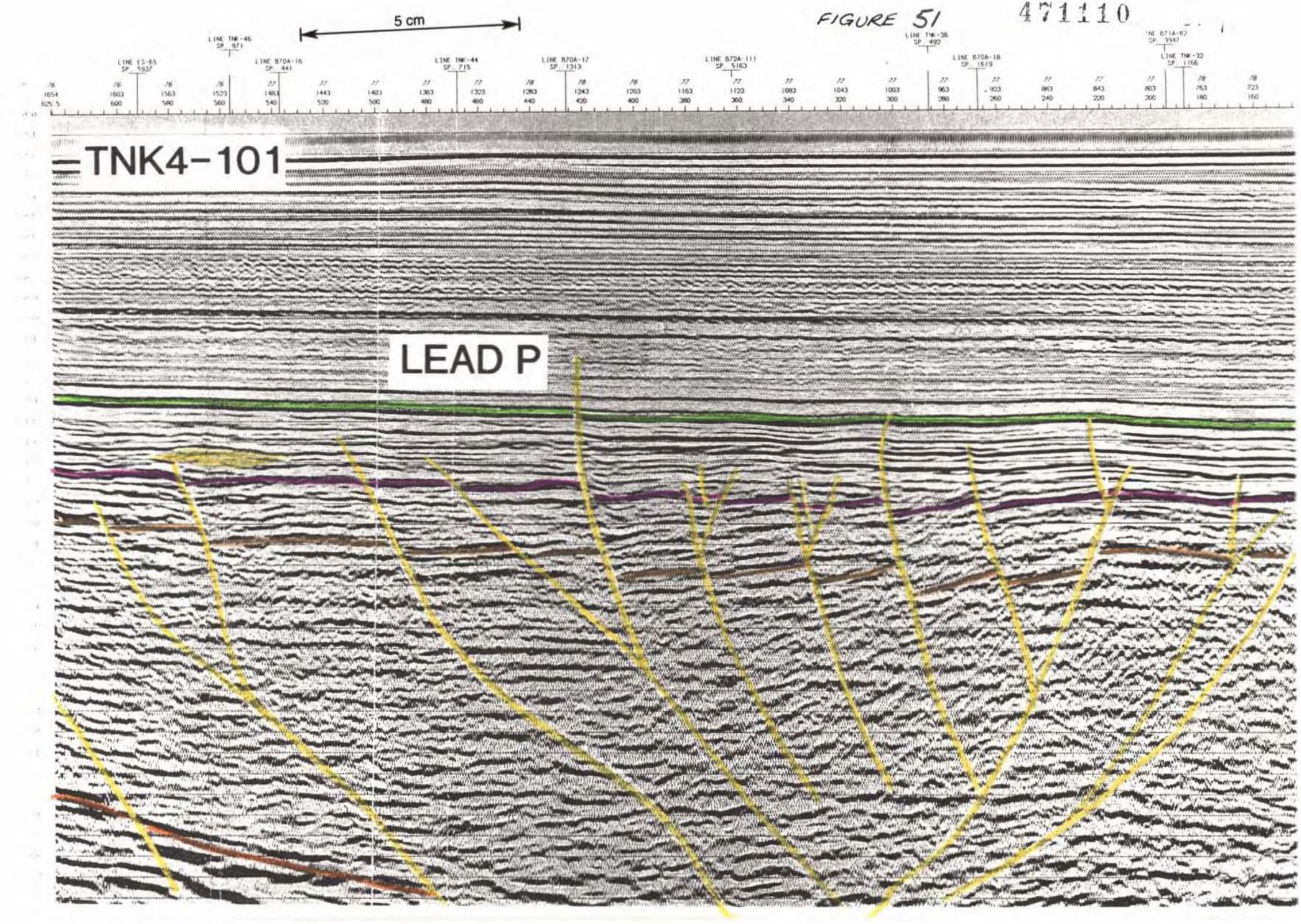
T91–2 GAZETTAL

MIDDLE M. DIVERSUS COMPOSITE TIME STRUCTURE

AUTHOR : R J SUTTILL	DATE : JULY 1991	PLAN No : BAS00.8067	
DRAWN : P.OLDHAM	DATUM		
[redacted]	CONTOUR INTERVAL	CHECKED :	FIG : 50

FIGURE 51

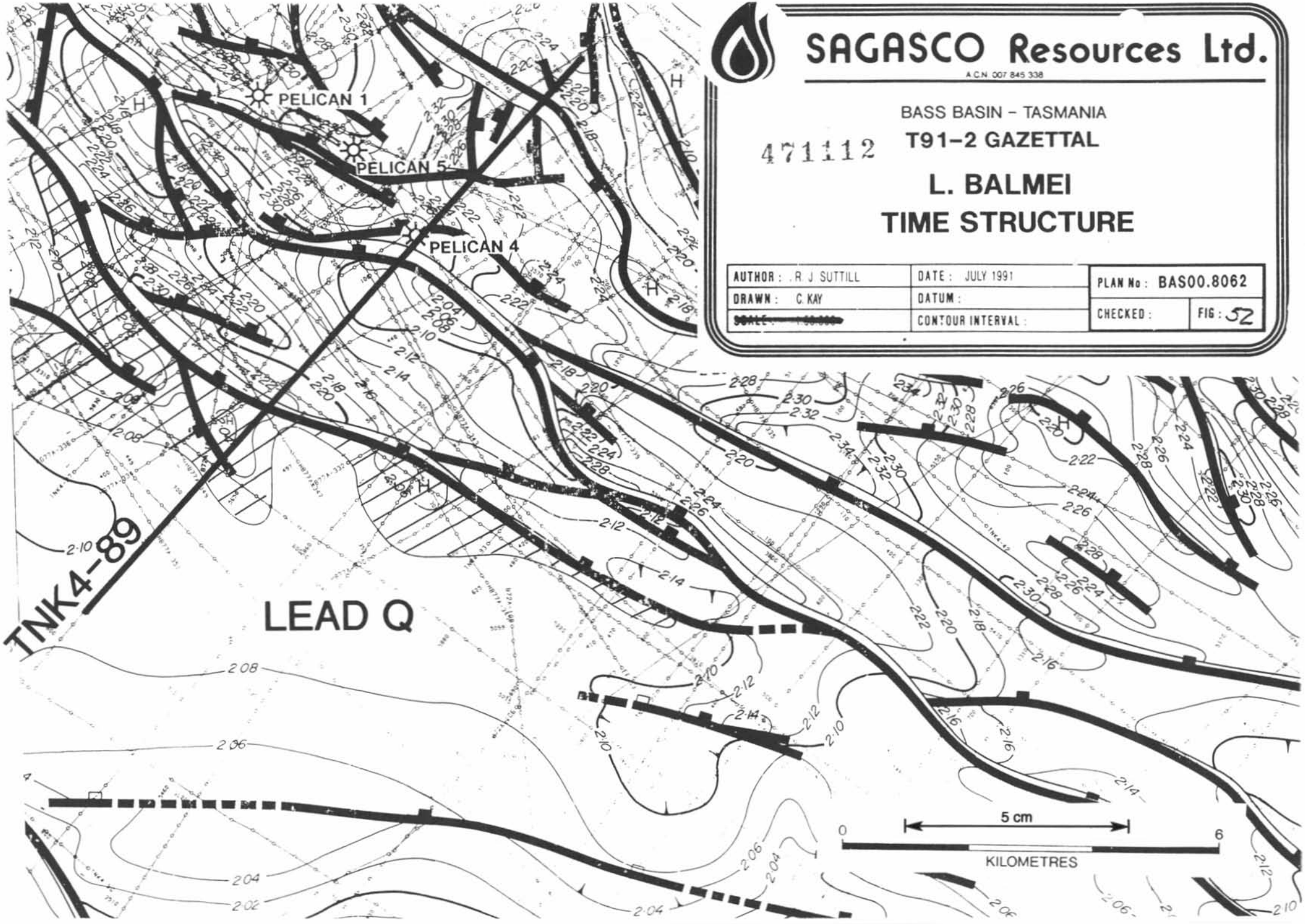
471110



GWF9107.009-RJS

LEAD Q

OBJECTIVE	M.*M. diversus*
CLOSURE (Km^2)	11.0 (at top *L.balmei*)
VERTICAL CLOSURE (m)	54 (at top *M.diversus*)
GROSS RESERVOIR THICKNESS (m)	473
DEPTH TO RESERVOIR (m)	2202
NET/GROSS RATIO (%)	24 (Pelican 5)
AVERAGE POROSITY (%)	14 (Av. effective Ø at Pelican 5)
HYDROCARBON SATURATION (%)	75
GAS EXPANSION FACTOR	245 (Pelican 5)
GIIP (TCF)	**0.202**
RECOVERY FACTOR (%)	85
REC. GAS (TCF)	**0.172**
SHRINKAGE FACTOR (%)	70
SALES GAS (TCF)	**0.120**
LIQUIDS FACTOR (BBLS/MMCF)	235 (Pelican 5)
RECOVERABLE LIQUIDS (MMSTB)	**40**



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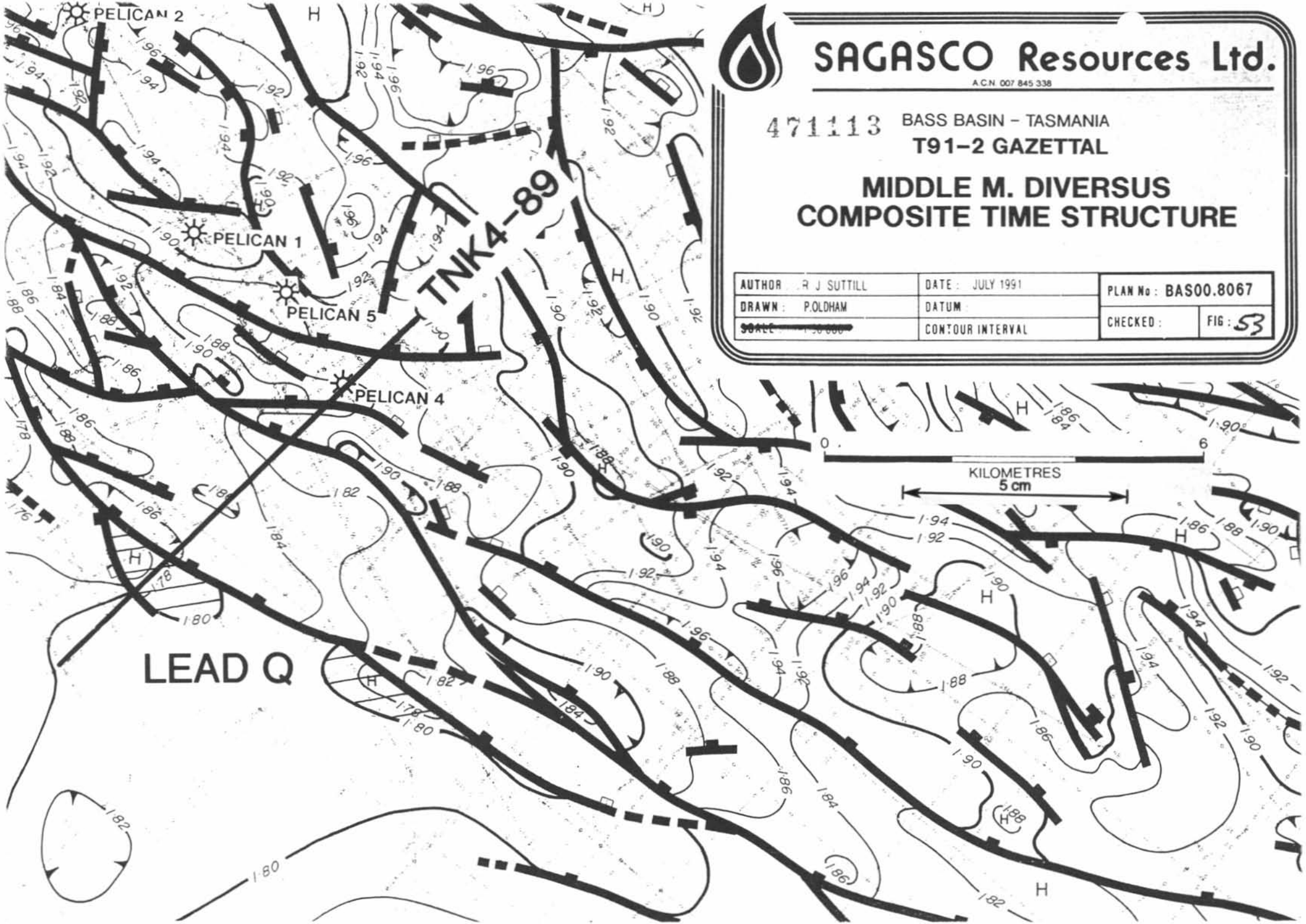
BASS BASIN – TASMANIA

471112

T91-2 GAZETTAL

L. BALMEI
TIME STRUCTURE

AUTHOR : R. J. SUTTILL	DATE : JULY 1991	PLAN No : BAS00.8062	
DRAWN : C. KAY	DATUM :	CHECKED :	FIG : 52
~~SCALE : 1:50000~~	CONTOUR INTERVAL :		



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A.C.N. 007 845 338

471113 BASS BASIN – TASMANIA

T91–2 GAZETTAL

MIDDLE M. DIVERSUS COMPOSITE TIME STRUCTURE

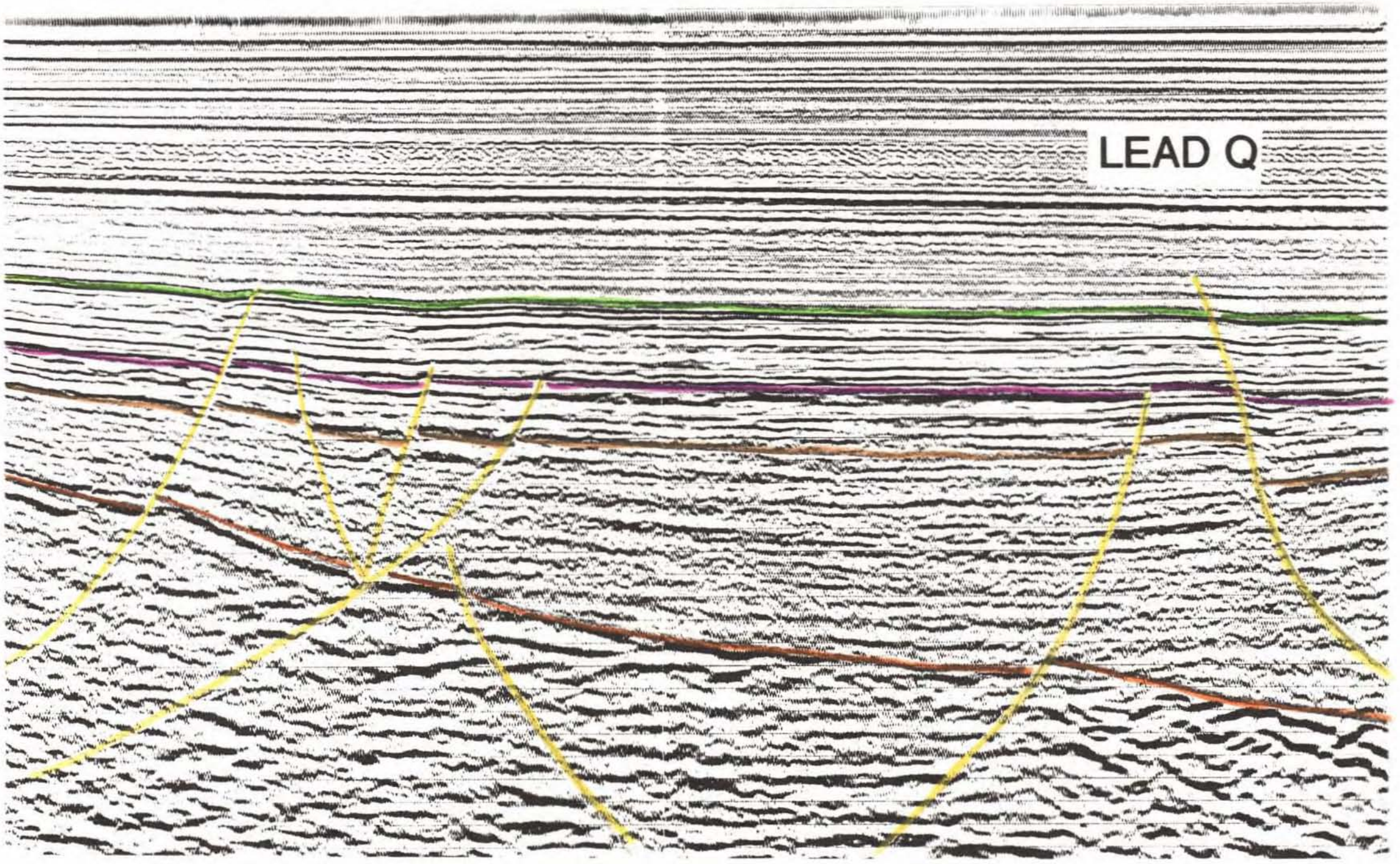
AUTHOR : R J SUTTILL	DATE : JULY 1991	PLAN No : BAS00.8067	
DRAWN : P.OLDHAM	DATUM :	CHECKED :	FIG : 53
~~SCALE~~	CONTOUR INTERVAL :		

TNK4-39

5 cm

FIGURE 54

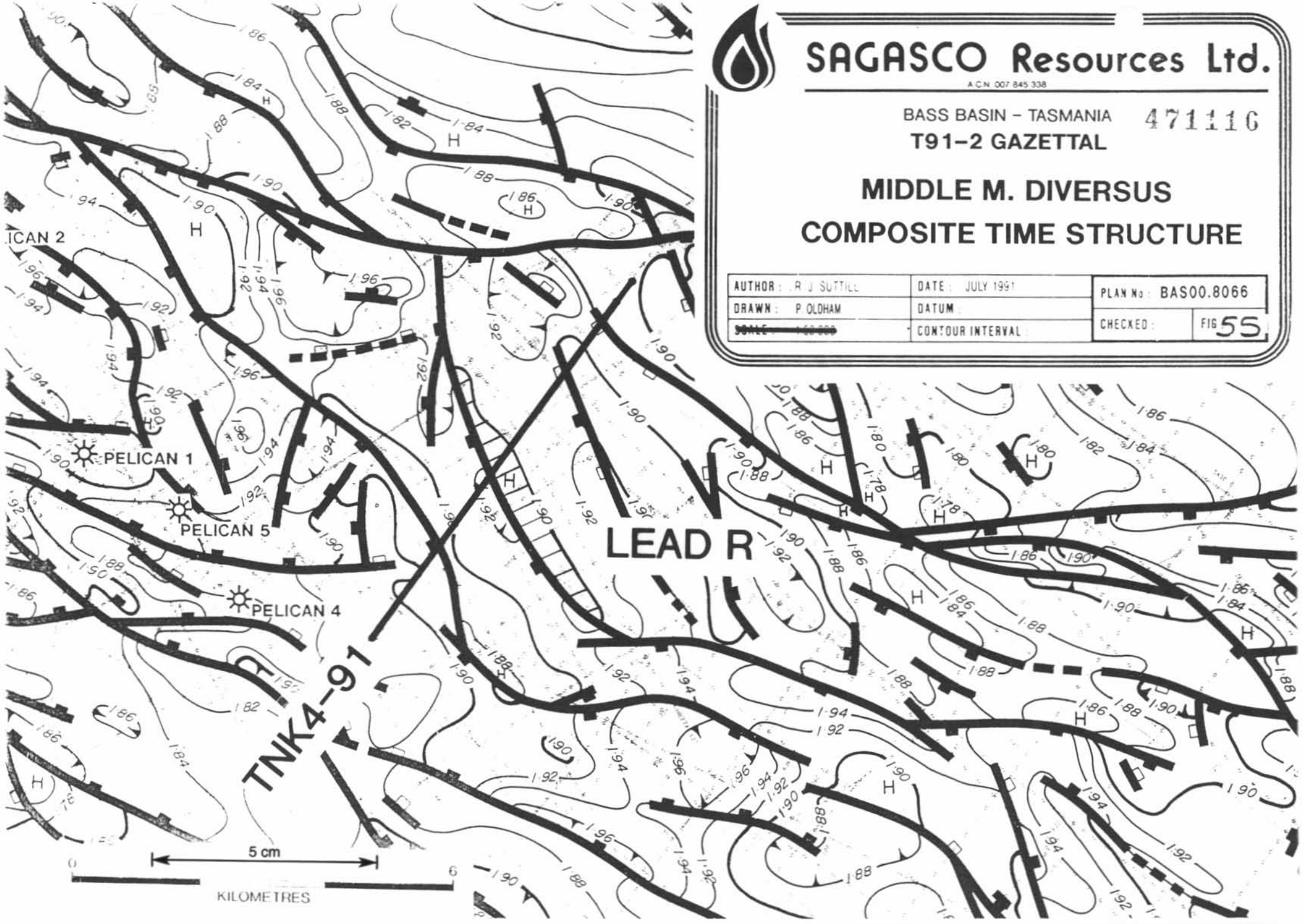
471114



GWF9107.009-RJS

LEAD R

OBJECTIVE	M.*M. diversus*
CLOSURE (Km^2)	1.89
VERTICAL CLOSURE (m)	15
GROSS RESERVOIR THICKNESS (m)	381
DEPTH TO RESERVOIR (m)	2423
NET/GROSS RATIO (%)	24 (Pelican 5)
AVERAGE POROSITY (%)	14 (Av. effective Ø at Pelican 5)
HYDROCARBON SATURATION (%)	75
GAS EXPANSION FACTOR	245 (Pelican 5)
GIIP (TCF)	**0.157**
RECOVERY FACTOR (%)	85
REC. GAS (TCF)	**0.133**
SHRINKAGE FACTOR (%)	70
SALES GAS (TCF)	**0.093**
LIQUIDS FACTOR (BBLS/MMCF)	235 (Pelican 5)
RECOVERABLE LIQUIDS (MMSTB)	**31**



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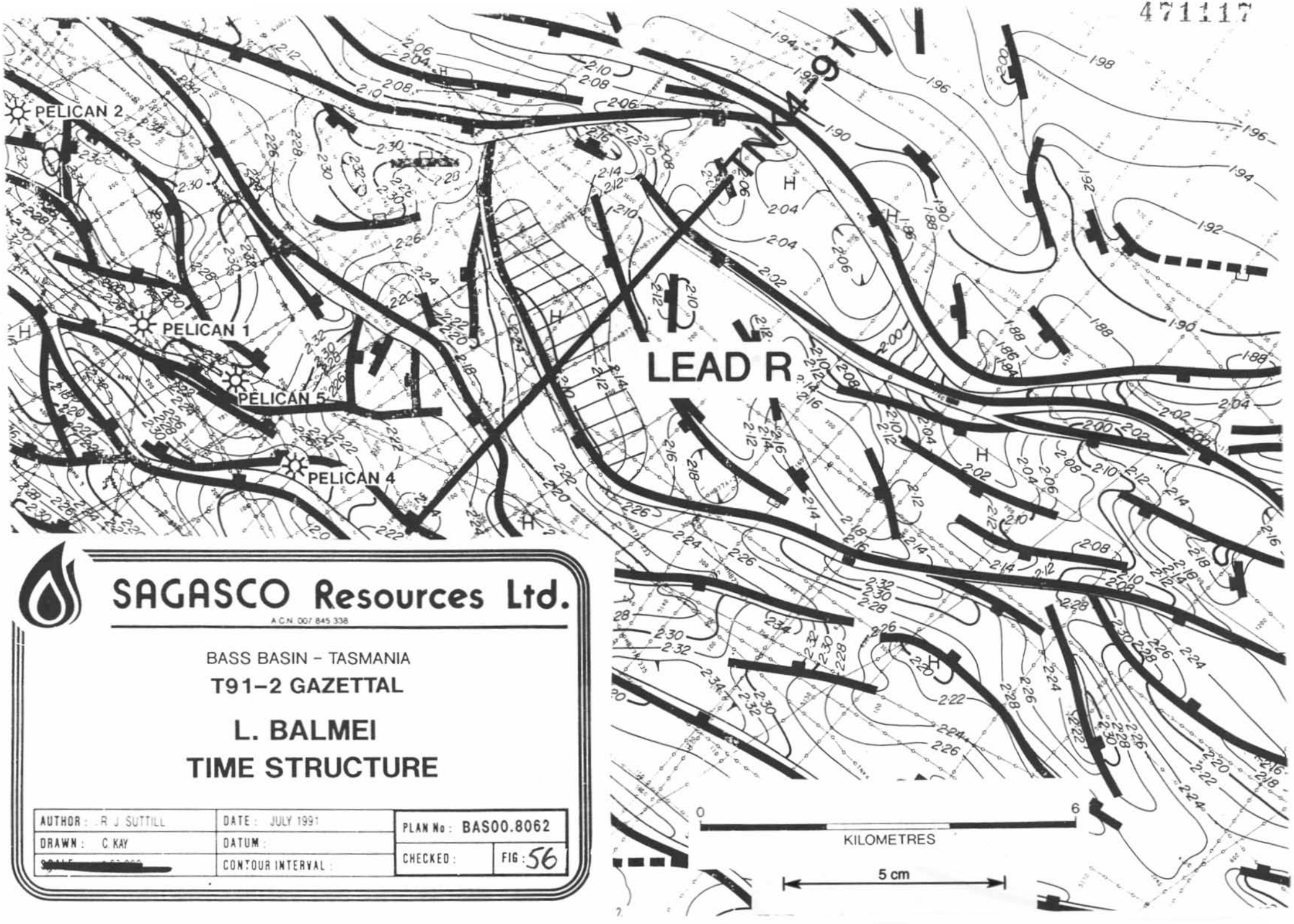
A.C.N. 007 845 338

BASS BASIN – TASMANIA 471116

T91–2 GAZETTAL

MIDDLE M. DIVERSUS
COMPOSITE TIME STRUCTURE

AUTHOR : R. J. SUTTILL	DATE : JULY 1991	PLAN No : BAS00.8066	
DRAWN : P. OLDHAM	DATUM :	CHECKED :	FIG 55
~~SCALE 1:50,000~~	CONTOUR INTERVAL :		



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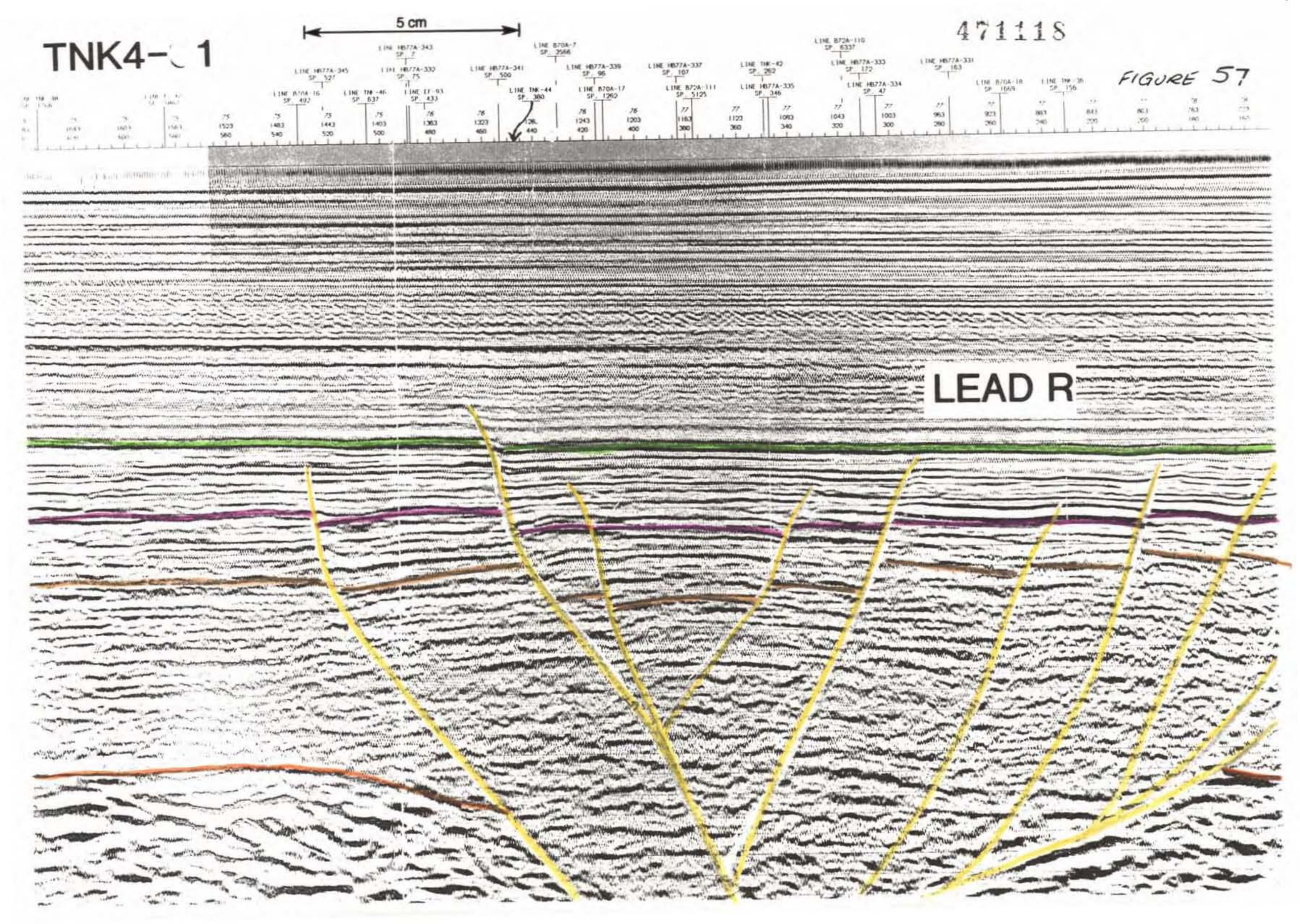
A.C.N. 007 845 338

BASS BASIN – TASMANIA

T91–2 GAZETTAL

L. BALMEI
TIME STRUCTURE

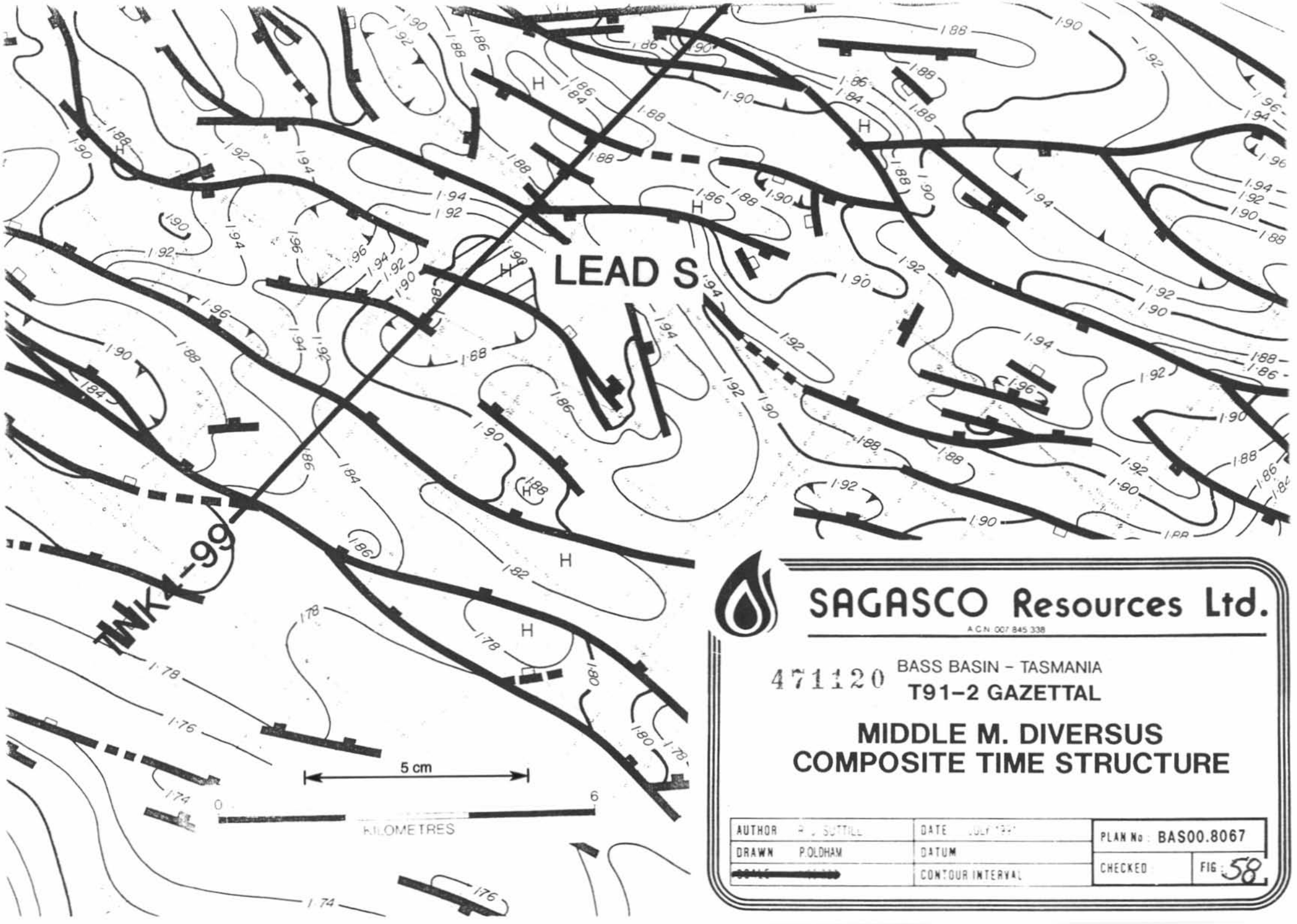
AUTHOR : R. J. SUTTILL	DATE : JULY 1991	PLAN No : BAS00.8062	
DRAWN : C. KAY	DATUM :	CHECKED :	FIG : 56
[redacted]	CONTOUR INTERVAL :		


TNK4-1
5 cm
471118
FIGURE 57
LEAD R

GWF9107.009-RJS

LEAD S

OBJECTIVE	M.*M. diversus*
CLOSURE (Km^2)	3.43 (at top *L.balmei*)
VERTICAL CLOSURE (m)	91 (at top M.*M. diversus*)
GROSS RESERVOIR THICKNESS (m)	511
DEPTH TO RESERVOIR (m)	2438
NET/GROSS RATIO (%)	24 (Pelican 5)
AVERAGE POROSITY (%)	14 (Av. effective Ø at Pelican 5)
HYDROCARBON SATURATION (%)	75
GAS EXPANSION FACTOR	245 (Pelican 5)
GIIP (TCF)	**0.382**
RECOVERY FACTOR (%)	85
REC. GAS (TCF)	**0.325**
SHRINKAGE FACTOR (%)	70
SALES GAS (TCF)	**0.228**
LIQUIDS FACTOR (BBLS/MMCF)	235 (Pelican 5)
RECOVERABLE LIQUIDS (MMSTB)	**76**



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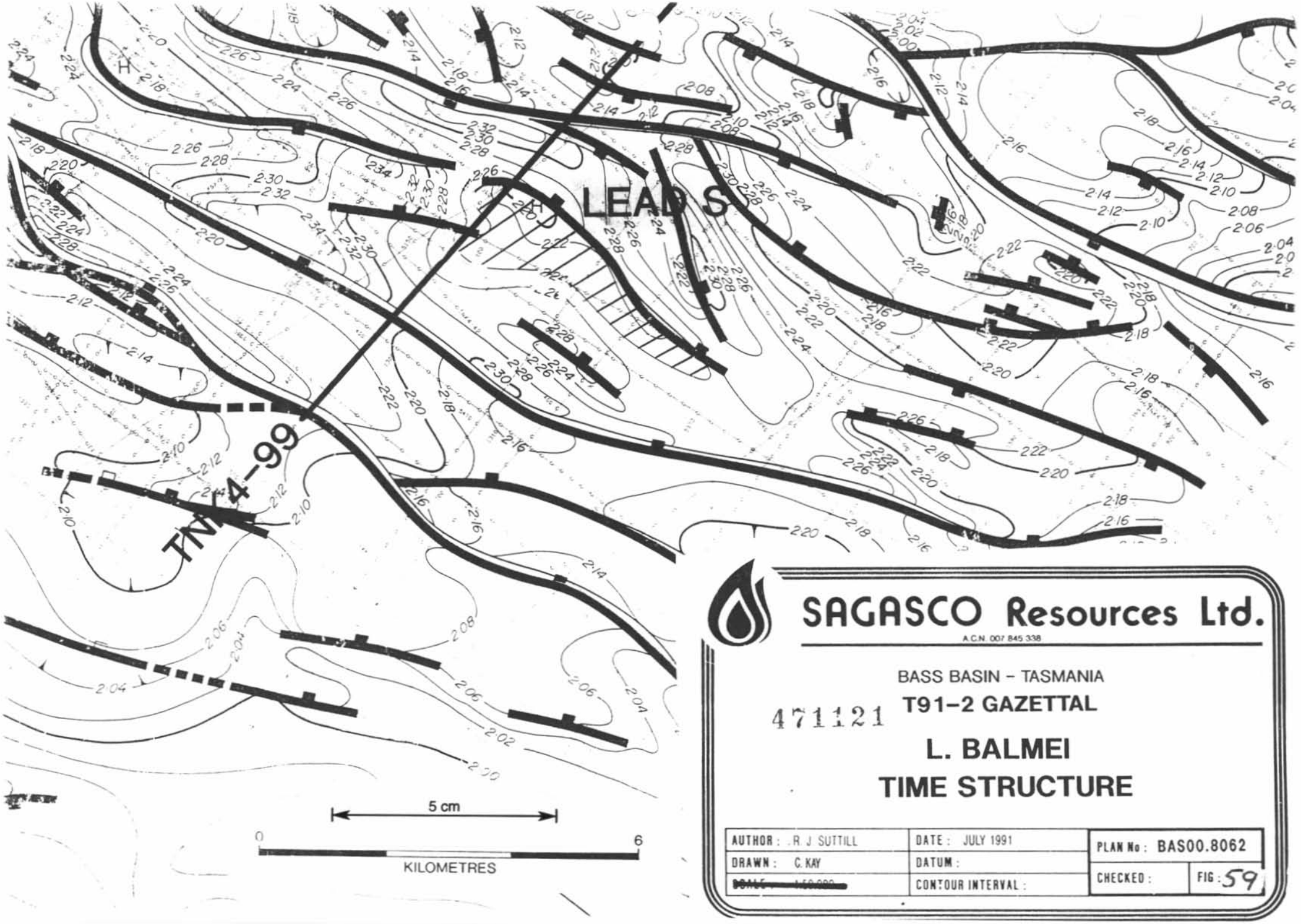
A.C.N. 007 845 338

471120 BASS BASIN – TASMANIA

T91–2 GAZETTAL

MIDDLE M. DIVERSUS COMPOSITE TIME STRUCTURE

AUTHOR R. J. SUTTILL	DATE JULY '91	PLAN No: BAS00.8067	
DRAWN P.OLDHAM	DATUM	CHECKED	FIG: 58
[redacted]	CONTOUR INTERVAL		



SAGASCO Resources Ltd.

A.C.N. 007 845 338

BASS BASIN – TASMANIA

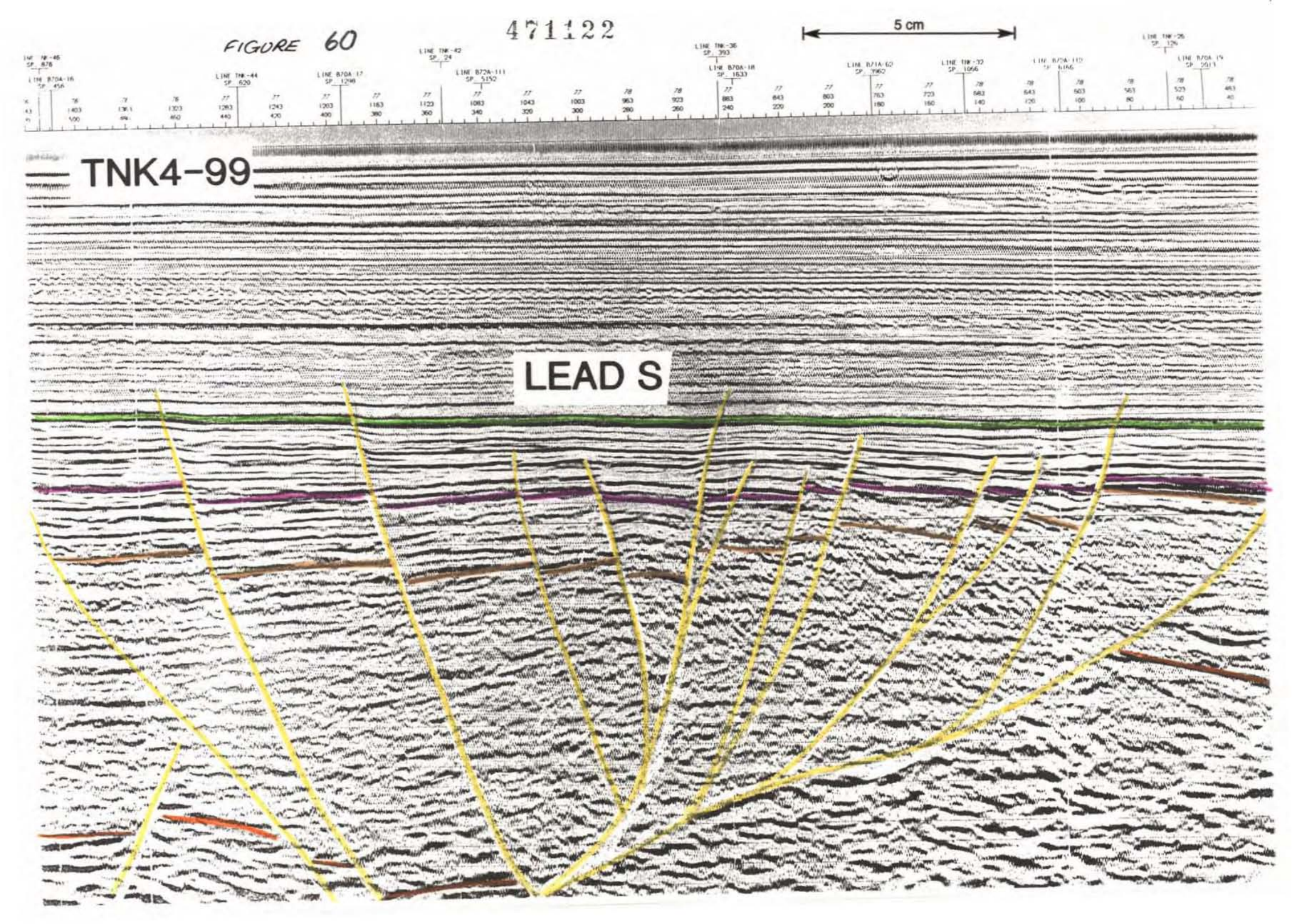
471121 **T91–2 GAZETTAL**

L. BALMEI
TIME STRUCTURE

AUTHOR : R. J. SUTTILL	DATE : JULY 1991	PLAN No : BAS00.8062	
DRAWN : C. KAY	DATUM :	CHECKED :	FIG : 59
~~SCALE : 1:50,000~~	CONTOUR INTERVAL :		

FIGURE 60

471122



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Etheridge, M.A., Branson, J.C. & Stuart-Smith, P.G. (1985) Extensional basin forming structures in Bass Basin and there importance for hydrocarbon exploration. APEA Journal, Volume 25, Part 1, P 345-361.

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APPENDIX 1

WELL SUMMARY & POST MORTEM SHEETS

APPENDIX 1

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WELL SUMMARY AND POST MORTEM

WELL: Pelican 1 **OPERATOR:** Esso **PERMIT:** T/P6

LOCATION: Lat: 40° 20' 20.8"S Long: 145° 50' 37.1"E

SPUD: 19 March 1970 **RIG RELEASE:** 1 May 1970

TD: 3178.5m **KB:** 30.48m **WATER DEPTH:** 76.5m

DRILLING RIG: Ocean Digger **STATUS:** Gas/Cond. Discovery, P&A

STRUCTURE: Pelican 1 is located on a fault segment of the highly faulted Pelican anticline. At the time of drilling the location was selected on the basis of faulted closure at the "uppermost" M.diversus level. Current mapping indicates that the well is within closure at the top of the middle M. diversus level. No closure occurs at the top of the Eastern View Coal Measures at this location.

STRATIGRAPHY:

	KB(M)	SS(M)
Torquay Group	107.0	- 76.5
Demons Bluff Fm	1635.2	-1604.7
EVCM	1755.6	-1725.2
M.M.diversus	2449.1	-2418.6
L.balmei	3113.5	-3083.1
TD (upper L.balmei)	3178.5	-3148.0

DRILLING DATA:

Hole Size (")	Depth (m:KB)
17½	777.2
12¼	2612.1
8½	3178.5
Casing Size (")	**Depth (m:KB)**
20	263.7
13 3/8	765.7
9 5/8	2603.0

DRILLING: No drilling problems related to the geology were reported.

CORES: Ten cores were cut as follows:

1	1706.9 - 1716.0m	Rec	9.1m	Demons Bluff Fm
2	1780.0 - 1786.4m	Rec	6.4m	Basal Demons Bluff Fm
3	2167.1 - 2173.2m	Rec	6.1m	EVCM - P.asperopolus
4	2361.9 - 2370.4m	Rec	8.5m	EVCM - upper M.diversus
5	2546.3 - 2555.4m	Rec	9.1m	EVCM - middle M.diversus
6	2603.0 - 2612.1m	Rec	9.1m	EVCM - middle M.diversus
7	2823.4 - 2829.5m	Rec	6.1m	EVCM - middle M.diversus
8	2873.0 - 2882.2m	Rec	8.5m	EVCM - lower M.diversus
9	3065.7 - 3074.8m	Rec	9.1m	EVCM - lower M.diversus
10	3165.7 - 3169.3m	Rec	3.7m	EVCM - upper L.balmei

SWC: 135 cores were attempted between 271.3 - 3161.4m
127 were recovered.

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TESTS: 21 FIT's were performed as listed below, no drill stem tests were performed.

FIT 1 — 2608.2m (8557')
Failed.

FIT 2 — 2585.9m (8484')
REC: 118 cubic feet Gas
+2500 cc Condensate
+7500 cc Mud Filtrate.
FSIP = 3710 psi
FS = 3549 psi
HP = 4640 psi

FIT 3 — 2550.3m (8367')
REC: 108.2 cubic feet Gas
+ 3250 cc Condensate
FSIP = 3530 psi
FP = 3040 psi
HP = 4360 psi

FIT 4 — 2480.5m (8138')
REC: 21,500 cc Mud Filtrate
FSIP = 3660 psi
FP = 3533 psi
HP = 4357 psi

FIT 5 — 2473.5m (8115')
REC: 26.5 cubic feet Gas
+ 1000 cc Condensate
+ 1000 cc Mud Filtrate
(chamber plugged?)
FSIP = 3596 psi
FP = 62 psi
HP = 4347 psi

FIT 6 — 2595.4m (8515')
REC: 125 cc Mud Filtrate
FSIP = 3600 psi
FP = 0 psi
HP = 4480 psi

FIT 7 — 3160.m (10,368')
REC: Mud, Failed

FIT 8 — 3161.4m (10,372')
REC: 37.5 cubic feet Gas
+ 550 cc Condensate
FSIP = 6114 psi
FP = 409 psi
HP = 6202 psi

FIT 9 — 3058.1m (10,033')
REC: Mud, Failed

FIT 10 — 3061.7m (10,045')
REC: Mud, Failed

FIT 11 3004.7m (9,858')
REC: 4800 cc Mud Filtrate
FSIP = 5100 psi
FP = 300 psi
HP = 5950 psi

FIT 12 2887.7m (9474')
REC: 21,000 cc Mud Filtrate
FSIP = 4575 psi
FP = 160 psi
HP = 5709 psi

FIT 13 3060.5m (10,041')
REC: 3.2 cubic feet Gas
+ 21,000 cc Mud Filtrate
+ trace condensate
FSIP = 5191 psi
FP = 280 psi
HP = 6015 psi

FIT 14 2871.8m (9422')
REC: Mud, Plugged

FIT 15 2872.4m (9424')
REC: 0.4 cubic feet Gas
+ 1000 cc Mud Filtrate
FSIP = 4311 psi
FP = 41 psi
HP = 5057 psi

FIT 16 2858.4m (9378')
REC: 3500 cc Mud Filtrate
FSIP = 4326 psi
FP = 50 psi

FIT 17 2794.1m (9167')
REC: 1750 cc Mud Filtrate
FSIP = 4145 psi
FP = 36 psi
HP = 4891 psi

FIT 18 2775.8m (9107')
REC: 230 cc Mud Filtrate
FSIP = Not reported
FP = 10 psi
HP = 4865 psi

FIT 19 2738.6m (8985')
REC: 69.8 cubic feet Gas
+ 1000 cc Condensate
+ 1750 cc Mud Filtrate
FSIP = 3948 psi
FP = 3653 psi
HP = 4756 psi

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FIT 20	2633.5m (8640') REC: 2200 cc Mud Filtrate FSIP = 3855 psi FP = 2818 psi HP = 4616 psi
FIT 21	2550.3m (8367') REC: = 139 cubic feet Gas + 6000 cc Condensate FSIP = 3684 psi FP = 3647 psi HP = 4450 psi

SHOWS: Background gas (methane, ethane and minor propane) were recorded through the Eastern View Coal Measures to approximately 2470m with peaks associated with coals. Below 2470m gas peaks (up to pentane) are recorded from sandstones belonging to the middle and lower M. diversus palynological zones. Also reported from these sandstones are numerous shows of good fluorescence and good cut.

RESERVOIR: Excellent quality sandstone reservoirs occur in the upper EVCM above the middle M. diversus palynological zone. Sandstones belonging to the lower to middle M. diversus palynological zones have log derived average effective porosities of 17-23% (Amoco report: Pelican Field Reserves). Core analysis data supports the log derived porosities and shows a wide variation in permeabilities which range from 1-400 md.

Facies analyses of core conclude that the sandstones of the lower to middle M. diversus zones were deposited in deltaic, fluvial and lacustrine environments and typically comprise fluvial channel fills and shoreface sandstones.

MATURITY: The maximum mean vitrinite reflectance of 0.86% recorded in Pelican 1 was near total depth at 3167.5m in the upper L. balmei sediments which are therefore near peak maturity for oil. The start of the oil window occurs at approximately 2600m (0.7% vitrinite reflectance), near the top of the middle M. diversus zone reservoir section.

SOURCE ROCK: A sequence of eight samples between 1783.3m and 3074.2m (upper EVCM to lower M. diversus) yielded total organic carbon contents of 0.63% for a light brown silty clay to 58.40% for a coal. Detailed analyses were undertaken on three samples, 1783.3m light brown silty clay, 2170.8m a very dark coaly shale or shaly coal, and at 2825.2m a dark laminated shale.

The light brown silty clay (1783.3m) has poor genetic potential (0.8mg/g) a low hydrogen index of 73 and a T max. of 405 (immature). The very dark coaly shale (2170.8m) had a high generic potential of 67.28 mg/g, a hydrogen index of 225 and was marginally to moderately mature. The dark laminated shale has a moderate source rock potential and a hydrogen index indicative of gas and some oil generation.

Total extracts yielded are fair for sample 1783.3, very high for 2170.8m and good for 2825.2m. The coaly sample at 2170.8m is believed to contain migrated hydrocarbons as indicated by the high amount of total extract at a relatively moderate level of maturity.

Samples from 1783.3m and 2170.3m are rich in aromatics indicative of a coaly source and both have a high pristane/phytane ratio indicating a land plant origin for the kerogen.

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CONTRIBUTIONS TO KNOWLEDGE/REASONS FOR FAILURE:

Pelican 1 established the presence of excellent quality reservoirs in the upper EVCM, but they were outside closure and water bearing.

In the lower to middle M. diversus zone condensate charged reservoirs were encountered within closure with good porosity. The deliverability characteristics of these reservoirs was not established by testing and the disappointing results from equivalent zones at Pelican 5 are cause for concern.

Maturity and source rock data from Pelican 1 together with the gas-condensate recoveries from FIT's have established the Pelican half graben as a major hydrocarbon source kitchen.

GWF9107.009-RJS

WELL SUMMARY AND POST MORTEM

WELL: Pelican 2 **OPERATOR:** Esso **PERMIT:** T/P5

LOCATION: Lat: 40° 18' 28.426"S Long: 145° 49' 12.27"E

SPUD: 28 July 1970 **RIG RELEASE:** 7 September 1970

TD: 3068.1m **KB:** 30.48m **WATER DEPTH:** 77.7m

DRILLING RIG: Ocean Digger **STATUS:** Gas/Cond Appraisal, P&A

STRUCTURE: Pelican 2 is located 4km to the northwest of Pelican 1 on a separate fault closed segment of the Pelican anticline. Current mapping indicates fault dependant closure at the middle M. diversus and L. balmei levels. No closure is mapped at the top of the Eastern View Coal Measures at this location.

STRATIGRAPHY:

	KB(M)	SS(M)
Torquay Group	108.2	- 77.7
Demons Bluff Fm	1674.6	-1644.1
EVCM	1794.7	-1764.2
M.M. diversus	2533.0	-2502.5
TD (lower M. diversus)	3068.1	-3037.6

DRILLING DATA:

Hole Size (")	Depth (m:KB)
12¼	3068.1
Casing size (")	**Depth (m:KB)**
20	264.3
13 3/8	9092

DRILLING: No drilling problems related to the geology were reported.

CORES: Three cores were cut as follows:

1.	2923.9 - 2932.2m	Rec	6.7m	EVCM middle M. diversus
2.	2981.6 - 2990.7m	Rec	9.1m	EVCM lower-middle M. diversus
3.	3017.8 - 3027.0m	Rec	9.1m	EVCM lower M. diversus

SWC: 89 cores were attempted between 944.9 - 3066.3m
80 were recovered.

TESTS: 11 FIT's were performed as described below, no drill stem tests were performed.

FIT 1-1 2879.5m (9447')
REC: 37 cubic feet Gas
+ 750 cc Condensate
+ 13,000 cc Mud Filtrate
FSIP = 4316 psi
FP = 407 psi
HP = 5300 psi

FIT 1-2 2828.3m (9312')
REC: 100 cc Mud
FSIP = 0 psi
FP = 57 psi
HP = 4986 psi

FIT 2-1 2788.6m (9149')
REC: 1.0 cubic feet Gas
+ 3800 cc Mud Filtrate
+ trace oil
FSIP = 4094 psi
FP = 57 psi
HP = 4800 psi

FIT 3-1 3050.1m (10,007')
REC: 50 cc Mud
FSIP = 0 psi
FP = 63 psi
HP = 5300 psi

FIT 3-2 2982.2m (9784')
REC: 50 cc Mud
FSIP = Not reported
FP = 26 psi
HP = 5182 psi

FIT 3-3 3019.3m (9906')
REC: 0.4 cubic feet Gas
+ 2100 cc Mud Filtrate
FSIP = 4997 psi
FP = 0 psi
HP = 5254 psi

FIT 3-4 2958.4m (9706')
REC: 3.7 cubic feet Gas
+ 16,300 cc Mud Filtrate
FSIP = 4377 psi
FP = 330 psi
HP = 5130 psi

FIT 3-5 3049.8m (10,006')
REC: 50 cc Mud
FSIP = 200 psi
FP = 200 psi
HP = 5300 psi

FIT 3-6 2982.5m (9785')
REC: 0.6 cubic feet Gas
+ 3400 cc Mud Filtrate
FSIP = 4796 psi
FP = 195 psi
HP = 5091 psi

FIT 3-7 3018.7m (9904')
REC: 1.7 cubic feet Gas
+ 3400 Mud Filtrate
FSIP = 4995 psi
FP = 40 psi
HP = 5219 psi

FIT 3-8 2982.2m (9784')
REC: 0.6 cubic feet Gas
+ 5300 Mud Filtrate
FSIP = 4824 psi
FP = 48 psi
HP = 5095 psi

SHOWS: Background gas (methane and ethane) were recorded through the Demons Bluff Fm and the upper EVCM to the top of the middle M. diversus zone at 2533m. In sandstones of the lower to middle M. diversus zone several gas peaks were recorded with butane recorded on the gas chromatograph. These shows which were often accompanied by fluorescence continued to total depth.

RESERVOIR: Pelican 2 had similar reservoir distribution and quality to that encountered in Pelican 1. In particular Pelican 2 established that some of the thicker sandstones penetrated in the lower to middle M. diversus zone at Pelican 1, extended between the two wells.

MATURITY: The maximum mean vitrinite reflectance of 0.82% was recorded near total depth at 3020.9m and is in agreement with the maturity profile established for Pelican 1.

SOURCE ROCK: There is no source rock data for samples from Pelican 2, see reports of detailed analyses conducted on the nearby Pelican 5.

CONTRIBUTIONS TO KNOWLEDGE/REASONS FOR FAILURE:

Pelican 2 confirmed the presence of the gas condensate charged reservoirs in the lower to middle M. diversus zone discovered in Pelican 1, on a separate fault block at the northern edge of the Pelican anticline.

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WELL SUMMARY AND POST MORTEM

WELL: Pelican 3 **OPERATOR:** Esso **PERMIT:** T/6P

LOCATION: Lat: 40° 15' 44.99"S Long: 145° 51' 50.60"E

SPUD: 1 May 1972 **RIG RELEASE:** 13 June 1972

TD: 2906.9m **KB:** 9.75m **WATER DEPTH:** 80.2m

DRILLING RIG: Glomar Conception **STATUS:** Gas shows, P&A

STRUCTURE: Pelican 3 is located on the high northern side of the major bounding fault to the Pelican half graben, it is therefore not located on the Pelican anticlinal feature where Pelican 1, 2, 4 and 5 were drilled. The well is located on a fault dependant closure at the middle M. diversus and L. balmei levels and near the crest of a fault independent closure at the top of the Eastern View Coal Measures.

STRATIGRAPHY:

	KB(M)	SS(M)
Torquay Group	90	- 80.2
Demons Bluff Fm	1667	-1657
EVCM	1788	-1778
M.M. diversus	2289	-2279
L. balmei	2416	-2406
TD (lower L. balmei)	2906.9	-2897.2

DRILLING DATA:

Hole size (")	Depth (m:KB)
12¼	2906.9
Casing size (")	**Depth (m:KB)**
20	237.1
13 3/8	923.2
9 5/8	2897.1

DRILLING: Abnormal pressure was encountered at approximately 2560m.

CORES: Three cores were cut as follows:

1.	2850.2 - 2864.5m	Rec	14.3m	EVCM - lower L. balmei
2.	2864.5 - 2883.4m	Rec	18.9m	EVCM - lower L. balmei
3.	2883.4 - 2902.0m	Rec	18.6m	EVCM - lower L. balmei

SWC: 60 cores were attempted between 975.3 - 2814.8m
48 were recovered.

TESTS: A production test over the inteval 2799.3 - 2817.3m recovered formation water after reverse circulating, with minor gas at a rate too small to measure. In addition 16 FIT's were run as described below:

FIT 1	2801.4m Lost seal, Recovered mud
FIT 2	2801.1m Nil recovery, tight

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FIT 3	2826.4m Nil recovery, tight
FIT 4	2870.6m REC 0.4 cubic feet Gas + 2100 cc water FSIP = 5143 psi HP = 5325 psi
FIT 5	2872.7m Nil recovery, lost seal, tight
FIT 6	2871.5m REC 22,000 cc Mud FSIP = 5252 psi HP = 5315 psi
FIT 7	2895.0m Nil recovery tight
FIT 8	2814.8m Nature of recovered fluids not identified. ISIP = 5067 psi FSIP = 4965 psi HP - 5534 psi
FIT 9	2872.7m REC 0.7 cubic feet gas + 7000 cc water ISIP = 5250 psi HP = 5753 psi
FIT 10	2815.4m REC 100 c water + trace mud, tight test
FIT 11	2800.2m Rec mud, no seal
FIT 12	2779.5m Nil recovery, no seal
FIT 13	2814.5m Nature of recovered fluids not identified. ISIP = 5000 psi FSIP = 4900 psi HP = 5700 psi
FIT 14	2872.4m Tool failure
FIT 15	2872.4m Nature of recovered fluids not identified FSIP = 5248 psi HP = 5759 psi
FIT 16	273.3m Nil recovery, tight. ISIP = 4455 psi HP = 5459 psi

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SHOWS: Minor gas shows were reported during drilling in the Palaeocene over the interval 2778 - 2820m and weak shows of fluorescence occurred in cores 1 to 3 over the interval 2850.2 - 2902m. FIT's and production testing recovered only minor gas from these zones.

RESERVOIR: Core analysis results from cores 1, 2 and 3 indicate reservoir quality in the Palaeocene abnormally pressured zone is poor with porosities in the range 8 - 23% and typical permeabilities of less than 2 millidarcies.

MATURITY: Only two vitrinite reflectance determinations have been made from samples from Pelican 3. Both samples are from near total depth and give a mean vitrinite reflectance range of 0.67 - 0.71% indicating the sediments are near the onset of the oil mature window.

SOURCE ROCK: Total organic carbon contents were determined for three samples at 2861.0, 2877.0 and 2891.0m giving values of 2.86, 1.50 and 1.42% respectively. The richest sample, at 2861.0m, a grey laminated shale was investigated further. Rock Eval results classify this sample as a moderate source rock, with a fairly low hydrogen index of 84 and a moderate maturity level (Tmax 434). The sediment yielded a good amount of total extract which was rich in aromatic hydrocarbons.

Terrestrial origin is indicated by odd - even predominances of the C_{25}+ n-alkanes, a low $(C_{21}+C_{22})$ / $(C_{28}+C_{29})$ ratio, low C_{27}/C_{29} diasterane and sterane ratios and the presence of eudesmane and diterpanes.

CONTRIBUTIONS TO KNOWLEDGE/REASONS FOR FAILURE:

Pelican 3 established that the lower to middle M. diversus palynological zone sediments that contained gas condensate charged reservoirs in Pelican 1 and 2 had thinned considerably over the Pelican 3 structure. Palynological age dating established that the lower to middle M. diversus sequence had thinned from 558m over the Pelican structure to 127m at Pelican 3. Also no sediments of the lower M. diversus zone were identified indicating that they are thin or absent due to onlap at Pelican 3.

The absence of hydrocarbons in the good quality middle M. diversus sandstones is interpreted to be due to the juxtaposition of these reservoirs with high porosity high permeability sandstones of the upper M. diversus and P. asperopolus zones across the fault which forms the southwestern limit of closure.

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WELL SUMMARY AND POST MORTEM

WELL: Pelican 4 **OPERATOR:** Hematite **PERMIT:** T/6P

LOCATION: Lat: 40° 21' 40.02"S Long: 145° 52' 15.36"E

SPUD: 17 January 1979 **RIG RELEASE:** 18 February 1979

TD: 3051m **KB:** 25m **WATER DEPTH:** 77.4m

DRILLING RIG: Ocean Endeavour **STATUS:** Gas Cond Appraisal, P&A

STRUCTURE: Pelican 4 is located 3.5 km southeast of Pelican 1 on a separate fault block of the Pelican anticline. Closure at the middle M. diversus and L. balmei levels is dependant on sealing on at least two faulted margins.

At the top of the Eastern View Coal Measures the well is located near the western limit of a large fault independant closure. A fault intersects the well in the lower M. diversus zone and faults out the lower-most part of the lower M. diversus zone.

STRATIGRAPHY:

	KB(M)	SS(M)
Torquay Group	102.4	- 77.4
Demons Bluff Fm	1634	-1609
EVCM	1735	-1710
M.M. diversus	2443.5	-2418.5
L balmei	2960	-2935
T.D. (upper L. balmei)	3051m	-3026

DRILLING DATA:

Hole size (")	Depth (m:KB)
26	247.8
17½	870.2
12¼	3051

Casing size (")	Depth (m:KB)
20	231.3
13 3/8	850.1

DRILLING: No drilling problems related to the geology were encountered, however abnormally pressured sediments were encountered within the middle M. diversus zone.

CORES: Two cores were cut as follows:

1.	2846 - 2858m	Rec	12m	EVCM - lower M. diversus
2.	2918 - 2931m	Rec	13m	EVCM - lower M. diversus

SWC: 95 cores were attempted between 887.0 - 3037.3m
89 were recovered.

TESTS: Four FIT and three RFT tests were performed as described below, no drill tests were performed.

FIT 1 2739.5m (8988')
Rec: 47.66 cubic feet Gas
+ 1500 cc Condensate
FSIP = 4000 psi
FP = 60 psi
HP = 4902 psi

FIT 2 2793.2m (9164')
Rec: 0.34 cubic feet Gas
+ 15,700 cc Water
FSIP = 4200 psi
FP = 400 psi
HP = 5068 psi

FIT 3 2847.4m (9342')
Rec: 0.3 cubic feet Gas
+ 700 cc Water
FSIP = 0 psi
HP = 5000 psi

FIT 4 2815.7m (9238')
Rec: 0.1 cubic feet Gas
+ 20,700 cc Water
FSIP = 4250 psi
FP = 500 psi
HP = 5300 psi

RFT 1 2824.0m (9265')
Rec: 0.09 cubic feet Gas
+ 125 cc Condensate
+ 10,752 cc Water
ISIP = 4253 psi
HP = 5070 psi

RFT 2 2822.8m (9261')
Rec: 0.03 cubic feet Gas
+ 9250 cc Water

RFT 3 2884.6m (9464')
Rec: 69.5 cubic feet Gas
= 900 cc Condensate
= 11,400 cc Water
ISIP = 4388 psi
FSIP = 4289 psi
HP = 5874 psi

SHOWS: Hydrocarbons were recovered from wireline tests in three sands:

2519m, 125 cc condensate
2740m, 47.66 cubic feet gas, 1500 cc condensate
2885m, 69.5 cubic feet gas, 900 cc condensate

During drilling, fluoresence from coals was reported below 2210m and high gas readings were associated with coal beds. Gas with hydrocarbon fractions heavier than methane was recorded on the gas chromatograph from depths below 2579m.

RESERVOIR: Log derived porosities for sands in the lower to middle M. diversus zone range between 11.2% and 18.5%. Values obtained from core analysis range up to 20.5%. Permeabilities calculated from pressure data by the operator are described as low throughout the entire lower to middle M. diversus zone. Permeabilities measured from core are also low (less than 10 millidarcies).

MATURITY: Only two maturity measurements were made at Pelican 4, both at approximately 2916.9m. The measured mean maximum vitrinite reflectance was 0.73 - 0.75% and is in agreement with maturity profiles established in other Pelican wells.

SOURCE ROCK: No source rock data has been collected from samples from Pelican 4, see data and observations from nearby Pelican 5.

CONTRIBUTIONS TO KNOWLEDGE/REASONS FOR FAILURE:

Pelican 4 confirmed the presence of gas condensate charged lower to middle M. diversus reservoirs in a fault block at the southern end of the Pelican structure. Permeability data derived from core and test data were not encouraging and the well was plugged and abandoned.

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WELL SUMMARY AND POST MORTEM

WELL: Pelican 5 **OPERATOR:** Amoco **PERMIT:** T/22P

LOCATION: Lat: 40° 20' 43.472"S Long: 145° 41' 49.296"E

SPUD: 28 December 1986 **RIG RELEASE:** 16 April 1986

TD: 4267m **KB:** 22.3m **WATER DEPTH:** 77m

DRILLING RIG: Diamond M.Epoch **STATUS:** Gas Cond Appraisal, P&A

STRUCTURE: Pelican 5 was drilled to establish the deliverability characteristics of the lower to middle M. diversus gas condensate charged reservoirs discovered and appraised by Pelican 1, 2 and 4. The location was selected on the basis of a map produced at the top of the 'F' sand (the thickest of the reservoir sands in the M. diversus zone). The selected location was on the same faulted block as the Pelican 1 well approximately half way between it and Pelican 4.

A secondary objective of the well was to evaluate the reservoir and hydrocarbon charge potential of the Palaeocene and Late Cretaceous sedimentary sequence which also have closure over the Pelican structure.

STRATIGRAPHY:

	KB(M)	SS(M)
Torquay Group	99.7	- 77.4
Demons Bluff Formation	1630.0	1608.0
EVCM	1747.0	-1725.0
M.M. diversus	2553.0	-2531.0
L. balmei	3111.0	-3089.0
? T. lillei	3940.0	-3918.0
TD (T. lillei)	4267.0	-4245.0

DRILLING DATA:

Hole Size (")	Depth (m:KB)
36	195
26	411
17½	1776
12¼	3002
8½	3647
6	4267
Casing size (")	**Depth (m:KB)**
30	192.0
20	400.2
13 3/8	1753.8
9 5/8	2994.1
7	3647.2
5	4065.1

DRILLING: Minor difficulties were encountered in the Torquay group during the first logging run and during running the 13 3/8" casing due to tight hole conditions. Despite increasing abnormal pressures below the M. diversus palynological zone, no drilling problems were encountered.

CORES: Three cores were cut as follows:

1.	2790.5 - 2808.5m	REC	18.0m	EVCM-M.M.diversus
2.	2863.5 - 2881.7m	REC	18.2m	EVCM-M.M.diversus
3.	2881.7 - 2896.2m	REC	11.5m	EVCM-M.M.diversus

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SWC: 210 cores were attempted between 1800 - 4255m, 172 were recovered.

TESTS: Five RFT tests and six production tests through casing were performed as summarised below:

RFT 1	2788.3m (9148') REC: 9500 cc Mud Filtrate Trace Condensate
RFT 2	2881.0m (9452.1') REC: 6500 cc Mud Filtrate
RFT 3	2882.0m (9455.4') REC: 9500 cc Mud Filtrate
RFT 4	2788.2m (9147.6') REC: 38.4 cubic feet gas 400 cc Condensate 5000 cc Mud Filtrate
RFT 5	2788.24m (9147.8') REC: 9500 ccr Mud Filtrate
DST 1	3671.9 - 3685.6m (12,047.0 - 12,092.0') No pressure. No flow.
DST 1A	3685.6 - 3699.0m (12,092.0 - 12,136.0') No pressure. No flow.
DST 2	3611.9 - 3618.0m (11,850.0 - 11,870.0') No pressure. No flow.
DST 3	3611.9 - 3618.0m (11,850.0 - 11,870.0') and 3440.0 - 3451.0m (11,285.9 - 11,322,0') NGTS REC: Gas cut mud from upper zone. Shut in pressure 800 psi declining to zero.
DST 4	3142.0 - 3163.0m (10,308.0 - 10,378.8') GTS at 0.75 MMCFD with trace condensate after 9½ hours on a ½" choke. GTS at 0.433 MMCFD on a 2" choke with 0.5 barrel condensate from the separator.
DST 5	2869.0 - 2883.0m (9412.6 - 9458.5') REC: Small quantity of condensate (waxy and parafinnic; 51° API at 60°F), and flowed at 0-23 psi.
DST 5A	2855.0 - 2860.5m (9366.6 - 9384.7') REC: 85 barrels of GCM and WCM.
DST 6	2786.0 - 27900m (9140.0 - 9153.5') GTS @ 3.5 MMCFD with 450 BCPD on a 3/8" choke. GTS @ 5.6 MMCFD with 302-441 BCPD and 662-705 BWPD on a 3/4" choke.

SHOWS: Pelican 5 recorded a similar distribution of gas shows and shows of fluorescence through the lower and middle M. diversus zones to that encountered in Pelican 1, 2 and 4. Below the top of the Palaeocene the gas and florescence shows continued to total depth in the Late Cretaceous. Increased concentrations of the heavy hydrocarbons (Butane to Pentane) are observed on the gas chromatograph with increased depth.

RESERVOIR: The lower to middle M. diversus sequence contained similar quality reservoirs to those encountered in the earlier Pelican wells. In the Palaeocene and Late Cretaceous sequence similar deltaic and fluvial sandstone reservoirs were encountered to those in the lower to middle M. diversus zones. Log analysis by the operator prior to testing indicated the potential for 62m of net pay using cut off of SW <50%, Vsh <50% and porosity >10%. Despite these promising results production testing failed to meet the initial enthusiasm and many of the apparent pay zones proved to be tight with low permeability. Only two zones flowed hydrocarbons, at the top of the Palaeocene, a sandstone between 3142 - 3163m flowed gas at 0.75 MMCFD, and a test of a sand in the "E" unit of the middle M. diversus zone flowed at a more encouraging rate of 5.6 MMCFD with 302-441 BCPD and 662-705 BWPD. The water in the second test is interpreted to be from a deeper interval via communication behind casing as there was no water recovery during an earlier flow period.

MATURITY: Pelican 5 provides the most complete maturity profile for the central part of the Pelican half graben. The profile down to the top L. balmei zone matches that recorded in other Pelican wells. Peak oil maturity (vitrinite reflectance 1.1%) is reached at a depth of approximately 3,600m and the wet gas window (vitrinite reflectance 1.3%) starts at approximately 3800m. The maximum mean vitrinite reflectance of 1.67% was measured in the deepest sample near to total depth.

SOURCE ROCK: The primary source rock interval in T91-2 is the Eastern View Coal Measures. The source potential of the Otway Group has not been tested in the permit and is unknown. Analysis of samples from the Eastern View Coal Measures has identified samples with good to very good gas richness (C_1-C_4=10,000 - 180,000 ppm) throughout the Eocene and Palaeocene intervals. Wet gas (C_5+) yields in excess of 1000 ppm occur at two levels which produced hydrocarbons on test. Total organic carbon valves are high because of the presence of abundant coal seams. TOC values range between 1.10-79.2% in the Eocene, 0.96 - 47.0% in the Palaeocene and 0.82 - 13.7% in the Late Cretaceous. Potential hydrocarbon yields (oil and gas) are very high in the Eocene and Palaeocene (S_1+S_2 >6-366 kg hydrocarbons/tonne). However, much of this genetic potential is likely to be for gas and condensate. Cuttings from the Late Cretaceous were contaminated by cavings. One carbonaceous claystone at 3846m gave a S_1+S_2, ratio of 24 kg hydrocarbons/tonne, whilst sidewall core data indicated poor source richness from the Late Cretaceous section (S_1+S_2 <2 kg hydrocarbon/tonne).

In the Eocene coal in the dominantly carbonaceous lithofacies, two main types of organic matter were identified, a good quality oil and gas-prone type II-III kerogen and a poor quality dry gas-prone type IV kerogen. The major kerogens are vitrinite (45-85%) and exinite (10-40%). The exinites include resinite and subertinite which are potentially generative at low maturities (vitrinite reflectance, 0.45% for oil generation).

In the Palaeocene the source rock consists of more mature oil and gas-prone type II-III kerogen. Coal is less abundant, and the major exinite is sporinite.

In the Late Cretaceous source rocks shale appears to be the most common organic-rich rock type. Many shales are very rich in exinite (up to 85% of DOM). The oil deadline for this exinite which is dominantly bituminite is a vitrinite reflectance of 0.9% and therefore most of these shales are now post-mature for oil Earlier in their history they were probably prolific sources of liquid hydrocarbons.

Source affinity studies were conducted on samples of liquid hydrocarbons recovered from Pelican 5. A condensate sample from 2788.2m has an alkane composition and aromatic content which reflect derivation from land-plant organic matter. The $C_{12}+$ composition also attests to a terrestrial source affinity as shown by dominance of C_{29} in the C_{27}-C_{29} sterane and diasterane distributions, high pristane/phytane and pristane/n-heptadecane ratios. These ratios also indicate that the organic matter was exposed to oxic conditions prior to being reworked in a peat swamp by anaerobic bacteria.

CONTRIBUTIONS TO KNOWLEDGE/REASONS FOR FAILURE:

Pelican 5 confirmed the presence of a large gas-condensate accumulation in the lower to middle M. diversus zone at Pelican Field. Testing of the reservoirs in this zone was disappointing with only low to moderate deliverability being achieved at best.

Pelican 5 also established that the rich gas condensate ratios (135 bbls/MMCF) measured from FIT recoveries in earlier wells were substantiated by test results.

The Palaeocene and Late Cretaceous sequence contains sandstone reservoirs which appear to be charged with rich gas condensate (from observation of the gas chromatograph) but when testing was attempted all zones proved to be tight.

Further drilling on the Pelican structure to establish if better permeability reservoirs occur on other fault blocks is considered high risk. Fault blocks at higher structural elevations may have better preserved reservoir quality and therefore provide a more acceptable level of risk.

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WELL SUMMARY AND POST MORTEM

WELL: Pipipa 1 **OPERATOR:** Hematite **PERMIT:** T/P5

LOCATION: Lat: 40° 23' 14"S Long: 145° 41' 45"E

SPUD: 4 May 1982 **RIG RELEASE:** 23 May 1982

TD: 2115m **KB:** 21m **WATER DEPTH:** 73m

DRILLING RIG: Southern Cross **STATUS:** Oil & Gas Shows, P&A

STRUCTURE: The Pipipa structure is located approximately 15km southwest and updip of the Pelican structural complex. Structurally therefore the well is located on the southwestern flank of the Pelican half graben. At the time of drilling the well was located to test the upper levels of the Eastern View Coal Measures in a fault controlled anticline. Current mapping indicates the presence of a large fault bounded prospect at depth within the Eastern View Coal Measures untested by Pipipa 1.

STRATIGRAPHY:

	KB(M)	SS(M)
Torquay Group	94.0	- 73.0
Demons Bluff Fm	1411.0	-1390.0
EVCM	1523.0	-1502.0
M.M. diversus (?)	2049.0	-2028.0
TD (? M.M. diversus)	2115.0	-2094.0

DRILLING DATA:

Hole Size (")	Depth (m:KB)
17½	880
12¼	2115

Casing size (")	Depth (m:KB)
20	213
13 3/8	866

DRILLING: No drilling problems are reported from Pipipa 1.

CORES: No cores were cut in Pipipa 1.

SWC: 30 cores were attempted between 1383.0 - 2105.0m
29 were recovered.

TESTS: No formation tests were performed.

SHOWS: At the top of the Eastern View Coal Measures a small gas peak of 20 units was detected, between this gas peak and a depth of approximately 1940m no fluorescence was observed in the cuttings and gas peaks were only associated with coals. Within the M. diversus zone over the interval 1940 - 2050m fluorescence was reported from cuttings in the range 0 - 40%, the best show being from a sandstone from 1945 - 1952m where fluorescence of up to 40% was observed. The fluorescence is described as milky yellow green with a moderate to fast milky cut. The chromatograph recorded the presence of methane to pentane below 1920m and hexane was observed between 1985m and 2050m. Sidewall core samples from 1949.8 and 1946.2m yielded oil saturations of 2 and 22% respectively.

Log analysis of this zone indicated only the presence of residual hydrocarbons and consequently no testing was undertaken. Log analysis by SAGASCO supports these conclusions.

RESERVOIR: Excellent porosity reservoirs are present in the upper EVCM with porosities in excess of 30% and good indicated permeability from mud cake build-up as indicated by the caliper log. In the basal part of the well where the shows are reported, reservoir quality is good with log derived average porosities of 17 - 21.7% in sandstones 2-8.7m in thickness, and good permeability is indicated by mud cake build-up.

MATURITY: The maturity profile in Pipipa 1 is normal until a depth of 1750m where an unusually high mean vitrinite reflectance measurement of 2.29% was recorded, indicating the presence of an intrusion near to the well location.

Examination of cuttings descriptions and logs reveals no evidence of an intrusion at the well location. Below this depth the maturity values decrease toward total depth to a value of 1.41 - 1.57%. Examination of the data from the deepest sample indicates a bimodal distribution in the measured vitrinite reflectance values indicating that either there is contamination of the sample (cuttings) from higher vitrinite reflectance zones above this depth, or that another intrusion is near to the total depth of Pipipa 1.

SOURCE ROCK: No source data has been collected from samples from Pipipa 1, the nearest data occurs in the Pelican 5 well where similar source rocks probably occur. The Pipipa location is ideally located to trap hydrocarbons migrating from mature source rocks in the depocentre of the Pelican half graben.

CONTRIBUTIONS TO KNOWLEDGE/REASONS FOR FAILURE:

Pipipa 1 was the first well drilled on the southern margin of the Pelican half graben, and is therefore an important control point in evaluating the stratigraphy, reservoirs and hydrocarbon potential of this flank. Unfortunately the well was not drilled deep enough to evaluate the middle to lower M. diversus gas condensate charged reservoirs encountered down dip at Pelican Field. However, the well did establish better quality reservoirs than exist at Pelican, and also demonstrated that hydrocarbons, most likely gas condensate but possibly also oil, have migrated from mature source rocks in the deeper part of the Pelican half graben.

The presence of nearby igneous intrusions is indicated from maturity data, however as at Yolla 1, there appears to have been no detrimental effect on reservoir quality.

The opportunity for hydrocarbon trapping along the southern flank of the Pelican half graben is significantly upgraded by the results of Pipipa 1.

GWF9107.009-RJS

WELL SUMMARY AND POST MORTEM

WELL: Poonboon 1 **OPERATOR:** Esso **PERMIT:** T/P6

LOCATION: Lat: 40° 08' 15.19"S Long: 145° 55' 01.29"E

SPUD: 29 August 1972 **RIG RELEASE:** 2 October 1972

TD: 3265.9m **KB:** 9.75m **WATER DEPTH:** 78.9m

DRILLING RIG: Glomar Conception **STATUS:** Gas shows, P&A

STRUCTURE: Poonboon 1 was drilled on the crest of a low relief closed anticlinal feature. Closure was mapped at all levels in the Eastern View Coal Measures above the L. balmei palynological zone.

STRATIGRAPHY:

	KB(m)	SS(m)
Torquay Group	88.7	- 78.9
Demons Bluff Fm	1755	-1745
EVCM	1892	-1882
M.M. diversus	2384	-2374
L. balmei	2684	-2674
TD (T. longus)	3265.9	-3256.1

DRILLING DATA:

Hole size (")	Depth (m:KB)
12¼	2690.5
8½	3265.9

Casing size (")	Depth (m:KB)
20	219.5
13 3/8	924.2
9 5/8	2670.4

DRILLING: Abnormal pressure was encountered at approximately 2830m. Pore pressure increased to T.D. at 3265.9m where drilling had to be stopped.

CORES: Five cores were cut as follows:

1.	1952.9 - 1960.5m	Rec 7.3m	EVCM - middle N. asperus
2.	2467.6 - 2474.4m	Rec 6.7m	EVCM - middle M. diversus
3.	2682.8 - 2690.5m	Rec 7.6m	EVCM - upper L. balmei
4.	3034.0 - 3042.5m	Rec 8.5m	EVCM - lower L. balmei
5.	3258.6 - 3265.9m	Rec 7.3m	EVCM - T. longus

SWC: 103 cores were attempted between 941.2 - 3258.9m
91 were recovered.

TESTS: 8 FIT's were performed as listed below, no drill stem tests were performed.

FIT 1 2670.1m
REC 0.1 cubic feet Gas
+ 400 cc water
FSIP = 3680 psi
HP = 4480 psi

FIT 2 3180.3m
REC 1.4 cubic feet Gas
+ 2200 water
FSIP = 5700 psi
HP = 6200 psi

FIT 3	3103.2m REC 1000 cc water Lost pad seal HP = 6200 psi
FIT 4	2964.8m REC 2200 cc water FSIP = 4500 psi HP = 5800 psi
FIT 5	3191.3m Misrun
FIT 6	3048.0m REC 2100 cc water FSIP = 5000 psi HP = 5750 psi
FIT 7	3178.2m REC 1.1 cubic feet Gas FSIP = 5300 psi HP = 6050 psi
FIT 8	3255.3m REC 2100 cc water FSIP = 5950 psi HP = 6700 psi

SHOWS: Only low levels of background gas were reported throughout the Eastern View Coal Measures, the only exception was when the well kicked from a sandstone interval (3183.3 - 3185.2m). Subsequent testing of the zone by FIT's produced fresh water and a small volume of gas, probably solution gas.

RESERVOIR: The reservoir quality of sandstones within the zone of abnormal pressure was good, individual beds up to 18m thick have core porosities of 15 - 28% and permeabilities of up to several hundred millidarcies.

MATURITY: The oil window (vitrinite reflectance 0.7%) was intersected at approximately 3050m. The maximum recorded mean vitrinite reflectance of 0.9% occurs at total depth, however, there is a large variation in the results at this depth with valves ranging from 0.70 - 0.95% from individual samples.

SOURCE ROCK: Only three samples were analysed from Poonboon 1, all for total organic carbon only. Two coals at 3040.3 and 2473.1m yielded 27.6% and 63.1% TOC respectively, whilst a shale at 2687.7m yielded 1.93% TOC.

CONTRIBUTIONS TO KNOWLEDGE/REASONS FOR FAILURE:

Poonboon 1 established that good quality reservoirs can be preserved at depth within the Eastern View Coal Measures and within the abnormally pressured zone.

The absence of hydrocarbons in the well other than in the interval 3183.3 - 3185.2m is not fully understood. Contributing factors may be, a small drainage area or poor source rock development in the drainage area. Further mapping of the Poonboon structure is required using the latest Amoco data to determine the structural validity of the well.

GWF9107.009-RJS

WELL SUMMARY AND POST MORTEM

WELL: Narimba 1 **OPERATOR:** Esso **PERMIT:** T/5P

LOCATION: Lat: 40° 16' 18.080"S Long: 145° 43' 53.581"E

SPUD: 31 August 1973 **RIG RELEASE:** 4 October 1973

TD: 3353.7m **KB:** 9.75m **WATER DEPTH:** 77.1m

DRILLING RIG: Glomar Conception **STATUS:** Gas shows, P&A

STRUCTURE: Narimba 1 was drilled to test an anticlinal map on tend with, and 12km to the northwest of the Pelican structure. Current mapping indicates that only a small area is closed at the middle M. diversus level, whilst closure is absent at both the top of the Eastern View Coal Measures and at the L. balmei level.

STRATIGRAPHY:

	KB(M)	SS(M)
Torquay Group	86.9	- 77.1
Demons Bluff Fm	1654.5	-1644.7
EVCM	1793.4	-1783.7
M.M. diversus	2545.1	-2535.3
T.D. (lower M. diversus)	3353.7	-3343.9

DRILLING DATA:

Hole size (")	Depth (m:KB)
26	235.3
16½	859.8
12¼	2697.5
8½	3353.7

Casing size (")	Depth (m:KB)
20	205.7
13 3/8	837.3
9 5/8	2684.7

DRILLING: No abnormally pressured section was reported in the well completion report, however studies of shale velocities at Pelican and Narimba show similar trends indicating that Narimba is also probably abnormally pressured below approximately 2800m. this conclusion is also in agreement with the high mud weight of 11.0 ppg used to reach total depth.

CORES: Three cores were cut as follows:

1.	2827.9 - 2836.8m	Rec	8.7m	EVCM - middle M. diversus
2.	2908.4 - 2914.2m	Rec	5.6m	EVCM - Lower M. diversus
3.	2971.8 - 2973.6m	Rec	1.8m	EVCM - lower M. diversus

SWC: 90 cores were attempted between 914.4 - 3346.1m
84 were recovered.

TESTS: No drill stem tests were performed. 5 FIT's were undertaken with the following results:

1. 2877.3m
   Rec. 0.1 cubic feet Gas
   + 2200 cc water
   ISP = 4250 psi
   FSIP = 4300 psi
   HP = 5075 psi

2. 2999.8m
Rec 0.35 cubic feet Gas
+ 1900 cc water
FSIP = 4380 psi
HP = 5750 psi

3. 2919.4m
Rec 0.5 cubic feet Gas
+ 2200 cc water
FSIP = 4150 psi
HP = 5500 psi

4. 3124.5m - No recovery
FSIP = 4700 psi
HP = 5800 psi

5. 3062.9m Tool plugged, no recovery

SHOWS: Background gas and peaks associated with coals were detected in the upper EVCM to the top of the middle M. diversus zone. In the middle and lower M. diversus zones several gas peaks from sandstones were recorded, the largest of which were tested by FIT. The FIT tests produced only small volumes of gas, probably solution gas. Shows of fluorescence and oil were reported from samples of the sandstone at approximately 2950m and at 3340m.

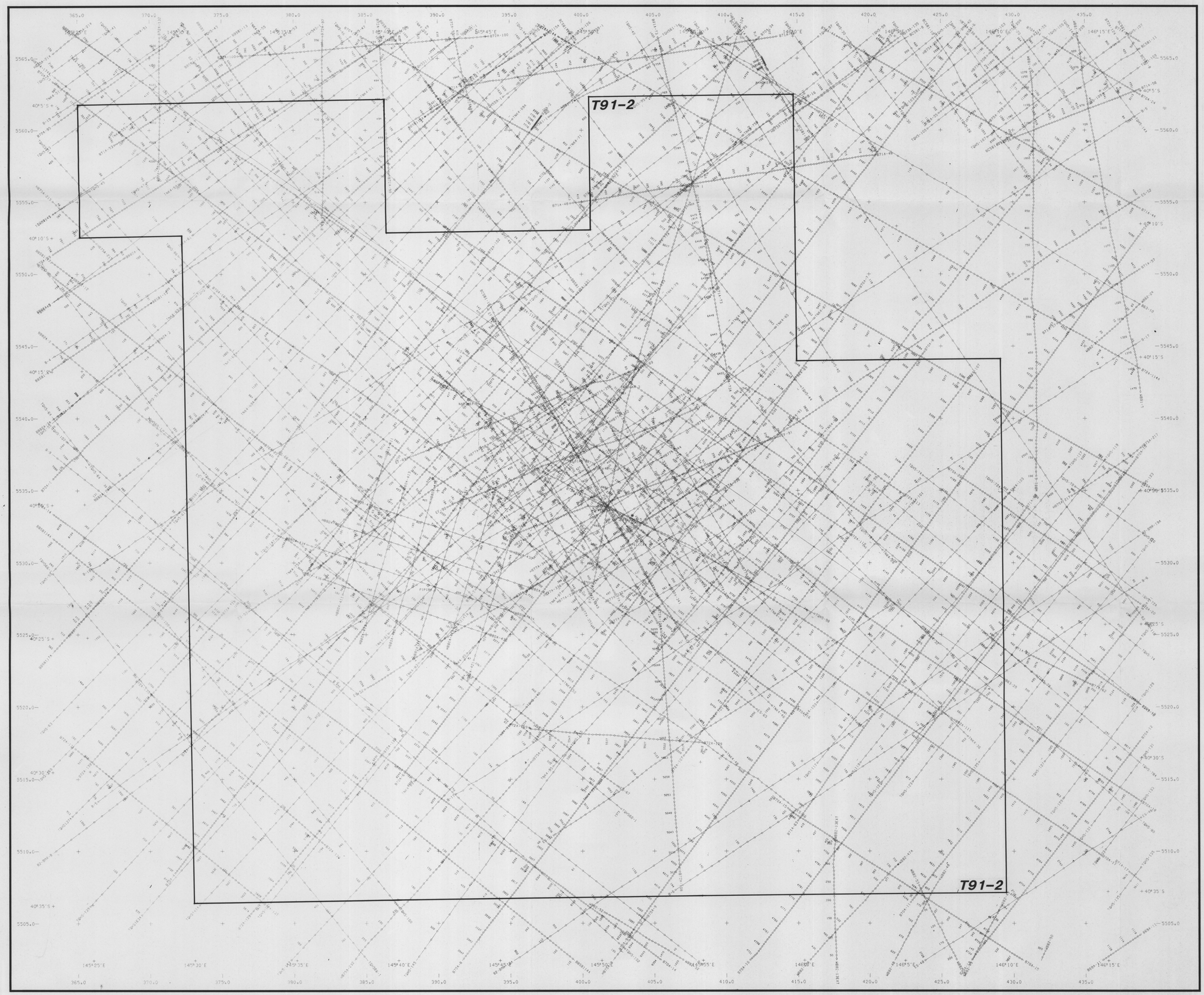
RESERVOIR: Good to excellent quality reservoirs are indicated from logs in the upper EVCM above the base of the upper M. diversus palynological zone. Whilst the better reservoirs of the lower and middle M. diversus zone were not cored, core analysis results from a sandstone in core 1 yield porosities of 18-25% and permeabilities of up to 330 millidarcies.

MATURITY: A small suite of four samples from 3137.6 - 3291.2m (lower M. diversus) were subjected to vitrinite reflectance determinations and gave values in the range 0.71 - 0.79%. These values plot approximately 0.1% lower in maturity than samples at equivalent depths at Pelican Field. The most likely explanation for this is that the Narimba structure has been subjected to a lesser amount of tectonic inversion than the Pelican structure.

SOURCE ROCK: The stratigraphical and lithogical successions in Narimba and the Pelican wells are similar and therefore it is likely that the source rock distribution and compositions are similar. Only limited source rock studies have been performed on samples from Narimba. Three samples were analysed for total organic carbon content, a coal at 2803.2m yielded a value of 70.25%, and a dark shale at 2911.4m yielded a value of 2.4% TOC and another dark shale at 2971.8m yielded a value of 2.47% TOC.

CONTRIBUTIONS TO KNOWLEDGE/REASONS FOR FAILURE:

Minor gas and fluorescence shows in Narimba are consistent with its location in the generative centre of the Pelican half graben. The absence of productive zones is consistent with the well being located outside significant closure at the key reservoir levels.



471152

0 10

Kilometres

5 cm

SAGASCO Resources Ltd.

BASS BASIN - TASMANIA

GAZETTAL T91-2

SEISMIC LOCATION BASE MAP

ACN 007 845 338

AUTHOR: R.Suttill	DATE: May 91	PLAN	BAS 00 7998
DRAWN: C.Kay	DATUM:		
SCALE: 1:100,000	CONTOUR INTERVAL:	CHECKED:	Encl. 1

OR-0361 vol 1.

T91-2

T91-2

0 10
Kilometres

5 cm

471153

SAGASCO Resources Ltd.
ACN 007 845 338

BASS BASIN - TASMANIA

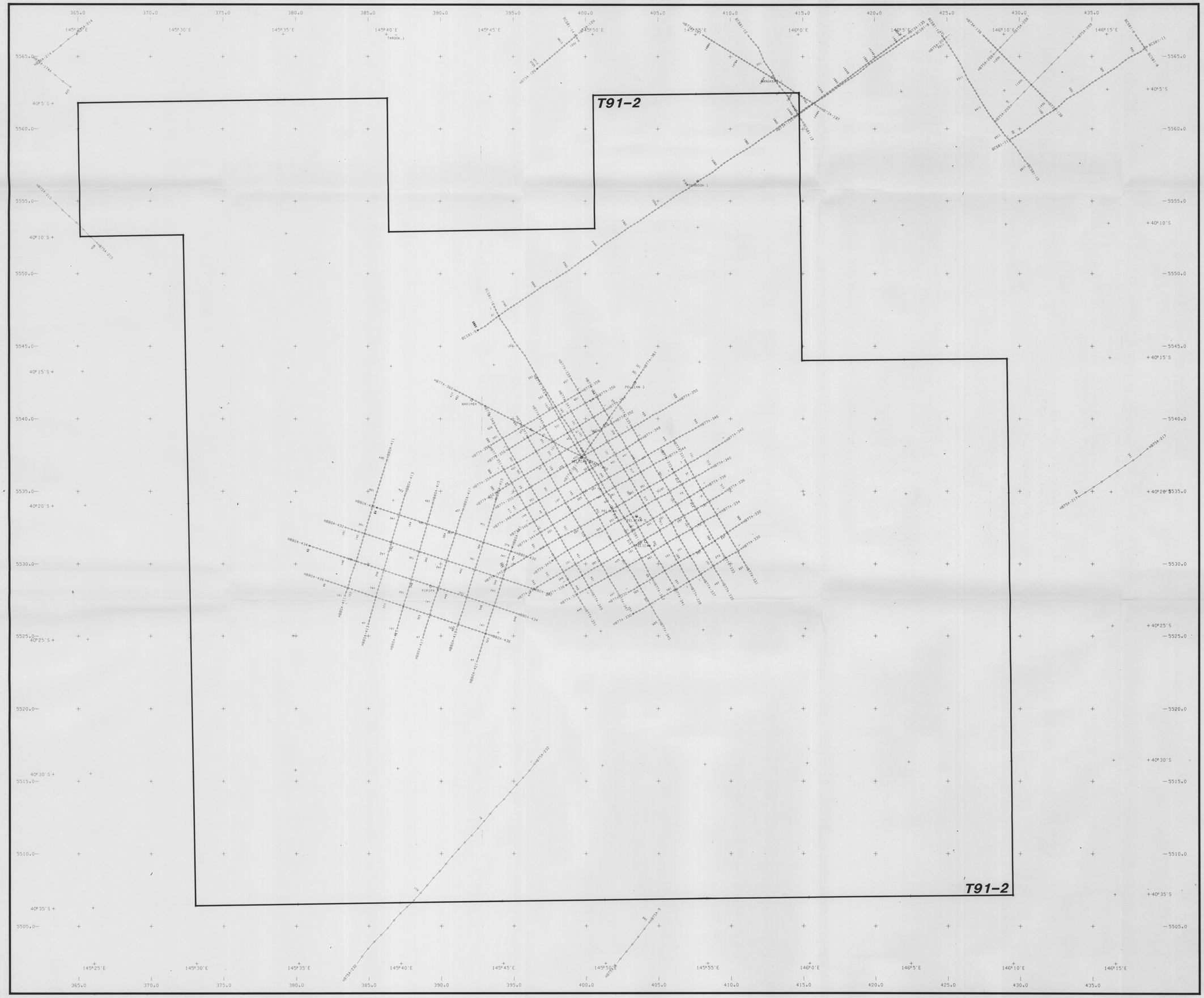
GAZETTAL T91-2

EARLY 1970's DATA

RECORDED BY ESSO-HEMATITE

AUTHOR: R.Suttill	DATE: June 91	PLAN No:	BAS00.8164
DRAWN: C.Kay	DATUM:		
SCALE: 1:100,000	CONTOUR INTERVAL:	CHECKED:	Encl. 2

OR.0361 VOL 1.



471154

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ACN 007 845 338

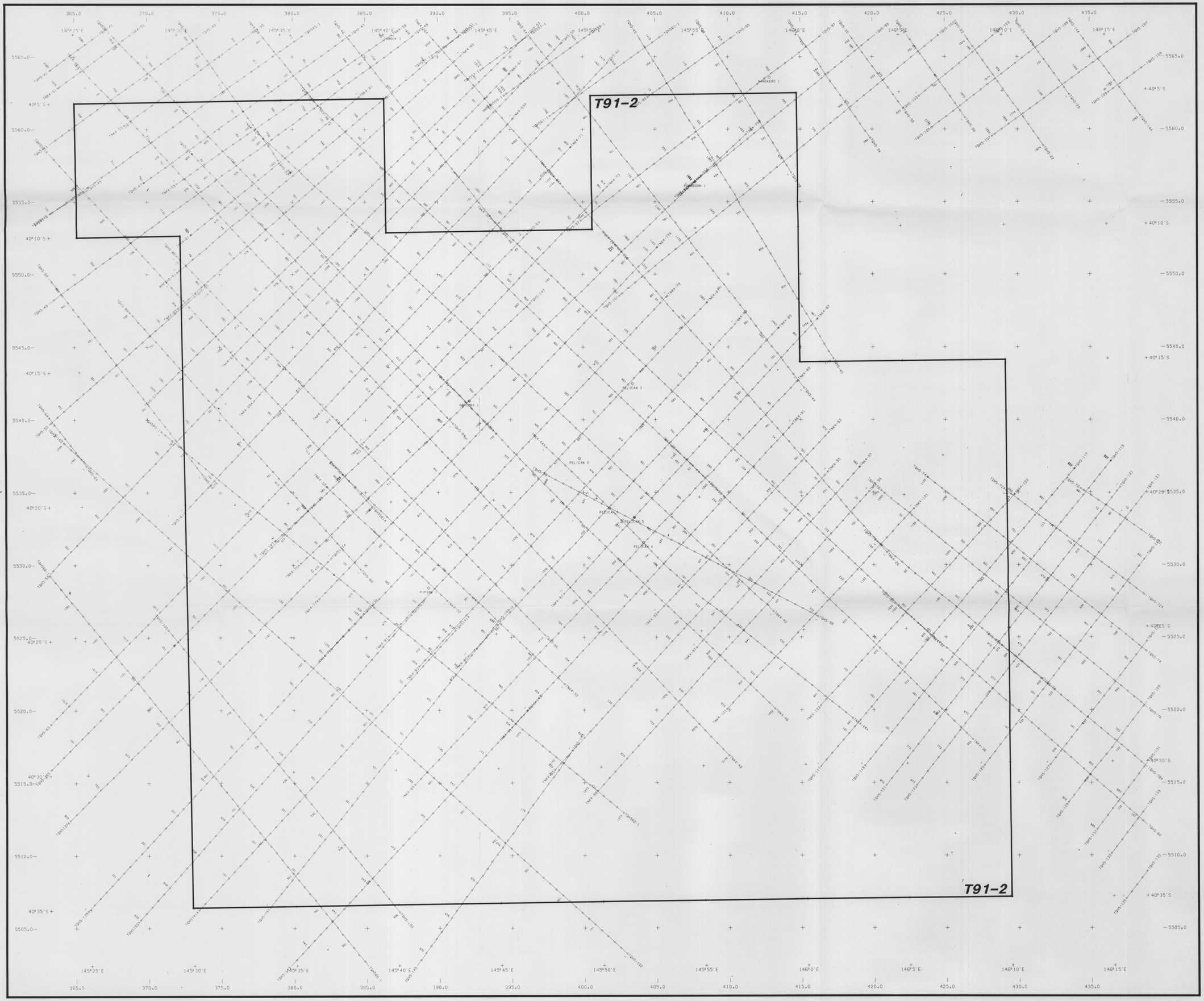
BASS BASIN - TASMANIA

GAZETTAL T91-2

ADDITIONAL DATA RECORDED PRIOR TO THE DRILLING OF PELICAN 4 & PIPIPA 1

AUTHOR: R.Suttill	DATE: June 91	PLAN No	BAS00.8165
DRAWN: C.Kay	DATUM:		
SCALE: 1:100,000	CONTOUR INTERVAL:	CHECKED	Encl. 3

OR-0361 VOL 1.



471155

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ACN 007 845 338

BASS BASIN - TASMANIA

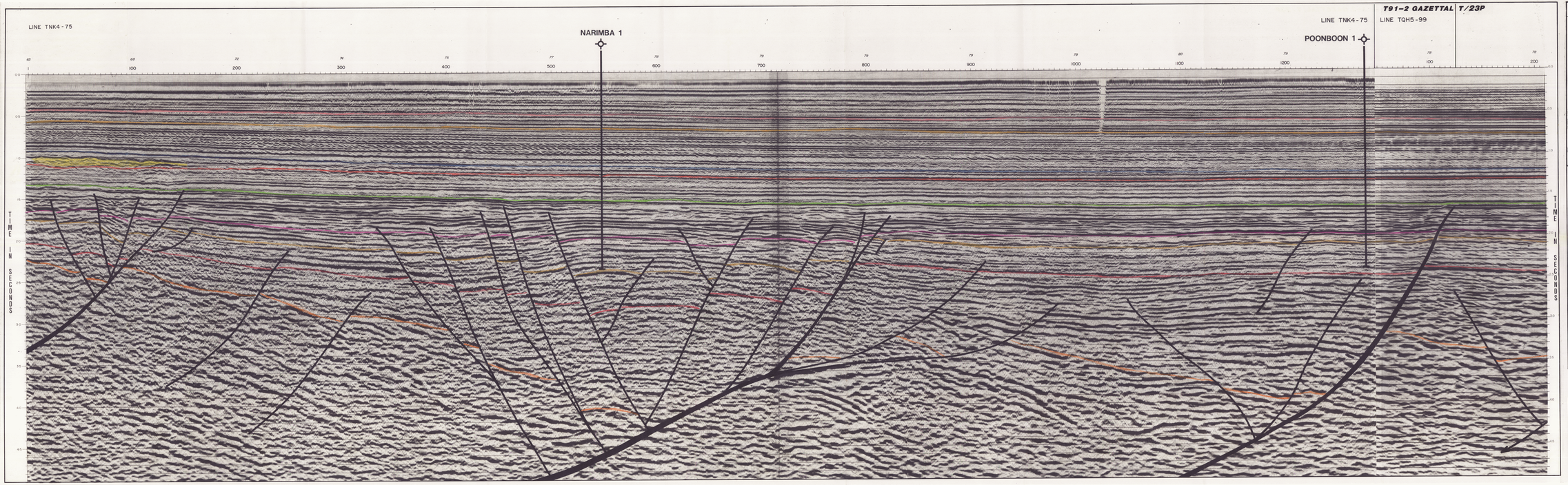
GAZETTAL T91-2

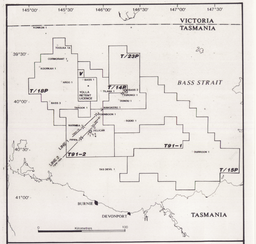
SEISMIC DATA

COLLECTED BY AMOCO JOINT VENTURE

AUTHOR: R.Suttill	DATE: June 91	PLAN No:	BAS00.8166
DRAWN: C.Kay	DATUM:	CHECKED:	Encl. 4
SCALE: 1:100,000	CONTOUR INTERVAL:		

OR.0361 VOL 1.





- LEGEND -

- TOP LATE MIOCENE EPISODE
- BASE LATE MIOCENE EPISODE
- TOP EARLY MIOCENE EPISODE
- BASE EARLY MIOCENE EPISODE
- NEAR TOP EVCM
- BASE UPPER M.diversus
- TOP UPPER L.balmei
- BASAL T.longus UNCONFORMITY
- BASE EVCM
- VOLCANICS
- INGNEOUS INTRUSION

5 cm

75 Water depth in metres 74

400 Shot point number 500

KILOMETRES

471116

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A.C.N. 007 845 338

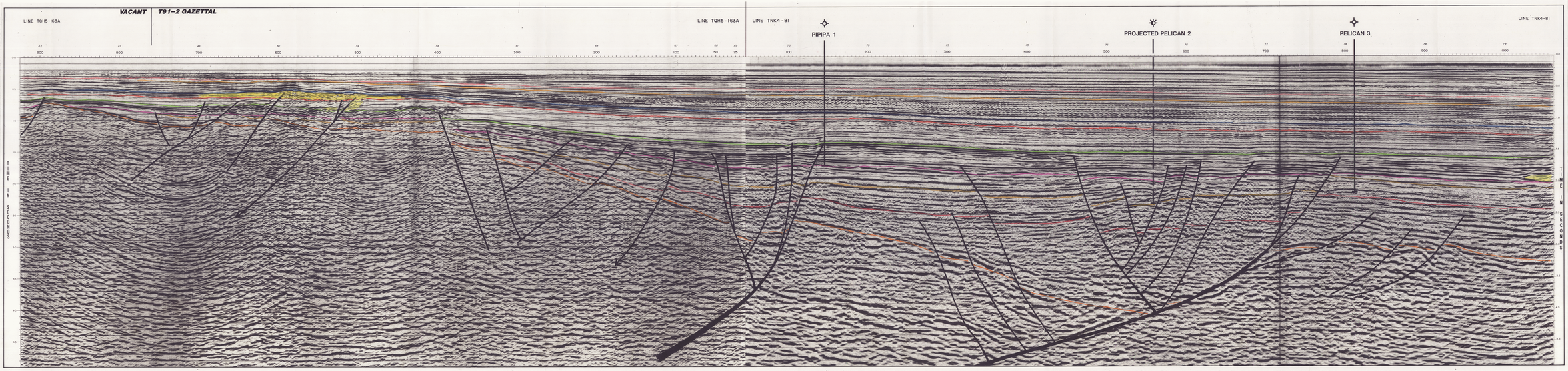
BASS BASIN - TASMANIA

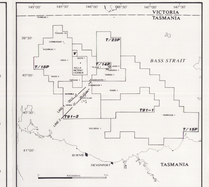
T91-2 GAZETTAL

REGIONAL SEISMIC SECTION NO.1

CR.0361 VOL.1.

AUTHOR : R. SMIT/ R. SUTTILL	DATE : JULY 1991	PLAN No : BAS00.8071
DRAWN : P. OLDHAM	DATUM :	CHECKED : ENCL. 5
SCALE : 1:250000	CONTOUR INTERVAL : M.S.L.	





- LEGEND -

- TOP LATE MIOCENE EPISODE
- BASE LATE MIOCENE EPISODE
- TOP EARLY MIOCENE EPISODE
- BASE EARLY MIOCENE EPISODE
- NEAR TOP EVCM
- BASE UPPER Malvernian
- TOP UPPER Lisdimo
- BASAL T.Longus UNCONFORMITY
- BASE EVCM
- VOLCANICS
- INGNEOUS INTRUSION

5 km

75 Water depth in metres 74

400 Shot point number 500

471557

SAGASCO Resources Ltd.

A.C.N. 000 000 000

BASS BASIN - TASMANIA

T91-2 GAZETTAL

REGIONAL SEISMIC SECTION NO.2

AUTHOR: R. SMIT / R. SUTTLE	DATE: JULY 1991	PLAN No: 8A200.8072	
DRAWN: P. OLDHAM	DATUM:		
SCALE: 1:250000	CONTOUR INTERVAL: M.S.L.	DESIGNED:	ENCL. 6