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Bass Strait Oil & Gas N.L.
17-23 Queensbridge Street,
SOUTH MELBOURNE, Vic. 3205

REPORT 705/8

T/18P part V*

D of M: A.G.	C.G.	E.O.	B.S.M.E.
Received	17 AUG 1981		E & I L
Answered			
DEPT. OF MINES			
REF. No. 7049/81			

QUARTERLY REPORT

ON

T 18P

BASS BASIN, TASMANIA

FOR

THE BASS STRAIT OIL & GAS

CONSORTIUM

General Geological Services
Work Order : BAS 705

August 1981

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- 5.30 BBS 81 Navigation Report (refer OR-166B)
- 5.40 Report on a Preliminary Seismic Interpretation
of the Cormorant Area T.18P Bass Basin Tasmania (refer OR-166C)

(Appendices 5.20 to 5.40 are under separate cover)

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- BAS 705/13A Position Map BBS 81 Seismic Survey 1:100,000
- BAS 705/13B Position Map BBS 81 Seismic Survey 1:100,000

1.00 INTRODUCTION

This report covers the work carried out for the Bass Strait Oil & Gas N.L. Consortium with respect to T.18P for the period April 24 1981 to July 23 1981. This is the final quarterly report for the first year of the permit.

During the period, data collection was finalised and the seismic re-interpretation of the Cormorant Area completed, along with the Burial and Thermal Geohistory Study outlined in the last quarterly report.

The marine seismic survey, BBS 81 totalling 730.92km has been processed final sections having been received from G.S.I. on July 20, 1981.

The work programme for the second year has been prepared and is included in this report. The commitment for Year One has been carried out and progress in the permit to date is considered satisfactory.

2.10 Data Collection

Collection of relevant geological and geophysical data was finalised during this quarter. This work has been essential to establish velocity control for the re-interpretation of seismic and preparation of a synthetic seismogram programme as well as providing raw source rock and temperature data for the Burial and Geohistory Studies.

Some seismic sections are still outstanding, but the bulk of the work is now satisfactorily completed.

2.20 Data Processing: BBS 81 Seismic Survey

Parameters for data processing were selected in the last quarter and were as follows: Record section at 96 trace 48 fold with Velscans 1 every 2.5km, no velocity filtering was carried out on the 25 lines of the survey and sections has a 32ms gapped convolution, played out to 5 sec record length.

The final sections were received on the 20th July along with the post plots for line location. Interpretation will commence in the next quarter. Data quality appears good. The two post plot maps for the survey 705/13A, 13B are included in Section 6.00 of this report.

2.30 Burial and Thermal Geohistory Study of the Bass Basin

A Burial and Thermal Geohistory Analysis of the Bass Basin which was conducted in two stages was completed during the quarter. The two areas covered in the study were:

STAGEDESCRIPTION

- | | |
|----|---|
| I | Preparation of Geohistory diagrams (with reports) for each well included in study. |
| II | Basin-wide time series analysis of thermal values, paleostructure and basement subsidence rates for the Bass Basin. Assessment of favourable areas for hydrocarbon generation and entrapment. |

The following are brief extracts from the report which is appended (under separate cover) in full to this quarterly report. (Section 5.20)

GENERAL SUMMARY

A. BURIAL AND THERMAL GEOHISTORY ANALYSIS of the following thirteen wells in the Bass Basin was carried out by Paltech Pty. Ltd. during the period March - July 1981.

AROO - 1
BASS - 1
BASS - 2
BASS - 3
CORMORANT - 1
DONDU - 1
DURROON - 1
NANGKERO - 1
NARIMBA - 1
PELICAN - 1
POONBOON - 1
TAROOK - 1
TOOLKA - 1

The study indicated the following:-

*The prime exploration target (for mature source, seal and reservoir) is the Lower Eastern View Coal Measures (earliest Eocene and older).

*If adequate migration paths for hydrocarbons do not exist the most favourable exploration areas are the Deep Basin and the high heat flow Northeast and Southwest Flanks of the Deep Basin.

*If adequate migration paths do exist the most favourable exploration areas are, besides those areas specified above, but especially, the Northeast and Southwest Basin Margins, adjacent to the high heat flow areas.

*Less than 50% of the wells drilled in the Bass Basin have adequately tested the structure, having terminated above or only just within the predicted mature zone.

*Future assessment of smaller areas of the Bass Basin will require the collection of standardised thermal maturation data, rather than from a wide diversity of studies as was used here.

B. THERMAL, MATURATION, POTENTIAL GENERATION AND MIGRATION OF HYDROCARBONS IN THE BASS BASIN

The assessment of any petroleum resource or play is usually considered to depend on the following factors:-

1. Reservoir present
2. Source rocks present
3. Thermal history favourable
4. Effective trap and seal
5. Timing of structure right
6. Protection from flushing

Factor 2 has been favourably assessed by Nicholas et al (1980) in "Petroleum Potential of the Bass Basin" by E. Nicholas, K. L. Lockwood, A. R. Martin, and K. S. Jackson. PESA - Symposium November 1980.

Heat flow computer production of a burial and thermal geohistory diagram involves calculation of the present day heat flow based on sea bottom temperature, bottom hole temperature and thermal conductivities of the rock sequence.

The Bass Basin has for the purposes of this study been divided into four (4) heat flow regimes. [above or below 1.50 hfu (heat flow units)].

Heat Flow 1.50 h.f.u.		Heat Flow 1.50 h.f.u.	
Area	Well	Area	Well
NE Flank	Dondu-1 Bass - 1	NE Slope (incl. S.E. Slope & N. Slope	Toolka-1 Cormorant-1 Bass - 2 Durroon - 1
SW Flank	Pelican - 1 Narimba - 1 Bass - 3	Deep Basin	Aroo - 1 Tarook - 1 Poonboon - 1 Nangkero - 1

Thus the high heat flow regimes are seen to flank the deep basin, and this differentiation of the Basin into areas is similar to that based on geothermal gradients presented by Nicholas et al (1980) but suggests symmetry of thermal properties exists in the Basin.

DEPTH TO MATURE ZONE:

The study found that most of the gas and condensate shows are found beneath the $R_o = 0.6\%$ level, including the major PELICAN-1 discovery. In some cases, shows are found above this level, probably due to the influence of volcanics.

The zone beneath the $R_o = 0.6\%$ level is here considered to be the mature zone for hydrocarbon generation.

If we assume that T.D. should be at least 500 metres below the top of the mature zone*to adequately test a prospect (ignoring problems of closure) the following wells were terminated at too shallow a depth.

Area	Poorly Tested Prospects	Expressed as % of wells in area
NE Flank	Bass - 1	50%
SW Flank	Bass - 3	33%
NE Slope	Toolka - 1 Cormorant - 1	50%
Deep Basin	Tarook - 1 Poonboon - 1 Nangkero - 1 Aroo - 1 **	100%

* To allow for lack of vertical migration.

** Considered inadequate because of volcanics in mature zone. Only 58 metres of the predicted mature zone was tested above the volcanics at 3138m (sub sea).

Thus the data presented above supports Nicholas et als (1980) conclusion that much of the Bass Basin has been inadequately tested at depth. The thermal history of the Bass Basin is favourable for hydrocarbon generation.

POTENTIAL GENERATION AND MIGRATION OF HYDROCARBONS IN THE BASS BASIN

The Burial and Geohistory study to date, has indicated that the Upper Eastern View Coal Measures [Upper EVCM refers to the interval above the intra-M. diversus zone unconformity (~52.5-50 m.y.)], in the wells drilled to date, is above the transitionally mature zone ($0.5 < R_o < 0.6$) or in rare cases within it (PELICAN - 1, NARIMBA - 1 and BASS - 1).

For the purpose of the study the main exploration target was selected as the Lower EVCM (especially that interval between the Cretaceous/Tertiary (K/T) boundary and the intra-M. diversus zone unconformity).

A potential migration path refers to a difference in depth of a particular horizon between two wells which would allow migration of hydrocarbons up dip as though no structures existed between the wells at the time. There is no doubt such structures did exist, but an assessment of their effect on hydrocarbon migration could only be gained from very detailed seismic analysis which was beyond the scope of the present study, as was the existence of cap rock to facilitate the migration necessary.

Potential migration was considered only from mature source zones ($R_o > 0.60$). Structurally high points within the Basin capable of forming traps of hydrocarbons following potential migration paths were termed potential traps. Based on computer predicted results the following wells were potential traps at one time or another in the last 20 m.y. - TOOLKA - 1, POONBOON - 1, NARIMBA - 1, BASS - 2, BASS - 3 and PELICAN - 1.

In terms of the petroleum play assessment factors referred to at the start of this Section, the timing of structure is right in the Bass Basin. The study has shown that, depending on existence of migration paths, some traps may not have been fully effective during the last 20 m.y.

MAJOR PREDICTED HYDROCARBON EXPLORATION PLAYS (LOWER EVCM TARGET)
IN THE BASS BASIN

Assessment of favourable "plays" for hydrocarbon exploration in the Bass Basin depends on one critical factor - migration. The report summarises the studies into migration effecting hydrocarbon plays as follows:-

If migration paths are available, the most favourable plays are indicated to be:

LOCATION	TRAPS	TARGET
Bass-2 Area	Off structure	Lower EVCM
Toolka-1 Area	Structural	" "
NE & SW Basin Margins (adjacent to high heat flow areas)	Structural and/or Stratigraphic	" "
DamaLa Nose	?Structural	" "

The major requirement for such plays is adequate protection from flushing.

If long distance migration paths are not available the most favourable plays are:-

LOCATION	TRAPS	TARGET	MINIMUM T.D.
NE Flank	Structural	Upper & Lower EVCM	3000m
SW Flank	Structural	Upper & Lower EVCM	3000m
Deep Basin	Structural	Lower EVCM	3500m

Once again protection from flushing is necessary, more so for the NE and SE Flanks than the Deep Basin.

Assessment of Upper EVCM "plays" has not been attempted in the studies, since in all the wells examined, the Upper EVCM was considered immature for hydrocarbon generation. However, the presence of a small oil show in CORMORANT - 1 in the Upper EVCM suggests that the Upper EVCM in deeper areas surrounding the "positive" structures drilled (e.g. AROO - 1) may be responsible for generating hydrocarbons such as the oil show in CORMORANT - 1.

The findings from this study will be incorporated with the seismic interpretation of the BBS 81 survey to produce target zones for further seismic, and more importantly drilling.

3.00 OPERATIONS PLANNED

3.10 Interpretation BBS 81 Survey

Continued development of a synthetic seismogram programme will be continued and two-way time maps of interesting horizons on a 1:100,000 scale are planned. These will be prepared in preliminary form during the next quarter and integrated with the work from the Burial and Thermal Geohistory study.

Geological interpretation will continue on formation picking and development of a depositional model.

3.21 Review of Wharf Facilities : Bass Strait

The Company is undertaking a review of wharf and base facilities for operating its offshore programmes from either Geelong or Devonport. Details of these investigations should be available for the next quarter.

3.22 Investigation of Rig Availability

The Company commenced early in the year detailed investigations into obtaining suitable drilling vessels. These will be continued and further reported on in the next quarter.

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4.00 EXPENDITURE

BASS STRAIT OIL & GAS N.L.PERMIT T A S T 18PQUARTERLY REPORT - EXPENDITUREQUARTER ENDING 23/7/81

LEASE FEES (RENTALS)	OFFICE OVERHEAD	OFFICE STUDIES	FIELD		
			GEOLOGICAL	GEOPHYSICAL	DRILLING
	\$12,500	Geological and Geophysical Evaluation \$40,000	\$5,000	\$111,000 (Data Processing)	

SIGNED: *Average*

BASS STRAIT OIL & GAS N. L.EXPENDITURE - YEAR 1PERMIT T.18P

1st Quarter	\$19,200
2nd Quarter	\$20,750
3rd Quarter	\$470,200
4th Quarter	\$168,500
Estimated Total Year 1 Programme	\$205,000
Actual Total Year 1 Programme	\$678,450

5.00 APPENDICES

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5.10 WORK PROGRAMME - YEAR 2

BASS STRAIT OIL & GAS N.L.

~~155 donce street~~ 17-23 Queensbridge Street
 south melbourne victoria 3205 australia
 telephone ~~699 8058~~ telex AA33427
 62 3837

The Director,
 Department of Mines,
 G.P.O. Box 124B,
 HOBART, Tas., 7001

Att: Mr. H. Murchie

Dear Sir,

RE : WORK PROGRAMME FOR YEAR TWO
 EXPLORATION PERMIT FOR PETROLEUM NO. T.18P
 BASS STRAIT OIL AND GAS N.L.

We are pleased to submit the programme of work to be carried out by Bass Strait Oil & Gas N.L. in Permit T.18P in the second year commencing on July 24, 1981.

The geological and geophysical data search and collation which was programmed for the first year was accomplished before the end of the Permit year. Interpretation and evaluation of this data enabled the Company to prepare a traversing grid for the initial marine seismic survey planned for the first year.

A total of 730.92 km of high resolution seismic was shot over the permit in the first year, whilst the work commitment called for 250 km of seismic. We would thus like to request that the 480.92 km extra work be credited to our second year work commitment (200 km) and accepted by your Department as fulfilling our total 2 year work commitment. If such approval is forthcoming our proposed second year programme would be as follows:-

1. Interpretation of BBS 81 seismic survey leading to the delineation of a drilling target in the Permit and detailing areas for further seismic work.
2. Commencement of work on preparing to drill 1 well towards the end of this Year 2 of the permit. Work to include establishing wharf and base facilities and ordering of well materials and other ancilliary services. Rig negotiations and tenders for third party services would also be carried out.

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3. Analysis and evaluation of the results of the past seismic surveys will be made with particular stress being placed on the hydrocarbon potential of the deeper sediments and prospective structural traps below the lower E.V. Coal Measures.
4. A review of all geological, geochemical and geophysical data will be undertaken with the aims of identifying areas requiring further investigation.
5. A palaeoenvironmental study will be commenced using well log records in areas adjacent to T.18P and by means of detailed vertical profile analysis and reappraisal of existing palaeontological and lithofacies data.

Yours faithfully,
BASS STRAIT OIL & GAS N.L.

Colin Glazebrook,
EXPLORATION MANAGER

5.20 BURIAL AND THERMAL GEOHISTORY STUDY
(under separate cover)

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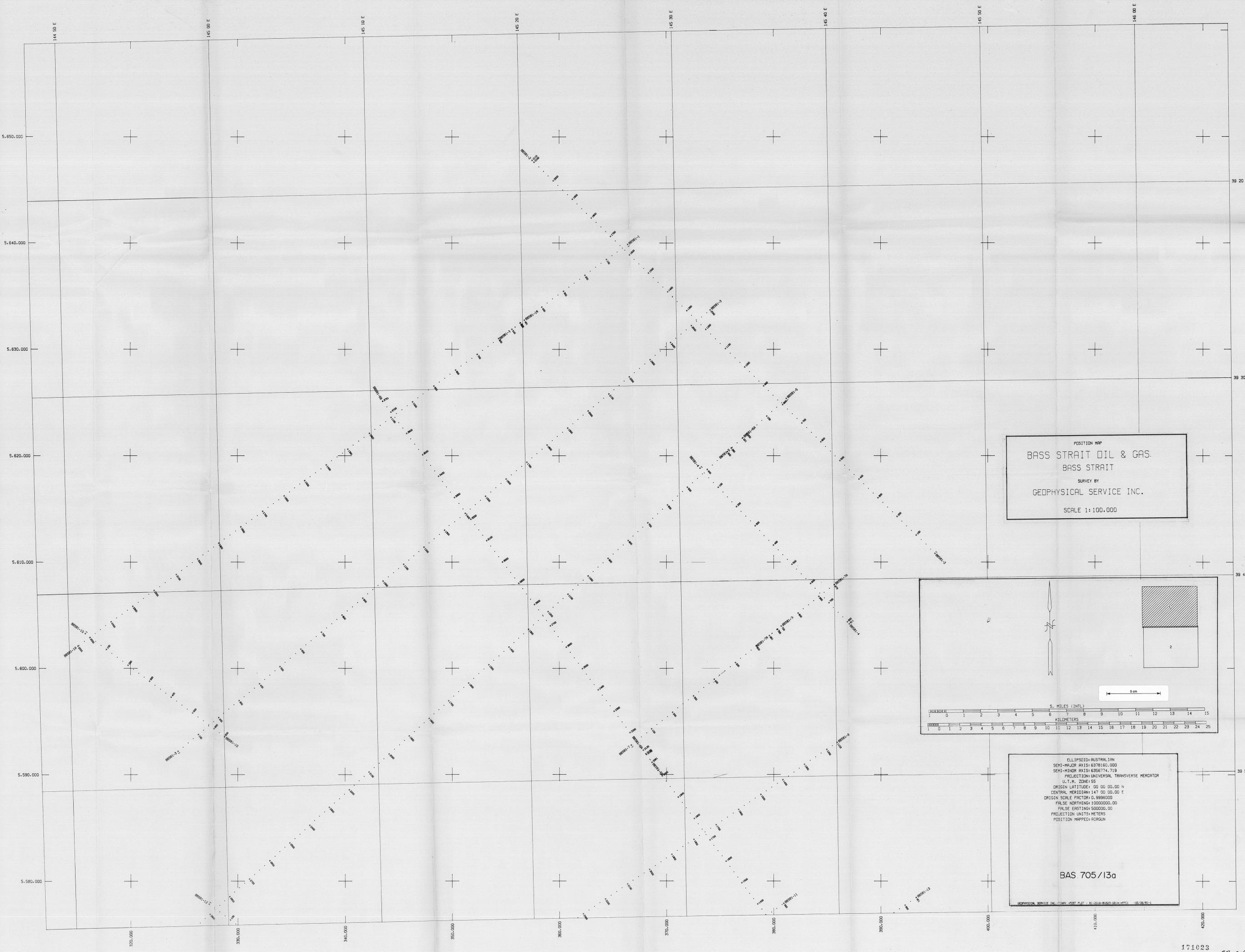
5.30 BBS 81 SEISMIC SURVEY
NAVIGATION REPORT
(under separate cover)

5.40 REPORT ON A PRELIMINARY SEISMIC
INTERPRETATION OF THE CORMORANT AREA
T.18P BASS BASIN, TASMANIA
(under separate cover)

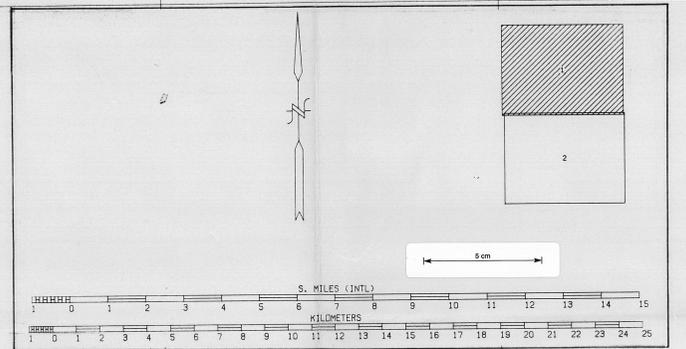
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ILLUSTRATIONS ACCOMPANYING REPORT

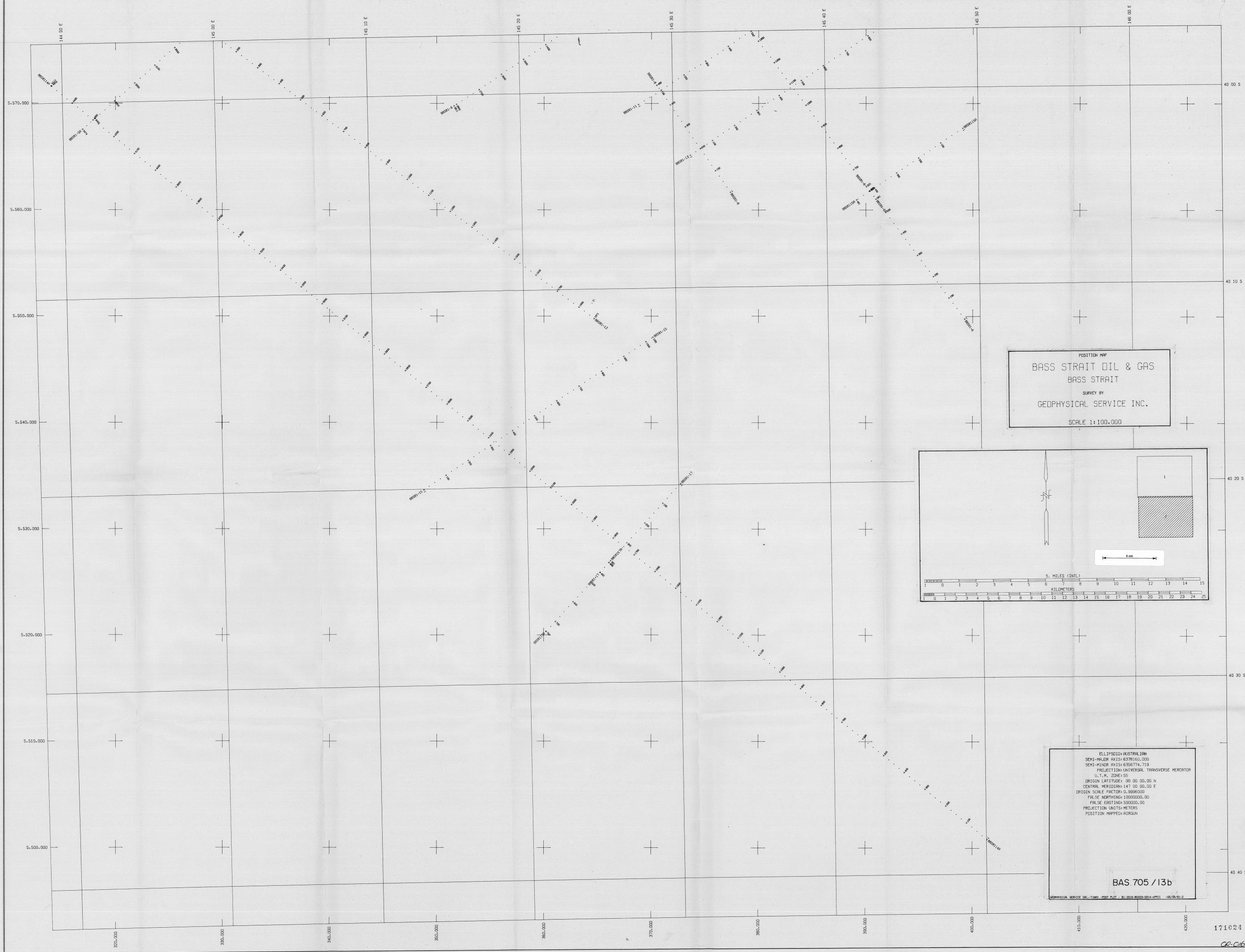


POSITION MAP
 BASS STRAIT OIL & GAS.
 BASS STRAIT
 SURVEY BY
 GEOPHYSICAL SERVICE INC.
 SCALE 1:100,000

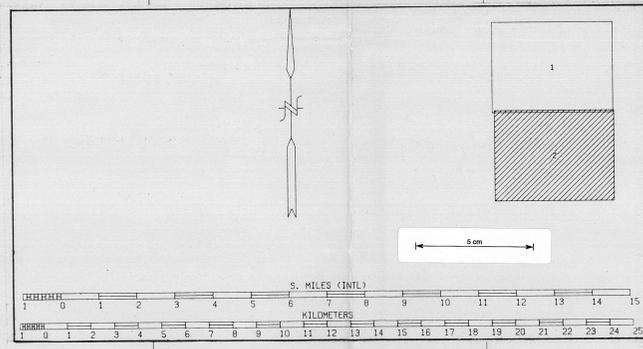


ELLIPSOID: AUSTRALIAN
 SEMI-MAJOR AXIS: 6378160.000
 SEMI-MINOR AXIS: 6356774.719
 PROJECTION: UNIVERSAL TRANSVERSE MERCATOR
 U.T.M. ZONE: 55
 ORIGIN LATITUDE: 00 00 00.00 N
 CENTRAL MERIDIAN: 147 00 00.00 E
 ORIGIN SCALE FACTOR: 0.9996000
 FALSE NORTHING: 10000000.00
 FALSE EASTING: 5000000.00
 PROJECTION UNITS: METERS
 POSITION MAPPED: AIRGUN

BAS 705/13a



POSITION MAP
 BASS STRAIT OIL & GAS
 BASS STRAIT
 SURVEY BY
 GEOPHYSICAL SERVICE INC.
 SCALE 1:100,000



ELLIPSOID: AUSTRALIAN
 SEMI-MAJOR AXIS: 6378160.000
 SEMI-MINOR AXIS: 6356774.719
 PROJECTION: UNIVERSAL TRANSVERSE MERCATOR
 U.T.M. ZONE: 55
 ORIGIN LATITUDE: 00 00 00.00 N
 CENTRAL MERIDIAN: 147 00 00.00 E
 ORIGIN SCALE FACTOR: 0.999600
 FALSE NORTHING: 1000000.00
 FALSE EASTING: 500000.00
 PROJECTION UNITS: METERS
 POSITION MAPPED: AIRGUN

BAS 705 /13b

GEOPHYSICAL SERVICE INC. - TUNNY POINT FLD - 81-2015-00323-0214-PTV1 - 05/08/01-2