Open File Envelope No.1269

PEL 8

OTWAY BASIN

GAMBIER TROUGH SEISMIC SURVEY FINAL REPORT

Submitted by

Alliance Oil Development Aust Nl
1970

Enquiries: Customer Services
Ground Floor
101 Grenfell Street, Adelaide 5000

Telephone: (08) 8463 3000
Facsimile: (08) 8204 1880

PRIMARY INDUSTRIES AND RESOURCES SA

CONTENTS ENVELOPE 1269

TENEMENT: Not Related

TENEMENT HOLDER: Alliance Oil Development Aust N.L.

ENVELOPE No 1269 (Cont)

Line AT 7, AT 2	1269-27
Monthly Stats May 1970	1269-28
" " March 1970	1269-29

FINAL REPORT

GAMBIER TROUGH SEISMIC SURVEY

P.E.L. 8

OTWAY BASIN, S.A.

FOR

ALLIANCE OIL DEVELOPMENT AUSTRALIA N.L.

BY

RAY GEOPHYSICS (AUSTRALIA) PTY. LTD.

CREW 319-735

SUPERVISOR: L. E. TWINING

PARTY CHIEF: GORDON SEARLE

ABSTRACT

The Gambier Trough Seismic Survey was conducted for Alliance Oil Development Australia N.L. in the Otway Basin, part of P.E.L. 8 of South Australia. The survey commenced on March 10, 1970 and was completed on May 6, 1970.

The 'Geograph' weight dropping method of surface injection was used throughout the survey by a Ray Geophysics (Australia) Pty. Ltd. 'Thumper' crew. The analog results were subsequently processed digitally by the company's processing facilities in Houston, Texas.

A total of 57.73 miles of six fold reflection coverage was obtained in a total production time of 365¾ hours.

Results were poor and no correlation has been possible across the whole of the area. The main feature of interest is a well defined 'high' trend passing through the prospect area in an east - west direction to the north of a major synclinal axis. There is a possibility of a small closure on this trend.

Final sections from digital processing are not yet to hand; these may enable a more complete interpretation to be made.

TABLE OF CONTENTS

TABLE OF CONTENTS

ENCLOSURES

MAPS:

Encl. 1	Station Location and Elevation
Encl. 2	Horizon 'A'
Encl. 3	Horizon 'B'
Encl. 4	Isochron "A"-"B"

SECTIONS:

Line AT-1
Line AT-1 Ext.
Line AT-2
Line AT-3
Line AT-3 Ext.
Line AT-4
Line AT-6
Line AT-7

FIGURES

TABLES

INTRODUCTION

A seismic survey has been conducted by Ray Geophysics (Australia) Pty. Ltd., on behalf of Alliance Oil Development Australia N.L. in the Gambier Trough Area, part of P.E.L. 8 of South Australia. This area, situated in the south-east corner of South Australia close to the Victoria border, lies in the western part of the Otway Basin.

The purpose of the survey was to experiment with surface injection methods in order to obtain data from the three different surface conditions prevalent in the area, namely, coastal sand dunes, Gambier Limestone and fossil sand dunes. Having obtained this data and developed normal production procedures consistent with both record quality and adequate coverage, it was desired to obtain stratigraphical and structural information in the area.

The 'Geograph' method of weight dropping was used throughout the survey. Also known as the 'Thumper' method, this is a surface injection method entailing the 'free fall' drop of a truck-mounted hydraulic operated weight of 6000 lbs. from a height of nine feet. This method, besides eliminating the need for shothole drilling and explosives, has proved successful in many areas where conventional methods have failed to produce usable data.

LOCATION MAP

PROSPECT AREA

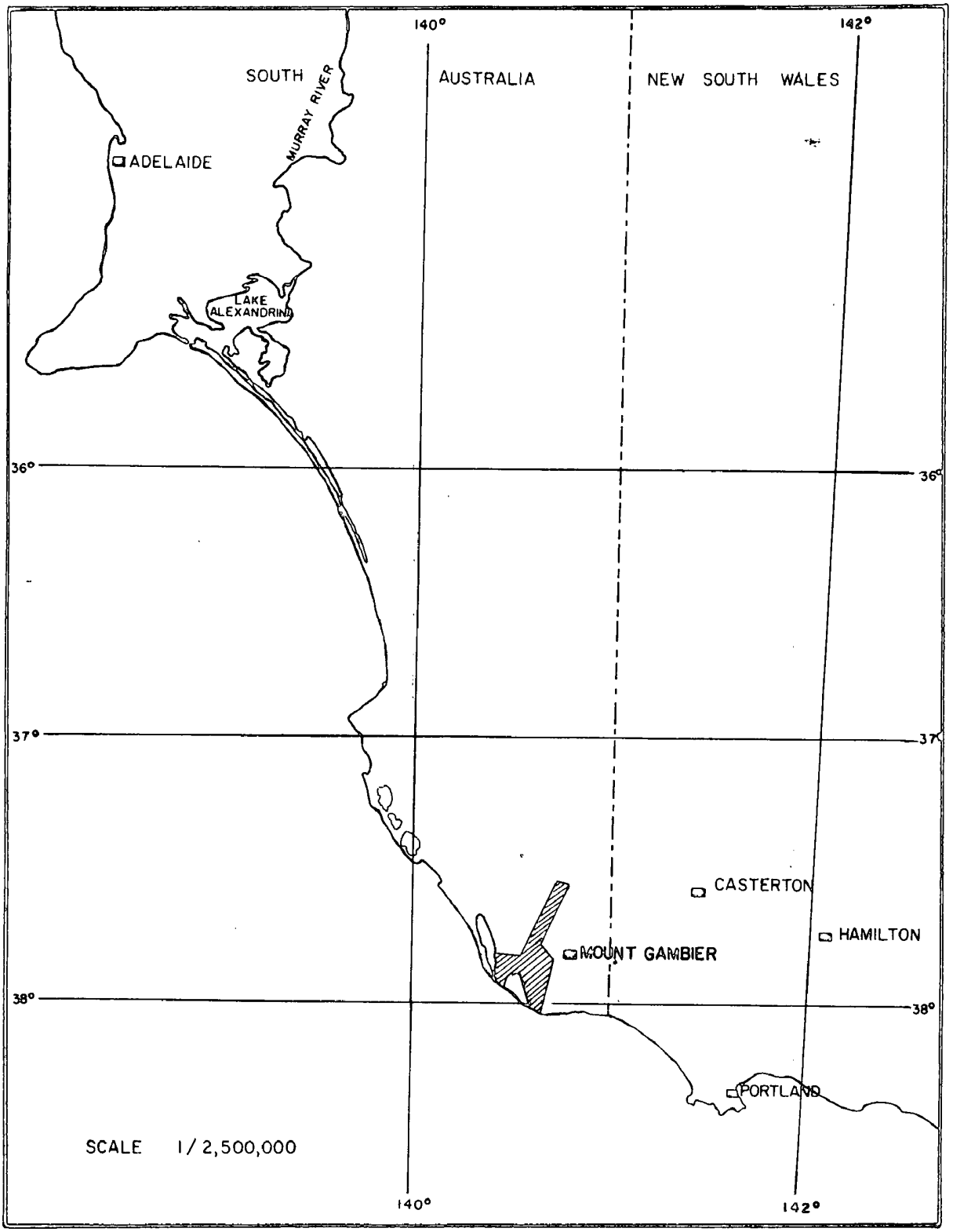


FIGURE 1

LOCATION MAP

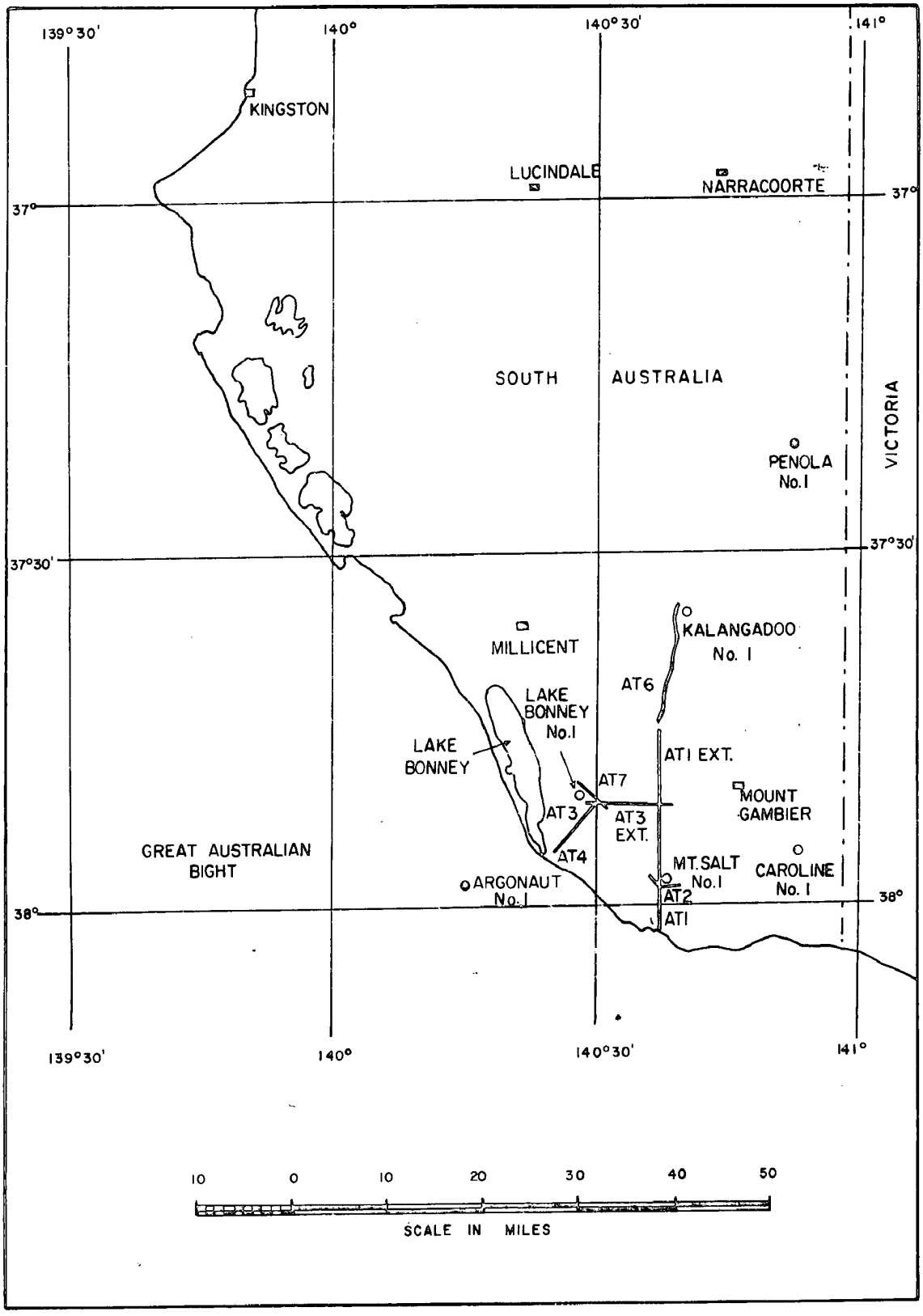


FIGURE - 2

Results from the analog processing showed strong interference from noise on the sections and all 4/0 field tapes and the 32/0 composite tapes were transmitted to the Houston Processing Centre of Ray Geophysical Division, Mandrel Industries, Inc. for digitizing and subsequent experimental processing. It is on the results of this digital processing that the interpretation covered by this report is based.

Date of Survey

The survey commenced on March 10, 1970 and was completed on May 6, 1970. During this time the crew worked a five and a half day week, operating from the town of Mt. Gambier, South Australia. Four days at the beginning of the survey were spent on dropping a noise spread and experimental profiles. For the following ten days, the crew was shut down due to instrument trouble. An instrument supervisor was flown from the United States and production dropping began on March 24, 1970.

Statistics

Total recording hours during the survey amounted to 365.75 hours of which 59.00 hours were used in daily travel to the field. Maintenance was carried out on Saturday afternoons and Sundays. No time was charged for time lost due to adverse weather conditions. Production during the course of the survey was 57.73 miles of six fold C.D.P. coverage, an average of 1.58 miles

per ten hour working day. A full statistical summary is presented with this report under the heading of TABLE I.

REGIONAL GEOLOGY

The Otway Basin is approximately 400 miles long and 75 miles wide filled with Mesozoic and Tertiary sediments. It has an east-west trend which is in sharp contrast with the north-westerly development of the continents Paleozoic history.

The basin was initiated probably along tension lines in the early part of the Mesozoic. The oldest sediments recognized to date, are Jurassic sandstones, but the bulk of the basin filling occurred during Lower Cretaceous times, when on a rapidly subsiding floor grey wacke type sediments have accumulated. The faulted horst structure of the slightly metamorphosed Paleozoic basement controlled the sedimentation, and thicknesses varies from few thousand feet above basement highs to an excess of 12,000 feet in deep basinal positions.

Several breaks during the deposition of the Otway Group are represented by local or regional unconformities but the most important of those occurred at the end of the Lower Cretaceous when the basin was filled and part of it uplifted.

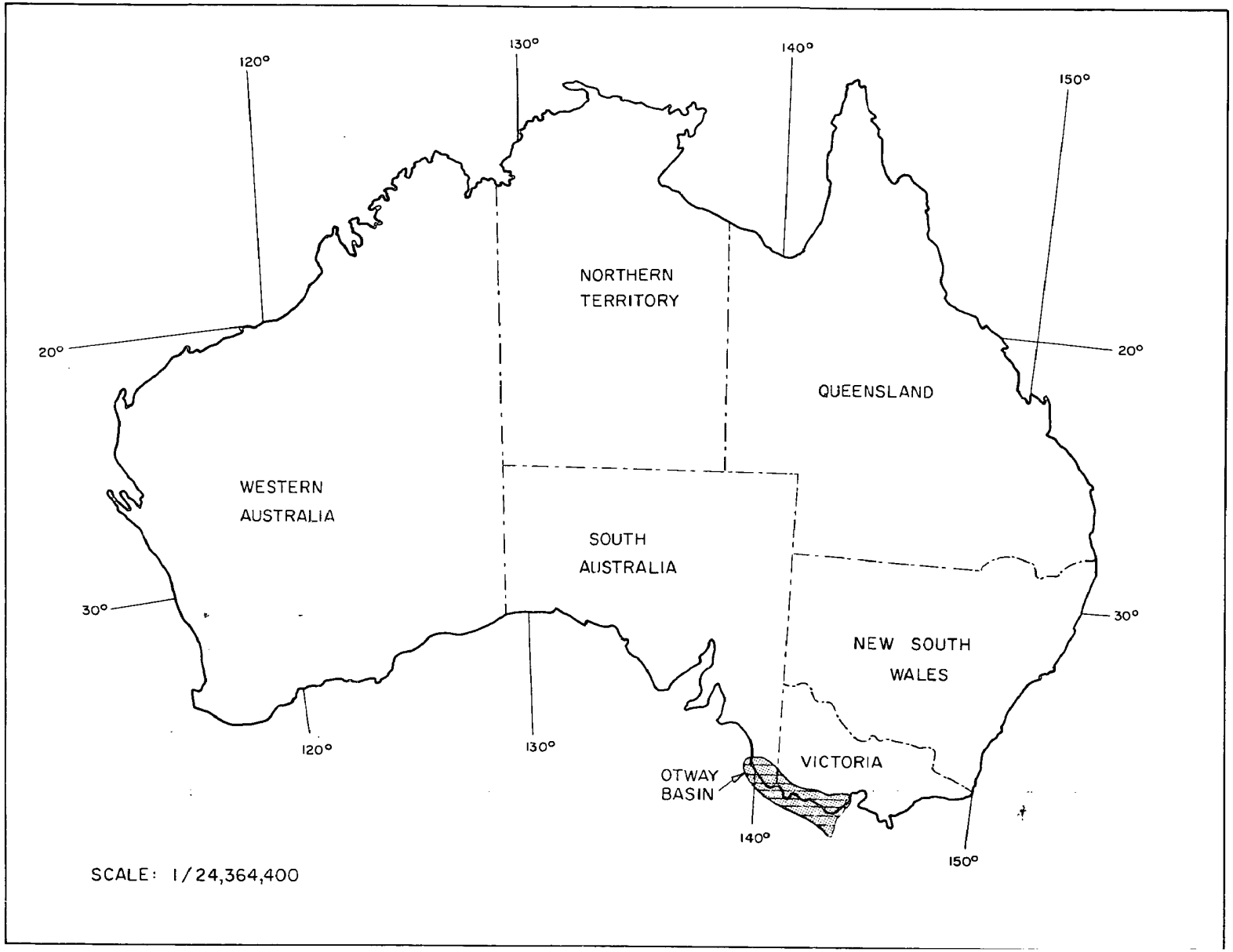

120°
130°
140°
150°
20°
20°
30°
30°
NORTHERN
TERRITORY
QUEENSLAND
WESTERN
AUSTRALIA
SOUTH
AUSTRALIA
NEW SOUTH
WALES
VICTORIA
OTWAY
BASIN
120°
130°
140°
150°
SCALE: 1/24,364,400

FIGURE - 3

At the beginning of the Upper Cretaceous, embayments of the old basin continued subsiding and received marine mudstones, later the deposition became fairly general and graded into paralic and deltaic environment. Large quantities of materials were carried into the basin. The source of these materials were dominantly the same as during the previous cycle but the newly uplifted Otway regions also contributed. The sinking of the basin was rapid but the supply was abundant and great thicknesses of sediments accumulated. In the Mt. Salt Well the Upper Cretaceous Sherbrook Group has a minimum thickness of 11,000 feet.

In some parts of the basin there is an erosional unconformity on top of the Sherbrook Group but in others sedimentation probably continued into the Tertiary when large quantities of well sorted sands overlain by limestones were deposited in a very widely spread basin.

Stratigraphy

As a type locality the Esso Argonaut Well is used as it penetrated an almost complete section of the Sherbrook Group, in a well developed basinal position. In the following stratigraphic description of this well, the Sherbrook Group is divided into its natural lithological units.

GROUP	THICKNESS
GLENELG GROUP - (seafloor (93'-1162')	1069'
Miocene-Oligocene Gambier Limestone 93'?-1070'	977'?
No samples were collected to 880' however it is assumed that the sequence was composed of soft and porous Coquina limestones and siltstones as the section drilled below.	
GROUP	
Upper Eocene - Nelson Formation 1070'-1162'	92'
Glauconitic unconsolidated coarse to pebbly sand with pyrite and coal.	
KNIGHT GROUP (1162'-2385')	
Eocene-Paleocene Dilwn Formation 1162'-2330'	1168'
Unconsolidated ironcoated coarse quartz sand with some brown silt matrix and interbedded brown siltstone.	
Paleocene Pebble Point Formation 2330'-2385'	
Unconsolidated coarse to pebbly sand with traces of coal and lithic grains.	
SHERBROOK GROUP (2385'-TD 12163')	9778'+
Upper Cretaceous Unit A 2385'-3370'	
corresponds to Curdies Beds.	985'
Unconsolidated white-clear fine to coarse grained quartz sand angular to sub-rounded	

THICKNESS

with pink and green silicates, pyrite, interbedded with light to medium brown silty mudstone. Coal bands with abundant amber are common. Gamma log shows thick, up to over 100 feet clear sands with equally thick beds of interbedded siltstones and mudstones. At 3370 feet a fairly distinct break occurs on the Gamma log, Sonic log, and a few millivolts shift can be noticed on the SP log. The presence of the green void filling clays which marked the top of the MacDonnel Member in the Caroline Well can not be traced in the Argonout lithological descriptions but a character charge at 3370' on the Electric log gives a convenient natural unit which would correspond to a bed in Caroline, and that is about 100 feet above the MacDonnel top.

Upper Cretaceous Unit B corresponds to MacDonnel Member 3370'-5440'. 2070'

The unit is composed of mainly sands they are white to clear quartz grains, from fine to pebble size and are slightly better rounded than those in Unit A. Below the first 100 feet the sands are often silt choked and are interbedded with light to medium grey pyritic siltstones. On the logs this is a very characteristic unit where sharp sand and shale peaks alternate with each other. The bedding is seldom thicker than 30 feet and mostly only a few feet thick. Towards the base the unit becomes carbonaceous.

	THICKNESS
Upper Cretaceous Unit C 5440'-7600'	2160'
This unit is essentially the same as Unit B the sands are the same as above only their thickness is increased. Sand beds of up to 100 feet thick or more are parted with 10 to 30 feet thick, light grey shaly siltstones. Below 6400 feet a few beds of dark grey micaceous and pyritic shale appears.	
Upper Cretaceous Unit D 7600'-10050'	2450'
Dark grey to black carbonaceous shale and coarse grained unconsolidated sand and sandstone beds of about equal thicknesses alternate in this unit. The Gamma log shows cycle configurations which are characteristic for deltaic deposits. The cycle starts with high count representing clean clays and gradually takes up an increased amount of coarse material until it finishes in clean sand with very low Gamma count at the end of the cycle. H. N. Fisk (1960) describes such deposits as barfinger sands, the lower part being the delta platform and the sand is the point bar at the end of a distributory.	
Upper Cretaceous Unit E 10050'-11630' Belfast Formation	1580'
Shale dark grey to black very carbonaceous glauconitic pyritic fossiliferous, sandy in parts.	

	THICKNESS
Upper Crataceous Unit F 11630'-TD 12163' Flaxmans Bed? - Warre Formation.	533'+
Sandstone very fine to medium to coarse non-porous with slight calcareous matrix, glauconitic, Chloritic. Interbedded dark grey abundantly glauconitic silty shale.	

Structure

P.E.L. 8 South Australia covers part of the western end of the Otway Basin. Within P.E.L. 8 are the two sub-basins, the Penola Trough and the Gambier Trough divided by an east-west basement high running through Kalangadoo to Beachport.

The Penola Trough north of Kalangadoo-Beachport high is filled with sediments of Lower Cretaceous and Jurassic age with a thin veneer of sediments of Upper Cretaceous and Tertiary age.

The Gambier Trough to the south of the Kalangadoo-Beachport high is filled with over 15,000 feet of Upper Cretaceous sediments overlain by a thin veneer of sediments of Tertiary age and underlain by sediments of Lower Cretaceous age. The axis of the Gambier Trough runs through Mt. Salt No. 1 Well.

The completed seismic survey cover by this report lies wholly in the Gambier Trough. The seismic work carried out in the offshore extension of the Gambier Trough

proves the presence of structure offshore but onshore seismic has so far been inadequate to prove the presence of structure except on Caroline Gravity High in which seismic proved closure at the base of the Tertiary.

Petroleum Prospects

The Belfast Mudstone is the most prospective source rock in the area. The Waarre Formation is the most prospective reservoir bed.

PREVIOUS GEOPHYSICAL WORK

Aeromagnetic

South Australian Mines Department (1962)
"Results of Airborne Magnetic Surveys in South Australia" (unpublished).
Haematite Explorations Pty. Ltd. (196)
"Bass Strait and Encounter Bay Aeromagnetic Survey 1960-61"
PSSA Published No. 60 Department of National Development.

Ground Magnetic

Industrial Geophysical Surveys Pty. Ltd. (1966)
"Magnetic Survey Caroline Area O.E.L. 22 South Australia."
Private report to Alliance Oil Development Australia N.L. OTW/M1.

Gravity

Stackler W. F. (1966) "Caroline Killanoola Gravity Survey O.E.L. 22 South Australia". Geosurveys of Australia Pty. Ltd. report for Alliance Oil Development Australia N.L.

Stackler W. F. and J. Radus (1967) "Kongorang Gravity Survey O.E.L. 22 South Australia". Geosurveys of Australia Pty. Ltd. report for Alliance Oil Development Australia N.L.

Seismic

"Penola Seismic Survey" 1964 -- submitted to Alliance Oil Development Australia N.L. - Namco International Inc., H. E. Bowman, W. J. Harkey.

"Kalangadoo-Lucindale Seismic Survey" 1965 -- submitted to Alliance Oil Development Australia N.L. by Namco International Inc., H. E. Bowman.

"Caroline-Killanoola Seismic Survey" 1966 -- submitted to Alliance Oil Development N.L. by Namco Geophysical Co., R. P. Chalker, H. E. Bowman.

"Mt. Schank Seismic Survey" 1964 -- submitted to Alliance Oil Development N.L. by Namco Geophysical Co., H. E. Bowman, L. Taylor.

"Otway and Sydney Basins Experimental Vibroseis Survey" 1964 -- submitted to Bureau of Mineral Resources, Geology and Geophysics Record No.1965/198 by Seismograph Service Limited T. L. Kendall.

PHYSICAL CONDITIONS

General Location

The area covered by the Gambier Trough Seismic Survey is situated in the south-east corner of South Australia, part of P.E.L. 8. It lies in the western part of the Otway Basin. The eastermost line of the survey is located approximately 9½ miles west of the town of Mt. Gambier. Lines extend 22 miles west and 19 miles north of this town; they pass close to three wells in the area, Lake Bonney No.1, Mt. Salt No.1 and Kalangadoo No.1.

The area surveyed is bounded by latitudes 37 degrees 35 minutes and 38 degrees 2 minutes South and by longitudes 140 degrees 24 minutes and 140 degrees 42 minutes East. Figure 1 shows the general location of the prospect area and Figure 1 a schematic map of the lines dropped during the course of the survey.

Towns

Mt. Gambier, situated approximately 12 miles west of the border with the State of Victoria, is the largest town in the area. With a population of over 17,500, Mt. Gambier has a regular scheduled air service from Adelaide and Melbourne.

Terrain

The prospect area consists mainly of well developed pastoral farmland with a number of large pine plantations controlled by the Forestry Department. The gently rolling pastures were closely fenced; most survey lines were laid out to follow existing roads in the area. Limestone outcrops were common in the area particularly in the south.

A network of good roads covered the area; these roads, most of which were sealed, were used both for access from the base of operations at Mt.Gambier and for alignment of lines.

LOGISTICS

The crew operated from the town of Mt. Gambier. Accommodation was readily obtainable in motels in the town and travel times from Mt. Gambier to the field was not excessive. All vehicle servicing and maintenance was carried out by local garages assisted by Ray personnel. Spare parts were normally obtainable locally; those parts not available either in Mt. Gambier or Adelaide were flown in by commercial airline from Perth. Key personnel were Perth based and no difficulty was experienced in obtaining additional labour locally. Full technical and administrative support for the crew was provided from the Ray Geophysics' office in Perth, W.A.

The survey was conducted on a five and one half day a week basis, Saturdays and Sundays being used for vehicle maintenance and instrument testing. Perth based personnel working on weekends accumulated rest leave at the rate of one day rest for each four worked; this rest leave was not taken until the completion of the survey.

All tapes and field reports were sent by air to Perth office of Ray Geophysics (Aust) Pty. Ltd. for processing. At the start of the survey, an Analyzer caravan unit was installed in Mt. Gambier for 'on the spot' processing of data. A considerable amount of experimental processing was accomplished by this Analyzer during the early part of the survey. However, it was apparent that, due to the complexity of the noise problem in the area, straight-forward processing such as was possible with this unit, would be inadequate to obtain usable data. The Analyzer was therefore closed down after the first month's operations.

FIELD PROCEDURE

Surveying

A Wild T-O theodolite was used to run elevations and traverses. All lines were tied to existing controls including the Mt. Gambier and The Bluff Trigomometrical Stations, and three wells, Kalangadoo No.1 to the north, Mt. Salt No.1 to the south, and Lake Bonney No.1 to the west.

A declination of 7 degrees 43 minutes East was used throughout the survey. The raw observation bearings were corrected for declination and computed and plotted in the field by the surveyor. Co-ordinates of all lines have been computed using true bearings and all lines are represented on the maps in their true locations.

Both horizontal and vertical results were adjusted to conform with the trig. stations and wells in the area. (Previous survey markings were ill-defined and difficult to locate and thus were not used for adjustment of readings). All adjustments were within the acceptable allowable limits, namely, horizontal, 200 feet in a 10 mile traverse and vertical, by the formula $\frac{1}{2}\sqrt{n}$, where n= miles of traverse and the allowable limit is in feet. Fair to good horizontal and vertical control may be considered to have been established in this prospect. Vertical control was established from the existing well locations and all hanging lines were double-run. The maximum vertical misclosure was +1.80 feet on Line AT4. Horizontal control was established by triangulation from the Mt. Gambier and The Bluff Trig. Stations; all hanging lines were similarly double-run. Maximum horizontal misclosure was N +84 yards and E -67 yards on Line AT3. Levels were run on all stations and all chained distances were checked by stadia.

Elevations in the northern part of the survey ranged from 222.2 feet west of Kalangadoo No.1 at station 115 on AT6 and 250.2 feet at station 74, to 193.7 feet at station 1. The area to the west, in the vicinity of Lake Bonney No.1, ranged 40-115 feet above sea level. Elevations in the south decrease to sea level, with Lines AT1 and AT4 terminating at the coastline of the Great Australian Bight.

Permanent markers of previous geophysical surveys were difficult to locate. New permanent markers with metal descriptive tags were placed throughout the prospect; locations of these markers are at the start and end of each line and at intersections of these lines.

Line Clearing

Little line clearing was required and the greater part of the survey was conducted along existing roads and farm tracks in the area. The several pine forests in the prospect area were bypassed by bending the seismic lines within reasonable limits. On line AT-6, a bulldozer was used on one day to clear a suitable line through a swamp in an old scrub forest area. No other bull-dozing was necessary.

Instruments

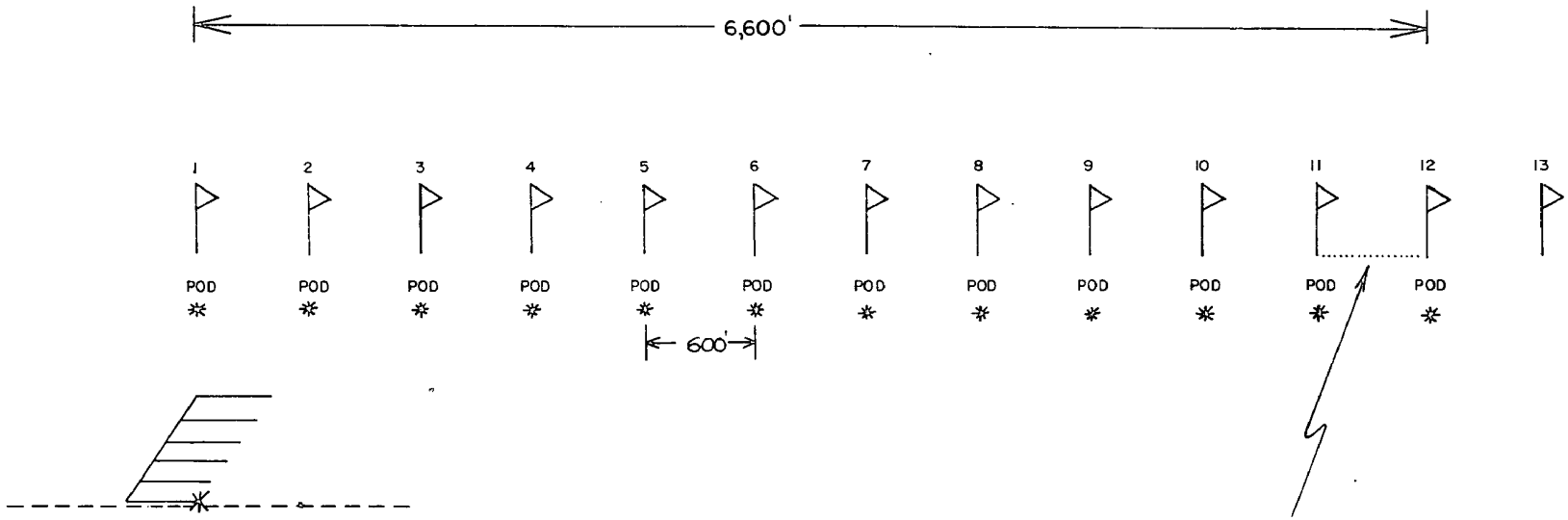
The Ray Geophysical Model 412, 5-drum, 12 channel Geograph "Automan" recording unit with modified S.I.E. GA-11 (RL) amplifiers was used for recording throughout with multiple geophone arrays giving six fold Common Depth Point coverage. Adequate spare parts including additional amplifiers were carried on the field party to ensure optimum efficiency during operations.

Electro-Tech geophones with a 14 Hz natural frequency were used in a number of different arrays. 2400 geophones (200 strings) were available on the crew providing a considerable number of spare strings both for replacement and experimental purposes.

Experimental Work

The Gambier Trough area is known to be a difficult area with respect to data recovery and a considerable amount of experimental work was carried out in the field both at the start of the survey and during production dropping, in an effort to produce usable data. Severe interference by noise was present throughout the area; a number of spread distances, geophone arrays and recording procedures were tried in order to reduce this interference and improve the signal to noise ratio.

PATCH COMPARISON AND NOISE ANALYSIS



1) ½ Feather - 6 strings, 72 phones
2) Pod - 12 phones
3) Inline Vadis - 300'- 24 phones

Superimposed for
PATCH COMPARISON

Starting at Stn. 12, dropped 4/0 every 30 ft for 80 drops. ie to 30 ft from Stn. 13.

Recorded into pods at Stns 1 - 12.

NOISE ANALYSIS

FIGURE - 4

Noise Study

In order to assess the characteristics of the prevalent noise in the area, a noise study was carried out at the start of the survey. The noise spread consisted of twelve equally spaced stations 600 feet apart. A pod consisting of a string of twelve geophones was buried at each station; recordings were made from each of these stations simultaneously from weight drops made in line off-end from station 12 at intervals of 30 feet from 0 to 570 feet. Four drops were made at each location, a total of eighty drops completing the noise study. A combination of these recordings in play back produced a noise section for an effective spread of 0 - 7170 feet. A diagram showing the field layout for the noise study is shown in Figure 4.

Specimen Profiles

Using the same stations selected for the noise study, experimental profiles were dropped in order to assess the recording parameters most suitable for data recovery.

For the first profile, feathered patches comprising six parallel strings of twelve geophones were laid out at stations 1 to 21. A drop segment of 64 drops across station 12 was recorded into stations 1 to 10 and a further drop segment across station

10 was recorded into stations 12 to 21. This method of dropping gave an experimental profile spread of 6600 - 1200, 1200 - 6600 feet.

A second experimental profile was then dropped using a 'Vadis' string of 24 geophones. A 'Vadis' string entails the variable distribution of identical seismometers; it is a string of geophones weighted towards the centre. The layout of geophones for this type of patch is shown in Figure 6. In order to minimize the effect of dip and any other sub-surface irregularities, this profile was dropped in the following manner. A drop segment across station 14 was recorded at station 12; the second drop segment across station 15 was recorded at station 11. Dropping then continued across all stations to 25 recording progressively back to station 1.

Examination of the noise study, monitors of the specimen profiles and playouts on the Analyzer stationed on the crew was made by Mr. L. E. Twining, Ray Geophysics' Manager and by Mr. S. J. Watson, Consulting Geophysicist for Alliance Oil both of whom were present in the field for the start of the operations. In view of the strength and varied nature of the noise, good cancellation could not be attained but it was decided that the 'Vadis' geophone arrangement would be most likely to produce usable data. Production work was started

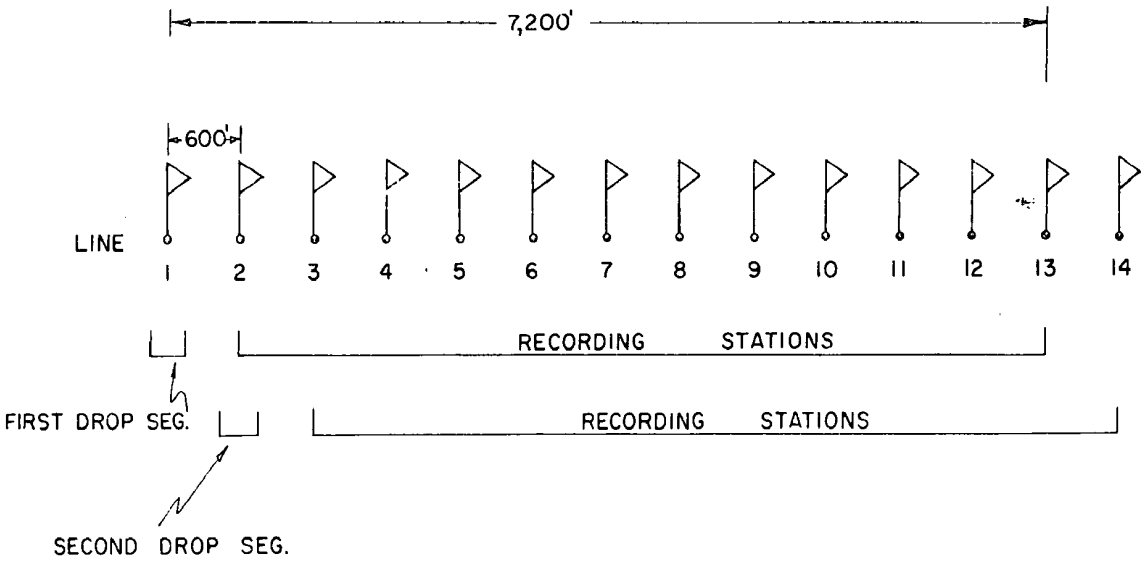
using this type of patch in a spread of 600 - 7200 feet. Drop segments consisted of 64 drops made in line over 600 feet.

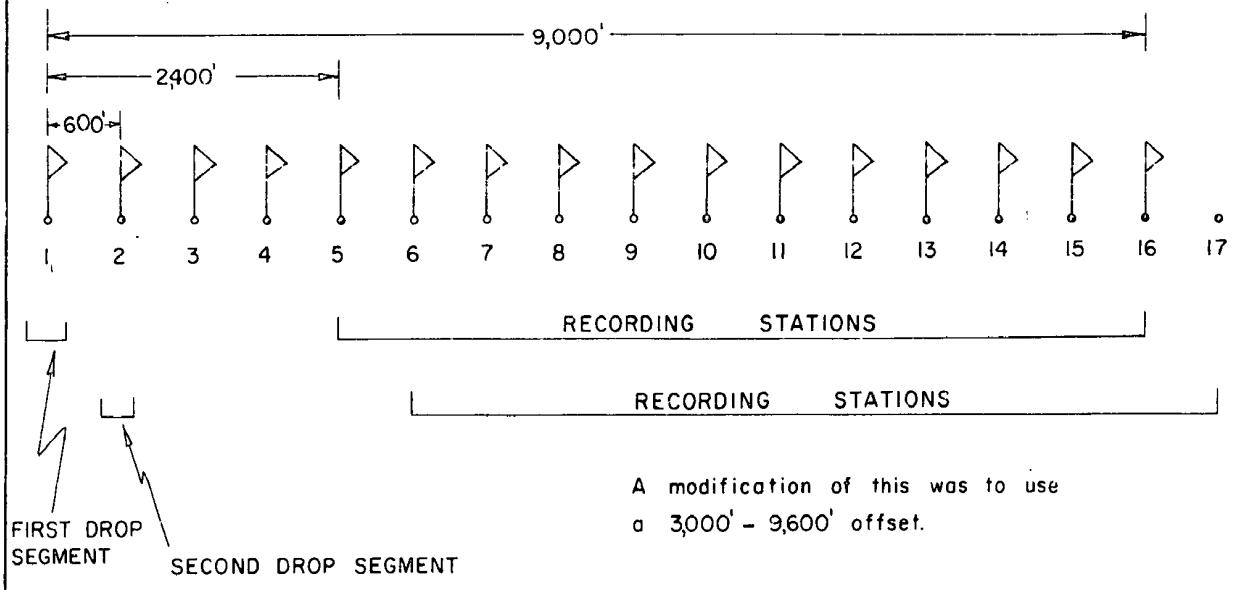
Recording

A normal off-end dropping method with variable offset distances was used over most of the prospect area. Diagrams of the three field layouts used in the survey are shown in Figure 5. On line AT-1, a 600 feet offset was used into a spread length of 600 - 7200 feet. In an effort to minimize the effect of unknown velocities on normal moveout corrections, a short split spread was tried on line AT-3. This spread, 3600 - 600 - 600 - 3600 feet, was not successful due to the strong noise on the near traces and on line AT-4, off-end dropping was resumed with a long offset distance of 2400 feet into a spread of 2400 - 9000 feet. Drop segments were reduced from 64 drops over a distance of 600 feet to 48 drops over a shorter distance of 300 feet. This method produced some improvement of data quality and was maintained for the remainder of the survey. In order to maintain the effort factor with a reduced number of drops, the patch size was increased to 60 geophones. These were arranged in a half star pattern, 375 feet long and 200 feet wide, in five strings of twelve geophones. The half star geophone patch was maintained as standard on the remaining lines of the survey.

FIELD LAYOUT

6 STACK CDP METHODS





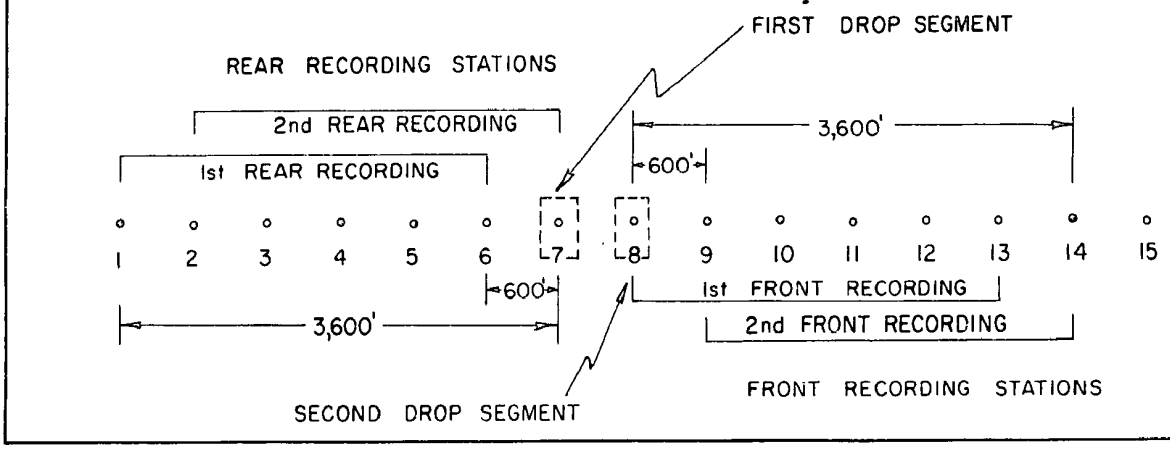
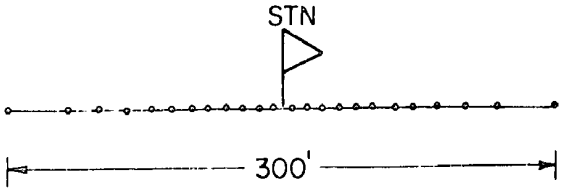


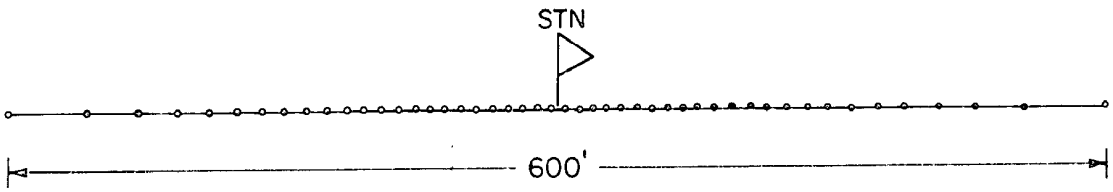
FIGURE - 5

PATCH DIAGRAMS

VADIS (VAriable Distribution of Identical Seismometers) INLINE



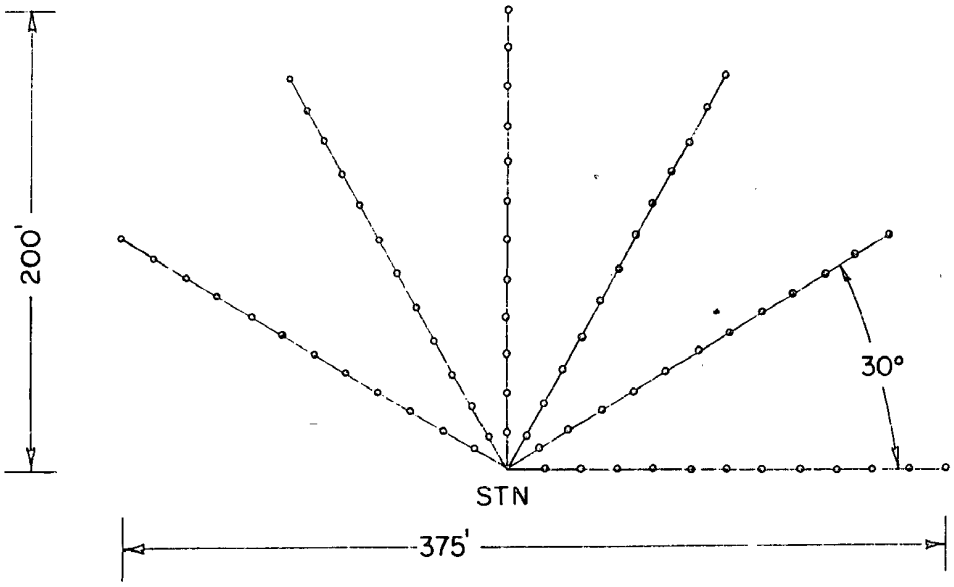
24 GEOPHONES



48 GEOPHONES

HALF STAR PATCH

200' x 375'



60 GEOPHONES

FIGURE - 6

RECORDING PROCEDURE DIAGRAM

12 PATCH OFF-END
600% COVERAGE

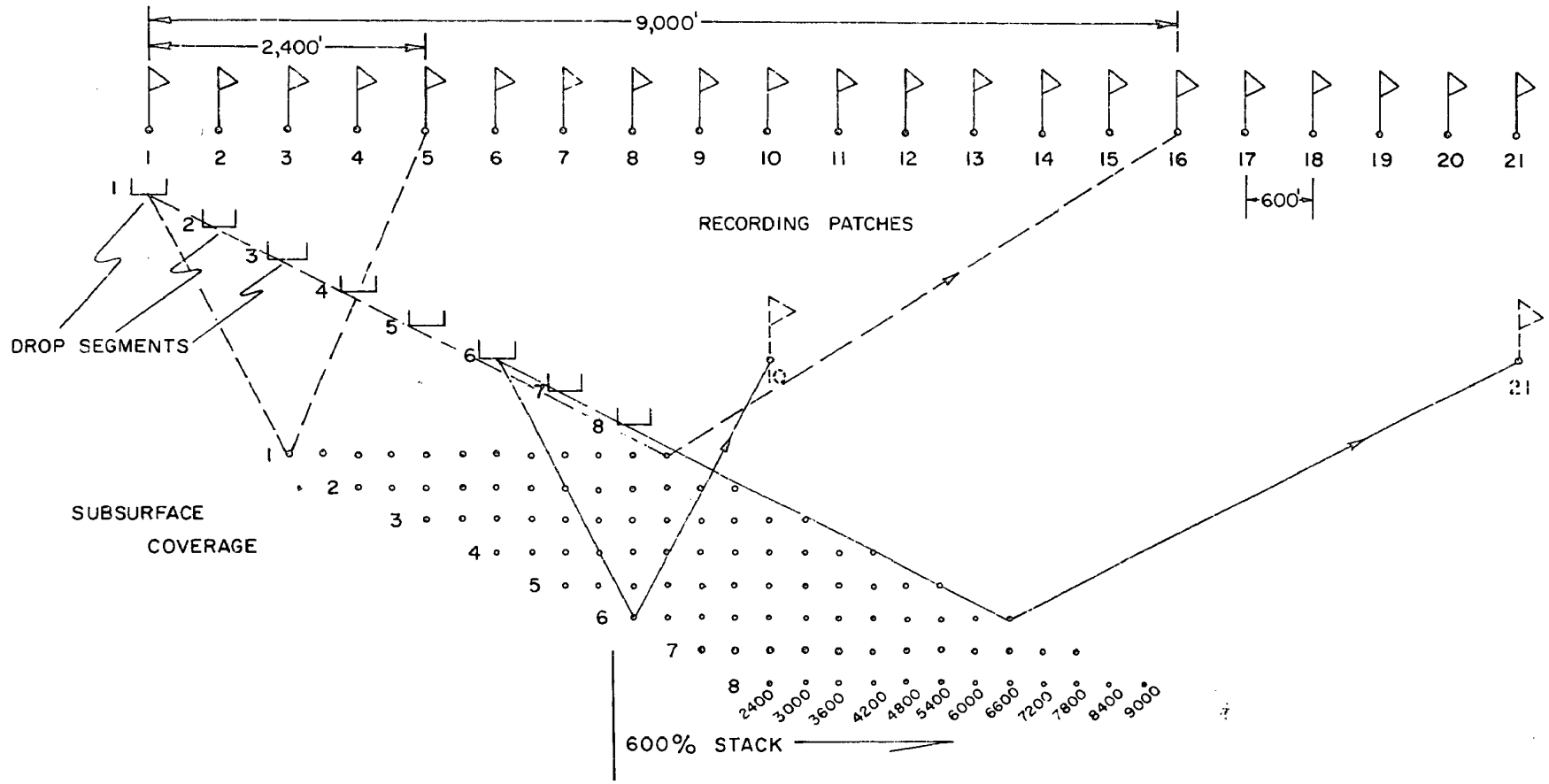


FIGURE - 7

RECORDING PROCEDURE DIAGRAM

6 PATCH SPLIT SPREAD

600% COVERAGE

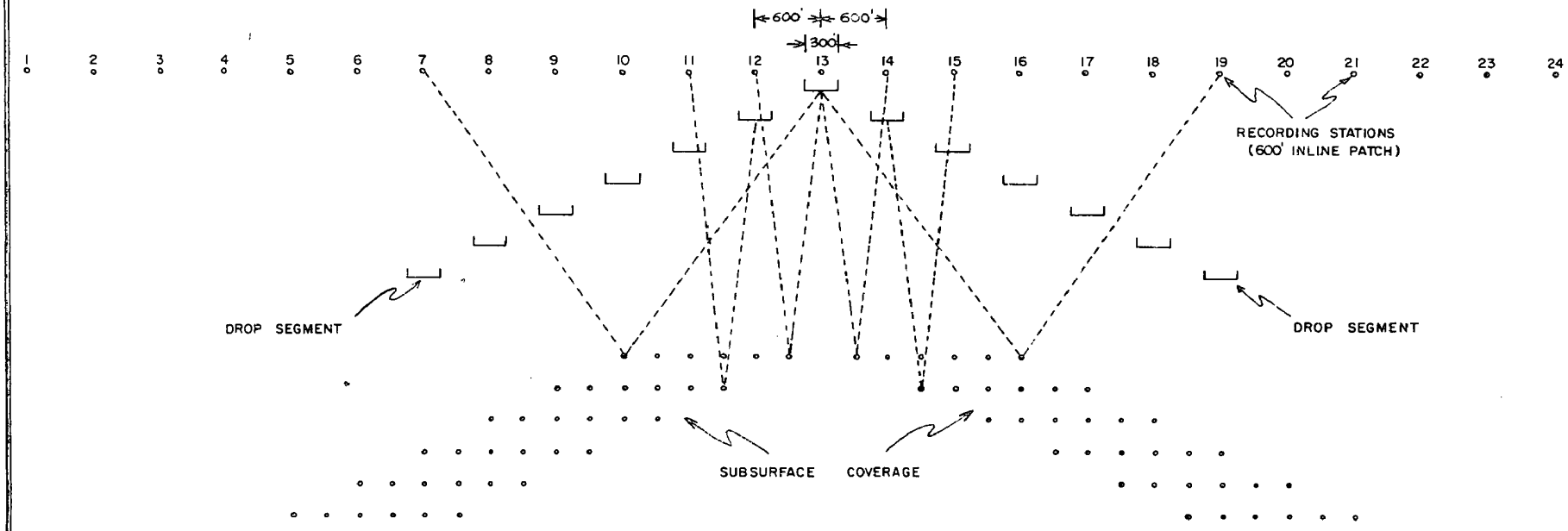


FIGURE – 8

All geophones were buried in order to minimize surface noise such as wind, air blast and field vehicles travelling in the vicinity of the line. Correct placement and burial of the geophones was regularly checked by the Observer or the Junior Observer.

Tap tests were taken at each geophone patch as part of the standard field procedure. A geophone in each patch was tapped and the response noted in the recording truck. This check ensured that all patches were connected with the same polarity. Reversed polarity of patches would cause cancellation of data when common depth point stacking is carried out in playback.

Record Quality

Data quality throughout the prospect area was poor. Great difficulty was experienced in deducing an appropriate velocity curve with which to correct field data for normal moveout. The velocity curve from Caroline No.1 well was used initially but did not appear to be adequate. A number of point sorts were run on the data from the first line, AT-1 but the strong interference from noise prevented the computation of a better velocity curve. An extensive velocity analysis was carried out by digital methods after all field tapes had been transmitted to Houston, Texas for digital processing.

This interpretation has been accomplished from the digital sections played back using these velocities.

Record quality on all lines with the exception of line AT-1 (Ext.) was poor to very poor. On this one line however, the data is considered fair. There appears no clear cut reason for the improvement of record quality on this line; terrain conditions were similar to those on other lines and the recording procedure, geophone patterns and drop method remained the same on lines AT-7, AT-2 and AT-6.

DATA PROCESSING, REDUCTION AND PRESENTATION

Data Processing

All raw field data were shipped by air to the Ray Geophysics office in Perth for processing. The raw tapes contained the four drop composite (4/0) traces, drop time corrected. The RAY GEOPHYSICAL DIVISION 'Geograph' corrector-analyzer was used to composite the 4/0 traces on the field tapes into a 32/0 trace on the composite tape. It was these 32/0 composite tapes and later the original 4/0 field tapes that were subsequently sent to the Ray Geophysical Division Processing Centre in Houston for conversion to a digital form for experimental processing.

In the analog processing centre in Perth, the normal analog processing procedures were followed. Each track on the composite tape was corrected for statics and dynamics by the Geospace SDP-1019 Seismic Data Processing System and transferred to a final stacked tape. Final tapes were then photographed on film sections. During this final stage, a wide range of filtering can be applied; a number of filter comparison tests were made but none produced any significant improvement of data.

Normal Moveout

Initial dynamic corrections were computed from the velocity information from the Caroline No.1 well. After the first part of line AT-1 was processed, it was suspected that this velocity information did not apply to the area under survey. Point sorts were therefore run in an effort to compute velocities that would correct the field data more fully. Several curves were computed; these are shown in Figure 9. Little improvement to the final sections was noted. The velocities obtained from the digital velocity analysis must be considered the most reliable.

Correction for Weathering and Elevation

From monitors of the noise study and specimen profiles weathering depth was seen to be very shallow and the sub-weathering velocities were

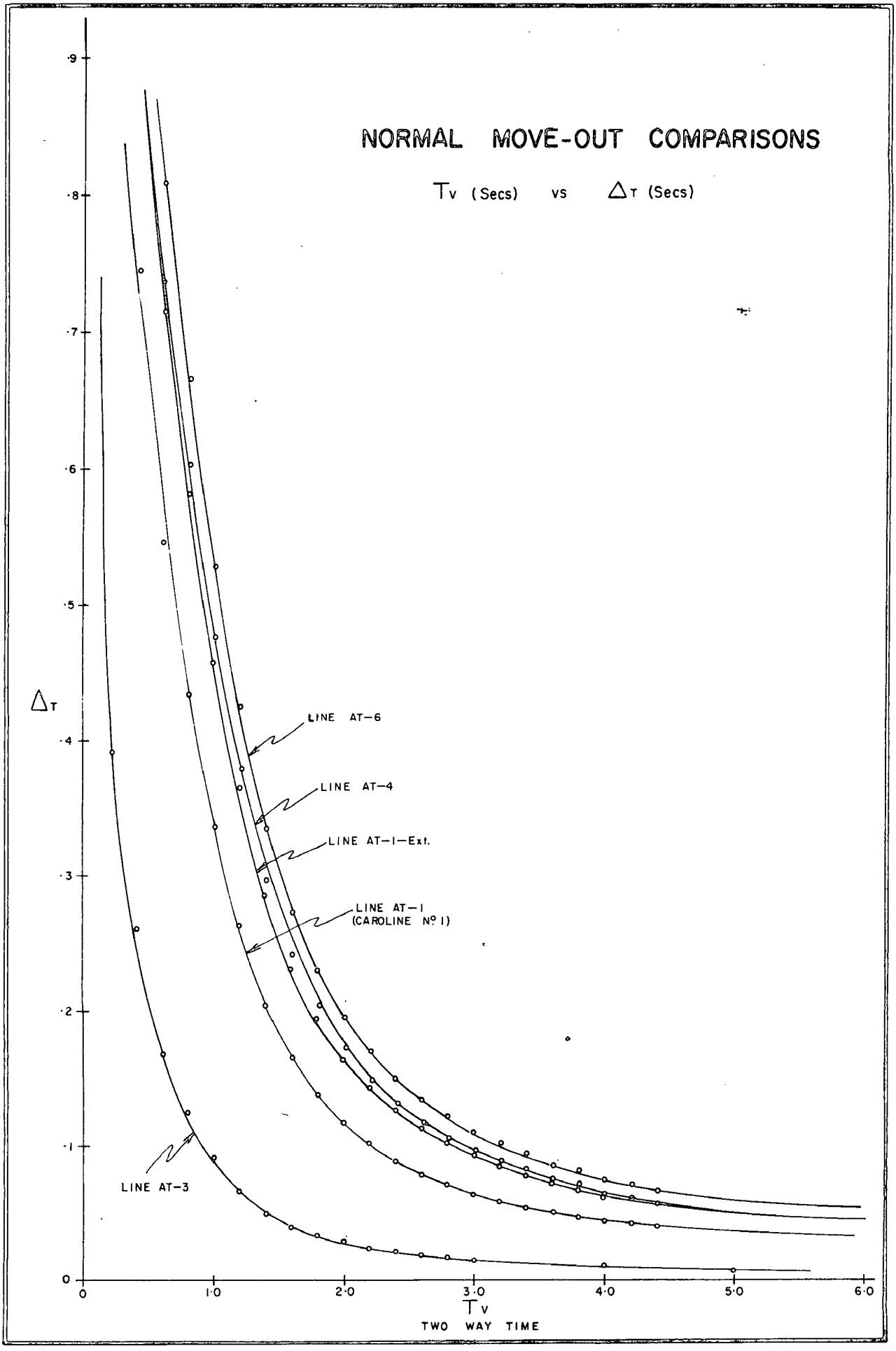

NORMAL MOVE-OUT COMPARISONS
Tv (Secs) vs ΔT (Secs)
ΔT
·9
·8
·7
·6
·5
·4
·3
·2
·1
0
LINE AT-6
LINE AT-4
LINE AT-1-Ext.
LINE AT-1
(CAROLINE Nº 1)
LINE AT-3
0
1·0
2·0
3·0
4·0
5·0
6·0
Tv
TWO WAY TIME

FIGURE - 9

comparatively high, between 7500 and 9000 feet per second. In view of the low elevations above Sea Level, an average velocity to datum was considered adequate for the computation of static corrections. The correction velocity chosen was 7000 feet per second.

Using the average velocity to datum, one-way correction times beneath the drop segment and the recording patch were computed; these times were then summed to correct each trace on the composite tape.

Presentation

All reflection sections are presented in Variable Area/Galvo trace form. Analog sections produced in Perth have a horizontal scale of 16 traces per inch and a vertical scale of 4.2 inches per second. Those sections originating from the digital processing in Houston have a horizontal scale of 12 traces per inches and a vertical scale of five inches per second. Final prints of all sections to accompany this report will be forwarded as soon as they are made available from Houston.

DISCUSSION OF RESULTS

Mapping

From the preliminary sections supplied from the digital processing carried out at the Ray Geophysical Division processing centre in Houston, Texas two horizons have been picked and mapped. These horizons have been designated 'A' and 'B'. Maps of these two horizons together with an Isochron map representing the time interval between these horizons are presented with this report.

Due to the extremely poor record quality over most of the area, neither horizon map can be considered reliable. Doubtful correlation across the several faults that cut the area would indicate that these horizons do not represent the same geological horizons over the whole area.

However, each map, taking each segment between faults individually, is believed to show a fair representation of structure and dip.

All maps have been drawn to a 1:100,000 scale in two-way time values and are contoured at intervals of 0.025 seconds.

Interpretation

Interpretation has been carried out using the preliminary sections produced from the digital processing. This should be reviewed when the final sections become available.

Three main faults appear to cross the area surveyed. All are normal faults downthrown to the north. The northernmost cuts line AT-6 at station 42. A second fault passes through the central part of the prospect area cutting line AT-1 (Ext.) at station 130, line AT-3 at station 10 and passes immediately to the south-east of line AT-4. A third fault to the south cuts line AT-1 at station 32. No correlation has been possible across these faults.

The synclinal axis of the basin passes through the central part of the area to the north of the Mt. Salt No.1 location. To the north of the syncline, a well defined east-west high trend appears to have a small amount of closure immediately to the north of line AT-3 (Ext.) in the vicinity of station 40. Both horizons show closure on this trend which is confirmed by considerable thinning on the upthrown side of the central fault.

No other structural features of interest were apparent on the lines surveyed. Dip from both

the north and the south into the main synclinal axis steepens with depth. The time interval between the two horizons varies from 0.200 seconds on the coast at the south end of line AT-1 and in the north in the vicinty of Kalangadoo No.1 well to as much as 0.500 seconds at station 45 on line AT-1.

CONCLUSIONS AND RECOMMENDATIONS

The only feature of interest brought to light during the Gambier Trough survey is the east - west high trend passing to the north of line AT-3 (Ext.) and to the south west of Lake Bonney No.1 well. Additional work would be necessary to prove the alighment of the central fault to the north of this trend and also to confirm the closure shown on the horizon maps presented with this report.

Should additional seismic work be deemed necessary in the Gambier Trough area, it is recommended that 24 channel digital instruments be used to obtain at least twelve fold Common Depth Point coverage. This would enable a high effort factor to be obtained economically in the field and would also enable the many digital programmes for data enhancement to be applied with ease during processing.

The Gambier Trough Seismic Survey did not define the best field parameters for the area and more experimental profiling should be carried out particularly with respect to noise cancellation by selective geophone patterns.

Submitted by:

Gordon Searle
Party Chief

TABLE I

STATISTICAL SUMMARY

Date of Commencement		March 10, 1970
Date of Completion		May 6, 1970
Number of days worked		35½
Number of production days		33
Number of days lost due to weather		½
Public holiday - Easter Monday, March 30		1
Camp move to Casterton		1
Total Hours:	Recording	306.75
	Travel	59.00
	Total Hours Worked	365.75
Total Number of Drops		25,480
Total Coverage in Miles		57.73 miles
Average Coverage per 10 hour working day		1.58 miles
Tapes used:	Field	3,333
	Composite	1,215
	Corrected	1,095
	Final	50
Total number of tapes used in survey		5,693

DETAILS OF PETROLEUM EXPLORATION LICENCE 8.

Petroleum Exploration Licence No. 8 is held by Comoral Exploration Company of Australia Limited of 68 Grenfell Street, Adelaide. Alliance Oil Development Australia N.L. has earned 35.3% working interest in, and is the operator of, that portion of P.E.L.8 enclosed by the following boundaries.

"Commencing at the intersection of the boundary of the State of South Australia with 36° 48' 00" South Latitude then south along the State boundary to the coastline then generally north westerly along the coast to the intersection of 37° 45' 30" South Latitude, then east to 140° 25' 40" East Longitude then north to 37° 34' 20" then east to 140° 30' 00" then north to 37° 30' 00" then east to 140° 36' 30" then north to 36° 48' 00" then east to point of origin."

Comoral Exploration Company Limited retains 63.7% working interest in this area and Beach Petroleum N.L. has a 1% working interest in this portion of P.E.L.8.

AN APPRECIATION OF THE EXPERIMENTAL WORK

GAMBIER TROUGH SEISMIC SURVEY

Experimental field work conducted by Ray Geophysics Thumper crews prior to the start of field profile production work consists of one or more noise studies and a specimen profile.

The noise study data provides a picture of the apparent noise pattern in the vicinity of the test area. From a study of this data certain field parameters such as station spacing, geophone spacing, spread distances, and possibly field filter setting for the instruments can be determined.

A normal noise study usually compares the noise patterns obtained from pods (a point receptor), and one or more large arrays, such as half feather, half star, VADIS array, etc. As the data is obtained from one set of drops, it is advantageous to have the comparison.

The data picked on a noise study presentation includes the following:

1. All first break slopes, such as V_1, V_2, V_3, V_4, etc.
2. Slope intercept times.
3. Velocity slopes of noise events.
4. Frequency or frequencies of noise events.
5. Pattern of noise displays.
6. Air blast trace, if present.
7. Apparent reflection indications.
8. Any other apparent occurrence is noted and studied.

From the velocity of the noise train and the frequency of the noise cycle, the wave length of the noise can be determined. The wave length is equal to the velocity divided by the frequency. This value, or values, if several noises present, is used to determine operation parameters.

cont

Where the noise pattern appears helps determine the spread lengths, particularly the near offsets.

A non-uniform spread arrangement could be developed to offset the noise pattern, to some degree.

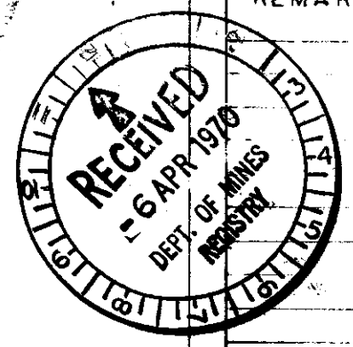
In the Gambier Trough Area, the noise study results obtained indicated little in the way of organized noise, but a terrific amount of random, high level disturbances. One strong ground roll with about 20Hz events and a velocity of about 3500'/seconds, and a second with a similar velocity but 14Hz events were discernable. The inherent noise level in the area was extremely high. The input meters were deflected almost ¾ full scale all the time whereas they normally appear almost dead.

Parameters calculated from the noise study data did not cancel the noise as desired, and the parameters were changed by trial until the monitors appeared to have a lower noise level. While not the best method, the one which had to be used when noise study data failed to produce usable parameters.

The specimen profile is an attempt to get a preliminary, uncorrected, record which might show reflections, and indicate where data might be expected to show up on the monitors. There was little evidence of any reflections which could be classed definite as such. There was little to choose from between the VADIS array as designed by Ray Geophysics and the half feather. It was thought the half feather might cancel transverse noise patterns more efficiently so they were used in preference to the VADIS arrays in the Gambier Trough area.

The most puzzling aspect of the experimental data was the apparent lack of step across the uncorrected monitors. This was not solved, and it could be the reason very poor data has been obtained in the general Gambier Trough Area in the past.

EHV 1269



MONTHLY STATISTICAL REPORT for ALLIANCE PETROLEUM by RAY GEOPHYSICS (AUST.) PTY., LTD.

MONTH: MARCH YEAR: 1970

AREA: MT. GAMBIER

GEOGRAPH PARTY: 319 - 735

REMARKS: START OF SURVEY – 11.3.70

	DATE	LINE No.	FROM STATIONS	TO STATIONS	RECORDING No of DROPS	RECORDING STATIONS	RECORDING COVERAGE (FEET)	RECORDING MILES	RECORDING TOTAL MILES IN AREA	HOURS PRODUCTION	HOURS TRAVEL	HOURS TOTAL	BULLDOZING HOURS LINE No.	BULLDOZING HOURS CUTTING	BULLDOZING HOURS WALKING	BULLDOZING HOURS STANDBY	BULLDOZING HOURS TOTAL	TAPES FIELD	TAPES COMPOSITE	TAPES CORRECTED	TAPES FINAL	TAPES TOTAL TAPES
Laying out patches and cables										–	1.00	6:00										
Contract started – exp. work and noise study										6.00	1.00	7.00						10	8	–	–	18
Experimental work – specimen profile										7.00	1.00	8.00						10	16	–	–	26
" " – 12 FOLD C.D.P spread.										8.00	1.00	9.00						16	96	–	–	112
Instruments down																						
" "																						
" "																						
" "																						
Saturday – No field work planned.																						
Sunday – " " " "																						
Instruments down – Technical supervisor from																						
" " USA arrived on crew																						
" " 18.3.70.																						
" "																						
		A	D - C		128	2	1,200	0.23	0.23	9.00	1.00	10.00						16	6	6	1	29
		A	B - 15		1088	17	10,200	1.93	2.16	9.50	1.00	10.50						136	51	51	3	241
Wt. Truck down 1½ hrs.		A	16 - 28		832	13	7,800	1.47	3.63	9.50	1.00	10.50						104	39	39	2	184
Good Friday		A	29 - 46		1152	18	10,800	2.05	5.68	8.50	1.00	9.50						144	54	54	3	255
Very high winds – light rain.		A	47 - 56		640	10	6,000	1.14	6.82	6.00	1.00	7.00						80	30	30	2	142
Maintenance on instruments and vehicles } Easter Day																						–
Easter Monday																						–
		A	57 - 75		1216	19	11,400	2.16	8.98	10.00	1.00	11.00						152	57	57	3	269
	TOTALS				5056	79	47,400	8.98	8.98	73.50	10.00	88.50						668	357	237	14	1276

FIELD PARAMETERS:

SPREAD	600 – 7200 ft
DROP SEGMENT	600 ft
No of DROPS	64
PATCH (VADIS)	2 or 4 Strings in parallel
No of GEOPHONES	24 or 48

SUPERVISOR : L. E. TWINING

PARTY CHIEF : G. J. SEARLE

PARTY MANAGER : J. A. FLETCHER

EHV 1269-29

ENV 1269

MONTHLY STATISTICAL REPORT for ALLIANCE PETROLEUM by RAY GEOPHYSICS (AUST.) PTY., LTD.

MONTH: APRIL | YEAR: 1970

AREA: GAMBIER TROUGH

GEOGRAPH PARTY: 319-735

REMARKS: COMMENCED PRODUCTION MARCH 11

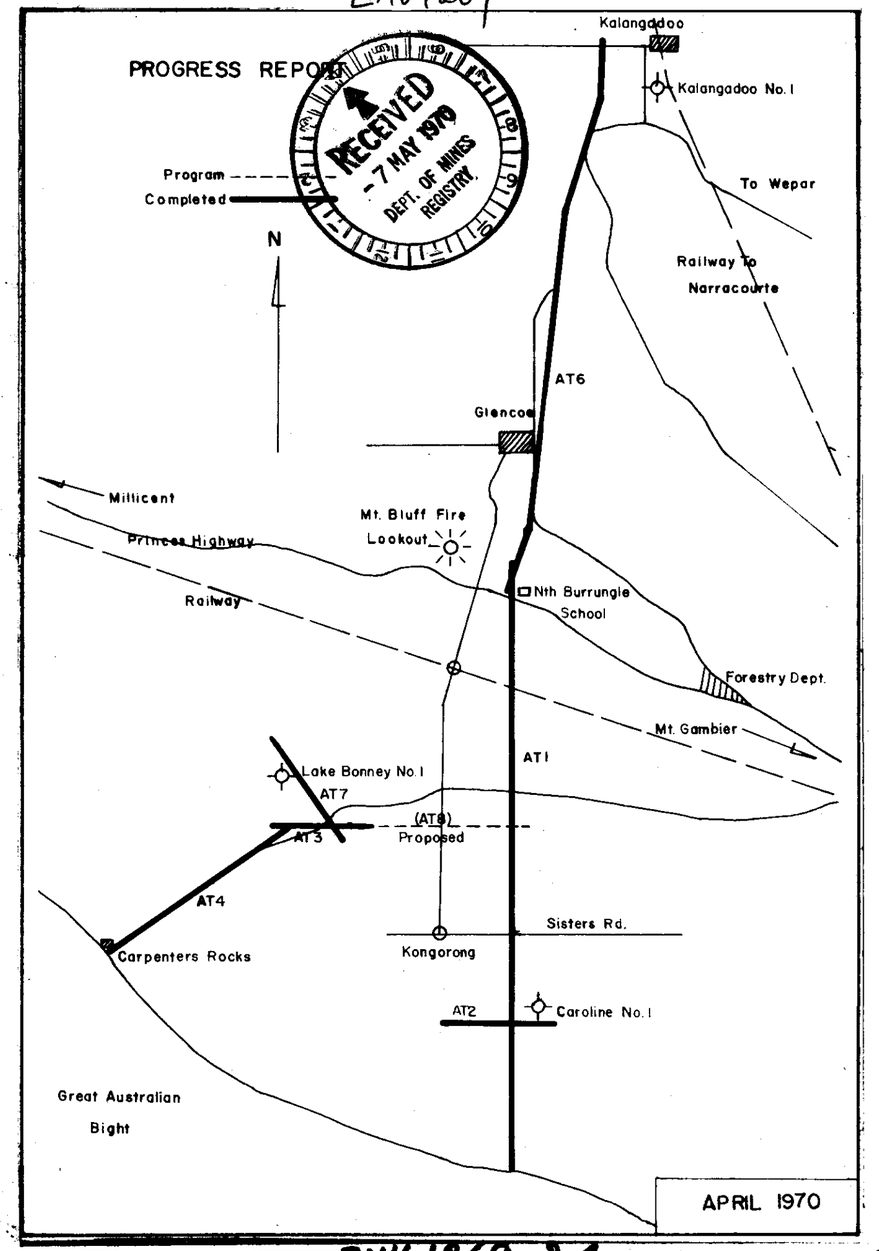
	DATE	LINE No.	FROM STATIONS TO	RECORDING: No. of DROPS	STATIONS	COVERAGE (FEET)	MILES	TOTAL MILES IN AREA	HOURS: PRODUCTION	TRAVEL	TOTAL	BULLDOZING: LINE No.	HOURS: CUTTING	WALKING	STANDBY	TOTAL	TAPES: FIELD	COMPOSITE	CORRECTED	FINAL	TOTAL TAPES
W/T TRANSMISSION TROUBLE. TOWED TO TOWN FOR REPAIRS 64 DROPS	1	AT1	75 - 78	256	4	2,400	0.45	0.45	4.50	1.00	5.50						32	8	8		
W/T DOWN FOR REPAIRS	2																				
" " " "	3																				
" " " "	4											AT6	6.50			6.50					
WIND & SOME RAIN. NOISE CAUSED BY HEAVY SURF. SUNDAY	5	AT1	79 - 93	960	15	9,000	1.70	2.15	9.00	1.25	10.25						120	30	30		
SWAMP & SURF AT E.O.L. AT1. DROPPED NOISE STUDY & PROFILE	6	"	94 - 98	320	5	3,000	0.57	2.72	11.00	1.25	12.25						105	10	10		
BEGIN LINE AT3. CHANGE TO 32 DROPS/SPREAD	7	AT3	E - 12	544	17	10,200	1.93	4.65	8.50	1.25	10.25						68	24	34		
W/T DOWN - AWAITING SPARES FROM MELBOURNE	8																				
" " " " " "	9																				
E.O.L. AT3	10	AT3	13 - 31	608	19	11,400	2.16	6.81	11.00	1.50	12.50						76	38	38		
BEGIN LINE AT4	11	AT4	6 - 17	384	12	7,200	1.36	8.17	5.50	1.50	7.00						48	24	24		
NO PRODUCTION SUNDAY	12																				
W/T PUT BACK IN RUNNING ORDER AFTER WEEKEND VANDALISM. 64 DROPS	13	"	18 - 20 / 1 - 7	544	10	6,000	1.14	9.31	6.00	1.50	7.50						68	20	20		
CHANGE TO 48 DROPS/SPREAD	14	"	8 - 25	1,056	18	10,800	2.05	11.36	10.00	1.50	11.50						132	36	36		
NOISE FROM SURF VERY BAD. E.O.L. AT4. BEGIN LINE AT7	15	AT4 / AT7	26 - 10 / 10 - 14	940	20	12,000	2.27	13.63	9.00	1.50	10.50						120	40	40		
	16	AT7	15 - 20 / 1 - 19	1,200	25	15,000	2.84	16.47	9.25	1.50	10.75						150	50	50		
E.O.L. AT7. BEGIN LINE AT2.	17	AT7 / AT2	20 - 20 / E - 9	768	16	9,600	1.82	18.29	9.50	1.50	11.00						96	32	32		
SHUT DOWN BECAUSE OF HIGH WIND SUNDAY	18	AT2	S - 15	528	11	6,600	1.25	19.54	4.75	2.00	5.75						66	22	22		
	19																				
E.O.L. AT2	20	AT2	(-1) - 21	1,056	22	13,200	2.50	22.04	9.50	1.50	11.00						132	44	44		
BEGIN LINE AT1 (EXT.)	21	AT1(EXT)	11 - 115	1,008	21	12,600	2.39	24.43	10.50	1.00	11.50						126	42	42		
HEAVILY FORESTED IN MOST PLACES	22	"	116 - 137	1,056	22	13,200	2.50	26.93	9.50	1.25	10.75						132	44	44		
W/T BROKE CABLE. TROUBLE WITH W/T RADIO (1 HR.)	23	"	138 - 157	960	20	12,000	2.27	29.20	8.75	1.50	10.25						120	40	40		
E.O.L. AT1 (EXT). HEAVY RAIN & WIND	24	"	158 - 170	624	13	7,800	1.48	30.68	8.75	1.50	10.25						78	26	26		
LAID OUT LINE AT6. NO PRODUCTION. STILL RAIN & WIND	25								4.25	1.50	5.75										
NO PRODUCTION SUNDAY	26																				
EXTREMELY HEAVY MUD, TOWING W/T WHILST DROPPING.	27	AT6	2 - 18	816	17	10,200	1.93	32.61	11.00	1.50	12.50						102	34	34		
THICK BUSH, HIGH TREES, AREA KNOWN AS	28	"	(-2) - 11	624	13	7,800	1.48	34.09	9.75	1.50	11.25						78	26	26		
DISMAL SWAMP. POWER LINES OVER STN. 19 ONWARDS	29	"	12 - 26	720	15	9,000	1.70	35.79	9.00	1.00	10.00						90	30	30		
TODAYS PARTICULARS NOT YET AVAILABLE; WILL FOLLOW	30	—	—	—	—	—	—	—	—	—	—						—	—	—		
	31																				
	TOTALS			14,972	315	189,000	35.79	35.79	179.00	30.00	209.00		6.50			6.50	1939	630	630		

FIELD PARAMETERS:

TO APRIL 15: PERIOD ①
APRIL 15 ON: PERIOD ②

SPREAD: 600'
DROP SEGMENT: 300'
No of DROPS: SEE REMARKS
PATCH ① 600' INLINE ② 200' x 500' ½ STAR
No of GEOPHONES: ① 48 ② 60

SUPERVISOR: L.E. TWINING
PARTY CHIEF: GORDON SEARLE
PARTY MANAGER: J.A. FLETCHER



ENV 1269-24

MONTHLY STATISTICAL REPORT for ALLIANCE OIL DEVELOPMENT AUSTRALIA N.L. by RAY GEOPHYSICS (AUST.) PTY., LTD.

MONTH: MAY | YEAR: 1970

AREA: GAMBIER TROUGH / WANNON

GEOGRAPH PARTY: 319-735

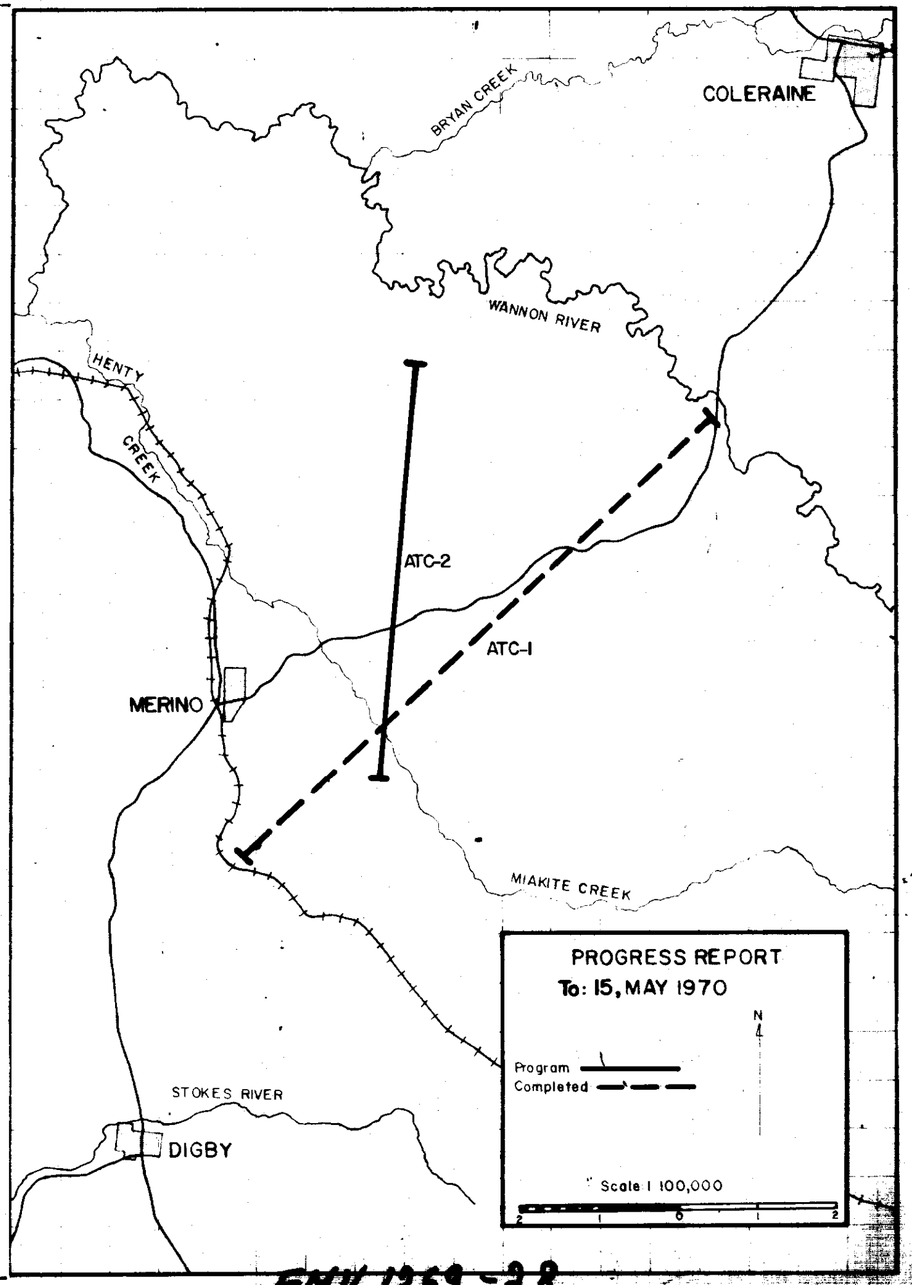
REMARKS:

DATE	LINE No.	STATIONS FROM	STATIONS TO	RECORDING: No of DROPS	STATIONS	COVERAGE (FEET)	MILES	TOTAL MILES IN AREA	HOURS: PRODUCTION	TRAVEL	TOTAL	BULLDOZING: LINE No.	HOURS: CUTTING	WALKING	STANDBY	TOTAL	TAPES: FIELD	COMPOSITE	CORRECTED	FINAL	TOTAL TAPES
1	AT6	49	76	1372	29	17,400	3.30	50.46	9.25	1.50	10.75						174	58	58		
HEAVY TRAFFIC ON RD. 48 DROPS																					
2		77	82	288	6	3,600	0.69	51.14	2.50	1.50	4.00						36	12	12		
RAINED OUT																					
3																					
NO PRODUCTION SUNDAY																					
4	"	83	100	864	18	10,800	2.05	53.19	8.50	1.50	10.00						108	36	36		
VERY WET. BAD LEAKAGE BECAUSE OF WET JUGS & CABLES SLOW. PICKED UP ALL GEAR TO TRY & KEEP IT DRY OVERNIGHT E.O.L																					
5	AT3EST	-1 32	-5 46	960	20	12,000	2.27	55.46	10.75	1.50	12.25						120	40	40		
VERY WET. MORE LEAKAGE TROUBLE P.M.G. CABLE BURIED UNDER PATCHES. BEGIN AT3 (ETE)																					
6	"	47	66	960	20	12,000	2.27	57.73	8.50	1.50	10.00						120	40	40		
SURFACE ROCKS & CAVES. PICK UP ALL GEAR. END OF PROGRAM																					
7								57.73		10.00	10.00										
MOVE TO CASTERTON																					
8																					
IN CASTERTON - VEHICLE MAINTENANCE																					
9																					
PREPARATION FOR NOISE STUDY																					
10																					
NO PRODUCTION SUNDAY																					
11	NOISE STUDY	—	—	—	—	—	—	—	10.00	1.00	11.00						131	46	—		
NOISE STUDY 1) 10 DROP EVERY 50' FOR 6,500 AWAY FROM LAYOUT 2) 24 DROPS " 300' " " BACK TO "																					
12	ATC-2	5 4	24 13	960	20	9000	1.70	1.70	10.00	1.00	11.00						120	60	60		
DROPPING 300' STNS. BESIDE RD. PWR. LINES, VERY BOGGY. 32 DROPS																					
13	"	14	44	1536	32	9,600	1.76	3.46	10.00	1.00	11.00						128	64	64		
DUE TO ROUGH TERRAIN & SLIPPERY MUD, SOME DROPS STACKED, SKIP STA35																					
14	"	45	81	1219	26	7,800	1.48	4.94	9.00	1.00	10.00						104	52	52		
ROUGH GOING, FIELDS STEEP & SLIPPERY																					
15	"	82	102	1008	21	6,300	1.19	5.13	9.00	1.00	10.00						84	42	42		
E.O.L ATC-2																					
16																					
RAINED OUT																					
17																					
NO PRODUCTION SUNDAY																					
18																					
19																					
20																					
21																					
22																					
23																					
24																					
25																					
26																					
27																					
28																					
29																					
30																					
31																					
TOTALS				9196	802	88,500	16.70	5.13	87.50	22.50	110.00						1,125	450	404	17	1996

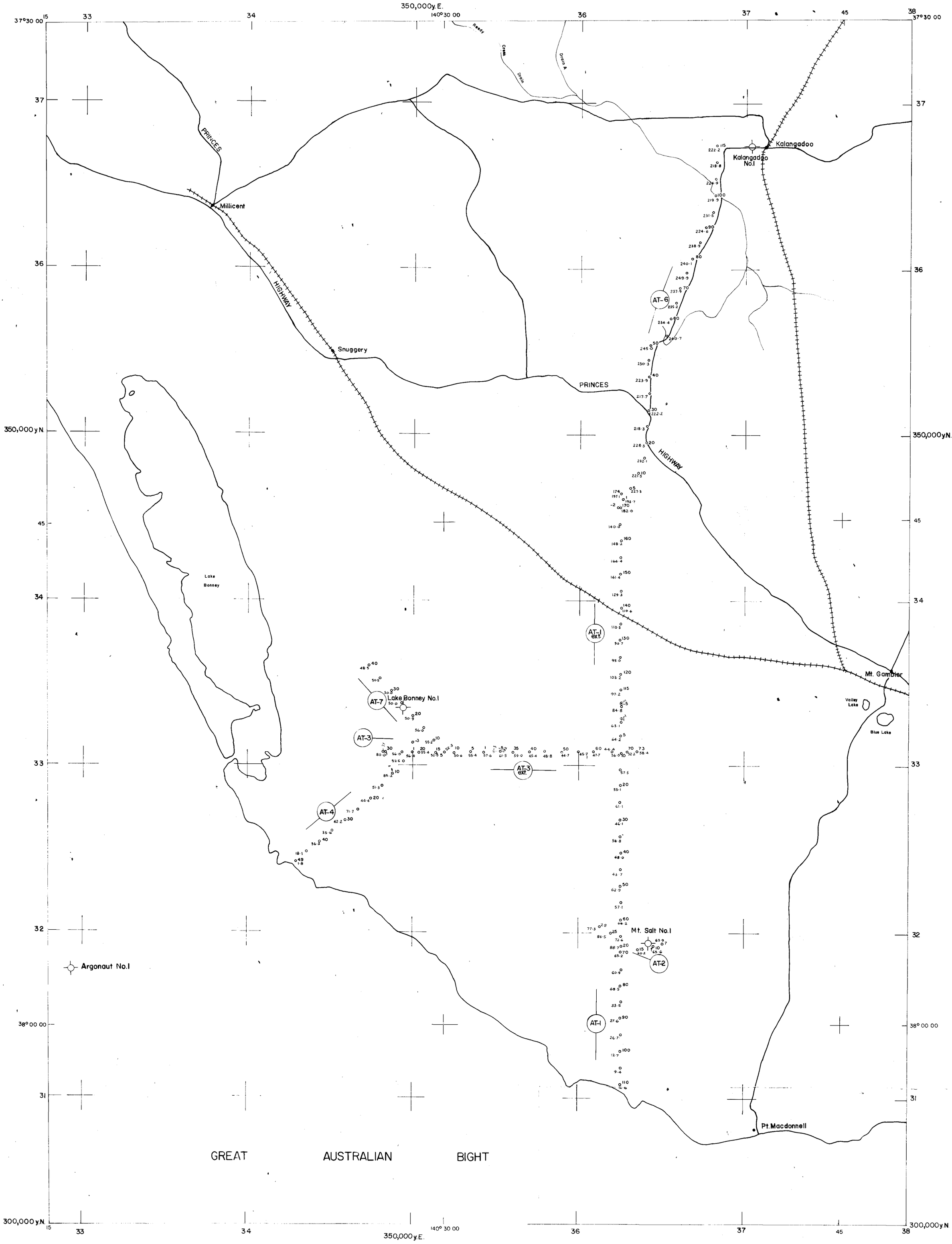
FIELD PARAMETERS:

SPREAD: 1050' — 4,350'
DROP SEGMENT: 300'
No of DROPS: SEE REMARKS
PATCH: ½ STAR 600' x 200'
No of GEOPHONES: 48

SUPERVISOR: L.E. TWINING
PARTY CHIEF: G. SEARLE
PARTY MANAGER: J.A. FLETCHER



ENV 1269-28



ALLIANCE OIL DEVELOPMENT AUST. N. L.

GAMBIER TROUGH AREA

P.E.L. 8 S. A.

STATION LOCATION and ELEVATION

SUPERVISOR : L. E. TWINING

PARTY CHIEF : G. J. SEARLE

SCALE : 1/100,000

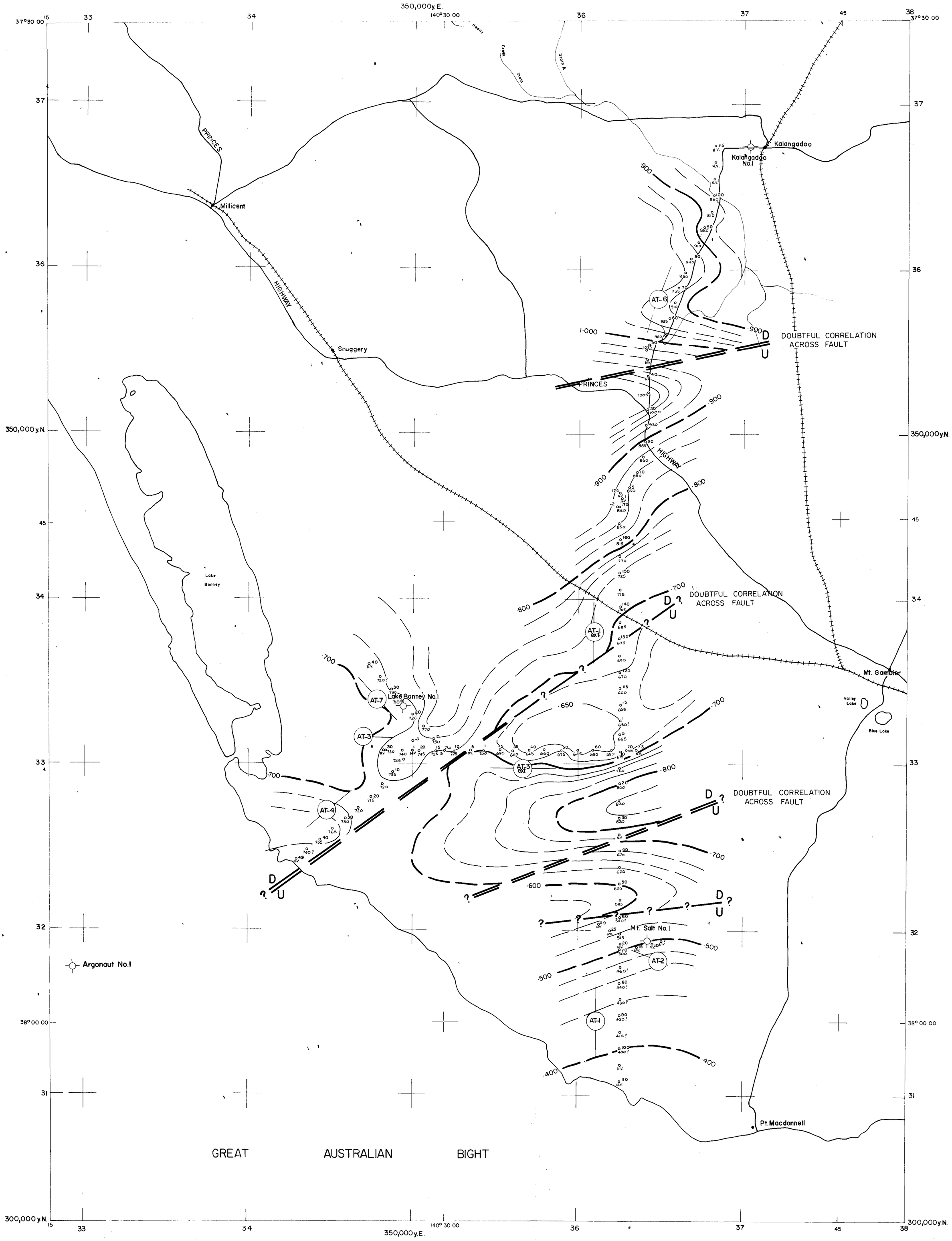
DATUM : M.S.L.

DATE : MAY, 1970.

RAY GEOPHYSICS (AUST.) PTY. LTD.

ENCLOSURE 1

ENV 1269-1



RECEIVED
13 OCT 1970
DEPT. OF MINES
REGISTRY
1269

ALLIANCE OIL DEVELOPMENT AUST. N. L.

GAMBIER TROUGH AREA

P.E.L. 8 S. A.

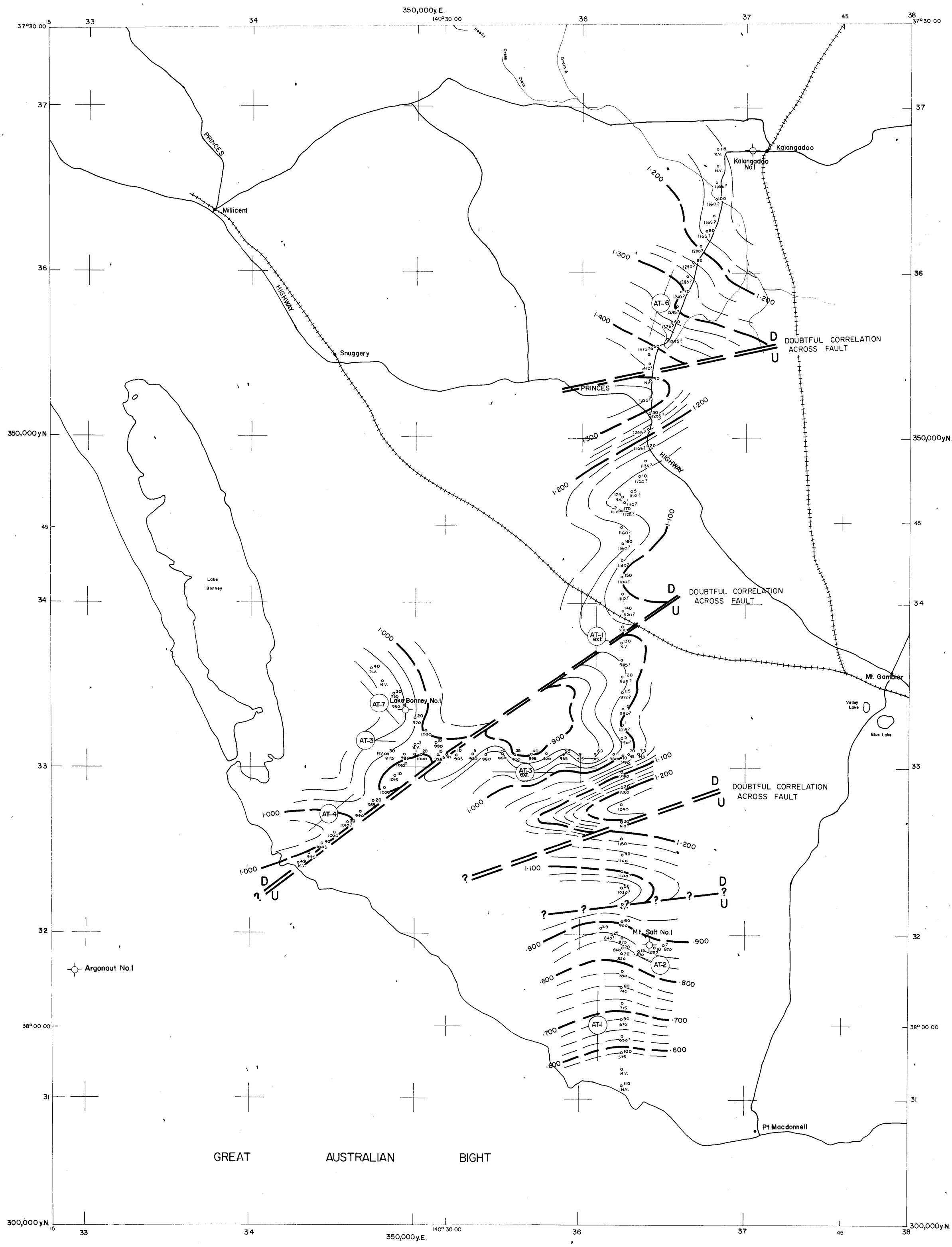
HORIZON 'A'

SUPERVISOR : L.E. TWINING
SCALE : 1/100,000
PARTY CHIEF : G. J. SEARLE
DATUM : M.S.L.
CONTOUR INTERVAL : ·025 SEC.
DATE : MAY, 1970.

RAY GEOPHYSICS (AUST.) PTY. LTD.

ENCLOSURE 2

ENV 1269-2



ALLIANCE OIL DEVELOPMENT AUST. N.L.

GAMBIER TROUGH AREA

P.E.L. 8 S.A.

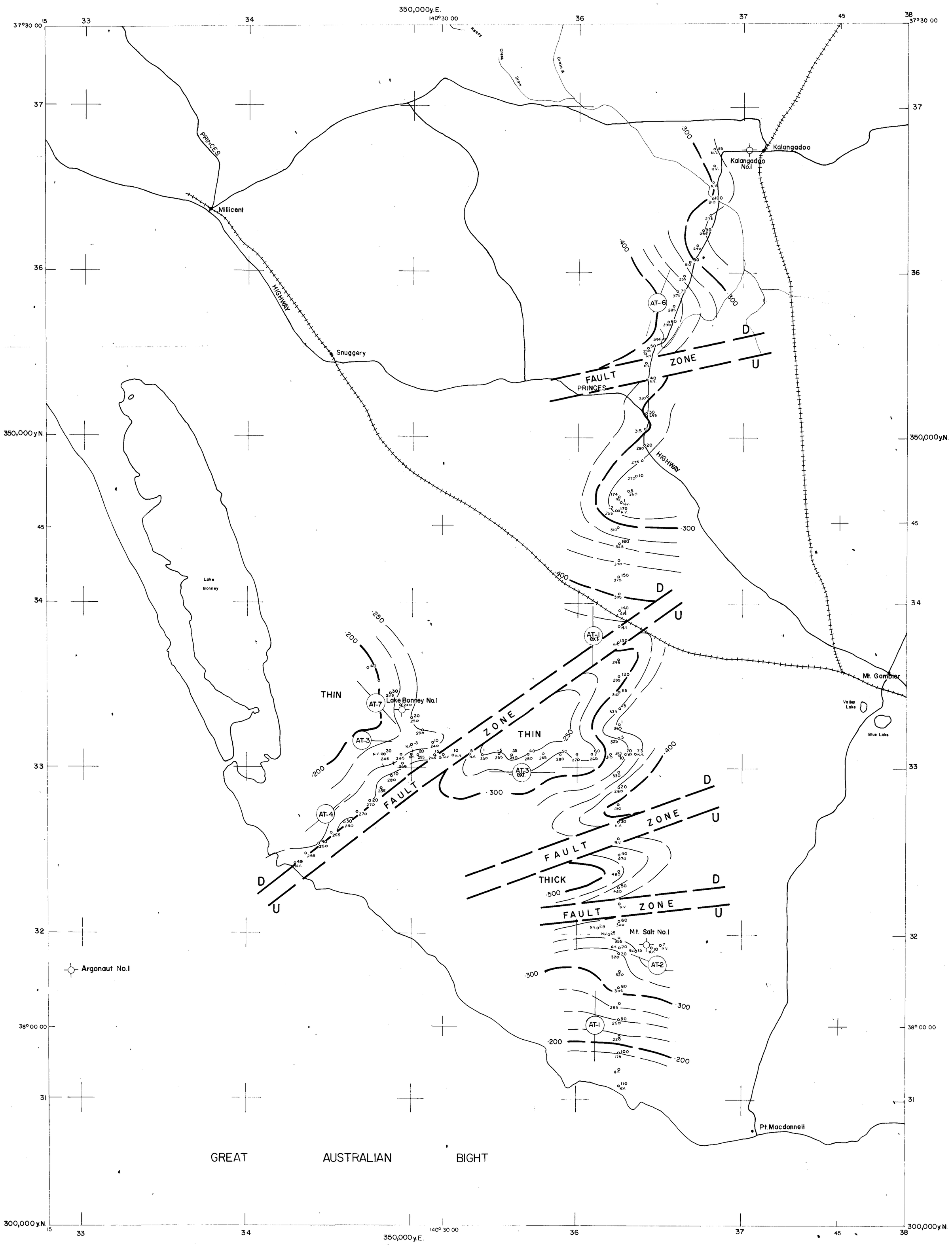
HORIZON 'B'

SUPERVISOR: L.E. TWINING
SCALE: 1/100,000
PARTY CHIEF: G. J. SEARLE
DATUM: M.S.L.
CONTOUR INTERVAL: ·025 SEC.
DATE: MAY, 1970.

RAY GEOPHYSICS (AUST.) PTY. LTD.

ENCLOSURE 3

ENV 1269-3



ALLIANCE OIL DEVELOPMENT AUST. N. L.

GAMBIER TROUGH AREA

P.E.L. 8 S. A.

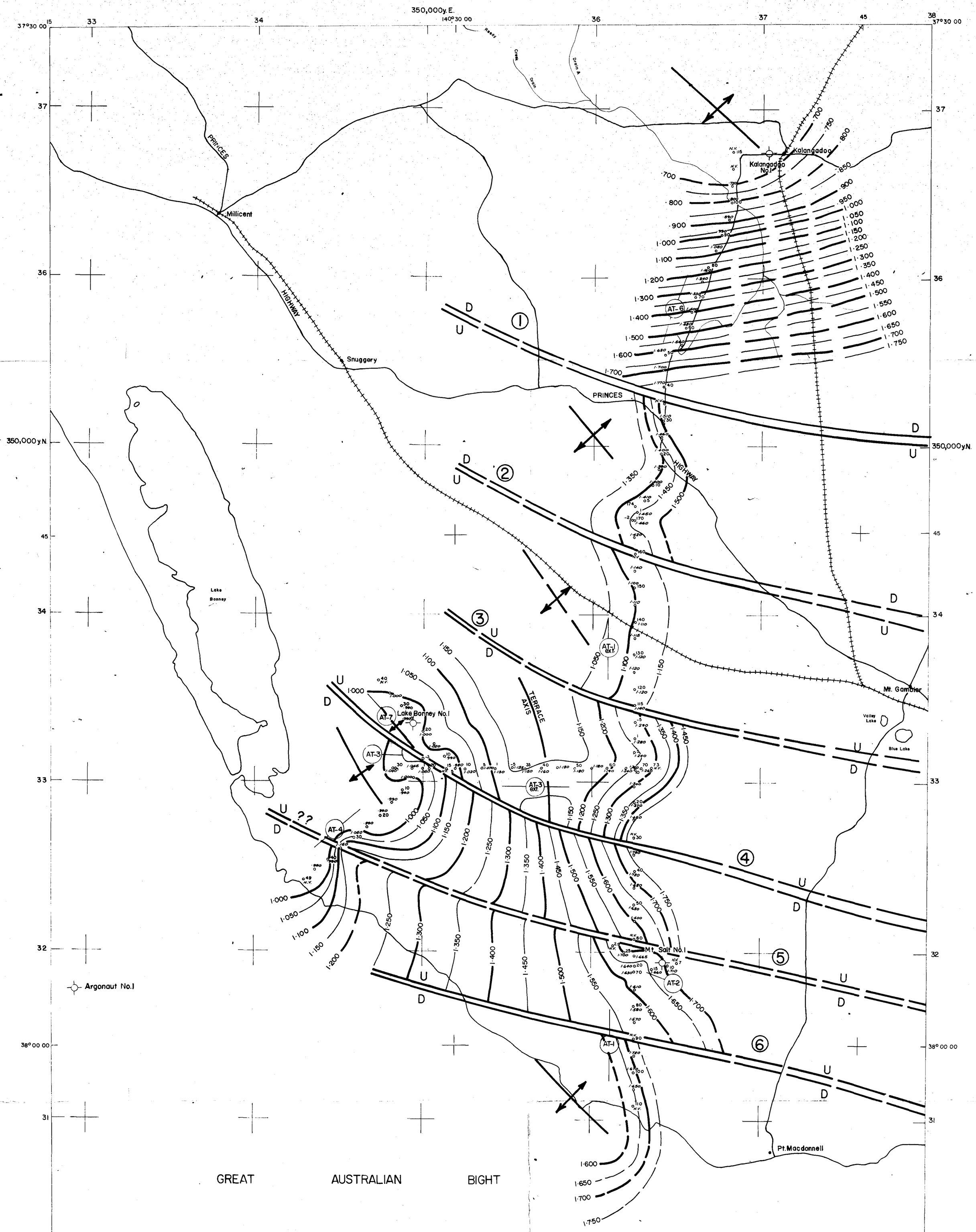
ISOCHRON 'A' - 'B'

SUPERVISOR : L.E. TWINING
SCALE : 1/100,000
PARTY CHIEF : G. J. SEARLE
DATUM : M.S.L.
CONTOUR INTERVAL : ·025 SEC.
DATE : MAY, 1970.

RAY GEOPHYSICS (AUST.) PTY. LTD.

ENCLOSURE 4

ENV 1269-4



Supplementary Report

ALLIANCE OIL DEVELOPMENT AUST. N. L.

GAMBIER TROUGH AREA

P.E.L. 8 S. A.

NEAR TOP OF OTWAY GROUP

INTERPRETATION BY SUPERVISOR: L. E. TWINING

SCALE: 1/100,000

PARTY CHIEF: G. J. SEARLE

DATUM: M. S. L.

CONTOUR INTERVAL: 0·050 SECS.

DATE: MAY, 1970.

RAY GEOPHYSICS (AUST.) PTY. LTD.

ENC 1269-6

1269.

ENV 1269

ENV1269-5

Alliance Petroleum
Crew 719-735
Mt. Gambier

Specimen Profiles

Drop Sta 14 (short - long)

30-30 | 25-30 | 20-30 | 15-45 | 0-30 | 10-40

Tapered Array

25-30 | 20-30 | 15-30 | 10-30

3/2 UNCORR.

Specimen Profile

Rear | Fwd | Rear - Fwd

0

14

28

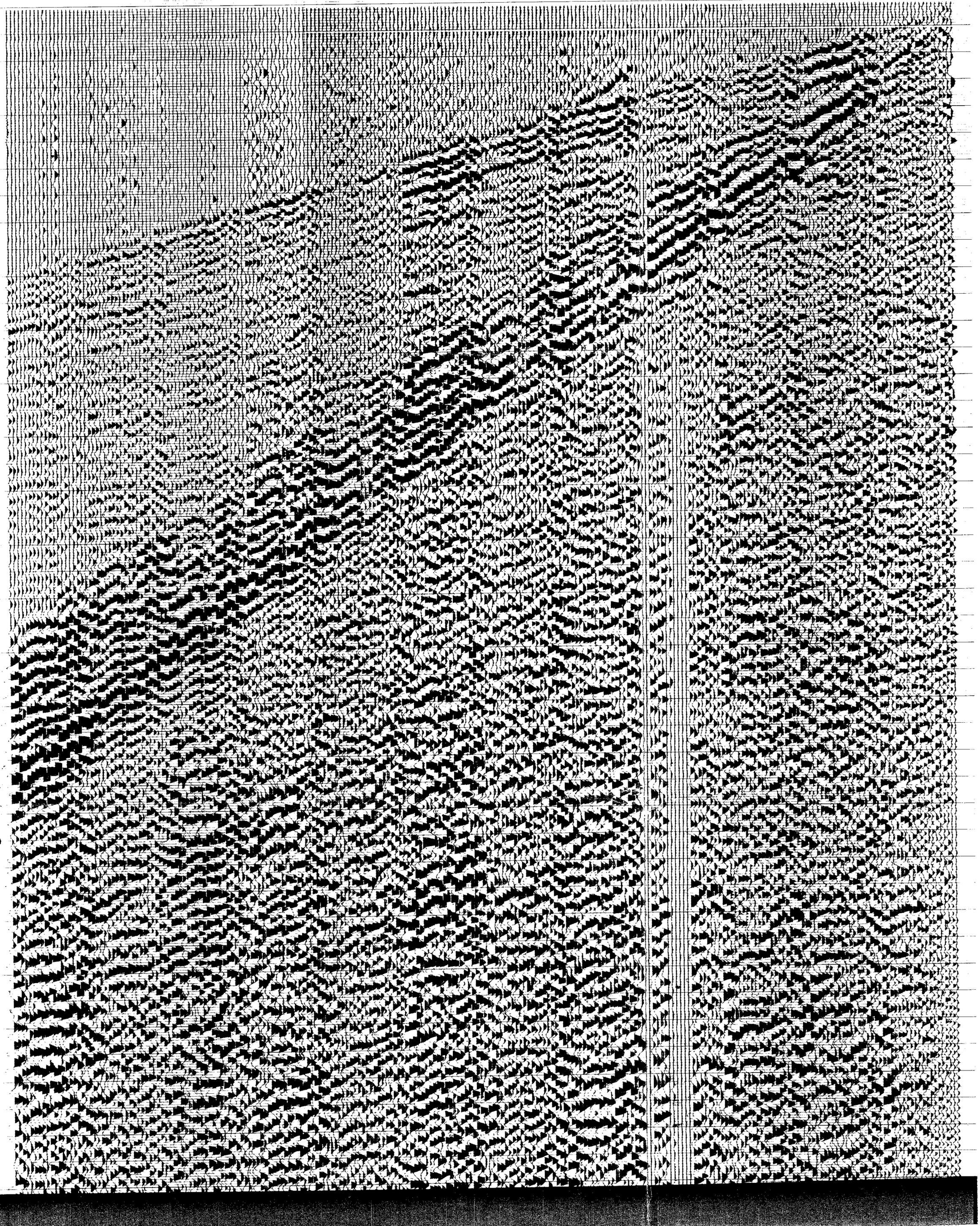
36

Allanic Petroleum NOISE STUDY 0-64 50 HZ NULL

Crew 319 - 735

Mt. Gambier

EHV 1269

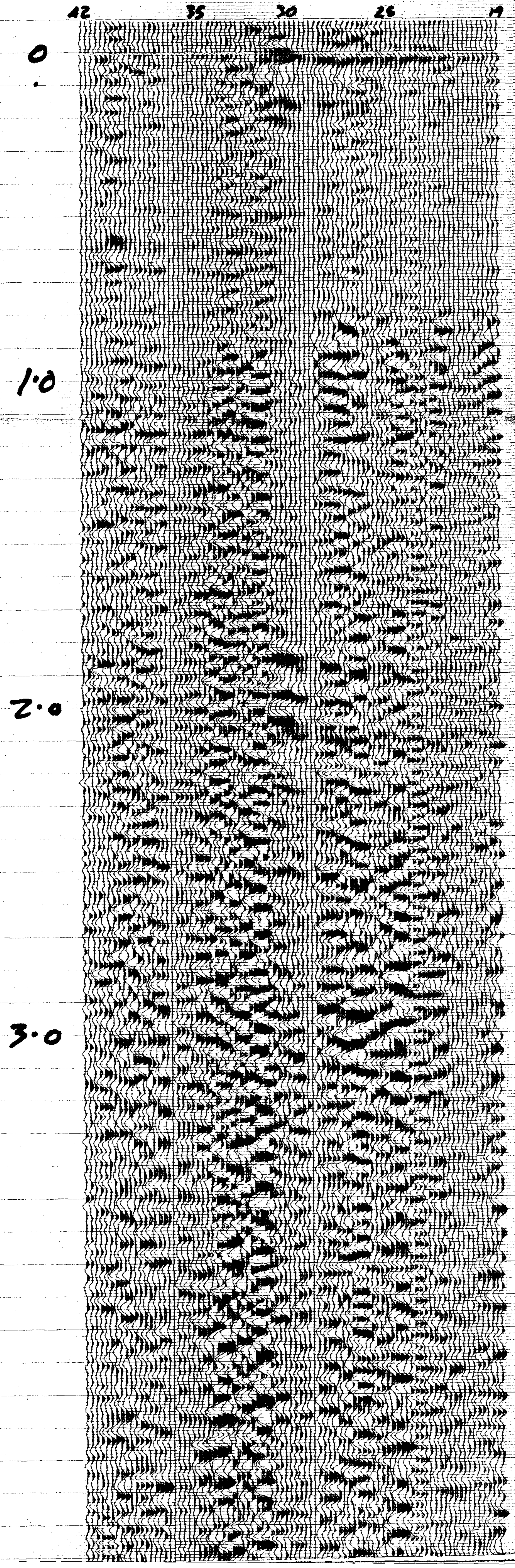


Alliance Petroleum
Crew 319 - 735
Mt. Gambier

LONG 3/2
0-46 No REC.

5400 - 7200

ENV 1269



ENV 1269-18

SNORTS. 20-56

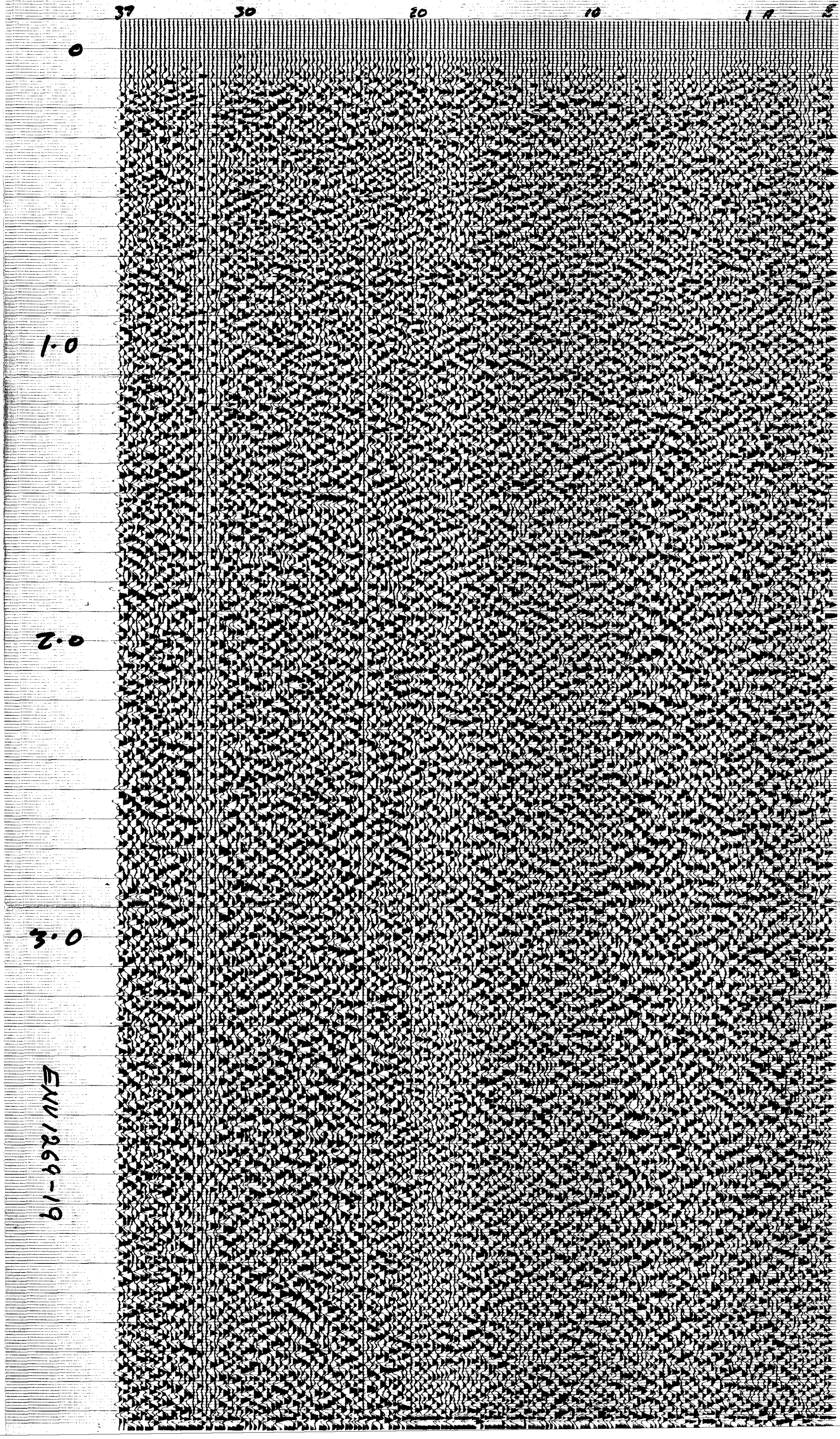
Perth PB Raw Data 32/0

600 - 2400'

Alliance Petroleum
Crew 319 - 735
Mt. Gambier

EXPERIMENTAL SECTION ONLY

EN 1269



SINGLE COV. LONGS

20 - 55 5400 - 7200'

Allantic Petroleum

Crew 319-735 Perth PB Raw Data 32/0

Mt. Gambier

EXPERIMENTAL SECTION ONLY

ENV 1269

42 40 30 20 10 0

0

1.0

2.0

3.0

ENV 1269 - 20

Mt. Gambier Drop Sta - 26.

Raw Data - Filter Comparison Alliance Petroleum

Crew - 319 - 735

32/0

ENV 1269

0-20 0-30 0-60 35-55 25-50 30-50 20-50

0

1.0

2.0

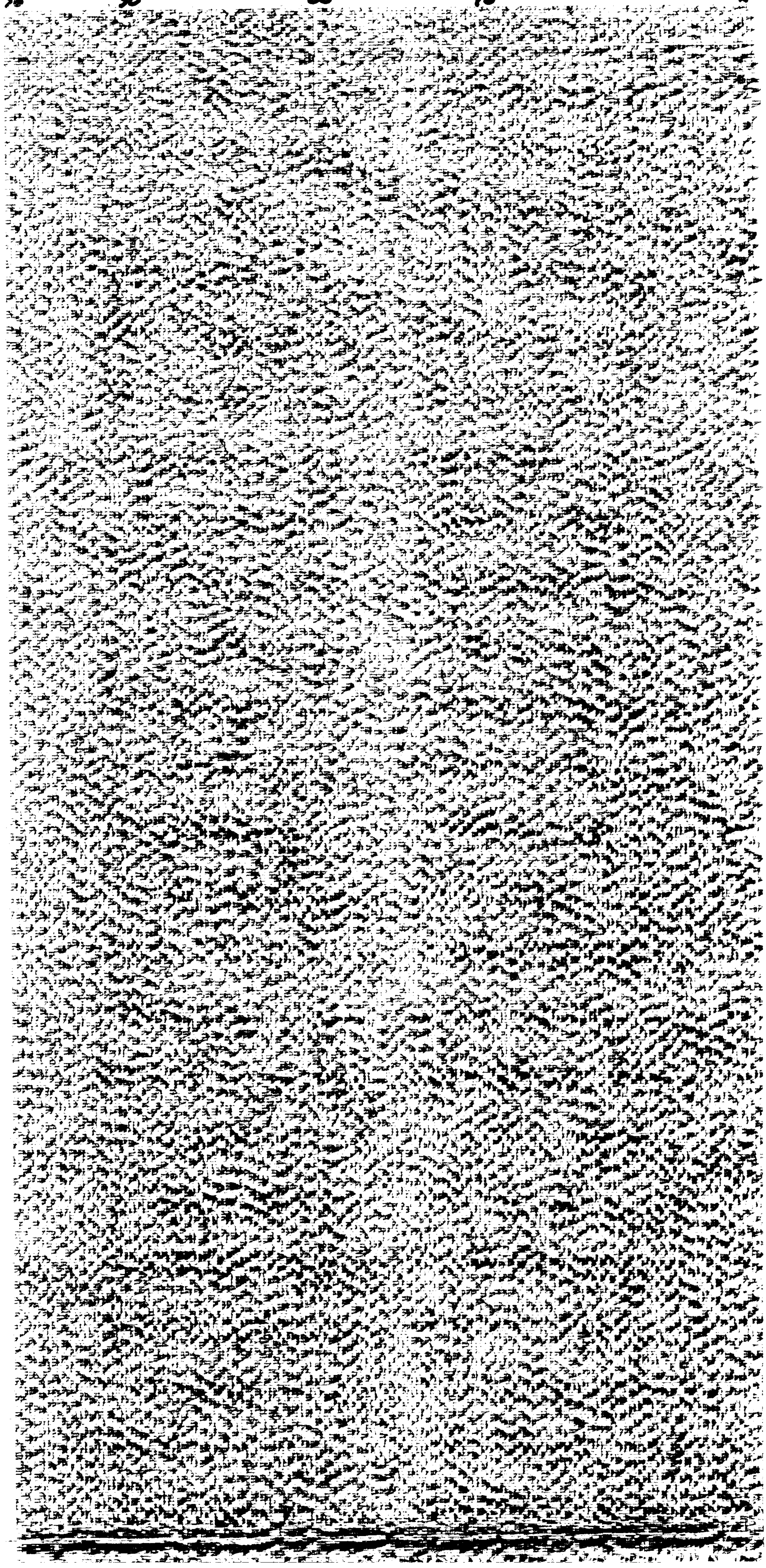
3.0

ENV. 1269-21

Alliance Petroleum Field Presentation with Dynamics & Statics cx
Crew 319 -
Mt. Gambier 20 - 62 50 NULL
600 - 7200'

EXPERIMENTAL SECTION ONLY

ENV 1269



ENV 1269 - 22

20-50.

32/0.

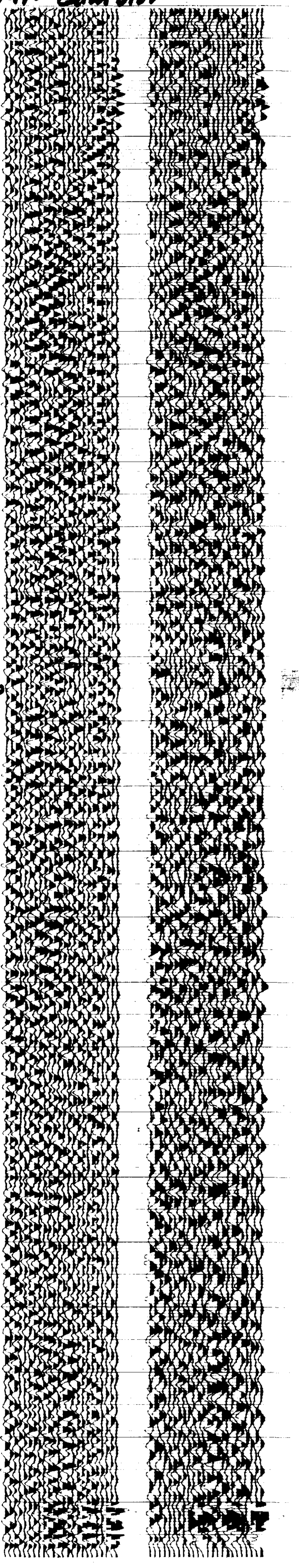
P.S.

Alliance Petroleum

319-735

EHV 1269

Mt. Gambier



Alliance Petroleum

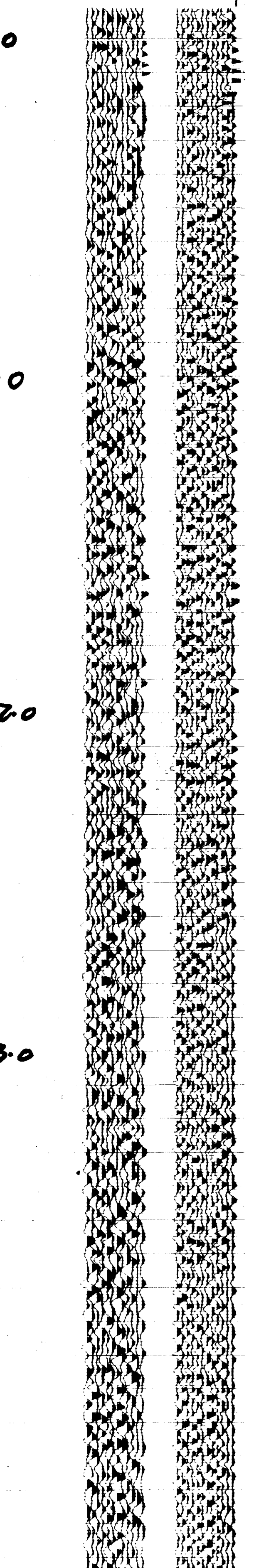
319-735

0·40 20-50

PS

64/0

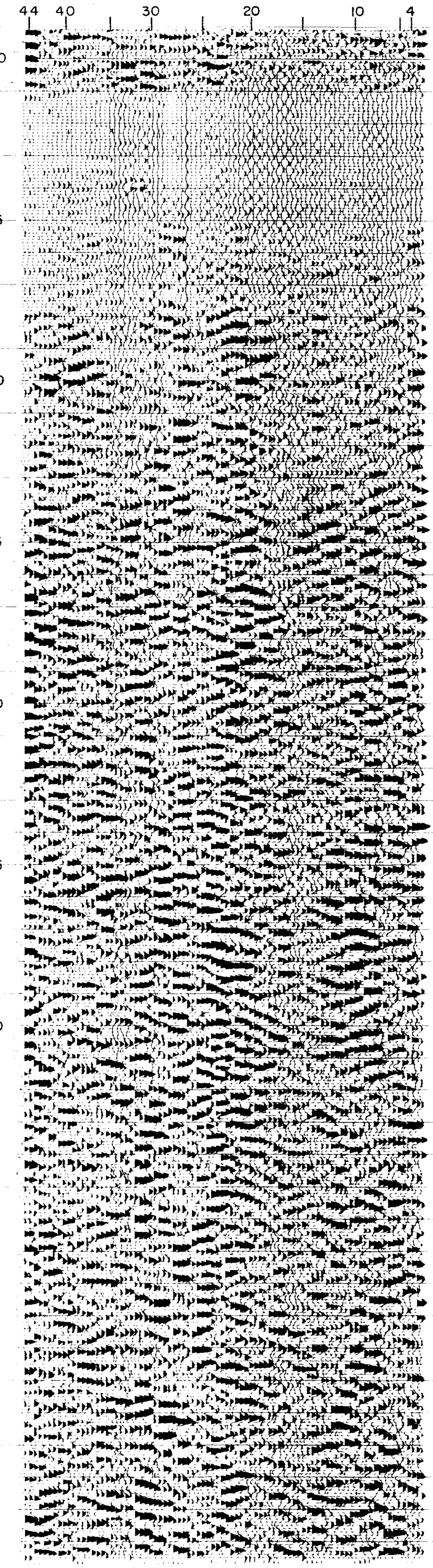
EHV 1269



EHV 1269-23

GAMBIER TROUGH

LINE AT4

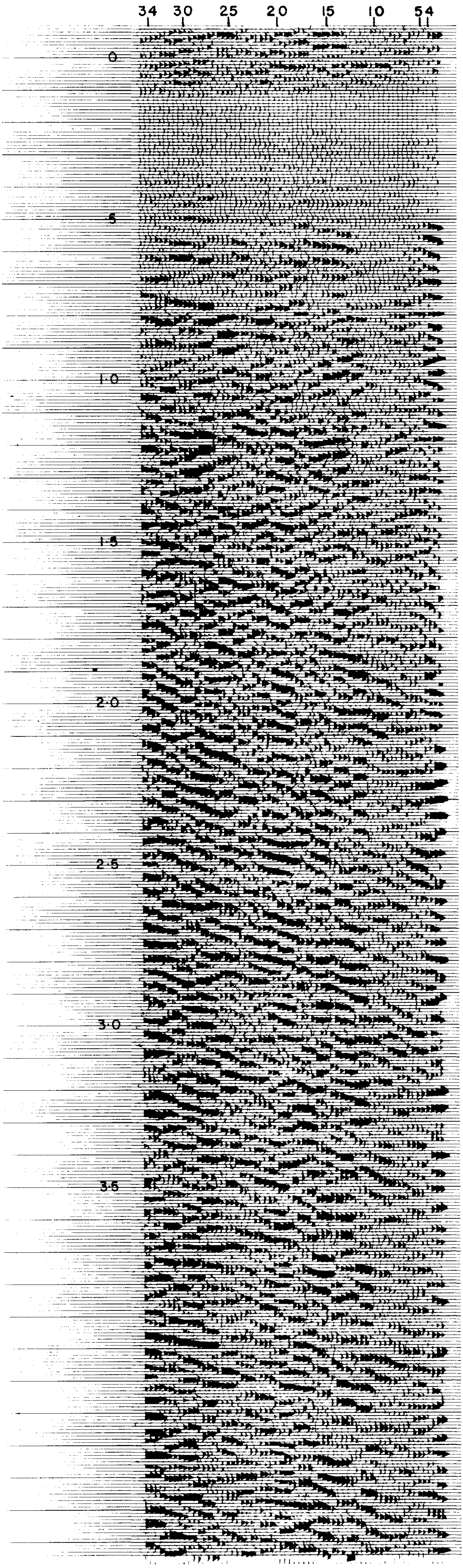


ENV 1269-25

2/1 COMP. OF RAW DATA

(Comp. prior to final corr.)

AT7

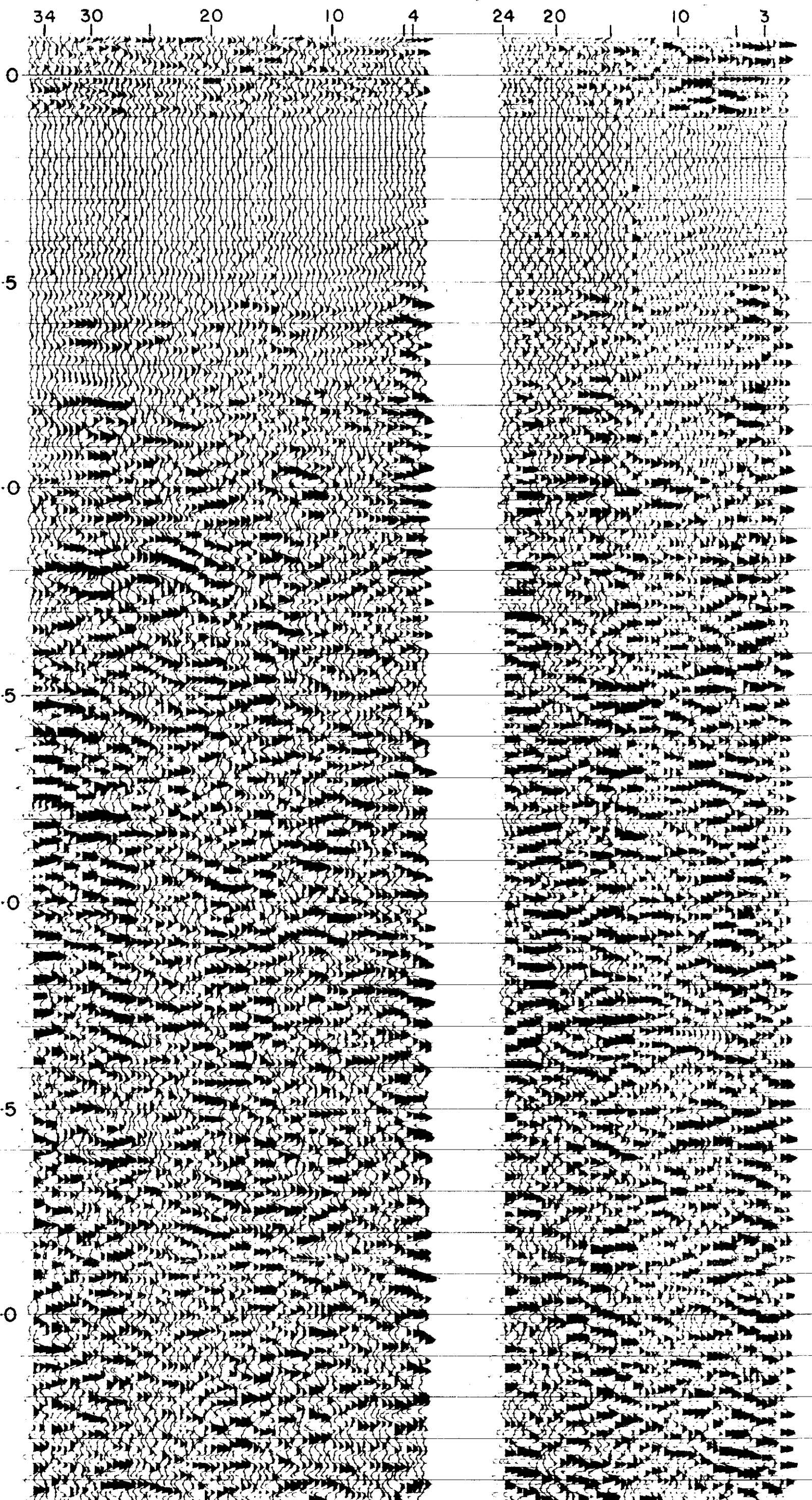


ENV 1269-26

GAMBIER TROUGH

LINE AT7

LINE AT2



ENV 1269-27