COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

PETROLEUM SEARCH SUBSIDY ACTS

Publication No. 33

ARCADIA ANTICLINE SEISMIC SURVEY QUEENSLAND, 1959

BY

ASSOCIATED AUSTRALIAN OILFIELDS N.L.

Issued under the Authority of Senator the Hon. W. H. Spooner,
Minister for National Development

1962

57

COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

Minister: SENATOR THE HON. W. H. SPOONER, M.M.

Secretary: H. G. RAGGATT, C.B.E.

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

Director: J. M. RAYNER.

This Report was prepared for publication in the Geophysical Branch

Chief Geophysicist: R. F. THYER.

FOREWORD

In 1959 the Commonwealth Government enacted the Petroleum Search Subsidy Act 1959. This Act enables companies that drill for new stratigraphic information, or carry out geophysical or bore-hole surveys in search of petroleum, to be subsidised for the cost of the operation, provided the operation is approved by the Minister for National Development.

The Bureau of Mineral Resources, Geology and Geophysics is required, on behalf of the Department of National Development, to examine the applications, maintain surveillance of the operations and in due course publish the results.

A seismic survey was carried out under the Petroleum Search Subsidy Act 1959 in the vicinity of the Arcadia Anticline, Queensland, by Associated Australian Oilfields N.L. This Publication deals with that survey and contains information furnished on behalf of Associated Australian Oilfields N.L. and edited in the Geophysical Branch of the Bureau of Mineral Resources. The final report was written by Mr. W.E. Hightower, Supervisor, Austral Geo Prospectors Pty Ltd. The methods of carrying out the seismic survey and the results obtained are presented in detail.

CONTENTS

ILLUSTRATIONS

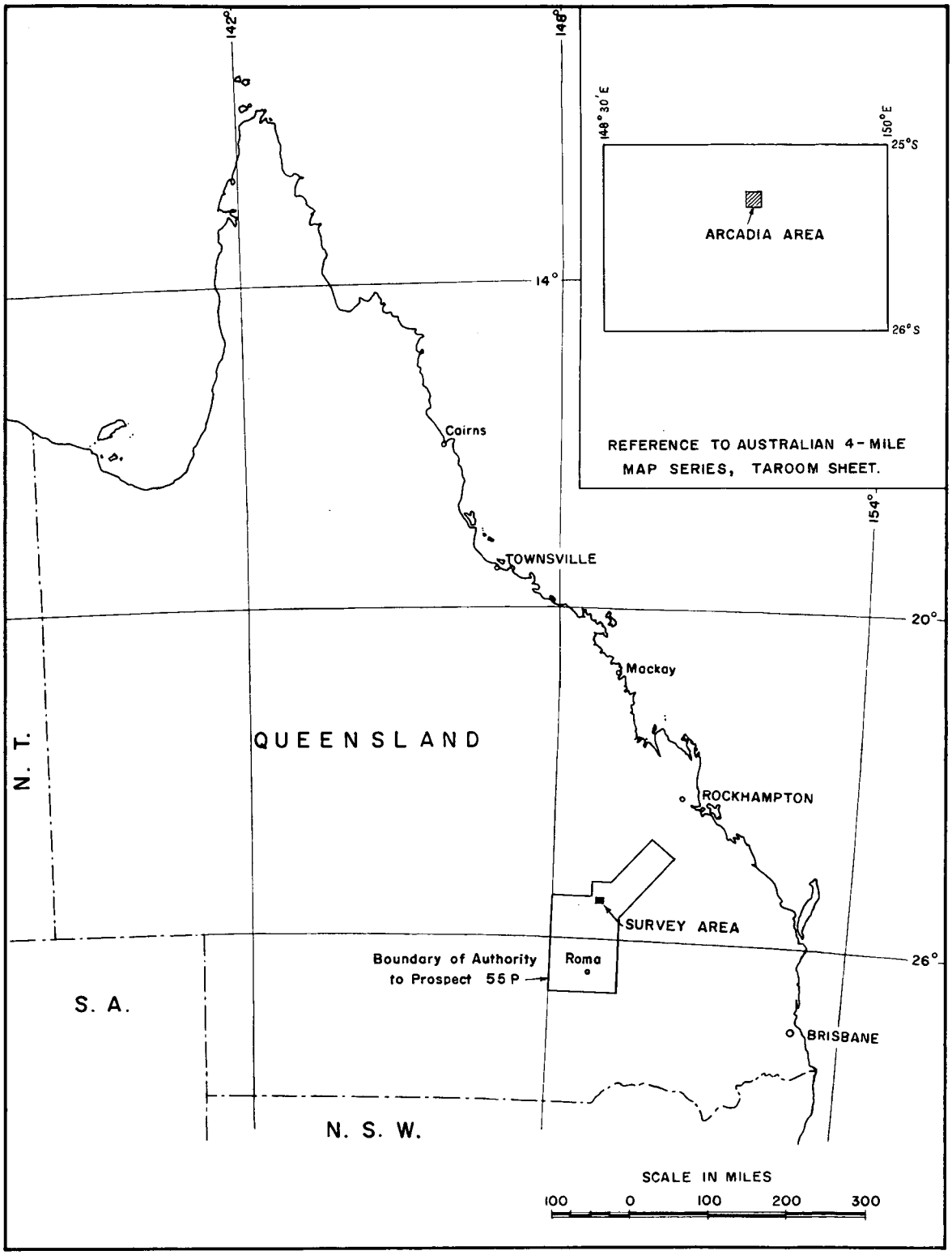


Fig. 1. LOCALITY MAP

ABSTRACT

A reflection seismic survey was conducted in 1959 on Authority to Prospect 55P by Austral Geo Prospectors Pty Ltd for Associated Australian Oilfields N.L. (A.A.O.), through A.A.O.'s management affiliate, Mines Administration Pty Ltd. The survey was made in the vicinity of the Arcadia Anticline, about 90 miles north of Roma, Queensland. Two exploratory bores had been drilled on the Arcadia Anticline, the first by Oil Search Ltd in 1936, and the second by Associated Australian Oilfields N.L. in 1957. The Oil Search test yielded a gas-flow, mainly of carbon dioxide, of 3,000,000 cu.ft per day from the Staircase Sandstone. Shows of oil and gas encountered in the Associated Australian Oilfields bore were insignificant.

The purposes of the seismic survey were as follows:-

(1) To outline subsurface structural conditions;

(2) To indicate whether a more detailed reflection seismic survey might locate drilling sites more favourable for the accumulation of oil or gas than those of the O.S.L. No.3 and A.A.O. No.7 Bores.

The three horizons that were mapped showed a general conformity of structure but the maps showing the intervals between the mapping horizons indicated a lack of conformity in thickness of the strata. These results led to the conclusion that the Arcadia Anticline is a fold of recent geological age.

The seismic data indicated that the Oil Search No. 3 Bore was drilled on the crest of the Arcadia Anticline. Additional seismic work would be necessary to determine the most favourable location for further investigation.

1. INTRODUCTION

A reflection seismic survey was conducted in August 1959 on Authority to Prospect 55P by Austral Geo Prospectors Pty Ltd for Associated Australian Oilfields N.L. (A.A.O.), through A.A.O.'s management affiliate, Mines Administration Pty Ltd. The area covered by the survey (see Figure 1) lies in the vicinity of the Arcadia Anticline, about 90 miles due north of the town of Roma, Queensland. No geophysical surveys had been conducted previously in this area.

The region was densely timbered and hilly. Sheer sandstone cliffs lying immediately to the west and south of the survey presented a barrier to the ready extension of seismic lines in those directions.

Two exploratory bores have been drilled on the Arcadia Anticline. The first, Oil Search No. 3 Bore (1936), encountered gas flows at several horizons. Some of the minor shows contained appreciable percentages of higher hydrocarbons but the largest flow (3,000,000 cu.ft per day) was mainly carbon dioxide. The second bore, Associated Australian Oilfields (A.A.O.) No. 7 Bore (1957), was one mile east of Oil Search No. 3 Bore. The A.A.O. No. 7 Bore was drilled down dip in the hope that oil might exist below gas in the anticlinal trap, but the bore encountered only a trace of gas and it was abandoned as a dry hole.

The purposes of the seismic survey [1] were as follows:-

(1) To outline subsurface structural conditions.

(2) To determine whether the Oil Search No. 3 Bore was located on the crest of the Arcadia Anticline as postulated by geological mapping.

(3) To indicate whether a more detailed reflection seismic survey might locate drilling sites more favourable for the accumulation of oil or gas than those of the O.S.L. No. 3 and A.A.O. No. 7 Bores.

2. GEOLOGY

The following general stratigraphic sequence has been established in the Arcadia area:

QUATERNARY	Alluvium		
TRIASSIC	Clematis Sandstone	Sandstone	500 ft
PERMIAN	Bandanna Formation	Sandstone and Shale	2000 ft
	Catherine Sandstone	Sandstone	320 ft
	Ingelara Shale	Shale	720 ft
	Transition Beds	Shale and Sandstone	90 ft
	Cattle Creek Formation	Calcareous Mudstone	470 ft

(1) Footnote by Mines Administration Pty. Limited.

This survey was done as a preliminary spot survey to sample the general area, using the two bores in the area (O.S.L. No. 3 and A.A.O. No. 7) as control. As regional and detailed seismic surveys are planned to cover the whole area, any conclusions drawn from the limited information available must be regarded as preliminary and tentative.

PERMIAN (Cont'd)	Staircase Sandstone	Sandstone	520 ft
	Undifferentiated	Shale	2950 ft
	Andesite		

Both bores drilled on the Arcadia Anticline encountered Permian sedimentary rocks from the top to the bottom. Associated Australian Oilfields No. 7 Bore was drilled to a total depth of 3,280 feet and bottomed in the Staircase Sandstone. Oil Search No. 3 Bore was drilled to a total depth of 6,036 feet and bottomed in andesite. The Clematis Sandstone forms the cliffs which surround the Arcadia Valley but was not found at either of the two bore locations.

Small oil and gas shows were reported in shallow beds in Oil Search No. 3 Bore but the reservoir rock with the most potential appears to be in the Staircase Sandstone. The thickness of the Staircase Sandstone in the Oil Search No. 3 Bore was approximately 520 feet and it yielded 3,000,000 cu. ft of gas per day.

Detailed mapping of the geology of this area indicated that the Arcadia Anticline is approximately 8 miles long and 3 miles wide.

3. METHODS OF OPERATION AND INTERPRETATION

(a) Field Procedure

The survey was conducted using the continuous profile method of seismic exploration. Field operations were completed in approximately four working days and no attempt was made to design a field technique especially to fit the area.

Other items of field procedure are outlined in the appendix to this report.

(b) Progress Maps

Progress maps were used for preliminary evaluation of data. Data on the accompanying maps were computed using slightly different procedures from those used for the preliminary interpretation but no significant changes in results were achieved.

(c) Weathered Layer Corrections

The first arrivals of energy were analysed for most of the shot-points. It was found that horizontal velocities varied considerably, suggesting abrupt variations in surface outcrops.

Since up-hole times and calculated up-hole velocities were far more consistent than the near surface horizontal velocities, it was decided that the simple up-hole weathering correction would be more reliable than a summation weathering correction. The information obtained from the up-hole survey of the one deep hole drilled in the area indicated that the elevation velocity was about 8,000 ft/sec. This value was used in the calculation of map data

but it may not be accurate; if the survey is extended the surface velocities should be examined more closely.

(d) Elevations

The elevations above sea level are not absolute values but only correct relative to each other. In the absence of reliable bench mark control, Shot-point No. 1 was used as a base point and given an assumed value of 1,100 feet above sea level. Using this value, the location of the A.A.O. No. 7 Bore is 1,256 feet above sea level, against a value used in the well survey of 1,227 feet above sea level. The error in the elevation assumed for the base point will cause an equal error in all subsurface values including below sea level datums at the two bore locations.

(e) Velocity Functions

Velocity functions of various types were applied to time data before, finally, the velocity functions (see Appendix II) determined from survey data in the Timbury Hills No. 2 Bore of the East Roma area (A.A.O., in preparation) were chosen as being applicable to time-depth conversions in the Arcadia area.

Arguments in favour of using the conversion curves from the East Roma survey are:

(1) Analysis of the sample log of the A.A.O. No. 7 Bore suggested that the Cattle Creek Formation and Staircase Sandstone were the sources of the first reflections. Use of the East Roma velocity functions placed Zone A near the top of the Cattle Creek Formation and Zone B near the base of the Staircase Sandstone.

(2) Dips shown by depth calculation of seismic data at Zone A and Zone B levels between the O.S.L. No. 3 and the A.A.O. No. 7 Bores were roughly compatible with those shown by sample correlations between the same two bores at the levels of the Cattle Creek Formation and the Staircase Sandstone.

(3) No reflections were obtained from the strata lying just above the Cattle Creek Formation and below the Staircase Sandstone. This ties in with the thick shale shown on the sample logs.

Arguments against the use of the East Roma velocity functions in the Arcadia area are as follows:-

(1) The elevation velocity of 8,000 ft/sec and the velocities given by the East Roma functions are considerably lower than those expected or normally used for formations of Permian age, and are below the values recorded for the Permian rocks in the East Roma area.

(2) Drilling rates recorded in the East Roma area through approximately the top 1,300 feet of the Roma Formation and the Blythesdale Group, are considerably higher than those recorded in the near surface formations

of the Arcadia area. The drilling rate from the top of the Walloon Coal Measures to the Timbury Hills Formation in the East Roma area was approximately equivalent to the drilling rates recorded in the A.A.O. No 7 Bore from the surface to total depth.

(3) The electric log of the A.A.O. No. 7 Bore suggested the Staircase Sandstone as the first main source of reflected energy.

4. INTERPRETATION OF RESULTS

Results of the survey are summarized by the maps and cross-sections at the back of this report.

The following additional data have been filed with the Bureau of Mineral Resources, Geology and Geophysics and are available for future reference:-

1. A complete set of record sections.

2. A complete set of cross-sections.

Surface elevations (see Plate 1) were contoured without reference to the drainage pattern of the area so that a direct comparison could be made between surface elevations and subsurface structure. The general configuration shows that the Arcadia Anticline is reflected to a certain degree by the surface relief.

Three horizons were mapped. Zone A was identified as being near the top of the Cattle Creek Formation, Zone B near the base of the Staircase Sandstone, and Zone C as Lower Permian. These identifications may not be correct. If the velocity functions chosen are not accurate, and are replaced by alternative functions, Zone A could be identified as near the base of the Staircase Sandstone and Zone C near the andesite such as that found at an approximate depth of 6,000 feet in the Oil Search No. 3 Bore.

The local structural features are reflected by all the horizons although the angle of dip increases considerably with depth. On each of the horizons a fault has been postulated trending north-east to south-west across the centre of the survey, and dipping across the centre of the survey and down towards the north-west. On the Zone C horizon, just east of the Oil Search No. 3 Bore, a cross fault has been postulated which extends in a south-south-easterly direction and dips towards the north-east. Some minor disturbance was noted at an equivalent position on the Zone B horizon but it was not of sufficient magnitude to be interpreted as faulting.

The records taken at the shot-points located south of the A.A.O. No. 7 Bore, and in the extreme southern portion of the area surveyed, were of an extremely poor quality. This can probably be attributed to surface conditions rather than to complex subsurface geology. The cross-section for shot-points in this area has not been published as only a few reflections are plotted on it.

The apparent conformity of general structure shown by the three mapping horizons is not reflected by the maps showing the intervals between horizons. The small area

covered allows little opportunity for accurate conclusions regarding the periods, position, and trends of folding, but the configuration shown by interval map contours clearly indicates that the Arcadia Anticline is a fold of recent geological age. Even if this conclusion were verified, it is possible that conditions favourable to the accumulation of oil or gas may be more closely associated with the early periods of folding than with the recent folds (such as the Arcadia Anticline). Data on both interval maps, and on the map of Zone C, suggest that a fold older than the Arcadia Anticline might lie immediately north-east of the prospect area.(2)

5. CONCLUSIONS

The information gained from this survey indicates that the Oil Search No. 3 Bore occupied a favourable (although not necessarily the most favourable) location on the Arcadia Anticline. The general conformity of structural maps, and the lack of conformity between interval and structural maps, indicates that the Arcadia Anticline is a fold of recent geological age. This survey was very limited and so no basic conclusions with respect to high points of structure, trend, or age of folding, etc., are possible. Should the conditions favourable to oil or gas accumulation be associated more closely with the older ages of folding than with the recent folds, the area of coverage required for complete analysis would be materially greater than that required for simple structural analysis.

It would probably be necessary to use some fairly elaborate field techniques in order to obtain seismic results of high quality over certain outcrops. This expected condition, coupled with the presence of dense vegetation, the rugged terrain, and the potential problem of oil trap analysis, suggests that seismic exploration in the Arcadia area would be more expensive than a seismic exploration conducted in the other Roma areas.

Further seismic work extending the survey described in this Publication would be necessary to determine the following:

(a) The probable cost of detailed seismic exploration in the Arcadia area.

(b) The structural details of the Arcadia Anticline and the surrounding area.

(c) A satisfactory explanation for the failure of the Oil Search No. 3 Bore.(3)

(d) The position and trend of the older geological systems of folding.

ACKNOWLEDGEMENTS

Every seismic interpretation should include, and be in agreement with, all the known geology of the area. Those who make the seismic interpretation are indebted therefore

Footnotes by Bureau of Mineral Resources.

(2) If the Arcadia Anticline is a structure in the Staircase Sandstone and younger sedimentary rocks, the seismic survey indicates the existence within the surveyed area of earlier folding than that which produced the Arcadia Anticline (See Appendix V).

(3) The "failure" of the Oil Search No. 3 Bore refers to the fact that the bore produced mainly carbon dioxide gas. It is difficult to envisage how additional seismic work by itself will determine a satisfactory explanation for this "failure".

to all those persons and organisations who have contributed to the basic information of the prospect area. In the analysis and assembly of seismic data into report form usually many persons make direct contributions. The author wishes to acknowledge those who have made a material contribution towards the contents of this report, to D.M. Traves and S.S. Chambers of Mines Administration Pty Ltd, H.S. Eshelman and H.M. Thralls of Geo Prospectors Inc., and all those who assisted in the analysis of data and in the preparation of the report.

REFERENCES

ASSOCIATED AUSTRALIAN OIL-FIELDS N.L.	1962	East Roma seismic survey, Queensland, 1960. P.S.S.A. Pub No. 35 (In Preparation).

APPENDIX I

FIELD PROCEDURE

Type Geophones Used	SIE S16; 18 c/s
Number Per Trace	5
Connection	Series
Spacing in Group	20 ft
Type Amplifiers	Century (Modified)
Number of Channels	24
Normal Filter Setting	28-54 c/s
Mixed or Unmixed	Unmixed
Spreads Used	Straddle; 1,320 ft
Method Used	Continuous profiling
Distance from Shot-point to Close Geophone Stations	110 ft
Relation of Far Geophone Stations to Interlocking Shot-points	At interlocking shot-points
Normal Hole Depth	10 ft into blue shale; approximately 60 ft deep
Normal Dynamite Charge	20 lb
Difficulties	Rough terrain; ground had to be bulldozed before lines were laid; cracks caused considerable loss of drilling fluid.

APPENDIX II

CALCULATION AND INTERPRETATION METHODS

Well Ties	Tied to 2 wells, O.S.L. No. 3 and A.A.O. No. 7
Type Correction Used	Normal up-hole

Interlock Ties	Datum-to-datum
Elevation Datum	1100 ft above M.S.L. (assumed)
Weathering Velocity	3000 ft/sec (est.)
Elevation Velocity	8000 ft/sec
Horizontal Velocity	Not uniform
Horizons Mapped	
Horizon	Zone A - Near Top of Cattle Creek Formation
Depth	$D_1 = 4630\ T_1 - 1424$
Time Range	500 to 645 msec
Horizon	Zone B - Near Base of Staircase Sandstone
Depth	$D_2 = D_1 + 5710\ (T_2 - T_1)$
Time Range	689 to 869 msec
Horizon	Zone C - Lower Permian
Depth	$D_3 = D_2 + 7280\ (T_3 - T_2)$
Time Range	915 to 1178 msec
Interval Mapped	
Interval	Zone A to Zone B
Time Range	216 to 317 msec
Interval	Zone B to Zone C
Time Range	189 to 234 msec

APPENDIX III

LOCATION, PERSONNEL, AND EQUIPMENT

Crew Headquarters	Roma, Queensland (Temporary camp set up at Arcadia)
Party Chief	W.E. Hightower
Observer	G.W. Pippin
Party Manager and Driller	G.P. Hughes
Surveyor	A.M. Wilson

Recording Unit	One 24-trace Century recording unit, amplifiers modified to Geo Prospectors, Inc. specifications; filter frequency range of 20 to 120 c/s. Recording instruments mounted on F-600 Ford truck. Shooting truck (F-600 Ford) included water tank, storage compartments for explosives, etc.
Drill Unit	One Mayhew-1000 drill mounted on F-600 Ford truck; One F-600 Ford water truck with 1000 gal tank and vacuum water lift.
Survey Unit	Plane table and alidade used for surveying; F-100 Ford pick-up used as survey vehicle.

APPENDIX IV

STATISTICS

Starting Date	22nd August 1959
Completion Date	26th August 1959
Recording Time	
Drive to and from Field	2.5 hr
Field	42.0 hr
Move	20.0 hr
Holidays	0.0 hr
Lost Due to Weather	0.0 hr
Lost Due to Equipment Breakdown	0.0 hr
Holes Shot	39
Miles of Traverse	8.3 miles
Number of Drills Used	1
Drill Time	
Drive to and from Field	2.5 hr
Field	42.0 hr
Move	20.0 hr
Holidays	0.0 hr
Lost due to Weather	0.0 hr

Lost Due to Equipment Breakdown	0.0 hr
Holes Drilled	36
Total Footage	2140 ft
Bits Used	Two 4 1/2-in. Hawthorne inserted 3-blade bits

APPENDIX V

REVIEW OF INTERPRETATION

by

Bureau of Mineral Resources

Mr. Hightower has concluded that the survey results indicate that the folding in the survey area is of recent geological age.

The faulting indicated on the plotted section along the traverse from Shot-point 12 to Shot-point 1 (Plate 7), if correctly represented, must have occurred subsequent to deposition of the Lower Permian sedimentary rocks (Zone C) and prior to the deposition of the Staircase Sandstone. The thickening of the interval Zone B to Zone C to the north-east (Plate 6) indicates that the Lower Permian sedimentary rocks (Zone C) were not horizontal during the period of deposition of the Staircase Sandstone and suggests that some folding had occurred prior to this period. The structure on Zone A (Plate 2) and Zone B (Plate 3), and the surface geology, show that some younger folding has taken place, but the generally uniform thickness of the interval between Zone A and Zone B (Plate 5) indicates that this young folding occurred after the deposition of the Cattle Creek Formation.

For these reasons it is considered that:-

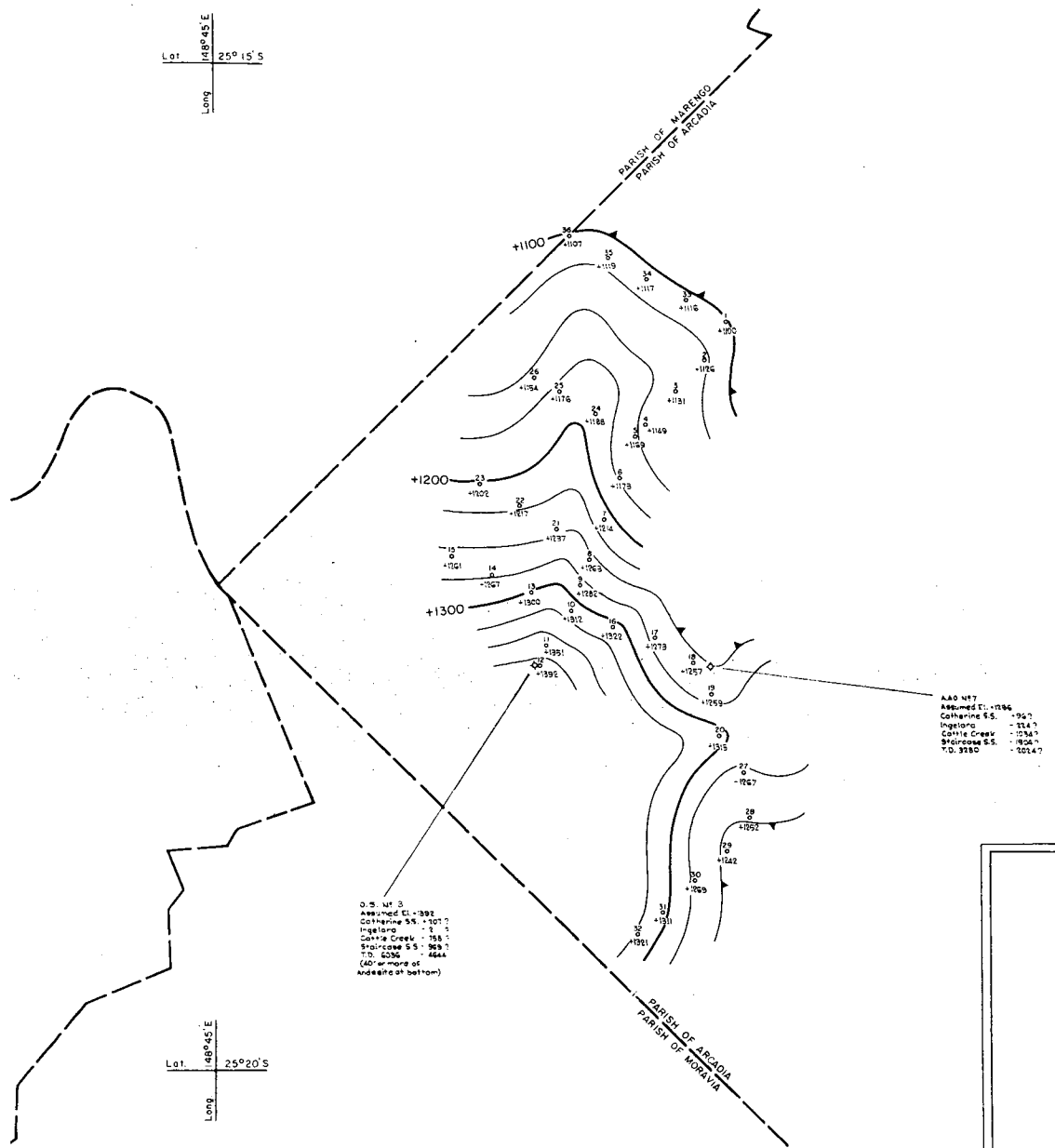
(i) some faulting and folding occurred subsequent to the deposition of the Lower Permian sedimentary rocks (Zone C) but prior to the deposition of the Staircase Sandstone (Zone B)

(ii) no movement took place during the period of deposition of the Staircase Sandstone and the Cattle Creek Formation, and

(iii) some folding took place subsequent to the deposition of the Cattle Creek Formation.

However, as the survey covered a very limited area, substantial reservations must be placed on such conclusions.

PLATE I



REFLECTION SEISMOGRAPH SURVEY
OF THE
ARCADIA AREA
QUEENSLAND

SURFACE ELEVATIONS
FOR
MINAD
BY

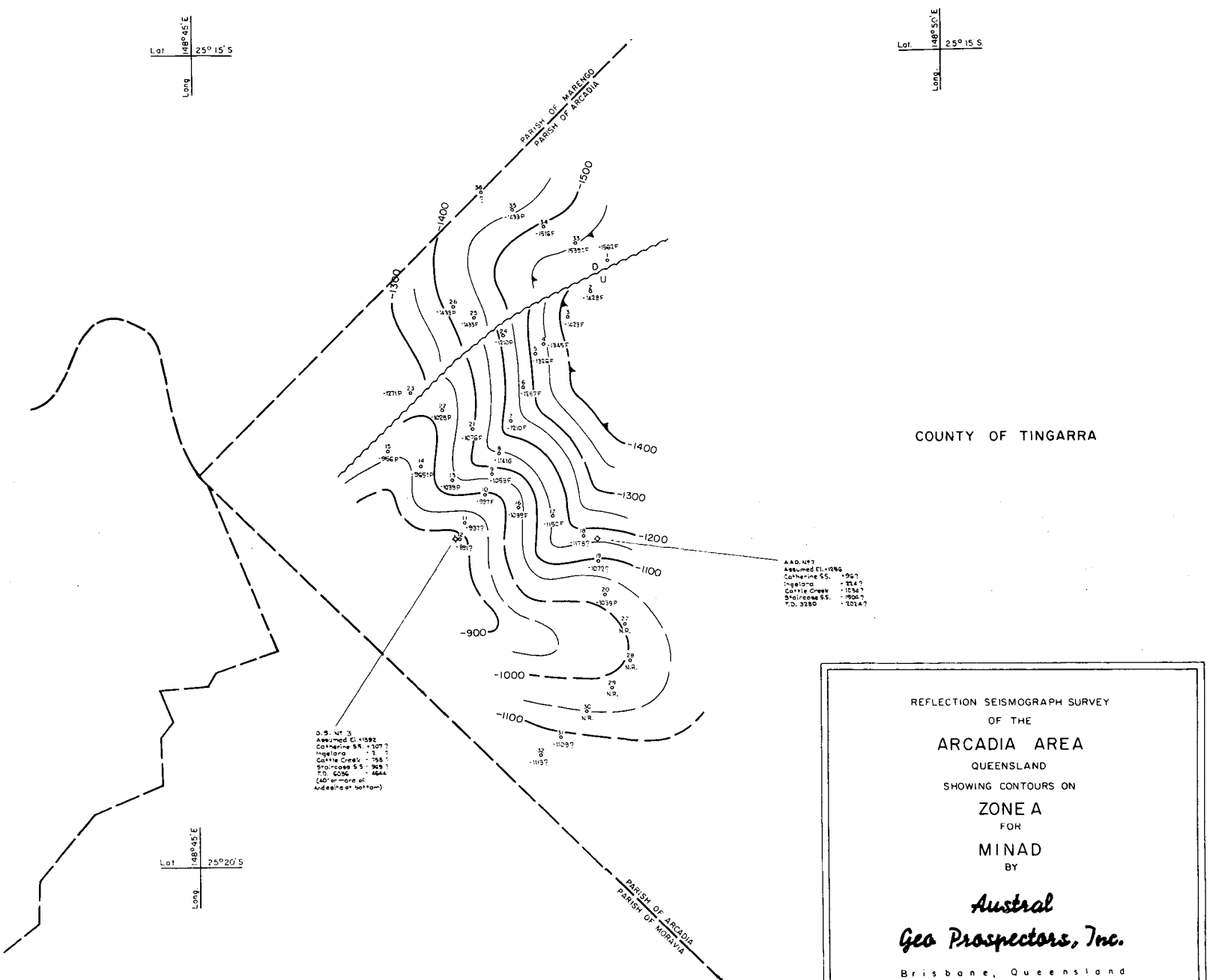
Austral
Geo Prospectors, Inc.

Brisbane, Queensland

0 1 2
MILES

Ve= f/s Va= f/s
C.I. 25 ft. SEISMIC DATUM: MAP DATUM: Sea Level
DATE, Sept. 24, 1960 INTERPRETATION BY:

PLATE 2



REFLECTION SEISMOGRAPH SURVEY

OF THE

ARCADIA AREA

QUEENSLAND

SHOWING CONTOURS ON

ZONE A

FOR

MINAD

BY

Austral Geo Prospectors, Inc.

Brisbane, Queensland

0 1 2

MILES

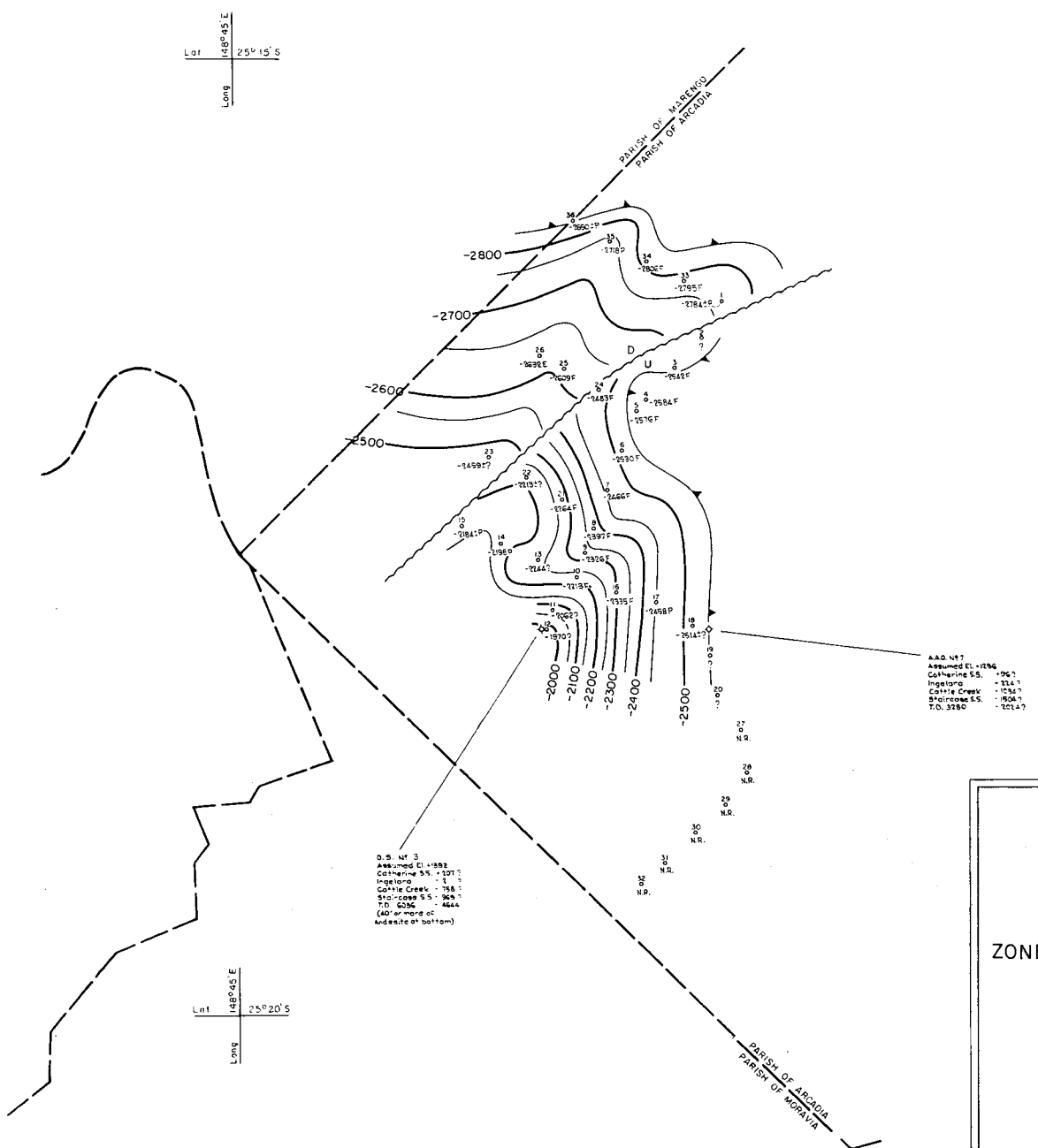
Ve: 8000 f/s Va: f/s

C.I. 50 ft. SEISMIC DATUM: +1100 ft. MAP DATUM: Sea Level

DATE, Sept. 24, 1960 INTERPRETATION BY

$D_1 = 4630T_1 - 1424$

PLATE 3



COUNTY OF TINGARRA

REFLECTION SEISMOGRAPH SURVEY
OF THE
ARCADIA AREA
QUEENSLAND
SHOWING CONTOURS ON
ZONE B (NEAR BASE OF STAIRCASE)
FOR
MINAD
BY

Austral
Geo Prospectors, Inc.

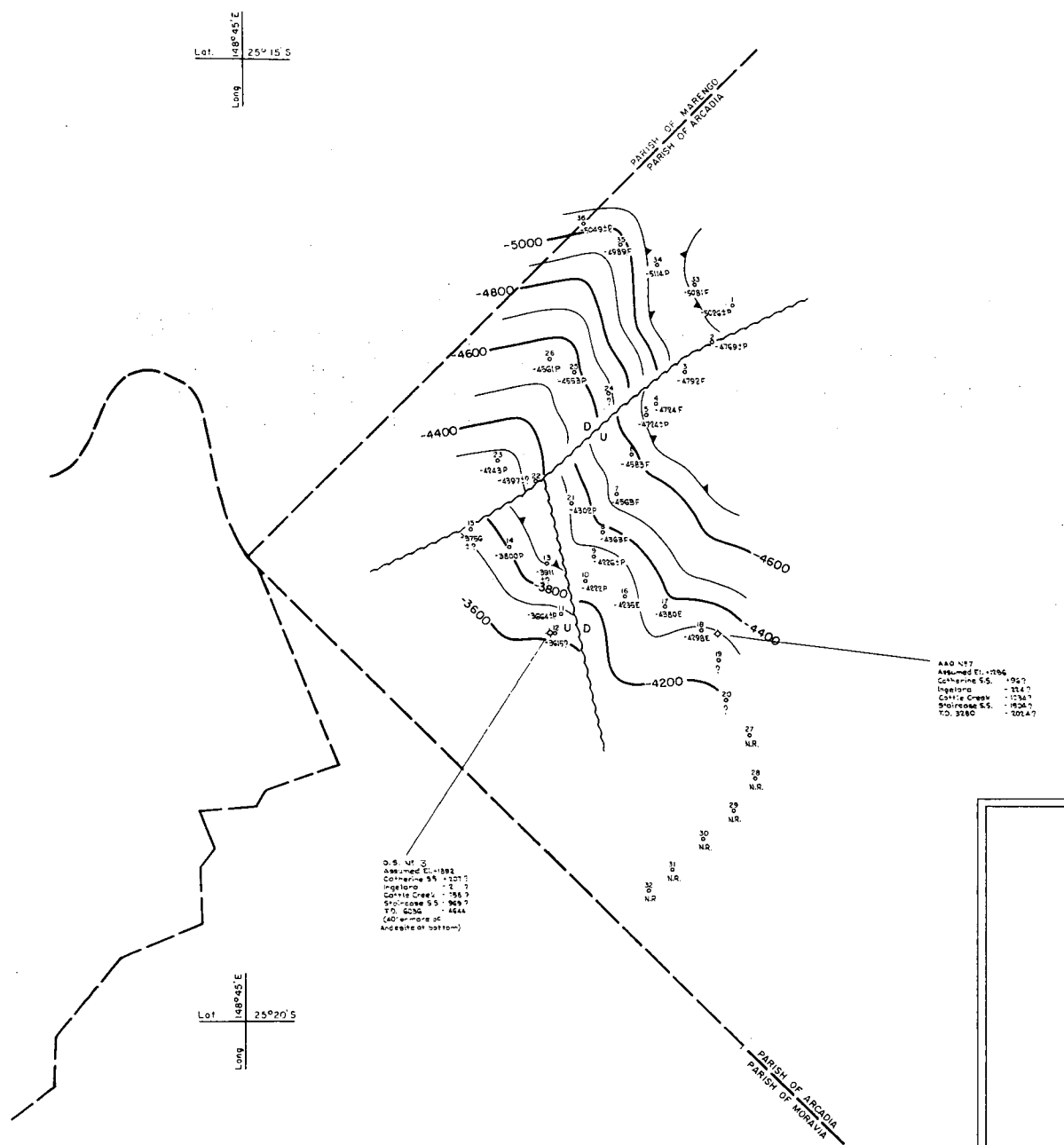
Brisbane, Queensland

0 1 2
MILES

Ve = 8000 f/s Va = f/s
C.I. 50 ft. SEISMIC DATUM: +1100 ft. MAP DATUM: Sea Level
DATE: Sept. 24, 1960 INTERPRETATION BY:

$D_2 = D_1 + 5710 (T_2 - T_1)$

PLATE 4



REFLECTION SEISMOGRAPH SURVEY
OF THE
ARCADIA AREA
QUEENSLAND
SHOWING CONTOURS ON
ZONE C
FOR
MINAD
BY

Austral
Geo Prospectors, Inc.

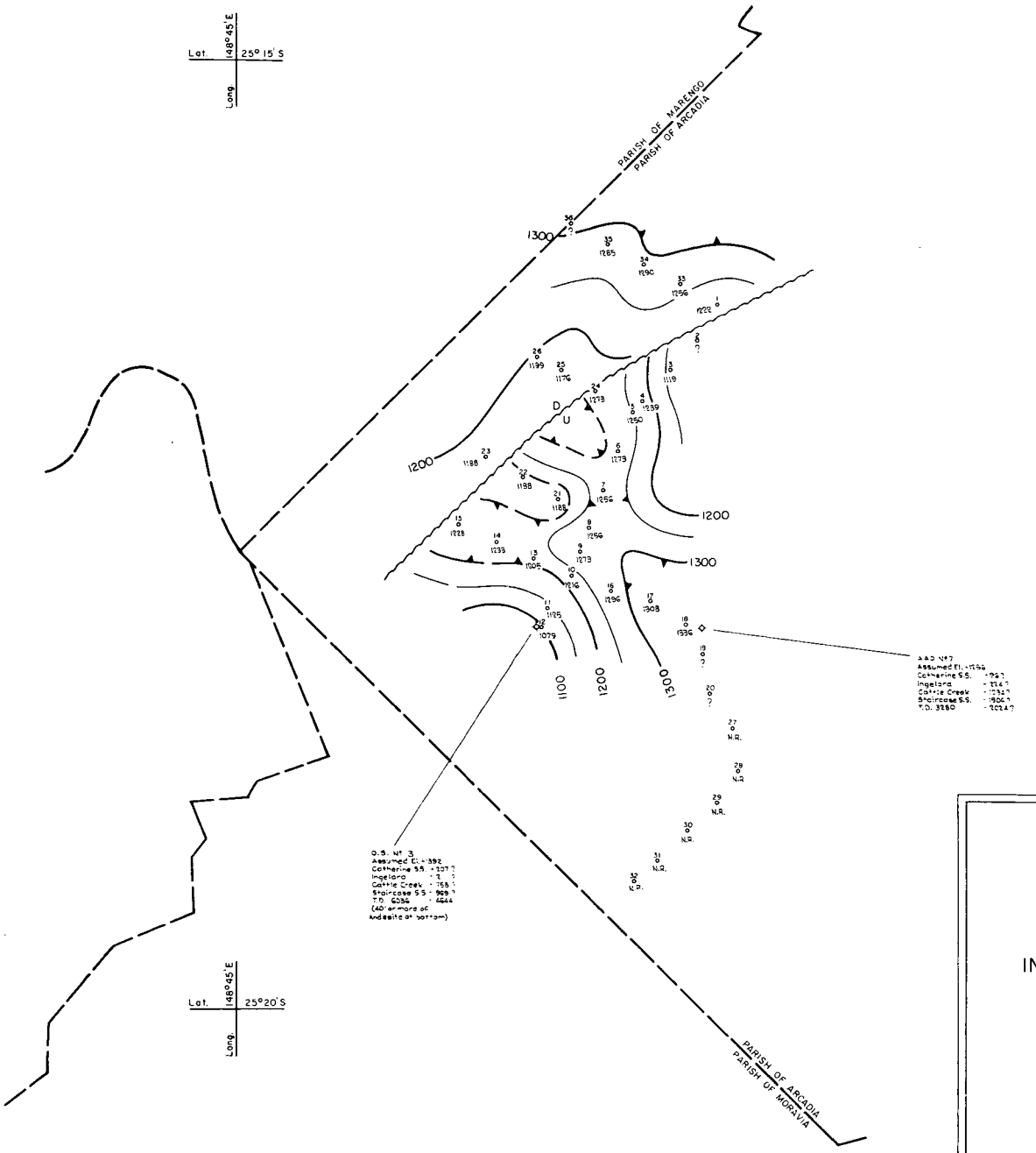
Brisbane, Queensland

0 1 2
MILES

Ve: 8000 f/s Vo: f/s
C.I.: 100 ft. SEISMIC DATUM: +1100 ft. MAP DATUM: Sea Level
DATE: Sept 24, 1960 INTERPRETATION BY:

$D_3 = D_2 + 7280\ (T_3 - T_2)$

PLATE 5



REFLECTION SEISMOGRAPH SURVEY

OF THE

ARCADIA AREA

QUEENSLAND

SHOWING CONTOURS ON

INTERVAL (ZONE A TO ZONE B)

FOR

MINAD

BY

Austral

Geo Prospectors, Inc.

Brisbane, Queensland

0 1 2

MILES

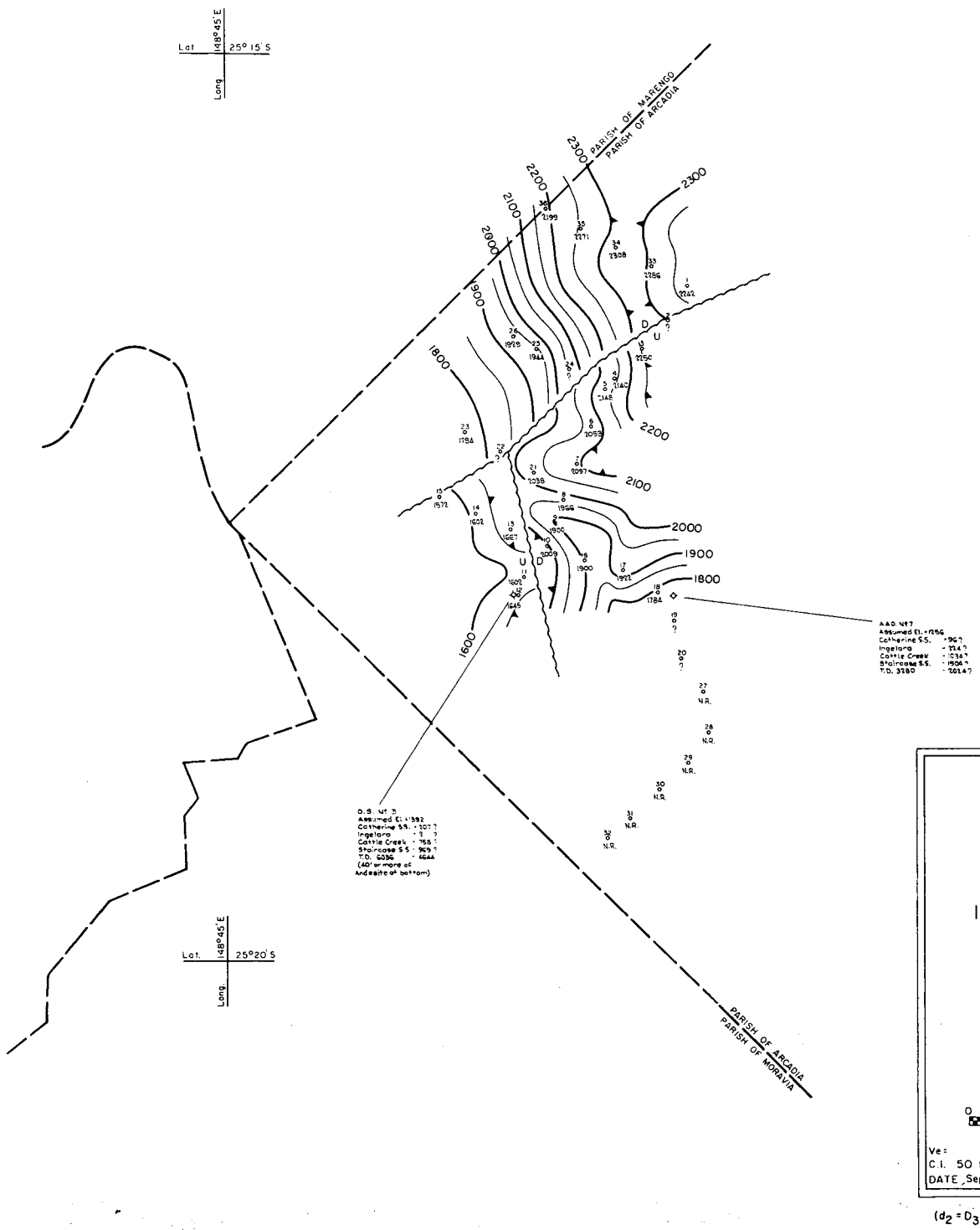
Ve = f/s Va = f/s

C.I. 50 ft. SEISMIC DATUM: MAP DATUM: Sea Level

DATE, Sept. 24, 1960 INTERPRETATION BY:

$d_1 = D_2 - D_1$

PLATE 6



REFLECTION SEISMOGRAPH SURVEY
OF THE
ARCADIA AREA
QUEENSLAND
SHOWING CONTOURS ON
INTERVAL (ZONE B TO ZONE C)
FOR
MINAD
BY

Austral Geo Prospectors, Inc.

Brisbane, Queensland

0 1 2
MILES

Ve= f/s Va= f/s
C.I. 50 ft. SEISMIC DATUM: MAP DATUM: Sea Level
DATE Sept 24, 1960 INTERPRETATION BY

$(d_2 = D_3 - D_2)$

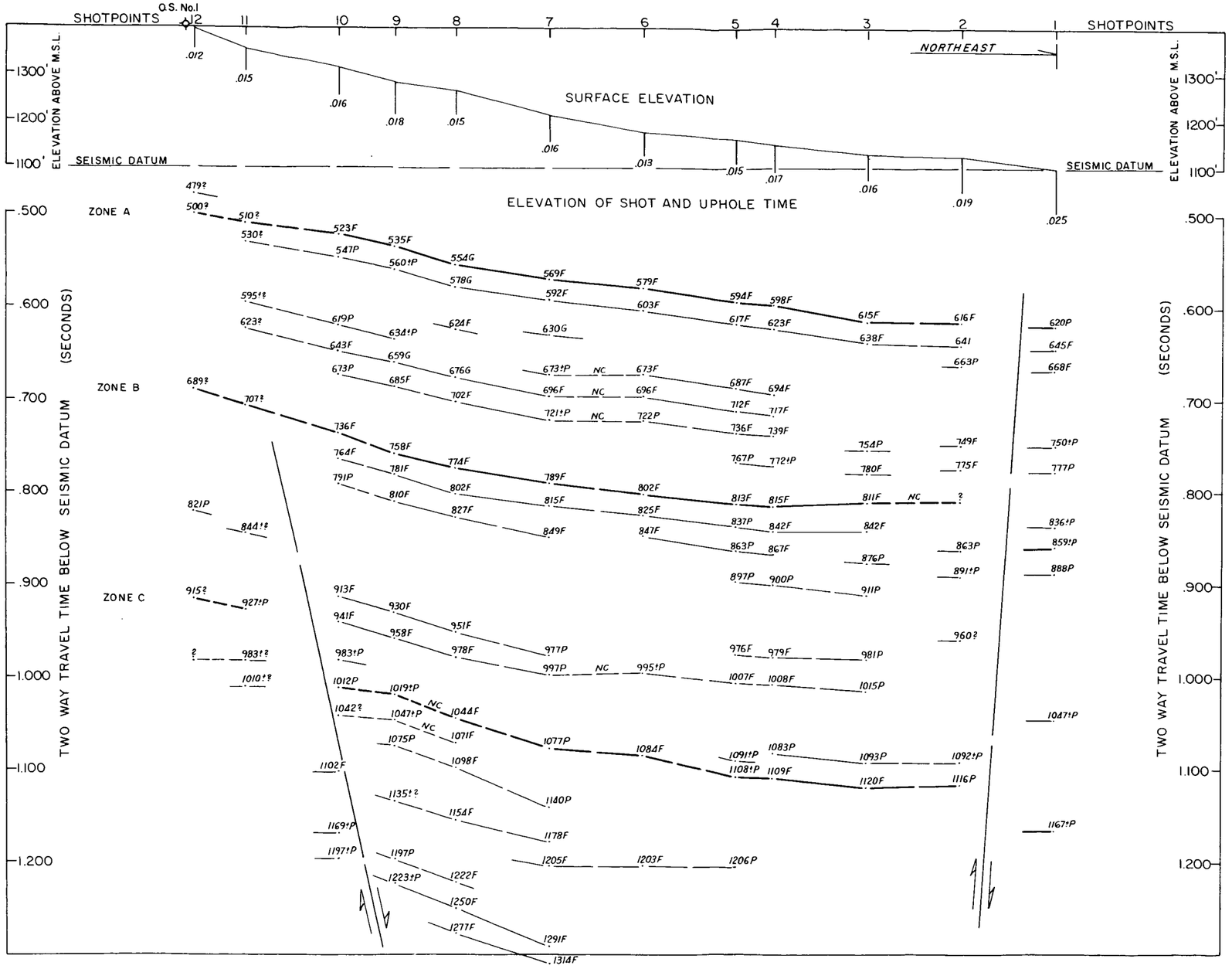


PLATE NO. 7

LEGEND

CONTINUITY GRADE

- Good or Fair (Reliable)
- Poor (Probable)
- Questionable (Possible)
- NC — No Continuity

Mapping Horizon shown by heavier line

HORIZONTAL SCALE IN FEET

1000 0 1000 2000 3000 4000

REFLECTION SEISMOGRAPH SURVEY OF THE

ARCADIA AREA

QUEENSLAND
CROSS SECTION

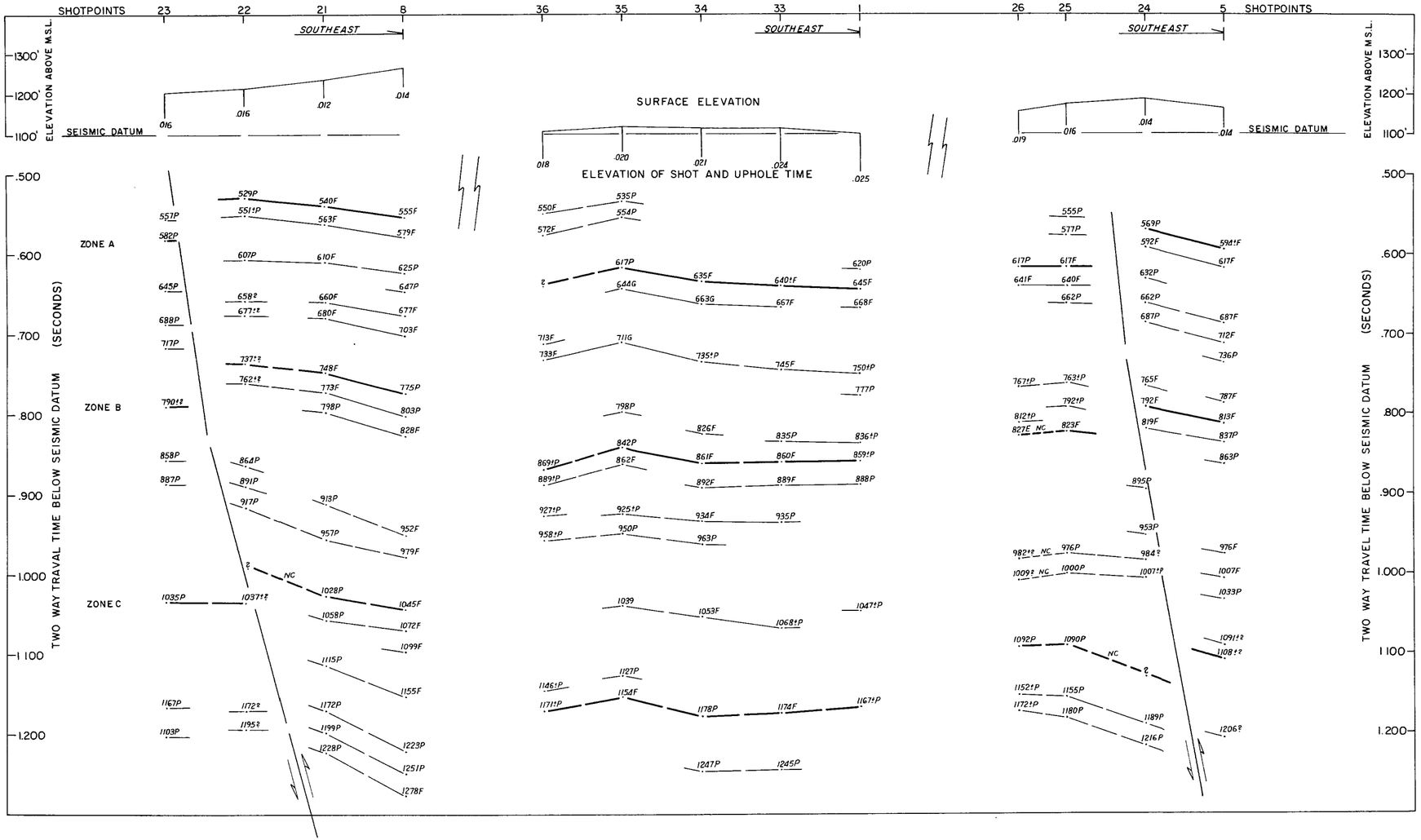
FOR

MINAD

BY

Austral Geo Prospectors, Inc.

Brisbane, Queensland



LEGEND

CONTINUITY GRADE

- Good or Fair (Reliable)
- Poor (Probable)
- Questionable (Possible)
- NC — No Continuity

Mapping Horizon shown by heavier line

HORIZONTAL SCALE IN FEET

1000 0 1000 2000 3000 4000

REFLECTION SEISMOGRAPH SURVEY OF THE

ARCADIA AREA

QUEENSLAND CROSS SECTION

FOR

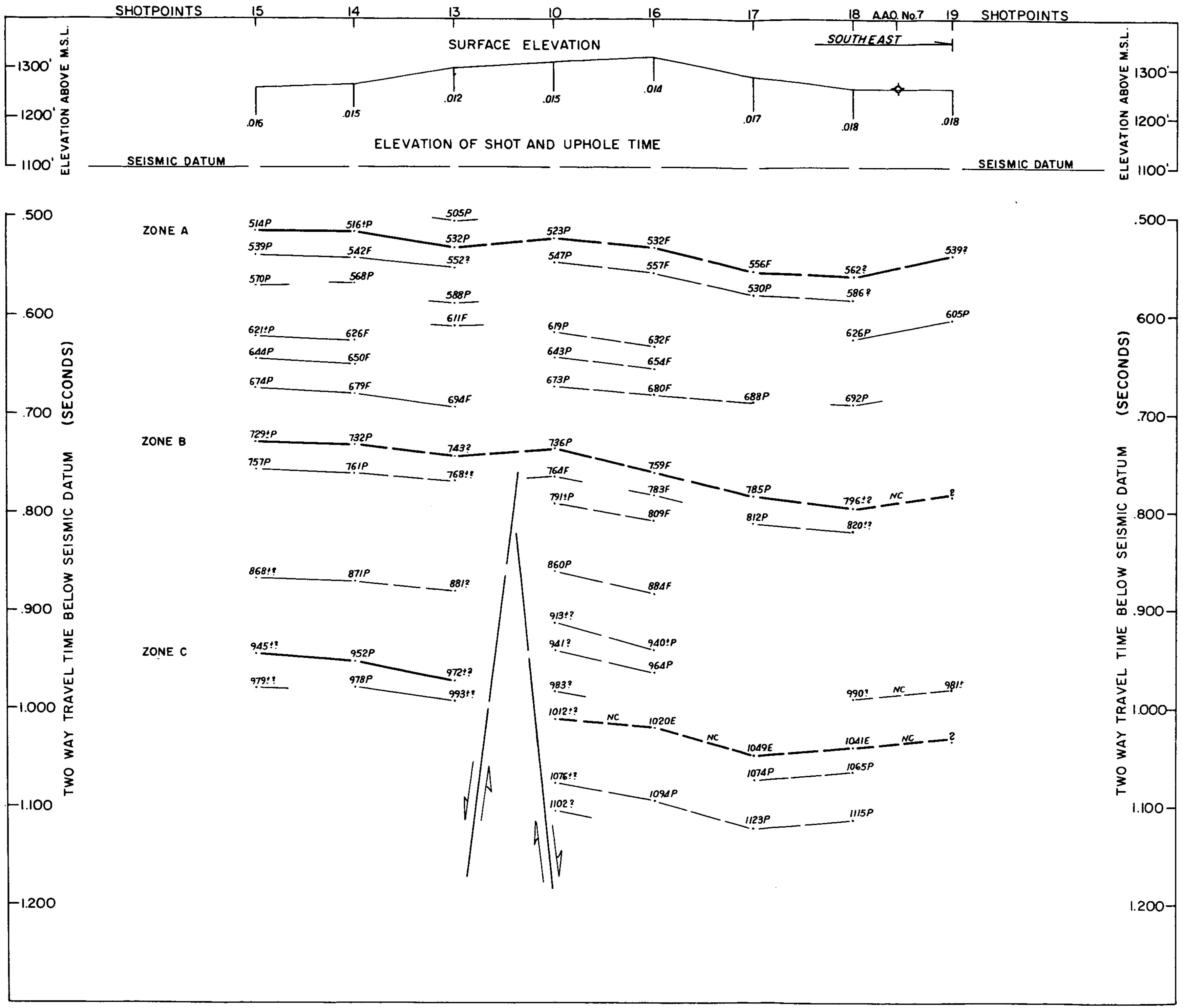
MINAD

BY

Austral Geo Prospectors, Inc.

Brisbane, Queensland

PLATE NO. 9



LEGEND

CONTINUITY GRADE

- Good or Fair (Reliable)
- Poor (Probable)
- Questionable (Possible)
- NC No Continuity

Mapping Horizon shown by heavier line

HORIZONTAL SCALE IN FEET

1000 0 1000 2000 3000 4000

REFLECTION SEISMOGRAPH SURVEY OF THE

ARCADIA AREA

QUEENSLAND

CROSS SECTION

FOR

MINAD

BY

Austral Geo Prospectors, Inc.

Brisbane, Queensland