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~~This report is to remain a  
closed file until G's 4/78,  
30/83, 31/83, 32/83 and 50/83  
have all been relinquished.~~

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AMOCO-E.Z. EXPLORATION OF THE GORDON LIMESTONE

**OPEN FILE**

S. Taylor

1. INTRODUCTION

This report contains:

1. a brief summary of previous exploration of the Gordon Limestone by Amoco Minerals Australia in E.L. 4/78 (Zeehan) in the period June, 1978-June, 1983.
2. an outline of the 1983-84 programmes and expenditure approved by the Amoco-Electrolytic Zinc Joint Venture in June, 1983 for E.L. 4/78 (Zeehan), E.L. 30/83 (Governor), E.L. 31/83 (Macquarie) and E.L. 32/83 (Princess).
3. an outline of the proposed exploration programmes and expenditure for E.L's 49/83 (Yolande River), 50/83 (Lynchford) and 52/83 (Owen).

2. AMOCO EXPLORATION 1978-1983

In the period June, 1978-June, 1983, Amoco conducted a systematic, integrated exploration programme designed to detect Pb-Zn mineralisation in the Ordovician Gordon Limestone in E.L. 4/78 (Zeehan). After the initial reconnaissance phase, this work involved gridding, geological mapping, geochemical sampling by hand auger and Jacro power auger, costeaning, pitting, data research of old workings, photo-geological interpretation and various geophysical techniques (I.P., gravity, ground and air electromagnetics, ground magnetics and several downhole techniques etc.).

During this work various foreign consultants with expertise in carbonate hosted Pb-Zn mineralisation, including K.H. Wolf (U.S.A.) and M.J. Russell (Strathclyde, Scotland) were invited to appraise its progress, interpret its results and advise on further action.

By mid-1983, Amoco had drilled off various geochemical/geophysical targets in the Oceana and Austral Valleys and also delineated areas of encouraging geochemistry in the Pyramid, Rose Valley and Myrtle Grids (see enclosure). At the site of the abandoned Oceana Pb-Ag-Zn mine, a 13 hole diamond drilling programme, totalling 4,034m, had outlined a reserve of 2 million tonnes @ 8.60% Pb, 4.02% Zn, 69.2 g/t Ag in two mineralised horizons of the Gordon Limestone. In the adjacent Austral Valley a 10 hole diamond drilling programme, totalling 2,314m, had tested various geochemical/geophysical targets and intersected similar, though low grade, mineralised strata in the Gordon Limestone. Further south in the Pyramid to Rose Valley grids, early favourable results in geochemical and gravity surveys suggested that similar drill targets could be generated in these areas.

In late 1982 Amoco invited E.Z. to assess the results of this exploration with a view to forming a joint venture for future exploration of E.L. 4/78 and their outlying, pending E.L's containing Gordon Limestone. In their preliminary investigation of the data, E.Z. staff recognised the similarities between the Oceana mineralisation and "Irish-style" carbonate-hosted mineralisation at Navan, Tynagh and Silvermines, Republic of Ireland. In so doing, they discounted the previously accepted theory that the Gordon Limestone mineralisation was genetically derived from hydrothermal fluids emanating from the Heemskirk Granite.

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In January, 1983, this new genetic interpretation was confirmed by Stewart Taylor, formerly Chief Geologist of Mogul of Ireland at Silvermines, who had gained considerable expertise on carbonate-hosted Pb-Zn mineralisation during six years work in Ireland in 1976-1982. In detailed examination of the Oceana core, Taylor recognised distinct areas of epigenetic stratabound mineralisation (Plate 1) and syngenetic/syndiagenetic stratiform mineralisation (Plate 2) and interpreted the Oceana Deposit as a small sedimentary exhalative orebody, similar in gross aspects to Silvermines, as indicated in Fig. 1.

Following a favourable report from Taylor on the prospectivity of the Gordon Limestone for significant Pb-Zn mineralisation, E.Z. entered into Joint Venture exploration with Amoco in June, 1983. Amoco expenditure up to that date is estimated at \$1.5 million.

### 3. AMOCO-E.Z. JOINT VENTURE EXPLORATION 1983-84

In the 1983-84 period the Amoco-E.Z. Joint Venture has approved a total expenditure of \$250,000 in E.L's 4/78, 30/83, 31/83 and 32/83 (Fig. 2). The programmes involve action at various stages of exploration, from initial grass-roots investigation of the virtually unexplored E.L's 30/83, 31/83 and 32/83 to drill testing of geochemical/geophysical/structural targets in areas of advanced exploration in the North Austral Valley of E.L. 4/78. Staffing of the project, which is managed by E.Z., comprises one E.Z. staff geologist and one Amoco staff geologist, both on a full time basis, plus two E.Z. field assistants, under the supervision of S. Taylor, who has recently been appointed Supervising Geologist - Tasmania by E.Z.

Brief summaries of the various work programmes are presented below:-

#### **E.L. 4/78 (Zeehan)**

##### North Austral Grid

1. Drill testing of mineralised limestone in the old Montague workings, plus E.M. anomalies adjacent to the Balstrup Fault.
2. Dipole-dipole I.P. investigation of a gravity anomaly in the North Austral Valley.
3. Reassessment of other geochemical/drilling data in Austral Valley.

##### Pyramid Grid

Grid soil sampling, pitting and trenching, plus ground magnetics adjacent to the old Pyramid workings.

##### Myrtle to Rose Valley Grids

Grid soil sampling, pitting and trenching, geological mapping, ground magnetics, reassessment of previous gravity data plus extension to gravity survey.

#### **E.L. 30/83 (Governor)**

Reconnaissance geological mapping, rock chip sampling, gridding, soil sampling by hand auger, portable power auger and Jacro auger, ground magnetics.

**E.L. 31/83 (Macquarie)**

Reconnaissance geological mapping, rock chip sampling and stream sediment sampling.

**E.L. 32/83 (Princess)****1. Bubbs Hill**

Reconnaissance stream sediment sampling and geological mapping, re-establishment of grid, soil sampling by hand auger and portable power auger, geological mapping and rock chip sampling, a dipole-dipole I.P. survey over some lines.

**2. Princess River**

Reconnaissance stream sediment sampling, rock chip sampling and limited geological mapping to check the results of previous exploration by Pickands Mather in 1968. If warranted, follow up work to comprise ridge and spur rock chip and soil sampling.

4. PROPOSED EXPLORATION PROGRAMMES IN E.L. 49/83 (YOLANDE), E.L. 50/83 (LYNCHFORD) AND E.L. 52/83 (OWEN)

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In the three contested areas of E.L. 49/83 (Yolande), E.L. 50/83 (Lynchford) and E.L. 52/83 (Owen) (Fig. 2), the Amoco-E.Z. Joint Venture proposed to explore the Gordon Limestone for "Irish-style" carbonate-hosted sedimentary exhalative mineralisation. In the formulation and execution of exploration programmes in these areas, considerable benefit will be derived from 1. the systematic exploration programmes developed by Amoco in similar areas of Gordon Limestone in the period 1978-1983; 2. the experience gained in grass-roots exploration of E.L. 30/83 (Governor), E.L. 31/83 (Macquarie) and E.L. 32/83 (Princess) in the 1983-84 period; 3. the expertise in carbonate-hosted mineralisation of the project geologists.

It is envisaged that in general the exploration programmes in these areas would involve the following stages:-

1. Reconnaissance geological mapping, stream sediment sampling, rock chip sampling, air photo interpretation;
2. Gridding of favourable areas.
3. Detailed geological mapping of grids.
4. Geochemical sampling of grids, using the Jacro power auger rig where necessary.
5. Gravity, ground magnetics and ground E.M. techniques.
6. Costeaming and pitting of anomalous areas.
7. Diamond drilling.

Anticipated expenditures for the first 12 month period, assuming favourable initial results, prior to the diamond drilling stage, are as follows:-

E.L. 49/83 (Yolande)	\$50,000
E.L. 50/83 (Lynchford)	\$66,000
E.L. 52/83 (Owen)	\$50,000

Details of proposed exploration programmes are as follows:-

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PROPOSED PROGRAMME - E.L. 49/83 - YOLANDE RIVER

Stage 1.

- 1. Reconnaissance geology, stream sediment sampling and rock chip sampling of Ewart Creek area and other areas of possible limestone outcrop.  

**est. \$10,000**
  
- 2. Grid soil sampling, geological mapping and geophysical surveys of part of the Ewart Creek Valley.  

**est. \$10,000**
  
- 3. Similar grid programmes in other areas where limestone subcrop is anticipated.  

**est. \$10,000**

Stage 2. (dependant on results of Stage 1.)

- 1. Jacro auger sampling of parts of gridded areas.  

**est. \$10,000**
  
- 2. Trenching and pitting of anomalous areas.  

**est. \$10,000**

Stage 3.

Diamond Drilling if warranted.

PROPOSED PROGRAMME - E.L. 50/83 - LYNCHFORD

Stage 1.

- 1. Examination of the Halls Creek limestone quarry, reconnaissance geology and rock chip sampling. Access by established roads and tracks.

**est. \$ 5,000**

- 2. Stream sediment sampling and reconnaissance geological mapping of the Newall Creek area. Access to area by established tracks and travel within area on foot.

**est. \$ 5,000**

- 3. Gridding of the Queen River Valley, detailed geological mapping and soil sampling. Soil sampling will be by Jacro auger rig mounted on a J5 Bombardier.

**est. \$ 20,000**

- 4. Ground magnetometer and gravity surveys of the Queen River Grid.

**est. \$ 6,000**

Stage 2. (dependant on results of Stage 1)

- 1. Gridding, detailed geological mapping, soil sampling and geophysical surveys of part of the Newall Creek area.

**est. \$10,000**

- 2. Trenching or pitting of anomalous areas.

**est. \$ 20,000**

Stage 3.

Diamond Drilling - if warranted.

PROPOSED PROGRAMME - E.L. 52/83 - OWEN

Stage 1.

- 1. Reconnaissance geological mapping and rock chip sampling of all possible limestone areas.

**est. \$ 5,000**

- 2. Grid soil sampling, geological mapping and geophysical surveys of the area east of Mt. Owen.

**est. \$ 15,000**

- 3. Soil sampling and geological mapping of the areas along the Kelly Basin Road.

**est. \$ 10,000**

Stage 2. (dependant on results of Stage 1)

- 1. Jacro auger sampling of parts of gridded areas.

**est. \$ 10,000**

- 2. Trenching and pitting of anomalous areas.

**est. \$ 10,000**

Stage 3.

Diamond Drilling if warranted.



PLATE 1 - Stratiform, epigenetic mineralisation in the Oceana Deposit - cavity infillings of siderite and galena.



PLATE 2 - Stratiform, syndiagenetic mineralisation in the Oceana Deposit - layers of slumped galena and siderite lying parallel to the bedding in the underlying sediments.

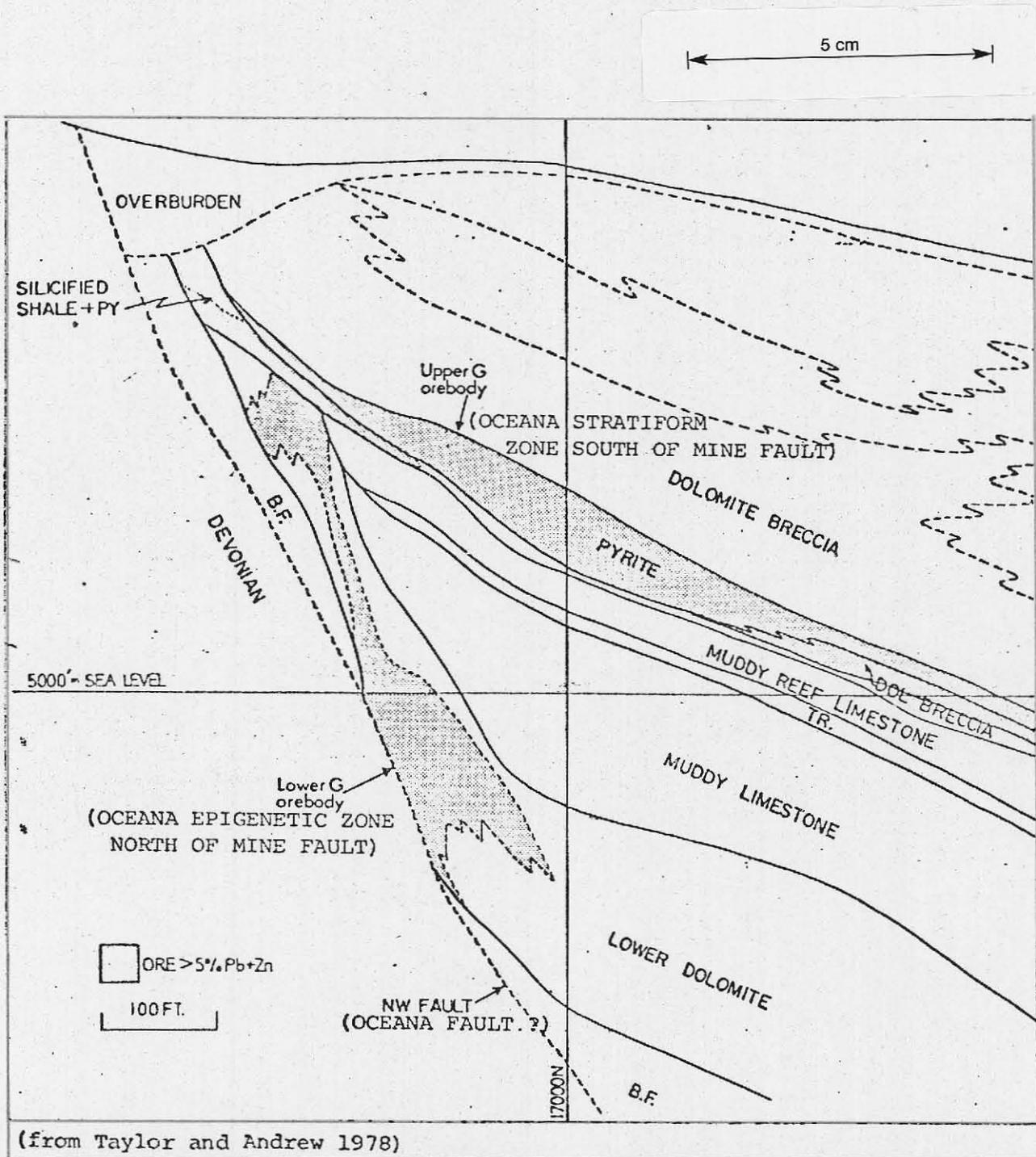


FIGURE 1 NORTH-SOUTH SECTION THROUGH THE G ZONE SECTION OF THE SILVERMINES OREBODY; a typical example of Irish style carbonate hosted sedimentary-exhalative mineralisation. The orebody comprises a lower discordant epigenetic zone in massive dolomite (equivalent to Oceana epigenetic deposit, between the Mine Fault and Oceana Fault) and an upper stratiform syngenetic zone (equivalent to the stratiform syndiagenetic ore at Oceana south of the Mine Fault). The NW fault is regarded as the feeder of the mineralisation. The Dolomite Breccia lithology consists of debris flow breccias.

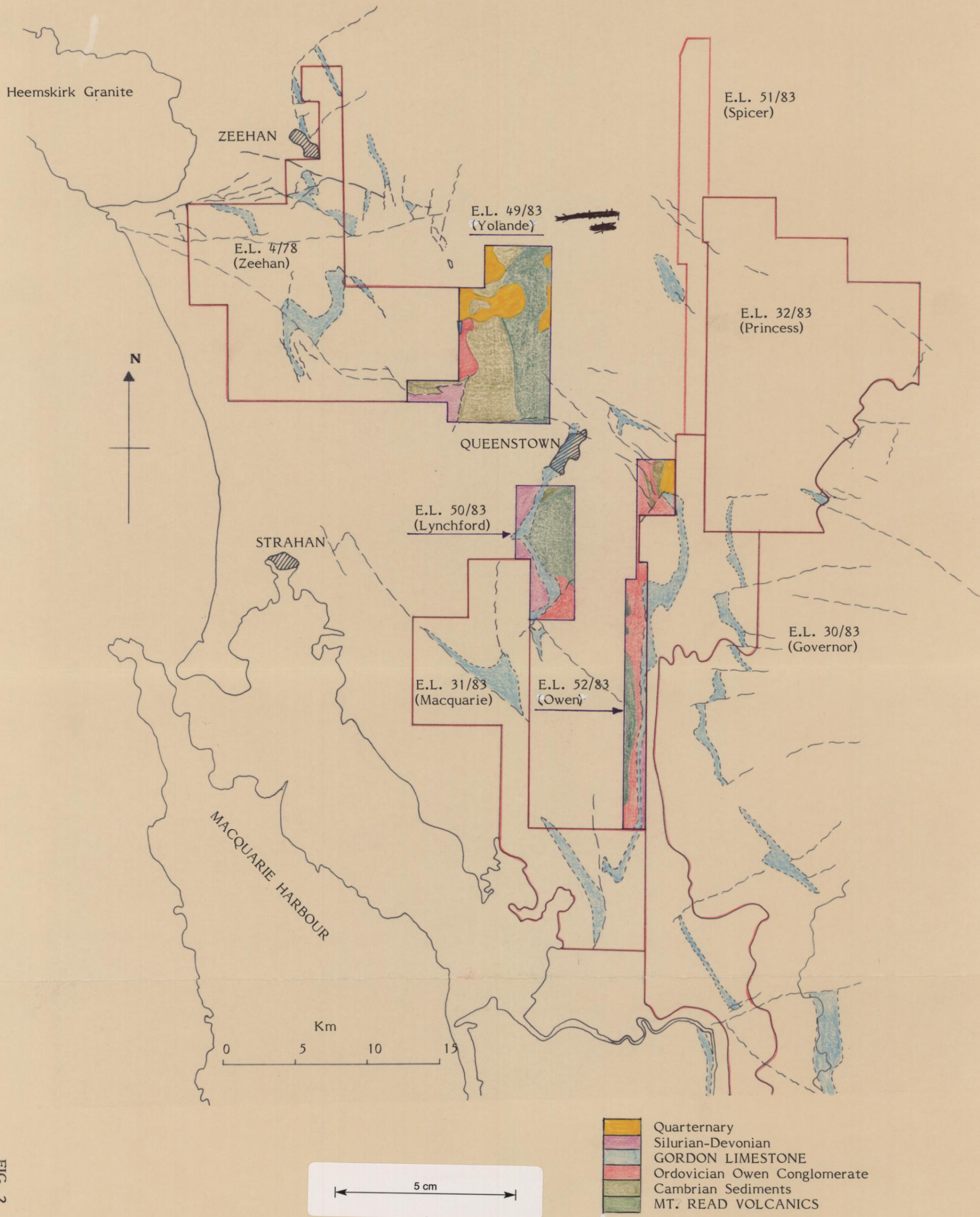
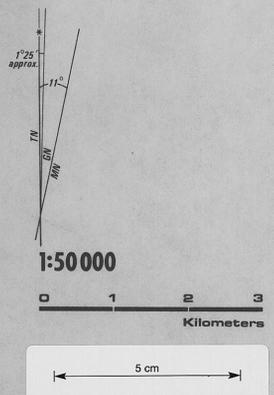
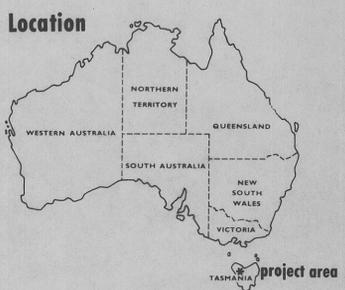
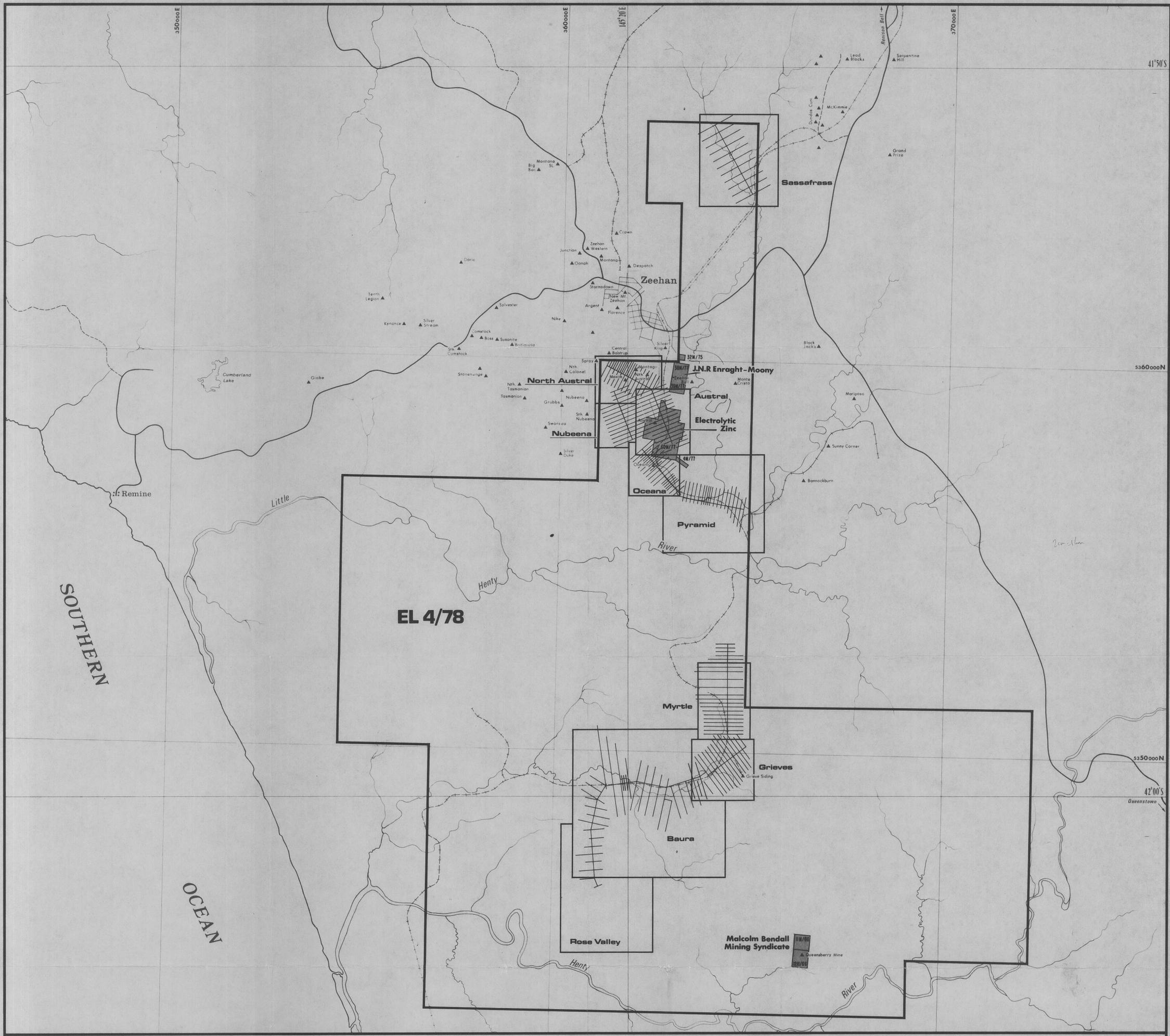


FIG. 2

GEOLOGY OF E.L.'s 49/83 (Yolande River), 50/83 (Lynchford) & 52/83 (Mt. Owen)

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Amoco Minerals Australia Company

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Project	ZEEHAN	Nº A-78-60
Project Partner	Zeehan EL 4/78	
<b>PROSPECT LOCATION</b>		
Map Ref. ANG	K-55-5	Latitude 42° 00' S Longitude 145° 20' E
Surveyed	Date	Scale 1:50000
Drawn	S.F., R. Smyh-King	Date August 1981 Drawing Nº M80-1476
Report	353	

Compiled from enlargement of Zeehan 1:63360 scale and Strahan 1:50000 scale geologic maps. Transverse Mercator Projection