EL 2038

MT. SHOOBRIDGE

ANNUAL REPORT

1980 - 81.

E+R naked.

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ANNUAL REPORT

1980 - 81.

E+R noted.

G. Hassall,
November, 1981

CR82/057

ABSTRACT

EL 2038, Mt. Shoobridge North, was granted to AAR limited on the 15th August, 1979 for a period of twelve months. An application for a twelve month renewal was granted on the 15th August, 1981. A 50% relinquishment was made on the 15th August, 1981.

During 1981 the project area was partially gridded on 200 x 200 metre centres to facilitate geological mapping at 1:2,500 scale. The grid area covered rocks of the Zamu Dolerite, Mt. Partridge and South Alligator Groups. The rocks have been domed, faulted and metamorphosed by the intrusion of the early Carpentarian Fenton Granite. Ground radiometric and rock-chip sample surveys were conducted in conjunction with mapping.

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1. INTRODUCTION

This report describes the results of work carried out on EL 2038, Mt. Shoobridge North, during 1980/81.

Tenure was granted to AAR Limited for all minerals on the 15th August, 1979.

1.1 Location and Access

EL 2038 is located approximately 120 kilometres south-south-east of Darwin (Figure 1). The area occurs within the Pine Creek 1:250,000 Geological Sheet area and the Tipperary 1:63,360 Geological Series area. A detailed description of the boundaries of the EL is as follows:-

All that piece or parcel of land in the Northern Territory of Australia containing an area of 5.14 square miles (13.30 sq.km) more or less, the boundary of which is described as follows:-

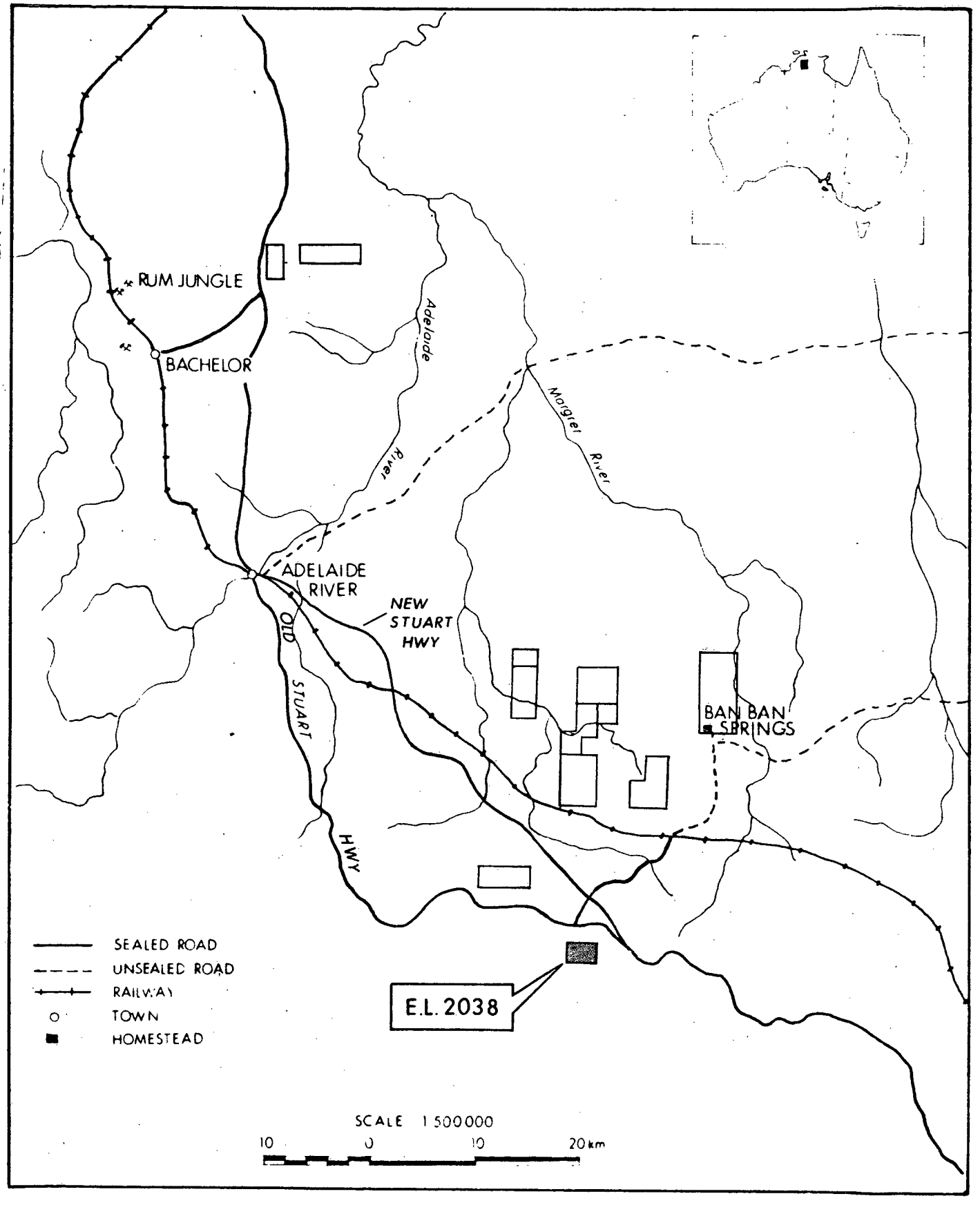
Commencing at the intersection of latitude 13 degrees 34 minutes with longitude 131 degrees 22 minutes thence proceeding to the intersection of latitude 13 degrees 34 minutes with longitude 131 degrees 24 minutes thence proceeding to the intersection of latitude 13 degrees 35 minutes with longitude 131 degrees 24 minutes thence proceeding to the intersection of latitude 13 degrees 35 minutes with longitude 131 degrees 22 minutes thence proceeding to the intersection of latitude 13 degrees 34 minutes with longitude 131 degrees 22 minutes.

Access to the eastern portion of the area is gained via the sealed Old Stuart Highway and side road to Douglas Springs. The sealed Douglas Springs road passes through the EL and this combined with numberous tracks in the area affords easy access.

The sealed road to Ooloo, also off the Old Stuart Highway, passes near the western boundary.

1.2 Topography and Climate

Within the EL the topography consists of low hills, with rocky outcrops, having a relief of up to 40 metres. The granitic areas are mainly flat to slightly undulating due to the development of lateritic soils. Outcrops of granite are rare. The river and creek valleys consist of granitic sand or 'black soil' plains.



LOCATION MAP.

E.L. 2038 - MT. SHOOBRIDGE

Figure 1

Climate is sub-tropical. The monsoonal season occurs from November to April, during which most of the annual rain falls in torrential storms. Rain fall averages more than 1 200 mm annually. During this time humidity is constantly high and temperatures range from 30-40°C. For the remainder of the year the humidity is lower with variations in temperature ranging from 30°C during the day to 10°C or less at night.

1.3 Tenement Situation

Exploration Licence 2038 was granted to AAR Limited on the 15th day of August 1979 for a period of twelve months. A twelve month renewal was granted on the 15th of August, 1980. A 50% relinquishment was made on the 15th August, 1981. A detailed expenditure statement is presented as Appendix I.

Implementation of exploration programmes in the Licence area is being undertaken by Mines Administration Pty Limited., a wholly owned subsidiary of AAR Limited.

1.4 Previous Work

The earliest geological investigations of the Pine Creek region resulted from the discovery of gold in 1872. A number of the mining fields and mines were mapped with the aid of aerial photographs by the Aerial, Geological and Geophysical Survey of Northern Australia between 1935 and 1939.

The BMR has carried out a number of regional mapping programmes which have included the EL. The area was studied at 1:63,360 scale in the Tipperary Inch to a Mile Geological Map Series (1959) and 1:250,000 scale in the Pine Creek Geological Sheet (Malone, 1962).

Walpole et.al. (1968) compiled all existing literature and mapping pertaining to the Katherine-Darwin Region. More recently, mapping of the entire Pine Creek Geosyncline was completed at 1:500,000 scale (Needham et.al., 1980).

During 1966, United Uranium initiated an exploration programme for base metals over an area which included the present EL (Sturm 1966). Work carried out included detailed examinations of all known mineral occurrences and a reconnaissance stream sediment sampling programme to locate additional prospects.

CRA carried out a regional mapping and soil and rock chip sampling programme on an area to the west of EL 2038 during

1978. Their work was oriented toward base metal exploration with major emphasis on the investigation of ironstones (Iksturms, 1979).

2. REGIONAL GEOLOGY

Exploration Licence 2038 is located near the centre of the Pine Creek Geosyncline. The regional geology of the Pine Creek Geosyncline has been described in detail by Needham et. al. (1980) and will be discussed only briefly in this report.

By correlating a Tuffaceous sequence Needham et. al., (op cit) have now defined the Pine Creek Geosyncline as a single intracratonic basin containing a thick sequence of mainly pelitic and psammitic Lower Proterozoic sedimentary rocks with interlayered tuff units resting on an Archean granitic basement. Cover rocks, of Carpentarian and younger age, unconformably overlie all of these rocks and conceal the basin margins (Table 1).

2.1 Archean Basement

The Archean Basement is represented by the domes of the Rum Jungle/Waterhouse and Nanambu Complexes. Possible Archean rocks outcrop in the Woolner area. All the complexes consist mainly of gneisses, migmatites and leucocratic granites with minor schists, metasediments and banded iron formations. All the Archean basement rocks have anomalous uranium concentrations and are possible source rocks for the deposits in the Pine Creek Geosyncline.

2.2 Lower Proterozoic Sedimentary Rocks

The oldest known Lower Proterozoic rocks are those of the Batchelor and Kakadu Groups which rest unconformably on Archean basement. The Batchelor Group, which surrounds the Rum Jungle/Waterhouse complex contains arkosic rudites, psammites, conglomerates, and minor shales of the Beestons and Crater Formations interbedded with massive crystalline carbonates of the Celia and Coomalie Dolomites. The Kakadu Group is best developed and adjacent to the Nanambu Complex and is comprised mainly of meta-arkose and paragneiss.

These two basal groups are overlain by the pelites and psammites of the Namoona Group. The dominant unit in this group is the Masson Formation which extends from west of the Rum Jungle/Waterhouse Complex almost to the South Alligator River. Further east it is thought to be equivalent to the lower member of the Cahill Formation, a partly calcareous and carbonaceous sequence of micaceous quartz-feldspathic schist,

with lenses of massive carbonate. These two units are the hosts to the major uranium deposits in the Rum Jungle and Alligator River areas. In the centre of the geosyncline the Masson Formation is unconformably overlain by the Stag Creek Volcanics. Elsewhere the Masson Formation is overlain by the sandstone-siltstone assemblage of the Mount Partridge Group which contains the Mundogie Sandstone, Mount Hooper Sandstone and Wildman Siltstone and correlates with the Acacia Gap Sandstone in the Rum Jungle Area. East of the South Alligator River the Mundogie Sandstone correlates with feldspathic quartz schist of the upper Cahill Formation and the overlying Wildman Siltstone correlates with the Nourlangie Schist.

Overlying the older rocks is the South Alligator Group which comprises the Koolpin Formation, Gerowie Tuff and Kapalga Formation. Together with the Koolpin Formation, the overlying Gerowie Tuff provides the main evidence for correlating the strata of the western and central parts of the geosyncline. The Kapalga Formation is the youngest unit in the South Alligator Group and represents a transitional sequence between the South Alligator Group and the overlying Finniss River Group.

The Finniss River Group is the youngest Lower Proterozoic Group and consists of a monotonous sequence of siltstone, slate, shale and greywacke. The Finniss River Group is made up of the Burrell Creek Formation, the Fisher Creek Siltstone and the Chilling Sandstone. The Burrell Creek Formation grades laterally and upwards into the Chilling Sandstone. The Fisher Creek Siltstone is present in the South Alligator Valley area and is a correlative of the Burrell Creek Formation.

At or near the end of sedimentation in the Lower Proterozoic the rocks were intruded by a suite of dolerites, mainly sills, known as the Zamu Dolerities. At approximately 1 800 m.y. the sills and sedimentary rocks were deformed and regionally metamorphosed. Both the grade of metamorphism and degree of deformation increased towards the north east of the geosyncline. The metamorphics were then intruded and in places domed by early Carpentarian granite plutons. This was followed by the intrusion of a series of tholeitic lopoliths known as the Oenpelli Dolerites.

3. RESULTS OF FIELD INVESTIGATIONS, 1981

During 1981 the western portion of EL 2038 was gridded on 200 x 200 metre centres and then geologically mapped at 1:2,500 scale (Map I). As well, 18 rock-chip samples were collected and assayed for a variety of elements (Appendix II). A ground radiometric survey was conducted over the east-west grid lines (Map II).

3.1 Geology

Lower Proterozoic Sedimentary Rocks.

The oldest sedimentary rocks outcropping within the project area belong to the Lower Proterozoic Mt. Partridge Group. The Mt. Partridge Group is represented within the grid area by the Wildman siltstone which consists of a fine grained, grey coloured, micaceous, graphitic schist which is slightly haematitic in places. The rock is very fissile and thinly bedded and where measured has a vertical dip.

Overlying the Mt. Partridge Group rocks are the oldest rocks of the South Alligator Group - the Koolpin Formation. Within the project area the Koolpin Formation can be conveniently divided into two members. The upper member Consists of interbedded re, very haematitic, fine grained, thinly bedded siltstone and chert and/or quartzite nodules and layers. Overlying this lower member of the Koolpin Formation is a fine to medium grained very micaceous, slightly to moderately haematitic, knotted graphitic schist which has been termed the upper member of the Koolpin Formation.

Conformably overlying the Koolpin Formation is the Gerowie Tuff. In the grid area the Gerowie Tuff consists of fine to medium grained whitish coloured quartzite which is very haematitic in places. Interbedded with the quartzite is very fine grained, extremely indurate blue black coloured chert.

Igneous Rocks

The oldest igneous rocks outcropping in the project area are fine to coarse grained dolerite sills belonging to the Zamu Dolerites. The sills have been folded with the surrounding sedimentary rocks.

Several pegmatite veins intrude the Lower Proterozoic sedimentary rocks. Mineralogically the veins consist of large books of muscovite and tourmaline crystals in a quartz groundmass. The largest vein outcropping in the area intrudes the Koolpin Formation and probably was emplaced along a pre-existing fault.

The early Carpentarian Fenton Granite outcrops to the east of the EL. Intrusion of the granite has caused doming and associated faulting of the overlying Lower Proterozoic sedimentary rocks.

Structure

Doming of the overlying Lower Proterozoic Sedimentary and igneous rocks has been caused by the intrusion of the Fenton Granite. Associated NW-SE and NE-SW trending faults occur. Quartz veins up to 10 metres wide infill the faults. As well haematitic quartz breccias occur in the fault zones.

3.2 Geochemistry

In conjunction with the mapping 18 rock-chip samples were collected and assayed for Cu, Pb, Zn, Ag, Au, Bi, Sb, Sn, Th, U and As. Results are presented as Appendix II. Sample locations are included on Map I.

3.3 Geophysics

In conjunction with the geological mapping a ground radiometric survey was conducted using a hand held Scintrex BGS-3 Scintillometer. A total of 6 line kilometres of gridding was completed on 200 x 200 metre centres. Readings were taken every 10 metres along the east-west grid lines. The radiometric results are presented as a contour map (Map II) and a grid plan is included as Appendix III.

4. CONCLUSIONS

Geological mapping of EL 2038, Mt. Shoobridge further defined the Lower Proterozoic Geology. Units of the Mt. Partridge and South Alligator Groups outcrop within the project area. These units include:-

(a) Mt. Partridge Group : Wildman Siltstone.

(b) South Alligator Group : Koolpin Formation, Gerowie Tuff.

Eighteen rock-chip samples were collected and assayed. A ground radiometric survey totalling six line kilometres was completed.

5. REFERENCES.

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APPENDIX 1

BRISBANE.

24th August, 1981.

MINES ADMINISTRATION PTY LIMITED

STATEMENT OF EXPENDITURE

MT. SHOOBRIDGE EL 2038

YEAR ENDED 15.8.81

REF: AC/MDE

	$
Salaries and Wages	3,851
Travel & Accommodation	237
Vehicle Hire	194
Communications	11
Drafting, Air Photography, Printing, etc.	119
Geophysics Contractor - Other	2,558
Surveying Consumables	1,839
	8,809

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G.T. Hall,
Accountant.

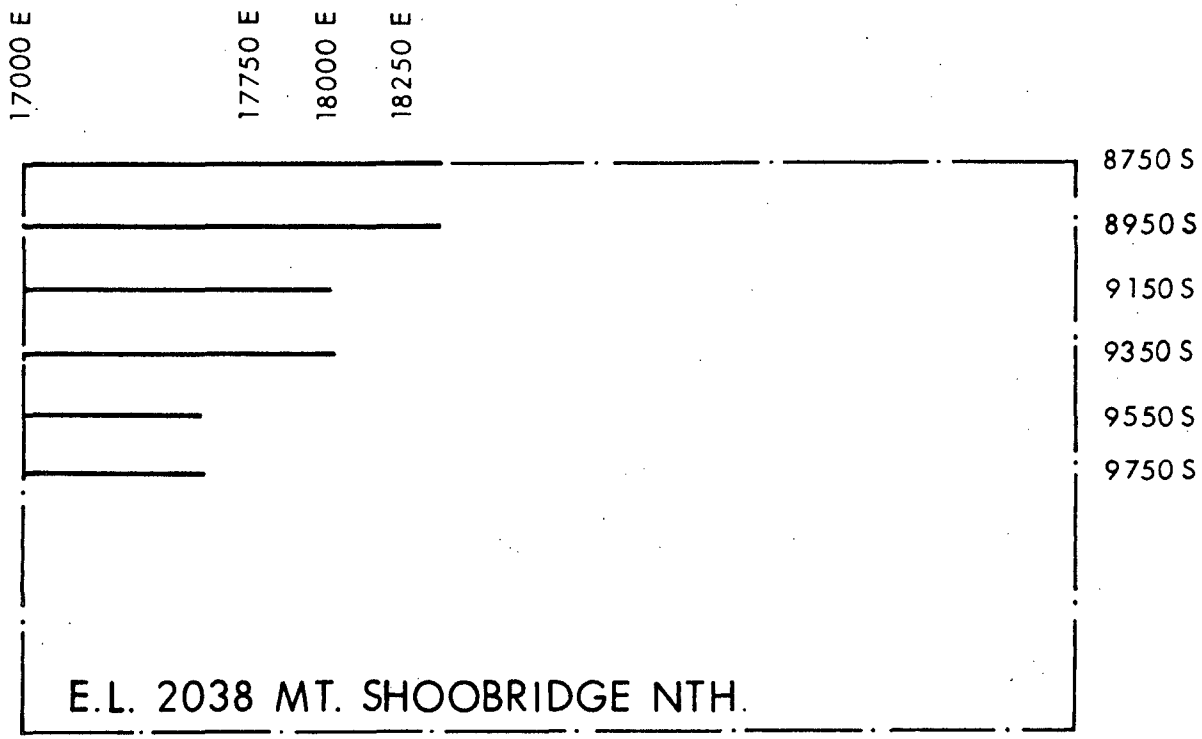
APPENDIX 2

TABLE I.

SAMPLE TYPE: ROCK CHIP

SAMPLE NO.	Cu	Pb	Zn	Ag	Bi	As	Sb	Au	U	Th	Sn	U_3O_8
11294	165	100	15	5	10	65	10	0.1	12	24	55	
11295	25	50	10	1	20	30	10	0.1	4	28	20	
11296	45	660	10	2	20	245	10	0.1	4	44	60	
11297	0.14%	0.10%	30	4	30	65	10	0.1	32	44	190	
11298	10	25	10	1	20	3	10	0.1	4	24	10	
11299	20	45	5	2	25	25	10	0.1	4	4	5	
11300	180	55	15	1	20	235	10	0.1	12	24	10	
11375	90	30	10	1	20	40	10	0.1	12	24	10	
11376	25	45	20	3	25	50	10	0.1	4	48	15	
11377	10	40	30	3	25	45	10	0.1	4	60	5	
11378	75	310	15	4	30	960	10	0.1	24	64	40	
11379	150	220	10	3	25	230	10	0.1	28	56	10	
11380	35	35	10	1	15	25	10	0.1	12	24	90	
11381	150	70	10	1	20	85	10	0.1	20	30	55	
11382	10	45	40	5	35	70	10	0.1	4	76	25	
11383	10	40	20	4	40	165	10	0.1	4	80	5	
11384	95	60	5	3	30	165	10	0.1	12	44	10	
11385	60	45	25	3	35	75	10	0.1	36	36	5	

APPENDIX 3

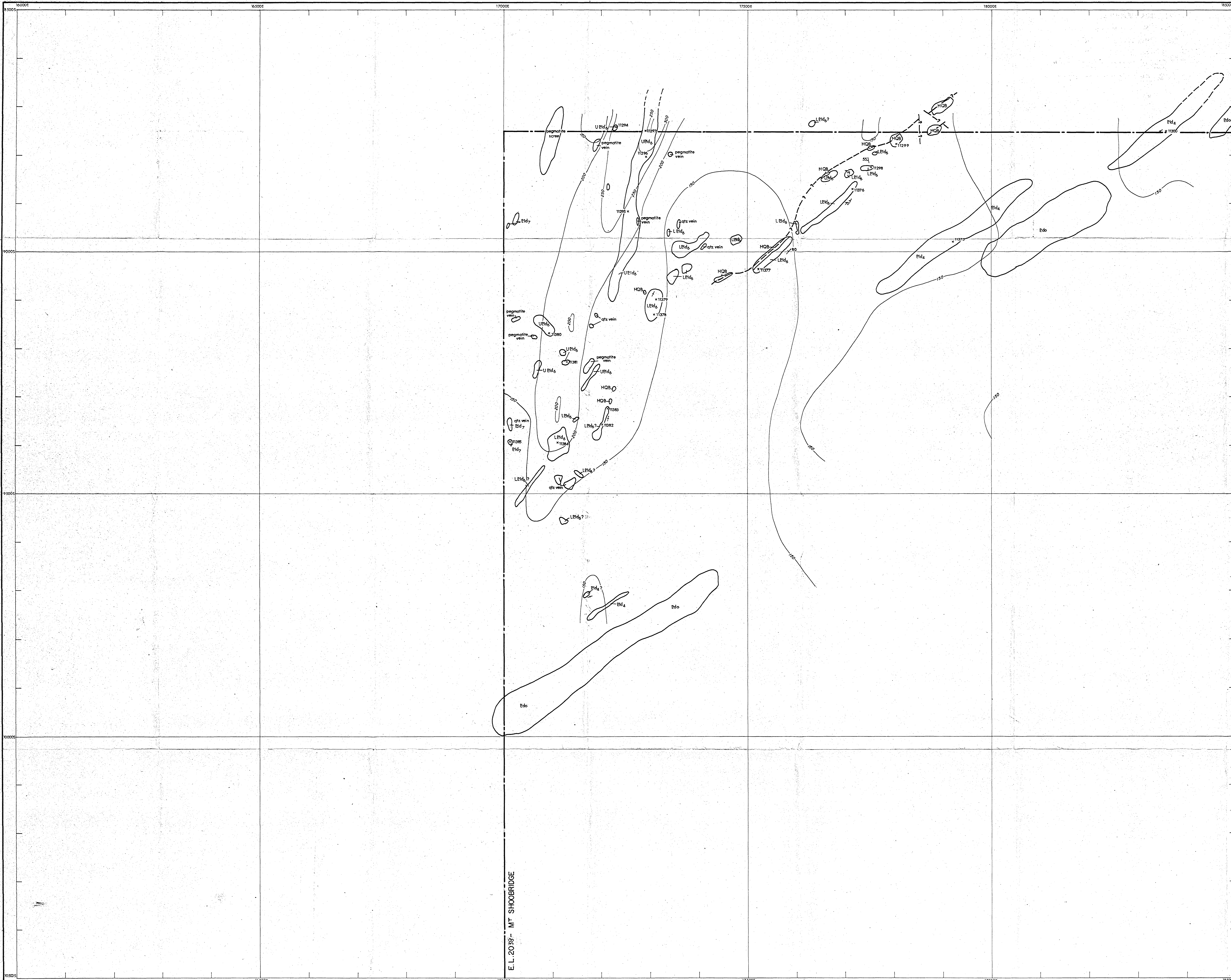


E.L. 2038 MT. SHOOBRIDGE NORTH

GRID PLAN

500m 0 1km

Scale 1 : 25000



GEOLOGICAL EXPLANATION

				Symbol	Description
LOWER PROTEROZOIC		ZAMU DOLERITE		Ꝑdo	Thoeleiitic basalt & dolerite
	SOUTH ALLIGATOR GROUP	GEROWIE TUFF		Ꝑld7 tuff	White, red, fine grained quartzite, blue black chert
		KOOLPIN FORMATION	UPPER MEMBER	UꝐld6	Grey, red grey, haematitic, graphitic knotted schist
			LOWER MEMBER	LꝐld6	Fine grained, haematitic siltstone and interbedded chert and quartzite nodules & layers
	M^T PARTRIDGE GROUP	WILDMAN SILTSTONE		Ꝑld4	Grey, fine grained micaceous graphitic schists

LEGEND

- Position accurate with Dip
- Position Approximate
- Inferred
- Unconformity
- Anticline, position Accurate with Plunge
- Syncline
- Monocline
- Plunge of minor Anticline
- Plunge of minor Syncline
- Plunge of Drag Fold
- Fault, Position Accurate with Dip
- Fault containing Mylonite
- Fault containing Fault Breccia
- Quartz-filled Fault
- Fault (D, U indicate movement)
- Normal Fault
- High-Angle Reverse Fault
- Relative Horizontal Movement
- Width of Fault in Metres
- Lineament
- Fault Zone
- Shear Zone
- Breccia
- Fault with Slickensides
- Bedding Strike, Dip not Determinable
- Measured Bedding
- Vertical Bedding
- Horizontal Bedding
- Strike & Dip of overturned Strata
- Prevailing Dip of gently folded Strata
- Prevailing Dip of strongly deformed Strata
- Generalized Strike & Dip of Undulating Strata
- Measured Joints
- Prevailing or Unmeasured Joints
- Measured Foliations
- Prevailing or Unmeasured Foliations
- Measured Clevage
- Prevailing or Unmeasured Clevage
- Clevage Strike, Dip Indeterminable
- Lineation
- Lava Flow
- Pyroclastic Flow
- HQB Haematitic quartz breccia

- Sand Ridge or Dune
- Fossil Locality, General
- Type Section
- Geological Section
- Dyke or Vein
- Gossan
- Minor Mineral Occurrence
- Unworked Deposit
- Prospect: Little or No Production
- Mine
- Open Cut or Quarry
- Alluvial Workings
- Mine, not being Worked
- Battery, Smelter, or other Treatment Plant
- Battery, Smelter, or other Treatment Plant, Not Operating
- Shaft
- Costean or Trench, showing Depth in Metres
- Open Cut or Quarry showing Pit
- Prospecting Pit showing Depth
- Sample Line c-Channel h-Chip b-Bulk
- 11375 × Grab Sample Locality
- Drill hole, showing projection in Horizontal plane & Inclination
- Vertical Drillhole showing Depth in Metres
- DD-Diamond Drill HD-Hand Drill PD Percussion Drill RD-Rotary Drill AD Auger Drill
- Dump
- Bore
- Spring, general symbol
- Tank for Water
- Earth Tank or 'Dam'
- Dam on Stream
- Sink Hole
- Waterhole
- Highway
- Road
- Vehicle Track
- Track
- Traverse Line
- Railway with Station / & Siding
- Fence
- Landing Ground
- Tenement Boundary
- Swamp, Marsh
- Escarpment

REFERENCE AUS. I.M.M. MONOGRAPH 9 PAGES 148-160

CR 82/1057

MINES ADMINISTRATION PTY. LIMITED

NORTHERN TERRITORY
M^T SHOOBRIDGE
E.L. 2038

LOWER PROTEROZOIC OUTCROP & RADIOMETRIC MAP M^T SHOOBRIDGE

Scale 1:2500
0 10 20 30 40 50 100 150m

AUTHOR: G. HASSALL
DATE: December, 1981 DWG. No. FILE No. PLATE 1 + 2.