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GIPPSLAND MINERALS

REPORT ON 10 ACRE GOLF COURSE LEASE, ZEEHAN, TASMANIA.

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J.D. CLARK

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GIPPSLAND MINERALS

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MEMORANDUM

FROM: P. O'SHEA

TO: MR. C. P. BARNES - CHIEF GEOLOGIST

SUBJECT: REPORT ON 10 ACRE GOLF COURSE LEASE - ZEEHAN, TASMANIA.

DATE: 1/12/70

The 10 acre area known as the "Golf Course Lease" was geologically mapped and sampling was carried out at a number of localities within the lease. Recommendations for future exploration are given.

Topography

Approximately two thirds of the area - in the east and south - are flat and swampy, being at an elevation of 650 feet above sea level. The terrain rises fairly sharply to a maximum altitude of approximately 825 ft. above sea level at the north-west corner peg. A NW-SE trending valley has been cut in the higher ground, along which a stream runs; this stream flows into a NE-SW trending stream which flows along the foot of the hill (see map).

Vegetation is in the form of scrub, reaching a maximum height of about 6 feet on the hillside and mainly button grass on the swamp flat. Exposure of rock is very limited on the low ground, but a number of man-made exposures occur on the hill side.

Geology

On the 1 inch to 1 mile Geological Survey of Tasmania map of the area, a NE-SW trending boundary fault between Pre-Cambrian Oonah Quartzite and Slate to the west and Cambrian Crimson Creek formation sediments to the east is shown passing through the lease area. This inferred fault approximately follows the 650 ft. form-line on the lease map.

Only the geology to the west of the proposed boundary fault has been elucidated in any detail due to poor exposure on the low lying ground.

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Oonah Quartzite and Slate Series

To the west of the proposed boundary fault, slates, shales, hard siltstones and quartzites occur, with interbedded spilite recorded in Adit No. 1 (see map). These sediments and associated volcanics are considered to belong to the Pre-Cambrian Oonah Quartzite and Slate Series.

The succession as displayed in the lease area, is one of grey-buff to dark grey slates, shales, siltstones and minor grey quartzites, with interbedded black slates and weathered spilite in the upper part of the series.

Weathering: the spilite has only been identified in Adit No. 1 where it is very weathered, and represented only by a cream to yellow-brown clay. Traces of the original amygdaloidal texture can be seen in the clay.

The slates, shales and siltstones are generally completely weathered at surface, becoming moderately weathered at a depth of between 1 and 2 feet below surface level. The completely weathered sediments are represented by dull-purple stiff clays and silty clays. Where quartzite is interbedded, white quartzite fragments are intermixed with the clays in the weathered surface material.

Structure: Minor shearing is often developed at the junction between grey and black slates and shales.

A regional NE-SW strike direction was recorded in the northern part of the area for these sediments , whereas south of the valley a regional NNW-SSE strike direction was recorded. This may be due to one or both of two major factors:

1. folding
2. faulting along the valley

The geological survey map shows a fault along this valley, however, no exposure of an actual fault plane was found. Drag folding in black slates exposed along the stream course, together with the very presence of the stream, suggests that a fault may well be present along the valley, the most probable explanation is that a combination of folding and faulting has produced this strike deviation.

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Two periods of faulting can be distinguished within the area:

1. Pre-lode emplacement faulting
2. Post-lode emplacement faulting

The first period of faulting probably occurred at the time of the Tabberabberan orogony (late Devonian), and accounted for the major fault patterns being established. The proposed boundary and valley faults (if present) would belong to this period of faulting, as would the WNW-ESE fault along the line of the pyritic lode in the major open cut (see map).

Proposed Boundary Fault: No direct evidence of this proposed fault could be found in the lease area, however, it is possible that the pyritic lode in the major open cut is present in a trench just north of the Argent No. 4 shaft, in which case it could have been displaced by a NE-SW trending fault in the position of the proposed boundary fault. The proposed fault has been picked up in the Argent No. 6 shaft to the east of the lease area according to A. H. Blisset (1962).

A second, less severe period of faulting, is thought to have occurred during the Mesozoic era, and it is these faults which have displaced many of the lodes in the general area. Displacement of lodes may also have occurred due to a second period of movement along the pre-lode emplacement faults, a purely hypothetical example being the possible displacement envisaged on the pyrite lode exposed in the major open cut by the proposed boundary fault.

Folding: the sediments dip at angles varying between 30^{o} and vertical, indicating that fairly strong tight folding has occurred. Field relationships indicate that folding occurred before the first periods of faulting, probably during the Tabberabberan orogeny.

Mineralization

Mineralization in the lease area has occurred along fault planes produced by the first period of faulting. It would appear that a certain amount of replacement

of country rock by mineral rich fluids has occurred in the pyritic lode in the major open-cut. Here, undisputed pyritic lode material passes into massive grey siltstone in which pyrite is abundantly disseminated.

True thicknesses of the pyrite lode and the siderite-pyrite lode exposed in the major open-cut cannot be measured as the lodes have been worked out in the cut; however, an approximate figure of between 8 to 10 ft. may be given for each lode. The two lodes in the open cut dip towards each other and may fuse into the same lode at depth.

Apart from these two lodes and the possible continuation of the pyrite lode just to the north of the Argent No. 4 shaft, the other signs of mineralization in the lease area are some traces of pyritic lode material in the open-cut to the immediate NE of the major open cut (probably a worked-out pyrite lode) and some pyrite veining present in Adit No. 1 and Adit No. 2.

Siderite-Pyrite Lode: The siderite-pyrite lode consists predominantly of massive siderite with varying amounts of galena, sphalerite and pyrite disseminated and in the form of thin veins. The same mineralogy is seen in the lode exposed in the open cut to the immediate west, which is assumed to be the same lode. An E-W trending (Mesozoic ?) fault has been postulated to account for the displacement of this lode between the two exposures (see map). In both exposures, the lode is seen to dip NE at between 60° and 65°.

Pyrite Lode: The pyrite lode exposed in the major open cut has mostly been worked out at surface; however, it is seen to consist of veins of pyrite and massive pyritic siltstone (possibly a replacement product), with some massive siderite present in the walls of the cut close to the siderite-pyrite lode.

It is possible that this lode (and also the siderite-pyrite lode) has been worked for galena, as some traces of this mineral are still present in the siderite. The lode dips SW at 55° as seen at outcrop.

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Pyrite mineralization in No. 1 Adit appears to be along minor shears at a black slate-grey slate and quartzite contact. In Adit No. 2 pyrite mineralization is encountered in association with quartz veining in a shear zone, approximately 10 ft. wide in black slates. This shear zone is encountered just out of the lease area and a winze has been sunk to an unknown depth on the shear zone. Taking into account the dip of the adjacent sediments it is possible that this zone at depth may be located just inside the lease area; however, to its proximity to the boundary of the lease area and the minimal signs of mineralization, it is not considered that drilling to intersect this zone at depth is warranted.

It is probable that the lodes exposed in the major open-cut have been worked at depth from the Argent No. 4 shaft; however, no records of the shaft have been located. An examination of the mullock heap from this shaft indicates that interbanded grey and black slates with rare quartzite bands were penetrated by the shaft, and sideritic lode material at the top of the pile suggests that the shaft may have finished on a lode. According to Mr. D. Dunkley, the shaft was sunk to about 180 ft. below surface level.

Sampling Procedures:

Chip samples across all exposures of mineralization were taken, in general each sample being taken over a five feet width.

Chip Sample No.	Location	Width Taken over
Z1	Adit No. 1	6 ft.
Z2	Adit No. 2	5 ft.
Z3	Major open cut-pyrite lode	5 ft.
Z4	Major open cut - siderite-pyrite lode	5 ft.
Z5	Major open cut - siderite-pyrite lode	6 ft.
Z6	Major open cut - pyrite lode	10 ft.
Z7	Adjacent open cut-siderite pyrite lode	9 ft.
Z8	Adjacent open cut - siderite pyrite lode	9 ft.
Z9	Adit No. 1	5 ft.
Z10	Adit No. 2	5 ft.

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The reason for taking samples over a greater width than 5 feet (e.g. 9 ft.) is that some of the exposures were very poor and a representative sample could only be collected over the greater width. Sampling across the complete width of the lodes in the major open cut could not be carried out due to the fact that the majority of the lode material has been worked out in the cut.

Recommendations

(a) Major Open Cut

Further investigation of the lodes exposed in the major open cut is recommended. In this context it is recommended that a bore hole be sited in the position shows on the 20 ft. to 1 inch detailed geological map of the area around the major open-cut. The direction of the hole should be 7° E of magnetic North, at an inclination of 83° from the horizontal. If the pyritic lode exposed in the major open-cut extends at depth, this hole should intersect it at between 190 and 200 feet below surface level (assuming a constant dip for the lode of 67°), i.e. below the level at which a drive from the base of the Argent No. 4 shaft might reasonably be expected to intersect the lode.

(b) Proposed Boundary Fault

It may be advisable to site a hole in order to test the presence of the proposed boundary fault which, if present, would be a likely channel for mineralization. A hole put down a few feet from the hole recommended to test the pyrite lode, in an easterly direction (100° E of magnetic north) at an inclination of about 40° would intersect any major fault present in the vicinity of the proposed boundary fault. It may also intersect the possible continuation of the pyrite lode, which may be present in the trench just north of the Argent No. 4 shaft. Accurate siting of such a hole is difficult as the structures to be investigated are hypothetical.

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Depending on the outcome of the above recommendations, further boreholes could be sited at a later date.

P. J. O'SHEA

Enc.

1. Geological Map 10 Acre Golf Course Lease
   Scale - 60' to 1"

2. Enlarged Geological map of lode development
   Scale 20' to 1"

2A. SECTION AA' & SECTION BB'

3. Enlarged Geological map of adits
   Scale 20' to 1"

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825' 800' 775' 750' 725' 700' 675' 650'

adit partial covered in.

PROPOSED BOUNDARY FAULT

STREAM

open cut along lode

old battery

argent No. 4 shaft.

mullock heap

golf course

adit No 1

adit No 2

hut

gossan outcrop

TRACK

golf course

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MAGNETIC NORTH

0 60 120 180

Scale in Feet

5 cm

LEGEND

PreCambrian Oonan Series

- grey to dark grey slates shales and quartzites
- black to dark grey slates
- grey slates with interbedded pale brown-white spilites

- pyrite lode material.
- siderite - galena - sphalerite - pyrite lode
- geological boundary
- fault
- dip and strike of major lineation
- swamp
- winze
- underground workings
- open - cut.
- form lines

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10 ACRE GOLF COURSE LEASE ZEEHAN – TASMANIA.	
DRAWN	P. J. O'SHEA
TRACED	N. HANSON.
CHECKED	Encl 1

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750'
725'
700'
675'
650'
A
B
A'
B'
70°
sample z5
sample z6
sample z3
sample z4
sample z8
sample z7
proposed bore-hole

0 20 40 60
Scale in feet.

MAGNETIC NORTH

LEGEND

- buff-grey and grey to dark grey slates and shales.
- black slates and shales
- siderite - quartz - pyrite lode
- siderite - galena - sphalerite lode, minor pyrite
- 75° dip and strike
- dip and strike of fault plane
- open-cut
- pit
- 20° fold axis showing, degree of plunge.
- syncline axis
- anticline axis

5 cm

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10 ACRE GOLF COURSE LEASE

ZEEHAN - TASMANIA

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CHECKED	Encl 2.

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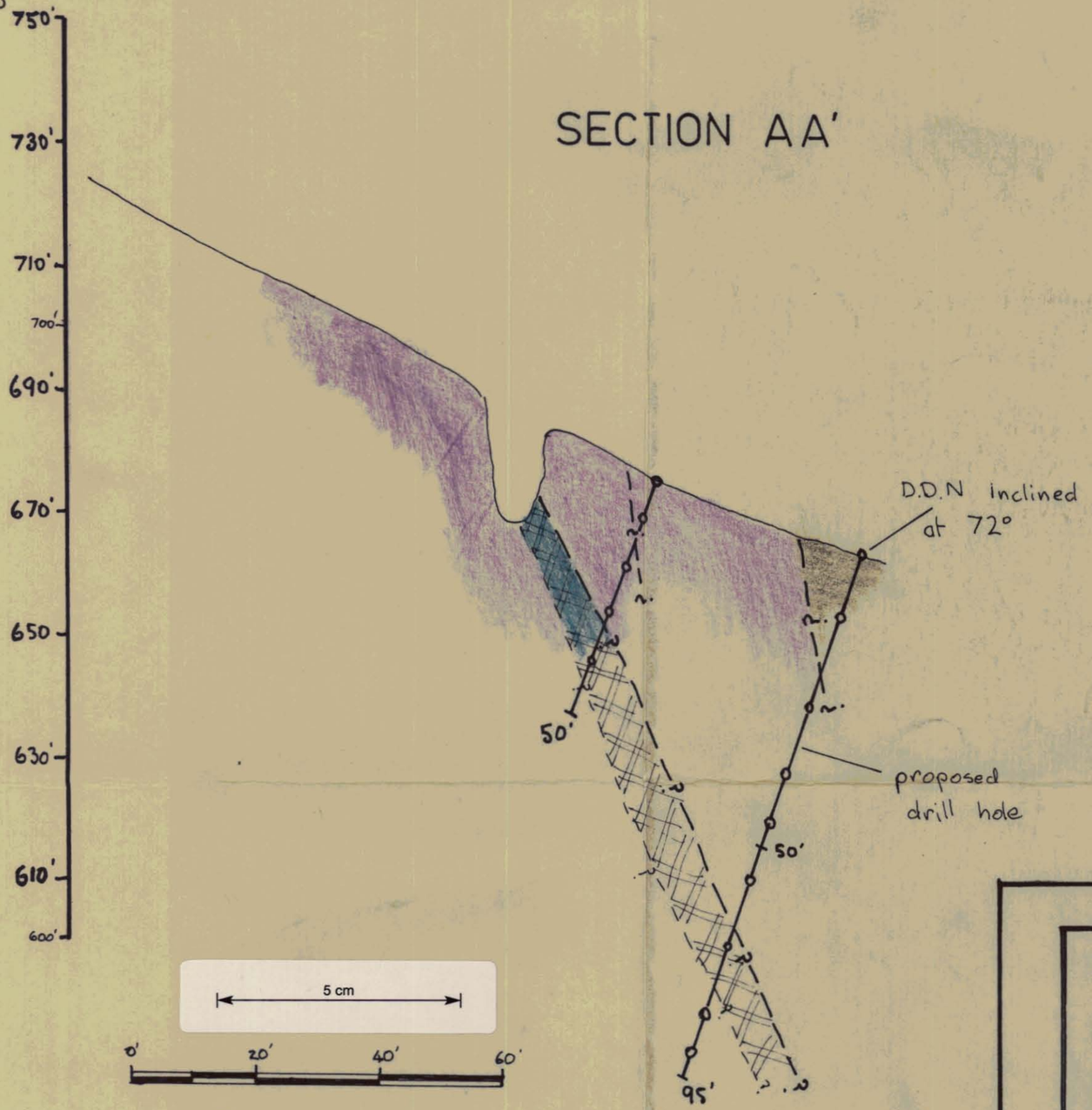
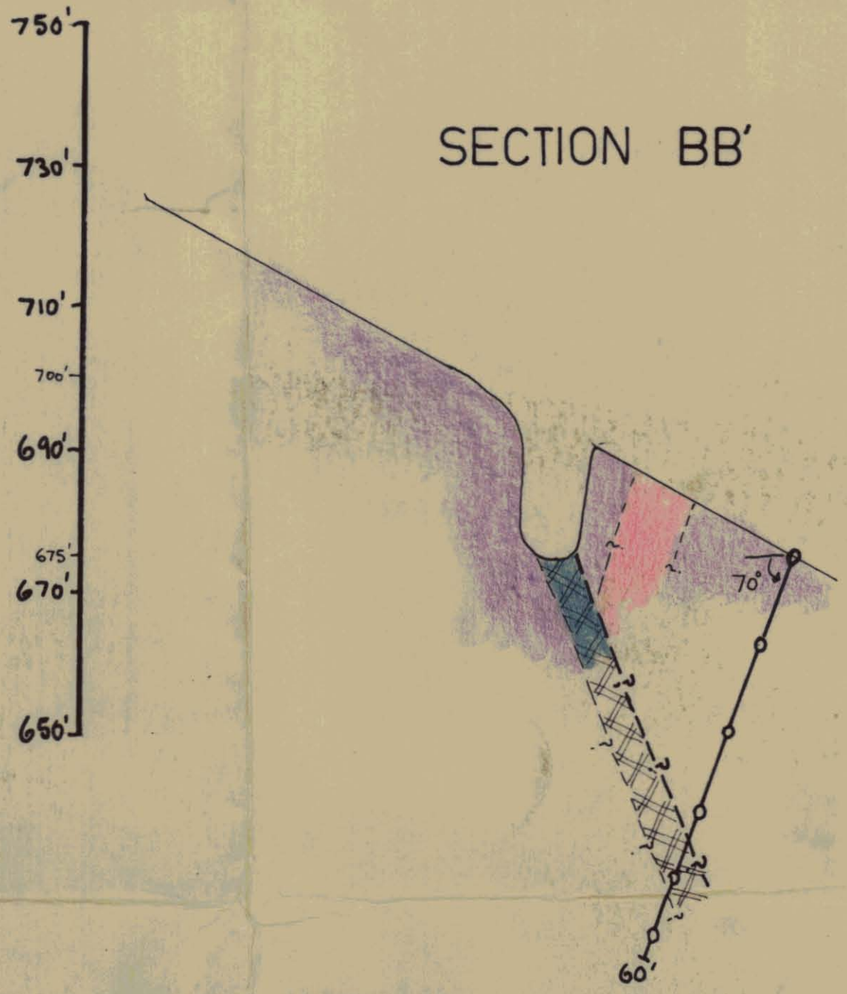
SECTION AA'



SECTION BB'



buff grey and grey to dark grey slates and shales

black slates and shales

siderite - quartz - pyrite lode

siderite - galena - sphalerite lode, minor pyrite.

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10 ACRE GOLF COURSE LEASE

ZEEHAN - TASMANIA.

DRAWN	P. J. O'SHEA
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	Encl 2A

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sample z1

sample z9

fault zone

sample z10

sample z2

hut

725'

700'

675'

650'

MAGNETIC NORTH

0 20 40 60

Scale in feet

5 cm

LEGEND

- grey to dark shales, slates and quartzites
- black to dark grey slates.
- grey slates with interbedded spilites.
- pyritic lode material.
- 60° dip and strike
- ?---? fault
- approximate geological boundary
- chip sample
- winze

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10 ACRE GOLF COURSE LEASE

ZEEHAN - TASMANIA.

DRAWN.	P. J. O'SHEA
TRACED.	N. HANSON
CHECKED.	Encl. 3