EXPLORATION LICENCE 6644, COPPERFIELD CREEK, NORTHERN TERRITORY.


Prepared for Rosequartz Mining N.L.,

by

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OPEN FILE
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1. INTRODUCTION.

Exploration Licence 6644 is situated immediately southwest of the Stuart Highway, ten kilometres south of Pine Creek township (Figure 1). It consists of seven graticular blocks, with a total area of 23 square kilometres, and lies in the Pine Creek 1:50,000 sheet area; it is part of the Bonrook pastoral lease (Figures 2 & 3).

The Licence was granted to Rosequartz Mining N.L. for a three year term commencing 7th. January 1990.

Topographically the area consists mainly of gently undulating country, interspersed with fairly extensive alluvial flats along the drainages, and with occasional low hills. Vegetation is open monsoonal woodlands typical of the region. The entire area is accessible by four wheel drive vehicles in the dry season.

This report describes exploration work carried out during the first year of the licence.
TENEMENT MAP

scale 1 : 50,000

Figure 2.
2. REGIONAL AND LOCAL GEOLOGY AND MINERALISATION.

The area is in the Cullen Mineral Field, towards the southwestern margin of the Early Proterozoic Pine Creek Geosyncline (Stuart-Smith & Needham 1984). More specifically it lies at the southern extremity of the so-called "Pine Creek Embayment", a complex roof pendant of metasediments enclosed by various facies of the Cullen Granite Batholith. The general geology is shown in Figure 4, which reproduces part of the published 1:500,000 Geology of the Pine Creek Geosyncline (BMR 1984).

Bedrock throughout the Licence area is presumed to be Burrell Creek Formation, a turbidite sequence at the top of the local Early Proterozoic succession. Exposure is generally very poor and is restricted to scattered low outcrops on the crests of low rises, and along the creek beds, with occasional prominent outcrops of more resistant silicified and/or quartz veined material marking fault zones and areas of stronger quartz injection. Lithologies observed include highly cleaved slates, and less cleaved metasiltstones, metagreywackes and quartz grits. Minor to major fracturing, alteration and quartz veining are almost ubiquitous. Superficial deposits include very widespread eluvial to colluvial gravels which form a shallow mantle over the undulating country, and spreads of black clay soils and alluvium, from 100m to 300m wide, along the seasonally flooded drainage courses.

The metasediments are folded into a series of northwest to north-northwest trending moderately tight folds which mainly plunge at low to moderate angles to the northwest. These folds are dislocated by a younger series of faults trending between north and north-northwest (Figure 7).

The Pine Creek Embayment is strongly mineralised, and contains a wide variety of hydrothermal deposits of tin, gold, copper and silver/lead/zinc. However the only known deposits to be of significant present or potential economic value are gold at Pine Creek and Union Reefs, and tin at Mount Wells. The present area of interest contains a number of apparently sub-economic mineral occurrences, including copper localised by the late fault zones, lead on the "Ironwood North" anticline, and gold on the "Woollybutt" anticline (Figure 5). It is part of the Copperfield Creek belt of small copper shows.
CAINOZOIC  Cz  soils & alluvium.

MEZOZOIC  K  Petrel Formation.

LOWER  Elj  Jindare Formation.
PALAEOZOIC  €0  Jinduckin Formation.

LATE  Pts  Stray Creek Sandstone.
PROTEROZOIC  Ptd  Depot Creek Sandstone.

EARLY  Pgc  Cullen Granite.
PROTEROZOIC  Pep  Plum Tree Volcanics.
Pdz  Zamu Dolerite.
Pfb  Burrell Creek Formation.
Pso  Mount Bonnie Formation.
Psg  Gerowie Tuff.
Psk  Koolpin Formation.

REGIONAL GEOLOGY

scale 1 : 500,000

Figure 4.
3. PREVIOUS EXPLORATION WORK.

Between 1986 and 1989 the area was explored for gold by Renison Ltd. under Exploration Licence 4725. Work completed included geological mapping, rock chip sampling, trenching and RAB, percussion and diamond drilling. Total expenditures amounted to $282,000 (Pine Creek Goldfields Exploration P.L., 1989). This work delineated bodies of low grade gold mineralisation associated with quartz/pyrite/arsenopyrite mineralisation along the hinge line of the "Woolybutt" anticline, but no commercial deposits were discovered.

Geological mapping of the EL as a whole amounted to little more than confirmation of the 1:100,000 BMR map. Three main anticlinal trends were identified, and from the northeast designated the Bloodwood, Ironwood/Woolybutt and Paperbark anticlines (Figure 5). Nine rock chip samples were collected from the Bloodwood anticline, sixty three from the Ironwood anticline, and none from the Paperbark structure because of poor outcrop. Previous sampling had already shown the Woolybutt anticline to be significantly mineralised (Vann, 1987). Apparently little or no sampling was done away from the identified anticlinal trends.

Detailed follow up work was confined to the Woolybutt trend and covered approximately 1300 metres length of the structure. Detailed mapping, trenching at average intervals of 100 metres, and shallow RAB drilling on 50m spaced cross sections in the southeast part of the zone, were used to define targets for deeper test drilling. The deep drilling comprised 313m of percussion drilling (Crawl-Air CM351 machine) in eleven holes, and 829m of diamond drilling in ten holes.

The deep drilling was carried out on two targets. In the northwest, mineralisation at Zone 6C was found to be limited to a five metre thick section of strata on the western fold limb; the best intersection was 6m @ 0.62 g/t Au. In the southeast, mineralisation at Zone 2B occurred over a length of some +100m across the fold axis, plunging gently northwest. Drill cross sections were spaced at average intervals of about 20m along strike. The best intersections were 12m @ 1.45, and 10m @ 1.06 g/t Au.
4. EXPLORATION WORK COMPLETED IN 1990.

During the first year of the Licence, work carried out included a detailed review and collation of the results of previous exploration, preparation of a new photogeological interpretive map, and a field reconnaissance and check of air photo features. This work was intended to provide a basis for devising the most effective program of exploration for the 1991 season.

A summary of previous exploration is compiled in Figure 6, and the photogeological map is shown in Figure 7.

The photogeological study confirmed the presence of a major northwest trending fold structure corresponding to the Ironwood/Woollybutt anticline identified by previous workers. However the supposed Bloodwood and Paperbark anticlines of Goldfields Exploration are not evident on the aerial photography, and indeed it appears more likely that synclinal folds occur in these positions.

Furthermore, the supposed "fault A" does not appear on the photography although a number of previously unidentified faults or major fractures are evident.

Expenditures incurred in carrying out the first years exploration work were as follows:-

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<tr>
<th>Contracting geologist</th>
<th>$1750</th>
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<tr>
<td>Transport</td>
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<td>Accommodation</td>
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<td>Air photos</td>
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<td>Overheads</td>
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</table>

**TOTAL** $2630
5. CONCLUSIONS AND RECOMMENDATIONS.

1. Past work, including drilling, in the south of the Woollybutt anticline has demonstrated that the mineralisation there is sub-economic, amounting at best to perhaps some 100,000 to 200,000 tonnes averaging less than 1 g/t Au.

2. Exploration of the remainder of the Woollybutt trend is incomplete and less detailed, but where tested the mineralisation is apparently poorer than in the south.

3. Exploration of the other supposed anticlinal trends, and the remainder the EL area, has produced negative results but is inconclusive for the following reasons:

   * the sampling was restricted to the supposed anticlinal trends which are often ill defined, and possibly misidentified, because of poor outcrop.

   * evidence of quartz veining and alteration is not restricted to the identified anticlines.

   * the only sampling done was rock chip sampling, which can be considered as rather hit or miss under the poor outcrop conditions.

4. It is concluded that some grass roots potential for significant gold mineralisation concealed beneath shallow eluvial/colluvial cover remains untested.

5. It is recommended that this potential be tested by a program of detailed drainage geochemical sampling, with an average sample density of about five samples per square kilometre. Samples should consist of 5kg of minus 10 mesh material, and should be analysed for gold by cyanide leach, and for arsenic by XRF.
6. The cost of executing the recommended program is estimated to be as follows:

- contracting geologist: $2,800
- field assistant: $900
- vehicle & fuel: $500
- accommodation: $900
- survey consumables: $50
- analytical work: $3,000
- report preparation: $50
- overheads: $1,200

**TOTAL:** $9,400.
REFERENCES


trench  area covered by RAB drilling
• diamond or deep percussion drillhole

WOOLLYBUTT ANTICLINE PREVIOUS EXPLORATION
(after Goldfields Exploration 1987-89)
scale 1 : 5,000

Figure 6.
Qa  alluvium & black clay soils.
Cz  soils, eluvium & colluvium.
Pfb Burrell Creek Formation.

---  creek.
---  track.
  ---  trench.
○   excavation.

...... air photo bedding trends.
---  linear air photo trends indicating faults, major fractures & zones of silicification & brecciation.

PHOTOGEOLOGICAL MAP
scale 1 : 25,000

Figure 7.