HOMESTAKE GOLD OF AUSTRALIA LIMITED  
(A.C.N. 008 143 137)  

MT. PORTER - ERL 116  
ANNUAL REPORT TO 12th SEPTEMBER, 1998  

Distribution:  
1. Homestake - Townsville  
2. Homestake - Perth  
3. Department Mines & Energy - NT  
4. RGC Exploration - Perth  
   Technical Report No. 669  
   Author: P. Rea  
   Date: November, 1998  
   1:250,000 Sheet - Pine Creek SD52-8  
   1:100,000 Sheet - Pine Creek 5270
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SUMMARY

ERL 116 lies approximately 25km north of Pine Creek township and is easily accessed by well formed gravel road for most of the year, except following heavy rainfalls.

During the 1998 field season a review of recent Mt. Porter drilling was conducted with the aim of establishing new drilling targets. However the structural complexity and the sharp attenuation of the gold mineralisation between close spaced drill sections indicates that there is little scope for immediate expansion of the Mt. Porter resource.

Rehabilitation of drill pads and site access was completed and reviewed by the Mines Department with approval.
1.0 INTRODUCTION

1.1 Access and Physiography

Exploration Retention License (ERL) 116 lies approximately 25km by road north of Pine Creek township. Pine Creek is situated 230km south of Darwin along the Stuart Highway (Figure 1). From Pine Creek travelling 3km along the Kakadu Highway then turning north onto the well made Francis Creek road and covering 25km leads directly to the project area. All roads in the area are subject to closure or become impassable due to heavy seasonal rains between November and March.

Within the project area vehicle access is heavily restricted by steep sided hills and deeply incised creeks. Following the wet season long grass, 1-2m high, restricts both vehicle and pedestrian traffic away from the main road.

1.2 Tenure

ERL 116, consisting of 757 hectares, was granted to Renison Goldfields on 12th September, 1990. It was renewed on 28th November, 1995 for a period of five years ending on the 11th September, 2000. Homestake Gold of Australia Limited (HGAL) became a joint venture partner in the project on 15th March, 1996 and may earn 60% from Renison by spending $2,350,000 by 14th March, 2001.

The tenement abuts EL 9265 Mt. Porter South and EL 8313 Mt. Francis South (Figure 2).

2.0 PREVIOUS EXPLORATION AND MINING

Previous mining activity in the area has been restricted to the iron deposits to the northeast at Francis Creek. According to Ahmad et al (1993) these were discovered in 1962 and mined by the Francis Creek Iron Mining Corporation Pty Ltd between 1966-1974. A total of eight million tonnes grading 59% Fe were produced, the bulk (6.1 million tonnes) from the Helene No. 6 and 7 lodes within AN389. The iron ore occurred as a series of massive hematite lodes conformable within tight to open folded pyritic, carbonaceous shales near the base of the Wildman Siltstone. The ore consists of massive and micaceous hematite with included shale and quartz grains in varying proportions. Ahmad et al (1993) postulate that the ore developed by oxidation of a pyritic horizon though no drill holes have penetrated this unit in the primary zone to confirm this interpretation.

Homestake Gold of Australia Limited became a joint venture partner in the project on 15th March 1996. Since then $786,648 has been spent on exploration, most of which has been on drilling the Mt. Porter resource.

The 1998 exploration program is discussed below.
3.0 GEOLOGICAL SETTING

ERL 116 covers an antiformal portion of the Koolpin Formation which consists of nodular cherts and carbonaceous shales, and is intruded by metadolerite dykes. All units are part of the early Proterozoic Pine Creek Geosyncline succession. Also present to the south of the tenement is the later, though still early Proterozoic, intrusive Allamber Springs Granite, which is part of the Cullen Batholith. The lithologies within ERL 116 are tightly folded with a high degree of structural complexity.

The metasediments to the east largely belong to Wildman Siltstone and Mundogie Sandstone of the Mount Partridge Group. These unconformably overlie the Masson Formation of the Namoona Group in the southeast corner of AN389 and are unconformably (?, weak warping) overlain by the Koolpin Formation and Gerowie Tuff of the South Alligator Group along the western margin of AN389 and the northwestern corner of EL8313. Metadolerite sills of the syn-sedimentary Zamu Dolerite intrude the Koolpin Formation and the contact between the Koolpin Formation and underlying Wildman Siltstone.

According to the published 1:100,000 geological map of the area (Pine Creek) the Masson Formation consists mainly of carbonaceous phyllite, slate, silty phyllite and sandy siltstone with minor quartzite and massive ironstone and rate tremolite marble. The Mundogie Sandstone is comprised of coarse pebbly feldspathic quartzite, arkose and micaceous quartzite with minor chert and pebble conglomerate. The Wildman Siltstone is divisible into two units. The upper part consists dominantly of siltstone, phyllite, carbonaceous phyllite and minor laminated coarse sandstone whereas the lower part includes mainly pyritic carbonaceous phyllite, siltstone and pyritic carbonaceous shale breccia (massive hematite ironstone lenses on the surface). In the South Alligator Group, the Koolpin Formation consists mainly of ferruginous (pyritic and pyrrhotitic) and carbonaceous phyllite with horizons of laminated, lensoidal and nodular chert along with minor dolomite and marl. The Gerowie Tuff is comprised of grey siltstone interlayered with crystal tuff, lithic tuff and black cherty tuff as well as minor laminated chert.

The Zamu Dolerite sills are composed of chloritised quartz dolerite and amphibolite.

Adjacent to the contact with the sediment and dolerites, the Allamber Springs Granite is composed mostly of pink, coarse, equigranular and porphyritic, biotite granite while further from the contact, in the southern half of EL8313, pink-green coarse porphyritic hornblende-biotite granite and pink-grey fine to medium equigranular leucogranite and alkali feldspar granite sequentially dominate. Greisen stockwork is extensively developed within a kilometre or two of the contact.

The metasediments and metadolerite sills are in upright folds which plunge at a shallow angle to the north-northwest. Folding was accompanied by lower greenschist regional metamorphism. The folding and the regional
metamorphism are overprinted by the effects of granite intrusion. The granite contact truncates the folded sequence in a passive manner and albite-epidote hornfels and hornblende hornfels facies contact metamorphism progressively overprints the regional metamorphic assemblages closer to the contact. A distinctive feature of the contact metamorphism is the development of fine white andalusite (chiastolite) needles in the more aluminous black carbonaceous meta-mudstones of the Masson Formation, Wildman Siltstone and Koolpin Formation.

Flat-lying Mesozoic sandstone, siltstone and conglomerate unconformably overlie all of the early Proterozoic rocks in the area. Several remnant outliers of these rocks are present in the Francis Creek area and one of these is within the eastern part of AN389. They form flat topped mesa-like landforms above an elevation of 240m ASL. According to Admad et al (1993) these sediments were originally mapped by Skwarko (1966) as Mullaman Beds, but were interpreted by Hughes (1978) as belonging to the Petrel Formation of Jurassic to Lower Cretaceous age and the Darwin Member of the Bathurst Island Formation of Lower to Upper Cretaceous age.

Finally Cainozoic alluvial and colluvial sand, silt clay and gravel are deposited across the area and as pointed out by Ahmad et al (1993) these are separated from the basement rocks by residual laterite in many areas.

Four main styles of gold mineralisation are known to occur through the region. These occur exclusively within the metasediments and metadolerites of the Pine Creek Geosyncline sequence and almost without exception above the stratigraphic level of the middle of the Koolpin Formation in the South Alligator Group.

Of prime interest is gold mineralisation of the Cosmo-Lowley/Golden Dyke style which is hosted by silicate-sulphide facies, cherty iron formations in the middle and upper levels of the Koolpin Formation. At the Golden Dyke Mine (and adjacent smaller deposits), 35km west of Francis Creek, the mineralisation occurs as a stratiform lens on the western side of the Golden Dyke Dome. At the Cosmo-Howley Mine, 50km west of Francis Creek, similar stratiform mineralisation occurs on the limbs and the crest of the Cosmo Anticline where it has been complicated by, and possibly remobilised and upgraded by, strong axial plane faulting and nearby granite intrusion. To date, no mineralisation of this type has been discovered below the iron formations in the Middle Koolpin Formation.

Of lesser importance in the Francis Creek titles, but of major importance elsewhere in the region, is gold mineralisation in sheeted and stockwork and saddle quartz-pyrite vein systems. This type of mineralisation is generally developed along the crest and limbs of major regional anticlines and is almost exclusively hosted by tuffaceous greywacke-siltstone sequences above the Koolpin Formation. Significant examples of stockwork-type gold mineralisation (as this type is collectively described) in the region include the Enterprise Mine at Pine Creek (1.3 million ounces of production and
resources), the Batman deposit at Mt. Todd further to the south (2-3 million ounces of reserves and resources), and the Union Reef, Brocks Creek, Rustlers Roost, Goodall and Woolwonga deposits. Lesser deposits include Chinese Howley, Big Howley, Spring Hill, Yam Creek, Fountain Head and Western Arm. Stratiform gold mineralisation hosted by pyritic chert and banded iron formation in the Gerowie Tuff is known at the Zapopan Mine and this may also be part of this group.

Stratiform poly-metallic base metal mineralisation (with associated gold) occurs at Mt. Bonnie and Iron Blow, 30km west of Francis Creek and at Fenton (unpublished). In both cases it is hosted by the lower Mt. Bonnie Formation.

Because of the stratigraphic position of ERL116 and the other Francis Creek titles, they are prospective for mineralisation of the Cosmo-Howley/Golden Dyke-type, especially in the Middle and Upper Koolpin Formation.

4.0 WORK COMPLETED

During the 1998 field season a review of recent Mt. Porter drilling was conducted with the aim of establishing new drilling targets. However the structural complexity and the sharp attenuation of the gold mineralisation between close spaced drill sections indicates that there is little scope for immediate expansion of the Mt. Porter resource. No drilling or other major field exploration was conducted during the year.

Rehabilitation of all drill pads and site access was completed with contouring and reseeding with native trees and grasses. The work was reviewed by the Mines Department staff and was met with a high degree of approval. Site examination in August showed that the surface of the earth works was settling well and should be readily colonized by vegetation during the wet season.

5.0 RESULTS AND DISCUSSION

Review of the Mt. Porter resource was not positive, and indicated that the mineralisation was structurally complex and had little scope for further drill testing. Possible scope exists for some deeper drilling to the north, although the deeper holes already drilled have not been promising. The Mt. Porter resource, however, still represents one of the best exposures of gold mineralisation within the Koolpin Formation outside of the Cosmo-Howley Mine.

Rehabilitation was completed and received Mines Department approval. The progress of revegetation will be monitored in the following year.
6.0 1998 EXPENDITURE - 12 MONTHS TO AUGUST, 1998

Salaries and Wages $2,350
Other Consultants and Technical 8,416
Assaying/Analysis 1,233
Field and Camp 432
Surface Works 660
Environmental/Reclamation 7,392
Travel, Accommodation and Meals 1,841
Vehicles and Field Equipment 216
Legal Costs 54
Support Activities 539
TOTAL $23,133

7.0 1999 WORK PROGRAM

At this point in time with the low gold price no immediate drill programmes are proposed for the 1998-1999 year. Homestake is currently considering joint venturing out the project, although will probably consider a small program to evaluate the northern strike extension of the mineralisation.

Salaries and Wages $5,000
Other Consultants and Technical 3,000
Assaying/Analysis 1,000
Field and Camp 1,000
Environmental/Reclamation 1,000
Travel, Accommodation and Meals 1,000
Vehicles and Field Equipment 2,000
Overheads 1,000
TOTAL $15,000

8.0 REFERENCES