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BILLITON AUSTRALIA  
THE METALS DIVISION OF THE  
SHELL COMPANY OF AUSTRALIA LIMITED

WANDIE CREEK - EL 2708  
ANNUAL REPORT FOR THE PERIOD  
08/09/88 TO 07/09/89

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### SUMMARY

The Wandie Creek Exploration Licence (EL 2708) is included as part of the Pine Creek Joint Venture (JV) between Denehurst Limited and The Shell Company of Australia Limited (operators and managers). Initially, EL 2708 was granted to Territory Mining Pty Ltd on 8/9/87 for a period of four (4) years. However, Denehurst Ltd acquired the tenement in early 1988.

The tenement is situated approximately 35 km east of Pine Creek and originally covered twelve (12) blocks. A 50% reduction was made on the second anniversary of the licence.

The Early Proterozoic Burrell Creek Formation is the dominant rock type in the area with a strongly developed west to northwest-striking regional trend. This trend represents the axial-plane cleavage direction of the  $F_1$  folding event which is dominant throughout the area. Three syn- to post-orogenic granitic plutons have intruded the Burrell Creek Formation and caused widespread contact metamorphism to the albite-epidote hornfels facies.

BCL gold results from stream sediment sampling over the tenement were generally low with only one discrete anomaly defined. In addition, -80# results defined a copper and tungsten anomaly and two tin anomalies. Follow up work is proposed over the copper, tungsten and tin anomalies. Gold results from regional soil traverses over the low-order gold anomalies were low (av. < 0.01 ppb Au) and thus have downgraded the gold potential of the area.

Reconnaissance mapping and bedrock sampling in the southeast corner of the tenement lead to the discovery of a narrow unit of banded, quartz-haematite rock which contained anomalous copper, lead, zinc, silver tungsten, tin and arsenic. This unit, however holds only very limited tonnage potential with a strike length of approximately 100 metres and true width of 1-5 metres.

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## C O N T E N T S

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## 1. INTRODUCTION

The Wandie Creek Exploration Licence (EL 2708) was initially granted to Territory Mining Pty Ltd on 08/09/87 for a period of four (4) years. Denehurst Ltd subsequently acquired the tenement and included it as part of the Pine Creek Joint Venture (JV) with The Shell Company of Australia Limited on the 30/06/89. Billiton Australia, The Metals Division of The Shell Company of Australia Limited are managers and operators of the JV.

The tenement is located approximately 35 km east of Pine Creek and on granting covered twelve (12) blocks or approximately 39 km<sup>2</sup> (Figure 1). A fifty percent reduction of the tenement was made on the 08/08/89 (Figure 2).

Access to the tenement is possible via two dirt tracks from Pine Creek. Unfortunately, access within the tenement is restricted to one 4WD track along the western boundary of the licence area. Off-road driving is possible throughout the remaining area but is slow and restricted due to steep topography.

This report encompasses a brief description of the physiographic setting, geology and mineralisation within the tenement, accompanied with a review of work completed, results and conclusions.

## 2. PHYSIOGRAPHY

Two physiographic settings have been recognised within the area: (i) Lowlands; and (ii) Dissected Foothills (Stuart-Smith *et al.*, 1988). The Lowlands are developed in peneplaned and deeply weathered sedimentary rocks of the Burrell Creek Formation and granites.

The ground surface consists of shallow gravelly loams or skeletal soils with eucalypt woodlands of tall deciduous, mixed or scrubby open forest, and grasses (Stuart-Smith *et al.*, 1988). This type of setting is extensively developed in the northwest corner of the tenement and covers approximately ten per cent of the licence area.

The Dissected Foothills covers approximately 90% of the tenement and is characterised by steep resistant strike ridges and hills of metasediments,

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bouldery granite hills and undulating rubble-strewn rises (Stuart-Smith *et al.*, 1988). Vegetation is mostly tall to stunted semi-deciduous eucalypt woodland and tall to mid-height perennial grasses (Stuart-Smith *et al.*, 1988).

### 3. GEOLOGY & MINERALISATION

The tenement is underlain dominantly by Early Proterozoic Burrell Creek Formation consisting of interbedded, phyllite, slate, siltstone, feldspathic greywacke, volcanolithic pebble conglomerate, dacatic volcanics and rare banded ironstone. Bedding within the area is parallel to the regional trend which strikes between west and northwest. Beds dip between 40-80° to the north and south.

Three syn- to post-orogenic granitic intrusions crop out within the tenement area. Two of these are members of the Wandie Granite which have been described as pink medium equigranular biotite granites. They are exposed on the eastern and western boundaries of the tenement, respectively.

The third pluton is a member of the McCarthy's Granite and is exposed in the mid-southern quarter of the area. During emplacement the pluton was fractionated into a pink, green coarse porphyritic hornblende-biotite granite and pink coarse porphyritic biotite leucogranite.

Contact metamorphism of country rock to hornblende hornfels facies adjacent to the plutons is common, and decreases outwards to albite-epidote hornfels facies. Stuart-Smith *et al.*, (1988) calculated that plutonism occurred at depths of less than 6 km with shallow dipping granitic margins - i.e., sub-horizontal northeast of the Wandie Granite.

Structurally the tenement lies in a region which is totally influenced by the early-phase ( $F_1$ ) folding event which is characterised by symmetrical and upright or inclined axial planes.  $S_1$  cleavage planes which represent axial planes surfaces to  $F_1$  folds, are penetrative and develop slaty to phyllitic texture in pelitic rocks and less prominent, spaced fracture cleavage in sandstone. No folds have been mapped within the tenement, although a strong cleavage does exist through the area.

Two prominent north-south and east-west faults occur in the southern part of the

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tenement. Additionally, numerous northsouth and north to northeasterly trending photolineaments have been recognised throughout the area. There appears to be no direct relationship between regional-scale structures and known mineralisation in the area.

A number of small copper workings known as the Fergusson Prospects (Stuart Smith *et al.*, 1988) occur in the southern part of the tenement. No records of production exist for these mines which consist only of shallow shafts and diggings, approximately two to three metres wide. Mineralisation occurs as 1-2 metre wide, subvertical gossans with strong malachite and azurite staining, and minor native copper. The host rocks are hornfelsed greywacke and siltstone of the Burrell Creek Formation.

An unnamed alluvial tin prospect occurs in the Wandie Granite on the western side of the tenement. A resource of 1.814t Sn averaging 0.45 kg Sn/m<sup>3</sup> was estimated for the prospect by Daly (1970).

#### 4. WORK COMPLETED & RESULTS

Work completed to date within Wandie Creek (EL 2708) includes regional and infill stream sediment sampling, regional soil sampling and reconnaissance mapping and rock chip sampling.

Results from initial stream sediment sampling in 1988 were generally less than 1 ppb Au and thus not considered anomalous. However, one isolated high order stream anomaly (61.9 ppb Au) was defined in the southeast portion of the tenement (Figure 3).

Results from the -80# samples highlighted a copper, tungsten and two tin anomalies. The copper anomaly occurs in the southeastern portion of the tenement, in the vicinity of the Fergusson copper prospects. The tungsten anomaly is located on the mid-northern boundary of the tenement. Its source is not fully understood. The larger of the two tin anomalies occurs over the mid-eastern boundary of the area. Several small tin workings were discovered in the area during recent field work.

The second, smaller tin anomaly lies directly in the drainage path of the alluvial tin deposit within the Wandie Granite (Figure 4). Gold results from

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in fill stream samples were low and downgraded the existing stream anomalies considerably. The 61 ppb Au value was not repeated and results from -80# samples did not contain any anomalous values (Figure 6.)

A regional soil sampling programme was recently completed over the northeast and southeast corners of the tenement (Figure 5). BCL gold results from the soil samples were very low and contained, on average, < 0.01 ppb Au. Unfortunately no base metals or tin were assayed from the soil samples.

A reconnaissance mapping exercise was carried out within the vicinity of the 61.9 ppb Au stream anomaly recently. Rock chip samples taken from a narrow (1-2m wide), horizon of banded quartz-haematite rock, over 150-200m, contained very little gold with average values of < 0.1 ppm Au. However, anomalous grades of copper, lead, zinc, silver, tin, tungsten and arsenic were recorded (Figure 6). This possible exhalative chert horizon is closely associated with dacitic volcanics within the Burrell Creek Formation, however potential is considered low due to the very limited extent of this unit. No further follow-up work is planned for this area.

Follow-up soil sampling and reconnaissance mapping are proposed over the tin anomaly in northeast corner of the tenement during the remainder of the 1989 field season.

## 5.0 CONCLUSIONS

The geology within the tenement consists dominantly of Burrell Creek Formation intruded by three granitic plutons. Contact metamorphism to albite-epidote hornfels facies is extensive throughout the area as a result of shallow dipping granite margins. The area lies within a region influenced by  $F_1$  folds which have prominent west to northwest trending axes. Only two faults have been mapped in the area but do not appear to be associated with any mineralisation.

Copper mineralisation occurs in narrow gossanous outcrops with strong malachite and azurite staining, and well developed boxworks texture. One alluvial tin deposit occurs in the Wandie Granite and is the source for a stream sediment tin anomaly.



BCL gold results from the infill stream sediment and soil samples were poor and failed to define any anomalies. Results from the -80# stream samples were also disappointing and downgraded previous stream anomalies. However, since no -80# samples were taken from the soil samples further sampling and testing of the tin and tungsten stream anomalies (northeast corner) is warranted.

Anomalous copper, lead, zinc, silver, tungsten, tin and arsenic values were recorded from rock chip samples from a zone of quartz-haematite rock. Unfortunately though, the zone is narrow (1-2m) and of limited strike extent, thus having a low tonnage potential.

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EXPENDITURE STATEMENT

EL 2708 - WANDIE CREEK

For the Period 08/09/88 - 07/09/89

	\$
Regional Office Staffing	10,842
Regional Office Support	5,994
Tenement Costs	60
Analyses	2,712
Air Photography	250
Head Office Management, Administration, Technical Services	2,254
	<hr/>
Sub-total	\$22,112
+ 10% Overheads	\$2,211
	<hr/>
TOTAL	\$ 24,323
	<hr/>

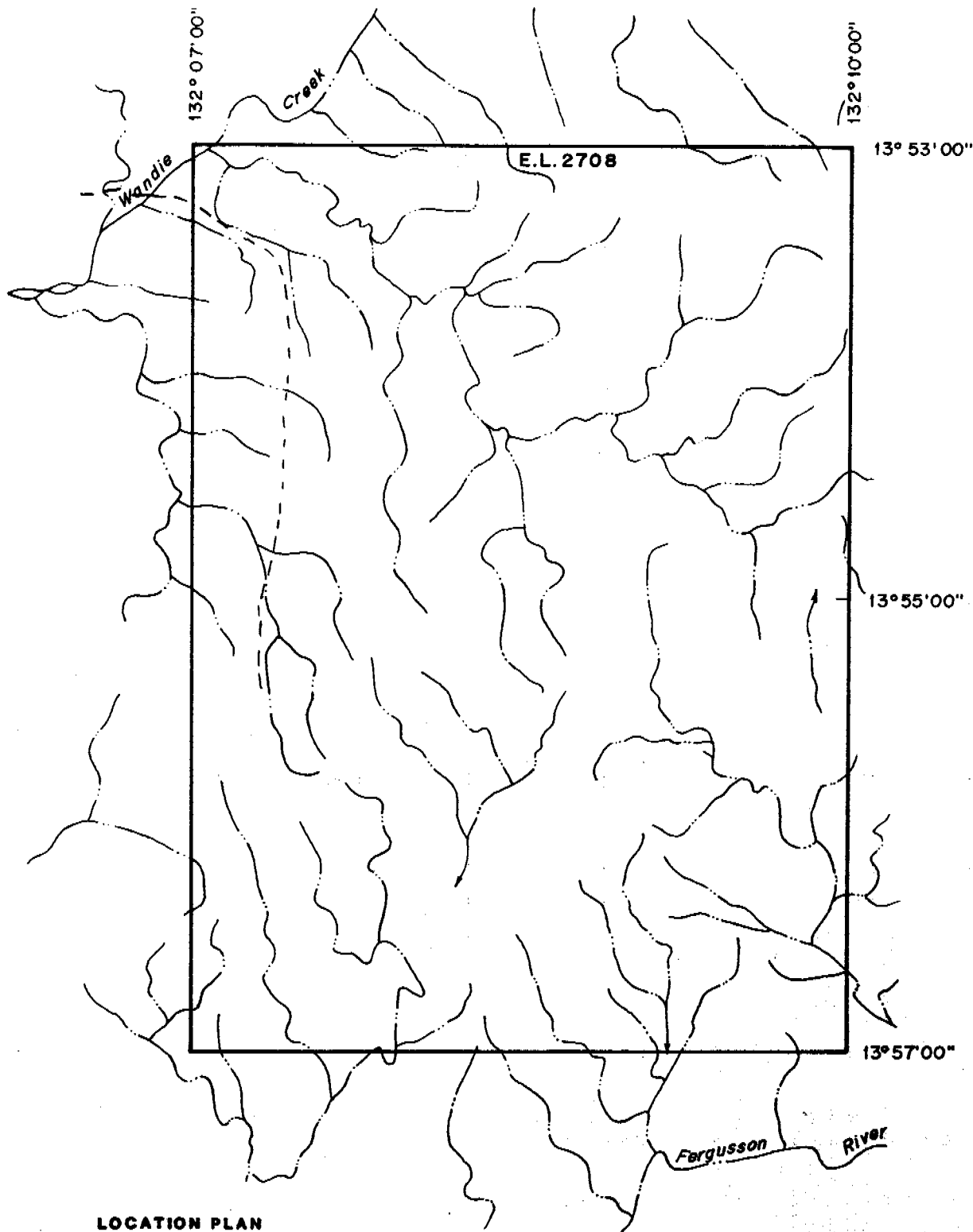
Covenant Year 2 = \$20,000

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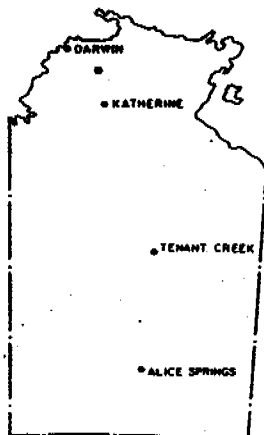
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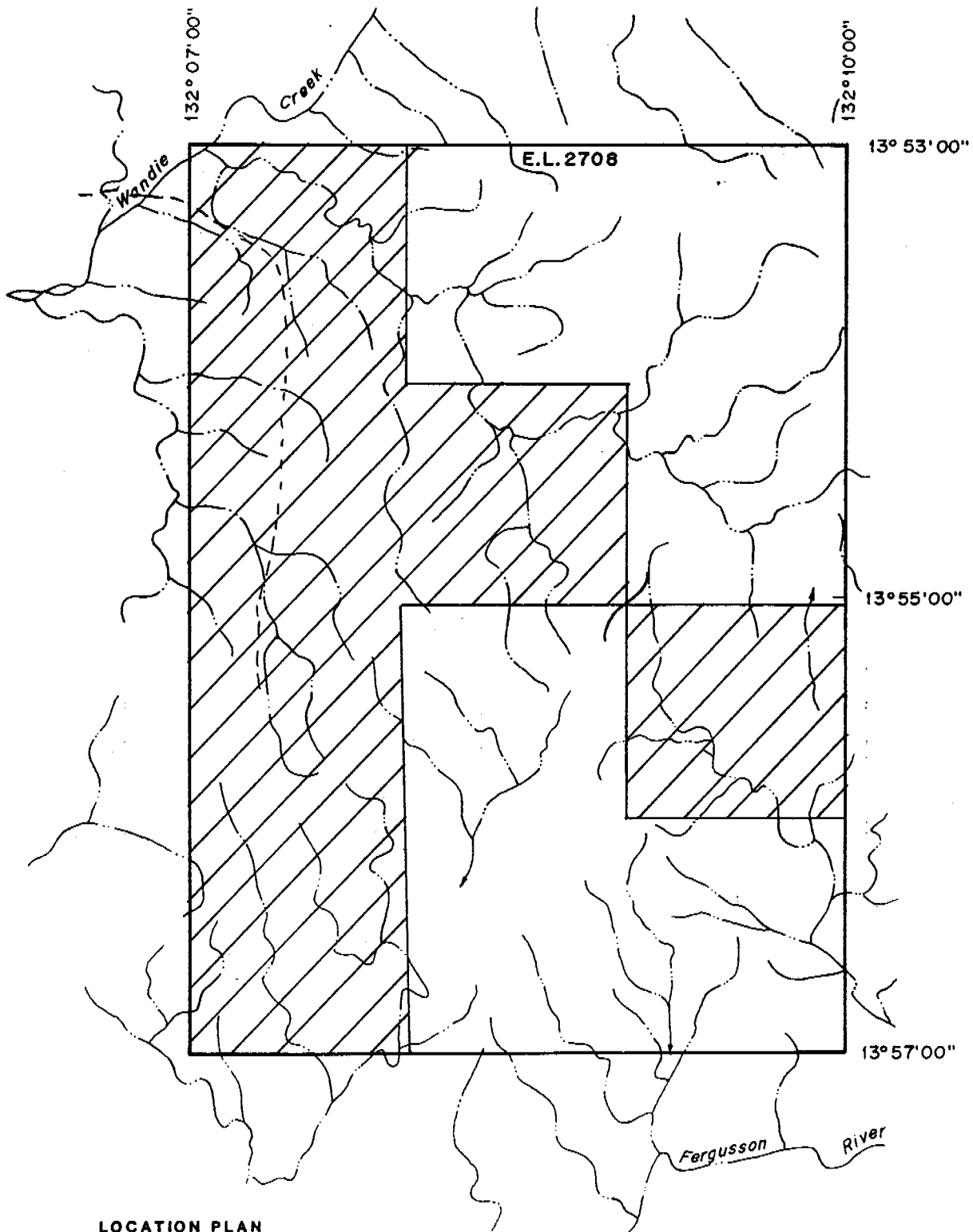
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Government Publishing Service Canberra.



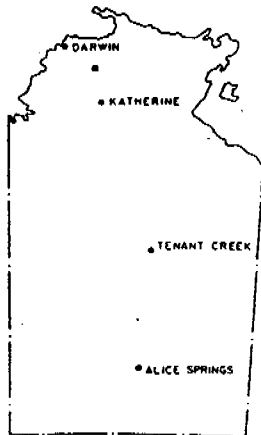
LOCATION PLAN




 The Barton Division of the Public Corporation of Australia Limited			
Project <b>WANDIE CK. E.L. 2708</b> NORTHERN TERRITORY			
Title <b>LOCATION PLAN</b>			
Author <b>A.J.T.</b>	Date <b>9/88</b>	Scale <b>1:50000</b>	
Drawn <b>P.J.W.</b>	Office <b>C.S.S.</b>	Revised	Date
Drawing No. <b>C/HJ 11/04X</b>			Fig. No.



LOCATION PLAN



 <b>Billiton Australia</b> <small>The Mining Division of the Shell Company of Australia Limited</small>			
Project: <b>WANDIE CK. E.L. 2708</b> NORTHERN TERRITORY			
Title: <b>LOCATION PLAN</b> Relinquished Area			
Author: A.J.T.	Date: 9/88	Scale: 1:50000	
Drawn: P.J.W.	Office Cns.	Revised	Date
Drawing No:	C/HJ 11/04X		Fig No: <b>2</b>