

80-1487

039001

RECEIVED	OCT 1983	Registrar
ANSWERED	DEPT OF MINES	E & IL
REF. No. 8383/80		

JN  
+ DJJ

PROPOSAL FOR THE FURTHER EVALUATION  
OF E.L. 9/76 - BLUE TIER, TASMANIA

**OPEN FILE**

Prepared by:  
Renison Mine Staff

Submitted by:  
L.A. NEWMHAM,  
CHIEF GEOLOGIST

*L.A. Newham*

10th October, 1980

AMG REFERENCE POINTS ADDED

1. SUMMARY

Drilling and general exploratory programs undertaken on E.L. 9/76 (Blue Tier) since 1976 have succeeded in both broadly defining a stanniferous deposit in the vicinity of the former Anchor Mine, and highlighting the economic potential for further tin deposits elsewhere in the Licence area.

An Indicative Feasibility Study was completed on the Anchor deposit in January 1980. This Study indicated that, based on a reserve of two million tonnes of 0.40% tin, the deposit could support a marginal operation. If however the reserves could be increased to 2.5 million tonnes of the same grade, then it would become a significantly more attractive financial proposition.

Hence a further drilling program was undertaken with a view to indicating the potential for this additional reserve.

Following the completion of this drilling, the reserve potential (possible ore) has been re-calculated as 2.5 million tonnes of 0.4% tin.

These figures were calculated using a 0.2% tin cut-off grade. A more natural cut-off grade for the deposit is however thought to be 0.1% tin. If this lower grade is applied, then the tonnage potential of the deposit can be substantially increased.

These figures are considered sufficiently encouraging to warrant further investigations to be initiated. Hence a program of work to take evaluation through to the Definitive Feasibility Study stage has been designed and costed.

The program, consisting of detailed ore definition, metallurgical studies, and various Report compilations, will take twelve months to complete and will cost approximately \$525,000. It is proposed to start work in November 1980.

Also included in the program is a provision for a continuing exploration effort elsewhere on the Licence area, searching

## 2. INTRODUCTION

The Anchor deposit is situated within Exploration Licence E.L. 9/76 held by Hellyer Mining & Exploration Pty Limited. Current interests are Renison 60%, Hellyer 40%. The deposit is best described as a low grade, cassiterite bearing greisenised (altered) granite. It is viewed as a potential open-cut/underground operation, with high cassiterite recoveries into high grade concentrates, lying in a geographically low infrastructure cost area.

The results of several periods of core drilling indicate a possible potential of 2.5 million tonnes of 0.4% tin as cassiterite using a 0.2% tin cut-off grade.

Recent drilling near the Moon Workings North of the Anchor intersected significant mineralisation (in one hole) of a type considered similar to that of the Anchor deposit.

This report briefly discusses the geology and potential of E.L. 9/76 and contains recommendations for further work.

### 3. GEOLOGY

The Blue Tier area is underlain by two major Devonian Granite phases. An older coarse grained granite has been intruded by a younger fine grained granite.

Accumulations of stanniferous hydrothermal fluids have been trapped for one reason or another within the fine grained granite, to form cassiterite bearing greisen zones.

Around the turn of the century, many of these greisen zones were mined to varying extents on the Blue Tier. Most mining was small scale, often of an alluvial-sluicing nature, but a substantial open-cut operation was developed on the thick greisen zones at the Anchor Mine.

Drilling around the Anchor over the last fifteen years, firstly by Aberfoyle and secondly by Renison, has shown the disposition and morphology of these greisen bodies to be complex and difficult to predict.

Mineralisation is confined to the younger fine grained granite but can occur in a variety of elevations or locations within this granite phase. In places the mineralisation has accumulated immediately below the coarse grained granite. In other areas it occurs as accumulations deeper down in the fine grained granite, often associated with pegmatitic zones.

This erratic distribution of mineralisation makes an accurate determination of geology and ore potential difficult with the existing drill hole density.

A more complete geological report is currently being compiled and should be available in the near future.

Briefly however, the ore potential can be considered in four situations:

- (i) Central area (just East of the old open-cut) where the

ore lies immediately below the coarse grained granite at a relatively shallow depth.

- (ii) Western area (beneath and on the northern margins of the old open-cut) where the mineralisation is essentially in an outcropping position.
- (iii) Southern area (South of the Central area) where the central mineralisation rolls deeper and becomes confused by pegmatitic zones.
- (iv) North-Eastern area (East of Central area) where the mineralised zones become thicker, deeper and more diffuse.

4. POTENTIAL4.1. Economic

In calculating the ore potential of the Anchor Deposit, a 0.2% cut-off grade was used. In places, a 0.1% grade would have been more "natural", and it is thought that the deposit tonnage potential could be substantially increased if a lower cut-off was applied.

At current tin prices (\$14,500 N.R.V.), a 0.2% tin ore would contain \$23 of recoverable tin (80% recovery), and a 0.1% tin ore would contain \$12 of recoverable tin.

Because \$12/tonne may cover costs on this deposit, it is proposed to calculate the tonnage potential at the lower cut-off grade, but for the purposes of this proposal the higher grade was used.

With a reserve potential of 2.5 million tonnes, and an ore grade of 0.4% Sn, the following style of operation could be envisaged:

Reserve tonnes:	2.5M	
Grade:	0.4% Sn	
L.O.M.:	10 years	
Throughput:	250,000 t.p.a.	
Recovery:	80%	
Production:	800 tonnes contained tin	
Value of Recoverable Tin:	\$46/tonne ore	} N.R.V. \$14,500/ tonne tin
Mine Revenue:	\$11.6M p.a.	

4.2. Geological

There is some potential for locating further tonnages of possible ore at the Anchor, principally to the West and the East. It is difficult however to see such possible extensions resulting in substantial increases in reserves using a 0.2% cut-off grade.

A hole (BT90) completed near the Moon Workings, three kilometres North of Anchor intersected 16m of 0.6% Sn. A second hole (BT95) completed 80m South of BT90 failed to intersect significant tin, but it is felt that considerable potential exists in this region for the definition of more mineralisation.

5. PROPOSED PROGRAM

It is proposed that a Definitive Feasibility Study should be completed as early as possible on the Anchor deposit.

The preparation of a D.F.S. will have to be preceded by various geological and metallurgical projects aimed at better definition and characterisation of the deposit, and environmental and land tenure studies.

Following upon this further geological definition of the Anchor deposit, it is proposed that exploration be continued elsewhere on the Exploration Licence with a view to locating further Anchor style deposits.

This program is estimated to cost \$525,000 and will take twelve months to complete. It is proposed to start work in mid-November. Details appear below. Schedule and budget layouts are appended.

5.1. Geological:

Three geological programs are proposed, viz:

- (a) definitive (detailed) drilling
- (b) bulk sampling
- (c) regional exploration and data compilation

(a) Definitive Drilling

A total of 1,800m of core and 400m of non-core drilling is proposed in a series of drill holes in and around the Anchor deposit. This drilling is aimed at firstly improving the definition of the deposit margins, secondly to define the limits of mineralisation to the West and North-East, and thirdly to increase the drilling density in certain areas within the deposit where either the existing

density is insufficient for accurate geological interpretation or the existing holes are inadequate for various reasons.

The drilling density at the conclusion of this program should be sufficient to enable detailed mine design to commence and accurate ore-reserve estimations to be made.

It is planned to base a Senior Geologist in the area by the end of October to design and implement this work. A drilling contractor is available to commence work in mid-November, and should complete the work by the end of January 1981. The actual drilling is estimated to cost a total \$89,000.

(b) Bulk Sampling

For the purposes of metallurgical testwork, it is proposed that three bulk samples, each of approximately three tonnes, be taken at three points within the deposit. The three sites chosen are shown on the accompanying map, and the samples would be obtained by means of large core drilling (PQ - 85mm diameter).

On each of the three sites a series of 6-8 holes would be drilled in a very small area. These holes would not only provide bulk samples, but they would provide geological information which could be used for geostatistical exercises aimed at studying grade variability. This is considered important on this deposit, which will undoubtedly be grade sensitive.

It is proposed that these bulk samples be taken after the definitive drilling has been completed.

However, so that the metallurgists can make an early start on bulk sample testwork, it is proposed to attempt the collection of two further bulk samples by means of bulldozing in the vicinity of the old open-cut in November

The drilling contractor engaged for the definitive drilling will also complete the bulk sample drilling which is planned for completion in March-April 1981.

The drilling is estimated to cost a total \$94,000. The bulldozed bulk samples would cost \$1,000. Thus, total bulk sampling will cost an estimated \$95,000.

(c) Regional Exploration and Data Compilation

Once the bulk sampling and definitive drilling have been completed, it is proposed that the following six month period be devoted to data compilation on the Anchor and regional exploration elsewhere on the Exploration Licence. Certain areas North of the Anchor are considered to have excellent potential for the development of deposits similar in style to the Anchor, as was highlighted by the recently completed hole BT90 at the Moon Workings.

The work envisaged will include:

- mapping
- core drilling at the Moon (2 x 200m)
- percussive drilling in the Poimena area (12 x 60m)

An amount of \$40,000 has been allocated for this work.

Also during this period, all geological data collected on the Anchor will be compiled into a final form and an accurate ore reserve estimation undertaken.

5.2. Metallurgical

A complete program of metallurgical testwork designed to determine the optimum plant flowsheet for Anchor mineralisation has been formulated. An experienced Project Metallurgist has been assigned to this work.

Renison Research facilities will be supplemented by outside organisations. The major components of the program are:

- (i) Heavy liquid testwork on small core samples.  
This work will probably be undertaken both at Renison and A.M.D.E.L., and include a considerable input by Central Mineralogical Services. Core from previously drilled holes is already available for this work and will be supplemented over the next six months by core from the definitive drilling program.
- (ii) Pilot scale testwork both on bulk samples and small core samples will be undertaken at the Department of Mines Laboratories in Launceston, in order to (amongst other things) optimise the primary grinding and pre-concentration circuits by investigating the performances of spirals, jigs, etc. Additional pre-concentration investigations will be undertaken by Mineral Deposits (to investigate the performance of cones) and A.M.D.E.L. (H.M.S.). Some consideration will also be given to photometric ore-sorting as a potential pre-concentration technique.
- (iii) Determination of work indices of the various ore types will be undertaken by Allis-Chalmers and possibly also by the C.S.I.R.O.

The design of further downstream concentrating stages must be dictated by the choice of pre-concentrating circuit and must therefore await the results of the above work:

5.3. Land Title and Environmental Studies

In order to fully appreciate the rather complex land tenure position in the general Anchor area, it is proposed to compile a complete land titles study on the area. This will be undertaken by a combination of Renison and independent surveyors and will be completed before December 1980.

Before Mining Leases can be granted at Blue Tier and before mining and concentrating can commence, a full Environmental Impact Study will be compiled. It is proposed that this be undertaken by an independent consultant. Whilst certain data necessary for the Study can be collected early on, the major work can only be done once the style of mining and ore concentration have been determined during the compilation of the D.F.S.

Thus, this work has been scheduled late in the program.

5.4. Definitive Feasibility Study

It is proposed that the D.F.S. be compiled by an independent consultant using basic metallurgical and geological data supplied by Renison personnel and environmental information as presented in the E.I.S.

A sum of \$150,000 has been allocated over a two month period for this work. This estimate is based on similar projects completed recently elsewhere in Tasmania.

BLUE TIER IMPLEMENTATION PROGRAM

039013

TIMING ITEM	1980		1981									
	NOV.	DEC.	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.
DEFINITIVE DRILLING	→			→								
BULK SAMPLING	→				→							
REGIONAL EXPLORATION & DATA COMPILATION												→
LABORATORY TESTWORK											→	
BULK SAMPLE TESTWORK		→	→							→		
LAND TITLES STUDY	→	→										
ENVIRONMENTAL STUDY												→
D.F.S.												→
EXPENDITURE (\$000)	20	40	30	35	50	50	20	20	25	35	100	100
CUMULATIVE EXPENDITURE (\$000)	20	60	90	125	175	225	245	265	290	325	425	525

\*  
\*  
Major Decision Point

## RENISON LIMITED

039014

EXPENDITURE ESTIMATES THROUGH TO D.F.S. COMPLETION

	\$
<u>GEOLOGICAL</u>	
Salaries and wages (Geologist + F.A. for two thirds of time)	30,000
Definitive Drilling	89,000
Bulk Sampling	95,000
Regional Exploration	40,000
Consumables (core trays, etc.)	3,000
Site Preparation and Rig Movements	3,000
Surveying	2,000
Vehicle and Tractor Hire	10,000
Office Rent	5,000
House Rent	3,000
Travel and Accommodation	1,000
Sub-Total	<u>281,000</u>
<u>METALLURGICAL</u>	
Salaries and Expenses of Renison personnel	35,000
Renison Laboratory Services	10,000
-Metallurgical Consultants	35,000
Sub-Total	<u>80,000</u>
<u>STUDIES</u>	
Land Titles	2,000
Environmental Impact	10,000
Definitive Feasibility	150,000
Sub-Total	<u>162,000</u>
<u>CAPITAL</u>	
Core Shed	<u>2,000</u>
TOTAL	<u><u>\$525,000</u></u>



E.L. 23/80  
ABERFOYLE

E.L. 19/78  
ABERFOYLE

E.L. 9/76  
HELLYER

E.L. 11/78  
C.S.R.

E.L. 21/80  
UNION CORP.

WELDBOROUGH

AMG  
575800E  
5439100 N

MOON

POIMENA

LOTTAH

ANCHOR

AMG  
590500E  
5432300 N

GOULDS COUNTRY

ST. HELENS  
20 KM.

Crystal Creek Lineament

-  POST DEVONIAN COVER
- DEVONIAN GRANITIC ROCKS**
-  YOUNGER GRANITE — STANNIFEROUS
-  — NON STANNIFEROUS
-  — UNDIFFERENTIATED
-  OLDER GRANITE — AREA OF EXPLORATION POTENTIAL
-  TIN MINERALISATION

1 KM.

AMG REFERENCE POINTS ADDED

5 cm

TO ACCOMPANY D.F.S.  
PROPOSAL SEPT. 1980  
RENISON LIMITED

FIGURE 2.