Attachment 2

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REPORT ON THE

ANCHOR MINE TIN DEPOSIT

December 1981

Prepared by:

A. SILVER, BE, MAusIMM, MMICA

TERENCE WILLSTEED & ASSOCIATES
CONSULTING MINING ENGINEERS

C O N T E N T S

PLAN OF PRELIMINARY OPEN PIT DESIGN

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REPORT ON THE ANCHOR MINE TIN DEPOSIT

1.   INTRODUCTION

Terence Willsteed & Associates have been requested by Santos
Limited to review the recent geological and resource assess-
ment made by Renison Ltd. on the Anchor Mine Tin prospect,
located in North-east Tasmania.

The prospect is being explored as a Joint Venture by the
two companies.

In summary the prospect was originally considered as having
a possible ore potential of 2.5 million tonnes at a grade of
0.4% Sn (Ross 1980). Further work was then initiated to
give detailed definition of ore grade mineralisation, and
metallurgical characteristic of the deposit. A program of
infill and perimeter core drilling and the excavation of
four bulk samples was undertaken by Renison Ltd. Based on
the results from this work Renison has re-assessed the ore
potential of the Anchor Deposit as follows:

      A Lens   0.2% Sn cut-off
a)   258,000 tonnes @ 0.85% Sn

b)   Marginal Mineralisation North
      0.1% Sn cut-off
      193,000 tonnes @ 0.23% Sn

c)   Marginal South
      0.1% Sn cut off
      82,800 tonnes @ 0.25% Sn

      B Lens   0.2% Sn cutt-off

a)   208,400 tonnes @ 0.45% Sn

b)   Potential marginal mineralisation in northeast.
      0.1% Sn cut-off
      1,243,000
      193,000 tonnes @ 0.23% Sn

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c) Potential mineralisation in floor and adjacent to
    workings
    0.1% Sn cut-off
    1,360,000 tonnes at 0.23% Sn

Renison's estimate postulates a possible ore potential (not
reserves) of 467,000 tonnes at 0.67% Sn for Lens A and B, at
a cut-off of 0.2%, with a further ore potential of 2.879 million
tonnes of marginal resource at 0.23% Sn, at 0.1% Sn cut-off
(Ross 1981).

The objective of this report is to make a preliminary economic
assessment of the prospect, based on the downgraded resource,
to examine whether the deposit can be further developed.

2. BASIS OF REPORT

The following parameters are set for the project as it now
stands:

a)   In view of the potential downgrading of the resource,
     the scale of operations would be 100,000 tonnes of ore
     throughput per year.

b)   An underground operation is not considered to be viable.
     The reasons are possible further depletion of the resource
     by pillars, high cost of development, problems of grade
     control, and a mining cost estimate of $20-25 per tonne.

c)   Consequently, an open cut operation only is considered,
     with the use of a contractor for overburden stripping
     to minimise capital outlay. The contractor may be also
     considered for mining ore.

d)   The total project capital cost needs to be limited.

e)   The crushing and milling facilities would be constructed
     at a modest cost "on a simple gravity circuit layout"
     (Renison Report 1980).

     The plant should be designed to permit expansion to
     200,000 tonnes per year at a later stage.

f)   Tin recovery is accepted to be 85% (Renison Report 1980).
     This is considered to be high, and would need to be
     confirmed by bulk ore tests.

3. MINE LAYOUT

A preliminary open pit design has been prepared to mine initially Lenses A and B, as outlined in the Renison plans.

Incorporated within this layout, it would be proposed to extract some of the marginal core immediately to the north of Lens A, where a resource of 193,000 tonnes at 0.23% Sn has been designated.

Bench heights have been taken at 5 metres vertical, and the overall angle of pit walls has been assumed to be 45°. This permits the layout of haul roads to be made, with individual bench batters of the order of $50^{\circ}-55^{\circ}$.

The proposed pit plan is appended with this report.

The total volume of waste to be stripped to enable both Lens A and B to be mined has been calculated at 2.760 million cubic metres. At a S.G. of 2.65, this is equal to 7.314 million tonnes of waste to be mined.

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4. RESOURCE COMPUTATIONS

Based on the proposed pit design, and the hanging wall and footwall contours of the ore lenses, the following mineable resource has been calculated.

Ore Location	Calculated Tonnes @ SG 2.65	Calculated Grade % Sn	Contained Sn Tonnes
Lens A	493,000	0.47%*	2317
Marginal Ore North of Lens A	103,000	0.23%	236
Lens B	255,000	0.39%*	994
Total Resource	851,000	0.42%	3547

As a comparison the resource potential for the proposed mine programme, based on Renison data is:

Ore Location	Quoted Tonnes	Grade of 0.2% Sn cut-off	Contained Sn Tonnes
Lens A	258,000	0.85%	2193
Marginal Ore	103,000	0.23%	236
Lens B	208,400	0.45%	937
Total Resource	569,400	0.59%	3366

*Calculated from weighted drill hole assays-Lens A & Lens B.

It is considered that allowing for the order of accuracy of the design prepared, the tin content of the proposed mining resource is comparable on both sets of calculations.

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Two courses of action become available:

a) To mine the higher grade ore on a selective basis, and
    thereby increase waste to ore ratio to 12.85 to 1 and reduce
    the .life of. mine to approximately 6 years.

b) Mine the total resource at a reduced grade, and at a reduced
    waste to ore ratio (8.6 to 1), and extend the life of mine
    to approximately 8.5 years.

In both cases the resources are considered insufficient to
sustain the mine life to a desired minimum of 10-12 years.
Further, the effect of lower grade ore on tin recovery can not
be quantified.

For the purpose of this exercise, the preliminary economic
assessment is based on the Renison resource data, that is to
selectively mine over the shorter period.

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5.   OPERATING COSTS

The following costs are projected for the operation.

	Cost/tonne milled
Mining 13.85 units @ $1.50/tonne	20.80
Milling	5.50
Administration & Overheads	2.04
Salaries & Fringe Benefits	1.80
Contingencies	2.89
	$ 33.03

Say $33.00/tonne milled

The cost of mining is equivalent to $3.90/bank cubic metre.
This cost has been calculated from a recent study on a tin
operation, in adverse climatic conditions in Tasmania and
based on owner-operator fleet. It is considered that $1.50/tonne
is a reasonable figure for mining contractor at Blue Tier for
open cut, with a high strip volume in the initial stage.

All other costs have been extracted from the Renison study
dated January 1980, and escalated by 12% for 2 years.

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6. REVENUE & NET VALUE/TONNE OF ORE MILLED

The revenue per tonne of ore milled is calculated on

a)   a tin price of $15,000/tonne

b)   smelter and selling charges of $1,100 per tonne of tin

c)   recovery of 85% of head grade.

The net revenue per tonne of Sn is $13,900.

The value per tonne of ore milled is:

$13900 x 85% x 0.59% Sn	=	$ 69.70 per tonne
Less: Operating Cost	=	33.00
Net Value/Tonne of Ore Milled	=	$ 36.70/tonne

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7. CAPITAL EXPENDITURE

The capital cost for the project at the reduced annual throughput of 100,000 tpa has been derived from Renison Indicative Feasibility Study 1980 (Enclosure XII).

The total capital expenditure quoted for Years 1 and 2 in that study was $7.95 million (unescalated).

The following adjustments have been made:

MILL

The cost of the mill has been reduced by $880,000, to reflect 50% of the gravity concentrating plant to treat 100,000 tpa.

The other mill installations have not been adjusted, so that the crushing-grinding plant cost remains at the initial 200,000 tpa capacity.

MINE

The mine plant listed in the 1980 Report has been reduced by one Air Trac Drill and one Cat 769 Truck in Year 2.

The total saving is $190,000 which allows all the necessary plant for the project to undertake its own open pit mining of ore, without resort to a contractor.

The capital cost of the project is therefore calculated at $6.88 million in 1980 dollars. Escalation at 12% compounded over 2 years brings this to $8.63 million in 1982 dollars.

It is considered that this is an adequate provision for capital, equivalent to $86 per annual tonne for an open pit mine, where infrastructure is to be kept to a minimum.

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8. ANNUAL CASH FLOW

It is proposed to prepare only a preliminary economic assess-
ment of the prospect. A more complete cash flow analysis
would require a comprehensive study of the resource data and
cost projections.

The following computations are given on an average annual
cash flow:

Annual production	–	100,000 tonnes
Annual surplus/tonne milled	–	$36.70
Annual surplus from operations	–	$3,670,000
Annual depreciation (life of mine – 6 years)	–	$1,437,000
Annual profit, before tax & royalty	–	$2,233,000
Tax 46% + Royalty @ 5%	–	1,138,000
Net Profit	–	$1,095,000
Add: Back depreciation	–	1,437,000
Annual cash flow	–	$2,532,000
Cash flow generated over life of mine	–	$14,430,000

This gives a surplus of cash flow of $5.8 million after return
of capital and would give a DCF rate of return of about 10-12%.

However this analysis is a simplification of the cash flow,
because high expenditure would be incurred in the first
two years on pre-stripping of waste to expose ore (of the
order of $6-8 million for pre-stripping).

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9.   CONCLUSIONS

The conclusions of this report are:

a)   The resource is limited, but of sufficient grade to warrant exploring for additional ore.

b)   At 100,000 tpa mill operation, the resource should be explored to provide additional 500,000 tonnes of comparable grade (0.6% Sn).

c)   It is imperative that the recovery of tin from ore be established by adequate testing.

     The reference of 85% has been taken from the Renison Indicative Feasibility Study.   There is one reference to recovery in recent metallurgical reports made available.   This quoted 84% recovery at 54% Sn in concentrate (Report by Selby).

d)   It is considered that tin price of A$15,000 used in this study, which is the current price, may be high for longer term projections.

e)   Santos Ltd. needs to satisfy itself as to the basis and method of computation of the resource potential quoted by Ross, for Lens A and Lens B.

f)   A geo-statistical study could be undertaken, together with any bulk sampling which will give a true picture of projected grade in defined mining zones.   As Ross quotes "the dominant mode of cassiterite is as erratic disseminations".
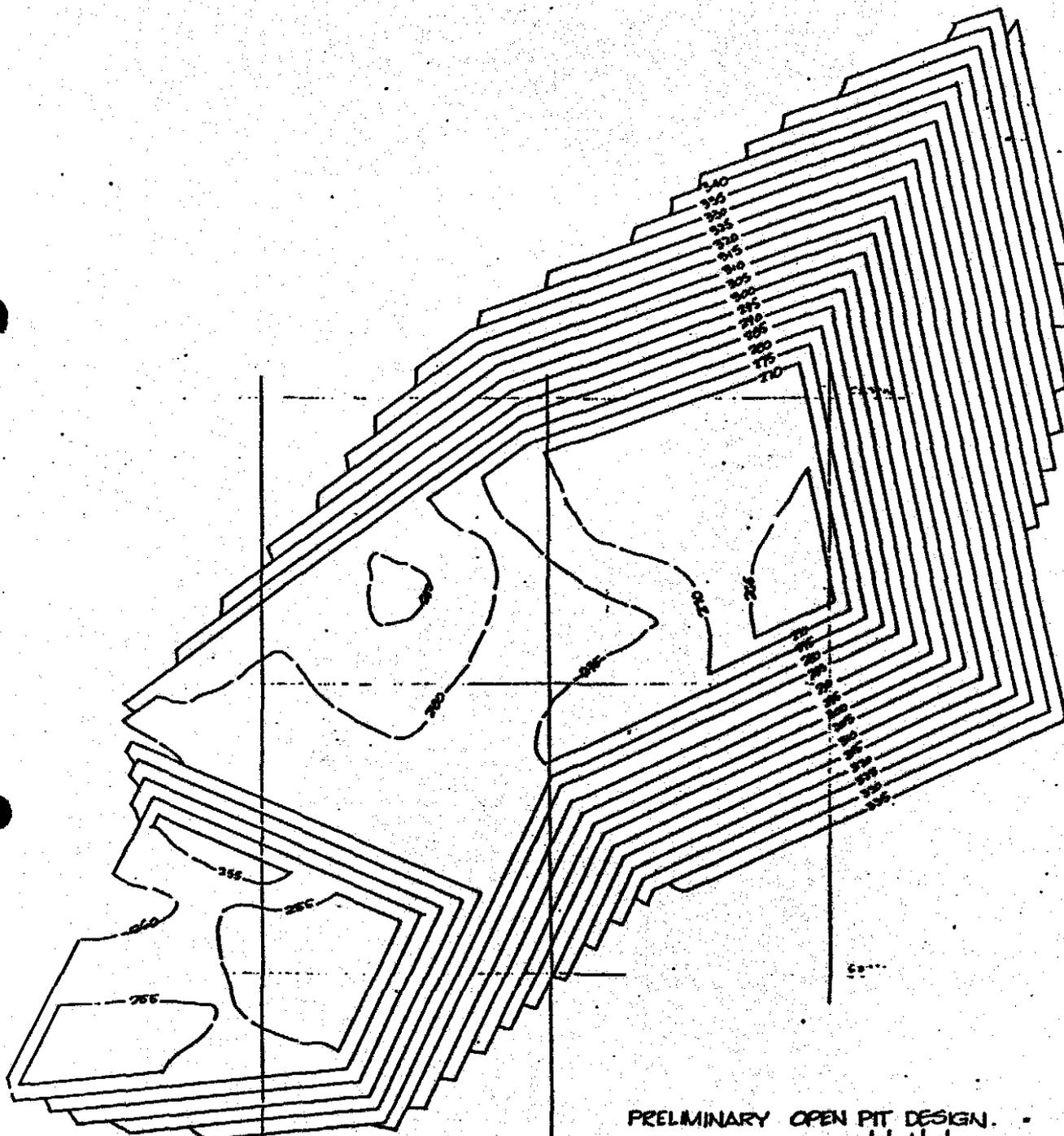
PRELIMINARY OPEN PIT DESIGN.
BLUE TIER LENS 'A' & 'B'

TERRACE WALLSTEED & ASSOCIATES.
DESIGN CRITERIA. A. SILVER
PREPARED BY: D. REEVE.