

# VAN DIEMAN MINES PTY LIMITED

## THE ENDURANCE PROJECT

E.L. 11 / 2000

MT. CAMERON, GLADSTONE DISTRICT

NORTH EAST TASMANIA

## REASSESSMENT

**PREPARED BY:**

*NIUGINI RESOURCES PTY., LIMITED.*

**DATE PREPARED:**

*20 November 2003*

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## OVERVIEW

Tin was discovered in the Endurance area in 1875. The first deposits worked were the shallow alluvials associated with streams draining Mt Cameron. The Endurance Tin Mining Syndicate, formed in 1922 appears to have been the first group to undertake mining on the deeper sections of the main Endurance lead. Production from the deposits continued intermittently until the late 1960's when ownership control moved to the Murray – Murray – Maguire – Mainline Group. The B.M.I mining group acquired the area in 1970. B.M.I while continuing production from shallow ground also commenced a thorough drilling assessment of the deposit. In 1978 Amdex Mining acquired the deposit from B.M.I. Amdex recalculated the reserves based on previous drilling by the Department of Mines (1958, 1968 – 69), Endurance Tin Mining Company (1943) and B.M.I. (1971 – 72). As a result of their work Amdex Mining have quoted a resource base as follows:

6,775,399 cubic metres at an average grade of 250.4 grams/cubic metre of 70% Sn concentrate at a cut-off of 200/100 grams / cubic metre.

This resource was contained in two resource blocks, specifically:

Block East of the Fault;

And

Block West of the Fault.

The "Fault" referred to by Amdex is reported by them as a post depositional fault occurring in the western section of the lead which has a relative vertical displacement of 14 metres and a relative horizontal displacement of 135 metres.

In June 2001 the author conducted a brief re-assessment of the old data and in particular the data produced by Amdex in support of their resource calculation. A review of those data indicates that while some infill drilling would upgrade the resource from possible to proven, drilling would be better utilised by drilling more lines to the west of the resource, the direction in which the resource remains "open". In addition the Amdex resource uses grades averaged from surface to base of lead (Whole of hole) and includes thick intersections of barren overburden.

Recent studies indicate that by recalculating the resource to exclude the barren overburden, an increase in the overall quantity of contained tin concentrate can be achieved. The current resource base is quoted as being:

1,643,395 m<sup>3</sup> containing an average grade of 983.72 gm / m<sup>3</sup> of SnO<sub>2</sub> at 70% contained Sn or 1,611 tonnes of SnO<sub>2</sub> concentrate.

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**ELECTRONIC FORMAT FILE CODES**

|                                 |             |
|---------------------------------|-------------|
| EL112000_200309_01_report.wrd   | Main Report |
| EL112000_200309_02_map.tiff     | Figure 2    |
| EL112000_200309_03_section.tiff | Section 1   |
| EL112000_200309_04_section.tiff | Section 2   |
| EL112000_200309_05_section.tiff | Section 3   |
| EL112000_200309_06_section.tiff | Section 4   |
| EL112000_200309_07_section.tiff | Section 5W  |
| EL112000_200309_08_section.tiff | Section 6   |
| EL112000_200309_09_section.tiff | Section 7   |
| EL112000_200309_10_section.tiff | Section 8   |
| EL112000_200309_11_section.tiff | Section 9   |
| EL112000_200309_12_section.tiff | Section 10  |
| EL112000_200309_13_map.tiff     | Plan        |

## 1. INTRODUCTION

Continuing work on this tenement by Mineral Holdings has resulted in an improvement to the resource base and several new geological interpretative assumptions that serve to increase overall prospectivity outside the current resource boundaries.

Recognition that active faulting during the Tertiary created a distinctive local geomorphology that favoured the development of an extensive tin bearing alluvial deposit running along the southern edge of the Mt Cameron granite massif. These features are dealt with in more detail later in the text.

As a result of continued studies the resource base at Endurance is quoted as being:

***A “Measured Mineral Resource” of 1,637,395 m<sup>3</sup> at an average grade of 983.72 gm / m<sup>3</sup> of 70% Sn concentrate, a total of 1,611 tonnes of SnO<sub>2</sub> concentrate. This resource is overlain by 7,510,494 m<sup>3</sup> of barren to very low grade overburden for an “Overburden to Ore” stripping ratio of 4.6 : 1.***

In addition to the contained tin Mineral Holdings have also established that the tin bearing gravels also contain valuable and recoverable accessory miners, specifically:

Au at grades of between 0.010 and 0.030 gm / m<sup>3</sup>;

Gem quality sapphire estimated to occur at grades of 2 gm / m<sup>3</sup>;

Ta as tantalite at a grade of 1.50 gm / m<sup>3</sup>; and

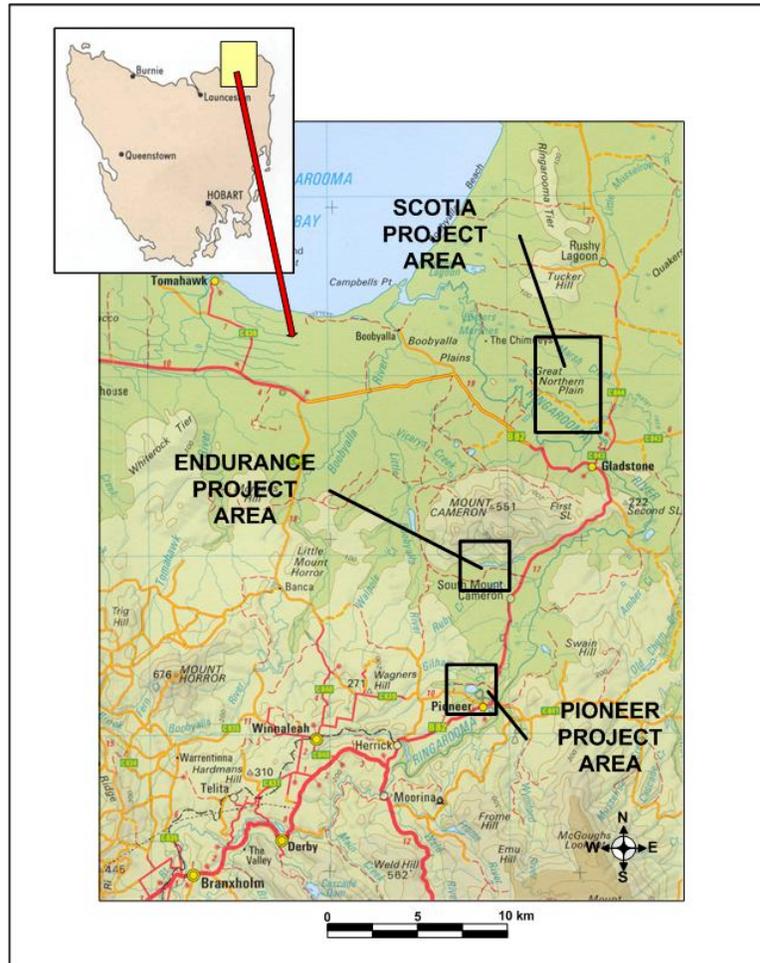
Zircon / Rutile at an average combined grade of 200 gm / m<sup>3</sup>.

Mineral Holdings have determined that this resource is open to the west and has not yet been adequately defined along its northern and southern edges. Preliminary studies indicate that these prospective extensions could contain a further 2,394,134 m<sup>3</sup> of tin bearing gravels at an average grade of 978.72 gm / m<sup>3</sup> of 70% SnO<sub>2</sub> concentrate. These extensions also contain valuable accessory minerals.

This report contains a number of recommendations aimed at taking the resource to “Proven” status, these works will include reformatting of all data to a digital base, preliminary mining feasibility studies including assessments of a variety of mining techniques, environmental studies and economic “Profit and Loss “ studies.

## 2. LOCATION, ACCESS AND INFRASTRUCTURE

The Endurance Project is located in north east Tasmania approximately 85 kilometres north east of the City of Launceston. More specifically the deposit is located along and immediately adjacent to the southern flank of the Mt Cameron Granite massif and just west of the Pioneer to Gladstone Road. See Figure 1.



**FIGURE 1: LOCATION PLAN**

Access to the project area is excellent. An all weather sealed road services the townships of Gladstone and Pioneer and a well formed gravel track provides heavy vehicle access from that public road to the project site. See Figure 2.

Mains power and telephone lines run immediately adjacent to the public road and local water supply is available from old mine ponds, the lake immediately adjacent to the project is estimated to contain 3,000 megalitres.

### 3. TENURE

The project area is currently encompassed by a 4 sq. km Exploration Licence, EL 11 / 2000. Specifically:

|                   |   |
|-------------------|---|
| Tenement Number   | 11 / 2000   |
| Area              | 4 square km.  |
| Location          | Mount Cameron   |
| Date of Grant     | 03 / 01 / 2000  |
| Date of Expiry    | 08 / 12 / 2005  |
| Beneficial Holder | Mineral Holdings Australia Pty., Limited.<br>11 Kent Court<br>TOORAK, Vic 3142. |
| Contact           | Mr. Neil Thomas.<br>Managing Director   |
| Contact Point     | Phone: +61 3 9822 0077<br>Fax: +61 3 9824 7617<br>Email: tominex@bigpond .com   |

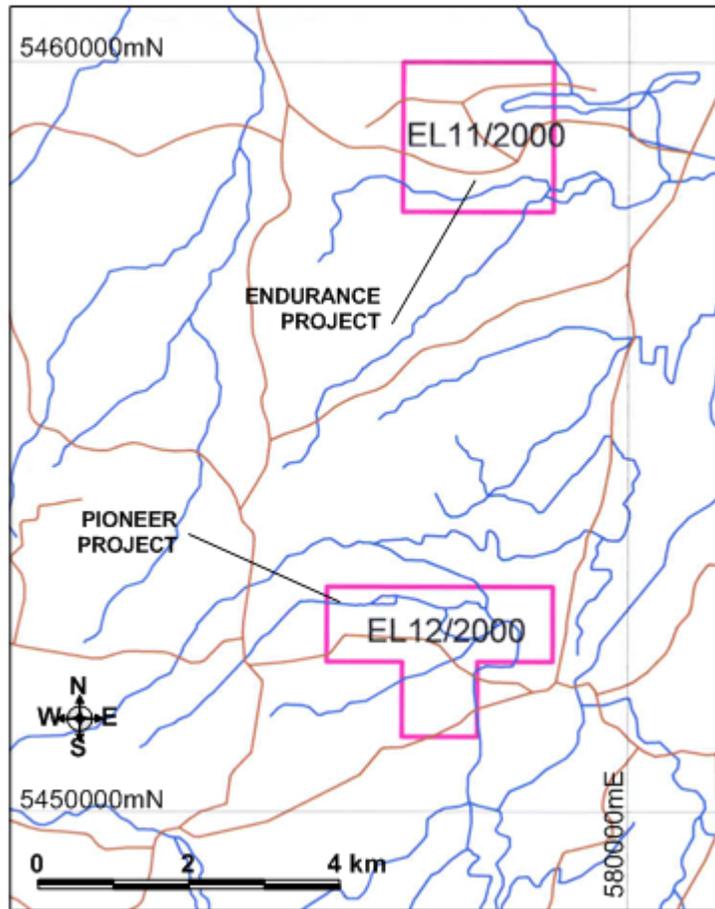


FIGURE 3 – TENURE LOCATION PLAN

#### 4. HISTORICAL BACKGROUND

The following historical data has been reproduced from a report by Amdex Mining dated 24<sup>th</sup> March 1980

Tin was discovered in the Endurance district in 1875. Initially miners exploited the shallow alluvial deposits associated with the many small, deeply incised and steeply rising streams along the southern flank of the Mt. Cameron massif. Those deposits occurred perched well above the buried Endurance deep lead. During this period the Clifton Tin Mining Company and the Endurance Tin Mining Syndicate were the major producers. The Clifton Company worked high-grade ground (2,000 to 3,000 gm/m<sup>3</sup>) along Clifton Creek and the Endurance Syndicate, shallow ground to the northwest of the Clifton workings.

The Endurance Tin Mining Company formed in 1922 acquired the assets of the Syndicate and appears to have also acquired the Clifton leases that were probably nearly completely mined. Initially the groups utilised hydraulic monitors supplied by steam driven water and gravel pumps. A lack of adequate water supply necessitated the establishment of pumped water return system. The groups appear to have been able to exploit ground to around 10 metres in depth at grades of up to 7,000 gm/m<sup>3</sup>.

By 1928 the scarcity of an adequate supply of wood to fire the boilers necessitated the introduction in that year of diesel driven plant. Declining tin prices soon forced the closure of all operations. Small-scale tribute mining continued until the early 1930's when the Endurance Company completed a successful restructure of its share capital and acquired, for the sum of \$30,000.00, the Tasmanian assets of the Pioneer Tin Mining Company. These assets included the hydroelectric power station at the Frome Dam and this enabled the Endurance Company to electrify its operations at Endurance.

In 1934, Mr. C. Ryan, the former manager of Pioneer was appointed General Manager of the Endurance operations. Ryan commenced a scheme to exploit the remaining shallow ground and to commence operations of the deeper sections of the main lead. The Ryan plan included:

- Installation of a pumping platform on the Ringarooma River to provide water for sluicing;
- Introduction of a 254 mm gravel pump to develop the shallow ground;
- Replacement of the pontoon steam driven plant by larger gravel pumps to enable exploitation of the deeper ground; and

- Provision of a tails race to the Ringarooma River to dispose of tailings derived from the upper or eastern end of the lead.

Sluicing of the ground commenced in February 1935 following the successful commissioning of the pumping plant. Initial mining was hampered by unreliable and inadequate boring results and it proved necessary for the Company to redrill some areas to allow for more selective mining to be implemented. By 1937 production was in full swing and in the first year of operations a total of 150.9 tonnes of high-grade tin concentrates were produced. Historical mining costs are quoted as being 7.44 cents / metre and recovery quoted as being 528 grams of SnO<sub>2</sub> / m<sup>3</sup>.

In 1939 as operations became more settled the Company treated some 277,500 m<sup>3</sup> of alluvial ground for a recovery of 142 tonnes of tin concentrates, a grade of 475 grams/m<sup>3</sup>. The more efficient operations resulted in the costs being lowered to around 5.5 cents / m<sup>3</sup>. At this time the Company estimated the deposit to contain a resource of just over 3.8 million m<sup>3</sup> containing 1,400 tonnes of tin concentrate equating to an average grade of around 310 grams/m<sup>3</sup>. In 1940 the lead produced 130.8 tonnes of concentrate from 359,000 m<sup>3</sup> of feed equating to an average grade of 364 grams/m<sup>3</sup> at a cost of 6 cents / m<sup>3</sup>.

By 1945 all the economic shallow ground at the eastern end of the lead had been exhausted although the deep unexploited ground still contained 2.68 million m<sup>3</sup>. In that year the production pontoon was moved to the western central section of the lead and by 1947 the operation was confined to the main lead apart from some small-scale production of 18 tonnes of concentrate from shallow ground. Total production for the 1947 year is reported to be 134 tonnes equating to an average grade of 338 grams/m<sup>3</sup>.

In 1950 sluicing was continuing in the western section of the main lead, 108.4 tonnes being produced for the year from 325,000 m<sup>3</sup> of wash at average grades of 333 grams/m<sup>3</sup> however costs in working the deeper ground had risen to 19.6 cents / m<sup>3</sup>. By 1954 profitability of mining the deeper ground had become a problem, costs had risen to around 32.7 cents / m<sup>3</sup> for a recovered grade of only 285 grams/m<sup>3</sup>.

In summary, the period 1946 to 1959 saw the Endurance Lead produce 1,220 tonnes of tin concentrates from some 3.82 million m<sup>3</sup> of alluvial wash for an average grade of 319 grams / m<sup>3</sup> SnO<sub>2</sub>. Operations were hampered by the inability to dispose of tailings and from time to time the presence of abundant pyritic material.

In 1960 the Company commenced sluicing eastwards from the Blue Lake region. Production was hampered however as the lead was becoming narrow, was hard against the flanks of the massif and contained abundant large boulders in the basal layers. The average annual production for the period 1960 to 1966 was 70 tonnes of tin concentrates per annum, an average grade of 237 grams/m<sup>3</sup>. In the period 1966 to 1968 production further declined with only 75 tonnes of concentrates being produced for the period and while the average remained at 237 grams/m<sup>3</sup> costs had risen and operations were terminated in the east in late 1968. Operations were relocated to the western sections in the same year.

In mid-1969 the ownership flowed to the Murray – Murray – Maguire Group to and from groupings that made up the Attunga Mining Syndicate and finally to interests associated with Walter Shapaloff. In early 1970 B.M.I Mining acquired the interests of the Endurance Mining Corporation and thus of the Endurance Lead. B.M.I discontinued the mining operations in the western lead in favour of mining of shallow terrace ground to the east. In conjunction with this move the group commenced an extensive evaluation of the deposit.

In 1978 the Triako – Amdex Mining Group acquired to B.M.I tenements and continued shallow mining and exploration, their operations ceased in the early 1980's. From that time the deposit has remained idle and the resource quoted by Amdex remains largely intact.

## 5. GEOLOGICAL SETTING

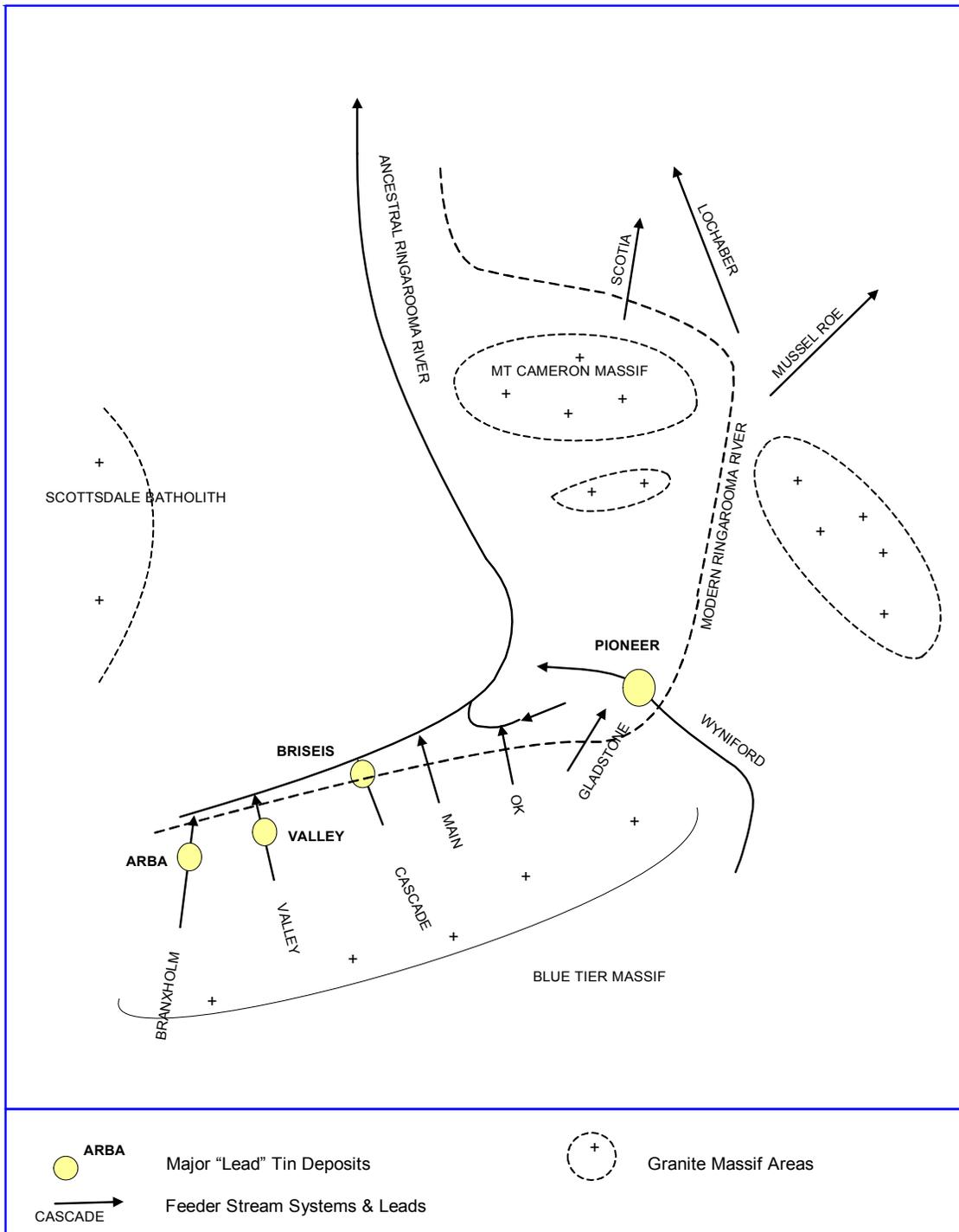
Basement studies indicate that the Ringarooma River, the main regional river system ran eastwards and then northwards through the area occupied by the present Boobyalla River. The river was fed by a number of major tributaries, the Branxholm / Black Creek, Valley Creek, Cascade River, Main Creek, Weld River, OK Creek, Gladstone Creek and the Wyniford River.

During this period the tin bearing Blue Tier massif formed a major elevated mountainous area south of the Ringarooma River basin. Streams draining this massif were probably deeply dissected and high energy systems that contributed a major heavy mineral rich sediment load into the basin.

Sharp changes in gradient at the junction of these systems with the basin, resulted in a reduction in stream energy, and thus assisted the development of deeply entrenched, major tin bearing alluvial deposits. Basement topographic levels along the ancestral channel would seem to indicate that these basinal deposits were probably elevated above the levels of the main river. Filling of these basins resulted in spilling of tin rich sediments further north to the main channel of the Ringarooma River.

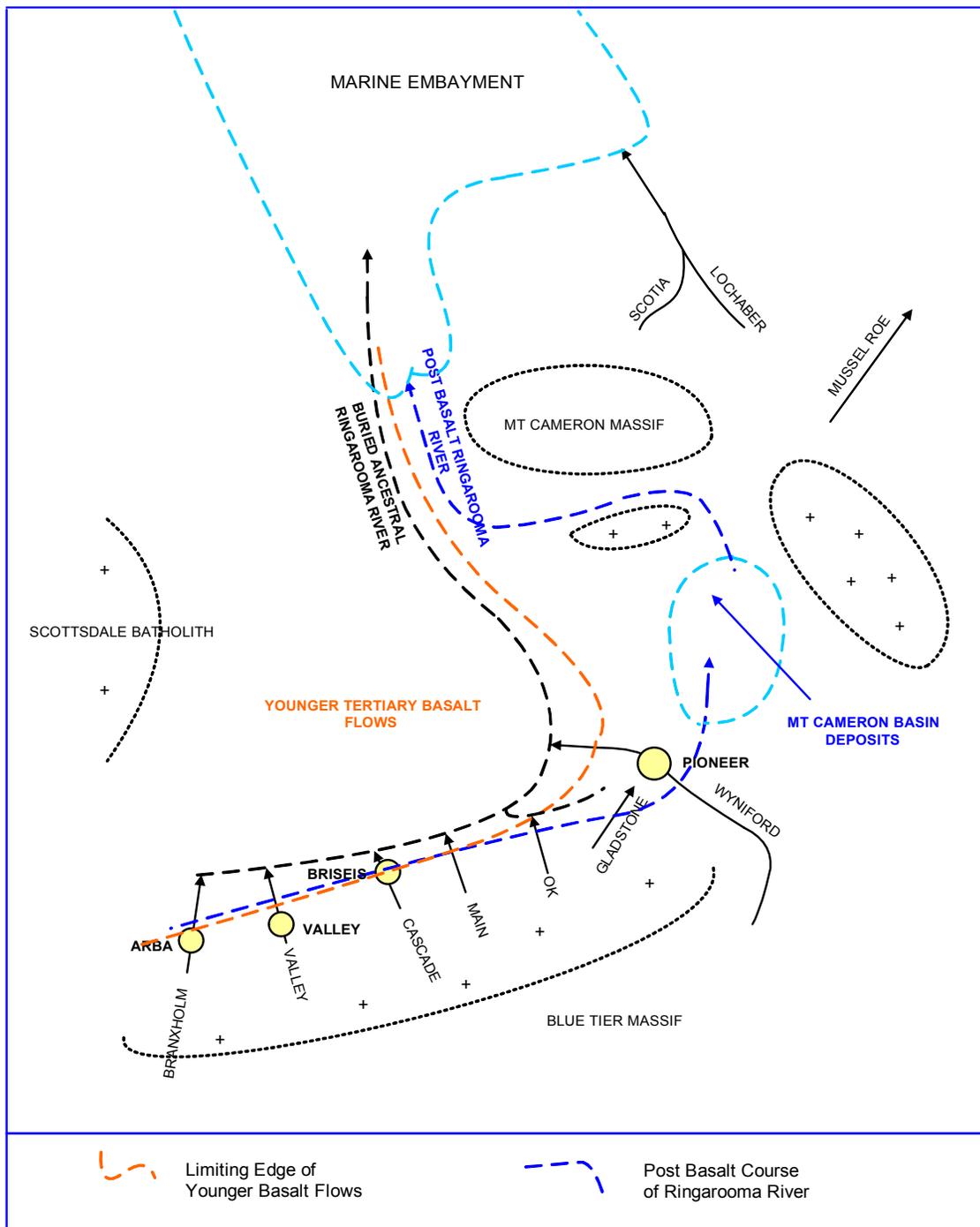
About 16 Ma the Ringarooma river valley was partly flooded by the Younger Basaltic flows. This pushed the river to the south against the granite massif and in places, below Derby, the river was forced to incise its course into granitic basement rocks. In turn this isolated the paleo-Ringarooma River and its tin bearing basinal deposits under thick basaltic flows.

Deposits such as Arba, Valley, Briseis and Pioneer were worked where exposed along the edge of the basalt flows however many were not fully exploited because of thick basaltic cover.



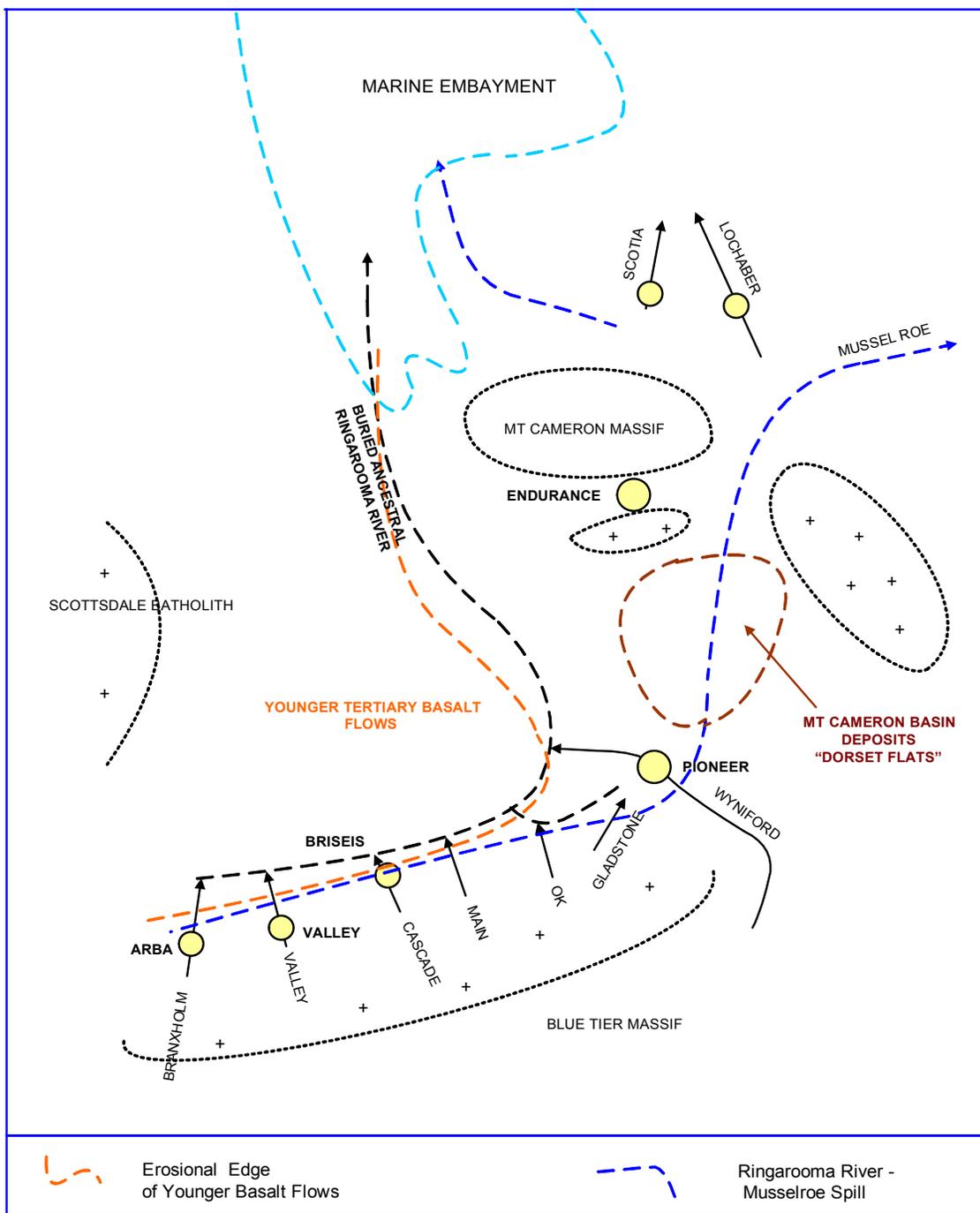
**STAGE 1  
PRE-YOUNGER BASALT GEOMORPHOLOGY  
DEPOSITION OF ZIRCOSPILIC TERTIARY SEDIMENTS**

**FIGURE 4**



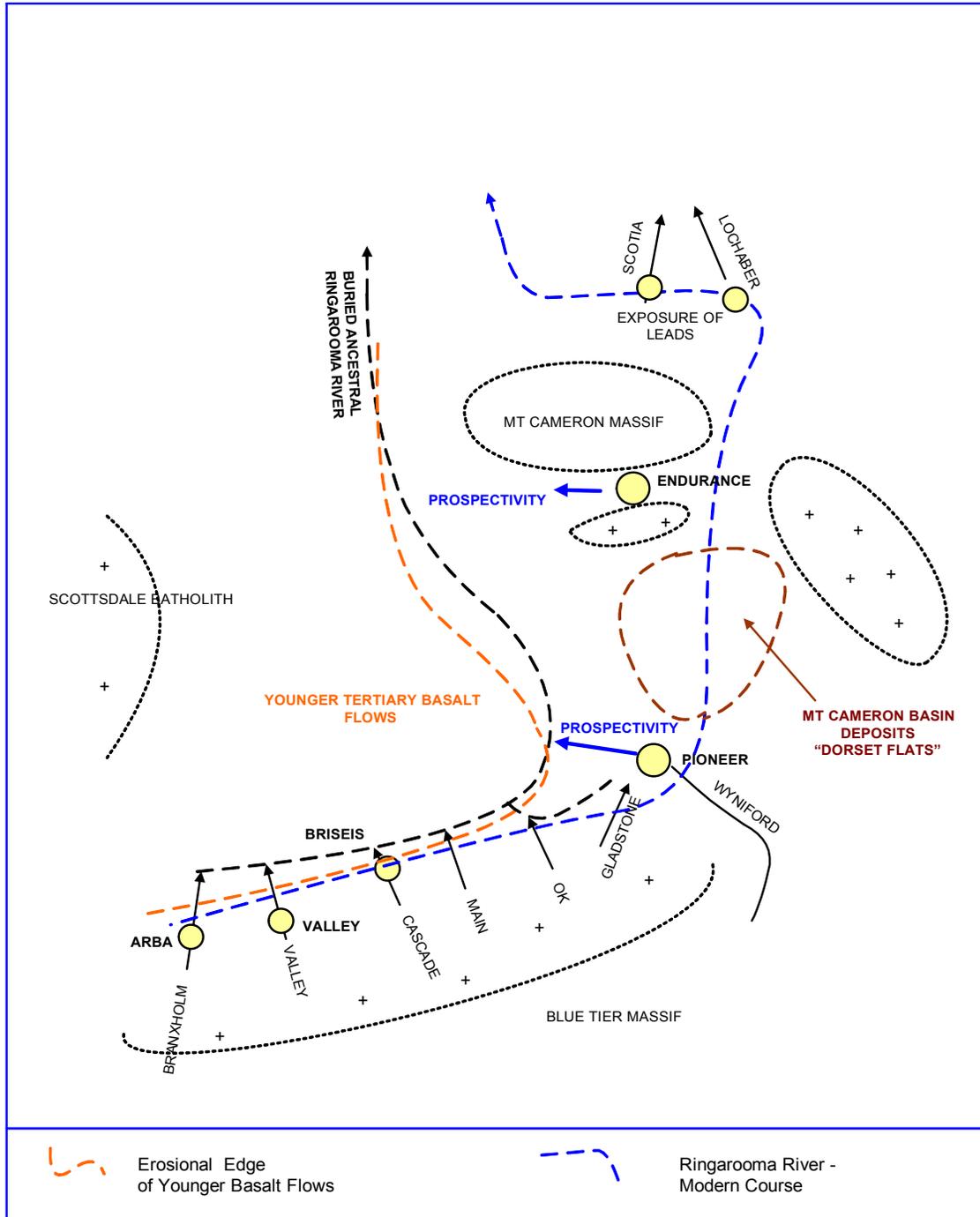
**STAGE 2  
PERIOD OF YOUNGER BASALT VOLCANISM  
BURIAL OF ANCESTRAL RINGAROOMA RIVER**

**FIGURE 5**



**STAGE 3  
MUSSELROE SPILL  
RINGAROOMA RIVER DIVERSION**

**FIGURE 6**



**STAGE 4  
RINGAROOMA RIVER CAPTURE  
FLOW DIVERSION TO RINGAROOMA EMBAYMENT**

**FIGURE 7**

## 5.1 THE ENDURANCE PROJECT

The first deposits to be worked in this area were the elevated shallow deposits along the edge of the Mt Cameron massif, probably the Clifton Creek deposits. These deposits are reported to have contained ground averaging 2,000 to 3,000 g/m<sup>3</sup> of tin. As this shallow ground became worked out, mining shifted to the deeper ground. This move represented the first exploitation of the shallow but very high grade (7,000 g/m<sup>3</sup>) headwater section of the main lead where basement was at around 10 metres maximum. This area is located just west of the Gladstone – Pioneer road. (Loc 7).

The geological and genetic history of this deposit is dominated by the emplacement of the Younger Basalts down the palaeo-channel of the Ringarooma River.

With much of the north and north westward flow from the Blue Tier being diverted to the east and the previous drainage through the Boobyalla / Palaeo-Ringarooma becoming restricted if not halted, all the Blue Tier sediment load was directed to the Mt Cameron Basin, a broad flat lying area located between the Mt Cameron massif and the edge of the Blue Tier. Initially flow was probably along the southern section of the palaeo-channel marked in blue on the geological map although the presence of ferricretes and silcrettes in this area suggests that this channel was also filled by basaltic material.

The Ringarooma River was pushed to the southern edge of this area along and partly within the granite massif discharging its sediment load into the area now called Dorset Flats. Major deviations in the course of the River such as at Loc 3, were probably caused as a result of Tertiary faulting and / or the presence of more resistant granitic rocks. Similar diversions in drainage are seen in Ruby Creek at Loc 4.

As sediment load increased and the basin filled initial spillage was across a low ridge at Loc 5 and into a narrow valley roughly conforming with the current valley of the Ringarooma River, and toward Loc 6. High granite basement at Loc 6 forced the stream to divert westward along and immediately adjacent to the southern flank of Mt Cameron. The geomorphology of this valley was controlled by a system of north-west to south-east trending Tertiary faults. Without exception these appear to have downthrown and northerly displaced western blocks.



The Endurance lead initially developed as a relatively narrow, very active stream, depositing high grade tin bearing basal gravels onto a highly decomposed granitic basement. The stream gradient profile was in the main west trending at shallow angles, locally faulting caused major diversions to the system and resulted in restrictions and sharp changes to that gradient.

Where these bends or diversions occurred they caused some damming of the stream, above the diversions the stream usually occupied a broad valley, below it usually discharged into a deep high grade pool that gradually opened out as the gradient lessened and the stream slowed down.

The unexploited section of the resource typifies this scenario. A broad shallow valley occupies the section east of the Tertiary fault, grades diminish slightly east to west and a small island of barren wash occurs immediately east of the fault where the stream system appears to become somewhat braided. West of the fault the tin bearing sequence thickens and the valley narrows. High grade tin bearing gravels were deposited in a deep pool immediately adjacent to, and downstream of the fault.

Further west the valley starts to widen, the sequence thins and the grades commence to drop. Past water bore drilling, Loc 1 and Loc 2 indicate the Lead continues, depth to basement at Loc 1 is reported to be 54.9 metres. The presence of the Lead is established by a shallow result (10.5 metres) from Loc 2 bore just to the south of Loc 1. A narrowing of the lead to the west as is reflected by current topography is thus not the case.

Prospective additional resources at Endurance are contained in three zones, specifically:

- ❖ Areas along the northern edge of the deposit between the main lead and the Mt Cameron granite massif where insufficient drilling has been conducted to accurately define the limits of the deposit. Deposits in these areas may include local high grade shed from the tin bearing granites of the massif;
- ❖ Areas along the southern edge where insufficient drilling has been conducted to accurately define the limits of the deposit; and
- ❖ The western extension where it is postulated that the system deepens and widens, that is an area that mirrors the other sections of the resource with respect to grade and size.

## 6. THE RESOURCE

Previous workers have tried to define the resource in terms of reliability of data, the JORC Code. In this study all available drill data has been converted into Imperial measurements and grade based cross sectional data accumulated as a basis on which to calculate the contained resource. Tabulation of the results of this assessment appear in Table 1.

**TABLE 1**

| <b>ORE RESOURCE SUMMARY</b>                |   |                              |                                   |                                      |            |
|--|---|------------------------------|-----------------------------------|--------------------------------------|------------|
| PROJECT                                    | Endurance                                 | TENEMENT                     | E.L. 11 / 2000                    | DATE                                 | 27/07/2003 |
| RESOURCE DEFINITION                        | AVERAGE GRADE<br>g/m3<br>SnO <sub>2</sub> | VOLUME ORE<br>m <sup>3</sup> | VOLUME O/BURDEN<br>m <sup>3</sup> | CONTAINED SnO <sub>2</sub><br>tonnes |            |
| <b>HIGH GRADE SECTION</b>                  |   |                              |                                   |                                      |            |
| <b>MAIN RESOURCE</b>                       |   |                              |                                   |                                      |            |
| BASAL WASH                                 | 983.72                                    | 1,637,395                    | 7,510,494                         | 1,611                                |            |
| <b>PROSPECTIVITY</b>                       |   |                              |                                   |                                      |            |
| NORTH SIDE                                 | 1061.57                                   | 100,933                      | 437,759                           | 107                                  |            |
| SOUTH SIDE                                 | 549.45                                    | 793,201                      | 2,897,022                         | 436                                  |            |
| WESTERN EXTENSION                          | 1200.00                                   | 1,500,000                    | 5,200,000                         | 1800                                 |            |
| <b>TOTAL INCL. PROSPECTIVITY</b>           |   | <b>4,031,529</b>             | <b>16,045,275</b>                 | <b>3,954</b>                         |            |
| <i>PREVIOUS</i>                            | <i>250.40</i>                             | <i>6,775,399</i>             | <i>1,697</i>                      |                                      |            |
| Stripping Ratio                            |   |                              | 4.0 : 1                           |                                      |            |
| <b>SURFACE TO BASEMENT</b>                 |   |                              |                                   |                                      |            |
| PREVIOUS ORE RESOURCE GRADES THIS BOUNDARY |   |                              |                                   |                                      |            |
| <b>MAIN RESOURCE</b>                       |   |                              |                                   |                                      |            |
|  | 225.26                                    | 9,109,233                    |                                   | 2,052                                |            |
| <b>PROSPECTIVITY</b>                       |   |                              |                                   |                                      |            |
| NORTH SIDE                                 | 215.74                                    | 553,643                      |                                   | 119                                  |            |
| SOUTH SIDE                                 | 160.80                                    | 3,575,098                    |                                   | 575                                  |            |
| WESTERN EXTENSION                          | 215.00                                    | 11,250,000                   |                                   | 2419                                 |            |
| <b>TOTAL INCL. PROSPECTIVITY</b>           |   | <b>24,487,974</b>            |                                   | <b>5,165</b>                         |            |
| <i>PREVIOUS</i>                            | <i>250.40</i>                             | <i>6,775,399</i>             |                                   | <i>1,697</i>                         |            |

The resource at Endurance is thus quoted as a "Measured Mineral Resource of: 1,643,395 m<sup>3</sup> containing an average grade of 983.72 gm / m<sup>3</sup> of SnO<sub>2</sub> at 70% Sn or 1,611 tonnes of SnO<sub>2</sub> concentrate. Stripping ratio of Overburden to Ore is quoted at 4.6 : 1.

In addition to the "Measured" resource the Endurance Project is also considered to have the following prospectivity, three areas, specifically:

a. NORTHERN RESOURCE EDGE:

100,933 m<sup>3</sup> at an average grade of 1,061.57 gm / m<sup>3</sup> SnO<sub>2</sub> at 70% Sn or 107 tonnes of SnO<sub>2</sub> concentrate.

b. SOUTHERN RESOURCE EDGE:

793,201 m<sup>3</sup> at an average grade of 549.45 gm / m<sup>3</sup> SnO<sub>2</sub> at 70% Sn or 436 tonnes of SnO<sub>2</sub> concentrate.

c. WESTERN EXTENSION:

1,500,000 m<sup>3</sup> at an average grade of 1,200 gm / m<sup>3</sup> SnO<sub>2</sub> at 70% Sn or 1,800 tonnes of SnO<sub>2</sub> concentrate.

## 7. CONCLUSIONS

This assessment has enabled the following conclusions to be made, specifically:

- a. The current resource base at the Endurance Project is considered to be:
  - ❖ The Main Resource  
1,643,550 m<sup>3</sup> containing an average of 982.34 gm / m<sup>3</sup> of SnO<sub>2</sub> as concentrate at a grade of 70% Sn, 1,615 tonnes of SnO<sub>2</sub> concentrate.
  - ❖ Prospectivity  
2,394,134 m<sup>3</sup> containing an average of 978.63 gm / m<sup>3</sup> of SnO<sub>2</sub> as concentrate at a grade of 70% Sn, 2,343 tonnes of SnO<sub>2</sub> concentrate.
- b. Application of selective cut-off grade parameters indicates that overburden material can be selectively removed from the resource at stripping ratios of 4.6 : 1, "Overburden to Ore".
- c. There does not appear to be any further areas of prospectivity within the current tenement. Minor tin bearing shed from the southern slopes of Mt Cameron may have developed localised, shallow, high grade deposits similar to those originally worked at Clifton Creek. Some investigation of all streams shedding from Mt Cameron should be undertaken.

## 8. RECOMMENDATIONS

It is recommended that:

- a. Mineral Holdings immediately make application for a Retention License over the four sub-blocks comprising the current Exploration License, that is, the tenement covering the Measured Mineral Resource.
- b. The current map data be digitized and AMG co-ordinates for all old drill holes be included in an upgraded set of drill logs.
- c. All drill data be transferred to electronic format.
- d. The Company commence a pre-mining feasibility study including mining, treatment and environmental assessments of the resource.
- e. The Company undertake an economic assessment based on the results of the studies detailed in (c) above.

## 9. SITE LOGISTICS

Current logistics at this project site are excellent, see Figure 2 and can be summarized as follows:

- ❖ **ACCESS:** Access to the project site is from Gladstone or Pioneer Townships along the public road system. An excellent gravelled track from that road provides access to the Project area, a distance of about 3 kilometres to the proposed Treatment Plant Site. being a
- ❖ **WATER SUPPLY:** A pump site is available on the existing mine pond which is estimated to have a 3,000 megalitre capacity. Further make-up water can be pumped from the Ringarooma River under the public road and allow to gravitate to the pond.
- ❖ **POWER:** Mains electric power is available at the main road approximately 3 kilometre east of the proposed Treatment Plant Site.
- ❖ **COMMUNICATIONS:** Telstra cabling is located at the main road and a local cable can be run along the access track to the plant site. Locally mobile (cell) phone coverage is intermittent as a direct line of sight from the Mt Horror repeater is masked by Mt Cameron.
- ❖ **STAFF ACCOMMODATION:** With the site local to three townships, it is not envisaged that it will be necessary to house staff and employees either on site or in Gladstone. Depending on who is appointed as Manager it may be necessary to arrange for his accommodation at Company cost. Suitable rental housing is available in all townships
- ❖ **TREATMENT PLANT SITE:** The site depicted on the plan is considered central to the deposit and will allow discharge of tailings into old ponds.

## 10. APPENDICES

### 10.1 SECTIONAL DATA



## ALLUVIAL DRILL HOLE RESULT SUMMARY

PROJECT: Endurance

TENEMENT: E.L 11/2000

DATE: 20/09/2002

SECTION LINE 2

WESTERN RESOURCE

| HOLE NUMBER            | R.L.<br>m | BASEMENT | ORIGINAL DATA   |                                  |                   | RECALCULATION     |                 |                                  |                   |
|------------------------|-----------|----------|-----------------|----------------------------------|-------------------|-------------------|-----------------|----------------------------------|-------------------|
|                        |           |          | DEPTH WASH<br>m | GRADE WASH<br>g / m <sup>3</sup> | WEIGHTED<br>D X G | DEPTH<br>O/B<br>m | DEPTH WASH<br>m | GRADE WASH<br>g / m <sup>3</sup> | WEIGHTED<br>D X G |
| A 353                  | 72.79     | 25.60    | 25.60           |                                  |                   |                   |                 |                                  |                   |
| P 137                  | 72.48     | 22.86    | 22.86           | 86.64                            | 1,980.59          | 10.67             | 3.05            | 618.13                           | 1,885.30          |
| A 101                  | 72.18     | NTB      | 31.85           |                                  |                   |                   |                 |                                  |                   |
| P 136                  | 71.87     | 24.38    | 24.38           | 1.74                             |                   |                   |                 |                                  |                   |
| P 169                  | 71.57     | 24.69    | 25.91           | 65.51                            | 1,697.36          | 21.34             | 4.57            | 370.08                           | 1,691.27          |
| P 110                  | 71.26     | 24.69    | 25.91           | 53.38                            | 1,383.08          | 22.86             | 3.05            | 468.24                           | 1,428.13          |
| P 170                  | 71.29     | 25.91    | 25.91           | 12.23                            | 316.88            | 24.38             | 1.52            | 115.69                           | 175.85            |
| P 111                  | 71.20     | 27.43    | 27.43           | 239.79                           | 6,577.44          | 22.86             | 4.57            | 1,367.75                         | 6,250.62          |
| P 171                  | 71.14     | 26.82    | 27.43           | 268.73                           | 7,371.26          | 22.86             | 4.57            | 1,609.13                         | 7,353.72          |
| P 112                  | 71.14     | 26.21    | 27.43           | 102.72                           | 2,817.61          | 24.38             | 3.05            | 886.07                           | 2,702.51          |
| P 172                  | 71.14     | 26.21    | 28.96           | 964.20                           | 27,923.23         | 22.86             | 6.10            | 4,538.20                         | 27,683.02         |
| P 113                  | 71.08     | 28.96    | 28.96           | 663.89                           | 19,226.25         | 22.86             | 6.10            | 3,136.00                         | 19,129.60         |
| P 173                  | 70.99     | 27.43    | 27.43           | 37.36                            | 1,024.78          | 25.91             | 1.52            | 404.17                           | 614.34            |
| P 114                  | 70.99     | 27.74    | 27.43           | 43.53                            | 1,194.03          | 22.86             | 4.57            | 245.81                           | 1,123.35          |
| P 174                  | 71.01     | 27.74    | 28.96           | 94.30                            | 2,730.93          | 24.38             | 4.58            | 564.00                           | 2,583.12          |
| P 115                  | 70.96     | 26.82    | 28.65           | 277.51                           | 7,950.66          | 22.86             | 5.79            | 1,357.44                         | 7,859.58          |
| P 175                  | 71.26     | 25.91    | 25.91           | 50.56                            | 1,310.01          | 24.38             | 1.52            | 736.78                           | 1,119.91          |
| P 140                  | 71.20     | 27.13    | 27.13           | 199.58                           | 5,414.61          | 22.86             | 4.27            | 1,251.48                         | 5,343.82          |
| A 109                  | 71.14     | 44.81    | 44.81           |                                  |                   |                   |                 |                                  |                   |
| P 221                  | 71.17     | 24.08    | 25.91           | 11.56                            | 299.52            | 24.08             |                 |                                  |                   |
| A 110                  | 71.20     | 43.28    | 43.28           |                                  |                   |                   |                 |                                  |                   |
| P 222                  | 71.20     | 19.81    | 19.81           | 1.19                             | 23.57             | 19.81             |                 |                                  |                   |
| A 111                  | 71.20     | 38.71    | 38.71           |                                  |                   |                   |                 |                                  |                   |
| A 112                  | 71.29     | 27.13    | 27.13           |                                  |                   |                   |                 |                                  |                   |
| A 113                  | 71.26     | 27.43    | 27.43           |                                  |                   |                   |                 |                                  |                   |
| A 114                  | 71.20     | 24.99    | 24.99           |                                  |                   |                   |                 |                                  |                   |
| A 162                  | 71.23     | 24.69    | 24.69           |                                  |                   |                   |                 |                                  |                   |
| A 163                  | 71.66     | 17.68    | 17.68           |                                  |                   |                   |                 |                                  |                   |
| A 164                  | 71.81     | 21.95    | 21.95           |                                  |                   |                   |                 |                                  |                   |
| A 165                  | 72.08     | 17.68    | 17.68           |                                  |                   |                   |                 |                                  |                   |
| A 166                  | 72.30     | 8.08     | 8.08            |                                  |                   |                   |                 |                                  |                   |
| A 167                  | 72.60     | 14.33    | 14.33           |                                  |                   |                   |                 |                                  |                   |
| A 168                  | 71.81     | 20.42    | 20.42           |                                  |                   |                   |                 |                                  |                   |
| A 169                  | 72.30     | 30.33    | 30.33           |                                  |                   |                   |                 |                                  |                   |
| A 170                  | 72.39     | 35.97    | 35.97           |                                  |                   |                   |                 |                                  |                   |
| A 171                  | 72.60     | 41.45    | 41.45           |                                  |                   |                   |                 |                                  |                   |
| <b>TOTALS</b>          |           |          | 305.72          |                                  | 83,540.82         | 338.32            | 58.83           |                                  | 86,944.13         |
|                        |           |          |                 |                                  |                   |                   |                 |                                  |                   |
|                        |           |          | 27.79           | 273.26                           |                   | 22.55             | 3.92            | 1,477.89                         |                   |
|                        |           |          |                 |                                  |                   |                   |                 |                                  |                   |
| <b>STRIPPING RATIO</b> |           |          |                 |                                  |                   |                   |                 | <b>5.61 : 1</b>                  |                   |



## ALLUVIAL DRILL HOLE RESULT SUMMARY

PROJECT: Endurance

TENEMENT: E.L 11/2000

DATE: 20/09/2002

SECTION LINE 4

WESTERN RESOURCE

| HOLE NUMBER     | R.L.<br>m | BASEMENT    | ORIGINAL DATA   |                                  |                   | RECALCULATION     |                 |                                  |                   |
|-----------------|-----------|-------------|-----------------|----------------------------------|-------------------|-------------------|-----------------|----------------------------------|-------------------|
|                 |           |             | DEPTH WASH<br>m | GRADE WASH<br>g / m <sup>3</sup> | WEIGHTED<br>D X G | DEPTH<br>O/B<br>m | DEPTH WASH<br>m | GRADE WASH<br>g / m <sup>3</sup> | WEIGHTED<br>D X G |
| P 229           | 72.02     | 26.82       | 27.43           | 14.64                            | 401.58            | 25.91             | 1.52            | 146.84                           | 223.20            |
| P 217           | 71.99     | 28.04       | 28.96           | 17.62                            | 510.28            | 24.38             | 1.52            | 124.96                           | 189.94            |
| P 228           | 72.05     | 28.65       | 28.96           | 8.90                             | 257.74            | 28.65             |                 |                                  |                   |
| P 218           | 72.18     | 29.57       | 30.48           | 9.37                             | 285.60            | 29.57             |                 |                                  |                   |
| P 227           | 72.21     | 29.57       | 30.48           | 10.17                            | 309.98            | 25.91             | 1.52            | 114.21                           | 173.60            |
| P 101           | 72.21     | 30.48       | 30.48           | 39.08                            | 1,191.16          | 25.91             | 4.57            | 229.34                           | 1,048.08          |
| P 226           | 72.21     | 31.39       | 32.00           | 355.09                           | 11,362.88         | 27.43             | 4.57            | 2,474.32                         | 11,307.64         |
| P 102           | 72.24     | 29.87       | 30.48           | 17.34                            | 528.52            | 28.96             | 1.52            | 186.88                           | 284.06            |
| P 225           | 72.30     | 29.57       | 30.48           | 12.74                            | 388.32            | 28.96             | 1.52            | 149.43                           | 227.13            |
| P 103           | 72.33     | 30.48       | 30.48           | 49.14                            | 1,497.79          | 27.43             | 3.05            | 427.09                           | 1,302.62          |
| P 224           | 72.45     | 28.96       | 30.48           | 23.87                            | 727.56            | 27.43             | 3.05            | 210.96                           | 643.43            |
| P 104           | 72.69     | 30.78       | 30.48           | 20.20                            | 615.70            | 27.43             | 3.05            | 179.69                           | 548.05            |
| P 223           | 72.66     | 32.00       | 30.48           | 19.60                            | 597.41            | 27.43             | 3.05            | 168.17                           | 512.92            |
| P 105           | 72.69     | 31.09       | 30.48           | 0.07                             | 2.13              | 31.09             |                 |                                  |                   |
| P 190           | 72.54     | 28.97       | 28.96           | 21.09                            | 610.77            | 27.43             | 1.53            | 145.35                           | 222.39            |
| P 106           | 73.03     | 32.00       | 33.53           | 172.02                           | 5,767.83          | 25.91             | 7.62            | 735.87                           | 5,607.33          |
| P 191           | 72.98     | NOT DRILLED |                 |                                  |                   |                   |                 |                                  |                   |
| P 107           | 72.94     | 30.78       | 32              | 232.14                           | 7428.48           | 25.91             | 6.09            | 1,219.79                         | 7,428.52          |
| P 139           | 72.85     | 28.96       | 28.96           | 7.03                             | 203.59            | 28.96             |                 |                                  |                   |
| A 210           | 73.15     | 36.27       | 36.27           |                                  |                   |                   |                 |                                  |                   |
| A 211           | 73.18     | 23.47       | 23.47           |                                  |                   |                   |                 |                                  |                   |
| A 212           | 73.03     | 16.46       | 16.46           |                                  |                   |                   |                 |                                  |                   |
| A 213           | 72.94     | 19.81       | 19.81           |                                  |                   |                   |                 |                                  |                   |
| A 214           | 73.00     | 16.46       | 16.46           |                                  |                   |                   |                 |                                  |                   |
| A 215           | 72.84     | NOT DRILLED |                 |                                  |                   |                   |                 |                                  |                   |
| A 216           | 72.88     | 18.29       | 18.29           |                                  |                   |                   |                 |                                  |                   |
| A 217           | 72.94     | 29.26       | 29.26           |                                  |                   |                   |                 |                                  |                   |
| A 218           | 73.06     | 36.58       | 36.58           |                                  |                   |                   |                 |                                  |                   |
| A 219           | 74.49     | 38.10       | 38.10           |                                  |                   |                   |                 |                                  |                   |
| A 220           | 75.50     | 41.45       | 41.45           |                                  |                   |                   |                 |                                  |                   |
| A 221           | 75.99     | 43.28       | 43.28           |                                  |                   |                   |                 |                                  |                   |
| A 222           | 75.90     | 40.84       | 40.84           |                                  |                   |                   |                 |                                  |                   |
| A 223           | 75.83     | 39.62       | 39.62           |                                  |                   |                   |                 |                                  |                   |
| A 224           | 75.16     | 41.15       | 41.15           |                                  |                   |                   |                 |                                  |                   |
| A 225           | 74.25     | 40.54       | 40.54           |                                  |                   |                   |                 |                                  |                   |
| A 226           | 72.36     | 41.15       | 41.15           |                                  |                   |                   |                 |                                  |                   |
| TOTALS          |           |             | 214.88          |                                  | 15,718.17         | 331.32            | 39.62           |                                  | 29,132.18         |
|                 |           |             | 30.70           | 73.15                            |                   | 30.12             | 3.60            | 735.29                           |                   |
| STRIPPING RATIO |           |             |                 |                                  |                   |                   |                 | 8.01 : 1                         |                   |













## 10.2 RESOURCE CALCULATION SHEETS

## ORE RESOURCE CALCULATION SHEET

PROJECT: Endurance

TENEMENT: E.L 11/2000

DATE: 20/09/2002

OVERBURDEN INCLUSIVE

MAIN RESOURCE

WESTERN RESOURCE

| SECTION NUMBER  | ORIGINAL DATA  |                 |                                     |  |                   |                          |   |
|-----------------|----------------|-----------------|-------------------------------------|--|-------------------|--------------------------|---|
|                 | AVERAGE        | SEPARATION<br>m | SECTIONAL<br>AREA<br>m <sup>2</sup> | AVERAGE<br>GRADE<br>g / m <sup>3</sup> | WEIGHTED<br>A X G | VOLUME<br>m <sup>3</sup> | WEIGHTED<br>GRADE<br>g / m <sup>3</sup> |
| 0               |                |                 | 0.00                                | 201.68                                 | 0.00              |                          |   |
| <b>0 - 1</b>    | <b>Average</b> | <b>60</b>       |                                     | <b>201.68</b>                          |                   | <b>118,000</b>           | <b>23,798,240</b>                       |
| 1               |                |                 | 5,900                               | 201.68                                 | 1,189,912         |                          |   |
| <b>1 - 2</b>    | <b>Average</b> | <b>260</b>      |                                     | <b>239.56</b>                          |                   | <b>1,627,978</b>         | <b>389,990,421</b>                      |
| 2               |                |                 | 6,630                               | 273.26                                 | 1,811,714         |                          |   |
| <b>2 - 3</b>    | <b>Average</b> | <b>177</b>      |                                     | <b>224.07</b>                          |                   | <b>1,206,984</b>         | <b>270,451,032</b>                      |
| 3               |                |                 | 7,010                               | 177.55                                 | 1,244,626         |                          |   |
| <b>3 - 4</b>    | <b>Average</b> | <b>122</b>      |                                     | <b>126.05</b>                          |                   | <b>843,910</b>           | <b>106,373,159</b>                      |
| 4               |                |                 | 6,825                               | 73.15                                  | 499,249           |                          |   |
| <b>4 - 5W</b>   | <b>Average</b> | <b>60</b>       |                                     | <b>216.95</b>                          |                   | <b>398,803</b>           | <b>86,520,223</b>                       |
| 5W              |                |                 | 6,470                               | 216.95                                 | 1,403,667         |                          |   |
| <b>5W - 6</b>   | <b>Average</b> | <b>40</b>       |                                     | <b>129.42</b>                          |                   | <b>315,581</b>           | <b>40,843,321</b>                       |
| 6               |                |                 | 9,400                               | 170.28                                 | 1,600,632         |                          |   |
| <b>6 - 7</b>    | <b>Average</b> | <b>100</b>      |                                     | <b>334.17</b>                          |                   | <b>936,498</b>           | <b>312,944,991</b>                      |
| 7               |                |                 | 9,330                               | 499.28                                 | 4,658,282         |                          |   |
| <b>7 - 8</b>    | <b>Average</b> | <b>150</b>      |                                     | <b>415.51</b>                          |                   | <b>1,100,993</b>         | <b>457,470,423</b>                      |
| 8               |                |                 | 5,516                               | 273.81                                 | 1,510,336         |                          |   |
| <b>8 - 9</b>    | <b>Average</b> | <b>180</b>      |                                     | <b>161.23</b>                          |                   | <b>1,051,632</b>         | <b>169,552,124</b>                      |
| 9               |                |                 | 6,175                               | 60.66                                  | 374,576           |                          |   |
| <b>9 - 10</b>   | <b>Average</b> | <b>150</b>      |                                     | <b>115.17</b>                          |                   | <b>1,088,854</b>         | <b>125,402,492</b>                      |
| 10              |                |                 | 8,400                               | 155.24                                 | 1,304,016         |                          |   |
| <b>10 - 11</b>  | <b>Average</b> | <b>150</b>      |                                     | <b>163.30</b>                          |                   | <b>420,000</b>           | <b>68,586,000</b>                       |
| 11              |                |                 | 0                                   | 155.24                                 | 0.00              |                          |   |
| <b>TOTAL</b>    |                |                 |                                     |  |                   |                          | <b>2,051,932,427</b>                    |
| <b>AVERAGES</b> |                |                 |                                     | <b>225.26</b>                          |                   | <b>9,109,233</b>         |   |

CONTAINED TIN CONCENTRATE

2,052 tonnes

PREVIOUS RESOURCE

250.4

6,775,399

CONTAINED TIN CONCENTRATE

1,697 tonnes

## ORE RESOURCE CALCULATION SHEET

PROJECT: Endurance

TENEMENT: E.L 11/2000

DATE: 20/09/2002

OVERBURDEN ONLY

WESTERN RESOURCE

| SECTION NUMBER | RECALCULATED DATA |                 |                                     |  |                   |                          |   |
|----------------|-------------------|-----------------|-------------------------------------|--|-------------------|--------------------------|---|
|                | AVERAGE           | SEPARATION<br>m | SECTIONAL<br>AREA<br>m <sup>2</sup> | AVERAGE<br>GRADE<br>g / m <sup>3</sup> | WEIGHTED<br>A X G | VOLUME<br>m <sup>3</sup> | WEIGHTED<br>GRADE<br>g / m <sup>3</sup> |
| 0              |                   |                 | 0.00                                |  |                   |                          |   |
| 0 - 1          | Average           | 60              |                                     |  |                   | 96,400                   |   |
| 1              |                   |                 | 4,820                               |  |                   |                          |   |
| 1 - 2          | Average           | 260             |                                     |  |                   | 1,332,987                |   |
| 2              |                   |                 | 5,440                               |  |                   |                          |   |
| 2 - 3          | Average           | 177             |                                     |  |                   | 997,283                  |   |
| 3              |                   |                 | 5,831                               |  |                   |                          |   |
| 3 - 4          | Average           | 122             |                                     |  |                   | 721,666                  |   |
| 4              |                   |                 | 6,000                               |  |                   |                          |   |
| 4 - 5W         | Average           | 60              |                                     |  |                   | 345,019                  |   |
| 5W             |                   |                 | 5,670                               |  |                   |                          |   |
| 5W - 6         | Average           | 40              |                                     |  |                   | 305,467                  |   |
| 6              |                   |                 | 9,400                               |  |                   |                          |   |
| 6 - 7          | Average           | 100             |                                     |  |                   | 803,322                  |   |
| 7              |                   |                 | 6,740                               |  |                   |                          |   |
| 7 - 8          | Average           | 150             |                                     |  |                   | 808,938                  |   |
| 8              |                   |                 | 4,150                               |  |                   |                          |   |
| 8 - 9          | Average           | 180             |                                     |  |                   | 869,523                  |   |
| 9              |                   |                 | 5,545                               |  |                   |                          |   |
| 9 - 10         | Average           | 150             |                                     |  |                   | 903,888                  |   |
| 10             |                   |                 | 6,520                               |  |                   |                          |   |
| 10 - 11        | Average           | 150             |                                     |  |                   | 326,000                  |   |
| 11             |                   |                 | 0                                   |  |                   |                          |   |
| TOTAL          |                   |                 |                                     |  |                   |                          |   |
| AVERAGES       |                   |                 |                                     |  |                   | 7,510,494                |   |

## ORE RESOURCE CALCULATION SHEET

PROJECT: Endurance

TENEMENT: E.L 11/2000

DATE: 20/09/2002

BASAL WASH ONLY

WESTERN RESOURCE

| SECTION NUMBER | RECALCULATED DATA |                 |                                     |  |                   |                          |   |
|----------------|-------------------|-----------------|-------------------------------------|--|-------------------|--------------------------|---|
|                | AVERAGE           | SEPARATION<br>m | SECTIONAL<br>AREA<br>m <sup>2</sup> | AVERAGE<br>GRADE<br>g / m <sup>3</sup> | WEIGHTED<br>A X G | VOLUME<br>m <sup>3</sup> | WEIGHTED<br>GRADE<br>g / m <sup>3</sup> |
| 0              |                   |                 | 0.00                                | 1,146.48                               | 0.00              |                          |   |
| 0 - 1          | Average           | 60              |                                     | 226.54                                 |                   | 21,600                   | 4,893,264                               |
| 1              |                   |                 | 1,080                               | 1,146.48                               | 1,238,198         |                          |   |
| 1 - 2          | Average           | 260             |                                     | 1,320.21                               |                   | 294,984                  | 389,442,811                             |
| 2              |                   |                 | 1,190                               | 1,477.89                               | 1,758,689         |                          |   |
| 2 - 3          | Average           | 177             |                                     | 1,276.74                               |                   | 209,744                  | 267,789,523                             |
| 3              |                   |                 | 1,180                               | 1,073.89                               | 1,267,190         |                          |   |
| 3 - 4          | Average           | 122             |                                     | 937.08                                 |                   | 120,032                  | 112,479,438                             |
| 4              |                   |                 | 800                                 | 735.29                                 | 588,232           |                          |   |
| 4 - 5W         | Average           | 60              |                                     | 1,189.89                               |                   | 48,000                   | 57,114,914                              |
| 5W             |                   |                 | 800                                 | 1,361.00                               | 1,088,800         |                          |   |
| 5W - 6         | Average           | 40              |                                     | 801.20                                 |                   | 34,176                   | 27,382,071                              |
| 6              |                   |                 | 910                                 | 859.14                                 | 781,817           |                          |   |
| 6 - 7          | Average           | 100             |                                     | 1,112.77                               |                   | 167,841                  | 186,767,650                             |
| 7              |                   |                 | 2,590                               | 1,201.88                               | 3,112,869         |                          |   |
| 7 - 8          | Average           | 150             |                                     | 1,117.40                               |                   | 291,763                  | 326,016,107                             |
| 8              |                   |                 | 1,365                               | 957.11                                 | 1,306,455         |                          |   |
| 8 - 9          | Average           | 180             |                                     | 802.11                                 |                   | 175,340                  | 140,642,227                             |
| 9              |                   |                 | 630                                 | 466.28                                 | 293,756           |                          |   |
| 9 - 10         | Average           | 150             |                                     | 460.51                                 |                   | 179,915                  | 82,853,170                              |
| 10             |                   |                 | 1,880                               | 458.58                                 | 862,130           |                          |   |
| 10 - 11        | Average           | 150             |                                     | 163.30                                 |                   | 94,000                   | 15,350,200                              |
| 11             |                   |                 | 0                                   | 458.58                                 | 0.00              |                          |   |
| TOTAL          |                   |                 |                                     |  |                   |                          | 1,610,731,376                           |
| AVERAGES       |                   |                 |                                     | 983.72                                 |                   | 1,637,395                |   |

CONTAINED TIN CONCENTRATE

1,611 tonnes

PREVIOUS RESOURCE

250.4

6,775,399

CONTAINED TIN CONCENTRATE

1,697

tonnes