MINERAL HOLDINGS AUSTRALIA 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:

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Neil R. Kinnane – Geologist.

Fell.RMIT., Ass.RMIT (Geology).

FAusIMM, CPGeo., MGSAust., MGSAmer.

MAIG., AssGSCanada.

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 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 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 Mineral Holdings asked the author to conduct 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. This study indicates that by recalculating the resource to exclude the barren overburden, an increase in the overall quantity of contained tin concentrate can be achieved.

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1.0 INTRODUCTION

The Endurance Project area is located in the north central section of the extensive Ringarooma River alluvial tinfield, a mineralised province that has historically produced in excess of 40,000 tonnes of tin from operations varying from small scale hand mining through to large scale dredging.

The Endurance alluvial deposits are in part derived from locally from streams shedding southwards from the Mt Cameron granitic massif and in part from tin bearing sediments forming part of the ancestral Ringarooma River alluvial system. The resource is contained within a deeply incised east-west trending channel lying immediately adjacent to the southern edge of the massif. See Figure 2 and 3.

The principal cassiterite deposits are concentrated in a basal alluvial horizon resting immediately on granitic bedrock. The deposit consists of coarse, granite-derived sands with a high felspathic component, often difficult to distinguish from weathered basement, and erratically distributed throughout these deposits gravel, pebble, cobble and boulder size fragments derived from granite and metamorphic sources, some ferruginous cement has been observed. The basal mineralised zone is in turn overlain by a horizon consisting of clayey sands and sandy clays.

Post depositional faulting has displaced the deposit, the fault trending north west – south east and lying west of the current mined area has a downthrow on the west of some 14 metres and a horizontal movement of the western block, 135 metres to the north.

While the bulk of the cassiterite is medium to fine grained, < 2.0 mm. Locally coarse fractions are recorded in sections of the lead proximal to the Mt Cameron massif, that is, where it has been fed by streams shedding mineralised zones in that massif. In addition to cassiterite the deposits contain zircon, monazite, ilmenite with minor rutile and corundum. The abundance of these accessory minerals varies dependant on the position in the deposits in relation to both gradient and source.

Previous resource calculations have included both the cassiterite bearing basal wash and the barren overburden or "drift" of the old miners. By application of a 200 gm / m^3 cut-off grade and exclusion of the barren overburden it can be shown that the areal extent of the resource can be increased that in turn results in an increase in contained tin concentrates. Further the resource remains open to the west, further drilling in that region would be expected to also increase the resource base.

2.0 LOCATION AND ACCESS

The project area is located in northeastern Tasmania approximately 83 kilometres northeast of the northern City of Launceston. More specifically the project is located proximal to the south of the Mt Cameron massif approximately 7 kilometres south west of the township of Gladstone. See Figure 1.

Access to the area is excellent. All weather roads provide vehicular access from Launceston. The northern link via the towns of Bridport and Tomahawk, the southern link via Scottsdale, Branxholm, Derby and Pioneer. In recent years upgrading of these roads has reduced the incidence of road closures due to flooding although extremely wet weather may cause local access difficulties around the Project site. Bulldozed and graded sandy gravel bush tracks provide access throughout the Project area.

3.0 TOPOGRAPHY AND CLIMATE

The project area occupies a relatively flat basin like depression immediately adjacent to the southern slopes of Mt Cameron at elevations of around 50 metres above sea level (ASL). From the northern boundary of the project area the topography rises sharply to the peak of Mt Cameron at an elevation of 551 metres ASL. See Figures 2 and 3.

The drainage is dominantly east into the Ringarooma River and west into the Boobyalla River. Both those streams flow northward into Ringarooma Bay.

Climate is typically temperate maritime with four seasons and moderate temperatures. Locally winter is the coldest and wettest period. Daily winter temperatures (June to October) range from below 0^{O}C to maximums in the 15 to 20^{O}C range and in summer (November to February) from 15^{O}C up to 30^{O}C. Average annual rainfall varies from 890 mm to 1020 mm.

4.0 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. 10th Floor 100 Collins Street, MELBOURNE, Vic 3000.
Contact	Mr. Neil Thomas. Managing Director
Contact Point	Phone: +61 3 9654 7999 Fax: +61 3 9650 3855 Email: tominex@bigpond .com

5.0 HISTORICAL BACKGROUND

The following historical data has been reproduced from a report by Amdex Mining dated 24th 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/m3) 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^3.

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 proved 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_2 / m^3.

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

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^3. 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^3.

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^3 of wash at average grades of 333 grams/m^3 however costs in working the deeper ground had risen to 19.6 cents / m^3. By 1954 profitability of mining the deeper ground had become a problem, costs had risen to around 32.7 cents /m^3 for a recovered grade of only 285 grams/m^3.

In summary, the period 1946 to 1959 saw the Endurance Lead produce 1,220 tonnes of tin concentrates from some 3.82 million m^3 of alluvial wash for an average grade of 319 grams / m^3 SnO_2. 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^3. 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^3 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 Shapwloff. 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.

6.0 DATA ASSESSMENT

In preparing this Resource Statement as much of the previous exploration data as was available from both within the files of Mineral Holdings and on Open File at the Department of Minerals and Energy, Tasmania was accumulated and assessed.

6.1 PREVIOUS EXPLORATION DATA

Early exploration drill results of the Department of Mines (1958, 1968 – 1969) and the Endurance Tin Mining Company (1943) were not initially available and have only just been located on "Open File".

The most reliable data package appears to be the work by B.M.I and Amdex Mining. Detailed logs are now available as are various plans depicting drill hole and resource locations.

The most recent and definitive work is that by Amdex in 1980. That group completely recalculated the resource converting all previous "Imperial "measurements to "Metric" and plotted boundaries of all worked ground. It should be noted however that Amdex continued the practice of calculating grades "Top to Bottom" or "Whole of Hole" of the drill holes probably because current mining practice at the time was to treat the resource "Top to Bottom".

The grades used in the Amdex assessment were based on holes drilled by the Department of Mines, Endurance Tin Mining Company and B.M.I. The holes were drilled at 15 metre intervals along lines that varied in separation from 48 to 259 metres. Line spacings average 150 metres. It is unclear from the Amdex work if volumes and grades quoted are "Bank" or "Loose" and a more detailed recalculation of the resource are considered essential to qualify the volume and grade types.

6.2 RECENT TESTING AND ASSESSMENT PROGRAMS

In June 2001 Mineral Holdings undertook a program of pitting, bulk sampling and sample treatment at the Monarch Project. Following the success of that program that included a re-assessment of the resource it was decided to briefly review the resource base at the Endurance Project. This involved several on site inspections of the worked areas and included the collection of several alluvial heavy mineral concentrates to determine if valuable accessory minerals also occurred in conjunction with the cassiterite.

An inspection of the Endurance data indicated that the Amdex resource was based on drill hole grades averaged "Top to Bottom" of all holes so that the resource included a substantial volume of barren overburden or "drift". Mineral Holdings in its work at the Monarch had already established that by removing this barren material from the resource calculation it was possible to increase the areal extent of the resource and also increase the volume of contained tin concentrate.

In order to establish if the same procedure would be successful at the Endurance Project three holes were selected at random and grades recalculated after deletion of barren surface zones. This work proved successful and it is a recommendation of this report that a full re-calculation of the resource be undertaken deleting from the calculations all barren surface zones.

6.3 RESULTS OF THE ASSESSMENT

Three drill holes were selected at random from the large number of holes available, specifically Holes P118, P127 and P175. All data were converted from "Imperial" to "Metric" and new intersectional grades calculated deleting any barren or low-grade surficial material. This recalculation achieved increases in grade of between 2.4X (Hole P175) to 3.6X (Hole P118). Results appear as Appendix 11.1.

Stripping ratios varied from a low of 2:1 to a high of 2.8:1. Results of this assessment appear as Table 1.

TABLE 1
ENDURANCE PROJECT
DRILL HOLE RE-ASSESSMENT

HOLE NUMBER	FROM m	TO m	INTERVAL m	GRADE gm/m^3	PREVIOUS
P118	0	21.43	21.42	O/B	
	21.34	28.97	7.63	**1,900.5**	**0 – 27.74, 27.74 m at 529.9 gm/m^3**
P127	0	39.62	39.62	O/B	
	39.62	56.08	16.46	**892.88**	**0 – 56.08, 56.08 m at 262.1 gm/m^3**
P 175	0	18.29	18.29	O/B	
	18.29	27.43	9.14	**142.88**	**0 – 26.21, 26.21 m at 58.6 gm/m^3**

Whilst the depths of barren overburden appear excessive the thickness of cassiterite bearing wash intervals reduce the stripping ratios to a manageable level of around 2 to 2.8:1. Further the removal of barren intersections brings into play areas along the margins of the Amdex resource that were excluded from the previous calculations. The effect of the inclusion of these areas and the general increases in grades are to increase the overall content of contained tin concentrates contained in the resource.

It is interesting to note that Amdex included comment in their resource report that many unsampled intervals were assigned theoretical volumes with zero grades. This methodology would have resulted in an undervaluing of nearly all of the "whole of hole" grades.

The resource is open to the west and further lines of drilling would no doubt extend the resource in a westerly direction, that is west of the post-depositional fault.

A complete recalculation of all intersections including those marginal to the Amdex resource is required before the full impact can be taken into account. It is likely that such recalculation and further drilling to the west would result in 30% to 50% increase in the contained tin concentrate resource base.

7.0 RESOURCE

The resource quoted here is that prepared by Amdex Mining in 1980 and is encompassed in two sections one east and one west of the northwest trending post depositional fault.

7.1 GRADE CALCULATIONS

Grades used by Amdex were based on grades reported in holes drilled by The Department of Mines (1958, 1968 to 1969), by the Endurance Tin Mining Company (1943) and by B.M.I (1971 to 1972). May of the holes drilled failed to report grades in the upper sections, the overburden or "drift". Amdex noted that in order to conduct the evaluation the "whole of hole" grades were calculated using only the grades from the sampled section. Unsampled intervals were assigned theoretical volumes with a zero grade.

Cut-off grade boundaries of 200 gm/m^3 and 100 gm/m^3 proved to be almost co-incident and thus Amdex only quote one reserve figure.

7.2 VOLUME CALCULATIONS

Amdex calculated reserve volumes using the cross-section method. The differences between "Geological" and "Possible" Reserves reflect the application of a mining batter of 60^O.

7.3 RESOURCE EXTENSION

An assessment of previous data indicates possible extensions to the resource base by:

- Recalculation of all drill hole data with the removal of overburden sections that, it is felt, will extend the resource boundaries into what now appears to be marginal ground; and
- Extension of the resource to the west of the area presently drilled.

8.0 RESOURCE STATEMENT

Amdex quote two different resources, specifically:

GEOLOGICAL RESOURCE

AREA	CLASS	CUT-OFF GRADE (gm/m^3 SnO_2)	VOLUME m^3	Wt.Av. Grade gm/m^3 SnO_2	CONTAINED SnO^2 tonnes
East of Fault	Probable	200 / 100	3,265,710	237.6	776
Top 18.3 m	Probable	200 / 100		37.4	81
West of Fault	Probable	200 / 100	2,171,675	343.5	746
				48.3	69
TOTAL			**5,437,385**	**307.5**	**1,672**

While slope stability at the Endurance is not known, Amdex applied the effect of batter on the geological reserves the probable mine reserves have been recalculated using a batter angle of 60^O.

POSSIBLE MINING RESERVES

AREA	CLASS	CUT-OFF GRADE (gm/m^3 SnO_2)	VOLUME m^3	Wt.Av. Grade gm/m^3 SnO_2	CONTAINED SnO^2 tonnes
East of Fault	Possible	200 / 100	3,701,700	236.1	838
West of Fault	Possible	200 / 100	3.073,699	279.3	858
TOTAL			**6,775,399**	**250.4**	**1,692**

9.0 CONCLUSIONS

Following a reassessment of the previous data it would appear that a recalculation of the resource base in respect of:

i The effect of removing barren overburden from the calculation of grade of each drill hole; and

ii Application of the removal of overburden from grade calculations in holes marginal to the resource.

Will, while decreasing the volume of the resource, will increase the grade and the content of contained cassiterite concentrate.

In addition further drilling of the resource to the west, the area currently deemed to be "Open" would also add additional volumes at grades similar to those already reported.

The effect of these additional programs, will, it is felt, increase the contained content of cassiterite concentrate in the resource by some 20% to 50%.

In reviewing the resource no effort has been made at this time to quantify the content of accessory minerals present in the basal wash zone. These minerals include, rutile, zircon, ilmenite, gold, sapphire, the REO's monazite and xenotime and possibly a tantalite/columbite mineral. While these minerals have been quantified in other resources in the region, resources that have the same mineralogical derivation as the alluvials at the Endurance, their contents at the Endurance remain conjectural. Ample evidence exists to suggest that rutile, zircon and ilmenite occur in grades of 50 to 200 gm/m^3, gold at 10 mgm/m^3, REO's in the order of 100 to 200 gm/m^3 and Ta minerals in the order of 1 to 2 gm/m^3. Sapphire has been observed in tin shed tailings and grades of 1 gm/m^3 of gem quality stone are proposed.

Clearly some work remains to be done on the Endurance Project to up-grade and increase the resource. This work should include quantitative testing for accessory minerals.

10.0 BIBLIOGRAPHY

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Ore Reserves of Alluvial Tin Deposits in Northeastern Tasmania.

Amdex Mining Limited.

11.0 APPENDIX

11.1 DRILL LOG RECALCULATION SHEETS