GEOTECH

Geotech International Pty Ltd

Annual Report

for RL10/1988 Moina

for the Period 22 October 2017 to 21 October 2018

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CHARTERED PROFESSIONAL
THE AUSTRALASIAN INSTITUTE OF MINING & METALLURGY
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ABSTRACT

This report describes the investigations and activities completed within RL10/1988 during the period 22 October 2017 to 21 October 2018.

The Tenement is located 56km SSW by road from Devonport.

The Tenement covers major occurrences of fluorite rich skarn, a smaller altered zinc and gold rich skarn, and includes the old Shepherd and Murphy mine.

Work done by Geotech International Pty Ltd during the period consisted of

- Conclude attempts to monitor progress on FAME metallurgical research.
- Field trip to recover core at Avoca was cancelled
- Review potentially valuable major, minor and trace elements
- Re-assess potentially commercial styles of mineralisation.

KEYWORDS

N Tasmania
Geology
Mineralisation
Skarn
Fluorite
Tin
Tungsten
Retention Licence

SUMMARY OF ACTIVITIES for RL10/1988 Moina
for the Period 22 October 2017 to 21 October 2018

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- Field trip to recover core at Avoca was cancelled
- Review potentially valuable major, minor and trace elements
- Re-assess potentially commercial styles of mineralisation.

CO-ORDINATES
All lat/long co-ordinates in this report refer to the GDA94 Datum, unless stated otherwise.
All AMG co-ordinates in this report refer to the GDA94 - Zone55, unless stated otherwise.

FILE SUMMARY LIST

File name	Format	Contents
RL10-1988_2018_report.pdf	pdf	Annual Report
Table2_Moina_Analyses.xlsx	xlsx	Summary analyses for Moina rocks

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1.0 INTRODUCTION

This report describes the investigations and activities completed within RL10/1988 during the period 22 October 2017 to 21 October 2018.

The Tenement is located 56km SSW by road from Devonport, in north-central Tasmania, Fig 1.

Table 1 - Tenement Details

Tenement	Holder	Date Granted	For	Size
RL10/1988 Moina	Geotech International Pty Ltd 100%	21 October 1988	All Minerals	2km^2

Crown Land for Forestry use covers most of the known mineralisation with only some of the northern and western mineralised areas within Private Land. There are no restrictive Reserves in the mineralised area.

The project lies within the Tasmania 1:25,000 map sheet of Cethana.

Access is via sealed roads, formed local roads and other rough tracks.

The Tenement covers major occurrences of fluorite rich skarn, a smaller altered zinc and gold rich skarn, and includes the old Shepherd and Murphy mine.

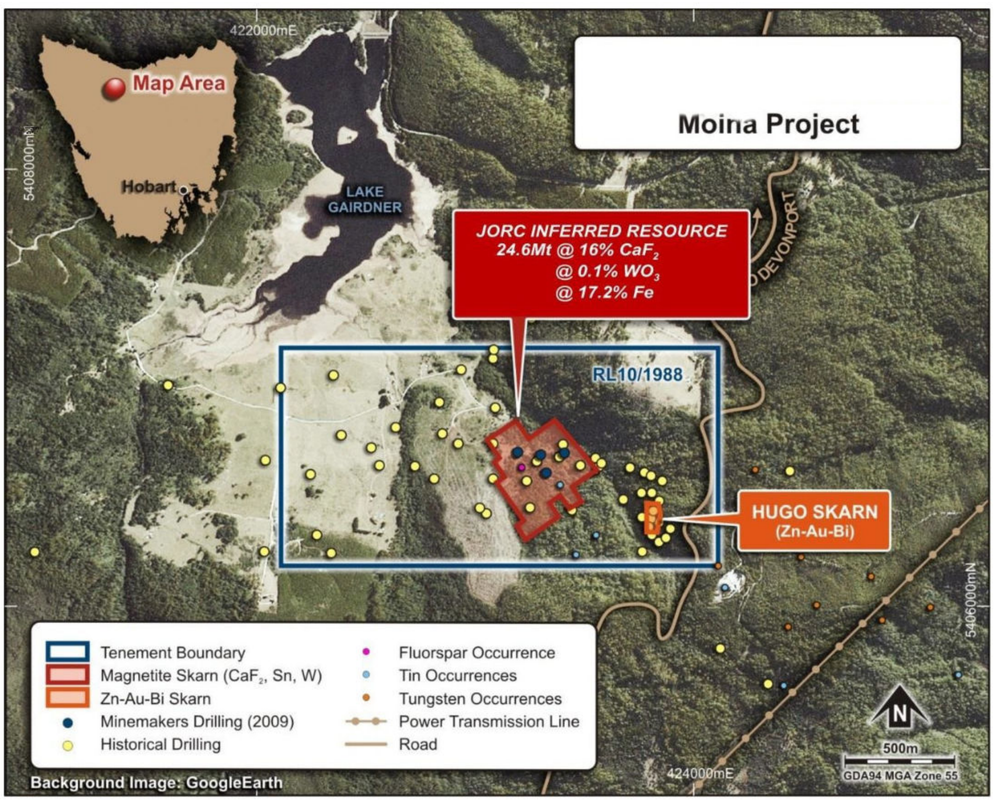

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Fig. 1 Tenement Location, Drill holes, Resource areas

2.0 GEOLOGICAL SETTING and MINERALISATION

The licence contains skarns, which have variably replaced Ordovician limestone and silty limestone. A set of tin and tungsten bearing sheeted quartz veins cuts the skarns and underlying sandstone. The hydrothermal fluids responsible for this mineralisation emanated from a Devonian granite which lies at about 200m below the surface. There has been structural preparation and control of the mineralisation by a NW trending fault system, the main fault being the Bismuth Creek Fault. A large portion of the area is covered by Tertiary basalt which locally has at its base Tertiary unconsolidated sediments.

The Ordovician sedimentary package is a graded sequence with Roland Conglomerate at the base, overlain by medium to coarse grained Moina Sandstone, in turn overlain by Gordon Limestone. These three formations are conformable, gradational, and relatively thin, typically being in the range 50m to 150m thick. The sedimentary package generally dips gently north with local perturbations near the faults. The Ordovician rocks are underlain by a Cambrian acid volcanic package.

The skarns are dominated by a characteristic finely banded, contorted, fine grained fluorite-magnetite-vesuvianite rock known as wrigglite. It carries trace to percent levels of several elements, especially tin and tungsten. A JORC compliant Inferred Mineral Resource of 24.6Mt at 1380ppm Sn, 1040ppm WO_3, 16% CaF_2 and 17% Fe was estimated by McKeown (2012).

The Devonian granite, the Dolcoath Granite, has been intersected in drilling and has been altered to greisen at its contact with sandstone.

The abandoned Shepherd and Murphy mine occurs in the southern edge of the wrigglite resource. The ore consisted of a set of about 20cm wide quartz veins usually trending E-W carrying cassiterite and wolframite, hosted by both sandstone and skarn. The mine produced at least 480t Sn, 340t WO_3, 69t Bi and some gold from intermittent production between 1893 and 1957.

Structurally the area has some complexity. The Bismuth Creek Fault, trending north-west, appears to have had several phases of movement. The Ordovician rocks adjacent to the fault have been folded, fractured and subjected to reverse fault thrusting. To the east of the Bismuth Creek fault, the Hugo’s Fault is a reverse thrust delivering sandstone above the skarn. Some further discussion of the structural complexity is in Section 4.4 of the 2017 Annual Report.

3.0 REVIEW OF PREVIOUS WORK

Prospecting around 1878 discovered the Shepherd and Murphy vein system. Especially in the 1950s several reports were completed by the Department of Mines on mineralisation in the Moina area, concentrating on the Shepherd and Murphy mine. An estimate of possible plus probable remaining reserves of 77 000t @0.2% Sn 0.4% WO_3 was made by Robinson (1957).

The first recorded modern company exploration was by the Mt Lyell Mining and Railway Company Limited ("Mt Lyell") in the early 1970s. Mt Lyell completed three diamond drill holes, exploring for vein type mineralisation. Two holes intersected wrigglite skarn but Mt Lyell did not recognize its potential.

The Tasmanian Department of Mines drilled three holes in 1972-3. One hole was located in the far west part of the Tenement, the others outside the Tenement.

In the mid to late 1970s, the Commonwealth Aluminium Corporation Limited ("Comalco") explored the area, seeking a source of fluorite for use in their aluminium smelter at Bell Bay in Northern Tasmania. Comalco undertook significant exploration, completed 15 diamond drill holes, undertook preliminary metallurgical investigations, and estimated the tonnage and grade of the Moina wrigglite resource west of the Bimuth Creek Fault to be 26.5Mt at 18% fluorite, 0.1% tin, 0.1% tungsten, (Askins, 1978, 1979).

From 1980 to 1985, The Shell Company of Australia Ltd (Shell), in joint venture with Comalco, completed several holes in an around the main skarn area.

In 1985 CRA Exploration (CRA) joined the joint venture and continued exploration, with emphasis on the retrograde zinc and gold bearing Hugo Skarn which occurs east of the Bismuth Creek fault.

In 1988 the current Retention Licence (then known as RL8810) was granted to Shell and CRA.

In 1993 a joint venture with Goldstream Mining NL (Goldstream) and Titan Resources NL (Titan) commenced over that portion of RL 8810 lying east of the Bismuth Creek Fault ("BCF"). Goldstream and Titan also held EL20/94 which surrounded RL 8810.

From 1993 until 1997 the Goldstream - Titan work was focussed on the zinc and gold potential of the Hugo Skarn, and 11 diamond drill holes were completed. A small resource of about 250,000t at approximately 0.8g/t gold, 5% zinc, and 0.07% bismuth was delineated. (Note that this resource is only the zinc and gold bearing parts of the skarn east of the BCF, and because of variable depth and sandstone overburden is probably partly not accessible by any open pit mining. East of the BCF there is also much more unquantified "normal" non-retrogressed wrigglite and calc-silicate rocks of complex distribution and variable depths below surface.)

In 1994 Shell's interest in RL 8810 was sold to Acacia Resources Ltd (Acacia), who managed the licence.

In 1999 Anglogold Australasia Ltd (Anglogold), acquired 100% ownership of Acacia, including all existing Joint Venture properties.

In 2000 Anglogold decided to withdraw as manager of the Moina Joint Venture and through to 2003 no work was done on the licence.

In 2004 the property was acquired 100% by Geotech, but with a residual right for Anglogold and RTZ to be paid a total of $250 000 upon commencement of mining (“Mining Payment Entitlement”).

In 2005 an option to purchase from Geotech 80% of the Moina licence was entered into with Minemakers NL, which intended to list on the ASX.

In late 2010 Minemakers assigned its rights in the licence to TNT Mines Ltd (TNT), as part of a demerger process where TNT was to seek separate listing on ASX.

In 2013, after unsuccessful attempts to list, TNT was acquired by the listed company Niuminco Group Ltd.

From 2006 to 2015 Minemakers and TNT’s work included a mining heritage survey, a maiden JORC resource estimate- (estimating 24.6Mt at 1380ppm Sn, 1040ppm WO_3, 16% CaF_2 and 17% Fe- for the main wrigglite body west of the BCF, excluding Hugo’s skarn- the area of the JORC resource is similar to that of the Askins 1978-9 estimates), a mining scoping study, drilling of four PQ/HQ-sized cored holes to recover wrigglite for further metallurgical studies, and various metallurgical studies including QEMSCAM analysis and Davis Tube recovery work.

In 2014 Anglogold assigned its share ($125 000) of the Mining Payment Entitlement to Franco-Nevada Australia Pty Ltd.

In 2015 TNT withdrew from the option-to-purchase agreement so Geotech now has 100% ownership of the project, with the Mining Payment Entitlement to RTZ and Franco-Nevada still extanct.

In 2016 Geotech retrieved diamond drill core and metallurgical samples, assembled past data, despatched a skarn bulk sample to Europe for FAME (Flexible and Mobile Processing) metallurgical testing, and commenced a review of exploration potential.

In 2017 Geotech unsuccessfully attempted to monitor progress of FAME metallurgical testing, and continued studies of exploration potential, with emphasis on aspects of the structural setting of mineralisation.

4.0 EXPLORATION COMPLETED DURING THE REPORT PERIOD

4.1 Assembling and organizing past data.

No further progress was made. Note that datasets used to calculate the most recent JORC compliant resource statements have yet to be retrieved.

4.2 Locating past diamond drill core.

A field trip during the year had to be cancelled (family health issues), one of the aims of which was to retrieve any drill core stored in in the former TNT office at Avoca.

4.3 Monitoring progress on FAME metallurgical research.

Several attempts were made to ascertain what metallurgical work had been done on a sample sent to Chris Broadbent, the program coordinator of this European research group. Absolutely no replies were received, so I have now abandoned any hope of getting any results or getting the sample returned.

The FAME group has published an interesting publication listing the geology and nature of European Sn, W and Li skarn, greisen and pegmatite deposits, Seltmann et al (2016). There are unfortunately no listed deposits of wrigglite type from which potentially useful metallurgical information might be gleaned.

4.4 Reviewing exploration potential.

Aspects of the potential for commercially attractive mineralisation are under continuing study. The main study findings this year follow:-

<u>Structural study of Hugo skarn area.</u>

A review of past work found that Newnham 1997 had already addressed this topic in some detail, and so priority was given to other studies, as below.

<u>Potentially valuable major, minor and trace elements.</u>

A review was done of the potentially valuable elements, especially the minor and trace elements, in rocks in the Moina area. These rocks include the unmineralized host rocks- Moina Sandstone and Gordon Limestone- and the mineralised greisenised Dolcoath Granite, calc-silicate rock, wrigglite, and Hugo's skarn.

Fluorite, tin, tungsten, bismuth, zinc and gold are the most abundant valuable known commodities at Moina. However other wrigglite skarns worldwide do carry significant abundances of beryllium, or rare earth elements; and in places indium occurs in tungsten and/or tin magmatic provinces, often within sphalerite. The wrigglite/calc-silicate rock body at Moina is probably the largest in the world and was formed from highly evolved fluids emanating from the specialised Dolcoath Granite, so it is feasible that economically attractive concentrations of other elements such as Li, Cs, B, M, Sb, U and Th could occur.

To carry out this review all previously recorded analyses from 1978 to the present for the main rock types were consulted, and ranges or typical values of all elements were tabulated, Table 2.

Regarding the calc-silicate rocks it was decided not to attempt to tabulate ranges of all available analyses for the following reasons:-

(a) Being originally interbedded siltstone and pure and dirty limestone that has been metamorphosed and variably metasomatized, and often being highly fractured and veined, means that they are inevitably mixed in composition, so that for each element the range of values can be confusing and relatively meaningless.

(b) The intervals analysed very frequently consist of pure calc-silicate rock interlayed with wrigglite, so very few analyses can be expected to reflect non-wrigglite-bearing material.

Therefore analyses quoted are for selected calc-silicate rocks described as free of veining and as free of fracture-related alteration as possible. This means that in zones where calc-silicate rocks are dominant it is likely that values for W Sn F etc can be much higher than quoted in Table 2 and be in fact similar to analyses for wrigglite zones elsewhere.

Regarding the Hugo deposit, all the skarn types from calc- silicate rocks to wrigglite and all the complex veined and retrograde altered equivalents are lumped together.

Regarding wrigglite, analyses compiled are meant to be typical rather than inclusive of extreme high values and uncommon outliers.

The study has revealed that the available analysed elements are very complete for wrigglite and less so for the calc-silicate rocks, for the Hugo skarn and for greisenised granite.
For wrigglite, elements which have not been analysed include some of the rare earth elements, and also Tc, Hf, Pt, Hg, Po, and Pu.
For calc-silicate rocks, the same elements have not been analysed, but also, importantly, the following potentially valuable elements have not been analysed: Ge, Pd, In, Os, and Ir.
For the Hugo skarn, the following potentially valuable elements have not been analysed: Ge, Ga, In, Os, Ir, Pt and Hg.
For the greisenised Dolcoath granite a number of elements are not analysed but the most important missing potentially valuable element is Cs.

The study has unfortunately not identified any heretofore unrecognized significant trace elements at Moina, however a glaring omission in analyses is indium for the Hugo skarn. Although indium is below the detection limit in wrigglite, the high sphalerite content of the Hugo skarn means that it is very possible that significant indium may occur here, and thus it should in future be analysed. Of course a downside of any high indium tenor at Hugo's skarn is that it is only a small body of about 250 000t.

Comments on each of the economically significant elements at Moina follow:

Fluorine. The fluorite at Moina occurs especially in the wrigglite. Unfortunately it is usually very fine grained, causing difficulty with conventional metallurgical beneficiation processes. A commercial resolution may be to selectively mine areas where the fluorite is coarser, and only the Hugo skarn area seems a possibility because retrograde alteration may have increased the grain size there. Some petrographic thin section descriptions in Smyth 1981 show evidence for such recrystallised fluorite but overall the descriptions (and logs of core) do not suggest that this is widespread.

Tin. Tin in wrigglite and calc-silicate rocks can locally reach around 0.7%, though the known JORC wrigglite resource contains about 0.14%. Past petrographic and metallurgical studies have shown that about 50% of tin occurs in garnet, so half the tin in wrigglite (and probably also the calc-silicate rocks) is not economically readily beneficiated; the remainder of the tin occurs as cassiterite but it can be very fine grained and so suffers low recoveries in standard beneficiation processes. As is the case for fluorite commercial resolution may be to selectively mine areas where the cassiterite is coarser, and again the Hugo skarn area seems a candidate because retrograde alteration may have increased the grain size there. This possibility has partly been addressed with petrographic studies in Smyth 1981; in chloritized zones (presumably replacing diopside and garnet) tin occurs as cassiterite but it is fine grained, less than 20 micron.
The distribution of high grade zones of tin (and tungsten) has not been fully studied, yet selective mining may enable successful exploitation.

Tungsten. Tungsten occurs mainly as scheelite, though historically wolframite was mined from quartz veins. Past petrographic and metallurgical studies have shown that scheelite occurs as mainly fine disseminated grains in wrigglite, and in fine to medium-sized grains in feldspar veinlets. The known JORC resource contains about 0.1% WO_4, but as is the case for tin, the distribution of high grade zones of tungsten has not been fully studied, and selective mining may enable successful exploitation. For example a 2.3m veined interval in MD41 at 101m carries 9570ppm W, and its extent is unknown.

Bismuth. Bismuth occurs apparently mostly as bismuthinite, though fine grained native bismuth is recorded in thin section petrographic work, Smyth 1981. Usually the wrigglite contains less than 0.1%, but bismuth nevertheless could potentially be valuable as a by-product from future mining. Bismuth tenor is much higher in retrograde altered rocks at the Hugo skarn where grades reach more than 1%. I suspect higher bismuth tenor will be more common anywhere close to the eponymous Bismuth Creek Fault.

Zinc. Tenor is low except in the retrograde altered rocks of the Hugo skarn where grades reach more than 20%. The unfortunately downside of course is that the tonnage is small.

Gold. The bulk of the wrigglite and calc-silicate rocks contain low gold, less than 0.1 g/t (ppm). The highest gold values occur in the fringes of the skarns, and especially in the Hugo Skarn which has an attractive maximum of 7g/t, and an average of about 0.8g/t. Newnham (in Mackay 1997) reviewed all past drilling at Moina and concluded that potential exists for an auriferous pyrrhotite skarn to extend at least 400m north of SMD 9 and MD 35 adjacent to a postulated fault, at depths of 100-200m. This area is readily

accessible to drill testing.
There must be other potential gold targets in the fringes of the skarn body. As evidence the Bell Creek Gold Field lies less than 1km north; here alluvial gold, with no known bedrock source, occurs.

Silver. Maximum values, but not of economic interest, around 18ppm, occur in the Hugo Skarn.

Beryllium. In the earth's crust Be ranges from 2 to 6 ppm. Therefore the Be content of wrigglite, typically around 300ppm, reaching 0.1%, is very high, but nonetheless probably not of economic interest. There is no increase in tenor in the retrograde Hugo's skarn. The nature of the mineral species in which the Be occurs in Moina wrigglite has not been studied. It is possible that some by product Be credit may be possible if in future fluorite extraction proves feasible, so this should be examined in future metallurgical studies.

Rare Earth Elements. The 17 rare-earth elements are cerium (Ce), dysprosium (Dy), erbium (Er), europium (Eu), gadolinium (Gd), holmium (Ho), lanthanum (La), lutetium (Lu), neodymium (Nd), praseodymium (Pr), promethium (Pm), samarium (Sm), scandium (Sc), terbium (Tb), thulium (Tm), ytterbium (Yb), and yttrium (Y).
Only some rare earth elements have been analysed, including Sc Y La Ce, all of which have low abundance, so it can be expected (but it is not certain!) that all rare earths even if not analysed will have low abundance.

Lithium. The greisenised Dolcoath granite contains up to 700ppm Li, which is apparently contained in micas. Although this is quite elevated it is nowhere near an economic tenor for a rock occurring at Moina beyond open-pittable depths.
There has been no metasomatic transfer of Li from granite to skarns; a tenor of less than 70ppb is recorded.

Cesium. Only a few semi-quantitative Cs analyses have been done of wrigglite and none of other rock types. Interestingly values up to 0.1% are highly anomalous, and beg further investigation for their potential economic significance. No studies of the possible mineral host have been done.

Indium. Those analyses that have been done are for wrigglite, recording less than the 10ppm detection limit in semi-quantitative analyses. However it is known that indium associated with tin deposits is located within sphalerite, yet no analyses for indium in the sphalerite rich Hugo's skarn have been done. This should be attended to because there is a growing specialised indium market.

Molybdenum. Molybdenite is overall not abundant, probably averaging less than 300ppm in wrigglite and calc-silicate rocks, but locally Mo can exceed 0.15% suggesting that in a future mine plan, zones with extractable Mo by-product should be evaluated.

Iron. Magnetite is a major component of the wrigglite but all metallurgical investigation to date has failed to produce a saleable product, because of its fine grain size and intergrown contaminants. I have always jokingly commented that the wrigglite with its high magnetite content and presence of fluorite flux, is a self-fluxing iron ore, though doubtless no iron smelter would welcome the presence of high temperature corrosive fluorine.

Rubidium. Quite high tenors of Rb, up to 0.25% in dumps (King 1964), occur in Moina rocks, but there is no potential market.

Other "long shots". Hg and Pt have not been analysed and have a slight chance of being significant.

In conclusion the study of elements making up mineralisation at Moina has identified that

(a) Fluorite, tin and tungsten are still the main valuable components, but there may be value in by-product extraction of Bi, Be, and Mo.
(b) For wrigglite and calc-silicate rocks, cesium is of potential interest and needs further study.
(c) For the Hugo skarn, indium requires analysis. The skarn is small, with high fluorite, tin, tungsten, zinc and gold content; it is possible that a significant indium content may render the deposit far more economically attractive.
(d) For greisenised granite, there are no significant quantities of lithium, nor any other element, to render it an attractive exploration target.

Moina Dumps.

In 1964 the BMR, (King 1964), reviewed the economic potential of mine dumps in Tasmania. They recorded that there were about 3500t containing 0.12%Sn, 0.1%W, 400ppm Li (I suspect this analysis is too high) and 0.5% Rb.

I have not attempted to verify if this is an accurate assessment of the tonnage and grade of dumps at Moina, but any future mining proposal will need to assess if they are a valuable resource.

Revised Mineralisation Styles.

Several known styles of mineralisation were are recognised in the 2017 Annual report, as follows:

(a) Wrigglite, being a replacement of pure limestone. (Fluorite, magnetite, tin, scheelite),
(b) Calc-silicate Skarns, being a replacement of silty limestone (Tin, scheelite).
(c) Retrograde skarns (Cassiterite, gold, zinc),
(d) Orthoclase veinlets in wrigglite (Scheelite),
(e) Sheeted quartz veins (Cassiterite, wolframite, scheelite),
(f) Greisen veins (Cassiterite),
(g) Deep Lead Alluvial deposits (Cassiterite, wolframite).
(h) A potential mineralised style, not as yet been identified, is mineralised joints fractures and bedding in sandstone carrying clean cassiterite, as occurs at Great Pyramid in eastern Tasmania.
(i) Potentially, lithium micas in greisen zones.

As a result of this year's study the potentially commercial styles at Moina can now be restated:

(a) Wrigglite, being a replacement of pure limestone. (Fluorite, cassiterite, scheelite, [by-product Bi, Be, Mo, ?? Cs]),

(b) Calc-silicate rocks, being a replacement of silty limestone (Cassiterite, scheelite).

(c) The Hugo retrograde skarn (Cassiterite, scheelite, gold, zinc, ?? indium),

(d) Feldspar veinlet swarms in wrigglite and calc-silicate rocks (Scheelite),

(e) Sheeted quartz veins in sandstone, wrigglite and calc-silicate rocks as at S&M Mine (Coarse cassiterite, wolframite, scheelite),

(f) The dumps.

(g) Deep Lead Alluvial deposits (Cassiterite, wolframite, scheelite). Any future mining operation at Moina is likely to capture this sub-basaltic resource in its open pit, so its potential value needs to be evaluated.

(h) Gold in fringing parts of the mineralised system

(i) Basalt overburden. Would be captured in any future open pit so its potential value as blue metal for road aggregate/ concrete should not be ignored.

(j) The potential mineralised style, not as yet been identified, of mineralised joints fractures and bedding in sandstone carrying clean cassiterite, as occurs at Great Pyramid in eastern Tasmania.

Key factors for future mining success are:-

(a) Breakthrough in metallurgical treatment of the wrigglite.

(b) Increases in commodity prices

(c) Selective mining, initially of high grade zones, especially of scheelite and tin. Accordingly a priority for future investigation and exploration is to locate and quantify higher grade zones.

Table 2. Moina analyses.

Atomic Number	Symbol	Element	Moina Sandstone	References	Gordon Limestone	References	Dolcoath Granite, greisenised	References	Calc-silicate rocks	References	Wrigglite	References	Hugo Skarn	References
3	Li	Lithium			5	Kwak Askins 1981	70-700	Kwak Askins 1981	50	Askins 1978	66	Kwak Askins 1981		
4	Be	Beryllium			5	Kwak Askins 1981	25-60	Kwak Askins 1981	1-40	Askins 1978 1979	340; max 1000	Kwak Askins 1981; Askins 1979	10-400	SMD24 Askins 1979
5	B	Boron			0	Kwak Askins 1981	3-600	Askins 1979	5	Askins 1978	98	Kwak Askins 1981		
9	F	Fluorine	0.5-3%	Fulton 2010			0.3-3.4%	Kwak Askins 1981	0.1-0.9%	Askins 1978	see CaF_2		see CaF_2	
11	Na	Sodium			0.14%	Kwak Askins 1981			0.42%	#7 Kwak Askins 1981	0.35%	Kwak Askins 1981		
12	Mg	Magnesium	0.8-1.7%	Fulton 2010	0.95%	Kwak Askins 1981			1.4%	#7 Kwak Askins 1981	0.9-6.6%	Composites Fulton 2012		
13	Al	Aluminium	1.6-6.6%	Fulton 2010	1.1%	Kwak Askins 1981			6.5%	#7 Kwak Askins 1981	3.3-5.7%	Composites Fulton 2012		
14	Si	Silicon	26.3-40.5%	Fulton 2010	4.4%	Kwak Askins 1981	25-35.7%	Kwak Askins 1981	18.4%	#7 Kwak Askins 1981	9.3-14.8%	Composites Fulton 2012		
15	P	Phosphorus			0.02%	Kwak Askins 1981			0.05%	#7 Kwak Askins 1981	0.03%	Kwak Askins 1981	0.003-10.3%	Niton SMD16 Fulton 2008
16	S	Sulfur	0.04-0.4%	Fulton 2010					0.02%	#7 Kwak Askins 1981	<.02-1.3%	Composites Fulton 2012	0.003-18.5%	Niton SMD16 Fulton 2008
19	K	Potassium					3.2-6.7%	Kwak Askins 1981	0.3%	#7 Kwak Askins 1981	1537-88889	Niton MD40 Fulton 2008	0.001-10.4%	Niton SMD16 Fulton 2008
20	Ca	Calcium	0.7-4.4%	Fulton 2010	36.8%	Kwak Askins 1981			21%	#7 Kwak Askins 1981	15-21%	Composites Fulton 2012	1-27%	Niton SMD16 Fulton 2008
21	Sc	Scandium			5	Kwak Askins 1981	3-30	Askins 1979	10	Askins 1979	5	Kwak Askins 1981	3-10	SMD24 Askins 1979
22	Ti	Titanium			0.06%	Kwak Askins 1981			0.3%	#7 Kwak Askins 1981	271-4065	Niton MD40 Fulton 2008	220-3750	Niton SMD16 Fulton 2008
23	V	Vanadium							50	Askins 1978	<10-1192	Niton MD40 Fulton 2008	10-440	Niton SMD16 Fulton 2008
24	Cr	Chromium									<10-393	Niton MD40 Fulton 2008	10-380	Niton SMD16 Fulton 2008
25	Mn	Manganese			0.05%	Kwak Askins 1981			0.85%	#7 Kwak Askins 1981	890-18980	Niton MD40 Fulton 2008	0.2-2.6%	
26	Fe	Iron	1.3-3.4%	Fulton 2010	0.6%	Kwak Askins 1981			7.5%	#7 Kwak Askins 1981	13-27%	Composites Fulton 2012	0.5-49%	Niton SMD16 Fulton 2008
26	Fe	Iron									17.2%	McKeown 2012		
27	Co	Cobalt							5	Askins 1978	<10-242	Niton MD40 Fulton 2008	10-460	Niton SMD16 Fulton 2008
28	Ni	Nickel			28	Kwak Askins 1981	33-136	Kwak Askins 1981	65	#7 Kwak Askins 1981	<10-580	Niton MD40 Fulton 2008	40-790	Niton SMD16 Fulton 2008
29	Cu	Copper	2-32	Fulton 2010	20	Kwak Askins 1981	2-181	Kwak Askins 1981	10-30	Askins 1978	<2-203	Composites Fulton 2012	10-2420	Niton SMD16 Fulton 2008
30	Zn	Zinc	9-126	Fulton 2010	0	Kwak Askins 1981	3-502	Kwak Askins 1981	100-200	Askins 1978	89-1860	Composites Fulton 2012	0.001-21%	Niton SMD16 Fulton 2008
31	Ga	Gallium			3	Kwak Askins 1981	21-126	Kwak Askins 1981	5	Askins 1978	31	Kwak Askins 1981		
32	Ge	Germanium									1-10	Askins 1978		
33	As	Arsenic									<10-817	Niton MD40 Fulton 2008	max 7900	Mackay 1997
37	Rb	Rubidium			20	Kwak Askins 1981	557-2816	Kwak Askins 1981	60	Kwak Askins 1981	<10-1402	Niton MD40 Fulton 2008	10-1970	Niton SMD16 Fulton 2008
38	Sr	Strontium					3-10	Kwak Askins 1981	34	#7 Kwak Askins 1981	<10-157	Niton MD40 Fulton 2008	10-140	Niton SMD16 Fulton 2008
39	Y	Yttrium			13	Kwak Askins 1981	0-786	Kwak Askins 1981	70,100	Askins 1979	10-100	Askins 1979	10-20	SMD24 Askins 1979
40	Zr	Zirconium					92-124	Kwak Askins 1981			<10-149	Niton MD40 Fulton 2008	10-180	Niton SMD16 Fulton 2008
41	Nb	Niobium					23-62	Kwak Askins 1981	20	Askins 1979	<10-20	Niton MD40 Fulton 2008	10-20	Niton SMD16 Fulton 2008
42	Mo	Molybdenum							3-30	Askins 1978 1979	10-1484	Niton MD40 Fulton 2008	10-880	Niton SMD16 Fulton 2008
42	Mo	Molybdenum	<5-316	Fulton 2010	0	Kwak Askins 1981	0-59	Kwak Askins 1981			<5-240	Composites Fulton 2012	max 1350	Borton 1994
43	Tc	Technetium												
44	Ru	Ruthenium									<2	Askins 1978		
45	Rh	Rhodium									<2	Askins 1978		
46	Pd	Palladium									<10	Niton MD40 Fulton 2008	<10	Niton SMD16 Fulton 2008
47	Ag	Silver							0.1-0.2	Askins 1978	1-6	Askins 1978	max 18	Mackay 1997
48	Cd	Cadmium	<5	Fulton 2010							<5-15	Composites Fulton 2012	10-730	Niton SMD16 Fulton 2008
49	In	Indium									<10	Askins 1979		
50	Sn	Tin	<50-200	Fulton 2010	<20	Kwak Askins 1981	4-560	Kwak Askins 1981	see text		580-3400	Composites Fulton 2012	0.001-1.47%	Niton SMD16 Fulton 2008
50	Sn	Tin									1380	McKeown 2012		
51	Sb	Antimony	<5	Fulton 2010							<5-73	Composites Fulton 2012	10-200	Niton SMD16 Fulton 2008
52	Te	Tellurium									<20	Askins 1978		
55	Cs	Cesium									10-1000	Askins 1978		
56	Ba	Barium									<10-298	Niton MD40 Fulton 2008	10-1530	Niton SMD16 Fulton 2008
57	La	Lanthanum							<50	Askins 1979	<50-150	Askins 1979		
58	Ce	Cerium			0	Kwak Askins 1981			<300	Askins 1979	<300	Askins 1979		
59	Pr	Praseodymium									<100	Askins 1978		
60	Nd	Neodymium									<300	Askins 1978		
61	Pm	Promethium												
62	Sm	Samarium												
63	Eu	Europium									<50	Askins 1978		
64	Gd	Gadolinium												
65	Tb	Terbium												
66	Dy	Dysprosium												
67	Ho	Holmium												
68	Er	Erbium									<100	Askins 1978		
69	Tm	Thulium												
70	Yb	Ytterbium			4	Kwak Askins 1981	15-80	Askins 1979	10	Askins 1979	5	Kwak Askins 1981		
71	Lu	Lutetium												
72	Hf	Hafnium												
73	Ta	Tantalum							<100	Askins 1979	<100	Askins 1979		
74	W	Tungsten	<10-45	Fulton 2010	<50	Kwak Askins 1981			190	#7 Kwak Askins 1981	0.10%	Total Resource Askins 1979	0.001-1.8%	Niton SMD16 Fulton 2008
74	W	Tungsten									340-1750	Composites Fulton 2012		
75	Re	Rhenium									<10	Askins 1978		
76	Os	Osmium									<10	Askins 1978		
77	Ir	Iridium									<2	Askins 1978		
78	Pt	Platinum												
79	Au	Gold							<0.1	Askins 1978	mostly<0.1	Mackay 1997	max 7.0	Mackay 1997
79	Au	Gold											0.5-2.3	Fulton 2011
80	Hg	Mercury												
81	Tl	Thallium									<1	Askins 1978		
82	Pb	Lead	<5-23	Fulton 2010	1	Kwak Askins 1981	12-214	Kwak Askins 1981	80	Askins 1978	<5-18	Composites Fulton 2012	10-680	Niton SMD16 Fulton 2008
83	Bi	Bismuth	<10-120	Fulton 2010					30	Askins 1978	40-1000	Composites Fulton 2012	10-4970	Niton SMD16 Fulton 2008
83	Bi	Bismuth											max 1.26%	Borton 1994
84	Po	Polonium												
90	Th	Thorium			4	Kwak Askins 1981	15-66	Kwak Askins 1981	15	#7 Kwak Askins 1981	183	Kwak Askins 1981		
91	Pa	Protactinium												
92	U	Uranium			0	Kwak Askins 1981	2-53	Kwak Askins 1981	1	#7 Kwak Askins 1981	4	Kwak Askins 1981		
94	Pu	Plutonium												
	CaF_2	Fluorite							see text		16%	McKeown 2012	1-23%	SMD16 Askins 1978
	CaF_2	Fluorite									18%	Total Resource Askins 1979		
	CaF_2	Fluorite									11-30%	Composites Fulton 2012		
	WO_3	Tungstate									1040	McKeown 2012		

Rare earth elements highlighted

All analyses in ppm unless shown as %

Important missing elements highlighted

5.0 PROPOSED FUTURE WORK

This is proposed to be

- Retrieve missing Minemakers past drill core.
- Retrieve datasets used for JORC studies.
- Further investigate Cs and In content in the skarns.
- Continue review on exploration potential, to develop exploration targets. To include
  - Assessment of all mineralisation styles for higher grade zones.
  - Structure/architecture/size potential of mineralisation outside the current JORC Resource, including the Hugo Skarn area and other skarns east of the Bismuth Creek Fault.

6.0 EXPENDITURE

Expenditures during the year are reported separately in the Annual Return. In summary, a total of $20 725 was reported.

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