

Report 2006  
EL 31/2002  
McDermott Mining Marshall Resources J/V  
October 30, 2006

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EL 31/2003 was granted to Marshall Resources on December 18<sup>th</sup>, 2003. Marshall Resources was unable to raise capital for a comprehensive exploration program and invited McDermott Mining to joint venture the licence.

A dealing was registered with MRT, giving McDermott Mining 66% of the joint venture, and a program consisting of the following was drawn up for submission to MRT. Marshall Resources withdrew from further active involvement in 31/2002.

McDermott Mining restarted an exploration program consisting of the following:

1. Further review of available literature undertaken.
2. Re-flagging of proposed road to Sweeny's Prospect.
3. Sampling of Sweeny's main adit and open cut.
4. Field reconnaissance and geological study undertaken
5. An exploration works proposal was prepared for submission to MRT.

1. Repeat literature review of Report 18-1466 Federation Area E.L.11/76, Renison Exploration.

2. Following visits to the area by mines inspector and forestry inspectors, a potential roadway deviating from the steep access road to Sweeny's was surveyed and flagged for future reference.

Preliminary study of open cut areas above main adit at Sweeny's was conducted to determine the feasibility of open cut with a view to separating the high grade sphalerite from the high grade cassiterite and producing two concentrates or two high grade wet ores for sale to existing local companies.

3. Sampling and assaying of the entire wall area of the number five open cut returned an average grade of 1.5% Sn over thirty metres with the face averaging 3% Sn across ten metres width. As well, the face gave assays of up to 23% zinc in sphalerite form.

Test work performed at Amdel Laboratories, South Australia, indicated the zinc could easily be removed from the gangue and concentrated using standard flotation treatment such as is used at Zinifex' Rosebery plant.

The tin recovery presented a more difficult scenario as the majority of the cassiterite tended report to the sphalerite con. and with the research laboratory being the subject of a takeover, the final test results were lost. However, enough encouragement was given to pursue this avenue and further test work is expected will be conducted in the future. Discussions with Burnie Research Laboratories bide well for a comprehensive study of the Sweeny's ore being conducted in the near future.

Further bulk sampling of the main adit at Sweeny's was carried out to determine the outline of the sphalerite zone. It appears the sphalerite is disseminated throughout the areas of cassiterite dissemination with the more enriched areas of mineralisation outlined in previous sampling hosting higher grades of both minerals although this may only be typical of the areas sampled. It was determined that there was not enough ore zone exposed either by excavation or drilling to determine whether this was typical of the total ore zone or simply an isolated occurrence.

4. In June 2006, the tenement, together with others operated by McDermott Mining, became the subject of an IPO and consulting geologist, Mr. Greg Lear was engaged to carry out field reconnaissance and submit his findings to the proposed IPO company, Stonehenge Metals.

Featherstone Geological Consultants, headed by Dr. A.C.Gifford was engaged to report on the prospect for possible inclusion in the proposed IPO.

A section of this report pertaining to this particular tenement is attached.

## **Conclusion**

The tenement, although still highly prospective, remains the subject of an IPO which is expected to list on the ASX on 20<sup>th</sup> December, 2006, at which time the transfer of the tenement from McDermott Mining to Stonehenge Metals Ltd, will take place (subject to ministerial approval).

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**Exploration Licence EL 31/2002**  
**Geological Report Compiled by Featherstone Geological resources**  
**Dr. A C Gifford**

**Exploration Licence 31/2002**

The tenement lies about 12km west of Zeehan and includes Lake Cumberland. The country rock underlying this tenement is part of the Heemskirk granite which is multiphase intrusion with the tin mineralisation being related to the latest phase. The licence covers a number of tin bearing lodes known as the South Heemskirk Tinfield.

**South Heemskirk Tinfield**

Alluvial tin was discovered here by a surveyor in 1876 followed by primary mineralization in lodes. By 1881 nine treatment plants had been erected comprising 80 heads of stamps with another four shortly afterwards. Unfortunately many of the prospects had not been developed to any extent and were unable to feed a regular supply of ore to a plant so production did not commence until 1884. In a number of the rich veins did not extend far along strike or down dip and in some others it was suspected that the presence of black tourmaline had led to an overestimation of grade. In a instances the ore contained a substantial amount of pyrite and the plants had not been designed to cope with pyrite. This resulted in many of the plants being unable to operate or only at reduced capacity. Since most of the money raised had been spent on plant and transporting it to the site there was little left to finance development of the mines. The Cumberland Mines were reputed to have produced a good amount of ore but no records of production are extant. The boom then turned to bust and no one would invest in South Heemskirk. The field was described as practically deserted in 1890.

**The Federation Mine**

In 1900 the Federation Tin Mining Co. NL was formed with a lease over the West Cumberland, Cumberland, and East Cumberland Mines. The West Cumberland lodes became the Western Workings with the Whip Shaft. About 600m NE the Cumberland lodes became the Central Workings with the Munro Shaft that was sunk from the top of a

hill which was the highest point on the property. A single lode and minor workings 500m ENE of Munro Shaft formed the Eastern Workings. A sketch plan of the mines is presented in figure 10. Levels at all workings at the mine were based on the depth below the collar of the Munro Shaft. Little work was then done except on the Tributors Workings.

Between 1920 and 1923 the company explored and sampled the ore bodies despite limited capital then in 1926 Federation Tin Mines was floated in England. Work started the following year and about 80 thousand pounds was spent on plant, a hydro electric scheme, and the construction of a self acting tramway from the Western Workings to a treatment plant 45m down the hill. A horse tramway was constructed from the Central workings to the Western Workings to connect up to the self acting tramway. Production commenced in 1928 but was suspended from 1929-1934 due to the low price of tin and lack of capital! Two bore holes drilled by the government proved disappointing and the company went into liquidation shortly after.

From 1939-1942 a private operator extracted 7.5t of concentrate, mainly from the Western Workings and from 1942-1953 about 7t was produced from an area about 600m south of Munro Shaft.

Total production from the Federation Mine area is estimated at 327t of concentrate containing 197t of tin metal. Analyzing some of the production records the estimated average grade of the ore was 1.34% Sn.

## The Wakefield Mine

This is located 1.7 km just west of south of the Munro's Shaft at the Federation Mine. This was another of the mines which spent all their money on plant before developing the mine. Only one lode has been reported here striking N-S. an adit has been driven about 15m along the lode but is not accessible. No reported production.

## The Montague Mine

The old workings lie 1.6km SSW of the Munro's Shaft at the Federation Mine. It was the original Montague Company which, in conjunction with the Cumberland Company constructed the Cumberland Dam with the object of supplying their mines with power and water. It is not stated when mining and treatment was started but in 1882 the mine flooded because the whim dewatering system could not cope with the inflow. At this stage the main shaft had been sunk to 36m with a crosscut at 30m and crossing lodes had been driven on: however the mine did not reopen. The main lode was up to 3.6m wide and contained rich shoots of cassiterite veining. It is reputed that 6t of cassiterite were produced from the Montague lodes and 5t of alluvial cassiterite from alluvium in the Montague Creek.

Subsequently a private miner worked the lods by underhand stoping to produce a small amount of concentrate. In 1943 anothr miner drove adits east and west from Montague Creek and exposed several tin bearing lodes.

## Colemans

This prospect lies about 1.4km SW of the Munro's Shaft on the Federation Mine. The workings consist of two adits and several trenches. No recorded production. Renison held an option to purchase this prospect and drilled three holes on it, Fed.6, Fed.11, & Fed 13. Fed 6 had a best intersection of 4m at 0.43% Sn but the other two holes did not intersect mineralization. The option was allowed to lapse.

## Sweeny's

This mine lies 1.5km SSE of Munro's Shaft and is also known as Birthday or Cornish Lease. The lode was unusual for the area in containing abundant black sphalerite with pyrite and small amounts of stibnite and chalcopyrite in a gangue of quartz, siderite, fluorite and tourmaline. A 75m adit was driven into the hill and a crosscut at 30m intersected a thin vein of cassiterite with pyrite in sericitic kaolinised granite containing some mineralization that is referred to as "greisen". In 1903-1904 about 13t of cassiterite was produced but it is believed that this was alluvial from Pykes Creek. The greisen mineralization was later appraised by Renison Ltd as described below. A number of outcrops of these bodies of greisen were located by soil sampling and geophysics.

## Anomaly 1

This prospect is one of Renison Ltd's zones of mineralization and is described below.

## Wolfram Trench

This prospect is on one of the few tungsten bearing lodes and described by Waterhouse 1915. It is located about 750m due south of the Munro's Shaft and consists of trench up to 3m deep on a bearing of 328degrees. The trench exposes white quartz with a little green tourmaline and wolframite with minor cassiterite which appeared to be about 18m wide although the full width of the reef was not uncovered by the trench. The reef was judged to strike at 280 degrees and dip south at 28 degrees but the dip was uncertain.

## Par Lap

This prospect is located a little west of south of the Munro's Shaft on the Federation Mine. An irregular trench has been cut in a heavily altered and mineralized white granite which is referred to as greisen. From the trench a shaft has been sunk 10m but a steady inflow of water soon filled the shaft. Material taken from near the bottom of the shaft was treated by sluicing and produced a plentiful quantity of cubic pyrite crystals up to 25mm across. The pyrite is associated with cassiterite which replaces parts of the pyrite crystals. In 1943 the needed to be crushed before they could be calcined and the inflow of water discouraging so further work had been suspended.

This is another example of mineralized greisen zones that were targeted by Renison Ltd whose work is described below.

## Waxman and Weston's Workings

These workings are located 500m ESE of Munro's Shaft in swampy ground between the north western end of Cumberland Dam and the eastern slopes of Federation Hill. The prospectors began work believing the prospect was outside the Federation lease but then discovered it was not and terminated prospecting.

It consisted of a N-S trench 34m long with a shaft at its southern end. The trench is up to 3m deep and the shaft was sunk 4m in mineralization. From the shaft a trench 9m long has been dug in a SW direction. The diggings are in greisenized granite. About 18m from the northern end a band containing cubic crystals of pyrite was intersected but this zone did not carry tin. At the collar of the shaft almost solid micaceous haematite is exposed and the haematite was accompanied by cassiterite in the walls of the shaft and was said to be high grade.

Renison put two DC holes Fed. 5 (3/79) and Fed.12 (2/80) beneath the trench. Fed 5 had a best intersection of 4m at 0.56% Sn and Fed. 12. (2/80) had a best intersection of 1m at 0.28% Sn. Fed.18 (2/81) was collared 65m west of Fed. 12 but failed to intersect any mineralization. These results were not considered to warrant further work at that time but the greisen zone had not been thoroughly investigated and the work carried in this area should be carefully reviewed.

## Summary

The lode style tin mineralization that is present in the granite consists of a lode filled with quartz- tourmaline veining and the tin mineralization is typically present as a rich shoot in a limited section of the lode. In some cases hydrothermal alteration of the granite walls which may also carry cassiterite mineralization. The grade of the quartz -tourmaline veining tends to be modest to nil along much of the strike. This style of mineralization is difficult to assess and is generally not amenable to modern mining techniques.

Prospecting that has been undertaken in the past has also identified another style of mineralization which is found in parts of the granite. These zones in the granite have undergone alteration by the hot hydrothermal solutions which have also deposited valuable minerals in the altered granite which is called greisen. These bodies of greisen are often of sufficient size to allow them to be mined by modern mechanical means and are therefore a target for current exploration. The grade of this mineralization is usually lower than that in the lodes and was therefore not attractive to the miners of 100 years ago. Recent exploration for greisen ore bodies is described below.

**Table 1**  
**Exploratory Drilling at Sweeny's Mine**

Hole No.	Intercept (m)	Tin Grade	Zinc Grade	Silver g/t	Comment
Swy 4	51	0.50	2.7	14	
Swy 5	Drilled in margin of greisen				
Swy 6	Drilled below the greisen				
Swy 7	38	0.75	2.84	31	
Swy 8	32	0.41	1.03	23	
Swy 9	Drilled to south of greisen				
Swy 10	Drilled to south of the greisen (intersected altered granite)				
Swy 11	23	1.17	1.7	121	stannite & topaz
Swy 12	In margin of granite				
Swy 13	In margin of granite				
Swy 14	23.6	0.27	0.52	42	
Swy 15	31.4	0.62	1.92	31	
Swy 16-17	failed to intersect main greisen zone				

This drilling attempted to determine the shape of the mineralized zone and is totally irregular so no survey data are presented in this report. A number of the holes failed to find the target and the results failed to reveal the shape of the mineralization. Various geophysical surveys were conducted to see if they could aid in defining the limits of the mineralization.

The assay results were considered very encouraging and it was not known what the distribution of greisen zones was in the Heemskirk granite as a whole so the EL was enlarged to 88km<sup>2</sup> in July 1977 to cover the entire outcrop of the granite. Colour air photography and photogeological interpretation were commenced over the whole tenement area. An access road to the Federation area was put in and gridding, mapping, and geological sampling of this area was commenced.

During 1978-79 a further DC hole was drilled at Sweeny's, Swy 18 (249m), which failed to locate any mineralisation. Six DC holes for 986m (Fed 1-16) were drilled on the Federation Plateau area mainly to follow up on the geophysics. Zones of alteration were intersected but only intercepts of low grade tin mineralisation of limited extent were found.

Hole Fed 1. was drilled into the Black Face lode on the Federation Mine in a zone of intense alteration including complete tourmalinization, tin values were extremely low, enquiries regarding the lack of found that the lode is reputed to only carry tin in one section.

In 1979-80 six more DC holes (Fed. 7-12) for 978m were drilled in the Federation area. More zones of greisen were identified but tin grades were low and inconsistent. In July

Fed 13 for 70m was drilled near Coleman's workings in order to make a decision on an option over this ground. Only red granite was encountered and it was recommended that the option not be exercised. Geophysics was also being conducted to locate greisen and guide drilling.

In 1980-81 three more DC holes (Fed. 14-16) for 315.m were drilled in the Federation area. Results were again mixed and no high grade tin mineralization was intersected. In early 1982 hole Fed. 17 (110.2m) was drilled to further investigate the alteration zone intersected in Fed 8 but did not give a clear result. Hole fed 18 (281m) was collared west of holes Fed. 5 & 12 at Waxman and Westons and confirmed the sericitic alteration continued to the west and was intersected from surface to 190.7m.

The results of Renison's work in the Federation Mine area indicate that the high grade tin occurred in small shoots within the lodes or as pipes within zones of alteration. There was no sign of mineralization of sufficient size and consistent grade to be attractive as a present day target. No further work was recommended on the old Federation Mine lodes in this area.

In 1981-82 contract mapping of the outcrop of the Heemskirk granite was completed and a further DC hole, Fed 19 (197.3m), was drilled at the Waxman and Westons prospect east of the Federation Mine. Past work here identified two zones of sericitic alteration a Northern and Southern Zone. Previously holes Fed.5, 12, & 17 were drilled into the Southern Zone and holes fed. 8 & 18 into the Northern Zone. This work was followed by a bedrock geochemical sampling programme on a 25m square grid. This confirmed two anomalous areas with tin values reaching 1480ppm Sn. In early 1982 hole Fed. 19 (197.3m) was drilled to test the eastern extension of the sericitic mineralization beneath the swamp. The hole intersected several alteration zones with minor sulphide mineralization but not a major body of alteration or mineralization. At Waxman and Westons there are two carrot shaped zones of alteration with low grade mineralization that get smaller and lower grade with depth.

In April 1984 Renison relinquished the major northern portion (55km<sup>2</sup>) of EL 11/76 (88km<sup>2</sup>). Work carried out indicated that the southern and south eastern margins of the granite were the most prospective for economic bodies of mineralized greisen. Shortly after this SPL 129 lying to the east was combined with EL 11/1976 increasing its area to 79km<sup>2</sup>. During 1985 the western area of 11/1976 containing the ground now covered by Stonehenge Metals tenement EL 31/2002 was relinquished.

Sweeny's Deposit in the south east of Stonehenge Metals licence was identified as the most favourable example of tin mineralization within a sericitic alteration zone. The shape of these deposits may typically be a mushroom shape but weathering might have removed the upper parts. Drilling them can be difficult and at Sweeny's the topography severely restricts the locating of a drill rig. Eighteen holes were drilled at Sweeny's but less than half made intersections with the alteration zone. Much more data is required to be able to estimate resources but Gold Fields considered that there was potential for a

body of mineralization of 0.5Mt at 0.6%Sn to be present at Sweeny's but in 1985 it was not considered attractive.

## Final Review

Stonehenge Metals tenements cover very prospective ground with numerous known exposures containing mineralization. Many of these were discovered and worked late in the nineteenth century and early in the twentieth century for lead and silver. The style of mineralization sought at the time was high grade lode style mineralization which was mined by hand without machinery and the ore could be hand cobbled to produce a smeltable product.

This style of mineralization is generally not attractive today because the lodes are usually not amenable to mechanised mining. Available information suggests that there could be some lodes with substantial reefs of zinc ore which was gangue as far as the silver miners were concerned. Stonehenge Metals should investigate the potential of these zinc lodes for open cut mining.

The presence of so many mineralized lodes indicates that this area of country is underlain by the granite which is the source of the hydrothermal mineralization. The rocks overlying the granite are therefore likely to contain other styles of mineralization that are attractive targets for mining and treatment today. These are typically large low grade deposits and were of no interest to the miners of a hundred years ago.

One of the main geological models that have been sought in this area is the skarn style tin mineralization which has been such an important source of ore for the Renison Bell Mine.

Stonehenge Metals' Granville East deposit is an example of this geological model and is already producing tin on a modest scale. This deposit has not been drilled so its size is unknown and it will be the new company's main exploration focus to fully appraise Granville East. Then a full study can be made to determine the optimum way of mining and treating the ore. The Central Big H prospect is also targeting the tin skarn model.

The Sweeny's Deposit was identified by Renison as the best example of greisen style tin mineralization that they located by their exploration programme. It was not fully appraised and not even resources were developed by their work. Further work should be carried out on Sweeny's to provide reliable figures on which judgement of its potential can be made.

Featherstone Geological Consultants