

**MINREX RESOURCES LIMITED**

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**2017 ANNUAL REPORT ON THE  
HEEMSKIRK PROJECT**

**3 April 2016 – 2 April 2017**

**EL18/2011**

**AT GRANITE CREEK**

**TASMANIA, AUSTRALIA**

**DISTRIBUTION:**

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## TABLE OF CONTENTS

	Page
<u>Abstract</u>	1
<u>1. Introduction</u>	2
<u>2. Review of Previous Work</u>	4
<u>3. Exploration Completed during the Report Period</u>	8
<u>4. Discussion of Results</u>	15
<u>5. Conclusions</u>	19
<u>6. Environment</u>	20
<u>7. Expenditure</u>	21
<u>8. References</u>	22
<u>Keywords</u>	24

Page

## FIGURES

Figure 1	E18/2011 Location and Tenement Plan	3
Figure 2	E18/2011 Geology with old mine sites	5
Figure 3	View of Typical Heemskirk Terrain	6
Figure 4	E18/2011 Location of Known Old Workings	7
Figure 5	Plan of Areas D & B Stream Sediment Sites Sampled in 2016	8
Figure 6	Old Peripatetic Mine during April-May 2016 Program	9
Figure 7	Results from Panned Steam Sediment Sampling – to date	10
Figure 8	Panning of Stream Sediment Samples 53284 & 53317	13
Figure 9	Overview of Heemskirk Area in 2016	14
Figure 10	Plan showing Anomalous Stream Sediment results	18

**TABLE OF CONTENTS (Continued)**

**Page**

**TABLES**

<b>Table 1</b>	<b>Assays for 43 stream sediment samples from April-May 2016</b>	<b>11</b>
<b>Table 2</b>	<b>Assays for 28 rock samples from April-May 2016</b>	<b>12</b>
<b>Table 3</b>	<b>Average assays for 2016 stream and rock samples</b>	<b>12</b>

## **Abstract**

This Annual Report on the Heemskirk Project (EL18/2011) covers the period 3<sup>rd</sup> April 2016 to 2<sup>nd</sup> April 2017, the fifth year of the tenement. An application to renew the licence has been submitted to Mineral Resources Tasmania, during March 2017.

The area contains numerous small old workings for tin, both alluvial and in basement granite, with minor tungsten, base metals and silver occurrences also. Minrex Resources Limited (Minrex) considers that this large area of granitic terrain is prospective for the discovery of large low-grade tin deposits, concealed deposits and/or deposits of other granite-associated metals.

Work to date includes an initial literature review, assessment of previous exploration in the area, re-processing and analysis of the government airborne magnetic and radiometric geophysical data and five field sampling programs, each of up to three weeks duration, that have collected a total of 99 rock samples, 78 soil samples and 129 stream sediment concentrate samples. The current (fifth) year work program has comprised two field visits, one in April-May 2016 and a second in February 2017. In the first some 28 rock samples were collected at the old workings and 43 stream sediment concentrate samples from creeks in the west and south of the licence. The February 2017 program has expanded the work to include 58 rock samples from old workings and prospective areas, a further 7 stream sediment concentrate samples from creeks in the west of the licence, and some 68 soil samples from the flanks of streams that have previously returned anomalous stream sediment results.

The exploration remains ongoing with no definitive conclusions. In the sixth year of the exploration program, if the licence is successfully renewed, Minrex plans to:-

- Continue the systematic soil sampling program near anomalous stream samples.
- Continue the stream sampling in new areas and also complete infill in other areas.
- Continue rock sampling at old workings and in otherwise anomalous areas.

\$56,825 has been expended in the fifth year of the tenement, bringing total expenditure to date by Minrex on the Heemskirk Project (EL18/2011) to \$208,315. An exploration budget of \$57,000 is proposed for the sixth year of the tenement and \$70,400 for the seventh year – once the renewal is received.

## **1. Introduction**

This annual report summarises the results of exploration activities at the Heemskirk Project (EL18/2011), during the period 3<sup>rd</sup> April 2016 to 2<sup>nd</sup> April 2017; the fifth year of the tenement. EL18/2011 is held by Minrex Resources Limited (Minrex) and comprises an area of some 44 km<sup>2</sup>, located to the north of Trial Harbour on the west coast of Tasmania, and some 16 km WNW of the township of Zeehan (Figure 1). An application to renew the licence has been submitted to Mineral Resources Tasmania, during March 2017.

The Heemskirk tin field saw a brief, hectic period of activity in the 1870's – 1880's, with companies spending on equipment rather than ore development, miners and prospectors inconsistently identifying cassiterite and ultimately a lack of capital, remote location and high costs forcing the closure of the field. Subsequent exploration of the area since the 1960's has seen piecemeal stream and rock chip sampling, along with geological mapping, sampling of the main old workings, the completion of three diamond drill holes, and various airborne geophysical programs completed. There has been no detailed sampling or field work completed in the area over this period.

While the entire area of EL18/2011 is underlain by the Heemskirk Granite there is little detail or certainty on the phases of granite intrusion, nature of the mineralised structures and detailed mineralogy of the deposits. While underlain by granite, the bulk (+80%) of the area is covered with a thin veneer of quartz-rich organic soil, probably mostly less than 1m thick, rendering exploration and prospecting for mineralisation difficult, stream valleys are infilled with deeper alluvial deposits and dense vegetation. The presence of a widely dispersed blanket of alluvial tin in the drainages of the area also compounds the exploration complexity.

Minrex is now completing detailed stream sediment concentrate sampling, rock sampling and soil sampling within the Heemskirk area, in an effort to discover previously overlooked large low-grade tin deposits, or smaller high to medium-grade tin deposits. Minrex believes that while the Heemskirk field is relatively old, the work previously completed has not been systematic or thorough and that potential remains for new discoveries in the area.

By completing detailed stream sediment sampling, augmented by rock sampling at old workings, pits, trenches and outcrops the Company hopes to hone into the areas containing the greatest amount of tin in drainages and hence having the most potential for basement deposits. These higher order target areas will then be subjected to detailed soil sampling, and infill stream sediment concentrate sampling, in an effort to hone in to soil covered, large low-grade tin deposits.

The Heemskirk mineral field has never been systematically explored; early mining was piecemeal and subsequent exploration has been sparse and, most recently, dominated by remote studies, not groundwork. Minrex has been completing field sampling programs in EL18/2011 from 2012-17, with the aim of discovering previously overlooked large low-grade tin deposits, or smaller high to medium-grade tin deposits.

Minrex believes that while the Heemskirk field is relatively old, the work previously completed has not been systematic or thorough and that potential remains for new discoveries in the area. Minrex proposes an annual exploration expenditure of \$57,000 in year six and

\$70,400 in year seven, on field programs in the licence area, to continue this sampling work for at least another two years.



Figure 1: E18/2011 Location and Tenement Plan.

The datum used throughout this report is GDA94.

## **2. Review of Previous Work**

The first tin was discovered in the Heemskirk area in 1876, sparking a small rush with alluvial leases being taken up for several years thereafter. The first vein tin was found in 1879 with a wave of speculation following with many companies being floated, in spite of the difficult conditions and poor communications. Over 50 companies staked claims over an area of 6,400ha of granitic terrain. The field is thought to have been badly managed and several mines installed expensive processing equipment before mine development and resource definition had fully outlined the mineralisation. This exhausted the available capital and led to the closure of many of the mines before the resources could be fully developed or exploration completed. In addition many of the miners and prospectors were unable to recognise cassiterite leading to the incorrect mining of non-tin-bearing material and, potentially, the overlooking of prospective ground. The mineral field fell into collapse after 1884, with only a dozen mines continuing by the late 1880's.

Government reports on the Heemskirk tin field include Waller, 1902, Waterhouse, 1915, Waterhouse, 1916 and Blissett, 1962. At least three university theses have examined the Heemskirk area from a more academic viewpoint, including Klominsky, 1972, Wells, 1978 and Hazitaheri, 1982 - but without major significant input to exploration of the mineralisation. Part of the area was examined for occurrences of radioactive minerals – Taylor & Burger, 1950.

Mineral Exploration company work in the area commenced in the 1960's with Geophoto Resources (EL7/68) conducting a geochemical drainage program (for copper, lead, zinc, silver, bismuth and molybdenum) in the lease area – a number of lead-zinc and copper-lead-zinc anomalies were returned, and then drilling three diamond drill holes at the old Peripatetic mine site – Rattigan, 1968, 1969 & 1970. The Australia and New Zealand Exploration Company also explored the area (EL28/71) for tungsten with a stream sediment sampling program – Callow, 1971.

Goldfields Exploration (Renison) then held the area (EL11/76) for a number of years, completing a major air-photo geological interpretation, Loxton, Hunting & Associates, 1978, and associated field mapping, a geochemical drainage survey (for tin, arsenic, copper, lead, zinc, tungsten, silver, bismuth, molybdenum and fluorine), with a number of highly anomalous tin results (up to 1.5% Sn) being returned – Roberts, 1984. Goldfields also completed sampling and mapping at the Longs Iron Blow prospect and Peripatetic mine sites – Stephenson, 1978 & Roberts, 1981.

New Holland Mining explored the area (EL28/87) in the late 1980's – Cromer, WC, 1988. Various other companies have explored in and around the area in the intervening years, including Stellar Resources.

Work by Minrex, since 2012, has included an initial literature review and field reconnaissance study – Allen, 2012. This included the collection of 23 samples (10 stream samples and 13 rock samples), with the highest stream sediment result being 3,820ppm Sn and for the rock samples 324ppm Sn. In 2012, Minrex also commissioned a re-processing and analysis of the government airborne geophysical data (magnetic and radiometric) over the Heemskirk area, Muir, 2012 (Figures 2, 3 & 4).

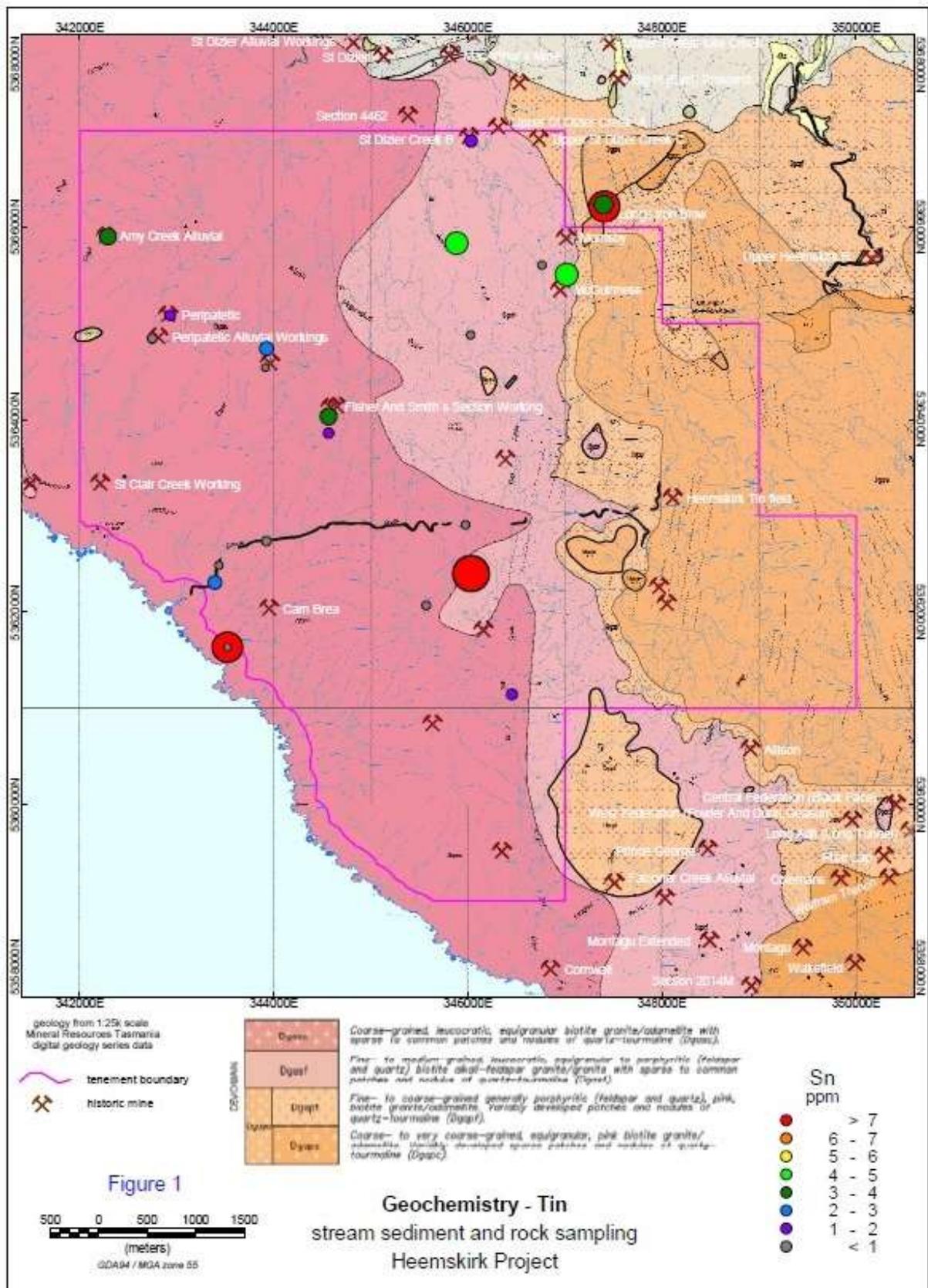


Figure 2: E18/2011 Geology with mine sites and tin geochemistry from pre-2012 exploration

Following the initial intensive analysis and reconnaissance, a systematic stream sediment sampling program was commenced over the entire tenement area. For this program, the tenement area was divided into four quadrants (named A to D) with each to be sampled in sequence. The samples to be taken by panning and screening large bulk stream sediment samples down to an approximately 100gm sample of heavy minerals. The program commenced with Area A (30 samples) in 2012 and Areas B & C were sampled in 2015 (49 samples) – Munro 2013, 2014, 2015 & 2016.

Repeat assay work in 2015 confirmed that the early sample analyses were not accurate for tin and tungsten, due to a failure of the mixed acid digest used to adequately digest cassiterite and, to a lesser extent, some of the tungsten present. All samples were re-analysed by the total-fusion laser ablation of glass beads in 2015, and all subsequent sample analysis has used the laser ablation technique as the standard procedure.



Figure 3: View of Typical Heemskirk Terrain

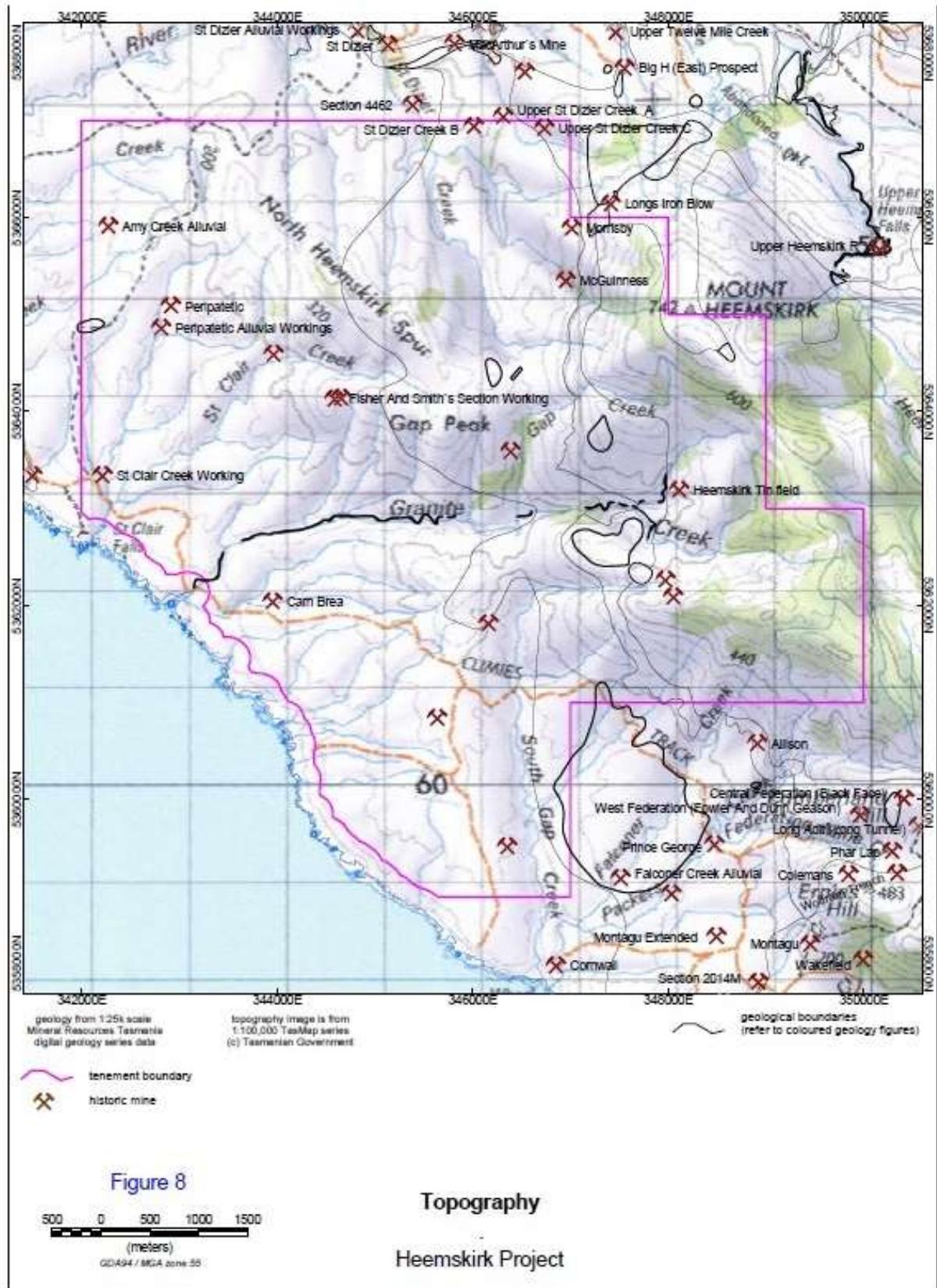


Figure 4: E18/2011 Location of Known Old Workings

### **3. Exploration Completed during the Report Period**

Two field sampling and mapping programs have been completed in the current year, these comprised a panned stream sediment sampling program, with contemporary rock sampling at old workings (43 stream concentrate and 28 rock samples) in April-May 2016 and a more detailed rock (58 rock samples), soil (68 soil samples) and small infill panned stream sediment sampling program (7 samples) in February 2017. A total of 204 samples have been collected from EL18/2011 in the current year.

In February 2016, Ron Gregory Prospecting (Tasmania) was contacted to continue the panned concentrate stream sampling into Area D, and this was subsequently expanded to also include some infill sampling in Area B (Figure 5).

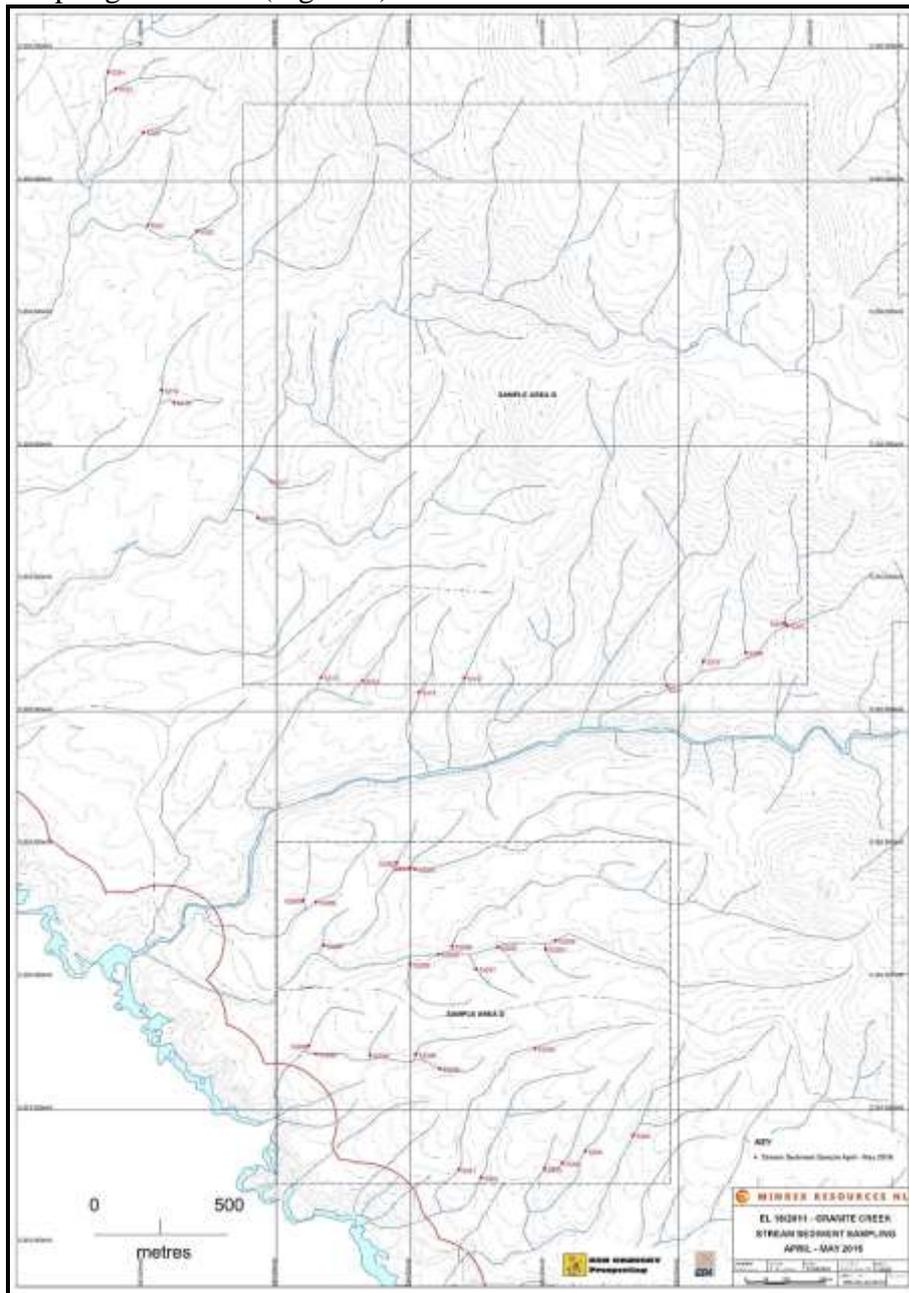


Figure 5: Plan of Area D & B-Infill Stream Sediment Sites Sampled in April-May 2016

The earlier work (Areas A, B & C) was also completed by Ron Gregory Prospecting and it was considered that it would be advantageous to use the same people, sampling methods and assay types during the new program to ensure that the old and new data sets were fully compatible. It was further decided to also collect rock samples from any old workings, dumps or mines which were seen while taking the stream sediment samples.

The 2016 stream sediment sampling program commenced on the 22<sup>nd</sup> April 2016, with mobilisation to Granville Harbour and setting up of a campsite. Area D sampling (25 samples) continued through to the 27<sup>th</sup> April, when a break was taken during very wet and windy weather and to re-supply the camp. Infill sampling in Area B (18 samples) was then completed on the 9<sup>th</sup> May and demobilisation was on the 10<sup>th</sup> May 2016. A total of 28 rock samples were also collected during the 17 days of field work and sampling. The 71 samples were then packaged and dispatched to Perth by Registered Post and then examined and geologically logged before being submitted to the Bureau Veritas Laboratory in Perth (Canning Vale), on the 8<sup>th</sup> July 2016. A number of maps were subsequently prepared by Ron Gregory along with documentation on the sampling methodology and a number of photographs of the sampling sites, sampling work and general location (Figures 5 & 6).



Figure 6: Old Peripatetic Mine in Area B during April-May Rock Sampling in EL18/2011

The 43 stream sediment samples and 28 rock samples from Areas D and B were submitted to the Bureau Veritas Laboratory in Perth on the 8<sup>th</sup> July 2016. All 71 of these Heemskirk 2016 samples were analysed using the total-fusion laser-ablation method. The analyses for the samples were received in July 2016. The plan below shows the results for the 122 stream sediment concentrate samples analysed to date (Figure 7).

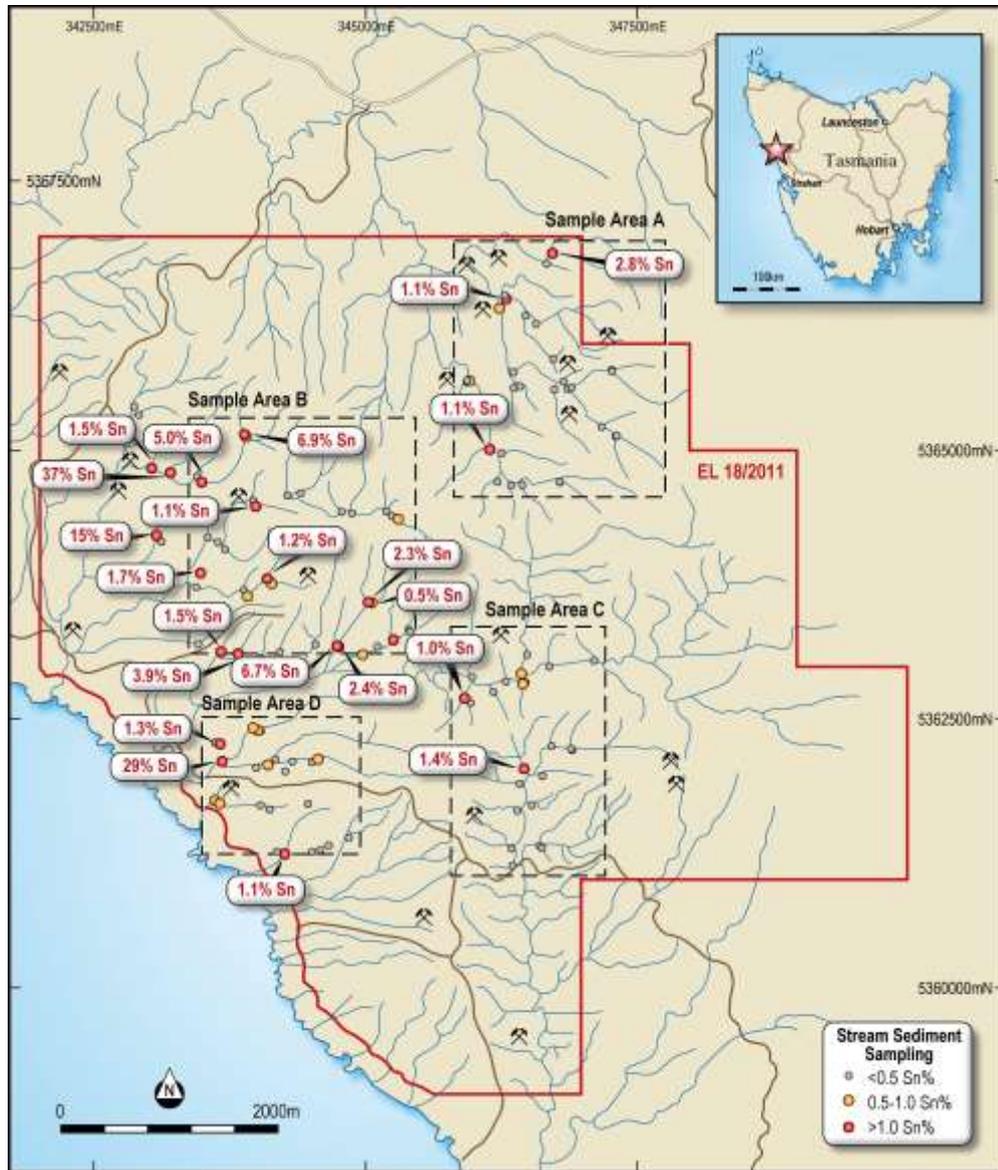


Figure 7: E18/2011 Results from Panned Stream Sediment Samples (to May 2016)

The stream sediment samples are panned concentrate samples and are therefore higher grade than the actual in-situ stream sediments; nonetheless, it is thought that the higher grade samples are directly relatable to the bedrock areas with the highest distribution of contained tin-minerals (Figure 8).

The full details of the 43 panned concentrate stream samples from Areas D and B, collected in April-May 2016 are listed below in Table 1. While the full details of the 28 rock samples, collected in April-May 2016 are listed below in Table 2. Table 3 compares the average grades returned by the stream sediment samples with those from the rock samples.

Sample No.	Easting GDA	Northing GDA	Area	Date	Ag_LA ppm	As_LA ppm	Cu_LA ppm	Mo_LA ppm	Pb_LA ppm	Sn_LA ppm	Sn_LA %	U_LA ppm	W_LA ppm	Zn_LA ppm
53282	343949	5362430	Area D	Apr-16	0.2	1.4	6	0.8	3	7830	0.78	18.1	27.6	60
53283	343999	5362410	Area D	Apr-16	-0.1	1.4	6	1	2	7080	0.71	8.46	23.4	50
53284	344017	5362406	Area D	Apr-16	-0.1	2	10	1	5	709	0.07	8.54	7	110
53285	343605	5362288	Area D	Apr-16	-0.1	1.2	8	1	3	764	0.08	5.68	4.2	70
53286	343650	5362278	Area D	Apr-16	-0.1	1.2	6	0.6	2	12600	1.26	7.69	41.2	45
53287	343674	5362119	Area D	Apr-16	-0.1	3	-2	1.2	4	294000	29.4	59.2	1010	20
53288	343995	5362047	Area D	Apr-16	-0.1	0.6	6	0.6	2	737	0.07	5.13	5.4	50
53289	344105	5362081	Area D	Apr-16	0.2	-0.2	12	2.2	3	6150	0.62	5.7	29.4	55
53290	344165	5362114	Area D	Apr-16	-0.1	1.2	4	1.6	2	2810	0.28	13.7	16.5	55
53291	344249	5362033	Area D	Apr-16	-0.1	0.8	6	0.4	3	2100	0.21	11.7	10.4	45
53292	344325	5362105	Area D	Apr-16	-0.1	1.2	6	0.6	2	759	0.08	4.32	4.4	60
53293	344501	5362104	Area D	Apr-16	-0.1	1.8	8	0.8	3	109	0.01	12.8	5.6	50
53294	344548	5362125	Area D	Apr-16	-0.1	0.4	-2	0.4	3	8570	0.86	7.67	40.2	40
53295	343625	5361738	Area D	Apr-16	-0.1	1.4	8	0.8	2	5630	0.56	8.48	18.7	45
53296	343648	5361716	Area D	Apr-16	0.3	1.4	6	0.8	2	6490	0.65	3.66	24.1	50
53297	343853	5361705	Area D	Apr-16	-0.1	1.2	8	0.8	2	1060	0.11	4.09	4.7	30
53298	344032	5361705	Area D	Apr-16	-0.1	0.8	4	0.8	-1	119	0.01	2.18	1.55	40
53299	344113	5361662	Area D	Apr-16	-0.1	0.6	8	1.2	-1	556	0.06	5.16	3.55	20
53300	344465	5361730	Area D	Apr-16	0.7	0.4	4	0.6	4	1420	0.14	17.9	13.2	40
53301	344181	5361273	Area D	Apr-16	-0.1	1.2	10	1	3	4360	0.44	10.4	18.5	55
53302	344268	5361240	Area D	Apr-16	0.3	0.4	-2	-0.2	3	10800	1.08	18.3	114	40
53303	344502	5361277	Area D	Apr-16	0.2	1.4	8	0.6	2	384	0.04	5.15	5.15	40
53304	344571	5361294	Area D	Apr-16	0.2	1.4	8	0.8	3	1030	0.10	11.4	13.3	55
53305	344660	5361338	Area D	Apr-16	-0.1	1	4	0.4	-1	1340	0.13	3.41	6.3	40
53306	344837	5361402	Area D	Apr-16	-0.1	0.6	8	0.4	2	4580	0.46	7.67	18.1	55
53307	345408	5363323	Area B	May-16	0.2	2.6	12	1	6	589	0.06	6.53	13.7	60
53308	345397	5363333	Area B	May-16	-0.1	3	6	1.2	6	852	0.09	6.76	29.6	65
53309	345255	5363222	Area B	May-16	-0.1	2.6	10	1.8	7	21300	2.13	44.7	95.7	75
53310	345101	5363184	Area B	May-16	0.7	-0.2	4	1.6	3	4180	0.42	11.2	19.7	45
53311	344965	5363099	Area B	May-16	-0.1	1	-2	1	2	6870	0.69	20.5	29.7	50
53312	344207	5363125	Area B	May-16	0.4	1.6	10	1.2	3	1900	0.19	13.7	8.95	60
53313	344032	5363073	Area B	May-16	-0.1	1.2	4	0.8	2	1720	0.17	12.3	8.25	55
53314	343822	5363116	Area B	May-16	-0.1	0.4	6	0.6	2	38600	3.86	25.5	165	20
53315	343667	5363129	Area B	May-16	0.2	1.2	6	0.6	-1	15100	1.51	6.93	57.4	45
53316	343431	5363729	Area B	May-16	-0.1	0.8	4	2.8	-1	2000	0.20	8.9	12.5	60
53317	343478	5363866	Area B	May-16	-0.1	1.8	-2	1.8	6	16800	1.68	31.9	98.5	20
53318	343118	5364165	Area B	May-16	-0.1	-0.2	-2	1.2	-1	194	0.02	10.5	3.45	40
53319	343070	5364210	Area B	May-16	-0.1	-0.2	-2	0.6	-1	154000	15.4	14.1	394	40
53320	343201	5364811	Area B	May-16	-0.1	0.4	-2	2	7	370000	37.0	58.3	1010	40
53321	343033	5364830	Area B	May-16	-0.1	-0.2	-2	-0.2	2	14400	1.44	11.6	51.8	10
53322	343008	5365160	Area B	May-16	-0.1	0.8	4	0.8	5	4720	0.47	43.7	21.6	50
53323	342903	5365338	Area B	May-16	-0.1	-0.2	-2	1.2	3	582	0.06	19.8	6.65	30
53324	342890	5365407	Area B	May-16	-0.1	1.4	6	0.4	6	378	0.04	5.38	21.1	45

Table 1 (above): 2016 Assay results for 43 panned concentrate stream sediment samples collected in April-May 2016

Sample No.	Easting GDA	Northing GDA	Area	Ag_LA ppm	As_LA ppm	Cu_LA ppm	Mo_LA ppm	Pb_LA ppm	Sn_LA ppm	Sn_LA %	U_LA ppm	W_LA ppm	Zn_LA ppm
16001	343891	5362312	Area D	-0.1	1.2	6	0.6	-1	57	0.01	2.55	8.75	35
16002	343662	5362259	Area D	-0.1	0.6	4	0.4	2	541	0.05	2.82	6	60
16003	343638	5362274	Area D	1	926	34	0.6	37	334	0.03	20.4	11.1	310
16004	344021	5362069	Area D	-0.1	3.6	18	6	7	94.8	0.01	7.79	6.6	65
16005	344001	5362154	Area D	-0.1	2.8	4	-0.2	-1	27.8	0.00	1.83	1.4	95
16006	344164	5361674	Area D	-0.1	5.8	12	192	2	23.8	0.00	11.6	790	35
16007	343606	5361757	Area D	-0.1	2.4	-2	1.2	3	29	0.00	4.11	3.45	70
16008	344597	5364089	Area B	1.7	0.4	-2	0.8	149	3410	0.34	4.34	21.1	100
16009	344597	5364089	Area B	0.2	1.2	4	-0.2	33	1790	0.18	2.52	12.7	95
16010	344608	5364050	Area B	0.4	6	-2	-0.2	1210	2290	0.23	5.93	8.35	50
16011	344608	5364050	Area B	21.3	321	38	0.8	245	25200	2.52	7.11	87.8	70
16012	344608	5364050	Area B	0.5	9.6	6	-0.2	17	327	0.03	4.08	8	100
16013	344608	5364050	Area B	0.9	4	-2	0.6	10	234	0.02	2.05	5.25	20
16014	344608	5364050	Area B	3.5	140	82	0.8	228	176	0.02	7.35	8.45	50
16015	344574	5364025	Area B	-0.1	0.8	-2	2	11	258	0.03	3.7	8.85	55
16016	344574	5364025	Area B	-0.1	-0.2	-2	-0.2	6	63.4	0.01	3.12	2.7	80
16017	344574	5364025	Area B	-0.1	0.8	-2	0.4	4	16.4	0.00	2.83	2.25	80
16018	344554	5363871	Area B	1.4	2.8	6	0.6	3	365	0.04	3.05	13.3	65
16019	342713	5365195	Area B	-0.1	-0.2	-2	1.8	-1	8.8	0.00	1.34	7	45
16020	342713	5365195	Area B	-0.1	-0.2	6	2.4	-1	33.2	0.00	1.04	8.2	40
16021	342713	5365195	Area B	0.2	1.4	-2	1.2	-1	10.4	0.00	0.35	1.9	45
16022	342867	5365049	Area B	0.5	14.6	10	1.6	16	946	0.09	2.02	12.9	45
16023	342867	5365049	Area B	-0.1	2	8	1.2	11	18.4	0.00	2.69	12.8	20
16024	342934	5365082	Area B	0.4	4.8	12	1.6	22	46.8	0.00	7.59	5.2	40
16025	342934	5365082	Area B	-0.1	3.8	44	1.2	17	41	0.00	3.96	10.1	75
16026	342729	5365022	Area B	1	27.8	40	1.2	3	394	0.04	1.62	20.9	35
16027	342729	5365022	Area B	0.8	1180	24	0.8	7	82.2	0.01	2.31	38.2	60
16028	342857	5364653	Area B	-0.1	6.2	6	1.2	3	75.2	0.01	1.49	17.2	45

Table 2: 2015 Assay results for 28 rock samples collected in April-May 2016

Average 2016 assay	Ag_LA ppm	As_LA ppm	Cu_LA ppm	Mo_LA ppm	Pb_LA ppm	Sn_LA ppm	Sn_LA %	U_LA ppm	W_LA ppm	Zn_LA ppm
Stream conc. (43)	0.01	1.1	4.8	0.9	2.6	24097	2.4	14.4	81.7	47.2
Rock (28)	1.2	95	13	8	73	1318	0.1	4.3	40.7	67.3

Table 3: Average Assays for the stream sediment and rock samples collected in 2016

In October 2016, Ron Gregory Prospecting (Tasmania) was again contacted to organise a field sampling program over the summer, to take advantage of the drier conditions and improved access provided. The idea was to expand the rock sampling program over the old workings, and other prospective areas, as well as commence soil sampling within the valleys of the streams that held the most anomalous stream sediment concentrate results to date, and, thirdly, to complete a small infill stream sediment sampling program in Areas B & D.

The February 2017 stream sediment sampling program commenced on the 6<sup>th</sup> February 2017, with mobilisation to Granville Harbour and setting up camp at a shack in the village there. Mapping and rock sampling was completed over 4 days at the Peripatetic, Carn Brea and Fisher & Smith mines (58 rock samples). Soil and stream sediment sampling then continued on for another week (68 soil samples and 7 stream sediment samples), with demobilisation on the 16<sup>th</sup> February 2017.



Figure 8: Panning of Stream Sediment Samples 53284 Area D and 53317 in Area B

A total of 133 samples were collected during the 11 days of field work and sampling. The 65 rock and stream sediment samples were then packaged and dispatched to Perth by Registered Post to be examined and geologically logged before being submitted to the Bureau Veritas Laboratory in Perth (Canning Vale), on the 20<sup>th</sup> March 2017. The 68 soil samples were

dispatched to the Bureau Veritas Laboratory in Adelaide (Wingfield) for sample preparation, before being forwarded to Perth (Canning Vale) for analysis. A number of maps were subsequently prepared by Ron Gregory along with documentation on the sampling methodology and a number of photographs of the sampling sites, sampling work and general location (Figure 9).

All 204 of these Heemskirk 2016 and 2017 samples have been (or are being) analysed using the total-fusion laser-ablation method. The analyses for the 2016 samples were received in July 2016, but the timeframe for completing this Annual Report (mid-March 2017) has prevented the analyses for the February 2017 samples from being available in time for reporting this year.



Figure 9: Overview of Heemskirk Area during 2016 Sampling Program in EL18/2011

This report comprises the Annual Report on exploration completed at the Heemskirk Project (EL18/2011) during the period 3<sup>rd</sup> April 2016 to 2<sup>nd</sup> April 2017. The full report comprises one text document (PDF), two geochemistry files (CSV format), and one surface map showing all sample sites, drainage and topography, as follows. All co-ordinates are in GDA94 format.

EL182011\_201704\_A\_01\_AnnualReport.pdf  
EL182011\_201704\_A\_02\_GeochemA.csv  
EL182011\_201704\_A\_03\_GeochemB.csv  
EL182011\_201704\_A\_04\_StreamMap.pdf  
EL182011\_201704\_A\_05\_RockMap.pdf

#### **4. Discussion of Results**

To date Minrex has received laser ablation analyses (also some gold by ICP and sulphur by XRF) for 173 samples collected from 2012-2016, from the E18/2011 licence. A further 133 samples from the February 2017 sampling program are currently in the Laboratory, with results expected after the cut-off date for completion of this report. Of the 173 analyses received, 122 are stream sediment concentrate samples and 51 are rock and soil samples, generally collected from the vicinity of the old workings. The stream sediment samples have been hand-panned, on site, to concentrate the heavier minerals in the samples and this should result in elevated values for precious metals, base metals, and metal oxide, where these are present in the in-situ stream sediments.

Examination of the assays returned from the 122 stream sediment concentrate samples indicates the following conclusions.

Gold and sulphur were only completed on the first stream 79 stream concentrate samples (gold by ICP and sulphur by XRF). Gold averages just 0.5ppb, with a maximum of 5.4ppb, and sulphur averages just 0.005%, with a maximum of 0.06%. These samples cover most of the licence area (Areas A-D) and demonstrate that neither gold nor sulphide minerals are present or concentrating in the drainage systems.

Similarly, the values for arsenic, silver, base and other metals are all low in all 122 stream concentrate samples analysed. Silver averages just 0.05ppm (maximum 0.7ppm), arsenic averages just 1.4ppm (maximum 7.6ppm), copper averages 2.5ppm (maximum 12ppm), lead averages 5.4ppm (maximum 26ppm), zinc averages 44ppm (maximum 110ppm) and molybdenum averages 0.8ppm (maximum 3.6ppm). As these metals tend to occur as sulphide minerals, and most have been observed in the basement prospects in the area, there is a strong suggestion that the acidic stream environment at Heemskirk is breaking down sulphide minerals and taking sulphur and metals into solution.

Tin is the only metallic element present in the stream sediment samples at elevated to highly concentrated levels (of those analysed – iron and others have not been assayed). The average tin assay for all 79 samples is 1.2% tin (12,174ppm) with a highest value of 37% tin. The samples are panned concentrate samples and are therefore higher grade than the in-situ stream sediments; nonetheless, it is clear that tin is relatively abundant in the area and is being concentrated in the drainage system. Tin levels in the pan concentrate samples averages about 14 times the level in the rock samples from the area.

In 2016, the 43 stream sediment concentrate samples collected were also analysed for uranium, with this element also being at low levels, an average of 14ppm and a maximum value of 59ppm.

By contrast, examination of the 51 rock and soil samples collected indicates the following conclusions.

Gold and sulphur were only completed on the first 23 rock and soil samples (gold by ICP and sulphur by XRF). Gold values are very low and similar to the stream sediment concentrate samples, averaging just 0.2ppb, with a maximum of 3ppb, suggesting that gold is not present

at significant levels in any of the areas tested. On the other hand, sulphur is very much higher in the rock samples (although it is strongly influenced by a single high value), sulphur averages 0.1%, with a maximum of 1.1%. These samples are from just a few of the old workings and demonstrate that gold is probably rare in the licence area, and that sulphide minerals are present in fresh rock (in places), but are probably broken down once released into the drainage systems.

The values for most metals are significantly higher in rock and soil samples than they are in the stream sediment concentrate samples, demonstrating that most metals are probably being taken into solution by the acidic ground and surface water at Heemskirk. This is especially true for arsenic and silver, which returned values 480 times and 14 times higher, respectively, in rock samples compared to stream sediment concentrates. Silver averaged 1ppm (maximum 21ppm) and arsenic averaged 645ppm (maximum 30.1%) in the rock and soil samples. The results are skewed by the presence of a single sample of arsenopyrite (30.1% As and 1.1%S) but several other rock samples also show the presence of sulphur, arsenic, copper, lead and zinc, suggesting the presence of sulphides in the rock and soil samples, while only very low values are present in the stream sediment concentrate samples .

In the 51 rock and soil samples analysed, copper averages 9ppm (maximum 82ppm), lead averages 47ppm (maximum 1210ppm), zinc averages 61ppm (maximum 370ppm) and molybdenum averages 5ppm (maximum 192ppm) (Table 3). Compared to the stream sediment concentrate samples the rock samples contain about four times the copper, ten times the lead, and six times the molybdenum, zinc is only slightly higher and tungsten is the same in both. Again, as most of these metals tend to occur as sulphide minerals, and have been observed in the basement prospects in the area, there is a strong suggestion that the acidic stream environment at Heemskirk is breaking down sulphide minerals and taking sulphur and metals into solution.

Tin values are highly variable in the rock and soil samples, reflecting the fact that the tin occurs in lode and greisen zones within otherwise barren granite as the country rock. Hence values are highly variable up to a maximum of 2.5% tin in one sample from the old Fisher and Smith workings, although several rock samples contain over 0.1% tin. The main anomalous zone to date, in the stream sediment concentrate sampling, is clearly in the west of the licence (in Areas B & D) in the general area of the Peripatetic, Carn Brea and Fisher & Smith workings. A total of 21 of the 122 assay results, from stream sediment concentrate samples, are over 1.0% Sn and another 17 are between 0.5% and 1.0% Sn. A plan showing the 38 assays over 0.5% tin has been prepared and is included below as Figure 10.

A major conclusion, to date, is that sulphide minerals and chalcophile elements, while known from basement outcrops and workings, are rare in the stream sediments in the area. Any sulphides generated in the granitic host rocks by greisenization, alteration and veining do not appear to have survived erosion and transport. This suggests that previous exploration programs (e.g. 1976 & 1984) aiming to test for base metal prospectivity using stream sediment sampling may have been ineffective.

On the other hand, tin is clearly present in the area and has been concentrated in the drainage systems. The main areas of high tin values appear to coincide with the main known workings in EL18/2011 (Peripatetic, Carn Brea and Fisher & Smith workings). However, the degree to which tin has been accrued by erosion of former deposits which may have overlain the current

surface, or the amount of lateral dispersal which may have occurred, when the area was a flat coastal plain, prior to the incision by the current young drainage system, remains unclear. There also remains an untested area in the north of the licence which is known to contain significant alluvial deposits at the St Dizier and Amy Creek alluvial deposits.

The full table of 2016 assay results (by laser ablation), for all 43 panned stream sediment samples and 28 rock samples is included above as Tables 1 and 2.

Exploration from 2012-2016 was primarily aimed at testing drainage systems with panned concentrate sampling, augmented by selected rock sampling at the known old workings. In 2017 a new phase of the exploration commenced with the collection of systematic soil samples around the valleys of the drainage systems with the highest stream sediment concentrate values. In all 68 soil samples were collected in February 2017, with the assay results yet to be received from the laboratory. Once the soil sample results are received, the results will be assessed prior to further soil sampling in anomalous areas.

The next stage of exploration will comprise stream sediment concentrate sampling in the northern portion of the licence area and further soil sampling in valleys where anomalous stream sediment concentrate sample results have been returned in 2012-2016. Further rock sampling will also be undertaken in areas with old workings, trenches and favourable outcrops. Also, sample residues have been retained and it is possible that future analyses may include other granite-associated elements such as lithium, thorium, tantalite, columbite, zirconium, yttrium, dysprosium, scandium and other REE.

Further work is yet to be concluded in the area. To date the significance of the refined magnetic and radiometric anomalies (from 2012) is not yet able to be determined, and further follow-up activities are planned to test the precision of magnetic exploration vectors.

In conclusion, the exploration results to date suggest that tin is the only element present in anomalous quantities within the Heemskirk (E18/2011) tenement area. However, further sampling work is warranted and more extensive analysis work is also planned.

An exploration budget of \$57,000 is now proposed for the sixth year of the tenement and \$70,400 for the seventh year – once the renewal of the licence has been received.

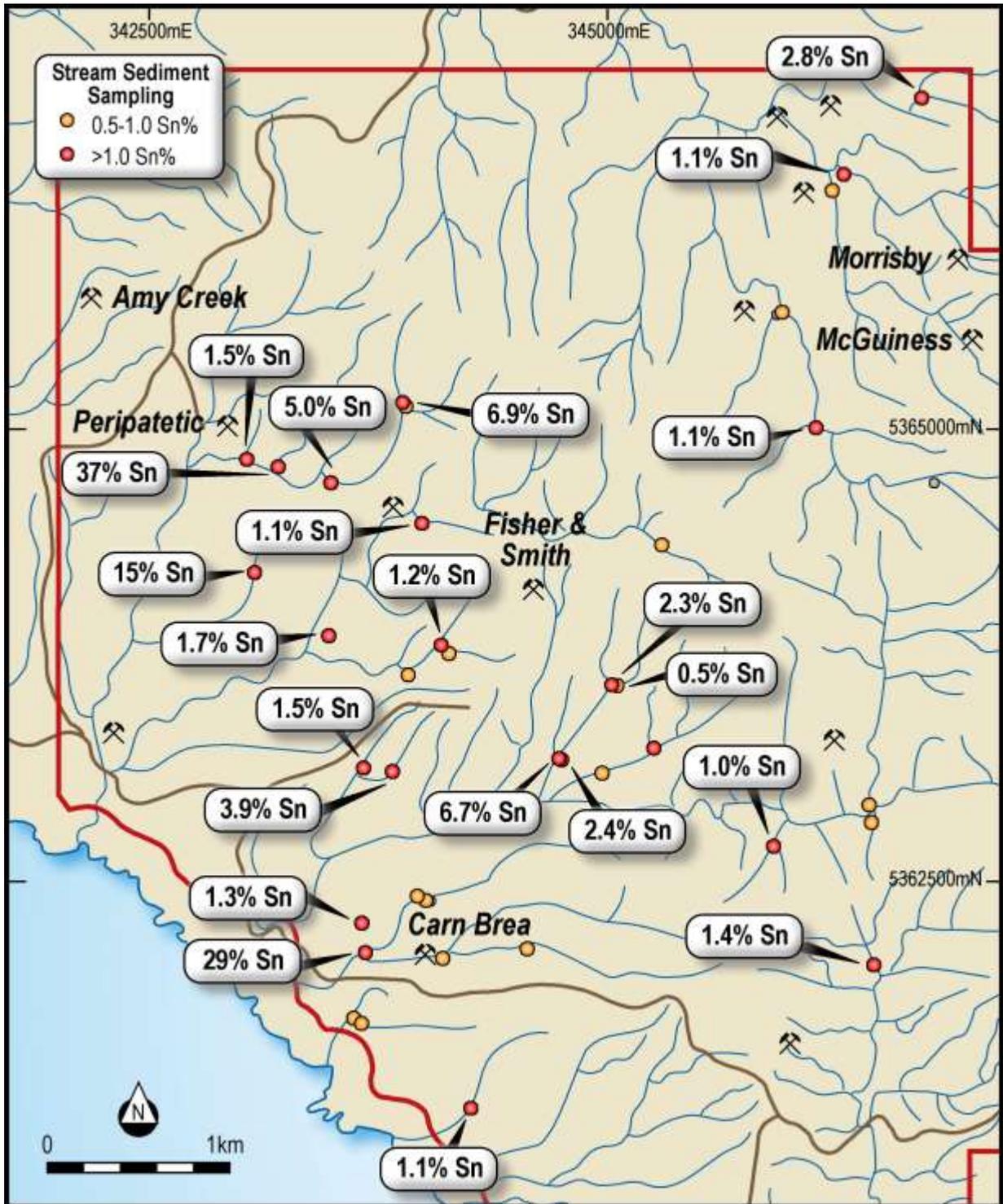


Figure 10: Plan showing Main Anomalous Panned Stream Sediment Sample Areas

## **5. Conclusions**

In the five years of exploration activities at the Heemskirk (EL18/2011) tenement, Minrex has completed a literature review, assessment of previous exploration results, re-processing and analysis of the government airborne magnetic and radiometric geophysical data, surface reconnaissance, mapping and evaluation of old workings. A total of five surface sampling field programs have been completed with the collection of 306 samples which have been analysed for multiple metallic elements. To date a total of 129 hand-panned stream concentrate samples, 99 rock samples and 78 soil samples have been collected.

At the date of this report, the final analyses from the 133 samples collected in the February 2017 sampling program are yet to be received.

A total of \$56,825 has been expended on the project in the past year, versus the commitment made of \$44,000. A grand total of \$208,315 has now been expended on the Project, versus the minimum expenditure of \$123,000 which was committed for the first five years.

Minrex has now applied for the Heemskirk Project (EL18/2011) licence to be renewed.

In the sixth year of the exploration program, Minrex plans to:-

- Continue the surface stream sediment sampling into the north of the licence.
- Conduct infill stream sampling, where best results were returned previously.
- Conduct more detailed mapping and sampling at old workings.
- Conduct further systematic soil sampling around anomalous stream systems.
- Review other mineralisation models for potential granite-hosted mineralisation.

An exploration budget of \$57,000 is now proposed for the sixth year of the tenement and \$70,400 for the seventh year – once the renewal of the licence has been received.

## **6. Environment**

Work completed during the year was conducted utilising quad bikes which were driven cautiously on the existing tracks within the tenement area. Access to the stream sediment sample sites, soil sample sites, old workings and general geology was by quad bike and on foot. A total of 204 samples were collected in the year, comprising 50 hand-panned stream concentrate samples, 86 rock samples from old workings and 68 soil samples. Any disturbance to stream beds, banks, valley flanks or access points by this hand-held sampling work was restored as soon as the sampling at each individual site was completed.

Every effort has been made to keep vehicle tyres, boots and sampling equipment free of weed seeds and possible plant and animal diseases.

None of these activities are thought to have caused any significant environmental damage or impact. Every care was taken not to damage plants, animals or the landscape and there was no spillage of fuels, rubbish or other chemicals. All equipment, foodstuffs, rubbish and other items have been removed from the licence area at the completion of each program.

Accommodation was at Granville Harbour during the programs, with daily access by quad bike. During the programs there was no camping or residing within the tenement area.

## **7. Expenditure**

In its application for EL18/2011, Minrex Resources Limited undertook to complete a review and interpretation of previous exploration and geophysical data, logging of historic drill core, MMI and rock chip geochemical survey and detailed geological mapping of selected targets; in the first two years of the licence. A minimum expenditure of \$26,000 was also set for the first two years and a total of \$67,907 was actually expended in the first two years.

In the third year a total of \$19,976 was expended on review of the previous work, drafting, reporting, planning and co-ordination for the subsequent exploration program; versus a planned expenditure of \$22,000.

In the fourth year a total of \$63,607 was expended on review of the previous work, drafting, reporting, planning and conducting an extensive field program of panned concentrate stream sediment sampling; versus a planned expenditure of \$31,000.

In this fifth year a total of \$56,825 has been expended on reviewing the previous work, reporting, planning and conducting two extensive field programs of panned concentrate stream sediment sampling, rock sampling and soil sampling; versus a planned expenditure of \$44,000.

A total of \$208,315 has therefore been expended by Minrex on EL18/2011 in the first five years, versus an expenditure commitment of \$123,000.

Minrex has now applied to renew the licence (EL18/2011) and aims to continue its exploration activities over the coming years.

An exploration budget of \$57,000 is now proposed for the sixth year of the tenement and \$70,400 for the seventh year – once the renewal of the licence has been received.

## **8. References**

- Allen, C, 2012: Previous Exploration Work & Initial Reconnaissance EL18/2011. June 2012 (EL182011\_2013A\_02\_ReportB.pdf).
- Blissett, A.H., 1962: Explanatory Report Zeehan (K55-5-50) Map Sheet. Geological Survey, Tasmanian Department of Mines.
- Callow, K.J., 1971: Report on Exploration Licence EL28/71. Unpublished Australia and New Zealand Exploration Company Report.
- Cromer, W.C., 1988: Annual Report on EL28/87 – Granville Harbour. Unpublished New Holland Mining Company Report.
- Hazitaheri, J., 1982: Genesis of the Mineralization Associated with the Heemskirk Granite. Unpublished PhD Thesis.
- Klominsky, J, 1972: The Heemskirk Granite Massif – Study of Chemical Variability in Plutonic Rocks, Unpublished PhD Thesis. University of Tasmania.
- Loxton, Hunting & Associates, 1978: A Photo-geological Study of the Heemskirk Granite and the area surrounding Zeehan. Unpublished Loxton, Hunting & Associates Report.
- Muir, P, 2012: Processing of Airborne Geophysical Data over EL18/2011 (Heemskirk Project). October 2012 (EL182011\_2013A\_03\_ReportC.pdf)
- Munro, K, 2013: 2013 Annual Report on the Heemskirk Project EL18/2011. March 2013 (EL182011\_2013A\_01\_ReportA.pdf).
- Munro, K, 2014: 2014 Annual Report on the Heemskirk Project EL18/2011. March 2014 (EL182011\_2014A\_01\_ReportA.pdf).
- Munro, K, 2015: 2015 Annual Report on the Heemskirk Project EL18/2011. March 2015 (EL182011\_2015A\_01\_ReportA.pdf).
- Munro, K, 2016: 2016 Annual Report on the Heemskirk Project EL18/2011. March 2016 (EL182011\_2016A\_01\_ReportA.pdf).
- Rattigan, J.H., 1968: Geochemical Drainage Survey of the Heemskirk area (EL7/68). Unpublished Geophoto Resources Company Report.
- Rattigan, J.H., 1969: Proposals on Drilling the Peripatetic Tin Prospect, Heemskirk (EL7/68). Unpublished Geophoto Resources Company Report.
- Rattigan, J.H., 1970: Completion Report on Diamond Drilling the Peripatetic Prospect (EL7/68). Unpublished Geophoto Resources Company Report.

Stephenson, P.R., 1978: Notes on Longs Iron Blow. Unpublished Goldfields Exploration Company Report.

Roberts, P.A., 1981: The Peripatetic Mine. Unpublished Goldfields Exploration Company Report.

Roberts, P.A., 1984: Relinquishment Report on Northern Portion of EL11/76. Unpublished Goldfields Exploration Company Report.

Taylor, B.L. & Burger, D. 1950: Alleged Occurrence of Radio Active Minerals at North Heemskirk. Geological Survey Geological Investigation, Tasmanian Department of Mines.

Waller, G.A., 1902: Report on the Tin Ore Deposits of Mount Heemskirk, Tasmanian Department of Mines.

Waterhouse, L.L., 1915: Reconnaissance of the North Heemskirk Tinfield. Geological Survey Report 6, Tasmanian Department of Mines.

Waterhouse, L.L., 1916: The South Heemskirk Tinfield. Geological Survey Bulletin 21, Tasmanian Department of Mines.

Wells, K, 1978: Geology and Mineralisation in the South Heemskirk Tin Field. Unpublished MSc Thesis, James Cook University.

## **Keywords**

Location:	Heemskirk, Granville Harbour, Granite Creek
Mineralisation type:	Skarn, veins, greisen, sulphides, cassiterite, granite, granite-hosted
Metals:	Tin, tungsten, base metals, copper, molybdenum, silver, arsenic
Exploration methods:	Literature research, aeromagnetic, radiometric, geochemistry, geophysics, geological mapping, rock chip samples, stream sediment samples, panned stream sediment concentrate samples, soil samples, assaying, analyses
Mine/prospect name:	Peripatetic Mine, McGuinness, Iron Blow, Fisher & Smith, Carn Brea, St Dizier Creek, Amy Creek
Stratigraphic Name:	Heemskirk Granite
Lithologic name:	Granite, skarn, vein, greisen
Datum:	GDA94