



**STELLAR RESOURCES LIMITED**  
Rubicon Min Tech Ventures Pty Ltd

**EL 46/2003 HEEMSKIRK**

**ANNUAL REPORT FOR THE PERIOD  
10 JANUARY 2014 – 9 JANUARY 2015**

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## ABSTRACT

This Annual Report for EL 46/2003, Heemskirk, covers the period from 10 January 2014 to 9 January 2015.

The Heemskirk licence area contains historical occurrences of copper, tin and gold. Previous exploration in the area includes extensive stream sediment sampling, especially in the central and southern areas, geological mapping and a range of geophysical surveys, which have revealed numerous anomalies. Some of these anomalies have been drill tested and some remain untested or inadequately drilled, the licence area is prospective for the discovery of base metal mineralisation.

With Stellar Resources' focus on the Heemskirk Tin Project at Zeehan the tin prospects on EL 46/2003 have assumed more significance. In particular the St Dizier Prospect has become a priority target due to its potential as an alternative source of tin ore for a Zeehan tin processing plant.

During 2014 the existing geochemical grid was extended to cover three magnetic anomalies adjacent to the St Dizier Skarn. No new targets were identified by this work.

Resource Consultant Tim Callaghan completed computer modelling of the St Dizier Tin Deposit and used it to produce a JORC 2012 compliant resource estimate, which is presented herein.

This was followed early in 2014 by costeaning and bulk sampling of the main St Dizier lode to gain samples for metallurgical testing which continued throughout the year and is ongoing. It is due for completion early in 2015.

Drilling followed, which was used to further define the deposit and to gain underground samples for the metallurgical work. Following on from this consultant mining engineers, Polberro Consulting, carried out a thorough mine design study leading to the completion of a mine scoping study. The results of the Scoping Study presented herein are preliminary, as the study cannot be finalised until the metallurgical work has been completed.

Environmental studies carried out in 2014 have included a Flora and Fauna study by P. Milner Landscape Consultants, an archaeological survey by P. Kostoglou of Tasarc Archaeological Services and preliminary rock geochemistry analysis by Geo-Environmental Management.

Total expenditure on EL46/2003 during 2014 totalled \$713,732

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# 1. INTRODUCTION

## 1.1. EXPLORATION RATIONALE & GEOLOGICAL SETTING

The licence covers the southern end of the Arthur Lineament and the northern and eastern contacts and aureole of the Heemskirk Granite. The northern granite aureole hosts the St Dizier magnetite-tin Skarn Deposit and several other small skarns and is considered prospective for other similar deposits. In the southeast the aureole also hosts the Avebury Nickel Deposit. The Heemskirk Granite itself also hosts several small greisen deposits, some of which are in the EL.

In the north the EL covers the southern end of the Arthur lineament, including the Bowry Formation. The Bowry Formation hosts scattered stratiform magnetite-pyrite-chalcopyrite-gold mineralisation. At Alpine significant copper mineralisation has been delineated. A VTEM survey has identified other targets, which warrant follow up exploration.

The licence is considered highly prospective for magnetite-pyrite-chalcopyrite-gold mineralisation in the north, for magnetite-tin skarn deposits in the aureole of the Heemskirk Granite and for tin greisen deposits in the granite in the southwest.

With Stellar's focus on the Heemskirk Tin Project at Zeehan the tin prospects in EL 46/2006 have assumed more importance as a potential source of mill feed for the proposed tin treatment plant at Zeehan. Activities during 2014 focused on the St Dizier Deposit with costeaning to define a metallurgical bulk sample site, drilling to define the deposit at depth and provide fresh samples for met testing, ongoing metallurgical studies, environmental surveys and finally mining studies leading to a mine scoping study.

### 1.1.1. Geological Setting

EL46/2003 covers part of the Meso-proterozoic rocks of the Zeehan-Waratah belt (mainly Oonah and Crimson Creek Formations) including the southern end of the Arthur Lineament Metamorphic Complex and the Dundas Trough. The Devonian Heemskirk Granite, a fractionated biotite granite - muscovite granite, intrudes these rocks. The interaction of this granite with reactive host rocks is the source of skarns and is thought to be the source of most of the base metal mineralisation in the Zeehan area.

The Proterozoic Oonah Formation rocks are mainly quartzite and shale but there are also some carbonate rich beds. All of these rocks have been regionally metamorphosed with some adjacent to the granite being affected by contact metamorphism. There are some Cambrian sedimentary and ultramafic rocks southeast of the licence, which have also been affected by the granite. These host the Avebury Nickel Deposit.

North of the Heemskirk Granite the Proterozoic rocks have a northwest trend, paralleling the Heemskirk Anticlinorium. To the west, where visible, a sequence of Palaeozoic rocks form the north trending Duck Creek-Healy Creek Synclinal Zone but most of this portion of the tenement is obscured by Tertiary basalts and alluvial deposits. Jurassic dolerites of the Eureka Cone Sheet also cover a portion of the Proterozoic rocks along the northeast edge of the tenement.

The St Dizier Deposit is located at the western end of a 3km long skarn that parallels the east – west trending granite contact. To the east along the skarn are the Central and Big H prospects. The St Dizier Deposit is a carbonate metasomatic skarn hosted in hornfelsed Precambrian sedimentary rocks on the northern edge of the Devonian Heemskirk Granite. The deposit forms a roof pendant located in a tight synformal trough on the surface of the granite. Hornfelsed quartzite forms the hangingwall to the skarn and hornfelsed slates the footwall. The skarn is a vertically dipping, east-west striking stratabound body extending to a depth in excess of 200m from surface. Mineralisation extends over a 400 metre strike length and varies between 3 and 40 metres in thickness. The skarn consists of magnetite-serpentinite-diopside and actinolite with minor pyrrhotite-pyrite-arsenopyrite-cassiterite-schoenfliesite-sheelite-bismuthinite. Tin mineralisation is zoned with dominantly cassiterite in the west and increasing amounts of schoenfliesite and other exotic tin species to the east.

## 1.2. LICENCE

Tenement number: 46/2003

Tenement name: Heemskirk

Tenement location: The licence consists of two blocks, following the 2008 relinquishment of the central part of the licence (Figure 1). The northern block (129.5km<sup>2</sup>) is centred 24 km northwest of Zeehan with main road access from the Heemskirk Road, which passes centrally through the block. The southern block (12.5km<sup>2</sup>) is centred 7km west of Zeehan with access from the Trial Harbour Rd in the south of the block. Most of the EL area is Crown Land with approx. 5% being private agricultural land.

The crown land is covered by areas of nothofagus and eucalyptus rainforest, dry eucalyptus forest, scrub, heathland and button grass plain. Access is provided by the Heemskirk Road from Zeehan, the Trial Harbour Road, the Granville Harbour Road, the Corinna Road to Waratah in the north, and old bush tracks. Some areas of the licence are only accessible by foot.

Reporting period: 10 January 2014 to 9 January 2015.

Licence date: 10 February 2014 to 9 February 2015.

Tenement holder: Rubicon Min Tech Ventures Pty Ltd., a wholly owned subsidiary of Stellar Resources Ltd.

### 1.3. LOCATION OF LICENCE



Figure 1. EL46/2003, Location Map with Main Prospects

## 1.4. LAND TENURE

### SCHEDULE

LAND DISTRICT: MONTAGU  
VICINITY: HEEMSKIRK RIVER (centred 24km NW, and 7km W of ZEEHAN)  
MUNICIPALITY: WEST COAST  
TENEMENT: EXPLORATION LICENCE 46/2003 142km<sup>2</sup>  
HOLDER: RUBICON MIN TECH VENTURES PTY. LTD.

#### Northern block:

Commencing at a northwest corner at grid coordinates 335 000 metres E 5 380 000 metres N, thence grid east to 344 000 metres E, grid south to 5 375 000 metres N, again grid east to 345 000 metres E, again grid south to 5 373 000 metres N, again grid east to 347 000 metres E, again grid south to 5 371 000 metres N, again grid east to 349 000 metres E, again grid south to 5 369 000 metres N, again grid east to 349 000 metres E, again grid south to 5 366 000 metres N, again grid west to 347 000 metres E, again grid north to 5 367 000 metres N, again grid west to 339 000 metres E, to a point 200 metres inland from the high water mark on the West Coast of Tasmania, thence in a general north-westerly direction 200 metres inland from, and parallel to, that high water mark to 334 000 metres E, again grid north to 5 378 000 metres N, again grid east to 335 000 metres E aforesaid, thence again grid north to the point of commencement.

#### Southern block:

Commencing at a northwest corner at grid coordinates 352 000 metres E 5 363 000 metres N, thence grid east to 357 000 metres E, grid south to 5 362 000 metres N, again grid west to 354 000 metres E, again grid south to 5 358 000 metres N, again grid west to 352 000 metres E, thence again grid north to the point of commencement.

Coordinate datum - AGD66, AMG Zone 55.

### EXCLUSIONS

- (a) Any land owned or leased by the Commonwealth of Australia.
- (b) Mining Leases amounting to 79ha (more or less) which were applied for or in force prior to the date of application for this licence.
- c) Areas of private land which either have been, or are in the process of being, purchased by the Crown under the Regional Forest Agreement - Private Forests Reserves Program and / or private land over which the landowners have agreed, or are in the process of agreeing, to place a covenant or management agreement for conservation purposes under the Regional Forest Agreement - Private Forests Reserves Program.

### LAND TENURE

The area comprises:

- Private Property
- Crown land
- Multiple Use State Forest
- Mount Heemskirk Regional Reserve
- Four Mile Beach Regional Reserve
- MDC Informal Reserves
- HEC Land

The licence area contains areas, which are listed (including listed on an interim basis) on the Register of the National Estate kept under the *Australian Heritage Commission Act 1975*.

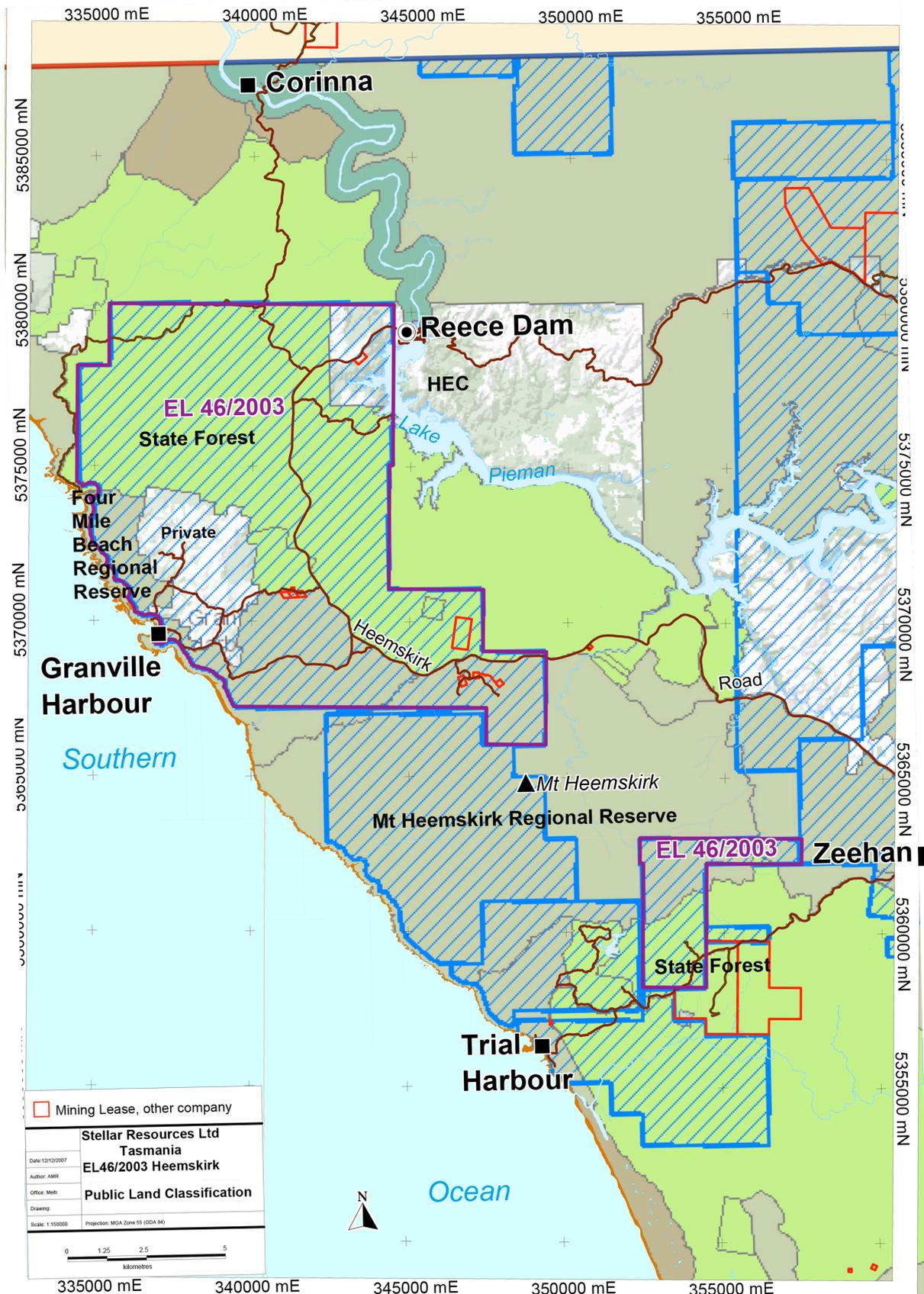
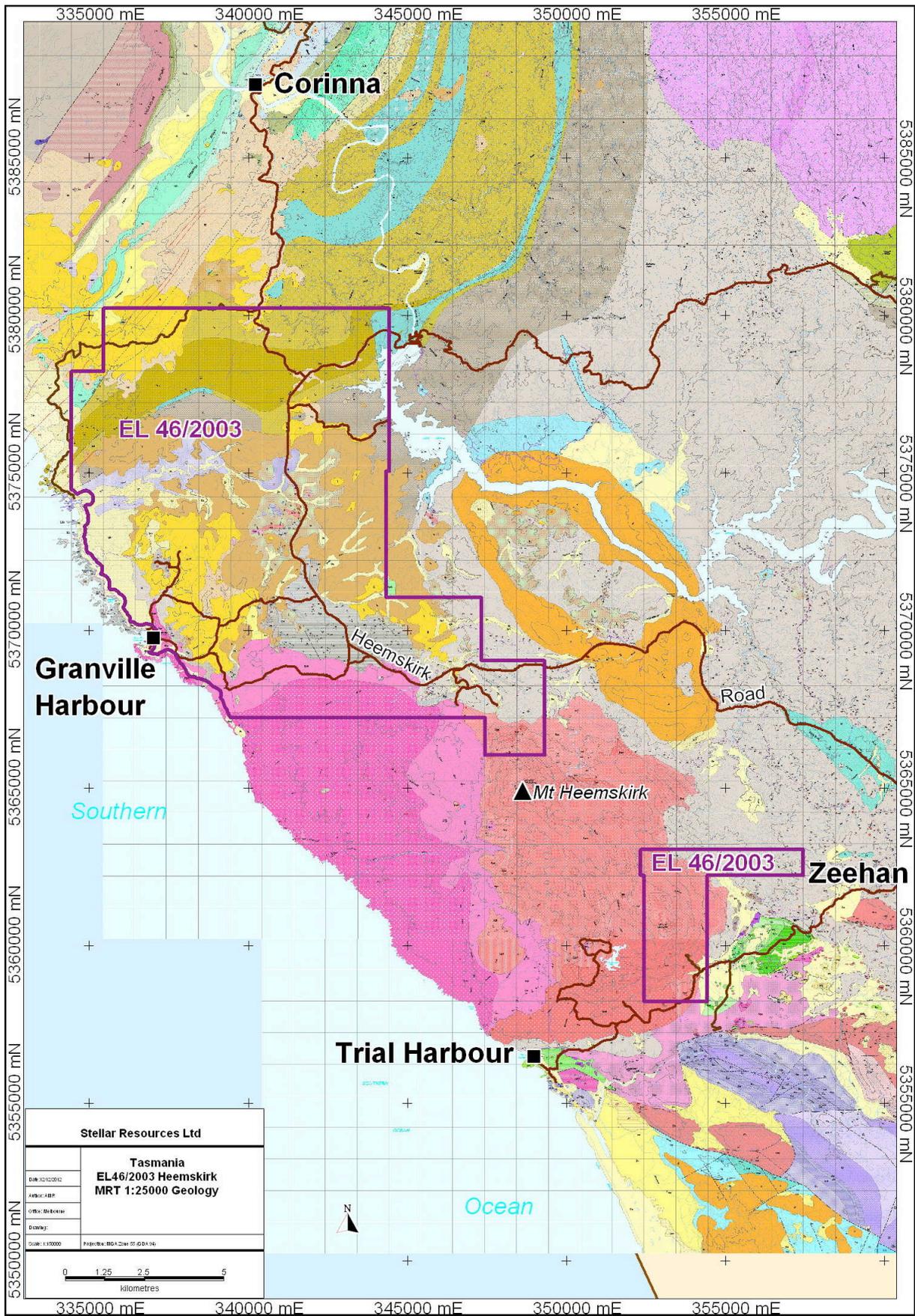


Figure 2. EL46/2003, Public Land Classification



**Figure 3. EL46/2003, Regional Geology (MRT)**

## 2. REVIEW OF PREVIOUS WORK

### Stellar Resources Exploration Work:

2005 - 2010: MRT digital geology and geophysics datasets, DPIWE topographic data as well as data captured from open-file company reports were reviewed. The capture of information from previous tenement holders (CRAE, Aberfoyle, Cominco, Placer, Minops, Pickands Mather, ACI, "Consolidated Syndicate", ANZECCO, Geophoto Resources, Goldfields/RGC, Geopeko, New Holland Mining, Outokumpu, Goldstream Mining and Titan Resources) from MRT open-file reports has been completed.

2006: Drilling: 1 DD hole at East Granville  
16 DD holes at the Alpine Prospect

2007: Drilling: 3 DD holes at Alpine Prospect  
7 RC holes at North Gourlay's Ck. Prospect  
3 DD holes at St. Dizier Deposit  
1 DD hole at Devises Prospect

Geophysics: Aeromagnetics survey over area north of 5399800mN, in northern part of EL.

2008: Geophysics: VTEM Survey over Bowry Formation/Gourlay's Ck area in northwest of EL.

2009: Partial relinquishment of portion of Licence deemed unprospective.

2010: Geophysics: Re-interpretation of Geophysical data  
Ground magnetic survey of Gourlay's Ck south targets.

2011: Drilling: 2 DD holes at Gourlay's Ck south targets.

2012: Capture of remaining MRT open-file data.

2013: Database development and resource modelling of St Dizier Deposit.

2014: Resource Estimate Release, St Dizier Deposit  
Geochemical Surveys, St Dizier Deposit  
Environmental Studies, St Dizier Deposit  
Archaeology Survey, St Dizier Deposit  
Costeaming & Bulk Sampling, St Dizier Deposit  
Drilling: 6 DD holes, One (BH01) at Big H Prospect and five (ST04 – ST08) at St Dizier  
Metallurgical Testwork, St Dizier Deposit  
Mine Planning & Project Scoping Study, St Dizier Deposit

### 3. ACTIVITIES COMPLETED DURING THE REPORTING PERIOD

#### 3.1. EXPLORATION ACTIVITIES

##### 3.1.1. Resource Estimation

During 2013 consultant geologist T. Callaghan created a computer database for the St Dizier Deposit and computer modelled the mineralisation. A JORC 2012 compliant resource estimate of the deposit was completed and released early in 2014. See Table 1 below. The complete resource report is appended in digital format as Appendix 4.

**Table 1. St Dizier Deposit Resource Estimate (JORC 2012)**

<b>Table 1. St Dizier Skarn Inferred and Indicated Resource Sn&gt;0.3% Cutoff</b>						
<b>Classification</b>	<b>Tonnes</b>	<b>Sn %</b>	<b>Sol Sn %</b>	<b>WO3 %</b>	<b>Fe %</b>	<b>S %</b>
Indicated Resource	1.20	0.69	0.09	0.04	23.70	2.64
Inferred Resource	1.06	0.52	0.22	0.05	22.20	1.81
<b>Total Resource</b>	<b>2.26</b>	<b>0.61</b>	<b>0.15</b>	<b>0.04</b>	<b>23.00</b>	<b>2.25</b>

The resource estimation is based mainly on historic diamond drilling, including 43 holes for 7,309m and Stellar's 2006 drilling of 3 confirmatory holes for 317m. The estimate does not include the results of the 2014 drilling program. All the historical data was loaded into an access database and validated against historic sections and plans. The data is considered to be of high industry standard as it was collected and collated by reputable mining companies. Most drill collars were surveyed by licensed surveyors and down hole surveys were carried out in the deeper drillholes.

Mineralised domains were modelled with Surpac<sup>(TM)</sup> software from historic cross sections using a 0.1% Sn boundary and a minimum width of 3m. Internal dilution was kept to a minimum of 3m with some allowances for continuity. Domains were split into a Western Lode, a Central Lode, comprising a northern and southern lens, and an Eastern Lode. Refer to Figure 5.

Drillhole data was composited on 1m intervals. Univariate statistical analysis was completed on all domains. Variogram modelling was completed on the well-drilled Central Lode only. Block modelled resource estimation was calculated using an Inverse Distance Squared algorithm. The resource is reported in accordance with the 2012 edition of the JORC Code above a block cutoff of 0.3% Sn

##### 3.1.2. Geochemical Surveys

During the December 2013 - February 2014 field season a geochemical soil-sampling program was conducted around the St Dizier Deposit with the objective of identifying proximal drill targets.

Three sample areas were selected over identified low-level magnetic anomalies. The sample grids were identified as North St Dizier, South St Dizier and North Central. Refer to Figure 4 for locations. The three areas were sampled on a 100m x 20m grid using a hand auger to retrieve soil from the B soil horizon. A description of survey and sampling methods is appended in digital format as Appendix 5.

##### 3.1.3. Costeans

In order to locate a site for the excavation of a bulk sample of the St Dizier mineralisation for metallurgical testing two north-south trending costeans were cut across the St Dizier lodes adjacent to drill hole ST06. Refer to Figures 4 & 6 for location. The western costean was about 58m long and the eastern costean 36m in length. The costeans were about 25m apart, up to 1.5m deep in places and approximately 1.5m wide. Both were excavated with a 20 tonne excavator on 19/3/14.

The trenches were geologically mapped and channel sampled on the 20/3/14. The eastern walls of both trenches were channel sampled at 2 metre intervals with the resultant 47 samples assayed at the ALS lab in Burnie. The trenches were left open until assays results were received and the bulk sample was subsequently taken on the 8/4/14. Refer to Figure 6. On completion of the bulk sampling the sample site and the trenches were backfilled and the site rehabilitated.

##### 3.1.4. Diamond Drilling

Based on Tim Callaghan's computer model of the St Dizier mineralisation 5 diamond drill holes were drilled (HQ / NQ3) proximal to the St Dizier deposit. Two holes (ST04 & ST05) were drilled east of the deposit and two holes (ST07 & ST08) west of the deposit. Hole ST06 was drilled into the deposit adjacent to the costeans and bulk sample site to gain fresh mineralised material for metallurgical test work. Refer to Figures 4 & 6 for locations and Table 2 for hole specifications.

One shallow vertical hole, BH01, was drilled into the Big H Prospect, located at the eastern end of the skarn, to test the orientation and depth of the skarn at that location. Refer to Figures 4 and 7 for location and Table 2 for hole specifications. Digital drill logs are appended as Appendix 8 and digital core photographs as Appendix 9.

**Table 2. St Dizier Drilling Specifications**

Hole No.	Collar			Azimuth (MGA)	Dip	Depth (m)	Start	Finish	Core Size
	Northing (MGA)	Easting (MGA)	R.L.						
ST04	5367891.74	345357.48	203.47	180°	-50°	289.00	19/3/14	10/4/14	HQ / NQ3
ST05	5367869.92	345300.29	203.98	180°	-47°	205.10	11/4/14	23/4/14	HQ
ST06	5367796.10	345172.61	172.00	195°	-69°	176.20	24/4/14	2/5/14	HQ
ST07	5367877.13	345070.96	167.06	185°	-50°	168.00	5/5/14	11/5/14	HQ
ST08	5367820.10	344971.19	166.43	012°	-53°	136.20	12/5/14	20/5/14	HQ / NQ3
BH01	5367393.63	347470.73	215.27	-	-90°	72.6	11/3/14	19/3/14	HQ

### 3.1.5. Bulk Sampling

A bulk sample of approximately 8 tonnes was excavated adjacent to the western costean on 8/4/14 using a 20 tonne excavator Refer to Figure 6 for location. The sample was transported to Zeehan for storage and then to Fieldwicks Crushing and Screening at Devonport on 16/4/14. ALS lab personnel collected grab samples from the bulk sample for comminution test work prior to crushing.

The sample was crushed to 100% passing 12-15mm and transported to the ALS lab at Burnie for metallurgical test work.

## **3.2. MINING STUDIES**

### **3.2.1. Metallurgical Testwork**

The full Metallurgical Report is appended in digital form as Appendix 10. Procedures are summarised below.

The metallurgical testwork program is being undertaken on samples collected from St Dizier for the purposes of preliminary scoping/concept level flowsheet development, and preliminary assessment of potentially achievable metallurgical performance. This metallurgical testwork program represents the first program completed in recent times (only limited testwork has been completed on the St Dizier deposit since the 1960's).

Keys aims of the program is to:

- Understand likely achievable overall grade/recovery response and treatment issues
- Develop an appropriate flowsheet
- Understand how this potentially fits with the overall Heemskirk Tin project currently being considered by Stellar Resources.

The testwork program is largely being carried out by ALS Metallurgy Burnie laboratory with metallurgical supervision, assistance and input to Stellar Resources provided by Worley Parsons. At the time of writing the program is still in progress, with results, interpretation and reporting for the overall program yet to be finalised. The report appended as Appendix 10 presents those results available at the time of writing. It is expected all currently planned testwork will be completed during 1st quarter 2015, with finalized results, and analysis of the overall program expected to be reported in the 2015 annual progress update.

The testwork program is being carried out on a series of 4 composite samples generated from samples collected from the St Dizier site.

These samples are:

- Saint Dizier Bulk Composite (Composite 1)  
The Bulk Composite sample was produced from several tonnes of material excavated from the western costean
- Composite 2  
Composite 2 was produced from drillcore from interval 20.3 – 50.0m in metallurgical drill hole ST06 (sample numbers 290657 – 290685).
- Composite 3  
Composite 3 was produced from drillcore from interval 57.0 – 88.0m in metallurgical drill hole ST06 (sample numbers 290693 – 290721).
- Composite 4  
Composite 4 was produced from drillcore from interval 106.0 – 114.0m in metallurgical drill hole ST06 (sample numbers 290737 – 290744)
- Composite 2+3  
A fifth composite was produced by combining composites 2 and 3 in equal weights.

Mineralogy and characterization testwork were carried out on the Bulk Composite and Composites 2, 3 and 4.

The testwork program consists of:

- Sample characterization (bulk sample and drill hole composites)
- Comminution testing (bulk sample only)
- Magnetic Separation bulk sample and drill hole composites)
- Gravity Separation (bulk sample and drill hole composites)
- Gravity concentrate dressing including sulfide flotation, magnetic separation and concentrate leaching (drill hole composites only)
- De-slime (drill hole composites only)
- Tin flotation (drill hole composites only)

The conceptual block flowsheet consisted of primary grinding to a relatively coarse grind size (P80~250 to 350 µm) followed by wet magnetic separation to remove magnetite ahead of gravity separation.

Magnetic separation consisted of roughing followed by regrind and cleaning of the magnetic product. This was largely focused on minimising tin losses to the magnetite concentrate, while reducing the quantity of magnetite in the feed to the gravity circuit to more manageable levels. The combined rougher and cleaner non-mags products from the magnetic separation testwork formed the feed to the gravity separation testwork.

The gravity circuit considered, consisted of classification of the circuit feed into coarse and fine fractions to allow separation concentration of these, to produce a crude concentrate suitable for upgrade via the dressing circuits. In addition to cassiterite, other high SG minerals present (pyrite, magnetite and siderite) were also strongly concentrated in the gravity circuit, and were expected to be the major diluents present in the crude concentrate produced. As such the dressing circuit is aimed at upgrading the concentrate to saleable Sn grades by removing these via sulfide flotation, magnetic separation and acid leaching.

Fine material exiting the gravity circuit is deslimed, prior to sulfide scavenger flotation and tin flotation.

### **3.2.2. Mine Scoping Study**

The full Scoping Study Report carried out by Alan Fudge of Polberro Consulting is appended in digital form as Appendix 11. The study procedures and scope are summarised below.

The work completed by Polberro is a scoping level study into the viability of an open cut operation recovering tin from the St Dizier tin/magnetite skarn mineralisation east of Granville Harbour in Western Tasmania.

The scope of the study is to determine the scale and viability of a potential open cut recovering a tin product at St Dizier to add value to the Heemskirk Tin Project. It is assumed that the St Dizier operation would form a component of the Heemskirk Tin Project and that all material recovered from the St Dizier operation would be processed at the Heemskirk processing facility as defined in the Heemskirk Tin Pre-Feasibility Study.

The scoping study reports with respect to mineral resources, geotechnical conditions, operating cost parameters and pit optimisation and design.

A geotechnical review to permit pit geometry assessment was conducted on the data available and subsequently optimal pit shells were generated with Threedify Flow Pit pit optimisation software. Sensitivity analysis was conducted and optimal pit shells derived for process recovery levels of 0.5, 0.6 and 0.7. Pit depth at St Dizier is restricted to between 50m and 70m depth by the practical limitation of providing a haul road for a relatively small steeply dipping deposit.

### **3.3. ENVIRONMENTAL STUDIES**

#### **3.3.1. Flora & Fauna Survey**

Phillip Milner of Phillip Milner Landscape Consultants Pty Ltd. was commissioned to carry out a flora and fauna habitat study of the proposed St Dizier Mine Site. This work was carried out by:

- Undertaking a desktop survey to confirm the known biological records and the natural values present in the proposed mine site and target area and in the vicinity.
- Undertaking a field survey of the proposed open pit area and surrounds on 6/5/14 to observe and record the natural values present including the vegetation types and plant communities, the flora and in particular any threatened species, and potential habitat for threatened species of fauna.
- Survey the target area for potential den sites of Tasmanian Devils and for other evidence of the species presence.
- Determine the possible impacts of the proposed open pit mine on the natural values present and make recommendations on how those impacts can be minimised.

Phillip completed this work on 18/6/14. The results of his work are summarized in Section 4.3.1 below and his complete report is appended as Appendix 12.

#### **3.3.2. Archaeology Survey**

As a prerequisite for MRT approval of the costeaning, bulk sampling and drilling program Stellar Resources commissioned Parry Kostoglou of Tasarc Archaeological Services, to carry out an archaeological survey of the St Dizier Deposit area. Parry surveyed the area on 3/2/14.

The results of this work are summarised in Section 4.3.2 below and the report is appended as Appendix 13.

#### **3.3.3. Rock Geochemistry Study**

Eleven composite rock samples representing the main rock types at the St Dizier Deposit were collected from the recent drilling program core. The samples were sent to Geo-Environmental Management in Canberra for rock geochemistry determination comprising acid-base analyses and NAG (Net Acid Generation) tests. The objective being identification of potential environmental risks associated with mine waste rock and mineralized material. Using this data Polberro estimated the volumes and locations of the various material types within the design open pit and their respective placement within the design waste dumps.

Rock types represented were:

- quartzite,
- siltstone (north & south of skarn),
- massive magnetite skarn,
- semi-massive magnetite skarn,
- magnetite/calc-silicate/serpentinite skarn,
- calc-silicate/serpentinite skarn,
- serpentinite skarn,
- dolomite/marble and
- granite.

A full list of the samples and their sources are appended in Appendix 14.

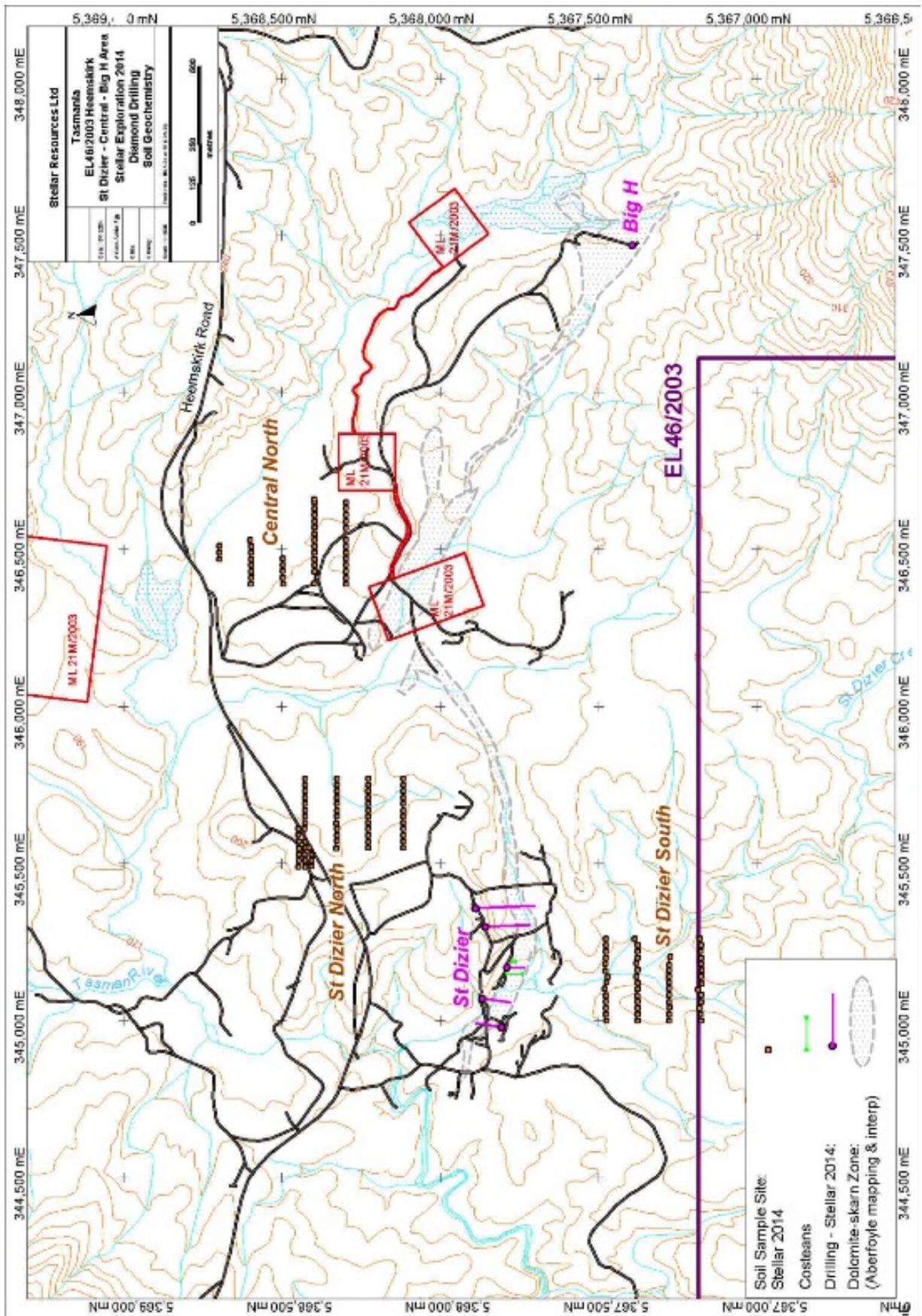


Figure 4. EL46/2003, 2014 Exploration Activities Location Plan

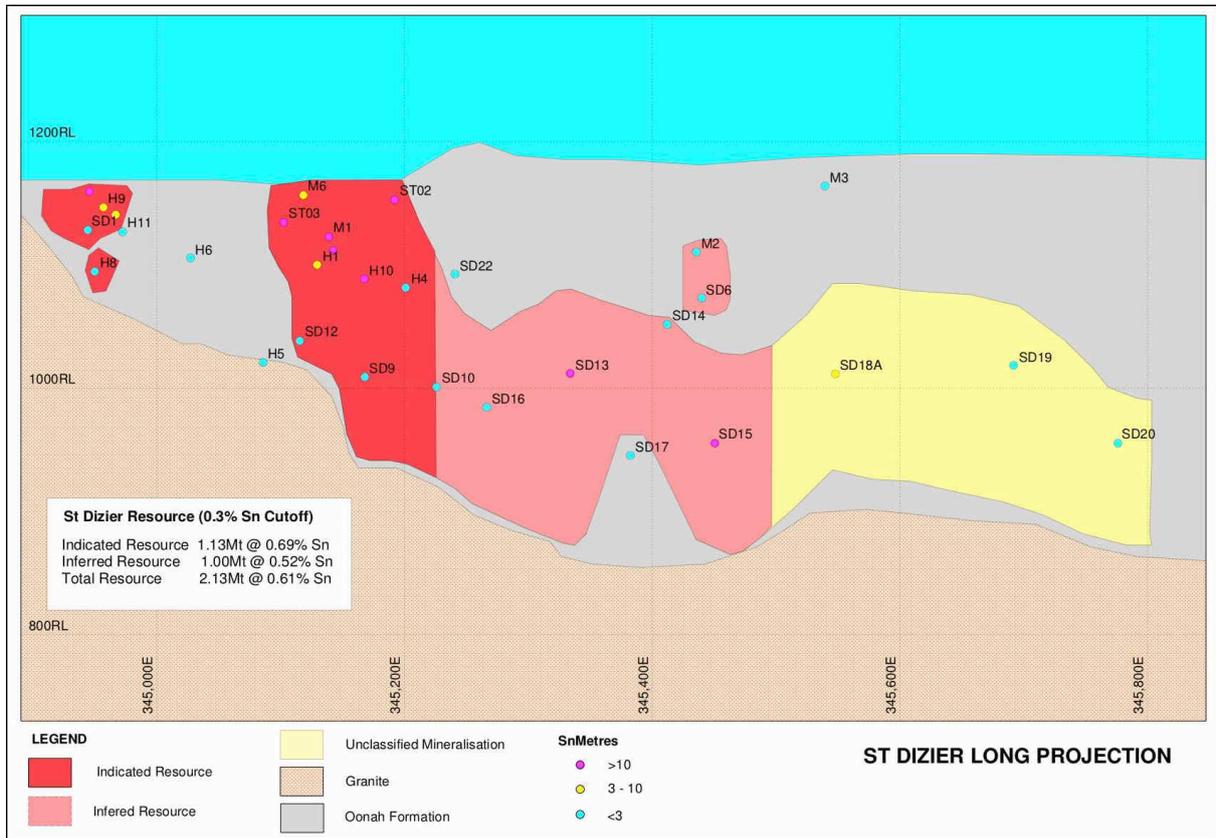


Figure 5. EL46/2003, St Dizier Deposit - Long Projection showing Resource Blocks

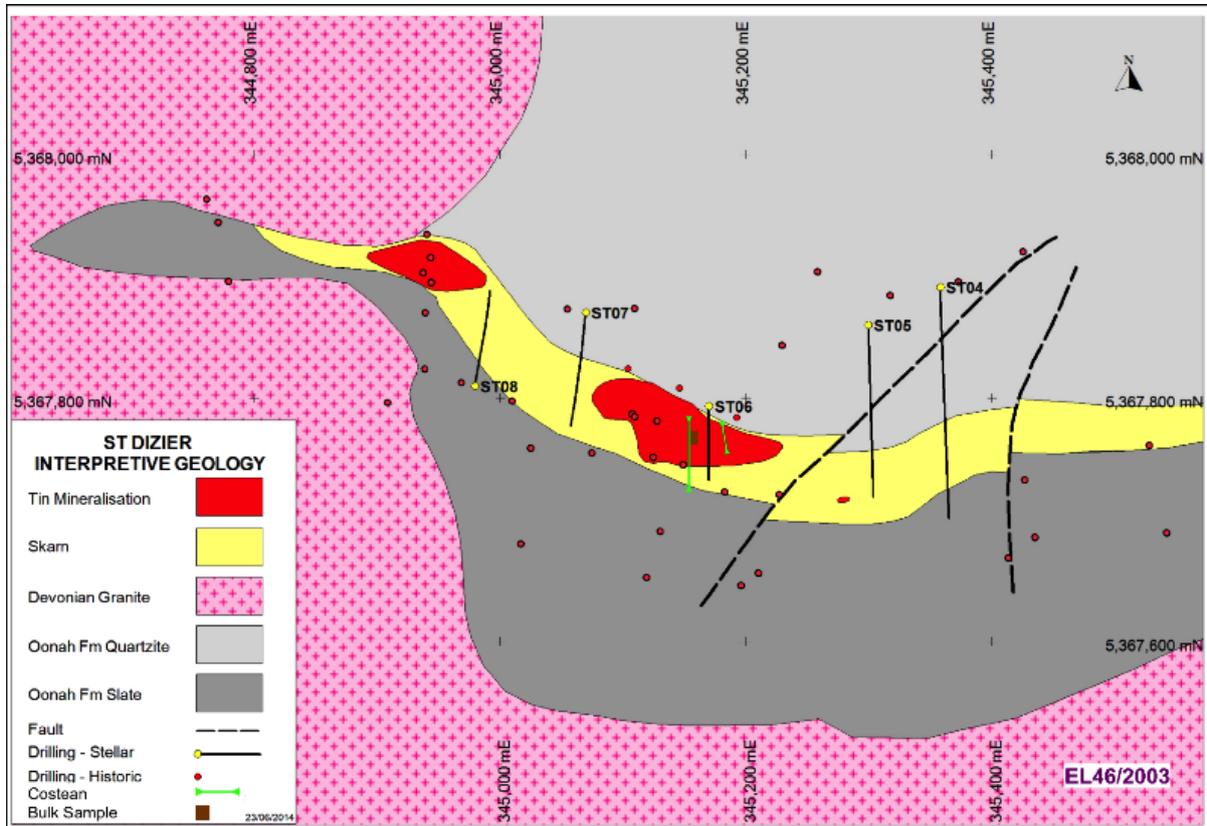
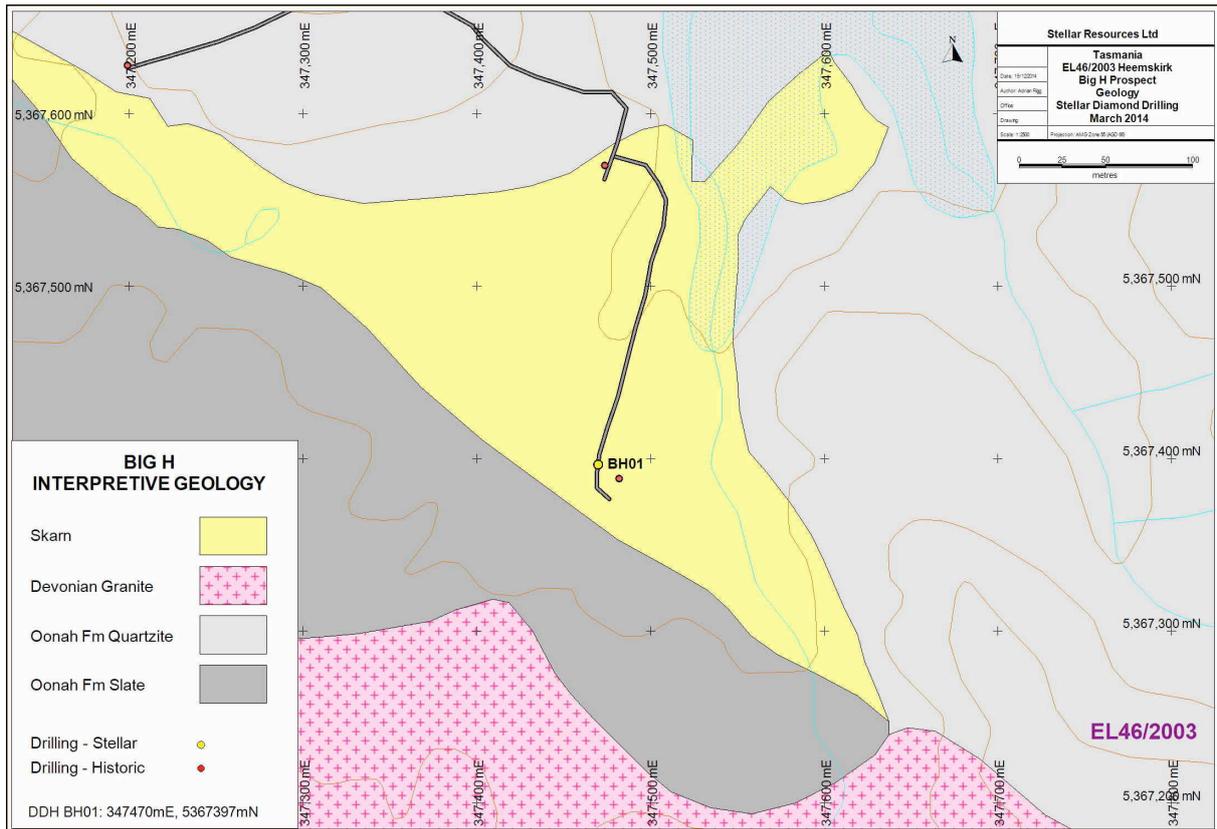


Figure 6. EL46/2003, St Dizier Deposit, 2014 Costeans, Bulk Sample & Drilling Locations on Geology Plan



**Figure 7. EL46/2003, Big H Prospect, 2014 Drilling Location on Geology Plan**

## 4. DISCUSSION OF RESULTS

### 4.1. EXPLORATION ACTIVITIES

#### 4.1.1. Geochemical Surveys

A total of 159 samples were collected and sent to the Burnie Research Lab to be assayed. Assay results were generally low in tin. Refer to Figure 8 for location and result summary. Full assay results and locations are tabulated in Appendix 6. Five samples, two on the North St Dizier grid and three on the South St Dizier grid, had anomalous tin assays but these are thought to be the result of cultural contamination.

#### 4.1.2. Costeans & Bulk Sample

Figure 9 depicts the results of the costean sampling and mapping. Full assay results are tabulated in Appendix 7.

In summary the western costean exposed a sequence of gossan, mud, clay, skarn and shale overlain in the north by an alluvial deposit of rounded cobbles and sand (wash). The gossan, mud and clay zones are thought to be surface expressions of the skarn rocks. Sampling defined a 26 metre wide zone averaging 0.79% Sn, including 2 metres at 2.19% Sn. The eastern costean exposed only skarn and hard siliceous gossan overlain by wash in the north. Sampling here defined a 6m wide zone averaging 0.83% Sn, including 2 metres at 1.12% Sn.

The bulk sample was excavated from the 26 metre mineralised zone in the western costean. It returned an average grade of 0.83% Sn.

#### 4.1.3. Diamond Drilling

Refer to Figures 4, 6 & 7 for locations, Appendix 1 for drilling summary, Appendix 8 for drill logs and Appendix 9 for core photographs.

Hole BH 1, drilled vertically to test the eastern end of the St Dizier skarn intersected 16 metres of magnetite-phlogopite skarn between 16.1 to 32.0 metres before intersecting the Heemskirk Granite at 43.3 metres. Apart from the magnetite no significant mineralisation was intersected. The skarn appear to be dipping shallowly to the north with minimal depth potential.

Drill holes ST04 and ST05, drilled to the south, through the St Dizier Skarn immediately east, and up dip of, the St Dizier Deposit, intersected the skarn but no significant mineralisation.

Hole ST06 drilled steeply south adjacent to the western costean and bulk sample site, between holes ST01 and ST02, intersected skarn from 10.2 to 131.5 metres. Three mineralised zones were intersected in the skarn:

- 10.7 - 50.0m, 39.3m @ 0.90% Sn
- 57.0 - 86.0m, 29.0m @ 0.99% Sn
- 106.0 - 114.0m, 8m @ 0.70% Sn

Drill hole ST07 was drilled to the south, through the skarn immediately west of the central portion of the St Dizier Deposit. It intersected the skarn from 62.0 to 163.6 metres before intersecting the Heemskirk Granite. Mineralised skarn was intersected from:

- 68.0 - 70.0m, 2.0m @ 0.29% Sn
- 161.0 - 163.0m, 2.0m @ 0.54% Sn

Hole ST08 was drilled north, through the skarn, south west of ST07. It intersected clay, breccia and pug with poor core recovery from surface to 76.1 metres where it intersected the skarn to 110.2 metres. Granite was intersected at 116.8 metres. The only mineralisation was 1 metre @ 0.25% Sn from 99.0 to 100.0 metres. The top 50 metres of the hole is thought to have drilled through an alluvial channel into underlying weathered material to 76 metres.

## 4.2. MINING STUDIES

### 4.2.1. Metallurgical Testwork

The full Metallurgical Report is appended in digital form as Appendix 10. Results are summarised below.

The St Dizier Bulk Composite sample collected from the costean is heavily weathered, and is not thought to be representative of the majority of the mineable St Dizier mineral resource.

The overall metallurgy of the Bulk Composite is difficult. Given the very high soluble tin content, modest gravity recovery, very high losses to both the magnetite concentrate (23.7%) and slimes tails (16.9%), is it expected overall Sn recovery for the Saint Dizier Bulk Composite is limited to something less than 50%.

Results for the Composite 2+3 material to date are more encouraging.

Key differences between the Bulk Composite and intersections from ST06 (from which Composite 2+3 was produced) are:

- Portion of soluble tin (as a % of total tin);  
Bulk sample; 22%, intersections - top; 8%, middle; 3%, bottom; 13.5%.
- Liberation of the drill samples is poorer than the bulk sample.
- Quantity of magnetite;  
Bulk sample; 31%, intersections - top; 22%, middle; 35%, bottom; 59%
- Binary associations of cassiterite with magnetite;  
Bulk sample; 11%, intersections top; 1%, middle; 3%, bottom; 21%
- Drill intersections have significantly less cassiterite locked with magnetite and less soluble tin associated with the magnetic fraction;  
Magnetic separation testwork on the Bulk Composite sample showed very high losses of Sn to the magnetite product compared to the drill hole composites (Comp 2, 3 and 4), being a combination of both high soluble tin deportment to the magnetic fraction and very fine intergrowths of cassiterite in magnetite.
- Drill intersections have:
  - less tin in ultra-fine size fraction – likely lower slimes losses
  - higher sulfur ~5% c.f. 1.3%

Results for the Composite 2+3 material to date are encouraging.

The magnetic separation stage represents a significant Sn loss for the overall circuit at 18.3%. However, this gives a significant mass reduction feeding into the gravity circuit with magnetite levels in the gravity feed reduced to more manageable levels.

Overall recovery to the combined gravity concentrates averaged 35% based on ore feed at an average grade of 12.1% Sn in lock cycle gravity testing.

Major diluents in the combine gravity concentrates were Fe at 33.7% and S at 27.6% (equivalent to ~52% pyrite), with only 4.31% SiO<sub>2</sub>. Given this, the concentrate should upgrade readily in concentrate dressing.

44.1% of Sn units based on ore feed reported to deslime feed, while 4.7% (based on ore feed) were lost to the fine gravity tails.

As expected due to the fine cassiterite mineralogy, overall recovery from Composite 2+3 will be very dependent on tin flotation. However, it is expected somewhere from mid 50's to 60% recovery is achievable.

### 4.2.2. Mine Scoping Study

The full Scoping Study Report is appended in digital form as Appendix 11. Results are summarised below.

An open pit incorporating a 15m wide haul road contained the following minable resource (In-pit

Resource) and mining inventory (Table 3). Refer to Figure 12 for proposed mine layout.

**Table 3. St Dizier Project, In-pit Resource Estimate**

Category	Ore Tonnes	SG	% Sn	% Fe	Waste Tonnes	Waste SG
<b>Minable Resource</b>	322,000	3.30	1.06	27.0	1.48M	2.97
<b>Mining Inventory</b>	368,000	3.28	0.90	23.4	1.45M	2.96

Pit optimisation sensitivity study indicates improving profitability with increasing process recovery with the optimal pit shell contained resource tonnes increasing from 310,000 to 511,000 tonnes at 1.10 and 0.96% Sn for process recoveries between 0.5 and 0.7 respectively. The base case optimal pit examined for St Dizier at a process recovery (PR) of 0.5 yielded \$9.55m profit and an NPV of \$4.8m for a two year project life at a discount rate of 5%. The actual pit based on the optimal pit shell at PR 0.5 yields an additional \$1.3m profit due to increased tin recovery attained during the manual design process and the inclusion of 20,100 tonnes of dilution grading 0.28% Sn.

All of the options examined repay the capital of \$4.25M required to develop an St Dizier open pit project. Sensitivity analysis of optimal pits indicates that a process recovery of greater than 0.55 is required to repay any pro-rata component applied from the overall Heemskirk Tin project capital of between \$9M and \$10M (tied pro-rata to tonnes mined from pit).

At this time determination of an accurate process recovery for the St Dizier project remains paramount.

Surface works include an open cut, stockpile area and a drainage diversion – all surface works may be maintained within a limited area in a single valley with limited visibility from nearby roads. Refer to Figure 12. At the end of the project life the pit may be partially or completely backfilled and then flooded when the drainage diversion is returned to the original route.

At the projected process recovery of 0.5 pit optimisation study indicates that there is potential for a pit at St Dizier to add value to the Heemskirk Tin project but not to be viable as a stand-alone project.

At projected process recovery levels of greater than 0.55 the optimization process indicates that there is potential for a St Dizier project to add to overall project value including pro-rata repayment of Heemskirk Tin project processing plant capital attributable to St Dizier ore.

The project is extremely sensitive to process recovery in terms of profitability, mined tonnage and pit dimensions - final process recovery must be determined prior to proceeding to a full feasibility study for St Dizier.

Maximum pit depth is constrained by ore body size and geometry which limits the provision of haulage access beyond 1120m RL for the PR 0.5 base case.

At a process recovery of 0.5 a mining inventory of 368,000 tonnes at 0.9% Sn can be recovered from the open cut. In order to recover this inventory 1.45 million tonnes of waste must be mined and stockpiled.

A starter pit – within the final pit limits of any pit design should be utilized to obtain geotechnical data, confirm pit geometry parameters and to obtain a smoothed ore/waste ratio production schedule for the project life.

The St Dizier project represents a small scale project that has the potential to add value to the Heemskirk Tin project and may be reviewed in that light when metallurgical recovery rates are better known – it does not represent a viable stand alone project.

### **4.3. ENVIRONMENTAL STUDIES**

#### **4.3.1. Flora & Fauna Survey**

Phil Milner presented the following conclusions on the completion of his study:

- No vegetation community listed as threatened under the Tasmanian *Nature Conservation Act 2002* or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* was observed in the area.
- No species of flora, which is listed under the Tasmanian Threatened Species Protection Act 1995, and/or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* was observed during the survey of the area.
- No species of threatened fauna listed under the above Acts was observed during the survey however evidence was observed (scats) of the presence of Tasmanian Devils in the area west of St Dizier Creek and it is likely that Devils would roam over the whole area at times. It is also likely that Spotted-tailed Quolls are present in the area but was not confirmed during the surveys.
- No potential denning habitat was observed for either the Devil or the Quoll in the survey area. Potential habitat for the Azure Kingfisher and the Australian Grayling was present along the nearby Tasman River.
- Evidence of the presence of Wombats was observed in the area west of St Dizier Creek and the heathland/ buttongrass vegetation was considered to be potential habitat for the Ground Parrot.
- No environmental weeds were observed within the area however Spanish Heath has been recorded from the verge of the nearby Heemskirk Road.
- No symptomatic evidence of Phytophthora was observed in the area during the surveys.
- The area west of St Dizier Creek, which is largely outside of the target area, had higher conservation values overall than the area east of St Dizier Creek where the open pit is to be sited.

The full report is presented in digital format as Appendix 12.

#### **4.3.2. Archaeology Survey**

As a result of his survey in February 2014 Kostoglou noted five features at the site. These were:

- A deep lead tunnel/cutting (the St Dizier Creek – Tasman River Tunnel)
- A shaft
- Hydraulically sluiced alluvials
- Old shallow alluvial workings
- Modified costean trench

He also found that there was no heritage related constraints to the proposed testing program, but that larger scale testing or actual production involving damage to the mine-scape should involve a thorough survey of the property.

Kostoglou's full report is presented in digital as Appendix 13.

#### **4.3.3. Rock Geochemistry Survey**

This work was carried out as a preliminary exercise to determine the environmental geochemistry of the principal rock types in the scoping study pit designs and thus how the various materials should be managed during mining to ensure minimal environmental impacts. The tabulated results from the work are presented digitally as Appendix 14.

As this work was preliminary in nature and further work will be required for pre-feasibility study no report on the test results was prepared.

#### **4.4. FUTURE WORK**

Activities on EL46/2003 will continue to focus on the St Dizier Deposit during 2015. A Notice of Intent (NOI) for the project has been submitted to the EPA so future work on the project will be based on their advice.

Likely work will include:

- Completion of the metallurgy test work.
- Finalization and public release of the Mine Scoping Study
- Ongoing environmental studies including:
  - a detailed topographic survey of the projeject area,
  - surface & subsurface hydrology studies (including piezometer installation),
  - surface & subsurface water chemistry studies,
  - geotechnical studies (including geotechnical drilling),
  - extended archaeological survey and
  - extended rock geochemistry testing
- Possibly drill testing of other proximal targets along the St Dizier Skarn.

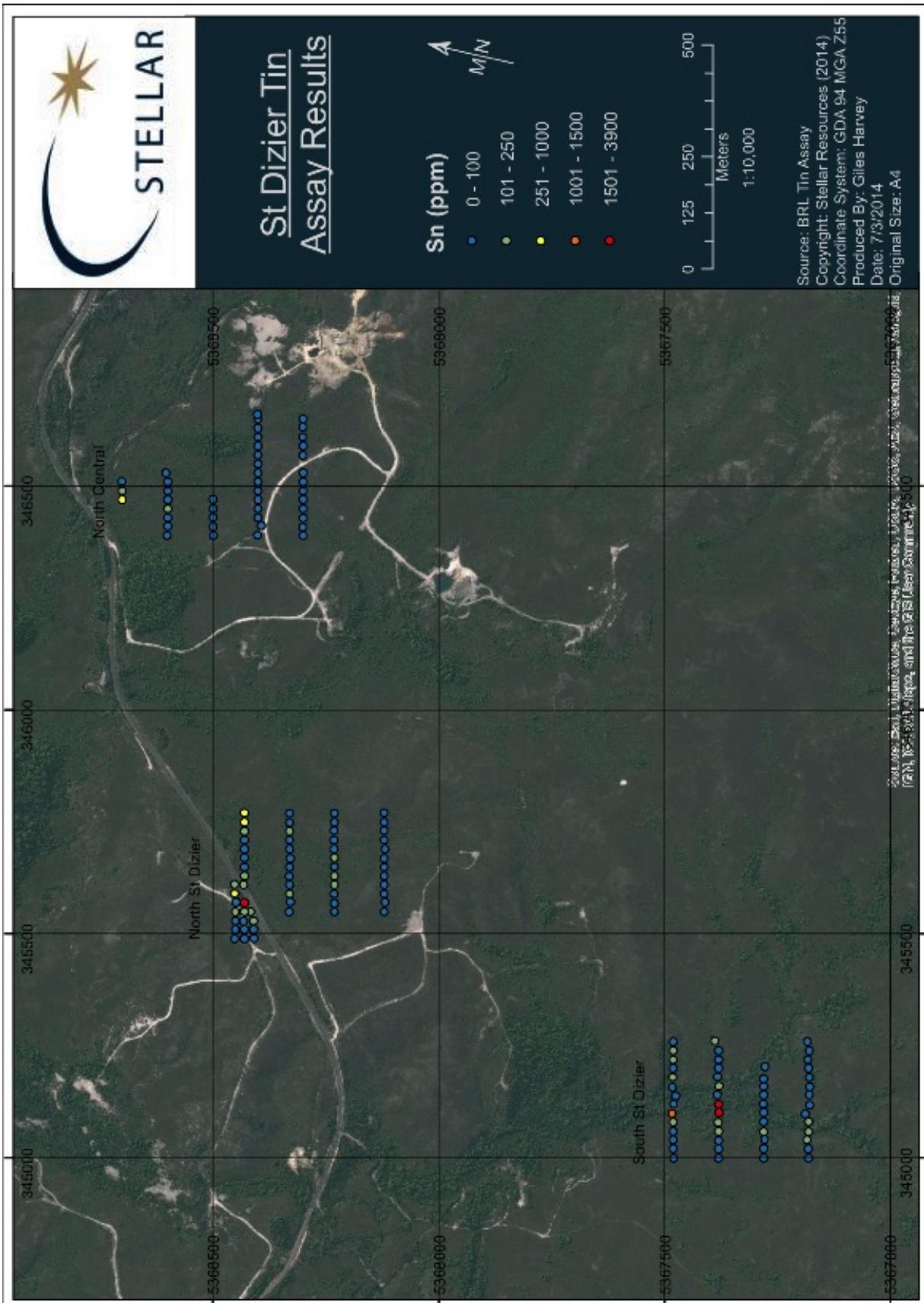


Figure 8. EL46/2003, St Dizier Geochemistry Survey Results

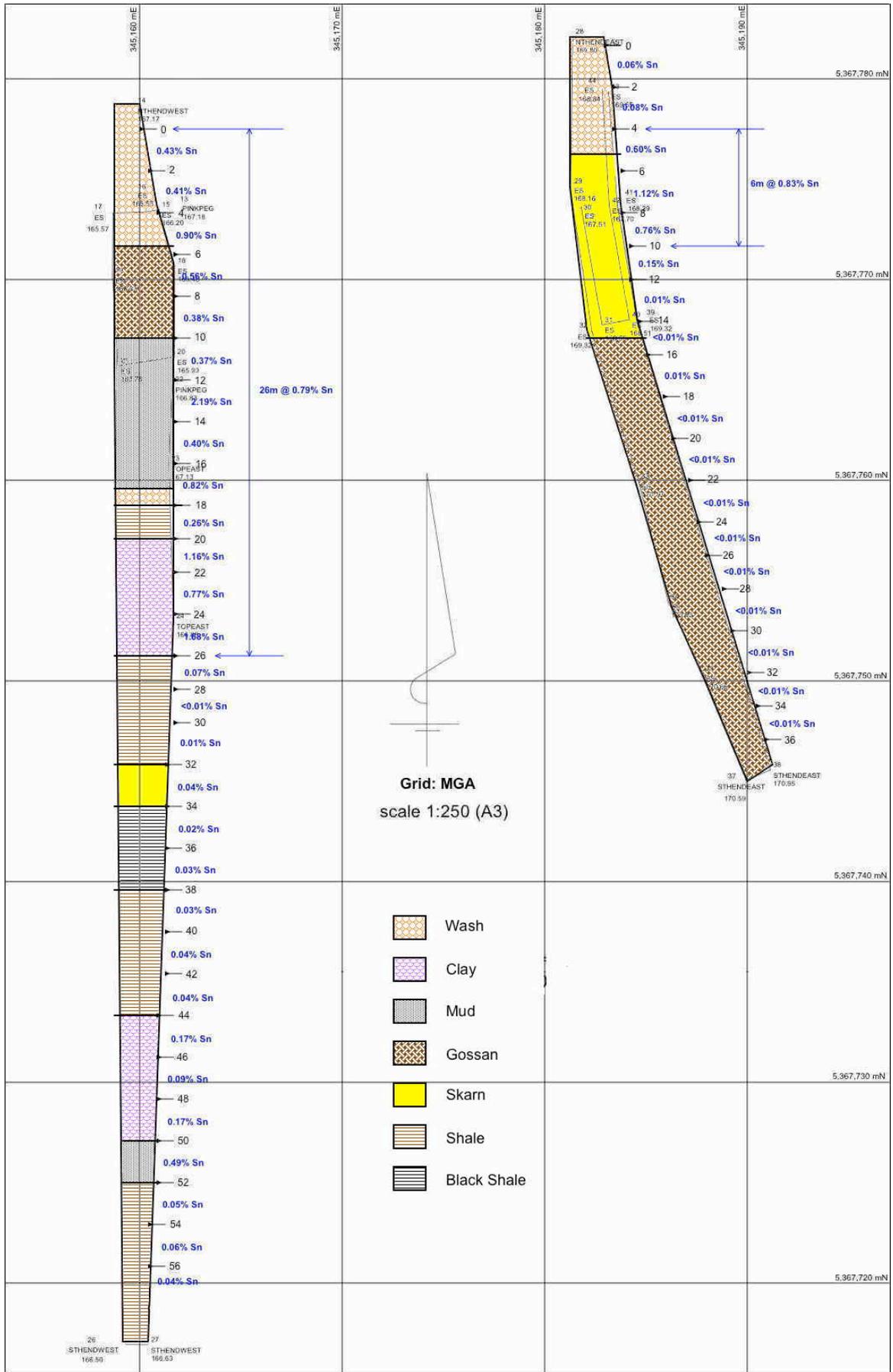


Figure 9. EL46/2003, St Dizier Deposit, Costean Geology & Assays

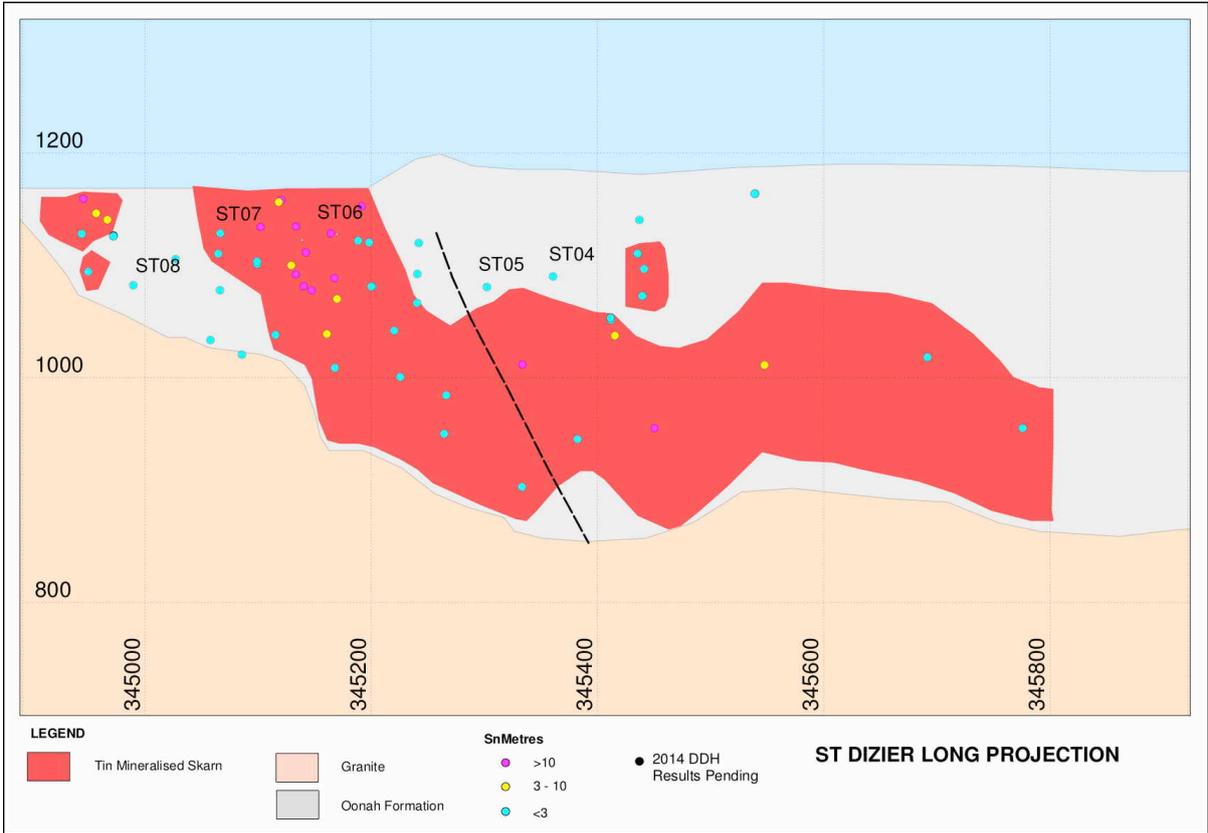


Figure 10. EL46/2003, St Dizier Deposit, Long Projection showing 2014 Drill Intercepts

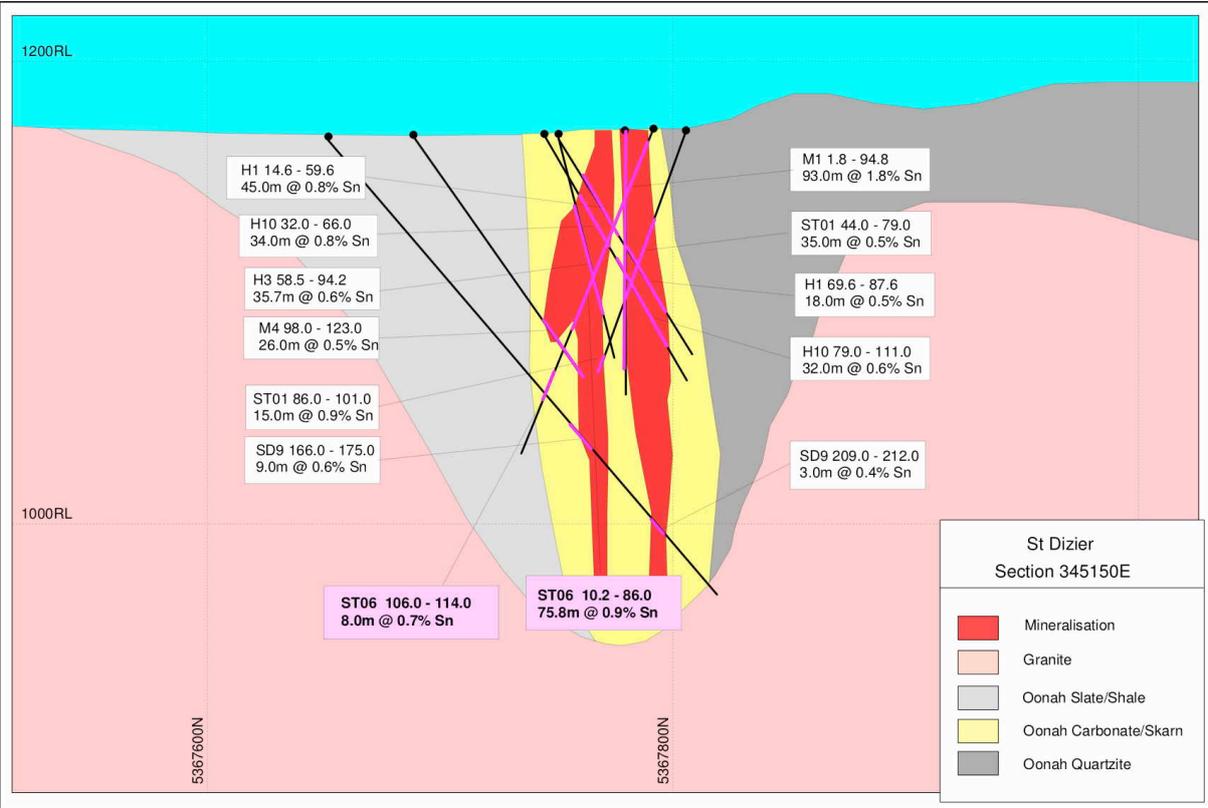
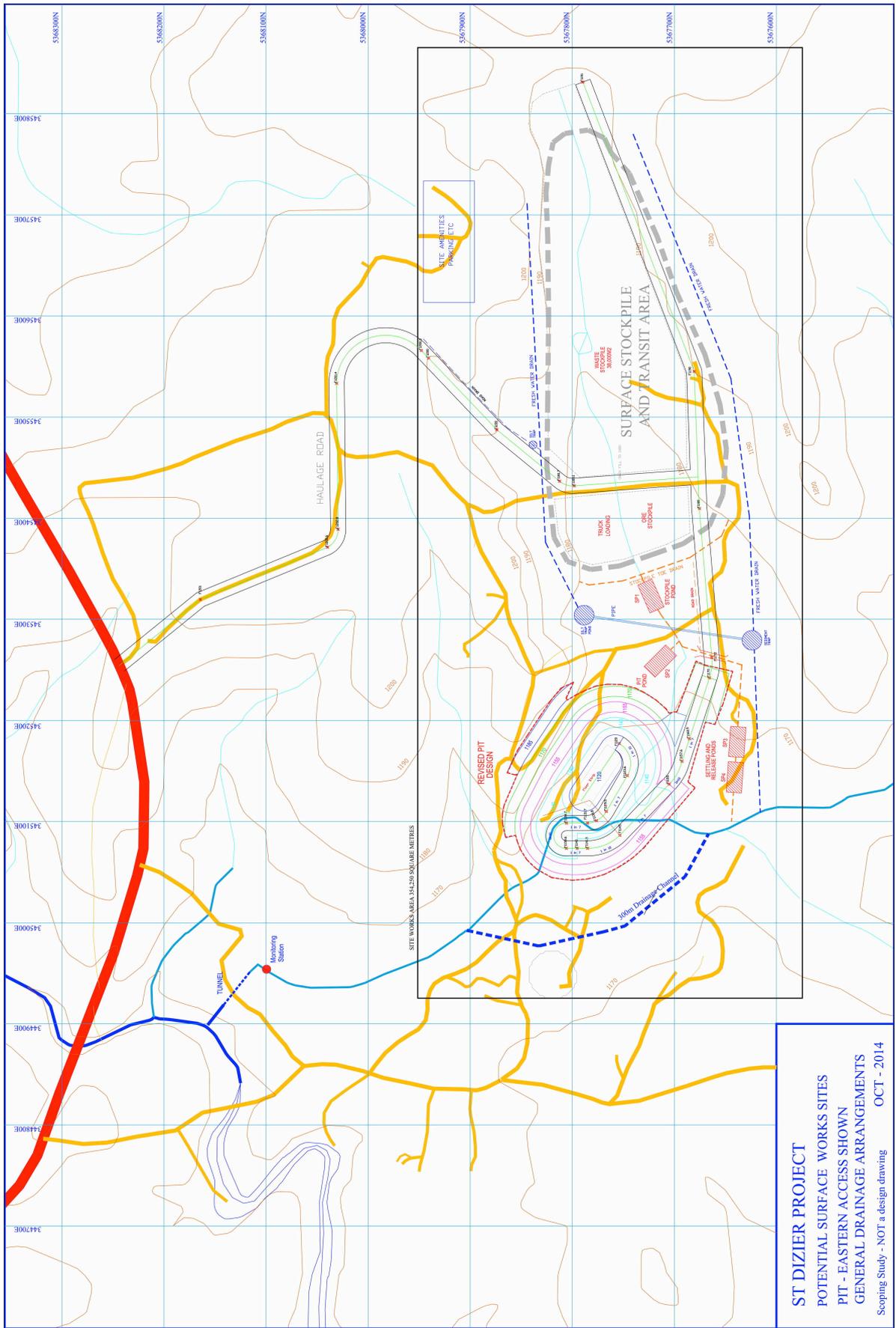


Figure 11. EL46/2003, St Dizier Deposit, Cross Section on 345,150mE showing DDH ST06



**Figure 12. EL46/2003, St Dizier Deposit, Scoping Study Project Layout Plan**

## **5. ENVIRONMENT**

All the geochemistry survey sample auger hole were backfilled immediately.

The St Dizier costeans and bulk sample site were backfilled and recontoured on completion of the bulk sample excavation on 9/4/14.

All the 2014 drill holes have been capped with a Van Reith plug and cement cap.

The BH01 site was left as is and the small sump is still open. The sump will be backfilled during the first quarter of 2015, weather permitting.

The ST04 and ST05 sites have been rehabilitated with sumps filled in and site scarified.

The access track to ST06 and ST06 has been blocked to limit vehicular access.

The ST06 sump has been filled in.

The ST07 sump has been filled in. The access track requires drainage and scarification.

The ST08 site and track requires backfilling and recontouring. This will be carried out during the first quarter of 2015, weather permitting

.

## 6. EXPENDITURE

2014 expenditure on EL46/2003 totals \$713,731. See expenditure break down below in Table 4.

**Table 4. St Dizier Project, 2014 Expenditure Breakdown**

<b>Transaction Report</b>				
Printed At: 09/12/2014 10:42:52		<b>Rubicon Limited</b>		Base Currency: AUD
				Page: 1
Job No	Job Details	Department		
Tran. Date	Doc Ref - Description	Posting Ref	Amount	
Job Code: 6501	EL 46/2003 Heemskirk	D1		
	1053	Technical	Total	\$23,399.91
	1054	Labour	Total	\$20,340.91
<b>Phase Total</b>	<b>106</b>	<b>STAFF COSTS</b>		<b>\$43,740.82</b>
	1061	Professional Technical	Total	\$12,842.50
<b>Phase Total</b>	<b>106</b>	<b>CONTRACT PERSONNEL</b>		<b>\$12,842.50</b>
	1072	Geoscientist	Total	\$73,976.94
	1073	Engineering	Total	\$35,938.90
	1074	Other	Total	\$10,019.41
	1075	Environmental	Total	\$9,520.00
<b>Phase Total</b>	<b>107</b>	<b>CONSULTANT PERSONNEL</b>		<b>\$129,455.25</b>
	1151	Site Preparation	Total	\$9,132.50
	1154	Diamond	Total	\$183,190.00
<b>Phase Total</b>	<b>115</b>	<b>DRILLING</b>		<b>\$192,322.50</b>
	1161	Analytical/Sample analysis	Total	\$149,133.96
<b>Phase Total</b>	<b>116</b>	<b>ASSAYS</b>		<b>\$149,133.96</b>
	1202	Purchase of existing data	Total	\$72.73
<b>Phase Total</b>	<b>120</b>	<b>DATA ACQUISITION</b>		<b>\$72.73</b>
	1251	Vehicle Costs All	Total	\$9,946.77
	1252	Office Costs	Total	\$294.37
	1253	Field Operations Consumables	Total	\$11,331.66
	1254	Safety Equipment	Total	\$35.00
<b>Phase Total</b>	<b>125</b>	<b>SUPPORT COSTS</b>		<b>\$21,607.80</b>
	1303	Computing	Total	\$1,200.00
	1304	Drafting and Presentation	Total	\$760.00
<b>Phase Total</b>	<b>130</b>	<b>DATA PROCESSING</b>		<b>\$1,960.00</b>
	1551	Meals and Accommodation	Total	\$662.14
	1552	Airfares	Total	\$440.74
	1553	Vehicle Hire	Total	\$119.81
	1554	General Expense	Total	\$25.67
<b>Phase Total</b>	<b>155</b>	<b>TRAVEL</b>		<b>\$1,248.36</b>
	1601	Rehabilitation	Total	\$435.00
<b>Phase Total</b>	<b>160</b>	<b>REHABILITATION</b>		<b>\$435.00</b>
	1651	Administration	Total	\$160,913.00
<b>Phase Total</b>	<b>165</b>	<b>OVERHEADS</b>		<b>\$160,913.00</b>
<b>Job Total : 6501</b>				<b>\$713,731.92</b>

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## **Keywords**

Location: Heemskirk  
Mineralisation environment: Skarns, Greisens  
Minerals: Chalcopyrite, Gold, Cassiterite, Arsenopyrite, Magnetite  
Exploration methods: Geochemistry, Costeaning, Bulk sampling, Drilling  
Mine/prospect name: St Dizier & Big H  
Stratigraphic name: Oonah Formation, Arthur Metamorphic Complex, Bowry Formation, Heemskirk Granite  
Lithologic name: sandstone, quartzite, phyllite, schist, granite, magnetite-serpentinite-diopside skarn, quartz  
Geological Province: Dundas Trough, Arthur Lineament  
Geological age: Lower Neoproterozoic, Palaeozoic

STELLAR RESOURCES LTD

January 2015

RL 5/1997 Zeehan – Report on 2014 program

## **APPENDICES**

STELLAR RESOURCES LTD

January 2015

EL 46/2003, St Dizier – Report on 2014 program

**Appendix 1: Drilling Summary**



Hole_ID	Company	Year	Easting (m) AMG	Northing (m) AMG	TD (m)	core size	Dip (°)	Azimuth (° AMG)	Logs	From (m)	To (m)	Int. (m)	% Sn	% AS Sn	% Cu	% As	% Zn	% Bi	% WO3	g/t Ag	% S	% Fe	Lab
SD18	Renison	1981	345430.00	5367506.00	132.60	HW / HQ	-55	355	Renison														Renison
SD18A	Renison	1981	345430.00	5367506.00	286.30		-55	4	Renison	201.00	205.00	4.00	0.11	0.11	0.02	0.05	1.94	0.003	0.01	<1	1.3		Renison
										215.00	220.00	5.00	0.55	0.26	0.22	<0.1	0.13	0.031	0.11	1	2.3		Renison
SD19	Renison	1982	345556.00	5367732.00	322.50	HQ	-67	175	Renison														Renison
SD20	Renison	1982	345610.00	5367752.00	340.60	HQ	-70	156	Renison	261.70	267.00	5.30	0.33	0.06	0.08	<0.1	1.47	0.010	0.09	5	1.5		Renison
										299.50	307.50	8.00	0.35	0.05	0.07	<0.1	0.04	0.031	0.07	3	3.0		Renison
SD21	Renison	1983	345563.00	5367760.00	433.50	HQ/NQ/BQ	-75	159	Renison														Not Assayed
SD22	Renison	1983	345117.00	5367660.00	293.30	HQ / NQ	-54	182	Renison														Renison
ST01	Stellar	2007	345034.00	5367624.00	109.20	NTW	-70	190	Stellar	44.00	101.00	57.00	0.60										B.R.L.
ST02	Stellar	2007	345080.00	5367600.00	95.10	NTW	-60	190	Stellar	13.00	35.00	22.00	1.12										B.R.L.
ST03	Stellar	2007	344992.00	5367640.00	111.20	NTW	-60	190	Stellar	39.20	43.30	4.50	3.82										B.R.L.
ST04	Stellar	2014	345357.48 MGA	5367891.74 MGA	289.00	HQ / NQ3	-50	180 MGA	Stellar														ALS - BRL
ST05	Stellar	2014	345300.27 MGA	5367869.92 MGA	205.10	HQ	-47	180 MGA	Stellar														ALS - BRL
ST06	Stellar	2014	345172.61 MGA	5367796.09 MGA	176.20	HQ	-69	193 MGA	Stellar	10.70	50.00	39.30	0.90										ALS - BRL
										57.00	86.00	29.00	0.99										ALS - BRL
										106.00	114.00	8.00	0.70										ALS - BRL
ST07	Stellar	2014	345070.96 MGA	5367877.13 MGA	168.00	HQ	-50	180 MGA	Stellar	68.00	70.00	2.00	0.29	0.23	0.02	0.00	0.02	0.020	0.00	<1	0.47	13.53	ALS - BRL
										161.00	163.00	2.00	0.54	0.12	0.17	0.09	0.21	0.010	0.00	2	0.86	21.63	ALS - BRL
ST08	Stellar	2014	344971.20 MGA	5367820.10 MGA	136.20	HQ / NQ3	-50	012 MGA	Stellar	99.00	100.00	1.00	0.25	0.12	0.00	0.00	0.05	0.010	0.00	<1	0.05	8.25	ALS - BRL

STELLAR RESOURCES LTD

January 2015

EL 46/2003, St Dizier – Report on 2014 program

**Appendix 2: Analytical Methods**



ALS Minerals Burnie  
39 River Rd, Wivenhoe, Tasmania, 7320, Australia  
Phone: 61 3 6431 6333

**PRIVATE & CONFIDENTIAL**

29<sup>th</sup> May 2013

Mr. Ray Hazeldene  
C/- Stellar Resources

Dear Ray,

**RE: ALS Analysis Methods**

Please find below a summary of analysis methods employed for the analysis of Stellar Resources samples.

**ME-XRF15d** (XRF fused bead analysis for Sn, WO<sub>3</sub>, Fe & S)

The sample is mixed with a borate flux, pre-oxidised @ 700°C then fused @ 1200°C. The homogenous glass bead is presented to the Axios X-ray spectrometer for measurement against a calibration constructed from synthetic standards & verified using Certified Reference Materials.

**ME-ICP41a** (ICP analysis for Soluble Sn, Cu, Pb, Zn, Ag, Bi, Ni & As)

High Grade aqua-regia digestion and ICP-AES for 30 elements. Quantitatively dissolves base metals for the majority of geological materials. Major rock forming elements and more resistive metals are only partially dissolved.

**QA-GRA08** (Specific Gravity)

Specific Gravity for bulk samples using the weight in air versus weight in water method.

Yours Sincerely,

Rocky Gelston  
Chief Chemist  
ALS Minerals Burnie