

# EXPLORATION LICENCE 46/2010

## Huskisson River, Tasmania

### SIXTH ANNUAL PROGRESS REPORT

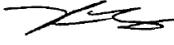
for the period 26 May 2017 – 25 May 2018



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**Date:** June 2018

**Distribution:** Yunnan Tin Australia TDK Resources Pty Ltd  
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*Co-ordinate system used in maps and diagrams within this report is MGA55 (GDA94), unless otherwise specified.*

# Abstract

The licence area is considered prospective for Renison Style mineralisation, associated with Ordovician granite. The area is also being explored for Avebury-style nickel, PGM, chromite and to a lesser extent, gold. The most significant geological feature within the tenement is the Huskisson River Ultramafic Complex (HRUC) and a portion of Wilson River Ultramafic Complex (WRUC).

During the reporting period, drill hole TCGA01 was geologically logged and some drill core samples were submitted for whole rock geochemical assay. MRT has also conducted its own tests of the drill hole with HyLogger scanning and XRD analysis of drill cores, as well as refining of 3D geological modelling with new data from TCGA01. The outcomes from those studies are summarized below:

- TCGA01 intersected 582 m serpentinite, terminated above target depth
- No visible mineralisation in the drill core
- General hardening of drill core towards bottom of the hole
- A number of major structure zones identified downhole
- HyLogger results indicate evidence of potential alteration activity

Exploration expenditure on the licence was \$261,427 for the reporting period.

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## List of Appendices

*(supplied in separate digital files)*

Appendix 1: *EL462010\_201806\_02\_Appendix 1\_Drill Collar.txt*

Appendix 2: *EL462010\_201806\_04\_Appendix 3\_Drill Core Logs.txt*

Appendix 3: *EL462010\_201806\_05\_Appendix 4\_Downhole geochemistry.txt*

Appendix 4: *EL462010\_201806\_03\_Appendix 2\_Drill hole downhole survey.txt*

Appendix 5: *EL462010\_201806\_06\_Appendix 5\_TCGA01 HyLogger interpretation.pdf*

## 1. Introduction

EL46/2010, Huskisson River, is located about 10 km west of Tullah, on the west coast of Tasmania (Figure 1). This tenement is found on Rosebery and Parsons 1:25,000 map sheets, with an area of 59 sq. kms.

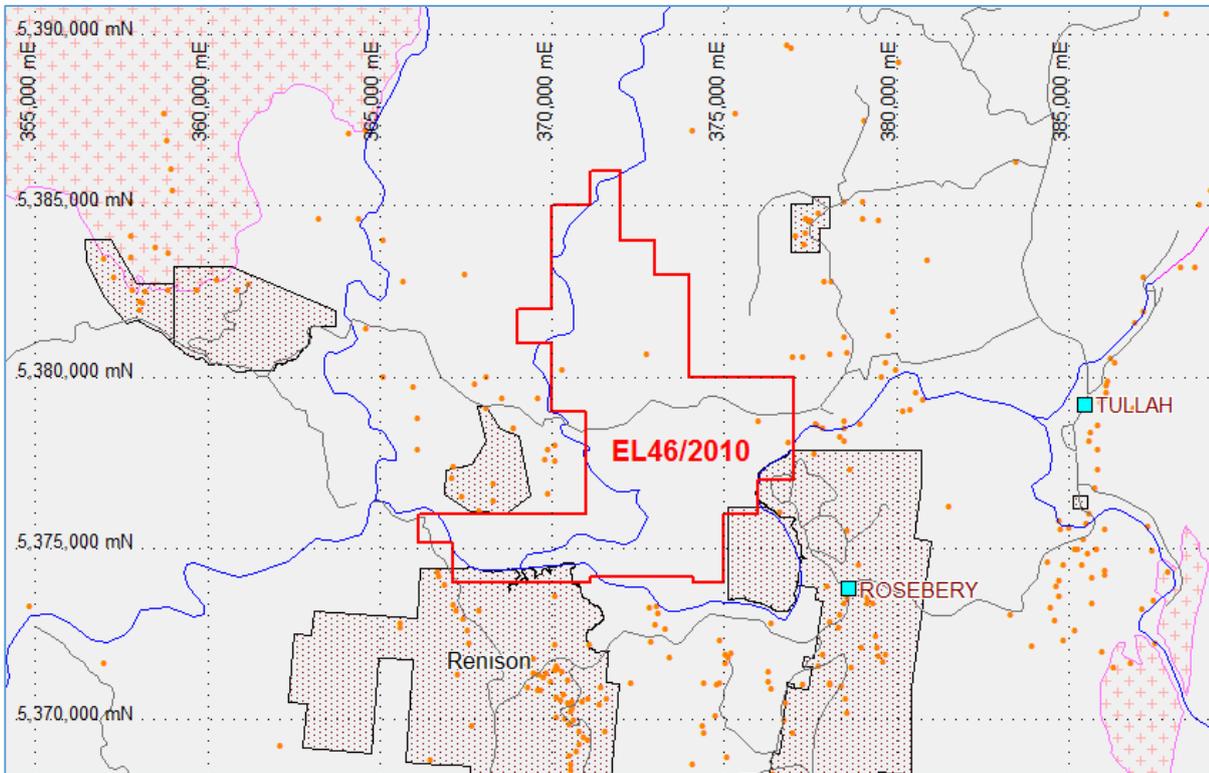


Figure 1: EL46/2010 Huskisson River locality plan

Topography is moderately rugged, and notable topographic features include Lynch Hill in the northern part of the tenement and parts of the Huskisson River catchment. The bitumen HEC Pieman Road bisects the area, providing access to the central portion of the tenement. The northern part of the area can be accessed via forestry tracks connected to Boco Siding, whilst the southern part of the area has very limited access.

The principal land use includes State Forest, Regional Reserve, and Forest Reserve.

The area contains temperate rainforest, eucalypt woodland and relatively open button grass flats.

## 2. Geology and Mineralisation

### 2.1. Regional Geology

The major geological feature within the tenement is the Huskisson River Ultramafic Complex (HRUC), which is a part of similar ultramafic bodies scattered along the Dundas and Adamsfield in western and north-western Tasmania. One such ultramafic body is the Wilson River Ultramafic Complex (WRUC), located to the west of the HRUC, which is the largest exposed ultramafic body in the Dundas Trough with an area of approximate 25 sq. km. The Huskisson River Ultramafic Complex has a relatively smaller exposed area, about 3.5 sq. km (Figure 2).

These two ultramafic bodies may be continuous with each other beneath Silurian-Devonian sedimentary rocks exposed in the core of the Huskisson Syncline (Owen, 2005).

These two complexes have been collectively studied and explored in the past.

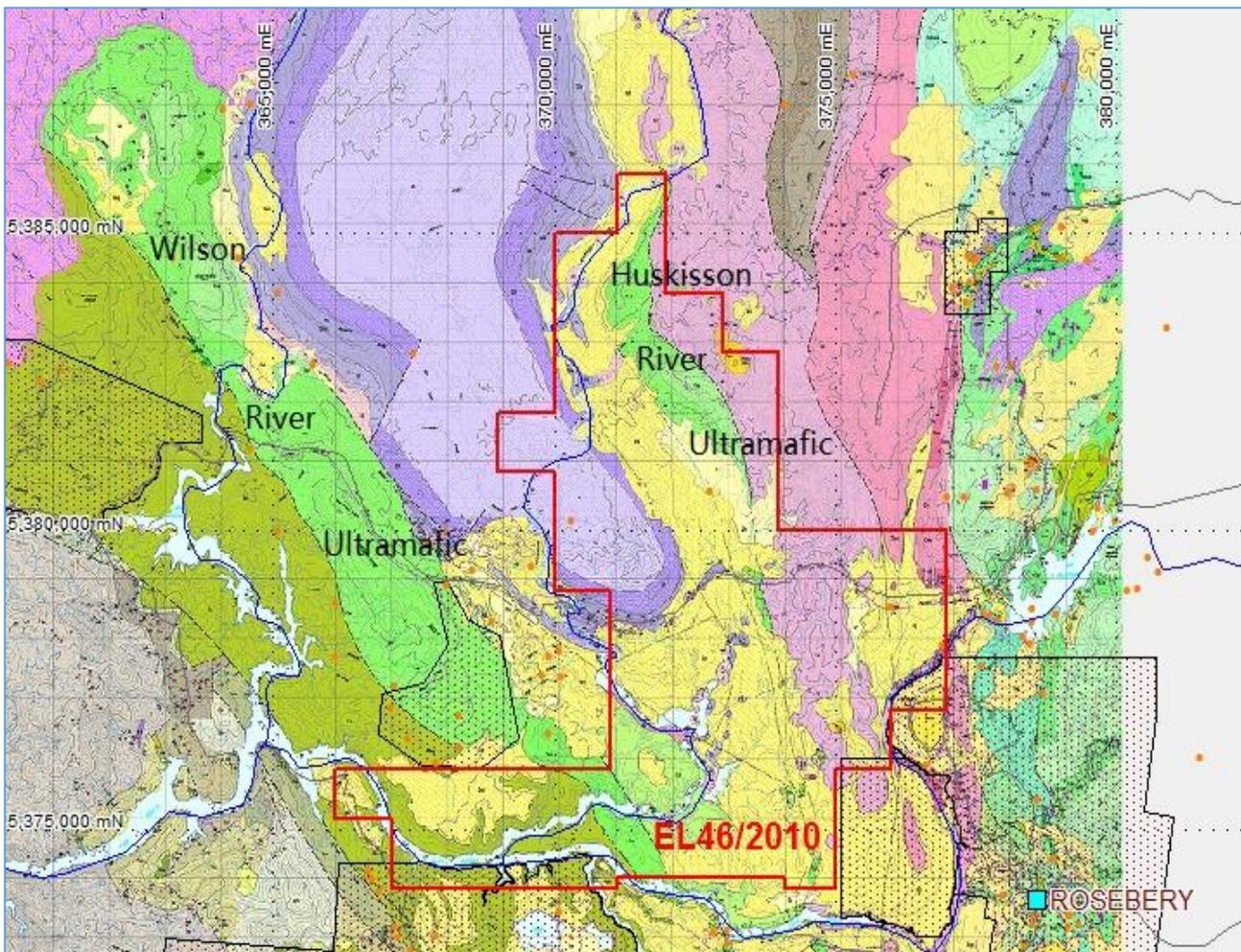


Figure 2: Geology of EL46/2010 area (base map from MRT 25K geological mapping)

Brown (1986) identified two petrogenetically distinct ultramafic successions within the WRUC and HRUC:

1) **Layered Dunite-Harzburgite succession (LDH)**, comprising fine to medium-grained, well-layered dunite, orthopyroxene-bearing dunite, and harzburgite composed of olivine, enstatite, chromite, and serpentine after the former silicate phases. Layering ranges from ca. 10 mm to 400 mm thick, with a primary bedding-parallel foliation defined by the primary alignment of enstatite and chromite crystals in the plane of bedding. There is also typically a later foliation defined by flattening of olivine crystals. Both olivine and orthopyroxene occur as cumulous phases, and chromite an accessory phase (1-5%) typically most abundant in the dunite layers. Discontinuous chromite laminations individually up to ca. 1-2 mm thick and 1-2 m long are locally present in the LDH.

Brown (1986) mentions the occurrence of PGE-rich chromite nodules in LDH of the Serpentine Ridge area. The western 100-150 m of the LDH in the Harman River area consists of interlayered dunite pyroxene-bearing dunite, and the eastern part layered harzburgite with minor thin dunite layers (Brown 1986).

2) **Layered Pyroxenite-Dunite succession (LPD)**, consisting of fine to medium-grained well-layered orthopyroxenite, olivine orthopyroxenite, and dunite. Layering is typically thinner than in the LHD, ranging up to 150 mm thick but mostly a few millimetres to 20 mm thick. Olivine and orthopyroxene dominate with accessory amounts of clinopyroxene (1-2%) and chromite (1-2%). Chromite is more common in the dunite layers. The layering sequence dunite-orthopyroxenite-dunite-orthopyroxenite is the most common, followed by dunite-orthopyroxenite-olivine orthopyroxenite-orthopyroxenite.

According to Brown (1986) serpentinite shears or faults separate the LDH and LPD everywhere and the original relationship of the two successions is unclear. The exposed parts of WRUC and HRUC are dominated by the LDH sequence. Two small, unfaulted blocks of LPD have been mapped by Brown (1986) at the north end of the WRUC (the Websterite Hill area), and the southern part of both complexes comprises LPD.

General interpretation is that the WRUC and HRUC are entirely fault bounded, the lower margins against Neoproterozoic and Early Cambrian volcanics and carbonates of the Crimson Creek Formation and correlatives, the upper margins against Devonian shallow-marine conglomerates, quartz arenites, siltstones and marls (Crotty Quartzite, Florence Quartzite, and Bell Shale), and locally slivers of the Cambrian Gordon Limestone. Radiometric dates are not available for the WRUC and HRUC and a broad Eocambrian to Cambrian age has been estimated according to stratigraphic constraints (e.g. Brown 1986). A major episode of folding during the Devonian formed

the north-west to north trending Huskisson Syncline, and contact metamorphism indicates emplacement of the WRUC and HRUC into the current stratigraphic position prior to the intrusion of the Meredith Granite around 370 Ma. Vein and replacement-style tin and tungsten mineralisation appears to be associated regionally with the intrusion of the Meredith Granite (Owen, 2005).

Although fault bounded, the prevalence of orthopyroxene over clinopyroxene, absence of protoclastic textures, and lack of stratigraphically associated sheeted dyke and pillow lava units suggests the WRUC-HRUC is not ophiolitic. Brown (1986) proposed intrusion of ultramafic bodies into the opening Dundas Trough during the Early Cambrian followed by tectonic reemplacment prior to the Devonian. The presence of serpentinite pebbles and abundant detrital chromite within Huskisson Group sedimentary rocks at Merton Hill and Red Lead Conglomerate of the correlative Dundas Group in the Mt Razorback area (Brown 1986) suggests exposure and partial erosion of the ultramafic complexes prior to the Middle Cambrian (Owen, 2005).

Quaternary fluvio-glacial sediments and Quaternary-Recent alluvial gravels cover much of the HRUC, and minor parts of the WRUC. Osmiridium, gold, and chromite are locally concentrated in the Quaternary-Recent alluvial gravels. Patches of laterite and saprolite are locally present over the WRUC in the Serpentine Ridge area, representing relicts of a more extensive lateritic cover developed during the Tertiary. Some lateritic nickel and cobalt mineralisation has been identified. Goethitic soils are widespread over Serpentine Ridge and the Websterite Hill area (Owen, 2005).

## **2.2. Mineralisation and Exploration History**

The licence area is considered prospective for nickel, Platinum Group Metals (PGMs), chromium and gold mineralisation, and has also been explored for tin, lead, zinc and silver.

Owen (2005) summarised mineralisation in the Wilson River and Huskisson River ultramafic complexes area in general and it was recited below.

Osmiridium, a rare naturally occurring alloy of the PGMs osmium and iridium, was first reported in Tasmania from the Wilson River valley in the 1876 by Surveyor-General Sprent (initially identified as palladium), and the Riley, Trinder, Three Mile, Lippy Jane, Fowler, Sweeney, Osmiridium and Gold creeks were later extensively worked for detrital osmiridium. An exact osmiridium production figure for the Wilson River area is not available, but of the total 31,100 oz produced from Tasmania between 1910 and 1968 (first and last reported production) around half came from the Adamsfield area ca. 120 km to the southeast and much of the rest from the Heazlewood-Bald Hill area near Waratah approx. 30 km to the north. Riley, Trinder, Three Mile, Lippy Jane, Fowler, Sweeney,

Osmiridium and Gold creeks were the most extensively worked for osmiridium in the Wilson River area. While there are some small test pits within serpentinite basement in the Riley Creek area the historic mining focussed on alluvial gravels in active creeks.

The detrital osmiridium typically occurs as flaky nuggets up to a few millimetres dimension, and petrographic work (Callina NL 1986-1990, Brown 1986) also indicates occurrence as inclusions within chromite grains from the ultramafic basement. Numerous workers have identified small chromite lenses up to 20-30 mm thick and 1-2 m long within the ultramafics, and analyses of some primary chromitites indicate highly anomalous PGM levels (Brown 1986).

There was additionally minor alluvial tin and gold production from the Wilson and Huskisson valleys and during the 1970's the area in the vicinity of the Meredith Granite was extensively explored for tin and tungsten mineralisation. Tin-bearing alluvials occur in many drainages on the north-eastern side of Serpentine Ridge, including Barnes, Sweeney and Tin creeks and Alfred River. Low-grade primary tin mineralisation occurs in the Harman River, Merton Hill, and Laurel Creek areas, and Reid (1932) makes reference to narrow dykes of tin-bearing quartz-feldspar porphyry cropping out in the vicinity of Tin Creek. Merton Hill was tested with 3 small adits by prospectors in the early 1900s, and later, 7 diamond drill holes (DDH MH1 to 7) by Renison Ltd (1980-1982). The drilling results were discouraging, the best intersection being 7.6m from 48.9m at 0.08% Sn, 0.76% Pb, 2% Zn and 36ppm Ag in MH1. The identified mineralisation was associated with veins and breccias within the Devonian Eldon Group (specifically, within the Crotty Quartzite and unnamed limestone member of the Amber Shale) associated with a north-east dipping fault zone adjacent to the contact with the Wilson River ultramafic body. Narrow granitic dykes with disseminated pyrrhotite were encountered in some of the drill holes at Merton Hill. Garnet skarns were identified in the Gordon Limestone around the confluence of Little Wilson and Wilson Rivers.

The source of the alluvial gold has not been thoroughly investigated but is in most cases probably reworked from glacial gravels. Significant gold mineralisation has not been reported from any of the identified tin prospects within the area, although it was not commonly assayed. Adit samples and some of the Renison drill core from the Merton Hill tin prospect (see above) was subsequently re-assayed for Au (Black Horse Mining, 1986-1987 and Cyprus Gold Australia Corp, 1987-1989) with a best result of 2m at 0.165ppm Au obtained in a magnetite skarn.

Lateritic nickel and cobalt mineralisation was identified in the southern Serpentine Ridge area by Aberfoyle in the late 1960s by a program that included hand auger drilling and man-portable coring (5 core holes) to a maximum depth of 30 ft. Grades of up to ca. 2% Ni and 1.5% Co were obtained from thin (<1-5m) patches of relict laterite and in the underlying saprolitic serpentinite assays of >0.5% Ni were commonly obtained. Sulfides were not observed. There was no systematic

investigation for Ni-sulphide mineralisation beyond the Serpentine Ridge – Riley Knob area (the Camp 30 area of Aberfoyle).

Callina NL (1985-1990) defined a detrital chromite resource in the Riley Creek area on the south western flank of Serpentine Ridge (the area that was also focus of the historic osmiridium workings). While the chromite is premium quality (>60% Cr<sub>2</sub>O<sub>3</sub>) the Callina resource was small (approx 1.7Mt at 1.9% chromite) and at the time not considered economic. The associated detrital PGM (Os and Ir, lesser Pt) and gold content were not assigned any economic value by Callina.

The last systematic exploration in the area was carried out by Adamus Resources Ltd during the period from 2003 to 2007, under EL18/2002. Work conducted during the period included stream sediment, soil and rock chip geochemistry. A heli-borne magnetic survey over Wilson River Ultramafic Complex was flown in 2005.

In 2007, Adamus carried out a substantial program of soil sampling with a 400m grid and a sample interval of 50m over the majority of the Wilson and Huskisson Ultramafic complexes. The grid was closed up to 200m line spacing over a previously identified electromagnetic anomaly on the north-western flank of Websterite Hill.

Fourteen lines were cut for approximately 267 samples over 22.5 km over the Huskisson River Ultramafic Complex, with a further 7 km of baseline also cut. Soil samples were assayed for Au, Ag, Cu, Pb, Zn, Ni, Co, Pt, Pd, Cr, Fe, Mg, Mo, Sb, Sn, W, Bi and S and pH was also determined for a number of samples. No significant results were reported (Grabham, 2007).

### **3. Exploration during the seventh year of tenure**

Working during the reporting period consists TCGA01 drill core logging, HyLogger scanning and assaying. With the data from current, MRT geophysical team has also refined their 3D geological model and is working towards updating interpretation of Tributary Creek Gravity Anomaly and hopefully generating more drilling targets.

#### **3.1 The results of TCGA01 drilling**

The drilling results are summarized below:

- TCGA01 intersected 582 m serpentinite & terminated above target depth of 1000m;
- No visible mineralisation in the drill core;
- General hardening of drill core towards bottom of the hole;
- A number of major structure zones identified downhole; and
- HyLogger results indicate evidence of potential alteration activity

In previous annual report, the positioning and rationale of TCGA01 hole were discussed. It is based on the model of Pine Hill Granite which has caused the Renison tin mineralisation system. The targeted final drill hole depth of 1000m was believed to be adequate to prove or disprove the existence of a Renison-like system in and around interpreted granite cupola, the shallowest part of which is predicated to be around 1000m deep (Fig. 3 ).

Unfortunately, the drilling could not reach the designed target depth due to difficult ground conditions. The 582m drill core achieved has subjected to core logging, geochemical assays and HyLogger scanning. Examination by MRT staff members was carried out for re-modelling of 3D model as well as mineralogical / alteration pattern.

Drill hole collar, down survey and core logs are included in Appendices 1, 2 & 3 respectively. As predicated, the drilling returned only ultramafic rocks for the whole length (Photo 1). A total of five drill core samples were submitted for whole rock analysis to ALS laboratory at Burnie. Those samples were selected at predefined depths of 30, 184, 300, 380 and 580m, due to the homogenous nature of drill core material returned. Whole rock assay results are included in Appendix 4.

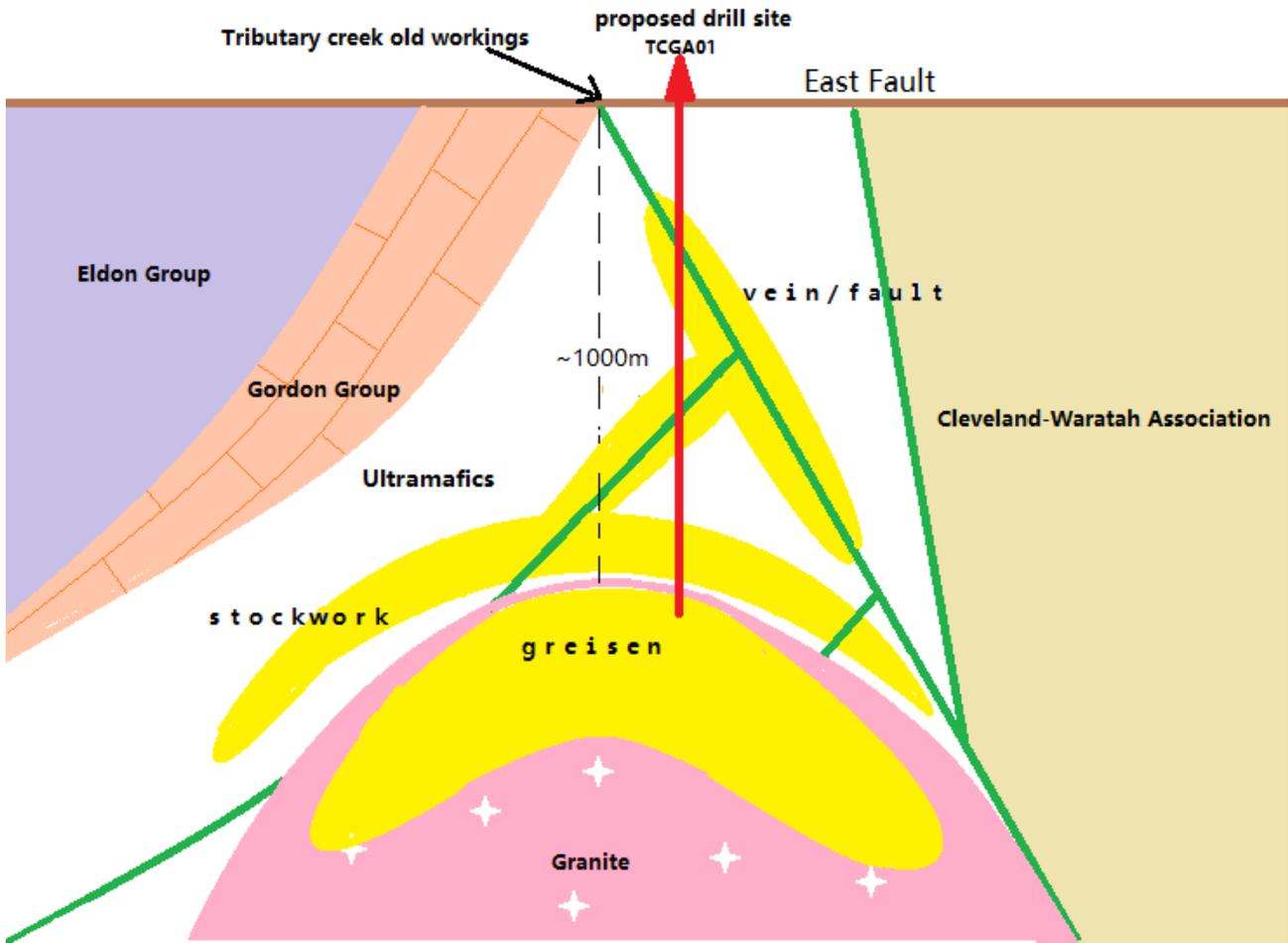


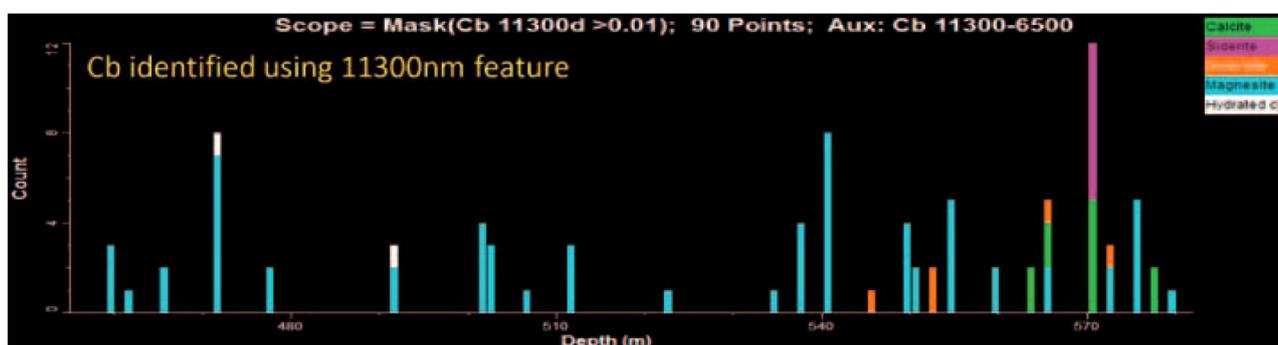
Fig. 3: Conceptual TCGA01 drill cross section, with potential mineralization types



Photo 1: Typical drill core of ultramafic rock from TCGA01

### 3.2 Test work by MRT

MRT carried out HyLogger and XRD analyses of TCGA01 drill cores (Bombardieri D. & Duffett M., 2018). A PVA coating was applied onto drill core prior to HyLogger scanning to fix asbestos in the drill core. HyLogger results indicate that the dominant minerals in the core are lizardite and carbonate. Carbonates become slightly more common approaching the bottom of the hole. Calcite, dolomite and siderite were tentatively identified and occur near the bottom of the hole. Mg-rich hydrated carbonates occur in the broken core and on joint/shear faces (Bombardieri D. & Duffett M., 2018).



**Figure 4:** HyLogger results towards the bottom of the TCGA01 (Bombardieri D. & Duffett M., 2018)

HyLogger results for bottom section of TCGA01 (above) suggest abundant carbonate (Cb) and magnesite (aqua) as generally dominant, with other species including dolomite (orange), calcite (green) and notably siderite (magenta) becoming more common approaching the bottom of the hole (Bombardieri D. & Duffett M., 2018).

Bombardieri D. & Duffett M. (2018) suggested that the mineralogical pattern observed in the drill core towards the bottom of TCGA01 could represent the distal part of a hydrothermal system arising from granite intrusion.

#### **4. Work Plan for Year Eight**

The proposed exploration work for Year 8 includes:

- Working with MRT, continuing the assessment of TCGA01, especially with refined 3D geological model with new information from TCGA01 drilling.
- Designing second drill hole to follow up the evidence of hydrothermal system derived from TCGA01 drilling.
- Extend geochemical sampling in northern part of the tenement, where soil geochemistry carried out in Year Six along tracks has indicated elevated base metal values.

## **5. Environment**

Yunnan Tin Australia TDK Resource Pty Ltd has environmental policies in place to always ensure minimisation of the impact that exploration activities have on the environment. Access track was cut by licenced cutter. All vehicular travel within the tenement has been on existing tracks.

TCGA01 drill pad has been rehabilitated with supervision from MRT staff member.

## 6. Expenditure Statement

A total expenditure of \$261,427 for the period 26/05/2017 to 25/05/2018 is detailed below:

<b>Expenditure</b>	<b>\$AUD</b>
Geology	\$87,495
Geochemistry	\$263
Geophysics	
Remote Sensing	
Gridding	
Drilling	\$14,143
Land Access Costs	\$3,760
Rehabilitation Costs	
Feasibility Study Cost	
Other Cost	
Administration Cost	\$23,766
<b>TOTAL</b>	<b>\$261,427</b>

Table 1: EL46/2010 Expenditure for current year

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