



**PROTO**

RESOURCES & INVESTMENTS LTD

**BARNES HILL WEST PROJECT  
TASMANIA  
EL 53/2008**

ANNUAL REPORT  
28<sup>TH</sup> APRIL 2011 TO 27<sup>TH</sup> APRIL 2012

**Tenement Holder/Manager**  
Proto Resources & Investments Ltd

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On behalf of Proto Resources & Investments Ltd

**Distribution:** Mineral Resources Tasmania  
Proto Resources & Investments Ltd

**Note: All figures and grids are according to the GDA94 datum and MGA94 grid system.**



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## **SUMMARY**

The Barnes Hill West Project (EL53/2008) is located in northern Tasmania, 10km west of the township of Beaconsfield. The exploration licence covers an area of 44km<sup>2</sup>.

The exploration licence was applied for to explore for nickel laterite mineralisation in ultramafic rocks of the Cambrian Andersons Creek Ultramafic Complex and also to explore for copper-gold mineral deposits in Proterozoic rocks of the Oonah formation.

During the previous reporting period soil sampling programs were conducted at both the Pandora Prospect and Extension Prospect. An area of coincident moderate intensity Cu-Pb-Zn anomalism was identified at the Extension Prospect although subsequent interpretation and a field visit indicates this anomaly is associated with a previously unknown mafic or ultramafic intrusion and is hence interpreted to be rock type related as opposed to mineralisation related.

Activities during the current reporting period have included the completion of a petrographic report based on thin section preparation and petrological description for three rock samples collected from the Extension Prospect.

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## **1 INTRODUCTION**

The Barnes Hill West Project is located in northern Tasmania approximately 10km west of the township of Beaconsfield. Proto Resources & Investments Ltd holds the adjoining exploration licence EL17/2006 to the east which contains the Barnes Hill Project with known nickel laterite resources of 12.1 Mt @ 0.83% nickel & 0.07% cobalt.

## **2 TENEMENT DETAILS**

The Barnes Hill West Project on Exploration Licence 53/2008 covers an area of 44km<sup>2</sup> and was granted on 28<sup>th</sup> April 2009 for a period of five years. A mining lease application number 1872P/M by Proto Resources & Investments Ltd overlies a small portion of the Barnes Hill West Project area.

## **3 LOCATION AND ACCESS**

The Barnes Hill West EL53/2008 licence is located approximately 35km north of Launceston and 10km west of Beaconsfield near the Tamar River in northern Tasmania (Figure 1).

The Barnes Hill West tenement can be accessed via a number of gazetted roads on the western side of the Tamar River including Tattersall's Roads and Coppermine Road.

A wide range of infrastructure and heavy industry occurs in the district including the nearby Beaconsfield Gold mining operation, the Bell Bay Power Station, the Temco Magnesium Refinery and the Bell Bay Alumina Refinery. The area also has deep water port facilities at Bell Bay and Beauty Point along with rail facilities. The regional City of Launceston has a population of over 90 thousand people and offers all the services of a major regional city including airport, university and advanced engineering facilities.

## **4 GEOLOGICAL SETTING**

The Barnes Hill West Project occurs in the Badger Head region of northern Tasmania, an important structural location, considered to be the area in which the Tamar Fracture System separates the western and eastern Tasmanian terrains. The area has a complex nature, a result of thrusting during the Devonian and later normal faulting in the Jurassic and Tertiary.

The geology of the Barnes Hill West Project area is dominated by Proterozoic sedimentary rocks of the Oonah Formation (Figure 2). A small portion of the Cambrian Andersons Creek Ultramafic Complex is mapped on the eastern side of the licence area. The Andersons Creek Ultramafic Complex is considered to be a thrust slice. The airborne magnetic data over the area is dominated by the response of the Anderson Creek Ultramafic Complex with much of the surrounding geology having only subtle responses. Sediments of the Permian to Carboniferous Lower Parmeener Super Group along with Jurassic dolerite are mapped in the southwest corner of the licence.



Figure 1 Location Diagram.

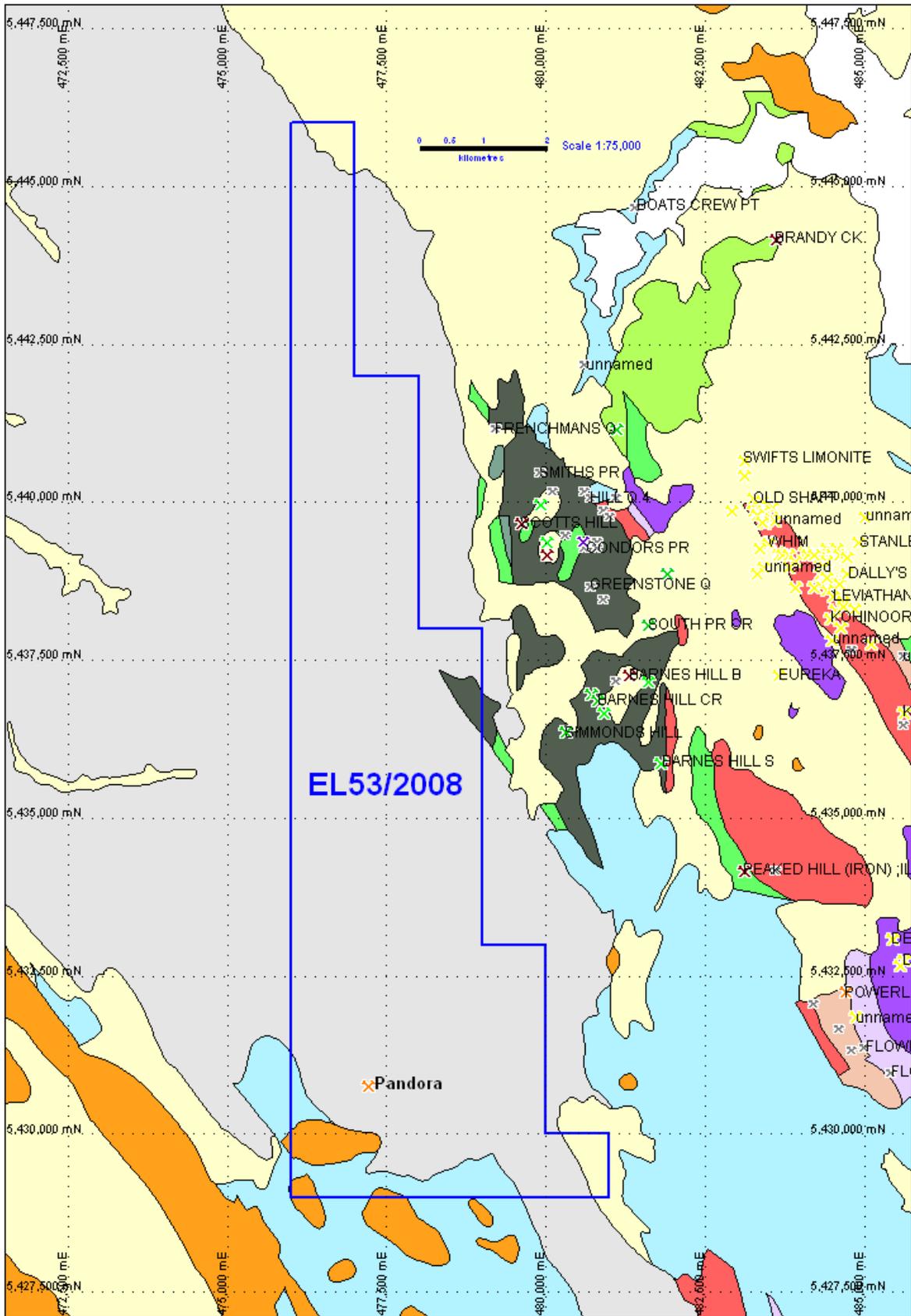


Figure 2 Geology of the Barnes Hill West EL53/2008 licence area. Onah Formation in grey. Andersons Creek Ultramafic Complex in green. Lower Parmeener Super Group in blue. Jurassic dolerite in orange.

## **5 EXPLORATION HISTORY**

A review of previous exploration on the Barnes Hill West licence has been completed. The area has been explored previously by several companies as discussed below. The main known mineral occurrence in the licence area is the Pandora Copper Mine which was mined on a small scale in the 1890's. These workings consist of a short adit and a 3 to 4 metre deep shaft.

Explorers in the area have included:

- BHP Co Ltd who in 1967 undertook a regional drainage stream sediment survey.
- Geopeko Ltd who in 1983 undertook pan concentrate and stream sediment sampling.
- Beaconsfield Gold Mines Ltd between 1987 to 1989 undertook drainage surveys for gold.
- Resolute Ltd between 1996 to 1997 undertook follow-up gold drainage surveys.
- Gujarat NRE Resources NL (formerly Zelos) between 2006 to 2007 undertook literature reviews of previous exploration and geophysical interpretation and stream sediment surveys.

During 2009-2010 Proto Resources & Investments Ltd undertook a field trip to the area of mapped Andersons Creek Ultramafic Complex. No outcropping rocks were found but the soil was dark red to brown and had similarities to the soils further east in the region of the Barnes Hill nickel deposit.

A field trip was also undertaken to try to locate the Pandora Copper Mine workings. The workings at Pandora, in the form of an adit and a shaft, were found in the base of a creek named Copper Mine Creek. The adit went in approximately 4m and was linked to a 4m deep shaft. The area was heavily vegetated.

Two rock chip samples numbered BHWR01 and BHWR02 were taken at the Pandora Copper Mine workings. Both samples were of mudstone with pyritic quartz vein material.

The samples were submitted to ALS Laboratories in Adelaide for multi-element analysis. At the time of reporting assay results had not been received. The assay results are discussed in Section 6.1 below and data given as Appendix A.

## **6 EXPLORATION COMPLETED**

The Barnes Hill West Project was acquired for two main reasons which were the occurrence of mapped ultramafic rocks in the area and thus perceived potential for nickel laterite style mineralisation and secondly because of the presence of the historic Pandora Copper Mine in the area (Figure 2).

Exploration completed during the reporting period included a review of historic exploration activity, with a focus on the stream sediment sampling programs in particular, the BHP zinc anomaly (175ppm Zn to 335ppm Zn) encountered to the east of the abandoned Pandora Copper Mine. This review is continuing with exploration currently limited to geological field trips.

## **6.1 PETROLOGY REPORT**

Three rock samples, sample numbers BHW1 to BHW3, were collected from an interpreted mafic/ultramafic intrusion at the Extension Prospect and sent to Prof Tony Crawford at the University of Tasmania in Hobart for petrological description (see appendix1).

The rock samples were collected in the vicinity of a moderate intensity Cu-Pb-Zn soil anomaly encountered by Proto as discussed in the previous reporting period, which is coincident with a low intensity magnetic bulls eye feature on airborne geophysics magnetic images of the area.

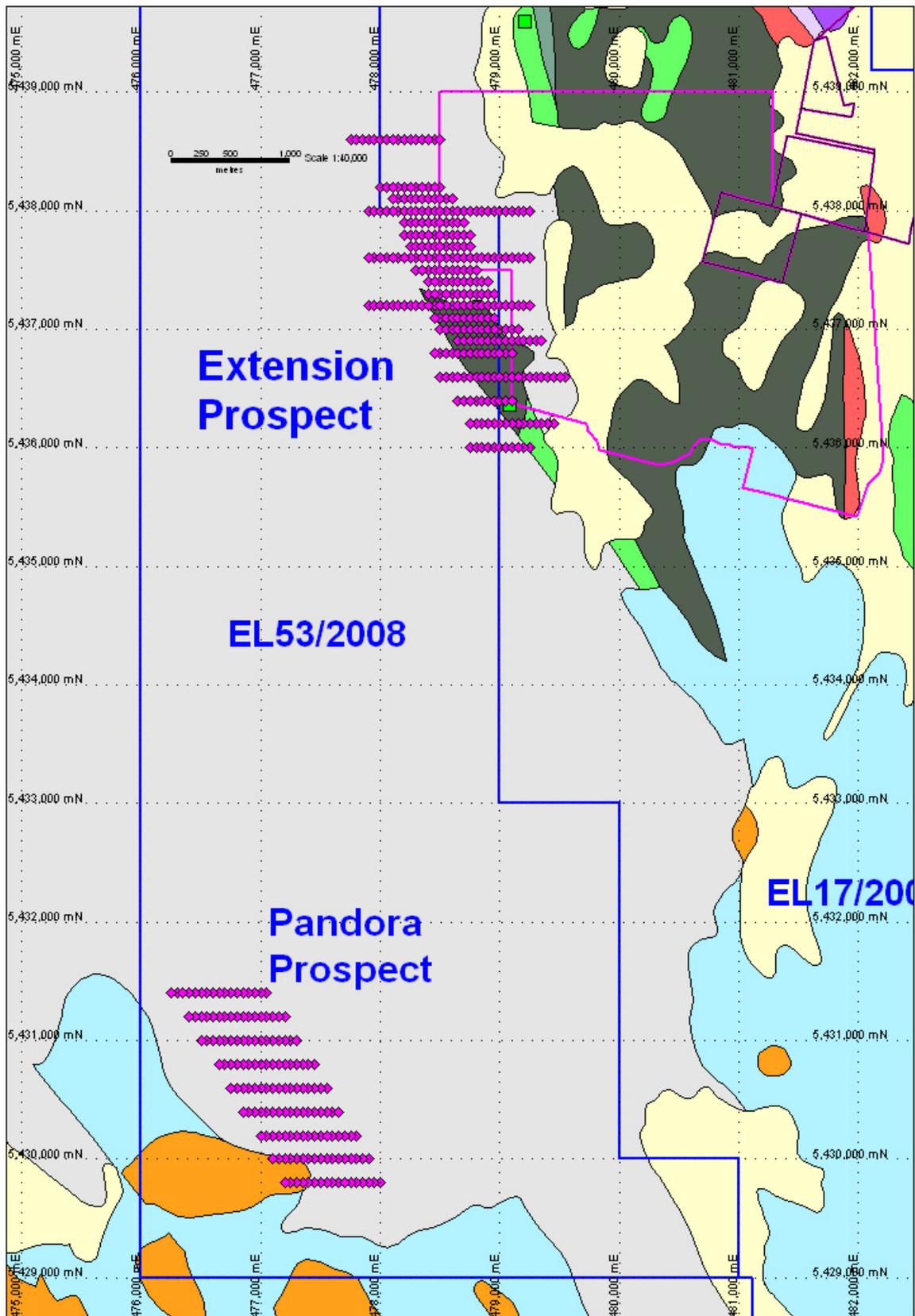


Figure 3 Previous Soil Sampling Locations on the Barnes Hill West EL53/2008 licence area.

## 7 EXPENDITURE

Expenditure from 28<sup>th</sup> April 2011 to 27<sup>th</sup> April 2012 is tabulated below for the Barnes Hill West EL53/2008 exploration licence.

**Table 1 Expenditure 28 April 2011 to 27 April 2012.**

<b>ITEM</b>	<b>Apr-11 to Apr-12</b>
<b>Administration</b>	\$12,935
<b>Geology &amp; Exploration Activities</b>	\$14,158
<b>Other</b>	\$1,431
<b>TOTAL - ELIGIBLE</b>	<b>\$28,524</b>

## 8 PROPOSED EXPLORATION

A variety of activities are proposed to be undertaken at the Barnes Hill West Project in the coming term including:

- Geological mapping and rock chip sampling of surface laterite iron enrichments throughout the Ironstone Hills area.
- Follow up Air Core drilling of lateritic iron enrichments found from mapping.
- Follow up bulk sampling and iron beneficiation test work in areas of lateritic iron enrichments delineated by Air Core drilling.
- Geological mapping and initial soil sampling at BHP Co Ltd (1967) defined stream sediment zinc anomalies (175 to 335ppm Zn), east of the Pandora Copper Mine.
- Possible ground EM survey at the Pandora Copper Mine.

## **APPENDIX A**

### **Petrographic Report**

**(see electronic pdf file on disc)**

# **PETROGRAPHIC REPORT**

## **3 ROCKS FROM BARNES HILL WEST PROJECT, WA**

for TasEx Geological Services  
(attn. Andrew Jones)

1/4/2011

**Dr Anthony J. Crawford**  
A & A Crawford Geological Research Consultants  
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Hobart, TAS 7054  
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## **SAMPLE NUMBER: BHW1**

**SUMMARY:** This is a multiply deformed, formerly sparsely pyroxene-phyric metadolerite with relatively abundant FeTi oxides (ie likely to be relatively Ti-rich), and likely to be part of the strongly metamorphosed basal thrust package below the ophiolitic Andersons Creek Complex (rather than a part of the Badger Head Block).

## **THIN SECTION DESCRIPTION:**

This sample is a multiply deformed, foliated, fairly fine-grained greenschist transitional to an amphibolite. Its mineralogy is dominated by a 0.2-0.5mm-sized foliated intergrowth of ragged actinolite, anhedral to subhedral albitised plagioclase, and common rather elongate FeTi oxides, with subordinate chlorite and very fine-grained epidote. The original mineralogy of this rock was undoubtedly augite-plagioclase-FeTi oxide, and the original texture almost certainly doleritic. Occasional 1mm-sized phenocrysts of former augite, now totally replaced by fibrous actinolite, sometimes contain elongate plagioclase laths in a typical ophitic texture, supporting the assignment of the protolith of this rock as a dolerite. The albitised plagioclase grains throughout this rock are partly replaced by murky microcrystalline epidote.

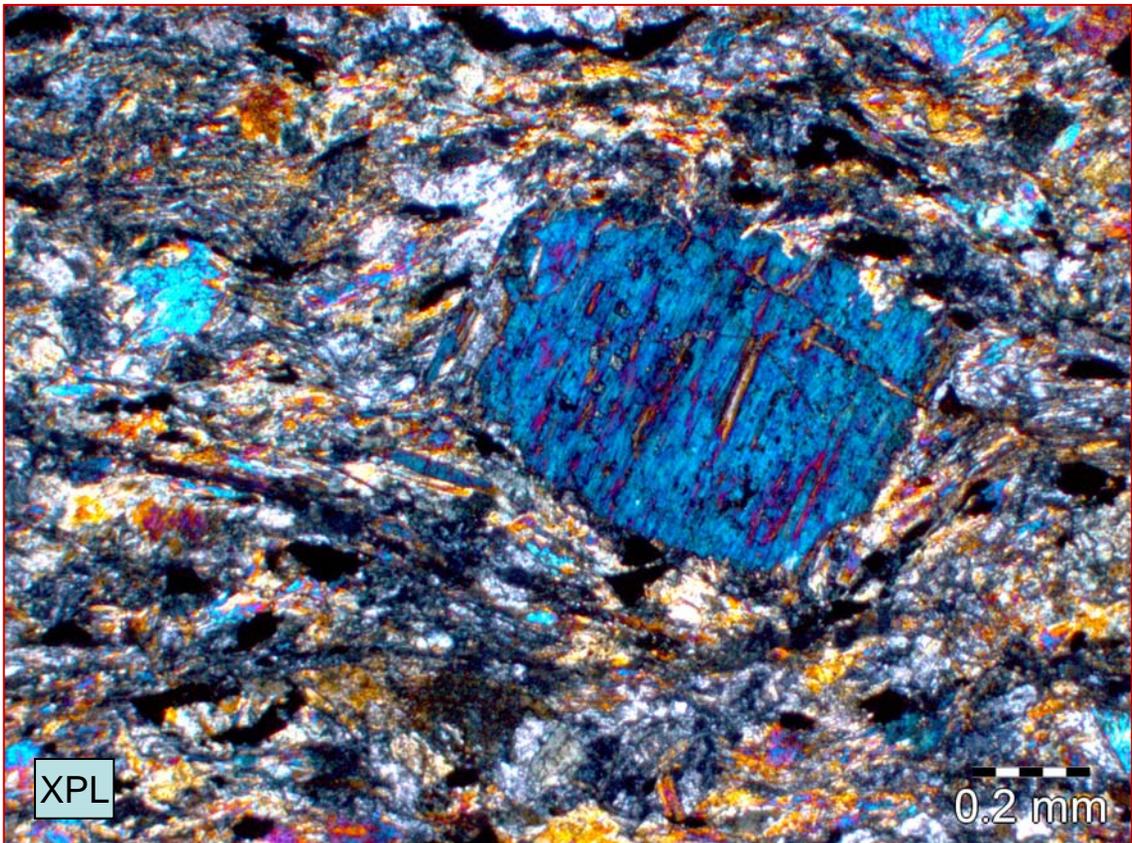
A foliation is well defined by elongation of bundles of pale green actinolite crystals, and elongate trails of FeTi oxides, and this foliation shows a strong crenulation. Late, linear epidote-chlorite veinlets transect both foliations.

This multiply deformed dolerite is quite unlike the dolerites common in the upper sections of the Tasmanian Cambrian mafic-ultramafic complexes, which may show greenschist metamorphic assemblages but in my experience are never multiply deformed. Furthermore, dolerites within the ophiolitic complexes are characteristically poor in FeTi oxides, whereas this rock is quite rich in FeTi oxides. However Reed (2002) reported a fault-bounded body of meta-mafic rocks from the western edge of the Andersons Creek Complex that he interpreted to be a slice of the sub-allochthon Crimson Creek Formation-correlated rocks dragged along under the ophiolite during emplacement. The petrography of this slide is appropriate for a multiply deformed Crimson Creek Formation-type tholeiitic dolerite or basalt. This rock is unlike the occasional dolerites in the Badger Head Block, and definitely not part of the Anderson Creek Complex.

SAMPLE: BHW1



SAMPLE: BHW1



## **SAMPLE NUMBER: BHW2**

**SUMMARY:** This is another multiply deformed, strongly foliated and deformed, and locally brecciated amphibolite, probably related to BHW1 and derived from a Crimson Creek Formation-type tholeiitic basalt which was part of the metamorphic sole of the Andersons Creek Complex ophiolite.

## **THIN SECTION DESCRIPTION:**

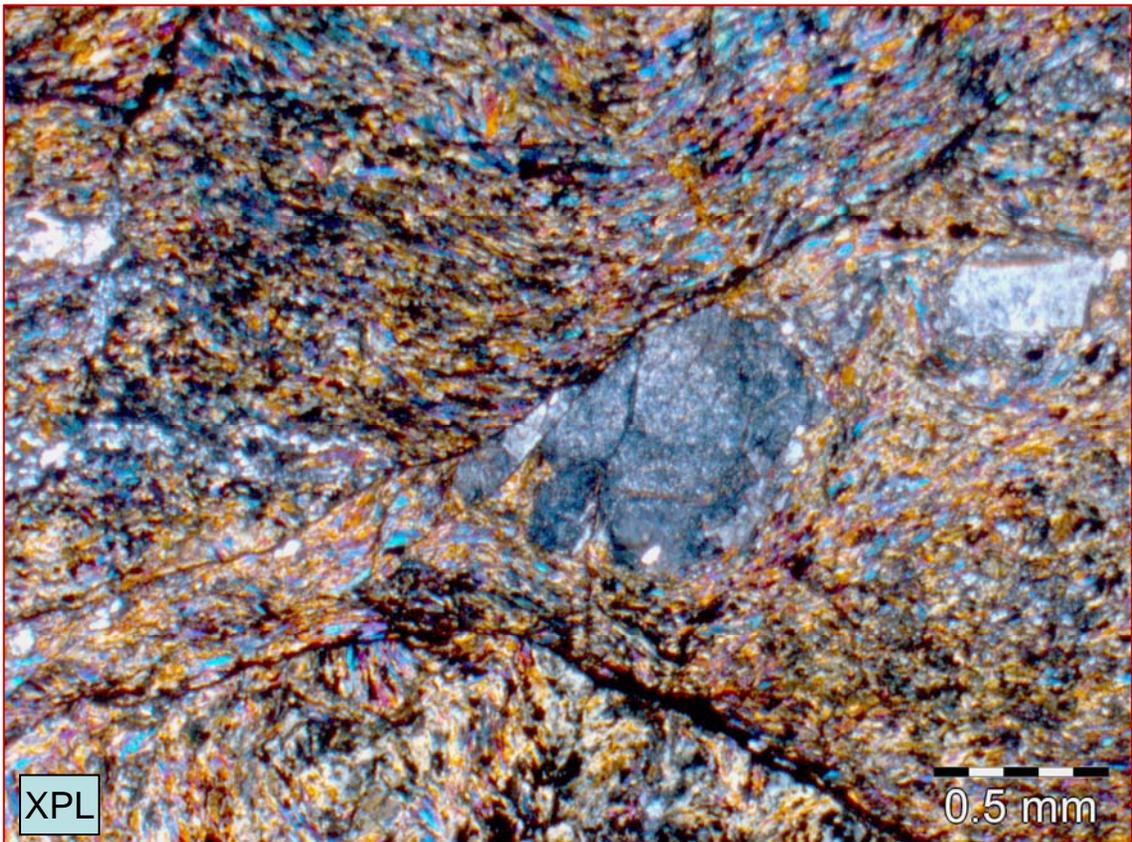
This is a much finer-grained, and more crushed, veined and brecciated version of the preceding sample BHW1. It consists of obviously fault-dislocated domains of strongly and multiply deformed foliated amphibolite with bands and patches of crushed and brecciated, texturally variable quartz-dominated quartz-albite intergrowths.

Throughout most of the rock, there is no plagioclase, and the rock consists entirely of masses of foliated pale green amphibole and often elongate crystals of FeTi oxides.

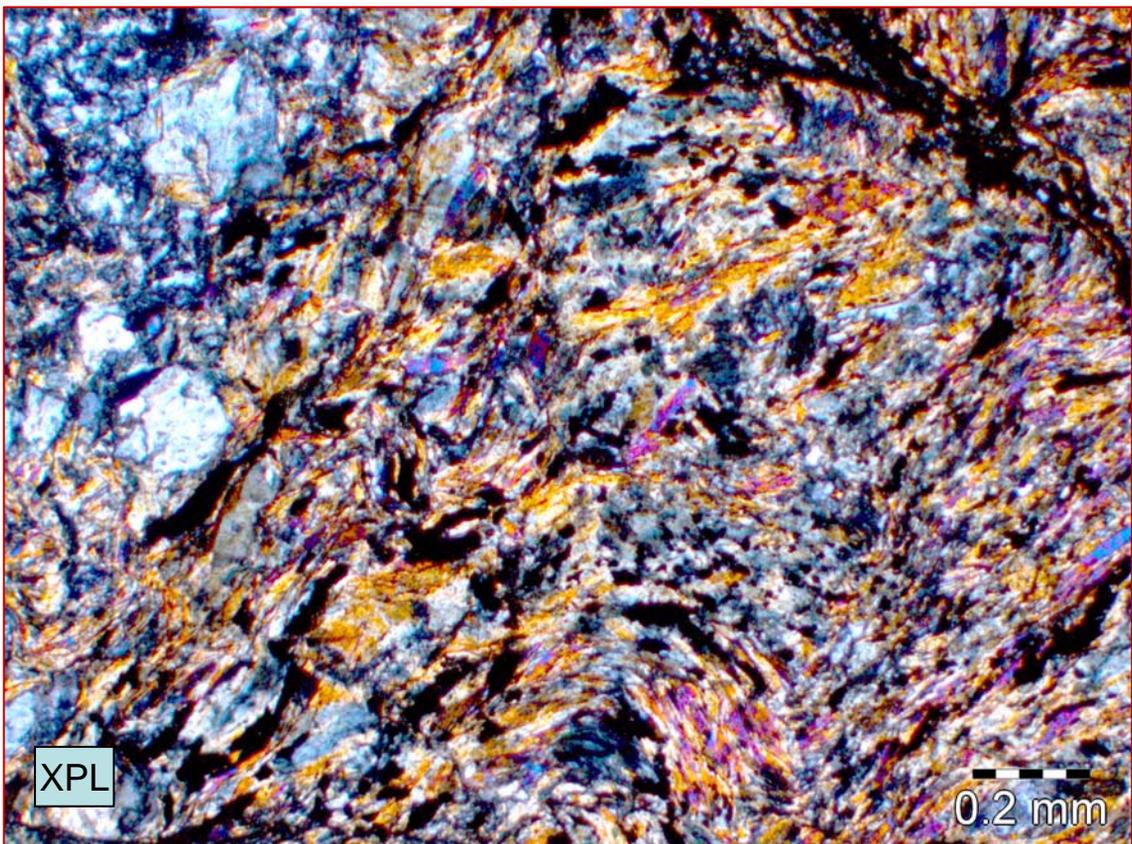
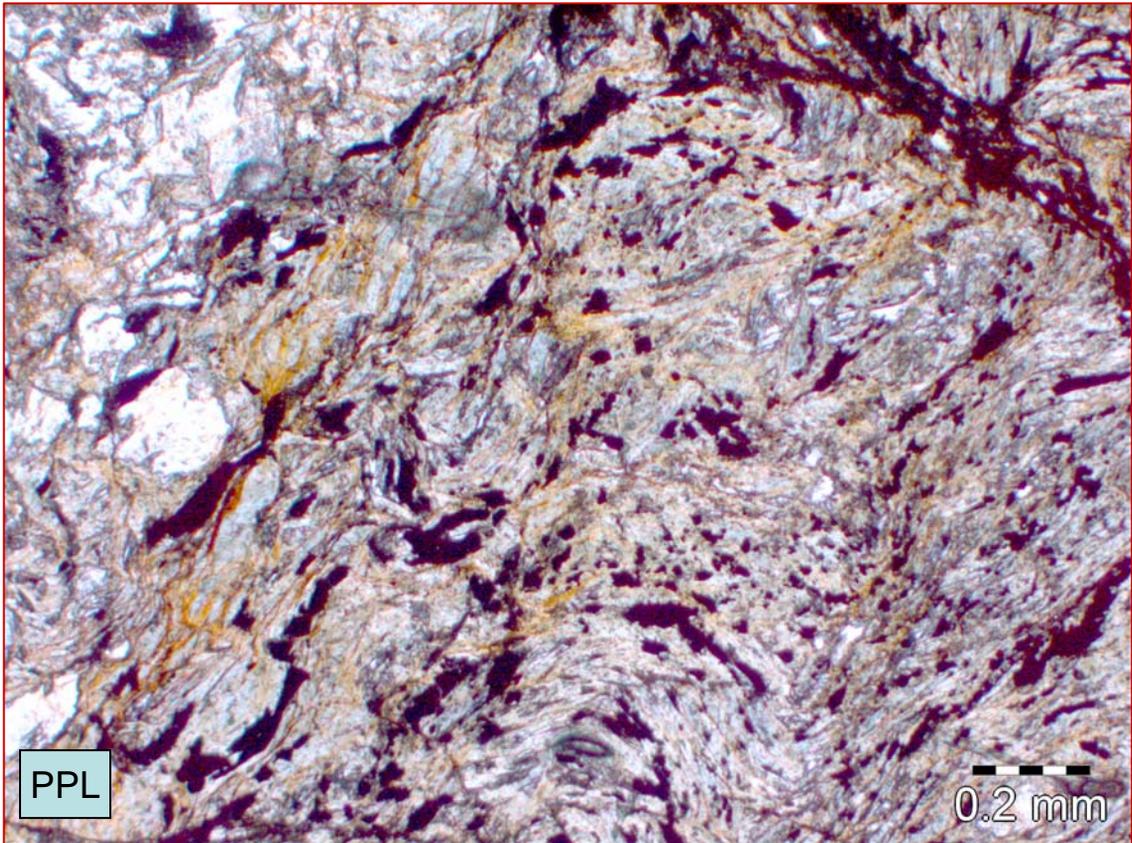
The rock shows complex, quite small scale discordant folding of the schistosity, which is defined by the dark trails of FeTi oxides and bundles of fibrous to elongate prismatic actinolite or actinolitic hornblende. Sharp changes in the orientation of the schistosity coupled with narrow bands of epidote indicate local brecciation and reorganisation of crush domains in this sample.

I suggest that this was another Crimson Creek Formation-type basalt or dolerite that was part of the footwall to the westward-emplaced Andersons Creek Complex ophiolitic slice. It was likely caught up in the basal melange – shear zone during emplacement, and suffered stronger deformation than BHW1. This rock has experienced strong local brecciation in a late brittle structural zone, perhaps associated with its exhumation from beneath the ophiolite, presumably during the Devonian Tabberabberan Deformation.

**SAMPLE: BHW2**



**SAMPLE: BHW2**



### **SAMPLE NUMBER: BHW3**

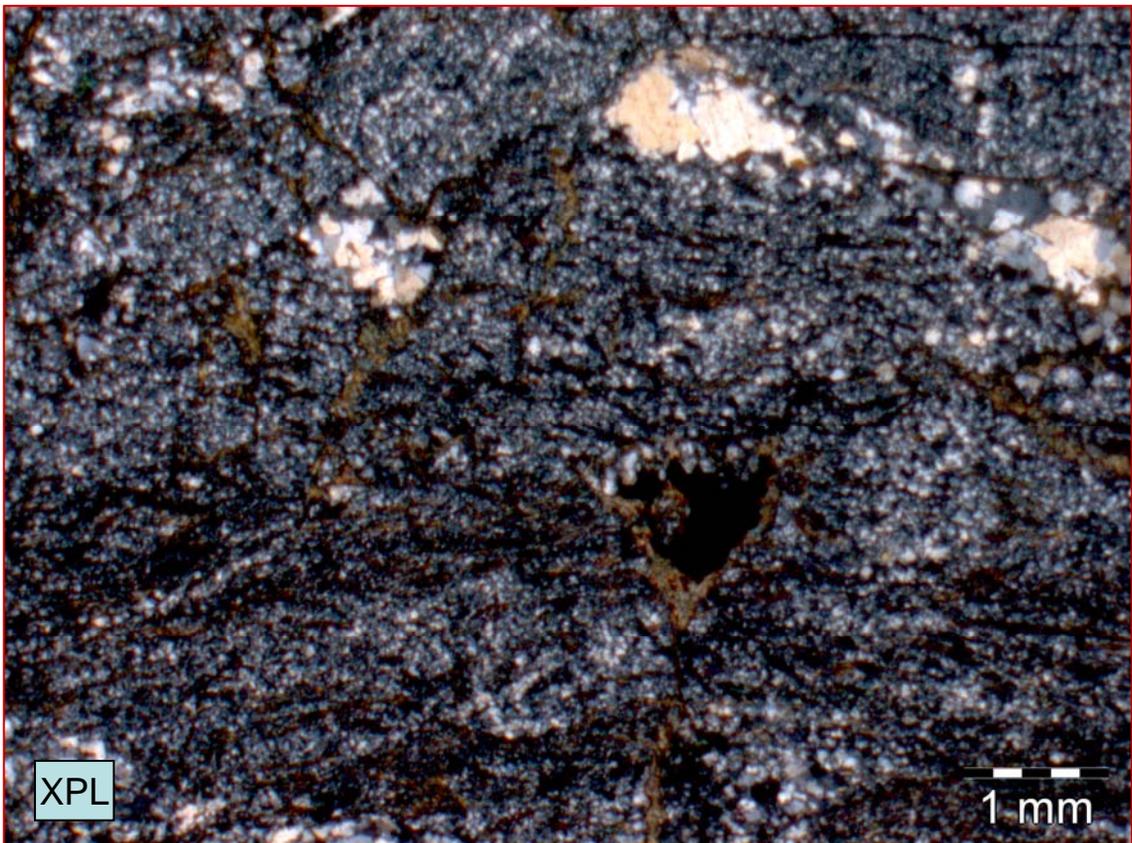
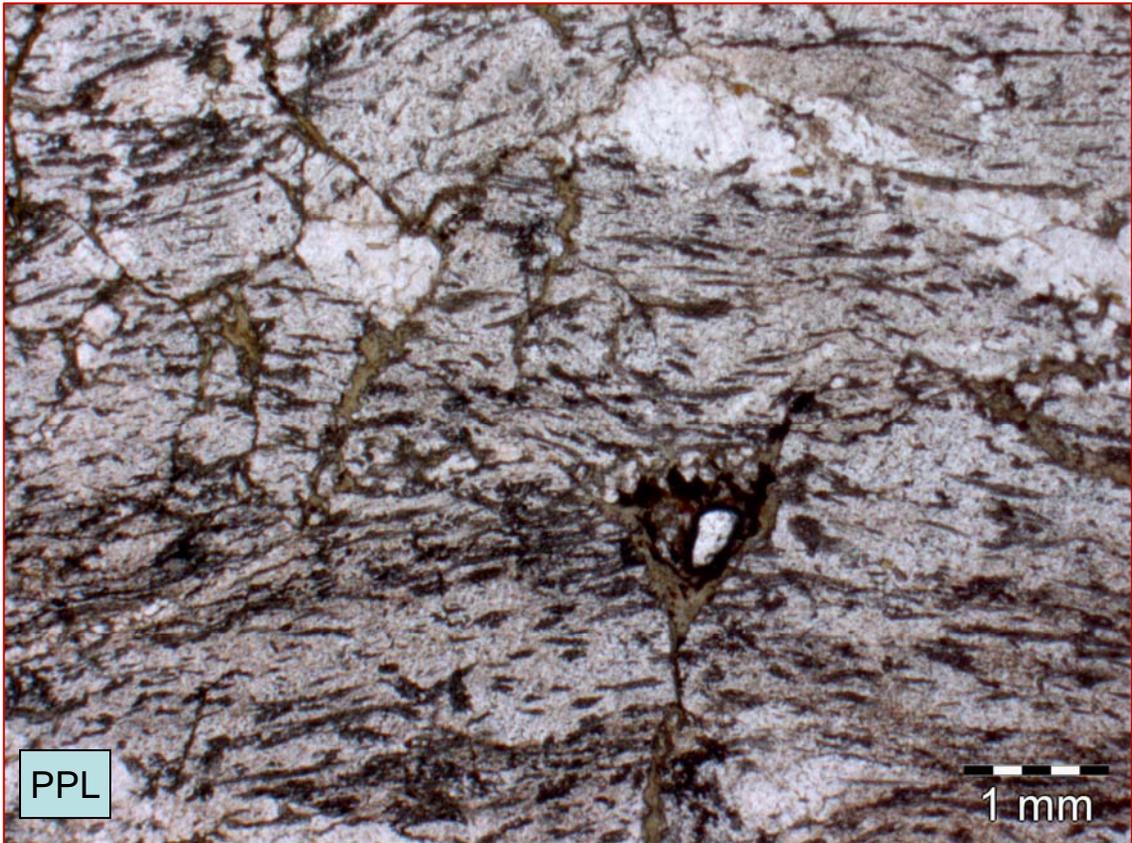
**SUMMARY:** This is a weakly foliated, quite siliceous greenschist composed entirely of sugary quartz and elongate actinolite prisms. It is probably part of the Badger Head Block metamorphic package.

### **THIN SECTION DESCRIPTION:**

This sample is a far more siliceous and lower metamorphic grade greenschist than the preceding samples BHW1 and BHW2, and it is composed of two major minerals, quartz and actinolite. Quartz dominates the rock and occurs as sugary-textured, fine-grained intergrowths peppered by elongate, subparallel actinolite sheaves and individual crystals which impart a very weak foliation on this rock. The actinolite crystals are mainly 0.1-0.2mm-long ragged-edged elongate prisms. Trails of tiny equant opaques are common through the rock, paralleling the foliation defined by the actinolite prisms, and these appear to be magnetite rather than pyrite (using a hand-held LED light). Common veinlets composed of either yellowish chlorite or quartz transect the rock, and irregular domains of coarser-grained secondary quartz appear to be fracture-fillings or boudinaged and recrystallised former quartz veinlets.

The texture and mineralogy of this rock is entirely metamorphic, and no trace of the protolith is preserved. The greenschist facies assemblage is lower grade than the two preceding samples from this area (BHW1 and BHW2), and it is probably from the Badger Head Block main metamorphic package rather than the melange – structural package from the sole of the ophiolite.

**SAMPLE: BHW3**



**SAMPLE: BHW3**

