

**PALOONA PROJECT  
EL 23/2008**

**FINAL RELINQUISHMENT REPORT  
AUGUST 2010**

**Tenement Holder/Manager**  
TasEx Geological Services Pty Ltd  
Wilmot Tasmania

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The conclusions and recommendations expressed in this report / table represent the opinions of the Authors based upon the data available and provided to them.

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

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**ABSTRACT**

TasEx Geological Services Pty Ltd commenced management of the Paloona exploration licence (EL23/2008) on 13 October 2008. During the 22 months of tenure exploration conducted on the tenement has included –

- Open file data compilation and review
- Field reconnaissance visits to ascertain vehicle access to licence and to establish the location of historic mine workings
- Completion of geological mapping, rock chip sampling and soil sampling programme over prospective units of the Mount Read Volcanics (MRV)

Multi-element assay results for the soil samples did not indicate any significant anomalism associated with the Mount Read Volcanics (MRV). Selective mapping and rock chip sampling did not locate any further areas of interest within the MRV and hence the licence is to be relinquished.

**Expenditure –** Current reporting period \$16,054.05

Total project to date \$24,178.05

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# 1 INTRODUCTION

This report is a summary of the exploration activities conducted on the Palooa exploration licence, EL23/2008 (Figure 1), for the period 13 October 2009 to 12 August 2010.

The exploration licence is situated near the central-north coast of Tasmania between the towns of Wilmot and Forth. Geologically the licence area is mapped as containing units of the Cambrian Mount Read Volcanics Belt. The licence was applied for primarily because of interest in the historic Alma Copper Mine workings located close to the western edge of Lake Palooa. Several other historic workings occur within the immediate area presumably associated with the Cambrian volcano-sedimentary stratigraphy which is considered by TasEx Geological Services Pty Ltd (TasEx) to be prospective for Hellyer-Rosebery style Volcanic Hosted Massive Sulphide (VHMS) mineralisation.

## 1.1 Location and Access

The Palooa licence is located less than 20km southwest of Devonport covering an area from the Palooa Dam to Lake Barrington just north of Wilmot township (Figure 1). The licence area is accessed via the Wilmot Road from Forth or Wilmot and then by unsealed roads and forestry tracks. The licence area can be found on the Forth (1:100,000) LTIS map sheet.

The topography of the licence area is undulating and steep and is primarily zoned as State Forest with a number of private timber reserves and private cadastral properties. The licence area does not encroach on any conservation areas.

## 1.2 Tenement Details

The Palooa exploration licence, EL23/2008, covers a total area of 54 km<sup>2</sup> and is held and managed by TasEx. The licence was granted on the 13<sup>th</sup> October 2008 for a period of 5 years.

## 1.3 Exploration Rationale

The Palooa exploration licence was applied for as the Company believes the northern correlates of the Cambrian Mount Read Volcanic Belt are under explored by modern exploration and have potential to yield a high-value VHMS-style discovery. Several factors combine to make the licence area attractive including;

- The presence of the historic Alma Copper-Barite Mine workings in the licence area
- Perceived little modern exploration in the licence area
- The presence of Cambrian lead isotopic signatures in historic exploration reports from the MacPhersons Mine located 7km west of the licence area (Virgoe, 1990)
- Reference in Twelvetees (1905) to chrome-rich green alteration in rocks west of the Alma Mine workings



## **2.1 Barrington Chert**

The Barrington Chert is a pale to dark grey or black chert with minor red and grey siliceous hematitic mudstone and siltstone bands (Vicary & McClenaghan, 2007). The chert represents a phase of deep-water siliciclastic sedimentation which has undergone anomalous high-pressure metamorphic grade compared to the surrounding Middle Cambrian facies. The chert is considered to represent an allochthonous relic of the Tyennan Orogeny and is considered Neoproterozoic to Early Cambrian in age (Seymour et al, 2006).

## **2.2 Western Volcano-Sedimentary Sequence (Mt Read Volcanics)**

The Middle to Late Middle Cambrian volcano-sedimentary facies within the licence area represent correlates of the Western Volcano-Sedimentary Sequence (WVS) of the Mt Read Volcanics (MRV).

At a regional scale, the Mt Read Volcanics (MRV) are a belt of volcanic, volcanoclastic and sedimentary rocks of Mid-Cambrian age. The belt is famous for hosting Tasmania's world-class polymetallic volcanic-hosted massive sulphide (VHMS) deposits such as Rosebery, Hercules, Mt Lyell, Hellyer and Que River.

Within the licence area the WVS is correlated with the Groove Creek Formation, Alma Formation and Gog Range Greywacke which young in that order towards the Upper felsic volcanoclastic unit of the Gog Range Greywacke which is considered the top of the WVS. In the region of the licence this felsic volcanoclastic unit is missing along with the favourable horizon for mineralisation that lies between the WVS and the Tyndall Group. However, a number of base metal prospects are known to occur within the Groove Creek/Alma Formation-Gog Range Greywacke units such as the Alma prospect within the licence area and Lucas & Perry's prospect less than 1km to the west of the licence (Vicary, 2008).

## **2.3 Gordon Group**

The Ordovician-aged Gordon Group is represented within the licence area by discrete remnants of pale grey to dark reddish grey generally pebbly and sometimes bioturbated quartz sandstone correlated to the Moina Sandstone (Vicary & McClenaghan, 2007). It is most prominent in the southern portion of the licence where a large raft lies in fault contact with much older Groove Creek Formation volcanoclastic sediments to the east and Barrington Chert to the south (Vicary & McClenaghan, 2007).

## **2.4 Tertiary Basalts & Quaternary Alluvium**

Very little cover material occurs within the licence area. A few minor zones of Tertiary basalt occur capping the Cambrian geology with the largest occurring in the southwest corner and along the eastern boundary of the licence. Quaternary deposits are almost entirely limited to alluvial deposits associated with the Forth River valley (Vicary & McClenaghan, 2007).

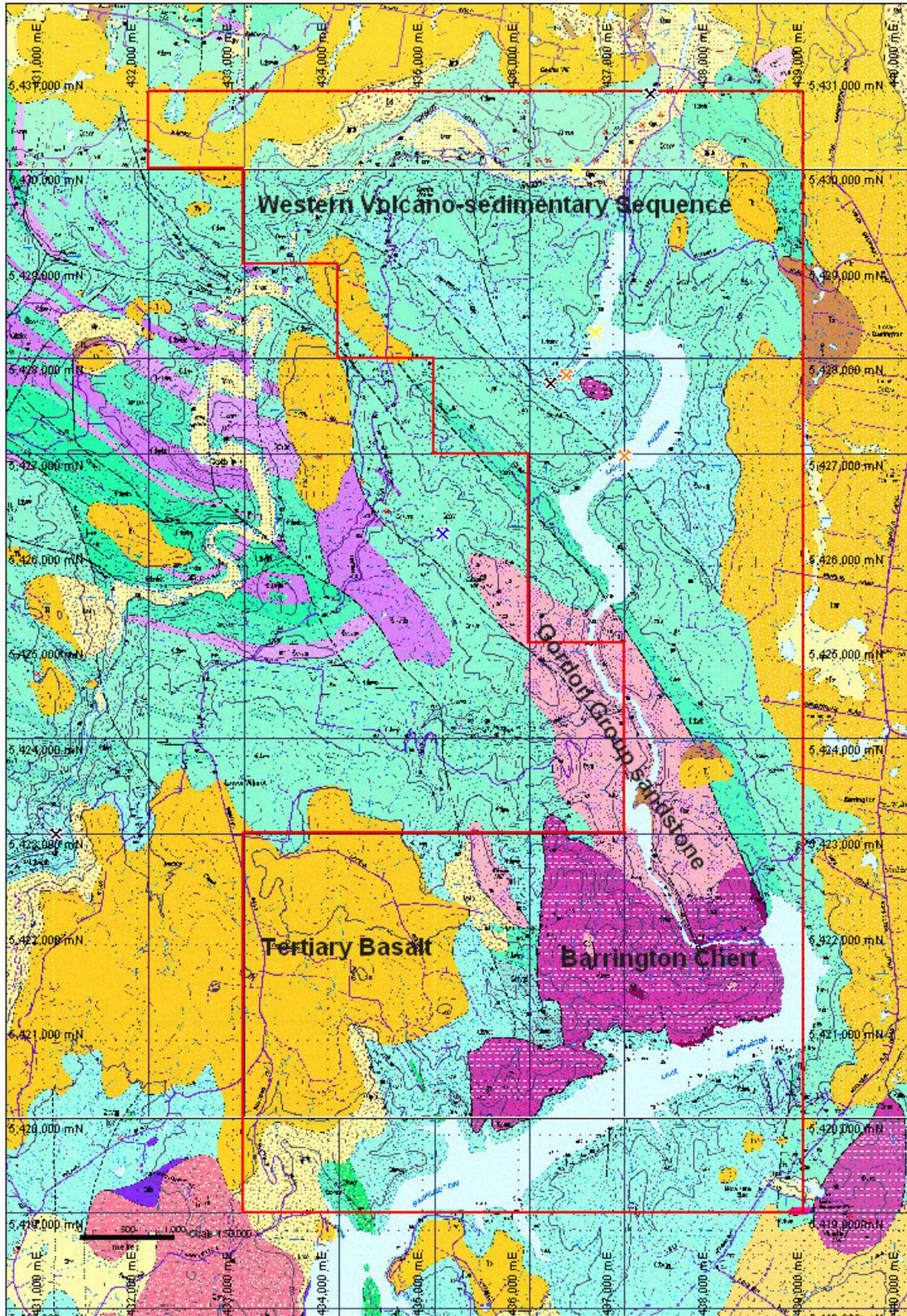


Figure 2. Regional Geology showing licence area and mineral occurrences. Digital geology taken from the Kindred, Castra and Wilmot 1:25000 sheets in GDA66.

### 3 EXPLORATION HISTROY

#### 3.1 Historical Mining Activity

The Mineral Resources Tasmania database records five separate mineral occurrences within the Palooa EL23/2008 licence area. These mineral occurrences include the Alma (also known as Barrington) Cu Mine which was worked in the late 1800's – early 1900's, the Crawfords Au occurrence, the Palooa Ba occurrence and an unnamed placer Au occurrence and an unnamed Cu-Ba occurrence. The unnamed placer Au occurrence and the unnamed Cu-Ba occurrence have been flooded since the Forth River was dammed to form Lake Palooa for Hydro Electric power generation.

The historic Alma Mine was worked for copper and barite in the late 1800's and early 1900's although there appears to have been no significant amounts of ore production (Jennings, 1979). Thureau (1882) and Twelvetrees (1905) visited the Alma Mine while it was operational and Blake (1928) after mining had ceased and describe the presence of two adits driven into the hillside north of Barrington Creek. The Main Adit runs for 130m and has three cross-cuts off it and then a smaller adit (the Devonport Adit) has been driven into the same hillside 50m west of the Main Adit. Two shallow shafts have been sunk up the hill from these adits on an iron-rich gossanous unit.

Mineralisation at Alma occurs in the form of barite and quartz veins hosted by siltstone, black slate and pebbly mudstone. Near the surface an ironstone gossan has developed on the pebbly mudstone and this gossanous unit occurs irregularly over a 1km strike length. The barite and quartz veins and surrounding host rocks are reported to also contain minor amounts of chalcopyrite, pyrite, native copper, siderite and malachite.

#### 3.2 Previous Exploration History

Modern exploration efforts in the Palooa licence area have been undertaken by several companies and also by the Mines Department who completed a soil sampling program in the vicinity of the Alma Mine workings between 1969 and 1970. A summary of this work is taken from the open file data available and is presented below. The majority of work completed has involved geological reconnaissance, stream sediment sampling and rock chip sampling. No ground geophysics or drilling activity has been undertaken within the E23/2008 licence area to date.

**Date:** 1969

**Company:** Broken Hill Proprietary Co Ltd

**Work Completed:** Stream sediment survey for Cu, Pb, Ag & As. This program covers the very western portion only of EL23/2008.

**Results and Conclusions:** Follow-up soil sampling of three prospect areas was recommended.

**Reference:** Bumstead, E.D. (1969)

**Date:** 1973

**Company:** Tasmanian Department of Mines

**Work Completed:** Close spaced geochemical soil sampling survey of 360 samples completed in the immediate vicinity of the Barrington (Alma) Cu Mine workings between 1969 and 1970. Samples assayed for Cu, Pb & Zn and some samples assayed for Ba.

**Results and Conclusions:** Peak results of >1,000ppm Cu, 960ppm Pb, 176ppm Zn and 9,800ppm Ba returned. Further surveying north of the sampling grid was recommended.

**Reference:** Cromer, W.C. (1973)

**Date:** 1974

**Company:** CRA Exploration Pty Limited

**Work Completed:** Geological mapping and stream sediment sampling. Approximately 15 samples were collected from the northern portion of the Paloona licence.

**Results and Conclusions:** Peak stream sediment results within the area of the Paloona licence included 26ppm Pb, 155ppm Zn & 85ppm Cu. A Cu-Zn anomaly was identified at Crosby Creek to the south of Wilmot and further work concentrated in that area.

**Reference:** Porter, T.M. (1974)

**Date:** 1984

**Company:** AMAX

**Work Completed:** A small amount of stream sediment sampling (4 samples) was completed around the Alma Mine workings.

**Results and Conclusions:** Stream sediment sample results returned peak values of 30ppb Au, 85ppm Pb and 250ppm Zn with Ag below detection limit or not analysed.

**Reference:** Vivian, R.M. (1984)

**Date:** 1984

**Company:** AUSTAMAX

**Work Completed:** Bulk stream sediment sampling and rock chip sampling on both sides of Lake Paloona with several samples from around the Alma Mine workings.

**Results and Conclusions:** They concluded that the likelihood of an outcropping major deposit was unlikely.

**Reference:** Vivian, R.M. (1984b)

## 4 EXPLORATION ACTIVITIES DURING PERIOD OF TENURE

During the first year of tenure TasEx concentrated on acquiring all available open file exploration data relevant to base metal exploration on the licence area. Compilation of this data along with geological mapping data by the Geological Survey of Tasmania allowed a meaningful assessment of the project and the prospectivity of the Cambrian volcano-sedimentary units contained within.

On the basis of the data compilation TasEx proposed a regional scale soil sampling programme to broadly test those units considered prospective for base metal anomalism and/or geochemical vectors to base metal mineralisation. The programme consisted of 6 north-south oriented soil lines spaced 400m apart and sampled at 100m intervals for a total of 11.1 line kilometers and 118 samples (Figure 3; Appendix A). No clearing took place and vehicle access will be via existing forestry and public tracks into the area to minimize ground disturbance.

Samples were collected from the C horizon and where possible sieved to a nominal 1mm size. The samples were then dispatched ALS for a combination Au-AA25 (gold by fire assay and AAS with detection between 0.01 and 100ppm on a 30g sample) and ME-MS61 (four acid – near total – digestion followed by a combination of ICP-MS and ICP-AES techniques) to detect trace level base metal and gold anomalism as well as other elements such as barium and thallium which are known to act as vectors to VHMS-style mineralisation within the same volcano-sedimentary units of the Mount Read Volcanics on the west coast of Tasmania.

During the soil sampling programme some selective geological mapping took place and 5 rock chip samples were collected and dispatched to ALS for the same Au-AAS25 and ME-MS61 techniques (Appendix B).

Once all assay results were received they were imported into MapInfo to assess any geographical anomalism associated with the known geology.

## 5 ENVIRONMENT

TasEx aims to operate to guidelines set out in the Mineral Resources Tasmania *Mineral Exploration Code of Practice*. As such, the soil programme currently underway is being conducted with no line clearing. Sample points are backfilled immediately, no rubbish is left behind and grid lines will be accessed by foot except where existing tracks occur. Where sampling occurs on private property all care will be taken to inform landholders of exploration activities and to negotiate the best access as to minimize disturbance to the landholder.

The attached Environmental Activity Map in Figure 4 shows the location of the licence relative to conservation areas. No conservation areas encroach on the Palooa tenement.

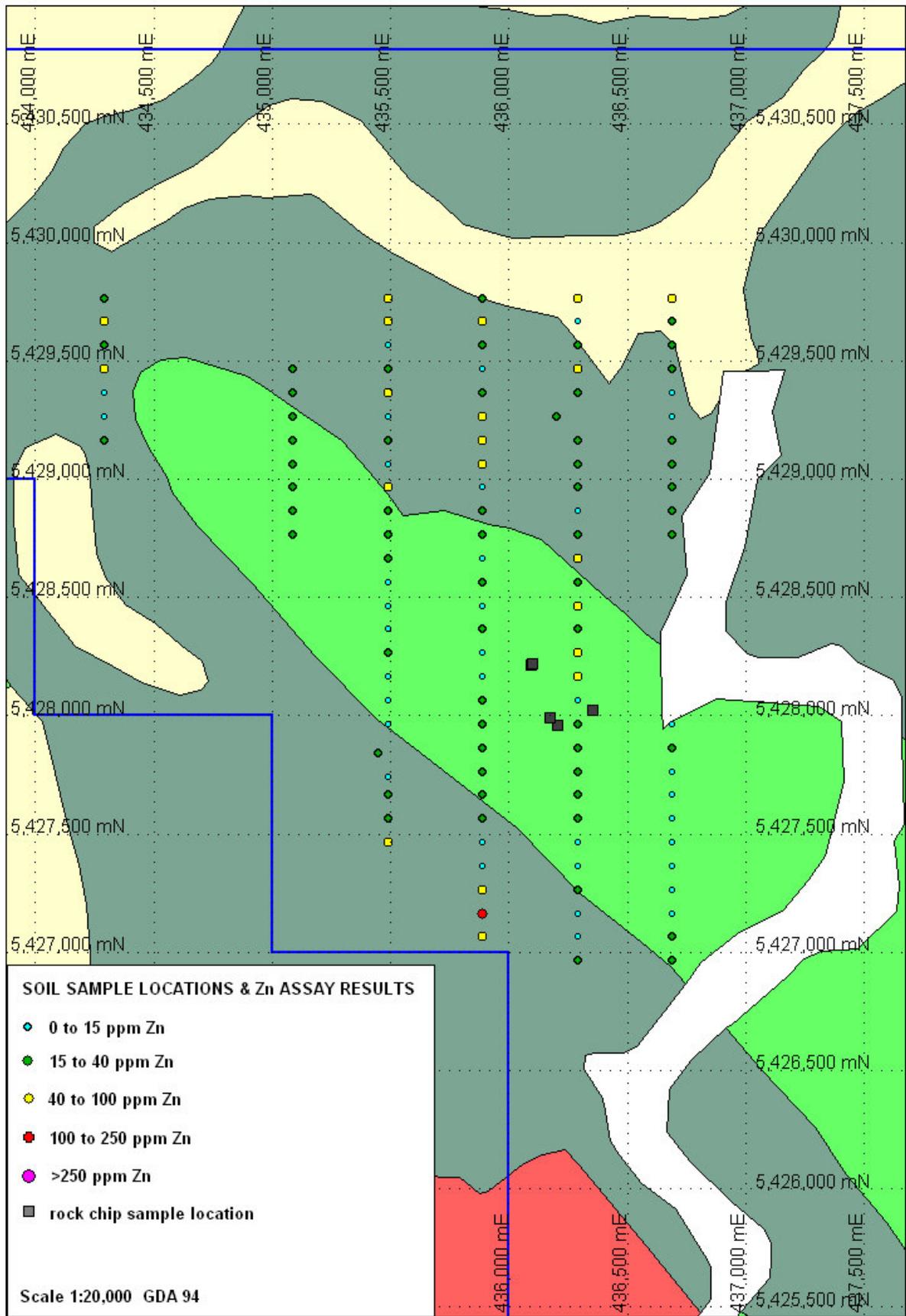


Figure 3. Thematic map showing soil sample locations and zinc levels on 1:250,000 interpreted geology. Solid blue line marks licence boundaries.

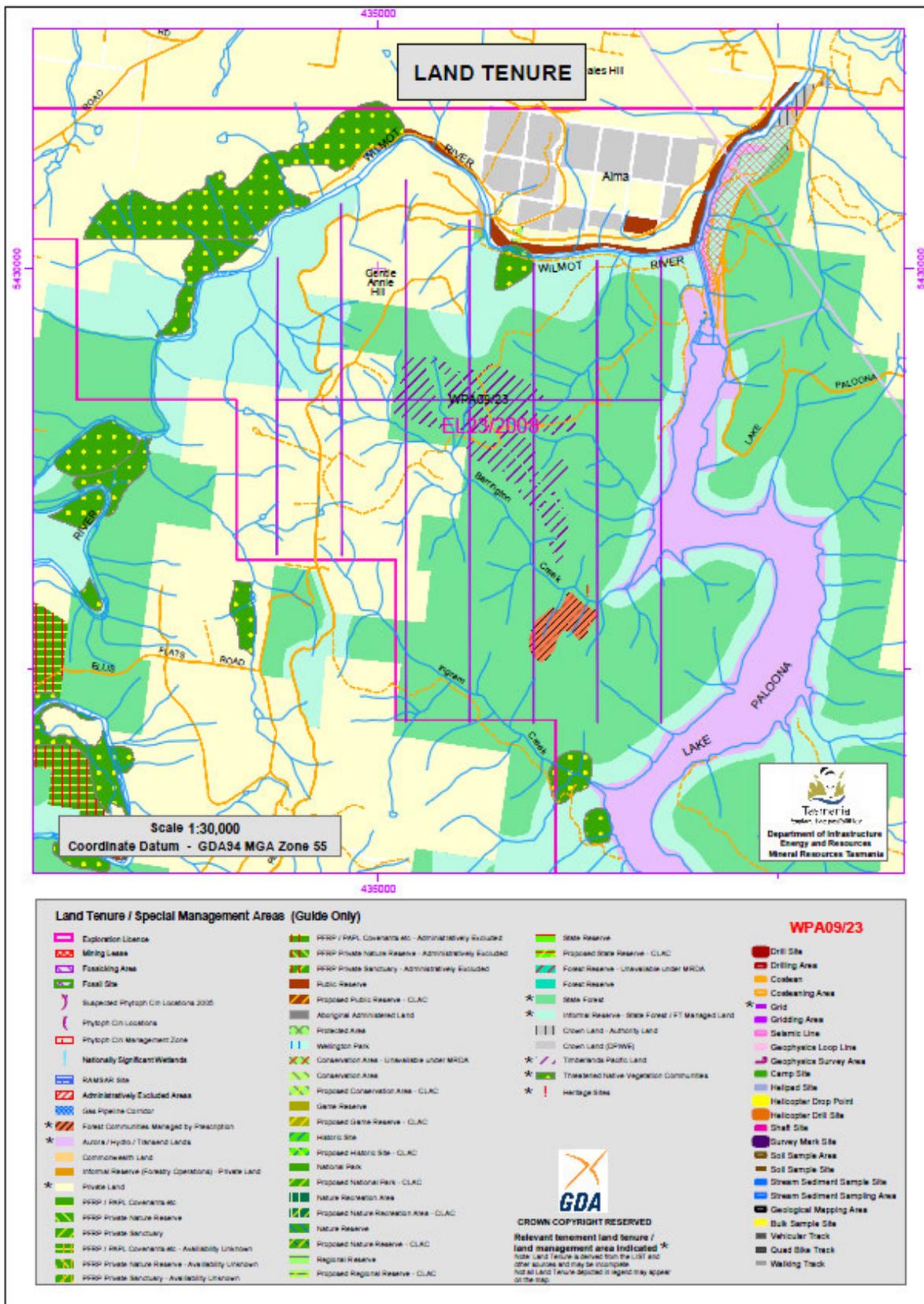


Figure 4. Environmental Activity Map of the Northern licence area. GDA94.

## 6 EXPENDITURE

Expenditure for the reporting period is directly associated with the collection, assay and geological analysis of the soil geochemical sampling program completed during the first half of 2010.

Table 1. EL23/2008 expenditure from the 13 October 2009 to 12 August 2010.

Categories	13-Oct-09 to 12-Aug-10
Geoscientific Costs	
- Geology	\$5,625.00
- Geochemistry incl. sample collection and assay	\$9,831.05
Drilling & Gridding Costs	-
Land Access Costs	-
Rehabilitation Costs	-
Feasibility Study Costs	-
Other Costs	
- Rental Fees for Exploration	-
- Contract Drafting & Surveying	-
Administration Costs	\$598.00
<b>TOTAL ELIGIBLE</b>	<b>\$16,054.05</b>

## 7 CONCLUSIONS

Assay results for the soil and rock chip samples did not indicate any significant anomalism either directly, in terms of elevated base metals, or indirectly with regards to vector elements such as thallium or barium. A weak chromium anomaly is thought to be geologically controlled and related to known chromititic accumulations within the stratigraphy as no chromium-related alteration was observed within this area.

Geological reconnaissance and mapping over the area sampled failed to reveal any outcrops, gossans nor historic workings of interest.

TasEx is confident that it has explored the most prospective portion of the licence area in the best method available to them and has therefore reached the conclusion that the licence should be relinquished.

## 8 REFERENCES

**Blake, F., 1928.** Preliminary Report on Barite in Tasmania. Tasmanian Department of Mines.

**Bumstead, E.D., 1969.** Sheffield Tasmania EL 15/65. Stream Sediment Survey. Broken Hill Proprietary Co Ltd.

**Cromer, W.C., 1973.** Geochemical survey in the vicinity of the Barrington copper mine, north-west Tasmania. Tasmanian Department of Mines.

**Jennings, I.B., 1979.** Geological Atlas 1 Mile Series. Sheet 37 (8115s). Sheffield. Explanatory Report. Tasmanian Department of Mines.

**McClenaghan, M.P., Green, D.C. & Vicary, M.J., 2008.** Digital Geological Atlas 1:25000 series, sheet 4241 Wilmot. Mineral Resources Tasmania.

**Mineral Resources Tasmania, 2005.** Mineral Exploration Opportunities in Tasmania Report.

**Porter, T.M., 1974.** EL 19/72 Dial Range, Northwest Tasmania, Progress Report. CRA Exploration Pty Limited.

**Seymour, D.B., Green, G.R., Calver, C.R., 2006.** The Geology and Mineral Deposits of Tasmania: a summary. Bulletin 72 Tasmanian Geological Survey, Mineral Resources Tasmania.

**Thureau, G., 1881.** Mr Thureau's Report on the North-West Mineral Deposits. Tasmanian Department of Mines.

**Tasmap Lands, 1983.** Inglis LTIS Sheet 8015 Edition 3, Tasmania 1:100,000 Topographic Base

**Twelvetrees, W.H., 1905.** Report on North-West Coast Mineral Deposits. Tasmanian Department of Mines.

**Vicary, M.J., 2008.** Revisions to geological maps in the southern part of the Dial Range/Fossey Mountain Trough, northern Tasmania, with emphasis on Cambrian geology. Tasmania Geological Survey Record 2008/01. Mineral Resources Tasmania.

**Vicary, M.J., Calver, C.R., Everard, J.L., Green, D.C. and Seymour, D.B., 2008.** Digital Geological Atlas 1:25000 series, sheet 4243 Kindred. Mineral Resources Tasmania.

**Vicary, M.J. & McClenaghan, M.P., 2007.** Digital Geological Atlas 1:25000 series, sheet 4242 Castra. Mineral Resources Tasmania.

**Virgoe, K.J., 1990.** EL 96/87 Preston. Annual Report on Exploration Activity. April 1989 – March 1990. Geopeko.

**Vivian, R.M., 1984.** First Quarterly Report on EL33/83 (Paloona) for the period 21st September 1983 to 20<sup>th</sup> December 1983. AMAX.

**Vivian, R.M., 1984b.** Final Report on Exploration Activities within EL33/83, Paloona, Northern Tasmania. AUSTAMAX.