



**OreTeck**  
Mining Solutions

# Tenement Review and Exploration Strategy- EL007281 Ross Creek

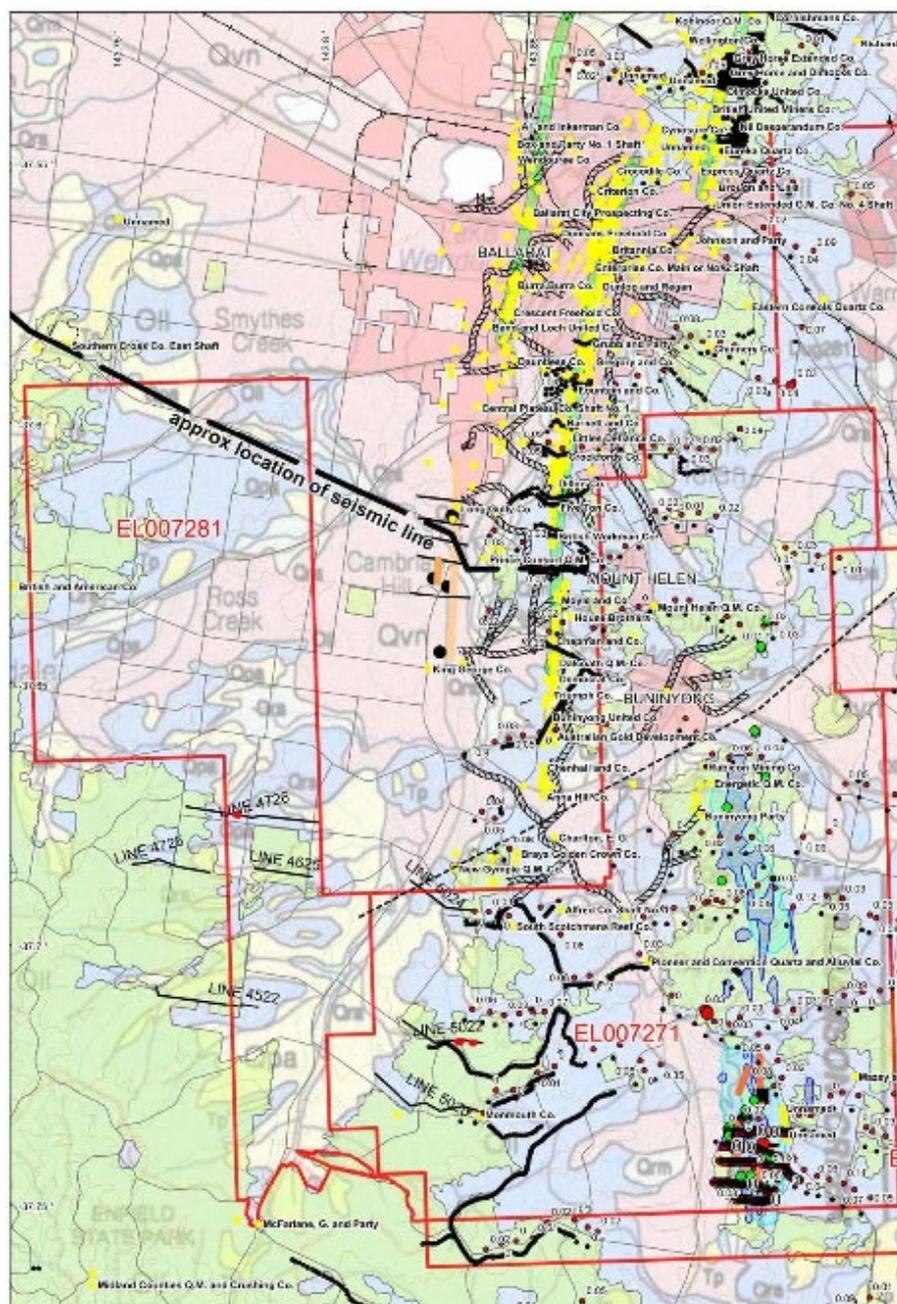
**Client: Red Rock Australasia**

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Revision:	0

## 1 EL007281- Ross Creek

Tenement ID	Local ID	Size (km <sup>2</sup> )	Mapping Sheet (1:100,000)	Municipality	Current Status
EL007281	Ross Creek	74	Ballarat	Golden Plains	Application

EL007281 is located to the west of Ballarat, covering the Ross Creek area and extends south towards Enfield (Figure 1).



**Figure 1. EL007281 Location and geology**

## 2 Regional Geology

Tenement EL007271 is in the south-west of the Bendigo zone in Victoria. The Bendigo Zone has an average width of 100 km and extends between the Avoca and Mt William Faults.

The basement stratigraphy of the tenement area consists of folded N-S striking (result of E-W compression) interbedded turbidite deposits of sandstone and siltstone of the Ordovician Castlemaine Group (Taylor et al. 1996). These sediments carry a pervasive north-south foliation, with gently north-south plunging isoclinal folds cut by west-dipping thrust faults.

Overlying the basement stratigraphy are the Early Tertiary White Hills Gravels that comprise cemented iron-enriched quartz cobble conglomerate. The White Hills Gravels are dissected and overlain by Mid Tertiary Calivil Formation that consists of channel river deposits that comprise basal gravels overlain by fine sands and clays colloquially known as drift. The areas of lowest topography were subsequently covered by basalt flows in the Early Quaternary and Recent alluvium/colluviums deposits (Dugdale 2010).

### 2.1 Local Geology

The southern section of the tenement is partially covered by tertiary basalt flows. These are the same flows covering the Ballarat West line of lode. The basalt covers Ordovician turbidite sequences typical of the Ballarat area.

The closest recorded primary goldfield is the Ballarat West field, which hosts a graphitic slate zone (Black Slate) that occurs throughout the line and is essentially the only significant lithological unit that can be extrapolated with confidence across this line.

The black slates of Ballarat West is a zone varying in thickness from 22 m to 44 m, and consists of series of graphitic, dolomitic and pyritic black slates, pyritic mineral seams, laminated quartz lodes, crushed quartz and sediments.

Being directly associated with the lode, the black slates have been well recorded in most historical texts and workings and in recent drill holes where intersected.

### 2.2 Mineralisation

Mineralisation data on the tenement is lacking due to no hard rock mining on the tenement. The Ballarat West style of mineralisation is favoured for the northern portion of the tenement. A large shale unit is mineralised on the western limb of the anticline and accounts for approximately 50% of the total production from hard rock mining in Ballarat West. Associated west dipping reverse faults (as seen in Ballarat East) interact with this shale, resulting in bedding parallel mineralised laminated veins. This style of mineralisation is more consistent in both strike and dip continuity and grade than the spur style veining in Ballarat East. In conjunction with the laminated veins were saddle reefs (similar to Bendigo) that formed on the anticlines and trough reefs on the synclines. These were often large masses of quartz with rich spur veins. An example of a typical section through the Ballarat West Field is shown in Figure 2.

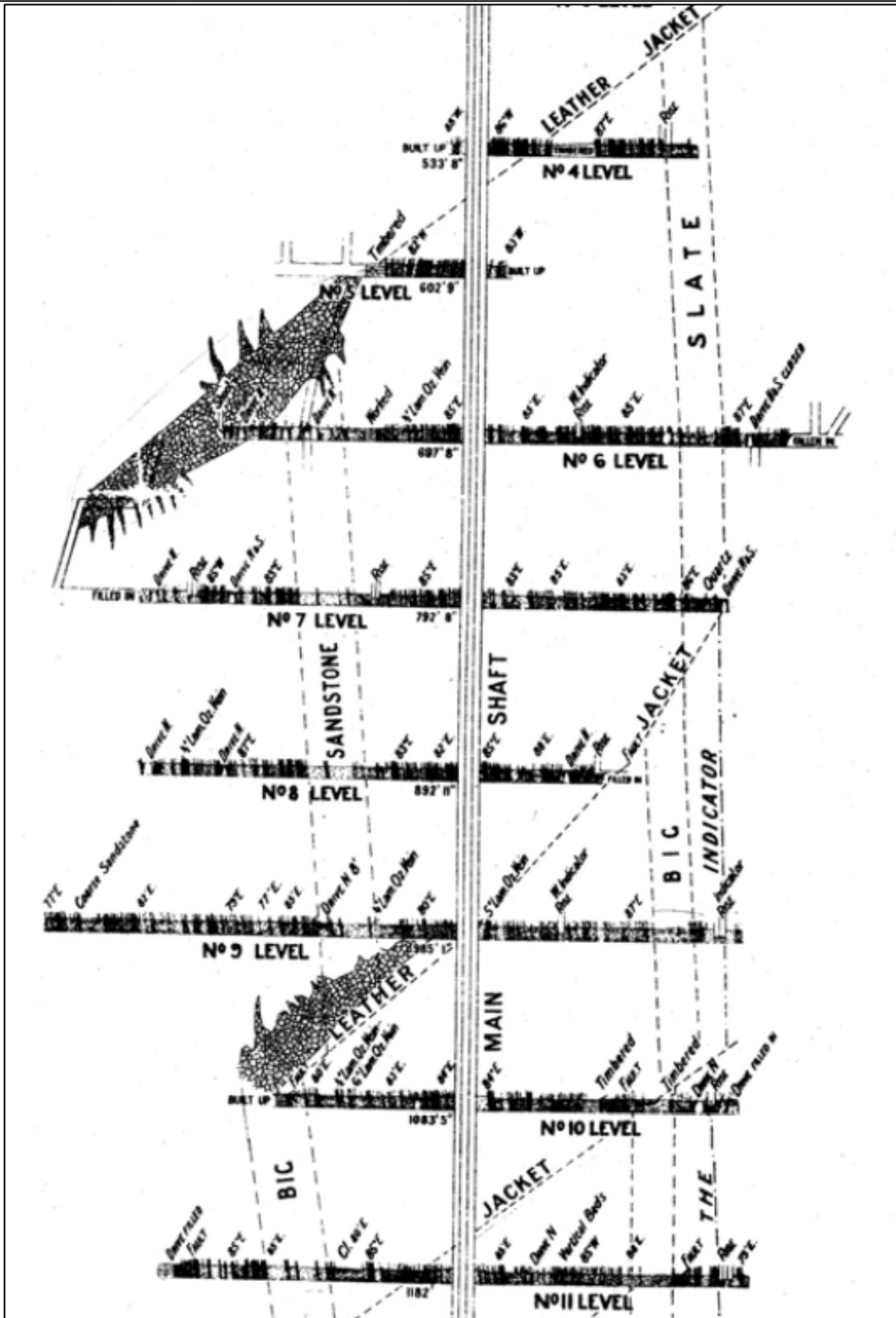


Figure 2. Sir Henry lock section looking north showing bedding parallel lode on west limb, Baragwanath, 1923

### **3 Mining History/Production**

In the northern portion of the tenement, several deep lead mines were established in the 1860's. These mines occur on an un-named lead with production figures not at hand. Individual mines include the New Band of Hope Co. and the Ross Creek GM Co that was mined to a depth of 93 m (GSV Database).

Swipers Gully and Whim Holes leads were mined in the southern portion of the tenement. These deposits can be described as surface remnants of older Tertiary gravels which develop into the deep lead systems to the north. The Western Champion shaft which tested the deep lead extension of the Swipers Gully alluvials was bottomed at 36 metres. From this shaft the deep lead apparently continues to the north east and is joined by a branch draining the Taylors Hill alluvials and extends through to Napoleons. Numerous shafts show a maximum depth of 7 m. Kenny (1941) describes the formation at Swipers Gully as consisting of quartz pebbles in a predominantly sandy matrix with a maximum depth of six metres. Fine gold is distributed throughout the gravel with best values on the bottom. A small sluicing plant set up in 1936 treated thirty-two tonnes at an average grade of 0.63 g/t Au (VAN RIEL, 1989). Literature researches have not any yielded production data for these leads to date.

The quartz mines of the Ballarat West goldfield have produced a recorded 800,000 ounces of gold at an average grade of approximately 14 grams per tonne. A further 6 million ounces of gold is estimated to have been won from the ancient river channels which cross the field (d'Auvergne, 2000).

#### **3.1 Nearby Mining Activity**

The Ballarat Goldmine operated by LionGold has been in almost constant operation since 2006, with over 300,000 oz of gold produced at an average of 5.66 g/t with a peak annual production of 46,083 oz in 2014-2015 (Buerger, 2019).

### **4 Exploration History**

The tenement has been the subject of limited exploration due to the lack of bedrock exposure over most of the tenement.

#### **4.1 Triad Minerals-Phoenix Resources, 1992**

Geochemical sampling to detect mineralised zones beneath soil cover was carried out on a reconnaissance basis in early 1992. Sample lines were oriented east-west along road reserves and designed to cover anomalies identified from a broad IP survey conducted by WMC.

Seven traverses totalling 13.5 km were completed using a sample interval of 50 m, partially within the tenement. A total of 278 samples was taken from the B-C horizon interface, dried, sieved and the -200 micron fractions analysed for gold in the ppb range. The results showed a background of <1 ppb Au in the survey area while the highest value recorded was 29 ppb Au (Appendix 3). Several anomalous areas requiring follow-up were defined, the most promising being (Woodland, 1992):

- 250m wide section on Line 4726 averaging 6.5 ppb Au.
- Open 200m section at the western end of Line 4726 averaging 4.5 ppb Au.
- 100m wide section on Line 5022 averaging 24 ppb Au.
- 50m section at 22 ppb Au on Line 5022.
- 100m wide section of Line 5022 averaging 6.5 ppb Au.

In 2006, a seismic survey was conducted south of Ballarat, a jointly funded project between the Victorian Government and Lihir Gold.

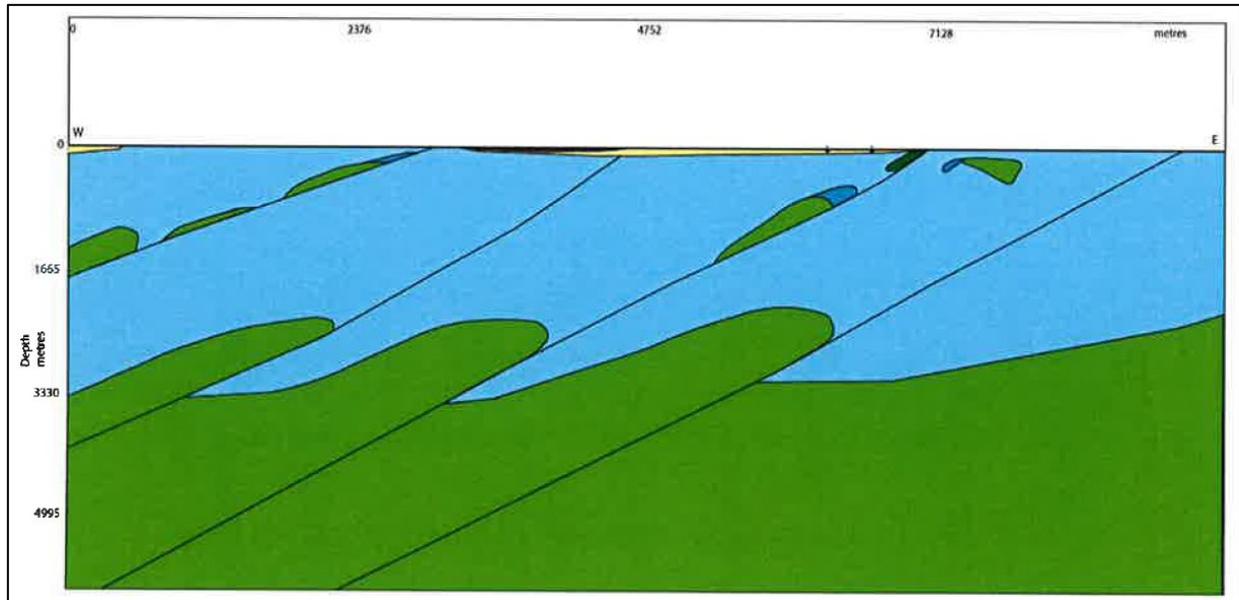
The survey commenced at Smythes Creek in the west, finishing at Mount Helen in the east, covering the western margin of EL007271 and the eastern margin of EL007281 (Figure 3) covering a distance of 12 km.



**Figure 3. Survey Traverse, Parkhowell, 2008**

The interpretation was overseen by Prof. Chis Wilson of University of Melbourne and Dr Hugh Rutter of Flagstaff Geoconsultants. Forward models created from the data (using the seismic data as constraints) validate previous models of thrust duplexes and greenstone fault slices, along with the interpreted presence of the Yarrowee Creek Fault. The modelling has highlighted alteration contrasts that can be correlated to the Ballarat East and West mineralised fields. A third anomaly of similar gravity response has been identified to the west of the main mineralised Ballarat fields (Parkhowell 2008).

The 3 km contact interpretation (Figure 4) shows the west dipping thrust faults with the Yellow Tertiary basalt at the surface, Ordovician turbidite sequences in blue and greenstone shown in green.



*Figure 4. 3km contact model. Parkhowell, 2008*

## 5 Exploration Strategy

The following activities form the exploration strategy for EL007281:

- The exploration model for the northern portion of the tenement is a repetition of the north south trending lodes of the Ballarat goldfields.
- Seismic data review to test location of potential similar signal to Ballarat East and West lines
- Follow up anomalies identified by Triad Minerals by completing a tighter spaced infill geochemical sampling program. Estimation of up to 30 samples - \$12,000.
- Complete a study on deep lead directions on the northern section of the tenement combined with seismic model data to assist in identifying the source of the deep lead gold.
- Systematic soil sampling on road reserves in the northern portion of the tenement. Surface soils have previously been used historically utilising the east west road network. Estimation of 100 samples - \$30,000.
- Review merits of geophysics considering man-made artifacts. Options to consider are 3D seismic survey and radiometrics.

## 6 References

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