

Geological Note

Reconnaissance of MMI anomaly at North Rosebery - EL 54/2004

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Summary

A brief reconnaissance of the area south of Mt Kershaw in EL 54/2004 indicates that the partial leach extraction anomaly detected by Bass Metals Ltd's soil geochemical survey lies immediately adjacent to the Rosebery Fault, and the location of the fault is about 100 metres further east than previously mapped. GPS position data indicate that the grid pegs on line 5379200N are mostly within about 10 metres of their planned locations.

Introduction

On 25th June I made a brief reconnaissance of the Bastyan Dam area in North Rosebery EL 54/2004 with the specific objective of accurately defining the position of the Rosebery Fault and its spatial relationship to the NNW-trending Cu, Ag, As, Bi, Cd, Mo, Tl anomaly detected by Bass Metals' partial leach extraction soil geochemical survey in 2008 (Herrmann, 2009).

Grid Location

The exact location of the peak soil geochemical anomaly on line 5379200N was in doubt because the survey lines had not previously been checked by GPS. I acquired some location data of the 5379200N grid pegs with my Garmin (Legend HCx) west of the BPD86 access track (Table 1). Satellite distribution on that day was reasonable and the receiver indicated its positional accuracy was about ± 6 -10 m. These data indicate that the eastings marked on the pegs are generally only about 10 metres less than the GPS estimates; i.e. the grid pegs and presumably also the soil sample sites are at approximately correct locations.

Figure 1 illustrates that the main anomaly of interest on line 9200N lies between 7300E and 7400E.

Rosebery Fault

Between 377350E and 377600E on line 9200N there are sparse outcrops of unremarkable weathered pale buff coloured massive felsic volcanic rocks, which I suspect may be pumice breccias similar to those in the North Bastyan altered zone exposed along Pieman Road.

At 377230E the line intersects a SSE draining creek just below its junction with a tributary gully entering from the north. This latter gully has recently, perhaps in the last year or so, experienced a landslip at its head near 377250E 537900N, which generated a major mudslide that has fortuitously scoured the bed of the gully and the main creek down to bedrock for at least 300 m in a generally N-S direction (Figure 2).

Downstream of line 5379200N the streambed exposes strongly deformed and boudinaged medium grained grey quartzwacke with layering dipping moderately to steeply to the east-northeast (Figure 3). For about 90 m upstream of the grid line there are exposures of cleaved, deformed thin-bedded dark grey slaty siltstone and sandstone (Figure 4). These collectively are similar to the Dundas Group lithofacies exposed downstream of Bastyan Dam in the footwall of the Rosebery Fault near 377445E 5378500N. An outcrop at 377230E 5379220N, of coarse lithicwacke containing abundant 1-4 cm sized pale clasts of probable felsic volcanic derivation, appears to be a 3 m wide sedimentary breccia unit within the quartzwacke-siltstone group.

Upstream, north of 5379290N, outcrops in the landslide gully are consistently of pale buff-grey weathered massive

felsic volcanic rock (Figure 5), similar to the few outcrops along the grid line and likewise suspected of being rhyolitic pumice breccia. They are sparsely feldspar phyric but do not contain quartz crystals.

Thus the surface trace of the Rosebery Fault separating the dominantly sedimentary Dundas Group on the west from entirely felsic volcanic rocks to the east, must pass through about 377260E 5379290N, trending south-southeast (Figure 6). The actual fault contact is not exposed in the gully but there are sufficient outcrops to pin it down within about 10 metres. This observation indicates the location of the Rosebery Fault is actually about 100 m further east than as depicted on MRV Map 2 (Corbett and McNeill, 1986).

Projecting that trend south-southeast wards suggests the Rosebery Fault intersects line 9200N at about 377300E, which is at the western edge of the MMI anomaly zone. That coincidence reduces the VHMS prospectivity of the MMI anomalous zone in two ways:

- Its close proximity to the Fault suggests that it may reflect minor epigenetic vein or disseminated sulfide mineralization in the fault zone.
- Its location in the immediate hangingwall of the fault limits the vertical depth potential. This is less of a problem if the mineralized source is stratiform and dipping east sub parallel to the fault.

Volcanic lithostratigraphy

Corbett & McNeill (1986) arbitrarily assigned the rocks east of the Rosebery Fault south of Mt Kershaw to the Central Volcanic Complex (Ccv) but they differentiated the better exposed rocks in the North Bastyan altered zone into feldspar phyric felsic lava (Ccv1) and fiamme-bearing eutaxitic volcanoclastics (Ccv2). As noted above I suspect that the felsic volcanics sparsely exposed on line 5379200 and adjacent to the Rosebery Fault may be massive pumice breccias; i.e. equivalent to Ccv1. Gifkins et al. (2005, Fig. 1.6) referred the pumice breccia dominated part of the sequence above the Mt Black Volcanics to the 'Kershaw Pumice Formation', essentially equivalent to the 'Hercules Pumice Formation' in the Rosebery Footwall.

Whatever the terminology, they are non quartz-phyric, therefore different to the distinctly quartz phyric felsic volcanoclastic sandstones, breccias and minor volcanoclastic siltstones exposed and intersected in drill holes at Bastyan Dam, which Purvis (1992) confidently assigned to the Hangingwall Volcanoclastics. It is unclear whether they represent:

- the direct lateral equivalent of Rosebery Footwall that has 'popped up' from beneath the Hangingwall Volcanoclastics north of Bastyan Dam, or
- the upper part of the Mt Black Volcanics-Kershaw Pumice Formation sequence structurally emplaced over the Hangingwall Volcanoclastics by the Mt Black Fault thrust, as has been interpreted south of

Bastyan Dam and depicted in Figure 5.19 of Gifkins et al. (2005).

Given the interpreted northerly plunge of the favourable unit to the north of Rosebery (e.g. Randell et al., 1986) the latter case is more likely, despite Purvis' (1992) observation that there is no prominent fault zone between the Mt Black Volcanics and structurally underlying Hangingwall Volcanoclastics in drill hole BY2. However, that interpretation is empirically less prospective for the 'far north Rosebery extended' concept because it places a major thrust displacement between the established Hangingwall - possible subsurface host unit sequence at Bastyan Dam, and the MMI anomaly zone hosted by Kershaw Pumice Formation to the north. Thus if the favourable host unit does exist north of Bastyan it is probably at great depth.

As the Kershaw Pumice Formation is purportedly stratigraphically equivalent to the Rosebery Footwall pumice breccia, it could be argued that it (or the unit directly stratigraphically above it) has analogous VHMS prospectivity. The Pinnacles prospect may occupy that geologic setting further north. However, no quartz-phyric equivalent of the Hangingwall Volcanoclastics is known between Pieman Road and Mt Kershaw, which suggests that only the lower part of the sequence exists in that area.

Notwithstanding all that conjecture, there are still unresolved structural complications around Bastyan Dam that may have significant prospectivity implications. For example the westerly dip and facing in Hangingwall Volcanoclastics exposed in the Bastyan Dam spillway which previously led me to speculate that BY1 may actually have intersected the favourable unit and found it to be barren (Appendix II, Herrmann, 2009).

References

- Corbett, K. D., and McNeill, A. W., 1986, Map 2, Geology of the Rosebery - Mt Black area, 1:25000, 1:25000, Geological Survey of Tasmania, Department of Mines, Hobart.
- Gifkins, C. C., Herrmann, W., and Large, R. R., 2005, Altered volcanic rocks - a guide to description and interpretation: Hobart, Centre for Ore Deposit Research, University of Tasmania, 275 p.
- Herrmann, W., 2009, Exploration History and Prospectivity of North Rosebery - EL 54/2004: Bass Metals Ltd, 24 p.
- Purvis, J. G., 1992, Mt Black EL 12/88 Western Tasmania Pasmenco-Austmin Joint Venture Annual Report August 1991 - August 1992: Pasmenco Exploration, 167 p., TCR 92-3375.
- Randell, J. P., Purvis, J. G., and Hungerford, N., 1986, Rosebery East JV, EL1/62, Progress report on exploration for the period ending 22/12/1986: Billiton Australia, EZ Co. Ltd., Little River P/L, 625 p., TCR 86-2622.

Table 1 GPS estimated locations of Grid Pegs on line 9200N

Waypoint	East AGD66	North AGD66	Peg East	Peg North	East Diff	North Diff
1	377567	5379204	7550	9200	17	4
2	377507	5379204	7500	9200	7	4
3	377461	5379201	7450	9200	11	1
4	377409	5379199	7400	9200	9	-1
5	377354	5379202	7350	9200	4	2
6	377311	5379191	7300	9200	11	-9
7	377264	5379204	7250	9200	14	4
8	377200	5379202	7200	9200	0	2
9	377164	5379198	7150	9200	14	-2
10	377113	5379209	7100	9200	13	9
11	377061	5379197	7050	9200	11	-3
12	377008	5379205	7000	9200	8	5
13	376993	5379210	EOL		Average Diff	10

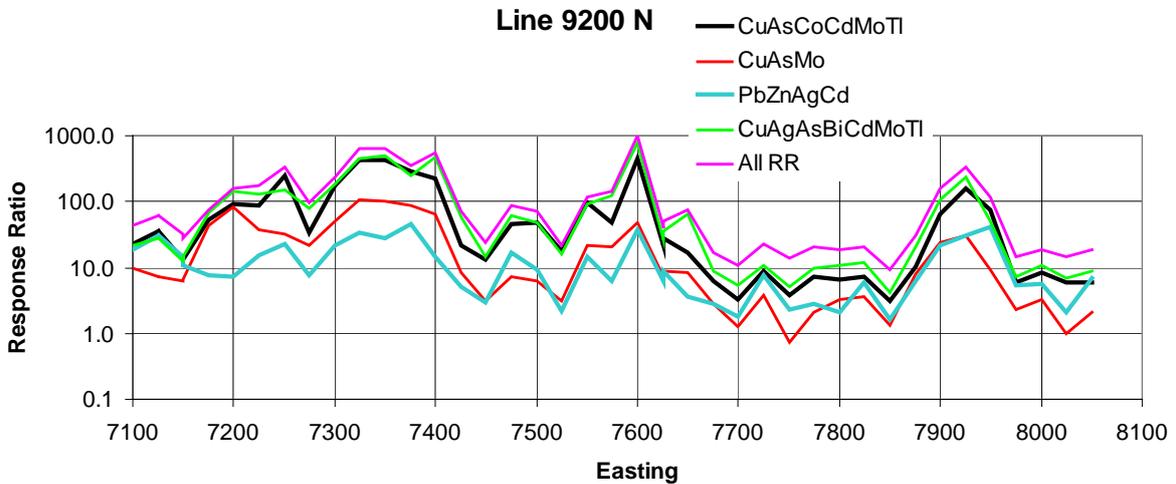


Figure 1 Line chart of MMI Response Ratios on line 9200N for several (added) element combinations illustrating that the most intense and broadest anomaly lies between the 7300E and 7400E grid pegs; i.e. approximately between and 377400E.



Figure 2 View northwards up the eroded gully towards the head of the landslide area.



Figure 3 Deformed and boudinaged bedded grey quartzwacke in bed of eroded gully at about 377280E 5379150N (AGD66).



Figure 4 Deformed cleaved dark grey siltstone in gully near 377250E 5379260N.



Figure 5 Massive pale buff coloured felsic volcanic, possibly feldspar phyric pumice breccia, in gully at 377270E 5379210N.

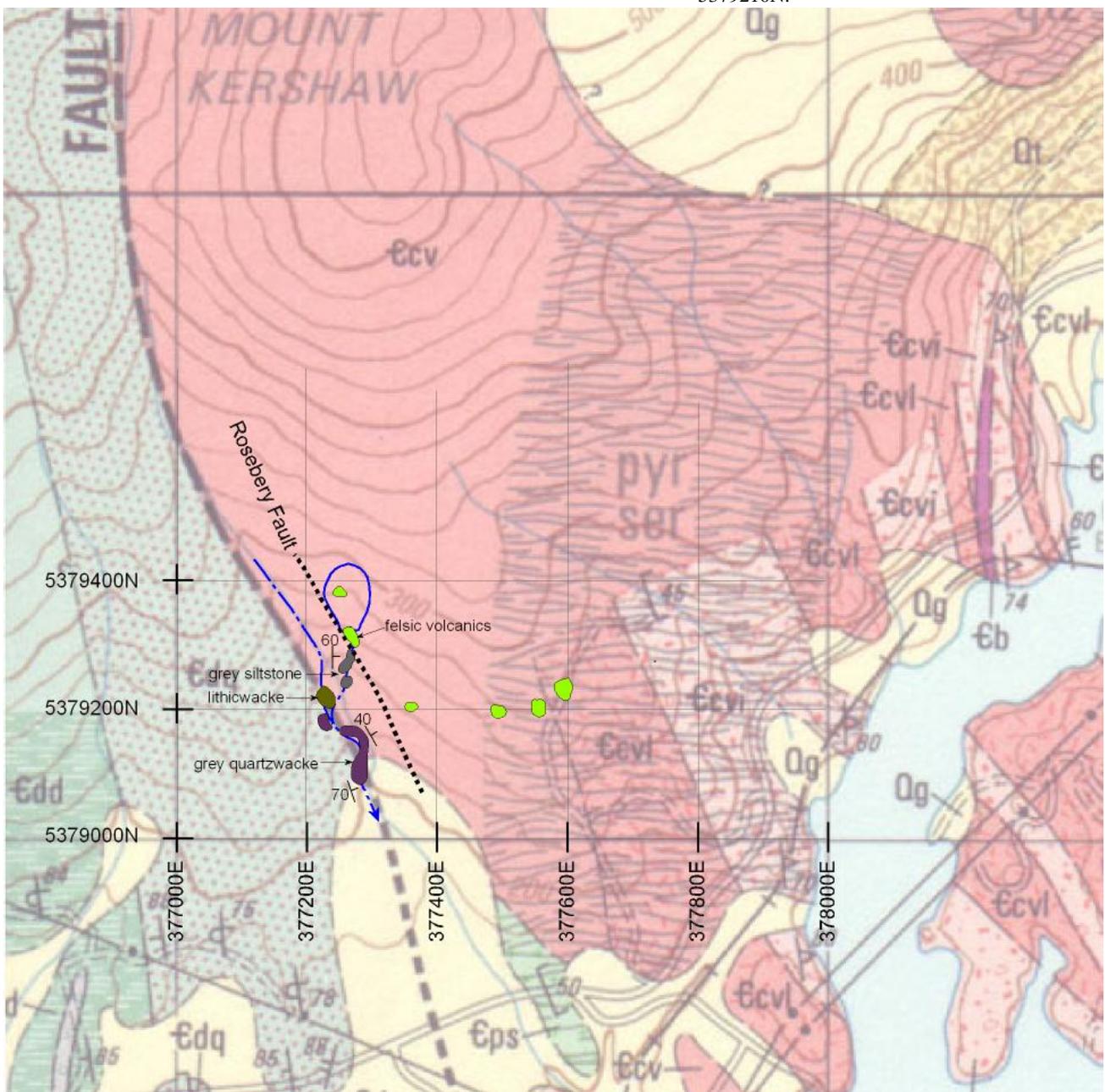


Figure 6 Sketch map showing outcrops and interpreted position of Rosebery Fault near line 5379200N overlaid on enlarged segment of MRV Map 2, approximate scale 1:10,000 (adapted from Corbett and McNeill, 1986).