The McNamaras & Mount Gordon Fault Zones, Mt Isa

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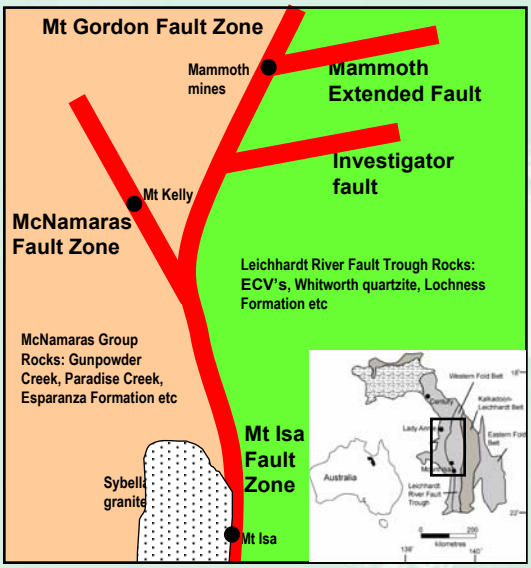
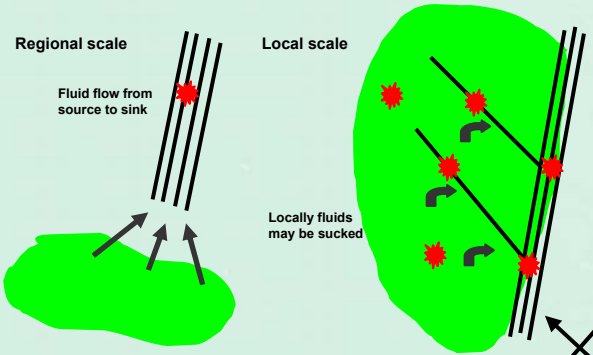
Introduction

The main aim of this work is to understand the controls on Cu within the Western Succession, Mt Isa, district, Queensland, Australia. Within the Western Fold belt there are numerous sediment hosted copper deposits e.g. Mt Isa, Gunpowder, and George Fisher. Work to date has concentrated on mapping around the Mount Kelly prospect, Mammoth mines and the Mount Gordon Fault Zone (MGFZ). There is a local exploration paradigm of copper being sourced from the Eastern Creek Volcanics (ECV's). Therefore how do the Cu deposits relate to the ECV's and how does Cu migrate into fault hosted locations? To test this, fault-fill textures, geochemical techniques, and isotope analyses are being undertaken. Currently mapping has been concentrated around potential source regions i.e. ECV's and results are being compared with known fault-hosted Cu deposits.

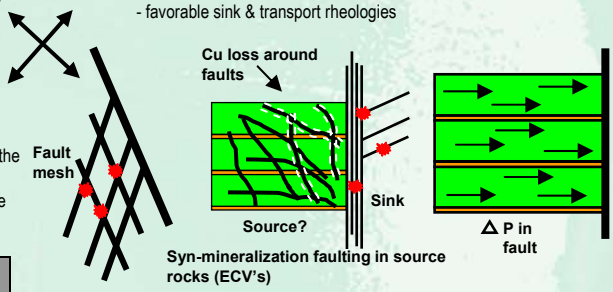


Are the ECV's a (proximal) source for Cu? If so how does the Cu get from ECV's to faults?



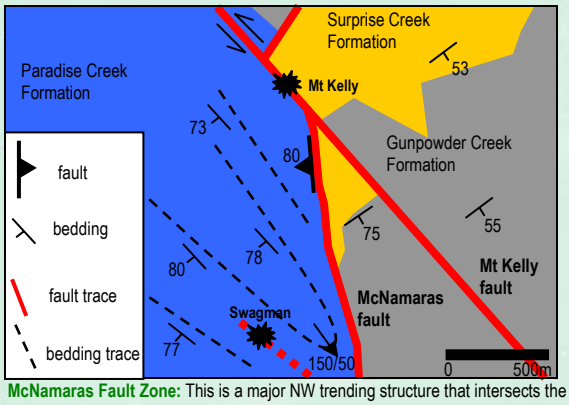
These questions/ scenarios are scale dependant

Cu may travel from source to sink via a fault-fracture mesh; syn-mineralization faulting causing Cu loss and/ or due to a change in pore fluid pressure within the fault itself. The above question is posed because of the importance of mafic rocks for the genesis of IOCG's, e.g. mafic rocks provided the Cu for Mt Isa ore genesis (Butera et al, *in prep* & Heinrich et al, 1995).



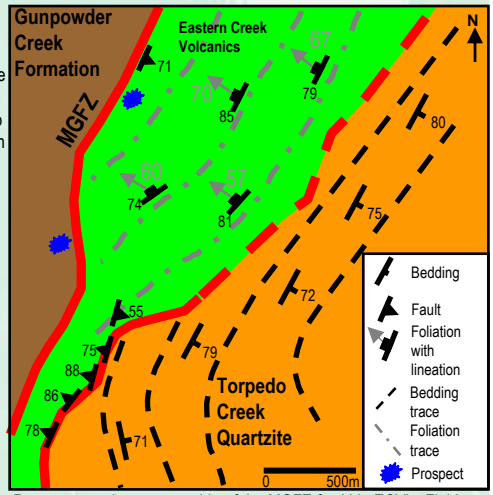
Fault hosted mineralization – general features

1. **Fluid volume**
   - High or low fluid volumes
2. **Fluid pressure cycling**
   - Magnitudes of pore fluid pressure changes due to seismicity or not?
   - Mineral solubility
3. **Favorable source & sink rock types/ chemistry**
   - i.e. proximal VS distal fault controlled Cu
   - favorable sink & transport rheologies



McNamaras Fault Zone: This is a major NW trending structure that intersects the Mt Isa and Mt Gordon fault zones. Aeromagnetic data shows ECV's at depth therefore are these faults in the area major upflow zones that can tap source rocks and help focus Cu bearing fluids?

MGFZ: There are ECV's and its unmineralized so comparisons with known Cu deposits can be made.



Prospects on the western side of the MGFZ & within ECV's. Fluids moving from ECV's or background Cu in the Gunpowder Creek Formation? Fluids from within ECV's have not been focused?

Future Work

- To continue mapping within and around the MGFZ and continue structural analyses.
- To commence numerical modelling (UDEC) of the Western Succession and work with J. McLellan, D. Keys and J. Miller
- To analyze samples - thin sections (textural studies); geochemistry

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