EXPLORING DEEPER: WHAT ARE YOU LOOKING FOR? WHAT DO YOU NEED TO FIND?

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Collectively >100 years mining industry experience
The research project is centred on part of the Eastern Fold Belt encompassing the Osborne-Kulthor Cu-Au mine, Starra line of Au-Cu deposits and mines, Mt Dore Cu deposit, Merlin Mo deposit, Mt Elliott Cu-Au complex (SWAN, Domain 81, Corbould, Mt Elliott) and numerous historic mining operations and prospects. District with multiple Cu-Au mines, lots of smoke, yet only one large mass-mineable deposit (Ernest Henry), and a large prospective resource (SWAN – Mt Elliott).

What are the prospects for discovery of additional mass-mineable deposits if we deepen the search space to 2km below surface?.....and what would a mineable deposit need to look like at this depth?

<table>
<thead>
<tr>
<th>Deposit</th>
<th>Mt</th>
<th>Cu (%)</th>
<th>Au (g/t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ernest Henry</td>
<td>220</td>
<td>1.1</td>
<td>0.5</td>
</tr>
<tr>
<td>Swan</td>
<td>375</td>
<td>0.44</td>
<td>0.25</td>
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1 Glencore Reserves & Resources, 2014  
2 AMC – Mt Elliott Scoping Study, 2012
DMQ aims to reduce the risk of deep exploration in the Cloncurry Cu-Au district through:

- Detailed geological understanding, informed by comprehensive analysis of geological, geophysical and geochemical datasets

- Considered interpretation of the controls on known orebody location, geometry, and tenor

- Insights into economic viability as affected by variations in deposit size, geometry, grade, depth, and proximity to transport and services infrastructure.
Introduction to PEET-UG

**Prospect Economic Evaluation Tool - Underground**

Interactive, spread-sheet based tool, for prospect/target evaluation (Pre-’Concept level’ analysis) in relative terms.

3 key purposes:

1. Where should I be exploring? .....mining constraints on prospectivity utilized in exploration strategy development.

2. Amongst my portfolio of targets/prospects, which of these has the potential to sustain a mining operation? Tool for ranking geological targets in terms of potential viability.

3. Tool for stage-gating the exploration process: is the prospect worth continued effort/expenditure?

The evaluative tool has been constructed to determine relative value of deposits amenable to underground mining, and as a standalone operation.
Venturing off the outcrop

Mt Isa Inlier
Greenfields Potential

>70% is under cover and virtually unexplored

(Hutton, 2015)
100m DEPTH OF COVER CONTOUR

500m DEPTH OF COVER CONTOUR

EXTENT OF OUTCROP

Mt Isa

Cloncurry
Mineral occurrences coloured as per legend on slide 6 & 9.
No-go zone for EFB-style Cu-Au?

However, not all ore deposit-types are created equally.....
In-ground Value of a Selection of Metalliferous Deposit Types (Metal Prices as at 29/6/2016)

Bubble Size Indicates Relative Value of Deposits Using the Product of Unit Value and Resource Tonnage
In-ground Value of a Selection of Metalliferous Deposit Types (Metal Prices as at 29/6/2016)

Value (USD) of Contained Metal per Tonne

Total Resource Tonnage (million tonnes)
Extraction Options at Depth – Operating Costs

![Diagram of extraction options at depth](image)

**SLOS**
- OC 8.1 (Reid & Najdek et al, 2014)
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- OC 8.1 (Reid & Najdek et al, 2014)
- OC 8.1 (Reid & Najdek et al, 2014)
- SN 5.1 (Wood et al, 2016)
- BC (Kilpauk Newcrest Min Ltd, 2012)
- BC (Carpentaria-GC Min, 2014)
- BC (Cada & East-Smith, 2013)
- BC (Wood et al, 2015)
- BC (Bevan-Fernandez, 2003)
- BC (Mervin, 2015)
- BC (Parks & Brown, 2003)
- BC (Gardner & Smith, 2013)
- BC (M3 Consultants, 2013)
- BC (Hugo NV-MRC, 2013)
- BC (Hail Cap Gold Ltd, 2012)
- BC (Reid & Najdek et al, 2014)
- SIC (Wood et al, 2011)
- SIC (Gibson-Mine, Ltd, 2015)
- SIC (Hedgeway Newman Min Ltd, 2017)
- SIC (Gawara-Guyana Goldfields, 2012)
- SIC (Lima-Chuquicamita Ltd, 2012)
- SIC (Reid & Smith, 2013)
- SIC (Girand-Castle Res, Inc, 2013)
- SIC (Los Calabos-Metminco, 2015)
- SIC (Wood et al, 2011)
- SIC (M3 Consultants, 2013)
- SIC (Bowers-European Goldfields, 2011)
- SIC (Wood-Brown-Heron Res, Ltd, 2015)
- SIC (Tulugrak-Chieftain Met Corp, 2014)
- SIC (Nicor-Fortuna Min Ltd, 2014)
- SIC (Selwyn-Selwyn Res, Ltd, 2012)
- SIC (Bacchara Lake-Metnor Res, Inc, 2013)
- SIC (Redd-VMS Vent Inc, 2012)
- SIC (Grono-BCF Gold Ltd, 2009)
- SIC (Cerro Trevor-KPALM, 2015)
- SIC (Palaeo-YWTP Ltd, 2013)
- SIC (Collins-Palm Silver Corp, 2014)
- SIC (Oshioke-Dundee Prec Met, 2003)
- ISL (Hai Cap Times FL Florence (M3 Corp, 2013)
- ISL (Queens Times FL Florence (M3 Corp, 2013)
- ISL (Hai Cap Times FL Florence (M3 Corp, 2013)

**SLC**

**BC**

**ISL**

![Images of mining operations](image)

**M3 Consultants, 2013**
Extraction Options at Depth – Operating Costs

PEET Options

![SLOS](image1)
![SLC](image2)

Not PEET Option

![BC](image3)
![ISL](image4)
Key workings of PEET-UG

1. Inputs & Assumptions
   - Grade Distribution
     - Grade
     - Dip
     - Width
     - Depth of Cover
     - Down-dip Extent
     - Strike-length
     - S.G.
     - Distance to transport hubs
     - Mining & Met. recovery
     - Metal prices
     - Length of new road required
     - Discount rate
     - Exchange rate

2. Derived Quantities
   - Tonnage
   - In-ground value
   - Contained metal
   - Tonnes/vertical metre
   - Mine capex estimates
   - Mining rate potential
   - Mining advance rate
   - Haulage distances
   - Opex estimates (Mining + Geology + Processing + Admin)

3. Mining Method Selection
   - Potential mining block height
   - SLOS vs SLC vs BC determined by deposit geometry, dip, min. block height, in-ground ‘ore’ value
   - Truck vs Conveyor test (determined by depth below surface and production rate)

4. Project & Prodtn. Schedule
   - Mine development by year
   - Schedule of ore processed and recovered metal
   - Production by year
   - Schedule of concentrate produced (tonnes and grade)
Key workings of PEET-UG (cont’d)

5. Revenue Schedule
- Payable metal by year
- Realisation costs by year
- Refining charges per year
- Total Gross Revenue by year

6. Capex Estimate Models
- Declines
- Vertical development
- Fixed plant and Infrastructure
- Lateral development
- Mobile equipment
- Infrastructure and services
- Processing Plant
- Sustaining capex
- Total capex
- Tax deduction for capex

7. Opex Estimate Models
- Mining costs assuming steady state production
- Processing costs
- General & Admin costs by year

8. Evaluation Model
- Collated revenue, capex, opex
- IRR calculation
- Maximum negative cash position
- NPV calculation
- Time to payback
- EBITDA
- Net Cashflow
Results: comparison with peer projects

Collated key inputs and outputs on single sheet

Not intended for critical financial or feasibility analysis
PEET-UG used in anger.....on simulated data
Parameters:
- 300m depth to top of deposit
- 80 degree dip
- CuEq calculation assumed Cu at USD$5500/t, and Au at USD$1200/oz, and a 20k:1 ratio of Cu:Au, as broadly observed in IOCG systems.

Above, Internal rate of return (IRR) vs grade. Bubble colour corresponds with geometry/mining-block (see image in top RH corner of slide). Bubble size is proportional to NPV, some annotated. Bigger target = more tonnes = higher value. Dashed line represents the 25% IRR ‘target’ outcome (AP pers. comms, 2016).
Impact of Orebody Dip and Geometry on Mining (& Financial) performance

Production rate vs Orebody dip, with bubble size indicating relative NPV (AUD millions)

Production Rate vs Orebody Footprint (bubble size = dip ranging from 90 to 45 deg)
Indicative ‘cut-off’ grades by mining method/orebody geometry

Parameters:
- 500m mining block height only
- 80 degree dip
- CuEq calculation assumed a 20k:1 ratio of Cu:Au, as broadly observed in IOCG systems.
DMQ Summary

Aiming to reduce the risk profile of exploring at depth in the Cloncurry district by identifying tracts of ground which are:

- prospective for large, mass-mineable mineral deposits, i.e. **fertility**

- comprise geotechnical, geothermal, geographical conditions which are technically amenable to mass-mining methods, i.e. **mineability**, and

- comprise all of the above, but with the prospect of positive financial outcomes....subject to internal & external factors, i.e. **viability**.