OMITIOMIRE COPPER DEPOSIT, NAMIBIA:
THE ROCKY ROAD TOWARDS PROJECT DEVELOPMENT

- Ken Maiden & Karl Hartmann

There should be warning signs for would-be mineral exploration entrepreneurs
South Australia

• Targets:
  - IOCG in the Gawler Block
  - Copper in the Adelaide Fold Belt
• Copper Range Ltd listed in 2006

Flinders Ranges, 2006
Central Queensland

- Target: Gold in Drummond Basin
- Company listed in 2007
- Discovered Anthony porphyry Mo deposit in 2007-08
- Zamia Metals still going well

*Clermont district, 2004*
2006: Looking for a new project
Isn’t it dangerous in Africa?
Namibia

- Area: 800,000 km²
  (about the same as NSW)
- Population ~ 2 million
- Very arid coastal fringe - Namib Desert
- Central area to ~ 2000m - savannah grassland & woodland
- Eastern: Kalahari sand sheet, grass plains & open woodland
- North: Sufficient rainfall for subsistence agriculture
Namib Desert
Wide open spaces
Spitzkoppe
Kalahari
Ran into a wart-hog
Mining Industry

- Beach & offshore diamonds
- Skorpion zinc
- Rössing uranium
Why Namibia?

• Good tenement system
• Good mining legislation
• Effective bureaucracy
• Good data (geological maps, geophysical coverage, historic exploration data)
• Good infrastructure
• Low political risk
Fraser Institute survey 2013

Investment attractiveness index - Namibia 34/112

- Below Botswana & Ghana, above all other African countries
- Above NSW, Victoria & Tasmania
In summary, it’s a good place to look at rocks.
Omitiomire area

- Commercial farms - cattle & game animals
- No villages
- ... and not much outcrop
The only outcrop of the Omitiomire copper deposit
Mesoproterozoic inlier
Felsic gneiss & amphibolite

Ekuja Dome

(after Kasch, 1986)
Previous drilling

GenMin 1970s: 3 holes → copper zone: 700m strike, 6 – 20m thick, 0.3 – 0.5% Cu

Nossob River Mining Company 1990s: 9 holes → copper zone 10 – 15m thick

Anglo American 1990s: 16 holes → copper zone 10 – 20m thick; area 600m x 700m
  • Hole OED5: 106m at 0.47% Cu

Straits Resources 1998: 13 holes; best intersection 9m at 0.6% Cu
  • Potential for 20 Mt at 0.5% Cu at 0.2% Cu cut-off

Drill core stored at Geological Survey of Namibia
Resource estimate (Hellman, 1996)

- Inferred Resource
  7.9 Mt at 0.9% Cu
  (0.5% Cu cut-off)

- Resource potential
  30 Mt at 0.7% Cu
  within drilled area

- Shallow dip to east
- Holes stopped in copper
- Open in all directions
Mesoproterozoic (~ 1100 Ma) bimodal volcanics

Damaran age (~ 600 Ma) imbricate shear system

Related to ESE-vergent nappes & thrusts

Copper hosted by altered mafic rocks

Highest copper in biotite-epidote schist
Manica Minerals

• 2005: Interpreted regional geophysical data
• 2006: Applied for five EPLs
• 2008: JV with IBML

Exclusive Prospecting Licence (EPL)

• Three-year licence
• Areas up to 1,000 km²
• Annual expenditure & reporting commitments
• May be renewed twice for two-year periods
• Further renewals require ministerial consent
IBML - Getting started in Namibia
Money Money Money
Funding

- West Minerals Pty Ltd
  - $\$
  - IBML
    - Registered in Namibia
- Craton Mining & Exploration (Pty) Ltd

- Alan Humphris
- Chen Qiang
- Zheng Fuhu
- Dr. Deng Jiniu
Where are those drill holes? (Feb 2007)
Project assessment, Feb 2007

- Potential for 30 Mt at 0.7% Cu
- Mainly chalcocite
- No carbonate → Potential SX-EW operation
- Potential for other deposits in the Ekuja Dome
Establishing a team

Karl Hartmann - Exploration Manager

Ken Hart - Senior Geologist

Simon Brodie - Database Manager

Ziggy Hartmann - Admin Manager

Desmond Schnugh - Logistics
Exploration objectives for 2007

- Target: Inferred Resource 15 Mt at 0.7% Cu
- Scope the likely eventual size of the Omitiomire deposit
- Assess technical & financial parameters
- Assess other targets
Access negotiation
Not always friendly
Namibian cell phone tower
Review of soil geochemistry

Ground magnetic survey

I.P. survey
First drill hole,
August 2007
Grade estimate for daily planning

Rock types for interpretation
Downhole photography

Provides structural information
Down-hole photography: strip log
Diamond drilling
The copper zone

*Disseminated chalcocite in biotite - hornblende - plagioclase schist*
• Structurally complex tabular body
• Variable grade 0.3 – 1.2% Cu
• Hosted by mafic schist
• Up to 50m thick
• Dip 10° - 25° east
Geology

Hanging wall:  
*barren felsic gneiss*

Ore zone:  *mafic schist*
Mineralogy

• Chalcocite $\text{Cu}_2\text{S}$ ~ 90%
• Bornite $\text{Cu}_5\text{FeS}_4$ ~ 8%
• Chalcopyrite $\text{CuFeS}_2$ trace
• No iron sulphide
• No Zambian-type mineral zoning
• Minor magnetite
• Minor hematite

*Chalcocite (shiny grey mineral) in drill core*
Oxidation of chalcocite
Malachite (green) and chrysocolla (blue-green)
Corporate objectives 2008

- Identify a resource of 400,000 tonnes of contained copper
- Produce a prospectus for an ASX listing in late 2008
- Raise A$30 million at Initial Public Offering (IPO)
- Initiate a bankable feasibility study
2008 - Heading towards an IPO
Lots of drilling
Delayed by rain
Staff party
February 2008
Omitiomire drilling to July 2008

- 250 holes (232 RC, 18 DD)
- Total 32,000m

Note farm house
Cover your drill holes

And no drilling on Sundays
O.K. we’ve covered the holes
Structural interpretation 2008

Elevation (m)

1600
1500

3370N

Fault

Drill holes showing +0.2% Cu

Mineralised zone

Elevation (m)

1600
1500

3070N

OMITIOMIRE SECTIONS
Resource August 2008

98 Mt at 0.51% Cu at 0.25% Cu cut-off

(500,000 tonnes contained copper)

(17% Indicated, remainder Inferred)
Preliminary mine planning
Metallurgy - Here’s the really good bit …

Most of the copper occurs as coarse-grained chalocite – $\text{Cu}_2\text{S}$ – 80% Cu
Style of deposit

- The ore is banded
- Copper is hosted in bands of mafic schist
- Bands of felsic gneiss are barren
Proposed sulphide copper pre-concentration

- Copper-bearing mafic schist is soft & heavy (> 2.8 g/cm³)
- Barren felsic gneiss is hard & light (< 2.7 g/cm³)

→ Effective pre-concentration by dense medium separation (DMS)

DMS doubles the grade of mill feed to ~ 1% Cu
Metallurgical testwork

Expected process outcomes -

• Dense medium separation of crushed ore (at 2.7 g/cc):
  – Doubles run-of-mine grade at 95% copper recovery

• Flotation of sulphide ore
  – Concentrate grade exceeds 50% Cu at 95% recovery
Preparation for an IPO

• Scoping study completed
• Independent geological report & valuation completed
• Investigating accountant’s report completed
• Prospectus prepared
• Two new non-executive directors appointed (Sept 2008)
  - James Macdonald - geologist (Chairman)
  - Peter Bradford - metallurgist

It looks like we’re on a winner!!
Storm clouds gathering
Global financial crisis

Poor timing for an IPO

Copper price (US$/lb)
Doom & gloom
Is this the end of the line for IBML?
IBML’s response to global financial crisis

- Cut costs
- Seek private funding
- Close down Australian projects
- Low-cost exploration at Omitiomire
No new field vehicles this year
2009 - Low cost field work
Infill soil geochem

Sample spacing
100m x 100m
RAB drilling

Omitiomire
RAB drilling
Bush tucker
Christmas feast
Christmas fun & games
2010 - copper price bounces back
Company strategy 2010

- Carry out a pre-feasibility study on the Omitiomire resource
- Prepare for an IPO and a listing of the Company’s shares
- Seek JV funding for other projects
2010 - Heading towards an IPO
Geology - 2010

• Tabular body, 10 – 60m thick
• Grade & thickness increase down dip to east
• Growth potential + 1 Mt contained Cu
Resource 2010

<table>
<thead>
<tr>
<th>Cut-off</th>
<th>Ore</th>
<th>Grade</th>
<th>Copper</th>
</tr>
</thead>
<tbody>
<tr>
<td>% Cu</td>
<td>Mt</td>
<td>% Cu</td>
<td>tonnes</td>
</tr>
<tr>
<td>0.25</td>
<td>117</td>
<td>0.5</td>
<td>579,000</td>
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</table>
Drilling

- 305 holes totalling > 42,000m
- Deposit covers 2,600m x 700m
- Depth > 150m at eastern edge
- Plunges north
- Remains open to northeast

Proposed pit outline
Pit design

Isometric view, looking north:
Final pit design of Cut 1 & Cut 4 of the 69 Mt pit
Process flow sheet

- MINING
  - CRUSHING AND SCREENING
  - MILLING
  - FLOTATION
    - CONCENTRATE TO SMELTER
      - TAILINGS DAM
  - DENSE MEDIUM SEPARATION
    - GRAVEL FOR ROAD BUILDING
Social & environmental impact assessment
Other issues

- Public road
- Black Nossob River
Black Nossob River - dry season
Black Nossob River - wet season
Proposed site layout
Infrastructure - big cost items

*Proposed water pipeline*

*Proposed power line*
Preparing for IPO 2010

- New MD appointed
- Pre-feasibility study completed
- Independent expert reports
- Lawyer appointed
- Prospectus prepared
- Marketing

Frank Bethune
Planned a big celebration
But … doom & gloom (again)

- Project financials not sufficiently attractive
- Unable to attract new investors
- Withdrew prospectus in early 2011
Again - no new field vehicles this year
Omitiomire camp
Tea break
Snake trouble
Understanding the geology a bit better
New structural interpretation

Multiple ore lenses

Resource Blocks

Indicated & Inferred
+ 1.00%
+ 0.50%
+ 0.35%
+ 0.20%

Potential

Section 3870N
Omitiomire - view from east

<table>
<thead>
<tr>
<th>Purple</th>
<th>Bruce Lens</th>
<th>Yellow</th>
<th>A Lens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grey</td>
<td>Kaya Lens</td>
<td>Orange</td>
<td>B Lens</td>
</tr>
<tr>
<td>Green</td>
<td>Central Lens</td>
<td>Red</td>
<td>C Lens</td>
</tr>
</tbody>
</table>
Plan view

Grade x thickness
Resource estimate, August 2012

Additional potential in area of sparse drilling:

94 Mt at 0.53% Cu at 0.25% Cu cut-off (516,000 t copper)

<table>
<thead>
<tr>
<th>Cut-off grade (% Cu)</th>
<th>Resource (Mt)</th>
<th>Grade (% Cu)</th>
<th>Metal (tonnes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.25</td>
<td>136</td>
<td>0.53</td>
<td>712,000</td>
</tr>
</tbody>
</table>
High grade copper in shear zones

Narrow zones of biotite-epidote schist with chalcocite, sphene & some fuchsite
Thin section of ore zone

Epidote poikiloblasts (yellow) with magnetite & chalcocite inclusions

→ Chalcocite is a primary mineral
Shear zones

Coarse-grained chalcocite in narrow shear zone
... this drill core is ore-some
High strain zones

Truncation surfaces between high strain zones (biotite-epidote schist) and primary contacts or S2
Shear zones

Narrow shear zones are characterised by -

• Strong deformation (shearing)
• Alteration to biotite-epidote
  i.e. strong retrograde fluid flow
• Concentrations of chalcocite \( \text{Cu}_2\text{S} \)

The brown mineral is chrome-epidote
More broadly, the three ore lenses are contained within a high strain zone 100m thick.

Within this zone, the rocks are variably deformed (sheared).

- **Mafic rocks strongly deformed & altered**
- **Felsic rocks less deformed**
The Omitiomire deposit is within a high strain zone up to 100m thick. Copper is hosted by altered mafic rocks in this high strain zone.
Ore genesis

- Retrograde metamorphic fluid
- Channelled into shear zone
- Late in Damaran orogenic event
  - post-peak metamorphism
- Reacted with tectonised amphibolite
Interpretation: High strain zone related to low-angle detachment faulting during exhumation of the Ekuja Dome.
Regional setting

After Miller (2008)
Pan-African orogenic belts 600 – 500 Ma
Regional setting

After Miller (2008)
Tectonic evolution - continental collision

- **D3 collision ~ 540 Ma**
- **M2 metamorphic peak 535 – 530 Ma**
Tectonic evolution - dome exhumation

Sphene cores ~ 1100 Ma
Sphene rims 520 – 485 Ma

Retrograde event
Back to the drawing-board:

New money,
new strategy
Heilong investment

- Heilong Group established in 1997
- Based in Harbin, the capital of Heilongjiang Province, China
- Exploration & project development expertise
- Initial investment in IBML in 2012
- Major shareholder in IBML in 2013
Finally - a new field vehicle!!
New strategy

A two-stage approach to bring Omitiomire into production:

• Phase 1 - a small project based on oxide copper resource
• Phase 2 - a larger project based on sulphide copper resource

Oxide copper (blue-green) exposed in the bulk sample pit
2012 - Scoping study

2013 - Definitive feasibility study
Infill drilling

- Three shallow high grade zones selected for mining
- Planned maximum depth 50m
- Reserve: 3.14 Mt at -
  0.60% Cu (oxide); plus
  0.33% Cu (sulphide)

The clusters of closely-spaced holes show oxide copper zones proposed for early mine development
West to east section

Resource Blocks
Cat. 1
Cat. 2&3.

SECTION: 7583270N

Section showing Pan Pit
Phase 1 project: pit layouts

Three small pits located on near-surface high grade oxide copper
Phase 1 project: ore processing

- **Chalcocite**: Flotation $\rightarrow$ copper concentrate
- **Oxide copper**: Acid leach – solvent extraction – electrowinning
  $\rightarrow$ cathode copper (at least 99.9% Cu)
- **Copper produced**: 25,570 tonnes
Phase 1 project: flow sheet
Phase 1 project - upside potential

Resource can be doubled by extending & deepening the pits
Site layout

- Farm boundary
- Omitiomire resource
- Don’t move the river
- Expanded pits
- Road diversion
Definitive feasibility study

- A financially viable project
- Upside potential identified
- Main sensitivities: copper price and exchange rate
- No major environmental issues
Social & environmental impact assessment (SEIA)

Specialist studies -

<table>
<thead>
<tr>
<th>Surface &amp; groundwater</th>
<th>Traffic</th>
<th>Biodiversity</th>
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</thead>
<tbody>
<tr>
<td>Air quality</td>
<td>Noise</td>
<td>Archaeology</td>
</tr>
<tr>
<td>Social / economic</td>
<td>Visual</td>
<td>Soils</td>
</tr>
</tbody>
</table>

Expected visual impact
Environmental management plan

• The EMP is a legal commitment for sound environmental practice
• Procedures & policies
  → Prevent pollution & limit damage
• Induction, training & awareness
• Stakeholder engagement

Clean up your mess
Public participation meetings

Don’t take our groundwater!
Phase 1 project

- Steering Committee recommended proceeding to development
- Craton Board recommended proceeding
- IBML Board accepted Craton Board recommendation
Moving towards project development
Mining licence application 13 Dec 2013
Current status

- Mining Licence application lodged
- Environmental Management Plan lodged
- Project Manager appointed
- Implementation team being appointed
- Non-executive directors appointed to Board of subsidiary company
Craton Board
Non-executive Directors

Elias Shikongo
Principal Partner,
Shikongo Law Chamber

Luo Zhehong
Chairman & MD,
Qinghai West Resources

Otto Shikongo
CEO
Debmarine Namibia

Purvance Heuer
Head of Corporate Finance
Simonis Storm Securities
Strategic planning - Feb 2014
Short-term objectives

- Obtain a Mining Licence
- Obtain environmental clearance
- Secure long-term surface access
- Resolve other outstanding issues
Company strategy

- Construct & operate the Omitiomire oxide copper project
- Expand copper resources within trucking distance of Omitiomire
- Complete a Definitive Feasibility Study for the larger Phase 2 project
- List IBML on an appropriate securities exchange
A big “thank-you” to our financial backers