INTERNATIONAL BASE METALS LIMITED

OMITIOMIRE COPPER DEPOSIT, NAMIBIA:

THE ROCKY ROAD TOWARDS PROJECT DEVELOPMENT

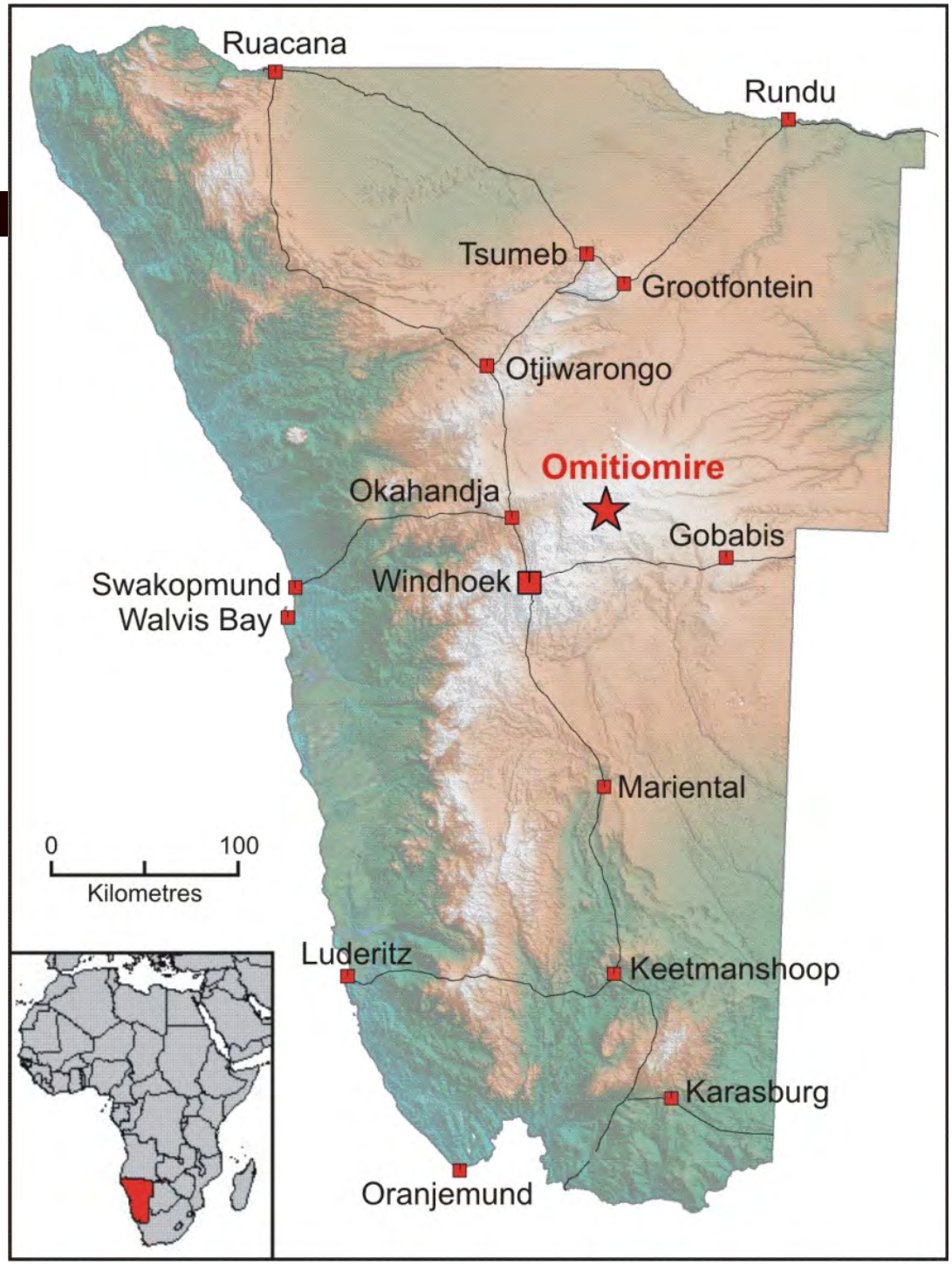
- Ken Maiden & Karl Hartmann

Presentation to Sydney Mineral Exploration Discussion Group (SMEDG), 25 September 2014

Namibia

- **Area: 800,000 km^2**

  (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**



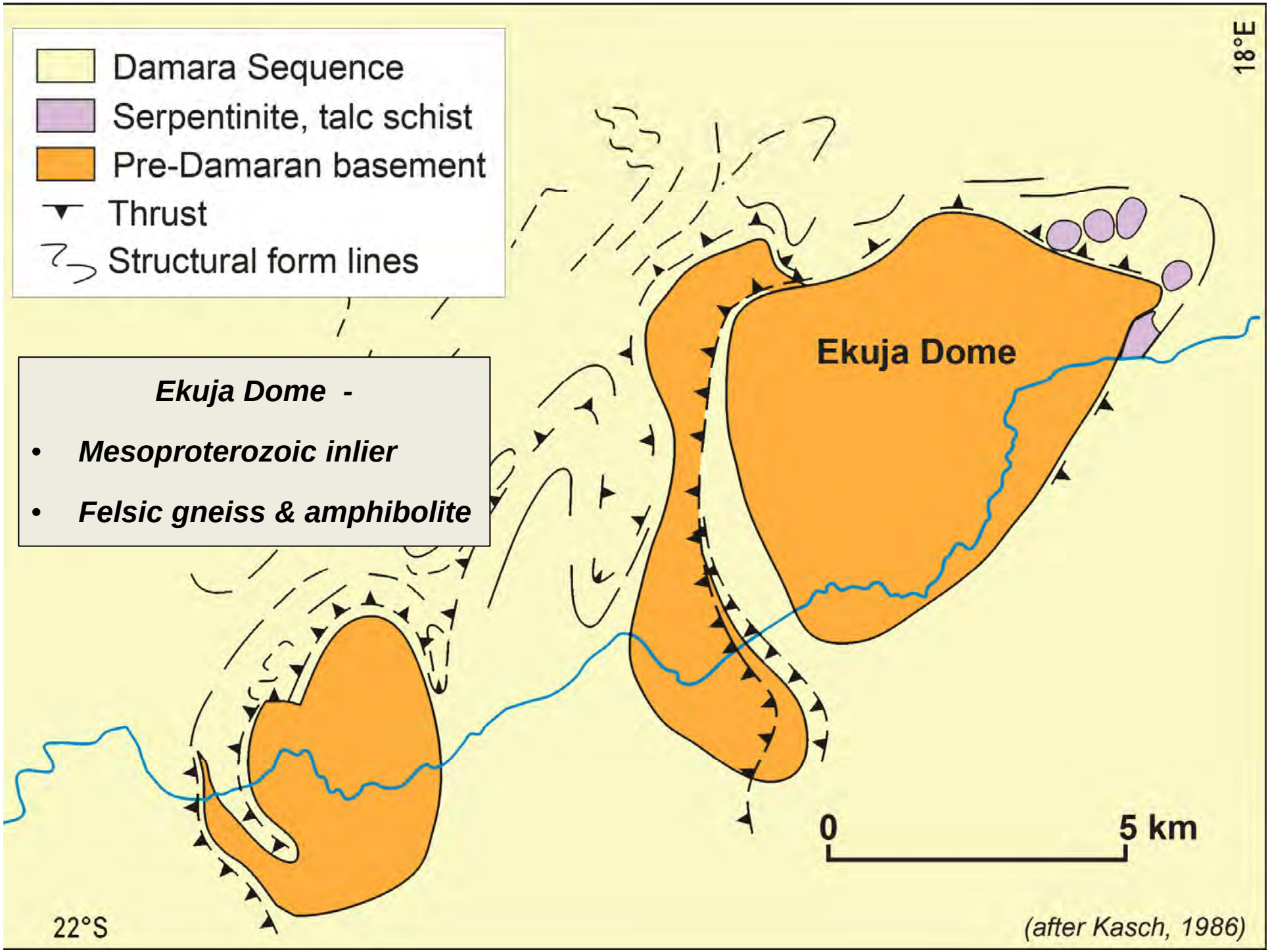
Why Namibia ?

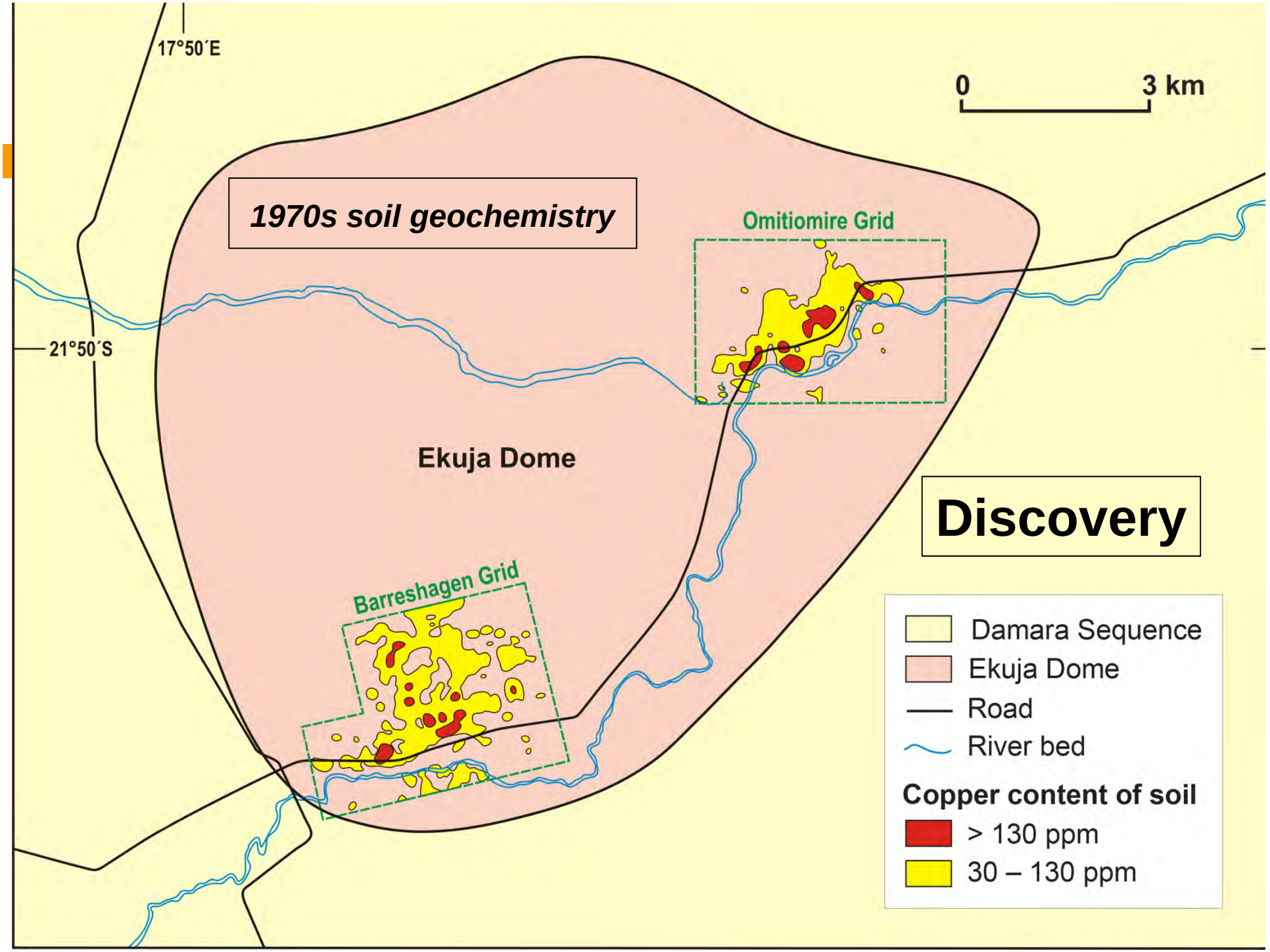
- **Good tenement system**
- **Good mining legislation**
- **Effective bureaucracy**
- **Good data (geological maps, geophysical coverage, historic exploration data)**
- **Good infrastructure**
- **Low political risk**

Fraser Institute survey 2013

Investment attractiveness index - Namibia 34/112

- **Below Botswana & Ghana, above all other African countries**
- **Above NSW, Victoria & Tasmania**


Damara Sequence
Serpentinite, talc schist
Pre-Damaran basement
Thrust
Structural form lines
Ekuja Dome -
• Mesoproterozoic inlier
• Felsic gneiss & amphibolite
Ekuja Dome
18°E
22°S
0
5 km
(after Kasch, 1986)


17°50´E
21°50´S
0
3 km
1970s soil geochemistry
Omitiomire Grid
Ekuja Dome
Barreshagen Grid
Discovery
Damara Sequence
Ekuja Dome
Road
River bed
Copper content of soil
> 130 ppm
30 – 130 ppm

Previous drilling

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

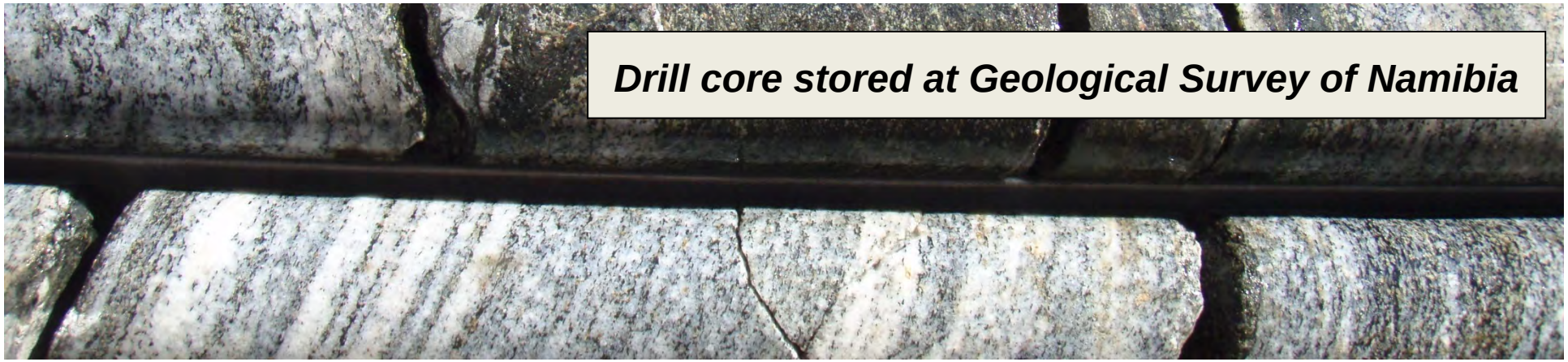
Nossob River Mining Company 1990s: 9 holes → copper zone 10 – 15m thick

Anglo American 1990s: 16 holes → copper zone 10 – 20m thick; area 600m x 700m

- **Hole OED5: 106m at 0.47% Cu**

Straits Resources 198: 13 holes; best intersection 9m at 0.6% Cu

- **Potential for 20 Mt at 0.5% Cu at 0.2% Cu cut-off**



Resource estimate (Hellman, 1996)

- **Inferred Resource**

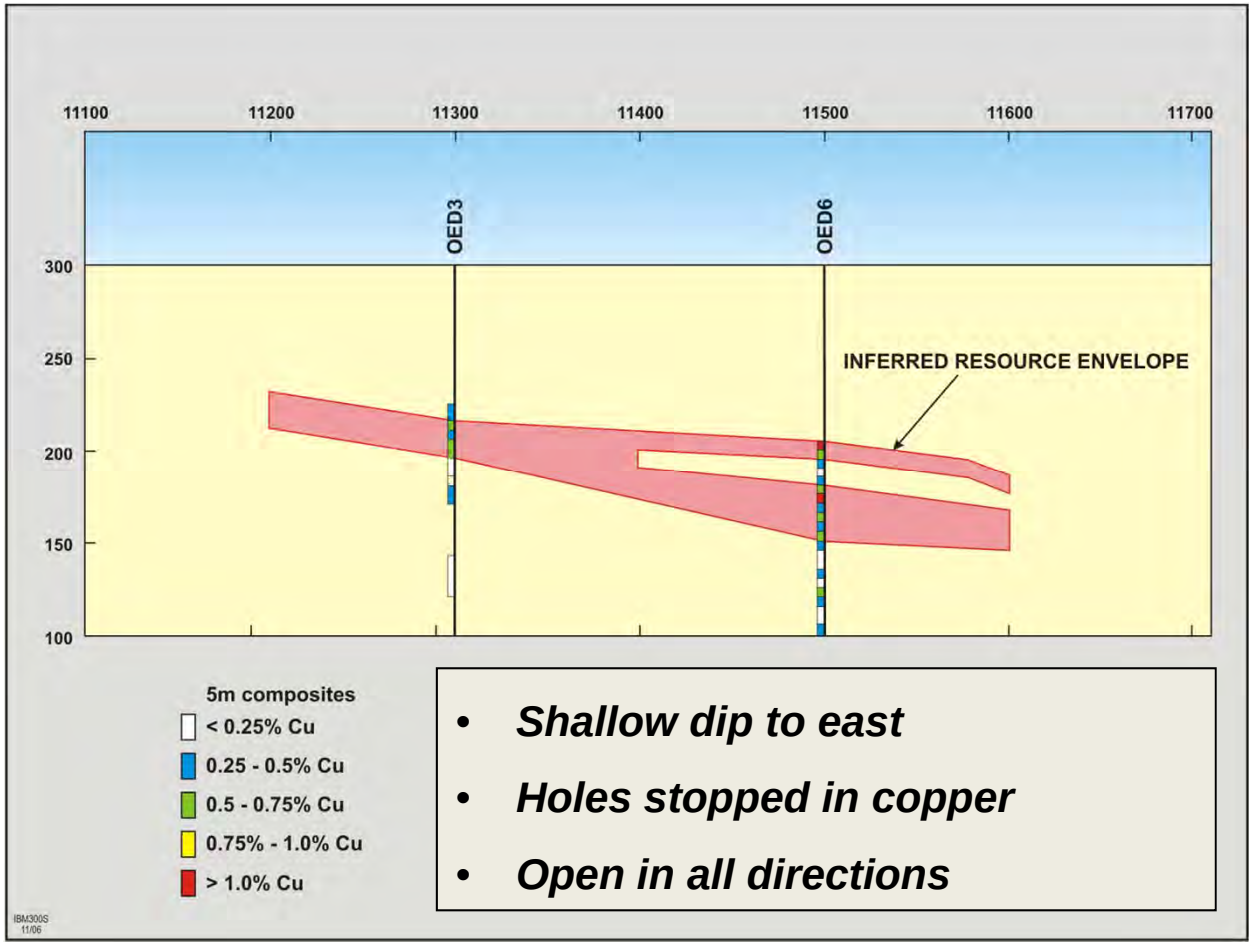
  7.9 Mt at 0.9% Cu

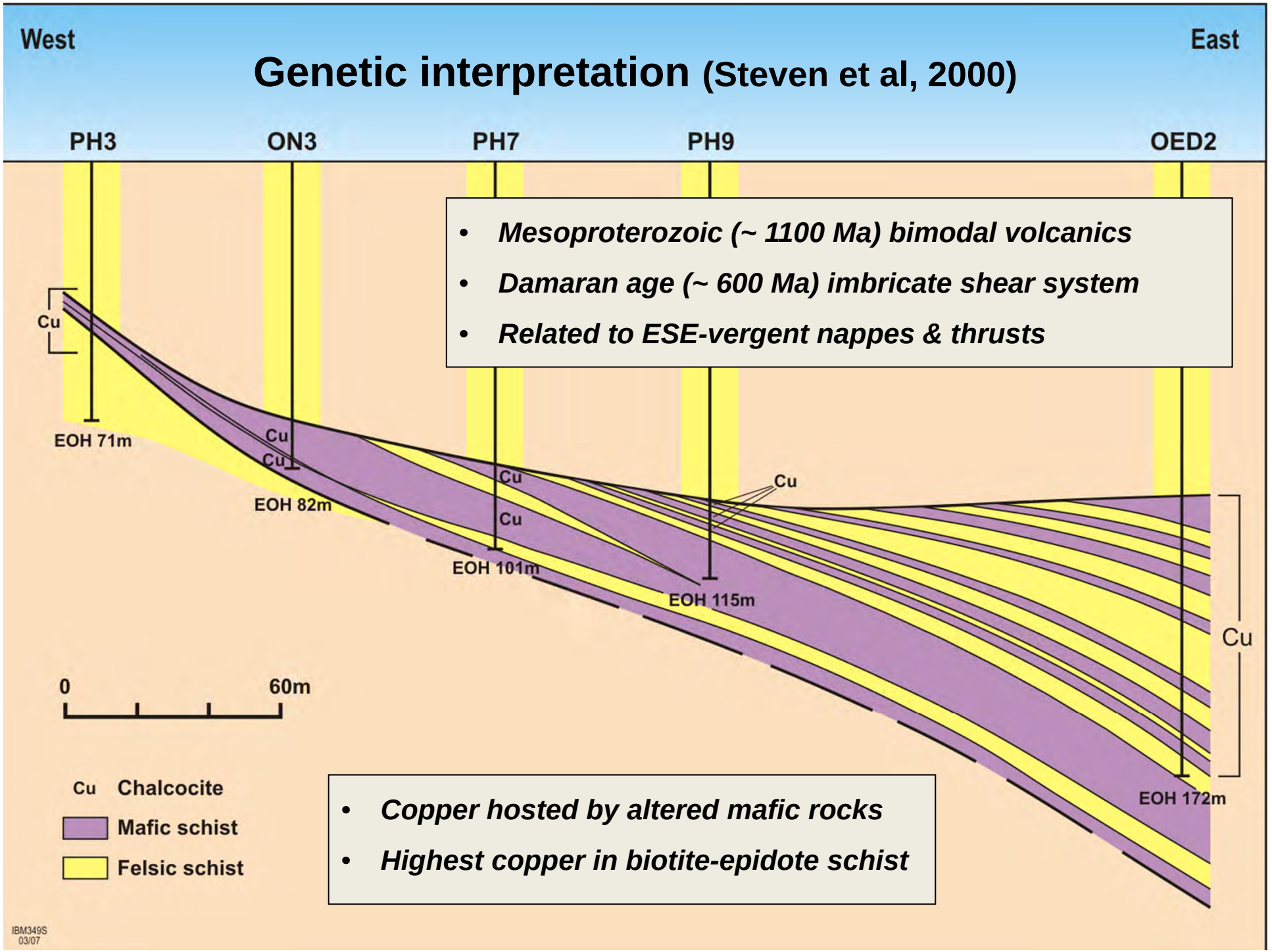
  (0.5% Cu cut-off)

- **Resource potential**

  30 Mt at 0.7% Cu

  within drilled area




West
East
Genetic interpretation (Steven et al, 2000)
PH3
ON3
PH7
PH9
OED2
• Mesoproterozoic (~ 1100 Ma) bimodal volcanics
• Damaran age (~ 600 Ma) imbricate shear system
• Related to ESE-vergent nappes & thrusts
Cu
EOH 71m
Cu
Cu
EOH 82m
Cu
Cu
EOH 101m
Cu
EOH 115m
Cu
EOH 172m
0
60m
Cu Chalcocite
Mafic schist
Felsic schist
• Copper hosted by altered mafic rocks
• Highest copper in biotite-epidote schist
IBM349S
03/07

Manica Minerals 2005-06

- **Interpreted regional geophysical data**
- **Applied for five EPLs**

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***

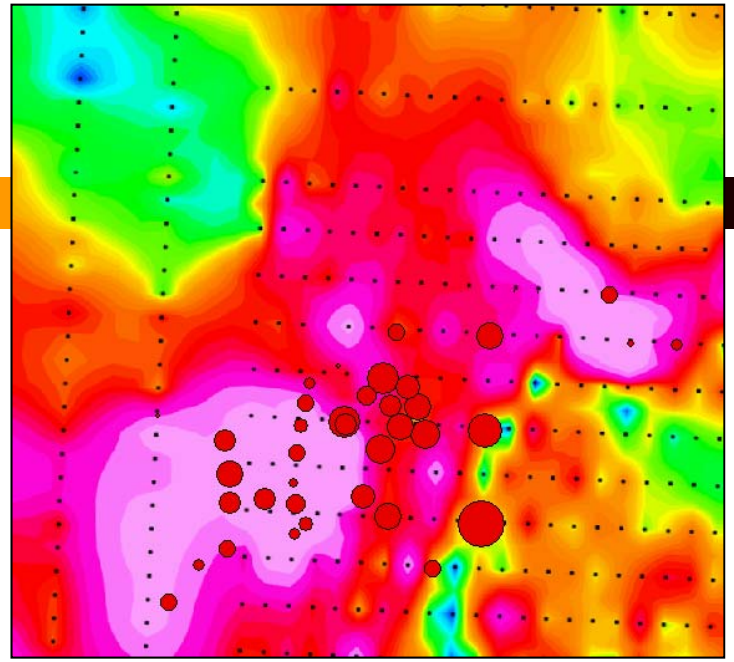
Project assessment, Feb 2007

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

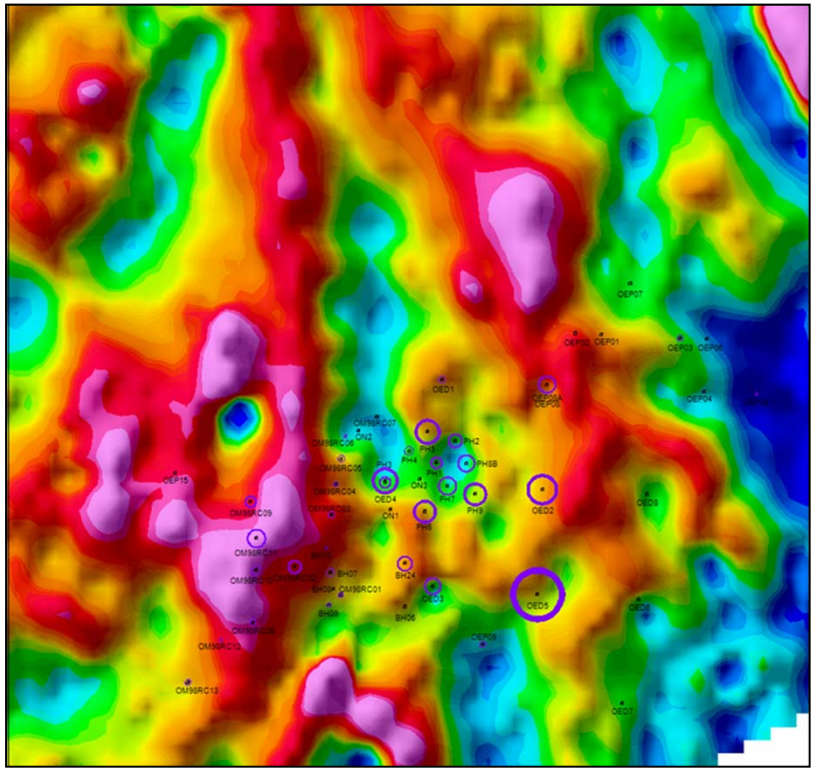
→ JV with Manica Minerals

Exploration objectives for 2007

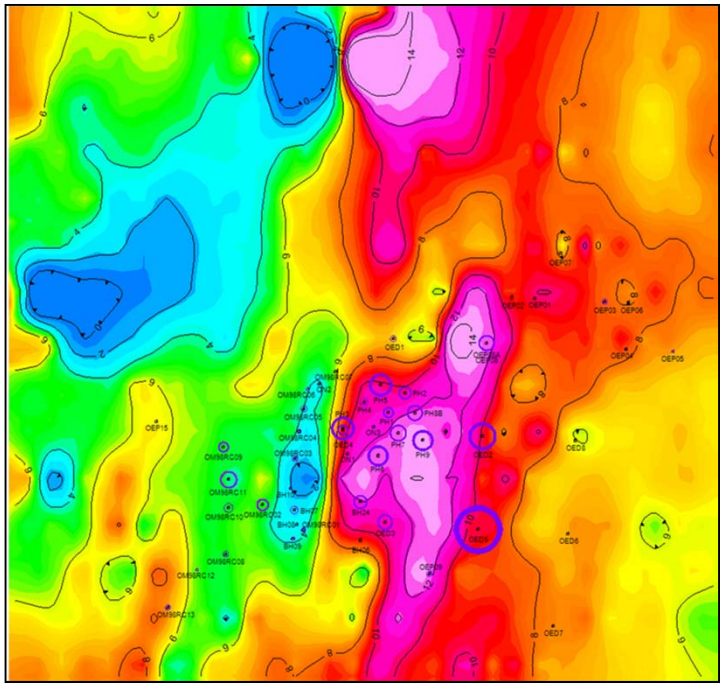
- **Target: Inferred Resource 15 Mt at 0.7% Cu**
- **Scope the likely eventual size of the Omitiomire deposit**
- **Assess technical & financial parameters**
- **Assess other targets in the Ekuja Dome**



Review of soil geochemistry

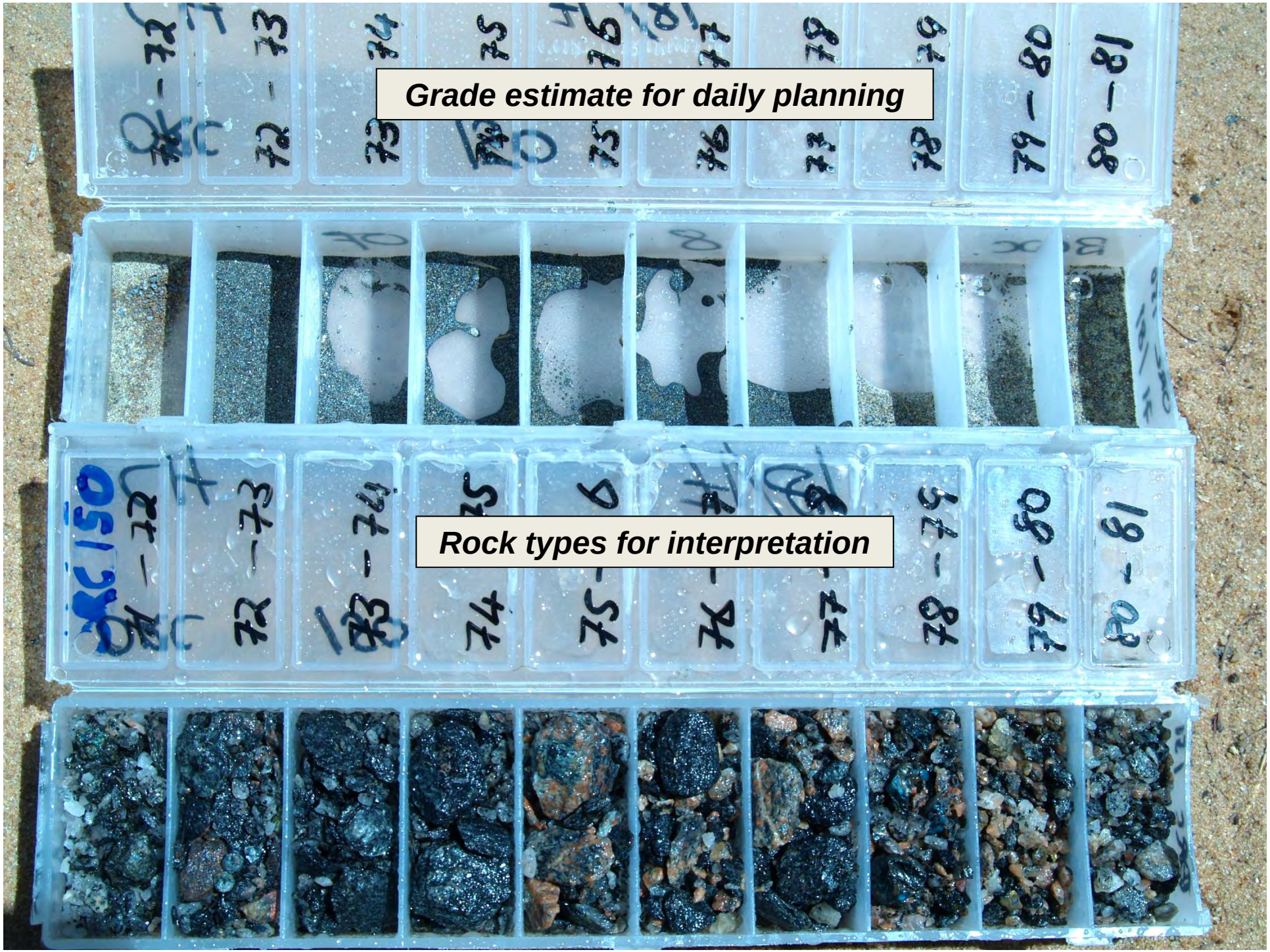


Ground magnetic survey



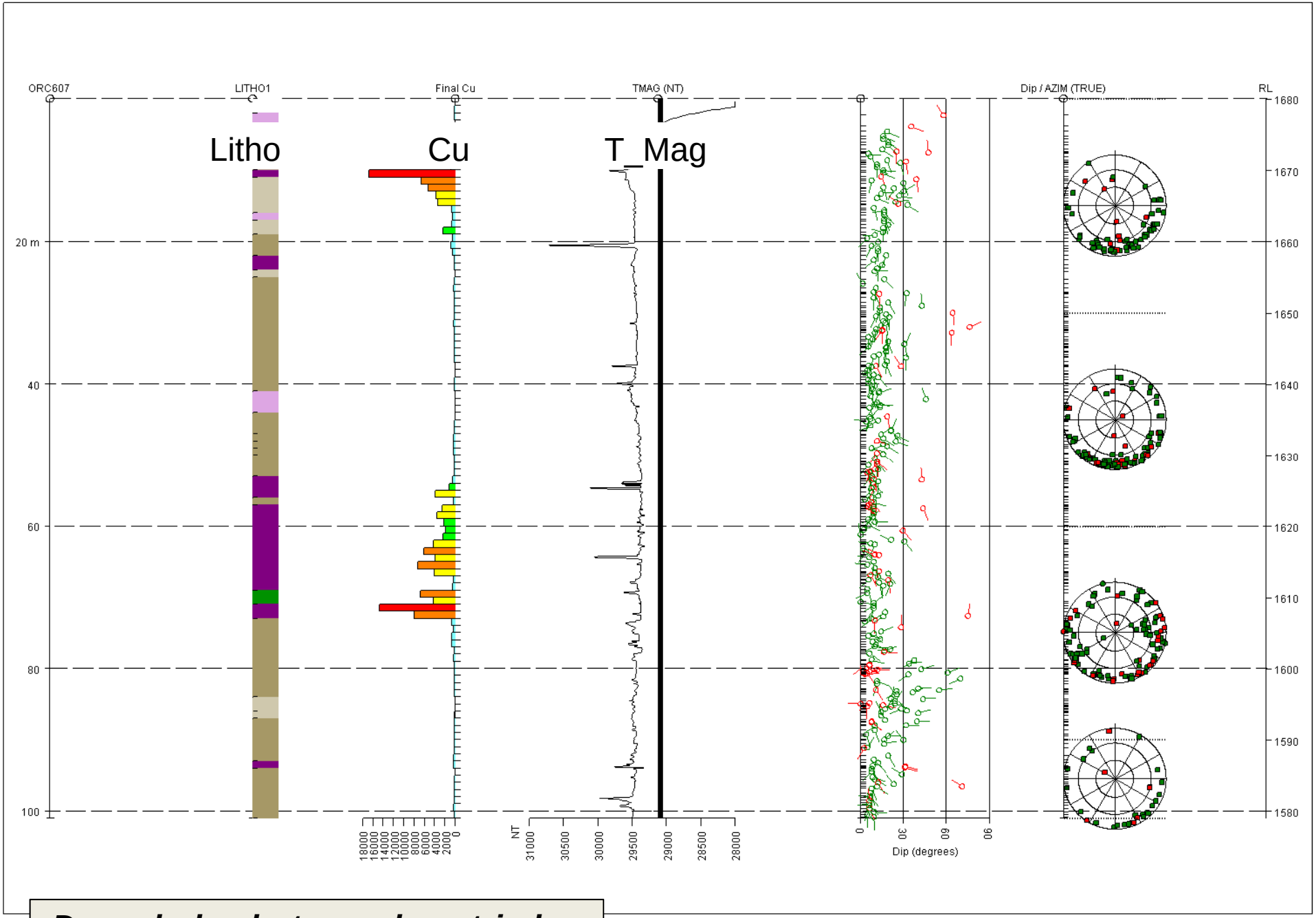
I.P. survey


First drill hole,
August 2007
SCHRAMM
OYOTA


Grade estimate for daily planning
Rock types for interpretation

Downhole photography

Provides structural information

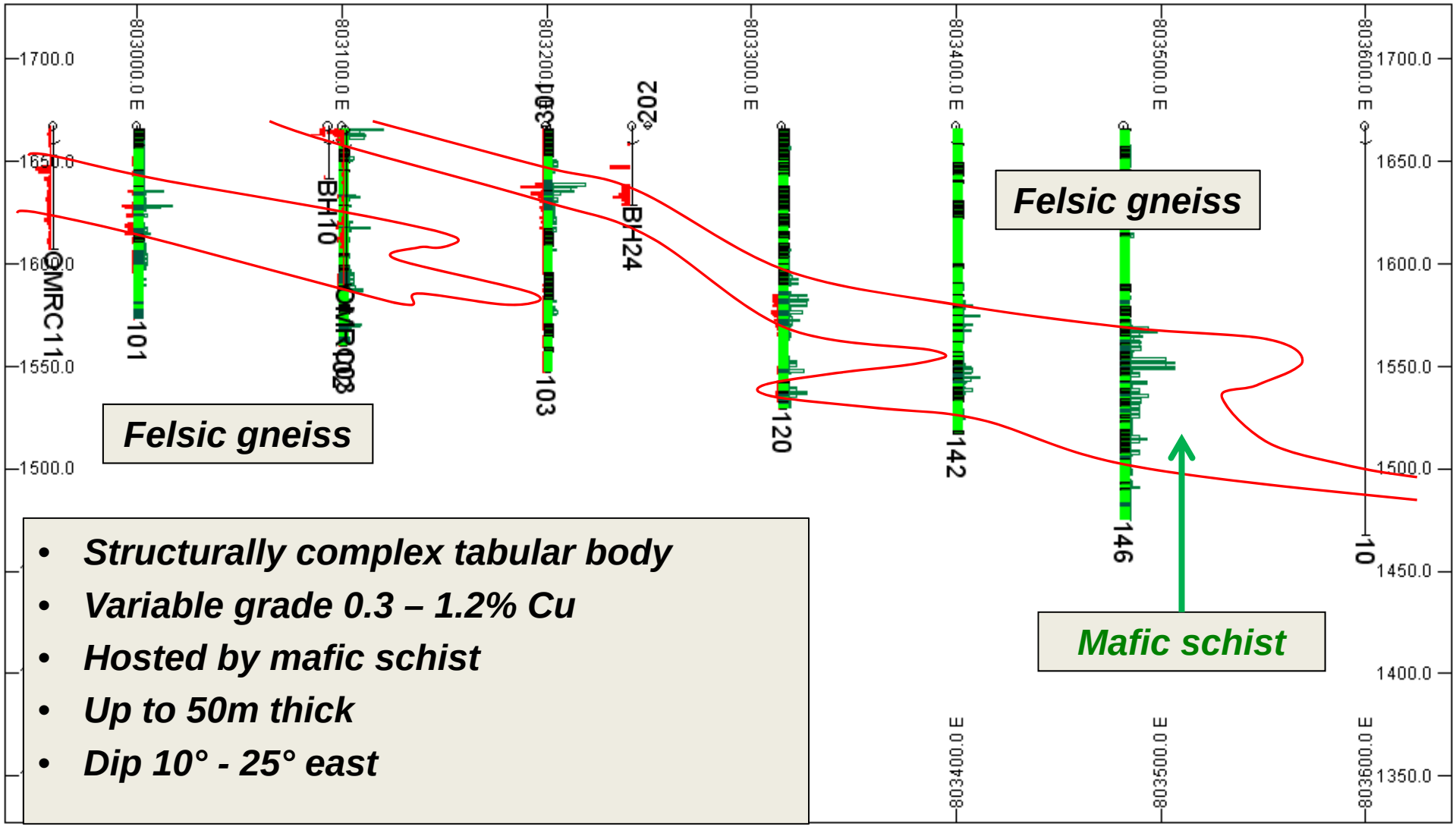


Down-hole photography: strip log

The copper zone

Disseminated chalcocite in biotite - hornblende - plagioclase schist

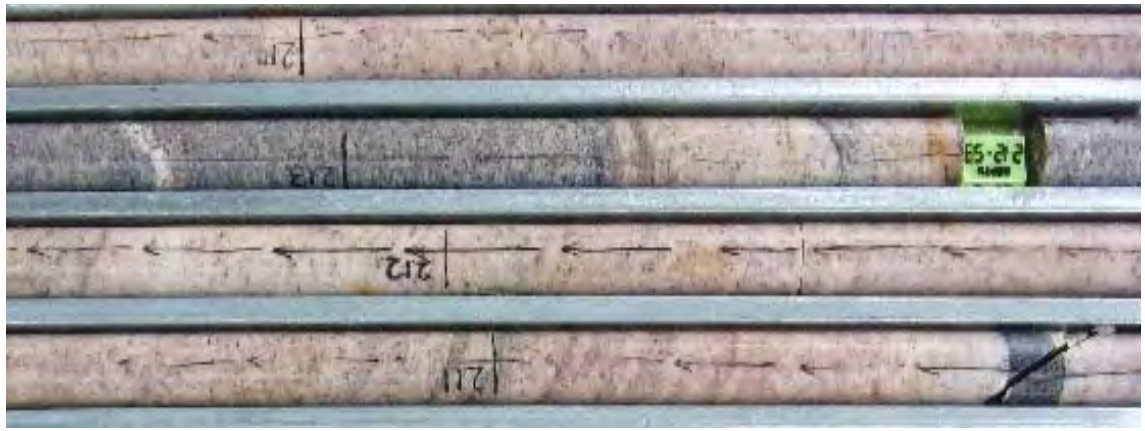
Geological section, Nov 2007

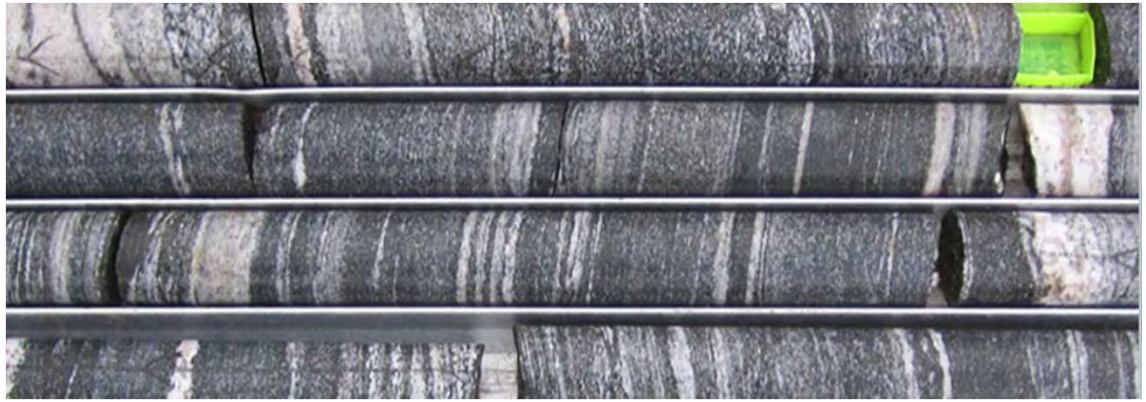


Geology

Hanging wall:

barren felsic gneiss



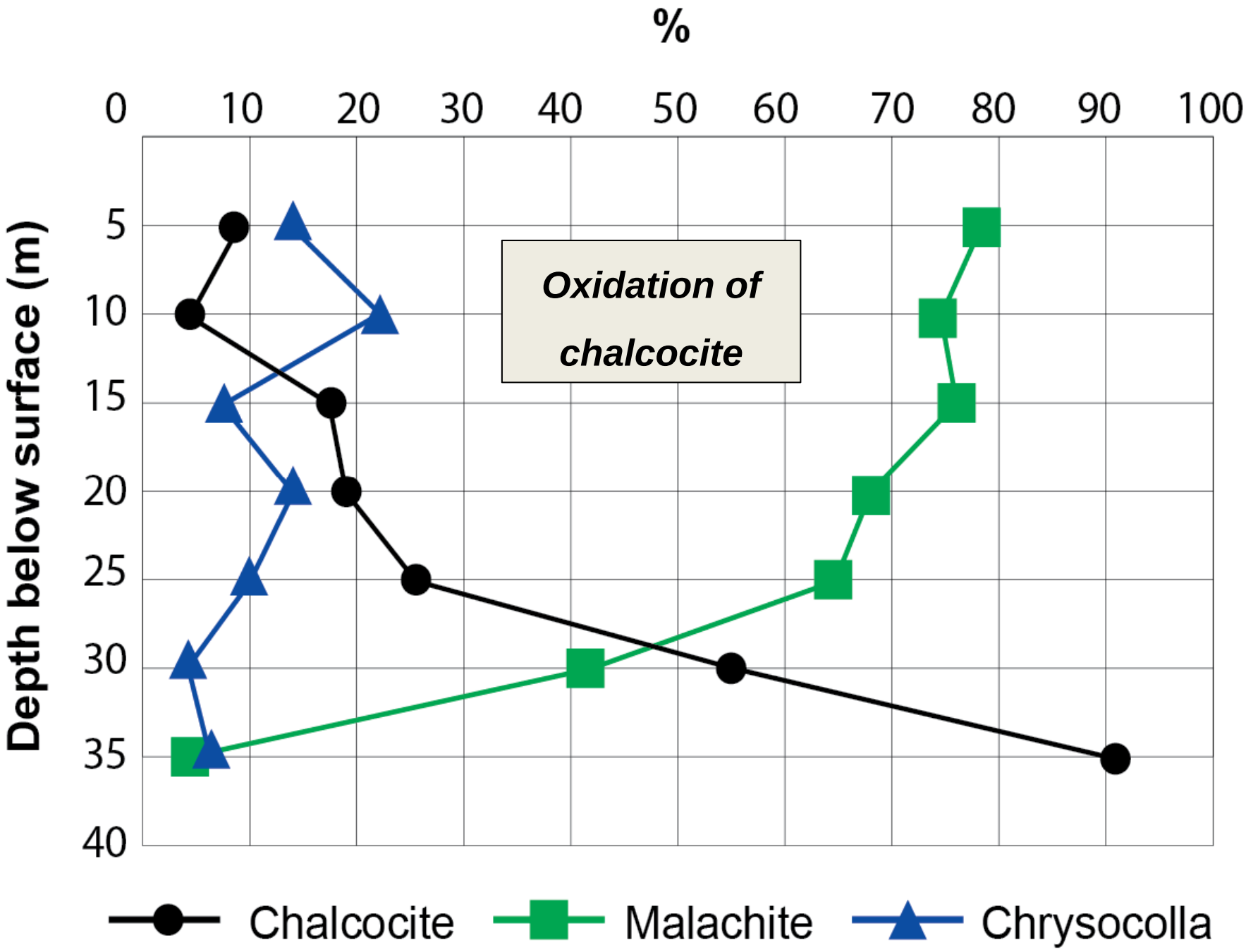


Ore zone: mafic schist

Mineralogy

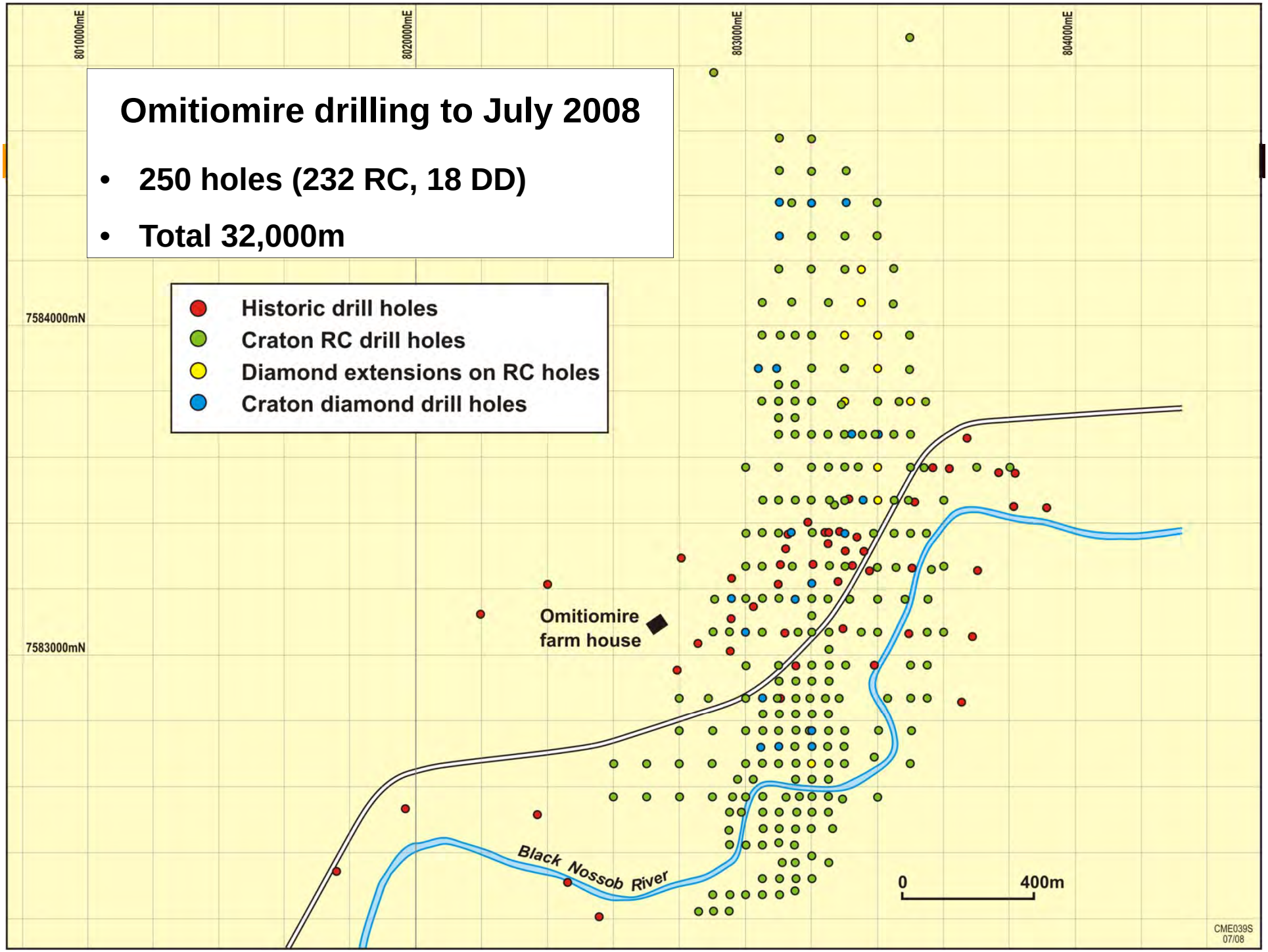
- **Chalcocite** Cu_2S **~ 90%**
- **Bornite** Cu_5FeS_4 **~ 8%**
- **Chalcopyrite** $CuFeS_2$ **trace**
- **No iron sulphide**
- **No Zambian-type mineral zoning**
- **Minor magnetite**
- **Minor hematite**

Chalcocite (shiny grey mineral) in drill core

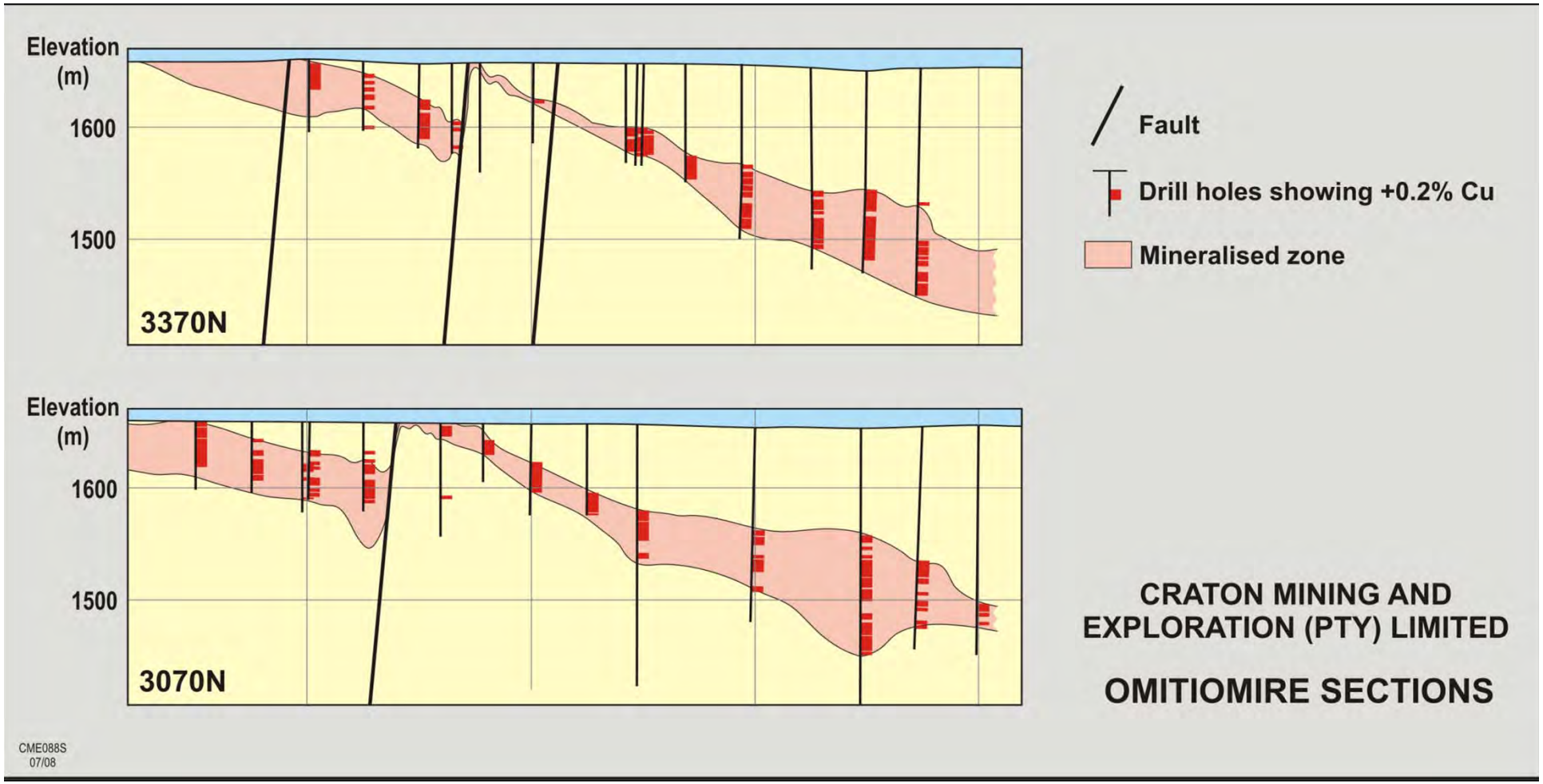

%
0
10
20
30
40
50
60
70
80
90
100
Depth below surface (m)
5
10
15
20
25
30
35
40
Oxidation of chalcocite
Chalcocite
Malachite
Chrysocolla

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**


Omitiomire drilling to July 2008
• 250 holes (232 RC, 18 DD)
• Total 32,000m
Historic drill holes
Craton RC drill holes
Diamond extensions on RC holes
Craton diamond drill holes
8010000mE
8020000mE
803000mE
804000mE
7584000mN
7583000mN
Omitiomire
farm house
Black Nossob River
0
400m
CME039S
07/08

Structural interpretation 2008



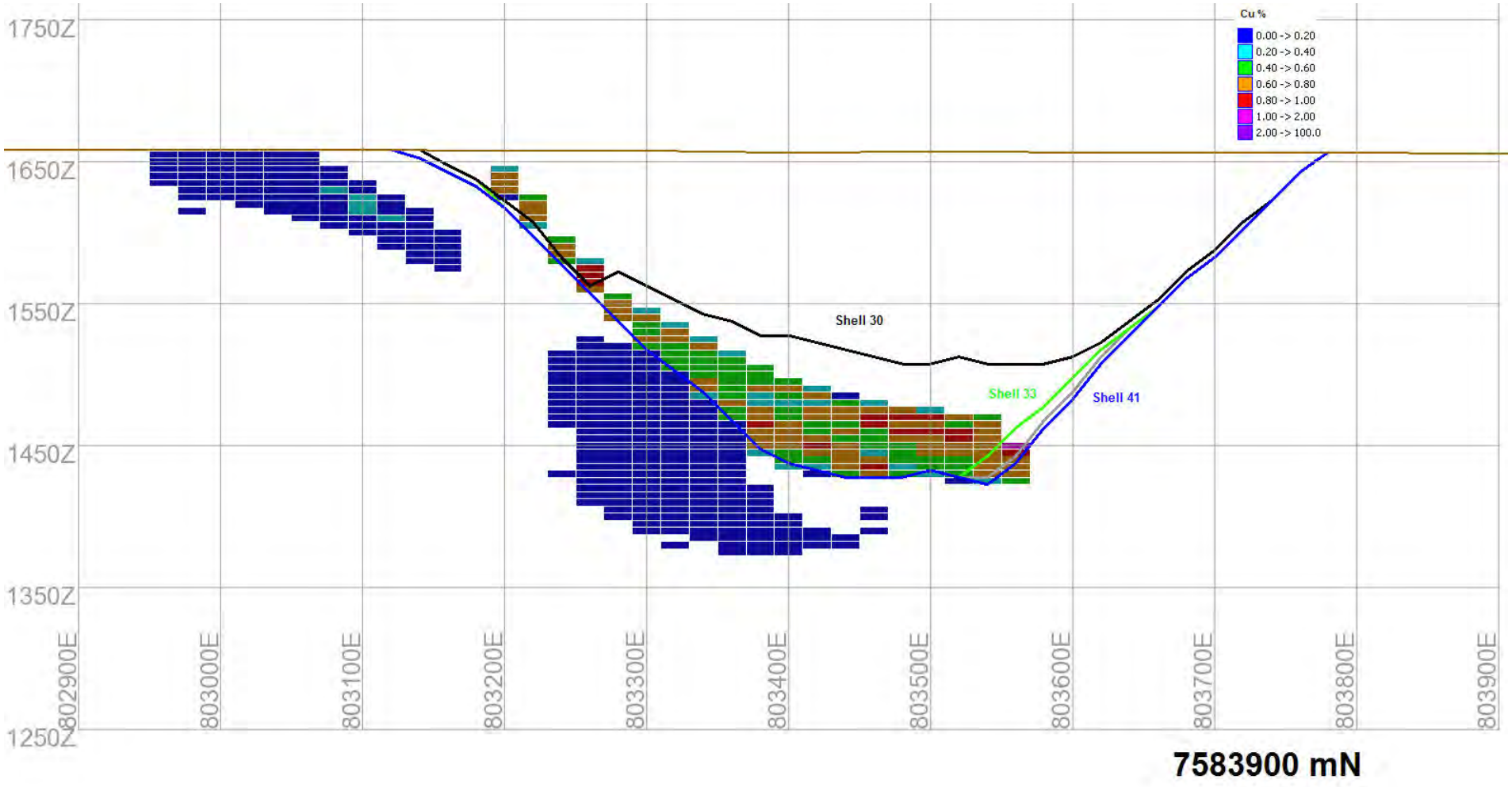
Resource August 2008

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 chalcocite – Cu_2S – 80% Cu

Proposed sulphide copper pre-concentration

- **Copper-bearing mafic schist is inter-banded with barren felsic gneiss**
- **Mafic schist is soft & heavy (> 2.8 g/cm^3)**
- **Felsic gneiss is hard & light (< 2.7 g/cm^3)**

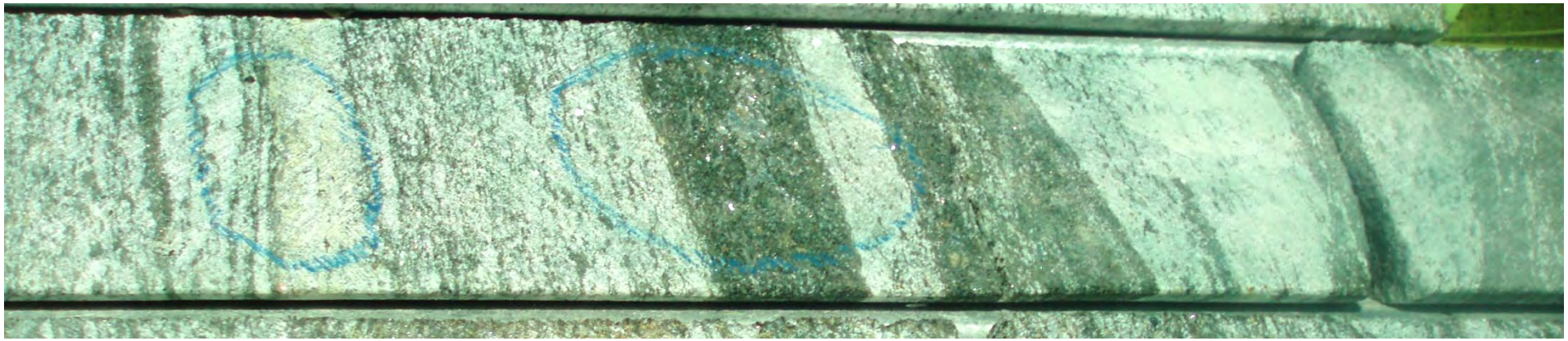
→ **Effective pre-concentration by dense medium separation (DMS)**

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

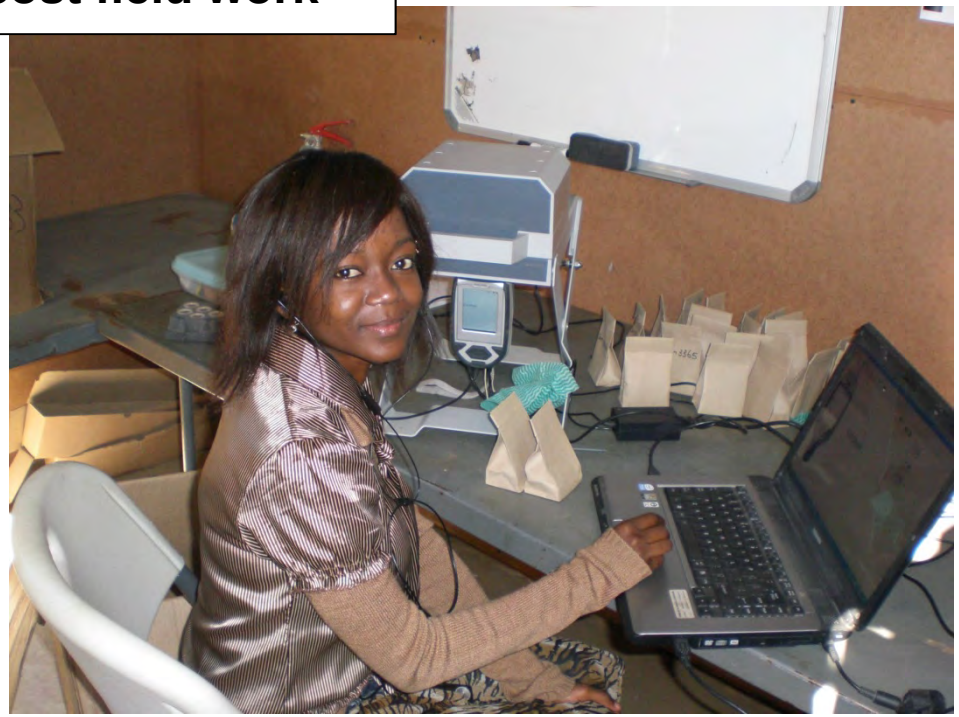
- **Scoping study completed**
- **Independent geological report & valuation completed**
- **Investigating accountant's report completed**
- **Prospectus prepared**
- **Two new non-executive directors appointed (Sept 2008)**

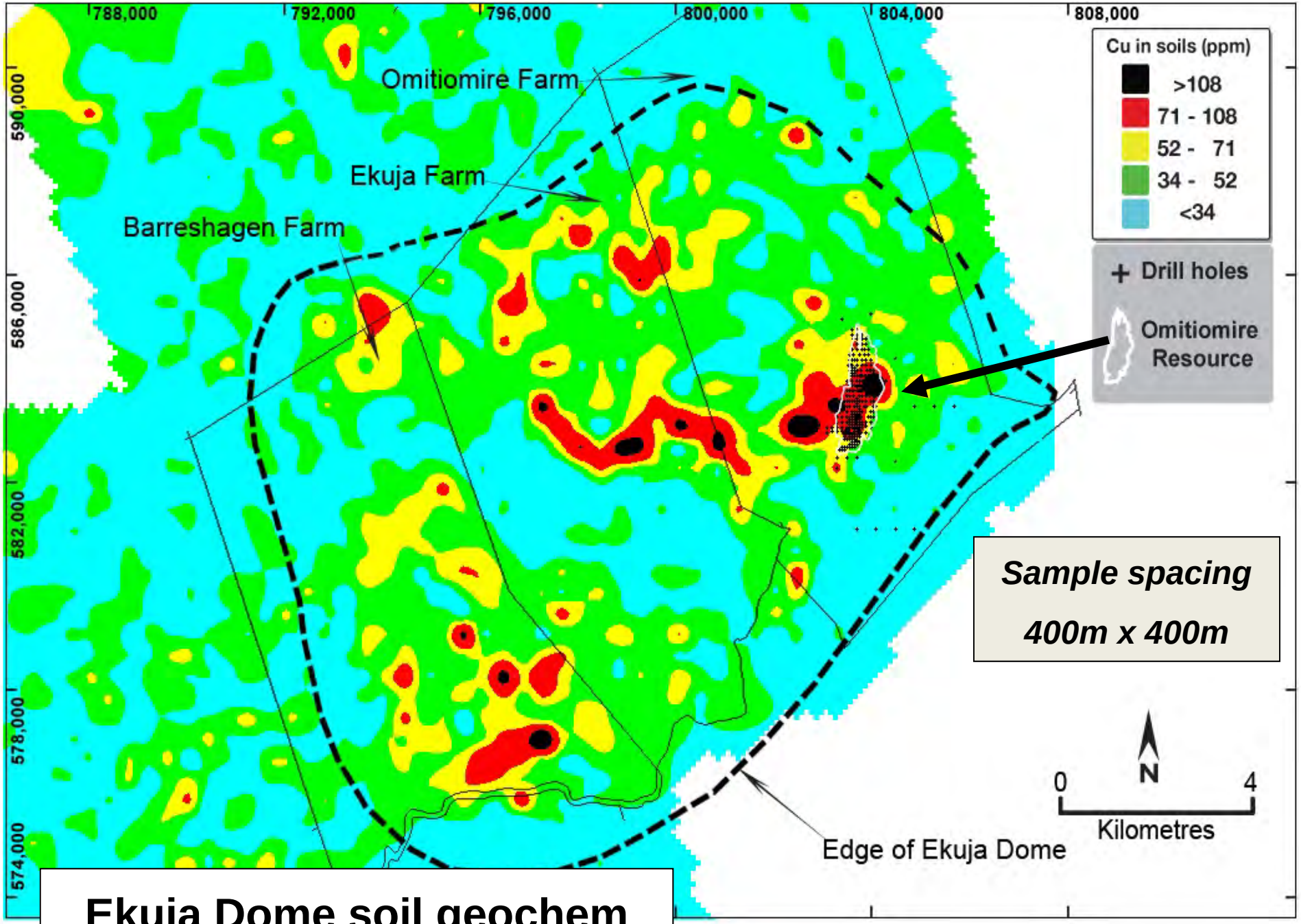
Global financial crisis

IBML's response to global financial crisis

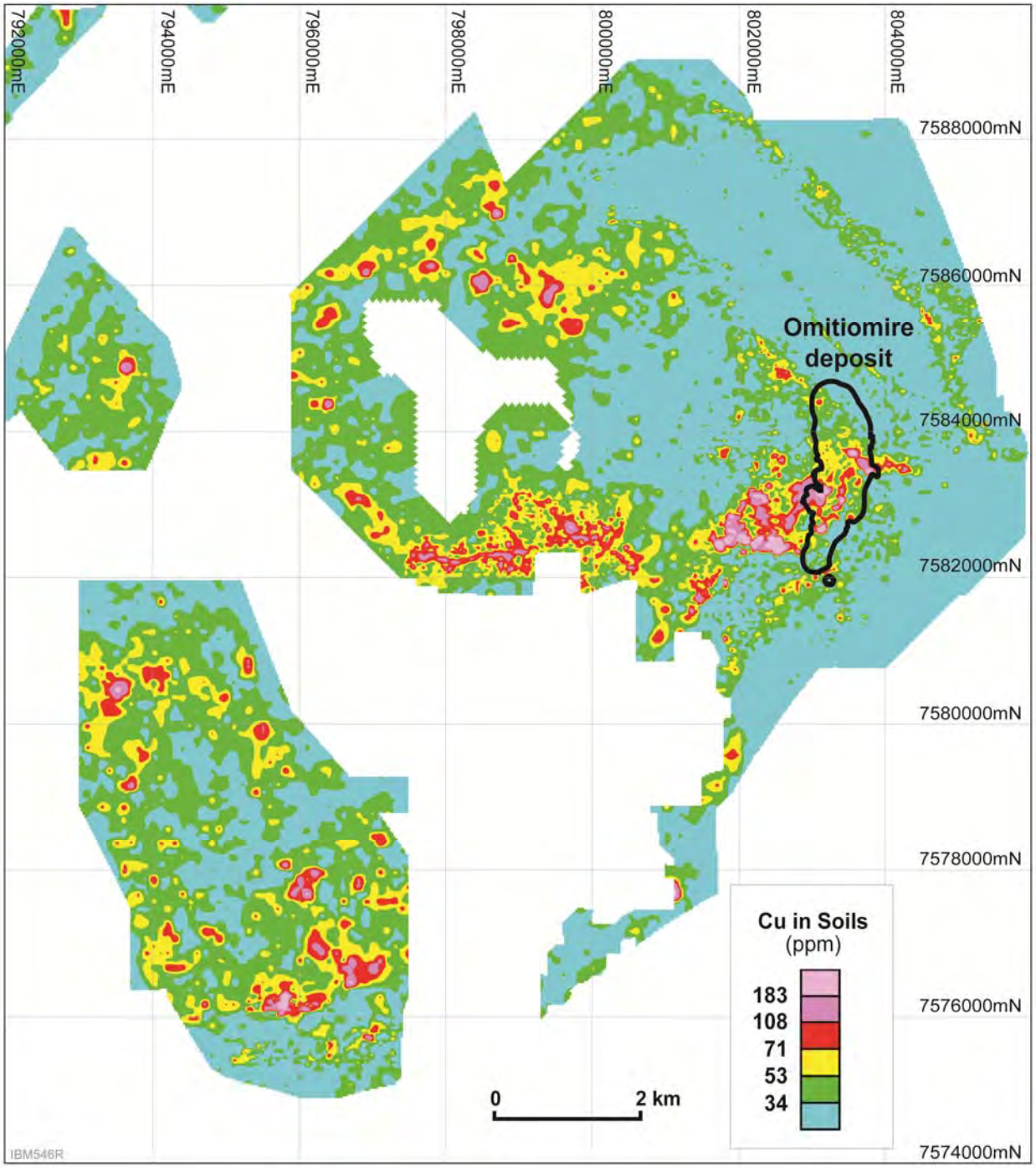
- **Cut costs**
- **Close down Australian projects**
- **Seek private funding**
- **Continue low-cost exploration at Omitiomire**

2009 - Low cost field work





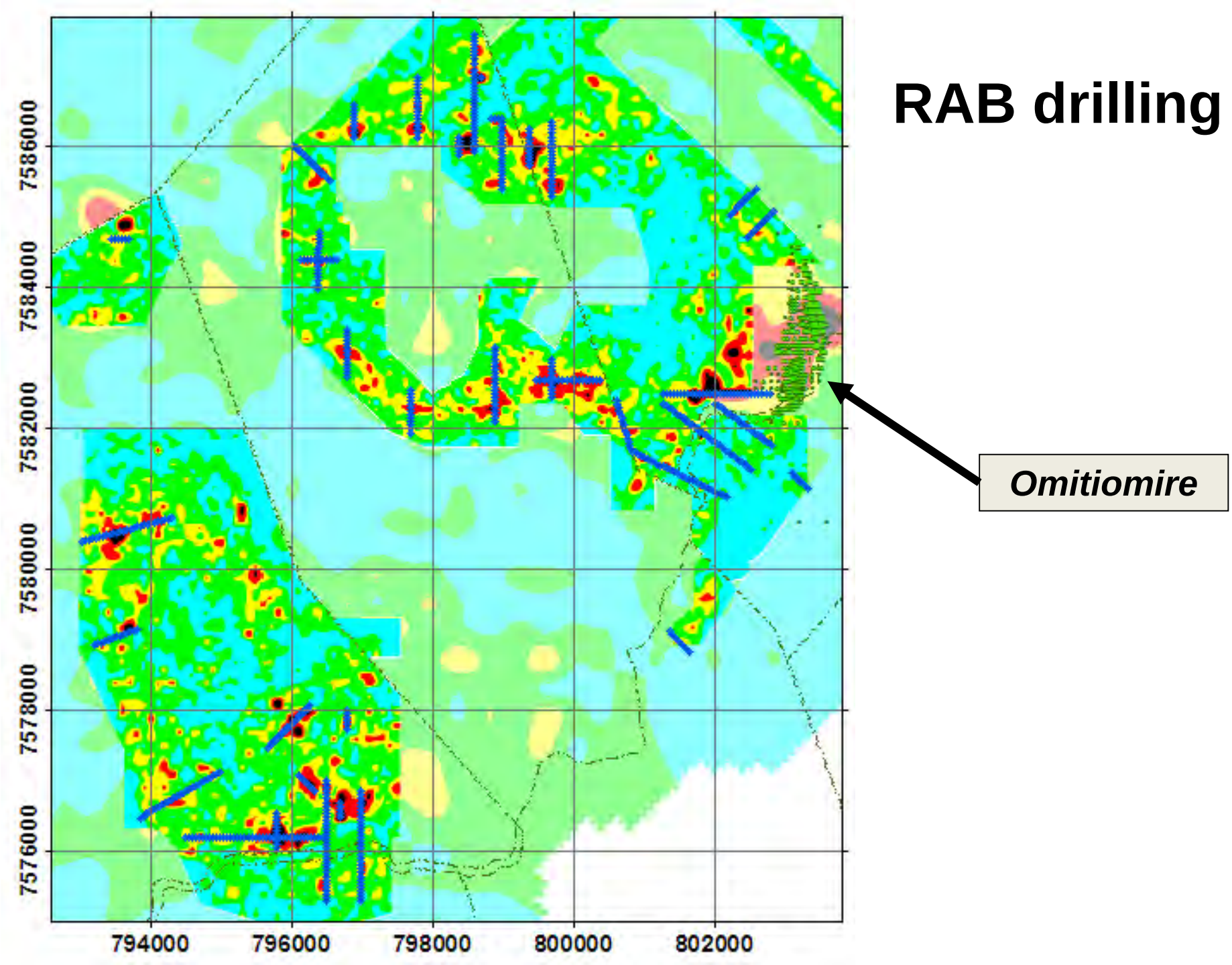
Ekuja Dome soil geochem



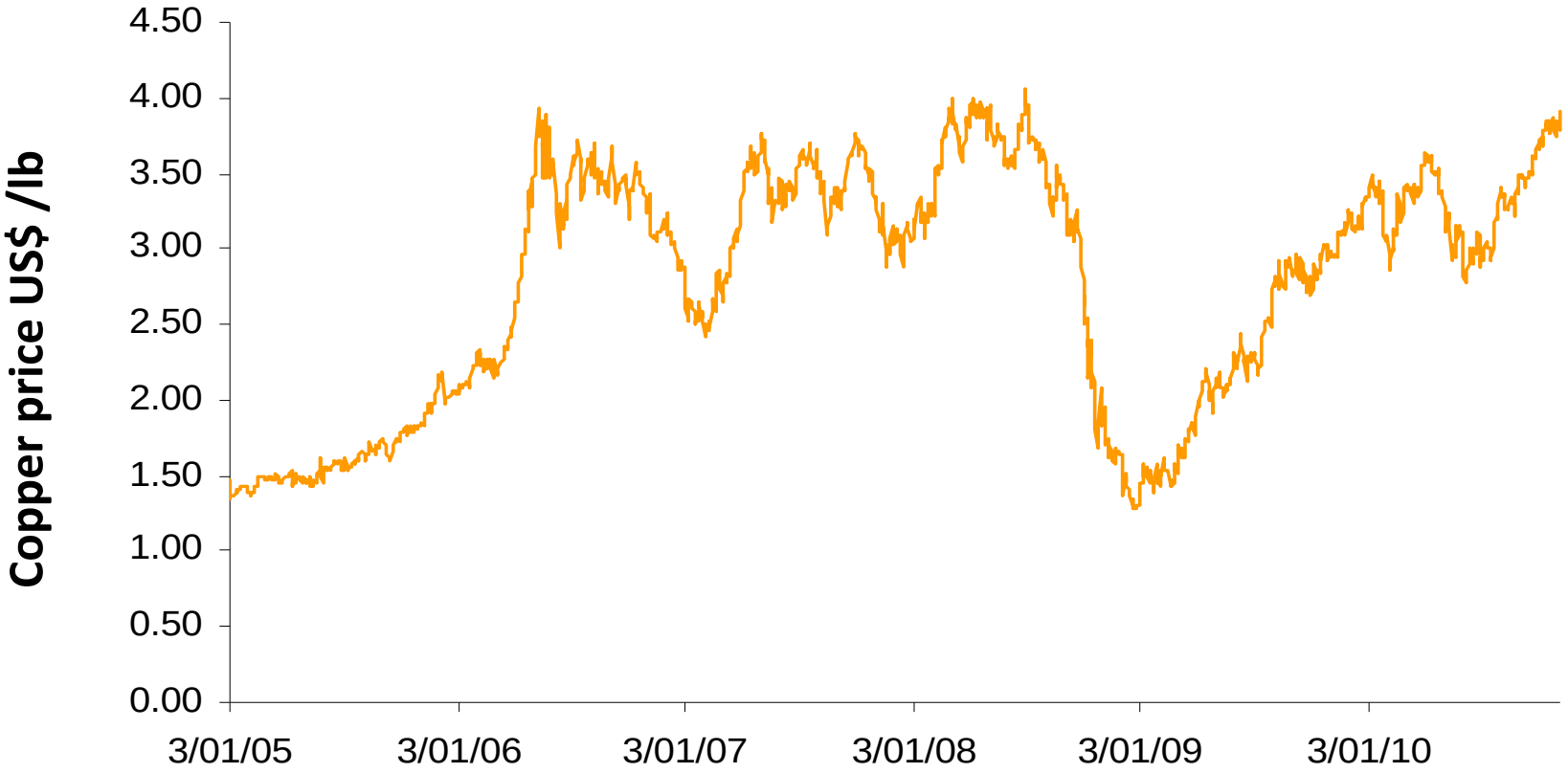
Infill soil geochem

Sample spacing

100m x 100m


RAB drilling
Omitiomire
7586000
7584000
7582000
7580000
7578000
7576000
794000
796000
798000
800000
802000

2010 - copper price bounces back

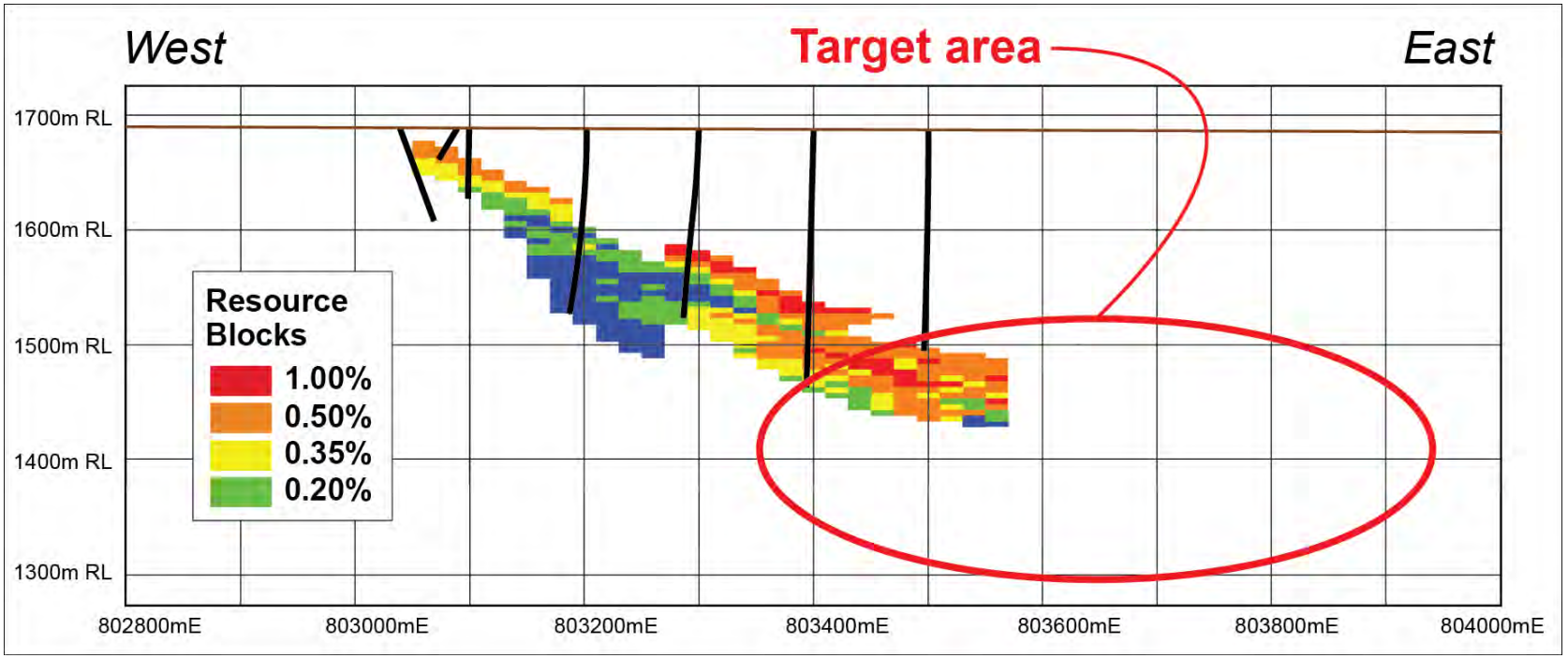


Company strategy 2010

- **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**

Geology - 2010

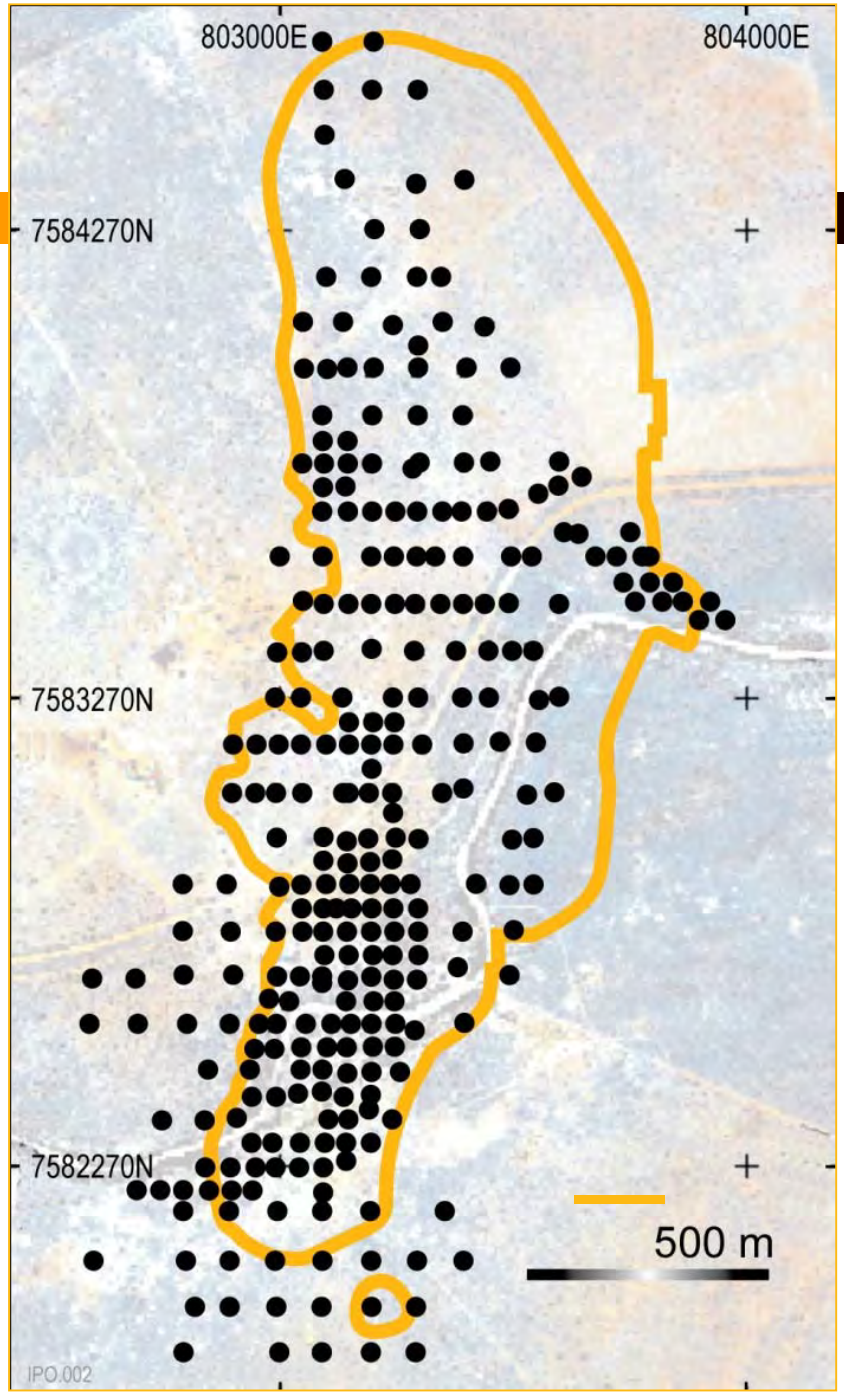
- **Tabular body, 10 – 60m thick**
- **Grade & thickness increase down dip to east**
- **Growth potential + 1 Mt contained Cu**



Resource 2010

Cut-off	Ore	Grade	Copper
% Cu	Mt	% Cu	tonnes
0.25	117	0.5	579,000

Drilling

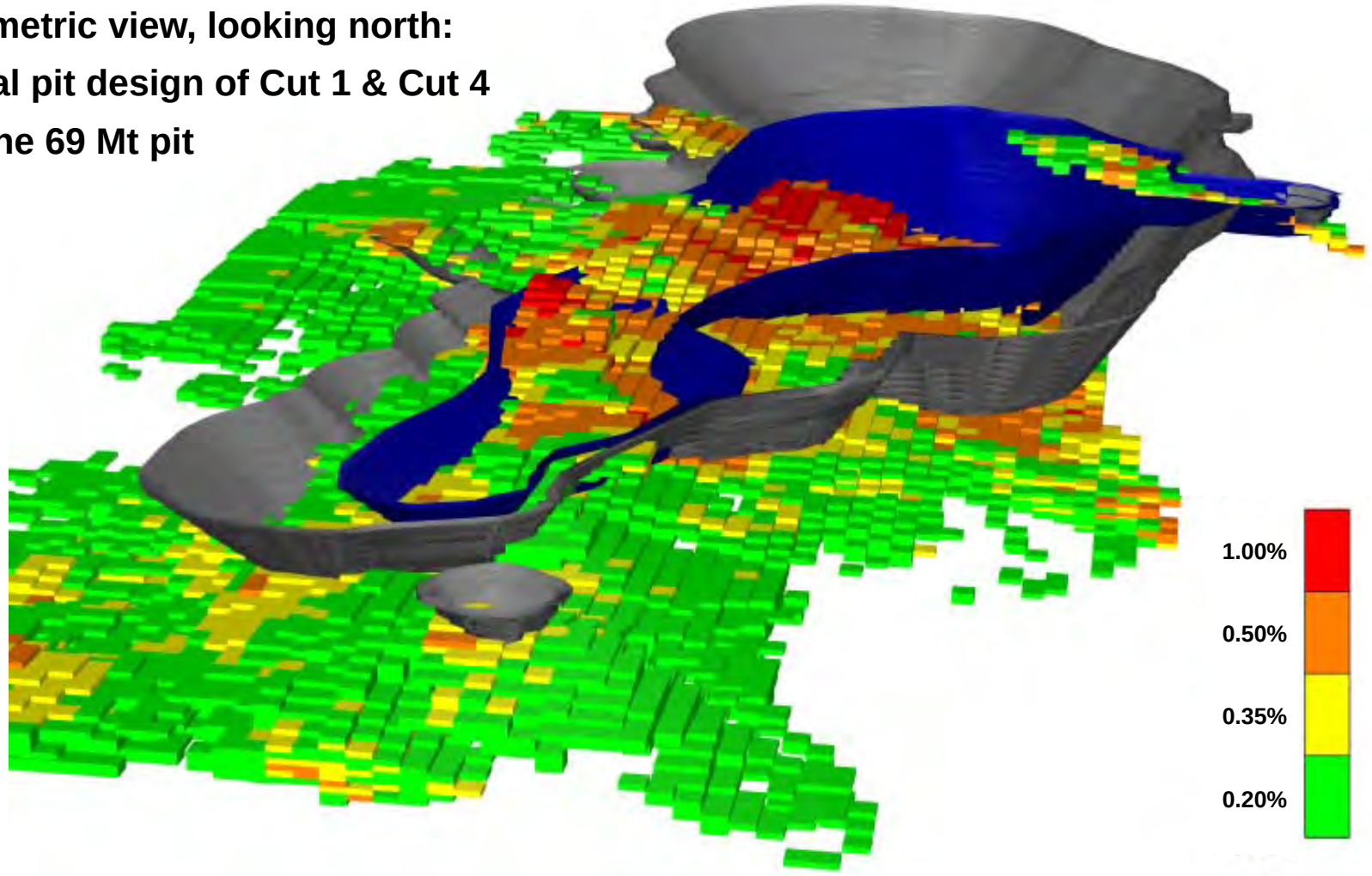


- **305 holes totalling > 42,000m**
- **Deposit covers 2,600m x 700m**
- **Depth > 150m at eastern edge**
- **Plunges north**
- **Remains open to northeast**

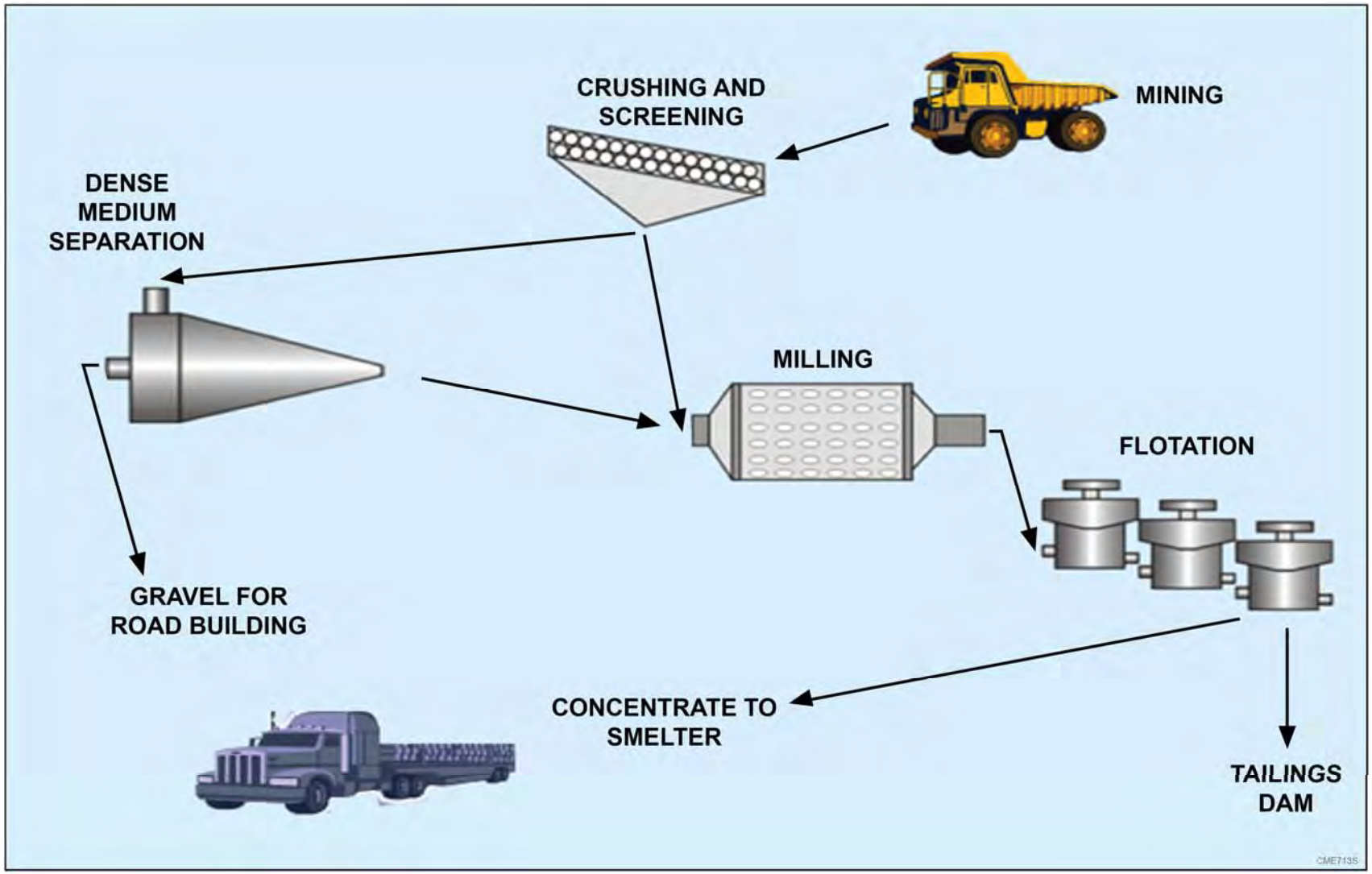
Proposed pit outline

Pit design

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



Process flow sheet



Major infrastructure costs

- Relocate the road around the mine
- Relocate the Black Nossob River
- Road upgrade
- Water supply pipeline
- Power line

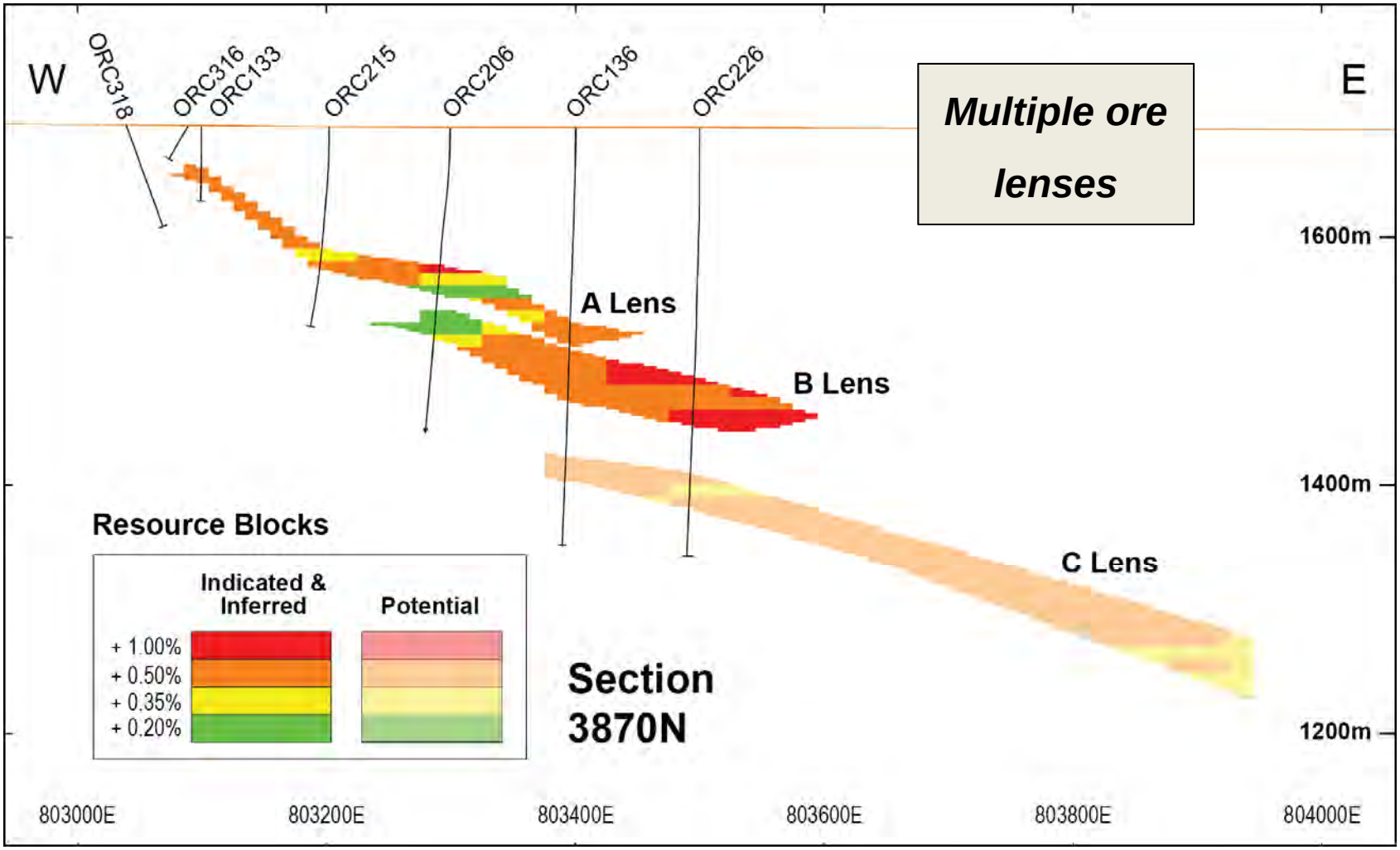
Preparing for IPO 2010

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

But …

- **Project financials not sufficiently attractive**
- **Unable to attract new investors**
- **Withdrew prospectus in early 2011**

New structural interpretation



Resource estimate, August 2012

Cut-off grade	Resource	Grade	Metal
(% Cu)	(Mt)	(% Cu)	(tonnes)
0.25	136	0.53	712,000

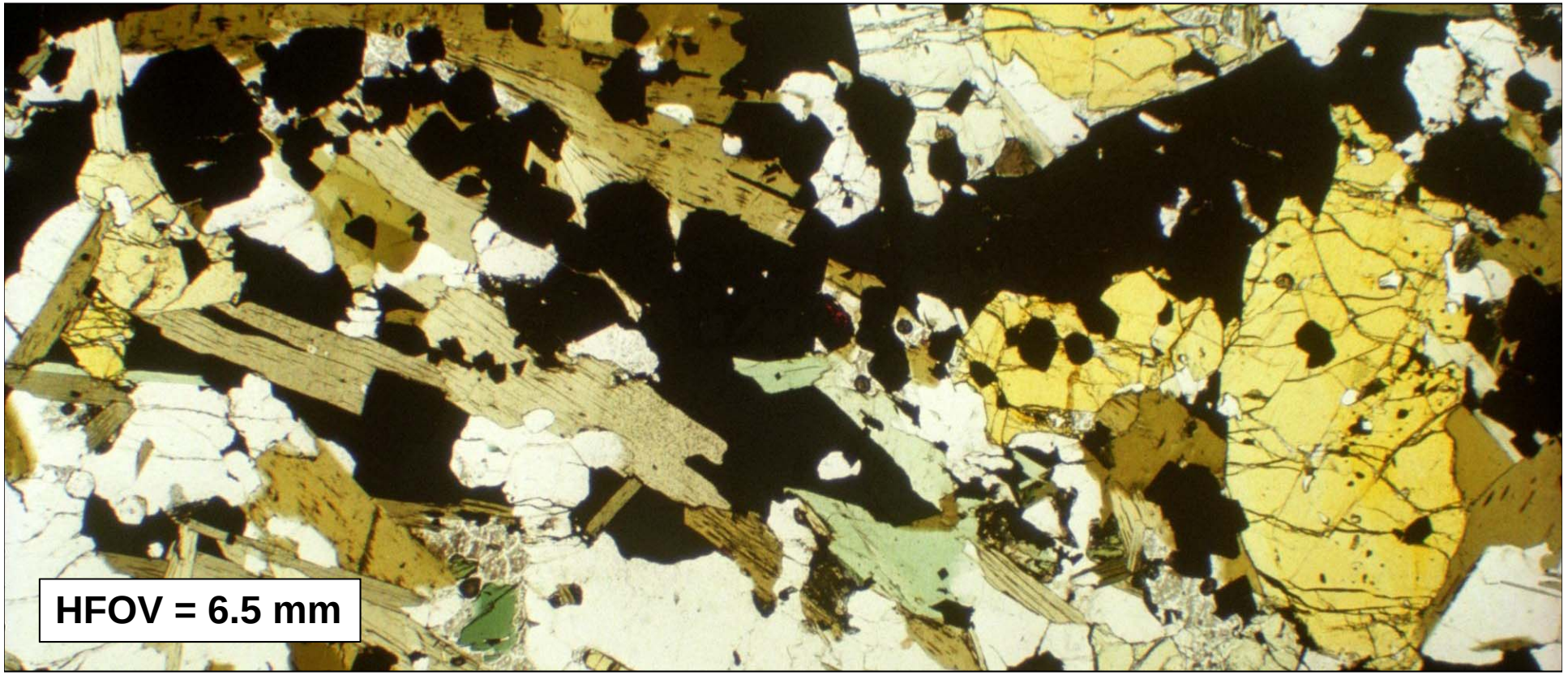
Additional potential in area of sparse drilling:

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

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

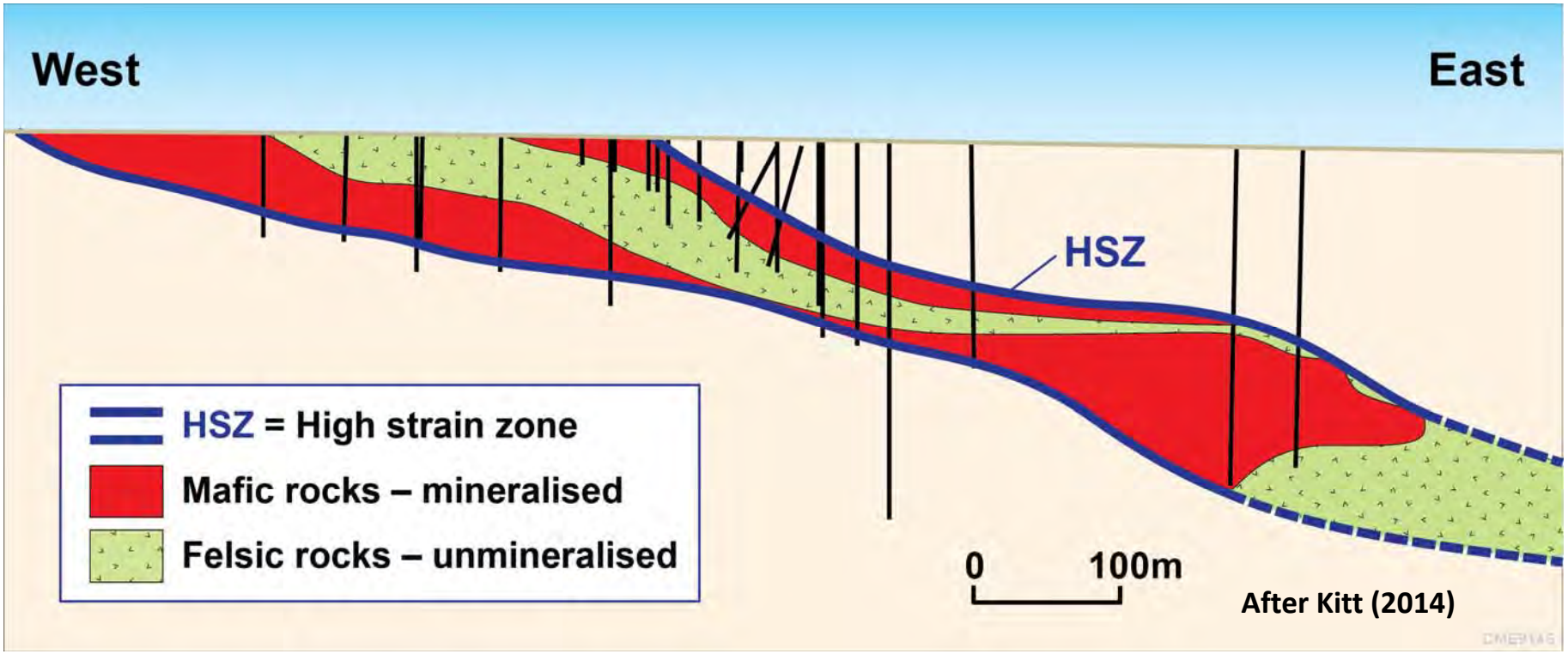
Shear zones

Narrow shear zones are characterised by -

- **Strong deformation (shearing)**
- **Alteration to biotite-epidote**

  i.e. strong retrograde fluid flow
- **Concentrations of chalcocite Cu_2S**

Omitiomire - cross section



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**
- **Reacted with tectonised amphibolite**
- **Late in Damaran orogenic event - post-peak metamorphism**
- **Shear zone interpreted as detachment fault related to exhumation of Ekuja dome**

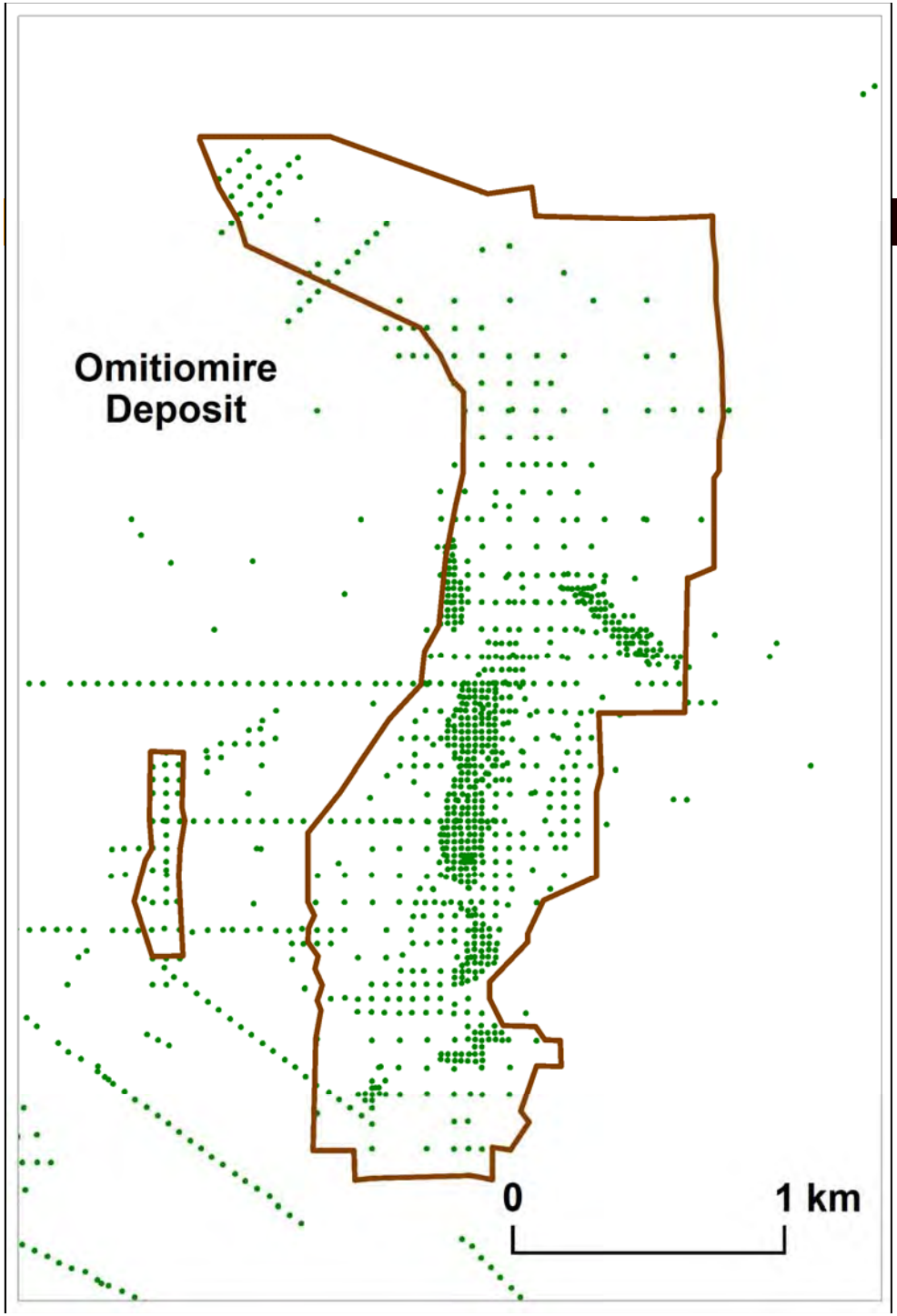
Heilong investment

- **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**

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**

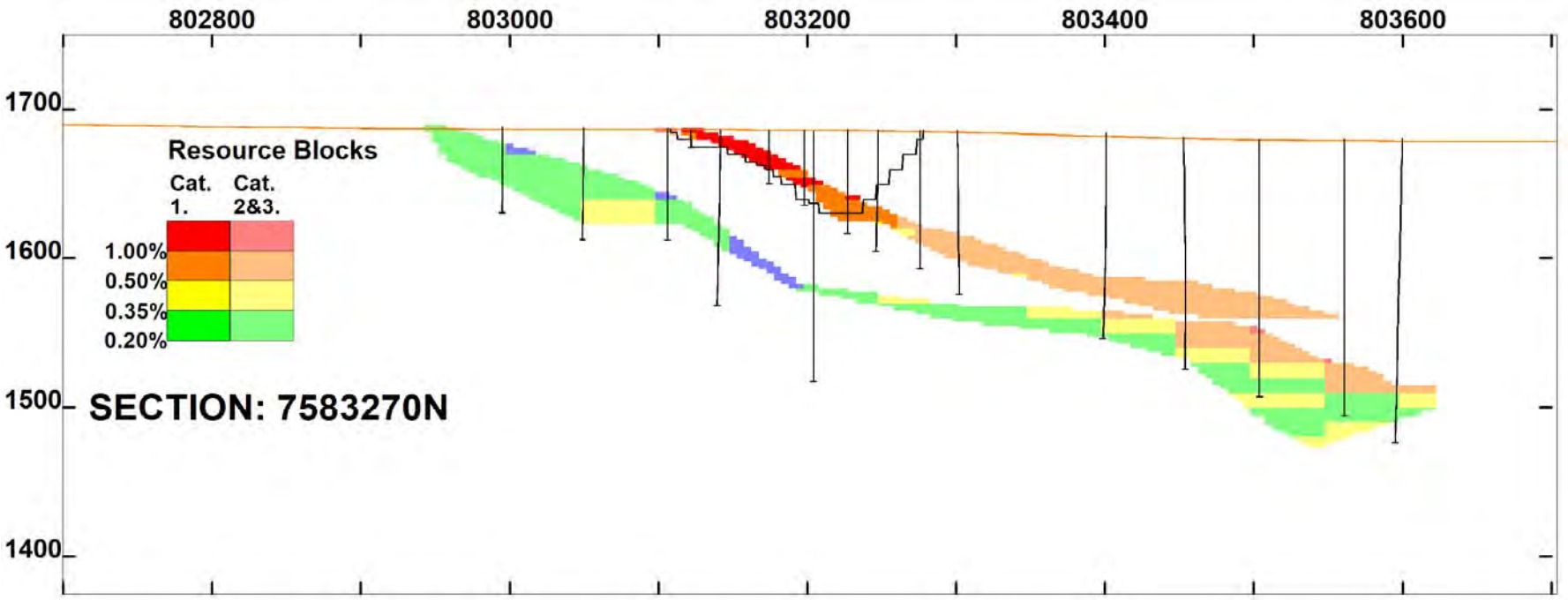


Infill drilling

- **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)**

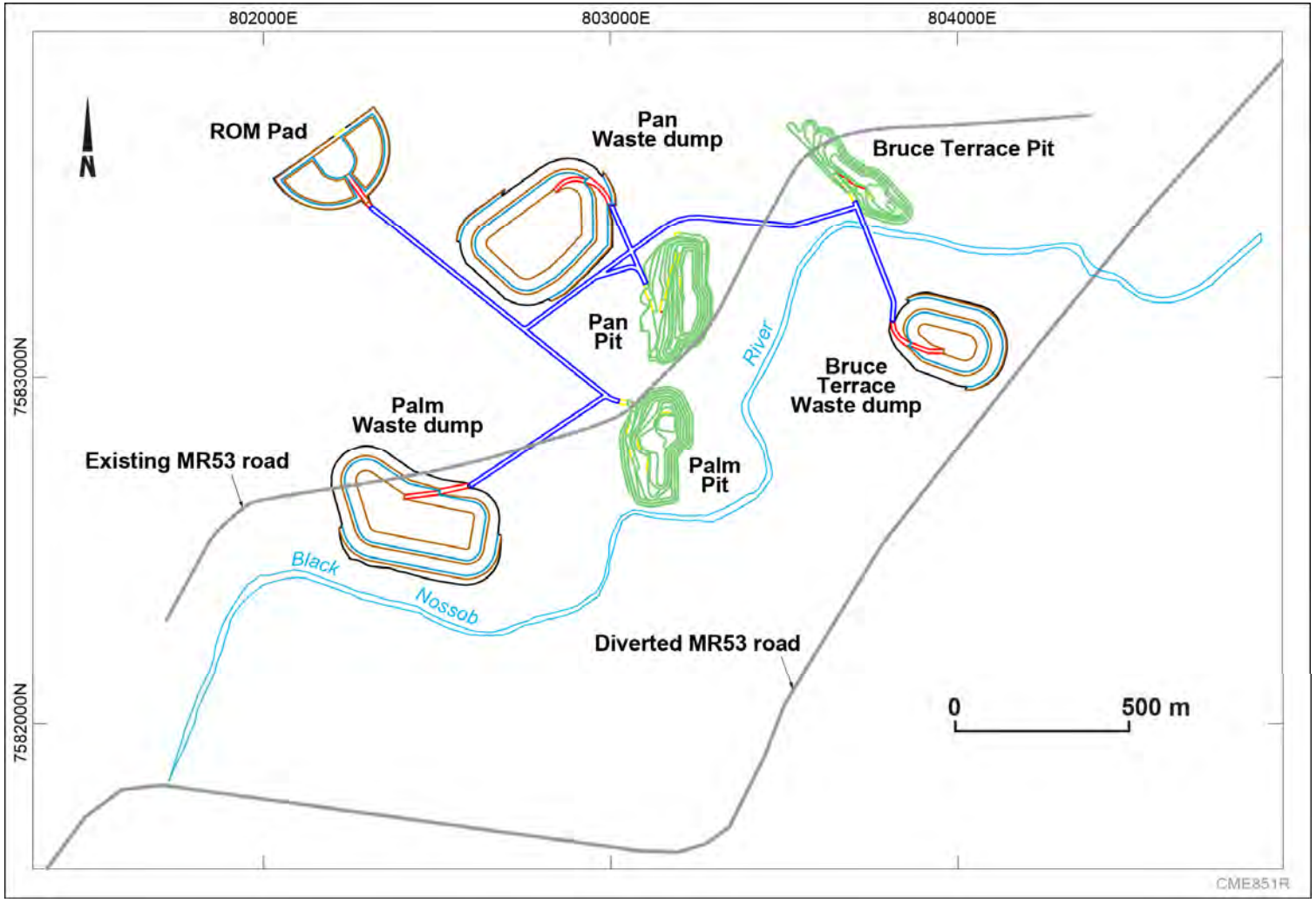
The clusters of closely-spaced holes show oxide copper zones proposed for early mine development

West to east section



Section showing Pan Pit

Phase 1 project: pit layouts



Three small pits located on near-surface high grade oxide copper

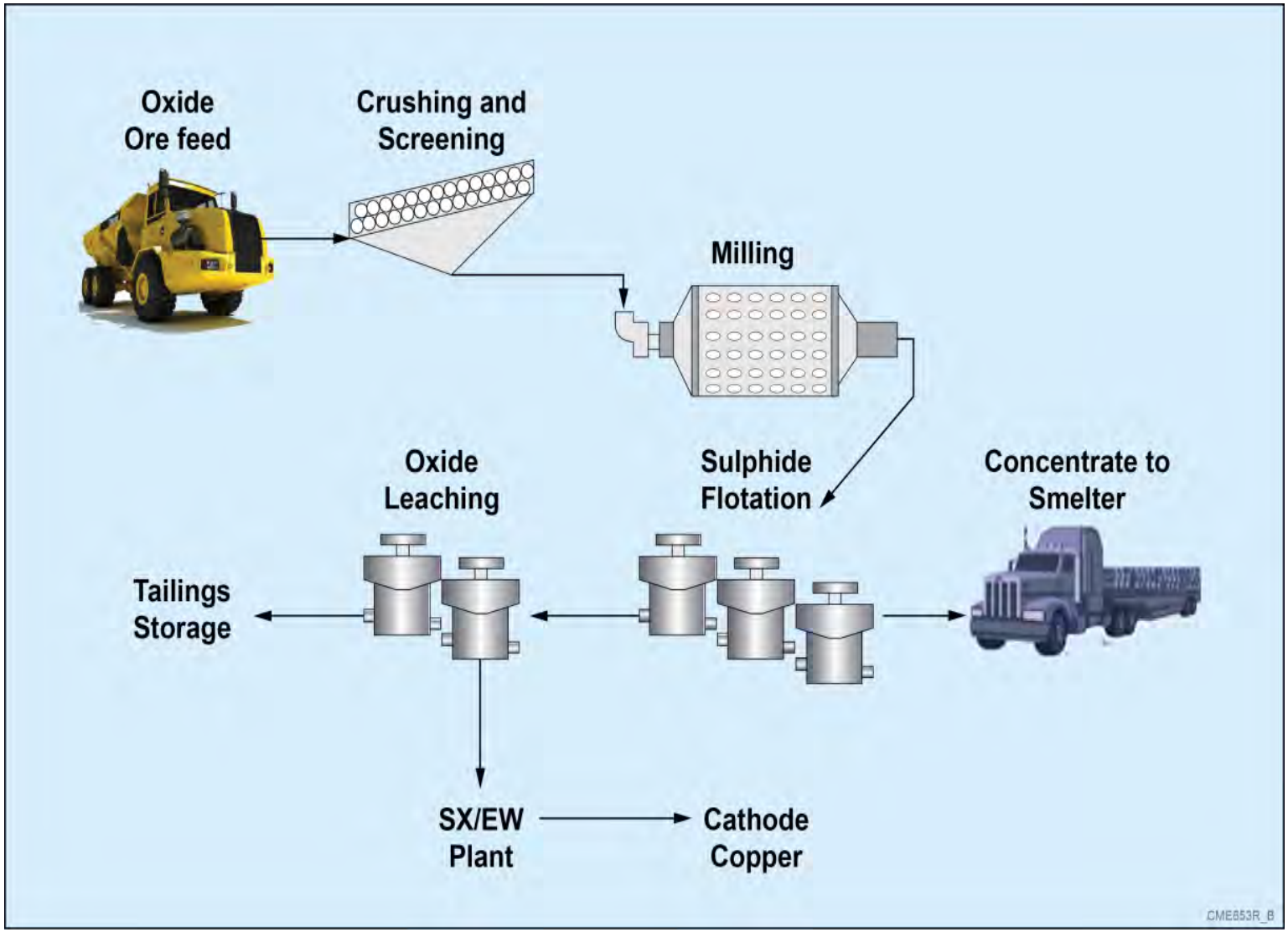
Phase 1 project: ore processing

- **Chalcocite: Flotation → copper concentrate**
- **Oxide copper: Acid leach – solvent extraction – electrowinning**

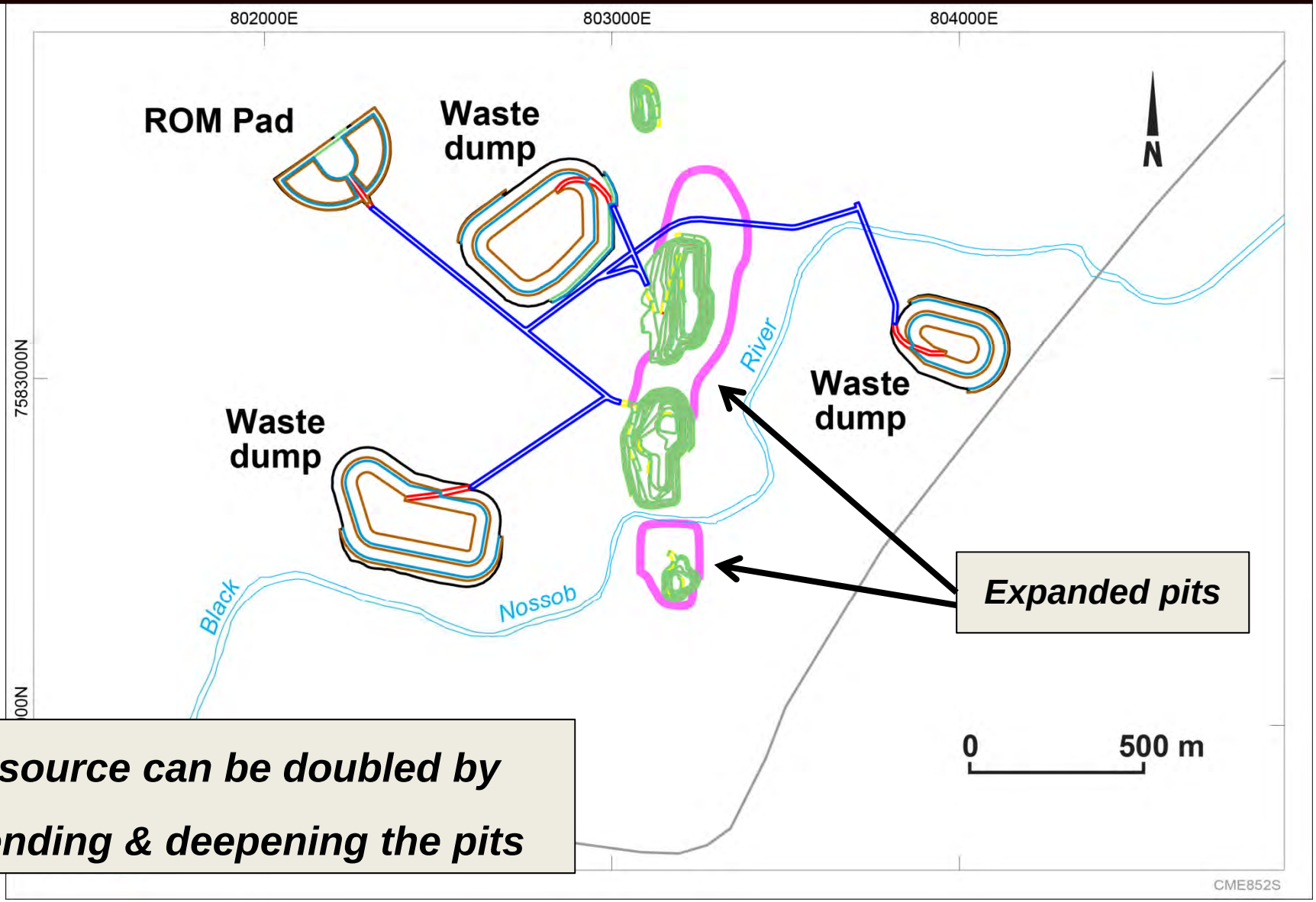
→ cathode copper (at least 99.9% Cu)

- **Copper produced: 25,570 tonnes**

Phase 1 project: flow sheet

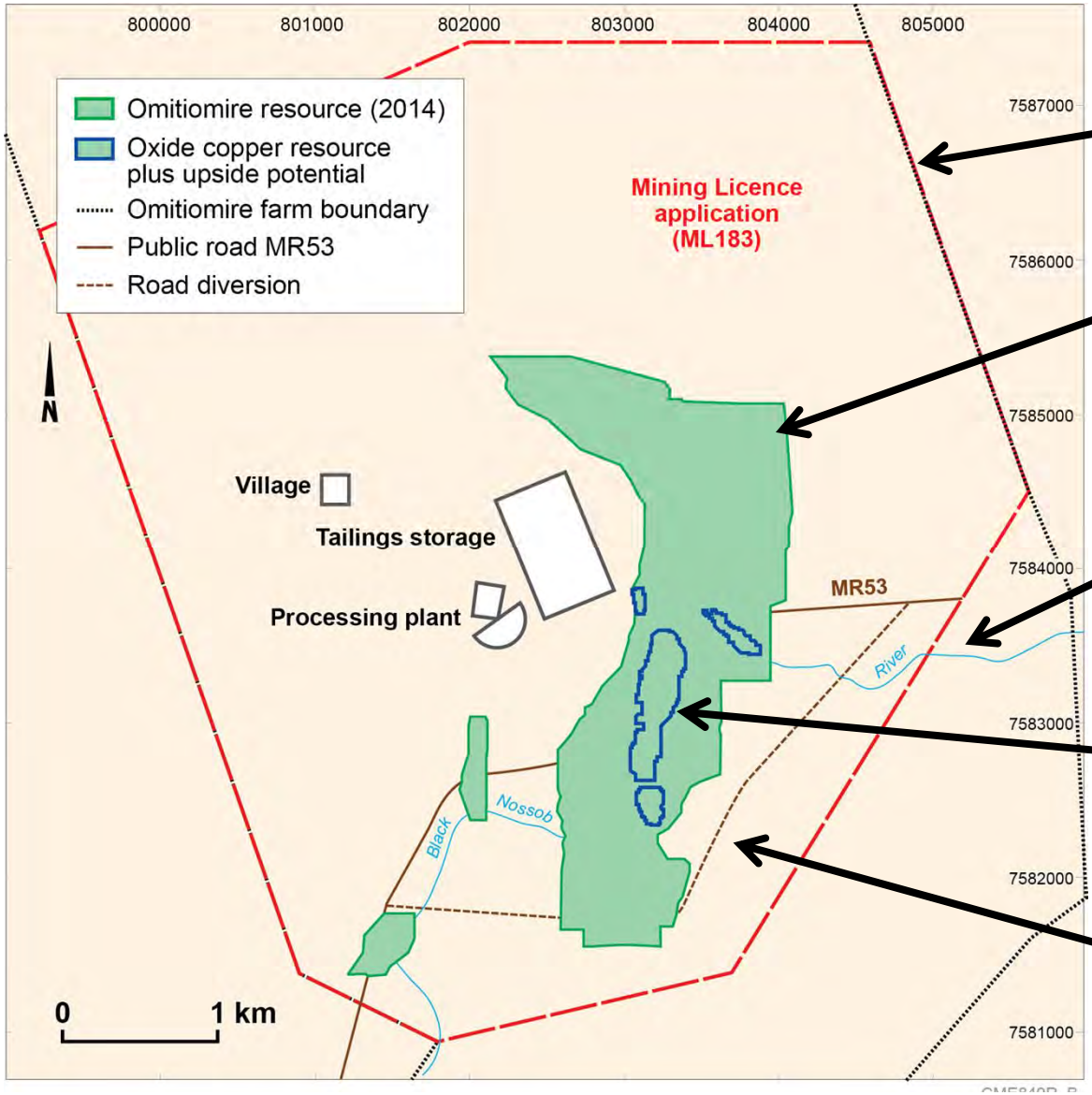


Phase 1 project - upside potential



Resource can be doubled by extending & deepening the pits

Site layout



Farm boundary

Omitiomire resource

River (not moved)

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 -

Surface & groundwater	**Traffic**	**Biodiversity**
Air quality	**Noise**	**Archaeology**
Social / economic	**Visual**	**Soils**

Environmental management plan

- **The EMP is a legal commitment for sound environmental practice**
- **Procedures & policies**

→ **Prevent pollution & limit damage**

- **Induction, training & awareness**
- **Stakeholder engagement, including public participation meetings**

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**

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**