

Does the Central African Copperbelt Extend into Northern Botswana?



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Botswana Resource Sector Conference

10 – 11th June 2014

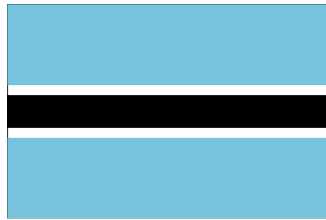
Simon Jones – District Geologist



Why The Central African Cu-Belt? **High Tonnes and High Grades**



Extending the Copperbelt – the Potential to Transform



of exports
76%

value of
**\$2.98
Billion**

45%
of government
tax revenues

DEBSWANA 

De Beers value (2011) **\$12.75 Billion**
Production **20,216 Carats**
\$701 million to government



80%
of exports

value of
**\$6.9
Billion**

45%
of government
tax revenues

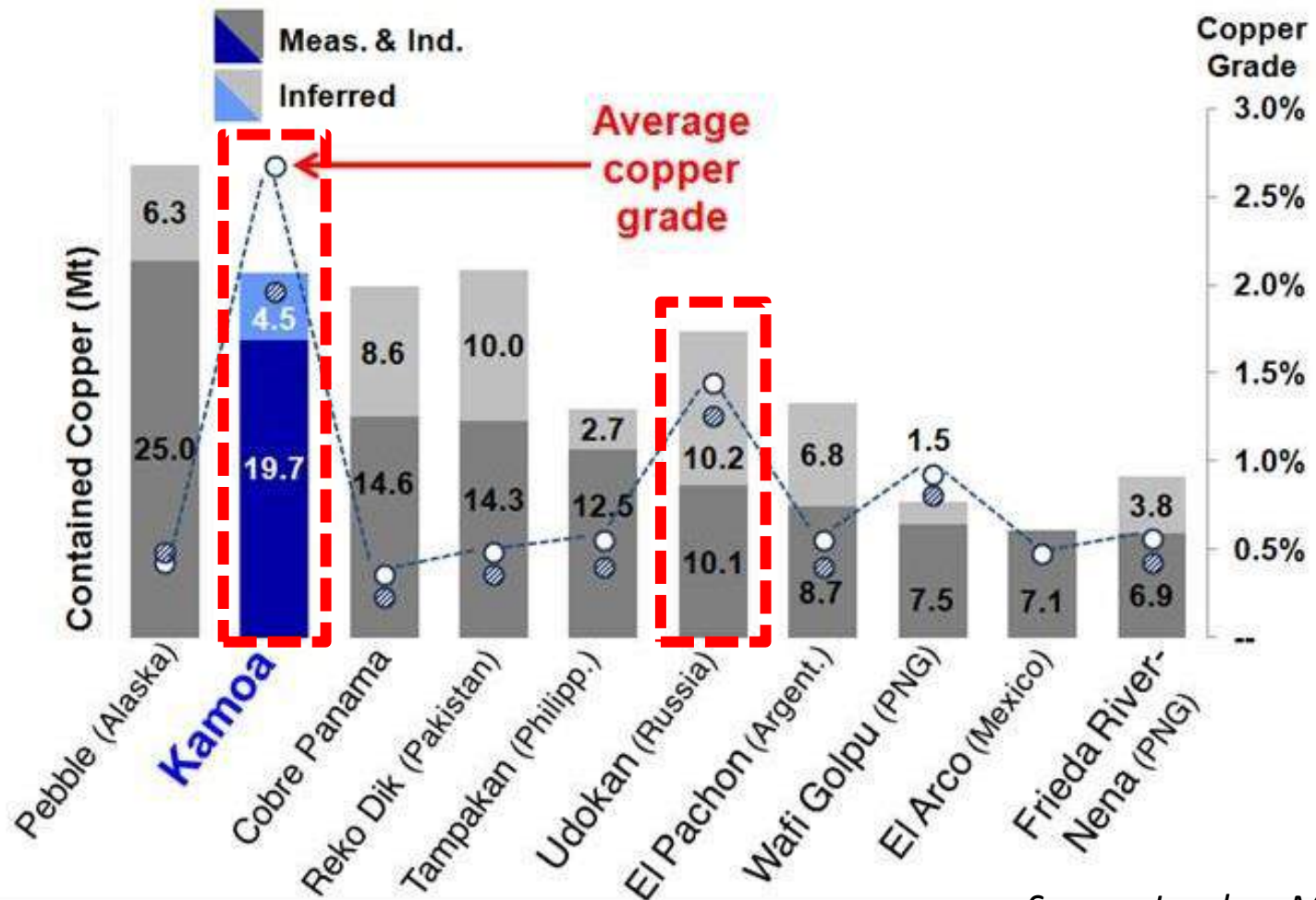

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Market Capitalisation \$13.08 Billion
Copper production 412,281 tonnes
\$620 million to government



Largest Undeveloped Copper Deposits

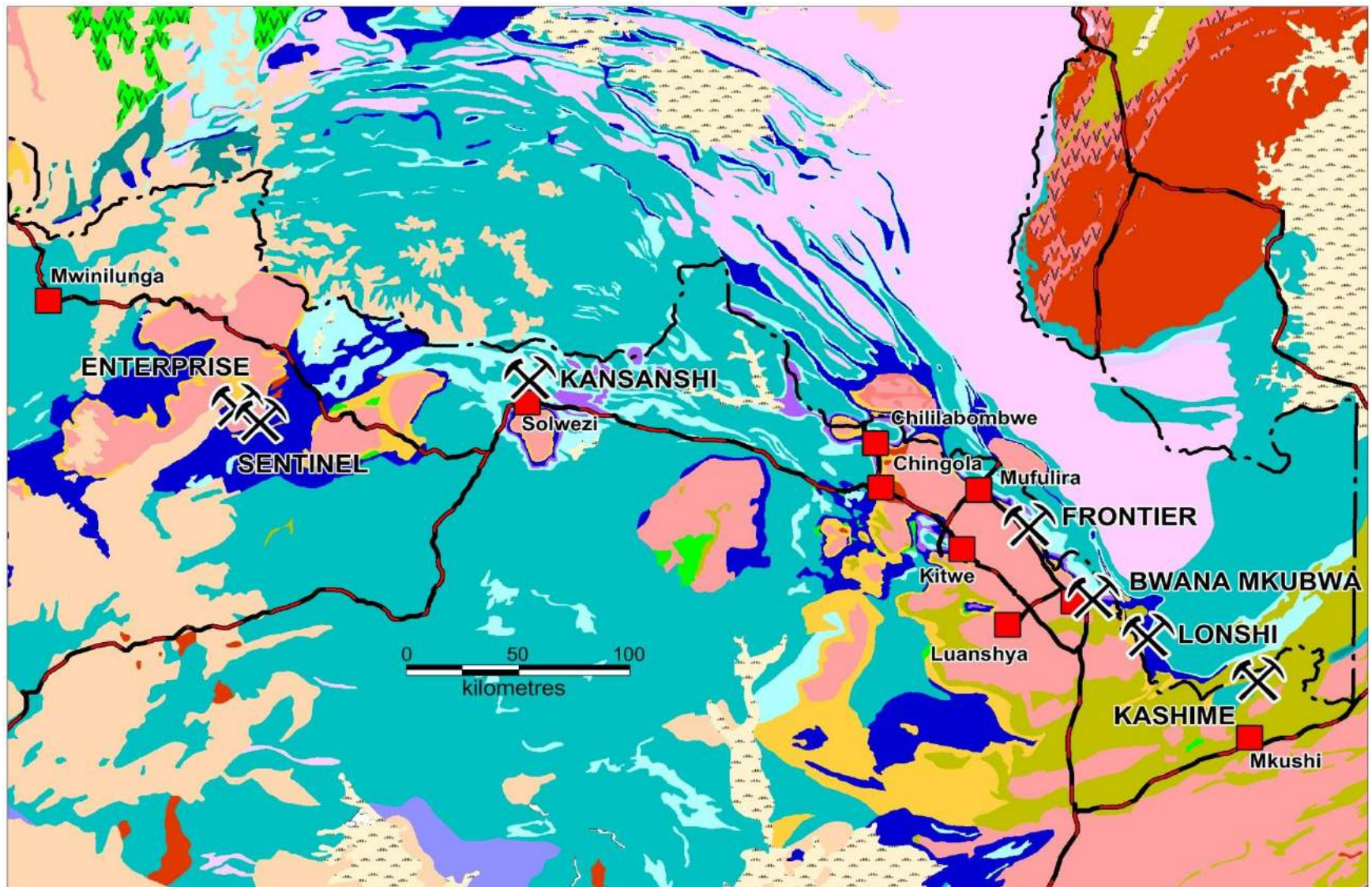
Sed-Cu Grades >> Porphyry Cu



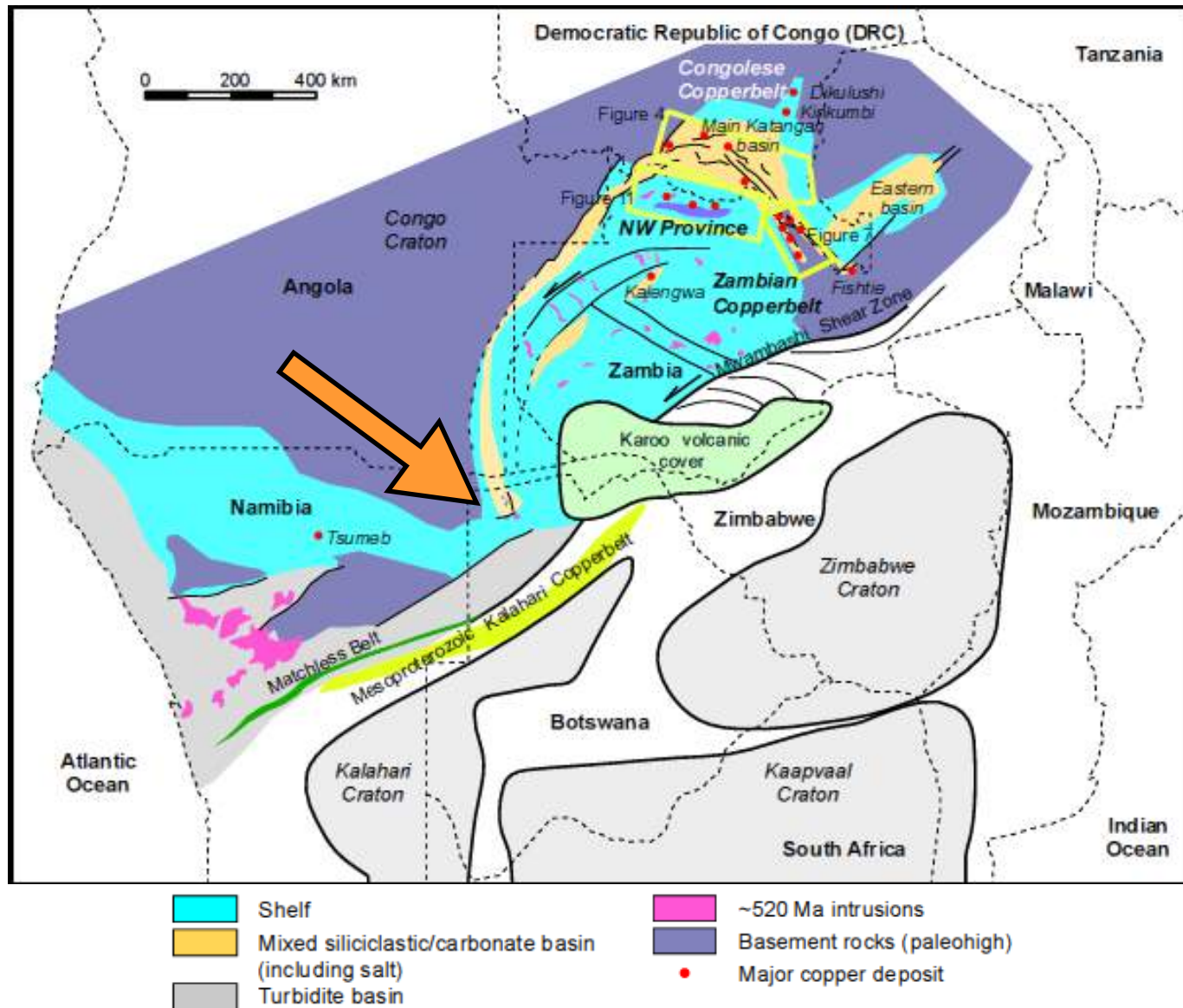
Source: Ivanhoe Mines, 2013



The Central African Copperbelt



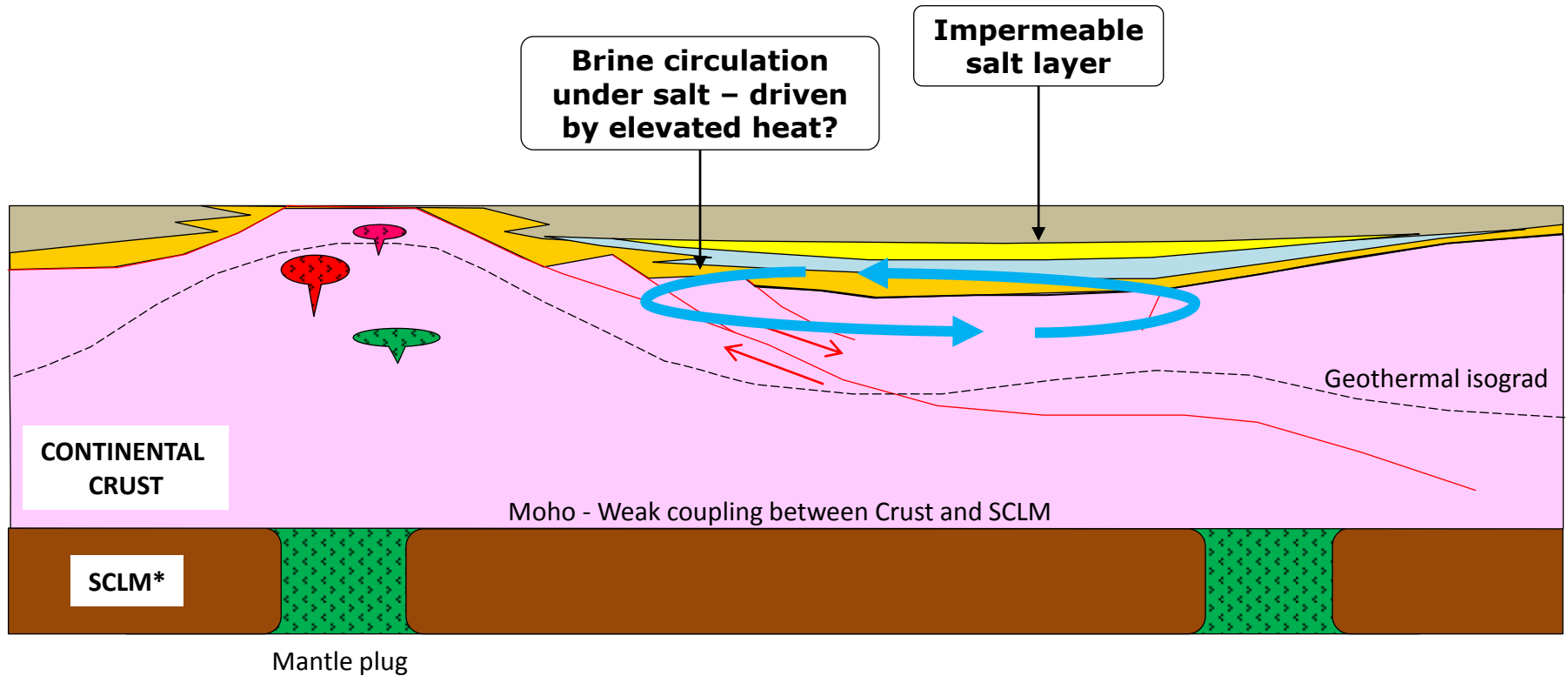
The Central African Copperbelt



Hitzman, 2010



The Central African Copperbelt: 800 – 600 Ma

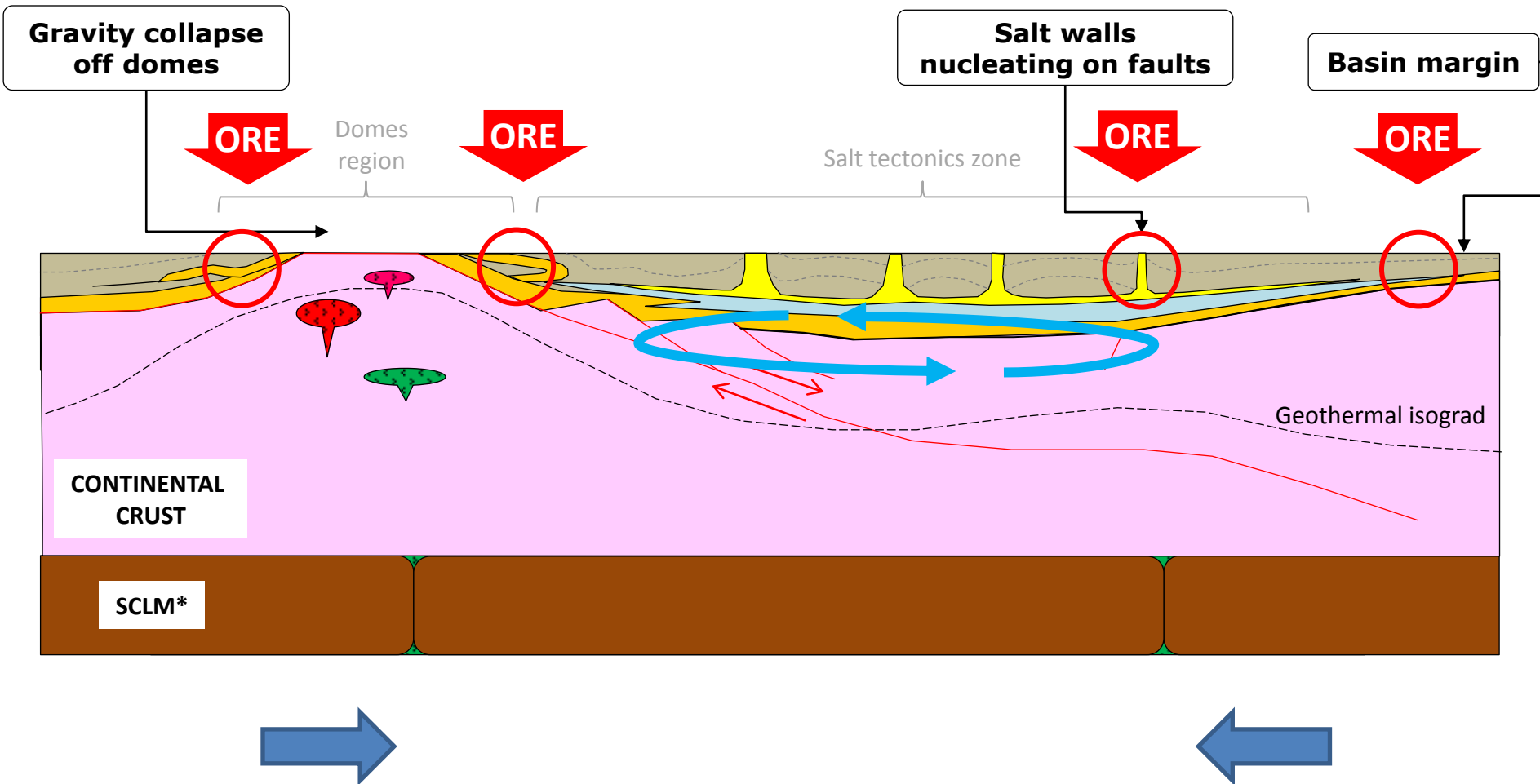


*Sub-Continental Lithospheric Mantle

Modified after Wood, 2012



The Central African Copperbelt: 600 – 500 Ma



Modified after Wood, 2012



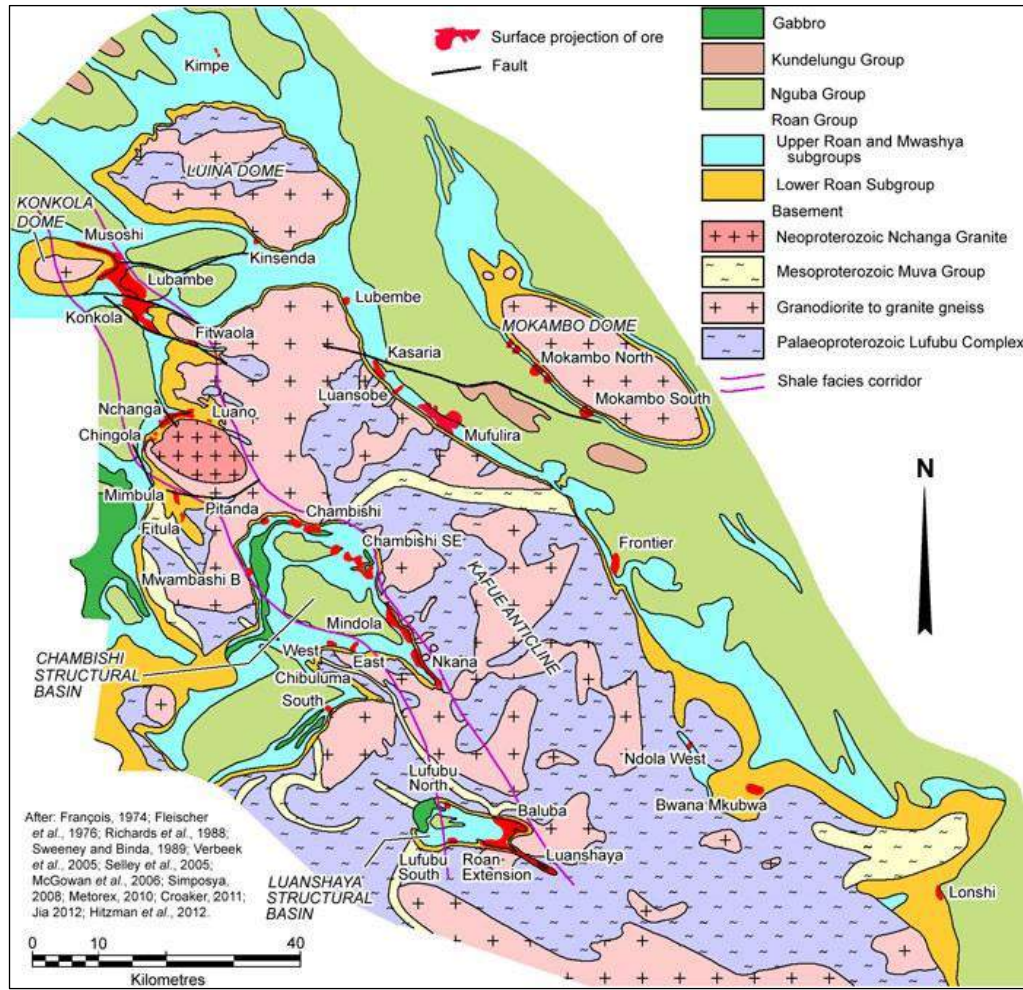


What do we see in Botswana? **Sed-hosted Cu processes**



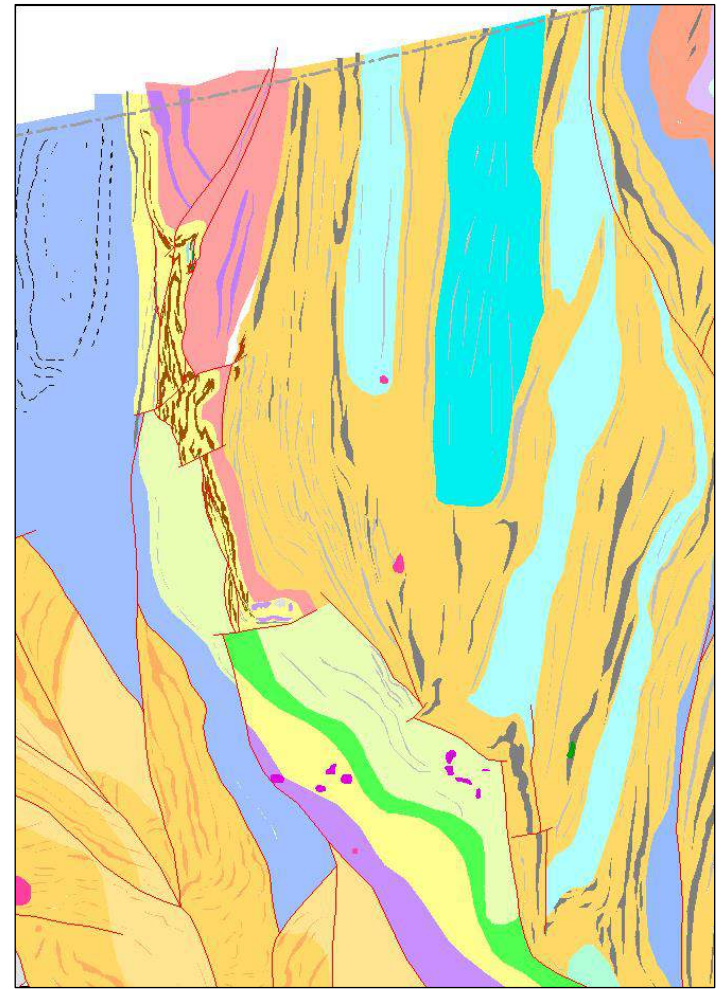
Macro-scale Structure

Zambia – Kafue anticline



Porter, 2014

Botswana – Xaudum Project



Godfroid, 2013

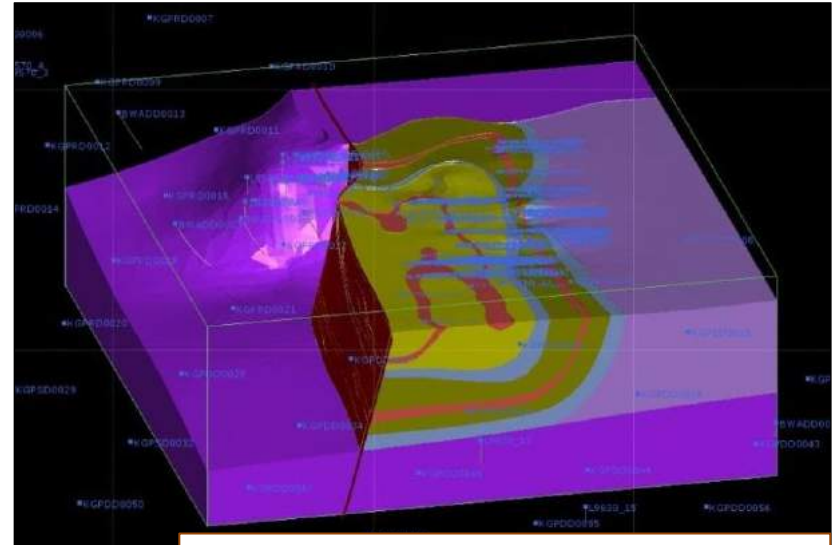


Disharmonic and complex folding

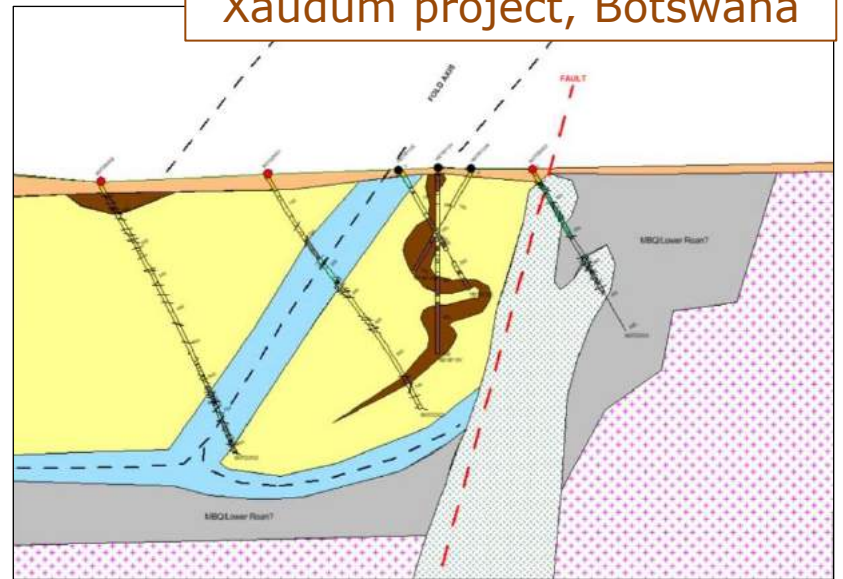
Nchanga mine, Zambia



Xaudum project, Botswana



Mufulira mine, Zambia



Above images: Kidder, 2014



Complex folding – flattening dominates

Zambia



Xaudum Project – Botswana





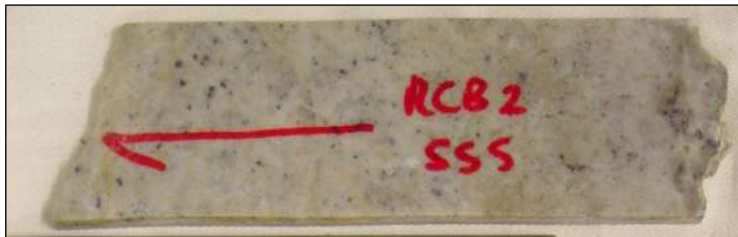
SHC Alteration Systems: Basin-Scale

MacIntyre, 2006



Brine metasomatism

Zambian Copperbelt



Xaudum project, Botswana

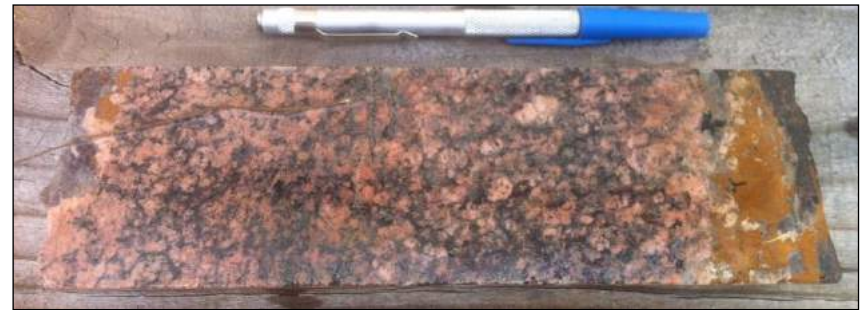


Potassium Metasomatism of Basement

Zambian Copperbelt



Xaudum project, Botswana



Halokinesis – salt evacuation driving deformation

Zambian & Congolese Copperbelt



Nkana mine, Zambia



Tenke Fungurume, DRC

Xaudum project, Botswana



Mafic rocks – Metal and Heat

Zambian Copperbelt

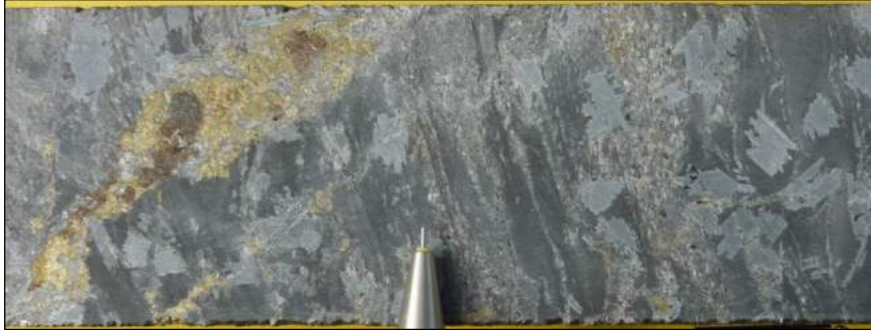


Xaudum project, Botswana



Reductants – Graphitic Shale

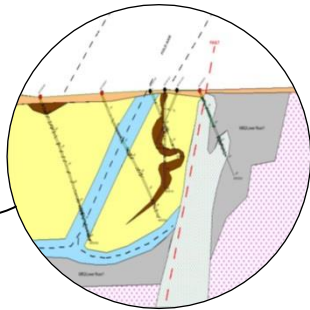
Zambian Copperbelt



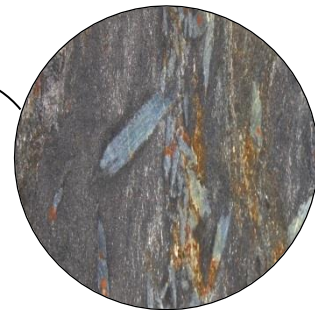
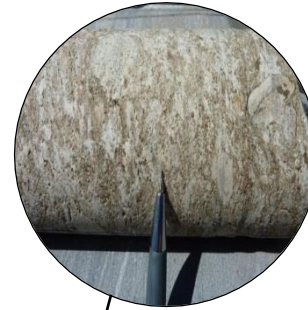
Xaudum project, Botswana



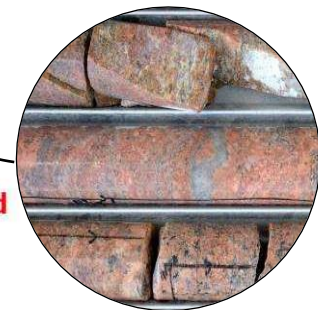
Structure



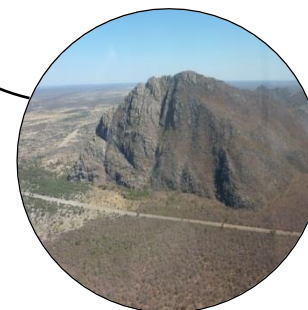
Halokenesis and brine metasomatism



K-feldspar metasomatised basement



Porous Lower Roan (?) Sandstones



Fishtie, Zambia
Kamoa, DRC

Frontier, DRC

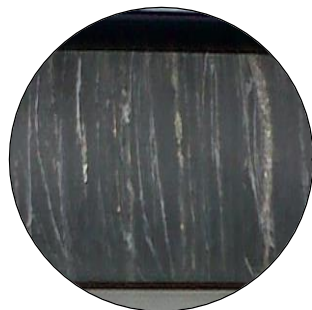
Lonshi, DRC

Nkana, Zambia
Kupferschiefer, Poland

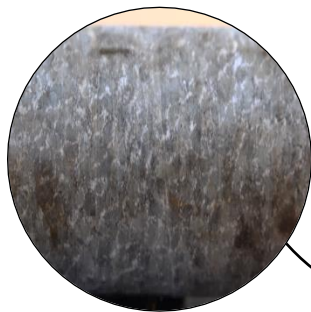
Copper.... watch this space



Reductants



Thermal input



How do we find these Deposits?

Time, Money & the Right People



KM-scale spaced drilling from **geochemical** sampling of Kalahari sand

Hydrogeochemistry sampling ground waters

Airborne **Gravity** to map basement domes

Airborne **Electro-Magnetics** to map graphitic shales

Drilling conceptual targets



Thank You for Listening.

Questions?

Find our stand at the back entrance to the Conference Hall



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