Defining the Challenge

Ron Hackney
Acting Section Leader
Regional Geology and Drilling
Defining the Challenge

1. Rates of discovery versus increasing demand
2. Maximising data potential
   • from the surface to the mantle
3. Science excellence
   • predictions from integrated data
4. Supporting stakeholders
   • narrowing the search space
5. Demonstrating Return on Investment
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Defining the Challenge – Discovery vs Demand

How much do we need?

Cumulative copper production for all history (1000 BC to 2016 AD) = 687 Mt Cu

Forecast cumulative demand over next 26 years (2017-2042) = 689 Mt Cu

Historic Demand
Average growth rate of 3.2% pa over last 25 years

Forecast Demand
Based on 1.8% pa growth

Source: MinEx Consulting © June 2017 based on historical data from USGS and the Australian Department of Industry.
How much are we finding?

MinEx Consulting, 2017
How much are we looking?

Time to tackle the 80% of Australia's subsurface that is largely under-explored

The Challenge and Opportunity: Looking Deep Under Cover
Defining the Challenge – Maximising Data Potential

Data from the surface to the mantle

- Integration is key

Cover a large enough area to encompass a new region with something new to discover

Multidisciplinary studies through the mineral systems lens
Crust

Lithospheric Mantle

Convecting Mantle

Lithospheric Mantle

Base of Plate

Moho

AusLAMP resistivity models

AusArray velocity models
Defining the Challenge – Science Excellence

Innovative prediction using new types of data and new/emerging technologies
Tools, analytics and workflows for the best chance of discovery
Better prediction of geology under cover
What areas are prospective for Cu-Au in NT?

Mineral System Components

- Source
- Driver
- Pathway
- Deposition

IOCG Example
What areas are economic undercover for Cu-Au?

- New economic fairways tool
  stuart.walsh@monash.edu

- Economic assessment for a Tennant Creek-sized IOCG deposit (4 Mt @ 2% Cu, 3 g/t Au)

- Prospective East Tennant region undercover is also economic.
Defining the Challenge – Supporting Stakeholders

Reduce the search space

- test mineral potential hypotheses to open new under-cover search spaces

Data and science to ensure investment in the most prospective areas

A culture of collaboration between industry, academia and government

Suitably skilling the next wave of geoscientists
Exploring for the Future – Northern Australia
Scale reduction
Scale reduction
Scale reduction
Scale reduction
Scale reduction
Defining the Challenge – Return on Investment

Return on Investment is part of the challenge

What are the returns to government from precompetitive geoscience?
Return on Investment – part of the challenge

EFTF has invested ~A$28.5 million to narrow the search space from northern Australia to the East Tennant area.
Return on Investment – part of the challenge

If an Ernest Henry-size mine (89.8 Mt of 1.17% copper + 0.6 g/t gold) were to be discovered in this region…

Net Present Value for a 30-year mine life

- up to $1.3 billion overall
- up to $748 million return to governments

Benefit/cost ratio of ~26 on government investment
Meeting the Challenges

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John Vann (Anglo American)
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