NW Mineral Province Discovery Program

Compilation Update

R Valenta – February 2018
Recent history – discoveries and studies

DNRME NW Mineral Province Discovery Program

SREP

Research ≠ Discoveries

RESEARCH + NEW DATA

EXPLORATION ACTIVITY

TIME

DEPTH


Lady Loretta  Starra/Mt Dore  Tick Hill  Grevillea  Rocklands

Pegmont  Maronan  Eloise  Ernest Henry

Osborne/Kulthor

increasing discovery depth

100m 200m

University studies (ARC, >50 PhD Theses)

GA/GSO mapping

IPI Projects

3D Map North Qld

NWQMEP

Open file compilations

CRC LEME 1 and 2

PMD*CRC

AGCRC

ongoing geophysical and geological studies
Current state

NWMP mines are maturing

- Short time frame to closures
- Declining economics of remaining ores

Lack of exploration success – need for a “step change”

- Multiple research projects and compilations over decades
- Strong base of data and knowledge
- Potential to improve industry focus of precompetitive products
- Untried approaches required

Decline in technical resources for exploration companies

- Declining exploration expenditure
- Decreasing resources for technical support

Increased role of junior companies

- Shorter time frames
- Need to reach drill stage quickly
- Need to maintain investor interest

New discoveries will not be easy

- Subtle
- Blind
- Buried under younger cover
Future state

- Maximised value and relevance of existing data and knowledge
- Key elements of mineral systems understood and mapped
- New data and approaches aiding exploration
- Full toolkit for footprint recognition of important mineral systems
NWMP Discovery Program Components

Comprehensive compilation
• updating the existing open file data compilations (to extent possible)
• distilling the results of geoscientific studies
• ensuring that this information is comprehensive, spatially consistent, well-explained
• delivered in a form which can be easily used by explorers and other projects

Mineral systems insight
• Regional structural/stratigraphic targeting frameworks
• Mineral systems and footprints
• Studies of Igneous fertility
• New insights from data analytics

Exploration toolkits
• Atlas of Northwest Mineral Province mineral deposits
• Geochemistry over post-mineralisation cover sequences
• Halo models for recognition of blind or covered systems

Transformative new data and interpretations
• New regional airborne gravity gradiometry
• Cover geochemical surveys
• Targeted drilling
• New interpretations of existing precompetitive datasets
Survey of Industry - results

- Responses from a range of major and junior companies
- Roles covering range from MD/CEO to Project Geologist

### Roles

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- Open file exploration data (1/26)
- Atlas of existing deposits and footprints (2/26)
- Full indexed GIS spatial compilation (4/26)
- Mount Isa drillcore repository (9/26)
Atlas of existing deposits and footprints

Northwest Mineral Province
Deposit Atlas Prototype

Mount Isa Cu-Pb-Zn-Ag and Ernest Henry Cu-Au

January 2018

Basic geology and geophysics
Atlas of existing deposits and footprints

Northwest Mineral Province
Deposit Atlas Prototype

Mount Isa Cu-Pb-Zn-Ag and
Ernest Henry Cu-Au

January 2018

Basic orebody geometry
Atlas of existing deposits and footprints

Northwest Mineral Province
Deposit Atlas Prototype

Mount Isa Cu-Pb-Zn-Ag and
Ernest Henry Cu-Au

January 2018

Metal zoning and ore examples
Atlas of existing deposits and footprints

Northwest Mineral Province
Deposit Atlas Prototype

Mount Isa Cu-Pb-Zn-Ag and Ernest Henry Cu-Au

January 2018

Halo mineral zoning
Atlas of existing deposits and footprints

Northwest Mineral Province
Deposit Atlas Prototype

Mount Isa Cu-Pb-Zn-Ag and
Ernest Henry Cu-Au

January 2018

Updated solid geology
Atlas of existing deposits and footprints

Northwest Mineral Province
Deposit Atlas Prototype

Mount Isa Cu-Pb-Zn-Ag and Ernest Henry Cu-Au

January 2018

Trace element zoning - plan
Atlas of existing deposits and footprints

Northwest Mineral Province
Deposit Atlas Prototype

Mount Isa Cu-Pb-Zn-Ag and
Ernest Henry Cu-Au

January 2018

Inner halo zoning
Mount Isa drillcore repository

• Key resource for explorers in the region
• Representative core and accompanying information all major deposits
• Collection under way
### Full indexed spatial data compilation

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Full indexed GIS spatial compilation

- Faceted spatial data index
- Updated time-space chart
- GIS time-sliced stratigraphy, structure, igneous events
- 2D isopachs/depths from existing 3D models
- Exploration target compilation
- Compilation of miscellaneous legacy datasets
  - Metamorphic map
  - NABRE sections
  - CRC LEME regolith maps
  - Others as available
- Update of solid geology interpretation where justified
Faceted spatial data index

- Full compilation of reports, theses, publications, etc
- Categorised by study focus, data type, mineralisation style,…
- Spatially indexed
- Faceted search by theme

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• Download
• View
• Link
Updated time-space chart

- Proterozoic Time-Space Chart, 2017
- North-West Queensland
- Strategic Resources Exploration Program
- NORTHWEST QUEENSLAND
- PROTEROZOIC TIME-SPACE CHART, 2017
- University of Queensland
- SMIBRC

1740-1800
Updated time-space chart

PROTEROZOIC TIME-SPACE CHART, 2017

1670-1650
2D isopachs/depths from existing 3D models

Pmd*CRC – Thickness Leichhardt Superbasin
Isopachs from 3D models

Pmd*CRC – Thickness Isa Superbasin

1670-1650
Exploration target compilation

Geophysical/Geochemical

Conceptual

Prospectivity

Geomechanical
Current Status and Next Steps

• Current Status
  – Time-space compilation complete
  – Atlas Prototype complete
  – Target compilation complete
  – Spatial data index well progressed
  – Core collection under way
  – Legacy datasets near completion
  – Solid geology updates under way

• Next Steps
  – Expand Atlas Prototype (Mt Isa/EH) to full atlas of all deposits
  – Full core collection
  – Additional studies based on gap analysis
Success Scenarios

1. In exposed and data-rich areas of the Mount Isa region: Value-added interpretation of geoscientific datasets, combined with state-of-the-art data analytics, uncovers a previously unrecognised or under-appreciated target which turns into a major discovery.

2. In areas under relatively thin cover: New insights into key controlling features and halos related to known deposits, combined with new geophysical and deep-looking geochemical data, result in a new major discovery.

3. In deeply covered areas: New interpretations and 4D models allow mapping of high priority target regions, and a new major discovery is made with the aid of these interpretations and new datasets.