



Northwest Mineral Province New Discovery Program

Rick Valenta – 5 December

Acknowledgements:

- Vladimir Lisitsin, Tony Knight, and entire GSQ Team
- Collaborating researchers
- Industry contributors

A World Class Mineral Province

Selected world class Sediment-hosted BM deposits







Current State



Mines Maturing Time Frame Economics



Declining Technical Resources Budgets Technical support



Lack of Exploration Success

Strong base of study Untried approaches needed



Increased Junior Presence Time frames Promotion



Discovery Challenges Cover Deep/blind targets



Increased Responsibility Access Social/environmental



Recent history – discoveries and studies





Observations

- Major studies did not lead to exploration success why?
 - Nothing left to be found?
 - Exodus of majors?
 - Insuffient link to exploration outcomes?
 - Inappropriate scale?
 - Lack of industry takeup?
 - Other factors (eg moratorium, company strategies,...)
- Hard to make a compelling case for another set of similar studies
- Can we make better use of what has been done already?



QLD Government response in NW QLD

Deliver minerals and natural gas geoscience data systems and promote the region's investment potential:

- Improve pre-competitive geoscientific data
- Establish a Minerals Collaborative Exploration Program
- Develop new geological databases
- Initiate gas exploration in proximity to the Province
- Promote the investment potential of the Province





Strategic Resources Exploration Program





Potential Drivers for a step change

New understanding of mineral systems

- Process
- Empirical

Redox and Geophysics



- New datasets and geoscientific products
- Compilations
- Analysis



New search technology

- Geophysics and geochemistry
- Data-driven exploration









Key Principles



Quality Geoscience

- Participation tailored to regional knowledge and appropriate skill set
- Best of Australian mineral exploration geoscience
- GSQ, Universities, GA, CSIRO



Collaboration with Industry and other initiatives

- Data sharing to maximise collective benefit
- Leverage funds to expand project (eg ARC Linkage)
- Financial support for exploration
- Maximise benefit from parallel initiatives eg Exploring for the Future, Minex CRC



Targeted products to aid exploration

- Geoscience products of maximum usefulness to explorers
- 3D models; geoscientific data; exploration data; atlas of signatures; target rationales
- Consistency and simplicity of access
- Addressing immediate exploration and targeting needs

Project Portfolio





CRICOS code 00025B

Getting to the Future State – progress update



Comprehensive Compilation



Exploration Toolkits





Mineral Systems Insight



New Data and Interpretations





Feedback and Knowledge Transfer



Survey of Industry - results

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

Updating compilations of open file exploration data 1006 6%					%			48%
Atlas of existing deposits and their footprints		48%				23%		
Ground gravity 17% 21%		34	%		28%			
Full indexed GIS spatial compilation		29%	23%		39%			
High resolution magnetics and radiometrics		24%		41%		17%		
Innovative geochemical exploration under cover		32%		42%		13%		
Regional structural-stratigraphic framework studies	20%		30%	30%		20%		
Targeted drilling	6% 13%		32%	32%	6	16%		
Mount Isa drillcore for major deposits	6%	35%	10%	29%		19%		
Preparation of a geochemical toolkit	7% 13%		33%	30%		17%		
Use of new core-based hyperspectral tools	7% 20	%	27%	23%		23%		
Field mapping – production of new field maps	8	52%		26%		19%	1	
Studies of Magma fertility	17%		30%	3	7%	7%		
Airborne Gravity Gradiometry	30%		30%	23%	1	.7%		
Remote sensing and geophysical alteration mapping	32%		23%	29%		10%		
Detailed solid geology interpretation	10%	45%		19%	19%	6		
Production of a regional high resolution gravity and magnetic inversion	7% 45%		28%		10%			
Inversion/interpretation of AEM/MT	23%		33%	23%	7%			
Reprocessing and interpretation of existing seismic data 7% 24	%	419	%	21%	7%			
ailed field-based structural-metamorphic-geochronological studies 3% 33	%	3	37%	13%	13%			
Airborne EM 4% 14%		57%		21%	4%			
Updating and/or reassessment of mineral process models 6% 23%		48%		16%	6%			
Magnetotellurics	21%	39	9%	21%				
Deposit economic geology studies 37%		43%		10% 10%				
rediction using deformation and fluid flow modelling 19% 35	%		35%	6% 3%				
Target prediction using machine learning 29%	32%		29%	3% 6%				
Very Low Priority	ate Pri	ority	High P	rioritv	Ve	erv Hi	zh Pr	iori



- Industry Advisory Panel
- Regular industry and public consultation forums
- Knowledge transfer workshops

Det

Target p

Integration with other initiatives





Exploring for the Future: realising the resource potential of the NW Mineral Province (and beyond)

Dr Richard Blewett – Branch Head Mineral Systems



APPLYING GEOSCIENCE TO AUSTRALIA'S MOST IMPORTANT CHALLENGES

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Success Scenarios – Challenge and Opportunity





Open File Drillholes Drilled depth >= 200m Drillhole Depth to Basement Ranges Outcropping Covered, depth < 200m Covered, depth 200m to 1500m

Success Scenarios – Outcropping Areas



In exposed and data-rich areas of the Mount Isa region:

Target

- previously unrecognised or under-appreciated (blind) target
- which turns into a major ٠ discovery

Search area

- 370,690 km² •
- 841 drillholes > 200m depth ٠
- 0.33 drillholes per 100km² •
- 99.7% untested below 200m •
- Highest value known ٠ orebody is subhorizontal

Tools

- Value-added interpretation of geoscientific datasets
- state-of-the-art data-driven exploration







Geochemical Toolkit



Mineral **Deposit Atlas**

Success Scenarios – Under Shallow Cover



In areas under relatively thin cover:

Target

 New major discovery under shallow cover

Search area

- 36,492 km²
- 360 drillholes
- 0.99 drillholes per 100km²
- 98.1% untested*

Tools

- insights into key controlling features and halos
- new geophysical and deeplooking geochemical data





Success Scenarios – Under Deep Cover



In deeply covered areas:

Target

• major deep discovery

Search area

- 217,400 km²
- 219 drillholes
- 0.23 drillholes per 100km²
- 99.8% untested*

Tools

- New interpretations and 4D models
- Deep-looking geophysical datasets
- Knowledge of maximum deposit footprints
- Knowledge of buried target economics





Cloncurry Nth Airborne

Cloncurry Mineral System



Mineral Chemistry Vectoring







ryulogeochennistry



Mineral Deposit Atlas



Conclusions

- New Discovery program is now well under way
- Huge remaining potential in one of the world's greatest base metal provinces
- Portfolio of projects tailored to supporting exploration success in the region
- Strong emphasis on practical outcomes and Industry collaboration and takeup
- Ongoing communication and feedback vital to success



Thank you

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