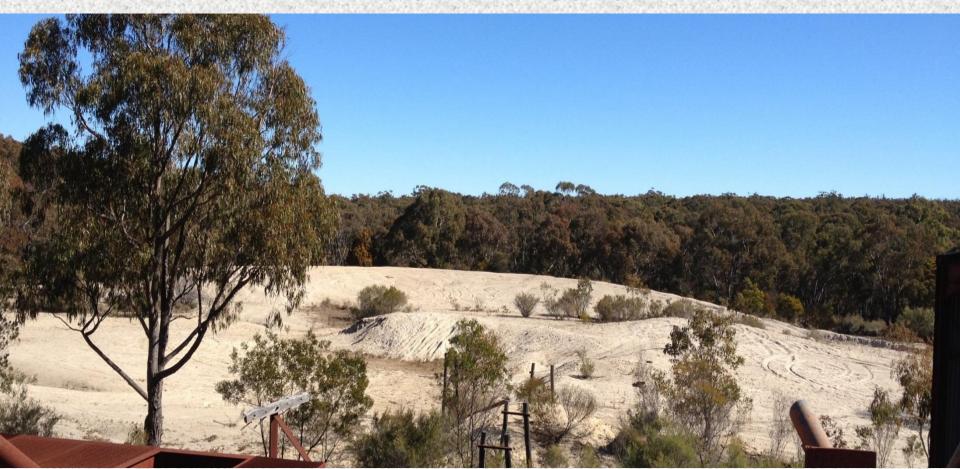
### KRUCIBLE METALS LIMITED

ABN 12 118 788 846

### PROJECT ACQUISITION HERALDS A NEW BEGINNING

# INTRODUCING THE TORRINGTON TUNGSTEN AND TOPAZ PROJECT



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### PROJECT ACQUISITION BACKGROUND

- Krucible assessed numerous projects and commodities and decided that Tungsten held the most promising future for the Company and that Torrington was the most prospective tungsten project available to it in Australia
- Agreement was reached with Resolve Geo (Pty) Limited to acquire 100% of EL 8258 and EL 8355 in Northern New South Wales subject to the Dept. of Trade and Investment (Resources and Energy) transferring the two ELs to Krucible's 100% owned subsidiary Torrington Minerals (Pty) Limited
- Acquisition includes issuing 12 million Krucible shares (escrowed) plus repayment of \$135,000 agreed expenditure and, subject to shareholder approval, two later tranches of 6 million Krucible shares each subject to certain hurdles up to completion of a Final Investment Decision (FID)
- Krucible is rationalising all its greenfields Queensland and Northern Territory tenement holdings with some being relinquished and others being offered for JV to allow the Company to focus solely on Torrington and has written off the total capitalised exploration expenditure carrying value of \$2.7 million.
- Krucible to immediately undertake an intensive exploration programme to increase the present JORC Code resource base and simultaneously commence baseline environmental and metallurgical studies at Torrington
- Krucible will contract Resolve Geo at favourable commercial consulting rates to conduct the Torrington exploration programmes under its direction and management
- Krucible will relocate its operational base and office from Townsville to Brisbane

<sup>\*</sup> Cover sheet photo of a ~140 - 180K tonne tailings dump, Pacific Copper Plant, EL 8258

# TORRINGTON PROJECT OVERVIEW

History	<ul> <li>Historical, successful multi-element (tungsten, bismuth and topaz) mining</li> <li>Contained largest single wolfram (WO<sub>3</sub>) mass (12.5t) recorded in Australia</li> <li>&gt;100 years mining activity within the area, including BHP from 1911 to 1919</li> <li>Pacific Copper tungsten and topaz production from mid 1970's to early 80's</li> </ul>
Resource Definition	<ul> <li>Previously defined resource of ~ 5.75Mt (Pre-JORC 2012)</li> <li>Current combined JORC 2012 Resource of 2,247 tonnes WO<sub>3</sub></li> <li>Recently completed LiDAR survey will materially increase the current JORC (2012) resources</li> <li>Friable nature of the tungsten (ferberite) resulted in low recoveries in RAB</li> <li>418 holes (from 438) in multiple drilling programmes inc;</li> <li>190 holes drilled for tungsten + or – bismuth &amp; topaz and silexite delineation</li> <li>224 holes drilled for topaz and silexite delineation</li> <li>12-Five tonne (minimum) bulk samples collected by Pacific Copper for tungsten grade and process control</li> </ul>
Successive price crashes and poor recoveries	<ul> <li>Tungsten prices peaked in 1917 and 1977 (\$170/Mtu) and fell to \$47/Mtu by 1986 with artisanal Chinese production – Pacific Copper Mine closed</li> <li>No fines circuit in previous mill design (30% topaz loss, &gt;25% ferberite loss)</li> <li>Little recognition of other potential mineral credits</li> </ul>

# Historical Torrington WO<sub>3</sub> concentrate production (tonnes)

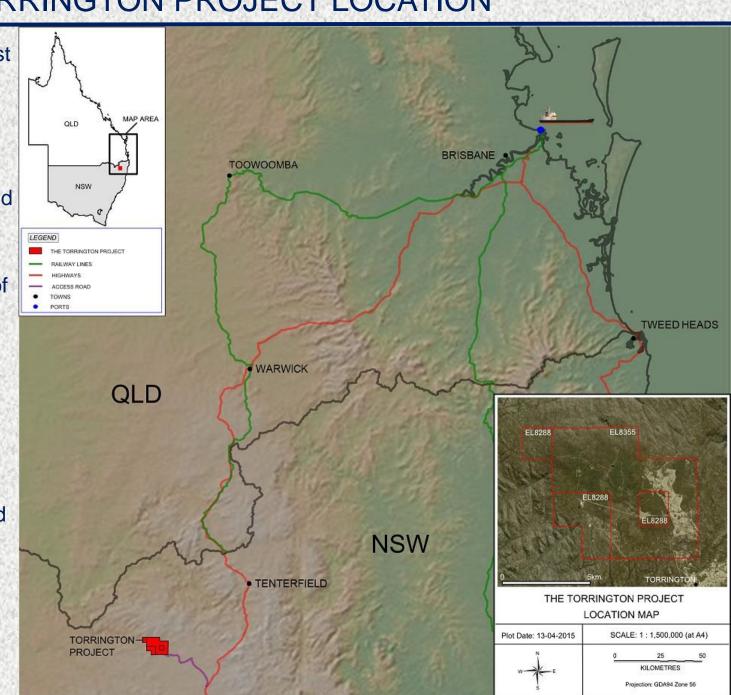
All historical production records below have been derived from mining within the current Torrington Tungsten and Topaz Project area

Period	Fielders Hill	Bismuth	Wolfram Hill	Carters	New Hope	Locks	Burnt Hut	Wild Kate	Mt Everard	Fossicking / Misc
To 1911	309	320	15	115	203	15		15	20	99
1912-1919	318	2		229	82	44		25		173
1920-1938			5							100
1939-1957	65	22		43	11.5	- 1	1.5			139
1958-1976				7	2					
1977-1981	95			17	9.5		40.5	0.5	10	3
Totals	787	344	20	394	308	60	42	40.5	30	514

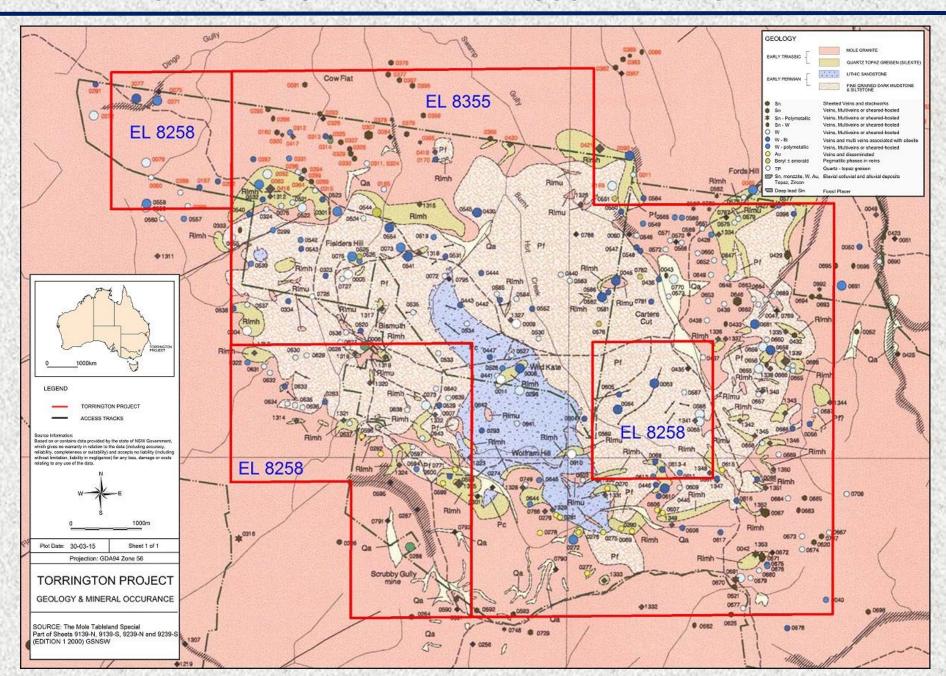
2,540 tonnes recorded historical WO<sub>3</sub> concentrate production

# TORRINGTON PROJECT LOCATION

- Tenterfield nearest large town (40 min by road)
- Excellent road infrastructure
- 22 kV Powerline and power available on site
- 353km to the Port of Brisbane
- Local earth moving and mining contractors
- Numerous small scale mines and a local mining culture
- Local workforce and services

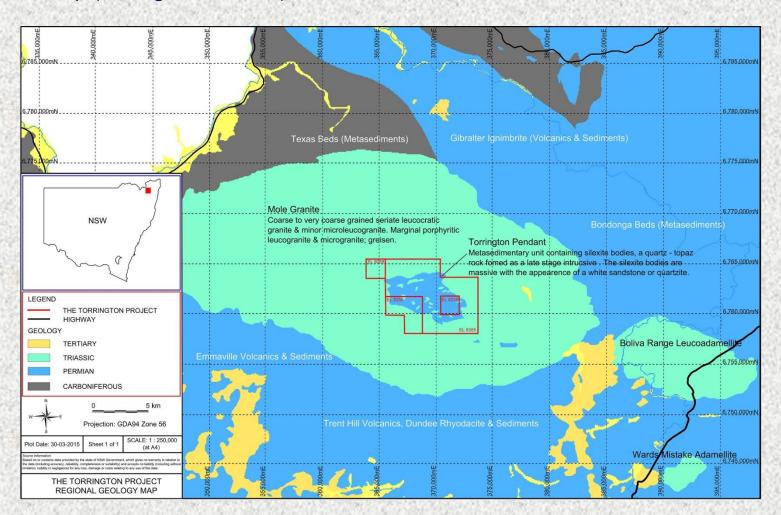


# TORRINGTON PENDANT >300 Mineral Occurrences



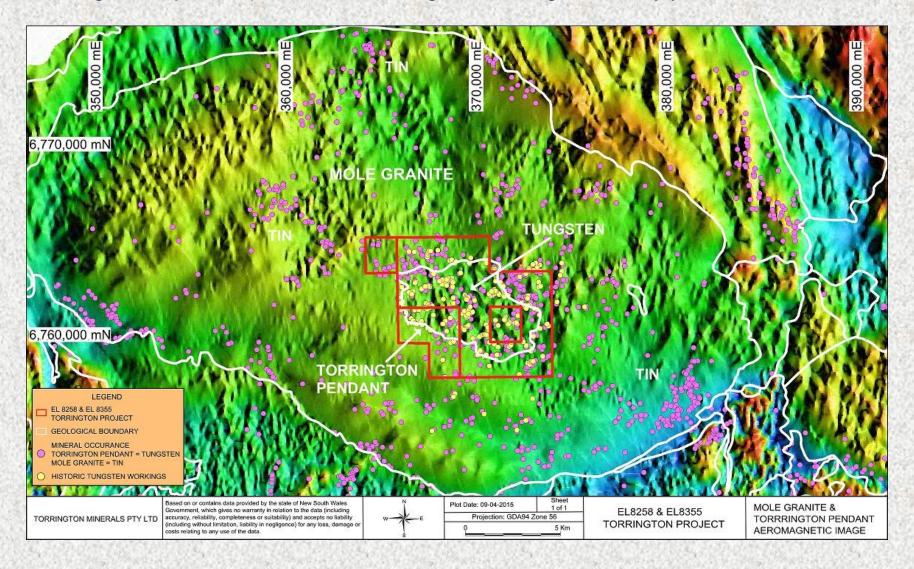
### TORRINGTON GEOLOGY

- The Torrington Project lies within the Late Permian Mole Granite and covers the Torrington Pendant, an elliptical body of Early Permian metasediments the remnant roof of the Mole Granite.
- The primary ore is silexite (a quartz-topaz greisen) developed both as a late stage intrusive and fractionated by-product of the granite, forming sills and dykes on the granite and in the metasediment cap (Torrington Pendant).

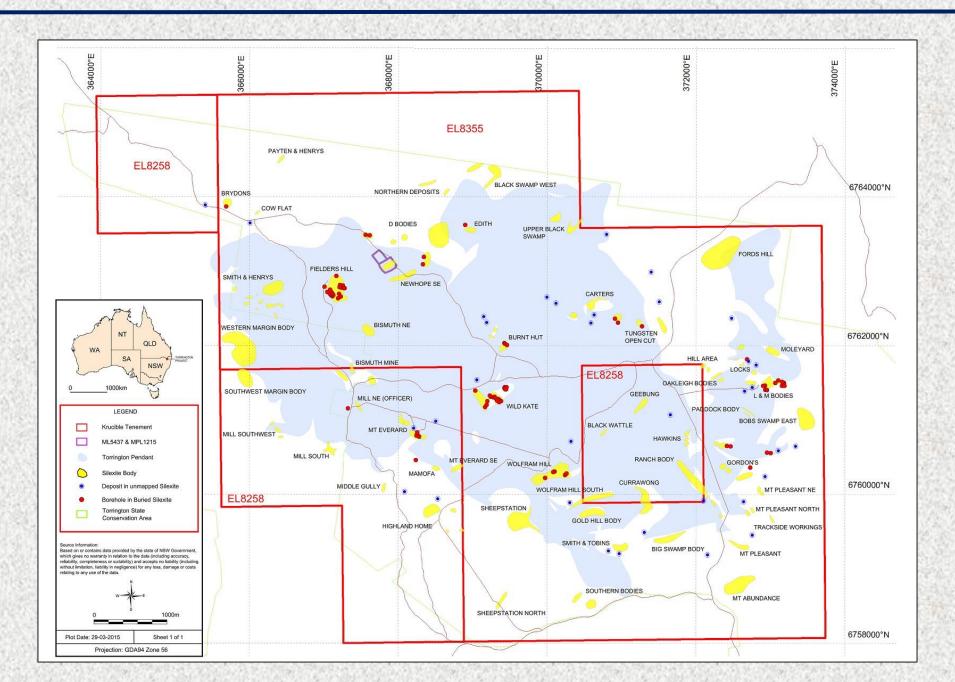


### TORRINGTON AEROMAGNETIC IMAGE

Aeromagnetic image showing the elliptical outline of the Mole Granite with the central Torrington Pendant outcrop. All recorded mineral occurrences shown by pink markers (tin in granite, tungsten in pendant). Documented tungsten workings shown by yellow markers.



# MAJOR KNOWN SILEXITE BODIES



### PROJECT DEVELOPMENT PATHWAY

#### PROCESS FROM EXPLORATION LEASE TO MINING LEASE (MAIN OREBODIES)

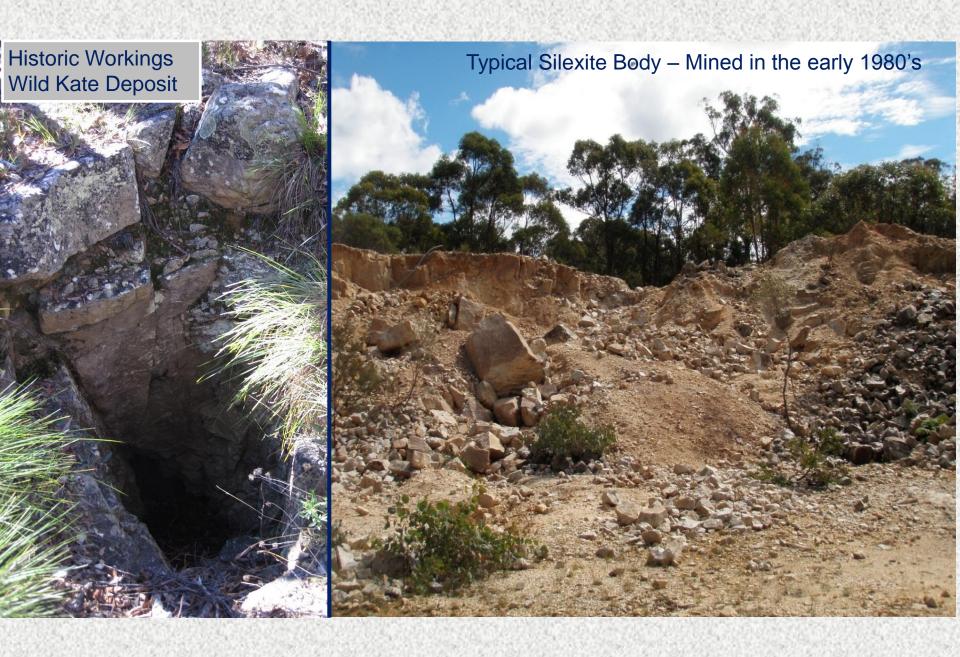
- LiDAR Survey completed March 2015
- Access negotiations and permitting
- Drilling for 2012 JORC Reserve, Ore samples and Metallurgical testwork
- Commence baseline Environmental Impact Statement (EIS) studies
- Assess viability (Scoping Study) of developing nominally a 650ktpa mining and processing operation to a
  "fixed" plant for a minimum of 10 years (In accordance with ASX LR 5.16.4 the Company clarifies that
  there is currently a low level of geological confidence associated with the inferred mineral resources and
  there is no certainty that further exploration work will result in the determination of indicated mineral
  resources or that the production target itself will be realised).
- Maintain Capex below \$30M to satisfy project of "regional" significance criteria
- Nominally 18 months to EIS approval and additional 4 months for Mining Operations Plan (MOPS) approval
- Process design flowsheet
- Finalise Products for sale and marketing
- Capital raising timing dependent upon rate of expenditure could be later
- Feasibility study report capital and operating cost estimates to 15% accuracy
- Detailed design and procurement for a D&C style contract

# PROPOSED FUTURE ACTIVITIES AND EXPENDITURE

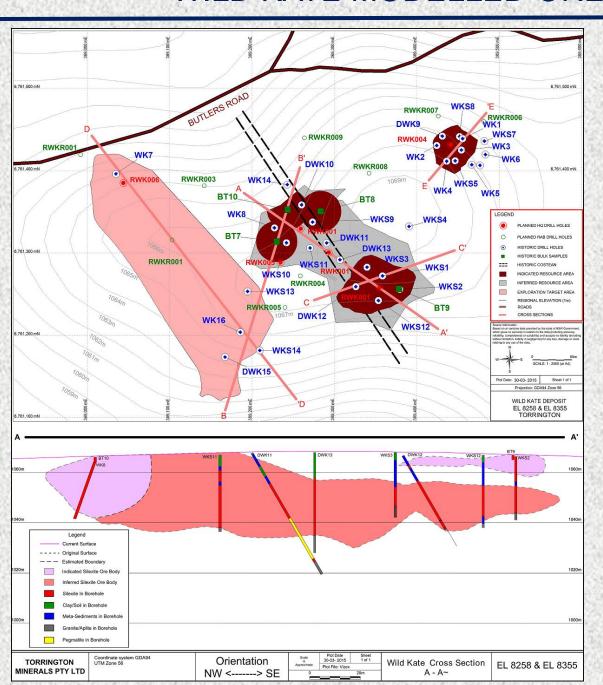
### Next steps for the Project and Preliminary Budget

ACTIVITY	AUS (\$)
LiDAR Survey	40,000
Review of Environmental Factors (REF)	20,000
Detailed Field Grade Control	25,000
Exploration Drilling	700,000
Bulk Sampling	100,000
Conceptual Project Development Plan (CPDP)	30,000
Environmental Impact Statement (EIS) and ML Permitting	1,150,000
TOTAL	\$2,065,000

# TORRINGTON HISTORIC OVERVIEW



# WILD KATE MODELLED OREBODY





# **JORC 2012 RESOURCES**

### Wild Kate Deposit JORC Resources Summary (EL8355)

Classification	Cilevite (t)	Tungsten (WO <sub>3</sub> )	Tungsten (WO <sub>3</sub> )	Topaz	Tono- (4)	
Classification	Silexite (t)	Grade (%)(1)	(t) <sub>(2)</sub>	Grade (%) <sub>(1)</sub>	Topaz (t)	
Inferred	770,000	0.18	1,380	17	131,000	
Indicated	192,000	0.21	410	17	33,000	
Total	962,000		1790		164,000	

### Mt Everard Deposit JORC Resources Summary (EL8258)

Classification	Cilovito (t)	Tungsten (WO <sub>3</sub> )	Tungsten (WO <sub>3</sub> )	Topaz	Tono 7 (t)
Classification	Silexite (t)	Grade (%) <sub>(1)</sub>	<b>(t)</b> (2)	Grade (%) (1)	Topaz (t)
Inferred	62,000	0.23	140	17	10,500
Indicated	140,000	0.23	317	17	24,000
Total	202,000		457		34,500

### **Total JORC Resources Summary**

Total	1,164,000		2247		198,500
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### **JORC 2012 EXPLORATION TARGETS**

### **Tungsten JORC Exploration Target Summary**

ST. C. C. S. CONST.	Location	Estimated Area of Host	Tungsten Grade Range (WO <sub>3</sub> )(1)		Estimate (80% >630ppm) WO <sub>3</sub>	
		Silexite (m <sup>2</sup> )	Min (%)	Max (%)	Min (t)	Max (t)
P-305	EL8258 and EL8355	1,804,768	0.12	0.5	33,200	116,850

#### **Bismuth JORC Exploration Target Summary**

Location	Estimated Area of Host	Bismuth G	Grade Range	Estimate (8	0% >630ppm WO <sub>3</sub> ) Bi (3)
	Silexite (m <sup>2</sup> )	Min (%)	Max (%)	Min (t)	Max (t)
EL8258 and EL8355	1,878,398	0.02	0.07	2,861	22,702

#### Topaz JORC Exploration Target Summary

CHICANOPTINESTY	Location	Estimated Area of Host	Area of Host		Estimate (80% >630ppm WO <sub>3</sub> ) Topaz (3)	
TOTAL SE		Silexite (m <sup>2</sup> )	Min (%)	Max (%)	Min (t)	Max (t)
0.000	EL8258 and EL8355	1,849,768	10	17	1,853,705	6,619,010

See Competent Persons Statement at end of presentation for notes 1, 2 & 3

### TECHNICAL WORK UNDERTAKEN TO DATE

Work completed by Resolve Geo since acquisition of the project in 2010 has resulted in the project moving to an advanced stage with a comprehensive review of the historic data and recent mining activities highlighting a production opportunity as follows:

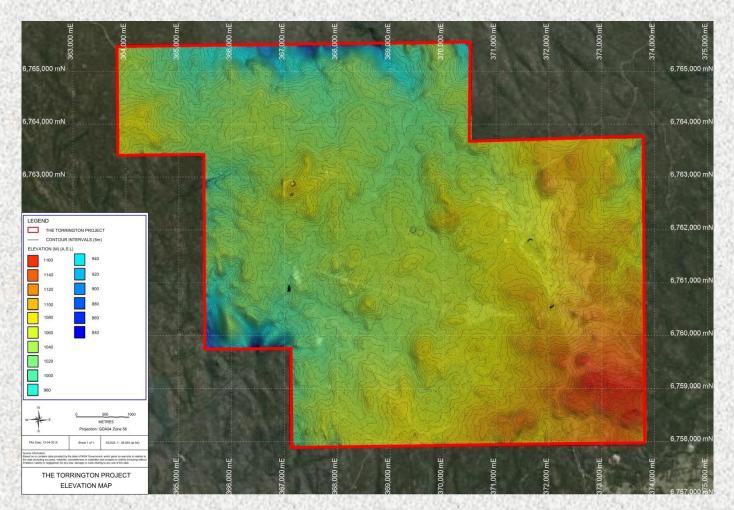
- JORC 2012 Compliant Resource Recalculation
  - Data reconciliation of 418 historical holes, multiple generations of acquisition, multiple sampling and analytical strategies
  - Remodelling of deposits, wire framing, grade projection
- Field mapping, grade control and resurvey of data points, LiDAR survey
  - Multiple silexite (topaz) data points, with a combination of existing and newly generated ore body geometries
- Grade control and confirmation of bulk sample grades on two sites
- Petrological analysis indicating approximately 50% >0.5mm ferberite population which is a processing advantage
- Vortex milling (Pulver Dryer testing, USA)

### TECHNICAL WORK COMMISSIONED BY RESOLVE

- Review of prior technical work completed on topaz feedstock for mullite production, including further technical consultation with Prof. Chris Sorrell, Material Sciences Lab, UNSW
- Development work, including the incorporation of Boron into topaz for introduction into high temperature glass melts (in cooperation with Mitsui, Japan)
- Focus on Tungsten
  - Liberation studies partially completed (Mineral Technologies)
  - Grade control around bulk sample sites completed with 50kg supervisory samples
- Discussions with Larpro Consultants to complete new scoping study
- · Discussions with Dr. Nigel Ricketts to advise on mineral processing
- Discussions with Ross Garling (Tradd) to advise on deposit geometry and grade

### LIDAR SURVEY

The LiDAR survey was flown on the 12<sup>th</sup> and 15<sup>th</sup> March 2015 and flew 15 parallel runs in an east-west direction spaced at 500m intervals at an altitude of approximately 1,000m above ground level. The total survey area was approximately 53km<sup>2</sup>. The LiDAR system defined the terrain surface, including in areas of dense vegetation, to an accuracy of 5cm

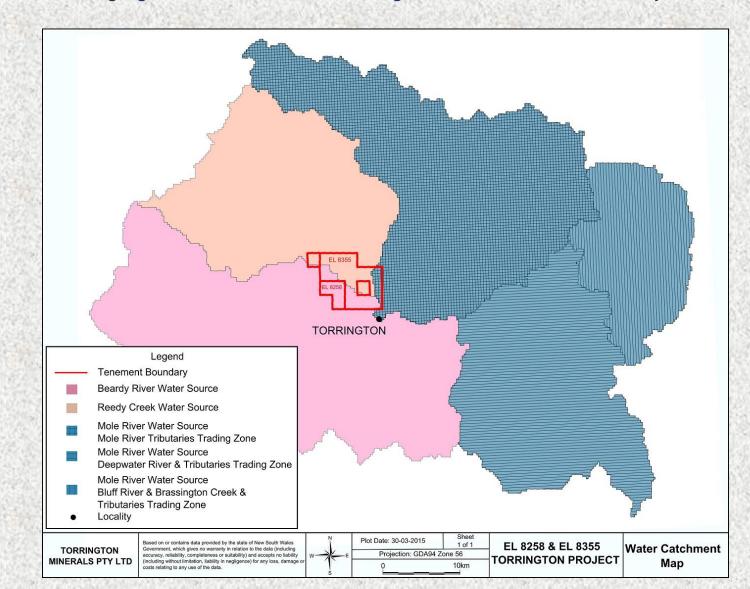


### **INFRASTRUCTURE**

- Water allocations from Beardy & Mole river catchments available
- Power well maintained 22kVA powerline on ELs
- Telecommunications on site
- Easy access to existing sealed public road network
- Local accommodation options
- Local experienced workforce
- Strong local and state government support for project

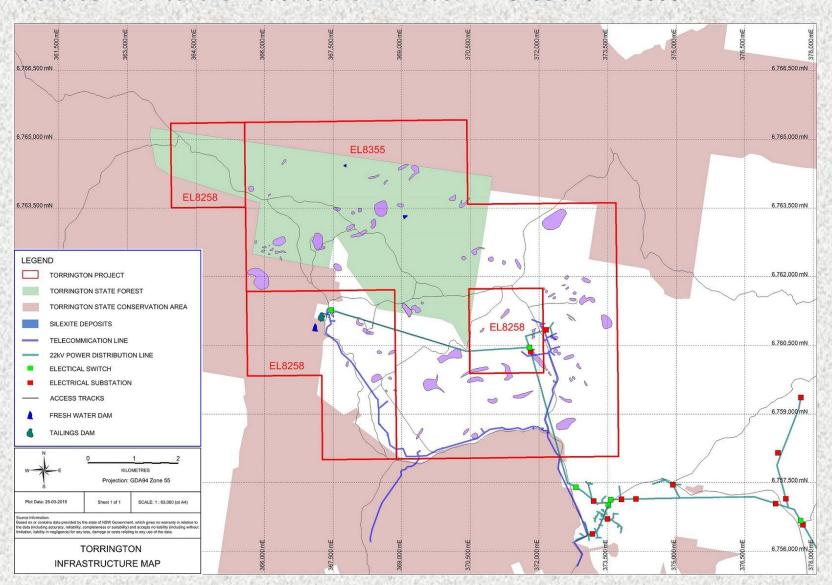
### WATER

- Water allocations from Beardy & Mole River Catchments available
- Water harvesting rights available for the Torrington State Forest and Reedy Creek Catchment



### POWER AND TELECOMMUNICATIONS

- An existing 22 kVA distribution line runs through both EL 8258 and EL 8355
- Telstra communications infrastructure within both EL 8258 and EL 8355



### MINERAL PROCESSING

- The tungsten mineral in Torrington is Ferberite, a tungsten-iron oxide
  - Ferberite is the iron rich endmember of the manganese iron wolframite solid solution series composed of iron(II) tungstate (FeWO<sub>4</sub>).
  - Ferberite has a high density and can be separated after crushing using simple gravity concentration in the form of jigs and spirals from the gangue minerals
  - Any bismuth and other heavy minerals will follow the tungsten
  - Ferberite is also slightly magnetic and can be separated from the other heavies by magnetic separation techniques
- The gangue is silexite, a rock composed mainly of an intergrowth of quartz and topaz
  - Topaz (Al<sub>2</sub>SiO<sub>4</sub>(F,OH)<sub>2</sub>) is denser than quartz and can be separated into a concentrated form using standard minerals processing techniques of jigs and spirals following crushing
  - Topaz is used in the abrasives, refractory materials and glass industries

### STATUTORY WORK COMPLETED TO DATE

Concept Project Development Plan (CPDP) developed in draft form includes:

- Resources Silexite, Tungsten and Topaz
- Resource Demand
- Mining Operations
- Environmental Setting
- Offsite Considerations

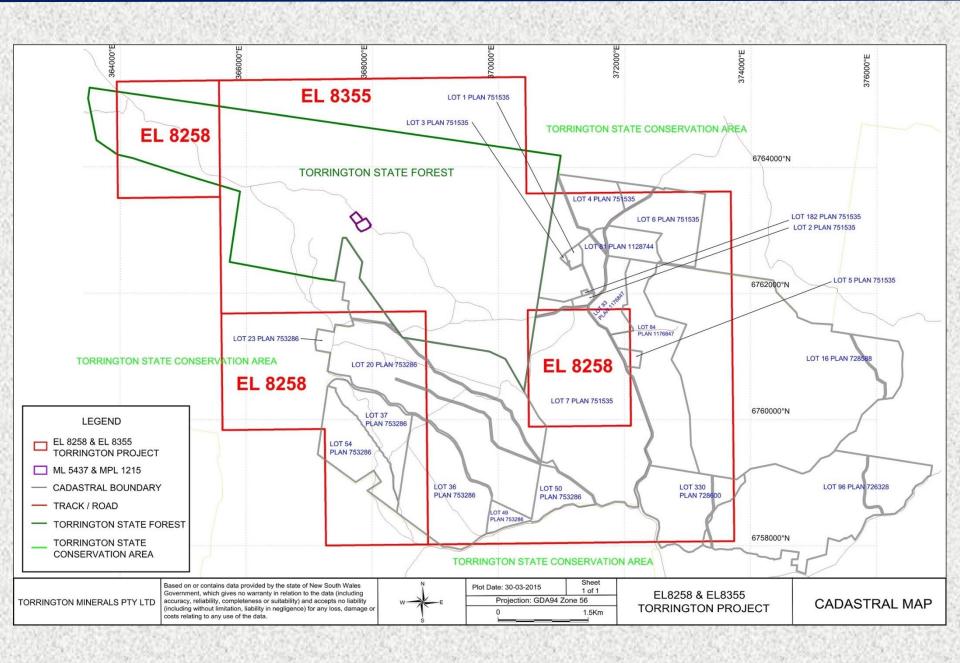
- Community Consultation
- Economic Benefits
- Legislative Processes
- Constraints to the Project

Consultation with the NSW Forestry Corporation

Consultation with land holders and other stakeholders

- State Government Dept. of Trade and Industry
- Tenterfield Shire Council
- Member for Northern Tablelands
- · Local business owners e.g. contract miners
- Employment of local environmental and statutory consultants
- Essential Energy (electricity supplier)

### TORRINGTON LAND TENURE



### RECOGNISED RISKS AND OPPORTUNITIES

#### RISKS

- Landholder and community relationships
- Water allocation
- Ore processing strategies
- Timing on environmental approvals process
- · Delays with funding
- Heterogeneity in grade and ore architecture
- Future Tungsten market price and demand

#### **OPPORTUNITIES**

- Mature infrastructure in place
- Mining method well understood
- Technically simple processing
- Water allocations from Beardy and Mole river catchments
- Low capital start-up project, allowing simplified permitting and approvals
- Significant growth in resource and revenue with small capital input
- Commodity prices favourable in a down market
- Topaz and Bismuth saleable byproducts
- Net revenue credits for any other minerals

### **RESOURCED COMMODITIES - TUNGSTEN**

### Tungsten – Unique in its extremes, difficult to replace



Ferberite Crystals (iron end member of wolframite)

Very Hard: Strongest of all metals - three times harder than chrome and titanium

Very Dense: Greater density than lead or uranium

Very Heat Resistant: 3400°C highest of all metals

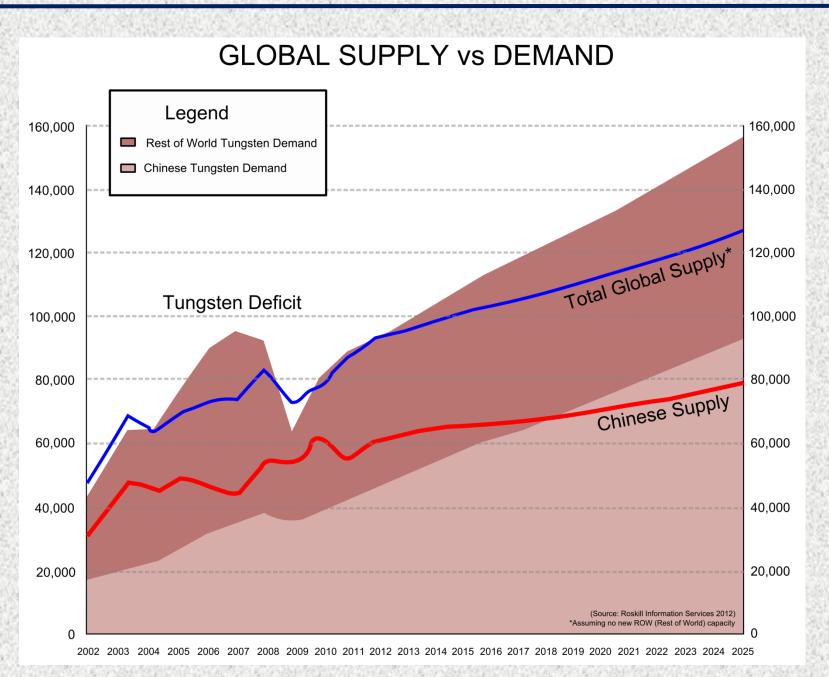
Environmentally Friendly: Very resistant to corrosion & completely non-toxic

Uses: > 60% in tungsten carbide for cutting tools, as an additive in the production of specialist steel; filament wire for lighting and increasingly in specialty uses - mobile phone handsets, military, ballistics and aerospace

Tungsten's global importance:

Classified as a "Critical Raw Material" by the EU and as a "Strategic and Critical Material" by the US Government

# TUNGSTEN - Supply and Demand



# BISMUTH – A mineral that is defining our future

High Electrical Resistance: Has highest Hall effect of any metal (greatest increase in electrical resistance when placed in a magnetic field)



**Bismuth Crystals** 

Low Conductivity: Lower than any metal except mercury

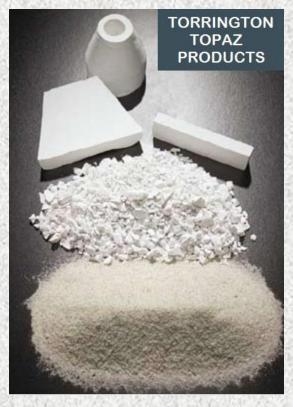
Environmentally Friendly: Non-toxic and increasingly used as a replacement for lead

Main Uses: Fire detectors & extinguishers, electrical fuses, solders, medicines, cosmetics, specialist low-melting alloys and in the automotive industry

Importance: Classified as a "Strategic and Critical Material" by the US Government

# TOPAZ - A superior refractory Mullite

Topaz (Al<sub>2</sub>SiO<sub>4</sub>(F,OH)<sub>2</sub>) can be converted to mullite - an important alumosilicate ceramic also know as porcelainite (3Al<sub>2</sub>O<sub>3</sub>SiO<sub>2</sub>)



- A higher refractory temperature of 1880°C
- Fluorine removal during calcination and sintering scavenges free silica from matrix and may replace fluorspar as a source of fluorine compounds
- Formation of acicular ceramic matrix occurs at lower temperatures than conventional mullite - forming a product with higher (ca.30%) thermal and physical shock resistance
- Potential to lower life cycle costs for many refractory applications
- Processing topaz to mullite results in a significant credit from scavenging fluorine compounds – significantly offsetting mullite production costs

Markets for topaz will need to be developed, but Resolve has met with potential customers in China and Japan and received offtake offers. There remains several tonne of product available for market trials from the Pacific Copper processing plant.

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•(1) All grades are reported as weight percentages, and Bismuth and Topaz is only reported within silexite bodies where the Tungsten grade is >630ppm (0.063%) WO<sub>3</sub>.

- •(2) A Tungsten cut-off grade of 0.063% contained Tungsten (WO<sub>3</sub>) has been derived from cost analysis contained within the Resolve Geo Pty Ltd financial model, and has been determined to exclude 20% of the known silexite ore from reporting to a resource estimation.
- •(3). Contained Tungsten (WO<sub>3</sub>) Range is calculated by multiplying the reported areal extent of silexite host rock by an estimated minimum and maximum thickness of silexite and minimum and maximum grades of Tungsten (WO<sub>3</sub>) Bismuth and Topaz. 20% of the exploration target ore bodies has not been reported, as it is assumed to be below the WO<sub>3</sub> grade cut off of 0.063% based on analysis from resource areas

#### **Competent person statement:**

- •An Exploration Target is a statement or estimate of the exploration potential of a mineral deposit in a defined geological setting where the statement or estimate, quoted as a range of tonnes and grade (or quality) relates to mineralisation for which there has been insufficient exploration to estimate a mineral resource. The Torrington Exploration Target is in the range of 33,200 to 116,850 tonnes of WO<sub>3</sub> and 2,861 to 22,702 tonnes of Bi and 1,853,705 to 6,519,010 tonnes of Topaz.
- •The information in this report that relates to JORC Resources and the Exploration Target is based on information compiled by Gordon Saul, who is a Member of the Australasian Institute of Geoscientists. Gordon Saul is a full-time employee of Resolve Geo Pty. Ltd. Gordon Saul has sufficient experience, which is relevant to the style of mineralisation and type of deposit under consideration and to the activity, which he is undertaking to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Gordon Saul consents to the inclusion in the report of the matters based on his information in the form and context in which they appear.