



**Breakaway  
Research**

September 2015

**Grant Craighead** | Research Manager  
gcraighead@breakawayinvestmentgroup.com

**Mark Gordon** | Senior Research Analyst  
mgordon@breakawayresearch.com

www.breakawayresearch.com

## Company Information

ASX Code	PNX
Share Price (28 August 2015)	A\$0.013
Ordinary Shares*	471.06m
Options	0.00m
Performance Rights	1.875m
<b>Market Cap – undiluted</b>	<b>A\$6.12m</b>
Cash (30 June 2015)	A\$0.87m
Placement Cash*	A\$1.48m
Liquid investments	A\$0.35m
Total Debt	A\$1.20m
<b>Enterprise Value</b>	<b>A\$4.62m</b>

\* Assumes shareholder approval of tranche 2 of recent placement

## Directors and Management

Non-Exec Chairman	Graham Ascough
Managing Director	James Fox
Non-Executive Director	Paul Dowd
Non-Executive Director	Peter Watson
Non-Executive Director	David Hillier
CFO & Company Sec.	Tim Moran
Exploration Manager	Andy Bennett

## Company Details

Address	Level 1, 135 Fullarton Road Rose Park SA 5067
Phone	+618 8364 3188
Web	www.phoenixcopper.com.au

## Top Shareholders (pre placement)

HSBC Custody Nominees	14.6%
Cartet Group Limited	8.6%
Talis SA	8.5%
Long Fortune Limited	7.6%
Asia Image Limited	6.9%
Top 20	~75%
Directors and Management	4.4%

## 1 Year Price Chart



# Phoenix Copper (PNX)

*Taking Flight*

*Recommendation: Speculative BUY*

## Key Points

- **The flagship Hayes Creek Project contains the 2.6Mt high grade poly-metallic Iron Blow resource in a well-established mining district**
- **Mt Bonnie less than 3km away, a 2<sup>nd</sup> deposit containing potentially significant high grade resources of zinc, gold and silver**
- **Located within the highly productive Pine Creek Orogen of the Northern Territory**
- **Working towards the rapid development of a potentially robust operation**
- **Results of recent drilling and EM surveying show the potential for significant resource expansions**
- **Highly prospective exploration package**
- **Close to infrastructure, including transport and power, and within 180km of Darwin by sealed highway**

*In Hayes Creek, Phoenix has a potentially very robust short term development opportunity in a proven mining district well served by infrastructure.*

*Mineralisation at the known Iron Blow and Mt Bonnie VMS deposits is high grade – amongst the highest of any ASX-listed companies with poly-metallic projects, and preliminary metallurgical work on these commonly problematic styles of mineralisation has returned positive results. The geometry of the mineralisation is amenable to simple open cut mining, with the grades at depth also supporting the future potential for underground operations.*

*The Company is also earning into a highly prospective package of exploration tenements, which contain a number of known mineral occurrences.*

*We rate Phoenix as a SPECULATIVE BUY, with a base case price target of \$0.067/share. We see significant upside in our valuation, and short term price movers will be material progress towards development of Iron Blow and Mt Bonnie, including the completion of a positive scoping study, and positive results from exploration.*

## Company Overview

Phoenix Copper Limited (ASX: PNX) is an Australian based junior explorer and developer concentrating activities on recently acquired projects in the Pine Creek Orogen of the Northern Territory. The key projects are the Iron Blow and Mt Bonnie poly-metallic stratabound deposits, which the Company plans to fast track to production, and both of which have had previous shallow oxide mining and are located on granted Mining Licenses.

The advanced projects are backed up by the regional exploration joint venture with TSX listed Newmarket Gold (TSX-V: NMI, "Newmarket"), which covers some 1,676km<sup>2</sup> of the Pine Creek Orogen south of Darwin.

The Company still retains its original South Australian projects, however options are being considered with regards to these.



## Investment Thesis

---

*High grade, open pitable poly metallic mineralisation at Hayes Creek in the Northern Territory*

### High Grade, Open Pitable Mineralisation

At the 100% owned Iron Blow deposit within the Hayes Creek Project in the Pine Creek Orogen of the Northern Territory, Phoenix Copper (“Phoenix” or “the Company”) has one of the highest grade poly-metallic sulphide resources in our universe of ASX-listed companies, with JORC-compliant resources of **2.6Mt grading at 2.4g/t Au, 130g/t Ag, 4.8% Zn, 0.3% Cu and 1% Pb**. Sulphide mineralisation starts from within 30m of surface, and resource geometries are amenable to open pit extraction.

*Potential for substantial resource expansions*

### Resource Expansion Potential

Drilling at the nearby, also 100% owned Mt Bonnie deposit (less than 3km from Iron Blow) has also intersected further high grade mineralisation, including **12m grading at 8.4% Zn, 2.57g/t Au, 228g/t Ag, 0.7% Cu and 2.0% Pb**, similar in style to that at Iron Blow, showing the potential for substantial resource expansions. Both deposits are also open down plunge, and given the high grades there is the possibility for future underground mining.

*Hayes Creek is located in a productive mining district*

### Located in a Mining District.....

Both deposits have previously had limited mining of oxide and supergene material, and are located on granted Mining Licenses in a well-developed mining district with a number of historic and current operations, including Newmarket’s Cosmo gold mine.

*Close to infrastructure*

### .....Close to Infrastructure

Hayes Creek is also close to infrastructure, including road, rail, electricity and gas, which will be beneficial for the development of any future operation.

*Phoenix is working towards short term development*

### Working towards Short Term Development

Phoenix is now working towards the short term development of an open cut mining operation, with a scoping study currently underway, and planned to be completed in early-2016.

*Excellent exploration upside in the regional tenements*

### Excellent Exploration Upside.....

Being located over the highly productive and prospective Pine Creek Orogen, Hayes Creek and the regional exploration joint venture tenements offer significant exploration upside for a number of metals, including zinc, copper, lead, gold and silver.

*High priority exploration targets have been identified*

### .....Demonstrated by High Priority Targets Thus Far Identified

Work to date has identified a number of exploration targets, including Joplin, which has geophysical characteristics similar to those at Iron Blow and Mt Bonnie, and which the Company plans to drill shortly.

### Supportive Cornerstone Investors

In the European groups, Sochrastem SA, Marilei International Ltd and Talis SA, Phoenix has attracted supportive cornerstone investors.

### Recent Capital Raising

These cornerstone investors have also supported the recent placement, with \$1.48m raised at \$0.013 per share to be used to advance the Hayes Creek Project and for working capital. This also included placements to new sophisticated investors, and directors taking up stock. The issue is in two tranches; the first for 69.5 million shares will



be issued immediately without shareholder approval, and the second, for 44.3 million shares will be voted on at the Company's AGM in November.

### Strong, Committed and Incentivised Board and Management

*Experienced principals have shareholdings*

The Board and Management have extensive industry experience in varied regions and commodities. In addition, Directors and Management have holdings in the Company, and thus will be motivated to producing strong returns for shareholders.

### Valuation

We have a risked base case valuation for Phoenix of \$0.067/share, a 500% premium to the current price of \$0.013/share.

The valuation, which in our view has considerable upside, includes a DCF valuation of a conceptual mining operation at Hayes Creek, which sensitivity analysis indicates is robust.

#### Phoenix Copper company valuation

*Risked base case valuation of \$0.067/share, with good upside*

Valuation - DCF	Value (m)	Unrisked / Share	Risk Multiple	Risked Value	Risked / Share	Method
Hayes Creek Pre Tax Cash Flow	\$119	\$0.253	15%	\$17.9	\$0.038	DCF, 8% DR
Pine Creek Exploration	\$10	\$0.021	100%	\$10	\$0.021	Current
South Australian Exploration Tenements	\$2	\$0.004	100%	\$2	\$0.004	Current
Cash	\$2.35	\$0.005	100%	\$2.35	\$0.005	Current
Avalon Resources holding	\$0.36	\$0.001	100%	\$0.36	\$0.001	Current
Debt	-\$1.20	-\$0.003	100%	-\$1.20	-\$0.003	Current
<b>PNX Valuation</b>	<b>\$132.5</b>	<b>\$0.281</b>	<b>23.65%</b>	<b>\$31.6</b>	<b>\$0.067</b>	

Source: Breakaway analysis

### Peer Comparison

We have included in our peer group junior ASX-listed poly-metallic and base metal explorers, developers and producers. Here we have, for comparison purposes, calculated a zinc equivalent grade for JORC-compliant resources using current metal prices, as well as the in-ground value ("IGV") of the resources and the enterprise value ("EV") per tonne of contained metal equivalent. Note that we have not factored in the effect of a resource being developed at Mt Bonnie for Phoenix.

*Phoenix is one of a number of ASX listed companies in our peer group*

Please note that the IGV is not the revenue or net smelter return ("NSR") that a company will receive per tonne of material milled. Our comparison is based on resources, and not reserves, and will be reduced by mining dilution, metallurgical recoveries and smelter charges. For example, although Phoenix's IGV is \$357/tonne of resources, our modelling (and valuation) results in an NSR of \$205/tonne milled.

*Phoenix has a relatively high in-ground value per tonne of mineralisation when compared to peers*

The comparison does however show the relatively high in-ground value per tonne of ore for Phoenix, and the potential for value increases as the projects advance, e.g. the Mt Bonnie deposit. Phoenix has a current resource size and equivalent grade similar to that of Aurelia's Hera operation, which, despite some current metallurgical/engineering issues, has a significantly higher EV/T of contained zinc equivalent.

However the EV/T metric does need to be treated as a guide only to relative value – there are any number of factors that can affect this figure.



## Phoenix Copper Peer Comparison (All figures in AUD)

Company	Project	EV Undiluted (\$m)	Global Resource (Kt)	Equity Resource (Kt)	ZnEq Grade (%)	IGV/t resource	Contained ZnEq kt Equity basis	EV/T ZnEq (company share)	Key Project Stage	Metals (all resources)
Auralia Metals	Hera, Nymagee	\$112.2	2,506	2,506	16.86%	\$407	422.41	\$266	Hera - Production Nymagee - FS	Cu, Pb, Zn, Ag, Au
Peel Mining	Mallee Bull	\$21.5	3,900	1,950	8.06%	\$195	157.10	\$137	Drilling, Resource Expansion	Cu, Pb, Zn, Ag, Au
Terramin	Angas, Tala Hamza	\$333.2	77,580	53,570	5.95%	\$144	3,188.88	\$104	FS - Hamza C & M - Angas	Zn, Pb
Red River Resources	Thalanga	\$23.2	3,800	3,800	15.45%	\$373	586.96	\$40	Restart	Cu, Pb, Zn, Ag, Au
KBL Mining	Mineral Hill	\$37.0	21,380	17,455	7.65%	\$185	1,336.13	\$28	Production	Cu, Pb, Zn, Ag, Au
Rox Resources	Reward	\$13.0	43,600	22,236	5.03%	\$122	1,117.95	\$12	Exploration	Zn, Pb
Phoenix Copper	Hayes Creek	\$4.6	2,605	2,605	14.78%	\$357	385.01	\$12	Scoping Study	Cu, Pb, Zn, Ag, Au
Ironbark	Citronen	\$28.4	70,800	70,800	5.63%	\$136	3,983.56	\$7	Feasibility	Zn, Cu, Pb
Heron Resources	Woodlawn	\$10.3	24,770	24,770	10.07%	\$243	2,495.06	\$4	Feasibility	Cu, Pb, Zn, Ag, Au
Venturex Resources	Sulphur Springs	\$3.6	18,370	18,370	7.13%	\$172	1,309.31	\$3	Feasibility	Cu, Pb, Zn, Ag, Au
Overland Resources	Yukon	\$1.2	12,560	12,560	6.13%	\$148	769.56	\$1	Feasibility	Zn, Pb
Metalicity	Admiral Bay All	\$6.5	72,000	72,000	6.45%	\$156	4,642.61	\$1	PFS	Zn, Pb, Ag

Source: IRESS, Company reports

\* Aurelia – Metal calculations based on Hera deposit only

### Risks

As in any resources stock there are a number of risks involved as listed below – we consider metallurgy to be the key technical risk here.

#### The key risk is metallurgy

- Metallurgy** – We view this as the key risk to progressing the Hayes Creek Project. Poly-metallic resources can be problematic in their metallurgy. However testwork to date has indicated the potential for good recoveries of the key three metals, zinc, gold and silver, which between them comprise around 90% of the value of the mineralisation. In addition, Managing Director James Fox has significant operational experience with complex processing operations. A metallurgical optimisation test program has also commenced.
- Resource** – With resources already estimated at Iron Blow with the potential to support a viable operation, the risk here is in identifying additional resources (above those that should be estimated at Mt Bonnie) to provide for a longer term, more robust operation.
- Exploration** – This is a risk for the joint venture tenements, but the exploration risk is reduced as this is largely a brownfields area and has a history of discoveries and production in a number of metals.
- Development** – There are always risks in taking a project through to development, with things commonly not going as planned. In this case the main development risk again lies with the metallurgy – there are a number of cases where complex sulphide ores do not behave in operations as predicted by the testwork.
- Funding** – Despite the recent raising, funding will, given the current tight capital markets, continue to be a risk for Phoenix.
- Permitting and Sovereign Risk** – Given the known mining jurisdictions and the location of key projects on granted mining leases we consider these as low risk in the case of Phoenix.



## Project and Activities Review

### Introduction

*Phoenix's focus is on its highly prospective Pine Creek Orogen projects in the Northern Territory*

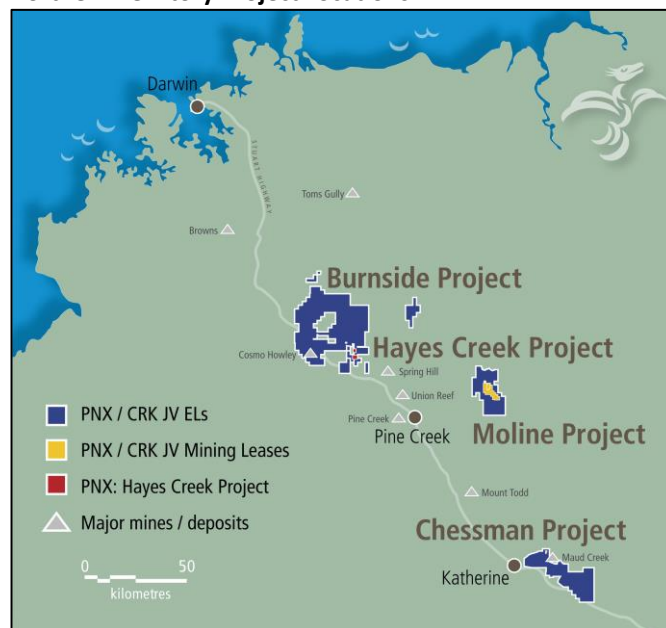
Phoenix's focus is on its highly prospective Pine Creek Orogen projects in the Northern Territory, with interests being acquired from Crocodile Gold Corp. ("Crocodile", who subsequently merged with Newmarket) through an Asset Sale and Farm-in Joint Venture Agreement.

The agreement, which was announced to the market on August 18, 2014 and finalised on November 20, 2014, comprises two main components:

*The projects were acquired from Crocodile Gold, who has subsequently merged with Newmarket*

- 100% acquisition of the Hayes Creek development project, which includes the Iron Blow and Mt Bonnie massive sulphide base and precious metal deposits, for a nominal \$1 and the grant of a 2% NSR on any future production of gold and silver. Crocodile also retains a 30% clawback right within six months of the completion of a Pre-Feasibility Study through the payment of three times Phoenix's accumulated expenditure.
- The right to earn 90% of the Burnside, Moline and Maud Creek exploration projects through the expenditure of \$4 million over four years. Phoenix is required to spend \$2 million to earn 51% in the first two years, and an additional \$2 million over the next two years to earn 90%. This includes an allowance of up to \$500,000 to be spent on Mt Bonnie/Iron Blow in years 1 and 2, and an additional \$500,000 in the subsequent two years.

### Northern Territory Project Locations



Source: Phoenix Copper

All projects are located within the highly prospective Pine Creek Orogen, which has a long and productive history of precious metals, base metals and uranium exploration and mining.

*Phoenix's strategy is to work towards an early development of Iron Blow and Mt Bonnie*

Phoenix's strategy is to work towards the early development of Iron Blow and Mt Bonnie, whilst carrying out exploration for additional precious and base metal resources on the other highly prospective tenements.

The Company also has assets in South Australia – as activities are concentrated in the NT, these will only be briefly discussed.



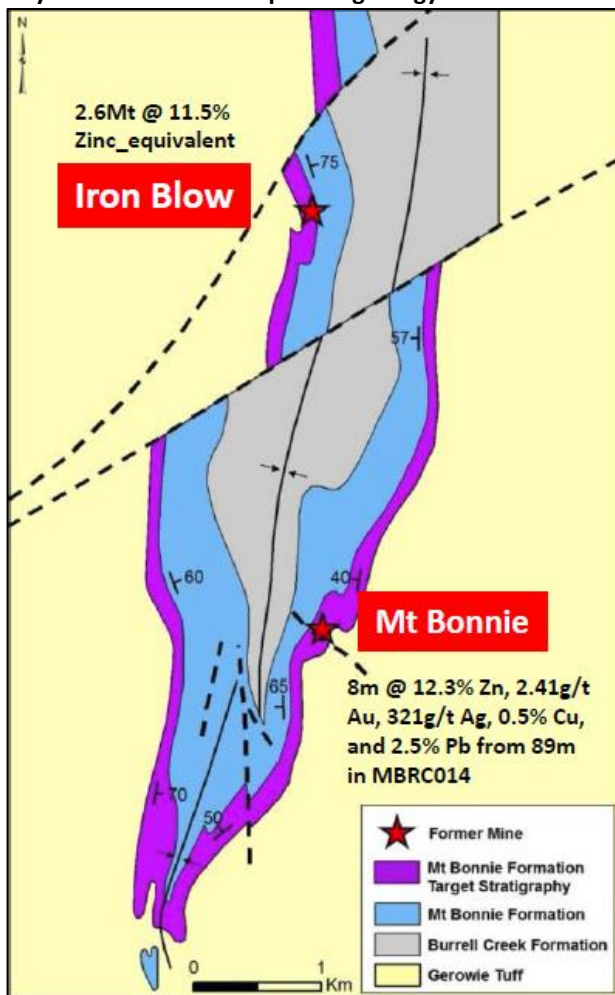
## Hayes Creek Project – PNX 100%

### Introduction and Tenure

Hayes Creek, which includes 14 mining leases, is located within 10km of the Stuart Highway, some 180km SE of Darwin

Hayes Creek is located approximately 180km south-east of Darwin. The project, which comprises 14 granted mining leases totalling 168 hectares, is located within 10km of the Stuart Highway, and 60km from the town of Pine Creek. It is also well located with respect to other infrastructure, including gas, electricity and rail.

### Hayes location with respect to geology



Source: Phoenix Copper

Hayes Creek includes the Iron Blow and Mt Bonnie massive sulphide deposits

### Mining and Exploration History

The project area has had mining dating back to the late 1800's, with more recent extraction carried out in the 1980's

The Iron Blow gossan was discovered in 1873, with small scale open cut mining from 1898 to 1906 producing approximately 13,700t of ore. Exploration recommenced in the 1950's and has continued at various times until the current day. In addition Henry Walker mined approximately 35,000t of oxide and supergene material from upper 40m in 1984, extracting only gold and silver. This parcel apparently included 10,000t of oxide grading at 9g/t Au and 250g/t Ag.

Exploration has been carried out from the 1950's to the present day

At Mt Bonnie Henry Walker extracted 110,000t @ 7g/t Au and 230g/t Ag from 1983-1985 – this deposit was discovered in 1902 and developed as an underground mine in 1912-1916.

Geopeko carried out drilling in 1970's, and estimated historic resources at Iron Blow of 942,000t @ 6.8% Zn, 0.8% Pb, 0.4% Cu, 1.86g/t Au and 97.3g/t Ag, and 480,000t @ 7.7% Zn, 1.8% Pb, 0.4% Cu, 1.5g/t Au and 186g/t Ag at Mount Bonnie.





Prior to Phoenix's acquisition, the most recent drilling was carried out by GBS Gold and Crocodile Gold, including six holes at Iron Blow and two at Mt Bonnie. Crocodile used this drilling to estimate an NI43-101 compliant resource for Iron Blow of 3,174,876 @ 3.28% Zn, 0.76% Pb, 0.19% Cu, 2.08g/t Au and 100.9g/t Ag

### Iron Blow open pit



Source – Phoenix Copper

*Hayes Creek is located over units of the highly prospective Paleoproterozoic Alligator River Group*

*Mineralisation is stratabound VMS in style*

*Iron Blow comprises two steeply east dipping lenses, 10-20m thick*

### Geology

Both Iron Blow and Mt Bonnie are hosted in the Margaret Syncline, Iron Blow on the west limb and Mt Bonnie on the eastern limb. The syncline trends and plunges gently to the north. Host rocks are interbedded clastic (including pyritic and carbonaceous shale) and minor carbonate rocks of the basal Mount Bonnie Formation, near its contact with the underlying Gerowrie Tuff. Both units are Paleoproterozoic in age, and belong to the extensive Alligator River Group.

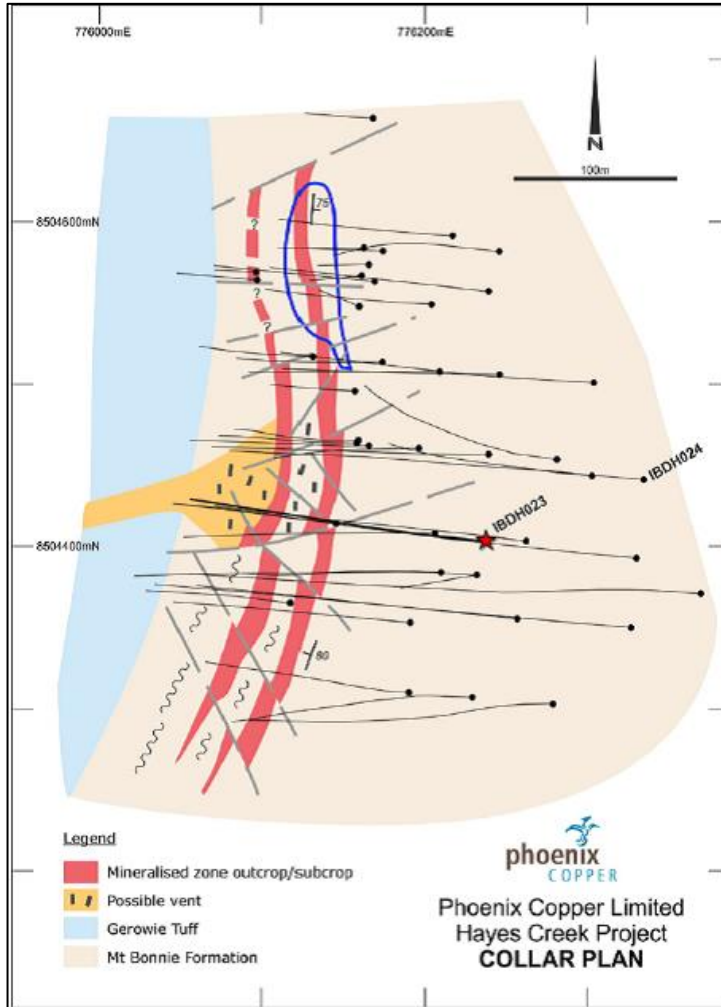
The geological setting represents a transition from subaerial to shallow marine felsic volcanism and sedimentation to inner and mid shelf marine sedimentation.

The mineralisation is stratabound, interpreted as being volcanogenic massive sulphide ("VMS") in style, with mineralisation occurring in discrete lenses. Mineralisation includes massive sphalerite and disseminated chalcopyrite. The primary gangue sulphide is pyrrhotite, which generally contains the galena and is finely disseminated within the host mineral. The mineralisation is visual, with sharp contacts between the lenses and host units.

Disseminated footwall mineralisation has also been intersected at Iron Blow – this comprises a discrete gold breccia lode and potentially represents the upper part of the hydrothermal vent sourcing the massive sulphide deposit. The breccia zone is outside the current boundaries of the resource model and contains a considerable amount of gold mineralisation

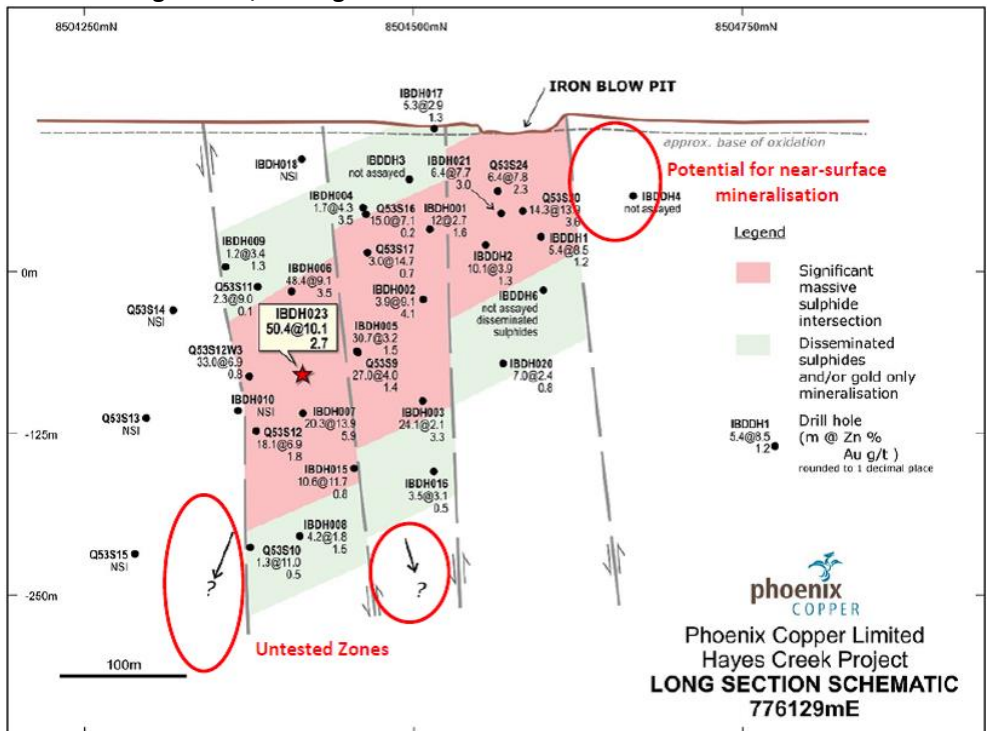
Iron Blow comprises two steeply west dipping main massive sulphide lenses, with a known strike length of ~400m, average lens thicknesses of 10-20m, and has been intersected to ~250m depth. Mineralisation is still open down plunge to the south, with some lenses also still open down dip. The mineralisation has been cut by a number of E-W and NW trending cross faults.

### Iron Blow plan showing drillholes



Source: Phoenix Copper

### Iron Blow long section, looking west



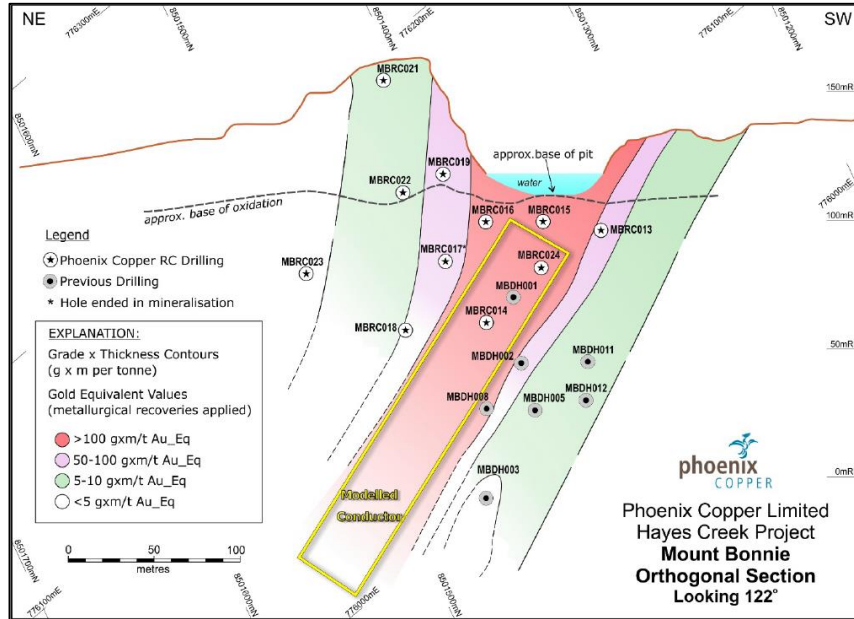
Source: Phoenix Copper





**Mt Bonnie section, looking SE**

*Mt Bonnie comprises a NW plunging lens, still open at depth*



Source: Phoenix Copper

**Resources**

Phoenix has estimated a JORC 2012 compliant inferred resource for Iron Blow, as presented in the table below. This was completed before two diamond holes were drilled late 2014 (discussed later), and hence does not include some potential footwall mineralisation.

*Iron Blow has 2.6Mt of resources, with up to 2.2Mt being potentially open pitable.*

**Iron Blow Inferred Mineral Resources**

Zone	Tonnes	Au (g/t)	Ag (g/t)	Cu (%)	Pb (%)	Zn (%)
>-90m RL, 0.7g/t Au cut	2.2Mt	2.4	140	0.3	1.0	4.9
>-90m RL, 3.0g/t Au cut	0.4Mt	2.7	71	0.4	4.1	10.0
<b>Total inferred</b>	<b>2.6Mt</b>	<b>2.4</b>	<b>130</b>	<b>0.3</b>	<b>0.9</b>	<b>4.8</b>
<b>Contained metal</b>		203koz	10.7Moz	7,000t	23,000t	125kt

Source: Phoenix Copper

The estimations were completed by AMC Consultants, using ordinary kriging methods, and using a bulk density of 3.63t/m<sup>3</sup>.

As part of the estimate, the consultants ran a Whittle open-pit optimisation on the block model, which resulted in a pit base at -90mRL, around 210m below surface, driven by the high grade mineralisation. This has resulted in the subdivision of the resource into an upper, potentially open pitable zone and a lower potential underground zone.

**Work Completed by Phoenix**

Since acquiring the projects Phoenix has undertaken an active work programme to take the project towards initially a Scoping Study (which will form a decision point), and ultimately development. Key programmes completed include:

*Phoenix has carried out an active work programme since acquiring Hayes Creek in late 2014*

- Drilling of two diamond holes for 705.8m at Iron Blow
- Resource drilling of 12 reverse circulation (“RC”) drillholes for 1,114m at Mt Bonnie
- Ground electro-magnetic (“EM”) surveying at Iron Blow, Mt Bonnie and the Joplin target – has provided additional drill targets
- Metallurgical and mineralogical testwork on Iron Blow composites
- Estimation of a JORC 2012 compliant mineral resource for Iron Blow (discussed previously).



*Drilling at both Iron Blow and Mt Bonnie has returned some exceptional intersections*

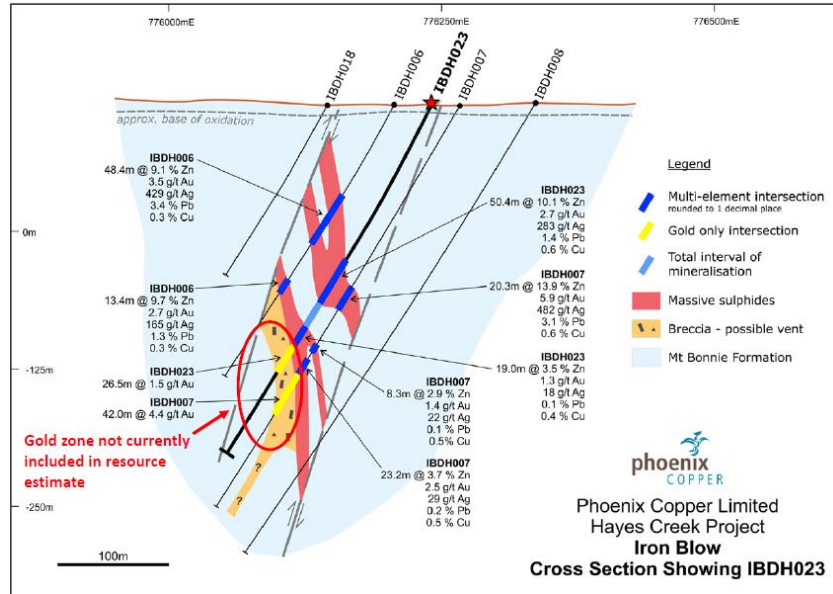
**Drilling**

Drilling at both Iron Blow and Mt Bonnie has returned very encouraging results, with some exceptional intersections.

The first hole at Iron Blow, IBDH023, intersected **50.39m grading at 10.12% Zn, 2.66g/t Au, 283g/t Ag, 0.57% Cu and 1.39% Pb**. This included **19.45m grading at 15.48% Zn, 2.65g/t Au, 492g/t Ag, 0.56% Cu and 2.52% Pb**. The hole also intersected a footwall gold zone of 26.5m grading at 1.5g/t Au.

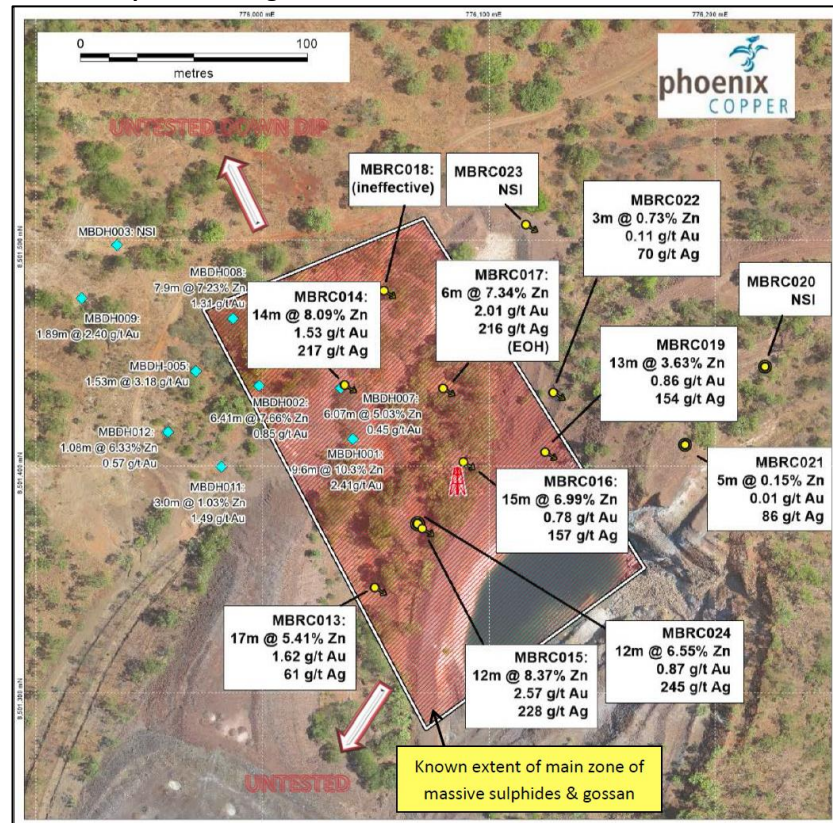
The RC drilling at Mt Bonnie comprised the initial phase of resource definition drilling, and only tested the upper part of EM conductors defined by Phoenix's earlier survey.

**Iron Blow section along hole IBDH023**



Source: Phoenix Copper

**Mt Bonnie plan showing drill results**



Source: Phoenix Copper



*Preliminary metallurgical testwork has given encouraging results, with optimisation testwork now underway.*

### Metallurgy

A key aspect of Hayes Creek will be the metallurgy. Poly-metallic deposits can be difficult to treat to extract maximum value. Phoenix has undertaken preliminary metallurgical testwork on samples collected from the diamond drill programme, which has given very encouraging results.

The company is currently carry out optimisation testwork, concentrating on zinc, gold and silver recoveries (which make up 90% of the in-ground value of the resource), with results expected before the end of 2015.

The initial work included diagnostic lead/zinc differential roughing tests using standard reagents.

Key points to come out of this work include:

*Zinc, gold and silver, which comprise the bulk of the value, have all performed well*

- Zinc has been the best performer, with >95% recoveries to a high grade concentrate
- Gold and silver both performed well, with recoveries of 65% and 75% respectively
- The bulk of the deleterious elements reported to tails, indicating that a clean concentrate could be produced.

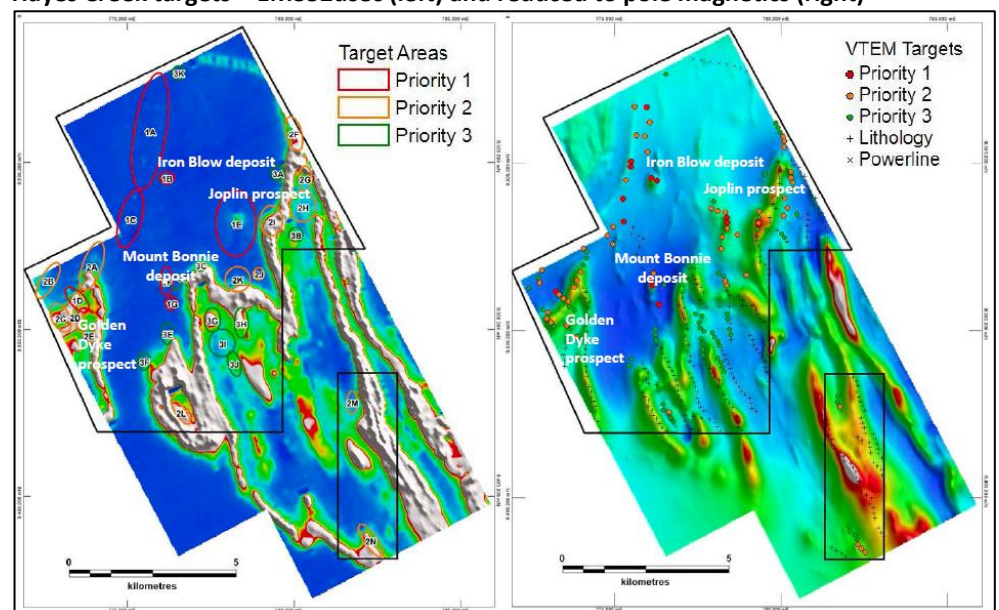
The company will be looking at various processing options. These include producing a zinc concentrate and a copper concentrate, which may also contain the bulk of the gold and silver (this is the scenario used in our modelling as discussed later). There may also be the possibility of producing gold-silver dore on site, through a gravity circuit and leaching of concentrate.

### Hayes Creek Upside

*There is good upside at Hayes Creek, including extensions to the known mineralisation, and additional targets identified from work to date*

There is significant resource and exploration upside at Hayes Creek, including possible down-plunge and strike extensions at the identified deposits, as well as exploration upside in the immediate area, with a number of targets identified from geophysical surveying, and 10km of the host stratigraphy for Iron Blow and Mt Bonnie being identified to date. One feature of VMS deposits is that they often occur in camps, and there is the potential for multiple deposits in the one district.

### Hayes Creek targets – EM352usec (left) and reduced to pole magnetics (right)



Source: Phoenix Copper

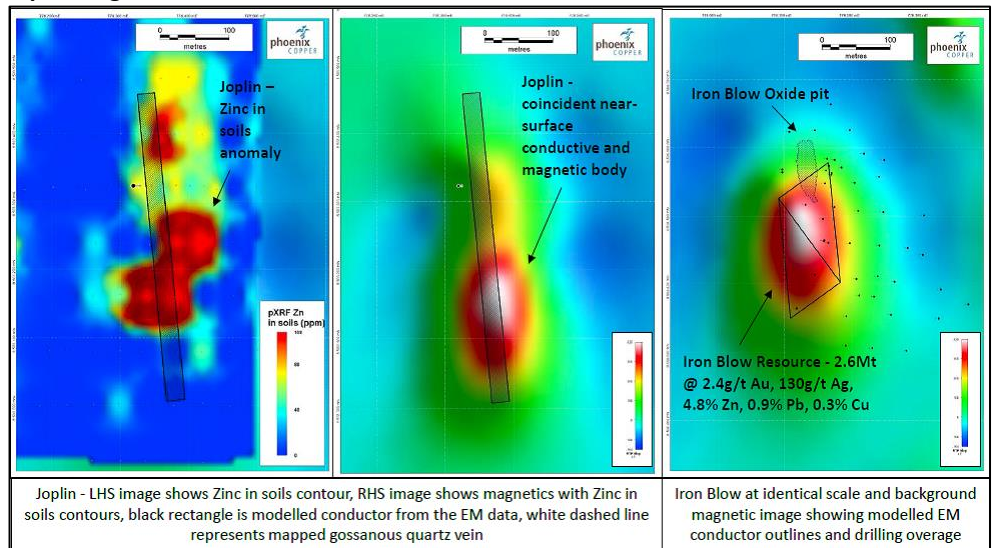




One such exploration target is Joplin, located within 3km of both Iron Blow and Mt Bonnie. This shows geophysical similarities to Iron Blow, as shown in the figure below, and the Company plans to drill test this shortly as statutory approvals have been obtained. The approvals process has included completion of a heritage survey.

### Joplin target

*Joplin is one such target, having geophysical similarities to Iron Blow and Mt Bonnie – Phoenix plan to drill this as soon as approvals are granted*



Source: Phoenix Copper

### Planned activities

*Subject to ongoing funding, Phoenix has an active work programme going forward*

Subject to funding, Phoenix has an aggressive work programme ahead, culminating in the completion of a Scoping Study, planned for the end of Q1, CY16.

### Proposed work program

		2015			2016+	
		Q2	Q3	Q4	Q1	Q2+
HAYES CREEK EXPLORATION	Exploration drilling Mount Bonnie	[Bar]		[Bar]	[Bar]	[Bar]
	Geophysics, exploration targeting and generation	[Bar]				
	Stage 1 testwork - diagnostic	[Bar]				
RESOURCE DEFINITION	Drill test Hayes Creek exploration targets	[Bar]		[Bar]	[Bar]	[Bar]
	Mt Bonnie exploration + resource extension	[Bar]		[Bar]	[Bar]	[Bar]
	Mt Bonnie resource estimate (JORC)	[Bar]		[Bar]	[Bar]	[Bar]
	Iron Blow exploration + resource extension	[Bar]		[Bar]	[Bar]	[Bar]
REGIONAL EXPLORATION	Iron Blow resource estimate (JORC)	[Bar]		[Bar]	[Bar]	[Bar]
	Stage 2 testwork - optimisation	[Bar]		[Bar]	[Bar]	[Bar]
	Fieldwork, new targets, mapping & sampling	[Bar]				
MINE DESIGN	Drill test regional exploration targets (2016)	[Bar]				
	Hayes Creek Reserves Study	[Bar]		[Bar]	[Bar]	[Bar]
FEASIBILITY	Hayes Creek Enviro + Hydro, studies	[Bar]		[Bar]	[Bar]	[Bar]
	Hayes Creek Concept Study/Scoping Study	[Bar]		[Bar]	[Bar]	[Bar]
	Hayes Creek Preliminary Feasibility	[Bar]		[Bar]	[Bar]	[Bar]

Source: Phoenix Copper

### Pine Creek Regional Tenements (PNX earning 90%)

*The regional joint venture tenements are highly prospective for a number of commodities*

The regional tenement package, comprising some ~1,676km<sup>2</sup> of granted tenements, is largely located over units of the highly prospective Paleoproterozoic South Alligator Group of the Pine Creek Orogen. The tenements are considered highly prospective for base metals and precious metals– the Pine Creek Orogen is the host to over 1,000 mineral occurrences, including a number within the tenement package.

*The region is host to a number of past and present operations, and mineral occurrences*

Current operations include Newmarket's Cosmo Mine, located near Hayes Creek - one of a number of gold deposits and occurrences along the Cosmo-Howley corridor, with a number of these located within the JV tenements. Should Phoenix make an economic gold discovery there may be the potential to treat material through the Cosmo plant.

Other occurrences in the area include Rockland's Thunderball uranium deposit, located



within an ML enclosed by JV tenement EL23431. In addition, previous drilling nearby intersected 12m @ 4.7g/t gold – this is being followed up. As mentioned earlier work in the Hayes Creek area has also traced at least 10km of the Iron Blow/Mt Bonnie host stratigraphy.

Although the Company’s focus is on the short term development of Hayes Creek, exploration is ongoing on these tenements, which have good potential for a brownfields or new discovery.

### South Australian Tenements

*The Company still has interests in its South Australian projects*

Phoenix holds some 4,000km<sup>2</sup> of tenements in South Australia, as shown in the map below. The Company is currently considering its options with respect to these tenements,

The Company’s 100% owned subsidiary Leigh Creek Copper Mine Pty Ltd (“LCCM”) and two surrounding exploration tenements have been optioned to Hillsgold Resources Pty Ltd (“Hillsgold”). The option can be exercised at any time until January 2016, contingent on Hillsgold preparing updated environmental plans (these have been submitted to the government for approval) for the three mining leases, and preparing certain feasibility studies.

There is nil consideration for the option, other than assuming the rehabilitation obligations at Mountain of Light and a one off payment of \$100,000 upon the production of 3,000t of copper.

#### South Australian tenements



Source: Phoenix Copper





## Valuation

The table below presents our NAV valuation of Phoenix. Cash and the value per share are predicated on shareholder approval of tranche 2 of the recent placement.

### Phoenix Copper company valuation

Valuation - DCF	Value (m)	Unrisked / Share	Risk Multiple	Risk Value	Risk Value / Share	Method
<b>Iron Blow/Mt Bonnie Pre Tax Discounted Cash Flow</b>	\$119	\$0.253	15%	\$17.9	\$0.038	DCF, 8% DR
<b>Pine Creek Exploration</b>	\$10	\$0.021	100%	\$10	\$0.021	Current
<b>South Australian Exploration Tenements</b>	\$2	\$0.004	100%	\$2	\$0.004	Current
<b>Cash</b>	\$2.35	\$0.005	100%	\$2.35	\$0.005	Current
<b>Avalon Resources holding</b>	\$0.36	\$0.001	100%	\$0.36	\$0.001	Current
<b>Debt</b>	-\$1.20	-\$0.003	100%	-\$1.20	-\$0.003	Current
<b>PNX Valuation</b>	<b>\$132.5</b>	<b>\$0.281</b>	<b>23.65%</b>	<b>\$31.6</b>	<b>\$0.067</b>	

Source: Breakaway analysis

The \$1.2 million in unsecured debt (provided by existing Phoenix shareholder Marilei International Ltd) was used to purchase shares in Avalon Minerals (current holdings of ~12.9 million shares), has a maturity date of November 6, 2016, and an interest (payable in Phoenix shares) rate of 7.5% per annum. There is the possibility, under certain circumstances, of repaying part of this by issuing stock in Phoenix.

We have undertaken a DCF valuation of a conceptual open pit operation at Hayes Creek, with inputs and results shown in the tables below. Metal prices and exchange rates are as quoted on August 20, 2015.

### Hayes Creek valuation outputs - all figures in AUD unless noted

Item	Values	Notes
<b>Concentrate production</b>	Zinc – 210kt, bulk (Cu, Au, Ag) – 30kt	
<b>Metal in concentrate</b>	Zn – 89kt, Cu – 5,746t, Au – 120koz, Ag – 8.08Moz	
<b>Revenue/tonne of Ore</b>	\$227.47	~65% of in-ground value
<b>Cash Costs/tonne of Ore</b>	-\$103.36	Includes smelter charges of \$22/tonne of ore
<b>Initial Capex/tonne of Ore</b>	-\$26.46	
<b>Sustaining Capex/tonne of Ore</b>	-\$6.32	
<b>Royalties/tonne of Ore</b>	-\$12.07	
<b>Margin/Tonne of Ore</b>	\$79.27	
<b>LOM Free Cash Flow</b>	\$209,746,179	
<b>Peak Free Cash Flow</b>	\$36,826,542	
<b>LOM Operating Cash Flow</b>	\$279,746,179	
<b>NPV - 8%</b>	\$123,701,036	
<b>IRR</b>	50%	
<b>NPV per Share</b>	\$0.346	
<b>NPV per tonne mined</b>	\$46.75	

Source: Breakaway analysis

Our scenario is based on the Iron Blow 2,200,000t >-90m RL inferred resource, with an additional 600,000t at the same grade assumed for an open pit operation at Mt Bonnie. The risk multiple of 15% we have used reflects the confidence level of the resource – we would expect this to rise with Mt Bonnie resources being estimated, and the confidence level of at least parts the Iron Blow resources being increased to indicated or measured.

We have completed an NAV valuation for Phoenix, with a base case value of \$0.067/share

The valuation includes modelling a conceptual 350ktpa open cut operation at Hayes Creek

We see upside in this scenario through resource expansions and the possibility of going underground

We also see upside here with the potential for resource expansions, and also possible underground mining – the grade is sufficient to support an underground operation should sufficient resources be defined. Our modelling indicates that the project is still viable using only the current 2.2Mt Whittle optimised open pit resource at Iron Blow.

Key features of the scenario are also the metallurgical assumptions used. We have used company guidance, including the results of the metallurgical testwork to date, as well as considering the metallurgical performance of similar deposits. Cost inputs as presented below have largely been sourced from mines with similar characteristics to our conceptual operation.

#### Hayes Creek valuation inputs – all figures in AUD unless noted

Parameter	Values
<b>Financial Parameters</b>	
<b>Discount Rate</b>	8% Real
<b>Metal Prices (US\$)</b>	Cu - \$5,035/t, Au - \$1,117/oz, Pb - \$1,680/t, Zn - \$1,773/t Ag - \$14.88/oz
<b>Exchange Rate</b>	1 AUD = 0.73 USD (rate and prices as of August 19, 2015)
<b>Metallurgical Recoveries</b>	Cu - 80%, Au - 65%, Zn – 85%, Ag - 75%
<b>Smelter Terms</b>	Payable Metal Cu – 95%, Au – 95%, Zn – 85%, Ag – 95%
	Zinc con TC - \$230/tonne at 50% Zn con grade
	Cu con TC - \$150/t, Cu RC - \$0.15/lb, Au RC - \$5/oz, Ag RC - \$0.30/oz – 20% Cu con grade
<b>Royalties</b>	6% NSR et, Includes 2% NSR for gold and silver payable to Newmarket, and an estimate of 4% for all metals payable to the NT Government. Actual NT royalties are based on a profit based regime, not Ad Valorem or NSR royalties as in other jurisdictions
<b>Initial Capital</b>	\$70 million
<b>Sustaining Capital</b>	3% of revenue
<b>Corporate Tax Rate</b>	Not applicable - pre-tax model
<b>Depreciation</b>	Fully depreciated to end of mine life
<b>Mining Cost</b>	O/C Ore - \$5/t, Waste - \$4/t moved
<b>Treatment Cost</b>	\$40/t milled
<b>Mine overheads</b>	\$4/t milled
<b>Transport Cost</b>	\$50/t concentrate
<b>Production Parameters</b>	
<b>Resource – open cut</b>	2,800,000t @ 0.30% Cu, 2.40g/t Au, 1.00% Pb, 4.90% Zn, 140g/t Ag
<b>Mining parameters</b>	10% mining losses, 5% dilution at zero grade
<b>“Reserve” – open cut</b>	2,646,000t @ 0.29% Cu, 2.29g/t Au, 0.95% Pb, 4.67% Zn, 133g/t Ag
<b>Construction period</b>	1 year – CY2017
<b>Mine Life</b>	7.6 years – CY2018 to FY2025
<b>Treatment/Mining Rate</b>	350,000tpa
<b>Open Cut Strip Ratio</b>	7:1
<b>Waste moved</b>	2,450,000tpa

Inputs have largely been sourced from similar operations

Source: Phoenix Copper, Breakaway analysis

As part of the valuation of Hayes Creek we have undertaken a sensitivity analysis on key inputs, with results given in the tables below – we have provided two tables – firstly one for the Hayes Creek NPV, and secondly for the Company per share net asset value.

#### Hayes Creek Project sensitivity analysis

Change	Zinc Price	Gold Price	Silver Price	Recovery	Opex	Capex	ER
-20%	\$94 m	\$97 m	\$100 m	\$56 m	\$155 m	\$132 m	\$208 m
-10%	\$106 m	\$108 m	\$109 m	\$88 m	\$137 m	\$125 m	\$159 m
0%	\$119 m	\$119 m	\$119 m	\$119 m	\$119 m	\$119 m	\$119 m
10%	\$132 m	\$130 m	\$129 m	\$150 m	\$101 m	\$113 m	\$87 m
20%	\$145 m	\$141 m	\$138 m	\$182 m	\$84 m	\$107 m	\$60 m

A sensitivity analysis indicates a potentially robust operation



### Company per share sensitivity analysis

Change	Zinc Price	Gold Price	Silver Price	Recovery	Opex	Capex	ER
-20%	\$0.054	\$0.056	\$0.057	\$0.035	\$0.084	\$0.073	\$0.111
-10%	\$0.060	\$0.061	\$0.062	\$0.051	\$0.075	\$0.070	\$0.086
0%	\$0.067	\$0.067	\$0.067	\$0.067	\$0.067	\$0.067	\$0.067
10%	\$0.073	\$0.072	\$0.071	\$0.082	\$0.058	\$0.063	\$0.050
20%	\$0.079	\$0.077	\$0.076	\$0.098	\$0.049	\$0.060	\$0.037

Source: Breakaway analysis

The analysis shows is that our conceptual Hayes Creek operation is robust – it can comfortably absorb 20% adverse movements in the sensitivity factor used, retaining positive NPV's in all cases.

### Breakaway's View

In Hayes Creek, Phoenix has a quality project with a good chance of proceeding to production. A key advantage is the project's proximity to infrastructure, with the concomitant reduction in capital and operating costs.

The conceptual 2.8Mt, 350,000tpa start-up operation we have modelled is robust and economically viable, even at current metal prices. This base model does rely on defining 600,000t of additional open pit resources at Mt Bonnie, however the project is still viable even if no additional open pit resources are defined (which given work done to date, seems highly unlikely).

There is also upside in a possible underground operation, with the high grade material being potentially able to support the higher underground mining costs should sufficient resources be delineated to cover the extra capital costs.

The key technical issue will be metallurgy. As mentioned previously poly-metallic mineralisation can be problematic, however we are encouraged by the results of the testwork completed to date. Also, the relative value weightings of zinc, gold and silver in the mineralisation does give some buffer should any one of them perform poorly metallurgically in any future operation.

We also see considerable upside in the exploration package. Promising base metal targets, including Joplin have been found close to Hayes Creek, and these, should they come in, are possible sources of ore to increase the scale of any future operation. More regionally, the package is highly prospective for a range of commodities, and there is also the potential, should economic gold mineralisation be found, to treat material through Newmarket's Cosmo plant.

Unfortunately, we are now living in difficult times in the resources industry, with capital markets being very tight. We are seeing falls in commodity prices, however from an Australia perspective things are being partially mitigated by a concurrent depreciation of the Australian dollar - however this factor is not widely recognised, and companies with Australian projects are in our view often harshly treated by investors.

Our view is that Phoenix is one of those – it has quality projects in a stable jurisdiction, and is headed by personnel with broad industry experience. As such we rate Phoenix as a SPECULATIVE BUY, with a base case valuation of \$0.067/share. Price movers will include material progress on the current scoping study, including resource expansions and upgrades. Also any exploration success should be positive.

The \$1.2 million unsecured debt – although not due and payable until late 2016, in current markets may be viewed by investors in a negative light, it should be noted however that at no point will it require the use of Company funds to settle.

*We rate Phoenix as  
SPECULATIVE BUY, with  
a base case valuation of  
\$0.067/share*



## Directors and Management

### *Non-Executive Chairman* **Graham Ascough**

**Graham Ascough** was appointed Phoenix Copper's new Chairman on 7 December 2012. Graham Ascough (BSc, PGeo, MAusIMM) is a senior resources executive with more than 24 years of industry experience evaluating mineral projects and resources in Australia and overseas. He is currently non-executive Chairman of three other ASX listed companies: Mithril Resources Limited, Musgrave Minerals Limited and Avalon Minerals Limited. Mr Ascough, a geophysicist by training, has had broad industry involvement playing a leading role in setting the strategic direction for companies, completing financing and in implementing successful exploration programmes. He was also a Councillor of the South Australian Chamber of Mines and Energy and Chair of its Exploration Committee from 2006 ~ 2012 and has strong ties to the SA Resources industry. He is a member of the Australian Institute of Mining and Metallurgy and is a Professional Geoscientist of Ontario, Canada. Mr Ascough was the Managing Director of Mithril Resources Ltd from October 2006 until June 2012. Prior to joining Mithril in 2006, he was the Australian Manager of Nickel and PGM Exploration at the major Canadian resources house, Falconbridge Limited, which was acquired by Xstrata Plc in 2006.

### *Managing Director & CEO* **James Fox**

**James Fox** with his appointment to the Board in November 2014 is now Managing Director & Chief Executive Officer of Phoenix Copper. James has been CEO of the Company since May 2012. He has more than 18 years' experience in the mining industry. Prior to working for Phoenix Copper Limited, he was responsible for the development and operation of the Nickel Laterite Heap Leach project at the Murrin Murrin operations in Western Australia. James has held various senior processing positions including Process Manager at the Nifty Copper Operation in Western Australia. He has worked in the UK, Cyprus, Uganda and Australia in gold, lead, zinc, copper, nickel and cobalt mining operations.

### *Non-Executive Director* **Paul Dowd**

**Paul Dowd** has a professional career spanning more than 45 years, primarily in the private sector, but also served in the Public Sector as head of the Victorian Mines and Petroleum Departments during the Kennett State Government. Mr Dowd retired as Managing Director of Phoenix Copper in 2012 but remains a non-executive director. Mr. Dowd has experience in developing business and managing mining operations in Australia, USA, Africa, Europe, Asia, Papua New Guinea, and Indonesia. He was previously VP of Newmont Australian Operations and Managing Director of Newmont Australia. Mr. Dowd has also held executive positions with, inter alia, Normandy Mining, responsible for Normandy's global mining interests. He serves on several mining industry bodies and advisory councils such as the CSIRO, and the Sustainable Minerals Institute at the University of Queensland. Mr. Dowd is a NED of Oz Minerals Ltd, and was also a NED of Macarthur Coal and AuRico Gold's Australian entities. Additionally, he is the Chairman of the Board of SA Resources & Engineering Skills Alliance - RESA.

### *Non-Executive Director* **Peter Watson**

**Peter Watson** studied Law at Melbourne University and graduated with honours. He has practiced law for over 40 years, specialising in commercial, corporate, resources and trade practices law. He is admitted to practice in South Australia, New South Wales, Victoria and Western Australia as well as the High Court of Australia. For over 20 years Peter was a partner in the national law firm now known as Norton Rose. During that time he established, and for 4 years managed, its Perth office. He also managed its Melbourne office for 2 years. In 1996 Peter joined Andersen Legal as its first Melbourne partner and in 1999 was recruited by Normandy Mining Limited as its group legal counsel and a group executive. Following the takeover of Normandy by Newmont Mining Corporation, Peter returned to private legal practice and founded the successful boutique law firm Watsons Lawyers in Adelaide. Peter, who was a founder of Phoenix Copper, is also a member of the board of trustees of the Bethlehem Griffiths Research Foundation (a medical research charitable foundation) and a director of Felton Grimwade and Bosisto's Pty Ltd (a natural products and therapeutic goods manufacturer and distributor).

### *Non-Executive Director* **David Hillier**

**David Hillier** is a Chartered Accountant and has more than 30 years' experience in commercial aspects of the resources industry. He is currently Executive Chairman of a private group which successfully identified a number of gold anomalies in the Maryborough Basin in Queensland, an area not previously considered prospective for gold. Throughout 2008, David was Chief Financial Officer and subsequently an executive director of Mineral Securities



Limited based in London. Prior to that he was Chief Executive of Buka Gold Limited and of a private group of companies. Between 1989 and 2002, David held a range of senior executive positions in the Normandy Mining Limited Group of companies and was Chief Financial Officer of Normandy for six of these years. He has served as Chairman and as a director of a number of public companies in the mining and exploration field.

*CFO & Company  
Secretary*

**Tim Moran**

**Tim Moran** is the Chief Financial Officer and Company Secretary of Phoenix Copper. Tim is a Chartered Accountant with 18 years' experience in accounting and finance and 10 years' experience in the mining and energy industries. Tim has a Bachelor of Commerce (Honours) from the University of British Columbia (Vancouver, Canada). Most recently, Tim was the CFO and Company Secretary of a Canadian listed oil and gas company in Calgary, Canada. Prior to that, he spent 12 years with KPMG, a global accounting and professional services firm, the latter nine years in Adelaide.

*Exploration Manager*

**Andy Bennett**

**Andy Bennett** commenced with Phoenix Copper in January 2015. Andy has more than 20 years' experience in the exploration and mining industry with roles in a wide variety of geological settings at both junior and large companies. Andy gained a solid technical background from exploration and underground mining positions with WMC Resources and BHP Billiton, where he was Chief Geologist during the Olympic Dam open pit expansion studies. Since then, Andy has managed project developments, exploration projects and feasibility studies with junior iron ore, gold and uranium companies. Recently, Andy was part of the team which brought the Roper Bar iron deposits in the Northern Territory from discovery into production within four years.

*Biographies extracted from PNX website, August 10, 2015*





### **Analyst Verification**

We, Grant Craighead and Mark Gordon, as the Research Analysts, hereby certify that the views expressed in this research accurately reflect our personal views about the subject securities or issuers and no part of analyst compensation is directly or indirectly related to the inclusion of specific recommendations or views in this research.

### **Disclosure**

Breakaway Investment Group (AFSL 290093) may receive corporate advisory fees, consultancy fees and commissions on sale and purchase of the shares of Phoenix Resources and may hold direct and indirect shares in the company. It has also received a commission on the preparation of this research note.

### **Disclaimer**

Any observations, conclusions, deductions, or estimates of figures that have been made by Breakaway Research and the Breakaway Investment Group in this report should not be relied upon for investment purposes and the reader should make his or her own investigations. This publication has been issued on the basis that it is only for the information and exclusive use of the particular person to whom it is provided. Any recommendations contained herein are based on a consideration of the securities alone. In preparing such general advice no account was taken of the investment objectives, financial situation and particular needs of a particular person. Before making an investment decision on the basis of this advice, investors and prospective investors need to consider, with or without the assistance of a securities adviser, whether the advice is appropriate in light of the particular investment needs, objectives and financial circumstances of the investor or the prospective investor. Although the information contained in this publication has been obtained from sources considered and believed to be both reliable and accurate, no responsibility is accepted for any opinion expressed or for any error or omission that may have occurred therein.

#### **Breakaway Investment Group**

AFSL 290093 ABN 84127962387

T+61293928010

F+61292792727

PO Box H116 Australia Square

Sydney, NSW 2001

Suite 505, 35 Lime Street,

Sydney, NSW 2000