



**Breakaway  
Research**

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### Company Information

ASX Code	IFE
Share Price (22 June 15)	A\$0.017
Ord Shares <sup>1</sup>	208.1
Options	37.7m
<b>Market Cap (FD)</b>	<b>A\$4.18m</b>
Cash (31 March 2015)	A\$0.75m
Investments <sup>2</sup>	A\$1.12m
Total Debt	A\$0.7m
<b>Enterprise Value</b>	<b>A\$3.01m</b>

1 – Takes account of 28.78m shares held by subsidiary that are to be cancelled

2 – ~13m shares in Orinoco Gold (ASX: OGX)

### Directors & Management

Executive Chairman	Ian Finch
Non-Exec Director	Neil McKay
Non-Exec Director	Peter Rowe
Non-Exec Director	Bruno Seneque

### Company Details

Address	Level 2, 679 Murray St. West Perth WA 6872
Phone	+618 9485 1040
Web	www.ironcladmining.com

### Top Five Shareholders

Admark Investments P/L	7.63%
New Pages Investments Ltd	3.17%
Ian Finch	2.91%
DBS Vickers Securities	2.82%
HSBC Custody Nominees	1.89%
Top 20	43.38%

### 1 Year Price Chart



Source: IRESS

# Ironclad Mining (IFE)

*A Golden Fleece for this Jumbuck?*

*Recommendation: Speculative BUY*

### Key Points

- **Recently completed Ironclad-Trafford merger brings synergies and cost savings to the merged entity**
- **Key Jumbuck Gold Project highly prospective for Challenger style gold mineralisation, as well as magmatic nickel/copper**
- **Region is potentially an Albany-Fraser Orogen look alike**
- **In addition to the iron ore resources, Wilcherry Hill tenements are prospective for base and precious metals**
- **Potential for sale of fixed assets to provide cash to fund exploration**

*With the Ironclad-Trafford merger now complete, Ironclad is recommencing exploration on its highly prospective Jumbuck Gold Project, located over the under-explored Archaean Christie Domain of the Gawler Craton of South Australia. The Christie Domain has similarities to the Fraser-Albany Orogen of Western Australia, host to Tropicana and Nova-Bollinger.*

*Previous regional sampling over the project area, which surrounds Kingsgate's 1Moz Challenger Gold Mine, identified +300 gold-in-calcrete anomalies, of which +250 are yet to be followed up. Follow-up work on around 50 anomalies has generated potentially economic gold grades in drilling at eight anomalies and one JORC-compliant resource; although further work is required on all of these prospects. Work has also identified prospectivity for magmatic nickel/copper mineralisation, potentially similar to that at Sirius' Nova-Bollinger deposit.*

*Should economic gold resources be delineated and dependent upon the operating status at Challenger at the time, there are potential ore treatment synergies with the Challenger mill, given that Ironclad is in an exploration JV with Kingsgate over part of the Jumbuck area.*

*We rate Ironclad as a SPECULATIVE BUY, with short to medium price movers being positive exploration results, and the successful sale of the Ironclad fixed assets.*

### Company Overview

Ironclad is an ASX-listed junior exploration company concentrating on projects in the Gawler Craton of South Australia. The Company's key focus is on the Jumbuck Gold Project, located around the operating Challenger Gold Mine of Kingsgate Consolidated. Holdings also include the Wilcherry Hill Project, originally primarily held for iron ore, but also prospective for a range of base and precious metals, including gold, lead, zinc, silver and tin.

The Company has recently completed a merger with Trafford Resources, combining the exploration assets of Trafford with the potential to raise significant cash from the sale of Ironclad's fixed assets.



## **Investment Thesis**

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### **Merger Complete – Now To Work**

*Merger between Ironclad and Trafford complete*

Ironclad Mining (ASX: IFE, “Ironclad” or “the Company”) has now completed the merger with Trafford Resources (“Trafford”), and activities will now concentrate on exploration on the highly prospective Jumbuck Gold Project (“Jumbuck”), located over the western Gawler Craton in South Australia, with work also planned at Wilcherry Hill.

### **Synergies Realised**

*Merger realises synergies, including potential cash from the sale of fixed assets*

The merger has been a prudent move in the current tight capital markets for exploration companies, combining the highly prospective exploration assets of Trafford with the potentially saleable fixed assets of Ironclad, valued at around \$10 million. The merger also has cost saving benefits, combining the overheads of the two related companies, which should allow for a higher proportion of dollars to be put into the ground.

### **Highly Prospective Exploration Assets**

*Jumbuck, the key but underexplored project, is highly prospective for gold and nickel/copper mineralisation*

With the Jumbuck Gold Project (“Jumbuck”) Ironclad has a high quality gold and nickel/copper exploration package in the highly prospective, but relatively underexplored Christie Domain of the Gawler Craton of South Australia. Exploration results and interpretations to date indicate similarities between this package and the Fraser-Albany Orogen in Western Australia, the host to the Tropicana gold and Nova-Bollinger nickel/copper mines.

### **Excellent Gold Exploration Hit Rate at Jumbuck**

*Previous work at Jumbuck has resulted in a high exploration “hit rate”, and a large number of targets that require follow up*

Previous regional calcrete sampling carried out over the Jumbuck area by Dominion Mining Limited (“Dominion”) led to the discovery of the +1 million ounce, high grade Challenger Gold Mine, which has been in continuous production since 2005. The regional programmes delineated over 300 calcrete gold anomalies, of which only around 50 have been followed up by Dominion and subsequent explorers.

Eight of the ten that were drilled have returned intersections with potentially economic gold grades, an excellent “hit rate” for an early stage exploration property, with the Golf Bore JORC compliant resource of 102,600oz also being delineated. All of these prospects still require further follow-up, as well as initial follow-up on the 250+ other gold anomalies that have not been subject to further work.

### **Don’t Forget the Nickel.....**

*Jumbuck is also prospective for Kambalda or Nova-style magmatic nickel/copper mineralisation*

More recent work has also highlighted the magmatic nickel/copper prospectivity, with calcrete samples also displaying large areas of nickel/copper anomalism. This is possibly associated with elevated gravity signatures, potentially reflecting large volumes of mafic intrusives. This is supported by historic drilling, that has intersected mafic intrusives and magmatic sulphides in the region.

### **.....and the Proximity to Challenger**

*The proximity to Challenger and the JV with Kingsgate provides the potential for toll treatment down the track*

One key to the project is the proximity to the Challenger Gold Mine (“Challenger”) which is central to the exploration package. Jumbuck includes both ground held 100% by Ironclad, as well as that under a joint venture (“JV”) between Ironclad (53%) and Kingsgate Consolidated Limited (ASX: KCN, 47%), the owners of Challenger. The JV agreement includes the capacity to toll treat JV ore at Challenger, as well as a first right of refusal by Ironclad on acquisition of the mill on any disposal of that asset, once a decision to mine is made.



*The toll treatment potential has benefits in cutting capital costs and lead times for any future operation*

## Potential for a Quick Start-up

The possibility to toll treat should allow a relatively quick production start-up should sufficient resources be delineated (and Challenger still be operating at that time), as well as greatly reducing capital costs and the ounces required justifying any commencement of mining. The Company estimates that an initial resource base of 500,000oz would be ideal to justify a toll treatment operation; this would be around 2,000,000oz should a standalone treatment facility or a mill restart be required.

*Work has identified good base and precious metals potential at Wilcherry Hill*

## Value at Wilcherry Hill

A second project, Wilcherry Hill, also has exciting exploration potential for base and precious metals, with exploration results to date confirming this, particularly with the discovery of significant tin associated with skarns.

*Market conditions have stalled the development of the WHIP, however there is the potential for a restart should markets improve*

## Iron Ore on the Back-burner

Recent falls in iron ore prices and the tightening of capital markets have stalled the development of the fully permitted Wilcherry Hill Iron Ore Project ("WHIP"), however this project, originally an 80:20 JV between Ironclad and Trafford could be restarted should market conditions improve. The WHIP has the capacity to produce a +60% Fe, low contaminant magnetite product.

## Highly Geared to Exploration Success

With an enterprise value of around \$3 million, Ironclad is highly geared to any exploration success.

## Risks

As in any resources stock there are a number of risks – ones currently pertinent to Ironclad are discussed below.

- **Exploration** – This is the key risk for Ironclad, being a junior explorer in a largely underexplored region. However results from work to date have shown the potential of the Company's projects, although exploration in this region is relatively cost intensive, given the small footprints of the known gold systems.
- **Funding** – The Company will now need funding to carry out its planned exploration programmes. Our estimate is that the minimum exploration expenditure commitment is in the order of \$750,000-\$1,000,000/year. Given the current relatively low appetite for exploration in the investment community, it may be difficult to source adequate equity funding. However, the potential sale of the WHIP fixed assets also has the capacity to supply funding.
- **Sovereign Risk and Permitting** – This risk is negligible, given that South Australia is a well understood and mining friendly jurisdiction, with a history of pro-actively supporting resources projects. This does carry into the permitting process, which is well understood.



## Project and Activities Review

### Introduction and Strategy

Ironclad (to be renamed “Tyranna Resources”) is the result of the merger of Ironclad and Trafford, with Trafford becoming a wholly owned subsidiary of Ironclad. This is in effect a reversal of the 2007 spin-out of Ironclad from Trafford, with Ironclad then being a special purpose vehicle to progress the WHIP.

The merger was in response to the tight capital markets, and brought together Trafford’s quality exploration portfolio and the potentially saleable fixed assets of Ironclad. Assuming the asset sales go to plan, this will result in a company adequately funded to carry out effective exploration.

Activities are focussed on the Archaean to Proterozoic Gawler Craton of South Australia, with two key projects:

- The Jumbuck Gold Project (originally held through Trafford, and previously known as the Western Gawler Craton Project),
- The Wilcherry Hill Project (including the WHIP), originally held by Ironclad.

Other projects, which will only be briefly discussed, include Lynas Find and Twin Peaks, both located in Western Australia.

#### Ironclad project location



Source: Ironclad Mining Merger Scheme Booklet

*Following the merger with Trafford, Ironclad has two key projects – Jumbuck and Wilcherry Hill*

*The target at Jumbuck is gold, however there is significant nickel/copper potential as well*

*In addition to iron, Wilcherry Hill is prospective for base and precious metals*

*Initial focus will be on short term gold production at Jumbuck*

As the name suggests, the key target at Jumbuck is gold, however a data review and historical exploration activities have highlighted the potential for nickel and copper mineralisation, possibly similar to that in the Fraser Range of Western Australia. Jumbuck includes tenements held 53% under JV with Kingsgate (gold rights only), as well as tenements and applications held 100% by Trafford (all minerals).

The 100% held Wilcherry Hill Project has primarily been explored and developed as a magnetite skarn and BIF iron ore project, however work has also highlighted the potential for precious and base metal mineralisation, including gold, silver, tin, tungsten, lead, zinc and manganese

Ironclad’s initial focus is aiming towards near term production at Jumbuck, with the potential to process through the Challenger mill and generate cash flow. The Company has an initial resource target of 500,000oz, with a pipeline of targets in the project area. The longer term resource target is +2Moz.



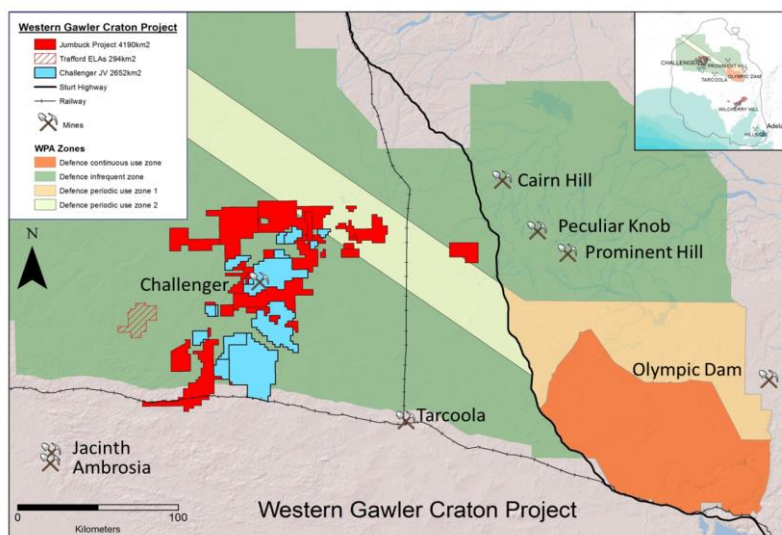
## Jumbuck Gold Project

### Introduction and Tenure

Jumbuck, (formerly the Western Gawler Gold Project) is located in north-western South Australia, on the western edge of the Gawler Craton. The tenement package of 7,926km<sup>2</sup> (including applications) comprises two groups – those held 100% by Trafford, and a number of tenements held in JV with Kingsgate, in which Trafford currently holds 53% of the gold rights only. Kingsgate own the Challenger Gold Mine, which is centrally located with respect to the tenement package.

*Jumbuck is located on the western side of the Gawler Craton*

### Jumbuck Project location map



*The project includes tenements held 100% by Ironclad, and those held in a 53:47 JV with Kingsgate, the operators of the Challenger Gold Mine*

Source: Ironclad Mining

The Western Gawler Craton Project JV was originally set up between Southern Gold (ASX: SAU) and Dominion Mining Limited (“Dominion”) in 2006. Original terms of the JV included:

*The JV agreement with Kingsgate contains a toll treatment provision and first right of refusal on the purchase of the Challenger Mill*

- Southern Gold, as manager, earned 51% by the expenditure of \$2m within two years
- If Dominion does not participate at 49%, Southern Gold can earn an additional 29% (to take the total to 80%) by the expenditure of a further \$2m in the following three years.
- There was a provision to allow Southern Gold to toll treat at the Challenger plant, and also provided them with a pre-emptive right of first refusal to purchase the plant should Dominion decide to divest and the JV had made a decision to mine.

Subsequent events included the takeover of Dominion by Kingsgate in February 2011 (with Dominion Gold Operations becoming a wholly owned subsidiary of Kingsgate), and Trafford’s purchase of Southern Gold’s interest in the JV in 2012. Trafford applied for its 100% held tenements at the same time as the JV purchase.

Trafford purchased the 51% interest in the JV for \$500,000 cash and 3,000,000 Trafford shares, with a further \$1m worth of shares due once a decision is made to conduct a feasibility study on a JORC-compliant gold resource of >500,000 ounces.

Trafford has subsequently earned an additional 2% equity in the JV project through Kingsgate diluting.

*A DoA is in place with the DoD for access to the Woomera area*

Given that the project is located over the Woomera Prohibited Area (“WPA”), Trafford has a Deed of Access (“DoA”) with the Department of Defence (“DoD”), which regulates periods of access and exclusion within the DoA area.



*Jumbuck tenements are located over high grade metamorphics of the Mulgathing Complex of the Christie Domain*

*The region is intensely deformed and metamorphosed*

*Gravity highs, potentially reflecting mafic intrusives, are present*

**Geology**

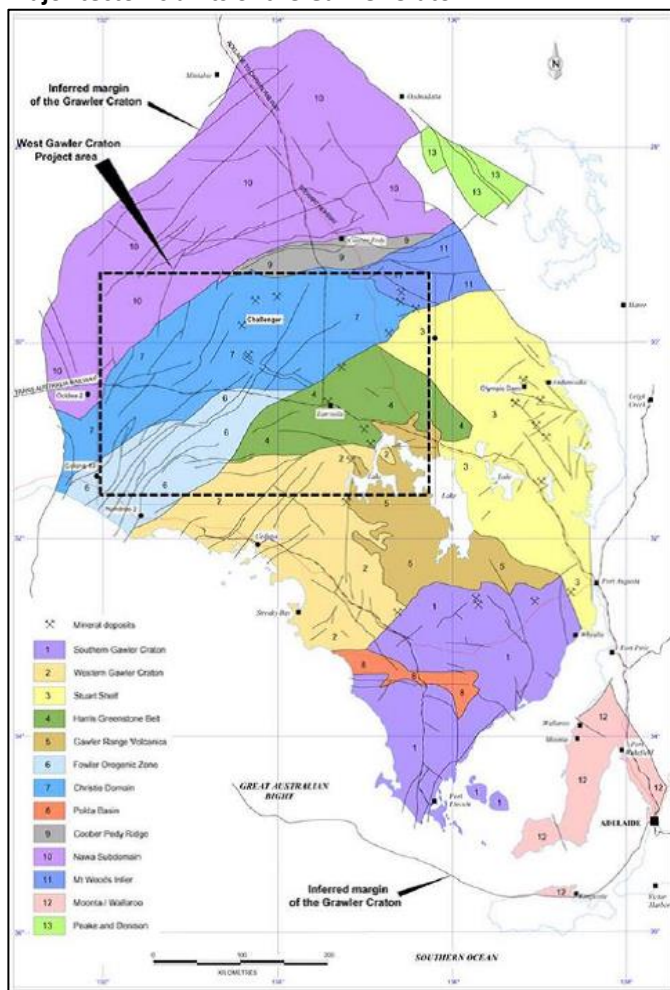
The tenements are located over high grade Archaean metamorphics of the Mulgathing Complex, a subset of the Christie Domain. These comprise some of the oldest units within the Gawler Craton. Lithologies are largely poorly understood, but include gneisses, migmatites (units that have undergone partial melting) calc-silicates and banded iron formations (“BIF’s”). The area has variable younger cover and very limited outcrop, and weathering generally down to 20-50m.

It is interpreted that the precursors to the high grade metamorphics included a wide range of sedimentary and volcanic units, including mafic/ultramafic sequences virtually identical to the nickel hosting Archaean komatiites of the Yilgarn Craton and Superior Province of Canada.

The region is intensely deformed and metamorphosed, with structural work at Challenger indicating that the latest main shortening direction is from the northwest and southeast, resulting in tight to isoclinal folds, associated with extensive faulting and shearing. Major structure includes the arcuate Karari Fault Zone separating the Christie Domain from the Coober Pedy Domain in the north, and second order structures including the NNE trending Talacootra and Coorabie Fault zones, lying to the west and east of Challenger respectively.

Key geophysical features include regional scale NE to NNE trending gravity highs, largely in the central to eastern part of the project area. These have never been drilled, however are interpreted as possibly representing large volumes of mafic intrusives (more later) underplating and/or intruding the cratonic crust.

**Major tectonic units of the Gawler Craton**



Source: Ironclad Mining Merger Scheme Booklet (after Teasdale, 1997)



### **Previous Exploration**

Exploration in the region has been carried out since the late 1960's, with the first systematic work carried out by CRA Exploration in 1990, however results of this earlier work were generally regarded as disappointing. Work by the South Australian Department of Mines and Energy in 1991 identified significant basement gold anomalism, which led to Dominion taking a tenement position in the region.

*Resolute undertook a regional calcrete sampling programme, which resulted in the Challenger discovery, as well as delineating +300 other gold anomalies*

Following an orientation survey, Dominion undertook regional calcrete sampling on a nominal 1,600m x 1,600m spacing in the mid 1990's, which identified over 300 anomalies, including the Challenger discovery, in addition to Golf Bore and others as discussed later. Challenger was discovered by the follow up of a high order (180ppb Au) calcrete sample anomaly. Work over the project area included drilling of over 6,300 RAB, 230 aircore, 500 reverse circulation and 45 diamond drillholes.

Dominion joint ventured the tenements to various companies in the mid 2000's, including Mithril Resources (ASX: MTH) for nickel (terminated in 2009) and Deep Yellow for uranium (terminated in 2008). Work by Mithril intersected mafic intrusives and magmatic sulphides at the Aristarchus prospect.

Work by Southern Gold included additional regional and infill geochemical sampling, drilling, and airborne and ground geophysical surveying over a number of prospects. The initial resource estimation for Golf Bore was also completed by Southern Gold.

### **Mineralisation and Resources**

The main gold mineralisation within the region is the Challenger Gold Mine, with the Golf Bore Deposit located some 40km northeast of Challenger also hosting a JORC-compliant resource. Potentially economic grades have also been intersected at Mainwood, Breakaway Bore, Campfire Bore, Typhoon and Monsoon, which form a compelling pipeline of targets.

#### *Challenger*

Although Ironclad has no interest in the Challenger Gold Mine, it is discussed here to provide background to the geology and mineralisation at Jumbuck.

Challenger, which was discovered in 1995 and commenced operations in 2002, has produced over 1Moz of gold from 6Mt of ore at an average grade of ~5.1g/t gold, initially from an open pit, and then an underground operation from 2005.

*Gold mineralisation at Challenger comprises a number of highly deformed high grade shoots.*

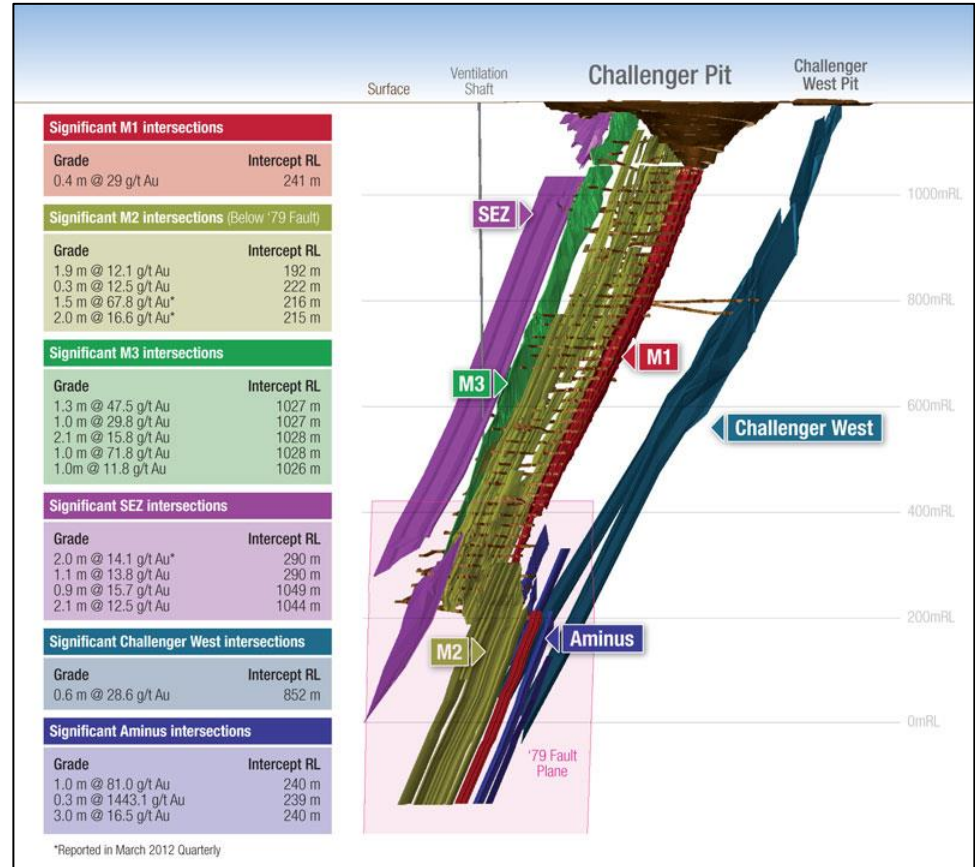
Mineralisation at Challenger comprises a number of narrow, shallowly plunging complexly deformed high grade shoots. The shoots plunge at around 30° to the NE, with mineralisation being defined to over 2.8km down plunge, (1.4km vertical depth). One feature of the mineralisation is the small surface footprint, which has exploration implications.

*These plunge at around 30° to the NE, and have been defined to at least 1,400m below surface*

The Challenger mineralisation is associated with strongly deformed "leucosomes"; partially melted quartz/feldspar/cordierite rich zones within a garnet rich gneiss. Mineralisation is interpreted as being formed at peak (granulite facies) metamorphism at around ~2,445Ma. This predates or is related to the early stages of the Sleaford Orogeny. In addition there is the interpretation that mineralisation was remobilised into boudinaged linear zones during the Meso-Proterozoic Klmban Orogeny.



## Challenger – Oblique View



Source: Kingsgate Consolidated

## Golf Bore

*Mineralisation at the Golf Bore deposit (102,600oz) is broadly similar to that at Challenger*

*The resource has been calculated using a low grade cut-off – drilling density to date is too low to confidently interpret the high grade mineralisation*

Mineralisation at the JV's Golf Bore deposit is broadly similar to that at Challenger, with mineralisation hosted in complexly folded leucosomes hosted in a fine grained weakly to moderately foliated gneiss. The gneisses, unlike at Challenger, have undergone retrograde alteration, overprinting what are believed to be garnet gneisses similar to those hosting Challenger and other gold shows in the region. The depth of oxidation is ~ 40m at Golf Bore, and there is a supergene gold zone developed at a depth varying between 10 and 25m below surface.

Although high grade leucosomes and veins have been intersected in the drilling, Southern Gold concluded that the drilling density was too low to allow a confident interpretation of the high grade, complexly folded zones. As such, the resource has been calculated using a broader, lower 0.2g/t Au cut-off, reflecting the broader mineralised host lithologies. The inferred resource of 102,600oz, which occurs in a number of sub-parallel zones, has a strike length of ~1,100m and extends to a depth of 120m below surface. Mineralisation is still open down dip and to the north.

## Golf Bore JORC-compliant inferred resources – 0.2g/t Au cut-off

Type	Tonnage (t)	Average Grade (g/t Au)	Contained Gold (oz Au)	Density (g/cc)
Oxide	806,000	1.2	31,300	2.57
Fresh	2,430,000	0.9	71,300	2.52
<b>Total</b>	<b>3,236,000</b>	<b>1.0</b>	<b>102,600</b>	<b>2.55</b>

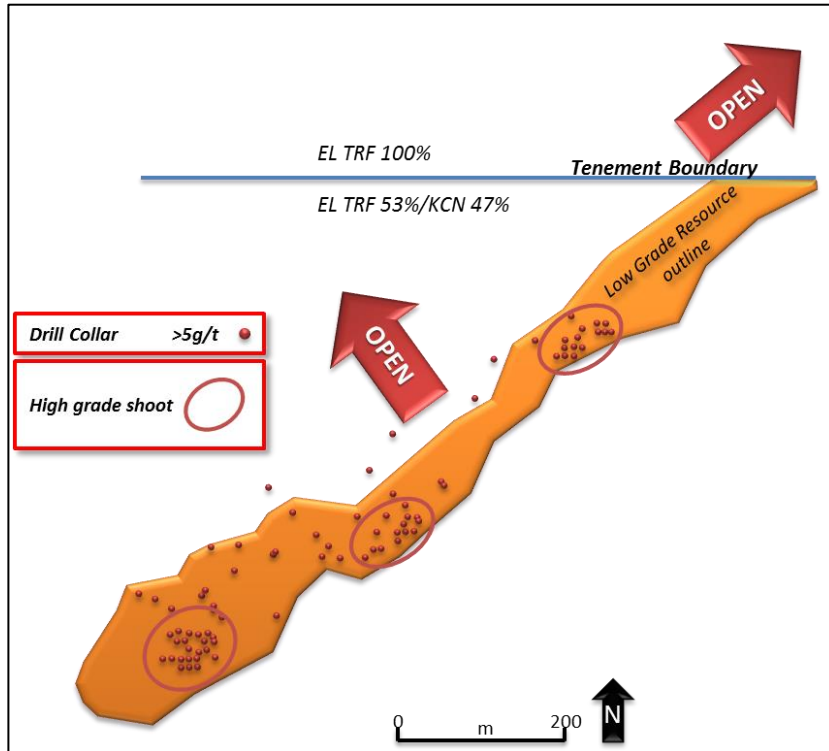
Source: Ironclad Mining

As part of the upcoming activities, Ironclad will be re-evaluating and re-interpreting the Golf Bore data.





### Gold Bore resource plan



*Gold Bore is open down dip, and along strike to the NE*

Source: Ironclad Mining

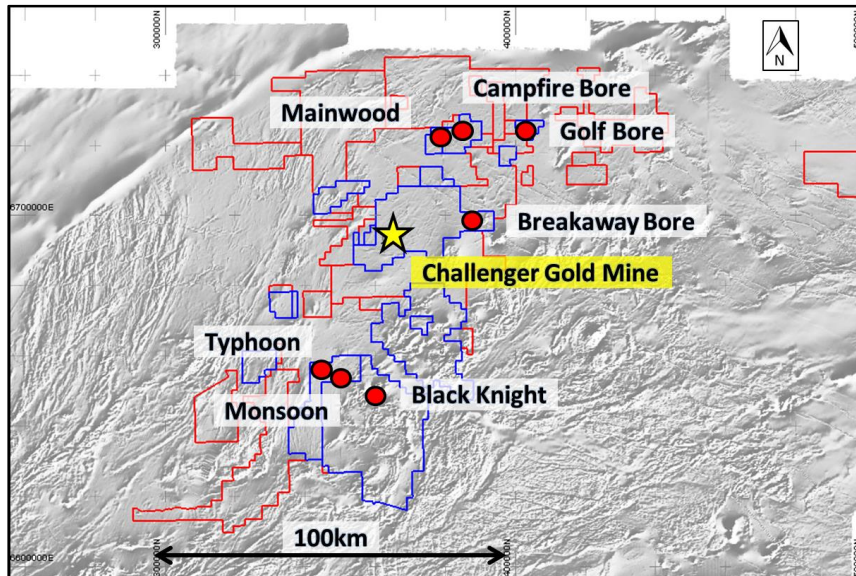
### Other Prospects

Previous work over the JV tenements has identified a number of other gold prospects that returned drill intersections with potentially economic gold grades, as well as coherent zones of mineralisation that have the potential to be developed into gold resources.

*Follow up drilling has defined a number of other prospects that have returned coherent mineralisation or potentially economic grades – these all require additional work*

Prospects where coherent zones of mineralisation have been identified include Campfire Bore, Typhoon and Monsoon; those with significant intersections include Mainwood, Breakaway Bore and Black Knight. The locations are shown in the diagram below, followed by a list of selected drilling intersections.

### Regional Prospects



Source: Adapted from Ironclad Mining



*Intersections up to 33.67g/t Au have been drilled*

### Significant intersections – regional prospects

Prospect	Intersection
Golf Bore	12m @ 4.74 g/t Au
Golf Bore	11m @ 7.56 g/t Au
Golf Bore	6m @ 12.80 g/t Au
Typhoon	7m @ 6.01 g/t Au
Typhoon	1m @ 33.67 g/t Au
Monsoon	12m @ 2.20 g/t Au
Monsoon	3m @ 8.08 g/t Au
Campfire Bore	14m @ 4.17 g/t Au
Campfire Bore	1m @ 25.29 g/t Au
Mainwood	4m @ 9.50 g/t Au
Breakaway Bore	1m @ 8.96 g/t Au
Black Knight	1m @ 7.85 g/t Au

Source: Ironclad Mining

*Jumbuck holds excellent exploration potential for gold and nickel/copper mineralisation*

*The region is considered under-explored*

*Geological interpretations indicate the similarity to the Fraser-Albany Orogen, host to Tropicana and Nova*

*Only around 50 of the 300+ calcrete gold anomalies have been tested, with exceptional results and a high “hit rate”*

*The nickel/copper potential has been reinforced by the re-assaying of the calcrete samples, and results from limited drilling*

### Exploration Potential

One of the keys to Jumbuck is the excellent exploration potential, both for gold mineralisation and for nickel/copper mineralisation. This is supported by the results of previous work. The area is considerably underexplored – historically access was limited due to the WPA, and then, following the discovery of Olympic Dam and other IOCG systems exploration funds were largely used for the exploration of these target types in the northern and eastern Gawler Craton, limiting funding for exploration in the western Gawler Craton.

Geological interpretations indicate that the region is potentially similar to the Albany-Fraser Mobile Belt which forms the eastern edge to the Yilgarn Craton in Western Australia. The Albany-Fraser Belt hosts significant mineralisation, including the Tropicana Gold Mine (116.8Mt @ 2.06g/t Au), and Sirius’ Nova-Bollinger Nickel/Copper Project (14.3Mt @ 2.3% Ni, 0.9% Cu). Mineralisation at Challenger is of the same age as that at Tropicana.

The original 1.6km x 1.6km regional calcrete sampling by Resolute in the Challenger region identified over 300 gold anomalies, of which only around 50 were followed up by closer spaced sampling and initial drilling, with over 250 anomalies yet to be followed up. Further follow up drilling over ten of the prospects intersected appreciable gold, a very high “hit rate” for exploration.

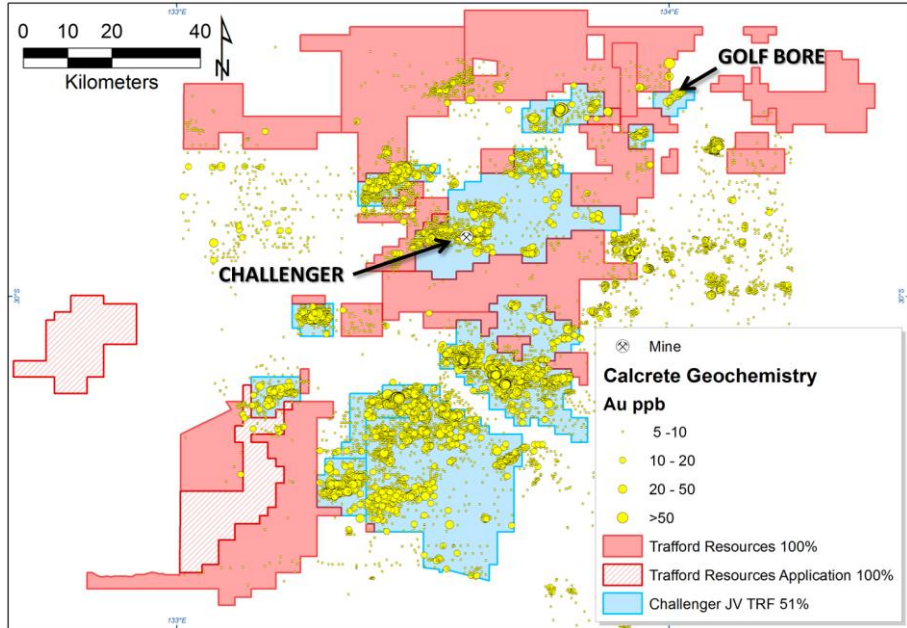
Re-assaying of the calcrete samples for base metals has also indicated the potential for nickel/copper mineralisation, supported by the work carried out by Mithril under their JV with Dominion. This work intersected mafic intrusives and magmatic nickel/copper sulphides, in areas coincident with the high gravity feature discussed earlier. This supports the interpretation that this may be a Fraser Range geological look-alike.

This is also supported by the geological setting, being located in a mobile belt at a craton margin

Although the majority of these samples occur on the gold JV ground, the limited samples on the 100% Ironclad ground have returned Ni/Cu anomalies, including a coincident 480ppm Ni/180ppm Cu anomaly at Thunderbolt Tank in the north of the tenement package. This opens up the prospectivity of the 100% Ironclad held ground, which has only limited regional geochemical sampling.

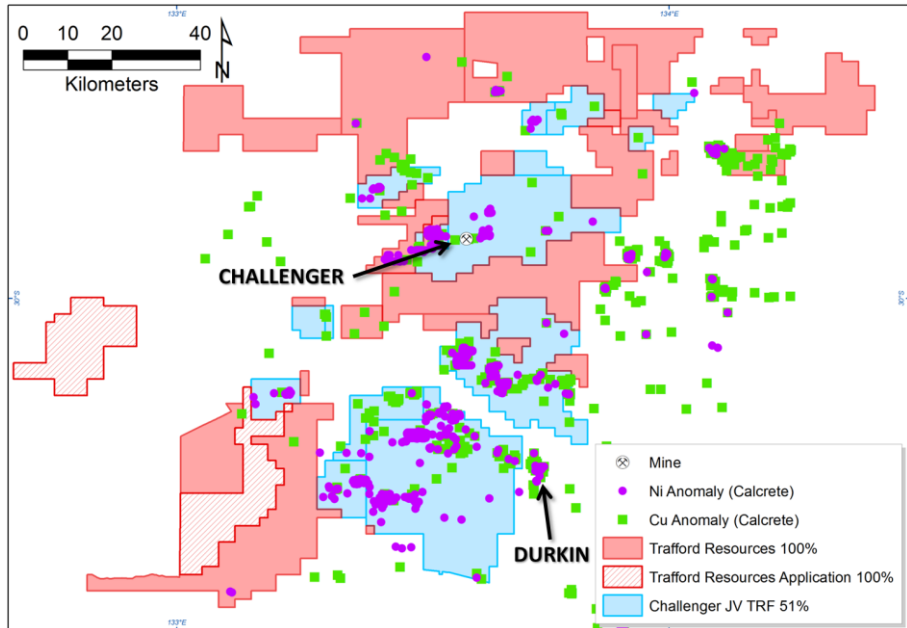


### Regional calcrete gold anomalies



Source: Ironclad Mining

### Regional calcrete nickel/copper anomalies



Source: Ironclad Mining

## Wilcherry Hill Project

### Introduction and Tenure

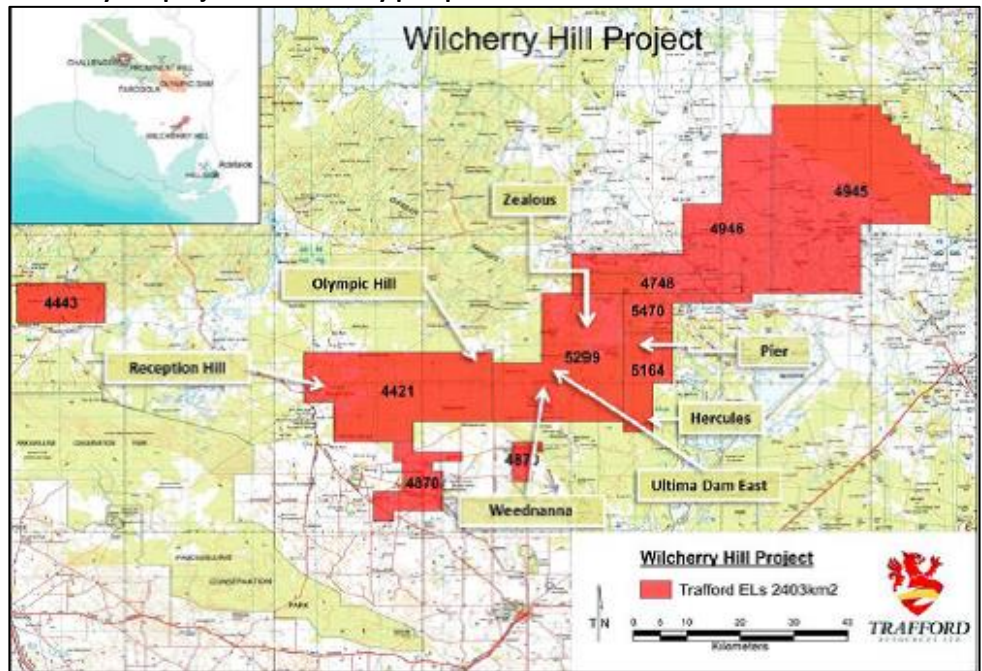
*Wilcherry Hill is located in the northern Eyre Peninsula*

The Wilcherry Hill Project, located in the northern Eyre Peninsula, includes seven granted EL's and one mining lease for a total of 2,273km<sup>2</sup>. The tenements are 100% beneficially held by Ironclad, with a 2% NSR payable to Aquila on all minerals on four of the tenements.

The focus at Wilcherry Hill has been on the development of a DSO iron ore operation (now stalled); however more recent work has involved assessing the tin, other base/precious metals and manganese potential.



## Wilcherry Hill project area and key prospects



Source: Ironclad Mining

*Wilcherry Hill is located over units of the Paleoproterozoic Hutchison Group metamorphics*

### Geology

The project is located over folded metamorphics of the Paleoproterozoic Hutchison Group, which unconformably overlies the early Paleoproterozoic Miltalie Gneiss and Archaean units of the Sleaford Complex. The Hutchison Group includes metamorphosed clastic and chemical sediments, including BIF's and mafic volcanics. Deformation, metamorphism and the syn-tectonic intrusion of the Moody Suite granites occurred during the 1,850-1,700Ma Kimban Orogeny.

These are overlain by the Mesoproterozoic (1,595-1,575Ma) Gawler Range Volcanics, and intruded by the syn-volcanic Hiltaba Suite Granites, which are found in the project area. This magmatic event is a major mineralising period in the Gawler Craton, giving rise to significant copper, gold and uranium mineralisation, including Olympic Dam amongst others.

*Hosts to mineralisation include magnetite skarns, and BIF's similar to those hosting the Middleback iron ore deposits*

### Mineralisation

The main hosts to mineralisation at Wilcherry Hill are magnetite skarns, with the skarn alteration interpreted as being caused by fluids associated with the Hiltaba Suite magmatic event. The primary focus at Wilcherry Hill has been iron ore mineralisation, largely hosted in the magnetite skarns, however BIF's (similar to those at Arrium's Middleback operation 70km to the southeast) are also an important host, particularly at Hercules. The units at Hercules include the Lower Middleback Jaspilite and Katunga Formation.

*Gold has been identified, however little follow up work has been completed*

Previous work has also identified gold in a number of the Wilcherry Hill prospects, particularly Weednanna, however there has been limited follow-up and no resource has been estimated, although significant intersects, including 36m @ 5.71g/t Au were drilled. This appears to be a separate structurally controlled mineralising event, occurring in a number of lithologies, and associated with sulphides.

*The tin discovery at Zealous has led to a re-appraisal of the project for tin, including a comprehensive re-assaying programme*

More recent work by Trafford has targeted base metals, particularly tin. Geochemical work to date has shown a Pb/Zn/Sn/W association in the skarns, however further work is required. A large proportion of the original drilling was not assayed for base metals, and the Company is currently undertaking a programme of re-assaying of drilling and surface samples.



*Encouraging manganese results have been returned at Hercules*

This follows on from the tin discovery at the Zealous Prospect in 2013, with drilling intersecting up to 12.3m @ 1.10% tin, with the dominant tin mineral being the metallurgical favourable oxide cassiterite.

Work has also been progressed on manganese at Hercules, with encouraging results being obtained from drilling and surface sampling.

A summary of the key prospects is presented in the table below.

#### **Selected Wilcherry Hill Project prospects and resources**

<b>Prospect</b>	<b>Style</b>	<b>Target</b>	<b>Resources</b>
<b>Weednanna</b>	Skarn	Primarily iron ore, however with gold up to 36m @ 5.71g/t Au. The gold appears to be associated with a later mineralising event. Re-assaying has also identified significant tin	11.2Mt @ 41.9% Fe
<b>Weednanna North</b>	Skarn	Iron ore. Re-assaying has also identified significant tin	9.4Mt @ 38.8% Fe
<b>Ultima Dam East North</b>	Skarn	Iron ore. Re-assaying has also identified significant tin	2.3Mt @ 44.1% Fe
<b>Ultima Dam East South</b>	Skarn	Iron ore. Re-assaying has also identified significant tin	3.8Mt @ 36.2% Fe
<b>Ultima Dam West</b>	Skarn	Iron ore. Re-assaying has also identified significant tin	3.2Mt @ 35.1% Fe
<b>Hercules</b>	BIF	Iron ore, manganese	215Mt @ 27.7% Fe
<b>Hercules East</b>	BIF	Manganese - intersections up to 5m @ 22.88% Mn	
<b>Hercules North</b>	BIF	Manganese - intersections up to 8m @ 16.82% Mn	
<b>Pier Dam</b>	BIF	Manganese - recent and historic rock chip sampling has returned values up to 44.2% MN	
<b>Zealous</b>	Skarn	Originally targeted for iron ore, however tin identified. Drilling has returned results up to 12.3m @ 1.1% Sn.	
<b>Golden Gate</b>	Skarn	Primarily iron ore, with intersections up to 14m @ 25.1% Fe. Also anomalous uranium has been intersected in drilling	
<b>Telephone Dam</b>	Skarn	Base metals prospect, with intersections of 12m @ 6.53% Pb/Zn and 93g/t Ag, 92m @ 2.18% Pb/Zn amongst others	

*Source: Ironclad Mining*

*Wilcherry Hill includes a number of areas prospective for a broad range of minerals*

#### **Iron Ore Resources**

A summary of iron ore resources for Wilcherry Hill is presented in the table below. The Company has also previously published reserves as part of the 2010 feasibility study, however the recent dramatic falls in the iron ore price will make these redundant, and hence they are not included here.

The resources are split between the skarn-hosted mineralisation at Weednanna and associated deposits, and the BIF-hosted mineralisation at Hercules.



## Wilcherry Hill and Hercules JORC-compliant resources

Deposit	Category	Tonnes	Fe%
<b>Wilcherry Hill</b>			
Weednanna	Total	11.2 Mt	41.9%
Weednanna North	Total	9.4 Mt	38.8%
Ultima Dam East North	Total	2.3 Mt	44.1%
Ultima Dam East South	Total	3.8 Mt	36.2%
Ultima Dam West	Total	3.2 Mt	35.1%
<b>Total Wilcherry Hill</b>	Measured	4.1 Mt	45.3%
<b>Total Wilcherry Hill</b>	Indicated	21.7 Mt	39.2%
<b>Total Wilcherry Hill</b>	Inferred	4.0 Mt	37.2%
<b>Total Wilcherry Hill</b>	<b>Total</b>	<b>29.9 Mt</b>	<b>39.6%</b>
<b>Hercules</b>			
Detrital	Inferred	5.7 Mt	41.6%
Goethite/Hematite	Inferred	44.0 Mt	40.8%
Goethite/Manganese	Inferred	8.9 Mt	35.1%
Magnetite	Inferred	157.0 Mt	23.1%
<b>Total Hercules</b>	Inferred	215.0 Mt	27.7%

Source: Ironclad Mining

### Wilcherry Hill Iron Ore Project

*Ironclad, in a JV with Trafford, was working towards the staged development of the permitted Wilcherry Hill Iron Ore Project*

Until the recent dramatic falls in iron ore prices, the then JV of Ironclad (80%) and Trafford (20%) was working towards the staged development of the Wilcherry Hill Iron Ore Project (“WHIP”). The Stage 1 project, including a transshipment port at Lucky Bay (where the JV was granted a 50ha site) is fully permitted, however now remains on hold, although has the potential to be restarted should prices improve, and the modest estimated capital of A\$23 million be sourced. The Company has estimated that the project will be viable at iron ore prices of around A\$100/tonne.

*Stage 1 included the production of up to 2mtpa of a +60% Fe fines product, using open cut mining and dry magnetic separation*

A feasibility study was completed in 2010 for the proposed Stage 1, which would produce, over 3-5 years, up to 2mtpa of DSO and beneficiated product from operations at the Wilcherry Hill skarn deposits. The Company was planning to progress to feasibility on the later Stage 2 and 3 operations.

These later planned expansions would include the beneficiation of the Hercules BIF mineralisation, aiming for a long life, 10-12 mtpa operation.

*The plan was to truck product 156km to a port at Lucky Bay for transshipment*

Key parameters of the proposed Stage 1 operation include:

- Open cut mining, with a 3.8:1 strip ratio
- Low intensity dry magnetic separation, to a +60% Fe, low contaminant product
- Truck ore 156km to the proposed Lucky Bay Port
- Transshipment to vessels offshore

A four year offtake agreement was signed with Asian interests in 2012, and later discussions were also held with Arrium regarding mine gate sales.

### Disposal of Fixed Assets

*The Company is looking at the disposal of fixed assets purchased for the iron ore project*

As part of the WHIP development, Trafford purchased a number of fixed assets, including a 1,650dwt tonnage powered barge, 80 person mining camp (located at Kimba), dry magnetic separators and a revolving bulk container handling system, used for unloading bulk containers. These assets were valued at A\$9.7 million as part of the merger process, and the Company is now looking at realising value through an orderly sale of the assets.



## Other Projects

Other projects include Lynas Find and Twin Peaks, both located in Western Australia. As these are not priority projects they will only be discussed briefly.

### Twin Peaks

*Twin Peaks, a non-priority iron project, is located in the Murchison Province of the Yilgarn Craton*

Twin Peaks, a JV between Independence Group (ASX: IGO) and Trafford, is located approximately 500km north of Perth in the Archaean Murchison Province of the Yilgarn Craton. The tenement package of 360km<sup>2</sup> includes two for which Trafford has earned 51% of the iron ore rights from Independence, and one held 100% by Trafford. Trafford earned 51% through the expenditure of A\$2 million over two years (commencing 15 October 2012), and may earn an additional 29% (taking total iron ore rights ownership to 80%) by spending an additional A\$3 million by October 2017.

The primary target is DSO iron ore hosted in BIFs, with Trafford completing 5,076m of RC drilling over a number of prospects, with these returning encouraging results. Intersections included 31m @ 63.56% Fe at the Woolbung Creek Prospect, and a number of lower grade fresh magnetite intersections (~30-35% Fe) at other prospects.

As this is not a priority project Ironclad will be considering its options with regards to future activities.

### Lynas Find

*Lynas Find is situated approximately 100km south of Port Hedland, and has previously produced 125,000oz of gold*

The Lynas Find Project, comprising thirteen prospecting and exploration licences of around 20km<sup>2</sup>, is centred some 100km south of Port Hedland in the eastern Pilbara Craton. Twelve tenements are held 100% by Trafford, with the other, of 9km<sup>2</sup>, being 80% held for the gold rights only.

The area was held by Lynas Gold NL from 1987 until 1997, which included mining activities at the Lynas Find Gold Project, where approximately 125,000oz was produced from around 2 million tonnes of ore between 1994 and 1998.

Gold mineralisation is largely associated with sheared ultramafic units within the Pilgangoora Greenstone Belt. The project geology also includes pegmatites, host to lithium and tantalum mineralisation.

Work carried out by Trafford has included RC drilling and the re-stating of a JORC 2004 compliant resource of 933,400t @ 1.65g /t Au (49,515oz Au contained) on the Old Faithful deposit, which was previously reported by Lynas, however is now not considered current by Ironclad.

The aim of the drilling was to extend the current Old Faithful resource and to test other grassroots anomalies. It is considered that there is potential for extensions to the known mineralisation.

## Breakaway's View

The merger of Ironclad and Trafford makes good commercial sense in the current market, delivering synergies and cost savings between the formerly sister companies. This should lower overheads, and allow for a larger proportion of funds to be put into the ground.

The merger has resulted in a large exploration package of around 10,000km<sup>2</sup>, prospective for a broad range of commodities.

As mentioned previously Ironclad was originally spun out of Trafford as a special purpose vehicle for the iron ore projects – this was during the iron ore boom, and a period of



escalating iron ore prices and a lot of interest in South Australian iron ore.

In our view the key asset, Jumbuck, is highly prospective, with the regional work carried out by Resolute and Dominion resulting in the discovery of Challenger, and the delineation of a large number of anomalies, many of which remain to be followed up. A number of those that have been followed up have returned very encouraging drilling results, resulting in a high hit rate in an exploration sense.

*Work to date has resulted in a high hit rate at Jumbuck, with good potential for further discoveries*

This included 10 out of around 44 followed up by Dominion. Given the number of anomalies that are apparently yet to be followed up we could reasonably expect more drilling success, and the potential for more Challenger-size discoveries. We would expect however that a large number of these anomalies may be false, transported or spurious, given the nature of and idiosyncrasies associated with calcrete sampling.

*However this is relatively difficult and expensive exploration*

However, this is not easy exploration. In addition to the large number of anomalies requiring follow up, the gold systems themselves have relatively small surface footprints, and can easily be missed in initial drilling. Also, given the small footprint, relatively tight drilling patterns are required to further delineate higher grade zones, hence exploration is relatively expensive. Also complicating matters is that geophysics is not an effective targeting tool for the gold systems.

*Although grassroots, the Ni-Cu potential is good*

The second prospective target is nickel/copper, given the geological setting and encouraging results in the region to date. However we are in the early days for exploration for this style of mineralisation, and it is very much grassroots exploration. We also note that Ironclad does not have the nickel or copper rights over the JV ground, where most sampling has been carried out – they only have base metal rights on the 100% held tenements.

*There are potential synergies with Challenger, however how long will the mine be operating for?*

The location close to the Challenger mill does present potential opportunities should an economic gold discovery be made, particularly on the JV ground, given the terms of the agreement. Any such synergies however will very much depend upon the status of operations at Challenger, and with the timing of the development and permitting of any new or existing resource, which we expect would take at least two years.

Will Challenger still be operating by then, and if not what will be the status of the mill?

Any potential mill restart after being on care and maintenance would require a significant resource base (>2Moz) to carry the capital required, and a longer time frame to find and delineate the resource.

Wilcherry Hill also makes an attractive exploration play, given the results of recent work, particularly with regards to tin.

*Funding is going to be a key issue*

This brings us to funding. Capital markets for exploration are very tight at the moment, and it may be reasonably difficult to source adequate funding from the market, despite the quality of the projects. As noted, our estimation is that the minimum annual exploration spend (excluding overheads) is \$750,000 to \$1,000,000/year. The Company is looking at disposal of fixed assets to source funds – although these have a market value as presented in the scheme booklet in the order of A\$9.7 million, given the nature of the assets we would assume that any sale would be at a considerable discount to market, particularly if the Company was looking for a quick (but not fire) sale.

*We rate Ironclad as a SPECULATIVE BUY.*

Despite some of our comments above, we rate Ironclad as a SPECULATIVE BUY, with high leverage to any exploration success. Short to medium term price movers will include exploration success and successful sales of the fixed assets.





## Directors and Management

*Executive Chairman*  
**Mr Ian Finch**

**Ian's** career as an exploration and mining geologist spans over 44 years. He has worked extensively throughout Southern Africa, Asia and Australia. He spent a total of 17 years as an exploration and mine geologist with Anglo American and Rio Tinto before establishing and successfully listing Taipan Resources Ltd on ASX in 1993. He was, more recently, Chairman of ASX listed Robust Resources and Bannerman Resources and President of Canadian listed Goldminco Corporation. He formed ASX listed companies Trafford Resources and IronClad Mining in 2006 and 2007 respectively. He is currently Executive Chairman of IronClad Mining and a Non-Executive Director of Orinoco Resources Ltd.

*Non-Executive Director  
and Company Secretary*  
**Neil McKay**

**Neil**, a former Associate of the Institute of Chartered Accountants in Australia, has been involved in the resources industry for more than 30 years. He has been Company Secretary for several listed resource public companies and held senior administrative and accounting positions for a number of other resource companies. Since 1995 he has operated as an independent consultant, specializing in the incorporation and administration of resource companies with special focus on South East Asia.

*Non-Executive Director*  
**Peter Rowe**

**Peter** has extensive mining industry experience gained over a 35 year career in Australia and South Africa. Following 20 years with Anglo American and De Beers, he moved to Australia in the early 1990s where he held a number of senior managerial positions. These included project director of the Fimiston expansion (Kalgoorlie Superpit), general manager of the Boddington Gold Mine and of the Boddington Expansion Project and managing director and CEO of Bulong Nickel.

*Non-Executive Director*  
**Bruno Seneque**

**Bruno** is a Certified Practicing Accountant with CPA Australia, and has 19 years experience as a qualified accountant. Over the last 17 years Bruno has accumulated experience in the mining industry in various roles including executive general management (Managing Director, Finance Director), CFO, company secretarial, corporate and mine site accounting. Bruno was previously Managing Director of Fox Resources Ltd, which operated the Radio Hill nickel/copper mine in Karratha, producing nickel and copper concentrates. His career has seen an active involvement in every stage from exploration to production and marketing of base metals concentrate and iron ore. Having been active in ASX listed companies, Bruno is experienced in capital raisings both from the debt and equity markets



### **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 Ironclad Mining and may hold direct and indirect shares in the company. It has also received a commission on the preparation of this research note.

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