

Great Southern Copper

Exploring for South America's next major copper discovery

This article will look at Great Southern Copper's portfolio of early stage exploration projects and with the use of comparisons, help to project forward the possible scale of the operation as well as highlight hurdles that they may need to overcome.

Company Profile

Great Southern Copper is a Chile focused, copper exploration company. Having acquired options over two under explored large land packages in North-Central Chile along the coastal range, the team intend to quickly develop and define drill targets. The two properties hold significant alteration footprints, with mineralisation having been defined by small scale miners who have and do operate in the region. The team intend to build on this knowledge and test the systems to depth, with the aim to potentially define a commercially scalable copper and gold opportunity.

Site Visit Video



Link: Video of Great Southern Copper site visit. Geological prospectivity and operational infrastrucutre (March 2022).

Charles Stephenson | ECM Analyst



www.gscplc.com
LSE:GSCU

Stock Data

Stock Data		
Listing	Standard Segment Main Market	
52-week Range	4.80 (3.3-5.2)	
Avg. Volume	149,543	
Capitalisation	Basic	Diluted
Shares Outstanding (M)	212,476,100	372,506,182
Market Capitalisation (£m)	7.76	
Enterprise Value (£m)	4.387	
Last Reported Cash and Equivalents (£m)	3.373	
Total Debt (£m)	0	
Major Shareholders	No. Ordinary Shares	Percentage of Enlarged Share Capital
Foreign Dimensions Pty Ltd	101,319,944	47.69
Clive Ian Duncan	7,912,254	3.72
Peter John Charles Davis	7,373,328	3.47
Monecor (London) Limited	10,600,000	4.99
Treweek Investments Pty Ltd	5,062,792	2.38
Metal Ventures Pty Ltd	4,926,878	2.32

Relative Performance



Development Stage Schematic



Company Snap Shot

GSC intend to make significant copper discoveries to fulfill the global short fall.

Project Options

Right to acquire 100% of licences with no royalties.

Capital

Managing Director

Sam Garrett

Great Southern Copper listed on the standard segment of the London Stock Exchange in December, 2021. The company plans to test two large geological targets that make up the San Lorenzo and Especularita projects with the hope of supplying the global shortfall in world class copper resource discoveries.

The company's two projects are held under Purchase Option Agreements which allow the Company to potentially own 100% of the projects subject to the payment in full of the Chilean government quotas. This being US\$117,080 per annum, and the fees of \$3,010,000 due by March 2024 for the concessions at the San Lorenzo and Especularita Project areas. There are no royalty or additional payments to the vendors for the projects nor any royalty, third party payments or other obligations in favour of third parties.

The Company has raised gross proceeds of £3,518,250 through a placing at 5p with a 1:1 warrant at 10p and a 2 year duration, giving net proceeds to the Company post listing of approximately £3,063,000. This was deemed by the company to be sufficient to meet working capital requirements for a period of at least 12 months.

Sam brings a huge amount of knowledge to the company being a geologist with over 30 years of exploration management, project assessment and operational experience. He has worked for large multinational and junior mining and exploration companies in eleven countries covering a broad range of geological environments. Highlights of his career include discovery credits for the **Mt. Elliot** Cu-Au mine (Queensland), **Dinkidi** Cu-Au mine (Philippines), **Tujuh Bukit** Au-Ag-Cu mine (Indonesia) and the **Havieron** Au-Cu project (West Australia). Sam also holds the executive director position of ASX-listed Flynn Gold Ltd as well as non-executive positions in various private and public resource and consulting companies.

Why Chile

OECD nation, with a mature mining industry and geology that has formed some of the worlds largest Copper deposits.

Chile represents an opportunity to potentially discover major copper and gold assets, within a well-developed jurisdiction that has suffered from a lack of green field exploration expenditure over the past decade. As a result, the current in-country operators are looking to secure future resources to replenish their dwindling reserves.

Within a well established mining industry and favourable geological setting for hosting world class deposits, Chile has become the worlds largest producer of copper, representing ~28% of global production, as well as being the second largest producer of lithium at ~22% of world supply (USGS Mineral commodity summaries 2022). This has also made the country heavily dependent on its mineral wealth, but also globally as an important country for these key battery transition metals.

Currently Chile is undergoing a historic change with the re-writing of its constitution. A process that has been growing in popularity since the fall of the Augusto Pinochet dictatorship in 1990.

According to the December 2021 Economic Forecast Summary, by the OECD, the Chilean economy is growing strongly, following a rapid vaccination rollout, large fiscal stimulus, and high commodity prices. GDP is expected to reach 12% by the end of 2021 and slowing to 2% into 2023 (pre-Ukrainian crisis). The country has been impacted by inflation, with growth in domestic demand as well as supply chain bottlenecks, however this could potentially return to 3% by the end of the year.

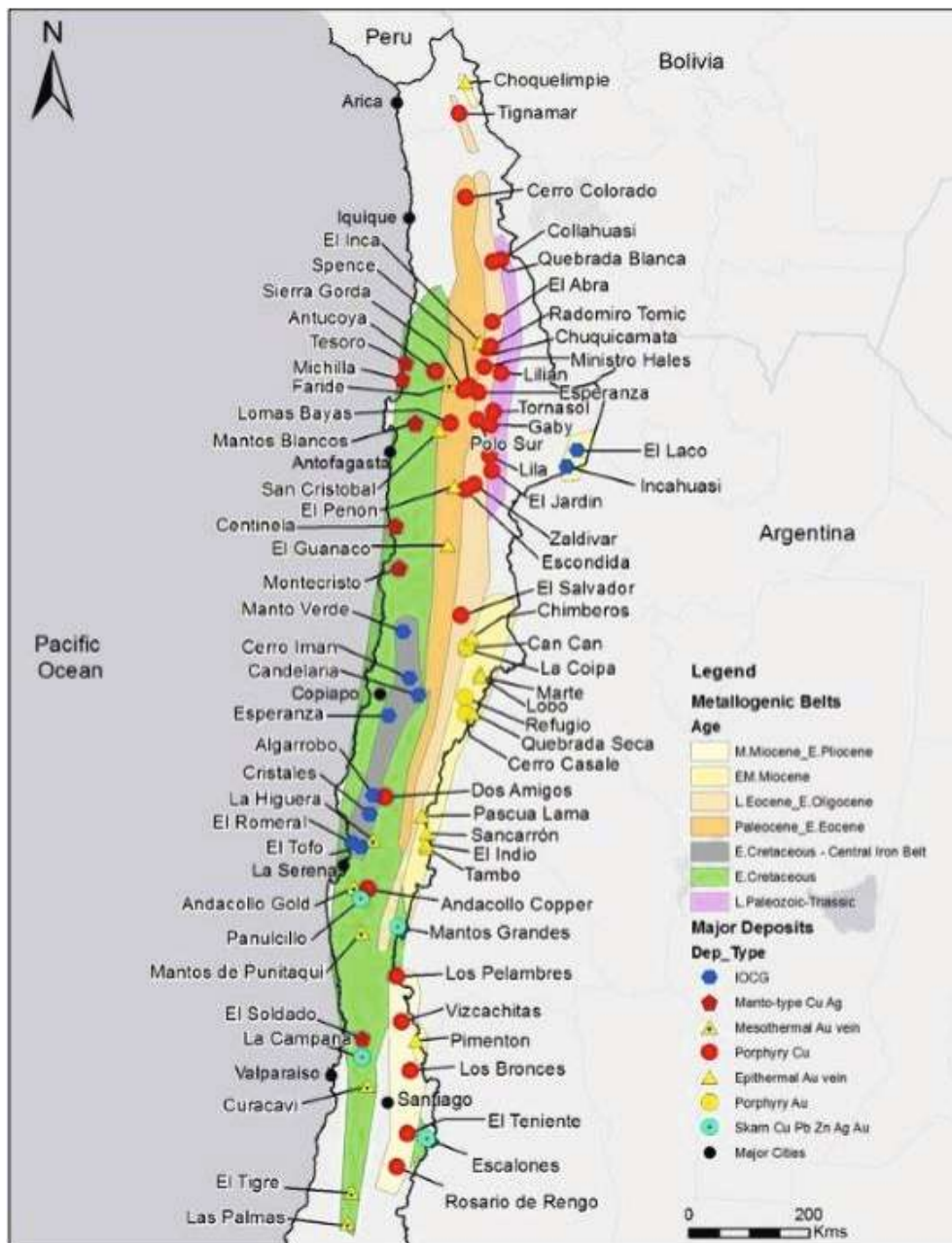
Introduction to Copper Assets

Chile is known for its large, low to moderate grade copper-gold deposits.

Copper deposits form in a number of geological settings including:

- Small, high grade volcanic massive sulphides.
- Polymetallic, magmatic, nickel-copper-PGE systems.
- Pervasive, sedimentary basin hosted copper.
- Large tonnage, low grade porphyry deposits.
- Smaller tonnage, but higher grade epithermal systems.
- More recently defined, Iron Oxide Copper Gold (IOCG) systems and Intrusion Related Gold System (IRSG).

Chile's geological setting has resulted in the country being overly endowed in copper mineralisation. This article focuses on the two largest copper producing geological settings: porphyries and IOCGs.



Map of Chile with varying copper-gold deposit types and geological belts.

Source: www.kuraminerals.com

IOCG & Porphyry Deposits

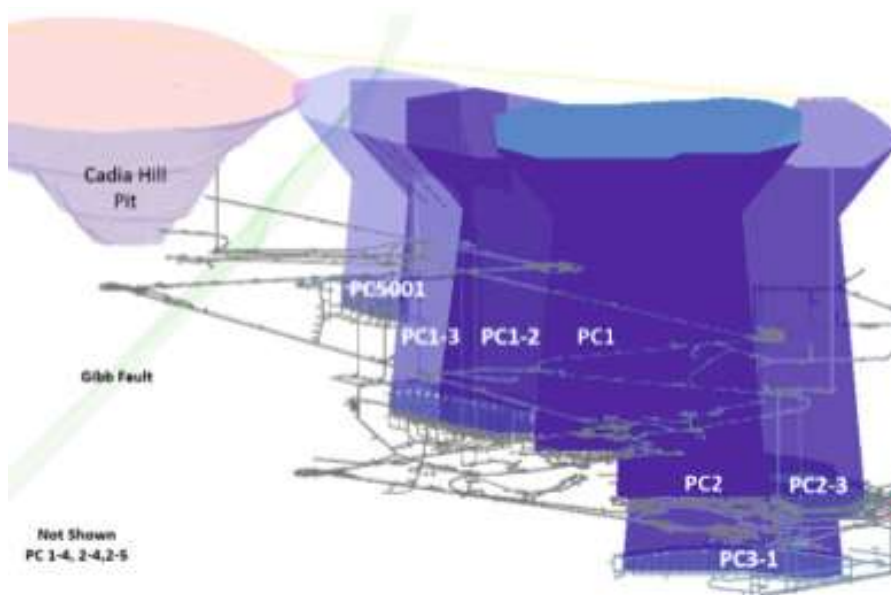
Large Copper, Gold, Silver and Molybdenum deposits that have prolonged life of mine.

Mining Methodology

To overcome low grade, profitability is leveraged of scales of economy.

Iron Oxide Copper Gold (IOCG) and porphyry systems are from an introductory level of understanding, very similar deposits. Both are large, hydrothermal ore systems that have a strong structural control, and form at a depth of 4 to 6km with later geological events exposing them near or at surface. Both host copper and gold, though IOCG's can also host commercial grade iron ore, as well as in Uranium and Rare earths as a by-product. A distinct geological feature that separates the two systems is the spatial association with an igneous intrusion, and as such giving geologists variable models to apply to their exploration strategy.

Given that both styles of deposit are low in grade (<1% Copper Equivalent (CuEq)), tonnage and location is critical for their commerciality and as such bulk mining methods are applied. Most operations are extensive open pits, following the vertically extensive systems down to depth, and account for the vast majority of mining operations. Some underground operation do exist, such as Newcrest's Cadia porphyry, located in New South Wales, Australia using block caving, an underground bulk mining method, that can reduce the cash cost (C1) to below those of many open pit operations. Within Chile there are small, underground operations that focus on high grade epithermal systems which are often found around the periphery of the porphyry systems.



Cross section of Cadia projects block model showing open pit mine and underground block caving model. Feasibility Study, 2021.

Project Comparison

What variables make a project commercial, and putting results into perspective.

This project comparison uses post-resource copper projects at varying stages of development, with similar geological, political, and metallurgical characteristics to project a potential valuation of the Great Southern Copper portfolio as well as identify hurdles to unlocking market realisation.

Key components that have been used in this peer comparison include:

- **Grade:** The projects range from 0.3% to 0.6% Copper (Cu), however it should be noted that many of these deposits are formed of higher grade centres, with large, low grade halos. In some cases, the addition of gold is critical to make these zones commercial.
- **Tonnage:** Such deposits generally require a critical size to be of commercial interest with large Capex requirements.
- **Location:** Water and land rights are two key issues in Chile, pushing high water consuming copper projects towards using sea-water for their processing. As such distance from sea water impacts the initial CAPEX requirements and operating costs.
- **Processing Capacity:** Copper ore is dominated by two forms, Copper oxides (Malachite and Azurite) which are processed through solvent extraction and electrowinning (SX-EW) and primary sulphides (Chalcopyrite, Bornite, and Chalcocite) which use flotation separation. Projects often have a mix of both ore types, being the surface copper oxide forming from the weathered primary sulphide as they are exposed at surface.
- **Stage of development:** As projects develop through discovery, Scoping study and through to bankability, the team conduct progressively more detailed surveys, acquire government licencing, and secure financing which reduces the risk to help build on refining and defining their path to production.

Peer Comparison

Table of Project Comparison

Company	Project	Stage	Country	Main Processing	M+I Resources (mt)	Cu/CuEq (%)	Distance to port (km)	Altitude	Access to power
Josemaria Resources	Josemaria	FS	Argentina	Flotation	1066	0.31	343	4000	252
Filo Mining Corp.	Filo Del Sol	PFS	Chile	SX-EW	425	0.33	240	4000	127
World Copper Ltd	Escalones	PEA	Chile	SX-EW	426	0.37	175	2400	50
Los Andes	Vizcachitas	PEA	Chile	Flotation	1284	0.4	120	1950	60
Hot Chili Resources	Costa Fuego	PEA	Chile	Flotation	391	0.52	40	1200	17
McEwen Mining	Los Azules	PEA	Argentina	Flotation	962	0.48	245	3300	127
Marimaca	Marimaca	PEA	Chile	SX-EW	70	0.6	25	100	7

Company	Project	Stage	Processing Capacity (ktpd)	C1 (\$/lb Cu)	Initial Capex (M\$)	LOM	NPV Post Tax (\$B)	NPV Discount	IRR Post Tax (%)
Josemaria Resources	Josemaria	FS	150	1.26	2910	19	1.53	8	15.4
Filo Mining Corp.	Filo Del Sol	PFS	60	1.23	1270	14	1.28	8	23
World Copper Ltd	Escalones	PEA	50	1.19	438.4	20	1.5	8	46.2
Los Andes	Vizcachitas	PEA	110	1.36	1900	45	2.7	8	26.7
Hot Chili Resources	Costa Fuego	PEA	40	1.47	360	n/a	n/a	n/a	n/a
McEwen Mining	Los Azules	PEA	120	1.28	2363	36	2.2	8	20.1
Marimaca	Marimaca	PEA	25	1.22	757	12	0.524	8	33.5



Map of Chile, with locations of pier comparison projects.

Source: Company reports, SI Capital estimates

Cost of location

Projects have been known to become stranded due to their lack of accessibility, water sourcing and capital requirements.

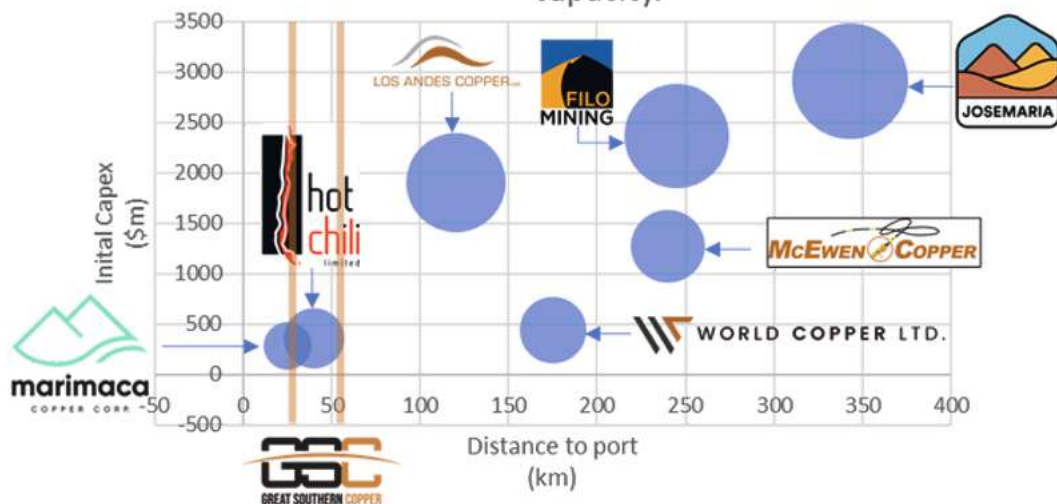
As distance from a port increases, miners rely on economies of scale to ensure their projects stay commercially viable and financially attractive.

Preliminary comparisons of the data highlighted distance from the port and initial capex requirements as being positively correlated. However, when the Capex is modified to ton's of processing capacity this correlation is lost, giving a range of \$8.77k to \$31k of initial capital cost per tone of ore processed, with an average of \$20.35k.

A similar effect is seen with the operating costs and distance to port, with projected C1 cost (\$/lb Cu) ranging from 1.19 to 1.58, with an average of projects reviewed being \$1.32/lb.

A proposal for this is that remote location projects compensating the high initial cost of developing operational infrastructure, including road access, power supply and securing local water rights, by using economies of scale. In addition, costs can be reduced by on site smelting of gold, however these major infrastructure developments cannot be avoided. As such, proximity to the coastline gives a project much more flexibility, with a lower hurdle rate for projects to reach commercial interest.

How distance from a port affects initial capital cost, and how this is reflected in production capacity.



Distance from the port against Initial Capex, with size of bubble representing processing capacity. Great Southern Coppers projects displayed as projections in orange.

Source: Company reports, SI Capital estimates

Market Appreciation Size of Return

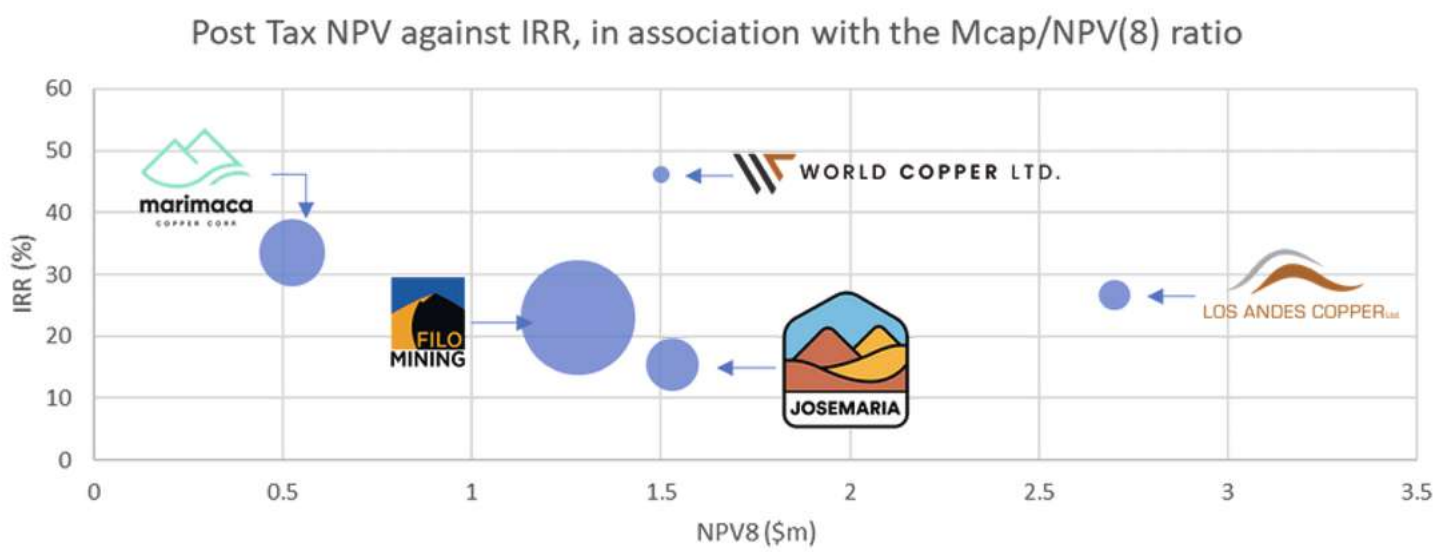
Mine proposals
profitability and how the
market has valued those
assets.

Using the project comparisons feasibility model, an idea of what makes a commercially attractive project can be defined, and from which market appreciation can be achieved.

The projects used for this comparison were at a scoping study/preliminary economic assessment (PEA) or at the later stages of Feasibility Study (FS). Utilising these studies as a baseline understanding of the regional copper deposits, with target parameters, challenges and opportunities to project development for the Great Southern Copper team.

From this understanding, a valuation of market cap, or market appreciated value against the post tax net present value (NPV) can be defined, though risk weighting to each project still needs to be taken into account.

In conclusion, the projects tend to have a requirement of >\$1b NPV8, However, project market value appreciation shows very little correlation to NPV (NPV/MCap [USD]), with outliers such as Filo Mining at 0.6, following recent drilling success, compared to World Copper at 33.2 suggesting market perceived challenges to development.



Post tax NPV8 of projects against the IRR. The size of the bubbles representing market value to the NPV.
Source: Company reports, SI Capital estimates

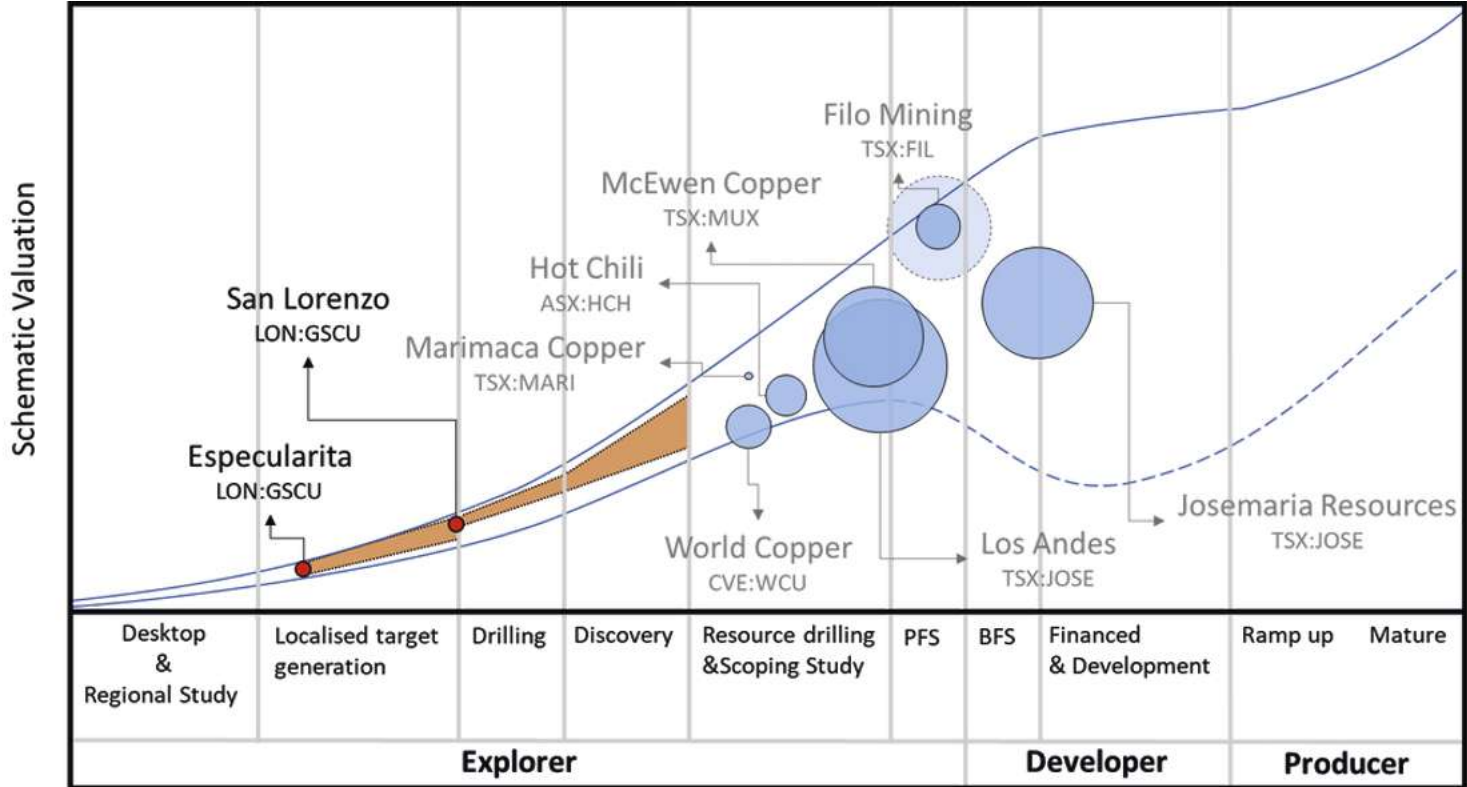
Lassonde Curve

A graph that schematically represents a junior mining company or projects valuation through stages of development.

Porphyry and IOCG targets are typically large and low grade, and as such require critical mass for economies of scale to become a commercially viable operation. These large footprints also cause issues with land use and their need for local resources, in particular water.

Following these needs, projects see a distinct step change in valuation as they overcome each of these hurdles towards production.

Filo is one such project, having completed a PEA in 2019 the market appreciation was held back by worries over access to water and the lack of resource critical mass. In March, 2021 the team intercepted 942m at 0.67% CuEq as part of a exploration campaign, extending the Deposit 1,000m to the North. Since then further drilling has helped to define the Filo Del Sol as a significant deposit, triggering the market value to reflect this, and more recently attracting a C\$100m investment by BHP. This growth potential is not encapsulated within the now outdated PEA, but with the clear path to production being created the project has become a stand out asset.



Schematic Lassonde curve with projects bubble defined by resource size. Faint bubble indicated projected resource size.

Peer Comparison Conclusion

Marimaca is still in the early stages of defining the full potential of a oxide copper resource that is located near operational infrastructure and in close proximity to the coast. As such, the team have had a much lower critical mass hurdle to reach commercialisation in comparison to their peers. In July 2020, The team identified through a drone-magnetic survey a large Sulphide Zone extended below the current resource. This critical mass again saw the market re-rate the stock with the potential of a much larger resource and extended life of mine.

A major hurdle in progressing porphyry and IOCG deposit is financing the large Capex of projects. Remote projects, such as Josemaria, have to overcome large critical mass hurdles along with securing mining licencing (in particular environmental licencing), and a fully feasibility study completion to unlocking value, defining a high return on investment with a low risk stage of development for debt providers and a cornerstone to pull the trigger on progressing to production.

In conclusion, These examples show two potential opportunities for Great Southern Copper value appreciation. Firstly, the initial discovery of a project with grades, over broad widths, that correlate with a large mineralising footprint. This new knowledge allows investors to put together an idea of the potential resource size which, assuming it is a match for the pre-existing operational infrastructure would give the project a line of sight to production. As seen previously, proximity to the coast reduces this hurdle dramatically.

Secondly, securing financing to production. Again coastal operations, with their lower initial Capex benefit, but debt financing requires much lower risk requirements factors such as environmental licencing are needed, therefore making access to water key in reducing the costs to production.

Great Southern Copper

San Lorenzo



The San Lorenzo project is located within the coastal Cordillera mountain ranges of northern central Chile, directly on strike with Hot Chile's Cortadera Project, to the North, and within the vicinity of numerous other operating mines including the Iron ore mine of El Condor, and the major iron ore exploration project El Romeral.

The project area is located ~35km from the coast, at ~900m elevation, 13km from a local wind farm and ~56km from the major city of La Serena. In addition, a recent high voltage transmission line has also been placed across the San Lorenzo property. The region around San Lorenzo is a known mining region, making the project strategically positioned to utilise and leverage off pre-existing local infrastructure.

The property is located within a moderately hilly terrain with some steep sided valleys. Along with the arid landscape, the region is predominantly desert with limited used for subsistence pastoral farming, and by local, small scale mining operators.

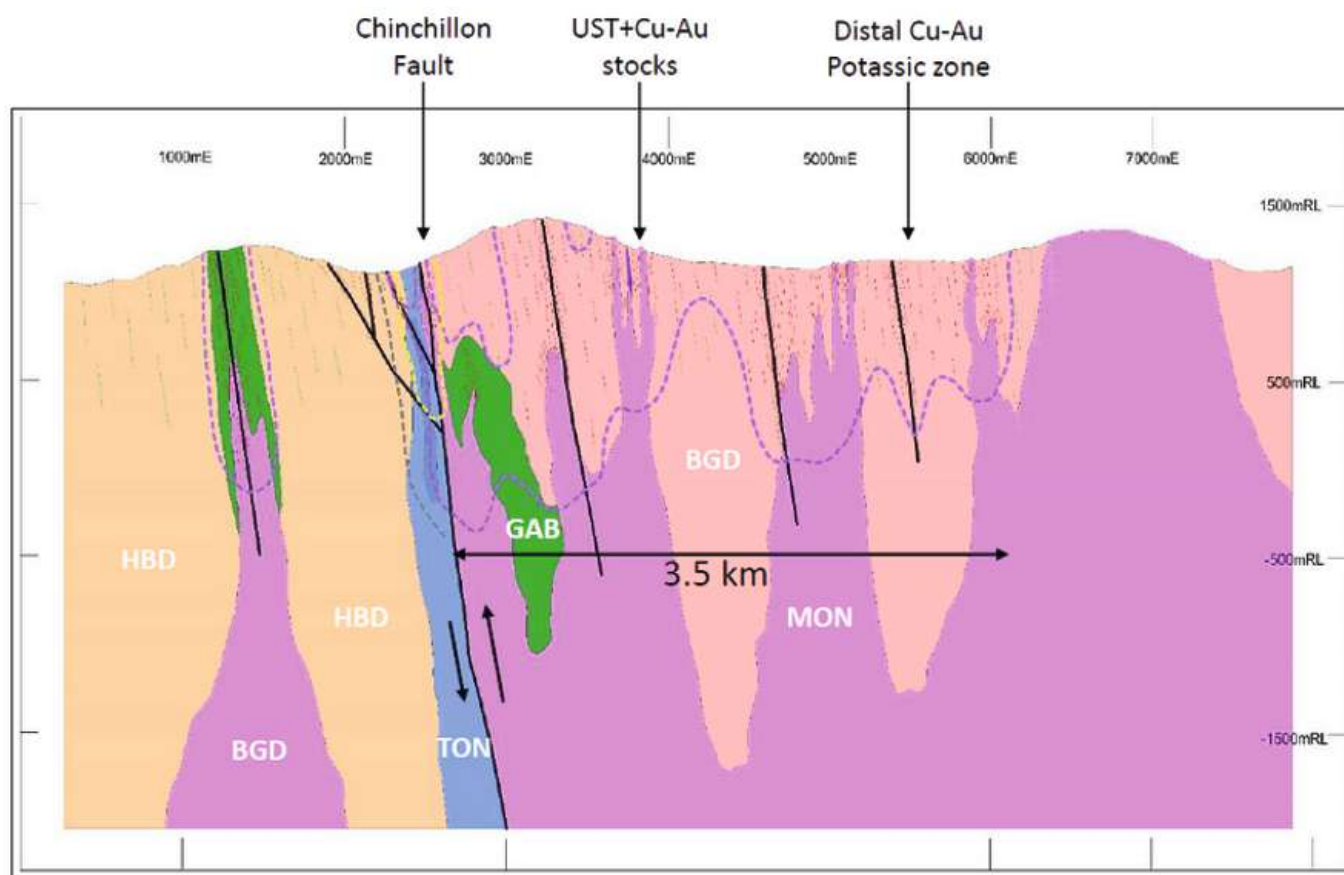


Artisanal pit, mining into a breccia pipe. Currently mined by locals for well formed crystals, the pit is also rich in copper oxides.

Geology

San lorenzo

The land package of San Lorenzo is known for small scale mining operations, with the hillsides peppered with shallow adits and pits. These are mostly seen on the north-western side of the major north east fault, dividing the property. These operations said to be focusing on the extraction of silver (\pm gold and copper) hold a metal composition that indicate they may be at the poriferas of a large system. To the south of the property in the Central Zone, is a well developed slag heap with stockpiles of strongly mineralised material, mostly of copper oxides (Malachite and Azurite). However, close to one of the deeper shafts are stockpiles of sulphide material, predominantly Chalcopyrite, Pyrite and some copper secondary sulphides such as Bornite and Covellite. One sample in particular hosted Molybdenite, a strong vectoring tool at Cortadera for identifying the high-grade zone of the porphyry. This material in particular resembles fractures seen on outcrops across the property, where the sulphide material has been weathered and leaving iron-stained traces of the sulphide mineralisation.



Schematic cross section of San Lorenzo property, showing faults, geology and alteration.

Source: Great Southern Copper company reports

The project area hosts numerous small scale mining pits and addits across the property, indicating the properties prospective ground. Before listing in December 2021, the Great Southern Copper team completed a scout drilling campaign focusing on the north-west side of the Chinchillon fault looking to test high grade, structurally controlled copper targets below the artisanal silver, gold and copper pits. Logging of the core and the metal composition indicated to the team that they were potentially testing the upper, distal portions of a porphyry system. Once further work was completed, and the acquisition of the properties to the south-east were secured, the team identified that the large Chinchillon fault has in fact displaced the porphyry system, leaving what is proposed to be the deeper portion of the system exposed to the South-East footwall. This is backed up by the known outcrops of small scale copper mining operation and slag heap also located within this South-Eastern block, and gold placer deposits either side of the Chincillon ridge.

Work conducted in early 2022, including trenching and further mapping has lead to the definition of a number of target areas that are being developed and drill target defined. With outcrops of broad zones of sheeted veins (act-kspar-mag+Feox) of the inner calc-potassic alteration zone intruded by clusters of quartz-monzonite intrusions, the team suspect that the alteration haloes surrounding the porphyries may have the potential to coalesce to produce a larger mineralising system at depth.



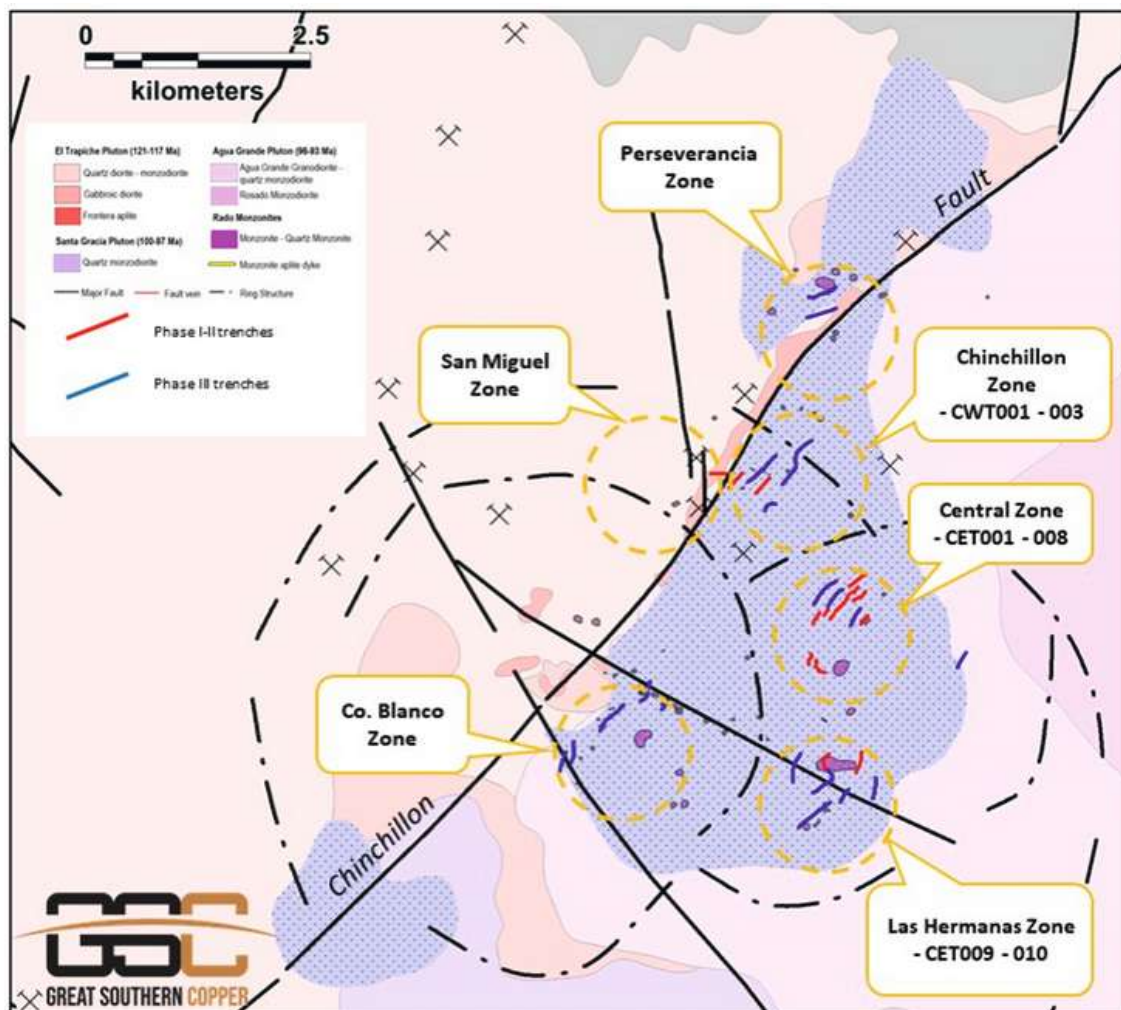
Left: View of trenching showing sheeted and stockwork fracturing. Right: Green Cu oxide and Fe oxide on individual fracture surface.

The San Lorenzo project is Great Southern Copper's flagship project, and with targets showing distinct similarities to other regional commercial copper and gold operations the team are keen on conducting a first pass drilling campaign on the newly defined targets.

Targets areas defined:

- **Chinchillon Zone:** Hosts the initial sheeted fracture textures with highly oxidised sulphide weathering textures and mineralisation indicating inner calc-potassic alteration zone. Trenching completed across this area (CWT001 to CWT003) intercepted broad zones of anomalous copper and gold mineralisation, with highlights of 0.8% Copper (Cu) and 6.77g/t Gold (Au). The team noted that the Ag, though below commercial grades, was found to be a key indicator as to defining the mineralised structures and proposed to be used as a exploration tool for defining drill targets.
- **Central Zone:** Located over the hill, ~2km South west from Chinchillon Zone is the Central zone. Located on strike with the orientation of the fracturing logged and mapped at Chinchillon, the zone hosts most of the small scale copper mining addits and pits. As such the Central Zone is one of the teams highest priority targets for drill testing. Trenching completed across the Monzonite porphyry and along strike all identified anomalous copper, with notable intercepts of 1.74% Cu, 1.6ppm Au and 5.62ppm Ag. Despite these grades, it was noted that copper as well as many other elements were significantly depleted despite the presence of distinct mineralising features such as actinolite-Iron Oxide fractures. This has suggested that, like much of the project area, weathering has leached the surface copper mineralisation, with a possible enrichment zone down at shallow depths.

- **Las Hermanas Zone:** Located around 1.5km to the south of the Central Zone. The area has boasted some of the highest grade rock chip samples of 0.7 to 1.4% Cu, and was a key follow up target for trenching. CET009, targeting a mineralised monzonite intrusive, observed copper ranging from 438ppm up to 3.515% Cu over a 48.3m interval, and was found to be coincidental with anomalous Gold and silver, with trench CET010 observing 100m of anomalous Cu-Ag-Au, being associated with oxide fractures within the host biotite granodiorite.
- **Follow up zones:** The targets of Co. Blanco, San Miguel and Perseverancia have yet to be trench tested, though the areas do boast distinct characteristics such as mapped monzonite porphyry intruding the granodiorite and grab samples of >1% Cu.



Map of San Lorenzo target areas overprinting the local geology. Trenching completed in red with phase 2 trenching to be completed in blue.

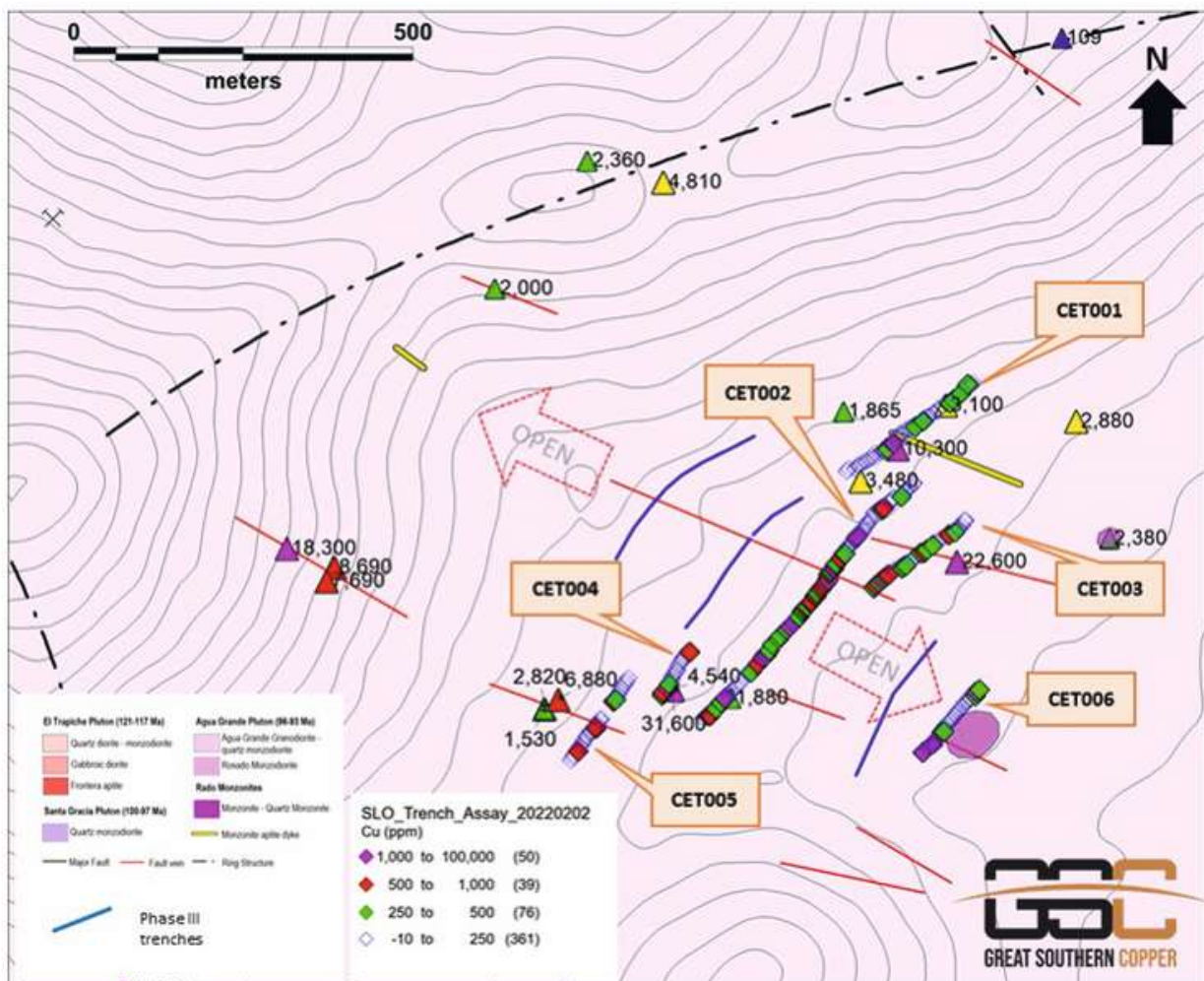
Source: Great Southern Copper company reports

Future Work

San Lorenzo

Following the first set of trenching results, the team are encouraged by the broad zones of copper-gold-silver anomalism associated with sheeted fracture systems and monzonitic intrusives and will look at further defining through a second stage of trench work. The next phase of trenching will test new zones as well as testing the known extensions of the Chinchillon, Central and Las hermanas Zones.

Geophysical programs have also been proposed with ground magnetic and IP, if appropriate, to be used on a local scale to help define targets to a drill ready stage. Currently the team are in preliminary discussion with drilling contractors to conduct a first pass drilling campaign on the newly defined targets with plans to commence in June-July of this year.



Map of Central zone target area showing proposed trenching in blue, with current mapping and sampling indicating extensions of the system.

Source: Great Southern Copper company report

Great Southern Copper

Especularita



South of San Lorenzo, the project area of Especularita is located around a distinct Advanced Argillic alteration lithocap, which hosts multiple small scale mining operations around the skirt of the siliceous zone. As such, the team are in the process of consolidating ground within the area.

The project area is located ~55km from the ocean, at ~950m elevation within the coastal mountain range giving the project access to low-cost sea water. Access to the property is good, with little vegetation, and paved highways, the team are able to access the majority of the project area with very little difficulty. When progressing towards production, upgrades will probably be required, but the national grid is accessible through one of the multiple small towns that surround the property.

The area is arid, with the majority of the land being used for subsistence farming as well as small scale mining operations. The small towns that have developed, though within area of the prospective ground, are also located outside of the high priority target area by around 2 to 4km. It should be noted that ~30km to the north is Glencore's old producing asset, the Punitaqui Cu-Ag-Au underground mine, that is going back into operation following its recent acquisition by Battery Mineral Resource (TSXV:BMR) from Xiana Mining in 2020. The project is a good example of what can be permitted in this region, being that it is located ~3km from the small town of Punitaqui, and operates using water from the local water table.

The project area is focused around the Cerro Colorado Litho cap, which when linked with the classic porphyry style of mineralisation model helps to define targets on the property. Small, historic mining operations to the north of the property show that the majority of the workings are focused on copper oxide extraction, with numerous pits ranging in depth from 5 to 10m deep, and around 20m to 50m in width. One such working, the Case Del Cobre pit is located within a window of the highly siliceous, Lithocap and shows extensive oxide copper mineralisation. This supports the thesis that the cap could be covering a much larger and yet un-defined porphyry system.

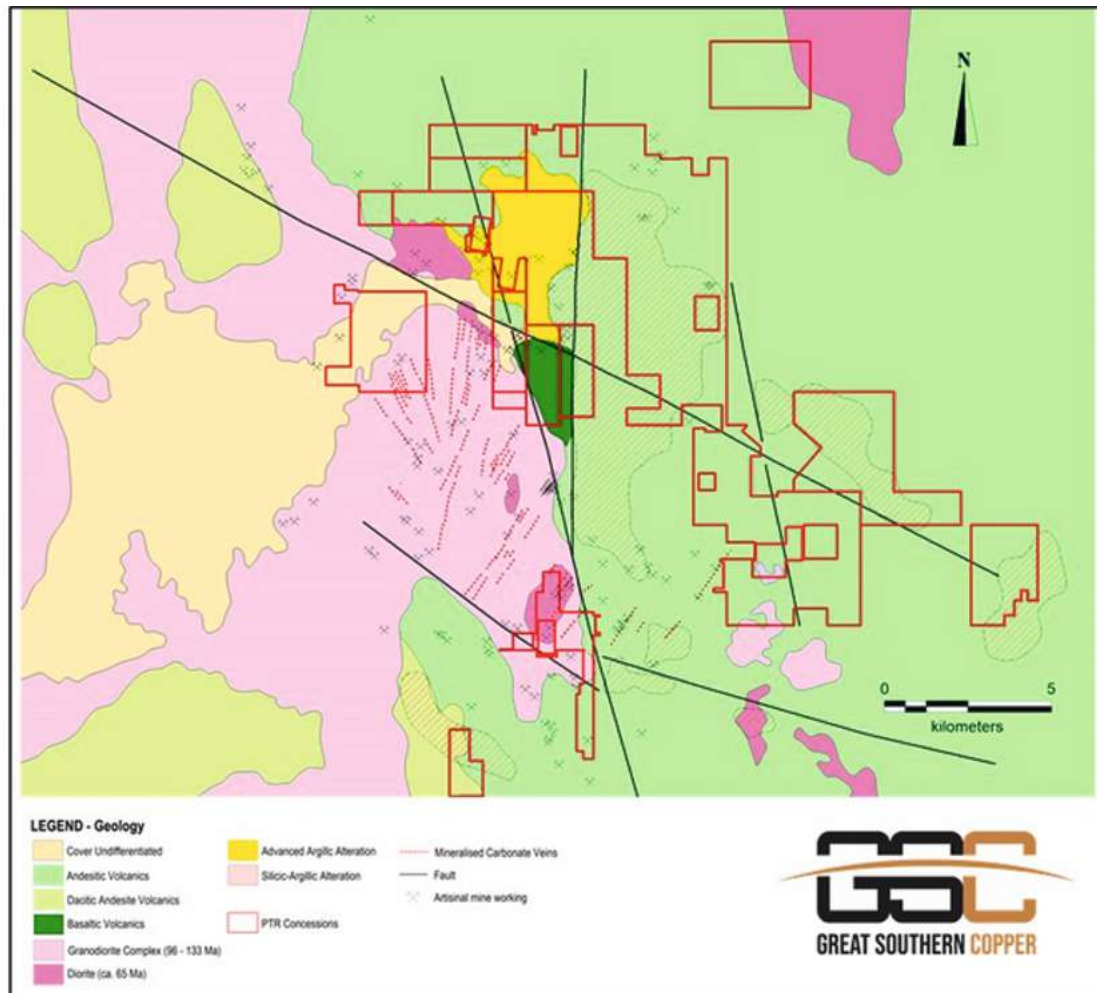
Mapping within the granite of the hillside also show sheeted quartz veins, like those seen at San Lorenzo and Cortadera, indicating proximity to the primary mineralising portion of the system.

To the western edge of the property, epithermal systems are also being defined. With one epithermal brecciated fault, mapped over ~800m long, showing features of a sulphide rich cement that has been weathered and replaced by iron-oxides, and is suspected to host primary mineralisation at depth.

Future Work

Especlarita

Ground-based reconnaissance exploration has commenced at Especlarita with mapping and sampling. Over the next couple of months, the team will continue to consolidate its land position in the area. Having identified numerous high priority follow up structures, further mapping will be required to produce a portfolio of targets across the area, which will follow into target ranking before further work will be carried out.



Top: Map of Especlarita properties and Geology. Bottom left: The Cerro Colorado high-sulphidation litho-cap Bottom Right: Leached and vuggy volcanics with overprinting silica-clay-iron oxide (pyrite) alteration.

Source: Great Southern Copper company reports

Conclusion

Great Southern Copper

The assets of Great Southern Copper, though being in the early stages of exploration, hold the same distinct characteristics that help to define commercial assets within the region.

From the comparisons, access to available water sources is key, and the optionality of using sea water prevents the project becoming stranded if rights to local fresh water sources are not granted. This is something that both assets benefit from at <50km from the coast. Both assets are located in semi-arid regions, which supports a local small scale, subsistence farming agricultural and pastoral industry, lacks water. This resulted in the farming being concentrated on the river banks leaving the bulk of the project areas near barren and easily accessible.

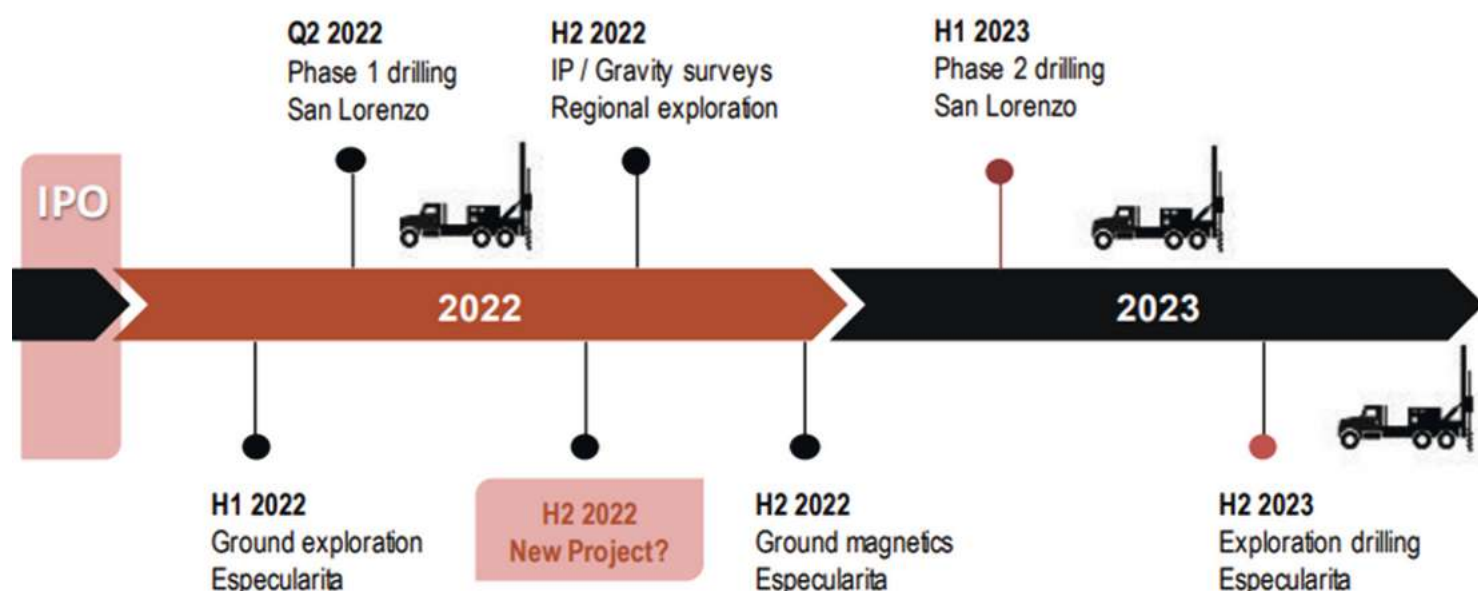
The projects both benefit from pre-existing operational infrastructure. Not just for cost effective exploration work, but also allowing any potentially commercial discovery to be put into production by connecting to the national grid and local green energy suppliers. Many remote locations have to rely on transporting fuel, which can give projects both a high operating cost but also a high carbon footprint per ton of concentrate produced. Being that debt financing from commercial banks now applies a decision weighting to operations carbon production, capital intensive projects such as copper porphyry's, could become financial stranded or have to accept less favourable terms if sustainable source of power and water are not available.

Splitting the two project up in regards to the geological results:

San Lorenzo is a much further advanced project, with the company having both secured the majority of the land around the system. Having now completed preliminary target definition work, the team are at a stage where drilling could commence.

As a target, the San Lorenzo area is extensive. However it is expected that as further target definition work will be completed, such as IP, magnetic surveys and scout drilling, the prospective area will be refined down. The large footprint and distinct surface expressions of porphyry type mineralisation with anomalous Cu-Au geochemistry support the potential of a large to world class resource.

As a project area, the Especularita district has characteristics of a highly active and fertile mineralising system. The area holds both large porphyry system features such as the advanced argillic lithocap, iron-oxide stained fracture networks, extensive copper secondary staining, and high grade epithermal targets, with kilometre long sulphide-weathered breccia's. Once the ground is secured, the team intend to quickly develop the targets with simple, low cost surveys and start project ranking. This brings the Especularita project up to a drill ready status.



Exploration Timeline and key work programs for the development of both the San Lorenzo and Especularita project area.

Source: Great Southern Copper company reports

Case Study 1

Marimaca Copper Corp.

TSX:MARI

Market Cap: C\$365m

Stage: PEA

Location: Coastal, North Chile

Geology: Copper Oxide, IOCG

Resource: M&I 80Mt @ 0.6% Cu

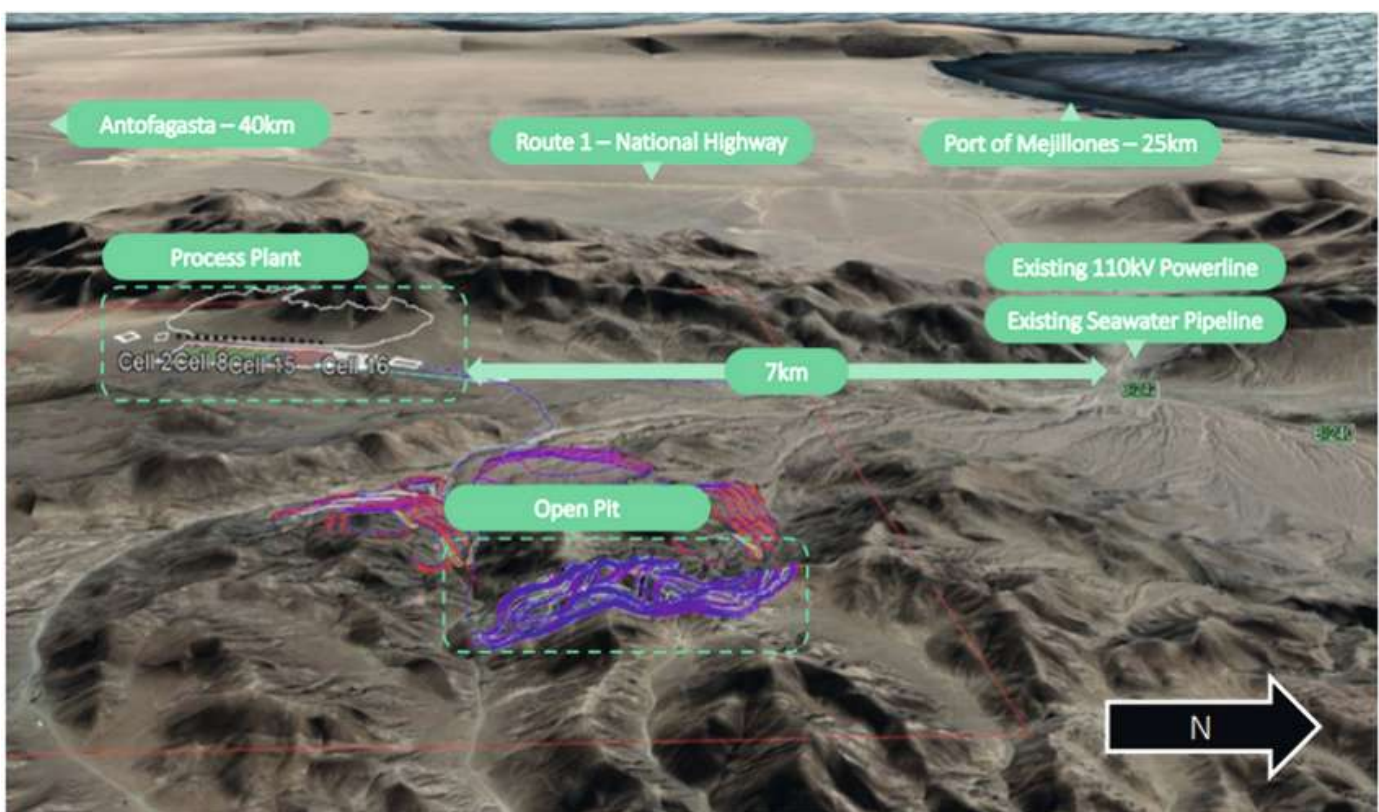
Processing: EST. 25,000 tpd by SX-EW (Heap Leach)

Comparison Case Studies

Marimaca Copper Project is located in the coastal region of North Chile, along the Coastal Copper Belt. The project was first defined as a discovery in 2016, with S&P global market Intelligence defining it as one of the only major copper discoveries between 2015 and 2020.

The project is located 45km northeast of the Port of Antofagasta, a city developed around the mining industry with ample mining personnel, services, and supplies. In regards to the project's infrastructure, the site is located 7km from an existing sea water pipeline and a 110kv power line. These lead 25km to the northwest, to the port of Mejillones.

A key aspect of the northern Chilean landscape is its arid nature, therefore reducing the issues associated with high value farm land. Additionally, the project hosts no settlements or re-housing requirements to move forward.



3D map of Marimaca project area and proximity to infrastructure, and distance to port.

Source: Marimaca Copper company reports

Geology

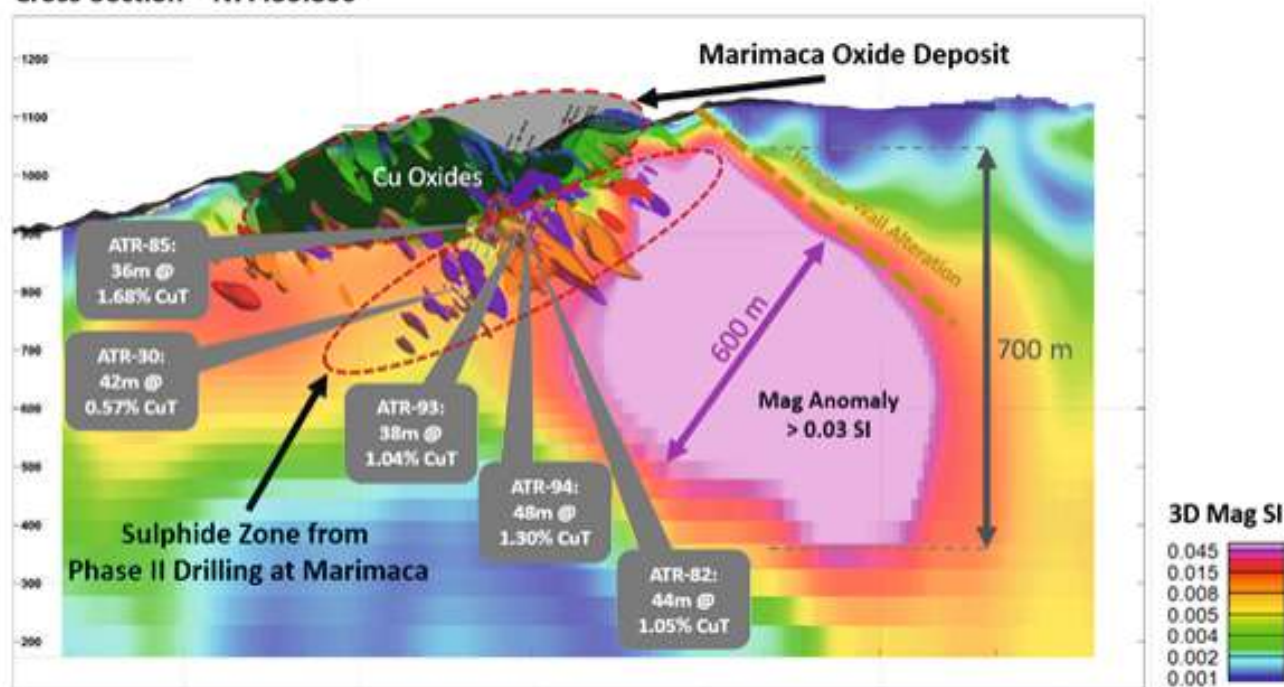
Marimaca

The Marimaca project is an IOCG, with the target mineralisation being copper. The current PEA has focused on the near surface, copper-oxide mineralisation. However down-dip extensions into the sulphides could see the resource grow dramatically. The PEA has however been designed purely around the copper-oxides that will be treated through a low capex, SX-EW (solvent extraction and electrowinning) plant. Whereas the sulphide portion of the resource will require a separate flotation circuit, and yet to be defined parameters.

The footprint of the Marimaca project is 1.5km long by ~900m wide, running along the ridge line. This structure has allowed the team to design a low strip ratio, open pit operation, with the mineralisation being at surface allowing for near no pre-strip requirements.

Detailed metallurgical work has been undertaken at the asset, with heap leach recoveries of 76% over the life of mine, and 40% recoveries from dump leach. A fifth phase of metallurgical test work is underway, with results having been expected by Q1 2022.

Cross-Section – N7.435.800



Cross section of Marimaca with mag defined anomaly. 2022

Source: Marimaca Copper company reports

Metallurgy

Marimaca

The key parameters that have been tested include:

- Agglomeration characteristics: The effect of particles accumulating and affecting the surface area to which leaching can take place as well as forming fluid pathways in the heap that may reduce recovery.
- Granulometry: Particle size and distribution, also affecting surface area with changes in porosity and permeability.
- Column height: determining the optimum heap height for leaching.
- Acid Consumption: Calculating optimal recovery against the cost of acid consumption.
- Sea water testing: Cost benefit analysis in processing ore using sea water, with its lower recovery rates, against a high cost, energy intense fresh water alternative.

Exploration

Marimaca

Being that the system is an IOCG, a form of mineralisation that often forms in clusters along major structural faults, the team have utilised magnetic surveys to identify numerous satellite targets. Being that the Marimaca project is at the PEA, and able to be funded as a stand alone asset. The additional satellite targets do not require the same critical mass to be of commercial interest, and can be quickly developed into an additional resource, growing the project's life of mine substantially.

The project also boasts a deep, sulphide portion to the system. This portion of the system has been a low-priority to the team, being that the metallurgy requires a separate flow sheet to extract. However, it does show the project has depth extensions which indicate the asset has a substantial future growth potential.

Future Work

Marimaca Cu Project

The team are currently conducting a 30,000m drilling program. This will be split into infill resource drilling as well as depth extensions into a newly defined oxide zone below the current pit shell. This newly defined zone of copper oxide was discovered when the team attempted to define the sulphide zone and were supposed to transition back into a thick zone of oxide mineralisation at depth. The team intend to complete this, along with a small portion of drilling on regional targets to be completed and incorporated into an upgraded resource estimate and DFS in the second half of next year.

Comparison

Marimaca

Despite being an IOCG deposit, and further advanced in regards to resource development, the Marimaca project hosts similar characteristics to both of the Great Southern Copper's assets.

Firstly, the projects proximity to the coast and to infrastructure. The projects are located <50km from the coast line and active port, along with cities which host mining professionals. These are both for future production and for accessing experienced contractor groups.

Secondly the morphological characteristics, being near surface with a possible surface oxide cap. Following the metallurgical work conducted by Marimaca, this gives the projects of Great Southern Copper confidence that sea water could be a viable alternative for processing. The size of the assets are also similar, being that Marimaca is a ~1.5km long system with further exploration indicating a much larger resource that could be developed.

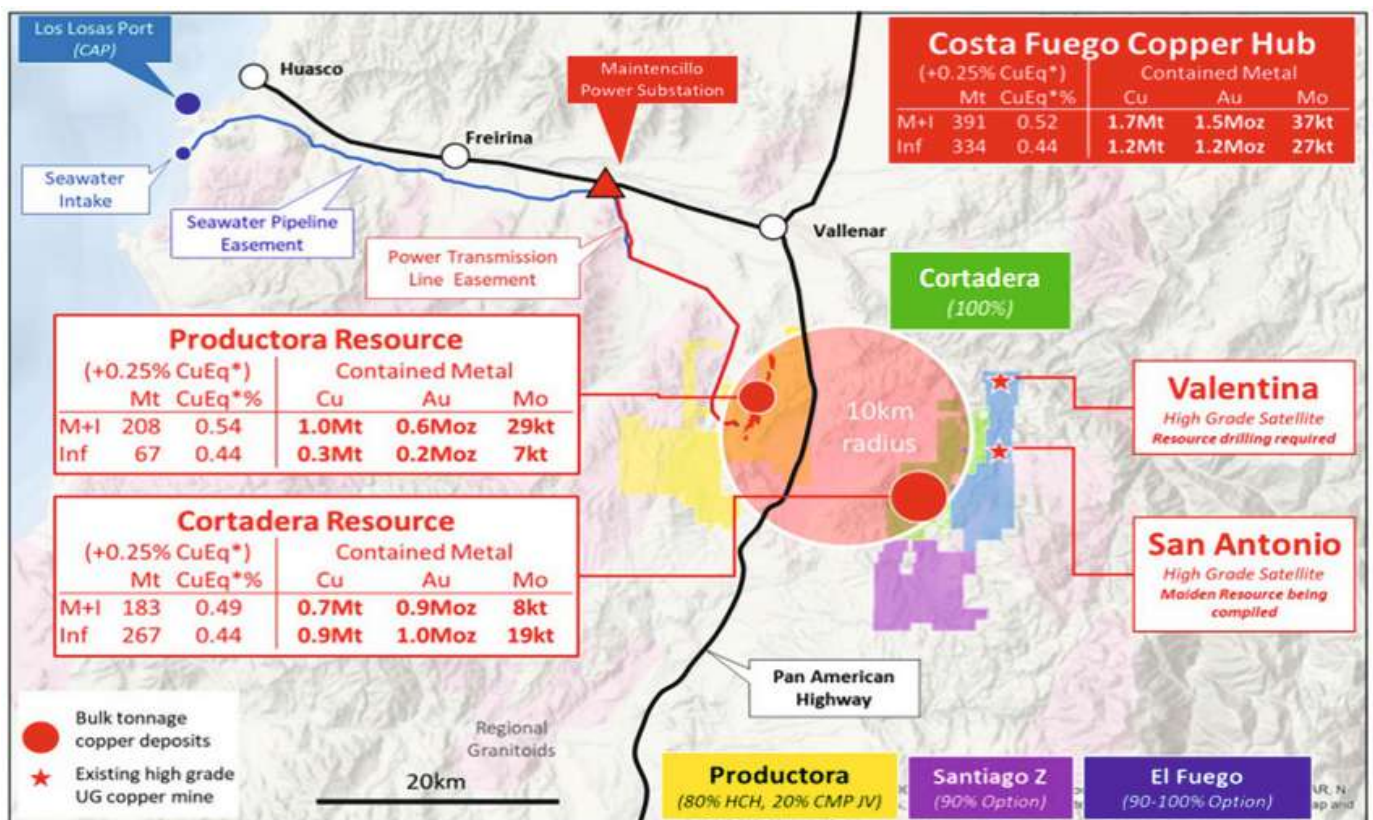
Case Study 2

Hot Chili Ltd

ASX: HCH
TSXV: HCH
OTCQB: HHLKF
Market Cap: A\$170
Stage: PEA
Location: Coastal, Central Chile
Geology: Copper-Gold Porphyry
Resource: Ind 725Mt @ 0.47%CuEq
Processing: EST. 40,000 tpd, by flotation

Located in the Vallenar region of north-central Chile, along the coastal range. The project was first defined as a major copper discovery in 2020, following a land package acquisition that held known mineralisation but was under explored. The Costa Fuego portfolio is located at 1200m elevation, next to infrastructure, at around 17km from the Pan American Highway and power lines. As well as, good access to the port of Los Lasas, ~50km to the west. Being at low altitude, the project has been modelled to require a single pumping station to extract and transport sea water to site.

The assets that make up the Costa Fuego projects are hosted within an arid region of Chile. Like that of Marimaca, San Lorenzo and Especularita, these areas are not high fertile agricultural areas, and will require little to no mediation to develop the project.



Map of Costa Fuego Copper project and infrastructure, 2022

Source: Hot Chili company reports

Geology

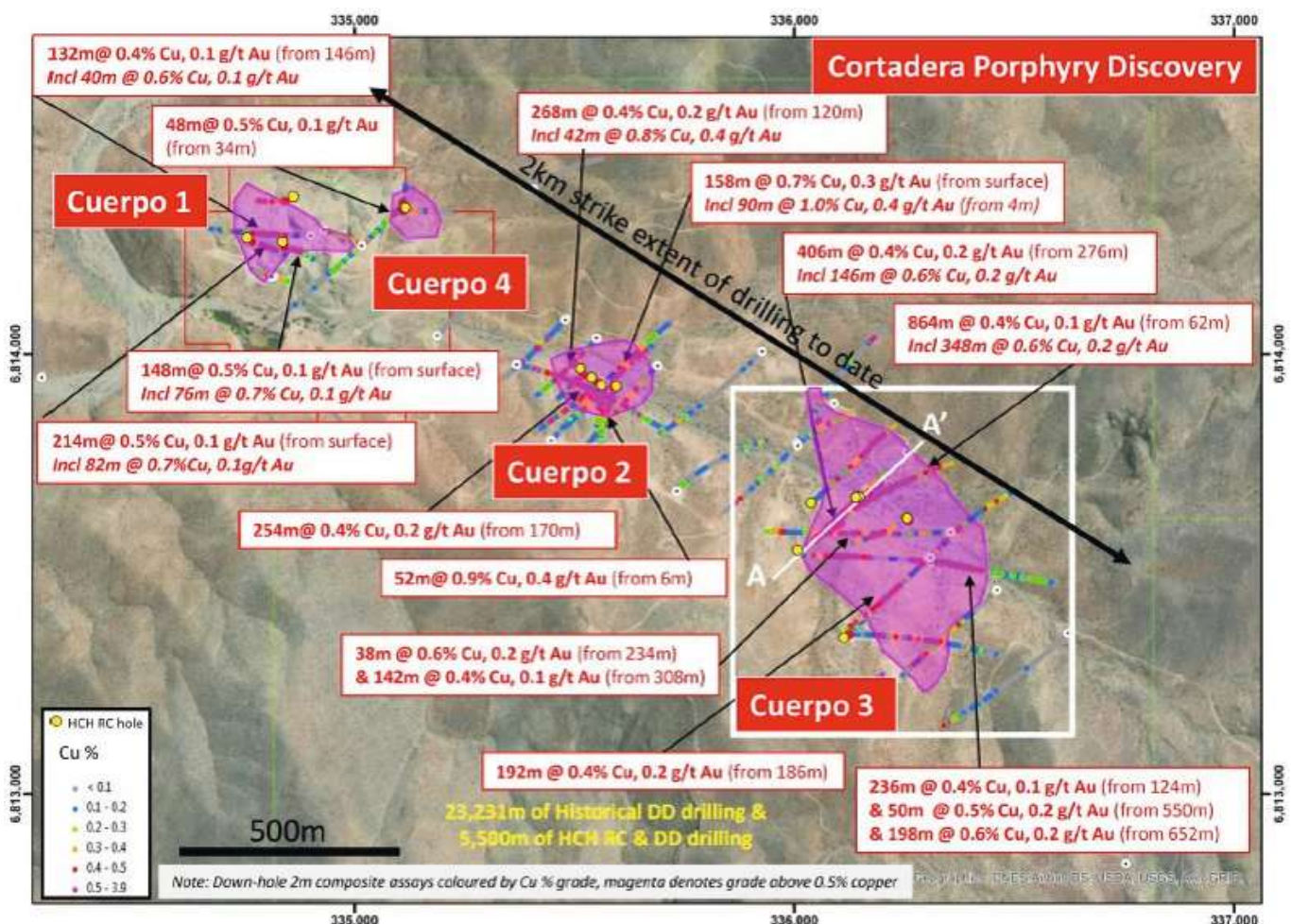
Cortadera

The Cortadera project is one of two corner stone assets of the Hot Chili portfolio. This has been taken as a case study for the region's Cu-Au Porphyry systems.

Porphyries of the region have been characterised into two main groups. Firstly the early Cretaceous, that hosts deposits such as Punta Colorada, Frontera and Pajonaies.

Secondly the late Cretaceous, forming La Verde, Las Campanas, as well as Hot Chili's Cortadera. These are all located along the coastal region of North Chile, with associations to plutonic rocks units, cretaceous stratification and major NNE-SSW fault structures.

The morphology of the Cortadera deposit, is that of a 2.2km long orebody that is focused into three main domains along the strike. These domains of +4% Cu are partially linked by a low grade copper-gold envelope, of ~0.1% Cu, and show strong vertical extensions.



Hot Chili's Cortadera Porphyry Discovery, July 8, 2019

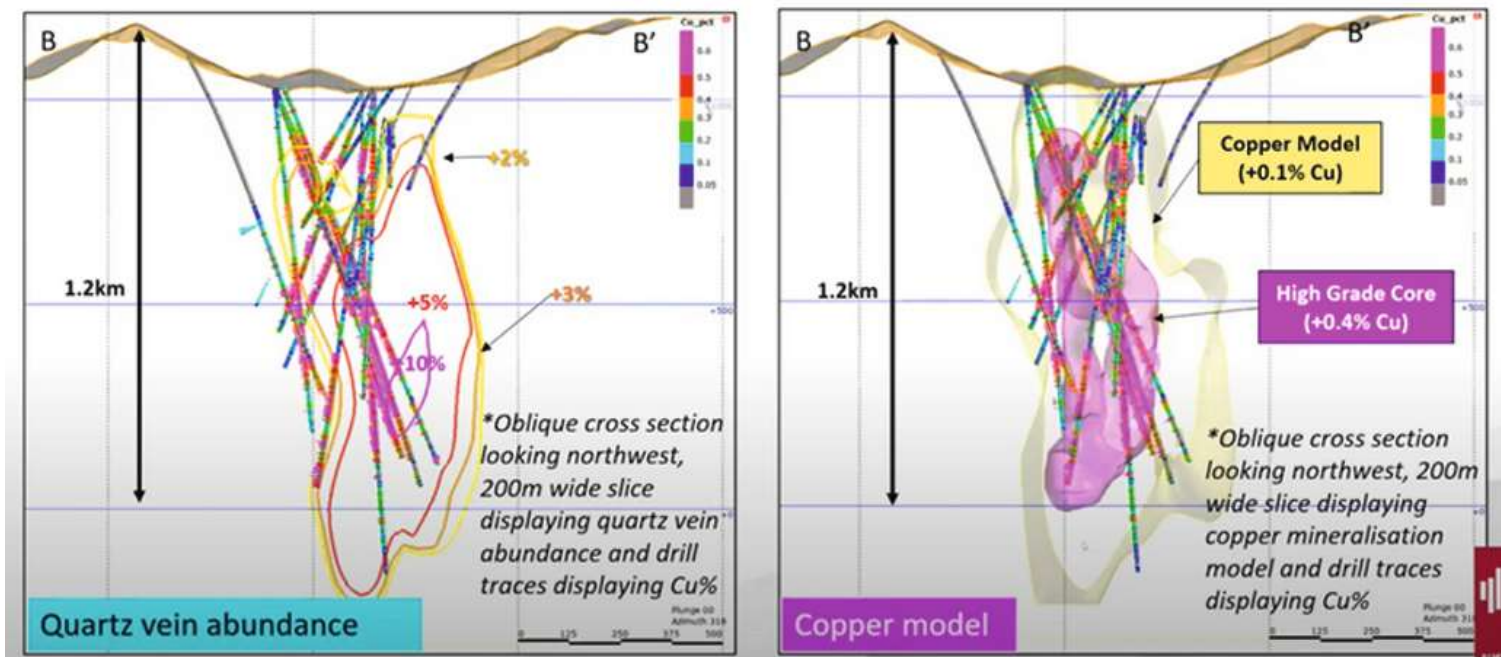
Source: Hot Chili company reports

Drilling

Cortadera

Detailed core analysis from logging observations and geochemical data has developed a distinct characteristic which the Hot Chili team are developing into their exploration model:

- Copper grades ranging from 0.1% to 0.5% create strong vectoring tools as to the heart of the system.
- Molybdenum from 20ppm to 50ppm was also found to be a strong vectoring tool towards the high-grade Copper portions of the system. However, at the heart of the system the Mo grades drop off in a zone surrounding the high-grade Cu and Au.
- Quartz vein abundance again were found to be strongly correlated with grade, ranging from +2% halo of quartz vein abundance in the porphyry, and concentrating into +10% with the highest-grade Cu and Au.
- The deposit has also been made up from multiple mineralising events.



Cross section of the Cortadera projects with left: Quartz vein abundance with shells ranging from +2% upto +10% quartz veining. Right: model of high copper core with low grade halo.

Source: Hot Chili company reports

Drilling

Cortadera

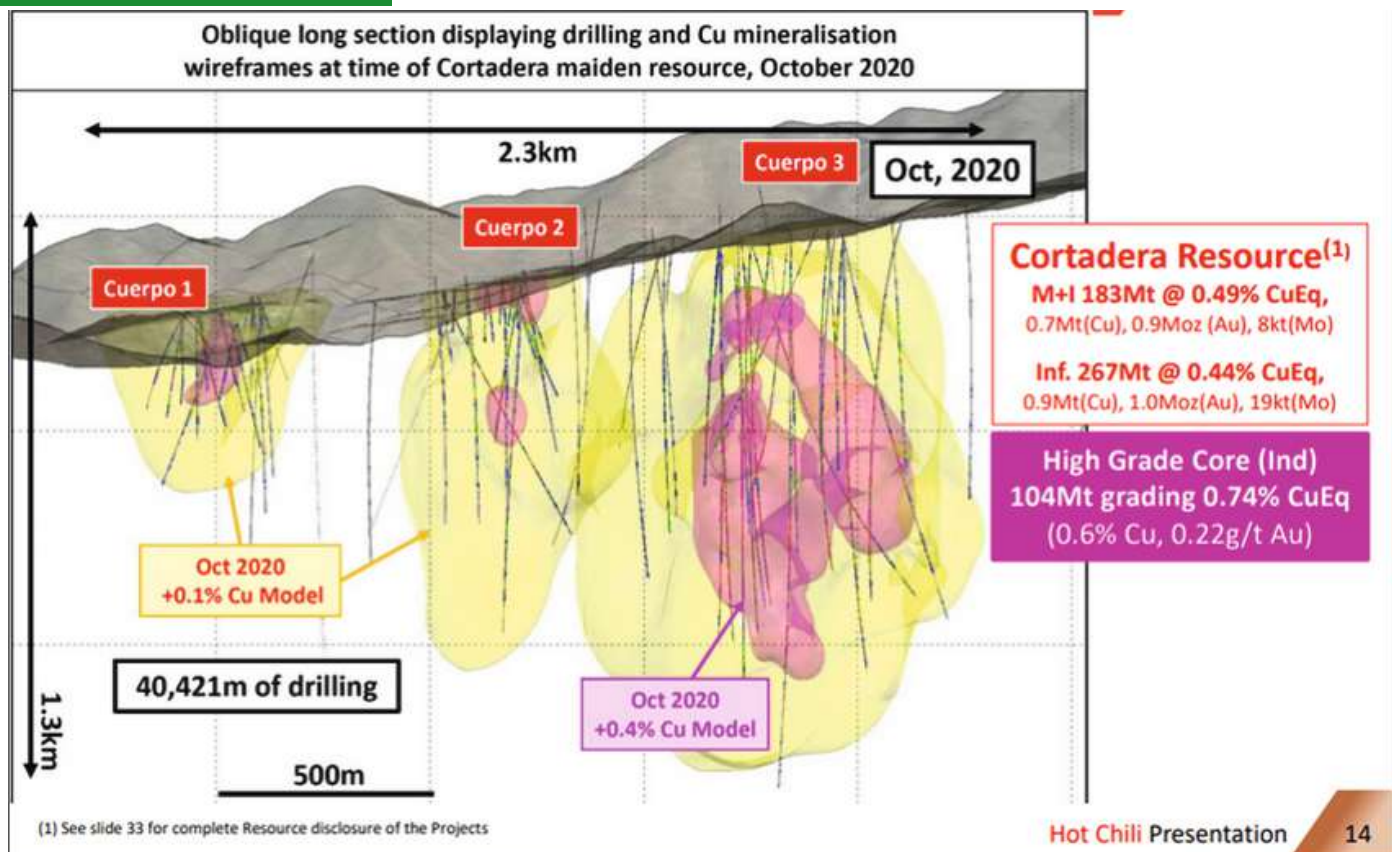
Currently the resource has been defined down to a depth of ~1.3km, with a quoted total of ~92,000m by MD Christian Easterray (2022) of drilling having been completed. To date the assays have shown broad intercepts of consistent moderate to low grade copper. With high grade domains of 0.7 to 0.9% Cu and 0.3 to 0.4g/t Au making up the central portions of each of the three bodies.

Notable drill intercepts include:

- 972m @ 0.5% Cu & 0.2g/t Au, from surface.
- 848m @ 0.4% Cu & 0.2g/t Au, from 112m.
- 813m @ 0.4% Cu & 0.1g/t Au, from 54m.

The team have recently announced a resource upgrade, with over 80% of the Costa Fuego's global resource estimate now being within the classified indicated category, from which the PFS study can be based on:

- Indicated: 725Mt @ 0.47% CuEq, containing 2.8Mt Cu, 2.6Moz Au, 10.5Moz Ag, and 67Kt Mo.
- Inferred: 202Mt @ 0.36% CuEq, containing 0.6Mt Cu, 0.4Moz Au, 2Moz Ag, and 13Kt Mo.



Cross section of Cortadera resource, 2020.

Source: Hot Chili company reports

Metallurgy

Cortadera

Test work was carried out in 2020 on the Cortadera Project, looking at both high- and low-grade samples from the sulphide zones of Cortadera, Productora and San Antonio. This confirmed and built on work conducted for the 2016 Productora PFS, where 24 samples were tested. Preliminary work using Rougher (first stage of processing circuit) indicated good recoveries using a relatively coarse grind size, and performed using sea water.

- High grade samples recovered of >95% Cu with recleaning production of a 28% Cu concentrate.
- Low grade samples recovered ~89% Cu producing with recleaning production of a 22% Cu concentrate.
- Recovery of other payable metals at Cortadera included 56-60% Au, 83-90% Mo, 37-59% Ag.
- The concentrate that was produced included no deleterious elements in the rougher concentrate.

This work will now be built on with the completion of grind size optimisation, cleaner flotation, and locked-cycle test work.

Exploration

Cortadera

With the development of the Cortadera and Productora projects, the team have developed an exploration model which they are deploying to further identify and define projects within their land package. The key components of their previous campaigns have included: Surface topography, being that features in the landscape are often heavily influenced by the characteristics of the underlying rock formations, giving distinct topographic highs and lows with orebodies located near or at surface; Geophysical campaigns, where electro magnetic (MIMDAS), Magnetics (MT) and Induced polarisation (IP) were used to define on a local scale the major structures which could be controlling the mineralisation, as well as identify anomalous features that could help define the drilling campaigns; localised surface mapping and sampling, with fracture density and vein paragenesis helping to define the site's location within the porphyry system.

Future Work

Cortadera

The Hot Chili team are progressing towards a PFS in Q3, 2022. This is following Glencore's strategic investment for 9.99% of the company, in addition to a separate agreement for a 60% off take agreement. With the strategic investment, and growing critical mass of the operation, the management of Hot Chile will be looking to finance the project into production.

Comparison

Cortadera

The projects of Great Southern Copper form to the south of the Costa Fuego Copper project, along the coastal range and are hosted within similar geological units. In addition, being that both projects are porphyry style Cu-Au systems and the geological model of Cortadera could be applied to that of San Lorenzo and Especularita. With both projects holding surface characteristics such as tight fracture networks that show clear resemblances to those outcrops that helped define the Cortadeara project.

Comparison of target surface outcrops



Cortadera

Defined as a high grade, high priority zone for drilling. Tightly spaced veins with iron-oxide staining indicating previously hosted copper-sulphide mineralisation.

Source: Hot Chili company reports



Especularita

Mapped outcrop showing tight vein network, with iron-oxide staining. The project area also hosts copper oxide staining across the area which has been worked on by small scale mining operation.

Source: Great Southern Copper site visit May 2022

Infrastructure here is also similar, with proximity to the coastline, both projects benefit from not having to rely on aquifers or other highly contested fresh water sources. With the assumption of similar metallurgical characteristics, it could be possible for any project discovery of Great Southern Copper to also be processed with sea water. This gives the projects optionality as they progress towards production.

The exploration footprint is also a key point in the project comparison, with Cortadera stretching across 2.3km of strike. Whereas the much earlier stage, and less well defined San Lorenzo project boasting an alteration footprint ~10km long alteration footprint. It should be expected that this area will be refined as the Great Southern Copper team conduct target definition work. However utilising the known morphology of the analogues Cortadera project, at around 570Mt at <0.46% CuEq, gives a blue print for the work being conducted at San Lorenzo.

Glossary

Cu	Copper
Au	Gold
Ag	Silver
Mo	Molybdenum
Fe	Iron
CuEq	Copper Equation
IRR	Internal Rate of Return
NPV	Net Present Value
Mcap	Market Capitalisation
PEA	Pre-Economic Assessment
PFS	Pre-Feasibility Study
FS	Feasibility Study
BFS	Bankable Feasibility Study
M&I	Measured and Indicated
I&I	Indicated and Inferred
Ind	Indicated
Inf	Inferred
IOCG	Iron Oxide Copper Gold
Km	Kilometers
Mt	Million Tonnes
Oz	Ounce
g/t	Grams per Ton
ppm	parts per million
TSXv	Toronto Stock Exchange Venture
ASX	Australian Stock Exchange
SX-EW	solvent extraction-electrowinning
MIMDAS	Electro-magnetic
MT	Magnetic
IP	Induced Polarisation



By Charlie Stephenson
Mining Specialist ECM Analyst

Charlie is an exploration and mining geologist with a wealth of knowledge and experience in the resource sector. Charlie started his career in 2013 as a Junior geologist in Turkey and has since worked on a range of projects across Europe, East Africa, Australia, and Chile. In November 2019 Charlie joined the team as an ECM Analyst within the Corporate Broking team, producing research notes and developing the SI Capital Research and Marketing Package.

Charlie holds a MSc in Mining Geology from Camborne School of Mines and a BSc in Geology from the University of Southampton.

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