



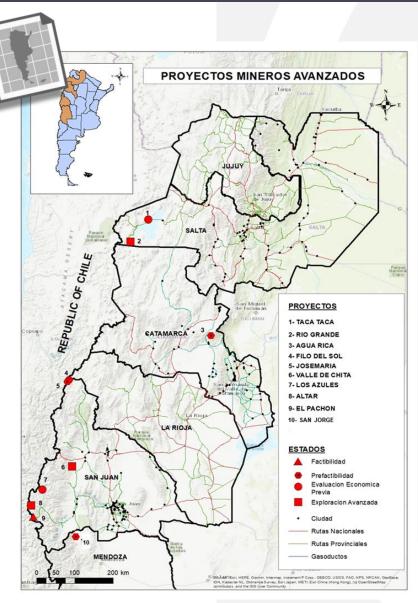


This publication of the National Government aims to display information from third parties on the exploratory results of advanced projects and the mining geological potential of the country. The information is obtained through diverse sources, mainly from public access portals of the operator/controller companies and from technical reports published by them on various websites under international standards aimed at guaranteeing a greater degree of reliability. In some cases the data are estimates, when this is the case, it is pointed out and indicated in the footer.

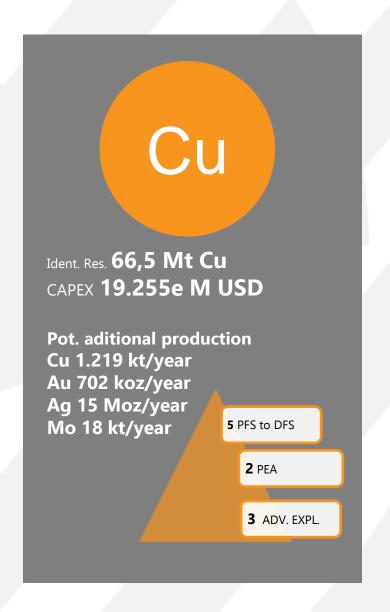
For more information on the legal, social and / or environmental status of the projects, the interested parties should consult the corresponding provincial authorities since the mines are private assets of the Nation or of the Provinces, depending on the territory in which they are located (according to Articles 124 and 75 subsection 12 of the NATIONAL CONSTITUTION, and Article 7 and concordant of the NATION MINING CODE, approved by Law No. 1919).

The SECRETARY OF MINING is not responsible for the misuse of this information.

Catalogue of ADVANCED COPPER PROJECTS



- 1- Taca Taca
- 2- Río Grande
- 3- Agua Rica
- 4- Filo del Sol
- 5- Josemaría
- 6- Valle de Chita
- 7- Los Azules
- 8- Altar
- 9- Pachón
- 10- San Jorge





TACA TACA

LOCATION (24° 41' 60" Lat. S; 68° 00' 00" Long. W)



It is located in the Puna de Salta, at the central-western end of the Salar de Arizaro, department of Los Andes, 240 km west of the city of Salta and 55 km east of the border with Chile, at 3,600 m.a.s.l. The nearest town is Tolar Grande, 34 km away. The access to the project is by the RN 51 to Cauchari and from there by the RN 27.

PROPERTY DATA



- > OWNER / CONTROLLER: First Quantum Minerals LTD
- > OPERATOR: CORRIENTE ARGENTINA S.A.
- > AREA: 2.546 ha

PROJECT STATUS - PRELIMINARY ECONOMIC

LAST PUBLIC TECHNICAL REPORT

COMPANY'S LAST ANNOUNCEMENT



- $\bullet \, \mathsf{PROSPECTING}$
- INITIAL EXPLORATION
- ADVANCED EXPLORATION
- PREL. ECON, ASSES. (PEA) 2012
- PREFEASIBILITY
- FEASIBILITY
- CONSTRUCTION
- OPERATION



Environmental
Impact Study for construction
presented to the authority of Salta.

PROJECT GEOLOGY

TYPE OF DEPOSIT:

Copper-Gold-Molybdenum porphyry system of the Andean type



REGIONAL GEOLOGY

It is included in the copper porphyry-type paleogenous (Tertiary) mineralization belt, of recognized economic importance in Chile. This mineralization is associated with the advance of the paleogenic magmatic arc over the Argentine Puna. Oligocene riodacitic intrusions of the Santa Inés Formation are responsible for the mineralization and alteration of the copper porphyry in Taca Taca.



DEPOSIT GEOLOGY

In the project area, porphyry type mineralizations of Cu-Mo (Taca-Taca alto and Taca Taca bajo) and low sulphidation epithermal (Taca Taca sur) have been defined. The alterations are represented by early potassium type, in some sectors of the deposit with intercalation of propylitic, and a subsequent alteration of philic type of heterogeneous intensity. Locally advanced argillic alteration zones were defined with which the hydrothermal process would culminate.

There are three main mineralization styles associated with the Taca Taca copper-gold-molybdenum porphyry: a supergenic / hypogenic porphyry copper mineralization, another characterized by copper-gold remnant oxides in the leach cap, and a third copper-gold mineralization in veins of quartz and hematite.

Taca Taca was defined as "an Andean Cu-Au-Mo porphyry system"

TACA TACA

TECHNICAL / ECONOMIC INFORMATION OF THE PROJECT

AVERAGE ANNUAL PRODUCTION

Copper	244 kt
Gold	110 koz
Molybdenum	4 kt



PRODUCT TO OBTAIN: Copper-gold concentrate

CAPEX: 3.005 MUSD

Estimated annual employment in operation: 1,630 jobs
Estimated annual employment in construction stage: 3,500

jobs

Estimated LOM: 28 years

Mining Method: OPEN PIT

SOURCES CONSULTED



- -https://www.first-quantum.com/
- -https://secure.kaiserresearch.com/i/jk/tr16/TRLCC20130524.pdf
- -Lumina Copper Corp. Taca Taca Copper- Gold Molybdenum Project.
 Preliminary Economic Assessment Report. May 24-2013,
 www.sedar.com/DisplayCompanyDocuments.do?lang=EN&issuerNo=000272
 59 Ref: May 24 2013 22:15:18 ET Technical report (NI 43-101) English)

RESOURCES AND RESERVES - ESTIMATION



RESOURCES	Tonnage		Grade		Me	tal Content	
RESOURCES	(Mt)	Cu (%)	Au (g/t)	Mo (%)	Cu (t)	Au (Oz)	Mo (t)
Indicated	2.165	0,44	0,08	0,01	9.581.000	5.560.000	278.957
Inferred	921	0,37	0,05	0,01	3.420.150	1.570.000	106.636

CONTACT



 $\frac{https://www.first-quantum.com/Investors-Centre/Contact/default.aspx}{info@fgml.com}$

Jorge Benavides (Gerente Asuntos Corporativos LATAM) - jorge.benavides@fqml.com Corriente Argentina S.A. – Carlos Martín Ramos



AGUA RICA

LOCATION (27° 22' 41" Lat. S; 66° 16' 13" Long. W.)



It is located in the province of Catamarca, department of Andalgalá, 35 km east of the Bajo de la Alumbrera deposit. It is an area of difficult access, with heights of up to 3,300 m.a.s.l. The closest city of influence is Andalgalá. It is accessed from Andalgalá, passing through the city of Piscoyuyo, along a dirt road suitable for double-traction vehicles.

PROPERTY DATA



- > OWNER/CONTROLLER: Yamana Gold Inc.-Glencore Plc.-Newmont Corp.
- > OPERATOR: Minera Agua Rica LLC
- > AREA: 60.000 ha.

PROJECT STATUS - PREFEASIBILITY

LAST PUBLIC TECHNICAL REPORT

COMPANY'S LAST ANNOUNCEMENT



- PROSPECTING
- INITIAL EXPLORATION
- ADVANCED EXPLORATION
- PREL. ECON. ASSES. (PEA)
- PREFEASIBILITY 2019
- FEASIBILITY
- CONSTRUCTION
- OPERATION



Feasibility study in process.

PROJECT GEOLOGY

TYPE OF DEPOSIT:

Copper-Gold-Silver-Molybdenum porphyry system.





Corresponds to the Post-accretionary Metallogenetic Belt associated with the Neo Magmatic arc (Tertiary), linked to transtensional areas with NE-SW orientation.

This belt in the transition zone (26°-30°) is characterized by a little evolved volcanism of the middle Miocene that widens to the east, linked to particular geotectonic conditions. It includes northwest corridors that control magmatic and hydrothermal activity, including Agua Rica and Bajo la Alumbrera. These corridors host polymetallic mineralizations in the north (Farallón Negro in Catamarca) and porphyries with subtypes linked to the characteristics of magmatism and the structural mechanisms with which they are associated.

DEPOSIT GEOLOGY

The Agua Rica deposit is a copper-molybdenum-gold- porphyry system that partially overlapped a high sulfur epitermal mineralization event with a strong hydrothermal alteration of the associated advanced argillic type and a final supergenic enrichment episode that transformed chalcopyrite and covelline hypogenic in secondary calcosine and covelline.

A rapid survey and the consequent erosive environment are proposed as responsible for this telescopic sequence, related to the magmatism of the upper Tertiary.

Three main stages of alteration / mineralization were clearly recognized: early porphyry copper-molybdenum-gold, then copper-gold-silver-arsenic-lead and zinc product of hydrothermal events, and finally a supergenic enrichment in copper.

AGUA RICA

TECHNICAL / ECONOMIC INFORMATION OF THE PROJECT

AVERAGE ANNUAL PRODUCTION



Copper		155 kt (e)
Gold		102 koz (e)
Silver	A	1.400 koz (e)
Molybdenum		5,2 kt (e)

PRODUCT TO OBTAIN: Copper-gold-silver concentrate +

doré CAPEX: 3.019 MUSD

Annual employment estimated in operation: 1,500 jobs (e)

Estimated annual employment in construction stage: 3,500 jobs (e)

Estimated LOM: 28 years

Mining Method: OPEN PIT

SOURCES CONSULTED



- -https://s22.q4cdn.com/899716706/files/doc_presentations/2019/DGF-FINAL-with-appendix.pdf-
- -https://www.yamana.com/English/investors/news/news-details/2019/Yamana-Gold-Announces-a-Positive-Pre-Feasibility-Study-With-an-Impressive-and-Increased-NPV-of-19-Billion-and-an-Increased-After-Tax-IRR-of-197-for-the-Long-Life-Integrated-Agua-Rica-Copper-Gold-Project/default.aspx-Yamana Gold Inc, Annual Information Form for de fiscal year ended December 31, 2015:
- -https://s22.q4cdn.com/899716706/files/doc_financials/annual/2015/2015-Yamana-AR.pdf

RESOURCES AND RESERVES - ESTIMATION

	Tonnage		Gr	ade		N			
RESOURCES	(Mt)	Cu (%)	Au (g/t)	Ag (g/t)	Mo (%)	Cu (t)	Au (Oz)	Ag (Oz)	Mo (t)
Meas.	53,6	0,22	0,13	1,55	0,02	117.920	224.000	2.671.000	10.720
Indic.	206,3	0,30	0,11	1,8	0,03	618.900	730.000	12.337.000	61.890
Inf.	742,9	0,23	0,09	1,62	0,03	1.708.670	2.150.000	38.693.000	222.870



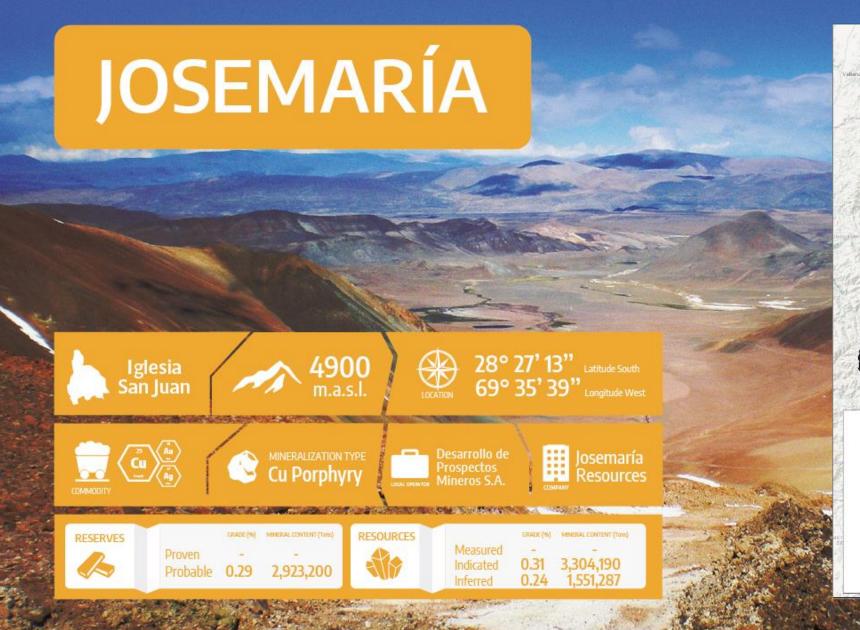
	Tonnago		Grade				Metal Content			
RESERVES	Tonnage (Mt)	Cu (%)	Au (g/t)	Ag (g/t)	Mo (%)	Cu (t)	Au (Oz)	Ag (Oz)	Mo (t)	
Prob.	517,6	0,43	0,16	2,63	0,03	2.225.680	2.663.000	43.766.000	155.280	
Prov.	587,2	0,57	0,25	3,02	0,03	3.347.040	4.720.000	57.014.000	176.160	

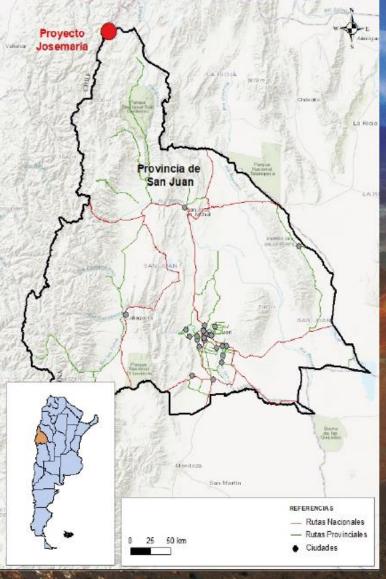
Mineral resources do not include mineral reserves

CONTACT



Nicolás Bareta - nbareta@yamana.com Mario Hernandez - mhernandez@yamana.com Chacabuco 793 - Catamarca (4700) www.aguarica.com.ar/





JOSEMARÍA

LOCATION (28°27'13" Lat S; 69°35'39" Long W.)



It is located near the limit of the Iglesia Department in the north of the province of San Juan, approximately 10 km from the border with Chile, in the middle of the Andes mountain range. It covers elevations from 4,000 to 4,900 m.a.s.l. The nearest city is Guandacol, in the province of La Rioja, located 200 km SE along gravel road.

PROPERTY DATA



- > OWNER/CONTROLLER: Josemaría Resources Inc.
- > OPERATOR: Desarrollo de Prospectos Mineros S.A.
- > AREA: 16.715ha.

PROJECT STATUS- PREFEASIBILITY

LAST PUBLIC TECHNICAL REPORT

COMPANY'S LAST ANNOUNCEMENT



- PROSPECTING
- •INITIAL EXPLORATION
- ADVANCED EXPLORATION
- •PREL. ECON. ASSES. (PEA)
- PREFEASIBILITY 2018
- FEASIBILITY
- CONSTRUCTION
- OPERATION



Feasibility study in process.

PROJECT GEOLOGY

TYPE OF DEPOSIT:



Copper-gold porphyry system.

REGIONAL GEOLOGY

The mining property is located within the Frontal Cordillera on the eastern flank of the Andes and its host rock is the Permian-Triassic batolithic rocks of the Choiyoi Formation. There are also volcanic rocks from the Tertiary period assigned to the Doña Ana Group. The latter are intruded by quartz-dioritic porphyry of estimated Miocene age.

It is a copper-gold porphyry type deposit. The geological characteristics, which include the tenor and the style of mineralization, the lithology of the host rock and the patterns of alteration and distribution of the mineralization, are similar to other Andean porphyry of the metallogenetic belt.

+

DEPOSIT GEOLOGY

In Josemaría, copper mineralization with associated gold occurs within altered intrusive dactitic rocks and hydrothermal gaps, accompanied by anhydrite, magnetite, pyrite, hematite, gypsum, quartz and sericite. Most of the copper and gold mineralization is within the Miocene porphyric system, which forms an elongated body, with dimensions of at least 900 m in the NS direction and 600-700 m in the EW direction and 600 to 700 m in the vertical direction The deposit is open both to the south and north. It is very likely that the north-south extension of the deposit will increase considerably.

JOSEMARÍA

TECHNICAL / ECONOMIC INFORMATION OF THE PROJECT

AVERAGE ANNUAL PRODUCTION



Copper		125 kt
Gold		230 koz
Silver	A	790 koz

PRODUCT TO OBTAIN: Copper-gold concentrate

CAPEX: 3.091 MUSD



Estimated annual employment in operation: 1,000 jobs (e)
Estimated annual employment in construction stage: 2,500 jobs

(e)

Estimated LOM: 20 years

Mining Method: OPEN PIT

SOURCES CONSULTED



https://www.josemariaresources.com/projects/technical-reports/ https://www.josemariaresources.com/site/assets/files/5636/jose_pfs_dec_2018.pdf

https://www.josemariaresources.com/projects/photos/

http://www.ngexresources.com/projects/technical-and-resource-reports/ Reporte Técnico NGEX. Marzo 2016- Análisis Económico Preliminar (PEA).

RESOURCES AND RESERVES - ESTIMATION

RESOURCES	Tonnage	Grade			Metal Content			
RESOURCES	(Mt)	Cu (%)	Au (g/t)	Ag (g/t)	Cu (t)	Au (Oz)	Ag (Oz)	
Indicated	1.166	0,31	0,22	1,0	3.304.600	7.989.993	35.882.696	
Inferred	404	0,24	0,15	0,8	969.600	1.966.335	10.536.125	



RESOURCES	Tonnage		Grade			Metal Conto	ent
RESOURCES	(Mt)	Cu (%)	Au (g/t)	Ag (g/t)	Cu (t)	Au (Oz)	Ag (Oz)
Probables	1.008	0,29	0,21	0,92	2.923.200	6.500.000	288.000.000

Mineral resources include mineral reserves.

CONTACT



Alfredo Vitaller <u>Alfredov@Lundinargentina.com.ar</u> - <u>https://www.josemariaresources.com/contact/contact-info/</u> Michelle Fyfe - Investor Relations Manager E-mail: <u>info@josemariaresources.com</u> -





Iglesia San Juan



5000 m.a.s.l.



28° 29' 30" Latitude South 69° 39' 46" Longitude West

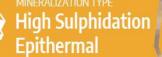












GRADE (%) MINERAL CONTENT (Tons)



Filo del Sol Exploración S.A.



Filo Mining Corp.



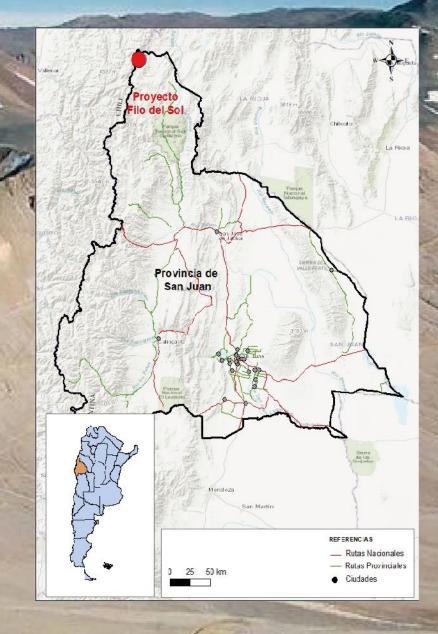


RESOURCES

Measured Indicated

GRADE (%) MINERAL CONTENT (Tons)

1,409,700 478,900



FILO DEL SOL

LOCATION (28°29'24" Lat. S; 69°39'36" Long. W.)



The bi-national Filo del Sol Project is located in the Atacama Region, in northern Chile and in the adjacent province of San Juan, Argentina, 140 kilometers southeast of the city of Copiapó, Chile, and extends to both sides of the border between Argentina and Chile. The center of the main deposit area is 28.49 ° S latitude and 69.66 ° W longitude. The average altitudes are from 4,000 to 4,900 m.a.s.l.

PROPERTY DATA



- > Owner / Controller: Filo Mining Corp.

 Filo del Sol Exploración S.A. (Argentina) + Frontera Chile Ltd (Chile)
- > OPERATOR: Filo Mining Corp..
- > AREA: 14.014 ha (Argentina+Chile)
- > "Treaty between the Republic of Chile and the Argentine Republic on Mining Integration and Complementation"

PROJECT STATUS- PREFEASIBILITY

LAST PUBLIC TECHNICAL REPORT

COMPANY'S LAST ANNOUNCEMENT



- PROSPECTING
- INITIAL EXPLORATION
- ADVANCED EXPLORATION
- PREL. ECON. ASSES. (PEA)
- PREFEASIBILITY 2019
- FEASIBILITY
- CONSTRUCTION
- OPERATION



Feasibility study in process.

PROJECT GEOLOGY

TYPE OF DEPOSIT:

High sulphidation epithermal copper-gold-silver deposit associated with a large copper-gold porphyry system.



REGIONAL GEOLOGY

It is found in the post-accretionary metallogenetic belt of the magmatic arc during the neogen (Tertiary). Between 30° and 34° Lat. S, during the middle Miocene (18-15 Ma) a horizontalization of the Nazca plate begins with the consequent cortical thickening. The magmatic activity reaches a great development in the provinces of San Juan and the center of Mendoza. With the progressive horizontalization of the plate, the arch migrates eastward. These particular conditions generated a magmatism that culminated in episodes of hydrothermal alteration, high sulphidation gold mineralization, porphyry copper and molybdenum, and locally associated vetiform polymetallic deposits.

DEPOSIT GEOLOGY



The Filo del Sol Project shows a complete transition between a high sulphidation epithermal environment and a porphyry system, and both types of deposits are represented. Weathering and supergenic processes have created high-grade copper and silver oxide zones. Mineralization, of potential economic interest, within the Filo del Sol deposit includes high grade leached oxide / mixed copper mineralization, structurally controlled gold and silver mineralization, sub-horizontal "mantle type" high grade silver mineralization and mineralization of scattered sulfides of copper, gold, silver and molybdenum.

FILO DEL SOL

TECHNICAL / ECONOMIC INFORMATION OF THE PROJECT



AVERAGE ANNUAL PRODUCTION

Copper		67 kt
Gold		159 koz
Silver	A	8,65 M koz

PRODUCT TO OBTAIN: Copper cathode + Doré



CAPEX: 1.266 M USD

Estimated annual employment in operation: 800 jobs (e)

Estimated annual employment in construction stage: 1.800 jobs

(e)

Estimated LOM: 14 YEARS

Mining Method: OPEN PIT

SOURCES CONSULTED



https://filo-mining.com/assets/docs/reports/102429-RPT-FINAL-43-101-Filo-del-Sol-PFS.pdf

https://filo-mining.com/operations/overview

https://filo-mining.com/operations/resource-estimate

https://filo-mining.com/operations/photo-gallery

RESOURCES AND RESERVES - ESTIMATION

	Tonnage		Grade			Metal Content		
RESOURCES	(Mt)	Cu (%)	Au (g/t)	Ag (g/t)	Cu (t)	Au (oz)	Ag (oz)	
Indicated	425,1	0,33	0,32	10,7	1.409.700	4.439.000	146.860.000	
Inferred	175,1	0,27	0,33	6,2	478.900	1.832.000	34.760.000	



	Tonnage		Gra	ade		Metal Content		
RESOURCES	(Mt)	Cu (%)	Au (g/t)	Ag (g/t)	Cu (t)	Au (oz)	Ag (oz)	
Probable	259,1	0,39	0,33	15,1	1.009.697	2.764.000	126.028.000	

Mineral resources include mineral reserves.

CONTACT



Alfredo Vitaller <u>Alfredov@Lundinargentina.com.ar</u> Suipacha 268, 8° C. CABA <u>info@filo-mining.com</u> belenpozzi@deprominsa.com.ar www.filo-mining.com







3600 m.a.s.l.



31° 13' 30'' Latitude South 70° 13' '' Longitude West







Cu Porphyry





McEwen Mining

RESERVES



Proven



Measured Indicated

GRADE (%) MINERAL CONTENT (Tons)

4,600,000 8,750,000



LOS AZULES

LOCATION (31°13'30" Lat. S; 70°13'50" Long. W.)



Los Azules Project is located in the Central West of the Province of San Juan, Calingasta Department, 129 km from the homonymous town. The area is located in the Cordillera de Los Azules and at the northern end of the Cordillera de La Totora. Approximately 250 km west of the city of San Juan and 3 km from the border with Chile.

PROPERTY DATA



- OWNER / CONTROLLER: McEwen Mining
- > OPERATOR: Minera Andes Inc.
- > AREA: 18.000 ha

PROJECT STATUS - PREVIOUS ECONOMIC ASSESSMENT

LAST PUBLIC TECHNICAL REPORT

COMPANY'S LAST ANNOUNCEMENT



- PROSPECTION
- INITIAL EXPLORATION
- ADVANCED EXPLORATION
- PREL. ECON. ASSES. (PEA) 2017
- PREFEASIBILITY
- FEASIBILITY
- CONSTRUCTION
- OPERATION



NI 43-101 Technical Report-Preliminary Economic Assessment Update for the Los Azules Project, Argentina- September 1, 2017

PROJECT GEOLOGY

TYPE OF DEPOSIT:

Andean copper porphyry.

REGIONAL GEOLOGY



The geological province in which it is located is the Cordillera Frontal, it comprises volcanic rocks of the Mesozoic with intrusion of Miocene diorite, intruded at the same time by a sub-parallel strip of diorite-dacite dikes along the main north fault northwest. The mineralization and hydrothermal alteration typical of porphyric copper is spatial, temporal and genetically related to the dikes. Copper mineralization (chalcocite + pyrite + chalcopyrite) is associated with intrusive bodies of dacitic composition to diorite of tertiary age.

DEPOSIT GEOLOGY



In the project area, geology is composed of volcanic rocks intruded by a dioritic stock, in turn, it is intruded by a system of sub-parallel dikes of dioritic to dacitic composition of faults of dominant NNW heading. The mineralization and alteration of the porphyry type system is temporary, spatial and genetically linked to the dikes.

The system has zoning:

- Leaching zone between 60 and 180 meters deep with jarosite, goethite and hematite.
- Supergenic enrichment zone between 60 and 300 meters with the presence of calcosine +/- covellite.
- Primary sulfide zone with chalcopyrite, bornite, pyrite +/- calcosine and primary covellite.

The Los Azules hydrothermal alteration system has a minimum length of 5 km and a minimum width of 4 km, and is extended in an NNW direction along an important structural corridor. The system disappears into a volcanic cover to the north, so its final extension is unknown. The altered area surrounding the Los Azules deposit is approximately 4 km long by 2.5 km wide. The limits of mineralization have not been fully defined by drilling.

LOS AZULES

TECHNICAL / ECONOMIC INFORMATION OF THE PROJECT



AVERAGE ANNUAL PRODUCTION

Copper		153 kt
Gold		35 koz
Silver	A	1,2 Moz

PRODUCT TO OBTAIN: Copper, gold and silver concentrate

CAPEX: 2.363 M USD



Estimated annual employment in operation: 800 jobs (e)
Estimated annual employment in construction stage: 1,500 jobs

(e)

Estimated LOM: 36 years

Mining Method: OPEN PIT

SOURCES CONSULTED



https://www.mcewenmining.com/media/galleries/los-azules/default.aspx https://s21.q4cdn.com/390685383/files/technical_reports/los_azules/LosAzule sPEA Rev0 20171016.pdf

https://www.mcewenmining.com/operations/los-azules/default.aspx Ministerio de Minería de San Juan (http://mineria.sanjuan.gov.ar/)

RESOURCES AND RESERVES - ESTIMATION



	Tonnag			Grade			Metal Content			
RESOURCES	e (Mt)	Cu (%)	Au (g/t)	Ag (g/t)	Mo (%)	Cu (t)	Au (Oz)	Ag (MOz)	Mo (t)	
Indicated	962	0,48	0,06	1,8	0,003	4.600.000	1.700.000	55,7	25.900	
Inferred	2.666	0,33	0,04	1,6	0,003	8.750.000	3.800.000	135,4	88.000	

CONTACT



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info@mcewenmining.com
www.mcewenmining.com







3600 m.a.s.l.



31° 45' 39" Latitude South 70° 43' 50" Longitude West













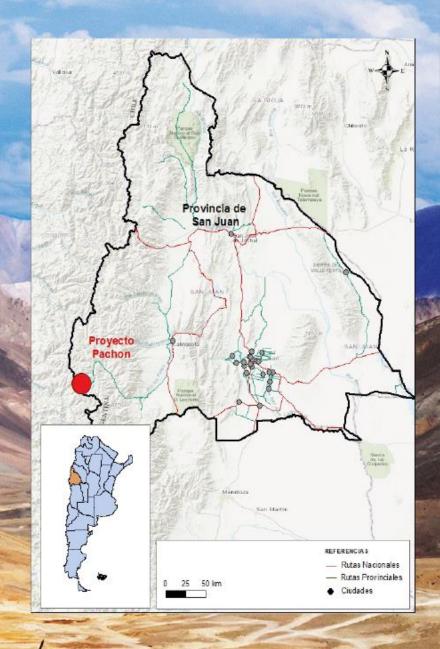
Glencore Plc

RESERVES





0.67 3,577,800 0.3 5,174,400 0.41 6,424,800



PACHÓN

LOCATION (31°45'39" Lat. S; 70°43'32" Long. W.)



It is located in the province of San Juan, in the department of Calingasta; approximately 300 km west of the city of San Juan, Argentina, and 5 km from the border with Chile. At an altitude of 3600 m.a.s.l. The community closest to the project area on the Argentine side is Barreal, which is approximately 150 km away.

PROPERTY DATA



- **→ OWNER/CONTROLLER: Glencore plc**
- > OPERATOR: El Pachón S.A. Minera
- > AREA: 1.004 ha

PROJECT STATUS - REINGEENIERING

LAST PUBLIC TECHNICAL REPORT

COMPANY'S LAST ANNOUNCEMENT



- PROSPECTING
- INITIAL EXPLORATION
- ADVANCED EXPLORATION
- EVAL. ECON. ASSES. (PEA)
- PREFEASIBILITY
- FEASIBILITY-Reengenering
- CONSTRUCTION
- OPERATION



Public report: Sustainability Report El Pachón 2013

Announcements: "Currently, working on the reevaluation of the project and realization of the exploitation IIA; [...]. The Project proposes to develop an open pit mine to extract copper ore and process it by flotation.

PROJECT GEOLOGY

TYPE OF DEPOSIT:

Copper and molybdenum porphyry.



REGIONAL GEOLOGY

It is found in the post-accretionary metallogenetic belt of the magmatic arc during the Neogene (Tertiary). Between 30° and 34° Lat. S, during the middle Miocene (18–15 Ma) a horizontalization of the Nazca plate begins and its consequent cortical thickening. Magmatic activity reaches a great development in the provinces of San Juan and center of Mendoza. With the progressive horizontalization of the plate produces a migration of the arch towards the east. These particular conditions give rise to a magmatism that culminates with episodes of hydrothermal alteration and high sulfurization gold mineralization. Another important type of mineralization is the Copper-Molybdenum porphyry such as Pachón, Mercedario in San Juan; Paramillos, San Jorge and San Benicio in Mendoza; with locally associated vetiform polymetallic deposits.



DEPOSIT GEOLOGY

The deposit is located in the Cordillera Principal, formed by a basement of granitoids and vulcanites (Gr. Choiyoi), above in discordance there are jurassic sedimentary units, on them - also in discordance - lie stratified and andesitic vulcanites and to a lesser extent rhyolitic and riodacitics (Fm. Pachón). The latter is locally intruded by mesosilicic bodies, granular to porphyric, with which mineralization is linked. The sequence of deposit formation was synthesized by Lencinas and Tonel (1994): 1-Intrusion of the Diorita Pachón stock. 2-Formation of the porphyric copper system. 3-Posthumous intrusion of dioritic porphyry in whose intrusive dome there is magmatic breccia with accumulation of hydrothermal fluids. 4-Hydrothermal brecciation, alteration and mineralization of the breccia. 5-Intrusion of the dacitic porphyry at the northern limit of the hydrothermal breccia. 6-Formation of poorly mineralized tourmaline breccias. 7-Leaching and supergenic enrichment.

The formation stage of the hydrothermal breccia is accompanied by a sinking of 50 to 70 m from the breccia body relative to the surrounding volcanoes.

PACHÓN

TECHNICAL / ECONOMIC INFORMATION OF THE PROJECT



AVERAGE ANNUAL PRODUCTION

Copper		280 kt
Silver	A	3 M oz

PRODUCT TO OBTAIN: Concentrado de cobre.

CAPEX: 4.500 M USD*



Estimated annual employment in operation: 1100 jobs (e)
Estimated annual employment in construction stage: 3.000 jobs

Estimated LOM: 30 years

Mining Method: OPEN PIT

* As part of the re-engineering, the value could decrease to around 2.800 M USD

SOURCES CONSULTED



- https://www.elpachon.com.ar/es/Paginas/home.aspx
- Reporte de recursos y reservas 2015 Glencore.
- Reporte-de-Sostenibilidad-El-Pachon-2011, 2012, 2013
- Wood Mackenzie (https://www.woodmac.com/)
- Ministerio de Minería de San Juan (http://mineria.sanjuan.gov.ar/)
- Registros de Dirección Nacional de Inversiones Mineras (MPyT).
- S&P Global Market Intelligence

RESOURCES AND RESERVES - ESTIMATION



RESOURCES	Tonnage (Mt)		Gra	ade	Metal Content			
		Cu (%)	Ag (g/t)	Mo (%)	Cu (M t)	Ag (M Oz)	Mo (t)	
Measured	534	0,67	2,4	0,013	3,58	41,2	69.420	
Indicated	1.056	0,49	2,0	0,011	5,17	67,9	116.160	
Inferred	1.528	0,41	1,8	0,01	6,4	90,7	137.520	

CONTACT



www.elpachon.com.ar

Calle Güemes 333 Sur – Segundo Piso San Juan Capital J5400 CPI contacto@elpachon.com

SAN JORGE



Las Heras Mendoza



3700 m.a.s.l.



32° 14' 41" Latitude South 69° 26' 16" Longitude West







MINERALIZATION TYPE
Cu Porphyry





Solway Investment & Aterra

RESERVES



Proven

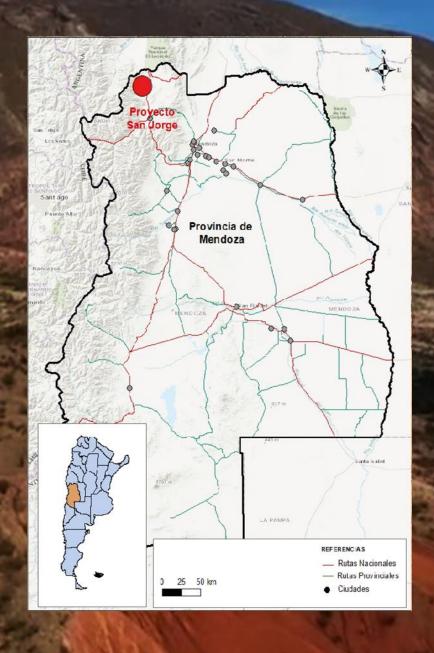
0.63

252,101 41,870 RESOURCES

Measured Indicated

CRADE (%) 0.42

452,247 436,603 43,172



SAN JORGE

LOCATION (32° 14' 41" Lat. S; 69° 26' 16" Long. W.)



It is located in the department of Las Heras, province of Mendoza, 110 km. To the northwest of the city of Mendoza, by National Route No. 7, and whose access door is 37 km from the district of Uspallata, by National Route No. 149. The Project is located at 2600 meters above sea level in the so-called Cordillera del Tigre.

PROPERTY DATA



- > OWNER/CONTROLLER: Solway Investment & Aterra Capital
- > OPERATOR: Minera San Jorge S.A.
- > AREA: 9.987 ha

PROJECT STATUS - PREFEASIBILITY (INACTIVE)

LAST PUBLIC TECHNICAL REPORT

COMPANY'S LAST ANNOUNCEMENT

No new ads



- PROSPECTING
- •INITIAL EXPLORATION
- ADVANCED EXPLORATION
- •PREL. ECON. ASSES. (PEA)
- PREFEASIBILITY 2012
- FEASIBILITY
- CONSTRUCTIÓN
- OPERATION



PROJECT GEOLOGY

TYPE OF DEPOSIT:

Copper and gold porphyry.



REGIONAL GEOLOGY

The property of San Jorge is located on the western periphery of the Graben de Uspallata-Calingasta-Iglesia. To the east of the graben is the Pre-Cordillera and to the west is the Cordillera Frontal..



DEPOSIT GEOLOGY

In the project area, rocks of the Yalguaraz Formation emerge: sandstones, conglomerates, limolites and clays. Sedimentites are intruded by a porphyry granite, stocks and dykes of the Perm - Triassic. On the western edge of the granitic bodies there are small tourmaline (crackling) holes. The contacts are subvertical and irregular.

The San Jorge porphyry system shows a vertical zonation from hypogene mineralization at depth, passing upwards into a supergene enriched zone, which is overlain by a zone of oxide mineralization and finally by a poorly developed leached cap. Superimposed on this basic zonation are lateral variations in the distribution of the mineralization types that relate to the main north to south and north-northeast striking fault zones. The porphyry system is ovoid in shape and covers an area of 1.1 km north-northeast by 700 m north northwest.

SAN JORGE

TECHNICAL / ECONOMIC INFORMATION OF THE PROJECT



AVERAGE ANNUAL PRODUCTION

Copper	40 kt
Gold	40 koz

PRODUCT TO OBTAIN: Copper cathodes + doré

CAPEX: 370 M USD



Estimated annual employment in operation: 350 jobs (e)

Estimated annual employment in construction stage: 600 jobs

(e)

Estimated LOM: 16 YEARS

Mining Method: OPEN PIT



https://solwaygroup.com/our-business/san-jorge-project-mendoza-argentina/-

www.corominig.com

- -Registros de la Subsecretaria de Desarrollo Minero
- -Preliminary Feasibility Study; SAN JORGE 25kt/y COPPER LEACH PROJECT IN SAN JUAN PROVINCE, Argentina (NI 43-101, Technical Report) 1 March, 2012.
- -http://www.solwaygroup.com/index.php/our-business/san-Jorge-project-Mendoza-argentina

RESOURCES AND RESERVES - ESTIMATION



RESOURCES	Tonnage	Grad	le	Metal Content		
RESOURCES	(Mt)	Cu (%)	Au (g/t)	Cu (t)	Au (Oz)	
Measured	79,5	0,57	0,22	452.247	584.000	
Indicated	104,09	0,42	0,19	436.603	626.000	
Inferred	11,2	0,38	0,16	43.172	59.000	

RESOURCES	Tonnag		Grade	Metal Content		
RESOURCES	e (Mt)	Cu (%)	Au (g/t)	Cu (t)	Au (Oz)	
Proven	40,01	0,63	-	252.101	-	
Probable	8,37	0,5	-	41.870	-	

CONTACT



Jorge Ortiz-Director.

Cerro Montura, Manzana 44, Casa 4, Barrio Jardín Norte, Uspallata, Mendoza -

— Cod. Postal: 5545 —

http://www.coromining.com — info@proyectosanjorge.com.ar







3400 m.a.s.l.



31° 28' 41" Latitude South 70° 28' 50" Longitude West







MINERALIZATION TYPE
Cu Porphyry



Peregrine Argentina S.A.



Aldebaran Resouces Ir

RESERVES

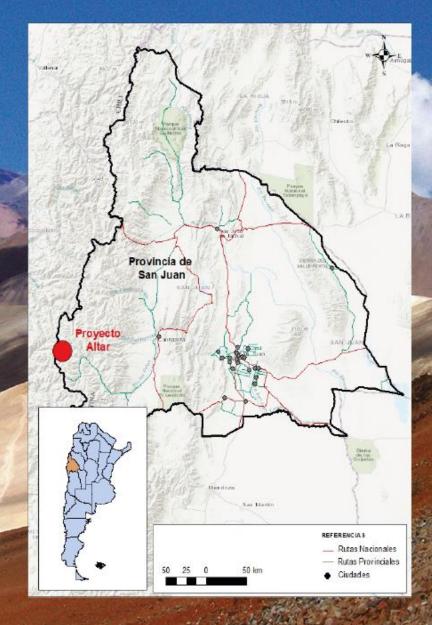


Proven

RESOURCES

Indicated

0.67 3,577,800 0.49 5,100,190



ALTAR

LOCATION (31°28'41" Lat. S - 70°28'50" Long. W.)



The project is located 10 km east of the border with Chile, and 180 km west of the city of San Juan, in the department of Calingasta, province of San Juan. Includes topographic heights between 3,100 and 4,000 m.a.s.l. The center of the deposit is approximately 3,400 m.a.s.l.

PROPERTY DATA



- > OWNER / CONTROLLER: Aldebaran Resources Inc.
- > OPERATOR: Minera Peregrine Argentina S.A
- > AREA: 8.443 ha

PROJECT STATUS – Advanced Exploration

LAST PUBLIC TECHNICAL REPORT

COMPANY'S LAST ANNOUNCEMENT



- PROSPECTING
- INITIAL EXPLORATION

ADVANCED EXPLORATION

- •PREL. ECON. ASSES. (PEA)
- PREFEASIBILITY
- FEASIBILITY
- CONSTRUCTION
- OPERATION



In August 2018, Sibanye-Stillwater entered into a series of agreements with Regulus Resources and a newly formed Regulus subsidiary, "Aldebaran Resources", to further explore and develop the Altar project

PROJECT GEOLOGY

TYPE OF DEPOSIT:

Copper and gold porphyry.



REGIONAL GEOLOGY

The Altar Project is located in the Cordillera Principal. The rocks of the basement correspond to the Choiyoi Group with andesitic volcanoes at the base and rhyolitic at the top, of Perm Triassic age. The volcanic sequence is intruded by granites and covered in discordance by marine Jurassic sediments (sandstones and clays). In other sectors (project area) G. Choiyoi is covered by acidic ignimbrites and andesitic volcanoes from the Miocene (Pachón Formation).

The project is flanked by two regional faults of North - South heading, the Pelambres fault to the West and the Rio Teatinos fault to the East. The Pelambres limits the Pachón Formation, to the East of the pelambres (paleogen) formation to the West. The Rio Teatinos fault puts the Pachón Formation in contact with Paleozoic and Mesozoic metasedimentites and intrusives.

DEPOSIT GEOLOGY



The Altar Project is located 2 km southeast of a target with Au and Ag called Quebrada de la Mina that integrates the group of mining properties of the project. The Altar porphyry is associated with intermediate subvolcanic bodies from the late Miocene that intrude ignimbrites and andesites from the early Miocene of the Pachón Formation. Copper mineralization is associated with high levels of Gold, Silver and Molybdenum.

The Quebrada de la Mina deposit is housed in the same andesitic sequence and the mineralization is primarily from Gold and Silver hosted in the Andesita Pachón and in the dacitic porphyry.

ALTAR

TECHNICAL / ECONOMIC INFORMATION OF THE PROJECT



AVERAGE ANNUAL PRODUCTION

Copper	127 kt (e)
Gold	24 koz (e)

PRODUCT TO OBTAIN: Copper concentrate + dore

CAPEX: 3.000° M USD



Estimated annual employment in operation: 800 jobs (e)

Estimated annual employment in construction stage: 1.500 jobs

(€

Estimated LOM: 36 years

Mining Method: OPEN PIT

SOURCES CONSULTED



https://www.aldebaranresources.com/projects/altar-copper-gold/overview/https://www.sedar.com/DisplayCompanyDocuments.do?lang=EN&issuerNo=0046243 "Aldebaran Resources Inc"

NI-43-101- TECHNICAL REPORT ESTIMATED MINERAL RESOURCES ALTAR PROJECT SAN JUAN PROVINCE ARGENTINA - Effective Date: August 16, 2018 -https://www.sibanyestillwater.com/business/americas/projects/

-ESTIMATED MINERAL RESOURCES ALTAR & QUEBRADA DE LA MINA DEPOSITS, SAN JUAN PROVINCE ARGENTINA Prepared for Stillwater Mining Company, January 31, 2014

RESOURCES AND RESERVES - ESTIMATION



RESOURCES	Tonnag	Grade			Metal Content			
	e (Mt)	Cu (%)	Au (g/t)	Ag (g/t)	Cu (t)	Au (Oz)	Ag (Oz)	
Measured	995	0,36	0,092	0,99	3.382.895	2.981.000	31.935.000	
Indicated	1.049	0,31	0,067	0,91	3.199.190	2.253.000	30.852.000	
Inferred	556,5	0,28	0,06	0,88	1.551.287	1.087.000	15.703.000	

CONTACT



Santa Fe 117 – piso 4° A –Oeste (5400) – Provincia de San Juan www.sibanyestillwater.com



VALLE DE CHITA

LOCATION (30° 32' 41" Lat. S; 69° 31' 9" Long. W.)



It is located in the west of the province of San Juan in the Cordillera Frontal area. The elevation is approximately 3000 to 3700 meters above sea level. Access to the property, from the city of San Juan, is by national route 40 north to Talacasto, where provincial route 436 is taken to the city of Iglesia and then provincial route 412 to the city of Tocota.

PROPERTY DATA



- > OWNER / CONTROLLER: Minsud Resources Corp.
- > OPERATOR: Minera Sud Argentina S.A
- > AREA: 17.423 ha

PROJECT STATUS – Advanced Exploration

LAST PUBLIC TECHNICAL REPORT

COMPANY'S LAST ANNOUNCEMENT



- PROSPECTING
- INITIAL EXPLORATION
- ADVANCED EXPLORATION
- PREL. ECON. ASSES. (PEA)
- PREFEASIBILITY
- FEASIBILITY
- CONSTRUCTIÓN
- OPERATION



Minsud and South32 Sign an Earn-in Agreement to explore the Chita Valley Project. November 4, 2019

PROJECT GEOLOGY



TYPE OF DEPOSIT:

Copper-gold-molybdenum porphyry.

REGIONAL GEOLOGY

The Valle de Chita Project is located in the Andes Mountain Range. The oldest rocks (basement) correspond to the Aguas Negras Formation of the Carboniferous - Permian (Quartzites and conglomerates). A Mesozoic to Tertiary age sequence covers the previous units and in turn is intruded by Mesozoic to Tertiary granitoids. The lithologies are intruded by andesitic to dacitic subvolcanic bodies of the tertiary. Pleistocene sediments and alluvial deposits of the Quaternary.



DEPOSIT GEOLOGY

The project is a spatially and temporarily divided hydrothermal system in areas that include an early porphyry style of Cu and Mo followed by high, intermediate and low sulphidation mineral components (quartz +/- Au-Ag). This deposit is located in the metallogenetic belt of the Cordillera Frontal, and in the homonymous geological province.

The lithology of the porphyry is of monzodioritic composition and is located in sedimentary rocks of carboniferous age that constitute the Agua Negra Formation.

VALLE DE CHITA

TECHNICAL / ECONOMIC INFORMATION OF THE PROJECT



AVERAGE ANNUAL PRODUCTION

Copper	s/d
Gold	s/d

PRODUCT TO OBTAIN: s/d

CAPEX: s/d



Estimated annual employment in operation: N/D

Estimated annual employment in construction stage:

N/D

Estimated LOM: N/D

Mining Method: N/D

SOURCES CONSULTED



-http://www.minsud.com/en/wp-content/uploads/2018/ChitaTechReportFinalApr27.pdf

-NI 43-101 TECHNICAL REPORT AND UPDATED MINERAL RESOURCE ESTIMATE ON THE CHITA VALLEY PROJECT - SAN JUAN PROVINCE, ARGENTINA - 30° 36′ S and 69° 30′ W ARGENTINA, FOR MINSUD RESOURCES CORP. February 1, 2016

-Ministerio de Minería de San Juan (http://mineria.sanjuan.gov.ar/)

RESOURCES AND RESERVES - ESTIMATION



PECOLIDAES	Tonnage	Grade				Metal Content			
RESOURCES	(Mt)	Cu (%)	Au (g/t)	Ag (g/t)	Mo (%)	Cu (t)	Au (Oz)	Ag (Oz)	Mo (t)
Indicated	33	0,43	0,07	2,28				2.420.465	5.942
Inferred	8,6	0,4	0,07	1,73	0,016	34.378	19.344	478.090	1.375

CONTACT



Sabrina Cecilia Lauberer cmassa@minsud.com dgregorini@minsud.com Esmeralda 684, piso 13 (1007) Buenos Aires www.minsud.com

RÍO GRANDE



Los Andes Salta



4500 m.a.s.l.



25° 01' 56" Latitude South 67° 52' 00" Longitude West







Minera Antares Argentina S.A.



RESERVES





219,811 94,529



RÍO GRANDE

LOCATION (25° 01' 56" Lat. S; 67° 52' 00" Long. W)



It is located in the Altiplano of northwest Argentina at elevations between 3,700 and 4,700 m, 250 km west of the capital of the province of Salta. The nearest city with services is Tolar Grande, located on Provincial Route 27, one and a half hours northeast of the project camp.

PROPERTY DATA



- > OWNER / CONTROLLER: Aldebaran Resources Inc.
- > OPERATOR: Minera Antares Argentina S.A.
- > AREA: 26.925 ha

PROJECT STATUS – Advanced Exploration

LAST PUBLIC TECHNICAL REPORT

COMPANY'S LAST ANNOUNCEMENT

No new ads



- PROSPECTING
- INITIAL EXPLORATION

• ADVANCED EXPLORATION

- PREL. ECON. ASSES. (PEA)
- PREFEASIBILITY
- FEASIBILITY
- CONSTRUCTIÓN
- OPERATION



PROJECT GEOLOGY



TYPE OF DEPOSIT:

Copper and gold porphyry.

REGIONAL GEOLOGY

The project is located in Puna, where the magmatic arc of the Andes is oriented in a north - south axis. The combination of the volcanic arc associated with transverse structures has concentrated magmatic activity and subsequent hydrothermal emanations generating large deposits of porphyry copper. Rio Grande is located in an extensional basin of 100 x 130 km that includes the Salar de Arizaro. The volcanic belt is characterized by eroded stratovolcanoes and dacitic to andesitic and pyroclastic and volcanogenic porphyritic bodies. These host many of the deposits of the mentioned hydrothermal systems..



DEPOSIT GEOLOGY

Río Grande is a copper and gold porphyry with alterations associated with the IOCG style (iron oxide, copper and gold) located in the province of Salta, in northwestern Argentina. The copper and gold mineralization in Rio Grande occurs within the eroded central core of an intrusive center of the middle Miocene and is distinguished by a well-defined alteration of superficial copper and gold (2 km by 2 km) coinciding with polarization charge anomalies induced (IP). The trenching and drilling programs of Teck Corporation (2000-2001), Antares (2004-2008) and Regulus (2010-2012) have partially delineated the "Discovery and Sofia" copper and gold zones along the margins southeast of the system, and determined the extent of mineralization to the north and west margins of the system.

RÍO GRANDE

TECHNICAL / ECONOMIC INFORMATION OF THE PROJECT



AVERAGE ANNUAL PRODUCTION

Copper	N/D
Gold	N/D

PRODUCT TO OBTAIN: N/D

CAPEX: N/D



Annual employment estimated in operation: N/D

Estimated annual employment in construction stage: N/D

Estimated LOM: N/D

Mining Method: N/D

SOURCES CONSULTED



https://www.aldebaranresources.com/projects/rio-grande/https://www.sibanyestillwater.com/news-investors/reports/annual/

www.regulusresources.com/projects/rio-grande-argentina

- -Registros de Dirección Nacional de Inversiones Mineras (MEM).
- -Regulus Resources Inc. Río Grande Cu-Au-Ag Project, Northwest Argentina, January 19,2012

RESOURCES AND RESERVES - ESTIMATION



RESOURCES	Tonnage	Grade			Metal Content		
	(Mt)	Cu (%)	Au (g/t)	Au (g/t)	Cu (t)	Au (Oz)	Ag (Oz)
Indicated	71	0,30	0,36	3,2	219.811	815.000	7.300.000
Inferred	41	0,23	0,28	2,8	94.529	375.000	3.600.000

CONTACT



Aldebaran Argentina SA Mariano Benitez 649 A4408FEM, Salta, Argentina www.aldebaranresources.com