LUMINA COPPER CORP

Taca Taca Property

Porphyry Copper-Gold-Molybdenum Project, Argentina

NI 43-101 Technical Report

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SIM GEOLOGICAL INC.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

1 SUMMARY

This Technical Report was prepared by SIM Geological Inc. (SIM Geological) for Lumina Copper Corp. (Lumina Copper) to provide an updated mineral resource for the Taca Taca porphyry copper-gold-molybdenum project. The report was written under the direction of Robert Sim P.Geo and Bruce Davis, FAusIMM, and Don Larsen, P.E., all independent "qualified persons" as defined by Canadian Securities Administrators National Instrument 43-101 *Standards of Disclosure for Mineral Projects* (NI 43-101) and as described in Section 28 (Certificates and Signatures) of this report.

Property Description and Location

The Taca Taca property is located in the Puna (Altiplano) region of northwestern Argentina, approximately 230 km west of the city of Salta. The centre of the property occurs at latitude 24.7^{o}S and longitude 68^{o}W. The property is accessible from Salta via gravel roads. The nearest village, Tolar Grande, is located 32 km to the east. The Taca Taca property consists of the Grupo Minero Taca Taca concession (Grupo Minero) covering 2,559.96 ha and 25 additional concessions and one land use application, owned wholly or in part, covering 43,180.67 ha. In the region, four additional mining rights applications have been registered, but not yet granted, totalling 18,112.6 ha.

Ownership

The Grupo Minero and additional mineral concessions are currently registered under the name Corriente Argentina S.A. (CASA). Lumina Copper is the beneficial owner of all the issued and outstanding shares of CASA. A member of Lumina Copper management holds approximately 1.5% of the issued and outstanding shares in the capital of CASA in trust for the benefit of Lumina Copper in order to address certain requirements applicable to Argentinean companies under Argentine corporate law.

Certain mining concessions are subject to contractual royalties of up to 1.5% of net smelter returns. A royalty of up to 3% net of smelting/refining, transportation, administration, and plant processing costs (the "mine mouth" value) is payable to the Province of Salta.

History

Copper mineralization was first discovered on the Taca Taca property in the mid-1960s. Between 1970 and 2008 the property was explored by several companies including Falconbridge Argentina S.A., Gatro Argentina Minera S.A. (GAMSA), Corriente Resources, BHP Minerals, and Río Tinto. Lumina Copper tested the extent of the porphyry mineralization from 2010 to 2012. Details of the drilling are summarized in Table 1.1.

TABLE 1.1: DRILLING HISTORY

HOLE SERIES	TYPE	NUMBER OF HOLES	TOTAL METRES	COMPANY	YEAR
TT01-03	BQ Core	3	529	Falconbridge Argentina S.A.	1975
TL01-08	RC	18	1,603	Gatro Argentina Minera S.A.	1995
TK001-033	RC, NQ core	35	11,483	BHP Minerals	1997
TK034-047	NQ core	14	3,246	Corriente Resources	1998
TK048-126	RC	80	4,428	Corriente Resources	1999
CCR001-007	RC	7	2,732	Rio Tinto	1999
ARI001-002	RC	2	606	Rio Tinto	1999
TTBJ0001-0008	HQ core	8	4,877	Rio Tinto	2008
TTBJ10-01 - 12-136	HQ core	137	89,058	Lumina Copper	2010-2012
TTRC11-01 - 12-97	RC	97	32,055	Lumina Copper	2011-2012
TTEX-01 - 07	HQ core	4	1,696	Lumina Copper	2011
TTGT-01 - 04	HQ core	4	2,404	Lumina Copper	2011
T7 – 21, GW3	HQ core	15	2,206	Lumina Copper	2011-2012
TTTV1 – 11, TW9	HQ core	12	6,094	Lumina Copper	2012
AV-SP4D - 5S	HQ core	4	520	Lumina Copper	2012
TOTAL		**440**	**163,537**		

Geology and Mineralization

The deposit on the Taca Taca property is a typical example of an Andean porphyry copper-gold-molybdenum deposit. Oligocene (29 Ma) sulphide mineralization is associated with rhyodacitic porphyry dykes and a probable small stock that intrudes an Ordovician (441 Ma) granite or granodiorite. Hypogene mineralization consisting of chalcopyrite, pyrite and minor bornite, chalcocite, digenite, and molybdenite is associated with well-developed quartz stockworks and pervasive phyllic (quartz-sericite) alteration. The bulk of mineralization lies on the western and northern sides of a buried porphyritic intrusion. Mineralization also partially encircles the intrusion to the east and south. It is exposed over an area of 3.0 km by 2.7 km and several drill holes have intersected good copper grades at depths greater than 900 m. The sulphide mineral resource remains open at depth in some areas and along the southern boundary of the deposit's northeastern limb.

The hypogene mineralization is overlain by a supergene enriched copper zone and a thick leach cap. The leach cap contains limonite assemblages consisting of hematite, jarosite, and goethite. It covers an area of at least 2 km by 2 km and is locally greater than 300 m thick. Gold content of the leach cap is elevated and there are small, localized zones of oxide copper mineralization (malachite, chrysocolla, atacamite, and brochantite). The boundaries of the oxide gold resource appear to be fully defined.

The supergene enriched copper zone is best developed in the north where there is a thick (200 m+), flat-lying blanket of chalcocite-rich mineralization, and along the north-northwest trending “West Fault”. The extent of enriched supergene copper mineralization has now been largely defined; only along the northwestern margin does significant mineralization remain open for expansion.

Other styles of mineralization identified on the property include hematite-quartz copper-gold veins located immediately to the north and west of the porphyry. The mineral resources listed in this Technical Report are an estimate of the porphyry supergene/hypogene style of mineralization.

Sample Database and Validation

A review of the sample collection and analysis practices used during the various drilling campaigns indicates this work was conducted using accepted industry procedures.

Portions of the data have been validated using several methods, including visual observations and comparisons with the assay results, and direct comparisons with assay certificates. Only the more recent sampling programs conducted by Rio Tinto (1999 and 2008) and Lumina Copper (2010-2012) were monitored using a QA/QC program typically accepted in the industry. Similarities between data of all drilling campaigns (location, style, and tenor) suggest that there is no reason to question the results from earlier drilling programs. It is the qualified person’s opinion that the database is sufficiently accurate and precise to generate a mineral resource estimate.

Mineral Resource Estimate

The resource estimate was generated from drill hole sample assay results and the interpretation of a geologic model which relates to the spatial distribution of copper, gold, and molybdenum. Interpolation characteristics were defined based on the geology, drill hole spacing, and geostatistical analysis of the data.

Grade estimates were made using ordinary kriging into a model with a nominal block size of 25 x 25 x 15 m (L x W x H). Statistical evaluations result in the segregation of data by mineral zone domains during grade interpolation. Potentially anomalous outlier grades were identified and controlled during interpolation through the use of outlier limitations. Bulk densities were assigned to blocks in the model based on mineral zone type.

The results of the modelling process have been validated using a series of methods; the results indicate the resource model is an appropriate estimation of global resources based on the underlying database.

The resources have been classified by their proximity to sample locations and are reported, as required by NI 43-101, according to the *CIM Definition Standards for Mineral Resources and Mineral Reserves* (November 2010). Based on the current distribution of drilling, resources in the Indicated category are delineated with holes spaced on a 150 m grid pattern. Resources in the Inferred category occur within a maximum distance of 250 m from a drill hole.

Due to the polymetallic nature of the deposit, mineral resources are expressed using a copper equivalent cut-off grade which is calculated in each model block based on the following assumptions:

$$CuEq\% = Cu\% + (Aug/t * 0.583) + (Mo\% * 6)$$

Assumptions:

Metal prices, US$2.00/lb Cu, US$800/oz Au, and US$12.00/lb Mo. Mining and metallurgical recoveries assumed to be 100%.

To ensure that the reported mineral resource estimate exhibits reasonable prospects for economic extraction, it is limited within a pit shell generated using copper equivalent grades in blocks classified in the Indicated and Inferred categories at a copper price of US$2/lb (45° pit slope, US$1.5/t mining cost for ore and waste, and US$6/t total site operating cost). It is important to realize that mineral resources are not mineral reserves, as their economic viability has not been demonstrated.

The 2012 Taca Taca mineral resource is summarized at a series of cut-off grades for comparison purposes in Tables 1.2 and 1.3. Highlighted in each table is the “base case” cut-off grade of 0.3% CuEq for Supergene and Primary Zone mineralization and at 0.2 g/t Au for the Leach Zone. These assumptions are derived from operations with similar characteristics, scale, and location.

TABLE 1.2: SUPERGENE AND PRIMARY SULPHIDE ZONE MINERAL RESOURCE ESTIMATE

Cut-off Grade (CuEq%) (1)	Mtonnes	Total Cu (%)	Mo (%)	Au (g/t)	CuEq (%)
INDICATED MINERAL RESOURCE					
0.2	2,817	0.38	0.011	0.07	0.49
0.25	2,484	0.41	0.012	0.07	0.53
0.3 (2)	**2,165**	**0.44**	**0.013**	**0.08**	**0.57**
0.35	1,851	0.48	0.014	0.09	0.61
0.4	1,545	0.51	0.015	0.09	0.65
0.45	1,249	0.56	0.015	0.10	0.71
0.5	997	0.61	0.016	0.11	0.77
0.55	811	0.65	0.017	0.12	0.83
0.6	660	0.70	0.018	0.13	0.88
0.65	544	0.75	0.018	0.13	0.94
0.7	454	0.80	0.019	0.14	0.99
INFERRED MINERAL RESOURCE					
0.2	1,396	0.31	0.010	0.05	0.40
0.25	1,135	0.34	0.011	0.05	0.43
0.3 (2)	**921**	**0.37**	**0.012**	**0.05**	**0.47**
0.35	731	0.40	0.012	0.06	0.51
0.4	571	0.44	0.013	0.06	0.55
0.45	421	0.48	0.014	0.06	0.59
0.5	302	0.52	0.014	0.07	0.64
0.55	219	0.56	0.015	0.07	0.69
0.6	162	0.59	0.015	0.07	0.73
0.65	117	0.63	0.016	0.07	0.77
0.7	76	0.68	0.016	0.07	0.81

(1) CuEq=Cu% + (Au g/t*0.583) + (Mo%*6). Metal prices (US$): $2.00/lb Cu, $800/oz Au, $12.00/lb Mo (assumes 100% mining and metallurgical recoveries).
(2) "Base case" cut-off grade for Supergene and Primary Zone resources is 0.30% CuEq.

TABLE 1.3: LEACH ZONE OXIDE MINERAL RESOURCE ESTIMATE

Cut-off Grade (Au g/t) (1)	Mtonnes	Au (g/t)	Total Cu (%)	Mo (%)
INDICATED MINERAL RESOURCE				
0.1	799	0.18	0.04	0.016
0.15	483	0.22	0.04	0.017
0.2	**243**	**0.27**	**0.04**	**0.018**
0.25	126	0.31	0.04	0.018
0.3	57	0.34	0.05	0.017
0.35	20	0.39	0.07	0.017
0.4	5.6	0.44	0.10	0.017
INFERRED MINERAL RESOURCE				
0.1	213	0.14	0.07	0.011
0.15	66	0.18	0.09	0.011
0.2	**17**	**0.23**	**0.11**	**0.008**
0.25	3	0.30	0.10	0.010
0.3	1	0.35	0.11	0.010
0.35	0	0.44	0.12	0.005
0.4	0.1	0.51	0.09	0.001

(1) “Base case” cut-off grade for Leach Zone resource is 0.2 g/t Au.

Metallurgy

Laboratory-scale flotation testing, using tap water, was completed on composited samples of supergene and primary materials obtained from drill core of the Taca Taca deposit. Bulk copper-molybdenum concentrates and separate copper and molybdenum concentrates were produced during the test program.

Lock-cycle flotation tests of the supergene and primary materials produced bulk copper-molybdenum concentrates that contained from 28.7% to 34.5% copper and 0.68% to 0.80% molybdenum. Copper recoveries in the bulk concentrates ranged from 90.2% to 94.7% and molybdenum recoveries ranged from 69.7% to 86.1%. Gold recoveries in the bulk concentrate ranged from 60.2% to 71.7%.

Open-circuit copper-molybdenum separation flotation tests were also performed on bulk concentrates obtained from the lock-cycle tests of supergene and primary materials. Molybdenum concentrates produced from the tests assayed from 41.5% to 53.2% molybdenum while molybdenum recoveries to the molybdenum concentrate ranged from 46.0% to 73.0%.

Lock-cycle flotation tests, using brine water for rougher flotation and tap water for cleaner flotation, were performed on composited samples of supergene and primary materials to produce bulk copper-molybdenum concentrates. Bulk concentrate assays ranged from 29.2% to 33.9% copper and 0.30% to 0.69% molybdenum. Metal recoveries in the bulk concentrates ranged from 86.5% to 91.2% for copper and 52.7% to 75.0% for molybdenum. Gold recoveries in the bulk concentrates ranged from 61.7% to 64.9%.

When the near surface oxide gold material was subjected to cyanide leaching using fresh water the gold recoveries were 45%, 75%, and 90% at crush sizes of -3/4 inch, -10 mesh, and -200 mesh, respectively. Reagent consumption increases as the crush size decreases. The presence of soluble copper increases cyanide consumption. The use of brine water decreases the gold recovery by 5% to 15% and increases lime consumption.

Comminution testing indicates that both supergene and primary ores are hard with approximate Bond Ball Mill Work indices of 18 kWh/t and 16 kWh/t, respectively. Based on a conceptual facility that could process 120,000 tonnes per day, Starkey & Associates (2012) recommended the following equipment: two 40-foot diameter SAG mills, four 26-foot diameter ball mills, and four pebble crushers.

Conclusions

Based on recent drilling conducted by Lumina Copper on the Taca Taca Project in Argentina, the following conclusions can be made:

- The level of understanding of the geology at Taca Taca is relatively good. The practices used during the various drilling campaigns were conducted in a professional manner and adhere to accepted industry standards. There are no factors evident that would lead one to question the integrity of the database.

- A significant porphyry copper-gold-molybdenum deposit was outlined. Oligocene-age mineralization associated with rhyodacitic porphyries is hosted in coarse-grained Ordovician granite that exhibits strong quartz stockworks and phyllic alteration.

- Recent drilling has revealed a rhyodacitic stock that occurs at shallow depths beneath the core of the Taca Taca alteration zone. This rhyodacitic intrusion and associated dykes are interpreted as the source of the mineralizing fluids.

- Drilling to date has outlined an Indicated sulphide resource estimate (at a 0.3% CuEq cut-off) of 2,165 Mtonnes at 0.44% Cu, 0.08 g/t Au, and 0.013% Mo (0.57% CuEq) which contains 21.1 billion pounds of copper, 5.6 million ounces of gold, and 616 million pounds of molybdenum.

- Drilling to date has also outlined an Inferred sulphide resource estimate (at a 0.3% CuEq cut-off) of 921 Mtonnes at 0.37% Cu, 0.05 g/t Au, and 0.012% Mo (0.47%

CuEq) which contains 7.6 billion pounds of copper, 1.6 million ounces of gold, and 235 million pounds of molybdenum.

- The sulphide resource is comprised of both primary and supergene copper mineralization. This mineralization remains open at depth in some areas and along the southern boundary of the deposit's northeastern limb. The Supergene Zone contains higher average copper grades as listed in the following conclusion.

- The supergene portion of the sulphide resource estimate (at a 0.3% CuEq cut-off) contains an estimated 701 Mtonnes at 0.60% Cu, 0.08 g/t Au, and 0.009% Mo (0.70% CuEq) in the Indicated category, and 90 Mtonnes at 0. 44% Cu, 0.06 g/t Au, and 0.005% Mo (0.50% CuEq) in the Inferred category.

- A well-developed, shallow supergene-enriched copper zone with thicknesses up to 300 m is present in the north and may form the basis for a *starter pit* for the Project. The leach cap in this area is thinner than to the south and has an average thickness of 100 m. The updated NI 43-101 mineral resource estimate (at a 0.5% CuEq cut-off) for this zone is: 253 Mtonnes at 0.85% Cu, 0.13 g/t Au and 0.016% Mo (1.02% CuEq) in the Indicated category.

- Thick zones of good grade hypogene copper mineralization are present in the northern part of the deposit. Several drill holes in this area resulted in greater than 0.5% Cu mineralization at depths less than 900 m.

- A portion of the copper-gold-molybdenum porphyry deposit is overlain by a leach cap that ranges from 150-300 m thick. In general, gold mineralization is present in the thickest portions of the leach cap. At a 0.2 g/t Au cut-off, there is an estimated Indicated oxide gold mineral resource of 243 Mtonnes at 0.27 g/t Au which contains 2.1 Moz of gold, and an estimated Inferred resource of 17 Mtonnes at 0.23 g/t Au which contains 0.10 Moz of gold.

- Metallurgical work indicates that conventional flotation milling of the mineralization will result in metal recoveries of 90.2% to 94.7% for copper, 69.7% to 86.1% for molybdenum, and 60.2% to 71.7% for gold and produce a bulk concentrate with copper grades ranging from 28.7% to 34.5%, molybdenum grades ranging from 0.68% to 0.80%, and no deleterious elements.

- Cyanide leaching of oxide gold material in the leach cap indicates that gold recoveries and reagent consumptions increase as the crush size decreases. The presence of soluble copper also increases cyanide consumption. The use of brine water decreases gold recovery by 5% to 15% and increases lime consumption.

- Sequential copper analyses were completed on the enriched zone from selected holes throughout the deposit. The results generally indicate that logging of upper and lower boundaries of secondary copper mineralization was quite good.

Recommendations

The following action is recommended for the Taca Taca Project:

- Conduct a preliminary scoping study that includes additional geotechnical work, hydrological studies, mine planning and an economic analysis of the Project. If results are positive, the Project should proceed to pre-feasibility. Estimated budget US$1.3 million. Lumina Copper is currently working on this recommendation.

Cautionary Note Regarding Forward-looking Information and Statements

Information and statements contained in this Technical Report that are not historical facts are “forward-looking information” or “forward-looking statements” within the meaning of Canadian securities legislation and the *U.S. Private Securities Litigation Reform Act of 1995* (hereinafter collectively referred to as “forward-looking statements”) that involve risks and uncertainties. Examples of forward-looking statements in this Technical Report include, information and statements with respect to: Lumina Copper’s plans and expectations for the Taca Taca Project estimates of mineral resources; the possibility that a higher grade Supergene Zone could form the basis of a starter pit; the results of the metallurgical testing, including potential for metal recovery; plans to conduct a preliminary scoping study, including additional geotechnical work, hydrological studies, mine planning and an economic analysis; and, budgets for recommended work programs.

In certain cases, forward-looking statements can be identified by the use of words such as "plans", "expects" or "does not expect", "is expected", "budget", “goal”, "scheduled", "estimates", "forecasts", "intends", "anticipates" or "does not anticipate", or "believes", or variations of such words and phrases or state that certain actions, events or results "may", "could", "would", "might" or "will be taken", "occur" or "be achieved". These forward-looking statements are based, in part, on assumptions and factors that may change, thus causing actual results or achievements to differ materially from those expressed or implied by the forward-looking statements. Such factors and assumptions include, but are not limited to, assumptions concerning copper, base metal and precious metal prices; cut-off grades; accuracy of mineral resource estimates and resource modeling; reliability of sampling and assay data; representativeness of mineralization; accuracy of metallurgical testwork and timely receipt of regulatory approvals.

Forward-looking statements involve known and unknown risks, uncertainties and other factors which may cause the actual results, performance or achievements of Lumina Copper to be materially different from any future results, performance or achievements expressed or implied by the forward-looking statements. Such risks and other factors include, among others, risks inherent in mineral resource estimation, fluctuation in the price of copper, base and precious metals; expropriation risks; restrictions on currency exchange; currency fluctuations; requirements for additional capital; restrictions on the import of mining plant, equipment supplies, and reagents; inflation; government regulation of mining operations; environmental, safety and regulatory risks; unanticipated reclamation expenses; title disputes or claims; limitations on insurance coverage; changes in project parameters as plans continue to be refined; failure of plant, equipment or processes to operate as anticipated; accidents, labour disputes and other risks of the mining industry; competition inherent in the mining exploration industry; delays in obtaining governmental approvals or financing or in the completion of exploration, development or construction activities, as well as those factors discussed in the sections entitled “Risks and Uncertainties” in Lumina Copper’s annual MD&A. Although Lumina Copper and the authors of this Technical Report have attempted to identify important factors that could affect Lumina Copper and may cause actual actions, events or results to differ, perhaps materially, from those described in forward-looking statements, there may be other factors that cause actions, events or results not to be as anticipated, estimated or intended.

There can be no assurance that forward-looking statements will prove to be accurate, as actual results and future events could differ materially from those anticipated in such statements. Accordingly, readers should not place undue reliance on forward-looking statements. The forward-looking statements in this Technical Report are based on beliefs, expectations and opinions as of the effective date of this Technical Report. Lumina Copper and the authors of this Technical Report do not undertake any obligation to update any forward-looking information and statements included herein, except in accordance with applicable securities laws.

2 INTRODUCTION

Lumina Copper Corp. (Lumina Copper) commissioned Robert Sim, P.Geo of SIM Geological Inc. (SIM Geological) and Bruce Davis, FAusIMM of BD Resource Consulting Inc. (BDRC) to provide an updated mineral resource estimate for the Taca Taca copper-gold-molybdenum project (Taca Taca Project). Don Larsen P.E. of Runge Pincock Minarco provided a review of the metallurgical work done on the Project. Robert Sim, P. Geo, and Bruce Davis, FAusIMM, and Don Larsen P.E. are all independent “qualified persons”, within the meaning of National Instrument 43-101 *Standards of Disclosure for Mineral Projects* (NI 43-101). They are responsible for the preparation of this technical report on the Taca Taca Property (Technical Report) which was prepared in accordance with NI 43-101 and Form 43-101F1. The information, conclusions, opinions, and estimates contained herein are based on:

- The qualified persons’ field observations.
- Data, reports and other information supplied by Lumina Copper and other third parties.

Robert Sim visited the site from 1-3 July 2008 and again from June 21-23, 2012; he reviewed drilling activities, inspected core from numerous drill holes, reviewed sampling procedures, and visited a series of drill sites on the property. Bruce Davis visited the site from 20-22 January 2011 and again from June 21-23, 2012; he reviewed Lumina Copper’s sampling procedures, inspected core from select drill holes, and visited select drill sites. On June 23, 2012, Robert Sim and Bruce Davis also visited Lumina Copper’s core facility and offices in Salta where they examined core from recent drilling and reviewed Lumina Copper’s sampling procedures. Don Larsen did not visit the Project.

In preparing this Technical Report, the authors reviewed and used the geological reports, maps, and miscellaneous technical papers listed in Section 27 (References) of this Technical Report. This report is based on drilling and sampling data available as of 30 October 2012. The resource model, including subsequent data validation and review, was completed in November 2012 and released on 21 November 2012 in a press release by Lumina Copper.

All measurement units used in this report are metric, and currency is expressed in US dollars (US$) unless stated otherwise. The currency used in Argentina is the peso: the exchange rate at the effective date of this Technical Report was approximately 4.77 pesos per US$1.

The effective date for this Technical Report and the mineral resource estimate is 30 October 2012.

2.1 LIST OF ABBREVIATIONS AND ACRONYMS

°C	degree Celsius
AAS	atomic absorption spectroscopy
ABA	acid-base accounting
Ag	silver
ALS	ALS Chemex Labs
As	arsenic
Au	gold
BDRC	BD Resource Consulting, Inc.
BBMWI	Bond Ball Mill Work Index
BQ	drill hole core size (approx 46 mm diam.)
CASA	Corriente Argentina S.A.
C.H. Plenge & Cia. S.A.	Plenge Lab
Cu	copper
DD	diamond drill
DK	Rhyodacite Dykes
g	gram
g/t	grams per tonne
gpt	grams per tonne
GAMSA	Gatro Argentina Minera S.A.
Global Copper Corp	Global
Grupo Minero	Grupo Minero Taca Taca Concession
ha	hectare
HQ	drill hole core size (approx. 78 mm diam.)
IDW	inverse distance weighed method
IP	Geophysical Induced Polarization method
kg	kilogram
km	kilometre
Ktonnes	kilotonnes
kWh/t	kilowatt hours per tonne
Lumina Copper Corp	Lumina Copper
LX	Leach Zone
MD&A	Management Discussion and Analysis
Minera Corriente Chile S.A.	Minera Corriente
MinZone	mineralized zone
MLA	mineral liberation analysis
mm	millimetres
Mo	molybdenum
Moz	million ounces
MT	Geophysical Magnetotelluric method
Mtonnes	million tonnes

NaCN	sodium cyanide
NaSH	sodium hydrosulphide
NQ	drill hole core size (approx. 60 mm diam.)
NSR	net smelter return
OVB	Overburden Zone
PEMU	Provincial Environmental Management Unit
ppm	parts per million
PR	Primary Zone
QA/QC	quality assurance/quality control
RAA	Recursos Americanos Argentinos
RC	reverse circulation drill hole
RDK	Rhyolite Dykes
RQD	rock quality designation
SIM Geological	SIM Geological Inc.
SMU	selective mining unit
sq. M/mt-d	square metres per dry metric ton
SRM	Standard Reference Material
SS	Supergene Zone
t/m^3	tonnes per cubic metre
Project	Taca Taca Project
TACSA	Taca Taca S.A.
t	tonne
TDS	total dissolved solid
Teck	Teck Resources Limited
tpd	tonnes per day
US$	US dollar
UTM	Universal Transverse Mercator

3 RELIANCE ON OTHER EXPERTS

The report was prepared by Robert Sim, P.Geo of SIM Geological Inc. (SIM Geological) and Bruce Davis, FAusIMM of BD Resource Consulting, Inc. (BDRC), and Don Larsen of Runge Pincock Minarco; all are independent "qualified persons" for the purposes of NI 43-101.

For the purpose of Section 4 (Property Description and Location) of this Technical Report, SIM Geological has relied on the ownership data (mineral, surface, access rights, and royalty rights) provided by Lumina Copper on 31 December 2012. On 31 December 2012, SIM Geological reviewed a legal title opinion from Zaballa-Carchio Abogados, dated 10 December 2012, concerning the Taca Taca property. SIM Geological believes this data and information are essentially complete and correct to the best of its knowledge and that no information was intentionally withheld that would affect the conclusions made herein. SIM Geological has not researched the property title or mineral rights for the Taca Taca Project and expresses no legal opinion as to the ownership status of the property.

4 PROPERTY DESCRIPTION AND LOCATION

4.1 LOCATION

The Taca Taca property is located in the Puna (Altiplano) region of Salta province, northwest Argentina. It is approximately 230 km west of the city of Salta and 55 km east of the Chilean border (Figure 4-1). The property is immediately west of, and partially covered by, the Salar de Arizaro, the largest dry salt lake in Argentina. The centre of the property is at latitude 24.7^{o}S and longitude 68.0^{o}W. The UTM coordinates are 7283500 N and 2628000 E (geographic projection: Gauss-Kruger POSGAR 94/Argentina WGS84, Zone 2).

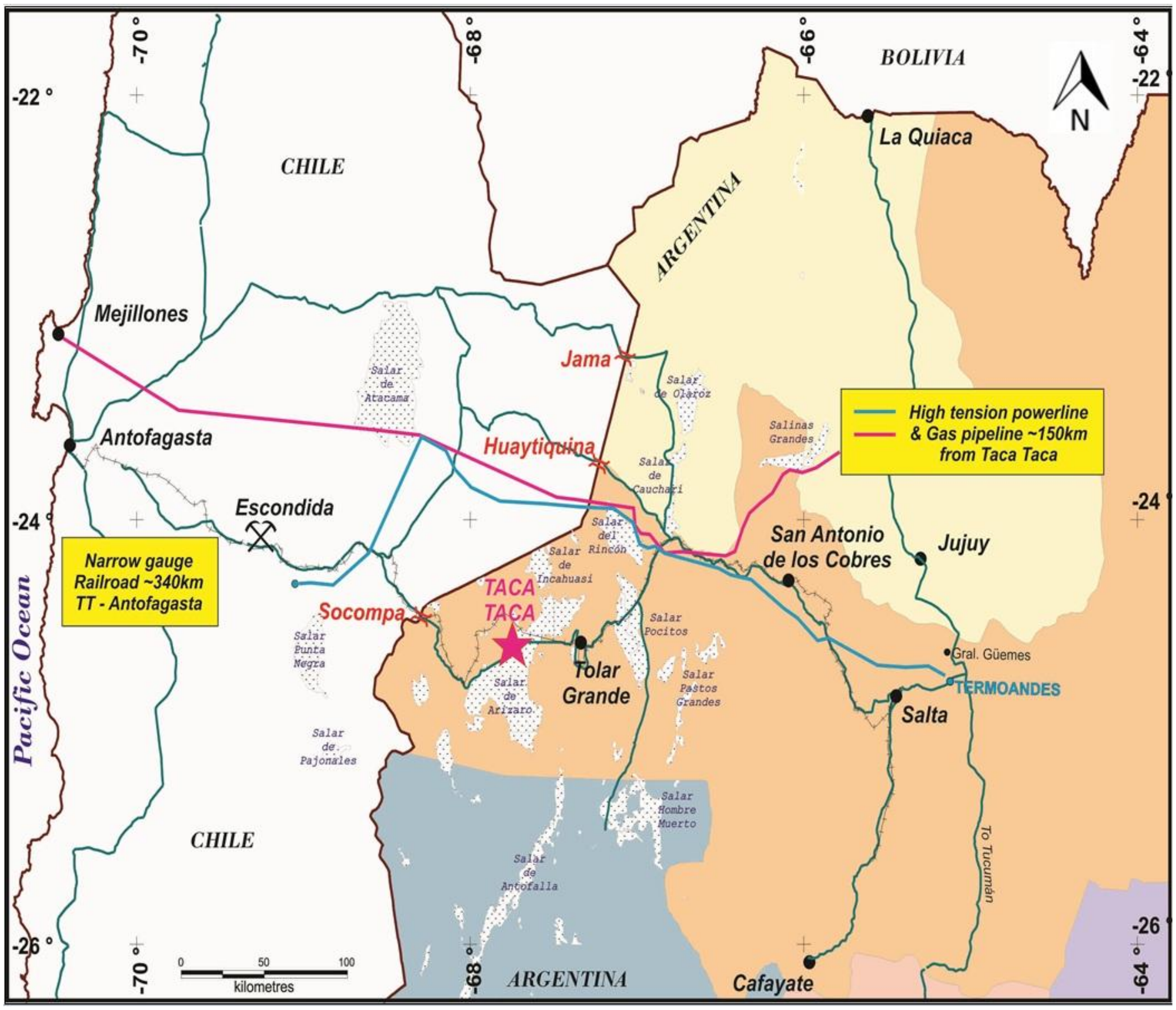

FIGURE 4-1: LOCATION MAP

4.2 LAND TENURE

The Taca Taca property consists of the Grupo Minero Taca Taca concession (Grupo Minero) that covers 2,559.96 ha, and 25 additional mining (mina) and exploration (cateo) concessions and one land use application, owned wholly or in part, that cover 43,180.67 ha. In the region, four additional exploration (cateo) concession applications have been registered, but not yet granted; these total 18,112.6 ha. The mining properties and rights comprising the Taca Taca property, including the applicable file numbers, area, status, and contractual royalty encumbrances are listed in Table 4.1 and shown in Figure 4-2.

TABLE 4.1: MINING CONCESSIONS - TACA TACA PROPERTY

CONCESSION	File Number	Area (Ha)	Status	Contractual Royalty
Mina Fruso Corriente	Claim 18.646/2007	4,502.57	Granted property	
Mina Corriente IV	Claim 19.716/2009	3,493.84	Granted property	
Mina Fruso Corriente II	Claim 18.685/2007	2,504.00	Granted property	
Mina Corriente III	Claim 19.715/2009	2,426.63	Granted property	
Mina Amira Norte	Claim 18.832/2007	1,500.15	Granted property	1.5% NSR
Mina Francisco 1	Claim 18.048/2005	1,313.49	Granted property (50%)	0.75% NSR
Mina Francisco 2	Claim 18.049	1,000.22	Granted property (50%)	0.75% NSR
Mina Corriente V	Claim 20.821/2011	522.96	Granted property	
Mina Amira	Claim 18.794/2007	434.16	Granted property	1.5% NSR
Mina Taca Taca 9	Claim 15.949/1997	376.46	Granted property	1.5% NSR
Mina La Sarita	Claim 1434/1942	167.99	Granted property	
Mina Corriente I	Claim 19.694/2009	134.44	Granted property	
Mina Amira Este	Claim 19.249/2008	81.05	Granted property	1.5% NSR
Mina Corriente II	Claim 19.693/2009	71.88	Granted property	
Mina Federico	Claim 9078/1974	39.98	Granted property	
Mina Don Ramón	Claim 18.851/2007	26.51	Granted property	
Grupo Minero Taca Taca	**Claim 18.690**	**2,559.96**	Granted property	1.5% NSR*
• Mina Carla	Claim 14.460		Granted property	
•Mina Paula	Claim 14.461		Granted property	
•Mina Punilla V	Claim 15.478		Granted property	
•Mina Tacalto 6	Claim 15.727		Granted property	
•Mina Tacalto 8	Claim 15.834		Granted property	
•Mina Taca Taca 1	Claim 7.578		Granted property	
•Mina Taca Taca 2	Claim 7.579		Granted property	
•Mina Taca Taca 3	Claim 7.580		Granted property	
•Mina Taca Taca 4	Claim 7.581		Granted property	
•Mina Taca Taca 5	Claim 7.582		Granted property	
•Mina Taca Taca 6	Claim 7.583		Granted property	
•Mina Taca Taca 7	Claim 7.584		Granted property	
•Mina Taca Taca 8	Claim 15.948		Granted property	
Cateo	Claim 21.227/2011	8,924.29	Granted property	
Cateo	Claim 21.226/2011	7,752.04	Granted property	
Cateo	Claim 21.225/2011	6,262.51	Granted property	
Cateo "Aracar"	Claim 21.386	927.75	Granted property	
Mina " La Escondida"	Claim 17.642	37.00	Granted property	
Mina "La Escondidita"	Claim 17.879	6.00	Granted property	
Mina La Gloria	Claim 21.307	196.88	Granted property	1.5% NSR
Mina Don Francisco	Claim 18.034	340.04	Granted –held in trust for CASA by S. Arbeleche	
Land Use application (Rwy)	Claim 21.679	90.46	Granted property	
Cateo	Claim 21.705	4,760.00	Pending application	
Cateo	Claim 21.709	5599.00	Pending application	
Cateo "Chuculaqui"	Claim 21.387	3,154.12	Pending application	
Cateo " EX3"	Claim 21.390	4,599.48	Pending application	
Granted properties total (ha)		**45,740.63**		
Pending applications total (ha)		**18,112.60**		
Grand total (ha)		**63,853.23**		

* A 1.5% NSR is payable in respect of each of the concessions formerly comprising the area covered by the Grupo Minero, other than Mina Punilla V, Mina Tacalto 6, and Mina Tacalto 8.

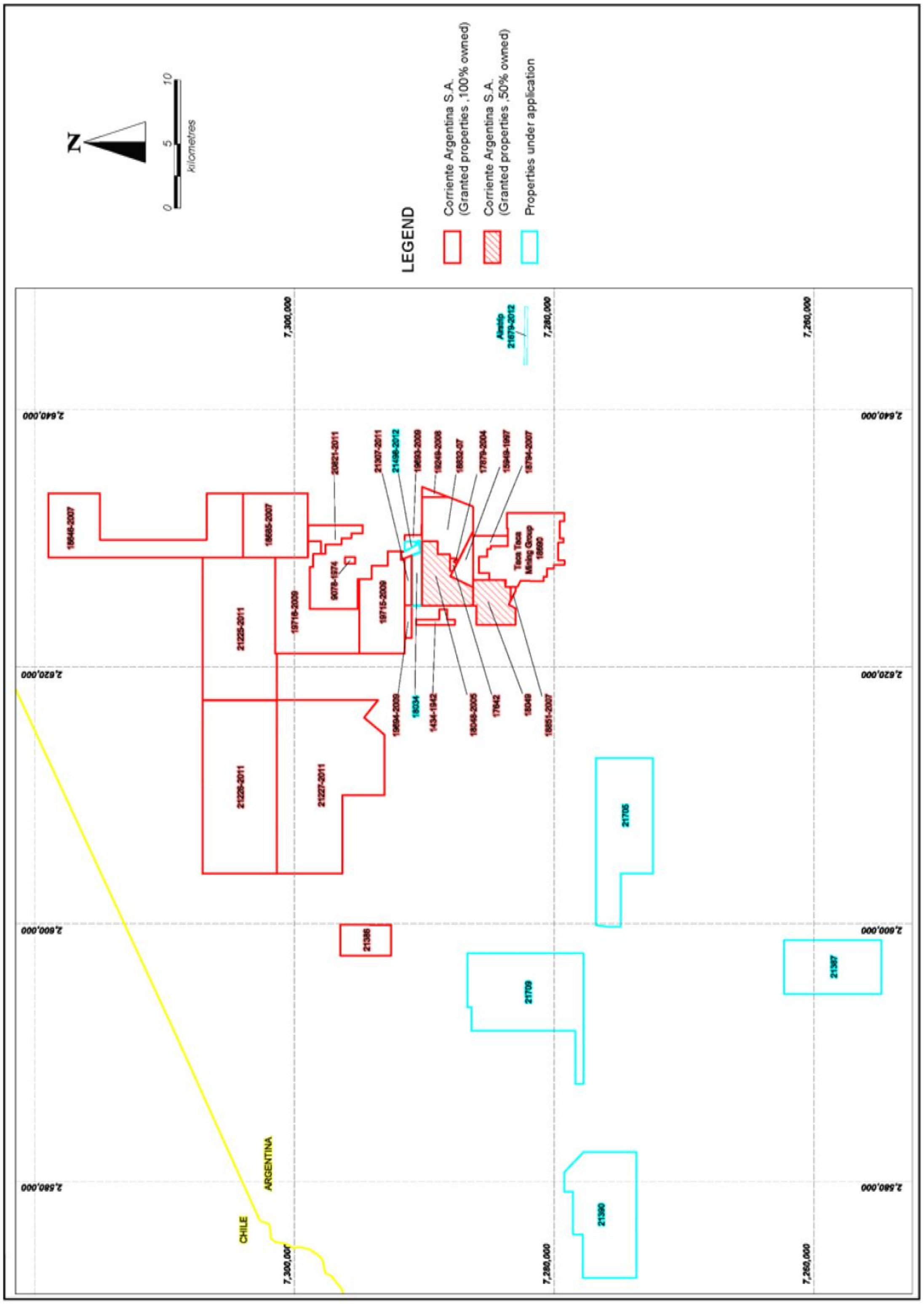

FIGURE 4-2: CLAIM MAP

The Grupo Minero is maintained through annual fees (*canon*) which at current exchange rates are equivalent to US$ 4,410 per year. The remaining concessions have an annual canon fee of US$ 23,360. One-half of the total annual canon fees (US$ 13,885) are paid semi-annually in June and December.

As of 30 October 2012, the effective date of this Technical Report, all of the mining concessions were in good standing through to 30 June 2013. The Grupo Minero and other concessions are valid for an unlimited period of time as long as the bi-annual canon payments are made. All exploration concessions (cateos) will have to be converted to mine properties (minas) in 2013 and 2014. The Grupo Minero and mining concessions (minas) include the right to exploit, subject to being granted by an environmental permit for exploitation. The exploration concessions (cateos) include the right to explore for all metals or minerals.

The surface lands covering the Taca Taca property are owned by the Province of Salta and the necessary access permits were granted for the current drilling work. All known mineralized zones are located hundreds of metres within the limits of the Taca Taca property.

The Grupo Minero and other mining and exploration concessions are registered under the name Corriente Argentina S.A. (CASA) except for Mina Don Francisco which is held in trust for CASA by S. Arbeleche and Mina Francisco 1 and Mina Francisco 2 which are jointly owned through a company 50% owned by CASA and 50% owned by Salta Exploraciones S.A. (SESA). Lumina Copper is the beneficial owner of all of the issued and outstanding shares of CASA. A member of Lumina Copper management holds approximately 1.5% of the issued and outstanding shares in the capital of CASA in trust for the benefit of Minera Corriente in order to address certain requirements applicable to Argentinean companies under Argentine corporate law.

Lumina Copper first acquired an interest in the Taca Taca property when shareholders of Global Copper Corp. (Global) approved a corporate reorganization effective 1 August 2008 by way of a statutory plan of arrangement (Global Arrangement); pursuant to the Global Arrangement, Teck acquired all Global's shares. Global's assets, excluding the Relincho Project in Chile, were transferred to Lumina Copper; this included ownership of Minera Corriente, Chile S.A. (Minera Corriente) which at the time indirectly held a 100% interest in the Taca Taca property as it was then structured. Effective 19 August 2012, Minera Corriente was wound up into Lumina Copper, leaving Lumina Copper the beneficial owner of all of the issued and outstanding shares of CASA.

Since completion of the Global Arrangement, CASA has subsequently acquired additional mineral concessions through a combination of purchases from third party owners, lotteries, and staking. The present property position is shown in Figure 4-2 and concessions are listed in Table 4.1.

Some of the mining concessions that form the Grupo Minero and one ancillary mining concession are subject to a contractual royalty of 1.5% of net smelter returns (Taca Taca Royalty). Franco Nevada Corp., through a wholly-owned subsidiary, holds the right to receive a 72% interest in the Taca Taca Royalty, and the remaining 28% interest is held by two individuals. A number of additional mining concessions are subject to contractual royalties of up to 1.5% of net smelter returns. Table 4.1 includes a summary of the contractual royalties that apply with respect to the mining properties and rights comprising the Taca Taca property.

A royalty of up to 3% net of smelting/refining, transportation, administrative, and plant processing costs (also known as the “mine mouth” value) is payable to the Province of Salta.

4.3 ENVIRONMENTAL REGULATIONS AND PERMITTING

The 1995 Environmental Protection Mining Code of Argentina requires that each Provincial government monitor and enforce the laws pertaining to sustainable development and protection of the environment. A party that wants to modify or begin any mining-related activity as defined by the Mining Code (prospecting, exploration, exploitation, development, preparation, extraction, storage of mineral substances, property abandonment, or mine closure activity) must submit an application to the Provincial Environmental Management Unit (PEMU) and obtain an approved *Informe de Impacto Ambiental* or Environmental Impact Assessment (EIA) prior to the start of work (Bastida, 2002). Each EIA must describe the nature of the proposed work, its potential risk to the environment, and the measures that will be taken to mitigate that risk. The PEMU has a 60-day period to review and either approve or reject the EIA; however, if PEMU has not responded within 60 days, that does not constitute an approval (Bastida, 2002). If the PEMU deems that the EIA does not have sufficient content or scope, the party submitting the EIA is granted 30 days to resubmit their document.

If accepted by the PEMU, the EIA is used as the basis to create a *Declaración de Impacto Ambiental* or Declaration of Environmental Impact (DEI) to which the party must swear to uphold during the mining-related activity in question. The DEI must be updated at least once every two years. Sanctions and penalties for DEI non-compliance are outlined in the Environmental Protection Mining Code, and may include warnings; fines; a suspension of the Environmental Quality Certification; restoration of the environment; temporary or permanent closure of activities; and/or, removal of authorization to conduct mining-related activities.

CASA filed updated EIA documents and received approval to proceed with the 2010, 2011, and 2012 drilling programs.

There are no known environmental liabilities currently existing on the Taca Taca property. In the unlikely case of abandonment of the mineral rights, closure activities may require restorative action to the original surface: filling trenches and removing the drill platforms.

5 ACCESSIBILITY, CLIMATE, INFRASTRUCTURE AND PHYSIOGRAPHY

5.1 ACCESSIBILITY

The Taca Taca Project is located in northwestern Argentina, approximately 230 km from the city of Salta. Access is provided by a network of paved and gravel roads through the towns of San Antonio de los Cobres, Cauchari, Salar de Pocitos, and Tolar Grande. The road continues beyond Taca Taca to the Socompa Pass on the Chilean border and, ultimately, into Antofagasta, Chile. The road conditions are generally good and the driving time from Salta to Taca Taca is typically 6 to 8 hours.

5.2 CLIMATE

The climate is arid. Winters are dry and cold (-10°C to 15°C), with scarce and minimal snowfalls. Precipitation is more common in the summer, with rare and modest rains. Temperatures in the summer range from 0°C to 25°C. Although westerly winds are generally strong, particularly during the winter months, exploration activities can be carried out year round and are not significantly hindered by local climatic conditions.

5.3 LOCAL RESOURCES AND INFRASTRUCTURE

The village of Tolar Grande (population 100) is located 32 km east of the Project. Tolar Grande can provide a source of manual labour, housing and cooking facilities. The city of Salta (population 535,000) is the nearest major centre in Argentina and can provide basic goods and services for the early stages of exploration and mining. Salta's airport receives daily flights from Buenos Aires and numerous other destinations in Argentina. The city of Antofagasta, Chile which is approximately 200 km west of the property has a deep-water port that is used by many mines in northern Chile.

Water resources may be available at shallow depths beneath the surface of the Salar de Arizaro. Previous exploration activities (trenching and drilling) have encountered the water table within 1-5 m of surface. Local and regional water studies (including drilling) form part of the ongoing exploration effort.

There are no nearby high tension lines or connections to the national power grid, and no power resources are available at the site. Current electric power requirements are being provided by diesel generators. A satellite phone system has been established in the area.

5.4 PHYSIOGRAPHY AND VEGETATION

The Project is located in the Puna (Altiplano) region of western Salta province. It is located on the east side of the Sierra de Taca Taca and the western edge of the Salar de Arizaro. The topographic relief is low to moderate and has two prominent 3,700 m hills: Cerro de Cobre and Cerro Agua del Desierto. The Salar de Arizaro is at an elevation of 3,470 m. The property has many flat areas to accommodate a variety of site layouts.

Vegetation is sparse to nonexistent in the property area.

6 HISTORY

Previous exploration on the Taca Taca property is summarized in Table 6.1 and discussed in more detail in *Amended Taca Taca Technical Report NI 43-101* (Sim, 2010).

TABLE 6.1: EXPLORATION AND OWNERSHIP HISTORY OF THE TACA TACA PROJECT

Year	Company	Description
Late 1960s	Fabricaciones Militares	Discovery of porphyry copper mineralization at Taca Taca.
1975	Falconbridge	Drilled three holes into leach cap and abandoned property.
1990-1995	GAMSA (Gencor)	Taca Taca S.A. (TACSA) acquired tenements over Taca Taca prospect, entered into an exploration agreement with Recursos Americanos Argentinos (RAA) and explored the property with GAMSA, a subsidiary of Gencor. Drilled 18 RC holes. Tested porphyry copper mineralization and an area of copper-gold veins north of the porphyry zone. GAMSA returned the property to RAA, who in turn returned the property to TACSA in 1995.
1995	Corriente	Corriente Resources Inc. (Corriente) signed an exploration agreement with TACSA.
1996-1997	Corriente/BHP	Corriente formed a joint venture with BHP Minerals (BHP) in 1996. Mapping, geophysics (36.8 km of TEM surveying), geochemistry, and drilling. Discovered supergene mineralization at base of leach cap. Target did not meet BHP's corporate criteria and the property was returned to Corriente in 1997.
1998-1999	CASA	Corriente acquired all shares of TACSA which merged into Corriente Argentina S.A. (CASA). Mapping, trenching (130 backhoe trenches), geochemistry, and drilling. Tested for shallow supergene and exotic copper mineralization.
1999	Rio Tinto	Rio Tinto options property from CASA. Mapping, geophysics [ground magnetics (136 km), radiometrics (K/Th)], and drilling, Tested for remnant oxide copper, supergene and exotic copper. Targets did not meet Rio Tinto size criteria, option with CASA terminated in 1999.
2003	Lumina Copper (1)	Acquires property after acquiring 100% interest in CASA, sampling of surface oxide copper zones.
2005	Global Copper	Acquires property after corporate reorganization of Lumina Copper.
2007	Rio Tinto	Rio Tinto options property from Global Copper. Mapping, radiometric dating, spectral analysis, and drilling. Tested for deep hypogene copper-molybdenum core. Results of drilling unfavourable and property returned to Global Copper.
2008	Lumina Copper (2)	Acquires property when Global Copper transferred its assets (excluding the Relincho Project) to Lumina Copper prior to being acquired by Teck Resources Limited.
2012	Lumina Copper/CASA	On 19 August 2012, Lumina Copper became the beneficial owner of all issued and outstanding shares of CASA.

(1) Lumina Copper Corp. formed in 2003, reorganized in 2005, and changed name to Regalito Copper Corp.

(2) Lumina Copper Corp. formed in August 2008.

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7 GEOLOGICAL SETTING AND MINERALIZATION

7.1 REGIONAL GEOLOGY

The Taca Taca porphyry copper-gold-molybdenum deposit is hosted in the southern half of a 50 km long Ordovician batholith which forms the Sierra de Taca Taca mountain range (Figure 7-1). The batholith consists of coarse-grained granite which is cut by several aplite dykes. This Early Paleozoic intrusion is intruded by Late Permian granites and aplites and overlain by Late Permian sediments and volcaniclastics. Narrow, north-south striking, steeply dipping rhyolitic dykes of Permo-Triassic age outcrop throughout the region. Oligocene rhyodacitic intrusions of the Santa Inés Formation are responsible for the porphyry copper mineralization and alteration at Taca Taca.

Late Tertiary red-bed sedimentary rocks are widely distributed in the region, but are most abundant east of Salar de Arizaro. These rocks possibly constitute the basal section of the sedimentary sequence that fills the salar basin. Lavas from recent (Pliocene to Pleistocene) volcanoes are exposed to the west and north of Taca Taca. Large evaporite deposits of alternating salts and sand were deposited in regional intermontane basins to form the present-day salars (Almandoz, 2008).

The Sierra de Taca Taca is interpreted to be an uplifted block of Paleozoic intrusive rocks. Oligocene volcanics that are exposed to the west of the property dip to the west. This suggests that the Sierra de Taca Taca was uplifted with an eastern convergence along a major, high angle reverse fault located near the western border of the Salar de Arizaro. Regional evidence suggests uplift occurred during the Oligocene (Almandoz, 2008).

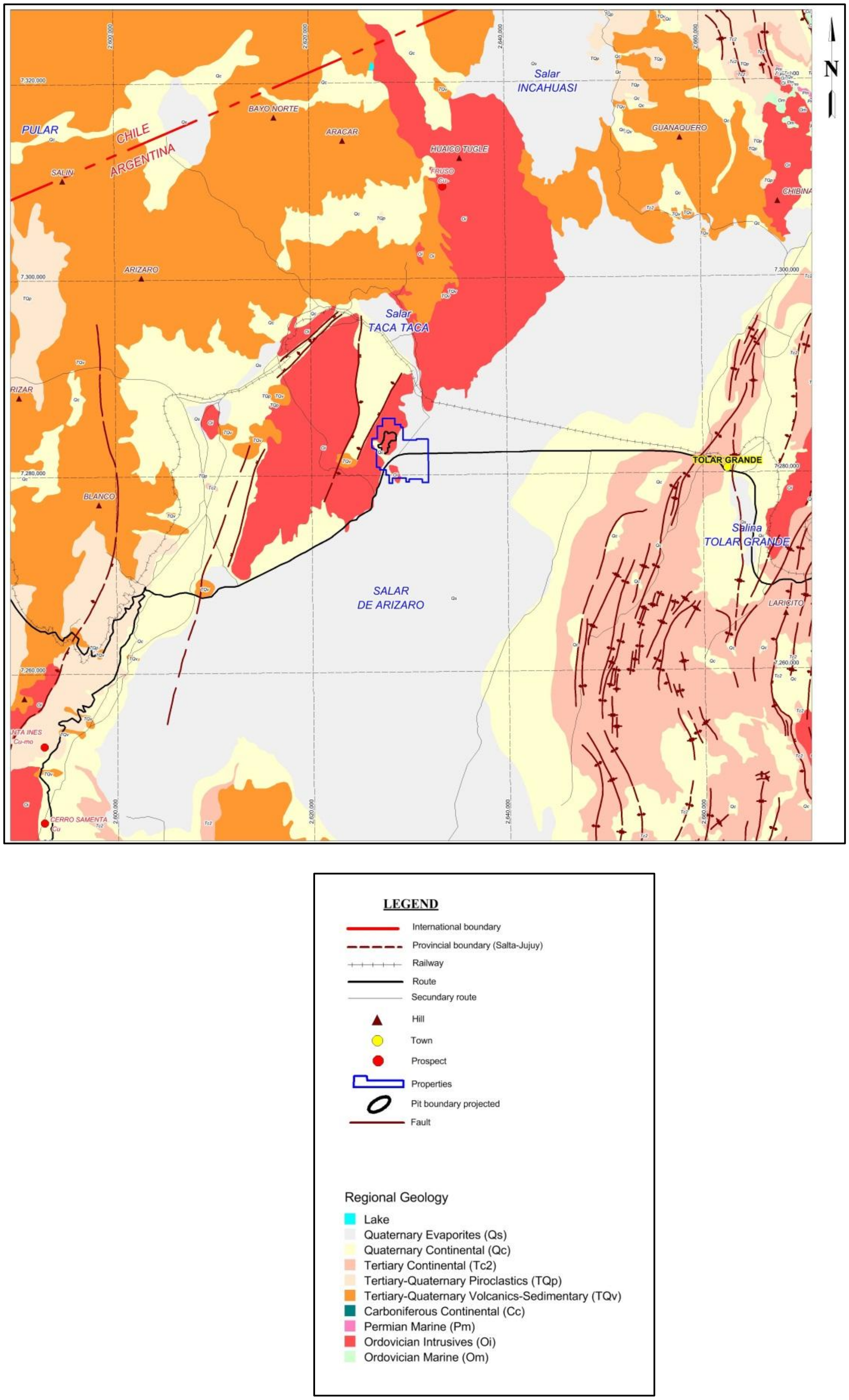


FIGURE 7-1: REGIONAL GEOLOGY (ALMANDOZ, 2008)

7.2 LOCAL AND PROPERTY GEOLOGY

7.2.1 Lithology

The surface geology of the Taca Taca property is presented in Figure 7-2.

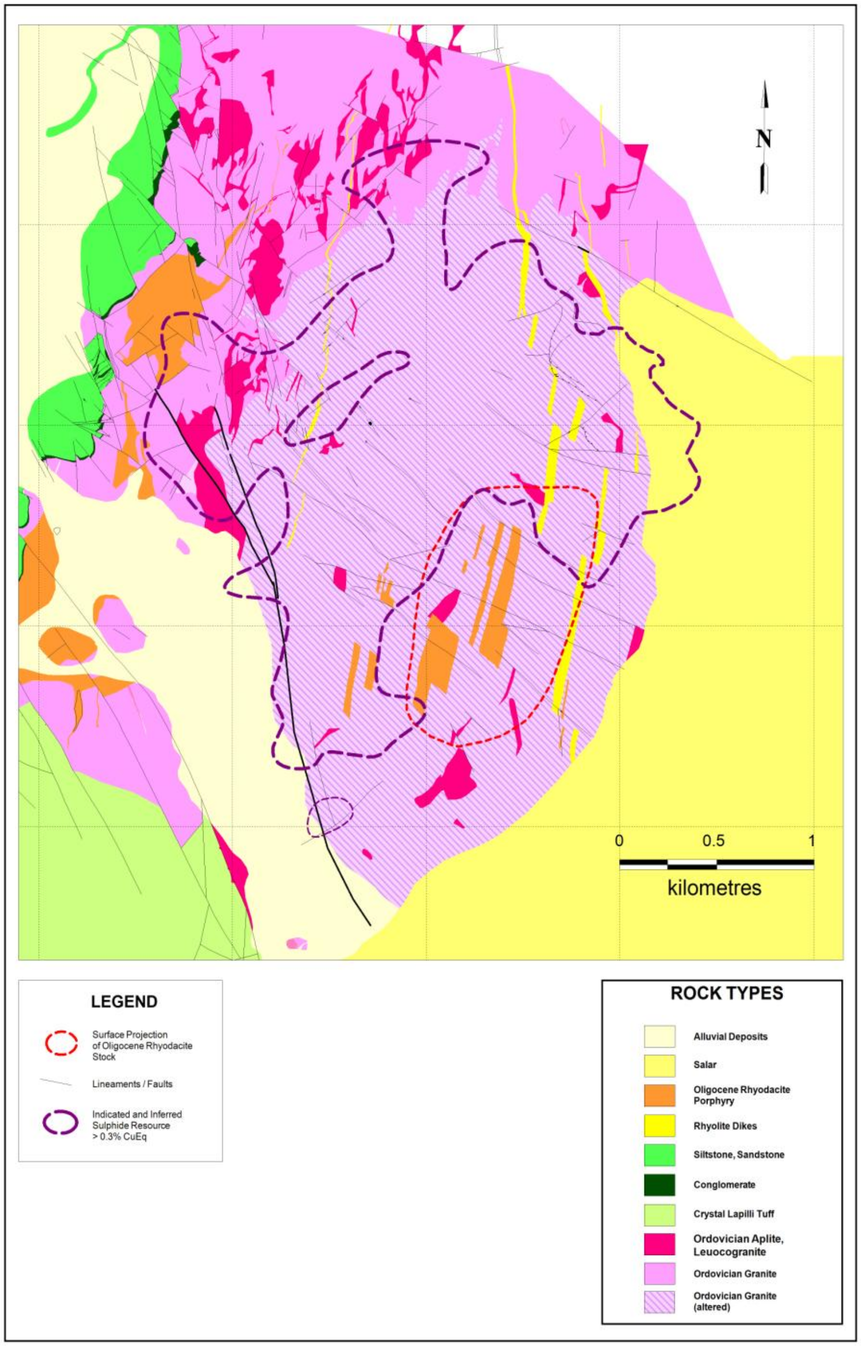


FIGURE 7-2: SURFACE GEOLOGY OF THE TACA TACA PROJECT (ALMANDOZ, 2008)

The Taca Taca deposit is hosted by pink, coarse grained, porphyritic granite (Chavez, 2008) or granodiorite (Cornejo, 2008) of Ordovician age (441.5 +/- 3.4 Ma U-Pb date from zircons). It exhibits an equigranular texture and is composed of phenocrysts of plagioclase, quartz (2-4 mm “eyes”), K feldspar, and rare rutile after amphibole and biotite. This intrusion is cut by several aplitic and aplo-granitic dykes that formed at the same time as the Ordovician granites. Minor foliated dolerite dykes are interpreted as the final stage in the formation of the Ordovician batholith (Sillitoe, 2008).

Narrow, north-south striking rhyolitic dykes occur mainly in the eastern part of the Project and minor thin acidic dykes occur in the west part of the Project. These are related to the Choiyoi volcanic event of Permo-Triassic age (262.4 +/- 2.3 Ma U-Pb date from zircons).

These older lithologies are cut by a number of northeast-southwest striking, steeply dipping porphyritic rhyodacitic dykes which coalesce at shallow depths and are interpreted as the source pluton for the porphyry mineralization. These dykes have an Oligocene age (29.30+/-0.57 Ma-U/Pb date from zircons) which is contemporaneous with the porphyry copper mineralization. This lithology is characterized by large plagioclase, K-feldspar, and quartz phenocrysts.

Two different Oligocene intrusive events were recognized:

1. Early-stage rhyodacite that is characterized by crowded phenocrysts (up to 1 cm) of feldspar and quartz hosted in a biotite-rich groundmass. This unit has a strongly developed stockwork of early white to grey quartz veins.

2. Late-stage intermineral rhyodacite is characterized by fewer phenocrysts of feldspar and quartz, an aplitic groundmass and quartz veinlet xenoliths. This unit has a weakly developed quartz stockwork.

Both rhyodacitic phases are strongly altered, but have low grade copper mineralization.

7.2.2 Alteration

Hypogene Alteration

Hydrothermal alteration associated with the Taca Taca copper-gold-molybdenum porphyry is typical of the Andean porphyry systems. Alteration types include potassic, propylitic, and phyllic, beginning with the earliest phase and progressing to assemblages that overlap or occur later in the development of the hydrothermal system, respectively. Descriptions of the following alterations are taken from Almandoz (2008).

Potassic: This is characterized by abundant, flaky, secondary biotite replacement of mafic minerals and rare secondary K feldspar that occurs as selvages of early veins. Potassic alteration occurs as remnant rafts in the central part of the mineralized zone due to a strong phyllic (sericite-quartz) alteration overprint.

Propylitic: It is characterized by illite-chlorite alteration of feldspars and mafic minerals with minor epidote alteration of plagioclase. Pyrite is common and varies 3-5%, although locally can be up to 10%. Propylitic alteration occurs on the peripheral edges of the hydrothermal system.

Phyllic: Phyllic (sericite-quartz) alteration is the most widely distributed and pervasive alteration phase associated with the Taca Taca porphyry copper-gold-molybdenum mineralization. It is exposed over an area measuring 3.5 km by 2 km. Two stages of phyllic alteration are present:

- An early phase is characterized by the presence of pale green sericite and quartz. The pale green sericite is related to an intermediate sulphidation mineral assemblage, which is characterized by chalcopyrite, minor pink bornite, and virtually no pyrite. The highest hypogene copper grades are directly associated with this alteration type.

- A late phase of phyllic alteration overprints potassic, propylitic, and green sericite phyllic alteration phases. It is characterized by coarse white sericite which completely replaces feldspar and mafic minerals. Pyrite commonly occurs as disseminations and in veinlets. The white sericite indicates a change in the sulphidation state of the mineralizing fluid from intermediate to high sulphidation. This change of sulphidation may be explained by cooler temperatures which produce more acidic, hydrothermal fluids.

Supergene Argillic Alteration

A well-developed, thick (150-300 m) leach cap overlies the porphyry copper-gold-molybdenum mineralization. It is characterized by abundant secondary kaolinite and hematite-jarosite fractures that replaced pre-existing sulphide veins. Copper oxides are rare although brochantite is common at the base of the leach cap and within a restricted area about the summit of Cerro de Cobre. The base of the leach cap is sub-horizontal and well-defined. A number of sub-vertical structures with supergene alteration were seen at depths up to 800 m below the surface. Secondary kaolinite, silica (chalcedony), alunite, and chalcocite are present in these structures.

7.2.3 Mineralization

There are three main styles of mineralization associated with the Taca Taca copper-gold-molybdenum porphyry: supergene/hypogene porphyry copper mineralization, remnant oxide copper-gold mineralization in the leach cap and hematite-quartz copper-gold veins. Each style of mineralization is discussed in more detail within this section.

Re-Os dating of the molybdenite has shown that the porphyry mineralization is Oligocene in age. The paragenesis of the mineralization and rock units is summarized in Figure 7-3.

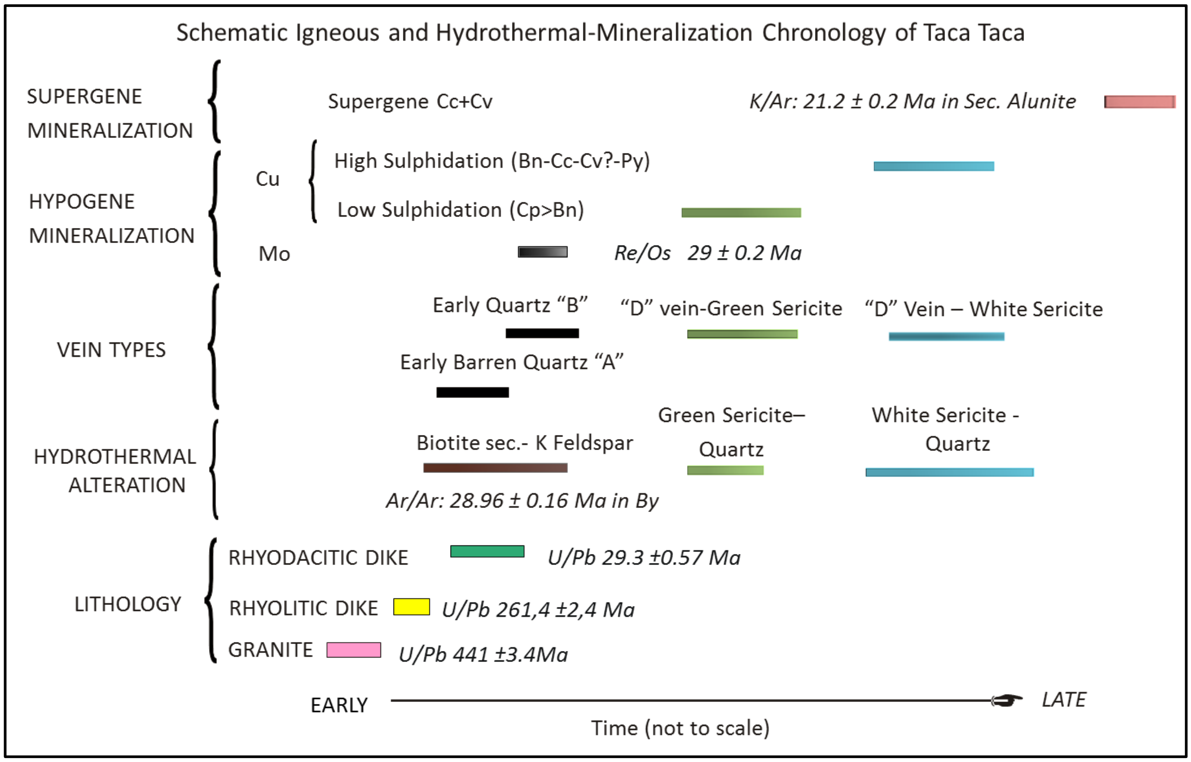


FIGURE 7-3: PARAGENESIS OF MINERALIZATION AT TACA TACA (ALMANDOZ, 2008)

Supergene/Hypogene Porphyry Copper Mineralization

Hypogene sulphide mineralization consists of chalcopyrite and pyrite with lesser bornite, chalcocite, digenite, and molybdenite occurring as disseminations and in quartz vein stockworks. Most of the copper mineralization is hosted by Ordovician granite and associated aplite and aplogranite dykes. Minor dolerite dikes have high copper contents due to the abundance of mafic minerals containing ferrous iron which facilitates the precipitation of copper from the hydrothermal solutions. Molybdenite is more common in the aplite dykes than the granite and occurs primarily in early quartz veins. In the central part of the system, total sulphide content is relatively low ranging from 3% to 5%. A pyritic shell with up to 10% sulphide content is peripheral to the copper-molybdenum hypogene core (Almandoz, 2008). Based on the present drilling, the hypogene porphyry mineralization has a north-easterly trend with dimensions of 3.0 km north-south by 2.7 km east-west (Figure 7-4). The sulphide mineralization remains open at depth in some areas and along the southern boundary of the deposit's northeastern limb.

The relationship of the hypogene sulphide zone to the overlying supergene enriched zone and leach cap is shown in Figure 7-5.

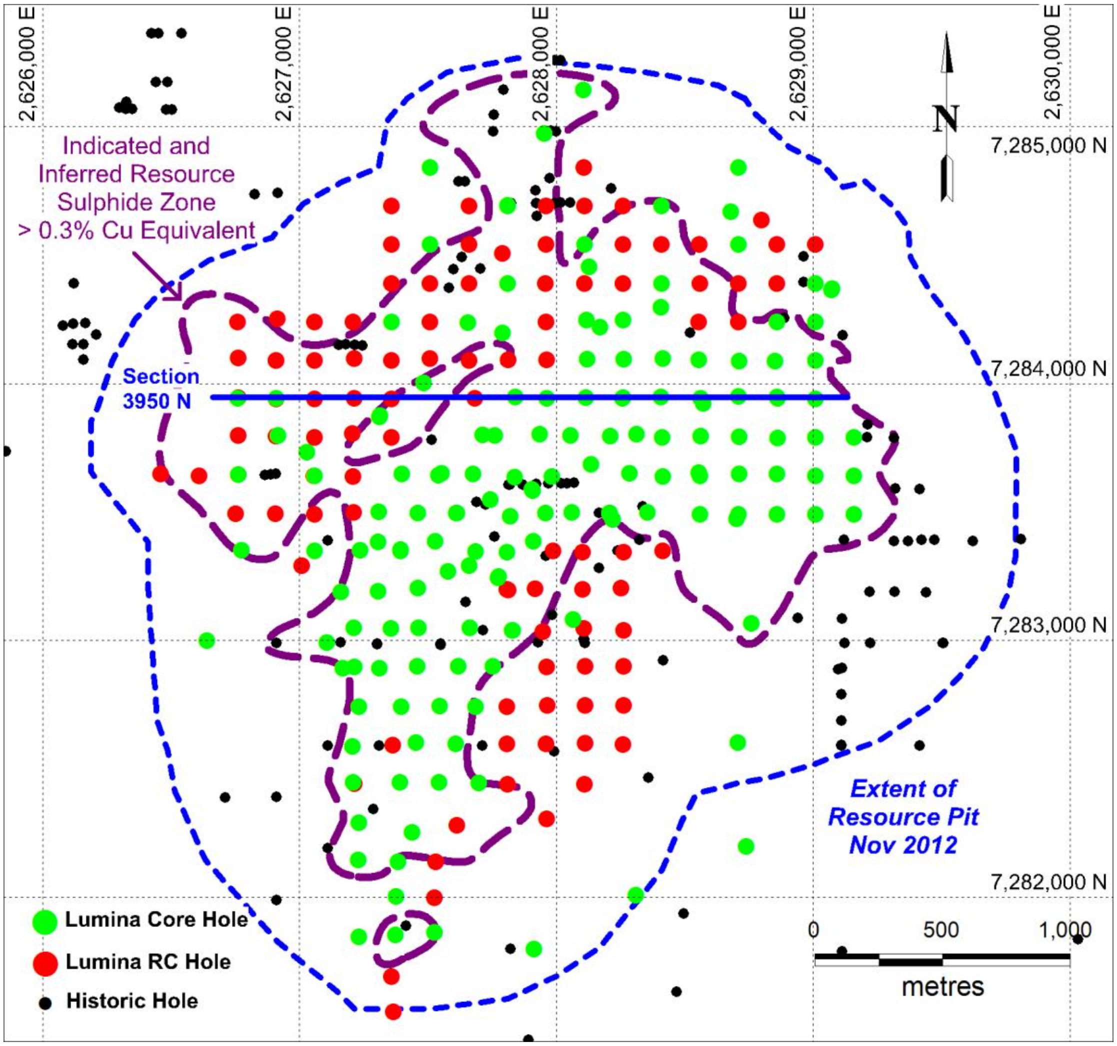


FIGURE 7-4: EXTENT OF HYPOGENE SULPHIDE MINERALIZATION (WELLS, 2012)

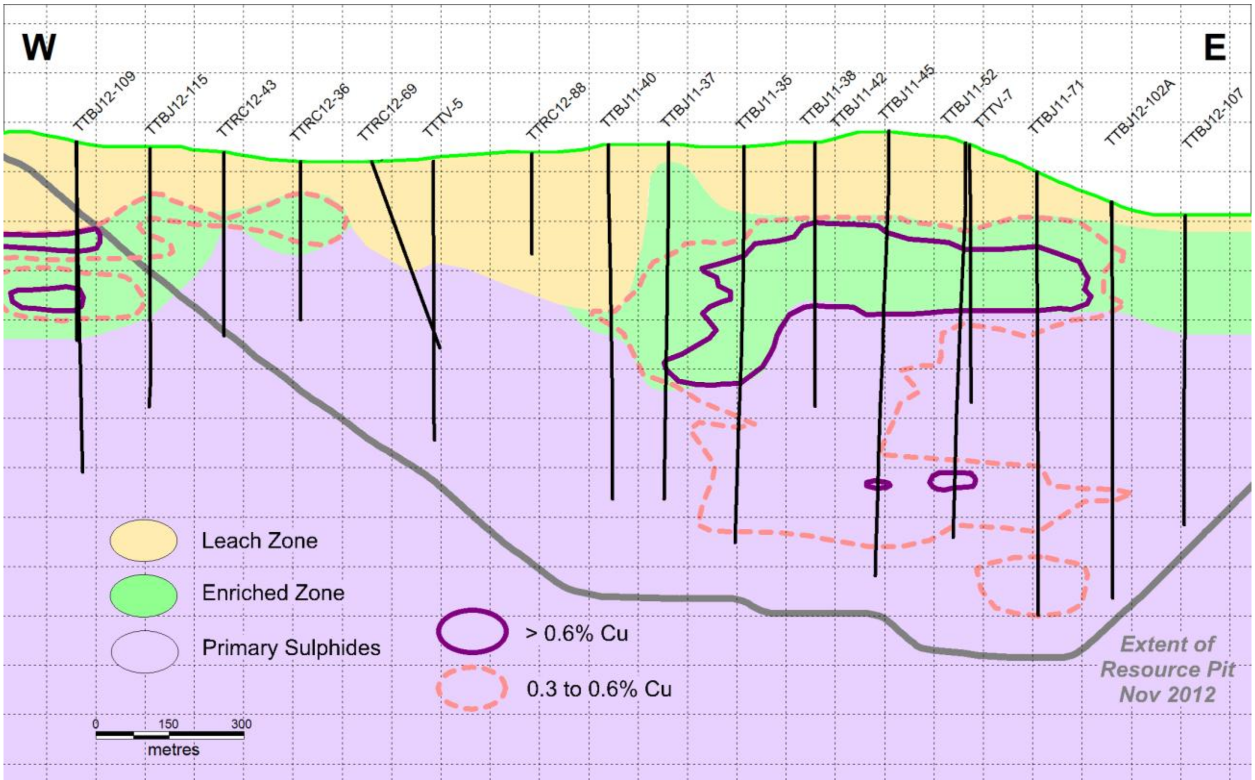


FIGURE 7-5: VERTICAL EAST-WEST ORIENTED CROSS SECTION 728 3950 N (WELLS, 2012)

In the potassic alteration phase, minor chalcopyrite with subordinate bornite is associated with secondary biotite. The strong “A” type quartz vein stockwork is essentially barren of sulphides. Milky quartz “B” veins commonly contain molybdenite with subordinate chalcopyrite.

The two phases of phyllic (quartz-sericite) alteration are associated with the highest hypogene copper and gold grades. The sulphides are commonly disseminated in sericitic vein selvedges, microfractures, and intergrown with the quartz veins. The early green sericite is associated with chalcopyrite-bornite and has the highest copper grades and above-average gold grades. The green sericite is a high temperature mineral associated with low sulphidation mineral assemblages. The late quartz and white sericite phase is associated with pyrite-bornite and pyrite-chalcocite-covellite sulphide assemblages. Copper grades decrease slightly and the gold grades are approximately half that seen in the early green phyllic alteration phase. The white sericite is formed at lower temperatures and is associated with the high sulphidation mineral assemblages.

In the central part of the porphyry system, the leach cap is strongly developed, but the supergene enrichment blanket is thin (< 5 m) or virtually absent. Two thicker zones (> 100 m) of supergene copper enrichment are present (Figure 7-6). One zone is associated with the West Fault and the second is located in the northeastern part of the deposit. The northeastern zone is up to 300 m thick. Copper mineralization in the Supergene Zones is dominantly fine-grained, black chalcocite with minor covellite. In addition to the stratiform supergene enrichment zones, several deep (> 500 m), steeply dipping supergene enriched structures were identified.

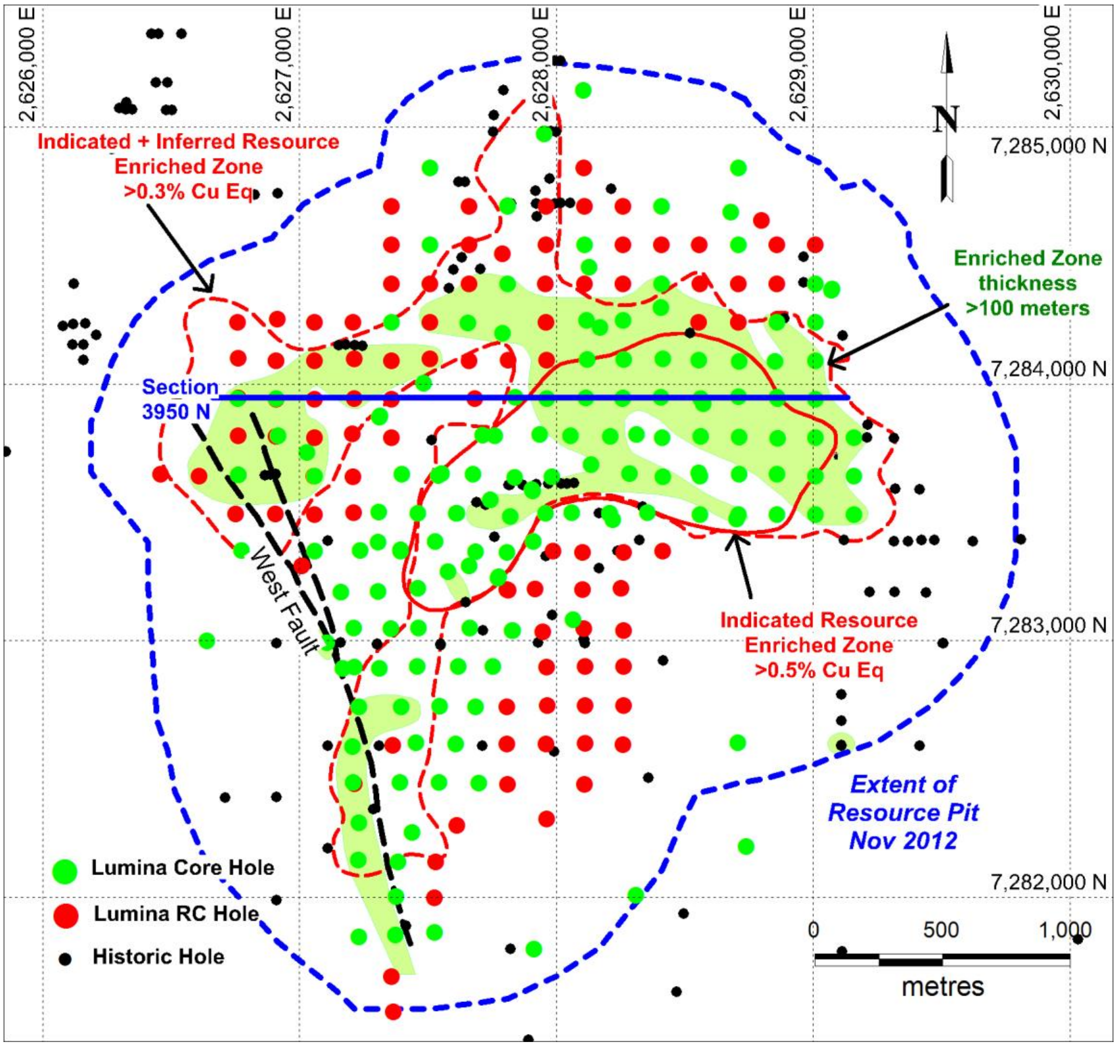


FIGURE 7-6: EXTENT OF SUPERGENE ENRICHMENT ZONE (WELLS, 2012)

Remnant Oxide Copper-Gold Mineralization in the Leach Cap

The leached portion of the porphyry deposit, which ranges from 150-300 m thick, is almost completely depleted of copper mineralization and is dominated by limonite assemblages consisting of hematite, jarosite, and goethite. Remnant zones of copper oxide mineralization consisting of malachite, chrysocolla, atacamite, and brochantite are present, but are limited to small sub-horizontal lenses up to several tens of metres in size. Concentrations of molybdenite and gold, being relatively immobile in supergene weathering environments, are approximately the same as that present in the hypogene zone. Reverse circulation (RC) drilling has helped define the extent of the gold mineralization in the Leach Zone. In general, the highest gold concentrations occur in the thickest portions of the leach cap and above the best hypogene copper-molybdenum mineralization.

The extent of gold mineralization with grades > 0.2 g/t in the leach cap is shown in Figure 7-7.

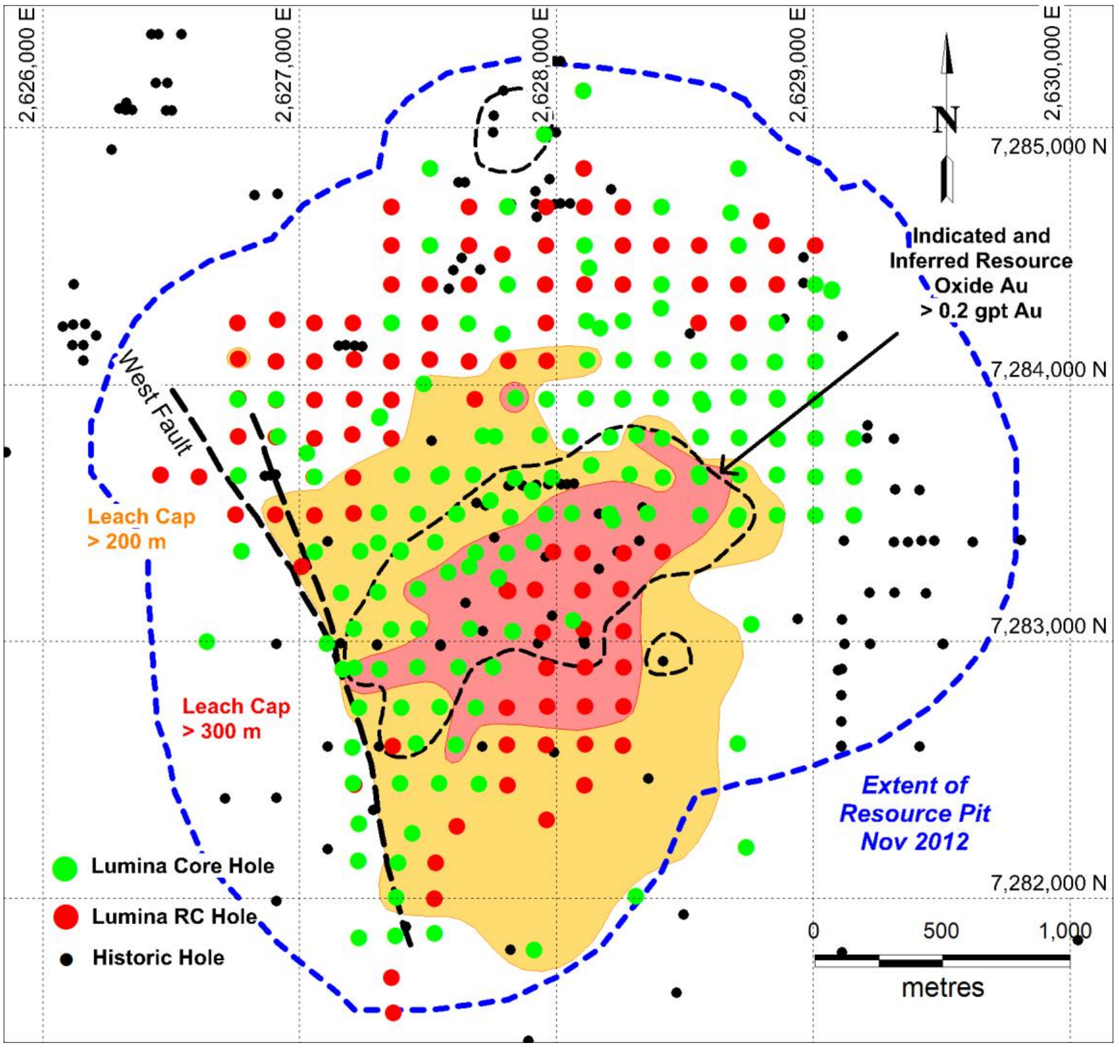


FIGURE 7-7: EXTENT OF GOLD IN LEACH CAP (WELLS, 2012)

Hematite-Quartz Copper-Gold Vein Mineralization

Numerous parallel, north-striking and steeply dipping quartz-pyrite veins that were oxidized to quartz-jarosite and quartz-hematite veins occur in the Planicie Norte and Oeste areas (Figure 7-8). The veins are 0.5 m to 2 m thick and consist of quartz with massive to semi-massive pyrite or hematite-jarosite with minor alunite. Chalcocite coatings on the sulphides are common. In the surface exposures, chrysocolla and brochantite occur as weathering products of the chalcocite coatings. Argillic alteration envelopes, comprised of sericite and kaolinite, commonly extend several metres from the veins. Copper found in this zone is secondary in nature, apparently having migrated northward from the porphyry and re-precipitated on sulphide grains associated with the vein's alteration selvages as well as within distal pyrite-bearing alteration phases (largely propylitic). Corriente explored these veins by trenching and shallow drilling. Significant supergene copper mineralization was found in this area by deeper drilling; it remains partially open. Note that there are no resources derived from these gold-copper, quartz-hematite veins included in the mineral resources listed in Section 14 (Mineral Resource Estimate).

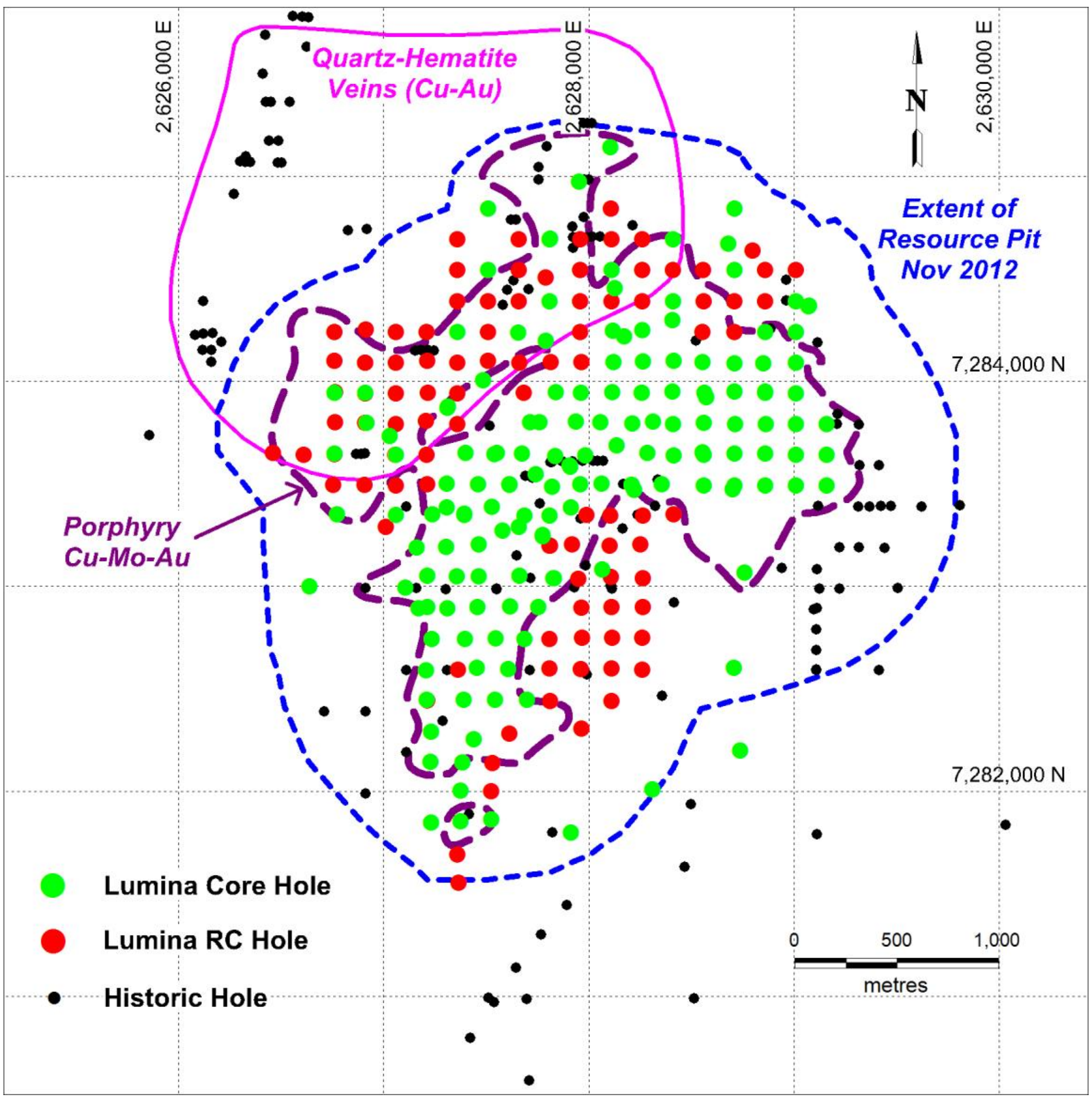


FIGURE 7-8: HEMATITE COPPER-GOLD VEINS (WELLS, 2012)

7.2.4 **Structure**

The structural fabric of the Ordovician granitic host rock is characterized by the presence of discrete but widespread north-northeast and northwest trending, steeply dipping proto-mylonite to mylonite zones. The emplacement of the Oligocene rhyodacitic dykes, quartz veining related to the porphyry system, fractures, and small scale faults were controlled by these pre-existing zones of structural weakness.

A vertical, north-northwest striking, normal fault (West Fault) is located in the western part of the Project. The rocks to the west of the fault have a thinner leach zone and are uplifted relative to those in the east. This normal fault was probably active during Miocene times and may have controlled development of a zone of supergene copper enrichment associated with the structure.

8 DEPOSIT TYPES

Mineralization at Taca Taca is a typical Andean porphyry copper-gold-molybdenum deposit (Lowell and Guilbert, 1970 and Pantaleyev, 1995). Common features of a porphyry deposit include the following:

- Large zones (> 10 km^2) of hydrothermally altered rocks that commonly grade from a central potassic core to peripheral phyllic, argillic, and propylitic altered zones.

- Generally low grade mineralization consisting of disseminated, fracture, veinlet, and quartz stockwork-controlled sulphide mineralization. Deposit boundaries are determined by economic factors that outline the mineralized zones.

- Mineralization commonly zoned with a chalcopyrite-bornite-molybdenite core and peripheral chalcopyrite-pyrite and pyrite. Enrichment of primary copper mineralization by late-stage hypogene high sulphidation events can sometimes occur.

- Important geological controls on porphyry mineralization that include igneous contacts, cupolas, and the uppermost, bifurcating parts of stocks and dyke swarms. Intrusive and hydrothermal breccias and zones of intensely developed fracturing, due to coincident or intersecting multiple mineralized fracture sets that commonly coincide with the highest metal concentrations.

- Modification by surface oxidation in weathered environments (for example, Escondida). Low pH meteoric waters generated by the oxidation of iron sulphides, leach copper from hypogene copper sulphides, and oxidized copper minerals such as malachite, chrysocolla, and brochantite and re-deposit copper as secondary chalcocite and covellite immediately below the water table in flat tabular zones of supergene enrichment. The process results in a copper-poor leach cap lying above a relatively thin but high-grade zone of supergene enrichment that caps a thicker zone of moderate grade primary hypogene mineralization.

- Presence of precious metal, rich epithermal, and other quartz vein systems, skarns, and exotic secondary copper deposits formed by the lateral migration of metal in low pH fluids away from the main body of porphyry mineralization.

9 EXPLORATION

Copper-gold-molybdenum porphyry style mineralization was discovered at Taca Taca in the late 1960s. Since that time, six companies have explored the property. This work is summarized in Table 6.1; a more detailed review of the historic work is provided in *Amended Taca Taca Technical Report NI 43-101* (Sim, 2010). Significant results are listed in the following Sections 9.1 and 9.2.

9.1 HISTORIC EXPLORATION PROGRAMS

9.1.1 **Falconbridge Argentina S.A. (1975)**

In 1975, Falconbridge drilled three short holes into the leach cap, but it did not intersect any significant mineralization.

9.1.2 **Gatro Argentina Minera S.A. (1990-1995)**

In 1994, GAMSA drilled 18 short reverse circulation (RC) holes that targeted epithermal gold mineralization in the Planicie Norte area and porphyry style mineralization associated with the leach cap. No significant mineralization was encountered and they dropped the property in 1995.

9.1.3 **BHP Minerals (1996-1997)**

In 1995, Corriente acquired the property and formed a joint venture with BHP. BHP carried out mapping, geophysical surveys (TEM and IP), and drilling. They outlined a large zone of supergene chalcocite and covellite enrichment on the northwest side of the core of the porphyry mineralization. The enrichment zone lies beneath 200 m to 300 m of leach cap and ranges from 20 m to almost 200 m thick. An estimate of the resource in the supergene blanket was made, but the tonnage was considered to be too small to meet corporate objectives. The property was returned to Corriente.

9.1.4 **Corriente Resources (1998-1999)**

In 1998 and 1999, Corriente's exploration activities focused on the gold-copper, quartz-hematite (pyrite at depth) veins located north of the porphyry leach cap. Exploration work included ground magnetic and radiometric surveys, excavator trenching, geochemical sampling and drilling. Best results were obtained in the Planicie Norte area (for example, hole TK-53: 1.31% Cu and 3.32 g/t Au over 24 m core length). Similar but lower grade mineralization was encountered in the Planicie Oeste area (for example, TK-59: 0.88% Cu and 0.24 g/t Au over 26 m core length).

In 1999, Corriente explored for an exotic copper deposit associated with the Taca Taca porphyry system. They conducted salar sand geochemical and gravity surveys to identify drill targets beneath the Salar de Arizaro.

9.1.5 Rio Tinto (1999 and 2008)

In 1999, Rio Tinto explored for zones of unleached copper oxides and/or unleached “perched” supergene enrichment zones within the near surface portion of the porphyry system at Taca Taca. Evidence of this type of mineralization consisted of mineralized outcrops, trenches and road cuts near the top of Cerro de Cobre and Cerro Agua del Desierto. Based on the results of a small seven-hole drill program, Río Tinto concluded that the extent of remnant oxide/supergene mineralization within the leach cap was not large enough to meet their corporate target.

Two RC holes tested for exotic copper deposits beneath the Salar de Arizaro. One hole (ARI001) located a zone of copper mineralization in basal gravels immediately above the bedrock-basin fill interface. At a depth of 246 m, it intersected weak copper oxide (brochantite) mineralization (486 ppm Cu over 14 m) that was underlain by a zone of native copper (1.2% Cu over 6 m). The other hole (ARI-002) was abandoned before it reached the bedrock contact. Rio Tinto decided this mineralization was too deep to be economic and did not pursue the target.

In 2008, Rio Tinto optioned the Taca Taca Project from Global Copper to assess the potential for a deep (> 600 m), high grade, hypogene copper-molybdenum core to the porphyry system. Eight drill holes tested this target and three holes intersected economic supergene and hypogene mineralization. Based on the low tonnage potential and grades, high strip and interpreted low potential to expand the resource, Rio Tinto dropped its option on the property.

9.2 LUMINA COPPER (2010-2012)

In 2010, Quantec Geoscience, on behalf of Lumina Copper, completed a Titan 24 survey over the Taca Taca porphyry mineralized zone to look for deep areas of sulphide enrichment. The survey was done on four north-east-oriented lines (5 km long) spaced at 400 m intervals. Several deep IP and MT targets were defined and provided some early targets for Lumina Copper’s drilling campaign (Figure 9-1).

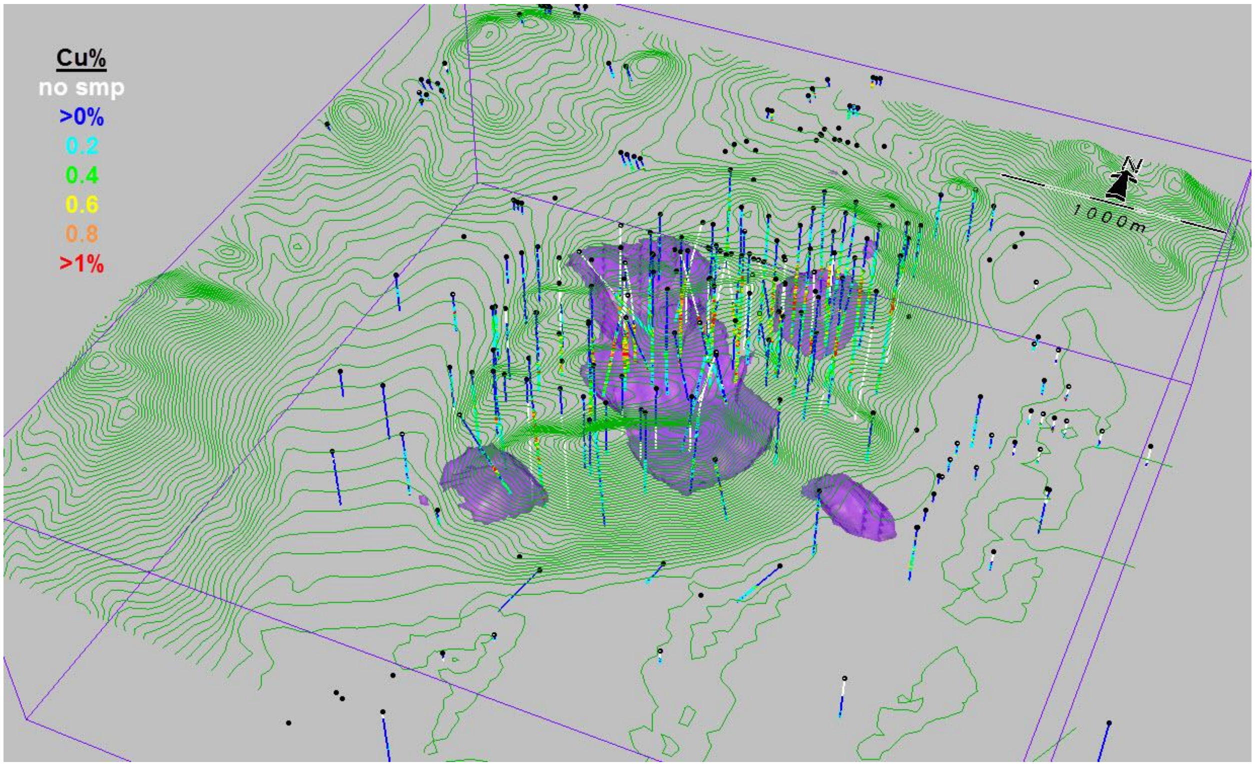


FIGURE 9-1: TITAN 24 IP AND MT ANOMALIES (SIM, 2011)

10 DRILLING

Six different companies have completed seven drilling campaigns at Taca Taca. These campaigns are summarized in Table 10.1. Figure 10-1 shows the location of the drill hole collars.

TABLE 10.1: DRILLING HISTORY

HOLE SERIES	TYPE	NUMBER OF HOLES	TOTAL METRES	COMPANY	YEAR
TT01-03	BQ Core	3	529	Falconbridge Argentina S.A.	1975
TL01-08	RC	18	1,603	Gatro Argentina Minera S.A.	1995
TK001-033	RC, NQ core	35	11,483	BHP Minerals	1997
TK034-047	NQ core	14	3,246	Corriente Resources	1998
TK048-126	RC	80	4,428	Corriente Resources	1999
CCR001-007	RC	7	2,732	Rio Tinto	1999
ARI001-002	RC	2	606	Rio Tinto	1999
TTBJ0001-0008	HQ core	8	4,877	Rio Tinto	2008
TTBJ10-01 - 12-136	HQ core	137	89,058	Lumina Copper	2010-2012
TTRC11-01 - 12-97	RC	97	32,055	Lumina Copper	2011-2012
TTEX-01 - 07	HQ core	4	1,696	Lumina Copper	2011
TTGT-01 - 04	HQ core	4	2,404	Lumina Copper	2011
T7 – 21, GW3	HQ core	15	2,206	Lumina Copper	2011-2012
TTTV1 - 11, TW6	HQ core	12	6,094	Lumina Copper	2012
AV-SP4D - 5S	HQ core	4	520	Lumina Copper	2012
TOTAL		**440**	**163,537**		

A total of 440 holes (163,537 m) have been drilled on the Taca Taca property. From 2010 to 2012, Lumina Copper drilled 273 holes (134,033 m). The mineral resource model is based on 310 drill holes (147,449 m) which tested the extents of the porphyry mineralization.

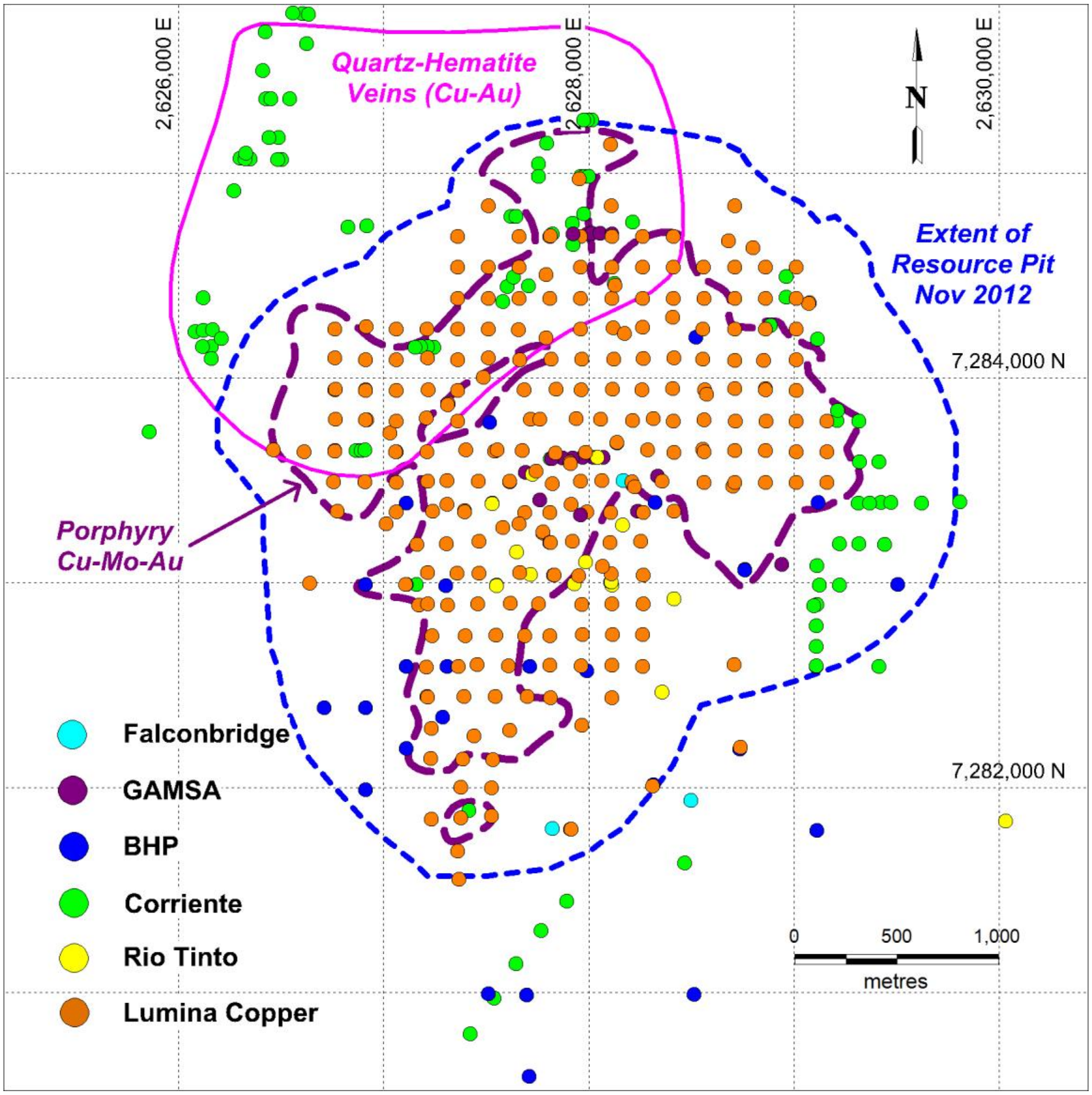


FIGURE 10-1: DRILL COLLAR PLAN MAP - TACA TACA PROJECT (WELLS, 2012)

10.1 HISTORIC DRILLING

10.1.1 Falconbridge Argentina S.A.

In 1975, Falconbridge drilled three short holes into the leach cap, but did not intersect any significant mineralization. Core from this phase of drilling was discarded. The collars of these holes have been found in the field and the locations have been confirmed through surveying.

10.1.2 Gatro Argentina Minera S.A.

In 1994, GAMSA drilled 18 short RC holes that targeted epithermal gold mineralization in the Planicie Norte area and porphyry-style mineralization associated with the leach cap. No significant mineralization was encountered and they dropped the property in 1995. Cuttings from the RC holes were discarded; however, the location of some of these holes was confirmed.

10.1.3 BHP Minerals

In 1997, BHP tested the potential for a zone of supergene enrichment beneath the leached cap of the Taca Taca porphyry system. Thirty-five combined RC and NQ diamond drill holes (TK 001-033) with a total length of 11,483 m were completed on a 400 m x 400 m grid pattern; this includes two holes, TK015A and 30A, which were abandoned and redrilled. Most of these holes were vertical and their lengths ranged between 91-520 m. Drill core from this program is stored at CASA's secure core storage facility in Salta. Cuttings from the RC section of the holes were discarded. Drill hole locations were confirmed.

10.1.4 Corriente Resources

In 1998, Corriente drilled 14 NQ diamond drill holes (TK034-047) to test for the presence of shallow supergene enrichment zones in the Planicie Norte area. Most of these holes were drilled to the east at dips of -60°, but a few holes were vertical. The holes ranged between 120-406 m deep. Drill core from this program no longer exists, but the drill hole locations were confirmed.

In 1999, Corriente drilled 80 RC holes (TK048-126) totalling 4,428 m in four different areas: Planicie Norte, Planicie Oeste, the Graben area, and beneath the Salar de Arizaro. The target in all four areas was exotic copper mineralization. The holes were drilled at dips ranging between vertical and -60°, and to depths ranging between 15 m and 117 m. Cuttings from these RC holes are no longer available. Drill hole locations were confirmed.

10.1.5 Rio Tinto

In 1999, Río Tinto completed nine RC drill holes in two different areas. Seven of the holes (CCR001-007), with lengths between 360 m and 408 m, and totalling 2,732 m, were targeted on remnant oxide mineralization within the leach cap in the central portion of the Taca Taca porphyry system. The other two holes (ARI001 and ARI002) were drilled to the east of Taca Taca to explore for exotic copper mineralization underlying the Salar de Arizaro. The RC cuttings are no longer available. Drill hole locations were confirmed.

In 2008, Rio Tinto completed eight HQ drill holes totalling 4,877 m which targeted deep hypogene mineralization. Major Perforaciones Argentina provided the drilling services using an AVD 600 machine. Drill core from this program is stored at CASA's secure core storage facility in Salta. Drill hole locations were confirmed.

10.2 LUMINA COPPER (2010-2012)

In 2010, Lumina Copper began a 99,500 m diamond drill program to test the extent of porphyry copper mineralization at Taca Taca and to assess the significance of the Titan 24 anomalies.

During the 2010 field season, Major Perforaciones of Mendoza (Major) was contracted to provide drilling services. They provided one skid-mounted ED50 diamond drill rig. The drilling began on 3 August 2010 and a total of 5 holes were completed in 2010.

The early drilling discovered extensive porphyry-style supergene and deep hypogene copper mineralization over an area of 2.5 km by 1.5 km. The exploration drilling program was redesigned and expanded to meet the following objectives:

- Delineate the shape and thickness of the supergene enrichment blankets.
- Assess the extent and potential for high-grade hypogene mineralization in the deeper parts of the porphyry system.
- Evaluate the gold potential of the leach cap.

Drilling continued until September 2012, with up to seven diamond drills operating on the property. Core drills were supplied by Major, Boart Longyear, and Alta Drilling. Two Schramm T685 WS-C RC rotary rigs from Major were used to evaluate the gold potential of the leach cap and provide pre-collars for the diamond drilling. Since 2010, Lumina Copper has completed 273 holes totaling 134,033 m.

REFLEX or Peewee survey tools are used to provide downhole orientation data for the diamond drill holes. All collar locations are initially located using a handheld GPS (Garmin 60CSx), but, after the hole is completed, the collar location is surveyed using a differential Trimble GPS, accurate to +/- 10 cm.

Drill core and RC rejects from this program are stored at CASA's secure core storage facilities in Salta.

11 SAMPLE PREPARATION, ANALYSES AND SECURITY

11.1 HISTORIC DRILLING

11.1.1 Falconbridge and GAMSA

No written record of the sample preparation or analytical methods was available for the Falconbridge (1975 core hole) or GAMSA (1994 RC hole) drilling programs. There is also no record of any quality assurance/quality control (QA/QC) protocols or results for these two drilling programs.

11.1.2 BHP Minerals

BHP cut the drill core in half using a diamond saw. One-half of the core was put into plastic sample bags and shipped for analysis, and the other half was retained as a permanent record. Most drill core was sampled using 2 m intervals. No written descriptions of any sampling methods for the RC drill campaigns were available for review. Sample cutting piles were observed at several collar locations during the site visit; this indicates the drill cuttings were probably split and sampled on-site before shipment to the assay lab. Samples were analyzed at Bondar Clegg in La Serena, American in Mendoza, and SGS in Salta and Santiago. The analytical methods and sample preparation protocols were not discussed in any of the BHP reports, but the results were presented in a spreadsheet format without original assay certificates. BHP's quality control protocols involved submitting one-quarter core duplicate sample for every 20 samples and submitting them to the original laboratory and submitting 300 coarse reject duplicates to Bondar Clegg as check assays. The results of the duplicate sampling or coarse reject duplicates were not available for review.

11.1.3 Corriente Resources

Corriente cut the drill core in half using a diamond saw; they submitted half of the core for analysis at ALS Chemex Labs (ALS Chemex) in Mendoza. Corriente's sample preparation protocols were not available for review. Copper analyses were done using atomic absorption spectroscopy and gold was analyzed by fire assay with an atomic absorption spectroscopy finish. Corriente did not collect quality control data, other than a routine submission of pulp duplicates to another lab for check analyses. The check lab data was not available for review.

11.1.4 Rio Tinto

1999

Samples from Río Tinto’s 1999 RC drilling program were prepared by Bondar Clegg’s laboratory in Mendoza using a “Large Pulp Preparation” procedure. The entire sample was crushed to -80 mesh and a 1 kg split of this material was pulverized. Bondar Clegg of Vancouver, Canada analyzed the samples for gold and 34 other elements using fire assay with an atomic absorption finish and total digestion ICP analysis, respectively.

Río Tinto carried out systematic QA/QC procedures. One field duplicate was inserted for approximately every 12 samples to check for splitting and lab errors. The samples were randomized and pulp duplicates, standards, and blanks were added. This QA/QC program adhered to accepted industry standards. Río Tinto’s QA/QC results were not analyzed in detail by Robert Sim, SIM Geological, but they were reviewed in graphical form. SIM Geological concluded that they appeared to support Río Tinto’s conclusion that “the analysis of the results obtained from the quality control indicates the lab’s performance was satisfactory” (Río Tinto, 1999).

2008

In 2008, Rio Tinto used the following procedures for the eight HQ drill holes:

Core Sampling

Core was placed in boxes by the drill crew and logged by the geology staff at the core shed. The sampling staff photographed the core and marked it with a line drawn down the centre. The core was cut along this line using a diamond rock saw. Samples were taken at 2 m intervals. Half the core was placed in a plastic bag for analysis, and the remaining half was placed back in the core box for reference. A lab-generated sample ticket was inserted in the plastic bag with the sample, and a second ticket was stapled into the throat of the bag. Nylon cable ties were used to seal the bags. The bags were taken from the sawing area to the core shed where the sample number was written on the bag. Each bag was weighed and up to five sample bags were sealed in a larger mesh sack. The sacks were sealed with a large, numbered cable tie and labelled “secured.” Samples were shipped only after all samples from one hole were complete.

Chain of Custody

The sample bags were checked onto the truck, and an inventory was sent with the shipment, and a copy kept on-site. Samples were transported from site in a covered pick-up truck, driven by a Rio Tinto staff member. Any tampering with individual bags or bag ties would have been immediately evident when they arrived at the lab: the lab was notified of the sample numbers, and, on arrival, the lab sent confirmation of the samples being received and their condition. No irregularities in any sample shipment were detected during the course of the program.

During the 2008 visit, SIM Geological concluded that all procedures were carefully observed and met or they exceeded industry standards for the collection, handling, and transport of drill core samples.

Analyses

The drill core samples were analyzed by: Alex Stewart (Assayers) Argentina S.A., Rodriguez Pena 1140, Luzuriaga, Maipu, M5516 BBX, Mendoza, Argentina. This lab is 9001:2000 certified.

The samples were analyzed for gold using a fire assay/atomic absorption finish on a 30 g charge. An additional 39 elements were analyzed by four acid digestion and an ICP finish; the elements included in the ICP package were: Ag, Al, As, Ba, Bi, Ca, Cd, Co, Cr, Cu, Fe, Ga, Hg, K, La, Li, Mg, Mn, Mo, Na, Nb, Ni, P, Pb, S, Sb, Sc, Se, Sn, Sr, Ta, Te, Ti, Tl, V, W, Y, Zn and Zr. The copper over-limit values were analyzed by atomic absorption (AAS).

A suite of 133 inter-laboratory check samples were also assayed at ALS Chemex in Lima, Peru; this lab is also ISO 9001:2000 certified.

QA/QC Procedures

During the 2008 Rio Tinto drill program, the sampling staff inserted standards, blanks, and duplicates as specified by Rio Tinto site geologists. A standard was systematically inserted for every 25 core samples. A few (seven or eight) field duplicate samples, which consist of the other half of the drill core, were also taken. Blank material was inserted at the rate of one in every 20 samples. The blank material consisted of quartzite from a quarry in San Luis Province, Argentina. It was included in the form of rock chips (BLQZ) and pulverized material (BLKL) to test sample preparation and analysis, respectively. In addition, the lab analyzes a split of the coarse and pulp reject at a rate of one per 25 samples.

A suite of 133 pulp duplicate samples from hole TTBJ0003, including 4 samples of the Altar 3 Gold Standard Reference Material, was sent to ALS Chemex in Lima and analyzed using a comparable four-acid digestion with atomic absorption finish for copper and molybdenum and 30 gram fire assay finish for gold.

Results of QA/QC work

A detailed review including charts and graphs of the QA/QC data from Rio Tinto’s eight drill holes were presented in *Amended Taca Taca Technical Report NI 43-101* (Sim, 2010).

The results are summarized as follows:

- Field duplicate samples were taken to check the geological variability of the sample size. Duplicate samples of coarse reject material were assayed to check the sample preparation protocol. If the protocol was adequate, 90% of the duplicate pairs of assays should fall within ± 30% of each other (pass). A comparison of field duplicate data and coarse reject duplicate data can be used to estimate geological variability. For copper and molybdenum, the sample preparation protocol appeared to be good. For molybdenum, the percentage of field duplicates falling within the ± 30% control limit was 86% which, given the small number of samples (seven), is not of concern and may indicate a higher geological variability than copper. Field duplicate results for gold, however, showed a poor reproducibility which improves markedly once the samples are crushed as indicated by the acceptable coarse reject duplicate results. This indicated that the high variability seen in field duplicate results may also be due to geological variability (also known as the nugget effect).

- For the pulp duplicates, over 90% of the pairs falling within ± 10% of each other is (control limit) considered adequate. Results obtained for the program indicated that the sample assay protocol was adequate for copper, but required review for gold and molybdenum.

- Rio Tinto used Standard Reference Material for copper and gold. Most samples plotted within 1 standard deviation of the accepted values. Consequently there were no significant issues with the copper or gold analyses. No reference material for molybdenum was specifically used, but the molybdenum results for the copper and gold standards indicated a consistency of results for both standards and no problems with analysis for this element was suspected.

- Blank results for copper, molybdenum, and gold were considered acceptable. Some contamination in the sample preparation stage was detected for copper and the five high values (> 100 ppm Cu) came from sample batches containing highly mineralized material (≤ 2.5% Cu). These spikes most likely resulted from sample to sample contamination at the jaw crusher stage. It was not thought to have affected many samples to a significant extent.

- Sample results for the inter-laboratory check samples were not available, but a visual inspection of graphs provided by Rio Tinto showed an excellent correlation for copper, a good correlation for molybdenum, and an acceptable correlation for gold. For copper, 97% of all checks returned a mean percentage difference of less than 10%. For molybdenum, 87% of all checks returned a mean percentage difference of less than 5%. For gold 72% of all checks returned a mean percentage difference that was less than 20% (Almandoz, 2008). Results from the four

Standard Reference Material samples submitted with this batch were not available, but Rio Tinto reported that results produced for gold were outside acceptable limits (Almandoz, 2008).

Conclusions

Results from Standard Reference Material indicated that the copper, gold, and molybdenum assay procedures were producing reliable assay data. Blank results indicated that there may be a minor contamination of blank samples by copper, which probably occurred when high grade copper samples contaminated a few samples that followed them through the preparation stage. This was not thought to be significant for resource estimation purposes. Blank material indicated that there was no detectable contamination of the sample preparation or assay procedure for molybdenum and gold.

Duplicate data indicated that the sample preparation stage worked well for copper, molybdenum, and gold. The high variation in field duplicate data for gold indicated a high geological variability (nugget effect). Molybdenum field duplicate variation was not quite as high as for gold.

Inter-lab duplicates showed excellent, good, and acceptable reproducibility for copper, molybdenum, and gold, respectively.

Robert Sim and Bruce Davis concluded that Rio Tinto's drill core sampling protocols at Taca Taca are similar to industry standard procedures. No recovery information was available for review, but the recovery seemed good for the examined diamond drill core and there is no evidence that diamond drill or reverse circulation recovery could materially impact the drill results.

None of the preceding conclusions are sufficiently important to make the Rio Tinto results unreliable for publication, particularly considering that gold and molybdenum make only minor contributions to the value of the contained metal at present day metal prices. The relative influence of Rio Tinto's drilling on the current mineral resource estimate is relatively minor due to the number and distribution of more recent drill holes completed by Lumina Copper.

11.2 LUMINA COPPER DRILLING (2010-2012)

Lumina Copper used the following procedures during their 2010-2012 diamond drill core and RC drill programs:

Core Sampling

The drill contractor places the HQ drill core into wooden boxes (1 m long by 3 rows) at the drill rig. Wooden tags marked with the downhole depth are placed in the box. Lids are placed on the box and it is transported by truck to the core shack. Upon receipt, Lumina

Copper field assistants check the depth and mark out the samples at 2 m intervals. Photos are taken of both dry and wet core. Two boxes are included in each photo. Lumina Copper geologists and technicians examine the core and prepare geological and geotechnical logs for each hole. The geotechnical log includes: RQD, core recovery, fracture and vein quantity, vein angles, and density measurements. Samples are taken at 10 m intervals for point load tests and density measurements. This information is entered directly into an Excel® spreadsheet for each hole.

The core is cut in half using a diamond saw. For each 2 m sample, one-half is put into a plastic bag and the other half is returned to the wooden box for reference. Bar coded sample tags are included in each sample bag and the sample number is written in permanent marker on the sample box. Sample bags are secured and put into a larger mesh sack with a tamper-proof nylon tie. Duplicate and standard samples are included, as required. When a hole is complete, the samples are sent by truck to either ALS Chemex or Alex Stewart in Mendoza, Argentina.

The remaining core is initially stored on pallets at the exploration camp and then moved to CASA's secure core storage facility in Salta.

RC Sampling

Lumina Copper geologists and assistants are present during the drilling of RC holes and they are responsible for taking the samples for assay. Samples are taken every 2 m. Cuttings are collected from the cyclone and placed directly into the Gilson adjustable sample splitter. The sample is split three times until there are two samples representing approximately 25% of the initial weight. Each sample weighs approximately 6-10 kg. One sample is sent to the lab for analysis and the other is stored for reference or future sampling. A small sample (100 g) is taken from the reject bag and placed on a chip strip where it is visually inspected and logged by a Lumina Copper geologist.

The Gilson adjustable sample splitter and all the tools used in the sampling process were cleaned with compressed air after every sample to reduce contamination.

Major water intersections encountered during drilling are noted by the geologist on site. Wet samples were split using a rotary wet splitter; one-half of the material was collected in a big bucket and left for a reasonable time to decant. After the water is removed, the sample is divided in two; one is sent to the assay lab and the other is put into storage.

Samples, duplicates, standards, and blanks from each hole are sorted at the exploration camp and transported directly to the ALS Chemex facility in Mendoza.

Chain of Custody

Lumina Copper uses the same sample procedures as Rio Tinto did in 2008. The sample bags are checked onto the truck, and an inventory of samples is sent with the shipment and a copy is kept on-site. Any tampering with individual bags or bag ties would be immediately obvious when the samples arrived at the lab. The lab is notified of the sample numbers that were sent and on arrival the lab sends confirmation of the samples received and their condition. No irregularities in any sample shipment were detected during the course of the program.

During Bruce Davis's site visit in 2012, he concluded that all procedures were being carefully observed and met or exceeded industry standards for the collection, handling, and transport of drill core samples.

Analyses

Samples from the Lumina Copper drill programs were sent to: ALS Geochemistry - Mendoza, Altos Hornos Zapla 1605, Mendoza Godoy Cruz, Argentina, (ALS) or Alex Stewart Argentina S.A., Carril Rodriguez Pena, M5516 Maipu, Mendoza, Argentina (Alex Stewart).

Both analytical labs are ISO 9001:2008 certified. The samples were analyzed for gold using a fire assay/atomic absorption finish on a 30 g charge and for another 35 elements by four acid digestion and an ICP finish. The elements included in the ICP package are: Ag, Al, As, Ba, Be, Bi, Ca, Cd, Co, Cr, Cu, Fe, Ga, K, La, Mg, Mn, Mo, Na, Ni, P, Pb, S, Sb, Sc, Se, Sn, Sr, Th, Ti, Tl, U, V, W, and Zn. Samples with copper values >10,000 ppm are analyzed by atomic absorption spectrometry.

QA/QC Procedures

The performance of ALS Chemex and Alex Stewart is monitored through the implementation of a quality assurance/quality control (QA/QC) program. The results of this program are tracked by Lumina Copper and reviewed by Bruce Davis on an ongoing basis. Irregular or suspect results were addressed in a timely manner to ensure the integrity of the database.

Lumina Copper established a QA/QC protocol that uses reject duplicates, standards, and blanks inserted into the sample batches at regular intervals. Duplicates are inserted during sample preparation (independent from the assay laboratory) by splitting the pulps. A range of copper-gold-molybdenum Standard Reference Materials (SRMs), of suitable matrix composition, including blanks, is inserted by Lumina Copper during the core sampling procedure. The structure of this QA/QC program follows accepted industry standards.

There is at least one of the eleven different SRMs, plus duplicates and blanks (QA/QC samples), included in every batch. A QA/QC sample is inserted into the sample stream once every eight samples. The SRMs cover a broad range of copper-gold-molybdenum concentrations encountered at the Project and one is inserted every 24 samples sequentially independent of the blanks and duplicates. A duplicate is selected from samples with sufficient material and inserted once in every 24 samples. A blank is inserted once in every 24 samples. When smaller batches of samples are sent to the lab, containing insufficient samples to maintain this frequency, at least one of the eleven SRMs, a duplicate, or a blank are inserted.

Assay results for the copper, gold, and molybdenum are compared with the accepted values for standards and blanks. Duplicates are compared with original values. Example ALS Chemex control charts for the OREAS 50C SRM are shown in Figures 11-1 to 11-3. The red lines indicate the upper and lower control limits (UCL and LCL) which are defined as ± 10% of the accepted value. The coarse blank for copper control chart appears in Figure 11-4. The UCL for blank material is three times the average detection value of all samples analyzed. The ALS Chemex coarse duplicate performance for copper is shown in Figure 11-5. UCL and LCL for coarse material are defined as ± 30% of the relative difference between both assay values.

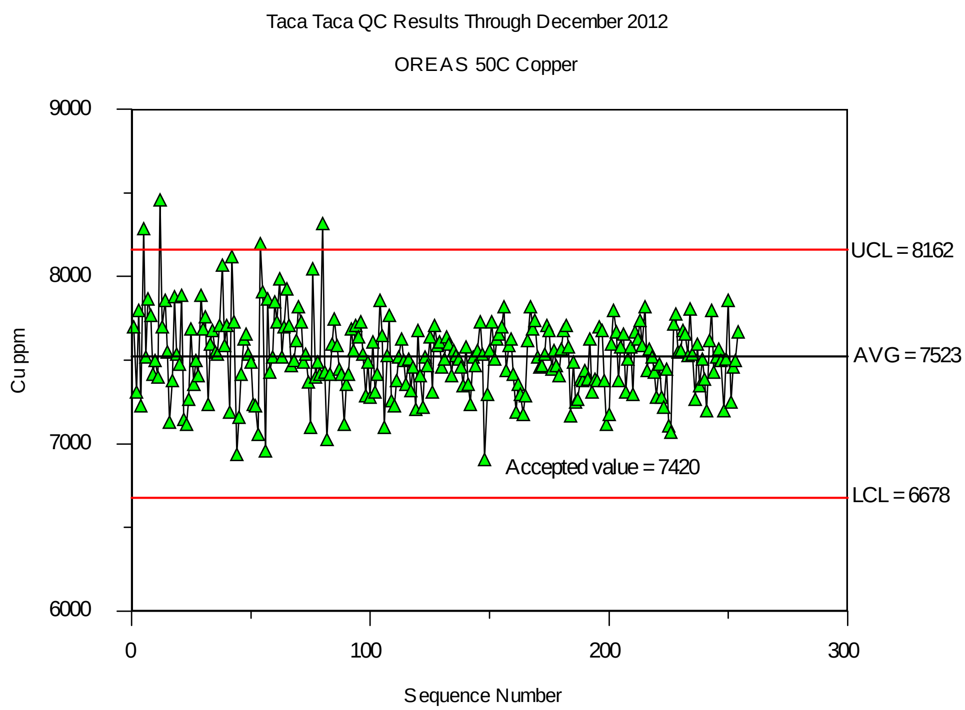


FIGURE 11-1: ALS CHEMEX OREAS 50C SRM COPPER CONTROL CHART

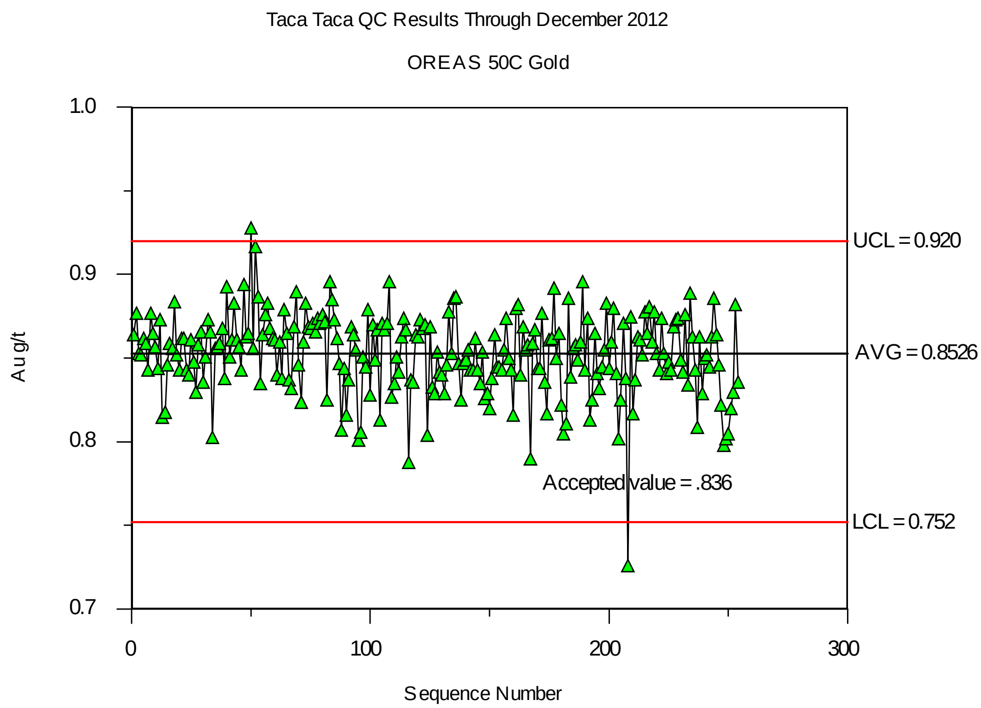


FIGURE 11-2: ALS CHEMEX OREAS 50C SRM GOLD CONTROL CHART

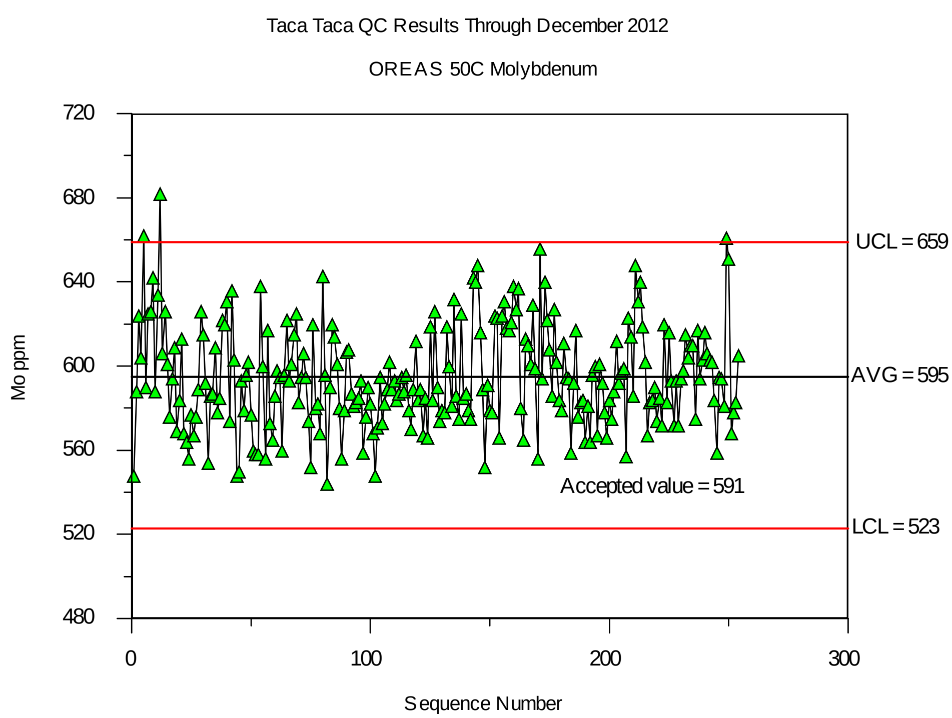


FIGURE 11-3: ALS CHEMEX OREAS 50C SRM MOLYBDENUM CONTROL CHART

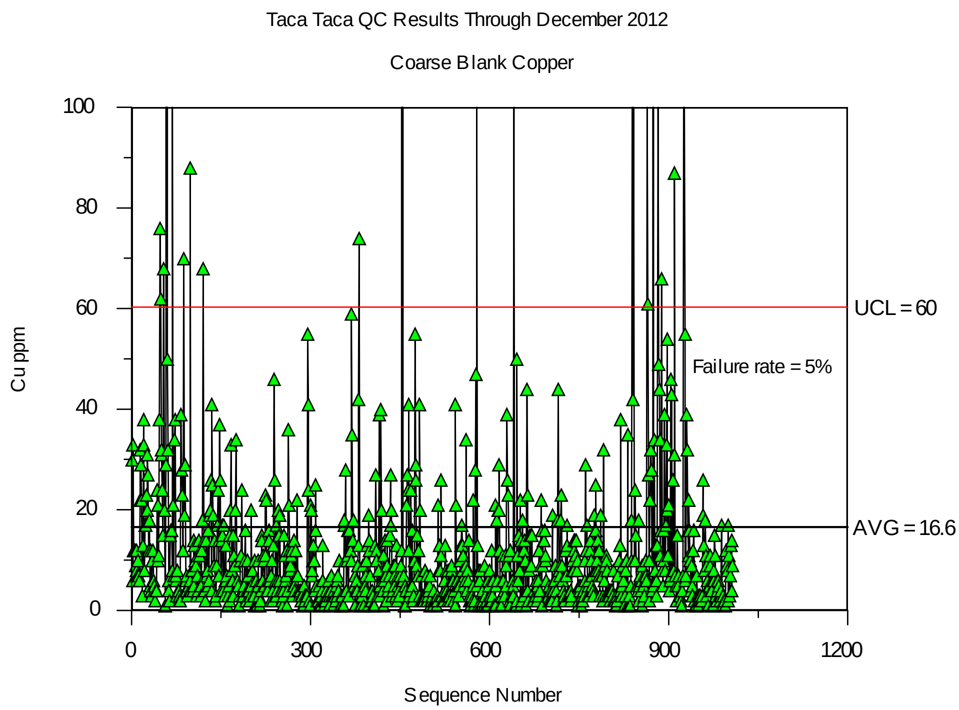


FIGURE 11-4: ALS CHEMEX COARSE BLANK COPPER CONTROL CHART

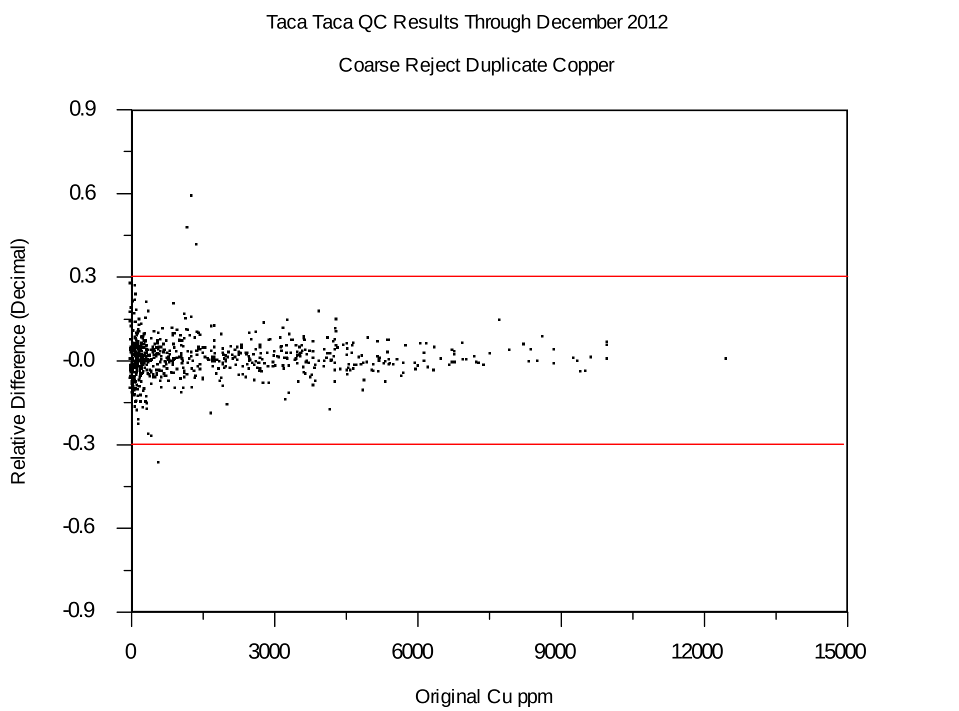


FIGURE 11-5: ALS CHEMEX COPPER COARSE DUPLICATE COMPARISONS

Examples of the Alex Stewart control charts for the OREAS 503 SRM are shown in Figures 11-6 to 11-8; OREAS 50c SRM examples were not available for use at Alex Stewart. The red lines indicate the upper and lower control limits (UCL and LCL) which are defined as ±10% of the accepted value. The coarse blank for copper control chart appears in Figure 11-9. The UCL for blank material is three times the average detection value of all samples analyzed. The Alex Stewart coarse duplicate performance for copper is shown in Figure 11-10. UCL and LCL for coarse material are defined as ±30% of the relative difference between both assay values.

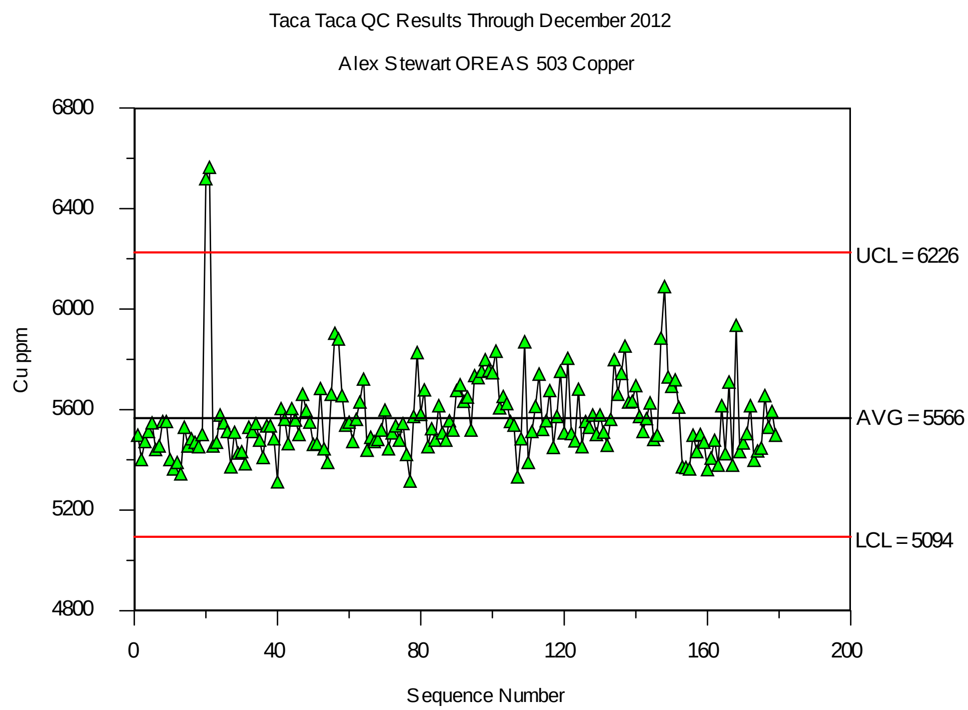


FIGURE 11-6: ALEX STEWART OREAS 503 SRM COPPER CONTROL CHART

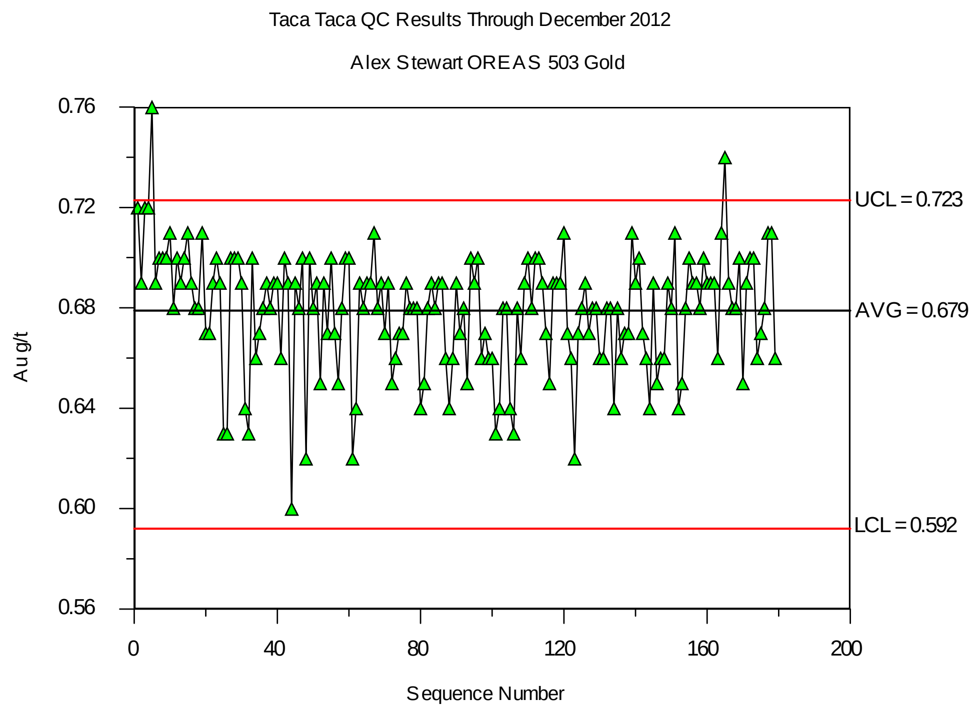


FIGURE 11-7: ALEX STEWART OREAS 503 SRM GOLD CONTROL CHART

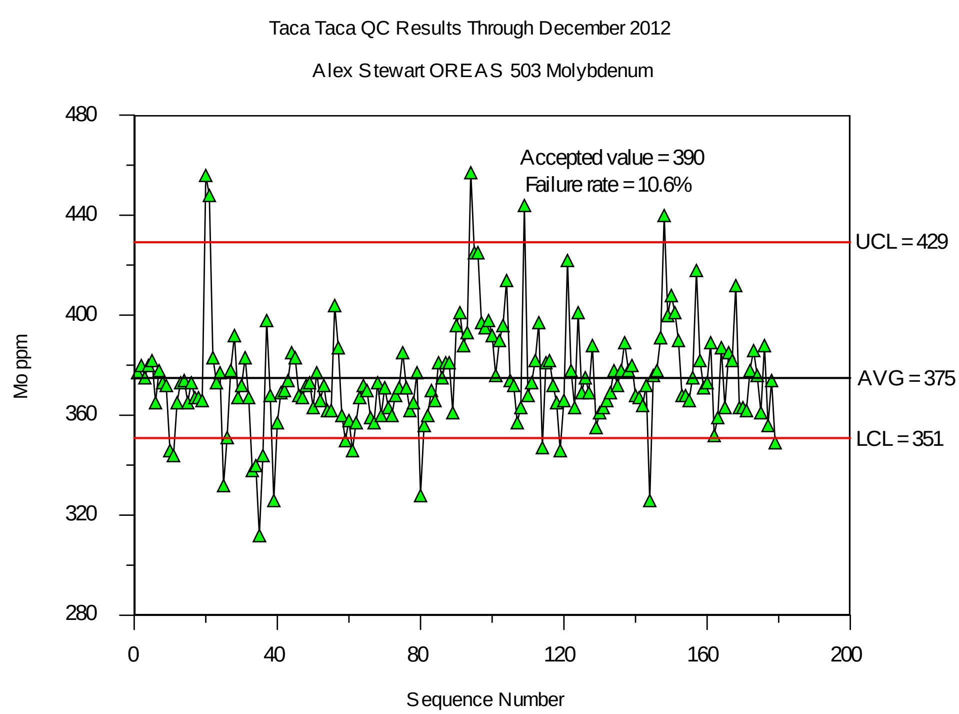


FIGURE 11-8: ALEX STEWART OREAS 503 SRM MOLYBDENUM CONTROL CHART

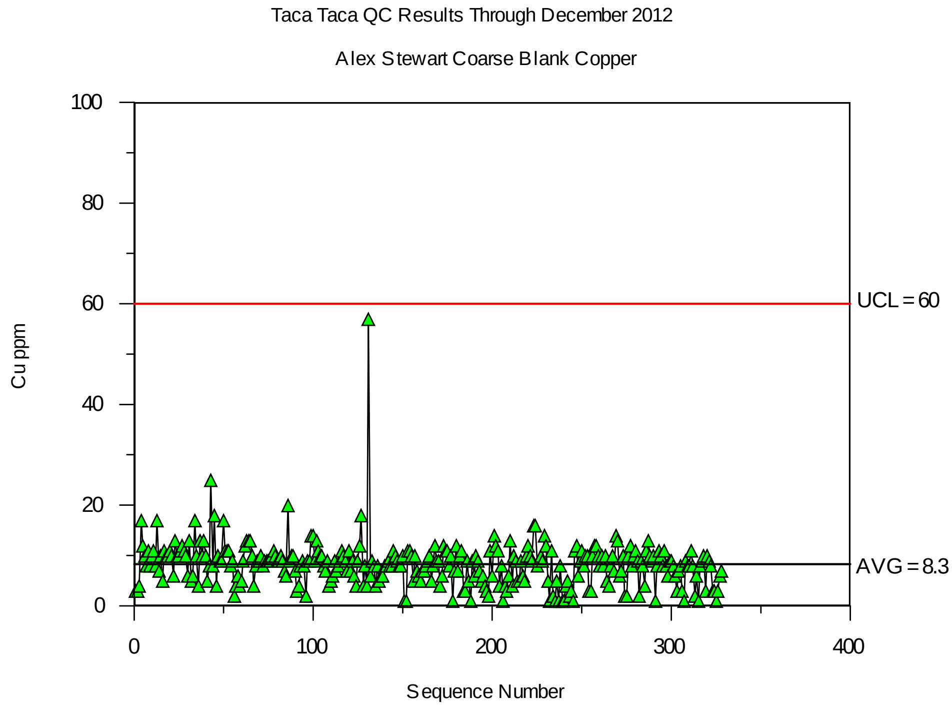


FIGURE 11-9: ALEX STEWART COARSE BLANK COPPER CONTROL CHART

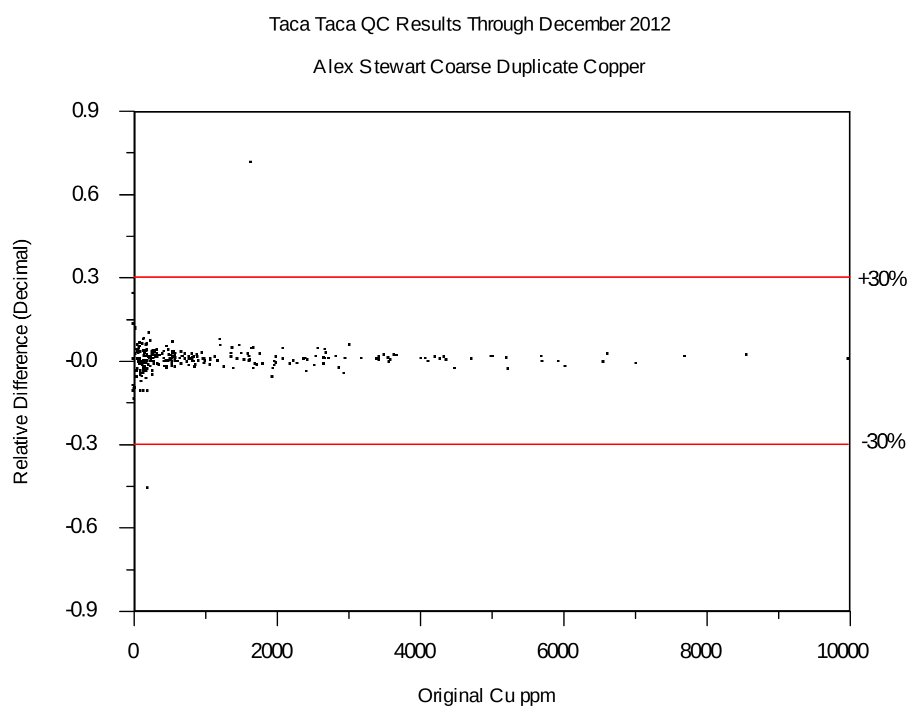


FIGURE 11-10: ALEX STEWART COPPER COARSE DUPLICATE COMPARISONS

All abnormal quality control results were addressed by re-assaying remaining material. Whenever re-assaying was required, the remedial results replaced original assays. No QC failures remain in the database.

Suites of duplicate samples were exchanged between Alex Stewart and ALS. Comparisons of the inter-lab duplicates for copper show very good results with most differences attributed to samples in the low grade range. Correlations between lab duplicates for gold and molybdenum are not as good, but these results are often attributed to the fact that many of the samples contain very low grades for these elements. Overall, there is no indication of bias, but precision is generally poor due to the low grade range of many of the samples. These results have little to no overall effect on the estimation of mineral resources.

Bruce Davis, FAusIMM, believes Lumina Copper's drill core sampling protocols at Taca Taca meet accepted industry standards. Recovery is good for the examined diamond drill core and there is no evidence that diamond drill or reverse circulation recovery could materially impact the drill results.

12 DATA VERIFICATION

12.1 HISTORIC DRILLING

Steve Blower, P.Geo, at AMEC's Vancouver office, visited the Project in April 2003 and authored an NI 43-101 report on the Project dated May 2003. At that time, the data verification consisted of: a collection of several representative samples for independent check assays, a comparison of assay data stored in Corriente's database, and the original assay certificate records.

In 2003, 11 copper and gold check assays were completed on drill core samples collected during AMEC's visit. The check sample intervals were randomly selected from both hypogene and supergene mineralization, using the same intervals as the previous exploration programs. Robert Sim, P.Geo, reviewed this data and concluded both the gold and copper check assay results agree with the original assay results. Differences between the check and original results are small, and the check assays are not systematically higher or lower than the original assays.

Assays for 11 drill holes from Corriente's spreadsheet database files were checked against the results from the original paper assay certificates. The only certificates available were from Corriente's third phase of drilling (TK-048 to TK-126). The 11 holes represent 14% of the data in Corriente's phase 3 campaign, or 7% of the total assay database at the time. All of the assay results in the database were the same as the values on the original certificates.

Robert Sim reviewed AMEC's validation work conducted on the sample data and he believes that the process and conclusions were appropriate to validate the data.

During property visits in July 2008 and June 2012, Robert Sim compared the assay results and the visual observations of the content of copper- and molybdenum-bearing mineralogy in randomly selected intervals from several drill holes. The quantity and type of minerals observed support the assay results in all cases. Drilling activities were observed and numerous drill hole collars from previous drilling programs were seen while visiting the property.

12.2 LUMINA COPPER DRILLING

Robert Sim compared the original assay certificates from ALS Chemex for ten holes from the recent Lumina Copper drilling and the assays listed in the electronic database. There were no errors noted in the database validation.

Robert Sim, P.Geo, and Bruce Davis, FAusIMM, reviewed a series of randomly selected drill core intervals during their site visits in July 2008, January 2011, and June 2012. In all cases, the type and content of observed copper-bearing minerals supported the copper grades present in the database.

Given the assay check results, observation of the drilling and core sampling, and the comparison of certificates to the electronic database, the sample assay data is within acceptable limits of precision and accuracy to generate a mineral resource estimate.

12.3 CONCLUSIONS

The Taca Taca database was derived from drilling programs conducted in the 1970s, 1990s, 2008, and 2010-2012. This data was verified using several methods including visual comparisons, resampling, and direct comparisons with assay certificates.

Industry accepted QA/QC programs have only been documented in the drilling programs conducted by Rio Tinto in 1999 and 2008, and by Lumina Copper in 2010-2012. The results of this work indicate that the data is sound. The fact that the drilling results prior to 1999 are not dissimilar to those obtained by Rio Tinto and Lumina Copper indicates this earlier data is also acceptable. Robert Sim and Bruce Davis believe that the sample database is sufficiently accurate and precise to generate estimates of mineral resources.

13 MINERAL PROCESSING AND METALLURGICAL TESTING

13.1 INTRODUCTION

In April 2010, C.H. Plenge & Cia. S.A. (Plenge Lab) in Lima, Peru began metallurgical testing of samples from the Taca Taca deposit. Through October 2012, two phases of testing were completed; the most notable test results are summarized in this section.

13.2 PHASE 1 METALLURGICAL TESTING

13.2.1 Scoping Test Program

In April 2010, two sets of drill core, representing supergene and primary mineralization, were obtained and tested at the Plenge Lab. The supergene samples were taken from two drill holes with interval depths ranging from 384 m to 474 m; this material was used to create a supergene composite and five sub-composites for testing purposes. The primary samples were taken from two drill holes with interval depths ranging from 324 m to 564 m; this material was used to create a primary composite and five sub-composites for testing purposes.

Sample testing included the following:

- Head assays
- JKTech SMC Test® for SAG mill design
- Bond Ball Mill Work Index (BBMWI)
- Specific gravity
- Flotation parameter screening and optimization
- Primary grinding
- pH on rougher flotation
- Regrind of flotation concentrates
- Flowsheet development and lock cycle testing
- Variability sample flotation
- Copper-Molybdenum separation
- Mineral liberation analysis (MLA) of rougher concentrates
- Copper concentrate settling tests

Table 13.1 shows the head assays for the two composites of the supergene and primary mineralization described here. Copper, gold, and molybdenum values were 0.60%, 0.11 g/t, and 207 ppm, respectively, for the supergene material composite, and 0.43% , 0.10 g/t and

200 ppm, respectively, for the primary material composite. Mineral liberation analysis (MLA) of the composites indicated that the supergene composite was mainly chalcocite, with lesser amounts of bornite and chalcopyrite. The primary composite was mainly chalcopyrite, with lesser amounts of chalcocite and bornite. No gold or silver minerals were identified. Liberation sizes for all copper minerals generally ranged from 100-200 microns, with some locking of copper minerals observed with pyrite and quartz minerals down to 50 micron sizes.

TABLE 13.1: SUPERGENE AND PRIMARY COMPOSITE HEAD ASSAYS

Element	Unit	Supergene	Primary
Ag	gpt	1.00	1.00
Au	gpt	0.11	0.10
Cu ASol	%	0.10	0.05
Cu CNsol	%	0.43	0.21
Cu Res	%	0.05	0.14
Cu Tot	%	0.60	0.43
Fe	%	1.39	0.82
Mo	%	0.02	0.02
S Tot	%	2.50	1.60
S Sul	%	1.10	0.30
pH		7.50	8.10
S.G.	gpcc	2.63	2.67

13.2.2 Kinetic and Lock Cycle Flotation

Kinetic rougher and tri-cleaner flotation testing was performed on the supergene and primary composites to determine optimum reagent addition levels, pH operating levels, and grind sizes (primary and regrind). Selection of the optimum conditions considered the metal recoveries and bulk concentrate grades.

The optimum conditions determined in the rougher and tri-cleaner tests were then used in three lock cycle tests for each composite. Each of the three tests varied grind sizes (P80's of 30, 35, and 40 microns, respectively) of rougher concentrates prior to cleaner flotation to determine the optimum concentrate regrind size. The optimum test conditions were identified from the results of the kinetic and lock cycle tests and are shown in Table 13.2. The optimum conditions were determined to be similar for each composite.

Table 13.3 shows the lock cycle test results for both composites using the optimum conditions. Metal recoveries for the supergene and primary composites were 87% and 90% for copper, 51% and 40% for gold, and 46% and 54% for molybdenum, respectively. Bulk concentrate grades for both were about 34% copper, with molybdenum values of 0.5% and 0.9%, respectively. Tailing assays for both were similar. In general, the composite test results were similar under the same test conditions. Penalty elements contained in the bulk concentrates like mercury (< 0.7 ppm), bismuth (< 5 ppm), antimony (< 80 ppm), and arsenic (< 350 ppm) are low enough that they should not result in smelter penalty.

TABLE 13.2: PHASE 1 - OPTIMUM TEST CONDITIONS LOCK CYCLE TESTS FOR SUPERGENE & PRIMARY

Test Condition	Unit	Value
Reagents		
CaO	gpt	330
Bisulfite	gpt	20
C-4920	gpt	32
Z-6	gpt	5
Z-14	gpt	8
Molyflo	gpt	16
Dow 250 Frother	gpt	12
pH Level (roughers)	pH	9.0
Primary Grind Size	P80 (microns)	150
pH Level (cleaners)	pH	11.0
Regrind Size (cleaners)	P80 (microns)	35
rougher float time	minutes	4
cleaner float time (3 stages)	minutes/stage	2

TABLE 13.3: LOCK CYCLE TEST RESULTS - SUPERGENE AND PRIMARY COMPOSITES

Supergene Composite		Assay					Distribution %			
Product	**Wt%**	**Ag gpt**	**Au gpt**	**Cu %**	**Mo %**	**Fe %**	**Ag**	**Au**	**Cu**	**Mo**
Cu/Mo Conc	1.47	22.20	4.20	33.89	0.547	25.3	28.0	51.3	86.9	45.8
Tails	98.53	0.80	0.06	0.08	0.010	1.0	72.0	48.7	13.1	54.2
Heads (Calc.)	100.00	1.20	0.12	0.57	0.018	1.3	100.0	100.0	100.0	100.0
Primary Composite		**Assay**					**Distribution %**			
Product	**Wt%**	**Ag gpt**	**Au gpt**	**Cu %**	**Mo %**	**Fe %**	**Ag**	**Au**	**Cu**	**Mo**
Cu/Mo Conc	1.05	38.60	4.86	34.49	0.946	23.9	36.2	39.5	90.1	54.1
Tails	98.95	0.70	0.08	0.04	0.009	0.6	63.8	60.5	9.9	45.9
Heads (Calc.)	100.00	1.10	0.13	0.40	0.018	0.8	100.0	100.0	100.0	100.0

13.2.3 Copper – Molybdenum Separation Testing

Supergene and primary composite materials were subjected to lock cycle tests to produce large enough quantities of bulk copper-molybdenum concentrates so that copper-molybdenum separation testing could be performed. The main objective was to determine if saleable molybdenum concentrates could be produced from the bulk concentrates, while still maintaining high molybdenum recovery to the molybdenum concentrate. For these tests, the optimized flowsheet, primary grind size, and reagent schemes determined in the previous tests were used; however, the regrind size was reduced from 30 microns to about 20 microns.

The separation tests were run in an open circuit with six stages of cleaning for molybdenum. Results indicate that molybdenum concentrates assaying 49% molybdenum can be produced from the supergene and primary composites. Molybdenum recoveries from the supergene and primary composites were 44% and 53%, respectively. Molybdenum recoveries to bulk concentrates, before separation, were 59% for supergene and 63% for primary materials; in other words, 10-15% of the molybdenum contained in the bulk concentrates would not be recovered into the molybdenum concentrate. Copper concentrate grades were slightly higher in the primary composite tests than in previous tests, and copper recoveries were slightly lower. The difference in copper metallurgy for primary materials was most likely a result of the finer regrind size that was used.

Table 13.4 shows the results of the copper-molybdenum separation tests for these materials.

TABLE 13.4: COPPER MOLYBDENUM SEPARATION TESTS

Supergene Composite		Assays					Distribution %			
Product	**Wt%**	**Ag gpt**	**Au gpt**	**Cu %**	**Mo %**	**Fe %**	**Ag**	**Au**	**Cu**	**Mo**
Moly Conc	0.02	2.40	0.82	0.94	49.81	1.00	0.10	0.10	0.03	44.10
Copper Conc	1.52	21.33	3.68	31.38	0.20	25.50	43.70	37.30	85.20	15.20
Bulk Conc	1.54	21.12	3.65	31.03	0.76	25.20	43.70	37.40	85.20	59.30
Midds Clnr	0.24	7.01	1.62	6.39	0.90	28.80	2.30	2.60	2.80	11.00
Tails	98.22	0.41	0.09	0.07	0.01	1.10	54.00	60.00	12.00	29.70
Heads (Calc)	100.00	0.74	0.15	0.56	0.02	1.50	100.00	100.00	100.00	100.00
Heads (Assay)		0.91	0.11	0.60	0.02	1.40				
Primary Composite		**Assays**					**Distribution %**			
Product	**Wt%**	**Ag gpt**	**Au gpt**	**Cu %**	**Mo %**	**Fe %**	**Ag**	**Au**	**Cu**	**Mo**
Moly Conc	0.02	5.00	1.26	1.09	49.19	6.10	0.10	0.20	0.10	52.50
Copper Conc	0.98	32.15	4.65	36.72	0.19	25.10	38.20	38.40	85.10	10.00
Bulk Conc	1.00	31.60	4.58	36.01	1.17	24.80	38.40	38.60	85.10	62.50
Midds Clnr	0.29	15.82	3.09	9.94	0.77	18.50	5.51	7.47	6.74	11.81
Tails	98.71	0.47	0.06	0.03	0.00	0.60	56.14	53.96	8.13	25.70
Heads (Calc)	100.00	0.82	0.12	0.42	0.02	0.90	100.00	100.00	100.00	100.00
Heads (Assay)		0.91	0.10	0.43	0.02	0.80				

13.2.4 Bond Work Index Testing

Two samples of supergene and primary mineralization were subjected to Bond Ball Mill Work Index (BBMWI) determination at the Plenge Lab. The supergene material was found to be *hard* and had an index value of 16.4 kWh/t. The primary material was found to be *medium hard* and had an index value of 14.0 kWh/t.

13.2.5 JKTech - SMC SAG Testing

SMC (SAG mill comminution) test data was generated at the Plenge Lab for two samples of supergene and primary mineralization; in June 2010, these were sent to JKTech in Australia for SAG mill analysis using their proprietary simulation software. The analysis of the SAG mill test results indicates that the supergene material is *soft* and the primary material is *medium soft*. SMC SAG mill test data are shown in Table 13.5.

TABLE 13.5: JKTECH - SMC TEST RESULTS

Sample	Dwi kWh/m^3	Dwi %	Mia kWh/t	Mih kWh/t	Mic kWh/t	A	b	SG	ta
Supergene	4.01	27	12.6	8.4	4.4	69.5	0.99	2.76	0.65
Primary	4.24	30	14.1	9.5	4.9	66.9	0.91	2.58	0.61

13.2.6 Settling Tests

Settling tests were performed on samples of supergene and primary composite materials. Samples of flotation rougher tails, cleaner scavenger tails, and bulk copper-molybdenum concentrates were subjected to settling tests with and without settling aids. Magnafloc 351 was used for tailings materials and MT-8834 was used for concentrate thickening. Unit area settling requirements to achieve underflow densities of 54% solids for both rougher tails were 0.08 sq. M/mt-d. Area requirement to achieve 30-50% underflow solids for cleaner scavenger tails was about 0.04 sq. M/mt-d. Concentrates settled to a density of 45% solids and required a unit area of about 0.2. Even though materials settled, more testing is required to determine optimum conditions and reagent type.

Two additional settling tests were performed on copper concentrates obtained from flotation of the supergene composite. Using Orifloc 2033, at a dosage of 20-29 g/t, underflow densities were 67% and unit area requirements were 0.05 sq. M/mt-d; these are better results than when the Magnafloc 351 reagent was used.

13.2.7 Acid Base Accounting

Samples of flotation products (rougher and scavenger cleaner tails) from supergene and primary materials flotation tests were subjected to ABA testing. Rougher tailings ABA values ranged from -0.4 to -10.1 $CaCO_3$ ton/ton and cleaner scavenger tailings ABA values ranged from -8.9 for primary material, to -170 $CaCO_3$ ton/ton for supergene material.

13.2.8 Variability Flotation Testing

In March 2011, 18 drill core samples were collected from nine drill holes with interval depths ranging from 310 m to 586 m. These samples were subjected to kinetic rougher and tri-cleaner flotation using the optimum conditions determined in previous tests, except the molybdenum collector dosage was increased to match the dosage used in the previous lock cycle tests. Table 13.6 shows the pertinent head assay information for the 18 samples and compares them to the samples previously tested. The mineralogy of the samples was reported as about equal for the supergene, mixed, and primary material types.

TABLE 13.6: HEAD ASSAYS - VARIABILITY SAMPLES VS. SUPERGENE & PRIMARY COMPOSITES

	Ag gpt	Au gpt	Cu %	Mo%	Fe %
Average	1.14	0.18	0.76	0.03	1.15
Std. Dev.	0.31	0.06	0.45	0.02	0.56
Supergene	1.00	0.11	0.60	0.02	1.39
Primary	1.00	0.10	0.43	0.02	0.82

Results of kinetic flotation of the variability samples (average values) were similar to previous tests performed on the supergene and primary composites. These results and how they compared to the previous tests are shown in Table 13.7.

TABLE 13.7: KINETIC AND TRI-CLEANER TESTS - VARIABILITY SAMPLES

	Grind (P80)	Au R inf %	Au k min -1	Cu R inf %	Cu k min -1	Mo R inf %	Mo k min -1
Average	124	76	1.62	97	2.79	85	2.02
Std. Dev.	46	10	0.47	2	0.30	8	0.33
Supergene	150	78	1.71	93	2.76	79	1.58
Primary	150	60	1.11	96	3.02	83	1.89

Tri-cleaner flotation tests performed on the 18 variability samples resulted in an average concentrate grade that was much higher (38% copper compared to 32% copper) when compared to the earlier composite tests. This may be due, however, to the fact that the variability sample head grades were higher, and the amount of secondary copper minerals present was also higher. Copper and gold recoveries were similar to the composite tests; however, molybdenum recovery was nearly twice as high in the variability tests. This is probably due to the higher head grade and the increased dosage of molybdenum collector. Table 13.8 shows the results of the variability sample tri-cleaner flotation tests compared to the previous composite test results.

TABLE 13.8: TRI-CLEANER TESTS - VARIABILITY SAMPLES VS. TO SUPERGENE AND PRIMARY COMPOSITES

		Concentrate Assays				Distribution %		
	Grind (P80)	Au gpt	Cu %	Mo %	Fe %	Au	Cu	Mo
Average	155	5.4	38.0	1.31	22	48	84	58
Std. Dev.	50	2.3	14.5	1.34	12	14	7	12
Supergene	150	3.5	31.5	0.395	27	50	81	32
Primary	150	3.8	33.4	0.676	27	37	75	36

BBMWI values (determined by comparison using the feed size distribution, sample weight, and mill power factor) for the variability samples averaged 17.8 kWh/t and ranged from a low of 12.5 kWh/t to a high of 26.9 kWh/t. The previous supergene and primary composite BBMWI values were 16.4 and 14.0, respectively. Table 13.9 shows the BBMWI values for the variability samples compared to the composites.

TABLE 13.9: BOND BALL MILL WORK INDEX VALUES - 18 VARIABILITY SAMPLES VS. COMPOSITES

	kWh/t
Average	17.8
Std. Dev.	3.9
Supergene	16.4
Primary	14.0

13.2.9 Gold Cyanidation Tests

In March 2011, three samples (designated as low, medium, and high grade) of near-surface (leach cap or waste material) oxidized material that contained gold values were sent to the Plenge Lab and subjected to bottle-roll cyanidation tests. These tests determine the potential for recovery of precious metals from the material. These samples were collected from five different drill holes with depths ranging from 22 m to 300 m. Table 13.10 shows the head assay information for the samples collected.

TABLE 13.10: HEAD ASSAYS - CYANIDATION TEST SAMPLES

	Units	Average	Low	High
Au	gpt	0.34	0.16	0.48
Ag	gpt	0.60	0.60	0.60
Cu	%	0.08	0.11	0.04
Cu Asol	%	0.02	0.03	0.01
Cu CNsol	%	0.04	0.06	0.02
Cu Res	%	0.01	0.01	0.01
S Sulf	%	0.13	0.26	0.10
Hg	ppm	0.02	0.02	0.02

Nine containers of brine water, collected from sources adjacent to the deposit, were sent to Plenge Lab to compare this potential process water with Lima's tap water which was used for all previous metallurgical tests.

The cyanidation testing investigated metal recoveries in relation to grind/crush size, reagent dosage, and water type. Gold recovery was found to be affected by grind/crush size and water type. Gold extraction results by crush size data using tap water are shown in Table 13.11.

TABLE 13.11: CYANIDATION TESTS - GOLD RECOVERY BY CRUSH SIZE

Average Grade material					
Size	**Heads Au gpt**	**Residue Au gpt**	**Extraction Au %**	**Reagent NaCN kg/t**	**Reagent CaO kg/t**
100% - 3/4"	0.41	0.22	46.5	1.8	0.6
100% - 10M	0.29	0.09	67.5	2.7	2.3
95% - 200 M	0.30	0.08	72.4	3.3	6.7
Low Grade material					
Size	**Heads Au gpt**	**Residue Au gpt**	**Extraction Au %**	**Reagent NaCN kg/t**	**Reagent CaO kg/t**
100% - 3/4"	0.21	0.12	46.2	1.7	0.5
100% - 10M	0.21	0.08	62.9	2.8	2.3
95% - 200 M	0.19	0.02	89.3	5.1	5.0
High Grade material					
Size	**Heads Au gpt**	**Residue Au gpt**	**Extraction Au %**	**Reagent NaCN kg/t**	**Reagent CaO kg/t**
100% - 3/4"	0.45	0.25	45.3	1.6	0.6
100% - 10M	0.49	0.14	71.9	2.4	2.0
95% - 200 M	0.47	0.07	85.5	2.6	4.2

Use of brine water for cyanidation testing (tests run at 1,000 ppm and 500 ppm cyanide in solution) showed reduced gold recoveries of 2% and 5%, respectively, compared to tap water. The pH of the tests was limited to 10.5 due to the buffering effects of the brine that caused lime additions to increase to about 7 kg/t. The presence of cyanide soluble copper in the materials also caused the cyanide consumptions to increase.

13.2.10 Optimization Flotation Tests

In May 2011, four drill core samples and 13 containers of brine water, collected from sources near the Project, were sent to Plenge Lab. The objective of this program was to optimize flotation conditions and to test the use of brine water for flotation. Brine water is readily available, but the amount of fresh water in the vicinity of the Project is limited.

The samples were composited into supergene and primary types and represented materials from three different drill holes at depth intervals ranging from 342 m to 494 m. The copper minerals identified in the supergene sample contained 80% as secondary copper minerals, and 1% as chalcopyrite; the primary sample contained 54% as secondary copper minerals, and about 30% as chalcopyrite.

BBMWI tests were performed on each of the samples. Supergene and primary sample index values were reported as 18.5 kWh/t and 17.4 kWh/t, respectively; these values are slightly higher than previously reported values.

Kinetic and tri-cleaner flotation testing was performed with variations to rougher and cleaner flotation pH, density, and reagent dosage levels. Test results indicated that optimum results were reached when rougher flotation density was increased to 37% solids; gold recovery increased when flotation collectors were increased and rougher pH was maintained at 9.0.

Cleaner flotation test results indicated that a longer first cleaner flotation time (from 2-4 minutes), maintaining a pH of 10.5, and increasing molybdenum flotation collector resulted in slightly increased molybdenum and gold recoveries. Table 13.12 shows the optimized flotation conditions and parameters.

Lock cycle tests, using the optimum conditions, were performed on the two samples. Results are shown in Table 13.13. The optimized conditions resulted in substantial increases to gold and molybdenum recoveries, with similar results for copper. Slightly lower copper grades in the concentrates (from 34% down to 31% copper) were realized when compared to previous tests.

TABLE 13.12: OPTIMIZED FLOTATION CONDITIONS

	Units	Value
Rougher/Scav		
Primary Grind	P80 microns	150
pH		9.0
% Solids		37
Conditioning time	min.	2
Flotation time	min.	3+3
Cleaning		
Regrind	P80 microns	30
pH		10.5
Conditioning	min.	5
1st Clnr	min.	4
Cleaner Scav	min.	4
2nd Clnr	min.	2
3rd Clnr	min.	2
Reagents		
CaO	gpt	330
Bisulfite	gpt	25
C-4920	gpt	43
Z-6	gpt	10
Z-14	gpt	13
Molyflo	gpt	25
D-250	gpt	14

TABLE 13.13: LOCK CYCLE TEST RESULTS, BULK CU-MO CONCENTRATES

		Assays				Distribution %		
	Wt%	Au gpt	Cu %	Mo %	Fe %	Au	Cu	Mo
Supergene	2.20	1.90	31.37	1.15	24.4	60.8	89.9	72.2
Primary	1.44	5.40	30.60	1.91	25.2	62.4	92.8	84.0

The use of brine water was compared to tap water for flotation of the supergene composite. Brine water was also used for rougher flotation and compared to the use of tap water for cleaner flotation. Results indicated that the use of brine water for rougher flotation showed similar recoveries of copper and molybdenum, although at a lower concentration ratio. However, when used for cleaner flotation, the brine water caused large reductions in recovery into the concentrate. This may be due to the buffering effects of the brine water. When using brine water for rougher flotation and then tap water for cleaner flotation, the recovery results were comparable to the use of tap water only; however, concentrate grades were lower (concentration ratio decreased). Table 13.14 compares rougher and cleaner flotation results for tap water and brine water on the supergene sample. Brine water test results for flotation of the primary sample showed similar results to the supergene sample.

TABLE 13.14: TAP WATER VS. BRINE WATER FLOTATION

		Assays			Distribution %		
Supergene Sample	**Wt%**	**Au gpt**	**Cu %**	**Mo %**	**Au**	**Cu**	**Mo**
Tap Water (rghr and clnr)							
Tri-cleaner Conc	1.9	1.90	34.0	1.10	49.6	86.1	57.5
Rougher Conc	10.6	0.50	6.8	0.30	74.6	94.9	85.8
Brine Water (rghr and clnr)							
Tri-cleaner Conc	1.3	2.20	40.8	0.84	31.3	68.4	32.0
Rougher Conc	13.9	0.50	6.1	0.23	61.1	93.4	79.7
Brine Water (rghr only)							
Tri-cleaner Conc (Tap Wtr)	2.5	1.57	26.1	0.95	48.0	84.5	68.3
Rougher Conc (Brine Wtr)	12.0	0.44	5.9	0.24	63.7	92.3	83.1

13.3 PHASE 2 METALLURGICAL TESTING

13.3.1 Test Program

In January 2012, the second phase of metallurgical testing was initiated at Plenge Lab. The key objectives of the second phase of testing were to:

- Expand the metallurgical database as the resource expands.
- Determine the impact of blending supergene materials with primary materials.
- Expand the variability samples flotation database.
- Further determine the impact of using brine water for flotation.
- Expand the comminution and physical properties database.
- Perform large scale lock cycle flotation tests for copper-molybdenum separation.
- Expand the oxide gold leaching database.
- Examine the opportunity for oxide copper leaching.

13.3.2 Copper-Molybdenum Separation

Four composite samples were prepared for the copper-molybdenum separation tests and represented supergene and primary samples from the anticipated first five years and second five years of mining. The samples were collected from 10 different drill holes within the pit boundary and were from depths that ranged from 220 m to 670 m. The head assays for this material are shown in Table 13.15. As expected, the amount of secondary copper minerals is higher in the supergene samples, and the amount of chalcopyrite is higher in the primary samples.

TABLE 13.15: HEAD ASSAYS - SEPARATION TEST MASTER COMPOSITES (YRS 0-5 AND 6-10)

		Master Composites			
Element	Units	Sup (0-5)	Pri (0-5)	Sup (6-10)	Pri (6-10)
Au	gpt	0.16	0.19	0.13	0.11
Cu Asol	%	0.17	0.06	0.20	0.04
Cu CNsol	%	0.49	0.15	0.53	0.13
Cu Res	%	0.06	0.38	0.10	0.27
Cu tot	%	0.72	0.61	0.84	0.46
Mo	%	0.022	0.022	0.017	0.017
Fe	%	1.25	1.80	1.72	3.93
S Sulf	%	1.01	1.55	1.46	3.49

Eight-cycle lock cycle tests using conditions established in earlier testing were performed on each of the four composites to produce bulk copper-molybdenum concentrates. Each bulk concentrate was then subjected to copper-molybdenum bulk rougher separation and then nine stages of cleaning in an open-circuit configuration. No regrinding was performed during separation or cleaning; the separation reagent used was NaSH, and the molybdenum cleaners were operated at a pH of 9.0.

Table 13.16 shows the results of the lock cycle tests on each of the four composites. Metallurgical results were better in these tests than in previous tests (see Table 13.3) with concentrate grades being slightly lower, but metal recoveries were substantially higher.

TABLE 13.16: LOCK CYCLE TESTS - BULK CONCENTRATES SUPERGENE AND PRIMARY COMPOSITES

		Bulk Conc. Assays				Distribution %		
	Wt. %	Au gpt	Cu%	Mo%	Fe%	Au	Cu	Mo
Sup (yr 0-5)	1.88	5.38	34.5	0.80	22.4	60.2	90.6	69.7
Pri (yr 0-5)	2.03	6.62	28.7	0.77	29.5	71.7	94.2	86.1
Sup (yr 6-10)	2.3	4.56	33.3	0.68	25.1	67.7	90.2	85.8
Pri (yr 6-10)	1.54	4.70	29.7	0.80	27.9	60.9	94.7	73.9
Average (4)	1.94	5.32	31.6	0.76	26.2	65.1	92.4	78.9

Table 13.17 shows the combined metallurgical balance for each of the composite tests and the individual concentrate and bulk concentrate results. Results indicate that concentrates are potentially saleable, although slightly lower in grade, than previous tests. Metal recoveries are, however, slightly higher than previous tests (see Table 13.4).

TABLE 13.17: OPEN CIRCUIT COPPER-MOLYBDENUM SEPARATION TESTS, SUPERGENE & PRIMARY COMPOSITES

		Assays				Distribution %		
	Wt %	Au gpt	Cu %	Mo %	Fe %	Au	Cu	Mo
Sup (0-5)								
Mo conc	0.02	1.24	1.90	**45.30**	3.3	0.20	0.10	**46.0**
Cu conc	1.77	**5.55**	**35.30**	0.09	23.2	**57.8**	**87.9**	8.0
Calc. Bulk conc	1.79	5.50	34.90	0.62	23.0	58.0	87.9	54.0
Sup (6-10)								
Mo conc	0.02	1.01	0.95	**49.60**	2.5	0.10	0.00	**62.3**
Cu conc	2.16	**4.52**	**33.30**	0.11	25.8	**64.2**	**86.2**	13.6
Calc. Bulk conc	2.18	4.48	33.00	0.61	25.6	64.3	86.2	76.0
Pri (0-5)								
Mo conc	0.02	0.88	1.27	**53.22**	2.00	0.10	0.00	**73.00**
Cu conc	2.08	**5.63**	**28.98**	0.18	30.80	**70.90**	**95.00**	7.50
Calc. Bulk conc	2.11	5.57	28.70	0.80	30.50	71.00	95.00	80.60
Pri (6-10)								
Mo conc	0.02	0.90	4.40	**41.50**	6.80	0.10	0.20	**47.20**
Cu conc	1.46	**5.01**	**29.60**	0.21	28.30	**59.80**	**91.20**	18.00
Calc. Bulk conc	1.48	4.96	29.30	0.74	28.04	59.90	91.35	65.20

Table 13.18 shows the sedimentation and filtration data obtained from tests performed on samples of copper concentrates and tailings from the separation testwork.

TABLE 13.18: SEDIMENTATION AND FILTRATION TESTS, CONCENTRATES AND TAILS

Sedimentation	Reagent	% Solids u/Flow	Area Req. m^2/tm-d	
Copper Conc (average of 4)	Magnafloc 351 (26 gpt)	58	0.07	
Float Tails (average of 4)	Magnafloc 351 (26 gpt)	52	0.07	
Filtration (Pressure)	**% Solids Initial**	**Cake % Moist.**	**Filter Time**	**Filter Ratio m^2hr/t**
Copper Conc (average of 8)	56	7	4 min.	1.14
Float Tails (average of 4)	50	11	4 min.	1.69

13.3.3 Variability Flotation Testing

Forty variability composites were selected for flotation testing: 15 samples were supergene and 25 were primary. The samples were selected from 31 different drill holes from across the deposit at depths ranging from 200 m to 795 m. The average head grades for each of the types are shown in Table 13.19. Supergene samples varied in copper grades ranging from 0.5-2.1% (average of 1.23%), and primary samples varied in copper grades ranging from 0.3-0.9% (average of 0.49%).

TABLE 13.19: AVERAGE HEAD ASSAYS - 40 VARIABILITY SAMPLES

	Ag gpt	Au gpt	Cu %	Mo %	Fe %	S sulf %
Supergene (15)	0.6	0.16	1.23	0.017	2.09	1.94
Primary (25)	0.6	0.14	0.49	0.016	1.63	1.18
Average (40)	0.6	0.15	0.86	0.016	1.86	1.56

Variability samples were subjected to kinetic flotation and open circuit tri-cleaner flotation testing. Average results of those tests are shown in Table 13.20 and compare well to the earlier test results (see Table 13.7). The supergene and primary samples yielded similar results.

TABLE 13.20: KINETIC AND TRI-CLEANER TESTS (AVERAGES), 40 VARIABILITY SAMPLES

	Au R inf %	Au k min -1	Cu R inf %	Cu k min -1	Mo R inf %	Mo k min -1
Supergene (15)	75.27	2.29	93.92	2.66	85.91	1.94
Primary (25)	76.48	2.03	96.81	2.89	91.57	2.42
Average (40)	76.03	2.16	95.37	2.78	88.74	2.18

13.3.4 Composite Blending and Water Compatibility Testing

Lock cycle flotation tests were performed on composites of supergene and primary materials to determine the impact of blending the materials and to observe the impact of using brine water for flotation as a follow-up to the earlier testing.

Head assays for the composites used in this series of tests are shown in Table 13.21.

TABLE 13.21: HEAD ASSAYS - WATER COMPATIBILITY AND BLEND COMPOSITES

	Au gpt	Cu %	Cu Asol	Cu Cnsol	Cu Res	Mo ppm	Fe %	S sulf %
Supergene	0.13	0.84	0.15	0.59	0.10	139	1.74	1.9
Primary	0.17	0.57	0.05	0.26	0.22	198	1.39	1.2
Blend (1:1)	0.15	0.70	0.10	0.43	0.16	169	1.56	1.5

Results of the lock cycle tests, using tap water only, for the individual composites and the blended (1:1) composite are shown in Table 13.22. Results show that the materials can be blended without significant impact to metallurgy.

TABLE 13.22: LOCK CYCLE TEST RESULTS (TAP WATER ONLY), SUPERGENE, PRIMARY AND BLEND

			Assays				Distribution %		
Ore Type	Product	Wt %	Au gpt	Cu %	Mo %	Fe %	Au	Cu	Mo
Supergene	Cu-Mo conc	1.82	4.12	38.6	0.41	21.8	51.5	86.4	53.9
Primary	Cu-Mo conc	1.47	6.91	36.2	1.02	25.0	64.7	92.5	72.7
Blend (1:1)	Cu-Mo conc	1.76	5.30	35.9	0.70	23.6	63.5	87.8	67.4
Average (3 tests)	Cu-Mo conc	1.68	5.44	36.9	0.71	23.5	59.9	88.9	64.7

Results of lock cycle tests, using brine water for rougher flotation and tap water for cleaner flotation, are shown in Table 13.23. Results indicate that metal recoveries are similar (see Table 13.8); however, concentrate grades are slightly lower when using brine water in rougher flotation. Although the detailed information is not presented here, the use of brine water in rougher flotation increases the mass pull to the cleaners by about 30% (11.9 weight percent with tap water and 14.3 weight percent with brine). This additional rougher concentrate material should be considered for future plant designs and to define process water requirements (brine and fresh).

TABLE 13.23: LOCK CYCLE TEST RESULTS - WATER COMPATIBILITY TESTS* SUPERGENE, PRIMARY & BLEND

				Assays				Distribution %	
Ore Type	Product	Wt %	Au gpt	Cu %	Mo %	Fe %	Au	Cu	Mo
Supergene	Cu-Mo conc	2.34	3.69	29.2	0.30	22.0	63.4	86.5	75.0
Primary	Cu-Mo conc	1.44	7.35	33.9	0.69	24.2	64.9	91.2	52.7
Blend (1:1)	Cu-Mo conc	2.06	4.21	29.3	0.64	25.1	61.7	88.8	75.0
Average (3 tests)	Cu-Mo conc	1.95	5.08	30.8	0.54	23.8	63.3	88.8	67.6

Note: Metal recoveries for supergene test were not available.
* Brine in roughers and tap water in bulk cleaners.

13.3.5 Physical Properties Tests

Physical property tests were conducted on various samples during the Phase 2 testing program and are summarized in Table 13.24.

TABLE 13.24: PHYSICAL PROPERTIES TESTS

	Units	Supergene	Primary	No. of Tests
Bond Crusher WI	kWh/st	6.65	8.11	30
SAG Design	kWh/t	9.35	8.9	10
Bond Ball Mill WI (from SAG)	kWh/t	17.33	15.73	10
Compression Strength	Mpa	12.2	12.8	10
Abrasion Index	Ai (g)	0.20	0.23	10
Bond Ball Mill WI (compare)	kWh/t	18.95	16.57	40
Angle of Repose	degrees	37	37	10
SG	g/cc	2.7	2.7	12
Apparent Density	g/cc	2.6	2.7	33

BBMWI values for supergene and primary material are about 18 kWh/t and 16 kWh/t, respectively. These values compare fairly well to the values observed in the earlier variability sample testing in Phase 1 (see Table 13.9).

In June 2012, Plenge Lab (a certified SAG Design® laboratory) performed grind tests on ten composited samples (four supergene and six primary) that had been specifically selected and designated for SAG design testwork. Starkey & Associates (Starkey, 2012) evaluated the test data from Plenge Lab and provided a report that evaluated the information and presented grinding mill sizes for a conceptual facility that could process 120,000 tonnes per day of material. Starkey's recommendations are shown in Table 13.25.

TABLE 13.25: SAG DESIGN DATA AND STARKEY RECOMMENDATIONS, 10 SAMPLES TESTED

Data Statistics	S.G.	Calc. SAG to 1.7 mm kWh/t	Sd-BWI 150 micron kWh/t	Calc BM to p80 kWh/t	Calc Total to p80 kWh/t	
Min.	2.67	6.65	14.94	8.58	15.28	
20th %	2.68	7.73	15.01	8.62	16.63	
50th %	2.72	8.78	16.17	9.28	18.35	
80th %	2.75	10.9	17.69	10.16	20.85	Design
Max.	2.78	11.28	20.27	11.63	22.91	
Average	2.72	9.12	16.51	9.48	18.6	
Std. Dev.	0.04	1.63	1.72	0.99	2.40	

Recommended Plant Design (2 grinding lines @ 1 SAG/2 Crushers/2 Ball Mills):

Plant Feed Rate	5,556 tph		
Feed Size	152 mm		
Product Size	p80 = 150 microns		
Mill Transfer Size	3,220 microns		
Plant Availability	90%		
Crushers	4	600 kW each	MP 800 Pebble crushers
SAG Mills	2	24,400 kW each	40' dia. X 23' EGL
Ball Mills	4	13,700 kW each	26' dia. X 34' EGL
		106,000 kW total installed	

13.3.6 **Oxide Gold Cyanidation Tests**

Bottle roll cyanidation tests (96 hours at 0.1% NaCN solution) were performed on various sample composites prepared from near-surface leach cap material. The test results are shown in Table 13.26.

TABLE 13.26: OXIDE GOLD LEACHING, 10-MESH AND ½-INCH CRUSH RESULTS

	Head Ag gpt	Head Au gpt	Extr. % Ag	Extr. % Au	Reagent NaCN kg/t	Reagent CaO kg/t
Low Grade (-10 mesh)	0.9	0.3	31.9	81.1	1.5	1.6
Mid Grade (-10 mesh)	0.8	0.4	20.8	80.1	1.1	1.3
High Grade (-10 mesh)	1.7	0.6	64.0	73.3	1.3	1.9
Average (-10 mesh)	1.1	0.4	47.1	77.5	1.3	1.6
Tap Water (-1/2 inch)	0.9	0.4	33.3	55.0	0.4	0.5
Brine Water (-1/2 inch)	1.0	0.4	44.8	40.6	0.1	53.0

The average extractions using tap water, at a grind of 100% passing 10-mesh, were 78% for gold and 47% for silver. For comparison purposes, the average recoveries of gold and silver, when ground to 80% passing 200-mesh, were 92% and 67%, respectively. The use of brine for leaching was also compared to the use of tap water for leaching at a crush size of minus ½-inch. These brine water tests indicated lower gold recovery and extremely high lime usage compared to tap water.

13.3.7 Oxide Copper Leaching and Flotation Tests

Bottle roll acid leaching tests were performed on various sample composites prepared from near-surface, leach cap material drill core. Test results are shown in Table 13.27. When crushed to -200-mesh, the average bottle roll extraction of copper was 41% (ranging from 33-51%). Sulphuric acid consumptions were low at about 7 kg/t.

TABLE 13.27: BOTTLE ROLL LEACHING OF OXIDE COPPER SAMPLES (72 HOURS AT 10 G/L ACID)

	Head Cu %	Residue Cu %	Extr. %	H_2SO_4 kg/t
Low Grade	0.13	0.07	51	7.50
Mid Grade	0.17	0.10	39	6.00
High Grade	0.28	0.19	33	6.50
Average			41	6.60

Batch flotation testing was also performed on the high-grade (0.27% copper) oxide material to determine if copper could be concentrated using standard flotation conditions. The test results indicated the production of a concentrate with a grade of 43% copper and a copper recovery of 71%. In the future, the flotation of these low-grade, near-surface materials should be reviewed to determine the possibility of stockpiling for future processing.

13.3.8 Brine Water

Various samples of Project area brine waters were collected and used in the two phases of testwork. Table 13.28 shows the analyses of those brine waters and how they compare to sea water which is being used by other copper flotation facilities around the world. The brine water used is a *salar*-type water that exists near the deposit. When compared to sea water, the Salar Arizaro used in phase 1 and the pit water used in phase 2 are about 10 times higher in chlorides and TDS.

TABLE 13.28: BRINE WATER ANALYSES

Constituent	Unit	Phase 1 Salar Arizaro	Phase 1 Plumas Verdes	Phase 2 Pit Water	Not Used Seawater
pH	pH unit	7.1	8.3	5.8 - 6.4	7.5 - 8.5
Conductivity	uS/cm	>200,000	17,420		50,000
TDS	mg/l	255,500	10,700	est. 350,000	
Alkalinity	mg/l	49	129		
Bicarbonate	mg/l	59	158		100
Calcium	mg/l	2,510	169	1,704	400
Magnesium	mg/l	1,350	82	1,741	1,300
Chloride	mg/l	153,000	6,120	184,600	19,900
Sulfate	mg/l	3,900	310		2,700
Nitrate	mg/l	600	30		
Sodium	mg/l	84,400	4,120	136,839	11,000
Potassium	mg/l	3,030	77	3,524	400

Seawater noted as a comparison due to its use at other mines for flotation.

14 MINERAL RESOURCE ESTIMATES

14.1 INTRODUCTION

The mineral resource estimate was prepared under the direction of Robert Sim, P.Geo, SIM Geological Inc., and assisted by Bruce Davis, FAusIMM, BD Consulting Resource Inc. Robert Sim is the independent "qualified person" within the guidelines of NI 43-101 for the purpose of the mineral resource estimate contained in this report. Estimates are generated from three-dimensional block models based on geostatistical applications using commercial mine planning software (MineSight® v7.50). The Project limits are based in the UTM coordinate system using a nominal block size of 25 x 25 x 15 m (L x W x H). The majority of drill holes in the main deposit area are vertically oriented with holes spaced on a nominal 150 m grid pattern. At the northern end of the deposit, the final 500 m has been tested with holes that are consistently inclined -70° east.

The resource estimate was generated using drill hole sample assay results and an interpretation of the geologic model which relates to the spatial distribution of copper, gold, and molybdenum. Interpolation characteristics were defined based on the geology, drill hole spacing, and geostatistical analysis of the data. The resources were classified by their proximity to the sample locations and are reported, as required by NI 43-101, according to the CIM standards on Mineral Resources and Mineral Reserves (November 2010).

14.2 GEOLOGIC MODEL, DOMAINS AND CODING

The copper, gold, and molybdenum mineralization on the Taca Taca property is interpreted to be the result of deep-seated rhyodacitic porphyry intrusions. The majority of the rocks that host the Taca Taca deposit are granodioritic in composition, plus minor dacite, diabase, and rhyolite dykes. The deposit is overlain by a leach cap that ranges from 300 m thick in the south to about 150 m in the north. This is underlain by a locally irregular Supergene Zone which varies in thickness from non-existent to greater than 300 m in some parts of the deposit. In some areas, supergene-type mineralization is locally present at depths of greater than 700 m below surface. This variability in supergene thickness is attributed to deep-seated enrichment along fault structures. The Supergene Zone contains varying amounts of chalcocite and covellite. Beneath the Supergene Zone is the Primary Zone domain comprised of varying amounts of pyrite, chalcopyrite, bornite, and minor molybdenite.

A sub-vertical fault is interpreted from drilling on the western side of the deposit area. Generally oriented at 345°, this structure shows variable vertical displacement with approximately 160 m of apparent displacement in the south, but little to no movement in the north. Copper mineralization is present on both sides of the structure, but there appears to be some post-depositional movement along this fault.

The majority of the deposit is hosted within rocks of granitic or granodioritic composition. A series of sub-vertical late/post-mineral dykes occur to the east and southeast of the main deposit area. These dykes have been interpreted based on a combination of drilling results and surface mapping. Dykes of rhyodacitic composition are present primarily in the southeastern part of the deposit and tend to be post-mineral in nature. Several Rhyolite Dykes are interpreted in the eastern part of the deposit. These Rhyolite Dykes show mineral trends which suggest they were emplaced prior to or during the mineralizing event.

Immediately east of the deposit area is a salt brine Salar in which a series of drill holes were collared from the surface of the salt crust. The base of the Salar was interpreted from the results of this drilling and was included as *Overburden* in the model.

The geologic interpretation of the base of Overburden Zone, the Leach Cap Zone, and the Supergene Zone was generated using drilling information. Three-dimensional, wireframe shape domains were generated and represent the extents of these various mineral zones (MinZone). The MinZone domains are summarized in Table 14.1 and shown in Figure 14-1.

TABLE 14.1: MINZONE DOMAINS AND CODING

Domain	Zone Code Number	Comment
Overburden (OVB)	1	Surface soil and gravel, plus the Salar.
Leach (LX)	2	Average 300 mV near-surface zone leached of copper.
Supergene (SS)	3	Supergene zone of enriched copper.
Primary (PR)	4	Zone of primary sulphide mineralization.
Rhyodacite Dykes (DK)	5	Late/post mineral dykes. Tend to be weakly mineralized or unmineralized.
Rhyolite Dykes (RDK)	6	Pre/syn mineral dykes. Tend to be mineralized similar to surrounding host rocks.

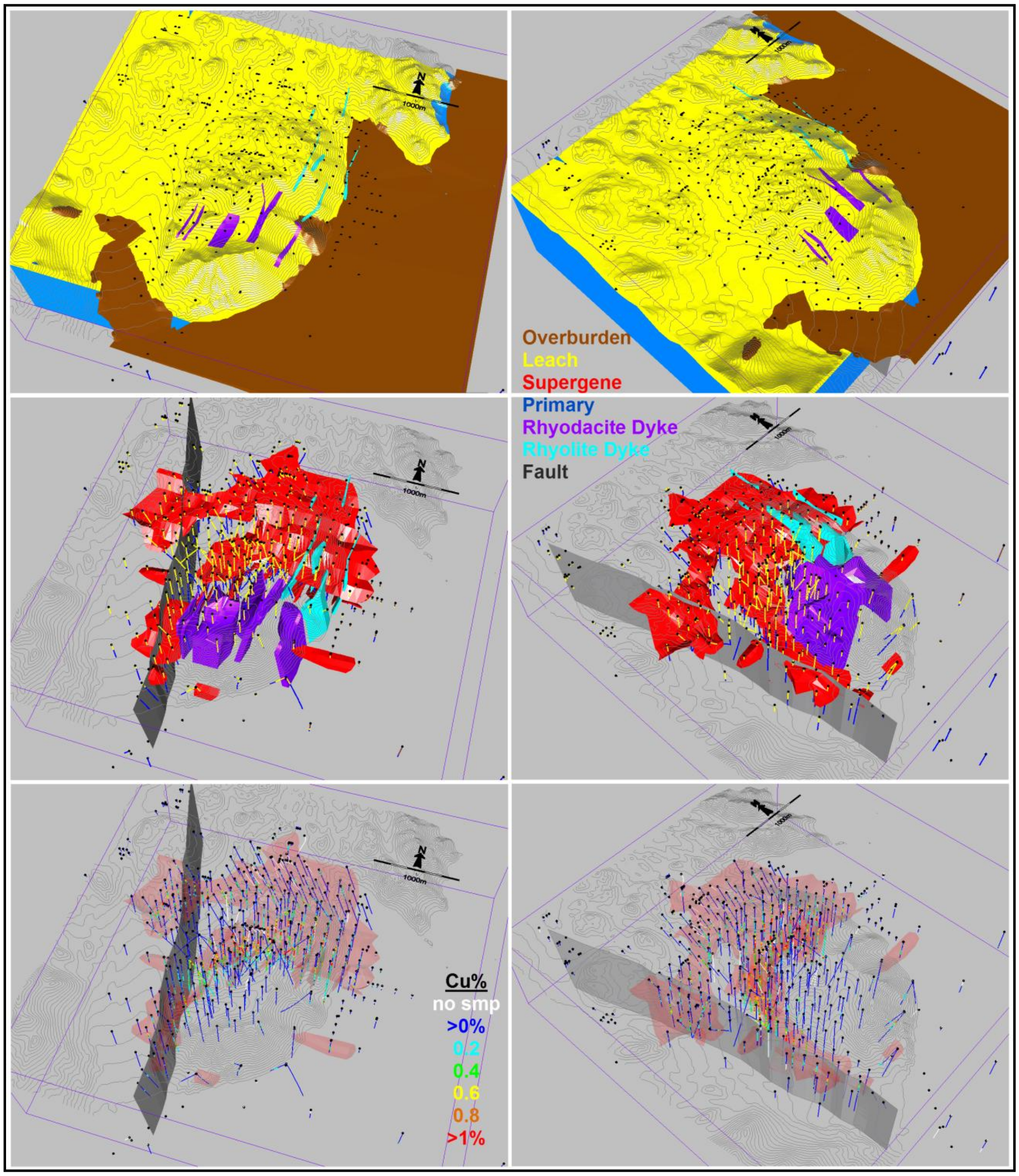


FIGURE 14-1: ISOMETRIC VIEWS OF MINZONE DOMAINS

14.3 AVAILABLE DATA

Delineation and exploration drilling have been ongoing at the Taca Taca property for several years. Lumina Copper delivered the final database on 30 October 2012 and it included information from 440 drill holes, with a cumulative length of 163,537 m. Drill holes occur over an area that measures 5 km x 5 km, as described in Section 10 (Drilling), with a few drill holes dating back to the 1970s.

Comments relating to the sample database include the following:

- Most of the holes drilled by Corriente in the 1990s were designed to target near-surface veins and mantos, and, as a result, these do not provide information relating to the deeper-seated porphyry mineralization.

- There are 52 holes in the database that do not have any associated sample results. Seven of these were drilled by Lumina Copper for geotechnical purposes and none of those have not been sampled or analyzed. The remaining 45 are older drill holes that were either never sampled or the assay data is missing.

- Lumina Copper drilled a total of 97 reverse circulation (RC) holes. Parts of the Leach Zone have been delineated using RC drilling. RC holes have been used primarily in testing the northern and northwestern mineralized areas where mineralization tends to occur to depths of only 300 m. Comparisons between samples from diamond drill (DD) holes and RC holes show local variability, but good overall correlation for copper and molybdenum. Gold grades tend to be slightly higher in DD holes than RC holes, but the differences are not considered significant.

The mineral resource estimate is based on a total of 147,449 m of drilling in 310 drill holes that are proximal to the potentially economic mineralization. The associated assay data includes: BHP, 28 holes (9,893 m); Corriente, 18 holes (1,454 m); Rio Tinto, 15 holes (7,608 m); and, Lumina Copper, 249 holes (128,494 m). The distribution of drilling is shown in Figure 14-2.

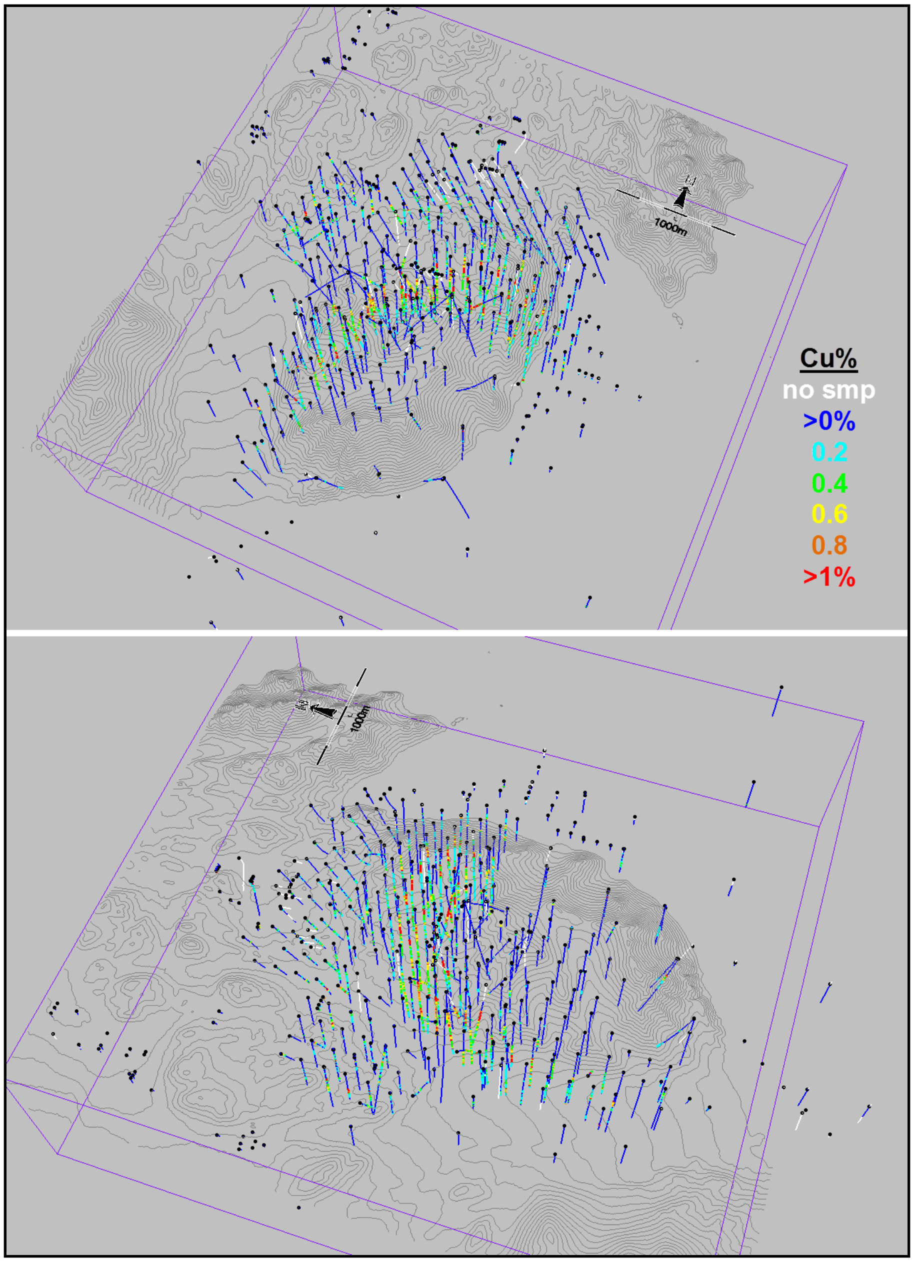


FIGURE 14-2: DISTRIBUTION OF COPPER GRADES IN DRILL HOLES

The previous mineral resource estimate was generated in April 2012. Figure 14-3 shows the distribution of data that was available for the April 2012 resource estimate (shown in blue) compared to the additional sample data available for use in the current resource estimate (shown in red). Significant additional drilling has been completed north and northwest of the main deposit area. Deep drilling has begun to delineate what appears to be the eastern limit of the deposit. Additional holes in the central and southern parts of the deposit have significantly improved the understanding of the deep-seated mineralization in these areas.

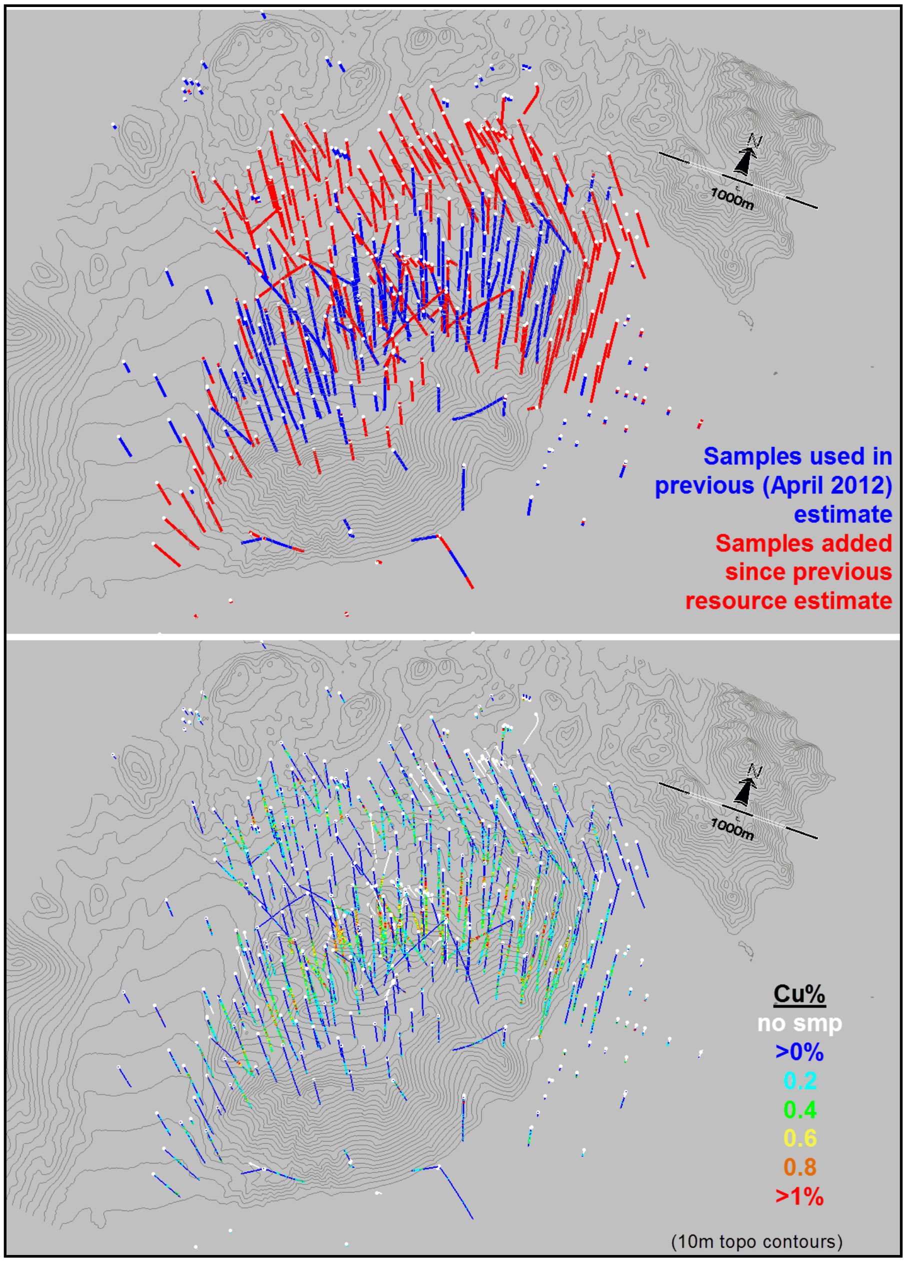


FIGURE 14-3: DISTRIBUTION OF ADDITIONAL SAMPLE DATA SINCE THE APRIL 2012 RESOURCE ESTIMATE

The majority of the drill holes that test the deeper porphyry zone are variably spaced between 100 m and 200 m intervals. Initial drilling on the deposit consisted of holes that ranged from 400-600 m long. In 2008, Rio Tinto drilled hole TTBJ0002 to a final depth of 1,153.3 m; this remains the deepest hole on the property. Lumina Copper has intersected appreciable copper mineralization in numerous drill holes pushed to greater than 900 m below surface. The majority of drill holes that test the porphyry are vertically-oriented with a few holes drilled at inclinations as shallow as -60°. Recent drill holes located in the northern part of the deposit area are inclined at -70° in an eastern direction to further evaluate a pervasive sub-vertical, north-south series of structures interpreted to be present.

Downhole survey data only exists for holes drilled since 2008; data includes holes drilled by Rio Tinto and all holes drilled by Lumina Copper. Available survey data indicates that drill hole deviations are variable, but can be significant in some cases, especially in the upper leached rocks. It is safe to assume that similar degrees of deviation have occurred in previous drill holes. This is not considered overly significant in respect to a global resource estimate using the current drill hole spacing; however, this fact should be considered as the Project evolves. Some drill holes may have to be re-drilled to confirm the exact location of the contained sample data.

A total of 149,293 m of the drilling was sampled and analyzed for copper and, in most cases, a suite of other minor elements. There are a total of 74,400 individual samples in the database that were tested for copper content, with an average sample length of 2 m. A total of 10 elements were incorporated into the resource model, many of which have no apparent economic influence on the Project. This report describes only the estimation of copper (Cu%), gold (Au g/t), and molybdenum (Mo%) in the resource model. A basic statistical summary of all of the primary sample data is listed in Table 14.2.

TABLE 14.2: BASIC SUMMARY OF ALL SAMPLE DATA

Element	Number of Samples	Total Length (m)	Minimum	Maximum	Mean	Standard Deviation
Copper (Cu%)	74,400	149,280	0	14.75	0.195	0.337
Molybdenum (Mo%)	73,872	148,229	0	1.000	0.009	0.015
Gold (Au g/t)	73,962	148,410	0	17.490	0.077	0.170

As stated previously, the Taca Taca drilling database includes holes that test for satellite exploration targets and near surface veins and mantos. Of the 440 drill holes in the database, 310 holes are within the immediate vicinity; these 310 holes have potential influence on the mineral resource estimate. A basic statistical summary of these proximal drill holes is listed in Table 14.3.

TABLE 14.3: BASIC SUMMARY OF SAMPLE DATA PROXIMAL TO THE RESOURCE MODEL

Element	Number of Samples	Total Length (m)	Minimum	Maximum	Mean	Standard Deviation
Copper (Cu%)	71144	143,740	0	14.75	0.201	0.341
Molybdenum (Mo%)	70,591	143,625	0	1.000	0.010	0.015
Gold (Au g/t)	70,714	143,713	0	14.300	0.078	0.149

The geologic information is derived primarily from observations during logging, and includes lithology, alteration facies, and mineral zonation type.

14.4 COMPOSITING

Drill hole samples are composited to standardize the database for further statistical evaluation. This step eliminates any effect sample lengths may have on the estimate.

To retain the original characteristics of the underlying data, a composite length that reflects the average original sample length is selected. The generation of longer composites results in some degree of smoothing which could mask some of the features of the data. Sample intervals range from 0.35-6 m long, with an average of 2 m. As a result, a standard 2 m composite sample length was generated for statistical evaluation and for use in grade estimations in the block model.

Drill hole composites are length-weighted and were generated “down-the-hole”; this means composites begin at the top of each hole and are generated at 2 m intervals down the length of the hole. The contacts of the MinZone (mineralized zone) domains, listed in Table 14.1, were honoured during compositing of drill holes. Several holes were randomly selected and the composited values were checked for accuracy. No errors were found. Logged lithology, alteration, and MinZone data were assigned to composited intervals on a majority basis to allow for statistical analysis of these variables.

14.5 EXPLORATORY DATA ANALYSIS

Exploratory data analysis (EDA) involves statistically summarizing the database to quantify the characteristics of the data. One of the main purposes of EDA is to determine if there is any evidence of spatial distinctions in grade; this would require the separation and isolation of domains during interpolation. The application of separate domains prevents unwanted mixing of data during interpolation; this will result in a grade model that better reflects the unique properties of the deposit. However, applying domain boundaries in areas where the data is not statistically unique may impose a bias in the distribution of grades in the model.

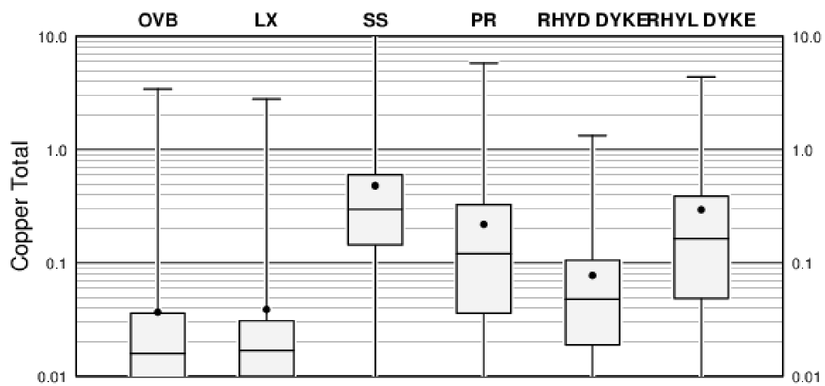
A domain boundary segregating the data during interpolation is typically applied if the average grade in one domain is significantly different from that of another domain. A boundary may also be applied where there is a significant change in the grade distribution across the contact.

14.5.1 Basic Statistics by Domain

The basic statistics for the distribution of copper, gold, and molybdenum were generated by lithology type, alteration facies type, and by interpreted MinZone type. The drill core logs have identified 13 different rock types; 86% are comprised of granite. Although some other rock types may suggest distinct metal properties, they tend to be so rare that it is not practical to use them for resource estimation purposes. The late stage Rhyodacite Dykes show relatively low copper grades compared to the Rhyolite Dykes that average 0.30% contained copper.

Comparison of alteration types show propylitic alteration tends to be lower in copper, gold, and molybdenum. This alteration type is present in only a few drill holes that tend to occur around the perimeter of the main deposit area.

The interpreted MinZone domains show copper grades to be highest in the Supergene Zone and lowest in the Leach Zone domain (Figure 14-4). The difference between the two types of dykes is quite evident: the Rhyolite Dyke grades are similar to the Supergene and Primary Zones, and the Rhyodacite Dykes show relatively low copper content. There are no significant differences in gold and molybdenum content in relation to the MinZone types.



	OVB	LX	SS	PR	RHYD DYKE	RHYL DYKE	
Number of data	569	24981	11937	32393	3215	1268	Number of data
Mean	0.037	0.039	0.483	0.22	0.078	0.297	Mean
Variance	0.022	0.01	0.326	0.072	0.009	0.152	Variance
Skewness	20.721	12.072	4.28	3.433	4.074	3.222	Skewness
Coef of Variation	4.031	2.581	1.182	1.223	1.189	1.315	Coef of Variation
Maximum	3.44	2.8	14.75	5.79	1.34	4.409	Maximum
Upper quartile	0.036	0.031	0.604	0.328	0.106	0.392	Upper quartile
Median	0.016	0.017	0.3	0.121	0.048	0.165	Median
Lower quartile	0.007	0.01	0.145	0.036	0.019	0.049	Lower quartile
Minimum	0.001	0.0	0.003	0.0	0.001	0.001	Minimum

FIGURE 14-4: BOX PLOT COPPER BY MINZONE DOMAIN

14.5.2 Contact Profiles

The nature of grade trends between two domains is evaluated using the contact profile; this profile graphically displays the average grades at increasing distances from the contact boundary. A contact profile that shows a marked difference in grade across a domain boundary is an indication that the two data sets should be isolated during interpolation. Conversely, if there is a more gradual change in grade across a contact, the introduction of a *hard* boundary (in other words, segregation during interpolation) may result in much different trends in the grade model. In this case, the change in grade between domains in the model is often more abrupt than the trends seen in the raw data. Finally, a flat contact profile indicates no grade changes across the boundary. In the case of a flat profile, hard or soft domain boundaries will produce similar results in the model.

Contact profiles were generated for copper grades between the interpreted MinZone domains. Distinct changes in grade are evident between all MinZones at the domain boundaries. The profiles for the Leach Zone-Supergene Zone (LX-SS) and Supergene Zone-Primary Zone (SS-PR) contacts are shown in Figures 14-5 and 14-6. The results suggest that these boundaries were honoured during the generation of the copper resource model. The Rhyolite Dyke does not show any significant grade change with the surrounding host rocks.

The nature of molybdenum and gold across domain boundaries was also reviewed and no significant trends or changes were identified.

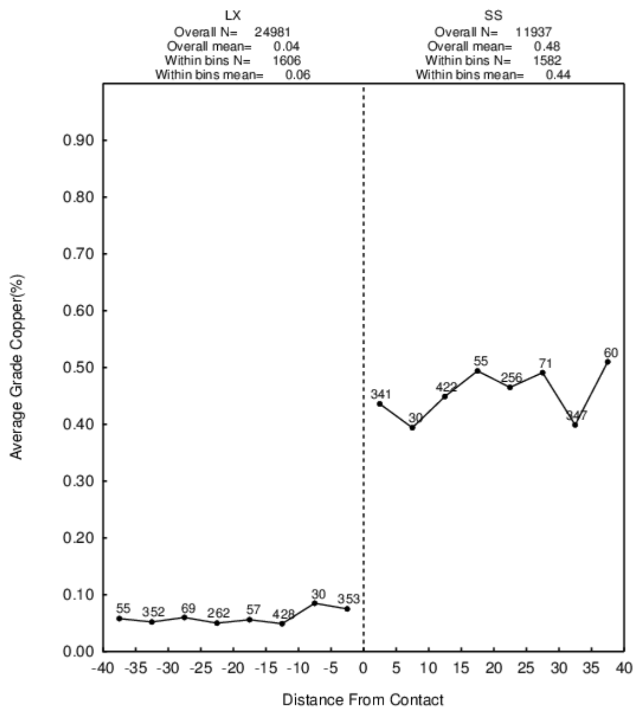


FIGURE 14-5: CONTACT PROFILE COPPER BETWEEN LX AND SS MINZONES

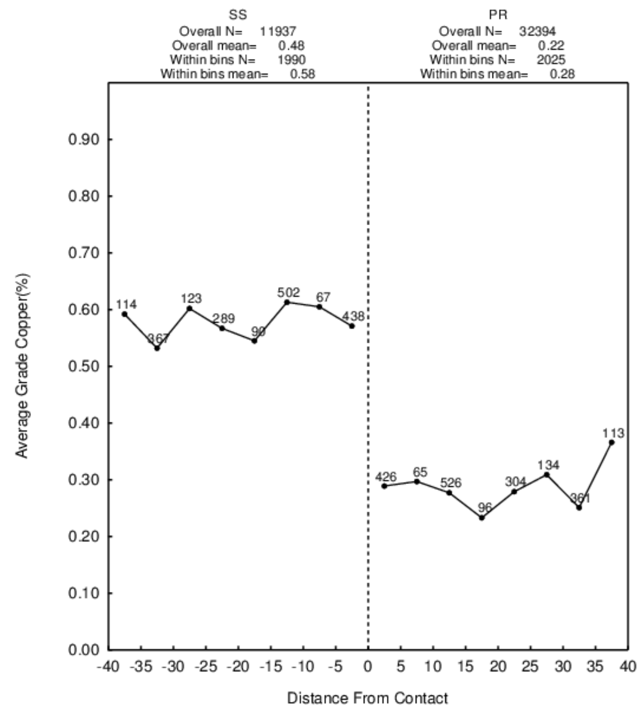


FIGURE 14-6: CONTACT PROFILES COPPER BETWEEN SS AND PR MINZONES

14.5.3 Conclusions and Modelling Implications

Boxplots show that differences exist in copper grades between the various MinZone domains, and this is further supported by the contact profile analysis. Late-stage Rhyodacite Dykes, containing lower copper grades, were interpreted using surface mapping and drill core logging information. All of these domains should be recognized and honoured with hard boundary conditions during block estimations of copper content in the resource model.

The Rhyolite Dykes show similar mineral content as their surrounding host rocks and, as a result, this unit does not require segregation during block grade interpolation. The areas identified as Rhyolite Dykes were included within the corresponding Leach, Supergene, or Primary MinZone domains.

There do not appear to be any significant differences in the distribution of gold or molybdenum in relation to any of the geologic domains present in the deposit. As a result, there are no restrictions during block grade interpolations of these elements.

The interpolation domains are summarized in Table 14.4.

TABLE 14.4: SUMMARY OF INTERPOLATION DOMAINS

Domain	Zone Code Number	Comments
Copper	1	OVB (Overburden Zone) – no estimates conducted
	2	LX (Leach Zone) -- hard boundary
	3	SS (Supergene Zone) – hard boundary
	4	PR (Primary Zone) – hard boundary
	5	Rhyodacite Dyke – hard boundary
Molybdenum	2-5	Combined all domains (excl. OVB)
Gold	2-5	Combined all domains (excl. OVB)

14.6 BULK DENSITY DATA

During the 2011-2012 drilling program, samples were sent to ALS Chemex in Lima, Peru for bulk density measurements. To date, a total of 662 samples were selected on approximately 100 m intervals from drill holes spread throughout the deposit area.

Bulk density was measured using the *wet* method: paraffin wax-coated pieces of core, averaging 10 cm to 15 cm in length, are weighed in air and then again while submerged in water. The following formula for specific gravity was used:

$$Specific\ Gravity\ = A/B - C - ((B - A)/D))$$

Note: A= weight of sample in air, B = weight of waxed sample in air, C = weight of waxed sample in water, and D = density of wax.

Although the density of data is considered insufficient to estimate the actual specific gravity (SG) values in model blocks, the data provides a relatively sound basis to determine average ranges. Table 14.5 lists the average bulk density values assigned to the model block by MinZone domain. These values are similar to the previous densities used in 2008 by Rio Tinto and are considered appropriate based on the rock types and mineralization present in the deposit.

TABLE 14.5: SUMMARY OF BULK DENSITY BY MINZONE DOMAIN

Domain	SG (t/m^3)
Overburden	1.90
LX	2.50
SS	2.62
PR	2.65
DYKE	2.60

14.7 EVALUATION OF OUTLIER GRADES

Histograms and probability plots were reviewed to identify the existence of anomalous outlier grades in the composited sample database. Following a review of the physical location of these potentially anomalous samples, it was decided that copper and molybdenum data could be controlled through an *outlier limitation*; this limits their effective distance to a maximum of 50 m during interpolation. Gold data is controlled through a combination of traditional top-cutting of composited samples > 3 g/t Au and an outlier limitation of samples > 1.5 g/t Au to a maximum influence distance of 50 m during block grade interpolation. These parameters are summarized in Table 14.6.

TABLE 14.6: SUMMARY OF OUTLIER LIMITS

Element/Domain	Threshold Grade	Number of Composites Affected	% Metal Loss in Model
Copper – LX	1.5%	20	-3.7%
SS	3.5%	44	-2.3%
PR	2.5%	23	-1.2%
DYKE	0.4%	38	-2.4%
Molybdenum	0.25%	19	-1.4%
Gold	Top cut to 3 g/t Au, >1.5 g/t Au limited to 50 m influence	19 comps >3 g/t Au 55 comps >1.5 g/t Au	-5.9%

Note: 2 m composited drill hole sample data. Outlier data limited to maximum distance of 50 m during interpolation except for gold as noted.

The proportion of copper metal lost in the LX (Leach Zone) domain appears significant, but this domain hosts very low copper grades and, as a result, the potential economic contribution is relatively small. Overall, the combined copper model is reduced by 1.4% as a result of the applied outlier limitations during block grade interpolations. The gold database shows a relatively skewed distribution, resulting in a moderate reduction in contained metal in the resource model. This suggests that additional drilling is required to fully understand the nature of gold in the deposit.

14.8 VARIOGRAPHY

The degree of spatial variability in a mineral deposit depends on both the distance and direction between points of comparison. Typically, the variability between samples is proportionate to the distance between samples. If the degree of variability is related to the direction of comparison, then the deposit is said to exhibit *anisotropic* tendencies which can be summarized with the search ellipse. The semi-variogram is a common function used to measure the spatial variability within a deposit.

The components of the variogram include the nugget, the sill, and the range. Often samples compared over very short distances (including samples from the same location) show some degree of variability. As a result, the curve of the variogram often begins at some point on the y-axis above the origin; this point is called the *nugget*. The nugget is a measure of not only the natural variability of the data over very short distances, but also a measure of the variability which can be introduced due to errors during sample collection, preparation, and assaying.

The amount of variability between samples typically increases as the distance between the samples increases. Eventually, the degree of variability between samples reaches a constant or maximum value; this is called the *sill*. The distance between samples at which this occurs is called the *range*.

The spatial evaluation of the data in this report was conducted using a correlogram instead of the traditional variogram. The correlogram is normalized to the variance of the data and is less sensitive to outlier values; this generally gives cleaner results.

Variograms were generated using the commercial software package Sage 2001© developed by Isaacs & Co. Multidirectional variograms were generated for copper, gold, and molybdenum in the various domains; the results are summarized in Tables 14.7, 14.8, and 14.9.

TABLE 14.7: VARIOGRAM PARAMETERS – COPPER

				1st Structure			2nd Structure		
Domain	**Nugget**	**Sill 1**	**Sill 2**	**Range (m)**	**Azimuth**	**Dip**	**Range (m)**	**Azimuth**	**Dip**
Leach	0.335	0.529	0.136	148	193	52	963	186	5
	Spherical			34	71	22	480	97	-2
				12	328	29	182	212	-85
Supergene	0.250	0.316	0.434	47	269	18	1191	82	6
	Spherical			27	356	-10	457	352	-4
				16	59	70	341	293	83
Primary	0.253	0.231	0.516	105	88	58	964	222	-20
	Spherical			43	351	4	677	186	66
				19	258	31	398	127	-13
Dyke	0.256	0.056	0.688	64	51	13	2045	8	20
	Spherical			59	314	26	1129	92	-15
				38	346	-61	131	148	64

Note: Correlograms conducted on 2 m composited drill hole sample data.

TABLE 14.8: VARIOGRAM PARAMETERS – MOLYBDENUM

				1st Structure			2nd Structure		
Zone	Nugget	S1	S2	Range (m)	AZ	Dip	Range (m)	AZ	Dip
LX+SS+PR+DK	0.300	0.385	0.315	72	36	7	1671	25	-25
	Spherical			37	289	65	1128	104	23
				4	129	23	733	338	55

Note: Correlograms conducted on 2 m composited drill hole sample data.

TABLE 14.9: VARIOGRAM PARAMETERS – GOLD

				1st Structure			2nd Structure		
Zone	Nugget	S1	S2	Range (m)	AZ	Dip	Range (m)	AZ	Dip
LX+SS+PR+DK	0.407	0.338	0.255	137	126	-30	2946	43	-12
	Spherical			26	22	-23	1305	128	24
				12	81	51	504	338	63

Note: Correlograms conducted on 2 m composited drill hole sample data.

14.9 MODEL SETUP AND LIMITS

The block model was initialized in MineSight® and the dimensions are defined in Table 14.10. The selection of a nominal block size measuring 25 x 25 x 15 mV is considered appropriate with respect to the current drill hole spacing and the selective mining unit (SMU) size which is typical of an operation of this type and scale. The model has not been rotated.

TABLE 14.10: BLOCK MODEL LIMITS

Direction	Minimum	Maximum	Block Size (m)	Number of Blocks
East	2626000	2630600	25	184
North	7281200	7285800	25	184
Elevation	2450	3770	15	88

Blocks in the model were coded on a majority basis with the MinZone code domains. During this stage, blocks along a domain boundary are coded if > 50% of the block occurs within the boundaries of that domain.

The proportion of blocks which occur below the topographic surface is also calculated and stored within the model as individual percentage items. These values are used as a weighting factor to determine the in-situ resources for the deposit.

14.10 INTERPOLATION PARAMETERS

The block model grades for copper, gold, and molybdenum were estimated using Ordinary Kriging (OK). The results of the OK estimation were evaluated using a series of validation approaches described in Section 14.11 (Validation). The interpolation parameters were adjusted until the appropriate results were achieved.

In most cases, the Taca Taca OK models were generated with a relatively limited number samples. This approach reduces the amount of smoothing or averaging in the model and, while there may be some uncertainty on a localized scale, this approach produces reliable estimations of the recoverable grade and tonnage for the overall deposit.

All grade estimations use length-weighted composite drill hole sample data. The interpolation parameters are summarized in Table 14.11.

The sub-vertical fault on the western edge of the deposit shows approximately 160 m of vertical displacement of the MinZone domain contacts. As a result, this fault is treated as a hard boundary (in other words, sample data is not mixed across this fault boundary) during interpolation of grades in the model.

Estimation of copper within the Supergene Zone domain was done in two passes. The first pass estimates blocks in the stratabound-type of supergene mineralization. The second pass reduces the mixing of data between the deep-seated, structure-type supergene mineralization by applying an oriented ellipse with shorter search ranges.

TABLE 14.11: INTERPOLATION PARAMETERS

Element/Domain	Search Ellipse Range (m)			Number of Composites			Other
	X	Y	Z	Min/block	Max/block	Max/hole	
Copper – LX	750	750	100	5	60	15	1 DH per quadrant
SS - strata	750	750	100	5	80	20	1 DH per quadrant
SS - structure	250	250	100	5	36	12	
PR	750	750	100	5	48	12	1 DH per quadrant
DYKE	750	750	100	5	24	8	1 DH per quadrant
Molybdenum	750	750	100	5	120	20	1 DH per quadrant
Gold	750	750	100	5	160	20	1 DH per octant

Note: Search ellipse Z-axis is vertical in all estimates except SS-structure. SS-structure ellipse oriented north-south dipping -70 degrees to the west.

14.11 VALIDATION

The results of the modelling process were validated through several methods including: a thorough visual review of the model grades in relation to the underlying drill hole sample grades; comparisons with the change of support model; comparisons with other estimation methods; and, grade distribution comparisons using swath plots.

14.11.1 Visual Inspection

A detailed visual inspection of the block model was conducted in both cross section and plan to ensure the desired results following interpolation. This included confirmation of the proper coding of blocks within the respective domains and below the topographic surface. The distribution of block grades was also compared relative to the drill hole samples to ensure the proper representation in the model.

Overall, all grade models showed the desired degree of correlation with the underlying sample data. The application of the deep-seated, supergene-type structures has restricted the impact on the high-grade intersections encountered at depth. At this stage of the Project, the nature of these structures is not well known, but this approach retains control of the model in these areas.

14.11.2 Model Checks for Change of Support

The relative degree of smoothing in the block model estimates were evaluated using the Discrete Gaussian or Hermitian Polynomial Change of Support method (Journel and Huijbregts, Mining Geostatistics, 1978). With this method, the distribution of the hypothetical block grades is directly compared to the estimated OK model using pseudo-grade/tonnage curves. Adjustments are made to the block model interpolation parameters until an acceptable match is made with the Herco distribution. In general, the estimated model should be slightly higher in tonnage and slightly lower in grade when compared to the Herco distribution at the projected cut-off grade. These differences account for selectivity and other potential ore-handling issues which commonly occur during mining.

The Herco (Hermitian correction) distribution is derived from the declustered composite grades which were adjusted to account for the change in support moving from smaller drill hole composite samples to the larger blocks in the model. The transformation results in a less skewed distribution, but retains the same mean as the original declustered samples.

Herco and model grade-tonnage plots were generated for the distribution of copper in the LX (Leach), SS (Supergene), and PR (Primary domains, and for molybdenum and gold in the combined domains. Examples for copper in the SS and PR domains, shown in Figures 14-7 and 14-8, exhibit the desired degree of correlation between models. Even though in some of the examples the model grade curves fall above the Herco grade curves, it should be noted that the change of support model is a theoretical tool intended to direct model estimation. There is uncertainty associated with the change of support model, and its results should not be viewed as final and correct values. In cases where the model grades are greater than the change of support grades, the model is relatively insensitive to changes in modelling parameters. Any extraordinary measures to change the grade curves are not warranted.

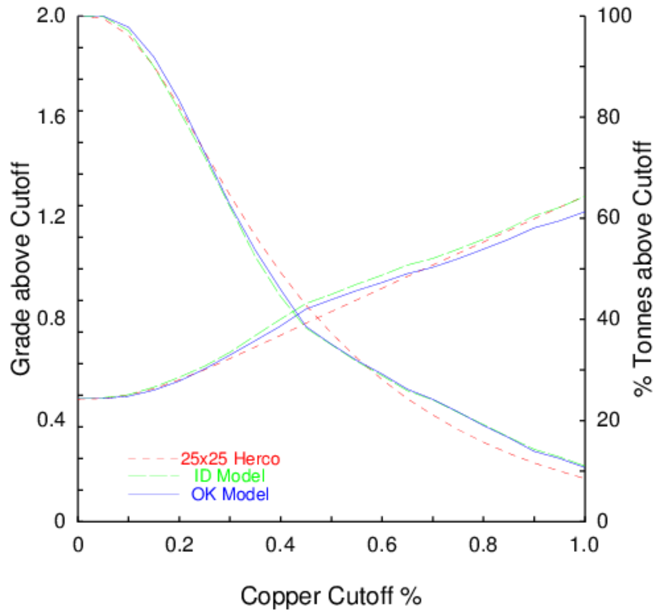


FIGURE 14-7: HERCO COPPER IN SS ZONE

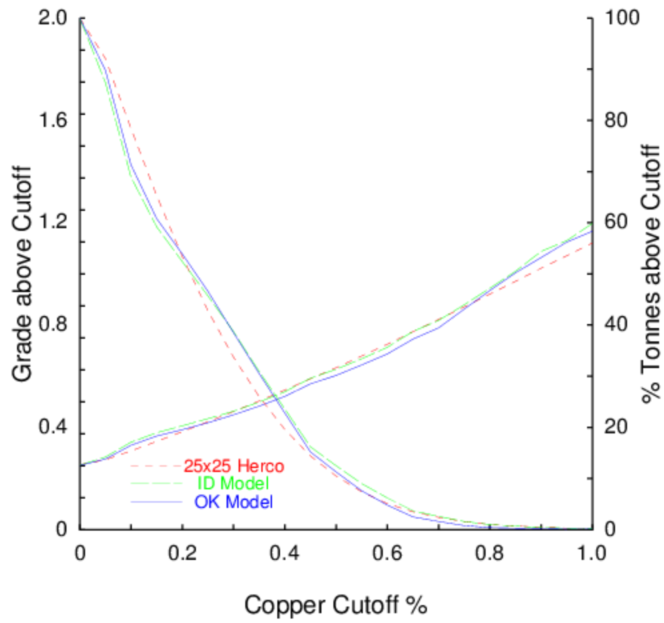


FIGURE 14-8: HERCO COPPER IN PR ZONE

14.11.3 Comparison of Interpolation Methods

For comparison purposes, additional models for copper, molybdenum, and gold were generated using both the inverse distance weighted (IDW) and nearest neighbour (NN) interpolation methods. (The NN model was created using data composited to 15 m intervals). The results of these models are compared to the OK models at various cut-off grades in the grade/tonnage graphs shown in Figures 14-9, 14-10, and 14-11. Overall, there is very good correlation between these models. It should be noted that the NN model reflects a different level of selectivity compared to the IDW or OK models. Therefore, it should follow the general trend of the other curves, but no error is suggested if the NN does not closely coincide with the other two models. Reproduction of the model using different methods tends to increase the level of confidence in the overall resource.

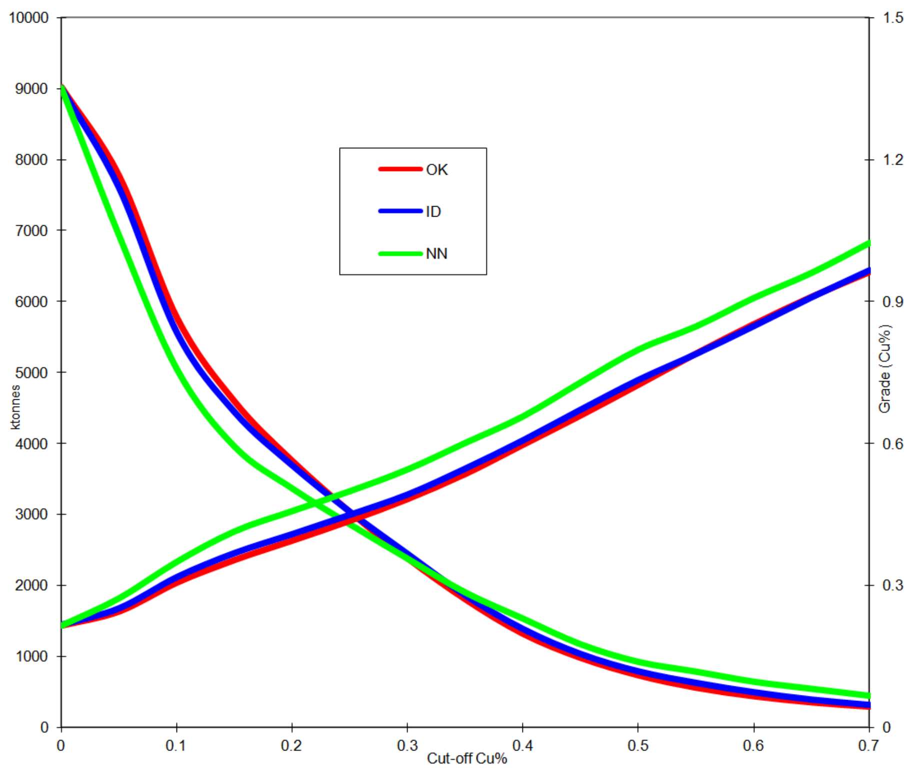


FIGURE 14-9: GT COMPARISON OF OK, IDW, AND NN COPPER MODELS

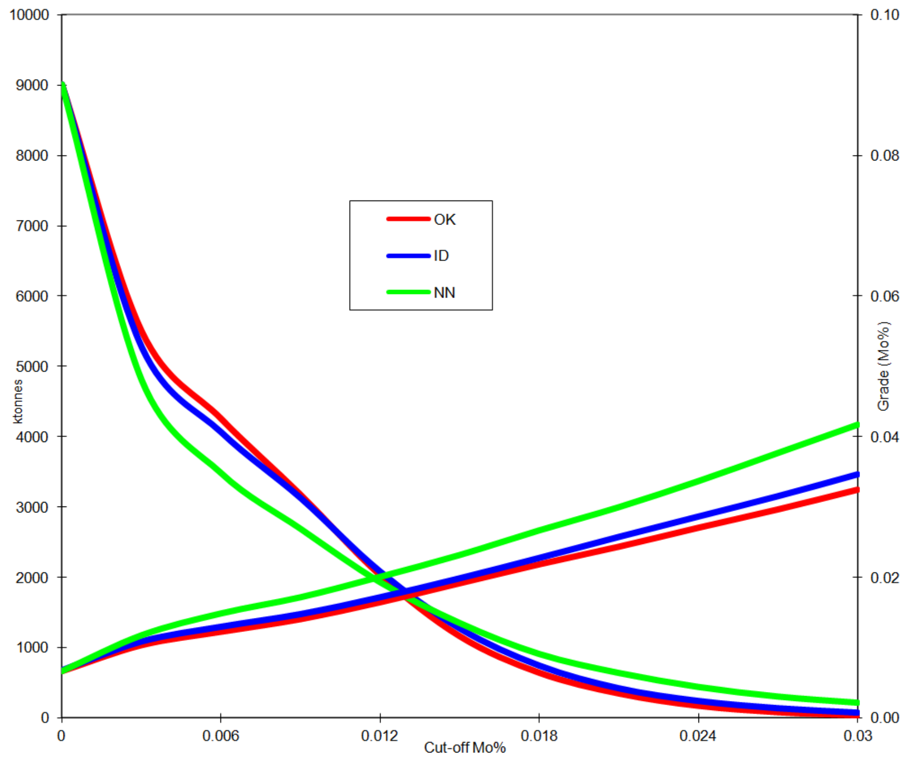


FIGURE 14-10: GT COMPARISON OF OK, IDW, AND NN MOLYBDENUM MODELS

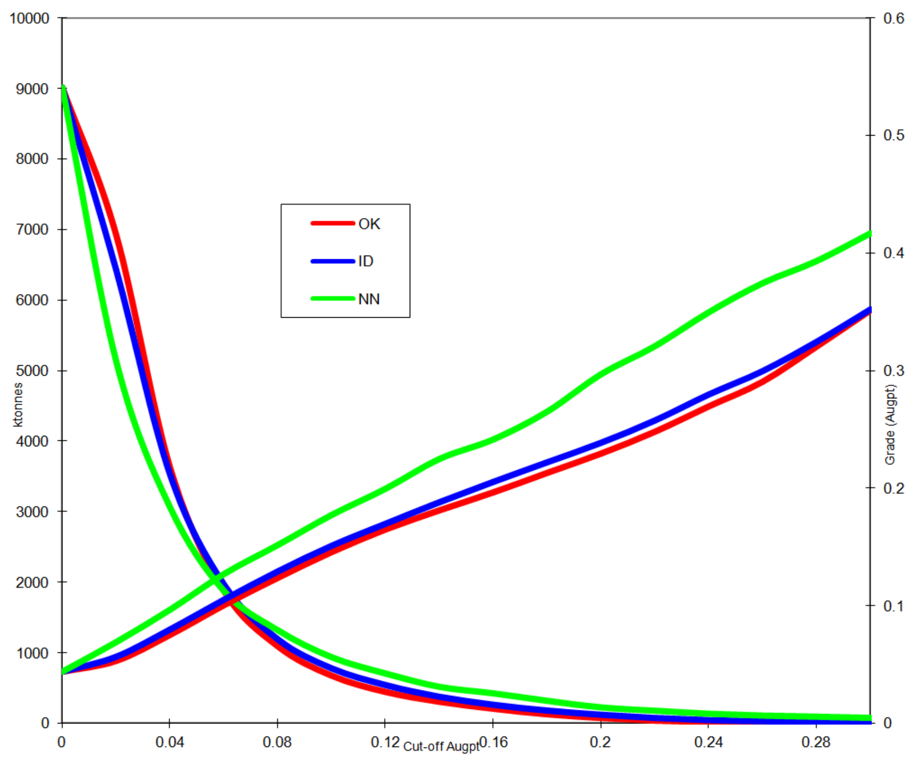


FIGURE 14-11: GT COMPARISON OF OK, IDW, AND NN GOLD MODELS

14.11.4 Swath Plots (Drift Analysis)

A swath plot is a graphical display of the grade distribution derived from a series of bands, or swaths, generated in several directions throughout the deposit. Grade variations from the OK model are compared using the swath plot to show the distribution derived from the declustered (NN) grade model.

On a local scale, the NN model does not provide reliable estimations of grade, but, on a much larger scale, it represents an unbiased estimation of the grade distribution based on the underlying data. Therefore, if the OK model is unbiased, the grade trends may show local fluctuations on a swath plot, but the overall trend should be similar to the NN distribution of grade.

Swath plots were generated in three orthogonal directions to compare the OK and NN distributions of copper, gold, and molybdenum in the deposit. Examples from the copper model are shown in Figures 14-12, 14-13, and 14-14.

There is good correspondence between the models in most areas of the deposit. The degree of smoothing in the OK model is evident in some of the peaks and valleys shown in the swath plots. Deviations tend to occur on the flanks of the deposit, or at depth, where the density of drilling often decreases.

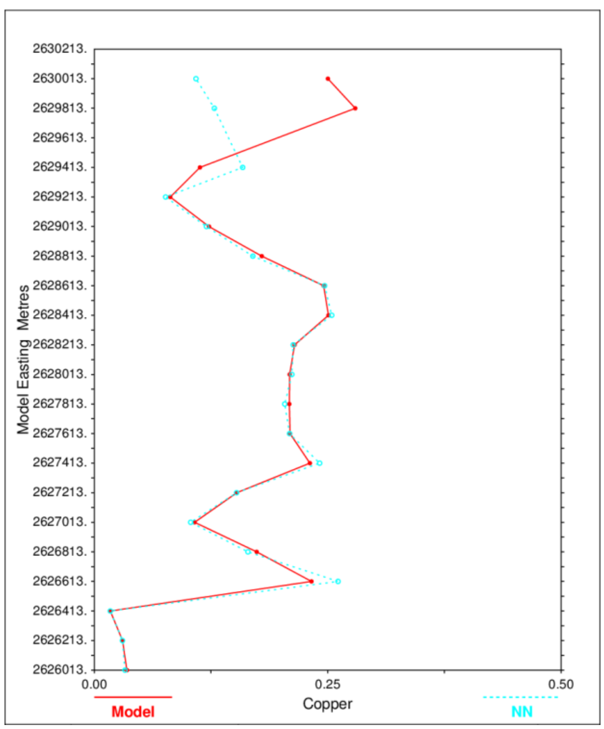


FIGURE 14-12: COPPER MODEL SWATH PLOT BY EASTING

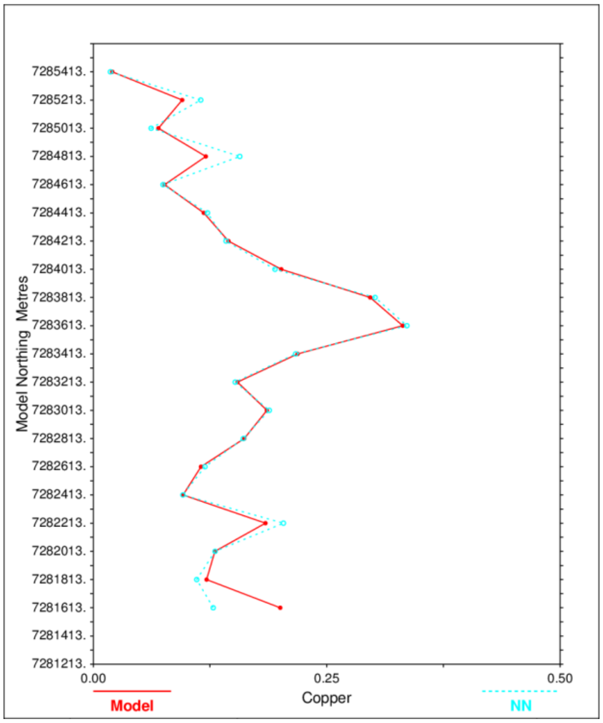


FIGURE 14-13: COPPER MODEL SWATH PLOT BY NORTHING

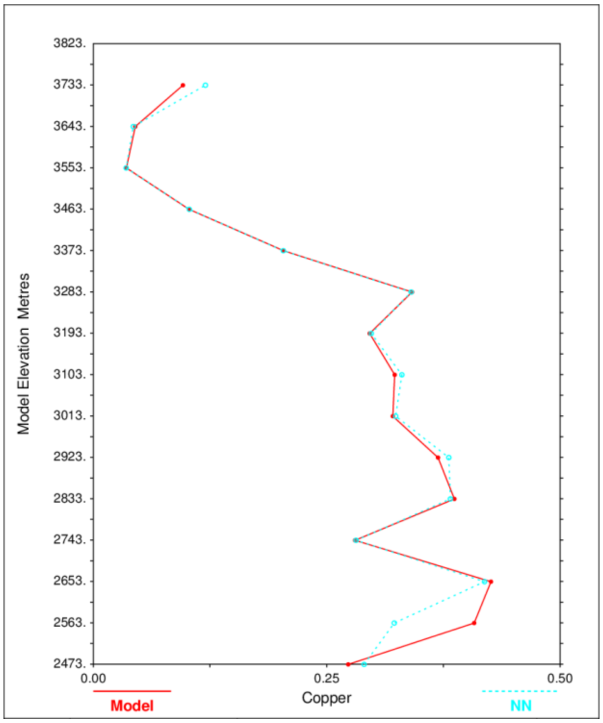


FIGURE 14-14: COPPER MODEL SWATH PLOT BY ELEVATION

14.12 RESOURCE CLASSIFICATION

Mineral resources for the Taca Taca Project were classified according to the *CIM Definition Standards for Mineral Resources and Mineral Reserves* (November 2010). The classification parameters are defined relative to the distance between sample data and are intended to encompass zones of reasonably continuous mineralization.

Mineral resources are limited to the porphyry-style mineralization and exclude any peripheral manto- or vein-type mineralization that was intersected in some of the short drill holes that flank the deposit. Although these peripheral veins and mantos represent only a minor fraction of the potential resource, the current drilling density is insufficient to properly evaluate the nature of these occurrences. The extent of the porphyry mineralization is shown in plan in Figure 14-15. Copper resources are also limited to resource blocks that occur within the Supergene and Primary Zone domains. Potentially leachable gold resources are also present in the Leach Zone domain and are included as additional Inferred resources based on gold cut-off grades. Because not all drill hole intervals that intersect the Leach Zone domain were sampled and analyzed for gold content, resources in this domain are classified in the Inferred category.

The results of the copper grade and indicator variograms, together with experience gained through visual interpretation of the drilling results to-date, form the basis of the classification criteria for mineral resources at Taca Taca. Inferred resources include blocks within a maximum distance of 250 m from a drill hole. Indicated resources are defined by areas delineated by continuous drilling with a maximum grid spacing of 150 m. Portions of the deposit that meet these initial criteria were further reviewed to ensure that they exhibit the appropriate continuity to support the level of confidence required for resources in the Indicated category. Ultimately, a manually generated volume was interpreted and used to code blocks in the model that meet the criteria for Indicated-class resources. There are no resources that meet the criteria necessary to be included in the Measured category.

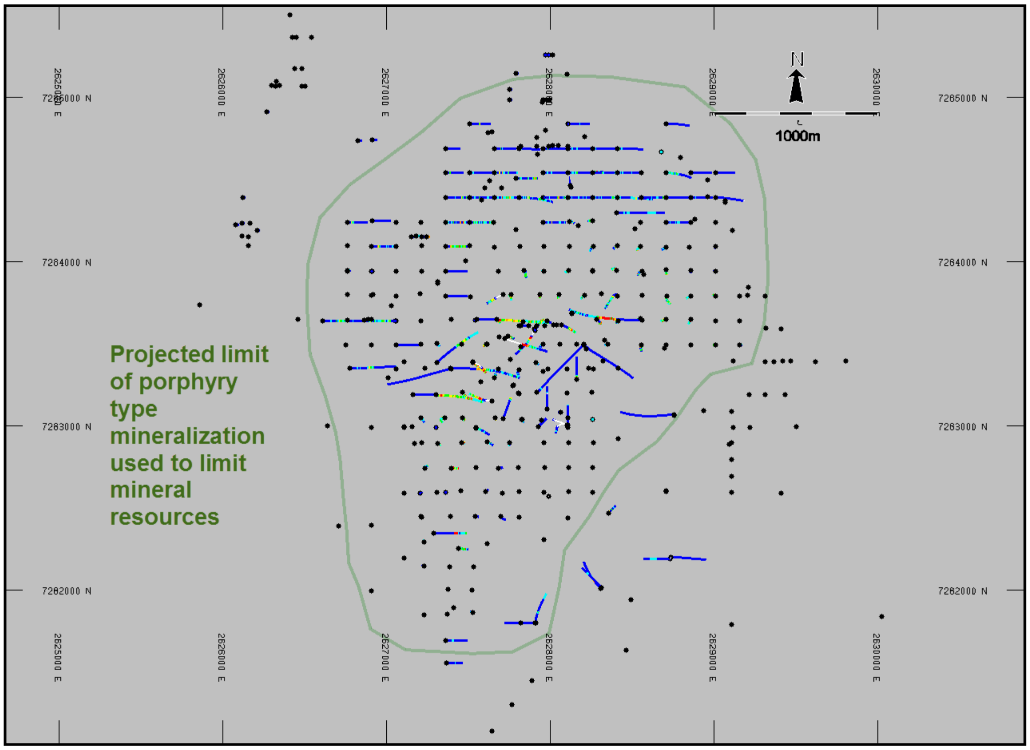


FIGURE 14-15: PLAN MAP SHOWING LIMIT OF PORPHYRY TYPE MINERALIZATION

14.13 MINERAL RESOURCES

Although the Taca Taca deposit is primarily a copper deposit, gold and molybdenum are sufficiently present to significantly contribute to the potential value of the deposit. As a result, the mineral resources are estimated based on a copper equivalent (CuEq) cut-off grade. The CuEq grades were calculated in each block in the model based on the following equation and assumptions:

$$CuEq\% = Cu\% + ((Aug/t * 0.583) + (Mo\% * 6)$$

CuEq% Assumptions:

Metal prices: US$2/lb Cu, US$800/oz Au, and US$12/lb Mo. Mining and metallurgical recoveries are assumed to be 100%.

The estimated Taca Taca mineral resources are summarized at various cut-off grades for comparison purposes in Tables 14.12 and 14.13; the base case cut-off grades for copper resources of 0.3% CuEq and for gold resources of 0.2 g/t Au are highlighted. The base case cut-off grades are based on assumptions derived from operations with similar characteristics, scale, and location. The base case cut-off grade for the copper mineral resource estimate has been decreased from 0.4% copper equivalent, used in the previous resource estimate, to 0.3% copper equivalent to align the mineral resource estimate with the net smelter return cut-off that will be used to define the parameters of the mine plan to be incorporated in the forthcoming Preliminary Economic Assessment ("PEA"). There has been no change to the cut-off grade of 0.2g/t gold for the oxide gold resource estimate.

To ensure that the reported resource estimate exhibits reasonable prospects for economic extraction, it is limited within a pit shell generated about copper equivalent grades in blocks classified in the Indicated and Inferred categories at a copper price of US$2/lb (including a 45° pit slope, US$1.5/t mining cost for ore and waste, and US$6/t total site operating cost). This test indicates that some of the deeper mineralization may not be economic due to the increased strip ratios that result from the local topographic configuration. It is important to understand that Tables 14.12 and 14.13 list mineral resources; mineral resources are not mineral reserves as they do not have demonstrated economic viability. There is no certainty that all or any part of the mineral resource will be converted into a mineral reserve upon application of modifying factors.

TABLE 14.12: SUPERGENE AND PRIMARY SULPHIDE ZONE MINERAL RESOURCE ESTIMATE

Cut-off Grade (CuEq%) (1)	Mtonnes	Total Cu (%)	Mo (%)	Au (g/t)	CuEq (%)
INDICATED MINERAL RESOURCE					
0.2	2,817	0.38	0.011	0.07	0.49
0.25	2,484	0.41	0.012	0.07	0.53
0.3	**2,165**	**0.44**	**0.013**	**0.08**	**0.57**
0.35	1,851	0.48	0.014	0.09	0.61
0.4	1,545	0.51	0.015	0.09	0.65
0.45	1,249	0.56	0.015	0.10	0.71
0.5	997	0.61	0.016	0.11	0.77
0.55	811	0.65	0.017	0.12	0.83
0.6	660	0.70	0.018	0.13	0.88
0.65	544	0.75	0.018	0.13	0.94
0.7	454	0.80	0.019	0.14	0.99
INFERRED MINERAL RESOURCE					
0.2	1,396	0.31	0.010	0.05	0.40
0.25	1,135	0.34	0.011	0.05	0.43
0.3	**921**	**0.37**	**0.012**	**0.05**	**0.47**
0.35	731	0.40	0.012	0.06	0.51
0.4	571	0.44	0.013	0.06	0.55
0.45	421	0.48	0.014	0.06	0.59
0.5	302	0.52	0.014	0.07	0.64
0.55	219	0.56	0.015	0.07	0.69
0.6	162	0.59	0.015	0.07	0.73
0.65	117	0.63	0.016	0.07	0.77
0.7	76	0.68	0.016	0.07	0.81

(1) CuEq=Cu% + (Au g/t*0.583) + (Mo%*6). Metal prices (US$): $2.00/lb Cu, $800/oz Au, $12.00/lb Mo (assumes 100% mining and metallurgical recoveries).
(2) "Base case" cut-off grade for Supergene and Primary Zone resources is 0.30% CuEq

TABLE 14.13: LEACH ZONE OXIDE MINERAL RESOURCE ESTIMATE

Cut-off Grade (Au g/t) (1)	Mtonnes	Au (g/t)	Total Cu (%)	Mo (%)
INDICATED MINERAL RESOURCE				
0.1	799	0.18	0.04	0.016
0.15	483	0.22	0.04	0.017
0.2	**243**	**0.27**	**0.04**	**0.018**
0.25	126	0.31	0.04	0.018
0.3	57	0.34	0.05	0.017
0.35	20	0.39	0.07	0.017
0.4	5.6	0.44	0.10	0.017
INFERRED MINERAL RESOURCE				
0.1	213	0.14	0.07	0.011
0.15	66	0.18	0.09	0.011
0.2	**17**	**0.23**	**0.11**	**0.008**
0.25	3	0.30	0.10	0.010
0.3	1	0.35	0.11	0.010
0.35	0	0.44	0.12	0.005
0.4	0.1	0.51	0.09	0.001

(1) “Base case” cut-off grade for Leach Zone resource is 0.2 g/t Au.

Figure 14-16 shows the distribution of the base case copper resource. Figure 14-17 shows the distribution of base case resources, including the Leach Zone gold resource.

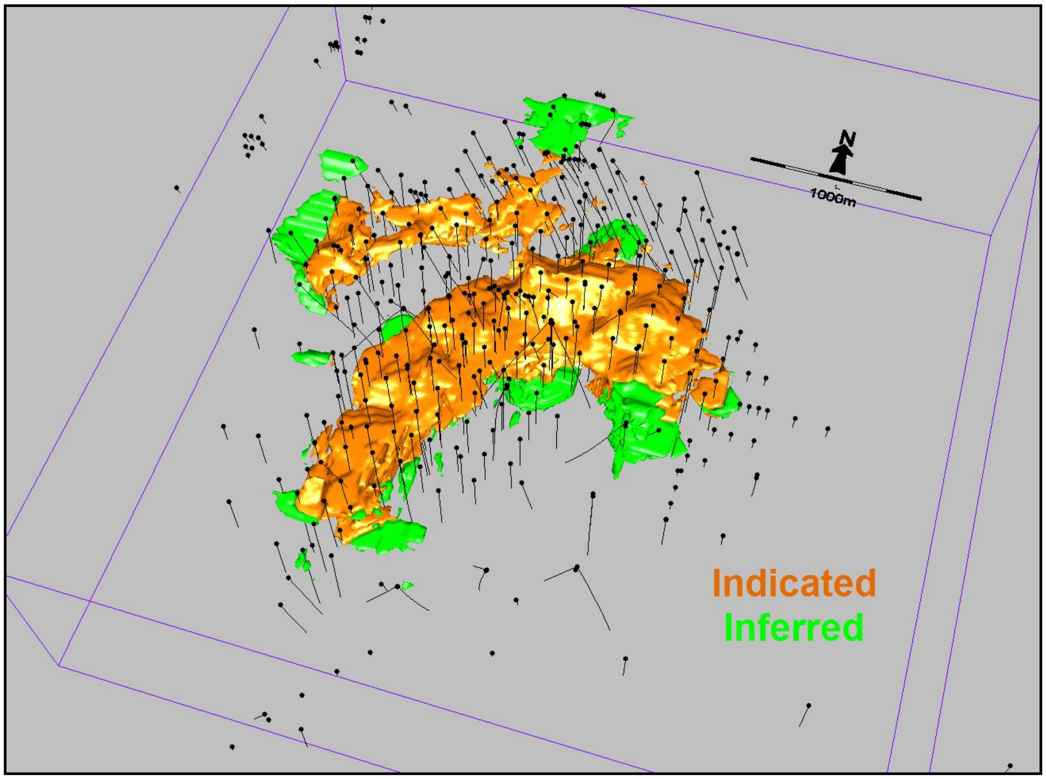


FIGURE 14-16: EXTENTS OF BASE CASE INDICATED AND INFERRED COPPER RESOURCES

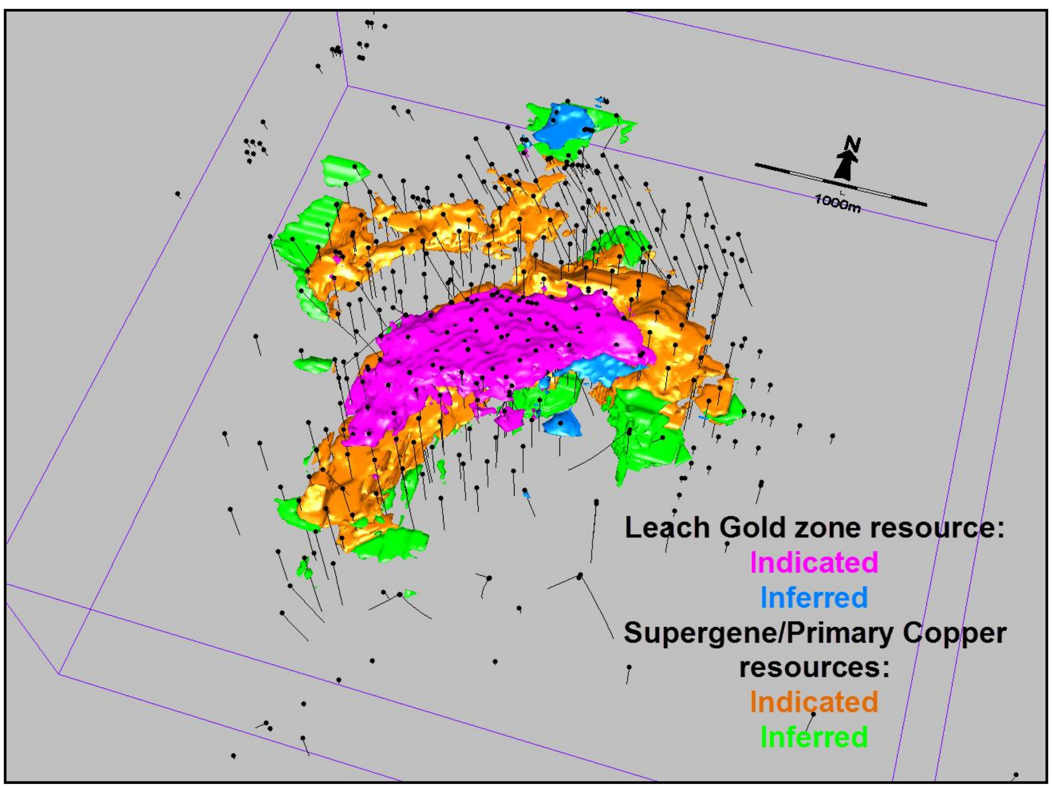


FIGURE 14-17: EXTENTS OF BASE CASE RESOURCES INCLUDING LX ZONE GOLD RESOURCE

The proportion of Supergene and Primary Zone resources are listed in Table 14.14.

TABLE 14.14: COPPER MINERAL RESOURCE ESTIMATE BY TYPE

	SUPERGENE				PRIMARY			
Cut-off Grade (CuEq%)	Mtonnes	Cu (%)	Mo (%)	Au (g/t)	Mtonnes	Cu (%)	Mo (%)	Au (g/t)
INDICATED MINERAL RESOURCE								
0.2	898	0.52	0.008	0.07	1,919	0.32	0.013	0.07
0.25	809	0.55	0.008	0.07	1,675	0.35	0.014	0.08
0.3	**701**	**0.60**	**0.009**	**0.08**	**1,464**	**0.37**	**0.015**	**0.08**
0.35	601	0.65	0.010	0.09	1,250	0.39	0.015	0.09
0.4	517	0.70	0.012	0.09	1,028	0.42	0.016	0.09
0.45	448	0.75	0.013	0.10	801	0.45	0.017	0.10
0.5	392	0.80	0.014	0.11	605	0.48	0.018	0.11
0.55	349	0.84	0.015	0.11	462	0.51	0.019	0.12
0.6	318	0.87	0.016	0.12	342	0.55	0.020	0.13
0.65	292	0.90	0.017	0.13	252	0.58	0.020	0.14
0.7	270	0.93	0.017	0.13	183	0.61	0.021	0.15
INFERRED MINERAL RESOURCE								
0.2	123	0.38	0.004	0.06	1,273	0.30	0.011	0.05
0.25	109	0.40	0.005	0.06	1,026	0.33	0.012	0.05
0.3	**90**	**0.44**	**0.005**	**0.06**	**831**	**0.37**	**0.012**	**0.05**
0.35	71	0.48	0.006	0.06	660	0.40	0.013	0.06
0.4	56	0.52	0.007	0.06	515	0.43	0.014	0.06
0.45	42	0.57	0.007	0.06	379	0.46	0.014	0.06
0.5	33	0.62	0.008	0.06	269	0.50	0.015	0.07
0.55	26	0.66	0.009	0.06	193	0.54	0.016	0.07
0.6	22	0.69	0.009	0.06	140	0.58	0.016	0.07
0.65	18	0.73	0.010	0.06	99	0.61	0.017	0.07
0.7	14	0.76	0.010	0.06	62	0.66	0.017	0.07

(1) CuEq=Cu% + (Au g/t*0.583) + (Mo%*6). Metal prices (US$): $2.00/lb Cu, $800/oz Au, $12.00/lb Mo (assumes 100% mining and metallurgical recoveries).
(2) “Base case” cut-off grade for Supergene and Primary Zone resources is 0.30% CuEq

14.14 COMPARISON WITH PREVIOUS RESOURCE ESTIMATE

The previous mineral resource estimate for the Taca Taca deposit is described in the Technical Report dated 21 June 2012 (effective date: 11 April 2012). The previous and current resource estimates are compared in Table 14.15 for the copper mineral resources and in Table 14.16 for the Leach Zone mineral resources.

TABLE 14.15: COMPARISON OF COPPER MINERAL RESOURCES – APRIL 2012 VS. NOV 2012

	NOVEMBER 2012				APRIL 2012			
Cut-off Grade (CuEq%) (1)	Mtonnes	Cu (%)	Mo (%)	Au (g/t)	Mtonnes	Cu (%)	Mo (%)	Au (g/t)
INDICATED MINERAL RESOURCE								
0.25	2,484	0.41	0.012	0.07	1,060	0.51	0.016	0.10
0.3 (2)	**2,165**	**0.44**	**0.013**	**0.08**	**995**	**0.53**	**0.017**	**0.11**
0.35	1,851	0.48	0.014	0.09	918	0.56	0.017	0.11
0.4	1,545	0.51	0.015	0.09	824	0.59	0.018	0.12
0.45	1,249	0.56	0.015	0.10	728	0.62	0.018	0.12
0.5	997	0.61	0.016	0.11	638	0.66	0.019	0.13
0.55	811	0.65	0.017	0.12	558	0.70	0.019	0.14
0.6	660	0.70	0.018	0.13	479	0.75	0.020	0.15
0.65	544	0.75	0.018	0.13	412	0.79	0.020	0.16
0.7	454	0.80	0.019	0.14	358	0.84	0.020	0.16
INFERRED MINERAL RESOURCE								
0.25	1,135	0.34	0.011	0.05	1,778	0.37	0.012	0.06
0.3 (2)	**921**	**0.37**	**0.012**	**0.05**	**1,479**	**0.40**	**0.012**	**0.07**
0.35	731	0.40	0.012	0.06	1,196	0.44	0.013	0.07
0.4)	571	0.44	0.013	0.06	938	0.48	0.014	0.08
0.45	421	0.48	0.014	0.06	717	0.52	0.014	0.09
0.5	302	0.52	0.014	0.07	538	0.58	0.015	0.09
0.55	219	0.56	0.015	0.07	410	0.63	0.015	0.10
0.6	162	0.59	0.015	0.07	314	0.69	0.016	0.10
0.65	117	0.63	0.016	0.07	242	0.76	0.016	0.11
0.7	76	0.68	0.016	0.07	189	0.82	0.016	0.11

(1) CuEq=Cu% + (Au g/t*0.583) + (Mo%*6). Metal prices (US$): $2.00/lb Cu, $800/oz Au, $12.00/lb Mo. Assumes 100% mining and metallurgical recoveries as these remain uncertain.
(2) "Base case" cut-off grade for Supergene and Primary Zone resources is 0.30% CuEq.

TABLE 14.16: COMPARISON OF LEACH ZONE MINERAL RESOURCES – APRIL 2012 VS. NOV 2012

	NOVEMBER 2012				APRIL 2012			
Cut-off Grade Au g/t (1)	**Mtonnes**	**Au (g/t)**	**Cu (%)**	**Mo (%)**	**Mtonnes**	**Au (g/t)**	**Cu (%)**	**Mo (%)**
INDICATED MINERAL RESOURCE								
0.1	799	0.18	0.04	0.016	492	0.20	0.04	0.017
0.15	483	0.22	0.04	0.017	327	0.23	0.04	0.017
0.2	**243**	**0.27**	**0.04**	**0.018**	**198**	**0.27**	**0.04**	**0.018**
0.25	126	0.31	0.04	0.018	112	0.31	0.05	0.018
0.3	57	0.34	0.05	0.017	51	0.36	0.05	0.018
0.35	20	0.39	0.07	0.017	22	0.42	0.06	0.018
0.4	5.6	0.44	0.10	0.017	10.0	0.48	0.07	0.018
INFERRED MINERAL RESOURCE								
0.1	213	0.14	0.07	0.011	336	0.17	0.06	0.015
0.15	66	0.18	0.09	0.011	157	0.22	0.06	0.017
0.2	**17**	**0.23**	**0.11**	**0.008**	**81**	**0.26**	**0.07**	**0.017**
0.25	3	0.30	0.10	0.010	34	0.31	0.06	0.017
0.3	1	0.35	0.11	0.010	13	0.36	0.06	0.017
0.35	0	0.44	0.12	0.005	5	0.43	0.09	0.016
0.4	0.1	0.51	0.09	0.001	2.5	0.49	0.12	0.016

(1) “Base case” cut-off grade for Leach Zone resource is 0.2 g/t Au.

Drilling conducted by Lumina Copper since the previous resource estimate has resulted in some significant changes to the estimated mineral resources. These changes include the following: (Note that changes to the base case copper resources are shown in Figures 14-18 and 14-19):

- The base case cut-off grade for the copper mineral resource estimate has been decreased from 0.4% copper equivalent to 0.3% copper equivalent to align the mineral resource estimate with the net smelter return cut-off that will be used to define the parameters of the mine plan to be incorporated in the forthcoming PEA. There has been no change to the cut-off grade of 0.2g/t gold for the oxide gold resource estimate.

- Indicated-class copper resource estimate has almost doubled because previously Inferred-class resources have been upgraded in the main deposit area, and new resources were delineated in the northern and northwestern extension areas. The additional resources in the northern and northwestern extension areas tend to be lower grade when compared to the main deposit area.

- Inferred-class resources have decreased because delineation drilling has upgraded these resources into the Indicated category.
- Leach Zone gold resources have changed because the previously Inferred-class resources have been upgraded to the Indicated category.

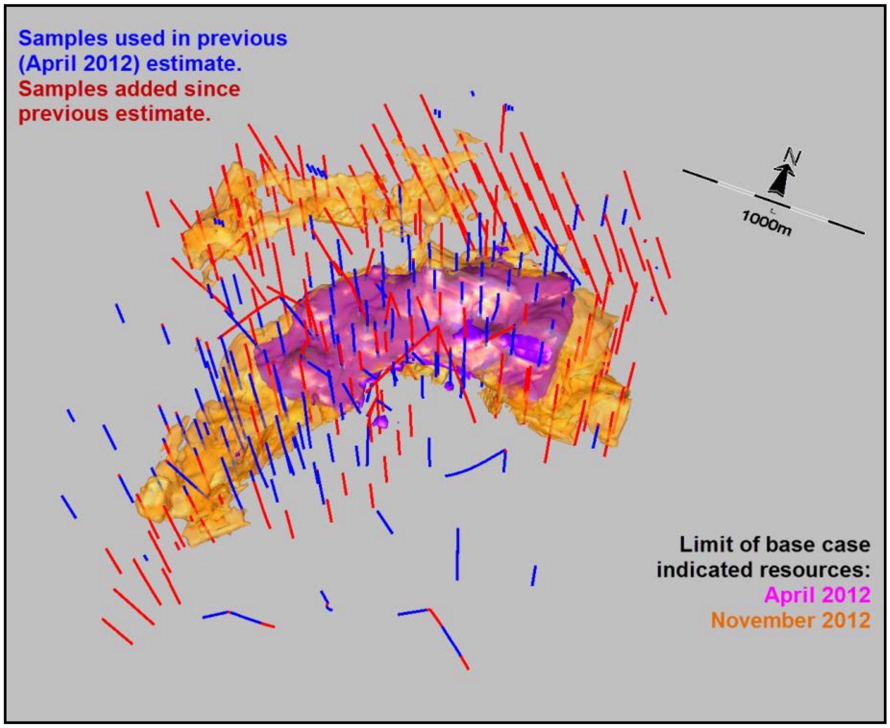


FIGURE 14-18: CHANGES TO BASE CASE INDICATED RESOURCES NOV 2012 VS. APRIL 2012

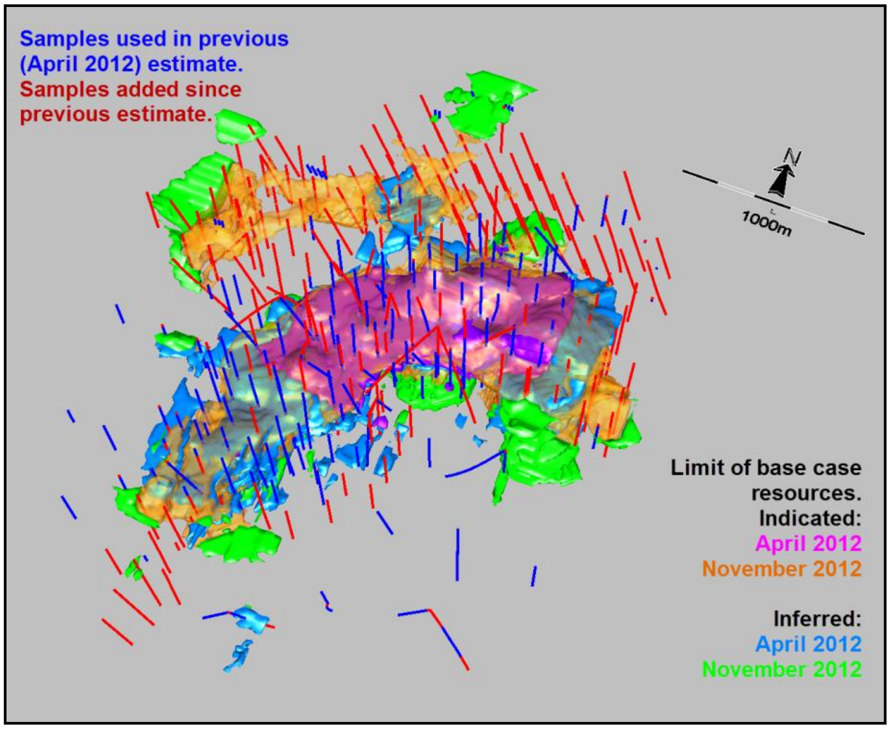


FIGURE 14-19: CHANGES TO BASE CASE INDICATED & INFERRED RESOURCES NOV 2012 VS. APRIL 2012

14.15 FOREIGN OPERATIONS AND POLITICAL RISK

The Taca Taca Project is located in Argentina, which has, from time to time, experienced economic or political instability. Lumina Copper may be materially adversely affected by risks associated with conducting exploration and potential development activities in Argentina, including: political instability and violence; war and civil disturbance; acts of terrorism; expropriation or nationalization; inequitable treatment of non-domiciled companies; renegotiation or nullification of existing concessions; changing legal and fiscal regimes; fluctuations in currency exchange rates; high rates of inflation; underdeveloped industrial and economic infrastructure; unenforceability of contractual rights; governmental regulations that favour or require the awarding of contracts to local contractors or require foreign contractors to employ citizens of, or purchase supplies from, a particular jurisdiction; and, other risks arising out of foreign governmental sovereignty.

In May 2012, the government of Argentina re-nationalized Yacimientos Petroliferos Fiscales, the country’s largest oil and gas company. Although Lumina Copper has not received any notice, nor is aware of any other indication that the federal government or any provincial government of Argentina has any intention of expropriating or nationalizing businesses in the mining sector, including the Taca Taca Project, there can be no assurance that the government of Argentina will not nationalize other businesses operating in the country, including businesses in the mining sector and more specifically, the Taca Taca Project. If an expropriation or nationalization were to occur, there is no certainty that Lumina Copper would receive the fair market value of the Taca Taca Project from such government body.

Provincial governments of Argentina have considerable authority over exploration and mining in their province and there are Argentinean provinces where the provincial government has taken anti-mining stances by passing laws to curtail or ban mining in those provinces. The current provincial government of the Province of Salta, where the Taca Taca Project is situated, is supportive of the exploration and mining industry; however, such a situation may change in the future. Future changes in applicable laws and regulations or changes in their enforcement or regulatory interpretation could negatively impact current or planned exploration and development activities for the Taca Taca Project.

In addition, Lumina Copper's mineral exploration and potential future mining activities in Argentina may be affected in varying degrees by factors beyond Lumina Copper's control including government regulations with respect to restrictions on production, price controls, foreign exchange controls, export controls, taxes, royalties, environmental legislation and mine safety. Such factors may prevent or restrict mining of some or all of the Taca Taca Project or cause a material reduction in mineral resources estimated for the Taca Taca Project. Accordingly, the Lumina Copper's exploration and development activities in Argentina could be substantially affected by factors beyond Lumina Copper's control, any of which could have a material adverse effect on Lumina Copper and the Taca Taca Project.

15 MINERAL RESERVE ESTIMATES

At present there are no mineral reserve estimates for the Taca Taca Project.

16 MINING METHODS

This section is not applicable.

17 RECOVERY METHODS

This section is not applicable.

18 PROJECT INFRASTRUCTURE

This section is not applicable

19 MARKET STUDIES AND CONTRACTS

This section is not applicable.

20 ENVIRONMENTAL STUDIES, PERMITTING, AND SOCIAL OR COMMUNITY IMPACT

Lumina Copper has the necessary permits to conduct the drill programs. Baseline environmental studies are ongoing and discussions were initiated with local communities and government agencies. Refer to Section 4.3 (Environmental Regulations and Permitting) of this Technical Report for further discussion on these matters.

21 CAPITAL AND OPERATING COSTS

This section is not applicable.

22 ECONOMIC ANALYSIS

This section is not applicable.

23 ADJACENT PROPERTIES

The Taca Taca Alto mineralized zone is located 4 km west of Taca Taca. It is hosted by a Paleozoic intrusive complex, which is intruded by granitic to rhyodacitic porphyries. The porphyritic intrusions associated with the mineralization were dated at 257 Ma (K/Ar, Rubinstein, 1997) and 260 Ma (Rio Tinto, 1999). This is much older than the mineralizing event at Taca Taca which is Oligocene (29 Ma). A 2.5 km by 3 km alteration zone is characterized by a potassic core overprinted by phyllic and advanced argillic alteration. Three mineralization stages have been recognized: early pyrite-bornite-chalcopyrite; pyrite-molybdenite related to the phyllic alteration phase; and, digenite-covellite related to supergene enrichment (Rubinstein et al, 2000).

The qualified persons have not verified the information concerning the Taca Taca Alto mineralized zone and this information is not necessarily indicative of the mineralization on the Taca Taca property.

24 OTHER RELEVANT DATA

There is no other relevant data or information.

25 INTERPRETATION AND CONCLUSIONS

The following conclusions are based on the recent drilling conducted by Lumina Copper at the Taca Taca Project in Argentina:

- The level of understanding of the geology at Taca Taca is relatively good. The practices used during the various drilling campaigns were conducted in a professional manner and adhere to accepted industry standards. There are no factors evident that would lead one to question the integrity of the database.

- A significant porphyry copper-gold-molybdenum deposit was outlined. Oligocene-age mineralization associated with rhyodacitic porphyries is hosted in coarse-grained Ordovician granite that exhibits strong quartz stockworks and phyllic alteration.

- Recent drilling has revealed a rhyodacitic stock that occurs at shallow depths beneath the core of the Taca Taca alteration zone. This rhyodacitic intrusion and associated dykes are interpreted as the source of the mineralizing fluids.

- Drilling to date has outlined an Indicated sulphide resource estimate (at a 0.3% CuEq cut-off) of 2,165 Mtonnes at 0.44% Cu, 0.08 g/t Au, and 0.013% Mo (0.57% CuEq) which contains 21.1 billion pounds of copper, 5.6 million ounces of gold, and 616 million pounds of molybdenum.

- Drilling to date has also outlined an Inferred sulphide resource estimate (at a 0.3% CuEq cut-off) of 921 Mtonnes at 0.37% Cu, 0.05 g/t Au, and 0.012% Mo (0.47% CuEq) which contains 7.6 billion pounds of copper, 1.6 million ounces of gold, and 235 million pounds of molybdenum.

- The sulphide resource is comprised of both primary and supergene copper mineralization. This mineralization remains open at depth in some areas and along the southern boundary of the deposit’s northeastern limb. The Supergene Zone contains higher average copper grades as listed in the following conclusion..

- The supergene portion of the sulphide resource estimate (at a 0.3% CuEq cut-off) contains an estimated 701 Mtonnes at 0.60% Cu, 0.08 g/t Au, and 0.009% Mo (0.70% CuEq) in the Indicated category, and 90 Mtonnes at 0.44% Cu, 0.06 g/t Au, and 0.005% Mo (0.50% CuEq) in the Inferred category.

- A well-developed, shallow supergene-enriched copper zone with thicknesses up to 300 m is present in the north of the deposit and may form the basis for a *starter pit* for the Project. The leach cap in this area is thinner than to the south with an average thickness of 100 m. The updated mineral resource estimate (at a 0.5% CuEq cut-off) for this zone is 253 Mtonnes at 0.85% Cu, 0.13 g/t Au, and 0.016% Mo (1.02% CuEq) in the Indicated category.

- Thick zones of relatively high-grade copper hypogene mineralization are present in the northern part of the deposit. Several drill holes in this area have intersected intervals with greater than 0.5% Cu over core lengths exceeding 900 m.

- A portion of the copper-gold-molybdenum porphyry deposit is overlain by a leach cap that ranges from 150-300 m thick. In general, gold mineralization is present in the thickest portions of the leach cap. At a 0.2 g/t Au cut-off, there is an estimated Indicated oxide gold mineral resource of 243 Mtonnes at 0.27 g/t Au which contains 2.1 Moz of gold, and an estimated Inferred resource of 17 Mtonnes at 0.23 g/t Au which contains 0.10 Moz of gold.

- Metallurgical work indicates that conventional flotation milling of the mineralization will result in metal recoveries of 90.2% to 94.7% for copper, 69.7% to 86.1% for molybdenum, and 60.2% to 71.7% for gold and produce a bulk concentrate with copper grades ranging from 28.7% to 34.5%, molybdenum grades ranging from 0.68% to 0.80%, and no deleterious elements.

- Cyanide leaching of oxide gold material in the leach cap indicates that gold recoveries and reagent consumptions increase as the crush size decreases. The presence of soluble copper also increases cyanide consumption. The use of brine water decreases gold recovery by 5% to 15% and increases lime consumption.

- Sequential copper analyses were completed on the enriched zone from selected holes throughout the deposit. The results generally support the results derived during core logging for the location of the upper and lower boundaries of secondary copper mineralization.

Foreign Operations and Political Risk

The Taca Taca Project is located in Argentina, which has, from time to time, experienced economic or political instability. Lumina Copper may be materially adversely affected by risks associated with conducting exploration and potential development activities in Argentina, including: political instability and violence; war and civil disturbance; acts of terrorism; expropriation or nationalization; inequitable treatment of non-domiciled companies; renegotiation or nullification of existing concessions; changing legal and fiscal regimes; fluctuations in currency exchange rates; high rates of inflation; underdeveloped industrial and economic infrastructure; unenforceability of contractual rights; governmental regulations that favour or require the awarding of contracts to local contractors or require foreign contractors to employ citizens of, or purchase supplies from, a particular jurisdiction; and, other risks arising out of foreign governmental sovereignty.

In May 2012, the government of Argentina re-nationalized Yacimientos Petroliferos Fiscales, the country's largest oil and gas company. Although Lumina Copper has not received any notice, nor is aware of any other indication that the federal government or any provincial government of Argentina has any intention of expropriating or nationalizing businesses in the mining sector, including the Taca Taca Project, there can be no assurance that the government of Argentina will not nationalize other businesses operating in the country, including businesses in the mining sector and more specifically, the Taca Taca Project. If an expropriation or nationalization were to occur, there is no certainty that Lumina Copper would receive the fair market value of the Taca Taca Project from such government body.

Provincial governments of Argentina have considerable authority over exploration and mining in their province and there are Argentinean provinces where the provincial government has taken anti-mining stances by passing laws to curtail or ban mining in those provinces. The current provincial government of the Province of Salta, where the Taca Taca Project is situated, is supportive of the exploration and mining industry; however, such a situation may change in the future. Future changes in applicable laws and regulations or changes in their enforcement or regulatory interpretation could negatively impact current or planned exploration and development activities for the Taca Taca Project.

In addition, Lumina Copper's mineral exploration and potential future mining activities in Argentina may be affected in varying degrees by factors beyond Lumina Copper's control including government regulations with respect to restrictions on production, price controls, foreign exchange controls, export controls, taxes, royalties, environmental legislation and mine safety. Such factors may prevent or restrict mining of some or all of the Taca Taca Project or cause a material reduction in mineral resources estimated for the Taca Taca Project. Accordingly, the Lumina Copper's exploration and development activities in Argentina could be substantially affected by factors beyond Lumina Copper's control, any of which could have a material adverse effect on Lumina Copper and the Taca Taca Project.

26 RECOMMENDATIONS

The following action is recommended for the Taca Taca Project:

- Conduct a preliminary scoping study that includes additional geotechnical work, hydrological studies, mine planning and an economic analysis of the Project. If results are positive, the project should proceed to pre-feasibility. Projected budget US$1.3 million. Lumina Copper is currently working on this recommendation.

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28 CERTIFICATES AND SIGNATURES

Bruce Davis, FAusIMM, BD Resource Consulting, Inc.

I, Bruce Davis, FAusIMM, do hereby certify that:

1. I am an independent consultant of BD Resource Consulting, Inc., located at 4253 Cheyenne Drive, Larkspur, CO, U.S.A., 80118, and incorporated January 18, 2008.

2. I graduated with a Doctor of Philosophy degree from the University of Wyoming in 1978.

3. I am a fellow of the Australasian Institute of Mining and Metallurgy, Registration Number 2111185.

4. I have practiced my profession continuously for 33 years and have been involved in geostatistical studies, mineral resource and reserve estimations and feasibility studies on numerous underground and open pit base metal and gold deposits in Canada, the United States, Central and South America, Europe, Asia, Africa and Australia.

5. I have read the definition of “qualified person” set out in National Instrument 43-101 (“NI 43-101”) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a “qualified person” for the purposes of NI 43-101.

6. I am responsible for the preparation of Section 11 of the technical report titled “Taca Taca Property, Porphyry Copper-Gold-Molybdenum Project, Argentina; NI 43-101 Technical Report” dated January 4, 2013, with an effective date of October 30, 2012 (the “Technical Report”).

7. I visited the property on January 20-22, 2011 and June 21-23, 2012.

8. I have had prior involvement with the property that is the subject of the Technical Report. I provided geostatistical analysis included prior NI 43-101 Technical Reports titled “Taca Taca Technical Report, Puna (altiplano) Region of northwest Argentina”, effective date October 9, 2008, “Taca Taca Porphyry Copper-Gold-Molybdenum Project, Argentina” effective date November 15, 2011 and “Taca Taca Property, Porphyry Copper-Gold-Molybdenum Project, Argentina” effective date April 11, 2012.

9. I am independent of Lumina Copper Corp. applying all of the tests in Section 1.5 of NI 43-101.

10. I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.

11. As of the date of this certificate, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to make the Technical Report not misleading.

Dated this 4th day of January, 2013.

“original signed and sealed”

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Bruce M. Davis, FAusIMM

Robert Sim, P.Geo, SIM Geological Inc.

I, Robert Sim, P.Geo, do hereby certify that:

1. I am an independent consultant of:

SIM Geological Inc.
6810 Cedarbrook Place
Delta, British Columbia, Canada V4E 3C5

2. I graduated from Lakehead University with an Honours Bachelor of Science (Geology) in 1984.

3. I am a member, in good standing, of the Association of Professional Engineers and Geoscientists of British Columbia, License Number 24076.

4. I have practiced my profession continuously for 28 years and have been involved in mineral exploration, mine site geology and operations, mineral resource and reserve estimations and feasibility studies on numerous underground and open pit base metal and gold deposits in Canada, the United States, Central and South America, Europe, Asia, Africa and Australia.

5. I have read the definition of "qualified person" set out in National Instrument 43-101 ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.

6. I am the principal author of this report and am responsible for the preparation of all sections, except Sections 11 and 13, of the technical report titled *Taca Taca Property, Porphyry Copper-Gold-Molybdenum Project, Argentina: NI 43-101 Technical Report*, dated January 4, 2013, with an effective date of October 30, 2012 (the "Technical Report").

7. I visited the property on July 1-3, 2008 and June 21-23, 2012.

8. I have had prior involvement with the property that is the subject of the Technical Report. I was a co-author of prior NI 43-101 Technical Reports titled "Taca Taca Technical Report, Puna (altiplano) Region of northwest Argentina", effective date October 9, 2008, "Taca Taca Porphyry Copper-Gold-Molybdenum Project, Argentina", effective date November 15, 2011 and "Taca Taca Property, Porphyry Copper-Gold-Molybdenum Project, Argentina" effective date April 11, 2012.

9. As of as of the effective date of the Technical Report, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

10. I am independent of Lumina Copper Corp. applying all of the tests in Section 1.5 of NI 43-101.

11. I have read NI 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.

Dated this 4th day of January, 2013.

"original signed and sealed"

____

Robert Sim, P.Geo

RungePincockMinarco

Don M. Larsen, Ph.D., P.E.
165 S. Union Blvd. Suite 950
Lakewood, Colorado 80228
Phone (303)986-6950
Fax (303)987-8907
dlarsen@rpmglobal.com

I, Don M. Larsen, PhD, P.E., do hereby certify that:

1. I am a Principal Process Engineer with the international consulting firm of RungePincockMinarco and have been so since June, 2008. My current position is Principal Process Engineer.

2. I am a graduate of Michigan Technological University with a Bachelors of Science degree in Metallurgical Engineering in 1979. I am a graduate of The University of Sydney with a Doctor of Philosophy degree in Chemical Engineering in 1985.

3. I am a Registered Professional Engineer in the state of Utah (ID. No. 171776-2202).

4. I have practiced my profession continually for 28 years and have been involved in metallurgical engineering studies for base metal and gold deposits in the United States, Canada, Central and South America and Australia.

5. I have read the definition of “qualified person” set out in National Instrument 43-101 (“NI 43-101”) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a “qualified person” for the purposes of NI 43-101.

6. I am responsible for the preparation of Item 13 and portions of Item 1, Item 25 and Item 27 of the Technical Report titled “Taca Taca Property, Porphyry Copper-Gold-Molybdenum Project, Argentina; NI 43-101 Technical Report” dated January 4, 2013, with an effective date of October 30, 2012 (the “Technical Report”).

7. I have not conducted a personal inspection of the Taca Taca property.

8. I have not had any prior involvement with the property that is the subject of the Technical Report.

9. As of the effective date of the Technical Report, to the best of my knowledge, information and belief, the technical report contains all scientific and technical information that is required to disclose to make the technical report not misleading.

10. I am independent of the Lumina Copper Corp. applying all the tests in Section 1.5 of NI 43-101.

11. I have read NI 43-101 and Form 43-101F1, and the “Technical Report” has been prepared in compliance with that instrument and form.

Dated in Lakewood, Colorado, this 2nd day of January, 2013.

“original signed and sealed”

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Don M. Larsen, Ph.D., P.E.