Updated Mineral Resource Estimation for the Marimaca Copper Project, Antofagasta Region, Chile

Report Prepared for: **Marimaca Copper Corp.**

Report Prepared by:
Luis Oviedo, P.Geo.
NCL Ingeniería y Construcción SpA

Effective Date: October 13, 2022
Report Date: November 28, 2022

Updated Mineral Resource Estimation for the Marimaca Copper Project, Antofagasta Region, Chile

Marimaca Copper Corp.
Address: Suite 2400, 745 Thurlow Street Vancouver, BC V6E 0C5
E-mail: jgutierrez@marimaca.com
Website : Marimaca.com
Tel: tel:+44 (0)20 7920 3150

NCL Ingeniería y Construcción SpA
Address: General del Canto 230
Santiago, Region Metropolitana, Chile
E-mail: ncl@ncl.cl
Website: www.ncl.cl
Tel: +56 2 2651 0800

NCL Project Number: 1935

Effective date: October 13th, 2022
Report date: November 28th 2022

Authored by: Luis Oviedo, P. Geo. NCL Ingeniería y Construcción SpA (Geology & Resources)

Reviewed by: Ricardo Palma, P. Eng. Consultant NCL

CERTIFICATE OF QUALIFIED PERSON

I, Luis Oviedo, P.Geo, I am a consultant and QP with NCL and I have an employment address at 230, General del Canto, Providencia, Santiago de Chile. This certificate applies to the technical report titled "Updated Mineral Resource Estimation for the Marimaca Copper Project, Antofagasta Region, Chile" that has an effective date October 13th, 2022 (the "technical report").

I am a registered Professional Geologist (P.Geo.) in Chile. I am registered member of the Comisión Calificadora de Competencias en Recursos y Reservas Mineras (Chilean Mining Commission: RM, CMC) with the number 013. I graduated with a Geologist degree from the University of Chile in 1977. Postgraduate "Evaluation and Certification of Mining Assets". Universidad Católica de Valparaíso, 2008, Chile.

I have practiced my profession for over 45 years since graduation. I have been directly involved in resource estimates for all types of mines, audits, due diligences, half-lives and technical reports of resources for stock exchanges and financial institutions in Canada, Chile, Peru, Ecuador and Colombia. I am a "qualified person" as that term is defined in NI 43-101 - Standards of Disclosure for Mineral Projects ("NI 43-101"), JORC and other stock exchanges in the world.

I visited the Marimaca Project (the "Project") 3 times, 3 days in December 2016, 2 days in August 2019 and 3 days in February 2022. I am responsible for the complete report.

I am independent of Marimaca Copper Corp. as Section 1.5 of NI 43-101 describes independence.

I have been involved with the Project since November 2016 for the preparation of the first resources estimation study in 2017, the preparation of the NI 43 -101 Technical Report "Updated Resource Estimate for the Marimaca Copper Project, Antofagasta Province Region II, Chile" May 2018, the NI 43-101 Technical Report "Updated and Expanded Resource Estimate for the Marimaca Copper Project, Antofagasta Province Region II, Chile" January 2020, and the NI 43-101 Technical Report "Preliminary Economic Assessment, Marimaca Project, Antofagasta, II Region, Chile" August 2020.

I have read NI 43-101 and the sections of the technical report for which I am responsible has been prepared in compliance with NI 43-101.

As of the effective date of the technical report, to the best of my knowledge, information and belief, the technical report for which I am responsible contain all the scientific and technical information that is required to be disclosed to make the technical report not misleading.

Effective date: October 13th, 2022
Report date: November 28th, 2022
Signed and sealed

Luis Oviedo H. P. Geo., QP

LIST OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

1 SUMMARY

This report provides an updated Mineral Resource Estimate (MRE) for the Marimaca Copper Project, located in the Antofagasta Province, Region II, northern Chile. Previous MRE results were reported in successive NI 43-101 compliance reports dated 2017, 2018 and 2020. In addition, one Definitive Feasibility Study (DFS) report corresponding to the resource hosted by the Marimaca 1-123 concession was published in 2017 and a Preliminary Economic Assessment (PEA) corresponding to the expanded resource was published in 2020. Marimaca Copper Corp. (formerly Coro Mining Corp.) owns and has operated the project since its discovery in 2016.

In 2021, the deep exploration project discovered attractive mixed and secondary sulphide mineralization beneath the previously evaluated upper oxide mineralized body (Marimaca Oxide Deposit or MOD). Following this discovery, in tandem with the Company's strategy to infill the MOD, the decision was made to proceed with an extensive infill drilling program. This program and associated field work was completed during the first 3 quarters of 2022. This MRE captures drilling from the 2021 program and drilling completed from February 2022 to June 2022, representing an additional 19,580m to the previous 91,210m accounted for the 2020 MRE (NI 43-101 released in 2020 titled "Updated and Expanded Resource Estimate for the Marimaca Copper Project, Antofagasta Province Region II, Chile).

Marimaca Copper mandated NCL to visit the project, estimate the Mineral Resources and compile an independent technical report pursuant to Canadian Securities Administrators' National Instrument 43-101. A team of independent qualified persons, as National Instrument 43-101 defines the term, visited operations at Marimaca from 2016 to actual times.

This report summarizes the technical information that is relevant to support the estimation of updated Mineral Resource Estimation of the Marimaca Copper Project pursuant to Canadian Securities Administrators' National Instrument 43-101.

As a result of the completion of this report, the previous 2018 DFS and 2020 PEA studies no longer reflect the current economic potential of the 2022 MRE and these previous studies should be seen as historical in nature and should not be relied upon. As these studies are no longer current, all the information contained therein related to "advanced property" as defined in NI 43-101 is no longer relevant to this technical report.

1.1 Property Description and Ownership

The Marimaca Copper Project is located in Chile's Antofagasta Province, Region II, approximately 25 km west from the port of Mejillones, approximately 45 km north of the city of Antofagasta and 1,250 km north of Santiago, Chile. The project area is located at approximately 374,820 E and 7,435,132 S in WGS84 UTM coordinates.

Figure 1-1 shows the project location, highlighting the proximity to first class utilities and infrastructure. The Figure also summarizes Marimaca's mining property position in the region.

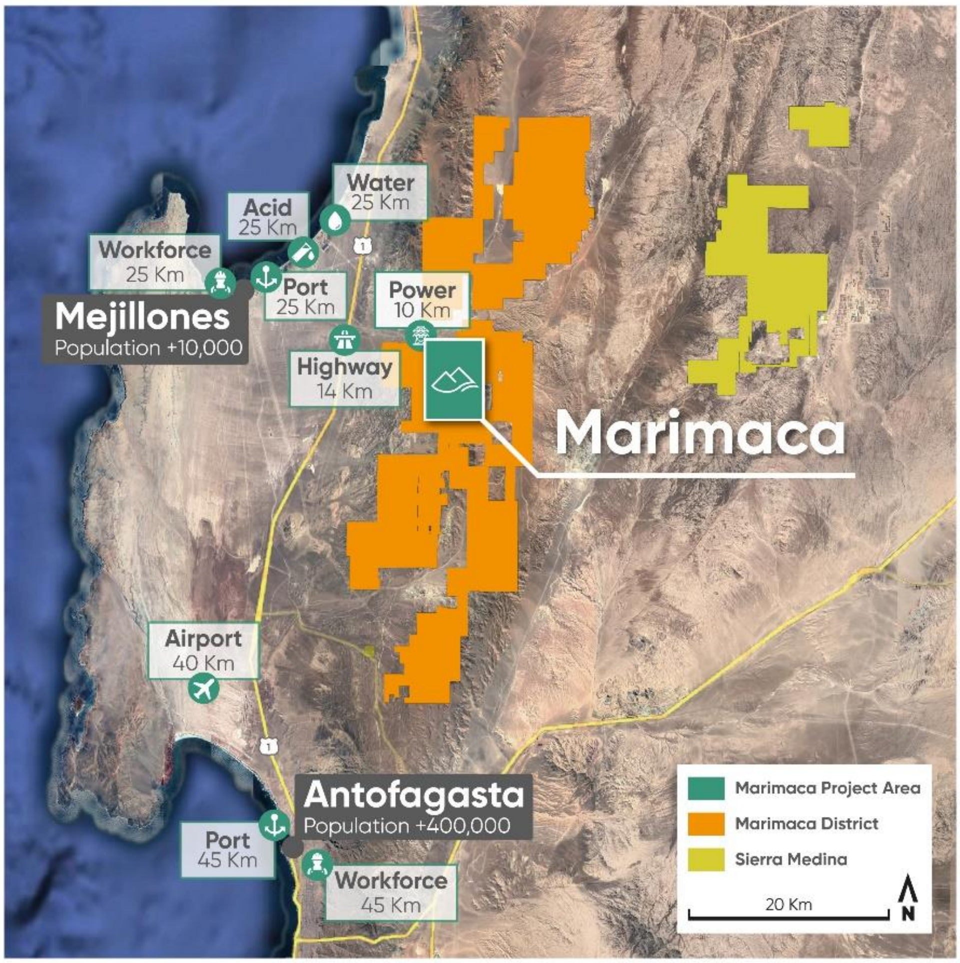


Figure 1-1: Marimaca Project location map, Marimaca Copper Corp., 2022

The Marimaca Project is comprised of 20 mining/exploitation concessions covering approximately 961 hectares. These concessions are listed in the national mining claims register, and are in Sierra Naguayán, Commune of Mejillones, Province and Region of Antofagasta. As shown in the Figure 1-1, tenements protecting project area are part of the much larger land position that the Company owns in the region.

Certain of the Company's interests in the mining/exploitation concessions were originally held via option agreements entered by Compañía Minera Cielo Azul ("MCAL"), a Chilean subsidiary of the Company. Most of the options held under these agreements have now been exercised.

MCAL currently has a provisional easement in respect of the surface rights over the concessions that provide for the Marimaca Project and elements of the wider Marimaca District. This provisional easement is registered in the name of MCAL, before the corresponding Real Estate Registrar. A definitive easement for the final development area of the Marimaca Project will be registered in due course.

The Company does not hold any water rights or maritime concessions. However, MCAL has entered into a water option agreement in October 2022 to secure the future water supply required for the Marimaca Project. Under the agreement, one of Chile's largest energy suppliers will supply seawater following its use in cooling systems at an electricity plant in Mejillones.

MCAL first obtained an Environmental Qualification Resolution (RCA) in July 2018 to be able to produce 10,000 tonnes of cathodes annually from the Marimaca 1-23 claims. Whilst this RCA still exists, it does not provide for the Marimaca Project as envisaged in the 2020 PEA.

A further RCA was obtained in November 2020 to provide for exploration and prospecting campaigns across the Marimaca Project and parts of the wider Marimaca District.

Currently, the Company is in the process of conducting environmental baseline studies to assess possible impacts that the Marimaca Project may have when it enters the Environmental Assessment System for purposes of obtaining an RCA for development. These studies do not currently identify any major environmental risks. In addition, there are no known material environmental liabilities in relation to the Marimaca Project.

1.2 History

Small-scale artisanal mining activities were undertaken in the general Project area from the 1990s to mid-2000s. Underground workings associated with small-scale mining reach a maximum of approximately 100m depth.

No modern exploration was undertaken until Coro Mining Corp (Coro), a predecessor company to Marimaca Copper, began to assemble the Project ground holdings. The Marimaca deposit was identified in 2016, following a reverse circulation (RC) drill program. Coro subsequently detailed geological surface mapping and rock chip sampling, additional RC drilling, core drilling to support geotechnical and geometallurgical studies, metallurgical test-work, and mining studies. An initial resource estimate was completed in January 2017, and Mineral Reserves were first estimated in 2018.

Coro completed a feasibility study in June 2018 (the 2018 Feasibility Study). This study considered an open pit mining using conventional equipment to feed a refurbished process plant, referred to as the Ivan plant, that would have the capability of producing 10,000t of cathode copper per year.

The 2018 Feasibility Study is not currently considered to be the preferred Project development option. Marimaca Copper is not treating the study as current, and the Mineral Reserve estimates are also not considered to be current. However, some of the baseline information generated in support of the 2018 Feasibility Study was used in the 2020 PEA. An Environmental Impact Statement (Declaración de Impacto Ambiental, DIA in the Spanish acronym) and the Mining Safety Regulations and Environmental Qualification Resolution (RCA) was approved on 5 July 2018. Mineral Resources were updated in late 2019, as part of an internal study of the Mixed area (MAMIX) and again in 2022 – the results of which are discussed in this report. The 2022 MRE captures a total of 110,790m drilled distributed across 429 drill holes.

Coro changed its name to Marimaca Copper in May 2020.

1.3 Geology, Mineralization and Deposit Types

The Marimaca deposit is located within a belt of Mesozoic age copper deposits, known as the Coastal Copper Belt, which range in (pre-mining) size from Mantos Blancos, (~500 Mt) to Ivan (~50 Mt). These deposits, which are recognized as both "manto-type" and IOCG types, occur in a variety of host rocks and alteration associations and have different morphologies and structure.

The host rocks in Marimaca are intrusives from the "Naguayán Stock", an equigranular monzodiorite that grades to diorite in part cut by monzodiorite porphyries and by various systems of dacitic and dioritic dikes (NE, NS, NW and WNW orientation).

A system of sub-parallel, planar, pervasive and persistent fractures occurring along an NS elongated structural belt is the most important structural feature of Marimaca, giving to the rock an appearance of "pseudo-stratification", composed of cent-decametric sub-parallel "sheeted-like" fractures. A WNW to NW system of late faults is important and created additional permeability favorable for the formation of an oxide blanket.

The Marimaca deposits consist of a copper oxide blanket, exposed at the surface extending for approximately 1,600 m along the NNW direction, 500 to 400 m wide and 200m to 300 m thick (Figures 7-9 and 7-10). Two thirds of the middle-upper part of the oxidized column correspond to copper oxides whereas the lower one-third corresponds to mixed and lesser chalcocite mineralization. Although general geometry is a blanket, the mineral zone interpretation was guided by the structural control, especially the NS dipping east and the late NW to EW structural system

The mineralogy of the oxide zone consists of brochantite, atacamite, chrysocolla and wad occurring as disseminations and impregnation of fractures in the parallel band system with a NS orientation, but also in diagonal faults systems with NE and NW orientation. The subjacent mixed zone consists of copper oxides and remnants of chalcocite and covellite, minor pyrite and chalcopyrite. The secondary sulfides carry mostly sooty chalcocite replacing pyrite and covellite after chalcopyrite

The Marimaca alteration consists of a metasomatism with very little evidence of destructive hydrothermal alteration. The calc-sodic (Na-Ca) metasomatism is background alteration, whereas albitization and chlorite are alteration minerals related to mineralization. Some K-spar and biotite are also observed. At the oxide zone, the limonite, mostly goethite, is associated with copper mineralization.

Marimaca displays many characteristics of the IOCG mineralized system: primary mineralization consisting of low pyrite and chalcopyrite-magnetite, calco-sodic alteration, however no Au occurrences are recorded or observed. Marimaca differ from typical coastal IOCG districts by the intense supergene alteration and mineralization.

The formation of the supergene blanket such as that discovered and evaluated at Marimaca has been not described in any other IOCG district. There is strong evidence that the actual oxide body was formed due to the oxidation of a previous sulphide blanket. Remnants of this blanket were encountered consisted of chalcocite and covellite replacement of pyrite and chalcopyrite. Evidence of the oxidation process can be encountered in the Mixed zone, where zoned green and black copper oxides partially replace secondary sulphides. Mineralogic zoning and copper grade distribution in the blanket also suggest repeated events of lateral migration and accumulation. This process requires abundant pyrite to produce enough sulphuric acid, but as established the IOCG system is low in pyrite. It is possible that a very rich and pervasive chalcopyrite >> pyrite primary mineralization and a long-lived process of oxidation can explain the formation of the Marimaca's uncommon secondary blanket.

1.4 Exploration Status

The present MRE update captures an additional 19,580 m of RC drilling relative to the 2019 MRE. The captured drilling includes 6,382m drilled from the 2021 program and 13,198 m from the 2022 infill program. Figure 1-2 shows the distribution of new drill holes added and used for the purposes of the present 2022 MRE.

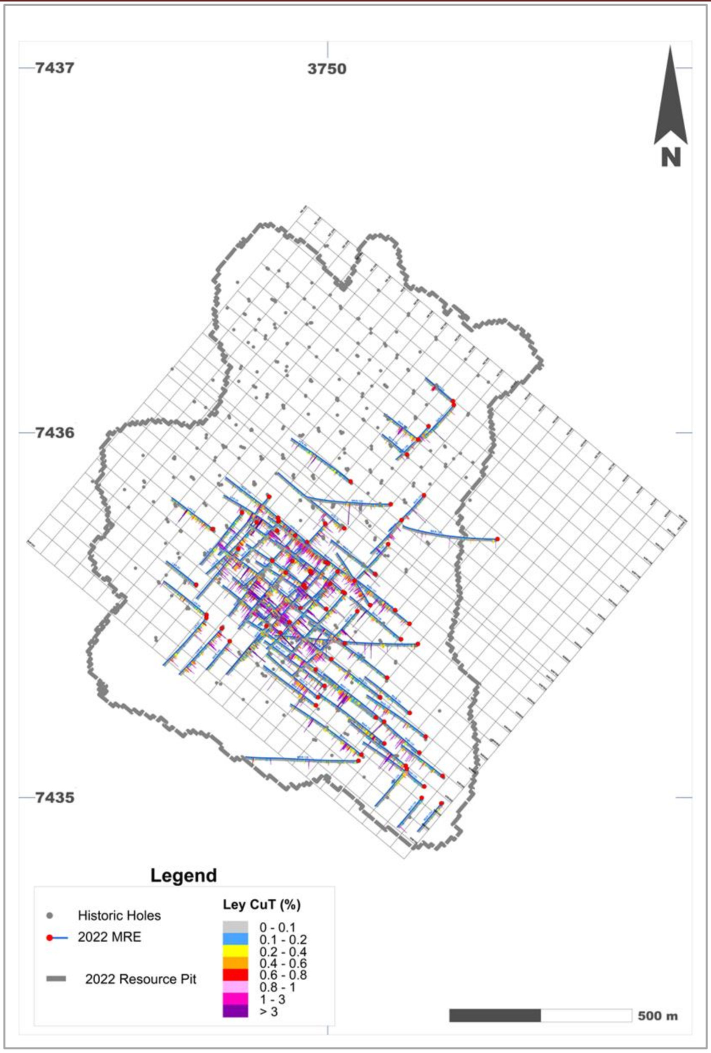


Figure 1-2: Location of new holes added for the 2022 MRE. Horizontal projections also show %CuT grades as histograms. Project local grid consisting in 50 m spaced sections in NE and NW directions is also shown. Marimaca Copper Corp., 2022

In addition to drilling since 2020 the following exploration work has been carried out:

- Full assay of the drilling sample database with Sequential Copper assays (mostly CuCN) for all the >0.1 Cu%. Since the 2021 campaign, Sequential Copper is the standard assay methodology for all samples
- Re-logging previous drill holes for a better definition of mixed and secondary sulphide mineralization, this work was benefited by the new Sequential Copper assaying
- Actualization and check of the Topographic field bases
- Completion of a new drone driven imaging and topographic orthorestitution
- Re-interpretation of the rock geochemistry
- High Resolution Magnetics and deep IP/R geophysics surveys
- Detailed surface mapping of dyke system, emphasizing rock types and contact relationships

1.5 Drilling, Sample Preparation, Analyses, QA/QC, Security and Specific Gravity

Assay samples reported in the 2022 MRE were prepared at a laboratory site in Calama and assayed by Andes Analytical Assay Ltd. (AAA) in Santiago. Marimaca RC holes are drilled on a continuous 2-meter basis and riffle split on site up to one-eighth (12.5%) of its volume, after which samples are sent for preparation and assaying. Diamond drill hole (DDH) samples are obtained every 2 meters from a half-core.

All samples are transferred by laboratory personnel from the Project to Calama for preparation, and then returned to generate analysis batches with the corresponding control samples. Finally, they are sent to the laboratory for AAS assaying to obtain total copper (CuT) and soluble copper (CuS) grades.

Appropriate facilities in the field (old adits) are used for storage of RC cuttings and rejects, as well as crushed rejects of DDH samples and trays with backup half-cores.

Specific gravity was determined from 562 samples collected during 2017-2019, using the water displacement method with paraffin coating. Measurements were done by Mecanica de Rocas (Rock Mechanics) lab in Calama.

The analytical quality control programs implemented at Marimaca involve the use of coarse/preparation and pulp duplicates for precision analyses, standard reference materials (SRM) and, only since 2018, fine blanks for contamination analyses. Check samples were only used during the initial discovery exploration campaign. Marimaca has protocols in place for handling analytical results that exceed acceptable limits, which can ultimately trigger re-assays of entire or portions of sample batches.

NCL reviewed Marimaca´s QA/QC programs with summary findings below:

Coverage: Around 20% in all cases, which more than meets industry standards, though with slight excess of duplicate sample coverage for RC holes, mostly in detriment of SRM sample coverage, which reached only 3% in the most recent campaign.

SRM samples: Materials obtained from Geostats (2016-2018) show good accuracy and precision, though with some uncertainty in a number of cases due to their low coverage. Intem materials, certified standards prepared with Marimaca's mineralized samples (2018-present) show generally improved results, with very good accuracy and precision.

Duplicate samples: Both preparation and pulp duplicates show very good precision, with virtually no observations. However, field duplicates should also be considered for insertion in the future, in order to properly control the first split right after drilling.

Check samples: The initial drilling campaign shows sufficiently good accuracy, despite a lack of other control measures, due to the considerable number of control samples and a decisively strong assay correlation between laboratories.

Blank samples: Fine blanks (technically SRMs with grades sufficiently close to the detection limit) show very good results, with no apparent signs of contamination. The lack of blank samples in early campaigns is of moderate to low concern, partly mitigated after a review of the quality controls reported by both laboratories. However, coarse blanks should be considered for insertion in the future, in order to properly control contamination during sample preparation.

The security as was observed in the field and in the digital files appears to be well kept and follows standard industry best practices. NCL considers that both company and laboratory personnel used care in the collection, management and assay of drill hole data. This, along with an extensive review of reports and analytical results suggest that, apart from minor concerns, the resource database is free of apparent bias.

1.6 Mineral Processing and Metallurgical Testing

Marimaca Copper Corp. has completed five metallurgical test programs (Geomet I, II, III, IV and V) to characterize the metallurgical response to samples collected from its Marimaca copper project. Preliminary tests were performed considering parameters such as: mineral subzone, agglomeration conditions, particle size, column height, irrigation rate and acid concentration in the irrigation solution. The Phase V metallurgical program also included a metallurgical variability study of the deposit.

A summary of the Phase V metallurgical program is provided below. Phase V represents the most recent and most extensive program completed to date at the Marimaca Deposit.

The Phase 5 Program was designed to confirm the 2020 PEA process design conditions and to evaluate potential optimization opportunities of both copper recovery and acid consumption identified during Phases 1 – 4. The results of the Phase 5 Program are positive, with optimization opportunities identified in most of the samples studied and tested.

The Phase V Heap Leach Program Design is summarized below. Results from Phase V support the metallurgical assumptions utilized in the 2022 MRE.

Sampling and sample preparation

- 5 composite samples collected representative of each mineral subzone: brochantite/atacamite (BROC), chrysocolla (CRIS), WAD, mixed (MIX), and enriched (ENR)

- Each composite was crushed in closed circuit to P90 at ½”. Crushing was monitored and simulated a PSD profile of a Metso-type industrial configuration. Care was taken not to over-grind the material to obtain the final product with a -100 # Tyler content of 10-12 %

Chemical Head Characterization & Mineralogical Analysis

- Characterization included sequential copper analysis, leaching potential, soluble impurities, analytic acid consumption, ICP, optical microscopy, QEMSCAN

Iso-pH Bottle Roll Tests

- Conducted under constant pH and Cl conditions to examine the correlation to the analytical acid consumption (AAC) diagnostic testing method, improve the acid consumption modeling, and review copper recovery relative to leaching potential

3 Acid Level Sensitivity Bottle Roll Test

- Conducted to examine copper recovery and acid consumption sensitivity relative to acid concentration

Sulfation Tests

- Conducted to determine the optimum agglomeration conditions for columns and minicolumns

Minicolumn Tests

- Designed to characterize the crushed ore metallurgical behavior under irrigation at different acidity levels
- 32 leaching tests in mini-columns, 30 cm high, 6” in diameter and loaded with approximately 9 to 10 kg of sample each

Column Tests

- Designed to confirm the viability of the PEA and optimized design conditions defined by the Phase 4 geometallurgy and METSIM dynamic simulation
- 10 leaching tests in columns, 4m high, 4” in diameter and loaded with approximately 52 to 60 kg of sample each

The Phase V ROM Leach Program Design is summarized below. Results from Phase V support the metallurgical assumptions utilized in the 2022 MRE.

Sampling and sample preparation

- Four composites were prepared: WAD-ROM, BROC-ROM and CRIS-ROM and a global composite ROM G5
- The global composite (ROM G5) was prepared representing utilizing the ore type distribution from the 2020 PEA mine plan for the ROM leach (60.4% WAD-ROM, 19.8% BROC-ROM and 19.8% CRIS-ROM)

Chemical Head Characterization & Mineralogical Analysis

- Characterization included sequential copper analysis, leaching potential, soluble impurities, analytic acid consumption, ICP, optical microscopy, QEMSCAN

Iso-pH Bottle Roll Tests

- Conducted under constant pH and Cl conditions to examine the correlation to the analytical acid consumption (AAC) diagnostic testing method, improve the acid consumption modeling, and review copper recovery relative to leaching potential

3 Acid Level Sensitivity Bottle Roll Test

- Conducted to examine copper recovery and acid consumption sensitivity relative to acid concentration

Crushed Column Tests

- Conducted to define the maximum expected recoveries from the ROM composites and establish a comparative base with the crushed material
- 6 leaching tests in crushed columns, 1 m high, 6" in diameter and loaded with approximately 30 to 40 kg of composite per subzone (BROC ROM, WAD ROM and CRIS ROM) each crushed to P90 1/2"

1m^3 Container test

- Conducted to individually characterize the metallurgical response of coarse material in a condition comparable to the first meter of a ROM operation
- 3 leaching tests were completed in ROM containers, 0.90m high, with a surface area of 1.06m2 (volumetric capacity of 0.96 m3) and loaded with approximately 1.8 tonnes of ROM composite per subzone (BROC ROM, WAD ROM and CRIS ROM) each, at ROM granulometry (100% under 8")
- Agglomeration or curing is not carried out, but irrigation is carried out directly at any time, after loading

Sequential ROM column

- Conducted to simulate the ROM design under PEA conditions using the ROM G5 global composite
- 1 leaching test in 4 ROM columns in series, each one 3m high, 0.58m in diameter and loaded with approximately 1.45 tonnes of ROM G5 global composite each at ROM granulometry (100% under 8")
- Test covers a total height equivalent to 12m when considering the 4 columns in series

1.7 Mineral Resources Estimate

The Mineral Resources Estimation discussed herein is based on information from 110,790m of DDH and RC drill, stored in a secured central database, and evaluated using a geostatistical block modeling technique.

Rock-structure and Mineral Zone distribution were interpreted by hand on paper in vertical cross sections oriented NE and NW, at 1:1,000 metric scale (see examples in Figures 1-2 and 1-3). Most of the deposit area was covered by a set of 50m spaced sections. Mineral Zones identified are: Brochantite, Chrysocolla, Enriched, Mixed, and Wad. In addition, a Chalcopyrite unit was identified and modelled but it has been considered as waste for the purpose of this MRE, which is based on leachable material.

The order of interpretation was litho-structure first and then the mineral zone into transparent overlays. Mineral Zone (MZ) interpretations were used as MRE domains. The mineral zones interpretation was based primarily on the drillhole logging.

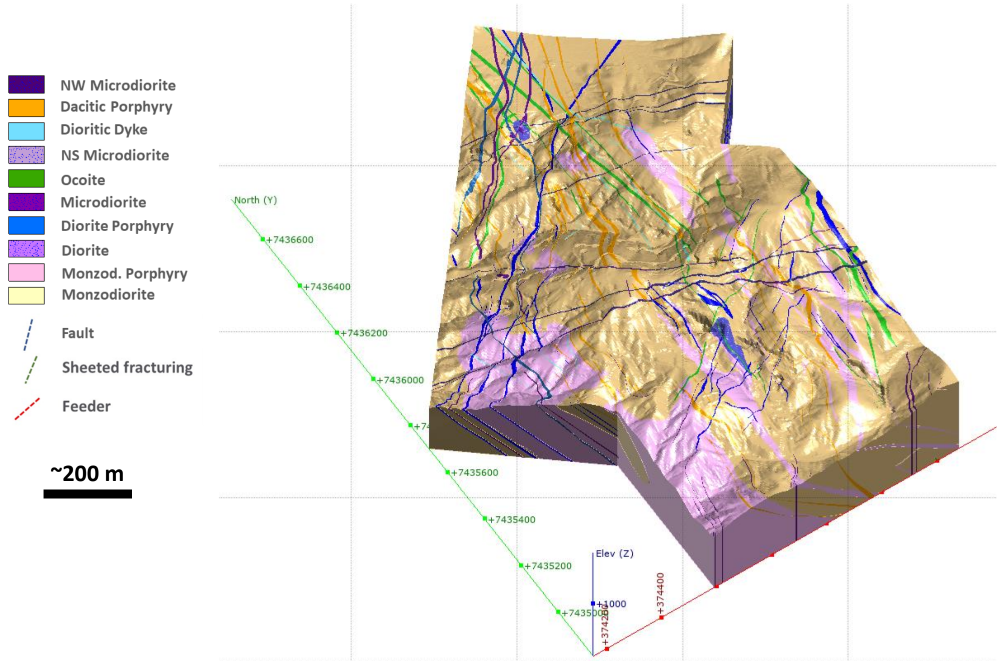


Figure 1-3: Marimaca Project. 3D Lithological Model (2020) built in Leapfrog Geo, Marimaca Copper Corp., 2022

The 3D models for litho-structure (Figures 1-4 and 1-5) and mineral zone were then assembled in Leapfrog TM using sections and drill hole data by consultants, Atticus Geo. For the 2022 MRE exercise the 2020 Leapfrog TM lithological model was used considered valid and not changed. The Mineral Zone model was updated, mostly reflecting the results from mineralization re-logging and deep sulphide results.

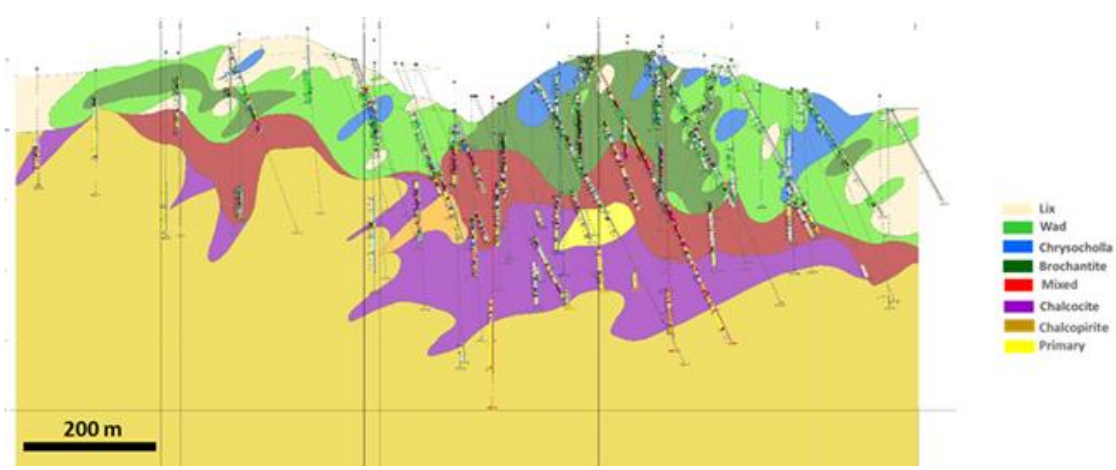


Figure 1-4: Marimaca Project. Updated Mineral Zones Section Interpretation, Marimaca Copper Corp., 2022

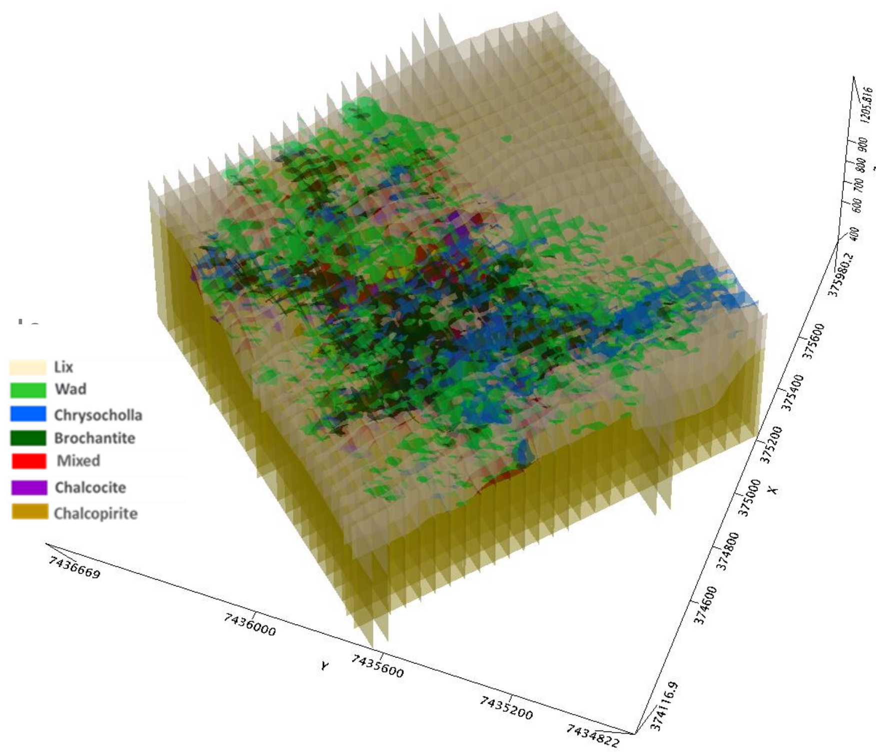


Figure 1-5: Mineral Zones Section Integration (3D view looking NE), Marimaca Copper Corp., 2022

The following stages were developed to build the resources model of the Marimaca deposit and generate the resource estimate:

- Analysis of exploration data and definition of the estimation populations
- Validation of three-dimensional solids to the defined population
- Statistical analyses of the samples of CuT and CuS in each population
- Variography and anisotropy analyses. Definition of preferential directions, calculation and adjustment of variograms per population
- Detection and definition of treatment of outliers
- Definition of the Block Model
- Definition of the estimation strategy and Kriging plans per element and population
- Estimation of grades for each element of each population
- Categorization of resources
- Validation of the Model through:
  - Comparative statistics between composites and estimated blocks
  - Analyses of smoothing of grades

- Moving window analyses of composites and blocks estimated in different directions and Nearest Neighbor comparison
- On screen validation
- Final Report of the geological resources by category

The drilling database contains Diamond Drill (DDH) as well as Reverse Circulation (RC) holes. Table 1.1 presents the information contained in the database.

Table 1-1: Marimaca Database General Information

	Total	RC	DDH
#Drill holes	430	391	39
Drilled meters*	113,230	104,254	8,976

	TOTAL		RC		DDH	
	#Samples	Meters	#Samples	Meters	#Samples	Meters
Samples with CuT > 0	56,234	112,459	51,743	103,486	4,491	8,973
Samples with CuS > 0	56,234	112,459	51,743	103,486	4,491	8,973

*Note: total drilling informing the 2022 MRE is 110,790m over 424 holes (6 additional holes noted above fall outside MOD area and are not included in the 2022 MRE)

The drilling, logging, sampling, analysis and recording information procedures are consistent with generally recognized industry best practices. NCL concludes that the samples are representative of the source materials and there is no evidence that the sampling process introduced any bias

The average specific gravity (SG) of each estimation unit was calculated using a set of 562 measures from the DDH campaigns and surface samples, divided according to each mineral zone. Outliers were not considered to obtain average figures; the following Table shows the specific gravity for each of the mineralized zones (Table 1-2).

Table 1-2: Mineral Zones Sspecific gravity

SZMIN	Mean (t/m3)
Brochantite	2.639
Chalcopyrite	2.719
Chrysocolla	2.670
Enriched	2.649
Waste	2.645
Lix	2.663
Mixed	2.688
Pyrite	2.711
Wad	2.642

Marimaca implemented analytical quality control measures, consistent with accepted industry best practices. The analytical quality control program includes the use of control samples inserted with all samples submitted.

To validate the use of data from the DDH and RC exploration campaigns, twin holes samples (RC vs. DDH) close to 10m maximum, from both exploration campaigns were compared using the GS Lib getpairs routine.

An analysis of the samples' length was done to check if regularization was required (compositing). Practically all the samples are 2 meters long, so it was concluded that no further action in this regard was needed. Therefore, the samples to be used in the grade modeling process are the raw samples from the drill hole database, coded according to the MZ solid that contains their centroids.

The contact characteristics between the units to estimate were reviewed according to the mean grade of the samples, in relation to their distance to the contact defined in the solids model.

The existence of outliers in the estimation populations was analyzed using the log-probability curves for each sample's population, for singularities in the curves that may signal the presence of an outlier limit. Identified values were used to cap the different populations.

Correlograms were performed for five Mineral Zones of the geological model (Brochantite+Chrysocolla), Enriched, Mixed, Wad and Chalcopyrite). The variography of CuT was developed using the total samples inside the estimation MZ solids. Correlograms in distinct directions were calculated, according to the structural zones defined in the structural model and discussions with Marimaca's technical team. The determination of the nugget for each population was done using down-hole correlograms.

Ordinary Kriging was used for grade interpolation given the nature of the deposit and the data availability. Four kriging plans were defined to be executed in sequential order. The general concept is to "fill" the grades model, starting with a restrictive estimation plan that considers only interpolation between drill holes, separated distances below the equivalent of 80% of the variogram sill. Then, the following plans increase the search distance and release other restrictions gradually, until the estimation is complete.

Resource Classification was done according to the conditions defined by the number and location of samples in the neighborhood of each block. This criterion attends the requirements established by the CIM code. The first pass generates block estimates with a minimum of two drill intercepts, both within distances shorter than the D80.The second pass maintains the restriction of the number of drill intercepts, but enlarges the search range by twice the D80. These two passes generate Measured and Indicated Resources respectively. The third pass increment the search radius to 4 times the D80 and reduces the number of drillholes within this range to one, generating Inferred Resource. A fourth pass was added using a very large search radio, to ensure that all the blocks inside the geological model are estimated. This fourth pass generates Potential mineralized rock.

Visual Validation, Statistic Validation, SWAT plots and Nearest Neighbor were done to ensure the quality of the generated block model. Validations carried out concluded that the estimated grades preserve the characteristic of the mean grade, global variability and tendencies of the original samples.

Once the block model was finished and validated, a Whittle pit was generated using the following technical parameters (Table1-3):

Table 1-3: Technical and Economical Parameters for Whittle Run

PARAMETERS	2022
Mining cost (base)	$1.51/t mined
MCaf ($/t-10m bench)	$0.04/t mined
HL Cost (including G&A and mining cost component from pit to Heap Leach)	$5.946/t processed
ROM Process Cost (including G&A and mining cost component from pit to ROM leach)	$1.654/t sold
Selling Cost including SX-EW processing cost	$0.164/lb
Heap Leach Recovery	76% of CuT
ROM Recovery	40% of CuT
Pit Slope angle [1]	42° - 52°
Cu Price	4.0 USD/lb

[1]*The pit slope is estimated at a range of 42° - 52° based on the geotechnical information currently available, but this is anticipated to improve as more data is generated*

The technical and economical parameters used for the 2022 Whittle run were informed by the 2020 PEA assumptions, a comparison of which is presented below. Due to the designation of mined material to either heap leach or ROM, certain cost elements from mining costs have been reallocated to heap leach costs and ROM cost to be appropriately captured in the Whittle run. However, on an aggregate basis, they are identical. The 2020 PEA cost assumptions are considered to be the most relevant cost assumptions for the 2022 MRE Whittle run at this stage.

Table 1-4: Technical and Economical Parameters for Whittle Run relative to 2020 PEA assumptions

PARAMETERS	2020 PEA	2022 MRE
Mining cost (base)	$1.76/t LOM avg. ($1.51/t base)	$1.51/t base ($1.76/t LOM avg)
MCaf ($/t-10m bench)	$0.04/t mined	$0.04/t mined
HL Cost (including G&A and mining cost component from pit to Heap Leach for 2022 MRE)	$5.390/t processed	$5.946/t processed
ROM Cost (including G&A and mining cost component from pit to ROM leach for 2022 MRE)	$1.355/t processed	$1.654/t processed
Selling Cost including SX-EW processing cost	$0.164/lb sold	$0.164/lb sold
Heap Leach Recovery	76% of CuT	76% of CuT
ROM Recovery	40% of CuT	40% of CuT
Pit Slope angle	42 - 52°	42 - 52°

For slope angles, the same figures from the 2020 MRE were used, as no new geotechnical information was available as of the 2022 MRE Whittle run. Slope angle zones defined in 2020 were projected linearly to cover the complete area of the new block model.

Table 1-5 summarizes the In Pit Resources per category for a cut off grade of 0.15% CuT, including all the Mineral Zones estimated. Detail per Mineral Zone is given in the body of this report

Table 1-5: In Pit Consolidated Mineral Resource Statement, Marimaca (COG 0.15% CuT), NCL Consulting (L. Oviedo, October 13th 2022)

Mineral Resource Category and Type	Quantity (kt)	CuT (%)	CuS (%)	CuT (t)	CuS (t)
Total Measured	47,051	0.54	0.36	253,157	167,614
Total Indicated	92,516	0.45	0.26	412,375	244,200
Total Measured and Indicated	**139,567**	**0.48**	**0.30**	**665,531**	**411,814**
Total Inferred	**82,678**	**0.39**	**0.16**	**322,910**	**128,416**

* Pit shell constrained resources with demonstrated reasonable prospects for eventual economic extraction (RPEEE) are generated using series of Lerchs-Grossmann pit shell optimizations completed by NCL
* CuT means total copper and CuS means acid soluble copper. Technical and economic parameters include: copper price US$4.00/lb; base mining cost US$1.51/t ($1.76/t average); Heap Leach ("HL") processing cost US$5.94/t (incl. G&A); Run-of-Mine ("ROM") processing cost US$1.65/t (incl. G&A); selling cost US$0.16/lb Cu; HL recovery 76% of CuT; ROM recovery 40% of CuT; and 42°-52° pit slope angle
* With the economic parameters stated above, the Cut-Off grade of the Mineral Resource Estimate is approximately 0.15% CuT and a strip ratio of 1:1 has been estimated by NCL.
*An external dilution factor was not considered during this resource estimation. Internal dilution within a 5 m x 5 m x 5 m is considered and the use of small loading equipment is foreseen for adequate selectivity. Assumes 100% mining recovery.
*Quantities and grades in a mineral resource estimate are rounded to an appropriate number of significant figures to reflect that they are approximations.
* Mineral resources which are not mineral reserves do not have demonstrated economic viability. Due to the uncertainty which may attach to inferred mineral resources, it cannot be assumed that all or any part of an inferred mineral resource will be upgraded to an indicated or measured mineral resource as a result of continued exploration

Table 1-6 shows the sensitivity of the 2022 MRE to variations in the CuT cutoff grade.

Table 1-6: Sensitivity of Tonnes, Grades and contained Metal to changes in the Cut Off Grade (base case cut-off 0.15% CuT), NCL Consulting (L. Oviedo, October 13th, 2022)

Cut-off grade (% CuT)	Measured			Indicated			Measured + Indicated			Inferred		
	Quantity kt	CuT [%]	CuS [%]	Quantity kt	CuT [%]	CuS [%]	Quantity kt	CuT [%]	CuS [%]	Quantity kt	CuT [%]	CuS [%]
0.40	24,607	0.79	0.53	37,550	0.72	0.44	62,158	0.74	0.48	27,222	0.68	0.25
0.30	32,157	0.68	0.46	54,563	0.60	0.37	86,720	0.63	0.40	41,422	0.56	0.22
0.25	36,837	0.63	0.42	65,910	0.55	0.33	102,746	0.58	0.36	52,332	0.50	0.20
0.22	40,000	0.60	0.40	73,517	0.51	0.31	113,517	0.54	0.34	60,431	0.47	0.19
0.20	42,206	0.58	0.39	78,880	0.49	0.30	121,086	0.52	0.33	66,256	0.44	0.18
0.18	44,291	0.56	0.37	84,610	0.47	0.28	128,900	0.50	0.31	72,670	0.42	0.17
0.15	47,051	0.54	0.36	92,516	0.45	0.26	139,567	0.48	0.30	82,678	0.39	0.16
0.10	50,536	0.51	0.34	100,946	0.42	0.25	151,482	0.45	0.28	96,064	0.35	0.14
0.05	57,125	0.46	0.30	119,653	0.36	0.21	176,777	0.39	0.24	123,552	0.29	0.11
0.00	61,333	0.43	0.28	129,985	0.34	0.20	191,318	0.37	0.22	134,056	0.27	0.11

* Pit shell constrained resources with demonstrated reasonable prospects for eventual economic extraction (RPEEE) are generated using series of Lerchs-Grossmann pit shell optimizations completed by NCL
* CuT means total copper and CuS means acid soluble copper. Technical and economic parameters include: copper price US$4.00/lb; base mining cost US$1.51/t ($1.76/t average); Heap Leach ("HL") processing cost US$5.94/t (incl. G&A); Run-of-Mine ("ROM") processing cost US$1.65/t (incl. G&A); selling cost US$0.16/lb Cu; HL recovery 76% of CuT; ROM recovery 40% of CuT; and 42°-52° pit slope angle
* With the economic parameters stated above, the Cut-Off grade of the Mineral Resource Estimate is approximately 0.15% CuT and a strip ratio of 1:1 has been estimated by NCL.
*An external dilution factor was not considered during this resource estimation. Internal dilution within a 5 m x 5 m x 5 m is considered and the use of small loading equipment is foreseen for adequate selectivity. Assumes 100% mining recovery.
*Quantities and grades in a mineral resource estimate are rounded to an appropriate number of significant figures to reflect that they are approximations.
* Mineral resources which are not mineral reserves do not have demonstrated economic viability. Due to the uncertainty which may attach to inferred mineral resources, it cannot be assumed that all or any part of an inferred mineral resource will be upgraded to an indicated or measured mineral resource as a result of continued exploration

1.8 Local Resources and Infrastructure

Antofagasta and Mejillones are modern cities with all regular services, serving a combined population of approximately 570,000. Numerous mining-related businesses are located in the cities. Power lines and water supply intakes are located near the property. Both Antofagasta and Mejillones are relevant shipping ports, especially Mejillones, which is a mega-port for larger cargo. In addition, there are five thermoelectric plants in Mejillones and the port represents the most important sulfuric acid terminal in the north of the country. The installed capacity of electric production currently available at Mejillones is close to 900 MW, while the sulphuric acid storage facilities import more than 6 million tons per year.

While Mejillones is an industrial port and most of the labor force is specialized in this type of job, Antofagasta has the largest labor force dedicated to mining in northern Chile. The level of specialized mining knowledge is high and they participate both in the work of large and medium scale mining. The city of Antofagasta is a "mining cluster", where research, education, technical training centers and the largest suppliers of equipment and services for mining in the country operate.

1.9 Conclusions and Recommendations

A team of independent consultants, under the leadership of NCL, was retained by Marimaca to visit the Marimaca deposit three times, one on the second week of December 2016, another in August 2019 and a third one in February 2022, inspect the project, review and audit the data and estimate the Mineral Resource. NCL examined the different sources of input information: raw data (QA/QC), exploration, geology and mineral modelling estimation units.

The purpose of the investigation was to estimate the Mineral Resource, in compliance with recognized industry best practices and report them according to Canadian Institute of Mining, Metallurgy and Petroleum Definition Standards for Mineral Resources and Mineral Reserves (May 2014).

NCL carried out a Resource Estimation of the Marimaca Project, resulting in the estimation of Measured, Indicated and Inferred Resources. For a cutoff grade of 0.15% CuT, the Resources inside an optimized pit envelope are 47,051kt of 0. 54% CuT and 0.36% CuS of Measured Resources, 92,516kt of 0.45% CuT and 0.26% CuS of Indicated Resources and 82,678kt of 0.39% CuT and 0.16% CuS of Inferred Resources.

Since 2016, aggressive exploration in Marimaca has defined copper mineralization zones amenable to open pit mining. The regional exploration potential of the exploration of the properties is good.

The technical information on Marimaca attests to the high overall quality of the exploration and design work completed by site personnel. NCL examined the data, the exploration, and the geology modeling and produced the Mineral Resource estimates of Marimaca. NCL concluded that the models, Mineral Resources and Statements for Marimaca are appropriately categorized and free of material errors.

The QP consider that the work carried out by Marimaca in relation with the Resource Estimation is of excellent quality and the following general recommendations are made to Marimaca:

- Continue to update the 3D geology and structural models of the Marimaca Oxide Deposit
- Complete the interpretation of the remaining data from the 2022 infill drilling campaign not captured in this 2022 MRE, and incorporate into a subsequent mineral resource update with the goal of converting Inferred Resources into the

Measured and Indicated categories for the purpose of developing Mineral Reserves
- Improve the Marimaca Oxide Deposit rock model in order to optimize future dilution and losses
- Integrate the geotechnical data within the geological model
- Develop and improve the resolution of the geo-metallurgical model prior for use in a Feasibility Stud
- Progress the study phase of the Marimaca Project towards a Feasibility Study

A budget of $8M to $12M is estimated to complete the recommended list of activities.

Other than those disclosed in this technical report, NCL is not aware of any other significant risks and uncertainties that could reasonably be expected to affect the reliability or confidence in the Marimaca Project.

2 INTRODUCTION AND TERMS OF REFERENCE

The Marimaca Project is located near Antofagasta in the Antofagasta Province, Region II of Chile. The Marimaca Copper Corp. (MC) is a British Columbia company incorporated under the Business Corporations Act of B.C., on September 22, 2004, with a registered office at the 745 Thurlow Street, Suite 2400, Vancouver, BC V6E 0C5.

Marimaca is a Canadian public company listed on the Toronto Stock Exchange (symbol MARI) which as a result, generates the requirement for Marimaca to file a technical report to support the disclosure of Mineral Resource memorandum.

In 2016, MC retained the services of NCL Ingenieria y Construccion SpA (NCL) to visit the MC project and compile a technical report pursuant to National Instrument 43-101 Standards of Disclosure for Mineral Projects and Form 43-101 published in January 2017. Following 2017, MC has executed several further drilling campaigns and has gathered new geological mapping and sampling information which has been reviewed and utilized by the QP for this technical report. A visit to the site was made in August 2019, for a total of three days, where QP had the possibility to visit the surface and the underground workings present in the newly drilled areas. A further visit to the site was made in February 2022, for a total of three days.

This technical report updates and summarizes the relevant technical information to support the new Mineral Resources Estimation for the Project. This technical report is based on an inspection of the property by a team of qualified persons, as this term is defined in National Instrument 43-101, conducted for 2 days in December 2016 and August 2019, and for 3 days in February 2022. In February 2022 MC began compiling a new dataset of technical information based on the 2022 drilling campaign. This dataset was available to NCL in electronic format in the second half of 2022 for review and discussions with technical personnel. The qualified persons have reviewed such technical information and determined it to be adequate for the purposes of this report. The authors do not disclaim any responsibility for this information.

2.1 Term and Reference

The scope of work is defined in an engagement letter executed between MC and NCL and involves mobilizing a qualified person to visit the subject mineral assets to review the technical information relevant to support the Mineral Resources estimate. The objective is to provide an estimation of the Mineral Resources for Marimaca as of October 2022, and to compile a technical report pursuant to National Instrument 43-101 to support the disclosure of Mineral Resources by NCL. Responsibilities for each report section are listed in Table 2-1.

Table 2-1: Responsibility of Report Section

1	SUMMARY	MC/NCL
2	INTRODUCTION AND TERMS OF REFERENCE	MC/NCL
3	RELIANCE ON OTHER EXPERTS	MC/NCL
4	PROPERTY DESCRIPTION AND LOCATION	MC
5	ACCESSIBILITY, CLIMATE, LOCAL RESOURCES AND INFRASTRUCTURE AND PHYSIOGRAPHY	MC
6	HISTORY	MC
7	GEOLOGICAL SETTING AND MINERALIZATION	MC
8	DEPOSIT TYPES	MC
9	EXPLORATION	MC/NCL
10	DRILLING	MC
11	SAMPLE PREPARATION, ANALYSIS AND SECURITY	MC
12	DATA VERIFICATION	MC/NCL
13	MINERAL PROCESSING AND METALLURGICAL TESTING	MC/NCL
14	MINERAL RESOURCE ESTIMATE	NCL
15	MINERAL RESERVE ESTIMATE	
16	MINING METHODS	
17	RECOVERY METHODS	
18	PROJECT INFRASTRUCTURE	
19	MARKET STUDIES AND CONTRACTS	
20	ENVIRONMENTAL STUDIES, PERMITTING, SOCIAL AND COMMUNITY IMPACT	
21	CAPITAL AND OPERATING COSTS	
22	ECONOMIC ANALYSIS	
23	ADJACENT PROPERTIES	MC
24	OTHER RELEVANT PROPERTIES AND INFORMATION	MC
25	INTERPRETATIONS AND CONCLUSIONS	MC/NCL
26	RECOMMENDATIONS	MC/NCL
27	REFERENCES	MC/NCL
28	ANNEX 1	MC/NCL
29	ANNEX 2	MC/NCL

2.2 Qualification of NCL

NCL includes more than 40 professionals, offering expertise in a wide range of resource estimation and engineering disciplines. The independence of NCL is ensured by the fact that it holds no equity in any project it investigates and that its ownership rests solely with its staff. These facts allow NCL to provide its clients with conflict-free and objective recommendations. NCL has proven assessments of Mineral Resources, project evaluations and audits, technical reports and autonomous feasibility evaluations to bankable standards on behalf of exploration and mining companies, and financial institutions worldwide. Through its work with many major international mining companies, NCL has established a reputation for providing valuable consultancy services to the global mining industry.

A group of professionals from the NCL Santiago offices compiled the technical report. In accordance with National Instrument 43-101 guidelines, qualified persons visited the Marimaca project between December 2016 and February 2022 as shown in Table 2-2.

Table 2-2: Qualified Person and professional's involvement

Company	Qualified Person	P. Engineer	Site Visit	Responsability
NCL	Luis Oviedo	Ricardo Palma	Dec-16	Overall responsibility on behalf of NCL
NCL	Luis Oviedo		Aug-19	
NCL	Luis Oviedo		Feb-22	

2.3 Basis of Technical Report

This technical report is based on information made available to NCL by MC in electronic files and information collected during the site and office visits. The author has no reason to doubt the reliability of the information provided by MC. Other information was obtained from the public domain. This report is based on the following sources of information:

- Discussions with Marimaca, personnel
- Information posted by MC in Intralinks; and
- Additional information from public domain sources
- New Intralinks and digital information from the 2021-2022 campaigns
- NCL's NI 43-101 Technical Report dated February 2018
- NCL's NI 43-101 Technical Report dated January 2020
- Press Release dated October 13, 2022

The qualified persons have reviewed such technical information and do not disclaim any responsibility for the information provided and reviewed.

2.4 Declaration

NCL's opinion contained herein and effective October 13, 2022 is based on information collected by NCL throughout the course of NCL's investigation. The information in turn reflects various technical and economic conditions at the time of writing the report. Given the nature of the mining business, these conditions can change significantly over relatively short periods. Consequently, actual results may be significantly more or less favorable.

This report may include technical information that requires subsequent calculations to derive subtotals, totals, and weighted averages. Such calculations inherently involve a degree of rounding and consequently introduce a margin of error. Where these occur, NCL does not consider them material.

NCL is not an insider, associate or affiliate of MC. The results of the report by NCL are not dependent on any prior agreements concerning the conclusions to be reached, nor are there any undisclosed understandings concerning any future business dealings.

2.5 Units and Currency Definitions

All units in this report are metric, unless specified explicitly in the text. The Currency used is dollars of the United States of America.

3 RELIANCE ON OTHER EXPERTS

NCL has not performed an independent verification of the land titles and tenures of this report. NCL did not verify the legality of any underlying agreements that may exist concerning the permits or other agreements between third parties but has relied on the information provided by the legal advisors of MC, Bofill Mir and Alvarez Jana Abogados, (Av. Andrés Bello 2711, piso 8, Las Condes, Santiago, Chile), in an opinion letter sent to MC on November 24th 2022 regarding title matters discussed in Chapter 4 of this technical report. This letter is attached as Appendix 1.

On the technical side, MC's professionals Sergio Rivera, Vice President of Exploration, Paola Kovacic, Exploration Manager, made vital contributions to the exploration of the project and the implementation of this report.

4 PROPERTY DESCRIPTION AND LOCATION

The concessions that make up the Marimaca Project and the surrounding Marimaca District concessions are in Chile's Antofagasta Province, Region II, within 25 km west of the port of Mejillones, approximately 45 km north of the city of Antofagasta and 1,250 km north of Santiago, Chile's capital city. The project area is located at approximately 374,820 E and 7,435,132 S in WGS84 UTM coordinates.

Figure 4-1 shows the project location, highlighting the proximity to first class utilities and infrastructure. The figure also summarizes Marimaca's mining property position.

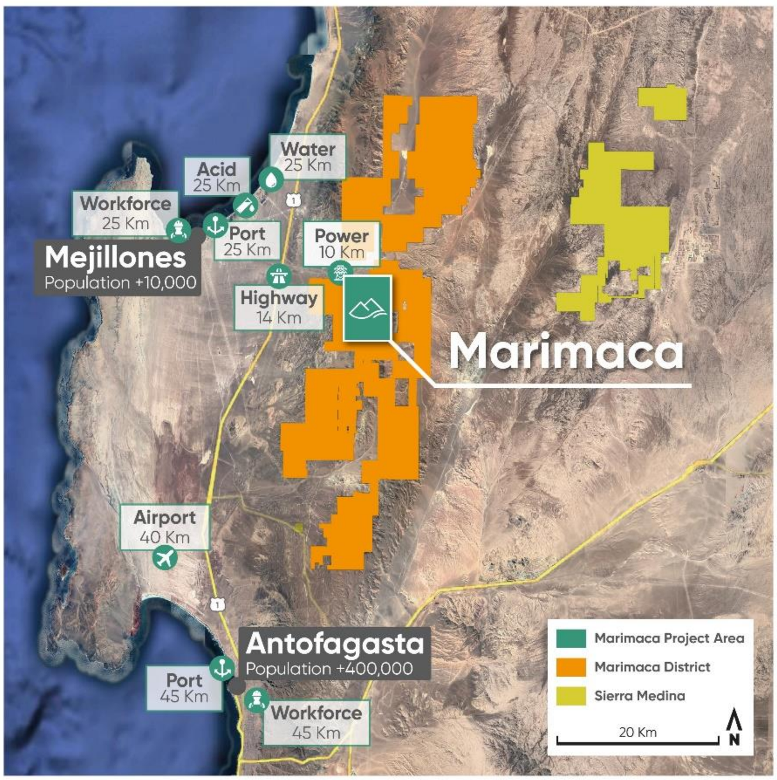


Figure 4-1: Marimaca Project location map, Marimaca Copper Corp., 2022

4.1 Mineral Tenure

The Marimaca Project is comprised of 20 mining/exploitation concessions covering approximately 961 hectares. These concessions are listed in the national mining claims register, and are in the area of Sierra Naguayán, Commune of Mejillones, Province and Region of Antofagasta.

All other concessions held by entities within the Marimaca group currently form part of the wider Marimaca District or the area of Sierra de Medina.

4.1.1 Properties that comprise the Marimaca Project

The Marimaca Project is protected by the mining/exploitation concessions listed in Table 28-1 of Annex 1 and as shown in Figure 4-2. These concessions are located in zones that are referred to as La Atómica, Marimaca 1-23, Atahualpa and certain parts of the zone referred to as Llanos/Mercedes. Each of these zones are made up of several mining/exploitation concessions.

Each of the mining/exploitation concessions that make up the Marimaca Project are in good standing and all required annual claim fees (*patented*) have been made up to and including 2022, without interruption.

Compañía Minera Cielo Azul ("MCAL"), a Chilean subsidiary of the Company, originally held certain of the Company's interests in the mining/exploitation concessions via option agreements entered into. Most of the options held under these agreements have now been exercised, as summarized below.

Certain concessions that underpin the Marimaca Project are held by other Chilean subsidiaries of the Company, namely Sociedad Contractual Minera Compañía Minera NewCo Marimaca ("Newco Marimaca"); and (iii) Inversiones Cielo Azul Limitada ("ICAL").

In addition, certain net smelter return (NSR) royalty interests have been created over the concessions that make up the Marimaca Project. These include the 1.0% NSR granted to Osisko Gold Royalties in September 2022, for which the Company received US$15.5 million.

The following information sets out all of the additional NSR interests over the Marimaca Project properties. Table 28-1 of Annex 1 also provides further information on NSR interests that apply to individual concessions.

Marimaca 1-23 Claims

The Company acquired 100% of the Marimaca 1-23 claims for US$12.2 million. A 1.5% NSR is payable on these claims, with the Company/MCAL retaining an option to purchase 1% of this interest within 24 months from commencement of commercial production from the claims.

The Osisko royalty terms require these buyback rights to be exercised prior to the commencement of commercial production.

La Atómica

The Company acquired 100% of the La Atomica property for US$6.0 million, which was paid from 2017 to 2021. A 1.5% NSR is payable on this, with the Company/MCAL retaining an option to purchase 0.5% of the 1.5% NSR for US$2.0 million at any time.

The Osisko royalty terms require these buyback rights to be exercised prior to the commencement of commercial production.

Atahualpa

Under the terms of a January 2018 LOI, the Company acquired 100% of the Atahualpa, Tarso, Sierra and Sorpresa properties for US$6.0 million. A 2% NSR was payable under the original option agreement. The Company acquired this interest for US$2.2 million.

Olimpo y Cedro (formerly called Naguayán)

The Company acquired 100% of the Olimpo y Cedro properties for US$6.5 million, which was paid from 2018 to 2022. A 1.5% NSR is payable on the properties, with the Company/MCAL retaining an option to purchase 0.5% of the 1.5% NSR for US$2 million within the first 12 months of commencement of commercial production from the properties.

Llanos/Mercedes

Under the terms of a May 2019 option agreement, the Company/MCAL may acquire the Llanos/Mercedes properties for a total consideration of US$2.0 million payable as follows: US$0.05 million upon signing (paid); US$0.05 million on the 16-month anniversary (paid); US$0.1 million on the 24-month anniversary (paid); US$0.125 million on the 28-month anniversary (paid); US$0.125 million on the 36-month anniversary (paid); US$0.15 million on the 40-month anniversary (paid); and US$1.4 million on the 48-month anniversary. In addition, the Llanos and Mercedes properties are subject to a 1% NSR. The Company/MCAL has an option to purchase this for US$0.5 million within 24 months from commencement of commercial production from the properties.

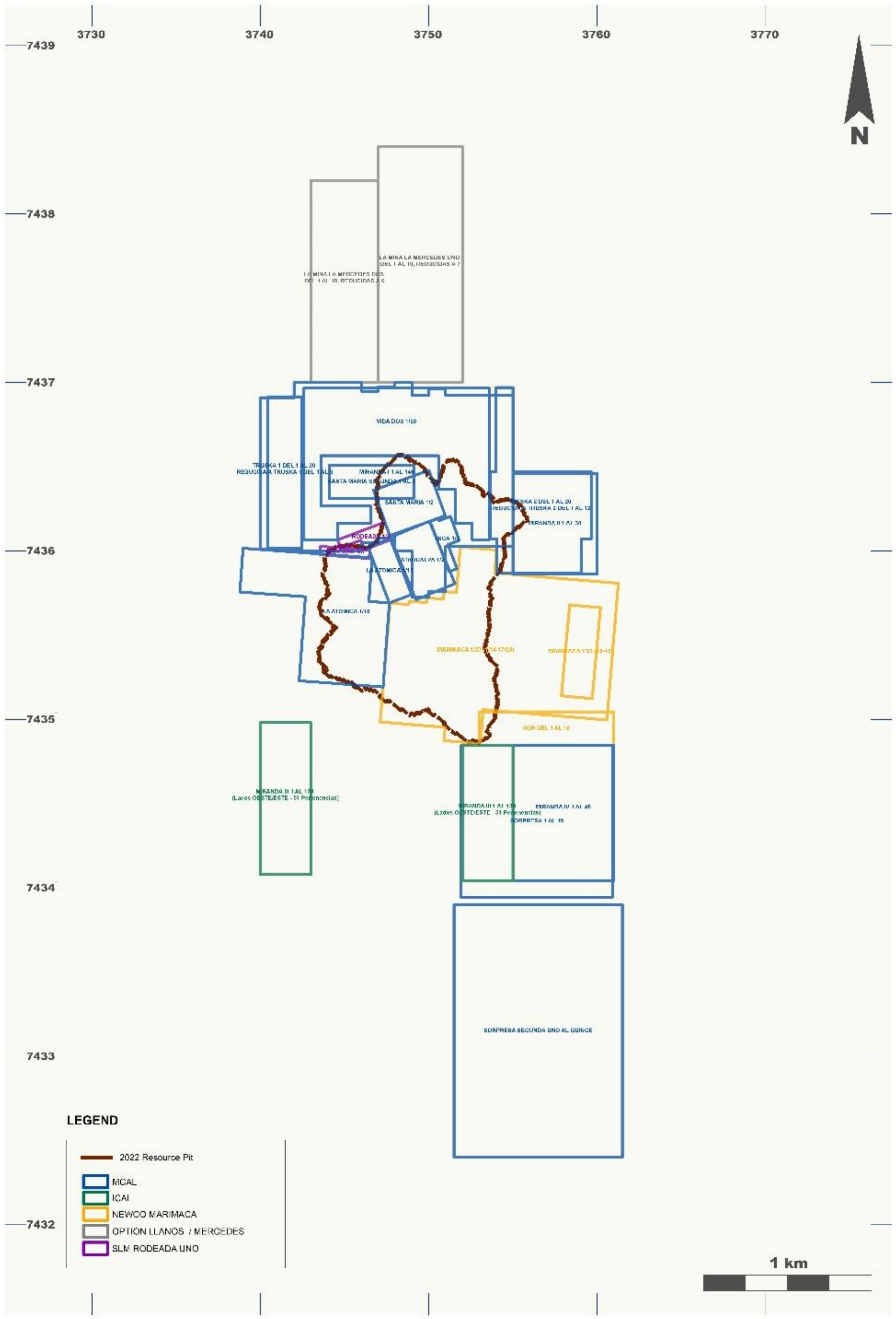


Figure 4-2: Marimaca Project Concessions, Marimaca Copper Corp., 2022

Table 28-1 of Annex 1 shows the list of concessions that comprise the Marimaca Project in more detail.

4.2 Mineral Rights in Chile

The Political Constitution of the Republic of Chile ("*Constitución Política de la República*") provides that the Chilean State has absolute, exclusive, inalienable and imprescriptible property over all mines and mineral substances located within the national territory, with the exception of surface clays, notwithstanding the ownership of natural or legal persons over the superficial land in the interior of which they are located.

Private individuals may develop mining exploration and exploitation works on the basis of mining concessions granted by judicial resolution. In accordance with Chilean mining legislation, there are two types of mining concessions in Chile: exploration concessions and exploitation concessions. The main characteristics of each are the following:

Exploration Concessions: the titleholder of an exploration concession has the right to carry out all types of mining exploration activities within the area of the concession. Exploration concessions can overlap or be granted over the same area of land; however, the rights granted by an exploration concession can only be exercised by the titleholder with the earliest dated exploration concession over a particular area.

For each exploration concession the titleholder must pay an annual fee of approximately US$1.30 per hectare to the Chilean Treasury and exploration concessions have duration of two years. At the end of this period, the exploration concession may be (a) renewed as an exploration concession, for a new term of up to two further years and in which case the titleholder must waive at least 50% of the surface area of the existing exploration concession, or (b) be converted, totally or partially, into exploitation concessions by exercising the pre-emptive right described in the next paragraph. As of February 2023, exploration mining concessions will have a fixed duration of 4 years, with no possibility of renewal and the annual fee will increase to approximately US$3.87 per hectare.

A titleholder with the earliest dated exploration concession has a preferential right to an exploitation concession in the area covered by the exploration concession. This preference pre-empts the rights of third parties with a later dated exploration concession for the same area, or of third parties without an exploration concession at all, and must be enforced in exploitation mining granting proceedings. Similarly, a pre-existing exploration concession with an earlier dated claim for a mining exploration concession ("*pedimento*") can void subsequent overlapping mining exploration concessions.

Nonetheless, for an exploration concession's preemptive rights to remain valid, the titleholder of an exploration concession must oppose any exploitation concession applications from third parties within the same area. This opposition must be filed within thirty days from the date upon which the survey request for any overlapping exploitation concession in process of being granted is published in the Mining Gazette. The opposition will suspend the exploitation mining concession granting process until the decision on the opposition –either rejecting the opposition or determining where the survey cannot take place given the exploration concession's existence and preferred rights– is final.

If the opposition is not filed in a timely manner, then: (a) the exploration mining concession will lose its rights to the overlapped area where the subsequent exploitation mining concession is granted; or (b) the subsequent exploitation concession cannot be voided on the basis of the overlap.

Exploitation Concessions: The titleholder of an exploitation concession is granted the right to explore and exploit the minerals, located within the area of the concession and to take ownership of the minerals that are extracted. Exploitation concessions cannot overlap or be granted over the same area of land.

Exploitation concessions are of indefinite duration and an annual fee is payable to the General Treasury of the Republic in relation to each exploitation concession of approximately US$6.50 per hectare. As of February of 2023, the exploitation mining fees per hectare will be calculated as follows: (i) approximately US$25.80 from year 1 to 5; (ii) approximately US$51.59 from year 6 to 10; (iii) approximately US$58.04 from year 11 to 15; (iv) approximately US$77.38 from year 16 to 20; (v) approximately US$193.45 from year 21 to 25; (vi) approximately US$386.90 from year 26 to 30; and (vii) approximately US$773.81 from year 30 on. These fees will be reduced to approximately US$6.50 per hectare if the project is in operation and to US$19.5 per hectare if the project is not in operation yet but is included in a mining project that has obtained an Environmental Approval Resolution or is in the process of obtaining one. It is believed that the authorities are currently reviewing the application of this regime and considering a possible delay until 2024, for the purpose of issuing the regulations required to govern the procedure to qualify for reduced fee rates.

Where a titleholder of an exploration concession has applied to convert the exploration concession into an exploitation concession, the application for the exploitation concession and the exploitation concession itself take the date of the exploration concession.

A titleholder to an exploitation concession must apply to annul or cancel any subsequent exploitation concessions which overlap the area covered by its exploitation concession within the 4-year term from the date upon which the judicial awarding of such exploitation concession is published in the Mining Gazette. If the holder of the earliest exploitation concession fails to annul the later exploitation concession, then the judicial decision that declares the statute of limitations to have elapsed will also extinguish the earliest mining concession in the overlapped surface. The preferential right over the areas covered by mining concessions is determined by the chronological order of the mining concessions judicial request. Therefore, the first mining concessionaire to request a mining concession over a certain area shall have the preferential right to explore or exploit such area once its mining concession is dully constituted. If that mining concessionaire fails to duly constitute its mining concession (due to not meeting deadlines or fulfilling requirements), then the preferential right shall pass to the mining concessionaire that has presented its judicial request right after the one who failed to constitute.

Rights over exploration and exploitation mining concessions in process of being granted may be transferred and disposed of once the judicial request has been duly registered in the corresponding Mining Registrar.

4.3 Surface Rights

MCAL currently has a provisional easement in respect of the surface rights over the concessions that provide for the Marimaca Project and elements of the wider Marimaca District. This provisional easement is registered in the name of MCAL, before the corresponding Real Estate Registrar. A definitive easement for the final development area of the Marimaca Project will be registered in due course.

4.4 Water Rights

The Company does not hold any water rights or maritime concessions. However, MCAL entered into a water option agreement in October 2022 to secure the future water supply required for the Marimaca Project. Under the agreement, one of Chile's largest energy suppliers will supply seawater following its use in cooling systems at an electricity plant in Mejillones. The option has a term of 5 years, with the ability to extend for 2 years. The option period will allow the Company to advance final project permitting and technical studies, including water pipeline studies that are already underway. The exercise of the option will trigger the execution of a water supply agreement priced on a take-or-pay basis for the Marimaca Project's life of mine. The principal terms of the water supply agreement have been negotiated and agreed in the option documentation.

4.5 Environmental Liabilities and Permits

MCAL first obtained an Environmental Qualification Resolution (RCA) in July 2018 to be able to produce 10,000 tons of cathodes annually from the Marimaca 1-23 claims. Whilst this RCA still exists, it does not provide for the Marimaca Project as envisaged in the 2020 PEA.

A further RCA was obtained in November 2020 to provide for exploration and prospecting campaigns across the Marimaca Project and parts of the wider Marimaca District.

Currently, the Company is in the process of conducting environmental baseline studies to assess possible impacts that the Marimaca Project may have when it enters the Environmental Assessment System for purposes of obtaining an RCA for development. These studies do not currently identify any major environmental risks. In addition, there are no known material environmental liabilities in relation to the Marimaca Project.

There are no other significant factors and risks that may affect access, title, the right or ability to perform work on the Marimaca Project.

5 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES AND INFRASTRUCTURE AND PHYSIOGRAPHY

5.1 Accessibility

The Project is connected to the well-maintained Chilean public road system (Figure 5—1) and is easily accessed from Mejillones (25km west) and Antofagasta (45km south) through paved highway Route 1. The Antofagasta Airport is located 40km south of the Project. The project can be accessed following the paved roads derived from Route 1. A network of unpaved roads connect the project area to Mantos Blancos and to the National Highway 5. Figure 5-1 shows the main access roads connecting Marimaca Project with the main neighboring cities and mining operations.

Figure 5-1: Accessibility to Marimaca Project, Marimaca Copper Corp., 2022

5.2 Local Resources and Infrastructure

Antofagasta and Mejillones are modern cities with all regular services, serving a combined population of approximately 570,000. Numerous mining-related businesses are located in the cities. Power lines and water supply intakes are located near the property. Both Antofagasta and Mejillones are relevant shipping ports, especially Mejillones, which is a mega-port for larger cargo. In addition, there are five thermoelectric plants in Mejillones and the port represents the most important sulfuric acid terminal in the north of the country. The installed capacity of electric production currently available at Mejillones is close to 900 MW, while the sulphuric acid storage facilities import more than 6 million tons per year.

While Mejillones is an industrial port and most of the labor force is specialized in this type of job, Antofagasta has the largest labor force dedicated to mining in northern Chile. The level of specialized mining knowledge is high and they participate both in the work of large and medium scale mining. The city of Antofagasta is a “mining cluster”, where research, education, technical training centers and the largest suppliers of equipment and services for mining in the country operate.

5.3 Climate

The Project is located approximately 39km north of the Tropic of Capricorn. The minimum temperatures vary between 10 and 15°C, and the maximum temperatures are between 20 and 29°C, while the average relative humidity oscillates between 67 and 70%. The climate is extremely dry, and the average annual rainfall is 2-3 mm as an annual average of 24 hours.

In the region, rainfall is very rare and decade’s events of rain, which can reach up to 12 to 30mm over 24 hours, can occur. In the Project area, however, they have no major impact because they do not have high slope drainage from the coastal cliff, a feature that develops both to the south and north of the Mejillones Peninsula (see Figure 5-2).

Towards the east, the central depression zone extends, and it is characterized by vast areas of low slope, the so called “pampas”, where the weather conditions are extremely arid and with notable variations in temperature between day and night. These, in general, vary between 28ºC (day) and 2°C (night) or less depending on altitude.

5.4 Physiography

The Marimaca Project is in the Cordillera de la Costa (Coastal Cordillera), a relevant physiographic unit in the Northern Territory of Chile. Although this cordillera characteristically displays a western border consisting of 0 to 700 m in the high cliff, in the Mejillones area the regularity is interrupted by the Mejillones Peninsula (Figure 5-2), and the Cordillera looks dissected by a series of valleys, most of them controlled by regional faults. Relief altitude varies between 0 and 1,000 m. Towards the east, the Cordillera grades to the Central Depression, and the landscape consist of flat lands or “pampas”.

Vegetation is minimal outside of inhabited valleys where irrigation and the “Camanchaca”, sea mist that comes from the nearby ocean, support very scarce to null vegetation that can withstand the desert environment.

Figure 5-2: Project location, showing relevant physiographic elements (vertical 3x). View toward NE. (CCF coastal cliff; MP: Mejillones Peninsula), Marimaca Copper Corp., 2022

6 HISTORY

The Marimaca Project is in an old mining district known as “Mineral de Naguayán” or “Distrito Minero Naguayan”. Small-scale artisanal mining activities were undertaken in the general Project area from the 1990s to mid-2000s. Underground workings associated with small-scale mining reach a maximum of approximately 100m depth.

No modern exploration was undertaken before Coro Mining Corp (Coro), a predecessor company to Marimaca Copper, began to assemble the Project ground holdings. The Marimaca deposit was identified in 2016, following a reverse circulation (RC) drill program. Coro subsequently detailed geological surface mapping and rock chip sampling, additional RC drilling, core drilling to support geotechnical and geometallurgical studies, metallurgical testwork, and mining studies. An initial resource estimate was completed in January 2017, and Mineral Reserves were first estimated in 2018.

Coro completed a feasibility study in June 2018 (the 2018 Feasibility Study). This study considered an open pit mining using conventional equipment to feed a refurbished process plant, referred to as the Ivan plant, that would have the capability of producing 10,000t of cathode copper per year.

The 2018 Feasibility Study is not currently considered to be the preferred Project development option. Marimaca Copper is not treating the study as current, and the Mineral Reserve estimates are also not considered to be current. However, some of the baseline information generated in support of the 2018 Feasibility Study was used in the 2020 PEA. An Environmental Impact Statement (Declaración de Impacto Ambiental, DIA in the Spanish acronym) and the Mining Safety Regulations and Environmental Qualification Resolution (RCA) was approved on 5 July 2018. Mineral Resources were updated in late 2019 (reported in the 2020 MRE), and again in 2022 – the results of which are discussed in this report. The 2022 MRE captures for a total of 110,790m drilled distributed across 429 drill holes. In most of the south-central area of the MOD, the drill grid is 50x50 m centers with holes oriented 310° and 220°. At the northern part hole distance is at 100 m centers, chiefly oriented 310º azimuth.

Coro changed its name to Marimaca Corp. in May 2020.

7 GEOLOGICAL SETTING AND MINERALIZATION

7.1 Introduction

The region consists mostly of Jurassic volcanic and intrusive rocks, and minor exposures of older Triassic acid volcanic and Paleozoic rocks. The main structural system is the Atacama Faults System (AFZS), active since the Jurassic. These NS to NE oriented faults formed the fabric of the Coastal Cordillera and especially control its eastern border. Figure 7-1, (taken from Ramirez, 2007) summarizes the main geological units for the area.

The metallogeny along the Coastal Cordillera is dominated by the occurrence of Cu-Ag “manto-type” and IOGC type deposits. The classic “manto - type” deposits (Buena Esperanza, Michilla, Mantos de La Luna and Ivan) are hosted by andesitic volcanic rocks. Mantos Blancos is a particular type of “manto - type” deposit, much larger in Cu content and hosted by bimodal acid and intermediate La Negra volcanic rock units. A few deposits are veins hosted in intrusive displaying IOCG affinity (Espinoza et al, 1996; Kojima et al, 2009).

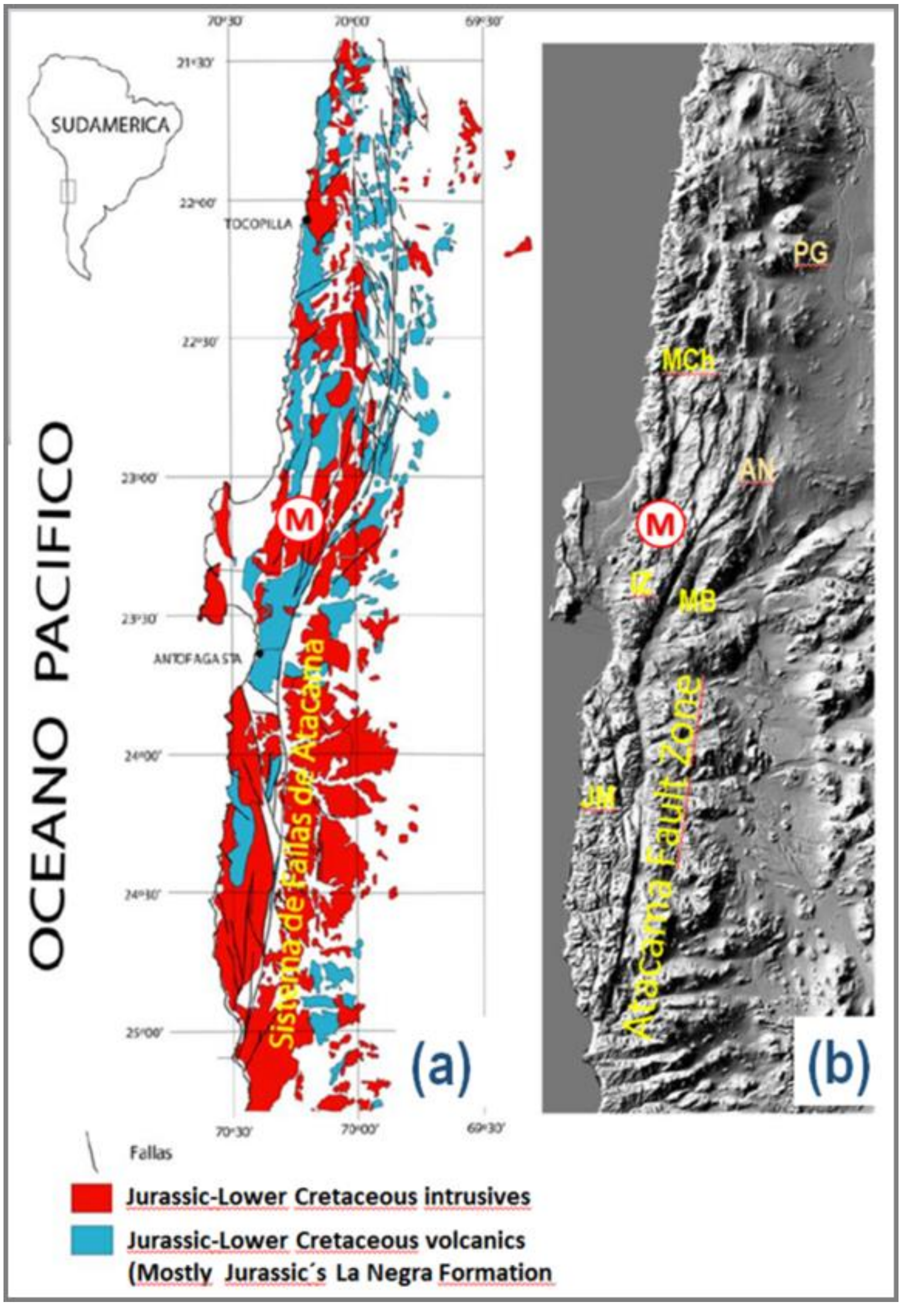


Figure 7-1: Regional Coastal Cordillera Geology (taken from Ramirez, 2007); a) corresponds to a summary of Jurassic intrusives and volcanics. b) corresponds to a DEM that highlights the Atacama Fault System and the main copper deposits (PG: Puntillas-Galenosa; MCh: Michilla; AN: Antucoya; IZ: Ivan-Zar; MB: Mantos Blancos; JM: Julia-Montecristo). Letter M shows the location of Marimaca Project.

7.2 Regional Geology

The geological setting is largely based on the published Mejillones and Peninsula of Mejillones 1: 100,000 geology maps by SERNAGEOMIN (Cortes, et al, 2007, Figure 7-2). This is complemented by specific studies carried out in the Mejillones Peninsula (Lucassen et al., 2000, Herve et al., 2007, Casquet et al., 2014). Economic geology studies have been carried out by geology graduates of the Universidad Católica del Norte (Vergara, 1985; Veliz, 1994; Gonzales, 2002).

New information regarding the nature of La Negra formation and Jurassic intrusive events, especially age determinations and new interpretations about the tectonic and metallogenic evolution have been presented by Mpodozis et al, (2015) and by Mpodozis and Cornejo (2019).

The oldest exposed rocks are late Paleozoic and Triassic in age, consisting of metasediments and intermediate intrusions. Intrusive bodies stocks from early Jurassic to lower Cretaceous characterize the area. These were dated at 155-154 Ma by Cortes et al (2007), but recently adjusted to the interval 174-169 Ma by Mpodozis et al (2015) and Mpodozis and Cornejo (2019). The younger intrusive of this unit hosts the mineralization at Marimaca. The of La Negra Formation volcanic, a LIPS like volcanic bimodal event dated in the interval 180-170 Ma (Mpodozis et al., 2015, Lopez et al, 2017; Mpodozis and Cornejo, 2019) extends to south and north, south, and east of the area (Figure 7-2).

A notable system of dyke assembly intrudes both the intrusive stocks and the volcanic. They are bimodal in composition, from gabbro to rhyodacite composition and extend for tens of kilometers (Cortes et al, 2007). As per previous (Scheuber and Gonzales, 1999; Cortes et al. 2007) and recent dating data (Mpodozis et al, 2015; Mpodozis and Cornejo, 2019), the age range for this dyke swarm is in the 148-145 Ma interval, which is coincident with the main event of copper mineralization (Mpodozis and Cornejo, 2019).

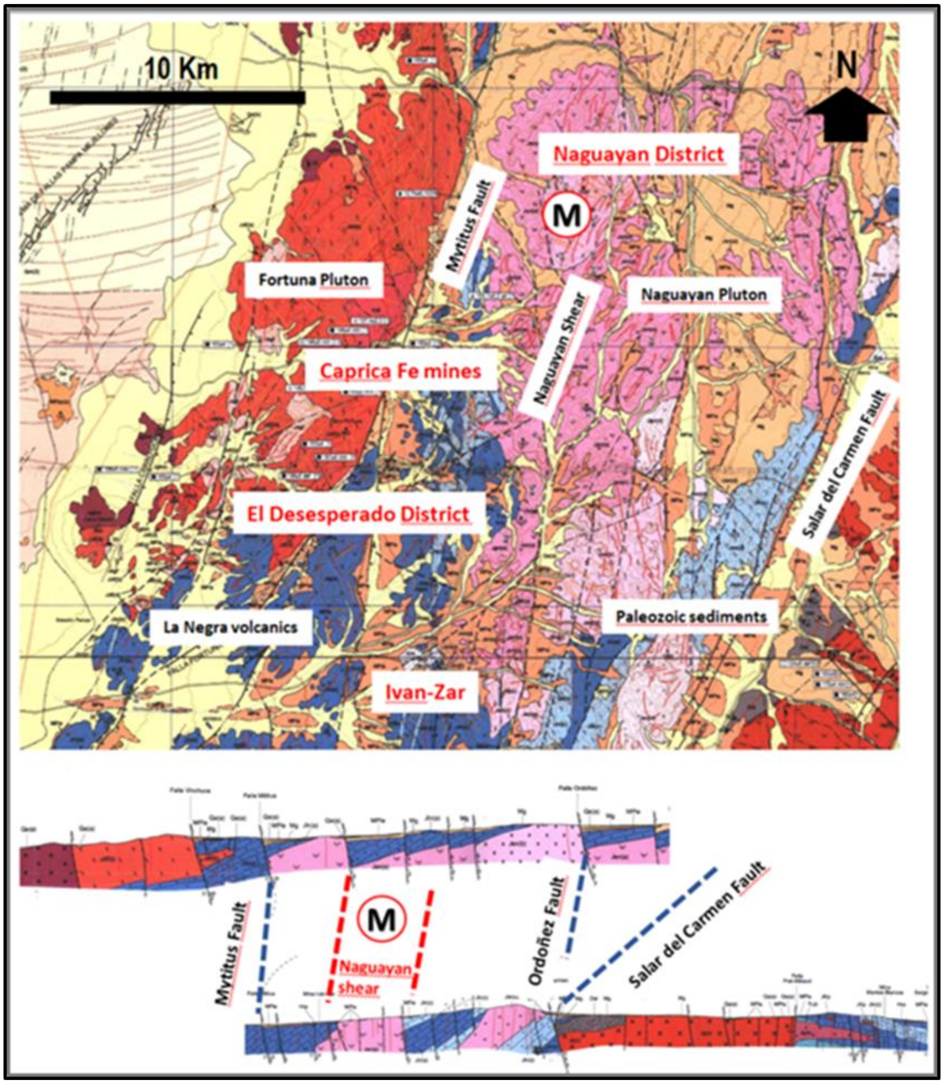


Figure 7-2: Marimaca Project Regional Geologic Setting (taken from Cortes, et al. 2007)

The Tertiary units correspond to marine sediments, which mark the paleo-coastal lines in the Mejillones Peninsula. Part of valleys and pampas towards the east are filled by gravels with intercalations of ash deposits dated 10-12 Ma (Cortes, et al, 2007).

The metallogenic setting the area consists of "manto-type" copper deposits hosted by La Negra Formation volcanism, as well as some IOCG-affiliated vein districts, hosted by Jurassic intrusive (Espinoza et al., 1997; Maksaev and Zentilli, 2002, Sillitoe and Perello, 2005). Towards the eastern border there are some porphyry-type copper systems of late Jurassic to lower Cretaceous age (Figure 7-3) as Antucoya. The recent discovery of Cachorro copper deposit (Arriagada, 2021), described as like Mantos Blancos style mineralization is re-opening the ground for exploration of larger manto-type copper deposits in the region.

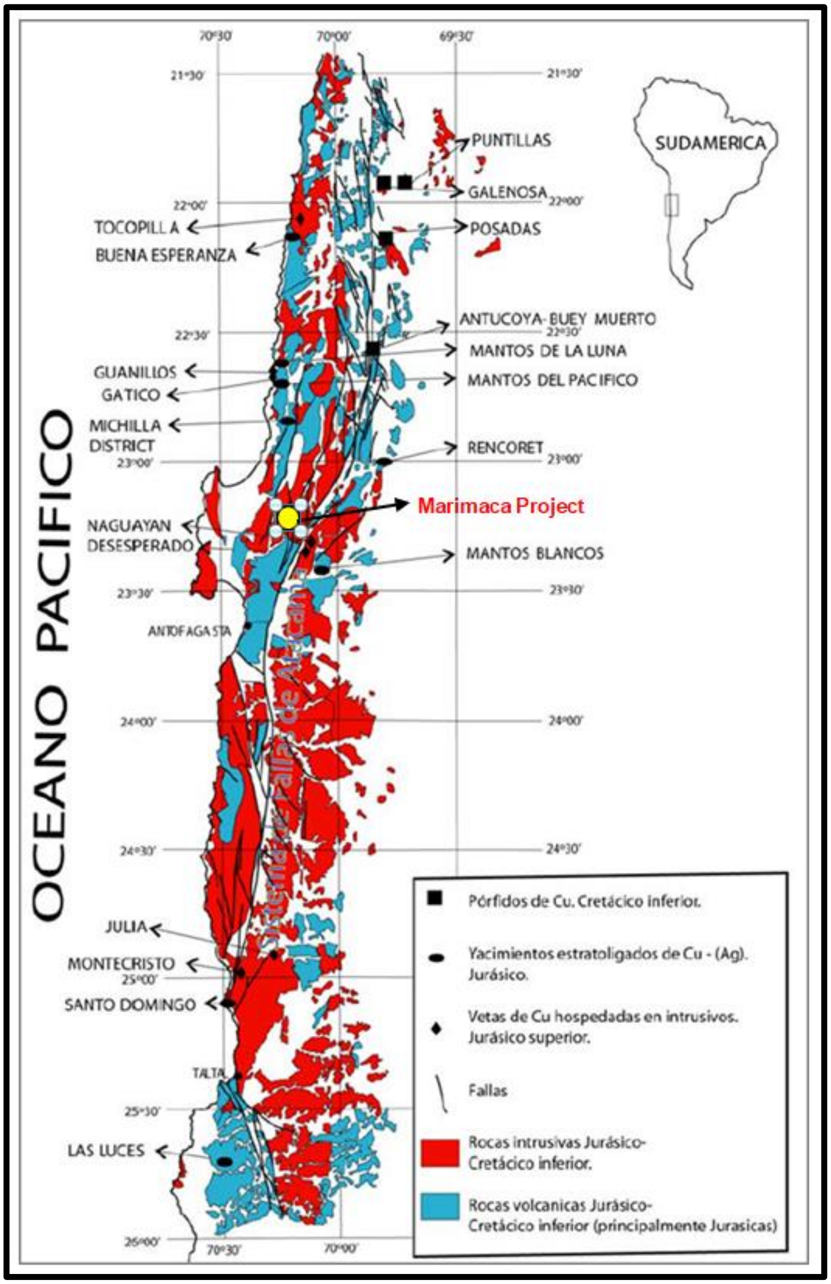


Figure 7-3: Coastal Cordillera main Copper Deposits Location (taken from Ramirez, 2007)

The "manto-type" copper deposits typically correspond to sulfides and copper oxides hosted by volcanic rocks, especially by the brecciated and vesicular upper portions of lava flows but by crosscutting veins and breccia bodies. Rock alteration, usually albitization and K-feldespar replacement is weak and difficult to distinguish from diagenetic alteration (Sato, 1984).

IOCG veins districts are hosted by Jurassic intrusive (Gatico, Naguayán, Montecristo; Espinoza et al, 1997, (Figures 7-1 and 7-2). Marimaca, located at the old Naguayán District is an anomaly in the context of this type of IOCG mineralization occurrences, due to their special structural and supergene mineralization features.

A key aspect of regional metallogenesis is the post-Jurassic geomorphological and climatic evolution that allowed the generation of deep columns of supergene enrichment and oxidation. In Michilla the oxidized and mixed minerals extend up to 200 m depth, the same as Mantos Blancos and Marimaca

7.3 Local Geology

The dominant rock types are intrusive from the "Naguayán Plutonic Complex" defined by Cortes et al. (2015). In Marimaca, the country rock is an equigranular to porphyritic monzodiorite intruded by a Dyke Swarm System consisting of various bimodal dyke episodes ranging in composition from gabbro to rhyodacite oriented NE, to NS, NW and WNW.

The main structural Naguayán fabric, consisting of a NS to NNE oriented sheeted-like fractures zone, including faults and dykes, controls the mineralization at Marimaca and can be observed for kilometers beyond the project area limits. A general view of the project setting is shown in the photograph of Figure 7-4 where the "stratified" appearance of the parallel fractured intrusive and the ensemble of dyke swarm can be noted.

Figure 7-4: Marimaca Project Geologic Setting. Panoramic view from Marimaca area towards south, showing Monzodiorite Stock and Dyke (darker bands) Swarms outcrops (looking ESE). Note also, the north-south trending dipping east "stratified" fabric, as well as the clearer coloured bands characteristics of the "Hanging Wall Alteration" front. The Highest hill is Cerro Naguayán (1,578 m elevation) (Marimaca Copper Corp., 2018)

Background rock alteration consists of Na-Ca metasomatism. The mineralization is related to albite-actinolite-chlorite-iron oxide alteration. The NS to NE parallel fracture and related veins control chalcopyrite-magnetite-rich primary mineralization.

Intense, extensive and pervasive events of supergene oxidation have produced the actual copper oxide blanket that forms the mineral deposit at Marimaca. The surface data show that the copper oxides are controlled by a very strongly fractured host rock creating a high permeability background generated by the superposition of several events of fracturing and dikes intrusions. The oxidation resulted from the alteration of a previous secondary sulfide enriched blanket that produces an expected acid-oxidation chemical zonation from brochantite-atacamite at cores immediately surrounding the secondary sulfides remnant patches and successive external haloes of predominant chrysocolla and further external wad.

As compared with other deposits of the belt, Marimaca is fully hosted by intrusive, rock units that become extremely permeable thanks to intense fracturing. Thus, the mineralization style is very different from the neighboring typical volcanic-hosted Manto-type copper deposits. At the same time, although the nature of primary mineralization is IOCG, the development of a consistent secondary blanket, makes a difference when compared with the typical IOCG from the Coastal Cordillera (Espinoza et al, 1996; Kojima et al, 2009).

For the purposes of this update, no significant and material changes in the previously defined rock & structure project framework have been accounted. The detailed surface map and lithological & structural section remain the same as the 2020 MRE (Oviedo and Palma, (2020). Considering the matter this chapter is a summary of the previous report.

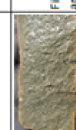
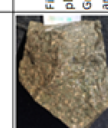
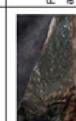
Same as above, no material changes have been registered for the definition of mineral zones and rock alteration. Nevertheless, because of the discovery and delineation of significant mixed and secondary sulphide mineralization below the oxide blanket (named MAMIX zone), the mineralization chapter has been updated.

7.3.1 Lithology

The surface geology is shown in Figure 7-5 and is complemented, by the review of the section for observing the lithological-structural controls of the mineralization and the mineral zone distributions at Figure 7-6. A detailed description of main rock types is provided in Table 7-1.

Pre dyke units from NPC were mapped as Monzodiorite (MZD), Monzodiorite Porphyry (PMD) and Diorite (DIO). Between them, contact relationships remain unclear, except certain evidence of gradational texture change between PMD and MZD. The MZD is the most common country rock (Figure 7-5, Table 7-1). Is recognized as a coarse to medium-grained, quartz monzodiorite. The monzodiorite Porphyry (PMD) is similar in composition to the MZD but displays a clear porphyritic texture. The Diorite (DIO) is medium to coarse-grained quartz diorite. It is characterized by pervasive secondary biotite alteration and fine copper sulfide disseminations (Table 7-1).

Table 7-1: Marimaca Project: summary characteristics of the main rock type units (Marimaca Copper Corp., 2020)

Rock Unit	ROCK TYPE	CODE	PHOTO	MINERALOGY/TEXTURE/CLASIFICATION	CONTACT/AGE RELATIONSHIP	SURFACE DISTRIBUTION	Age Relationships/Regional Equivalent Unit
Naguayan Monzodiorite	MONZODIORITE	MZD		Equigranular, medium to coarse grained pyroxene and hornblende bearing Quartz Monzodiorite. Intersticial K-Sp and quartz.	Corresponds to the oldest rock unit, commonly younger dioritic units contains MZD xenoliths. This unit is cross cut by all the dyke swarm system.	Most common country rock in the project area.	U-Pb dating in the 169-170 Ma range. Defined as "Unidad Oriental Cerro Naguayan (UCENA)" by Vergara (1985) and as "Naguayan Plutonic Complex" by Cortes et. Al. (2015). Also recognized as "Naguayan Stock" by Mpodozis et. al (2015) and Mpodozis and Cornejo (2019)
	MONZODIORITE PORPHYRY	PMD		Porphyryitc monzogranite to quartz monzodiorite, containing lesser pyroxene, hornblende and a quartz-orthoclase rich matrix. Commonly pyroxenes are altered to amphibole.	Shows gradational contacts with MZD. It is intruded by all the younger set of dykes and similar intrusions.	It is fairly un common at the main mineralized area. The PMD unit occurs mostly towards north.	Recognized by Vergara (1985) as part of his UCENA unit and by Cortes et. Al. (2015) as part of the "Naguayan Plutonic Complex"
Marimaca Diorite	DIORITE	DIO		Equigranular,medium to coarse grained quartz diorite, bearing pyroxenes partially replaced by amphibole. Weak to moderate biotite alteration. Showing chalcopyrite and pyrite dissemination.	Observed in isolated outcrops and mostly in drill holes, intruding MZD and intruded by de main NS to NW dyke system.	Occurs at small stocks partially aligned NS at the central part of Marimaca. Mapped mostly in drill holes	Same as previous
NE Early Dyke System	DIORITE PORPHYRY	PDI		Porphyritic fine grained ground mass bearing diorite. Mineralogy includes chiefly plagioclase and pyroxene phenocryst; same at the groundmass that also contains olivine relicts.	Intrudes MZD and its clearly intruded by the main dyke systems	The main NE trending PDI dyke system has been observed towards the NW and a minor trend exist at the SE corner of the area.	Dyke units of different composition described by Vergara (1985) and by Cortes, et. al. (2015). Described as "Dyke Swarms" and linked to mineralization by Mpodozis, et. al. (2015)
	MICRODIORITE	MDI		Microgranular to weakly porphyritic diorite, scarce plagioclase and pyroxene phenocryst and a fine amphibole, chlorite, magnetite matrix.	Intrudes MZD and it is cross cut by main NS to NW dykes	Roughly parallel to PDI NE trending dyke system, also mapped at the NW and SW parts of the area	Same as previous
Main NS Dyke System	OCOITE	OCO		Coarse porphyritic diorite. "Ocoite" is the common name given in Chile to this type of rock, characterized by +5mm fresh plagioclase phenocryst in a pyroxene and magnetite ground mass.	Post PDI and MDI dykes, intruded by MDI NS, PDA and MDI NW dyke systems.	NE to NNW oriented dykes, sub-parallel to MDI and PDI dyke systems.	Same as previous
	NS MICRODIORITE	MDI NS		Fine grained diorite, composed by plagioclase and pyroxene.	NS trending dkyes intruded DIO, PDI, MDI and OCO units. Intruded by NW trending dykes.	NS trending dykes. Structural orientation is NS dipping 45-50 towards east.	Same as previous
	DACITIC PORPHYRY	PDA		Fine grained porphyritic dacite, containing plagioclase and scarce pyroxene phenocryst. Ground mass contains K-Spar. Common amigdules filled by quartz, chlorite and sericite.	NS trending eastward dipping dykes, intruding all previous units. Intruded by NW late dykes systems.	A series of NS trending eastward dipping dykes, showing an spatial relationship with mineralization. Can traced by kms along strike	Same as previous
Late NW Dykes	NW MICRODIORITE	MDI NW		Fine grained microdiorite bearing plagioclase and amphibole.	Late dyke event intruding all previous units.	Distributed along main WNW to EW oriented dyke system corridors. Controls copper oxide distribution and separates main structural domains.	Same as previous

The dyke units are part of the major Dyke Swarm System (DSS) that characterizes the area. Individual dykes average 1 to 2 m in width. As an exception, some PDI and PDA bodies reach widths of 10 to 20 m along strike, dykes often extend for many hundreds of meters or even kilometers. The dykes vary in composition from rhyodacite to gabbro; and occur as sets oriented NE, NS and a set NW to WE. Most are dipping east like the rock fracturing (NS to NE dipping 45-60 east), but the NW to WE oriented are vertical.

The earliest dyke event is north south oriented, eastward dipping (Figures 7-5 and 7-6) and consists of earlier porphyritic diorites also named as “ocoites”. Other units of dykes are the NS trending microdiorites (NS trending MDIs). The Dacitic Porphyry dykes (PDA) are fine-grained porphyritic in texture and commonly shows amygdales filled with crystalline quartz, chlorite and sericite. PDAs are related to high-grade mineralization zones.

The NS oriented earlier dykes are intruded by NE oriented, 50-60° SE dipping, Diorite Porphyry (PDI) and Microdiorite (MDI) dykes (see map of Figure 7-5). PDI is a fine-grained porphyritic diorite. MDI is a fine grained to weakly porphyritic (Table 7-1).

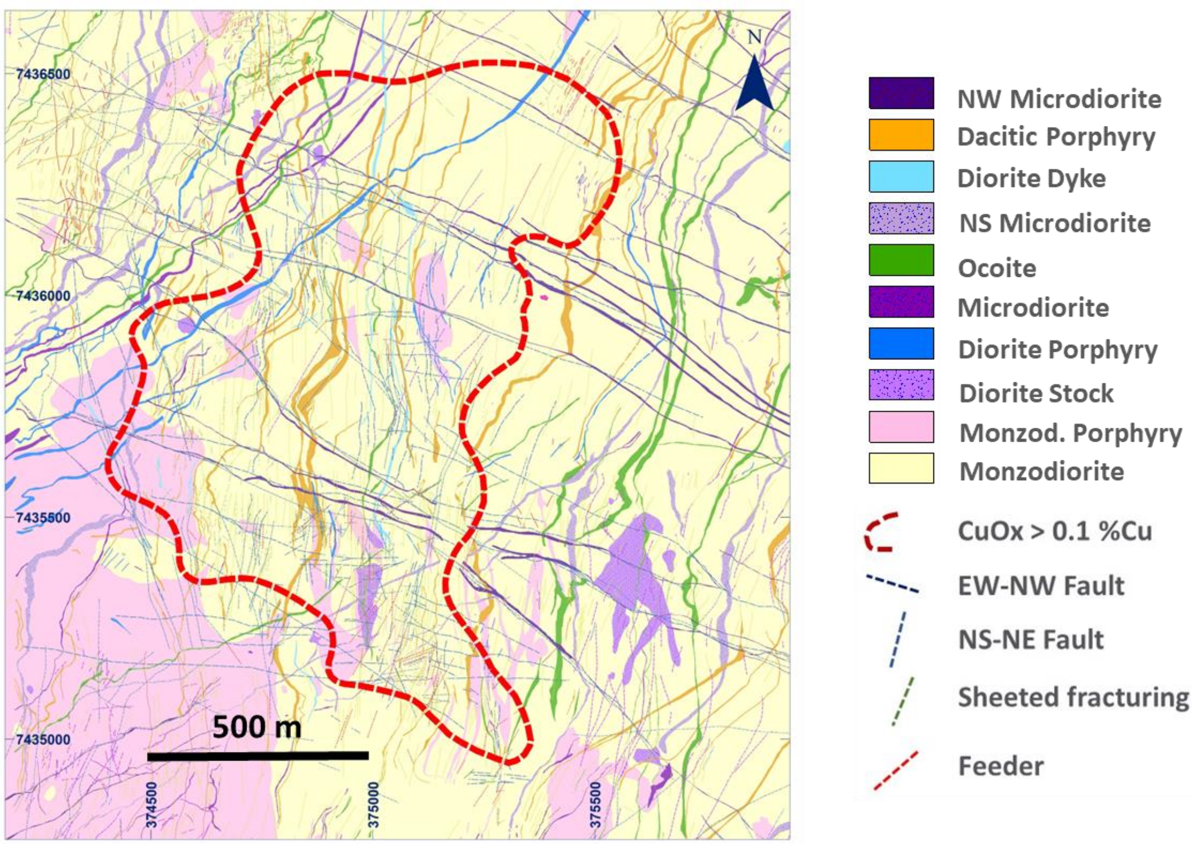


Figure 7-5: Marimaca Project Detailed Sub-Surface Interpreted Geology (Kovacic, 2017; IMG, 2019)

The later event of diking is related to WNW to NW trending, vertical, faults. Dykes are described as Microdiorite (MDI, Table 7-1). This unit is related to NW post-mineral faults.

Nevertheless, late events of secondary mineralization are controlled by this fracture-dyke systems (Figure 7-6).

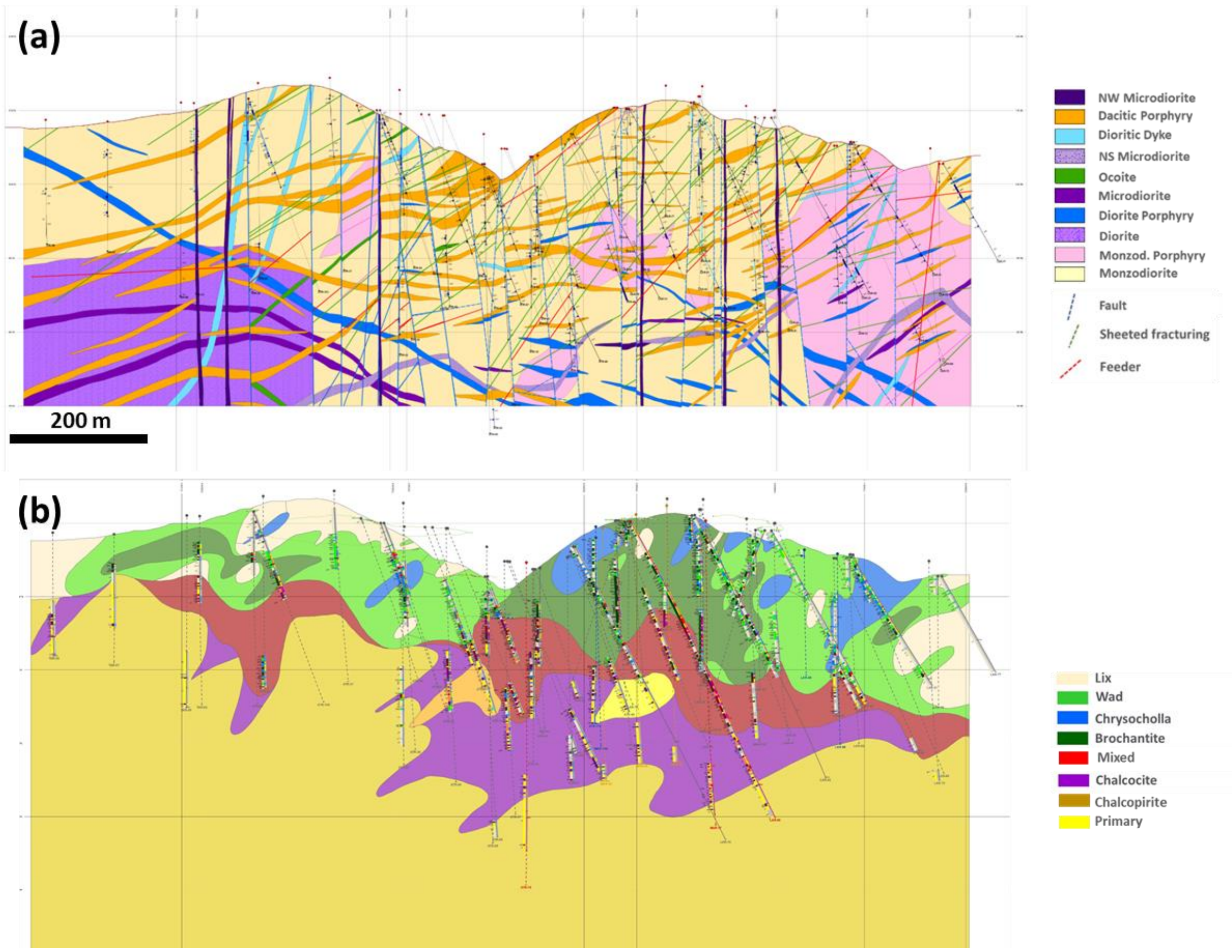


Figure 7-6: Marimaca project. Marimaca Project, Illustrative Litho-Structure from 2020 MRE (a) and Updated Mineralization Section NE100 (b). Sections are 220°south-east (Marimaca Copper Corp., 2022)

The lithological arrangement of Marimaca is complex and reveals several superimpose magmatic and mineralization-alteration events. Shortly after the cooling of the monzodiorite stock, a major extensional tectonic event permitted the formation of the parallel fracture-fault zone and the subsequent emplacement of the earlier event of NS dykes. Extensional controlled tilting and late events of faulting and dyke emplacement complete the complex litho-structural setting.

Although radiometric ages from Cortes et al. (2007) for the NPC are in the range of 140-150 Ma, recent more precise dating by Mpodozis et al. (2015) and Mpodozis, and Cornejo (2019) are in the range of 174-169 Ma. According to Lopez et al (2019), part of these ages is coincident with the older ages from the base of La Negra Formation. Age of diking in the region is in the range of 148 to 145 Ma, which is compared with the age of mineralization at the main copper deposits in the region such as Mantos Blancos and Michilla (Mpodozis and Cornejo, 2019), also could be the estimated age for the Marimaca's main alteration-mineralization event.

The 2020 litho-structural framework was interpreted at the surface from a detailed map and then projected to a regular set of NW and NE vertical sections. Sections were digitized and a 3D model was built by means of Leapfrog™ by Atticus Geo. (Figure 7-7).

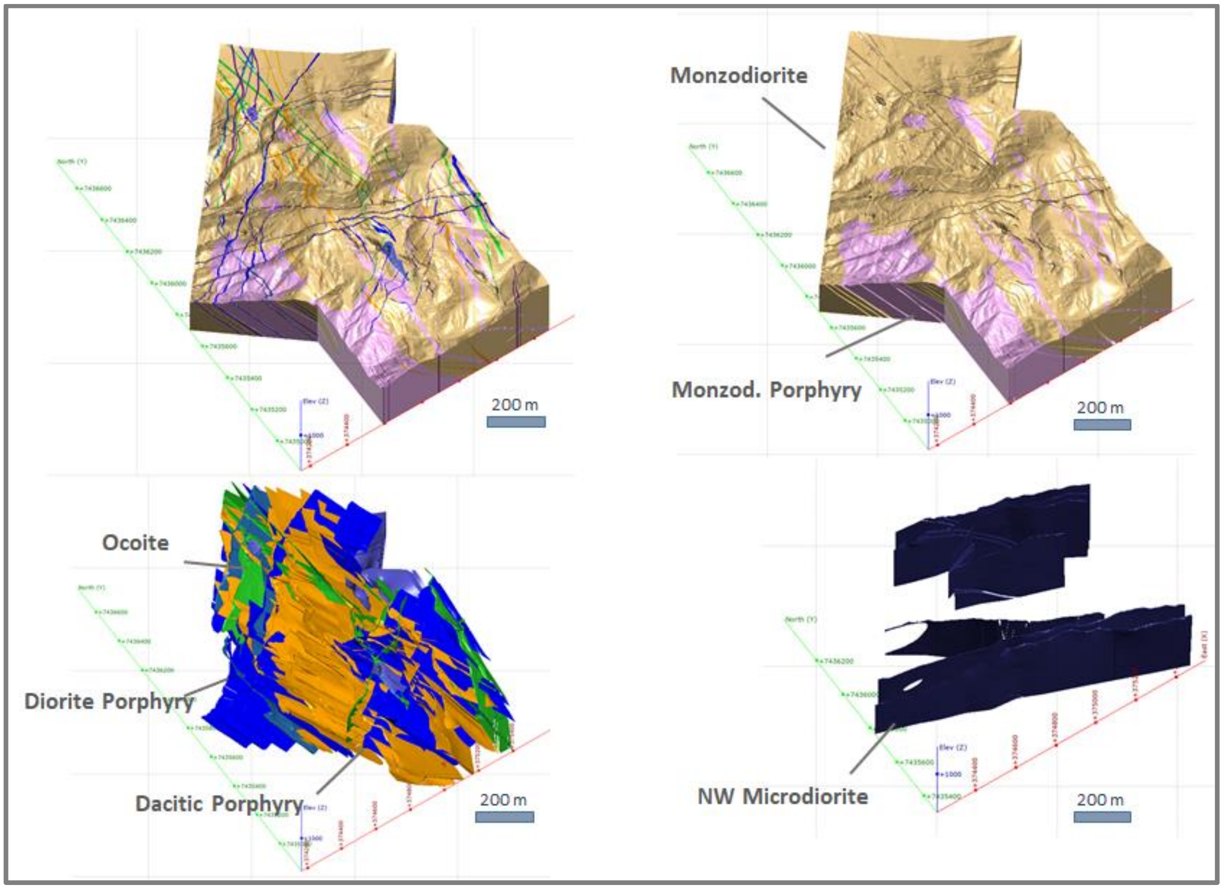
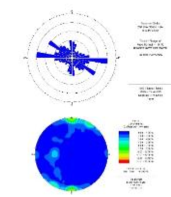
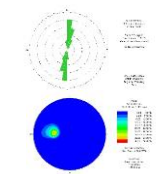
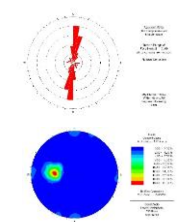
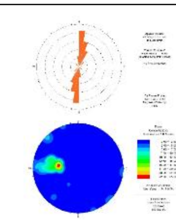


Figure 7-7: Marimaca Project: 2020 MRE 3D. Lithologic model (from Leapfrog TM 3D Model produced by Atticus Geo, 2022)

7.3.2 Structure

Structure plays a key role in the control of secondary mineralization at Marimaca. In order of relevance the following types and system structures have been defined: the parallel set of NS to NNE faults, fractures and related dykes, other systems of NE and NW oriented faults, dykes, and NS to NE trending veins and "feeders".

STRUCTURE TYPE	CODE	DESCRIPTION	MAPPING CRITERIA	DISTRIBUTION	STRUCTURAL ORIENTATION
FAULT	FAL	Fault planes controlling contacts between rock types or alteration-mineralization zones. Evident from outcrops but also from geomorphological expressions such as ridges or creeks.	Shear zones and damage fractures. Gouge and slickensides as main kinematic markers. Normally displaced dykes and are sealed by copper mineralization	There are some NS main faults but mineralized and are describes as "Feeders". The most prominent faults are vertical and strikes EW to NW-SEE. This structural system controls the supergene alteration and mineralization and divides the mineralized zone into five discrete structural domains. Late diorite dykes are controlled by the late faulting. Also controls the geomorphology at some main creeks.	
BANDING	BAN	The most pervasive and characteristics structural system of the area. Observed as sheeted like fracturing, extends for kilometers and controls the distribution of primary as well as oxide mineralization.	Characterized by a pervasive and persistent sub-parallel sheeted-like fracturing. Fracture spacing is close to 3 to 7 fractures per meter. Oriented NS to NNE and dipping 45-50° east. Observed like a "pseudo stratification" of the intrusive host. Main NS trending dykes are roughly parallel to the banding.	Extensively distributed in the project area. Apparently more pervasive at the central mineralized area.	
FEEDER	FEE	Copper mineralized faults. Widths of centimeters to meters. Clearly post banding development. Some shows vein aspect filled by iron oxides and partially brecciates.	1 to 5 meters wide mineralized fault-veins. Mineralization extends to the damage borders. Part of the filling material looks brecciated, related to Fe-Cu mineralization.	Most of the old mining workings follows the high copper grades feeders. Oriented NS to NNE and dips 45 to 70° east. Are more common towards de Marimaca 1-23 sector.	
VEINS	VTS	1 to 3 meters wide, magnetite-hematite with or without copper mineralization structures. Tourmaline is common as well as gypsum, quartz and actinolite.	Easily recognized because their massive aspect, with "gossan" like, goethite-hematite rich, expressions at surface. Some also consisted in sets of centimetric of parallel veinlets.	Commonly related to feeder like structures. Some magnetite rich veins are controlled by dyke contacts. Strikes NS top NNE and dips vertical to 60° east. Mapped for hundred of meters, observable in most of the old mining workings, specially underground at Atahualpa	

A summary of modelled structure characteristics is presented in Table 7-2. The 3D modeling process realized in the 2020 MRE is shown in Figure 7-8. More detailed descriptions, structural rosettes, and illustrative photographs can be revised in 2020 MRE report (Oviedo and Palma, 2020).

The sub-parallel, planar, penetrative and persistent structure system is the most conspicuous structural feature of Marimaca (Table 7-2). This fracture system gives the rock an appearance of "pseudo-stratification", consisting of decametric, sub-parallel fractures that show different types of penetration, filling, spacing and persistence. Preferent orientation of the parallel fractures is 360° to 010-020° dipping 45-50° east.

The different set of dykes are also very important structures. Dykes sealed different episodes of faulting and record the abrupt changes in stress conditions and orientations that affected the area once the NPC was cooled and uplifted. All details about different events of diking, including composition description, preferred orientations and relationship with mineralization has been described in 7.3.1 item of this report

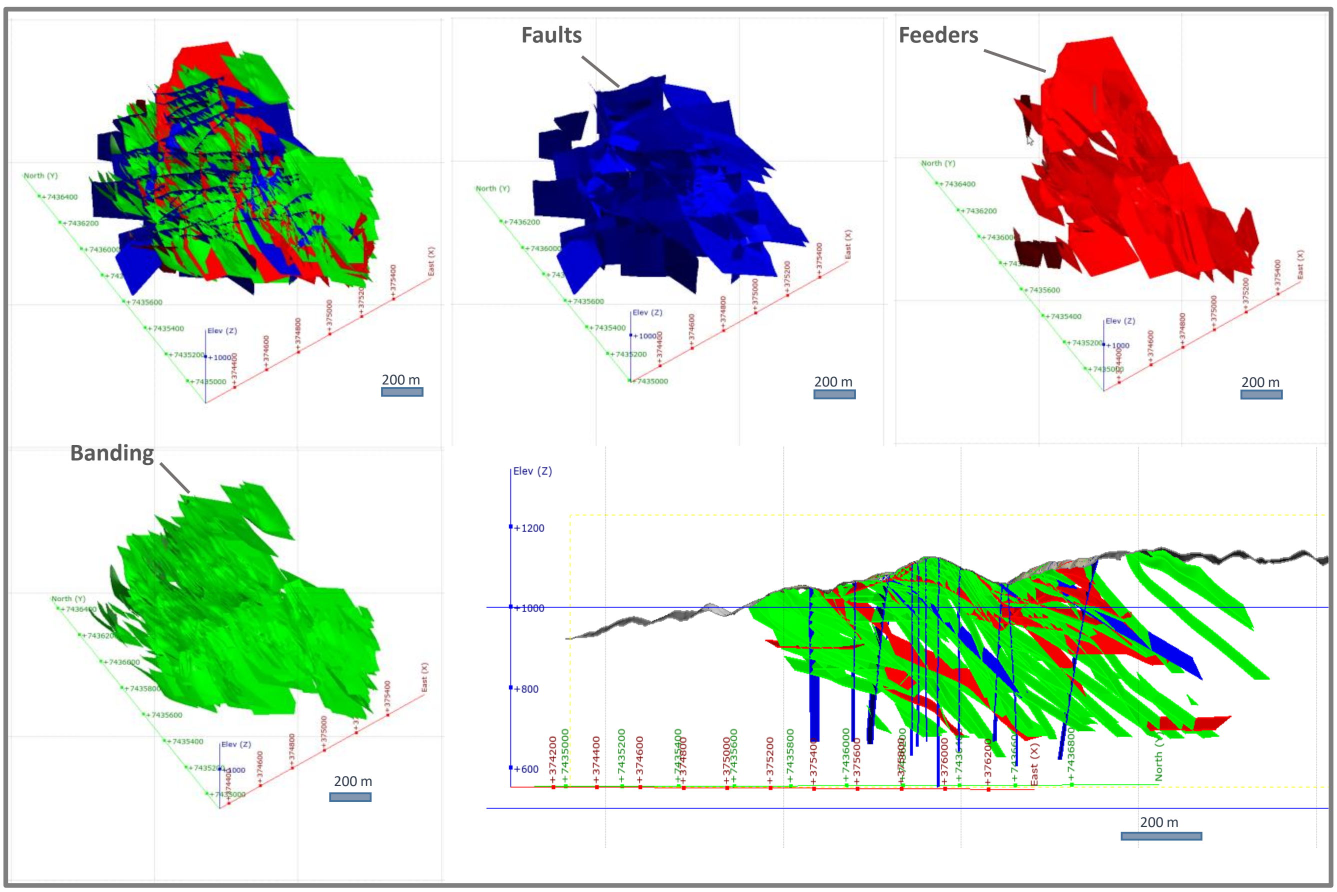


Figure 7-8: Marimaca Project: 2020 MRE 3D Structure modeling (Images from Leapfrog TM 3D Model produced by Atticus Geo, 2022)

Feeders structure details are summarized in Table 7-2. These structures are mineralized faults, bearing gouges and damage zones. Fault zone widths are in the range of a few centimeters to 10 m. Slickenside evidence of vertical and lateral movements. Strong supergene alteration, limonite staining, and fracture filling as well as copper oxide mineralization is a characteristic of this feeder-fault zone (Table 7-2).

Veins (Table 7-2) are 1-3 m wide iron and copper oxide rich structures. Most of the time, they are affected by strong supergene alteration. Gangue minerals such as tourmaline, quartz, actinolite, and gypsum are common. At surface, they can be easily recognized because the structurally aligned gossan outcrops. Some veins are dyke contact controlled, especially PDA type. Underground workings offer excellent examples of strongly oxidized veins.

There are NS, NE and NW trending faults, the same as dyke orientation, and probably at same age order. NS trending faults, feeders, and veins are related to the initial structural event, they are closely related to the earlier PDA (dacitic porphyry) and OCO (ocoite) dykes and parallel structure system. The NW trend of faults also displays relationships with dykes and were considered post mineral, but recent 220° infill drilling demonstrates that an event of late chrysocolla rich oxidation was controlled by this fault system. On the other hand, prominent faults such as the Manolo Fault, display later events of pyrite-sericite alteration, meaning that the mineralization-alteration system remains active even up to the later events of faulting, and/or that part of the supergene alteration was already synchronous with heated late fluids circulation through the active NW faults.

The structures in combination with lithology, especially dykes, are key factors controlling the mineralization in the Marimaca deposit. The structural ensemble composed by the parallel fracture system, feeders and veins, linked to the main NS dyke system emplacement, controlled primary mineralization-alteration. There is evidence that this first stage of hypogene mineralization-alteration occurs at the main extension tectonics stage and continues during the process of block tilting.

New diking sealed a major structural adjustment from NS to NE and jump from NW and EW. This later structural event culminated with the uplifting process and related supergene alteration and hypogene sulfides oxidation. At this stage, the supergene process was favored by a pervasive permeability created by the combination of the NS diking-banded fracturing, and the various NS to NE faulting and the late NW to EW renewed diking and faulting. This step gives to the mineralization the actual geometry of a sub horizontal to eastward dipping secondary blanket.

7.3.3 Alteration

The most relevant alteration related to oxide mineralization is supergene, consisting of limonites, and minor clays mixed with copper oxides. Goethite and minor hematite are common limonites staining fractures or fill open fractures. Fault gouge is commonly composed by limonites mixed with, gypsum and rock flour. Jarosite is less common except as halos of some NW faults zones such as Manolo in the southern part of the area and some veins located towards the east.

The Marimaca hypogene background alteration consists of calco-sodic metasomatism. This is characterized by the replacement of mafics by actinolite and magnetite and the plagioclase and orthoclase by albite. The DIO unit displays biotite-magnetite replacement related to fine copper sulfide dissemination.

Mineralization related alteration consist of earlier actinolite-magnetite, which is characteristic of veins, feeders and rock banding, such type of alteration is common at district scale, and it is related to white albite-chlorite replacement and vein halo development. Strong albite is also related to the brecciation textures observed as related to veins and feeders, in some cases is associated with sericite and chlorite and in others, with hematite. Tourmaline has been observed related to the main feeder veins at the Atahualpa and La Atómica zones.

Because no direct relationship of wall rock alteration with copper mineralization or another metallurgical parameter at the oxide zones has been encountered, no detailed descriptions or studies concerning alteration have been completed to date. Nevertheless, the presence, abundance and mode of occurrence of certain alteration minerals such as albite, K Feldespar, actinolite, etc. has been detailed recorded in drill sample logging.

7.3.4 Mineralization

The Marimaca deposit consists of a copper oxide blanket, exposed at the surface that extends for approximately 1,600 m along the NNW direction, 500 to 400 m wide and 200 to 300 m thick (Figures 7-9, 7-10 and Table 7-3). Two thirds of the middle-upper part of the oxidized column correspond to copper oxides whereas the lower one-third corresponds to mixed and lesser chalcocite mineralization. Although general geometry is a blanket, the mineral zone interpretation was guided by the structural control, emerging the main structural orientations, especially the NS dipping east and the late NW to EW structural system.

Table 7-3: Marimaca Project. Mineral Zone summary.

MINERALIZATION ZONE	CODIGO	PHOTO	MINERALOGY/Cu GRADE	TEXTURE AND OCURRENCE	ZONING
BROCHANTITE	BROC		Mineral zone composed by more than 60% of green copper minerals such as brochantite and atacamite. A 30 to 35% corresponds to chrysocholla and wad. The BROC unit represents a 14% of the Cu oxide zones. Minor amounts of cuprite, gerhardite, tenorite and Cu-limonites has been mapped representing less than 1% of total Cu minerals in the unit. Average Cu grade is 0.7%, analytical sulphuric acid solubilities are more than 70%, and the CN analytical solubilities are less than 5%.	Main occurrence is as veinlets, veins and fracture filling and staining where crystals are easily observable by eye. Disseminations are less common. Common replacement relationships are chrysocholla by atacamite and remnants of chalcocite replaced by brochantite.	Brochantite derives from oxidation of chalcocite and covellite, whereas atacamite seems to be a late occurrence, so it is related mostly to chrysocholla. The high grade cores composed mostly by green oxides are in the central part of the oxide blanket and looks surrounded by chrysocholla and outer halos of wad. This unit is more deep in the Marimaca sector but, because erosion, is already exposed at surface towards north to the Atahualpa sector.
CRYSOCHOLLA	CRIS		This mineral sub-zone represents a 11% of the Cu Oxide zone. Composed by more than 60% of chrysocholla, whereas a 30-35% is consist of green oxides such as brochantite-atacamite. Other minerals and species such of cuprite, gerhardite, tenorite, chenevixite and malachite has been observed totaling less than 2%. Average Cu grade is 0.6%, the analytical acid solubilities more than 70% and CN solubility of less than 5%.	Most common occurrence as fracture filling and staining. Less late veinlets. Common textures as brochantite replacement, but looks replaced by atacamite and wad.	This unit is a product of alteration of the brochantite central zones and occurs as borders. Well preserved by topography at the Marimaca and northern most sector. Mostly eroded at the central Atahualpa and La Atómica. Grades outwards to more wad rich zones.
WAD	WAD		Corresponds to the Black Oxide zone, composed mostly by a mineral substance identified at hand lense as Cu Wad and lesser Cu-limonites, which amounts more than 90% of the Cu mineralogy in the unit. Green oxides and chrysocholla amounts close to 10%, whereas other species such as tenorite represents less than 1%. Cu grades are in the 0.1 to 0.5%, analytical acid solubilities 30-50%, and CN solubility les than 5%.	Main occurrence is as fracture staining. Commonly observed in fractures cross-cutting green oxides.	Is the most common unit towards the borders of the Cu oxide blanket. Part of it has been defined close to the high grade cores at Atahualpa but this results from the abundance of tenorite like minerals rather than pure wad type species. This held to definition of two Wad zones in relation to the Cu grades.
MIXED	MIX		Corresponds to the mineral zone composed by Cu oxides and secondary sulphides. Commonly contains green Cu Oxides such as brochantite and atacamite plus chalcocite. Other minerals included in this zone are "almagrados" (local name for a mix of cuprite-Cu limonites-chalcocite), chalcopyrite, covellite and tenorite. Chrysocholla and wad are very scarce. Average Cu grade is 0.8% and analytical acid solubility 20-60%, the CN solubility is less than 15%.	Most common occurrence is as fracture filling and staining. Textures reveals replacing of chalcocite by brochantite and late fractures and cavities are filled by chrysocholla and atacamite.	Mixed zones are common in the transition between enriched sulphides and green oxides, very close to the oxide/sulphide interface. Patches of mixed zones has been defined occasionally in the green oxide zones. Are more common towards the central part of the Cu oxide blanket at Atahualpa, but less common at Marimaca or La Atómica.
ENRICHED (SULPHIDES)	ENR		The enriched zone is defined by the content of secondary Cu sulphides, chiefly chalcocite and lesser covellite in a percentage of more than 80%. Green oxide minerals such as brochantite and atacamite are fairly common. Remnants of chalcopyrite and lesser bornite are also mapped in this unit. Average Cu grade is 0.7 %, and analytical solubilities of less than 10%, but Cn solubilities are in the 15-40% range.	Massive to earthy occurrences of chalcocite defines this unit. Replacement textures bordering/staining pyrite and chalcopyrite has been observed.	Controlled by main feeders and other faults. Actual drill data is not enough to define clear controls, but its relationship with oxide suggest that a previous enriched blanket was developed an then oxidized in several stages up to reach the actual product. Most common at Atahualpa and La Atómica, lesser remnants at Marimaca.
CHALCOPYRITE	CP		This unit is composes by more than 50% of chalcopyrite and pyrite, whereas a minor percentage is occupied by secondary copper sulphides and traces of Cu oxides plus limonites. Average Cu grade is in the 0.7-0-9% range, solubilities les than 10% for acid and 15% for CN.	Chalcopyrite occurs as massive filling of veins and bands, gange is scarce. Disseminations around veinlets or veins occurrences are common and more related to pyrite. Replacement textures by chalcocite has been observed.	Perhaps a global zone of primary sulphides has been delineated beneath oxides, little drilling information exist for a more detailed definition. Up to now the most frequent chalcopyrite intercepts has been obtained at the Atahualpa sector.

Table 7-3 provides a detailed description of the copper mineral zones defined. Figure 7-9 shows the distribution of the mineralized zones at the surface in relation to the geology and structure. A typical cross section is also shown in Figure 7-6 as compared with lithology-structure. It is necessary to clarify here that the term "enriched sulphide" is used the same as "secondary sulphide" or "chalcocite zone", meaning a mineralization zone defined by the relative abundance of chalcocite that could replace either chalcopyrite or pyrite.

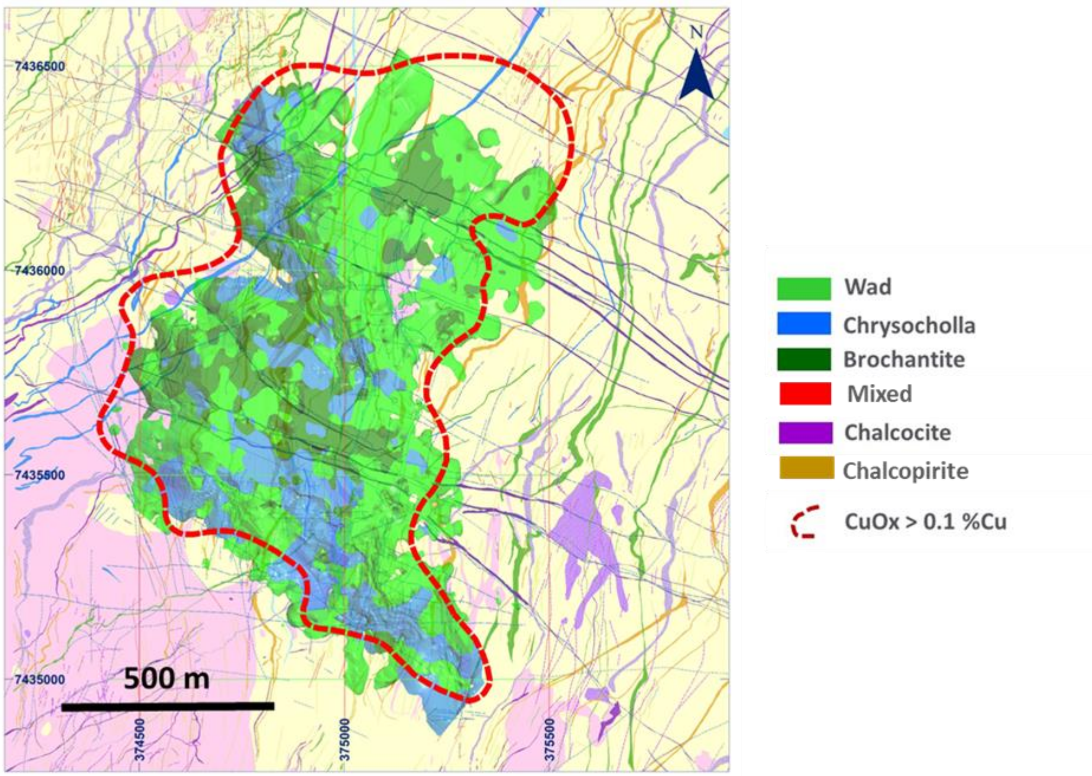


Figure 7-9: Marimaca Project. Sub-Surface Mineralization Map (Marimaca Copper Corp., 2022)

The secondary blanket displays vertical as well as lateral zoning: copper oxides dominate the upper part mostly atacamite, brochantite, chrysocolla and wad. Below oxides, there is an irregular zone of mixed oxide and sulphide mineralization; sulphides are mostly chalcocite, covellite, and remnants of chalcopyrite. The lower zone consists of secondary sulphides, chiefly chalcocite and covellite, the former occurring mostly as sooty chalcocite replacing pyrite and chalcopyrite, whereas the latter occurs as replacing chalcopyrite. In some holes, remnants of primary sulphide mineralization were encountered massive veins of chalcopyrite-magnetite (Figure 7-10).

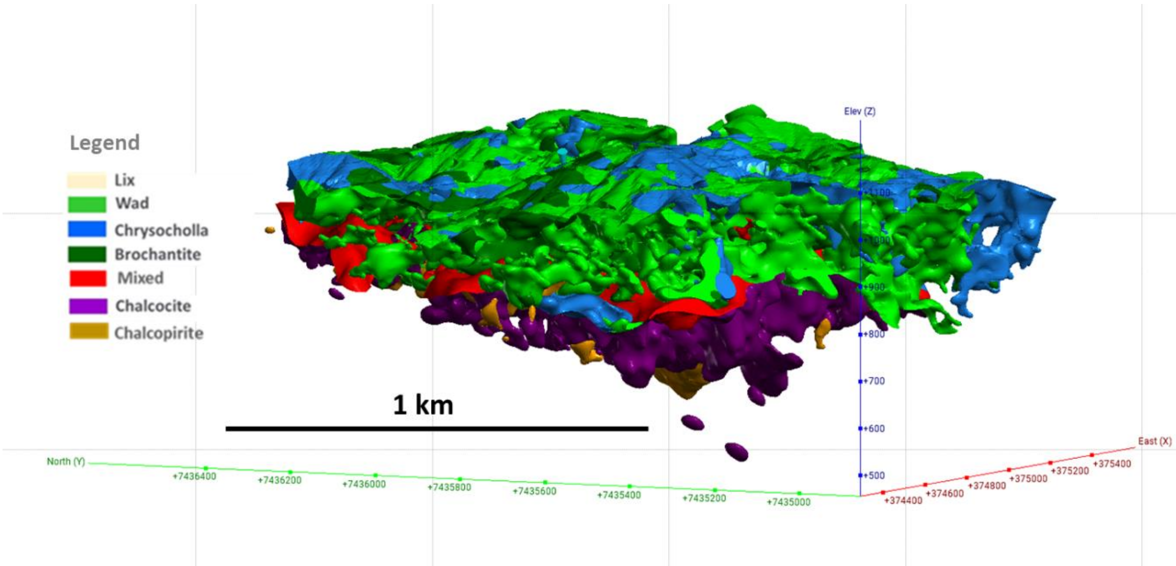


Figure 7-10: 3D view of the Marimaca oxide blanket looking towards NE (Mineral domains modelled in Leapfrog). (Marimaca Copper Corp., 2022)

Lateral zoning in the upper oxides consists of atacamite-brochantite cores surrounded by chrysocolla and outer wad halos. The infill drilling demonstrates that late NW faults also hosted significant chrysocolla mineralization that, at least, crosscut the first stage of oxide zoning (Figures 7-9 and 7-13).

In the blanket, most of the copper oxides occur as fracture staining and fracture-vein-veinlets filling. A key factor that controls the copper oxide distribution is the filling and staining of the parallel fractures. This occurrence helps to enhance the mineralization continuity in between the different sets of feeders, veins and dyke contacts (see illustrative photos in Figure 7-11).

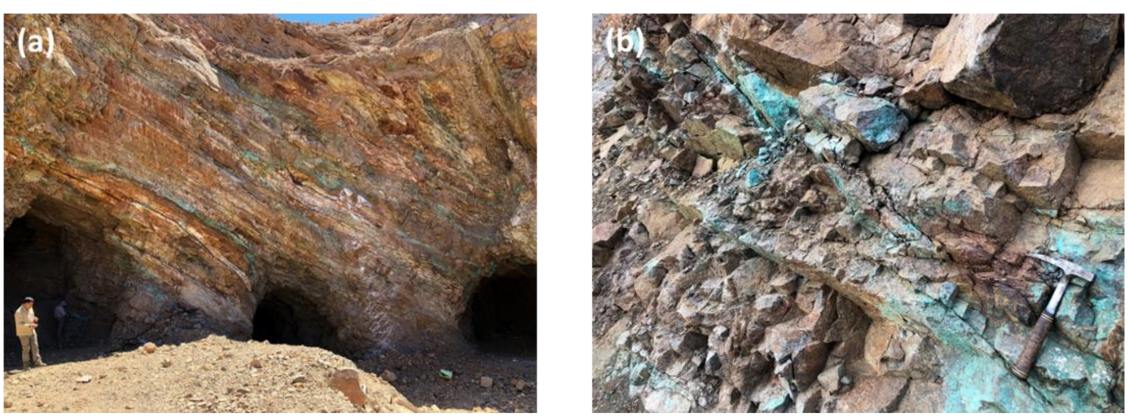


Figure 7-11: Copper Oxide Mineralization Outcrops. (a) intense sheeted fractured monzonite hosting bands of green copper oxides and some "almagrado" rich bands with clay halo at Marimaca 1-23 sector; (b) detail of green copper mineralization at sheeted fractures exposed in a new road cut at Atahualpa sector (hammer for scale reference) (Marimaca Copper Corp., 2021)

Gangue minerals are mostly limonites, chiefly goethite and minor hematite, iron oxides, clays, and minor gypsum. Carbonates are minor in occurrence. Alteration minerals related to mineralization are amphiboles such as actinolite, chlorite and magnetite.

For mineralization interpretation and modeling, six main zones of mineralization or mineral domains have been defined (Table 7-3). These were interpreted by hand on paper sections, digitized, and the solids created in a 3D Leapfrog model, Figure 7-12 illustrates the 3D grid of 50 m spaced sections and Figure 7-13 shows the basis for the 3D modeling of the blanket. These include, the drill hole location, blanket mineral domains, lower limit or Top of Sulphide limit and the 3d solid model.

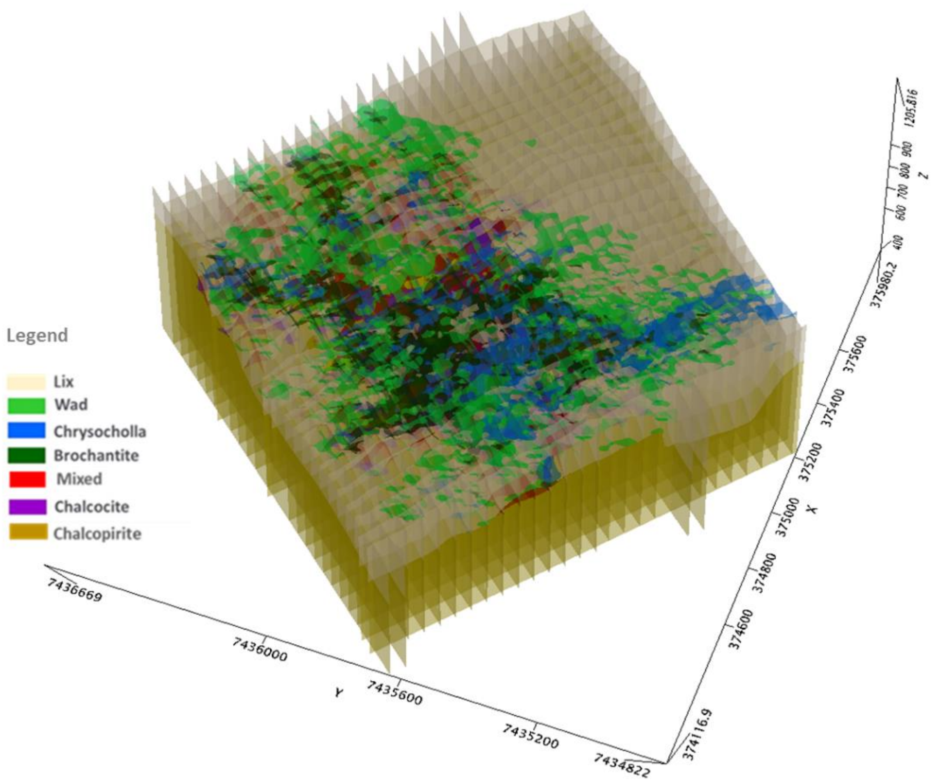


Figure 7-12: 3D view of the 50 m spaced section grid interpreted for mineral zone domains (Marimaca Copper Corp., 2022)

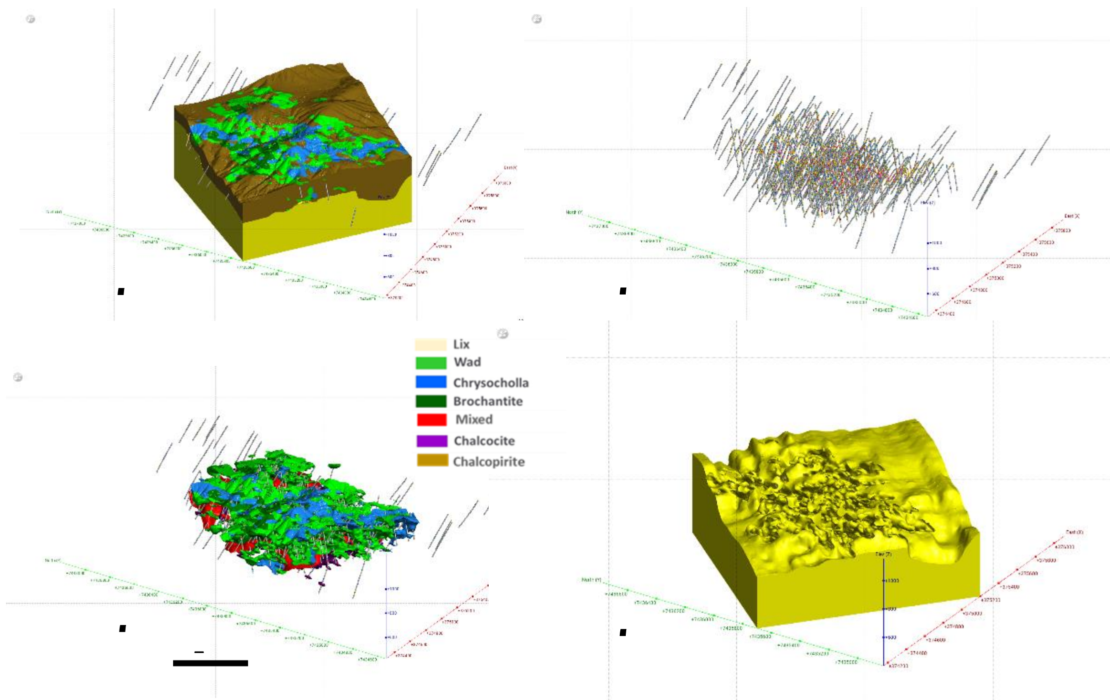


Figure 7-13: Marimaca Project: updated mineral zones views from 3D model. (a) View towards north-east of mineralization zones solid model; (b) drill hole data projection; (c) Mineral zone 3D Model; (d) top of sulfide 3D view. Views from Leapfrog TM model produced by Atticus Geo, 2022.

The brochantite zone contains more than 60% of atacamite and brochantite, and 30% to 35% of chrysocolla and minor wad. In terms of 3D zonation (Figures 7-9, 7-10 and 7-14), this zone is located at the high-grade cores, immediately surrounding the higher graded mixed zones. The chrysocolla zone is bordering the brochantite, and it is characterized by more than 60% of chrysocolla. The wad zone (Table 7-3; Figure 7-19) is the outer and lower grade, containing more than 90% of non-green copper oxides; this species is described as wad.

The mixed zone consists into a mixture of oxides and secondary sulphides with lesser pyrite and chalcopyrite. The type of oxides and sulphides shows a zoning from central parts in which atacamite-brochantite altered or are mixed with covellite and chalcocite, to borders where black oxides are related to remnants of weakly chalcocite replaced pyrite. Thus, the nature of mixed zone changes from cores to border zones by mixing secondary sulfides or pyrite with either green or black oxides This must reflects the nature and zoning of the primary mineralization and the effects of cumulative, further oxidized, secondary enrichment process (Table 7-3 and Figure 7-14).

The secondary sulfide zone consists of chalcocite and lesser covellite that occurs as fracture staining, sulfide coating, or massive replacement in breccias or veins (bands). A zonation of remnants zones of enriched sulfides is encountered beneath the central part of the; blanket, and within mixed zones.

The chalcopyrite zones are not well defined due to a lack of enough drilling information. In some deep drill holes, massive occurrences of chalcopyrite are the most frequent. Some pyrite, these can be found in this sulfide zones. Most of the time, actinolite and magnetite are related to chalcopyrite occurrences.

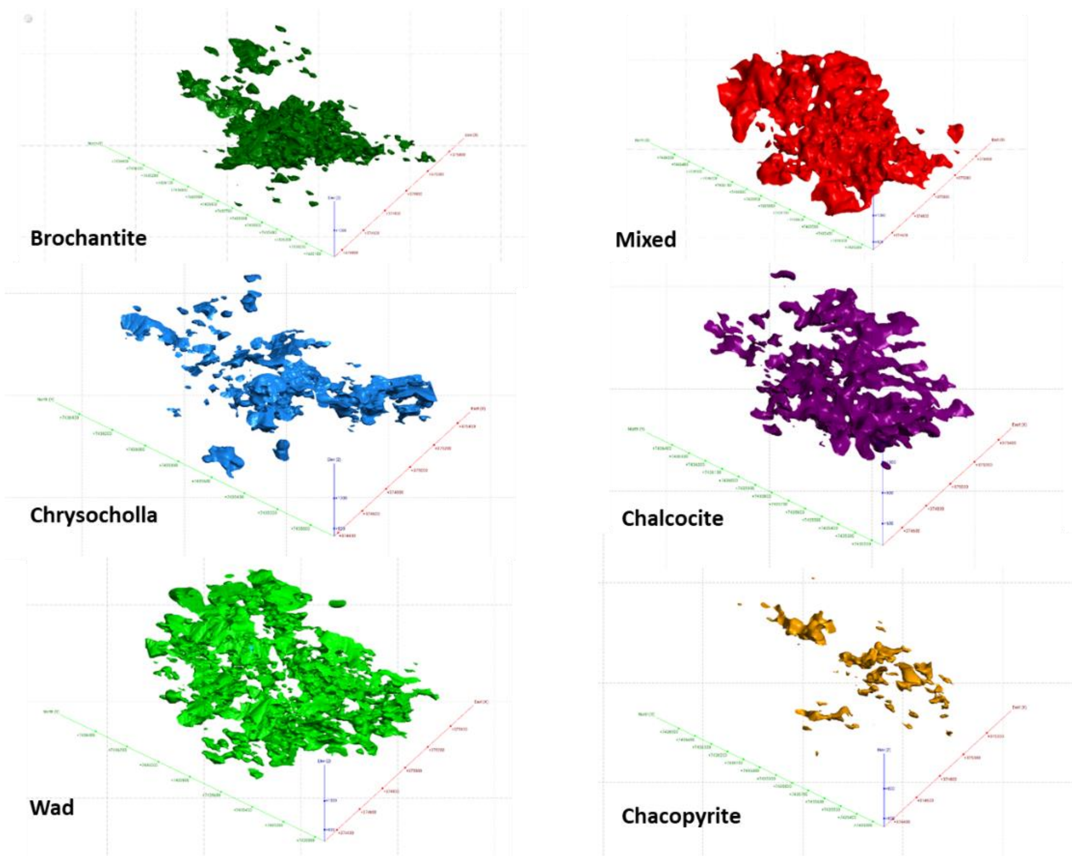


Figure 7-14: Copper oxide blanket mineral zones views from 2022 3D model. Views from Leapfrog TM model produced by Atticus Geo, 2022.

The comparison of the updated 2022 MRE mineralization model with the 2020 MRE reveals that:

- The infill drilling at the south-central part probes the geometry and continuity of the secondary blanket. Figure 7-15 illustrate the zonation of the oxides with brochantite centers and borders of chrysocolla and outer wad.

- Brochantite and wad shows little differences. Chrysocolla increases the volume as compared with 2020 MRE because of 220° oriented drilling improved the definition of the chrysocolla rich NW trending fracture zones.

- Major changes occur – as expected – in the MAMIX deep zone. Figure 7-16 shows the updated secondary blanket interpretation highlighting the distribution of the mixed and secondary sulphides. Figure 7-16 illustrate the notable differences between the 2020 and 2022 models because the MAMIX mineralization as observed when compared mixed and secondary sulphide zones.

- The combined control of NS and WNW fracture zones becomes more evident from the updated mineral zone model. The southern limit previously outlined by the Manolo fault zone was probed by new drilling. In addition, it becomes evident that the WNW late faults are also mineralized with oxides and secondary sulphides. As previously stated, this explained the increment in chrysocolla mineralization, but also tested the possibility of being used as feeders for later events of mineralization (Figure 7-15).

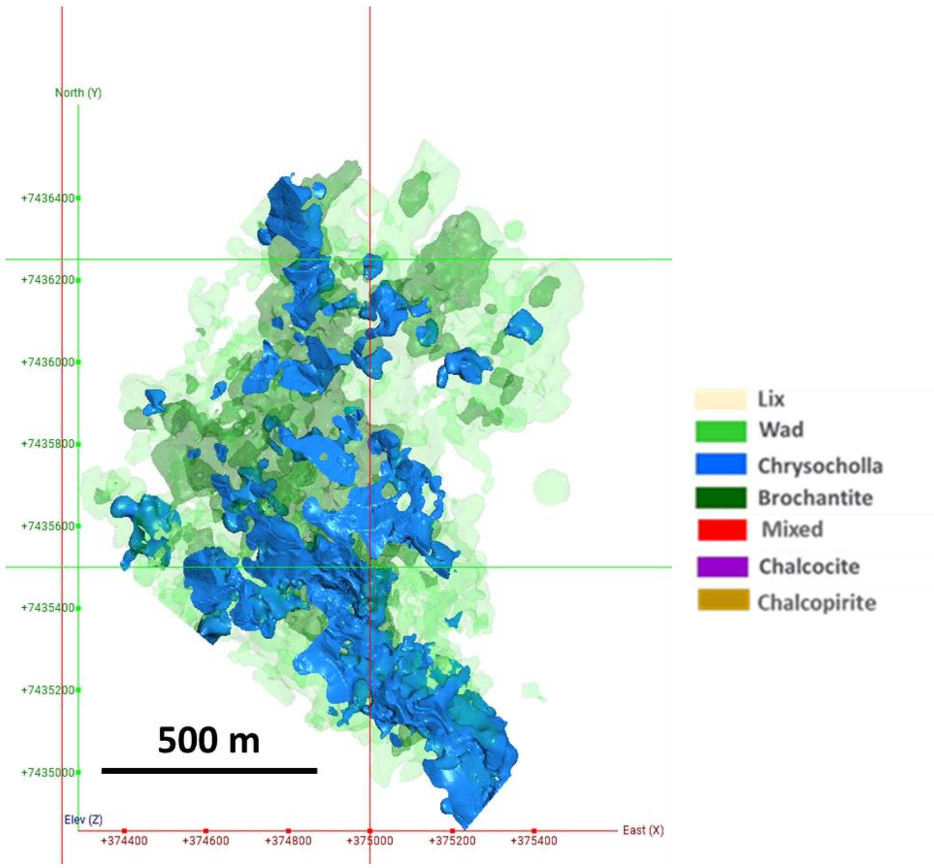


Figure 7-15: 2022 Updated Copper Oxide Domains. Vertical view. (Marimaca Copper Corp., 2022)

A very relevant characteristic of the Marimaca mineralization is that it is exposed at the surface, in outcrops, roads cuts and shallow historic mining workings. Figure 7-15 illustrate the updated oxide copper domains projected to surface, highlighting the domain zonation, same as can be compared with the map of Figure 7-9.

From previous maps revision is evident the structural controls by NS as well by WNW faults systems and the mineral zoning described as high-grade central parts defined by the development of the brochantite zone, surrounded by chrysocolla and outermost wad.

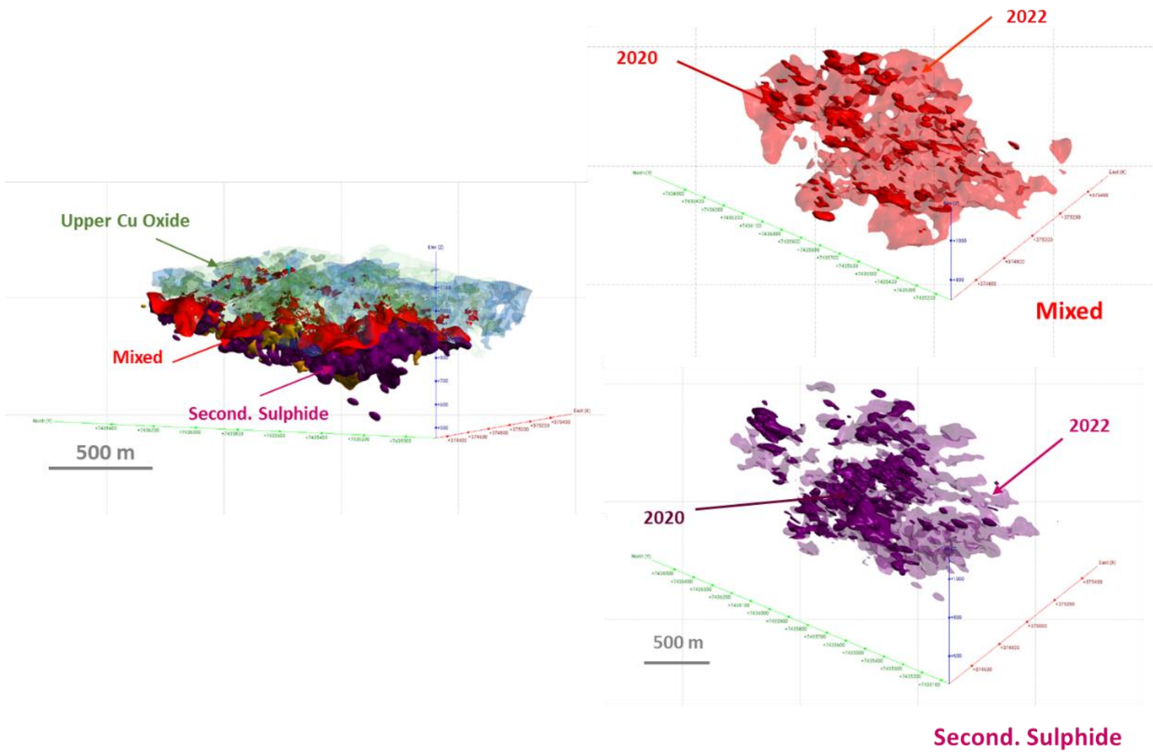


Figure 7-16: 3D views of 2022 MRE MAMIX's mineral zone domains. Note the enhancement of Mixed and Secondary Sulphide zones by comparing 2020 with 2022 MRE, Marimaca Copper Corp., 2022

New infill drilling demonstrates the continuity of the high-grade core, existence of which was highlighted in previous MRE exercises. Geologic evidence shows that higher copper grades are related to the brochantite mineral domain, and new updated interpretation confirms this conclusion. As shown in Figure 7-17 the brochantite zone can be correlated with the distribution of the >0.6% > 1.0% Cu grades. It is possible to note that grades higher than 0.6% Cu fits in most of the volume defined for the brochantite zone. Most importantly, when projected to the surface the high-grade core is clearly demonstrated by the combined distribution of 0.6 – 0.1%Cu and brochantite zone distribution.

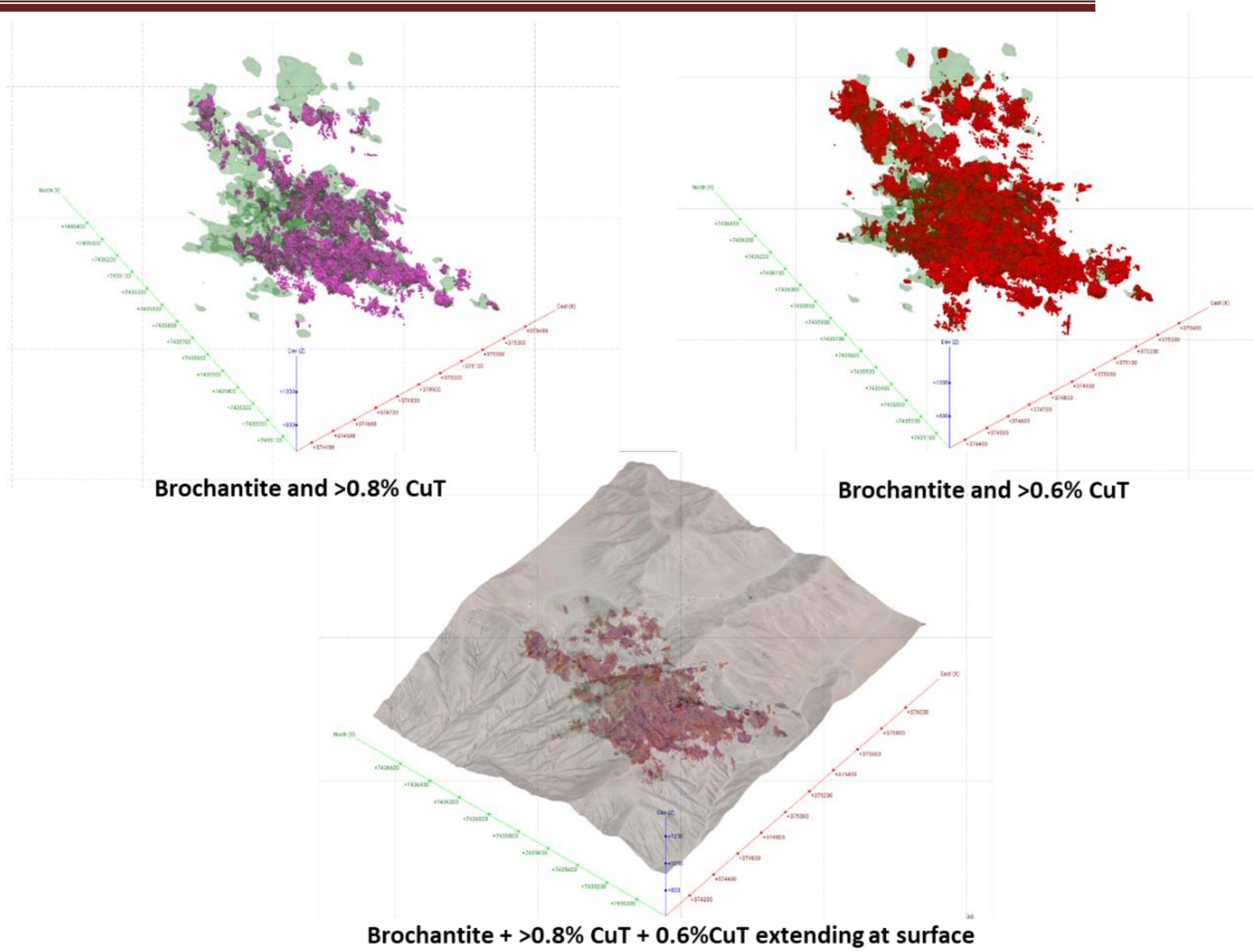


Figure 7-17: 3D views illustrating the Brochantite Mineral Zone and high Cu grades relationship, defining the high-grade core that characterizes the Marimaca deposit, Marimaca Copper Corp., 2022

8 DEPOSIT TYPES

Marimaca displays many characteristics of the IOCG mineralized system: primary mineralization consisting of low pyrite and chalcopyrite-magnetite, calco-sodic alteration, however no Au occurrences are recorded or observed. Marimaca differs from typical coastal IOCG districts by the intense supergene alteration and mineralization.

The formation of the supergene blanket such as that discovered and evaluated at Marimaca has been not described in any other IOCG district. There is strong evidence that the actual oxide body was formed due to the oxidation of a previous sulphide blanket. Remnants of this blanket that were encountered consisted of chalcocite and covellite replacement of pyrite and chalcopyrite. Evidence of the oxidation process can be encountered in the Mixed zone, where zoned green and black copper oxides partially replace secondary sulphides. Mineralogic zoning and copper grade distribution in the blanket also suggest repeated events of lateral migration and accumulation. This process requires abundant pyrite to produce enough sulphuric acid, but as established the IOCG system is low in pyrite. It is possible that a very rich and pervasive chalcopyrite >> pyrite primary mineralization and a long-lived process of oxidation can explain the formation of the Marimaca's uncommon secondary blanket.

9 EXPLORATION

The present MRE captures the addition of 19,580m of RC drilling, which includes 6,382m drilled from the 2021 Program and 13,198m from the 2022 infill program. The MAMIX zone was delineated in the 2022 infill program following the 2021 discovery of mixed and secondary sulphide below the Marimaca Oxide Deposit (MOD). Figure 9-1 shows the distribution of new drill holes added and used for the purposes of the present 2022 MRE.

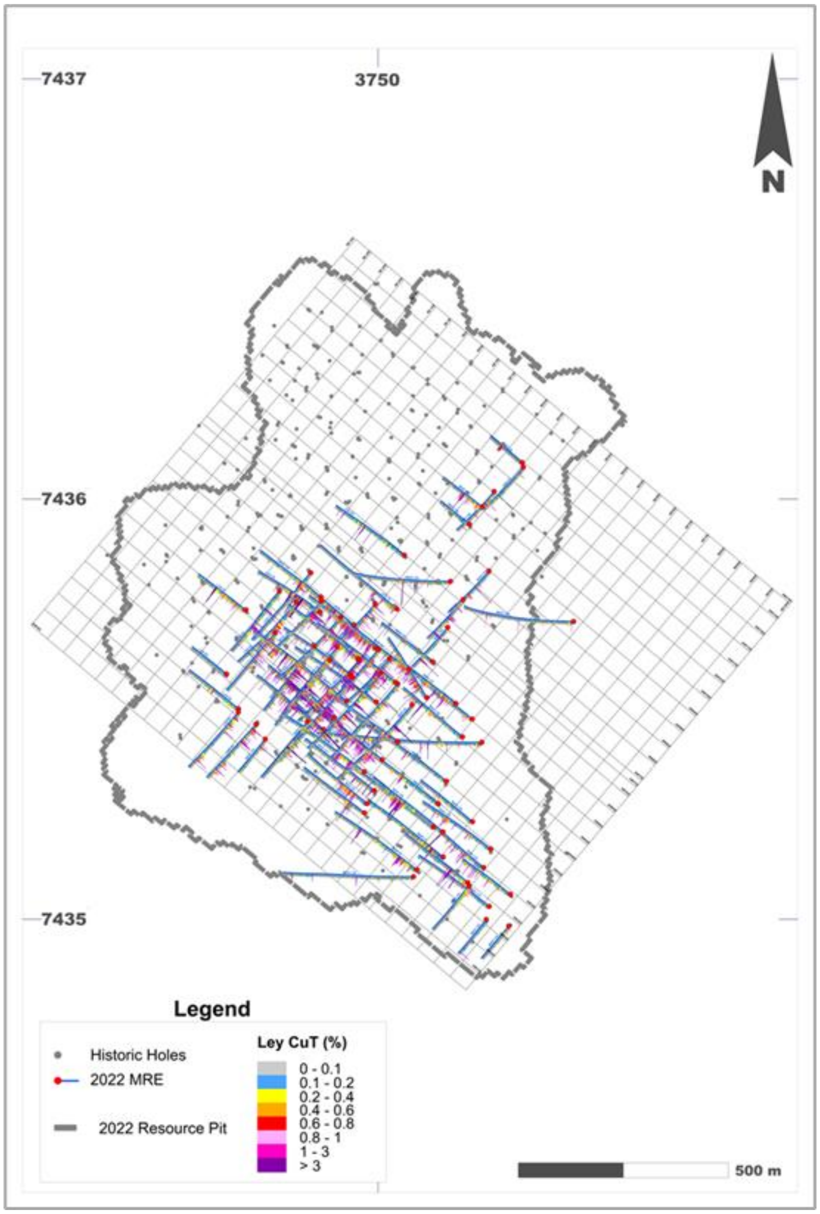


Figure 9-1: Location of new holes added for the 2022 MRE. Horizontal projections traces show CuT grades as histograms. Project local grid consisting in 50 m spaced sections in NE and NW directions is also shown, Marimaca Copper Corp., 2022

In addition to drilling since 2020 the following exploration work has been carried out:

- Completion of the drilling sample database with Sequential Copper assay (mostly CuCN) for all the >0.1 Cu%. Since the 2021 campaign, Sequential Copper is the standard assay methodology for all samples.
- Re-logging previous drill holes for a better definition of mixed and secondary sulphide mineralization, this work benefited by the new Sequential Copper assaying
- Actualization and check of the Topographic field bases
- Completion of a new Drone driven imaging and topographic orthorestitution
- Re-interpretation of the rock geochemistry
- High Resolution Magnetics and deep IP/R geophysics surveys provided additional information for the deep sulphide exploration
- Detailed surface mapping of dyke system, emphasizing rock types and contact relationships

Additional Infill drilling is in progress, including new geologic and geotechnical diamond drilling. This work will be completed with an updated MRE planned for 2023.

9.1 Surveying, Image and Topographic Base

The 2020 photogrammetric survey was updated by means a new High Resolution UAV survey. The total district area was surveyed (56km^2) along 55-70 m apart 302 flight lines, at an average altitude of 200 m above the surface (Figure 9-2). Flight resolution was 5 cm per pixel. A digital elevation model (DEM) was generated with interpolated level curves at 1 m for use at the 1:1,000 scale (Figure 9-2). Other products such as RGB, Lithology, Limonite and FeOx Index images were also received. The topographical support was made by conventional topography, which, from official bases, generated a sufficient network of points to balance and orthorectification of UAV image and DEM (Figure 9-2). All topographic bases have been certified and coordinates reported in UTM PSAD56 and WGS85 systems.

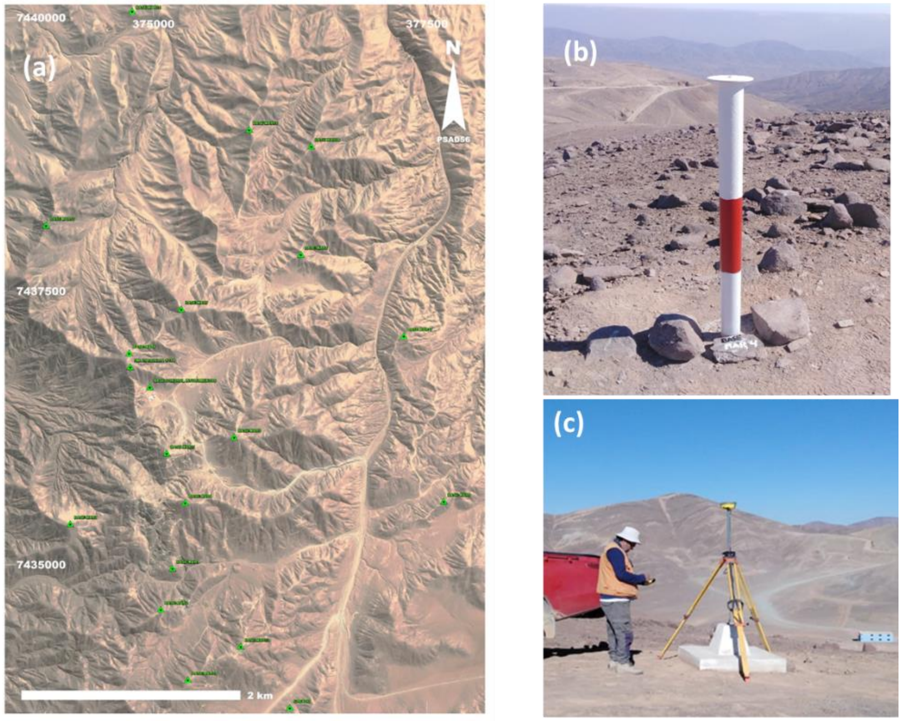


Figure 9-2: Topographic Reference Point Grid. (a) example of registered control point; (b) HM ATAHUALPA I 1/154 coordinate base point (c) survey point (Marimaca Copper Corp., 2022)

Updated images and topography of the project area are shown in Figure 9-3.

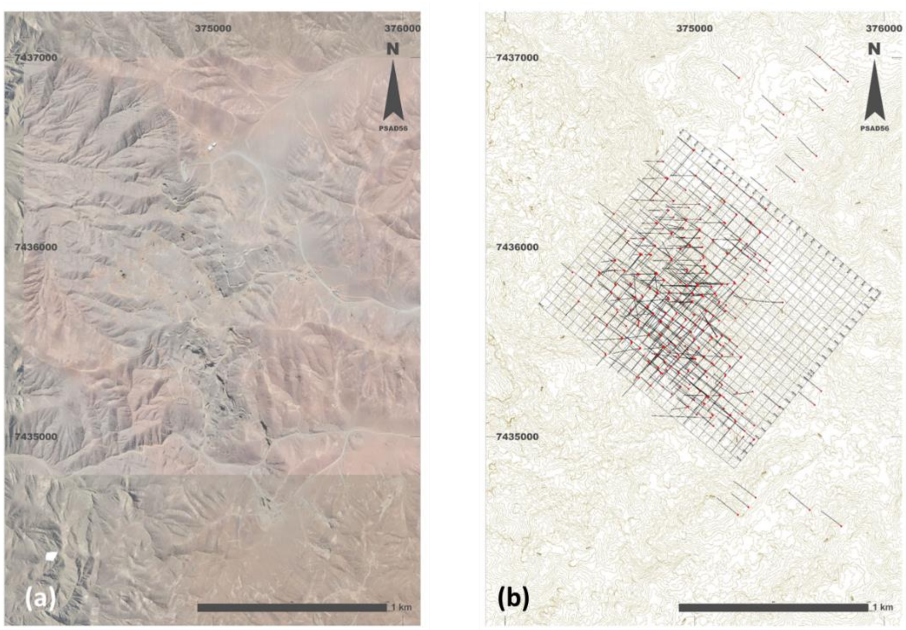


Figure 9-3: Image (a) and topographic contour map (b). UAV special flight covering and contours from topographic restitution controlled by base points from Fig 9-1 and other key points such as drill collars obtained image, Marimaca Copper Corp., 2022.

9.2 Detailed Geological Mapping

The 1:1,000 scale surface geological map (Kovacic, 2017) was updated. Emphasis was placed on dyke units definition, rock composition and contact relationships; the same review was focused on mineralized structures, as well as late faults. The resulting updated map is shown in Figure 9-4.

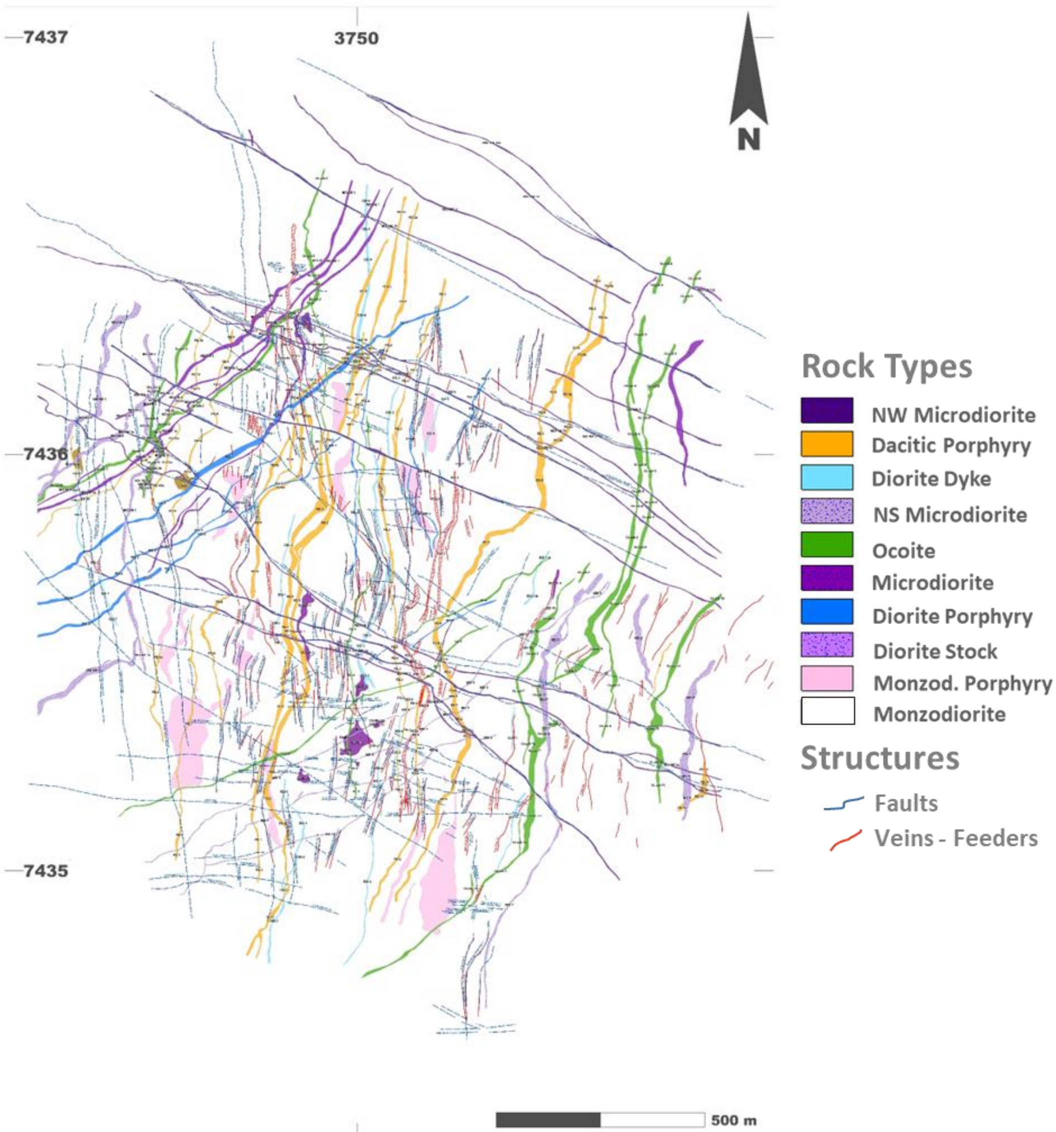


Figure 9-4: Updated geologic surface map. Flagging of main rock and structures is shown. The >0.1%Cu limit is also shown for reference. Marimaca Copper Corp., 2022

9.3 Drill Sample Re-Assaying and Logging

The discovery of significant mixed and secondary sulphide mineralization called attention to a better definition of these mineral zones. This work requires a detailed mapping of secondary sulphides supported by Sequential Copper assaying methodology. All >0.1%Cu from the historic database were assayed for CuCN, and all new drilling samples from since the 2021 campaign are assayed by Sequential Copper methodology.

Historic drill samples were re-logged taking into consideration the updated assays. All new information was updated in the project database. Consequently, the mixed and secondary sulphide mineral domains below the MOD were better defined

9.4 Geochemistry

As part of the district exploration previous 100x100 m rock Geochem sampled areas were detailed to 50x50 and all this new data and the previous Cu results were re-interpreted. An updated map is shown in Figure 9-5. The outer limit of >0.1%Cu is coincident with >500 ppm rock Geochem and projected CuT block model, projected to surface.

Rock Geochem >500 ppm results in a good guide to Marimaca style mineralized areas. In the map of Figure 9-5 extensions of mineralized structures towards NE and SE are evident and offer the potential for extending the MOD.

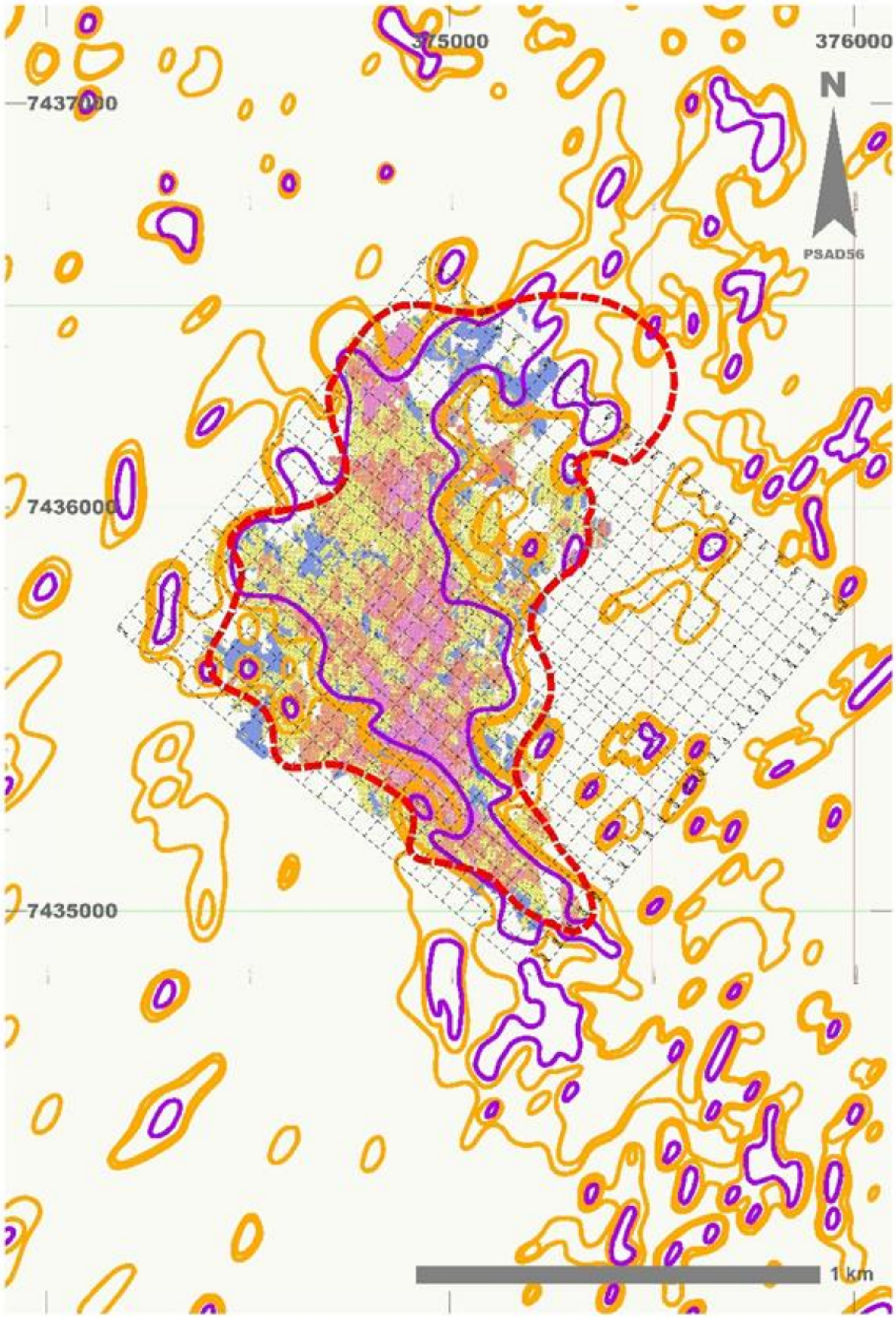


Figure 9-5: Updated rock geochemistry interpretation. Purple color lines indicates > 500 ppm and orange the >200 ppmCu in rocks. Section grid and >0.1% Cu mineralization border are also shown, Marimaca Copper Corp., 2022

9.5 Geophysics

In July 2020 the Company released the results of a High-Resolution Mag Drone survey over the Marimaca deposit covering a 2 x 2 km area. The objective was to model the deep extension of a high mag anomaly, considering the empirical relationship between copper sulphides and magnetite encountered in the systematic magnetic susceptibility measurements of drill samples. The high-resolution aeromagnetic survey was carried out using an updated GeoMagDrone™ technology (http://www.geomagdrone.cl) in 2020.

Modelled results clearly show a relevant anomaly extending downward, east from the actual MOD, dipping 40-45° east. Oxide zone is coincident with the demagnetized upper parts of the anomaly. Figures 9-6 illustrate the result of the magnetic survey and 3D modeling.

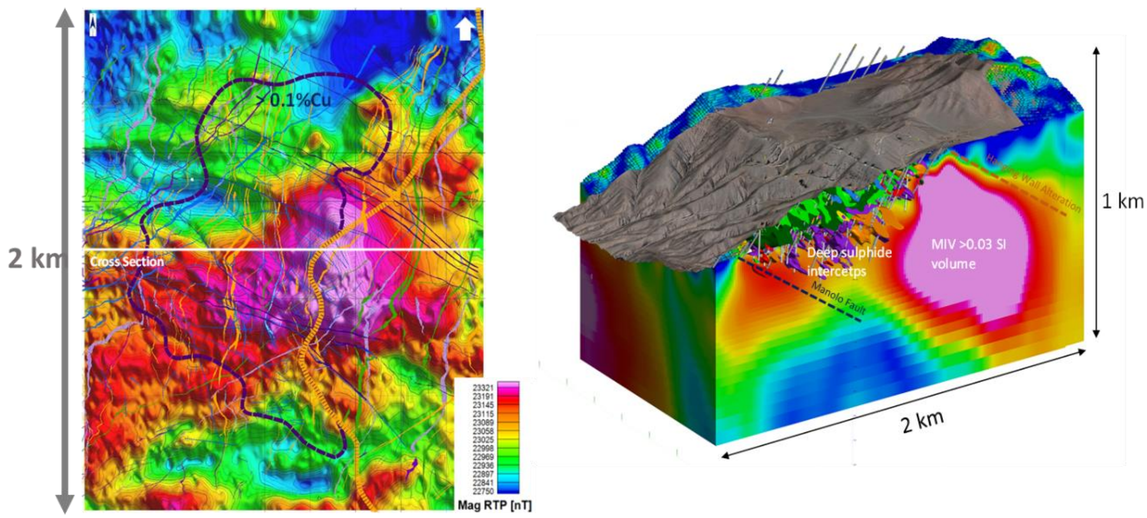


Figure 9-6: High Resolution Magdrone Reduced to Pole map and 3D inverted model interpretation. A mag anomaly extending at depth toward east and could represent the extension of the magnetite rich primary mineralization. (Marimaca Copper Corp., 2021)

An Induced Polarization survey was carried out for targeting sulphides below the MOD. A deep penetration method (MIMDAS) was used and a total of 5 lines were surveyed. Results were released February 2021. Figure 9-7 shows the results by means of a comparison of the magnetic inverse model with the Chargeability section.

Data suggests that chargeability does not coincide with high mag signatures, however is quite clear that magnetics represent a useful geologic vector. IP could have a better response from the mixed and secondary sulphide mineralization rather than a more structurally controlled primary chalcopyrite-magnetite.

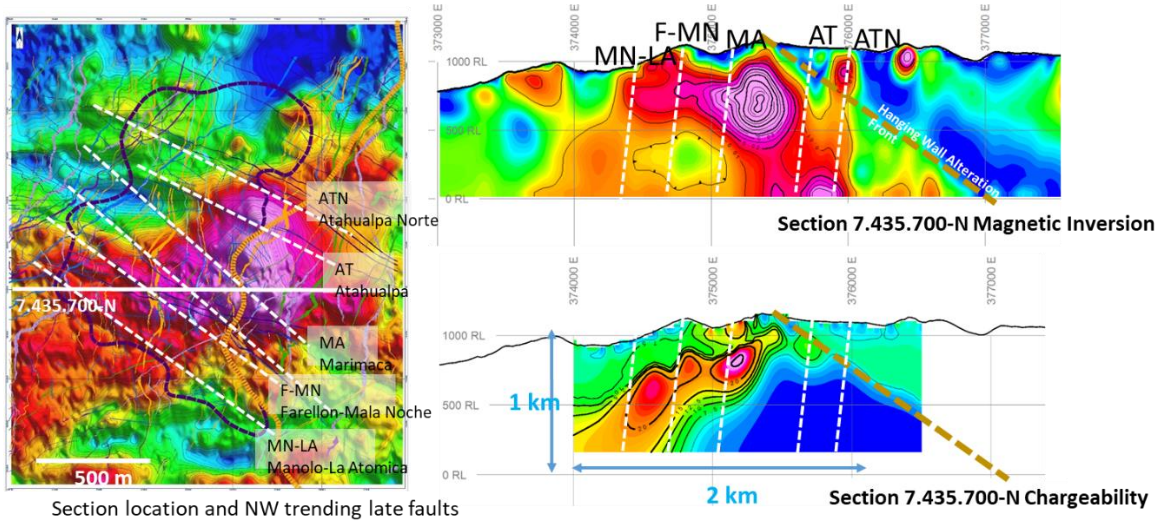


Figure 9-7: IP Chargeability results compared with magnetics. The probable effect of the NW faults on the IP anomalies is highlighted (Marimaca Copper Corp., 2021)

9.6 NCL Comments

Exploration drilling completed by MCAL demonstrates the potential for extending the oxide north and sulfide mineralization and for new discoveries amenable to mining. The infill program shows respectable results and the new land control described in Chapter 4, strengthens the exploration potential of MCAL properties.

10 DRILLING

Table 10-1 contains the summary of the Marimaca project drilling to date. The actual database consists of 110,790 m, divided into 101,814 m of RC and 8,976 m of DDH. As compared with the previous 2020 MRE a total of 19,580 m has been added from the 2021 MAMIX and 2022 Infill programs.

Table 10-1: Marimaca Project. Drilling Summary 2016 – 2022.

MARIMACA PROJECT DRILLING SUMMARY 2016 -2022			
MARIMACA PROJECT			
DRILLING SUMMARY 2016			
PROJECT	**TYPE**	**HOLES**	**TOTAL METERS**
Discovery RCH drilling	Reverse circulation	15	2,710
Resource 100x100 RCH drilling	Reverse circulation	39	8,910
DDH Metallurgy column test	Diamond drilling HQ	6	2,008
	Total RCH	**54**	**11,620**
	Total DDH	**6**	**2,008**
MARIMACA PROJECT			
DRILLING SUMMARY SEPTEMBER - DECEMBER 2017			
PROJECT	**TYPE**	**HOLES**	**TOTAL METERS**
Infill 50X50m RCH drilling	Reverse circulation	59	11,928
DDH Geometallugy	Diamond Drilling PQ	4	820
DDH Geothecnics	Diamond Drilling HQ	6	1,230
	Total RCH	**59**	**11,928**
	Total DDH	**10**	**2,050**
MARIMACA NORTH-EAST			
DRILLING SUMMARY NOVEMBER 2017 - JANUARY 2018			
PROJECT	**TYPE**	**HOLES**	**TOTAL METERS**
Discovery RCH drilling	Reverse circulation	11	2,950
	Total RCH	**11**	**2,950**
LA ATOMICA			
DRILLING SUMMARY NOVEMBER 2017 - JANUARY 2018			
PROJECT	**TYPE**	**HOLES**	**TOTAL METERS**
Discovery RCH drilling	Reverse circulation	14	3,220
	Total RCH	**14**	**3,220**
PHASE II LA ATOMICA PROJECT			
DRILLING SUMMARY AUGUST-2018 - AUGUST 2019			
PROJECT	**TYPE**	**HOLES**	**TOTAL METERS**
Exploration - Delineation	Reverse circulation	55	12,980
EW Exploration	Reverse circulation	6	1,050
Manolo Sector Exploration	Reverse circulation	9	2,120
DDH Geometallugy - La Atomica	PQ Diamond Drilling	9	2,203
	Total RCH	**70**	**16,150**
	Total DDH	**9**	**2,203**
PHASE II ATAHUALPA - TARSO PROJECTS			
DRILLING SUMMARY AUGUST-2018 - AUGUST 2019			
PROJECT	**TYPE**	**HOLES**	**TOTAL METERS**
Discovery and Exploration	Reverse circulation	61	17,700
High Grade Exploration - Delineation	Reverse circulation	16	4,200
EW Exploration	Reverse circulation	32	7,266
Tarso - Exploration	Reverse circulation	29	7,200
DDH Geometallugy - Atahualpa	PQ Diamond Drilling	14	2,715
	Total RCH	**138**	**36,366**
	Total DDH	**14**	**2,715**
PHASE III MARIMACA DEEP DRILLING, MARIMACA MIXED TARGET (MAMIX)			
DRILLING SUMMARY FEBRUARY - SEPTEMBER 2021			
PROJECT	**TYPE**	**HOLES**	**TOTAL METERS**
Marimaca Deep Drilling	Reverse circulation	4	2,772
Marimaca re-entry (MAMIX)	Reverse circulation	13	3,610
	Total RCH	**4**	**6,382**
	Total DDH	**0**	**-**
PHASE IV MARIMACA INFILL - MAMIX			
DRILLING SUMMARY FEBRUARY - JUNE 2022			
PROJECT	**TYPE**	**HOLES**	**TOTAL METERS**
Marimaca Infill RCH drilling	Reverse circulation	33	9,580
Marimaca re-entry (MAMIX)	Reverse circulation	18	2,968
Marimaca (MAMIX)	Reverse circulation	2	650
	Total RCH	**35**	**13,198**
	Total DDH		
MARIMACA 2022 MRE	**Reverse Circulation**	**385**	**101,814**
	Diamond Drilling	**39**	**8,976**
	Total	**424**	**110,790**

The drilling companies Drillex and Major Drilling using diameters 5‘¾ to 5‘5/8 completed the 2021 and 2022 RC drilling.

The drill holes were positioned at 50 m regularly spaced. Holes were drilled in two directions: 220° and 310° and -60º dip. As part of MAMIX discovery and delineation campaign 31 holes were re-entry totaling 6,578 m, most of these holes reach depths up to 500 m.

Local contractors carried out the supervision of the drilling operation. An experienced topographer surveyed the collars. Data Well Services carried out the downhole surveys for the 2021 and 2022 campaigns.

Samples were collected each 2 m interval. Marimaca staff supervised all the drilling and sampling. Recoveries were controlled by weighing samples and accurate control was extended toward the division process realized in the drill location. The recoveries were measured in weight percent as compared with a theoretical sample weight. Marimaca technical staff checked all data. Measured recoveries are over 95% for RC drilling, without significant variations and unrelated to copper grades.

All holes were geologically logged on digital data capture. The data are rock, structure, alteration and mineralization based on drilling intervals, recoveries and analytical results. After validation, the mineral and alteration zones were defined. The results were entered in the database as a table with all mapped data and a consolidated log of the drill was prepared. Most of this work was done by experienced senior consultant geologist supported by consultant junior geologist.

Drill cuttings from RCH were collected and cleaned for a geological description of samples. A first logging collected rock, structure (as cutting allows) and alteration. Copper mineralogy was re-logged as chemical results were received.

In addition to measuring deviations, most of the holes were surveyed using an optical tele viewer (OPTV or BHTV), with structures and orientation measurements, which continuously and thoroughly recorded the holes' walls and measured structures. The structures were measured in ranks according to their width and the results were reported and plotted on stereographic networks and rosette diagrams. This was valuable information for the structural model interpreted for the 2020 MRE and validated in this new exercise.

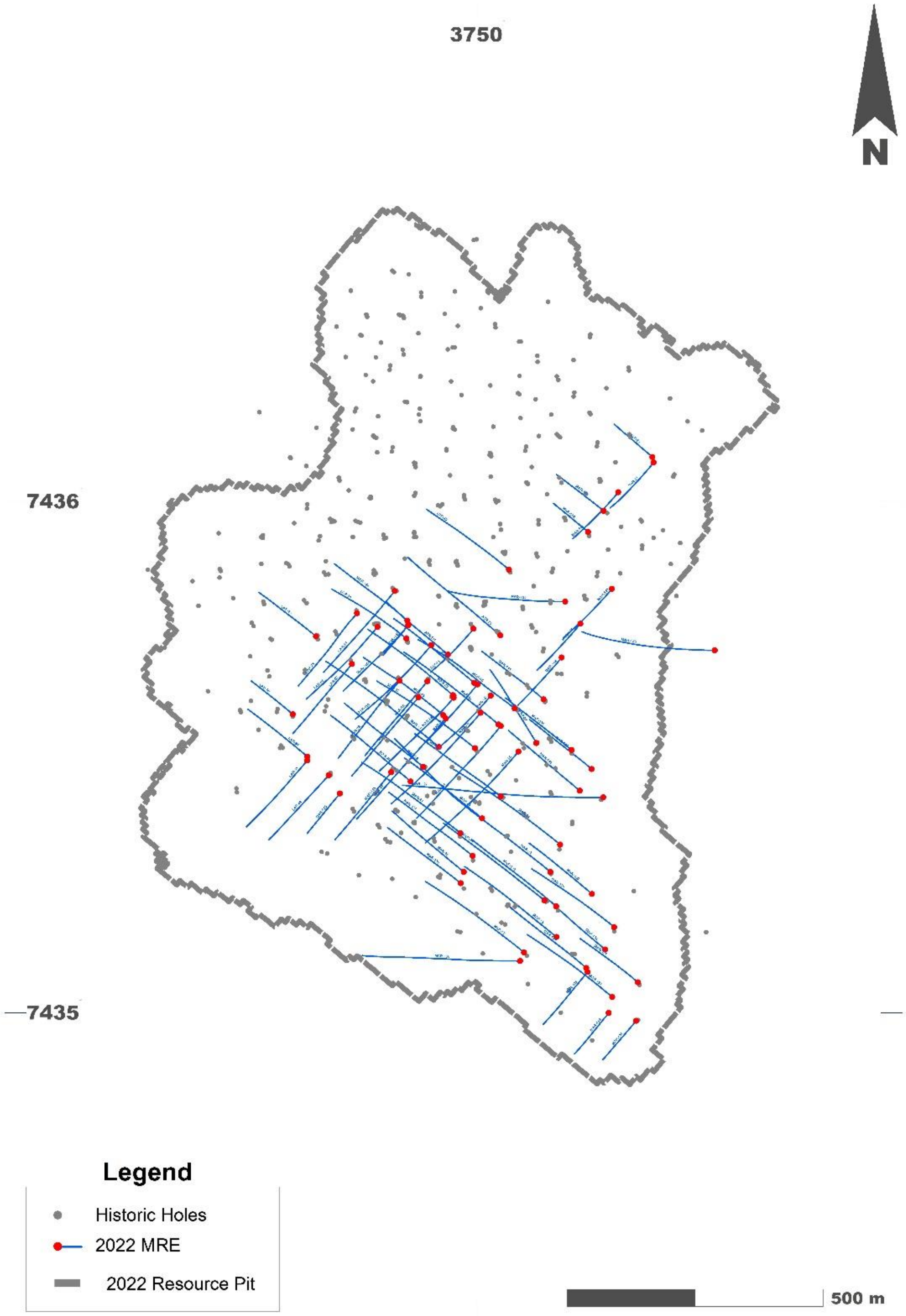


Figure 10-1: Drill hole database plan view, 2022 drilling noted with blue drill traces (Marimaca Copper Corp., 2022)

11 SAMPLE PREPARATION, ANALYSES AND SECURITY

11.1 Drillhole Sampling

Assay samples informing the Marimaca Mineral Resources are, since 2017, prepared at a laboratory site in Calama and assayed by Andes Analytical Assay Ltd. (AAA) in Santiago. During earlier campaigns, samples were prepared at the project site and assayed by Geolaquim Ltd. in Copiapo, with AAA as the umpire laboratory. MC only worked with an umpire laboratory during the first RC drilling campaign.

Marimaca RC holes are drilled on a continuous 2-meter basis and its samples riffle split on site three times, up to one eighth (12.5%) of its volume. The last split yields "sample A", which is sent for preparation and assaying, and "sample B", which is used to obtain drill cuttings (1 kg) and coarse/preparation duplicates, and then stored in special facilities on site. For diamond drillholes (DDH), samples are obtained every 2 meters from a half-core, with the other half stored on site.

Samples are transferred by laboratory personnel from the project to Calama, and then the preparation pulps are returned to generate the analysis batches. Upon reception, sample details are logged and insertion points for quality control samples in the sample flow are determined.

Samples are prepared following a standard protocol: Drying (<5% humidity), crushing up to 80% to -10#Ty, homogenizing, splitting and pulverizing a 400-gram subsample up to 95% to -150#Ty. All samples are assayed by AAS for total copper (CuT) and soluble copper (CuS). The latter was initially obtained from a specific CuS test and currently from a sequential copper (CuSec) routine.

Laboratory results are loaded directly from digital assay certificates into the database, in order to minimize error sources.

11.2 Sample Rejects and Pulps Storage

- RC cuttings are stored at appropriate facilities in the field (old adits), as are coarse rejects of about 8-9 kg, obtained from the third riffle split.
- The laboratory was also requested to store in appropriate project facilities all the crushed rejects of DDH samples (-1/4"), trays with backup half-cores and bags of 1 kg RC sample rejects.

- From metallurgical test cores, a representative 10-cm sample is left and stored in boxes systematically.

11.3 Specific Gravity Data Sampling

Specific gravity was measured systematically on core fragments taken from the deposit for density and geotechnical issues. Specific gravity is determined using a water displacement method with paraffin coating. The fragments sampled are 7 to 26 cm long. Measurements were done by Mecanica de Rocas (Rock Mechanics) lab at Calama

In order to obtain density measurements characterizing the Marimaca mineralized rocks, test samples were taken from core samples. The sample selection criteria and laboratory tests are as follows: Each selected piece was logged in detail and photographed. Then they were then sent to Calama's Rock Tests certified laboratories, for the corresponding unit weight assaying. The method was the weight-volume ratio, with previously kerosene waterproofed and weighted in air and then, weighed submerged in water.

Density samples were collected at approximate intervals of 20 m. From the 2016 program, 58 samples were tested and from the 2017 program, another 98 and 427 samples in 2019 were tested, which makes it a total of 562 samples. Measurements were performed using standard protocols following the paraffin-coated Archimedes (water immersion) method.

11.4 Quality Assurance and Quality Control Programs (QA/QC)

The analytical quality control programs implemented at Marimaca involve the use of coarse/preparation (PRD) and pulp (PUD) duplicates for precision analyses, standard reference materials (SRM) and, only since 2018, fine blanks (FBL) for contamination analyses. Check samples (CHD) were only used during the pilot exploration campaign.

Control samples are systematically inserted among regular samples and submitted for assaying to the primary laboratory, which is currently Andes Analytical Assay (AAA), and previously Geolaquim (GLQ). MCC has protocols in place for handling analytical results that exceed acceptable limits (described further in this section), which can ultimately trigger re-assays of entire or portions of sample batches.

Table 11-1 sums up the evolution of Marimaca's QA/QC programs and their respective coverage.

Table 11-1: Control programs and their coverage for each drilling campaign (* not blanks but low grade SRMs)

Hole Type	Campaign	Period	Holes	Lab	Coverage					
					CHD	PRD	PUD	SRM	FBL	Total
RC	MAR 01-16	2016	15	GLQ AAA	19%	-	-	-	-	19%
	MAR 17-54	2016	39	GLQ	-	6%	6%	6%	-	18%
	MAR 55-124 LAR 01-14	2017-2018	84	AAA	-	7%	7%	5%	1%*	20%
	LAR 15-84	2018	70	AAA	-	7%	7%	4%	3%	21%
	AER 01-03 ATR 01-109 TAR 01-26	2018-2019	138	AAA	-	8%	8%	4%	4%	24%
	MAR 125-155 & Ext LAR 85-87 & Ext ATR 110-111 & Ext TAR 27-28	2021-2022	70	AAA	-	7%	7%	3%	4%	21%
DDH	MAD 01-06	2016	6	GLQ	-	-	10%	8%	-	18%
	MAD 07-16	2017	10	AAA	-	-	10%	7%	1%*	18%
	ATD 01-13 LAD 01-09	2019	22	AAA	-	-	11%	7%	2%	20%

It is evident that MCC has improved and refined its QA/QC programs over time, following recommendations made by NCL in previous reports. Total coverage is around 20% in all cases, which more than meets industry standards, though with slight excess of duplicate sample coverage for RC holes, mostly in detriment of SRM sample coverage, which reached only 3% in the most recent campaign. Recommendations will be made in this and other regards in the following sections.

11.4.1 Standard Reference Material (SRM) Analysis

Two companies provided SRMs: Geostats Pty Ltd (Australia) during 2016-2018, with 966 samples of 17 materials; and Intem Ltd. (Chile) with 1,250 samples of 6 materials during 2018-2019, and 293 samples of 8 materials during 2021-2022. Geostats' SRMs come from different sources, depending on the required grade, while Intem SRMs are prepared from the project's RC drilling rejects, which are homogenized and analyzed in a round robin program, in order to obtain their best value.

NCL's SRM review begins with a direct comparison of each material's average grade (AV) against their best value (BV) by calculating the bias (AV/BV-1), which shouldn't exceed ±5%. Next, Shewart control charts are constructed, plotting time series of the SRM values against acceptability (precision) windows of BV±2*SD / BV±3*SD (round robin SD) in the case of Geostats SRMs, or BV±5% / BV±10% in the case of Intem SRMs, as the latter don't count with a suitable SD for quality control purposes. Values surpassing these windows (outliers) should remain below 5% of all samples (with an exceptional tolerance of 10%), especially in the case of the outermost windows.

Table 11-2 summarizes the SRM analysis of Geostats materials, while Tables 11-3 and 11-4 summarize SRM analyses of Intem materials for the 2018-2019 and 2021-2022 periods, for comparison purposes. Results for the 2016-2019 period are provided irrespective of campaign or drillhole type, as there are no major issues to point out when reviewing them separately, as detailed in NCL (2020).

Table 11-2: SRM analysis summary for Geostats materials in the 2016-2018 campaigns

SRM Type	SRM Samples	SRM %CuT		Global Bias (<5%)	Outliers (<5%)			
					BV ± 2SD		BV ± 3SD	
		BV	AV		#	%	#	%
GBM 309-6	100	0.028	0.028	**2.1%**	0	**0.0%**	0	**0.0%**
GBM 999-4	41	0.103	0.105	**2.2%**	0	**0.0%**	0	**0.0%**
GBM 311-6	50	0.104	0.103	**-0.9%**	0	**0.0%**	0	**0.0%**
GBMS 911-2	73	0.142	0.146	**3.1%**	1	**1.4%**	0	**0.0%**
GBM 311-2	135	0.227	0.226	**-0.7%**	0	**0.0%**	0	**0.0%**
GBMS 304-5	46	0.229	0.227	**-1.0%**	0	**0.0%**	0	**0.0%**
GBM 913-6	66	0.321	0.308	**-4.0%**	1	**2.1%**	0	**0.0%**
GBM 995-4	108	0.350	0.351	**0.3%**	0	**0.0%**	0	**0.0%**
GBM 908-10	20	0.360	0.361	**0.2%**	0	**0.0%**	0	**0.0%**
GBMS 304-3	38	0.364	0.368	**1.2%**	0	**0.0%**	0	**0.0%**
GBM 309-2	20	0.529	0.525	**-0.8%**	0	**0.0%**	0	**0.0%**
GBM 910-7	58	0.534	0.536	**0.4%**	4	**9.8%**	3	**7.3%**
GBM 301-7	20	0.558	0.559	**0.3%**	0	**0.0%**	0	**0.0%**
GBM 311-4	65	0.620	0.608	**-1.9%**	2	**3.5%**	0	**0.0%**
GBMS 911-3	52	0.765	0.767	**0.3%**	0	**0.0%**	0	**0.0%**
GBM 907-14	18	0.817	0.812	**-0.6%**	0	**0.0%**	0	**0.0%**
GBM 905-12	56	2.185	2.132	**-2.4%**	2	**4.2%**	0	**0.0%**

Table 11-3: SRM analysis summary for Intem materials in the 2018-2019 campaigns

SRM Type	SRM Samples	SRM %CuT		Global Bias (<5%)	Outliers (<5%)			
					BV ± 5%		BV ± 10%	
		BV	AV		#	%	#	%
MRC-2	599	0.201	0.202	0.3%	13	2.5%	0	0.0%
MRC-3	211	0.301	0.302	0.4%	4	2.1%	0	0.0%
MRC-4	130	0.409	0.409	0.1%	0	0.0%	0	0.0%
MRC-5	141	0.594	0.593	-0.1%	1	0.8%	0	0.0%
MRC-6	65	0.827	0.831	0.4%	1	1.8%	0	0.0%
MRC-7	104	1.208	1.204	-0.3%	3	4.1%	0	0.0%

Table 11-4: SRM analysis summary for Intem materials in the 2021-2022 campaign

SRM Type	SRM Samples	SRM %CuT		Global Bias (<5%)	Outliers (<5%)			
					BV ± 5%		BV ± 10%	
		BV	AV		#	%	#	%
MRC-2	66	0.201	0.203	1.0%	5	7.6%	0	0.0%
MRC-3	36	0.301	0.303	0.7%	1	2.9%	0	0.0%
MRC-4	19	0.409	0.409	0.0%	1	5.3%	0	0.0%
MRC-5	26	0.594	0.593	-0.2%	0	0.0%	0	0.0%
MRC-6	6	0.827	0.803	-2.9%	2	33.3%	0	0.0%
MRC-7	23	1.208	1.180	-2.3%	2	9.1%	1	4.5%
MRC-9	105	0.148	0.149	0.7%	2	1.9%	0	0.0%
MRC-10	12	0.243	0.241	-0.8%	1	8.3%	1	8.3%

Geostats materials (Table 11-2) show good accuracy (bias %) and precision (outlier %), though with some uncertainty in a number of cases due to their low coverage (<50 samples), which is a direct consequence of the wide SRM variety. The change to in-house SRMs mitigated this issue by reducing the number of reference values to 6 and increasing, as a result, their individual coverage. As expected, Intem materials during 2018-2019 (Table 11-3) show improved results, with very good accuracy and precision.

Shewart charts are only provided for materials MRC-2 (Figure 11-1), MRC-5 (Figure 11-2) and MRC-7 (Figure 11-3) of the 2021-2022 campaign due to their relevance, and in order to limit this chapter's extension.

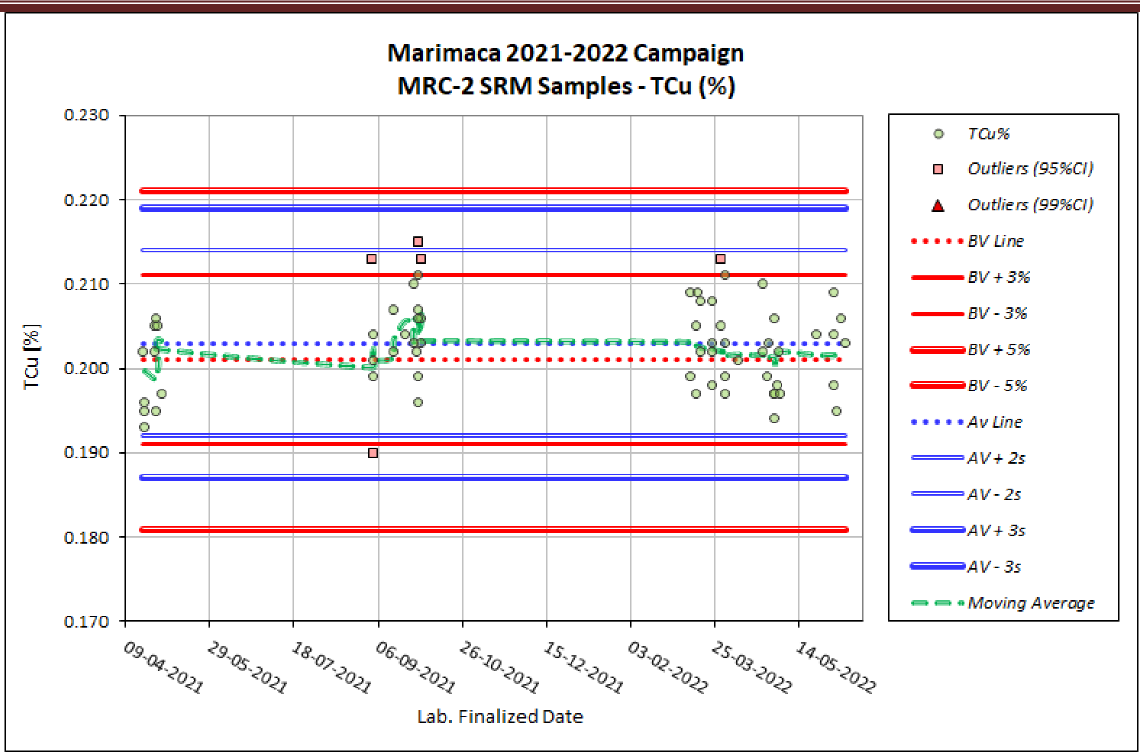


Figure 11-1: Shewart chart for material MRC-2 in the 2021-2022 campaign

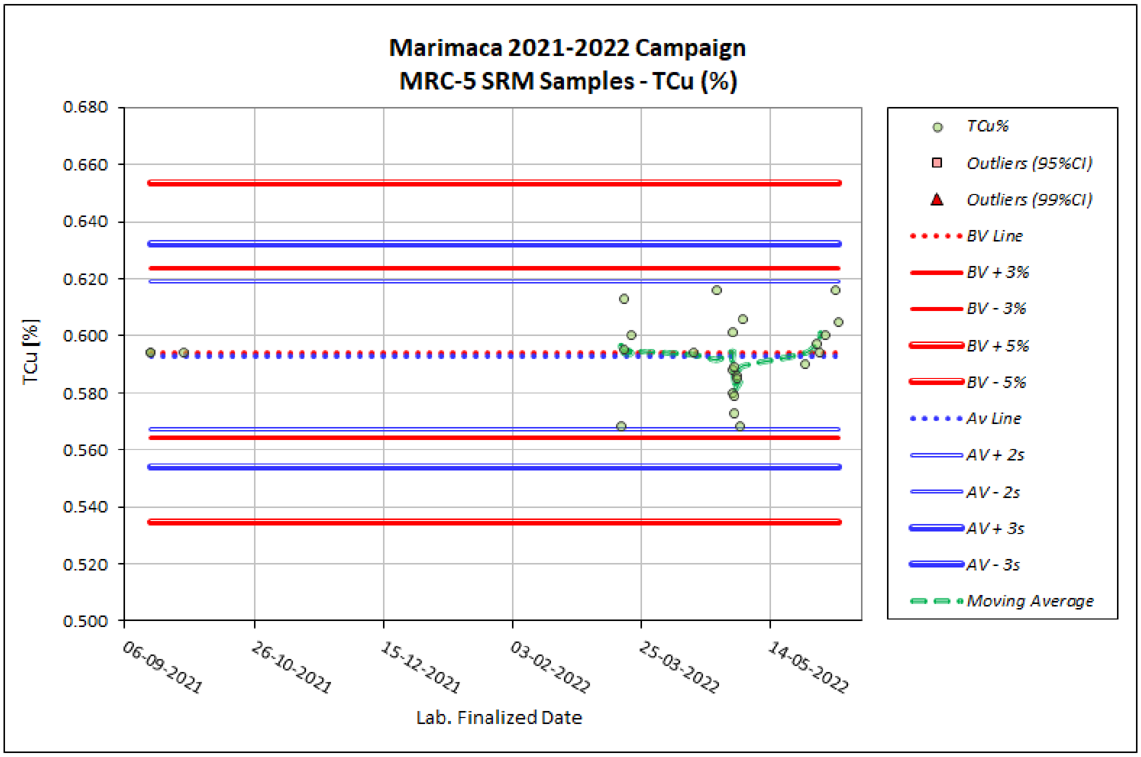


Figure 11-2: Shewart chart for material MRC-5 in the 2021-2022 campaign

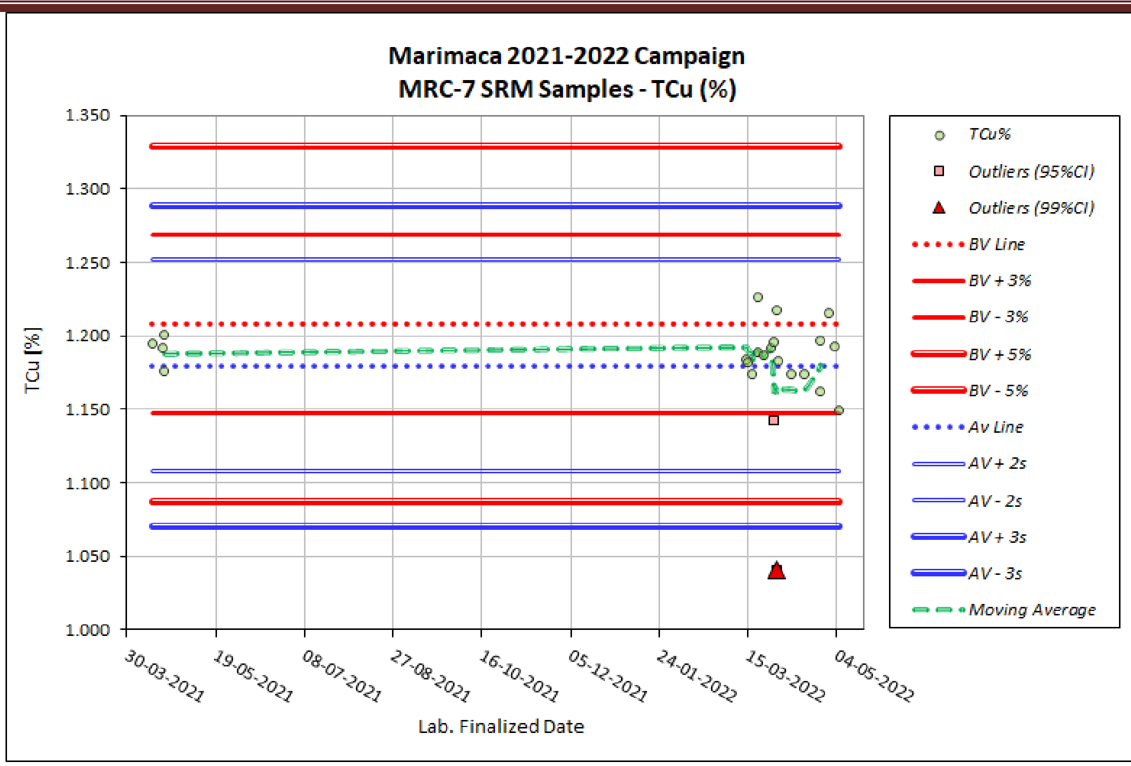


Figure 11-3: Shewart chart for material MRC-7 in the 2021-2022 campaign

In conclusion, the SRM analysis shows very good accuracy and precision, with minor observations. NCL recommends at least doubling the total SRM coverage as well as, to the extent possible, reducing the number of reference values to 5 or less.

11.4.2 Duplicate Sample Analysis

Preparation (PRD) and pulp duplicate (PUD) samples were inserted consistently in every campaign, with the exception of the discovery campaign which included check samples (CHD) of pulp duplicates as the sole control measure.

NCL's duplicate review is based on the hyperbolic method (Simon, 2006). It begins by calculating the relative error (RE) of the original assay (OA) with respect to its duplicate (DA), as the absolute percentage value of 2*(OA-DA)/(OA+DA), which should generally remain below 20% for PRD pairs and 10% for PUD pairs. Next, a practical detection limit (PDL) is determined based on grade behavior near the reported detection limit (RDL), usually at a slightly higher value to represent a more realistic limit, given the reduced precision of analytical tests at lower grades. Finally, duplicate pairs are validated by plotting them against a hyperbolic function (dependent on constants calculated from the PDL and a maximum tolerable RE for each duplicate type), which acts as an acceptability boundary that compensates for higher RE at lower grades. Failed pairs should remain below 10% of all duplicate samples.

NCL's check sample review is performed via reduced major axis (RMA) regression plots and their main parameters: Coefficient of determination (R2), which should approximate 1 to be acceptable, and slope (RMAS), allowing for a bias percentage calculation (1-RMAS) which should approximate 0 to be acceptable.

Table 11-5 summarizes the duplicate analysis. Results for the 2016-2019 period are provided irrespective of campaign, as there are no major issues to point out when reviewing them separately, as detailed in NCL (2020). Table 11-6 presents the results for the pilot campaign's check samples.

Table 11-5: Duplicate analysis summary of all drilling campaigns

Period	Hole Type	Duplicate Type	Duplicate Pairs	Failed Pairs (<10%)		Mean RE (<10% PUD) (<20% PRD)	Average %CuT		Average Difference (<5%)
				#	%		OA	DA	
2016-2018	DDH	**PUD**	477	7	**1.5%**	**3.1%**	0.478	0.479	**0.2%**
	RC	**PUD**	2,936	58	**2.0%**	**3.7%**	0.228	0.226	**-0.8%**
		PRD	3,008	46	**1.5%**	**6.6%**	0.224	0.224	**0.3%**
2021-2022	RC	**PUD**	679	22	**3.2%**	**4.1%**	0.197	0.200	**1.2%**
		PRD	679	34	**5.0%**	**8.3%**	0.197	0.197	**0.0%**

Table 11-6: Check sample analysis of 2016's pilot campaign

Duplicate Type	Duplicate Pairs	Average %CuT		Bias	R^2
		OA	DA		
CHD	240	0.816	0.819	**0.01%**	**0.99**

All drilling campaigns with duplicates show very good precision in every test performed (Table 11-5), with slightly higher fail and mean RE percentages in the 2021-2022 campaign, though still within acceptable limits. In addition, it's important to note that field duplicates (FID) haven't been considered, which means that the first split right after drilling isn't being properly controlled. To mitigate this, NCL recommends reducing the coverage of PRD and PUD samples in favor of FID samples.

The pilot drilling campaign shows very good accuracy in principle (Table 11-6), though with moderate uncertainty due to a lack of appropriate control programs accompanying check samples to the main and especially the umpire laboratory. Despite this, the strong assay grade correlation between laboratories hints at a good reproducibility.

Validation charts are only provided for the 2021-2022 campaign's PRD (Figure 11-4) and PUD (Figure 11-5) samples to due to their relevance, and in order to limit this chapter's extension.

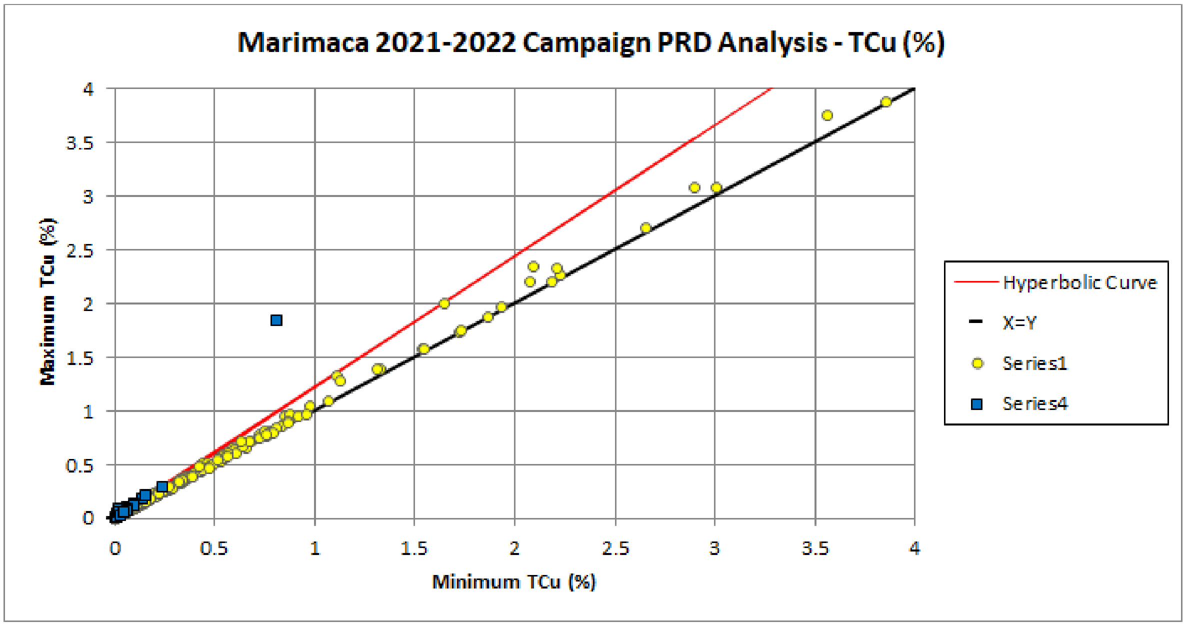


Figure 11-4: Validation plot for PRD samples in the 2021-2022 campaign

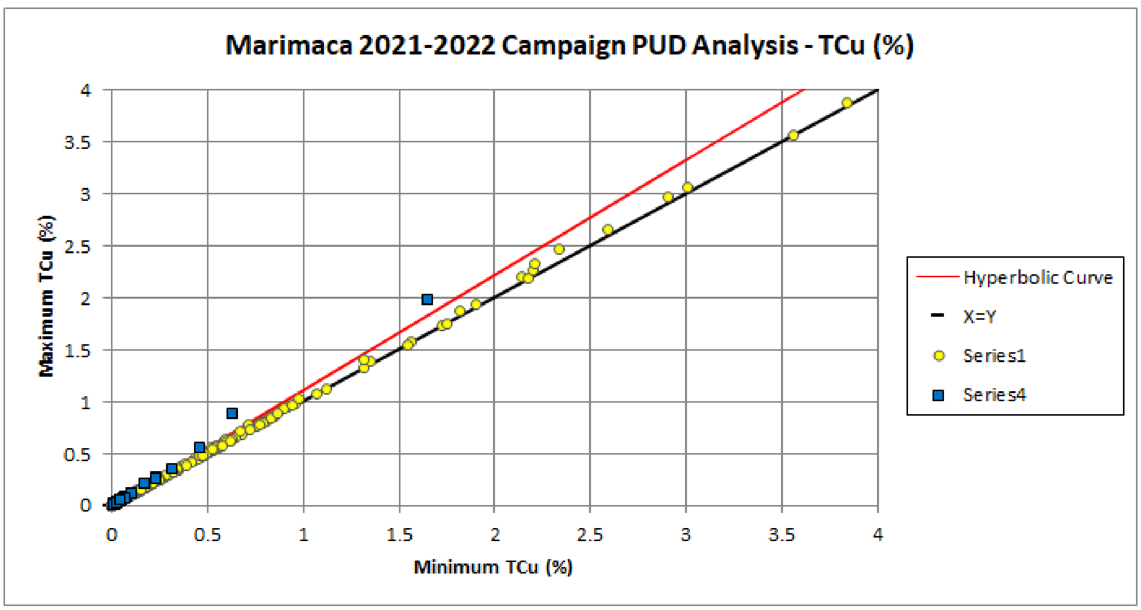


Figure 11-5: Validation plot for PUD samples in the 2021-2022 campaign

In conclusion, the duplicate analysis shows very good precision with virtually no observations, save for the limited control measures in the pilot drilling campaign, an issue moderately mitigated thanks to the strong correlation between check samples. NCL recommends considering the insertion of FID samples in future campaigns as well as reducing the excessive duplicate coverage in favor of other control types.

11.4.3 Blank Sample Analysis

Information received by NCL did not include a database of blank samples for the 2016-2017 campaigns, and upon questioning; MCC confirmed that they did not use this type of control. Since 2018, fine blanks (FBL) were inserted in the form of very low grade SRMs provided by Intem Ltd. (prepared in the same way as the rest of materials), with values of 0.006% (MRC-1) and 0.003% (MRC-8) CuT. These are technically not blanks because they do not have copper grades below the reported detection limit (RDL), which is usually 0.001% CuT in standard AAS tests, but NCL considers them sufficiently close to the RDL to treat them as such.

NCL's blank review begins by plotting a time series of blank assay values against an acceptability limit of 3-5 times the RDL. As with SRMs, outliers should remain below 5% of all samples. Since MCC uses slightly higher value "blanks", it seems reasonable to use the lower factor (3*RDL) and the acceptability limit as a window of ±3*RDL (±0.003% CuT) from the best value (BV) of the SRMs. In case of elevated outlier percentages, blank values are plotted against their corresponding previous sample values in an RMA regression, to look for a correlation that could imply systematic error and thus contamination.

Table 11-7 summarizes the blank analysis. Results for the 2016-2018 period are provided irrespective of campaign or drillhole type, as there are no major issues to point out when reviewing them separately, as detailed in NCL (2020).

Table 11-7: Blank sample analysis of all drilling campaigns

Period	Blank Type (SRM)	SRM Samples	SRM %CuT		Outliers (<5%) BV ± 3DL	
			BV	AV	#	%
2016-2018	**MRC-1**	991	0.006	0.005	6	**0.6%**
2021-2022	**MRC-1**	170	0.006	0.005	2	**1.2%**
	MRC-8	254	0.003	0.003	0	**0.0%**

These campaigns show very good results, with no apparent signs of contamination, and more than reasonable insertion rates. The lack of blanks in previous campaigns can be relatively mitigated by reviewing the quality controls performed and reported by the laboratory. NCL had access to the QA/QC protocols of GLQ and to the reports of AAA and both laboratories seem to have well-structured quality control measures in place, including the insertion of blank samples.

In addition, it's important to note that coarse blanks (CBL) weren't considered for any campaign, which means that potential contamination during sample preparation isn't being properly controlled. To mitigate this, NCL recommends reducing the coverage of FBL samples in favor of CBL samples.

Control charts are only provided for the 2021-2022 campaign's blanks (Figures 11-6 and 11-7) due to their relevance, and in order to limit this chapter's extension.

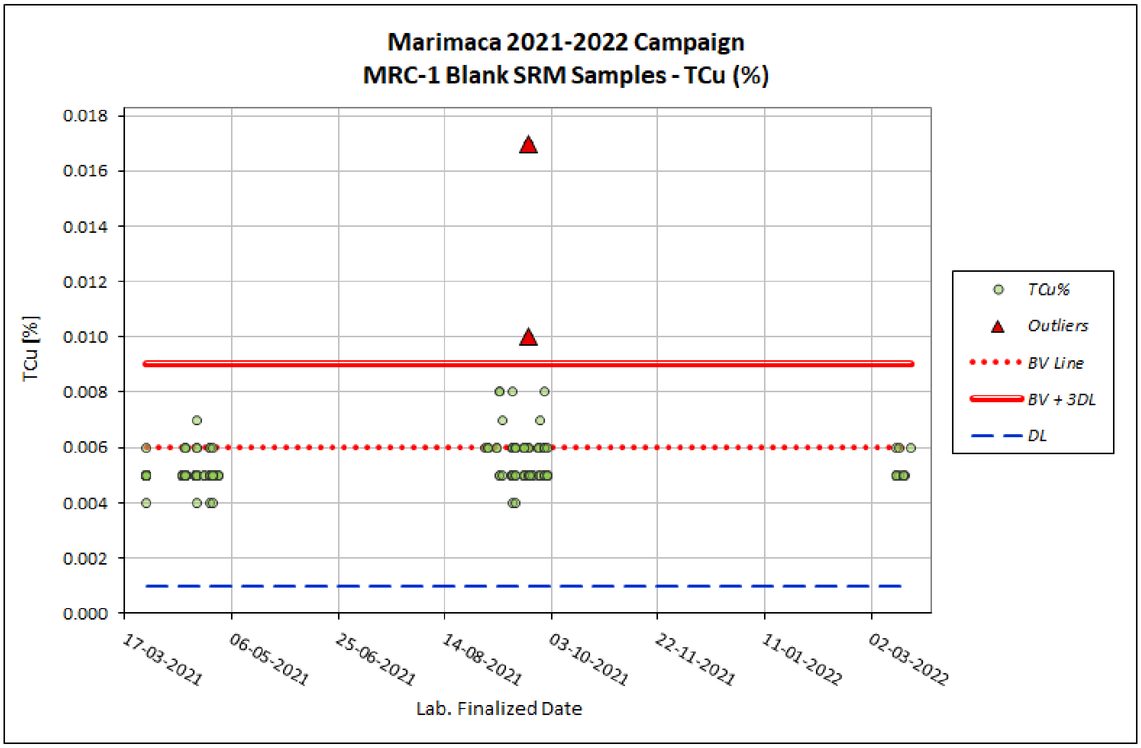


Figure 11-6: Control chart for material MRC-1 in the 2021-2022 campaign

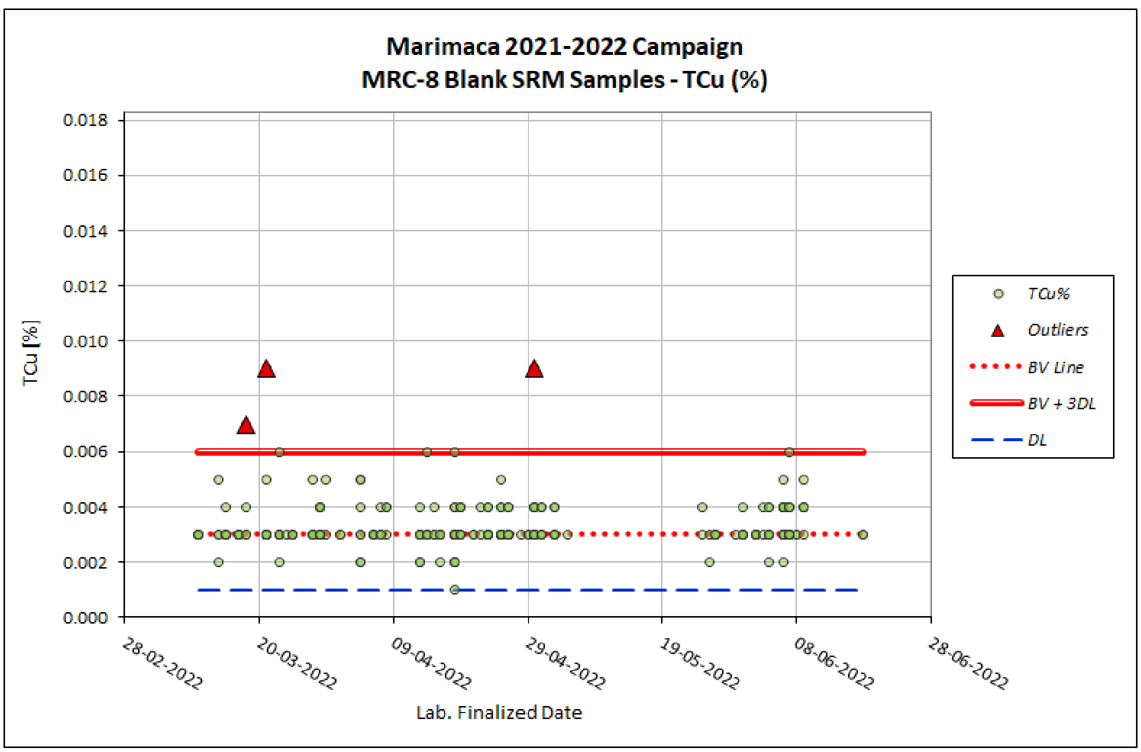


Figure 11-7: Control chart for material MRC-8 in the 2021-2022 campaign

In conclusion, the blank analysis shows no evidence of contamination. The lack of blank samples in previous campaigns, while not irrelevant, is of moderate to low concern, especially after reviewing the quality controls performed and reported by both laboratories. Adding this to the fact that the SRM and duplicate sample analyses performed very well, it seems reasonable to infer that there is a low probability of contamination in campaigns missing blanks. NCL recommends considering the insertion of CBL samples in future campaigns.

11.5 Sample Security

All drilling assay samples are collected by company personnel or under the direct supervision of company personnel. Samples from Marimaca were initially processed at the project site and shipped directly from the property to a laboratory facility for final preparation, and later, upon their return, to the laboratory for analysis.

Appropriately, qualified staff at the laboratories collect assay samples. Sample security involved two aspects: Maintaining the chain of custody of samples to prevent unnoticed contamination or mixing of samples and making active tampering as difficult as possible.

During the site visit, NCL found no evidence of active tampering or contamination of assay samples collected in the Marimaca properties.

11.6 NCL Comments

After carefully reviewing field protocols and procedures, NCL concludes that both company and laboratory personnel used care in the collection, management and assay of drill hole data, and thus has no reason to doubt the reliability of exploration and production information provided by MCC. Furthermore, an extensive review of reports and analytical results suggest that, apart from minor concerns that can be easily mitigated through NCL recommendations, the resource database used by MCC is free of apparent bias.

12 DATA VERIFICATION

12.1 Verifications by Marimaca

The exploration and evaluation work completed by MC is conducted using documented procedures and involves verification and validation of exploration and evaluation data, prior to consideration for geological modeling and Mineral Resource estimation. During drilling, experienced geologists implemented industry standard measures designed to ensure the consistency and reliability of the exploration data.

Quality control failures are investigated and appropriate actions are taken when necessary, including requesting re-assaying of certain batches of samples.

12.2 Verifications by NCL

In accordance with National Instrument 43-101, professionals under the supervision of NCL visited the Marimaca properties on December 6 -7, 2016, accompanied by Sergio Rivera, Exploration Vice president of MC. The team included Ricardo Palma, P. Eng. and Luis Oviedo P. Geo. Who are qualified persons under National Instrument 43-101. NCL carried out a new site visit in August 2019, to verify the changes produced by the new drill program and February 2022. The biggest changes were the quality of the resource because of the densification of the drilling, with a substantial increment in Measured and Indicated resources and the total volume of the resource.

During the visits, all aspects that could impact materially the integrity of the drillhole and sampling databases (core logging, sampling, and database management) were reviewed with MC staff. NCL was able to interview staff to ascertain exploration procedures and protocols.

NCL toured the Marimaca area and observed diamond and RC drill sites, collars and field status of the demarcations, and examined core from a number of drillholes, finding that the logging information accurately reflects actual core. The lithology and grade contacts checked by NCL match the information reported in the core logs.

Luis Oviedo on behalf of NCL reviewed the drill hole databases in 2022 for the preparation of this technical report and concluded that it is adequate to produce the block models, tonnage and grade evaluations to a satisfactory degree.

NCL also completed statistical comparisons of the block models' global grade against the informing drilling data and visually compared on plans and sections the block models against the informing samples to confirm that the estimations are generally an adequate representation of the distribution of the copper mineralization. The QP visited the properties in 2020 and 2022 where he subsequently reviewed the new data produced by MC.

13 MINERAL PROCESSING AND METALLURGICAL TESTING

Marimaca Copper Corp. has completed five metallurgical test programs (Geomet I, II, III, IV and V) to characterize the metallurgical response to samples collected from its Marimaca copper project. Preliminary tests were performed considering parameters such as: mineral subzone, agglomeration conditions, particle size, column height, irrigation rate and acid concentration in the irrigation solution. The Phase V metallurgical program also included a metallurgical variability study of the deposit.

A summary of the Phase V metallurgical program is provided below. Phase V represents the most recent and most extensive program completed to date at the Marimaca Deposit.

The Phase 5 Program was designed to confirm the 2020 PEA process design conditions and to evaluate potential optimization opportunities of both copper recovery and acid consumption identified during Phases 1 – 4. The results of the Phase 5 Program are positive, with optimization opportunities identified in most of the samples studied and tested.

The Phase V Heap Leach Program Design is summarized below. Results from Phase V support the metallurgical assumptions utilized in the 2022 MRE.

Sampling and sample preparation

- 5 composite samples collected representative of each mineral subzone: brochantite/atacamite (BROC), chrysocolla (CRIS), WAD, mixed (MIX), and enriched (ENR)
- Each composite was crushed in closed circuit to P90 at ½". Crushing was monitored and simulated a PSD profile of a Metso-type industrial configuration. Care was taken not to over-grind the material to obtain the final product with a -100 # Tyler content of 10-12 %

Chemical Head Characterization & Mineralogical Analysis

- Characterization included sequential copper analysis, leaching potential, soluble impurities, analytic acid consumption, ICP, optical microscopy, QEMSCAN

Iso-pH Bottle Roll Tests

- Conducted under constant pH and Cl conditions to examine the correlation to the analytical acid consumption (AAC) diagnostic testing method, improve the acid consumption modeling, and review copper recovery relative to leaching potential

3 Acid Level Sensitivity Bottle Roll Test

- Conducted to examine copper recovery and acid consumption sensitivity relative to acid concentration

Sulfation Tests

- Conducted to determine the optimum agglomeration conditions for columns and minicolumns

Minicolumn Tests

- Designed to characterize the crushed ore metallurgical behavior under irrigation at different acidity levels
- 32 leaching tests in mini-columns, 30 cm high, 6" in diameter and loaded with approximately 9 to 10 kg of sample each

Column Tests

- Designed to confirm the viability of the PEA and optimized design conditions defined by the Phase 4 geometallurgy and METSIM dynamic simulation
- 10 leaching tests in columns, 4m high, 4" in diameter and loaded with approximately 52 to 60 kg of sample each

The Phase V ROM Leach Program Design is summarized below. Results from Phase V support the metallurgical assumptions utilized in the 2022 MRE.

Sampling and sample preparation

- Four composites were prepared: WAD-ROM, BROC-ROM and CRIS-ROM and a global composite ROM G5
- The global composite (ROM G5) was prepared representing utilizing the ore type distribution from the 2020 PEA mine plan for the ROM leach (60.4% WAD-ROM, 19.8% BROC-ROM and 19.8% CRIS-ROM)

Chemical Head Characterization & Mineralogical Analysis

- Characterization included sequential copper analysis, leaching potential, soluble impurities, analytic acid consumption, ICP, optical microscopy, QEMSCAN

Iso-pH Bottle Roll Tests

- Conducted under constant pH and Cl conditions to examine the correlation to the analytical acid consumption (AAC) diagnostic testing method, improve the acid consumption modeling, and review copper recovery relative to leaching potential

3 Acid Level Sensitivity Bottle Roll Test

- Conducted to examine copper recovery and acid consumption sensitivity relative to acid concentration

Crushed Column Tests

- Conducted to define the maximum expected recoveries from the ROM composites and establish a comparative base with the crushed material
- 6 leaching tests in crushed columns, 1 m high, 6" in diameter and loaded with approximately 30 to 40 kg of composite per subzone (BROC ROM, WAD ROM and CRIS ROM) each crushed to P90 1/2"

$1m^3$ Container test

- Conducted to individually characterize the metallurgical response of coarse material in a condition comparable to the first meter of a ROM operation
- 3 leaching tests were completed in ROM containers, 0.90m high, with a surface area of 1.06m2 (volumetric capacity of 0.96 m3) and loaded with approximately 1.8 tonnes of ROM composite per subzone (BROC ROM, WAD ROM and CRIS ROM) each, at ROM granulometry (100% under 8")
- Agglomeration or curing is not carried out, but irrigation is carried out directly at any time, after loading

Sequential ROM column

- Conducted to simulate the ROM design under PEA conditions using the ROM G5 global composite
- 1 leaching test in 4 ROM columns in series, each one 3m high, 0.58m in diameter and loaded with approximately 1.45 tonnes of ROM G5 global composite each at ROM granulometry (100% under 8")
- Test covers a total height equivalent to 12m when considering the 4 columns in series

In this MRE, a fixed value of 76% was used for the heap leach metallurgical recoveries and 40% for the ROM leach, which are the same values used in 2019, which are supported by the results obtained in Phase 5.

.

14 MINERAL RESOURCE ESTIMATES

14.1 Introduction

This section outlines the Mineral Resource estimation methodology utilized and summarizes the key assumptions adopted for the generation of the Mineral Resource models.

Mineral Resources were estimated for the deposit located on the Marimaca property, which will be mined by open pit methods.

The Marimaca open pit Mineral Resource model was generated by NCL for Total Copper (CuT) and Soluble Copper (CuS). Grades were estimated for the portion of the deposit covered by the Mineral Zones solid model described in Chapter 7 of this report, which most likely will be mined by open pit methods.

In the opinion of NCL, the resource evaluation reported herein is a reasonable representation of the Mineral Resources found on the Marimaca project at the current level of sampling. The Mineral Resources have been estimated in conformity with generally accepted CIM Estimation of Mineral Resource and Mineral Reserves Best Practices Guidelines and are reported in accordance with Canadian Securities Administrators' National Instrument 43-101.

Mineral Resources are not Mineral Reserves and have not demonstrated economic viability. There is no certainty that all or any part of the Mineral Resource will be converted into Mineral Reserve.

14.2 Geological Interpretation and Modeling

Rock-Structure and Mineral Zone distribution was interpreted by MCC geologists using hand-paper traditional method on vertical cross sections oriented NE, NW and EW, at 1:1,000 metric scale (see examples in Figures 14-1 and 14-4). Most of the deposit area was covered by a set of 50 m totaling 25 NW and 28 NE oriented sections (Figures 14-1 and 14-2).

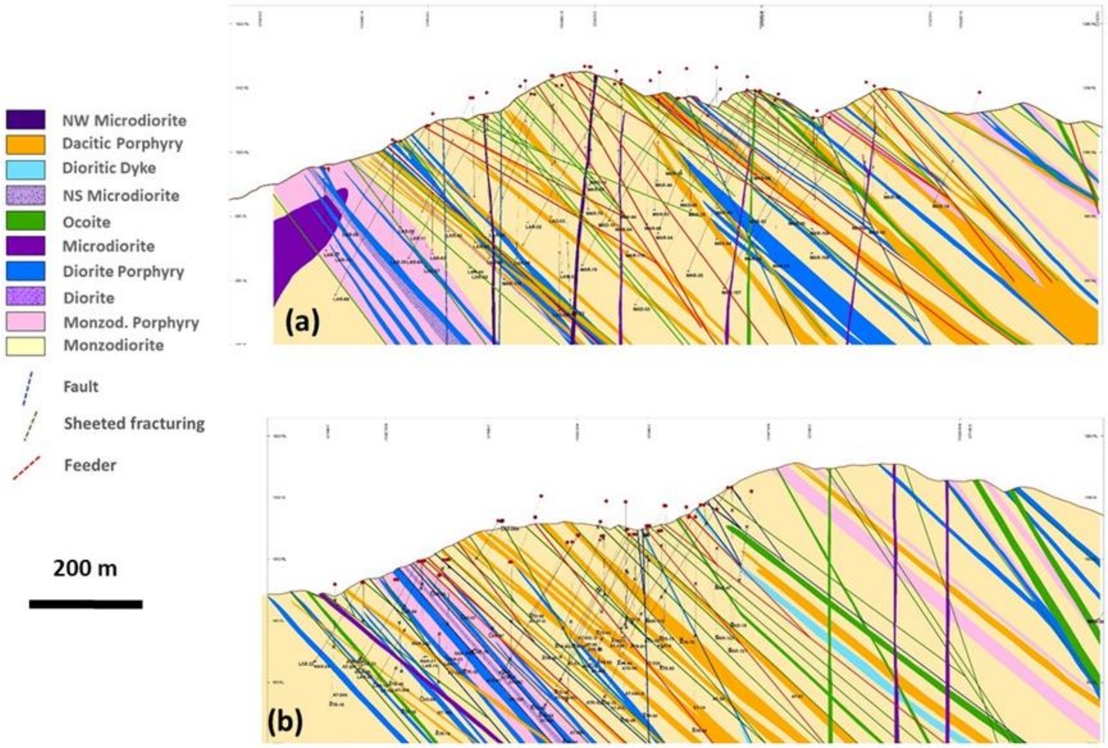


Figure 14-1: Lithological and Structural Interpretation. Sections NW 400 (a) and NW 650 (b), Marimaca Copper Corp., 2022

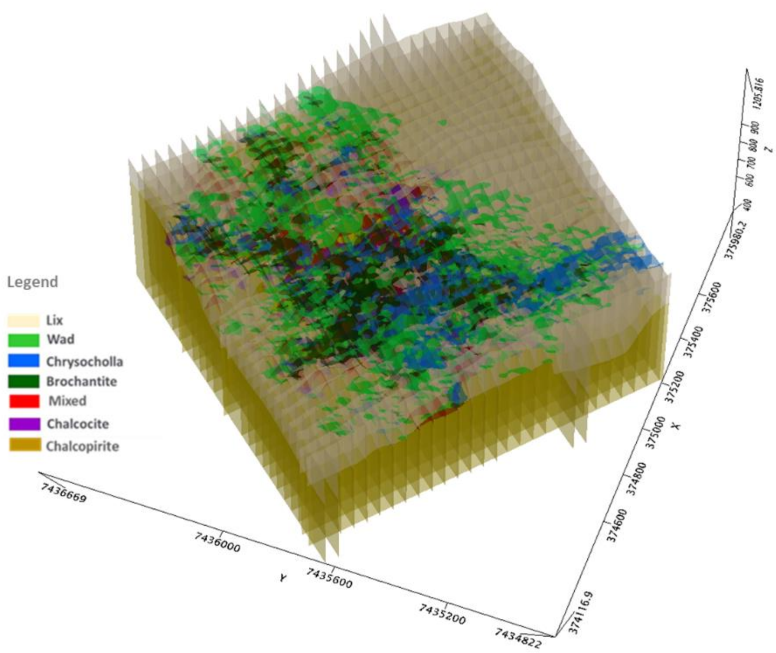


Figure 14-2: Lithology & Structure Section Integration, Marimaca Copper Corp., 2022

The order of interpretation was litho-structure first and then the mineral zone into transparent overlays. The mineral zone interpretations were later used as MRE domains. The lithological units and structural interpretations were based primarily on the detailed surface geology map, as well as underground mine workings maps (Figure 14-3) with drill hole logging as support, as well as anisotropies identified in structural analyses. The mineral zone interpretation was based primarily on the drill hole logging (Figure 14 -4 a, b).

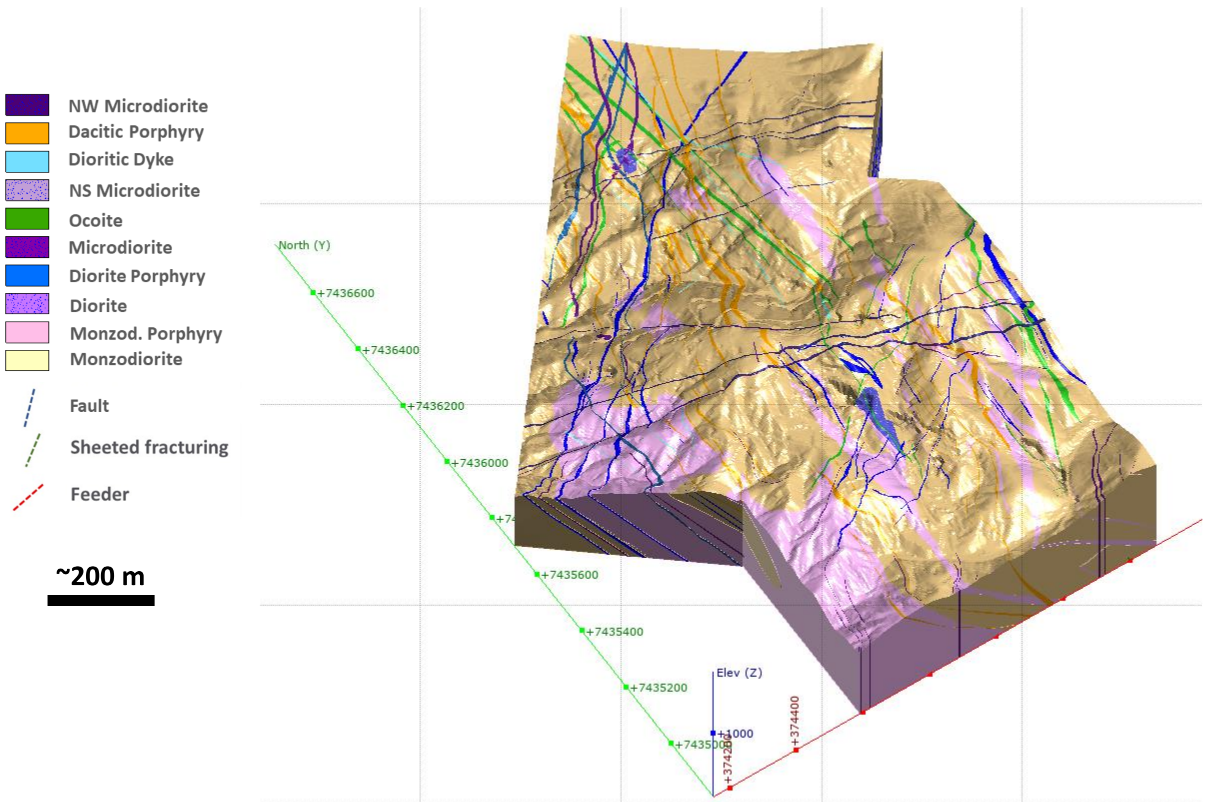


Figure 14-3: Marimaca Project, Illustrative Litho-Structure from 2020 MRE (a) and Updated Mineralization Section NE100 (b). Sections are 220°south-east, Marimaca Copper Corp., 2022

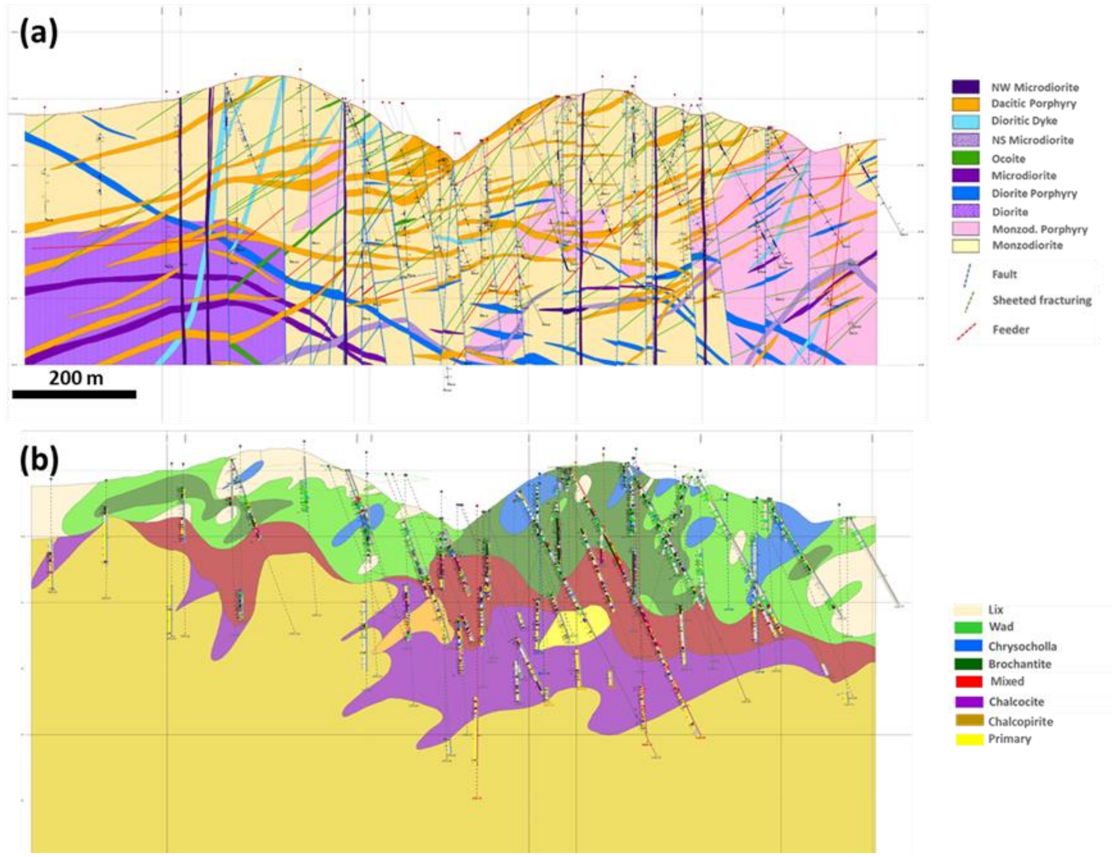


Figure 14-4: Modeling of the mineral units, Marimaca Copper Corp., 2022

Figure 14-5 shows the 3D combination of the data to produce a mineral unit.

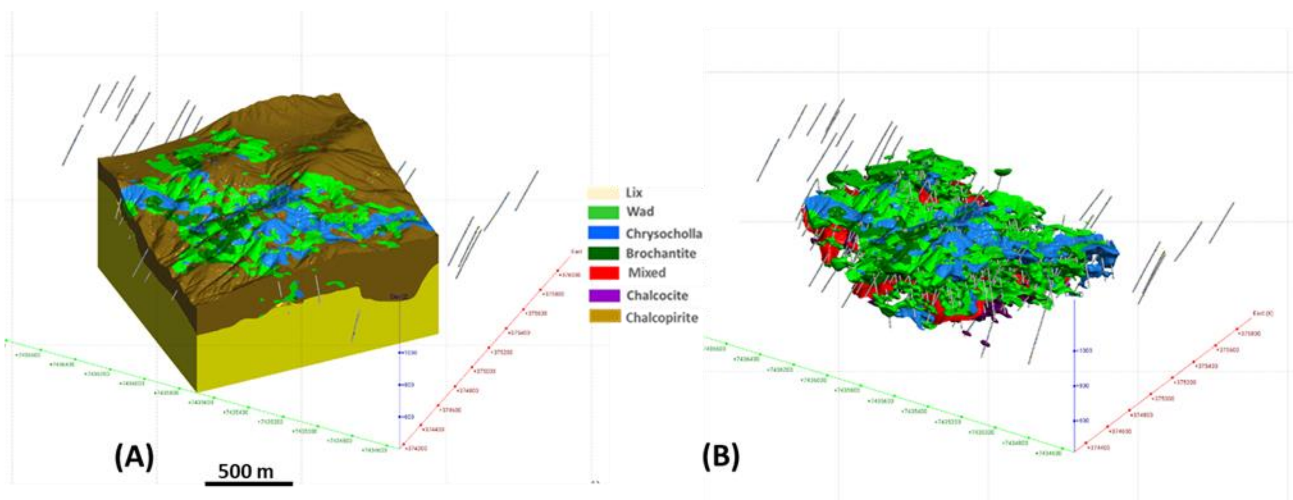


Figure 14-5: 3D Mineral Zones Model built in Leapfrog Geo, Marimaca Copper Corp., 2022

After comparing the Marimaca Mineral Resource model against the informing composites and the statistics of the model, NCL concludes that the modeling approach produced a reasonable and reliable model.

14.3 Resource Estimation Procedures

The following stages were developed to build the resources model of the Marimaca deposit and generate the resource estimate:

- Analysis of exploration data and definition of the estimation populations
- Validation of three-dimensional solids of the defined populations
- Statistical analyses of the composites of the different variables in each population
- Variography and anisotropy analyses. Definition of preferential directions, calculation and adjustment of variograms per population and elements to be estimated
- Detection and treatment of outliers
- Definition of the Block Model
- Definition of the estimation strategy and Kriging plans per element and population
- Estimation of grades for each element of each population
- Categorization of resources
- Validation of the Model through:
    - Comparative statistics between composites and estimated blocks
    - Analyses of smoothing of grades
    - Moving window analyses of composites and blocks estimated in different directions and Nearest Neighbor comparison
    - On screen validation
- Final Report of the geological resources by category

14.4 Database

MC has executed three main drilling campaigns in the area to date; the first two correspond to the exploration, delineating and further infill drilling of the Marimaca 1-23 southern part of the deposit, then successive campaigns extends the deposit towards north and north-west. During 2021 and 2022 MCC discovered mixed and sulphide mineralization beneath the oxide blanket and started a new delineation and infill drilling program. The following are summarized exploration tasks to date:

- 2015: geological surface reconnaissance as well as an UAV flight for orthorectification image and a detailed topographic map. Image processing was performed to emphasize lithology, structures, distribution of iron oxides and alteration. A geochemical rock grid spaced at 100 x 100 m was completed and assayed for Cu. A magnetic survey was done using Mag-Drone™ technology.

- 2016: RCH and DDH drilling campaigns were performed, the first one was discovery drilling totaling 15 RC holes; 2,710 m. In light of the good results, a 100 x 100 m grid for drilling was completed, using two orientations controlled to cut the primary and secondary structural directions of the mineralization. A total of 8,910 m of RC drilling in 39 holes and another 2,008 m of DDH in 6 holes was completed. With these results, the first resource estimation exercise was done, published in January of 2017 (NCL, 2017).

- 2017: drilling was performed following the two orientations in a 50 x 50 m Infill Program. A total of 11,928 m RC in 59 holes was drilled. Another 820 m in 4 PQ drill holes for metallurgical purposes was added and a further 1,230 m in 6 holes with HQ3 methodology for geotechnical purposes was completed.

- At the end of 2017 another 11 RC holes totaling 2,950 m were drilled to explore the NE extension of the Marimaca style mineralization always inside the mining concession; and because at this time the La Atómica 1-10 concesion was optioned a first set of 14 RC holes totaling 3,220 m discovery holes were completed.

- Starting in 2017 an intensive program of 1:5,000 to 1:1,000 metric scale detailed and systematic geologic mapping program has been carried out on most of the interest area.

- At the same time underground workings and road cuts have been mapped and sampled.

- 2018-2019 following the mining property consolidation, towards north with the acquisition of the Atahualpa and Olimpo mining concessions group, the so called Phase II of drilling oriented to the discovery confirms the extension of the oxide body and this delineation was successfully completed, by means the drilling of 70 RC, 16,150 m and 9 DDH, 2,203 m at La Atómica 1-10 and 138 RC holes, 36,366 m and 14 DDH´s, 2,715 m at Atahualpa and Tarso sectors.

- 2021, MC drilled deep holes targeting sulphide mineralization beneath oxide blanket. This program resulted in the discovery of attractive mixed and secondary sulphide mineralization extending at depth. This mineralization was probed by re-entry of historic holes

- 2022 infill RC drill program confirms the extension of the mixed and secondary sulphide mineralization as well as initiated the delineation and infill of the new mineralization extensions, for the purpose of improvement of resource category.

The tonnage and grades from the previous and most recent exploration and delineation drilling and surface-subsurface geologic work has been integrated and these results are included in this report.

The NI 43-101 2022 MRE database contains the information shown in Table 10-1.

All samples without grade value in the database were eliminated prior to the resource modeling, also values labeled <0.001% were changed to 0.0005% for both CuT and CuS.

Specific gravity values used in this update are the same as in 2019, because no new specific gravity data has been collected in the interim. A total of 562 core samples from the DDH campaigns were used.

In the opinion of NCL, the analytical results are free of apparent bias. The sampling preparation, security, and analytical procedures used are consistent with generally accepted industry best practices and are therefore adequate to support Mineral Resource estimation.

14.5 Analysis of DDH vs RC Twin Holes

No additional twin holes have been drilled since the last resource estimation in 2019, so it is considered that the analysis carried out by then is still valid, as no new relevant information has been added. The procedure developed and the results obtained in 2019 are summarized as follows:

Samples close to 5m maximum, from 11 twin holes were compared. The GSLib getpairs routine was used for this work.

When comparing the averages of CuT and CuS grade of DDH and RC drilling, it is observed that they are very similar and there is no global error. Table 14-1 shows the average CuT and CuS, for DDH and RC drilling as well as the number of pairs separated a maximum of 10m detected. A more detailed analysis was carried out in 2019 and it was concluded that the use of DDH and RC drill holes together is valid for resource estimation.

Table 14-1: Average CuT vs Cus-Twin Holes

Range	Average (%)		Pairs
	CUT_RC	CUT_DDH	
0 - 5m	0.49	0.45	6678

Range	Average (%)		Pairs
	CUS_RC	CUS_DDH	
0- 5m	0.31	0.28	6338

14.6 Sample Statistic

Samples from the database have been coded based on the updated geological model 3D solids codes, according to the solid that contains the sample centroid. Two additional codes from the solid model were introduced to each sample, one for Mineral Zone (MZ) and another for Geotechnical Domain (GD) Tables 14-2 and 14-3 show the basic statistic per population, according to the original MZ database codes and the new codes obtained from the 3D solids.

Table 14-2: Sample Statistic for CuT, per Rock Type.

Statistic	Original Raw Data CUT						
	Brochantite	Chrysocolla	Enriched	Mixed	Wad Cu => 0.1	Wad Cu < 0.1	Chalcopyrite
N° Sample	5458	4051	3268	2444	3232	3539	1407
Minimum %	0.044	0.024	0.021	0.093	0.09	0.09	0.09
Maximum %	14.43	4.12	14.08	19.25	7.21	0.39	13.98
Median %	0.76	0.47	0.64	0.61	0.35	0.14	0.83
Std. Dev.	0.83	0.45	1.00	1.02	0.34	0.03	1.53
Coef. of Var.	1.10	0.95	1.55	1.68	0.98	0.21	1.84
Statistic	**Solid Coded Data CUT**						
	Brochantite	**Chrysocolla**	**Enriched**	**Mixed**	**Wad Cu => 0.1**	**Wad Cu < 0.1**	**Chalcopyrite**
N° Sample	7667	5025	5478	7060	4823	4941	1131
Minimum %	0.004	0.0005	0.001	0.0005	0.008	0.002	0.005
Maximum %	19.25	14.08	8.22	13.21	8.35	3.45	13.98
Median %	0.60	0.43	0.24	0.36	0.29	0.06	0.41
Std. Dev.	0.88	0.58	0.54	0.84	0.37	0.08	1.08
Coef. of Var.	1.45	1.37	2.30	2.31	1.26	1.36	2.64

Table 14-3: Sample Statistic for CuS, per Rock Type.

Statistic	Original Raw Data CUS						
	Brochantite	Chrysocolla	Enriched	Mixed	Wad Cu => 0.1	Wad Cu < 0.1	Chalcopyrite
N° Sample	5458	4051	3268	2444	3539	3232	1407
Minimum %	0.01	0.004	0.002	0.01	0.003	0.002	0.0005
Maximum %	13.85	4.06	1.44	6.49	0.19	6.89	0.77
Median %	0.63	0.38	0.07	0.24	0.06	0.19	0.03
Std. Dev.	0.78	0.41	0.09	0.45	0.03	0.31	0.05
Coef. of Var.	1.23	1.09	1.31	1.86	0.54	1.64	1.67
Statistic	**Solid Coded Data CUS**						
	Brochantite	**Chrysocolla**	**Enriched**	**Mixed**	**Wad Cu => 0.1**	**Wad Cu < 0.1**	**Chalcopyrite**
N° Sample	7667	1131	5025	5478	7060	4941	4823
Minimum %	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.002
Maximum %	13.85	5.25	6.32	2.78	6.49	3.15	7.58
Median %	0.43	0.03	0.32	0.04	0.09	0.02	0.16
Std. Dev.	0.69	0.22	0.47	0.09	0.26	0.06	0.30
Coef. of Var.	1.58	7.24	1.44	2.14	2.76	2.98	1.84

It can be noted from the above given tables, that all the samples with CuT grade have a CuS value. A check for eventual CuS values greater than CuT grades was done and no contradictions were found. Therefore, the samples to be used in the grade modeling process are the raw samples from the drill hole database, coded according to the MZ solid that contain their centroids.

14.7 Contact Analyses

The contact characteristics between the MZ units to estimate have been reviewed, according to the mean grade of the samples, in relation to their distance to the contact defined in the updated solids model. As an example of the analyses carried out, Figures 14-6, 14-7 and 14-8 show the conduct of the CuT grades along the border of the contact between the most relevant units.

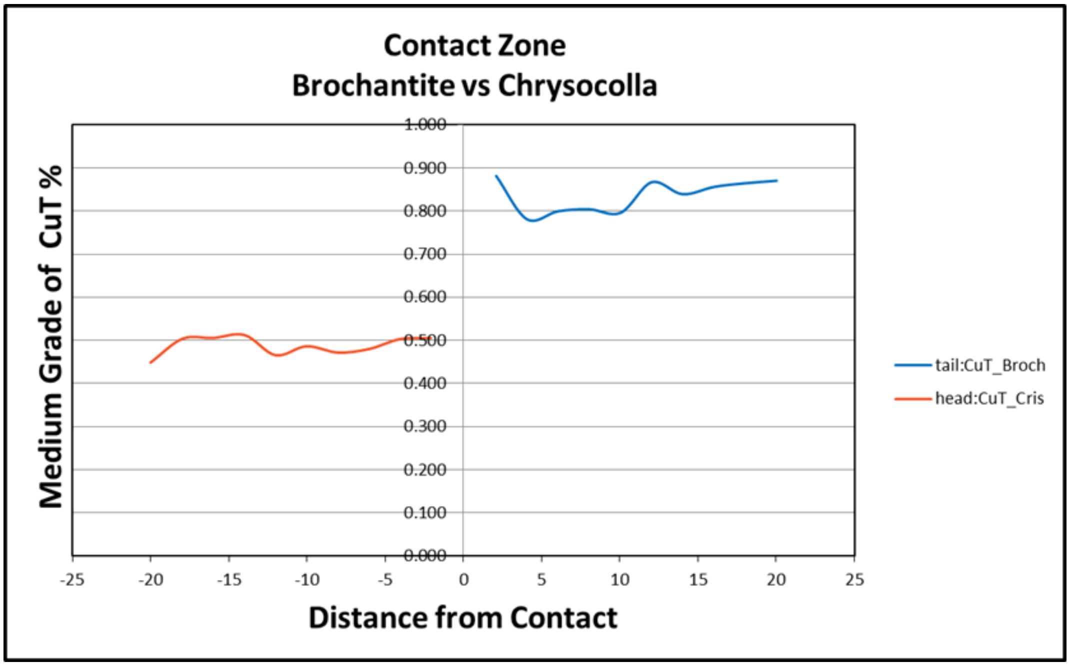


Figure 14-6 : Brochantite - Chrysocolla Contact, Cut

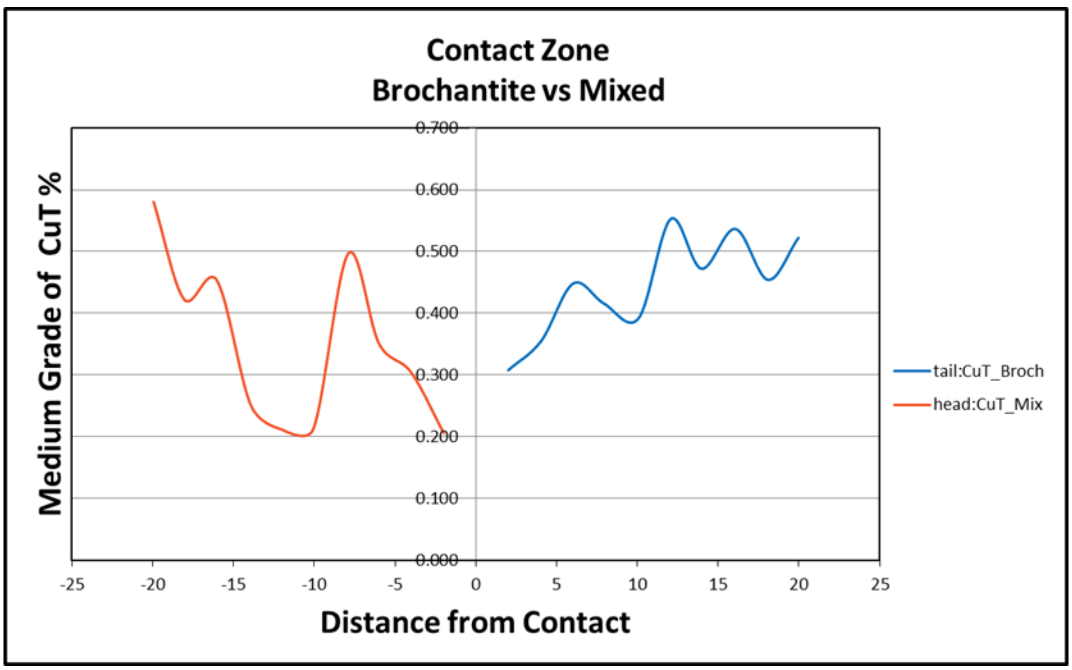


Figure 14-7: Brochantite – Mixed Contact, CuT

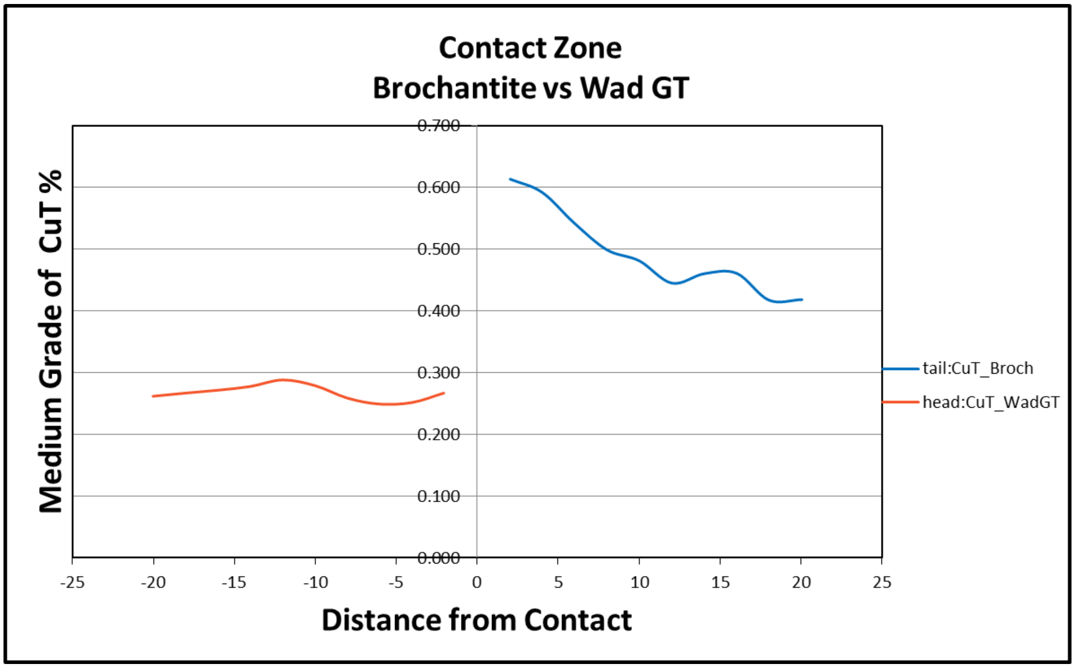


Figure 14-8: Brochantite – Wad >=0.1% Contact, CuT

It can be noted in the above figures, that all the contacts seem hard. Based on this analysis, it was decided to estimate the MZ units independently.

14.8 Outliers

An analysis of the existence of outliers in the estimation populations was done using the log-probability curves for each samples' population, looking for some singularities in the curves that may signal the presence of an outlier limit.

Figure 14-9 shows, as an example, the log-probability plot of brochantite:

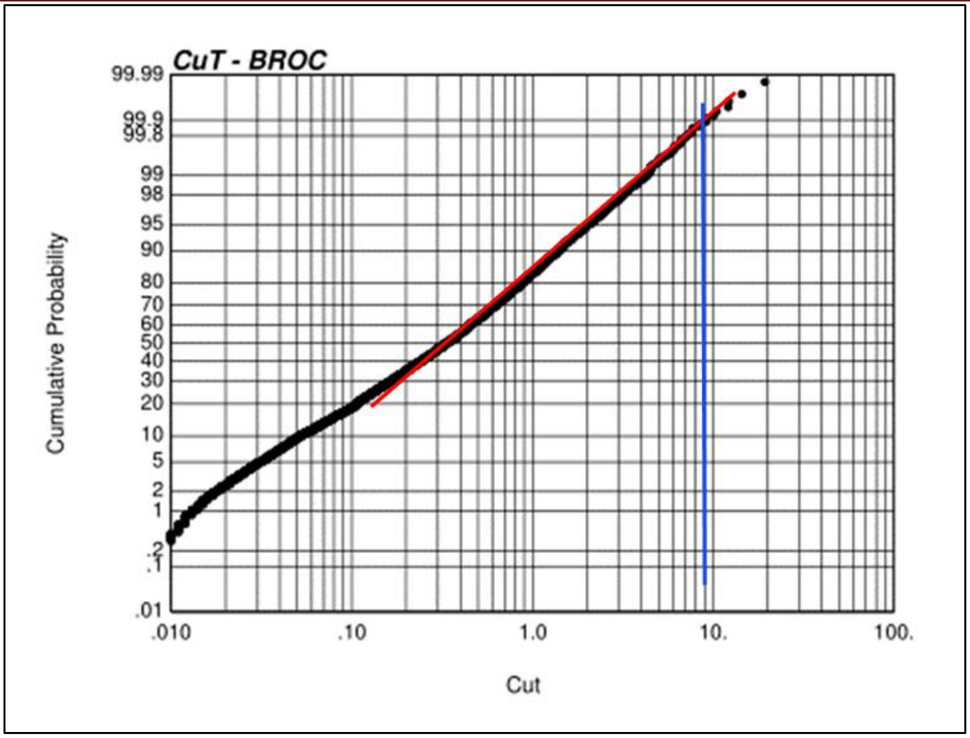


Figure 14-9: Log-Probability Plot CuT – Brochantite

Based on the shape of the curves, the outliers' limits were defined for each population, as shown in Table 14-4.

Table 14-4: Outliers Limits.

Zone Mineral	CuT (%) Capping	CuS (%) Capping
Brochantite	**9**	**6**
Chrysocolla	3	2.9
Enriched	4.5	0.7
Mixed	6.5	2.1
Wad	2.2	1.8
Chalcopyrite	3.8	0.15

For values above the above-defined limits, at the estimation stage the search ellipsoid will have a radius of 5 meters, encapsulating the outliers to the block that contains them, maintaining the value of the high grade sample, but restricting their influence to the blocks that contain them. This decision was taken considering the real presence of outliers values in the deposit, as seen in the site visit to the underground excavations and the samples' inspection.

14.9 Calculation and Variogram Adjustment

Correlograms were calculated, instead of conventional variograms, as they are considered more stable. Correlograms were performed for the 5 Mineral Zones of the geological model. The variography of CuT has been developed using the samples of the populations derived from the Contact Analysis.

Table 14-5 shows the parameters of the adjusted CuT Correlograms. Figure 14-10 shows, as an example, the adjusted correlogram for Brochantite and Chrysocolla.

Table 14-5: Correlograms, Adjusted Models CuT

ZMIN	Principal Azimut	Principal Dip	Intermediate	Nugget	1st Structure Sill 1	Range (m) X´	Y´	Z´	2st Structure Sill 2	Range (m) X´	Y´	Z´
Broch + Chry	135	-78	45	0.35	0.45	70	70	20	0.2	70	70	100
Enriched	90	0	0	0.5	0.30	18	18	27	0.2	28	28	27
Mixed	90	82	0	0.35	0.45	80	65	11	0.2	25	65	60
Wad	120	-70	30	0.35	0.45	35	60	55	0.2	30	60	15
Chalcopyrite	90	-20	0	0.4	0.45	5	18	6	0.15	100	120	16

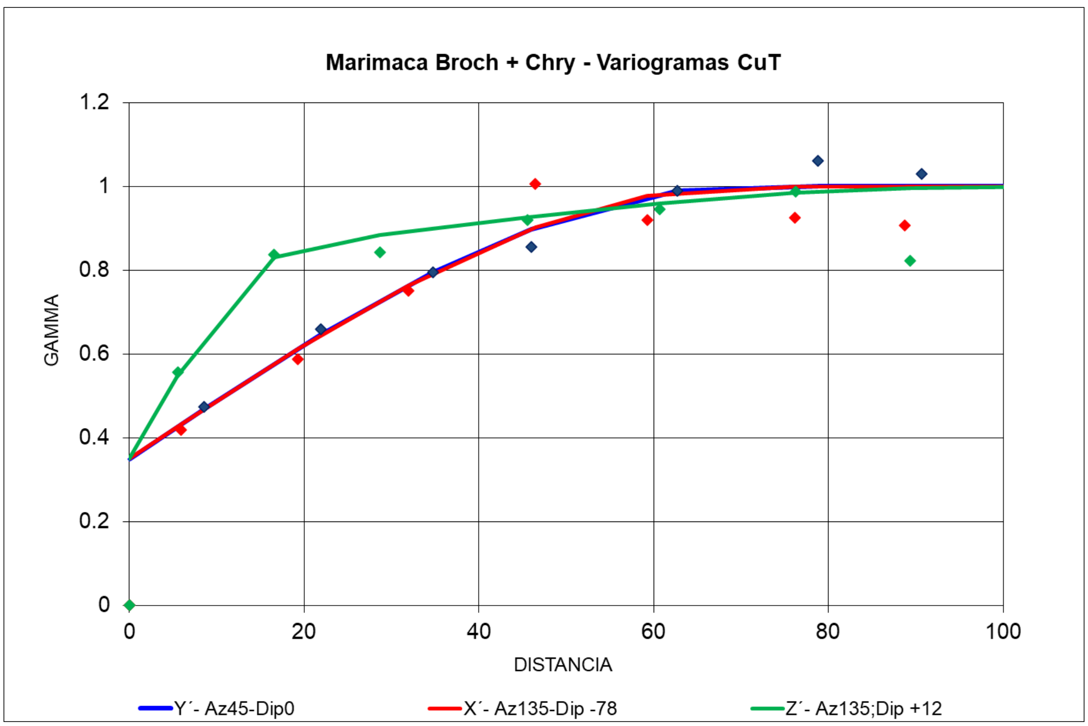


Figure 14-10: Correlograms CuT – Brochantite

It was decided to use the CuT correlograms to estimate both, CuT and CuS, in order to prevent the generation of CuS grades greater than the CuT values.

14.10Definition and Generation of the Block Model

Attending to the characteristics of the deposit and the geological model constructed, it was decided to use a percentage model, as featured in the modelling software GEMS. This approach has proved to be adequate in previous estimations for the Marimaca deposit. During the grade estimation process, the grade for each Mineral Zone was estimated for each block.

As in previous estimations developed, a block model of 5m*5m*5m, rotated N 40º E was used, in order to match with the geological sections. Table 14-6 presents the geometric parameters of the model, which was expanded in relation with previous estimations, to reflect the increase of the explored area and the size of the updated geological model.

Table 14-6: Definition of the Block Model.

Axis	Minimum	Maximum	N° of Blocks	Block Size	Extension (m)
X	375,018.597	376,993.597	395	5	1,975
Y	7,434,324.224	7,436,099.224	355	5	1,775
Z	225	1,225	200	5	1,000
Rotation	N40°E				

Using the interpretation of the mineral zones, the respective models were generated, assigning the codes defined per each block of the model, using the intersection of the blocks and the respective solids. According to the blocks and the definition of the populations, a final model has been generated with a unique code per each block of the model and Table 14-7 presents a summary of the codification used.

Table 14-7:Total Coded Blocks

Domain	N°Blocks	Volume m^3
Brochantite	244,986	24,006,077
Chrysocolla	193,270	18,077,484
Enriched	384,496	38,470,740
Mixed	291,910	28,695,003
Wad CuT >= 0.1%	319,045	27,457,778
Wad CuT < 0.1%	294,306	25,065,254
Chalcopyrite	81,875	7,727,468
Total	**1,809,888**	**169,499,806**

14.11Geological Model Coding

The remaining blocks below surface topography were coded as waste. Validation of the correctness of the rock coding was done, checking some sections and plans on screen. Figure 14-11 shows Section NW 300, with the solid's contour, the coded boreholes and the block model.

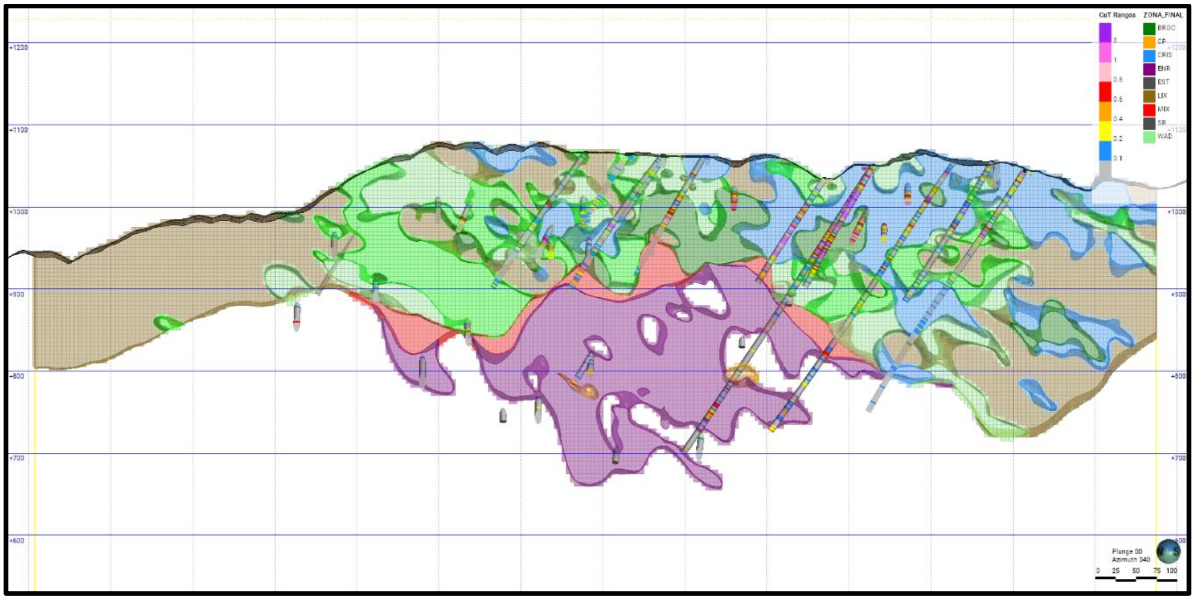


Figure 14-11: Solids, Blocks and Samples - Section NW 300 view to SW, Marimaca Copper Corp., 2022

14.12 Specific Gravity Model

In 2019, the average specific gravity of each estimation unit was calculated using a set of 562 measures, divided according to each mineral zone. Outliers were eliminated. The following Table shows the specific gravity for each of the mineralized zones. (Table 14-8).

Table 14-8: Specific Gravity per Unit

SZMIN	Mean (t/m3)
Brochantite	2.639
Chalcopyrite	2.719
Chrysocolla	2.67
Enriched	2.649
Waste	2.645
Lix	2.663
Mixed	2.688
Pyrite	2.711
Wad	2.642

14.13 Kriging Plans and Resource Classification Criteria

The grade interpolation method selected was Ordinary Kriging, attending to the nature of the deposit and the data availability. The kriging was done using the software Gems. Four kriging plans were defined, to be executed in sequential order, starting with a restrictive estimation plan that considers only interpolation between drill holes, separated distances below the equivalent of 80% of the variogram sill. Then, the following plans increase the search distance and release other restriction gradually, until the estimation is complete.

It must be noted that the estimation carried out in 2020 used the D85 values instead of the D80 of this updating; the decision is based on the improvements introduced to the geological model and the increase in the data availability, that lead to better correlograms with larger ranges.

The geometric parameters of the estimation of each kriging plan are shown in Table 14-9.

Table 14-9: Kriging Plan Parameters

Estimation Plan	Run1	Run2	Run3	Run4
Max N° Composite per Octant	4	4	4	4
Min N° of Octants with inf.	3	3	1	1
Min N° of Composites	8	6	4	4
Max N° of Composites	12	12	12	12
Search Range	D80	2 x D80	4 x D80	1000
Min N° of Drillhole	2	2	1	1

Each population was estimated with its own samples.

The utilized D80 for each population are shown in Table 14-10, were it can be noted that anisotropic search was used for all estimation units:

Table 14-10: D_{80} per Direction and Population (m)

Domain	D_{80} X	D_{80} Y	D_{80} Z
Brochantite	35	35	15
Chrysocolla	35	35	15
Enriched	9	9	11
Mixed	31	33	8
Wad	17	30	21
Chalcopyrite	3.5	46	3.5

14.14 Grade Estimation Results

Table 14-11 summarizes the number of blocks estimated in each kriging pass per kriging domain.

Table 14-11: Estimation Results; CuT and CuS

SZMIN	Total N°Blocks	Total N°Blocks Estimated	Total N° Blocks Estimated in 1st		Total N° Blocks Estimated in 2nd		Total N° Blocks Estimated in 3rd Pass		Total N° Blocks Estimated in 4th	
			N° of Blocks	% of Total Estimated	N° of Blocks	% of Total Estimated	N° of Blocks	% of Total Estimated	N° of Blocks	% of Total Estimated
Brochantite	244,986	244,986	81,371	33%	112,761	46%	50,682	21%	172	0.1%
Chrysocolla	193,270	193,270	48,442	25%	85,173	44%	58,531	30%	1,124	1%
Enriched	384,496	384,496	5,781	2%	29,912	8%	206,164	54%	142,639	37%
Mixed	291,910	291,910	30,166	10%	90,579	31%	154,087	53%	17,078	6%
Wad (CuT>=0.1)	319,045	319,045	28,710	9%	136,236	43%	148,024	46%	6,075	2%
Wad (CuT<0.1)	294,306	294,306	29,542	10%	105,566	36%	147,284	50%	11,914	4%
Chalcopyrite	81,875	81,875	8	0%	1,523	2%	28,830	35%	51,514	63%
Total	**1,809,888**	**1,809,888**	**224,020**	**12%**	**561,750**	**31%**	**793,602**	**44%**	**230,516**	**13%**

Resource Classification has been done according to the conditions defined by the number and location of samples in the neighborhood of each block, as show in Table 14-12. This criterion attends the requirements established at the CIM code.

For the classification, the 1st pass generates block estimates with a minimum of two drill intercepts, both within distances shorter than the D_{80} (distance corresponding to the point where the correlogram reaches 80% of the sill); The 2nd pass maintains the restriction of the number of drill intercepts, but enlarges the search range by twice the D_{80}.

Pass 1 generates Measured resources, Pass 2 generates Indicated and Pass 3 increments the search radius to 4 times the D_{80} and reduces the number of drill holes within this range to one, generating Inferred Resource. A fourth pass was added using a very large search radio, in order to ensure that all the blocks inside the geological model are estimated.

Taking these criteria into account, the categorization of resources has been done according to Table 14-12.

Table 14-12: Kriging Passes and Resource Classification

N° Kriging	Search Range	N° Intercepts	Classification
1	D_{80}	2	Measured
2	2 x D_{80}	2	Indicated
3	4 xD_{80}	1	Inferred

A classification code was added to the block model. The codes utilized to this model are: 1, Measured; 2 Indicated; 3 Inferred.

14.16Resource Model Validation

To ensure the adequate quality of the generated model, three validation exercises were performed, as described in this chapter.

- Visual Validation
- Statistic Validation
- Moving window Analysis and Nearest Neighbor modelling.

The results of these validations are presented below.

14.16.1 Visual Validation

Several plan views and vertical sections of the block model were prepared, comparing the grades of the blocks and the drill holes. Also the resource classification was analyzed comparing the existing information. As an example, the results of this validation are presented in Figures 14-12 and 14-13.

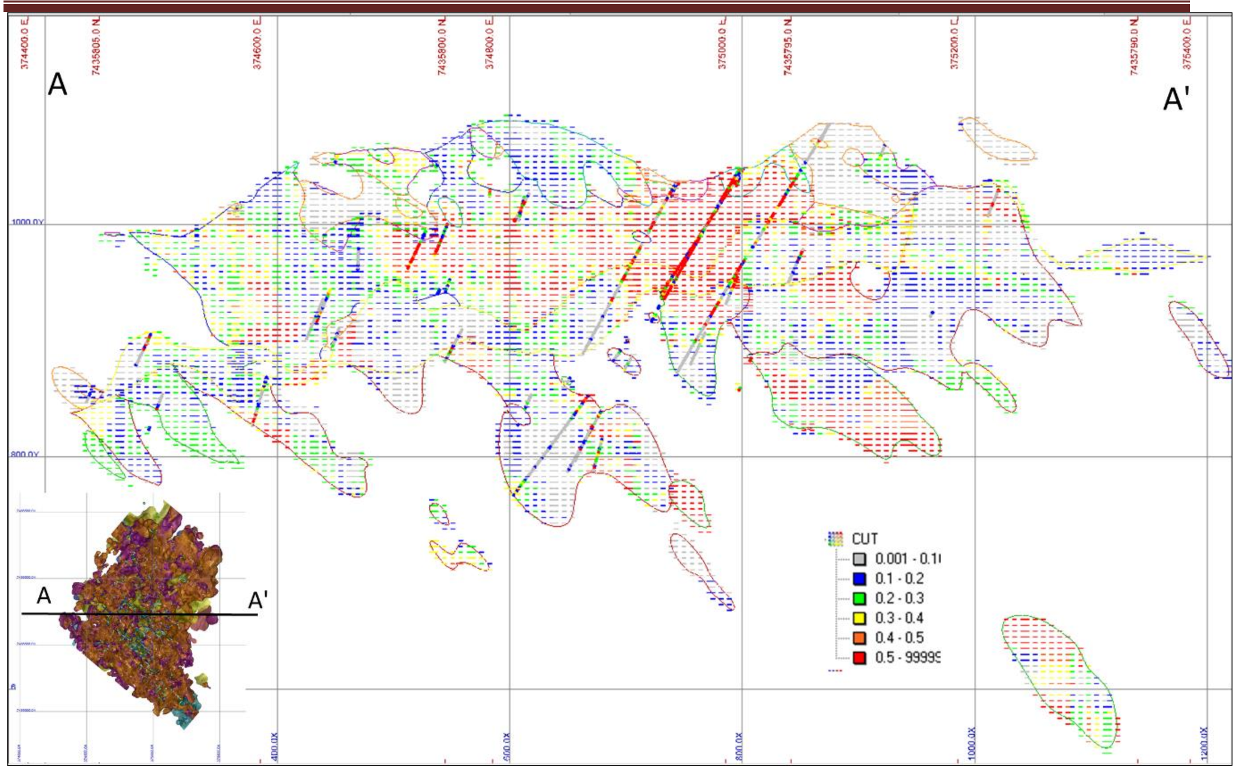


Figure 14-12: Visual Revision of the Model of CuT – Section A-A', Marimaca Copper Corp., 2022

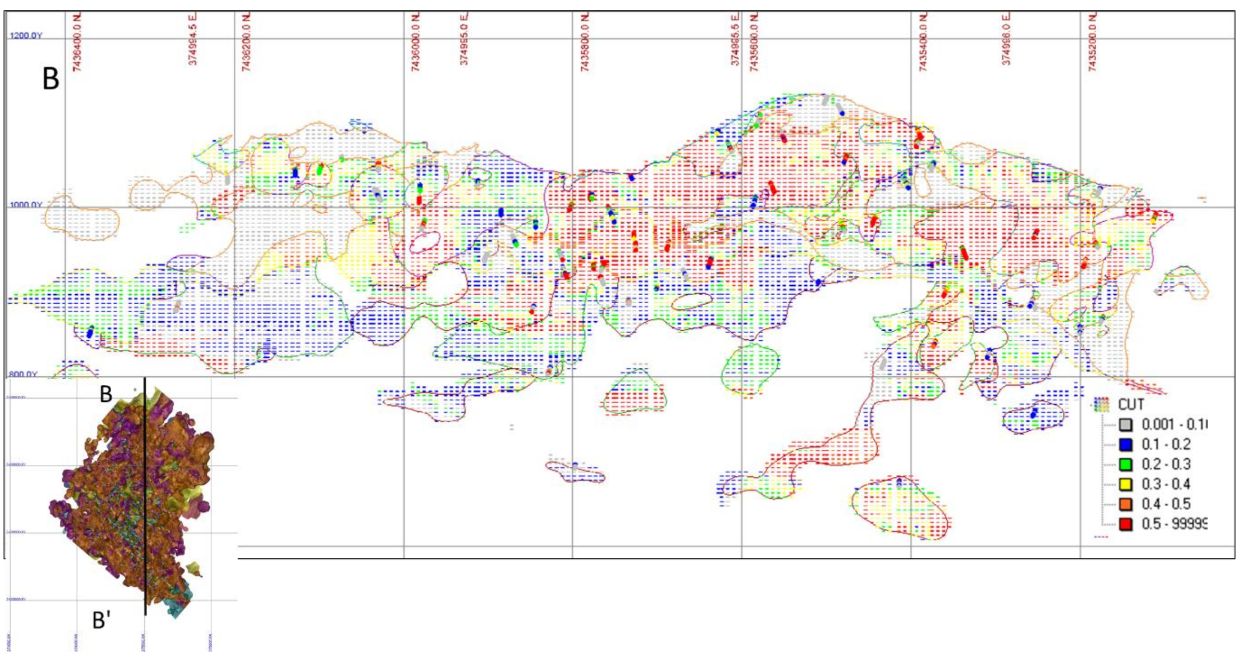


Figure 14-13: Visual Revision of the Model of CuT – Section B-B', Marimaca Copper Corp., 2022

14.16.2 Statistical Validation

Tables 14-13 and 14-14 present a comparison of the basic statistic of composites and blocks per population. Also included in the comparative Table are the declustered grades, obtained through the technique of nearest neighbor.

Table 14-13: Statistic Comparison, Blocks vs Composites – CuT

SZMIN	Var.	N° Sample	Min %	Max %	Average %	Std.Dev.	Coef. Of Var.
Brochantite	Kriged Blocks	244986	0.010	4.89	0.58	0.39	0.68
	NN Blocks	244986	0.004	9.00	0.56	0.75	1.34
	Samples	7667	0.004	19.25	0.60	0.88	1.45
Chrysocolla	Kriged Blocks	193270	0.003	2.16	0.36	0.22	0.62
	NN Blocks	193270	0.000	3.00	0.36	0.43	1.18
	Samples	5025	0.001	14.08	0.43	0.58	1.37
Enriched	Kriged Blocks	384496	0.005	3.28	0.24	0.22	0.93
	NN Blocks	384496	0.001	4.50	0.24	0.48	1.98
	Samples	5478	0.001	8.22	0.24	0.54	2.30
Mixed	Kriged Blocks	291910	0.005	3.96	0.30	0.34	1.12
	NN Blocks	291910	0.001	6.50	0.29	0.67	2.27
	Samples	7060	0.001	13.21	0.36	0.84	2.31
Wad >=0.1	Kriged Blocks	319045	0.079	1.74	0.28	0.14	0.49
	NN Blocks	319045	0.008	2.20	0.27	0.26	0.95
	Samples	4823	0.008	8.35	0.29	0.37	1.26
Wad	Kriged Blocks	294306	0.009	0.18	0.06	0.02	0.32
	NN Blocks	294306	0.002	0.55	0.06	0.04	0.71
	Samples	4941	0.002	3.45	0.06	0.08	1.36
Chalcopyrite	Kriged Blocks	81875	0.008	3.14	0.37	0.34	0.93
	NN Blocks	81875	0.005	3.80	0.36	0.71	1.99
	Samples	1131	0.005	13.98	0.41	1.08	2.64

Table 14-14: Statistic Comparison, Blocks vs Composites – CuS

SZMIN	Var.	N° Sample	Min %	Max %	Average %	Std.Dev.	Coef. Of Var.
Brochantite	Kriged Blocks	244986	0.002	3.32	0.42	0.31	0.73
	NN Blocks	244986	0.000	6.00	0.41	0.59	1.45
	Samples	7667	0.001	13.85	0.43	0.69	1.58
Chrysocolla	Kriged Blocks	193270	0.001	1.92	0.27	0.19	0.71
	NN Blocks	193270	0.000	2.90	0.27	0.38	1.39
	Samples	5025	0.001	6.32	0.32	0.47	1.44
Enriched	Kriged Blocks	384496	0.000	0.58	0.04	0.04	0.84
	NN Blocks	384496	0.000	0.70	0.04	0.08	1.70
	Samples	5478	0.001	2.78	0.04	0.09	2.14
Mixed	Kriged Blocks	291910	0.001	1.50	0.08	0.10	1.19
	NN Blocks	291910	0.000	2.10	0.08	0.20	2.46
	Samples	7060	0.001	6.49	0.09	0.26	2.76
Wad >=0.1	Kriged Blocks	319045	0.017	1.44	0.15	0.11	0.74
	NN Blocks	319045	0.002	1.80	0.15	0.20	1.40
	Samples	4823	0.002	7.58	0.16	0.30	1.84
Wad	Kriged Blocks	294306	0.002	0.10	0.02	0.01	0.47
	NN Blocks	294306	0.000	0.37	0.02	0.02	1.10
	Samples	4941	0.001	3.15	0.02	0.06	2.98
Chalcopyrite	Kriged Blocks	81875	0.001	0.13	0.02	0.02	0.78
	NN Blocks	81875	0.000	0.15	0.02	0.03	1.64
	Samples	1131	0.001	5.25	0.03	0.22	7.24

From the above Tables, it is concluded that the estimation shows no global bias.

14.16.3 Trend Analyses (SWAT Plots)

For trend analyses of the block model, the mean and the declustered mean of the samples has been compared with the block results. The comparison of mean grades of blocks versus direct mean and declustered mean of composites for each estimation domain, are presented in the following pages. Graphs include the number of composites per slice as a graph bar. As an example, the results of this validation for Brochantite are presented in the next Figures (14-14, 14-15 and 14-16).

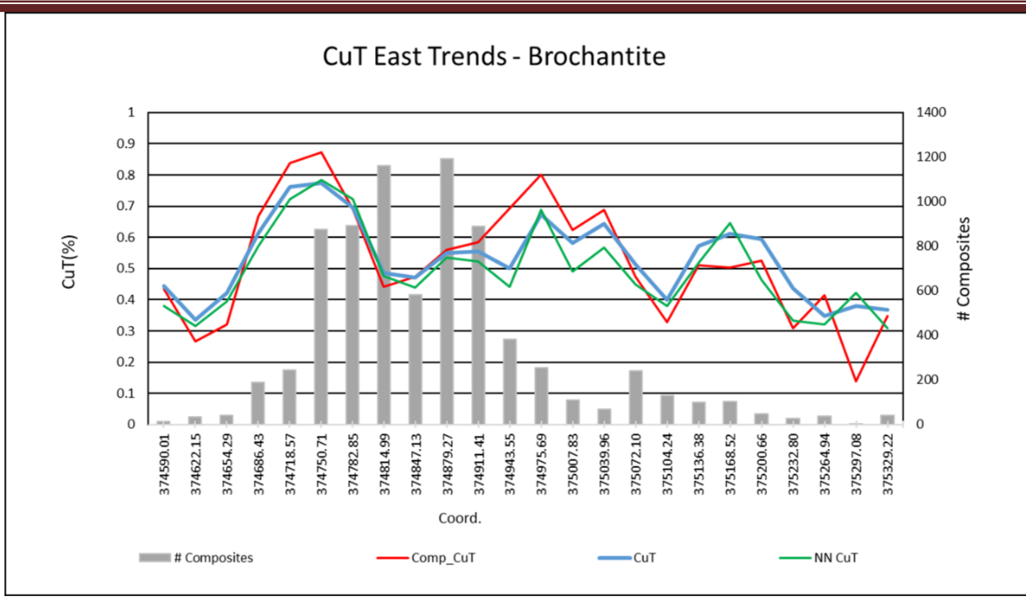


Figure 14-14: Trend Analysis – Brochantite – E Direction

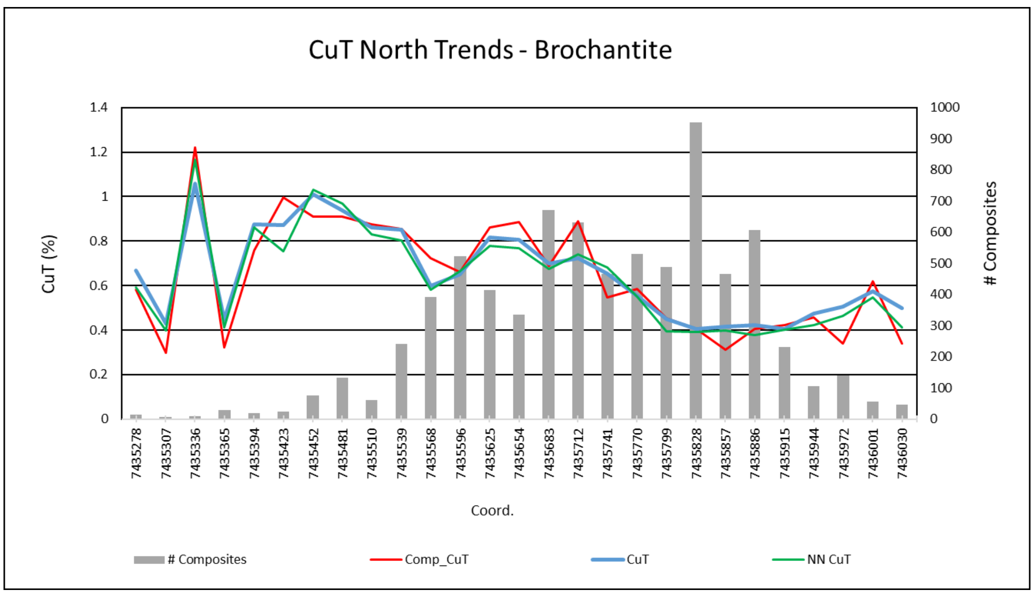


Figure 14-15: Trend Analysis – Brochantite – N Direction

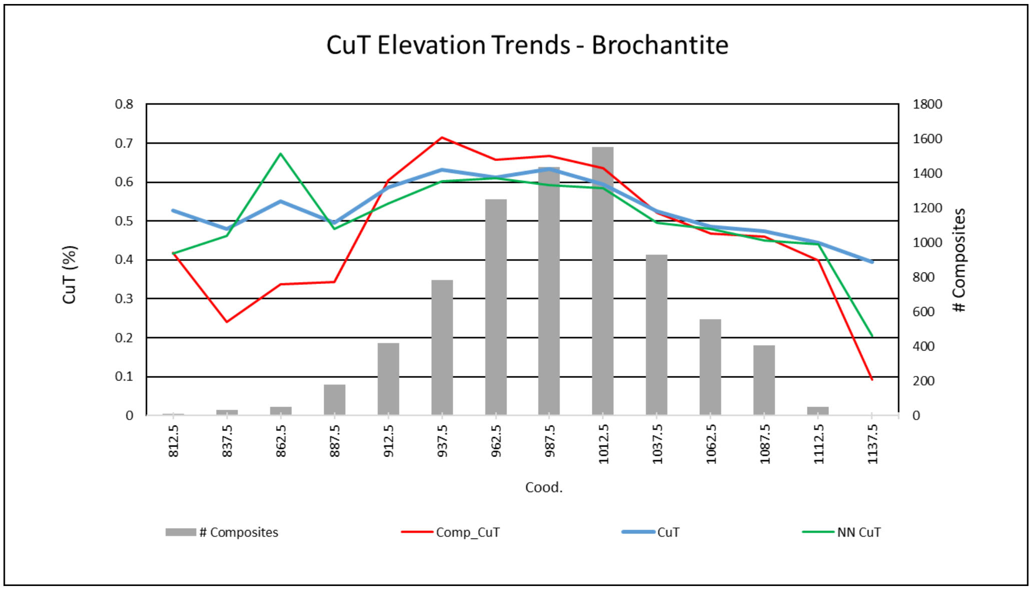


Figure 14-16: Trend Analysis – Brochantite – Elevation

The same analysis was made for the rest of the Mineral Zones and the estimated mean behaves in a satisfactory way, similarly to the declustered mean. Excessive smoothing is not observed.

It is concluded that the model of estimated grades, preserves the characteristic of the mean grade, global variability and tendencies of the original samples.

14.17 Reasonable Prospects for Eventual Economic Extraction

Once the block model was finished and validated, a Whittle pit was run using the following technical parameters, provided by Marimaca and agreed upon by NCL for Resource estimation (Table 14-15):

Table 14-15: Technical and Economical Parameters for Whittle Run

PARAMETERS	2022
Mining cost	$1.58/t
MCaf ($/t-10m bench)	$0.04/t
HL Process Cost (including G&A and SX/EW cost)	$5.946/t
ROM Process Cost including G&A	$1.654/t
Selling Cost	$0.164/lb
Heap Leach Recovery	76%
ROM Recovery	40%
Pit Slope angle [1]	42° - 52°
Cu Price	4.0 USD/lb

[1] *The pit slope is estimated at a range of 42° - 52° based on the geotechnical information currently available, but this is anticipated to improve as more data is generated*

For the purpose of this Resource Estimation, no new changes to the mineral processing assumptions have been made relative to the 2020 MRE. Since the 2020 MRE, Marimaca has completed its Phase 5 Metallurgical Program which confirm and support the assumptions used. Phase 5 Metallurgy generated a robust geometallurgical dataset, with column tests completed at the 2020 PEA industrial operating conditions (4m column heights).

In this MRE, a fixed value of 76% was used for the heap leaching plant and 40% for the ROM leach, which are the same values used in 2019, which are supported by the results obtained in Phase 5 metallurgy.

The technical and economical parameters used for the 2022 Whittle run were informed by the 2020 PEA assumptions, a comparison of which is presented below. Due to the designation of mined material to either heap leach or ROM, certain cost elements from mining costs have been reallocated to heap leach costs and ROM cost to be appropriately captured in the Whittle run. However, on an aggregate basis, they are identical. The 2020 PEA cost assumptions are considered to be the most relevant cost assumptions for the 2022 MRE Whittle run at this stage.

Table 14-16: Technical and Economical Parameters for Whittle Run relative to 2020 PEA assumptions

PARAMETERS	2020 PEA	2022 MRE
Mining cost (base)	$1.76/t LOM avg. ($1.51/t base)	$1.51/t base ($1.76/t LOM avg)
MCaf ($/t-10m bench)	$0.04/t mined	$0.04/t mined
HL Cost (including G&A and mining cost component from pit to Heap Leach for 2022 MRE)	$5.390/t processed	$5.946/t processed
ROM Cost (including G&A and mining cost component from pit to ROM leach for 2022 MRE)	$1.355/t processed	$1.654/t processed
Selling Cost including SX-EW processing cost	$0.164/lb sold	$0.164/lb sold
Heap Leach Recovery	76% of CuT	76% of CuT
ROM Recovery	40% of CuT	40% of CuT
Pit Slope angle	42 - 52°	42 - 52°

For slope angles, figures from the 2020 exercise were used, as no new geotechnical information was available now of the Whittle run. Slope angle zones defined in 2018 were projected linearly to cover the complete area of the new block model. The following figure shows the 2019 information projected to cover the complete 2022 block model and the 2022's Resource Pit.

Figure 14-17 shows the slope angle zones defined by Ingeroc and Table 14-17 shows the values used in the Whittle optimization run.

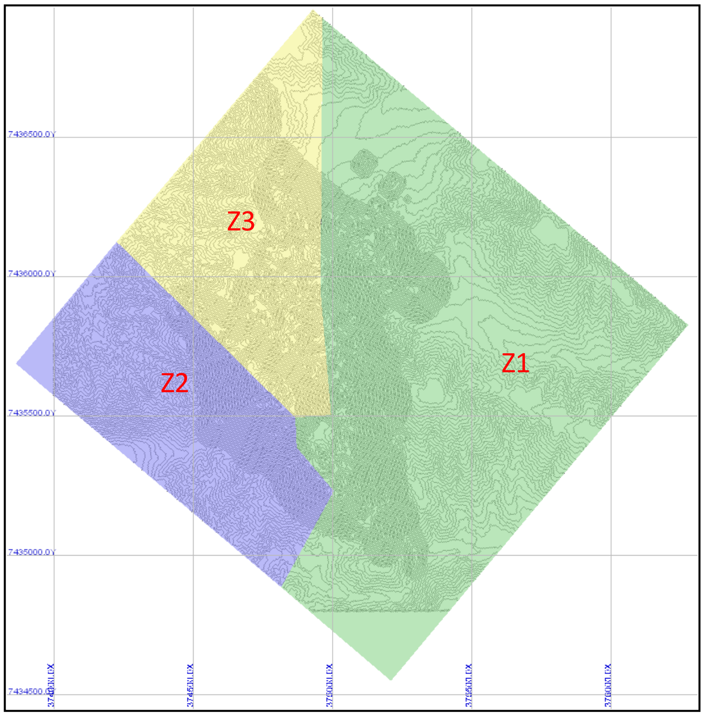


Figure 14-17: Geotechnical Zones – Slope Angles

Table 14-17: Inter Ramp and Overall Slope Angles

ZONE	Interramp Slope					Overall Slope		
	IRA	Face Angle	Height	Backbreak	Berm	Catch Berm	Slope Height	Slope Angle
	⍰ (º)	⍰ (º)	H (m)	a (m)	b (m)	c (m)	L (m)	⍰ (º)
Zone 1	52.0	75.0	10.0	2.7	5.1	10.0	150	50.9
Zone 2	42.0	70.0	10.0	3.6	7.5	10.0	150	41.6
Zone 3	45.0	75.0	10.0	2.7	7.3	10.0	150	44.5

The Cut Off Grade for Heap Leach was calculated using the following expression:

- COG = (Mc + HLc)/((Cu Price – SC) * HL Rec * 2204.62 The following value was obtained:
- Cut Off Grade Heap Leach: 0.15% CuT
- Marginal COG values for Heap and ROM processes were calculated using the above expression without considering the Mine Cost:
- Marginal Cut Off Grade Heap: 0.09% CuT
- Marginal Cut Off Grade ROM: 0.05% CuT

Five meters benches that are doubled to 10 meters, with an inter-ramp heights of 150 m and ramp widths of 25 m were considered.

14.18 Other considerations and criteria used for the optimization process

- All material outside the Mineral Zone solids is considered as waste, at zero grade.
- The Chalcopyirite Mineral Zone is considered waste.
- The pit walls are not constrained by the property boundaries, as allowed by Chilean regulations, in case the material within the property justifies the mining. However, the resultant pit falls within the Marimaca claim.
- Measured, Indicated and Inferred categories were considered valuable.
- Due to some characteristics of the pit optimization software, it was necessary to modify the "percentage model" generated in the grade estimation process to an integrated model, with only one value per block and variable. To do this, the following processes were done per variable:
    - CuT and CuS grades: the integrated values were calculated using the weighted grades and percentages of each of the parcels in the block.
    - Mineral Zone: The final value assigned to the block was the one corresponding to the greater percentage of Mineral Zone in the block.
- Attending to the integration process done to the block model, no further dilution was considered for the optimization process.

14.19 Mineral Resource Estimate

Table 14-18 summarizes the In Pit Resource per category, including all the valuable Mineral Zones, highlighting 0.15 % CuT. It must be noted that the reported figures do not include non-leachable material (chalcopyrite). This Mineral Zone has been treated as waste for the purposes of pit generation and reporting, nevertheless, there is some minor tonnage included in the pit limits, which, as mentioned, is not reported as a Resource of any kind.

Table 14-18: In Pit Consolidated Mineral Resource Statement, Marimaca, (COG 0.15% CuT) NCL Consulting (L. Oviedo, October 13th, 2022)

Mineral Resource Category and Type	Quantity (kt)	CuT (%)	CuS (%)	CuT (t)	CuS (t)
Total Measured	47,051	0.54	0.36	253,157	167,614
Total Indicated	92,516	0.45	0.26	412,375	244,200
Total Measured and Indicated	**139,567**	**0.48**	**0.30**	**665,531**	**411,814**
Total Inferred	**82,678**	**0.39**	**0.16**	**322,910**	**128,416**

* Pit shell constrained resources with demonstrated reasonable prospects for eventual economic extraction (RPEEE) are generated using series of Lerchs-Grossmann pit shell optimizations completed by NCL
* CuT means total copper and CuS means acid soluble copper. Technical and economic parameters include: copper price US$4.00/lb; base mining cost US$1.51/t ($1.76/t average); Heap Leach ("HL") processing cost US$5.94/t (incl. G&A); Run-of-Mine ("ROM") processing cost US$1.65/t (incl. G&A); selling cost US$0.16/lb Cu; HL recovery 76% of CuT; ROM recovery 40% of CuT; and 42°-52° pit slope angle
* With the economic parameters stated above, the Cut-Off grade of the Mineral Resource Estimate is approximately 0.15% CuT and a strip ratio of 1:1 has been estimated by NCL.
*An external dilution factor was not considered during this resource estimation. Internal dilution within a 5 m x 5 m x 5 m is considered and the use of small loading equipment is foreseen for adequate selectivity. Assumes 100% mining recovery.
*Quantities and grades in a mineral resource estimate are rounded to an appropriate number of significant figures to reflect that they are approximations.
* Mineral resources which are not mineral reserves do not have demonstrated economic viability. Due to the uncertainty which may attach to inferred mineral resources, it cannot be assumed that all or any part of an inferred mineral resource will be upgraded to an indicated or measured mineral resource as a result of continued exploration

Detail per Mineral Zone Tonnage Grade Curves inside the Resources pit were calculated.

The following Figure shows a 3D view of the Resources pit.

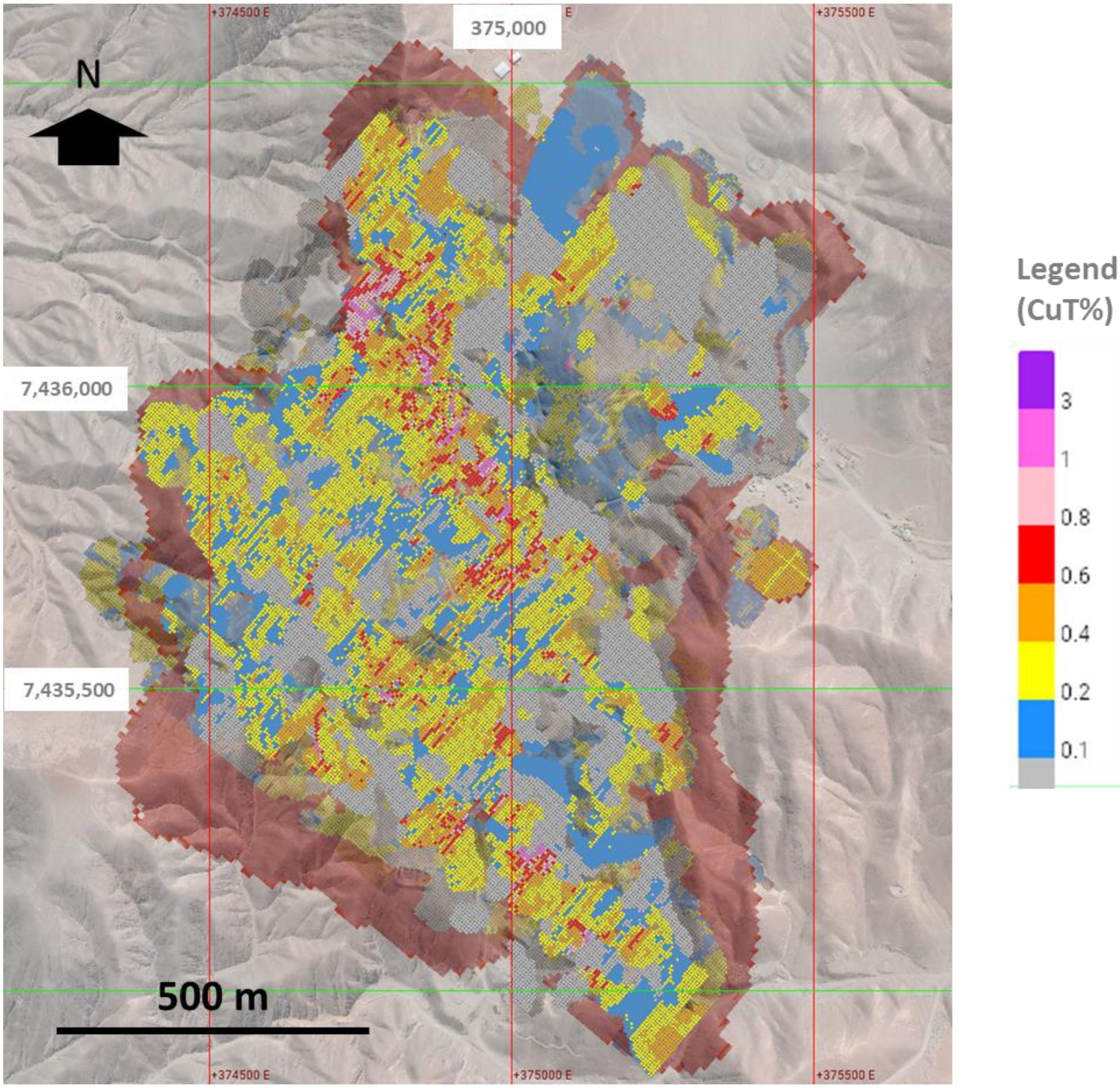


Figure 14-18: Resource Pit and CuT Block Model (NCL, Marimaca Copper Corp., 2022)

Table 14-19 shows the estimated mineral resource per category, for a COG = 0.15 % CuT.

Table 14-19: Mineral Resource Estimate for the Marimaca Deposit, base cutoff grade of 0.15% CuT, NCL Consulting (L. Oviedo, Ocotber 13th 2022)

Mineral Resource Category and Type	Quantity (kt)	CuT (%)	CuS (%)	CuT (t)	CuS (t)
Measured					
Brochantite	22,371	0.65	0.47	144,870	104,957
Chrysocolla	12,252	0.46	0.36	56,558	44,057
Wad/Black oxides	6,578	0.31	0.17	20,366	11,445
Mixed	5,106	0.55	0.13	28,176	6,693
Enriched	743	0.43	0.06	3,186	462
Total Measured	**47,051**	**0.54**	**0.36**	**253,157**	**167,614**
Indicated					
Brochantite	27,865	0.60	0.44	166,469	122,706
Chrysocolla	18,239	0.41	0.30	74,012	55,497
Wad/Black oxides	28,036	0.29	0.16	82,607	45,340
Mixed	14,557	0.51	0.13	73,595	18,413
Enriched	3,819	0.41	0.06	15,692	2,244
Total Indicated	**92,516**	**0.45**	**0.26**	**412,375**	**244,200**
Measured and Indicated					
Brochantite	50,235	0.62	0.45	311,340	227,663
Chrysocolla	30,492	0.43	0.33	130,571	99,554
Wad/Black oxides	34,614	0.30	0.16	102,973	56,785
Mixed	19,664	0.52	0.13	101,771	25,106
Enriched	4,562	0.41	0.06	18,877	2,706
Total Measured and Indicated	**139,567**	**0.48**	**0.30**	**665,531**	**411,814**
Inferred					
Brochantite	10,364	0.52	0.37	54,026	38,124
Chrysocolla	9,028	0.35	0.25	31,400	22,496
Wad/Black oxides	24,907	0.28	0.14	70,325	35,229
Mixed	17,129	0.47	0.12	80,152	19,809
Enriched	21,249	0.41	0.06	87,008	12,758
Total Inferred	**82,678**	**0.39**	**0.16**	**322,910**	**128,416**

* Pit shell constrained resources with demonstrated reasonable prospects for eventual economic extraction (RPEEE) are generated using series of Lerchs-Grossmann pit shell optimizations completed by NCL
* CuT means total copper and CuS means acid soluble copper. Technical and economic parameters include: copper price US$4.00/lb; base mining cost US$1.51/t ($1.76/t average); Heap Leach ("HL") processing cost US$5.94/t (incl. G&A); Run-of-Mine ("ROM") processing cost US$1.65/t (incl. G&A); selling cost US$0.16/lb Cu; HL recovery 76% of CuT; ROM recovery 40% of CuT; and 42°-52° pit slope angle
* With the economic parameters stated above, the Cut-Off grade of the Mineral Resource Estimate is approximately 0.15% CuT and a strip ratio of 1:1 has been estimated by NCL.
*An external dilution factor was not considered during this resource estimation. Internal dilution within a 5 m x 5 m x 5 m is considered and the use of small loading equipment is foreseen for adequate selectivity. Assumes 100% mining recovery.
*Quantities and grades in a mineral resource estimate are rounded to an appropriate number of significant figures to reflect that they are approximations.
* Mineral resources which are not mineral reserves do not have demonstrated economic viability. Due to the uncertainty which may attach to inferred mineral resources, it cannot be assumed that all or any part of an inferred

14.20 Reporting Sensitivity

Table 14-20 shows the sensitivity of the Marimaca Mineral Resource Estimate to variations in the CuT cutoff grade, highlighting in bold text the base case COG.

Table 14-20: Sensitivity of the mineral resource to changes in CuT cut-off grade, NCL Consulting (L. Oviedo, October 13th 2022)

Cut-off grade (% CuT)	Measured			Indicated			Measured + Indicated			Inferred		
	Quantity kt	CuT [%]	CuS [%]	Quantity kt	CuT [%]	CuS [%]	Quantity kt	CuT [%]	CuS [%]	Quantity kt	CuT [%]	CuS [%]
0.40	24,607	0.79	0.53	37,550	0.72	0.44	62,158	0.74	0.48	27,222	0.68	0.25
0.30	32,157	0.68	0.46	54,563	0.60	0.37	86,720	0.63	0.40	41,422	0.56	0.22
0.25	36,837	0.63	0.42	65,910	0.55	0.33	102,746	0.58	0.36	52,332	0.50	0.20
0.22	40,000	0.60	0.40	73,517	0.51	0.31	113,517	0.54	0.34	60,431	0.47	0.19
0.20	42,206	0.58	0.39	78,880	0.49	0.30	121,086	0.52	0.33	66,256	0.44	0.18
0.18	44,291	0.56	0.37	84,610	0.47	0.28	128,900	0.50	0.31	72,670	0.42	0.17
0.15	47,051	0.54	0.36	92,516	0.45	0.26	139,567	0.48	0.30	82,678	0.39	0.16
0.10	50,536	0.51	0.34	100,946	0.42	0.25	151,482	0.45	0.28	96,064	0.35	0.14
0.05	57,125	0.46	0.30	119,653	0.36	0.21	176,777	0.39	0.24	123,552	0.29	0.11
0.00	61,333	0.43	0.28	129,985	0.34	0.20	191,318	0.37	0.22	134,056	0.27	0.11

* Pit shell constrained resources with demonstrated reasonable prospects for eventual economic extraction (RPEEE) are generated using series of Lerchs-Grossmann pit shell optimizations completed by NCL
* CuT means total copper and CuS means acid soluble copper. Technical and economic parameters include: copper price US$4.00/lb; base mining cost US$1.51/t ($1.76/t average); Heap Leach ("HL") processing cost US$5.94/t (incl. G&A); Run-of-Mine ("ROM") processing cost US$1.65/t (incl. G&A); selling cost US$0.16/lb Cu; HL recovery 76% of CuT; ROM recovery 40% of CuT; and 42°-52° pit slope angle
* With the economic parameters stated above, the Cut-Off grade of the Mineral Resource Estimate is approximately 0.15% CuT and a strip ratio of 1:1 has been estimated by NCL.
*An external dilution factor was not considered during this resource estimation. Internal dilution within a 5 m x 5 m x 5 m is considered and the use of small loading equipment is foreseen for adequate selectivity. Assumes 100% mining recovery.
*Quantities and grades in a mineral resource estimate are rounded to an appropriate number of significant figures to reflect that they are approximations.
* Mineral resources which are not mineral reserves do not have demonstrated economic viability. Due to the uncertainty which may attach to inferred mineral resources, it cannot be assumed that all or any part of an inferred

14.21 General Considerations and Other Factors

Apart from the conditions identified in this report, and according to the available information, NCL is not aware of other environmental, permitting, legal title, taxation, socio-economic or political factors that could affect materially the Mineral Resource estimate.

14.22 Conclusions

It is the opinion of NCL that the Resource estimation carried out in this exercise is adequately supported by a sound database and geological knowledge of the deposit. The figures obtained are reliable and according to international standards for Resource disclosure.

Further exploration may improve the data density and therefore the resource classification, but it is not expected that the overall geological interpretation will suffer any substantial change that may lead to significant changes.

15 MINERAL RESERVE ESTIMATE

Mineral reserves are not yet defined.

16 MINING METHODS

Not applicable

17 RECOVERY METHODS

Not applicable

18 PROJECT INFRASTRUCTURE

Not applicable

19 MARKET STUDIES AND CONTRACTS

Not applicable

20 ENVIRONMENTAL STUDIES, PERMITTING, SOCIAL AND COMMUNITY IMPACT

Not applicable

21 CAPITAL AND OPERATING COSTS

Not applicable

22 ECONOMIC ANALYSIS

Not applicable

23 ADJACENT PROPERTIES

Marimaca has acquired all the properties that it considers of interest for the project. It is NCL's understanding that the existing property in the hands of Marimaca ensures that the Resource reported in this document is not under any risk related with adjacent properties.

24 OTHER RELEVANT DATA AND INFORMATION

The QP’s are not aware of any other relevant information or explanation necessary to make this report understandable or not misleading.

25 INTERPRETATIONS AND CONCLUSIONS

NCL was retained by Marimaca Copper Corporation to visit their properties at the Marimaca Project, inspect the Project, review and audit the data and develop an update of the Mineral Resource estimation. NCL examined the different sources of input information: raw data (QA/QC), exploration, geology and mineral modeling estimation units including all the new exploration data available until the end of September 2022.

The purpose of the investigation was to estimate the Mineral Resources, update the 2020 block model, in compliance with generally recognized industry best practices and report them according to the Canadian Institute of Mining, Metallurgy and Petroleum Definition Standards for Mineral Resources and Mineral Reserves (May 2014).

25.1 Mineral Resource Modelling and Estimation

NCL carried out a Resource Estimation for the part of the deposit located on the Marimaca - La Atómica and Atahualpa claims, resulting in the estimation of Measured, Indicated and Inferred Resources. Resultant figures inside an optimized pit envelope with a COG of 0.15% CuT are 139.6 Mt @ 0.48% CuT of Measured + Indicated Resources, plus 82.7 Mt @ 0.39% CuT of Inferred Resource.

This increase in the Resource is mainly due to the success of the new exploration campaigns, which identified important quantities of Mixed and Enriched material.

New information collected by Marimaca, as well as the one used in previous estimations, attests to the high overall quality of the exploration and design work completed by the internal personnel. NCL examined the data, the exploration, and the geology model produced.

In the opinion of Luis Oviedo (QP), the classifications applied to the estimates at Marimaca accurately reflect the confidence in the geological model and grade estimates.

On the basis of this work, NCL concluded that the models, Mineral Resources and Statements for Marimaca as of October 2022 are appropriately categorized and free of material errors. Findings of this estimation support this updated estimate to be robust in methodology and representative of the input data. It is the opinion of the QP that the updated Marimaca Mineral Resource estimate has low risk.

Other than those disclosed in this technical report, NCL is not aware of any other significant risks and uncertainties that could reasonably be expected to affect the reliability or confidence in the Resource estimated for the Marimaca Project.

26 RECOMMENDATIONS

26.1 Geology and Mineral Resource Estimation Recommendations

The QP consider that the work carried out by Marimaca in relation with the Resource Estimation is of excellent quality and the following general recommendations are made to Marimaca:

- Continue to update the 3D geology and structural models of the Marimaca Oxide Deposit
- Complete the interpretation of the remaining data from the 2022 infill drilling campaign not captured in this 2022 MRE, and incorporate into a subsequent mineral resource update with the goal of converting Inferred Resources into the Measured and Indicated categories for the purpose of developing Mineral Reserves
- Improve the Marimaca Oxide Deposit rock model in order to optimize future dilution and losses
- Integrate the geotechnical data within the geological model
- Develop and improve the resolution of the geo-metallurgical model prior for use in a Feasibility Stud
- Progress the study phase of the Marimaca Project towards a Feasibility Study

A budget of $8M to $12M is estimated to complete the recommended list of activities.

Other than those disclosed in this technical report, NCL is not aware of any other significant risks and uncertainties that could reasonably be expected to affect the reliability or confidence in the Marimaca Project.

27 REFERENCES

- Arriagada, I., 2022, Growth Opportunities. 2021 Preliminary Results. Antofagasta Minerals. Presentation. BMO Meeting.
- Casquet, C., Herve, F., Pankhurst, R.J., Baldo, E., Calderon, M., Fanning, C.M., Rapela, C.W., y Dahlquist, J., 2014, The Mejillonia suspect terrane (Northern Chile): Late Triassic fast burial and metamorphism of sediments in a magmatic arc environment extending into the Early Jurassic, Gondwana Research, 25, p. 1271-1286.
- Cortes, J., Marquardt, C., Gonzalez, G., Wilke, H.G., y Marinovic, N., 2007, Cartas Mejillones y Península de Mejillones, Región de Antofagasta, Serv. Nac. de Geol. y Min. Carta Geológica de Chile Nos 103 y 104, 63 p.
- Espinoza, S., Véliz, H., Esquivel, J., Arias, J., y Moraga, A., 1996. The Cupriferous Province of the Coastal Range, Northern Chile. In: Camus, F., Sillitoe, R.H., and Petersen, R., eds. Andean Copper Deposits: New Discoveries, Depósitos Estratoligados de Cu -(Ag) Chilenos 11 Mineralization, Styles and Metallogeny. Society of Economic Geologists, Special Publication Number 5, pp. 19-32
- Gonzalez, R., 2002, Geología de la Cordillera de la Costa de Mejillones, entre los 23°00'00'' – 23°08'11,5'' Sur y los 70°12'01,3'' – 70°20'46,9'' Oeste. Región de Antofagasta. Chile. Memoria Titulo de Geólogo. Univ Cat del Norte. Inédito. 129 p.
- Hervé, F., Faundez, V., Caldern, M., Massonne, H.-J. & Willner, A.P., 2007, Metamorphic and plutonic basement complexes, in The Geology of Chile, pp. 231–261, eds Moreno, T. & Gibbons, W., Geological Society of London.
- IMG, 2019, Minera Cielo Azul Ltda. Distrito Naguayán. Marimaca-La Atómica-Atahualpa Mapa Integrado. Litología Integrada 1k+5k IMG. Unpublished Map.
- Kalanchey, R., Castillo; R., Weston, S., Oviedo, L., Guzman, C., and Jo, M., 2020, Preliminary Economic Assessment, Marimaca Project, Antofagasta, II Region, Chile Available online at www.sedar.com
- Kovacic, P., 2017, Informe Geológico Proyecto Marimaca. Reconocimiento geológico 1:5000 y 1:1000. Comuna de Mejillones, Region de Antofagasta. MC. Inédito.
- Kojima, S., Tristá-Aguilera, D. and Hayashi, K., 2009, Genetic aspects of the Manto-type copper deposits based on geochemical studies of North Chilean deposits. Resource Geol.,
- 59, 87-98
- Lopez, C., Riquelme; R., Martínez; F., Sanchez, C., and Mestre, A., 2018, Zircon U-Pb geochronology of the mesozoic to lower Cenozoic rocks of the Coastal Cordillera in the Antofagasta region (22°30′-23°00′ S): Insights to the Andean tectono-magmatic evolution, Journal of South American Earth Sciences, Vol 87, pp 113-138.
- Lucassen, F., Becchio, R., Wilke, H.G., Franz, G., Thirlwall, M.F., Viramonte, J., Wemmer, K., 2000. Proterozoic–Paleozoic development of the basement of the Central Andes (18–26°). A mobile belt of the South American craton. Journal of South American Earth Sciences 13, 697–715
- Maksaev, V., y Zentilli, M., 2002. Chilean strata-bound Cu- (Ag) deposits: An Overview. In - Porter, T.M. (Editor), 2002 - Hydrothermal Iron Oxide Copper-Gold & Related Deposits: A Global Perspective, volume 2; PGC Publishing, Adelaide, Australia, pp. 185-205

- Mpodozis; C., Cornejo, P., and Mora, R., 2015, Evolving copper mineralization styles linked to the changing Jurassic-Early Cretaceous tectonic regime along the coastal Range of Northern Chile (Antofagasta-Tocopilla región), XIV Congreso Geologico Chileno, La Serena. Actas.
- Mpodozis, C., and Cornejo, P., 2019, Evolving active margin magmatism, tectonics and mineralization in the Northern Chilean Andes: a short review. SEG Meeting 2019, Santiago, Abstracts.
- Oviedo, L. and Palma, R., 2017, Technical report for the Marimaca Copper Project, Antofagasta Province, Region II, Chile, 99 p. Available online at www.sedar.com
- Oviedo, L. and Palma, R., 2018, Updated resource estimate for the Marimaca Copper Project, Antofagasta Province, Region II, Chile.130 p. Available online at www.sedar.com.
- Oviedo, L. and Palma, R., 2020. Updated and Expanded Resource Estimate for the Marimaca Copper project, Antofagasta Province, Region II, Chile. 217p. Available online at www.sedar.com.
- Quiroga, E., Oviedo, L. and Guzman, C. , 2018, Definitive feasibility study for Marimaca 1-23 Claim Project, Antofagasta, II Region, Chile, NI 43101 Technical Report.354 p. Available online at www.sedar.com.
- Ramírez, 2007, L., Metalogénesis, petrogénesis y tectónica del Distrito Minero de Mantos Blancos, Cordillera de la Costa, Norte de Chile, Tesis Doctorado en Ciencias, Univ. De Chile, Inédito, 178 p.
- Sato, T., 1984, Manto type Copper deposits in Chile- a Review. Bull Geol Surv Jpn Vol 35, pp 565-582.
- Scheuber, E., y Andriessen, A.M., 1990, the kinematics and geodynamic significance of the Atacama Fault Zone, northern Chile. JSG 12, 243-257.
- Scheuber, E.; González, G. 1999. Tectonics of the Jurassic-Early Cretaceous magmatic arc of the north Chilean Coastal Cordillera (22°-26°S): A story of crustal deformation along a convergent plate boundary. Tectonics Vol 18, pp 895-910.
- Sillitoe, R.H., 2003, Iron Oxide-copper-gold deposits: an Andean view. Mineralium Deposita, 38, 787-812
- Sillitoe, R.H., and Perelló, J., 2005. Andean copper province: tectonomagmatic settings, deposit types, metallogeny, exploration, and discovery. Hedenquist, J., Thompson, J.F.H., Goldfarb, R.J., Richards, J.P., eds Economic Geology One Hundredth Anniversary Volume 1905-2005, pp.845-890, Littleton
- Simon, A., 2019, Diagramas de sondajes y superficie. Unpubished Report, 41 p.
- Veliz, H., 1994; Antecedentes geológicos, deformación frágil e implicancias metalogénicas del sistema de Falla Atacama, entre las Quebradas El Desesperado y La Chimba. Cordillera de la Costa, Segunda Región de Antofagasta, Chile. Memoria Titulo de Geólogo. Univ Cat del Norte. Inédito. 137 p.
- Venegas, R., y Vergara, M., 1985, Yacimientos de Fe-Cu-(Au) ligados a rocas intrusivas y volcánicas jurásicas de la Cordillera de la Costa a la latitud de Mejillones. II Región de Antofagasta. IV Congr. Geol. Chileno, Actas 3, 3/730-3/751
- Vivallo, W.; Henriquez, F. 1998, Génesis común de los yacimientos estratoligados y vetiformes de cobre del Jurasico Medio a Superior en la Cordillera de la Costa, Región de Antofagasta, Chile. Revista Geológica de Chile 25 (2), 199-228
- Vergara, M., 1985, Geología de los Distritos cupríferos Naguayán; Desesperado y Chacaya. II Región de Antofagasta. Tesis de Grado. Univ. Cat. Del Norte. Inédito, 80p.

28 ANEXX 1

28.1 Lawyers letter

BOFILL MIR
ABOGADOS

November 24, 2022

To: NCL Ingeniería y Construcción SpA
Attn: Luis Oviedo, Ricardo Palma

VIA EMAIL

Ref. Marimaca Project Property Description and Location. Mineral Resource Estimation NI43101 Report, November 2022.

Dear Luis and Ricardo,

We are acting as legal counsel in Chile for Marimaca Copper Corp. ("Marimaca") and have been asked to review Chapter 4 ("Property Description and Location") of their Mineral Resource Estimation NI43101 Report of November 2022.

For the purposes of this opinion, we have examined Chapter 4 and the originals or copies, certified or identified to our satisfaction, of the documents related to the Marimaca mining concessions ("Properties") and of official public records, certificates of public officials and other documents and have considered such questions of law and made such other investigations as we have deemed relevant or necessary as a basis for the opinion expressed herein.

We have assumed the genuineness of all signatures, the legal capacity of all individuals (other than Chilean individuals), the authenticity of all documents submitted to us as originals and the conformity to authentic original documents of all documents submitted to us as certified, conformed or photostatic copies or facsimiles thereof. We have also assumed the completeness, truth and accuracy of all facts set forth in the official public records, certificates and documents supplied by public officials or otherwise conveyed to us by public officials.

We are solicitors qualified to carry on the practice of law in Chile only and we express no opinion as to any laws or matters governed by any laws other than the laws of Chile.

In relation to the aforementioned, we can inform the following:

Bofill Mir Abogados Limitada
Av. Andrés Bello 2711 - Torre Costanera, piso 8, CP 7550611, Las Condes. Santiago, Chile.
Tel. +56 2 2757 7600
www.bofillmir.cl

BOFILL MIR
ABOGADOS

1. We are not aware of any significant environmental, social or permitting issues that would prevent future exploitation of the Marimaca project deposit.

2. The Properties are, as of this date, valid and in good standing, legally registered under its concessionaire's name, free of mortgages, encumbrances, injunctions and litigation, and with its annual fees duly paid.

If you require any further information or clarification, please let me know.

Yours sincerely,

PABLO JOSE MIR BALMACEDA
Firmado digitalmente por PABLO JOSE MIR BALMACEDA
Fecha: 2022.11.24 17:05:07 -03'00'

Pablo Mir
Bofill Mir Abogados Limitada

Bofill Mir Abogados Limitada
Av. Andrés Bello 2711 - Torre Costanera, piso 8, CP 7550611, Las Condes.
Santiago, Chile.
Tel. +56 2 2757 7600
www.bofillmir.cl

28.2 List of Mining and Exploration Concessions

Marimaca Project Exploitation												
Quantity	Concession	Natiaonal Role	Concessionaire	Surface	Tipe of Concession	Current situation	Page	Number	Year	Mining Registrar	Commune Concession	Royalty Interest
20	Marimaca 1/23 (1/14 - 17/23)	02203-0273-3	Newco Marimaca	103	Explotación	Constituida	38 v	13	2017	Mejillones	Mejillones	1% NSR Osisko; 1,5% NSR original royalty
	Marimaca 1/23 (15-16)	02203-1440-5	Newco Marimaca	10	Explotación	Constituida	36	11	2017	Mejillones	Mejillones	1% NSR Osisko; 1,5% NSR original royalty
	SOR 1/16	02203-1441-3	Newco Marimaca	16	Explotación	Constituida	1172	260	2018	Mejillones	Mejillones	1% NSR Osisko; 1,5% NSR original royalty
	Miranda III 1 al 130 (Lados OESTE/ESTE 51 p	02203-1676-9	Inversiones Cielo Azul Ltda.	51	Explotación	Constituida	1	1	2020	Mejillones	Mejillones	1% NSR Osisko
	La Atomica 1/10	02203-0025-0	Cia. Mra. Cielo Azul Ltda.	50	Explotación	Constituida	856	170	2021	Mejillones	Mejillones	1% Osisko NSR; 1,5% original royalty
	Miranda I 1 al 146	02203-1546-0	Cia. Mra. Cielo Azul Ltda.	146	Explotación	Constituida	650	108	2017	Mejillones	Mejillones	1% NSR Osisko
	Miranda II 1 al 30	02203-1545-2	Cia. Mra. Cielo Azul Ltda.	30	Explotación	Constituida	1191	263	2018	Mejillones	Mejillones	1% NSR Osisko
	Miranda IV 1 al 48	02203-1548-7	Cia. Mra. Cielo Azul Ltda.	48	Explotación	Constituida	642	107	2017	Mejillones	Mejillones	1% NSR Osisko
												1% NSR Osisko
	RODEADA 1/3	02203-0064-1	SLM Rodeada Uno	4	Explotación	Constituida	1080	224	2018	Mejillones	Mejillones	1% NSR Osisko
	ATAHUALPA 1/2	02203-0001-3	Cia. Mra. Cielo Azul Ltda.	10	Explotación	Constituida	1132	249	2018	Mejillones	Mejillones	1% NSR Osisko
	INCA 1/2	02203-0161-3	Cia. Mra. Cielo Azul Ltda.	3	Explotación	Constituida	1129	246	2018	Mejillones	Mejillones	1% NSR Osisko
	SANTA MARIA 1/2	02203-0226-1	Cia. Mra. Cielo Azul Ltda.	10	Explotación	Constituida	1126	243	2018	Mejillones	Mejillones	1% NSR Osisko
	SANTA MARIA II UNO AL DOS	02203-0452-3	Cia. Mra. Cielo Azul Ltda.	10	Explotación	Constituida	1127	244	2018	Mejillones	Mejillones	1% NSR Osisko
	SORPRESA 1 AL 10	02203-0448-5	Cia. Mra. Cielo Azul Ltda.	81	Explotación	Constituida	1130	247	2018	Mejillones	Mejillones	1% NSR Osisko
	SORPRESA II 1 AL 15	02203-0486-8	Cia. Mra. Cielo Azul Ltda.	150	Explotación	Constituida	1131	248	2018	Mejillones	Mejillones	1% NSR Osisko
	TRUSKA 1 DEL 1/9	02203-0938-K	Cia. Mra. Cielo Azul Ltda.	18	Explotación	Constituida	1133	250	2018	Mejillones	Mejillones	1% NSR Osisko
	TRUSKA 2 DEL 1/12	02203-0939-8	Cia. Mra. Cielo Azul Ltda.	39	Explotación	Constituida	1134	251	2018	Mejillones	Mejillones	1% NSR Osisko
	VIDA DOS 1/20	02203-0593-7	Cia. Mra. Cielo Azul Ltda.	64	Explotación	Constituida	1128	245	2018	Mejillones	Mejillones	1% NSR Osisko
	La Mina la Mercedes Uno 1 al 7	02203-0850-2	Proyecta S.A.	70	Explotación	Constituida	386	65	2019	Mejillones	Mejillones	1% NSR Osisko; 1% NSR Llanos/Mercedes Option
	La Mina la Mercedes Dos 1 al 6	02203-0851-0	Proyecta S.A.	48	Explotación	Constituida	394	66	2019	Mejillones	Mejillones	1% NSR Osisko; 1% NSR Llanos/Mercedes Option
20			Totales	961								

Notes: Section 4-2 summarieses the material terms of each royalty. The term 'original royalty' refers to the NSR interest created as part of the original purchase or option arrangements. Certain of these NSRs are subject to buyback rights.
The buyback rights are summarised in section 4-2. The Osisko roylaty terms require the buyback rights in respect of Marimaca 1-23 Claims and under the La Atomica option agreement to be exercised prior to commercial production from these properties.
Proyecta S.A. is the concession holder under the Llanos/Mercedes option agreement.

Table 28-1: List of Concessions that form the Marimaca Claims.

29 ANNEX 2

29.1 Marimaca splitting, recovery and sample collection protocols

RC DRILLHOLES	PROTOCOLS
Field	
Location of field recommendations with GPS in corrected PSAD56 coordinates	Table of recommendations in excel
Construction of platform and staking of the recommendation with lime mark in azimuth	Control shift equipment
Verification of equipment installation with compass and inclinometer	
Drilling bit diameter register	Report scanned drill holes
Database with serial numbers and identification of control samples (B), reference materials and duplicates	Registration in excel and serial cards
Preparation of materials: bags; Labels, cutting boxes	Serial Sample Cards
Report of shift, log diameter and other operational	Report scanned drill holes
Continuous sampling every 2 m	Report scanned drill holes
Collection and quartet in riffles	Controller observation
Control of mass in situ shows total and in 1st and 3rd quartet	Record in notebook / report
Samples A and B are pocketed in plastic bags 40x60 labeled with probing, interval, series with bracket ticket	
Sample of cutting, plastic box 20 divisions thick and thin, back bag of approx 1 kg	Physical backing
Sample B is stored in the site	Physical backing
Sample A is sent to mechanical preparation	Guide (1) preparation request, pulps in three envelopes, rejection is eliminated
Transportation of samples by truck from project to laboratory	Guide (1) preparation request
Identification of the collar using PVC pipe and metal plate with the name of the well	Physical location
Measurement of deflection and orientation of structures	Meter Report
Measurement of collar location with topography	Definitive certificate of coordinates
Laboratory	
Lab receiving and mass control	Data to lab control system. Mass control report in excel + physical table and particle size control every xxx samples
Mechanical Preparation	Preparation Protocols
Drying 105 ° C	Preparation Protocols
Sieving and crushing 85% low # 10	Preparation Protocols
Rotary divider split	Preparation Protocols
Spray 500-700 g 95% low # 150	Preparation Protocols
Obtain three envelopes of pulps 2 of 125g and 1 of 250 g	Preparation Protocols
Send the envelopes to MCAL to generate lots of analysis	
MCAL receiving pulps	Received in physical
Standard revision according to shipping guides to preparation	Revision against shipping guides (1)

Insertion of control samples, reference materials and duplicates of 2 ° on	
Shipping to chemical analysis	Test request guide (2) with attached detail of samples sent (according to master table)
Chemical analysis	
Reception of batches of pulps	
CuT: 1 g digestion with 10 ml mixture HNO3 + 4 ml HClO4 + 1 ml H2SO4 in 20 ml dilution of 50% HCl for a 100 ml gauge flask	Chemical analysis protocols
Quantification with AAS limit of detection of 0.01% for CuT	Chemical analysis protocols
CuS: 1 g leaching with 50 ml H2SO4 in 250 ml gauge flask, shaking at 130 RPM for 1 hour	Chemical analysis protocols
Quantification with AAS limit of detection of 0.01% for CuT	Chemical analysis protocols
MCAL receiving results and Qa-Qc	Laboratory reports in excel sheet by lots of approx 50 samples
Input of results to database	Excel table
Review of control samples according to Qa-Qc system	Excel chart charts and statistics
Under Qa-Qc re-analysis is requested (new reception circuit-review results)	Excel table
Validated results are sent to users	Excel table
Official database	Excel table with backs of physical certificates of laboratory
Chemical Results Master Chart	
Table with masses - recoveries	
Operating time chart	
Tables of Qa-Qc	
Excel tables with lab results - digital files	
Physical backups	
Samples B (MAR 17 to 54)	
Cutting boxes and backing	
Pulps	

DDH	PROTOCOLS
Field	
Location of field recommendations with GPS in corrected PSAD56 coordinates	Table of recommendations in excel
Construction of platform, settling pool, and staked recommendation with lime mark on azimuth	Control shift equipment
Verification of equipment installation with compass and inclinometer	
Drilling diameter registration	
Obtaining the control sample according to drilling races	
Sample is available in aluminum trays, runs provided by wooden blocks (white color)	
Record drilling depths and recoveries	Report scanned drill holes
Transfer of tray to sample and first geological revision	
Race review, recoveries and regularization at intervals of 2 m marked with wooden blocks (yellow)	Registration of careers and regularized sections with their recovery measures

Geotechnical mapping and identification of PU specimens and geotechnical tests	Logging in
Photograph of trays of witnesses (in natural light)	Photographic record
Weighing of each tray	Weight record of trays with full control
Geological mapping	Log
Database with serial numbers and identification of control samples (B), reference materials and duplicates	Registration in excel and serial cards
Preparation of materials: bags; Labels.	Serial Sample Cards
Sampling by hydraulic guillotine break at intervals of 2 m and shelf in plastic bags 40x60 labeled with probing, interval, series with clasped ticket	
Weighing of each sample	Weight register
Tray Weighing (sample quality check)	Tray weight register with half control
Photo of trays with half of witnesses (in natural light)	Photo Registration
Tray storage	
Transportation of samples by truck from project to laboratory	
Identification of the collar using PVC pipe and metal plate with the name of the well	Physical location
Measurement of deviation	Meter Report
Measurement of collar location with topography	Definitive certificate of coordinates
Lab receiving and mass control	Data to lab control system. Mass control report in excel + physical table and granulometric control every xxx samples
Mechanical preparation	Preparation Protocols
Drying 105 ° C	Preparation Protocols
Sieving and crushing at ¼ “	
Sieving and crushing 85% low # 10	Preparation Protocols
Rotary divider split	Preparation Protocols
Spray 500-700 g 95% low # 150	Preparation Protocols
Obtain three envelopes of pulps 2 of 125g and 1 of 250 g	Preparation Protocols
Sending the envelopes to MCAL to generate lots of analysis	
Pulp reception	Physical reception
Serial revision according to shipping guides to preparation	Revision against shipping guides (1)
Insertion of control samples, reference materials and duplicates of 2 ° on	
Shipping to chemical analysis	Analysis request guide (2) with attached detail of submitted samples (according to master table)
Reception of batches of pulps	
CuT: 1 g digestion with 10 ml mixture HNO3 + 4 ml HClO4 + 1 ml H2SO4 in 20 ml diluent of 50% HCl for a 100 m capacity flask l	Chemical analysis protocols
Quantification with AAS limit of detection of 0.01% for CuT	Chemical analysis protocols
CuS: 1 g leaching with 50 ml H2SO4 in 250 ml gauge flask, shaking at 130 RPM for 1 hour	Chemical analysis protocols
Quantification with AAS limit of detection of 0.01% for CuT	Chemical analysis protocols

Reception of results and Qa-Qc	Laboratory reports in excel sheet by lots of approx 50 samples
Input of results to database	Excel table
Review of control samples according to Qa-Qc system	Excel chart graphs and statistics
Under Qa-Qc re-analysis is requested (new circuit of reception-revision of results)	Excel table
Validated results are sent to users	Excel table
Official database	Excel table with backs of physical certificates of laboratory
Chemical Results Master Chart	
Table with recoveries of races and regularization	
Table with masses of trays and samples	
Operating time chart	
Tables of Qa-Qc	
Excel tables with lab results - digital files	
Physical backups	
Preparation reject at -10 #	
Half Wit Trays	
Pulps	

OTHER PROCEDURES
PU Test Tubes
Serial identification
Photography
Geological description (Rx-ZAL-ZMIN)
Uniaxial Loading Probes
ID
Photography
Serial identification
PU samples made on full-length and full-length test specimens
Pre and post test photo lab registration
Metallurgical samples
Interval selection table
Tray Extraction
Record of weights sub-samples of 2 m
Bags, sample number, bag number
Shipping to lab