CANGREJOS GOLD-COPPER PROJECT
EL ORO PROVINCE, ECUADOR

NI 43-101 Technical Report Preliminary Economic Assessment

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1 SUMMARY

1.1 Introduction

The Cangrejos Gold-Copper Project (Cangrejos or the Project) is a gold-copper project located within the historic El Oro province in southwestern Ecuador. The Cangrejos concessions are fully owned by Lumina Gold Corp. (Lumina or the Company), based in Vancouver, British Columbia, Canada, through its 100% owned Ecuadorian subsidiary, Odin Mining del Ecuador S.A. (Odin).

For this report, the International System (SI) of units is used throughout unless otherwise noted and all currency is reported in United States dollars (US$), which is the currency used in the country of Ecuador.

MTB Enterprises Inc. (MTB) was engaged to update the 2018 PEA and Preliminary Economic Assessment (PEA), with the main purpose of incorporating the updated resource estimate for the Project and other engineering work and studies that were completed between 2018 and 2020. The 2020 PEA demonstrates substantial improvements with the addition of the Gran Bestia satellite deposit, increased mineral resource definition, and improved process flow sheet.

MTB was assisted by SIM Geological Inc. (SIM), Independent Mining Consultants Inc. (IMC), Ausenco Engineering Canada, Inc. (Ausenco), Global Resource Engineering Ltd. (GRE), ND King Consulting LLC (NDK), BD Resource Consulting, Inc. (BDRC), Wylie & Norrish Rock Engineers, Inc. (W&N), Robert Michel Enterprises (RME), and AKA PROS, Inc. (AKA) who provided the Qualified Persons (QPs) responsible for the report.

Initially the engagement was for the completion of a Preliminary Feasibility Study (PFS) on the main Cangrejos deposit. A decision was made to update the 2018 Scoping Study and PEA to a second PEA given that Lumina had only been working on the Gran Bestia deposit since 2018 and further work is required to bring Gran Bestia to a PFS level. Lumina felt that it is important to include Gran Bestia for the purpose of scaling the project correctly for future studies and permitting efforts.

There are no Mineral Reserves for the Project currently. The information reported in this PEA is preliminary in nature and includes Inferred Mineral Resources that are considered too speculative geologically to have economic considerations applied to them that would enable them to be categorized as Mineral Reserves. Inferred Mineral Resources are based on limited geological evidence and sampling. The tonnage and grade of Inferred Mineral Resources have significant uncertainty as to their existence and as to whether they can be mined economically. There is no certainty that this PEA will be realized.

Table 1-1 compares the June 2018 Mineral Resource Estimate with the updated 2020 Mineral Resource Estimate. Lumina converted 10.4 million ounces of contained gold and 1.4 billion pounds of contained copper from Inferred to Indicated. In addition, the Project also has 6.7 million ounces of contained gold and 0.8 billion pounds of contained copper in the Inferred category. The total contained metal at the Project increased substantially given the addition of the Gran Bestia deposit, expansion drilling at the Cangrejos deposit, and a change in cut-off grade based on more refined assumptions and a higher gold price.

The 2019 Mineral Resource estimate served as the basis for development of the mine plan, which envisions open pit mining of the two deposits operating over a 25-year mine life. The nominal production rate ramps up to 40,000 tpd during the first year of operation and includes an expansion to ramp up to 80,000 tpd in year six. Compared to the 2018 PEA, the mine life increased from the previous 16 years to the current 25 years.

TABLE 1-1: COMPARISON OF 2018 AND 2020 MINERAL RESOURCES

Date	Mt	Average Grade					Contained Metal			
		AuEq (g/t)	Au (g/t)	Cu (%)	Ag (g/t)	Mo (ppm)	Au (Moz)	Cu (Mlbs)	Ag (Moz)	Mo (Mlbs)
Indicated										
June 2018	----	----	----	----	----	----	----	----	----	----
June 2020	570.8	0.73	0.57	0.11	0.7	21.2	10.4	1,409	12.8	26.7
Inferred										
June 2018	408.0	0.85	0.65	0.11	0.6	25.0	8.5	1,033	7.8	22.5
June 2020	500.4	0.53	0.41	0.08	0.6	13.0	6.7	838	10.3	14.3

Note: The estimates in Table 1-1 are limited inside the $1,500/oz Au pit shell. The base case cut-off grade is 0.30 g/t gold equivalent (AuEq). Mineral Resources are not Mineral Reserves because the economic viability has not been demonstrated.

The 2020 PEA highlights include:

- Life of mine (LOM) average annual payable production of 366 thousand ounces gold
- LOM average annual payable by-product production of 46 Mlbs copper
- 25-year mine life
- 40 ktpd processing operation from years 1-5, with an expansion to 80 ktpd in year 6
- After-tax NPV (5%) and IRR of $1.6 billion and 16.2%
- After-tax NPV (5%) and IRR of $2.5 billion and 21.7% using $1,680 per ounce gold (Please refer to Table 22-2 for details)
- Average cash operating costs of $545/oz and all-in sustaining costs of $604/oz, net of by-product credits
- LOM processed grades of 0.56 g/t gold and 0.10% copper
- LOM revenue mix of 78.9% gold, 19.4% copper and 1.7% molybdenum plus silver
- Initial capital costs including working capital and refundable Value Added Tax (VAT), of $1,000 million
- Expansion capital to double throughput of $454 million, including working capital and VAT

The effective date of the PEA is June 8, 2020. Base case economics were calculated using a gold price of $1,400 per ounce, copper price of $2.75 per pound, molybdenum price of $9.00 per pound and a silver price of $16.00 per ounce.

A comparison of the economic results between the 2018 and 2020 PEAs is provided in Table 1-2.

TABLE 1-2: 2020 FINANCIAL RESULTS COMPARED TO 2018

Description	June 2018	June 2020
Gold Price	$ 1,300/oz	$ 1,400/oz
Copper Price	$ 3.25/lb	$ 2.75/lb
Post-tax NPV (5%)	$ 920 M	$ 1,571 M
Post-tax IRR	15.0%	16.2%
Processed Tonnes	339 Mt	640 Mt
LOM Processed Gold Grade	0.69 g/t Au	0.56 g/t Au
LOM Processed Copper Grade	0.12% Cu	0.10% Cu
LOM Contained Gold	7.5 Moz	11.4 Moz
LOM Contained Copper	0.9 Blbs	1.5 Blbs
Average Annual Gold Production	373 koz	366 koz
Average Annual Copper Production	43 Mlbs	46 Mlbs
Mine Life	16 years	25 years
Initial Capital Cost, including working capital and VAT	$831 M	$ 1,000 M
Expansion Capital Costs, including working capital and VAT	$ 406 M	$ 454 M
Sustaining Capital Costs	$ 230 M	$ 445 M
Ecuadorian NSR Royalty	5%	3%

1.2 Conclusions

1.2.1 Summary

- The results of this PEA show that the Mineral Resources at the Cangrejos Project are potentially viable with a Net Present Value (NPV) of 16.2% and an Internal Rate of Return (IRR) of $1,571 M at a 5% discount rate over a mine life of 25 years processing approximately 640 Mt.
- The life of mine average mill feed grade is 0.556 gpt gold, 0.1% copper, 0.67 gpt silver, and 20 ppm molybdenum. This equates to an average gold equivalent grade of 0.695 gpt.
- The initial capital cost to construct the mine, processing facilities, and required infrastructure is approximately $1,000 M including freight, duties, taxes, contingency, VAT and working capital.
- The average operating cost over the life of the mine is approximately $11.31 per tonne of material processed.
- The information reported in this PEA is preliminary in nature and includes Inferred Mineral Resources that are considered too speculative geologically to have economic considerations applied to them that would enable them to be categorized as Mineral Reserves. Inferred Mineral Resources are based on limited geological evidence and sampling. The tonnage and grade of Inferred Mineral Resources have significant uncertainty as to their existence and as to whether they can be mined economically. There is no certainty that this PEA will be realized.

1.2.2 Resource

- Based on the current level of exploration, the Cangrejos and Gran Bestia deposits contain a total estimated Indicated Mineral Resource of 571 Mt at a grade of 0.57 g/t Au, 0.11% Cu, 0.7 g/t Ag and 21.2 ppm Mo containing 10.4 Moz Au, 1,409 Mlbs Cu, 12.8 Moz Ag and 26.7 Mlbs Mo.
- There is an additional total estimated Inferred Mineral Resource of 500 Mt at a grade of 0.41 g/t Au, 0.08% Cu, 0.6 g/t Ag and 13 ppm Mo containing 6.7 Moz Au, 838 Mlbs Cu, 10.3 Moz Ag and 14.3 Mlbs Mo.
- Mineral Resources are constrained within pit shells and are tabulated at a cut-off grade of 0.30 g/t gold equivalent.
- Mineral Resources are not Mineral Reserves because the economic viability has not been demonstrated.

1.2.3 Mining

- The Cangrejos Project is amenable to conventional, large-scale, open pit mining methods.
- The production schedule developed for the Project includes seven phases over a 25-year mine life following an 18-month preproduction period.

1.2.4 Mine Geotechnical

- For this Study, it is assumed that through-going, low shear strength, geologic structures (i.e. regional faults) are not present based on current structural interpretations by Lumina and third-party geologists that included field mapping, image analyses, and the inability to correlate structures between borings.
- The detailed statistical evaluation of a comprehensive database of rock quality parameters led to the conclusion that rock quality is high, is not spatially variable to any significant extent, and is not lithologically controlled.
- Saprolith deposits (i.e., saprolite over saprock) were assumed to have combined thickness to a maximum of 40 m based on borehole intersections and to have exhibited historical instability probably related to precipitation.
- Pit slope designs incorporated groundwater levels that were assumed to be high in both the bedrock and saprolith due to predicted limited natural drawdown related to pit excavation.

1.2.5 Metallurgy

- Metallurgical test data shows that economically viable metal recovery processes are available for samples taken from Cangrejos and Gran Bestia.

1.2.6 Process and Infrastructure Design

- The process and infrastructure design that has been completed as the basis for this Study is a conceptual design that has been completed to a scoping-level of accuracy. Unit operations have been optimized and/or added based on an improved understanding of the resources at Cangrejos and Gran Bestia. This includes HPGR comminution, addition of sand flotation and cyanide leaching to increase gold recovery and more detailed designs. The additional work results in more accurate cost estimates, particularly for tailings filtration and overland conveying of both crushed rock and the filtered tailings.

1.2.7 Geotechnical

Seismic

- Based on a review of the available technical literature, Ausenco concluded that the seismicity in the Cangrejos project area is controlled mainly by the crustal background seismicity within the coastal zone, as well as intra-slab seismicity.
- In accordance with the review and the Ecuadorian Construction Code (ECN), Ausenco recommends using a design peak ground acceleration (PGA) of 0.40g for 1:475 yr and 0.61g for 1:2,475 return periods measured in soils of type C-D (typical soils present in the Project area) for project infrastructure in accordance with international design standards.

Geotechnical Investigation

- A geotechnical program was performed in 2019 including test pits and boreholes along with the collection of soil and rock samples, laboratory testing and geotechnical surface mapping and geophysical investigations to understand the foundation conditions for the Plant Site, Primary Crusher area, Waste Rock Storage Facility (WRSF), Haul Road, Dry Stack Tailings Facility (DSTF), and Saprolite Storage Facility (SSF).
- This information was used to develop the conceptual designs for the site infrastructure. A limited field program was conducted and additional geotechnical investigations will be required during the Prefeasibility Study.
- Geochemistry work to date indicates that tailings, waste rock, saprolite, and saprock are non-acid generating based on results of acid-based accounting, paste pH testing and barrel leaching tests. The tailings and waste rock contain naturally-occurring minerals that are net neutralizing, as well as low concentrations of sulfide. Therefore, runoff should not produce any constituents of concern except for potential sediment that will be captured in sediment ponds directly below the DSTF and WRSF.

Dry Stack Tailings Facility

- Ausenco evaluated disposal technologies and storage sites. Applyjng safety, terrain, and land usage criteria the selected technology is filtered dry stack tailings. The site for the DSTF is located 2.1 kms from the plant site and was selected based on location and stable terrain deemed ideal for such infrastructure. The site has storage capacity to provide secure and permanent storage of 640 Mt of filtered tailings.
- The filtered tailings will be transported to the DSTF by overland conveyor and stacked using portable conveyors, radial stacker and dozers and compactors in thin lifts to improve stability of this facility. In addition, the filtered tailings surface will be compacted and raincoats will be installed to reduce rain infiltration and erosion. The conceptual design for the facility uses bottom up construction along with an extensive underdrain system to capture near surface groundwater and seepage. The facility was designed in accordance with Canadian Dam Association (CDA) 2014 guidelines.
- Based on the geotechnical parameters that were determined by laboratory testing and the DSTF configuration, an operating dry stack facility with an overall slope of 3.25:1 (H:V) was designed. Stability analyses were performed and the design has an

adequate factor of safety (i.e., greater than 1.3). In addition, the ultimate facility has an acceptable long-term factor of safety greater than 1.5 and a pseudo-static factor of safety greater than 1.0.

Waste Rock and Saprolite Storage Facilities

- The WRSF and SSF are designed to provide secure and permanent storage of approximately 728 Mt of non-economical waste rock and overburden (i.e., saprolite and saprock). The WRSF is scheduled to be constructed in multiple phases, initially from the top down to create the WRSF haul road and then from the bottom up to improve stability. During the initial years, the saprolite and saprock will be stored in a separate facility until the ratio of transitional and fresh rock to saprolite and saprock is greater than 7:1. This concept keeps the saprolite and saprock away from the toe areas of the WRSF and provides necessary stability. This facility was designed in accordance with international waste rock storage guidelines. The facility has an extensive underdrain system to capture near surface groundwater and seepage.
- Based on the geotechnical parameters that were determined by laboratory testing and the WRSF and SSF configurations, stability analyses were performed and both facilities were found to have an adequate factor of safety (i.e., greater than 1.3). In addition, the ultimate combined facilities have acceptable long-term factors of safety greater than 1.5 and a pseudo-static factor of safety greater than 1.0.

1.2.8 Water Supply

- Because the Project is in an area with a net positive water balance and abundant surface water resources, there is sufficient water to supply the operations.

1.2.9 Geochemistry

- Geochemical analyses of waste rock and tailings that have been completed to date indicate that the mine waste rock and mine tailings are non-acid generating. Mine contact water quality meets Ecuadorian standards for direct discharge to the environment after sedimentation but without further treatment.

1.3 Recommendations

The outcome of this PEA is an overall recommendation to complete a Preliminary Feasibility Study to advance the development of the Project.

The estimated costs to complete the Prefeasibility Study, as recommended by the Qualified Persons (QPs) and supporting consultants who completed this PEA, are summarized in Table 1-3.

TABLE 1-3: ESTIMATED COST TO ADVANCE TO PREFEASIBILITY STUDY

Description	Estimated Cost (US$ 000)
Project Management	418
Resource Drilling	6,073
Resource Estimation and QA/QC	54
Mine Design	200
Mine Geotechnical Drilling	208
Mine Geotechnical	250
Structural Modeling	60
Metallurgy	405
Metallurgical Oversight	56
Process & Infrastructure Engineering	780
Engineering Design Oversight	48
Geotechnical	539
Hydrogeology, Geochemistry, Surface Water Management, Environmental Management, and Water Balance	463
Marketing/Transportation Update	50
Environmental	445
Power Supply Update	30
General and Administrative	70
Subtotal	10,149
Contingency (15%)	1,522
Total to Complete a Prefeasibility Study	11,671

1.4 Economic Analysis

There are no Mineral Reserves for the Project currently. The information reported in this PEA is preliminary in nature and includes Inferred Mineral Resources that are considered too speculative geologically to have economic considerations applied to them that would enable them to be categorized as Mineral Reserves. Inferred Mineral Resources are based on limited geological evidence and sampling. The tonnage and grade of Inferred Mineral Resources have significant uncertainty as to their existence and as to whether they can be mined economically. There is no certainty that this PEA will be realized.

A discounted cash flow analysis was completed to evaluate the potential viability of the Mineral Resources at the Cangrejos Project.

Details of the assumptions and the outcome of the analysis are provided in Table 1-4.

TABLE 1-4: FINANCIAL ANALYSIS ASSUMPTIONS AND RESULTS

Assumption/Outcome	Value/Results
Prices	
Gold (per oz)	$ 1,400
Silver (per oz)	$ 16.00
Copper (per lb)	$ 2.75
Molybdenum (per lb)	$ 9.00
Material Processed (Mt)	640.3
Average LOM Grades	
Gold (g/t)	0.56
Silver (g/t)	0.67
Copper (%)	0.10
Molybdenum (ppm)	20
NSR to Ecuador	3%
VAT	12%
Discount Rate	5%
Pre-tax IRR	20.2%
Pre-tax NPV	$ 2,555 M
Post-tax IRR	16.2%
Post-tax NPV	$ 1,571 M

The sensitivity of the economic outcome to operating costs and capital costs are provided in Tables 1-5 and 1-6, respectively. The results are shown graphically in Figure 1-1.

TABLE 1-5: OPERATING COST SENSITIVITY ANALYSIS

Operating Cost	OPEX $/t processed	IRR	NPV (5%) $M
80%	$ 9.05	18.8%	$ 2,059
90%	$ 10.18	17.6%	$ 1,818
100%	**$ 11.31**	**16.2%**	**$ 1,571**
10%	$ 12.44	14.7%	$ 1,322
20%	$ 13.57	13.1%	$ 1,071

TABLE 1-6: INITIAL PLUS EXPANSION CAPITAL COST SENSITIVITY [1]

Capital Cost	CAPEX $M	IRR	NPV (5%) $M
80%	$ 1,043	19.5%	$ 1,749
90%	$ 1,173	17.7%	$ 1,662
100%	**$ 1,304**	**16.2%**	**$ 1,571**
10%	$ 1,434	14.9%	$ 1,479
20%	$ 1,564	13.7%	$ 1,384

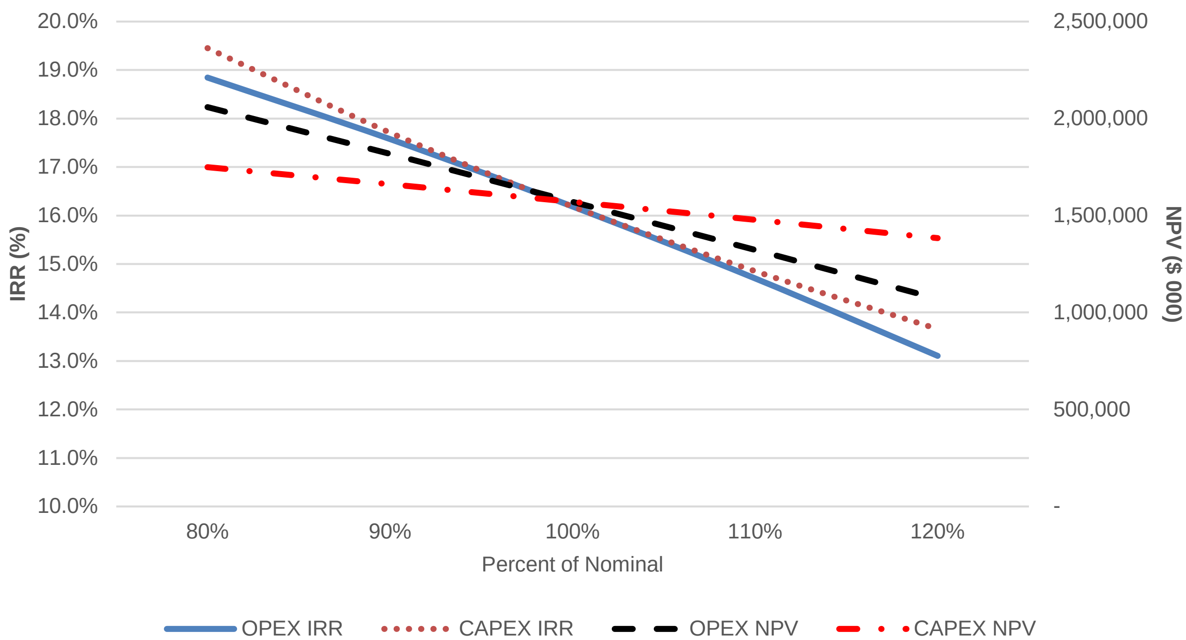


FIGURE 1-1: SENSITIVITY ANALYSES FOR CAPITAL AND OPERATING COSTS

1.5 Execution Plan

To support the capital cost estimate, a conceptual execution plan and schedule were developed. The plan comprises engineering, procurement, construction, and other related preproduction activities that are required to bring the Cangrejos Project into commercial production.

The plan assumes that the Project will move into a three-year preproduction period after environmental approval, receipt of all required licenses and permits, project financing, and corporate approval to proceed. A summary-level schedule was developed using logic and durations for major activities, including manufacturing and delivery durations for major mining and

[1] Capital costs in Table 1-6 do not include spare parts or initial fills. Therefore, the values shown are different from the values shown in Table 1-2.

process equipment provided by IMC/Lumina and ONIX, respectively. Durations for preproduction mining activities were developed by IMC using first principles. Durations for critical path activities were developed using recent data from similar projects. Other construction activities were considered to fit within the overall timeline for the critical activities.

During a future Feasibility Study some early/basic engineering may be performed to facilitate early placement of purchase orders for the primary crusher, ball mills, high pressure grinding roll (HPGR), and other long-lead items in order to reduce schedule risk due to vendor manufacturing/delivery delays. Early engineering of some of the site infrastructure during the permitting process may be advantageous if it facilitates an efficient start of construction on site after permit approvals are received.

Basic and detailed process and related infrastructure engineering, procurement, and construction management (EPCM) services are to be completed by an international engineering firm with experience in the design and construction of similar projects. Experienced international companies will also be contracted to complete the mine design, specification of mining equipment, and materials, and detailed design and quality assurance services for geotechnical facilities including the WRSF and DSTF.

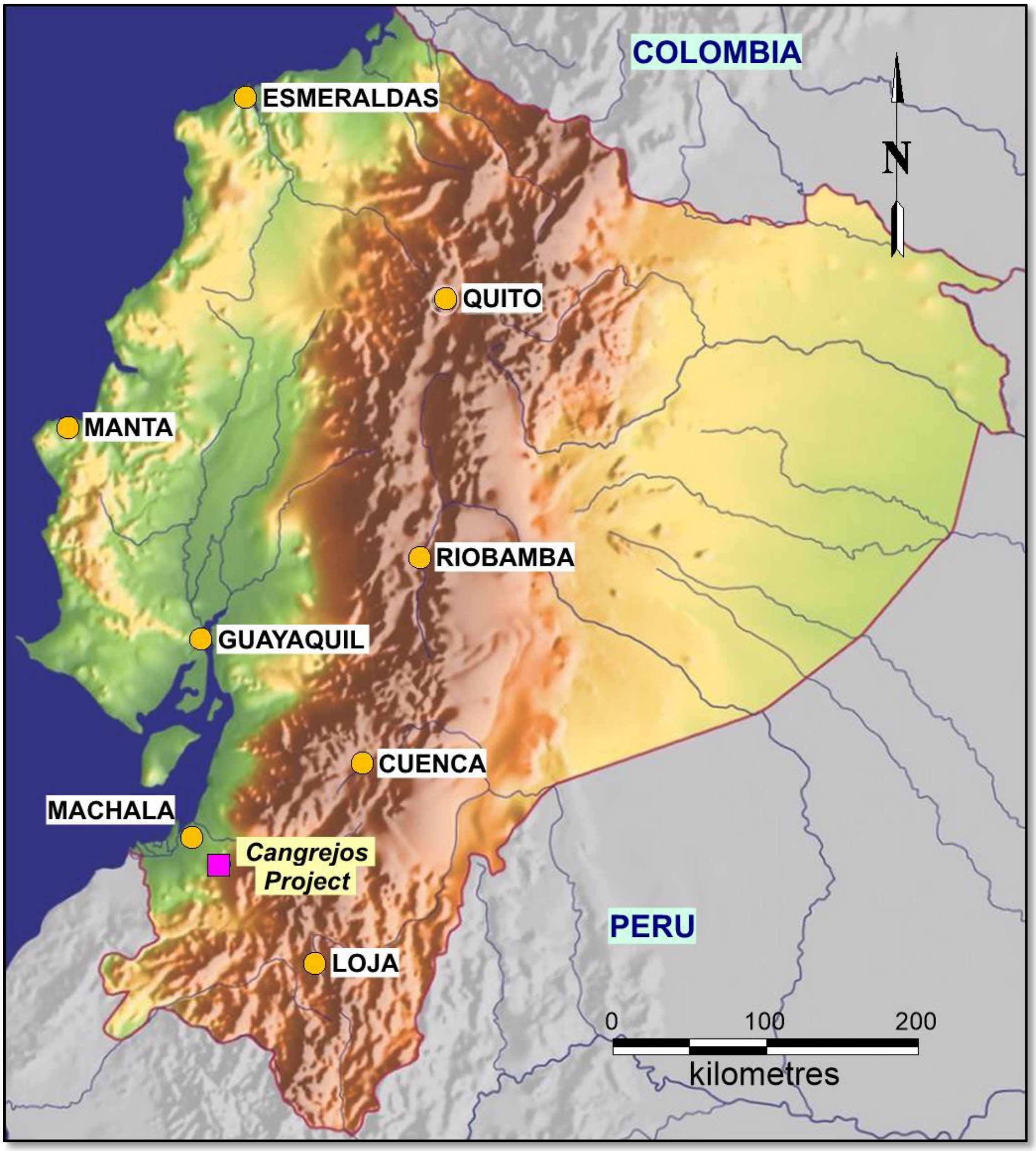
Discrete packages for some infrastructure and ancillary facilities will be subcontracted to qualified Ecuadorian engineering firms for detailed design and procurement. It is anticipated that the EPCM contractor will source materials and equipment from within Ecuador to the extent possible.

1.6 Technical Summary

1.6.1 Property Description and Location

Cangrejos is located in southwestern Ecuador in the province of El Oro, about 223 km from Guayaquil and 30 km southeast of the provincial capital of Machala at 3° 28’ 58” south latitude, 79° 49’ 3” west latitude, as shown in Figure 1-2. The Project lies primarily within the Cantons (i.e., counties) of Santa Rosa and Atahualpa. The Project is in the El Oro Metamorphic Belt Zone of the Cordillera Real, in steep, high-relief terrain near the northeastern rim of an ancient caldera at the eastern edge of the coastal plain. Project elevations range from approximately 100 masl to 1,370 masl.

The Universal Transverse Mercator (UTM) coordinates for the Project are 9614300 North and 633200 East (geographic projection: Provisional South American 1956, Zone 17S). The proposed mine and major elements of supporting infrastructure will be located primarily in areas of evergreen montane and secondary forest, as well as altered pasture and agricultural areas in the central part of the Project.

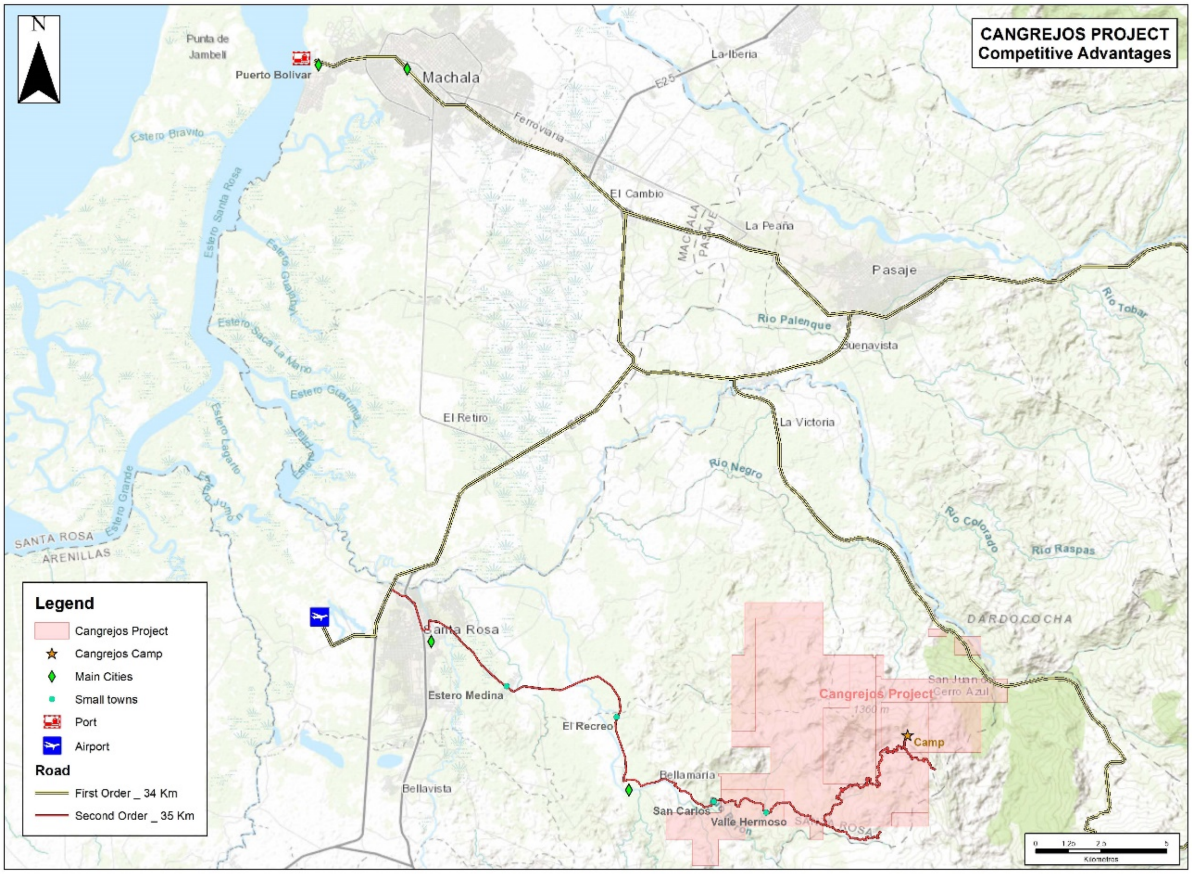


Source: Lumina, 2017

FIGURE 1-2: CANGREJOS PROJECT LOCATION

1.6.2 Land Tenure

The Cangrejos Project currently consists of a group of ten mining concessions totaling 6,373 ha. All concessions are held by Lumina through Odin. The concessions are in good standing with all fees paid to date. In addition, Odin owns or controls by legal easement land areas of approximately 1,512 ha. The concessions are outlined in the Project area shown in Figure 1-3.



Source: Odin Mining, 2020

FIGURE 1-3: CANGREJOS PROJECT IN RELATIONSHIP TO THE LOCAL AREA

1.6.3 Existing Infrastructure and Accessibility

Currently infrastructure on site includes an exploration camp and core logging and storage facilities. The site also has power and cell phone coverage.

1.6.4 History

In 1992, Odin carried out a stream sediment sampling program to locate the source of the Birón alluvial gold deposit that it was mining (69,000 oz Au). A number of good gold stream sediment anomalies were located and mineral concessions were acquired over these areas. In 1994, Odin formed the El Joven Joint Venture with Newmont Overseas Exploration Limited (Newmont) to explore the region. Newmont was the operator and carried out an airborne magnetic-radiometric survey, an IP survey, geological mapping and extensive soil and rock geochemical surveys.

Survey procedures, sampling methodology, and analysis of these samples are described in detail by Mayor and Soria (2000) and Potter (2004, 2010). Detailed information on the geological mapping and airborne and ground geophysics programs are also discussed in the above-mentioned reports.

From these exploration programs, well-defined gold and/or copper soil anomalies have been delineated. A sub-circular, gold-copper soil anomaly with a diameter of approximately 2,700 m occurs at the center of the property. The Cangrejos and Gran Bestia mineralized zones occur within this area of anomalous gold and copper soil values.

Other mineralized showings on the property also have anomalous,but somewhat less-extensive, gold and copper soil values.

In 1999, Newmont drilled the large gold-copper soil anomaly and discovered a zone of porphyry-style, gold-copper mineralization (Hole C99-14: 1.57 g/t Au, 0.19% Cu over 192 m) (Odin Mining, Dec. 1999) which was subsequently named the Cangrejos Zone. Newmont also discovered another zone of porphyry-style mineralization at Gran Bestia, located 1.2 km northwest of the Cangrejos Zone (Hole C99-06: 1.19 g/t Au over 132 m) (Odin Mining, Sept. 1999).

In 2001, Newmont withdrew from the Joint Venture following a risk and evaluation review of the Project that suggested that it would not meet corporate requirements. Odin retained the northern claims which covered the Cangrejos Zone and several other geochemical anomalies. Between 2004 and 2007, it carried out additional stream sediment and soil sampling.

From April 2008 to November 2009, the Ecuadorian government imposed a country-wide moratorium on exploration, so no work was done on the property during that time.

In 2010, exploration work continued with additional soil sampling.

In 2011 and 2012, drilling tested the extent of the Cangrejos Zone and a gold soil anomaly in the Casique area.

In 2014 and early 2015, additional drilling extended the lateral and depth extents of the Cangrejos Zone and tested the El Capitán copper-molybdenum soil anomaly. Based on the historical and 2014 drilling at the Cangrejos Zone, an initial Inferred Mineral Resource estimate of 191.8 Mtonnes of mineralized material at 0.64 g/t Au, 0.8 g/t Ag, 0.10% Cu, 31.2 ppm Mo (using a 0.35 g/t Au equivalent cut-off and a $1,250/oz Au pit shell) contained 4.0 million ounces of gold, 4.6 million ounces of silver, 440 million pounds of copper and 13 million pounds of molybdenum (Brepsant et al., 2017).

In 2017, additional drilling of the Cangrejos Zone discovered a deep, high-grade gold-copper zone. An updated mineral resource estimate was published in December 2017 (Sim and Davis, 2017) and was updated for a PEA completed in August 2018 (Rose et al., 2018). The Cangrejos Zone had an Inferred Mineral Resource estimate of 408 Mtonnes of mineralized material at 0.65 g/t Au, 0.6 g/t Ag, 0.11% Cu and 25 ppm Mo (using a 0.35 g/t Au equivalent cut-off and a $1,400/oz Au pit shell) which contained 8.5 Moz Au, 1,033 Mlbs Cu, 7.8 Moz Ag and 22.5 Mlbs Mo (Lumina, 2018a).

Drilling continued at Cangrejos to convert the Inferred Mineral Resource to Indicated and to assess the extent of mineralization at Gran Bestia. The Mineral Resource estimate described in this Technical Report is based on these drill results.

1.6.5 Geology and Mineralization

The Cangrejos Project is underlain by Miocene quartz diorite intrusions which intrude the El Oro metamorphic complex. A large gold-copper soil anomaly is associated with breccia zones located near the contacts of these Miocene intrusions.

The Cangrejos Zone is a northeasterly trending zone of porphyry-style, gold-copper-silver-molybdenum mineralization. It extends for approximately 1,000 m in a northeasterly direction, has widths ranging from 70 m to 600 m, and has been defined to a depth of at least 600 m. The zone remains open to expansion with further exploration to the west and at depth.

At Gran Bestia, the porphyry-style gold-copper mineralization is associated with breccias. The mineralized zone has dimensions of 700 m (north-south) by 600 m (east-west) and has been defined to depths of 700 m. The zone remains open to the north, west, and at depth.

Mineralization consists of finely disseminated chalcopyrite, pyrite and minor bornite, molybdenite and pyrrhotite. The host rocks exhibit patchy secondary biotite (potassic) alteration and a late-stage, calcic-sodic alteration which is characterized by actinolite, chlorite and albite.

1.6.6 Exploration Status

The Cangrejos Project is an advanced exploration project that has seen extensive geological mapping, historical geochemical (streams, soils, top of bedrock soils and rocks) surveys and an airborne magnetic-radiometric survey. This work defined several exploration targets and drilling outlined mineralized zones at Cangrejos and Gran Bestia.

1.6.7 Mineral Resources

This is the fifth estimate of Mineral Resources for the Cangrejos Project. The most recent previous estimate was presented in a technical report titled, *Cangrejos Gold-Copper Project, Ecuador, NI 43-101 Technical Report,* dated December 12, 2019, with an effective date of November 7, 2019 (Sim, et.al., 2019). The mineral resource model presented in the December 2019 Technical Report remains essentially unchanged and forms the basis of resources in this PEA. However, there have been some minor adjustments to the classification of model blocks in the deeper part of the Gran Bestia deposit that resulted in some minor changes to the extent of the resource limiting pit shell. These changes had a negligible effect on the resources for the Cangrejos deposit but resulted in a minor increase (of approximately 25 Mt) of Mineral Resources in the Inferred category at the Gran Bestia deposit. There has been no additional exploration drilling completed on the Cangrejos Project since the generation of the resource block model and, therefore, the effective date of the estimate of Mineral Resources in this report is June 8, 2020.. There has been no additional exploration drilling completed on the Cangrejos Project since the generation of the resource block model.

The Mineral Resource estimate was generated using drill-hole sample assay results and the interpretation of a geological model which relates to the spatial distribution of gold, copper, silver, molybdenum, and sulfur. Interpolation characteristics were defined based on the geology, drill hole spacing, and geostatistical analysis of the data. Estimations are made from 3D block models based on geostatistical applications using commercial mine planning software (MinePlan® v15.60, formerly called MineSight®).

Grade estimates were made using ordinary kriging (OK) into a model with a nominal block size of 15 m × 15 m × 15 m. Potentially anomalous outlier grades have been identified and their influences on the grade models are controlled during interpolation through the use of top-cutting and outlier limitations. Specific gravities are estimated in model blocks using the inverse distance weighting (IDW) interpolation method.

The results of the modelling process were validated using a combination of visual and statistical methods to ensure the grade estimates are approriate representations of the underlying sample data.

The Mineral Resources were classified according to their proximity to the sample data locations and are reported, as required by NI 43-101, according to the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) *Definition Standards for Mineral Resources and Mineral Reserves* (May 2014). Mineral Resources in the Indicated category include zones of consistent mineralization where drill holes are spaced at a maximum distance of 100 m. Inferred class Mineral Resources include areas that are within a maximum distance of 150 m from a drill hole.

To ensure that the Mineral Resource exhibits reasonable prospects for eventual economic extraction, it has been constrained within a floating cone pit shell that was generated using the following projected economic and technical parameters:

Mining (open pit)	$2.00/t
Processing	$8.00/t
General and Administrative (G&A)	$1.50/t
Gold price	$1,500/oz
Silver price	$18.00/oz
Copper price	$3.00/lb
Molybdenum price	$7.00/lb
Gold process recovery	83% fresh rock; 80% part oxidized; 75% Saprolite (SAP) & Saprock (SRK)
Silver process recovery	60% fresh rock; 60% part oxidized; 65% SAP&SRK
Copper process recovery	87% fresh rock; 50% part oxidized
Molybdenum process recovery	50% fresh rock and part oxidized
Pit slope	47.5 degrees

The estimate of Mineral Resources, contained within the $1,500/oz Au pit shell, is based on gold equivalent grades (AuEq) calculated using the following formula:

$$AuEq = Au\ g/t + (Ag\ g/t \times 0.012) + (Cu\% \times 1.37) + (Mo\ ppm/10{,}000 \times 3.2)$$

(Note: there is no contribution from copper or molybdenum in the saprolite or saprock units)

Using the assumed metal prices, operating costs and metallurgical recoveries listed above, the base case cut-off grade for Mineral Resources is estimated to be 0.30 g/t AuEq.

Table 1-7 shows the combined estimate of Mineral Resources at Cangrejos and Gran Bestia. Note that totals may not add due to rounding.

TABLE 1-7: ESTIMATE OF MINERAL RESOURCES AT CANGREJOS AND GRAN BESTIA

Type	Mt	Average Grade						Contained Metal			
		AuEq (g/t)	Au (g/t)	Cu (%)	Ag (g/t)	Mo (ppm)	S (%)	Au (Moz)	Cu (Mlbs)	Ag (Moz)	Mo (Mlbs)
Indicated											
SAP+SRK	17.0	0.60	0.57	0.09	2.8	4.8	0.04	0.3	35	1.5	0.2
TransOxide	19.5	0.71	0.56	0.10	0.7	16.1	0.19	0.4	41	0.5	0.7
Fresh	534.3	0.74	0.57	0.11	0.6	21.9	0.24	9.8	1331	10.8	25.8
Combined	570.8	0.73	0.57	0.11	0.7	21.2	0.24	10.4	1,409	12.8	26.7
Inferred											
SAP+SRK	11.6	0.44	0.42	0.07	1.9	4.3	0.10	0.2	17	0.7	0.1
TransOxide	16.9	0.49	0.38	0.07	0.7	11.5	0.38	0.2	25	0.4	0.4
Fresh	471.9	0.53	0.42	0.08	0.6	13.3	0.33	6.3	791	9.3	13.8
Combined	500.4	0.53	0.41	0.08	0.6	13.0	0.33	6.7	838	10.3	14.3

Note: The estimates in Table 1-7 are limited inside the $1,500/oz Au pit shell. The base case cut-off grade is 0.30 g/t gold equivalent (AuEq). Mineral Resources are not Mineral Reserves because the economic viability has not been demonstrated.

Mineral Resources in the Inferred category have a lower level of confidence than that applied to Indicated Mineral Resources and, although there is sufficient evidence to imply geologic grade and continuity, these characteristics cannot be verified based on the current data. It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.

1.6.8 Mineral Reserves

There are no Mineral Reserves for the Cangrejos Project at this time. The information reported in this PEA is preliminary in nature and includes Inferred Mineral Resources that are considered too speculative geologically to have economic considerations applied to them that would enable them to be categorized as Mineral Reserves. Inferred Mineral Resources are based on limited geological evidence and sampling. The tonnage and grade of Inferred Mineral Resources have significant uncertainty as to their existence and as to whether they can be mined economically. There is no certainty that this PEA will be realized.

The material to be moved according to this mine plan will be referred to as potentially minable material which is a sub-set of the mineral resource. Material that is to be fed to the processing plant is referred to as mill feed or processed material.

1.6.9 Mining Method

The Cangrejos Project consists of two adjacent open pit mines referred to as 1) Cangrejos (eastern pit) and 2) Gran Bestia (western pit). Both pits will be mined with conventional hard rock open pit mining methods. The terrain is very steep with evergreen montane secondary forest, saprolite, and saprock overlying both pit areas. Dealing with the saprolite and saprock presents challenges for mine operations. This was anticipated during the development of the mine production schedule and in selecting the mine equipment.

The mine delivers 40,000 tpd of feed to the plant beginning in mid-year one through year five. The production ramps up during year six so the mine delivers 80,000 tpd of mill feed in years 7 to 25. IMC developed the production schedules by rock types of saprolite, saprock, partially oxidized, and fresh rock. A summary of the mined and processed material based on all material types is provided in Table 1-8. The material listed as Processed during the PP period is stockpiled and fed to the plant during year one.

TABLE 1-8: MINE PRODUCTION SCHEDULE – ALL MATERIAL TYPES

Year	Cutoff NSR $/t	Material Mined								Waste kt	Total Material kt
		Processed kt	NSR $/t	Gold gpt	Silver gpt	Copper %	Moly ppm	Gold Eq gpt	Sulfur %		
PP	21.00	1,163	27.73	0.817	2.5	0.11	10	0.898	0.12	5,588	6,751
1	21.00	9,057	30.54	0.818	1.1	0.14	21	0.959	0.15	14,917	23,974
2	21.00	14,600	34.74	0.854	0.7	0.16	32	1.061	0.21	31,400	46,000
3	20.00	14,600	31.71	0.749	0.8	0.17	21	0.969	0.27	50,400	65,000
4	20.00	14,600	28.05	0.718	0.7	0.11	21	0.860	0.20	50,400	65,000
5	18.00	14,600	27.44	0.678	0.4	0.12	31	0.837	0.23	50,400	65,000
6	17.00	26,280	28.52	0.678	0.6	0.14	27	0.869	0.24	38,720	65,000
7	16.00	29,200	25.97	0.641	0.9	0.12	19	0.796	0.24	35,800	65,000
8	14.00	29,200	24.51	0.633	0.8	0.08	21	0.748	0.25	35,800	65,000
9	12.00	29,200	26.02	0.651	0.8	0.11	26	0.796	0.22	35,800	65,000
10	10.50	29,200	22.41	0.547	0.6	0.11	23	0.687	0.21	35,800	65,000
11	9.50	29,200	22.25	0.525	0.6	0.12	19	0.679	0.26	35,800	65,000
12	9.50	29,200	27.87	0.671	0.7	0.13	17	0.849	0.28	28,629	57,829
13	9.50	29,200	18.85	0.476	0.6	0.08	16	0.577	0.29	32,067	61,267
14	9.50	29,200	20.86	0.515	0.6	0.09	21	0.637	0.23	33,257	62,457
15	9.50	29,200	22.72	0.545	0.8	0.11	21	0.693	0.35	31,631	60,831
16	9.50	29,200	21.22	0.518	0.7	0.09	18	0.647	0.34	32,594	61,794
17	9.50	29,200	17.55	0.431	0.6	0.08	15	0.535	0.30	33,611	62,811
18	9.50	29,200	21.92	0.527	0.7	0.10	18	0.668	0.25	25,774	54,974
19	9.50	29,200	25.77	0.591	0.8	0.14	27	0.785	0.28	20,917	50,117
20	9.50	29,200	25.26	0.599	0.8	0.13	21	0.771	0.32	16,151	45,351
21	9.50	29,200	18.50	0.453	0.7	0.09	14	0.566	0.27	24,154	53,354
22	9.50	29,200	16.77	0.413	0.6	0.07	15	0.513	0.30	8,716	37,916
23	9.50	29,200	14.95	0.362	0.4	0.07	17	0.456	0.26	6,345	35,545
24	9.50	29,200	14.85	0.359	0.4	0.07	17	0.452	0.26	8,958	38,158
25	9.50	19,754	19.43	0.489	0.4	0.08	15	0.592	0.26	4,480	24,234
TOTAL		**640,254**	**22.74**	**0.556**	**0.7**	**0.10**	**20**	**0.695**	**0.26**	**728,109**	**1,368,363**

A monthly schedule was developed by IMC for the 18 months prior to plant commissioning for planning the capital expenditures, personnel requirements, and for scheduling. The preproduction period begins after the road between the site facilities and the crusher site is completed. The initial five months are for access pioneering only. Additional pioneering continues throughout the period of preproduction mining.

Waste material was reported by the rock types of saprolite, saprock, partially oxidized, and fresh rock. During the first five years of the mine life, the saprolite and saprock are delivered to the saprolite storage facility (SSF) located south-southeast of the Cangrejos pit. The SSF is constructed in four stages.

The fresh rock waste is delivered to the waste rock storage facility (WRSF) located south of the Cangrejos pit and the primary crusher. A portion of the saprock is delivered to the WRSF during the first five years. After year five, all of the saprolite and saprock are stored in the main WRSF. The WRSF is built in five stages.

Cangrejos is unique in that the waste haulage distances begin to slowly reduce over much of the mine life from year seven until just a few years before the end of the mine life in year 25. This is because the waste dump rises in elevation to meet the exit elevation from the pit.

1.6.10 Metallurgical Testing

Following a moratorium on exploration drilling in Ecuador, Odin embarked on additional exploration work beginning in 2009. C.H. Plenge & CIA. S.A. (Plenge) conducted metallurgical testing programs in 2015, 2018, 2019, and 2020 using a total of 63 samples including saprolite, saprock, partially oxidized, and fresh rock samples. Initial optimization work was conducted using composite samples and, after the optimized conditions were determined, additional tests were conducted using variability samples of the three fresh rock lithologies (i.e., breccia, equigranular quartz diorite, and porphyritic quartz diorite) from both deposits. Pilot plant tests were also completed using separate samples from Cangrejos and Gran Bestia in order to prepare samples of flotation concentrate and tailings for additional testing.

The estimated recoveries by rock type are provided in Table 1-9.

TABLE 1-9: ESTIMATED METALLURGICAL RECOVERY BY ROCK TYPE

Products	Units	Fresh Rock	Partially Oxidized	Saprock	Saprolite
Doré					
Gold Recovery	% Au	10	20	75	75
Silver Recovery	% Ag	10	10	65	65
Gold-Copper Concentrate					
Gold Recovery	% Au	72	60	0	0
Silver Recovery	% Ag	60	50	0	0
Copper Recovery	% Cu	86	50	0	0
Molybdenum Concentrate					
Molybdenum Recovery	% Mo	50	50	0	0

Recovery assumptions:

- Gold and silver recoveries are constant
- Copper concentrate grades for fresh rock are variable
- Copper concentrate grade for partially oxidized material is 15% copper
- Molybdenum concentrate grade is 45% molybdenum

The copper concentrate grade for fresh rock material is estimated using the following equation, where S_T is the total sulfur concentration and Cu is the copper grade, in percent, of the processed material:

$$Copper\ Concentrate\ Grade\ (\%\ Cu) = -4.45 \times \ln \frac{S_T}{Cu} + 20.96$$

Metallurgical testing also included mineralogy, comminution including high pressure grinding roll (HPGR) testing, and liquid-solid separation testing to provide data to be used as the basis for the process design and capital and operating cost estimates.

1.6.11 Processing

The unit operations include:

- Primary crushing
- Secondary crushing
- HPGR crushing
- Ball milling with hydro-cyclone classification
- Bulk copper-molybdenum rougher flotation
- Regrinding of the bulk flotation concentrate
- Three stages of bulk concentrate cleaner flotation and cleaner scavenger flotation
- Thickening of the bulk concentrate
- Copper-molybdenum separation flotation via rougher flotation, scavenger flotation, and five stages of cleaner flotation
- Thickening and filtering of copper and molybdenum final concentrates
- Hydro-cyclone classification of the bulk copper-molybdenum flotation tailings
- Sand flotation of the cyclone underflow of the flotation tailings
- Carbon-in-leach (CIL) of the combined sand flotation concentrate and cleaner scavenger tailings
- Detoxification of the residual cyanide in CIL tailings
- Thickening and filtering of the tailings and recycling decant water
- Dry stack tailings storage

A summary of the conceptual process design criteria is provided in Table 1-10.

TABLE 1-10: PROCESS DESIGN CRITERIA

Criteria	Units	Value	Source
Plant Throughput Years 1 – 5	tpd	40,000	Production Schedule
Plant Throughput Years 1 – 5	Mtpa	14.6	Production Schedule
Plant Throughput Years 6 – 25	tpd	80,000	Production Schedule
Plant Throughput Years 6 – 25	Mtpa	29.2	Production Schedule

Criteria	Units	Value	Source
Plant Availability (primary crushing)	%	75	Onix
Plant Availability (other)	%	92	Onix
Plant Throughput Years 1 – 5	tph	1,800	Calculated
Plant Throughput Years 6 – 25	tph	3,600	Calculated
Head Grade	gpt Au	0.556	Production Schedule
Head Grade	gpt Ag	0.7	Production Schedule
Head Grade	% Cu	0.10	Production Schedule
Head Grade	ppm Mo	20	Production Schedule
Mineralized Material Specific Gravity	g/cc	2.7	Plenge
Bond Ball Mill Work Index (BWi)	kWh/t	17.1	FLS
Bond Abrasion Index (Ai)	g	0.3511	FLS
Primary Grind Size (P_{80})	µm	90	Plenge
Concentrate Regrind Size (P_{80})	µm	35	Plenge
Bulk Rougher Flotation Time	minutes	12	Plenge Data – factored
Tailings Thickener Sizing	m^2/tpd	0.125	Pocock

The CIL circuit nominally processes 10% of the plant feed, approximately 4,000 tpd during the first five years and 8,000 tpd following the plant expansion in year 5 and commencing in year 6.

1.6.12 Project Infrastructure

The Project includes all infrastructure required to support the mining and processing operations including:

- Dry Stack Tailings Facility (DSTF)
- Saprolite Storage Facility (SSF)
- Waste Rock Storage Facility (WRSF)
- Water supply and water management facilities
- Mine truck shop, warehouse, fuel storage and delivery, explosives storage
- Office building, warehousing, guard house

1.6.13 Market Studies

H&H Metals Inc. (H&H) completed a marketing study and provided the terms for the gold-copper and molybdenum concentrates, including the estimated treatment charges (TCs), refining charges (RCs), ocean shipping costs, and payment terms. Costs for shipping the doré and payment terms were estimated based on similar projects.

1.6.14 Environmental, Permitting, and Social Considerations

The Project will be located primarily in areas of evergreen montane and secondary forest and altered pasture and agricultural areas in the central part of the Project. The Project is drained by a network of small streams; apart from these streams, no significant surface water features are directly impacted by the Project. The natural environment in the area of the Project has been significantly altered by a wide range of intrusive human influences that span many decades, and archaeological evidence suggests a history of human habitation and influence that dates back hundreds of years. No primary forest remains. Current land usage in the area of the Project is typically a mixture of cattle grazing and light agriculture, in cleared areas adjacent to secondary forest "islands." The latter are usually situated in steep ravines and rugged terrain unsuitable for agriculture or grazing. There are no villages or significant groups of dwellings in the project's environmental Area of Influence (AOI).

The Project is being developed in accordance with the Constitution, the Ecuadorian Mining Law and its Regulations, the Environmental Organic Code and its Regulations, the Organic Law of Water Resources and its Regulations,and other applicable Ecuadorian norms, standards, laws, and regulations. Based on the experience of similar-scale projects in Ecuador, it is estimated that, in aggregate, major permitting actions (excluding certain municipal, tax registration, and potential concentrate export permits), several of which can occur in parallel, will take a minimum of 24 months to complete.

Social Capital Group completed a socioeconomic study for the Cangrejos Project. The Project is located almost entirely in the parishes of Bellamaria and La Victoria, which are both within the Canton of Santa Rosa. A small portion of the Project footprint crosses into the Canton of Atahualpa. The Cantons of Santa Rosa and Atahualpa are both located within the coastal Province of El Oro. The Project´s mining operation, access road (after exiting the national highway), and water impacts will almost entirely be limited to Bellamaria parish. As a result, the social AOI includes seven nearby settlements in Bellamaria parish and one in La Victoria. However, the Project's exploration and prospective construction activities are on rural land and are physically removed from these villages. There are no nearby villages in Atahualpa.

Lumina corporate policies guide Odin's management of social and other issues associated with Project development.

1.6.15 Capital Cost Estimate

The capital cost estimate for the Project includes the initial capital, sustaining capital, and expansion capital. The capital cost estimates include:

- Contracted Direct Costs
- Construction Indirect Costs
- Contracted Indirect Costs
- Owner's Direct and Indirect Costs

The capital costs were organized by area using a Work Breakdown Structure (WBS). Direct Capital Costs were estimated for the mine by IMC, for the processing plant by ONIX, for the geotechnical infrastructure by Ausenco, and for water management by GRE. Support was provided by MTB and PLS for the G&A costs. Contingency, freight, duty, and taxes are included in the capital costs. Table 1-11 provides a summary of the estimated initial and expansion capital costs.

TABLE 1-11: INITIAL AND EXPANSION CAPITAL COSTS INCLUDING CONTINGENCY

WBS	Description	Initial Capital (US$ M)	Expansion Capital (US$ M)
0100	Mine	59.2	-----
0200	Crushing and Conveying	113.1	67.2
0300	Grinding	67.0	67.0
0400	Flotation & Concentrate Filtration	30.0	30.0
0500	CIL / Detox	12.4	12.4
0600	Carbon Plant & Refinery	3.4	3.4
0700	Reagent Preparation & Storage	4.3	4.3
0800	Tailings Thickening, Filtration, Conveying, Storage	136.1	92.4
0900	Site & Off-site Infrastructure and Facilities	30.1	3.1
1000	Plant Mobile Equipment & Light Vehicles	1.3	-
2000	Site Development	39.2	6.1
	Total Direct Costs	**496.3**	**286.0**
3000	Construction Indirect Costs	24.8	5.3
4000	Contracted Indirect Costs	80.6	48.9
	Total Indirect Costs	**105.4**	**54.2**
5000	Owner's Direct Costs	137.7	0.2
6000	Owner's Indirect Costs	42.0	7.3
	Total Owner's Costs	**179.7**	**7.5**
	Freight, Duty, and Taxes	24.1	9.2
	Total Contingency	107.6	57.9
	TOTAL CAPITAL COSTS	**913.2**	**414.9**
	Working Capital	1.7	2.3
	VAT	87.0	N/A
	Total	**1,000.2**	**417.2**
	Contingency Percentage of Total Costs	13.8%	16.7%

1.6.16 Operating Cost Estimate

Operating costs were estimated from first principles for mining, processing, General and Administrative (G&A) costs, and tailings deposition costs. The life-of-mine operating costs are summarized in Table 1-12. It should be noted that the costs associated with thickening, filtering and transporting the tailings to the DSTF by overland conveyor are included in the process operating costs. The tailings deposition costs include costs for tranporting them from the end of the overland conveyor to the location where they will be deposited in the facility, spreading and compacting, and purchasing and placing of geomembrane raincoats. The process operating costs for thickening, filtering, and long-distance conveying, excluding reagents and maintenance, is estimated to be $1.42 per tonne for years 1 through 5, bringing the total cost for dry stack tailings to over $1.71 during this time period, which is consistent with costs for dry stack tailings at similar projects.

TABLE 1-12: LIFE OF MINE OPERATING COST SUMMARY

Area	Total LOM Cost US$ M	Average Unit Costs per t Processed		
		Years 1 – 5 US$/t	Years 6 – 25 US$/t	LOM US$/t
Mining	2,555	7.72	3.54	3.99
Processing	4,039	6.51	6.29	6.31
G & A	500	1.37	0.71	0.78
Tailings Deposition	148	0.29	0.22	0.23
Total	**7,243**	**15.90**	**10.76**	**11.31**

Cautionary Note Regarding Forward-looking Information and Statements

Certain statements and information herein, including all statements that are not historical facts are “forward-looking information” or “forward-looking statements” within the meaning of applicable securities laws. Examples of forward-looking statements in this Technical Report include, but are not limited to, information and statements with respect to: Lumina’s plans and expectations for the Project; estimates of mineral resources; possible related discoveries or extensions of new mineralization or increases or upgrades to reported mineral resources estimates; mined and processed material estimates for the Project; the internal rate of return of the Project; the annual production of the Project; the net present value of the Project; the life of mine of the Project; the capital costs, operating costs and other costs and payments estimated for the Project; the proposed infrastructure for the Project; projected metallurgical recoveries; the proposed equipment and employment for the Project; the potential upgrade of the Project to the pre-feasibility study stage; the timing for completion of the Project; plans to conduct further comprehensive engineering and metallurgical studies; anticipated environmental liabilities; anticipated royalty liabilities and budgets for recommended work programs. In certain cases, forward-looking statements can be identified by the use of words such as "budget", "estimates", or variations of such words or state that certain actions, events or results "may", "would", or "occur".

These forward-looking statements are based, in part, on assumptions and factors that may change, thus causing actual results or achievements to differ materially from those expressed or implied by the forward-looking statements. Such factors and assumptions include, but are not limited to, assumptions concerning base metal and precious metal prices; cutoff grades; accuracy of mineral resource estimates and resource modelling; reliability of sampling and assay data; representativeness of mineralization; accuracy of metallurgical testwork; timely receipt of regulatory approvals; general business and economic conditins and anticipated costs and expenditures. The foregoing list of assumptions is not exhaustive.

Forward-looking statements involve known and unknown risks, uncertainties and other factors which may cause the actual results, performance or achievements of Lumina to be materially different from any future results, performance or achievements expressed or implied by the forward-looking statements. Such risks and other factors include, among others, fluctuation in the price of base and precious metals; expropriation risks; currency fluctuations; requirements for additional capital; government regulation of mining operations; environmental, safety and regulatory risks; risks related to inaccurate geological and engineering assumptions; risks relating to unanticipated operational difficulties, unavailability of materials and equipment, unanticipated reclamation expenses; title disputes or claims; limitations on insurance coverage; changes in project parameters as plans continue to be refined; failure of plant, equipment or processes to operate as anticipated; accidents, labour disputes; risks relating to adverse weather conditions; political risk and social unrest; the risks of global or localized pandemics or epidemics; other risks of the mining industry; competition inherent in the mining exploration industry; delays in obtaining governmental approvals or financing or in the completion of exploration, development or construction activities, as well as those factors discussed in the sections entitled "Risks and Uncertainties" in Lumina's annual Management's Discussion and Analysis. Although Lumina and the authors of this Technical Report have attempted to identify important factors that could affect Lumina and may cause actual actions, events or results to differ, perhaps materially, from those described in forward-looking statements, there may be other factors that cause actions, events or results not to be as anticipated, estimated or intended. There can be no assurance that forward-looking statements will prove to be accurate, as actual results and future events could differ materially from those anticipated in such statements. Accordingly, readers should not place undue reliance on forward-looking statements. The forward-looking statements in this Technical Report are based on beliefs, expectations and opinions as of the effective date of this Technical Report. Lumina and the authors of this Technical Report do not undertake any obligation to update any forward-looking information and statements included herein, except in accordance with applicable securities laws.

2 INTRODUCTION

2.1 Purpose of the Technical Report

MTB Enterprises Inc. (MTB) was engaged by Lumina Gold Corp. (Lumina) to update the 2018 Scoping Study and Preliminary Economic Assessment (PEA). A number of consultants were retained to support completion of this Study, as outlined in Section 2.2. The purpose of this report is to disclose the results of the PEA.

Lumina is a Vancouver, Canada based precious and base metals exploration and development company focused on developing the Cangrejos Project, located in the historic El Oro Province in southwestern Ecuador. The Cangrejos concessions are fully owned by Lumina through its 100% owned Ecuadorian subsidiary, Odin Mining del Ecuador S.A. (Odin).

The Project is located 223 km from Guayaquil and 30 km southeast of the provincial capital of Machala. It lies primarily within the Cantons (i.e., counties) of Santa Rosa and Atahualpa. The Project is in the El Oro Metamorphic Belt Zone of the Cordillera Real, in steep, high-relief terrain near the northeastern rim of an ancient caldera at the eastern edge of the coastal plain. The Project consists of two deposits, Cangrejos and Gran Bestia that are to be mined using open pit mining methods. The processing rate is 40,000 tpd for the first five years of the mine life followed by a plant expansion and ramp up to 80,000 tpd in year six for the remaining 25-year mine life.

The recovery processes include flotation to recover gold-copper and molybdenum flotation concentrates plus a carbon-in-leach (CIL) circuit to process approximately 10% of the plant feed (i.e., 4,000 tpd and 8,000 tpd for the initial and expansion time periods, respectively) to produce precious metal doré.

2.2 Sources of Information

The following Qualified Persons (QPs) are responsible for the information provided in the indicated sections. All of the QPs are independent within the meaning of Canadian National Instrument 43-101 - *Standards of Disclosure for Mineral Projects* (NI 43-101). They are responsible for the preparation of this Technical Report on the Cangrejos Project, which has been prepared in accordance with NI 43-101 and Form 43-101F1 Technical Report (Form 43-101F1). This Technical Report is based on information known to the QPs as of June 8, 2020.

- Robert Sim, P.Geo. of SIM Geological Inc. (SIM) is responsible for Sections 7, 8, 9, 10, 14, and portions of Sections 1, 25, 26, 27, and 28.
- Bruce M. Davis, FAusIMM of BD Resource Consulting, Inc. (BDRC) is responsible for Sections 11 and 12 and portions of Section 1, 14, and 25.
- Joseph McNaughton, P.E. of International Mining Consultants (IMC) is responsible for Sections 15 and 16 and portions of Sections 1, 21, 25, 26, 27, and 28.
- Norman I. Norrish, P.E. of Wyllie & Norrish Rock Engineers Inc. (W&N) is responsible for the majority of Section 16.4.2 and portions of Sections 1, 25, 26, 27, and 28.

- Nelson King, SME Registered Member of ND King Consulting, LLC (NDK) is responsible for Section 13 and portions of Sections 1, 21, 25, 26, 27, and 28.
- Scott Elfen, P.E. of Ausenco Engineering Canada, Inc. (Ausenco) is responsible for Sections 18.4, 18.5, 18.6 and portions of Sections 1, 21, 25, 26, 27, and 28.
- Kathleen Ann Altman, Ph.D., P.E. of AKA PROS, Inc. (AKA) is responsible for Sections 2, 3, 4, 5, 6, 17, 18.1, 18.2, 18.7, 18.8, 18.9, 24 and portions of Sections 1, 21, 25, 26, 27, and 28.
- Larry Breckenridge, P.E. of Global Resource Engineering, Ltd. (GRE) is responsible for Sections 18.3 and 20 and portions of Sections 1, 21, 25, 26, 27, and 28.
- Robert S. Michel, SME Registered Member of Robert Michel Enterprises (RME) is responsible for Sections 19 and 22 and portions of Sections 1, 21, 25, 26, 27, and 28.

The process design and the capital cost estimate were completed by ONIX Engenharia e Consultoria Ltda. (ONIX) of Nova Lima, Brazil under the direction of AKA. MTB, H&H Metals (H&H), C.H. Plenge & CIA. S.A. (Plenge), P.L. Services Eirelli (PLS), and Social Capital Group (SCG) also contributed to this PEA under the direction of the QPs.

2.3 Personal Inspection of the Cangrejos Project

Robert Sim visited the Cangrejos Project from November 28 to 29, 2017. He inspected drill core from numerous holes and visited a number of drill sites and the core storage facility.

Joseph McNaughton visited the Cangrejos Project from May 5 to 7, 2019. The purpose of the site visit was to review the area geology, examine core, and inspect topography to commence mine design.

Nelson King visited the Cangrejos Project from January 16 to 17, 2018. The purpose of the site visit was to observe site conditions, examine core, and inspect topography for process facility siting.

Larry Breckenridge visited the Cangrejos Project most recently from May 9 to July 23, 2019. The purpose of the site visit was to inspect and evaluate the environmental network and sampling plan onsite together with the Lumina/Odin team, select geochemical samples for analysis, evaluate core drilling results for waste rock storage and handling, and present hydrological and hydrogeological issues to other consultants that were visiting the site in that period.

Scott Elfen completed site visits on January 15-18, 2018 and May 16 to 18, 2019. The purpose of the site visit was to gain an understanding of the local conditions as they relate to tailings and waste rock storage, roads, and project infrastructure development.

Norman Norrish visted the project site from May 2 – 8, 2019. The purpose of the site visit was site familiarization, progress review of the ongoing borehole televiewer program, surface mapping, core examination, sample selection for rock mechanics testing and test pit excavations for characterization and sample selection of saprolite.

Kathleen Altman, Bruce Davis, and Robert S. Michel have not conducted personal inspections of the Cangrejos Project as it was not required to complete the scope of work for which they were retained.

2.4 Abbreviations

Units of measurement used in this report conform to the metric system. All currency in this report is US dollars (US$) unless otherwise noted. Abbreviations used throughout this report are shown in Table 2-1.

TABLE 2-1: ABBREVIATIONS

Abbreviation	Meaning	Abbreviation	Meaning
A	ampere	M	mega (million); molar
a	annum (year)	Ma	Mega-annum or million years
btu	British thermal units	m^2	square meters
C$	Canadian dollars	m	meter
cal	calorie	m^3	cubic meters
cfm	cubic feet per minute	m^3/h	cubic meters per hour
cm	centimeter	masl	meters above sea level
cm^2	square centimeter	µ	micron
cm^3	cubic centimeter	µm	micrometer
d	day	mg	milligrams
dB	Decibel	mg/L	milligrams per liter
°C	degree Celsius	mi	mile
dia	diameter	min	minute
dmt	dry metric tonne	mm	millimeters
dwt	dead-weight ton	mph	miles per hour
°F	degree Fahrenheit	MVA	megavolt-amperes
ft	foot	MW	megawatt
ft/s	foot per second	MWh	megawatt-hour
ft^2	square foot	NAG	Non-Acid Generating
ft^3	cubic foot	NPV	Net Present Value
g	gram	NSR	Net Smelter Return
G	giga (billion)	oz	Troy ounce (31.1035 g)
g/L	gram per liter	oz/st	Troy ounce per short ton
g/t	gram per tonne	oz/t, opt	Troy ounce per metric tonne
gr/ft^3	grain per cubic foot	ppb	part per billion
gr/m^3	grain per cubic meter	ppm	part per million
ha	hectare	PS 6	IFC Performance Standard 6
hp	horsepower	psia	pound per square inch absolute
hr	hour	psig	pound per square inch gauge
Hz	hertz	RL	relative elevation
in	inch	ROM	Run of Mine

Abbreviation	Meaning	Abbreviation	Meaning
in^2	square inch	s	second
J	joule	st	short ton
k	kilo (thousand)	stpa	short ton per year
K-Ar	Potassium-Argon dating	stpd	short ton per day
kcal	kilocalorie	t	metric tonne
kg	kilogram	tpa	metric tonne per year
km	kilometer	tpd	metric tonne per day
km/h	kilometer per hour	US$	United States dollar
km^2	square kilometer	USg	United States gallon
kPa	kilopascal	USgpm	US gallon per minute
kVA	kilovolt-amperes	V	volt
kW	kilowatt	W	watt
kWh	kilowatt-hour	wmt	wet metric tonne
L	liter	wt %	weight percent
L/s	liters per second	yd^3	cubic yard
lb	pound	yr	year (see also annum)

3 RELIANCE ON OTHER EXPERTS

This report has been prepared at the request of Lumina Gold Corp. (Lumina or the Company). The information, conclusions, opinions, and estimates contained herein are based on:

a) Information available at the time of preparation of this report
b) Assumptions, conditions, and qualifications as set forth in this report
c) Data, reports, and opinions supplied by Lumina and other third-party sources

The current status of the concessions is based on a legal opinion provided by Tobar ZVS *Legal Opinion on Cangrejos Project* dated March 20, 2020 (Zumarraga, 2020). No independent research has been conducted regarding property title or mineral rights for the Project. Therefore, no independent opinion as to the ownership status of the property is expressed in this report.

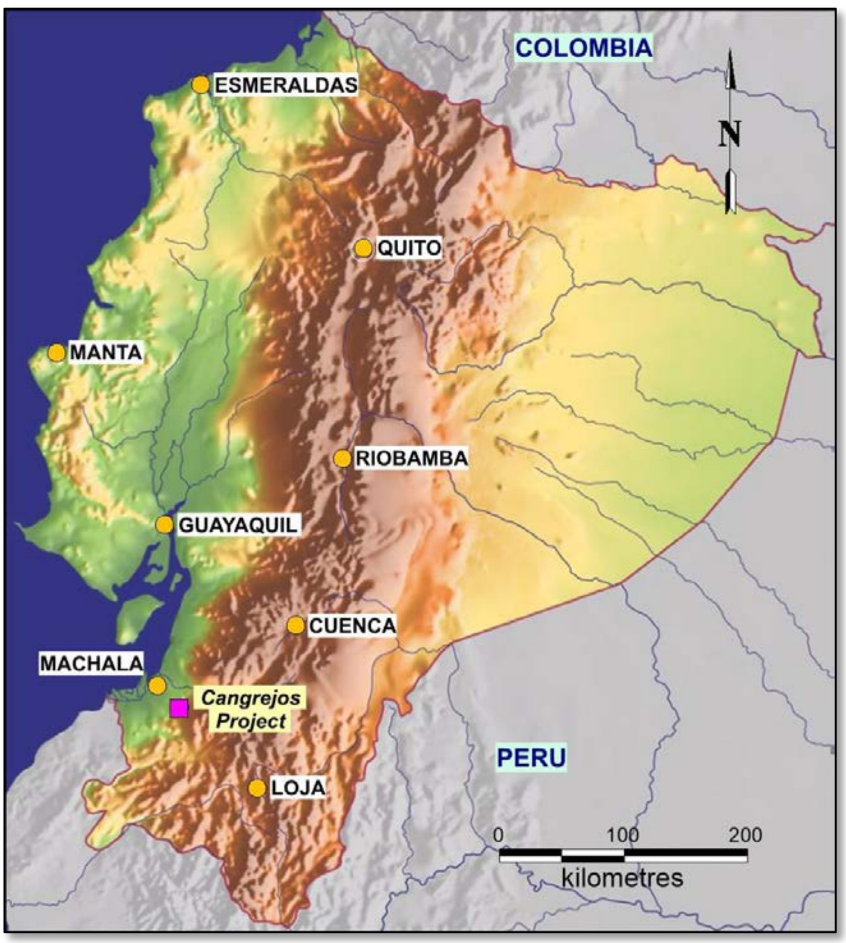
Lumina and PLS provided guidance on applicable taxes, royalties, and other government levies or interests, applicable to revenue or income from the Project.

4 PROPERTY DESCRIPTION AND LOCATION

4.1 Property Location

Cangrejos is located in southwestern Ecuador in the province of El Oro, about 223 km from Guayaquil and 30 km southeast of the provincial capital of Machala as shown in Figure 4-1. The Project lies primarily within the Cantons (i.e., counties) of Santa Rosa and Atahualpa. The Project is in the El Oro Metamorphic Belt Zone of the Cordillera Real, in steep, high-relief terrain near the northeastern rim of an ancient caldera at the eastern edge of the coastal plain. Project elevations range from approximately 100 masl to 1,370 masl.

The Universal Transverse Mercator (UTM) coordinates for the Project are 9614300 North and 633200 East (geographic projection: Provisional South American 1956, Zone 17S). The proposed mine and major elements of supporting infrastructure will be located primarily in areas of evergreen montane and secondary forest, as well as altered pasture and agricultural areas in the central part of the Project.

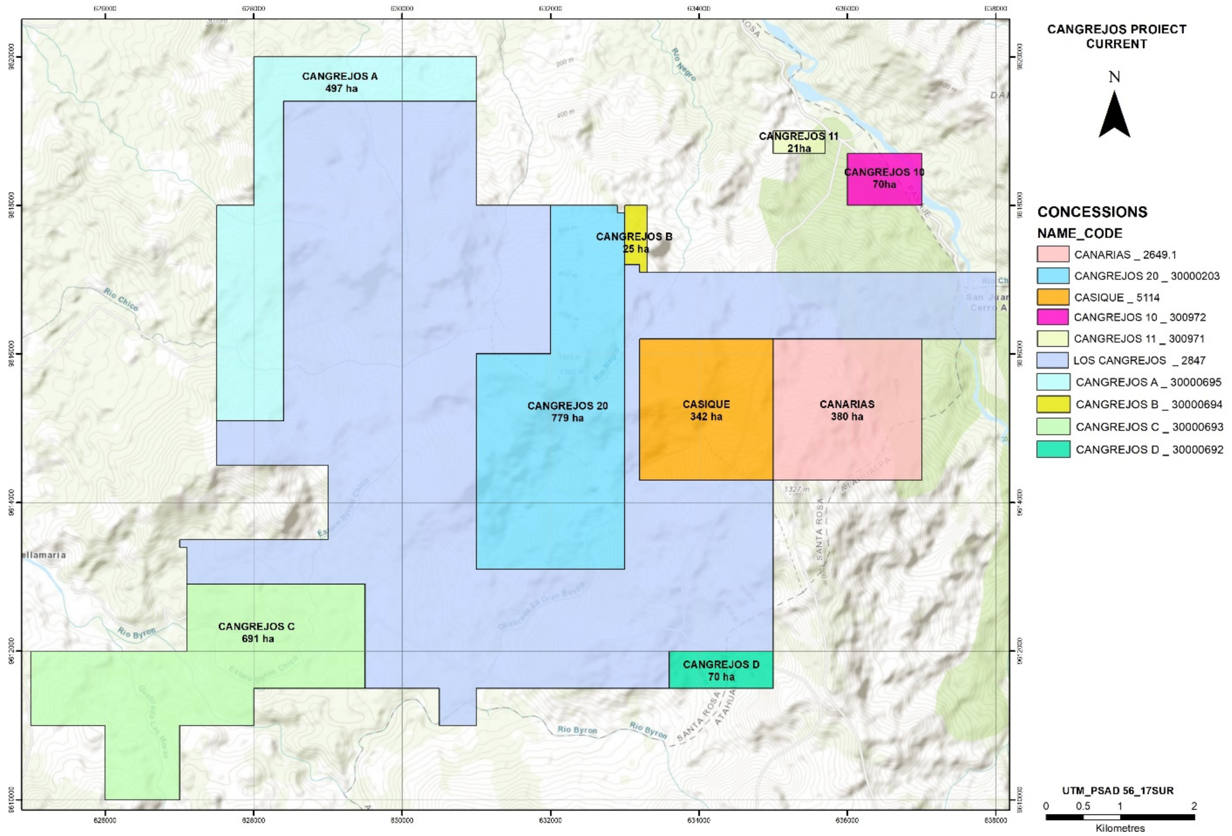


Source: Lumina, 2017

FIGURE 4-1: CANGREJOS PROJECT LOCATION

4.2 Property Ownership and Agreements

The Cangrejos Project currently consists of a group of ten mining concessions totaling 6,373 ha, as depicted in Figure 4-2. All concessions are held by Lumina through Odin.



Source: Lumina, 2019

FIGURE 4-2: CURRENT CONCESSION BOUNDARIES

Table 4-1 presents the legal descriptions and land areas of these concessions.

TABLE 4-1: MINING CONCESSIONS – CANGREJOS

File Number	Concession	Date of Concession	Date of Registration or Re-registration	Area (ha)	Phase	Date of Expiration day/month/year
2847	Los Cangrejos*	04/05/2010	25/05/2010	3,498	Small Mining	29/08/2031
300972	Cangrejos 10	05/05/2010	25/05/2010	70	Initial Exploration	25/09/2034
300971	Cangrejos 11	04/05/2010	25/05/2010	21	Initial Exploration	26/09/2034
5114	Casique*	06/05/2010	25/05/2010	342	Small Mining	07/11/2031
2649.1	Las Canarias*	05/05/2010	25/05/2010	380	Small Mining	01/11/2031
30000203	Cangrejos 20	29/11/2016	13/12/2016	779	Advanced Exploration	15/12/2041
30000695	Cangrejos A	17/04/2019	28/05/2019	497	Small Mining	22/07/2031
30000694	Cangrejos B	17/04/2019	27/05/2019	25	Small Mining	21/07/2031
30000693	Cangrejos C	17/04/2019	27/05/2019	691	Small Mining	27/07/2031
30000692	Cangrejos D	17/04/2019	28/05/2019	70	Small Mining	22/07/2031

* Odin initiated the process of consolidating the small-scale mining concessions and changing the regime to large-scale mining.

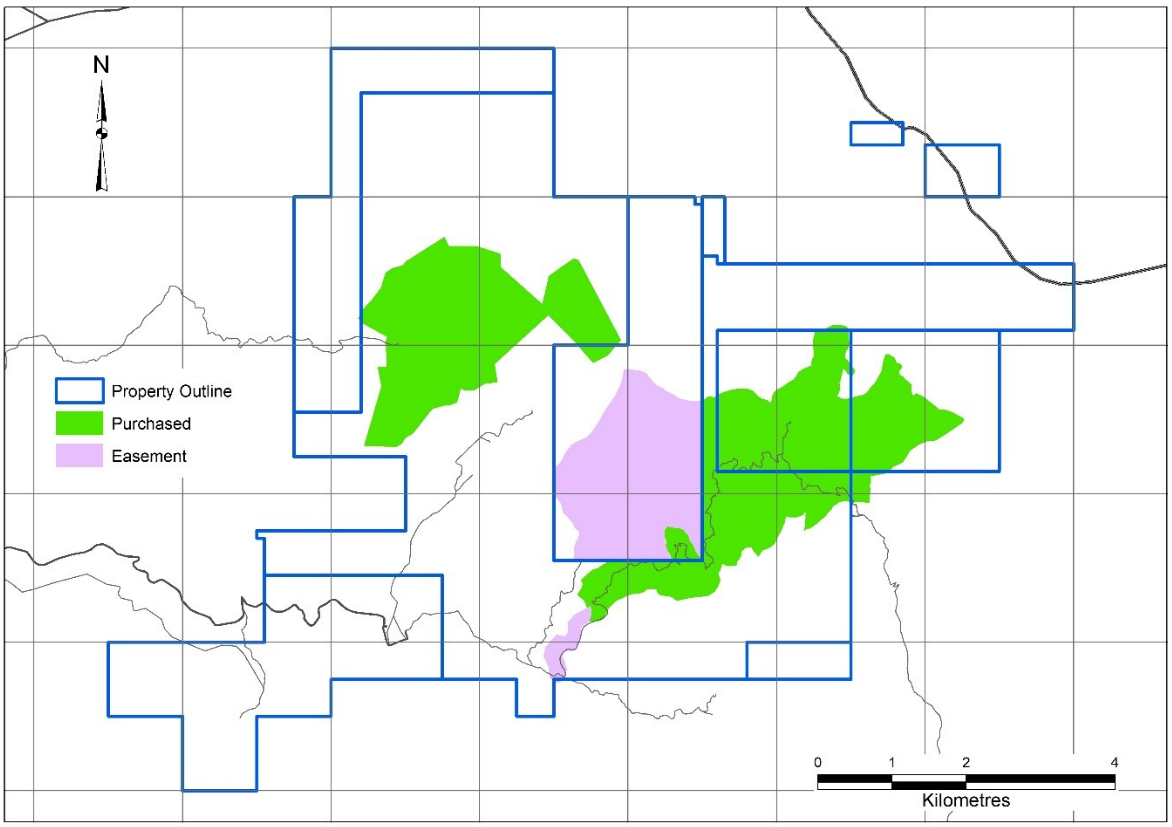
The maintenance of each mining concession requires an annual payment that is due before the 31st of March each year. For 2020, this amount totalled $61,424 for the ten mining concessions. These fees were paid, and all concessions are in good standing. The Small Mining concession royalty for the Los Cangrejos concession has been reported as zero, as instructed by the Mining Control Agency.

Table 4-2 and Figure 4-3 describe land areas within or adjacent to these concessions that are currently owned by Odin or controlled by Odin via legal easement. The 25-year life span for the concessions can be renewed for additional 25 year periods as many times as needed.

TABLE 4-2: SURFACE RIGHTS

Number	Previous Owner	Area ha	Location	Date of Registration Day-month-year
1	Víctor Manuel Ramírez Román	54.00	Santa Rosa	10-Apr-07
2	Manuel Abad Ruiz	66.38	Santa Rosa	21-Sep-07
3	Carlos Porfirio Tituana	81.20	Santa Rosa	17-Dec-07
4	Juan Antonio Tituana Torres	76.00	Atahualpa	02-Apr-08
5	Víctor Manuel Ramírez Román	58.75	Santa Rosa	29-May-08
6	Francisco Castro Sanchez	122.40	Atahualpa	22-Aug-16
7	Francisco Castro Sanchez	46.50	Santa Rosa	28-Dec-16
8	Juan Eduardo Venegas Francisco Soria Venegas	95.00	Santa Rosa	17-Feb-17
9	Jose Ernesto Ponton Loaiza	24.69	Santa Rosa	08-Jan-19
10	Jorge Vicente Ponton Loaiza	21.77	Santa Rosa	08-Jan-19
11	Lauro Evaristo Pineda Labanda	79.47	Santa Rosa	22-Nov-19

Number	Previous Owner	Area ha	Location	Date of Registration Day-month-year
12	Noblecilla Family	400.50	Santa Rosa	TBD [2]
	Total Purchased	**1,126.66**		
13	Mauricio Mendieta (C20 Easement)	359.94	Santa Rosa	27-Mar-18
14	Andrea Armijos (Access Easement)	25.70	Santa Rosa	23-Nov-18
	Total Surface Rights	**1,512.30**		



Source: Odin Mining, 2020

FIGURE 4-3: SURFACE RIGHTS

Physical access to the Cangrejos 20 (C20) concession required a mining easement over a portion of the surface of the concession in order to proceed with exploration. On May 11, 2017, Odin filed an easement request with the Mining Regulation and Control Agency (Agencia de Regulación y Control Minero or ARCOM) for 359.94 ha of private surface rights within C20, in order to legally access the area of geologic interest and conduct exploration work. The easement was granted

[2] Promise to buy in effect; last payment due November 2020, registry programmed for November 2020.

in December 2017, enabling the execution of exploration and drilling in C20. The legal easement is valid for the duration of the Project and mine, however, ARCOM will perform a new economic evaluation and define financial terms to compensate the owner over the long term when the Project moves to the production phase. ODIN has the legal rights to change the regime phase of the mining easement with addional compensation requirements regulated by ARCOM's valuation.

Project lands and mining concessions have no royalty requirements beyond a 3% to 8% Net Smelter Return (NSR), mandated by and for the Ecuadorian government, which is negotiated once a Prefeasibility Study is completed. [3] No "back-in" rights or any other encumbrances exist that could affect the Project's title, nor are there any other known impediments or significant risks that could affect the ability to perform mining work on the property.

Odin is currently engaged in a legal process with the Ministry of Energy and Non-Renewable Natural Resources (Ministerio de Energía y Recursos Naturales No Renovables or MERNNR) to consolidate the key areas of the Project's mineral rights, as described above, into a single new, unified mineral concession of 4,999 ha, as the Mining Law establishes a maximum concession size of 5,000 ha for projects to pass to the exploitation phase. This consolidation of the Project into a single, large concession is desirable to enable more effective negotiations with governmental authorities, as well as more efficient processing of the permitting requirements that will arise as the Project advances towards construction and operation. The unified concession will contain all the mineralized areas projected for the development of the Cangrejos and Gran Bestia deposits, as described in this PEA. Odin anticipates that the unified concession will be considered to be in the Advanced Exploration regime and is working to complete the consolidation in 2020 with support from Ecuadorian legal counsel. However, timing for completion of the process is dependent on regulatory approvals.

The consolidation process involves several steps. The first step, as depicted in Figure 4-2, was to divide the original Los Cangrejos concession (4,781 ha), which was then considered to be under the Small Mining regime, into five smaller concessions as follows:

- Los Cangrejos (now reduced to 3,498 ha)
- Cangrejos A (497 ha)
- Cangrejos B (25 ha)
- Cangrejos C (691 ha)
- Cangrejos D (70 ha)

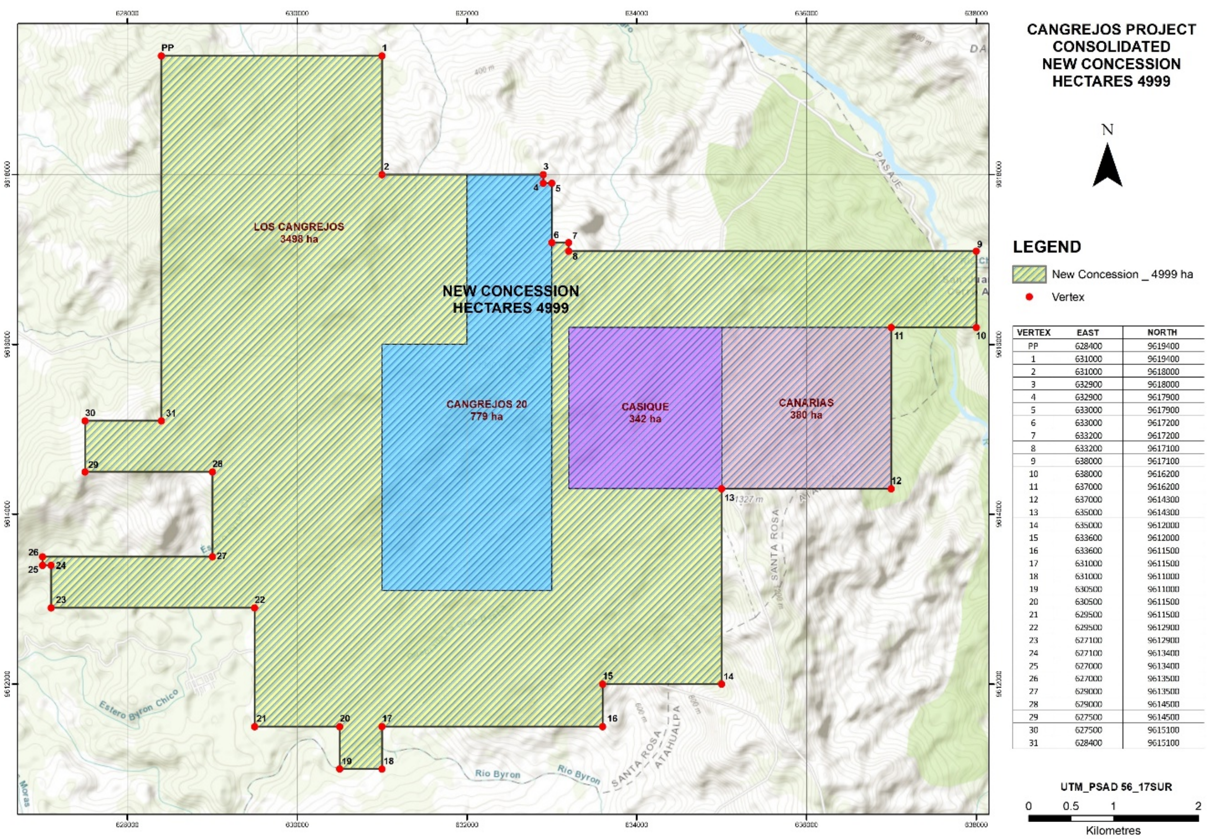
The second step was to file requests for regime change (i.e., from Small Mining to Large-Scale Mining) for three concessions:

- Los Cangrejos (3,498 ha)
- Casique (342 ha)
- Las Canarias (380 ha)

[3] Recent agreements signed by other companies indicate a 5% NSR; however, negotiation of a 3% NSR is considered feasible because of the potential size of the Project.

Approval of these regime change requests is pending. MERNNR and ARCOM representatives conducted a field inspection, which was followed by the issuance of internal reports on technical, economic, and regulatory issues, all of which were favorable. MERNNR is expected to issue a decision in 2020 that will allow the mining titles to be changed from Small Mining to Large-Scale Mining. After the mining titles have been changed, four contiguous Advanced Exploration concessions will exist as follows and as depicted in Figure 4-4:

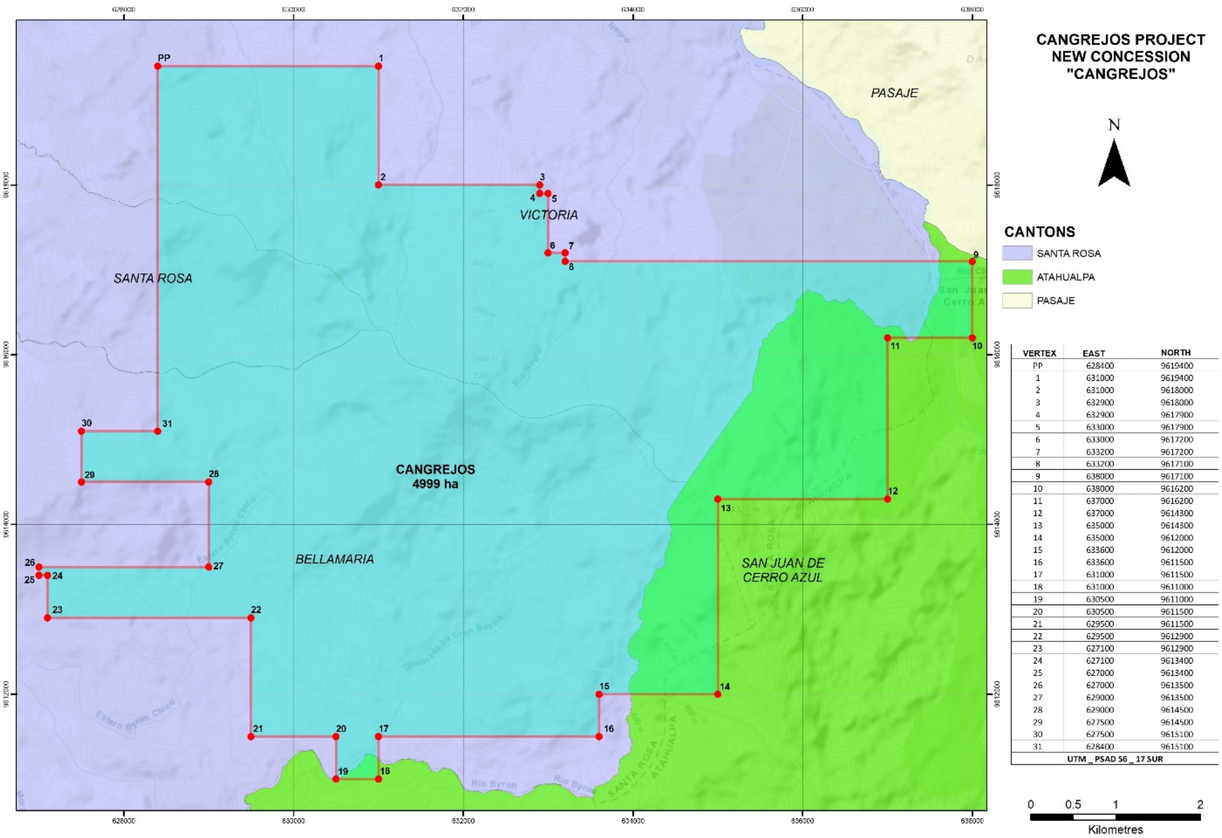
- Los Cangrejos (3,498 ha)
- Casique (342 ha)
- Las Canarias (380 ha)
- Cangrejos 20 (779 ha)



Source: Odin Mining, 2020

FIGURE 4-4: CONCESSION CONSOLIDATION PROCESS – CONTIGUOUS ADVANCED EXPLORATION CONCESSIONS

These four contiguous concessions will then be merged into a final single unified Advanced Exploration concession of 4,999 ha as shown in Figure 4-5.



VERTEX	EAST	NORTH
PP	628400	9619400
1	631000	9619400
2	631000	9618000
3	632900	9618000
4	632900	9617900
5	633000	9617900
6	633000	9617200
7	633200	9617200
8	633200	9617100
9	638000	9617100
10	638000	9616200
11	637000	9616200
12	637000	9614300
13	635000	9614300
14	635000	9612000
15	633600	9612000
16	633600	9611500
17	631000	9611500
18	631000	9611000
19	630500	9611000
20	630500	9611500
21	629500	9611500
22	629500	9612900
23	627100	9612900
24	627100	9613400
25	627000	9613400
26	627000	9613500
27	629000	9613500
28	629000	9614500
29	627500	9614500
30	627500	9615100
31	628400	9615100
UTM _ PSAD 56 _ 17 SUR		

Source: Odin Mining, 2020

FIGURE 4-5: FINAL CONSOLIDATION/UNIFICATION OF ADVANCED EXPLORATION MINERAL CONCESSIONS

4.3 Environmental Liabilities and Permitting

The Project is being developed in accordance with the Constitution, the Ecuadorian Mining Law and its Regulations, the Environmental Organic Code and its Regulations, the Organic Law of Water Resources and its Regulations,and other applicable Ecuadorian norms, standards, laws, and regulations. These include:

- Regulations to the Environmental Organic Code
- The Organic Law of Water Resources and Water Use and the Regulation for the Organic Law of Water Resources and Water Use, issued by DE No. 650 on March 31, 2015 and published in the First Supplement to RO No. 483 April 20, 2015
- The Organic Law of Rural Lands and Ancestral Territories and the Regulation for the Organic Law of Rural Lands and Ancestral Territories, issued December 16, 2016 by DE No. 1283 and published in the Supplement to RO No. 920 January 11, 2017
- General Regulation of the Mining Law, issued by DE No. 119 November 4, 2009, published in RO Supplement No. 67 November 16, 2009; last updated January 31, 2019

- Environmental Regulation for Mining Activities, issued by Ministerial Agreement No. 37 of March 24, 2014, published in the R.O.S. 213 of March 27, 2014 and last updated June 12, 2019
- Regulation for Mining Workplace Health and Safety, issued by Resolution ARCOM 020-INS-DIR-ARCOM-2014 April 25, 2014, published in RO No. 247 May 16, 2014
- Regulation for the Control of Mineral Exports issued under Resolution No. 002-005-2019-DIR-ARCOM August 6, 2019 and published in Official Gazette No. 23 on August 22, 2019
- Regulation of the Organic Health Law, issued through DE No. 1395 and published in RO No. 457 October 30, 2008; last amended May 8, 2012
- General Regulation for the Application of the Organic Law of Ground-based Transport, Transit and Roadway Safety, issued by DE No. 1196 June 11, 2012, published in Second Supplement to RO No. 731June 25, 2012; last amended September 13, MA2017
- Environmental Regulation for Hydrocarbon Operations in Ecuador, issued by DE No. 1215 and published in RO No. 265 February 13, 2001
- Regulations for Workers' Health and Safety and the Improvement of the Work Environment, issued by DE No. 2393, published in RO No. 565 November 17, 1986; last amended February 21, 2003
- Unified Text of Secondary Legislation of the Ministry of Environment (TULSMA), entered into force in RO No. 725 December 16, 2002, ratified by DE No. 3516, and published fully in the EE of RO No. 51 March 31, 2003; last updated April 21, 2019

Prior to the commencement of mine construction and mineral production, the Project will be subject to a wide array of additional permitting and related support actions, as required by current Ecuadorian laws and regulations. Based on the prior experience with similar-scale projects in Ecuador, it is estimated that, in aggregate, major permitting actions (excluding certain municipal, tax registration, and potential concentrate export permits), several of which can occur in parallel, will take a minimum of 24 months to complete. A summary is included in the following paragraphs.

- **Mining Phase Change - Permitting for Initiating Production Phase** (estimated minimum duration: approximately eight months): After the end of advanced exploration, the concessionaire may prepare the economic evaluation of the deposit. In order to move to the production phase, the concessionaire must submit an application supported by a technical report based on guidelines issued by the Mining Regulation and Control Agency [Agencia de Regulación y Control Minero (ARCOM)] and specific MERNNR instructions for exploration, exploitation, negotiation, and execution of exploitation agreements. It will also be necessary to negotiate and develop a production contract that, among its requirements, defines the royalties for the Project. Negotiation of signature approval of the production contract is estimated to require at least six months after formal initiation of the production phase.

- **Environmental Licensing Process** (estimated minimum duration: approximately twelve months): Since under Ecuadorian law the Environmental License applies to specific activities, and not the concession *per se*, the licensing process may commence prior to submitting the petition for exploitation. Registration of the Project and its associated production contract in a governmental information management system, Sistema Unico de Informacion Ambiental (SUIA) formally initiates the change from advanced exploration to exploitation status. A comprehensive exploitation-phase EIA/EMP will then need to be developed using a team of Ministerio de Ambiente y Agua de la República del Ecuador [4] (MAAE) approved consultants. The selected consultants must prepare and upload the proposed Terms of Reference (TOR) for the EIA/EMP and obtain MAAE approval prior to initiation of work. A biotic investigation permit will also be required to conduct an updated biotic and forestry baseline study and supporting fieldwork. Biotic samples must be managed in compliance with specific guidelines and all scientific studies must be submitted for approval. An updated archaeological study must also be performed in the proposed AOI and submitted for National Institute of Cultural Heritage (INPC) concurrence, and, if required, authorization for execution of archaeological rescue activities.

Once the draft EIA/EMP documents are prepared in accordance with the approved TOR, they must be uploaded to the SUIA for MAAE review. The Project must also organize and conduct a documented Public Participation Process (PPS), using the timing, locations, and scope defined by the TOR. The MAAE will review the results of the PPS, and if acceptable, will issue a favorable pronouncement of approval. The Project's Forest Inventory must also be separately reviewed and approved. After resolution of MAAE review comments, the final version of the EIA/EMP must be uploaded to the SUIA. Required fees, including ecosystem services loss fees for lands predicted to be impacted by the mining process must be paid, and an EMP compliance insurance policy or bank guarantee submitted. When these actions are complete and approved, the MAAE will issue the Project's exploitation-phase Environmental License.

- **Water Permits** (estimated minimum duration: approximately twelve months): The Project needs to prepare a detailed technical report describing its overall water management approach, as well as identifying all potential impacts to water bodies and any use of groundwater or surface water for mining processes and other human needs. Abstraction/usage permits must be negotiated with MAAE, in parallel with the early phases of the Environmental Licensing process as previously discussed. Results and specific ongoing water management actions need to be reflected in the exploitation-phase EIA/EMP.
- **Health and Safety Planning Actions** (estimated minimum duration: approximately two months): An appropriately detailed workplace/occupational health and safety system must be prepared to support mine construction and operation. Local workers must be registered with the Ecuadorian Institute of Social Security (IESS), and a joint (management and workforce) Health and Safety Committee established and registered. An internal Workplace Health and Safety Regulation must be developed and submitted

[4] In 2020, the President of Ecuador issued a Presidential Decree ordering the merger of the Ministerio del Ambiente (MAE) and Secretaría Nacional del Agua (SENAGUA) to form Ministerio del Ambiente y Agua del Ecuador (MAAE).

for Ministry of Labor approval. Industrial safety and medical service units must be established within the Project's management organization and a comprehensive Emergency Preparedness and Response Plan prepared. These planning actions should also be completed during the early development of the exploitation phase EIA/EMP and results reflected therein.

- **General Environmental Permits** (estimated minimum duration: approximately four months): Other general environmental permits need to be negotiated with MAAE, typically within two to three months prior to the end of the Environmental Licensing process described above. The Project needs to seek authorization for any stationary emission sources not already addressed in the exploitation phase EIA/EMP. Separate discharge and disposal permits for liquid effluents may be also required if not already addressed in the EIA/EMP. The Project will also need to register as a Hazardous Waste Generator. All reagents and other hazardous chemical substances employed in construction and mineral production must be identified and registered and supported by a Reduction, Elimination, or Replacement Plan for restricted or prohibited substances. Controlled substances subject to periodic inspection need to be registered and transport guides must be prepared. Authorizations are also required for the storage of chemical substances and/or hazardous wastes.
- **Electricity Related Permits** (estimated minimum duration: approximately 12 months): Permits need to be negotiated with the MERNNR and the Electricity Regulation and Control Agency (ARCONEL) for the construction of the electrical substations and transmission lines required to serve the infrastructure defined by final mine and plant designs. From discussions with the electrical power consultant, EPTEC, permit application/approval actions may take up to 12 months. In addition, per Odin's permitting consultant, such actions should be planned so they can be completed no later than two to three months from the end of the Environmental Licensing process.
- **Transport/Road Related Permits** (estimated minimum duration: approximately three months): Permits issued by the Ministry of Transport and Public works and MAAE will also be required for the construction of roads and the transport of heavy machinery to the Project site. Permit application and approval should be completed within three months of the end of the Environmental Licensing process.
- **Municipal Permits** (estimated minimum duration: approximately two months): A formal patent from the Municipality of Santa Rosa will be required, along with additional local permits for land use, various aspects of mine construction, and general Project operations. An operating permit from the Santa Rosa fire department is also required. Permit applications and approval actions should be completed within the two months prior to the end of the Environmental Licensing process.
- **Fuel Permits** (estimated minimum duration: approximately two months): Permits from the Hydrocarbon Regulation and Control Agency (ARCH) are required for the purchase,

transport, and safe controlled storage of fuel. The fuel permit should be completed within two months prior to the end of Environmental Licensing.

- **Explosives Permit** (estimated minimum duration: approximately two months): A permit will also be required from the Joint Command of the Armed Forces (CC.DD.AA.) Firearms Control Office in Machala for the purchase, transport, and the safe, secure, and controlled storage and usage of explosives. This permit should be obtained within the two months prior to the end of Environmental Licensing.
- **Heliport** (estimated minimum duration: approximately six months): If the final design requires location of a heliport at the Project, authorization from the Civil Aviation Authority (AAC) should be sought early in the Environmental Licensing process.
- **Internal Revenue Service Tax Authorizations** (estimated minimum duration: approximately one month): Current Internal Revenue Service (SRI) tax registration documents must be updated to accommodate the change to the production phase of operation. Since sale and export of minerals or concentrates may not proceed until these updates are approved, they should be submitted well ahead of the start of production, nominally 24 months after receipt of the Exploration License and the beginning of construction.
- **Customs Permits for Outgoing Product** (estimated minimum duration: to be determined): Permits for exportation of concentrates related to large-scale mining are not yet defined by the current regulatory framework. Regulatory changes in this area should be carefully monitored and new permitting requirements should be addressed well in advance of the projected date for shipment of concentrates.
- **Telecommunications** (estimated minimum duration: approximately six months): An Enabling Title of Use with the Agency for the Regulation and Control of Telecommunications (ARCOTEL) may be required to support radio communications. Negotiations should be completed as early as possible and in parallel with the early phases of Environmental License development.
- **Easements/Rights of Way** (estimated minimum duration: approximately six months): Negotiation of the easements with surface property owners that may be required by final mine design should be completed as soon as possible and in parallel with the early phases of Environmental License development.

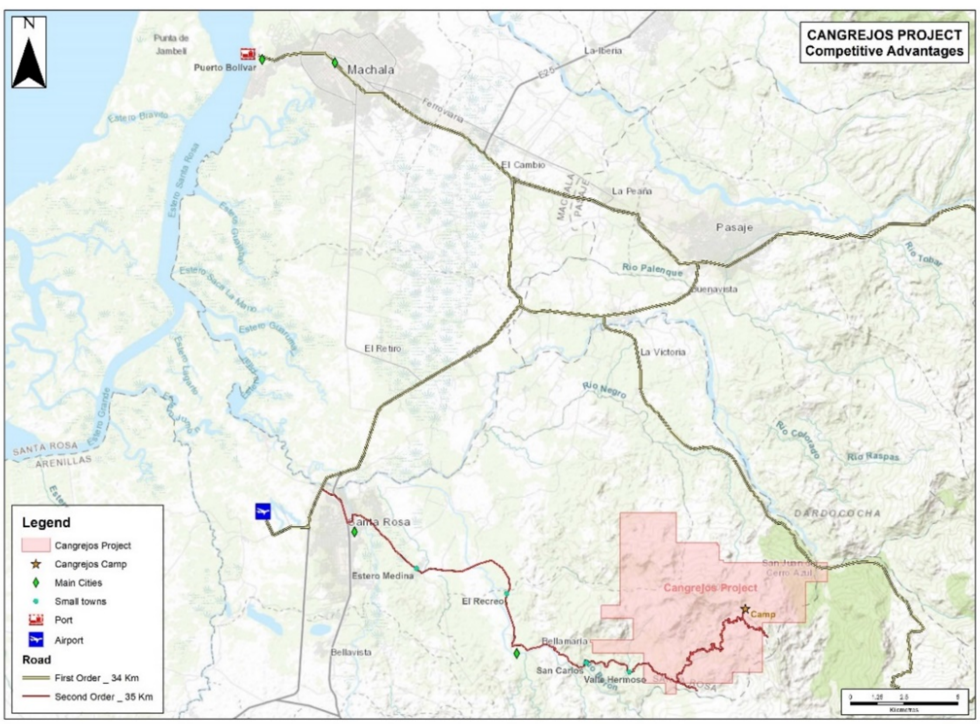
The QP is not aware of any environmental liabilities on the property. To the QP's knowledge, Lumina has all necessary permits required to conduct the proposed work on the property. Lumina is not aware of any other significant factors or risks that may affect access, title, or the right or ability to perform the proposed work program on the property.

5 ACCESSIBILITY, CLIMATE, INFRASTRUCTURE, AND PHYSIOGRAPHY

5.1 Accessibility

Figure 5-1 shows the relative locations of the population centers and the Cangrejos project site. Machala (population approximately 250,000 [5]) is 58 km from the Project and is the closest major city; it also is the capital of El Oro province. Santa Rosa is the closest urban area to the Project, at a distance of 24 km, and has a population of approximately 50,000. It also hosts the nearest commercial airport.

Access to the Project is provided by paved roads to the village of Valle Hermoso. The Company rebuilt an abandoned road from Valle Hermoso to the Project area and exploration camp in 2019. Driving time from Machala to the Cangrejos future plant site is typically 75 minutes and the drive from Santa Rosa to the future plant site is approximately 35 minutes. The site access road from Santa Rosa to Valle Hermoso passes through four small towns: Medina, El Recreo, Bellamaria, and San Carlos. Gravel road bypasses, 10-m wide, will be constructed around the towns of Bellamaria and San Carlos to reduce potential conflicts between mine and local traffic.



Source: Odin Mining, 2020

FIGURE 5-1: ACCESS TO CANGREJOS

[5] Population estimates are based on the national census of 2010.

The mine will be accessed by a private gravel road with a security gatehouse, visitor and truck parking, and truck scale. The mine access road is approximately 860-m long and starts 300 m west of the town of Valle Hermoso and passes to the north of the town. The mine access road terminates at the mine gate house and parking area.

5.2 Climate

The Project is located in the El Oro Metamorphic Belt Zone of the Cordillera Real, in high-relief terrain near the northeastern rim of an ancient caldera at the eastern edge of the coastal plain. Elevations range from approximately 100 masl to 1,370 masl and temperatures are relatively constant, ranging between 18°C and 22°C.

The Project area experiences a wet season, typically from January through May and a dry season that lasts roughly June through December. Average annual rainfall for the Project varies greatly by elevation and by year. The site set up two meteorological stations, one at high elevation (i.e., 1149 masl) near the exploration camp and one at low elevation (i.e., 348 masl) near the future plant site to measure the meteorological conditions at two different elevations. Average precipitation at the upper station is ~1500 mm/yr, but in 2019, the station measured 2,571 mm. The lower meterological station measured approximately 30% to 50% less precipitation in the same time periods.

Based on the available information, the mine and the processing facilities can operate year round. However, the mine production schedule allows for the loss of five days per year due to weather delays.

5.3 Local Resources and Infrastructure

Machala, with a population of approximately 250,000, is the largest city in the vicinity of the Project, while Santa Rosa, a smaller city with a population of approximately 50,000, is closest to the Project. Both Santa Rosa and Machala can provide basic goods and services for the early stages of exploration and mining. Skilled and unskilled labour are also available from various small towns and villages in closer proximity to the Project.

The Project is well served by regional transportation infrastructure; Machala and Santa Rosa are both situated on the section of the Pan-American Highway linking Guayaquil to Lima, Peru. There are regular flights between Quito and the Santa Rosa airport, which also serves Machala.

Puerto Bolivar is a major deep-water port located nine kilometers to the west of Machala and approximately 60 km from the Project. Having ready access to Puerto Bolivar is expected to facilitate the exportation of concentrate and importation of equipment, materials, and other consumables. The Mirador mine is currently shipping concentrates from Puerto Bolivar. It is expected, however, that some of the imported goods for the Project will require use of the Port of Guayaquil.

The power study (EPTEC, 2020) indicates that the national grid has sufficient power to supply the total demand for the Project for both the 40,000 tpd and 80,000 tpd milling operations.

Since the Project is in an area with a net positive water balance, there is sufficient water to supply the operations.

Since Odin owns or controls approximately 6,400 ha of concessions and over 1,500 ha of surface rights, in the opinion of the QP, there is sufficient area to support the mining, processing, mine overburden and waste disposal, and tailings deposition that are required over the life of the mine. Additionally, the local area is capable of providing sufficient manpower, power, and water.

5.4 Physiography

Cangrejos is located in moderately hilly terrain located southeast of the coastal plain. Elevations range between 100 m and 1,370 m above sea level. A prominent northwest-trending ridge, Cerro Azul, forms a watershed boundary between Rio Caluguro and Rio San Agustin.

The Project will be located primarily in areas of evergreen montane and secondary forest and altered pasture and agricultural areas in the central part of the Project. The Project is drained by a network of small streams; apart from these streams, no significant surface water features are directly impacted by the Project. The natural environment in the area of the Project has been significantly altered by a wide range of intrusive human influences that span many decades, and archaeological evidence suggests a history of human habitation and influence that dates back hundreds of years. No primary forest remains. Current land usage in the area of the Project is typically a mixture of cattle grazing and light agriculture, in cleared areas adjacent to secondary forest "islands." The latter are usually situated in steep ravines and rugged terrain unsuitable for agriculture or grazing. There are no villages or significant groups of dwellings in the project's environmental Area of Influence (AOI).

Ecuador is a very biodiverse country and like other nations has established a range of laws and regulations to protect its environmental resources. At the same time, the country is seeking to diversify and grow its economy, an increasingly vital component of which is mining. In keeping with Ecuadorian law and international Best Management Practices (BMPs), mining project proponents must seek a practical and appropriate balance between project economics and environmental protection, including the preservation of biodiversity.

In order to better understand the specific biodiversity considerations in the Project area, Odin commissioned environmental studies as part of the various exploration phase EIAs. A desktop biodiversity screening study was completed in 2017. Dry and wet season field studies were conducted in 2019 that were focused specifically on biodiversity in and around the initial Project footprint, as defined by Odin's 2018 PEA.

The 2019 studies confirmed that the Project location is many kilometers distant from any officially protected environmental areas and that the Project's concession areas have been significantly impacted by centuries of intrusive human activity. Primary forest no longer exists and the area of the Project is now comprised of a mixture of agricultural and grazing clearances and young or mature secondary forest islands. Such types of forest are not unique and can be found elsewhere in coastal areas of Ecuador.

Minor populations of several sensitive and/or endemic species of flora and fauna were found in land areas that will be required for mine construction and operation. However, the Project is adjacent to (and in several cases already owns) substantial areas not required for mining that are forested or modified. These can be set aside or rehabilitated as ecological offsets to compensate for any disturbance or loss of habitat that might be critical to the species observed. Establishment of offsets, in conjunction with a biodiversity monitoring program, robust adaptive management protocols, and specific management and mitigation measures based on international BMPs will enable successful Project permitting and compliance with all applicable regulatory requirements.

Ecuador is a seismically active country. The seismicity has been taken into account in the conceptual design.

6 HISTORY

Odin Mining is a company incorporated under the laws of the Republic of Ecuador by public deed and registered on December 15, 1993 (Zumarraga, 2020). It is a subsidiary of Lumina, which is a Canadian company. The history in this section is taken primarily from Potter (2010).

After mining the Biron alluvial gold mine on the Rio Caluguro north of Bellamaria, Odin Mining initiated an exploration program in 1992. The objective of the exploration program was to locate the hard-rock source of the alluvial gold in the Biron deposit. A number of gold anomalies were identified in the general area. The overall extent of the anomalies was sufficiently encouraging for Newmont Overseas Exploration Limited (Newmont) to enter into a joint venture agreement with Odin Mining. The area of interest was 22,500 ha encompassing the entire area that could be the source of the Biron Project and the joint venture was named the “El Joven Joint Venture”. Odin Mining held a 40% interest and Newmont held 60% and was the operator.

In 1999 and 2000 the work on the northern sector culminated in the drilling of 29 HQ diamond drill holes. Twenty three holes tested the Cangrejos gold-copper porphyry zone, five holes tested the gold-copper porphyry-style mineralization at Gran Bestia, and one hole tested a gold soil anomaly at Casique. The results from these holes appeared to indicate good potential for widespread disseminated sulfide mineralization with grades of about 1.0 g/t Au and 0.1% Cu associated with extensive hydrothermal alteration and brecciation within a quartz diorite intrusive cut by intrusive andesites.

Towards the end of 2000, Newmont carried out a risk and evaluation review of the project. With the gold price at about $270 per ounce, in order to continue with the project, Newmont required strong evidence for the presence of several hundred million tonnes of mineralization at a grade higher than 1.0 g/t gold. Since Newmont did not consider this outcome to be likely, they reduced their work on the project and formally withdrew from the joint venture in August 2001.

In accordance with the terms of the joint venture agreement Newmont transferred back to Odin the seven concessions that had been contributed to the joint venture by them. These concessions were Los Cangrejos, Cangrejos 1, Cangrejos 2, Cangrejos 4 and Cangrejos 5, Estero Zapato, and Tadao with a total area of 4,576 hectares. These concessions were later consolidated into the Los Cangrejos concession (Zumarraga, 2020).

Newmont also transferred to Odin all the remaining drill cores and an information package.

In early 2000, when the gold price was about US$ 300 per ounce, Odin commissioned Equity Engineering of Vancouver, British Columbia to carry out a review of the potential of the property as indicated by the Newmont results. AGRA Simons also carried out a conceptual scoping study based on the conclusions of the Equity Engineering review. These studies concluded that the property had the potential for the discovery of a sufficient quantity of gold-copper mineralization to support a major open pit milling operation of between 5 Mt/a and 15 Mt/a.

The property lay dormant during 2001, 2002, and 2003. In 2004 Odin commissioned a consultant to conduct a review of all the information available over the entire area of interest of the El Joven Joint Venture.

Later in 2004, Odin Mining commissioned Mr. Michael Potter, who had been Odin's Chief geologist from 1988-1998, to write a NI 43-101 Technical Report for the Cangrejos property. The basis of the Report was the information that Newmont transferred to Odin when they withdrew from the joint venture. The Report included recommendations for a drilling program to test the known geochemical anomalies away from the areas drilled by Newmont with a view to assessing the potential of the property to contain large tonnage and sufficient mineralization to support a large-scale (i.e., 5Mt to 15Mt/yr) open pit operation.

The 2004 NI 43-101 Technical Report (Potter, 2004) proposed a program of 20 scout diamond drill holes totalling 5,000 m to investigate the potential of the geochemical anomalies away from the area already drilled by Newmont. However, Odin did not implement this program. The Board of Directors believed that access to two contiguous concession blocks would be needed in order to develop a large-scale open pit mine. In late 2004 Odin acquired four additional concessions (Cangrejos 10, 11, 12, and 13) with a combined area of 3,043 hectares by direct application to the government.

Between November 2005 and February 2006 Odin Mining carried out a top-of-bedrock soil sampling exercise over the Dos Bocas target in the northeast corner of the concession block. Then, in July and August 2006 Odin carried out a similar exercise over the Trinchera/Paloma target in the area drilled by Newmont in 1999 and 2000.

Importantly, in May 2007 Odin reached an agreement with Mr. Castro to include the Casique and Las Canarias concessions with a combined area of 722 hectares in the Cangrejos property.

By mid-2007 the gold price had risen to about US$ 650 per ounce but construction and operation costs for large scale, open-pit mines was also rising rapidly. Consequently, Odin no longer considered the large-scale mining scenario conceptualized in the May 2004 Technical Report an attractive exploration target. Therefore, Odin moved its first stage exploration focus away from the low-grade, high-tonnage, porphyry-style, gold-copper mineralization towards the higher-grade, lower-tonnage, structurally-controlled style of gold mineralization that was thought to dominate on the Castro concessions.

The Castro agreement included control of about 160 hectares of surface land. Subsequently, Odin purchased several additional land packages with a total area of approximately 380 ha in critical locations to ensure that their development programs could be carried out in a timely and cost effective manner.

In March 2008 Odin announced plans for a new drilling program on the Cangrejos property. However, in April, eleven days after their announcement, the Ecuadorian Constitutional Council accepted the Mining Mandate. This mandate intended to cancel the majority of mining titles in Ecuador without compensation and imposed a moratorium on all metalliferous mineral exploration and mining throughout the country until a new mining law could be brought into effect. This development created uncertainty as to the practicality and desirability of continued mineral exploration in Ecuador, so Odin announced the indefinite suspension of its drilling and fund raising plans. In July 2008, Odin also laid off its entire technical team in Ecuador and suspended all technical assistance from outside consultants. Technical work on the property remained at a standstill until the moratorium was lifted.

The new Mining Law came into effect on January 29, 2009, but general regulations had to be developed in order to implement the law. In March 2009 Odin's Ecuadorian legal team advised that they had informal indication that all of the Cangrejos concessions were likely to survive. Nevertheless, at the end of that month Odin voluntarily relinquished the Cangrejos 13 concession as a non-core asset.

On November 16, 2009 the general regulations needed to implement the new Mining Law were brought into effect and the mining and mineral exploration moratorium was lifted. However, exploration was now to be conducted in a much more strictly regulated regime than it had been previously. Environmental controls, evidence of social acceptance within the local community, and an increased level of government involvement in the approval, review, and audit of annual work plans and budgets were required under the new law.

Following resolution of the situation, Odin completed a non-brokered private placement to raise C$ 1.5 M during December 2009. The funding allowed Odin to re-engage its former technical staff within Ecuador and its external technical advisors. In January 2010 Odin restarted fieldwork on the Cangrejos property with a new top-of-bedrock soil sampling over much the same area that was covered previously, but following the ridges and spurs rather than on a grid pattern. Also, in January 2010 the company submitted a revised environmental impact study to begin to acquire the necessary permits to enter the advanced stage of exploration status that would allow diamond drilling on the property.

In May 2010 Odin received formal confirmation that all twelve of the greater Cangrejos mining concessions were in good standing. In June 2010, after the completion of the ridge and spur soil sampling, Odin embarked on a program of detailed stream sediment sampling to extend the program carried out in 2007 over the eastern side of the property to cover the whole area of the Cangrejos property.

In 2011 and 2012 Odin drilled 17 HQ holes on the Cangrejos Project. Four holes tested the extent of the Cangrejos Zone and the remaining 13 holes tested a gold soil anomaly in the Casique area. The mineralization at Casique is confined to relatively narrow, discontinuous zones related to silicified diorite, hydrothermal breccias, faults, or fracture zones.

In 2014 and early 2015, Odin completed nine HQ drill holes. Eight holes tested the lateral and down-dip extent of the Cangrejos Zone and confirmed the grade that was previously defined by Newmont. One hole tested the El Capitán copper-molybdenum soil anomaly, but found no significant mineralization.

In 2015, four samples taken from the 2014 drilling program were used to conduct a preliminary metallurgical testing program that included determination of physical properties, comminution parameters, and testing of the metallurgical recovery of copper, gold, and molybdenum. The tests concluded that the samples were medium hard and both cyanide leaching and flotation were viable recovery options.

In 2016, Odin changed its name to Lumina Gold Corp. (Lumina) after acquiring 100% ownership of Ecuador Gold and Copper Corp, the owner of the Condor Project.

In September 2016, an Independent Technical Report was filed on the System for Electronic Document Analysis and Retrieval (SEDAR) to provide an updated review of the exploration activity (Brepsant, 2016). The Cangrejos 20 concession was registered on December 15, 2016 and subsequently changed to an Advanced Exploration claim.

In 2017, Lumina completed 15 HQ drill holes on the Cangrejos Zone. A maiden Mineral Resource Estimate was reported in a March 2017 Technical Report (Brepsant, Sim, and Davis, 2017) and an updated Mineral Resource Estimate was reported in a Technical Report in November 2017 (Sim and Davis, 2017). The drilling discovered a zone of higher grade gold-copper mineralization associated with hydrothermal breccias which occur below the resource pit used for the November 2017 resource that was reported in a 43-101 Technical Report.

Lumina applied for two mining easements in 2017. The C20 easement was registered on March 27, 2018 and an access easement was registered on October 6, 2018. They also acquired additional surface property rights for 95 ha in the Cangrejos area.

In July of 2018, the Ecuadorian Minister of Energy and Non-Renewable Natural Resources (Ministerio de Energia y Recursos Naturales No Renovables or MERNNR), Carlos Pérez Garcia, enacted a Ministerial Agreement, which allows mining concession holders to perform "non-systematic" exploration drilling, also known as "Scout Drilling". Drilling activities were previously only permitted during the Advanced Exploration Phase of mining concessions and required an environmental license. That Ministerial Agreement and subsequent norms enabled the drilling of previously untested areas on the west side of the Cangrejos deposit (Cangrejos 20), as well as the Gran Bestia satellite deposit, located approximately one kilometer to the northwest, where Newmont Mining Corp. previously drilled 978 meters over five holes in 1999. Lumina's tests helped to determine that the Gran Bestia deposit contains mineral resources that add to the existing Cangrejos deposit and to the conceptual mine plan.

Lumina continued to drill in 2018 and 2019. A total of 72 holes were drilled in the Cangrejos Zone including 52 infill drilling holes, 11 geotechnical holes, four metallurgical holes and five condemnation holes in the area of planned infrastructure for the Project. In addition to the drilling at Cangrejos, 26 holes were completed at Gran Bestia to assess the significance of the mineralized zone and complete an initial Mineral Resource Estimate.

Eight samples from the 2018 drilling program were used for an additional metallurgical testing program. The testing included mineralogy, comminution tests, gravity concentration, cyanide leaching, and flotation tests. The results from the metallurgical testing and drilling were used to complete an updated Mineral Resource Estimate and a Scoping Study to evaluate the economic viability of the Cangrejos Property. The results were reported publically in a Preliminary Economic Analysis (PEA) Technical Report that was posted on SEDAR in August 2018 (Rose, et. al., 2018).

In early 2019, the current technical team was assembled with the objective of completing a Prefeasibility Study (PFS) for the Project. The scope of work included additional drilling to expand the mineral resource, geotechnical drilling, geochemical analyses, hydrogeological and hydrological evaluations of the surface and underground waters at the site, and an extensive metallurgical testing program to optimize the conceptual processing plant design. Using the additional data, engineering for the Project was also advanced with updated designs for the mine, the processing plant, infrastructure, and dry stack tailings facility (DSTF).

In conjunction with the work at site and in engineering, Odin acquired additional surface property rights and was able to access further areas for drilling that had previously been inaccessible. As a result of the success in drilling at Gran Bestia, the decision was made to complete another PEA for development of the Cangrejos and Gran Bestia deposits and incorporate the Inferred Mineral Resources in the PEA instead of completing the planned PFS. The Mineral Resource estimate that supports this PEA was reported in a 43-101 Technical Report that was posted on SEDAR in December 2019 (Sim, Davis, and King, 2019).

Table 6-1 summarizes the exploration history for the Cangrejos Project.

TABLE 6-1: EXPLORATION HISTORY OF THE CANGREJOS PROJECT

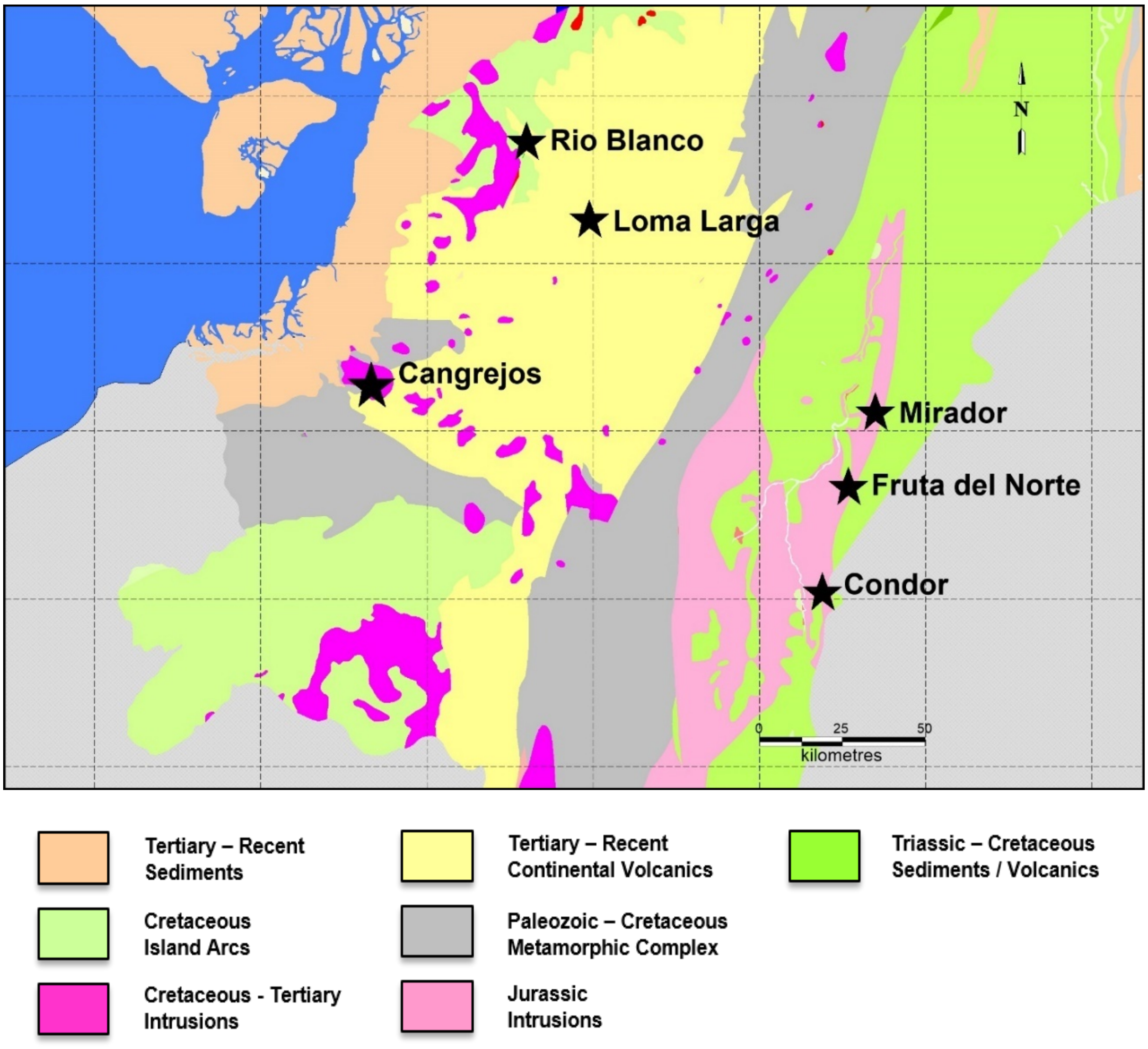
Year	Company	Description
1992	Odin	Regional stream sediment and geological mapping program to locate the source of the Birón alluvial gold (1987–1995: production; 69,000 oz Au).
1994	Odin/ Newmont	Formation of “El Joven Joint Venture” to explore stream anomalies with Newmont as the Operator. The Cangrejos Project is located in the northern part of the Joint Venture area.
1994-2001	Odin/ Newmont	Airborne magnetics, radiometrics, soil and rock geochemistry, geological mapping, and 29 diamond drill holes (7,509.2 m) completed on the Cangrejos Project.
2001	Odin/ Newmont	Newmont withdrew from the Joint Venture, and the original seven concessions were returned to Odin. Odin also acquired Newmont’s drill core and exploration data for the Cangrejos Project.
2004	Odin	Acquired an additional four concessions (3,043 ha).
2007	Odin	Top of bedrock soil sampling, additional stream sediment sampling.
2008-2009	Odin	The Government of Ecuador imposed a moratorium on exploration; no work is done on the Cangrejos Project.
2010	Odin	Top of bedrock, ridge, and spur soil sampling.
2011-2012	Odin	Diamond drill testing of gold soil anomalies at Casique (13 holes; 3,296.13 m) and the extent of mineralization at Cangrejos (four holes; 1,402 m).
2014-2015	Odin	Diamond drilling to test the strike and depth extent of the Cangrejos Zone (8 holes; 3,188.5 m) and a Cu-Mo-Au soil anomaly at El Capitán (one hole; 350.15 m).
2017	Lumina	Diamond drilling to infill and test the depth extent of the Cangrejos Zone (15 holes; 7,186.1 m)
2018-2019	Lumina	Diamond drilling to infill and test the extents of the Cangrejos deposit (72 holes; 26,450.9 m) and the Gran Bestia deposit (26 holes; 13,170.8 m)

The Mineral Resource estimates that were completed and reported in 2017, 2018, and 2019 are all in compliance with 43-101 categories. Historically, there has been artisanal mining on the Cangrejos property but no production estimates have been reported.

7 GEOLOGICAL SETTING

7.1 Regional Geology

The regional geology of southern Ecuador is shown in Figure 7-1. There are several north-south-trending domains of volcanic and sedimentary rocks which accreted onto the Amazon Craton from Late Jurassic to Eocene. These terranes are cut by younger magmatic intrusions which locally host porphyry copper/gold and epithermal gold deposits (shown as black stars in Figure 7-1).



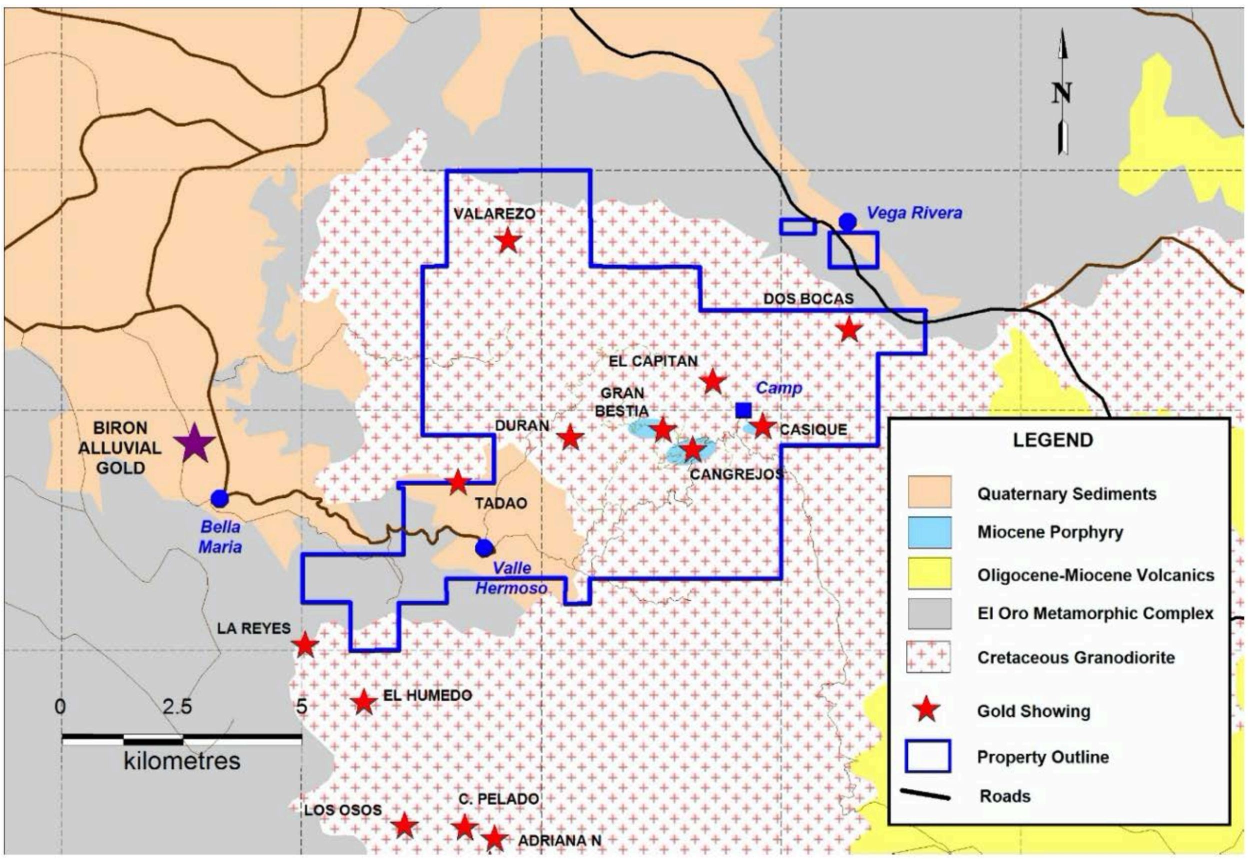
Source: DINAGE, 2001; Lumina, 2017

FIGURE 7-1: REGIONAL GEOLOGY

7.2 Local and Property Geology

A more detailed picture of the geology in the vicinity of the Cangrejos Project is shown in Figure 7-2. Quaternary sediments occur to the northwest in the coastal areas around Machala. Oligocene continental volcanics occur to the east. These two domains are separated by the Late Cretaceous-Paleozoic El Oro metamorphic complex which consists of phyllites, schists, amphibolites, granites, and serpentinites.

The Cangrejos Project is largely underlain by a Miocene (K-Ar age, 16.89 Ma and 19.92 Ma (Potter, 2010)) porphyritic quartz diorite and a Cretaceous equigranular diorite which is interpreted as being part of the El Oro metamorphic complex. Gold showings are associated with the Miocene porphyry and adjacent breccias and metamorphic rocks.



Source: Newmont, 2001; INIGEMM, 2017; Lumina, 2019

FIGURE 7-2: LOCAL GEOLOGY CANGREJOS PROJECT

7.3 Geological Studies and Age Dating

Additional drilling at Cangrejos and Gran Bestia has helped improve the geological map in these areas. Drill holes were relogged by Pratt, Gordon, and Rowe (2018) and Gordon and Rowe (2019) to produce a geological model for the gold-copper mineralization.

Age-dating of selected rock types has helped to interpret the geology. Seven samples representing the main rock types were dated at the Geological Institute, Bulgarian Academy of Sciences in Sofia, Bulgaria. U-Th-Pb isotope analyses of zircons were completed using a laser ablation ICP mass spectrometer (LA-ICP-MS) (Lumina, 2018). The porphyritic quartz diorite (PQD) returned a Miocene age ranging from 21.22 Ma to 22.49 Ma. The foliated and equigranular quartz diorite (SCH and EQD) is Cretaceous with ages ranging from 76.4 Ma to 79.09 Ma which correlates with the El Oro metamorphic complex.

Re-Os ages for two molybdenite samples were determined using Re-Os isotope analyses completed at ALS Labs in North Vancouver, Canada (Lumina, 2018). The age of the mineralization is 23.40 Ma to 23.52 Ma which is slightly older than the Miocene porphyritic quartz diorite intrusions.

7.4 Lithology

Based on relogging of drill core by Pratt, Gordon, and Rowe (2018) and Gordon and Rowe (2019), there are four main lithological units:

1. Saprolite (SAP)/Saprock (SRK) – This unit includes weathered bedrock which occurs as a generally thin layer at the top of a drill hole. Clay content varies from 10% to 50% and is dominated by kaolinite and smectite. The base of the saprolite/saprock is generally sharp with an abrupt change into fresh rock.

2. El Oro Metamorphic Complex (EQD, GSC, SCH) – This unit comprises of meta-diorites, amphibolites and schists. An equigranular, medium- to coarse-grained quartz diorite (EQD) is the most common lithology at Cangrejos. The rock is frequently foliated and grain-size reduction is apparent. Feldspars are broken in sheared diorite in contrast to the euhedral crystals seen in the Miocene porphyries. Two types of schists are present: a fine-grained, massive amphibole-rich meta-basalt (GSC) and a fine-grained biotite-feldspar-quartz schist (SCH). Folding and boudinage are common in both schists. Rare intervals of medium- to coarse-grained meta-gabbros (GAB) are also present.

3. Miocene Intrusions (PQD, PAD) – Porphyritic quartz diorite intrusions (PQD) occur as stocks and dikes that intrude the metamorphic complex. The PQD comprises of euhedral, crowded feldspar phenocrysts (1 mm to 4 mm) and large mafic phenocrysts in a very fine-grained siliceous groundmass. This unit contains early porphyry “A” type barren quartz veins and commonly exhibits strong biotite and calcic-sodic alteration. Late, fine-grained, porphyritic diorite to andesitic dikes (PAD) cross-cut the early PQD intrusions.

4. Breccias – There are three types of magmatic and hydrothermal breccias associated with the quartz diorite porphyritic intrusions:

- Igneous breccia: This unit is pre- and inter-mineralization and can be both clast- and matrix-supported. Subangular to rounded clasts occur in a matrix comprising feldspar phenocrysts, biotite, mafic minerals, and fine-grained igneous material. This type of breccia is common at Gran Bestia.

- Hydrothermal breccia: This unit is clast-supported with a matrix comprising actinolite, albite, chlorite, tourmaline, ± sulfides, and ± carbonates. It resembles a jigsaw breccia where the clasts are the same composition as the adjacent porphyry intrusion. The gold and copper mineralization occurs as open-space fillings and veinlets. This unit is common within the porphyry and at contacts with the country rock.
- Magnetite-biotite hydrothermal breccia: This unit is angular to subrounded clasts of metamorphic country rock occuring in a matrix of magnetite and subordinate biotite and quartz. Early quartz veins and chalcopyrite-bornite-pyrrhotite veinlets cross-cut this unit. This lithology is associated with some of the highest gold-copper values and dominantly occurs within the metamorphic country rock adjacent to porphyry contacts.

7.5 Alteration

Hydrothermal alteration is associated with the gold-copper mineralization. The main types of alteration include:

- Potassic – The equigranular and porphyritic quartz diorite intrusions exhibit porphyry-style potassic alteration which is characterized by secondary biotite alteration of the mafic minerals and weakly developed “A” and “D” type veins.
- Propylitic – Propylitic alteration consists of chlorite and epidote which overprints and is peripheral to the potassic alteration.
- Calcic-Sodic – Calcic-sodic alteration overprints the early porphyry alteration phases. It is characterized by actinolite replacing hornblende and biotite, albite replacing feldspar crystals and bleaching the matrix, and minor epidote associated with tourmaline and chlorite. It is commonly seen in the breccia units. Most of the sulfide and gold-copper mineralization is associated with this alteration phase.
- Phyllic/Intermediate Argillic – The Cangrejos and Gran Bestia areas exhibit limited evidence of this style of alteration. Scattered, narrow pyrite-rich veinlets with light green micaceous selvages, illite haloes and minor carbonate may represent an intermediate argillic alteration.

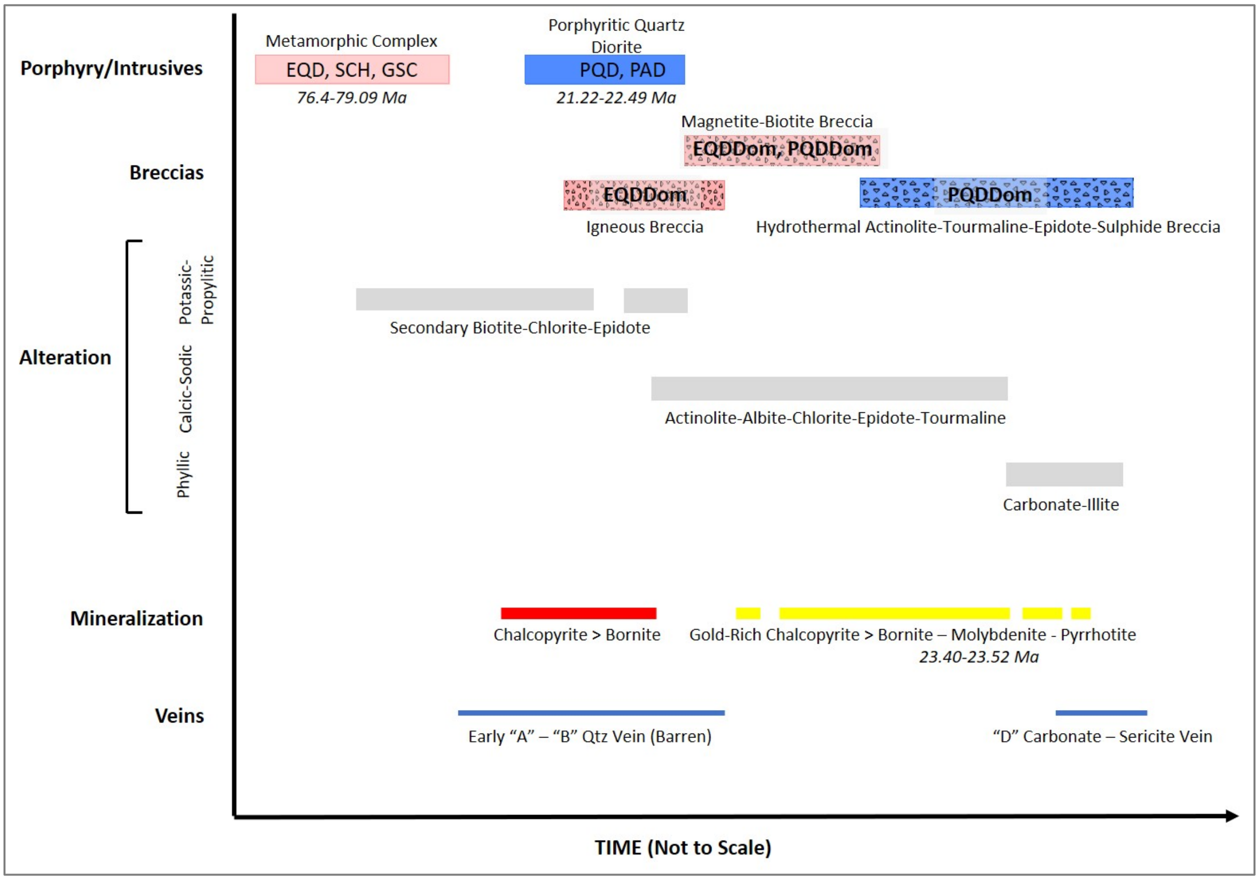
7.6 Mineralization

Gold-copper mineralization is associated with sulfides that occur as open-space breccia fill or as disseminations in former mafic phenocrysts. Total sulfide content is generally less than 5% and consists of chalcopyrite and pyrite with minor bornite, molybdenite and pyrrhotite. In drill hole C17-65, native copper is found on fracture surfaces at depths ranging from 142 m to 186 m. This is not very common and is probably due to strong oxidation along a fracture zone.

The highest gold grades occur in calcic-sodic altered breccias at contacts between the PQD and the metamorphic complex. The best gold grades occur in breccias where the dominant clast type is EQD. The EQD is more mafic in composition, and gold is preferentially deposited in reducing (mafic) environments.

7.7 Paragenetic Sequence

A preliminary paragenetic sequence for the lithologies, alteration, and mineralization is shown in Figure 7-3.

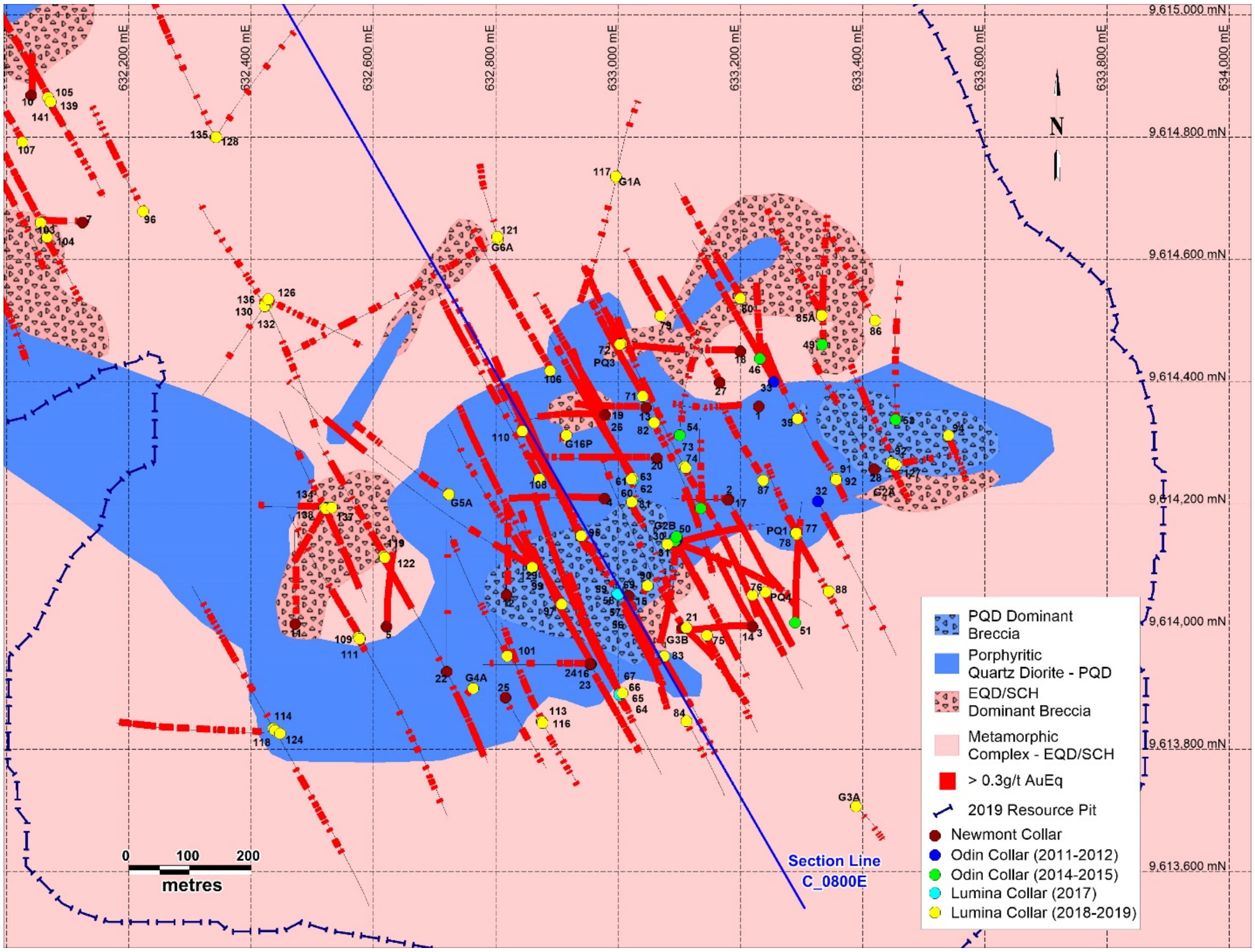


Source: Lumina, 2017, 2019

FIGURE 7-3: PARAGENETIC SEQUENCE

7.8 Cangrejos Zone

Current understanding of the surface geology of the Cangrejos Zone is limited because of a lack of outcrop exposures. The simplified geological map shown in Figure 7-4 is based primarily on drill hole geological logs and assays. An east-northeasterly trending porphyritic quartz diorite (PQD) intrudes quartz diorites (EQD) and schists (SCH) of the metamorphic complex. The southeastern contact is steep, but the northwestern contact dips approximately 50° to the southeast and is defined by porphyry dikes. The edges of the porphyry are brecciated with dominant PQD clasts. These breccias extend at depth and may relate to breccia pipes that are associated with the intrusion of the porphyry. Breccias with dominant metamorphic clasts (EQD, SCH) occur at the edge of the porphyry.



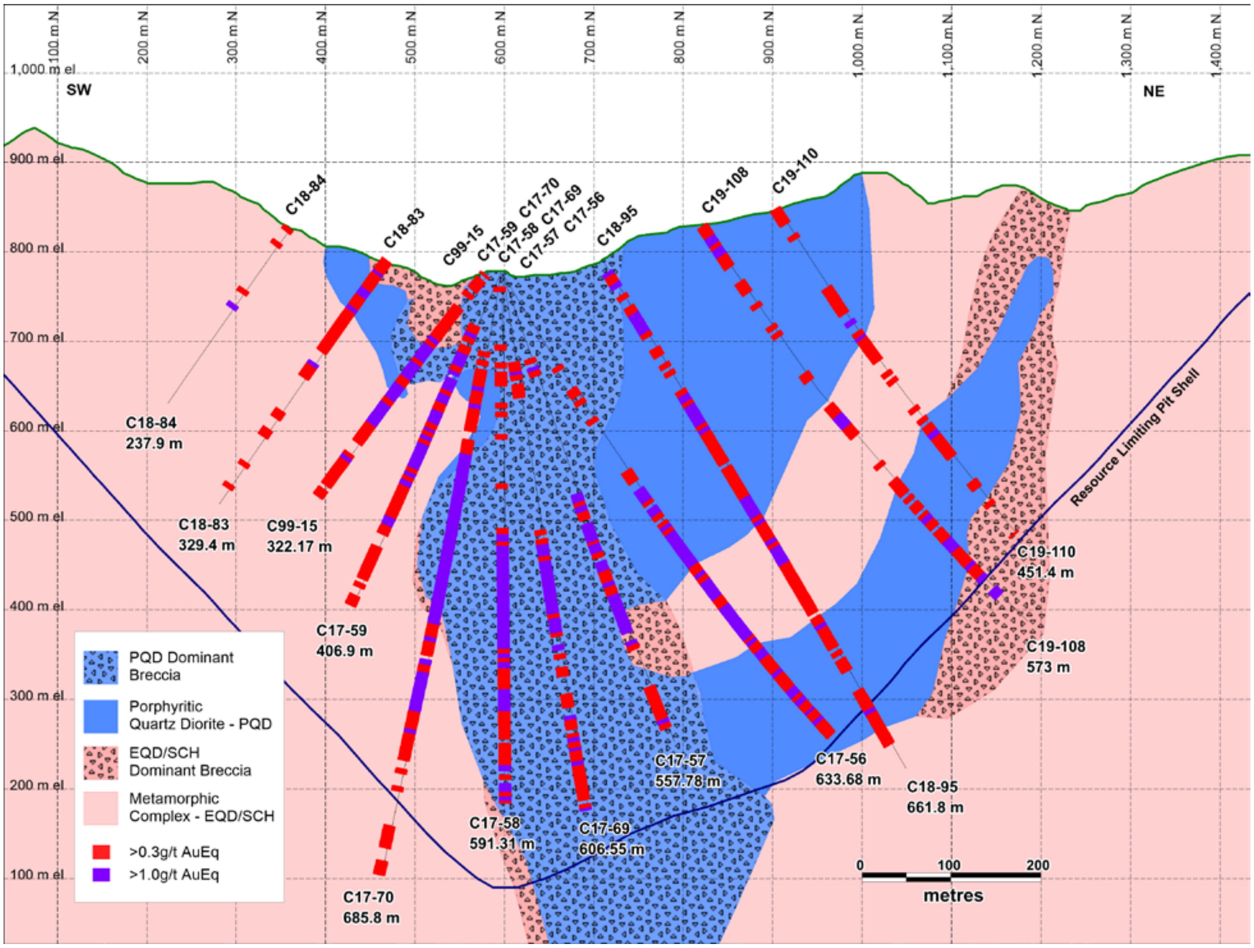
Source: Lumina, 2019

FIGURE 7-4: SIMPLIFIED GEOLOGY PLAN OF THE CANGREJOS GOLD – COPPER ZONE

A vertical cross section across the central part of the deposit is shown in Figure 7-5; a higher grade gold-copper zone is highlighted on this figure.

Drilling has defined a northeast-southwest-trending, steeply dipping zone of gold-copper mineralization which is commonly associated with hydrothermal breccias and quartz vein stockwork in the quartz diorite porphyry (Figure 7-5). Gold-copper values are not restricted to these lithologies and can be found in all units except the late stage dikes.

The mineralized zone extends for approximately 1,000 m in a northeasterly direction, has widths ranging from 70 m to 600 m, and has been defined to a depth of at least 600 m below surface. The zone remains open to expansion with further exploration to the west and at depth.



Source: Lumina, 2019

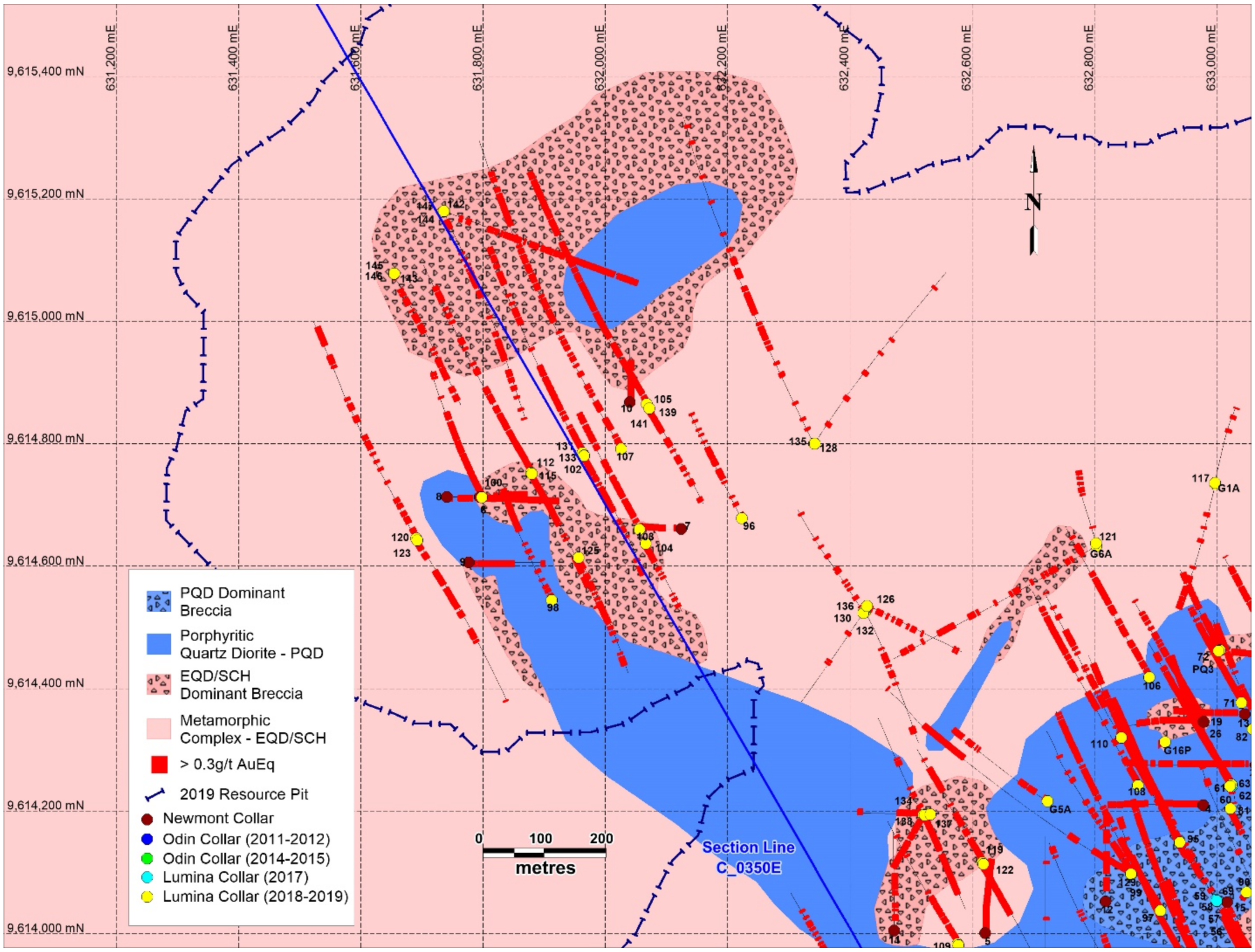
FIGURE 7-5: CROSS SECTION 800E – CANGREJOS ZONE

7.9 Gran Bestia Zone

As with Cangrejos, current understanding of the surface geology of the Gran Bestia Zone is limited because of a lack of outcrop exposures. The simplified geological map shown in Figure 7-6 is based primarily on drill hole geological logs and limited outcrop exposures.

The southern portion of the Gran Bestia deposit is similar to the Cangrejos deposit in that porphyritic quartz diorite (PQD) intrusions are present. Gold-copper mineralization occurs at the contact between the porphyries and the surrounding metamorphic country rock, with higher grades associated with breccias and quartz vein stockworks. The southern breccia has dimensions of 400 m (northwest-southeast) by 200 m (northeast-southwest).

The northern part of the Gran Bestia deposit is underlain by a polymictic intrusive breccia. Metamorphic complex clasts are hosted in a fine-grained diorite porphyry matrix. Several massive diorite porphyry dikes also occur within this breccia. The northern breccia has dimensions of 600 m by 400 m.

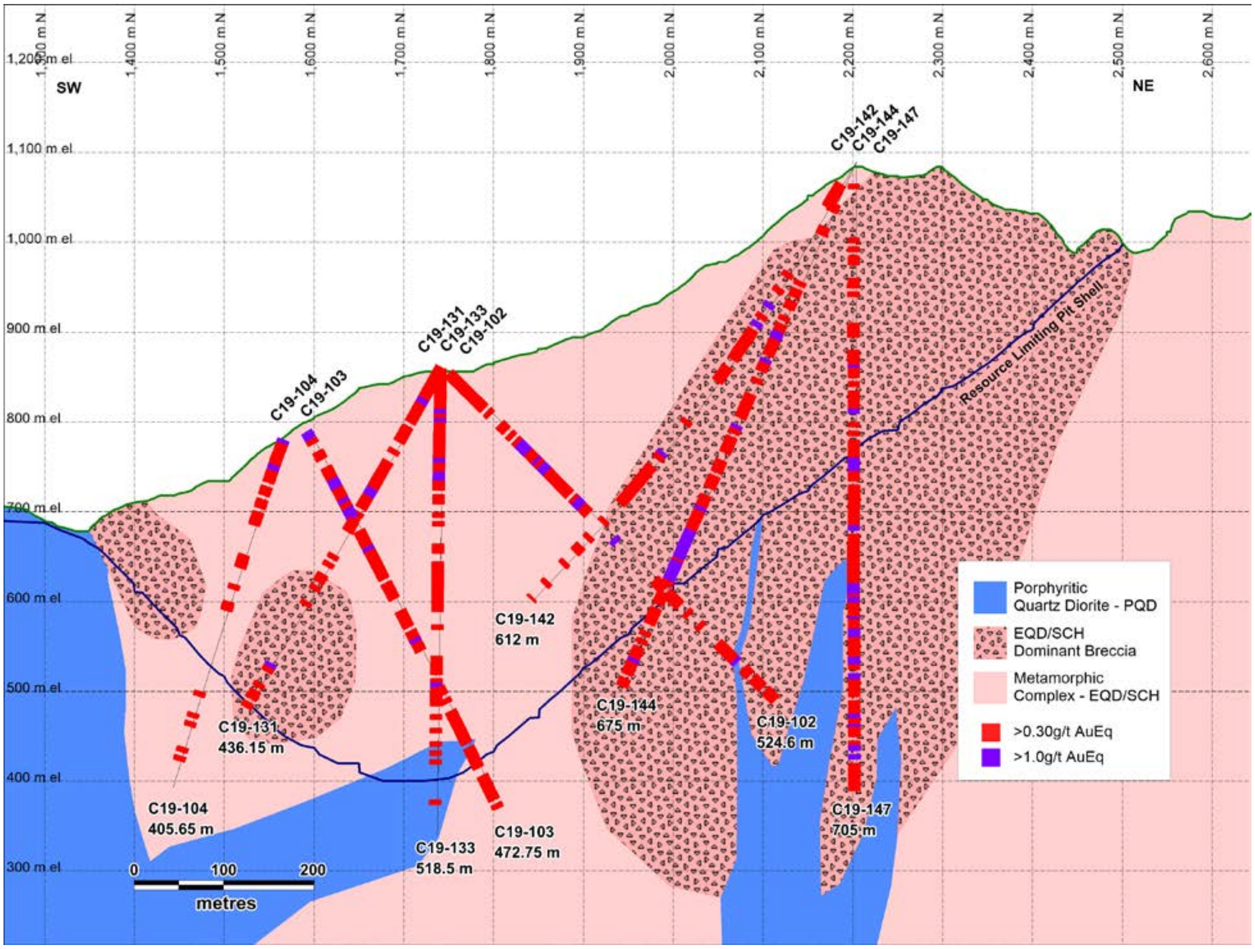


Source: Lumina, 2019

FIGURE 7-6: SIMPLIFIED GEOLOGY PLAN OF THE GRAN BESTIA GOLD – COPPER ZONE

A vertical cross section across the central part of the Gran Bestia deposit is shown in Figure 7- 7.

The gold-copper mineralized zone at Gran Bestia extends for approximately 700 m (north-south) by 600 m (east-west) and has been defined to depths ranging from 200 m in the south to 700 m in the north. The zone remains open to the north, west, and at depth.



Source: Lumina, 2019

FIGURE 7-7: VERTICAL CROSS SECTION – GRAN BESTIA – SECTION 350E

8 DEPOSIT TYPES

The Cangrejos and Gran Bestia deposits are gold-copper, silica-saturated, alkalic porphyry-style deposits. This type of deposit is found along paleo-subduction margins (Carter, 1981; Cox et al., 1987).

Other deposits of note within this family include Cadia, Australia; Bingham Canyon, USA; Andacollo, Chile; and Red Chris, Canada. All of these deposits have the following similar chemical affinities and host-rock provenance:

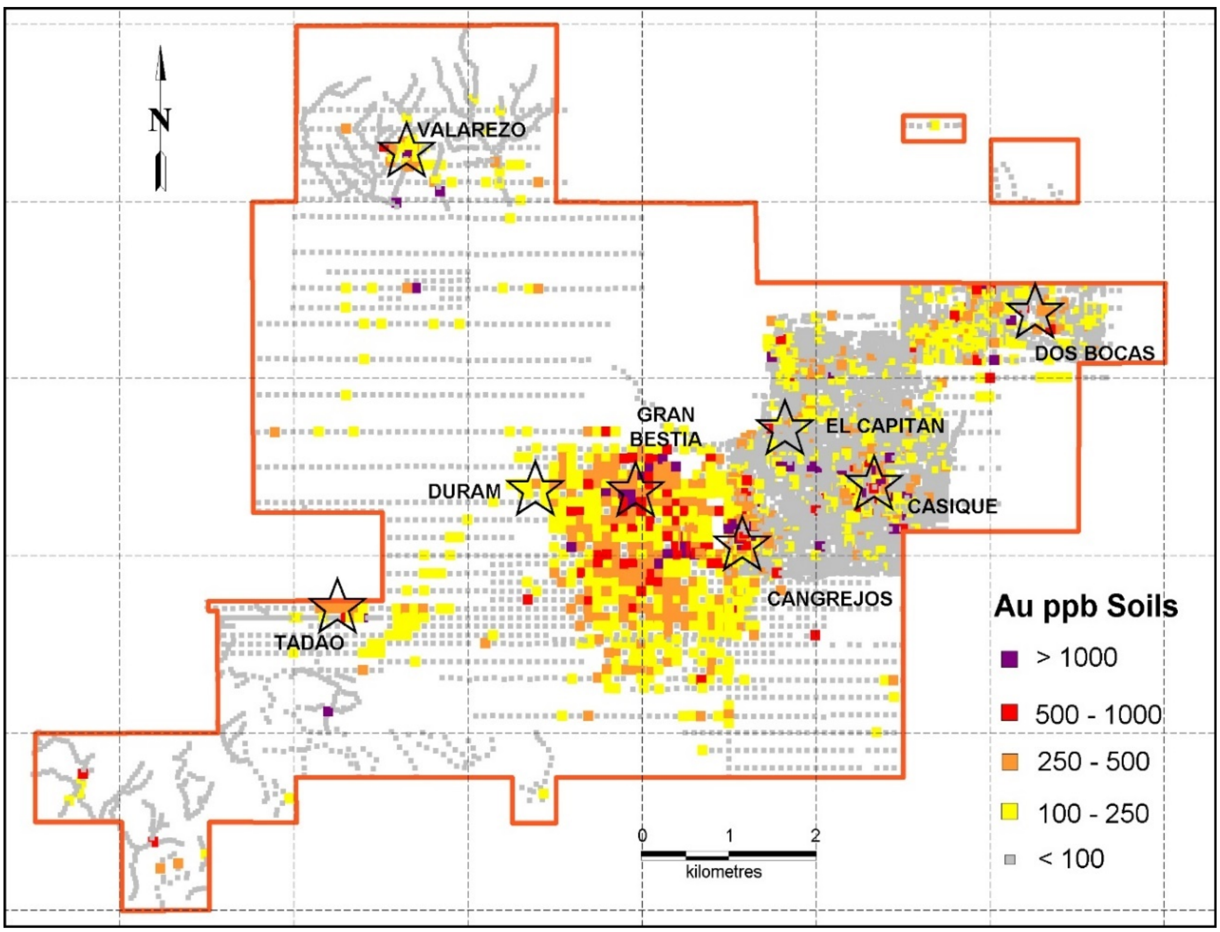
- They are associated with porphyry intrusive rocks that intrude volcanic and sedimentary packages as stocks, plugs, dikes, and dike swarms.
- Mineralization results from late-stage hydrothermal activity driven by remnant heat from the porphyry intrusion. Thermal gradients within these systems give rise to broadly concentric, although often complexly intermingled, zones of alteration and mineralization. Mineralization is generally low grade and consists of disseminated, fractured, veinlet and quartz stockwork-controlled sulfide mineralization. Deposit boundaries are determined by economic factors that outline the zones of mineralized material.
- The distribution of alteration and mineral facies are largely influenced by breccias, dikes, veins, and fracture systems which concentrate and control fluid flow.
- Weathering from percolation of meteoric water can result in the oxidation of the hypogene sulfide mineralization in a portion of the deposit to chalcocite and native copper.

9 EXPLORATION

Extensive geochemical surveys (streams, soils, top of bedrock soils and rocks), geological mapping, and airborne and ground geophysical surveys were completed by Odin and the Odin-Newmont El Joven Joint Venture during the period between 1992 to 2010.

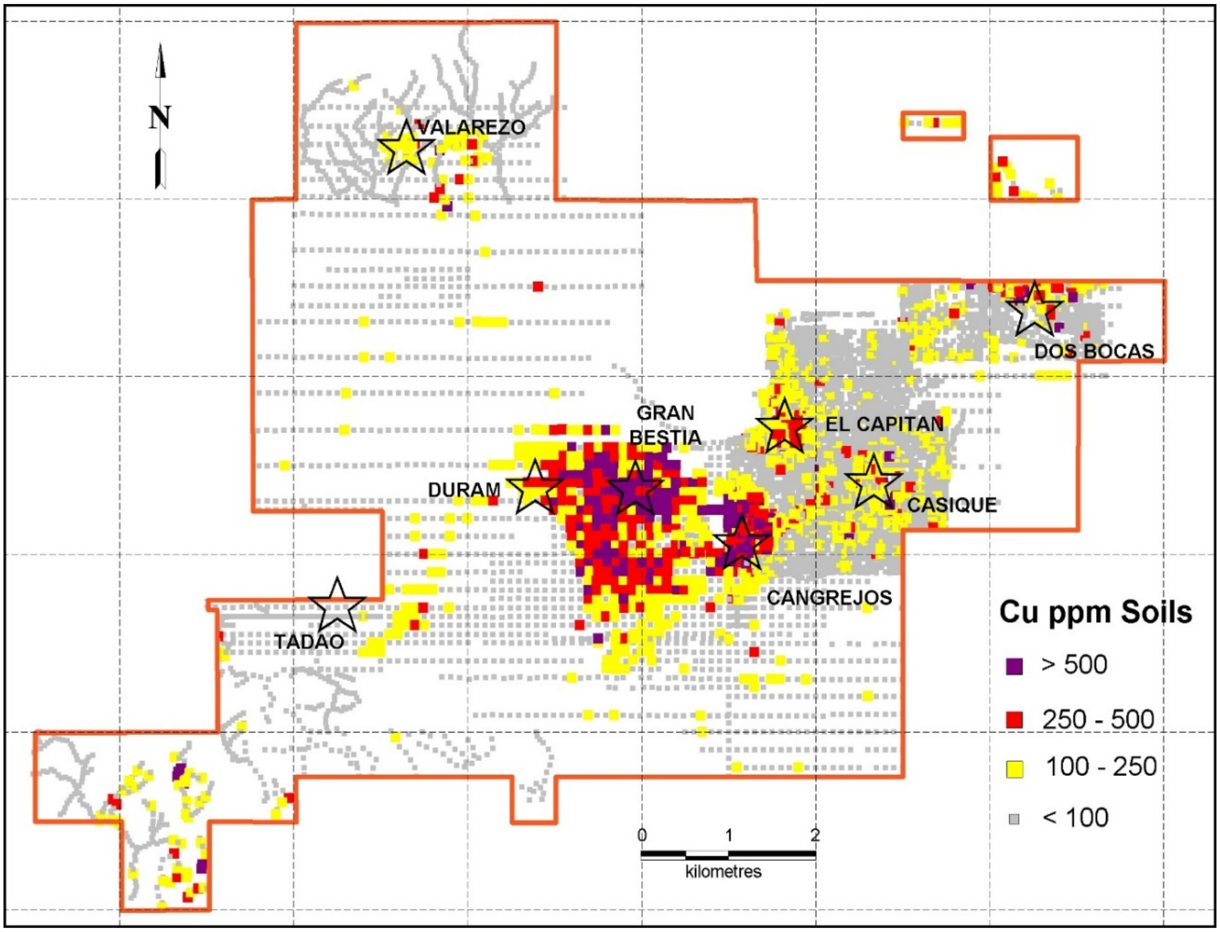
Survey procedures, sampling methodology, and analysis of these samples are described in detail by Mayor and Soria (2000) and Potter (2004, 2010). Detailed information on the geological mapping and airborne and ground geophysics programs is also discussed in the above-mentioned reports.

Well-defined gold and/or copper soil anomalies have been defined by this previous work and are shown in Figures 9-1 and 9-2. A sub-circular, gold-copper soil anomaly with a diameter of approximately 2,700 m occurs at the center of the property. The Cangrejos and Gran Bestia mineralized zones occur within this area of anomalous gold and copper soil values. The other mineralized showings on the property also have anomalous, but somewhat less-extensive, gold and copper soil values.



Note: Cangrejos Project is outlined in orange.
Source: Lumina, 2017

FIGURE 9-1: SOIL GEOCHEMISTRY – GOLD



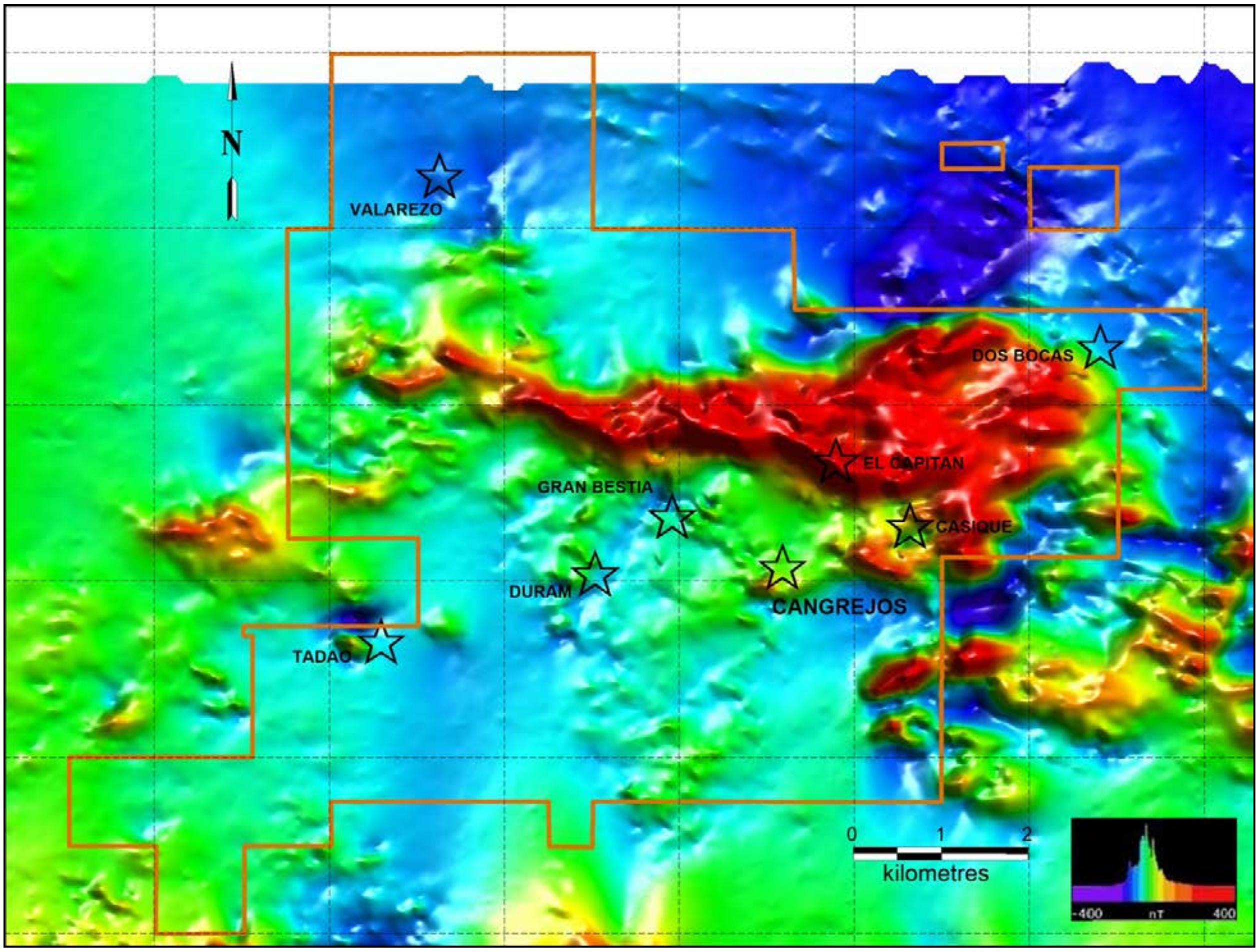
Note: Cangrejos Project is outlined in orange.
Source: Lumina, 2017

FIGURE 9-2: SOIL GEOCHEMISTRY – COPPER

The airborne magnetic survey was used to help define structures. In addition, small circular magnetic highs are interpreted as breccia pipes. The location of exploration targets other than the Cangrejos and Gran Bestia deposits are shown in Figure 9-3 and described in Table 9-1.

Other than diamond drilling, Lumina has not conducted any other exploration on the Cangrejos Project.

Terra Remote Sensing completed a light detection and ranging (Lidar) orthophotographic survey over part of the Project area from February 24, 2019 to March 31, 2019. This helicopter survey covered an area of 76.82 km^2 with a point density of 12 points per m^2 and a 10 cm orthophoto resolution. The purpose of the survey was to provide an accurate digital terrain model (DTM) for the area covering the Cangrejos and Gran Bestia deposits.



Note: Cangrejos Project is outlined in orange.
Source: Encom, 2007; Lumina, 2017

FIGURE 9-3: EXPLORATION TARGETS – CANGREJOS PROJECT – RTP MAGNETICS

TABLE 9-1: UNTESTED EXPLORATION TARGETS – CANGREJOS PROJECT

Target	Geochemistry	Magnetics	Geology
TADAO	Anomalous gold: rocks, soils and local streams	Circular magnetic high	Breccia pipes
DURAM	Anomalous gold, copper: rocks, soils	North-trending series of magnetic highs	Breccia pipes
DOS BOCAS	Anomalous gold, copper: streams, soils, rocks	Several magnetic highs and lows	Unknown
VALAREZO	Anomalous gold, copper, arsenic: rocks, soils	Weak to moderate magnetic anomaly south of the geochemical anomaly	Unknown

Source: Lumina, 2017

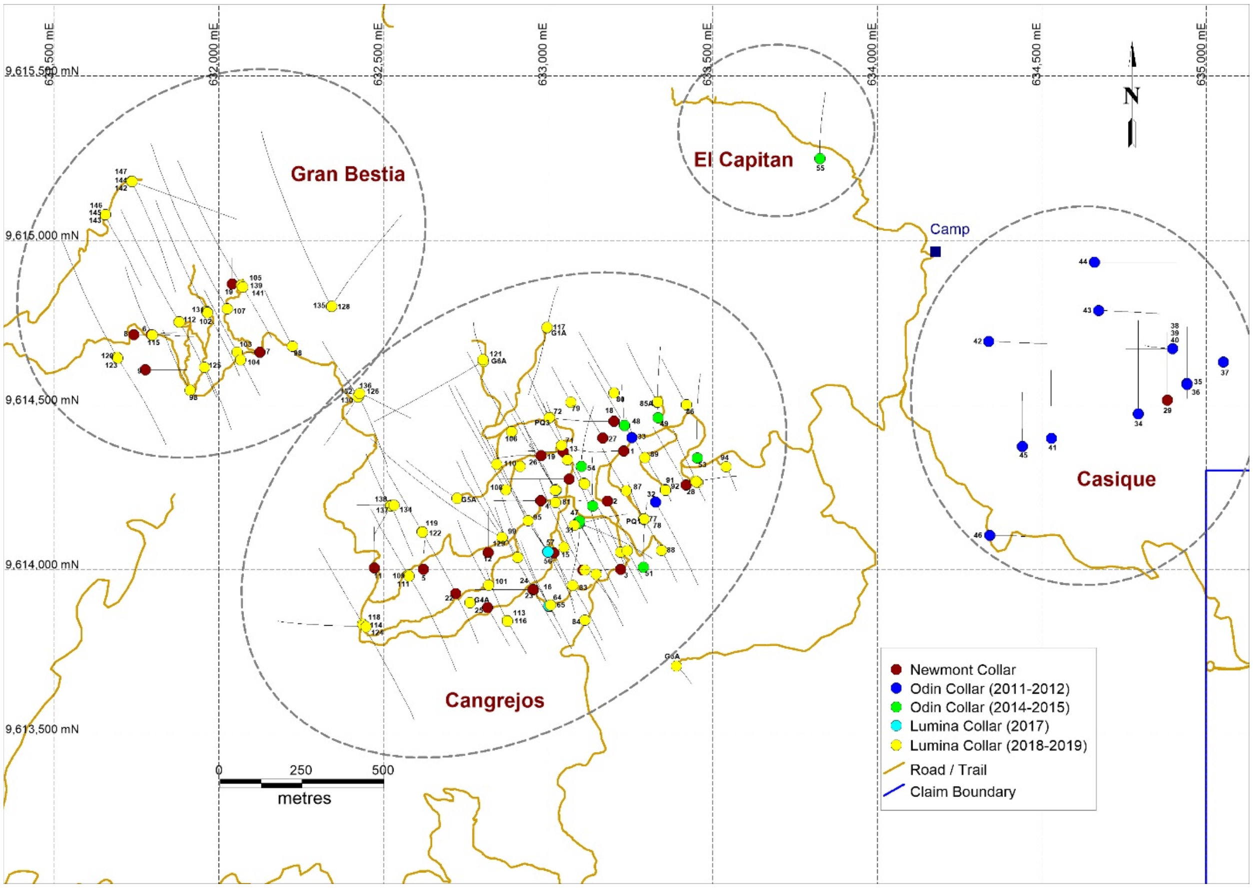
10 DRILLING

Since 1999, a total of 168 holes, totalling 62,553.75 m has been completed on the Project. This is summarized in Table 10-1 and shown in Figure 10-1. Seven additional drill holes totalling 408 m were drilled by Lumina in 2019 for metallurgical and condemnation purposes. These holes were not assayed and have not been used for the resource calculation.

TABLE 10-1: SUMMARY OF DRILLING CANGREJOS PROJECT

Zone	Year	Operator	Number of Holes	Meters
Cangrejos	1999	Odin Mining-Newmont JV	17	4,617.10
	2000	Odin Mining-Newmont JV	6	1,620.30
	2011–2012	Odin Mining	4	1,402.00
	2014	Odin Mining	8	3,188.50
	2017	Lumina	15	7,186.07
	2018–2019	Lumina	72	26,450.85
	TOTAL		122	44,464.82
Gran Bestia	1999	Odin Mining-Newmont JV	5	977.81
	2018–2019	Lumina	26	13,170.84
	TOTAL		31	14,148.65
Casique	2000	Odin Mining-Newmont JV	1	294.00
	2011–2012	Odin Mining	13	3,296.13
	TOTAL		14	3,590.13
El Capitán	2015	Odin Mining	1	350.15
GRAND TOTAL			168	62,553.75

Source: Lumina, 2019



Source: Lumina, 2019

FIGURE 10-1: DRILL COLLAR PLAN MAP CANGREJOS PROJECT

10.1 Drill Programs

Details of the various drill programs are presented in the following sections.

10.1.1 Newmont (1999–2000)

In 1999–2000, Newmont used Connors Perforaciones S.A. to drill 29 HQ holes totalling 7,509.2 m in the northern part of the El Joven Joint Venture area (Potter, 2004).

Drills were mobilized by helicopter and moved between sites by large crews of local workers. Twenty three holes (6,237.4 m) tested the Cangrejos gold-copper porphyry zone; five holes (977.8 m) tested the gold-copper, porphyry-style mineralization at Gran Bestia; and one hole (294 m) tested a gold soil anomaly at Casique.

A Tropari was used to provide down-hole deviation data. This was available for the 1999 drill program but not for the 2000 drill program.

Cangrejos Zone

Hole C99-14 intersected a wide zone of porphyry-style, gold-copper mineralization associated with the soil anomalies (Hole C99-14: 1.57 g/t Au, 0.19% Cu over a core length of 192 m; this may not represent the true width of the zone because additional drilling is required to determine the exact geometry of the mineralized zone) (Odin Mining, Dec. 1999).

Additional drilling delineated two sub-parallel northeasterly trending zones: Trinchera (southern zone) and Paloma (northern zone). These zones appear to have steep to sub-vertical dips. The Newmont drilling indicated that the mineralized zones have a lateral extent of 850 m, horizontal widths ranging from 100 m to 250 m and extend to depths of approximately 250 m.

Gran Bestia Zone

Five holes tested a gold-copper soil anomaly in the Gran Bestia area, approximately 1.2 km northwest of the Cangrejos Zone. All holes intersected wide zones of low-grade, gold mineralization associated with intrusive breccias containing fragments of diorite, porphyritic diorite, and quartz diorite. The rocks exhibit silica-chlorite alteration with patchy biotite, albite, and silica overprints. Sulfide mineralization consisting of pyrite, chalcopyrite, and traces of molybdenite occurs in quartz veins and as disseminations. Overall, sulfide content is low (<5%). Hole C99-06 returned values of 1.19 g/t Au over 132 m (based on a 1 g/t Au cut-off) (Odin Mining, September 1999). Due to the widely spaced drilling, the true width of this mineralization is unknown, and additional drilling is required to determine the exact geometry of the mineralized zone.

Casique

One hole (C00-29) tested a gold soil anomaly in the Casique area. A 22-m wide zone with 2.56 g/t Au is associated with a silicified fracture or fault zone (Potter, 2010).

10.1.2 Odin Mining (2011–2012)

In 2011 and 2012, Odin Mining used Terranova Drilling S.A.C. to drill 17 HQ holes on the Cangrejos Project. A Hydracore 2000 drill was used and drill moves were completed using a small tractor. A Reflex EZ-SHOT™ was used to provide down-hole deviation data.

Four holes (1,402 m) tested the extent of the Cangrejos Zone and the remaining 13 holes (3,296.13 m) tested a gold soil anomaly in the Casique area. The mineralization at Casique is confined to relatively narrow, discontinuous zones related to silicified diorite, hydrothermal breccias, faults, or fracture zones.

Significant results from this drill program have been included in several press releases (Odin Mining; January 2012, April 2012, June 2012). Highlights include the following holes:

- C12-37: 8.96 g/t Au, 0.23% Cu over 6 m
- C12-39: 2.55 g/t Au, 0.18% Cu over 18 m
- C12-40: 1.65 g/t Au, 0.08% Cu over 24 m
- C12-45: 14.2 g/t Au, 0.24% Cu over 2 m

10.1.3 Odin Mining (2014–2015)

In 2014 and early 2015, Odin Mining used Hubbard Perforaciones S.A. (Hubbard) to complete nine HTW (HQ) drill holes (3,538.65 m) on the Cangrejos Project. A Hydracore 2000 drill was used and drill moves were completed using a small tractor. A Reflex EZ-SHOT™ was used to provide down-hole orientation data at 50-m intervals.

Eight holes (3,188.5 m) tested the lateral and down-dip extent of the Cangrejos Zone and confirmed the grade as previously defined by Newmont (Odin Mining, 2015). In addition, one hole (350.15 m) tested the El Capitán copper-molybdenum soil anomaly. It intersected unaltered granodiorite with thin andesite dikes and intrusive breccia zones. No significant mineralization was present.

10.1.4 Lumina (2017)

In 2017, Lumina used Hubbard to complete 15 HTW (HQ) drill holes (7,186.1 m) on the Cangrejos Zone. A Hydracore 2000 drill was used and drill moves were completed using a small tractor. A Reflex EZ-SHOT™ was used to provide down-hole orientation data at 50 m intervals.

This drilling discovered a zone of higher grade gold-copper mineralization associated with hydrothermal breccias which occurs at depth below the resource pit used for the November 2017 Mineral Resources estimate (Sim and Davis, 2017).

10.1.5 Lumina (2018–2019)

In 2018 and 2019, Lumina continued to use Hubbard to complete 63 HTW (HQ) drill holes (26,457.31 m) on the Project. Two Hydracore 2000 drills were used and drill moves were completed using a small tractor. A Reflex EZ-SHOT™ was used to provide down-hole orientation data at 50-m intervals. In February 2019, two more Hydracore 2000 drills owned by Rumi Drilling Company (Rumi) were mobilized to the Project. Rumi completed 35 HQ drill holes (13,164.38 m) on the Project. It used a small tractor to make drill moves. A Reflex EZ-SHOT™ was used to provide down-hole orientation data at 50 m intervals.

A total of 72 holes (26,450.85 m) were completed on the Cangrejos Zone. This included infill resource holes (52 holes; 21,129.77 m) that have been used for the updated Mineral Resources estimate contained in this Report, geotechnical holes (11 holes; 4,590.25 m), metallurgical holes (four holes; 585.0 m), and condemnation holes in areas of planned infrastructure (five holes; 145.83 m).

Wide-spaced drilling (26 holes; 13,170.84 m) was completed at Gran Bestia to assess the significance of this mineralized zone and provide an initial Mineral Resources estimate.

10.2 Drill Collar Coordinates

Drill hole collars were initially located using a hand-held Garmin GPS. Since 2017, all of the holes at the Cangrejos and Gran Bestia deposits have been surveyed by a local contractor, Victor Tobar. He used a Trimble differential GPS and base station which is accurate to 0.005 m horizontal and 0.010 m vertical.

10.3 Diamond Drill Core Logging Procedures

There is no documentation for the logging procedures used in Odin's 2011–2012 drill program. However, except for the introduction of geotechnical logging during the 2014–2015 drill program, procedures were similar to what is currently in place.

With respect to both the Odin and Lumina drill programs, drill core was logged in the core logging facility located at the Cangrejos exploration camp. Upon receipt from the drill, Lumina field assistants checked the depth and recorded the "FROM_TO" intervals on the outside of the core box. Photos were taken of both dry and wet core. Lumina geologists then examined the core and prepared geotechnical and geological logs. The geotechnical log includes rock quality data (RQD), core recovery, fracture and vein quantity, and vein angles. Point-load tests were taken at 5-m intervals and density measurements were taken at 10-m intervals. For the 2017 and 2018–2019 drill programs, every tenth density sample was shipped to ALS Labs in Lima, Peru for a second density measurement using paraffin-coated samples.

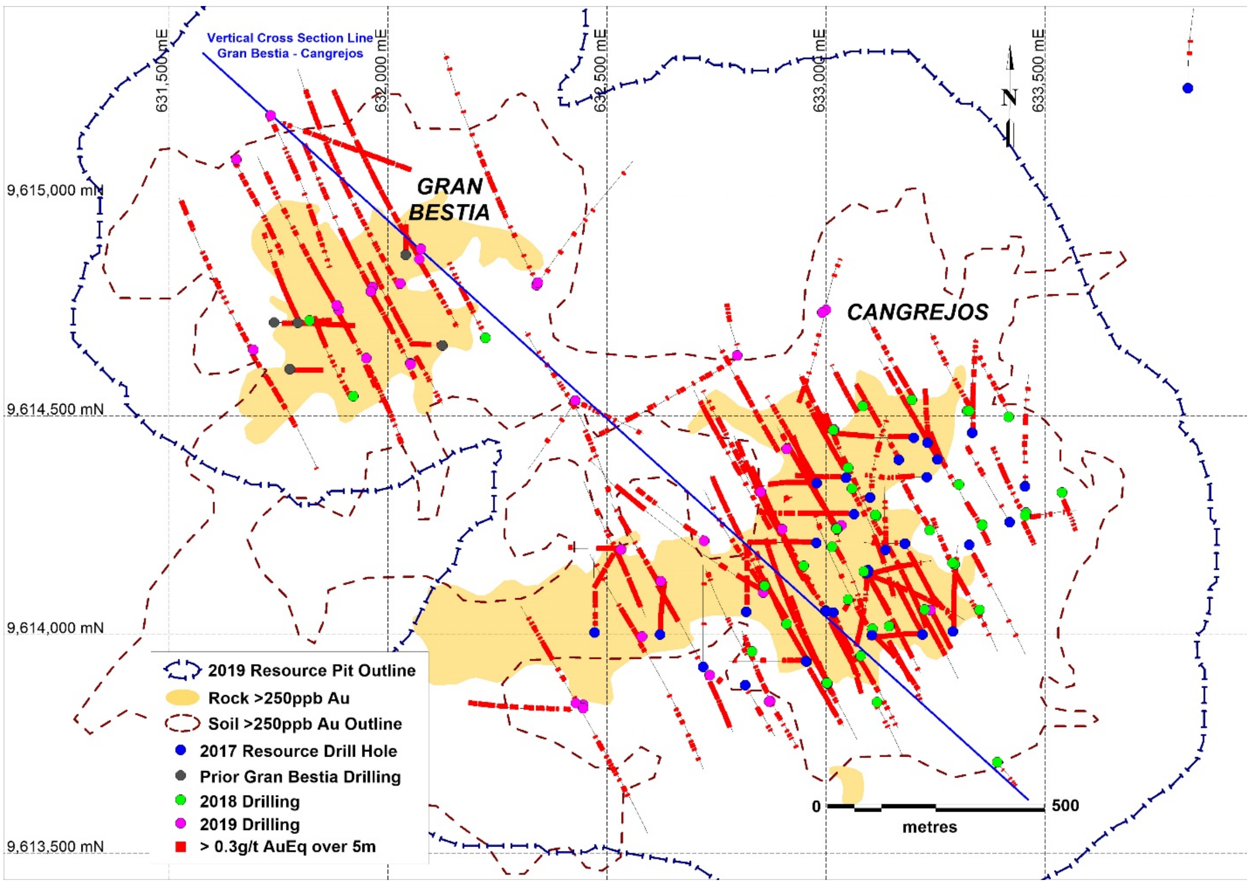
All drill data from the Newmont (1999–2000), Odin (2011–2012), (2014–2015), and Lumina (2017 to March 2018) drill programs were compiled in Excel® spreadsheets. In March 2018, Lumina purchased the GeoSpark ACCESS®-based database management system. All previous drill data were imported into GeoSpark. Since March 2018, drill data have been entered directly into GeoSpark's core logging form which includes data validation and pick lists for collar information, down-hole surveys, lithology, alteration, mineralization and geotechnical information. Assay sample numbers and intervals were also entered in the field, and, when assay data were received from the lab, they were imported directly into the GeoSpark database.

10.4 Drill Core Storage

All drill core from the Cangrejos Project is stored in a dry, secure building at Lumina's field camp, located at the Project. The drill core from the 1999 drill program on the Cangrejos 20 concession is stored in Machala at a warehouse owned by the previous concession owner.

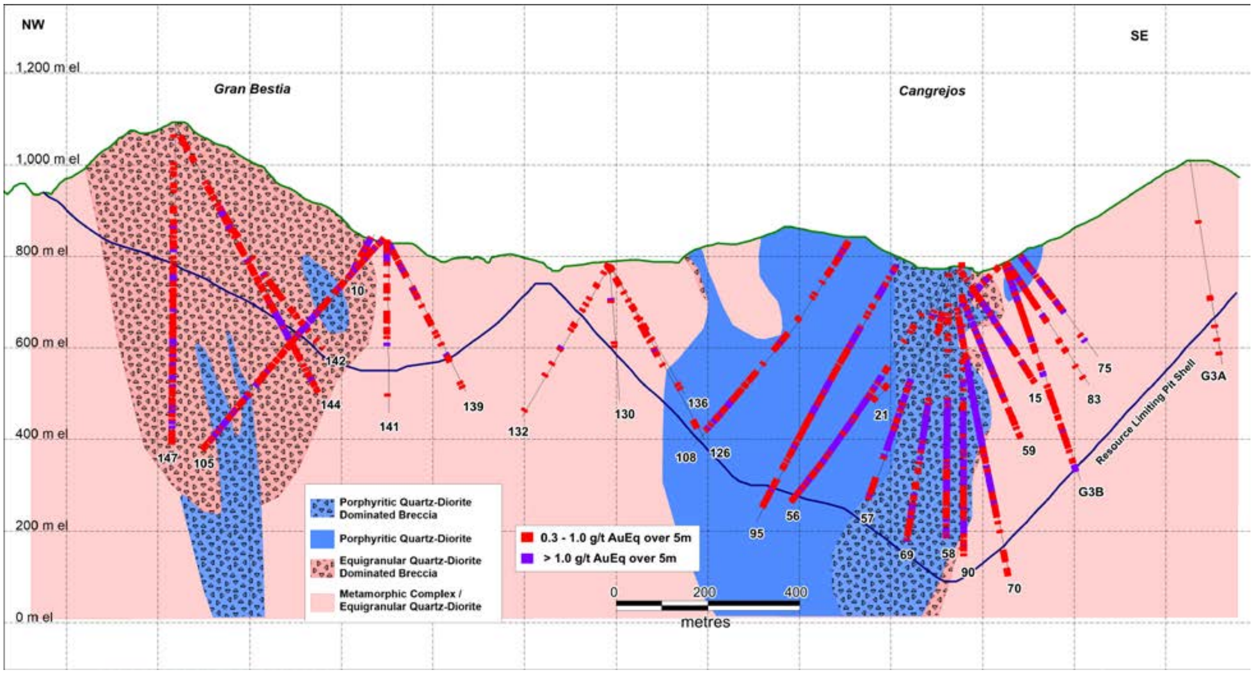
10.5 Summary of Drill Results

Drilling at the Cangrejos Project has defined two zones of porphyry-style gold-copper mineralization. The Cangrejos Zone has dimensions of 1,000 m by 70 m to 600 m and has been tested to depths of at least 600 m. It is open to the west and at depth. The Gran Bestia Zone is located approximately 700 m northwest of Cangrejos (Figure 10-2). It has dimensions of 700 m by 600 m and has a vertical extent of 200 m in the south to at least 700 m in the north. Figure 10-3 is a vertical cross section showing the relationship of the two mineralized zones. Gran Bestia remains open to the north, west, and at depth.



Source: Lumina, 2019

FIGURE 10-2: PLAN MAP – CANGREJOS, GRAN BESTIA



Source: Lumina, 2019

FIGURE 10-3: VERTICAL CROSS SECTION – GRAN BESTIA TO CANGREJOS

10.6 Qualified Person's Opinion on Drilling Procedures

In the QPs' opinion, the core handling, logging, sampling, and core storage protocols in place on the Cangrejos Project meet or exceed common industry standards, and the QPs are not aware of any drilling, sampling, or recovery factors that could materially impact the accuracy and reliability of these results.

11 SAMPLING PREPARATION, ANALYSES, AND SECURITY

11.1 Drill Hole Sampling

Drill hole sampling, analytical, QA/QC, and security procedures for each of the drilling phases is described in the following sections.

11.1.1 Newmont Drilling (1999–2000)

Mayor and Soria (2000) and Potter (2004, 2010) describe the sampling procedures used by Newmont. The core was cut in half using a diamond saw and 2-m samples were sent to Bondar Clegg (now ALS Chemex) for sample preparation in Quito, Ecuador and analysis in Vancouver, Canada. Pulps were analyzed for gold using a fire assay procedure with an atomic absorption (AA) finish using a 30 g charge. Samples with Au > 0.5 g/t were analyzed for copper, lead, zinc, molybdenum, and silver by atomic absorption after a 4-acid digestion.

Newmont also selected some samples for "blaster" gold analysis. This method is similar to conducting a screen metallic gold assay where the coarse (+150 mesh) and fine (-150 mesh) fractions are analyzed for gold. This method tests for coarse gold. The results from the fire assay and "blaster" analyses were similar, which suggests that, if coarse gold exists, it is not being liberated in the sample preparation process.

Newmont inserted its own standards every 25 samples to control the analytical quality.

There is no record of any special measures taken to monitor the security of the samples during their transportation to the preparation lab in Quito.

Rejects and pulps from this drill program were stored in a house in Santa Rosa, but most of this material was damaged and is no longer available.

11.1.2 Odin Mining Drilling (2011–2012)

Section 11.1.4 (Lumina Drilling) describes core handling procedures that were similar to those used during Odin's 2011–2012 drill program.

Drill core samples from the 2011–2012 drill program were assayed by Acme Labs (now Bureau Veritas) in Vancouver. Samples were prepared at LAC y Asociados Cia. Ltda. (LAC), which has ISO 9001:2008 accreditation and is Acme Labs' preparation lab in Cuenca, Ecuador. Pulps were sent to Acme Labs in Vancouver for analysis. All samples were analyzed for gold using a fire assay technique using a 30 g charge. In addition, a 35-element ICP analysis was done using a 4-acid digestion.

QA/QC samples were inserted on a random basis, but, generally, insertion averaged every 10 samples. These included six certified standards, a blank, and duplicate samples.

During this drill program, 2,563 samples were analyzed: 83 were blanks, 75 were certified reference material, 74 were duplicates, and 2,331 were core samples.

Remaining reject and pulp material from the 2011–2012 drill program was returned to Odin and stored in a secure warehouse located in Quito.

11.1.3 Odin Mining Drilling (2014–2015)

Section 11.1.4 (Lumina Drilling) describes core handling procedures that were similar to those used during Odin's 2014–2015 drill program.

Drill core samples from the 2014–2015 drill program were assayed by Acme Labs (now Bureau Veritas) in Vancouver. Sample shipments were picked up by a representative from LAC and delivered to its lab in Cuenca where the samples were processed. Approximately 250 g of pulverized material was shipped for analysis at Acme Labs. Certified reference standards, purchased from CDN Resource Laboratories Ltd., were hand-delivered to Acme Labs and inserted into each sample batch. All samples were analyzed for gold using a fire assay technique using a 30 g charge. In addition, a 35-element ICP analysis was done using a 4-acid digestion.

Remaining reject and pulp material from the 2014–2015 drill program was returned to Odin and is stored in a secure warehouse located in Quito.

11.1.4 Lumina Drilling (2017–2019)

The core handling and sample procedures described here were used for Lumina's 2017 and 2018–2019 drill programs and all previous drill campaigns by Odin.

The drillers placed the HQ drill core in plastic boxes (four rows; total approximately 2.5 m per box). Wooden tags marked with the down-hole depth were placed in the box. Lids were placed on the box and taped shut. The core was then transported by tractor to the nearest road and then trucked to Lumina's core facility at the Cangrejos Project exploration camp. Upon receipt, Lumina field assistants checked the depth and recorded the "FROM_TO" intervals on the outside of the box. Photos were taken of both dry and wet core. Lumina geologists then examined the core and prepared geotechnical and geological logs.

The geologist marked up samples at 2-m intervals and the core was cut in half using a diamond saw. For each 2-m sample, half the core was put into a plastic bag, and the other half was returned to the plastic box and stored on site. Bar-coded sample tags were included in each sample bag and a duplicate sample tag was stapled into the core box. Sample bags were secured with a tamper-proof plastic tag and put into larger mesh sacks which were also tied with a numbered, tamper-proof nylon tie.

These large sample sacks were driven to a secure warehouse in Santa Rosa. When a large batch of samples accumulated in the warehouse or a drill hole was complete, a representative from Carlos Puig & Asociados S.A. (ALS Labs' preparation lab in Quito, Ecuador) picked up the samples from the secure warehouse and drove them directly to the preparation lab in Quito. The secure, tamper-proof plastic tag was checked against a list emailed to the lab. Note: No irregularities were detected in any sample shipment. The samples were then crushed and pulverized. From September 2018 onwards, samples were sent to ALS Corplabec S.A. which is ALS Lab's new preparation lab in Quito.

The core samples were crushed to 70% passing minus 2 mm (ALS procedure CRU-31); a 1 kg sub-sample was split from the crushed material using a riffle splitter and pulverized to 85% passing 75 microns (ALS procedure PLU-32).

For each sample, approximately 250 g of pulverized material was split and placed in a kraft paper bag and shipped to ALS, Lima, Peru for analysis. All samples were analyzed for gold using a fire assay technique using a 30 g charge and atomic absorption spectroscopy (AAS) finish. In addition, a 33-element ICP analysis was done using a 4-acid digestion.

QA/QC samples were inserted after every eight core samples. These include three certified standards (high, medium, and low gold grades) and a coarse blank, fine blank, coarse duplicate, and fine duplicate.

Remaining reject and pulp material from the 2017–2019 drill programs has been returned to Lumina and is stored in a dry secure warehouse in Quito.

11.2 Quality Assurance and Quality Control

A review of the QA/QC protocols was conducted prior to drilling and formalized in a detailed QA/QC manual developed by Lumina. Each drilling phase was reviewed by a QP who was on site during the drill program. The procedures for core processing and the insertion of blanks and standards were examined. The QA/QC program was conducted in accordance with industry best practice.

No quality control issues were discovered with the Odin (2011–2012) and Newmont (1999–2000) drill programs.

During the 2014–2015 drill program, 2,139 samples were analyzed: 60 blanks, 60 certified reference material, 60 coarse duplicates, 59 fine duplicates, and 1,900 drill core samples. After each batch of analytical results came in, the QA/QC samples were reviewed by an Odin geologist. Odin's QA/QC consultant also reviewed the data on a regular basis.

QA/QC monitoring of the gold assays from Odin's 2014–2015 drill program indicated that the gold assays were apparently biased consistently high. Based on the Odin QA/QC consultant's recommendation, any sample with > 0.1 g/t Au was re-assayed at a second lab. This resulted in 1,215 samples being re-assayed at the ALS Chemex laboratory in Lima, Peru. The re-assayed results replaced the original assays in the Project database.

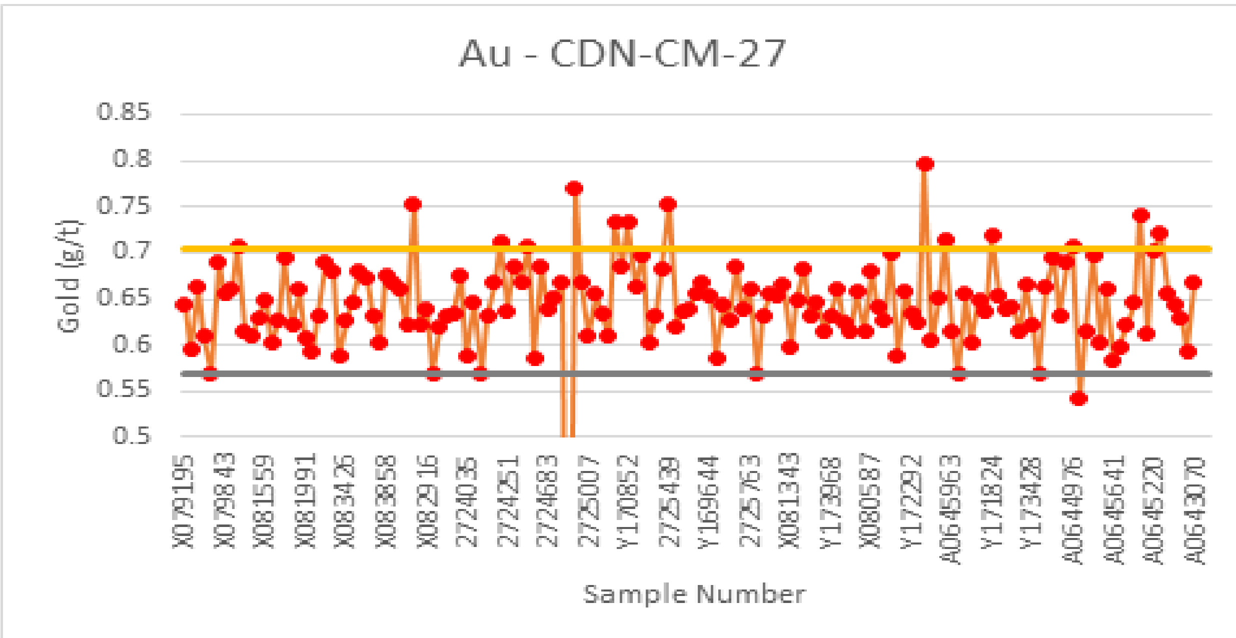
During the 2017 drill program, 4,036 samples were analyzed: 112 blanks, 114 certified reference materials, 112 coarse duplicates, 112 fine duplicates, and 3,586 drill core samples. After each batch of analytical results was released by the lab, the QA/QC samples were reviewed by a Lumina geologist. Lumina's QA/QC consultant also reviewed these data.

Lumina's QA/QC consultant indicated that the results from the 2017 drill program were acceptable and no further action was required.

During the 2018–2019 drill program, 22,036 samples were analyzed: 615 blanks, 619 certified reference materials, 611 coarse duplicates, 612 fine duplicates, and 19,579 drill core samples.

After each batch of analytical results was released by the lab, the QA/QC samples were reviewed by a Lumina geologist. Lumina's QA/QC consultant also reviewed these data.

Two of the CDN standards used in the 2018–2019 drill program were suspected of being more heterogeneous than certified and have been replaced. All other standards performed adequately. Figure 11-1 shows an example of a control chart for gold in standard CM-27. The failure rate for CM-27 is approximately 7%.

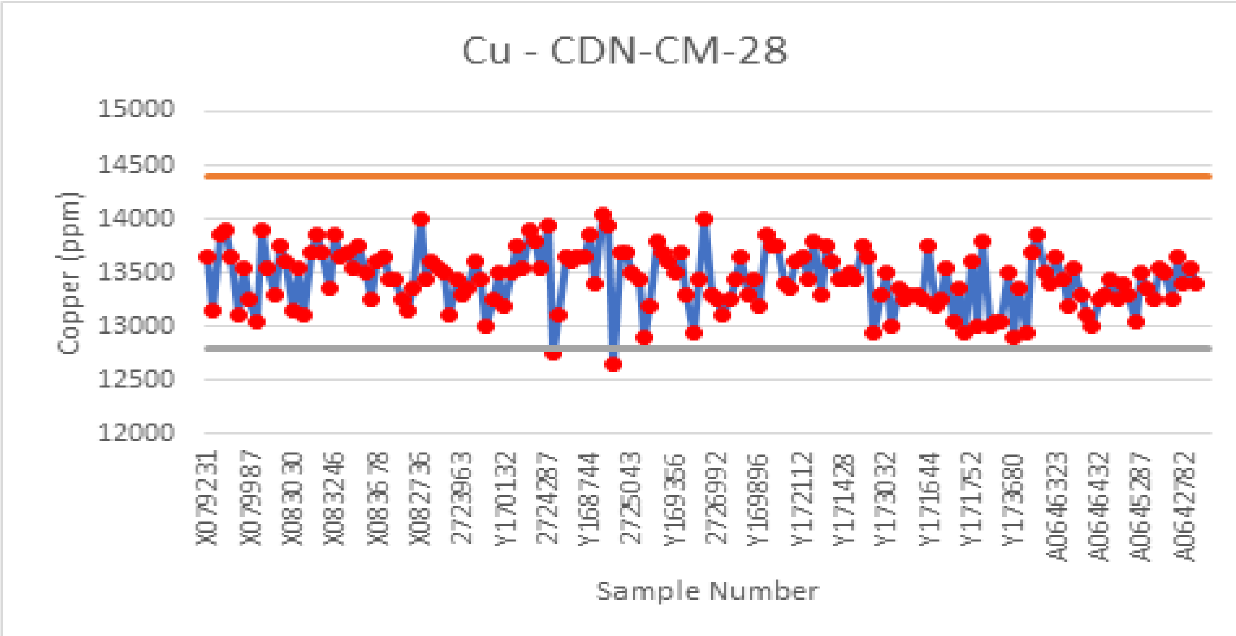


Source: Lumina, 2019

FIGURE 11-1: AU G/T FOR CDN-CM-27

All failures trigger the assaying of duplicates for three samples immediately before and after the standard failure. The duplicates were submitted for assay, including another sample of the same standard that failed. Averages of the original and duplicate sets were never more than 2% different and the original assays were, therefore, accepted.

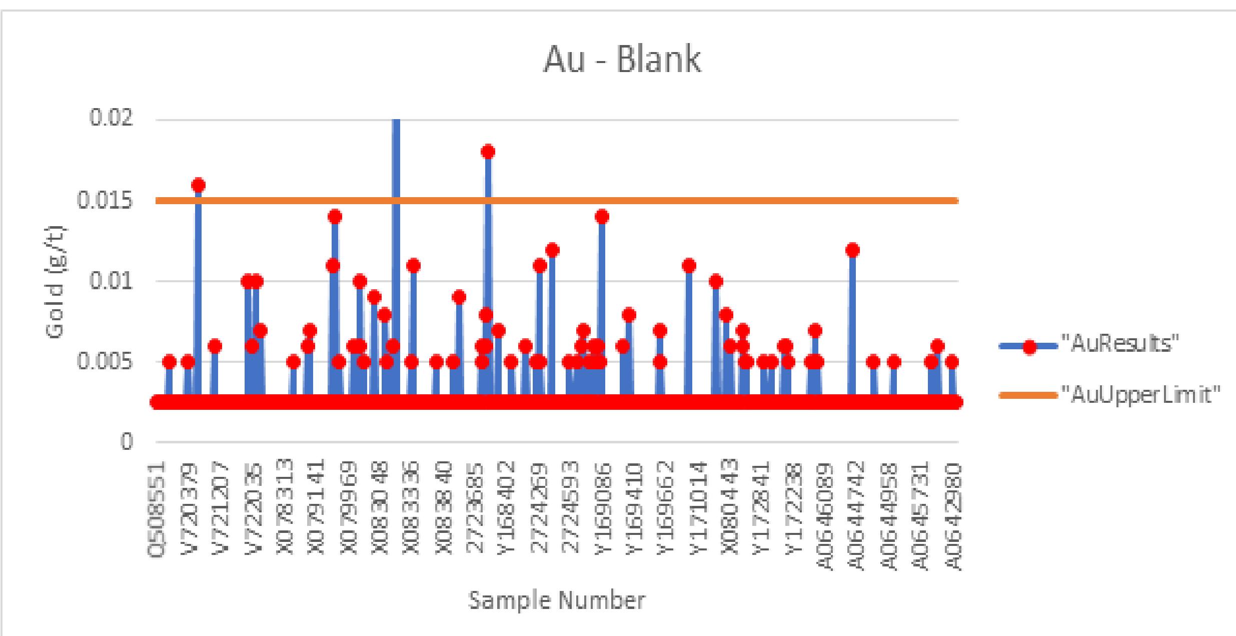
All standards, including CM-28 and CM-43, performed well for copper with failure rates well below 10%. An example of a control chart for CM-28 is shown in Figure 11-2.



Source: Lumina, 2019

FIGURE 11-2: CU PPM FOR CDN-CM-28

The control limit for gold in sample blanks is 0.015 g/t (3 times the detection limit of 0.005 g/t). There are very few failures as shown in Figure 11-3. All failures were investigated by assaying duplicates and more blank material. No abnormalities in the preparation or assay processes were identified.



Source: Lumina, 2019

FIGURE 11-3: AU G/T - BLANK

Lumina's QA/QC consultant and the QP indicated that the results from the 2018–2019 drill program were acceptable and no further action was required.

11.3 Qualified Person's Opinion on Sample Preparation, Analytical and Security Procedures

In the QPs' opinion, the security, sampling, and analytical procedures are appropriate and consistent with common industry practice. The laboratories are recognized, accredited commercial assayers which are independent from Lumina and previous operators. Lumina analyzed its samples at ALS Chemex in Lima, Peru which has ISO/IEC 17025:2005 accreditation. Odin (2011–2012) used Acme Labs (now Bureau Veritas) in Santiago, Chile which had an ISO 9001:2000 accreditation at the time the work was done. Newmont/Odin (1999–2000) used Bondar Clegg (now ALS Chemex) which has an ISO/IEC 17025:2017 accreditation.

The sampling has been carried out by trained technical staff under the supervision of a QP and in a manner that meets or exceeds common industry standards. Samples are properly identified and transported in a secure manner from site to the lab.

A sample bias in the gold assays was identified by the QPs during the review of the drill data and assays for the 2014–2015 drill program. This bias was corrected. There were no significant issues with the assays from the other drill programs.

12 DATA VERIFICATION

12.1 Database Validation

12.1.1 Collar Coordinate Validation

All drill collars at the Cangrejos and Gran Bestia deposits have been surveyed using a Trimble differential GPS and base station. Collar elevation data are validated by comparing surveyed elevations with the LIDAR digital elevation model (DEM). Most elevation differences in the collars were less than one meter.

12.1.2 Down-hole Survey Validation

The down-hole survey data were validated by identifying any large discrepancies between sequential dip and azimuth readings. No significant discrepancies were found**.**

12.1.3 Assay Verification

All the collars, surveys, geology, and assays were exported from GeoSpark into Excel® files which were then imported into MinePlan® software. No identical sample identifications exist; all FROM_TO data are either zero or a positive value; and, no interval exceeds the total depth of its hole.

To validate the data, the following checks were confirmed:

- The maximum depth of a sample was checked against the depth of the hole.
- The less-than-the-detection-limit values were converted into a positive number equal to one-half the detection limit.
- All gold values greater than 0.1 g/t from each drill hole were checked against the original assay certificate. No errors were found.

The core recovery for the 2018–2019 drill program averaged just over 95%. There is no indication that grade is related to core recovery.

12.2 Geological Data Verification and Interpretation

Several geological variables were captured during core logging. The geological data were verified by confirming that the geological designations were correct in each sample interval. This process included the following:

- Examine FROM_TO intervals for gaps, overlaps, and duplicated intervals.
- Look for collar and sample identification mismatches.
- Verify correct geological codes.

A geological legend was provided and it was used to compare the values logged in the database. The geological model was found to be reasonable and adequate for use.

12.3 Conclusion

Inspection of the drill core during the site visit and validation of the collected data indicate that the drill data are adequate for interpretation.

In the QPs' opinion, the database management, validation, and assay QA/QC protocols are consistent with common industry practices. Therefore, the database is acceptable for use in this Report.

13 MINERAL PROCESSING AND METALLURGICAL TESTING

13.1 Introduction

Metallurgical testing programs were performed by NMS of Englewood, Colorado, USA in 1999, and by Plenge, FLSmidth Minerals Testing and Research Center (FLS Testing) of Salt Lake City, Utah, USA, FLSmidth USA, Inc. Ore Characterization & Process Mineralogy Labs (FLS Mineralogy), also of Salt Lake City, Utah USA, and Pocock Industrial, Inc. (Pocock) of Salt Lake City, Utah USA between 2015 and January 2020.

Laboratory reports reviewed for this report include:

- Metallurgical Study for Cangrejos (Ecuador) Ores – Progress Report 1 – NMS Project No. 11802 (NMS, 1999)
- Metallurgical Study for Cangrejos (Ecuador) Ores – Progress Report 2 – NMS Project No. 11802, (NMS, 1999)
- Cangrejos Project, Progress Report, (Plenge, 2015)
- Comminution, Head Assays and XRD, (Plenge, 2018a)
- Saprolite, Sap-Rock and Oxide Screening Tests, Gravity, Cyanidation and Flotation, (Plenge, 2018b)
- Comminution, Gravity, Cyanidation and Flotation, (Plenge, 2018c)
- Primary Optimization and Variability; Oxide and Saprock Progress Report, (Plenge, 2019)
- HPGR and Comminution Suite, (Rucci, 2019)
- Lumina Gold Cangrejos Mineralogy, (Zahn, 2019)
- Cangrejos and Gran Bestia Deposits, Variability and Flotation Piloting Progress Report, (Plenge, 2020)
- Sample Characterization & PSA, Flocculant Screening, Gravity Sedimentation, Pulp Rheology and Pressure Filtration Studies, (Pocock, 2020)

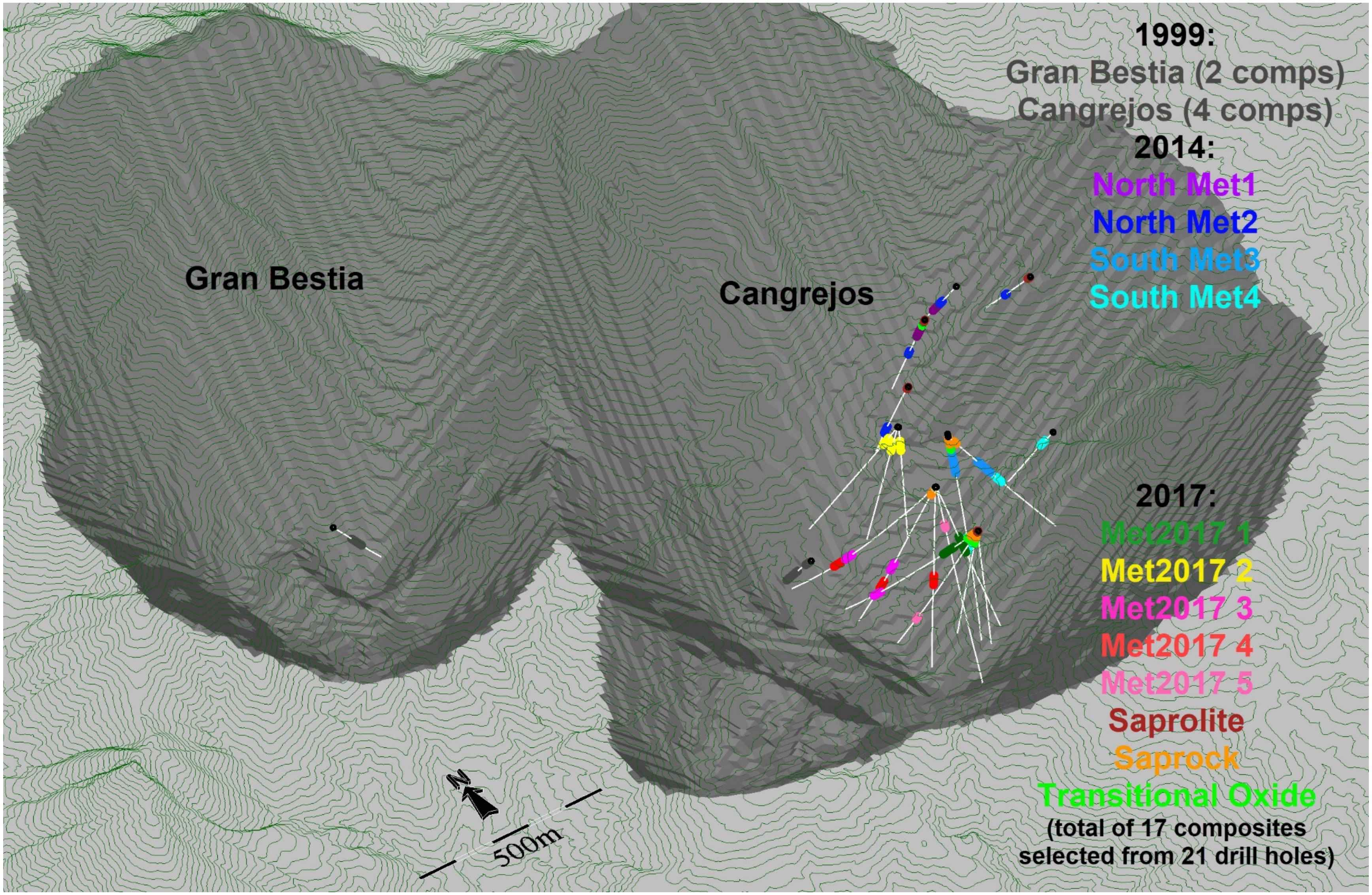
13.2 Metallurgical Samples

Samples for the Plenge metallurgical test programs completed to date were obtained from 60 drill holes representing various rock types, alterations, lithologies, metal concentrations, and locations within the current Cangrejos and Gran Bestia pit areas. In the opinion of the QP, the test samples are considered representative of the various types and styles of mineralization found in the deposits.

Figures 13-1 and 13-2 show isometric views of all the metallurgical drill holes in relation to the potential pits.

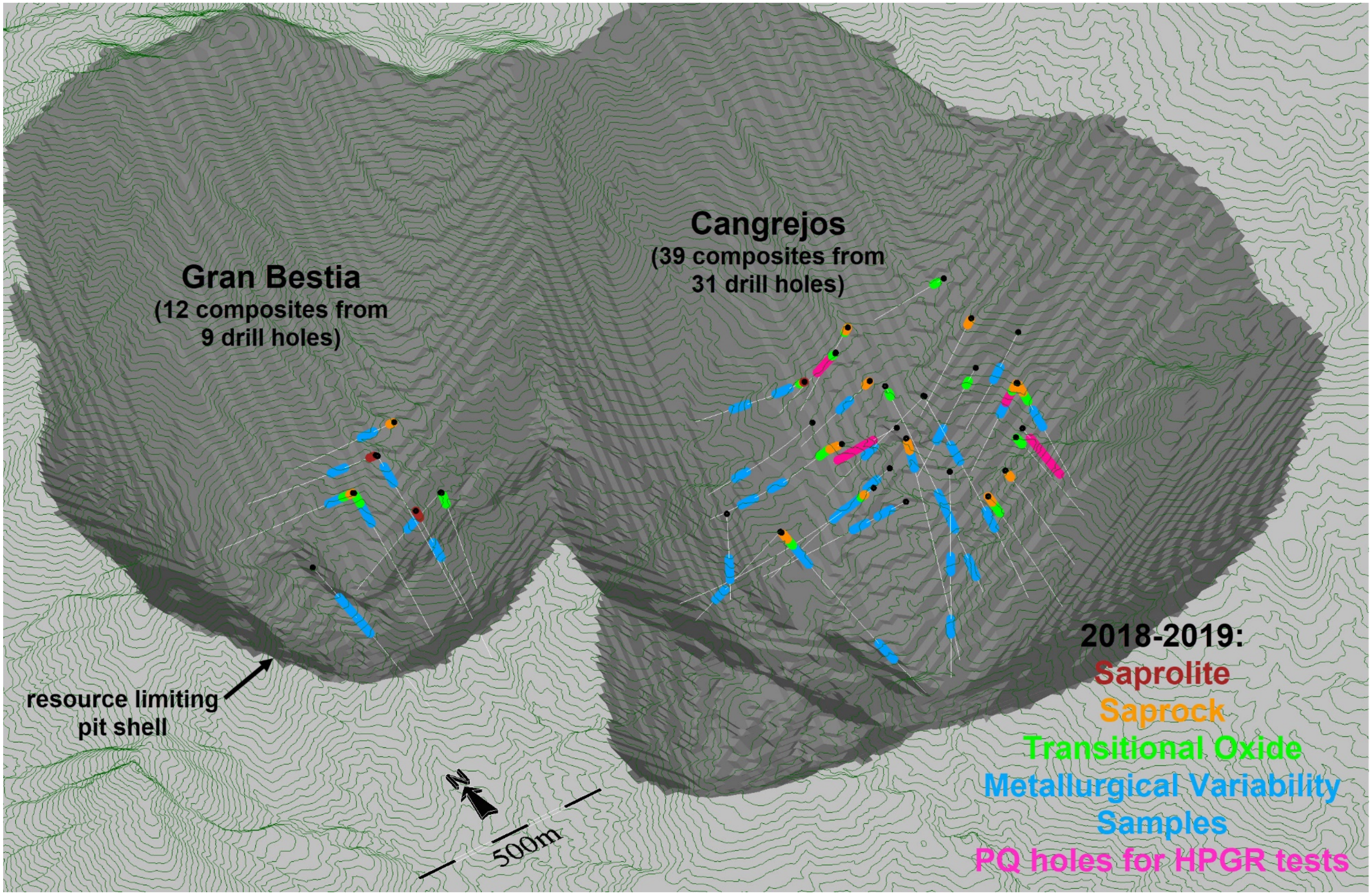
The predominant lithologies (e.g., rock types) identified by Lumina are:

- Hydrothermal or Intrusive Breccia (BX)
- Equigranular Quartz Diorite (EQD), also as Schistose (SCH) EQD or Foliated Quartz Diorite (FQD)
- Porphyritic Quartz Diorite (PQD) or Porphyritic Diorite (POR)



Source: SIM Geological, 2020

FIGURE 13-1: ISOMETRIC VIEW OF THE METALLURGICAL DRILL HOLES IN RELATION TO THE POTENTIAL PIT (1999–2017)



Source: SIM Geological, 2020

FIGURE 13-2: ISOMETRIC VIEW OF THE METALLURGICAL DRILL HOLES IN RELATION TO THE POTENTIAL PIT (2018–2019)

13.3 Metallurgical Testing

Detailed descriptions of the historical metallurgical testing programs are available in the 2019 Technical Report (Sim, Davis, and King, 2019). The information in this report is focused on metallurgical data and information that became available after that report was published and the information that is used as the basis of this PEA.

Plenge performed testing from 2015 through December 2019 using 68 composite samples that were prepared from 60 diamond drill holes. Plenge test results are summarized as follows:

- Comminution tests indicate that the fresh rock and partially oxidized samples are hard and moderately abrasive with the Bond ball mill work index (BWi) ranging from 13 kWh/t to 17 kWh/t, abrasion indices averaging 0.26 g, JK specific energy values averaging 12 kWh/t and JK A×b values averaging approximately 26. Saprolitic samples are softer and have a BWi ranging from 5 kWh/t to 12 kWh/t.
- In 2017, gravity concentration tests on the fresh rock master composite indicated that 37% of the gold and 9% of the silver were recovered into a gravity gold concentrate that assayed 143 g/t gold. An average of 17% of the gold was recovered by gravity concentration from the saprolite, saprock, and partially oxidized materials.
- In 2019, gravity concentration tests on a lower-grade master composite of fresh rock recovered 24% of the gold and 17% of the silver into a concentrate that assayed 74 g/t Au.
- In 2017, locked-cycle flotation testing of fresh rock gravity tailings produced a bulk gold-copper-molybdenum concentrate that assayed 21% copper. Copper, gold, and molybdenum recoveries in the concentrate were 86%, 43%, and 65%, respectively. Overall gold recovery for this test (gravity plus flotation) was 82%.
- In 2019, locked-cycle flotation testing using a low-grade sulfur and copper fresh rock composite, without prior gravity concentration, produced a bulk gold-copper-molybdenum concentrate that assayed 21.5% copper. Copper, gold and molybdenum recoveries in the concentrate were 87%, 73%, and 67%, respectively. Cyanidation of the cleaner scavenger flotation tailings plus a sand flotation concentrate that was produced by flotation of the plus 74-µm size fraction from the rougher flotation tailings recovered an additional 9% of the gold. Overall gold recovery was estimated to be 82%, which is similar to the results achieved during the 2017 test program.
- In late 2019, a continuous mini-pilot flotation plant was operated to separately treat composite samples taken from the Cangrejos and Gran Bestia deposits. The sulfur and copper concentrates recovered from the two large composites were two to three times larger than the flotation concentrates produced from the 2019 locked-cycle test. Bulk flotation concentrate assays averaged 15% copper with copper, gold, and molybdenum recoveries in the final concentrates averaging 86%, 72%, and 49%, respectively. Cyanidation of the bulk cleaner scavenger tailings plus the sand flotation concentrate is estimated to recover an additional 10% of the gold into doré for a total gold recovery of 82%. These results are similar to the results from previous tests.
- In 2015, a separate molybdenum concentrate was produced by flotation from the bulk gold-copper-molybdenum concentrate. The final, cleaned molybdenum concentrate assayed 43% molybdenum at a recovery of 51%.
- Open circuit flotation using four partially oxidized samples resulted in salable concentrate grades that ranged from 15% copper to 22% copper. Based on the test

data, NDK estimates that 80% of the gold and 50% of the copper will be recovered from partially oxidized materials by the flotation plus leaching process.

- Bulk rougher flotation recoveries from three saprock samples in 2019 were 75% for gold and 35% for copper. Cleaner flotation of the saprock did not produce salable flotation concentrates. However, during the 2019 flotation testing, when saprock was blended with fresh rock, gold in saprock reported to copper concentrates and the cleaner flotation tailings where it was recovered by cyanide leaching. NDK estimates that 75% of the gold, but none of the copper, will be recovered from saprock.
- In 2017, rougher flotation of saprolite materials indicated that gold and copper recoveries were 43% and 32%, respectively, which are similar to the saprock rougher flotation recoveries from that year. A salable copper concentrate was not produced by cleaning. More work is required on saprolite to better determine gold recoveries by the flotation plus leaching process; however, NDK estimates that 75% of the gold will be recovered due to its similar rougher flotation response to that of saprock in 2017.
- Cyanide leaching tests of fresh rock samples recovered 90% of the gold and 45% of the silver. For near-surface rock (partially oxidized, saprock, and saprolite), gold recoveries were similar; however, silver recoveries increased to 84% due to oxidation of sulfide minerals.
- The selected processing flow sheet produces separate gold-copper and molybdenum flotation concentrates and precious metal doré.

Flotation Tests

Bulk rougher flotation tests and cleaner flotation tests were conducted using gravity tailings and tests that did not include gravity concentration. Cleaner flotation tests of the bulk flotation concentrate were also conducted. Finally, in 2014 one copper-molybdenum separation test was conducted.

Mineralogy

Mineralogy was performed by Plenge using X-Ray Diffraction (XRD) Bulk Mineralogy. The majority of the minerals are noted as Quartz, Anorthite, Albite, Actinolite, Chamosite, Labradorite, Kaolinite, Biotite and Andesine. Additional mineralogical examinations were completed by Eagle Engineering in Butte, Montana USA and the FL Smidth (FLS) Ore Characterization & Process Mineralogy Labs in Salt Lake City, Utah USA.

In summary, mineralogical investigations indicate that the fresh rock materials contain copper primarily as chalcopyrite and bornite with minor amounts of chrysocolla. Gold is mostly free or exposed at a 74-µm grind with gravity concentrates containing gold sizes ranging from 30 µm to 40 µm, flotation concentrates contain gold particle sizes of approximately 20 µm, and flotation tailings contain gold particles encapsulated in non-sulfides at approximately 5 µm in size. Refractory gold exists and is locked in pyrite and pyroxene. Copper mineral liberation is approximately 150 µm for 50% liberation and 36 µm for 100% liberation. Copper mineralization in partially oxidized materials is primarily chalcopyrite with minor amounts of bornite and tenorite (copper oxide). Saprock materials contain copper minerals primarily as copper chlorite.

Comminution Tests

In addition to the historical comminution tests that were completed by Plenge, in 2019 the FLS Minerals Testing and Research Center in Salt Lake City, Utah USA performed basic comminution and high pressure grinding roll (HPGR) testing using a sample that was composited from four PQ (i.e., 85 mm diameter) drill holes. The FLS Testing comminution data is provided in Table 13-1.

TABLE 13-1: FLS COMMINUTION TESTING RESULTS

Samples	DWT A*b	UCS psi	CWi kWh/t	Ai g	RWi kWh/t	Feed BWi kWh/t
2019 Master Comp	27.4	20179	10	0.3511	18.1	17.1
2017-2018 Averages	25.8	14286	---	0.2841	17.3	15.5

The HPGR test results were reported "very positive, showing a specific energy of 1.8 kWh/t at a recirculating load of 65% to reduce the material from 16.5 mm to below 1 mm" (Rucci, 2019). A summary of the results from the HPGR Locked Cycle Test are provided in Table 13-2.

TABLE 13-2: SUMMARY OF HPGR LOCKED CYCLE TEST

Value	Units	Pass 1	Pass 2	Pass 3	Pass 4
Total Feed	kg	144.33	144.33	144.33	144.33
% Moisture	%	3.0	3.0	3.0	3.0
Total Dry Feed	kg	140.0	140.0	140.0	140.0
Operating Gap	mm	3.0	3.0	3.0	3.0
Throughput	dmtph	10.96	10.39	10.29	10.08
Specific Throughput (M-dot)	ts/hm3	292.3	277.1	274.4	268.8
Specific Press Force	kN/m2	3490.6	3489.16	3490.07	3492.12
Net Power Draw	kW	20.68	18.81	17.73	18.18
Specific Energy	kWh/dmt	1.89	1.81	1.72	1.8
Total Feed P_{80}	microns	16586	---	---	---
% Oversize +2 mm	%	73.2	73.5	63.3	64.2
Additional Material	kg	35.56	37.93	52.21	51.57
% Undersize -2 mm	%	24.6	26.3	36.2	35.7
Total Undersize Product P_{80}	microns	894	875	916	921

FLS used the results of the comminution tests performed at their laboratory to size the comminution equipment and recommend the comminution circuit configurations. The information provided by FLS was used to complete a comminution trade-off study and as the basis for the process design of the HPGR – ball mills circuit.

Gravity Concentration

Gravity concentration resulted in gold recoveries between approximately 5% and 30% to a mass that is approximately 0.25% of the feed.

Cyanidation Tests

Cyanidation tests were conducted using composite samples and the variability samples that were tested in 2019. In addition intensive cyanide leaching tests were conducted on gravity concentrates, cleaner scavenger tailings, and sand flotation concentrates. The results of these tests were used to complete the process trade-off study and to estimate the metallurgical performance of the processing plant.

Solid Liquid Separation Tests

In addition to sedimentation and filtration tests that were conducted by Plenge, Pocock Industrial performed sedimentation and pressure filtration tests using a combined sample of Cangrejos and Gran Bestia (3:1 weight ratio) tailings, including rougher flotation tailings and detoxified leach residues from the mini-pilot plant tests to provide data needed to size the tailings filtration circuit. Pocock's results and recommendations are as follows:

- P_{80} size of the solids was 80 µm with 46.5% minus 25 µm.
- Recommended flocculant was a medium to high molecular weight seven percent charge density anionic polyacrylamide (AN 905 SH).
- Recommended conventional thickener design criteria includes feed density of 20% to 25% solids by weight, flocculant dosage of 15 g/t to 25 g/t, maximum underflow density of 67% solids by weight, and a design basis of 0.125 m^2/t/d tails.
- Recommended high-rate thickener design criteria includes feed density of 18% to 22% solids by weight, flocculant dosage of 20 g/t to 25 g/t, maximum underflow density of 67% solids by weight, and a design net feed loading rate of 3.67 m^3/ m^2/hr.
- Pressure filtration tests were performed using thickened and diluted tailings slurry for fill times of 0.08 minutes to 0.3 minutes at 552 kPa (80 psi) and air-blowing. The targeted moisture content was 16% by weight in order to minimize the estimated number of filters required. The analysis indicates that there are 89 cycles per 20-hour day required to achieve 40,000 tpd of tailings filtration. This is equivalent to eight recessed plate and frame pressure filters fitted with 168 plates, each with 2.5 m x 2.5 m x 60 mm plate chamber openings for a plant processing 40,000 tpd.

Flotation Concentrate Assays

Assays of the gold-copper flotation concentrate show that the samples from Cangrejos are clean and did not contain elements that are subject to smelter penalties. The molybdenum concentrate contained elevated levels of copper that potentially affect the payment terms.

Process Development and Flowsheet Design

The testing completed by Plenge focused on selection of an appropriate process flowsheet and optimization of the processes. The 2018 flowsheet included semi-autogenous grinding and ball milling as the comminution circuit because the preliminary comminution data indicated that was the preferred flowsheet. Similarly, the 2018 flowsheet included a gravity concentration circuit and no cyanide leaching. During the 2019 test program, comminution testing conducted by FLS using samples taken from PQ holes demonstated that HPGR and ball milling resulted in a more economic comminution process from both capital and operating cost perspectives. Also, flotation testing of samples taken from the western side of the Cangrejos deposit and from Gran Bestia had lower concentrations of gold and sulfide sulfur which resulted in lower recoveries of gold to the flotation concentrate. As a result sand flotation of the rougher flotation tailings was tested and cyanide leaching tests were conducted on bulk cleaner scavenger tailings plus the sand flotation concentrate in order to improve the overall gold recovery. These tests proved successful and the carbon-in-leach circuit was added to the process flowsheet. For the current flowsheet, gravity concentration was also removed due to inconsistent results in the tests and the large mass recovered to the gravity concentrate. Future testing using samples from new areas of the deposits must continue to evaluate and confirm the results achieved to date.

13.4 Projected Metallurgical Performance

The 2019 Plenge tests were used to estimate the gold and copper recoveries for processing fresh rock. They included open circuit bulk rougher flotation and three-stage bulk cleaner flotation tests and the mini-pilot plant tests using all of the Cangrejos and Gran Bestia variability samples. Results from cyanide leaching of the combined cleaner scavenger flotation tailings plus the sand flotation concentrates were also used.

The following were established from Plenge's data:

- Rougher flotation copper recoveries for the 40 variability samples averaged 89% from samples with head assays that ranged from 0.04% copper to 0.45% copper (average of 0.14% copper). As a comparison, the rougher flotation copper recoveries from the mini-pilot plant tests averaged 91% with head assays of approximately 0.13% copper.
- Copper recoveries to the final gold-copper flotation concentrates from the mini-pilot plant tests averaged 86%.
- Rougher flotation gold recoveries for the 40 variability samples averaged 83%. As a comparison, rougher flotation gold recoveries in the mini-pilot plant tests averaged 78%, but another 5% gold recovery was added with sand flotation of the rougher flotation tailings.
- Gold recoveries in final gold-copper flotation concentrates from the mini-pilot tests averaged 72%. Additional gold recoveries to doré, after cyanide leaching of the bulk cleaner scavenger tailings plus the sand flotation concentrates, are estimated to be 10% for a total of 82%.
- Copper concentrate grades are predicted to be variable, depending on the ratio of total sulfur to copper (i.e., the higher the ratio, the more pyrite reports to and dilutes the final concentrates). At average head grades for sulfur and copper, the final concentrate grade is estimated to average approximately 17% copper.

An equation was developed to estimate the grade of copper in the final concentrates assuming a constant copper recovery in the final concentrate of 86% as shown in Figure 13-3.

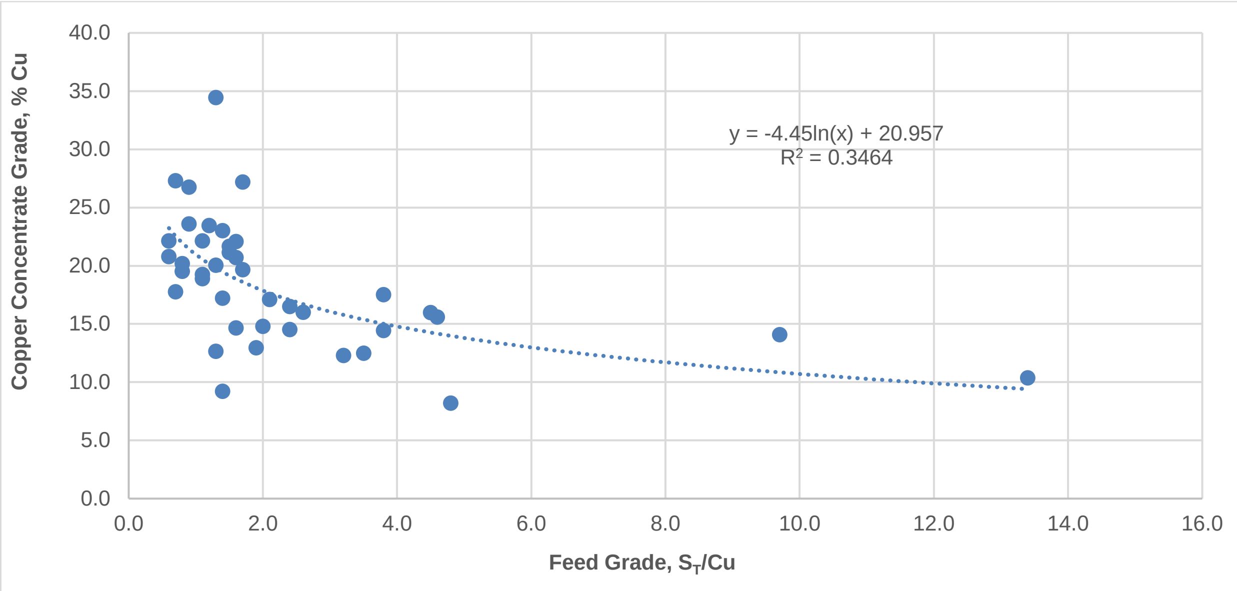


FIGURE 13-3: DATA ANALYSIS TO ESTIMATE THE GRADE OF THE COPPER CONCENTRATE

The equation is:

$$Copper\ Concentrate\ Grade\ (\%\ Cu) = -4.45 \times \ln\frac{S_T}{Cu} + 20.957$$

Table 13-3 summarizes the estimated metallurgical recoveries by rock type.

TABLE 13-3: ESTIMATED METALLURGICAL RECOVERY BY ROCK TYPE

Products	Units	Fresh Rock	Partially Oxidized	Saprock	Saprolite
Doré					
Gold Recovery	% Au	10	20	75	75
Silver Recovery	% Ag	10	10	65	65
Gold-Copper Concentrate					
Gold Recovery	% Au	72	60	0	0
Silver Recovery	% Ag	60	50	0	0
Copper Recovery	% Cu	86	50	0	0
Molybdenum Concentrate					
Molybdenum Recovery	% Mo	50	50	0	0

Assumptions:

- Gold and siver recoveries are constant
- Copper concentrate grades for fresh rock are variable
- Copper concentrate grade for partially oxidized material is 15% copper
- Molybdenum concentrate grade is 45% molybdenum

There are no known deleterious elements that could have a significant effect on potential economic extractions.

14 MINERAL RESOURCE ESTIMATE

14.1 Introduction

The Mineral Resource estimate was prepared under the direction of Robert Sim, P.Geo, with the assistance of Bruce Davis, Ph.D., FAusIMM. This section of the Report describes the mineral resource estimation methodology and summarizes the key assumptions considered by the Qualified Person (QP) to prepare the mineral resource model for the gold, copper, silver, molybdenum, and sulfur mineralization at the Cangrejos Project. This is the fifth estimate of Mineral Resources for the Cangrejos Project. The most recent previous estimate was presented in a technical report titled, *Cangrejos Gold-Copper Project, Ecuador, NI 43-101 Technical Report,* dated December 12, 2019, with an effective date of November 7, 2019 (Sim, Davis, and King, 2019). The mineral resource model presented in the December 2019 Technical Report remains essentially unchanged and forms the basis of resources in this PEA. However, there have been some minor adjustments to the classification of model blocks in the deeper part of the Gran Bestia deposit that resulted in some minor changes to the extent of the resource limiting pit shell. These changes have had a negligible effect on the resources for the Cangrejos deposit but have resulted in a minor increase (of approximately 25 M tonnes) of Mineral Resources in the Inferred category at the Gran Bestia deposit. There has been no additional exploration drilling completed on the Cangrejos Project since the generation of the resource block model and, therefore, the effective date of the estimate of Mineral Resources in this report is June 8, 2020.

In the opinion of the QP, the Mineral Resource estimate reported herein is a reasonable representation of the mineralization found at the Cangrejos Project at the current level of sampling. The Mineral Resources were estimated in conformity with generally accepted guidelines stated in Canadian Institute of Mining, Metallurgy and Petroleum (CIM) *Estimation of Mineral Resources and Mineral Reserves Best Practices Guidelines* (November 29, 2019) and is reported in accordance with NI 43-101 (CIM, 2019).

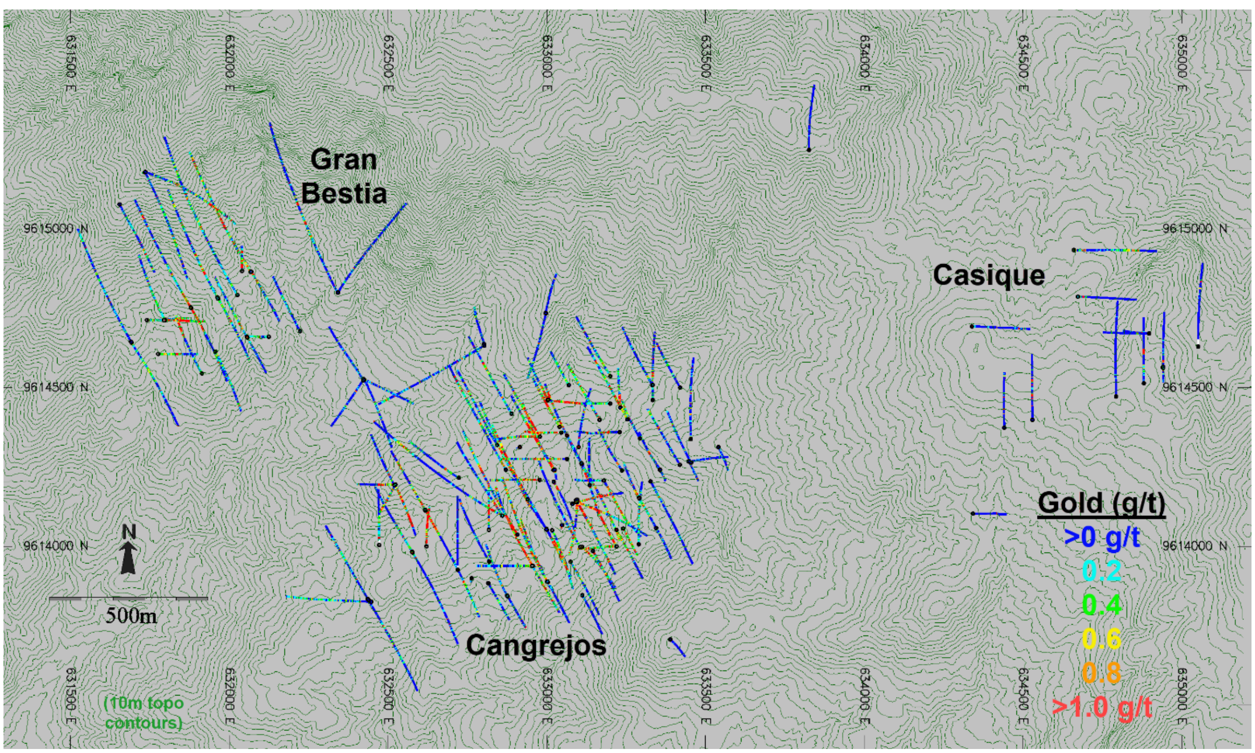
Mineral Resources are not Mineral Reserves, and they do not have demonstrated economic viability. There is no certainty that all or any part of the Mineral Resource will be converted into a Mineral Reserve upon application of modifying factors.

Estimations are made from 3D block models based on geostatistical applications using commercial mine planning software (MinePlan® v15.60, formerly called MineSight®). The Project limits are based in the Universal Transverse Mercator (UTM) coordinate system (Provisional South American Datum 1956, UTM Zone 17S) using a nominal block size measuring 15 m x 15 m x 15 m. Drill holes penetrate the Cangrejos deposit at a variety of orientations to depths approaching 750 m below surface. The Mineral Resources estimate was generated using drill hole sample assay results and the interpretation of a geological model which relates to the spatial distribution of gold, copper, silver, molybdenum, and sulfur. Interpolation characteristics were defined based on the geology, drill hole spacing, and geostatistical analysis of the data. The Mineral Resources were classified according to their proximity to the sample data locations and are reported, as required by NI 43-101, according to the CIM *Definition Standards for Mineral Resources and Mineral Reserves* (May 2014).

14.2 Available Data

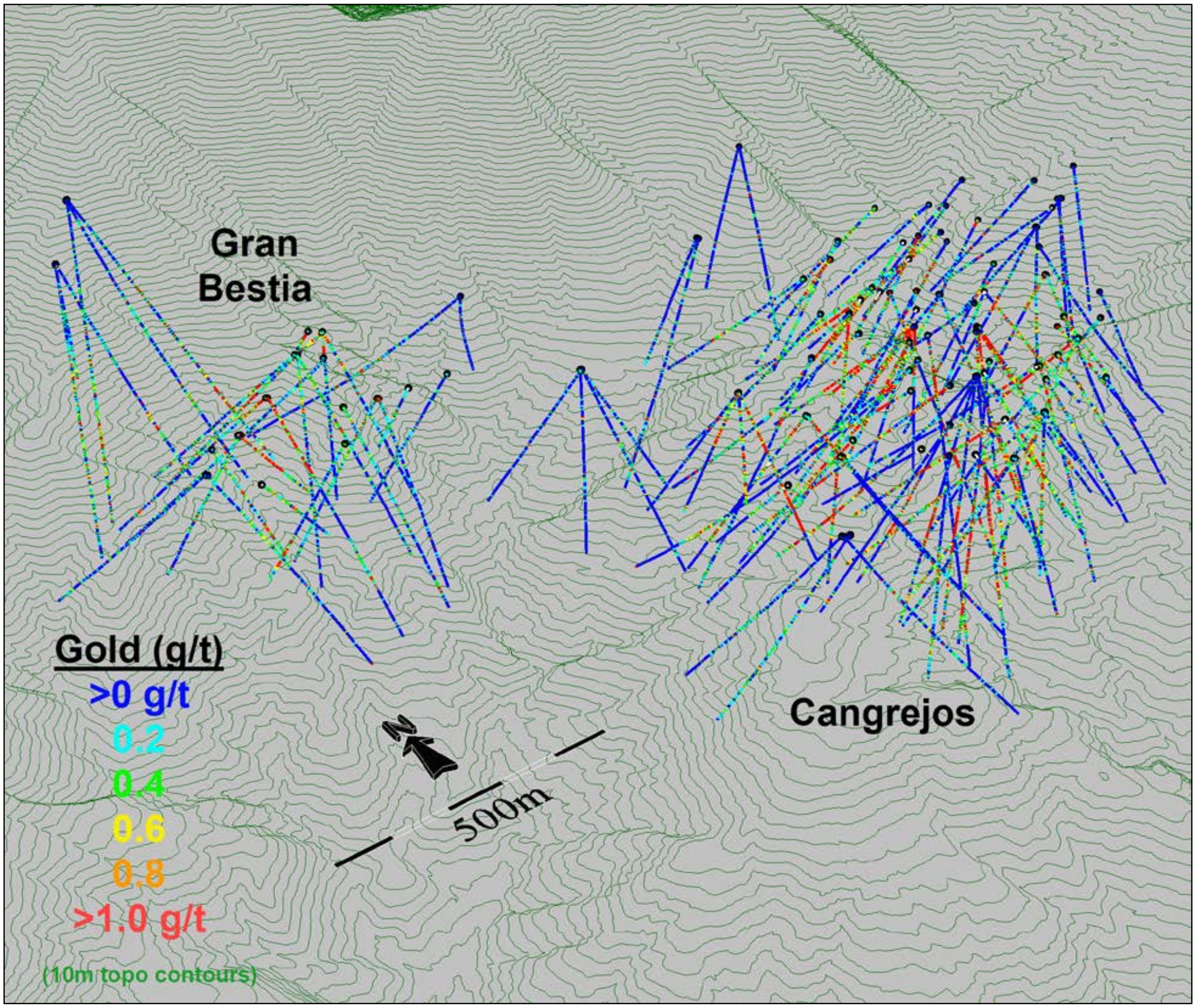
Lumina provided the drill hole sample data for the Cangrejos Project on October 8, 2019. This comprised a series of Excel® (spreadsheet) files containing collar locations, down-hole survey results, geologic information, and assay results for a total of 161 drill holes representing 62,146 m of drilling. (Note: This database excludes seven holes (408.15 m) included in Table 10-1 that were drilled for condemnation purposes or were drilled to collect additional material for metallurgical testing. These seven holes were not assayed.) Of these, 115 drill holes, totalling 43,998 m of drilling, test the Cangrejos deposit. An additional 31 drill holes, totalling 14,207 m of drilling, were completed in the vicinity of the Gran Bestia deposit. The remainder of the drilling, 15 holes totalling 3,941 m, tested for mineralization approximately 1.5 km east of the Cangrejos deposit in an area called Casique. All holes are HQ diamond drill holes. The distribution of gold grades in all drill holes is shown in plan view in Figure 14-1.

In the opinion of the QP, Lumina has completed sufficient drilling at the Cangrejos and Gran Bestia deposits to support estimates of Mineral Resources, but there is not enough delineation drilling at Casique to support a Mineral Resources estimate at this time. The distribution of gold grades in drilling at the Cangrejos and Gran Bestia deposits is shown in an isometric view in Figure 14-2.



Source: SIM Geological, 2019

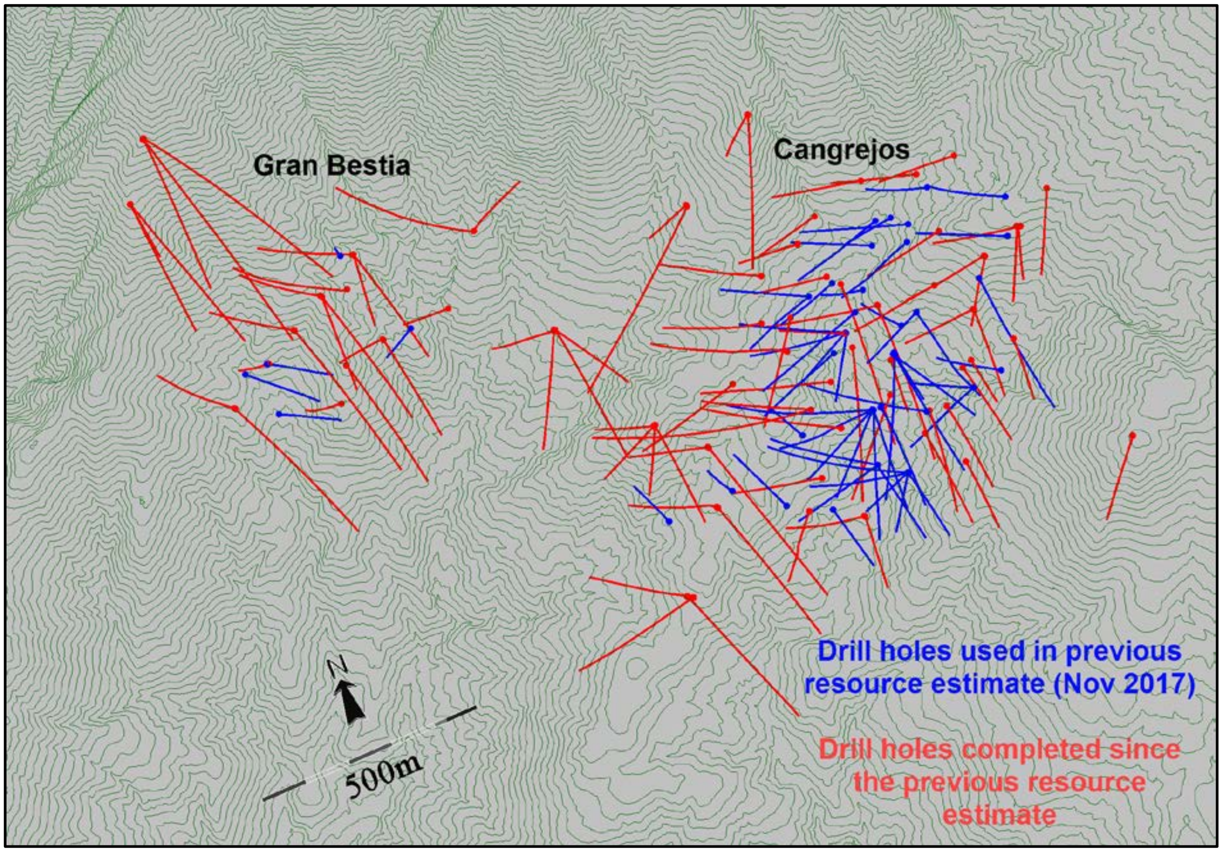
FIGURE 14-1: PLAN VIEW OF GOLD GRADES IN DRILLING



Source: SIM Geological, 2019

FIGURE 14-2: ISOMETRIC VIEW OF GOLD GRADES IN DRILLING AT CANGREJOS AND GRAN BESTIA DEPOSITS

Figure 14-3 shows the location of drill holes completed on the Cangrejos Project since the estimate of Mineral Resources in November 2017.

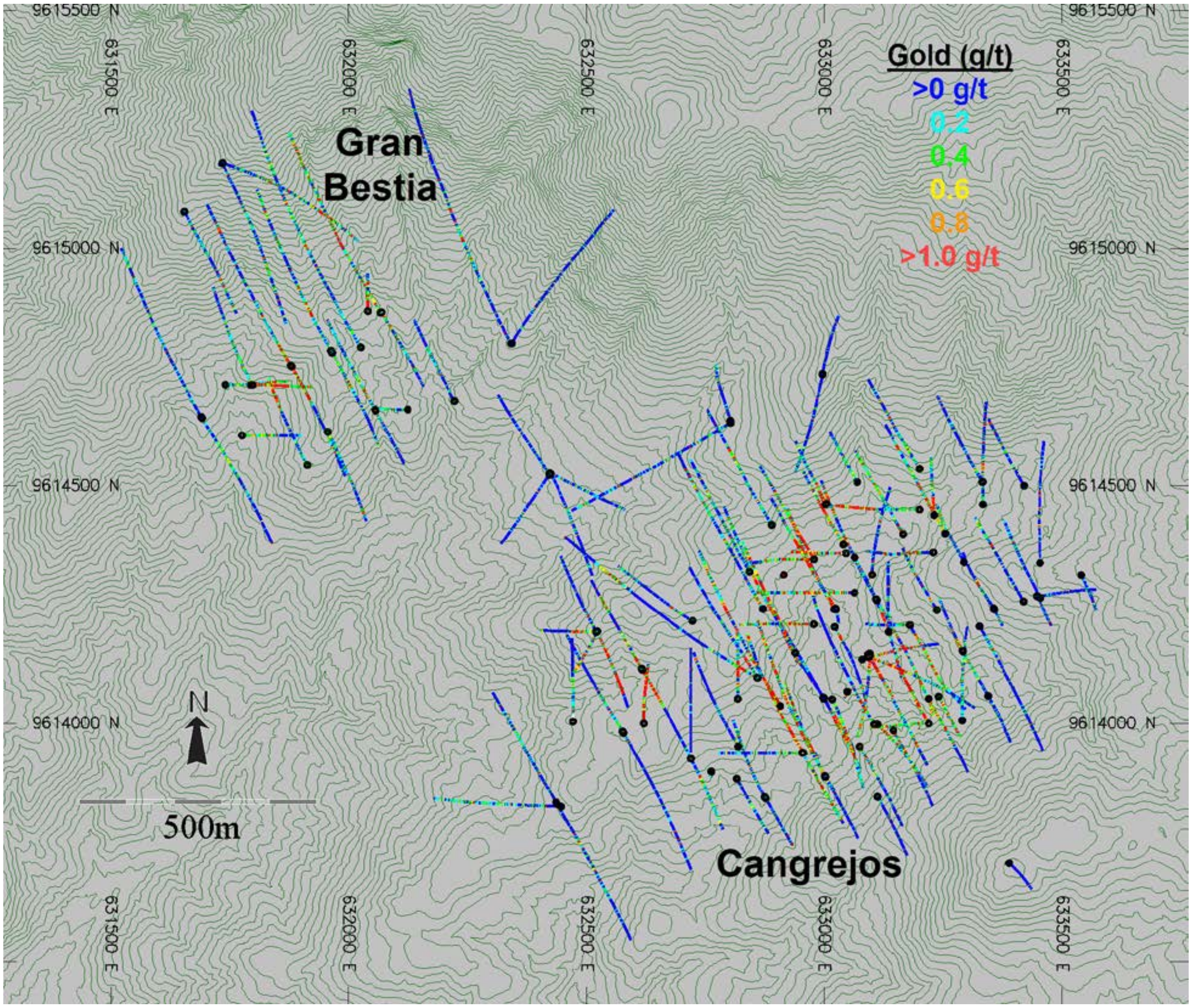


Source: SIM Geological, 2019

FIGURE 14-3: ISOMETRIC VIEW OF DRILLING COMPLETED SINCE THE PREVIOUS ESTIMATE OF MINERAL RESOURCES

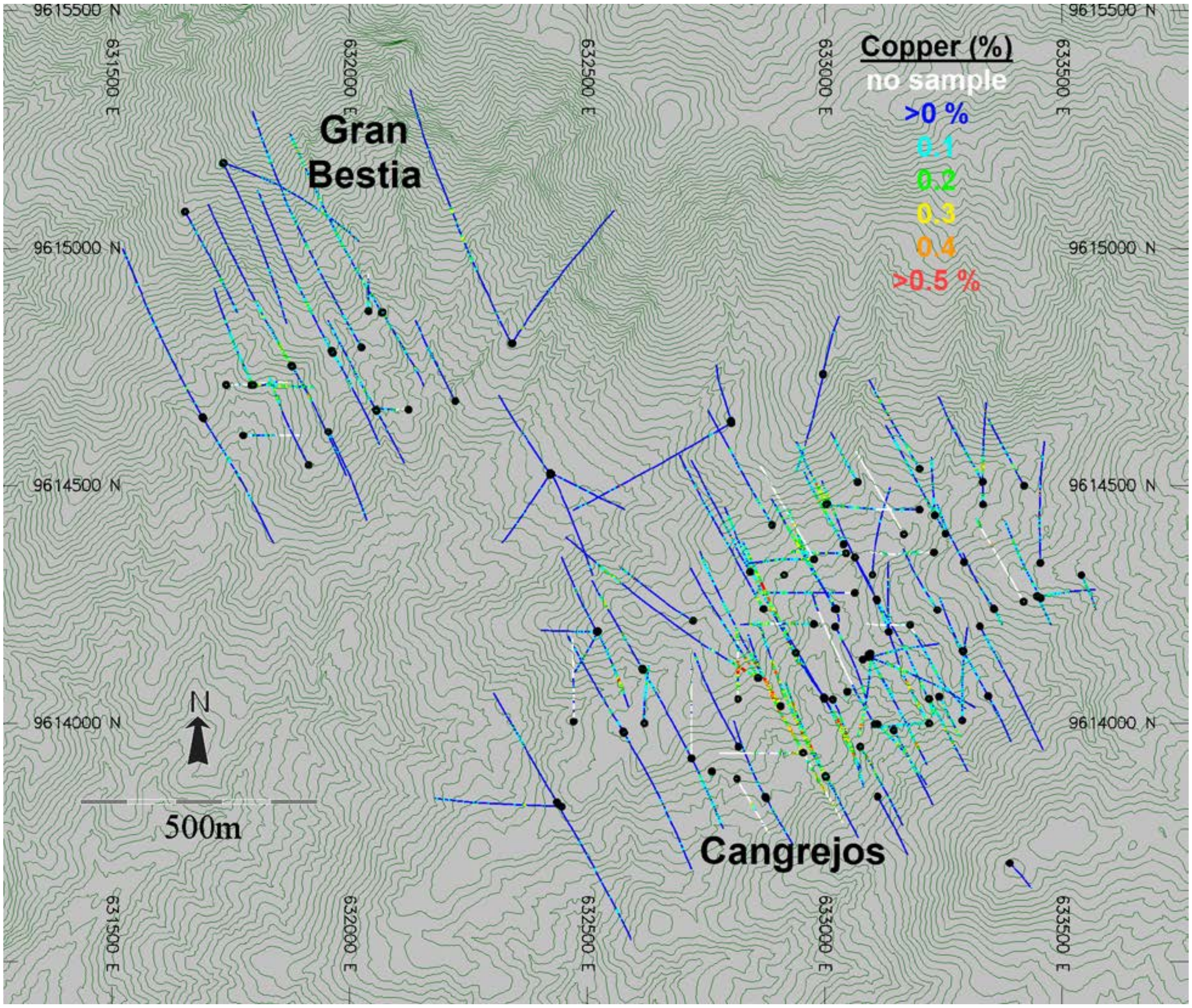
There are a total of 30,893 individual samples in the Project database, the majority of which were analyzed for a variety of elements (as part of a multi-element package). Individual sample intervals range from a minimum of 0.35 m to a maximum of 9 m and average 2 m long, and over 98% of the samples in the database are exactly 2 m long. Sample data for gold, silver, copper, molybdenum, and sulfur have been extracted from the main database and imported into MinePlan® to develop the mineral resource model.

All cored intervals were sampled and analyzed for gold content except for 289 m, which mainly represents intervals of overburden or saprolitic material that were not originally sampled and assayed. In some rare instances, these missing samples represent intervals of poor core recovery. With respect to holes drilled by Newmont in 1999 and 2000, not all samples were analyzed for copper, silver, molybdenum, or sulfur, and, as a result, this information is missing (about 6% of core intervals in the database are missing copper, silver, and molybdenum data, and about 12% of core intervals are missing sulfur data). The distributions of gold data and available copper, silver, molybdenum and sulfur data are shown in plan view in Figures 14-4 through 14-8, respectively. The distribution of core intervals, where sample data are missing, correlates reasonably well with low-grade (copper, silver, and molybdenum) zones encountered in the more recent drilling. It is assumed that these intervals were not sampled because they do not show visible signs of significant mineralization. Based on this assumption, core intervals without sample assay results were assigned the following default grades: Cu = 0.01%; Ag = 0.1 g/t; and Mo = 5 ppm. No adjustments were made to account for missing sulfur data. Resampling and analyzing for these missing elements are recommended if core or sample rejects are available.



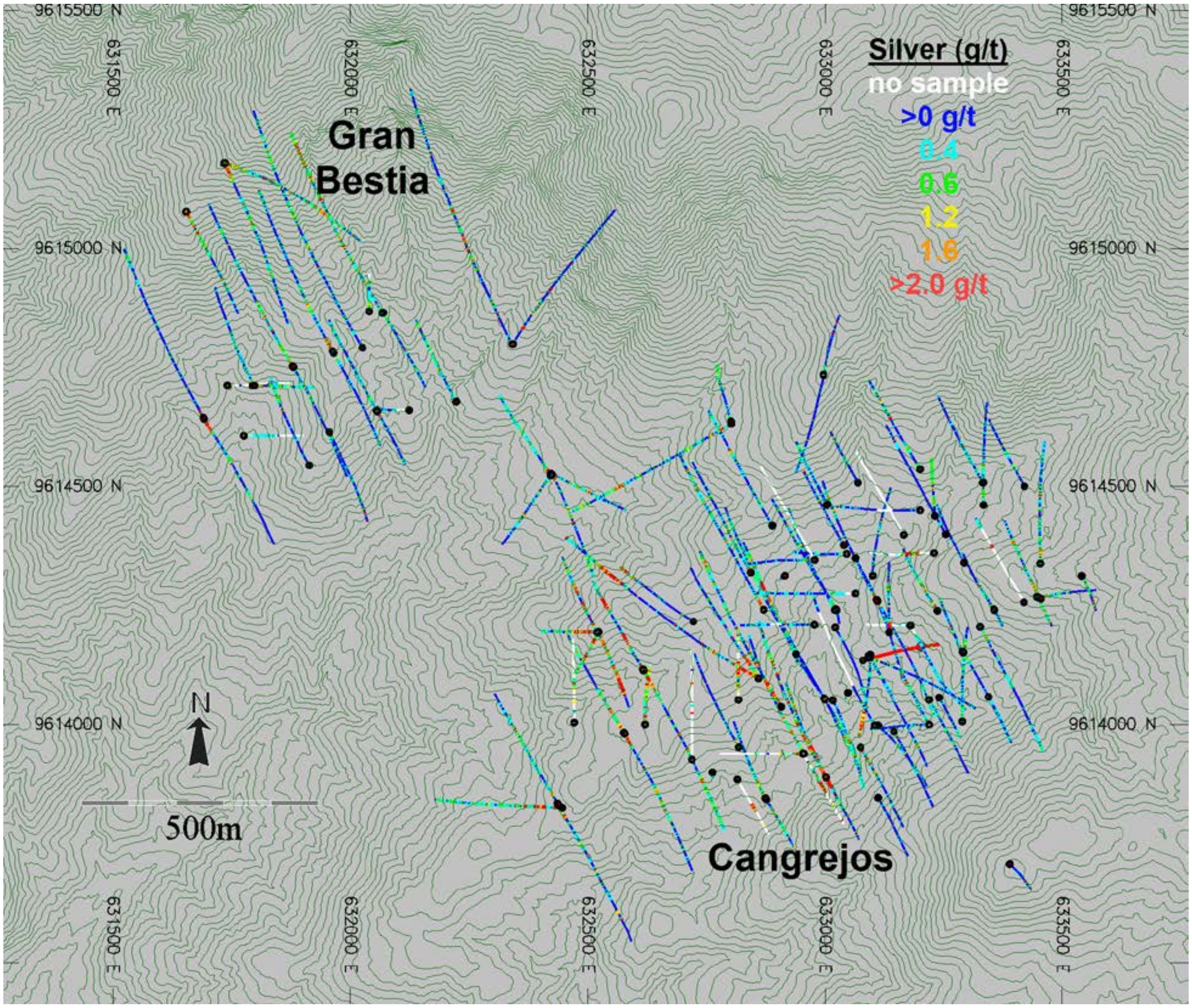
Source: SIM Geological, 2019

FIGURE 14-4: PLAN VIEW OF GOLD SAMPLE DATA IN DRILLING



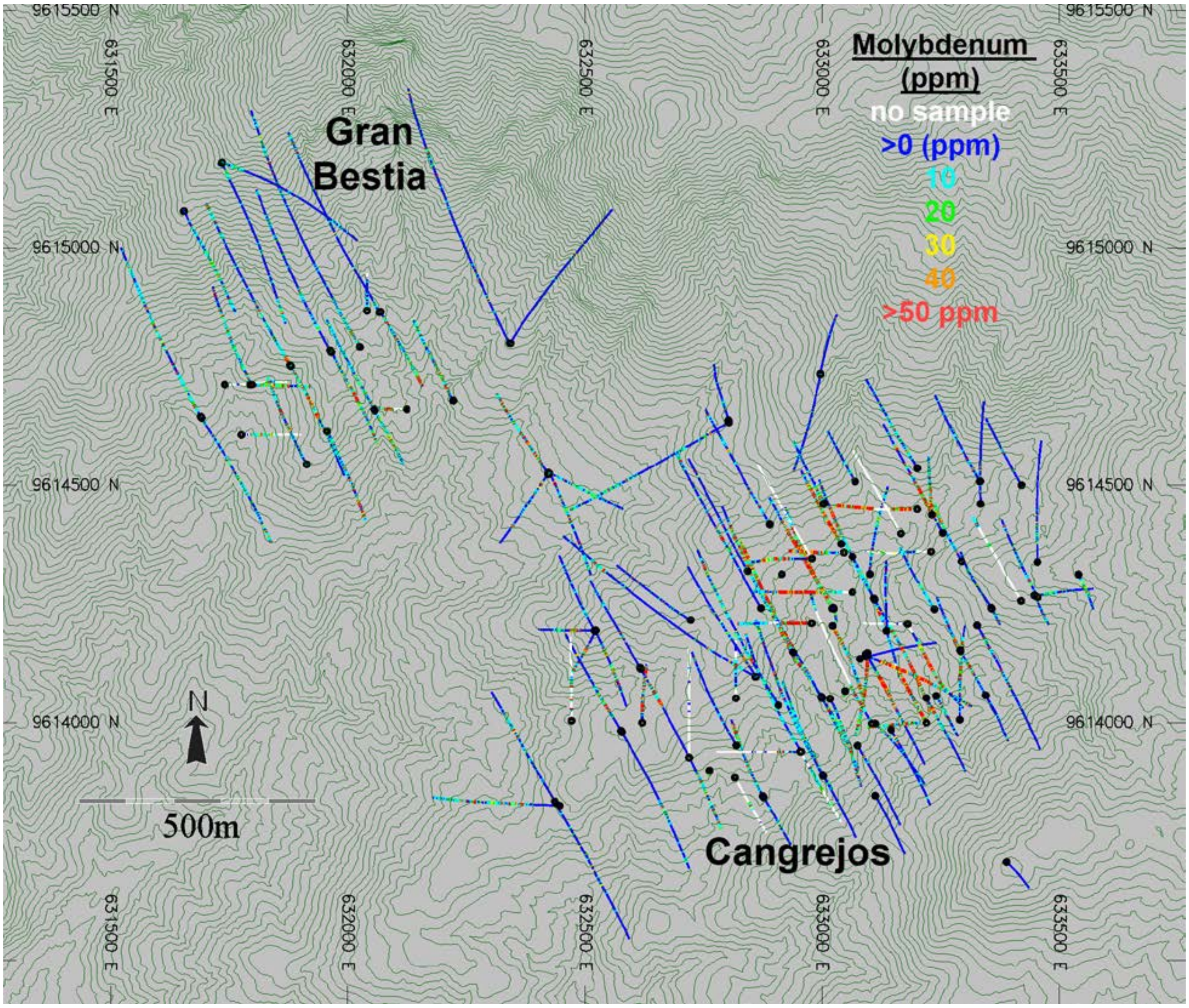
Source: SIM Geological, 2019

FIGURE 14-5: PLAN VIEW OF COPPER SAMPLE DATA IN DRILLING



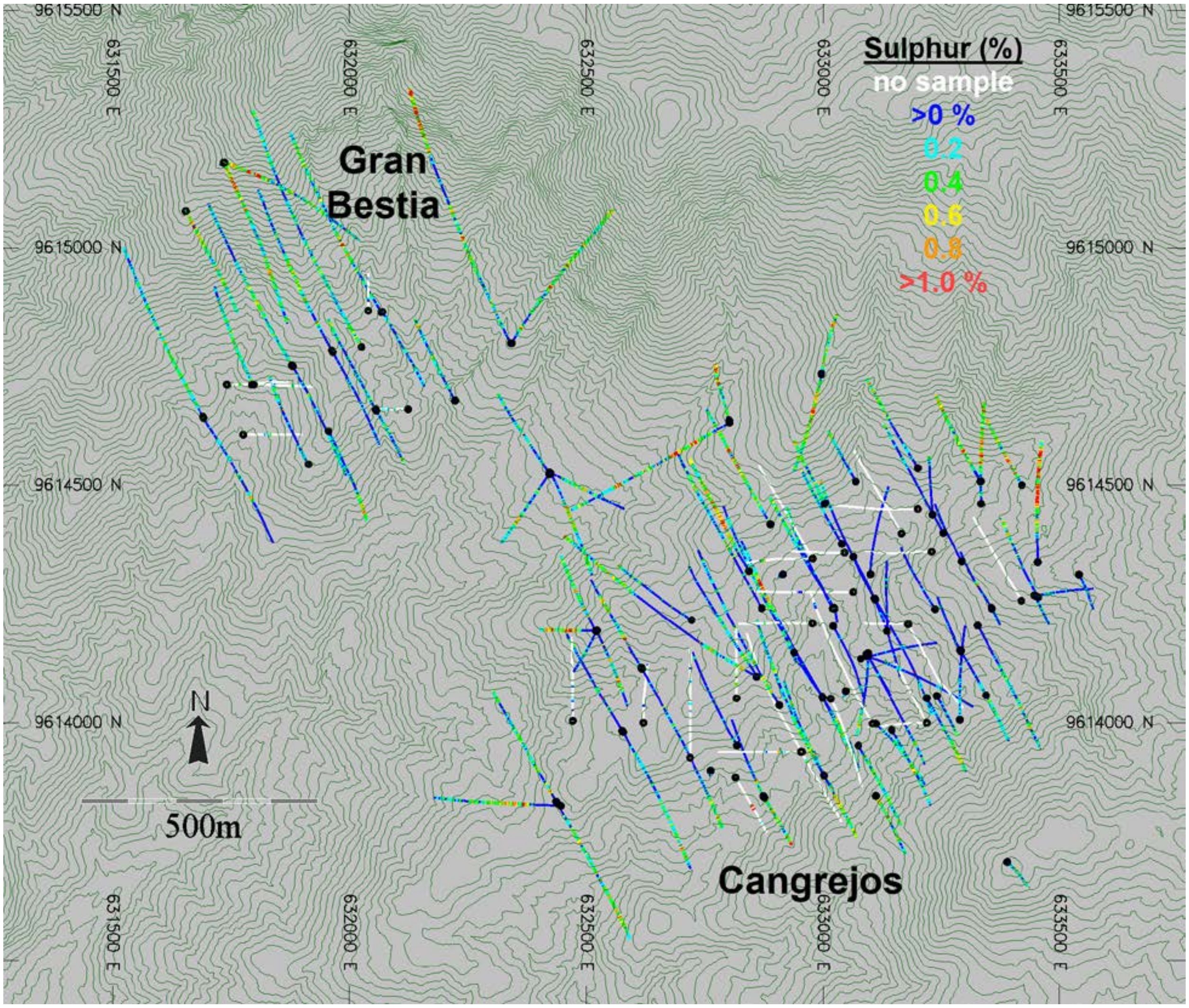
Source: SIM Geological, 2019

FIGURE 14-6: PLAN VIEW OF SILVER SAMPLE DATA IN DRILLING



Source: SIM Geological, 2019

FIGURE 14-7: PLAN VIEW OF MOLYBDENUM SAMPLE DATA IN DRILLING



Source: SIM Geological, 2019

FIGURE 14-8: PLAN VIEW OF SULFUR SAMPLE DATA IN DRILLING

Specific gravity (SG) data are available for 111 holes that were drilled by Lumina and Odin between 2014 and 2019. Newmont did not conduct SG measurements on holes drilled in 1999 and 2000 and Odin also did not conduct SG measurements on holes drilled during the initial drill programs in 2011 and 2012. Samples selected for SG measurements are spaced at 10 m intervals down each drill hole. The volume and distribution of SG data are considered sufficient to interpolate density values in the transitional (partial oxidized) rocks and fresh rocks. There are only a few SG measurements recorded for the saprolite and saprock zones and this is not enough to support SG estimation in these upper, highly oxidized units.

A Lidar survey was conducted in 2019; it provides detailed topographic information for the Cangrejos property.

Geologic information, derived from observations during core logging, provide lithology code designations for the various rock units present on the property.

The statistical properties of the data in the vicinity of the Cangrejos mineral resource model, excluding exploration drill holes, are shown in Table 14-1; this table shows the statistics for the initial sample data and the statistics for copper, silver, and molybdenum following the assignment of default grades for missing data.

TABLE 14-1: SUMMARY OF BASIC STATISTICS OF DATA PROXIMAL TO THE CANGREJOS MINERAL RESOURCE MODEL

Element	Number of Samples	Total Sample Length (m)	Min	Max	Mean	Std. Dev.	Coef. of Variation
Gold (g/t)	39,960	43,767	0.001	38	0.443	0.8762	1.98
Copper1 (%)	38,304	41,101	0	4.76	0.092	0.135	1.47
Copper2 (%)	39,960	43,767	0	4.76	0.087	0.132	1.523
Silver1 (g/t)	38,304	41,101	0.1	114	0.78	2.69	3.44
Silver2 (g/t)	39,960	43,767	0.1	102.1	0.74	2.59	3.5
Molybdenum1 (ppm)	38,304	41,101	0	2,696	19.8	52.6	2.7
Molybdenum2 (ppm)	39,960	43,767	0	2,696	18.9	51.1	2.7
Sulfur (%)	36,205	37,912	0.01	10	0.238	0.334	1.408
SG	3,537	n/a	1.34	3.61	2.747	0.114	0.041

Note: Original sample data are weighted by sample length. The data used in Table 14-1 are restricted to drill holes in the vicinity of the Cangrejos deposit. An Element suffix of "1" denotes initial sample data; a suffix of "2" includes default grades assigned to missing sample data (copper, silver and molybdenum).
Source: SIM Geological, 2019

The statistical properties of the data in the vicinity of the Gran Bestia mineral resource model, excluding exploration drill holes, are shown in Table 14-2; this table shows the statistics for the initial sample data and the statistics for copper, silver and molybdenum following the assignment of default grades for missing data.

TABLE 14-2: SUMMARY OF BASIC STATISTICS OF DATA PROXIMAL TO THE GRAN BESTIA MINERAL RESOURCE MODEL

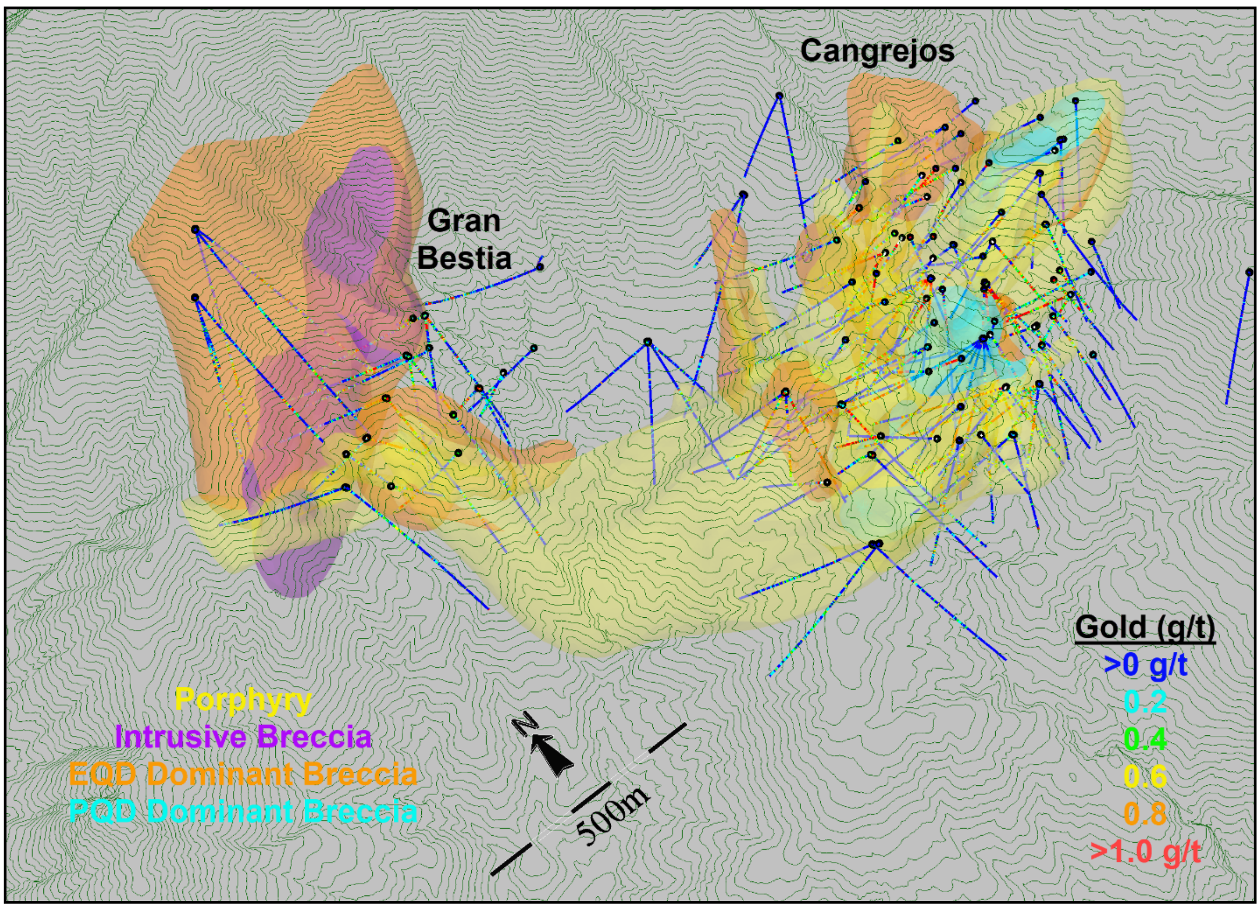
Element	Number of Samples	Total Sample Length (m)	Min	Max	Mean	Std. Dev.	Coef. of Variation
Gold (g/t)	13,001	14,189	0.003	32.3	0.364	0.7349	2.022
Copper1 (%)	12,755	13,752	0	1.33	0.066	0.066	0.994
Copper2 (%)	13,001	14,189	0	1.33	0.065	0.066	1.016
Silver1 (g/t)	12,755	13,752	0.1	100	0.77	2.63	3.41
Silver2 (g/t)	13,001	14,189	0.1	100	0.75	2.59	3.46
Molybdenum1 (ppm)	12,755	13,752	1	1,890.00	13.9	37.7	2.7
Molybdenum2 (ppm)	13,001	14,189	1	1,890.00	13.6	37.2	2.7
Sulfur (%)	12,494	13,306	0.01	3.32	0.322	0.295	0.918
SG	1,231	na	1.19	3.54	2.759	0.087	0.032

Note: Original sample data are weighted by sample length. The data used in Table 14-2 are restricted to drill holes in the vicinity of the Gran Bestia deposit. An Element suffix of "1" denotes initial sample data; a suffix of "2" includes default grades assigned to missing sample data (copper, silver and molybdenum).
Source: SIM Geological, 2019

14.3 Geological Model, Domains and Coding

The Cangrejos deposit is interpreted as a gold-copper porphyry deposit with mineralization resulting from the intrusion of quartz-dioritic rocks in host of metamorphosed schistose volcanic rocks, also of dioritic composition. A series of brecciated zones were identified that generally straddle the contact between the intrusive porphyry and the schistose host rocks. Sulfide mineralization is present in all rock types but generally tends to occur in the vicinity of the contact between the porphritic and metamorphic host rocks.

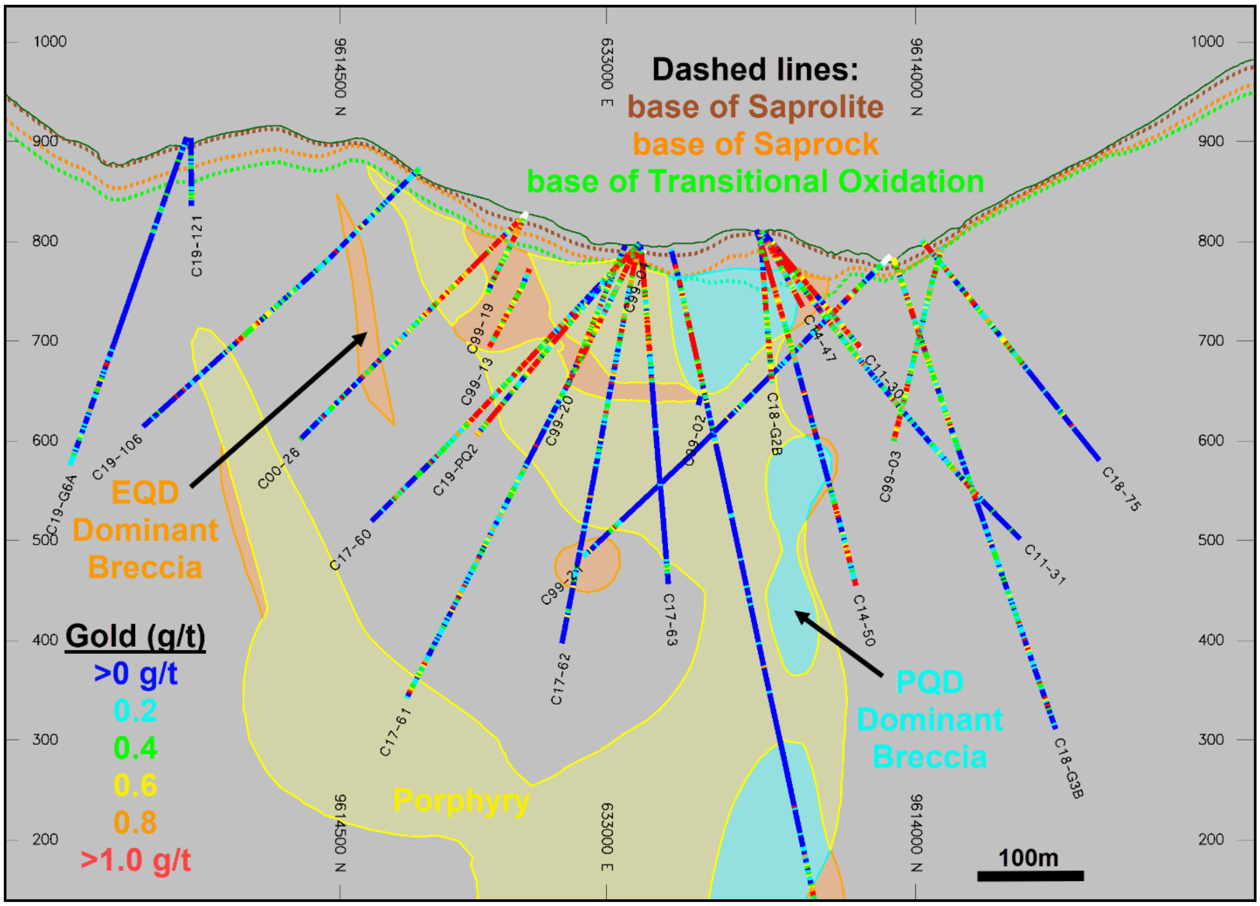
Figure 14-9 shows the shape and extent of the intrusive porphyry and the various breccia units in relation to the gold grades encountered in drilling. The rocks surrounding these interpreted lithologic domains (not shown on Figure 14-9) represent the metamorphic host rocks.



Source: SIM Geological, 2019

FIGURE 14-9: ISOMETRIC VIEW OF INTERPRETED LITHOLOGIC UNITS IN THE CANGREJOS AND GRAN BESTIA DEPOSIT AREAS

The type of surface oxidation recorded is also based on observations during drill core logging. *Saprolite* comprises a clay-like texture in which no original textures have been retained. *Saprock* is partially altered material that contains remnants of the original rock texture in a clay-rich host. Transitional, partially oxidized rocks, *Transitional Oxidation*, exhibit some signs of minor oxidation, typically along fracture surfaces. There is only a thin layer of organic overburden material on the surface and this material is included in the interpreted Saprolite unit. Surfaces representing the base of Transitional Oxidation, Saprock, and Saprolite were interpreted over the deposit areas. These surfaces are used to assign oxide-material types to model blocks on a majority basis. An example of the oxidation surfaces, relative to the gold grades in drilling and the interpreted lithologic domains, are shown in vertical cross section in Figure 14-10.



Source: SIM Geological, 2019

FIGURE 14-10: VERTICAL CROSS SECTION THROUGH THE CANGREJOS DEPOSIT SHOWING OXIDATION SURFACES AND LITHOLOGIC DOMAINS RELATIVE TO GOLD GRADES IN DRILLING

14.4 Specific Gravity Data

There are 4,843 individual measurements for SG taken from samples in 111 holes drilled by Lumina between 2014 and 2019. SG is measured using the water immersion method (weight in air vs. weight in water) with unwaxed core samples (Note: there is little or no evidence of porosity in the rocks from the Cangrejos Project). During the 2017 drill program, approximately 10% of the samples were sent to ALS Chemex for SG determinations using waxed samples. These results show reasonable comparison with the results obtained by Lumina.

Samples for SG measurement were initially taken at 5-m intervals throughout the length of the drill holes, but this distance was increased to 10-m intervals for the majority of drill holes. SG values range from a minimum of 1.19 to a maximum of 3.61 and average 2.75. A series of 13 SG measurements taken from the top 150 m of hole C17-56 are anomalously low (SG <2). It appears there may have been an error in these measurements, and, as a result, they were removed from the database. A review of the remaining SG data showed that several anomalous high and low SG values were still present, and, as a result, three samples with SG values less than 1.85 and five samples with SG greater than 3.40 were also removed from the database.

There are very few SG measurements taken from the near-surface oxidized units (only one from Saprolite and three from Saprock material). The volume and distribution of SG data are considered sufficient to support the estimation of SG values in the Transitional Oxide and Fresh rocks at the Cangrejos and Gran Bestia deposits. However, there are not enough data to support estimation in the Saprolite and Saprock units; therefore, these units are assigned default values of 1.50 and 1.90, respectively.

14.5 Compositing

Compositing the drill hole samples helps standardize the database for further statistical evaluation. This step eliminates any effect that inconsistent sample lengths might have on the data.

To retain the original characteristics of the underlying data, a composite length was selected that reflects the average, original sample length. The generation of longer composites can result in some degree of smoothing which could mask certain features of the data. A composite length of 2 m was selected for both the Cangrejos and Gran Bestia deposits, reflecting the fact that over 98% of the original samples were selected on 2 m intervals.

Drill hole composites are length-weighted and were generated down-the-hole; meaning that composites begin at the top of each hole and are generated at 2-m intervals down the length of the hole.

14.6 Generation of a Gold Probability Shell Domain

A probability shell domain was generated based on the distribution of gold in the deposit. Indicator values are assigned to 2 m composited sample data based on a threshold grade of 0.15 g/t Au. Probability estimates are made in model blocks using ordinary krigging (OK). A 3D domain was then produced in which the areas inside the probability shell represent areas where there is a greater than 50% probability that the grade will be greater than 0.15 g/t Au. In areas where gold mineralization is not bounded by drill holes, this shell domain extends for a maximum distance of 200 m from drilling.

The probability shell domain tends to be quite large and extensive at depth at the Cangrejos deposit and in parts of the Gran Bestia deposit because the lateral and depth extents of the mineralization have not been defined by the current drilling. The probability shell domain does, however, outline the low-grade zone in the center of the Cangrejos deposit.

14.7 Exploratory Data Analysis

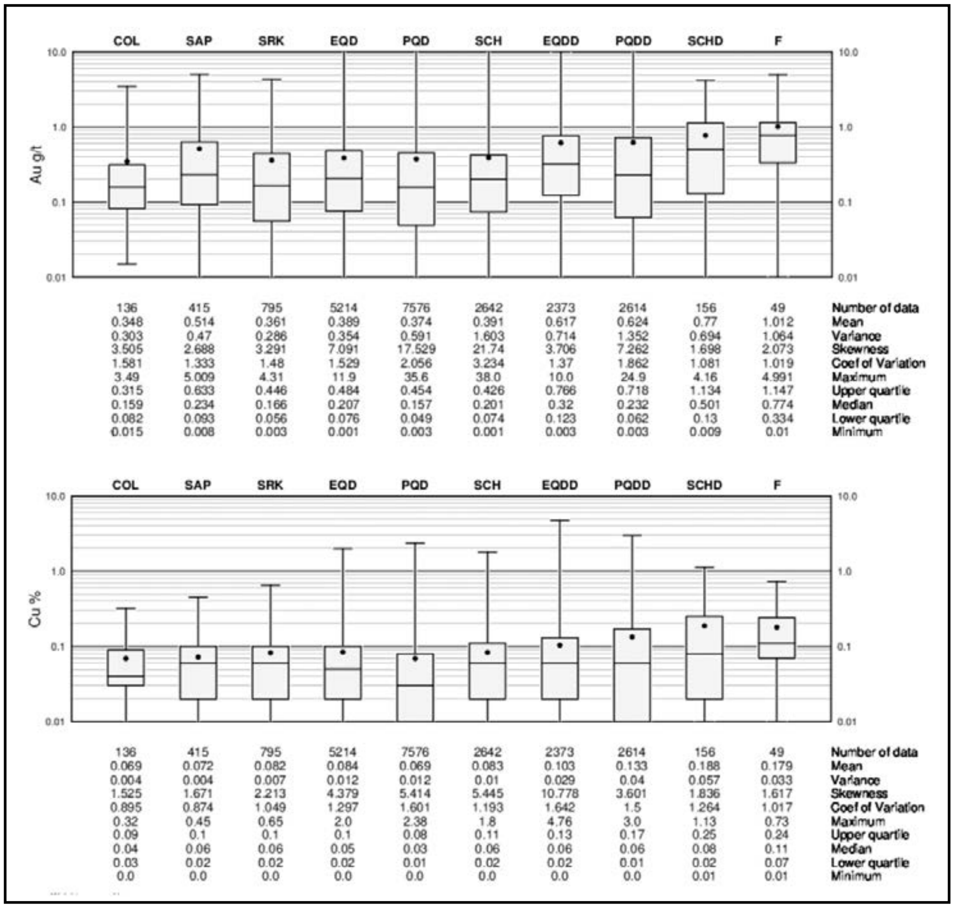
Exploratory data analysis (EDA) involves the statistical summarization of the database to better understand the characteristics of the data that may control grade. One of the main purposes of this exercise is to determine if there is evidence of spatial distinctions in grade which may require the separation and isolation of domains during interpolation. The application of separate domains prevents unwanted mixing of data during interpolation, and, therefore, the resulting grade model will better reflect the unique properties of the deposit. However, applying domain boundaries in areas where the data are not statistically unique may impose a bias in the distribution of grades in the model.

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

14.7.1 Basic Statistics by Domain

The basic statistics for the distribution of gold, copper, silver, molybdenum, and sulfur were evaluated by reviewing the original, logged lithology codes and also by evaluating the various interpreted lithologic domains shown in Figure 14-9. The results are quite similar, suggesting the interpreted lithology model is an appropriate representation of the underlying geology data. The results based on the logged geology information are presented in this section.

The boxplot in Figure 14-11 shows similar distributions of gold and copper in essentially all of the logged lithology types. Elevated average grades occur in the breccia rocks (EQDD, PQDD, and SCHD), but there remains a wide interquartile range of grades within each of these units that tends to coincide with grades in other units. Similar trends are also seen at Gran Bestia as shown in Figure 14-12.

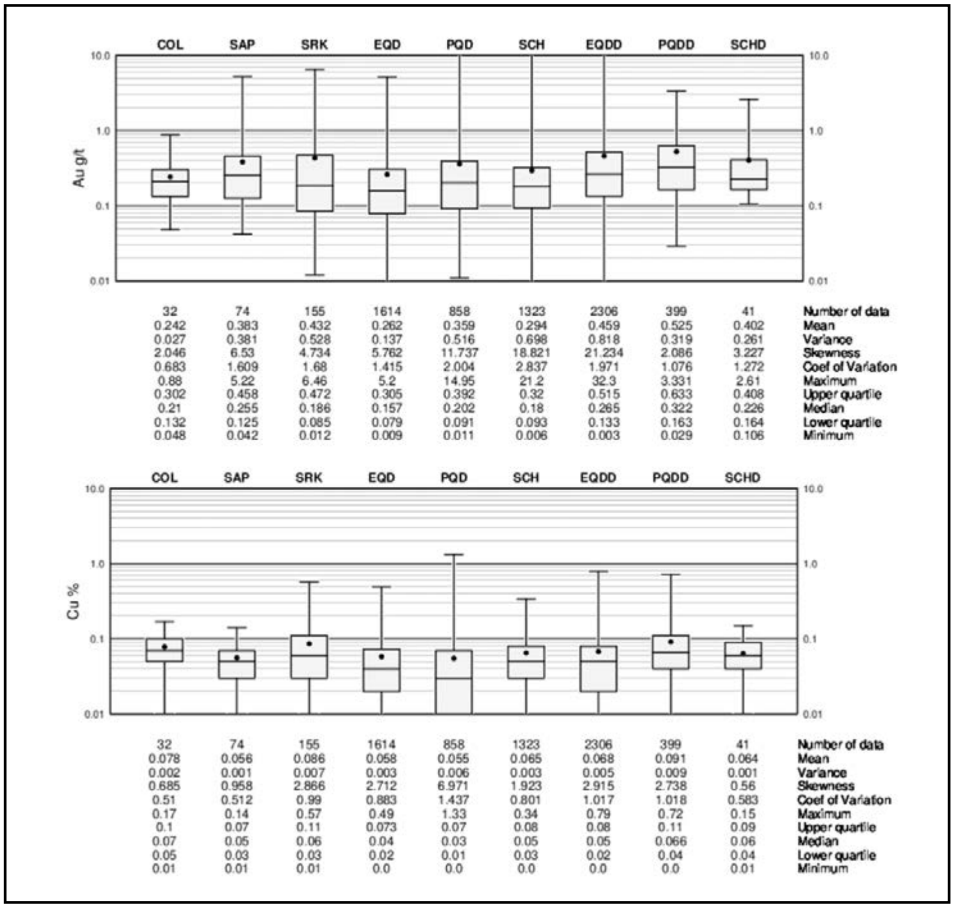


	COL	SAP	SRK	EQD	PQD	SCH	EQDD	PQDD	SCHD	F
Number of data	136	415	795	5214	7576	2642	2373	2614	156	49
Mean	0.348	0.514	0.361	0.389	0.374	0.391	0.617	0.624	0.77	1.012
Variance	0.303	0.47	0.286	0.354	0.591	1.603	0.714	1.352	0.694	1.064
Skewness	3.505	2.688	3.291	7.091	17.529	21.74	3.706	7.262	1.698	2.073
Coef of Variation	1.581	1.333	1.48	1.529	2.056	3.234	1.37	1.862	1.081	1.019
Maximum	3.49	5.009	4.31	11.9	35.6	38.0	10.0	24.9	4.16	4.991
Upper quartile	0.315	0.633	0.446	0.484	0.454	0.426	0.766	0.718	1.134	1.147
Median	0.159	0.234	0.166	0.207	0.157	0.201	0.32	0.232	0.501	0.774
Lower quartile	0.082	0.093	0.056	0.076	0.049	0.074	0.123	0.062	0.13	0.334
Minimum	0.015	0.008	0.003	0.001	0.003	0.001	0.003	0.003	0.009	0.01

	COL	SAP	SRK	EQD	PQD	SCH	EQDD	PQDD	SCHD	F
Number of data	136	415	795	5214	7576	2642	2373	2614	156	49
Mean	0.069	0.072	0.082	0.084	0.069	0.083	0.103	0.133	0.188	0.179
Variance	0.004	0.004	0.007	0.012	0.012	0.01	0.029	0.04	0.057	0.033
Skewness	1.525	1.671	2.213	4.379	5.414	5.445	10.778	3.601	1.836	1.617
Coef of Variation	0.895	0.874	1.049	1.297	1.601	1.193	1.642	1.5	1.264	1.017
Maximum	0.32	0.45	0.65	2.0	2.38	1.8	4.76	3.0	1.13	0.73
Upper quartile	0.09	0.1	0.1	0.1	0.08	0.11	0.13	0.17	0.25	0.24
Median	0.04	0.06	0.06	0.05	0.03	0.06	0.06	0.06	0.08	0.11
Lower quartile	0.03	0.02	0.02	0.02	0.01	0.02	0.02	0.01	0.02	0.07
Minimum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.01	0.01

Source: SIM Geological, 2019

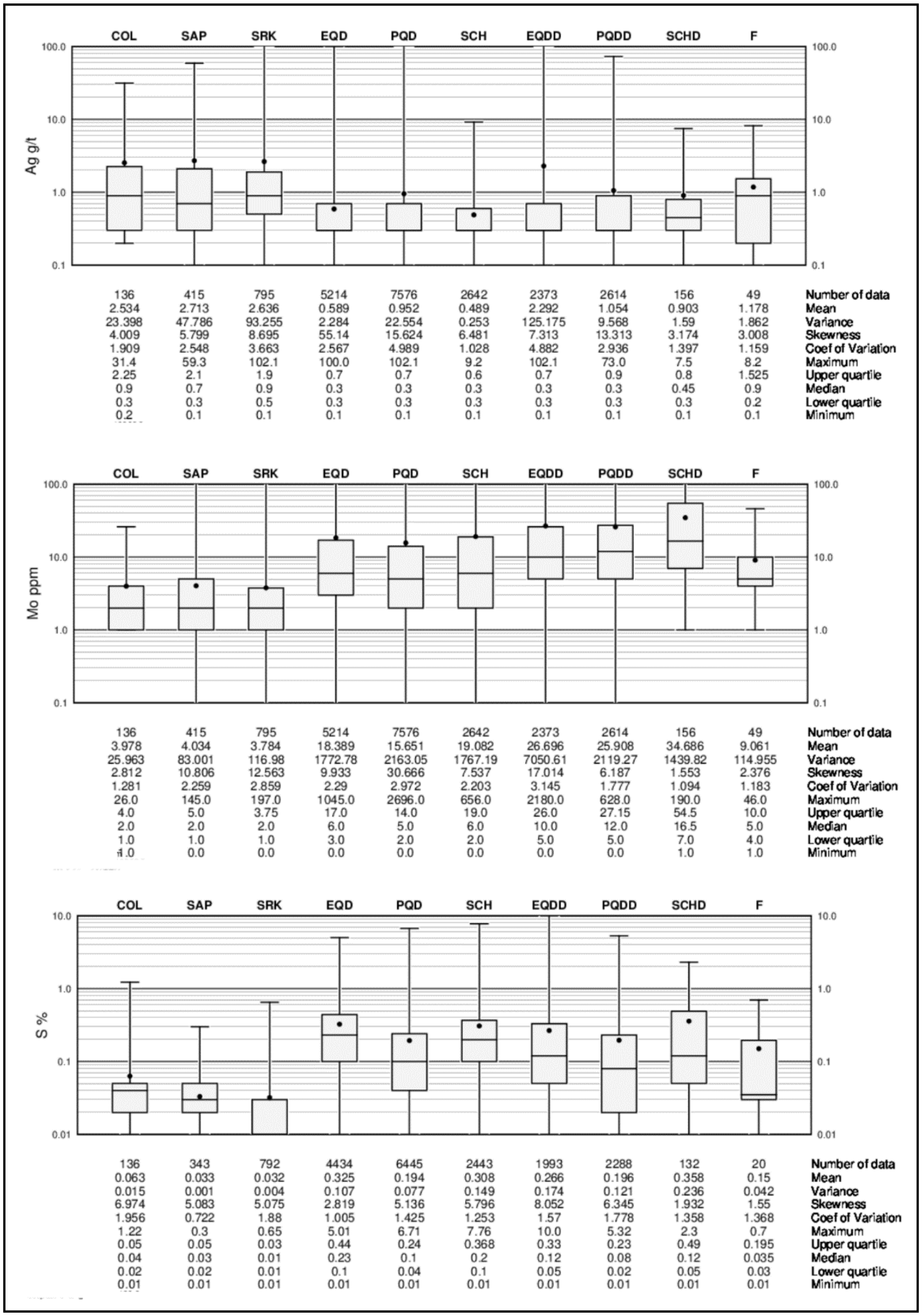
FIGURE 14-11: BOXPLOTS OF GOLD AND COPPER BY LOGGED LITHOLOGY TYPE AT CANGREJOS



Source: SIM Geological, 2019

FIGURE 14-12: BOXPLOTS OF GOLD AND COPPER BY LOGGED LITHOLOGY TYPE AT GRAN BESTIA

Figure 14-13 shows that the distributions of silver, molybdenum, and sulfur are relatively consistent in rock units above and below the oxidation layer. The Saprolite and Saprock units show elevated silver grades and lower molybdenum and sulfur grades compared to the deeper (fresh) rocks. Similar trends are also seen at Gran Bestia.



	COL	SAP	SRK	EQD	PQD	SCH	EQDD	PQDD	SCHD	F
Number of data	136	415	795	5214	7576	2642	2373	2614	156	49
Mean	2.534	2.713	2.636	0.589	0.952	0.489	2.292	1.054	0.903	1.178
Variance	23.398	47.786	93.255	2.284	22.554	0.253	125.175	9.568	1.59	1.862
Skewness	4.009	5.799	8.695	55.14	15.624	6.481	7.313	13.313	3.174	3.008
Coef of Variation	1.909	2.548	3.663	2.567	4.989	1.028	4.882	2.936	1.397	1.159
Maximum	31.4	59.3	102.1	100.0	102.1	9.2	102.1	73.0	7.5	8.2
Upper quartile	2.25	2.1	1.9	0.7	0.7	0.6	0.7	0.9	0.8	1.525
Median	0.9	0.7	0.9	0.3	0.3	0.3	0.3	0.3	0.45	0.9
Lower quartile	0.3	0.3	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.2
Minimum	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

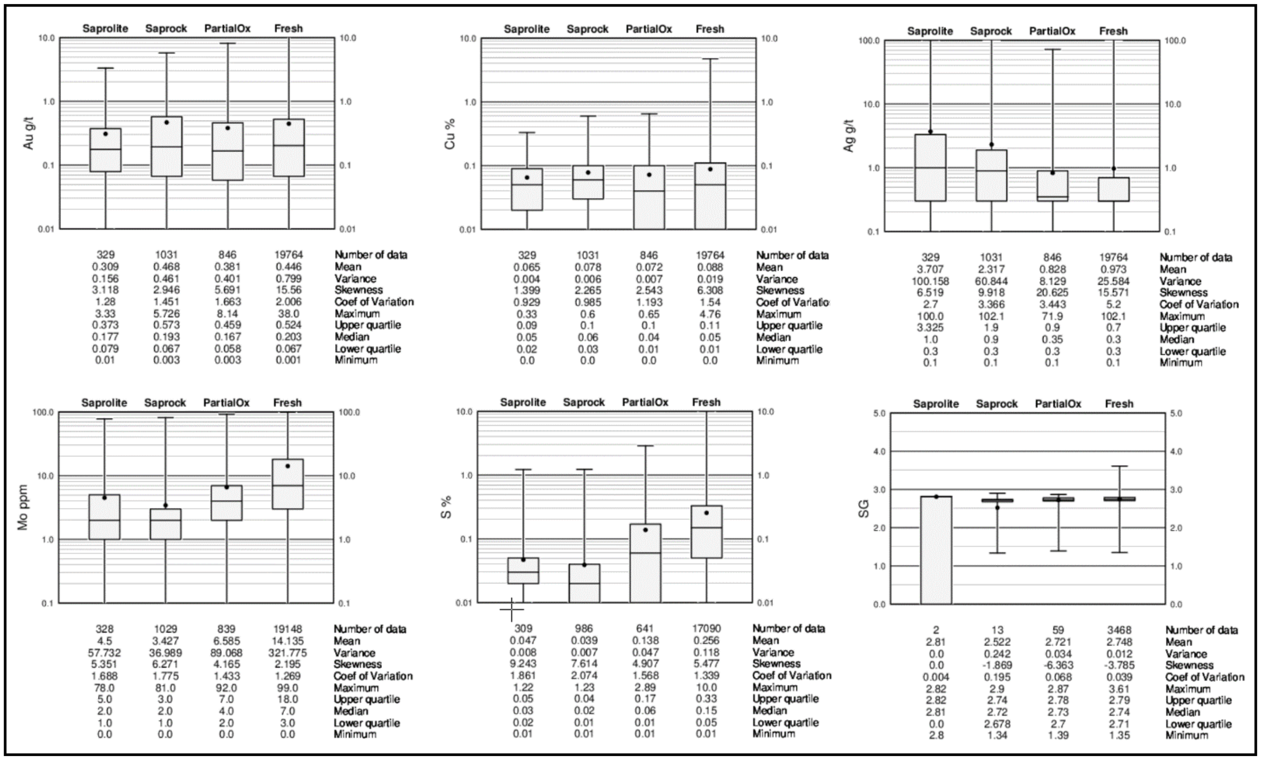
	COL	SAP	SRK	EQD	PQD	SCH	EQDD	PQDD	SCHD	F
Number of data	136	415	795	5214	7576	2642	2373	2614	156	49
Mean	3.978	4.034	3.784	18.389	15.651	19.082	26.696	25.908	34.686	9.061
Variance	25.963	83.001	116.98	1772.78	2163.05	1767.19	7050.61	2119.27	1439.82	114.955
Skewness	2.812	10.806	12.563	9.933	30.666	7.537	17.014	6.187	1.553	2.376
Coef of Variation	1.281	2.259	2.859	2.29	2.972	2.203	3.145	1.777	1.094	1.183
Maximum	26.0	145.0	197.0	1045.0	2696.0	656.0	2180.0	628.0	190.0	46.0
Upper quartile	4.0	5.0	3.75	17.0	14.0	19.0	26.0	27.15	54.5	10.0
Median	2.0	2.0	2.0	6.0	5.0	6.0	10.0	12.0	16.5	5.0
Lower quartile	1.0	1.0	1.0	3.0	2.0	2.0	5.0	5.0	7.0	4.0
Minimum	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0

	COL	SAP	SRK	EQD	PQD	SCH	EQDD	PQDD	SCHD	F
Number of data	136	343	792	4434	6445	2443	1993	2288	132	20
Mean	0.063	0.033	0.032	0.325	0.194	0.308	0.266	0.196	0.358	0.15
Variance	0.015	0.001	0.004	0.107	0.077	0.149	0.174	0.121	0.236	0.042
Skewness	6.974	5.083	5.075	2.819	5.136	5.796	8.052	6.345	1.932	1.55
Coef of Variation	1.956	0.722	1.88	1.005	1.425	1.253	1.57	1.778	1.358	1.368
Maximum	1.22	0.3	0.65	5.01	6.71	7.76	10.0	5.32	2.3	0.7
Upper quartile	0.05	0.05	0.03	0.44	0.24	0.368	0.33	0.23	0.49	0.195
Median	0.04	0.03	0.01	0.23	0.1	0.2	0.12	0.08	0.12	0.035
Lower quartile	0.02	0.02	0.01	0.1	0.04	0.1	0.05	0.02	0.05	0.03
Minimum	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

Source: SIM Geological, 2019

FIGURE 14-13: BOXPLOTS OF SILVER, MOLYBDENUM, AND SULFUR BY LOGGED LITHOLOGY TYPE AT CANGREJOS

Figure 14-14 shows the distributions of all elements across the oxidation domains at Cangrejos. There are no significant changes in gold or copper grades between these units. However, silver is elevated and molybdenum and sulfur are depressed in the Saprolite and Saprock units. There are almost no SG samples in the upper units. The SG of Transitional Oxide and Fresh rocks are very similar. Similar trends are also seen at Gran Bestia.



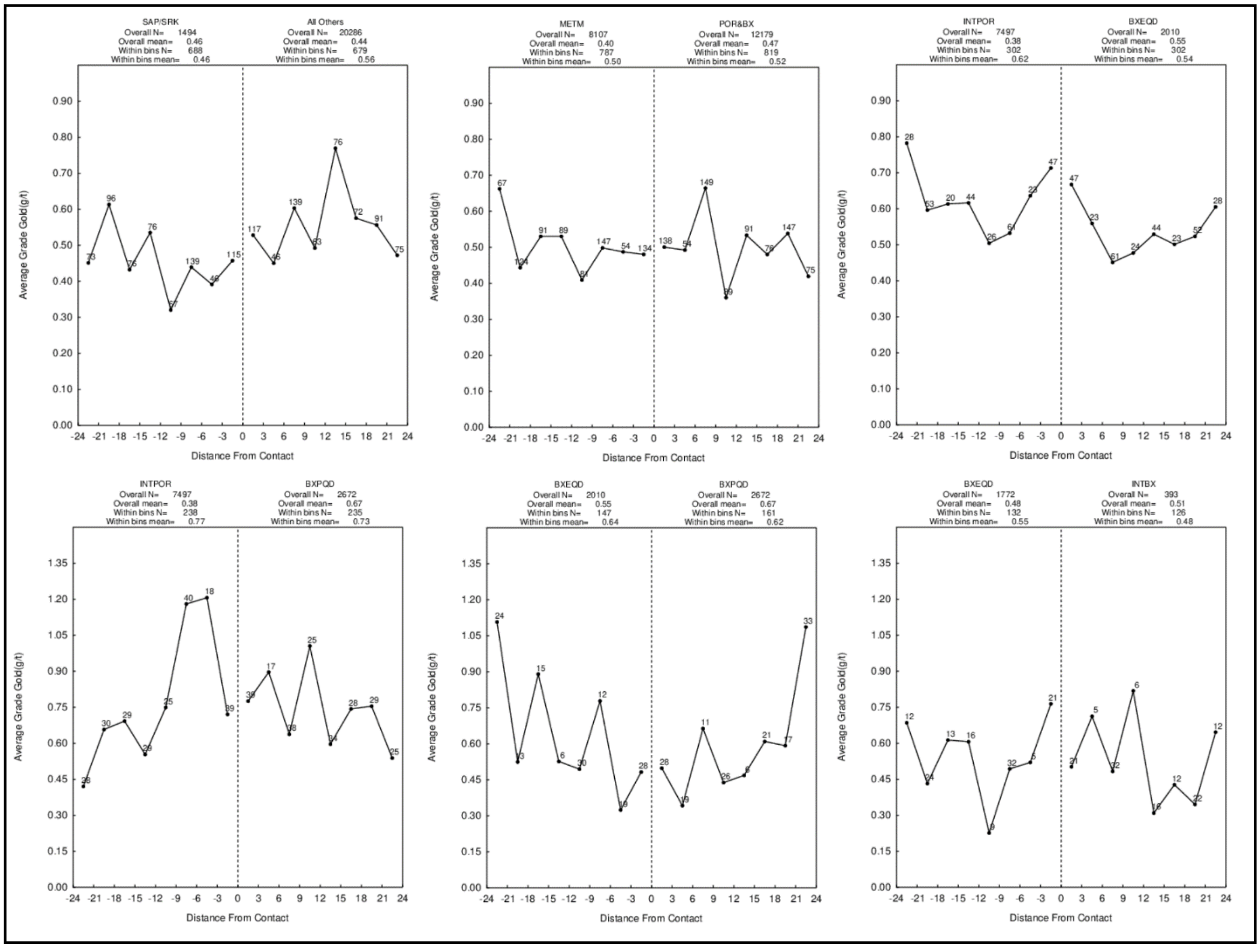
Source: SIM Geological, 2019

FIGURE 14-14: BOXPLOTS COMPARING SAMPLE DATA BETWEEN OXIDATION DOMAINS AT CANGREJOS

14.7.2 Contact Profiles

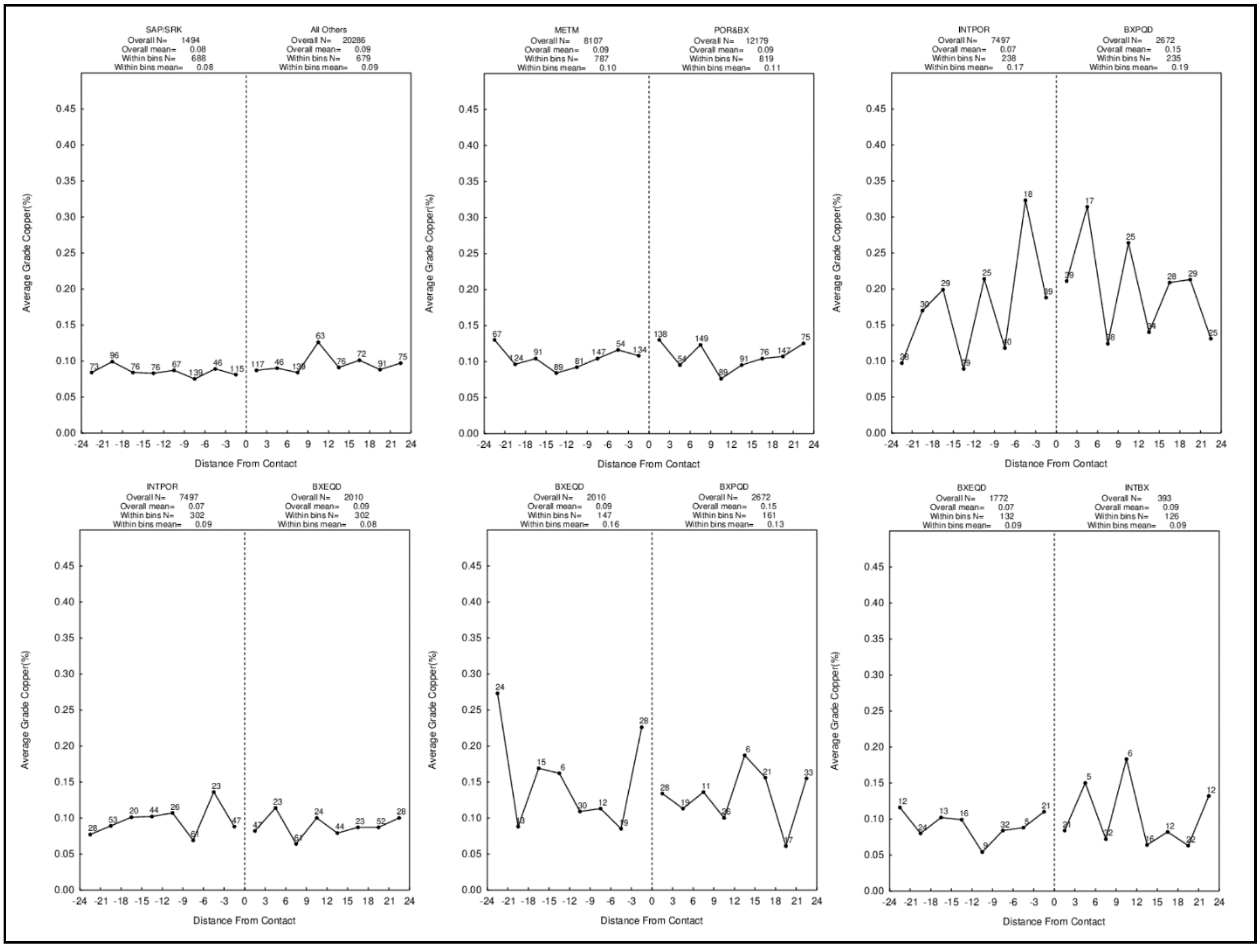
Contact profiles evaluate the nature of grade trends between two domains: they graphically display the average grades at increasing distances from the contact boundary. Those contact profiles that show a marked difference in grade across a domain boundary indicate that the two datasets should be isolated during interpolation. Conversely, if a more gradual change in grade occurs across a contact, the introduction of a hard boundary (e.g., segregation during interpolation) may result in a much different trend in the grade model; in this case, the change in grade between domains in the model is often more abrupt than the trends seen in the raw data. Finally, a flat contact profile indicates no grade changes across the boundary; in this case, hard or soft domain boundaries will produce similar results in the model.

A series of contact profiles were produced to evaluate the nature of gold and copper grades across the lithologic and oxidation domain boundaries. Figure 14-15 shows gold and Figure 14-16 shows copper in a series of contact profiles between various domains and, in all cases, the gold and copper grades are either constant or marginally transitional across all contacts. This suggests that these domains have no distinct influence on the distribution of gold or copper in these deposits.



Source: SIM Geological, 2019

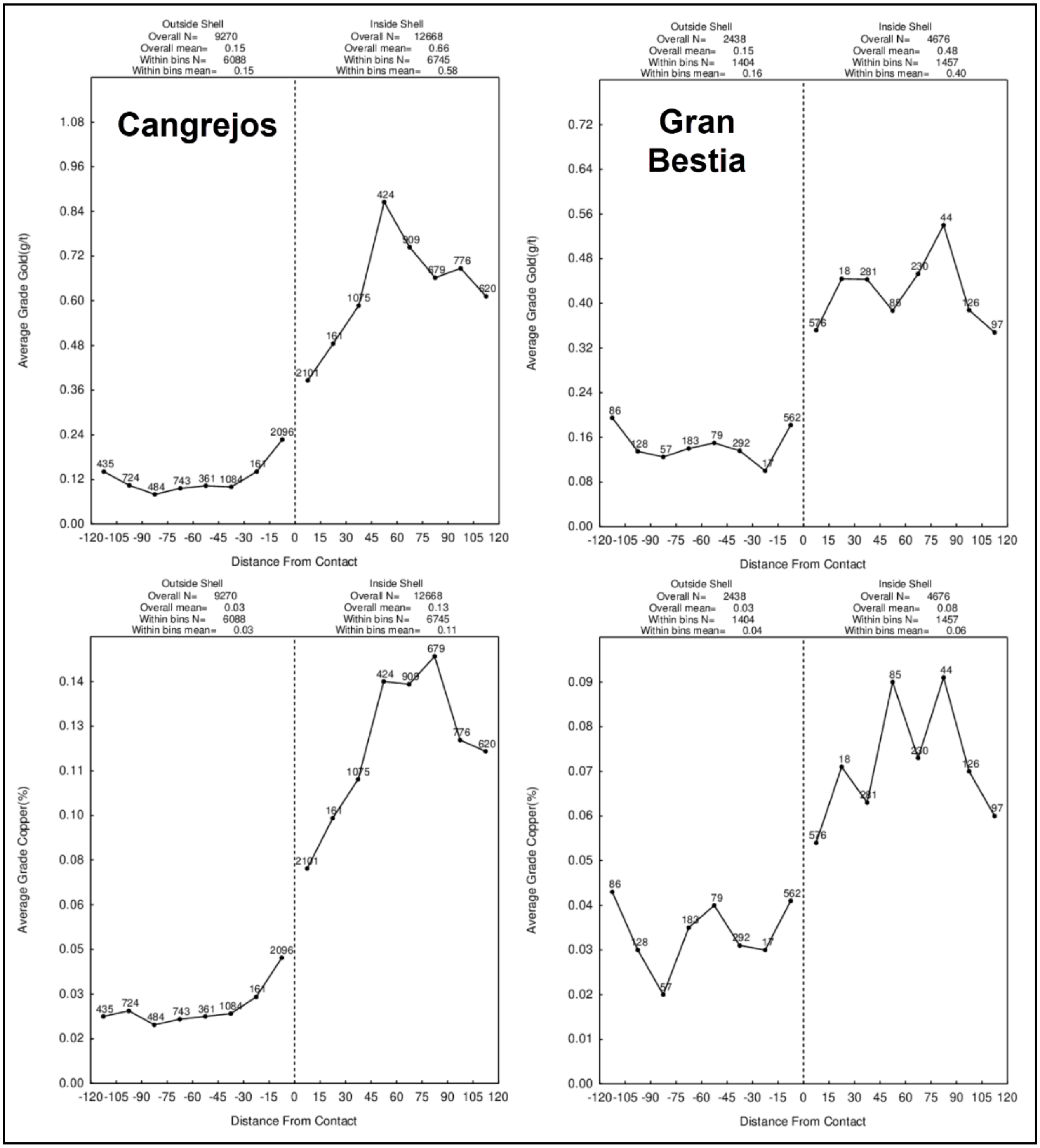
FIGURE 14-15: CONTACT PROFILES FOR GOLD SAMPLES BETWEEN INTERPRETED GEOLOGY DOMAINS AT CANGREJOS



Source: SIM Geological, 2019

FIGURE 14-16: CONTACT PROFILES FOR COPPER SAMPLES BETWEEN INTERPRETED GEOLOGY DOMAINS AT CANGREJOS

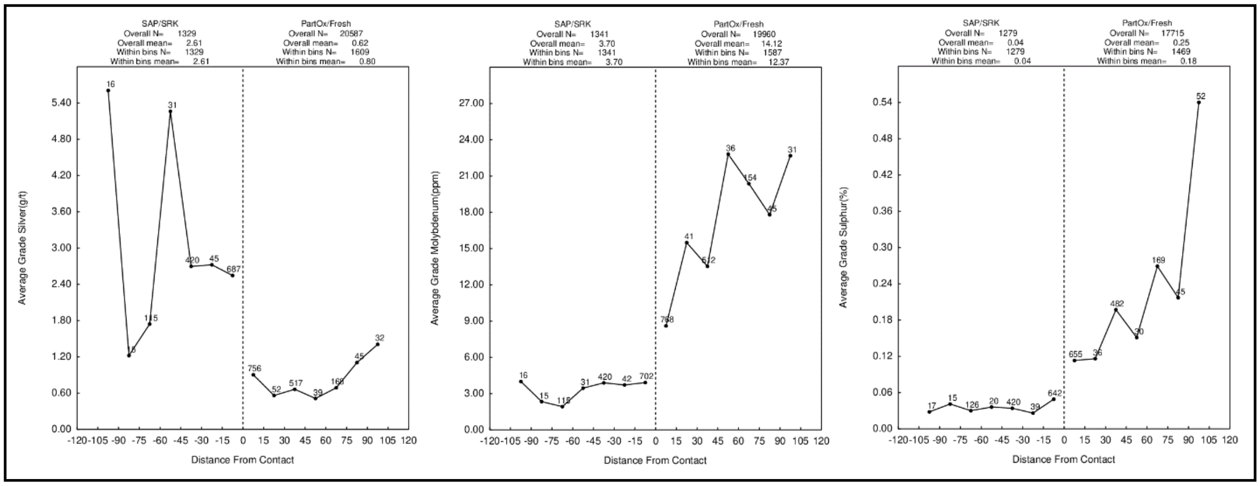
Figure 14-17 shows the change in grade for both gold and copper moving across the contact of the grade probability shell domain. The change in grade is considered significant. Note that the distributions of gold and copper in the deposits are quite coincident, and, as a result, the gold probability shell domain also encompasses areas with elevated copper mineralization. In the absence of geologic controls, the probability shell domain essentially segregates mineralized from unmineralized rocks for estimation purposes.



Source: SIM Geological, 2019

FIGURE 14-17: CONTACT PROFILES FOR GOLD AND COPPER ACROSS THE PROBABILITY GRADE SHELL DOMAIN

Figure 14-18 shows contact profiles of silver, molybdenum, and sulfur across the contact between Saprolite plus Saprock (SAP+SRK) and the underlying Transitional Oxide plus Fresh (TransOxide+Fresh) rocks in the Cangrejos deposit. Similar trends are also seen at the Gran Bestia deposit. In all cases, the change in grade for all three elements is relatively abrupt. This suggests the data should not be mixed across this boundary during grade estimation in the mineral resource model.



Source: SIM Geological, 2019

FIGURE 14-18: CONTACT PROFILES FOR SILVER, MOLYBDENUM AND SULFUR ACROSS THE SAP+SRK VS. TRANSOXIDE+FRESH ROCK BOUNDARY AT CANGREJOS

14.7.3 Conclusions and Modelling Implications

The results of the EDA indicate that the gold and copper grades are not distinctly controlled by any of the interpreted lithologic domains. This is not that uncommon in porphyry-type deposits where mineralization is often present in both the intrusive (porphyry) as well as the host rocks, and grades tend to be gradational or transitional in nature. The oxidation domains are quite recent events and have little to no influence on the distribution of gold or copper in the deposits.

The distributions of silver, molybdenum, and sulfur are moderately influenced by the presence of the Saprolite and Saprock layers. These boundaries should be recognized during grade estimation for these elements.

A summary of estimate domains are shown in Table 14-3.

TABLE 14-3: SUMMARY OF ESTIMATION DOMAINS

Element	Domain	Boundary Type
Gold	ProbShell	Hard
Copper	ProbShell	Hard
Silver	SAP+SRK, TransOxide+Fresh	Hard
Molybdenum	SAP+SRK, TransOxide+Fresh	Hard
Sulfur	SAP+SRK, TransOxide+Fresh	Hard
SG	TransOxide+Fresh only (assign SG to SAP and SRK)	Hard

Source: SIM Geological, 2019

14.8 Evaluation of Outlier Grades

Histograms and probability plots for the distribution of gold, copper, silver, molybdenum, and sulfur were reviewed to identify the presence of anomalous outlier grades in the composited (2 m) database. Following a review of the physical location of potentially erratic samples in relation to the surrounding sample data, it was decided that these would be controlled during block grade interpolations using a combination of traditional top-cutting and the application of outlier limitations. An outlier limitation controls the distance of influence of samples above a defined grade threshold. During grade interpolations, samples above the outlier thresholds are limited to a maximum distance-of-influence of 35 m.

The grade thresholds are shown in Table 14-4 for Cangrejos and Table 14-5 for Gran Bestia. These tables also list the reduction in contained metal (as a percentage) resulting from the treatment of anomalous high-grade sample data. These reductions are considered appropriate for projects at this stage of exploration.

TABLE 14-4: TREATMENT OF OUTLIER SAMPLE DATA AT CANGREJOS

Element	Domain	Maximum	Top-cut Limit	Outlier Limit	Contained Metal Lost (%)
Gold (g/t)	Inside Shell	24.90	-	10	-8
	Outside Shell	38.000	-	4	
Copper (%)	Inside Shell	4.76	2.5	1.50	-1
	Outside Shell	3.00	-	0.50	
Silver (g/t)	All	102.1	-	80	-3
Molybdenum (ppm)	All	2696	1500	700	-5
Sulfur (%)	All	10.00	8	3	-1

Note: Table 14-4 reflects 2 m composited drill hole data.
Source: SIM Geological, 2019

TABLE 14-5: TREATMENT OF OUTLIER SAMPLE DATA AT GRAN BESTIA

Element	Domain	Maximum	Top-cut Limit	Outlier Limit	Contained Metal Lost (%)
Gold (g/t)	Inside Shell	32.300	-	5	-7
	Outside Shell	4.000	-	2	
Copper (%)	Inside Shell	1.33	-	0.45	-2
	Outside Shell	0.49	-	0.20	
Silver (g/t)	All	100.0	-	15	-5
Molybdenum (ppm)	All	1890	1000	300	-4
Sulfur (%)	All	3.20	-	2	-2

Note: Table 14-5 reflects 2 m composited drill hole data.

14.9 Variography

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

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

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

In this Report, the spatial evaluation of the data was conducted using a correlogram rather than the traditional variogram. The correlogram is normalized to the variance of the data and is less sensitive to outlier values, generally giving better results.

Variograms were prepared using the commercial software package Sage 2001© developed by Isaaks & Co. Multidirectional variograms for gold, copper, silver, moybdenum, and sulfur were generated from the sample data located inside the pertinent estimation domains. The results are summarized in Tables 14-6 and 14-7.

TABLE 14-6: VARIOGRAM PARAMETERS FOR CANGREJOS

Element	Nugget	Sill 1	Sill 2	1st Structure			2nd Structure		
				Range (m)	Azimuth (°)	Dip	Range (m)	Azimuth (°)	Dip
Gold Inside Prob Shell	0.375	0.443	0.182	60	11	7	230	302	16
	Spherical			19	99	-18	216	139	73
				18	123	71	72	33	5
Gold Outside Prob Shell	0.600	0.350	0.050	132	338	1	435	277	71
	Spherical			25	248	19	197	149	12
				8	72	71	36	236	-15
Copper Inside Prob Shell	0.300	0.433	0.267	39	94	23	967	313	26
	Spherical			31	15	-23	473	175	56
				23	324	56	141	53	19
Copper Outside Prob Shell	0.341	0.456	0.203	220	177	2	591	177	10
	Spherical			42	267	0	449	67	63
				12	3	88	328	92	-25
Silver	0.349	0.250	0.400	164	86	-59	257	256	61
	Spherical			30	340	-10	18	27	20
				5	64	29	17	125	21

Element	Nugget	Sill 1	Sill 2	1st Structure Range (m)	1st Structure Azimuth (°)	1st Structure Dip	2nd Structure Range (m)	2nd Structure Azimuth (°)	2nd Structure Dip
Molybdenum	0.532	0.357	0.111	98	77	-59	592	66	74
	Spherical			27	45	27	211	26	-13
				11	142	14	149	118	-10
Sulfur	0.300	0.437	0.263	147	298	25	805	97	-66
	Spherical			143	4	-41	462	66	21
				50	50	39	300	340	-11

Note: Correlograms were conducted on 2 m composite sample data.
Source: SIM Geological, 2019

TABLE 14-7: VARIOGRAM PARAMETERS FOR GRAN BESTIA

Element	Nugget	Sill 1	Sill 2	1st Structure Range (m)	1st Structure Azimuth (°)	1st Structure Dip	2nd Structure Range (m)	2nd Structure Azimuth (°)	2nd Structure Dip
Gold Inside Prob Shell	0.419	0.427	0.154	202	92	-8	282	318	21
	Spherical			20	17	60	145	57	22
				7	178	29	70	189	59
Gold Outside Prob Shell	0.121	0.255	0.624	106	78	-39	684	145	4
	Spherical			32	43	45	12	55	-3
				7	152	19	7	355	85
Copper Inside Prob Shell	0.595	0.205	0.200	36	72	24	718	266	54
	Spherical			36	285	62	228	135	26
				25	348	-13	46	33	24
Copper Outside Prob Shell	0.470	0.359	0.171	152	120	-44	473	261	1
	Spherical			120	51	21	197	357	75
				8	159	39	85	171	15
Silver	0.187	0.762	0.051	96	296	-23	1289	169	-27
	Spherical			22	350	54	341	134	58
				6	218	26	272	71	-16
Molybdenum	0.550	0.377	0.073	80	78	-3	1126	267	30
	Spherical			21	136	84	544	107	59
				13	348	5	321	182	-9
Sulfur	0.300	0.317	0.383	30	286	12	1242	16	57
	Spherical			30	21	21	492	67	-22
				13	167	65	189	147	23

Note: Correlograms were conducted on 2 m composite sample data.
Source: SIM Geological, 2019

14.10 Model Setup and Limits

A block model was initialized in MinePlan®, and the dimensions are defined in Table 14-8. This block model covers the extents of both the Cangrejos and Gran Bestia deposits. The selection of a nominal block size measuring 15 m x 15 m x 15 m is considered appropriate with respect to the current drill hole spacing as well as the selective mining unit (SMU) size typical of an operation of this type and scale.

TABLE 14-8: BLOCK MODEL LIMITS

Direction	Minimum	Maximum	Block Size (m)	Number of Blocks
X (east)	631050	633900	15	190
Y (north)	9613300	9616150	15	190
Z (elevation)	0	1500	15	100

Source: SIM Geological, 2019

Blocks in the model were coded on a majority basis with the gold probability shell domain and the oxidation domains. During this stage, blocks along a domain boundary are coded if more than 50% of the block occurs within the boundaries of that domain.

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

14.11 Interpolation Parameters

The block model grades for gold, copper, silver, molybdenum, and sulfur were estimated using OK. The results of the OK estimation were compared with the Hermitian Polynomial Change of Support model (also referred to as the Discrete Gaussian Correction). This method is described in more detail in Section 14.12.2. Estimates for SG were made using the inverse distance weighting (IDW) interpolation method.

The Cangrejos OK model was generated with a relatively limited number of samples to match the change of support or Herco (Hermitian Correction) grade distribution. This approach reduces the amount of smoothing or averaging in the model, and, while there may be some uncertainty on a localized scale, this approach produces reliable estimates of the recoverable grade and tonnage for the overall deposit.

The estimation parameters for the various elements in the mineral resource block model are shown in Table 14-9 for the Cangrejos deposit and in Table 14-10 for the Gran Bestia deposit. All grade estimations use length-weighted composite drill hole sample data.

TABLE 14-9: INTERPOLATION PARAMETERS FOR CANGREJOS

Element	Search Ellipse[1] Range (m)			Number of Composites			Other
	X	Y	Z	Min/Block	Max/Block	Max/Hole	
Gold Inside Prob Shell	500	500	200	8	44	11	1 DH per octant
Gold Outside Prob Shell	500	500	200	8	33	11	1 DH per octant
Copper Inside Prob Shell	500	500	200	8	44	11	1 DH per octant

Element	Search Ellipse[1] Range (m)			Number of Composites			Other
	X	Y	Z	Min/Block	Max/Block	Max/Hole	
Copper Outside Prob Shell	500	500	200	8	44	11	1 DH per octant
Silver	500	500	200	8	27	9	1 DH per octant
Molybdenum	500	500	200	8	44	11	1 DH per octant
Sulfur	500	500	200	8	44	11	1 DH per octant
SG	500	500	200	3	12	3	1 DH per octant

Note: [1] Ellipse orientation with long axis north-south and west-east and vertical short axis. DH = drill hole.
Source: SIM Geological, 2019

TABLE 14-10: INTERPOLATION PARAMETERS FOR GRAN BESTIA

Element	Search Ellipse[1] Range (m)			Number of Composites			Other
	X	Y	Z	Min/Block	Max/Block	Max/Hole	
Gold	500	500	200	8	44	11	1 DH per octant
Gold Inside Prob Shell	500	500	200	8	44	11	1 DH per octant
Gold Outside Prob Shell	500	500	200	8	44	11	1 DH per octant
Copper Inside Prob Shell	500	500	200	8	44	11	1 DH per octant
Copper Outside Prob Shell	500	500	200	8	33	11	1 DH per octant
Silver	500	500	200	8	33	11	1 DH per octant
Molybdenum	500	500	200	8	33	11	1 DH per octant
Sulfur	500	500	200	8	44	11	1 DH per octant
SG	500	500	200	3	12	3	1 DH per octant

Note: [1] Ellipse orientation with long axis north-south and west-east and vertical short axis. DH = drill hole

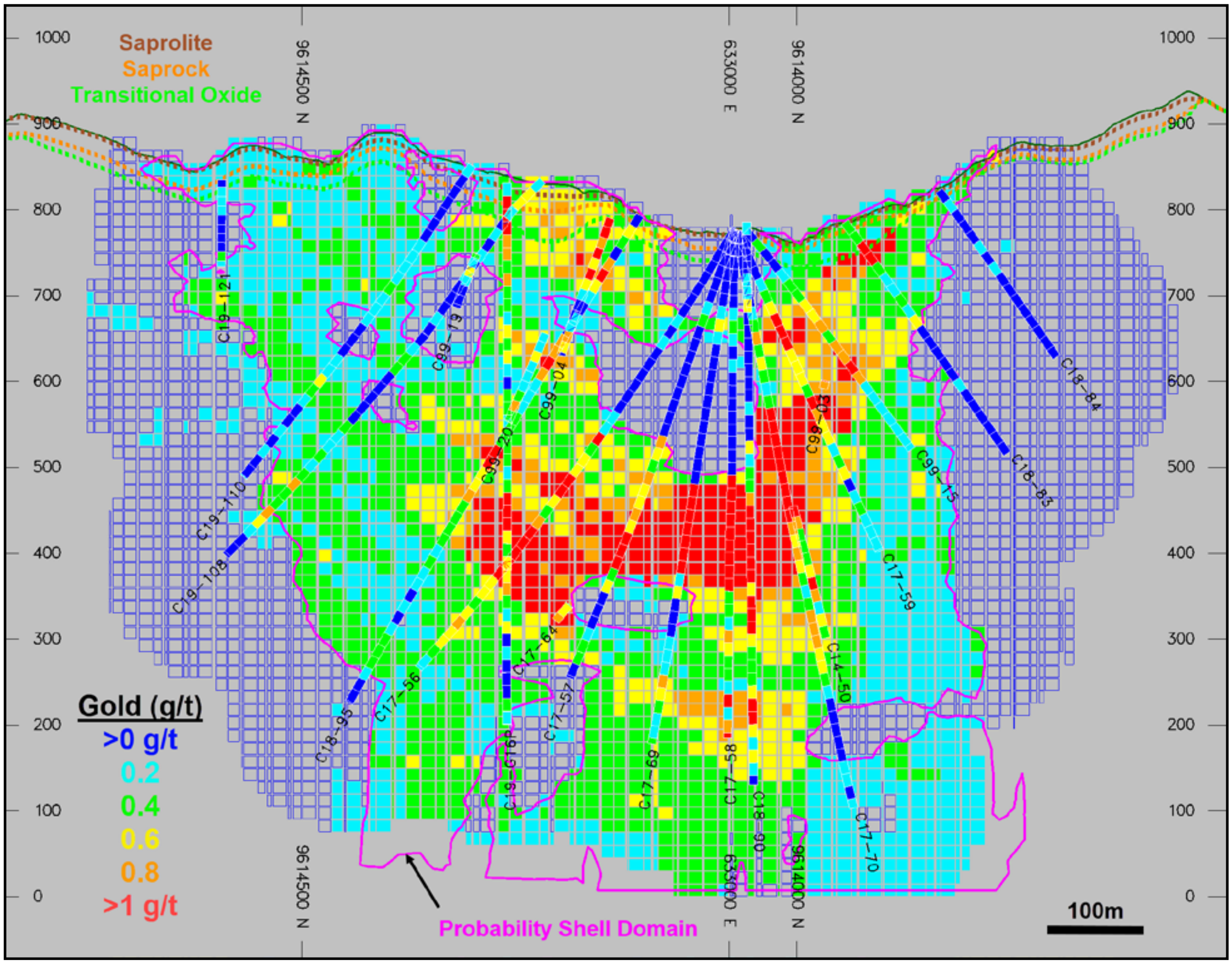
14.12 Validation

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

14.12.1 Visual Inspection

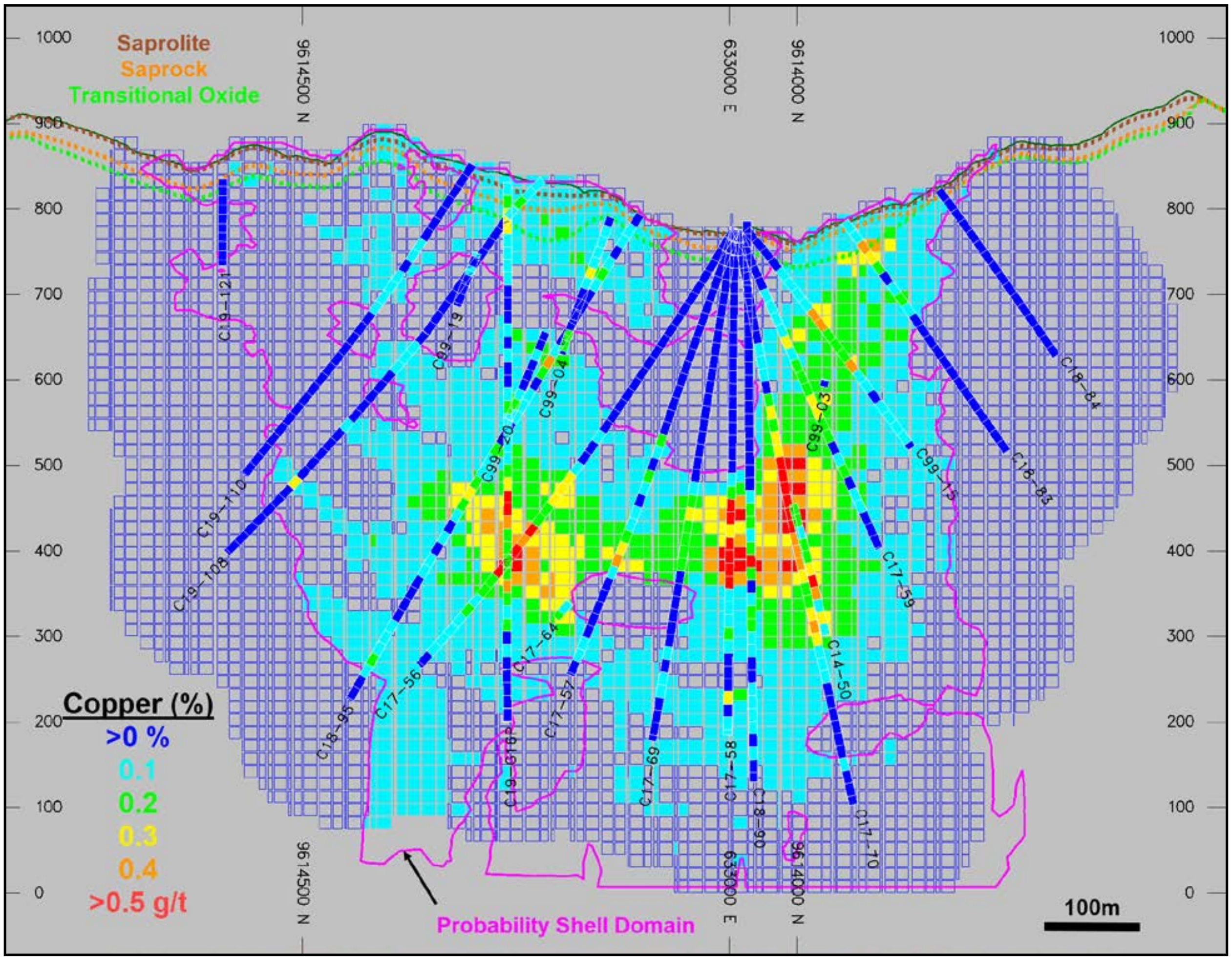
A detailed visual inspection of the block model was conducted in both section and plan to ensure the desired results following interpolation. This includes confirmation of the proper coding of blocks within the gold grade probability shell domain. The estimated gold, copper, silver, and molybdenum grades in the model appear to be a valid representation of the underlying drill hole sample data.

Examples of the distribution of gold and copper grades in model blocks compared to the drill hole sample data at Cangrejos are shown in Figures 14-19 and 14-20, respectively. Examples of the distribution of gold and copper grades in model blocks compared to the drill hole sample data at Gran Bestia are shown in Figures 14-21 and 14-22, respectively.



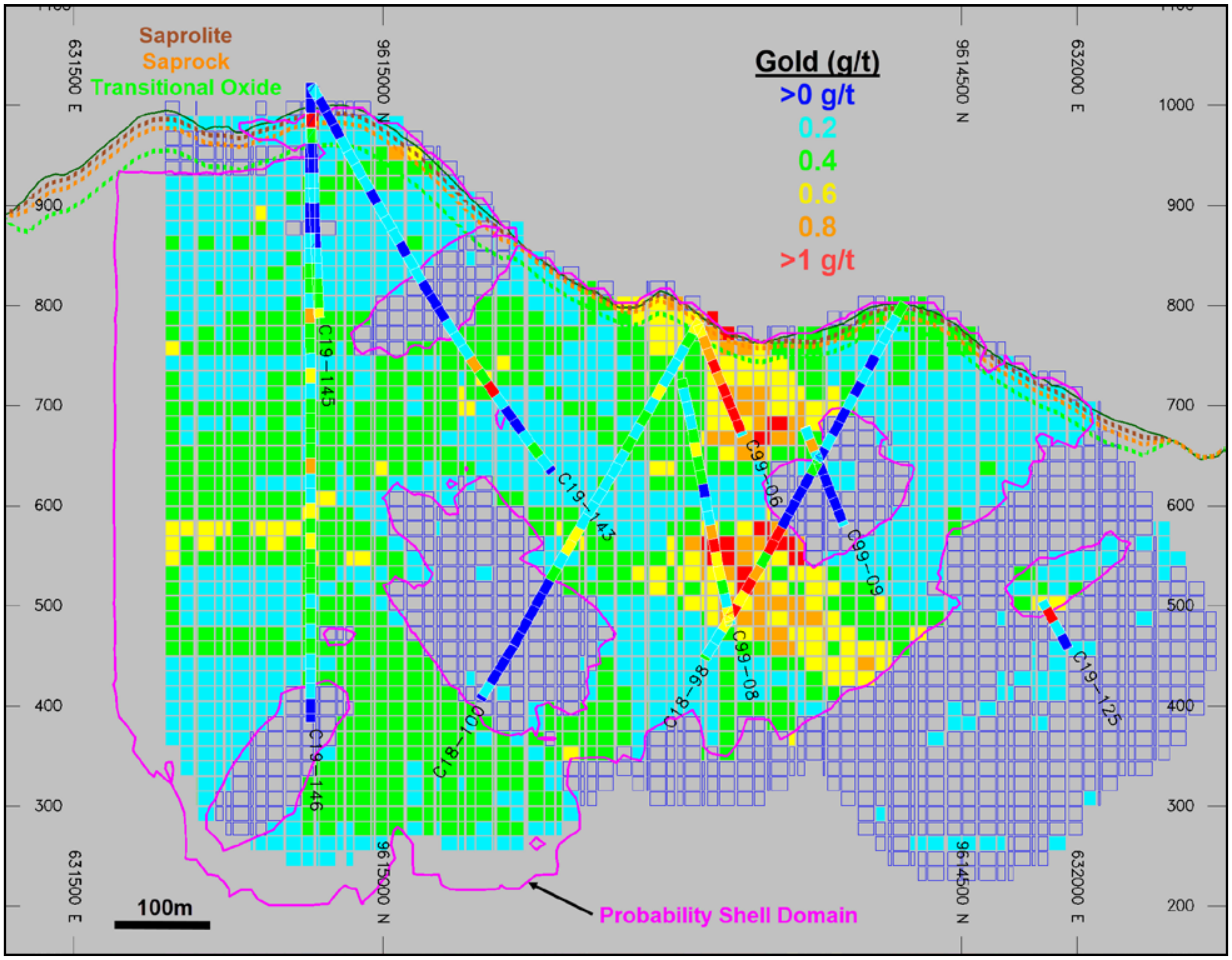
Source: SIM Geological, 2019

FIGURE 14-19: VERTICAL CROSS SECTION SHOWING GOLD GRADES IN DRILLING AND BLOCK MODEL AT CANGREJOS



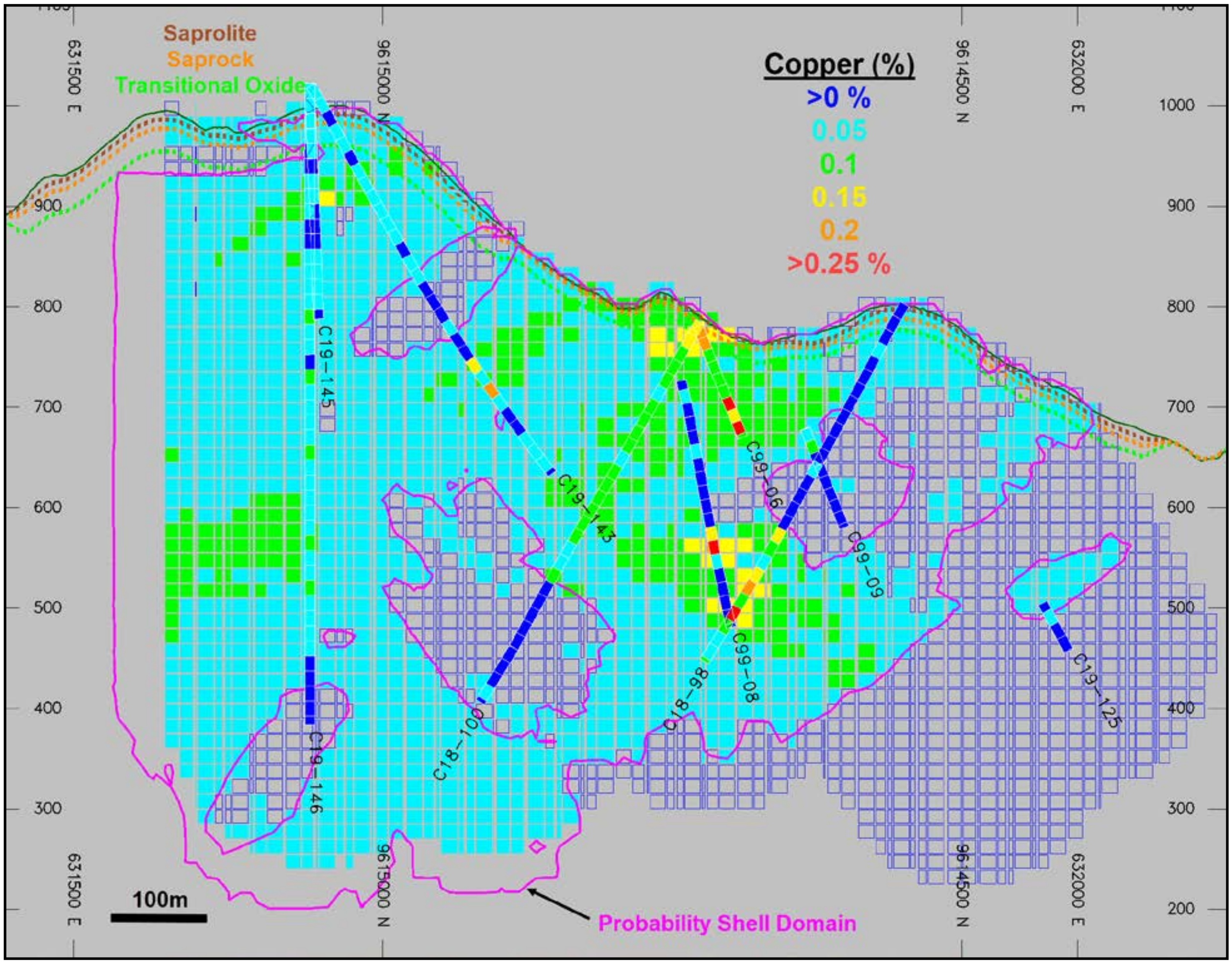
Source: SIM Geological, 2019

FIGURE 14-20: VERTICAL CROSS SECTION SHOWING COPPER GRADES IN DRILLING AND BLOCK MODEL AT CANGREJOS



Source: SIM Geological, 2019

FIGURE 14-21: VERTICAL CROSS SECTION SHOWING GOLD GRADES IN DRILLING AND BLOCK MODEL AT GRAN BESTIA



Source: SIM Geological, 2019

FIGURE 14-22: VERTICAL CROSS SECTION SHOWING COPPER GRADES IN DRILLING AND BLOCK MODEL AT GRAN BESTIA

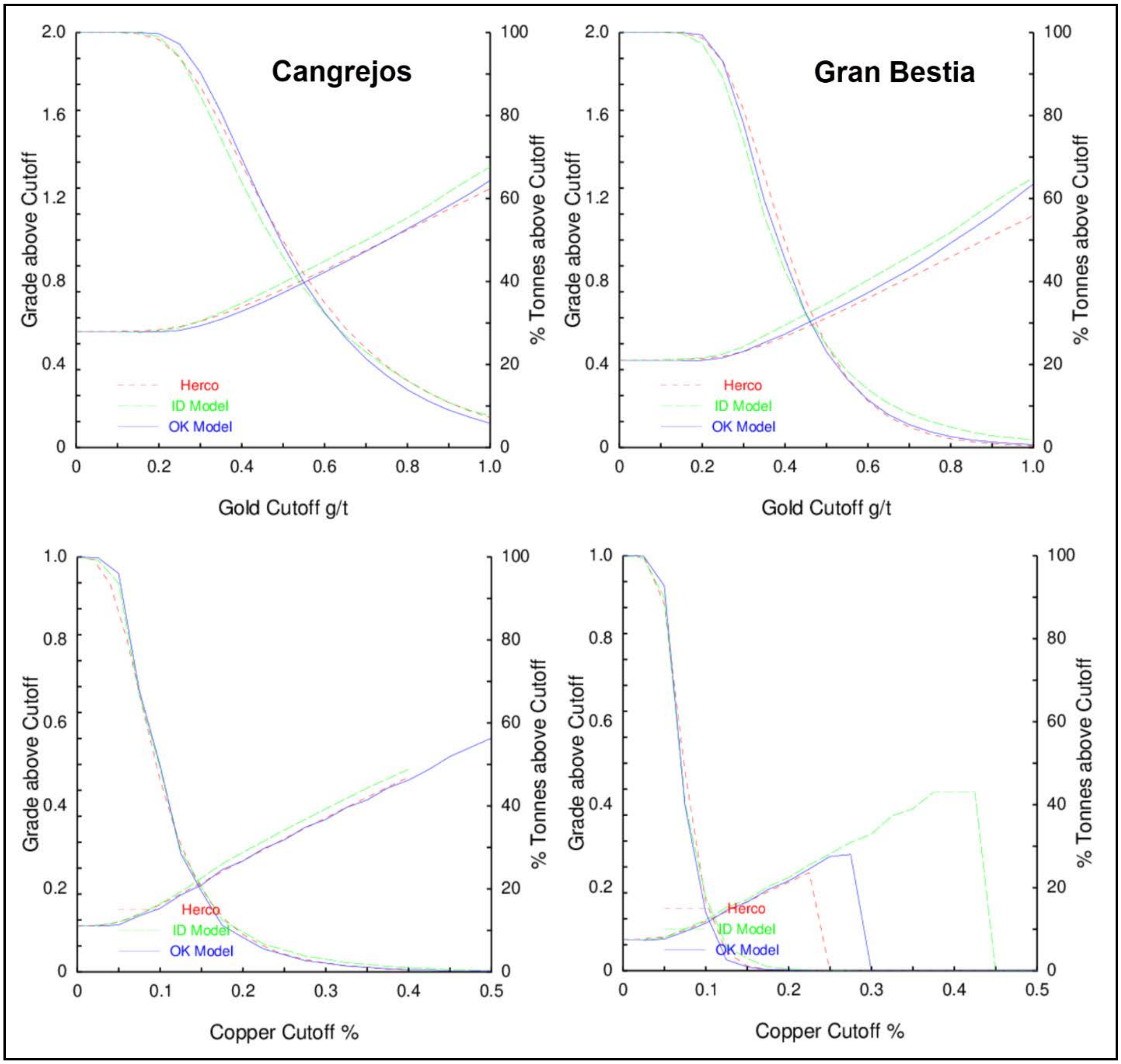
14.12.2 Model Checks for Change of Support

The relative degree of smoothing in the block model estimates were evaluated using the Discrete Gaussian of Hermitian Polynomial Change of Support method (described by Rossi and Deutsch, Mineral Resource Estimation, 2014).

Using this method, the distribution of the hypothetical block grades can be directly compared to the estimated (OK) model through the use of pseudo-grade/tonnage curves. Adjustments are made to the block model interpolation parameters until an acceptable match is made with the Herco distribution. In general, the estimated model should be slightly higher in tonnage and slightly lower in grade when compared to the Herco distribution at the projected cut-off grade. These differences account for selectivity and other potential ore-handling issues which commonly occur during mining.

The Herco distribution is derived from the declustered composite grades which have been adjusted to account for the change in support, going from smaller drill hole composite samples to the large blocks in the model. The transformation results in a less skewed distribution but with the same mean as the original declustered samples.

Examples showing the distributions of the gold and copper models at Cangrejos and Gran Bestia models are shown in Figure 14-23.



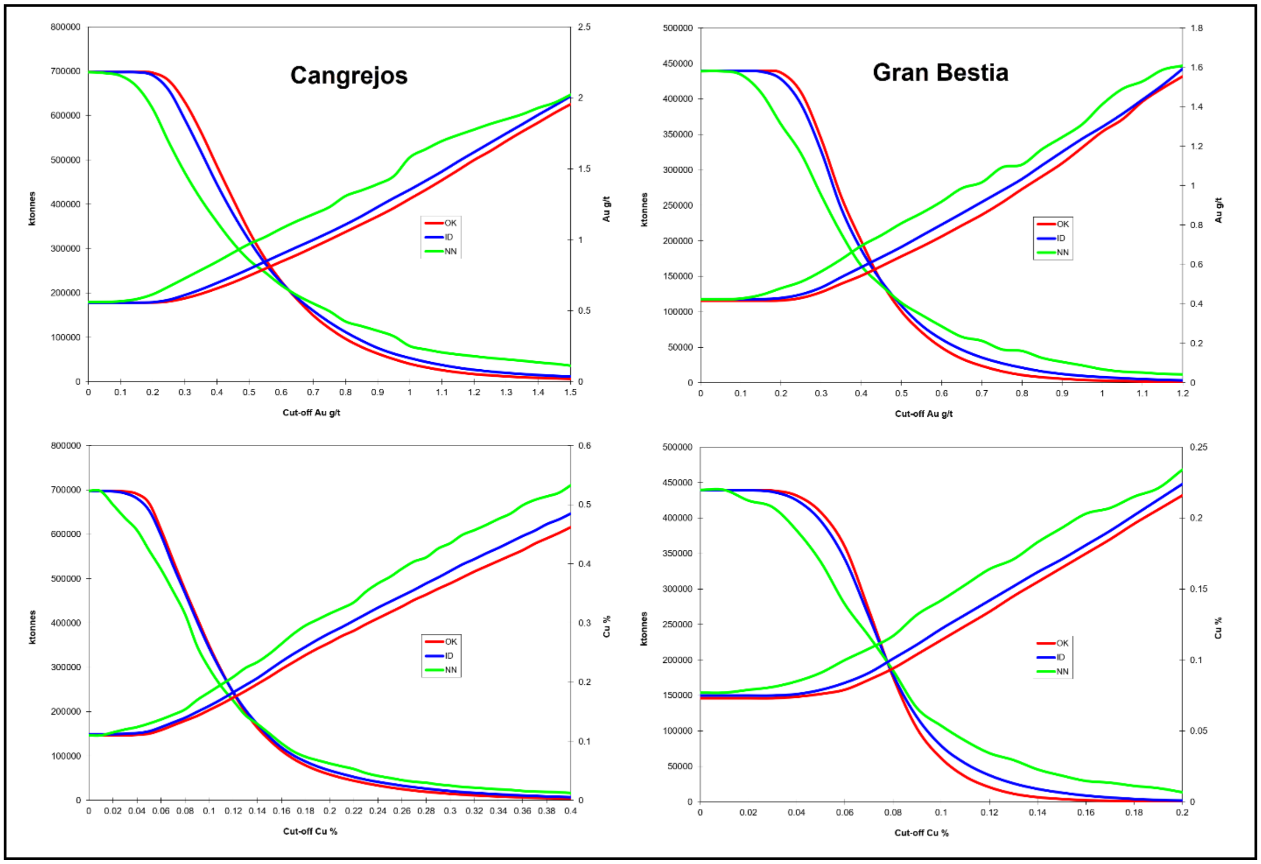
Source: SIM Geological, 2019

FIGURE 14-23: HERCO GRADE/TONNAGE PLOT FOR GOLD AND COPPER MODELS

14.12.3 Comparison of Interpolation Methods

For comparison purposes, additional models for gold, copper, silver, molybdenum, and sulfur were generated using both the inverse distance weighted (IDW) and nearest neighbor (NN) interpolation methods (the NN model was generated using data composited to 15 m intervals).

Comparisons are made between these models on grade/tonnage curves. Examples of the grade/tonnage curves for gold and copper at Cangrejos and Gran Bestia are shown in Figure 14-24. There is good correlation between the OK and ID models throughout the range of cut-off grades. The NN distribution, generally showing less tonnage and higher grade, is the result of the absence of smoothing in this modelling approach. Similar results were achieved with the silver, molybdenum, and sulfur models. Reproduction of the model using different methods tends to increase the confidence in the overall Mineral Resources estimate.



Source: SIM Geological, 2019

FIGURE 14-24: GRADE/TONNAGE COMPARISON OF GOLD MODELS

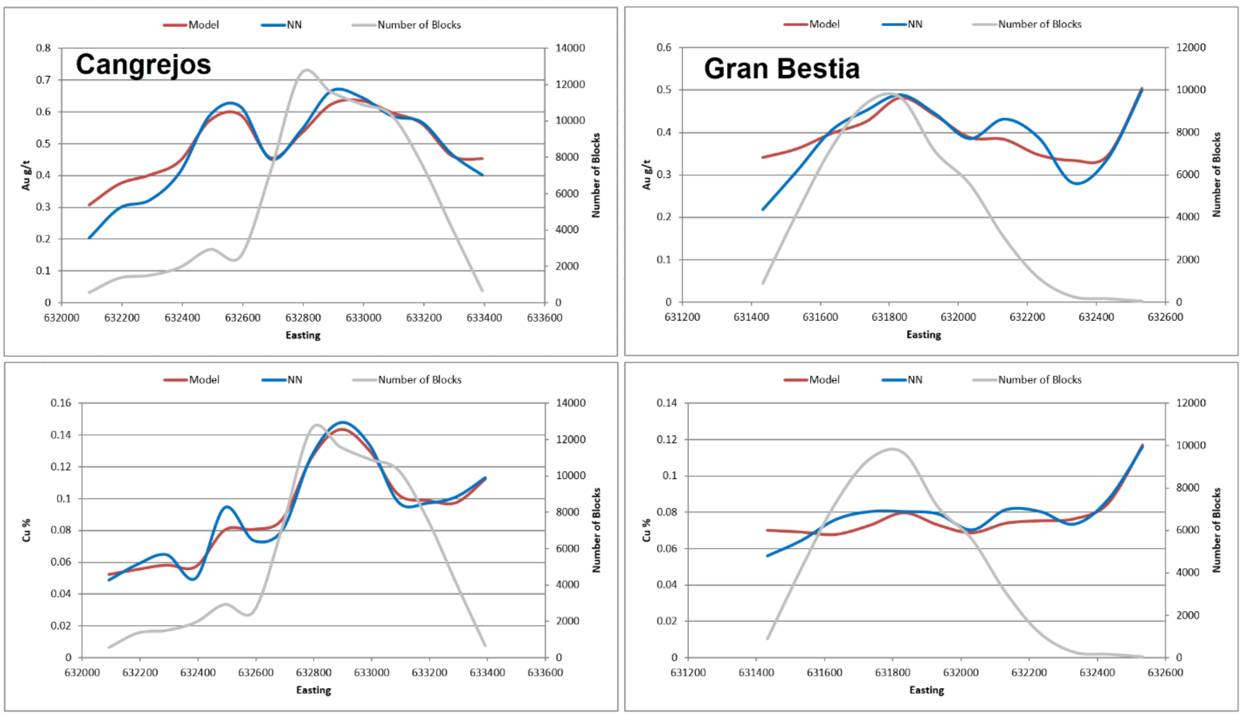
14.12.4 Swath Plots (Drift Analysis)

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

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

Swath plots were generated in three orthogonal directions for all models. An example of the gold distribution in north-south swaths is shown in Figure 14-25.

There is good correspondence between the models in most areas. The degree of smoothing in the OK model is evident in the peaks and valleys shown in the swath plots. Areas indicating large differences between the models tend to be the result of "edge" effects, where there are less available data to support a comparison. The validation results indicate that the OK model is a reasonable reflection of the underlying sample data.



Source: SIM Geological, 2019

FIGURE 14-25: SWATH PLOT OF GOLD AND COPPER OK AND NN MODELS BY EASTING

14.13 Mineral Resource Classification

The Mineral Resources for the Cangrejos and Gran Bestia deposits were classified in accordance with the CIM *Definition Standards for Mineral Resources and Mineral Reserves* (May 2014). The classification parameters are defined relative to the distance between gold sample data and are intended to encompass zones of reasonably continuous mineralization that exhibit the desired degree of confidence. These parameters are based on visual observations and statistical studies. Classification parameters are based primarily on the nature of the distribution of gold data as it is the main contributor to the relative value of this polymetallic deposit.

The following criteria were used to define Mineral Resources in the Indicated and Inferred categories.

14.13.1 Indicated Mineral Resources

Mineral Resources in the Indicated category include relatively large volumes that show consistent zones of mineralization and are delineated with drilling spaced at a maximum distance of 100 m.

14.13.2 Inferred Mineral Resources

Mineral Resources in the Inferred category include model blocks that are located within a maximum distance of 150 m from a drill hole.

Domains were interpreted to encompass model blocks that are included in the Indicated and Inferred categories. This step ensures consistency of classification across the deposit. Some drill holes were terminated in appreciable mineralization and there are some instances where the lateral extents of mineralization have not been defined with current drilling. In these instances, the lateral extents of mineralization were manually truncated at 100 m or less from drilling and the depth extent of Inferred Mineral Resources is limited to 50 m vertically below drill holes to ensure that the appropriate level of confidence in the resource retained.

14.14 Mineral Resources

CIM *Definition Standards for Mineral Resources and Mineral Reserves* (May 2014) define a Mineral Resource as:

"[A] concentration or occurrence of solid material of economic interest, in or on the Earth's crust in such form, grade or quality and quantity, that there are reasonable prospects for eventual economic extraction. The location, quantity, grade or quality, continuity and other geological characteristics of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge, including sampling."

The "*reasonable prospects for eventual economic extraction*" requirement generally implies that quantity and grade estimates meet certain economic thresholds and that Mineral Resources are reported at an appropriate cut-off grade that takes into account extraction scenarios and processing recovery.

The economic viability of the Mineral Resource was tested by constraining it within a floating cone pit shell; the pit shell was generated using the following projected economic and technical parameters:

Mining (open pit)	$2.00/t
Processing	$8.00/t
G&A	$1.50/t
Gold price	$1,500/oz
Silver price	$18.00/oz
Copper price	$3.00/lb
Molybdenum price	$7.00/lb
Gold process recovery	83% fresh rock; 80% part oxidized; 75% SAP&SRK
Silver process recovery	60% fresh rock; 60% part oxidized; 65% SAP&SRK
Copper process recovery	87% fresh rock; 50% part oxidized

Molybdenum process recovery	50% fresh rock and part oxidized
Pit slope	47.5 degrees

Based on the metal prices and recoveries listed here, recoverable gold equivalent (AuEqR) grades are calculated using the following formulas:

$$\text{SAP\&SRK:AuEqR} = (\text{Au g/t} \times 0.75) + (\text{Ag g/t} \times 0.65 \times 0.012)$$

$$\text{Part Oxidized:AuEqR} = (\text{Au g/t} \times 0.80) + (\text{Ag g/t} \times 0.60 \times 0.012) + (\text{Cu\%} \times 0.50 \times 1.37) + (\text{Mo ppm}/10{,}000 \times 0.50 \times 3.2)$$

$$\text{Fresh Rock:AuEqR} = (\text{Au g/t} \times 0.83) + (\text{Ag g/t} \times 0.60 \times 0.012) + (\text{Cu\%} \times 0.87 \times 1.37) + (\text{Mo ppm}/10{,}000 \times 0.50 \times 3.2)$$

The pit shell is generated using a floating cone algorithm based on the AUEqR block grades. There are no adjustments for mining recoveries or dilution. This test indicates that some of the deeper mineralization may not be economic due to the increased waste stripping requirements. It is important to recognize that these discussions of surface mining parameters are used solely to test the "*reasonable prospects for eventual economic extraction*," and that they do not represent an attempt to estimate mineral reserves. There are no mineral reserves calculated for this Project. These preliminary evaluations are used to prepare the Mineral Resources estimate contained in this Report and to select appropriate reporting assumptions.

The estimate of Mineral Resources, contained within the $1,500/oz Au pit shell, are based on gold equivalent grades (AuEq) calculated using the following formula:

$$\text{AuEq} = \text{Au g/t} + (\text{Ag g/t} \times 0.012) + (\text{Cu\%} \times 1.37) + (\text{Mo ppm}/10{,}000 \times 3.2)$$

(Note: there is no contribution from copper or molybdenum in the SAP or SRK units.)

Using the assumed metal prices, operating costs, and metallurgical recoveries, the base case cut-off grade for Mineral Resources is estimated to be 0.30 g/t AuEq. Table 14-11 shows the estimate of Mineral Resources at Cangrejos. Table 14-12 shows the estimate of Mineral Resources at Gran Bestia. Table 14-13 shows the combined estimate of Mineral Resources at Cangrejos and Gran Bestia.

The distribution of the base case mineral resource within the $1,500/oz Au pit shell is shown from a series of isometric viewpoints in Figures 14-26 to 14-29.

There are no known factors related to environmental, permitting, legal, title, taxation, socio-economic, marketing, political, or other relevant factors which could materially affect the Mineral Resources estimate contained in this Report. Mineral Resources in the Inferred category have a lower level of confidence than that applied to Indicated Mineral Resources, and, although there is sufficient evidence to imply geologic grade and continuity, these characteristics cannot be verified based on the current data. It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.

TABLE 14-11: ESTIMATE OF MINERAL RESOURCES AT CANGREJOS

Type	Mt	Average Grade						Contained Metal			
		AuEq (g/t)	Au (g/t)	Cu (%)	Ag (g/t)	Mo (ppm)	S (%)	Au (Moz)	Cu (Mlbs)	Ag (Moz)	Mo (Mlbs)
Indicated											
SAP+SRK	14.5	0.61	0.57	0.10	2.9	4.2	0.04	0.3	30	1.3	0.1
TransOxide	14.8	0.71	0.56	0.10	0.8	15.7	0.18	0.3	33	0.4	0.5
Fresh	440.5	0.77	0.59	0.12	0.7	23.2	0.24	8.4	1,165	9.2	22.5
Combined	469.7	0.77	0.59	0.12	0.7	22.4	0.23	8.9	1,222	10.9	23.2
Inferred											
SAP+SRK	7.4	0.43	0.41	0.07	2.0	2.7	0.07	0.1	11	0.5	0.0
TransOxide	9.4	0.46	0.36	0.07	0.7	11.8	0.38	0.1	15	0.2	0.2
Fresh	238.1	0.56	0.43	0.09	0.7	15.3	0.34	3.3	446	5.0	8.0
Combined	254.9	0.55	0.43	0.08	0.7	14.8	0.33	3.5	472	5.7	8.3

Note: The estimates in Table 14-11 are limited inside the $1,500/oz Au pit shell. The base case cut-off grade is 0.30 g/t gold equivalent (AuEq). Mineral Resources are not Mineral Reserves because the economic viability has not been demonstrated.
Source: SIM Geological, 2020

TABLE 14-12: ESTIMATE OF MINERAL RESOURCES AT GRAN BESTIA

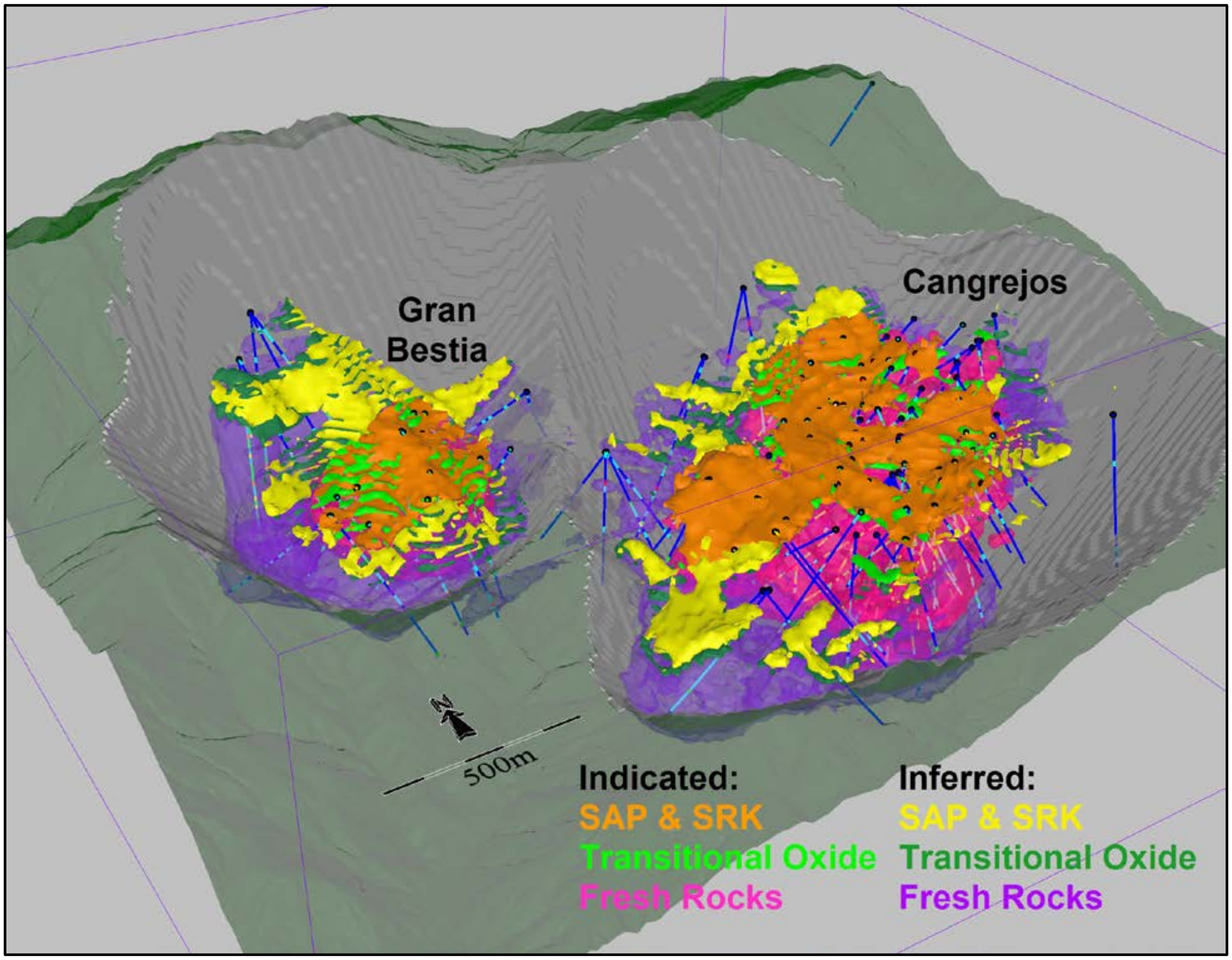
Type	Mt	Average Grade						Contained Metal			
		AuEq (g/t)	Au (g/t)	Cu (%)	Ag (g/t)	Mo (ppm)	S (%)	Au (Moz)	Cu (Mlbs)	Ag (Moz)	Mo (Mlbs)
Indicated											
SAP+SRK	2.6	0.55	0.52	0.08	2.4	8.6	0.04	0.0	4	0.2	0.0
TransOxide	4.7	0.69	0.56	0.08	0.6	17.2	0.22	0.1	9	0.1	0.2
Fresh	93.8	0.58	0.45	0.08	0.5	15.5	0.27	1.4	168	1.6	3.2
Combined	101.1	0.58	0.46	0.08	0.6	15.4	0.27	1.5	180	1.9	3.4
Inferred											
SAP+SRK	4.1	0.46	0.44	0.07	1.6	7.1	0.17	0.1	6	0.2	0.1
TransOxide	7.5	0.51	0.41	0.06	0.7	11.1	0.38	0.1	10	0.2	0.2
Fresh	233.9	0.50	0.40	0.07	0.6	11.3	0.33	3.0	351	4.3	5.8
Combined	245.5	0.50	0.40	0.07	0.6	11.3	0.33	3.1	368	4.7	6.1

Note : The estimates in Table 14-12 are limited inside the $1,500/oz Au pit shell. The base case cut-off grade is 0.30 g/t gold equivalent (AuEq). Mineral Resources are not Mineral Reserves because the economic viability has not been demonstrated.
Source: SIM Geological, 2020

TABLE 14-13: ESTIMATE OF MINERAL RESOURCES AT CANGREJOS AND GRAN BESTIA

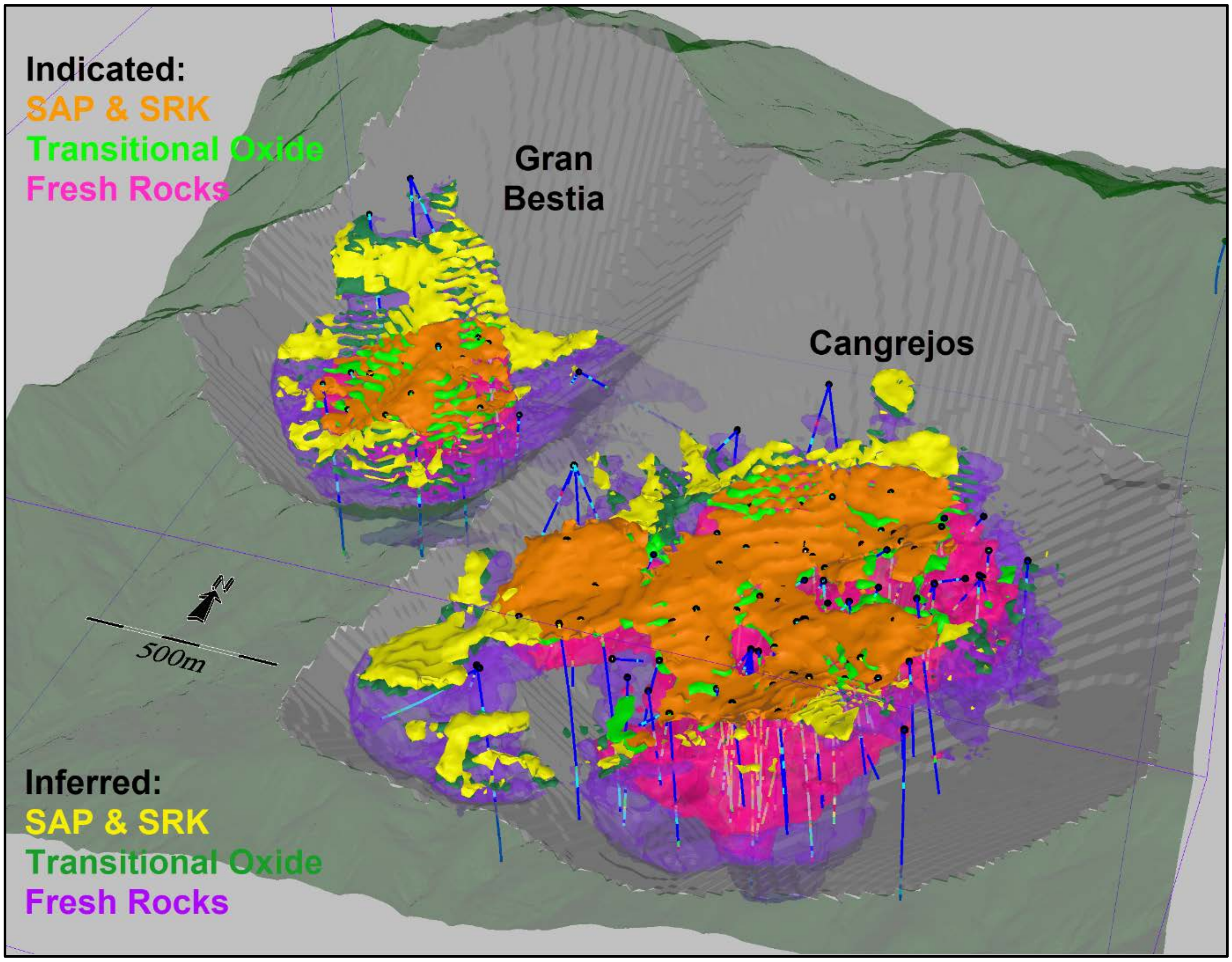
Type	Mt	Average Grade						Contained Metal			
		AuEq (g/t)	Au (g/t)	Cu (%)	Ag (g/t)	Mo (ppm)	S (%)	Au (Moz)	Cu (Mlbs)	Ag (Moz)	Mo (Mlbs)
Indicated											
SAP+SRK	17.0	0.60	0.57	0.09	2.8	4.8	0.04	0.3	35	1.5	0.2
TransOxide	19.5	0.71	0.56	0.10	0.7	16.1	0.19	0.4	41	0.5	0.7
Fresh	534.3	0.74	0.57	0.11	0.6	21.9	0.24	9.8	1331	10.8	25.8
Combined	570.8	0.73	0.57	0.11	0.7	21.2	0.24	10.4	1,409	12.8	26.7
Inferred											
SAP+SRK	11.6	0.44	0.42	0.07	1.9	4.3	0.10	0.2	17	0.7	0.1
TransOxide	16.9	0.49	0.38	0.07	0.7	11.5	0.38	0.2	25	0.4	0.4
Fresh	471.9	0.53	0.42	0.08	0.6	13.3	0.33	6.3	791	9.3	13.8
Combined	500.4	0.53	0.41	0.08	0.6	13.0	0.33	6.7	838	10.3	14.3

Note: The estimates in Table 14-13 are limited inside the $1,500/oz Au pit shell. The base case cut-off grade is 0.30 g/t gold equivalent (AuEq). Mineral Resources are not Mineral Reserves because the economic viability has not been demonstrated.
Source: SIM Geological, 2020



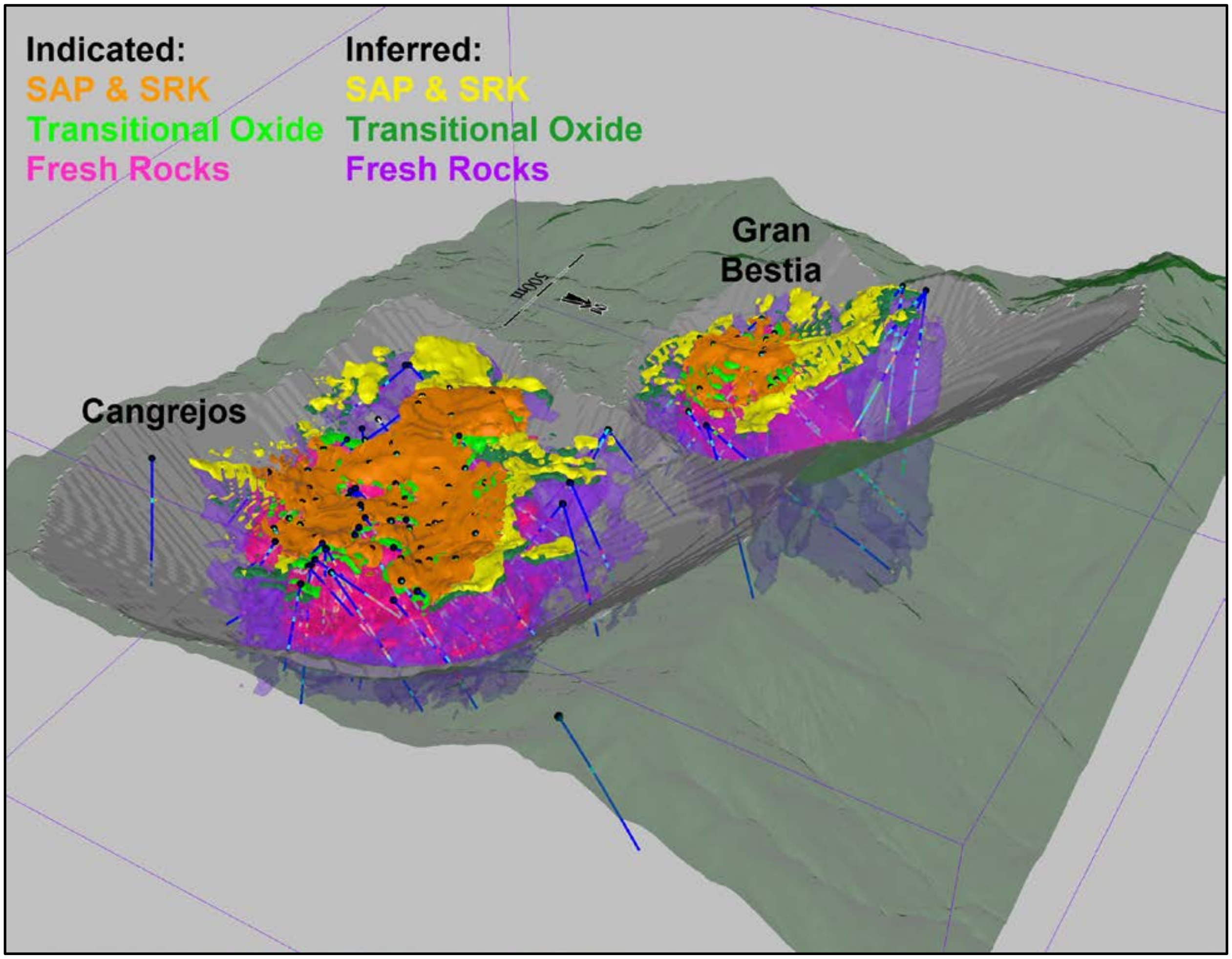
Source: SIM Geological, 2020

FIGURE 14-26: ISOMETRIC VIEWS OF BASE CASE WITH RESOURCE LIMITING PIT SHELL



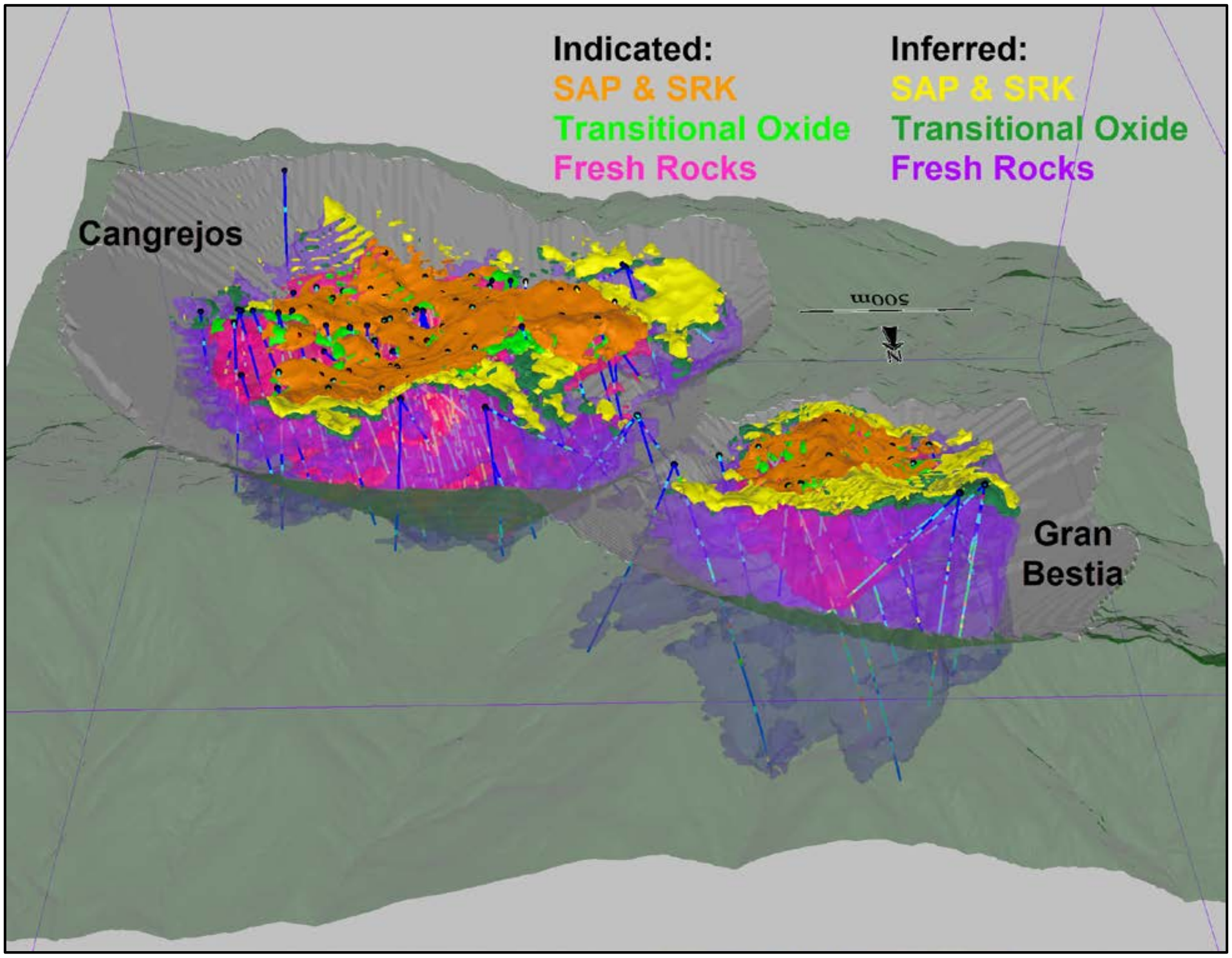
Source: SIM Geological, 2020

FIGURE 14-27: ISOMETRIC VIEWS OF BASE CASE MINERAL RESOURCE WITH RESOURCE LIMITING PIT SHELL



Source: SIM Geological, 2020

FIGURE 14-28: ISOMETRIC VIEWS OF BASE CASE MINERAL RESOURCE WITH RESOURCE LIMITING PIT SHELL



Source: SIM Geological, 2020

FIGURE 14-29: ISOMETRIC VIEWS OF BASE CASE MINERAL RESOURCE WITH RESOURCE LIMITING PIT SHELL

14.15 Sensitivity of Mineral Resources

The sensitivity of Mineral Resources, contained within the $1,500/oz Au pit shell, is demonstrated by listing Mineral Resources at a series of cut-off thresholds. Tables 4-14 and 4-15 show the sensitivity of Indicated and Inferred Mineral Resources at Cangrejos, respectively. Tables 4-16 and 14-17 show the sensitivity of Indicated and Inferred Mineral Resources at Gran Bestia, respectively. Tables 14-18 and 14-19 show the sensitivity of total Indicated Mineral Resources at Cangrejos and Gran Bestia and Inferred Mineral Resources at Cangrejos and Gran Bestia, respectively.

TABLE 14-14: SENSITIVITY OF INDICATED MINERAL RESOURCE TO CUT-OFF GRADE AT CANGREJOS

Cut-Off AuEq (g/t)	Mt	Average Grade						Contained Metal			
		AuEq (g/t)	Au (g/t)	Cu (%)	Ag (g/t)	Mo (ppm)	S (%)	Au (Moz)	Cu (Mlbs)	Ag (Moz)	Mo (Mlbs)
0.15	605.2	0.64	0.49	0.10	0.7	20.1	0.23	9.6	1334	13.8	26.8
0.20	536.3	0.70	0.54	0.11	0.7	21.1	0.23	9.3	1289	12.6	24.9
0.25	495.6	0.74	0.57	0.12	0.7	21.9	0.23	9.1	1257	11.6	23.9
0.30	**469.7**	**0.77**	**0.59**	**0.12**	**0.7**	**22.4**	**0.23**	**8.9**	**1222**	**10.9**	**23.2**
0.35	450.7	0.78	0.61	0.12	0.7	22.8	0.23	8.8	1202	10.4	22.7
0.40	429.2	0.80	0.62	0.12	0.7	23.3	0.23	8.6	1173	10.1	22.0
0.45	400.4	0.83	0.64	0.13	0.7	24.0	0.23	8.3	1121	9.5	21.2
0.50	367.6	0.86	0.67	0.13	0.8	24.8	0.23	7.9	1070	8.9	20.1
0.55	331.7	0.90	0.70	0.14	0.8	25.6	0.23	7.5	1002	8.1	18.7
0.60	295.2	0.94	0.73	0.14	0.8	26.4	0.23	6.9	924	7.4	17.2

Note: The estimates in Table 14-14 are limited inside the $1,500/oz Au pit shell. The base case cut-off grade used is 0.30 g/t gold equivalent (AuEq). Mineral Resources are not Mineral Reserves because the economic viability has not been demonstrated.
Source: SIM Geological, 2020

TABLE 14-15: SENSITIVITY OF INFERRED MINERAL RESOURCE TO CUT-OFF GRADE AT CANGREJOS

Cut-Off AuEq (g/t)	Mt	Average Grade						Contained Metal			
		AuEq (g/t)	Au (g/t)	Cu (%)	Ag (g/t)	Mo (ppm)	S (%)	Au (Moz)	Cu (Mlbs)	Ag (Moz)	Mo (Mlbs)
0.15	580.8	0.36	0.27	0.06	0.7	11.5	0.34	5.1	743	12.9	14.7
0.20	419.1	0.43	0.33	0.07	0.7	12.6	0.34	4.4	628	9.4	11.6
0.25	313.5	0.50	0.39	0.08	0.7	13.9	0.33	3.9	539	7.1	9.6
0.30	**254.9**	**0.55**	**0.43**	**0.08**	**0.7**	**14.8**	**0.33**	**3.5**	**472**	**5.7**	**8.3**
0.35	218.1	0.59	0.46	0.09	0.7	15.4	0.33	3.2	423	4.8	7.4
0.40	184.9	0.63	0.49	0.09	0.7	16.1	0.33	2.9	383	4.1	6.6
0.45	153.2	0.68	0.53	0.10	0.7	16.7	0.32	2.6	338	3.4	5.6
0.50	126.3	0.72	0.56	0.11	0.7	17.3	0.31	2.3	298	2.8	4.8
0.55	103.9	0.76	0.59	0.11	0.7	17.9	0.31	2.0	259	2.4	4.1
0.60	84.9	0.80	0.63	0.12	0.7	18.4	0.30	1.7	223	2.0	3.4

Note: The estimates in Table 14-15 are limited inside the $1,500/oz Au pit shell. The base case cut-off grade used is 0.30 g/t gold equivalent (AuEq). Mineral Resources are not Mineral Reserves because the economic viability has not been demonstrated.
Source: SIM Geological, 2020

TABLE 14-16: SENSITIVITY OF INDICATED MINERAL RESOURCE TO CUT-OFF GRADE AT GRAN BESTIA

Cut-Off AuEq (g/t)	Mt	Average Grade						Contained Metal			
		AuEq (g/t)	Au (g/t)	Cu (%)	Ag (g/t)	Mo (ppm)	S (%)	Au (Moz)	Cu (Mlbs)	Ag (Moz)	Mo (Mlbs)
0.15	122.7	0.52	0.41	0.07	0.6	15.5	0.26	1.6	197	2.2	4.2
0.20	114.8	0.54	0.43	0.08	0.6	15.2	0.27	1.6	192	2.1	3.8
0.25	105.7	0.57	0.45	0.08	0.6	15.3	0.27	1.5	184	1.9	3.6
0.30	**101.1**	**0.58**	**0.46**	**0.08**	**0.6**	**15.4**	**0.27**	**1.5**	**180**	**1.9**	**3.4**
0.35	93.2	0.60	0.48	0.08	0.6	15.4	0.27	1.4	171	1.7	3.2
0.40	79.3	0.64	0.51	0.09	0.6	15.5	0.27	1.3	152	1.5	2.7
0.45	65.0	0.69	0.55	0.09	0.6	15.8	0.27	1.2	130	1.3	2.3
0.50	52.5	0.74	0.60	0.10	0.6	16.0	0.28	1.0	110	1.1	1.9
0.55	42.9	0.79	0.64	0.10	0.7	16.2	0.28	0.9	94	0.9	1.5
0.60	35.0	0.84	0.68	0.10	0.7	16.4	0.28	0.8	80	0.8	1.3

Note: The estimates in Table 14-16 are limited inside the $1,500/oz Au pit shell. The base case cut-off grade used is 0.30 g/t gold equivalent (AuEq). Mineral Resources are not Mineral Reserves because the economic viability has not been demonstrated.
Source: SIM Geological, 2020

TABLE 14-17: SENSITIVITY OF INFERRED MINERAL RESOURCE TO CUT-OFF GRADE AT GRAN BESTIA

Cut-Off AuEq (g/t)	Mt	Average Grade						Contained Metal			
		AuEq (g/t)	Au (g/t)	Cu (%)	Ag (g/t)	Mo (ppm)	S (%)	Au (Moz)	Cu (Mlbs)	Ag (Moz)	Mo (Mlbs)
0.15	343.4	0.42	0.33	0.06	0.6	11.7	0.32	3.6	447	6.5	8.9
0.20	306.3	0.45	0.35	0.06	0.6	11.6	0.33	3.5	425	5.9	7.8
0.25	262.7	0.49	0.39	0.07	0.6	11.3	0.33	3.3	382	5.1	6.5
0.30	**245.5**	**0.50**	**0.40**	**0.07**	**0.6**	**11.3**	**0.33**	**3.1**	**368**	**4.7**	**6.1**
0.35	219.6	0.52	0.42	0.07	0.6	11.1	0.33	2.9	339	4.2	5.4
0.40	178.9	0.55	0.44	0.07	0.6	10.9	0.34	2.6	284	3.5	4.3
0.45	134.7	0.60	0.48	0.08	0.6	10.4	0.34	2.1	223	2.7	3.1
0.50	98.4	0.64	0.52	0.08	0.7	10.1	0.34	1.7	169	2.1	2.2
0.55	71.1	0.69	0.56	0.08	0.7	9.9	0.35	1.3	127	1.6	1.6
0.60	50.7	0.73	0.61	0.09	0.7	9.7	0.35	1.0	95	1.1	1.1

Note: The estimates in Table 14-17 are limited inside the $1,500/oz Au pit shell. The base case cut-off grade used is 0.30 g/t gold equivalent (AuEq). Mineral Resources are not Mineral Reserves because the economic viability has not been demonstrated.
Source: SIM Geological, 2020

TABLE 14-18: SENSITIVITY OF INDICATED MINERAL RESOURCE TO CUT-OFF GRADE AT CANGREJOS AND GRAN BESTIA

Cut-Off AuEq (g/t)	Mt	Average Grade						Contained Metal			
		AuEq (g/t)	Au (g/t)	Cu (%)	Ag (g/t)	Mo (ppm)	S (%)	Au (Moz)	Cu (Mlbs)	Ag (Moz)	Mo (Mlbs)
0.15	727.9	0.62	0.48	0.10	0.7	19.3	0.24	11.2	1541	15.9	31.0
0.20	651.1	0.67	0.52	0.10	0.7	20.1	0.24	10.9	1493	14.7	28.9
0.25	601.3	0.71	0.55	0.11	0.7	20.7	0.24	10.6	1445	13.5	27.4
0.30	**570.8**	**0.73**	**0.57**	**0.11**	**0.7**	**21.2**	**0.24**	**10.4**	**1409**	**12.8**	**26.7**
0.35	544.0	0.75	0.58	0.11	0.7	21.5	0.24	10.2	1367	12.2	25.8
0.40	508.4	0.78	0.61	0.12	0.7	22.1	0.24	9.9	1323	11.6	24.8
0.45	465.4	0.81	0.63	0.12	0.7	22.9	0.24	9.5	1252	10.8	23.5
0.50	420.1	0.85	0.66	0.13	0.7	23.7	0.24	8.9	1176	10.0	22.0
0.55	374.6	0.89	0.69	0.13	0.8	24.5	0.24	8.3	1098	9.0	20.2
0.60	330.3	0.93	0.73	0.14	0.8	25.4	0.24	7.7	1005	8.2	18.5

Note: The estimates in Table 14-18 are limited inside the $1,500/oz Au pit shell. The base case cut-off grade used is 0.30 g/t gold equivalent (AuEq). Mineral Resources are not Mineral Reserves because the economic viability has not been demonstrated.
Source: SIM Geological, 2020

TABLE 14-19: SENSITIVITY OF INFERRED MINERAL RESOURCE TO CUT-OFF GRADE AT CANGREJOS AND GRAN BESTIA

Cut-Off AuEq (g/t)	Mt	Average Grade						Contained Metal			
		AuEq (g/t)	Au (g/t)	Cu (%)	Ag (g/t)	Mo (ppm)	S (%)	Au (Moz)	Cu (Mlbs)	Ag (Moz)	Mo (Mlbs)
0.15	924.3	0.38	0.29	0.06	0.7	11.6	0.34	8.7	1182	19.3	23.6
0.20	725.4	0.44	0.34	0.07	0.7	12.2	0.34	7.9	1055	15.4	19.5
0.25	576.2	0.49	0.39	0.07	0.7	12.7	0.33	7.1	915	12.0	16.1
0.30	**500.4**	**0.53**	**0.41**	**0.08**	**0.6**	**13.0**	**0.33**	**6.7**	**838**	**10.3**	**14.3**
0.35	437.7	0.56	0.44	0.08	0.6	13.3	0.33	6.2	762	9.0	12.8
0.40	363.8	0.59	0.47	0.08	0.7	13.5	0.33	5.5	666	7.6	10.8
0.45	287.9	0.64	0.51	0.09	0.7	13.8	0.33	4.7	559	6.2	8.8
0.50	224.8	0.69	0.54	0.09	0.7	14.2	0.33	3.9	466	4.9	7.0
0.55	175.0	0.73	0.58	0.10	0.7	14.6	0.32	3.3	386	3.9	5.6
0.60	135.6	0.78	0.62	0.11	0.7	15.1	0.32	2.7	317	3.1	4.5

Note: The estimates in Table 14-19 are limited inside the $1,500/oz Au pit shell. The base case cut-off grade used is 0.30 g/t gold equivalent (AuEq). Mineral Resources are not Mineral Reserves because the economic viability has not been demonstrated.
Source: SIM Geological, 2020

14.16 Comparison with the Previous Estimate of Mineral Resources

Table 14-20 compares the current and previous estimates of Mineral Resources.

TABLE 14-20: COMPARISON OF CURRENT AND PREVIOUS ESTIMATE OF MINERAL RESOURCES

Date	Mt	Average Grade					Contained Metal			
		AuEq (g/t)	Au (g/t)	Cu (%)	Ag (g/t)	Mo (ppm)	Au (Moz)	Cu (Mlbs)	Ag (Moz)	Mo (Mlbs)
Indicated										
Dec 2019	568.2	0.73	0.57	0.11	0.7	21.2	10.4	1,403	12.8	26.6
June 2020	570.8	0.73	0.57	0.11	0.7	21.2	10.4	1,409	12.8	26.7
Inferred										
Dec 2019	476.0	0.52	0.41	0.08	0.7	13.4	6.3	787	9.9	14.1
June 2020	500.4	0.53	0.41	0.08	0.6	13.0	6.7	838	10.3	14.3

Source: SIM Geological, 2020

As stated previously, the resource block model presented in the December 2019 Technical Report remains essentially unchanged and forms the basis of resources in this PEA. However, there have been some minor adjustments to the classification of model blocks in the deeper part of the Gran Bestia deposit that resulted in some minor changes to the extent of the resource limiting pit shell. These changes have had a negligible effect on the resources for the Cangrejos deposit but have resulted in a minor increase (of approximately 25 Mt) of Mineral Resources in the Inferred category at the Gran Bestia deposit.

14.17 Summary and Conclusions

Based on the current level of exploration, the Cangrejos and Gran Bestia deposits contain total Indicated Mineral Resources of 571 Mtonnes of mineralized material at a grade of 0.57 g/t Au, 0.11% Cu, 0.7 g/t Ag and 21.2 ppm Mo containing 10.4 Moz Au, 1,409 Mlbs Cu, 12.8 Moz Ag and 26.7 Mlbs Mo. There are additional total Inferred Mineral Resources of 500 Mtonnes of mineralized material at a grade of 0.41 g/t Au, 0.08% Cu, 0.6 g/t Ag and 13 ppm Mo containing 6.7 Moz Au, 838 Mlbs Cu, 10.3 Moz Ag and 14.3 Mlbs Mo.

The Cangrejos deposit remains open to expansion with further exploration to the west and at depth. The Gran Bestia deposit remains open to the north, west, and at depth.

15 MINERAL RESERVES

There are no Mineral Reserves for the Cangrejos Project at this time.

16 MINING METHODS

16.1 Introduction

There are no Mineral Reserves for the Project currently. The information reported in this PEA is preliminary in nature and includes Inferred Mineral Resources that are considered too speculative geologically to have economic considerations applied to them that would enable them to be categorized as Mineral Reserves. Inferred Mineral Resources are based on limited geological evidence and sampling. The tonnage and grade of Inferred Mineral Resources have significant uncertainty as to their existence and as to whether they can be mined economically. There is no certainty that this PEA will be realized.

The qualified person for this work is Joe McNaughton P.E., a Senior Engineer at IMC. The material to be moved according to this mine plan will be referred to as potentially minable material which is a sub-set of the mineral resource. Material that is to be fed to the processing plant is referred to as mill feed or processed material.

16.2 Mine Production Schedule

The Cangrejos Project consists of two adjacent open pit mines referred to as 1) Cangrejos (eastern pit) and 2) Gran Bestia (western pit). Both pits will be mined with conventional hard rock open pit mining methods. The terrain is very steep with evergreen montane secondary forest, saprolite, and saprock overlying both pit areas. Dealing with the saprolite and saprock will present a challenge for mine operations. This was anticipated during the development of the mine production schedule and in selecting the mine equipment.

Numerous optimization trials were completed during the development of the conceptual mine plan and mine production schedule. The trials addressed the overall pit sizes, production rates to the processing plant, and the mine production schedule. This report summarizes the results of the evaluations but does not report the results of each option that was evaluated. Table 16-1 summarizes the mine production schedule that is a result of the work.

The mine delivers 40,000 tpd of feed to the plant beginning in mid-year one through year five. The production ramps up during year six so the mine delivers 80,000 tpd of mill feed in years 7 to 25.

TABLE 16-1: MINE PRODUCTION SCHEDULE – ALL MATERIAL TYPES

Year	Cutoff NSR $/t	Material Mined Processed kt	NSR $/t	Gold gpt	Silver gpt	Copper %	Moly ppm	Gold Eq gpt	Sulfur %	Waste kt	Total Material kt
PP	21.00	1,163	27.73	0.817	2.5	0.11	10	0.898	0.12	5,588	6,751
1	21.00	9,057	30.54	0.818	1.1	0.14	21	0.959	0.15	14,917	23,974
2	21.00	14,600	34.74	0.854	0.7	0.16	32	1.061	0.21	31,400	46,000
3	20.00	14,600	31.71	0.749	0.8	0.17	21	0.969	0.27	50,400	65,000
4	20.00	14,600	28.05	0.718	0.7	0.11	21	0.860	0.20	50,400	65,000
5	18.00	14,600	27.44	0.678	0.4	0.12	31	0.837	0.23	50,400	65,000
6	17.00	26,280	28.52	0.678	0.6	0.14	27	0.869	0.24	38,720	65,000
7	16.00	29,200	25.97	0.641	0.9	0.12	19	0.796	0.24	35,800	65,000
8	14.00	29,200	24.51	0.633	0.8	0.08	21	0.748	0.25	35,800	65,000
9	12.00	29,200	26.02	0.651	0.8	0.11	26	0.796	0.22	35,800	65,000
10	10.50	29,200	22.41	0.547	0.6	0.11	23	0.687	0.21	35,800	65,000
11	9.50	29,200	22.25	0.525	0.6	0.12	19	0.679	0.26	35,800	65,000
12	9.50	29,200	27.87	0.671	0.7	0.13	17	0.849	0.28	28,629	57,829
13	9.50	29,200	18.85	0.476	0.6	0.08	16	0.577	0.29	32,067	61,267
14	9.50	29,200	20.86	0.515	0.6	0.09	21	0.637	0.23	33,257	62,457
15	9.50	29,200	22.72	0.545	0.8	0.11	21	0.693	0.35	31,631	60,831
16	9.50	29,200	21.22	0.518	0.7	0.09	18	0.647	0.34	32,594	61,794
17	9.50	29,200	17.55	0.431	0.6	0.08	15	0.535	0.30	33,611	62,811
18	9.50	29,200	21.92	0.527	0.7	0.10	18	0.668	0.25	25,774	54,974
19	9.50	29,200	25.77	0.591	0.8	0.14	27	0.785	0.28	20,917	50,117
20	9.50	29,200	25.26	0.599	0.8	0.13	21	0.771	0.32	16,151	45,351
21	9.50	29,200	18.50	0.453	0.7	0.09	14	0.566	0.27	24,154	53,354
22	9.50	29,200	16.77	0.413	0.6	0.07	15	0.513	0.30	8,716	37,916
23	9.50	29,200	14.95	0.362	0.4	0.07	17	0.456	0.26	6,345	35,545
24	9.50	29,200	14.85	0.359	0.4	0.07	17	0.452	0.26	8,958	38,158
25	9.50	19,754	19.43	0.489	0.4	0.08	15	0.592	0.26	4,480	24,234
TOTAL		640,254	22.74	0.556	0.7	0.10	20	0.695	0.26	728,109	1,368,363

Table 16-2 summarizes the Mill Production Schedule.

TABLE 16-2: MILL PRODUCTION SCHEDULE

Year	Total Mill Feed						Gold Equiv gpt	Sulfur %
	Feed kt	NSR $/t	Gold gpt	Silver gpt	Copper %	Moly ppm		
PP								
1	10,220	30.22	0.818	1.3	0.14	20	0.952	0.15
2	14,600	34.74	0.854	0.7	0.16	32	1.061	0.21
3	14,600	31.71	0.749	0.8	0.17	21	0.969	0.27
4	14,600	28.05	0.718	0.7	0.11	21	0.860	0.20
5	14,600	27.44	0.678	0.4	0.12	31	0.837	0.23
6	26,280	28.52	0.678	0.6	0.14	27	0.869	0.24
7	29,200	25.97	0.641	0.9	0.12	19	0.796	0.24
8	29,200	24.51	0.633	0.8	0.08	21	0.748	0.25
9	29,200	26.02	0.651	0.8	0.11	26	0.796	0.22
10	29,200	22.41	0.547	0.6	0.11	23	0.687	0.21
11	29,200	22.25	0.525	0.6	0.12	19	0.679	0.26
12	29,200	27.87	0.671	0.7	0.13	17	0.849	0.28
13	29,200	18.85	0.476	0.6	0.08	16	0.577	0.29
14	29,200	20.86	0.515	0.6	0.09	21	0.637	0.23
15	29,200	22.72	0.545	0.8	0.11	21	0.693	0.35
16	29,200	21.22	0.518	0.7	0.09	18	0.647	0.34
17	29,200	17.55	0.431	0.6	0.08	15	0.535	0.30
18	29,200	21.92	0.527	0.7	0.10	18	0.668	0.25
19	29,200	25.77	0.591	0.8	0.14	27	0.785	0.28
20	29,200	25.26	0.599	0.8	0.16	21	0.771	0.32
21	29,200	18.50	0.453	0.7	0.09	14	0.566	0.27
22	29,200	16.77	0.413	0.6	0.07	15	0.513	0.30
23	29,200	14.95	0.362	0.4	0.07	17	0.456	0.26
24	29,200	14.85	0.359	0.4	0.07	17	0.452	0.26
25	19,754	19.43	0.489	0.4	0.08	15	0.592	0.26
TOTAL	640,254	22.74	0.556	0.7	0.10	20	0.695	0.26

Figure16-1 summarizes the movement of mined material by year.

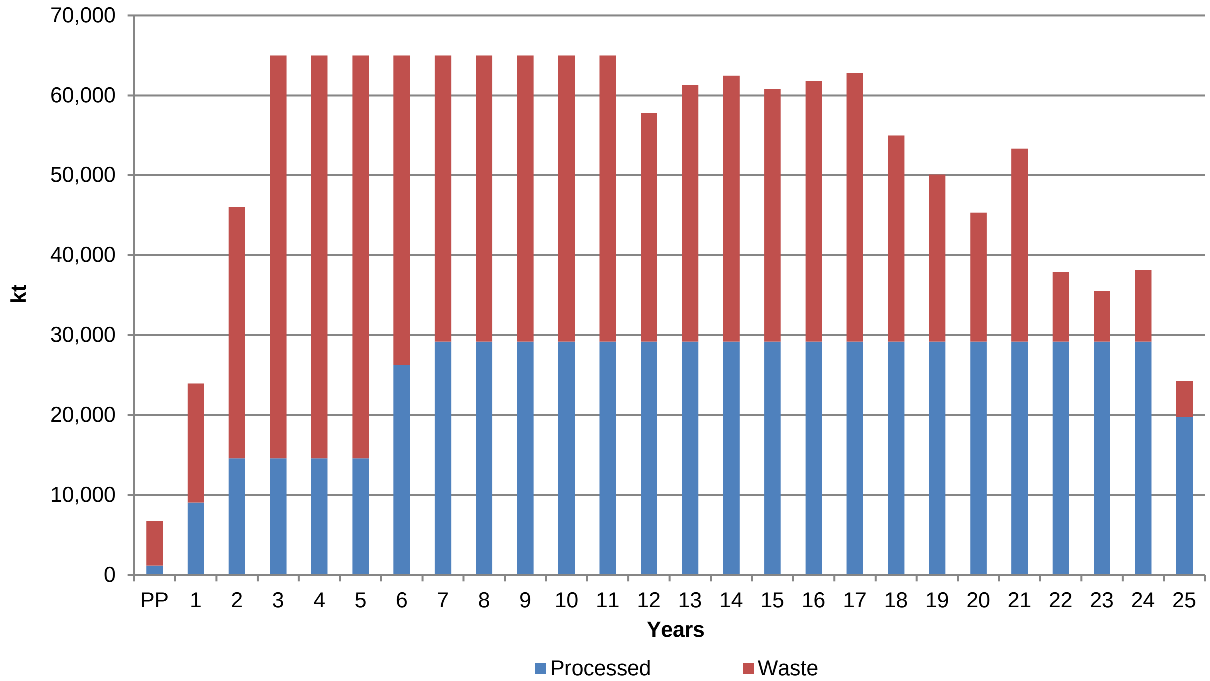


FIGURE 16-1: MINED MATERIAL MOVEMENT

After the annual schedule was developed, IMC provided a monthly schedule during the 18-month preproduction period to be used for planning the capital expenditures, personnel requirements, and for scheduling. The preproduction period begins after the road between the site facilities and the crusher site is completed. The initial five months are for access pioneering only. Additional pioneering continues throughout the period of preproduction mining.

Mill feed material that is encountered during this pre-stripping period is delivered to a stockpile located just east of the crusher location. That stockpile will be rehandled during year one and added to the year one feed to the process plant.

Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.

16.3 Pit Optimization

Initial design parameters referred to as "mill feed definition parameters" by Lumina were established by IMC and Lumina working with the entire project team.

Slope angles for the pit optimization are based on guidance provided by W&N. IMC reduced the angles by a few degrees to provide an allowance for haul roads. Fresh rock overall slope angles range from 45° to 50° with the shallower slopes on the east and west-northwest sides of the pit as a consequence of structural geologic controls. Saprolite and saprock slope angles are dependent on the upslope inclination of the natural terrain above the pit wall. In addition, a 15-m to 25-m wide safety bench is recommended depending on the thickness of saprolite. To allow for the safety bench and the variable inclinations, IMC measured the upslope inclinations and the depth of saprolite to establish overall saprolite slope angle estimates for the pit optimization.

Saprolite overall slopes varied from 24.8° to 25.6° and saprock was generally 30.5° for the pit optimization.

IMC utilized NSR to combine the economic values for all of the potentially economic metals that will be recovered at Cangrejos. Simply put, NSR is the net revenue for metal sales less all off-site costs for transportation, smelting, and refining. NSR was estimated based on the metal grade units provided in the model using the following equations:

Gold NSR = Au grade x Recovery x (1-Royalty) x (Price – Au Refine) x 0.03215

+ Silver NSR = Ag grade x Recovery x (1-Royalty) x (Price – Ag Refine) x 0.03215

+ Copper NSR = Cu grade x Recovery x (1-Royalty) x (Price- Smelt/lb) x 22.0462

+ Moly NSR = Mo grade x Recovery x (1-Royalty) x (Price – Roast/lb) x 0.00220462

Total NSR in $ per tonne

Gold makes up approximately 80% of the project value and copper contributes to approximately 19% of the value. The remaining value is predominantly silver with minor credit for molybdenum. The internal cut-off grade for NSR is $9.50/tonne, which was the total estimated cost for processing and G&A costs.

The base case NSR was calculated for every block in the model. Then, in order to establish pit design guidance for smaller pits, the NSR was reduced by factoring downward on a percentage basis (revenue factors). Initial phase design work targeted the $1,250 pit. Production schedules using those phases indicated that smaller final pits would improve the project return on investment (ROI). Consequently, the $1,100 pit was selected as the target for final pit design. Sixty two percent of the $1,100 processed material tonnage is based on Indicated Mineral Resources and the remaining 38% is based on Inferred Mineral Resources.

16.4 Phase Design

A phase or pushback is a practical expansion of the open pit that is not tied to time. The initial phase or pushback develops the highest value mill feed for initial production. The final pushback is the final pit design. Phase designs include all access roads required for practical production and incorporate appropriate room to operate the mine equipment. For this size of operation, mine phase designs are generally separated from each other by at least 100 m.

For the conceptual design, every 200 vertical meters a 25-m safety bench is left in the fresh rock slopes. At the base of the saprolite-saprock, a safety bench of 15-m to 25-m width is left in the pit. Haul roads are 33-m wide including the ditch and the berm with a maximum gradient of 10%.

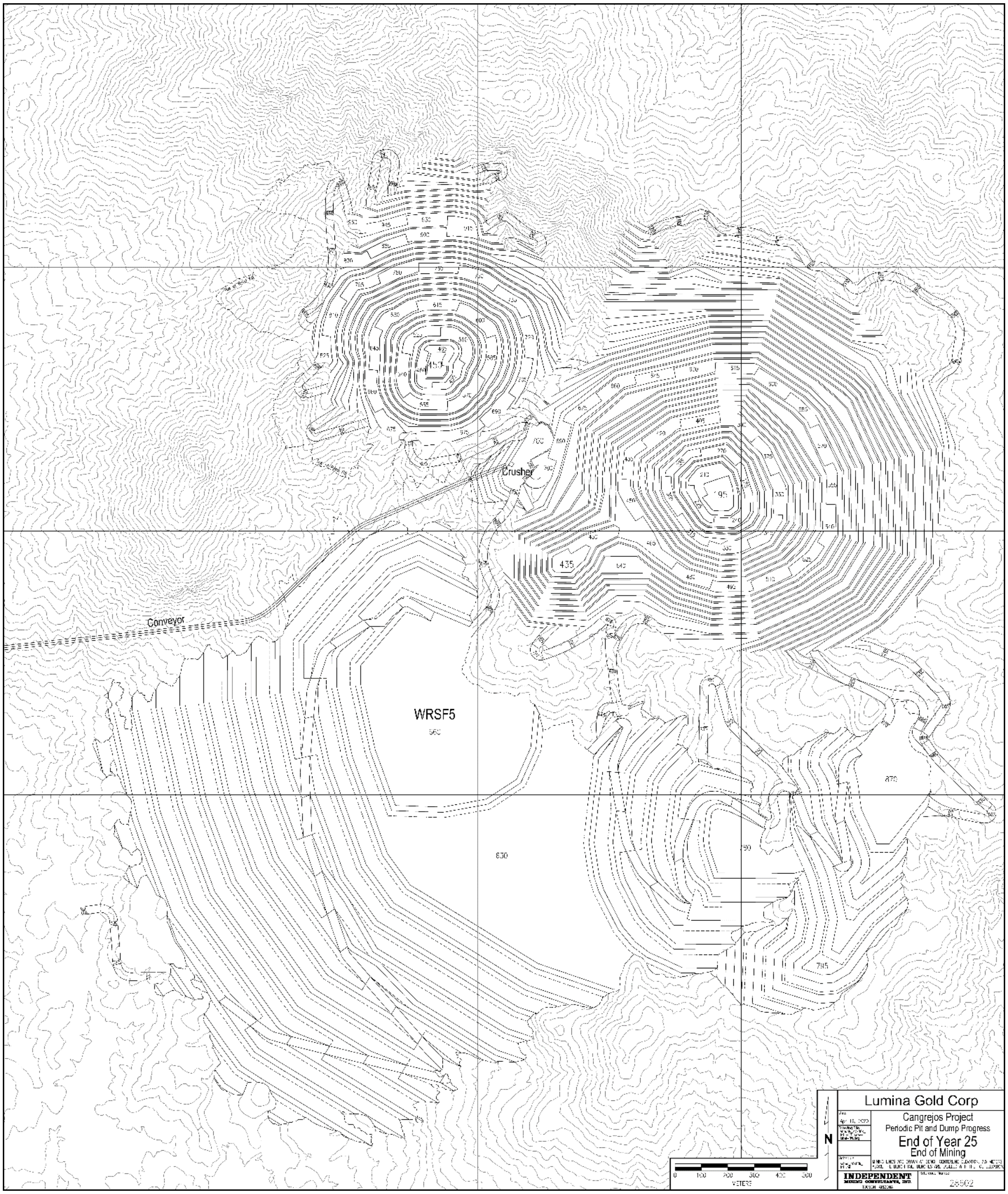
Table 16-3 summarizes the contained tonnage and grade for the phase designs using the base case metal prices and the internal cut-off grade of $9.50 NSR/t. The tabulations include Indicated and Inferred Mineral Resources. The model includes no Measured Mineral Resources. Mineral Resources are not Mineral Reserves because the economic viability has not been demonstrated.

The phase tabulations do not match the mill feed tonnages in the production schedule because the mine production schedule utilized higher cut-off grades in the early years than the cut-off grades reported in Table 16-3. Note that the NSR/t declines from Phase 1 to Phase 7 and the cash cost per equivalent ounce generally increases from Phase 1 to Phase 7. The reversal in cost per equivalent ounce at the Gran Bestia Phase 1 is due to the low strip ratio of that phase. However, mining could not start at Gran Bestia because there is insufficient mill feed on each bench to sustain the process without an impractical vertical development rate in the pit.

Table 16-3: Tonnage Tabulations within Phase Designs

Phase Number	Location	Potentially Mineable Material at $9.50 NSR Cut-off, M+I+I Processed kt	NSR $/t	Gold g/t	Silver g/t	Copper %	Moly ppm	Sulfur %	Equiv Oz g/t	Waste kt	Total Material kt	Cost per Equiv Oz
1	Cangrejos Ph1	47,068	$28.32	0.714	1.0	0.14	22	0.18	0.877	13,976	61,044	$ 734
2	Cangrejos Ph2	93,233	$24.97	0.607	0.7	0.12	22	0.24	0.764	89,192	182,425	$ 845
3	Cangrejos Ph3	138,932	$24.20	0.600	0.7	0.11	21	0.25	0.739	151,252	290,184	$ 875
4	Gran Bestia Ph1	26,833	$23.34	0.616	0.8	0.09	16	0.22	0.723	1,189	28,022	$ 803
5	Cangrejos Ph4	81,816	$22.74	0.548	0.7	0.11	21	0.28	0.694	112,390	194,206	$ 941
6	Cangrejos Ph5	192,299	$20.37	0.485	0.7	0.10	19	0.29	0.621	212,014	404,313	$ 987
7	Gran Bestia Ph2	135,030	$16.16	0.399	0.5	0.07	14	0.30	0.494	73,139	208,169	$ 1,094
Totals		715,211	$21.82	0.534	0.7	0.10	19	0.27	0.668	653,152	1,368,363	$ 922

Figure 16-2 shows the open pit and WRSF configuration at Year 25.



Source: IMC, 2020

FIGURE 16-2: MINE AND WASTE STORAGE CONFIGURATION AT THE END OF YEAR 25

16.4.1 *Waste Storage*

Waste material was reported by the rock types of saprolite, saprock, partially oxidized, and fresh rock. During the first five years of the mine life, the saprolite and saprock are delivered to the SSF located south-southeast of the Cangrejos pit. The SSF is constructed in four stages.

The fresh rock waste is delivered to the WRSF located south of the Cangrejos pit and the primary crusher. A portion of the saprock is delivered to the WRSF during the first five years. After year five, all of the saprolite and saprock are stored in the main WRSF. The WRSF is built in five stages.

Cangrejos is unique in that the waste haulage distances begin to slowly reduce over much of the mine life from year seven until just a few years before the end of the mine life in year 25. This is because the waste dump rises in elevation to meet the exit elevation from the pit.

There are three large road developments that are constructed from fresh and partially oxidized waste rock in order to connect to the final pushback at Cangrejos to get to the top of the Gran Bestia Pit, and to provide access to the final pit at Gran Bestia. These roads have portions of cut material, but the significant portion is constructed using mine waste as fill material.

16.4.2 *Geotechnical Recommendations*

Wyllie & Norrish Rock Engineers Inc. (W&N), with sub-consultants Dr. R.L. Burk of Burk GeoConsult, LLC and Dr. B. Fisher of Fisher Rock Engineering, LLC, performed geotechnical analyses in support of scoping-level pit slope recommendations for the Cangrejos Project. W&N designed the geotechnical investigation program and provided guidance to Lumina personnel for data collection. Procedures and data integrity were reviewed at the site by W&N during the course of the program.

Sources of data for the geotechnical study included:

- Exploration Boreholes (49 at Cangrejos and 24 at Gran Bestia)
- Geotechnical Boreholes (nine holes at Cangrejos)
- Geologic Mapping
- Laboratory Testing
- Groundwater Levels from a Hydrogelogical Study completed by GRE
- Background Information provided by Lumina

Recommendations for PEA-level bench face angles and inter-ramp slope angles by material type are summarized in Figures 16-3 and 16-4 for fresh rock and saprolite and saprock, respectively.

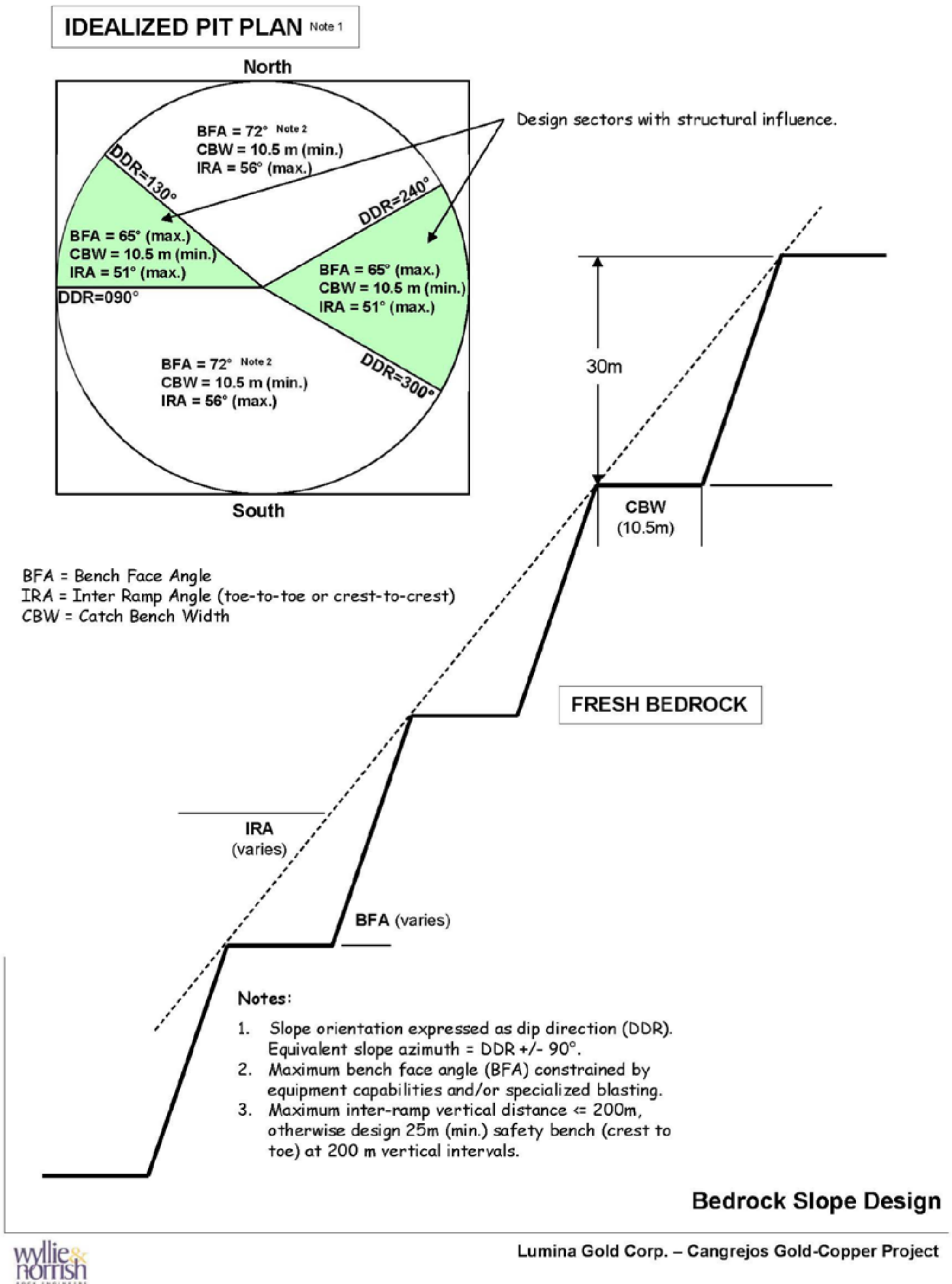


FIGURE 16-3: FRESH ROCK SLOPE DESIGN

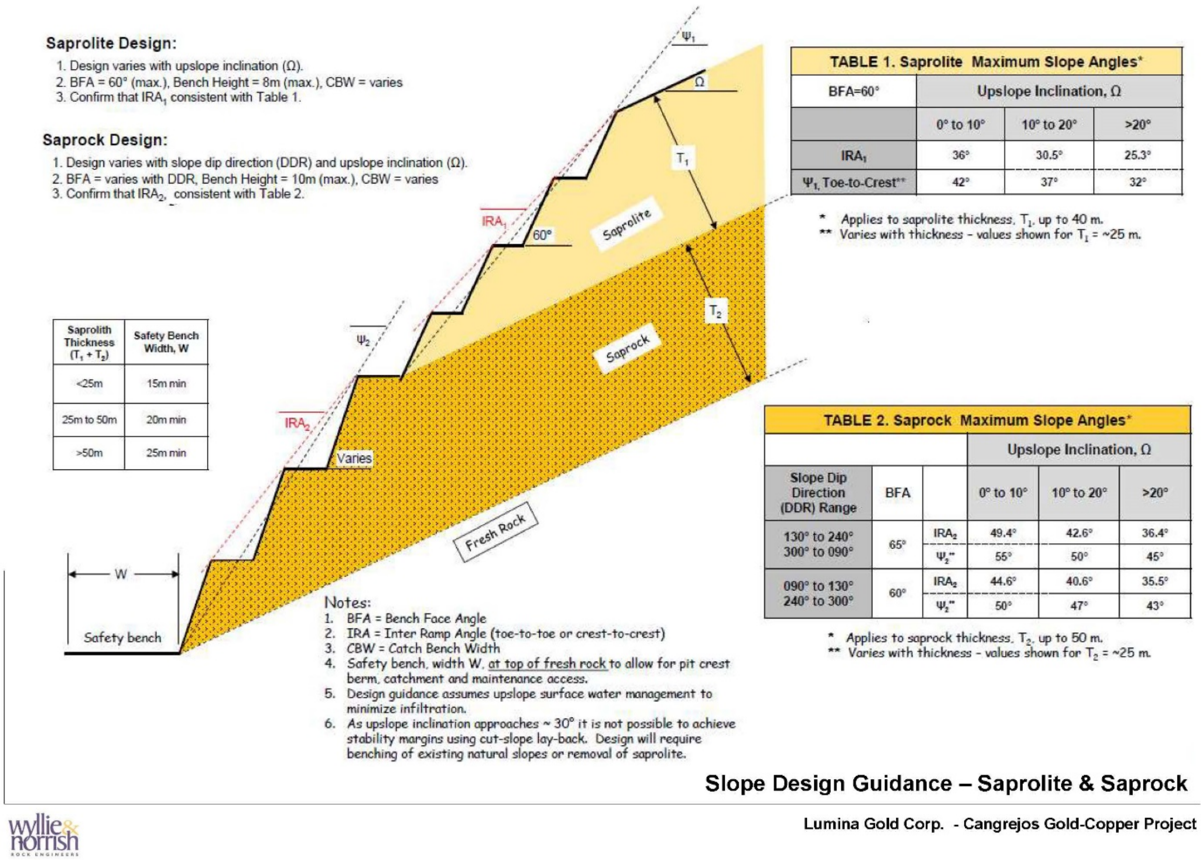


FIGURE 16-4: SLOPE DESIGN GUIDANCE FOR SAPROLITE AND SAPROCK

16.5 Mine Equipment

IMC estimated the mine equipment requirements based on the mine plan and the operating conditions at Cangrejos. The equipment fleet is larger than used at other mine sites due to steep terrain, saprolite cover, and intense rainfall. The equipment is based on three different categories of equipment, including:

1. Pioneering Units to be used for road building during preproduction and the early years of mining
2. Narrow Mining Units for saprolite and saprock mining
3. Primary Mining Fleet to mine the 15-m bench height

IMC estimated equipment and manpower requirements and the associated capital and operating costs by evaluating the production required, the productivity for the equipment, the number of operating shifts required to meet the production, and the mechanical availability and utilization. Table 16-4 summarizes the mine equipment on hand at Cangrejos for select years.

TABLE 16-4: MINE EQUIPMENT FLEET ON HAND FOR SELECTED YEARS

Equipment Type or Class	End PP	Year 1	Year 3 to 10	Year 15	Years 18	Years 19 to 23	Year 25
Major Mine Equipment							
Epiroc PV351 Blast Hole Drill (31.1 cm bit / 64,000 kg pulldown)	1	2	4	4	4	4	4
CAT 6050 FS Hydraulic Shovel (23 m^3 bucket / 2550 HP)	1	1	3	3	3	3	3
CAT 793F Haul Truck (175 m^3 bed / 220 t)	8	9	26	26	21	21	21
Epiroc D45 Presplit Drill (10 cm bit / 264 kW)		1	1	1	1	1	1
CAT 994H Front End Loader (17 m^3 bucket / 1577 HP)	1	1	1	1	1	1	
CAT 777F Haul Truck (60.1 m^3 bed / 91.2 t)	6	8	8	8	8	8	
CAT D6T Track Dozers (3.3 m blade / 215 HP)	2	2	2	2	1	1	1
CAT D8T Track Dozers (3.9 m blade / 360 HP)	3	3	3	3	3	3	3
CAT D10T Track Dozers (4.9 m blade / 600 HP)	1	1	2	2	2	2	2
CAT 844/854 Wheel Dozer (4.6/5.4 m blade / 680/900 HP)	2	2	3	3	3	3	2
CAT 14M Motor Grader (14 m blade / 259 HP)	2	2	2	1	1	1	1
CAT 16M Motor Grader (16 m blade / 259 HP)	1	1	2	2	2	2	2
CAT 24M Motor Grader (24 m blade / 259 HP)	1	1	2	2	2	2	2
CAT 785D Water Truck (34000 L tank / 150 t)	2	2	3	3	3	3	1
CAT 992 Aux Loader (10.7 m^3 bucket / 900 HP)	1	1	1	1	1	1	1
CAT 740C Aux Truck (23 m^3 bed / 38 tn)	8	9	9	9	9	9	
Epiroc D45 Pioneering Drill (10 cm bit / 264 kW)	2	2	2	2	2	2	2
CAT 349D2 L Excavator (3.1 m^3 bucket / 6.1-m Boom)	3	3	3	2	2	2	
Total	45	51	77	76	69	69	46
Minor Support Equipment Fleet on Hand							
Blasthole Stemmer (skid steer-CAT226D)	1	2	3	3	3	3	3
Blasters Flatbed Truck (2 t)	1	1	1	1	1	1	1
ANFO/Slurry Truck (9,300 L)	1	1	2	2	2	2	2
Fuel/Lube Truck 13,600 L fuel, 7-380 L lube	1	1	2	2	2	2	2
Ammonium Nitrate Storage (90.7 t)	2	3	3	3	3	3	3
Emulsion Storage Bin (90.7 t)	2	3	3	3	3	3	3
Powder Magazine (14.5 t)	2	2	2	2	2	2	2
Spare Loader Bucket (17 m3)	1	1	1	1	1	1	1
Flatbed Truck (8 - 10 t)	1	1	1	1	1	1	1
Crane Truck (19 t) - 2017 Terex BT3870	1	1	1	1	1	1	1
Cat 988 with Tire Handler	1	1	1	1	1	1	1
Mechanics Truck (5-t crane, air compressor and welder)	2	2	2	2	2	2	2
Welding Truck (Combined with Mechanical Truck)	1	1	1	1	1	1	1
Mine Equipment Tractor and Lowboy			1	1	1	1	1
Shop Forklift (Hyster H100XM)	1	2	2	2	2	2	2
RT Forklift (Sellick S160-4)	1	1	1	1	1	1	1
Man Bus	2	2	2	2	2	2	2
Pickup Truck (4x4)	16	16	16	16	16	16	16
Light Plants	15	15	15	15	15	15	15

Equipment Type or Class	End PP	Year 1	Year 3 to 10	Year 15	Years 18	Years 19 to 23	Year 25
Mine Radios (Handheld & Fixed Units)	89	99	119	119	119	119	119
Mine Communications Network	1	1	1	1	1	1	1
Mine Dispatch System	1	1	1	1	1	1	1
Integrated Tool Carrier (CAT IT62)	1	1	1	1	1	1	1
Mine Planning Software	1	1	1	1	1	1	1
Tire Press	1	1	1	1	1	1	1
Shop Jacks	1	1	1	1	1	1	1
Hydraulic Hammer	1	1	1	1	1	1	1
Backhoe Loader (1.1 m3)	1	1	1	1	1	1	1
Fuel/Lube Truck 2,500 L fuel, 3-100 380 L lube	1	1	1	1	1	1	1
Total	154	168	191	191	191	191	191

Costs for equipment are provided in Section 21.

16.6 Mine Labor

Based on the equipment fleet, operating schedule, and work requirements for the mine fleet, the mine operations and maintenance labor and salaried labor were estimated. Table 16-5 summarizes the hourly labor requirements for select years and Table 16-6 summarizes the salaried labor requirements for select years.

TABLE 16-5: HOURLY MINE LABOR FOR SELECTED YEARS

Title	Year 1	Year 12	Year 17	Year 25
Mine Operations				
Drill Operator	9	18	18	13
Shovel and Backhoe Operator	12	16	16	8
Loader Operator	4	4	4	0
Haul Truck Driver	58	80	78	33
Track Dozer Operator	22	22	18	14
RTD Operator (Wheel Dozer)	6	9	9	9
Grader Operator	13	14	12	12
Water Truck Operator	6	8	7	6
Utility Equip Operator (Service Crew)	48	21	18	9
Blasting Crew	2	4	4	4
Blasting Helper	2	2	2	2
Mine Dispatcher	4	4	4	4
Laborer	8	8	8	8
Mine Operations Total	194	210	198	122
Mine Maintenance				
Senior Maintenance Mechanics	50	56	48	29
Maintenance Technicians	18	20	17	10
Welder / Mechanic	16	17	15	9
Support Maintenance Personnel	16	17	15	9

Title	Year 1	Year 12	Year 17	Year 25
Fuel & Lube Crew	8	8	8	8
Tire Crew	4	4	4	4
Laborer Mnt	4	4	4	4
Mine Maintenance Total	116	126	111	73
Vacation, Sick Leave & Absent at 10%	31	34	31	20
Total Personnel	341	370	340	215
Maintenance/Operations Ratio	60%	60%	56%	60%

Numbers of hourly and salaried personnel in the tables are for the total number of people on the payroll. Operations and maintenance personnel working shifts include four crews. At any given time, two crews will work 12-hour shifts while the other two crews are on days off.

TABLE 16-6: SALARY MINE LABOR

Title	Year 1 to Year 2	Year 3 to Year 16	Year 17 to Year 20	Year 21 to Year 25
Mine Operations				
Mine Manager (Expat)	1	1	1	1
Mine Superintendent	1	1	1	1
FL Supervisors (Shift Foremen)	12	12	12	12
Drill & Blasting Supervisor (Expat)	1	0	0	0
Drill & Blasting Supervisor (Trainee)	1	0	0	0
Drill & Blasting Supervisor (National)	0	1	1	1
Mine Operations Supervisor	1	1	1	1
Mine Trainer (Expat)	1	0	0	0
Mine Trainer (Trainee)	1	0	0	0
Mine Trainer (National)	0	1	1	1
Mine Operations Total	*19*	*17*	*17*	*17*
Mine Maintenance				
Maintenance Manager	1	1	1	1
Mine Fleet Superintendent	1	1	1	1
Mine Maintenance General Foreman	2	2	2	2
FL Supervisors Mtn (Shift Foremen)	8	8	4	4
Maintenance Planners	1	1	1	1
Maintenance Trainer (Expat)	1	0	0	0
Maintenance Trainer (Trainee)	1	0	0	0
Maintenance Trainer (National)	0	1	1	1
Mine Maintenance Total	*15*	*14*	*10*	*10*
Mine Engineering				
Mine Engineering Manager	1	1	1	1
Chief Mining Engineer (Expat)	1	0	0	0
Chief Mining Engineer (Trainee)	1	0	0	0
Chief Mining Engineer (National)	0	1	1	1

Title	Year 1 to Year 2	Year 3 to Year 16	Year 17 to Year 20	Year 21 to Year 25
Junior Mining Engineer	2	2	2	2
Ore Control Engineer	1	1	1	1
Surveyor	1	1	1	1
Samplers	4	8	8	4
Clerk	1	1	1	1
Mine Engineering Total	*12*	*15*	*15*	*11*
Mine Geology				
Senior Mine Geologist	1	1	1	1
Mine Geologist	1	1	1	1
Geotechnical Engineer	1	1	1	1
Hydrology Engineer	1	1	1	1
Geo Tech - Sampler	2	2	2	2
Mine Geology Total	*6*	*6*	*6*	*6*
Total Personnel	52	52	48	44

Some of the salaried staff, including management and some technical staff, will work day shift only on a standard work week schedule.

Burdened costs for mine labor are provided in Section 21.

17 RECOVERY METHODS

In 2019, samples from additional sections of Cangrejos and Gran Bestia became available due to access to additional parts of the property. When the head assays and preliminary test results for the metallurgical samples became available, the gold, copper, and sulfide concentrations were lower than those for the samples that had been tested previously. Correspondingly, the gold and copper recoveries to the flotation concentrate were also lower.

Based on the preliminary observations, alternative flow sheets were tested and, with changes in recovery processes, the gold and/or copper recoveries increased. The two processes that were tested included the addition of sand flotation plus leaching to the previous flow sheet and whole ore leaching. One trade-off study was completed to compare flotation plus leaching to leaching only to identify the optimum recovery process.

Since the 2019 metallurgical testing program included the FLS comminution study, more accurate data using representative samples was available to complete a second comminution trade-off study.

17.1 Process Trade-off Study

For the Process Trade-off Study, whole ore leaching resulted in an average gold recovery of 90% but zero percent copper recovery. The payments for gold in doré are also higher than they are for gold in flotation concentrate and are made more quickly. The total average gold recovery for flotation plus leaching was approximately 83%, average copper recovery was 83%, and the average molybdenum recovery was approximately 49%. The estimated average silver recovery was 53% and 60% for cyanide leaching and flotation plus leaching, respectively. All of these factors were taken into account and the results of a discounted cash flow analysis were used to select the optimum process.

The basis of the process trade-off study was the comminution circuit used for the 2018 PEA.

A summary of the Process Trade-off Study results is provided in Table 17-1.

TABLE 17-1: PROCESS TRADE-OFF STUDY RESULTS

Parameter	SABC-Leach	SABC-Flotation + Leach
Initial Capital Cost (40,000 tpd)	$ 415.6 M	$ 417.7 M
Expansion Capital Cost (80,000 tpd)	$ 327.6 M	$ 322.0 M
Operating Cost (40,000 tpd) per t	$ 10.67	$ 8.58
Operating Cost (80,000 tpd) per t	$ 10.34	$ 8.24
Internal Rate of Return (IRR)	10.2%	16.6%
Net Present Value (NPV) at 5%	$ 354.4 M	$ 965.9 M
Initial Capital Cost Payback (years)	5.2	4.4
Expansion Capital Payback (years)	9.3	4.8

Note: The financial results reported for both of the Trade-off Studies are not comparable to the results of the current PEA because they were estimated using a different basis that applies only to the Trade-off Studies.

17.2 Comminution Trade-off Study

Two comminution options were evaluated. They were SAG mill - ball mills circuit compared to the HPGR - ball mills circuit. Using the data from the FLS comminution test work, FLS provided equipment sizing, budgetary quotations, and operating costs for the major equipment for both options. The remaining operating costs were estimated by ONIX, AKA, and NDK.

A summary of the Comminution Trade-off Study results is provided in Table 17-2.

TABLE 17-2: COMMINUTION TRADE-OFF STUDY RESULTS

Parameter	SABC	HPGR-Ball Mill
Initial Capital Cost (40,000 tpd)	$ 166.7 M	$ 152.3 M
Expansion Capital Cost (80,000 tpd)	$ 149.2 M	$ 134.9 M
Connected Power (40,000 tpd) MW	70.2	65.7
Connected Power (80,000 tpd) MW	139.0	130.1
Operating Cost (40,000 tpd) per t	$ 5.62	$ 3.75
Operating Cost (80,000 tpd) per t	$ 5.60	$ 3.72

Since both the capital costs and the operating costs for the HPGR-ball mills option were lower, a discounted cash flow analysis was not required to select HPGR-ball mill as the optimum process.

The results from the two trade-off studies led to the conceptual process flowsheet that is used as the basis for this PEA.

The unit operations include:

- Primary crushing
- Secondary crushing
- HPGR crushing
- Ball milling with hydro-cyclone classification
- Bulk copper-molybdenum rougher flotation
- Regrinding of the bulk flotation concentrate
- Three stages of bulk concentrate cleaner flotation and cleaner scavenger flotation
- Thickening of the bulk concentrate
- Copper-molybdenum separation flotation via rougher flotation, scavenger flotation, and five stages of cleaner flotation
- Thickening and filtering of copper and molybdenum final concentrates
- Hydro-cyclone classification of the bulk copper-molybdenum flotation tailings
- Sand flotation of the cyclone underflow of the flotation tailings
- Carbon-in-leach (CIL) of the combined sand flotation concentrate and cleaner scavenger tailings
- Detoxification of the residual cyanide in CIL tailings

- Thickening and filtering of the tailings and recycling decant water
- Dry stack tailings storage

A simplified flowsheet is provided in Figure 17-1. Figure 17-2 shows the General Arrangement.

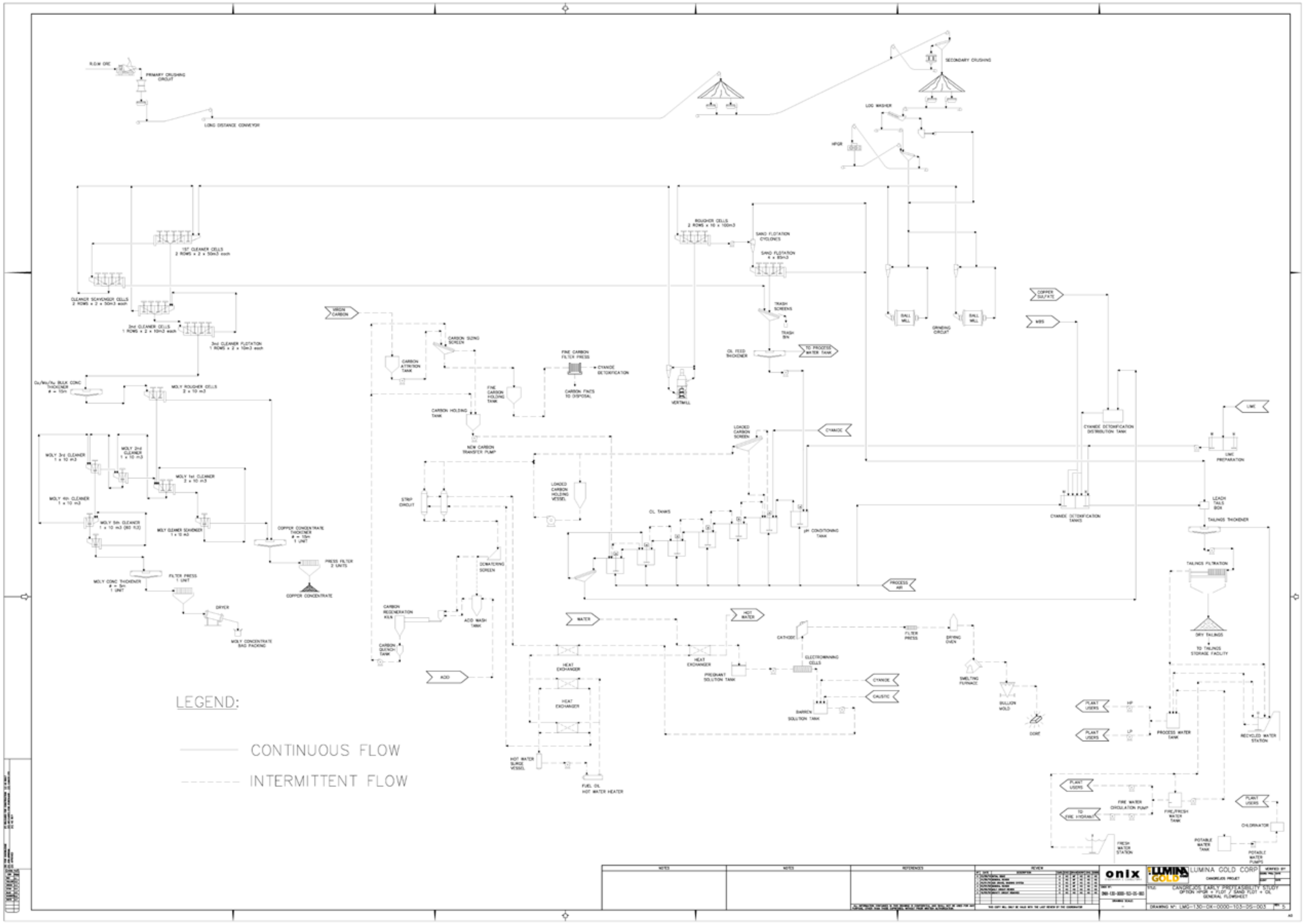


FIGURE 17-1: SIMPLIFIED PROCESS FLOWSHEET

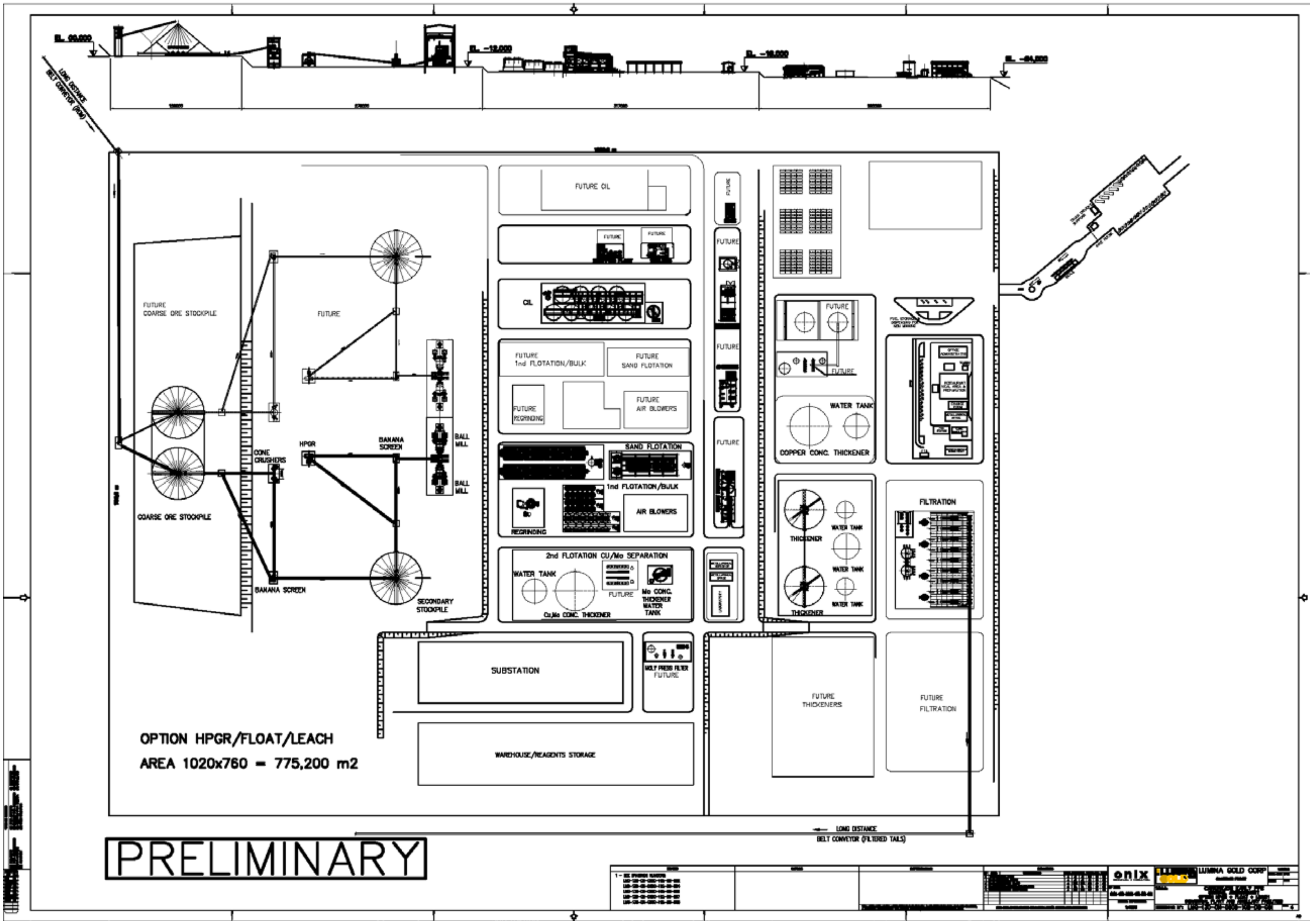


FIGURE 17-2: PLANT GENERAL ARRANGEMENT

A summary of the conceptual process design criteria is provided in Table 17-3.

TABLE 17-3: PROCESS DESIGN CRITERIA

Criteria	Units	Value	Source
Plant Throughput Years 1 – 5	tpd	40,000	Production Schedule
Plant Throughput Years 1 – 5	Mtpa	14.6	Production Schedule
Plant Throughput Years 6 – 25	tpd	80,000	Production Schedule
Plant Throughput Years 6 – 25	Mtpa	29.2	Production Schedule
Plant Availability (primary crushing)	%	75	ONIX
Plant Availability (other)	%	92	ONIX
Plant Throughput Years 1 – 5	tph	1,800	Calculated
Plant Throughput Years 6 – 25	tph	3,600	Calculated
Head Grade	gpt Au	0.556	Production Schedule
Head Grade	gpt Ag	0.7	Production Schedule
Head Grade	% Cu	0.10	Production Schedule
Head Grade	ppm Mo	20	Production Schedule
Mineralized Material Specific Gravity	g/cc	2.7	Plenge
Bond Ball Mill Work Index (BWi)	kWh/t	17.1	FLS
Bond Abrasion Index (Ai)	g	0.3511	FLS
Primary Grind Size (P80)	µm	90	Plenge
Concentrate Regrind Size (P80)	µm	35	Plenge
Bulk Rougher Flotation Time	minutes	12	Plenge Data – factored
Tailings Thickener Sizing	m2/tpd	0.125	Pocock

The CIL circuit nominally processes 10% of the plant feed, approximately 4,000 tpd during the first five years and 8,000 tpd following the plant expansion.

A summary of the major equipment for the 40,000 tpd plant is provided in Table 17-4.

TABLE 17-4: MAJOR EQUIPMENT LIST

Equipment	Number	Size Each	kW each
Primary Crusher	1	152 cm x 280 cm	750
Overland Conveyor	3	2.658 km[1]	2,720[2]
Coarse Material Stockpile	1	40,000 t capacity	N/A
Secondary Cone Crushers	2	Raptor 1100	745
High Pressure Grinding Roll	1	F3900	6,400
Ball Mills	2	7.92 m x 13.72 m	17,000
Bulk Rougher Flotation Tank Cells	20	100 m^3	132
Vertimill Regrind Mill	1	163 tph	2,250
Bulk 1st Cleaner Flotation Cells	4	50 m^3	75
Bulk Cleaner Scavenger Flotation Cells	4	50 m^3	75
Bulk 2nd Cleaner Flotation Cells	2	10 m^3	15
Bulk 3rd Cleaner Flotation Cells	2	10 m^3	15

Equipment	Number	Size Each	kW each
Bulk Concentrate Thickener	1	15 m diameter	6
Sand Flotation Cells	4	85 m^3	110
CIL Feed Thickener	1	15 m diam	1
pH Conditioning Tank with Agitator	1	12 m diam x 14 m	100
CIL Tanks with Agitators	5	12 m diam x 14 m	100
Cyanide Detox Tanks with Agitators	2	9 m diam x 10 m	40
Carbon Plant and Refinery	1	2-t capacity	180
Moly Rougher Flotation Cells	2	10 m^3	15
Moly 1st Cleaner Flotation Cells	2	10 m^3	15
Moly Cleaner Scavenger Flotation Cells	1	10 m^3	15
Moly 2nd Cleaner Flotation Cells	1	10 m^3	15
Moly 3rd Cleaner Flotation Cells	1	10 m^3	15
Moly 4th Cleaner Cells	1	10 m^3	15
Moly 5th Cleaner Cells	1	10 m^3	15
Moly Concentrate Thickener	1	5 m diameter	5
Copper Concentrate Thickener	1	15 m diameter	6
Moly Filter	1	121 m^2	22
Moly Dryer - gas-fired rotary	1	1.2 m x 9.1 m	15
Copper Concentrate Filter	1	186 m^2	30
Tailings Thickeners	2	60 m diameter	11
Tailings Filters	9	202 chambers 2.5 m x 2.5 m	450
Tailings Overland Conveyor	4	2.095 km[1]	2,460[2]

Notes 1: Total installed length
2: Total installed power

The capital costs for the processing plant are included in Section 21.

17.3 Process Description

Run-of-mine (ROM) material is hauled from the mine by truck and either stockpiled or directly dumped into the primary crusher. The primary crushed material is transported by an apron feeder and short conveyor to the overland conveyor system for transport to the process plant site. The primary crusher and the structure for the overland conveyor are sized for 80,000 tpd. The drives on the overland conveyor are sized to convey 40,000 tpd. They are designed to be changed quickly to support the 80,000 tpd operation during the plant expansion.

The overland conveyor system transports the crushed material to the coarse material stockpile. Apron feeders draw material from the coarse material stockpile and transport it to a double-deck banana screen. Underflow from the screen discharges to the coarse material stockpile and the screen oversize is crushed in two secondary cone crushers that operate in parallel. Discharged material from the crushers drops onto a transfer conveyor that returns it to feed the banana screen.

Apron feeders withdraw material from the coarse material stockpile and a conveyor belt transfers it to a log washer. The log washer is included in the conceptual design in order to remove clay that may hamper subsequent operations. Fines from the log washer are pumped to the ball mill hydro-cyclone feed. Oversize from the log washer is fed to the washing screen. Oversize from the washing screen is conveyed to the single HPGR with 3,200 kW dual drives (i.e., 6,400 kw total). Discharge from the HPGR is conveyed to the washing screen that is operated in closed circuit with the HPGR. Oversize from the washing screen is returned to the HPGR for further size reduction and undersize from the screen is the product from the HPGR that is split and fed to two ball milling circuits that each operate in closed circuit with hydrocyclones. The cyclone underflow is fed to the ball mills. Discharge from the ball mills is pumped to the cyclone feed. Overflow from the cyclones has a particle size distribution of 80% passing (P_{80}) 90 µm.

The ball mill cyclone overflow is pumped to the bulk rougher flotation circuit that consists of two sets of tank cells that operate in parallel to provide approximately 30 minutes of retention time. Potassium amyl xanthate (PAX), Aero Promotor 208 (A208), methyl isobutyly carbinol (MIBC), and Dowfroth 250 (DF250) are the flotation reagents that are fed to the flotation circuits.

Concentrate from the rougher flotation circuit is reground in a Vertimill to reduce the particle size of the bulk rougher concentrate to P_{80} 35 µm. The cleaner flotation circuit consists of three stages of cleaner flotation plus cleaner-scavenger flotation. Concentrate from the third cleaner flotation circuit is fed to the bulk concentrate thickener.

Underflow from the bulk concentrate thickener is pumped to an agitated conditioning tank where sodium hydrosulfide (NaHS) is added to depress copper minerals to prohibit them from floating. From the conditioning tank, the bulk concentrate is pumped to the molybdenum flotation circuit that consists of rougher flotation, five stages of cleaner flotation, and a cleaner scavenger flotation circuit. Reagents in the molybdenum flotation circuit include fuel oil and MIBC. Concentrate from the molybdenum fifth cleaner flotation circuit is the final molybdenum concentrate.

Tailings from the bulk rougher flotation circuit are fed to the sand flotation circuit. First, the tailings are classified in sand flotation cyclones. The cyclone overflow reports to the final tailings box. The cyclone underflow is processed in the sand flotation circuit. Tailings from the sand flotation cells combine with the overflow from the sand flotation cyclones and report to the final tailings box.

The combined concentrate from the molybdenum rougher flotation tailings and the molybdenum cleaner scavenger tailings feeds the copper concentrate thickener. The thickener underflow feeds an agitated storage tank and then to a plate and frame pressure copper concentrate filter. The discharge from the filter is the final copper concentrate.

Concentrate from the molybdenum fifth cleaner flotation circuit feeds the molybdenum concentrate thickener. Underflow from the thickener is fed to an agitated storage tank and then to the plate and frame pressure molybdenum concentrate filter. The filtered molybdenum concentrate is dried in a rotary gas-fired dryer.

Concentrate from the sand flotation cells combines with the tailings from the bulk cleaner-scavenger flotation circuit. The slurry flows through a trash screen and into the CIL feed thickener. The thickener underflow is pumped to the agitated pH conditioning tank. Lime is added to the pH conditioning tank to adjust the slurry pH to approximately 11.0. Overflow from the pH conditioning tank flows by gravity through five CIL tanks that operate in series and are designed to provide a total of approximately 24-hours of retention time. Each CIL tank is fitted with interstage screens that are included to allow the appropriate carbon transfer, transfer pumps, and agitators. Sodium cyanide is added to CIL tank 1 and processed air from blowers is injected into the CIL tanks to provide oxygen that is necessary for leaching.

Fresh and/or regenerated carbon is added to CIL tank five and advanced intermittently in flow that is counter-current to the slurry that flows by gravity from tank five to tank one. Slurry that contains the loaded carbon is pumped from CIL tank one across the loaded carbon screen. The slurry passes through the loaded carbon screen and returns to CIL tank one. The loaded carbon is retained on the screen deck and flows into the loaded carbon holding vessel.

Tailings from the CIL circuit are detoxified using the sulfur dioxide-air process. The sulfur dioxide is provided by sodium metabisulfite and air is provided by air blowers. The circuit consists of two agitated tanks that are designed to provide a residence time of approximately 2.5 hours. Copper sulfate is provided to catalyze the reaction and milk of lime is used to control the pH range between 8.0 and 9.0.

Carbon is stripped in a batch system that includes a pressure strip vessel that is designed to strip 2-t of carbon per cycle. Sodium cyanide and caustic soda are added to barren solution to prepare the strip solution. The circuit includes a water heater and heat exchanger to increase the operating temperature and pressure of the strip solution. Barren solution and pregnant solution tanks are included in the circuit.

Pregnant solution is pumped through three electrowinning cells where gold and silver are plated onto the electrowinning cell cathodes.

A hydrochloric acid wash is included after the carbon strip circuit to remove inorganic contaminants from the carbon and an electric rotary carbon regeneration kiln is included to remove organic contaminants from the carbon in order to retain the carbon activity. The stripped and regenerated carbon discharges from the carbon regeneration kiln into a carbon quench tank to cool the carbon and stop the regeneration process. It is pumped to a carbon sizing screen that is designed to remove fine particles of carbon prior to returning it to CIL tank five. A carbon attrition tank is also provided to prepare new carbon for use. After carbon is attrited in the agitated tank, it is pumped to the same carbon sizing screen to remove fine carbon prior to using it.

Cathodes from the electrowinning cells are power washed and sludge from the electrowinning cells is pumped to a filter press for dewatering. The filtered sludge is dried in a drying oven, mixed with fluxes, and smelted in a gas-fired smelting furnace to produce gold-silver doré. The doré is shipped off site for further refining.

The detoxified leach tailings, sand flotation cyclone overflow, and sand flotation tailings, are combined in the tailings box and flow to two tailings thickeners that operate in parallel. Underflows from the tailings thickeners feed the tailings filtration plant. The plant includes nine pressure plate and frame filters. The design allows for eight operating filters and one standby filter. The dewatered tailings are conveyed to the DSTF via an overland conveyor and placed using portable conveyors and a stacker.

The conceptual process design includes all facilities required to receive, mix or prepare, store, and pump all of the reagents required in the processes. The reagents include:

- PAX
- MIBC
- Fuel oil
- Milk of lime
- NaHS
- Antifoam by Moly Cop
- Sodium metabisulfite
- Copper sulfate
- Flocculant
- Sodium cyanide

Plant utilities include:

- Fresh water
- Process water
- Fire water system
- Air blowers
- Air compressors
- Standby power generation
- Gland water system

The plant support systems include an analytical laboratory, metallurgical laboratory, truck scale, hoists, cranes, pumps, automatic on-stream samplers and analyzers, and standard process control systems including field instruments, programmable logic controllers, personal computers, and operations control rooms.

17.4 Process Labor

Table 17-5 summarizes the number of Expatriates that will be employed and the duration of their employment as they train local employees to take over their positions.

TABLE 17-5: EXPATRIATES REQUIRED AND DURATION

Labor Category	Duration Years	Number
Process Manager	Permanent	1
Mill General Foreman	2 years	1
Maintenance General Foreman	2.5 years	1
Chief Metallurgist	2.5 years	1
Process Control Engineer	2 years	1
Chief Chemist	2 years	1
Chief Refiner	Permanent	1
Lead Production Trainer	2 years	1

Table 17-6 summarizes the proposed management positions that are used as a basis for this PEA.

TABLE 17-6: PROCESS MANAGEMENT AND TECHNICAL PERSONNEL REQUIREMENTS

Labor Category	Duration	40,000 tpd	80,000 tpd
Mill Management			
Mill General Foreman Trainee	2 years	1	0
Mill General Foreman Permanent		1	1
Maintenance General Foreman Trainee	2.5 years	1	0
Maintenance General Foreman Permanent		1	1
Mill Technical			
Chief Metallurgist Trainee	2.5 years	1	0
Chief Metallurgist Permanent		1	1
Metallurgist	Permanent	2	3
Metallurgical Technician	Permanent	2	3
Process Control Engineer Trainee	2 years	1	0
Process Control Engineer Permanent		1	1

Table 17-7 summarizes the employees required for the assay lab, mill production, and maintenance.

TABLE 17-7: ASSAY LAB AND MILL PRODUCTION LABOR

Labor Category	Shifts	40,000 tpd	80,000 tpd
Assay Lab			
Chief Chemist Trainee (2 years)	No	1	0
Chief Chemist Permanent	No	1	1
Assayers/Chemists	Yes	2	4
Assay Technicians	Yes	4	8
Sample Technician	Yes	4	8
Admin Lab Assistant	No	1	1
Mill Production and Maintenance			
Production Trainers	No	4	8
Shift Foreman	Yes	4	4
Control Room Operator	Yes	8	12
Primary Crusher Operator	Yes	4	4
Secondary Crusher and HPGR Operators	Yes	4	8
Grinding Operator	Yes	4	8
Flotation and Regrind Operator	Yes	8	8
Molybdenum Plant Operator	Yes	4	4
Concentrate Handling Operator	Yes	4	4
Cyclones and Tails Flotation Operator	Yes	4	8
Cyanide Leach and Detox Operator	Yes	4	4
Refinery Operator	No	2	2
Tailings Thickening and Filtering Operator	Yes	8	12
Reagent Operator	Yes	2	2
ADR Operators	Yes	4	4

Labor Category	Shifts	40,000 tpd	80,000 tpd
Operator Helpers	Yes	24	48
Laborers	Yes	12	20
Mobile Equipment Operator	Yes	4	4
Production Trainer Trainee	No	1	0
Production Trainer Permanent	No	0	1
Production Trainers	No	4	8
Mechanic Foremen	Yes	4	4
Electrical and Instrumentation Foremen	No	2	2
Planner	No	2	2
Mechanic 1	Yes	14	28
Mechanic Senior	Yes	10	16
Pipefitter	No	2	3
Welder	No	2	3
Electrician 1	Yes	5	5
Electrician Senior	Yes	5	5
Instrument Technicians	No	3	3
Mobile Equipment Operator	Yes	1	2

The number of people shown as working shifts are the total number on the payroll. The staffing is based on four crews with two crews working 12-hour shifts at any given time while two crews are on days off.

Burdened labor costs for process labor are included in the process operating costs provided in Section 21.

18 PROJECT INFRASTRUCTURE

18.1 Power Supply and Distribution

Power is supplied in Ecuador by La Corporación Eléctrica del Ecuador (CELEC), which is a state company in charge of generating and supplying electricity to the country under the control of Consejo Nacional de Electricidad (CONELEC).

EPTEC was retained to evaluate the National Interconnected System (NIS) and to provide information required to estimate the capital and operating costs for power supply to support this Study. EPTEC reported that the NIS has sufficient capacity to supply power for Cangrejos. During construction, power will be supplied by diesel generators since they are more cost effective than constructing a power line to the Project site. The recommended connection point to the NIS is the new Avanzada Substation planned for completion in 2023 via a 230 kV single-circuit, 16-km long transmission line. The total estimated cost to complete the substation modifications at La Avanzada, construct the Cangrejos main substation, and construct the 16-km, 230 kV single-circuit transmission line was estimated by EPTEC to cost approximately $14.94 M. Assuming a constant power consumption of 66 MW per month during the initial five years of operation when the plant capacity is 40,000 tpd, EPTEC estimated the weighted average power cost, including all factors to be $0.0681 per kWh. (EPTEC, 2020)

18.2 Communications

Communication is the infrastructure backbone for the entire operation. Servers are required at four office locations with full networking capability between the offices. Connectivity is assumed to be over a Virtual Private Network (VPN) using company-provided laptops and mobile phone equipment. A large-scale system using SQL or SAP application software will provide the overall structure for the management and control of the operation.

Communication on site will be via a combination of mobile phones and two-way radios.

18.3 Water Supply and Use

The conceptual water management plan at Cangrejos includes surface water (i.e., hydrology), groundwater (i.e., hydrogeology), and a site-wide water balance.

GRE developed a water balance to estimate the project's water consumption and water supply needs. This water balance considers drought conditions and other extreme weather events. GRE designed a system to preferentially use water that falls on the Project footprint and that minimizes the size of the plant supply ponds and any surface water abstraction during the dry season. Because the project is in an area with a net positive water balance with an abundance of surface water sources, there is sufficient water available to supply operations without significantly impacting the local water supply.

18.4 Roads

18.4.1 Site Access Road

Access to the site is by a sealed asphalt public road network from Santa Rosa to Valle Hermoso that is approximately 19.5-km long, passing through four small towns: Medina, El Recreo, Bellamaria, and San Carlos. Gravel road bypasses, 10-m wide, will be constructed around the towns of Bellamaria and San Carlos to reduce potential conflicts between mine and local traffic.

18.4.2 Mine Access Road

The mine will be accessed by a private gravel road with a security gatehouse, visitor and truck parking, and truck scale. The mine access road is approximately 860-m long and starts 300 m west of the town of Valle Hermoso and passes to the north of the town, thereby avoiding conflicts between mine traffic and local traffic within the town. The mine access road terminates at the mine gate house and parking area.

18.4.3 Haul Roads

The mine haul roads are designed for 30-t articulated trucks for pioneering and road building, 92-t trucks for operating in smaller spaces during pre-production and ongoing mine development and 220-t haul trucks for full scale production mining. For double lane traffic, the industry standard indicates the running surface width should be a minimum of three times the width of the largest truck. The overall width of a 220-t haul truck is 8.5 m, which results in a running surface of 25.5 m. The overall width of the haul road must account for safety berms and diversion channels. The haul roads have been designed in accordance with Guidelines for Mine Haul Road Design (Tannant and Regensburg, 2001).

18.4.4 Ancillary Roads

Ancillary roads are internal roads that connect various mine facilities and provide maintenance access to facilities like the overland conveyors. These roads are single or double lane roads depending on their function and usage frequency. The main ancillary roads at Cangrejos include:

- DSTF access road that provides access between the storage facility and the process plant
- The haul road from the tailings stockpile to the base of the DSTF
- The crushed material overland conveyor maintenance road
- The tailings overland conveyor maintenance road
- Diversion channel maintenance access roads

18.5 Waste Rock and Saprolite Storage Facilities

The WRSF and SSF are designed to provide secure and permanent storage of approximately 728 Mt of non-economic waste rock and overburden (i.e., saprolite and saprock) over the 25-year mine life.

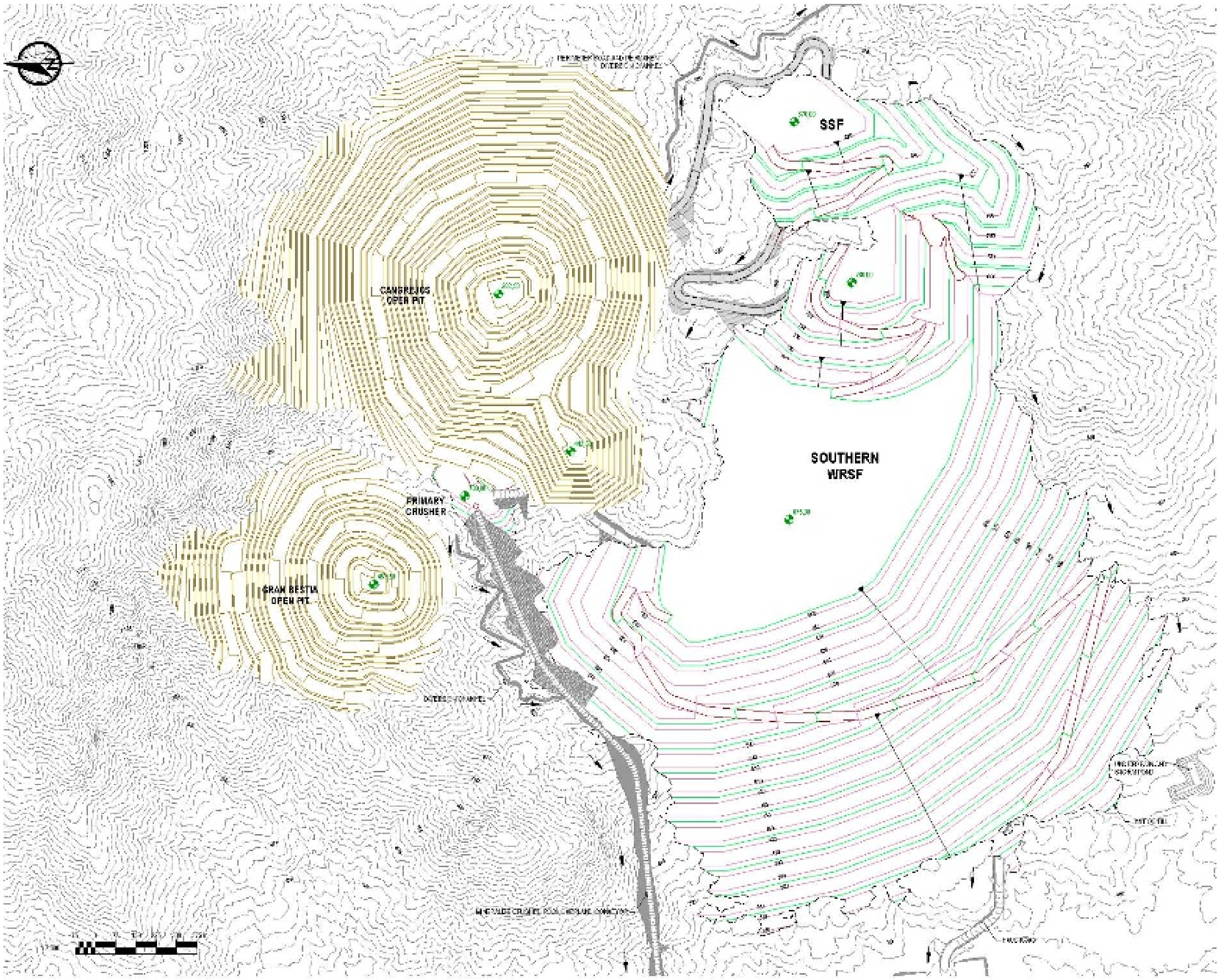
Non-economic waste rock and overburden produced by mining activities at the project will be used to construct site infrastructure, as road base, for other required construction or maintenance products, or placed in the storage facilities to the south and east of the Cangrejos open pit. There are two waste material storage facilities developed below the Cangrejos open pit: 1) the waste rock storage facility, 2) the saprolite storage facility.

During the first four years, the waste rock and overburden (saprolite and saprock) generated during operations will be managed in the two separate storage facilities due to the low waste rock to saprolite ratio (i.e., less than 7:1 ratio). At those ratios, the saprolite mechanical properties govern the stability of the waste storage facility. After year five, the ratio is higher than 7:1. At that point, the mine can co-mingle waste rock and saprolite in a single facility and the mechanical properties of the waste rock govern. The initial SSF is located on the southeast side of the WRSF.

Management of the waste storage facilities includes management of contact water and non-contact water. Contact water is defined as precipitation that falls onto the surface of the mine infrastructure or flows into the mine infrastructure from surface water sources. The contact waters will be collected and used for mine operations while the non-contact water will be released into the drainage below the facilities.

The waste storage facilities are located within a short haul distance from the open pits. The conceptual facilities provide adequate capacity for waste materials over the life of the mine. Waste rock and overburden will be hauled from the pit via strategically positioned egress points. As part of the mine plan, the internal pit ramps connect to the external haul roads that support the primary crusher, WRSF, SSF, truck maintenance area, ready-lines, and fuel depot.

Additionally, organic materials that are excavated from within the pit limits, the stockpile areas, and infrastructure footprints will be stripped and stockpiled for future reclamation use. This topsoil will be placed in stockpiles around the property. The general layout of the WRSF and SSF are provided in Figure 18-1.



Source: Ausenco, 2020

FIGURE 18-1: WASTE ROCK STORAGE FACILITY AND SAPROLITE STORAGE FACILITY

18.6 Dry Stack Tailings Storage Facility

Based on a trade-off study between various potential disposal sites and technologies, Lumina selected the concept of filtered and dry stacked tailings. The tailings concept has distinct advantages over other options, most notably they are deemed to be significantly safer for the environment and local residents than conventional wet tailings, as the consequences of any accident, including dam failure, could be readily controlled and limited to a few hundred meters. In addition, water usage is significantly reduced.

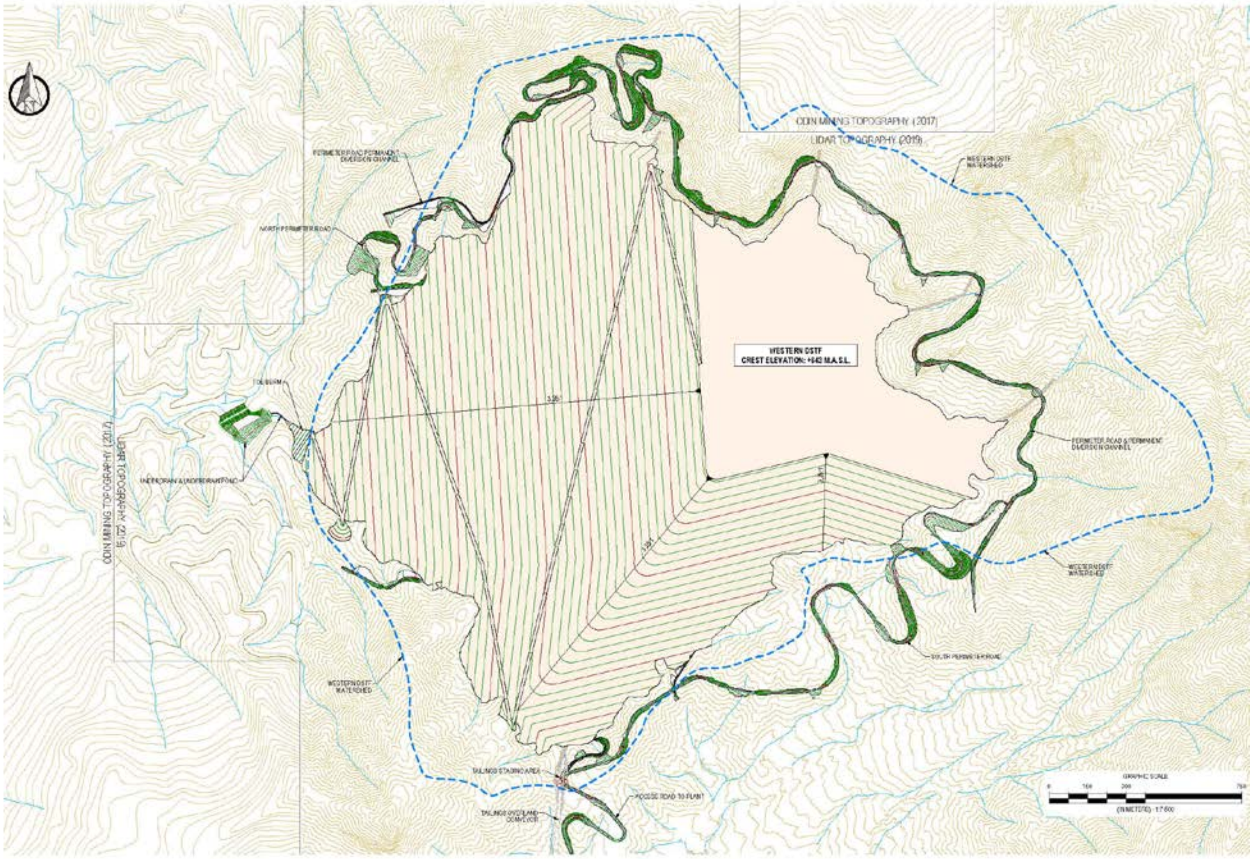
Ausenco updated the initial scoping-level design of the DSTF for this PEA with the primary objectives of further reducing the project footprint and deferring initial capital costs where possible. The selection of the current DSTF location results in a superior site to the one selected during the 2018 PEA for geotechnical stability and water management aspects and also because the site will contain all of the estimated tailings and allow for expansion, if needed. The current design accomodates 640 Mt of tailings. In addition, the project footprint is kept compact because the site is located approximately 2.1 kms from the plant site.

Tailings will be transported from the processing facilities to the ridge above the DSTF by overland conveyor to a staging area. From the staging area, tailings will be transported to the final storage spot within the DSTF using semi-mobile conveyors, mobile conveyors, and a stacking system.

For the first two years, in combination with the stacking system, dozers, a grader, and compactors will grade and compact the tailings to form a surface suitable to construct a conveyor system to the toe of the DSTF. Dozers and compactors will then spread and compact the tailings in 0.5-m lifts, densifying them to significantly reduce any potential for liquefaction of the tailings under either static liquefaction or during a potential design seismic event.

Any potential seepage from the DSTF, including infiltration from precipitation, runoff that comes in direct contact with the tailings, as well as groundwater discharges, will be collected in the underdrain system or in temporary internal diversion channels. Contact water will flow to the sediment pond that will be located west of the DSTF. Water collected in the sediment pond will be collected, tested, treated, if necessary, and released. Surface runoff from the undisturbed area (i.e., non-contact water) above the DSTF will be collected and diverted around the DSTF. The diversion channels will be phased to match the expansion of the facility. To reduce infiltration and contact water along with attenuating contact water from the top of the DSTF, raincoats will be installed to collect runoff from rainfall and divert it to either non contact diversion structures that route runoff around the facility or convey it to the underdrain pond. The raincoats will be installed in areas where tailings are exposed, with the exception of active deposition areas, to reduce infiltration. In addtion, progressive closure of completed slopes will also be performed to minimize erosion and reduce infiltration.

The layout of the DSTF is provided in Figure 18-2.



Source: Ausenco, 2020

FIGURE 18-2: DRY STACK TAILINGS FACILITY

18.7 Concentrate Storage, Handling, and Transport

Dewatered gold-copper flotation concentrate will be transported in 20-ft (6-m) long, tipping type B containers that have a maximum payload of 28,550 kg. The containers will be transported by truck between Cangrejos and Puerto Bolivar, which is approximately 60 km from the Project. Conceptually, the concentrate will be stored at site to reduce the cost of storing concentrate at the port and, once at the port, the port operator will transport the containers to the berth, lift them, and flip the loaded containers with installed rotation spreaders to discharge the contents into the ship's hold for shipment to the designated smelters. For this PEA, it is assumed that a ship will arrive at the port every 45 days.

Dried molybdenum concentrate will be placed in bags at Cangrejos, loaded into 40-ft (12-m) long shipping containers and transported to either Puerto Bolivar or Guayaquil. Guayaquil is considered an option for the molybdenum concentrate because it is a busier port with more vessels docking. Being able to ship and receive payments more quickly may offset the additional costs associated with the longer transport distance.

18.8 Port

Several port options were evaluated during this Study. Puerto Bolivar was selected as the basis for this Study since it is close (i.e., approximately 60 km) to the Project and because other options that were considered were more difficult to access. Puerto Bolivar currenty ships concentrate from the Mirador copper project.

18.9 Site Ancillary Facilities

The conceptual design and cost estimates for this Study include all ancillary facilities that are required to operate a mine of this size including:

- Office Facilities
- Construction Camp that will remain at site to accommodate operations personnel who do not live in the local area and the construction workforce during the expansion in years 4 and 5
- Truck Shop and Shop Tools
- Fuel Dispensing
- Explosives Storage
- Pit Dewatering Systems
- Sanitary Landfill
- Water Supply Systems
- Sewage Treatment Facilities
- Domestic Water Treatment System
- Site Security Fencing
- Metallurgy and Assay Laboratories
- Process Reagent Mixing Systems

19 MARKET STUDIES AND CONTRACTS

A market study was provided by H&H Metals Corp (H&H, 2020). To determine the market pricing for use in the model, the team reviewed the H&H forecast market values, current trading values, price forecasts from numerous financial institutions, and had discussions with Lumina and H&H. The following metal prices for this PEA cash flow model were selected as the basis:

Gold - $1,400/oz *Copper - $2.75/lb*

Silver - $16.00/oz *Molybdenum - $9.00/lb*

The precious metal markets are highly liquid and benefit from terminal markets around the world (e.g., London, New York, Tokyo, and Hong Kong). The London PM fix for gold and silver on June 8, 2020 was $1,690/oz and $17.63/oz, respectively. As of June 8, 2020 year-to-date, gold traded between $1,324/oz and $1,748/oz and silver traded between $12.01/oz and $19.31/oz.

On June 8, 2020, the closing price for copper was $2.58/lb and molybdenum was $8.16/lb. As of June 8, 2020, year-to-date copper traded between $2.10/lb and $2.84/lb and molybdenum traded between $7.90/lb and $12.38/lb.

To calculate gross revenue from mining, metals prices for gold, copper, silver, and molybdenum were applied to corresponding recovered, payable gold and silver Troy ounces and copper and molybdenum pounds in the economic model.

19.1 Transportation Costs

19.1.1 Concentrate

The transportation costs are the costs to move the concentrates to smelters for further treatment. Domestic transportation charges for shipping two concentrate products from the Cangrejos Project were provided by local transportation providers. H&H provided the international shipping cost estimates of $35.00 per wet tonne to ship the gold-copper flotation concentrate to China and $24.81 per dry tonne to ship molybdenum concentrate to Chile.

19.1.2 Doré

Doré requires special handling due to its inherent value. Industry sources provided typical doré freight and insurance costs of $3.53/oz of doré. This estimated charge covers transportation and insurance costs to transport the doré from the mine to the destination.

19.2 Treatment Charges, Refining Charges, Payment Terms and Penalties

19.2.1 Flotation Concentrates

Smelters apply TCs, RCs, and penalties based upon the composition of the concentrates. They also typically provide terms of payment. The economic model applies costs for concentrate TCs, RCs, and penalties taken from the H&H marketing study (H&H, 2020) and subsequent email clarification and elaboration. The results of the marketing study are typical for processing gold-copper and molybdenum concentrates. The marketing study is based on providing an average of 100,000 t/a of the gold-copper concentrate. The gold-copper concentrate TCs were reported as $70 per wet t of concentrate and refining charges of $7.50 per ounce of gold, $0.65 per ounce of silver, and $0.07 per pound of copper. The concentrate payable metal returns for the gold-copper concentrate were reported as 97.5% for gold and 97% for silver.

The molybdenum concentrate carries a 15% price discount to the treatment charge due to its high copper content. Using the molybdenum price of $9/lb and the 15% discount, the estimated discount is approximately $2,976 per dry tonne. The estimated discount is applied in the model and the molybdenum is 95.5% payable according to the H&H report.

Payment terms for the concentrates allow for 90% payment at the Ecuadorian port upon loading the concentrate into the shipping vessels, with 10% settlement 45 days later. Molybdenum concentrate payment terms are assumed to be 90% 15 days after shipping with the balance paid in 75 days.

Assays of the concentrates that were performed as part of the metallurgical testing indicate that the concentrates are considered "clean" and that they contain no deleterious contaminants that would trigger penalties. Therefore, no penalties are included in the cash flow analysis.

19.2.2 Doré

Doré also carries TCs and RCs based on composition and weight. The model applies doré treatment and refining charges based upon industry sources available to the Cangrejos Project. The treatment charges are estimated to be $0.30 per oz of doré. Doré payables are 99.95% for gold and 99.5% for silver.

19.3 Contracts

At this PEA stage of project development, no marketing contracts exist.

19.4 Conclusion

The QP has reviewed the marketing studies and analyses and, in the QP's opinion, the results support the assumptions in this Technical Report.

20 ENVIRONMENTAL STUDIES, PERMITTING, AND ENVIRONMENTAL AND SOCIAL IMPACTS

20.1 Environmental Setting

The Project will be located primarily in areas of evergreen montane and secondary forest and altered pasture and agricultural areas in the central part of the Project. The Project is drained by a network of small streams; apart from these streams, no significant surface water features are directly impacted by the Project. The natural environment in the area of the Project has been significantly altered by a wide range of intrusive human influences that span many decades, and archaeological evidence suggests a history of human habitation and influence that dates back hundreds of years. No primary forest remains. Current land usage in the area of the Project is typically a mixture of cattle grazing and light agriculture, in cleared areas adjacent to secondary forest "islands." The latter are usually situated in steep ravines and rugged terrain unsuitable for agriculture or grazing.

There are no villages or significant groups of dwellings in the project's environmental Area of Influence (AOI).

20.2 Environmental Permitting Requirements

The Project is being developed in accordance with the Constitution, the Ecuadorian Mining Law and its Regulations, the Environmental Organic Code and its Regulations, the Organic Law of Water Resources and its Regulations,and other applicable Ecuadorian norms, standards, laws, and regulations.

Prior to the commencement of mine construction and mineral production, the Project will be subject to a wide array of additional permitting and related support actions, as required by current Ecuadorian laws and regulations. Based on prior experience with similar-scale projects in Ecuador, it is estimated that, in aggregate, major permitting actions (excluding certain municipal, tax registration, and potential concentrate export permits), several of which can occur in parallel, will take a minimum of 24 months to complete.

Permitting requirements are discussed in more detail in Section 4.3 of this Technical Report.

20.3 Environmental Baseline and Impact Studies

Environmental baseline studies were conducted as part of Estudio de Impacto Ambiental (EIA) processes for exploration licensing and are ongoing. Baseline studies include the collection of surface water, groundwater, biodiversity, climate, and geochemical data. Odin commissioned an advanced exploration-phase environmental baseline study in the original Cangrejos concession areas. Field work began in July 2007 that culminated in the 2010 EIA. A similar study was conducted in 2017 as part of the initial exploration-phase EIA for C20. Additional environmental baseline data collection infrastructrucure, including permanent surface water flow measurement stations, was completed in 2019. In 2020, the C20 EIA was updated and resubmitted for final regulatory approval; the MAAE review is ongoing.

20.4 Environmental Area of Influence

For the purposes of this PEA, the environmental AOI for the Project is defined as the specific areas within the concessions potentially disturbed by mine development, construction, and operation, plus a 100-m buffer/environmental monitoring zone around the perimeter of that footprint. Mining haul roads, service roads, and the access road are all considered to be within the Project's environmental AOI. Haul roads located outside the pits will have a nominal 75-m buffer zone established on either side of the road centerlines; regular access and service roads will be provided with a 50-m buffer on either side of their centerlines. It is understood that the primary site access road will ultimately revert to being government property. The environmental AOI is entirely within the specific areas that have been previously evaluated in focused biological and archaeological baseline studies.

20.5 Biodiversity Studies

Ecuador is a very biodiverse country. Like other nations, it has established a range of laws and regulations to protect its environmental resources. At the same time, the country is seeking to diversify and grow its economy, an increasingly vital component of which is mining. In keeping with Ecuadorian law and international Best Management Practices (BMPs), mining project proponents must seek a practical and appropriate balance between project economics and environmental protection, including the preservation of biodiversity.

In order to better understand the specific biodiversity considerations in the Project area, Odin commissioned environmental studies as part of the various exploration phase EIAs. A desktop biodiversity screening study was completed in 2017. Dry and wet season field studies were conducted in 2019 that were focused specifically on biodiversity in and around the initial Project footprint, as defined by Odin’s 2018 PEA.

The 2019 studies confirmed that the Project location is many kilometers distant from any officially protected environmental areas and that the Project’s concession areas have been significantly impacted by centuries of intrusive human activity. Primary forest no longer exists and the area of the Project is now comprised of a mixture of agricultural and grazing clearances and young or mature secondary forest islands. Such types of forest are not unique to the project area and can be found elsewhere in coastal areas of Ecuador.

Minor populations of several sensitive and/or endemic species of flora and fauna were found in land areas that will be required for mine construction and operation. The Project, however, is adjacent to and already owns substantial areas not required for mining that are forested or modified. These can be set aside or rehabilitated as ecological offsets to compensate for any disturbance or loss of habitat that may be critical to the species observed. Establishment of such offsets, in conjunction with a biodiversity monitoring program, robust adaptive management protocols, and specific management and mitigation measures based on international BMPs, will enable successful Project permitting and the Project’s compliance with all applicable regulatory requirements.

20.6 Archaeological Studies

In 2012, Odin commissioned a detailed archaeological survey of the concessions (excluding C20, as it was not under its control at the time). The survey evaluated 18 areas in 12 discrete concessions that Odin had tentatively identified as having potential mineral interest. In the archaeologists' opinions, the evidence over almost the entire area of study revealed a historical presence of the Milagro culture of the Integration Period (about 500 A.D. to 1500 A.D.), with an association to the Cañari culture and a possible interrelation with the Manteño culture. None of the sites in the original study, however, are in the current environmental AOI for the Project.

Odin commissioned two additional archaeological investigations to support advanced exploration activities in C20 in 2019. No archaeological artifacts were encountered in either study.

Odin has implemented a "chance finds" procedure to address the handling and, if necessary, preservation and protection of archaeological resources or artifacts that may be discovered during the exploration process. No significant cultural resources or artifacts have been encountered in any of the drilling campaigns associated with initial exploration or advanced exploration activities.

20.7 Socioeconomic Study

20.7.1 Social Setting

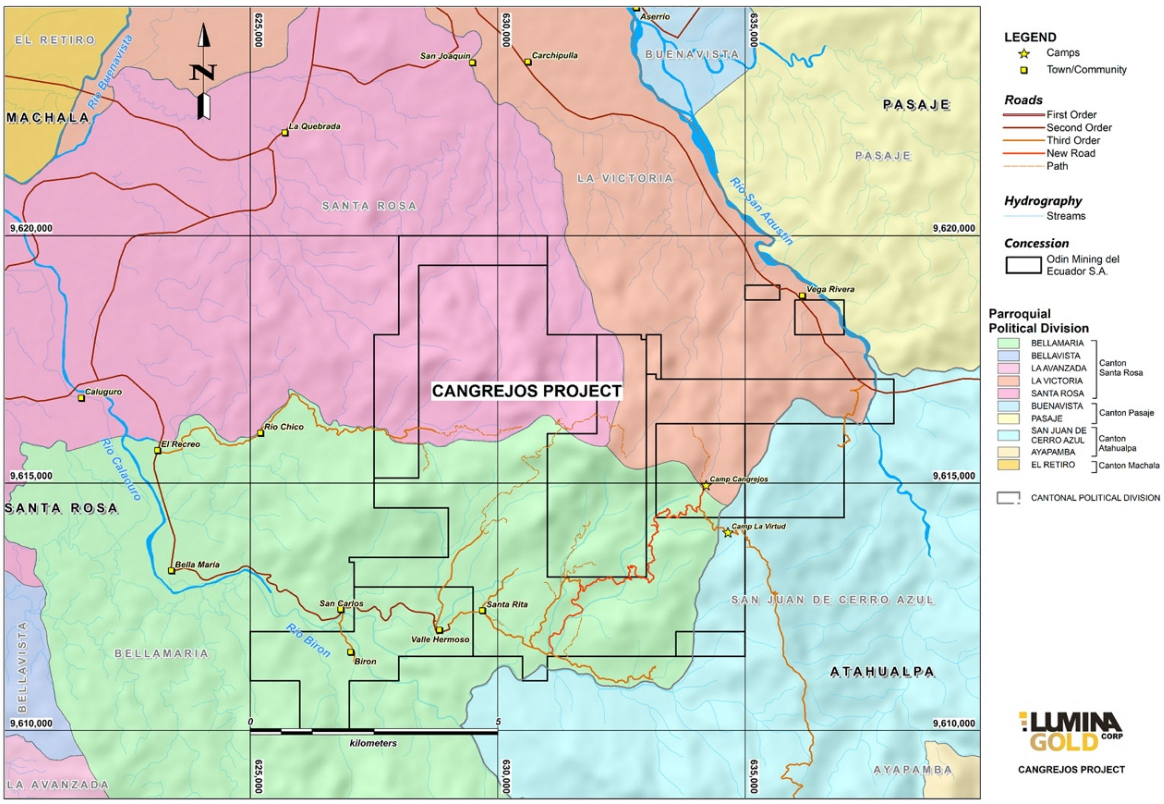
Social Capital Group completed an updated socioeconomic study for the Cangrejos Project in 2020. The Project is located almost entirely in the upper reaches of the parishes of Bellamaria and La Victoria, which are both within the Canton of Santa Rosa. A small portion of the Project footprint crosses into the Canton of Atahualpa. The Cantons of Santa Rosa and Atahualpa are both located within the coastal Province of El Oro.

The Project´s mining operation, access road (after exiting the national highway), and potential water and other environmental impacts will almost entirely be limited to Bellamaria parish. As a result, the social AOI includes seven nearby settlements in Bellamaria parish and one in La Victoria. However, the Project's exploration and prospective construction activities are all on rural land and are physically removed from these villages. There are no nearby villages in Atahualpa.

In the latest available census (2010), Bellamaria parish registered a total population of 2,322 (21 persons/km^2) and La Victoria parish had a population of 3,187 (45 persons/km^2). Both parishes are classified as rural according to the National Institute of Census and Statistics (INEC).

The Project´s social area of influence (AOI) includes the following seven settlements within Bellamaria parish: Bellamaria (pop. 800) and Valle Hermoso (pop. 550), as well as the small villages of Santa Rita (comprised of four families), Biron (pop. 190), San Carlos (pop. 200), Rio

Chico (240) and El Recreo (500). The social AOI also includes Vega Rivera (pop. 270) in La Victoria.



Source: Odin Mining, 2020

FIGURE 20-1: SOCIAL SETTING - PROJECT LOCATION IN RELATION TO PARISH AND CANTON AREAS

20.7.2 Social AOI

The key socioeconomic aspects of the settlements in the social area of influence include:

- **Roadways**: There are paved roads from the city of Santa Rosa to Bellamaria and to La Victoria that are regularly used by passenger buses and private and commercial vehicles. Access to most villages typically involves a combination of paved and unpaved roads. Road maintenance, especially for unpaved roadways, is a continuing challenge due to high levels of rainfall.
- **Communications**: Bellamaria and La Victoria parishes have limited access to cellular phone and Internet services, but have open-signal and cable TV and AM/FM radio.
- **Education**: There are primary and secondary schools in Bellamaria. The highest level of education achieved by most adults in Bellamaria parish and in La Victoria is primary. Women slightly outperform men in terms of education and literacy.
- **Health services**: There are health centers in Bellamaria and Valle Hermoso; the nearest hospital is in Machala.

- **Basic utilities**: Both parishes have basic services such as electricity, water, and sanitation. However, in Bellamaría parish, wastewater from homes is typically dumped directly into the tributaries of the Santa Rosa River without treatment.
- **Non-mining economic activities**: The local economy in the lower area of these villages is based on agriculture, livestock, commerce, and general services. For the towns of Bellamaria and Valle Hermoso and the villages of El Recreo, Rio Chico, San Carlos, Biron, the non-mining aspect of the economy is based on agriculture (cacao and fruit), livestock (cattle and pork), poultry, and some tourism. The location of the Project does not interfere with agricultural activities or the raising of animals. Poultry and pork are also produced at the household level and sometimes sold in the markets of Santa Rosa and weekly fairs in Bellamaria. There is also some timber production in Biron. Economic activities in the village of Vega Rivera include agriculture, livestock, and general commerce.

  Further downriver from the social AOI and nearer to the coast, the land flattens out and transforms into far more productive and valuable land for agriculture and livestock production. The most productive farms are dedicated to permanent crops such as bananas, cacao, oranges, and coffee, with an average of about seven hectares in production. Other less economically important crops include plantain, sugar cane, corn, rice, mango, passion fruit, lemons, and beans. Cattle, pork, sheep, and poultry are also raised. However, all processing plants for these products are outside the canton in the cities of Machala, Guayaquil, or Cuenca.

  There are also significant shrimp farming areas on the coast and on offshore islands. These constituencies may eventually develop an active interest in the development of the project, in particular its potential effects on water quality and quantity.

- **Mining activities**. In the upper reaches of the parishes, artisanal/small-scale mining is a significant economic activity. A number of entities and individuals have legal permits to conduct artisanal/small-scale mining, but illegal activities do occur. In Bellamaría parish, there is a great deal of such activity, above all near the settlements of Calaguru, Estero Medina, Río Chico, and Bellamaria. Based on information obtained via interviews with local authorities, at least 35% of the families of the parish receive some income from mining activity, although it is unclear just how much of this income is derived from illegal activities.

  In the areas bordering the Project, significant legal mining operations include: Mina Los Ingleses - Sociedad Tucadulombo; Minera Bravo; Los Ingleses-Eminza, Minera Carolina; Colorado V - El Humedo; and, Duran. There are at least 14 other entities involved in mining activities in Bellamaria, Valle Hermoso, and Birón. In addition, there are small international companies doing exploration in the area, including Challenger Exploration Ltd.

  At present, no active illegal mining is known to be taking place within the proposed Project footprint. However, over the years such work has been an occasional issue in the concessions, and, when encountered, is routinely reported to the Agency for Mining Regulation and Control (ARCOM) for their appropriate action. Several farms in the concessions area have traces of illegal mining activity dating back 10 to 15 years. Environmental liabilities associated with illegal mining works have also been periodically identified and reported; these include alluvial mining at the Gran Bestia ravine, as well as underground mining at the Gran Bestia ravine, the Dos Bocas Sector in Vega Rivera, and the Las Pavas ravine.

- **Land ownership**: According to information from local authorities, at least 90% of the parcels of non-urbanized land and farms in the area are private and have supporting documentation, while the remaining 10% are public (i.e., state-owned). Odin owns or controls approximately 60% of the surface land over the area required for Project facilities.
- **Indigenous peoples**: No indigenous peoples or communities occupy or use land in the Project's social AOI, nor live in proximity to it.
- **Religious Organizations and Facilities**: The local population is predominantly Catholic. There is presently only one ordained priest serving the villages in the Santa Rosa canton. Religious facilities include:
  - Bellamaria: one large Catholic church (and a smaller Protestant church)
  - San Carlos: one Catholic church
  - Biron: a small covered outdoor shrine dedicated to the Virgen de El Cisne
  - Valle Hermoso: one large Catholic church
  - Vega Rivera: one small Catholic chapel

20.7.3 Social Risks, Impacts and Mitigation Measures

Table 20-1 presents an initial summary of the primary sources of social impacts (both positive and negative) and risks anticipated for the Project based on local studies, results of public participation processes, and prior experience. The management and mitigation strategies reflected in the Project's technical design and Lumina's social management approach are also provided for each general category.

TABLE 20-1: SOCIAL MANAGEMENT / MITIGATION STRATEGIES ACCORDING TO SOURCES OF IMPACTS (POSITIVE & NEGATIVE) AND RISKS

Sources of Social Impacts and Risks	Potential Management/Mitigation Strategies
Generation of direct employment	• Job creation at a local and national level (in addition to creating opportunities to be fulfilled by international expertise) • Training to increase opportunities for long-term local residents to work in project construction and operation • Monitoring effectiveness of these measures and, when necessary, taking corrective action to ensure a positive impact in the social area of influence • Clear communication with local stakeholders regarding the results of these efforts and seeking feedback on how to improve performance
Generation of supply chain opportunities	• Identification of regional and local providers capable of providing necessary goods and services • Outreach to increase local businesses' ability to understand and meet project requirements • Monitoring effectiveness of these measures and, when necessary, taking corrective action to ensure a positive impact within the social area of influence • Clear communication with local stakeholders regarding the results of these efforts and seeking feedback on how improve performance
Impact of workforce accommodation	• Workforce from the local area will reside in their homes and the workforce from outside the social area of influence will reside in a camp established inside the Project boundary on the access road to mine • Contractors will transport workers out of the social area of influence when they have finished their work rotations

Sources of Social Impacts and Risks	Potential Management/Mitigation Strategies
	• Codes of conduct will regulate social behavior of Project workers staying at camp to minimize the potential for negative social interactions with local residents including the spread of infectious disease • Participatory monitoring, stakeholder engagement and the Project Grievance Mechanism will help ensure proper behavior and early detection of any incidents that require legal intervention or corrective action
In-migration of job seekers	• The Project will avoid significant in-migration of job seekers into the social area of influence by not creating incentives: • Non-local residents will only be able to apply for work outside of social area of influence • Only existing local residents will be eligible for hiring within the social area of influence • The Project will seek to generate a modest level of local employment but monitor its impacts to avoid creating an economic boom in the social area of influence that would stimulate in-migration. It will take particular care to avoid a boom in the social area of influence during construction
Impact on traffic and access	• Traffic increase in the social area of influence, would be partially offset by the significant access improvements that also benefit local residents and more improvements will be completed prior to construction • Scheduling of major deliveries of materials and equipment for daylight hours, with routes avoiding schools, markets, and other urbanized areas to the extent possible • Implementation of safety measures and controls in coordination with local stakeholders to promote safety around its primarily daylight logistics
Land acquisition	• Acquisition of remaining land by negotiating directly with the property owners • No village resettlement requirement for Project development
Vulnerable Groups	• Identification of the vulnerable groups within the social area of influence, identification of how the Project might adversely or positively impact them and establishment of management actions to address impacts and monitor results • Monitoring of prices of goods, services and land in the social area of influence in comparison to tendencies in areas further from the Project and implement corrective actions as needed to reduce the possible negative impact of inflation attributable to the Project's activities
Tension or conflict due to real or perceived impact on water or other environmental receptors.	• Design to minimize and manage water and other environmental impacts • Additional measures to focus water management within one basin • Information sharing on water and environmental management in public meetings, engagement with stakeholders and local authorities, and ongoing communications
Presence of illegal mining	• Actively monitor its concessions against incursions from illegal mining and denounce activities that may be discovered • Communicate legal responsibilities, concerns and actions regarding illegal mining with local stakeholders and authorities as part of its ongoing stakeholder engagement
Improvements in living conditions or quality of life due to social investment	• Continue to provide social investments within the social area of influence that promote collaborative local development and the fair distribution of benefits among local stakeholders • Final impact will depend on building leadership and participation of the directly affected populations into the management of these investments

Sources of Social Impacts and Risks	Potential Management/Mitigation Strategies
Increase in public budget from royalties and taxes	• The Project will pay significant taxes and royalties • Magnitude of benefits generated by the taxes and royalties within the social area of influence will depend on future government decisions on how to best spend the additional income

20.7.4 Legal Requirements.

As noted in Section 4.3, the COA and associated regulations require the submittal of advanced exploration and exploitation-phase EIAs and EMPs for MAAE approval. In addition to the Project's ongoing stakeholder engagement activities, it also complies with the MAAE's legal requirements for public participation linked to the revision and final approval of EISs.

An initial EIS was approved for the Cangrejos concessions to support advanced exploration activities. Approval was granted after completing public presentations in the villages of Bellamaria and Vega Rivera. The EIS included a Community Relations Plan (CRP) that committed Project support to agricultural development, childcare, environmental protection, and local infrastructure. Since the approval of this EIA, the environmental and social performance of the Project has been subject to regular audits by the MAAE.

In 2018 a public participation process was implemented as part of the requirements for the approval of an EIS to conduct advanced exploration in the then recently acquired C-20 concession. The public participation process involved implementation of a two-week Consultation and Information Office for local residents. In addition, the study was made available via the MAAE's website and notifications were issued through the radio and the written press, as well as by the posting of public notices. Over 100 people attended a public presentation of the EIA in the village of Valle Hermoso. The presentation was followed by public commentary and a question and answer session, during which the primary public concerns had to do with opportunities for employment and infrastructure improvements. Participants included stakeholders from the Santa Rosa Canton, Bellamaria and La Victoria parishes, the town of Valle Hermoso and neighboring villages, landowners with property located within the concession area, and authorities from the Ministry of Mines and the environmental department of the Provincial Municipality.

In January 2020, the Project also implemented a MAAE-mandated public participation process (PPP) linked to an update for the C-20 EIA. MAAE published the EIS report online for a 15-day period. The Project directly informed over 60 local stakeholders of the study and provided a link for public access. The MAAE subsequently approved the PPP.

20.7.5 Stakeholder Mapping

As part of the communications program defined by the Project's Strategic Community Relations Plan (SCRP), the Project's Community Relations team periodically conducts social mapping exercises to identify key stakeholders and document their specific interests and expectations for consideration in the planning of Project activities. The most recent mapping exercise (Social Capital Group, 2020) focused on the primary authorities in the stakeholder communities. The individuals contacted in this mapping exercise were generally favorable to responsible mining activity and open to constructive dialogue, as was evidenced in the public participation process for the C-20 EIA in April 2018.

20.7.6 Socioeconomic Benefits, Community Relations, and Communications

The Project will be managed to provide reasonable, fair, and appropriate socioeconomic benefits to local stakeholders and the nation as a whole. Beyond the expected allocation of a percentage of royalties (intended to cover improvements in public infrastructure, especially in the social area of influence), such benefits shall include training opportunities for employment and provision of goods and services, noting that the scope and scale of such opportunities may be expected to increase as the Project enters construction and operation. Lumina also plans to actively assist with community development projects on an ongoing basis, including: health and safety support in response to the COVID-19 pandemic; improvement and maintenance of churches and schools; provision of appropriate support for local cultural activities, including festivals and community workdays; implementation of productivity initiatives, including local agriculture and animal husbandry projects; and/or providing resources and/or technical assistance with other issues identified in stakeholder discussions.

The communications program defined by the Project SCRP requires the Project's Community Relations team to regularly engage and dialogue with leaders of the communities and organizations in the social AOI at a level generally commensurate with the extent and complexity of Project activities. In addition to establishing agreements with the communities, other outreach activities are expected to include: regular contact/informational meetings with communities and stakeholders; training of local workers and contractor personnel; monitoring of media interests and positions regarding the development of the Project; continuing re-analysis of the social/stakeholder risks associated with Project activities; systematic documentation of stakeholder interactions; and, periodic stakeholder mapping exercises to identify key stakeholders and learn about their specific interests and expectations. Interactions with those stakeholders having the most immediate relationships to the Project are documented and form the basis for continuing dialogue that presents proposed activities and the mitigation measures to be taken to minimize any negative environmental and social impacts.

20.8 Social Management Policies and Social Management System

Lumina corporate policies guide Odin's management of social and other issues associated with Project development. These policies reflect a corporate commitment to conducting mineral exploration and mine development activities in a manner that is fair, ethical, and in conformance with governing laws and regulations. They also reflect a commitment to developing relationships of trust based on communication that is transparent, respectful, and informative. The rights, interests, and cultural heritage of host communities and affected landowners are also specifically considered. These policies also embody a commitment to minimize and mitigate environmental and social impacts, as well as to rehabilitate impacted areas in a manner acceptable to affected stakeholders and regulators. The policies are implemented through management plans including a Strategic Community Relations Plan (SCRP).

20.9 Geochemistry

20.9.1 Static Geochemical Samples

For this study, GRE collected 70 waste rock samples for an industry-standard static geochemical testing program. Fifty-eight were from the Cangrejos pit and twelve were from the Gran Bestia pit.

The rock and tailings samples were analyzed for the following:

- Acid Base Accounting (ABA)
- Whole Rock Analysis
- Metals by aqua regia digestion and inductively coupled plasma mass spectrometry (ICP/MS)
- Synthetic Precipitation Leaching Procedure **(**SPLP)

Tailings supernatant solution was analyzed for the following:

- Wet chemistry and metals
- Chloride, fluoride, cyanide, and nitrogen species
- Additional analysis required to test for regulated parameters under Ecuadorian law

The sample collection covered the entire range of rock types on site.

Acid Base Accounting Testing Results for Waste Rock

GRE conducted acid base accounting tests. The acid generating potential (AP) and neutralization potential (NP) values are combined to derive a quantitative screening-level estimate of a material's overall acid generating or neutralizing potential, resulting in the classification of the sample as "potentially acid-generating" (PAG), "non-potentially acid-generating" (NAG) or "uncertain". This testing is commonly called Acid Base Accounting (ABA) testing. Two formulations are commonly used:

- Net Neutralization Potential (NNP), obtained by subtracting sample AP from NP (NP-AP)
- Neutralization Potential Ratio (NPR), obtained by dividing sample NP by AP (NP/AP)

The results of the ABA testing are presented in Figure 20-2. The horizontal lines represent the different cutoff points.

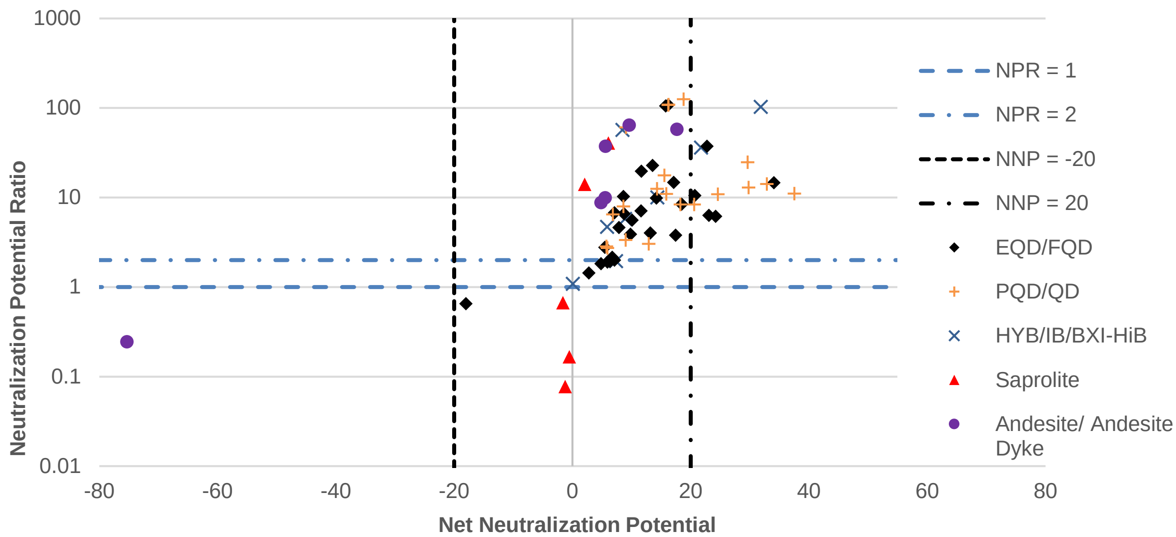
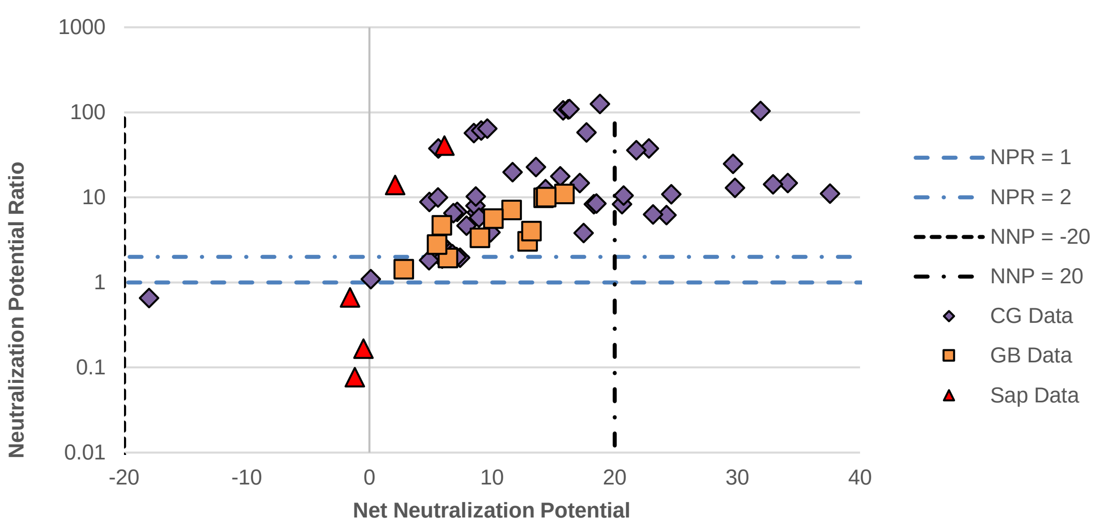


FIGURE 20-2: GRAPHIC OF ABA RESULTS BY ROCK TYPE

The figure shows that nearly all of the scoping-level samples are safely within the NAG category (upper center, and upper right). This is due to the generally low AP values in the sample set, and the presence of NP. One sample of the andesite dike showed PAG behavior (lower left). Some samples landed in the "uncertain" range (in the middle of the graph). Saprolite samples fell in the non-reactive zone at the bottom middle of the graph.

If examined by rock type and location, as shown in Figure 20-3, there is a noticeable difference between the Cangrejos and Gran Bestia sample clusters.



Note: two extreme samples, at -80NNP and +60 NNP have been omitted from Figure 20-3 for better scaling.

FIGURE 20-3: GRAPHIC OF ABA RESULTS BASED ON LOCATION

This figure shows that the Gran Bestia samples appear to have lower NP and therefore slightly higher ARD risk than the Cangrejos samples. On average, the NP in Cangrejos samples is 18.0

tonnes $CaCO_3$ per tonne of material (t/kt $CaCO_3$) equivalent, and the average NP of Gran Besita samples is 13.4 t/kt. This difference is statistically significant based on the t-test, 95% confidence interval. However, the Gran Bestia samples are still in the NAG region.

Saprolite and saprock have significantly lower concentrations of NP and AP due to the leached-out nature of these geologic formations.

Metals Analysis

Metals analysis of the rock mass can be used to screen out metals for consideration in future water quality analysis. This is best done by comparing the concentration of each metal in the rock mass with the average concentration of the metals in the earth's crust. In general, if a rock type has a concentration of a metal that is greater than five times the crustal average, it can be considered enriched for that metal. If a rock is enriched with a concentration of a metal, it is at higher risk for leaching the metal under acidic conditions or neutral conditions. However, if the rock has a metal concentration that is near the crustal average, it is often safe to remove it from consideration as a future geochemical issue.

The comparison shows that the following metals may be Constituents of Concern (COCs) for the mine leachate water quality:

- Silver
- Arsenic (in saprolite)
- Copper
- Molybdenum
- Selenium

The following metals that are frequently problematic in mine leachate water quality, appear to be near or below crustal averages:

- Arsenic (in rock)
- Cadmium
- Chromium
- Mercury
- Lead
- Zinc

It is important to note that arsenic contained in saprolite is stable since the saprolite contains iron-arsenic compounds. Therefore, it is not leachable. The results of the metals leach testing are consistent with the geological description of the deposit. Elevated concentrations of copper and molybdenum are expected because those are the primary metals being recovered. Sulfide minerals containing arsenic, zinc, and lead are not present.

Leaching Tests

Leach tests were conducted using the mine rock to determine if there are any readily soluble elements that could impact water quality. The test used was the SPLP, based on EPA Method 1312 (US EPA 1994). This method leaches the samples with water at pH 5.5 in order to simulate precipitation.

The SPLP results were also compared to effluent discharge guideline values from Ministerio de Ambiente y Agua del Ecuador (MAAE, November 2015, Table 9) to provide an initial indication of COCs. This comparison is for reference purposes only because the short-term leach results cannot be extended directly to the long-term composition of mine discharge associated with the waste rock storage facility.

The SPLP results have no values in excess of international water standards. The pH is neutral, total dissolved solids are low, and no elevated metals concentrations were detected. Arsenic leachate from saprolite samples is also below regulatory standards, despite elevated concentrations in the rock.

Tailings Static Geochemical Testing Results

The following sections describe the test results from samples of the tailings solids and tailings supernatant.

ABA Results

The results of the ABA testing of a tailings sample are shown in Table 20-2.

TABLE 20-2: ABA RESULTS OF CANGREJOS MINE TAILINGS

Parameter	Units	Detection Limit	Tailings Result
Paste	pH	0.02	8.92
Total Inorganic Carbon	%	0.01	0.11
$CaCO_3$	NP		9.2
S(Total)	%	0.005	0.037
$S(SO_4)$	%	0.01	<0.01
$S(S^{-2})$	%	0.01	0.01
Insoluble S	%		0.03
AP	t/kt $CaCO_3$		0.3
NP	t/kt $CaCO_3$	0.5	18.4
Net NP	t/kt $CaCO_3$		18.1
Fizz Test			None

The NNP and NPR both show that the mine tailings are NAG. This is likely because the sulfides are recovered into the concentrates during the flotation process, but the residual acid-consuming minerals (such as calcite) remain in the tailings.

Short-Term Leaching and Supernatant

The mine tailings appear to have largely inert supernatant solution and leachate. The results of the supernatant analysis are compared to the fresh water discharge standards in Table 20-3.

TABLE 20-3: SUPERNATANT ANALYSIS

Parameter	Units	Cangrejos Supernatant	Reg. Official No. 387 Table 9* Fresh Water Discharge Standard
Titrator pH		8.43	6 - 9
Redox	mV	375	
Conductivity	uS/cm	1261	0
Acidity (to pH 4.5)	mg $CaCO_3$/L	#N/A	0
Total Acidity (to pH 8.3)	mg $CaCO_3$/L	#N/A	
Alkalinity	mg $CaCO_3$/L	93.2	0
Chloride	mg/L	72	1000
Fluoride	mg/L	0.89	
Ammonia+Ammonium (N)	as N mg/L	4.1	
Nitrate (as N)	as N mg/L	< 0.6	
Nitrite (as N)	as N mg/L	< 0.3	
Total CN	mg/L	< 0.01	
WAD CN	mg/L	< 0.01	
Free CN	mg/L	< 0.01	
Thiocyanate (SCN)	mg/L	11	
Cyanate (CNO)	mg/L	< 1	
Total Dissolved Solids	mg/L	809	
Sulfide	mg/L	< 0.02	
Sulfate	mg/L	336	1000
Dissolved Metals			Total Metals
Hardness CaCO3	mg/L	318	
Aluminum Al	mg/L	0.029	5
Antimony Sb	mg/L	0.0167	
Arsenic As	mg/L	0.0324	0.1
Barium Ba	mg/L	0.0219	2
Beryllium Be	mg/L	< 0.000007	
Bismuth Bi	mg/L	< 0.000007	
Boron B	mg/L	0.258	2
Cadmium Cd	mg/L	0.000288	0.02
Calcium Ca	mg/L	106	
Chromium Cr	mg/L	0.00016	
Cobalt Co	mg/L	0.00162	0.5
Copper Cu	mg/L	0.226	1
Iron Fe	mg/L	0.008	10
Lead Pb	mg/L	0.00022	0.2
Lithium Li	mg/L	0.0299	
Magnesium Mg	mg/L	12.6	
Manganese Mn	mg/L	0.422	2
Mercury Hg	ug/L	< 0.01	0.005
Molybdenum Mo	mg/L	0.0587	

Parameter	Units	Cangrejos Supernatant	Reg. Official No. 387 Table 9* Fresh Water Discharge Standard
Nickel Ni	mg/L	0.0059	2
Phosphorus P	mg/L	0.027	10
Potassium K	mg/L	21.2	
Selenium Se	mg/L	0.00467	0.1
Silicon Si	mg/L	4.81	
Silver Ag	mg/L	0.00006	0.1
Sodium Na	mg/L	128	
Strontium Sr	mg/L	0.412	
Sulfur (S)	mg/L	147	
Thallium Tl	mg/L	0.000340	
Tin Sn	mg/L	0.00023	5
Titanium Ti	mg/L	0.00010	
Uranium U	mg/L	0.000799	
Vanadium V	mg/L	0.00138	
Zinc Zn	mg/L	0.111	5
Zirconium Zr	mg/L	< 0.002	

* (Ministerio de Ambiente, 2015)

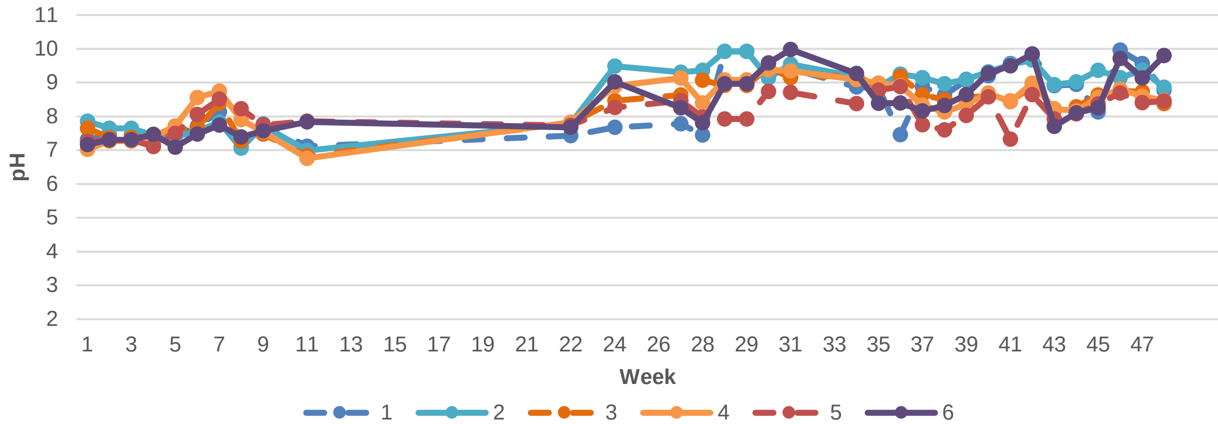
Frequently, copper or gold mines using flotation processing have supernatant solution with excess sulfate and trace metals concentrations. In contrast, Cangrejos supernatant meets the criteria necessary for direct-discharge of excess supernatant water to fresh water. The high wet season precipitation and runoff from non-mine impacted ground will serve to further dilute any discharged supernatant.

20.9.2 Kinetic Geochemical Testing

In anticipation of completing a Prefeasibility Study, Lumina authorized the commencement of long-duration kinetic geochemical testing for waste rock and tailings samples from the Cangrejos project. The results of this testing are summarized below.

Waste Rock Kinetic Testing

The Cangrejos project has operated onsite kinetic testing of Cangrejos waste rock samples since May 2019. Gran Bestia samples were added to the testing in October 2019. Samples were selected that cover the range of AP values on site as discussed in Section 20-10. Up to 48 weeks of testing has been completed, and all kinetic cells show pH neutral or pH alkaline conditions. Figure 20-4 shows the results of the pH readings collected from twelve onsite kinetic cell tests.



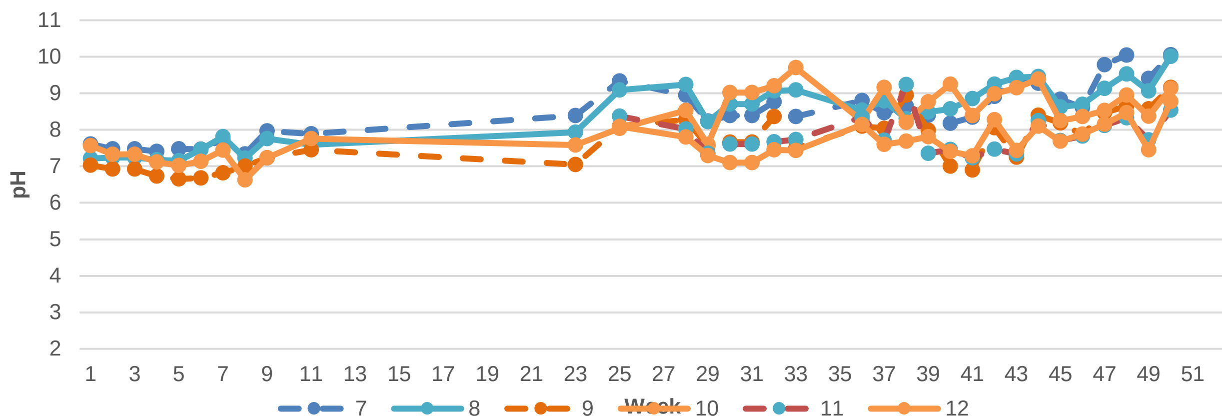


FIGURE 20-4: ON SITE KINETIC CELL LEACHATE, PH RESULTS

The pH values from all of the tests have been steady and firmly neutral or slightly alkaline.

Furthermore, bi-monthly leachate samples sent to the laboratory show that no metals or chemical parameters have had concentrations in excess of surface water standards (MAAE, 2015, Tabla 9). This testing further confirms that the Cangrejos waste rock does not produce ARD nor metals leaching.

Tailings Kinetic Testing

Since January 30, 2020, a sample of the Cangrejos Tailings has been in a laboratory humidity cell (ASTM D5744-07e1 2007). As of week 11 (the final week considered in this report), the leachate from the tailings humidity cell is pH neutral and the alkalinity is constant. This is a strong indication that residual sulfites are not oxidizing. However, the leachate samples have higher concentrations of arsenic than the concentrations allowed in surface water quality discharge standards. Arsenic concentrations are approximately 0.16 mg/L and the standard is 0.10 mg/L. This exceedance will be monitored and evaluated as the testing continues.

Despite the slightly elevated arsenic concentration, the ongoing humidity cell test provides strong evidence of the non-acid generating behavior of mine tailings.

20.9.3 Geochemistry Conclusions

In general, based on the existing dataset, the geochemical risk from the Cangrejos waste rock and mine tailings appears to be low to very low. In the QP's opinion, for a PEA, it is safe to assume that the waste rock and tailings are non-acid generating and that the tails and waste rock will have no significant impact on water quality. Tailings supernatant appears to be suitable for direct discharge to the environment with only sediment control.

Kinetic testing results of samples collected from the waste rock and in the areas of the post-mining pit walls strongly indicate that the post-mining pit lakes will contain water that will not be detrimentally impacted by geochemical reactions. Additionally, because groundwater is of good quality it is likely that the water in the post-mining pit lakes will meet surface water discharge standards.

20.10 Baseline Water Quantity and Quality

20.10.1 Hydrology

The site has abundant surface water located primarily in steep mountain streams that are subject to sudden changes in flow due to heavy precipitation. Lumina installed three Parshall flumes in key drainages around the site to characterize the hydrologic system in the vicinity of the Project. The data demonstrates that the Project has heavy rainfall events and strong runoff conditions. The flumes measure year-round baseflows during the dry season that range from 4.0 L/s to 118 L/s.

Manual flow readings in other rivers around the site are taken by Lumina staff.

Surface water quality samples from seven locations around the site were also analyzed. All of the contaminants regulated under Ecuadorian law were at or near non-detect levels and far below the discharge standards.

GRE created a series of hydrologic models. The models predict the runoff response from various rainfall events. They were created and calibrated based on the storm responses that were measured using the flume data and the manual flow readings. The models were used to estimate runoff and size diversion channels.

In general, surface water will be managed at the project to reduce runoff over saprolite zones and to reduce the amount of water accumulating within the pits. The volume of water accumulating within the pits will be minimized by diverting surface water from natural areas around project-impacted areas and back to natural drainages downstream of the project areas via drainage channels and culverts.

The conceptual site-wide surface water conveyance structures will be engineered and constructed to manage storm water runoff and to minimize erosion of disturbed areas. Key water management concepts include, but are not limited to:

- Upstream diversions to route runoff around disturbed areas
- Engineered diversions to route stream flows through work areas
- Engineered culvert crossings to route stream flows underneath roads

- Ponds and pumping to collect and convey water away from critical areas such as the pit highwalls, where diversions are not possible
- Surface water pumping and pipeline system to route plant makeup water to the process plant when necessary
- Pumps and pipeline system to convey water out of the pits
- Engineered channel reinforcement to prevent channel scour over erodible subgrade
- Progressive reclamation of disturbed areas, with revegetation of soil cover areas as soon as practical to prevent erosion

20.10.2 Hydrogeology

The hydrogeology of the Cangrejos Project is characterized by a low-conductivity, fine-grained saprolith (saprolite and saprock) formation sitting atop a very low conductivity hard rock formation with few fractures. As a result, there is very little groundwater in the system. The lack of prolific unconsolidated-material aquifers or hard-rock aquifers results in low groundwater inflow into the open pits.

A multi-faceted characterization program conducted in 2018-2019 characterized the groundwater system in the vicinity of the Cangrejos Project. Groundwater levels were measured using a network of vibrating wire piezometers (VWPs) and standpipe piezometers located in the area of the Cangrejos pit.

Groundwater on site is generally shallow, hosted within the saprolite or saprock. Deep VWPs have consistently lower pore pressures than the shallow piezometer in the same hole. The presence of lower water levels at depth may indicate that the pit will not experience artesian or pressurized fracture conditions within the pit. Shallow wells and VWPs located within the saprolite and saprock respond to seasonal rainfall, rising in the wet season, and dropping in the dry season. This behavior has been considered in slope stability modeling.

No groundwater level monitoring exists in the area of the Gran Bestia pit at this phase in the project development.

The hydraulic conductivity of the Cangrejos hydrogeologic units was evaluated using two techniques: 1) packer testing in the fresh rock and 2) single-well aquifer testing in the saprolite/saprock.

Groundwater samples were collected from two wells and analyzed to evaluate the water quality. Neither sample had concentrations that exceeded Ecuadorian drinking water standards.

The data shows that the Project will have high groundwater levels but low total groundwater yield.

The conceptual groundwater management plan within the open pits includes in-pit dewatering sumps and horizontal borings to depressurize the pit slopes.

20.10.3 Water Balance

A site wide water balance was completed to estimate the water consumption and water supply needs. This water balance considers drought conditions and other extreme weather events that may hamper the mine’s ability to process material. It also took into consideration estimated precipitation at the various locations on the property, evaporation, runoff, and consumption under various conditions from very wet to extreme drought as well as annual precipitation cycles in order to estimate water storage requirements.

Due to the small up-stream drainage basins, the water balance demonstrates that the project cannot reliably meet its total year round water demand from the drainage basins covered by the site footprint, so during typical and dry precipitation conditions, the project may require a modest off-site groundwater or surface water source.

20.11 Conceptual Closure Plan

A conceptual closure plan was prepared to provide the basis for estimating Project closure costs. The primary considerations in developing the closure strategy include:

- Physical and chemical stabilization of mine waste
- Placement of topsoil over impacted ground surfaces, as required
- Revegetation
- Regrading of mine haul roads
- Runoff management
- Demolition of the processing facilities
- Post closure monitoring and management

The closure costs are included in the financial analysis for the Project.

20.12 Compliance with International Practices

The Project will comply first and foremost with Ecuadorian regulations, financial guarantees, and requirements that are described in detail in Section 4.3 but will also follow leading international practices related to the mining and mineral industry, which may include the following:

- International Cyanide Management Code (ICMC)
- International Finance Corporation (IFC), World Bank (WB) Guidelines
- International Council on Mining and Minerals (ICMM)
- World Health Organization (WHO)

21 CAPITAL AND OPERATING COSTS

There are no Mineral Reserves for the Project currently. The information reported in this PEA is preliminary in nature and includes Inferred Mineral Resources that are considered too speculative geologically to have economic considerations applied to them that would enable them to be categorized as Mineral Reserves. Inferred Mineral Resources are based on limited geological evidence and sampling. The tonnage and grade of Inferred Mineral Resources have significant uncertainty as to their existence and as to whether they can be mined economically. There is no certainty that this PEA will be realized.

21.1 Capital Cost Estimate

The capital cost estimate for the Project includes the initial capital, sustaining capital, and expansion capital. The capital cost estimates include:

- Contracted Direct Costs
- Construction Indirect Costs
- Contracted Indirect Costs
- Owner's Direct and Indirect Costs

21.1.1 Initial and Expansion Capital Costs

The capital costs were organized by area using a Work Breakdown Structure (WBS). Direct Capital Costs were estimated for the mine by IMC, for the processing plant by ONIX, for the geotechnical infrastructure by Ausenco, and for water management by GRE. Support was provided by MTB and PLS. Construction Indirect Costs include construction equipment and temporary facilities required to complete the construction of the Project. Contracted Indirect Costs include services needed during construction such as Engineering, Procurement, and Construction Management (EPCM) services, Quality Control/Quality Assurance (QC/QA) support, vendor representatives and commissioning assistance, initial fills, and spare parts. Owner's Direct Costs include costs associated with the preproduction of the mine and support costs during the preproduction and construction periods. Finally, Owner's Indirect Costs include employment and training expenses, management costs, insurance, travel, employee meals, community development, and costs to retain outside consultants, among others.

In completing capital cost estimates during the early stages of project development, such as this PEA, it is impossible to define all costs that will be associated with construction of the project. The anticipated costs that are not clearly defined but expected are covered by adding a contingency. For this PEA, the contingency was estimated on an area by area basis dependent upon the level of work completed to estimate the area costs and the level of accuracy. The total contingency for the initial project is $107.6 M, which is 13.8% of the direct and indirect capital costs. It is $57.9 M for the expansion capital cost, which is 16.7% of the direct and indirect capital costs.

Freight, Duties, and Taxes are included in the capital costs. The total estimated costs for taxes are $24.1 M for the initial capital and $9.2 M for the expansion capital bringing the total costs to

$1,000.2 M and $417.2 M for the initial capital and expansion capital, respectively. The VAT is refundable after production commences; the total initial VAT is estimated to be approximately $87 M.

Table 21-1 summarizes the initial and expansion capital costs.

TABLE 21-1: INITIAL AND EXPANSION CAPITAL COST ESTIMATES INCLUDING CONTINGENCY

WBS	Description	Initial Capital (US$ M)	Expansion Capital (US$ M)
0100	Mine	59.2	---
0200	Crushing and Conveying	113.1	67.2
0300	Grinding	67.0	67.0
0400	Flotation & Concentrate Filtration	30.0	30.0
0500	CIL / Detox	12.4	12.4
0600	Carbon Plant & Refinery	3.4	3.4
0700	Reagent Preparation & Storage	4.3	4.3
0800	Tailings Thickening, Filtration, Conveying, Storage	136.1	92.4
0900	Site & Off-site Infrastructure and Facilities	30.1	3.1
1000	Plant Mobile Equipment & Light Vehicles	1.3	---
2000	Site Development	39.2	6.1
	Total Direct Costs	**496.3**	**286.0**
3000	Construction Indirect Costs	24.8	5.3
4000	Contracted Indirect Costs	80.6	48.9
	Total Indirect Costs	**105.4**	**54.2**
5000	Owner's Direct Costs	137.7	0.2
6000	Owner's Indirect Costs	42.0	7.3
	Total Owner's Costs	**179.7**	**7.5**
	Freight, Duty, and Taxes	24.1	9.2
	Total Contingency	107.6	57.9
	Sub-total Capital Costs	**913.2**	**414.9**
	Working Capital	1.7	2.3
	VAT	87.0	N/A
	TOTAL CAPITAL COSTS	**1,000.2**	**417.2**
	Contingency Percentage of Total Costs	13.8%	16.7%

The comparative estimate from the previous PEA was approximately $761 M for the initial capital cost and $369 M for the expansion capital, excluding working capital and VAT. The capital costs include duties, freight, taxes, contingency, working capital, and VAT. The major areas of cost increases are shown in Table 21-2.

TABLE 21-2: AREAS OF MAJOR COST INCREASES

Cost Increases US$ M	Area	Reasons
28.6	Tailings Filtration	Testing on Representative Sample; Vendor Involvement; Additional Engineering
25.8	Crushed Material Overland Conveyor and Reclaim	Larger Site Plan
23.8	Filtered Tailings Conveying and Deposition	Larger Site Plan
17.3	Addition of CIL, Cyanide Detox, Carbon Plant and Additional Reagents	Process Change
15.6	Site Development (vegetation removal, clearing and grubbing, and earthworks to prepare areas for construction	Larger Site Plan
11.5	Construction Camp, including Catering and Cleaning	Quotation from a Local Provider
11.0	EPCM	Larger Project

A summary of the initial capital cost estimate by major categories is provided in Figure 21-1.

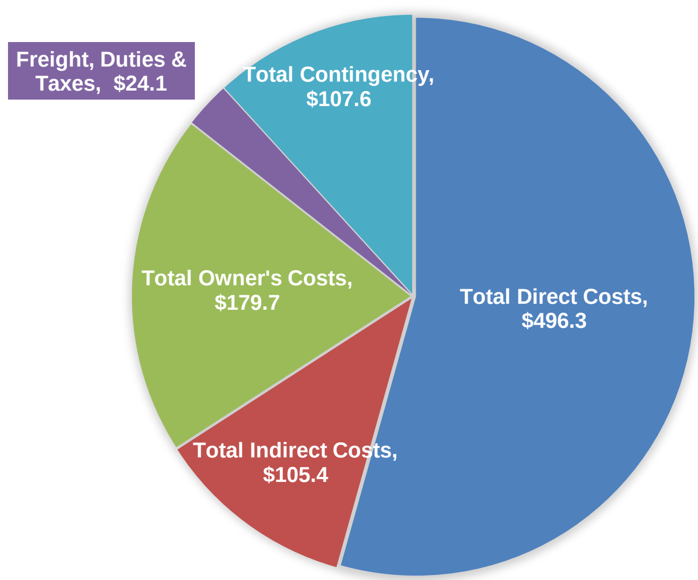


FIGURE 21-1: INITIAL CAPITAL COST ESTIMATE BY MAJOR CATEGORIES

21.1.2 Sustaining Capital Costs

Sustaining capital costs include the costs required to maintain the operation over the life of the mine as the operation expands or equipment must be replaced. It includes costs for mine equipment, expanding the DSTF, WRSF, SSF, vegetation removal as the footprint of the operation expands, mobile equipment, and costs related to maintaining the water supply and water management systems. The total estimated cost for Sustaining Capital over the mine life is $444.8 M.

21.1.3 Reclamation and Closure Costs

The reclamation and closure costs at the end of the mine life are estimated to be $100.2 M, including a contingency allowance of 20%. The costs, including a net present value (NPV) estimate, are included in the cash flow analysis in year 25, although closure costs are estimated to occur in two years at the end of the mine life. Ten years of post closure monitoring is also included in the estimate.

21.1.4 Working Capital

Costs for initial fills and spare parts are included in the capital cost estimate, which reduces working capital costs. Working capital was estimated by comparing the estimated operating costs to the revenue on a week by week basis at the start of the operation. The estimated working capital is approximately $1.7 M for the initial construction and $2.3 M for the expansion. Working capital costs may seem low because first fills and spare parts are not included in working capital. They are included in other areas of the capital cost estimates.

21.2 Operating Cost Estimate

Operating costs were estimated from first principles for mining, processing, General and Administrative (G&A) costs, and tailings deposition costs. The life-of-mine operating costs are summarized in Table 21-3 and shown graphically in Figure 21-2. It should be noted that the costs associated with thickening, filtering and transporting the tailings to the DSTF by overland conveyor are included in the Processing operating costs. The tailings deposition costs include costs for transporting them from the end of the overland conveyor to the location where they will be deposited in the facility, spreading and compacting, and purchasing and placing of geomembrane raincoats. The process operating costs for thickening, filtering, and long-distance conveying, excluding reagents and labor, is estimated to be $1.42 per tonne for years 1 through 5, bringing the total cost for dry stack tailings to over $1.71 during this time period, which is consistent with costs for dry stack tailings at similar projects.

TABLE 21-3: LIFE-OF-MINE OPERATING COST SUMMARY

Area	Total LOM Cost US$ M	Average Unit Costs per t Processed		
		Years 1 – 5 US$/t	Years 6 – 25 US$/t	LOM US$/t
Mining	2,555	7.72	3.54	3.99
Processing	4,039	6.51	6.29	6.31
G & A	500	1.37	0.71	0.78
Tailings Deposition	148	0.29	0.22	0.23
Total	7,243	15.90	10.76	11.31

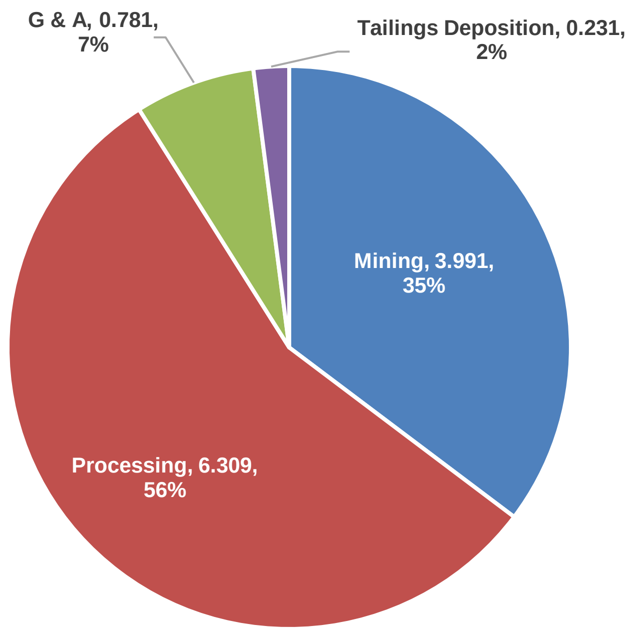


FIGURE 21-2: LIFE-OF-MINE OPERATING COST SUMMARY PER TONNE PROCESSED

21.3 Labor Costs

Labor costs for all areas were estimated using the staffing schedules and organizational charts provided by IMC for mining and AKA for processing. PLS developed the staffing schedule and organizational charts for General and Administration labor.. The burdened labor costs were estimated by PLS using actual Ecuadorian salaries and wages including burden. Burdens in Ecuador include:

- Mandatory overtime pay for shift work
- Paid holidays calculated as the annual salary or wages, including overtime divided by 24
- 13th monthly salary
- 14th monthly salary that is an allowance that is equal to the minimum annual salary (i.e., currently $400) divided by 12
- Employers contribution to the social tax at the rate of 12.15% of the base salary or wages, excluding overtime
- A reserve fund equal to 8.33% of the nominal salary or wages for employees that do not work shifts or 8.33% of the overtime pay for employees that do work shifts

21.4 Mine Operating Costs

Mine operating costs were developed from first principles using the mine plan, equipment list, and staffing schedule provided in Section 16. The unit costs for the mine major equipment consumables were derived from the Mine Cost Service Handbook (InfoMine, 2019). The unit costs for labor were provided by PLS. The fuel costs were set at $0.4987 per liter based on the government of Ecuador's published rate in April 2020.

Preproduction is estimated to be 18 months in total, including five months of access pioneering and 13 months of preproduction. Mine access roads from the crusher pad to each of the working areas are developed during the first five months. The first 14 months of preproduction operates at one shift per day. Thereafter, the mine plan assumes operating two 12-hour shifts per day for 365 days per year. Five days (10 shifts) of loss time are assumed to account for weather delays.

Operating labor and maintenance labor (including burden) for the mine mobile equipment are included.

Mine access road construction and maintenance is included with the exception of the main mine haul road which is constructed by a project contractor for schedule reasons. If mine haul trucks drive on the road, it's cost and maintenance is included in the mine operating costs.

The small stockpile (1,162 kt) that is generated during preproduction stripping is re-handled to the plant in Year 1.

IMC considered all costs (with the exception of purchase cost for capital equipment) during preproduction as operating costs. For the purposes of this PEA, all IMC "operating costs" during pre-production are included in the initial capital costs under WBS 5010 Preproduction Mine Development. The estimated LOM costs for mining by area are provided in Table 21-4.

TABLE 21-4: MINE OPERATING COST SUMMARY

Area	LOM US$ 000	US$/t Moved	US$/t Processed
Drilling	206,853	0.152	0.323
Blasting	686,290	0.504	1.072
Loading	205,402	0.151	0.321
Hauling	851,424	0.625	1.330
Auxiliary	316,102	0.232	0.494
General Mine	110,409	0.081	0.172
General Maintenance	61,716	0.045	0.096
G&A	108,555	0.080	0.170
Pit Dewatering	8,447	0.006	0.013
Total Mine Operation Costs	**2,555,198**	**1.875**	**3.991**

Notes: Total Material Moved 1,369,528 kt
Total Material Processed 640,256 kt

21.5 Process Operating Costs

Process Operating Costs Process operating costs were also estimated from first principles. They are summarized in Table 21-5.

TABLE 21-5: PROCESS OPERATING COSTS

Item	LOM (US$ 000)	Average Years 1 – 5 US$/t Processed	Average Years 6 – 25 US$/t Processed	Average LOM US$/t Processed
Plant Mobile Equipment	64,025	0.100	0.100	0.100
General Supplies Allowance	42,273	0.078	0.065	0.066
External Services Allowance	160,064	0.250	0.250	0.250
Average Labor Costs	170,740	0.398	0.251	0.267
Plant Maintenance Allowance	281,823	0.520	0.431	0.440
Reagent Costs	955,736	1.493	1.493	1.493
Media Consumption	982,994	1.535	1.535	1.535
Power Costs	1,370,113	2.116	2.143	2.140
Analytical Costs	8,374	0.013	0.013	0.013
Water Supply Costs	3,228	0.008	0.005	0.005
Total Process Operating Cost	**4,039,370**	**6.512**	**6.285**	**6.309**

21.6 General and Administrative Operating Costs

The G&A costs for the Project were estimated by PLS and MTB. They are summarized in Table 21-6.

TABLE 21-6: GENERAL AND ADMINISTRATIVE OPERATING COSTS

Item	LOM (US$ 000)	LOM US$/t Processed
Labor (Burdened)	133,673	0.209
Social Benefits (Mining, Process and G&A Staff)	39,010	0.061
Pension Fund Contributions (Mining, Process and G&A Staff)	59,876	0.094
Employee Travel and Transportation (Bus, Air)	9,565	0.015
Corporate Travel and Services	3,362	0.005
Medical, Security and Safety Supplies	28,283	0.044
Employee Meals (Catering, Cleaning & Laundry)	52,817	0.082
Office Leases Incl. Utilities	4,472	0.007
IT and Communications	9,939	0.016
Training	5,206	0.008
Legal, Permits and Fees	2,468	0.004
Insurance	95,016	0.148
Environmental Services and Consumables	11,846	0.019
Security Services	7,404	0.012
Outside Consultants	5,923	0.009
Community Development	22,212	0.035
Fuel & Maintenance for Mobile Equipment, Light Vehicles	9,202	0.014
Total G&A Operating Costs	**500,275**	**0.781**

21.6.1 General and Administrative Labor

Labor costs were estimated using the staffing schedule provided in Table 21-7. The total number of G&A personnel varies by plus or minus one position in several years. Otherwise it is constant throughout the operating mine life.

TABLE 21-7: GENERAL AND ADMINISTRATIVE STAFFING LEVEL (YEAR 1 OF OPERATIONS)

Position	Number
Expatriates	
General Manager	1
Marketing Manager	1
Administration Management	
General Manager Assistant	1
Financial Department	
Financial Superintendent	1
Financial Administrative Assistant	1
Controller	1
Controller Administrative Assistants	2
Accounting Manager	1
Treasurer	1
Accountant (Payroll)	1
Accountant (Payables)	1
Accountant (Receivables)	1
Accounting Assistants	4
Administration	
Administration Superintendent	1
Administration Superintendent Assistant	1
Human Resources Department	
Human Resources Manager	1
Human Resources Assistant	1
Human Resources Analysts	4
Information Technology Department	
I.T. Manager	1
I.T. Technicians	4
General Maintenance	
Maintenance Supervisor	1
Cleaning Helpers	6
General Maintenance Technicians	8
Legal/Permitting Department	
Legal/Permitting Manager	1
Legal/Permitting Manager Assistant	1
Legal Assistant	2
Permitting Assistant	2

Position	Number
Supply Chain, Logistics and Procurement	
Logistics Superintendent	1
Logistics Superintendent Assistant	1
Contracts Department	
Contract Manager	1
Contract Officer	1
Import/Export Resources	
Import/Export Manager	1
Import/Export Manager Assistant	1
Forwarding Assistant	1
Customs/Duty Assistant	1
Purchasing Department	
Procurement Supervisor	1
Buyers	1
Inventory Controllers	1
Warehouse Department	
Warehouse Manager	1
Warehouse Workers	8
Health, Safety and Environment Division	
HSEC Superintendent	1
HSEC Superintendent Assistant	1
Environmental Department	
Environmental Manager	1
Environmental Technicians	8
Government and Community Relations	
Government Relations Manager	1
Community Relations Coordinator	1
Community Relations Field Assistants	8
Health and Safety Department	
Health and Safety Manager	1
Health and Safety Manager Assistant	1
Health and Safety Technicians	12
Doctor	1
Nurses/Paramedics	8
Corporate Training Department	
Training Manager	1
Training Assistants	3
Security	
Security Superintendent	1
Marketing	
Marketing Assistant	1
Total	**129**

22 ECONOMIC ANALYSIS

22.1 Introduction

There are no Mineral Reserves for the Project currently. The information reported in this PEA is preliminary in nature and includes Inferred Mineral Resources that are considered too speculative geologically to have economic considerations applied to them that would enable them to be categorized as Mineral Reserves. Inferred Mineral Resources are based on limited geological evidence and sampling. The tonnage and grade of Inferred Mineral Resources have significant uncertainty as to their existence and as to whether they can be mined economically. There is no certainty that this PEA will be realized.

22.1.1 Key Objectives

To evaluate the potential economic viability of the Cangrejos Project, MTB and Robert Michel Enterprises (RME) completed a scoping-level economic evaluation and review of the Project for Lumina Gold.

Key objectives for developing the economic evaluation were to:

- Integrate information from project team members, as listed in Section 1
- Identify and balance project components to maximize value
- Provide a high-level economic simulation over the expected life of the Project and assess the project's potential economic viability
- Support Lumina's management in their project decision-making process
- Provide a foundation for the next logical phase of project development

22.1.2 General Criteria and Assumptions

The general assumptions and key inputs used for the cash flow projections are clearly laid out in the following sections. All currencies are in US dollars and no inflation was applied. Cost estimates were static (i.e., not escalated) and cash flow values were discounted to net present value (NPV) using a 5% annual discount rate starting one calendar year from the data date. Metal prices were selected based on discussions with Lumina and H&H Metals, considering market activity up to the effective date of June 8, 2020 and publicly available price forecasts. Taxation rates applied were 15% profit tax, 22% corporate income tax, and 3% royalty to the Ecuadorian government based on Net Smelter Return (NSR). Depreciation was calculated using depreciation methods prescribed by Ecuadorian mining practices. Value added tax (VAT or IVA) of 12% was applied to all goods services, including operating costs less labor and power. VAT was recaptured to the extent possible on initial capital in Year 1. The balance was captured at a maximum of 12% of exported goods' value per year.

Benefits to the Ecuadorian government were compared with Lumina's profits over the life of the project using the prescribed method to determine whether a Sovereign Adjustment Tax would apply; no Sovereign Adjustment is required for the base case. Financial sensitivity analyses that trigger Sovereign Adjustment reflect the adjustment.

The assumptions and methods used in developing the economic model are further explained in the following sections and technical parameters are provided as applicable.

Inputs to the model are provided in detail in previous sections of this Technical Report.

Summations of key project input data and assumptions along with key results are presented in tables extracted from the model. A listing of select model inputs is provided in Table 22-1.

TABLE 22-1: ECONOMIC MODEL INPUTS

Economic Model Inputs	Values
Description	
Construction Period	3 Years
Preproduction Period	1 Year
Mine Life (after preproduction)	24.7
Life of Mine Mill Feed (kt)	640,254
Life of Mine Payable Gold (koz)	9,152
Life of Mine Payable Silver (koz)	9,351
Life of Mine Payable Copper (klbs)	1,148,268
Life of Mine Payable Molybdenum (klbs)	13,368
Life of Mine Average Plant Feed Grades	
Gold (g/t)	0.56
Silver (g/t)	0.67
Copper (%)	0.10%
Molybdenum (ppm)	20
Average Annual Production	
Gold (koz)	366
Silver (koz)	374
Copper(klbs)	45,931
Molybdenum (klbs)	535
Market Prices	
Gold ($/oz)	$ 1,400
Silver ($/oz)	$ 16.00
Copper ($/lb)	$ 2.75
Molybdenum ($/lb)	$ 9.00
Cost and Tax Basis	
Estimate Basis	8-Jun-2020
Inflation	None
Leverage	100% Equity
Tax - Federal	22%
Profit Tax	15%
VAT (IVA) Recouped with Export	12%
Depreciation - All Asset Categories	5 Year or UOP
Sovereign Adjustment Tax	Not Required
Royalty	
Ecuadorian Government	3%

Economic Model Inputs	Values
Advance Royalty Agreement	-
Transportation	
Ecuador Ground Transport ($/wt AuCu conc)	$ 9.60
Ecuador Ground Transport ($/dt Moly conc)	$ 42.86
Dore ($/oz doré) Mine to Smelter	$ 3.53
Bulk Concentrate Intl. Shipping ($/wt)	$ 35.00
Moly Concentrate Intl. Shipping ($/dt)	$ 24.81
Concentrate Payment Terms	
Advance	90%
Settlement	10%
Doré Payment Terms	
Advance	98%
Settlement	2%

Key results are provided in Table 22-2. Totals may not add up due to rounding.

TABLE 22-2: KEY RESULTS

Cangrejos Project Key Results	Units	Value
Life of Mine Average Gold Recovery	%	82%
Life of Mine Average Silver Recovery	%	69%
Life of Mine Average Copper Recovery	%	84%
Life of Mine Average Molybdenum Recovery	%	50%
Gold Payable (Weighted Average)	%	97.9%
Silver Payable (Weighted Average)	%	97.5%
Copper Payable	%	93.5%
Molybdenum Payable	%	95.5%
Proportion of Revenue from Gold Sales	%	78.9%
Proportion of Revenue from Silver Sales	%	0.9%
Proportion of Revenue from Copper Sales	%	19.4%
Proportion of Revenue from Molybdenum Sales	%	0.7%
Gross Revenue	US$ M	16,241
Initial Capital Cost	US$ M	1,000.2
Expansion Capital Cost	US$ M	454.5
Sustaining Capital Cost	US$ M	444.8
Life of Mine Mine Operating Costs	US$ M	2,555
Life of Mine Process Operating Costs	US$ M	4,039
Life of Mine Tailings Operating Costs	US$ M	147.9
Life of Mine General and Administrative Operating Costs	US$ M	500.3
Life of Mine Total Operating Costs	US$ M	7,243
Operating Cash Costs (Gold Equivalent)	US$/EqOz	725.2
After Tax Payback Time - Initial Capital	Years	5.1
After Tax Payback Time - Expansion Capital	Years	3.1
Cumulative Net Pre-tax Cash Flow	US$ M	5,983

Cangrejos Project Key Results	Units	Value
Pre-tax IRR	%	20.2%
Pre-tax NPV (5% Annual Discount Rate)	US $ M	2,555
Cumulative Net After-tax Cash Flow	US$ M	3,922
Post-tax IRR	%	16.2%
Post-tax NPV (5% Annual Discount Rate)	US$ M	1,571

22.2 Gross Revenue from Mining

The project's economic value depends on revenue derived from sales of metals and flotation concentrates. To determine the market pricing for use in the model, the team reviewed H&H Metals' forecast market values, current trading values, price forecasts from numerous financial institutions, and had discussions with Lumina and H&H. The following metal prices for this PEA cash flow model were selected as the basis:

Gold - $1,400/oz *Copper - $2.75/lb*

Silver - $16.00/oz *Molybdenum - $9.00/lb*

The precious metal markets are highly liquid and benefit from terminal markets around the world (e.g., London, New York, Tokyo, and Hong Kong). The London PM fix for gold and silver on June 8, 2020 was $1,690/oz and $17.63/oz, respectively. As of June 8, 2020 year-to-date, gold traded between $1,324/oz and $1,748/oz and silver traded between $12.01/oz and $19.31/oz.

On June 8, 2020, the closing price for copper was $2.58/lb and molybdenum was $8.16/lb. As of June 8, 2020, year-to-date copper traded between $2.10/lb and $2.84/lb and molybdenum traded between $7.90/lb and $12.38/lb.

To calculate gross revenue from mining, metals prices for gold, copper, silver, and molybdenum were applied to corresponding recovered, payable gold and silver Troy ounces, and copper and molybdenum pounds in the economic model.

The gross revenue from mining for the Cangrejos Project, based on the results of this PEA, is estimated to be $16.1 B.

22.3 Net Smelter Return Calculation

The NSR is used to calculate the royalty that is payable to the government of Ecuador. It is determined by subtracting the transportation costs and treatment charges and refining charges (TCs and RCs) from the gross revenue. The estimated life of mine NSR for Cangrejos is $15.5 B.

22.3.1 Transportation

Concentrate

The transportation costs are the costs to move the concentrates to smelters for further treatment. Domestic transportation charges for shipping two concentrate products from the Cangrejos Project were by local transportation providers. H&H Metals of New York provided the international shipping cost estimates of $35.00 per wet tonne to ship the gold-copper flotation concentrate to China and $24.81 per dry tonne to ship molybdenum concentrate to Chile.

Doré

Doré requires special handling due to its inherent value. Industry sources provided typical doré freight and insurance costs of $3.53/oz of doré. This estimated charge covers transportation and insurance costs to transport the doré from the mine to the destination.

22.3.2 Treatment Charges, Refining Charges, Payment Terms and Penalties

Flotation Concentrates

Smelters apply TCs, RCs, and penalties based upon the composition of the concentrates. They also typically provide terms of payment. The economic model applies costs for concentrate TCs, RCs, and penalties taken from a marketing study dated April 1, 2020 received from H&H Metals Corp. of New York, which is referenced in Section 19 of this Technical Report.

The gold-copper concentrate TCs were reported as $70 per wet t of concentrate and refining charges of $7.50 per ounce of gold, $0.65 per ounce of silver, and $0.07 per pound of copper.

The molybdenum concentrate carries a 15% price discount to the treatment charge due to its high copper content. Using the molybdenum price of $9/lb and the 15% discount, the estimated discount is approximately $2,976 per dry tonne. The estimated discount is applied in the model and the molybdenum is 95.5% payable according to the H&H report.

Doré

Doré also carries TCs and RCs based on composition and weight. The model applies doré treatment and refining charges based upon industry sources available to the Cangrejos Project. The treatment charges are estimated to be $0.30 per oz of doré. Doré payables are 99.95% for gold and 99.5% for silver.

22.4 Royalty

The Federal Government of Ecuador requires that a royalty be paid on gold produced in Ecuador. Based on expert guidance from within Ecuador, this financial evaluation applied a 3% royalty across the life of the project. This 3% royalty is calculated using proceeds paid by smelters less certain costs, including costs incurred to transport the concentrates to the smelters, or the NSR, for mineralized material produced in the property area subject to the royalties. The project's total royalty payments add up to $466 M over the life of the project. This results in $15.1 B in gross income from mining and processing to the Project.

22.5 Operating Margin

Gross income less operating costs yield Net Profit. Operating costs were previously described in Section 21 of this PEA and served as inputs to the economic model to arrive at Net Profit.

Retention taxes were applied to the labor cost estimates according to Ecuadorian requirements, with social taxes of 12.5% applied on all earnings, including overtime, and 8.33% contributed to a pension plan, after the first year of employment.

22.6 Depreciation and Income Tax

Income taxes are included in the model based on Ecuador's federal tax rates after anticipated deductions, which are subtracted from net profit to arrive at taxable income. The tax rate of 22% on taxable income is applied assuming that a stability agreement will be in effect for the Project, based on recent successful negotiations by two other projects.

In calculating depreciation, all initial capital costs were assigned a five-year asset life and depreciated in accordance with current Ecuadorian mining tax practices. Sustaining and expansion capital were depreciated on a unit of production basis, except for vehicles and mining equipment, which were depreciated on a five-year schedule. The model applies depreciation considering zero value at the end of the assets' useful lives.

After deducting allowable depreciation, the model accounts for a 15% profit sharing tax, applies any tax loss carry forward, and then calculates the 22% federal income tax on the net income before taxes.

After the federal tax is calculated, depreciation and any losses carried forward are added back to arrive at net income from operations.

22.7 Value Added Tax

A 12% VAT is applied to all goods and services, including operating costs less costs for labor and power. VAT is assumed to be recouped upon exportation of the concentrate products at a maximum rate of 12% of the export value per year. The initial capital VAT is fully recouped in the model within the first year of production, in accordance with Ecuadorian legal guidance. Each year thereafter, VAT paid is shown to be fully recouped during the same year.

22.8 Initial and Expansion Capital Costs

Initial and expansion capital cost estimates provide the basis for the main project investment costs. These estimates were previously described in Section 21 of this Technical Report. The cost estimates served as input to the economic model.

Of the total initial capital, $14.9 M is identified as spare parts, consumables, and initial fills. Because the cost of these items is recaptured at the end of mine life in Year 25, their value is represented as a separate line item in the cash flow after being deducted from other initial capital costs. Similarly, $9.5 M for initial mill ball charges is part of the expansion capital and this value is added back into the cash flow at the end of the mine life in Year 25.

22.9 Sustaining Capital Costs

Sustaining capital costs consist of the costs for adding newly required assets, marginally increasing facility capacities, or replacing assets over the life of the Project. Such expenditures fall into nine categories for the Cangrejos Project:

1. Mine equipment
2. Waste rock storage facility (WRSF)
3. Dry stack tailings facility (DSTF)
4. Dry stack tailings conveying and compaction
5. Saprolite and saprock storage facility (SSF)
6. Sanitary landfill
7. Vegetation suppression
8. Mobile equipment
9. Pit dewatering.

Sustaining capital costs are shown in detail in Section 21 of this report. The largest single item is mining equipment, which is estimated to cost approximately $333.7 M over the life of mine, based on the mine equipment utilized over the life of the mine, as shown in Section 16. Total life of mine sustaining capital costs are estimated to total $444.8 M.

22.10 Working Capital

Working capital is defined as the highest deficit between revenue and costs that is encountered during the initial operating period.

For the initial construction, the largest deficit of funds is expected to occur in week two, in the amount of $1.7 M. This working capital investment was reflected in the cash flow model in Year -1, with recovery at the end of mine life in Year 25. For the expansion project, the largest deficit of funds is estimated to occur in week three, in the amount of $2.3 M. This working capital investment was reflected in the cash flow model in Year 6, with recovery at the end of mine life in Year 25. Working capital costs may seem low because first fills and spare parts are not included in working capital. They are included in other areas of the capital cost estimates.

22.11 Employment Severance Costs

The cash flow model accounts for employment severance costs that are predominantly incurred at the end of the Project in Year 25. The costs are estimated based on Ecuadorian employment practices. The total cost $37.9 M over the life of the project. Of this amount, $37.7 M is estimated in Year 25.

22.12 Equipment Salvage Value

The process and mining equipment retains some market value at the end of the mine life. For process equipment, experience with similar projects indicates a salvage value of 10% of the original $253 M equipment cost or $25.3 M. The value of salvageable mining equipment at the end of the project is estimated to be $15.4 M, resulting in an estimated total salvage value of $40.7 M that is applied to the cash flow in Year 25 and applied to offset some of the closure costs.

22.13 Cash Flow Projections

The base case analysis for this Study estimates that payback of the initial capital investment occurs early in the sixth year of the mine life (i.e., approximately 5.1 years after initial production). The expansion capital payback is estimated to occur 3.1 years after the initial expansion production commences.

The base case financial model was developed from information described in this section. Based upon this information, the Cangrejos Project is estimated to have an after-tax IRR of 16.2%. Assuming a discount rate of five percent over an estimated mine life of 24.7 years, the after-tax NPV is estimated to be approximately $1,571 M.

22.14 Sensitivity Analysis

The results presented in the Cash Flow Projections Section reflect the Cangrejos Project results using base case conditions as outlined in the assumptions. Since actual conditions are anticipated to vary from base case assumptions, a series of sensitivity analyses were performed to evaluate the financial results for the Project for a range of conditions.

The base case discounted cash flow model was evaluated for its sensitivity to the change in selected inputs. The following inputs were evaluated at base case plus or minus 10% and 20%: metals prices, capital expenses, metal feed grades, and overall operating cost. The project's sensitivity to metallurgical recovery was evaluated by varying recovery by plus or minus two and four percentage points. The Project's sensitivity to the discount rate was also evaluated by setting the discount rate at three, five, seven, and nine percent. The base-case NPVs at the other discount rates are presented in Table 22-3. The same data is shown graphically in Figure 22-1.

TABLE 22-3: AFTER-TAX NPV AT VARIOUS DISCOUNT RATES

Discount Rate	NPV (US$ M)
3%	2,272
5%	1,571
7%	1,068
9%	702

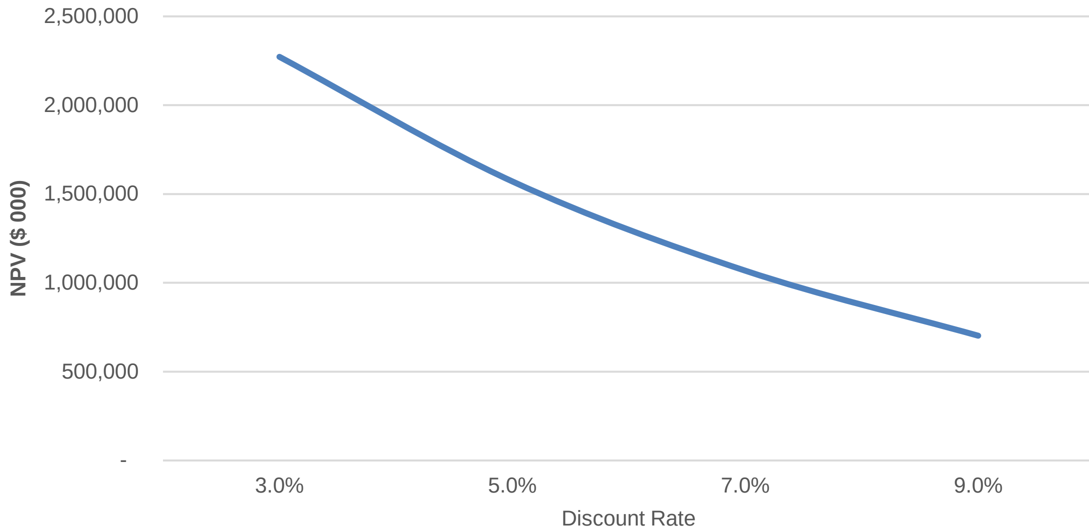


FIGURE 22-1: AFTER-TAX NPV SENSITIVITY AT VARIOUS DISCOUNT RATES

Table 22-4 reflects the sensitivities for IRR and NPV in 10% increments of negative and positive deviation from the base case for the basket of metal prices. The data is shown graphically in Figure 22-2.

TABLE 22-4: METAL PRICE SENSITIVITY

Metals Prices	Gold/oz	Silver/oz	Copper/lb	Moly/lb	IRR	NPV (5%) $M
80%	$ 1,120	$ 12.80	$ 2.20	$ 7.20	8.7%	$ 451
90%	$ 1,260	$ 14.40	$ 2.48	$ 8.10	12.8%	$ 1,023
100%	$ 1,400	$ 16.00	$ 2.75	$ 9.00	16.2%	$ 1,571
110%	$ 1,540	$ 17.60	$ 3.03	$ 9.90	19.1%	$ 2,106
120%	$ 1,680	$ 19.20	$ 3.30	$ 0.80	21.7%	$ 2,519

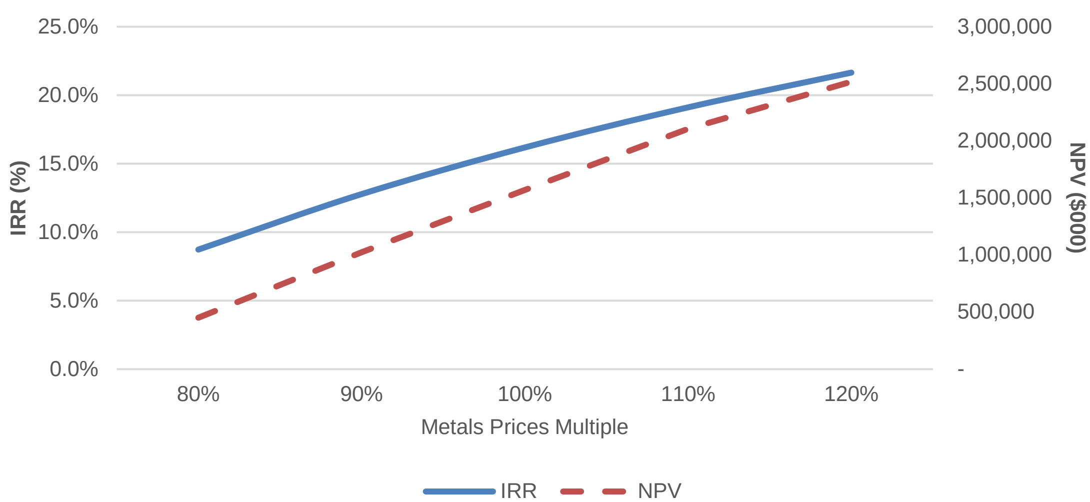


FIGURE 22-2: METAL PRICE SENSITIVITY

The operating cost and capital cost sensitivity analyses are presented in Tables 22-5 and 22-6 and shown graphically in Figure 22-3. From the data, it appears that the Project is more sensitive to operating costs than to capital costs.

TABLE 22-5: OPERATING COST SENSITIVITY

Operating Cost	OPEX $/t processed	IRR	NPV (5%) $M
80%	$ 9.05	18.8%	$ 2,059
90%	$ 10.18	17.6%	$ 1,818
100%	**$ 11.31**	**16.2%**	**$ 1,571**
110%	$ 12.44	14.7%	$ 1,322
120%	$ 13.57	13.1%	$ 1,071

TABLE 22-6: INITIAL PLUS EXPANSION CAPITAL COST SENSITIVITY [6]

Capital Cost	CAPEX $M	IRR	NPV (5%) $M
80%	$ 1,043	19.5%	$ 1,749
90%	$ 1,173	17.7%	$ 1,662
100%	**$ 1,304**	**16.2%**	**$ 1,571**
110%	$ 1,434	14.9%	$ 1,479
120%	$ 1,564	13.7%	$ 1,384

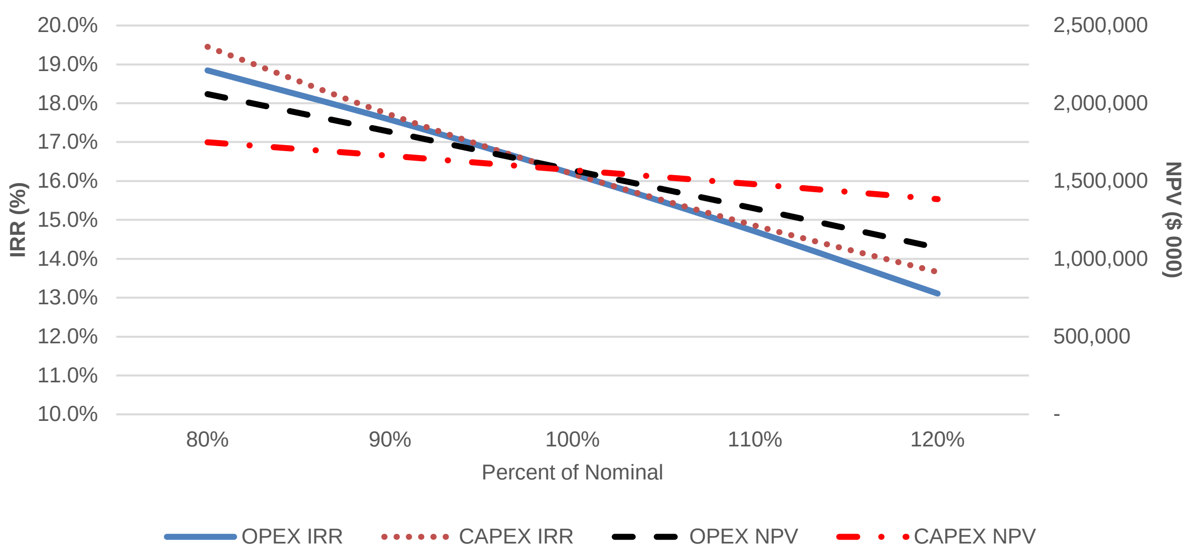


FIGURE 22-3: CAPITAL AND OPERATING COST SENSITIVITY ANALYSES

Variances in metallurgical recovery for the four metals are shown in Table 22-7 in two percent increments with gold recovery as a reference. The data is shown graphically in Figure 22-4.

[6] Initial and expansion capital costs reported in Table 22-6 do not include spare parts or initial fills. Therefore, they do not match the costs shown in Table 22-2.

TABLE 22-7: METAL RECOVERY SENSITIVITY

Metals Recovery	Gold Recovery	IRR	NPV (5%) (US$ M)
96%	78%	14.9%	$ 1,356
98%	80%	15.6%	$ 1,463
100%	**82%**	**16.2%**	**$ 1,571**
102%	83%	16.8%	$ 1,678
104%	85%	17.4%	$ 1,785

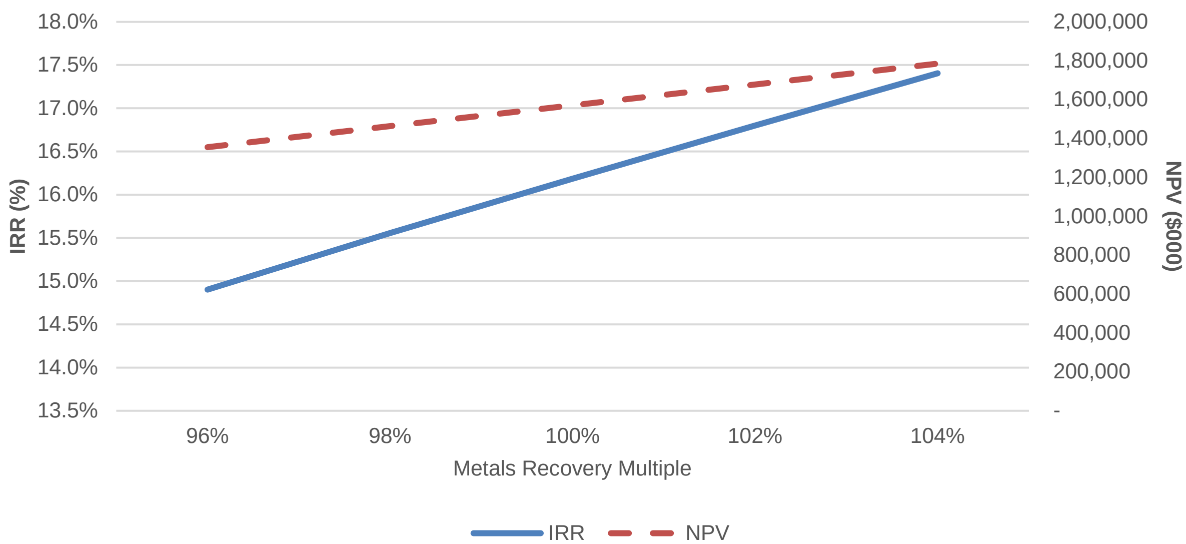


FIGURE 22-4: METAL RECOVERY SENSITIVITY ANALYSIS

Variances in metal grade are shown in Table 22-8 in ten percent increments with gold grade as a reference. The data is shown graphically in Figure 22-5.

TABLE 22-8: VARIATION IN GOLD GRADE

Metals Grade	Gold Grade (g/t) Reference	After Tax IRR	NPV (5%) $M
80%	0.4445	8.8%	$ 461
90%	0.5001	12.8%	$ 1,028
100%	**0.5557**	**16.2%**	**$ 1,571**
10%	0.6112	19.1%	$ 2,102
20%	0.6668	21.6%	$ 2,513

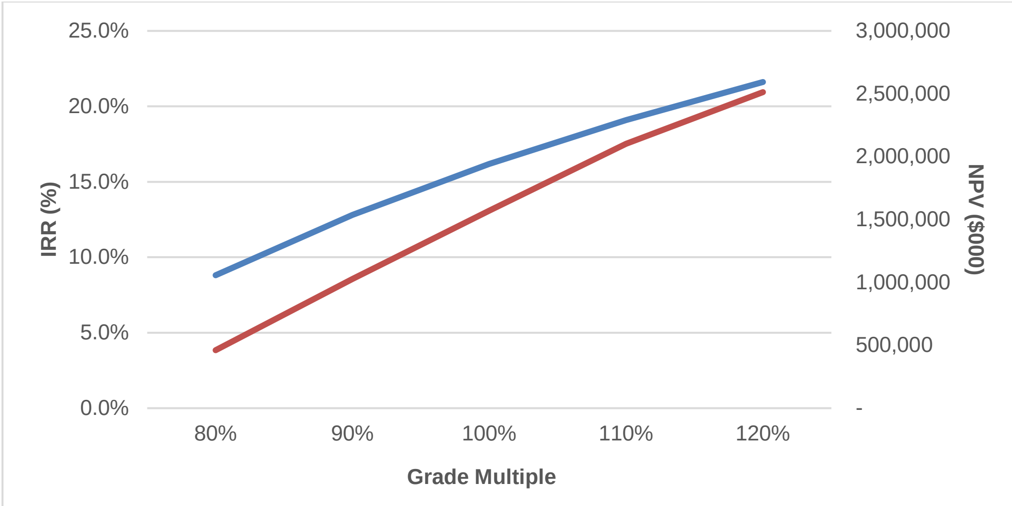


FIGURE 22-5: METAL GRADE SENSITIVITY

Table 22-9 presents the summary cash flow model.

TABLE 22-9: CASH FLOW ANALYSIS

	Inputs	Units	Average	Total/LOM		Preproduction																										
		Year			-3	-2	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
PRODUCTION SUMMARY																																
Material Mined		ktonnes	54,464	1,368,363			6,751	23,974	46,000	65,000	65,000	65,000	65,000	65,000	65,000	65,000	65,000	65,000	57,829	61,267	62,457	60,831	61,794	62,811	54,974	50,117	45,351	53,354	37,916	35,545	38,158	24,234
Mill Feed		ktonnes	25,564	640,254			1,163	9,057	14,600	14,600	14,600	14,600	26,280	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	29,200	19,754
Saprolite Material Processed		ktonnes	171	4,265			-	675	10	119	177	4	8	383	195	376	423	177	131	621	128	15	-	-	1	1	106	274	328	113	-	-
Saprock Material Processed		ktonnes	390	9,751			-	1,897	134	186	573	26	84	1,185	265	688	507	230	173	1,042	951	322	-	-	6	8	219	654	360	241	-	-
Partially Oxidized Material Processed		ktonnes	876	21,890			-	2,727	1,116	580	1,118	329	276	1,742	582	1,130	2,031	1,126	88	726	863	1,393	112	-	9	265	1,695	1,472	1,556	940	14	-
Fresh Rock Material Processed		ktonnes	24,174	604,351			-	4,920	13,341	13,715	12,731	14,242	25,913	25,890	28,158	27,007	26,239	27,668	28,808	26,811	27,259	27,470	29,088	29,200	29,183	28,925	27,180	26,801	26,956	27,906	29,186	19,754
CuAu Concentrate Produced		dry tonnes	132,314	3,307,859				45,515	98,543	108,951	70,341	82,800	169,033	162,272	124,657	146,339	145,654	166,013	183,741	124,766	127,161	166,728	149,858	133,263	148,698	195,210	180,259	132,534	128,523	114,252	116,249	86,499
Dore Produced		tonnes	4.329	108.2				7.661	2.753	3.094	4.039	1.706	3.831	9.024	5.177	6.339	5.148	4.180	4.645	5.624	4.900	4.642	3.747	3.169	3.781	4.317	4.926	4.670	3.880	2.790	2.333	1.849
Molybdenum Concentrate Produced		dry tonnes	564	14,109				201	529	332	335	498	784	600	663	828	738	637	545	492	651	670	583	487	584	904	678	466	479	544	552	329
GROSS REVENUE																																
Market Price	**Price**																															
Gold	1400	$/toz	$ 1,400					$ 1,400	$ 1,400	$ 1,400	$ 1,400	$ 1,400	$ 1,400	$ 1,400	$ 1,400	$ 1,400	$ 1,400	$ 1,400	$ 1,400	$ 1,400	$ 1,400	$ 1,400	$ 1,400	$ 1,400	$ 1,400	$ 1,400	$ 1,400	$ 1,400	$ 1,400	$ 1,400	$ 1,400	$ 1,400
Silver	16.00	$/toz	$ 16.00					$ 16.00	$ 16.00	$ 16.00	$ 16.00	$ 16.00	$ 16.00	$ 16.00	$ 16.00	$ 16.00	$ 16.00	$ 16.00	$ 16.00	$ 16.00	$ 16.00	$ 16.00	$ 16.00	$ 16.00	$ 16.00	$ 16.00	$ 16.00	$ 16.00	$ 16.00	$ 16.00	$ 16.00	$ 16.00
Copper	2.75	$/lb	$ 2.75					$ 2.75	$ 2.75	$ 2.75	$ 2.75	$ 2.75	$ 2.75	$ 2.75	$ 2.75	$ 2.75	$ 2.75	$ 2.75	$ 2.75	$ 2.75	$ 2.75	$ 2.75	$ 2.75	$ 2.75	$ 2.75	$ 2.75	$ 2.75	$ 2.75	$ 2.75	$ 2.75	$ 2.75	$ 2.75
Molybdenum	9.00	$/lb	$ 9.00					$ 9.00	$ 9.00	$ 9.00	$ 9.00	$ 9.00	$ 9.00	$ 9.00	$ 9.00	$ 9.00	$ 9.00	$ 9.00	$ 9.00	$ 9.00	$ 9.00	$ 9.00	$ 9.00	$ 9.00	$ 9.00	$ 9.00	$ 9.00	$ 9.00	$ 9.00	$ 9.00	$ 9.00	$ 9.00
Contained Metals in Plant Feed																																
All Material Types Combined																																
Gold		koz	458	11,438				269	401	352	337	318	573	602	594	611	514	493	630	447	484	511	487	405	495	555	562	425	388	339	337	311
Silver		koz	554	13,848				415	344	398	316	189	515	834	766	713	528	581	667	620	603	756	657	563	658	757	779	673	499	387	376	254
Copper		Cu klb	58,796	1,469,909				31,943	51,228	53,327	34,622	38,701	80,713	78,579	51,169	69,847	69,861	75,823	83,034	49,920	56,227	68,598	57,839	51,500	64,350	89,520	81,039	56,881	50,510	44,777	45,059	34,840
Molybdenum		Mo klb	1,126	28,156				436	1050	661	669	988	1557	1203	1321	1660	1483	1273	1083	983	1297	1332	1157	966	1159	1793	1349	940	961	1085	1094	653
Saprolite Ore																																
Gold		koz	3	79				19	0	3	4	0	0	8	4	7	8	3	2	9	2	0	-	-	0	0	1	4	4	1	-	-
Silver		koz	12	292				59	1	5	17	0	1	39	11	30	30	11	7	32	6	1	-	-	0	0	6	12	19	5	-	-
Copper		Cu klb	281	7,032				1,786	35	236	273	11	14	507	258	746	746	234	144	685	141	20	-	-	1	1	187	423	434	149	-	-
Molybdenum		Mo klb	2	54				10	0	1	1	0	0	3	2	6	8	4	1	3	1	0	-	-	0	0	2	5	5	2	-	-
Saprock Ore																																
Gold		koz	8	190				55	3	5	14	1	2	24	5	13	10	4	3	14	13	5	-	-	0	0	3	9	4	3	-	-
Silver		koz	29	731				141	7	20	63	1	11	156	17	53	37	15	10	57	49	18	-	-	0	1	13	29	22	11	-	-
Copper		Cu klb	684	17,110				5,365	443	410	1,011	69	111	1,567	351	1,365	1,006	406	229	1,149	1,048	426	-	-	4	9	338	1,009	476	319	-	-
Molybdenum		Mo klb	4	108				27	1	2	4	0	1	8	2	12	10	5	1	5	4	1	-	-	0	0	3	10	6	4	-	-
Partially Oxidized Rock Ore																																
Gold		koz	16	397				72	28	13	26	6	6	36	11	21	43	20	1	10	11	18	1	-	0	2	26	18	18	10	0	-
Silver		koz	21	533				73	36	21	32	5	4	56	13	22	39	22	2	14	22	31	2	-	0	13	60	28	25	12	0	-
Copper		Cu klb	1,664	41,602				8,752	3,691	1,279	2,465	943	608	2,304	898	2,242	4,478	1,986	97	800	951	1,536	123	-	8	234	2,616	2,272	2,058	1,243	19	-
Molybdenum		Mo klb	32	798				143	49	23	47	15	14	50	13	35	76	45	2	30	30	58	3	-	0	8	26	39	58	33	1	-
Fresh Rock Ore																																
Gold		koz	431	10,772				123	368	331	292	312	566	534	575	570	453	466	624	414	457	488	485	405	494	552	531	396	361	326	337	311
Silver		koz	492	12,293				142	300	353	205	183	500	583	724	608	422	534	648	517	526	707	655	563	657	744	699	603	433	359	375	254
Copper		Cu klb	56,167	1,404,165				16,041	47,059	51,402	30,874	37,678	79,980	74,201	49,662	65,494	63,632	73,197	82,564	47,286	54,086	66,617	57,715	51,500	64,337	89,276	77,898	53,177	47,542	43,065	45,041	34,840
Molybdenum		Mo klb	1,088	27,197				256	1,000	635	617	973	1,542	1,142	1,304	1,608	1,388	1,220	1,080	946	1,262	1,272	1,154	966	1,158	1,786	1,318	886	891	1,046	1,094	653
Products	**Recovery**																															
Saprolite Material																																
Dore Gold	75%	koz	2	59				14.12	0.18	2.16	3.20	0.09	0.14	5.83	2.71	5.42	5.85	1.94	1.24	6.69	1.42	0	-	-	0	0.01	1.11	2.76	3.09	0.98	-	-
Dore Silver	65%	koz	8	190				38.56	0.38	2.98	10.73	0.04	0.60	25.61	7.34	19.64	19.45	7.03	4.38	20.76	3.74	0	-	-	0	0.04	3.99	8.02	12.34	3.54	-	-
CuAu Concentrate Gold	0%	koz	-	-				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CuAu Concentrate Silver	0%	koz	-	-				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CuAu Concentrate Copper	0%	Cu klb	-	-				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum Concentrate Molybdenum	0%	Mo klb	-	-				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Saprock Material																																
Dore Gold	75%	koz	6	143				41.48	2.62	3.47	10.51	0.43	1.19	18.23	3.66	10.00	7.64	2.89	2.06	10.75	9.98	3	-	-	0	0.06	2.36	6.53	3.22	2.06	-	-
Dore Silver	65%	koz	19	475				91.72	4.76	12.83	40.71	0.33	7.02	101.53	11.08	34.51	24.37	9.61	6.51	37.02	31.80	11	-	-	0	0.33	8.70	19.13	14.29	7.05	-	-
CuAu Concentrate Gold	0%	koz	-	-				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CuAu Concentrate Silver	0%	koz	-	-				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CuAu Concentrate Copper	0%	Cu klb	-	-				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Molybdenum Concentrate Molybdenum	0%	Mo klb	-	-				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Partially Oxidized Rock Material																																
Dore Gold	20%	koz	3	79				14.34	5.68	2.62	5.29	1.19	1.15	7.12	2.13	4.12	8.51	4.05	0.22	2.06	2.19	3.64	0	-	0	0.50	5.26	3.50	3.59	1.93	0.03	-
Dore Silver	10%	koz	2	53				7.27	3.59	2.05	3.24	0.53	0.35	5.60	1.31	2.18	3.92	2.17	0.23	1.40	2.22	3.14	0	-	0	1.28	5.99	2.84	2.50	1.21	0.02	-
CuAu Concentrate Gold	60%	koz	10	238				43.02	17.05	7.85	15.87	3.57	3.44	21.37	6.39	12.36	25.54	12.14	0.65	6.19	6.56	10.91	1	-	0	1.50	15.79	10.51	10.78	5.78	0.08	-
CuAu Concentrate Silver	50%	koz	11	266				36.36	17.94	10.26	16.18	2.64	1.77	28.00	6.55	10.90	19.59	10.86	1.13	7.00	11.10	15.68	1	-	0	6.39	29.97	14.20	12.51	6.04	0.09	-
CuAu Concentrate Copper	50%	Cu klb	832	20,801				4,376.06	1,845.27	639.34	1,232.38	471.46	304.24	1,152.13	449.08	1,121.05	2,238.79	992.96	48.50	400.14	475.65	767.76	62	-	4	116.84	1,307.89	1,135.82	1,029.12	621.70	9.26	-
Molybdenum Concentrate Molybdenum	50%	Mo klb	16	399				71.51	24.60	11.51	23.42	7.25	7.00	24.96	6.42	17.44	38.06	22.34	1.07	15.21	15.22	29.17	1	-	0	3.80	13.08	19.47	29.16	16.58	0.28	-
Fresh Rock Material																																
Dore Gold	10%	koz	43	1,077				12.30	36.84	33.12	29.22	31.18	56.57	53.44	57.49	56.96	45.30	46.61	62.43	41.38	45.75	48.84	48.54	40.46	49.45	55.24	53.13	39.55	36.14	32.57	33.69	31.06
Dore Silver	10%	koz	49	1,229				14.17	30.02	35.28	20.47	18.32	49.99	58.27	72.42	60.78	42.18	53.37	64.83	51.72	52.58	70.65	65.46	56.33	65.68	74.40	69.91	60.32	43.33	35.89	37.53	25.40
CuAu Concentrate Gold	72%	koz	310	7,756				88.54	265.28	238.43	210.42	224.51	407.30	384.76	413.90	410.11	326.17	335.61	449.47	297.90	329.38	351.65	349.47	291.33	356.01	397.73	382.54	284.77	260.20	234.49	242.54	223.61
CuAu Concentrate Silver	60%	koz	295	7,376				85.02	180.15	211.65	122.79	109.89	299.92	349.60	434.54	364.68	253.08	320.24	389.00	310.32	315.50	423.93	392.78	337.97	394.07	446.38	419.45	361.90	260.00	215.33	225.20	152.43
CuAu Concentrate Copper	86%	Cu klb	48,303	1,207,582				13,795.10	40,470.69	44,205.56	26,551.40	32,402.94	68,782.49	63,812.77	42,709.45	56,325.00	54,723.28	62,949.34	71,004.95	40,666.35	46,514.10	57,290.62	49,635.06	44,289.93	55,330.19	76,777.43	66,992.32	45,732.58	40,886.28	37,036.32	38,735.11	29,962.44
Molybdenum Concentrate Molybdenum	50%	Mo klb	544	13,598				127.87	500.00	317.48	308.74	486.67	771.23	570.78	651.82	803.79	694.16	609.97	539.84	472.86	631.01	635.89	577.15	482.81	579.04	892.76	659.14	443.15	445.71	522.94	546.92	326.63
Payable Metals by Product	**Payable**																															
Dore Gold	99.95%	koz	54	1,358				82	45	41	48	33	59	85	66	76	67	55	66	61	59	56	49	40	49	56	62	52	46	38	34	31
Dore Silver	99.50%	koz	77	1,937				151	39	53	75	19	58	190	92	117	89	72	76	110	90	85	65	56	66	76	88	90	72	47	37	25
CuAu Concentrate Gold	97.50%	koz	312	7,794				128	275	240	221	222	400	396	410	412	343	339	439	296	328	353	341	284	347	389	388	288	264	234	237	218
CuAu Concentrate Silver	97.00%	koz	297	7,413				118	192	215	135	109	293	366	428	364	264	321	378	308	317	426	382	328	382	439	436	365	264	215	219	148
CuAu Concentrate Copper	93.48%	Cu klb	45,931	1,148,268				16,986	39,556	41,920	25,972	30,730	64,581	60,728	40,344	53,699	53,247	59,772	66,419	38,388	43,925	54,272	46,456	41,401	51,725	71,879	63,846	43,812	39,182	35,202	36,217	28,008
Molybdenum Concentrate	95.50%	Mo klb	535	13,368				190	501	314	317	472	743	569	629	784	699	604	517	466	617	635	552	461	553	856	642	442	453	515	523	312
Total Payable Metals																																
Gold		koz	366.1	9,152				210	321	281	269	255	459	481	476	488	410	395	505	357	387	410	390	324	397	445	450	340	310	272	270	249
Silver		koz	374.0	9,351				269	231	268	210	128	350	556	520	481	354	393	454	418	407	512	447	384	448	515	524	455	336	262	256	173
Copper		Cu klb	45,930.7	1,148,268				16,986	39,556	41,920	25,972	30,730	64,581	60,728	40,344	53,699	53,247	59,772	66,419	38,388	43,925	54,272	46,456	41,401	51,725	71,879	63,846	43,812	39,182	35,202	36,217	28,008
Molybdenum		Mo klb	534.7	13,368				190	501	314	317	472	743	569	629	784	699	604	517	466	617	635	552	461	553	856	642	442	453	515	523	312
Metal Revenues																																
Gold		$ (000)	512,515	12,812,881				$ 294,664	$ 448,800	$ 394,055	$ 376,378	$ 357,370	$ 643,287	$ 672,780	$ 666,038	$ 683,729	$ 574,281	$ 552,327	$ 706,674	$ 500,288	$ 541,583	$ 573,383	$ 546,185	$ 454,283	$ 555,306	$ 623,029	$ 630,291	$ 476,290	$ 434,318	$ 380,499	$ 378,362	$ 348,682
Silver		$ (000)	5,984	149,608				$ 4,299	$ 3,691	$ 4,290	$ 3,353	$ 2,052	$ 5,605	$ 8,901	$ 8,313	$ 7,693	$ 5,663	$ 6,288	$ 7,264	$ 6,690	$ 6,507	$ 8,187	$ 7,158	$ 6,142	$ 7,169	$ 8,238	$ 8,385	$ 7,275	$ 5,383	$ 4,195	$ 4,094	$ 2,770
Copper		$ (000)	126,309	3,157,736				$ 46,712	$ 108,779	$ 115,280	$ 71,422	$ 84,508	$ 177,597	$ 167,002	$ 110,945	$ 147,673	$ 146,429	$ 164,373	$ 182,653	$ 105,567	$ 120,794	$ 149,247	$ 127,753	$ 113,854	$ 142,244	$ 197,668	$ 175,576	$ 120,482	$ 107,750	$ 96,805	$ 99,598	$ 77,023
Molybdenum		$ (000)	4,812	120,308				$ 1,714	$ 4,509	$ 2,828	$ 2,855	$ 4,245	$ 6,689	$ 5,120	$ 5,657	$ 7,058	$ 6,293	$ 5,435	$ 4,649	$ 4,195	$ 5,554	$ 5,716	$ 4,972	$ 4,150	$ 4,978	$ 7,706	$ 5,778	$ 3,976	$ 4,081	$ 4,637	$ 4,703	$ 2,807
Gross Revenue		**$ (000)**	**649,621**	**16,240,533**				**$ 347,388**	**$ 565,779**	**$ 516,453**	**$ 454,008**	**$ 448,176**	**$ 833,178**	**$ 853,804**	**$ 790,954**	**$ 846,154**	**$ 732,667**	**$ 728,423**	**$ 901,240**	**$ 616,741**	**$ 674,439**	**$ 736,534**	**$ 686,068**	**$ 578,428**	**$ 709,698**	**$ 836,641**	**$ 820,029**	**$ 608,023**	**$ 551,532**	**$ 486,137**	**$ 486,758**	**$ 431,283**

	NSR																																
	Product Freight & Insurance- Ecuador & Intl	**Moisture**																															
	CuAu Concentrate	9%	wet tonnes	145,400	3,635,010				50,016.9	108,288.5	119,726.2	77,297.7	90,989.0	185,750.9	178,321.2	136,985.6	160,812.5	160,059.7	182,431.8	201,912.6	137,105.2	139,737.8	183,217.6	164,679.4	146,442.5	163,403.9	214,516.2	198,086.9	145,642.2	141,233.8	125,551.6	127,745.8	95,054.1
	Dore	0%	dry tonnes	4	108				7.66	2.75	3.09	4.04	1.71	3.83	9.02	5.18	6.34	5.15	4.18	4.65	5.62	4.90	4.64	3.75	3.17	3.78	4.32	4.93	4.67	3.88	2.79	2.33	1.85
	Molybdenum Concentrate	0%	dry tonnes	564	14,109				200.99	528.79	331.62	334.80	497.87	784.44	600.50	663.49	827.79	738.07	637.36	545.23	491.97	651.39	670.37	583.13	486.67	583.82	903.72	677.58	466.31	478.66	543.82	551.57	329.23
	Ecuador Transportation																																
	CuAu Concentrate ($/wmt)	$ 9.60	$ (000)	(1,396)	(34,896)				(480)	(1,040)	(1,149)	(742)	(873)	(1,783)	(1,712)	(1,315)	(1,544)	(1,537)	(1,751)	(1,938)	(1,316)	(1,341)	(1,759)	(1,581)	(1,406)	(1,569)	(2,059)	(1,902)	(1,398)	(1,356)	(1,205)	(1,226)	(913)
	Molybdenum Concentrate ($/dmt)	$ 42.86	$ (000)	(24)	(605)				(9)	(23)	(14)	(14)	(21)	(34)	(26)	(28)	(35)	(32)	(27)	(23)	(21)	(28)	(29)	(25)	(21)	(25)	(39)	(29)	(20)	(21)	(23)	(24)	(14)
	Port Handling Charges																																
	CuAu Concentrate ($/wmt)	$ 23.79	$ (000)	(3,459)	(86,477)				(1,190)	(2,576)	(2,848)	(1,839)	(2,165)	(4,419)	(4,242)	(3,259)	(3,826)	(3,808)	(4,340)	(4,804)	(3,262)	(3,324)	(4,359)	(3,918)	(3,484)	(3,887)	(5,103)	(4,712)	(3,465)	(3,360)	(2,987)	(3,039)	(2,261)
	Molybdenum Concentrate ($/dmt)	$ 11.00	$ (000)	(6)	(155)				(2)	(6)	(4)	(4)	(5)	(9)	(7)	(7)	(9)	(8)	(7)	(6)	(5)	(7)	(7)	(6)	(5)	(6)	(10)	(7)	(5)	(5)	(6)	(6)	(4)
	International Freight																																
	CuAu Concentrate ($/wmt)	$ 35.00	$ (000)	(5,089)	(127,225)				(1,751)	(3,790)	(4,190)	(2,705)	(3,185)	(6,501)	(6,241)	(4,794)	(5,628)	(5,602)	(6,385)	(7,067)	(4,799)	(4,891)	(6,413)	(5,764)	(5,125)	(5,719)	(7,508)	(6,933)	(5,097)	(4,943)	(4,394)	(4,471)	(3,327)
	Dore ($/oz dore)	$ 3.53	$ (000)	(492)	(12,297)				(870)	(313)	(352)	(459)	(194)	(435)	(1,025)	(588)	(720)	(585)	(475)	(528)	(639)	(557)	(527)	(426)	(360)	(430)	(491)	(560)	(531)	(441)	(317)	(265)	(210)
	Molybdenum Concentrate ($/dmt)	$ 24.81	$ (000)	(14)	(350)				(5)	(13)	(8)	(8)	(12)	(19)	(15)	(16)	(21)	(18)	(16)	(14)	(12)	(16)	(17)	(14)	(12)	(14)	(22)	(17)	(12)	(12)	(13)	(14)	(8)
	Sub-Total: Freight Cost		**$ (000)**	**(10,480)**	**(262,005)**				**(4,307)**	**(7,760)**	**(8,566)**	**(5,772)**	**(6,456)**	**(13,201)**	**(13,268)**	**(10,009)**	**(11,783)**	**(11,589)**	**(13,002)**	**(14,380)**	**(10,054)**	**(10,165)**	**(13,110)**	**(11,734)**	**(10,414)**	**(11,651)**	**(15,232)**	**(14,160)**	**(10,528)**	**(10,137)**	**(8,946)**	**(9,045)**	**(6,737)**
	Treatment and Refining Charges																																
	CuAu Concentrate Gold RC ($/oz Au)	$ 7.50	$ (000)	(2,338)	(58,458)				(962)	(2,065)	(1,801)	(1,655)	(1,668)	(3,004)	(2,970)	(3,073)	(3,089)	(2,572)	(2,543)	(3,291)	(2,224)	(2,457)	(2,651)	(2,560)	(2,130)	(2,604)	(2,919)	(2,913)	(2,159)	(1,982)	(1,757)	(1,774)	(1,635)
	CuAu Concentrate Silver RC ($/oz Ag)	$ 0.65	$ (000)	(193)	(4,818)				(77)	(125)	(140)	(88)	(71)	(190)	(238)	(278)	(237)	(172)	(209)	(246)	(200)	(206)	(277)	(248)	(213)	(249)	(285)	(283)	(237)	(172)	(140)	(142)	(96)
	CuAu Concentrate Copper RC ($/lb Cu)	$ 0.07	$ (000)	(3,215)	(80,379)				(1,189)	(2,769)	(2,934)	(1,818)	(2,151)	(4,521)	(4,251)	(2,824)	(3,759)	(3,727)	(4,184)	(4,649)	(2,687)	(3,075)	(3,799)	(3,252)	(2,898)	(3,621)	(5,032)	(4,469)	(3,067)	(2,743)	(2,464)	(2,535)	(1,961)
	CuAu Concentrate TC ($/wmt)	$ 70.00	$ (000)	(10,178)	(254,451)				(3,501)	(7,580)	(8,381)	(5,411)	(6,369)	(13,003)	(12,482)	(9,589)	(11,257)	(11,204)	(12,770)	(14,134)	(9,597)	(9,782)	(12,825)	(11,528)	(10,251)	(11,438)	(15,016)	(13,866)	(10,195)	(9,886)	(8,789)	(8,942)	(6,654)
	Molybdenum Concentrate RC ($/dmt)	$ 2,976.24	$ (000)	(1,680)	(41,992)				(598)	(1,574)	(987)	(996)	(1,482)	(2,335)	(1,787)	(1,975)	(2,464)	(2,197)	(1,897)	(1,623)	(1,464)	(1,939)	(1,995)	(1,736)	(1,448)	(1,738)	(2,690)	(2,017)	(1,388)	(1,425)	(1,619)	(1,642)	(980)
	Dore Treatment Cost ($/oz dore)	$ 0.30	$ (000)	(42)	(1,044)				(74)	(27)	(30)	(39)	(16)	(37)	(87)	(50)	(61)	(50)	(40)	(45)	(54)	(47)	(45)	(36)	(31)	(36)	(42)	(48)	(45)	(37)	(27)	(23)	(18)
	Sub-Total: Concentrate Treatment and Refining Charges		**$ (000)**	**(17,646)**	**$ (441,142)**				**(6,401)**	**(14,139)**	**(14,273)**	**(10,007)**	**(11,757)**	**(23,089)**	**(21,816)**	**(17,789)**	**(20,867)**	**(19,922)**	**(21,643)**	**(23,988)**	**(16,227)**	**(17,505)**	**(21,593)**	**(19,360)**	**(16,972)**	**(19,685)**	**(25,984)**	**(23,596)**	**(17,091)**	**(16,244)**	**(14,795)**	**(15,058)**	**(11,343)**
1	**Total Transportation, Treatment and Refining Charges**		**$ (000)**	**(28,126)**	**$ (703,147)**				**(10,708)**	**(21,899)**	**(22,839)**	**(15,778)**	**(18,213)**	**(36,289)**	**(35,084)**	**(27,798)**	**(32,650)**	**(31,511)**	**(34,645)**	**(38,368)**	**(26,281)**	**(27,670)**	**(34,703)**	**(31,094)**	**(27,385)**	**(31,336)**	**(41,216)**	**(37,756)**	**(27,619)**	**(26,382)**	**(23,741)**	**(24,103)**	**(18,080)**
	NSR		**$ (000)**	**621,495**	**$ 15,537,387**				**336,680**	**543,880**	**493,615**	**438,230**	**429,963**	**796,889**	**818,720**	**763,156**	**813,504**	**701,156**	**693,778**	**862,872**	**590,459**	**646,769**	**701,831**	**654,974**	**551,043**	**678,362**	**795,425**	**782,273**	**580,404**	**525,150**	**462,396**	**462,655**	**413,203**
	ROYALTY																																
	Ecuador Royalty on NSR	3%	$ (000)	(18,645)	$ (466,122)				(10,100)	(16,316)	(14,808)	(13,147)	(12,899)	(23,907)	(24,562)	(22,895)	(24,405)	(21,035)	(20,813)	(25,886)	(17,714)	(19,403)	(21,055)	(19,649)	(16,531)	(20,351)	(23,863)	(23,468)	(17,412)	(15,754)	(13,872)	(13,880)	(12,396)
	Gross Income from Mining		**$ (000)**	**602,851**	**$ 15,071,265**				**326,580**	**527,564**	**478,806**	**425,083**	**417,064**	**772,982**	**794,159**	**740,261**	**789,099**	**680,121**	**672,965**	**836,986**	**572,746**	**627,366**	**680,776**	**635,325**	**534,512**	**658,011**	**771,562**	**758,805**	**562,992**	**509,395**	**448,524**	**448,775**	**400,807**
	OPERATING MARGIN																																
	Operating Cost																																
	Mining		$ (000)	(102,208)	$ (2,555,198)				(61,055)	(99,553)	(132,447)	(120,913)	(116,072)	(128,625)	(129,799)	(127,055)	(122,720)	(123,431)	(120,575)	(104,139)	(101,088)	(103,880)	(106,217)	(108,431)	(114,424)	(105,900)	(102,985)	(95,845)	(99,866)	(64,905)	(57,844)	(62,529)	(44,899)
	Processing		$ (000)	(161,575)	$ (4,039,370)				(70,572)	(94,069)	(94,067)	(94,069)	(94,069)	(167,397)	(183,557)	(183,557)	(183,559)	(183,555)	(183,556)	(183,560)	(183,555)	(183,555)	(183,555)	(183,554)	(183,554)	(183,554)	(183,554)	(183,554)	(183,553)	(183,553)	(183,555)	(183,552)	(121,136)
	Dry Stack Tailings		$ (000)	(5,917)	$ (147,914)				(3,557)	(3,852)	(4,160)	(4,279)	(4,172)	(5,478)	(5,630)	(5,691)	(5,999)	(5,997)	(5,997)	(5,997)	(6,318)	(6,370)	(6,427)	(6,318)	(6,318)	(6,318)	(6,639)	(6,639)	(6,959)	(6,959)	(7,280)	(7,280)	(7,280)
	G&A		$ (000)	(20,011)	$ (500,275)				(17,939)	(18,542)	(19,058)	(19,069)	(19,255)	(20,664)	(20,664)	(20,664)	(20,664)	(20,664)	(20,664)	(20,664)	(20,664)	(20,664)	(20,664)	(20,664)	(20,664)	(20,664)	(20,664)	(20,664)	(20,664)	(20,560)	(20,609)	(20,609)	(14,014)
1	**Total Annual Operating Cost**		**$ (000)**	**(289,710)**	**$ (7,242,758)**				**(153,124)**	**(216,017)**	**(249,733)**	**(238,330)**	**(233,568)**	**(322,164)**	**(339,649)**	**(336,967)**	**(332,942)**	**(333,647)**	**(330,792)**	**(314,361)**	**(311,625)**	**(314,469)**	**(316,863)**	**(318,967)**	**(324,960)**	**(316,436)**	**(313,841)**	**(306,701)**	**(311,042)**	**(275,977)**	**(269,287)**	**(273,969)**	**(187,329)**
	Unit Operating Costs																																
	Mining		$/tonne mined		$ (1.88)				2.55	2.16	2.04	1.86	1.79	1.98	2.00	1.95	1.89	1.90	1.85	1.80	1.65	1.66	1.75	1.75	1.82	1.93	2.05	2.11	1.87	1.71	1.63	1.64	1.85
	Mining		$/ore-tonne		$ (3.99)				5.97	6.82	9.07	8.28	7.95	4.89	4.45	4.35	4.20	4.23	4.13	3.57	3.46	3.56	3.64	3.71	3.92	3.63	3.53	3.28	3.42	2.22	1.98	2.14	2.27
	Processing		$/ore-tonne		$ (6.31)				6.91	6.44	6.44	6.44	6.44	6.37	6.29	6.29	6.29	6.29	6.29	6.29	6.29	6.29	6.29	6.29	6.29	6.29	6.29	6.29	6.29	6.29	6.29	6.29	6.13
	Dry Stack Tailings		$/ore-tonne		$ (0.23)				0.35	0.26	0.28	0.29	0.29	0.21	0.19	0.19	0.21	0.21	0.21	0.21	0.22	0.22	0.22	0.22	0.22	0.22	0.23	0.23	0.24	0.24	0.25	0.25	0.37
	G&A		$/ore-tonne		$ (0.78)				1.76	1.27	1.31	1.31	1.32	0.79	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.71	0.70	0.71	0.71	0.71
	Total Annual Unit Operating Cost		**$/ore-tonne**		**$ (11.31)**				**14.98**	**14.79**	**17.10**	**16.33**	**16.00**	**12.26**	**11.63**	**11.54**	**11.40**	**11.43**	**11.33**	**10.77**	**10.67**	**10.77**	**10.85**	**10.92**	**11.13**	**10.84**	**10.75**	**10.50**	**10.65**	**9.45**	**9.22**	**9.38**	**9.48**
	Net Profit		**$ (000)**		**$ 7,828,507**				**173,456**	**311,547**	**229,074**	**186,754**	**183,496**	**450,818**	**454,509**	**403,294**	**456,157**	**346,474**	**342,173**	**522,625**	**261,121**	**312,897**	**363,913**	**316,358**	**209,552**	**341,575**	**457,721**	**452,104**	**251,950**	**233,418**	**179,237**	**174,806**	**213,477**
	PRE-TAX INCOME																																
	Depreciation		$ (000)	(71,026)	$ (1,775,640)				(187,815)	(202,732)	(210,367)	(210,625)	(210,653)	(43,159)	(34,094)	(29,663)	(31,728)	(32,915)	(31,273)	(31,223)	(30,910)	(32,192)	(34,183)	(38,279)	(50,828)	(54,932)	(53,499)	(51,568)	(48,201)	(36,235)	(32,534)	(32,450)	(23,581)
	Miscellaneous Taxes		$ (000)	(667)	$ (18,675)	(386)	(738)	(1,075)	(1,058)	(957)	(700)	(689)	(676)	(697)	(684)	(680)	(678)	(666)	(653)	(641)	(637)	(633)	(628)	(625)	(643)	(635)	(610)	(585)	(563)	(551)	(541)	(527)	(519)
	Adjusted Net Profit		**$ (000)**	**241,456**	**$ 6,034,192**	**(386)**	**(738)**	**(1,075)**	**(15,417)**	**107,858**	**18,006**	**(24,560)**	**(27,833)**	**406,963**	**419,731**	**372,951**	**423,751**	**312,893**	**310,248**	**490,761**	**229,574**	**280,072**	**329,102**	**277,454**	**158,081**	**286,007**	**403,613**	**399,952**	**203,185**	**196,633**	**146,162**	**141,830**	**189,377**
	Profit Sharing Tax	15%	$ (000)	(36,625)	$ (915,630)				-	(16,179)	(2,701)	-	-	(61,044)	(62,960)	(55,943)	(63,563)	(46,934)	(46,537)	(73,614)	(34,436)	(42,011)	(49,365)	(41,618)	(23,712)	(42,901)	(60,542)	(59,993)	(30,478)	(29,495)	(21,924)	(21,274)	(28,407)
	Taxable Income Pre-Carry Forward Loss		**$ (000)**	**204,830**	**$ 5,120,761**				**(15,417)**	**91,679**	**15,305**	**(24,560)**	**(27,833)**	**345,918**	**356,771**	**317,008**	**360,189**	**265,959**	**263,710**	**417,146**	**195,138**	**238,061**	**279,737**	**235,836**	**134,368**	**243,106**	**343,071**	**339,959**	**172,707**	**167,138**	**124,238**	**120,555**	**160,971**
	Carry Forward Loss Applied (25% of Current Year Income Max)		$ (000)	(2,837)	$ (70,933)				-	(18,540)	-	-	-	(52,393)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Net Income Before Taxes		**$ (000)**	**201,993**	**$ 5,049,828**				**(15,417)**	**73,140**	**15,305**	**(24,560)**	**(27,833)**	**293,525**	**356,771**	**317,008**	**360,189**	**265,959**	**263,710**	**417,146**	**195,138**	**238,061**	**279,737**	**235,836**	**134,368**	**243,106**	**343,071**	**339,959**	**172,707**	**167,138**	**124,238**	**120,555**	**160,971**
	Federal Income Taxes	22%	$ (000)	(45,035)	$ (1,125,880)				-	(16,091)	(3,367)	-	-	(64,575)	(78,490)	(69,742)	(79,241)	(58,511)	(58,016)	(91,772)	(42,930)	(52,373)	(61,542)	(51,884)	(29,561)	(53,483)	(75,476)	(74,791)	(37,996)	(36,770)	(27,332)	(26,522)	(35,414)
	NET INCOME AFTER TAXES		**$ (000)**	**$ 156,958**	**$ 3,921,748**	**(386)**	**(738)**	**(1,075)**	**(15,417)**	**57,049**	**11,938**	**(24,560)**	**(27,833)**	**228,949**	**278,282**	**247,266**	**280,947**	**207,448**	**205,694**	**325,374**	**152,207**	**185,687**	**218,195**	**183,952**	**104,807**	**189,623**	**267,595**	**265,168**	**134,712**	**130,367**	**96,905**	**94,033**	**125,557**
	Add-Back Depreciation		$ (000)	71,026	$ 1,775,640				187,815	202,732	210,367	210,625	210,653	43,159	34,094	29,663	31,728	32,915	31,273	31,223	30,910	32,192	34,183	38,279	50,828	54,932	53,499	51,568	48,201	36,235	32,534	32,450	23,581
	Add-Back Carry Forward Loss		$ (000)	2,837	$ 70,933				-	18,540	-	-	-	52,393	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	NET INCOME FROM OPERATIONS		**$ (000)**	**$ 230,821**	**$ 5,768,321**	**(386)**	**(738)**	**(1,075)**	**172,398**	**278,321**	**222,305**	**186,065**	**182,820**	**324,502**	**312,376**	**276,929**	**312,675**	**240,363**	**236,967**	**356,598**	**183,118**	**217,880**	**252,378**	**222,231**	**155,636**	**244,555**	**321,094**	**316,736**	**182,913**	**166,602**	**129,439**	**126,483**	**149,138**
	Initial Capital less VAT		$ (000)		$ (898,265)	(224,566)	(314,393)	(359,306)																									
	Initial Spare Parts, Initial Fills		$ (000)		$ -			(14,942)																									14,942
	Initial Working Capital		$ (000)		$ -			(1,725)																									1,725
	VAT (IVA) Net Cash Flow	12%	$ (000)		$ -	(12,789)	(34,103)	(38,366)	85,259	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1	**Total Initial Capital**		**$ (000)**		**$ (898,265)**	**(237,355)**	**(348,496)**	**(414,340)**	**85,259**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**16,667**
	Expansion Capital		$ (000)		$ (405,399)							(182,429)	(182,429)	(40,540)																			
	Expansion Spare Parts, Initial Fills		$ (000)		$ -								(9,494)																				9,494
	Working Capital for Expansion		$ (000)		$ -									(2,346)																			2,346
1	**Total Expansion Capital**		**$ (000)**		**$ (405,399)**				**-**	**-**	**-**	**(182,429)**	**(191,923)**	**(42,885)**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**11,840**
	Sustaining Capital																																
	Mine Equipment Replacement		$ (000)		$ (333,659)				(14,376)	(72,604)	(37,010)	(920)	-	(9,005)	(2,365)	(14,250)	(7,438)	(5,550)	(3,015)	(1,525)	(12,031)	(11,196)	(14,216)	(23,430)	(64,271)	(30,951)	(1,675)	(1,718)	(1,675)	(4,439)	-	-	-
	All Other Sustaining Capital		$ (000)		$ (111,167)				(6,022)	(15,330)	(9,834)	(3,031)	(1,129)	(15,483)	(5,241)	(605)	(12,689)	(1,215)	-	(3,676)	(2,924)	(5,257)	(2,751)	(123)	(2,050)	(2,724)	(4,082)	(3,110)	(4,602)	(2,050)	(6,662)	(502)	(73)
1	**Total Sustaining Capital**		**$ (000)**		**$ (444,826)**				**(20,398)**	**(87,934)**	**(46,844)**	**(3,951)**	**(1,129)**	**(24,488)**	**(7,606)**	**(14,855)**	**(20,127)**	**(6,765)**	**(3,015)**	**(5,201)**	**(14,955)**	**(16,453)**	**(16,968)**	**(23,553)**	**(66,321)**	**(33,675)**	**(5,757)**	**(4,829)**	**(6,277)**	**(6,489)**	**(6,662)**	**(502)**	**(73)**
	Mine Closure and Reclamation	$ 100,192	**$ (000)**		**$ (100,192)**																												(100,192)
	Severance	$ 37,880	**$ (000)**		**$ (37,880)**				-	-	-	-	-	-	-	(2)	-	-	-	-	-	-	-	(7)	-	(2)	-	-	(113)	(12)	-	-	(37,744)
	Equipment Salvage Value	$ 40,656	**$ (000)**		**$ 40,656**																												40,656
	ANNUAL PRE-TAX CASH FLOW		**$ (000)**	**$ 213,664**	**$ 5,982,601**	**(237,355)**	**(348,496)**	**(414,340)**	**238,317**	**223,613**	**182,229**	**373**	**(9,557)**	**383,445**	**446,903**	**388,436**	**436,030**	**339,710**	**339,158**	**517,424**	**246,166**	**296,444**	**346,946**	**292,798**	**143,231**	**307,898**	**451,964**	**447,276**	**245,561**	**226,917**	**172,575**	**174,304**	**144,631**
	CUMULATIVE PRE-TAX CASH FLOW		**$ (000)**			**(237,355)**	**(585,851)**	**(1,000,191)**	**(761,874)**	**(538,261)**	**(356,032)**	**(355,659)**	**(365,215)**	**18,229**	**465,133**	**853,569**	**1,289,599**	**1,629,308**	**1,968,466**	**2,485,891**	**2,732,057**	**3,028,500**	**3,375,446**	**3,668,245**	**3,811,475**	**4,119,373**	**4,571,337**	**5,018,613**	**5,264,174**	**5,491,090**	**5,663,665**	**5,837,969**	**5,982,601**
	ANNUAL AFTER-TAX CASH FLOW PRE-SOVEREIGN ADJUSTMENT		**$ (000)**	**$ 140,086**	**$ 3,922,415**	**(237,741)**	**(349,235)**	**(415,415)**	**237,259**	**190,387**	**175,461**	**(316)**	**(10,232)**	**257,128**	**304,770**	**262,072**	**292,547**	**233,598**	**233,952**	**351,397**	**168,163**	**201,427**	**235,410**	**198,672**	**89,315**	**210,878**	**315,337**	**311,908**	**176,524**	**160,101**	**122,777**	**125,981**	**80,292**
	CUMULATIVE AFTER-TAX CASH FLOW PRE-SOVEREIGN ADJUSTMENT		**$ (000)**			**(237,741)**	**(586,975)**	**(1,002,390)**	**(765,131)**	**(574,745)**	**(399,284)**	**(399,600)**	**(409,832)**	**(152,704)**	**152,065**	**414,137**	**706,685**	**940,283**	**1,174,234**	**1,525,631**	**1,693,794**	**1,895,221**	**2,130,631**	**2,329,303**	**2,418,617**	**2,629,495**	**2,944,832**	**3,256,740**	**3,433,264**	**3,593,365**	**3,716,142**	**3,842,123**	**3,922,415**
	SOVEREIGN ADJUSTMENT, IF REQUIRED				$ -				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	ANNUAL AFTER-TAX CASH FLOW POST-SOVEREIGN ADJUSTMENT		**$ (000)**		**$ 3,922,415**	**(237,741)**	**(349,235)**	**(415,415)**	**237,259**	**190,387**	**175,461**	**(316)**	**(10,232)**	**257,128**	**304,770**	**262,072**	**292,547**	**233,598**	**233,952**	**351,397**	**168,163**	**201,427**	**235,410**	**198,672**	**89,315**	**210,878**	**315,337**	**311,908**	**176,524**	**160,101**	**122,777**	**125,981**	**80,292**
	CUMULATIVE AFTER-TAX CASH FLOW POST-SOVEREIGN ADJUSTMENT		**$ (000)**			**(237,741)**	**(586,975)**	**(1,002,390)**	**(765,131)**	**(574,745)**	**(399,284)**	**(399,600)**	**(409,832)**	**(152,704)**	**152,065**	**414,137**	**706,685**	**940,283**	**1,174,234**	**1,525,631**	**1,693,794**	**1,895,221**	**2,130,631**	**2,329,303**	**2,418,617**	**2,629,495**	**2,944,832**	**3,256,740**	**3,433,264**	**3,593,365**	**3,716,142**	**3,842,123**	**3,922,415**
	CASH COSTS																																
	NET CASH COST		**$/OZ**		**$ 545**				**528**	**377**	**534**	**694**	**695**	**399**	**430**	**531**	**465**	**564**	**538**	**362**	**679**	**595**	**523**	**584**	**763**	**541**	**362**	**380**	**668**	**674**	**776**	**766**	**556**
	ALL IN SUSTAINING NET CASH COST		**$/OZ**		**$ 604**				**625**	**652**	**700**	**709**	**699**	**452**	**446**	**563**	**506**	**580**	**546**	**372**	**720**	**637**	**565**	**645**	**967**	**626**	**375**	**391**	**687**	**695**	**800**	**768**	**947**
	CO-PRODUCT COSTS (GOLD EQ)																																
	NET CASH CO-PRODUCT COST		**$/EQ-OZ**		**$ 725**				**660**	**589**	**739**	**815**	**837**	**627**	**636**	**668**	**644**	**745**	**746**	**586**	**815**	**753**	**717**	**750**	**900**	**728**	**627**	**616**	**827**	**828**	**911**	**907**	**718**
	ALL-IN SUSTAINING CO-PRODUCT COST		**$/EQ-OZ**		**$ 772**				**742**	**806**	**866**	**827**	**841**	**668**	**648**	**695**	**678**	**758**	**752**	**594**	**849**	**788**	**750**	**799**	**1,060**	**794**	**637**	**625**	**841**	**845**	**931**	**909**	**1,034**
	Initial Payback Year								0.0	0.0	0.0	0.0	0.0	5.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	INITIAL CAPITAL AFTER TAX PAYBACK CALCULATIONS					(237,741)	(349,235)	(415,415)	237,259	190,387	175,461	182,113	181,691	300,013	304,770	262,072	292,547	233,598	233,952	351,397	168,163	201,427	235,410	198,672	89,315	210,878	315,337	311,908	176,524	160,101	122,777	125,981	68,453
	CUMULATIVE					(237,741)	(586,975)	(1,002,390)	(765,131)	(574,745)	(399,284)	(217,170)	(35,479)	264,534	569,304	831,375	1,123,923	1,357,521	1,591,473	1,942,869	2,111,032	2,312,459	2,547,869	2,746,541	2,835,855	3,046,733	3,362,070	3,673,978	3,850,502	4,010,603	4,133,380	4,259,361	4,327,814
	Expansion Payback Year								0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EXPANSION CAPITAL AFTER TAX PAYBACK CALCULATIONS										-	(182,429)	(191,923)	94,877	148,582	123,608	136,210	113,417															
	CUMULATIVE										-	(182,429)	(374,353)	(279,476)	(130,894)	(7,286)	128,924	242,341															

After-tax	Cash Flow
IRR	16.2%
$NPV_{5\%}$ $(000)	$ 1,570,811
EBITDA $(000)	$ 7,828,507
Initial CAPEX Payback (yr)	5.1
Expansion CAPEX Payback (yr)	3.1

Pre-tax	Cash Flow
IRR	20.2%
$NPV_{5\%}$ $(000)	$ 2,555,055

23 ADJACENT PROPERTIES

Although there are several gold showings and small mines in the area, there are no nearby published Mineral Reserves. No information from any adjacent properties has been used in the estimate of Mineral Resources for the Project.

24 OTHER RELEVANT DATA

24.1 Execution Plan

24.2 Introduction

To support the capital cost estimate, a conceptual execution plan and schedule were developed. They compile engineering, procurement, construction, and other related preproduction activities that are necessary to bring the Cangrejos Project into commercial production. The execution plan assumes that the Project will be executed after all the required prerequisites are satisfied. Details of the cost estimates are included in Section 21.

Prerequisites that are necessary to move the Project into the three-year preproduction period include:

- Completion of Estudio de Impacto Ambiental (EIA) Public Participation Process (PPS)
- EIA/Environmental Management Plan (EMP) approval
- Completion of all other required permitting actions, as summarized in Section 4.3
- Approval and receipt of the exploitation-phase Environmental License
- Receipt of the Investor Protection Agreement (IPA)
- Project financing obtained by the Company, as required
- Corporate approval to proceed with project development

A summary-level schedule was developed using logic and durations for major activities, including manufacturing and delivery durations for major mining and process equipment provided by IMC/Lumina and ONIX, respectively. Durations for preproduction mining activities were developed by IMC using first principles. Durations for critical path activities were developed using recent data from similar projects. Other construction activities were considered to fit within the overall timeline for the critical activities.

During a future Feasibility Study some early/basic engineering may be performed to facilitate early placement of purchase orders for the primary crusher, ball mills, high pressure grinding roll (HPGR), and other long-lead items in order to reduce schedule risk due to vendor manufacturing/delivery delays. Early engineering of some of the site infrastructure during the permitting process may be advantageous if it facilitates an efficient start of construction on site after permit approvals are received.

Durations for completion of the power supply activities were provided by the Electric Power and Communications Company (EPTEC) in a report that is summarized in Section 18.1.

The summary Project Execution Schedule is included in Section 24.4 as Figure 24-1.

24.3 Execution Plan

24.3.1 Engineering, Procurement, and Construction Management

Basic and detailed process and related infrastructure engineering, procurement, and construction management (EPCM) services will be performed by an international engineering firm with substantial experience in engineering and construction of large gold-copper flotation concentrators and carbon-in-leach (CIL) plants, as well as having familiarity with Ecuadorian regulatory requirements, standards, business practices, and construction methodologies/ capabilities. Ecuadorian engineers will be utilized, either as individuals or through consulting engineering firms, to provide further insight regarding local codes, standards, and practices.

Discrete packages for certain infrastructure elements and ancillary facilities will be subcontracted to qualified Ecuadorian engineering firms for detailed design and procurement using locally available equipment, materials, and construction labor whenever possible.

Mine design and specification of mining equipment and materials will be performed by an experienced international mining consultant. Procurement of the mining equipment will be performed by Lumina.

Detailed design and quality assurance services for critical geotechnical facilities, including the waste rock storage facility (WRSF) and dry stack tailings facility (DSTF), will be provided by an international geotechnical engineering firm with substantial experience in constructing these specific facilities under similar conditions, including:

- Adverse topography
- Heavy forestation/vegetation
- High seasonal precipitation
- Significant presence of saprolite soils in construction areas

Specification and procurement of any required equipment or materials will be performed by the geotechnical engineering firm.

Design, permitting, and oversight of the procurement and construction of the 230-kV electrical transmission line, La Avanzada substation modifications, and the Cangrejos main substation will be performed by a specialty Ecuadorian engineering firm engaged by, and under the supervision of, the Company.

24.3.2 Procurement and Logistics

After specifying the technical requirements for process equipment and materials, the EPCM contractor will determine which items are available within Ecuador and which meet the Project's schedule and cost requirements. Equipment and materials which are not reasonably available in Ecuador will be purchased by the EPCM contractor from leading international suppliers.

The EPCM contractor, in conjunction with the Company, will engage a freight forwarding/logistics contractor which has substantial international experience and familiarity with local Ecuadorian customs practices and transport providers. The contractor will coordinate, track, and report all transport of project equipment and materials.

24.3.3 Construction

As discussed previously in Section 24.3.1, overall construction management services for the process plant and related infrastructure will be provided by the EPCM contractor working with the Company's project and construction management staff.

The technical oversight of the geotechnical construction will be provided by the geotechnical engineering firm. Contract administration/construction management of the construction of the geotechnical facilities will either be provided by the EPCM contractor or the Company's project staff.

Major construction work packages are expected to consist of the following:

- Vegetation removal
- Road construction (i.e., light earthworks)
- Road construction (i.e., heavy earthworks)
- Major earthworks
- Civil concrete construction, including supply and operation of an onsite concrete batch plant
- Platework and structural steel erection
- Mechanical and piping erection/installation
- Electrical, instrumentation, and controls installation
- Architectural (i.e., buildings, etc.) construction
- Installation of electrical overhead transmission lines

The work packages may be combined into several major contracts, or split into smaller packages, depending on contractor capabilities, and if it is advantageous to the Project. The splitting of early work packages will be beneficial if it facilitates the use of local contractors since they do not require site accommodations and support services, are able to mobilize and begin work quickly, and are likely to have established work forces.

Construction will be completed by in-country contractors, whenever possible, depending on adequate resources and demonstrated capabilities. Whether qualified local resources exist in adequate numbers to support the project schedule must be evaluated at a later stage of the project development, as actual construction nears. Where particular skills and experiences do not exist or do not exist in adequate numbers to support the project schedule, the EPCM contractor will source contractors or personnel from outside Ecuador.

The EPCM contractor needs to include well-experienced, expatriate technical and supervisory staff on its team to augment contractors in specialized areas, such as mill installation. Vendor field engineers will also form an important component of the construction team.

To the extent possible, the design will largely progress in advance of construction needs, so lump sum and unit price contracts are envisioned for the major contract packages.

Contractor management and supervision of construction will be performed by a team consisting of the EPCM contractor and the Company's Project management staff. Costs are included in the capital cost estimate to provide these functions.

24.3.4 Preoperational Testing

Construction will proceed to mechanical completion, followed by preoperational testing of the completed process systems in order to ensure that each system performs as designed. Preoperational testing occurs without mineralized material feed or actual process solutions.

Preproduction testing will be performed by a team comprised of the EPCM contractor's staff, the Company's preproduction operations staff, vendor representatives for key process equipment, and select construction contractors' support labor. Costs are included in the capital cost estimate to provide these functions.

24.3.5 Commissioning

When preoperational testing of a system has been satisfactorily completed, the system will be formally turned over to the Company. From this point on, the responsibility for care, custody, and control of this system rests with the Company. Construction personnel may no longer access or operate the system unless the Company approves and participates.

EPCM contractor's staff, construction contractor's staff personnel, and vendor representatives for key process equipment are available to assist the Company's operations staff with commissioning.

Costs are included in the capital cost estimate to provide the commissioning support.

24.3.6 Estimated Manpower

The estimated construction manhours (excluding earthworks) were developed by: analyzing factors applied to the equipment costs to obtain total construction costs, converting the resulting construction costs to manhours using an average cost per manhour from a recently completed project in Ecuador, adjusted for an average performance factor; and comparing the estimated manhours to hours expended during the construction of a similar project in Latin America. The estimated manhours, based on the factored approach, compared favorably with the actual manhours from the other project.

Estimated manhours for earthworks were developed by applying historical manhours to known unit rates based on experience by Ausenco for other projects in Latin America.

The average construction workforce during the 36-month construction period is expected to range from 500 people to 700 people depending on specific activities occurring at given times. The workforce is expected to peak at 1,000 people for a short period of time (i.e., several months).

For this estimate, thirty percent of the construction workforce is assumed to be available locally and to reside within the local communities rather than in the construction camp.

A detailed estimate of direct and indirect construction manhours and the workforce versus time will be completed as part of the PFS labor estimate since major construction costs will be based on material take offs and will not utilize factoring of equipment costs to obtain construction costs.

24.4 Schedule

The preliminary summary project execution schedule is shown below as Figure 24-1.

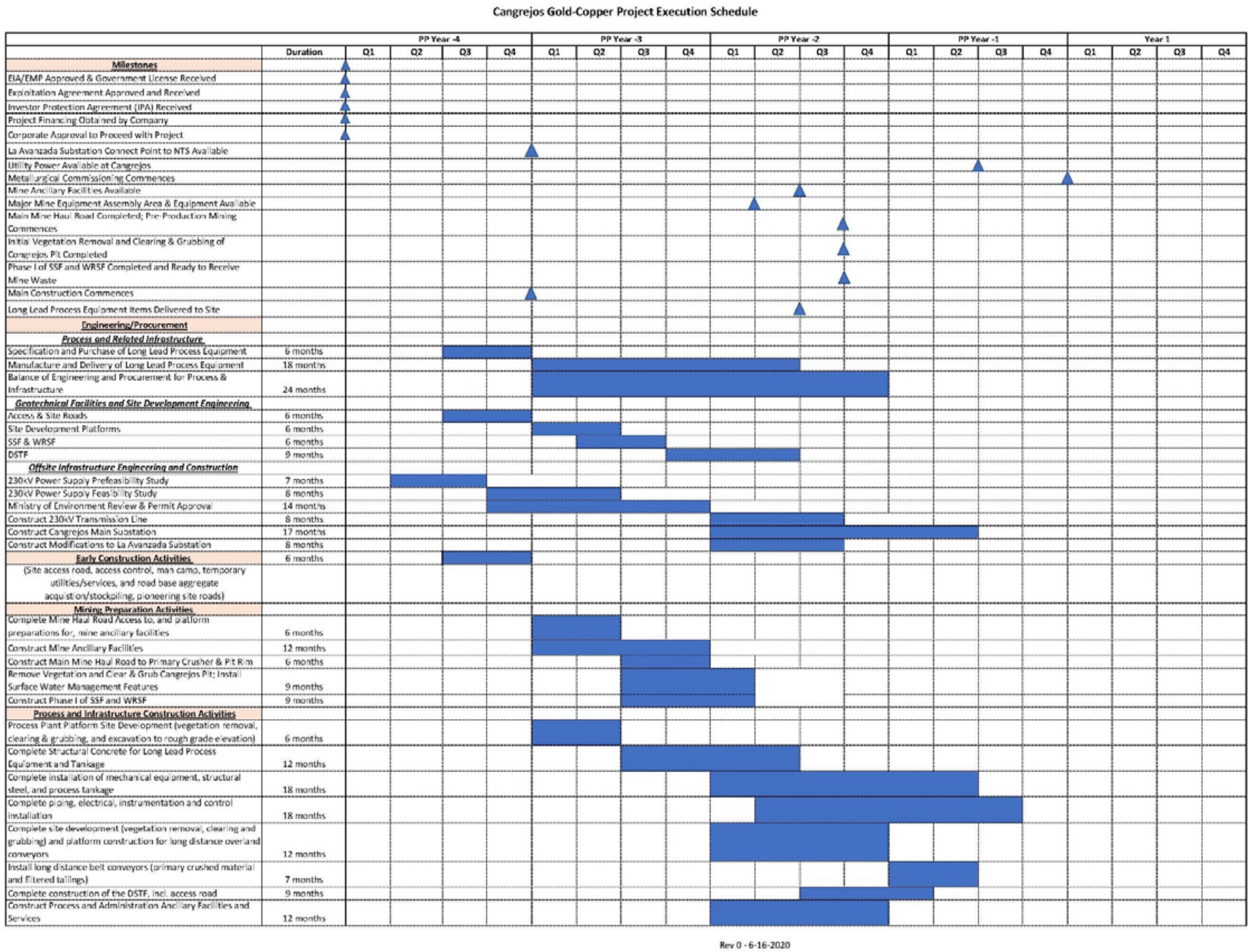


FIGURE 24-1: CANGREJOS GOLD-COPPER PROJECT PRELIMINARY EXECUTION SCHEDULE

*24.4.1 **Basis of Schedule***

Sequencing of the major process and related infrastructure activities is based on durations from comparable projects and fabrication/delivery durations for the longest lead-time equipment.

Based on vendor quotations that were provided in support of the scoping-level engineering and capital cost estimate, there are at least seven purchase orders with estimated delivery times more than 72 weeks. They are:

- Pressure Filters (tailings)
- Gyratory Crusher
- HPGR
- Ball Mills
- Verti-mill (regrind mill)
- Carbon Plant Package
- Belt Conveyor Package, of which the long-distance overland conveyors are critical

Eight weeks were added to the vendor's quoted durations for delivery to allow for inland transport at port of origin, ocean freight to Guayaquil, customs clearance, and inland transport to Cangrejos.

Engineering deliverables that are required to support timely placement of purchase orders for critical equipment and materials, as well as other purchase orders and construction bid documents to support the overall construction schedule, will be identified and prioritized during a future Feasibility Study.

Early construction activities that must be completed in advance of the main construction effort for the process and related infrastructure include:

- Construction of bypasses around two local communities and improvement of existing public road access to site
- Construction of the main access road from the existing public road to site
- Preparation of major mining equipment assembly/contractor laydown areas
- Preparation of the construction man camp site
- Installation of the initial phase of the man camp, including associated utilities (e.g., power supply, water, and sewage disposal)
- Purchase and stockpiling of road base aggregates for initial site road construction
- Construction of pioneer roads to areas within the project site for installation of surface water management features to control precipitation runoff and erosion
- Installation of a mobile crushing plant at a site quarry location for production of additional aggregates that are needed for road construction, concrete preparation, drain materials, and ultimately for blasthole stemming when the mine operation begins
- Vegetation removal in the areas for the mine ancillary facilities, process plant, and main haul road platform areas

24.4.2 Critical Paths

After completion of the early construction activities, there are two critical paths. The first critical path for the 36-month construction schedule includes:

- Site preparation (i.e., major earthworks) of the process plant platform
- Installation and commissioning of an onsite concrete batch plant and mixer trucks

- Structural concrete installation for crushing, grinding, flotation, CIL, thickening, and filtration facilities
- Installation of major mechanical equipment (including tankage)
- Completion of the DSTF, including installation of the long distance filtered tailings conveyor, ten semi-mobile conveyors, eight grasshopper conveyors, and the mobile radial stacker
- Piping, electrical and instrumentation installation
- Completion of the 230-kV power supply to site
- Preoperational testing and commissioning.

A second critical path supports the initial mine operation including:

- Completion of mine ancillary facilities (i.e., truckshop/warehouse, fuel storage and dispensing, mine equipment ready lines, and explosives storage)
- Assembly of major mining equipment, as it is delivered
- Initial phase construction of the saprolite storage facility (SSF) and WRSF
- Completion of the main haul road to access the Cangrejos open pit

24.5 Assumptions, Qualifications, and Clarifications

The following assumptions, qualifications, and clarifications apply to the durations of activities and the overall project schedule:

- Early construction activities for non-process infrastructure, as discussed previously, may start prior to the 36-month main construction period, if possible.
- Adequate levels of skilled contractors, labor, and equipment are available within Ecuador.
- The studies, engineering, and permit approval activities for the 230-kV power supply to Cangrejos are started as early as possible during the feasibility study stage of the Cangrejos Project.
- The 230-kV power supply from the national grid is available at least six months prior to the scheduled Project completion.
- For purposes of this PEA, the schedule is based on 50 hours per week. Labor regulations in Ecuador are complex and subject to review and approval by the Ministry of Labor. The current understanding is that employers, such as construction contractors, may utilize standard work weeks in excess of the Ministry of Labor's base standard if all of the employees approve. From discussions with some contractors, a 60-hour work week may be standard in some cases, which has the potential to improve the schedule.
- The work week may be adjusted seasonally based on available daylight and weather conditions. Spot overtime will be utilized, as necessary, to complete critical activities required to maintain the overall Project schedule.
- Higher precipitation than average during the rainy season has potential to adversely impact construction, particularly vegetation removal, road construction, and major earthworks. Activity durations and the overall project completion schedule could be adversely impacted, depending on the frequency, severity, and duration of the precipitation events.

25 INTERPRETATION AND CONCLUSIONS

25.1 Interpretations and Conclusions

25.1.1 Summary

- There are no Mineral Reserves for the Project currently. The information reported in this PEA is preliminary in nature and includes Inferred Mineral Resources that are considered too speculative geologically to have economic considerations applied to them that would enable them to be categorized as Mineral Reserves. Inferred Mineral Resources are based on limited geological evidence and sampling. The tonnage and grade of Inferred Mineral Resources have significant uncertainty as to their existence and as to whether they can be mined economically. There is no certainty that this PEA will be realized.
- The results of this PEA show that the Mineral Resources at the Cangrejos Project are potentially viable with a Net Present Value (NPV) of 16.2% and an Internal Rate of Return IRR) of $1,571 M at a 5% discount rate over a mine life of 25 years processing approximately 640 Mt.
- The life of mine average mill feed grade is 0.556 gpt gold, 0.1% copper, 0.67 gpt silver, and 20 ppm molybdenum. This equates to an average gold equivalent grade of 0.695 gpt.
- The initial capital cost to construct the mine, processing facilities, and required infrastructure is approximately $1,000 M including freight, duties, taxes, contingency, working capital, and VAT.
- The average operating cost over the life of the mine is approximately $11.31 per tonne of material processed.

25.1.2 Resource

- Based on the current level of exploration, the Cangrejos and Gran Bestia deposits contain a total estimated Indicated Mineral Resource of 571 Mt at a grade of 0.57 g/t Au, 0.11% Cu, 0.7 g/t Ag and 21.2 ppm Mo containing 10.4 Moz Au, 1,409 Mlbs Cu, 12.8 Moz Ag and 26.7 Mlbs Mo.
- There is an additional total estimated Inferred Mineral Resource of 500 Mt at a grade of 0.41 g/t Au, 0.08% Cu, 0.6 g/t Ag and 13 ppm Mo containing 6.7 Moz Au, 838 Mlbs Cu, 10.3 Moz Ag and 14.3 Mlbs Mo.
- Mineral Resources are constrained within pit shells and are tabulated at a cut-off grade of 0.30 g/t gold equivalent.
- Mineral Resources are not Mineral Reserves because the economic viability has not been demonstrated.

25.1.3 Mining

- The Cangrejos Project is amenable to conventional, medium-scale, open pit mining methods.

- The production schedule developed for the Project includes seven phases over a 25-year mine life following an 18-month preproduction period.

25.1.4 Mine Geotechnical

- For this Study, it is assumed that through-going, low shear strength, geologic structures (i.e. regional faults) are not present based on current structural interpretations by Lumina and third-party geologists that included field mapping, image analyses, and the inability to correlate structures between borings.
- The detailed statistical evaluation of a comprehensive database of rock quality parameters led to the conclusion that rock quality is high, is not spatially variable to any significant extent, and is not lithologically controlled.
- Saprolith deposits (saprolite over saprock) were assumed to have combined thickness to a maximum of 40 m based on borehole intersections and to have exhibited historical instability probably related to precipitation.
- Pit slope designs incorporated groundwater levels that were assumed to be high in both the bedrock and saprolith due to predicted limited natural drawdown in response to pit excavation.

25.1.5 Metallurgy

- Metallurgical test data shows that economically viable metal recovery processes are available for samples taken from Cangrejos and Gran Bestia.

25.1.6 Process and Infrastructure Design

- The process and infrastructure design that has been completed as the basis for this PEA is a conceptual design that has been completed to a scoping-level of accuracy. Unit operations have been optimized and/or added based on the new understanding to the resources at Cangrejos and Gran Bestia. This includes HPGR comminution, addition of sand flotation and cyanide leaching to increase gold recovery and more detailed conceptual designs and associated more accurate cost estimates for tailings filtration and overland conveying of both crushed rock and the filtered tailings.

25.1.7 Geotechnical

Seismicity

- Based on a review of the available technical literature, Ausenco concluded that the seismicity in the Cangrejos project area is controlled mainly by the crustal background seismicity within the coastal zone, as well as intra-slab seismicity.
- In accordance with the review and the Ecuadorian Construction Code (ECN), Ausenco recommends using a design PGA of 0.40g for 1:475 yr and 0.61g for 1:2,475 return periods measured in soils of type C-D for project infrastructure in accordance with international design standards.

Geotechnical Investigation

- A geotechnical program was performed in 2019 including test pits and boreholes along with the collection of soil and rock samples, laboratory testing and geotechnical surface mapping and geophysical investigations to understand the foundation conditions for the Plant Site, Primary Crusher area, Waste Rock Storage Facility (WRSF), Haul Road, Dry Stack Tailings Facility (DSTF), and Saprolite Storage Facility (SSF).
- The information was used to develop the conceptual designs for the site infrastructure. Data for the DSTF area was incomplete due to permitting issues and the final general layout of the infrastructure changed. Therefore, additional geotechnical investigations are required.
- Geochemistry work to date indicates that tailings, waste rock, saprolite, and saprock are non-acid generating based on results of acid-based accounting, paste pH testing and short-term barrel leaching tests. The tailings and waste rock contain low concentrations of sulfide sulfur and naturally-occurring minerals that are net neutralizing. Therefore, runoff should not produce any constituents of concern except for potential sediment that will be captured in sediment ponds directly below the DSTF and WRSF.

Dry Stack Tailings Facility

- Ausenco evaluated disposal technologies and storage sites. Applyjng safety, terrain and land usage criteria the selected technology is filtered tailings. The site for the DSTF is located 2.1 kms from the plant site and was selected based on location and stable terrain deemed ideal for such infrastructure. The site has storage capacity to provide secure and permanent storage of 640 Mt of filtered tailings.
- The filtered tailings will be transported to the DSTF by overland conveyor and stacked using portable conveyors, radial stacker and dozers and compactors in thin lifts to improve stability of this facility. In addition, the filtered tailings surface will be compacted and raincoats will be installed to reduce rain infiltration and erosion. The conceptual design for the facility uses bottom up construction along with an extensive underdrain system to capture near surface groundwater and seepage. The facility was designed in accordance with Canadian Dam Association (CDA) 2014 guidelines.
- Based on the geotechnical parameters that were determined by laboratory testing and the DSTF configuration, an operating dry stack facility with an overall slope of 3.25:1 (H:V) was designed. Stability analyses were performed and the design has an adequate factor of safety (i.e., greater than 1.3). In addition, the ultimate facility has an acceptable long-term factor of safety greater than 1.5 and a pseudo-static factor of safety greater than 1.0.

Waste Rock Storage Facility

- The WRSF and SSF are designed to provide secure and permanent storage of approximately 728 Mt of non-economical waste rock and overburden (i.e., saprolite and saprock). The WRSF is scheduled to be constructed in multiple phases, initially from the top down to create the WRSF haul road and then from the bottom up to improve stability. During the initial years, the saprolite and saprock will be stored in a separate facility until the ratio of transitional and fresh rock to saprolite and saprock is greater than 7:1. This concept keeps the saprolite and saprock away from the toe areas of the WRSF and provides the necessary stability. This facility was designed in accordance with international waste rock storage guidelines. The facility has an extensive underdrain system to capture near surface groundwater and seepage.

- Based on the geotechnical parameters that were determined by laboratory testing and the WRSF and SSF configurations, stability analyses were performed and both facilities were found to have an adequate factor of safety (i.e., greater than 1.3). In addition, the ultimate combined facilities have acceptable long-term factors of safety greater than 1.5 and a pseudo-static factor of safety greater than 1.0.

25.1.8 Water Supply

- Because the Project is in an area with a net positive water balance and abundant surface water resources, there is sufficient water to supply the operations.

25.1.9 Geochemistry

- Geochemical analyses that have been completed to date, indicate that the waste rock, dry stack tailings, and post-closure pit wall material is non-acid generating and the water quality from mine waste leachate or supernatant is sufficient for direct discharge to the environment after sedimentation but without further treatment.

25.2 Risks and Opportunities

25.2.1 Risks

Resource

- There are no known factors related to environmental, permitting, legal, title, taxation, socio-economic, marketing, political or other relevant factors which could materially affect the Mineral Resources estimate contained in this Report.
- Mineral Resources in the Inferred category have a lower level of confidence than that applied to Indicated Mineral Resources, and, although there is sufficient evidence to imply geologic grade and continuity, these characteristics cannot be verified based on the current data. It is reasonably expected that most of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.

Mining

- Inferred Mineral Resources that are included in the mine plan have the potential to be a risk or an opportunity. Inferred Mineral Resources are speculative and may or may not exist. Half of the material included in the production schedule from Gran Bestia and 46% of the material planned for mining during the last ten years are in the Inferred Mineral Resource category. Additional drilling is required to determine if the resources can be converted into the Indicated Mineral Resource category.

- The thickness of the saproliths (i.e., saprolite and saprock) is not well defined for the northern portions of the pit. The thickness has a potential impact on the pit geometry and overburden movement during the early mine life. Better definition of the saprolith is required to reduce risks associated with determining the final pit wall early in the mine life.

Mine Geotechnical

- **Rock Mass Quality***:* Based on an evaluation of all available information, this PEA assumes a uniform, high-quality rock mass for all slopes. Should there be spatial variation in rock mass quality, as yet undetected, slope inclinations could potentially require flattening. The probability of this outcome is considered *low*.
- **Major Structures***:* Persistent, low-shear strength faults with adverse orientations often control pit slope design inclinations. No such features have thus far been identified, but a targeted subsurface investigation and ongoing structural interpretation specific to each wall is required to discount their presence. The probability of this outcome is considered *low*.
- **Saprolith***:* Site reconnaissance and explorations of the steep areas upslope and north of the pit crests for Cangrejos and Gran Bestia have been limited due to the current lack of access. An exploration road is required across this area so that the thickness and nature of the saprolite and saprock deposits can be determined. This potential risk is categorized as *moderate*, but with the caveat that engineered design features should enable mitigation of this risk.
- **Geotechnical Characterization***:* The evolution of the pit design from the 2018 version to the 2020 version enlarged the Cangrejos Pit with the consequence that previously planned geotechnical boreholes do not provide optimal coverage to critical areas of the ultimate pit walls. Further, while considerable exploration drilling at Gran Bestia indicates consistency with Cangrejos, no geotechnical drilling has been undertaken specific to the Gran Bestia deposit. This means that undetected geologic conditions or features may be present that have not been accounted for in the present slope designs. This potential risk is categorized as *moderate*, but the PFS and FS programs will provide opportunities to ameliorate this risk.

Metallurgy

- There is a risk that production of molybdenum concentrate may not be economic after samples that more nearly represent the molybdenum grades in the updated mine plan are tested.

Process and Infrastructure Design

- The primary risk to the process and infrastructure designs is that they may be required to change again as the Cangrejos deposit is expanded and the Gran Bestia deposit is better understood due to delineation drilling, as it did between the 2018 Scoping Study and this PEA.
- The 2019 site wide geotechnical investigation did not provide optimal coverage of mine infrastructure due to changes in the size and location of facilties. Additional geotechnical investigation for the WRSF, SSF, plant site and DSTF is required to provide facility specification foundation characteristics to better define foundation requirements and recommendations. This potential risk is categorized as low, but

the PFS and FS programs will provide opportunities to develop engineering solutions, if required.

- Additional geotechnical testing of the tailings is required to better define the geotechnical parameters for development of the DSTF due to the proposed height of this facility and to ensure long term stability. This potential risk is categorized as low, but the PFS and FS programs will provide opportunities to develop engineering solutions, if required.

Water Supply

- Recently collected site meteorological and hydrological data substantially lowers the water supply risk in comparison to the 2018 PEA. However, permitting challenges may exist with regards to utilization of surface water sources.

Geochemistry

- Geochemical testing in Gran Bestia was not as widespread as the testing performed in the area of the Cangrejos pit. The lower concentration of acid-consuming materials in Gran Bestia indicate that there is slightly higher potential for acid rock drainage (ARD) from waste rock in the Gran Bestia deposit than from the Cangrejos deposit. However, it is unlikely that the material will become potentially acid generating (PAG) due to the low sulfide and residual carbonate concentrations so this is considered to be a low risk.

Pit Dewatering and Pit Slope Depressurization

- Pit dewatering and pit slope depressurization may be more expensive and less effective than estimated in this PEA. Additional hydrogeologic characterization and modeling is required to determine the final necessary spacing and penetration depth of pit slope depressurization borings.

Upper Pit Sumps and Saprolite Slopes

- The sumps located above the Cangrejos pit are conceptually designed as lined embankments that are constructed from low permeability fill and include an emergency spillway. The sumps are not expected to overtop; however, in the event of high intensity or long duration storms occurring during pump failure, or other failure, the sumps may overtop and runoff into the Cangrejos pit. Cascading water along the pit slopes in the saprolite zone can cause a significant threat to pit stability. The probability of this occurring can be reduced through the use of bigger sumps, spillway pipelines to the bottom of the pit, and/or the avoidance of the saprolite zones.

Environmental and Social

- Sedimentation risks resulting from the presence of fine-grained saprolitic soils can be mitigated by larger sedimentation ponds, flocculant, and other management tools. Erosion control best management practices must be applied through the site to any impacted ground to minimize the mobilization of sediments (GRE 2019).
- The Project must begin to prepare to manage safety issues and community concerns related to road usage and transportation of materials, reagents, explosives and equipment. In addition, some stretches of road may eventually have to be modified to provide bypasses, allow for increased traffic, or address pinchpoints.

- Updated social data must be taken into account in developing the Project's long-term community relations strategy to be based on representative demographic information, especially if the Project's social AOI expands to include more communities. The Project will also have to manage expectations for employment and business opportunities, especially in the local cantons. Lastly, project development will have to consider the long-term effects of COVID-19. During the course of the pandemic, Odin has worked hard to provide information, food, sanitary, and personal and protective equipment (PPE) supplies and other forms of support as needs arise.
- There is a risk that the Project will be unable to purchase or secure control over all of the land it needs to carry out its operations or that it may have to do so at much higher prices than projected.
- Owing to ongoing evolution of the Project a possibility exists that the current surface water sampling program is not sufficiently representative of background or potential Project impacts in the watershed areas.
- There is risk to biodiversity in the event of delays in the establishment of biodiversity offset areas and related measures until the start of construction.

25.2.2 Opportunities

Resource

- The Cangrejos deposit remains open to expansion with further exploration to the west and at depth.
- The Gran Bestia deposit remains open to the north, west, and at depth.

Mining

- Depending on the outcome of additional delineation drilling, conversion of Inferred Mineral Resources to Indicated Mineral Resources has the potential to be an opportunity as well as a risk.
- Depending on the outcome of additional drilling and geotechnical evaluations, better definition of the saprolith also has the potential to be an opportunity.

Mine Geotechnical

- **Overall Slope Optimization:** There is an inverse relationship between ultimate slope height (or pit depth) and maximum achievable overall slope angle. The current design employs two inter-ramp angles dependent on the presence or absence of structural control for bench face angles but irrespective of overall slope height. The opportunity exists for steeper inter-ramp and toe-to-crest slope angles for the lower height walls on the south and west sides. The probability of this realization is estimated as *moderate*.
- Bench Face Optimization: The BFAs recommended herein have been reconciled with structural fabric for the Cangrejos Pit. The requisite data for Gran Bestia is non-existent. Given the inferred good quality rock mass and the inferred dominance of steep, large-scale intrusive structures, there is a *low to moderate* probability that BFA values could be increased. This would probably require specialized drilling and blasting procedures but could be a component of improved

rockfall control. Such design changes are subject to confirmation of structural fabric and to a cost-benefit analysis incorporating increased mining costs.

Metallurgy

- Additional metallurgical testing may identify cost saving and/or improved metal recovery options. For example, if higher metal recoveries are achieved or more of the gold reports to doré, the economics improve due to higher payment terms and faster payments.

Water Supply

- Water SupplyAdditional pond capacity can be constructed to manage any risk related to an interruption in the water supply. Interruptions could be from mechanical failure. It is important to note that extreme drought is already considered in the existing project design.
  - A hydrogeologic study needs to be performed to identify potential for additional groundwater supply.
- Groundwater from the pits or from local groundwater sources may make surface water utilization unnecessary.

Environmental and Social

- There are several options to reduce long-term transportation risks, including:
  - Development of a comprehensive transportation safety management plan
  - Optimization of heavy vehicle traffic routing and convoy design
  - Logistics planning and coordination
  - Preparation of documented emergency preparedness and response protocols and mock drills/training programs
  - Transporter licensing/certification requirements
  - Potential roadway and transportation infrastructure expansions and upgrades
- The Project can continue to build constructive relations with local stakeholders through dialogue, as well as start to prepare some of them to be able to take advantage of the opportunities that the Project and a more formal economy will generate in terms of direct employment, contracting for goods and services, improved public infrastructure, and other potential benefits.
- The Project can continue its efforts to acquire or secure control over surface areas needed to advance development objectives.
- The Project can refine its surface water monitoring program and develop a more detailed characterization of background conditions up- and down-gradient from areas that will be disturbed during the construction and operation of the mine.
- The Project has time to take measures needed to protect local biodiversity, including establishing offset areas. Doing so early in the process, will make them increasingly viable and effective during the construction, operational, decommissioning/closure, and post-closure phases of the Project.

26 RECOMMENDATIONS

26.1 Overall Recommendation

Since this Study results in a positive economic return for the Cangrejos Project, the study team recommends that the project be advanced to a Prefeasibility Study (PFS). The total estimated cost to complete the work is approximately $12.0 M.

An summary of the estimated costs is provided in Table 26-1.

TABLE 26-1: COST ESTIMATE

Description	Estimated Cost (US$ 000)
Project Management	418
Resource Drilling	6,073
Resource Estimation and QA/QC	54
Mine Design	200
Mine Geotechnical Drilling	208
Mine Geotechnical	250
Structural Modeling	60
Metallurgy	405
Metallurgical Oversight	56
Process & Infrastructure Engineering	780
Engineering Design Oversight	48
Geotechnical	539
Hydrogeology, Geochemistry, Surface Water Management, Environmental Management, and Water Balance	463
Marketing/Transportation Update	50
Environmental	445
Power Supply Update	30
General and Administrative	70
Subtotal	10,148
Contingency (15%)	1,522
Total to Complete a Prefeasibility Study	11,670

26.2 Recommendations from Individual QPs

26.2.1 Resource Estimate

Delineation Drilling

Sim recommends additional delineation drilling to upgrade the current Inferred Mineral Resources to Indicated Mineral Resources so they can be used in a PFS.

For Cangrejos, 51 holes totalling 15,370 m are recommended. The total estimated cost at Cangrejos is approximately $3.7 M.

At Gran Bestia, 34 holes totalling 7,835 m for a total cost of approximately $1.9 M are recommended.

Exploration Drilling

Additional drilling is also recommended to expand the resources at depth by entering the existing drill holes in the center of the deposit and extending them from the current depth of 500 m by an additional 150 m to 250 m. Four holes consisting of 700 m of drilling are recommended at Cangrejos. The total estimated cost is approximately $168,000.

One deep (i.e., 1,200 m) “wildcat” hole in Cangrejos is also recommended to test for possible high-grade mineralization below the existing resource. The estimated cost is $ 360,000.

Since both a geophysical analysis and a geochemical analysis indicate that the Cangrejos deposit may continue in the west/southwest direction, an additional six 500-m deep, exploration drill holes on 200-m spacing are recommended. This totals 3,000 m of drilling for an estimated cost of $ 900,000.

At Gran Bestia, extending one hole that was terminated in significant mineralization by 200 m is recommended. The total estimated cost is $ 48 k.

26.2.2 Mining

IMC recommends additional drilling to upgrade the Inferred Mineral Resource to Indicated Mineral Resources. During this drilling IMC recommends that additional geotechnical information be gathered to better define the saprolite/saprock interface with the fresh rock. The cost of the IMC recommendations is included in the costs for delineation drilling and the mine geotechnical recommendations.

IMC also recommends completing a PFS in order to convert the Mineral Resources to Mineral Reserves. The estimated cost to complete the mine design work is approximately $ 200,000.

26.2.3 Mine Geotechnical

W&N recommends the items in this section to improve information needed for the pit slope designs.

26.2.4 Geotechnical Drilling

A six-hole 2800-m program is recommended and is comprised of two holes in the Cangrejos deposit on Sections 5 and 6. Four holes are recommended in the Gran Bestia deposit of which two holes are on Section 1 on the north wall and one hole each on the east and west walls. It is estimated that four of the six proposed geotechnical holes will intersect porphyritic rock types and will therefore serve as dual purpose infill holes for resource definition. All holes are to be televiewer logged and core should be geotechnically logged at the drill sites. Strength profiling by point load testing should also be continued, as per the current practice at the Project. The televiewer logging and standby costs are estimated to cost approximately $ 63,700. The estimated cost for drilling and core logging is approximately $174,000.

Surficial Mapping

It is recommended that an access road be constructed upslope of the planned pit crest for bothpits, specifically the north and east walls for Cangrejos and the north wall for Gran Bestia. Road cut mapping should be supplemented by test pit excavations. The information should be used to refine the saprolith thickness maps and to update engineering properties of the rock based on laboratory testing. Geophysical surveys should also be considered to supplement the saprolith thickness database. The estimated cost for surficial mapping is approximately $ 50,000. The estimated cost for the road construction is approximately $20,000.

Laboratory Testing

Laboratory testing, including moisture content, gradation, triaxial strength, Atterberg limits, and density, should be performed to classify the saprolite. Also the site specific relationship between point load strength and unconfined compressive strength should be refined and shear strength tests should be conducted to determine the basic friction angle for major rock types. The estimated cost for the laboratory testing is approximately $15,000.

Structural Modeling

The structural model should be updated to incorporate all new drilling available at the time the PFS is completed. Borehole fault intersections should be traced for continuity to determine if structural control is present in the pit walls of either pit. The cost for updating the model is approximately $60,000. The cost for reviewing the model is estimated to be approximately $10,000.

Rock Engineering Analyses

After the new data is available, the rock engineering analysis should include:

- Update the structural fabric database to incorporate both the Cangrejos and Gran Bestia pit areas. Evaluate the data for spatial variation and/or lithologic correlations.
- Update the rock mass geomechanical parameters and revise design values, as required.
- Update saprolith geomechanical parameters and spatical distribution of saprolith thickness. Evaluate hazard posed by upslope saprolith deposits relative to pit crests and design conceptual mitigation measures accordingly.
- Perform slope stability analyses to optimize design for each wall for both pits.
- Retain an expert geotechnical review board to provide guidance as to best practices for pit slope design in high-relief, tropical settings.

The estimated cost for the rock engineering analysis, including the expert review board, is approximately $ 150,000.

26.2.5 Metallurgy

Metallurgical Samples

A detailed analysis of the metallurgical samples that have been tested to date in relationship to the updated resource model is recommended. The analysis should include an evaluation of the grade distribution of the Cangrejos and Gran Bestia deposits within the areas to be mined and the proportions of the three lithologies contained within the areas. Based on the results, additional samples should be collected and composited to represent the results of the evaluation taking care to ensure that the head grades, particularly for gold, copper, and sulfur are representative of the resource and that sufficient dilution material is contained in the samples. The estimated cost to license the software and complete the work is approximately $ 9,000.

Metallurgical Test Work

Additional testing is recommended to provide data needed to complete a trade-off study as to whether gravity gold recovery should be included in the process flowsheet or not and to evaluate the best means of treating the gravity concentrate.

Additional test work is recommended to provide more information about copper-molybdenum separation. The work is required to estimate the molybdenum recovery and to confirm the process design criteria and the costs associated with making the separation.

To support a PFS that meets industry standards, additional work is recommended with regard to gold adsorption onto activated carbon particularly given the low gold grades of the material that will potentially be leached and recovered in the cyanide leaching circuit. Recommended testing includes leaching kinetics tests, gold loading tests, and carbon elution tests. The data collection should support an evaluation as to whether to use carbon-in-leach (CIL) or carbon-in-pulp (CIP) gold extraction and recovery.

Future metallurgical testwork should include some tests that are conducted with water from the site. This is particularly important in preparing tailings samples that will be used for environmental and geochemical testing.

In order to determine if the sand flotation circuit can be reduced in size or potentially eliminated, flotation tests to compare flotation recoveries by extension of rougher flotation time to the current sand flotation of coarse rougher flotation tailings is recommended.

Additional testing is recommended to investigate the buildup of gold inventory in the cleaner flotation circuit and the use of depressants to maximize gold deportment to the cyanide leaching circuit and copper to the flotation concentrate.

Additional flotation tests are recommended using blends of Cangrejos saprolite, saprock, partially oxidized rock, and fresh rock to reflect the blend anticipated during the first several years of processing.

Additional flotation tests are recommended using blends of Cangrejos and Gran Bestia material to reflect material planned for mining in later years.

Bond ball mill work index tests are recommended for the composite samples.

The estimated cost to complete the test work is approximately $ 395,000 and the cost of oversight is approximately $ 56,000.

26.2.6 Processing

Trade-off Studies

AKA is responsible for the processing recommendations. Three trade-off studies are recommended during the PFS. First, a trade-off study should be completed to determine whether gravity concentration should be included in the process design or not and to evaluate the best treatment method for gravity concentrate. Second, a detailed study should be performed to optimize the gold extraction/gold recovery circuit. The current CIL circuit contains high quantities of activated carbon that results in high gold inventories in the processing circuit, which is not ideal. Third, a trade-off study should be completed to confirm the economic viability of including molybdenum recovery in the process design.

Engineering Design Requirements

Evaluate the impact of saprolite and saprock on the comminution circuit, particularly secondary crushing and HPGR. Refine the design as required. The cost for the engineering is estimated to be $780,000. The cost for coordintation and metallurgical oversight of the engineering is approximately $48,000.

26.2.7 Geotechnical

Ausenco makes the following recommendations to support a PFS.

Geotechnical Investigation

The following recommendations are made for geotechnical site investigation work.

Completion of seven 250-m geotechnical boreholes, 26 test pits, and geophysics in the areas of the DSTF, WRSF, SSF, plant site, overland conveyors, haul roads, and ancillary roads to investigate and confirm foundation conditions, specifically the extent of the saprolite and colluvium along with depth to groundwater and to bedrock.

- Fifteen test pits and drilling of four 80-m boreholes to confirm suitability and quantity of borrow materials for infrastructure construction.
- Additional laboratory index testing, including compaction tests, mechanical strength tests, and permeability tests on foundation soils and potential borrow materials.
- Laboratory testing to confirm the physical characteristics of the filtered tailings, including strength, trafficability, and permeability tests at both low and very high confining stresses to represent the height of the DSTF.
- Using the new data, recommend designs for foundations, borrow sources, construction materials for infrastructure, and tailings and waste rock storage facility exterior slope configurations.

The estimated cost is approximately $ 293,500 including the drilling and excavator rental.

DSTF, WRSF, SSF, Mine Roads, and Plant Platform Design and Analysis

- Acquire additional satellite imagery to fill in additional topography below the plant site, the access road from Valle Hermoso to site, and below the DSTF.
- Perform deterministic and probablistic local seismic hazard study for the development of design seismic for infrastructure.
- Review and update meteorological and hydrology information, updating surface water and sediment management for the DSTF, WRSF, SSF and mine roads.
- Confirm geochemical characteristization of tailings and waste rock from additional waste characterization studies.
- Develop seepage predictions and seepage control measures for the DSTF, WRSF and SSF.
- Update the tailings and waste rock deposition strategy to optimize material handling, including trafficability of material handling equipment for the DSTF.
- The stability model should be reviewed and updated, as required, with consideration of the final stacking plan using updated data about the material properties of the waste rock, tailings, and the foundations for both the DSTF and WRSF.
- Perform a liquefaction assessment with consideration of updated information on material properties and the updated stacking plan for the DSTF.
- Solicit budgetary quotes for earthworks and geosynthetics (i.e., geomembrane, geotextile, and piping) to get more accurate pricing for the next cost estimates.
- Develop cost estimates (i.e, capital, sustaining capital, and operating costs) for DSTF, WRSF, Haul Road, Mine Roads, and Plant Site Platform.

The estimated cost for the recommended work is approximately $ 245,030.

26.2.8 Hydrogeology, Geochemistry, Surface Water Management, and Environmental Management, and Water Balance

GRE makes the following recommendations to support a PFS.

Pit Hydrogeology

A hydrogeologic investigation of the Gran Bestia pit that is similar to the work completed at Cangrejos is recommended. The program should include:

- A packer testing program conducted in geotechnical bore holes is recommended. Packer testing isolates a specific interval of the boring and injects water into the interval to quantify the hydraulic conductivity of the rock mass.
- Additional aquifer testing of the saprolite and saprock formations is recommended. This information is essential to complete a conceptual design the pit slope depressurization borings.
- Vibrating wire piezometers (VWPs) should be installed in the open pit areas and under the future pit highwalls. VWPs are sensors that measure pit water levels at a specific depth and location within the rock mass. They can be used to determine the water level behind a pit high wall or to help determine if a rock fracture carries hydrostatic pressure that will result in artesian water flows.
- A three-dimensional groundwater model is recommended to estimate the volume of water and potential effectiveness of the conceptual dewatering design. The model should focus on the slope stability and must have sufficient detail to simulate the

horizontal pit dewatering boreholes. It can also be used to determine groundwater impacts from the Project.

The estimated cost is approximately $181,300. The cost of drilling is included in the geotechnical drilling program.

Geochemistry

An expanded geochemistry program is recommended to support a PFS. Additional samples, particularly from the Gran Bestia pit area should be collected and sampled. The following geochemistry program is recommended in order to meet internationally-accepted standards for geochemistry testing as described by INAP (2009).

- Approximately 50 additional static testing samples of waste rock in the Gran Bestia pit
- Continue the existing onsite kinetic cell testing for waste rock
- Continue humidity cell testing for tailings (i.e., two samples, run for a year)
- Additional samples of the tailings produced during execution of the PFS metallurgical testing

The estimated cost is approximately $61,600.

Surface Water Management

GRE recommends adjusting and expanding the surface water sampling program to take into account the current understanding of the program. The estimated cost for the expanded program is approximarly $65,000.

GRE recommends that additional testing and analysis is required to meet PFS standards for a surface water management plan (SWMP), including the following:

- Continued monitoring of rainfall and stream flow using the existing surface water monitoring infrastructure and methods
- Additional surface water monitoring infrastructure within the watershed for the dry stack tailings facility (DSTF)
- Identification of saprolite zones within and around the pit areas
- Sedimentation sampling
- Sedimentation pond design based on sedimentology and testing
- Geotechnical drilling at sediment pond locations including laboratory testing of samples collected during drilling
- Stability analysis of the subsurface and cut slope for diversion channels included in the conceptual designs

After the additional data is collected, the SWMP should be re-designed and calibrated against field measurements of the surface water flows. The estimated cost is approximately $65,000.

Environmental Monitoring

In order to support permitting requirements and to meet international standards for a PFS, the following environmental monitoring is recommended.

- Drill additional groundwater wells and complete aquifer testing
- Continue data collection from meteorological stations
- Install air quality monitoring sensors to support open pit operations

- Install ambient noise monitoring sensors

The estimated cost, including drilling is approximately $140,000.

Water Balance

After the recommended three-dimensional groundwater model is completed and additional data is collected, the site-wide water balance should be updated and revised as necessary. GRE further recommends adding a mixing model and a sedimentation model to the water balance model. The additions will allow evaluation of the water quality and concentrations of total suspended solids. The results will confirm whether it is safe to discharge water without treatment and mitigate potential risks associated with the requirement for treatment beyond sedimentation.

The estimated cost to update the water balance is approximately $20,600.

Water Supply

The revisions to the water balance are expected to de-risk the project water supply. Furthermore, groundwater modeling described above (see Pit Hydrogeology), a revised water balance, and further hydrogeologic characterization will provide essential insight to the feasibility of supplying the mine requirements with groundwater.

Closure Planning

The conceptual closure plan should be updated to incorporate the new information. The estimated cost is approximately $23,400.

26.2.9 Environmental and Social

Social Baseline Study

A social baseline study is recommended to examine the results of the 2020 census, the effects of the Covid-19 pandemic, and other factors on the expectations and concerns that local community residents, regulatory authorities, and other external stakeholders may have with respect to the future of the Project. The estimated cost to complete the study is approximately $75,000.

Strengthening the Community Relations Program

It is recommended that the Project continue to develop and strengthen relations with the communities through ongoing communications and implementation of management plans and social programs that support local development needs and target different segments of the populace (e.g., children, mothers, farmers, aged). Specific tasks within the effort should include:

- The Project's stakeholder map is regularly updated, however external support from consultants for a more extensive and detailed evaluation should be conducted prior to undertaking an FS.
- The Project should continue to refine and implement its stakeholder engagement plan and social programs in anticipation of and in response to changes in the project's profile and related expectations.
- The Project should continue to make targeted efforts to maximize sourcing from local providers. In the near term, work can be done to continue to identify existing and potential providers as well as opportunities and requirements. Over time, the Project

should make it a priority to help these entities and individuals to close identified gaps in order to enable their participation in the Project benefits. This should be a progressive program that evolves and expands as Project needs, prospects, and profile change.

Land Acquisition Program

It is recommended that the Project develop, implement and evaluate a sustained program to identify and purchase or otherwise secure long-term access to lands needed for infrastructure, buffers, biodiversity, or other purposes.

Implementation of Biodiversity Monitoring and Management Plan and Focused Reforestation/Revegetation Program

It is recommended that the Project begin to implement a basic Project Biodiversity Monitoring and Mangement Plan (BMMP) with the goal of increasing the ecological value of certain modified habitat areas that can serve as ecological corridors or offsets. A focused reforestation/rehabilitation program would be undertaken in land areas that are not expected to be further disturbed by mining using an appropriate mix of species.

Annual direct costs for BMMP implementation and a focused reforestation/revegetation program over the next five years are estimated to be approximately $30,000 for a total of $150,000.

27 REFERENCES

Brepsant, Michel Rowland, 2016, Cangrejos Gold-Copper Project, Ecuador NI 43-101 Technical Report, Prepared for Odin Mining & Exploration Ltd., September 16, 2016.

Brepsant, Michel Rowland, Sim, Robert, and Davis, Bruce 2017, Cangrejo Gold-Copper Project, Ecuador NI 43-101 Technical Report, Prepared for Lumina Gold Corporation, March 6, 2017.

Candian Dam Association, 2007 (2013 Edition), Dam Safety Guidelines 2007, 2013

Canadian Dam Association, 2007, Technical Bulletin – Geotechnical Considerations for Dam Safety, 2007

Canadian Institute of Mining, Metallurgy and Petroleum, 2003, Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines, November 2003.

Canadian Institute of Mining, Metallurgy and Petroleum, 2014, CIM Definition Standards for Mineral Resources and Mineral Reserves, May 10, 2014.

Canadian Institute of Mining, Metallurgy and Petroleum, 2019, Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines, November 29, 2019.

Carter, N.C., 1981, Porphyry Copper and Molybdenum Deposits, West-Central British Columbia, BC Ministry of Energy, Mines and Petroleum Resources, Bulletin 64, 1981.

Cox, D.P., Singer, D.A., Rodriguez, E.A., 1987, Mineral Deposit Models, USGS open file report, 87-48, 1987.

Ecuadorian Ministry of Mines, 2015, General Regulation of the Mining Law, issued by DE No. 119 November 4, 2009, published in RO Supplement No. 67 November 16, 2009, Quito, Ecuador, Ministry of Mines, last updated January 31, 2019.

Encom Technology, 2007, Greater Cangrejos Project – Ecuador – Data Interpretation, Internal Lumina report and data package, 2007.

EPTEC, 2020, Lumina Gold/Odin Mining Cangrejos Project Electric Energy Supply Study for the Mining Project “Cangrejos,” April 19, 2020.

Gordon, C., Rowe, T., 2019, Lithological Modelling of Cangrejos & Gran Bestia, Ecuador, Unpublished internal report, 2019.

GRE, 2019a, HydroCAD Modeling Methodology, 2019.

Hawley, P.M. Cunning, J., 2017, Guidelines for Mine Waste Dump and Stockpile Design, CRC Press, May 2017.

H&H Metals Corp, 2020, Cangrejos Market Study for Lumina Gold Corp., April 1, 2020.

Independent Mining Consultants, 2019, Internal figures, 2019.

Infomine USA, Inc., 2019, CostMine Mine Cost Estimating, An Estimator’s Guide, 2019.

Instituto Nacional de Estadisticas y Censos (INEC), 2010, Censo de Población y Vivienda, 2010.

Instituto Nacional de Investigación Geológico Minero Metalúgico (INIGEMM), 2017, Geológica Santa Rosa de El Oro, escala 1:100,000, 2017.

Lumina, 2017, Internal company documents, 2017.

Lumina, 2018, Age dating, Internal company document, 2018.

Lumina, 2019, Internal company documents, 2019.

Marinos, V., Marinos, P. and Hoek, E. (2005). The geological strength index; applications and limitations. *Bull Eng Geol Environ*, 64: pp. 55 – 65.

Mayor, J.N. Soria, F., 2000, Cangrejos Project, El Oro Province, Ecuador, Unpublished internal Newmont Company report, 2000.

Newmont Metallurgical Services, 1999a, Metallurgical Study for Cangrejos (Ecuador) Ores – Progress Report 1 – NMS Project No. 11802, September 30, 1999.

Newmont Metallurgical Services, 1999b, Metallurgical Study for Cangrejos (Ecuador) Ores – Progress Report 2 – NMS Project No. 11802, November 3, 1999.

Newmont, 2001, Information package on the Cangrejos area, El Joven Joint Venture, 2001.

Odin, September 1999, Press Release

Odin, December 1999, Press Release

Odin, January 2012, Press Release

Odin, April 2012, Press Release

Odin, June 2012, Press Release

Odin, 2015, Press Release

Plenge, C. H., 2015, Metallurgical Investigation No. 16596-99, Odin Mining and Exploration Ltd., Cangrejos Project, Progress Report, November 11, 2015.

Plenge, C. H., 2018a, Report of Investigation No. 18412-13, Lumina Gold, Cangrejos Project, Comminution, Head Assays and XRD, May 8, 2018.

Plenge, C. H., 2018b, Report of Investigation No. 18417-19, Lumina Gold, Cangrejos Project, Saprolite, Sap-Rock and Oxide Screening Tests, Gravity, Cyanidation and Flotation, June 12, 2018.

Plenge, C. H., 2018c, Report of Investigation No.18278-81, Lumina Gold, Cangrejos Project, MET 2017-01, -02, -03, and -04, Comminution, Gravity, Cyanidation and Flotation, July 10, 2018.

Plenge, C. H., 2019, Report of Investigation No. 18417, Lumina Gold, Cangrejos Project, Primary Optimization and Variability; Oxide and Saprock Progress Report, October 2019.

Plenge, C. H., 2020, Report of Investigation No. 18529, Lumina Gold, Cangrejos Project, Cangrejos and Gran Bestia Deposits, Variability and Flotation Piloting Progress Report, June 2020.

Pocock Industrial Inc., 2020, Sample Characterization & PSA, Flocculant Screening, Gravity Sedimentation, Pulp Rheology and Pressure Filtration Studies, January 2020.

Potter, M., 2004, Summary Report on the Greater Cangrejos Property, Southwest Ecuador, Mineral Concessions Los Cangrejos, Cangrejos Uno, Cangrejos Dos, Cangrejos Cuatro, Cangrejos Cinco, Estero Zapato and Tadao, Prepared for Odin Mining and Exploration Limited, May 27, 2004.

Potter, M., 2010, Summary Report on the Greater Cangrejos Property, Southwest Ecuador, Prepared for Odin Mining and Exploration Limited, December 1, 2010.

Pratt, W., Gordon, C., Rowe, T., 2018, Mineralization at Los Cangrejos, Ecuador, Unpublished internal report, 2018.

Read, J. and Stacey, P., 2009, Guidelines for Open Pit Slope Design, CSIRO Publishing, 2009.

Rose, N.D., Scholz, M., Burden, J., King, M., Maggs, C., and Havaej, M., 2018, Quantifying transitional rock mass disturbace in open pit slopes related to mining excavation. XIV Congreso Internacional de Energia y Recursos Minerales. Slope Stability 2018. April 10-13, 2018. Seville, Spain.

Rose, W., Breckenridge, L., Sim, R., Davis, B., Michel, R., King, N., Norrish, N., Elfen, S., 2018, Cangrejos Gold-Copper Project, Ecuador, NI 63-101 Technical Report Preliminary Economic Assessment, August 10, 2018.

Rossi, M. and Deutsch, C., 2014, Mineral Resource Estimation, Springer, New York, NY, 2014.

Rucci, 2019, FLSmidth Testing, Lumina Gold – Cangrejos, HPGR and Comminution Suite, July 1, 2019.

Sim Geological, 2019, Internal figures, 2019.

Sim, R., and Davis, B., 2017, Cangrejos Gold-Copper Project, Ecuador, NI 43-101 Technical Report, December 15, 2017.

Sim, R., Davis, B., and King, N., 2019, Cangrejos Gold-Copper Project, Ecuador, NI 43-101 Technical Report, December 12, 2019.

Tannant, D., Regensburg, B., 2001, Guidelines for Mine Haul Road Design, 2001.

United States Environmental Protection Agency, 1994, Method 1312: Synthetic Precipitation Leaching Procedure, part of Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, September 1994.

Zahn, 2019, FLS Mineralogy, Lumina Gold Cangrejos Mineralogy, June 27, 2019.

Zumarrage, 2020, letter, Legal Opinion on Cangrejos Project, March 20, 2020.

28 DATE AND SIGNATURE PAGES

CERTIFICATE OF QUALIFIED PERSON

Kathleen Ann Altman, P.E.

I, Kathleen Ann Altman, P.E., as an author of this report entitled "Cangrejos Gold-Copper Project, El Oro Province, Ecuador NI 43-101 Technical Report Preliminary Economic Assessment", prepared for Lumina Gold Corp., dated July 24, 2020 with an effective date of June 8, 2020 do hereby certify that:

1. I am CEO and Consulting Metallurgical Engineer of AKA PROS, Inc., 3301 W. 26th Ave., Denver, CO 80211.
2. I am a graduate of the Colorado School of Mines in 1980 with a B.S. in Metallurgical Engineering. I am a graduate of the University of Nevada, Reno Mackay School of Mines with an M.S. in Metallurgical Engineering in 1994 and a Ph.D. in Metallurgical Engineering in 1999.
3. I am registered as a Professional Engineer in the State of Colorado (Reg. #37556). I have worked as a metallurgical engineer for a total of 39 years since my graduation. My relevant experience for the purpose of the Technical Report is:
    - Review and report as a metallurgical consultant on numerous mining operations and projects around the world for due diligence and regulatory requirements.
    - I have worked for operating companies, including the Climax Molybdenum Company, Barrick Goldstrike, and FMC Gold in a series of positions of increasing responsibility.
    - I have worked as a consulting engineer on mining projects for approximately 24 years in roles such a process engineer, process manager, project engineer, area manager, study manager, and project manager. Projects have included scoping, prefeasibility and feasibility studies, basic engineering, detailed engineering and start-up and commissioning of new projects.
    - I was the Newmont Professor for Extractive Mineral Process Engineering in the Mining Engineering Department of the Mackay School of Earth Sciences and Engineering at the University of Nevada, Reno from 2005 to 2009.
4. I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
5. I did not visit the Cangrejos Project.
6. I am responsible for Sections 2, 3, 4, 5, 6, 17, 18.1, 18.2, 18.7, 18.8, 18.9, 24 and portions of Sections 1, 21, 25, 26, 27, and 28 of the Technical Report.
7. I am independent of the Issuer applying the test set out in Section 1.5 of NI 43-101.
8. I have had no prior involvement with the property that is the subject of the Technical Report.
9. I have read NI 43-101, and the Technical Report has been prepared in compliance with NI 43-101 and Form 43-101F1.

10. At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the Section Nos. for which I am responsible in the Technical Report contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 24th day of July, 2020

(Original Signed & Sealed) ***"Kathleen Ann Altman"***

Kathleen Ann Altman, P.E.

CERTIFICATE OF QUALIFIED PERSON

Larry Breckenridge, P.E.

I, Larry Breckenridge, P.E., do hereby certify that:

1. I am an Environmental Engineer and have an address at 600 Grant Street, Suite 975, Denver, Colorado 80203
2. I graduated from Dartmouth College (BA in Engineering) and the Colorado School of Mines (MS in Environmental Science and Engineering.
3. I am a member, in good standing, of the Board of Colorado Professional Engineers, License Number 38048
4. I have 23 years of experience in environmental engineering, mine water management, and geochemistry.
5. I have read the definition of "qualified person" set out in National Instrument 43-101 *Standards of Disclosure for Mineral Projects* ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
6. I am responsible for the preparation of Sections 18.3 and 20 and portions of Sections 1, 21, 25, 26, 27, and 28. of the technical report titled Cangrejos Gold-Copper Project, El Oro Province, Ecuador NI 43-101 Technical Report Preliminary Economic Assessment, dated July 24, 2020, with an effective date of June 8, 2020 (the "Technical Report").
7. I visited the Cangrejos Project from May 9th 2019 to July 12th, 2019.
8. I am independent of Lumina Gold Corp. applying all of the tests in Section 1.5 of NI 43-101.
9. I have had no prior involvement with the property that is the subject of the Technical Report.
10. I have read NI 43-101, Form 43-101F1 and the Technical Report and confirm the Technical Report has been prepared in compliance with that instrument and form.
11. As of the effective date of the Technical Report, to the best of my knowledge, information and belief, the Sections of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 21st day of July, 2020.

<u>(Original Signed & Sealed) "J. Larry Breckenridge"</u>

J. Larry Breckenridge, P.E.

CERTIFICATE OF QUALIFIED PERSON

Bruce M. Davis, FAusIMM

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

1. I am an independent consultant of BD Resource Consulting Inc., and have an address at 4253 Cheyenne Drive, Larkspur, Colorado USA 80118.
2. I have B.S. (1974) and M.S. (1975) degrees from Brigham Young University. I graduated from the University of Wyoming with a Doctor of Philosophy (Geostatistics) in 1978.
3. I am a Fellow of the Australasian Institute of Mining and Metallurgy, Number 211185.
4. I have practiced my profession continuously for over 40 years and have been involved in mineral resource and reserve estimations and feasibility studies on numerous underground and open pit base metal and gold deposits in Canada, the United States, Central and South America, Europe, Asia, Africa and Australia.
5. I have read the definition of "qualified person" set out in National Instrument 43-101 *Standards of Disclosure for Mineral Projects* ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
6. I am responsible for the preparation of Sections 11 and 12, and portions of Sections 1, 14, and 25 of the Technical Report titled *Cangrejos Gold-Copper Project, El Oro Province Ecuador NI 43-101 Technical Report Preliminary Economic Assessment*, dated July 24, 2020, with an effective date of June 8, 2020 (the "Technical Report").
7. I have not visited the Cangrejos Project.
8. I am independent of Lumina Gold Corp. applying all of the tests in Section 1.5 of NI 43-101.
9. I have had prior involvement with the property that is the subject of the Technical Report. I was a co-author of a previous technical report titled *Cangrejos Gold-Copper Project, Ecuador NI 43-101 Technical Report Report Preliminary Economic Assessment*, dated August 10, 2018, with an effective date of June 27, 2018.
10. I have read NI 43-101, Form 43-101F1 and the Technical Report and confirm the Technical Report has been prepared in compliance with that instrument and form.
11. As of the effective date of the Technical Report, to the best of my knowledge, information and belief, the Sections of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 24th day of July, 2020.

(Original Signed) "Bruce M. Davis"

Bruce M. Davis, FAusIMM

CERTIFICATE of QUALIFIED PERSON

Scott C. Elfen, P.E.

I, Scott C. Elfen, P.E., do hereby certify that:

1. I am the Global Lead Geotechnical and Civil Services of Ausenco Engineering Canada Inc., 855 Homer Street, Vancouver, BC V6B 2W2, Canada.

2. I graduated from the University of California, Davis with a Bachelor of Science degree in Civil Engineering (Geotechnical) in 1991.

3. I am a Registered Civil Engineer in the State of California (No. C56527) by exam since 1996 and am also a member of the American Society of Civil Engineers (ASCE), Society for Mining, Metallurgy & Exploration (SME) that are all in good standing.

4. I have practiced my profession continuously for 23 years and have been involved in geotechnical, civil, hydrological, and environmental aspects for the development of mining projects; including feasibility studies on numerous underground and open pit base metal and precious metal deposits in North America, Central and South America, Africa and Australia.

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

6. I am responsible for the preparation of Sections 18.4, 18.5, 18.6 and portions of Sections 1, 21, 25, 26, and 27 of the Technical Report titled Cangrejos Gold-Copper Project, El Oro Province, Ecuador NI 43-101 Technical Report Preliminary Economic Assessment, dated July 24, 2020, with an effective date of June 8, 2020 (the “Technical Report”).

7. I visited the Cangrejos Project from January 15 to 18, 2018 and May 16 to 18, 2019.

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

9. I have had prior involvement with the property that is the subject of the Technical Report. I was a co-author of a previous technical report titled Cangrejos Gold-Copper Project, Ecuador NI 43-101 Technical Report Preliminary Economic Assessment, dated August 10, 2018, with an effective date of June 27, 2018.

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

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

Dated this 24th day of July, 2018.

(Original Signed & Sealed) “Scott C. Elfen”

Scott C. Elfen, P.E.

CERTIFICATE OF QUALIFIED PERSON

Nelson D. King, SME Registered Member

I, Nelson D. King, SME Registered Member, do hereby certify that:

1. I am a Principal Consultant (Metallurgical Engineer) with N D King Consulting LLC and have an address at 8317 Devinney Street, Arvada, Colorado, U.S.A.
2. I graduated from Colorado School of Mines with a B.Sc. degree in Metallurgical Engineering in 1972.
3. I am a member, in good standing, of the Society for Mining, Metallurgy and Exploration, Inc. (SME) and am an SME Registered Member, No. 4152661 RM.
4. I have 47 years of relevant experience including work in copper, gold, silver, lead, zinc and molybdenum operations in the U.S.A., engineering and construction company experience in the U.S.A. and Canada and metallurgical consulting experience on global mining projects from offices located in the U.S.A. and Australia.
5. I have read the definition of "qualified person" set out in National Instrument 43-101 *Standards of Disclosure for Mineral Projects* ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
6. I am responsible for the preparation of Section 13 and portions of Sections 1, 21, 25, 26, 27 and 28 of the technical report titled "*Cangrejos Gold-Copper Project, El Oro Province, Ecuador NI 43-101 Technical Report Preliminary Economic Assessment*" dated July 24, 2020, with an effective date of June 8, 2020 (the "Technical Report") by Lumina Gold Corp.
7. I visited the Cangrejos Project from January 16 to 17, 2018.
8. I am independent of Lumina Gold Corp. applying all the tests in Section 1.5 of NI 43-101.
9. I have had prior involvement with the property that is the subject of the Technical Report. I was a co-author of a previous Technical Report titled "*Cangrejos Gold-Copper Project, Ecuador NI 43-101 Technical Report Preliminary Economic Assessment*" dated August 10, 2018 with an effective date of June 27, 2018.
10. I have read NI 43-101, Form 43-101F1 Technical Report ("Form 43-101F1"), and the Technical Report and confirm the portions of the Technical Report for which I am responsible have been prepared in compliance with that instrument and form.
11. As of the effective date of the Technical Report, to the best of my knowledge, information and belief, the sections of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 24th day of July 2020.

(Original Signed & Sealed) "Nelson D. King"

Nelson D. King, SME Registered Member

CERTIFICATE OF QUALIFIED PERSON

Joseph McNaughton, P.E.

I, Joseph McNaughton, P.E., do hereby certify that:

1. I am a senior mining engineer of:

   Independent Mining Consultants, Inc. 3560
   East Gas Road
   Tucson, AZ 85714

2. I graduated with the following degrees:

   Bachelors of Science, Mining Engineering from the University of Arizona (2012)
   Bachelors of Science, Engineering Management from the University of Arizona
   (2012) Bachelors of Arts, Business Finance from Butler University (2004)

3. I am a registered Professional Engineer in good standing in the State of Arizona in

   Mining Engineering Registration # 65646

4. I have worked as a mining engineer for a total of 9 years. I have worked as a short and long-range mine planner. I have worked on numerous projects that include mine design, mine planning, resource and reserve estimation, scheduling and cost estimation and evaluation.

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

6. I am responsible for sections 15 and 16 and I contributed to sections 1, 21, 25, 26, 27 and 28 for the preparation of the technical report titled "Cangrejos Gold-Copper Project, El Oro Province, Ecuador NI 43-101 Technical Report Preliminary Economic Assessment" (the "Technical Report"), dated effective June 8, 2020, prepared for Lumina Gold Corp.

7. I have visited the project site on May 5-7, 2019.

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

9. I have provided mine planning and various other engineering support as requested.

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

11. I am not aware of any material fact or material change with respect the subject matter of

the Technical Report that is not reflected in the Technical Report, the omission to disclose which makes the Technical Report misleading.

12. I am independent of the issuer applying all of the tests in Section 1.5 of National Instrument 43-101.I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.

13. I have read National Instrument 43-101 and Form F43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.

14. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

Signed and dated this 24th day of July, 2020.

(Original Signed & Sealed) "Joseph S.C. McNaughton"

Joseph McNaughton, P.E.

CERTIFICATE OF QUALIFIED PERSON

Robert S. Michel, SME Registered Member

I, Robert S. Michel, SME Registered Member, do hereby certify that:

1. I am a Principal Consultant and have an address at 133 Furman Ave., Asheville, NC.
2. I graduated from the Colorado School of Mines with a B.S. in Metallurgical Engineering in 1984 and from Kettering University with a M.S. in Manufacturing Management in 1993.
3. I am a member, in good standing, of the Society for Mining, Metallurgy and Exploration, Inc. (SME) and am an SME Registered Member, No. 04170421RM.
4. I have worked as a Metallurgical Engineer, manufacturing manager, or Project Manager continuously for a total of 36 years since my graduation from university. In the past twelve years I have worked as a Project Manager on the development of underground and open pit mining projects and related infrastructure in Peru, Chile, Columbia, Macedonia, Mali, and in the United States.
5. I have read the definition of “qualified person” set out in National Instrument 43-101 *Standards of Disclosure for Mineral Projects* (“NI 43-101”) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a “qualified person” for the purposes of NI 43-101.
6. I am responsible for the preparation of Sections 19 and 22 and portions of Sections 1, 21, 25, 26, 27, and 28 of the technical report titled *Cangrejos Gold-Copper Project, El Oro Province, Ecuador NI 43-101 Technical Report Preliminary Economic Assessment*, dated July 24, 2020, with an effective date of June 8, 2020 (the “Technical Report”).
7. I have not visited the Cangrejos Project.
8. I am independent of Lumina Gold Corp. applying all of the tests in Section 1.5 of NI 43-101.
9. I have had prior involvement with the property that is the subject of the Technical Report as a co-author and Qualified Person for the 2018 Technical Report titled *Cangrejos Gold-Copper Project, Ecuador NI 43-101 Technical Report Preliminary Economic Assessment*, dated August 10, 2018, with an effective date of June 27, 2018.
10. I have read NI 43-101, Form 43-101F1 and the Technical Report and confirm the Technical Report has been prepared in compliance with that instrument and form.
11. As of the effective date of the Technical Report, to the best of my knowledge, information and belief, the Sections of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 24th day of July, 2020.

(Original Signed & Sealed) “Robert S. Michel”

Robert S. Michel, SME Registered Member

CERTIFICATE OF QUALIFIED PERSON

Norman I. Norrish, P.E.

I, **Norman I. Norrish, P.E.**, do hereby certify that:

1. I am a Professional Engineer and have an address at 704 228th Ave NE, #773, Sammamish, WA 98074.
2. I graduated from the University of British Columbia with a B.A.Sc. in Geological Engineering (Geotechnical) and an M.A.Sc. in Mining Engineering (Rock Mechanics).
3. I am a member, in good standing, of the Washington State Board of Registration for Professional Engineers and Land Surveyors (#37407) and the American Society of Civil Engineers.
4. I have 42 years of experience in the application of rock mechanics to mining, transportation, and civil construction projects including senior level project responsibility for the investigation, design and construction management of mining and transportation projects in mountainous terrain throughout Western North America. I have worked internationally on mining projects in Canada, Argentina, Columbia, Mexico, Panama, Peru, Chile, the Philippines, the former Soviet Union and the Peoples Republic of China. In addition to 38 years of consulting experience, I worked as Senior Mining Engineer for four years at Brenda Mines Ltd, a subsidiary of Noranda Inc.
5. I have read the definition of "qualified person" set out in National Instrument 43-101 *Standards of Disclosure for Mineral Projects* ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
6. I am responsible for the preparation of portions of Sections 1, 16, 25, 26, 27, and 28 of the Technical Report titled *Cangrejos Gold-Copper Project, El Oro Province, Ecuador NI 43-101 Technical Report Preliminary Economic Assessment*, dated July 24, 2020, with an effective date of June 8, 2020 (the "Technical Report").
7. I visited the Cangrejos Project from May 2 to 8, 2019.
8. I am independent of Lumina Gold Corp. applying all of the tests in Section 1.5 of NI 43-101.
9. I participated in an earlier study of the property and the resultant Technical Report titled *Cangrejos Gold-Copper Project, Ecuador NI 43-101 Technical Report Preliminary Economic Assessment*, dated August 10, 2018, with an effective date of June 27, 2018.
10. I have read NI 43-101, Form 43-101F1 and the Technical Report and confirm the Technical Report has been prepared in compliance with that instrument and form.
11. As of the effective date of the Technical Report, to the best of my knowledge, information and belief, the Sections of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 24th day of July, 2020.

(Original Signed & Sealed) " Norman I. Norrish"

Norman I. Norrish, P.E.

CERTIFICATE of QUALIFIED PERSON
Robert Sim, P.Geo, SIM Geological Inc.

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

1. I am an independent consultant of: SIM Geological Inc. and have an address at 508–1950 Robson Street, Vancouver, British Columbia, Canada V6E 1E8.
2. I graduated from Lakehead University with an Honours Bachelor of Science (Geology) in 1984.
3. I am a member, in good standing, of Engineers and Geoscientists British Columbia, Licence Number 24076.
4. I have practiced my profession continuously for 35 years and have been involved in mineral exploration, mine site geology and operations, mineral resource and reserve estimations and feasibility studies on numerous underground and open pit base metal and gold deposits in Canada, the United States, Central and South America, Europe, Asia, Africa and Australia.
5. I have read the definition of "qualified person" set out in National Instrument 43-101 *Standards of Disclosure for Mineral Projects* ("NI 43-101") and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101.
6. I am responsible for the preparation of Sections 7, 8, 9, 10, 14 and portions of Sections 1, 25, 26, 27 and 28 in the Technical Report titled "*Cangrejos Gold-Copper Project, El Oro Province, Ecuador NI 43-101 Technical Report Preliminary Economic Assessment"* dated July 24, 2020, with an effective date of June 8, 2020 (the "Technical Report
7. I visited the Cangrejos Project from November 28 to 29, 2017.
8. I am independent of Lumina Gold Corp. applying all of the tests in Section 1.5 of NI 43-101.
9. I have had prior involvement with the property that is the subject of the Technical Report. I was a co-author of previous Technical Reports titled "Cangrejos Gold-Copper Project, Ecuador NI 43-101 Technical Report" dated December 12, 2019 with an effective date of November 7, 2019, and "Cangrejos Gold-Copper Project, Ecuador NI 43-101 Technical Report Preliminary Economic Assessment" dated August 10, 2018 with an effective date of June 27, 2018, and "Cangrejos Gold-Copper Project, Ecuador NI 43-101 Technical Report" dated December 15, 2017 with an effective date of November 6, 2017 and "Cangrejos Gold-Copper Project, Ecuador NI 43-101 Technical Report" dated March 6, 2017 with an effective date of January 25, 2017.
10. I have read NI 43-101, Form 43-101F1 Technical Report ("Form 43-101F1") and the Technical Report and confirm the portions of the Technical Report for which I am responsible have been prepared in compliance with NI 43-101 and Form 43-101F1.
11. As of the effective date of the Technical Report, to the best of my knowledge, information and belief, the sections of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated this 24th day of July, 2020.

(Original Signed & Sealed) "Robert Sim"

Robert Sim, P.Geo.