FREEPORT-McMoRAN

Technical Report Summary of

Mineral Reserves and Mineral Resources

for

Cerro Verde Mine

Arequipa, Peru

Effective Date: **December 31, 2022**
Report Date: **January 31, 2023**

IMPORTANT NOTE

This Technical Report Summary (TRS) has been prepared for Freeport-McMoRan Inc. (FCX) in support of the disclosure and filing requirements of the United States (U.S.) Securities and Exchange Commission (SEC) under Subpart 1300 of Regulation S-K. The quality of information, conclusions, and estimates contained herein apply as of the date of this TRS. Events (including changes to the assumptions, conditions, and/or qualifications outlined in this TRS) may have occurred since the date of this TRS, which may substantially alter the conclusions and opinions herein. Any use of this TRS by a third-party beyond its intended use is at that party's sole risk.

CAUTIONARY STATEMENT

This TRS contains forward-looking statements in which potential future performance is discussed. The words "anticipates," "may," "can," "plans," "believes," "estimates," "expects," "projects," "targets," "intends," "likely," "will," "should," "could," "to be," "potential," "assumptions," "guidance," "aspirations," "future," "commitments," "pursues," "initiatives," "objectives," "opportunities," "strategy" and any similar expressions are intended to identify those assertions as forward-looking statements. Forward-looking statements are all statements other than statements of historical facts, such as plans, projections, forecasts or expectations relating to business outlook, strategy, goals, or targets; global market conditions; ore grades and processing rates; production and sales volumes; unit net cash costs and operating costs; net present values; economic assessments; capital expenditures; operating or Life-of-Mine (LOM) plans; cash flows; FCX's commitment to deliver responsibly produced copper, including plans to implement and validate its operating sites under specific frameworks; improvements in operating procedures and technology innovations; potential environmental and social impacts; exploration efforts and results; development and production activities, rates and costs; future organic growth opportunities; tax rates; export quotas and duties; the impact of price changes in the commodities FCX produces, primarily copper; mineral resource and mineral reserve estimates and recoveries; and information pertaining to the financial and operating performance and mine life of the Cerro Verde mine.

Readers are cautioned that forward-looking statements in this TRS are necessarily based on opinions and estimates of the Qualified Persons (QPs) authoring this TRS, are not guarantees of future performance, and actual results may differ materially from those anticipated, expected, projected or assumed in the forward-looking statements. Material assumptions regarding forward-looking statements are discussed in this TRS, where applicable. In addition to such assumptions, the forward-looking statements are inherently subject to significant business, economic and competitive uncertainties, and contingencies. Important factors that can cause actual results to differ materially from those anticipated in the forward-looking statements include, but are not limited to, supply of and demand for, and prices of the commodities FCX produces, primarily copper; availability and increased costs associated with mining inputs and labor; fluctuations in price and availability of commodities purchased, including higher prices for fuel, steel, power, labor, and other consumables and components contributing to higher costs; constraints on supply and logistics, and transportation services; changes in cash requirements, financial position, financing or investment plans; changes in general market, economic, regulatory, or industry conditions, including as a result of Russia's invasion of Ukraine or potential global economic downturn or recession; reductions in liquidity and access to capital; changes in tax laws and regulations, including the impact of the Inflation Reduction Act; any major public health crisis; political and social risks, including the potential effects of civil unrest in Peru, and relations with local communities and Indigenous Peoples; operational risks inherent in mining, with higher inherent risks in underground mining; mine sequencing; changes in mine plans or operational modifications, delays, deferrals, or cancellations; production rates; timing of shipments; results of technical, economic, or feasibility studies; potential inventory adjustments; potential impairment of long-lived mining assets; expected results from improvements in operating procedures and technology, including innovation initiatives; industry risks; financial condition of FCX's customers, suppliers, vendors, partners, and affiliates; cybersecurity incidents; labor relations, including labor-related work stoppages and costs; compliance with applicable environmental, health and safety laws and regulations; weather- and climate-related risks; environmental risks, including availability of secure water supplies, and litigation results; FCX's ability to comply with its responsible production commitments under specific frameworks and any changes to such frameworks; and other factors described in more detail under the heading "Risk Factors" contained in Part I, Item 1A. of FCX's Annual Report on Form 10-K for the year ended December 31, 2022, filed with the SEC.

Investors are cautioned that many of the assumptions upon which the forward-looking statements are based are likely to change after the date the forward-looking statements are made, including for example commodity prices, which FCX cannot control, and production volumes and costs or technological solutions and innovation, some aspects of which FCX may not be able to control. Further, FCX may make changes to its business plans that could affect its results. FCX and the QPs who authored this TRS caution investors that FCX undertakes no obligation to update any forward-looking statements, which speak only as of the date made, notwithstanding any changes in the assumptions, changes in business plans, actual experience, or other changes.

This TRS also contains financial measures such as site cash costs and unit net cash costs per pound of metal and free cash flow, which are not recognized under U.S. generally accepted accounting principles.

Qualified Person Signature Page

Mine: Cerro Verde
Effective Date: December 31, 2022
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/s/ James Young

James Young, P.Eng., RM-SME
Manager of Mine Planning for Reserves

/s/ Paul Albers

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/s/ Luis Tejada

Luis Tejada, Ing. Geol. Peru, RM-SME
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Jacklyn Steeples, RM-SME
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Table of Contents

List of Tables

List of Figures

1 EXECUTIVE SUMMARY

This Technical Report Summary (TRS) is prepared by Qualified Persons (QPs) for Freeport-McMoRan Inc. (FCX), a leading international mining company with headquarters located in Phoenix, Arizona, United States (U.S.). The purpose of this TRS is to report mineral reserve and mineral resource estimates at the Cerro Verde mine using estimation parameters as of December 31, 2022.

1.1 Property Description, Current Status, and Ownership

The Cerro Verde mine is an open-pit copper and molybdenum mining complex that has been in operation since 1976. It produces copper concentrate and cathode products, with silver in the concentrate. The Cerro Verde mine also produces a molybdenum concentrate. The mine is situated approximately 30 kilometers southwest of the city of Arequipa, capital of the Arequipa province and the second largest city in Peru.

The mine operates 365 days per year on a 24 hour per day schedule. Mining and ore processing operations are currently in production and the mine is considered a production stage property. The Cerro Verde mine encompasses the Cerro Verde (CV), Santa Rosa (SR), and Cerro Negro (CN) ore deposits.

The Cerro Verde mine is operated by FCX through a majority owned subsidiary, Sociedad Minera Cerro Verde S.A.A. (SMCV). FCX holds a 53.56 percent ownership interest in SMCV, with the remaining 46.44 percent held by SMM Cerro Verde Netherlands B.V. (SMM) (21 percent), Compañia de Minas Buenaventura S.A.A. (BV) (19.58 percent), and other stockholders whose Cerro Verde shares are publicly traded on the Lima Stock Exchange (5.86 percent).

As of December 31, 2022, the Cerro Verde mine encompasses approximately 178,000 acres of mining concessions/holdings, including 62,000 acres of surface rights and 14,600 acres granted through an easement from the Peru National Assets Office, plus 150 acres of owned property, and 1,151 acres of rights-of-way outside the mining concession area.

1.2 Geology and Mineralization

The Cerro Verde mining district comprises a copper-molybdenum porphyry cluster that includes a series of deposits (CV, SR, and CN), which are related to calc-alkaline intrusions (dacite monzonite porphyry) and quartz-tourmaline hydrothermal breccia bodies.

In general, these deposits are low grade and high tonnage, genetically related to igneous epizonal intrusions and characterized by multiple events from a parental magmatic chamber, which are distributed along the Incapuquio fault system corridor.

In the Cerro Verde mining district, mineralization is directly linked to multiple igneous intrusive events. The resulting hypogene mineralization is dominantly chalcopyrite with minor bornite. Retrograde events resulted in a slight increase in chalcopyrite and precipitation of molybdenite. Supergene processes formed a profile containing zones of leached capping, oxide copper mineralization, chalcocite enrichment, and a mixed chalcocite-hypogene transition zone. Mineralization spans approximately 5.6 kilometers in length trending northwest-southeast and 1.6 kilometers in width.

1.3 Mineral Reserve Estimate

Mineral reserves are summarized from the Life-of-Mine (LOM) plan, which is the compilation of the relevant modifying factors for establishing an operational, economically viable mine plan.

Mineral reserves have been evaluated considering the modifying factors for conversion of measured and indicated resource classes into proven and probable reserves. Inferred resources are considered to be waste in the LOM plan. The details of the relevant modifying factors included in the estimation of mineral reserves are discussed in Sections 10 through 21.

The LOM plan includes the planned production to be extracted from the in-situ mine designs and from previously extracted material, known as Work-In-Process (WIP) inventories. WIP includes material on crushed leach and Run of Mine (ROM) leach pads for processing, and in stockpiles set aside to be rehandled and processed at a future date. WIP is estimated as of December 31, 2022, from production of reported deliveries through mid-year and the expected production to the end of the year.

As a point of reference, the mineral reserve estimate reports the in-situ ore and WIP inventories from the LOM plan containing copper, molybdenum, and silver metal and reported as commercially recoverable metal.

Table 1.1 summarizes the mineral reserves reported on a 100 percent and pro rata property ownership basis. The mineral reserve estimate is based on commodity prices of $3.00 per pound for copper, $12 per pound for molybdenum, and $20 per ounce for silver.

Table 1.1 – Summary of Mineral Reserves

CERRO VERDE MINE			Tonnage[b]	Cutoff	Average Grade			Average Recovery[d]			Recoverable Metal[b]		
Summary of Mineral Reserves[a]		Ownership	Metric	Grade[c]	Copper	Molybdenum	Silver	Copper	Molybdenum	Silver	Copper	Molybdenum	Silver
As of December 31, 2022		%	M Tons	%EqCu	%	%	g/t	%	%	%	M lbs	M lbs	k ozs
Open-Pit Inventories													
Mill	Proven		620		0.37	0.02	1.94	85.5	54.4	44.9	4,303	119	17,373
	Probable		3,489		0.35	0.01	1.83	85.4	54.4	44.9	22,808	576	92,094
	Total		**4,109**	**0.13**	**0.35**	**0.01**	**1.85**	**85.5**	**54.4**	**44.9**	**27,110**	**696**	**109,467**
Crushed Leach	Proven		8		0.42			77.0			56		
	Probable		1		0.45			77.0			10		
	Total		**9**	**0.25**	**0.43**			**77.0**			**66**		
ROM Leach	Proven		36		0.35			50.9			143		
	Probable		81		0.21			50.9			190		
	Total		**116**	**0.08**	**0.25**			**50.9**			**333**		
Total Open-Pit Reserves	Proven		664		0.37	0.01	1.81	83.6	54.4	44.9	4,501	119	17,373
	Probable		3,571		0.34	0.01	1.79	85.0	54.4	44.9	23,008	576	92,094
	Total		**4,235**		**0.35**	**0.01**	**1.79**	**84.7**	**54.4**	**44.9**	**27,510**	**696**	**109,467**
Stockpile Inventories													
Mill Stockpile	Proven		69		0.27	0.01	1.05	64.2	51.7	44.9	259	7	1,046
Leach Stockpile	Proven		587		0.44			4.6			263		
	Total		**656**		**0.43**	**0.00**	**0.11**	**8.5**	**51.7**	**44.9**	**523**	**7**	**1,046**
Total Reserves Inventories													
Total Mineral Reserves	Proven		1,319		0.40	0.01	0.97	43.6	54.3	44.9	5,024	127	18,420
	Probable		3,571		0.34	0.01	1.79	85.0	54.4	44.9	23,008	576	92,094
	Total	**100%**	**4,890**		**0.36**	**0.01**	**1.57**	**72.6**	**54.4**	**44.9**	**28,032**	**703**	**110,513**
Net Equity Interest[e]													
Total FCX		**53.56%**	**2,619**		**0.36**	**0.01**	**1.57**	**72.6**	**54.4**	**44.9**	**15,014**	**377**	**59,191**
Total SMM		**21.00%**	**1,027**		**0.36**	**0.01**	**1.57**	**72.6**	**54.4**	**44.9**	**5,887**	**148**	**23,208**
Total BV		**19.58%**	**958**		**0.36**	**0.01**	**1.57**	**72.6**	**54.4**	**44.9**	**5,489**	**138**	**21,639**
Total Public Shares		**5.86%**	**287**		**0.36**	**0.01**	**1.57**	**72.6**	**54.4**	**44.9**	**1,643**	**41**	**6,476**

Notes

a. Reported as of December 31, 2022, using metal prices of $3.00 per pound for copper, $12 per pound for molybdenum, and $20 per ounce for silver.

b. Amounts may not foot because of rounding.

c. Operational cutoff grade reported as equivalent copper (EqCu).

d. Process recoveries include all applicable processes such as concentration, smelting, transportation losses, etc.

e. The Cerro Verde mine is operated by FCX through a majority owned subsidiary, Sociedad Minera Cerro Verde S.A.A. (SMCV). FCX holds a 53.56 percent ownership interest in SMCV, with the remaining 46.44 percent held by SMM Cerro Verde Netherlands B.V. (SMM - 21 percent), Compañia de Minas Buenaventura S.A.A. (BV - 19.58 percent), and other stockholders whose shares are publicly traded on the Lima Stock Exchange (Public Shares - 5.86 percent).

The mineral reserve estimate has been prepared using industry accepted practice and conforms to the disclosure requirements of the U.S. Securities and Exchange Commission (SEC) under Subpart 1300 of Regulation S-K (S-K1300). Mineral reserve and mineral resource estimates are evaluated annually, providing the opportunity to reassess the assumed conditions. All the technical and economic issues likely to influence the prospect of economic extraction are anticipated to be resolved under the stated assumed conditions.

1.4 Mineral Resource Estimate

Mineral resources are evaluated using the application of technical and economic factors to a geologic resource block model and employing optimization algorithms to generate digital surfaces of mining limits, using specialized geologic and mine planning computer software. The resulting surfaces volumetrically identify material as potentially economical, using the assumed parameters. Mineral resources are the resultant contained metal inventories.

The mineral resource estimate is the inventory of material identified as having a reasonable likelihood for economic extraction inside the mineral resource economic mining limit, less the mineral reserve volume, as applicable. The modifying factors are applied to measured, indicated, and inferred resource classifications to evaluate commercially recoverable metal. As a point of reference, the in-situ ore containing copper, molybdenum, and silver metal is inventoried and reported by intended processing method.

The reported mineral resource estimate in Table 1.2 is exclusive of the reported mineral reserve, on a 100 percent and pro rata property ownership basis. The mineral resource estimate is based on commodity prices of $3.50 per pound for copper, $15 per pound for molybdenum, and $20 per ounce for silver.

Table 1.2 – Summary of Mineral Resources

CERRO VERDE MINE Summary of Mineral Resources[a] As of December 31, 2022		Ownership %	Tonnage[b] Metric M Tons	Cutoff Grade[c] %EqCu	Average Grade Copper %	Average Grade Molybdenum %	Average Grade Silver g/t	Contained Metal[b,d] Copper M lbs	Contained Metal[b,d] Molybdenum M lbs	Contained Metal[b,d] Silver k ozs
Open-Pit Inventories										
Mill	Measured		33		0.26	0.01	1.38	186	7	1,447
	Indicated		2,080		0.33	0.01	1.73	14,906	494	115,822
	Subtotal		**2,112**		**0.32**	**0.01**	**1.73**	**15,092**	**502**	**117,269**
	Inferred		1,396		0.33	0.01	1.76	10,147	347	78,850
	Total		**3,508**	**0.12**	**0.33**	**0.01**	**1.74**	**25,239**	**849**	**196,120**
ROM Leach	Measured		6		0.36			49		
	Indicated		20		0.24			106		
	Subtotal		**26**		**0.27**			**155**		
	Inferred		22		0.29			137		
	Total		**48**	**0.08**	**0.28**			**292**		
Total Resources Inventories										
Total Mineral Resources	Measured		39		0.28	0.01	1.16	236	7	1,447
	Indicated		2,100		0.32	0.01	1.72	15,012	494	115,822
	Subtotal		**2,138**		**0.32**	**0.01**	**1.71**	**15,247**	**502**	**117,269**
	Inferred		1,418		0.33	0.01	1.73	10,285	347	78,850
	Total	**100%**	**3,556**		**0.33**	**0.01**	**1.72**	**25,532**	**849**	**196,120**
Net Equity Interest[e]										
Total FCX		**53.56%**	**1,905**		**0.33**	**0.01**	**1.72**	**13,675**	**454**	**105,042**
Total SMM		**21.00%**	**747**		**0.33**	**0.01**	**1.72**	**5,362**	**178**	**41,185**
Total BV		**19.58%**	**696**		**0.33**	**0.01**	**1.72**	**4,999**	**166**	**38,400**
Total Public Shares		**5.86%**	**208**		**0.33**	**0.01**	**1.72**	**1,496**	**50**	**11,493**

Notes

a. Reported as of December 31, 2022, using metal prices of $3.50 per pound for copper, $15 per pound for molybdenum, and $20 per ounce for silver. Mineral resources are exclusive of mineral reserves.

b. Amounts may not foot because of rounding.

c. Internal cutoff grade reported as equivalent copper (EqCu).

d. Estimated expected recoveries are consistent with those for mineral reserves but would require additional work to substantiate.

e. The Cerro Verde mine is operated by FCX through a partially owned subsidiary, Sociedad Minera Cerro Verde S.A.A. (SMCV). FCX holds a 53.56 percent ownership interest in SMCV, with the remaining 46.44 percent held by SMM Cerro Verde Netherlands B.V. (SMM - 21 percent), Compañia de Minas Buenaventura S.A.A. (BV - 19.58 percent) and other stockholders whose shares are publicly traded on the Lima Stock Exchange (Public Shares - 5.86 percent).

The mineral resource estimate has been prepared using industry accepted practice and conforms to the disclosure requirements of S-K1300. Mineral reserve and mineral resource estimates are evaluated annually, providing the opportunity to reassess the assumed conditions. Although all the technical and economic issues likely to influence the prospect of economic extraction of the estimated mineral resource are anticipated to be resolved under the stated assumed conditions, no assurance can be given that the estimated mineral resource will become proven and probable mineral reserves.

1.5 Capital and Operating Cost Estimates

The capital and operating costs are estimated by the property's operations, engineering, management, and accounting personnel in consultation with FCX corporate staff, as appropriate. The cost estimates are applicable to the planned production, mine schedule, and equipment requirements for the LOM plan. The capital costs are summarized in Table 1.3.

Table 1.3 – Sustaining Capital Costs

	$ billions
Mine	$1.6
Concentrator	1.1
Supporting Infrastructure and Environmental	2.5
Total Capital Expenditures	$5.2

Estimates are derived from current costs and adjusted to the reserve price environment. The estimates are not adjusted for escalation or exchange rate fluctuations. Actual realized costs are reviewed periodically, and estimates are refined as required.

Capital costs are primarily sustaining projects consisting of mine equipment replacements and planned site infrastructure projects, most notably to increase tailings storage facility (TSF) and leach pad capacities over the production of the scheduled reserves. Capital cost estimates are derived from current capital costs based on extensive experience gained from many years of operating the property and do not include future inflation. FCX and the Cerro Verde mine staff review actual costs periodically and refine cost estimates as appropriate.

The operating costs for the LOM plan are summarized in Table 1.4.

Table 1.4 – Operating Costs

	$ billions
Mine	$ 20.5
Processing	25.4
Balance	5.4
Total site cash operating costs	51.3
Freight	4.3
Treatment charges	7.9
Peruvian mining royalty tax	0.3
By-product credits	(9.2)
Total net cash costs	$ 54.6
Unit net cash cost ($ per pound of copper)	$ 1.95

Estimates are derived from current costs and adjusted to the reserve price environment. The estimates are not adjusted for escalation or exchange rate fluctuations. Actual realized costs are reviewed periodically, and estimates are refined as required.

The operating cost estimates are derived from current operating costs and practices based on extensive experience gained from many years of operating the property and do not include future inflation.

1.6 Permitting Requirements

In the QP's opinion, the Cerro Verde mine has adequate plans and programs in place, is in good standing with Peruvian environmental regulatory authorities, and no current conditions related to environmental compliance, permitting, and local engagement represent a material risk to continued operations. The Cerro Verde mine staff have a high level of understanding of the requirements of environmental compliance, permitting, and local stakeholders in order to facilitate the development of the mineral reserve and mineral resource estimates. The periodic inspections by governmental agencies, FCX corporate staff, third-party reviews, and regular reporting confirm this understanding.

Based on the LOM plan, additional permits will likely be necessary in the future for continued operation of the Cerro Verde mine, including modifications to the Environmental and Social Impact Studies (ESIS) and obtaining approval for modified leach pad configurations, increased tailings storage capacity, and corresponding water supply.

1.7 Conclusions and Recommendations

FCX and the QPs believe that the geologic interpretation and modeling of exploration data, economic analysis, mine design and sequencing, process scheduling, and operating and capital cost estimation have been developed using accepted industry practices and that the stated mineral reserves and mineral resources comply with SEC regulations. Periodic reviews by third-party consultants confirm these conclusions.

No recommendations for additional work are identified for the reported mineral reserves and mineral resources as of December 31, 2022.

2 INTRODUCTION

This TRS is prepared by QPs for FCX, a leading international mining company with headquarters located in Phoenix, Arizona, U.S. The purpose of this TRS is to report mineral reserve and mineral resource estimates at the Cerro Verde mine using estimation parameters as of December 31, 2022.

2.1 Terms of Reference and Sources of Information

FCX owns and operates several affiliates or subsidiaries. This TRS uses the name “FCX” interchangeably for Freeport-McMoRan Inc. and its consolidated subsidiaries.

FCX operates large, long-lived, geographically diverse assets with significant proven and probable reserves of copper, gold, and molybdenum. FCX has a dynamic portfolio of operating, expansion, and growth projects in the copper industry and believes it is the world’s largest producer of molybdenum.

FCX maintains standards, procedures, and controls in support of estimating mineral reserves and mineral resources. The QPs, including the Manager of Mine Planning for Reserves, annually review the estimates of mineral reserves and mineral resources prepared by mine site and FCX corporate employees, the supporting documentation, and compliance with internal controls. Based on their review, the QPs recommend approval of the mineral reserve and mineral resource estimates to FCX senior management.

The reported estimates and supporting background information, conclusions, and opinions contained herein are based on company reports, property data, public information, and assumptions supplied by FCX employees and other third-party sources, including the reports and documents listed in Section 24 of this TRS, available at the time of writing this TRS.

Unless otherwise stated, all figures and images were prepared by FCX. Units of measurement referenced in this TRS are based on local convention in use at the property and currency is expressed in U.S. dollars.

The effective date of this TRS is December 31, 2022. This TRS updates the previously filed “Technical Report Summary of Mineral Reserves and Mineral Resources for Cerro Verde Mine”, which was effective as of December 31, 2021. The mineral reserve and mineral resource estimates in this TRS supersede any previous estimates of mineral reserves and mineral resources for the Cerro Verde mine.

Mineral reserves and mineral resources are reported in accordance with the requirements of S-K1300.

2.2 Qualified Persons

This TRS has been prepared by the following QPs:

- James Young, Manager of Mine Planning for Reserves.
- Paul Albers, Manager of Exploration Americas.
- Luis Tejada, Manager of Geomechanical Engineering.
- Jacklyn Steeples, Manager of Processing Operational Improvement.
- Michael Snihurowych, Manager of Metallurgy.

James Young is Manager of Mine Planning for Reserves for the Strategic Planning department of FCX. He has over 20 years of experience working for large-scale, open-pit operations in Peru, Chile, Indonesia, Canada, and the U.S. He holds a Bachelor of Applied Science in Mining and Mineral Process Engineering from the University of British Columbia and is registered as a Professional Engineer (P.Eng.) with Engineers and Geoscientists of British Columbia, Canada. Mr. Young is a Registered Member of the Society of Mining, Metallurgy and Exploration (RM-SME). In his role with FCX, he discusses aspects of the mine with site staff regarding overall approach to mine planning, current operating conditions, targeted production expectations, and options for potential resource development. He worked at the Cerro Verde mine from 2014 to 2016 and has visited the site various times since. His most recent visit to the Cerro Verde mine was on April 9 and 10, 2018.

Paul Albers is Manager of Exploration Americas for FCX. He has over 17 years of mineral exploration and mining experience, including 12 years in copper-molybdenum porphyry deposits in North America and South America. He holds a Bachelor of Science degree in Geology from St. Norbert College and Master of Science degree in Geology from the University of Minnesota-Duluth. He is registered as a Certified Professional Geologist (P.Geo.) with the State of Minnesota. Mr. Albers is a RM-SME. In his role with FCX, he provides technical support and collaborates with site staff on exploration and mineral resource modeling programs. His most recent visit to the Cerro Verde mine was on July 20 to 22, 2022.

Luis Tejada is Manager of Geomechanical Engineering for the Strategic Planning department of FCX. He has over 20 years of experience working for large-scale, open-pit operations in Peru and the U.S. He holds a Bachelor of Science in Geological Engineering from the San Agustin University in Arequipa, Peru, and is registered as a Geological Engineer (Ing. Geol.) with the Colegio de Ingenieros del Peru. He is a RM-SME. In his role, he provides technical support and collaborates with site staff on geomechanical engineering, slope monitoring systems, mine hydrogeology, options for slope design improvements and slope optimization. He worked at the Cerro Verde mine from 2004 to 2016 and has visited the site various times since. His most recent visit to the Cerro Verde mine was on November 14 to 18, 2022.

Jacklyn Steeples is Manager of Processing Operational Improvement for FCX and has over 15 years of experience working for large-scale, open-pit copper processing operations including leach and solution extraction (SX) and electrowinning (EW), concentrator, and crush and convey divisions. She holds a Bachelor of Science in Chemical Engineering from the Colorado School of Mines. She is a RM-SME. In her role with FCX, she collaborates with site staff on leach pad placements, SX/EW operations, current operating conditions performance, and improvements for hydrometallurgical operations. She has visited the site various times throughout her career. Her most recent visit to the Cerro Verde mine was on October 19 to 21, 2022.

Michael Snihurowych is a Manager of Metallurgy for FCX. He has over 15 years of experience working for large-scale copper and molybdenum processing operations in the U.S., Canada, and South America. With FCX, he has worked in technical services and concentrator operations. He holds a Bachelor of Science degree in Geology from the University of Western Ontario and a Master of Science degree in Metallurgical Engineering from the University of Utah. He is a RM-SME. In his role with FCX, he provides technical support to Cerro Verde mineral processing facilities including capital project process design, process performance assessments, and process optimization recommendations. His most recent visit to the Cerro Verde mine was on November 11, 2022.

The QPs reviewed the reasonableness of the background information for the estimates. The details of the QPs' responsibilities for this TRS are outlined in Table 2.1.

Table 2.1 – Qualified Person Responsibility

Qualified Person	Responsibility
James Young	Sections 2 through 5, 11.2 through 13.1, 13.1.3 through 13.3, 15 through 26, and corresponding sections of the Executive Summary
Paul Albers	Sections 2, 6 through 7.5, 7.8, 8, 9, 11.1, 21 through 26, and corresponding sections of the Executive Summary
Luis Tejada	Sections 2, 7.6 through 7.8, 13.1.1, 13.1.2, 21 through 26, and corresponding sections of the Executive Summary
Jacklyn Steeples	Sections 2, 10, 12, 14, 15, 18, 21 through 26, and corresponding sections of the Executive Summary
Michael Snihurowych	Sections 2, 10, 12, 14, 15, 18, 21 through 26, and corresponding sections of the Executive Summary

3 PROPERTY DESCRIPTION AND LOCATION

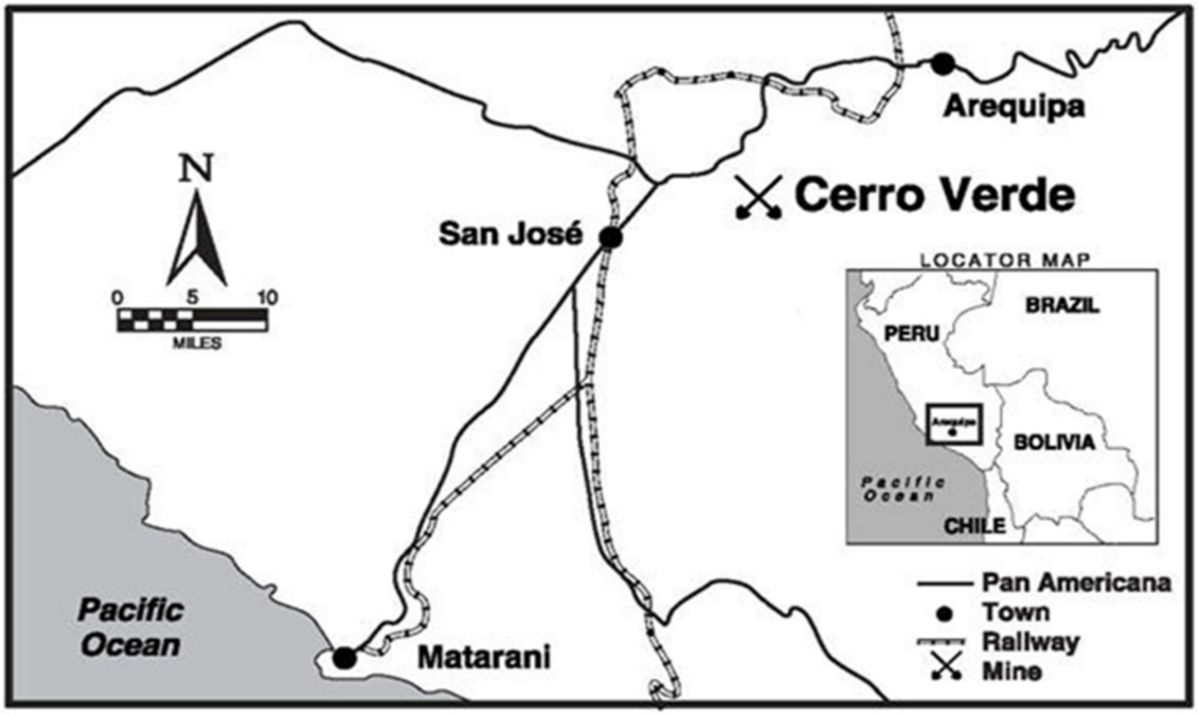
The Cerro Verde mine is an open-pit copper and molybdenum mining complex that has been in operation since 1976. It produces copper concentrate and cathode products, with silver in the concentrate. The Cerro Verde mine also produces a molybdenum concentrate. The mine is situated approximately 30 kilometers southwest of the city of Arequipa, capital of the Arequipa province and the second largest city in Peru.

The mine operates 365 days per year on a 24 hour per day schedule. Mining and ore processing operations are currently in production and the mine is considered a production stage property. The Cerro Verde mine encompasses the CV, SR, and CN ore deposits.

3.1 Property Location

The property location map is illustrated in Figure 3.1.

Figure 3.1 – Property Location Map



The property is located at latitude 16.53 degrees south and longitude 71.58 degrees west using the World Geodetic System 84 coordinate system.

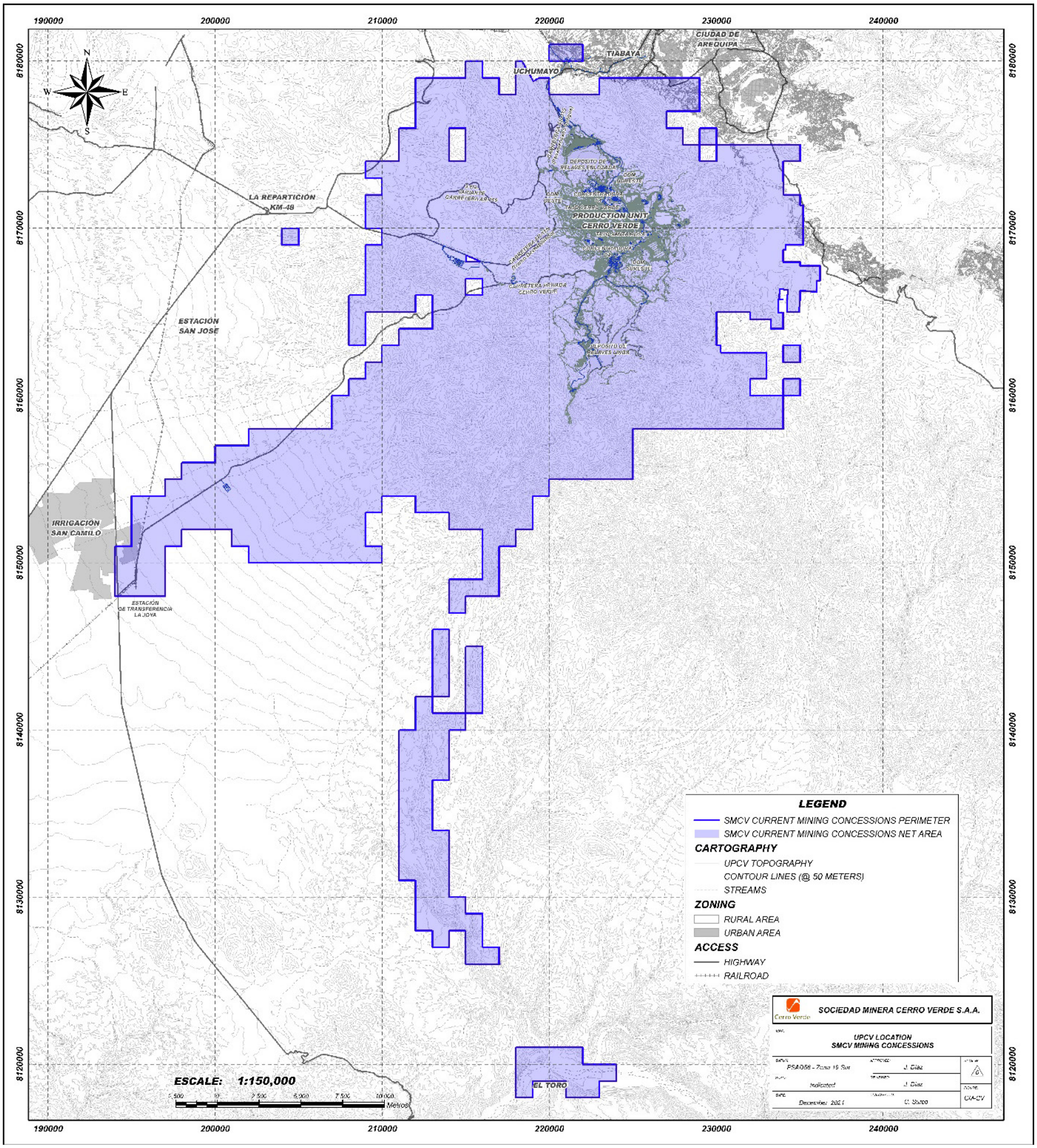
3.2 Ownership

The Cerro Verde mine is operated by FCX through a majority owned subsidiary, SMCV. FCX holds a 53.56 percent ownership interest in SMCV, with the remaining 46.44 percent held by SMM (21 percent), BV (19.58 percent), and other stockholders whose Cerro Verde shares are publicly traded on the Lima Stock Exchange (5.86 percent).

3.3 Land Tenure

As of December 31, 2022, the Cerro Verde mine encompasses approximately 178,000 acres of mining concessions/holdings, including 62,000 acres of surface rights and access to 14,600 acres granted through an easement from the Peru National Assets Office, plus 150 acres of owned property, and 1,151 acres of rights-of-way outside the mining concession area leased from both government agencies and private parties. Figure 3.2 shows a map of the land claim status.

Figure 3.2 – Cerro Verde Mine Mineral Concession Map



3.4 Mineral Rights and Significant Permitting

In Peru, mining rights through claims and concessions are regulated by Peru's general mining law. The Peru general mining law and Cerro Verde's mining stability agreement grant the surface rights of mining concessions located on government land. Government land obtained after 1997 must be leased or purchased. Cerro Verde's major operations take place in the mining concession "Cerro Verde N° 1, 2, y 3" and in the Cerro Verde processing facilities concession "Cerro Verde Beneficiation Plant", hereinafter known as the Beneficiation Plant. SMCV is the titleholder of the entire mining concession, all other concessions, and areas where the Cerro Verde operations are located. They are retained through the annual payments of rights for the concessions or the corresponding penalties for not exploiting them. Surface land is not owned, however Supreme Decree 017-1996-AG granted mining companies surface rights of those concessions already titled by the time this regulation was passed upon formal declaration before the Peruvian Ministry of Energy and Mines (MINEM). Cerro Verde’s mining and main core concessions were declared and exempted from the farmland’s privatization processes. The Beneficiation Plant’s authorization includes the processing and recovery methods of ore entirely sourced from the mining concession.

SMCV operates the mine in the Cerro Verde Production Unit (CVPU) which comprises among others, the Cerro Verde mining concession, and the Beneficiation Plant. The Beneficiation Plant has an authorization from MINEM to treat a total of 548,500 metric tons of ore per day of installed capacity through all processes.

SMCV has valid titles for the areas occupied by ancillary facilities such as the pump stations next to the Río Chili watershed in Uchumayo and the acid storage facilities in the nearby town of Matarani. It also owns the areas where the current 220 kilovolt (kV) line towers are located, and easements have been acquired for the electrical lines and for the water pipelines. Alternative routes for power lines, water lines, and storage facilities are also available.

SMCV signed a Contract of Investment Promotion Measures and Guarantees on July 17, 2012, under the general mining law, so the tax and administrative regime of that date applies to operations in the CVPU. The Stability Contract requires SMCV to pay an applicable income tax of 32 percent. In December 2015, SMCV submitted to the MINEM the Update of the Feasibility Study and Investment Schedule for the execution of the CVPU Expansion (CVPUE). After it was approved, SMCV signed an Addendum to the Stability Contract, including the updated Feasibility Study, in December 2016 and the initial execution of the CVPUE was completed. The term of this Stability Contract is 15 years from January 1, 2014, expiring on December 31, 2028.

With the CVPUE, SMCV, the Regional Government of Arequipa, provincial and district mayors, the National Water Authority, the representatives of the User Boards, and the civil society of Arequipa and the Water and Sewage Service Company of Arequipa (SEDAPAR) agreed on general guidelines for SMCV to finance and build the Wastewater Treatment Plant (WWTP) “La Enlozada” and reuse part of the wastewater treated in this facility. This contract allows SMCV to reuse a cubic meter per second of treated wastewater on an annual average basis. The rest of the treated water that is within maximum permissible limits is available to the SEDAPAR authority to distribute. Between the WWTP and fresh water from the Río Chili, SMCV has licenses and authorization of 2,160 liters per second of average annual flow, as of December 31, 2022. SMCV has an additional water license of 200 liters per second from the CV and SR pit dewatering system.

3.5 Comment on Factors and Risks Affecting Access, Title, and Ability to Perform Work

FCX and the Cerro Verde mine staff believe that all major permits and approvals are in place to support operations at the Cerro Verde mine. Based on the LOM plan, additional permits will likely be necessary in the future for increased capacities of leach pad stockpiles and TSFs as discussed in Section 17. Such processes to obtain these permits and the associated timelines are understood and similar permits have been granted in the past. FCX and the Cerro Verde mine have environmental, land, water, and permitting departments that monitor and review all aspects of property ownership or other rights and permit requirements so that they are maintained in good standing and any issues are addressed in a timely manner.

The mine has a partially unionized workforce and has been subject to various lawsuits and work stoppages over the operating history of the mine. FCX and the Cerro Verde mine understand the importance of the workforce and work in good faith to resolve conflicts.

Political uncertainty has created potential instability in the regulatory environment in Peru. There have been widespread and sometimes violent political protests, including attacks on civil infrastructure and businesses, which have resulted in delays in the transport of supplies, products, and people at the Cerro Verde mine. Although the impact on mine supplies has been limited and the Cerro Verde mine continues to operate safely, the situation in Peru remains uncertain, and there is a risk that the protests could negatively impact operations. Any sustained impacts to operations would be incorporated into future mineral reserve and resource estimates.

As of December 31, 2022, FCX and the Cerro Verde mine believe the mine’s access, payments for titles and rights to the mineral claims, and ability to perform work on the property are all in good standing. Further, to the extent known to the QPs, there are no significant encumbrances, factors, or risks that may affect the ability to perform work in support of the estimates of mineral reserves and mineral resources.

4 ACCESSIBILITY, CLIMATE, PHYSIOGRAPHY, LOCAL RESOURCES, AND INFRASTRUCTURE

The property is located in the District of Uchumayo, Province of Arequipa, Department of Arequipa, in the southern part of Peru.

4.1 Accessibility

The mine is accessible by two public highways: 30 kilometers by road south from Arequipa and 21 kilometers by road east from Route 108/AR 115. The mine is approximately 100 kilometers northeast of Matarani and 1,000 kilometers southeast of Lima. The Southern Railway of Peru connects Matarani to Arequipa and passes within 12 kilometers of the mine site. The nearest airport is in Arequipa, Peru.

4.2 Climate

The property is situated in a mountainous desert environment with two markedly different seasons: rainy season (November to March) and dry season (April to October). The mine area is an arid desert with rainfall averaging about 40 millimeters per annum. Temperatures range from a low of freezing, with snowfall rare, to a high of approximately 25 degrees Celsius. The mine operates throughout the year with production marginally affected during the rainy season.

4.3 Physiography

The regional topography is characterized by well-shaped rocky hills with gradual slopes at intermediate elevation. Mountain peaks reach elevations above 6,000 meters above sea level. Chachani, the highest snow-capped mountain in the area, is approximately 20 kilometers directly north of the city of Arequipa with an elevation of 6,057 meters. Chachani and Pichu Pichu are dormant volcanoes in the Arequipa region while El Misti, with an elevation of 5,822 meters located 15 kilometers northeast of Arequipa, is active and last erupted in 1985. A ridge of hills called the Coastal Batholith separates the Arequipa valley from the coastal prairie. The Coastal Batholith is part of the Occidental Branch foothills in the Andes Cordillera. The Río Chili, the main river in the region, flows through Arequipa west to the Pacific Ocean.

The area is seismically very active. The site is located within Earthquake Region 1, as designated in the Peruvian Code for Anti-seismic Design, or Zone 4 of the Uniform Building Code, 1997 edition.

The vegetation in the area is a mix of cacti, seasonal herbaceous vegetation, and some sparse shrubs species representing the local desert species, typical of a desert environment.

4.4 Local Resources and Infrastructure

Infrastructure is in place to support mining operations. Section 15 contains additional detail regarding site infrastructure.

Accommodations for mine employees and supplies are available in the nearby communities of Arequipa and Matarani.

Cerro Verde operations are supplied water by renewable sources through a series of storage reservoirs on the Río Chili watershed that collect water primarily from seasonal precipitation and from wastewater collected from the city of Arequipa and treated at a wastewater treatment plant. A third, smaller source is the CV and SR pit dewatering system, which is mainly used in mine operations. FCX and the Cerro Verde mine believe the operation has sufficient water resources to support current and future operations.

The Cerro Verde mine currently receives electrical power from the National Interconnected Electric System that is primarily sourced under long-term contracts with ElectroPerú S.A. and Engie Energía Peru S.A.

Site operations are adequately staffed with experienced operational, technical, and administrative personnel. FCX and the Cerro Verde mine believe all necessary supplies are available as needed.

5 HISTORY

First activities of the Cerro Verde porphyry copper deposit date back to the late 1800s when artisanal mining produced high-grade oxide ore. In 1917 Anaconda Copper Mining Company acquired the property and operated intermittently until 1970 when the property was nationalized. Minero Perú S.A., a government-controlled mining company, commenced mining and processing of ore with a SX/EW plant and pilot concentrator plant in 1977. The SX/EW plant was among the first in the world to be commissioned.

Minero Perú S.A. sold Cerro Verde to Cyprus Climax Metals Company in 1994. By 1996, remaining ownership included Buenaventura and a variety of individual investors trading their shares on the Lima Stock Exchange. Shortly thereafter, Cyprus invested in improvements to the leach process production. Cyprus Climax Metals Company was acquired by Phelps Dodge Corporation (PDC) in 1999. By 2004, the SX/EW plant capacity was at 200 million pounds of copper cathode per year (Bernal and Velarde, 2004).

In 2005, SMM Cerro Verde Netherlands B.V. acquired 21 percent ownership, and Buenaventura increased their ownership to 18.3 percent while PDC retained 53.56 percent as part of construction of a primary sulfide concentrator (C1). Production at C1 started in 2006, with a capacity of 108,000 metric tons of ore per day. In 2011, C1 capacity was increased to 120,000 metric tons per day following completion of various debottlenecking projects.

FCX acquired PDC in 2007. In 2007, FCX started a drilling program for deep exploration, infill confirmation, geomechanical, hydrogeological, and condemnation targets. Between 2008 and 2011, more than 200,000 meters were drilled.

Construction of new, additional concentrator facilities (C2) with a nominal capacity of 240,000 metric tons of ore per day was completed in 2016. As a result, the total Cerro Verde concentrating capacity expanded to 360,000 metric tons of ore per day. Recent production trends are exceeding the designed capacities. In 2018, ore processing capacity of C2 was increased to 288,000 metric tons of ore per day.

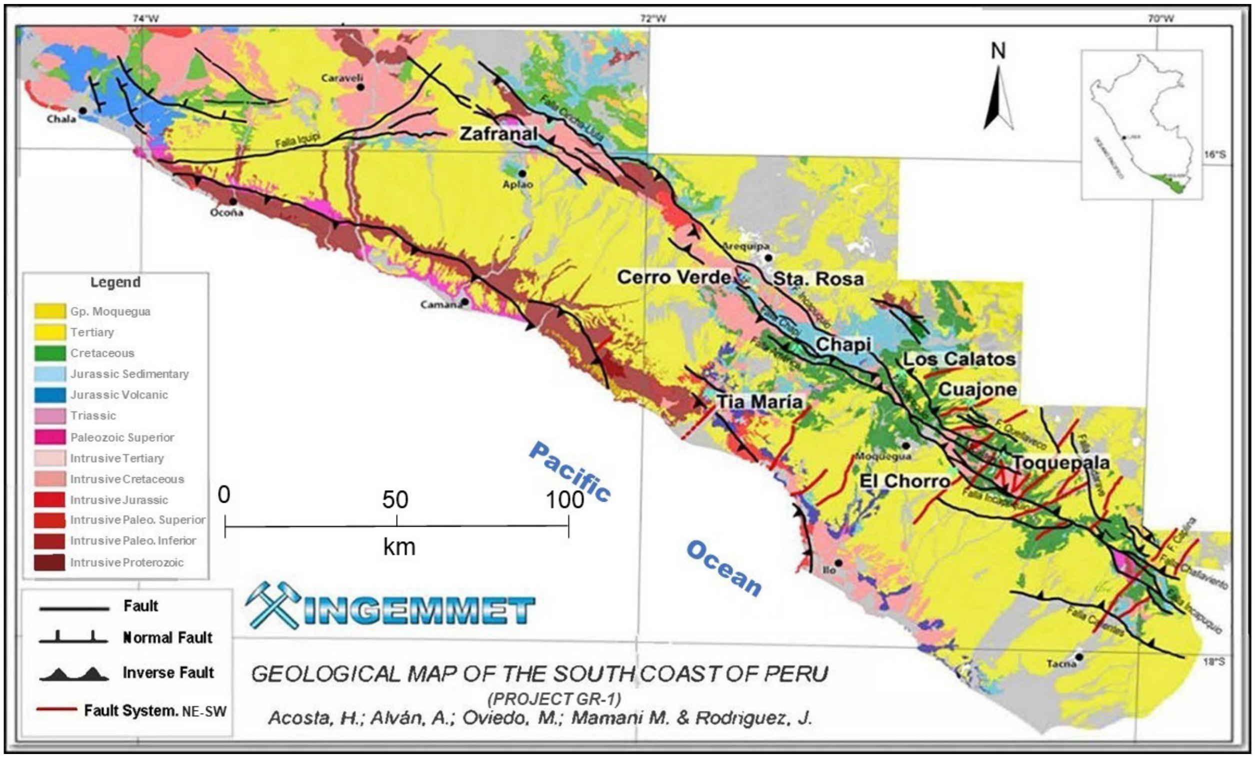
The Cerro Verde mine is a well-developed property currently in operation, and all previous exploration and development work has been incorporated where appropriate in the access and operation of the property. Exploration and development work is included in the data described in Sections 6 through 11 of this TRS.

6 GEOLOGICAL SETTING, MINERALIZATION, AND DEPOSIT

6.1 Regional Geology

The Cerro Verde district is part of the Paleocene copper-molybdenum porphyry metallogenic belt, which includes non-FCX mines, such as Cuajone, Quellaveco, and Toquepala, and other non-FCX deposits such as Mina Chapi and Don Javier. These deposits are generally aligned parallel to the Nazca Trench and the Incapuquio Sinestral fault system with northwest-southeast orientations as shown in Figure 6.1 (modified from Acosta et al., 2010).

Figure 6.1 – Incapuquio Fault System Structural Corridor



The regional framework consists of a metamorphic basement. These basement rocks form part of the Arequipa massif, which accreted onto the western margin of Gondwana in the late Proterozoic (Acosta, 2006 and references therein). The basement rocks have been subjected to metamorphic events at 1.9, 1.2, and 0.97 billion years (Wasteneys et al., 1995; Martignole and Martelat, 2003; Pino et al., 2004).

Lower Jurassic volcanic and sedimentary rocks are represented by the Chocolate Volcanics, comprising of a sequence of lava flows of andesitic composition and reddish volcanic breccias with small sedimentary intercalations. Volcanism was followed by the deposition of limestones of the Socosani Formation and siliclastic-calcareous rocks of the Yura Group, as a consequence of accumulation, subsidence, and weathering in the Arequipa basin (Sempéré, et al., 2002; Pino, 2003).

During the Upper Cretaceous – Lower Paleocene, compressional tectonics affected the Arequipa basin (Vicente, 1990) causing the inversion of the volcano-sedimentary basins of the Upper Cretaceous (Cornejo and Matthews, 2001; Zappettini et al., 2001). The northwest-southeast Incapuquio Sinestral fault system facilitated abundant magmatism that is represented by the Toquepala Group (Jacay et al., 2002, Sempéré et al., 2002). Then, in the Lower Paleocene – Eocene (63 to 55 million years) an episode of bimodal volcanism developed, partly under an extensional regime (Benavides-Cáceres, 1999). These rocks are associated with epithermal gold and silver deposits and copper porphyry deposits (Sillitoe et al., 1991). The various magmatic pulses of the Cerro Verde porphyries are associated with these events.

6.2 Deposit Geology

The Cerro Verde mining district comprises a copper-molybdenum porphyry cluster that includes a series of deposits (CV, SR, and CN) which are related to calc-alkaline intrusions (dacite to monzonite porphyry) and quartz-tourmaline hydrothermal breccia bodies.

In general, these deposits are low grade and high tonnage, genetically related to igneous epizonal intrusions and characterized by multiple events from a parental magmatic chamber, which are distributed along the Incapuquio fault system corridor.

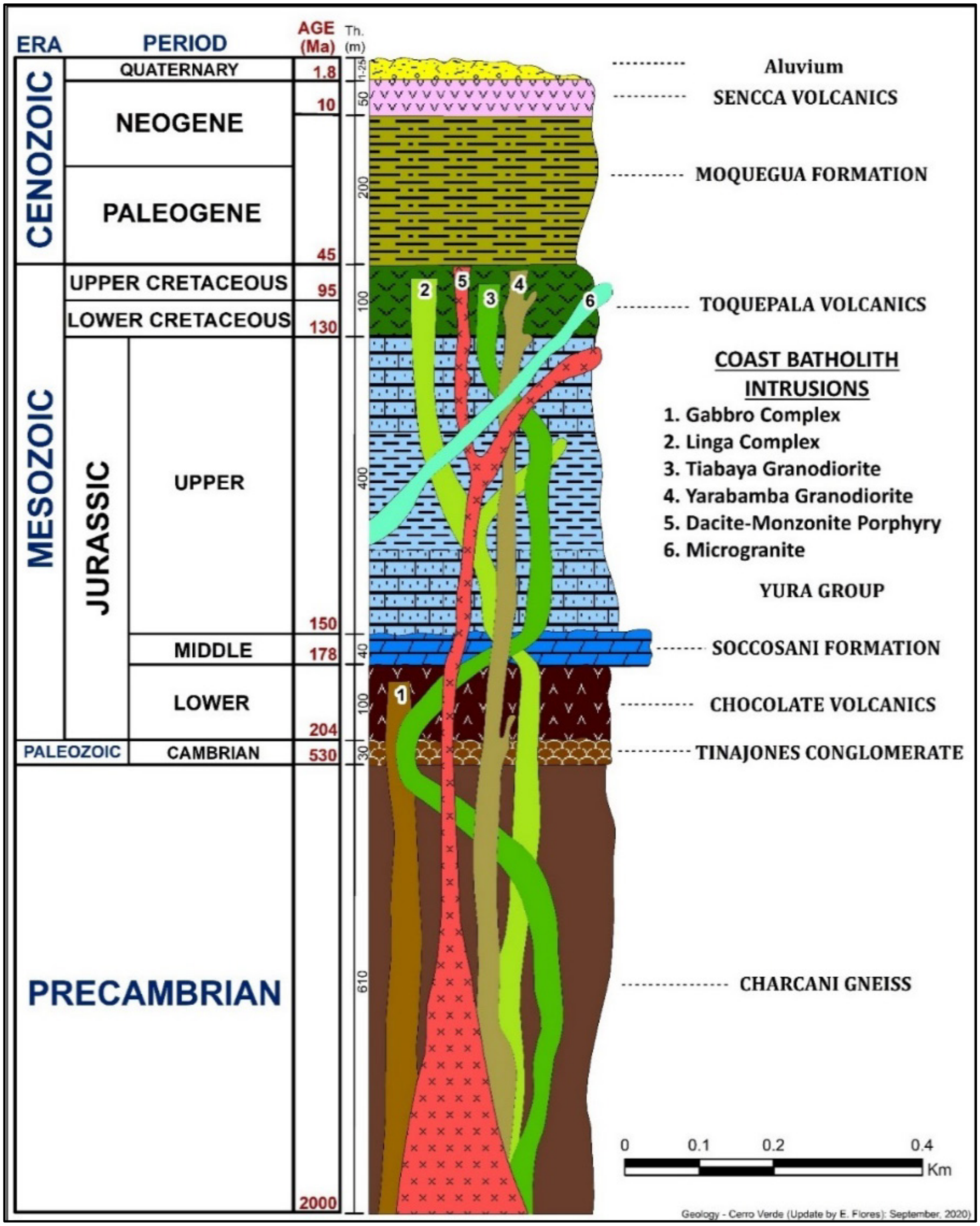
The three deposits are currently in production with each having similar characteristics. The deposits are differentiated by the level of erosion, alteration intensity, and magmatic history.

Age dates of the rocks within the mine area (Stegen, Barton, and Waegli, 2018) are as follows:

- Tiabaya Granodiorite: 79.9 million years (uranium-lead zircon dating).
- Yarabamba Granodiorite: 61.8 to 62.3 million years (uranium-lead zircon dating).
- Dacite Porphyry, which is part of the Dacite-Monzonite Porphyry suite: 60.9 to 62.4 million years (uranium-lead zircon dating).
- Late Dacite Porphyry: 58.5 to 59.8 million years (uranium-lead zircon dating).
- Fragmental rock at CN: 57.0 million years plus or minus 1.5 million years (potassium–argon sericite dating).

Figure 6.2 shows a regional stratigraphic column and intrusive history of rocks in the district.

Figure 6.2 – Regional Stratigraphic Column of the CV and SR Deposits



6.2.1 Structural Geology

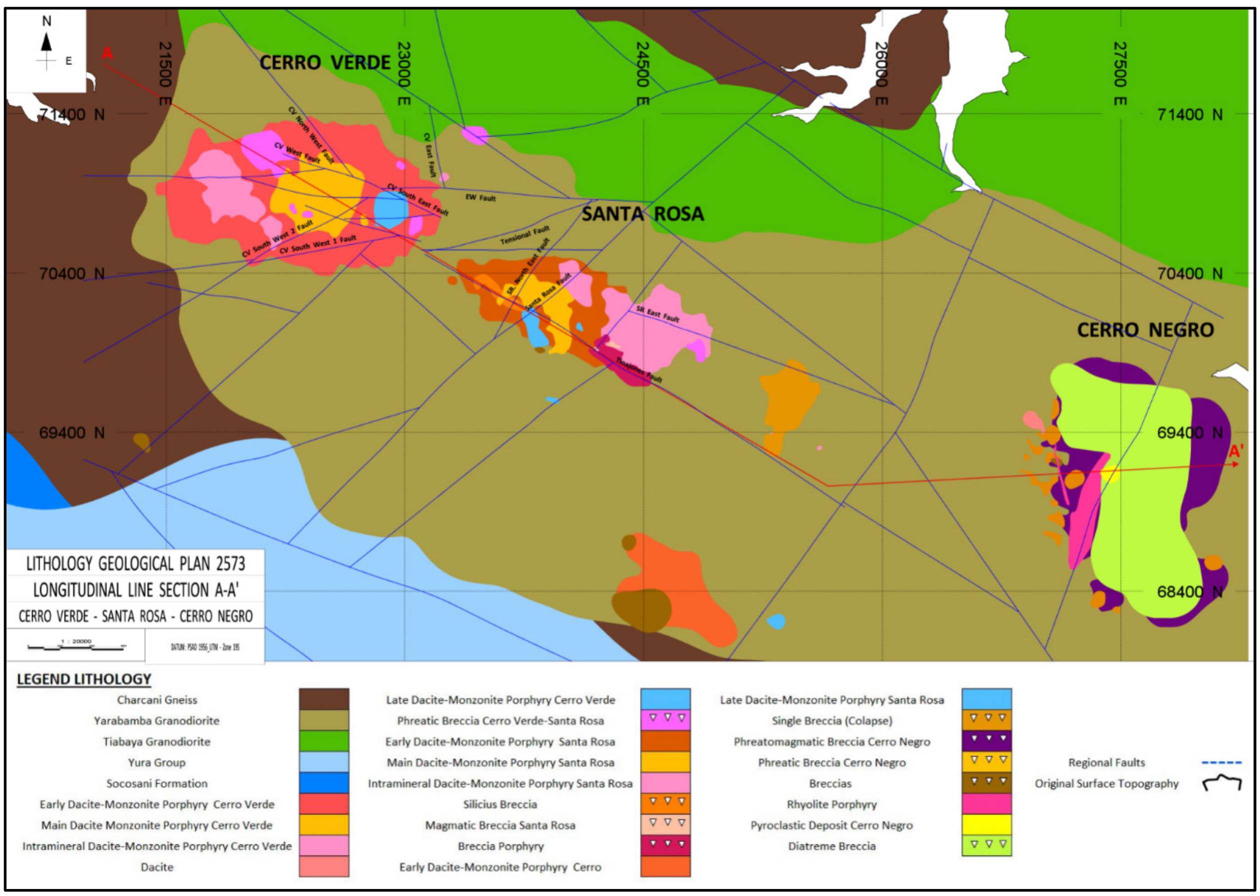
The CV and SR deposits are located in the core of a gently folded west-northwest striking basement-cored anticline or southwest-tilted structural block. The anticlinal axis parallels the Tinajones fault system, a regional north 60-degree west to east-west striking fault zone/lineament. The influence of this structural zone is reflected in the copper grade distribution at depth.

A series of parallel north 60-degree east, steeply northwest dipping faults were mapped in the CV and SR pits. Copper contours at depth also define several north-south trends suggestive of underlying structural control. The general fault pattern in the district suggests a major left-lateral fault zone. No major offsets in copper grade contours have been noted, suggesting that post-mineral faulting was minor in the district. The northwest-trending and southwest-dipping Charcani Gneiss-Yarabamba Granodiorite contact played an important role in the localization of the productive porphyries in the Cerro Verde mine area.

6.2.2 Rock Types

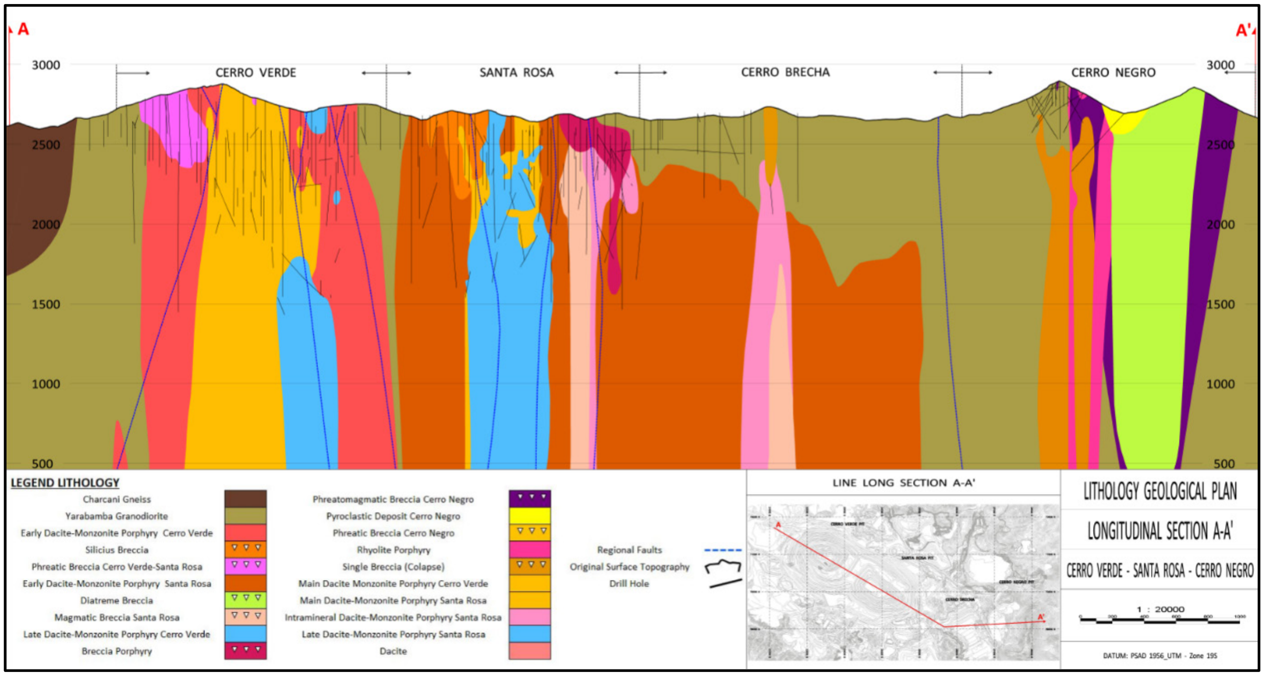
A plan map and cross section of the CV, SR, and CN deposit locations, structures, and lithologies is shown in Figure 6.3 and Figure 6.4.

Figure 6.3 – Structure and Lithology of CV, SR, and CN Deposits



Plan view at 2573-meter elevation.

Figure 6.4 – Structure and Lithology Cross Section of CV, SR, and CN Deposits



Section line is shown on plan map in Figure 6.3. Elevations are in meters.

Descriptions of the individual units from oldest to youngest are presented below.

The Charcani gneiss consists of leucocratic quartz-feldspar bands alternating with dark biotitic bands, commonly containing magnetite. Elsewhere the rock is a medium to coarse granitoid composed of quartz, orthoclase, biotite, and lesser plagioclase and muscovite.

The Late Cretaceous Tiabaya granodiorite batholith is exposed north of the mine area. According to García (1968), the intrusive has an oval shape with steeply dipping contacts with its long axis trending northwest. The intrusive predates the mineralization but is seldom affected by alteration. According to Kihien (1975), the granodiorite shows minor propylitic and phyllic alteration with anomalous copper values in an area northeast of Cerro Verde. The coarse-grained equigranular rock consists of plagioclase, quartz, potassium-feldspar, hornblende, and biotite.

The Tiabaya and Yarabamba granodiorites are the more evolved facies of the Caldera batholith. Regionally, different units of the batholith display a concentric arrangement with the youngest intrusive at the center of the batholith. The Yarabamba granodiorite is spatially associated with dacite porphyry intrusives and is an important ore host in the Cerro Verde district. In drill hole core, granodiorite has several textural and compositional varieties ranging from granodiorite to tonalite. At least six different units of Yarabamba granodiorite can be distinguished through drill hole logging.

A fine to medium-grained equigranular quartz diorite to tonalite was mapped by Kihien (1975) in an area northeast of the main CV deposit. The quartz diorite is more common in the SR area.

A medium-grained hypidiomorphic granodiorite with a minor amount of small, rounded quartz phenocrysts forms a small stock in SR. Similar quartz-porphyry rocks occur in close proximity to the main dacite porphyry complexes. A fine-grained microgranite, with a low phenocryst-to-groundmass ratio, is present in proximity to CN.

A late intrusive event is represented by several dacite porphyry units hosting quartz, biotite, and plagioclase. These dacite porphyry apophyses show a close spatial relationship with porphyry copper mineralization at CV and SR. The hydrothermal systems center on separate dacite porphyry hypabyssal intrusives, indicating at least two major dacitic intrusive events took place in the district. The various dacite porphyry phases are identical in mineral composition and crystal size; however, the phenocryst-to-groundmass ratio may vary.

A diorite porphyry, located toward the northern portion of the SR pit, occurs as an endogenous dome, intruding and underlying the contact between Yarabamba granodiorite and dacite porphyry. The roots of this late-phase intrusion have not been located. It is post-alteration and post-mineral.

Late magmatic events resulted in emplacement of multiple narrow dacite dikes in the SR areas and as a north-south dike with an approximate width of 75 meters in the CN area. They are generally barren with little pyrite.

Various hydrothermal breccias are widespread in the CV and SR porphyry systems. CV was formed by at least three coalescing breccia bodies measuring 1,000 meters in a northwest direction. The main characteristic of hydrothermal breccia is the presence of an open space that is filled with a variety of hydrothermal minerals.

6.2.3 Alteration and Mineralization

Prograde alteration in the district is associated with the intrusion of the early dacite-monzonite porphyry stock. From the center of the hydrothermal system outward, three alteration zones are recognized:

- A broad development of secondary potassium-feldspar and secondary quartz (potassic alteration).
- Potassium-feldspar with biotite (biotitic potassic).
- A lower-temperature phase that constitutes an external halo of propylitic alteration.

Retrograde alteration constitutes a transitional phase between the late magmatic phase and later the hydrothermal stages of phyllic and intermediate argillic. Retrograde alteration includes the precipitation of silica, replacement of secondary biotite with chlorite, and the development of anhydrite veins. In this phase small quantities of copper are introduced into the system, but it is the main phase for precipitation of molybdenite.

In the Cerro Verde mining district, mineralization is directly linked to multiple igneous intrusive events. The resulting hypogene mineralization is dominantly chalcopyrite with minor bornite. Retrograde events resulted in a slight increase in chalcopyrite and precipitation of molybdenite. Supergene processes formed a profile containing zones of leached capping, oxide copper mineralization, chalcocite enrichment, and a mixed chalcocite-hypogene transition zone. Copper ore types used for resource estimation and material routing are summarized in Table 6.1.

Table 6.1 – Mineralogical Ore Types

Ore Type	Mineralogy
Leached Cap	Hematite, goethite, and lesser jarosite
Oxide	Chrysocolla, brochantite, and lesser malachite
Copper Pitch	Copper-manganese oxides
Secondary Sulfide	Chalcocite, covellite
Transition Sulfide	Partial replacement of chalcopyrite by chalcocite
Primary Sulfide	Chalcopyrite, minor bornite

The majority of the oxide and secondary sulfide mineralization at CV and SR has already been mined.

The hypogene ore grade shell with a 0.2 percent total copper grade (TCu) is larger and has a greater horizontal to vertical aspect ratio at SR than the CV deposit. The grade shell at CV is more compact with a greater vertical component. Encompassing both deposits, this grade shell measures approximately 5.6 kilometers in length trending northwest-southeast, 1.6 kilometers in width and 2.0 kilometers in depth, based on current drill hole lengths.

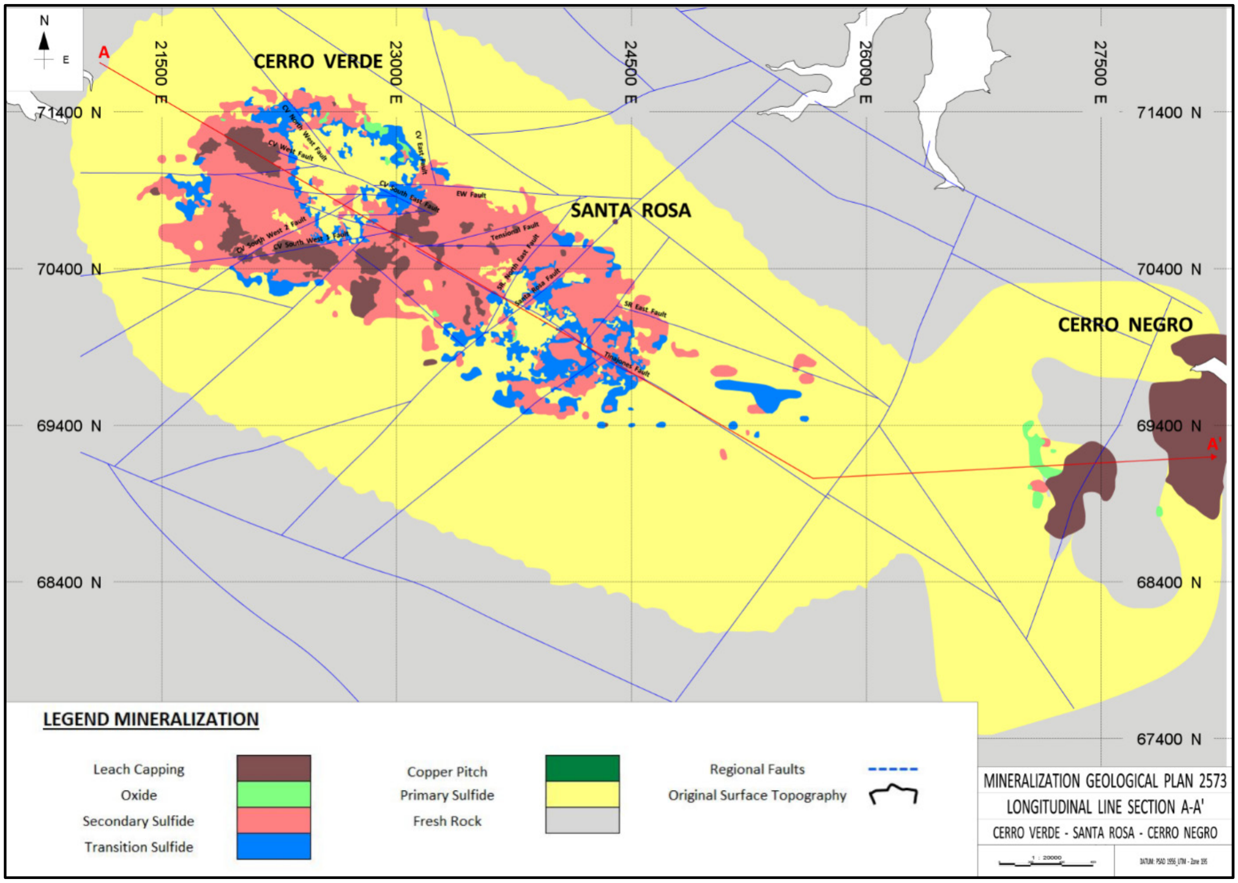
There are several breccia types at CV and SR that typically contain elevated copper grades. Mineralization associated with breccias is more prevalent at SR.

Lead, zinc, and arsenic are associated mainly with mineralized faults, veins, and breccias. These elements are included in the geologic modelling because elevated values in the copper concentrates can result in smelter penalties.

CN has very well-developed oxide mineralization. The predominant mineral is chrysocolla with lesser amounts of tenorite and malachite. Mineralization occurs mainly in fractures. Moderate amounts of specularite occur as a replacement of the matrix or as fragments in the tourmaline breccia.

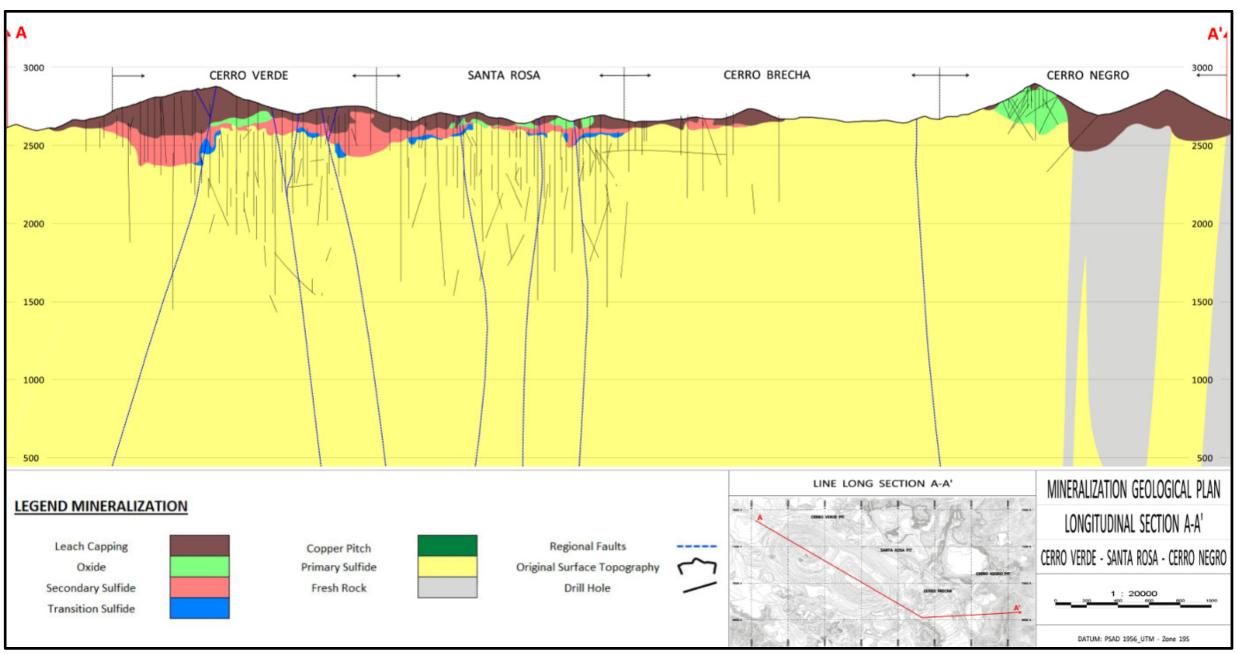
Figure 6.5 and Figure 6.6 provide interpreted copper mineral types in map view and cross section at CV, SR, and CN deposits.

Figure 6.5 – Copper Mineral Types of CV, SR, and CN Deposits



Mid-bench elevation 2573-meter elevation.

Figure 6.6 – Copper Mineral Type Cross Section of CV, SR, and CN Deposits



Section line is shown on plan map in Figure 6.5. Elevations are in meters.

7 EXPLORATION

Cerro Verde is a mature mining district with a long history of exploration. The data, methods, and historical activities presented in this section document actions that led to the initial and continued development of the mine but are not intended to convey any discussion or disclosure of a new, material exploration target as defined by S-K1300.

Exploration outside of the current operation is in collaboration with the FCX Exploration Group and incorporated into the geologic model. New drilling was included in the update of the geological resource model to support the mineral reserves and mineral resources. Drilling results added for the model update provide local refinement of the geologic interpretations and grade estimates, but do not materially alter these interpretations and estimates on a district-wide scale.

7.1 Drilling and Sampling Methods

The district has been drilled using diamond drill core and reverse circulation (RC) techniques for exploration, infill, geotechnical, hydrogeological, condemnation, and drilling for clay material. Some of these low grade to barren drill holes are not in the immediate mining areas and are not used for resource estimation. Drill holes used for geologic modeling are summarized in in Table 7.1. Approximately 2 percent of the data was obtained from RC drilling.

Table 7.1 – Summary of Drill Hole Programs

			Meters		
Years	**Company**	**# of Holes**	**Core**	**RC**	**Total**
1971 to 1975	Minero Peru	227	80,831	-	80,831
1994 to 1999	Cyprus	330	64,384	13,811	78,195
2000 to 2006	PDC	329	79,050	1,364	80,414
2007 to 2021	FCX	1,825	605,751	3,042	608,793
Total		2,711	830,016	18,217	848,233

Numbers may not foot due to rounding.

The deepest hole on the property is over 2,000 meters whereas most holes are less than 500 meters deep. At Cerro Verde, 83 percent of drill holes are vertical, 15 percent are angle, and 2 percent are horizontal drain holes.

Historically, sampling was done at irregular intervals depending on the observed mineralization (representing 19 percent of intervals included in the model). Between 1999 and 2009, samples were collected based on drill hole runs which had varying lengths. Starting in 2010, a regular 3-meter sample interval was implemented for vertical holes. Starting in 2020, a regular 3-meter sample interval was implemented for angle holes. Prior to 2020, angle holes were sampled on the downhole distance corresponding to a vertical distance of 3 meters for holes steeper than 45 degrees and the downhole distance corresponding to a horizontal distance of 3 meters for holes flatter than 45 degrees. For example, an 80-degree angle hole would have had a sample interval of 3.05 meters.

7.2 Collar / Downhole Surveys

Upon completion of a drill hole, collar locations are surveyed using Global Positioning System (GPS) units. All coordinates are based on the local mine grid system.

Historically, downhole surveys were not systematically performed. For historical holes lacking surveys, the collar azimuth and dip are used for the entire length of the hole. In recent drilling programs, downhole surveys are completed for all angle drilling and for all drill holes exceeding 200 meters in depth.

Currently, core and RC drill holes are primarily surveyed using a single-shot camera method. Surveys are conducted on 30 to 50-meter intervals down the hole. In cases where downhole surveys are not conducted on shallow holes, values from the hole design are used. Downhole surveys are carefully evaluated to review the accuracy of the survey data. Survey data are part of the district-wide database and are used in the modeling process to locate drill hole intercepts.

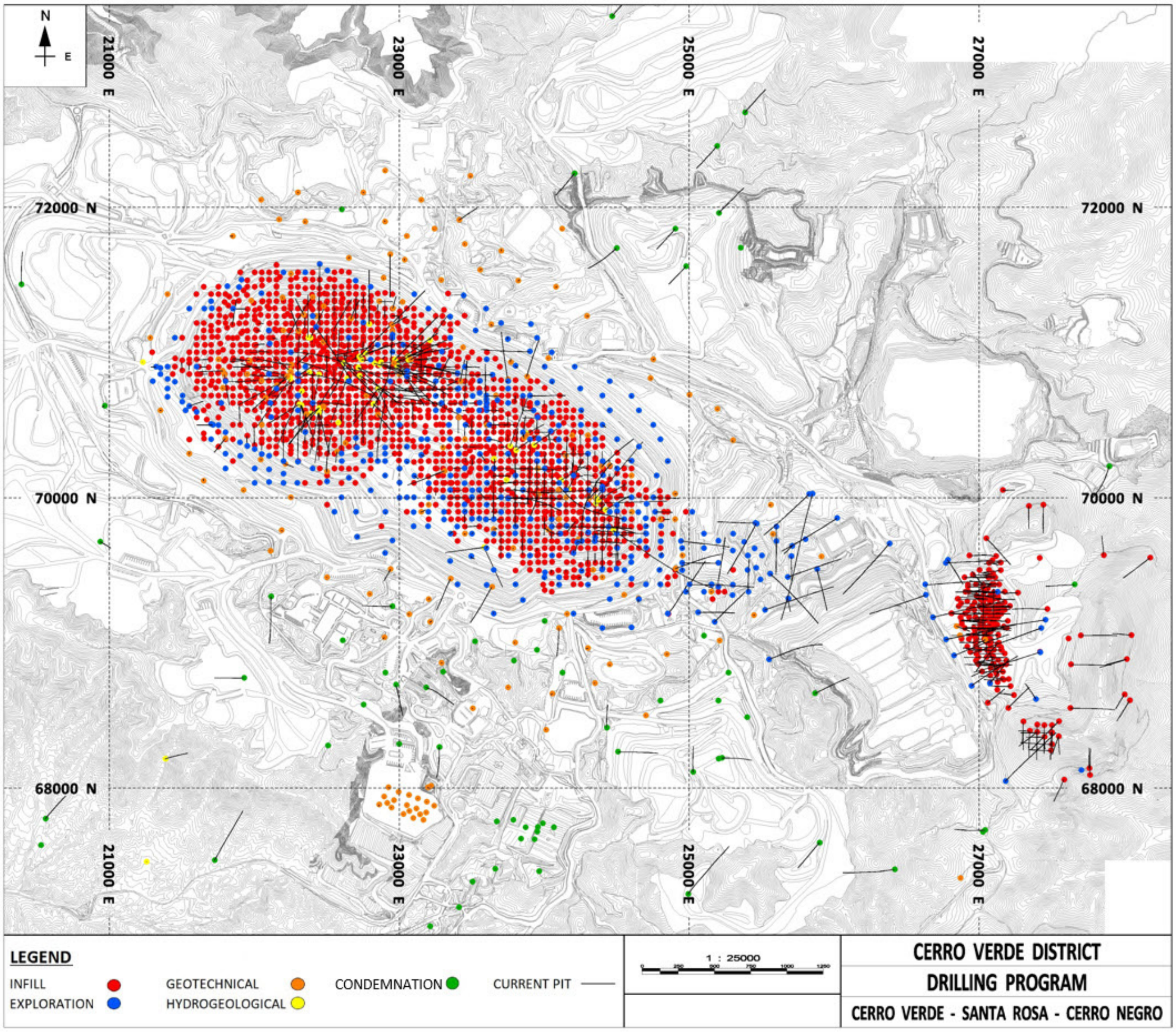
Final reports for collar and downhole surveys are included in the drill hole log files. Original survey records are stored in a secure facility. Spatial locations of the drill holes are visually validated in the resource modeling software.

7.3 Drill Hole Distribution

Core drill holes are typically drilled with a 50-meter grid spacing and a diameter of HQ-size (2.5 inches). Average drill hole spacing increases at depth, so the mine conducts over 10 kilometers of infill drilling on an annual basis. Drill programs are guided by geological and mineralogical characteristics and by the district mining sequence.

Most of the holes drilled in the district are vertical and are distributed along east-west and north-south orientations. Angled holes are drilled to address geological and mineralogical requirements and are used where access to planned drill sites is not available. The distribution of drill holes in the district is shown in Figure 7.1.

Figure 7.1 – Drill Hole Collar Locations



7.4 Sample Quality

At the Cerro Verde mine, core drilling is used as the most accurate method for obtaining geological and assay information. Core recovery is generally above 95 percent.

Core samples are sawn and taken on 3-meter intervals from the collar. A geologist is present during RC drilling to log samples and monitor sample quality. RC samples are taken at the drill rig utilizing a cyclone to capture a sample. Split sample analyses show that recovery and grades are representative of the material drilled and show no preferential bias of grades due to sampling methods.

The historical Anaconda drilling is no longer used for geologic resource modeling due to concerns about the quality of the information and the disposal of all corresponding drill hole samples.

7.5 Sample Logging

Core logging procedures used at the Cerro Verde mine were developed under the ownership of Minero Peru, Cyprus, PDC, and FCX. Historical logging was done on paper and includes information regarding rock types, structure, mineralization, and alteration.

Currently, geological logging is done on laptop computers. Since 2007, all information is entered into a drill hole database. Information collected includes rock type, alteration type and intensity, mineralization, geomechanical parameters, core recovery, rock quality designation (RQD), point load test data, and specific gravity (SG). Since 2005, high-resolution photographs have been taken for each box of drill hole core prior to logging.

Completed logs are validated, approved, and then printed out and stored on-site for each drill hole.

7.6 Hydrogeology

Hydrogeologic work is part of an innovative workflow that allows reconciliation of observed open-pit slope pore pressures against geotechnical targets and predicted depressurization results. The prediction of expected hydrogeologic responses from the existing and planned additions to the piezometer network, horizontal drain holes, and vertical dewatering wells is generated using a three-dimensional numerical groundwater flow model. Hydrogeological modelling is based on continuing work by third-party consultants.

The Cerro Verde mine works to achieve slope depressurization and dewatering goals and continues to update water management plans to intercept groundwater with horizontal drain hole drilling programs for specific slope depressurization needs, annual piezometer and vertical well installation focused on targeted areas, and necessary dewatering rates.

Ongoing hydrogeologic investigation includes:

- Design and implementation of appropriate proactive dewatering and slope depressurization measures including a piezometer network, pilot holes, vertical production wells, and horizontal drain holes.
- Field activities associated with mine dewatering and pit slope depressurization, including RC pilot borehole hydrogeologic logging, airlift and recovery testing and characterization, water quality testing, dewatering well design, and piezometer design and construction.
- Monitoring of production from vertical well and horizontal drain flows, piezometer performance, and pit sump pumping.
- Routine construction and replacement of a groundwater and pore pressure monitoring system utilizing a piezometer network, pilot holes, dewatering wells, and associated pumping and piping infrastructure.

7.7 Geomechanical Data

Geomechanical work includes an integrated workflow to manage needs that include field investigation, slope stability studies, mine dewatering, and pit slope depressurization. A comprehensive geology model is used as a baseline to integrate the stability models to hypothesize failure mechanisms, define geomechanical domains, estimate strength parameters, and identify slope depressurization targets.

The Cerro Verde mine uses limit equilibrium and numerical models to evaluate slope stability and establish annualized depressurization targets required to achieve the slope stability design acceptance criteria for factor-of-safety and strength-reduction-factors. Moreover, stability studies update the recommendations for bench geometries, inter-ramp slope angles, and overall slope configurations. Efforts also include site characterization, material characterization, stability studies, and risk assessment for certain waste dumps and ROM stockpiles. Geomechanical modelling is based on continuing work by third-party consultants.

Televiewer surveying is used on geomechanical holes. A third-party consultant uses the data collected in conjunction with physical examination of the drill hole core to characterize the orientation and properties of the geologic structures.

Ongoing geomechanical investigation includes:

- Design and implementation of appropriate proactive geotechnical measures including geomechanical core drilling, televiewer surveying, cell mapping, photogrammetry, and rock testing.
- Geomechanical core drilling is planned and executed to characterize the orientation and properties of geologic structures with televiewer surveying to obtain geomechanical parameters, rock testing, and install instrumentation.
- Geomechanical models including RQD are used for predicting the spatial variability and assessing rock quality as it relates to the degree of fracturing within the in-situ rock mass.
- Structure data is collected through cell mapping and photogrammetry to characterize the orientation and properties of geologic structures.
- Rock testing quantities are governed by rock quality and sample availability and include, but are not limited to, triaxial tests, uniaxial tests, disk tension tests, and small-scale direct shear tests. Testing is performed in accordance with the American Society of Testing and Materials, the International Society for Rock Mechanics, and the British Standards.
- Routine replacement and addition of geomechanical drill holes in areas of interest.

These activities are supervised and guided by an expert group specialized in mining geomechanics, hydrogeology, mine dewatering, and pit slope depressurization allowing completion of the geomechanical and hydrogeologic activities to established FCX mining geomechanical standards. The group consists of site personnel, FCX Corporate Geomechanical and Hydrogeology teams, primary geomechanical and hydrogeological third-party consultants, external reviewers, and industry experts.

7.8 Comment on Exploration

In the opinion of the QPs:

- The exploration programs completed at Cerro Verde (drilling, sampling, and logging) are appropriate for geologic resource modeling.
- The data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for mineral reserve and mineral resource estimation.
- The geomechanical and hydrogeologic programs are appropriate to support slope design recommendations according to the established slope design criteria and mine plans.

8 SAMPLE PREPARATION, ANALYSES, AND SECURITY

8.1 Sampling Techniques and Sample Preparation

Historically, core samples were split using a manual press splitter. Electric disc splitters were used from 1999 to 2009 with the objective of obtaining a better cut in the sample, avoiding bias, and the loss of fines. Since 2010, semi-automatic core saws have been employed. The core saws are more efficient and provide a representative split of the drill hole intervals.

Sample technicians place one-half of the sample back into the original core box in the same position and direction as it was originally oriented. The other half is placed in a labeled plastic bag, with the name of the drill hole, sample identification, and interval number. Sample weights are approximately 15 kilograms for split HQ-size (2.5 inches) core and 9 kilograms for NQ-size (1.875 inches) core. Drill hole core storage is located in on-site facilities. Core splits and rejects from all drilling programs are stored chronologically, with the exception of the Anaconda drilling programs.

In heavily faulted or other zones of poor core recovery, it is not possible to obtain a representative sample for assay. In these cases, a sample number is assigned but no sample is sent to the laboratories. It is entered in the database as having no recovery or grade.

For RC drilling, a sample is taken each meter from the cyclone. Each group of 3 samples is then combined to form a 3-meter sample. These samples are then taken to the Cerro Verde mine assay laboratory where they are quartered, split, and portioned by weight to produce a single sample weighing approximately 15 kilograms for each 3-meter drill hole interval. The material size for RC samples is approximately a quarter inch.

Samples from core and RC drilling are sent to the Cerro Verde mine assay laboratory for preparation and analysis. Sample preparation is done according to mine site procedures. Wet samples are taken to the sample preparation yard and left at ambient temperature for 3 hours. In case of rain, samples are dried in the oven for approximately 2 hours.

After drying, samples are crushed to minus a quarter inch using a Boyd crusher. Twenty percent of the sample is retained for further processing, while the remaining 80 percent is placed in a new bag for storage. Samples are then pulverized to minus 100 mesh and five pulps of 80 grams. Pulp samples are returned to the Cerro Verde geologists for insertion of quality assurance and quality control (QA/QC) samples, described in Section 8.3. For chain of custody purposes, the names of the individuals delivering and receiving the samples are recorded and stored at the mine site.

8.2 Assaying Methods

Assaying for Minero Peru drill hole samples was performed at the Cerro Verde mine assay laboratory. Selected duplicate verification samples were sent to the SGS Group (SGS) laboratories in Lima, Peru. Cyprus and PDC also conducted assay work at the mine assay laboratory. Grade reports were completed via hand-filled paperwork.

FCX continues to send drill hole samples to the Cerro Verde mine assay laboratory. This laboratory has a Peruvian Technical Standard ISO/IEC certification 17025:2006. In addition, some composites are sent to FCX's Technology Center facilities in Tucson, Arizona, U.S. (TCT). The TCT laboratory is accredited under the ISO 9001:2015 Quality

System. Secondary laboratory samples are sent to Certimin S.A., a third-party laboratory in Lima, Peru, that has a Peruvian Technical Standard ISO certification IEC 17025:2019.

Historically, samples have been analyzed by atomic absorption spectroscopy (AAS). In addition to TCu, samples were analyzed for acid-soluble copper (ASCu) followed by cyanide-soluble copper (CNCu) on the residue from the acid-soluble sample. Since 2008, copper has been analyzed by inductively coupled plasma. Samples exceeding 10,000 parts per million copper are reanalyzed by AAS. Cyanide testing was stopped in 2019 due to safety concerns and replaced with a ferric sulfate-soluble copper assay, known as quick leach test (QLT).

Other elements analyzed include total molybdenum (TMo), total iron (TFe), total arsenic (TAs), lead, sulfur, zinc, silver, gold, and manganese. There is also information on mineral characterization from x-ray diffraction (XRD) and cation exchange capacity. Composite samples for metallurgical recovery tests have mineralogical analyses performed by SGS's quantitative evaluation of minerals by scanning electron microscopy (QEMScan).

8.3 Sampling and Assay QA/QC

No written documentation exists for QA/QC procedures used by Minero Peru, Cyprus, and PDC. QA/QC information for these pre-FCX drill holes consisted only of duplicates. Despite the lack of robust QA/QC programs for these holes, no issues have been identified in the geologic and assay information associated with this drilling. Furthermore, a significant portion of the intervals for these holes have been mined out at the Cerro Verde mine.

Current procedures at the Cerro Verde mine for QA/QC on drill hole samples are as follows:

- Standards are inserted on a 1 in 20 basis by Cerro Verde for assay by Cerro Verde mine assay laboratory. These standards were made from primary sulfide mineralization taken from the CV and SR open-pits. This locally sourced material was sent to SGS in Lima, Peru for preparation of sample pulps. SGS's laboratory in Lima has a Peruvian Technical Standard ISO/IEC certification 17025:2017. The standard values are blind to the laboratory and are added to assess accuracy.
- Blanks are utilized and inserted on a 1 in 20 basis to confirm that there is no contamination between samples due to the sample preparation errors at the laboratory. Blanks were prepared and certified by SGS. Certification was based on inter-laboratory analytical results compiled by SGS. Another set of blanks were prepared at the Cerro Verde mine using unmineralized quartz material. The blanks are blind to the laboratory.
- Duplicates are analyzed on a 1 in 20 basis at the splitting (sample) and pulverization (pulp) stages of sample reduction. For core samples, the remaining half of split core, normally reserved for reference and metallurgical testwork, is sent to the laboratory as a duplicate sample. For RC samples, a duplicate sample is collected during drilling from the rig mounted cyclone splitter. The sample duplicates are blind to the laboratory. Each pulp duplicate is taken as a split from the pulverized material of the corresponding sample duplicate. Duplicate results are used to assess analytical precision and to evaluate the sampling nomograph.
- Over the years, random selections of pulp samples were sent to various secondary laboratories for validation of the primary laboratory results, with a targeted insertion rate of 3 to 5 percent.

- QA/QC data is entered directly into the drill hole database. All QA/QC check assays are examined for acceptability using QA/QC tools in the database software. Assays that meet QA/QC requirements are accepted into the database; those that did not are rejected, and reruns are ordered from Cerro Verde mine assay laboratory.

8.4 Bulk Density Measurements

The Cerro Verde mine tests core samples from CV, SR, and CN for density using the immersion method on unsealed pieces of dry drill hole core. One SG measurement is generally made for each 3 meters of core. Sample selection considers various geological criteria such as rock type, alteration, mineralization, fracturing, faulting, and other representative parameters. The weight of the sample in air and weight of the sample in water are entered into the database, providing a SG value for each interval by using the following formula:

SG = weight in air / (weight in air – weight in water)
Assumes water has an SG of 1 and surface tension is not a factor.

8.5 Comment on Sample Preparation, Analyses, and Security

In the QP's opinion, sample preparation, analytical methods, security protocols, and QA/QC performance are adequate and support the use of the analytical data for mineral reserve and mineral resource estimation.

9 DATA VERIFICATION

9.1 Data Entry and Management

Drill hole information is maintained in a database and managed by a database manager that has full access and the ability to restrict and monitor access for other end users. This database manager coordinates and controls the entry of all geologic information into the district-wide drill hole database.

Analytical data is loaded into the database directly from the laboratory via software importers. Prior to loading, the information is checked and validated. As needed, analytical results are rejected, and the relevant samples are reanalyzed. There is no manipulation of the assay information.

Outlier evaluations are routinely completed for the 3-meter assay intervals and 15-meter composites. The analytical values are compared to visual estimates as a check of the logging quality and the assay values. Assay intervals are validated and checked against the actual sample intervals.

Collar survey data is loaded directly from GPS units into the database. Collar locations are checked against surveyed topographic surfaces. Downhole surveys are examined for anomalous changes in azimuth and dip between adjacent surveys in cross section before they are imported into the database.

For historical drill holes, collar coordinates, downhole surveys, mineralogy and alteration codes, lithology and assays were migrated to the database via manual entry from the original core logging sheets. SG, uniaxial compressive strength, and RQD were entered from geotechnical logs. The transfer and validity of this data has been frequently checked during various model updates throughout the years.

9.2 Comment on Data Verification

As confirmation of the mineral reserve and resource process, third-party consultants are occasionally hired to perform verification studies. The Cerro Verde mine was last reviewed for year-end reporting during 2022. The study concluded that the geological methodologies analyzed "are reproducible, and therefore auditable, and are supported by procedures, protocols and standards used by the industry."

The QP has been involved in recent model audits of the Cerro Verde mine including reviews of the drill hole data. The data has been verified and no limitations have been identified.

In summary, data verification for the Cerro Verde mine has been performed by mine site and FCX corporate staff, and external consultants contracted by FCX. Based on reviews of this work, it is the QP's opinion that the Cerro Verde mine drill hole database and other supporting geologic data align with accepted industry practices and are adequate for use in mineral reserve and mineral resource estimation.

10 MINERAL PROCESSING AND METALLURGICAL TESTING

Mineral reserves and mineral resources are evaluated to be processed using hydrometallurgy and/or concentrating (mill) operations. The applicable processes and testing are discussed below.

10.1 Hydrometallurgical Testing and Recovery

Hydrometallurgical recovery is estimated based on the recoverable copper content and the time required to extract the recoverable copper. The final recovery is realized only after multiple leaching passes or cycles on the stockpiles. A leach cycle consists of solution application to a leach pad, followed by a rest period without solution application. Subsequent leach cycles recover diminishing portions of remaining copper.

Hydrometallurgical recoveries at the Cerro Verde mine have been developed from a combination of assay results to determine the range of mineral solubilities, column leach testing using standardized practices by the on-site laboratory and monitoring of field results. Recoverable copper content and kinetic recovery curves vary by ore type and applied leach cycles. Leach production results are tracked over many years to confirm actual hydrometallurgical recoveries. The range of expected long-term leach recoveries by process is listed in Table 10.1 for hydrometallurgy operations.

Table 10.1 – Hydrometallurgical Recoveries

Hydrometallurgical Method	Estimated Copper Recovery (%)
Crushed Leach	70 to 82
ROM Leach	41 to 70

Historical recovery estimates have been based on CNCu assays. This assaying method was eliminated in 2019 due to safety concerns. Analysis was undertaken to replace CNCu with QLT in the leach recovery equations for the range of mineral solubilities. No material differences were identified between recovery methodologies. The original recovery equations based on CNCu continue to be utilized for material lacking QLT data, since the original information is available and remains valid. QLT based equations are utilized where data is available.

Field results are a combination of ore type deliveries to the leaching processes. Actual results of the aggregate copper recovery compare favorably to the estimated recoveries, and it is the QP's opinion that the recovery estimates and kinetic recovery curves are reasonable.

10.2 Concentrating Metallurgical Testing and Recovery

Metallurgical testing and development activities were undertaken during 2003 and 2004 to support the initial C1 concentrator development. Much of the metallurgical testwork performed by PDC and third-party laboratories was done on variability samples or composites representing the different ore types. The parameters from the testwork were used as inputs to predictive performance models for the plant, in terms of throughput in the comminution circuit, metal recovery, and concentrate grade in the flotation circuits. The testwork and engineering studies ultimately led to the construction and commissioning of the C1 concentrator in early 2007.

The C2 concentrator was commissioned in late 2015. The design and construction were based on the original testwork for C1, with additional trade-off studies and the operating data from C1 to improve parts of the circuit.

Current predictive plant performance models have been based on operating results more than initial testwork, especially with respect to the tonnage capability of the plants, which have exceeded the original design criteria for the concentrators. The historical performance of the plants helps to define the capability of the plant but does not confirm future performance.

The Cerro Verde mine also relies on a geometallurgical testwork program to determine the characteristics of future ores. The majority of the geometallurgical testwork was completed by the Cerro Verde mine laboratory. Geometallurgical campaigns are designed to focus on ore to be processed in the next 5 years of operation, with a smaller number of samples covering the expected future ores deliveries to compare to the ore currently being processed. The testwork includes flotation tests, Bond Work Index (BWI) testing, and mineralogical analysis including QEMScan and XRD.

The QA/QC procedures for the hardness testing include repeats, duplicates, and a laboratory round-robin verification program. For flotation testing the main QA/QC methodology is by use of repeats and duplicates.

Metallurgical recovery of copper and molybdenum considers three ore types, namely primary sulfides, secondary sulfides, and transitional sulfides. Recovery estimates have been developed by ore type for the district and are supported by analytical testing at the operation along with field results. The long-term metal recovery estimates by ore type are listed in Table 10.2 for concentrator operations.

Table 10.2 – Concentrator Recoveries

Ore Type Description	Copper Recovery (%)	Molybdenum Recovery (%)
Primary Sulfides	90	55
Secondary Sulfides	85	52
Transitional Sulfides	85	52
Stockpiled Ore	65	52

Silver is a by-product of the copper concentrate produced and is recovered in the smelter.

From 2015 to 2022, metallurgical recovery of copper has been affected by a high percentage of ore feed from previously stockpiled ore. This ore is primarily comprised of oxidized sulfide material with a lower realized recovery than the original testwork. The current stockpile inventory is planned to be depleted by 2028 in the LOM plan and primary sulfide ore will be the majority of ore feed deliveries. As a result, future metallurgical recovery is expected to better align with the estimates of the ore types.

Arsenic is present in the ore but does not occur in the copper concentrates at levels above the contract specifications. Arsenic can occur at levels above contract specifications in the molybdenum concentrate. The Cerro Verde mine manages this material through blending of concentrates with lower levels of arsenic so that the final product is shipped within contract specifications.

While there are some isolated areas of high zinc and lead in the mine, neither the copper nor the molybdenum concentrates are impacted by these impurities.

10.3 Comment on Mineral Processing and Metallurgical Testing and Recoveries

In the opinion of the QPs, the metallurgical testwork completed has been appropriate to establish reasonable processing methods for the different mineralization encountered in the deposits. Geometallurgical samples are properly selected to represent future ores and recovery factors have been confirmed from production data collected from ore processed in the open-pits. As a result, the processing and associated recovery factors are considered appropriate to support mineral reserve and mineral resource estimation and mine planning.

11 MINERAL RESOURCE ESTIMATE

Mineral resources are evaluated using the application of technical and economic factors to a geologic resource block model and employing optimization algorithms to generate digital surfaces of mining limits, using specialized geologic and mine planning computer software. The resulting surfaces volumetrically identify material as potentially economical, using the assumed parameters. Mineral resources are the resultant contained metal inventories.

11.1 Resource Block Model

Relevant geologic and analytical information is incorporated into a three-dimensional digital representation referred to as a geologic resource block model. The Cerro Verde mine resource block model was updated on March 23, 2022, with an effective date for exploration drill hole data of December 1, 2021. The Cerro Verde resource block model includes rock type and mineralogical ore type interpretations for the Cerro Verde district based on drilling and projections from production data and interpolation parameters which distinguish geostatistical domains.

11.1.1 Compositing Strategy

Drill hole assay intervals are combined into 15-meter composites, corresponding to the mine bench height. Composites are broken on lithological contacts, with a minimum length of 7.5 meters. If the composite length is shorter, it is added to the previous composite. The purpose of breaking composites on lithological contacts is to retain the correlation between samples and composites. This was done for TCu, ASCu, and QLT.

For analytes such as TMo, TFe, TAs, and others, a separate bench composite is created to facilitate merging calculated composites with analytical composites. If any portion of a drill hole is flatter than 48 degrees, the compositing program reverts to 15-meter fixed-length composites.

Geological codes are composited by majority code. These codes may be edited manually based on the results of outlier analysis for each rock type and mineral type.

11.1.2 Statistical Evaluation

Exploratory data analysis of the composites serves to identify populations for the various analytes to be estimated and checks for trends and extreme values. This analysis is based on cumulative probability plots, QQ plots, histograms, box plots, scatter plots, and basic statistics by each geological domain. Contact analysis is performed to determine the nature of boundaries between geologic domains as either hard or soft.

Numerous statistical studies over the years have demonstrated that ore types based on copper mineralogy comprise distinct populations for copper in the oxide and supergene zones. In the CV deposit, the oxide zone has the highest TCu grades, followed by secondary and primary sulfides. In the SR deposit, secondary sulfides have the highest TCu grades, followed by oxide and primary sulfides. The primary sulfide grades for CV and SR are very similar. For primary sulfide mineralization, late-stage porphyry intrusions are distinctly lower grade while breccias are higher grade. Down hole and direction variograms are used to define anisotropy for Ordinary Kriging (OK).

11.1.3 Block Model Setup

Model limits and block sizes for the geologic resource block model are shown in Table 11.1. East and west coordinates are truncated Universal Transverse Mercator coordinates where 200,000 has been subtracted from east coordinates and 8,100,000 has been subtracted from north coordinates. Elevation is in meters above sea level and the vertical block size matches the mine bench height for open-pit operations. The model has not been rotated and the extent of the model encompasses the CV, SR, and CN deposits.

Table 11.1 – Cerro Verde Block Model Parameters

Direction	Minimum	Maximum	Size (meters)	# of Blocks
X-East	20,300	28,300	20	400
Y-North	67,000	73,400	20	320
Z-Elevation	443	2,963	15	168

11.1.4 Topography

Geological interpretations and grade estimates are carried to the original topographic surface in the geologic resource model. The original topography is from Anaconda and is based on aerial photography. Estimated year-end topography is constructed from site surveys and estimated mining progress. Volumes between the estimated year-end topographic surface and the in-place, hard-rock surface are coded as fill material.

11.1.5 Geologic Model Interpretation

Rock type interpretations are developed on 129 east-west sections, 161 north-south sections, and 168 mid-bench plans. Sections are spaced 50 meters apart while bench plans are 15 meters apart. Interpretations are reconciled in all three directions. After final checks and minor editing, the mid-bench plan polygonal shapes are used to code the model using the majority percentage for the block.

Interpretations for copper mineral types and alteration are developed in the same way as for rock type. Rock type and mineral codes are used to define interpolation domains for grade estimation.

11.1.6 Grade Estimates

The grade interpolation search distances for OK, Inverse Distance Weighting (IDW), and Nearest Neighbor (NN) methods are based on the statistical and geostatistical analyses. Model items for TCu, TMo, ASCu, and QLT are all estimated in the same set of runs using OK. Model items for TAs, RQD, and BWI are estimated using IDW with a power of 3. NN values are utilized to check the interpolated values.

Mineral types for copper are the main control for interpolation of TCu, ASCu, and QLT for non-hypogene mineralization. For hypogene mineralization, copper grade shells and rock types are used to constrain the interpolations. Search distances are 200 meters by 200 meters by 60 meters in X, Y, and Z directions for most interpolation domains. Smaller domains have shorter distances. Separate estimation parameters have been developed for CV, SR, and CN.

11.1.7 Bulk Density

Bulk density was estimated using measured SG values for each drill hole interval composited to 15 meters. A default SG value of 2.698 was assigned for CV and SR, and a default SG value of 2.550 was assigned for CN. Final SG values in the block model were determined using drill hole composite values and NN estimation based on deposit and mineralogic ore types. Search distances for this assignment vary by direction and deposit but do not exceed 200 meters. Beyond this search, averages by deposit are assigned.

11.1.8 Mineral Resource Classification

Drill hole spacing and the number of composites used for interpolation are key components in evaluating the uncertainty of mineral resource estimates. Approximately 98 percent of the drilling at the Cerro Verde mine is core. Suspect drill holes have been identified so as not to be used; therefore, sample type is not a consideration in assessing uncertainty of the mineral resource estimates.

FCX's experience with porphyry copper deposits has established drill hole spacing criteria that provide estimates of ore tonnage, grade, and contained and recoverable metal meeting corporate standards for each process method. The required drill hole spacing considers uncertainty in grade estimates as well as geometric uncertainty associated with geologic interpretation of copper mineral types, rock types, and alteration. Experience has shown that drill hole spacings of 50 and 100 meters are adequate for determination of measured and indicated resources, respectively, and inferred resources can be projected up to 200 meters from a drill hole.

Resource classification criteria are summarized in Table 11.2 for CV and SR and Table 11.3 for CN. The targeted drill hole spacings for measured and indicated resources at CV and SR have been increased by 10 percent to 55 and 110 meters to allow for holes that cannot be placed exactly on grid locations. If a percentage of the variogram range is less than the established distances, it takes precedence. In most cases, the variogram ranges are longer than the average distance criteria.

Table 11.2 – Resource Classification Criteria for CV and SR

Domain	Resource Classification	Variogram Range		Average Distance (meters)	Minimum # of Composites	Minimum # of Holes
		%	Distance (meters)			
All Domains, except late porphyry	Measured	50	-	0 to 55	5	3
	Indicated	75	0 to 100	-	5	3
	Indicated	75	-	0 to 110	3	2
	Inferred	100	0 to 200	-	1	1
	Not classified	>100	>200	-	1	1
Hypogene - late porphyry	Measured	50	-	0 to 55	5	3
	Indicated	75	0 to 98	-	5	3
	Indicated	75	-	0 to 110	3	2
	Inferred	100	0 to 200	-	1	1
	Not classified	>100	>200	-	1	1

Measured: 0 to 50 percent of variogram range or average distance of less than or equal to 55 meters
Indicated: 51 to 75 percent of variogram range or distance of less than or equal to 100 meters
Indicated: 51 to 75 percent of variogram range or average distance of less than or equal to 110 meters
Inferred: 76 to 100 percent of variogram range or distance of less than or equal to 200 meters
Not classified: Greater than 100 percent of variogram range or distance greater than 200 meters

Table 11.3 – Resource Classification Criteria for CN

Domain	Resource Classification	Variogram Range		Average Distance (meters)	Minimum # of Composites	Minimum # of Holes
		%	Distance (meters)			
All Domains	Measured	50	-	0 to 55	6	3
	Indicated	75	0 to 100	-	6	3
	Indicated	75	-	0 to 100	4	2
	Inferred	100	0 to 200	-	1	1
	Not classified	>100	>200	-	1	1

Measured: 0 to 50 percent of variogram range or average distance of less than or equal to 55 meters
Indicated: 51 to 75 percent of variogram range or distance of less than or equal to 100 meters
Indicated: 51 to 75 percent of variogram range or average distance of less than or equal to 100 meters
Inferred: 76 to 100 percent of variogram range or distance less than or equal to 150 meters (for oxides) or 200 meters (for all remaining domains)
Not classified: Greater than 100 percent of variogram range or distance greater than 200 meters

11.1.9 Model Validation and Performance

The geologic resource model is evaluated by visual inspection, statistical analysis, and comparison with the blast hole model. Reconciliations between the resource model and blast hole models provide a measure of uncertainty associated with mineral resource classification.

Cross sections and level plans showing block model codes and drill hole composites are visually examined to verify proper coding of rock type, alteration, and mineral type. Similarly, block model grades are compared with supporting composite values. These inspections show that block model values compare well with the drill hole composites.

Comparisons among assay, composite, and block model grades are performed for each mineralogical ore type as an integral part of the model process. Estimated grades in the model are evaluated by statistical analyses including cumulative probability plots of assays, composites, and blocks. The cumulative probability plots are developed to review that the block grade distributions mimic the distributions of the underlying data. Block model OK and IDW results are compared with the composite data and NN estimates.

As confirmation of the mineral reserve and resource process, third-party consultants are occasionally hired to perform verification studies. The Cerro Verde mine was last reviewed for year-end reporting during 2022. The study concluded that the geological methodologies analyzed “are reproducible, and therefore auditable, and are supported by procedures, protocols and standards used by the industry.”

FCX standards provide that the resource model should be within 10 percent of the blast hole model for tonnage, grade, and contained or recoverable metal over a 12-month period. For sites such as the Cerro Verde mine with multiple processing methods, comparisons are made for each, but consideration is given to the processing method that represents the greatest proportion of production. As of December 31, 2022, the comparison between the resource model and blast hole model indicate that the resource model is underpredicting in molybdenum grade; however, over a 36-month period, the model meets FCX criteria. Reconciliation data is routinely reviewed, and action plans are administered to investigate noted variances.

11.1.10 Comment on Geologic Resource Model

The Cerro Verde mine has a long history of mining and has been the subject of numerous geological studies. In the opinion of the QP, who is a member of the FCX Resource Model Audit Team and has participated in reviews of the most recent model updates:

- The Cerro Verde geology staff has a good understanding of the lithology, structure, alteration, and copper mineral types in the district. The understanding of the controls on mineralization are adequate to support estimation of mineral reserves and mineral resources.
- The understanding and interpretation of ore types based on copper mineralogy is a key component to supporting classification of mineral reserves and mineral resources by process method.
- The geological knowledge of the district is sufficient to provide reliable inputs to mine planning, geomechanics, and metallurgy.
- The geologic resource model has been completed using accepted industry practices.
- The geologic resource model is suitable for estimation of mineral reserves and mineral resources.

11.2 Resource Evaluation

Mineral resource estimates are developed by applying technical and economic modifying factors to the geologic block model to identify material with potential for economic extraction. The process of evaluation is iterative, involving an initial draft using the assumptions, understanding the implications of the resulting economical mining limits, and adjusting the assumptions as warranted for subsequent evaluations.

Mineral resource estimates are determined using measured, indicated, and inferred classified materials as viable ore sources during evaluations with the modifying factors.

11.2.1 Economic Assumptions

FCX executive management establishes reasonable long-term metal pricing to be used in determining mineral reserves and mineral resources. These prices are based on reviewing external market projections, historical prices, comparison of peer mining companies' reported price estimates, and internal capital investment guidelines. The long-term sale prices align the company's strategy for evaluating the economic feasibility of the mineral reserves and mineral resources.

The mineral reserves and mineral resources are based on specific volumes of potentially economic, mineralized material in which FCX has the most confidence to produce an acceptable economic result, given a set of evaluation assumptions. As work continues to increase FCX's confidence through drilling, test work, and the evaluation of engineering work and other modifying factors, FCX anticipates conversion of resources to reserves in the future, which may require, among other things, higher metal prices.

In developing the economic assumptions used to determine mineral reserves and mineral resources during early 2022, FCX and its QPs made comparisons of the commodity price assumptions against various periods of historical average prices and current spot prices. Additionally, long-term forward-looking price projections from various sources of third-party market consensus services and financial institution reports covering periods ranging from 2022 to 2035 were reviewed. This information is used as reference for reasonableness of the assumptions. FCX concluded that mineral reserve price assumptions of $3.00 per pound for copper, $12 per pound for molybdenum, and $20 per ounce for silver were reasonable in comparison to the reference points and expected volumes of potentially economic material. FCX also concluded mineral resource price assumptions of $3.50 per pound for copper, $15 per pound for molybdenum, and $20 per ounce for silver were reasonable and aligned with industry-accepted practice to use higher metal prices for the mineral resource estimates than the pricing used for determining mineral reserves.

For copper, London Metal Exchange copper settlement prices over various historical periods were reviewed. For the 10-year period ended December 31, 2022, the price ranged from $1.96 per pound to $4.87 per pound and averaged $3.06 per pound. During 2022, forward-looking prices ranged from $2.70 per pound to $4.08 per pound.

For molybdenum, weekly average molybdenum prices quoted by Platts Metals Daily over various historical periods were reviewed. For the 10-year period ended December 31, 2022, the price ranged from $4.46 per pound to $31.37 per pound and averaged $10.97 per pound. During 2022, forward-looking prices ranged from $8.00 per pound to $13.00 per pound.

For silver, London PM silver prices over various historical periods were reviewed. For the 10-year period ended December 31, 2022, the price ranged from $12.01 per ounce to $32.23 per ounce and averaged $19.20 per ounce. During 2022, forward-looking prices ranged from $14.00 per ounce to $24.79 per ounce.

Unit costs are derived from current operating forecasts benchmarked against historical results and other similar operations. Additional input from appropriate internal FCX departments such as Global Supply Chain, Sales and Marketing, and Finance and Accounting are considered when developing the economic assumptions.

To recognize the relationship between commodity prices and principal consumable cost drivers, FCX scales unit costs to reflect the cost environment associated with the reported metal prices. This is evidenced in the differences in economic assumptions between mineral reserves and mineral resources.

The metal price and cost assumptions are used over the timeframe of the expected life of the mine and reflect steady-state operating conditions in the metal price cost environment. Details of the economic assumptions are outlined in Table 11.4.

11.2.2 Processing Recoveries

Processing recoveries are outlined in Section 10.

11.2.3 Physical Constraints

Slope angle recommendations are provided by FCX geomechanical groups and third-party consultants. The recommendations are derived from empirical analysis of geological and hydrogeological modeling, drill hole results, and in-field measurements.

Boundary limits for resource evaluation include property ownership and permitting limits, and additional major infrastructure relocation requiring capital investment for boundary expansions.

11.2.4 Time-Value Discounting

To recognize the time delay in extracting increasingly deeper portions of the mine as part of the mining process, FCX uses bench discount factoring for resource evaluation processes. This factor discounts each block's value relative to the block's elevation in the geologic block model, effectively assigning a higher relative value to material located closer to the surface than deeper material, which cannot be accessed until overlying material has been removed.

Additionally, hydrometallurgical processes achieve final recoveries after a period of years of repeated solution applications whereas concentrating process recoveries are realized on a more immediate timeframe. In recognition of this distinction, a time-value discount is applied to hydrometallurgical recovery based on the planned recovery curves.

11.2.5 Cutoff Grades

A cutoff grade is used to determine whether material should be mined and if that material should be processed as ore or routed as waste. The mine planning software evaluates the revenue and cost for each block in the block model to determine routing, selecting material that has a reasonable basis for economic extraction using the provided assumptions. The following formula demonstrates how the cutoff grades are determined within the software:

> Internal cutoff grade = Sum of [processing costs + general site and sustaining costs] / Sum of [payable recoverable metal * (metal price – metal refining and sales costs)]

A break-even cutoff grade calculation is similar to the internal cutoff grade formula but includes mining costs. Blocks with grades above the break-even cutoff grade generate positive value, while blocks with grades above the internal cutoff grade minimize negative value. The cutoff grades reported for mineral resources reflect the internal cutoff grades based on economical destination routing from the software results.

Input parameters are applied to individual deposits and distinct ore types as appropriate. Unique parameters can result in distinct cutoff grades. Cutoff grades are reported in terms of an Equivalent Copper Grade (EqCu) defining the relative value of all commercially recoverable metals in terms of copper by ore processing methods.

11.2.6 Economic and Technical Assumptions

The economic and technical assumptions used for the generation of potentially economical mining limits are summarized in Table 11.4.

Table 11.4 – Economic and Technical Assumptions for Resource Evaluation

Cerro Verde Mine as of December 31, 2022	**Units**	**Mineral Reserve Assumptions**	**Mineral Resource Assumptions**
Economic Parameters			
Metal Prices			
Copper	$ per pound	3.00	3.50
Copper Cathode Premium	$ per pound	0.025	0.025
Molybdenum	$ per pound	12	15
Silver	$ per ounce	20	20
Mining Costs			
Mining Rate	metric ton per day	930,000	930,000
Base Waste Mining Cost	$ per dmt-Mined	1.72	1.82
Haulage Increment per bench	$ per dmt-Mined per bench	0.03	0.03
Incremental Mill Haulage Cost/(Credit)	$ per dmt-Mined	(0.35)	(0.37)
Incremental Crushed Leach Haulage Cost/(Credit)	$ per dmt-Mined	0.02	0.02
Incremental ROM Leach Haulage Cost/(Credit)	$ per dmt-Mined	(0.06)	(0.06)
Leaching Costs			
ROM Placement Rate	metric ton per day	27,000	27,000
ROM Leach Cost	$ per dmt-ROM	2.16	2.37
Crushed Stacking Rate	metric ton per day	28,000	28,000
Crushed Leach Cost	$ per dmt-Crushed	5.04	5.71
SX/EW Processing Rate	million pounds per year	80	80
SX/EW Cost	$ per pound copper	0.26	0.26
EW Cathode Freight to Market and Sales Cost	$ per pound copper	0.05	0.05
Milling Costs			
Milling Rate	metric ton per day	420,000	420,000
Milling Cost	$ per dmt-Milled	5.71	5.84
Freight, Smelting, Refining and Sales Costs	$ per pound copper	0.45	0.45
Copper Concentrate Grade	% copper	25.2%	25.2%
Smelting	$ per dmt-Concentrate	100	100
Refining	$ per pound copper	0.10	0.10
Silver Refining Cost	$ per ounce	0.35	0.35
By-product Credit – Silver	$ per pound copper	0.08	0.08
Transportation Losses	%	0.3%	0.3%
Copper Smelter Payable Term	%	96.0%	96.0%
Silver Smelter Payable Term	%	90.0%	90.0%
Molybdenum Production Rate	million pounds per year	25	25
Molybdenum Cost	$ per pound molybdenum	3.81	4.19
Molybdenum Roasting Recovery	%	99.0%	99.0%
General Site Costs			
Site G&A Assigned to Mill	$ per dmt-Milled	0.73	0.76
Total Site Taxes	$ per pound copper	0.03	0.03
Sustaining Capital Costs			
Mine Equipment Capital Allowance	$ per dmt-Mined	0.35	0.35
EW Sustaining Capital Allowance	$ per pound copper	0.01	0.01
Mill Sustaining Capital Allowance	$ per dmt-Milled	0.58	0.58
Major Commodity Costs			
Delivered Acid Cost	$ per wmt-acid	123	160
Power Cost	$ per kWh	0.07	0.07
Delivered Diesel Cost	$ per U.S. gallon	2.66	2.81
Technical Parameters			
Bench Height	Meters	15	15
Bench Discount Factor	% per bench	1.50%	1.50%
Range of Open-Pit Slope Angles	degrees	20 minimum to 52 maximum	
Process Recoveries	%	Refer to Section 10	

Notes:
dmt = dry metric ton
wmt = wet metric ton

Metal prices and other assumptions for mineral reserve and mineral resource evaluations are reviewed at least annually with FCX management. As of December 31, 2022, FCX and its QPs concluded that the assumptions for mineral reserve and mineral resource determinations were reasonable.

11.3 Mineral Resource Statement

The mineral resource estimate is the inventory of material identified as having a reasonable likelihood for economic extraction inside the mineral resource economical mining limit, less the mineral reserve volume, as applicable. The modifying factors are applied to measured, indicated, and inferred resource classifications to evaluate commercially recoverable metal. As a point of reference, the in-situ ore containing copper, molybdenum, and silver metal is inventoried and reported by intended processing method.

The reported mineral resource estimate in Table 11.5 is exclusive of the reported mineral reserve, on a 100 percent and pro rata property ownership basis. The mineral resource estimate is based on commodity prices of $3.50 per pound for copper, $15 per pound for molybdenum, and $20 per ounce for silver.

Table 11.5 – Summary of Mineral Resources

CERRO VERDE MINE Summary of Mineral Resources[a] As of December 31, 2022		Ownership %	Tonnage[b] Metric M Tons	Cutoff Grade[c] %EqCu	Average Grade Copper %	 Molybdenum %	 Silver g/t	Contained Metal[b,d] Copper M lbs	 Molybdenum M lbs	 Silver k ozs
Open-Pit Inventories										
Mill	Measured		33		0.26	0.01	1.38	186	7	1,447
	Indicated		2,080		0.33	0.01	1.73	14,906	494	115,822
	Subtotal		**2,112**		**0.32**	**0.01**	**1.73**	**15,092**	**502**	**117,269**
	Inferred		1,396		0.33	0.01	1.76	10,147	347	78,850
	Total		**3,508**	**0.12**	**0.33**	**0.01**	**1.74**	**25,239**	**849**	**196,120**
ROM Leach	Measured		6		0.36			49		
	Indicated		20		0.24			106		
	Subtotal		**26**		**0.27**			**155**		
	Inferred		22		0.29			137		
	Total		**48**	**0.08**	**0.28**			**292**		
Total Resources Inventories										
Total Mineral Resources	Measured		39		0.28	0.01	1.16	236	7	1,447
	Indicated		2,100		0.32	0.01	1.72	15,012	494	115,822
	Subtotal		**2,138**		**0.32**	**0.01**	**1.71**	**15,247**	**502**	**117,269**
	Inferred		1,418		0.33	0.01	1.73	10,285	347	78,850
	Total	**100%**	**3,556**		**0.33**	**0.01**	**1.72**	**25,532**	**849**	**196,120**
Net Equity Interest[e]										
Total FCX		**53.56%**	**1,905**		**0.33**	**0.01**	**1.72**	**13,675**	**454**	**105,042**
Total SMM		**21.00%**	**747**		**0.33**	**0.01**	**1.72**	**5,362**	**178**	**41,185**
Total BV		**19.58%**	**696**		**0.33**	**0.01**	**1.72**	**4,999**	**166**	**38,400**
Total Public Shares		**5.86%**	**208**		**0.33**	**0.01**	**1.72**	**1,496**	**50**	**11,493**

Notes

a. Reported as of December 31, 2022, using metal prices of $3.50 per pound for copper, $15 per pound for molybdenum, and $20 per ounce for silver. Mineral resources are exclusive of mineral reserves.

b. Amounts may not foot because of rounding.

c. Internal cutoff grade reported as equivalent copper (EqCu).

d. Estimated expected recoveries are consistent with those for mineral reserves but would require additional work to substantiate.

e. The Cerro Verde mine is operated by FCX through a partially owned subsidiary, Sociedad Minera Cerro Verde S.A.A. (SMCV). FCX holds a 53.56 percent ownership interest in SMCV, with the remaining 46.44 percent held by SMM Cerro Verde Netherlands B.V. (SMM - 21 percent), Compañia de Minas Buenaventura S.A.A. (BV - 19.58 percent) and other stockholders whose shares are publicly traded on the Lima Stock Exchange (Public Shares - 5.86 percent).

Extraction of the mineral resource may require significant capital investment, specific market conditions, expanded or new processing facilities, additional material storage facilities, changes to mine designs, or other material changes to the current operation.

In the opinion of the QP, risk factors that may materially affect the mineral resource estimate include (but are not limited to):

- Metal price and other economic assumptions.
- Changes in interpretations of continuity and geometry of mineralization zones.
- Changes in parameter assumptions related to the mine design evaluation including geotechnical, mining, processing capabilities, and metallurgical recoveries.
- Changes in assumptions made as to the continued ability to access and operate the site, retain mineral and surface rights and titles, maintain the operation within environmental and other regulatory permits, and social license to operate.

Uncertainty in geological resource modeling is monitored by reconciling model performance against actual production results, as part of the FCX geologic resource model verification process.

11.4 Comment on Mineral Resource Estimate

The mineral resource estimate has been prepared using industry accepted practice and conforms to the disclosure requirements of S-K1300. Mineral reserve and mineral resource estimates are evaluated annually, providing the opportunity to reassess the assumed conditions. Although all the technical and economic issues likely to influence the prospect of economic extraction of the resource are anticipated to be resolved under the stated assumed conditions, no assurance can be given that the estimated mineral resource will become proven and probable mineral reserves.

12 MINERAL RESERVE ESTIMATE

Mineral reserves are summarized from the LOM plan, which is the compilation of the relevant modifying factors for establishing an operational, economically viable mine plan. The LOM plan incorporates:

- Scheduling material movements for ore and waste from designed final mining excavation plans with a set of internal development sequences, based on the results of the resource evaluation process.
- Planned production from scheduled deliveries to processing facilities, considering metallurgical recoveries and planned processing rates and activities.
- Capital and operating cost estimates for achieving the planned production.
- Assumptions for major commodity prices and other key consumable usage estimates.
- Revenues and cash flow estimates.
- Financial analysis including tax considerations.

Mineral reserves have been evaluated considering the modifying factors for conversion of measured and indicated resource classes into proven and probable reserves. Inferred resources are considered to be waste in the LOM plan. The details of the relevant modifying factors included in the estimation of mineral reserves are discussed in Sections 10 through 21.

The LOM plan includes the planned production to be extracted from the in-situ mine designs and from previously extracted material, known as WIP inventories. WIP includes material on crushed leach and ROM leach pads for processing, and in stockpiles set aside to be rehandled and processed at a future date. WIP is estimated as of December 31, 2022, from production of reported deliveries through mid-year and the expected production to the end of the year.

12.1 Cutoff Grade Strategy

The cutoff grade strategy is a result of the mine plan development, determined by the economic evaluation of the mineral reserves via strategic long-range mine and business planning. Operational cutoff grades are determined from the LOM planning results and can vary based on processing throughput expectations, ore availability, future ore and overburden requirements, and other factors encountered as the mine operates. This approach is consistent with accepted mining industry practice. Cutoff grades reported are the minimum grades expected to be delivered to a processing facility.

12.2 Mineral Reserve Statement

As a point of reference, the mineral reserve estimate reports the in-situ ore and WIP inventories from the LOM plan containing copper, molybdenum, and silver metal and reported as commercially recoverable metal.

Table 12.1 summarizes the mineral reserves reported on a 100 percent and pro rata property ownership basis. The mineral reserve estimate is based on commodity prices of $3.00 per pound for copper, $12 per pound for molybdenum, and $20 per ounce for silver.

Table 12.1 – Summary of Mineral Reserves

CERRO VERDE MINE Summary of Mineral Reserves[a] As of December 31, 2022		Ownership %	Tonnage[b] Metric M Tons	Cutoff Grade[c] %EqCu	Average Grade Copper %	Average Grade Molybdenum %	Average Grade Silver g/t	Average Recovery[d] Copper %	Average Recovery[d] Molybdenum %	Average Recovery[d] Silver %	Recoverable Metal[b] Copper M lbs	Recoverable Metal[b] Molybdenum M lbs	Recoverable Metal[b] Silver k ozs
Open-Pit Inventories													
Mill	Proven		620		0.37	0.02	1.94	85.5	54.4	44.9	4,303	119	17,373
	Probable		3,489		0.35	0.01	1.83	85.4	54.4	44.9	22,808	576	92,094
	Total		**4,109**	**0.13**	**0.35**	**0.01**	**1.85**	**85.5**	**54.4**	**44.9**	**27,110**	**696**	**109,467**
Crushed Leach	Proven		8		0.42			77.0			56		
	Probable		1		0.45			77.0			10		
	Total		**9**	**0.25**	**0.43**			**77.0**			**66**		
ROM Leach	Proven		36		0.35			50.9			143		
	Probable		81		0.21			50.9			190		
	Total		**116**	**0.08**	**0.25**			**50.9**			**333**		
Total Open-Pit Reserves	Proven		664		0.37	0.01	1.81	83.6	54.4	44.9	4,501	119	17,373
	Probable		3,571		0.34	0.01	1.79	85.0	54.4	44.9	23,008	576	92,094
	Total		**4,235**		**0.35**	**0.01**	**1.79**	**84.7**	**54.4**	**44.9**	**27,510**	**696**	**109,467**
Stockpile Inventories													
Mill Stockpile	Proven		69		0.27	0.01	1.05	64.2	51.7	44.9	259	7	1,046
Leach Stockpile	Proven		587		0.44			4.6			263		
	Total		**656**		**0.43**	**0.00**	**0.11**	**8.5**	**51.7**	**44.9**	**523**	**7**	**1,046**
Total Reserves Inventories													
Total Mineral Reserves	Proven		1,319		0.40	0.01	0.97	43.6	54.3	44.9	5,024	127	18,420
	Probable		3,571		0.34	0.01	1.79	85.0	54.4	44.9	23,008	576	92,094
	Total	**100%**	**4,890**		**0.36**	**0.01**	**1.57**	**72.6**	**54.4**	**44.9**	**28,032**	**703**	**110,513**
Net Equity Interest[e]													
Total FCX		**53.56%**	**2,619**		**0.36**	**0.01**	**1.57**	**72.6**	**54.4**	**44.9**	**15,014**	**377**	**59,191**
Total SMM		**21.00%**	**1,027**		**0.36**	**0.01**	**1.57**	**72.6**	**54.4**	**44.9**	**5,887**	**148**	**23,208**
Total BV		**19.58%**	**958**		**0.36**	**0.01**	**1.57**	**72.6**	**54.4**	**44.9**	**5,489**	**138**	**21,639**
Total Public Shares		**5.86%**	**287**		**0.36**	**0.01**	**1.57**	**72.6**	**54.4**	**44.9**	**1,643**	**41**	**6,476**

Notes

a. Reported as of December 31, 2022, using metal prices of $3.00 per pound for copper, $12 per pound for molybdenum, and $20 per ounce for silver.

b. Amounts may not foot because of rounding.

c. Operational cutoff grade reported as equivalent copper (EqCu).

d. Process recoveries include all applicable processes such as concentration, smelting, transportation losses, etc.

e. The Cerro Verde mine is operated by FCX through a majority owned subsidiary, Sociedad Minera Cerro Verde S.A.A. (SMCV). FCX holds a 53.56 percent ownership interest in SMCV, with the remaining 46.44 percent held by SMM Cerro Verde Netherlands B.V. (SMM - 21 percent), Compañia de Minas Buenaventura S.A.A. (BV - 19.58 percent), and other stockholders whose shares are publicly traded on the Lima Stock Exchange (Public Shares - 5.86 percent).

In the opinion of the QP, risk factors that may materially affect the mineral reserve estimate include (but are not limited to):

- Metal price and other economic assumptions.
- Changes in interpretations of continuity and geometry of mineralization zones.
- Changes in parameter assumptions related to the mine design evaluation including geotechnical, mining, processing capabilities, and metallurgical recoveries.
- Changes in assumptions made as to the continued ability to access and operate the site, retain mineral and surface rights and titles, maintain the operation within environmental and other regulatory permits, and social license to operate.

As confirmation of the mineral reserve and resource process, third-party consultants are occasionally hired to perform verification studies. The Cerro Verde mine was last reviewed for year-end reporting during 2022. The study concluded that “the reserve model, the mineral reserve estimates, and the production plan for the Cerro Verde operation have been developed using standard procedures generally accepted by the mining industry and that the mineral reserves established meet the SEC’s guidelines.”

The positive economics of the financial analysis of the LOM plan demonstrate the economic viability of the mineral reserve estimate.

12.3 Comment on Mineral Reserve Estimate

The mineral reserve estimate has been prepared using industry accepted practice and conforms to the disclosure requirements of S-K1300. Mineral reserve and mineral resource estimates are evaluated annually, providing the opportunity to reassess the assumed conditions. All the technical and economic issues likely to influence the prospect of economic extraction are anticipated to be resolved under the stated assumed conditions.

Mineral reserve estimates consider technical, economic, environmental, and regulatory parameters containing inherent risks. Changes in grade and/or metal recovery estimation, realized metal prices, and operating and capital costs have a direct relationship to the cash flow and profitability of the mine. Other aspects such as changes to environmental or regulatory requirements could alter or restrict the operating performance of the mine. Significant differences from the parameters used in this TRS would justify a re-evaluation of the reported mineral reserve and mineral resource estimates. Mine site administration and FCX dedicate significant resources to managing these risks.

13 MINING METHODS

The Cerro Verde mine has a long operational history and mining conditions are well understood by the site and FCX corporate staff. The mining method is a conventional truck and shovel, open-pit operation.

13.1 Mine Design

The results of the economical mining limit evaluation discussed in Section 11 are used as guides to develop the final mine design and the phased pushback designs for mine sequencing. Mine designs are developed using specialized mine design computer software.

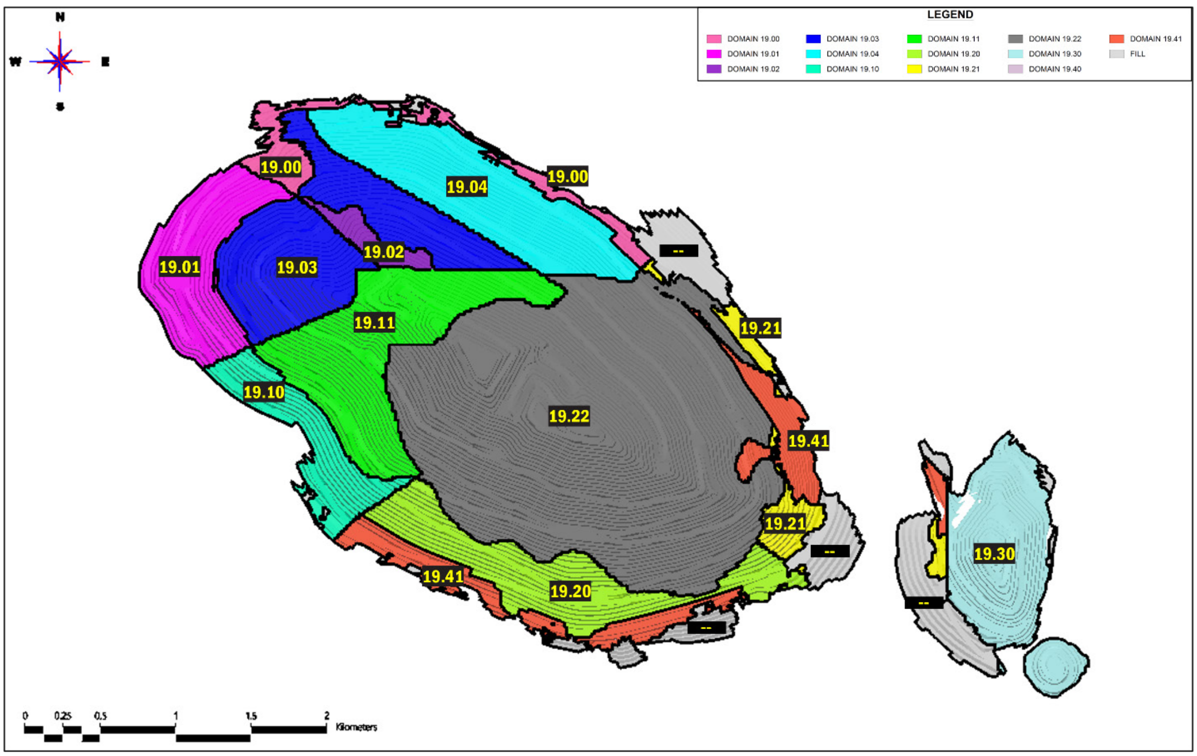
13.1.1 Pit Slope Design Parameters

Slope angle recommendations are determined and reviewed by FCX engineers and third-party consultants. These recommendations are based on comprehensive geomechanical testing, studies, and the geomechanical monitoring procedures in the field.

Haul roads and geomechanical catchment berms or step-ins, in conjunction with the recommended inter-ramp slope angles, determine the overall pit slope angles for the design. Inter-ramp slope angles account for differences in rock quality and can include single or double bench designs and various catch bench widths. Thirteen geotechnical domains have been defined at the pit areas, each with different design inter-ramp slope angles. The inter-ramp slope angles vary between 38 to 52 degrees.

Figure 13.1 provides the geotechnical domain areas for the Cerro Verde mine. Pit wall slopes are designed with inter-ramp slope angles assigned to each of those domains.

Figure 13.1 – Geotechnical Domains



13.1.2 Geomechanical and Hydrological Modeling

Geomechanical and hydrological modeling is discussed in Section 7.

The performance of the open-pit wall slopes is monitored with a network of geomechanical and hydrogeological instrumentation. The Cerro Verde mine uses instrumentation that includes slope stability radars, laser scanners, satellite monitoring, extensometers, inclinometers, time domain reflectometry, piezometers, seismic blast monitoring, GPS tracking, and robotic survey stations. Groundwater and pore pressure are controlled with dewatering wells and horizontal drain holes for specific slope depressurization needs as the pit area increases during the life of the mine. The monitoring plan defines responsibilities and outlines the monitoring procedures and trigger points for the initiation of specified remedial measures if movement is detected, and it is the basis for the design of any required remedial measures.

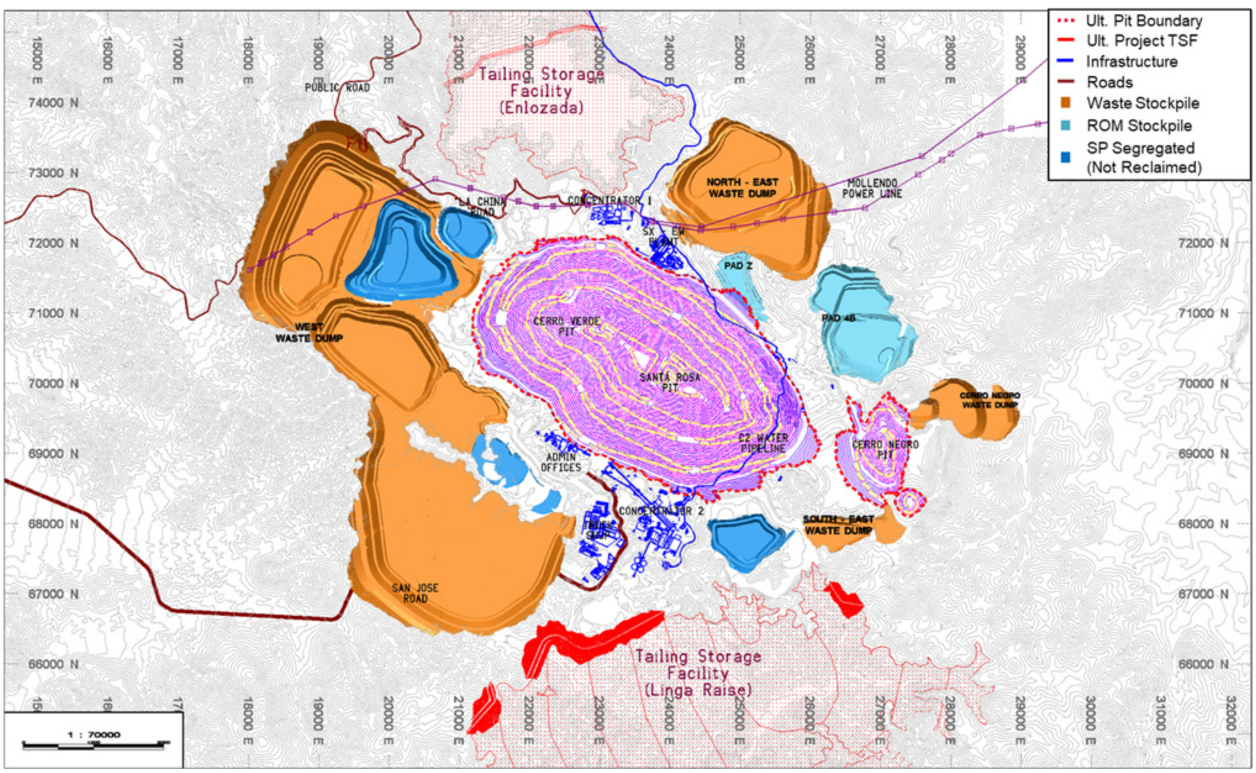
13.1.3 Final Mine Design

Using specialized computer software, mine designs are developed with key considerations that include:

- Compliance with the geomechanical recommendations.
- Reasonable haul road widths and effective grades.
- Operational bench height that is safely manageable with the loading equipment, in single and/or double bench configurations where allowable.
- Adequate mining width for practical mining.
- Locating pit exits near to material destinations as practical.
- Infrastructure location requirements and other boundary restrictions.
- Mine sequencing that maintains continuous production throughout the mine life.

Mine designs are reviewed for compliance to key parameters and reasonableness with comparison to historical and current operating practices. The reserve final mine design is illustrated in Figure 13.2.

Figure 13.2 – Final Mine Design



The final mine design for the CV and SR open-pit is approximately 2.8 kilometers in width (northeast-southwest) and 5.3 kilometers in length (northwest-southeast). The expected depth of the pit is about 1,200 meters ranging from 1,538 to 2,768 meters above sea level. The CN open-pit design is approximately 1.0 kilometer in width (northeast-southwest) and 1.5 kilometers in length (northwest-southeast). The expected depth of the pit is 270 meters with open-pit exit elevations at approximately 2,800 meters above sea level. Mining is designed to take place on 15-meter benches, with pit slopes allowing for double bench configuration where feasible.

The haul ramps are planned with widths of 35 to 40 meters and with a 10 percent grade but can vary in different sections of the ramp. They are designed to accommodate the current truck fleets.

13.2 Mine Plan Development

The mine plan is developed based on supplying ore to the processing facilities considering equipment production rates, the mining advance rate through the deposit, ore/waste routing, waste stripping requirements, material storage facility capacities, and expansion opportunities. LOM plan schedules are developed using specialized mine planning software.

The mine plan is developed utilizing measured and indicated mineral resource material only. Resource material that is classified as inferred within the mine design is considered waste for LOM planning and mineral reserve estimation.

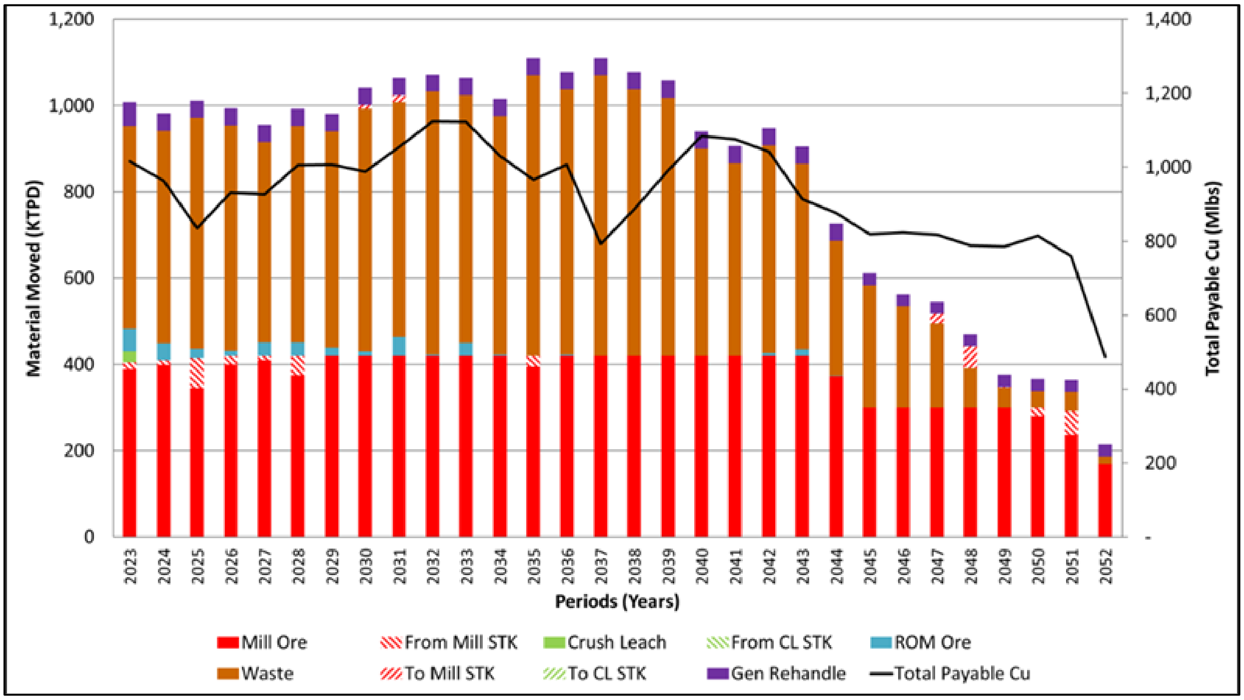
The deposit is a typical disseminated porphyry type copper deposit, where contact dilution is incorporated into the grade estimation process. As a result, no additional dilution assumption is applied.

Mining ore block recovery is directly related to the mining dilution. Mining recovery in open-pit mines tends to be very high, particularly in disseminated deposits associated with large loading equipment. As result, mining ore block recovery is assumed at 100 percent.

The mine plan is scheduled to ramp up to deliver a targeted average mill production rate of 420,000 metric tons of ore per day by 2026 through 2044, then reduce to 300,000 metric tons of ore per day when C1 ceases production. The average leach production rate is 25,000 metric tons of ore per day through 2023 for crushed leach and ROM leach deliveries are variable through 2044 as material is available. The LOM plan stripping ratio (waste tonnage to ore tonnage) at the Cerro Verde mine is 1.08. Mining activities are projected to end in 2052, when the current reserves are expected to be exhausted.

The mine production rate and expected mine life are illustrated in Figure 13.3.

Figure 13.3 – Total Tonnage Planned Material Movement



The LOM plan does not include plans for underground development or backfilling of the open-pit although future studies could prove these options as viable improvements to the mine plan development.

13.3 Mine Operations

Mine unit operations include drilling, blasting, loading, hauling, and auxiliary support.

Primary production equipment is used to mine ore and waste and as of December 31, 2022 comprises of 17 blast hole drills, 13 electric rope shovels with bucket sizes ranging from 33 to 57 cubic meters, 2 hydraulic shovels with a bucket size of 21 cubic meters, 3 front end loaders, and 154 haul trucks. The truck fleet is comprised of 93 units with a 245-metric ton payload factor, 54 units with a 300-metric ton payload factor, 3 units with a 360-metric ton payload factor, and 4 units with a 363-metric ton payload factor. The primary production equipment is supported by a fleet of ancillary equipment including track dozers, wheel loaders, motor graders, backhoes, and water trucks. Support equipment is used for building access roads, road maintenance, and other mine services.

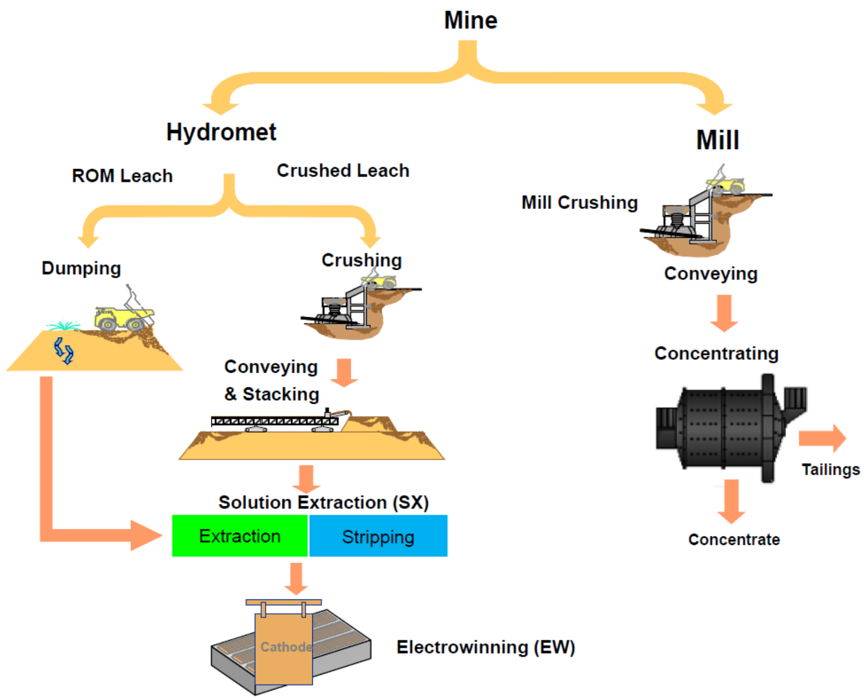
The LOM plan includes equipment units up to 14 electric rope shovels and 194 haul trucks with a 245-metric ton payload factor. Mine equipment is replaced or rebuilt after its useful life is achieved. Costs for mine equipment replacements and additions are accounted for in the financial modeling.

The site is in operation with experienced management and sufficient personnel. The mine operates 365 days per year on a 24 hour per day schedule. Operational, technical, and administrative staff are on-site to support the operation. As of December 31, 2022, mine operations have 2,765 employees with additional contractors available as needed.

14 PROCESSING AND RECOVERY METHODS

The process facilities operate 365 days per year with exceptions for maintenance. The facilities have a long operating history. FCX and the Cerro Verde mine anticipate that the site will have adequate energy, water, process materials, and permits to continue operating throughout the LOM plan. Figure 14.1 illustrates an overview process map.

Figure 14.1 – Site Process Diagram



Ore can be directed through hydrometallurgical or concentrating facilities. The hydrometallurgical operation consists of crushed and ROM leach pads, stacking equipment for ore placement, a SX plant consisting of five SX trains, and an EW facility with two cell lines. The hydrometallurgical process produces a high-quality copper cathode.

Primary and certain secondary and transitional sulfide ores are processed in the concentrators, which produce copper and molybdenum concentrates. The C1 concentrator was commissioned in late 2006, with a design capacity of 108,000 metric tons of ore per day, and the C2 concentrator was commissioned in late 2015 with a design capacity of 240,000 metric tons of ore per day. Actual performance and ongoing debottlenecking activities support the LOM plan achieving a combined concentrator capacity of up to 420,000 metric tons per day.

The C1 concentrator has one line of comminution equipment and the C2 concentrator has two lines of comminution equipment, with each line consisting of a primary gyratory crusher, secondary cone crushers, tertiary high-pressure grinding roll (HPGR) crushers, and ball mills. The ore is floated in rougher and cleaner flotation circuits to produce a bulk copper-molybdenum concentrate. The copper-molybdenum concentrate is sent to a molybdenum flotation plant to produce a molybdenum concentrate and a final copper concentrate. All concentrates are dewatered before transport.

These processing methodologies are accepted industry practices for the types of mineralization found at the mine site and are supported by recovery results.

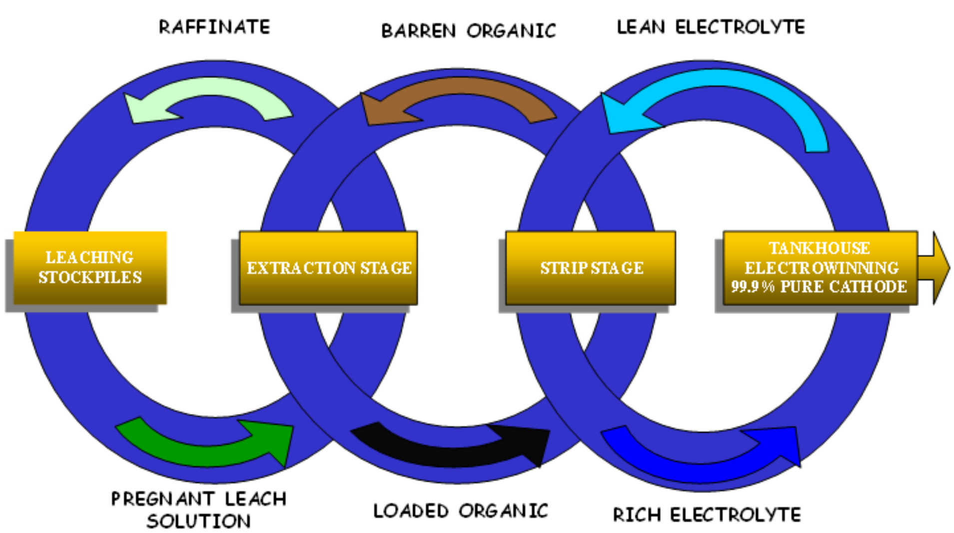
14.1 Hydrometallurgical Processing Description

Oxide, and secondary and transitional sulfide ores from the mine are delivered to leach pads. The SX/EW plant is designed to extract copper from the pregnant leach solutions (PLS) collected from the site's leach pads. Copper is extracted from the ores by using a grid solution system to deliver an aqueous solution containing acid from the plant, called raffinate, to the leach pads. As this acidic solution passes through the heaped material, it extracts copper in the form of copper ions in the PLS.

The PLS is delivered to the SX/EW plant via collection ditches, ponds, and pumping systems. The process takes PLS and extracts the copper ions in extraction mixer-settlers. The copper is extracted via a liquid ion-exchange reagent carried in diluent. A chemical reaction selectively causes the copper to transfer from the PLS to the organic phase. The barren raffinate leaving the SX plant is pumped to the leach pads to extract additional copper from the stacked ore. The loaded organic phase is separated and flows to a strip mixer-settler where the copper is transferred from the organic to the electrolyte that is circulated to the EW plant.

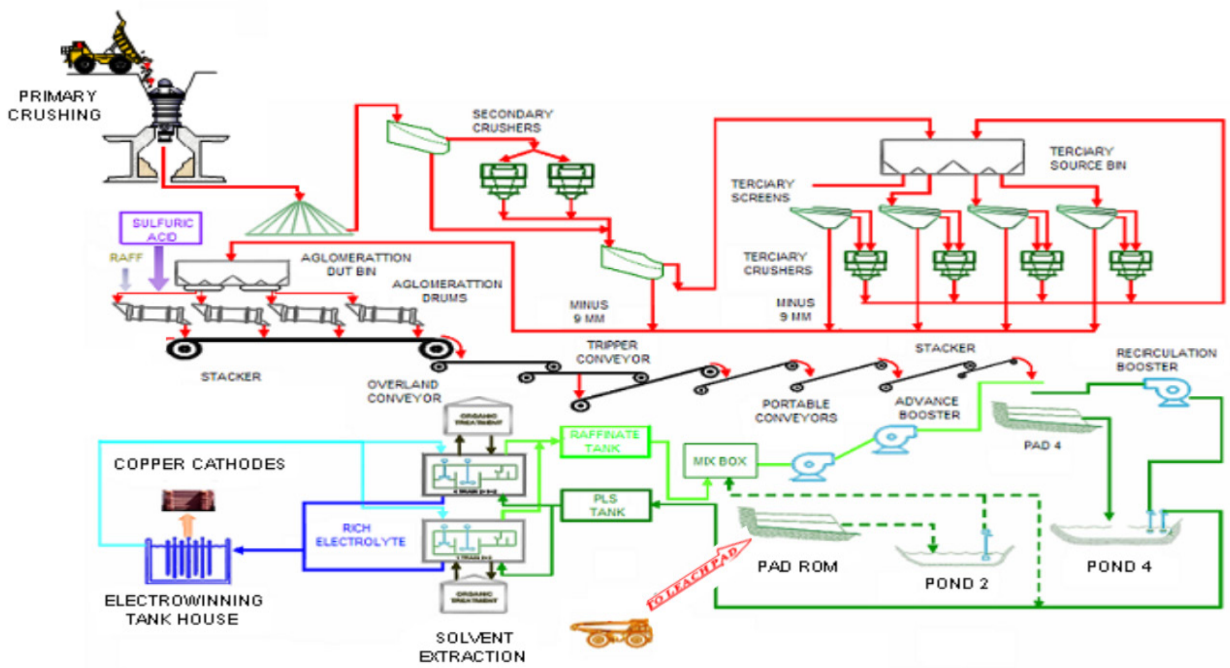
The electrolyte is filtered and heated before being passed through the EW cells where the copper is plated onto copper starter sheets. Once an adequate amount of copper has been plated out of solution as cathodes, these are removed from the cells, washed, and the copper sheets are mechanically harvested. Figure 14.2 illustrates the hydrometallurgical copper transfer process.

Figure 14.2 – Hydrometallurgical Transfer Process



A diagram illustrating the Cerro Verde mine's hydrometallurgical process is shown in Figure 14.3. The SX plant processes between 1,700 to 5,600 cubic meters per hour of PLS flow and the EW tank house cathode production capacity is approximately 200 million pounds per year.

Figure 14.3 – Hydrometallurgical Process Diagram



Hydrometallurgical recoveries are tracked from the leach stockpiles through to the production of copper cathode. Items that can affect the rate of recovery through the stockpiles include, but are not limited to, application rate and method, particle size, leach cycle (i.e., days under leach), acid addition and consumption, solution chemistry, ore type and mineralization, pyrite content, stacking methodology, and stacking height.

Recoveries are tracked over multiple years. Additionally, performance is reviewed periodically through FCX corporate audits to monitor that recoveries are on track to being achieved and continue to be appropriate.

14.2 Concentrator Processing Description

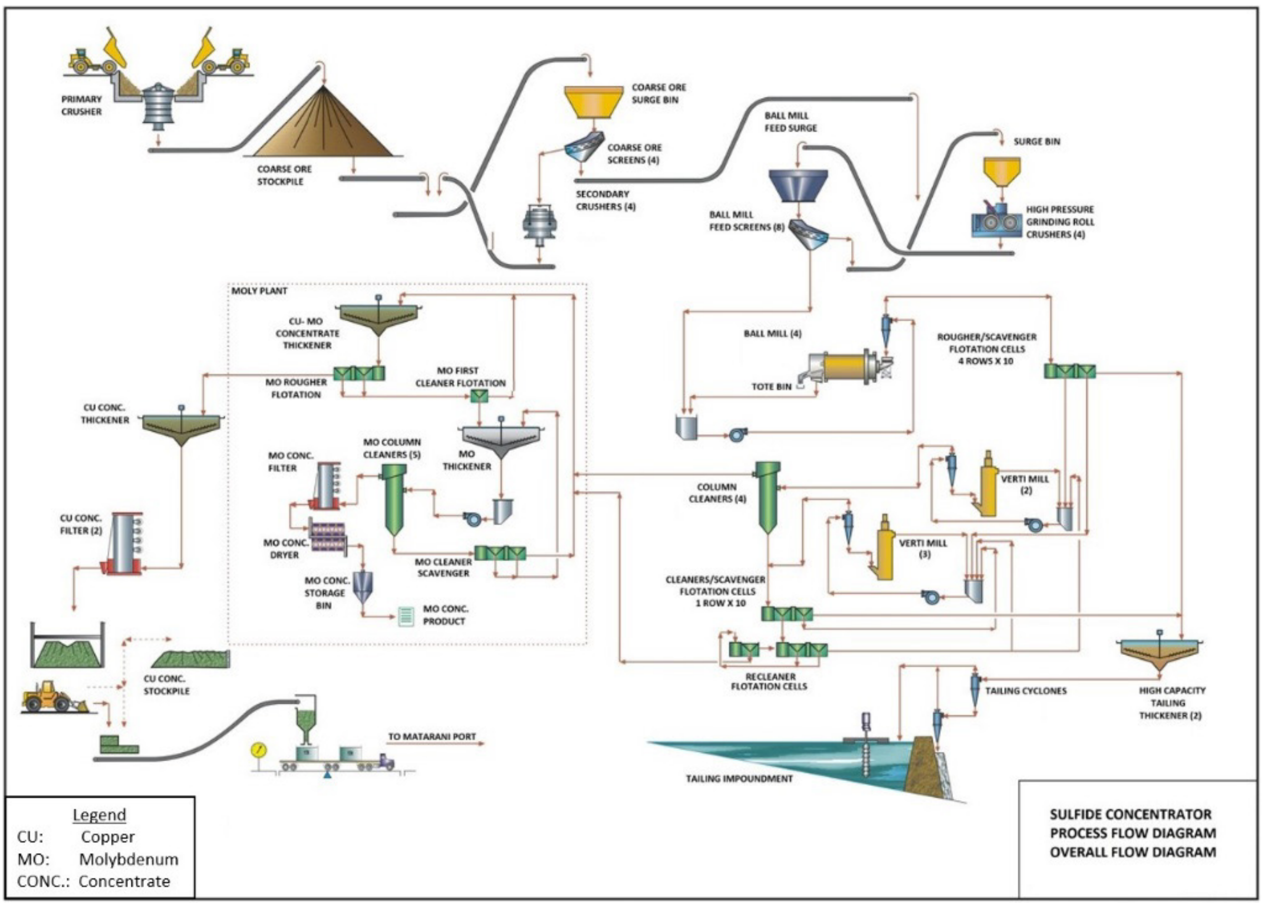
Primary and certain secondary and transitional sulfide ores are processed in the concentrators, which produce copper and molybdenum concentrates. The C1 concentrator facility is located north of the CV and SR open-pits. The C2 concentrator facility is located south of the CV and SR open-pits. The ore is processed using the same technology for both concentrators. C1 and C2 concentrators include multi-stage crushing, ball mill grinding, and flotation separation circuits.

The C1 crushing circuit equipment consists of 1 primary gyratory crusher, 4 secondary cone crushers in closed circuit with 4 dry vibrating screens, and 4 tertiary HPGR crushers in closed circuit with 8 wet vibrating screens. The grinding circuit consists of 4 parallel lines each fed by 2 of the screens. Each line of grinding comprises of 1 ball mill, 1 cyclone feed pump, and 1 cyclone cluster. Ground ore is processed in 4 parallel trains of conventional tank cells making up the rougher/scavenger flotation circuit.

The C2 crushing circuit equipment consists of 2 primary gyratory crushers, 8 secondary cone crushers in closed circuit with 8 dry vibrating screens, and 8 tertiary HPGR crushers in closed circuit with 12 wet vibrating screens. The grinding circuit consists of 6 parallel lines each fed by 2 of the screens. Each line of grinding comprises 1 ball mill, 1 cyclone feed pump, and 1 cyclone cluster. Ground ore is processed in 6 parallel trains of conventional tank cells making up the rougher/scavenger flotation circuit.

For each concentrator the rougher and scavenger concentrates are reground and cleaned in two stages of column cells and tank cells. Each concentrator also has a re-cleaner circuit designed to increase recovery of molybdenum. Flotation concentrate reports to the molybdenum plant for separation of the copper and molybdenum sulfide minerals. The concentrate produced in the plant is the molybdenum concentrate and tailings from the plant is the final copper concentrate. Figure 14.4 provides a simplified process flow diagram of the mill.

Figure 14.4 – Mill Process Diagram



The processing facility performance is reviewed regularly, and adjustments are made as necessary to improve performance and reduce costs.

14.3 Processing Requirements

FCX believes adequate supplies for energy, water, process materials, and sufficient personnel are currently available to maintain operations and are anticipated throughout the LOM plan. Process materials are provided to the site on an as-needed basis through the FCX and the Cerro Verde mine global supply chain departments. The actual consumption of key processing materials varies depending on ore feed and operating conditions in the plants. Table 14.1 includes the typical ranges of consumption for key processing requirements.

Table 14.1 – Processing Facilities Consumables

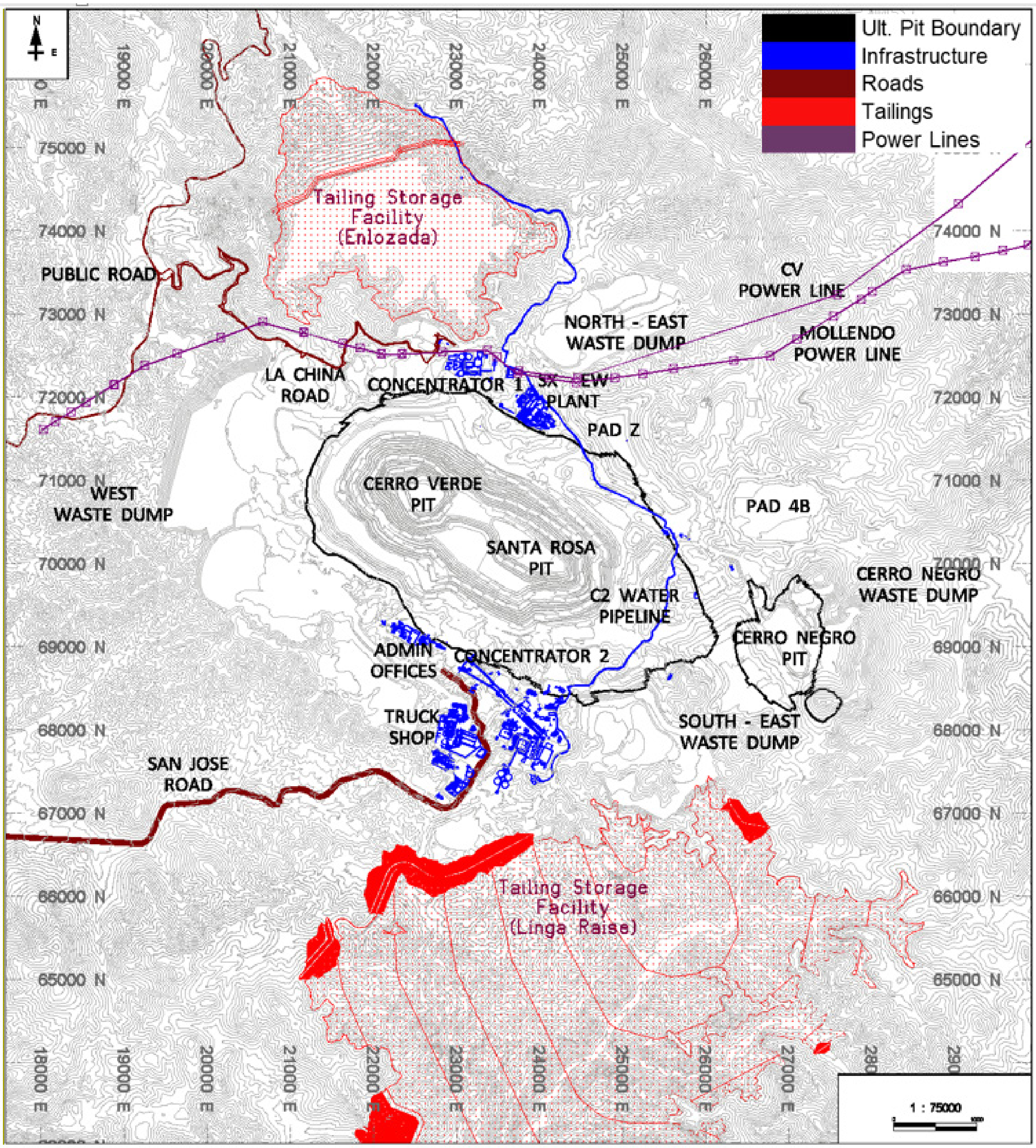
Parameter		Typical Range
Concentrator Energy (kWh per metric ton ore)		20 to 25
Hydrometallurgical Energy (kWh per pound of copper)		1.0 to 2.0
Mill Makeup Water (cubic meter of water per metric ton ore)		0.3 to 0.4
Hydrometallurgical Makeup Water (cubic meter of water per metric ton ore)		0.2 to 0.3
Process Materials		
	Liners and Wear Parts (kg of steel per metric ton ore)	0.1 to 0.2
	Balls (kg of steel per metric ton ore)	0.5 to 0.7
	Primary Collector (g of collector per kg copper)	3 to 7
	Lime (kg of lime per metric ton ore)	1 to 3
	Acid (kg of acid per metric ton ore)	3 to 11

Consumable and personnel requirements for the processing facilities are expected to be near current levels in the near-term with variation dependent on production levels in the various unit operations. As of December 31, 2022, the concentrating operations have 1,150 employees and the hydrometallurgical operations have 229 employees. FCX believes contractors are available as needed.

15 SITE INFRASTRUCTURE

The site infrastructure at the Cerro Verde mine has been established over the history of the project and supports the current operations. The current major mine infrastructure includes waste rock storage facilities, ROM leach pads, crushed leach pads and stacking systems, temporary stockpiles, TSFs, power and electrical systems, water usage systems, various on-site warehouses and maintenance shops including large-scale mine truck shops, and offices required for administration, engineering, maintenance, and other related mine and processing operations. The communication system at site includes internet and telephone access connected by hard-wire, fiberoptic, and mobile networks. Access to the property is discussed further in Section 4 of this TRS. The site infrastructure is shown in Figure 15.1.

Figure 15.1 – Site Infrastructure Map



15.1 Waste Rock Storage Facilities

The Cerro Verde mine LOM plan considers placing mined waste material in the waste rock storage facilities. FCX believes there is sufficient storage capacity to handle the waste deliveries as scheduled in the LOM plan.

15.2 Leach Pads and Stockpiles

The Cerro Verde mine utilizes stockpiles including ROM and crushed leach pads. Mined material is routed directly to the ROM leach pads whereas the crushed leach pad receives mined material that has been reduced in size through a primary crushing stage. The LOM plan includes leach placements concluding in 2044 with the leach pads continuing to be leached through 2046 when the SX/EW plant is expected to conclude operations. Additional leach pad stockpile capacity is required in the LOM plan. A placeholder of estimated costs for the additional capacity is included in the financial analysis.

The mine also has temporary mill stockpiles. Mined material is directed to these stockpiles to be rehandled and processed through the concentrators later in the LOM plan. FCX believes the mill stockpiles have sufficient capacity for the planned deliveries in the LOM plan.

Leach pads, stockpiles, and waste rock storage facilities are surveyed regularly, and daily production records are used to track the mine deliveries.

15.3 Tailings Storage Facilities

There are two TSFs at the Cerro Verde mine: the Enlozada and Linga dams. The Enlozada dam receives flotation tailings from the C1 concentrator while Linga receives tailings from C2. The flotation tailings are thickened and pumped to the TSFs where they are deposited, and water is recycled back to the mill.

The TSFs, as currently designed, lack sufficient storage capacity for the entire planned mineral reserves estimate in the LOM plan. However, FCX and the Cerro Verde mine anticipate having sufficient tailings storage available as required in the LOM plan since the current storage capacity is sufficient until 2035 at planned rates, and options to increase capacity have been identified in potential expansions of the currently designed TSFs and alternate locations for additional TSFs. A placeholder of estimated costs for the additional capacity is included in the LOM plan financial analysis.

15.4 Power and Electrical

The Cerro Verde mine's electrical power is currently sourced under long-term contracts with ElectroPerú S.A. and Engie Energía Peru S.A. Two 220 kV and one 138 kV transmission lines from Socabaya substation and two 220 kV transmission lines from San Jose substation supply the main power feed to the property.

15.5 Water Usage

The Cerro Verde mine's water is supplied by a combination of sources, including the Río Chili and treated wastewater from the city of Arequipa. Water from the Río Chili is treated to remove solids but is not suitable for human consumption. The water feeding the concentrators passes through water treatment plants (the local Peruvian Degremont plant or the on-site WWTP). A small portion of the fresh water supply is treated for domestic use in washrooms, change-house facilities, and emergency wash stations. The treatment plants are skid-mounted, self-contained units using reverse osmosis technology to produce domestic water. Drinking water is provided as bottled water. A portion of the fresh water pumped from the Río Chili discharges into the fresh/firewater tanks. Processing facilities operate using a combination of fresh, treated, and reclaimed water from the in-pit dewatering system and existing TSFs.

15.6 Product Handling

The copper concentrate is delivered to the Port of Matarani, approximately 100 kilometers southwest of the mine site, in sealed containers using a fleet of dedicated truck-trailer road vehicles connecting with railway haulage. The molybdenum concentrate is shipped by truck to either the port of Callao or Matarani in tote bags. At the port, the copper concentrates are loaded onto ocean vessels where it is sold to metal smelting companies in Asia and Europe. Perurail manages the transport of the copper concentrates while the port facilities are operated by Terminal Internacional del Sur. The existing concentrate storage facility at Matarani is adequate to handle the concentrate volumes from Cerro Verde and the other operating mines utilizing the facilities. Copper cathode produced from the leaching operations is sold directly to customers in Peru and Europe.

15.7 Logistics, Supplies, and Site Administration

The operation is integrated between mining and processing facilities and has common management and services, as well as a logistics network that includes warehouses, vehicles, and personnel required to distribute and store the large quantity of supplies used by the operation and its workforce. Bus service is provided to the mine and workplaces. Warehouses are maintained at various locations throughout the site.

Supporting infrastructure at the mine and in Arequipa has been built, improved, and expanded over the life of the project including administration offices, training, recreational, and health service facilities.

16 MARKET STUDIES

The Cerro Verde mine produces copper concentrate and cathode products, with silver in the concentrate. A molybdenum concentrate is also produced.

16.1 Market for Mine Products

Copper is an internationally traded commodity, and its prices are determined by the major metal exchanges. Prices on these exchanges generally reflect the worldwide balance of copper supply and demand and can be volatile and cyclical. In general, demand for copper reflects the rate of underlying world economic growth, particularly in industrial production and construction. FCX believes copper will continue to be essential in these basic uses as well as contribute significantly to new technologies for clean energy, to advance communications, and to enhance public health.

Molybdenum is a key alloying element in steel and the raw material for several chemical-grade products used in catalysts, lubrication, smoke suppression, corrosion inhibition, and pigmentation. Molybdenum chemicals are used to produce high-purity molybdenum metal used in electronics such as flat-panel displays and in super alloys used in aerospace. Reference prices for molybdenum are available in several publications including Platts Metals Daily, CRU Prices Service, and Fastmarkets Metals Bulletin.

Silver is used for jewelry, coinage, and bullion as well as various industrial and electronic applications. Silver can be readily sold on numerous markets throughout the world. Benchmark prices are generally based on London Bullion Market Association quotations.

FCX owns smelting, refining, and product conversion facilities for copper and molybdenum products, operated as separate business segments. Sales between FCX's business segments are based on terms similar to arms-length transactions with third-parties at the time of the sale.

The Cerro Verde mine sells its copper concentrate at market rates to major copper smelters worldwide, as well as to major trading companies. The copper cathode production is sold to third-party consumers domestically and merchant traders worldwide.

The mine's molybdenum concentrate is processed through FCX's wholly owned roaster operations at Fort Madison in Iowa, Sierrita mine in Arizona, and Rotterdam in the Netherlands, and a portion through the concentrate leach process at FCX's Bagdad mine in Arizona. The resultant molybdenum products from the Rotterdam plant supply the chemical and steel industries in Europe while the molybdenum products from the U.S. plants supply the industries in the U.S. and Asia. Climax Molybdenum Company, FCX's wholly owned subsidiary, administers the molybdenum business segment.

Most of the copper and molybdenum products resulting from the Cerro Verde mine are sold to customers with whom FCX has built and maintained long-term relationships. The majority of the sales agreements are negotiated annually and are relatively standardized. The underlying copper price is determined by, and fluctuates with, the commodity exchange price while the treatment and refining charges and premiums are negotiated annually based on market conditions. The underlying molybdenum price is determined by published Platts Metals Daily index reference pricing, which is determined by globally reported spot transaction reporting.

16.2 Commodity Price Assumptions and Contracts

Long-term metal prices reported are used to demonstrate the economic viability of the mineral reserves and should not be construed as a prediction of future commodity prices. Assumed prices for mineral reserve estimation are:

- $3.00 per pound for copper.
- $12 per pound for molybdenum.
- $20 per ounce for silver.

All contracts currently necessary for supplies and services to maintain the Cerro Verde mine's facilities and production are in place and are anticipated to be renewed or replaced within timeframes and conditions of common industry practices.

FCX and the QPs believe that the marketing and metal price assumptions for metal products are suitable to support the financial analysis of the mineral reserve evaluation. Further information regarding the sale and marketing of the mine's metal products are discussed in FCX's Annual Report on Form 10-K for the year ended December 31, 2022.

17 ENVIRONMENTAL STUDIES, PERMITTING, AND SOCIAL IMPACT

The Cerro Verde mine adheres to FCX's environmental and sustainability programs, including policies and management systems regarding environmental, permitting, and community issues. Cerro Verde has implemented an Environmental Management System that is certified to the internationally recognized ISO-14001:2015 standard. FCX's programs are based on policies and systems that align with the International Council on

Mining and Metals Sustainable Development Framework and the Copper Mark. FCX routinely evaluates implementation of these policies through internal and external independent assessments and publicly reports on its performance.

Further discussion regarding environmental and social or community impacts is available in the latest FCX Annual Report on Sustainability.

17.1 Environmental Considerations

Environmental monitoring is ongoing at the Cerro Verde mine and will continue over the life of the operations and beyond through closure. The Cerro Verde mine has received multiple ESIS regulatory approvals from the local and national agencies for the construction, operation, and closure of the mine. Many of these regulatory approvals had public participation components. Several of these authorizations required that the Cerro Verde mine conduct environmental and social baselines and impact studies for environmental resources including, but not limited to, air quality, surface and groundwater quality, landscape, soil, climate, traffic, biodiversity, and cultural resources. The Cerro Verde mine continues to monitor these baselines and impact studies regularly at compliance points and report to required agencies.

In December 2012, the MINEM approved the initial ESIS of the CVPUE. The first modification of the CVPUE ESIS was approved by the authorities in 2016. In 2018, as a result of the average capacity increase of the C2 concentrator, SMCV obtained approval of the Beneficiation Plant for processing 548,500 metric tons of ore per day through all processes.

17.2 Permitting

FCX and the Cerro Verde mine staff believe that all major permits and approvals are in place to support operations at the Cerro Verde mine; however, additional permits will likely be necessary in the future. Where permits have specific terms, renewal applications are made to the relevant regulatory authority as required, prior to the end of the permit term.

Any major mining project in Peru requires preparation of an ESIS, including the construction, operation, and closure stages, completed by a third-party consultant, which is submitted to the regulatory agency. An update to the ESIS is required 5 years after its approval. After the ESIS is approved, a comprehensive closure plan including closure cost estimates and financial guarantee schedule is submitted for approval to meet the applicable Peruvian laws and regulations.

Based on the LOM plan, additional permits will likely be necessary in the future for continued operation of the Cerro Verde mine, including a modification of the ESIS and obtaining approval for modified leach pad configurations, increased tailings storage capacity, and corresponding water supply. The Cerro Verde mine will need to submit the Second Modification of the ESIS prior to reaching current tailings storage capacity, which is sufficient until 2035 at planned rates in the LOM plan. Closure strategies will be developed for these proposed facilities as part of the permitting process.

17.3 Waste and Tailings Storage, Monitoring, and Water Management

The Cerro Verde mine has developed and continues to implement detailed, comprehensive mine waste and tailings management programs to meet the applicable Peruvian waste regulations and FCX environmental management practices. These programs incorporate commitments included in the ESIS and the Engineer of Record designs, for the specific cases of TSFs and certain leach pad stockpiles. The site also follows FCX's Tailings Management Policy.

17.4 Mine Closure Plans

MINEM of Peru governs facility closure under the country's Mine Closure Law and requires preparation of a closure and post closure plan, including development of cost estimates and financial assurance for permitted facilities such as TSFs, leach pad stockpiles, and other mine facilities. The Cerro Verde mine closure strategy and mine reclamation plan, developed by third-parties, considers long-term physical and chemical stability and implementation of feasible post mining land uses for the site following the end of mine operations. The closure strategy and reclamation plan details tasks to be performed at closure and the post-closure phase of the mine's life cycle. The Closure Law requires updates to the closure plan and cost estimates every 5 years and these updates are submitted for approval to the Peruvian regulatory authorities. The current closure plan and cost estimates for the CVPUE were submitted to the Peru regulatory authorities in 2016 and approved in February 2018.

The closure strategy incorporates various approaches including, but not limited to, in-place closure of TSFs and leach pad stockpiles, demolition of processing facilities, and post closure monitoring and maintenance of closed facilities and points of compliance wells. Closure of TSFs includes regrading tailings and installing cover systems that manage water through evaporation. Water management systems are intended to stabilize closed facilities, minimize erosion, and protect water resources.

The total closure cost estimate in the LOM plan is approximately $0.5 billion based on a cash flow schedule for the implementation of closure and post closure tasks. The Cerro Verde mine has complied with the annual renewal of the financial guarantees corresponding to the closure plan.

17.5 Local Stakeholder Considerations and Agreements

As part of the ongoing permitting and compliance obligations with the regional and national agency authorizations, and as part of the mine's commitment to local stakeholder engagement, the Cerro Verde mine is dedicated to local community and social matters. The Cerro Verde mine seeks to conduct its activities in a transparent manner that promotes proactive and open relationships with the local community, government, and other stakeholders to maximize the positive impacts of its operations and mitigate potential adverse impacts throughout the LOM plan.

The Cerro Verde ESIS includes information on community and social matters, such as a social baseline, potential impacts to communities within the direct area of influence, and community development projects that will be implemented based on feedback received from external stakeholders.

The Cerro Verde mine seeks to provide opportunities to support economic development by purchasing local goods and services, according to its requirements and technical specifications.

Based on the objectives pursued in the strategic development program proposed in the CVPUE ESIS, the Cerro Verde mine complies with regional and local hiring requirements. The Cerro Verde mine operates in the Arequipa province with a large portion of mine employees and contractors from the local and regional labor force. Most of the workforce at the Cerro Verde mine is from Peru.

17.6 Comment on Environmental Compliance, Permitting, and Local Engagement

In the QP's opinion, the Cerro Verde mine has adequate plans and programs in place, is in good standing with Peruvian environmental regulatory authorities, and no current conditions related to environmental compliance, permitting, and local engagement represent a material risk to continued operations. The Cerro Verde mine staff have a high level of understanding of the requirements of environmental compliance, permitting, and local stakeholders in order to facilitate the development of the mineral reserve and mineral resource estimates. The periodic inspections by governmental agencies, FCX corporate staff, third-party reviews, and regular reporting confirm this understanding.

18 CAPITAL AND OPERATING COSTS

The capital and operating costs are estimated by the property's operations, engineering, management, and accounting personnel in consultation with FCX corporate staff, as appropriate. The cost estimates are applicable to the planned production, mine schedule, and equipment requirements for the LOM plan. The capital costs are summarized in Table 18.1.

Table 18.1 – Sustaining Capital Costs

	$ billions
Mine	$1.6
Concentrator	1.1
Supporting Infrastructure and Environmental	2.5
Total Capital Expenditures	$5.2

Estimates are derived from current costs and adjusted to the reserve price environment. The estimates are not adjusted for escalation or exchange rate fluctuations. Actual realized costs are reviewed periodically, and estimates are refined as required.

Capital costs are primarily sustaining projects consisting of mine equipment replacements and planned site infrastructure projects, most notably to increase TSF and leach pad capacities over the production of the scheduled reserves. Capital cost estimates are derived from current capital costs based on extensive experience gained from many years of operating the property and do not include future inflation. FCX and the Cerro Verde mine staff review actual costs periodically and refine cost estimates as appropriate.

The operating costs for the LOM plan are summarized in Table 18.2.

Table 18.2 – Operating Costs

	$ billions
Mine	$ 20.5
Processing	25.4
Balance	5.4
Total site cash operating costs	51.3
Freight	4.3
Treatment charges	7.9
Peruvian mining royalty tax	0.3
By-product credits	(9.2)
Total net cash costs	$ 54.6
Unit net cash cost ($ per pound of copper)	$ 1.95

Estimates are derived from current costs and adjusted to the reserve price environment. The estimates are not adjusted for escalation or exchange rate fluctuations. Actual realized costs are reviewed periodically, and estimates are refined as required.

The operating cost estimates are derived from current operating costs and practices based on extensive experience gained from many years of operating the property and do not include future inflation. The operating cost estimates reflect certain pricing assumptions, primarily for energy and foreign exchange rates, that are reflective of the copper market environment ($3.00 per pound for copper price) at which the reserve plan has been prepared. As the property has a long operating history, FCX believes that the accuracy of the cost estimates is better than the minimum of approximately +/- 25 percent required for a pre-feasibility study level of mineral reserves as per S-K1300, and the level of risk in the cost forecasting is low. FCX and the Cerro Verde mine staff review actual costs periodically and refine cost estimates as appropriate.

The LOM plan summary in this TRS is developed to support the economic viability of the mineral reserves. The latest guidance regarding updated operational forecast cost estimates is available in FCX's Annual Report on Form 10-K for the year ended December 31, 2022, filed with the SEC.

19 ECONOMIC ANALYSIS

The LOM plan includes comprehensive operational drivers (mine and corresponding processing plans, metal production schedules, and corresponding equipment plans) and financial estimates (revenues, capital costs, operating costs, downstream processing, freight, taxes, and royalties, etc.) to produce the reserves over the life of the property. The LOM plan is an operational and financial model that also forecasts annual cash flows of the production schedule of the reserves for the life of the property under the assumed pricing and cost assumptions. The LOM plan is used for economic analyses, sensitivity testing, and mine development evaluations.

The financial forecast incorporates revenues and operating costs for all produced metals, processing streams, and overall site management for the life of the property. The economic analysis summary in Table 19.1 includes the material drivers of the economic value for the property and includes the net present value (NPV) of the unleveraged after-tax free cash flows as the key metric for the economic value of the property's reserve plan under these pricing and cost assumptions. This analysis does not include economic measures such as internal rate of return or payback period for capital since these measures are not applicable (and are not calculable) for an on-going operation that does not have a significant upfront capital investment to be recovered.

Table 19.1 – Economic Analysis

Metal Prices	
Copper ($ per pound)	$ 3.00
Molybdenum ($ per pound)	$ 12
Silver ($ per ounce)	$ 20
Life of Mine Plan	
Copper (billion pounds)	28.0
Molybdenum (billion pounds)	0.7
Silver (million ounces)	110.5
Ore (billion metric tons)	4.3
Copper grade (%)	0.35
Copper metallurgical recovery (%)	88.3
Capital costs ($ billions)	$ 5.2
Site cash operating costs ($ billions)	$ 51.3
Unit net cash cost ($ per pound of copper)	$1.95
Economic Assumptions and Metrics	
Discount Rate (%)	8
Peruvian Mining Taxes (% of operating income)	6.2 [a]
Corporate Tax Rate (%)	32 [b]
Exchange rate (Peruvian Nuevo Sol/$)	3.15
Net present value @ 8% ($ billions)	$ 6.4
Internal rate of return (%)	NA [c]
Payback (years)	NA [c]

a. Peruvian mining taxes include Peruvian mining royalty tax and special mining tax.
b. Tax rate reduced to 29.5% after 2028, when the tax stability agreement expires.
c. Not Applicable (NA) as the property is an on-going operation with no significant negative initial cashflow/initial investment to be recovered.

The key drivers of the economic value of the property include the copper market price, copper grades and recoveries, and costs. Depending on the changes in these key drivers, FCX can adjust operating plans (in the near-term as well as the long-term, as appropriate) to minimize negative impacts to the overall economic value of the property.

Table 19.2 summarizes the economic impact of changes to these key drivers on the property's NPV (as included in Table 19.1). The sensitivities are estimates for the changes in each key drivers' effect on the base plan summarized for the production of the mineral reserves over the life of the property.

Table 19.2 – Sensitivity Analysis

Sensitivity Analysis ($ billions)	Incremental Impact to NPV	
	+ 5% Change	**- 5% Change**
Copper price	$ 1.03	$ (1.03)
Copper grade/recovery	0.90	(0.91)
Capital cost	(0.13)	0.13
Operating cost	(0.63)	0.62
Discount rate	(0.23)	0.24

Sensitivity analysis does not reflect changes in mine plans or costs with changes in above items.

The after-tax NPV of the LOM plan is most sensitive to copper price, followed by grades and recovery, and then operating costs. The sensitivity analysis does not reflect changes in mine plans or costs with changes in the reported driver. Sustained periods in these economic scenarios would warrant a re-evaluation of the LOM plan assumptions, mine plan development, and reported mineral reserves.

Table 19.3 summarizes the LOM plan including the annual metal production volumes, mine plan schedule, capital and operating cost estimates, unit net cash costs, and unleveraged after-tax free cash flows over the life of the property. Free cash flow is the operating cash flow less the capital costs and is a key metric to demonstrate the cash that the property is projected to generate from its operations after capital investments for the reserve production plan at assumed pricing and cost assumptions. The property's ability to create value from the reserves is determined by its ability to generate positive free cash flow. The summary demonstrates the favorable free cash flow generated from the property's LOM plan under the assumptions. This economic analysis supports the economic viability of the mineral reserves statement.

Table 19.3 – LOM Plan Summary

	2023-2027	2028-2032	2033-2042	2043-2052
Metal Prices				
Copper ($ per pound)	$3.00	$3.00	$3.00	$3.00
Molybdenum ($ per pound)	$12	$12	$12	$12
Silver ($ per ounce)	$20	$20	$20	$20
Annual Averages				
Copper (billion pounds/year)	0.96	1.05	1.00	0.79
Molybdenum (million pounds/year)	23	25	26	20
Silver (million ounces/year)	3.6	4.1	4.0	3.2
Ore processed (million metric tons/year)	164	161	155	112
Copper grade (%)	0.32	0.34	0.34	0.37
Copper metallurgical recovery (%)	83.1	88.2	89.7	89.8
Copper revenues ($ billions/year)	$2.89	$3.16	$3.01	$2.38
Molybdenum and silver revenues/by-product credits ($ billions/year)	$0.31	$0.33	$0.34	$0.27
Royalties ($ billions/year)	$0.01	$0.01	$0.01	$0.00
Corporate taxes ($ billions/year)	$0.18	$0.20	$0.18	$0.22
Capital costs ($ billions/year)	$0.24	$0.24	$0.24	$0.04
Site cash operating costs ($ billions/year)	$1.80	$1.91	$1.97	$1.31
Unit net cash cost ($ per pound)	$1.98	$1.94	$2.08	$1.76
Free cash flow ($ billions/year)	$0.51	$0.62	$0.47	$0.61

Summary of annual cash flow forecast based on annual production schedule for the life of the property.

NOTE: The purpose of the presented figures is to demonstrate the economic viability of the mineral reserves. Given the long-lived nature of the reserves, and inherent variability in the timing of capital expenditures and annual mine planning processes, the annual cash flows may vary in subsequent disclosures. Investors are cautioned that the above is based upon certain assumptions which may differ from FCX's long-term outlook or actual financial results, including, but not limited to, metal prices, escalation assumptions, and other technical inputs. Significant variation of metal prices, costs, and other key assumptions may require modifications to mine plans, models, and prospects.

20 ADJACENT PROPERTIES

As of December 31, 2022, there are no adjacent properties impacting the Cerro Verde mine mineral reserve or mineral resource estimates.

21 OTHER RELEVANT DATA AND INFORMATION

There have been news articles identifying the mining industry as a potential area for review for increased participation of Peruvian state revenues potentially through increased taxes, royalties, or other such programs. The mineral reserve and resource estimates in this TRS use the assumptions as previously stated; however, increased taxation would have a direct impact on the cash flows of the property. Any enacted legislation would be incorporated into future mineral reserve and resource estimates.

Political uncertainty has created potential instability in the regulatory environment in Peru. There have been widespread and sometimes violent political protests, including attacks on civil infrastructure and businesses, which have resulted in delays in the transport of supplies, products, and people at the Cerro Verde mine. Although the impact on mine supplies has been limited and the Cerro Verde mine continues to operate safely, the situation in Peru remains uncertain, and there is a risk that the protests could negatively impact operations. Any sustained impacts to operations would be incorporated into future mineral reserve and resource estimates.

In the opinion of the QPs, there is no additional information necessary for the mineral reserve and mineral resource estimates in this TRS. Further discussion regarding operational risks, health and safety programs, and other business aspects of the mine are available in FCX's Annual Report on Form 10-K for the year ended December 31, 2022.

22 INTERPRETATION AND CONCLUSIONS

Estimates of mineral reserves and mineral resources are prepared by and are the responsibility of FCX employees. All relevant geologic, engineering, economic, metallurgical, and other data is prepared according to FCX developed procedures and guidelines based on accepted industry practices. FCX maintains a process of verifying and documenting the mineral reserve and mineral resource estimates, information for which are located at the mine site and FCX corporate offices. FCX conducts ongoing studies of its ore bodies to optimize economic value and to manage risk.

FCX and the QPs believe that the geologic interpretation and modeling of exploration data, economic analysis, mine design and sequencing, process scheduling, and operating and capital cost estimation have been developed using accepted industry practices and that the stated mineral reserves and mineral resources comply with SEC regulations. Periodic reviews by third-party consultants confirm these conclusions.

The Cerro Verde mine is a large-scale producing mining property that has been operated by FCX and its predecessors for many years. Mineral reserve and mineral resource estimates consider technical, economic, environmental, and regulatory parameters containing inherent risks. Changes in grade and/or metal recovery estimation, realized metal prices, and operating and capital costs have a direct relationship to the cash flow and profitability of the mine. Other aspects such as changes to environmental or regulatory requirements could alter or restrict the operating performance of the mine. Significant differences from the parameters used in this TRS would justify a re-evaluation of the reported mineral reserve and mineral resource estimates. Mine site administration and FCX dedicate significant resources to managing these risks.

23 RECOMMENDATIONS

Although ongoing initiatives in productivity and recovery improvements are underway, the mineral reserves and mineral resources are based on the stated long-term metal prices and corresponding technical and economic performance data.

No recommendations for additional work are identified for the reported mineral reserves and mineral resources as of December 31, 2022.

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25 RELIANCE ON INFORMATION PROVIDED BY THE REGISTRANT

FCX is experienced in managing the challenges and requirements of operating at local, regional, national, and international levels to support requirements for successfully mining metals throughout the world, using functioning divisions, departments, and teams, organized at mine sites and at the corporate level, that are tasked with meeting and supporting FCX business and operations requirements. These closely integrated departments are focused on subjects that may be peripheral to the direct production of salable metals but are essential to meeting all business requirements for FCX and to navigating the many aspects of modern mining.

As an illustrative example of the FCX organization, within the Office of President, there are departments of Financial and Operational Analysis, Information Services, Administration and Sales, Business Development and Growth, General Counsel, Global Strategic Relations, Government Relations, Communications, Finance, Accounting, Tax, and Investor Relations. Other corporate teams are similarly organized to provide additional broad services. These departments support and integrate with the operating divisions providing requirements and information. A mine site, as part of the operating divisions, will be organized into its own management teams including Mine Management, Operations, Maintenance and Construction, Processing Management, Finance and Accounting, Social Responsibility and Community Development, Environmental, Regional Supply Chain, and Human Resources. These staffed teams are organized to provide responses to the many mining requirements, and they have experience in conducting their specific duties. They represent reliable sources for information and as such, they have been consulted to prepare, support, and characterize the information in this TRS.

Specific to the preparation of this TRS, FCX departments have provided the following categories of information:

- Macro-economic trends, data, interest rates, and assumptions.
- Marketing information.
- Legal matters outside of QP expertise.
- Environmental matters outside of QP expertise.
- Accommodations through community development to local groups.
- Governmental factors outside of QP expertise.

The QPs prepared Sections 3, 4, 5, 15, 16, 17, 18, 19, 20, and 21 of this TRS in reliance on the information provided by FCX above.

As explained, FCX corporate and mine site divisions that provided information for this TRS are business-directed areas that must produce reliable information in support of FCX business objectives. This organizational form contributes to producing expected results for FCX and provides appropriate information supporting mineral reserves and mineral resource estimates.

26 GLOSSARY – UNITS OF MEASURE AND ABBREVIATIONS

Unit	*Unit of Measure*
#	number
$	U.S. Dollar
%	percent
dmt	dry metric ton
g	gram
kg	kilogram
km	kilometer
kV	kilovolt
kWh	kilowatt-hour
lb	U.S. pound
m	meter
M	million
Ma	million years (annum)
oz	troy ounce
wmt	wet metric ton

Abbreviation	*Description*
AAS	Atomic Absorption Spectroscopy
ASCu	Acid-Soluble Copper
BV	Compañia de Minas Buenaventura S.A.A.
BWI	Bond Work Index
CN	Cerro Negro deposit
CNCu	Cyanide-Soluble Copper
CV	Cerro Verde deposit
CVPU	Cerro Verde Production Unit
CVPUE	CVPU Expansion
EqCu	Equivalent Copper Grade
ESIS	Environmental and Social Impact Studies
EW	Electrowinning
FCX	Freeport-McMoRan Inc. and its consolidated subsidiaries
GPS	Global Positioning System
HPGR	High-Pressure Grinding Roll
IDW	Inverse Distance Weighting
Ing. Geol.	Geological Engineer (Peru)
LOM	Life-of-Mine
MINEM	Ministry of Energy and Mines (Peru)
NA	Not Applicable
NN	Nearest Neighbor
NPV	Net Present Value
OK	Ordinary Kriging
P.Eng.	Professional Engineer (Canada)
P.Geo.	Professional Geologist
PDC	Phelps Dodge Corporation
PLS	Pregnant Leach Solution
QA/QC	Quality Assurance and Quality Control
QEMScan	Quantitative Evaluation of Minerals by scanning electron microscopy
QLT	Quick Leach Test, ferric sulfate-soluble copper assay
QP	Qualified Person
RC	Reverse Circulation
RM-SME	Registered Member of the Society of Mining, Metallurgy and Exploration (U.S.)
ROM	Run of Mine
RQD	Rock Quality Designation
SEC	Securities and Exchange Commission (U.S.)
SEDAPAR	Water and Sewage Service Company of Arequipa, Peru
SG	Specific Gravity

SGS	*SGS Group laboratories (Peru)*
S-K1300	*Subpart 1300 of SEC Regulation S-K*
SMCV	*Sociedad Minera Cerro Verde S.A.A.*
SMM	*SMM Cerro Verde Netherlands B.V.*
SR	*Santa Rosa deposit*
SX	*Solution Extraction*
SX/EW	*Solution Extraction and Electrowinning*
TAs	*Total Arsenic*
TCT	*FCX's Technology Center facilities in Tucson, Arizona, U.S.*
TCu	*Total Copper*
TFe	*Total Iron*
TMo	*Total Molybdenum*
TRS	*Technical Report Summary*
TSF	*Tailings Storage Facility*
U.S.	*United States*
WIP	*Work-In-Process*
WWTP	*Wastewater Treatment Plant*
XRD	*X-ray Diffraction*